



XM10NP03S

用途

- ❖ 负载开关
- ❖ PWM 应用
- ❖ 不间断电源

APPLICATIONS

- ❖ Load Switch
- ❖ PWM Application
- ❖ Uninterruptible power supply

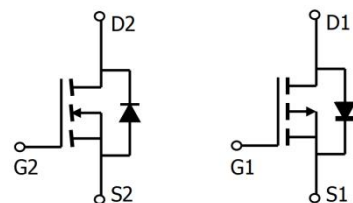
特点

- ❖ 高级沟槽技术
- ❖ 优异的导通电阻 (RDS(ON)) 和低门极电荷
- ❖ RoHS 产品
- ❖ 产品全部经过雪崩测试

FEATURES

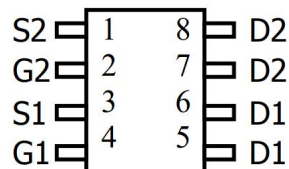
- ❖ Advanced Trench Technology
- ❖ Excellent RDS(ON) and Low Qg
- ❖ RoHS product
- ❖ 100% avalanche tested

封装 Package



n-channel

p-channel



SOP-8

XM10NP03S

主要参数

MAIN CHARACTERISTICS

	Rdson-typ (@Vgs=10V)	Vdss	Id	Qg-typ	EAS
N-Channel	10mΩ	30V	10A	11nC	26mJ
P-Channel	26mΩ	-30V	-9.5A	14nC	55mJ

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		
XM10NP03S	SOP-8	YES	编带	3000



绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

参数名称 Parameter name	符号 Symbol	型号		单位
		XM10NP03S		Value
		N-Channel	P-Channel	
最高漏极—源极直流电压 Drain-Source Voltage	VDSS	30	-30	V
连续漏极电流 Drain Current-continuous	ID Tc=25℃	10	-9.5	A
	ID Tc=100℃	6.5	-6	
最大脉冲漏极电流（注1） Drain Current - pulse (note 1)	IDM	32	-28	A
最高栅源电压 Gate-Source Voltage	VGSS	±20	±20	V
单脉冲雪崩能量（注2） SinglePulsedAvalanche Energy (note 2)	EAS	26	55	mJ
雪崩电流（注 2） Avalanche Current (note 2)	IAR	10	-9.5	A
耗散功率 Power Dissipation	PD Tc=25℃	2.2	2.2	W
		0.65	0.65	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	TL	300		℃

热特性 THERMAL CHARACTERISTIC

参数名称 Parameter name	符号 Symbol	型号	单位 Unit
		XM10NP03S	
结到管壳的热阻 Thermal Resistance, Junction to Case	Rth(j-c)	30	°C/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	Rth(j-A)	65	°C/W



N-Channel

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-源击穿电压 Drain-Source Voltage	BVDSS	ID=250 μA, VGS=0V	30	—	—	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	ID=250 μA, referenced to 25°C	—	0.05	—	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	IDSS	VDS=30V, VGS =0V	—	—	1	uA
反向栅极体漏电流 Gate-body leakage current	IGSS	VDS=0V, VGS =±20V	—	—	±100	nA

导态特性 On - Characteristics

阈值电压 Gate Threshold Voltage	VGS(th)	VDS = VGS, ID=250 μA	1.2	1.5	2.5	V
静态导通电阻 Static Drain-Source On-ResistanceStatic Drain-Source	RDS(ON)	VGS =10V, ID=5A	—	10	12	mΩ
		VGS =4.5V, ID=5A	—	14	20	mΩ
正向跨导 Forward Transconductance	gfs	VDS = 5V, ID=5A (note 4)	—	20	—	S

交流特性 AC Characteristics

输入电容 Input capacitance	Ciss	VDS=15V, VGS =0V, f=1.0MHZ	—	910	—	pF
输出电容 Output capacitance	Coss		—	110	—	pF
反向传输电容 Reverse transfer capacitance	Crss		—	95	—	pF
栅极电阻 Gate resistance	Rg	VDS=0V, VGS=0V, f=1MHz	—	1.8	—	Ω



N-Channel

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=5A, RG=20Ω (note 4, 5)	—	4.5	—	ns
上升时间 Turn-On rise time	tr		—	9	—	ns
延迟时间 Turn-Off delay time	td(off)		—	28	—	ns
下降时间 Turn-Off Fall time	tf		—	6	—	ns
栅极电荷总量 Total Gate Charge	Qg	VDS =20V , ID=5A VGS =10V (note 4, 5)	—	11	—	nC
栅—源电荷 Gate-Source charge	Qgs		—	4	—	nC
栅—漏电荷 Gate-Drain charge	Qgd		—	3	—	nC

N-Channel

漏—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	IS	—	—	10	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I	ISM	—	—	32	A
正向压降 Drain-Source Diode Forward Voltage	VSD	VGS=0V, IS=5A	—	—	1	V
反向恢复时间 Reverse recovery time	trr	TJ = 25°C, If = 5A dIf/dt=100A/μs (note 4)	—	12	—	ns
反向恢复电荷 Reverse recovery charge	Qrr	TJ = 25°C, IF = 5A dIf/dt=100A/μs (note 4)	—	3	—	nC

注释:

1: 脉冲宽度由最高结温限制

2: L=0.1mH, VG=10V, VDD=20V, RG=25Ω, 起始结温 TJ=25°C

3: ISD ≤5A, di/dt ≤300A/μs, VDD≤BVDSS, 起始结温 TJ=25°C

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=0.1mH, VG=10V, VDD=20V, RG=25Ω, Starting TJ=25°C

3: ISD ≤5A, di/dt ≤300A/μs, VDD≤BVDSS, Starting TJ=25°C

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

5: Essentially independent of operating temperature.



P-Channel

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-源击穿电压 Drain-Source Voltage	BVDSS	ID=-250 μ A, VGS=0V	-30	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DS}/\Delta T_J$	ID=-250 μ A, referenced to 25°C	-	0.05	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	IDSS	VDS=-30V, VGS =0V	-	-	-1	μ A
反向栅极体漏电流 Gate-body leakage current	IGSS	VDS=0V, VGS = $\pm$ 20V	-	-	$\pm$ 100	nA

静态特性 Static Characteristics

阈值电压 Gate Threshold Voltage	VGS(th)	VDS = VGS, ID=-250 μ A	-0.7	-1.1	-1.5	V
静态导通电阻 Static Drain-Source On-ResistanceStatic Drain-Source	RDS(ON)	VGS=-10V, ID=-5A	-	26	34	m Ω
		VGS=-4.5V, ID=-3A	-	33	44	m Ω
正向跨导 Forward Transconductance	gfs	VDS = -5V, ID=-5A (note 4)	-	17	-	S

动态特性 Dynamic Characteristics

输入电容 Input capacitance	Ciss	VDS=-15V, VGS =0V, f=1.0MHZ	-	1300	-	pF
输出电容 Output capacitance	Coss		-	170	-	pF
反向传输电容 Reverse transfer capacitance	Crss		-	115	-	pF
栅极电阻 Gate resistance	Rg	VDS=0V, VGS=0V, f=1MHz	-	1.5	-	Ω



P-Channel

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=-5A, RG=10Ω (note 4, 5)	-	8	-	ns
上升时间 Turn-On rise time	tr		-	15	-	ns
延迟时间 Turn-Off delay time	td(off)		-	50	-	ns
下降时间 Turn-Off Fall time	tf		-	13	-	ns
栅极电荷总量 Total Gate Charge	Qg	VDS =-20V, ID=-5A VGS =-10V (note 4, 5)	-	14	-	nC
栅-源电荷 Gate-Source charge	Qgs		-	4.5	-	nC
栅-漏电荷 Gate-Drain charge	Qgd		-	4	-	nC

P-Channel

漏-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	IS	-	-	-9.5	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I	ISM	-	-	-28	A
正向压降 Drain-Source Diode Forward Voltage	VSD	VGS=0V, IS=-5A	-	-	-1.2	V
反向恢复时间 Reverse recovery time	trr	TJ = 25°C, If = -5A dIf/dt=100A/μs (note 4)	-	51	-	ns
反向恢复电荷 Reverse recovery charge	Qrr	TJ = 25°C, IF = -5A dIf/dt=100A/μs (note 4)	-	5	-	nC

注释:

1: 脉冲宽度由最高结温限制

2: L=0.1mH, VGS=-10V, VDD=-20V, RG=25Ω, 起始结温 TJ=25°C

3: ISD ≤ -4A, di/dt ≤ 300A/μs, VDD ≤ BVDSS, 起始结温 TJ=25°C

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=0.1mH, VGS=-10V, VDD=-20V, RG=25Ω, Starting TJ=25°C

3: ISD ≤ -4A, di/dt ≤ 300A/μs, VDD ≤ BVDSS, Starting TJ=25°C

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

5: Essentially independent of operating temperature.



N-Channel

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

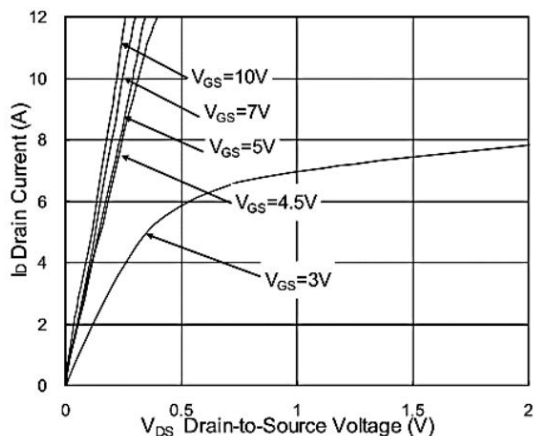


Figure 1: Output Characteristics

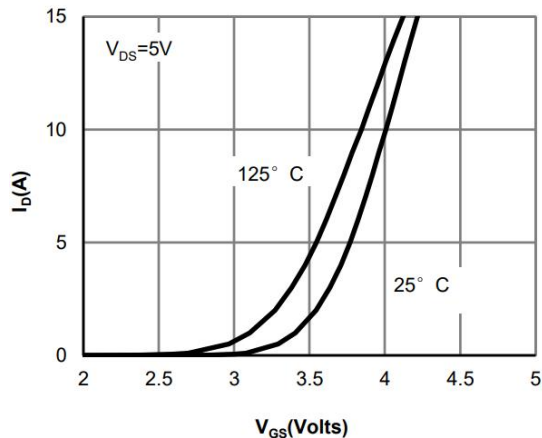


Figure 2: On-Resistance Static VS VGS

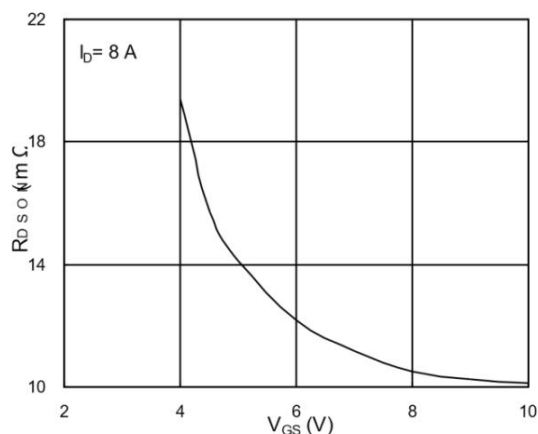


Figure 3: Rdson-Drain Current

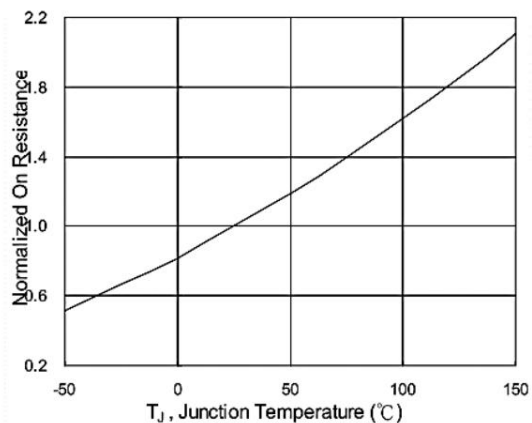


Figure 4: Rdson-Junction Temperature

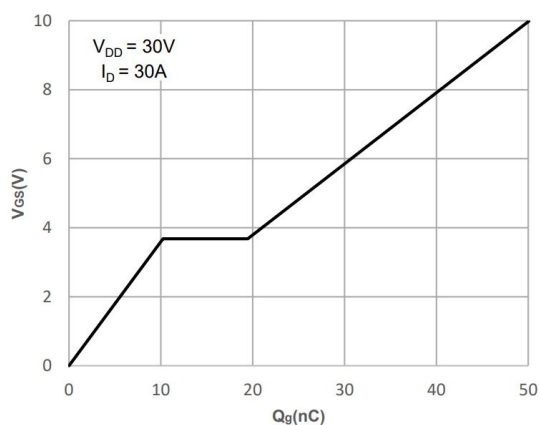


Figure 5: Gate Charge

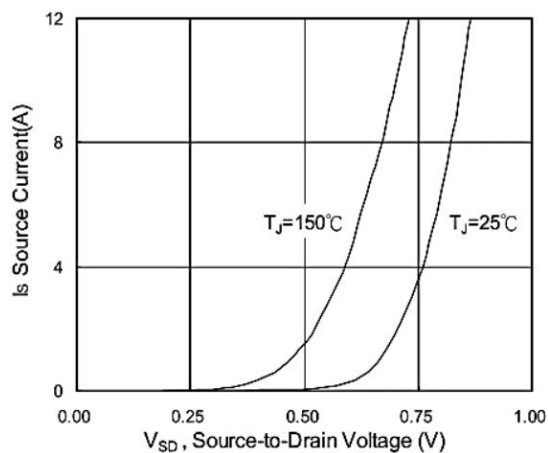


Figure 6: Source- Drain Diode Forward



N-Channel

特征曲线 ELECTRICAL CHARACTERISTICS (curves)

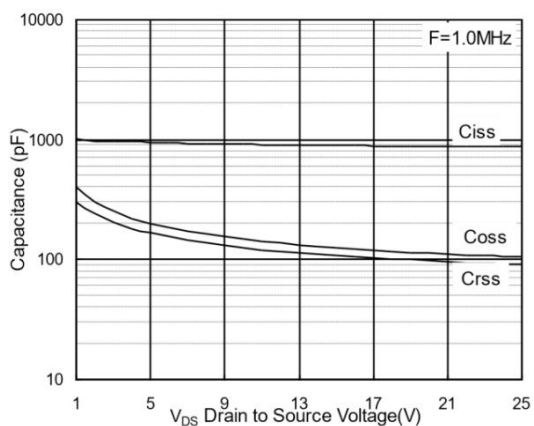


Figure 7: Capacitance vs Vds

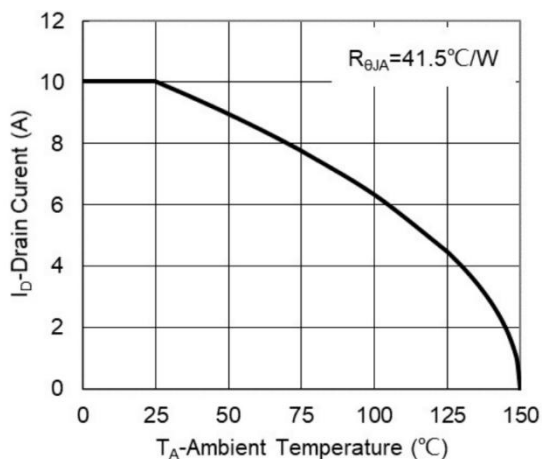


Figure 8: ID Current- Junction Temperature

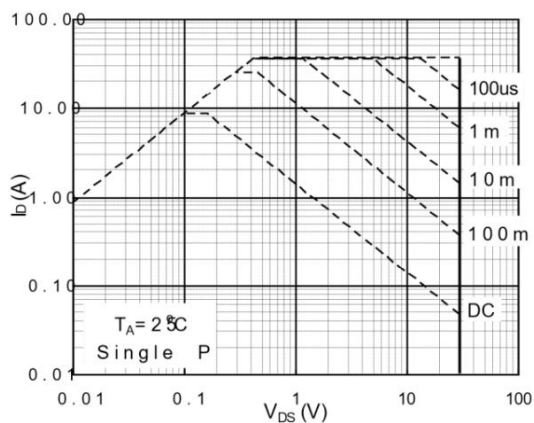


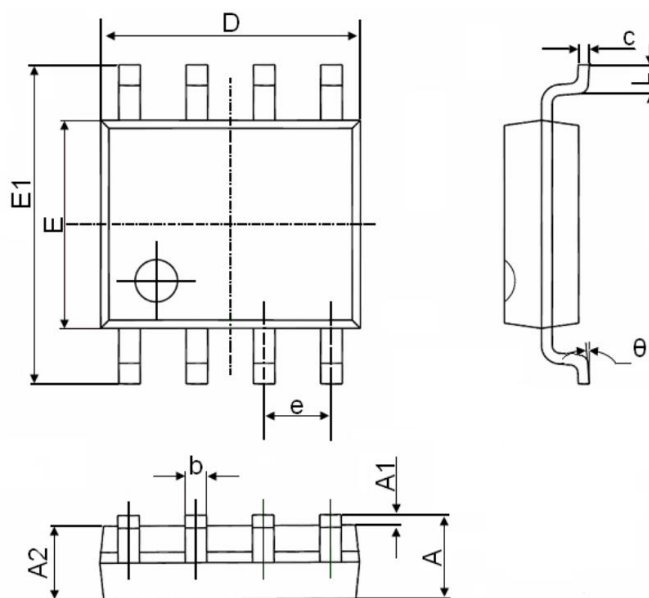
Figure 9: Safe Operation Area



外形尺寸 PACKAGE MECHANICAL DATA

SOP-8

单位 Unit: mm



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



版本更新 Version updates

版本号 Edition	时间 Date	更新记录



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