深圳市旭茂微电子有限公司
Shenzhen Xumao Microelectronics Co., LTD

XM90N02D

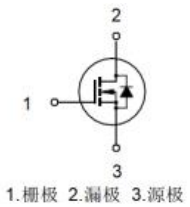
用途 APPLICATIONS

- 负载开关 — Load Switch
- PWM 应用 — PWM Application
- 电源管理 — Power Management

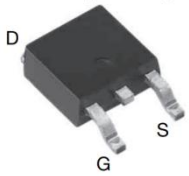
特点 FEATURES

- 高级沟槽技术 — Advanced Trench Technology
- 优异的导通电阻(RDS(ON))和低门极电荷 — Excellent RDS(ON) and Low Qg
- RoHS 产品 — RoHS product
- 产品全部经过雪崩测试 — 100% avalanche tested

封装 Package



DPAK (TO-252)



XM90N02D

主要参数
MAIN CHARACTERISTICS

Rdson-typ (@Vgs=4.5V)	VDSS	ID	Qg-typ	EAS
2.8mΩ	20V	90A	62nC	155mJ

订货信息
ORDER MESSAGE

订货型号 Order codes			包装方式 Package	包装数量 SPQ(Pcs)
印记 Marking	封装形式 Package form	无卤素 Halogen Free		
XM90N02D	TO-252-3L	YES	编带	2500

绝对最大额定值 ABSOLUTE RATINGS (Tc=25℃)

参数名称 Parameter name	符号 Symbol	型号 XM90N02D	单位 Value
最高漏极一源极直流电压 Drain-Source Voltage	VDSS	20	V
连续漏极电流 Drain Current-continuous	ID Tc=25℃	90	A
	ID Tc=100℃	55	
最大脉冲漏极电流（注1） Drain Current - pulse (note 1)	I_{DM}	360	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	±12	V
单脉冲雪崩能量（注2） SinglePulsedAvalanche Energy (note 2)	E_{AS}	155	mJ
雪崩电流（注 1） Avalanche Current (note 1)	I_{AR}	90	A
耗散功率 Power Dissipation	P_D T_C=25℃	50	W
最高结温及存储温度 Operating and Storage Temperature Range	TJ, TSTG	-55～+150	℃
最高焊接温度 Maximum welding temperature	T_L	300	℃

热特性 THERMAL CHARACTERISTIC

参数名称 Parameter name	符号 Symbol	型号 XM90N02D	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	2.4	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	62	℃/W

关态特性 Off -Characteristics

参数名称 Parameter name	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最 大 Max	单位 Units
漏一源击穿电压 Drain-Source Voltage	BVDSS	ID=250μA, VGS=0V	20	-	-	V
击穿电压温度特性 Breakdown. Voltage Temperature. Coefficient	$\Delta BV_{DSS}/\Delta T_J$	ID=250μA, referenced to 25℃	-	0.03	-	V/℃
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	IDSS	VDS=20V, TC=25℃	-	-	1.0	uA
		VDS=20V, TC=125℃	-	-	10	
反向栅极体漏电流 Gate-body leakage current	IGSS	VDS=0V, VGS =±12V			±100	nA

通态特性 On-Characteristics

阈值电压 Gate Threshold Voltage	VGS(th)	VDS = VGS , ID=250μA	0.5	0.8	1.0	V
静态导通电阻 Static Drain-Source On-ResistanceStatic Drain-Source	RDS(ON)	V_{GS} =4.5V , I_D=30A	-	2.8	3.6	mΩ
		V_{GS} =2.5V , I_D=20A	-	3.8	4.9	
正向跨导 Forward Transconductance	gfs	V_{DS} = 5V, I_D=20A (note 4)	-	30	-	S

动态特性 Dynamic Characteristics

输入电容 Input capacitance	Ciss	VDS=10V, VGS =0V, f=1.0MHZ	-	3410	-	pF
输出电容 Output capacitance	Coss		-	520	-	pF
反向传输电容 Reverse transfer capacitance	Crss		-	467	-	pF
栅极电阻 Gate resistance	Rg	VDS=0V , VGS=0V , f=1MHz	-	1.8	-	Ω

开关特性 Switching Characteristics

参数名称 Parameter name	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最 大 Max	单位 Units
延迟时间 Turn-On delay time	td(on)	VDD=15V, ID=30A, RG=3Ω (note 4, 5)	-	9	-	ns
上升时间 Turn-On rise time	tr		-	24	-	ns
延迟时间 Turn-Off delay time	td(off)		-	68	-	ns
下降时间 Turn-Off Fall time	tf		-	58	-	ns
栅极电荷总量 Total Gate Charge	Qg	VDS =15V , ID=30A VGS =4.5 (note 4, 5)	-	62	-	nC
栅一源电荷 Gate-Source charge	Qgs		-	8	-	nC
栅一漏电荷 Gate-Drain charge	Qgd		-	11	-	nC

漏一源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings

正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	I	I_S	-	-	90	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I	I_{SM}	-	-	360	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	VGS=0V, IS=30A	-	-	1.2	V
反向恢复时间 Reverse recovery time	t_{rr}	VGS=0V, IS=20A dIF/dt=100A/μs (note 4)	-	16	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}	VGS=0V, IS=20A dI_F/dt=100A/μs (note 4)	-	6	-	nC

注释：

1：脉冲宽度由最高结温限制

2：L=0.5mH, IAS=16A, VDD=15V, RG=3Ω，起始结温 TJ=25℃

3：ISD ≤30A, di/dt ≤300A/μs, VDD≤BVDSS, 起始结温 TJ=25℃

4：脉冲测试：脉冲宽度≤300μs, 占空比≤2%

5：基本与工作温度无关。

Notes:

1 ： Pulse width limited by maximum junction temperature

2：L=0.5mH, IAS=16A, VDD=15V, RG=3Ω, Starting TJ=25℃

3 ： ISD ≤30A, di/dt ≤300A/μs, VDD≤BVDSS, Starting TJ=25℃

4：Pulse Test：Pulse Width ≤300μs, Duty Cycle≤2%

5：Essentially independent of operating temperature.

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

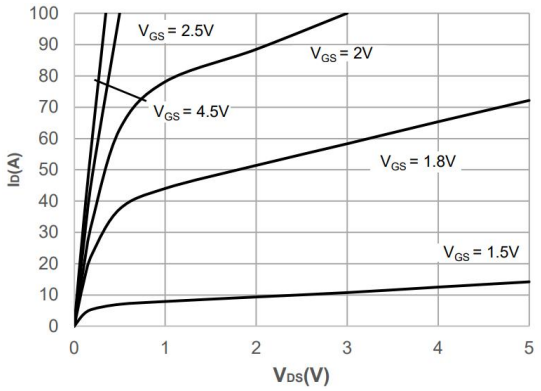


Figure 1: Output Characteristics

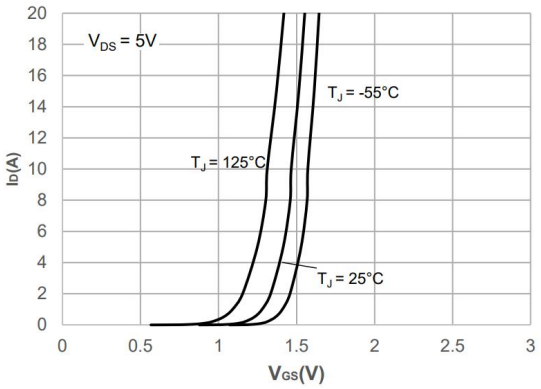


Figure 2: Typical Transfer Characteristics

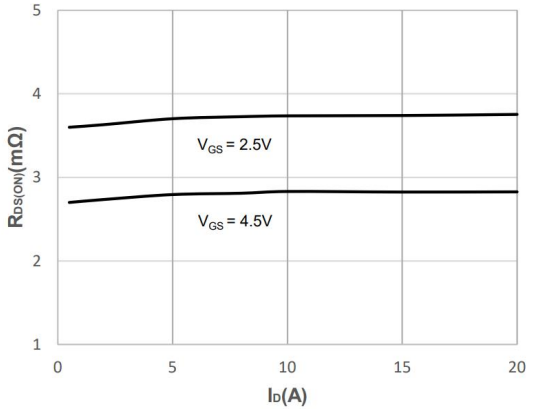


Figure 3: On-resistance vs. Drain Current

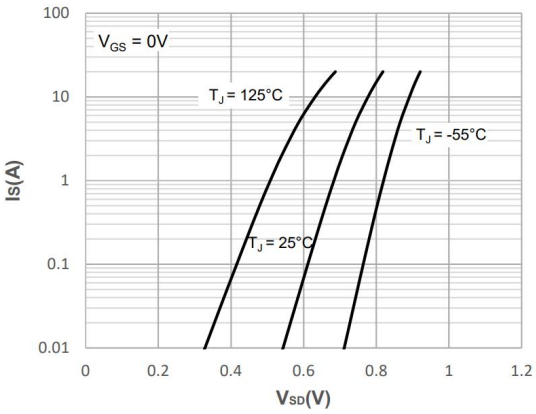


Figure 4: Body Diode Characteristics

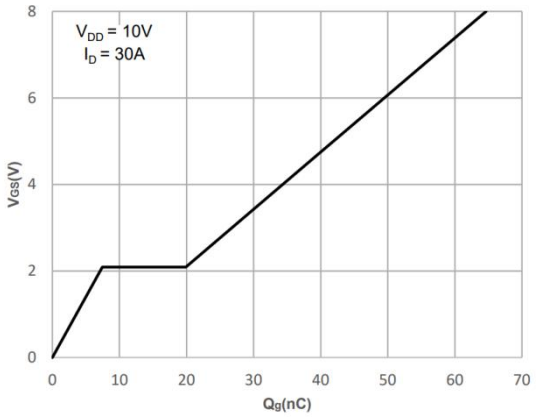


Figure 5: Gate Charge Characteristics

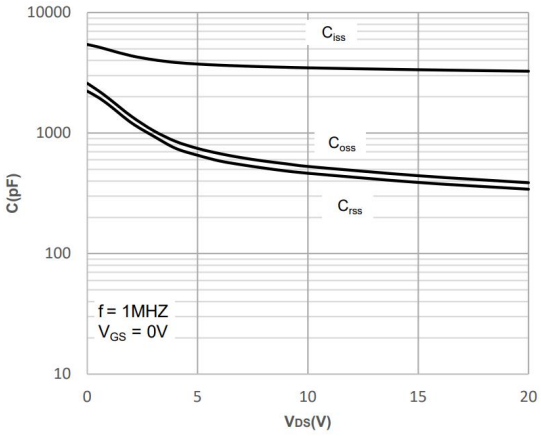


Figure 6: Capacitance Characteristics

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

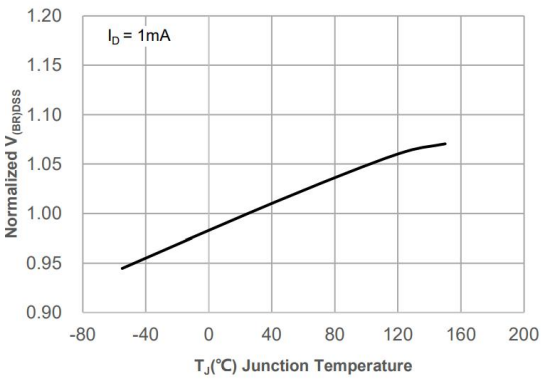


Figure 7: Normalized Breakdown voltage vs. Junction Temperature

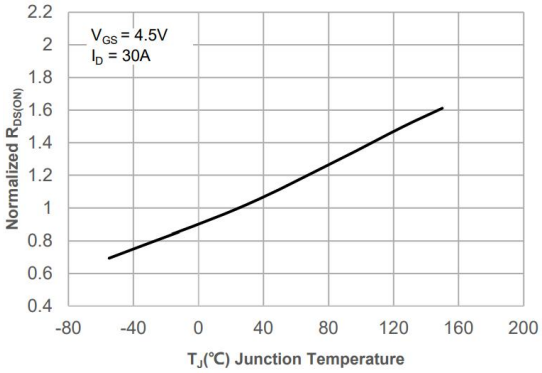


Figure 8: Normalized on Resistance vs. Junction Temperature

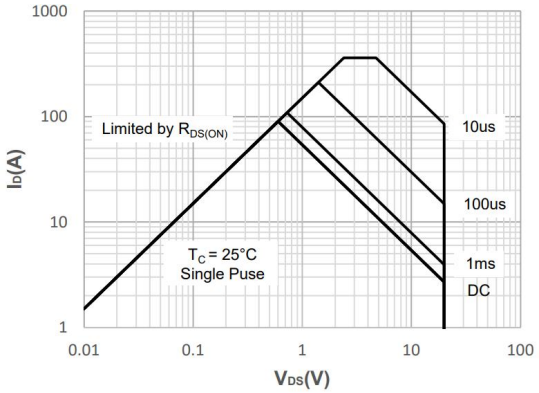


Figure 9: Maximum Safe Operating Area

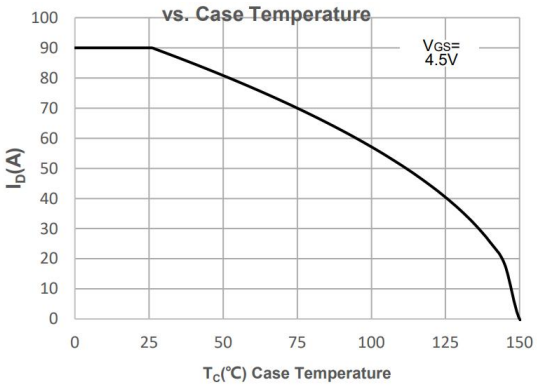


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

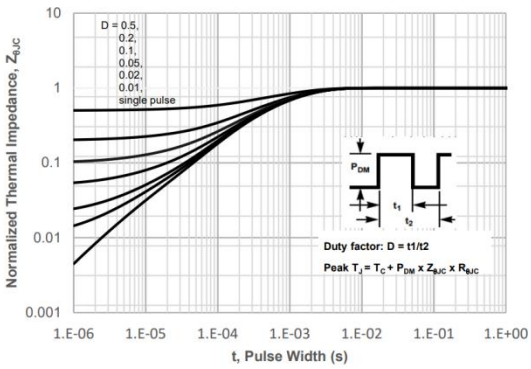


Figure 11: Normalized Maximum Transient Thermal Impedance

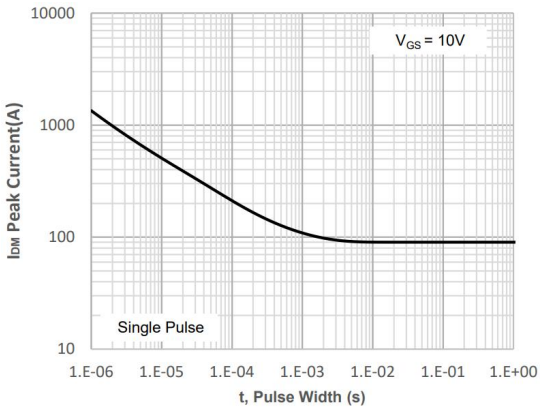
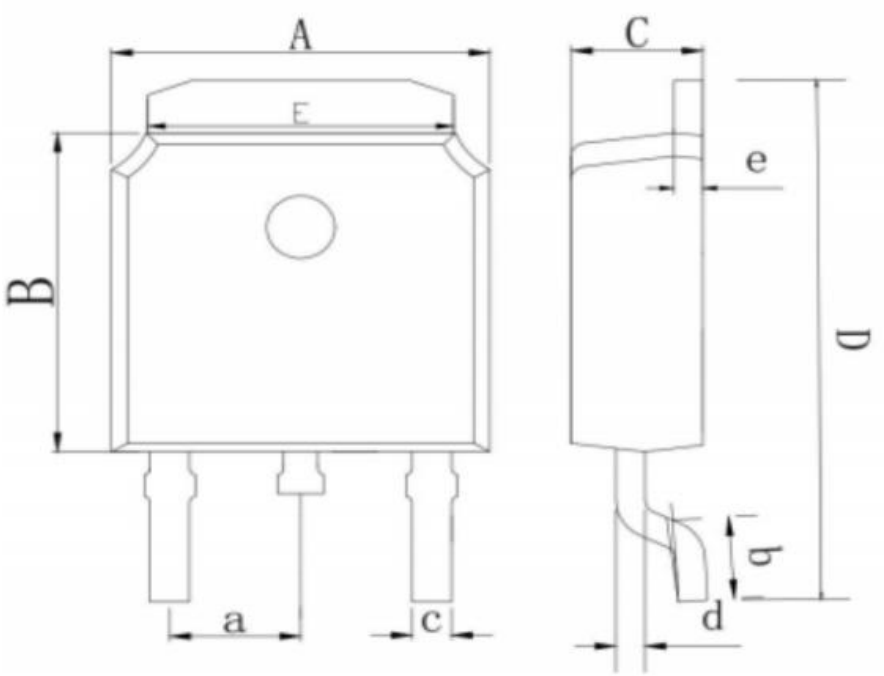


Figure 12: Peak Current Capacity

外形尺寸 PACKAGE MECHANICAL DATA

TO-252-3L 单位 Unit：mm



DIM	INCHES		MM		NOTE
	min	max	min	max	
A	0.25	0.27	6.3	6.9	
B	0.23	0.25	5.8	6.4	
C	0.08	0.10	2.1	2.5	
D	0.35	0.43	9.0	11.0	
E	0.21	0.22	5.3	5.5	
a	0.08	0.10	2.1	2.5	
b	0.06	0.06	1.4	1.6	
c	0.02	0.03	0.6	0.8	
d	0.02	0.02	0.4	0.6	
e	0.02	0.02	0.4	0.6	

版本更新 Version updates

版本号 Edition	时间 Date	更新记录

重要注意事项

1.深圳市旭茂微电子有限公司保留说明书的更改权，恕不另行通知。客户在下单前应获取我司最新版本资料，并验证相关信息是否最新和完整。

2.我司产品属于消费类和/或民用类电子产品。

3.在应用我司产品时请不要超过产品的最大额定值，否则会影响整机的可靠性。任何半导体产品特定条件下都有一定的失效或发生故障的可能，买方有责任在使用我司产品进行系统设计、试样和整机制造时遵守安全标准并采取安全措施，以避免潜在失败风险可能造成人身伤害或财产损失情况的发生。

4.购买产品时请认清我司商标，如有疑问请与本公司联系。

5.转售、应用、出口时请遵守中国、美国、英国、欧盟等国家、地区和国际出口管制法律法规。

联系方式

公司名称：	深圳市旭茂微电子科技有限公司
corporate name：	Shenzhen Xumao Microelectronics Co., Ltd
公司地址：	深圳市龙岗区坂田街道环城南路 15 号恒大都会广场 1 栋 405 室
Company address：	Room 405, Building 1, Hengdu Metropolis Plaza, No. 15 Huancheng South Road, Bantian Street, Longgang District, Shenzhen
生产商：	四川旭茂微电子有限公司
Manufacturer：	Sichuan Xumao Micro Technology Co., Ltd
生产商地址：	四川省遂宁市射洪县经济开发区河东大道
Manufacturer address：	Hedong Avenue, Economic Development Zone, Shehong County, Suining City, Sichuan Province
杭州办事处：	浙江省杭州市余杭区博园路 1 号杭州电子市场西区 3E136
Hangzhou Office：	3E136, West Zone, Hangzhou Electronic Market, No.1 Boyuan Road, Yuhang District, Hangzhou City, Zhejiang Province
中山办事处：	广东省中山市古镇镇曹二文化路一街 6 巷 2 号 1 楼
Hangzhou Office：	1st Floor, No. 2, Lane 6, Cao'er Culture Road, Guzhen Town, Zhongshan City, Guangdong Province
广州办事处：	广东省广州市增城区宁西街香山大道 42 号雄兴孵化 1 栋 1305
Hangzhou Office：	Room 1305, Building 1, Xiongxing Incubation, No. 42 Xiangshan Avenue, Ningxi Street, Zengcheng District, Guangzhou City, Guangdong Province