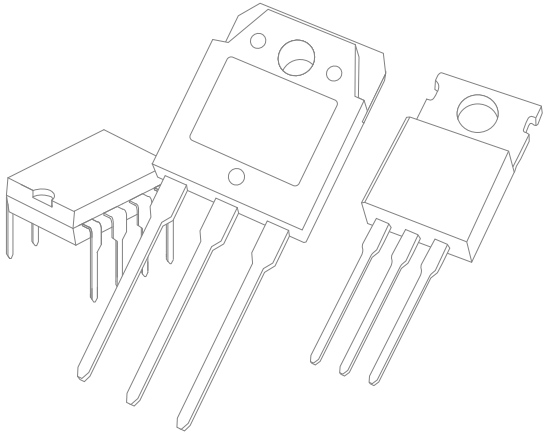
SAMWIN® 产品手册

XI'AN SEMIPOWER ELECTRONIC TECHNOLOGY CO.,LTD.

超结MOSFET专辑 · 2016



芯派科技 SEMiPOWER

芯源科技 SAMWIN

SAMWIN® 产品手册

CATALOG OF SAMWIN

超结MOSFET系列 · 2016

西安芯派电子科技有限公司是一家专业从事功率场效应管及电源管理IC研发、生产和销售的高新技术企业。

公司于2008年在西安高新技术产业开发区注册成立，位于高新区创新大厦。高新区优惠的扶持政策、西安丰富的人力资源和公司对创新型、高品质产品的坚持，使公司迅速成长为国内一流的功率器件供应商。公司拥有的自主品牌 Samwin® 系列产品已在手机充电器、UPS电源、便携及台式计算机电源、汽车逆变电源、HID汽车照明、LED照明以及电动车、手持电动工具等多个领域得到广泛应用。国际国内知名品牌APPLE、SAMSUNG、联想、华为、小米、OPPO、魅族等手机的充电器，飞利浦的节能灯、LED照明电源、蓝光DVD，GE的LED照明电源，惠普、华硕电脑的电源适配器，乐视的机顶盒，NFA的车用逆变电源，科士达的UPS等电子产品中已大量使用 Samwin® 品牌的产品。公司良好的企业信誉及稳定的产品质量，在电源行业得到了普遍的认同并赢得广泛赞誉。

2011年7月，公司携手西安高新创业园，总投资3500万元建立了国内首家半导体功率器件及电源管理集成电路测试应用中心。依托先进的实验设备和能力，以及所拥有的优秀核心技术团队，芯派科技能够为广大客户和提供更为专业、更为完整的数据分析、产品性能对比、可靠性试验、失效分析、完整解决方案等技术支持，为我们的合作伙伴提供更为高效可靠的测试与分析服务。

公司本着“创新、诚信、和谐、感恩”的经营理念，将一如既往地为客户提供优质的产品、完善的服务及全方位的技术支持。愿芯派科技成为您忠诚的合作伙伴，愿 Samwin® 系列产品成为您绿色电源系统的最佳选择。

合作高校

西北大学 信息科学与技术学院 软件学院 NORTHWEST UNIVERSITY
西北工业大学 软件与微电子学院
西安理工大学 XIAN UNIVERSITY OF TECHNOLOGY
西安电子科技大学 微电子学院 XiDian University School Of Microelectronics
西安交通大学 电子与信息工程学院微电子系 XIAN JIAOTONG UNIVERSITY
西安邮电大学 电子工程学院
西安科技大学 电气与控制工程学院
长安大学 电子与控制工程学院

联合实验室

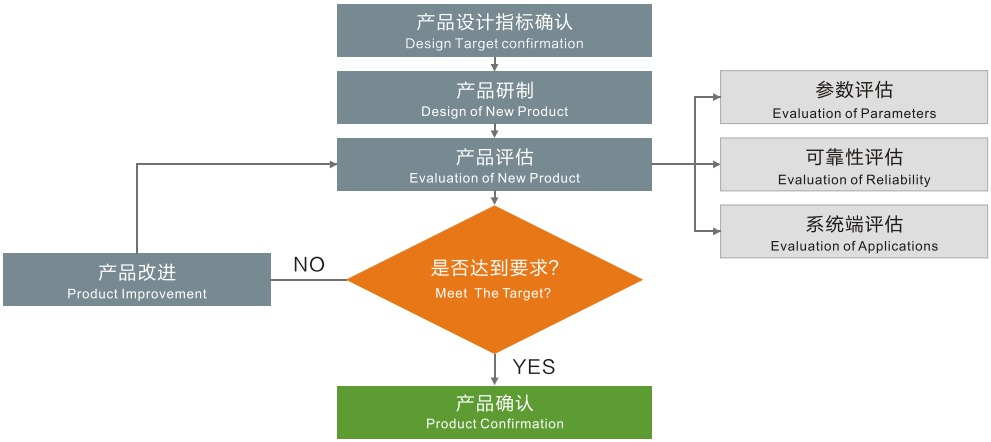
sti YOUR DISCRETE TEST SOURCE SCIENTIFIC TEST,INC.
ITC Integrated Technology Corporation
Qualmark Accelerated ReNability Testing Systems
Vötsch Industrietechnik 德国富奇公司
PVA TePla
ANALYSI TECH
HIRAYAMA
Agilent Technologies

公司荣誉

- 国家级高新技术企业
- 国家集成电路设计企业
- 国家CNAS认证实验室
- 国家发改委专项资金支持企业
- 中国电源协会常务理事单位
- 科技部指定大学生科技创业见习基地
- 陕西省半导体功率器件测试应用中心
- 陕西省半导体行业协会常务理事单位
- 西安市企业技术中心
- 西安市科技局专项资金资助企业
- 通过ISO9001:2008质量管理体系认证
- 通过ISO14001:2004环境管理体系认证
- 产品通过国防科工委可靠性评测
- 产品全线通过RoHS、REACH、无卤HF认证

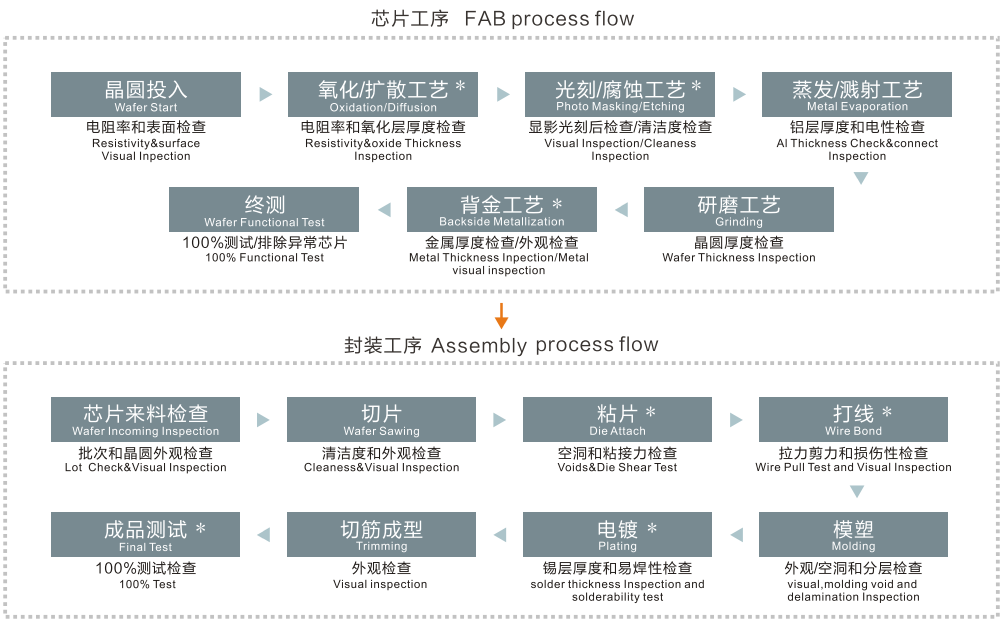
产品设计流程

PRODUCT DESIGN PROCESS



产品工序流程

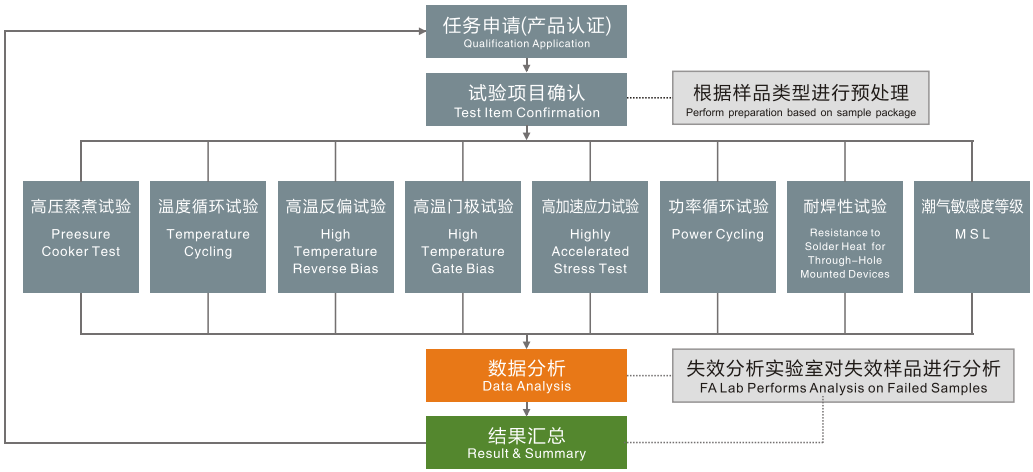
PRODUCT PROCESS FLOW



*：Critical-To-Quality 品质关键点。

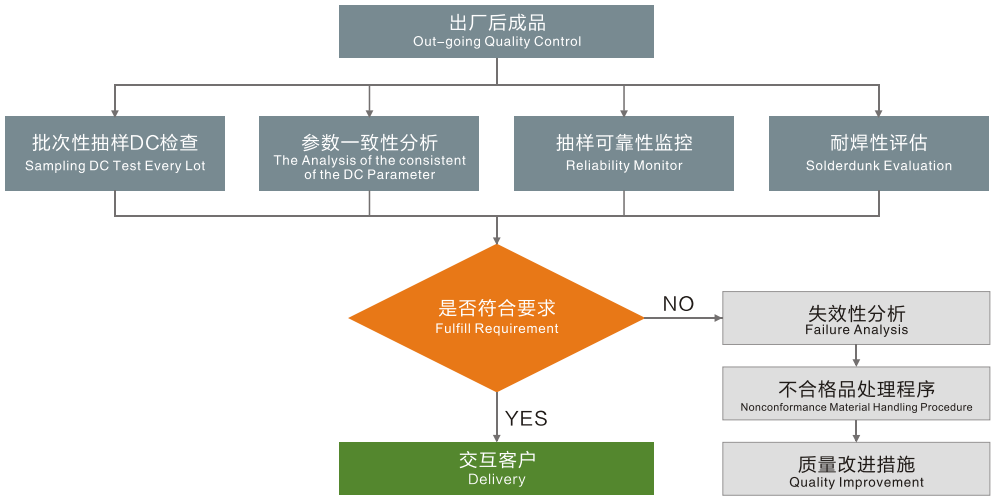
产品认证流程

PRODUCT QUALIFICATION PROCESS



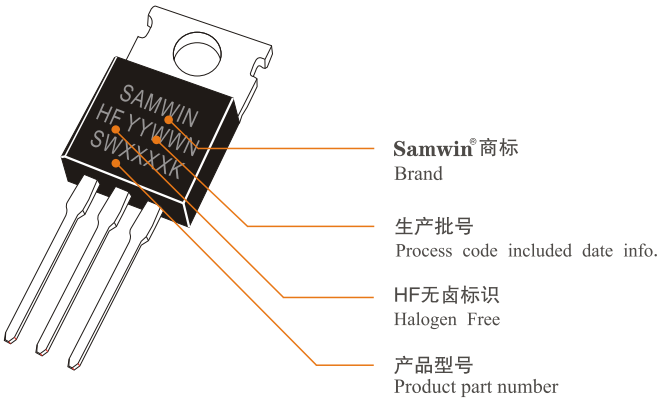
出厂质量控制体系

OUT-GOING QUALITY CONTROL



激光打印说明

Describe Laser Marking



产品编码说明

DESCRIPTION OF PRODUCT PART NUMBER

SW P 10 N 65 K***

耐压（X10） Breakdown Voltage Rating(divided by 10)

沟道类型 Channel Type

电流 Current Rating

Samwin®

封装类型 Package Type

版本编码 Tech.Platform

P	TO-220
F	TO-220F
I	TO-251
D	TO-252
L	TO-126
C	TO-92
U	TO-262
B	TO-263
W	TO-3P
...	

K	一代超结产品
K2	二代超结产品
KF	体二极管带快恢复功能的一代超结产品
K2F	体二极管带快恢复功能的二代超结产品

西安功率器件测试应用中心

XI'AN SEMIPOWER TESTING AND APPLICATION CENTER

● 应用/系统测试实验室 ● 可靠性实验室 ● 器件测试实验室 ● 失效分析实验室

西安市半导体功率器件测试应用中心是一家提供半导体功率器件和电源管理集成电路测试及分析的开放型中心。测试应用中心目前已累计投资3500万元，由应用/系统测试实验室、可靠性实验室、器件测试实验室和失效分析实验室四个部分构成。实验项目涵盖了功率器件研发、生产、应用各个环节需要的全面测试与分析。中心拥有先进的设施设备100余台，经验丰富的专业人员40余名，并已通过国家CNAS及国际ILAC认可。

作为开放型测试应用中心，我们本着尊重科学，共同发展的理念，与国内外企业、学校、科研单位展开了广泛的合作，成为Globbal Sources的合作伙伴，美国ITC、STI、Qualmark、Annatech公司、德国PVA、Votsch公司合作实验室、中国电源学会等著名商业机构及国内学术机构的指定测试应用实验室，并积极开展技术研讨会、高校联合培养、行业培训、学生实习等多种技术交流与推广活动，获得很好的效果和评价。我们热忱地欢迎有志于功率器件研究与发展的广大工程师朋友们，以中心为平台，以设备为工具，与我们一起用我们敏锐的双眼，勤劳的双手和聪慧的大脑，去探索功率器件世界的无穷奥秘。





WWW.SEMIPOWERLAB.ORG

CNAS认证

实验设备

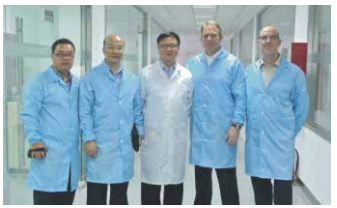
高加速寿命试验与
高加速应力筛选试验箱

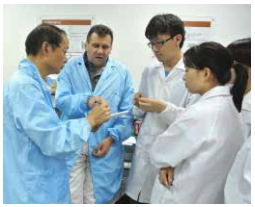
功率器件动态参数测试系统

开关电源自动测试系统

高低温循环试验箱

SEMiPOWER





参数中英文对照

PARAMETERS（CHINESE/ENGLISH）

简称	英文说明	中文说明	单位
绝对最大额定参数			
V_{DSS}	Drain to Source Voltage	漏极电压	V
I_D	Continuous Drain Current (@Tc=25℃)	漏极连续电流	A
	Continuous Drain Current (@Tc=100℃)	漏极连续电流	A
I_{DM}	Pulsed Drain Current	漏极脉冲电流	A
V_{GS}	Gate to Source Voltage	栅极电压	V
E_{AS}	Single Pulsed Avalanche Energy	单脉冲雪崩能量	mJ
E_{AR}	Repetitive Avalanche Energy	重复脉冲雪崩能量	mJ
dv/dt	Peak Diode Recovery dv/dt	二级管转换速率	V/ns
P_D	Total Power Dissipation (@Tc=25℃)	总耗散功率	W
	Derating Factor above 25℃	超过 25℃时功耗降额系数	W/℃
T_{STG},T_J	Operating junction temperature & Storage temperature	工作结温及储藏温度	℃
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.	最高焊接转导温度	℃
热特性参数			
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	热阻，结到管壳	℃/ W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	热阻，结到环境	℃/ W
电性能参数（关断参数）			
BV_{DSS}	Drain- Source Breakdown Voltage	漏极击穿电压	V
$\triangle BV_{DSS}/\triangle Tj$	Breakdown Voltage Temperature coefficient	击穿电压温度系数	V/℃
I_{DSS}	Drain-Source Leakage Current	漏极-源极漏电流	uA
I_{GSS}	Gate-Source Leakage Current	栅极-源极漏电流	nA
	Gate-Source Leakage Reverse	栅极-源及反向漏电流	nA
电性能参数（开启参数）			
V_{GS}(th)	Gate Threshold Voltage	栅极开启电压	V
$R_{DS(ON)}$	Static Drain-Source On-state Resistance	静态漏极-源极导通电阻	ohm
G_{fs}	Forward transconductance	正向跨导	S
动态参数			
Ciss	Input Capacitance	输入电容	pF
Coss	Output Capacitance	输出电容	
Crss	Reverse Transfer Capacitance	反向传输电容	
$t_{d(on)}$	Turn-on Delay Time	导通延迟时间	ns
t_r	Rise Time	上升时间	
$t_{d(off)}$	Turn-off Delay Time	关断延迟时间	
t_f	Fall Time	下降时间	
Qg	Total Gate Charge	栅极总电荷	nc
Qgs	Gate-Source Charge	栅极-源极电荷	
Qgd	Gate-Drain Charge (Miller Charge)	栅极-源极电荷：米勒电荷	
源极-漏极寄生二极管额定参数			
I_S	Continuous Source Current	源极连续电流	A
I_{SM}	Pulsed Source Current	源极脉冲电流	
V_{SD}	Diode Forward Voltage	寄生二极管电压	V
t_{rr}	Reverse Recovery Time	反向恢复时间	ns
Q_{rr}	Reverse Recovery Charge	反向恢复电荷	uc

目录 Catalog

产品方案应用

超结MOSFET选型指南

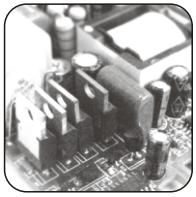
超结MOSFET规格书

目录 Catalog

产品封装说明

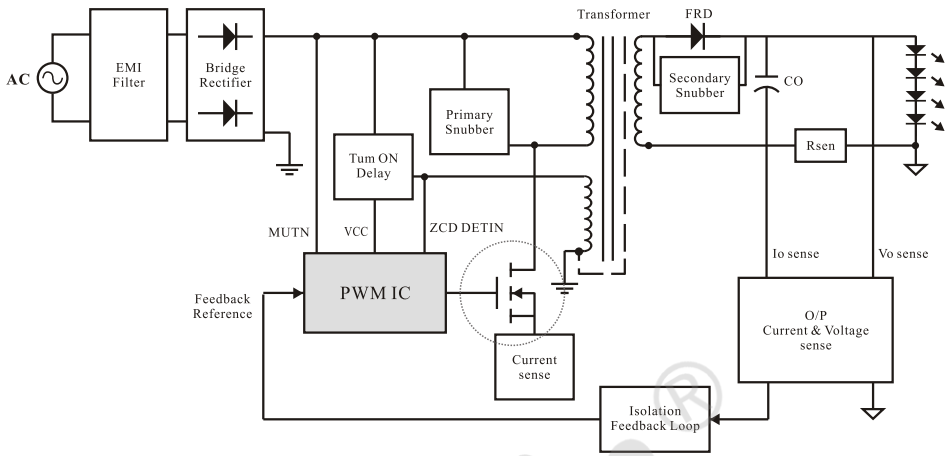
MOSFET选型指南

Samwin® 产品方案应用


PRODUCTS APPLICATION

LED驱动电源应用



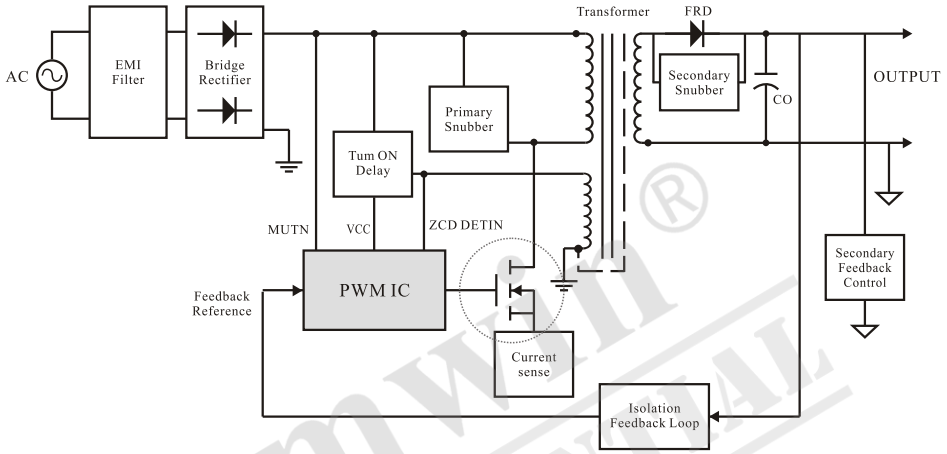
应用：球泡灯电源、 Pa灯电源、吸顶灯电源、投光灯电源、T8灯管电源、路灯电源等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW4N65K	650V	4A	1.25Ω	13nC	TO-251/TO-252/TO-220F	30W以内	高PF方案
SW4N70K	700V	4A	1.3Ω	13nC	TO-251/TO-252/TO-220F	30W以内	印度
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	36W以内	高PF方案
SW6N70K	700V	6A	1.3Ω	13nC	TO-251/TO-252/TO-220F	36W以内	印度
SW7N60K	600V	7A	0.6Ω	21nC	TO-251/TO-220F	45W以内	低PF方案
SW7N65K2	650V	7A	0.55Ω	14nC	TO-251/TO-252/TO-220F	45W以内	高PF方案
SW10N60K	600V	10A	0.4Ω	29nC	TO-220F	60W以内	低PF方案
SW10N65K	650V	10A	0.4Ω	29nC	TO-251/TO-252/TO-220F	60W以内	高PF方案
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	80W以内	高PF方案
SW16N65K	650V	16A	0.25Ω	43nC	TO-220/TO-220F	80W以内	高PF方案
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	120W以内	高PF方案

适配器充电器电源应用



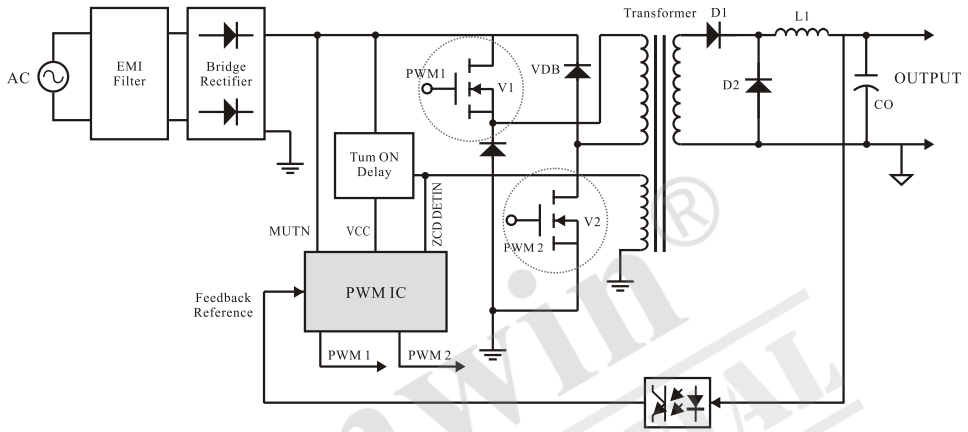
应用：便携式电源、小型适配器、充电器、能效要求较高的电源产品等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW4N60K	600V	4A	1.15Ω	13nC	TO-251/TO-252/TO-220F	24W以内	Charge/Adapter
SW4N65K	650V	4A	1.25Ω	13nC	TO-251/TO-252/TO-220F		
SW4N65K2	650V	4A	1.05Ω	7nC	TO-251/TO-252/TO-220F		
SW4N70K2	700V	4A	1.1Ω	12nC	TO-251		
SW6N65K	650V	6A	0.9Ω	17nC	TO-251/TO-252/TO-220F	30W以内	Adapter
SW6N70K2	700V	6A	1.3Ω	13nC	TO-251/TO-252/TO-220F		
SW7N65K	650V	7A	0.6Ω	21nC	TO-251/TO-252/TO-220/TO-220F	42W以内	
SW7N70K	700V	7A	0.9Ω	17nC	TO-251/TO-252/TO-220/TO-220F		
SW10N60K	600V	10A	0.4Ω	29nC	TO-220F	60W以内	
SW10N65K2	650V	10A	0.32Ω	24nC	TO-251/TO-252/TO-220F		
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	80W以内	
SW20N65K	650V	20A	0.19Ω	60nC	TO-220/TO-220F	100W以内	

双管正激开关电源应用



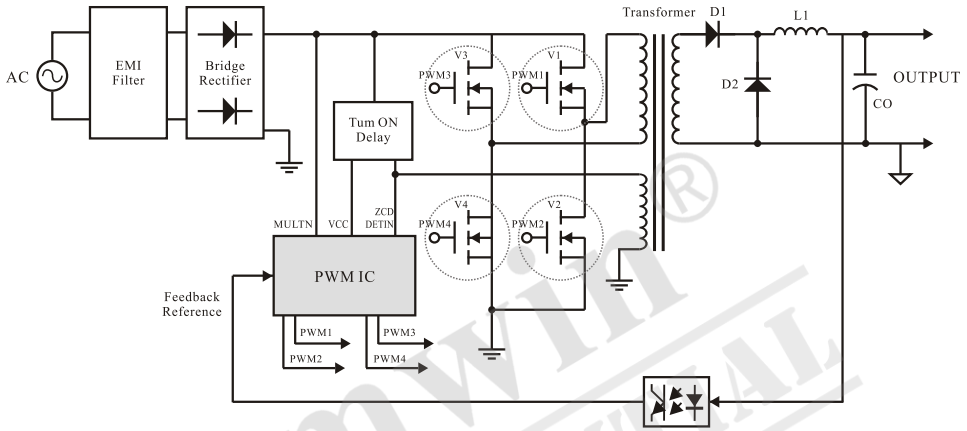
应用：工业电源、LED屏电源、蓄电瓶充电器、TV电源、PC电源、服务器电源等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	90W以内	大功率电源
SW6N70K	700V	6A	1.3Ω	13nC	TO-251/TO-252/TO-220F		
SW7N65K	650V	7A	0.6Ω	21nC	TO-251/TO-252/TO-220/TO-220F	120W以内	
SW7N70K	700V	7A	0.9Ω	17nC	TO-251/TO-252/TO-220/TO-220F		
SW8N65K2	650V	8A	0.45Ω	17nC	TO-251/TO-252/TO-220F		
SW10N60K	600V	10A	0.4Ω	29nC	TO-220F	400W以内	
SW10N65K2	650V	10A	0.32Ω	24nC	TO-251/TO-252/TO-220F		
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	500W以内	
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	700W以内	
SW25N65K	650V	25A	0.125Ω	91nC	TO-220	1KW以内	
SW38N65K2	650V	38A	0.089Ω	87.6nC	TO-220F/TO-247	1.2KW以内	
SW47N65KF	650V	47A	0.072Ω	152nC	TO-247	1.8KW以内	

全桥大功率开关电源应用



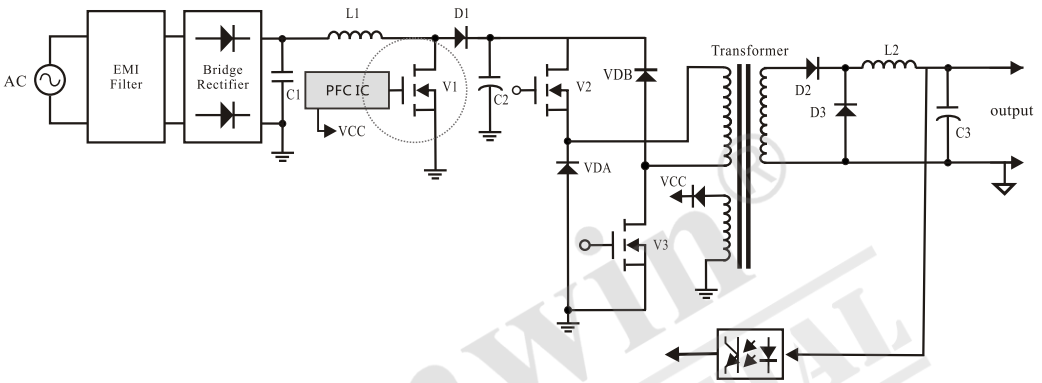
应用：工业电源、LED屏电源、蓄电瓶充电器、TV电源、PC电源、服务器电源等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	90W以内	大功率电源
SW6N70K	700V	6A	1.3Ω	13nC	TO-251/TO-252/TO-220F		
SW7N60K	600V	7A	0.6Ω	21nC	TO-251/TO-220F	120W以内	
SW7N65K	650V	7A	0.6Ω	21nC	TO-251/TO-252/TO-220/TO-220F		
SW7N70K	700V	7A	0.9Ω	17nC	TO-251/TO-252/TO-220/TO-220F		
SW8N65K2	650V	8A	0.45Ω	17nC	TO-251/TO-252/TO-220F		
SW10N60K	600V	10A	0..4Ω	29nC	TO-220F	400W以内	
SW10N65K2	650V	10A	0.32Ω	24nC	TO-251/TO-252/TO-220F		
SW16N65K	650V	16A	0.25Ω	43nC	TO-220/TO-220F	500W以内	
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	700W以内	
SW25N65K	650V	25A	0.125Ω	91nC	TO-220	1KW以内	
SW38N65K2	650V	38A	0.089Ω	87.6nC	TO-220F/TO-247	1.2KW以内	
SW47N65KF	650V	47A	0.072Ω	152nC	TO-247	1.8KW以内	

大功率电源-PFC电路应用



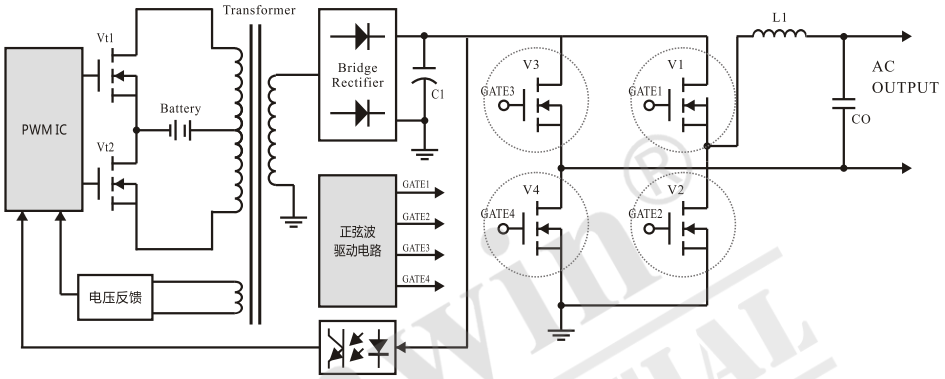
应用：大功率适配器、大功率LED驱动电源、工业电源、LED屏电源、蓄电瓶充电器、TV电源、PC电源、服务器电源、对PFC有要求的电源产品等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW4N60K	600V	4A	1.15Ω	13nC	TO-251/TO-252/TO-220F	100W以内	高PF方案
SW4N65K	650V	4A	1.15Ω	13nC	TO-251/TO-252/TO-220F		
SW4N70K	700V	4A	1.3Ω	13nC	TO-251/TO-252/TO-220F		
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	200W以内	
SW7N65K	650V	7A	0.6Ω	21nC	TO-251/TO-252/TO-220/TO-220F	300W以内	
SW10N65K2	650V	10A	0.32Ω	24nC	TO-251/TO-252/TO-220F	450W以内	
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	700W以内	
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	1KW以内	
SW25N65K	650V	25A	0.125Ω	91nC	TO-220	1.3KW以内	
SW38N65K2	650V	38A	0.089Ω	87.6nC	TO-220F/TO-247	1.7KW以内	
SW47N65KF	650V	47A	0.072Ω	152nC	TO-247	2.2KW以内	

DC-AC逆变器电源-工频转换部分电路应用



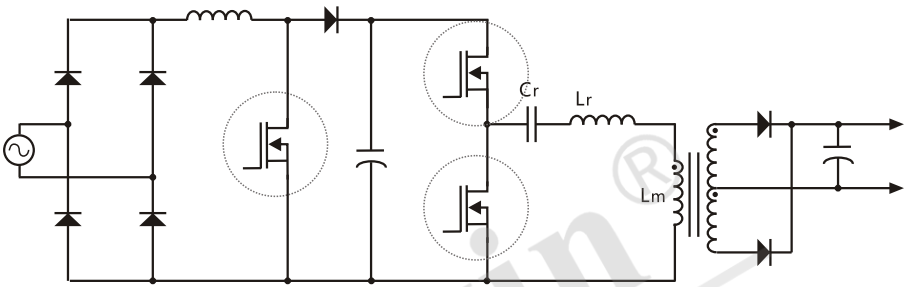
应用：工频逆变器、正弦波逆变器、车载逆变器、高频逆变器、电力逆变器、太阳能风能逆变器等。

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	90W以内	车载 工频逆变
SW6N70K	700V	6A	1.3Ω	13nC	TO-251/TO-252/TO-220F	90W以内	
SW7N65K	650V	7A	0.6Ω	21nC	TO-251/TO-252/TO-220/TO-220F	120W以内	
SW8N65K2	650V	8A	0.45Ω	17nC	TO-251/TO-252/TO-220F	120W以内	
SW10N65K2	650V	10A	0.32Ω	24nC	TO-251/TO-252/TO-220F	400W以内	电力 太阳能 风能
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	500W以内	
SW16N65K	650V	16A	0.25Ω	43nC	TO-220/TO-220F	500W以内	
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	700W以内	
SW22N65K	650V	22A	0.15Ω	76nC	TO-220	800W以内	
SW25N65K	650V	25A	0.125Ω	91nC	TO-220	1KW以内	
SW38N65K2	650V	38A	0.089Ω	87.6nC	TO-220F/TO-247	1.3KW以内	
SW43N65K	650V	43A	0.08Ω	137nC	TO-247	1.7KW以内	
SW47N65KF	650V	47A	0.072Ω	152nC	TO-247	2KW以内	

LLC开关电源应用



应用：TV电源、LED驱动电源、PC电源、服务器电源、DC-DC等

超结场效应管

SUPER JUNCTION MOSFETS

产品名称 ProductName	漏极击穿电压 BVDSS	漏极连续电流 ID	静态漏极—源极导通电阻 RDS(ON)	栅极总电荷 Qg	封装 Package	功率	场合
SW6N65K	650V	6A	0.9Ω	17nC	TO-251/TO-252/TO-220F	90W以内	大功率电源
SW6N65K2	650V	6A	0.65Ω	12nC	TO-251/TO-252/TO-220F	90W以内	
SW8N65K2	650V	8A	0.45Ω	17nC	TO-251/TO-252/TO-220F	120W以内	
SW10N60K	600V	10A	0.37Ω	29nC	TO-220F	300W以内	
SW12N65K2	650V	12A	0.28Ω	26nC	TO-220F	400W以内	
SW15N65K2	650V	15A	0.23Ω	28nC	TO-220F	500W以内	
SW16N65K	650V	16A	0.25Ω	43nC	TO-220/TO-220F	500W以内	
SW20N65K	650V	20A	0.19Ω	60nC	TO-220/TO-220F	700W以内	
SW20N65K2	650V	20A	0.17Ω	45.8nC	TO-220F	700W以内	
SW38N65K2	650V	38A	0.089Ω	87.6nC	TO-220F/TO-247	1KW以内	
SW47N65KF	650V	47A	0.072Ω	152nC	TO-247	1.8KW以内	

Samwin® 超结MOSFET 选型指南 01：

Part Number	Package	Product status	Channel Type	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd [Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
500V												
SW 4N50K	TO-251/TO-252/TO-220F	Preliminary	N	4	500	0.9	2	5	6	13	384	31
SW 5N50K	TO-251/TO-252/TO-220F	Preliminary	N	5	500	0.6	2	5	6	14	505	375
SW 7N50K	TO-251/TO-252/TO-220F	Preliminary	N	7	500	0.42	2	5	9	19	650	475
SW 10N50K	TO-220/TO-247/TO-220F	Preliminary	N	10	500	0.3	2	5	14	29	1080	52
SW 16N50K	TO-220/TO-220F	Preliminary	N	16	500	0.18	2	5	17	37	1360	945
SW 20N50K	TO-220/TO-220F	Preliminary	N	20	500	0.12	2	5	23	55	1950	1323
SW 38N50K	TO-247	Preliminary	N	38	500	0.07	2	5	40	89	4640	3140
SW 47N50K	TO-247	Preliminary	N	47	500	0.046	2	5	50	137	5140	3600
600V												
SW 2N60K	TO-251/TO-252	Production	N	2	600	2.4	2	4	3	6.5	187	8.6
SW 4N60K	TO-251/TO-252/TO-220F	Production	N	4	600	1.15	3	5	6.5	13	384	17
SW 7N60K	TO-251/TO-220F	Production	N	7	600	0.6	2.5	5	11	21	550	23
SW 10N60K	TO-220F	Production	N	10	600	0.4	2	5	14	29	1015	40
650V												
SW 4N65K	TO-251/TO-252/TO-220F	Production	N	4	650	1.25	3	5	6.5	13	384	17
SW 6N65K	TO-251/TO-252/TO-262//TO-220F	Production	N	6	650	0.9	3	5	9	17	690	18.5
SW 7N65K	TO-251/TO-252/TO-220/TO-220F	Production	N	7	650	0.6	2.5	5	10	21	638	22
SW 10N65K	TO-251N/TO-220/TO-252/TO-220F	Production	N	10	650	0.4	2	5	14	29	1015	40
SW 16N65K	TO-220/TO-220F	Production	N	16	650	0.25	2	5	19	43	1500	51
SW 20N65K	TO-220/TO-3P/TO-220F	Production	N	20	650	0.19	2	5	26	60	2150	69
SW 22N65K	TO-220	Preliminary	N	22	650	0.15	2	5	33	76	2750	1860
SW 25N65K	TO-220	Preliminary	N	25	650	0.125	2	5	39	91	3300	2230
SW 38N65K	TO-247	Production	N	38	650	0.1	2	5	44	96	3640	117
SW 38N65KF	TO-247	Production	N	38	650	0.1	2	5	44	96	3640	117
SW 43N65K	TO-247	Preliminary	N	43	650	0.08	2	5	50	137	5150	3490
SW 47N65K	TO-247	Production	N	47	650	0.072	2	5	66	152	5670	175
SW 47N65KF	TO-247	Preliminary	N	47	650	0.072	2	4	71	152	5510	186
700V												
SW 4N70K	TO-220F/TO-252/TO-251	Production	N	4	700	1.3	3	5	7	13	408	28
SW 6N70K	TO-251/TO-252/TO-220F	Production	N	6	700	1.3	3	5	7	13	383	27
SW 7N70K	TO-251/TO-252/TO-220/TO-220F	Production	N	7	700	0.9	3	5	9	17	690	18.5
SW 10N70K	TO-220F	Production	N	10	700	0.42	2	5	14	29	1015	40
SW 16N70K	TO-262/TO-263	Preliminary	N	16	700	0.27	2	5	21	42	1490	60
800V												
SW 4N80K	TO-251/TO-252/TO-220F	Preliminary	N	4	800	2.1	2	5	7	13	382	14
SW 5N80K	TO-251/TO-252/TO-220F	Preliminary	N	5	800	1.5	2	5	7	17	606	450
SW 7N80K	TO-251/TO-252/TO-220F	Preliminary	N	7	800	1.05	2	5	11	23	780	570
SW 8N80K	TO-220F/TO-251/TO-252	Preliminary	N	8	800	0.75	2	4	14	30	994	44
SW 10N80K	TO-251/TO-252/TO-220F	Preliminary	N	10	800	0.68	2	5	17	35	1296	62

Samwin® 超结MOSFET 选型指南 02：

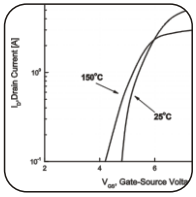
Part Number	Package	Product status	Channel Type	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
800V												
SW 16N80K	TO-220/TO-220F	Preliminary	N	16	800	0.45	2	5	20	44	1632	1134
SW 20N80K	TO-220/TO-220F	Preliminary	N	20	800	0.31	2	5	28	66	2340	1588
SW 38N80K	TO-247	Preliminary	N	38	800	0.175	2	5	48	107	5568	3768
SW 47N80K	TO-247	Preliminary	N	47	800	0.115	2	5	60	164	6168	4320
900V												
SW 4N90K	TO-220/TO-220F	Preliminary	N	4	900	1.2	2	5	12	28	710	35
SW 5N90K	TO-220/TO-220F	Preliminary	N	5	900	1	2	5	15	34	850	42
SW 6N90K	TO-220/TO-220F	Preliminary	N	6	900	0.8	2	5	18	42	1100	52
SW 8N90K	TO-220/TO-220F	Preliminary	N	8	900	0.5	2	5	29	68	1700	83
SW 10N90K	TO-220/TO-220F	Preliminary	N	10	900	0.34	2	5	41	94	2400	120

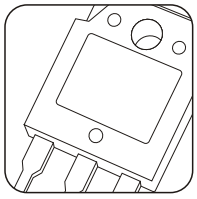
第二代超结MOSFET:

Part Number	Package	Product status	Channel Type	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
650V												
SW3N65K2	TO-251/TO-252/TO-220F	Preliminary	N	3	650	1.35	1.5	3	1.5	5.4	230	18
SW4N65K2	TO-251/TO-252/TO-220F	Production	N	4	650	1.05	1.2	3	2	7	301	23
SW6N65K2	TO-251/TO-252/TO-220F	Preliminary	N	6	650	0.65	0.73	3	3.1	12	474	25
SW7N65K2	TO-251/TO-252/TO-220F	Production	N	7	650	0.55	0.62	3	3.6	14	560	30
SW8N65K2	TO-251/TO-252/TO-220F	Production	N	8	650	0.45	0.52	3	6	17	685	36
SW10N65K2	TO-251/TO-252/TO-220F	Preliminary	N	10	650	0.32	0.4	3	6.3	24	810	33
SW12N65K2	TO-220F	Preliminary	N	12	650	0.28	0.31	3	7.1	26	1035	42
SW15N65K2	TO-220F	Production	N	15	650	0.23	0.26	3	9	28	1260	52
SW20N65K2	TO-220F	Preliminary	N	20	650	0.17	0.19	3	11.7	45.8	1700	70
SW38N65K2	TO-220F/TO-247	Preliminary	N	38	650	0.089	0.099	3	22.5	87.6	4390	130
SW38N65K2F	TO-220F/TO-247	Preliminary	N	38	650	0.089	0.099	3	22.5	87.6	4390	130
SW58N65K2	TO-220F/TO-247	Preliminary	N	58	650	0.067	0.074	3	29.8	116	4325	178
SW58N65K2F	TO-220F/TO-247	Preliminary	N	58	650	0.067	0.074	3	29.8	116	4325	178
SW69N65K2	TO-247/TO-264	Preliminary	N	69	650	0.037	0.04	3	58	220	8040	360
SW69N65K2F	TO-247/TO-264	Preliminary	N	69	650	0.037	0.04	3	58	220	8040	360
700V												
SW3N70K2	TO-251/TO-252/TO-220F	Preliminary	N	3	700	1.36	1.5	3	2.5	8.5	303	23
SW4N70K2	TO-251/TO-252/TO-220F	Preliminary	N	4	700	1.1	1.3	3	3	12	380	25
SW5N70K2	TO-251/TO-252/TO-220F	Preliminary	N	5	700	0.71	0.8	3	4.6	13.7	510	28
SW6N70K2	TO-251/TO-252/TO-220F	Preliminary	N	6	700	0.58	0.65	3	5.7	16.8	680	34
SW12N70K2	TO-251/TO-252/TO-220F	Preliminary	N	12	700	0.3	0.36	3	9	28	1280	50
800V												
SW2N80K2	TO-251/TO-252/TO-220F	Production	N	2	800	2.7	3.2	3	2	7	305	23
SW4N80K2	TO-251/TO-252/TO-220F	Production	N	4	800	0.98	1.1	3	6	17	703	35
SW8N80K2	TO-220F	Production	N	8	800	0.54	0.6	3	9	28	1290	49

Samwin®

超结MOSFET规格书



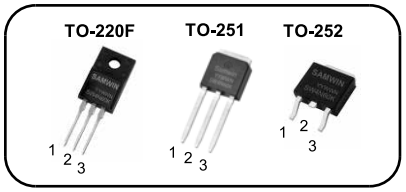


MOSFET SPECIFICATION

N-channel Enhanced mode TO-220F/TO-251/TO-252 MOSFET

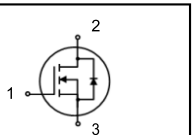
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 1Ω)@V_{GS}=10V
- Low Gate Charge (Typ 13nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Adapter,LED, Charge



1. Gate 2. Drain 3. Source

BV_{DSS} : 600V
I_D : 4A
$R_{DS(ON)}$: 1Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 4N60K	SW4N60K	TO-220F	TUBE
2	SW I 4N60K	SW4N60K	TO-251	TUBE
3	SW D 4N60K	SW4N60K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
V_{DSS}	Drain to source voltage	600			V
I_D	Continuous drain current (@T_C=25°C)	4*			A
	Continuous drain current (@T_C=100°C)	2.5*			A
I_{DM}	Drain current pulsed (note 1)	16			A
V_{GS}	Gate to source voltage	±30			V
E_{AS}	Single pulsed avalanche energy (note 2)	50			mJ
E_{AR}	Repetitive avalanche energy (note 1)	5			mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)	23.5	106.4	101.4	W
	Derating factor above 25°C	0.19	0.85	0.81	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150			°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
R_{thjc}	Thermal resistance, Junction to case	5.31	1.18	1.23	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.5	82.8		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	600			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.55		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=600V, V_{GS}=0V			1	uA
		V_{DS}=480V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=2A		1	1.15	Ω
G_{fs}	Forward transconductance	V_{DS}=20V, I_D=2A		3		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		384		pF
C_{oss}	Output capacitance			17		
C_{rss}	Reverse transfer capacitance			1.1		
$t_{d(on)}$	Turn on delay time	V_{DS}=300V, I_D=4A, R_G=25Ω, V_{GS}=10V (note 4,5)		10		ns
t_r	Rising time			25		
$t_{d(off)}$	Turn off delay time			25		
t_f	Fall time			22		
Q_g	Total gate charge	V_{DS}=480V, V_{GS}=10V, I_D=4A (note 4,5)		13		nC
Q_{gs}	Gate-source charge			3		
Q_{gd}	Gate-drain charge			6.5		

Source to drain diode ratings characteristicsa

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			4	A
I_{SM}	Pulsed source current				16	A
V_{SD}	Diode forward voltage drop.	I_S=3.5A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=4A, V_{GS}=0V, dI_F/dt=100A/us		207		ns
Q_{rr}	Reverse recovery charge			1.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 25mH, I_{AS} =2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

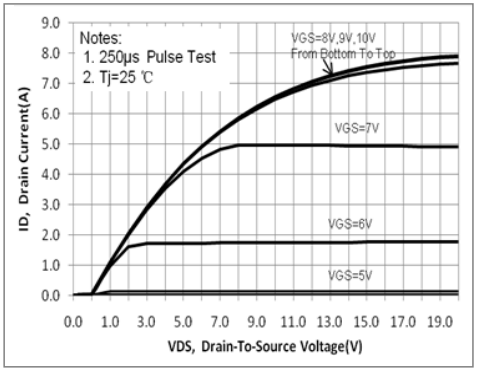


Fig. 2. On-resistance variation vs. drain current and gate voltage

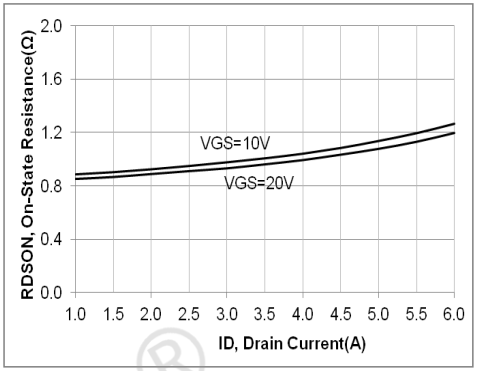


Fig. 3. Gate charge characteristics

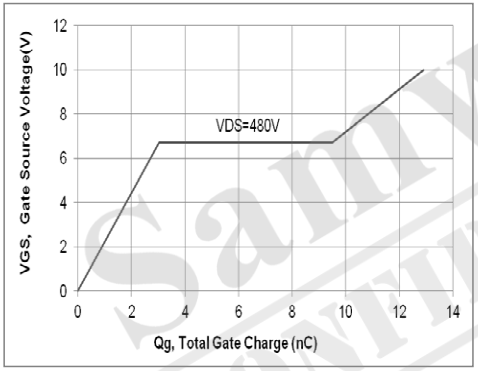


Fig. 4. On state current vs. diode forward voltage

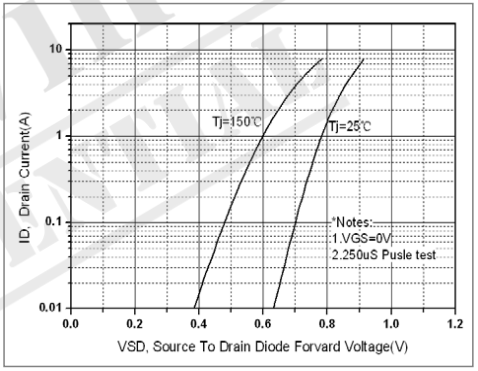


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

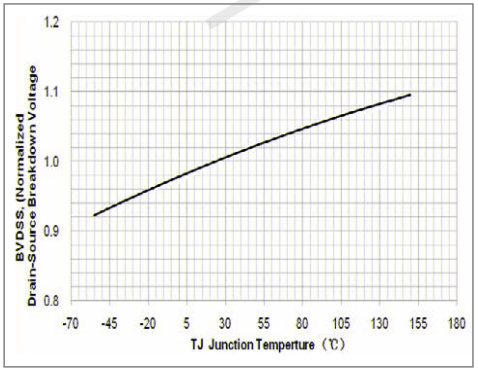


Fig. 6. On resistance variation vs. junction temperature

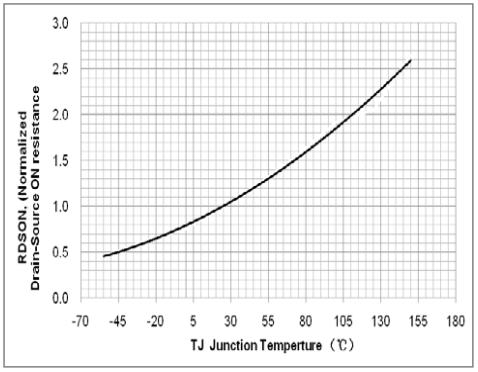


Fig. 7. Maximum safe operating area（TO-220F）

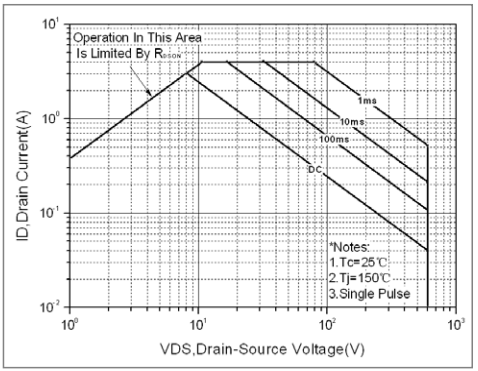


Fig. 8. Maximum safe operating area（TO-251）

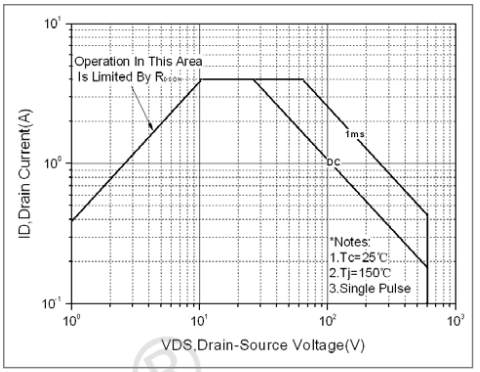


Fig. 9. Maximum safe operating area（TO-252）

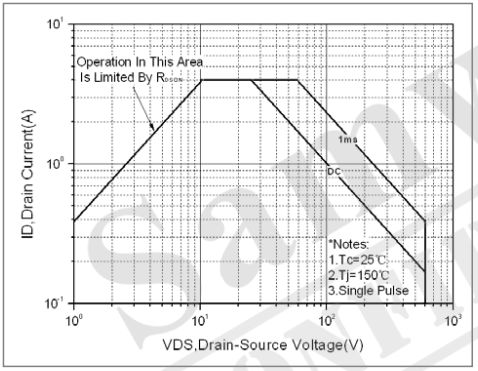


Fig. 10. Capacitance Characteristics

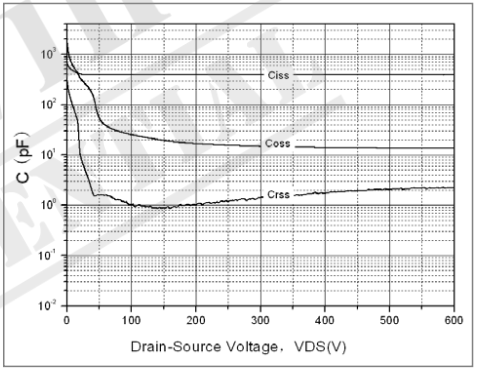


Fig. 11. Transient thermal response curve（TO-220F）

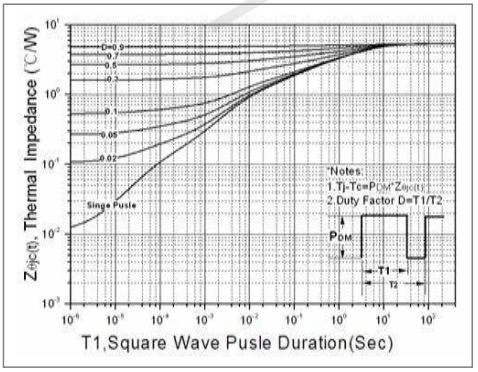


Fig. 12. Transient thermal response curve（TO-251）

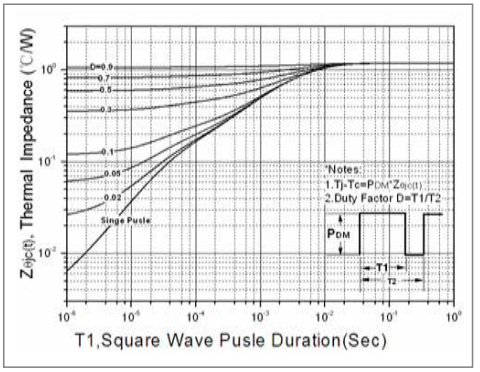


Fig. 13. Transient thermal response curve (TO-252)

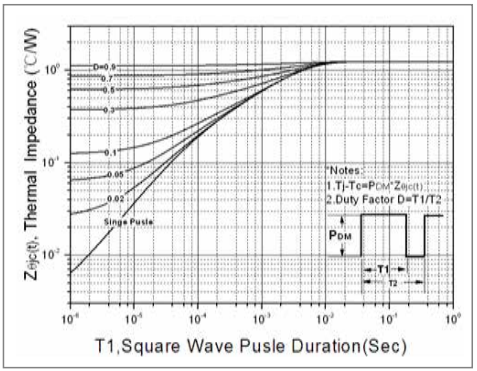


Fig. 14. Gate charge test circuit & waveform

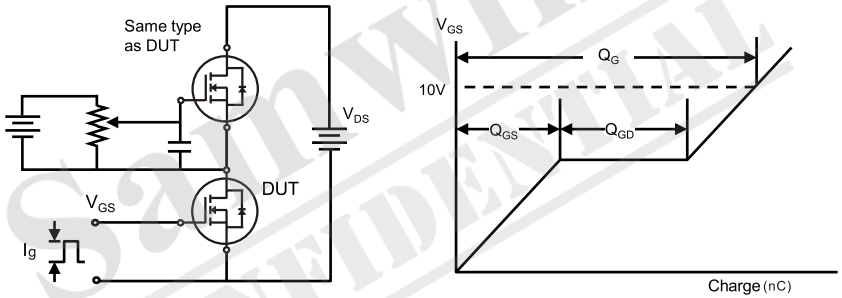


Fig. 15. Switching time test circuit & waveform

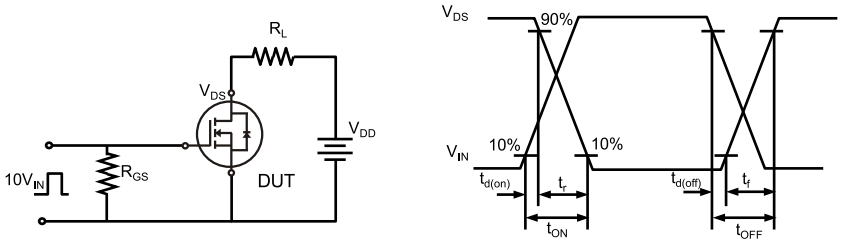


Fig. 16. Unclamped Inductive switching test circuit & waveform

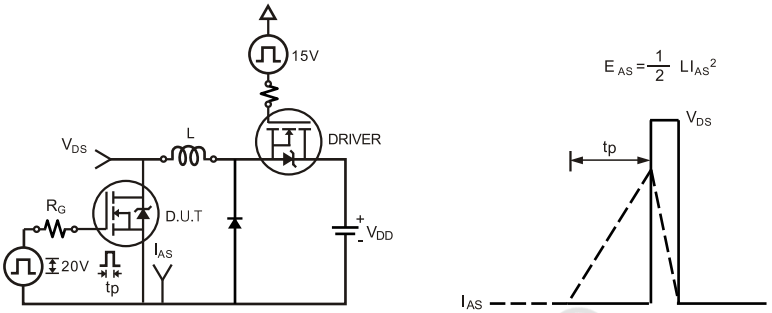
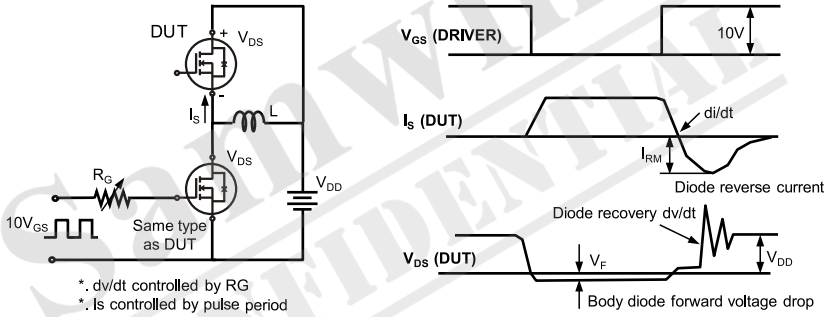


Fig. 17. Peak diode recovery dv/dt test circuit & waveform



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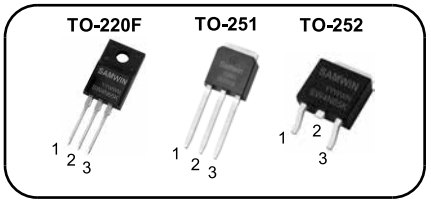
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F/TO-251/TO-252 MOSFET

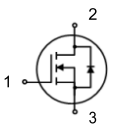
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 1Ω)@V_{GS}=10V
- Low Gate Charge (Typ13 nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Adapter,LED,Charge, TV-Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 4A
$R_{DS(ON)}$:1 Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 4N65K	SW4N65K	TO-220F	TUBE
2	SW I 4N65K	SW4N65K	TO-251	TUBE
3	SW D 4N65K	SW4N65K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
V_{DSS}	Drain to source voltage	650			V
I_D	Continuous drain current (@T_C=25°C)	4*			A
	Continuous drain current (@T_C=100°C)	2.5*			A
I_{DM}	Drain current pulsed (note 1)	16			A
V_{GS}	Gate to source voltage	±30			V
E_{AS}	Single pulsed avalanche energy (note 2)	50			mJ
E_{AR}	Repetitive avalanche energy (note 1)	5			mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)	23.5	106.4	101.4	W
	Derating factor above 25°C	0.19	0.85	0.81	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150			°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
R_{thjc}	Thermal resistance, Junction to case	5.31	1.18	1.23	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.5	82.8		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.55		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=2A		1	1.25	Ω
G_{fs}	Forward transconductance	V_{DS}=20V, I_D=2A		2.8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		384		pF
C_{oss}	Output capacitance			17		
C_{rss}	Reverse transfer capacitance			1.1		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=4A, V_{GS}=10V, R_G=25Ω (note 4,5)		10		ns
t_r	Rising time			25		
$t_{d(off)}$	Turn off delay time			26		
t_f	Fall time			22		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=4A (note 4,5)		13		nC
Q_{gs}	Gate-source charge			3		
Q_{gd}	Gate-drain charge			6.5		

Source to drain diode ratings characteristicsa

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			4	A
I_{SM}	Pulsed source current				16	A
V_{SD}	Diode forward voltage drop.	I_S=3.5A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=4A, V_{GS}=0V, dI_F/dt=100A/us		207		ns
Q_{rr}	Reverse recovery charge			1.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 25mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

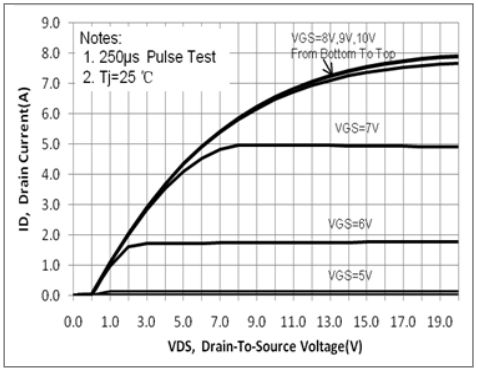


Fig. 2. On-resistance variation vs. drain current and gate voltage

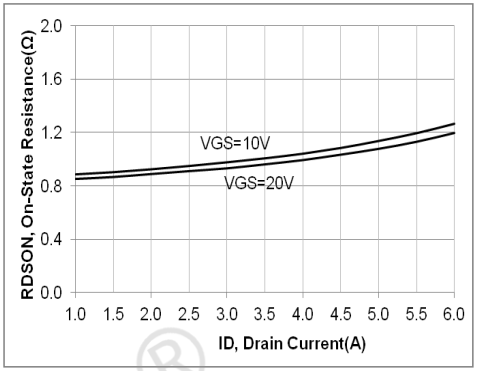


Fig. 3. Gate charge characteristics

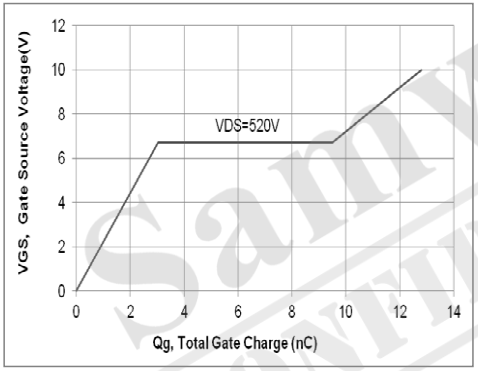


Fig. 4. On state current vs. diode forward voltage

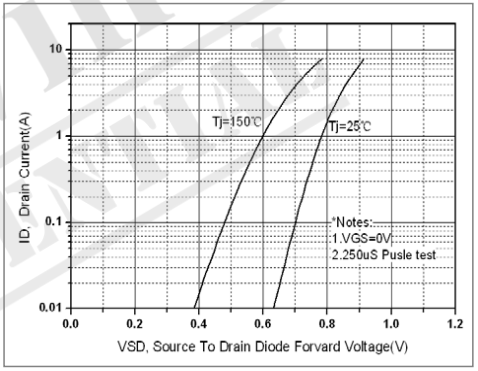


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

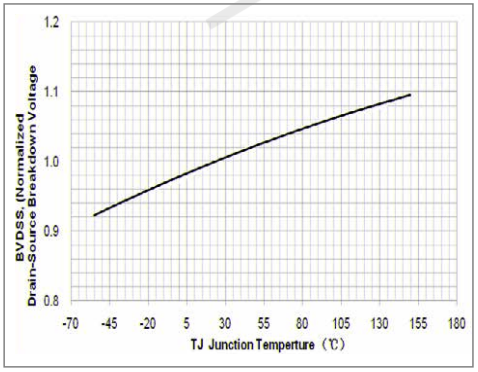


Fig. 6. On resistance variation vs. junction temperature

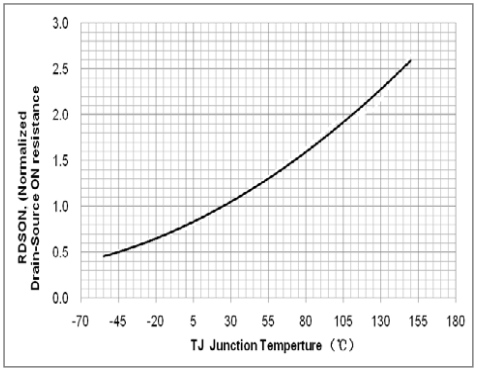


Fig. 7. Maximum safe operating area（TO-220F）

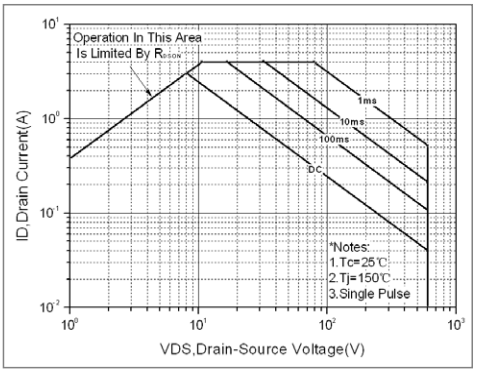


Fig. 8. Maximum safe operating area（TO-251）

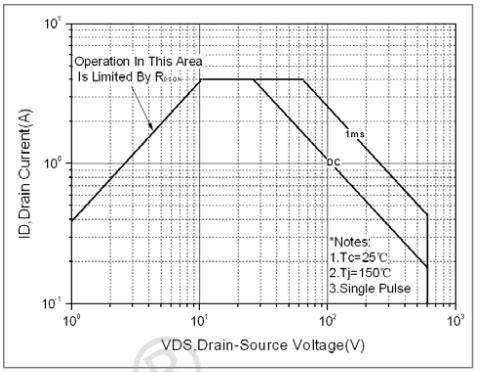


Fig. 9. Maximum safe operating area（TO-252）

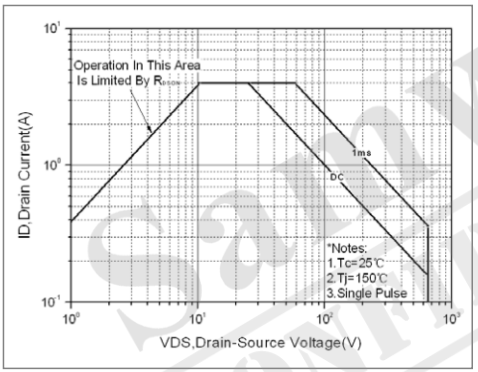


Fig. 10. Capacitance Characteristics

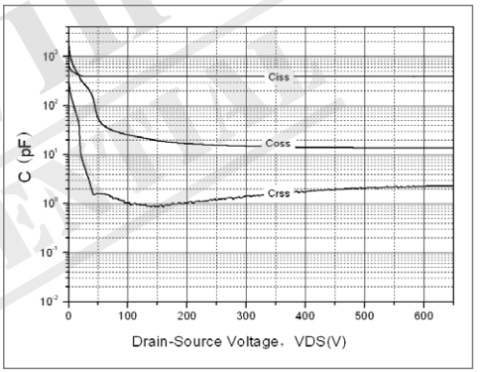


Fig. 11. Transient thermal response curve（TO-220F）

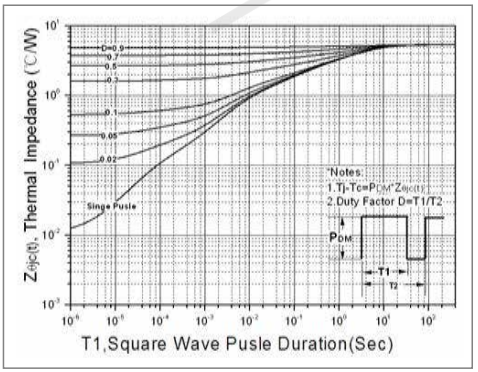


Fig. 12. Transient thermal response curve（TO-251）

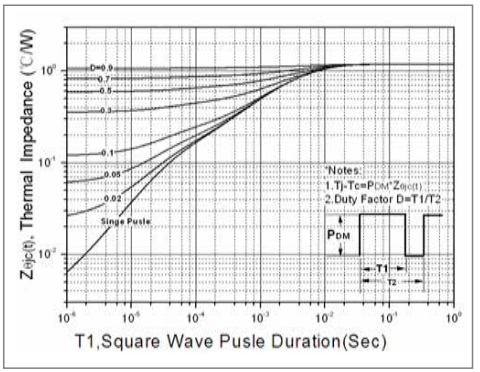


Fig. 13. Transient thermal response curve (TO-252)

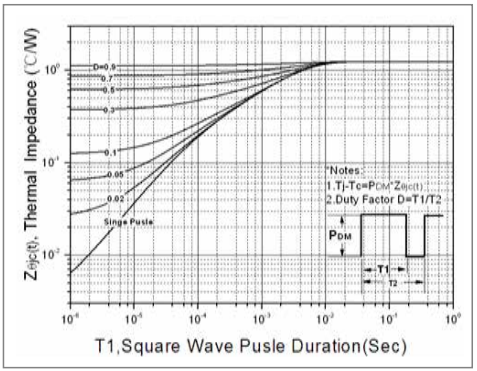


Fig. 14. Gate charge test circuit & waveform

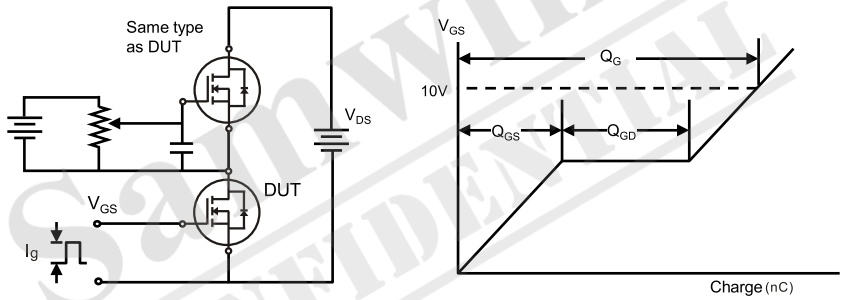


Fig. 15. Switching time test circuit & waveform

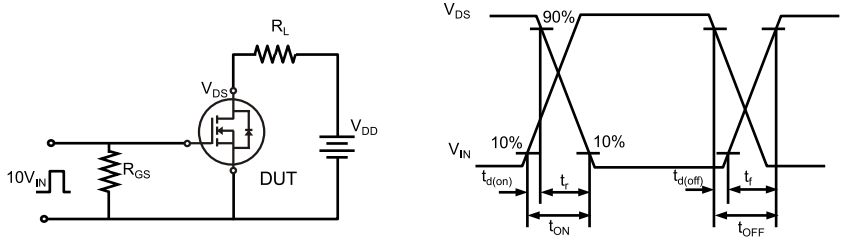


Fig. 16. Unclamped Inductive switching test circuit & waveform

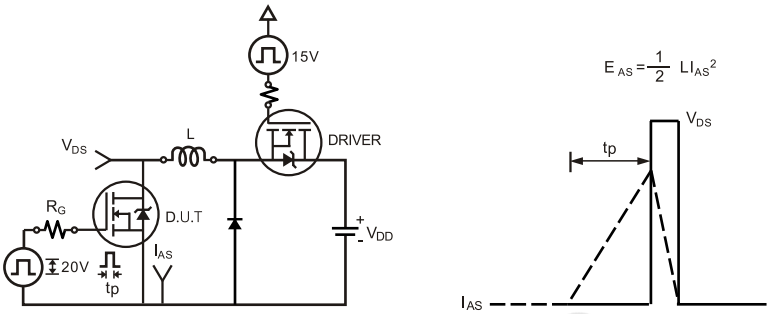
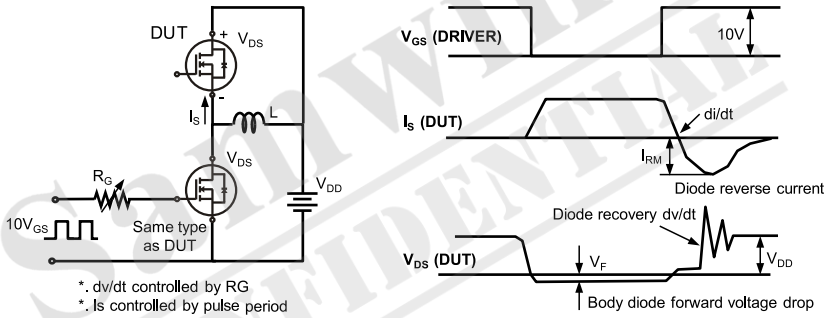


Fig. 17. Peak diode recovery dv/dt test circuit & waveform



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N-channel Enhanced mode TO-220F/TO-251/TO-252 MOSFET

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- High ruggedness
- Low $R_{DS(ON)}$ (Typ 1Ω)@V_{GS}=10V
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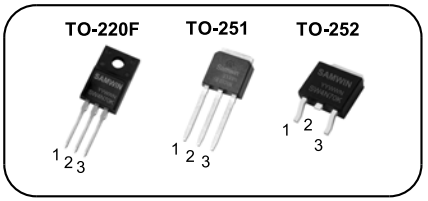
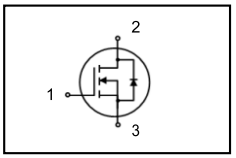


1. Gate 2. Drain 3. Source

BV_{DSS} : 700V
I_D : 4A
$R_{DS(ON)}$: 1.0Ω



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2	SW I 4N70K	SW4N70K	TO-251	TUBE
3	SW D 4N70K	SW4N70K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
V_{DSS}	Drain to source voltage	700			V
I_D	Continuous drain current (@T_C=25°C)	4*			A
	Continuous drain current (@T_C=100°C)	2.5*			A
I_{DM}	Drain current pulsed (note 1)	16			A
V_{GS}	Gate to source voltage	±30			V
E_{AS}	Single pulsed avalanche energy (note 2)	50			mJ
E_{AR}	Repetitive avalanche energy (note 1)	8			mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)	19.5	82.4	83.3	W
	Derating factor above 25°C	0.16	0.66	0.66	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150			°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
R_{thjc}	Thermal resistance, Junction to case	6.4	1.5	1.5	°C/W
R_{thja}	Thermal resistance, Junction to ambient	50	81		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	700			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.39		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=700V, V_{GS}=0V			1	uA
		V_{DS}=560V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=2A		1.0	1.3	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=2A		2.6		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		408		pF
C_{oss}	Output capacitance			28		
C_{rss}	Reverse transfer capacitance			11		
$t_{d(on)}$	Turn on delay time	V_{DS}=350V, I_D=4A, R_G=25Ω, V_{GS}=10V (note 4,5)		6.5		ns
t_r	Rising time			21		
$t_{d(off)}$	Turn off delay time			20		
t_f	Fall time			21		
Q_g	Total gate charge	V_{DS}=560V, V_{GS}=10V, I_D=4A (note 4,5)		13		nC
Q_{gs}	Gate-source charge			3.2		
Q_{gd}	Gate-drain charge			7		

Source to drain diode ratings characteristicsa

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			4	A
I_{SM}	Pulsed source current				16	A
V_{SD}	Diode forward voltage drop.	I_S=4A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=4A, V_{GS}=0V, dI_F/dt=100A/us		170		ns
Q_{rr}	Reverse recovery charge			1.4		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 44.4mH, I_{AS} = 1.5A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

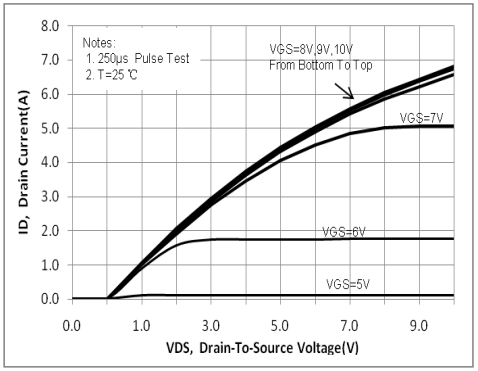


Fig. 2. On-resistance variation vs. drain current and gate voltage

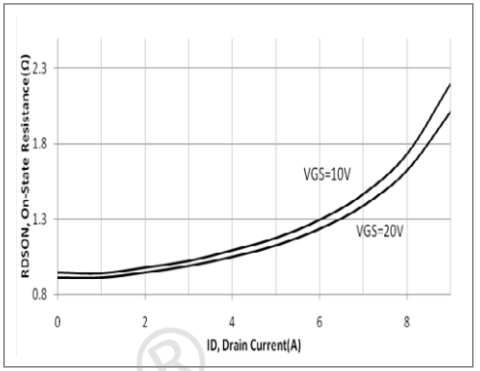


Fig. 3. Gate charge characteristics

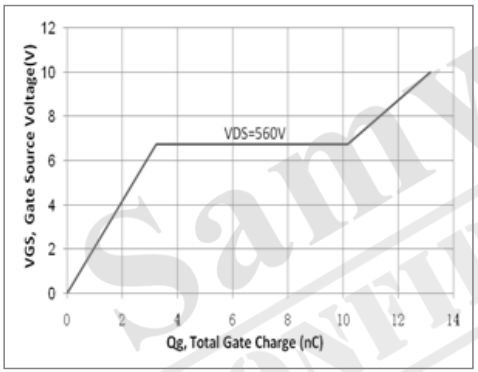


Fig. 4. On state current vs. diode forward voltage

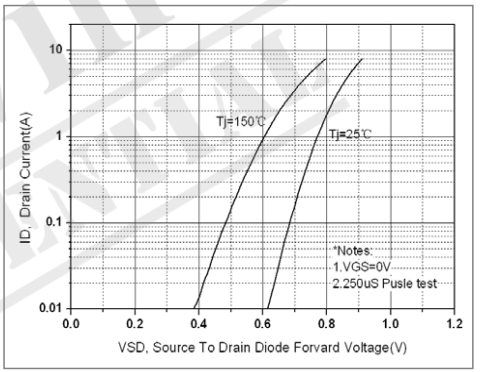


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

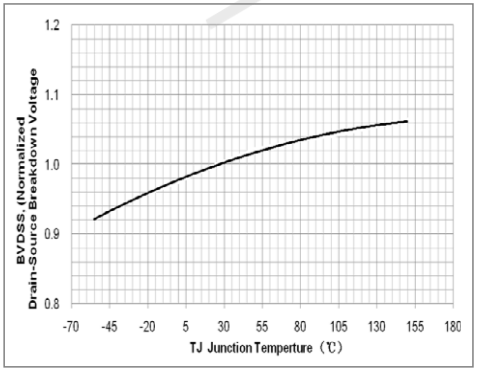


Fig. 6. On resistance variation vs. junction temperature

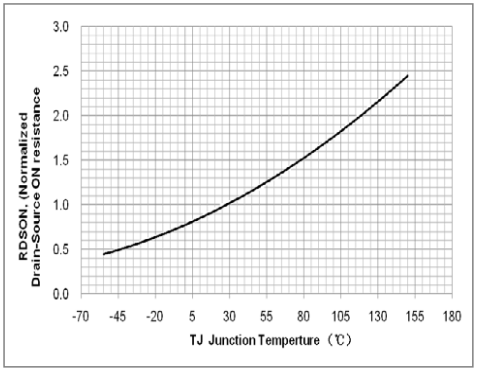


Fig. 7. Maximum safe operating area（TO-220F）

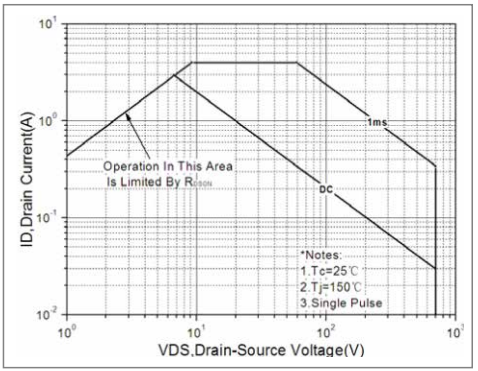


Fig. 8. Maximum safe operating area（TO-251）

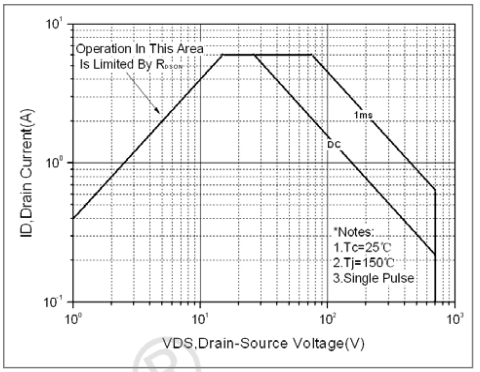


Fig. 9. Maximum safe operating area（TO-252）

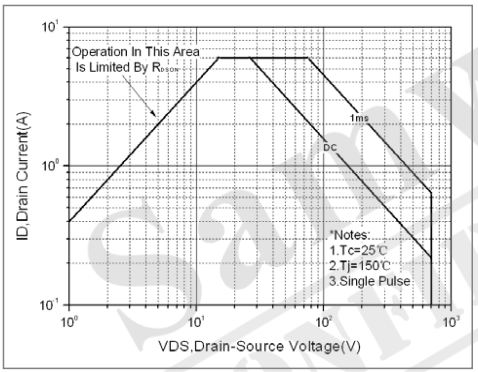


Fig. 10. Capacitance Characteristics

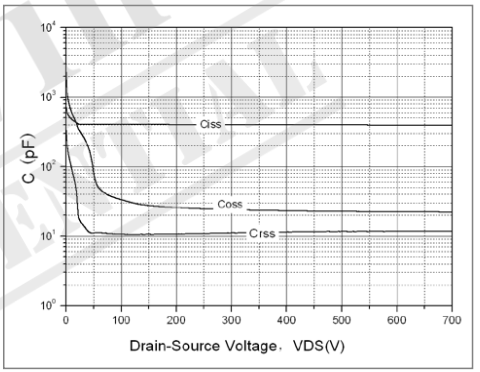


Fig. 11. Transient thermal response curve（TO-220F）

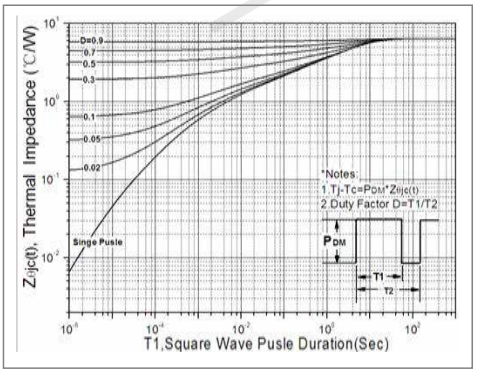


Fig. 12. Transient thermal response curve（TO-251）

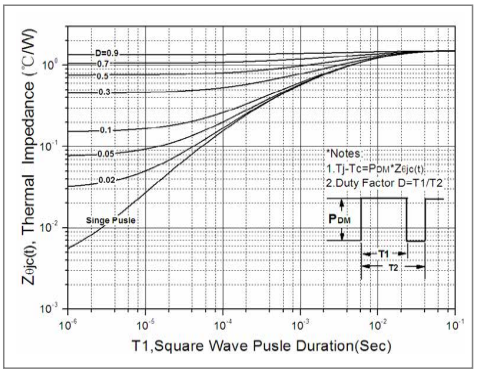


Fig. 13. Transient thermal response curve (TO-252)

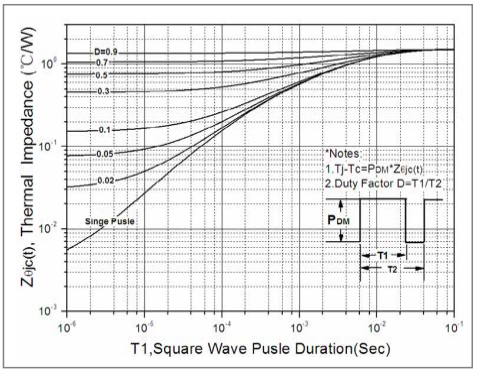


Fig. 14. Gate charge test circuit & waveform

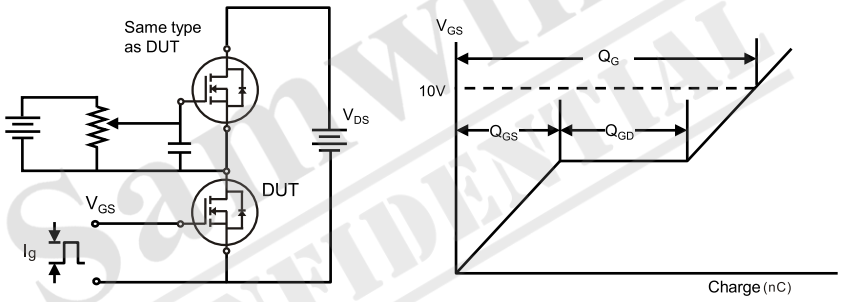


Fig. 15. Switching time test circuit & waveform

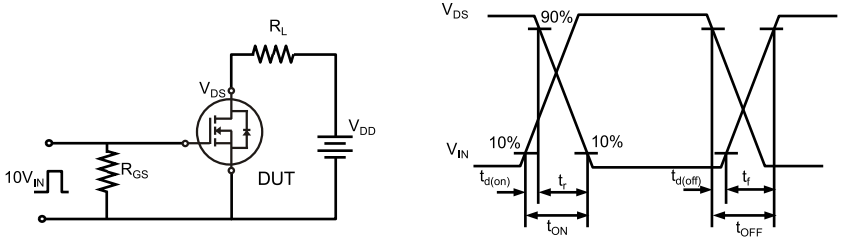


Fig. 16. Unclamped Inductive switching test circuit & waveform

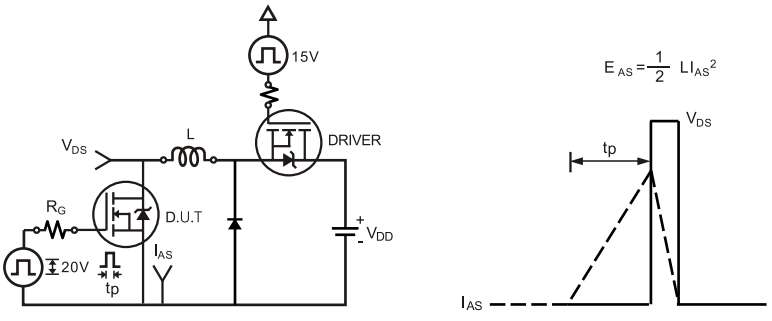
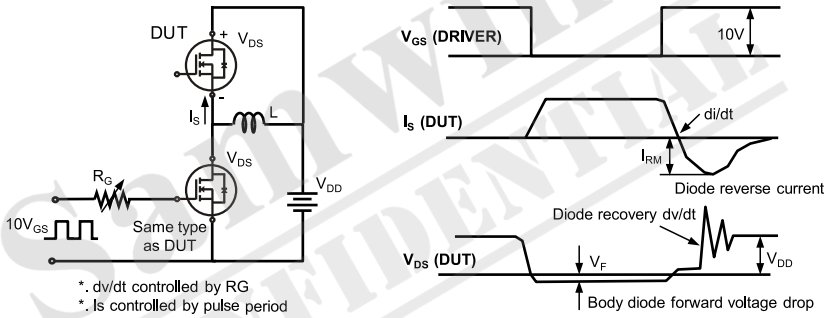


Fig. 17. Peak diode recovery dv/dt test circuit & waveform



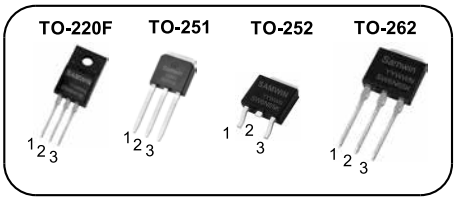
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F/TO-251/TO-252/TO-262 MOSFET

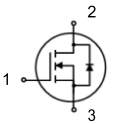
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.8Ω)@V_{GS}=10V
- Low Gate Charge (Typ 17nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Charge,LED



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 6A
$R_{DS(ON)}$: 0.8Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 6N65K	SW6N65K	TO-220F	TUBE
2	SW I 6N65K	SW6N65K	TO-251	TUBE
3	SW D 6N65K	SW6N65K	TO-252	REEL
4	SW U 6N65K	SW6N65K	TO-262	TUBE

Absolute maximum ratings

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-262	
V_{DSS}	Drain to source voltage	650				V
I_D	Continuous drain current (@T_C=25°C)	6*				A
	Continuous drain current (@T_C=100°C)	3.8*				A
I_{DM}	Drain current pulsed (note 1)	24				A
V_{GS}	Gate to source voltage	±30				V
E_{AS}	Single pulsed avalanche energy (note 2)	120				mJ
E_{AR}	Repetitive avalanche energy (note 1)	9				mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5				V/ns
P_D	Total power dissipation (@T_C=25°C)	24.5	147	156	192.3	W
	Derating factor above 25°C	0.2	1.2	1.3	1.54	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150				°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300				°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-262	
R_{thjc}	Thermal resistance, Junction to case	5.10	0.85	0.80	0.65	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.4	80.0		70	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.64		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3A		0.8	0.9	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=3A		3.5		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		690		pF
C_{oss}	Output capacitance			18.5		
C_{rss}	Reverse transfer capacitance			3.6		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=6A, R_G=25Ω, V_{GS}=10V (note 4,5)		12		ns
t_r	Rising time			30		
$t_{d(off)}$	Turn off delay time			34		
t_f	Fall time			24		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=6A (note 4,5)		17		nC
Q_{gs}	Gate-source charge			4		
Q_{gd}	Gate-drain charge			9		
R_g	Gate resistance	V_{DS}=0V, Scan F mode		2.5		Ω

Source to drain diode ratings characteristicsa

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			6	A
I_{SM}	Pulsed source current				24	A
V_{SD}	Diode forward voltage drop.	I_S=6A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=6A, V_{GS}=0V, dI_F/dt=100A/us		276		ns
Q_{rr}	Reverse recovery charge			3.4		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 60mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 6A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

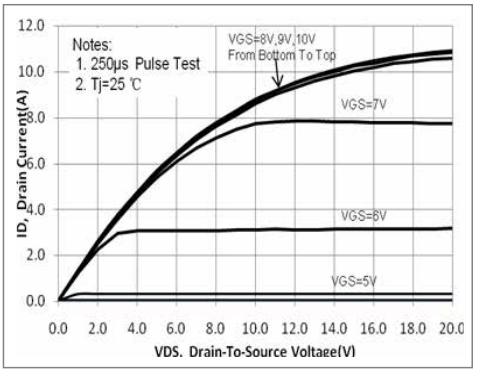


Fig. 2. On-resistance variation vs. drain current and gate voltage

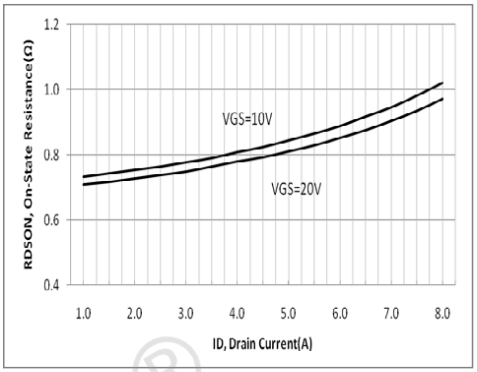


Fig. 3. Gate charge characteristics

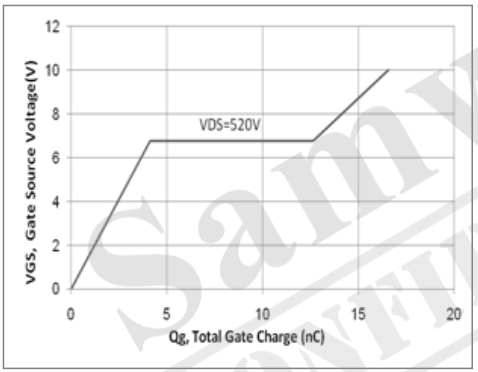


Fig. 4. On state current vs. diode forward voltage

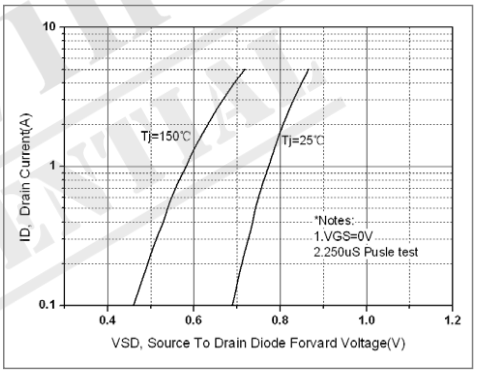


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

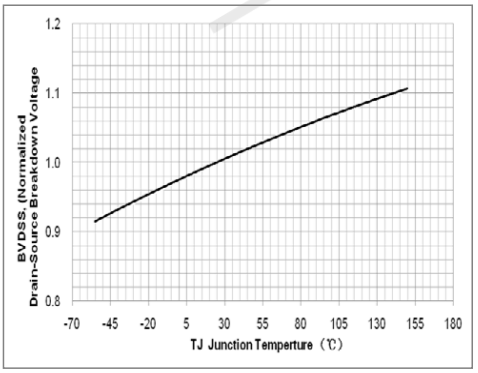


Fig. 6. On resistance variation vs. junction temperature

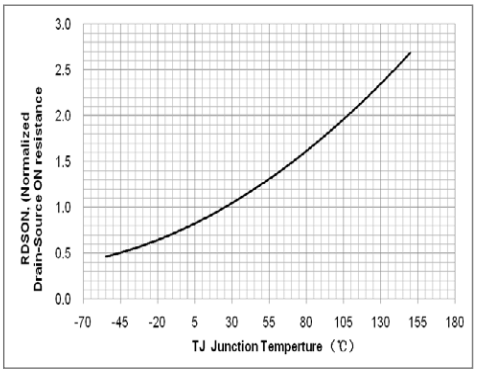


Fig. 7. Maximum safe operating area (TO-220F)

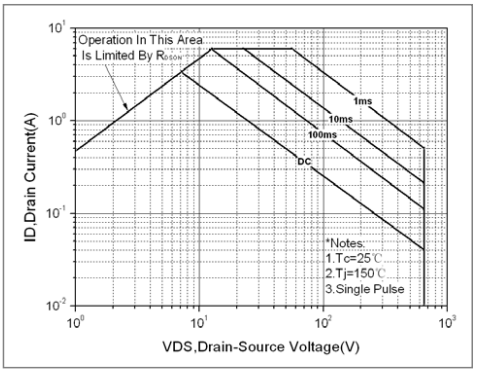


Fig. 8. Maximum safe operating area（TO-251）

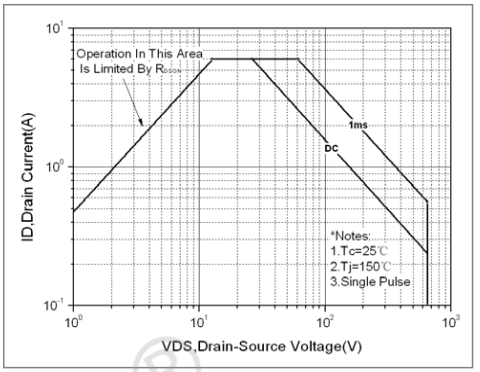


Fig. 9. Maximum safe operating area (TO-252)

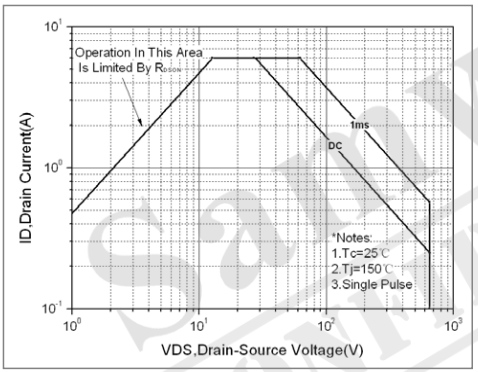


Fig. 10. Maximum safe operating area（TO-262）

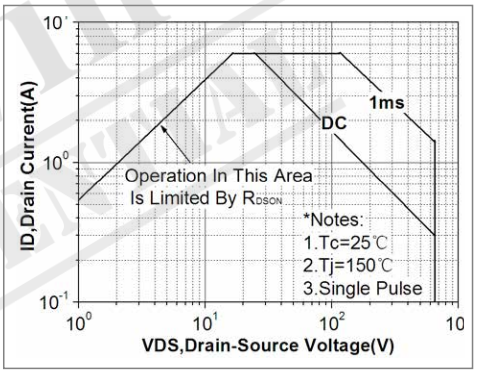


Fig. 11. Capacitance Characteristics

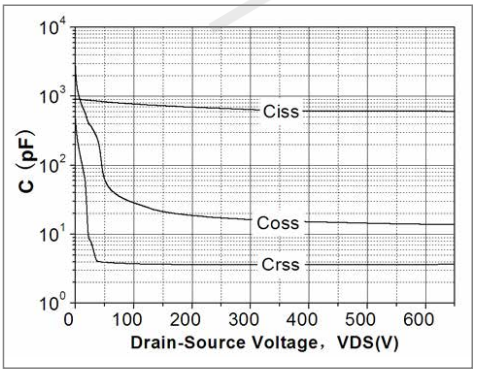


Fig. 12. Transient thermal response curve (TO-220F)

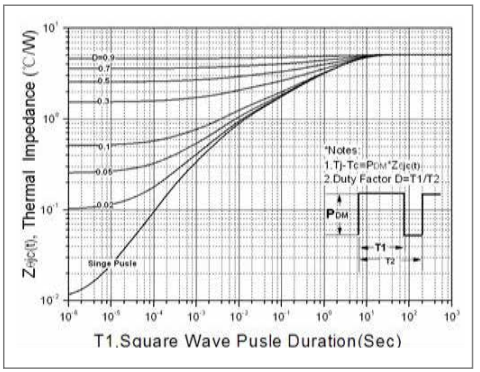


Fig. 13. Transient thermal response curve (TO-251)

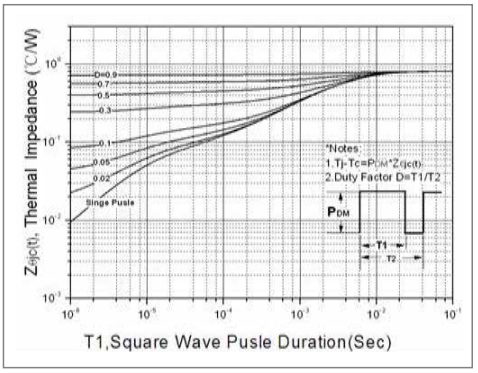


Fig. 14. Transient thermal response curve (TO-252)

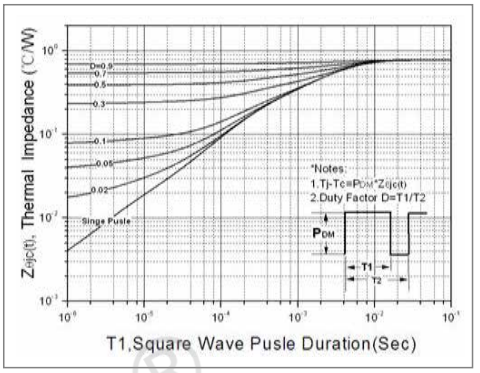


Fig. 15. Transient thermal response curve (TO-262)

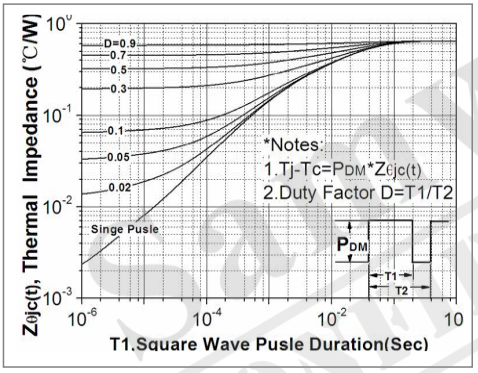


Fig. 16. Gate charge test circuit & waveform

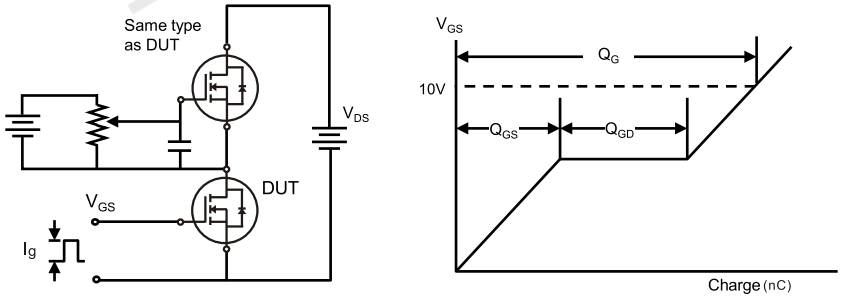


Fig. 17. Switching time test circuit & waveform

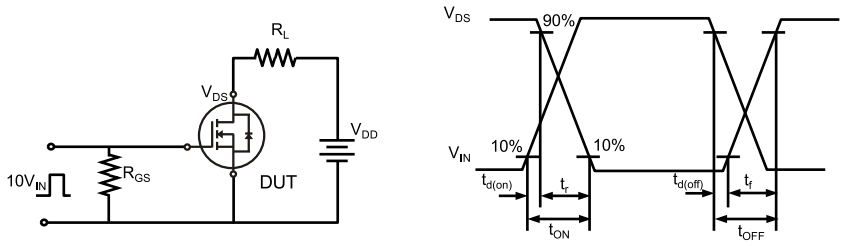


Fig. 18. Unclamped Inductive switching test circuit & waveform

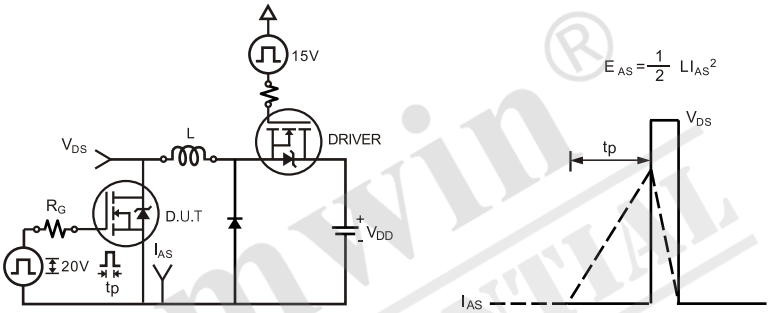
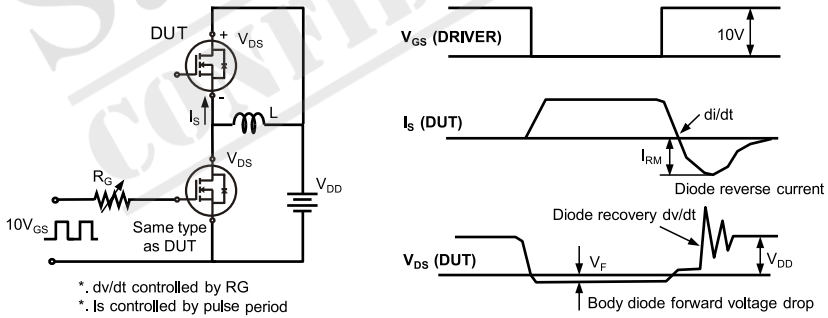


Fig. 19. Peak diode recovery dv/dt test circuit & waveform



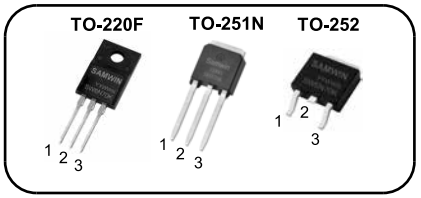
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F/TO-251N/TO-252 MOSFET

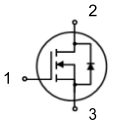
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 1.1Ω)@V_{GS}=10V
- Low Gate Charge (Typ 13nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Charge,LED,TV-Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 700V
I_D : 6A
$R_{DS(ON)}$: 1.1Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 6N70K	SW6N70K	TO-220F	TUBE
2	SW N 6N70K	SW6N70K	TO-251N	TUBE
3	SW D 6N70K	SW6N70K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter		Value			Unit
			TO-220F	TO-251N	TO-252	
V_{DSS}	Drain to source voltage		700			V
I_D	Continuous drain current (@T_C=25°C)		6*			A
	Continuous drain current (@T_C=100°C)		3.8*			A
I_{DM}	Drain current pulsed	(note 1)	24			A
V_{GS}	Gate to source voltage		±30			V
E_{AS}	Single pulsed avalanche energy	(note 2)	60			mJ
E_{AR}	Repetitive avalanche energy	(note 1)	9			mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)		23.5	147.1	154.3	W
	Derating factor above 25°C		0.19	1.18	1.23	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150			°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220F	TO-251N	TO-252	
R_{thjc}	Thermal resistance, Junction to case	5.32	0.85	0.81	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.4	80.0		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	700			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.65		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=700V, V_{GS}=0V			1	uA
		V_{DS}=560V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3A		1.1	1.3	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=3A		2.8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		383		pF
C_{oss}	Output capacitance			27		
C_{rss}	Reverse transfer capacitance			11		
$t_{d(on)}$	Turn on delay time	V_{DS}=350V, I_D=6A, V_{GS}=10V, R_G=25Ω (note 4,5)		10		ns
t_r	Rising time			29		
$t_{d(off)}$	Turn off delay time			24		
t_f	Fall time			23		
Q_g	Total gate charge	V_{DS}=560V, V_{GS}=10V, I_D=6A (note 4,5)		13		nC
Q_{gs}	Gate-source charge			3		
Q_{gd}	Gate-drain charge			7		

Source to drain diode ratings characteristicsa

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			6	A
I_{SM}	Pulsed source current				24	A
V_{SD}	Diode forward voltage drop.	I_S=6A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=6A, V_{GS}=0V, dI_F/dt=100A/us		210		ns
Q_{rr}	Reverse recovery charge			2.0		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 30mH, I_{AS} = 2A, V_{DD} = 25V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 6A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

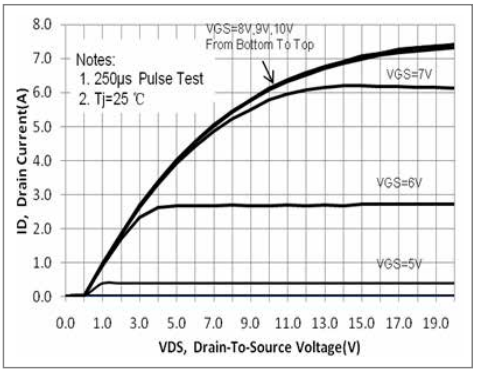


Fig. 2. On-resistance variation vs. drain current and gate voltage

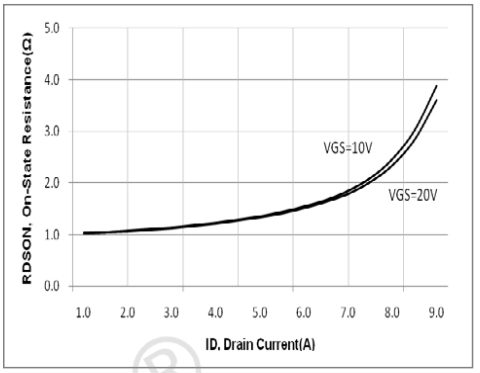


Fig. 3. Gate charge characteristics

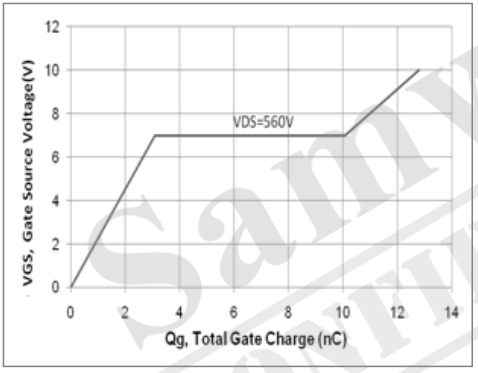


Fig. 4. On state current vs. diode forward voltage

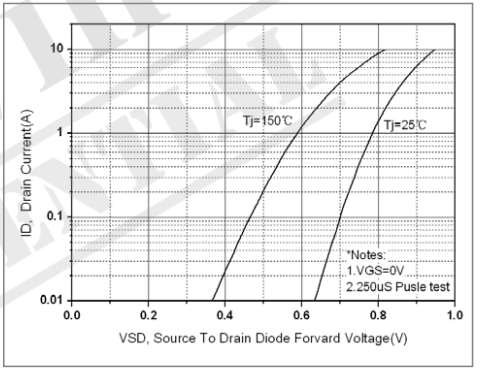


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

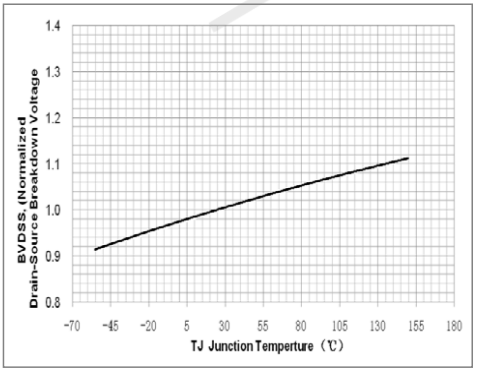


Fig. 6. On resistance variation vs. junction temperature

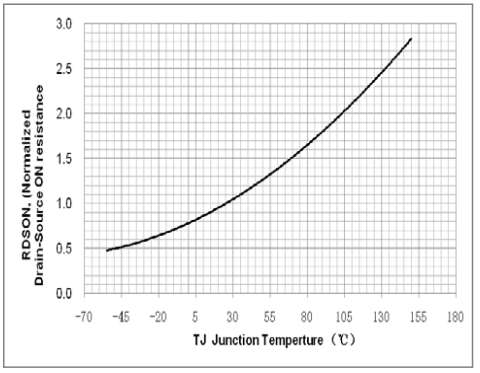


Fig. 7. Maximum safe operating area (TO-220F)

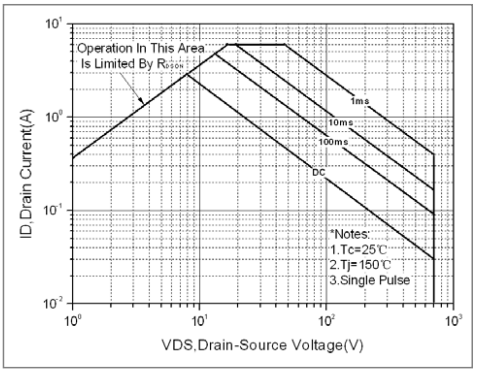


Fig. 8. Maximum safe operating area（TO-251N）

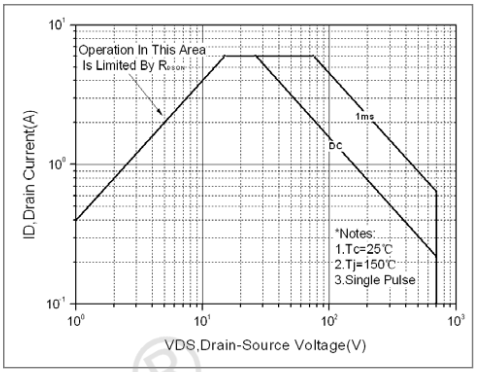


Fig. 9. Maximum safe operating area (TO-252)

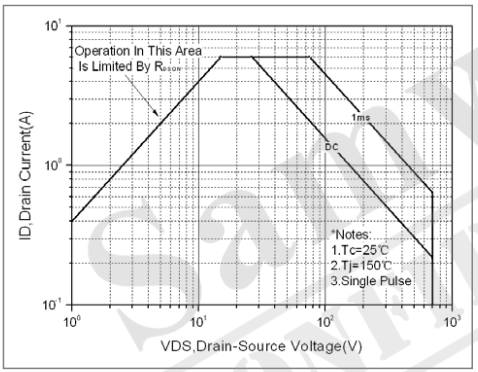


Fig. 10. Capacitance Characteristics

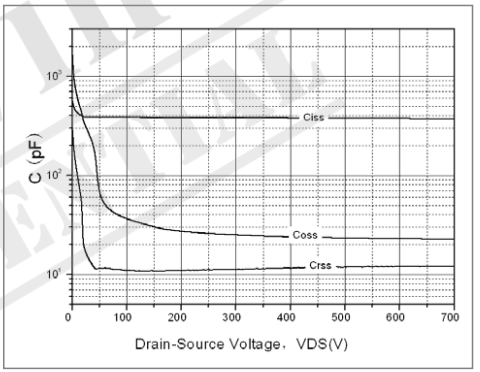


Fig. 11. Transient thermal response curve (TO-220F)

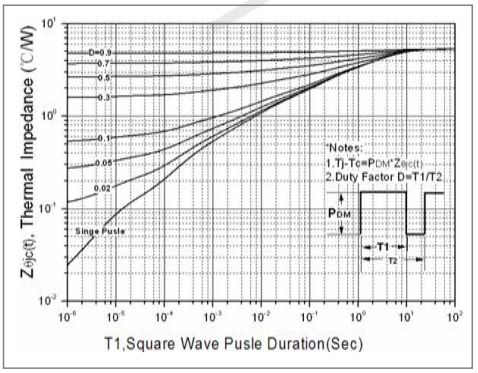


Fig. 12. Transient thermal response curve (TO-251N)

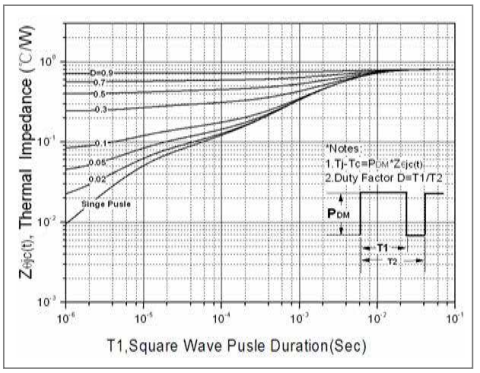


Fig. 13. Transient thermal response curve（TO-252）

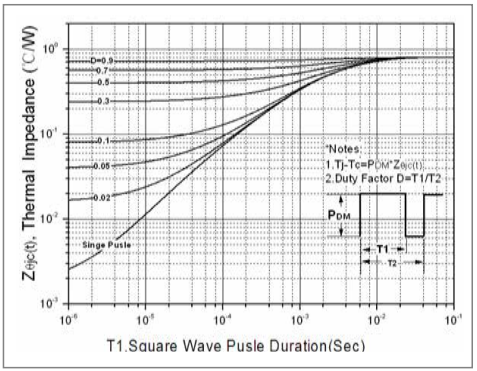


Fig. 14. Gate charge test circuit & waveform

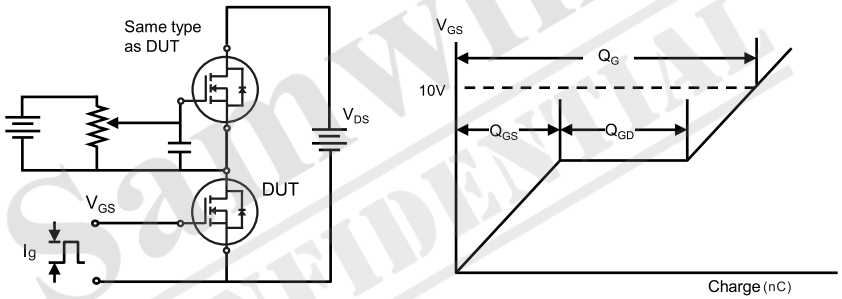


Fig. 15. Switching time test circuit & waveform

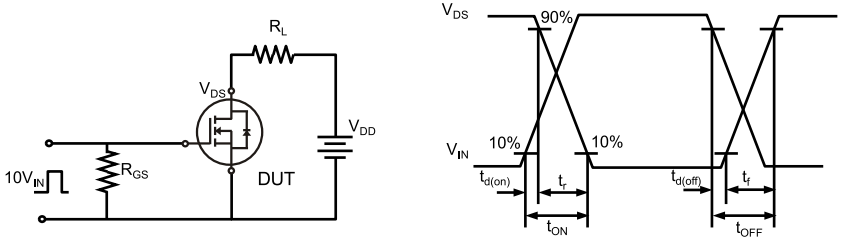


Fig. 16. Switching time test circuit & waveform

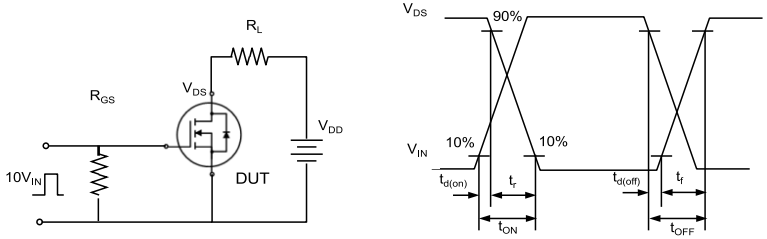


Fig. 17. Unclamped Inductive switching test circuit & waveform

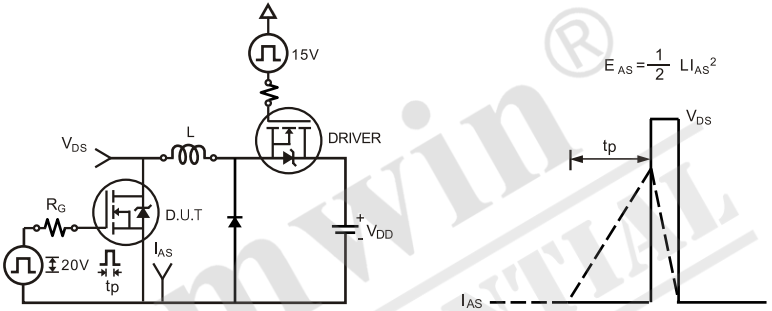
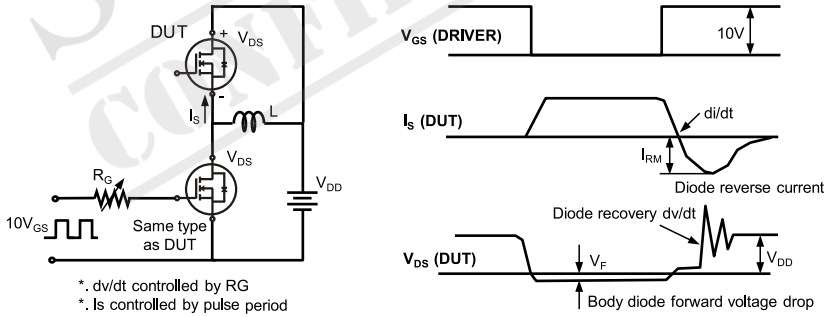


Fig. 18. Peak diode recovery dv/dt test circuit & waveform



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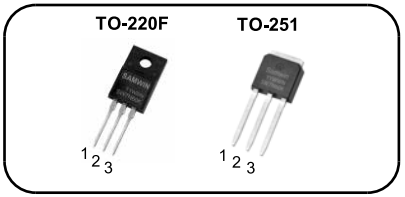
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F/TO-251MOSFET

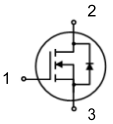
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.5Ω)@V_{GS}=10V
- Low Gate Charge (Typ 21nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: Adaptor, LED



1. Gate 2. Drain 3. Source

BV_{DSS} : 600V
I_D : 7A
$R_{DS(ON)}$: 0.5Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 7N60K	SW7N60K	TO-220F	TUBE
2	SW I 7N60K	SW7N60K	TO-251	TUBE

Absolute maximum ratings

Symbol	Parameter	Value		Unit
		TO-220F	TO-251	
V_{DSS}	Drain to source voltage	600		V
I_D	Continuous drain current (@T_C=25°C)	7*		A
	Continuous drain current (@T_C=100°C)	4.4*		A
I_{DM}	Drain current pulsed (note 1)	28		A
V_{GS}	Gate to source voltage	±30		V
E_{AS}	Single pulsed avalanche energy (note 2)	120		mJ
E_{AR}	Repetitive avalanche energy (note 1)	8		mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5		V/ns
P_D	Total power dissipation (@T_C=25°C)	19.8	166.7	W
	Derating factor above 25°C	0.2	1.3	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150		°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300		°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value		Unit
		TO-220F	TO-251	
R_{thjc}	Thermal resistance, Junction to case	6	0.8	°C/W
R_{thja}	Thermal resistance, Junction to ambient	47.6	80.5	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	600			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.6		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=600V, V_{GS}=0V			1	uA
		V_{DS}=480V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2.5		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3.5A		0.5	0.6	Ω
G_{fs}	Forward transconductance	V_{DS}=20V, I_D=3.5A		5.5		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		550		pF
C_{oss}	Output capacitance			23		
C_{rss}	Reverse transfer capacitance			3.2		
$t_{d(on)}$	Turn on delay time	V_{DS}=300V, I_D=7A, V_{GS}=10V R_G=25Ω (note 4,5)		9		ns
t_r	Rising time			28		
$t_{d(off)}$	Turn off delay time			62		
t_f	Fall time			30		
Q_g	Total gate charge	V_{DS}=480V, V_{GS}=10V, I_D=7A (note 4,5)		21		nC
Q_{gs}	Gate-source charge			3		
Q_{gd}	Gate-drain charge			11		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			7	A
I_{SM}	Pulsed source current				28	A
V_{SD}	Diode forward voltage drop.	I_S=7A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=7A, V_{GS}=0V, dI_F/dt=100A/us		234		ns
Q_{rr}	Reverse recovery charge			2.2		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 60mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 7A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

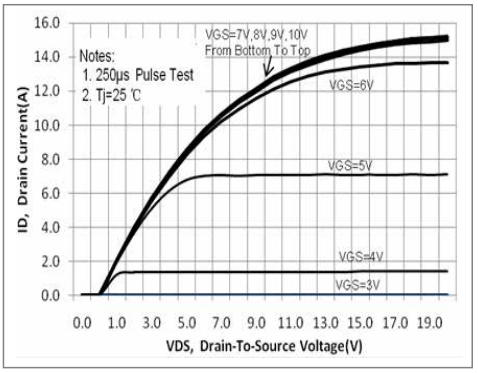


Fig. 2. On-resistance variation vs. drain current and gate voltage

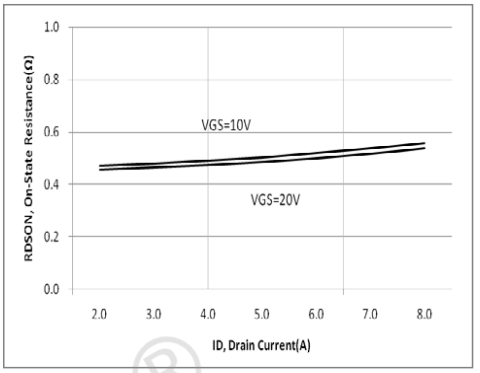


Fig. 3. Gate charge characteristics

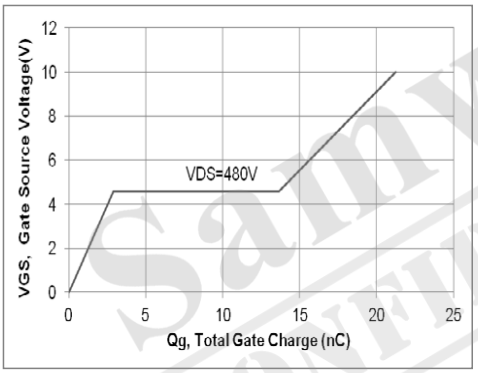


Fig. 4. On state current vs. diode forward voltage

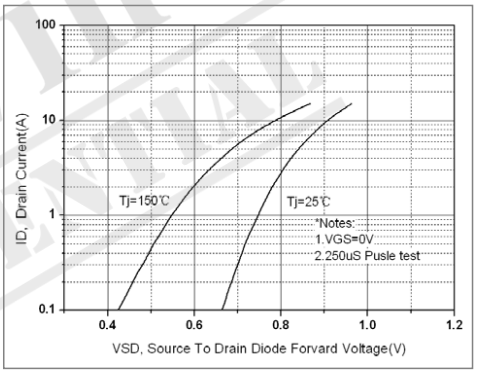


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

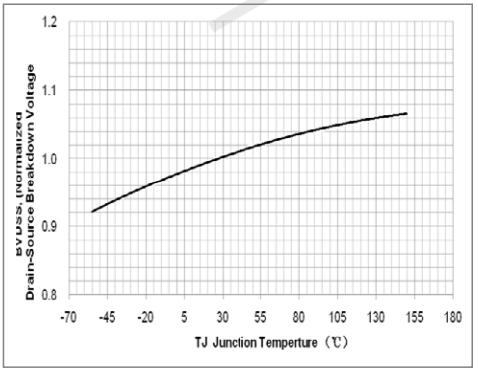


Fig. 6. On resistance variation vs. junction temperature

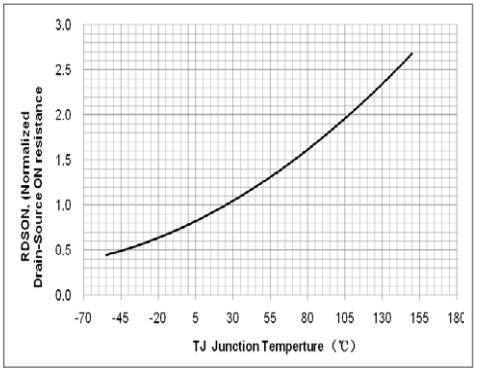


Fig. 7. Maximum safe operating area(TO-220F)

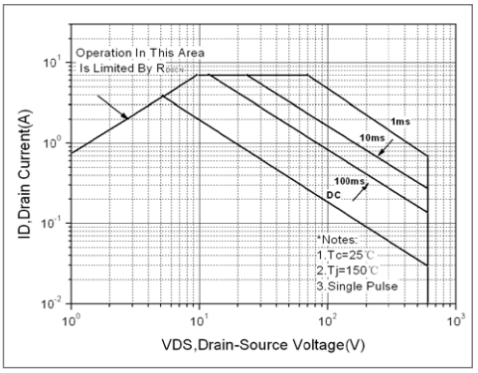


Fig. 8. Maximum safe operating area(TO-251)

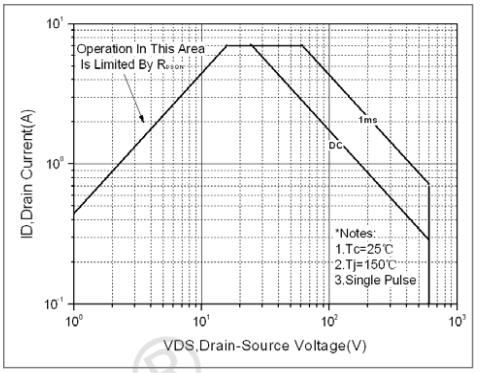


Fig. 9. Capacitance Characteristics

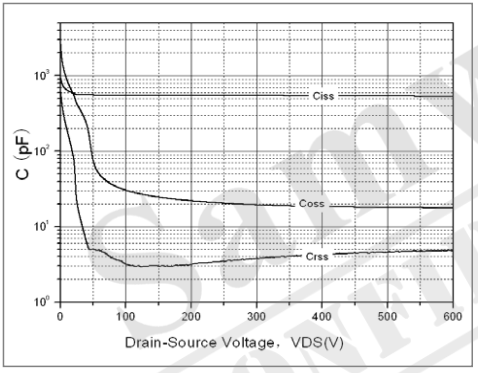


Fig. 10. Transient thermal response curve(TO-220F)

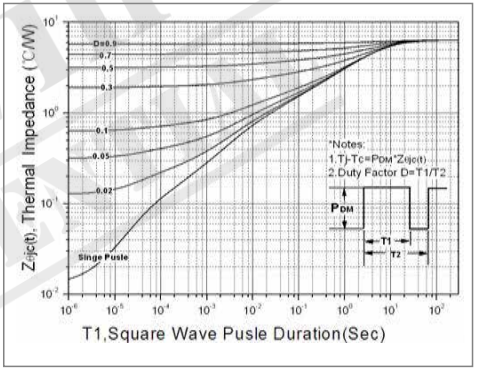


Fig. 11. Transient thermal response curve(TO-251)

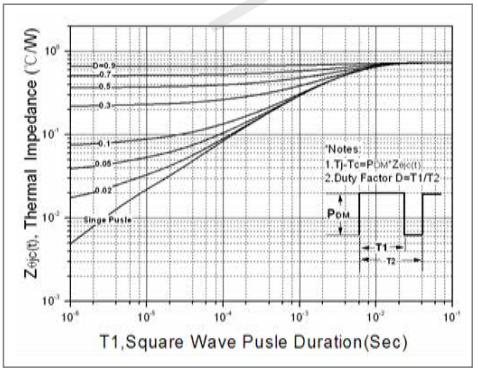


Fig. 12. Gate charge test circuit & waveform

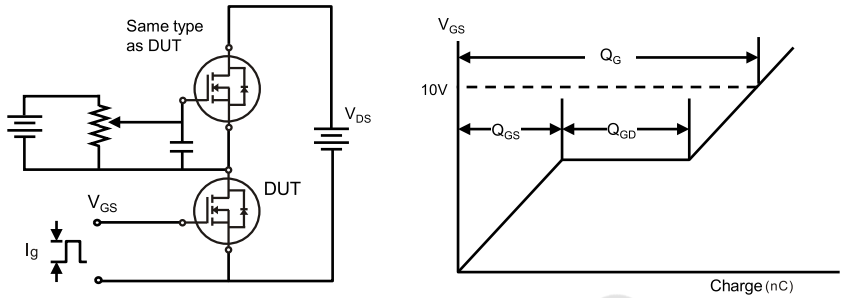


Fig. 13. Switching time test circuit & waveform

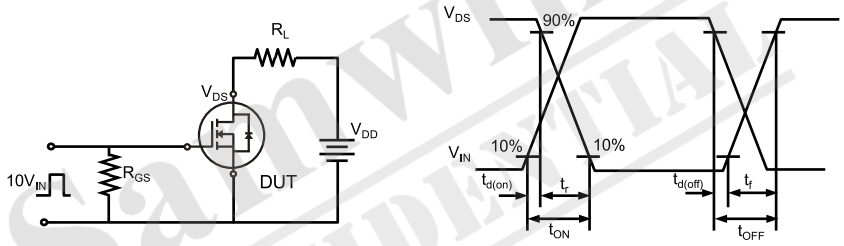


Fig. 14. Unclamped Inductive switching test circuit & waveform

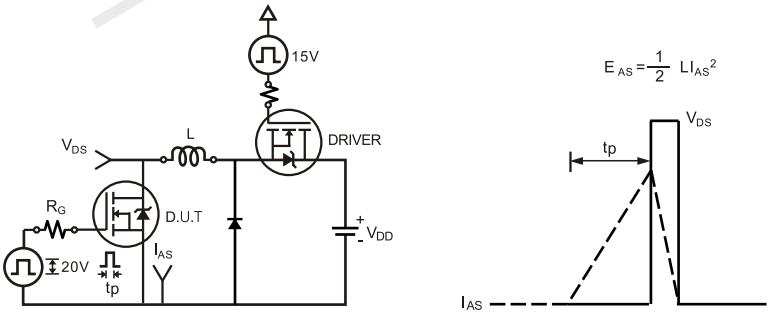
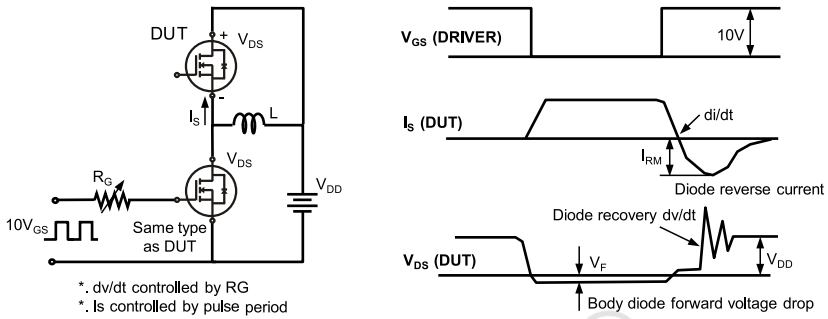


Fig. 15. Peak diode recovery dv/dt test circuit & waveform



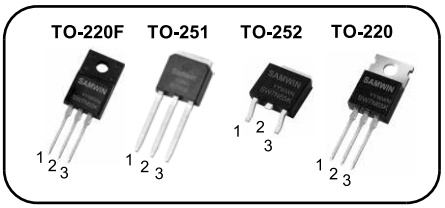
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F/TO-251/TO-252/TO-220 MOSFET

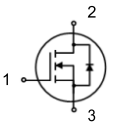
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.5Ω)@V_{GS}=10V
- Low Gate Charge (Typ 21nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: Charge,LED,PC Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 7A
$R_{DS(ON)}$:0.5 Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 7N65K	SW7N65K	TO-220F	TUBE
2	SW I 7N65K	SW7N65K	TO-251	TUBE
3	SW D 7N65K	SW7N65K	TO-252	REEL
4	SW P 7N65K	SW7N65K	TO-220	TUBE

Absolute maximum ratings

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-220	
V_{DSS}	Drain to source voltage	650				V
I_D	Continuous drain current (@T_C=25°C)	7*				A
	Continuous drain current (@T_C=100°C)	4.4*				A
I_{DM}	Drain current pulsed (note 1)	28				A
V_{GS}	Gate to source voltage	±30				V
E_{AS}	Single pulsed avalanche energy (note 2)	150				mJ
E_{AR}	Repetitive avalanche energy (note 1)	7.6				mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5				V/ns
P_D	Total power dissipation (@T_C=25°C)	22.4	152.6	148.8	161.7	W
	Derating factor above 25°C	0.18	1.22	1.19	1.29	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150				°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300				°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-220	
R_{thjc}	Thermal resistance, Junction to case	5.57	0.82	0.84	0.77	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.1	81.9		56	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.4		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2.5		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3.5A		0.5	0.6	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=3.5A		4.8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		638		pF
C_{oss}	Output capacitance			22		
C_{rss}	Reverse transfer capacitance			2.5		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=7A, V_{GS}=10V, R_G=25Ω (note 4,5)		11		ns
t_r	Rising time			29		
$t_{d(off)}$	Turn off delay time			48		
t_f	Fall time			28		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=7A (note 4,5)		21		nC
Q_{gs}	Gate-source charge			5		
Q_{gd}	Gate-drain charge			10		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			7	A
I_{SM}	Pulsed source current				28	A
V_{SD}	Diode forward voltage drop.	I_S=7A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=7A, V_{GS}=0V, dI_F/dt=100A/us		220		ns
Q_{rr}	Reverse recovery charge			2.4		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =33mH, I_{AS} = 3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 7A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

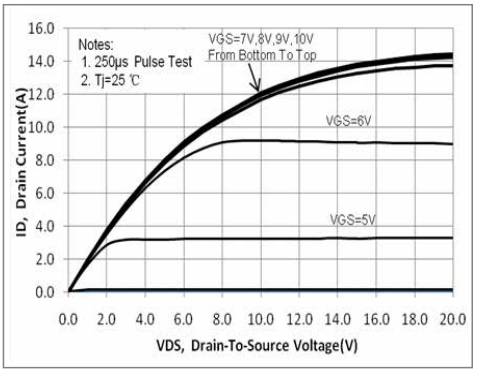


Fig. 2. On-resistance variation vs. drain current and gate voltage

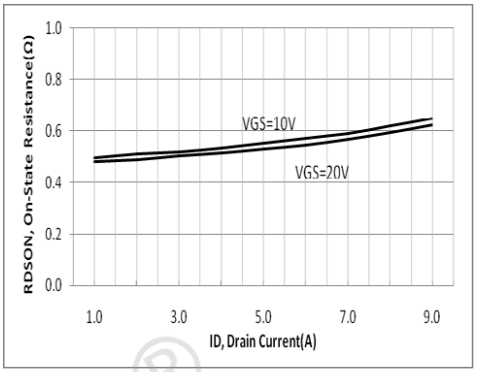


Fig. 3. Gate charge characteristics

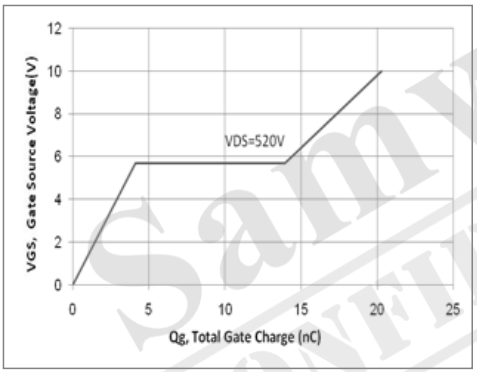


Fig. 4. On state current vs. diode forward voltage

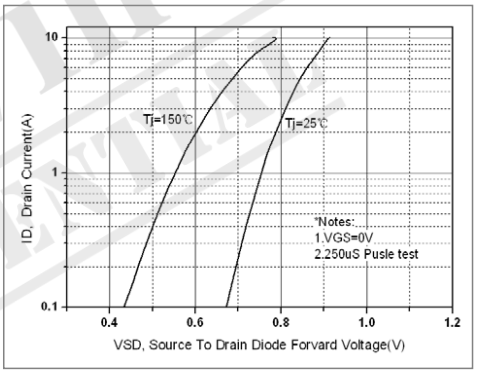


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

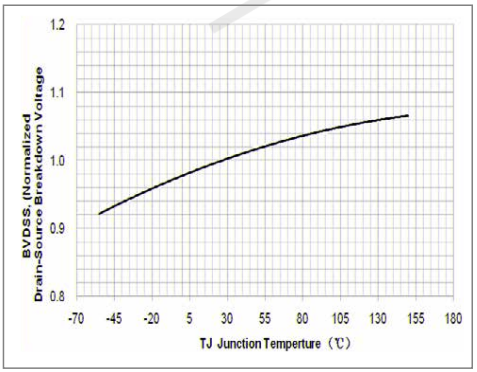


Fig. 6. On resistance variation vs. junction temperature

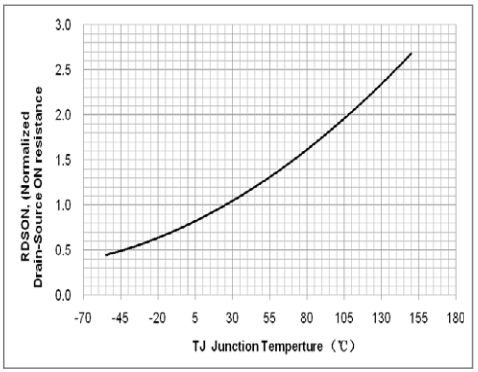


Fig. 7. Maximum safe operating area(TO-220F)

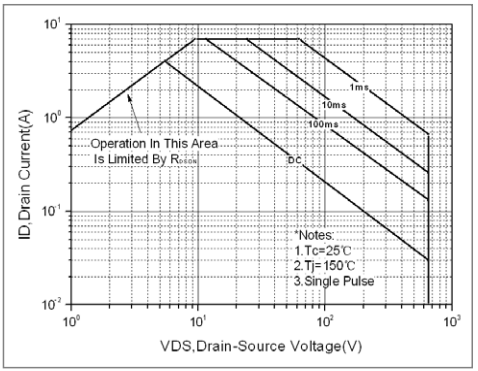


Fig. 8. Maximum safe operating area(TO-251)

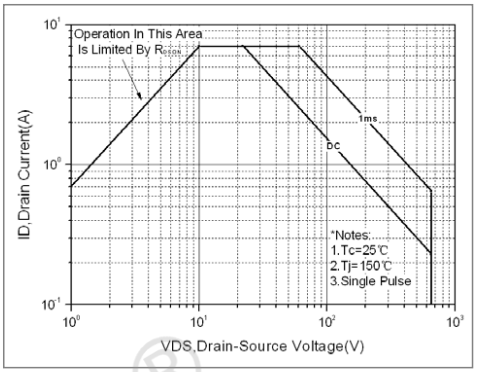


Fig. 9. Maximum safe operating area(TO-252)

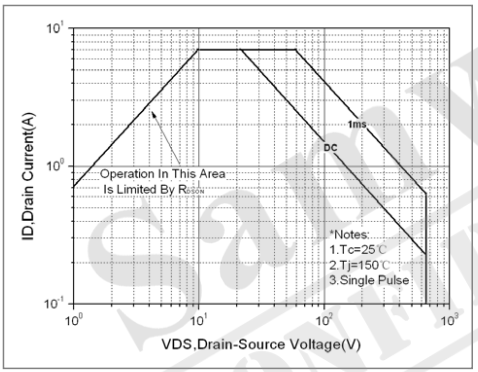


Fig. 10. Maximum safe operating area(TO-220)

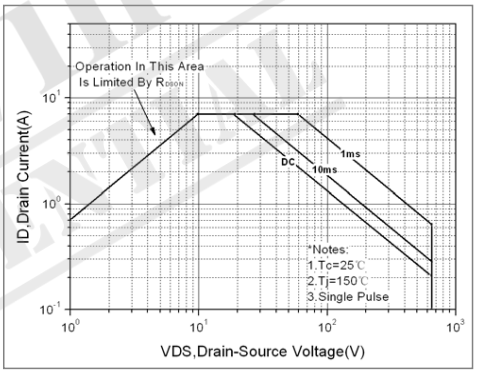


Fig. 11. Capacitance Characteristics

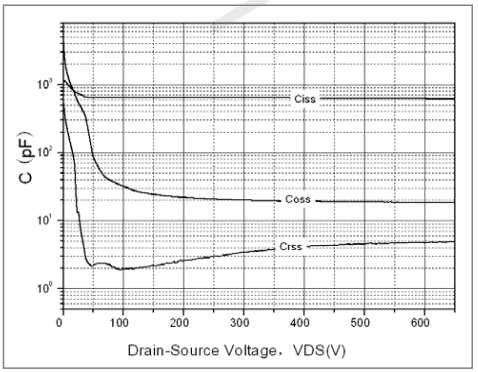


Fig. 12. Transient thermal response curve(TO-220F)

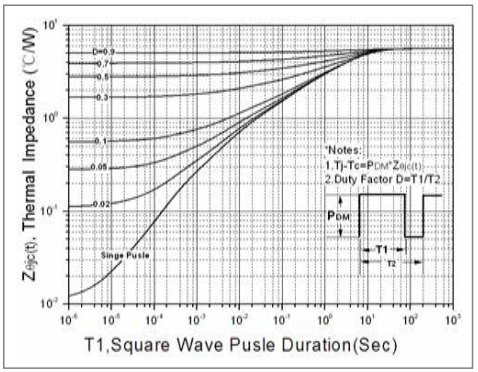


Fig. 13. Transient thermal response curve(TO-251)

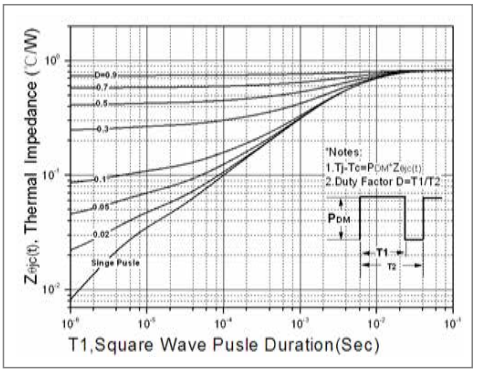


Fig. 14. Transient thermal response curve(TO-252)

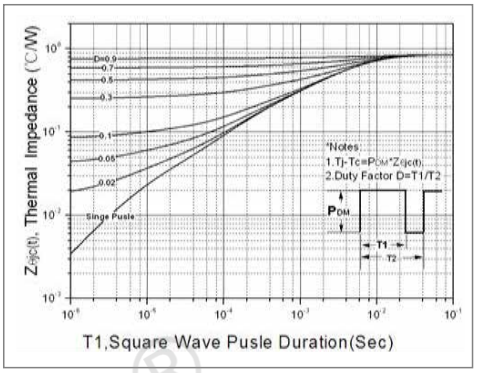


Fig. 15. Transient thermal response curve(TO-220)

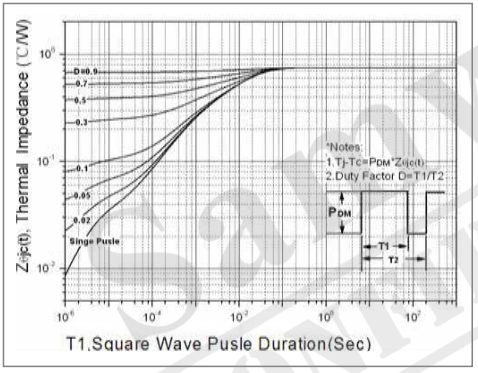


Fig. 16. Gate charge test circuit & waveform

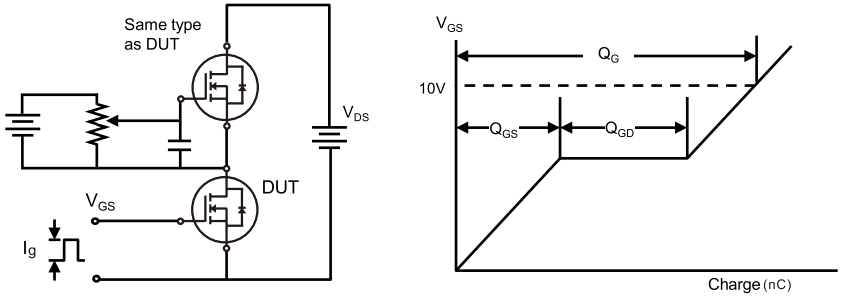


Fig. 17. Switching time test circuit & waveform

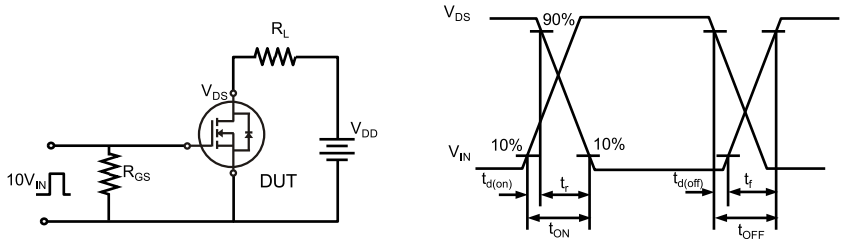


Fig. 18. Unclamped Inductive switching test circuit & waveform

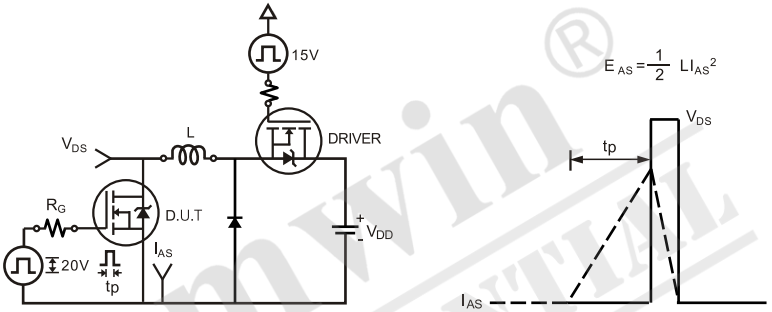
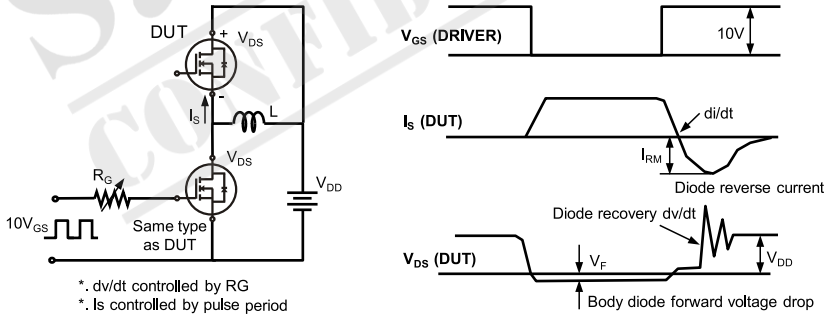


Fig. 19. Peak diode recovery dv/dt test circuit & waveform



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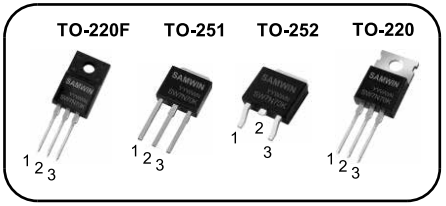
N-channel Enhanced mode TO-220F/TO-251/TO-252/TO-220 MOSFET

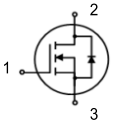
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.81Ω)@V_{GS}=10V
- Low Gate Charge (Typ 17nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: Charge,LED,TV-Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 700V
I_D : 7A
$R_{DS(ON)}$: 0.81Ω



Pb LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 7N70K	SW7N70K	TO-220F	TUBE
2	SW I 7N70K	SW7N70K	TO-251	TUBE
3	SW D 7N70K	SW7N70K	TO-252	REEL
4	SW P 7N70K	SW7N70K	TO-220	TUBE

Absolute maximum ratings

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-220	
V_{DSS}	Drain to source voltage	700				V
I_D	Continuous drain current (@T_C=25°C)	7*				A
	Continuous drain current (@T_C=100°C)	4.4*				A
I_{DM}	Drain current pulsed (note 1)	28				A
V_{GS}	Gate to source voltage	±30				V
E_{AS}	Single pulsed avalanche energy (note 2)	120				mJ
E_{AR}	Repetitive avalanche energy (note 1)	9				mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5				V/ns
P_D	Total power dissipation (@T_C=25°C)	24.5	147	156	133	W
	Derating factor above 25°C	0.2	1.2	1.3	1.06	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150				°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300				°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value				Unit
		TO-220F	TO-251	TO-252	TO-220	
R_{thjc}	Thermal resistance, Junction to case	5.10	0.85	0.80	0.94	°C/W
R_{thja}	Thermal resistance, Junction to ambient	49.40	80.00		55.7	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	700			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.64		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=700V, V_{GS}=0V			1	uA
		V_{DS}=560V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	3		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3.5A		0.81	0.9	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=3.5A		4		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		690		pF
C_{oss}	Output capacitance			18.5		
C_{rss}	Reverse transfer capacitance			3.6		
$t_{d(on)}$	Turn on delay time	V_{DS}=350V, I_D=7A, V_{GS}=10V, R_G=25Ω (note 4,5)		13		ns
t_r	Rising time			34		
$t_{d(off)}$	Turn off delay time			31		
t_f	Fall time			25		
Q_g	Total gate charge	V_{DS}=560V, V_{GS}=10V, I_D=7A (note 4,5)		17		nC
Q_{gs}	Gate-source charge			4		
Q_{gd}	Gate-drain charge			9		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			7	A
I_{SM}	Pulsed source current				28	A
V_{SD}	Diode forward voltage drop.	I_S=7A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=7A, V_{GS}=0V, dI_F/dt=100A/us		284		ns
Q_{rr}	Reverse recovery charge			3.7		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 60mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 7A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

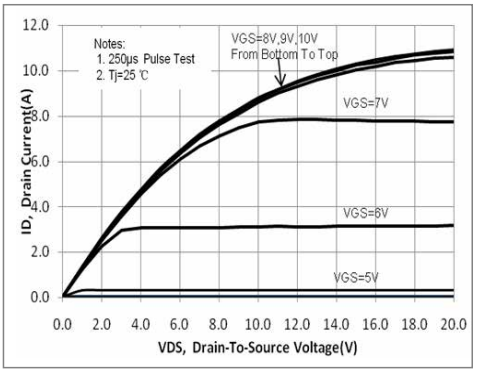


Fig. 2. On-resistance variation vs. drain current and gate voltage

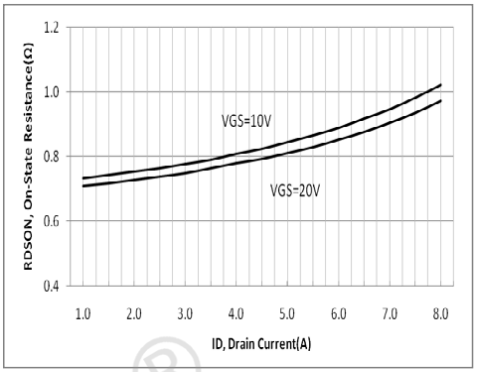


Fig. 3. Gate charge characteristics

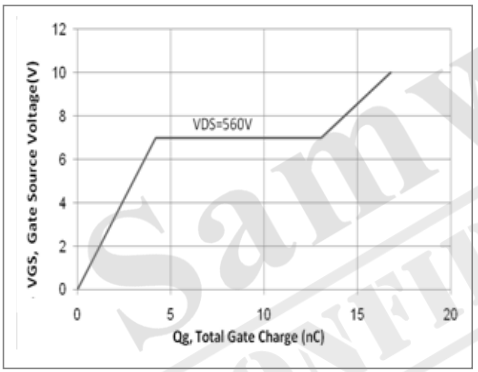


Fig. 4. On state current vs. diode forward voltage

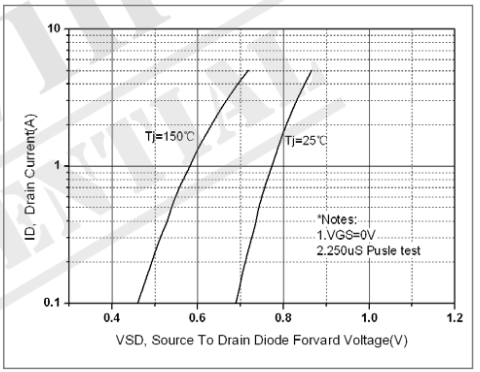


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

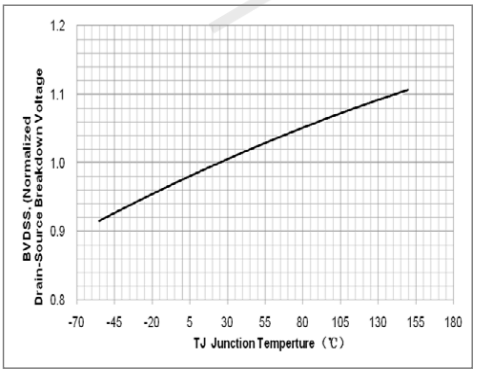


Fig. 6. On resistance variation vs. junction temperature

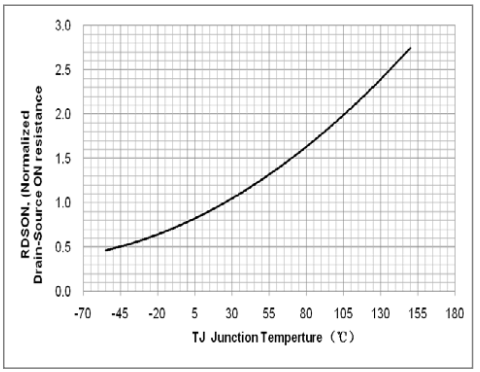


Fig. 7. Maximum safe operating area(TO-220F)

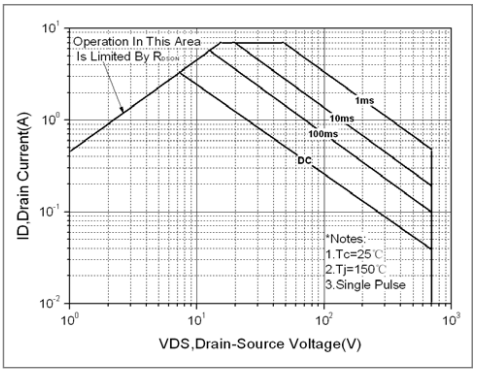


Fig. 8. Maximum safe operating area(TO-251)

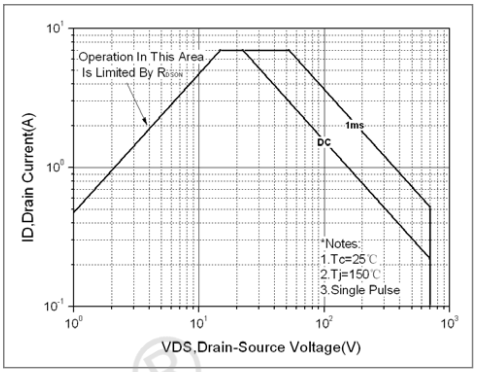


Fig. 9. Maximum safe operating area(TO-252)

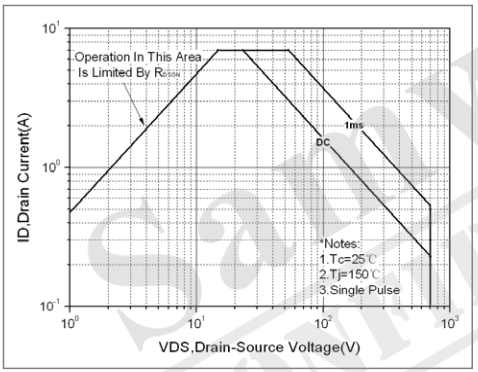


Fig. 10. Maximum safe operating area(TO-220)

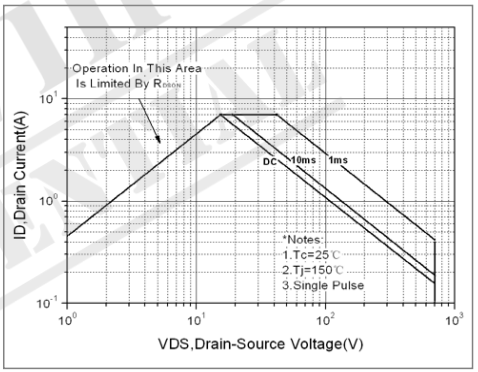


Fig. 11. Capacitance Characteristics

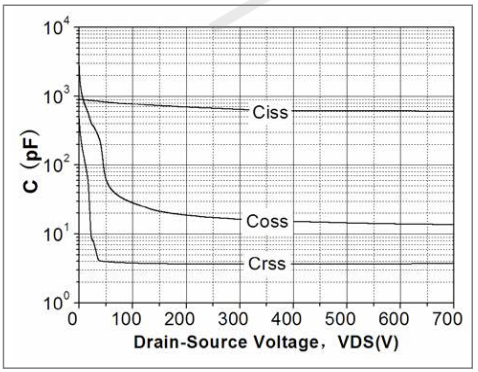


Fig. 12. Transient thermal response curve(TO-220F)

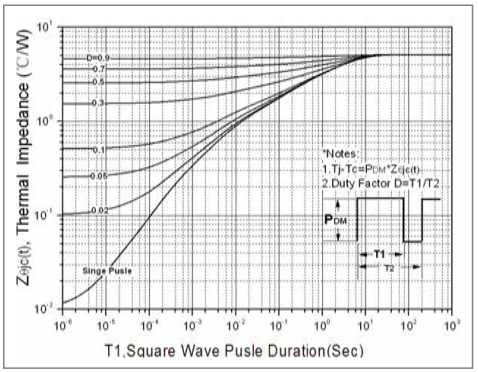


Fig. 13. Transient thermal response curve(TO-251)

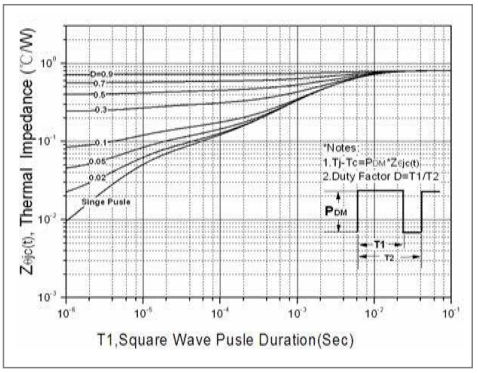


Fig. 14. Transient thermal response curve(TO-252)

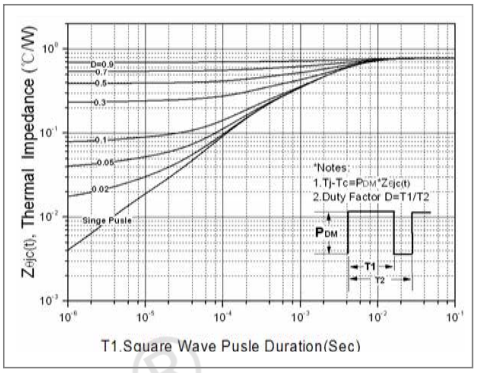


Fig. 15. Transient thermal response curve(TO-220)

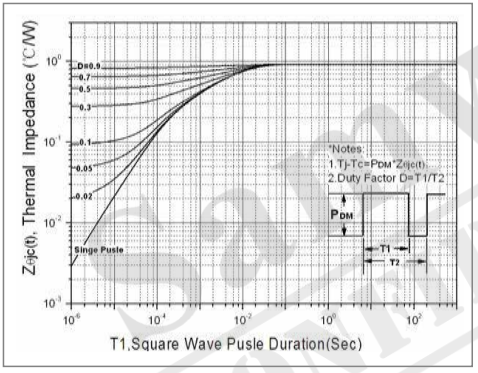
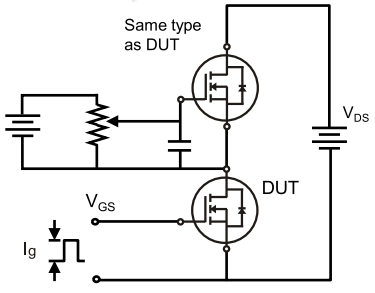


Fig. 16. Gate charge test circuit & waveform



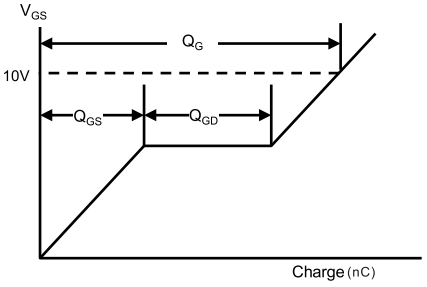


Fig. 17. Switching time test circuit & waveform

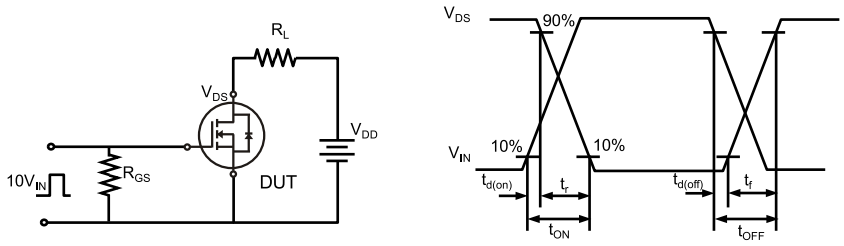


Fig. 18. Unclamped Inductive switching test circuit & waveform

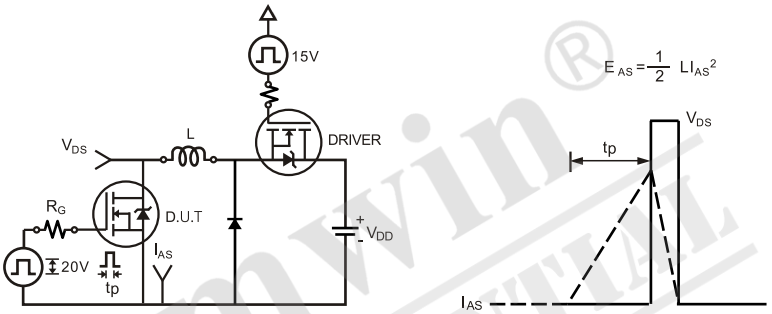
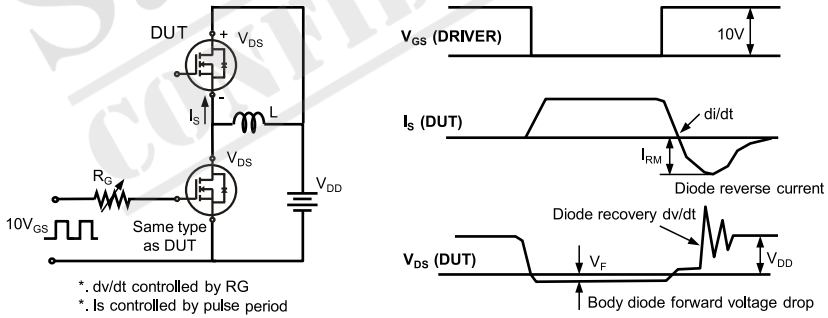


Fig. 19. Peak diode recovery dv/dt test circuit & waveform



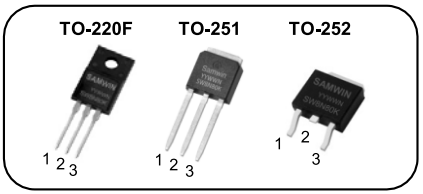
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhancement mode TO-220F/TO-251/TO-252 MOSFET

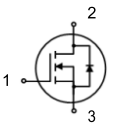
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.67Ω)@V_{GS}=10V
- Low Gate Charge (Typ 30nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Adapter,LED,Charger



1. Gate 2. Drain 3. Source

BV_{DSS} : 800V
I_D : 8A
$R_{DS(ON)}$: 0.67Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 8N80K	SW8N80K	TO-220F	TUBE
2	SW I 8N80K	SW8N80K	TO-251	TUBE
3	SW D 8N80K	SW8N80K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter		Value			Unit
			TO-220F	TO-251	TO-252	
V_{DSS}	Drain to Source Voltage		800			V
I_D	Continuous Drain Current (@T_C=25°C)		8*			A
	Continuous Drain Current (@T_C=100°C)		5*			A
I_{DM}	Drain current pulsed	(note 1)	32			A
V_{GS}	Gate to Source Voltage		±30			V
E_{AS}	Single pulsed Avalanche Energy	(note 2)	270			mJ
E_{AR}	Repetitive Avalanche Energy	(note 1)	30			mJ
dv/dt	Peak diode Recovery dv/dt	(note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)		20	192.3	227.3	W
	Derating Factor above 25°C		0.16	1.54	1.82	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature		-55 ~ + 150			°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.		300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220F	TO-251	TO-252	
R_{thjc}	Thermal resistance, Junction to case	6.2	0.65	0.55	°C/W
R_{thja}	Thermal resistance, Junction to ambient	50	95		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	800			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.73		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=800V, V_{GS}=0V			1	uA
		V_{DS}=640V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D =4A		0.67	0.75	Ω
Gfs	Forward Transconductance	V_{DS} =30V, I_D =4A		6.5		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		994		pF
C_{oss}	Output capacitance			44		
C_{rss}	Reverse transfer capacitance			12		
$t_{d(on)}$	Turn on delay time	V_{DS}=400V, I_D=8A, R_G=25Ω, V_{GS}=10V (note 4,5)		17		ns
tr	Rising time			41		
$t_{d(off)}$	Turn off delay time			71		
t_f	Fall time			43		
Q_g	Total gate charge	V_{DS}=640V, V_{GS}=10V, I_D=8A (note 4,5)		30		nC
Q_{gs}	Gate-source charge			5.5		
Q_{gd}	Gate-drain charge			14		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			8	A
I_{SM}	Pulsed source current				32	A
V_{SD}	Diode forward voltage drop.	I_S=8A, V_{GS}=0V			1.4	V
T_{rr}	Reverse recovery time	I_S=8A, V_{GS}=0V, dI_F/dt=100A/us		295		ns
Q_{rr}	Reverse recovery Charge			3.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =60mH, I_{AS} = 3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 8A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C Pulse
4. Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

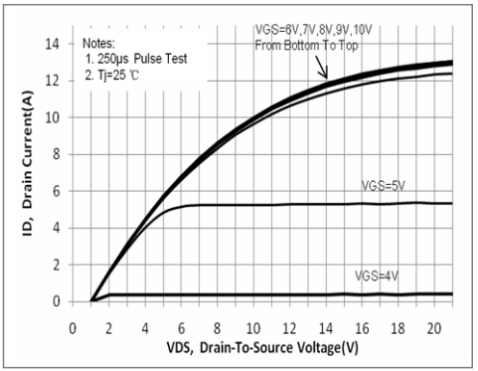


Fig. 2. On-resistance variation vs. drain current and gate voltage

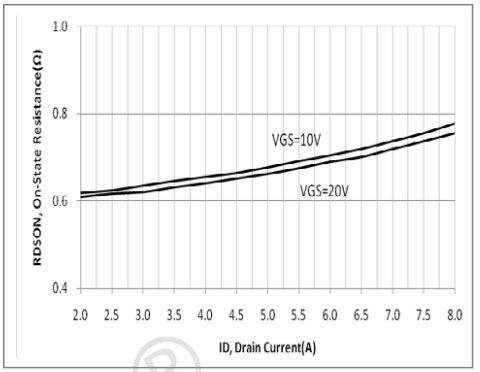


Fig. 3. Gate charge characteristics

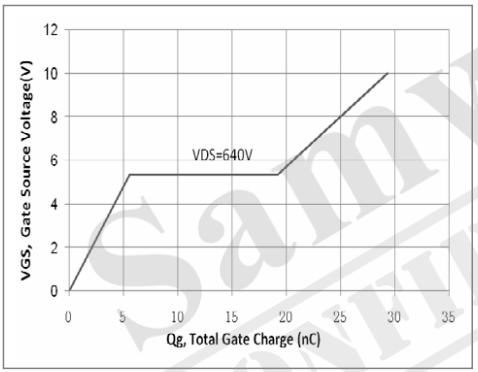


Fig. 4. On state current vs. diode forward voltage

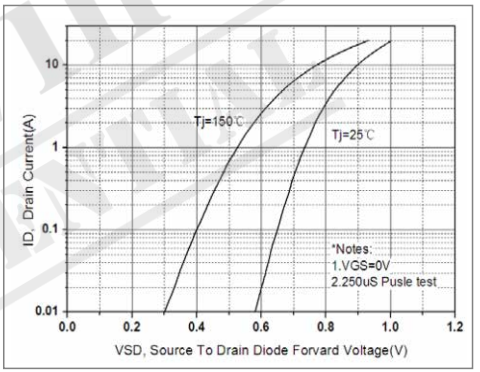


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

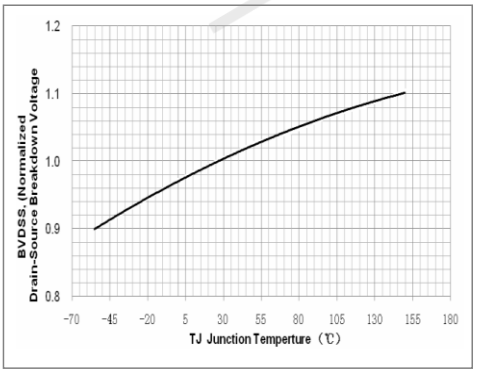


Fig. 6. On resistance variation vs. junction temperature

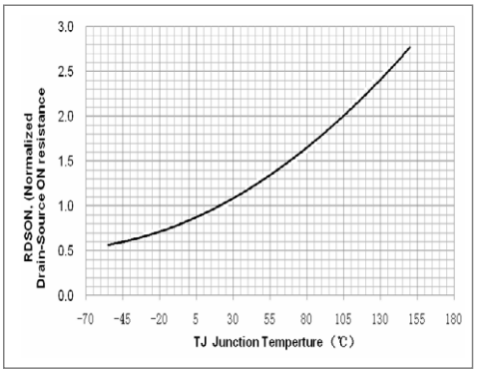


Fig. 7. Maximum safe operating area(TO-220F)

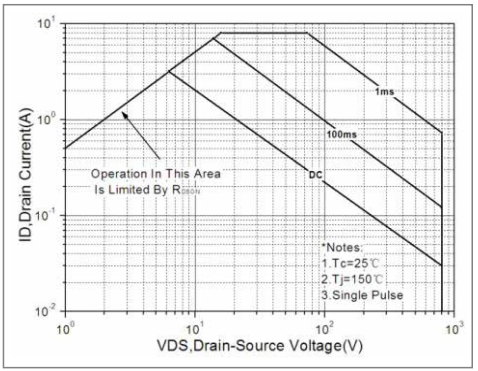


Fig. 8. Maximum safe operating area(TO-251)

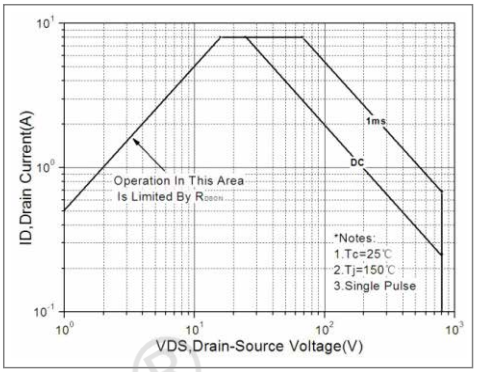


Fig. 9. Maximum safe operating area(TO-252)

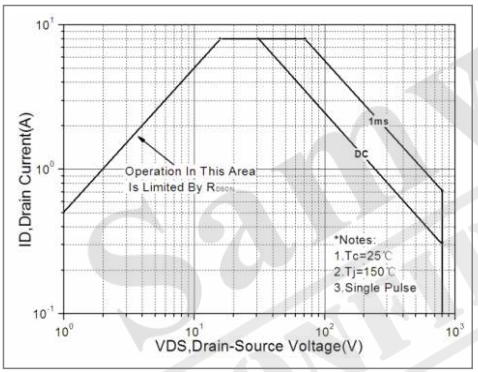


Fig. 10. Capacitance Characteristics

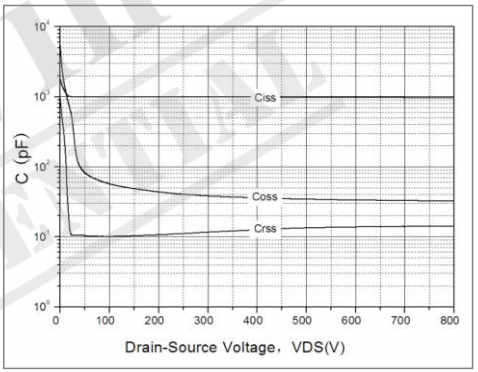


Fig. 11. Transient thermal response curve (TO-220F)

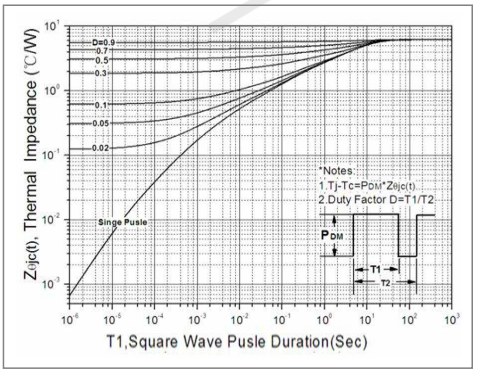


Fig. 12. Transient thermal response curve (TO-251)

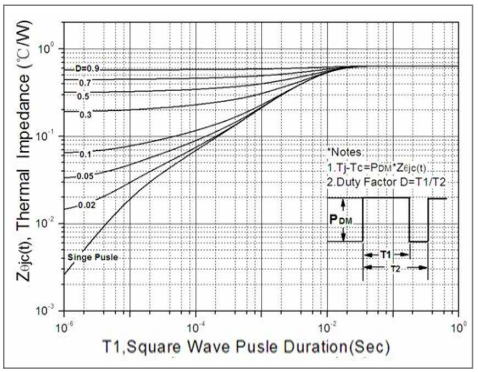


Fig. 13. Transient thermal response curve (TO-252)

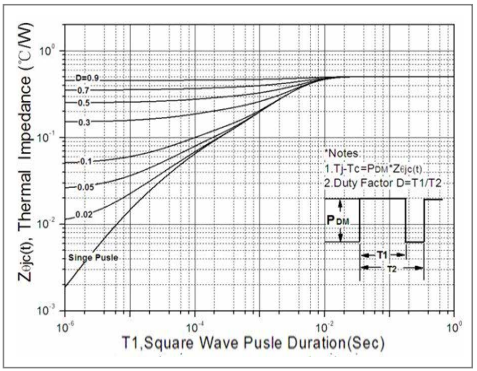


Fig. 14. Gate charge test circuit & waveform

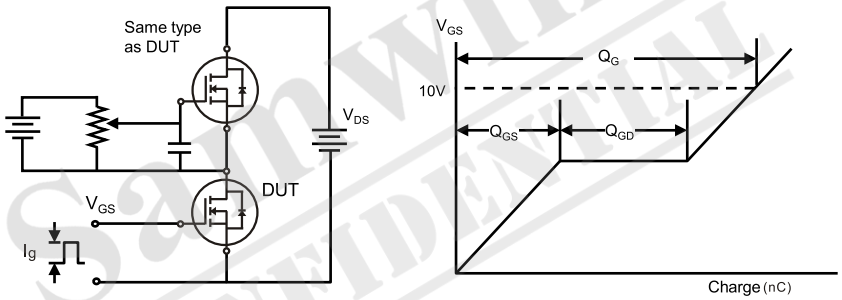


Fig. 15. Switching time test circuit & waveform

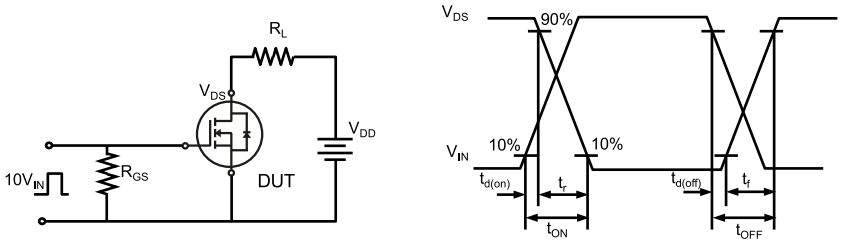


Fig. 16. Unclamped Inductive switching test circuit & waveform

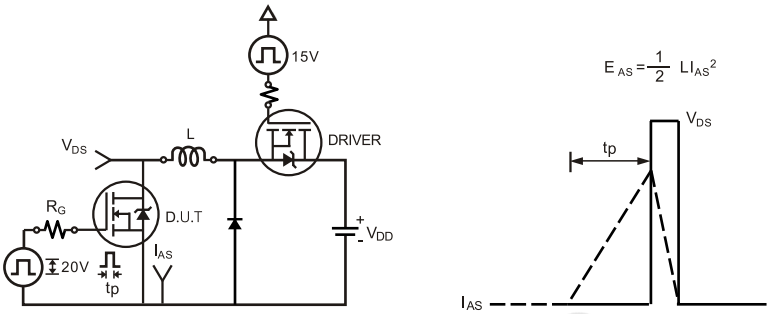
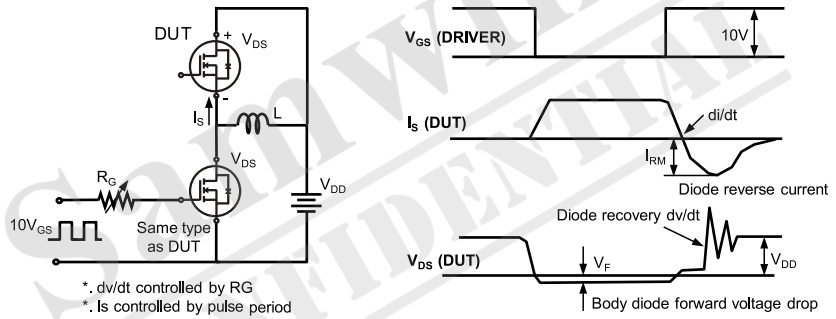


Fig. 17. Peak diode recovery dv/dt test circuit & waveform



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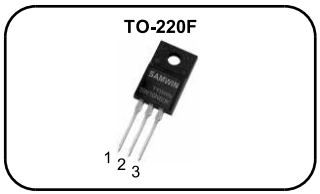
N-channel Enhanced mode TO-220F MOSFET

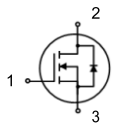
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.37Ω)@V_{GS}=10V
- Low Gate Charge (Typ 29nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:PC Power,LED,Charge



1. Gate 2. Drain 3. Source

BV_{DSS} : 600V
I_D : 10A
$R_{DS(ON)}$: 0.37Ω



Pb LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 10N60K	SW10N60K	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		600	V
I_D	Continuous drain current (@T_C=25°C)		10*	A
	Continuous drain current (@T_C=100°C)		6.3*	A
I_{DM}	Drain current pulsed	(note 1)	40	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	270	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	60	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		25.5	W
	Derating factor above 25°C		0.2	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	4.9	°C/W
R_{thja}	Thermal resistance, Junction to ambient	48.7	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	600			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.65		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=600V, V_{GS}=0V			1	uA
		V_{DS}=480V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=5A		0.37	0.4	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=5A		6.8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1015		pF
C_{oss}	Output capacitance			40		
C_{rss}	Reverse transfer capacitance			3.9		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=10A, V_{GS}=10V, R_G=25Ω (note 4,5)		16		ns
t_r	Rising time			34		
$t_{d(off)}$	Turn off delay time			55		
t_f	Fall time			27		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=10A (note 4,5)		29		nC
Q_{gs}	Gate-source charge			7		
Q_{gd}	Gate-drain charge			14		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			10	A
I_{SM}	Pulsed source current				40	A
V_{SD}	Diode forward voltage drop.	I_S=10A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=10A, V_{GS}=0V, dI_F/dt=100A/us		266		ns
Q_{rr}	Reverse recovery charge			3.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =60mH, I_{AS} =3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 10A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

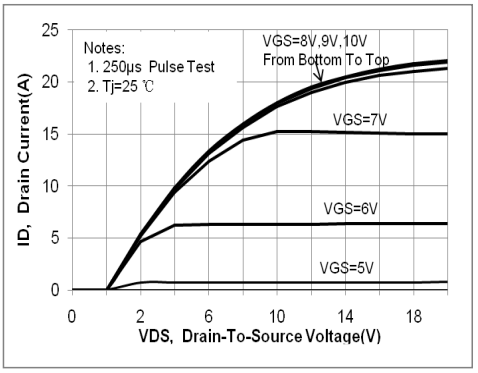


Fig. 2. On-resistance variation vs. drain current and gate voltage

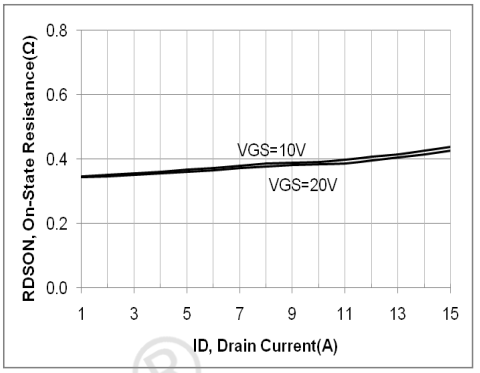


Fig. 3. Gate charge characteristics

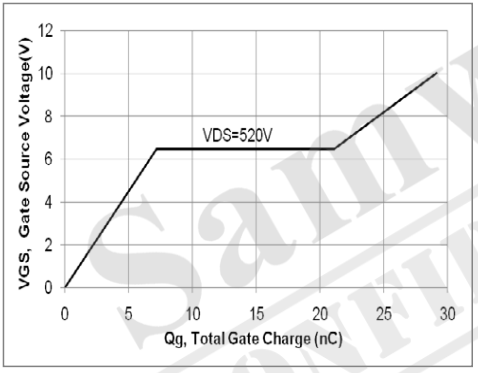


Fig. 4. On state current vs. diode forward voltage

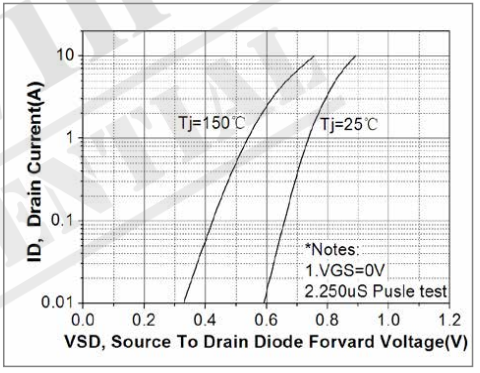


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

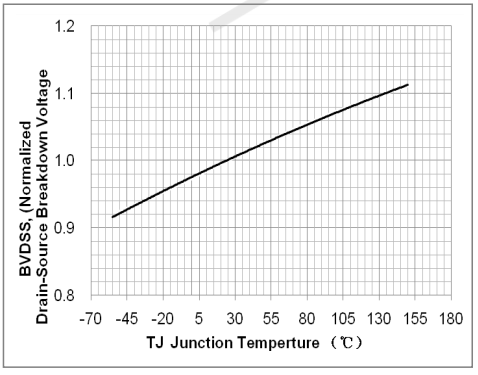


Fig. 6. On resistance variation vs. junction temperature

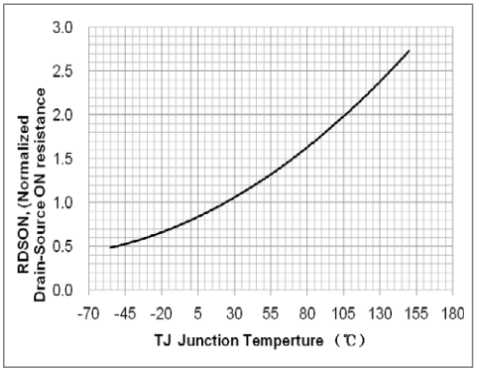


Fig. 7. Maximum safe operating area

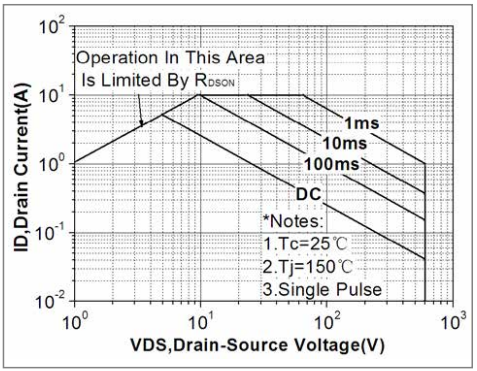


Fig. 8. Capacitance Characteristics

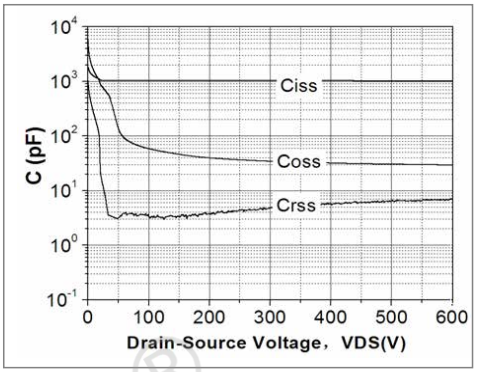


Fig. 9. Transient thermal response curve

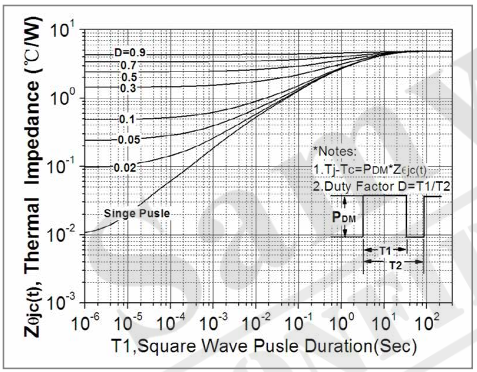


Fig. 10. Gate charge test circuit & waveform

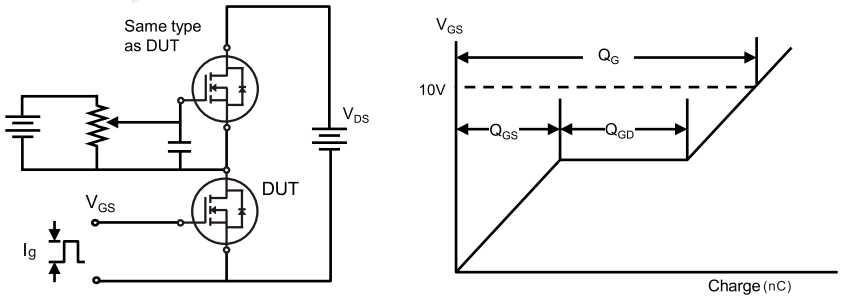


Fig. 11. Switching time test circuit & waveform

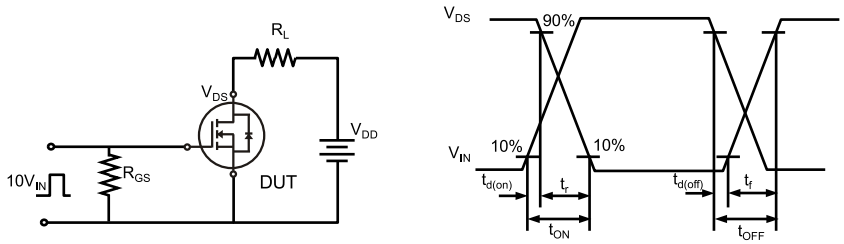


Fig. 12. Unclamped Inductive switching test circuit & waveform

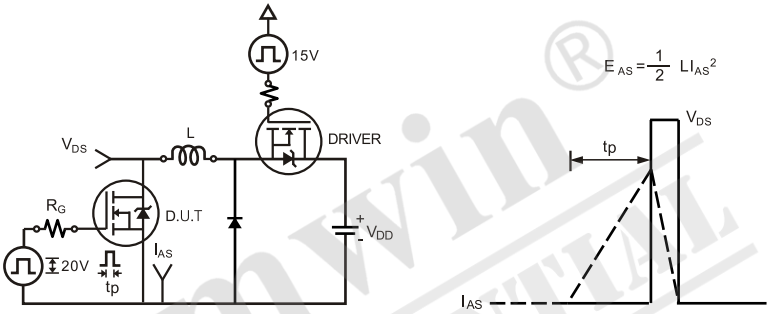
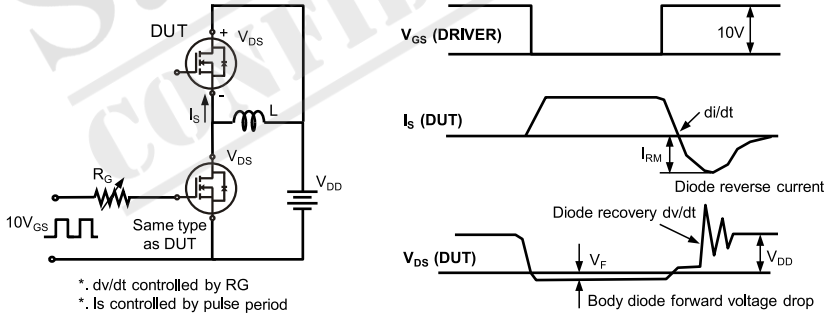


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



DISCLAIMER

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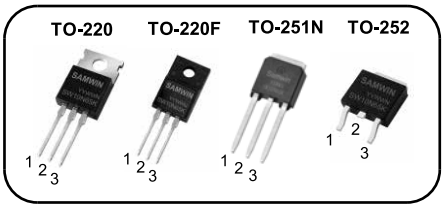
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220/TO-220F/TO-251N /TO-252 MOSFET

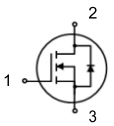
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.36Ω)@V_{GS}=10V
- Low Gate Charge (Typ29nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:LED, Charge, PC Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 10A
$R_{DS(ON)}$:0.36 Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW P 10N65K	SW10N65K	TO-220	TUBE
2	SW F 10N65K	SW10N65K	TO-220F	TUBE
3	SW N 10N65K	SW10N65K	TO-251N	TUBE
4	SW D 10N65K	SW10N65K	TO-252	REEL

Absolute maximum ratings

Symbol	Parameter	Value				Unit
		TO220	TO220F	TO251N	TO252	
V_{DSS}	Drain to source voltage	650				V
I_D	Continuous drain current (@T_C=25°C)	10*				A
	Continuous drain current (@T_C=100°C)	6.3*				A
I_{DM}	Drain current pulsed (note 1)	40				A
V_{GS}	Gate to source voltage	±30				V
E_{AS}	Single pulsed avalanche energy (note 2)	270				mJ
E_{AR}	Repetitive avalanche energy (note 1)	60				mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5				V/ns
P_D	Total power dissipation (@T_C=25°C)	178.6	25.5	96.2	104	W
	Derating factor above 25°C	1.43	0.2	0.77	0.83	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150				°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300				°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value				Unit
		TO220	TO220F	TO251N	TO252	
R_{thjc}	Thermal resistance, Junction to case	0.7	4.9	1.3	1.2	°C/W
R_{thja}	Thermal resistance, Junction to ambient	53.7	48.7	80.0		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.65		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=5A		0.36	0.4	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=5A		6.8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1015		pF
C_{oss}	Output capacitance			40		
C_{rss}	Reverse transfer capacitance			3.9		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=10A, R_G=25Ω, V_{GS}=10V (note 4,5)		16		ns
t_r	Rising time			34		
$t_{d(off)}$	Turn off delay time			55		
t_f	Fall time			27		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=10A (note 4,5)		29		nC
Q_{gs}	Gate-source charge			7		
Q_{gd}	Gate-drain charge			14		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			10	A
I_{SM}	Pulsed source current				40	A
V_{SD}	Diode forward voltage drop.	I_S=10A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=10A, V_{GS}=0V, dI_F/dt=100A/us		266		ns
Q_{rr}	Reverse recovery charge			3.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =60mH, I_{AS} =3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 10A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

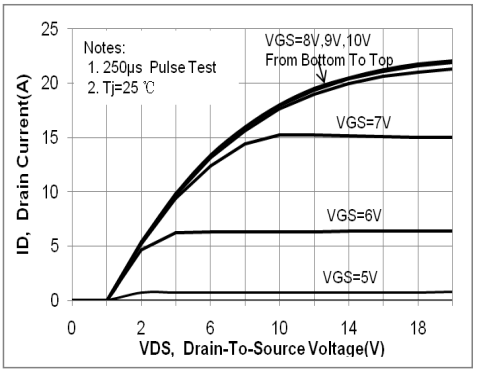


Fig. 2. On-resistance variation vs. drain current and gate voltage

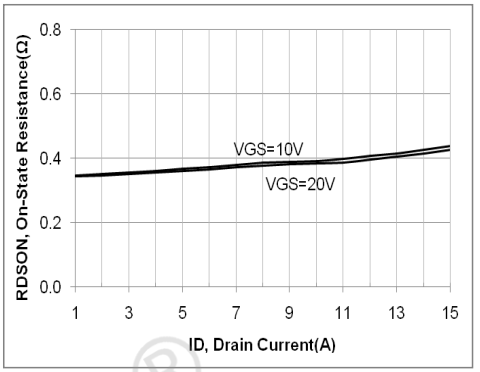


Fig. 3. Gate charge characteristics

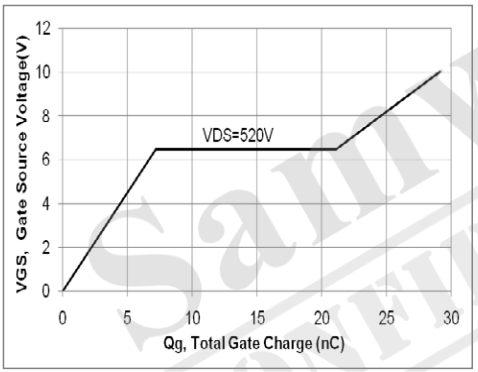


Fig. 4. On state current vs. diode forward voltage

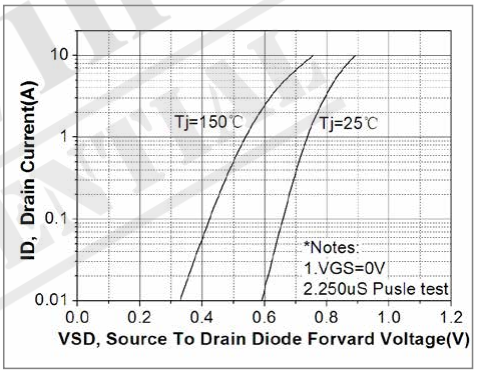


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

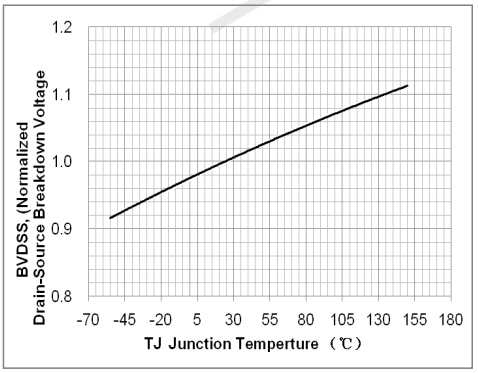


Fig. 6. On resistance variation vs. junction temperature

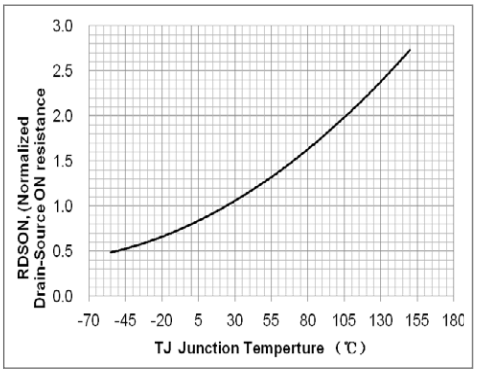


Fig. 7. Maximum safe operating area(TO-220)

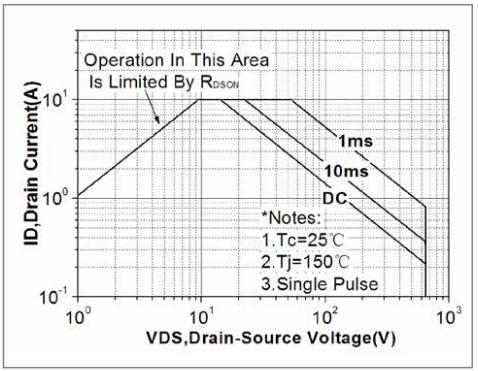


Fig. 8. Maximum safe operating area(TO-220F)

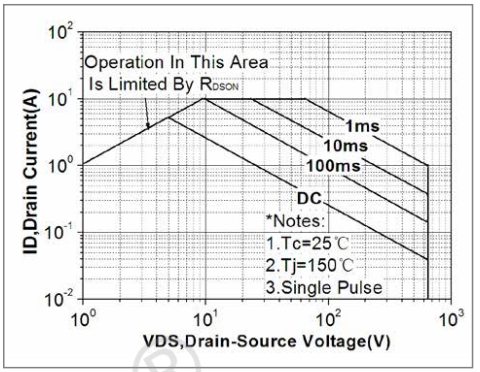


Fig. 9. Maximum safe operating area(TO-251N)

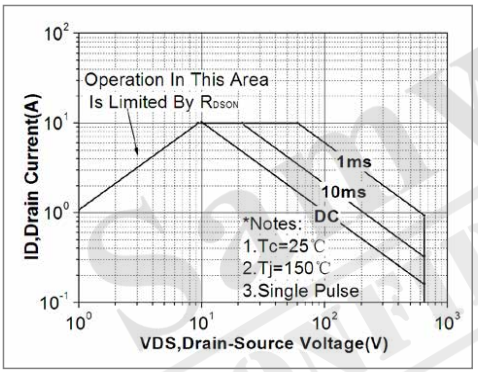


Fig. 10. Maximum safe operating area(TO-252)

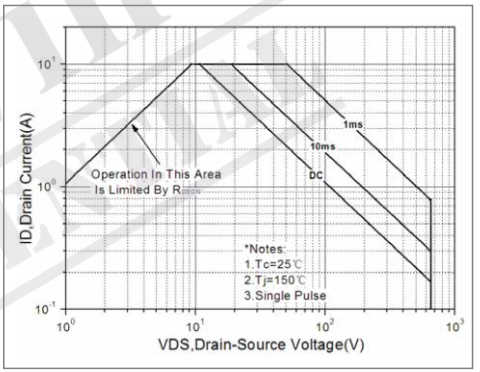


Fig. 11. Capacitance Characteristics

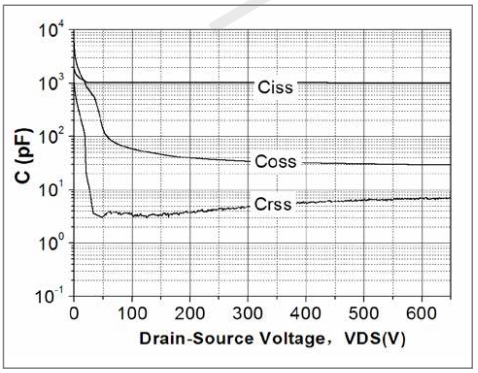


Fig. 12. Transient thermal response curve(TO-220)

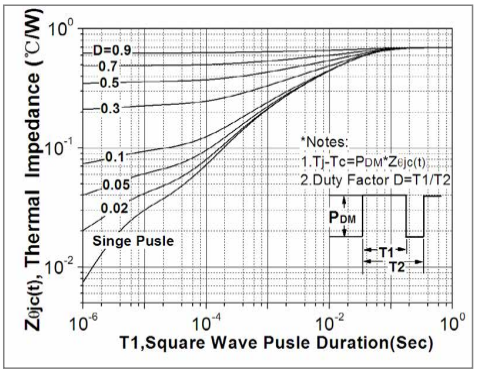


Fig. 13. Transient thermal response curve(TO-220F)

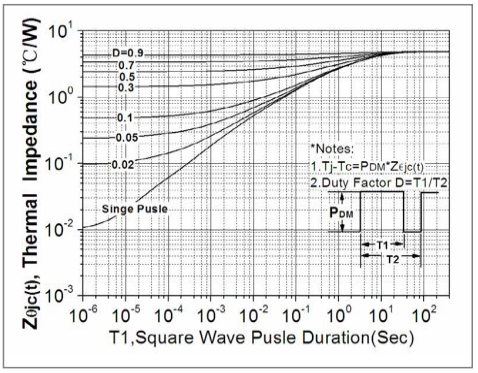


Fig. 14. Transient thermal response curve(TO-251N)

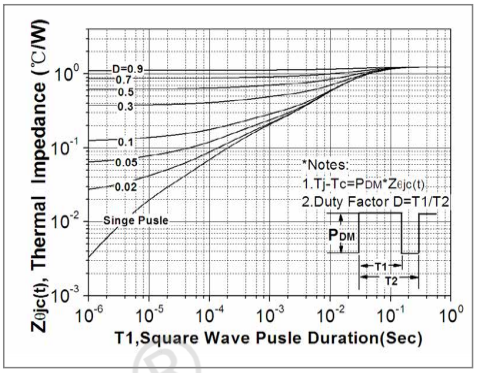


Fig. 15. Transient thermal response curve(TO-252)

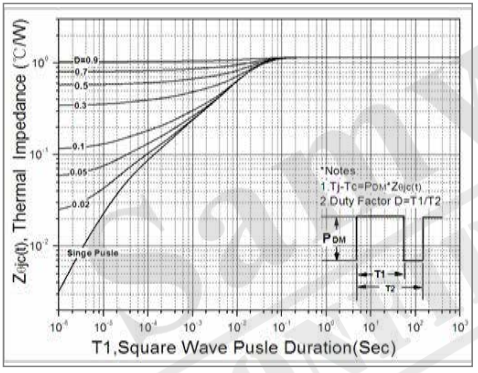


Fig. 16. Gate charge test circuit & waveform

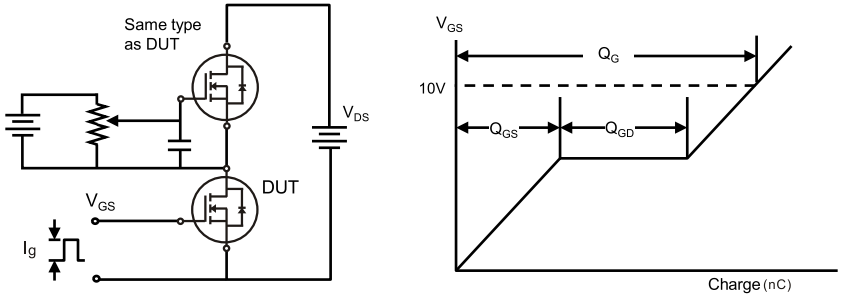


Fig. 17. Switching time test circuit & waveform

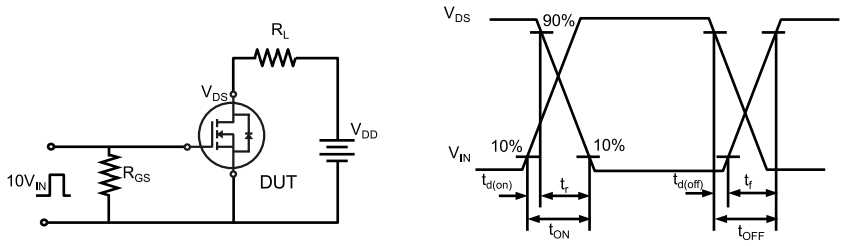


Fig. 18. Unclamped Inductive switching test circuit & waveform

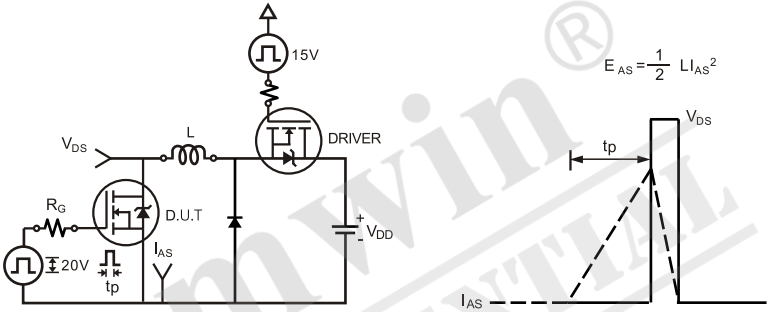
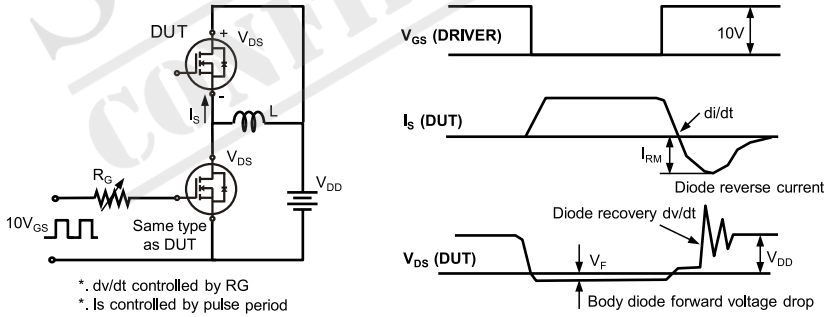


Fig. 19. Peak diode recovery dv/dt test circuit & waveform



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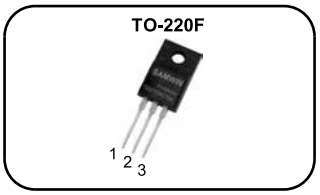
N-channel Enhanced mode TO-220F MOSFET

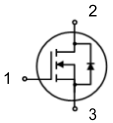
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.36Ω)@V_{GS}=10V
- Low Gate Charge (Typ 29nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Charge,LED,TV-Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 700V
I_D : 10A
$R_{DS(ON)}$: 0.36Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 10N70K	SW10N70K	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		700	V
I_D	Continuous drain current (@T_C=25°C)		10*	A
	Continuous drain current (@T_C=100°C)		6.3*	A
I_{DM}	Drain current pulsed	(note 1)	40	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	120	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	15	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		25.5	W
	Derating factor above 25°C		0.2	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	4.9	°C/W
R_{thja}	Thermal resistance, Junction to ambient	48.7	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	700			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.65		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=700V, V_{GS}=0V			1	uA
		V_{DS}=560V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=5A		0.36	0.42	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=5A		7		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1015		pF
C_{oss}	Output capacitance			40		
C_{rss}	Reverse transfer capacitance			3.9		
$t_{d(on)}$	Turn on delay time	V_{DS}=350V, I_D=10A, V_{GS}=10V, R_G=25Ω (note 4,5)		16		ns
t_r	Rising time			34		
$t_{d(off)}$	Turn off delay time			55		
t_f	Fall time			27		
Q_g	Total gate charge	V_{DS}=560V, V_{GS}=10V, I_D=10A (note 4,5)		29		nC
Q_{gs}	Gate-source charge			7		
Q_{gd}	Gate-drain charge			14		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			10	A
I_{SM}	Pulsed source current				40	A
V_{SD}	Diode forward voltage drop.	I_S=10A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=10A, V_{GS}=0V, dI_F/dt=100A/us		266		ns
Q_{rr}	Reverse recovery charge			3.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 60mH, I_{AS} = 2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 10A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

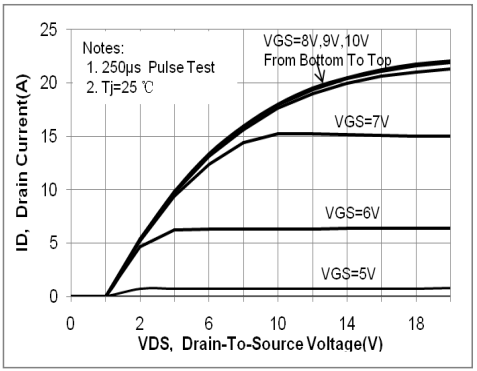


Fig. 2. On-resistance variation vs. drain current and gate voltage

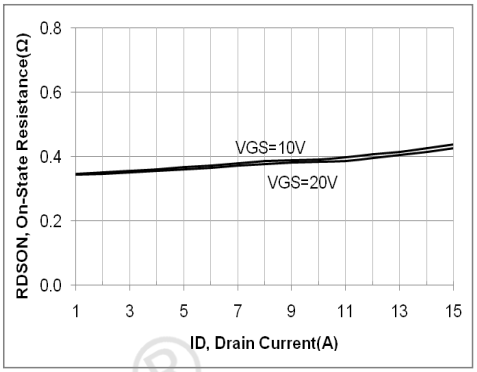


Fig. 3. Gate charge characteristics

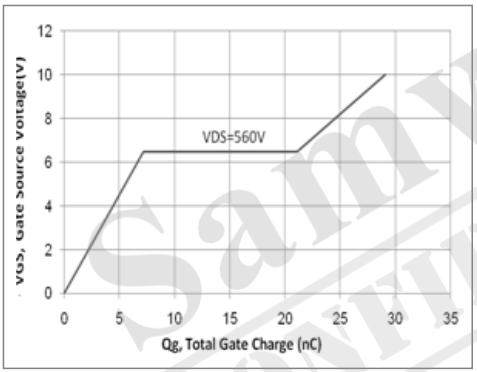


Fig. 4. On state current vs. diode forward voltage

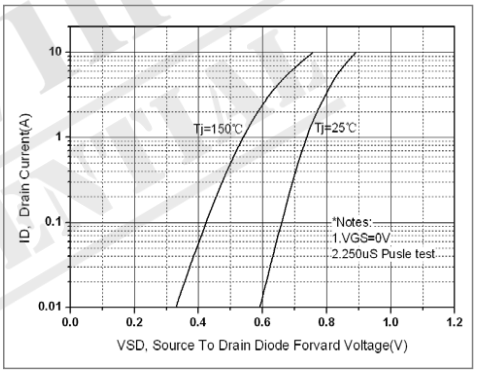


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

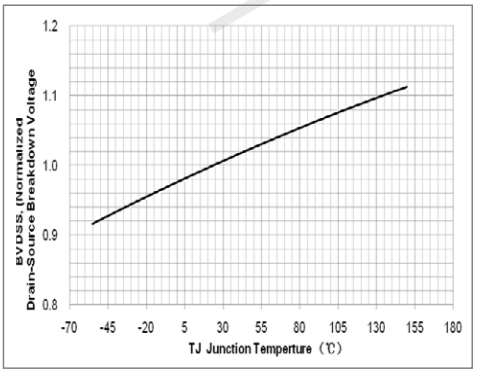


Fig. 6. On resistance variation vs. junction temperature

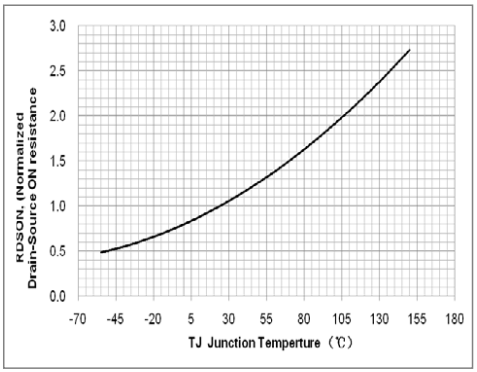


Fig. 7. Maximum safe operating area

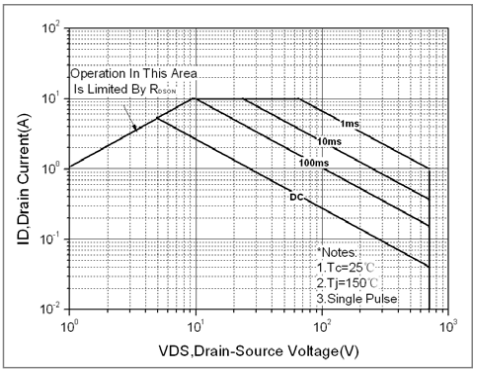


Fig. 8. Capacitance Characteristics

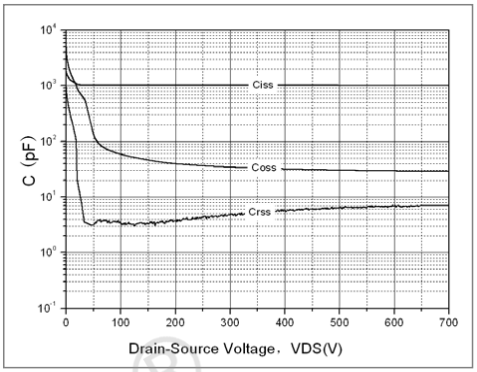


Fig. 9. Transient thermal response curve

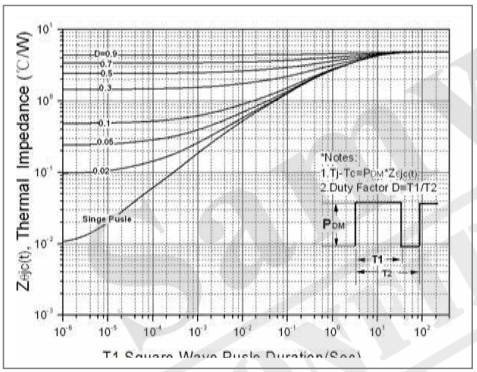


Fig. 10. Gate charge test circuit & waveform

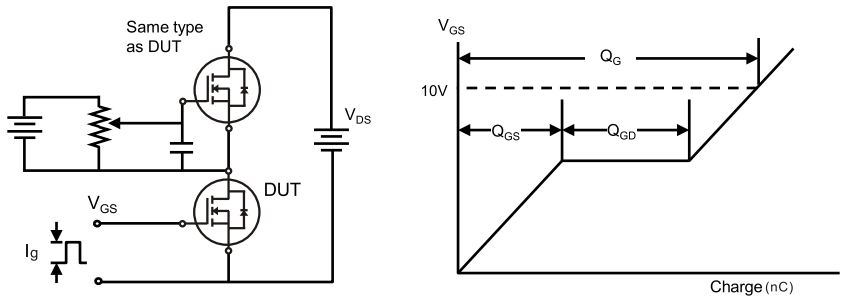


Fig. 11. Switching time test circuit & waveform

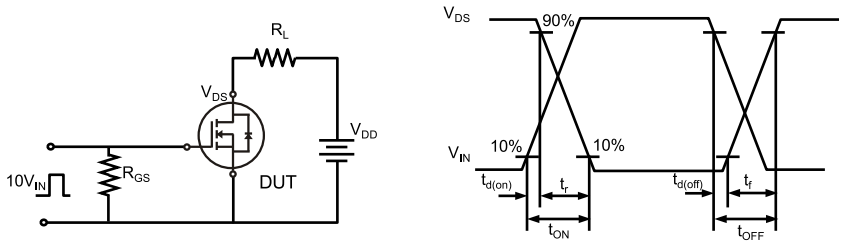


Fig. 12. Unclamped Inductive switching test circuit & waveform

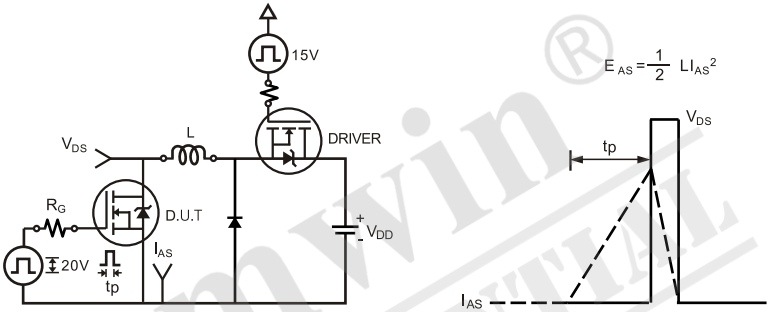
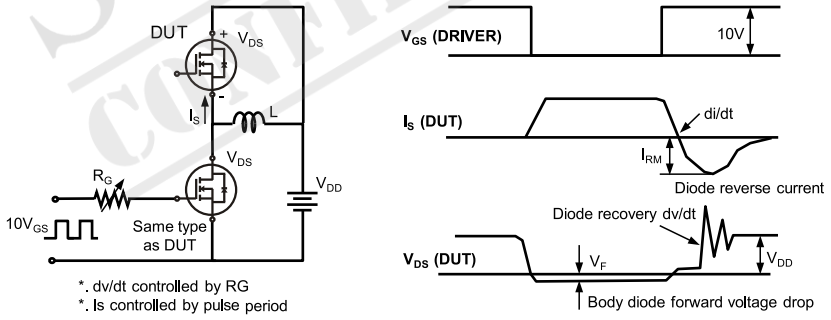


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



DISCLAIMER

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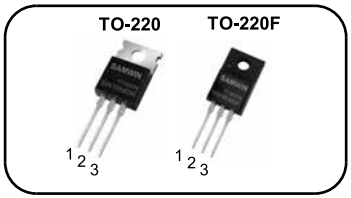
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220/TO-220F MOSFET

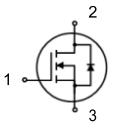
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.23Ω)@V_{GS}=10V
- Low Gate Charge (Typ 43nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:LED, Charge, PC Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 16A
$R_{DS(ON)}$:0.23Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW P 16N65K	SW16N65K	TO-220	TUBE
2	SW F 16N65K	SW16N65K	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value		Unit
			TO-220	TO-220F	
V_{DSS}	Drain to source voltage		650		V
I_D	Continuous drain current (@T_C=25°C)		16*		A
	Continuous drain current (@T_C=100°C)		10.1*		A
I_{DM}	Drain current pulsed	(note 1)	64		A
V_{GS}	Gate to source voltage		±30		V
E_{AS}	Single pulsed avalanche energy	(note 2)	300		mJ
E_{AR}	Repetitive avalanche energy	(note 1)	16		mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5		V/ns
P_D	Total power dissipation (@T_C=25°C)		271.7	32.2	W
	Derating factor above 25°C		2.2	0.26	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150		°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300		°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value		Unit
		TO-220	TO-220F	
R_{thjc}	Thermal resistance, Junction to case	0.46	3.88	°C/W
R_{thja}	Thermal resistance, Junction to ambient	55.4	45.1	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.67		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=8A		0.23	0.25	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=8A		10		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1500		pF
C_{oss}	Output capacitance			51		
C_{rss}	Reverse transfer capacitance			4.6		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=16A, R_G=25Ω, V_{GS}=10V (note 4,5)		21		ns
t_r	Rising time			48		
$t_{d(off)}$	Turn off delay time			77		
t_f	Fall time			35		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=16A (note 4,5)		43		nC
Q_{gs}	Gate-source charge			13		
Q_{gd}	Gate-drain charge			19		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			16	A
I_{SM}	Pulsed source current				64	A
V_{SD}	Diode forward voltage drop.	I_S=16A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=16A, V_{GS}=0V, dI_F/dt=100A/us		347		ns
Q_{rr}	Reverse recovery charge			5.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 37.5mH, I_{AS} = 4A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 16A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

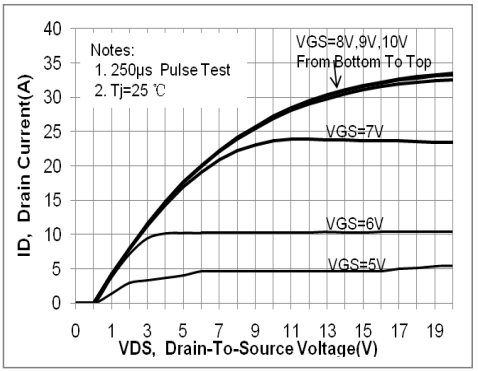


Fig. 2. On-resistance variation vs. drain current and gate voltage

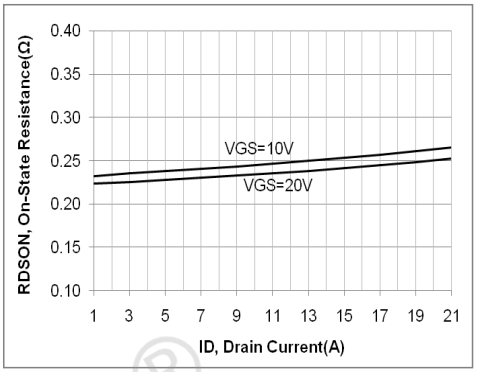


Fig. 3. Gate charge characteristics

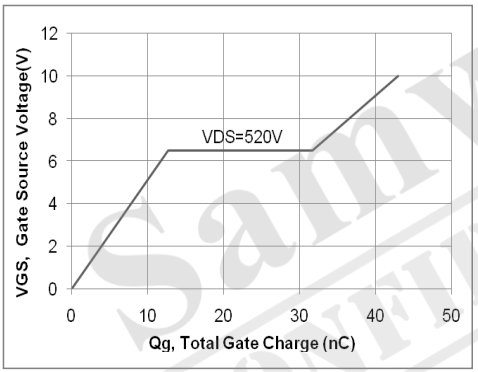


Fig. 4. On state current vs. diode forward voltage

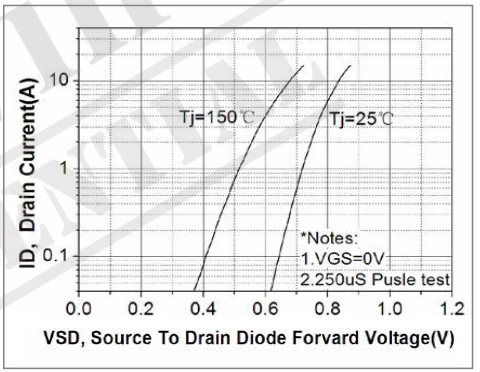


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

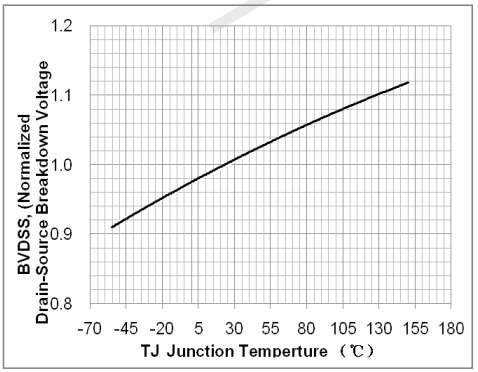


Fig. 6. On resistance variation vs. junction temperature

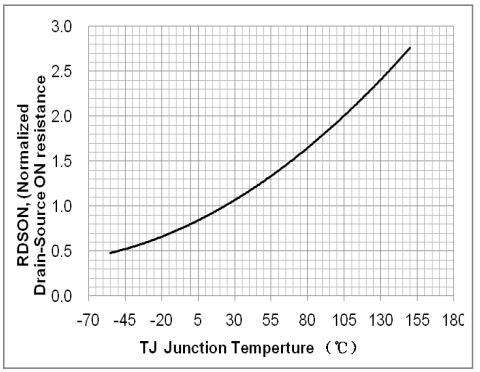


Fig. 7. Maximum safe operating area(TO-220)

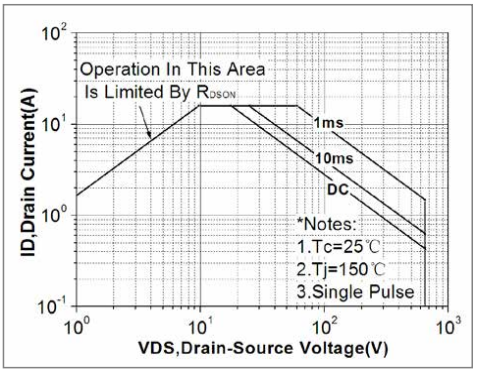


Fig. 8. Maximum safe operating area(TO-220F)

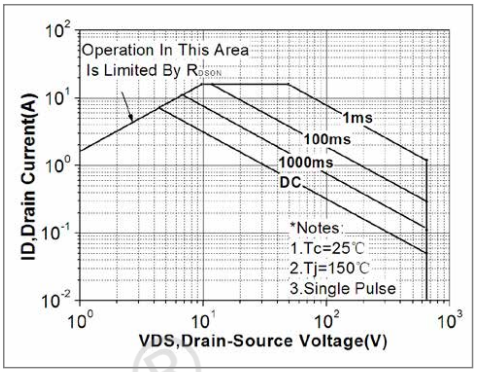


Fig. 9. Capacitance Characteristics

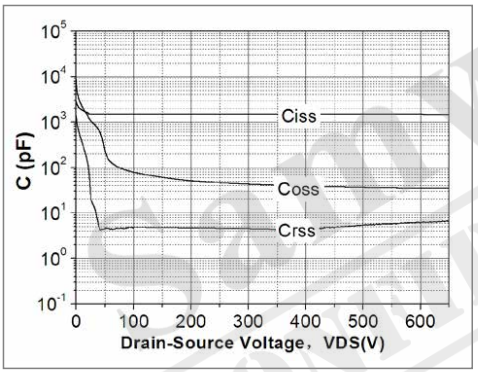


Fig. 10. Transient thermal response curve(TO-220)

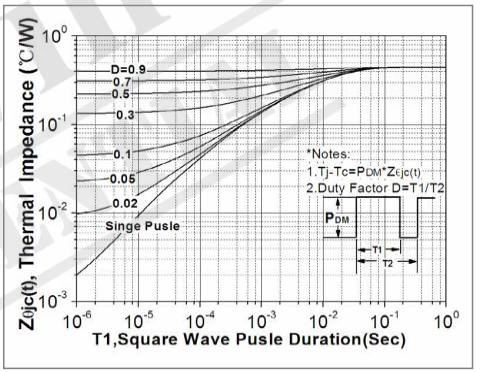


Fig. 11. Transient thermal response curve(TO-220F)

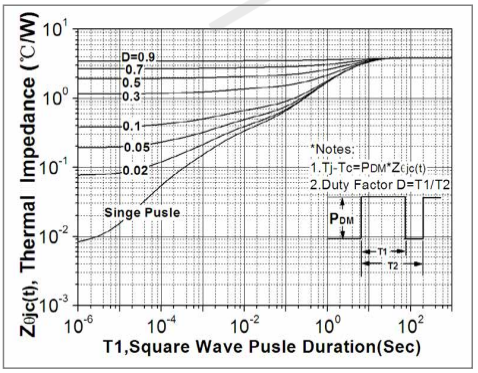


Fig. 12. Gate charge test circuit & waveform

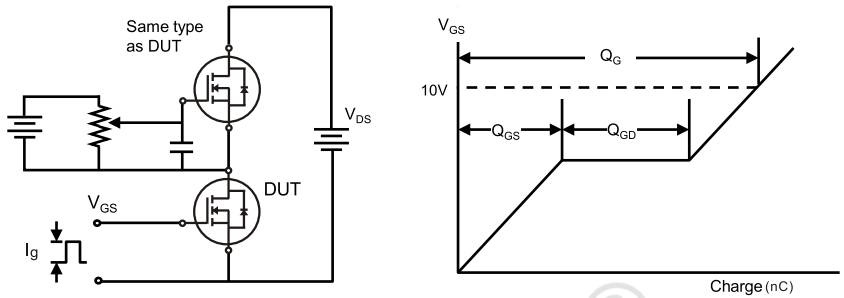


Fig. 13. Switching time test circuit & waveform

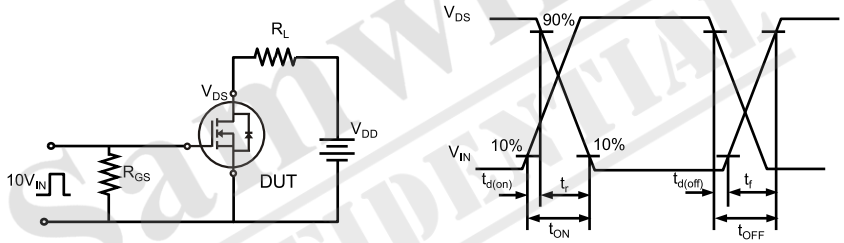


Fig. 14. Unclamped Inductive switching test circuit & waveform

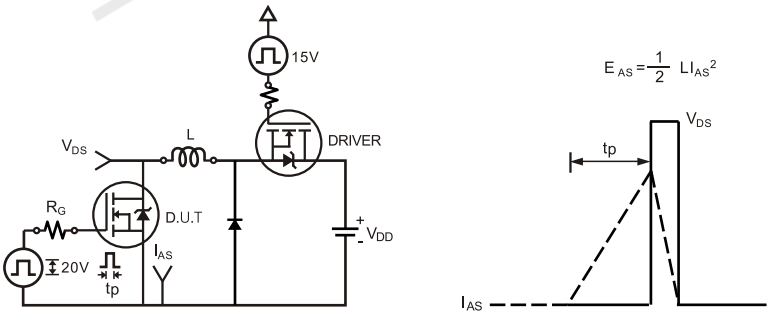
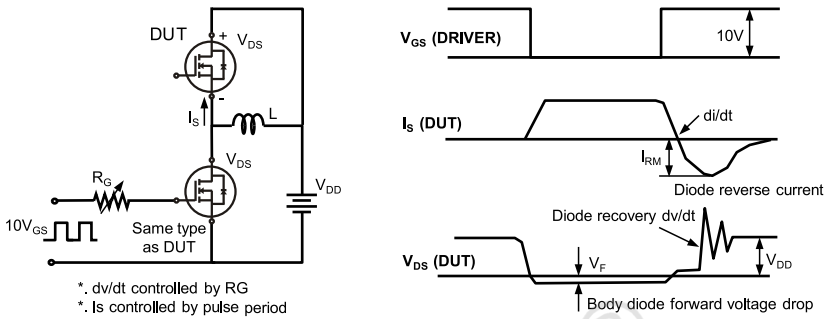


Fig. 15. Peak diode recovery dv/dt test circuit & waveform



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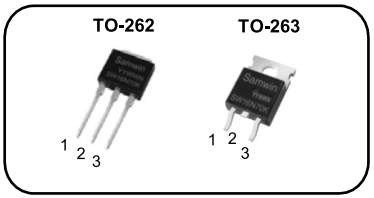
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhancement mode TO-262/TO-263 MOSFET

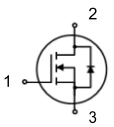
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.23Ω)@V_{GS}=10V
- Low Gate Charge (Typ 42nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: DC-DC,LED,PC



1. Gate 2. Drain 3. Source

BV_{DSS} : 700V
I_D : 16A
$R_{DS(ON)}$: 0.23Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW U 16N70K	SW16N70K	TO-262	TUBE
2	SW B 16N70K	SW16N70K	TO-263	TUBE

Absolute maximum ratings

Symbol	Parameter		Value		Unit
			TO-262	TO-263	
V_{DSS}	Drain to Source Voltage		700		V
I_D	Continuous Drain Current (@T_C=25°C)		16*		A
	Continuous Drain Current (@T_C=100°C)		10*		A
I_{DM}	Drain current pulsed	(note 1)	64		A
V_{GS}	Gate to Source Voltage		±30		V
E_{AS}	Single pulsed Avalanche Energy	(note 2)	360		mJ
E_{AR}	Repetitive Avalanche Energy	(note 1)	50		mJ
dv/dt	Peak diode Recovery dv/dt	(note 3)	5		V/ns
P_D	Total power dissipation (@T_C=25°C)		278	278	W
	Derating Factor above 25°C		2.22	2.22	W/°C
T_{STG}, T_J	Operating Junction Temperature & Storage Temperature		-55 ~ + 150		°C
T_L	Maximum Lead Temperature for soldering purpose, 1/8 from Case for 5 seconds.		300		°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value		Unit
		TO-262	TO-263	
R_{thjc}	Thermal resistance, Junction to case	0.45	0.45	°C/W
R_{thja}	Thermal resistance, Junction to ambient	69		°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	700			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.49		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=700V, V_{GS}=0V			1	uA
		V_{DS}=560V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=8A		0.23	0.27	Ω
Gfs	Forward Transconductance	V_{DS} =30V, I_D=8A		10		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1490		pF
C_{oss}	Output capacitance			60		
C_{rss}	Reverse transfer capacitance			15		
$t_{d(on)}$	Turn on delay time	V_{DS}=350V, I_D=16A, R_G=25Ω, V_{GS}=10V (note 4,5)		25		nS
tr	Rising time			57		
$t_{d(off)}$	Turn off delay time			94		
t_f	Fall time			40		
Q_g	Total gate charge	V_{DS}=560V, V_{GS}=10V, I_D=16A (note 4,5)		42		nC
Q_{gs}	Gate-source charge			10		
Q_{gd}	Gate-drain charge			21		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			16	A
I_{SM}	Pulsed source current				64	A
V_{SD}	Diode forward voltage drop.	I_S=16A, V_{GS}=0V			1.4	V
T_{rr}	Reverse recovery time	I_S=16A, V_{GS}=0V, dI_F/dt=100A/us		325		nS
Q_{rr}	Reverse recovery Charge			5.14		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 80mH, I_{AS} =3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤16A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C Pulse
4. Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

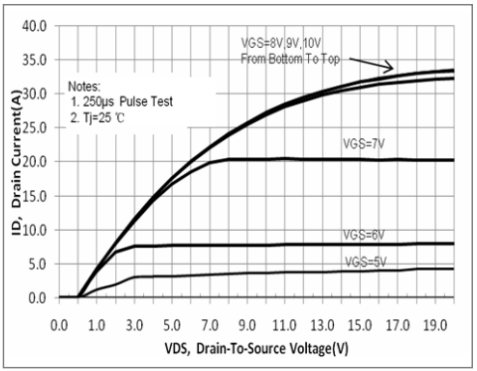


Fig. 2. On-resistance variation vs. drain current and gate voltage

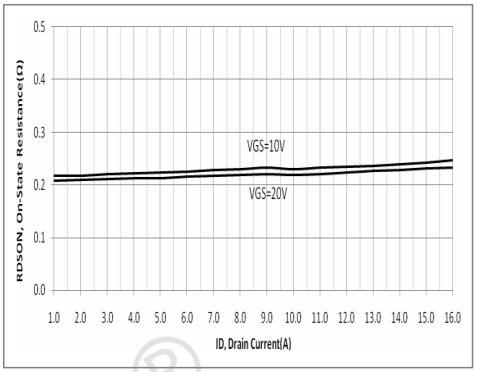


Fig. 3. Gate charge characteristics

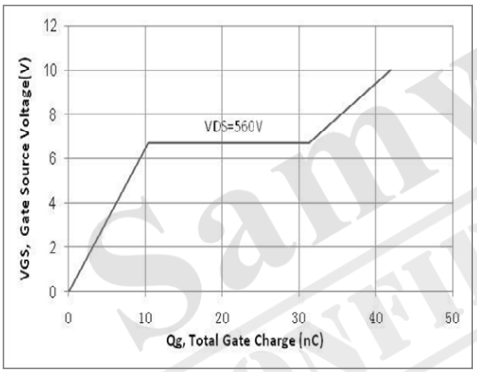


Fig. 4. On state current vs. diode forward voltage

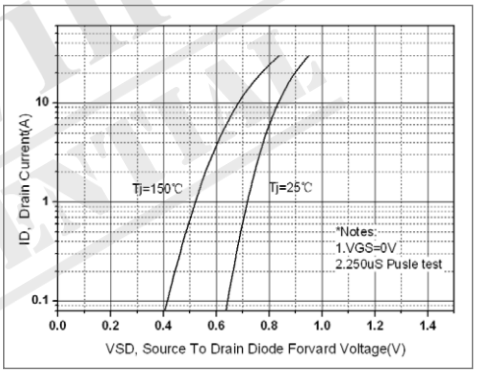


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

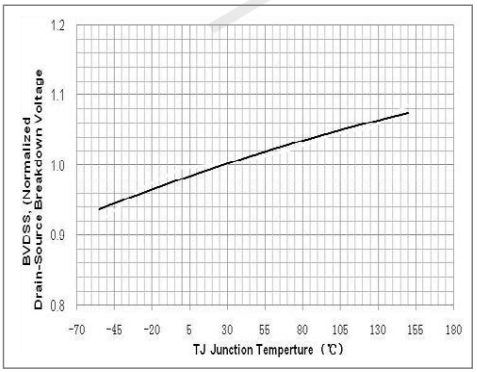


Fig. 6. On resistance variation vs. junction temperature

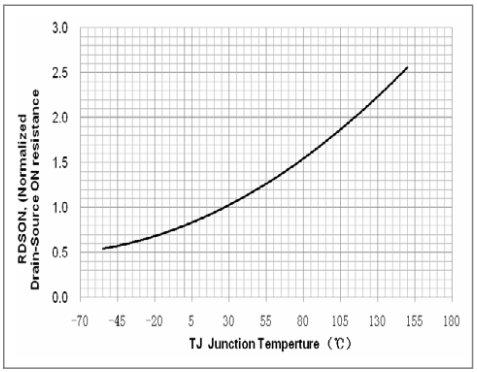


Fig. 7. Maximum safe operating area(TO-262)

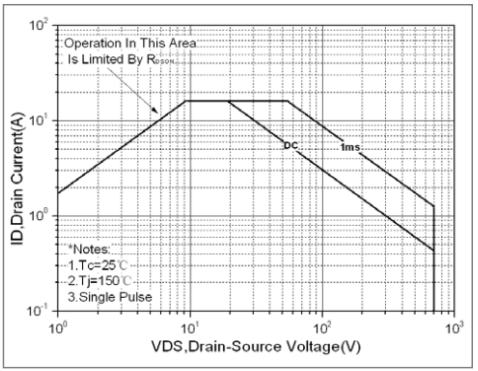


Fig. 8. Maximum safe operating area(TO-263)

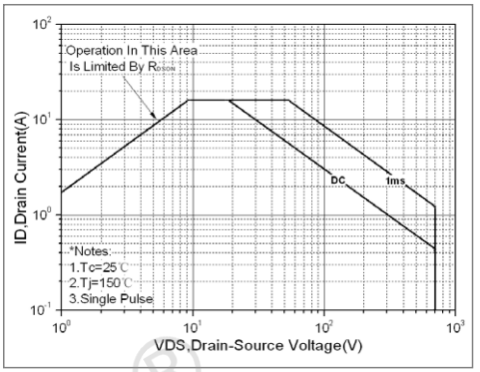


Fig. 9. Capacitance Characteristics

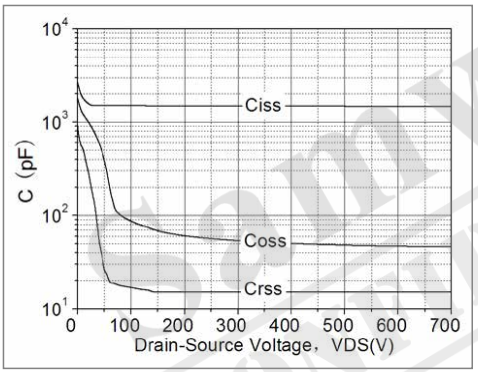


Fig. 10. Transient thermal response curve(TO-262)

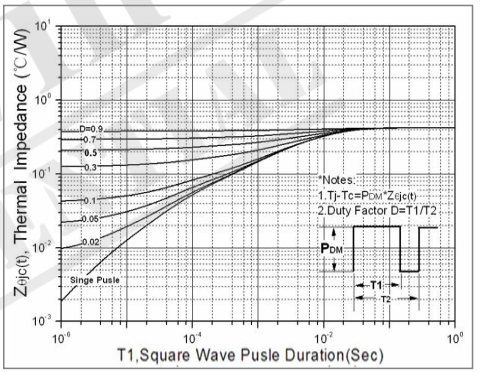


Fig. 11. Transient thermal response curve(TO-263)

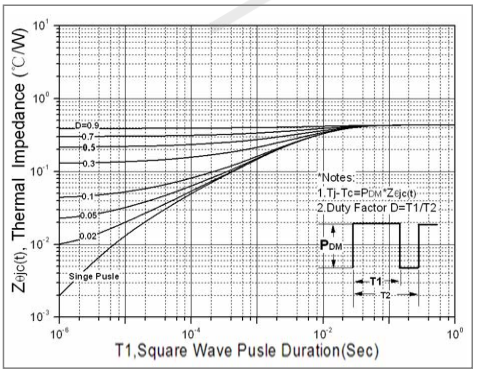


Fig. 12. Gate charge test circuit & waveform

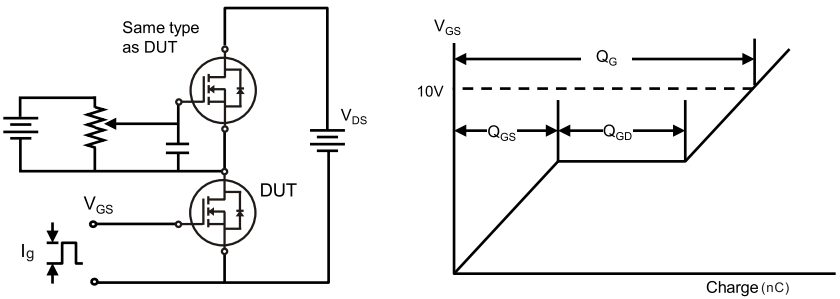


Fig. 13. Switching time test circuit & waveform

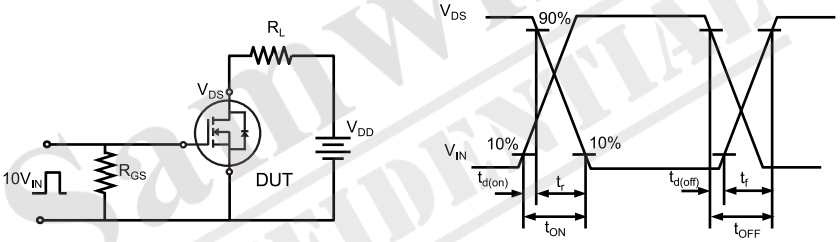


Fig. 14. Unclamped Inductive switching test circuit & waveform

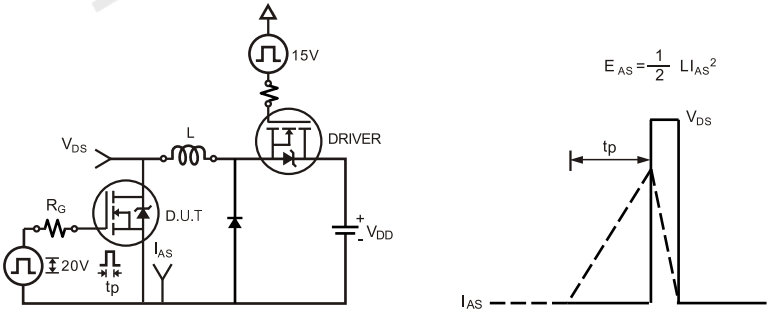
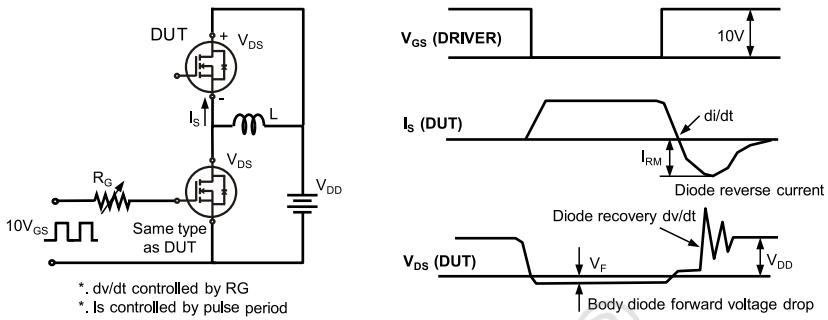


Fig. 15. Peak diode recovery dv/dt test circuit & waveform



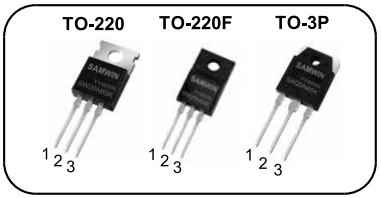
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220/TO-220F/TO-3P MOSFET

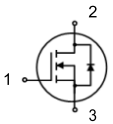
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.16Ω)@V_{GS}=10V
- Low Gate Charge (Typ 60nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:LED,Charge,PC Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 20A
$R_{DS(ON)}$: 0.16 Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW P 20N65K	SW20N65K	TO-220	TUBE
2	SW F 20N65K	SW20N65K	TO-220F	TUBE
3	SW W 20N65K	SW20N65K	TO-3P	TUBE

Absolute maximum ratings

Symbol	Parameter	Value			Unit
		TO-220	TO-220F	TO-3P	
V_{DSS}	Drain to source voltage	650			V
I_D	Continuous drain current (@T_C=25°C)	20*			A
	Continuous drain current (@T_C=100°C)	12.6*			A
I_{DM}	Drain current pulsed (note 1)	80			A
V_{GS}	Gate to source voltage	±30			V
E_{AS}	Single pulsed avalanche energy (note 2)	500			mJ
E_{AR}	Repetitive avalanche energy (note 1)	24			mJ
dv/dt	Peak diode recovery dv/dt (note 3)	5			V/ns
P_D	Total power dissipation (@T_C=25°C)	341.5	35.9	403.2	W
	Derating factor above 25°C	2.7	0.3	3.2	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature	-55 ~ + 150			°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.	300			°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value			Unit
		TO-220	TO-220F	TO-3P	
R_{thjc}	Thermal resistance, Junction to case	0.36	3.48	0.31	°C/W
R_{thja}	Thermal resistance, Junction to ambient	55.7	47.3	41.6	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.64		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=10A		0.16	0.19	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=10A		14		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		2150		pF
C_{oss}	Output capacitance			69		
C_{rss}	Reverse transfer capacitance			9		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=20A, R_G=25Ω, V_{GS}=10V (note 4,5)		28		ns
t_r	Rising time			52		
$t_{d(off)}$	Turn off delay time			116		
t_f	Fall time			40		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=20A (note 4,5)		60		nC
Q_{gs}	Gate-source charge			17		
Q_{gd}	Gate-drain charge			26		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			20	A
I_{SM}	Pulsed source current				80	A
V_{SD}	Diode forward voltage drop.	I_S=20A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=20A, V_{GS}=0V, dI_F/dt=100A/us		366		ns
Q_{rr}	Reverse recovery charge			6.8		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 62.5mH, I_{AS} = 4A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 20A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

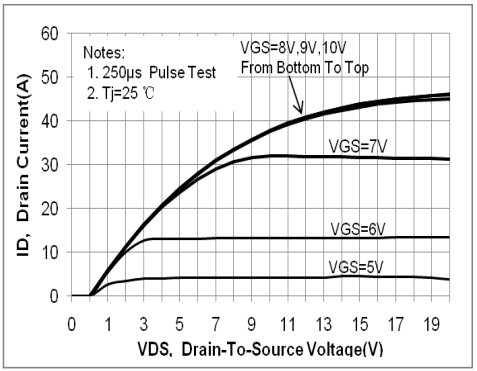


Fig. 2. On-resistance variation vs. drain current and gate voltage

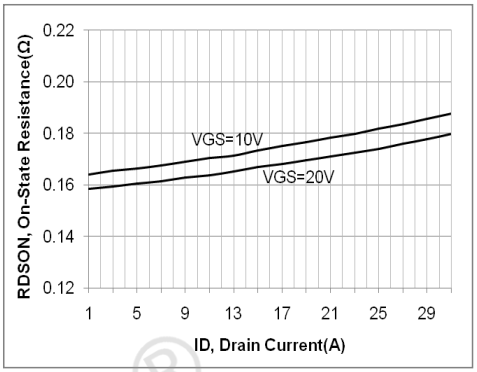


Fig. 3. Gate charge characteristics

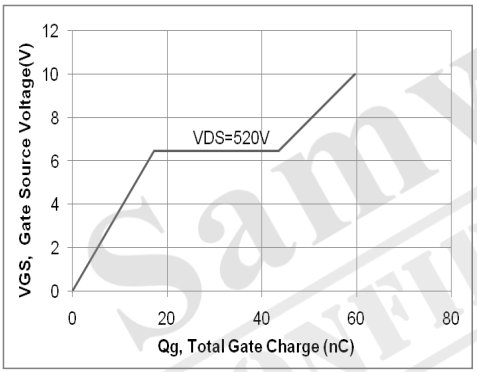


Fig. 4. On state current vs. diode forward voltage

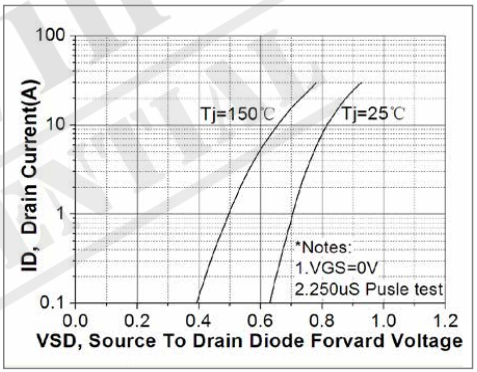


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

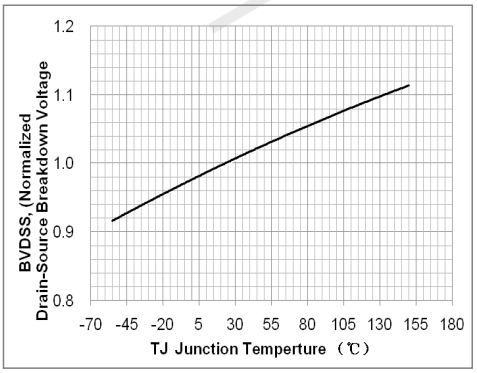


Fig. 6. On resistance variation vs. junction temperature

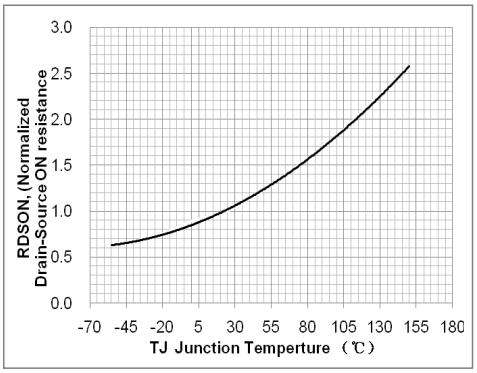


Fig. 7. Maximum safe operating area(TO-220)

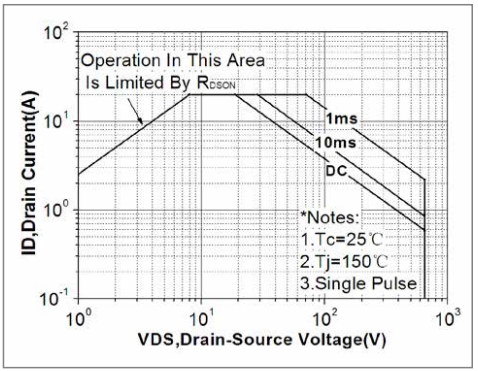


Fig. 8. Maximum safe operating area(TO-220F)

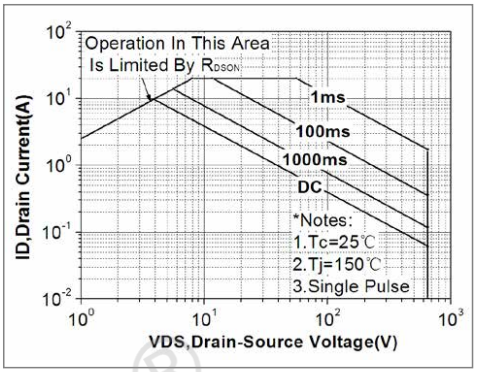


Fig. 9. Maximum safe operating area(TO-3P)

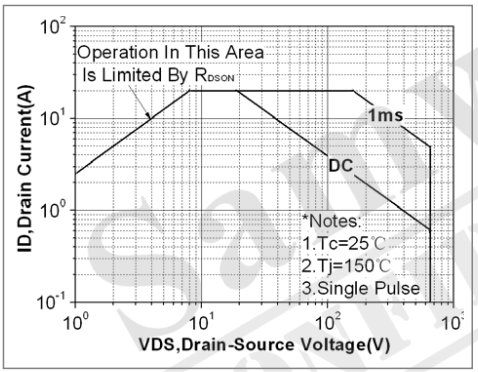


Fig. 10. Capacitance Characteristics

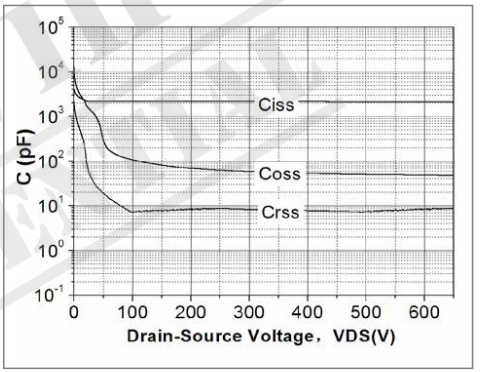


Fig. 11. Transient thermal response curve(TO-220)

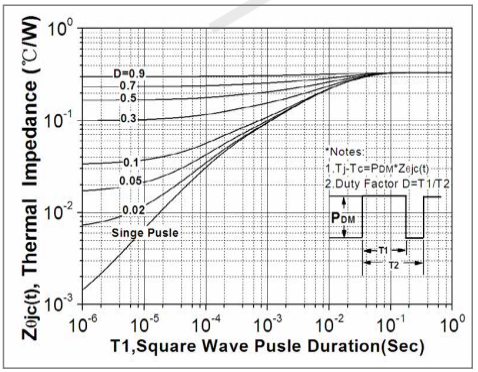


Fig. 12. Transient thermal response curve(TO-220F)

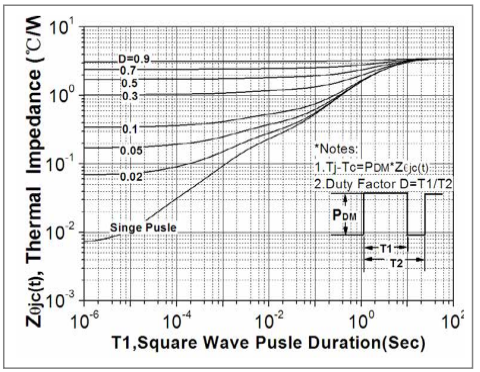


Fig. 13. Transient thermal response curve(TO-3P)

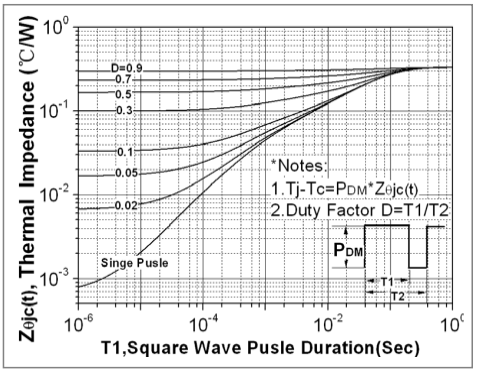


Fig. 14. Gate charge test circuit & waveform

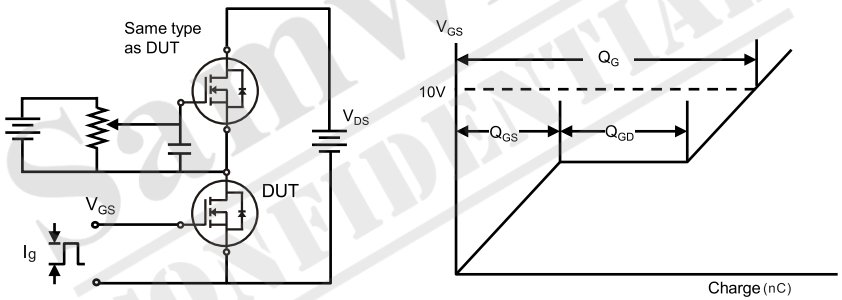


Fig. 15. Switching time test circuit & waveform

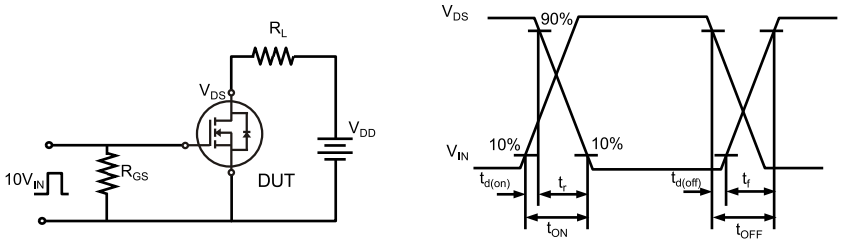


Fig. 16. Unclamped Inductive switching test circuit & waveform

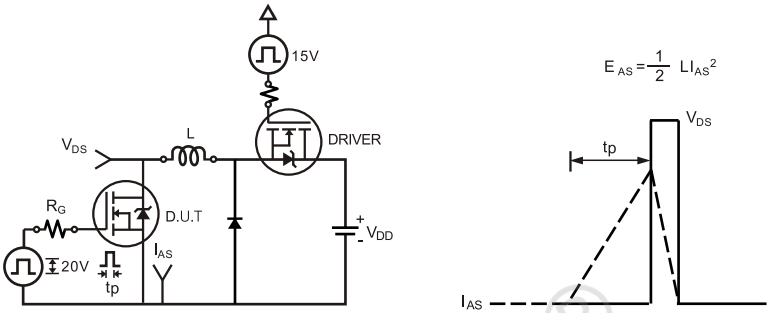
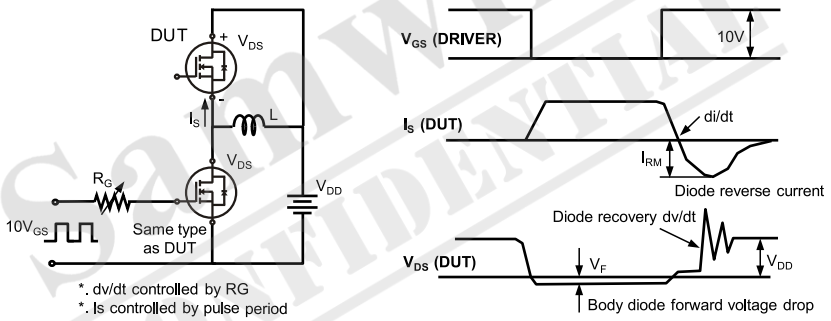


Fig. 17. Peak diode recovery dv/dt test circuit & waveform



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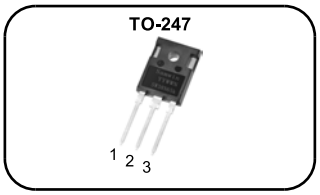
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-247 MOSFET

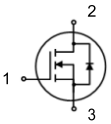
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.09Ω)@V_{GS}=10V
- Low Gate Charge (Typ 96nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Charge, LED, UPS, Servicer



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 38A
$R_{DS(ON)}$:0.09 Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW T 38N65K	SW38N65K	TO-247	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		38*	A
	Continuous drain current (@T_C=100°C)		24*	A
I_{DM}	Drain current pulsed	(note 1)	152	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	800	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	120	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		357.2	W
	Derating factor above 25°C		2.9	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	0.35	°C/W
R_{thja}	Thermal resistance, Junction to ambient	34.6	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.6		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=19A		0.09	0.1	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=19A		25		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		3640		pF
C_{oss}	Output capacitance			117		
C_{rss}	Reverse transfer capacitance			17		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=38A, V_{GS}=10V, R_G=25Ω (note 4,5)		44		ns
t_r	Rising time			64		
$t_{d(off)}$	Turn off delay time			209		
t_f	Fall time			58		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=38A (note 4,5)		96		nC
Q_{gs}	Gate-source charge			27		
Q_{gd}	Gate-drain charge			44		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			38	A
I_{SM}	Pulsed source current				152	A
V_{SD}	Diode forward voltage drop.	I_S=38A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=20A, V_{GS}=0V, dI_F/dt=100A/us		1603		ns
Q_{rr}	Reverse recovery charge			31		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =25 mH, I_{AS} =8A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 20A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

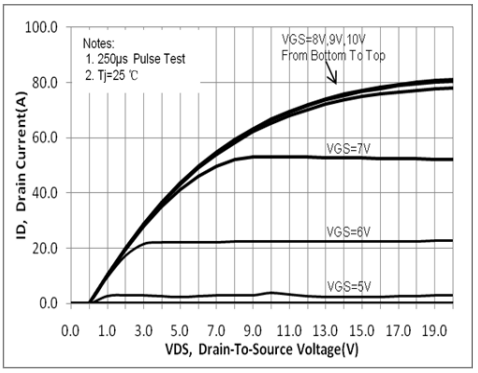


Fig. 2. On-resistance variation vs. drain current and gate voltage

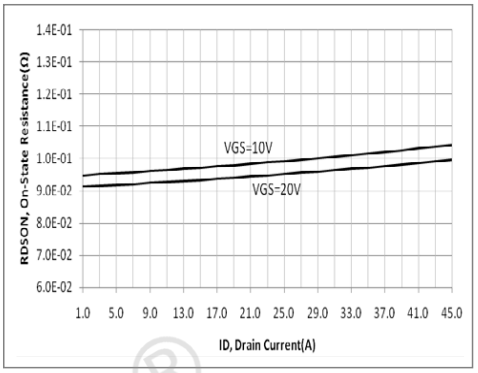


Fig. 3. Gate charge characteristics

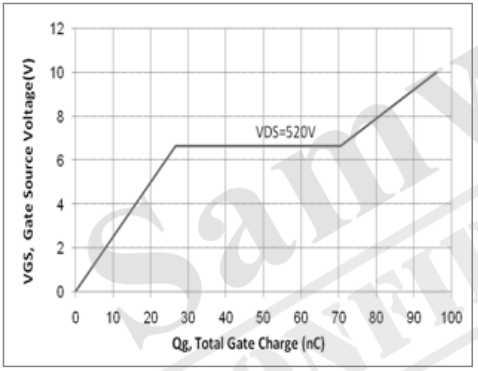


Fig. 4. On state current vs. diode forward voltage

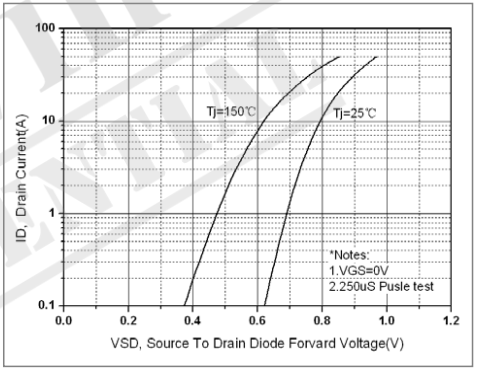


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

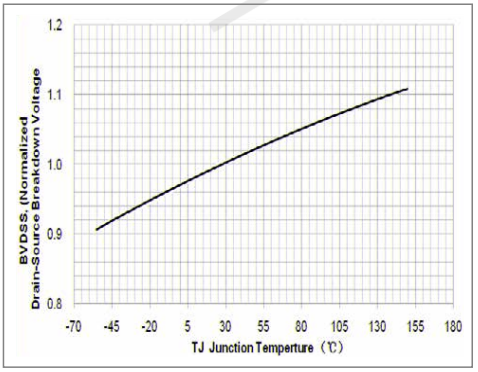


Fig. 6. On resistance variation vs. junction temperature

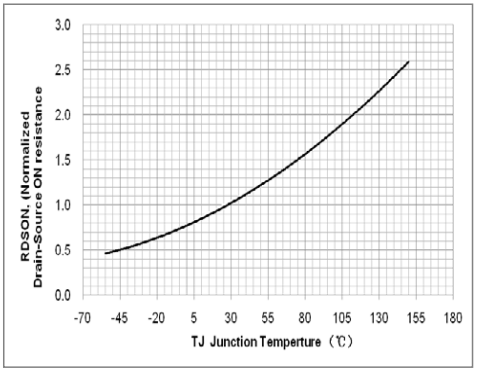


Fig. 7. Maximum safe operating area

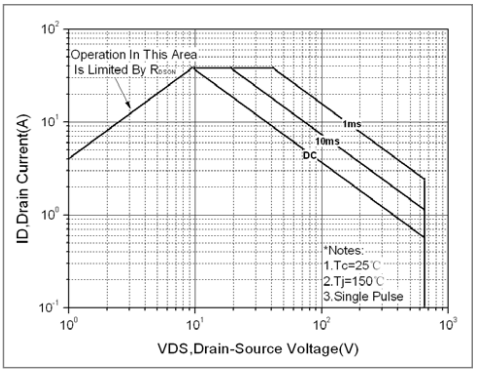


Fig. 8. Capacitance Characteristics

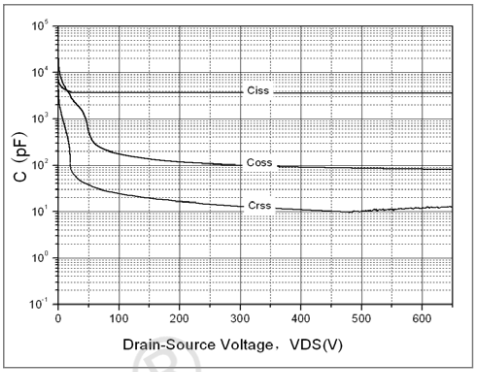


Fig. 9. Transient thermal response curve

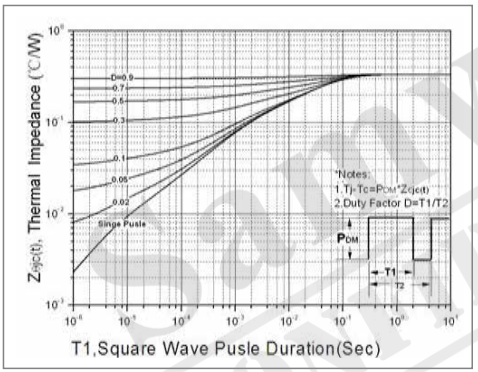


Fig. 10. Gate charge test circuit & waveform

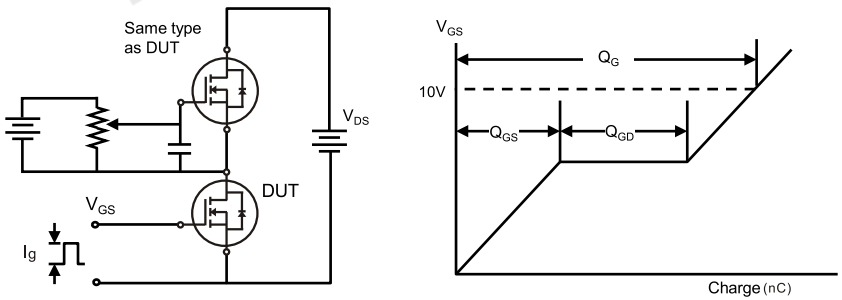


Fig. 11. Switching time test circuit & waveform

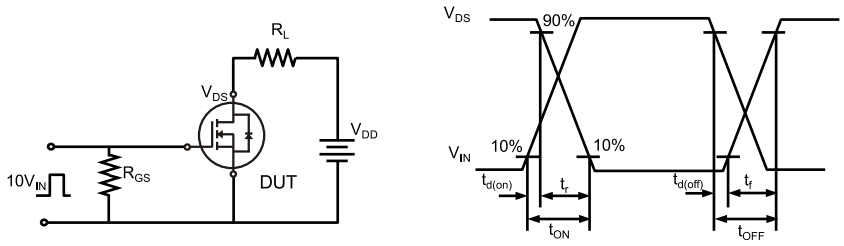


Fig. 12. Unclamped Inductive switching test circuit & waveform

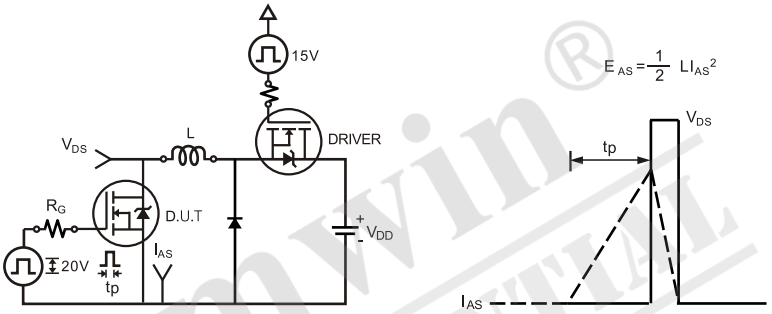
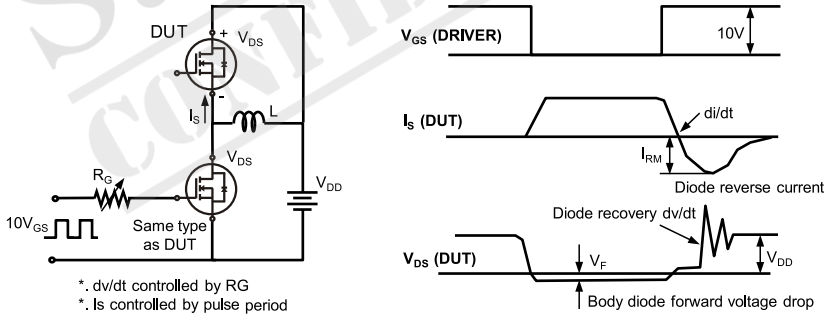


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



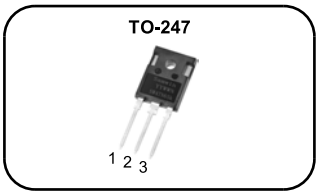
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-247 MOSFET

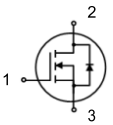
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 60mΩ)@V_{GS}=10V
- Low Gate Charge (Typ 152nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:Charge,LED,PC Power



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 47A
$R_{DS(ON)}$:60mΩ



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Pb LEAD-FREE RoHS

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW T 47N65K	SW47N65K	TO-247	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		47*	A
	Continuous drain current (@T_C=100°C)		29.6*	A
I_{DM}	Drain current pulsed	(note 1)	188	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	1200	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	150	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		328.9	W
	Derating factor above 25°C		2.6	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	0.38	°C/W
R_{thja}	Thermal resistance, Junction to ambient	34.9	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.62		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		5	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=23A		60	72	mΩ
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=23A		33		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		5670		pF
C_{oss}	Output capacitance			175		
C_{rss}	Reverse transfer capacitance			25		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=47A, V_{GS}=10V, R_G=25Ω (note 4,5)		70		ns
t_r	Rising time			99		
$t_{d(off)}$	Turn off delay time			302		
t_f	Fall time			84		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=47A (note 4,5)		152		nC
Q_{gs}	Gate-source charge			48		
Q_{gd}	Gate-drain charge			66		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			47	A
I_{SM}	Pulsed source current				188	A
V_{SD}	Diode forward voltage drop.	I_S=47A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=20A, V_{GS}=0V, dI_F/dt=100A/us		1584		ns
Q_{rr}	Reverse recovery charge			31		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 37.2mH, I_{AS} =8 A, V_{DD} =50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤ 20A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

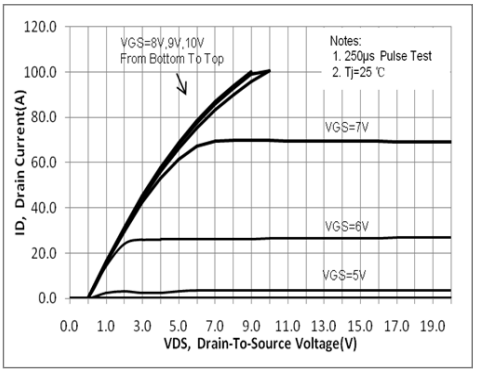


Fig. 2. On-resistance variation vs. drain current and gate voltage

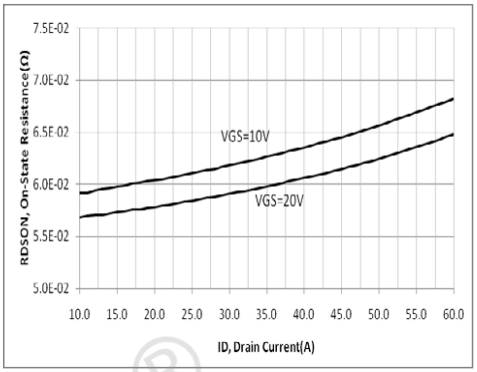


Fig. 3. Gate charge characteristics

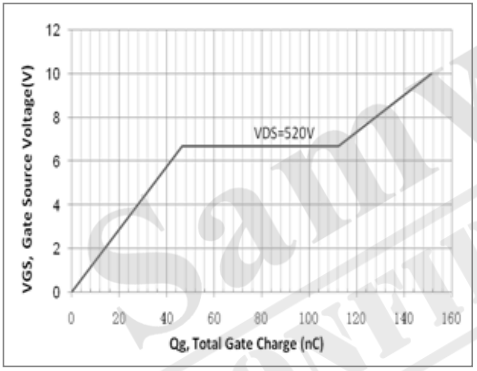


Fig. 4. On state current vs. diode forward voltage

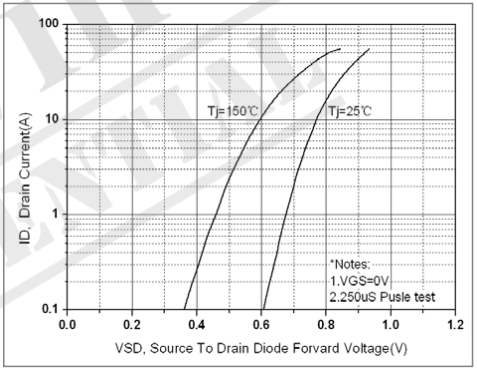


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

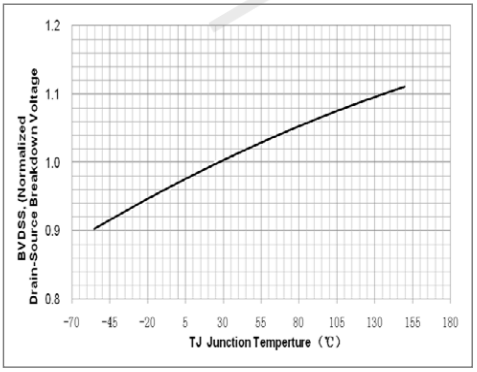


Fig. 6. On resistance variation vs. junction temperature

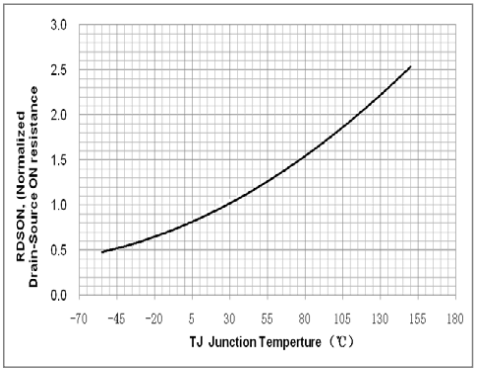


Fig. 7. Maximum safe operating area

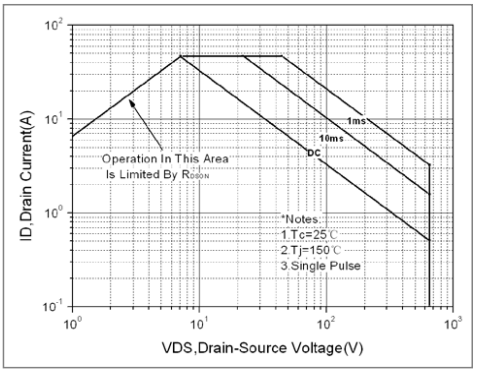


Fig. 8. Capacitance Characteristics

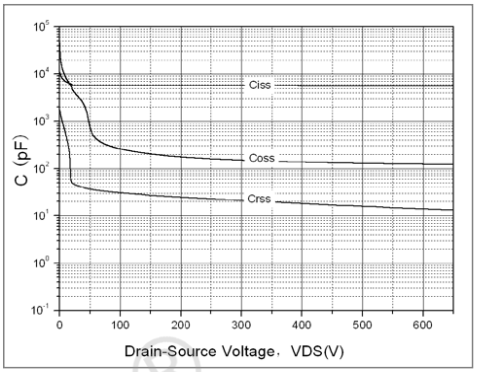


Fig. 9. Transient thermal response curve

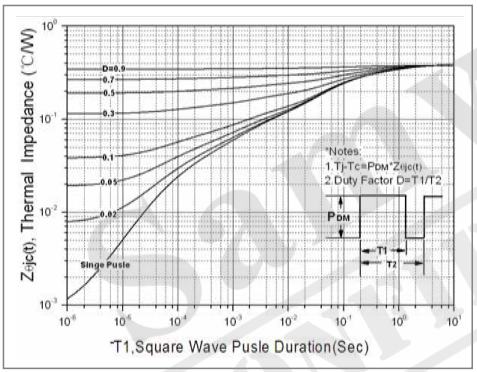
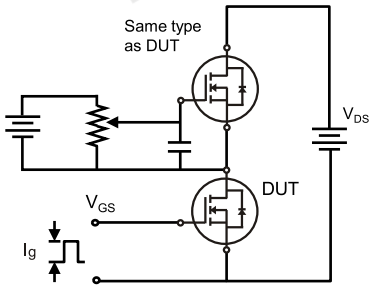


Fig. 10. Gate charge test circuit & waveform



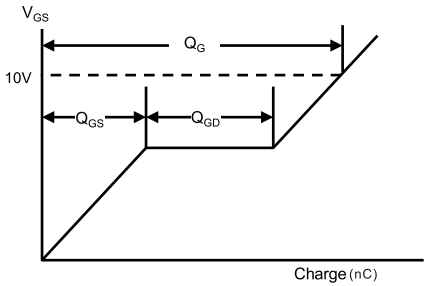


Fig. 11. Switching time test circuit & waveform

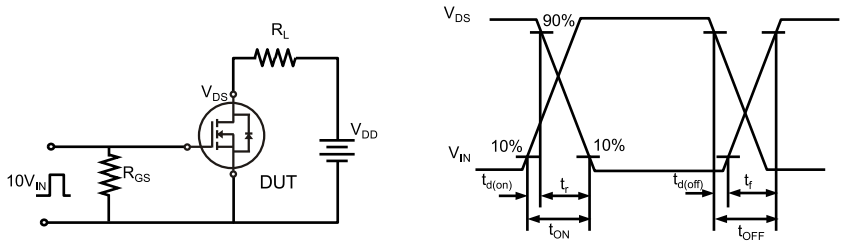


Fig. 12. Unclamped Inductive switching test circuit & waveform

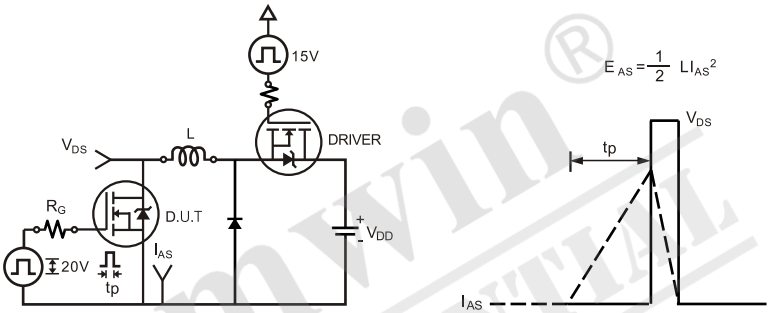
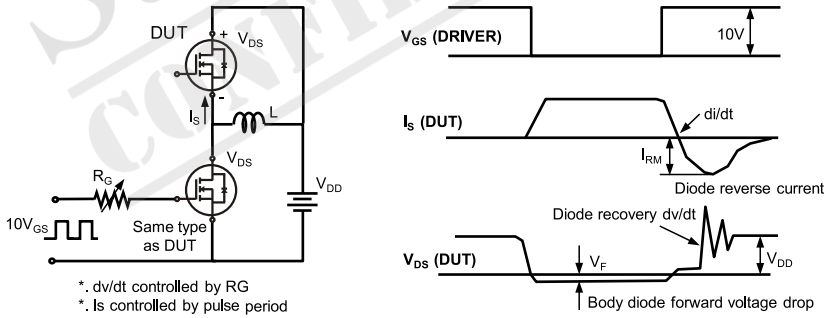


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



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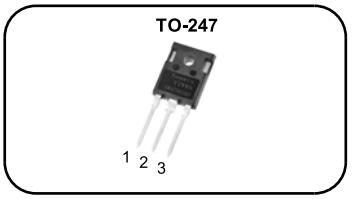
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-247 MOSFET

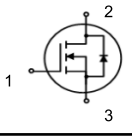
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 60mΩ)@V_{GS}=10V
- Low Gate Charge (Typ 152nC)
- Extremely Low trr and Qrr
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application:LED, UPS, Charge, Servicer



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 47A
$R_{DS(ON)}$: 60mΩ



General Description

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Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW T 47N65KF	SW47N65KF	TO-247	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		47*	A
	Continuous drain current (@T_C=100°C)		29.6*	A
I_{DM}	Drain current pulsed	(note 1)	188	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	1500	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	150	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		312.5	W
	Derating factor above 25°C		2.5	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	0.4	°C/W
R_{thja}	Thermal resistance, Junction to ambient	39	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.59		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			10	uA
		V_{DS}=520V, T_C=125°C		75		uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=23A		60	72	mΩ
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=23A		32		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		5510		pF
C_{oss}	Output capacitance			186		
C_{rss}	Reverse transfer capacitance			18		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=47A, R_G=25Ω, V_{GS}=10V (note 4,5)		54		ns
t_r	Rising time			108		
$t_{d(off)}$	Turn off delay time			394		
t_f	Fall time			117		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=47A (note 4,5)		152		nC
Q_{gs}	Gate-source charge			28		
Q_{gd}	Gate-drain charge			71		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			47	A
I_{SM}	Pulsed source current				188	A
V_{SD}	Diode forward voltage drop.	I_S=47A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=20A, V_{GS}=0V, dI_F/dt=100A/us		243		ns
Q_{rr}	Reverse recovery charge			2.5		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L = 30mH, I_{AS} =10 A, V_{DD} = 80V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤20A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

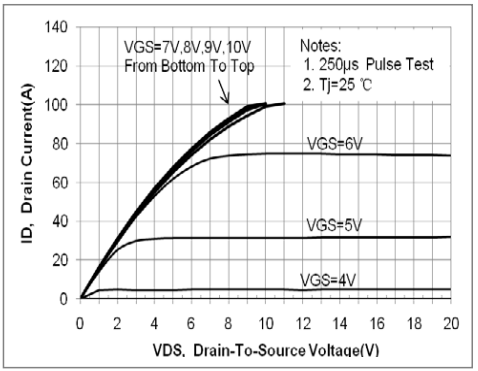


Fig. 2. On-resistance variation vs. drain current and gate voltage

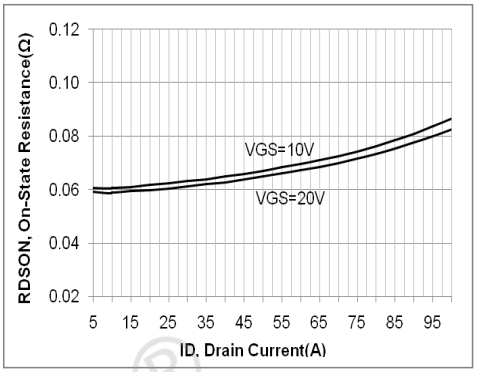


Fig. 3. Gate charge characteristics

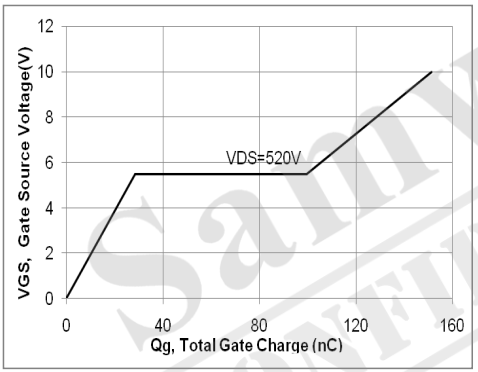


Fig. 4. On state current vs. diode forward voltage

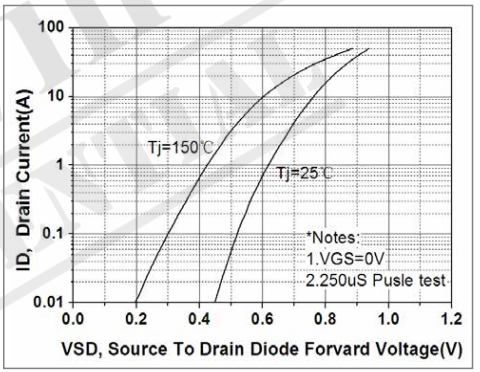


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

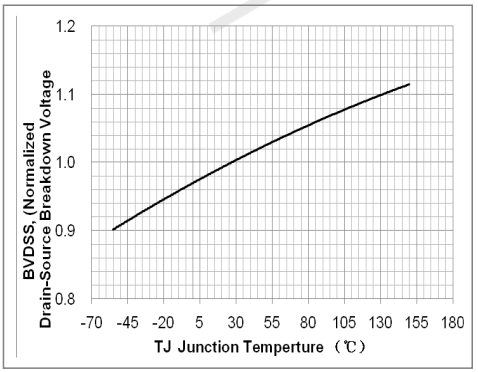


Fig. 6. On resistance variation vs. junction temperature

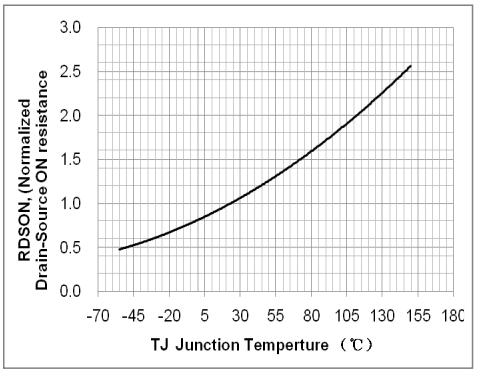


Fig. 7. Maximum safe operating area

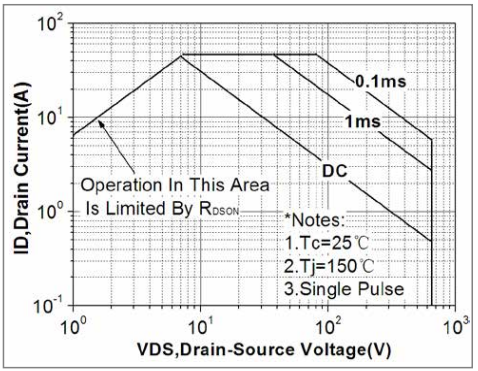


Fig. 8. Capacitance Characteristics

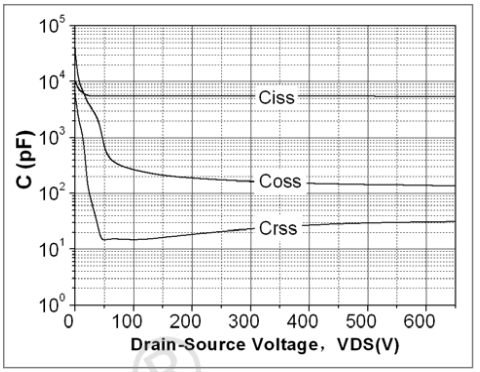


Fig. 9. Transient thermal response curve

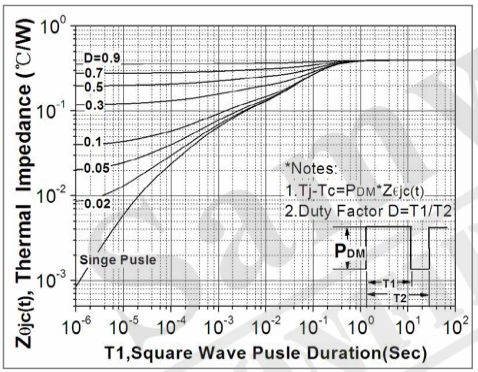
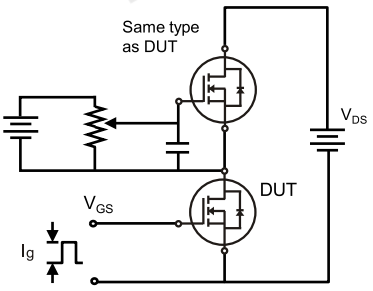


Fig. 10. Gate charge test circuit & waveform



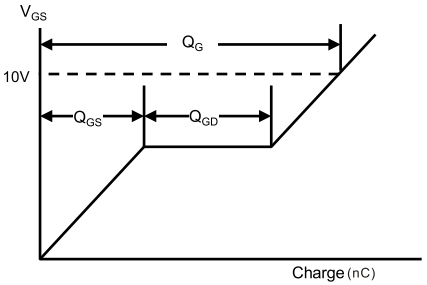


Fig. 11. Switching time test circuit & waveform

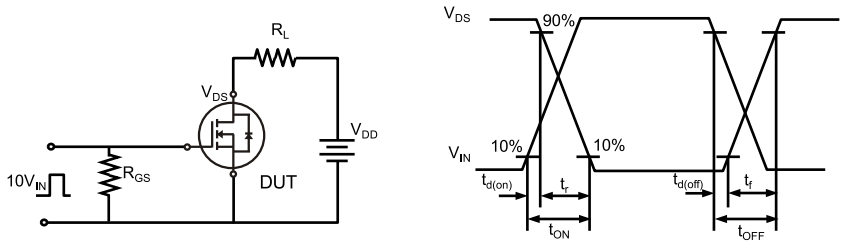


Fig. 12. Unclamped Inductive switching test circuit & waveform

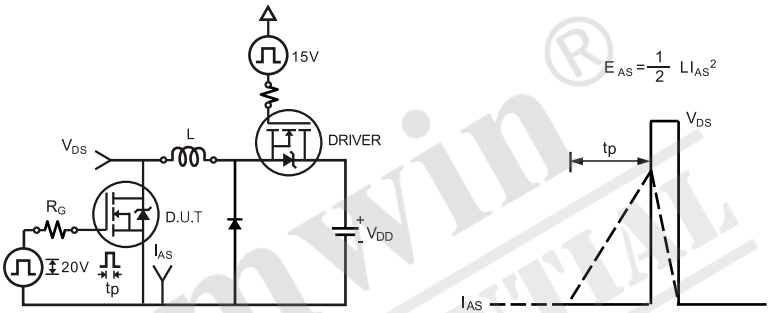
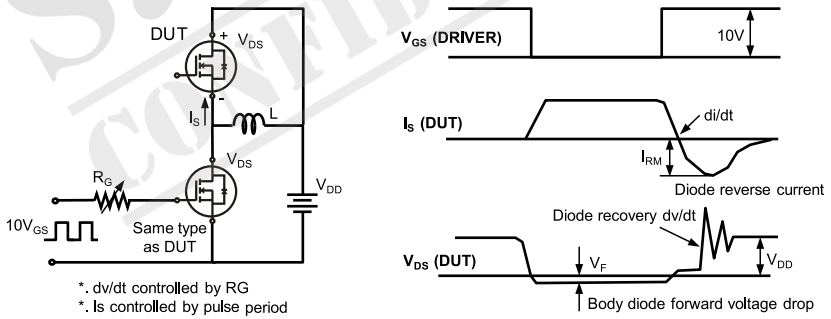


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



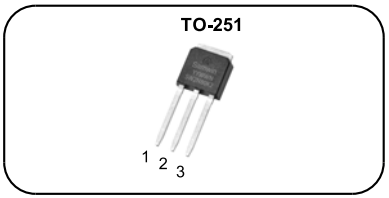
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-251 MOSFET

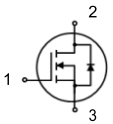
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 2.5Ω)@V_{GS}=10V
- Low Gate Charge (Typ 7nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 800V
I_D : 2A
$R_{DS(ON)}$: 2.5Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with advanced super junction technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW I 2N80K2	SW2N80K2	TO-251	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		800	V
I_D	Continuous drain current (@T_C=25°C)		2*	A
	Continuous drain current (@T_C=100°C)		1.3*	A
I_{DM}	Drain current pulsed	(note 1)	8	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	10	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	2	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		73.5	W
	Derating factor above 25°C		0.59	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	1.7	°C/W
R_{thja}	Thermal resistance, Junction to ambient	89	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	800			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.49		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=800V, V_{GS}=0V			1	uA
		V_{DS}=640V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=1A		2.5	3.2	Ω
G_{fs}	Forward transconductance	V_{DS}=10V, I_D=1A		2.6		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		305		pF
C_{oss}	Output capacitance			23		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=400V, I_D=2A, R_G=25Ω, V_{GS}=10V (note 4,5)		8		ns
t_r	Rising time			22		
$t_{d(off)}$	Turn off delay time			17		
t_f	Fall time			22		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=2A (note 4,5)		7		nC
Q_{gs}	Gate-source charge			2		
Q_{gd}	Gate-drain charge			2		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			2	A
I_{SM}	Pulsed source current				8	A
V_{SD}	Diode forward voltage drop.	I_S=2A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=2A, V_{GS}=0V, dI_F/dt=100A/us		164		ns
Q_{rr}	Reverse recovery charge			0.98		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =20mH, I_{AS} =1A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤2A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

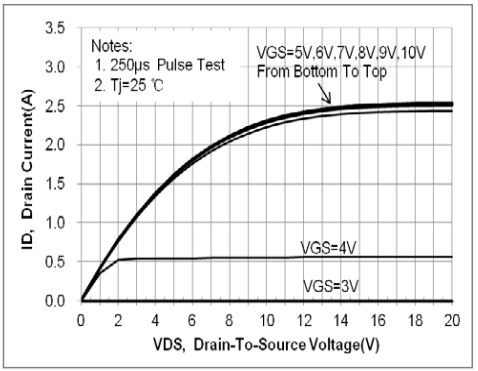


Fig. 2. On-resistance variation vs. drain current and gate voltage

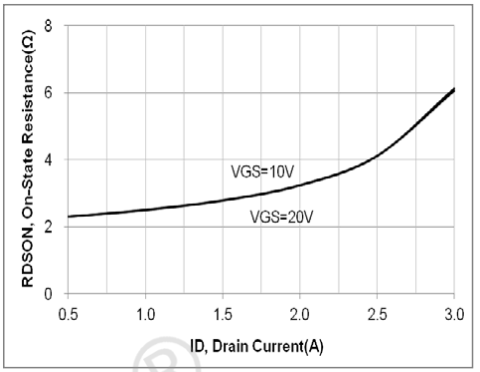


Fig. 3. Gate charge characteristics

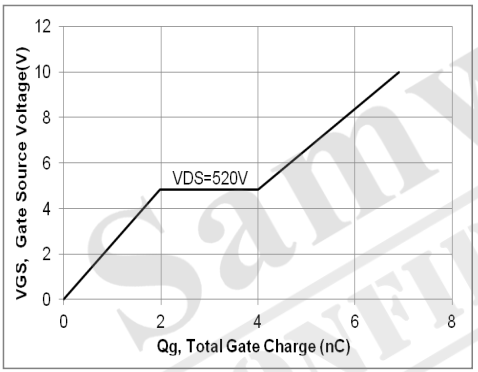


Fig. 4. On state current vs. diode forward voltage

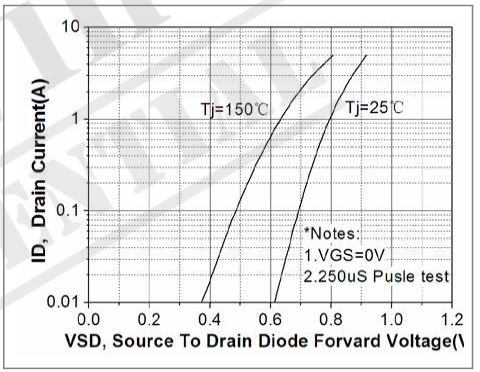


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

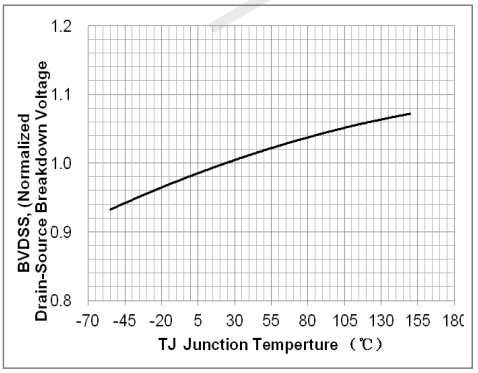


Fig. 6. On resistance variation vs. junction temperature

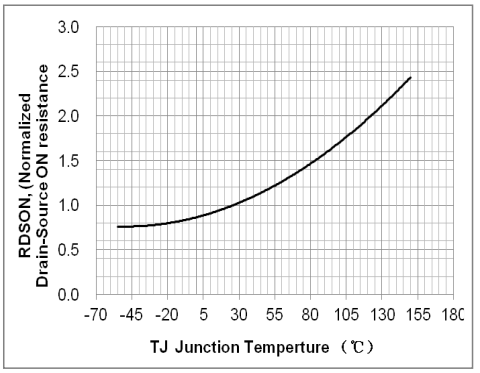


Fig. 7. Maximum safe operating area

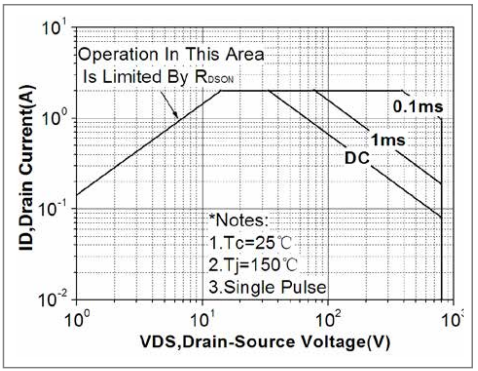


Fig. 8. Capacitance Characteristics

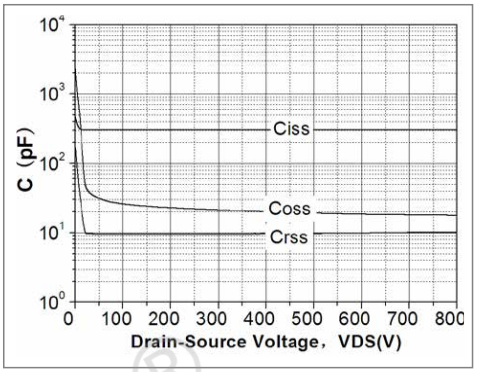


Fig. 9. Transient thermal response curve

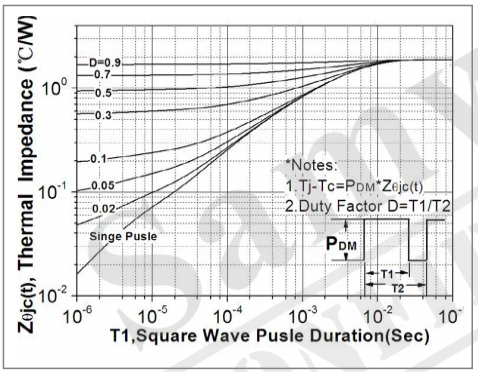
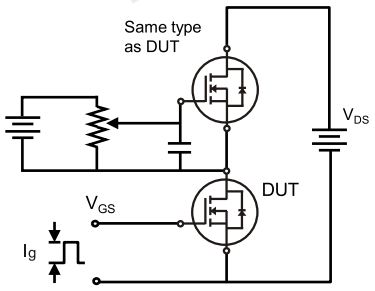


Fig. 10. Gate charge test circuit & waveform



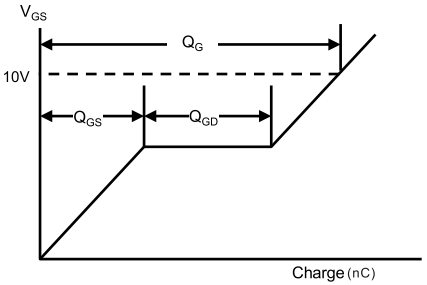


Fig. 11. Switching time test circuit & waveform

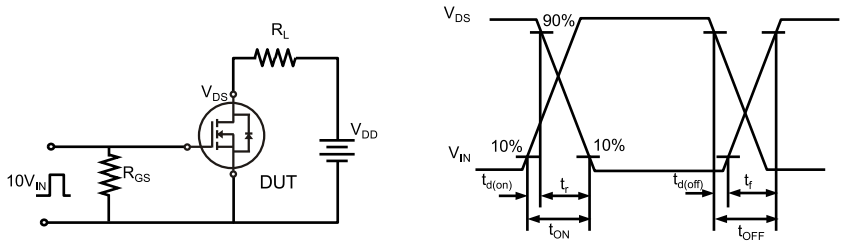


Fig. 12. Unclamped Inductive switching test circuit & waveform

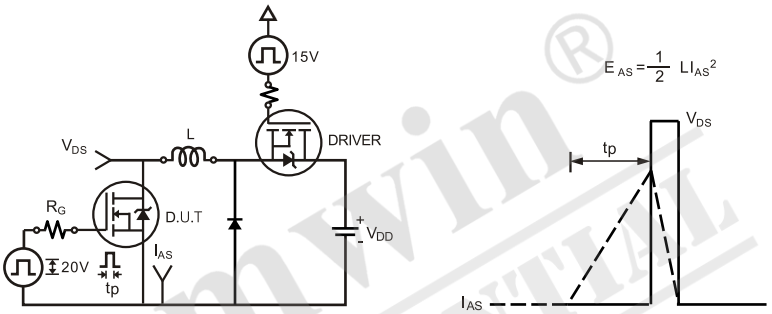
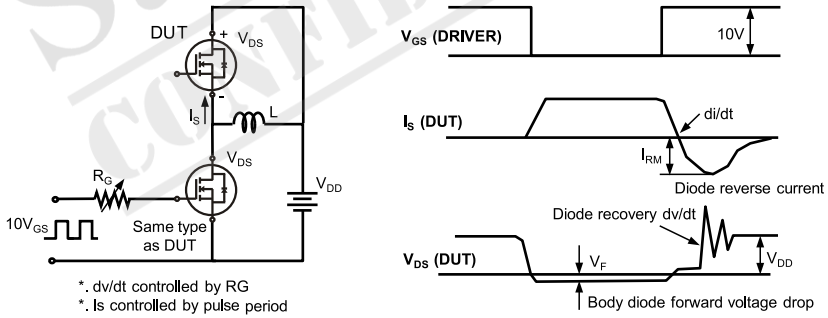


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-251 MOSFET

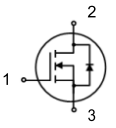
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 1.05Ω)@V_{GS}=10V
- Low Gate Charge (Typ 7nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor

TO-251

1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 4A
$R_{DS(ON)}$: 1.05Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW I 4N65K2	SW4N65K2	TO-251	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		4*	A
	Continuous drain current (@T_C=100°C)		2.5*	A
I_{DM}	Drain current pulsed	(note 1)	16	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	15	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	3	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		73.5	W
	Derating factor above 25°C		0.59	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	1.7	°C/W
R_{thja}	Thermal resistance, Junction to ambient	91	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.54		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=2A		1.05	1.2	Ω
G_{fs}	Forward transconductance	V_{DS}=20V, I_D=2A		4		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		301		pF
C_{oss}	Output capacitance			23		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=4A, R_G=25Ω, V_{GS}=10V (note 4,5)		6		ns
t_r	Rising time			21		
$t_{d(off)}$	Turn off delay time			18		
t_f	Fall time			21		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=4A (note 4,5)		7		nC
Q_{gs}	Gate-source charge			2		
Q_{gd}	Gate-drain charge			2		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			4	A
I_{SM}	Pulsed source current				16	A
V_{SD}	Diode forward voltage drop.	I_S=4A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=4A, V_{GS}=0V, dI_F/dt=100A/us		169		ns
Q_{rr}	Reverse recovery charge			1.1		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =30mH, I_{AS} =1A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

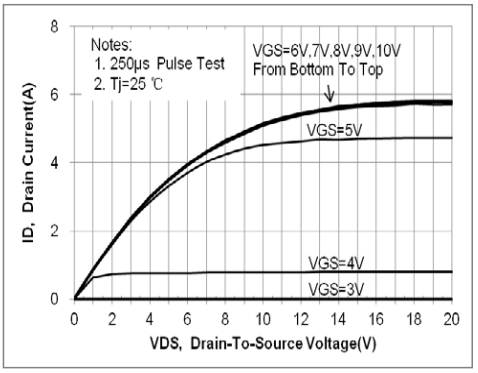


Fig. 2. On-resistance variation vs. drain current and gate voltage

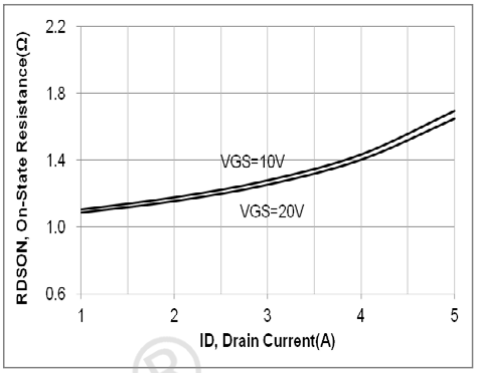


Fig. 3. Gate charge characteristics

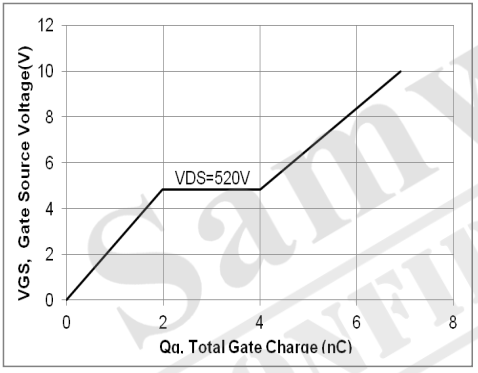


Fig. 4. On state current vs. diode forward voltage

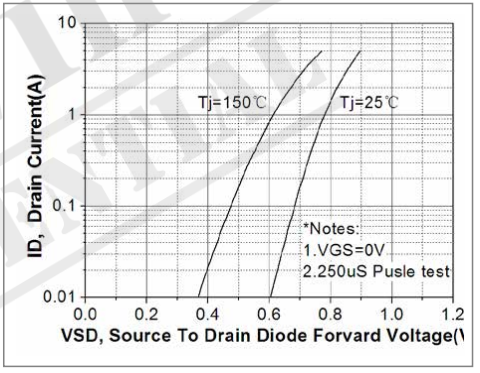


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

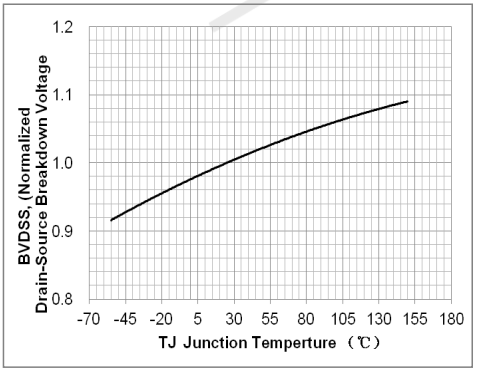


Fig. 6. On resistance variation vs. junction temperature

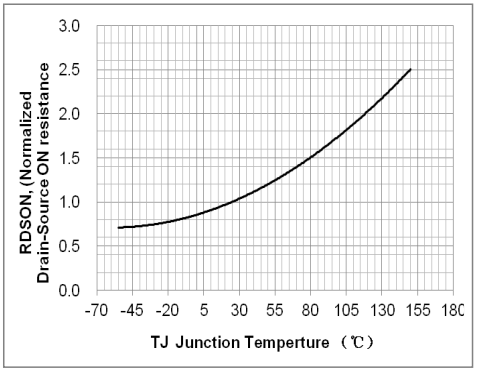


Fig. 7. Maximum safe operating area

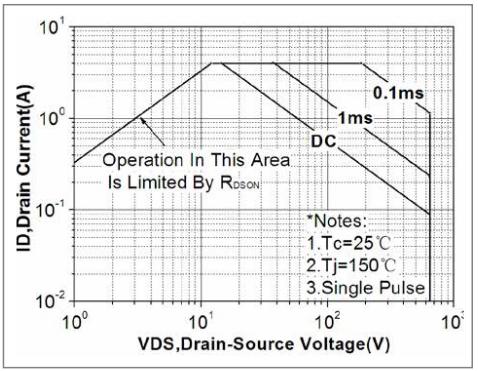


Fig. 8. Capacitance Characteristics

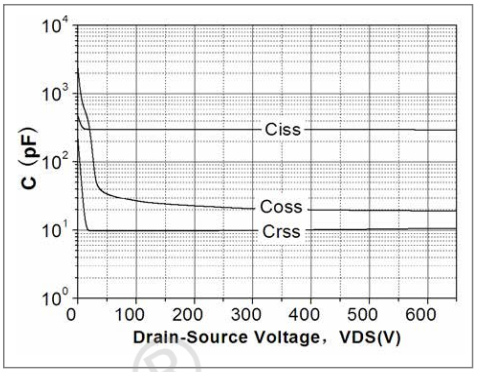


Fig. 9. Transient thermal response curve

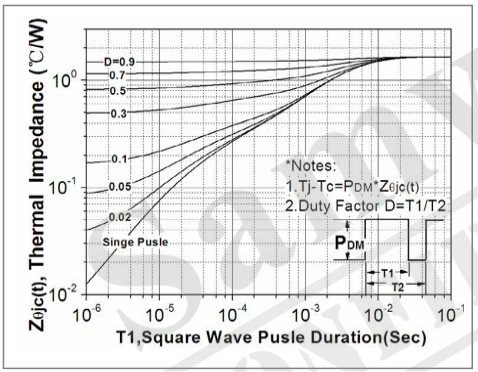
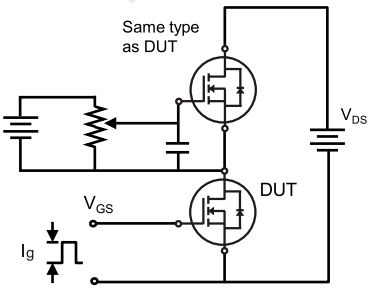


Fig. 10. Gate charge test circuit & waveform



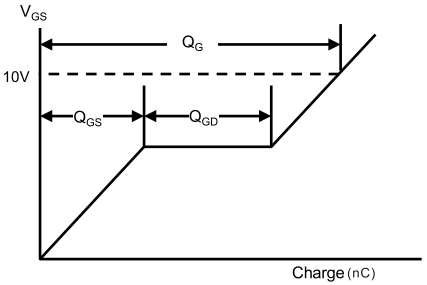


Fig. 11. Switching time test circuit & waveform

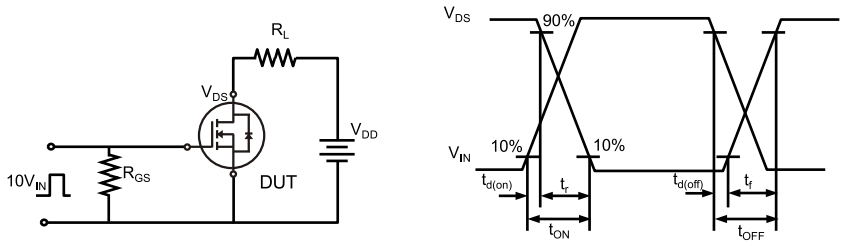


Fig. 12. Unclamped Inductive switching test circuit & waveform

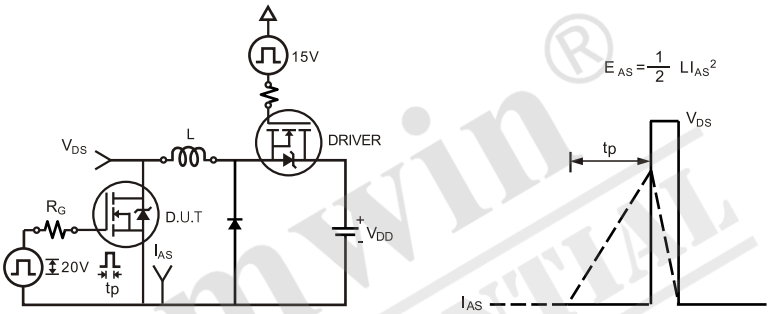
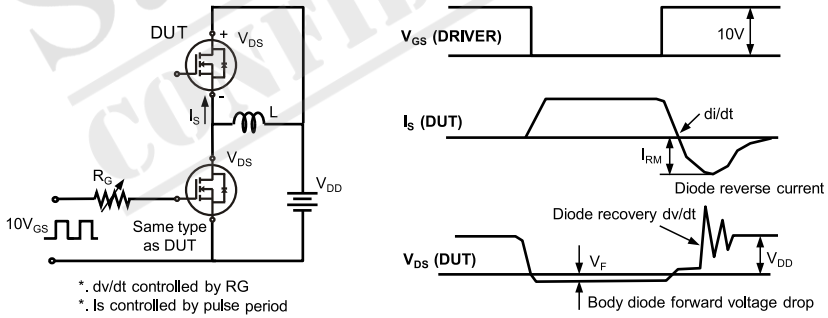


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



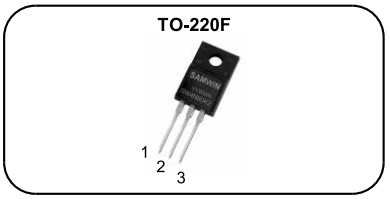
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F MOSFET

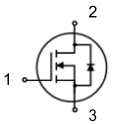
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.98Ω)@V_{GS}=10V
- Low Gate Charge (Typ 17nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 800V
I_D : 4A
$R_{DS(ON)}$: 0.98Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 4N80K2	SW4N80K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		800	V
I_D	Continuous drain current (@T_C=25°C)		4*	A
	Continuous drain current (@T_C=100°C)		2.5*	A
I_{DM}	Drain current pulsed	(note 1)	16	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	40	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	5	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		23.6	W
	Derating factor above 25°C		0.19	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	5.3	°C/W
R_{thja}	Thermal resistance, Junction to ambient	54	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	800			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.43		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=800V, V_{GS}=0V			1	uA
		V_{DS}=640V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=2A		0.98	1.1	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=2A		8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		703		pF
C_{oss}	Output capacitance			35		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=400V, I_D=4A, R_G=25Ω, V_{GS}=10V (note 4,5)		12		ns
t_r	Rising time			24		
$t_{d(off)}$	Turn off delay time			36		
t_f	Fall time			25		
Q_g	Total gate charge	V_{DS}=640V, V_{GS}=10V, I_D=4A (note 4,5)		17		nC
Q_{gs}	Gate-source charge			3.5		
Q_{gd}	Gate-drain charge			6		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			4	A
I_{SM}	Pulsed source current				16	A
V_{SD}	Diode forward voltage drop.	I_S=4A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=4A, V_{GS}=0V, dI_F/dt=100A/us		223		ns
Q_{rr}	Reverse recovery charge			2.0		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =20mH, I_{AS} =2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤4A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

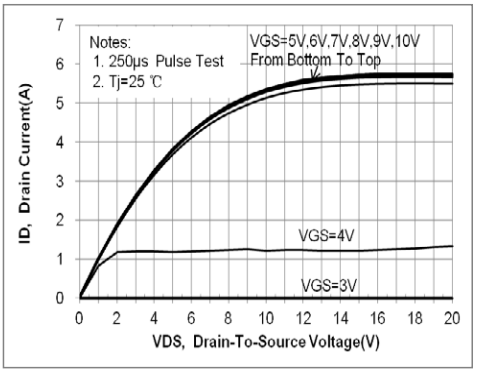


Fig. 2. On-resistance variation vs. drain current and gate voltage

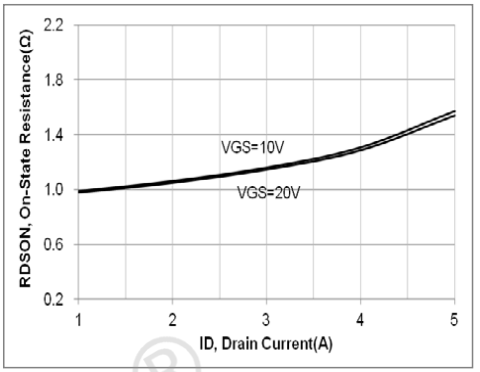


Fig. 3. Gate charge characteristics

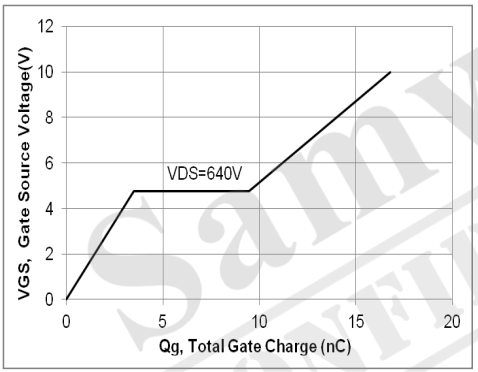


Fig. 4. On state current vs. diode forward voltage

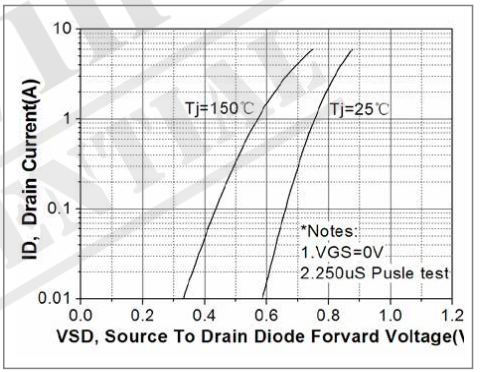


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

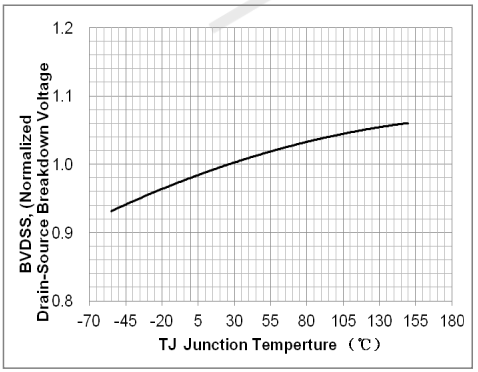


Fig. 6. On resistance variation vs. junction temperature

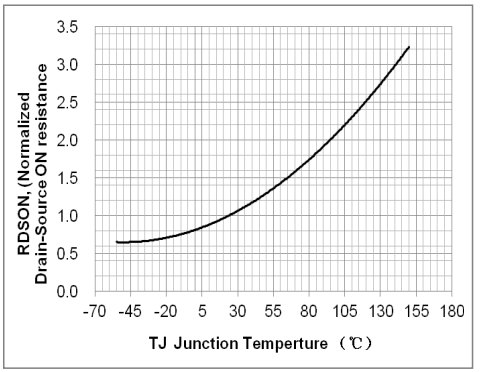


Fig. 7. Maximum safe operating area

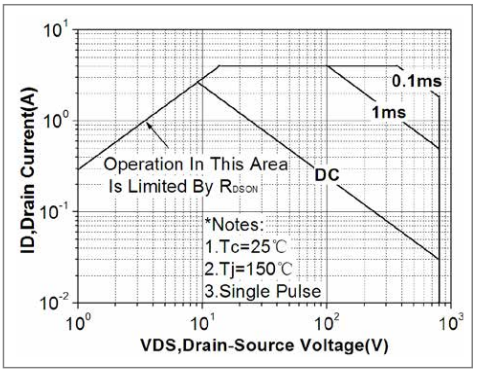


Fig. 8. Capacitance Characteristics

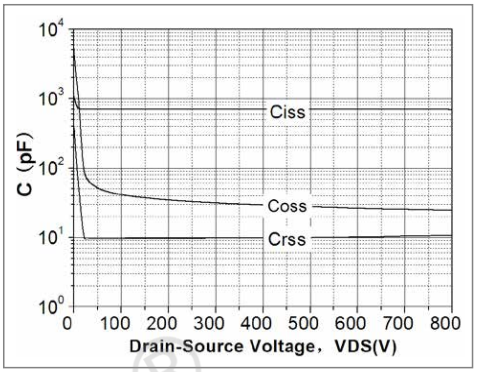


Fig. 9. Transient thermal response curve

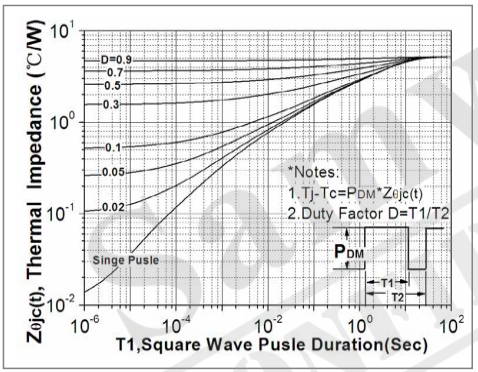
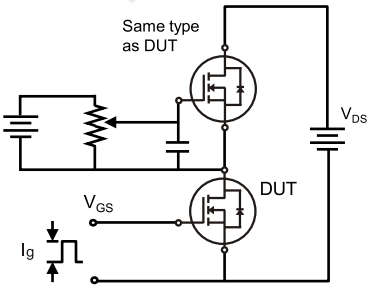
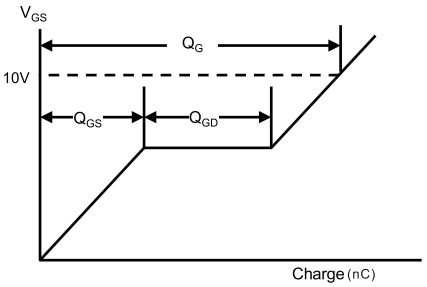


Fig. 10. Gate charge test circuit & waveform





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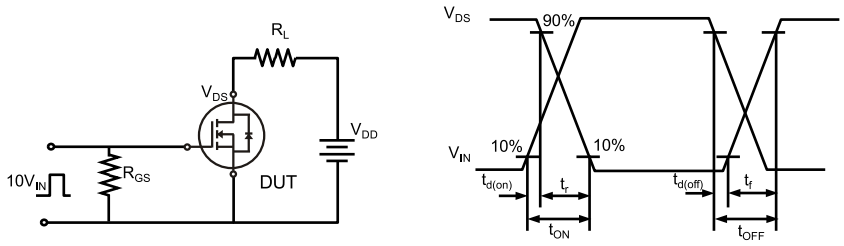


Fig. 12. Unclamped Inductive switching test circuit & waveform

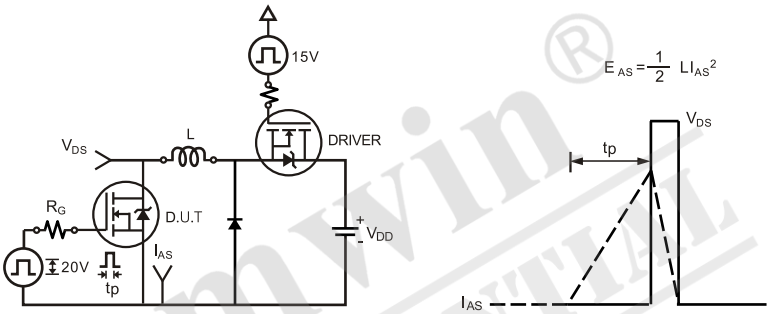
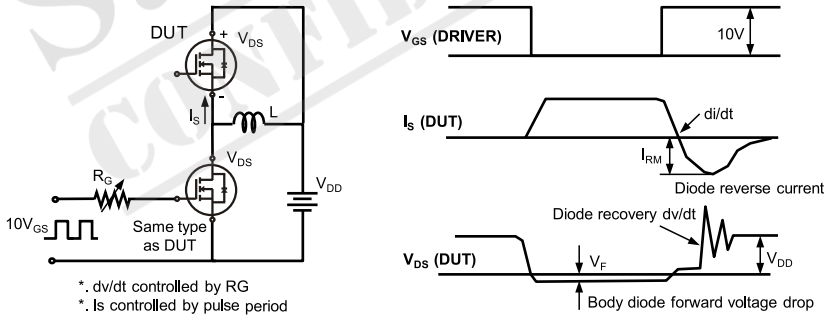


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



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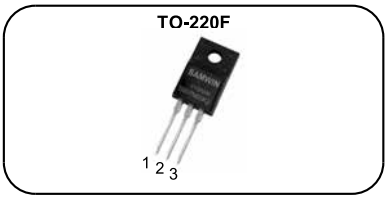
N-channel Enhanced mode TO-220F MOSFET

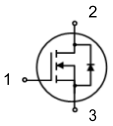
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.5Ω)@V_{GS}=10V
- Low Gate Charge (Typ 15nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 7A
$R_{DS(ON)}$: 0.58Ω



LEAD-FREE RoHS

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Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 7N65K2	SW7N65K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		7*	A
	Continuous drain current (@T_C=100°C)		4.4*	A
I_{DM}	Drain current pulsed	(note 1)	28	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	60	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	5	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		19.5	W
	Derating factor above 25°C		0.16	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	6.4	°C/W
R_{thja}	Thermal resistance, Junction to ambient	55	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

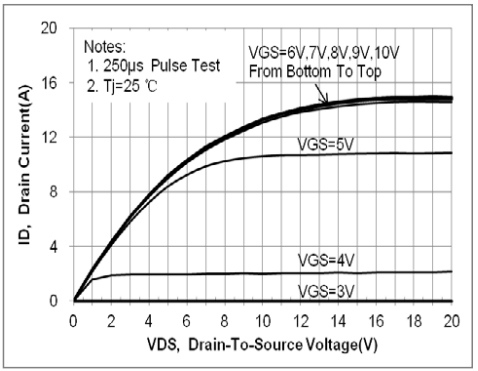
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.44		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=3.5A		0.58	0.65	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=3.5A		8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		510		pF
C_{oss}	Output capacitance			30		
C_{rss}	Reverse transfer capacitance			9		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=7A, R_G=25Ω, V_{GS}=10V (note 4,5)		7		ns
t_r	Rising time			23		
$t_{d(off)}$	Turn off delay time			31		
t_f	Fall time			23		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=7A (note 4,5)		15		nC
Q_{gs}	Gate-source charge			3.4		
Q_{gd}	Gate-drain charge			4.8		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			7	A
I_{SM}	Pulsed source current				28	A
V_{SD}	Diode forward voltage drop.	I_S=7A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=7A, V_{GS}=0V, dI_F/dt=100A/us		190		ns
Q_{rr}	Reverse recovery charge			1.8		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =30mH, I_{AS} =2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤7A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics



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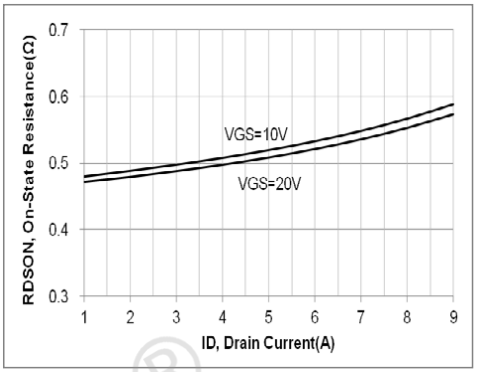


Fig. 3. Gate charge characteristics

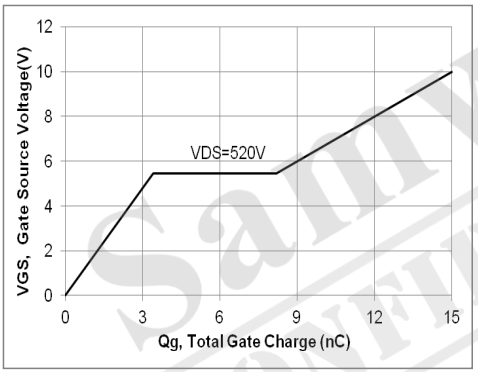


Fig. 4. On state current vs. diode forward voltage

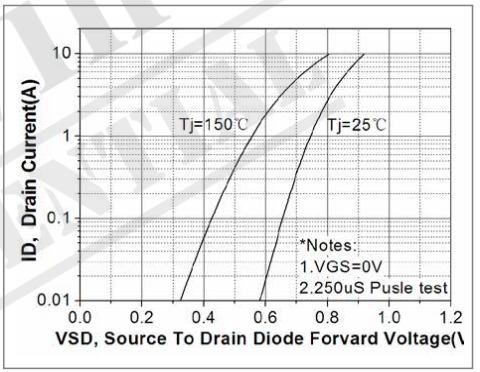


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

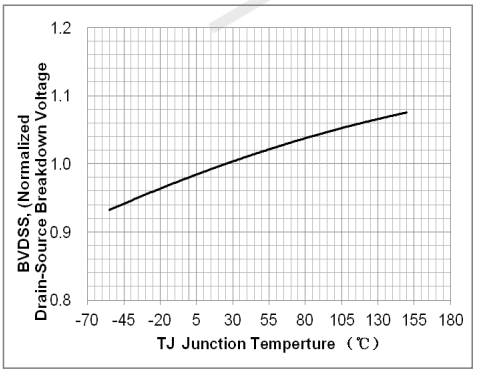


Fig. 6. On resistance variation vs. junction temperature

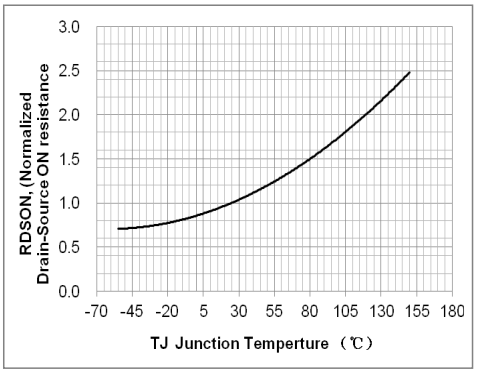


Fig. 7. Maximum safe operating area

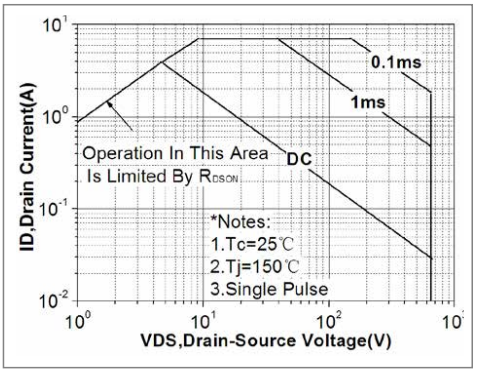


Fig. 8. Capacitance Characteristics

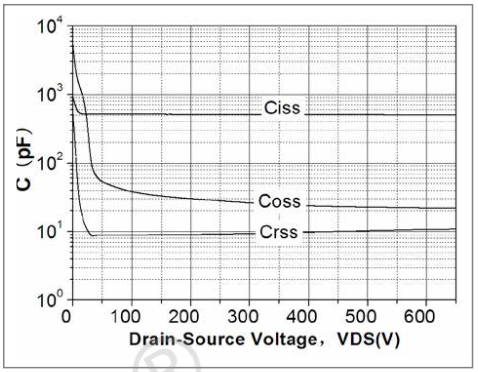


Fig. 9. Transient thermal response curve

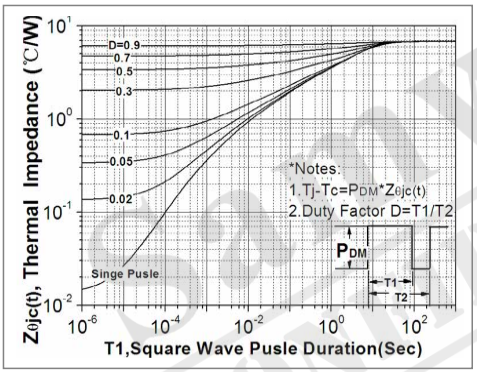
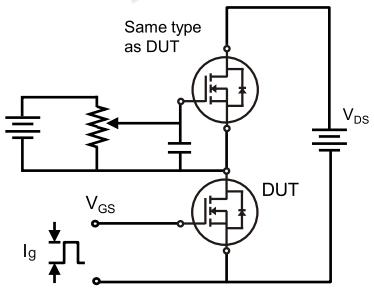


Fig. 10. Gate charge test circuit & waveform



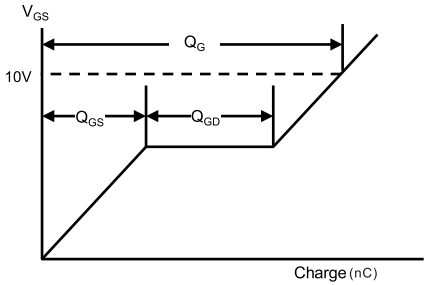


Fig. 11. Switching time test circuit & waveform

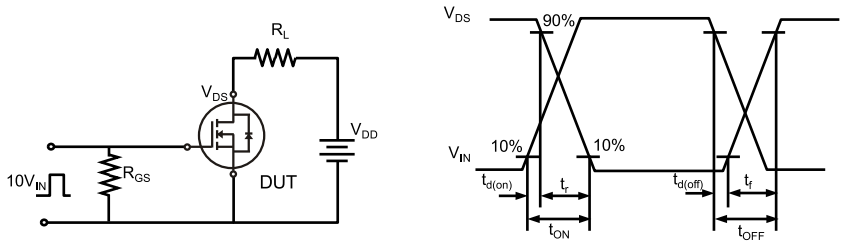


Fig. 12. Unclamped Inductive switching test circuit & waveform

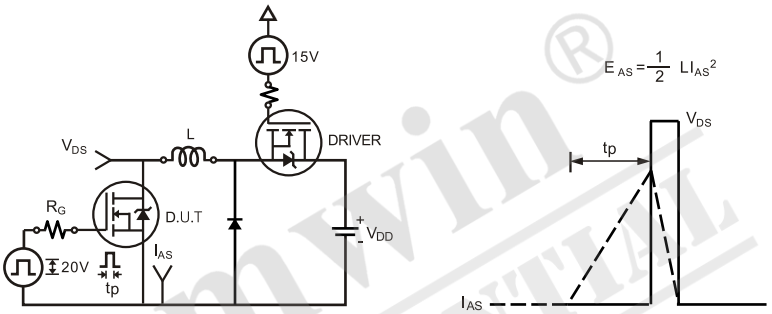
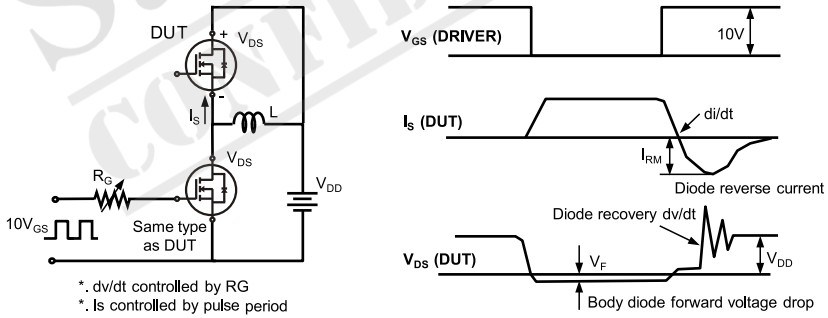


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



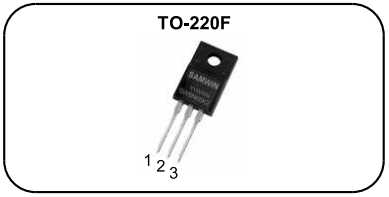
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F MOSFET

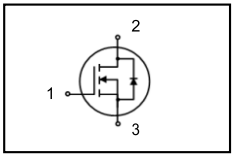
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.45Ω)@V_{GS}=10V
- Low Gate Charge (Typ 17nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 8A
$R_{DS(ON)}$: 0.45Ω



Pb LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 8N65K2	SW8N65K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		8*	A
	Continuous drain current (@T_C=100°C)		5*	A
I_{DM}	Drain current pulsed	(note 1)	32	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	60	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	5	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		19.5	W
	Derating factor above 25°C		0.16	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	6.4	°C/W
R_{thja}	Thermal resistance, Junction to ambient	55	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.44		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=4A		0.45	0.52	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=4A		8		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		685		pF
C_{oss}	Output capacitance			36		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=8A, R_G=25Ω, V_{GS}=10V (note 4,5)		8		ns
t_r	Rising time			24		
$t_{d(off)}$	Turn off delay time			39		
t_f	Fall time			25		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=8A (note 4,5)		17		nC
Q_{gs}	Gate-source charge			4		
Q_{gd}	Gate-drain charge			6		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			8	A
I_{SM}	Pulsed source current				32	A
V_{SD}	Diode forward voltage drop.	I_S=8A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=8A, V_{GS}=0V, dI_F/dt=100A/us		206		ns
Q_{rr}	Reverse recovery charge			2.1		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =30mH, I_{AS} =2A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤8A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

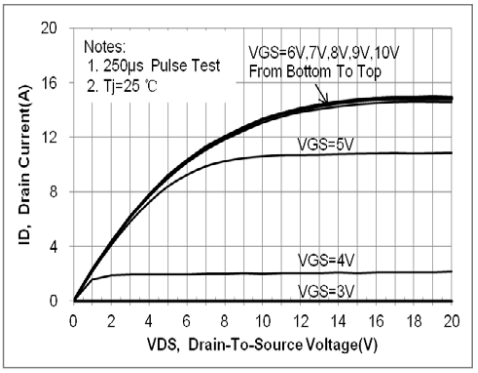


Fig. 2. On-resistance variation vs. drain current and gate voltage

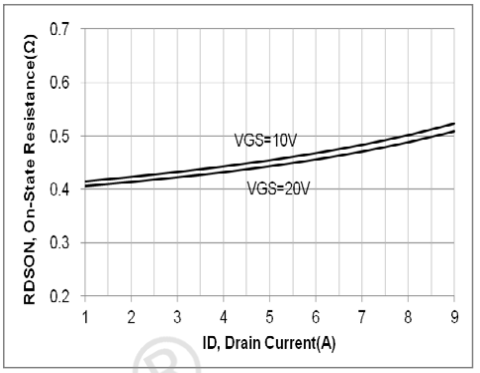


Fig. 3. Gate charge characteristics

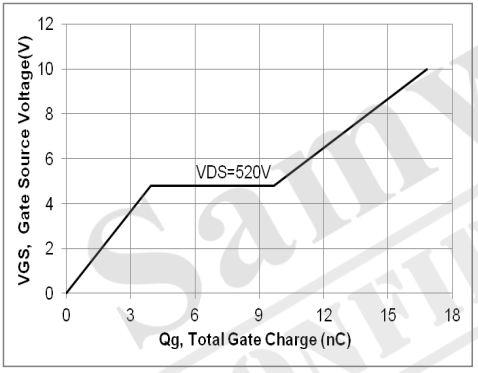


Fig. 4. On state current vs. diode forward voltage

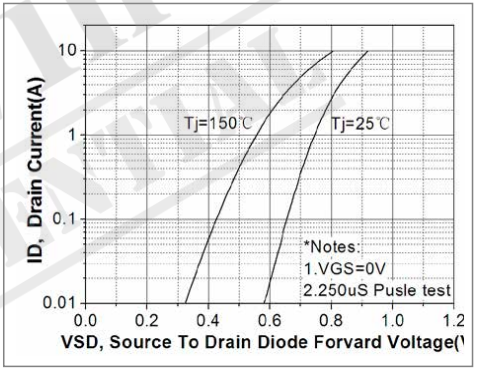


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

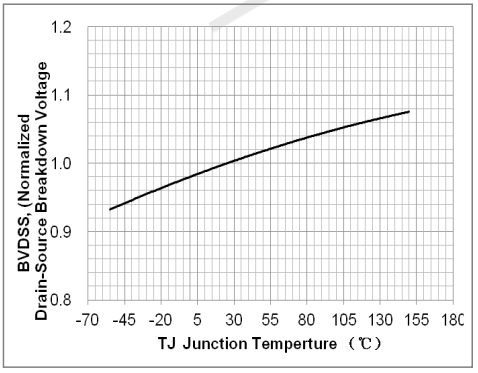


Fig. 6. On resistance variation vs. junction temperature

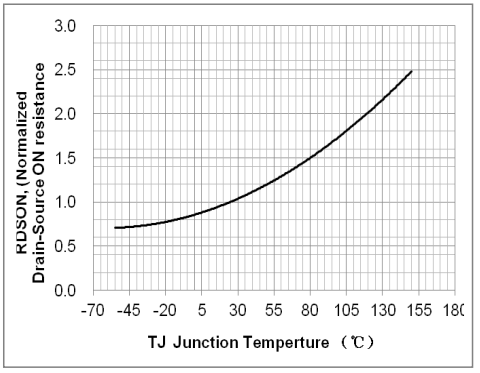


Fig. 7. Maximum safe operating area

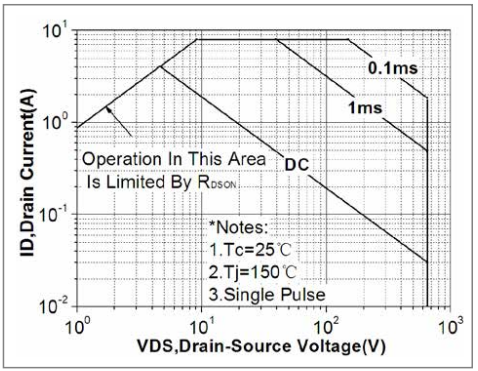


Fig. 8. Capacitance Characteristics

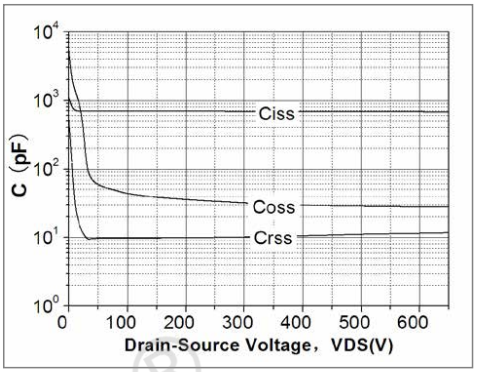


Fig. 9. Transient thermal response curve

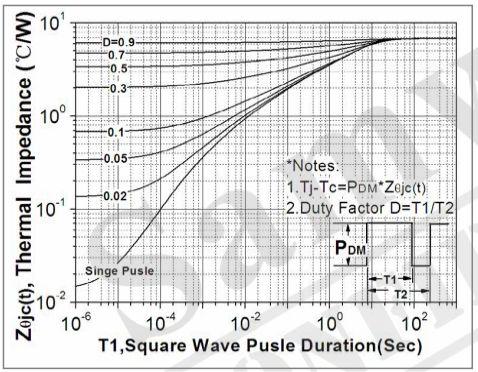
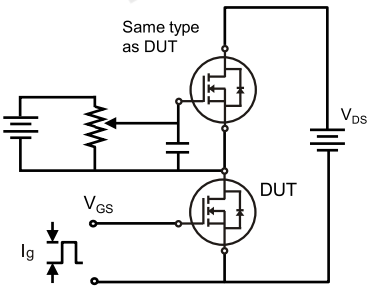


Fig. 10. Gate charge test circuit & waveform



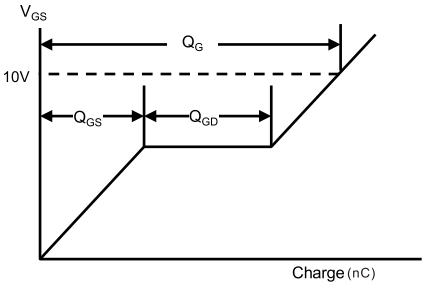


Fig. 11. Switching time test circuit & waveform

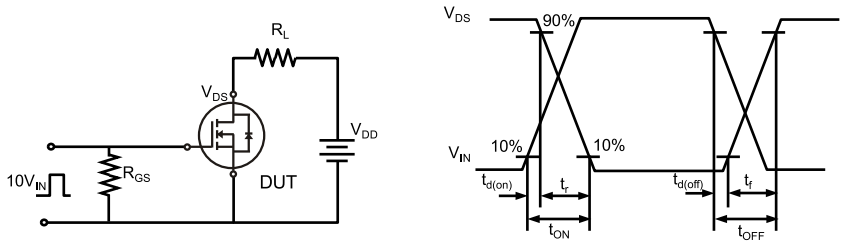


Fig. 12. Unclamped Inductive switching test circuit & waveform

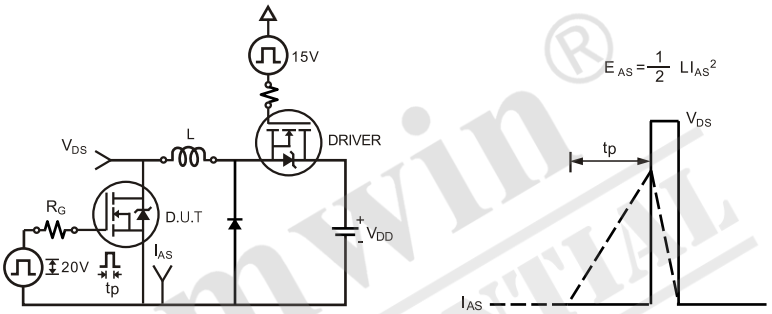
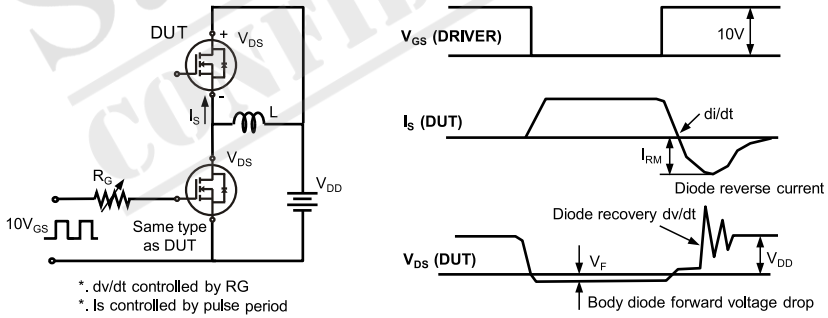


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



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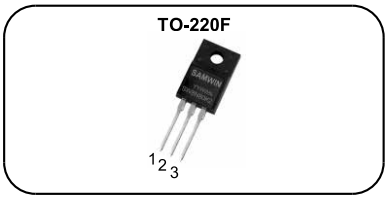
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F MOSFET

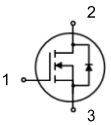
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.54Ω)@V_{GS}=10V
- Low Gate Charge (Typ 28nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 800V
I_D : 8A
$R_{DS(ON)}$: 0.54Ω



General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 8N80K2	SW8N80K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		800	V
I_D	Continuous drain current (@T_C=25°C)		8*	A
	Continuous drain current (@T_C=100°C)		5*	A
I_{DM}	Drain current pulsed	(note 1)	32	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	90	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	8	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		41.7	W
	Derating factor above 25°C		0.33	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	3.0	°C/W
R_{thja}	Thermal resistance, Junction to ambient	41	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	800			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.37		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=800V, V_{GS}=0V			1	uA
		V_{DS}=640V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=4A		0.54	0.60	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=4A		10		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1290		pF
C_{oss}	Output capacitance			49		
C_{rss}	Reverse transfer capacitance			9		
$t_{d(on)}$	Turn on delay time	V_{DS}=400V, I_D=8A, R_G=25Ω, V_{GS}=10V (note 4,5)		17		ns
t_r	Rising time			30		
$t_{d(off)}$	Turn off delay time			65		
t_f	Fall time			35		
Q_g	Total gate charge	V_{DS}=640V, V_{GS}=10V, I_D=8A (note 4,5)		28		nC
Q_{gs}	Gate-source charge			6		
Q_{gd}	Gate-drain charge			9		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			8	A
I_{SM}	Pulsed source current				32	A
V_{SD}	Diode forward voltage drop.	I_S=8A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=8A, V_{GS}=0V, dI_F/dt=100A/us		284		ns
Q_{rr}	Reverse recovery charge			3.6		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =20mH, I_{AS} =3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤8A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

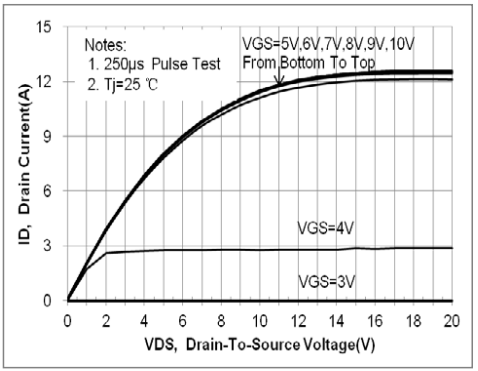


Fig. 2. On-resistance variation vs. drain current and gate voltage

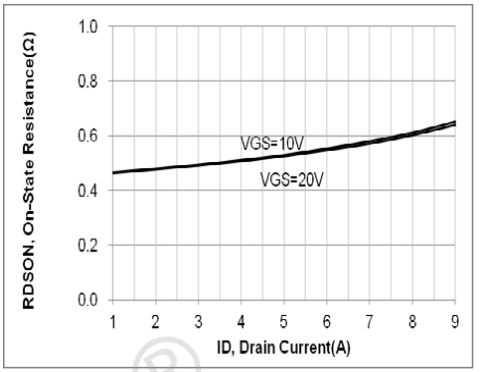


Fig. 3. Gate charge characteristics

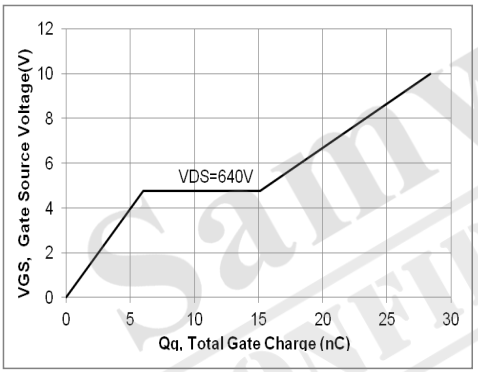


Fig. 4. On state current vs. diode forward voltage

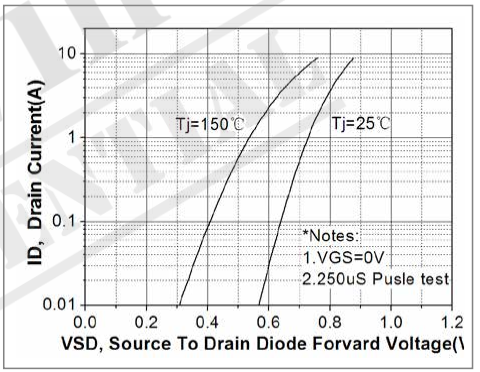


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

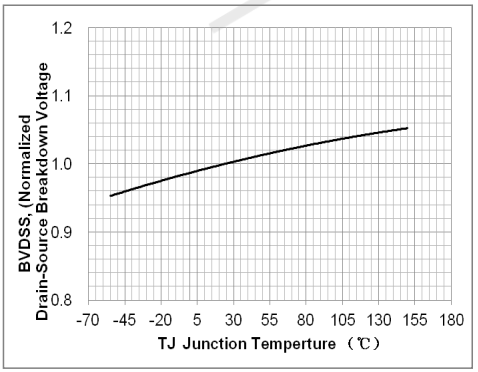


Fig. 6. On resistance variation vs. junction temperature

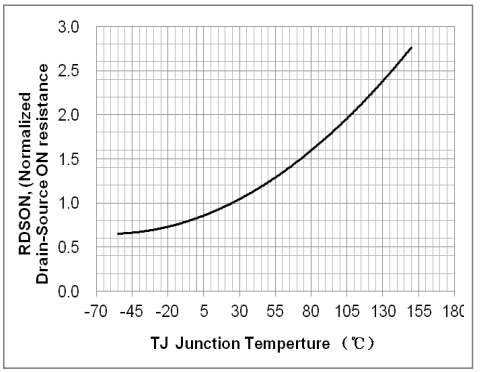


Fig. 7. Maximum safe operating area

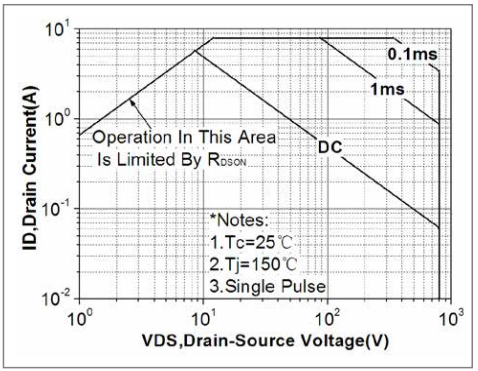


Fig. 8. Capacitance Characteristics

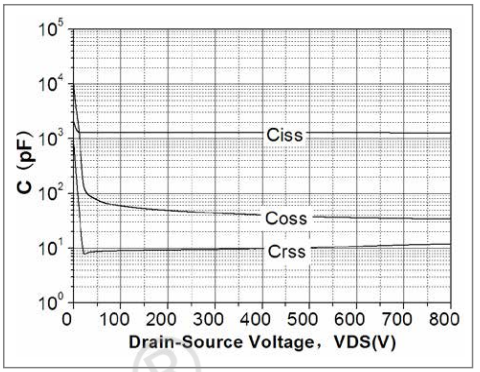


Fig. 9. Transient thermal response curve

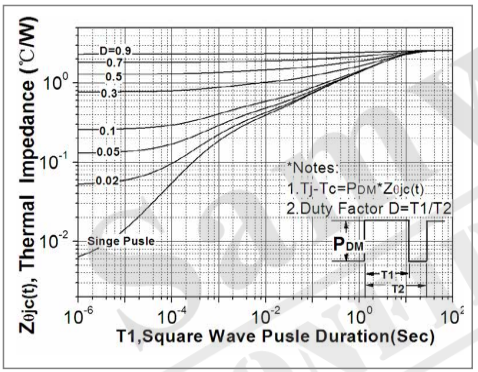
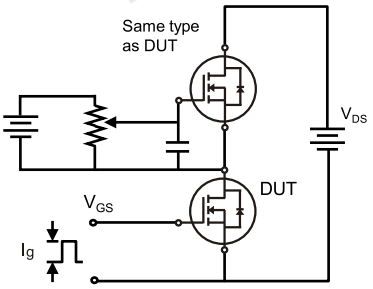


Fig. 10. Gate charge test circuit & waveform



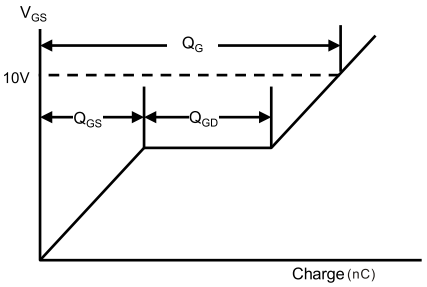


Fig. 11. Switching time test circuit & waveform

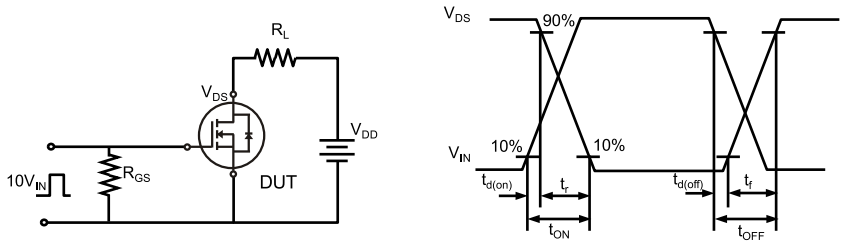


Fig. 12. Unclamped Inductive switching test circuit & waveform

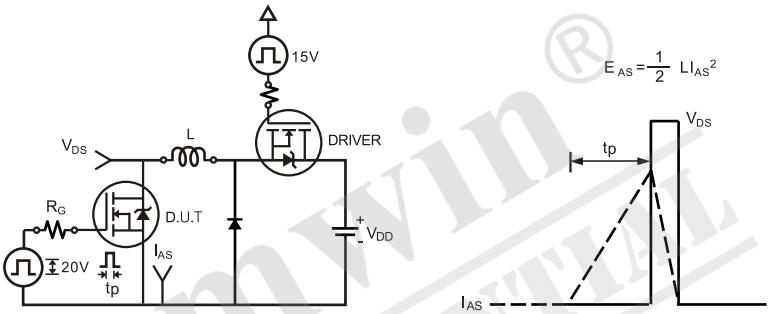
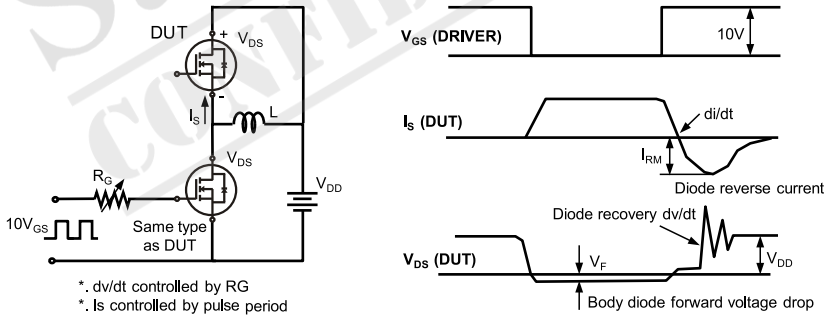


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



DISCLAIMER

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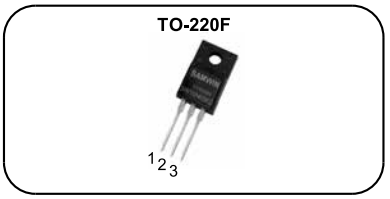
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F MOSFET

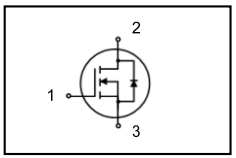
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.34Ω)@V_{GS}=10V
- Low Gate Charge (Typ 20nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 10A
$R_{DS(ON)}$: 0.34Ω



Pb LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 10N65K2	SW10N65K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		10*	A
	Continuous drain current (@T_C=100°C)		6.3*	A
I_{DM}	Drain current pulsed	(note 1)	40	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	93	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	10	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		43.1	W
	Derating factor above 25°C		0.34	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	2.9	°C/W
R_{thja}	Thermal resistance, Junction to ambient	45	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.51		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=5A		0.34	0.40	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=5A		14		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		845		pF
C_{oss}	Output capacitance			41		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=10A, R_G=25Ω, V_{GS}=10V (note 4,5)		10		ns
t_r	Rising time			27		
$t_{d(off)}$	Turn off delay time			46		
t_f	Fall time			29		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=10A (note 4,5)		20		nC
Q_{gs}	Gate-source charge			5.2		
Q_{gd}	Gate-drain charge			7.2		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			10	A
I_{SM}	Pulsed source current				40	A
V_{SD}	Diode forward voltage drop.	I_S=10A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=10A, V_{GS}=0V, dI_F/dt=100A/us		230		ns
Q_{rr}	Reverse recovery charge			2.7		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =30mH, I_{AS} =2.5A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤15A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

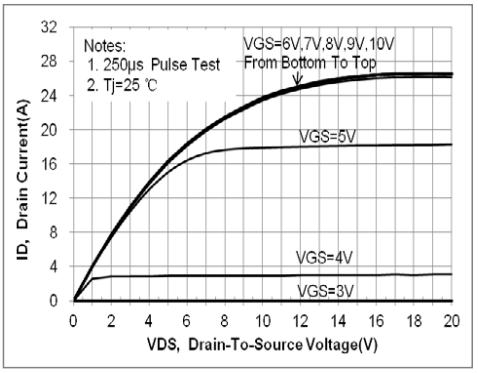


Fig. 2. On-resistance variation vs. drain current and gate voltage

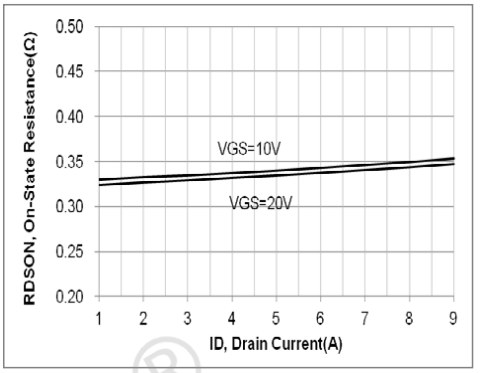


Fig. 3. Gate charge characteristics

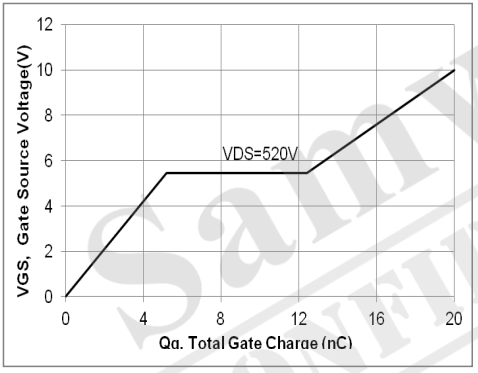


Fig. 4. On state current vs. diode forward voltage

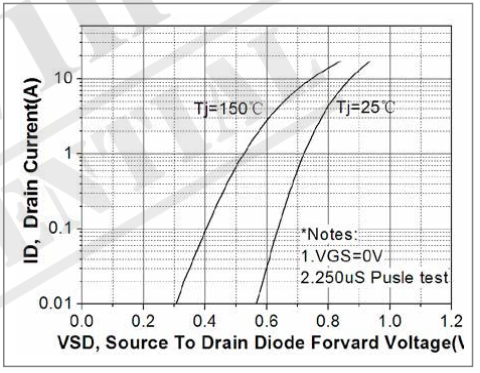


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

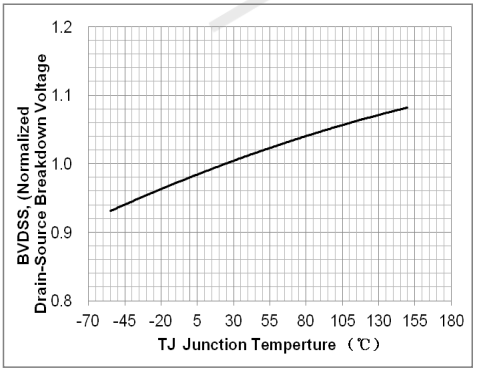


Fig. 6. On resistance variation vs. junction temperature

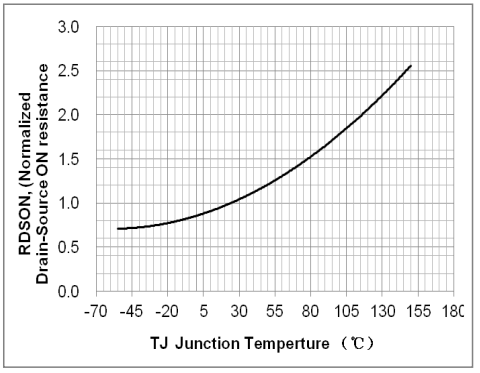


Fig. 7. Maximum safe operating area

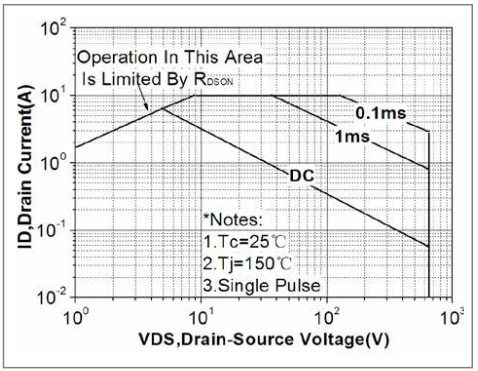


Fig. 8. Capacitance Characteristics

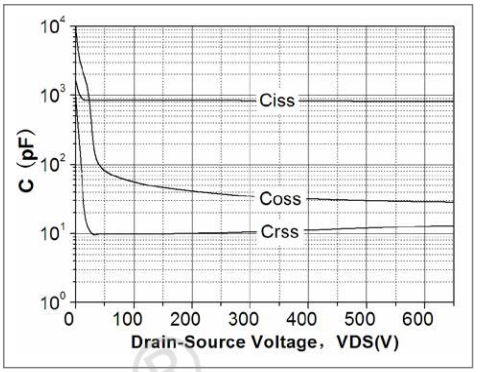


Fig. 9. Transient thermal response curve

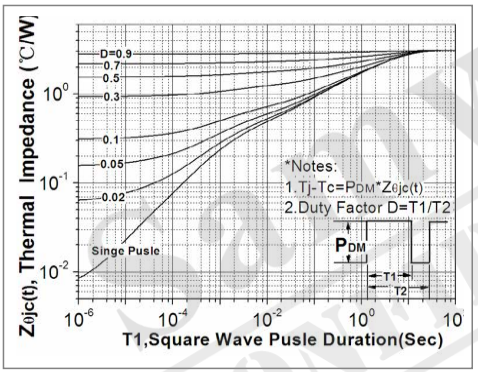
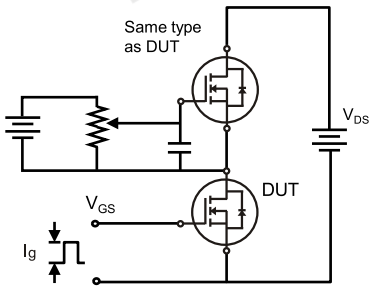


Fig. 10. Gate charge test circuit & waveform



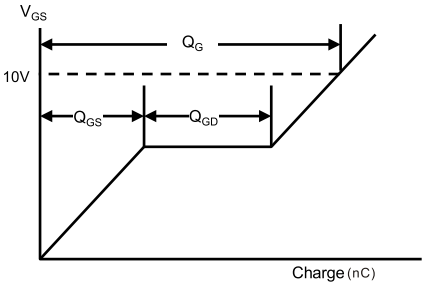


Fig. 11. Switching time test circuit & waveform

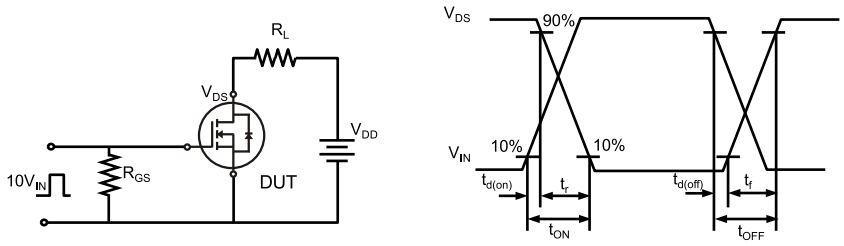


Fig. 12. Unclamped Inductive switching test circuit & waveform

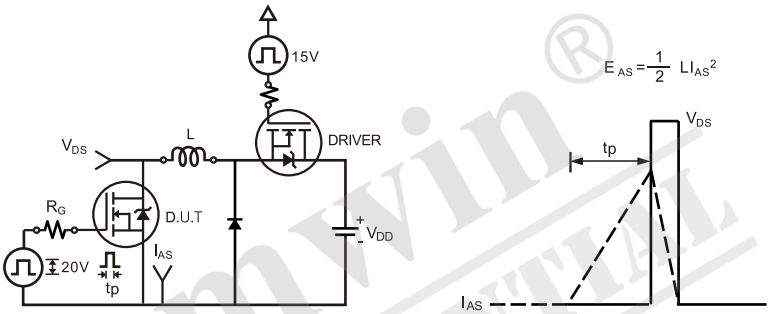
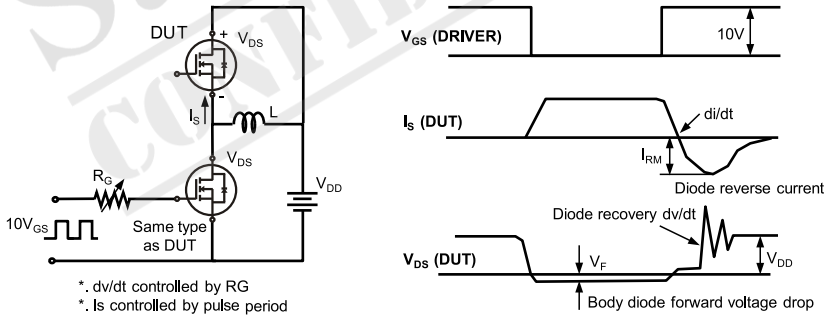


Fig. 13. Peak diode recovery dv/dt test circuit & waveform



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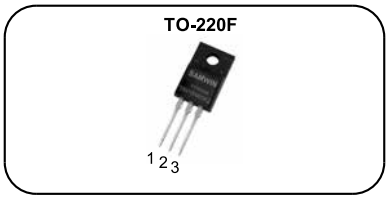
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

N-channel Enhanced mode TO-220F MOSFET

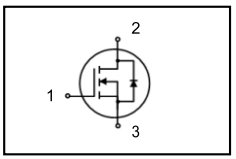
Features

- High ruggedness
- Low $R_{DS(ON)}$ (Typ 0.23Ω)@V_{GS}=10V
- Low Gate Charge (Typ 28nC)
- Improved dv/dt Capability
- 100% Avalanche Tested
- Application: LED, Charge, Adaptor



1. Gate 2. Drain 3. Source

BV_{DSS} : 650V
I_D : 15A
$R_{DS(ON)}$: 0.23Ω



LEAD-FREE RoHS

General Description

This power MOSFET is produced with super junction advanced technology of SAMWIN. This technology enable the power MOSFET to have better characteristics, including fast switching time, low on resistance, low gate charge and especially excellent avalanche characteristics.

Order Codes

Item	Sales Type	Marking	Package	Packaging
1	SW F 15N65K2	SW15N65K2	TO-220F	TUBE

Absolute maximum ratings

Symbol	Parameter		Value	Unit
V_{DSS}	Drain to source voltage		650	V
I_D	Continuous drain current (@T_C=25°C)		15*	A
	Continuous drain current (@T_C=100°C)		9.5*	A
I_{DM}	Drain current pulsed	(note 1)	60	A
V_{GS}	Gate to source voltage		±30	V
E_{AS}	Single pulsed avalanche energy	(note 2)	135	mJ
E_{AR}	Repetitive avalanche energy	(note 1)	15	mJ
dv/dt	Peak diode recovery dv/dt	(note 3)	5	V/ns
P_D	Total power dissipation (@T_C=25°C)		43.1	W
	Derating factor above 25°C		0.34	W/°C
T_{STG}, T_J	Operating junction temperature & storage temperature		-55 ~ + 150	°C
T_L	Maximum lead temperature for soldering purpose, 1/8 from case for 5 seconds.		300	°C

*. Drain current is limited by junction temperature.

Thermal characteristics

Symbol	Parameter	Value	Unit
R_{thjc}	Thermal resistance, Junction to case	2.9	°C/W
R_{thja}	Thermal resistance, Junction to ambient	45	°C/W

Electrical characteristic (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
Off characteristics						
BV_{DSS}	Drain to source breakdown voltage	V_{GS}=0V, I_D=250uA	650			V
ΔBV_{DSS} / ΔT_J	Breakdown voltage temperature coefficient	I_D=250uA, referenced to 25°C		0.51		V/°C
I_{DSS}	Drain to source leakage current	V_{DS}=650V, V_{GS}=0V			1	uA
		V_{DS}=520V, T_C=125°C			50	uA
I_{GSS}	Gate to source leakage current, forward	V_{GS}=30V, V_{DS}=0V			100	nA
	Gate to source leakage current, reverse	V_{GS}=-30V, V_{DS}=0V			-100	nA
On characteristics						
$V_{GS(TH)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250uA	2		4	V
$R_{DS(ON)}$	Drain to source on state resistance	V_{GS}=10V, I_D=7.5A		0.23	0.26	Ω
G_{fs}	Forward transconductance	V_{DS}=30V, I_D=7.5A		14		S
Dynamic characteristics						
C_{iss}	Input capacitance	V_{GS}=0V, V_{DS}=200V, f=1MHz		1260		pF
C_{oss}	Output capacitance			52		
C_{rss}	Reverse transfer capacitance			10		
$t_{d(on)}$	Turn on delay time	V_{DS}=325V, I_D=15A, R_G=25Ω, V_{GS}=10V (note 4,5)		13		ns
t_r	Rising time			33		
$t_{d(off)}$	Turn off delay time			71		
t_f	Fall time			39		
Q_g	Total gate charge	V_{DS}=520V, V_{GS}=10V, I_D=15A (note 4,5)		28		nC
Q_{gs}	Gate-source charge			7		
Q_{gd}	Gate-drain charge			9		

Source to drain diode ratings characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_S	Continuous source current	Integral reverse p-n Junction diode in the MOSFET			15	A
I_{SM}	Pulsed source current				60	A
V_{SD}	Diode forward voltage drop.	I_S=15A, V_{GS}=0V			1.4	V
t_{rr}	Reverse recovery time	I_S=15A, V_{GS}=0V, dI_F/dt=100A/us		297		ns
Q_{rr}	Reverse recovery charge			3.8		uC

※. Notes
1. Repeatitive rating : pulse width limited by junction temperature.
2. L =30mH, I_{AS} =3A, V_{DD} = 50V, R_G=25Ω, Starting T_J = 25°C
3. I_{SD} ≤15A, di/dt = 100A/us, V_{DD} ≤ BV_{DSS}, Staring T_J =25°C
4. Pulse Test : Pulse Width ≤ 300us, duty cycle ≤ 2%
5. Essentially independent of operating temperature.

Fig. 1. On-state characteristics

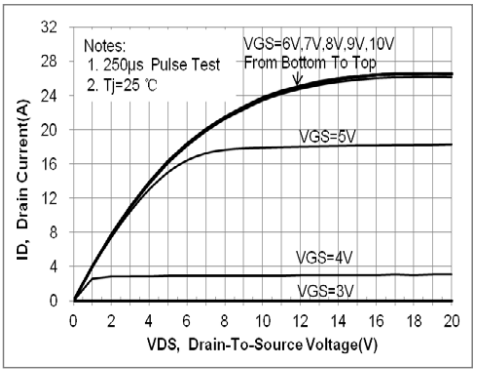


Fig. 2. On-resistance variation vs. drain current and gate voltage

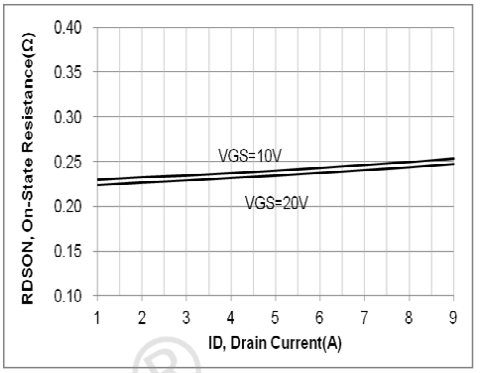


Fig. 3. Gate charge characteristics

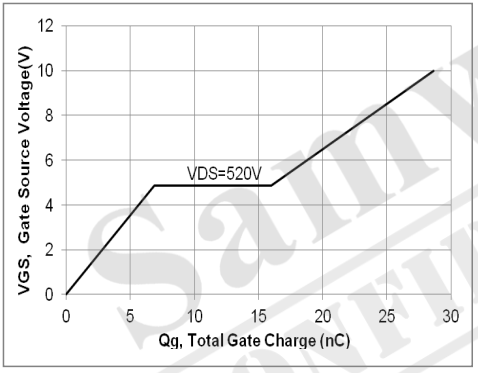


Fig. 4. On state current vs. diode forward voltage

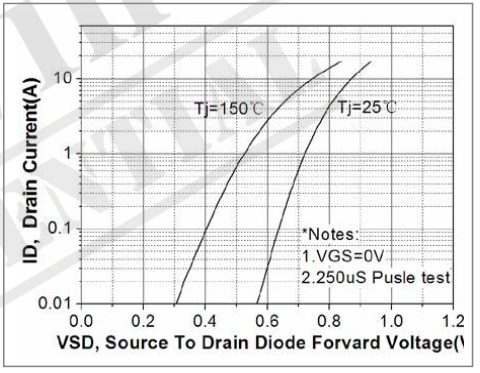


Fig 5. Breakdown Voltage Variation vs. Junction Temperature

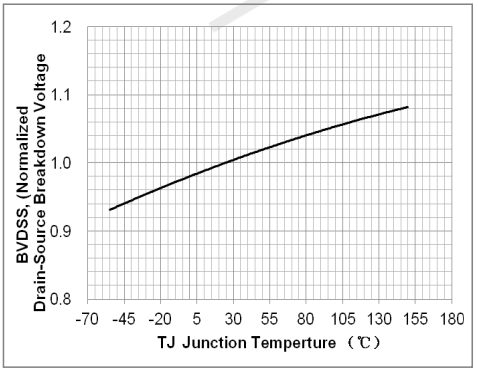


Fig. 6. On resistance variation vs. junction temperature

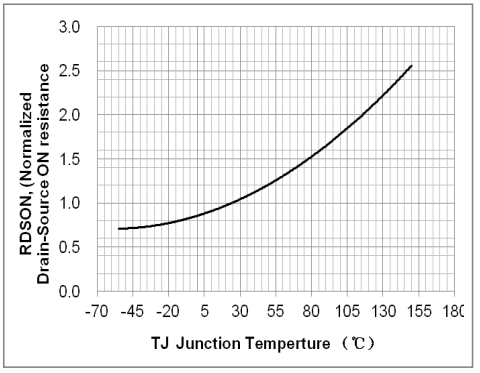


Fig. 7. Maximum safe operating area

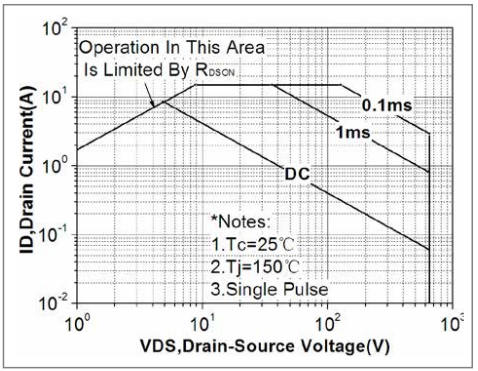


Fig. 8. Capacitance Characteristics

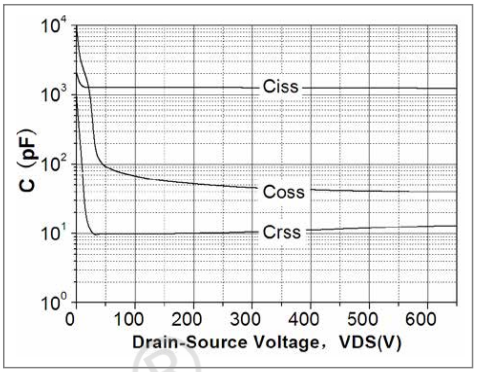


Fig. 9. Transient thermal response curve

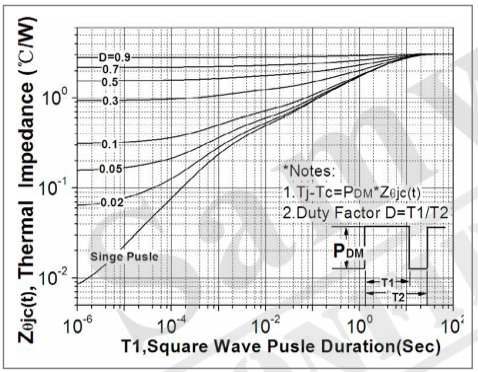
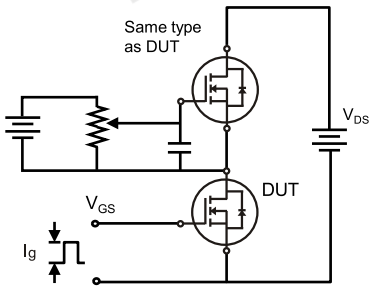


Fig. 10. Gate charge test circuit & waveform



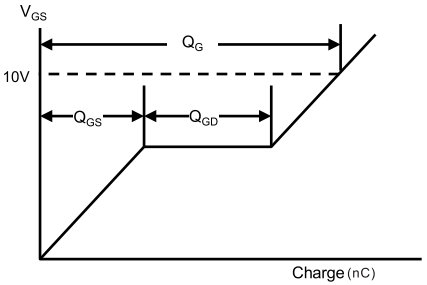


Fig. 11. Switching time test circuit & waveform

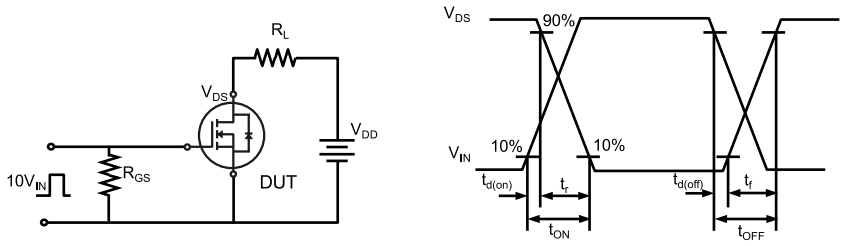


Fig. 12. Unclamped Inductive switching test circuit & waveform

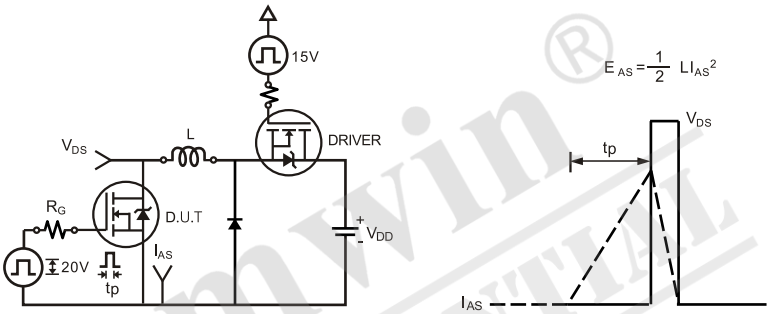
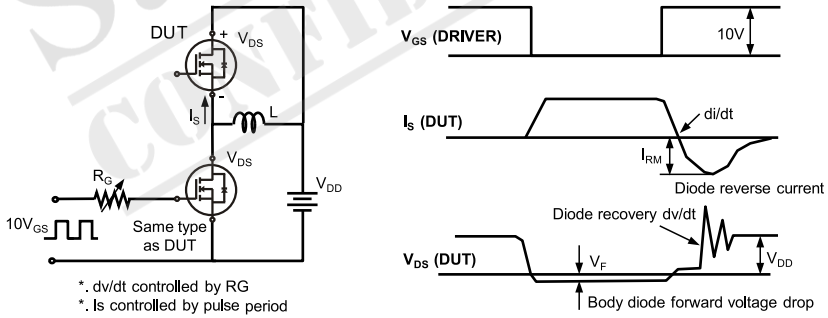


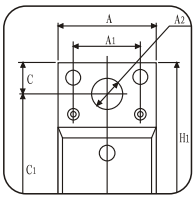
Fig. 13. Peak diode recovery dv/dt test circuit & waveform

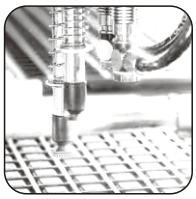


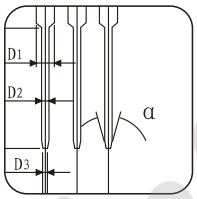
DISCLAIMER

* All the data&curve in this document was tested in XI'AN SEMIPOWER TESTING & APPLICATION CENTER.
* This product has passed the PCT,TC,HTRB,HTGB,HAST,PC and Solderdunk reliability testing.
* Qualification standards can also be found on the Web site (http://www.semipower.com.cn)
* Suggestions for improvement are appreciated, Please send your suggestions to samwin@samwinsemi.com

Samwin® 产品封装

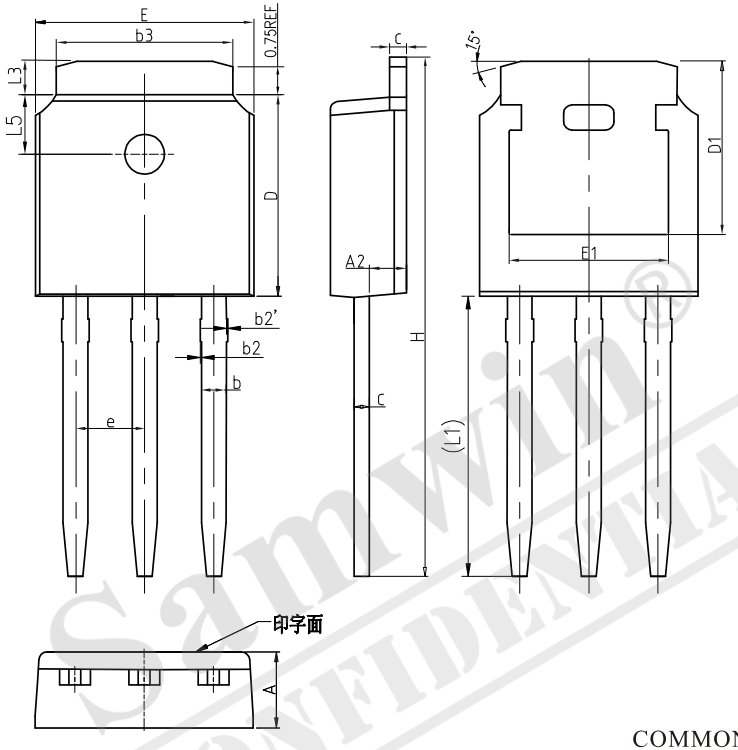






PACKAGING

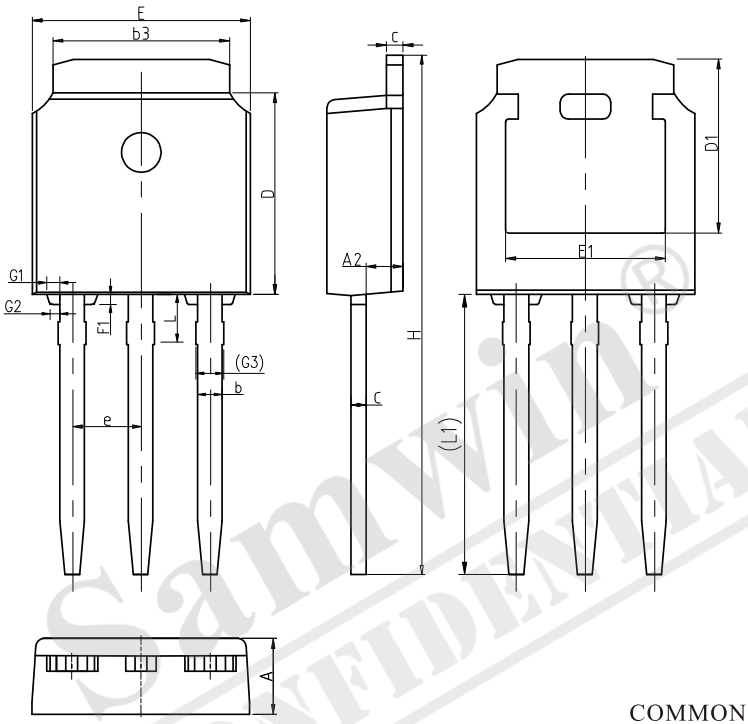
TO-251



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b2	0.00	0.04	0.10
b2'	0.00	0.04	0.10
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30 REF		
E	6.40	6.60	6.80
E1	4.63	–	–
e	2.28 BSC		
H	16.22	16.52	16.82
L1	9.15	9.40	9.65
L3	0.88	1.02	1.28
L5	1.65	1.80	1.95

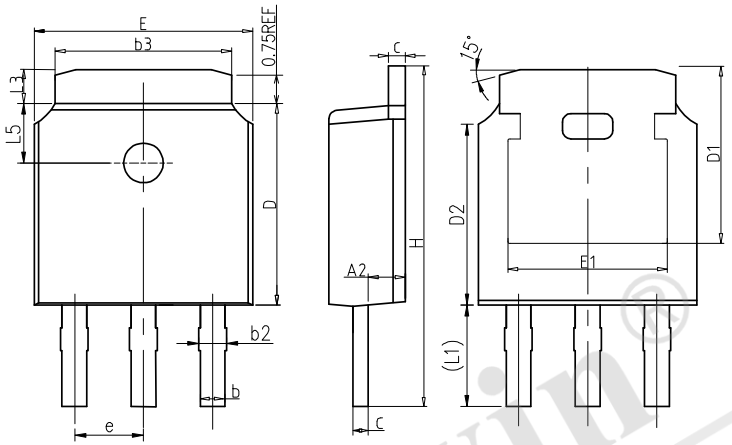
TO-251N

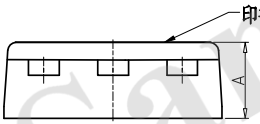


COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A2	0.97	1.07	1.17
b	0.58	0.68	0.80
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30 REF		
E	6.40	6.60	6.80
E1	4.63	–	–
e	2.28 BSC		
F1	0.23	0.30	0.37
G1	0.33	0.40	0.47
G2	0.23	0.30	0.37
G3	0.60	0.74	0.88
H	16.22	16.52	16.82
L	1.15	1.35	1.55
L1	9.15	9.40	9.65

μIPAK

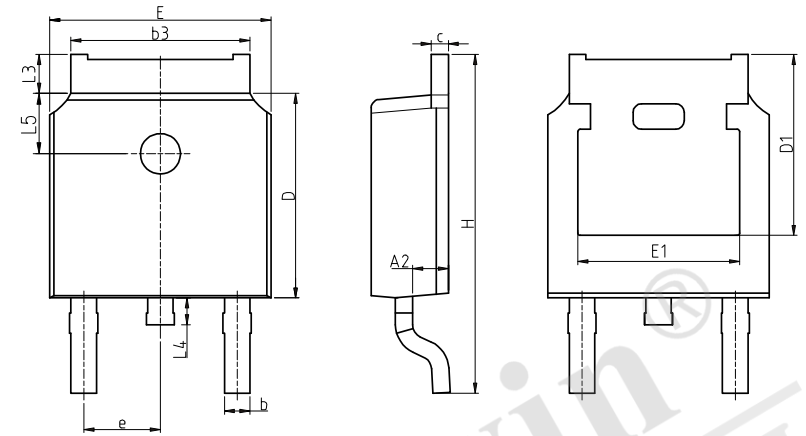


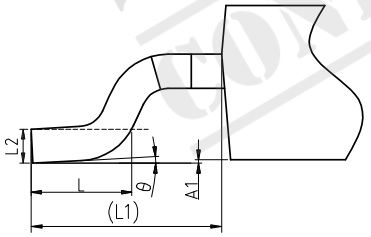


COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b2	0.76	0.84	0.95
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30 REF		
D2	5.26	5.46	5.66
E	6.40	6.60	6.80
E1	4.63	–	–
e	2.286 BSC		
H	9.40	9.62	9.85
L1	2.30	2.50	2.70
L3	0.88	1.02	1.28
L5	1.65	1.80	1.95

TO-252

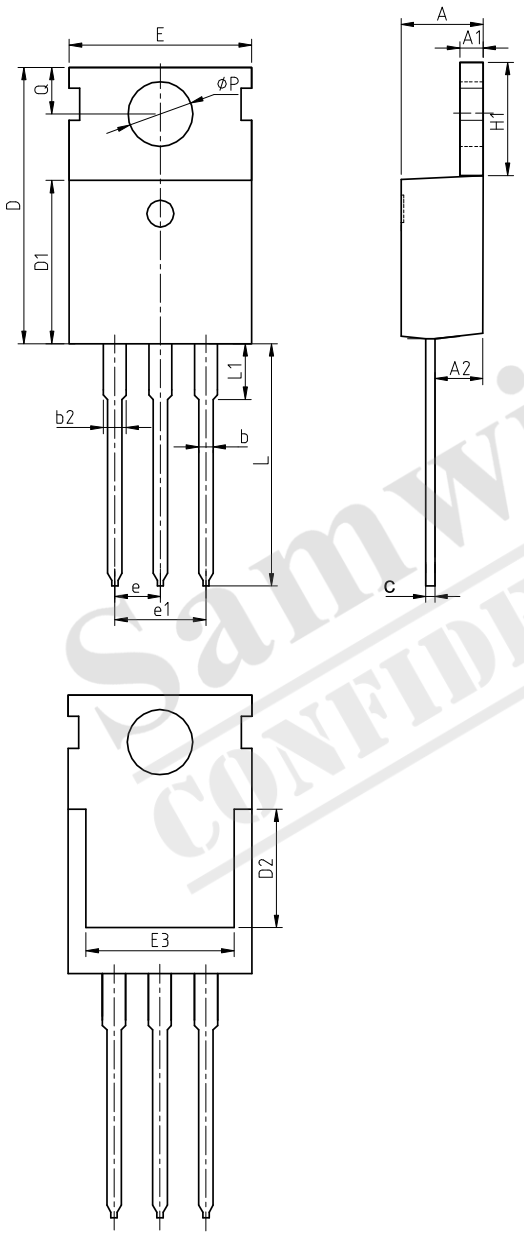




COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	2.20	2.30	2.40
A1	0.00	–	0.20
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.50
c	0.43	0.53	0.63
D	5.98	6.10	6.22
D1	5.30 REF		
E	6.40	6.60	6.80
E1	4.63	–	–
e	2.286 BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90 REF		
L2	0.51 BSC		
L3	0.88	–	1.28
L4	–	–	1.00
L5	1.65	1.80	1.95
θ	0°	–	8°

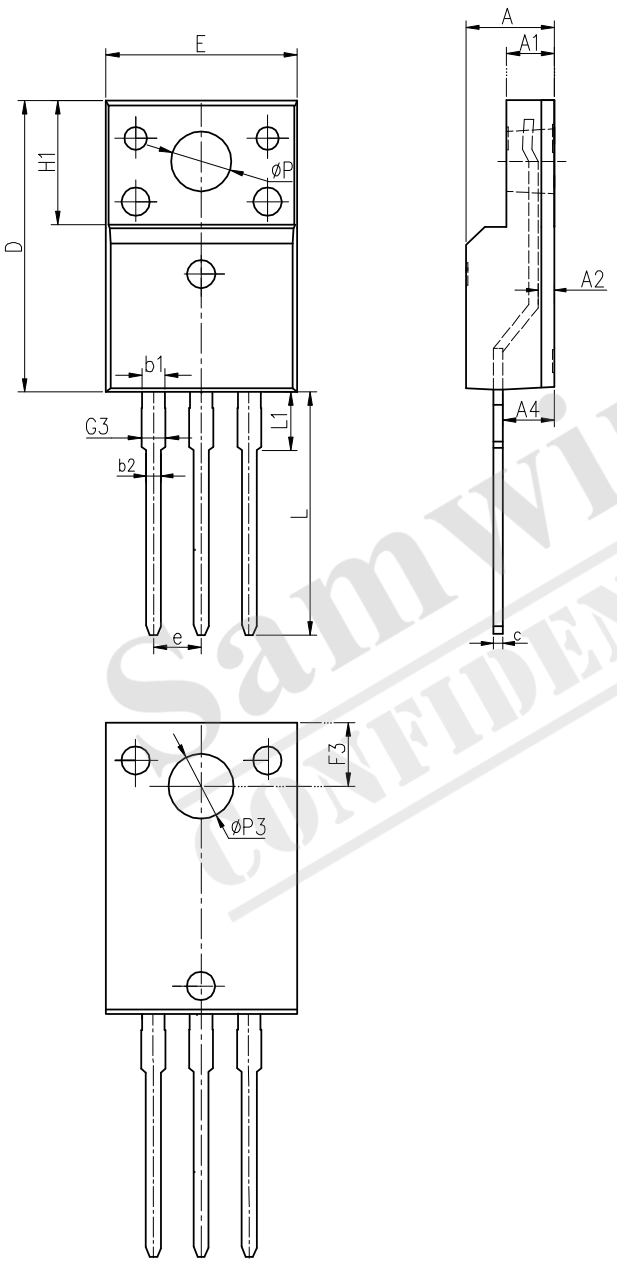
TO-220



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	–	–
E	9.70	10.00	10.30
E3	7.00	–	–
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	–	3.10	3.40
P	3.40	3.60	3.80
Q	2.60	2.80	3.00

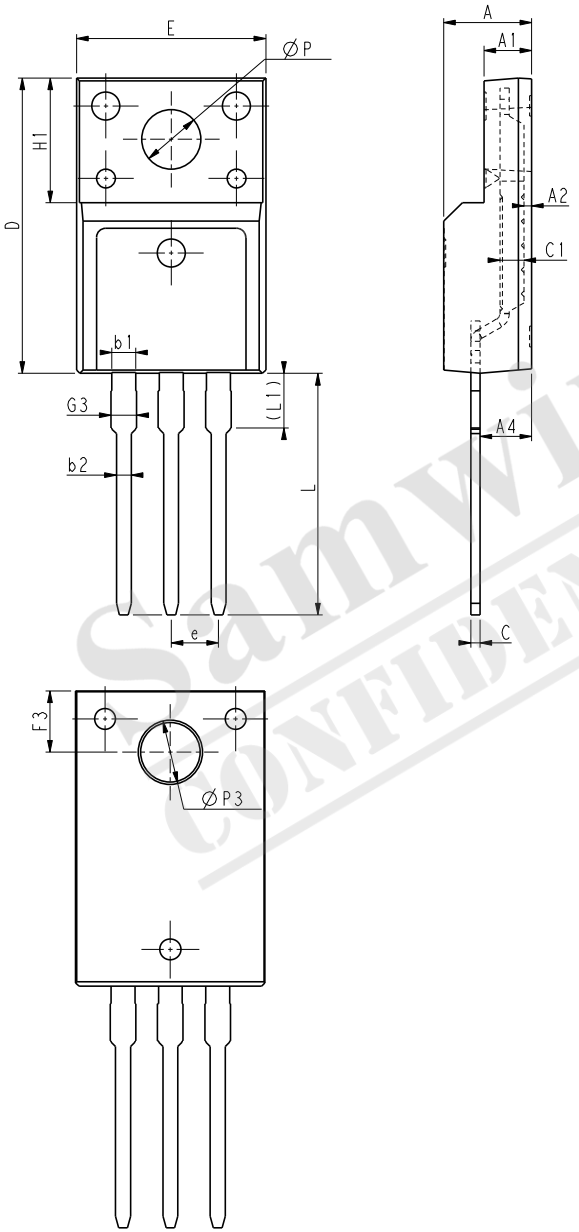
TO-220F



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
E	10.00	10.20	10.40
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.65	0.85	1.30
A4	2.55	2.75	2.95
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70 REF		
e	2.54 BSC		
P	3.18 REF		
L	12.68	12.98	13.28
L1	3.15	3.45	3.65
P3	3.45 REF		
F3	3.10	3.30	3.50
G3	1.10	1.30	1.50
b1	1.05	1.20	1.35
b2	0.70	0.80	0.92

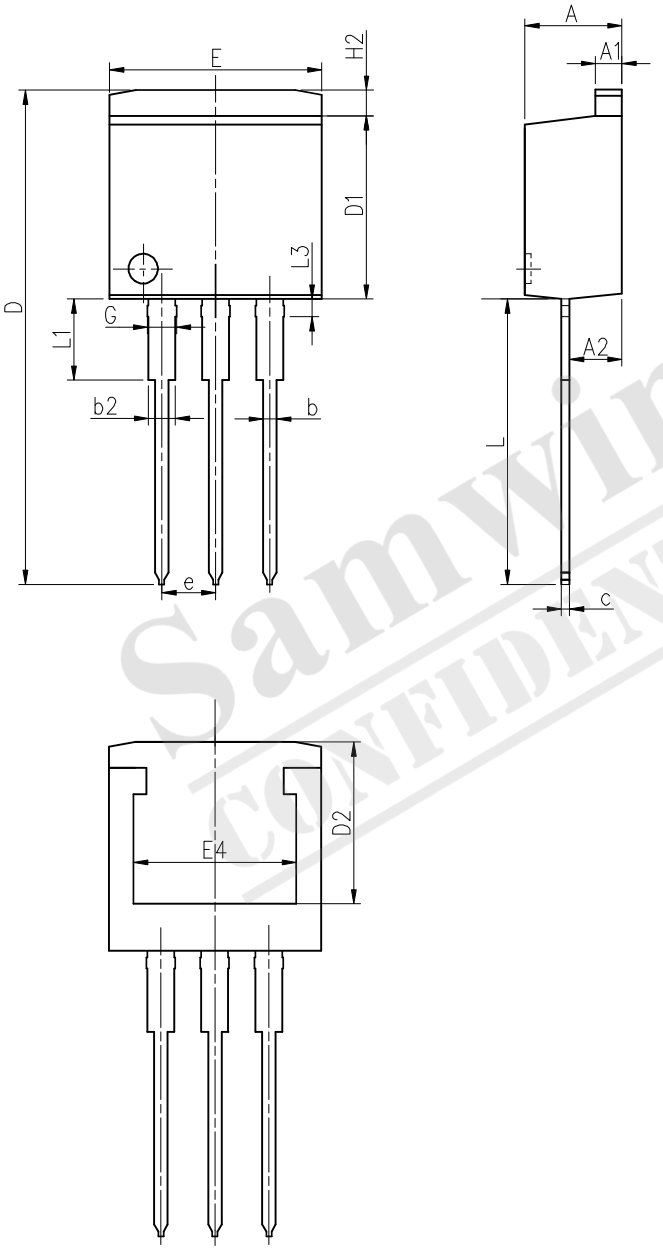
TO-220MF



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.30	0.45	0.60
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
c1	1.20	1.30	1.35
D	15.57	15.87	16.17
H1	6.70 REF		
e	2.54 BSC		
L	12.68	12.98	13.28
L1	2.93	3.03	3.13
P	3.03	3.18	3.38
P3	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.43
b2	0.70	0.80	0.95

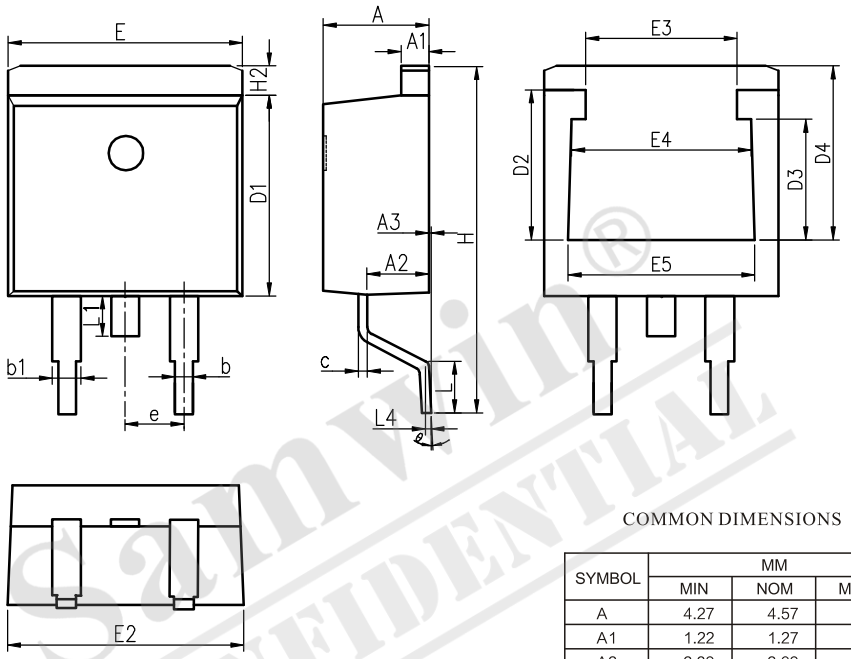
TO-262



COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.22	1.27	1.42
A2	2.47	2.67	2.87
b	0.70	0.813	0.97
b2	1.17	1.270	1.42
c	0.28	0.381	0.53
D	23.20	23.61	24.02
D1	8.38	8.70	8.90
D2	6.00	-	-
E	9.90	10.16	10.39
E4	7.30	-	-
e	2.54 BSC		
G	1.25	1.35	1.50
H2	-	-	1.31
L	13.34	13.73	14.10
L1	3.30	3.56	4.06
L3	0.95	1.05	1.15

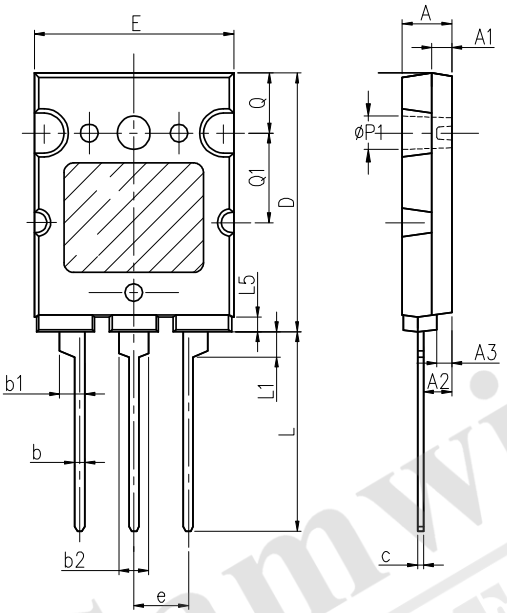
TO-263

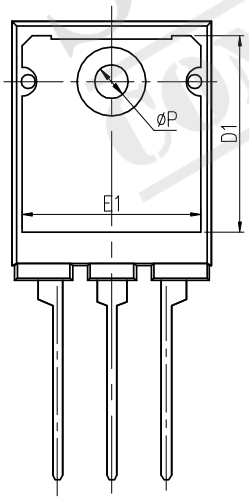


COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.27	4.57	4.87
A1	1.22	1.27	1.42
A2	2.39	2.69	2.99
A3	0.00	0.13	0.20
b	0.70	0.81	1.01
b1	1.17	1.27	1.50
c	0.30	0.38	0.53
D1	8.40	8.70	9.00
D2	5.33	6.33	6.63
D3	4.54	5.54	5.84
D4	6.60	7.60	8.00
E	9.88	10.16	10.50
E2	9.80	10.10	10.40
E3	4.94	5.94	6.24
E4	6.67	7.67	7.97
E5	7.06	8.06	8.36
e	2.54 BSC		
H	14.70	15.10	15.50
H2	1.00	1.27	1.50
L	2.00	2.30	2.60
L1	1.35	1.55	1.75
L4	0.25 BSC		
θ	0°	5°	9°

TO-264

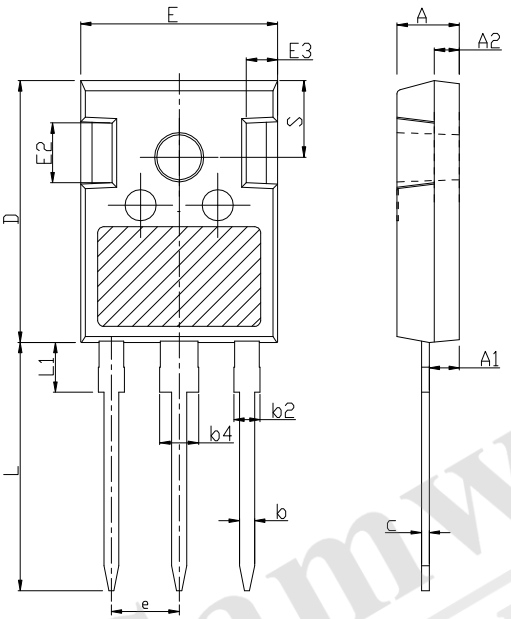


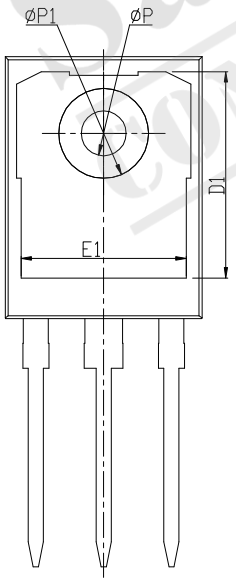


COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1		2.00 REF	
A2	2.50	2.80	3.10
A3		1.50 REF	
b	0.90	1.00	1.25
b1	2.30	2.50	2.75
b2	2.80	3.00	3.20
c	0.50	0.60	0.85
D	25.70	26.00	26.30
D1	19.00	–	–
E	19.50	20.00	20.50
E1	16.00	–	–
e		5.45 TYP	
L	19.50	20.00	20.50
L1	2.30	2.50	2.70
L5		1.35 REF	
P	3.00	3.20	3.40
P1	3.20	3.40	3.60
Q	5.80	6.00	6.20
Q1	8.80	9.00	9.20

TO-247

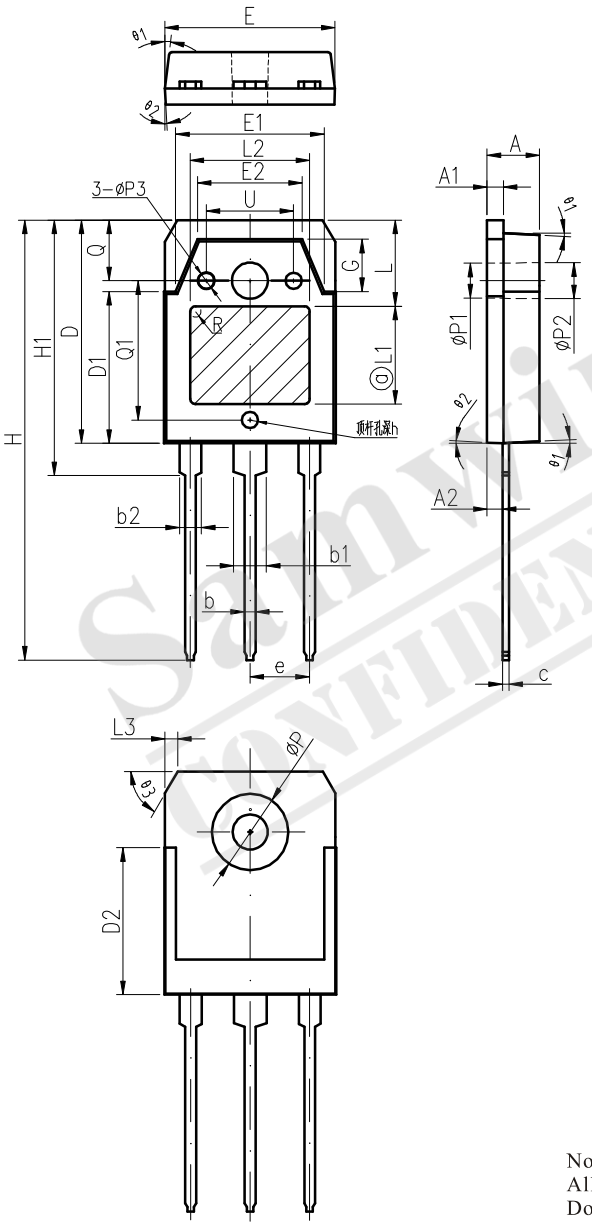




COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44 BSC		
L	19.62	19.392	20.22
L1	–	–	4.30
P	3.40	3.60	3.80
P1	–	–	7.30
S	63.15 BSC		

TO-3P

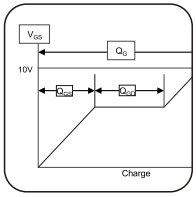


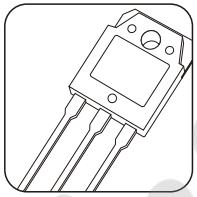
COMMON DIMENSIONS

SYMBOL	MM		
	MIN	NOM	MAX
A	4.60	4.80	5.00
A1	1.40	1.50	1.60
A2	1.33	1.38	1.43
b	0.80	1.00	1.20
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
D	19.75	19.90	20.05
D1	13.70	13.90	14.10
D2	12.90 REF		
E	15.40	15.60	15.80
E1	13.40	13.60	13.80
E2	9.40	9.60	9.80
e	5.45 TYP		
G	4.60	4.80	5.00
H	40.30	40.50	40.70
H1	23.20	23.40	23.60
h	0.05	0.10	0.15
L	7.40 TYP		
L1	9.00 TYP		
L2	11.00 TYP		
L3	1.00 REF		
P	6.90	7.00	7.10
P1	3.20 REF		
P2	3.50 REF		
P3	1.40	1.50	1.60
R	0.50 REF		
Q	5.00 REF		
Q1	12.56	12.76	12.96
U	7.8	8	8.2
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	60° REF		

Notes
All Dimensions refer to jedec standard TO-3P,
Do not include mold flash or protrusions.

Samwin® 产品选型指南





PRODUCT SELECTION GUIDE

Samwin® MOSFET 选型指南（低压部分 .01.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW5003	TO-220	Preliminary	N	–	50	30	0.011	1	3	4.5	23	2000	280
SW75N03	TO-220	Production	N	75	75	30	0.007	1	3	27	48	3298	1400
SW100N03	TO-220	Production	N	113	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-251	Production	N	96	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-252	Production	N	83	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-263	Production	N	96	100	30	0.0053	1	3	195	69	9500	800
SW120N03	TO-220	Preliminary	N	–	120	30	0.004	1	3	10	48	3550	1350
SW210N03	TO-220	Preliminary	N	–	210	30	0.0025	2	4	98	250	11000	1300
SW120N04M	TO-220	Production	N	138.7	120	40	0.005	1	3	13	57	2945	462
SW180N04B	TO-220	Production	N	336	180	40	0.004	2	4	74	147	6400	1380
SW190N04A	TO-220	Production	N	224	190	40	0.0045	2	4	60	112	4606	1066
SW190N04	TO-220	Preliminary	N	–	190	40	0.0035	2	4	64	163	6500	916
SW200N04	TO-220	Preliminary	N	–	200	40	0.004	2	4	56	170	9000	880
SW210N04	TO-220	Production	N	388.5	210	40	0.0045	2	4	93	256	11450	895
SW210N04A	TO-220	Production	N	497	210	40	0.0036	2	4	82	184	7275	1351
SW210N04M	TO-220	Production	N	295.5	210	40	0.002	2	4	45	153	7950	1190
SW210N04	TO-220	Preliminary	N	–	210	40	0.0032	2	4	98	250	11000	1300
SW230N04B	TO-220	Production	N	288.7	230	40	0.004	2	4	96	190	7830	1790
SW4955	TO-220	Preliminary	N	–	49	55	0.015	2	4	16	50	2350	237
SW3205	TO-220	Production	N	250	110	55	0.012	2	4	25	65	4250	1650
SW110N55	TO-220	Preliminary	N	–	110	55	0.006	2	4	49	125	4900	470
SW120N55	TO-220	Preliminary	N	–	120	55	0.0055	2	4	49	125	4900	470
SW2N7002	SOT-23	Production	N	0.35	0.3	60	2	1	2.5		1.7	36	18
SW6016	SOP-8	Production	N	2.3	8	60	0.012	1.2	2.5	22	69	2667	235
SW15N06	TO-220	Production	N	72.8	15	60	0.09	2	4	9	14	346	196
SW15N06L	TO-252	Production	N	72.7	15	60	0.065	1	2.5	14	1.5	312	192
SW30N06	TO-220	Production	N	250	30	60	0.036	2	4	15	25	760	280
SW30N06	TO-251	Production	N	186	30	60	0.036	2	4	15	25	760	280
SW30N06	TO-252	Production	N	104	30	60	0.036	2	4	15	25	760	280
SW30N06U	TO-251	Production	N	103.5	30	60	0.04	2	4	13	27	1000	280
SW50N06	TO-220	Production	N	215	50	60	0.023	2	4	11	31	1220	550
SW50N06	TO-220F	Production	N	42	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-251	Production	N	108	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-252	Production	N	108	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-220	Production	N	215	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-220F	Production	N	42	50	60	0.023	2	4	11	31	1220	550
SW50N06D	TO-220	Production	N	95	50	60	0.013	2	4	17	31	1500	244
SW50N06U	TO-251	Production	N	195.3	50	60	0.023	2	4	15	32.5	1220	550
SW50N06U	TO-252	Production	N	195.3	50	60	0.023	2	4	15	32.5	1220	550
SW50N06C	TO-220	Production	N	165	50	60	0.023	2	4	20	40	1330	364
SW50N06C	TO-220F	Production	N	38.7	50	60	0.023	2	4	20	40	1330	364

Samwin® MOSFET 选型指南（低压部分 .02.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW50N06T	TO-252	Production	N	87.4	50	60	0.0168	2	4	19	41	2178	195
SW50N06T	TO-220	Production	N	114.7	50	60	0.0168	2	4	19	41	2178	195
SW60N06T	TO-220	Production	N	141	60	60	0.008	2	4	35	77	3960	335
SW60N06V	TO-251S	Production	N	85.8	60	60	0.012	1	2	14	31	1170	237
SW60N06V	TO-252	Production	N	84	60	60	0.012	1	2	14	31	1170	237
SW60N06V	TO-220	Production	N	113.6	60	60	0.012	1	2	14	31	1170	237
SW75N06	TO-220	Preliminary	N	–	75	60	0.0115	2	4	16	50	2350	237
SW7506	TO-220	Preliminary	N	–	75	60	0.0115	2	4	16	50	2350	237
SW100N06	TO-220	Preliminary	N	–	100	60	0.0065	2	4	28	85	4800	440
SW3205N	TO-220	Production	N	170	110	60	0.0105	2	4	33	66	2919	554
SW150N06A	TO-220	Production	N	251.8	150	60	0.006	2	4	62	115	4652	813
SW180N06A	TO-220	Production	N	321.1	180	60	0.005	2	4	69	133	5929	1002
SW210N06	TO-220	Preliminary	N	–	210	60	0.004	2	4	98	250	11000	1120
SW75N07	TO-220	Preliminary	N	–	75	70	0.012	2	4	16	50	2350	237
SW80N07	TO-220	Production	N	150	80	70	0.0082	2	4	33	78	3940	341
SW80N07	TO-220	Preliminary	N	–	80	70	0.008	2	4	24	94	3400	310
SW90N71	TO-220	Preliminary	N	–	90	71	0.0068	2	4	28	85	4800	440
SW75N75	TO-220	Production	N	312	75	75	0.008	2	4	47	126	1260	135
SW75N75A	TO-220	Production	N	142.2	75	75	0.00918	2	4	47	99	4780	390
SW78N75	TO-220	Preliminary	N	–	78	75	0.0085	2	4	24	94	3400	290
SW80N75	TO-220	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75D	TO-263	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75T	TO-247	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75	TO-220	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW110N75	TO-220	Preliminary	N	–	110	75	0.009	2	4	18	114	4700	440
SW140N75	TO-220	Preliminary	N	–	140	75	0.0055	2	4	40	120	7650	540
SW180N75A	TO-220	Production	N	484.5	180	75	0.0045	2	4	86	178	7527	1075
SW210N75	TO-220	Production	N	357.4	210	75	0.0042	2	4	122	268	11385	902
SW210N75	TO-220	Preliminary	N	–	210	75	0.004	2	4	98	250	11000	914
SW210N75T	TO-247	Preliminary	N	–	210	75	0.004	2	4	98	250	11000	914
SW260N75T	TO-247	Preliminary	N	–	260	75	0.003	2	4	55	160	15700	2410
SW350N75T	TO-247	Preliminary	N	–	350	75	0.0025	2	4	105	380	19000	1650
SW75N08	TO-220	Production	N	227	75	80	0.011	2	4	29	74	4700	480
SW80N08A	TO-220	Production	N	185.6	80	80	0.0092	2	4	42	82	3540	447
SW80N08B	TO-220	Production	N	173.6	80	80	0.0085	2	4	29	72	6620	496
SW98N08	TO-220	Preliminary	N	–	98	80	0.008	2	4	49	125	4900	410
SW105N08D	TO-263	Preliminary	N	–	105	80	0.008	2	4	49	152	4900	410
SW110N08	TO-220	Preliminary	N	–	105	80	0.008	2	4	49	152	4900	410
SW110N08A	TO-220	Production	N	266.3	110	80	0.0072	2	4	52	107	4588	618
SW120N08	TO-220	Preliminary	N	–	120	80	0.006	2	4	64	163	6500	520
SW150N08A	TO-220	Production	N	328	150	80	0.0051	2	4	73	143	5783	838

Samwin® MOSFET 选型指南（低压部分 .03.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW150N85	TO-220	Preliminary	N	–	150	85	0.0048	2	4	60	200	8800	680
SW150N85T	TO-247	Preliminary	N	–	150	85	0.0048	2	4	60	200	8800	680
SW210N85	TO-220	Preliminary	N	–	210	85	0.005	2	4	98	250	11000	914
SW210N85T	TO-247	Preliminary	N	–	210	85	0.005	2	4	98	250	11000	914
SW2N10	SOT-23	Production	N		2	100	0.24	1	3	3.2	13	550	50
SW3N10	TO-252	Production	N	44	3	100	0.107	1.5	2.5	5	21	1050	65
SW1710	TO-220	Preliminary	N	–	17	100	0.07	2	4	9.4	31	1350	240
SW19N10	TO-220	Production	N	208	19	100	0.12	2	4	6.5	15	780	215
SW19N10	TO-252	Production	N	118	19	100	0.12	2	4	6.5	15	780	215
SW19N10A	TO-252	Production	N	99.6	19	100	0.102	2	4	11	25	1050	185
SW2810D	TO-263	Preliminary	N	–	28	100	0.018	2	4	25	95	3700	630
SW50N10	TO-220	Production	N	165	50	100	0.017	2	4	32	82	4030	243
SW3710	TO-220	Production	N	195	57	100	0.023	2	4	38	85	4250	1650
SW5710	TO-220	Preliminary	N	–	57	100	0.016	2	4	25	95	4400	320
SW5710A	TO-220	Preliminary	N	–	57	100	0.017	2	4	24	94	3400	260
SW5710T	TO-247	Preliminary	N	–	57	100	0.016	2	4	25	95	4400	320
SW5910	TO-220	Preliminary	N	–	59	100	0.015	2	4	25	95	4900	400
SW7010	TO-220	Preliminary	N	–	70	100	0.014	2	4	25	95	4900	400
SW100N10	TO-220	Production	N	209.1	100	100	0.011	2	4	43	109	16700	548
SW100N10A	TO-220	Production	N	390	100	100	0.0074	2	4	56	127	5732	679
SW100N10B	TO-220	Production	N	318	100	100	0.0105	2	4	47	106	4571	509
SW100N10	TO-220	Preliminary	N	–	100	100	0.013	2	4	28	85	4800	340
SW110N10	TO-220	Preliminary	N	–	110	100	0.009	2	4	64	163	6500	380
SW140N10	TO-220	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW140N10D	TO-263	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW140N10T	TO-247	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW150N10A	TO-220	Production	N	464	150	100	0.0056	2	4	75	160	7201	805
SW210N10T	TO-247	Preliminary	N	–	210	100	0.0043	2	4	118	377	16500	1061
SW290N10T	TO-247	Preliminary	N	–	290	100	0.0035	2	4	184	586	21000	1652
SW4015D	TO-263	Preliminary	N	–	40	150	0.045	2.5	4.5	31.5	105	4200	203
SW5015	TO-220	Preliminary	N	–	50	150	0.023	2.5	4.5	64	163	3250	670
SW7915	TO-220	Preliminary	N	–	79	150	0.019	2	4	98	250	11000	463
SW8315T	TO-247	Preliminary	N	–	83	150	0.019	2	4	98	250	11000	463
SW100N15	TO-220	Preliminary	N	–	100	150	0.012	2	4	128	326	13000	640
SW110N15T	TO-247	Preliminary	N	–	110	150	0.013	2	4	118	377	16500	1344
SW150N15T	TO-247	Preliminary	N	–	150	150	0.008	2	4	184	586	21000	1446

Samwin® MOSFET 选型指南（中高压部分 .01.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW630	TO-252	Production	N	48	10	200	0.4	2	4	13	21	770	120
SW630	TO-220F	Production	N	70	10	200	0.4	2	4	13	21	770	120
SW630	TO-220	Production	N	120	10	200	0.4	2	4	13	21	770	120
SW630A	TO-220	Production	N	132	10	200	0.4	2	4	13	22	420	100
SW630A	TO-252	Production	N	148	10	200	0.4	2	4	13	22	420	100
SW640U	TO-220	Production	N	178.2	18	200	0.18	2	4	12	25	907	280
SW640	TO-220	Production	N	240	18	200	0.18	2	4	30	35	1750	240
SW640	TO-3P	Production	N	245	18	200	0.18	2	4	30	48	1750	240
SW1820	TO-220	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW1820D	TO-263	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW1820F	TO-220F	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW2420D	TO-263	Preliminary	N	–	24	200	0.08	1	2	17	60	4200	163
SW4020	TO-220	Preliminary	N	–	40	200	0.041	2	4	64	163	6500	290
SW4020F	TO-220F	Preliminary	N	–	40	200	0.041	2	4	64	163	6500	290
SW634	TO-220F	Production	N	38	9	250	0.45	2	4	13	26	1220	130
SW634	TO-220	Production	N	133	9	250	0.45	2	4	13	26	1220	130
SW634	TO-252	Production	N	143.9	9	250	0.45	2	4	13	26	787	116
SW5N30D	TO-251	Production	N	83	5	300	0.9	2.5	4.5	7	12	475	71
SW2N40D	TO-92	Production	N	1.1	2	400	3.5	2.5	4.5	3.5	7	176	30
SW730	TO-220	Production	N	192	6.5	400	1	2	4	17	33	750	215
SW740U	TO-220	Production	N	226	10	400	0.55	2	4	18	38	1150	170
SW740	TO-220	Production	N	250	10	400	0.55	2	4	13	32	1800	200
SW830D1	TO-220F	Production	N	18.7	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-251	Production	N	101.9	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-252	Production	N	113.4	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-220	Production	N	123.6	5	500	1.54	2.5	4.5	8	17	519	76
SW830	TO-220F	Production	N	39	5.5	500	1.5	2	4	14	30	1100	115
SW830A	TO-220F	Production	N	39	5.5	500	1.5	2	4	14	30	1100	115
SW830	TO-220	Production	N	135	5.5	500	1.5	2	4	14	30	1100	115
SW830A	TO-220	Production	N	135	5.5	500	1.5	2	4	14	30	1100	115
SW830D	TO-252	Production	N	200	5.5	500	1.5	2	4	3	17	570	75
SW830C	TO-251	Production	N	215	5.5	500	1.5	2	4	9	19.5	1100	115
SW830C	TO-252	Production	N	215	5.5	500	1.5	2	4	9	19.5	1100	115
SW840	TO-220F	Production	N	21	8.5	500	0.9	2	4	22	47	1450	210
SW840	TO-220	Production	N	195	8.5	500	0.9	2	4	22	47	1450	210
SW840A	TO-220	Production	N	195	8.5	500	0.85	2	4	22	47	1450	210
SW9N50D	TO-220F	Production	N	23.3	9	500	0.8	2.5	4.5	13	31	1479	126
SW9N50D	TO-220	Production	N	200	9	500	0.8	2.5	4.5	13	31	1479	126
SW13N50B	TO-220F	Production	N	67.5	13	500	0.52	2	4	9	29	1500	200
SW13N50	TO-220F	Production	N	184	13	500	0.48	2	4	9	27	1600	200
SW15N50	TO-220F	Production	N	34.6	15	500	0.32	2	4	29	66	2610	283

Samwin® MOSFET 选型指南（中高压部分 .02.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW15N50A	TO-220F	Production	N	51.2	15	500	0.315	2	4	30	72	2900	267
SW20N50	TO-3P	Production	N	215	20	500	0.27	3	5	37	90	3600	500
SW20N50U	TO-3P	Production	N	386	20	500	0.27	2	4	41	103	4157	374
SW1N55D	TO-251	Production	N	77.1	1	550	6.5	2.5	4.5	3.5	7	182	30
SW601Q	SOT-23	Production	N	0.5	0.185	600	700	-2.7	-1.5	45	1300	15	145
SW1N60L	TO-92	Production	N	1	0.3	600	23	3	4.5	3.5	4.5	60	12
SW1N60A	TO-92	Production	N	4.3	0.5	600	15	3	4.5	3.6	6	150	25
SW1N60C	TO-92	Production	N	3.13	0.8	600	9	2	4	1.9	5.6	150	25
SW1N60E	TO-92	Production	N	3.58	1	600	8	2	4	1	3.7	270	60
SW1N60D	TO-92	Production	N	4.2	1	600	8.5	2.5	4.5	3.7	6.8	150	28
SW1N60	TO-126	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60	TO-251	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60	TO-252	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60C	TO-251	Production	N	50	1	600	9	2	4	1.9	5.6	150	25
SW1N60C	TO-252	Production	N	50	1	600	9	2	4	1.9	5.6	150	25
SW1N60DC	TO-252	Production	N	52	1	600	8.5	2.5	4.5	4.7	6.3	160	32
SW1N60D	TO-251	Production	N	65.9	1	600	8.5	2.5	4.5	3.7	6.8	150	28
SW1N60E	TO-251	Production	N	103	1	600	8	2	4	1	3.7	270	60
SW2N60D	TO-220F	Production	N	17.45	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60B	TO-220F	Production	N	18.5	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60B	TO-126	Production	N	20	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60A1	TO-220F	Production	N	23	2	600	5	2	4	4	10	330	40
SW2N6O	TO-220F	Production	N	28	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-220F	Production	N	28	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-251	Production	N	40	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-252	Production	N	40	2	600	5	2	4	7.5	15	520	50
SW2N60B	TO-251	Production	N	69	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60B	TO-252	Production	N	69	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60DC	TO-251	Production	N	77.6	2	600	4.5	2.5	4.5	4	9.5	305	45
SW2N60DC	TO-252	Production	N	78.1	2	600	4.5	2.5	4.5	4	9.5	305	45
SW2N60D	TO-252	Production	N	85.5	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60D	TO-251	Production	N	88.7	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60	TO-220	Production	N	108	2	600	5	2	4	7.5	15	520	50
SW2N60A1	TO-251	Production	N	122	2	600	5	2	4	4	10	330	40
SW4N60B	TO-220F	Production	N	19.1	4	600	2.5	2	4	4	11	463	63
SW4N60D	TO-220F	Production	N	23.5	4	600	2.2	2.5	4.5	9	18	522	57
SW4N60A	TO-220F	Production	N	33	4	600	2.2	2	4	17	30	740	83
SW4N60	TO-220F	Production	N	33	4	600	2.2	2	4	17	30	740	83
SW226N	TO-251	Production	N	60	4	600	2.3	2	4	13.8	30	740	90
SW 226N	TO-252	Production	N	60	4	600	2.3	2	4	13.8	30	740	90
SW4N60B	TO-251	Production	N	140	4	600	2.5	2	4	4	11	463	63

Samwin® MOSFET 选型指南（中高压部分 .03.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW 4N60D	TO-252	Production	N	141	4	600	2.2	2.5	4.5	9	18	522	57
SW 4N60B	TO-252	Production	N	144.5	4	600	2.5	2	4	4	11	463	63
SW 4N60D	TO-251N	Production	N	152.6	4	600	2.2	2.5	4.5	9	18	522	57
SW 4N60A	TO-220	Production	N	198	4	600	2.2	2	4	17	30	740	83
SW 4N60	TO-220	Production	N	198	4	600	2.2	2	4	17	30	740	83
SW 226NV	TO-251	Production	N	270	4	600	2.5	2	4	14	27	740	90
SW 226NV	TO-252	Production	N	270	4	600	2.5	2	4	14	27	740	90
SW 4N60V	TO-251	Production	N	312.5	4	600	2.5	2	4	13.7	27	740	83
SW 4N60V	TO-252	Production	N	312.5	4	600	2.5	2	4	13.7	27	740	83
SW 5N60D	TO-220F	Production	N	19.5	5	600	2.45	2.5	4.5	8.6	17	555	70
SW 5N60	TO-220F	Production	N	24	5	600	2.2	2	4	10	22	630	65
SW 6N60	TO-251	Production	N	24	6	600	1.5	2	4	12.4	29	700	95
SW 6N60	TO-252	Production	N	24	6	600	1.5	2	4	12.4	29	700	95
SW 6N60D	TO-220F	Production	N	24	6	600	1.7	2.5	4.5	12	23	794	94
SW 6N60	TO-220F	Production	N	50	6	600	1.5	2	4	12.4	29	700	95
SW 6N65	TO-252	Production	N	162	6	600	1.4	2	4	11	26	1004	87
SW6N60D	TO-252	Production	N	205	6	600	1.7	2.5	4.5	12	23	794	94
SW7N60D	TO-220F	Production	N	23.76	7	600	1.2	2.5	4.5	15	30	1000	115
SW7N60R	TO-220	Production	N	23.8	7	600	1.25	2	4	6	19	943	110
SW7N60R	TO-220F	Production	N	23.8	7	600	1.25	2	4	6	19	943	110
SW7N60H	TO-220F	Production	N	28.6	7	600	1.32	2	4	12	28	1073	87
SW7N60	TO-220F	Production	N	68.5	7	600	1.3	2	4	13	32	1260	135
SW7N60	TO-220	Production	N	147	7	600	1.3	2	4	13	32	1260	135
SW8N60	TO-220F	Production	N	53	7.5	600	1.3	2	4	12	28	1255	135
SW 8N60	TO-220	Production	N	147	7.5	600	1.3	2	4	12	28	1255	135
SW8N60B	TO-220F	Production	N	21.8	8	600	1.25	2	4	7	19	930	120
SW 10N60D	TO-220F	Production	N	41.8	10	600	1.1	2.5	4.5	17	35	1120	122
SW 10N60	TO-220F	Production	N	50	10	600	0.9	2	4	15.5	40	2530	205
SW 10N60	TO-220	Production	N	156	10	600	0.9	2	4	15.5	40	2530	205
SW 11N60	TO-220F	Production	N	48	11	600	0.8	2	4	18	50	2080	177
SW 12N60D	TO-220F	Production	N	32.3	12	600	0.8	2.5	5	24	48	1456	157
SW 12N60	TO-220F	Production	N	52	12	600	0.7	2	4	11	31	2530	205
SW 12N60	TO-220	Production	N	250	12	600	0.7	2	4	11	31	2530	205
SW 20N60	TO-3P	Production	N	265	20	600	0.3	3	5	42	97	3600	500
SW 20N60U	TO-3P	Production	N	367.7	20	600	0.45	2	4	47	108	4082	350
SW 22N60U	TO-3P	Production	N	520	22	600	0.35	2	5	48	124	5028	373
SW2N65B	TO-220F	Production	N	16.7	2	650	5.6	2	4	4.6	7.7	260	40
SW2N65	TO-220F	Production	N	19.2	2	650	5.5	2	4	4.4	7.8	260	40
SW 2N65	TO-220	Production	N	62.5	2	650	5.5	2	4	4.4	7.8	260	40
SW4N65B	TO-220F	Production	N	15.8	4	650	2.7	2	4	6	11	740	90
SW4N65D	TO-220F	Production	N	23.3	4	650	2.6	2.5	4.5	9	18	531	60

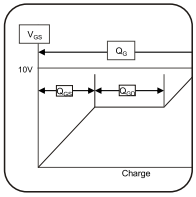
Samwin® MOSFET 选型指南（中高压部分 .04.）：

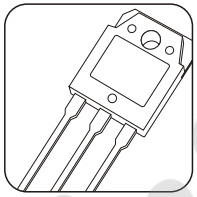
Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW4N65	TO-220F	Production	N	43	4	650	2.6	2	4	7	17	740	90
SW4N65	TO-251	Production	N	54	4	650	2.6	2	4	7	17	740	90
SW4N65	TO-252	Production	N	54	4	650	2.6	2	4	7	17	740	90
SW4N65U	TO-220F	Production	N	54.6	4	650	2.6	2	4	8	17	560	65
SW4N65	TO-220	Production	N	100	4	650	2.6	2	4	7	17	740	90
SW4N65D	TO-252	Production	N	144.4	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65D	TO-251N	Production	N	157.1	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65D	TO-251S	Production	N	157.1	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65U	TO-251N	Production	N	250.1	4	650	2.6	2	4	8	17	560	65
SW7N65D	TO-220F	Production	N	27.9	7	650	1.4	2.5	4.5	15	30	950	108
SW7N65	TO-220F	Production	N	45	7	650	1.32	2	4	13	32	1500	145
SW7N65B	TO-220F	Production	N	65.17	7	650	1.4	2	4	7	19	850	110
SW7N65	TO-220	Production	N	147	7	650	1.32	2	4	13	32	1500	145
SW7N65D	TO-251	Production	N	173.6	7	650	1.4	2.5	4.5	15	30	950	108
SW7N65D	TO-252	Production	N	255.1	7	650	1.4	2.5	4.5	15	30	950	108
SW8N65B	TO-220F	Production	N	24.9	8	650	1.5	2	4	6	19	959	115
SW8N65A1	TO-220F	Production	N	31	8	650	1.42	2	4	12	31	1210	110
SW10N65D	TO-220F	Production	N	41.8	10	650	1.1	2.5	4.5	17	35	1120	122
SW10N65B	TO-220F	Production	N	43	10	650	1.2	2	4	6.5	23	1200	130
SW10N65	TO-220	Production	N	156	10	650	1.1	2	4	14.5	40	2530	205
SW10N65	TO-220F	Production	N	38*	10	650	1.1	2	4	14.5	40	2530	205
SW12N65D	TO-220F	Production	N	45.2	12	650	0.8	2.5	4.5	22	45	1456	157
SW12N65B	TO-220F	Production	N	54	12	650	0.85	2	4	9	28	1450	160
SW12N65A1	TO-220F	Production	N	58	12	650	0.8	2	4	20	43	2100	170
SW12N65	TO-220	Production	N	165	12	650	0.8	2	4	21	53	2530	205
SW12N65D	TO-262	Production	N	186.6	12	650	0.8	2.5	4.5	22	45	1456	157
SW12N65A1	TO-263	Production	N	208	12	650	0.8	2	4	20	43	2100	170
SW12N65A1	TO-220	Production	N	215	12	650	0.8	2	4	20	43	2100	170
SW12N65	TO-220F	Production	N	65	12	650	0.8	2	4	21	53	2530	205
SW1N70A	TO-92	Production	N	3	0.5	700	15	3	4.5	2.4	7	150	25
SW1N70C	TO-92	Production	N	3.64	0.8	700	16	2.3	4.5	3.5	15	100	30
SW2N70D	TO-251N	Production	N	76	2	700	6.2	2.5	4.5	5.5	11	360	42
SW2N70	TO-251	Production	N	120	2	700	7	2	4	6.5	11	530	50
SW2N70	TO-252	Production	N	120	2	700	7	2	4	6.5	11	530	50
SW4N70B	TO-220F	Production	N	24.1	4	700	2.8	2	4	4	12	595	55
SW4N70D	TO-251	Production	N	145	4	700	2.7	2.5	4.5	9	20	790	72
SW4N70B	TO-251	Production	N	147.1	4	700	2.8	2	4	4	12	595	55
SW6N70DA	TO-220F	Production	N	21.9	6	700	1.9	2.5	4.5	11	26	1040	88
SW6N70D	TO-220F	Production	N	30.3	6	700	1.7	2	4	7	20	995	93
SW6N70P	TO-251	Production	N	137.5	6	700	1.7	2	4	7	20	995	93
SW6N70P	TO-252	Production	N	192.3	6	700	1.7	2	4	7	20	995	93

Samwin® MOSFET 选型指南（中高压部分 .05.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW6N70DA	TO-252	Production	N	195.3	6	700	1.9	2.5	4.5	11	26	1040	88
SW 6N70DA	TO-251S	Production	N	219	6	700	1.9	2.5	4.5	11	26	1040	88
SW6N70A	TO-251	Production	N	222	6	700	1.8	2	4	10	24	936	86
SW 7N70	TO-262	Production	N	147	7	700	1.35	2	4	15	35	1500	145
SW8N70A	TO-220F	Production	N	39.8	8	700	1.2	2.1	4	8	25	1660	134
SW 8N70	TO-220F	Production	N	50	8	700	1.6	2	4	18	35	1130	100
SW1N80A	TO-92	Production	N	4.1	1	800	16	3	5	3.1	6	150	25
SW 3N80C	TO-220F	Production	N	18.4	3	800	4.9	2	4	8	12.5	700	70
SW3N80	TO-220F	Production	N	35	3	800	4.5	3	5	7	13	700	70
SW 3N80	TO-220	Production	N	106	3	800	4.5	3	5	7	13	700	70
SW3N80C	TO-251	Production	N	147	3	800	4.9	2	4	8	12.5	700	70
SW 3N80C	TO-252	Production	N	147	3	800	4.9	2	4	8	12.5	700	70
SW 4N80B	TO-220F	Production	N	41.65	4	800	4	2	4	6	14	520	65
SW 4N80B	TO-251N	Production	N	252.1	4	800	4	2	4	6	14	520	65
SW 5N80B	TO-220F	Production	N	22.3	5	800	2.68	2	4	7.5	18	743	85
SW 5N80	TO-220F	Production	N	45	5	800	2.4	3	5	15.7	33	1450	200
SW5N80B	TO-251	Production	N	173.6	5	800	2.68	2	4	7.5	18	743	85
SW 7N80B	TO-220F	Production	N	48	7	800	1.59	2	4	10	25	1150	117
SW 7N80U	TO-220F	Production	N	65	7	800	1.9	3	5	21	43	1400	130
SW 7N80U	TO-262	Production	N	290.7	7	800	1.9	3	5	21	43	1400	130
SW10N80	TO-220F	Production	N	37.1	10	800	1.1	3	5	34	66	2143	198
SW10N80B	TO-220F	Production	N	46.3	10	800	1.15	2	4	14	36	1760	168
SW 6N90	TO-262	Production	N	231	6	900	2.3	3	5	19	40	1400	120
SW 7N90	TO-220F	Production	N	32	7	900	1.8	3	5	20	40	1880	185
SW 7N90	TO-3P	Production	N	390	7	900	1.8	3	5	23	50	1880	185
SW 8N90	TO-220F	Production	N	69	8	900	1.5	2	4	27	57	2100	160
SW 9N90	TO-3P	Production	N	219	9	900	1.45	3	5	39	74	2700	260
SW4N100U	TO-220F	Production	N	35	4	1000	3.5	3	5	16.5	33	1100	122

Samwin® 产品选型指南





PRODUCT SELECTION GUIDE

Samwin® MOSFET 选型指南（低压部分 .01.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW5003	TO-220	Preliminary	N	–	50	30	0.011	1	3	4.5	23	2000	280
SW75N03	TO-220	Production	N	75	75	30	0.007	1	3	27	48	3298	1400
SW100N03	TO-220	Production	N	113	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-251	Production	N	96	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-252	Production	N	83	100	30	0.0053	1	3	195	69	9500	800
SW100N03	TO-263	Production	N	96	100	30	0.0053	1	3	195	69	9500	800
SW120N03	TO-220	Preliminary	N	–	120	30	0.004	1	3	10	48	3550	1350
SW210N03	TO-220	Preliminary	N	–	210	30	0.0025	2	4	98	250	11000	1300
SW120N04M	TO-220	Production	N	138.7	120	40	0.005	1	3	13	57	2945	462
SW180N04B	TO-220	Production	N	336	180	40	0.004	2	4	74	147	6400	1380
SW190N04A	TO-220	Production	N	224	190	40	0.0045	2	4	60	112	4606	1066
SW190N04	TO-220	Preliminary	N	–	190	40	0.0035	2	4	64	163	6500	916
SW200N04	TO-220	Preliminary	N	–	200	40	0.004	2	4	56	170	9000	880
SW210N04	TO-220	Production	N	388.5	210	40	0.0045	2	4	93	256	11450	895
SW210N04A	TO-220	Production	N	497	210	40	0.0036	2	4	82	184	7275	1351
SW210N04M	TO-220	Production	N	295.5	210	40	0.002	2	4	45	153	7950	1190
SW210N04	TO-220	Preliminary	N	–	210	40	0.0032	2	4	98	250	11000	1300
SW230N04B	TO-220	Production	N	288.7	230	40	0.004	2	4	96	190	7830	1790
SW4955	TO-220	Preliminary	N	–	49	55	0.015	2	4	16	50	2350	237
SW3205	TO-220	Production	N	250	110	55	0.012	2	4	25	65	4250	1650
SW110N55	TO-220	Preliminary	N	–	110	55	0.006	2	4	49	125	4900	470
SW120N55	TO-220	Preliminary	N	–	120	55	0.0055	2	4	49	125	4900	470
SW2N7002	SOT-23	Production	N	0.35	0.3	60	2	1	2.5		1.7	36	18
SW6016	SOP-8	Production	N	2.3	8	60	0.012	1.2	2.5	22	69	2667	235
SW15N06	TO-220	Production	N	72.8	15	60	0.09	2	4	9	14	346	196
SW15N06L	TO-252	Production	N	72.7	15	60	0.065	1	2.5	14	1.5	312	192
SW30N06	TO-220	Production	N	250	30	60	0.036	2	4	15	25	760	280
SW30N06	TO-251	Production	N	186	30	60	0.036	2	4	15	25	760	280
SW30N06	TO-252	Production	N	104	30	60	0.036	2	4	15	25	760	280
SW30N06U	TO-251	Production	N	103.5	30	60	0.04	2	4	13	27	1000	280
SW50N06	TO-220	Production	N	215	50	60	0.023	2	4	11	31	1220	550
SW50N06	TO-220F	Production	N	42	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-251	Production	N	108	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-252	Production	N	108	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-220	Production	N	215	50	60	0.023	2	4	11	31	1220	550
SW50N06A	TO-220F	Production	N	42	50	60	0.023	2	4	11	31	1220	550
SW50N06D	TO-220	Production	N	95	50	60	0.013	2	4	17	31	1500	244
SW50N06U	TO-251	Production	N	195.3	50	60	0.023	2	4	15	32.5	1220	550
SW50N06U	TO-252	Production	N	195.3	50	60	0.023	2	4	15	32.5	1220	550
SW50N06C	TO-220	Production	N	165	50	60	0.023	2	4	20	40	1330	364
SW50N06C	TO-220F	Production	N	38.7	50	60	0.023	2	4	20	40	1330	364

Samwin® MOSFET 选型指南（低压部分 .02.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW50N06T	TO-252	Production	N	87.4	50	60	0.0168	2	4	19	41	2178	195
SW50N06T	TO-220	Production	N	114.7	50	60	0.0168	2	4	19	41	2178	195
SW60N06T	TO-220	Production	N	141	60	60	0.008	2	4	35	77	3960	335
SW60N06V	TO-251S	Production	N	85.8	60	60	0.012	1	2	14	31	1170	237
SW60N06V	TO-252	Production	N	84	60	60	0.012	1	2	14	31	1170	237
SW60N06V	TO-220	Production	N	113.6	60	60	0.012	1	2	14	31	1170	237
SW75N06	TO-220	Preliminary	N	–	75	60	0.0115	2	4	16	50	2350	237
SW7506	TO-220	Preliminary	N	–	75	60	0.0115	2	4	16	50	2350	237
SW100N06	TO-220	Preliminary	N	–	100	60	0.0065	2	4	28	85	4800	440
SW3205N	TO-220	Production	N	170	110	60	0.0105	2	4	33	66	2919	554
SW150N06A	TO-220	Production	N	251.8	150	60	0.006	2	4	62	115	4652	813
SW180N06A	TO-220	Production	N	321.1	180	60	0.005	2	4	69	133	5929	1002
SW210N06	TO-220	Preliminary	N	–	210	60	0.004	2	4	98	250	11000	1120
SW75N07	TO-220	Preliminary	N	–	75	70	0.012	2	4	16	50	2350	237
SW80N07	TO-220	Production	N	150	80	70	0.0082	2	4	33	78	3940	341
SW80N07	TO-220	Preliminary	N	–	80	70	0.008	2	4	24	94	3400	310
SW90N71	TO-220	Preliminary	N	–	90	71	0.0068	2	4	28	85	4800	440
SW75N75	TO-220	Production	N	312	75	75	0.008	2	4	47	126	1260	135
SW75N75A	TO-220	Production	N	142.2	75	75	0.00918	2	4	47	99	4780	390
SW78N75	TO-220	Preliminary	N	–	78	75	0.0085	2	4	24	94	3400	290
SW80N75	TO-220	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75D	TO-263	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75T	TO-247	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW80N75	TO-220	Preliminary	N	–	80	75	0.008	2	4	30	100	4400	340
SW110N75	TO-220	Preliminary	N	–	110	75	0.009	2	4	18	114	4700	440
SW140N75	TO-220	Preliminary	N	–	140	75	0.0055	2	4	40	120	7650	540
SW180N75A	TO-220	Production	N	484.5	180	75	0.0045	2	4	86	178	7527	1075
SW210N75	TO-220	Production	N	357.4	210	75	0.0042	2	4	122	268	11385	902
SW210N75	TO-220	Preliminary	N	–	210	75	0.004	2	4	98	250	11000	914
SW210N75T	TO-247	Preliminary	N	–	210	75	0.004	2	4	98	250	11000	914
SW260N75T	TO-247	Preliminary	N	–	260	75	0.003	2	4	55	160	15700	2410
SW350N75T	TO-247	Preliminary	N	–	350	75	0.0025	2	4	105	380	19000	1650
SW75N08	TO-220	Production	N	227	75	80	0.011	2	4	29	74	4700	480
SW80N08A	TO-220	Production	N	185.6	80	80	0.0092	2	4	42	82	3540	447
SW80N08B	TO-220	Production	N	173.6	80	80	0.0085	2	4	29	72	6620	496
SW98N08	TO-220	Preliminary	N	–	98	80	0.008	2	4	49	125	4900	410
SW105N08D	TO-263	Preliminary	N	–	105	80	0.008	2	4	49	152	4900	410
SW110N08	TO-220	Preliminary	N	–	105	80	0.008	2	4	49	152	4900	410
SW110N08A	TO-220	Production	N	266.3	110	80	0.0072	2	4	52	107	4588	618
SW120N08	TO-220	Preliminary	N	–	120	80	0.006	2	4	64	163	6500	520
SW150N08A	TO-220	Production	N	328	150	80	0.0051	2	4	73	143	5783	838

Samwin® MOSFET 选型指南（低压部分 .03.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW150N85	TO-220	Preliminary	N	–	150	85	0.0048	2	4	60	200	8800	680
SW150N85T	TO-247	Preliminary	N	–	150	85	0.0048	2	4	60	200	8800	680
SW210N85	TO-220	Preliminary	N	–	210	85	0.005	2	4	98	250	11000	914
SW210N85T	TO-247	Preliminary	N	–	210	85	0.005	2	4	98	250	11000	914
SW2N10	SOT-23	Production	N		2	100	0.24	1	3	3.2	13	550	50
SW3N10	TO-252	Production	N	44	3	100	0.107	1.5	2.5	5	21	1050	65
SW1710	TO-220	Preliminary	N	–	17	100	0.07	2	4	9.4	31	1350	240
SW19N10	TO-220	Production	N	208	19	100	0.12	2	4	6.5	15	780	215
SW19N10	TO-252	Production	N	118	19	100	0.12	2	4	6.5	15	780	215
SW19N10A	TO-252	Production	N	99.6	19	100	0.102	2	4	11	25	1050	185
SW2810D	TO-263	Preliminary	N	–	28	100	0.018	2	4	25	95	3700	630
SW50N10	TO-220	Production	N	165	50	100	0.017	2	4	32	82	4030	243
SW3710	TO-220	Production	N	195	57	100	0.023	2	4	38	85	4250	1650
SW5710	TO-220	Preliminary	N	–	57	100	0.016	2	4	25	95	4400	320
SW5710A	TO-220	Preliminary	N	–	57	100	0.017	2	4	24	94	3400	260
SW5710T	TO-247	Preliminary	N	–	57	100	0.016	2	4	25	95	4400	320
SW5910	TO-220	Preliminary	N	–	59	100	0.015	2	4	25	95	4900	400
SW7010	TO-220	Preliminary	N	–	70	100	0.014	2	4	25	95	4900	400
SW100N10	TO-220	Production	N	209.1	100	100	0.011	2	4	43	109	16700	548
SW100N10A	TO-220	Production	N	390	100	100	0.0074	2	4	56	127	5732	679
SW100N10B	TO-220	Production	N	318	100	100	0.0105	2	4	47	106	4571	509
SW100N10	TO-220	Preliminary	N	–	100	100	0.013	2	4	28	85	4800	340
SW110N10	TO-220	Preliminary	N	–	110	100	0.009	2	4	64	163	6500	380
SW140N10	TO-220	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW140N10D	TO-263	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW140N10T	TO-247	Preliminary	N	–	140	100	0.0068	2	4	35	120	105000	914
SW150N10A	TO-220	Production	N	464	150	100	0.0056	2	4	75	160	7201	805
SW210N10T	TO-247	Preliminary	N	–	210	100	0.0043	2	4	118	377	16500	1061
SW290N10T	TO-247	Preliminary	N	–	290	100	0.0035	2	4	184	586	21000	1652
SW4015D	TO-263	Preliminary	N	–	40	150	0.045	2.5	4.5	31.5	105	4200	203
SW5015	TO-220	Preliminary	N	–	50	150	0.023	2.5	4.5	64	163	3250	670
SW7915	TO-220	Preliminary	N	–	79	150	0.019	2	4	98	250	11000	463
SW8315T	TO-247	Preliminary	N	–	83	150	0.019	2	4	98	250	11000	463
SW100N15	TO-220	Preliminary	N	–	100	150	0.012	2	4	128	326	13000	640
SW110N15T	TO-247	Preliminary	N	–	110	150	0.013	2	4	118	377	16500	1344
SW150N15T	TO-247	Preliminary	N	–	150	150	0.008	2	4	184	586	21000	1446

Samwin® MOSFET 选型指南（中高压部分 .01.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW630	TO-252	Production	N	48	10	200	0.4	2	4	13	21	770	120
SW630	TO-220F	Production	N	70	10	200	0.4	2	4	13	21	770	120
SW630	TO-220	Production	N	120	10	200	0.4	2	4	13	21	770	120
SW630A	TO-220	Production	N	132	10	200	0.4	2	4	13	22	420	100
SW630A	TO-252	Production	N	148	10	200	0.4	2	4	13	22	420	100
SW640U	TO-220	Production	N	178.2	18	200	0.18	2	4	12	25	907	280
SW640	TO-220	Production	N	240	18	200	0.18	2	4	30	35	1750	240
SW640	TO-3P	Production	N	245	18	200	0.18	2	4	30	48	1750	240
SW1820	TO-220	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW1820D	TO-263	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW1820F	TO-220F	Preliminary	N	–	18	200	0.08	2	4	17	60	4200	163
SW2420D	TO-263	Preliminary	N	–	24	200	0.08	1	2	17	60	4200	163
SW4020	TO-220	Preliminary	N	–	40	200	0.041	2	4	64	163	6500	290
SW4020F	TO-220F	Preliminary	N	–	40	200	0.041	2	4	64	163	6500	290
SW634	TO-220F	Production	N	38	9	250	0.45	2	4	13	26	1220	130
SW634	TO-220	Production	N	133	9	250	0.45	2	4	13	26	1220	130
SW634	TO-252	Production	N	143.9	9	250	0.45	2	4	13	26	787	116
SW5N30D	TO-251	Production	N	83	5	300	0.9	2.5	4.5	7	12	475	71
SW2N40D	TO-92	Production	N	1.1	2	400	3.5	2.5	4.5	3.5	7	176	30
SW730	TO-220	Production	N	192	6.5	400	1	2	4	17	33	750	215
SW740U	TO-220	Production	N	226	10	400	0.55	2	4	18	38	1150	170
SW740	TO-220	Production	N	250	10	400	0.55	2	4	13	32	1800	200
SW830D1	TO-220F	Production	N	18.7	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-251	Production	N	101.9	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-252	Production	N	113.4	5	500	1.54	2.5	4.5	8	17	519	76
SW830D1	TO-220	Production	N	123.6	5	500	1.54	2.5	4.5	8	17	519	76
SW830	TO-220F	Production	N	39	5.5	500	1.5	2	4	14	30	1100	115
SW830A	TO-220F	Production	N	39	5.5	500	1.5	2	4	14	30	1100	115
SW830	TO-220	Production	N	135	5.5	500	1.5	2	4	14	30	1100	115
SW830A	TO-220	Production	N	135	5.5	500	1.5	2	4	14	30	1100	115
SW830D	TO-252	Production	N	200	5.5	500	1.5	2	4	3	17	570	75
SW830C	TO-251	Production	N	215	5.5	500	1.5	2	4	9	19.5	1100	115
SW830C	TO-252	Production	N	215	5.5	500	1.5	2	4	9	19.5	1100	115
SW840	TO-220F	Production	N	21	8.5	500	0.9	2	4	22	47	1450	210
SW840	TO-220	Production	N	195	8.5	500	0.9	2	4	22	47	1450	210
SW840A	TO-220	Production	N	195	8.5	500	0.85	2	4	22	47	1450	210
SW9N50D	TO-220F	Production	N	23.3	9	500	0.8	2.5	4.5	13	31	1479	126
SW9N50D	TO-220	Production	N	200	9	500	0.8	2.5	4.5	13	31	1479	126
SW13N50B	TO-220F	Production	N	67.5	13	500	0.52	2	4	9	29	1500	200
SW13N50	TO-220F	Production	N	184	13	500	0.48	2	4	9	27	1600	200
SW15N50	TO-220F	Production	N	34.6	15	500	0.32	2	4	29	66	2610	283

Samwin® MOSFET 选型指南（中高压部分 .02.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW15N50A	TO-220F	Production	N	51.2	15	500	0.315	2	4	30	72	2900	267
SW20N50	TO-3P	Production	N	215	20	500	0.27	3	5	37	90	3600	500
SW20N50U	TO-3P	Production	N	386	20	500	0.27	2	4	41	103	4157	374
SW1N55D	TO-251	Production	N	77.1	1	550	6.5	2.5	4.5	3.5	7	182	30
SW601Q	SOT-23	Production	N	0.5	0.185	600	700	-2.7	-1.5	45	1300	15	145
SW1N60L	TO-92	Production	N	1	0.3	600	23	3	4.5	3.5	4.5	60	12
SW1N60A	TO-92	Production	N	4.3	0.5	600	15	3	4.5	3.6	6	150	25
SW1N60C	TO-92	Production	N	3.13	0.8	600	9	2	4	1.9	5.6	150	25
SW1N60E	TO-92	Production	N	3.58	1	600	8	2	4	1	3.7	270	60
SW1N60D	TO-92	Production	N	4.2	1	600	8.5	2.5	4.5	3.7	6.8	150	28
SW1N60	TO-126	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60	TO-251	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60	TO-252	Production	N	30	1	600	12	2	4	2.4	7	150	25
SW1N60C	TO-251	Production	N	50	1	600	9	2	4	1.9	5.6	150	25
SW1N60C	TO-252	Production	N	50	1	600	9	2	4	1.9	5.6	150	25
SW1N60DC	TO-252	Production	N	52	1	600	8.5	2.5	4.5	4.7	6.3	160	32
SW1N60D	TO-251	Production	N	65.9	1	600	8.5	2.5	4.5	3.7	6.8	150	28
SW1N60E	TO-251	Production	N	103	1	600	8	2	4	1	3.7	270	60
SW2N60D	TO-220F	Production	N	17.45	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60B	TO-220F	Production	N	18.5	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60B	TO-126	Production	N	20	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60A1	TO-220F	Production	N	23	2	600	5	2	4	4	10	330	40
SW2N6O	TO-220F	Production	N	28	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-220F	Production	N	28	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-251	Production	N	40	2	600	5	2	4	7.5	15	520	50
SW2N60	TO-252	Production	N	40	2	600	5	2	4	7.5	15	520	50
SW2N60B	TO-251	Production	N	69	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60B	TO-252	Production	N	69	2	600	4.5	2	4	5.5	7.5	520	50
SW2N60DC	TO-251	Production	N	77.6	2	600	4.5	2.5	4.5	4	9.5	305	45
SW2N60DC	TO-252	Production	N	78.1	2	600	4.5	2.5	4.5	4	9.5	305	45
SW2N60D	TO-252	Production	N	85.5	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60D	TO-251	Production	N	88.7	2	600	4.5	2.5	4.5	4	9	306	43
SW2N60	TO-220	Production	N	108	2	600	5	2	4	7.5	15	520	50
SW2N60A1	TO-251	Production	N	122	2	600	5	2	4	4	10	330	40
SW4N60B	TO-220F	Production	N	19.1	4	600	2.5	2	4	4	11	463	63
SW4N60D	TO-220F	Production	N	23.5	4	600	2.2	2.5	4.5	9	18	522	57
SW4N60A	TO-220F	Production	N	33	4	600	2.2	2	4	17	30	740	83
SW4N60	TO-220F	Production	N	33	4	600	2.2	2	4	17	30	740	83
SW226N	TO-251	Production	N	60	4	600	2.3	2	4	13.8	30	740	90
SW 226N	TO-252	Production	N	60	4	600	2.3	2	4	13.8	30	740	90
SW4N60B	TO-251	Production	N	140	4	600	2.5	2	4	4	11	463	63

Samwin® MOSFET 选型指南（中高压部分 .03.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW 4N60D	TO-252	Production	N	141	4	600	2.2	2.5	4.5	9	18	522	57
SW 4N60B	TO-252	Production	N	144.5	4	600	2.5	2	4	4	11	463	63
SW 4N60D	TO-251N	Production	N	152.6	4	600	2.2	2.5	4.5	9	18	522	57
SW 4N60A	TO-220	Production	N	198	4	600	2.2	2	4	17	30	740	83
SW 4N60	TO-220	Production	N	198	4	600	2.2	2	4	17	30	740	83
SW 226NV	TO-251	Production	N	270	4	600	2.5	2	4	14	27	740	90
SW 226NV	TO-252	Production	N	270	4	600	2.5	2	4	14	27	740	90
SW 4N60V	TO-251	Production	N	312.5	4	600	2.5	2	4	13.7	27	740	83
SW 4N60V	TO-252	Production	N	312.5	4	600	2.5	2	4	13.7	27	740	83
SW 5N60D	TO-220F	Production	N	19.5	5	600	2.45	2.5	4.5	8.6	17	555	70
SW 5N60	TO-220F	Production	N	24	5	600	2.2	2	4	10	22	630	65
SW 6N60	TO-251	Production	N	24	6	600	1.5	2	4	12.4	29	700	95
SW 6N60	TO-252	Production	N	24	6	600	1.5	2	4	12.4	29	700	95
SW 6N60D	TO-220F	Production	N	24	6	600	1.7	2.5	4.5	12	23	794	94
SW 6N60	TO-220F	Production	N	50	6	600	1.5	2	4	12.4	29	700	95
SW 6N65	TO-252	Production	N	162	6	600	1.4	2	4	11	26	1004	87
SW6N60D	TO-252	Production	N	205	6	600	1.7	2.5	4.5	12	23	794	94
SW7N60D	TO-220F	Production	N	23.76	7	600	1.2	2.5	4.5	15	30	1000	115
SW7N60R	TO-220	Production	N	23.8	7	600	1.25	2	4	6	19	943	110
SW7N60R	TO-220F	Production	N	23.8	7	600	1.25	2	4	6	19	943	110
SW7N60H	TO-220F	Production	N	28.6	7	600	1.32	2	4	12	28	1073	87
SW7N60	TO-220F	Production	N	68.5	7	600	1.3	2	4	13	32	1260	135
SW7N60	TO-220	Production	N	147	7	600	1.3	2	4	13	32	1260	135
SW8N60	TO-220F	Production	N	53	7.5	600	1.3	2	4	12	28	1255	135
SW 8N60	TO-220	Production	N	147	7.5	600	1.3	2	4	12	28	1255	135
SW8N60B	TO-220F	Production	N	21.8	8	600	1.25	2	4	7	19	930	120
SW 10N60D	TO-220F	Production	N	41.8	10	600	1.1	2.5	4.5	17	35	1120	122
SW 10N60	TO-220F	Production	N	50	10	600	0.9	2	4	15.5	40	2530	205
SW 10N60	TO-220	Production	N	156	10	600	0.9	2	4	15.5	40	2530	205
SW 11N60	TO-220F	Production	N	48	11	600	0.8	2	4	18	50	2080	177
SW 12N60D	TO-220F	Production	N	32.3	12	600	0.8	2.5	5	24	48	1456	157
SW 12N60	TO-220F	Production	N	52	12	600	0.7	2	4	11	31	2530	205
SW 12N60	TO-220	Production	N	250	12	600	0.7	2	4	11	31	2530	205
SW 20N60	TO-3P	Production	N	265	20	600	0.3	3	5	42	97	3600	500
SW 20N60U	TO-3P	Production	N	367.7	20	600	0.45	2	4	47	108	4082	350
SW 22N60U	TO-3P	Production	N	520	22	600	0.35	2	5	48	124	5028	373
SW2N65B	TO-220F	Production	N	16.7	2	650	5.6	2	4	4.6	7.7	260	40
SW2N65	TO-220F	Production	N	19.2	2	650	5.5	2	4	4.4	7.8	260	40
SW 2N65	TO-220	Production	N	62.5	2	650	5.5	2	4	4.4	7.8	260	40
SW4N65B	TO-220F	Production	N	15.8	4	650	2.7	2	4	6	11	740	90
SW4N65D	TO-220F	Production	N	23.3	4	650	2.6	2.5	4.5	9	18	531	60

Samwin® MOSFET 选型指南（中高压部分 .04.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW4N65	TO-220F	Production	N	43	4	650	2.6	2	4	7	17	740	90
SW4N65	TO-251	Production	N	54	4	650	2.6	2	4	7	17	740	90
SW4N65	TO-252	Production	N	54	4	650	2.6	2	4	7	17	740	90
SW4N65U	TO-220F	Production	N	54.6	4	650	2.6	2	4	8	17	560	65
SW4N65	TO-220	Production	N	100	4	650	2.6	2	4	7	17	740	90
SW4N65D	TO-252	Production	N	144.4	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65D	TO-251N	Production	N	157.1	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65D	TO-251S	Production	N	157.1	4	650	2.6	2.5	4.5	9	18	531	60
SW4N65U	TO-251N	Production	N	250.1	4	650	2.6	2	4	8	17	560	65
SW7N65D	TO-220F	Production	N	27.9	7	650	1.4	2.5	4.5	15	30	950	108
SW7N65	TO-220F	Production	N	45	7	650	1.32	2	4	13	32	1500	145
SW7N65B	TO-220F	Production	N	65.17	7	650	1.4	2	4	7	19	850	110
SW7N65	TO-220	Production	N	147	7	650	1.32	2	4	13	32	1500	145
SW7N65D	TO-251	Production	N	173.6	7	650	1.4	2.5	4.5	15	30	950	108
SW7N65D	TO-252	Production	N	255.1	7	650	1.4	2.5	4.5	15	30	950	108
SW8N65B	TO-220F	Production	N	24.9	8	650	1.5	2	4	6	19	959	115
SW8N65A1	TO-220F	Production	N	31	8	650	1.42	2	4	12	31	1210	110
SW10N65D	TO-220F	Production	N	41.8	10	650	1.1	2.5	4.5	17	35	1120	122
SW10N65B	TO-220F	Production	N	43	10	650	1.2	2	4	6.5	23	1200	130
SW10N65	TO-220	Production	N	156	10	650	1.1	2	4	14.5	40	2530	205
SW10N65	TO-220F	Production	N	38*	10	650	1.1	2	4	14.5	40	2530	205
SW12N65D	TO-220F	Production	N	45.2	12	650	0.8	2.5	4.5	22	45	1456	157
SW12N65B	TO-220F	Production	N	54	12	650	0.85	2	4	9	28	1450	160
SW12N65A1	TO-220F	Production	N	58	12	650	0.8	2	4	20	43	2100	170
SW12N65	TO-220	Production	N	165	12	650	0.8	2	4	21	53	2530	205
SW12N65D	TO-262	Production	N	186.6	12	650	0.8	2.5	4.5	22	45	1456	157
SW12N65A1	TO-263	Production	N	208	12	650	0.8	2	4	20	43	2100	170
SW12N65A1	TO-220	Production	N	215	12	650	0.8	2	4	20	43	2100	170
SW12N65	TO-220F	Production	N	65	12	650	0.8	2	4	21	53	2530	205
SW1N70A	TO-92	Production	N	3	0.5	700	15	3	4.5	2.4	7	150	25
SW1N70C	TO-92	Production	N	3.64	0.8	700	16	2.3	4.5	3.5	15	100	30
SW2N70D	TO-251N	Production	N	76	2	700	6.2	2.5	4.5	5.5	11	360	42
SW2N70	TO-251	Production	N	120	2	700	7	2	4	6.5	11	530	50
SW2N70	TO-252	Production	N	120	2	700	7	2	4	6.5	11	530	50
SW4N70B	TO-220F	Production	N	24.1	4	700	2.8	2	4	4	12	595	55
SW4N70D	TO-251	Production	N	145	4	700	2.7	2.5	4.5	9	20	790	72
SW4N70B	TO-251	Production	N	147.1	4	700	2.8	2	4	4	12	595	55
SW6N70DA	TO-220F	Production	N	21.9	6	700	1.9	2.5	4.5	11	26	1040	88
SW6N70D	TO-220F	Production	N	30.3	6	700	1.7	2	4	7	20	995	93
SW6N70P	TO-251	Production	N	137.5	6	700	1.7	2	4	7	20	995	93
SW6N70P	TO-252	Production	N	192.3	6	700	1.7	2	4	7	20	995	93

Samwin® MOSFET 选型指南（中高压部分 .05.）：

Part Number	Package	Product status	Channel Type	PD [max] (W)	ID [max] (A)	BVDSS [min] (V)	RDSon [max] @ VGS = 10 V (Ohm)	VGSth [min] (V)	VGSth [max] (V)	Qgd[Typ] (nC)	Qg [Typ] (nC)	Ciss [max] (pF)	Coss [max] (pF)
SW6N70DA	TO-252	Production	N	195.3	6	700	1.9	2.5	4.5	11	26	1040	88
SW 6N70DA	TO-251S	Production	N	219	6	700	1.9	2.5	4.5	11	26	1040	88
SW6N70A	TO-251	Production	N	222	6	700	1.8	2	4	10	24	936	86
SW 7N70	TO-262	Production	N	147	7	700	1.35	2	4	15	35	1500	145
SW8N70A	TO-220F	Production	N	39.8	8	700	1.2	2.1	4	8	25	1660	134
SW 8N70	TO-220F	Production	N	50	8	700	1.6	2	4	18	35	1130	100
SW1N80A	TO-92	Production	N	4.1	1	800	16	3	5	3.1	6	150	25
SW 3N80C	TO-220F	Production	N	18.4	3	800	4.9	2	4	8	12.5	700	70
SW3N80	TO-220F	Production	N	35	3	800	4.5	3	5	7	13	700	70
SW 3N80	TO-220	Production	N	106	3	800	4.5	3	5	7	13	700	70
SW3N80C	TO-251	Production	N	147	3	800	4.9	2	4	8	12.5	700	70
SW 3N80C	TO-252	Production	N	147	3	800	4.9	2	4	8	12.5	700	70
SW 4N80B	TO-220F	Production	N	41.65	4	800	4	2	4	6	14	520	65
SW 4N80B	TO-251N	Production	N	252.1	4	800	4	2	4	6	14	520	65
SW 5N80B	TO-220F	Production	N	22.3	5	800	2.68	2	4	7.5	18	743	85
SW 5N80	TO-220F	Production	N	45	5	800	2.4	3	5	15.7	33	1450	200
SW5N80B	TO-251	Production	N	173.6	5	800	2.68	2	4	7.5	18	743	85
SW 7N80B	TO-220F	Production	N	48	7	800	1.59	2	4	10	25	1150	117
SW 7N80U	TO-220F	Production	N	65	7	800	1.9	3	5	21	43	1400	130
SW 7N80U	TO-262	Production	N	290.7	7	800	1.9	3	5	21	43	1400	130
SW10N80	TO-220F	Production	N	37.1	10	800	1.1	3	5	34	66	2143	198
SW10N80B	TO-220F	Production	N	46.3	10	800	1.15	2	4	14	36	1760	168
SW 6N90	TO-262	Production	N	231	6	900	2.3	3	5	19	40	1400	120
SW 7N90	TO-220F	Production	N	32	7	900	1.8	3	5	20	40	1880	185
SW 7N90	TO-3P	Production	N	390	7	900	1.8	3	5	23	50	1880	185
SW 8N90	TO-220F	Production	N	69	8	900	1.5	2	4	27	57	2100	160
SW 9N90	TO-3P	Production	N	219	9	900	1.45	3	5	39	74	2700	260
SW4N100U	TO-220F	Production	N	35	4	1000	3.5	3	5	16.5	33	1100	122

Samwin® 绿色电源的最佳选择

The Best Choice for Greenpower

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