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2015 年 3 月

FDMS86255ET150

N 沟道屏蔽栅极 PowerTrench® MOSFET
150 V, 63 A, 12.4 mΩ

特性

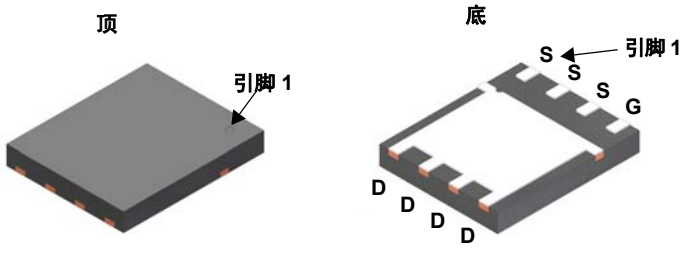
- 扩展额定 T_J 至 175°C
- 屏蔽栅极 MOSFET 技术
- 最大 $r_{DS(on)}$ = 12.4 mΩ (V_{GS} = 10 V, I_D = 10 A)
- 最大 $r_{DS(on)}$ = 15.5 mΩ (V_{GS} = 6 V, I_D = 8 A)
- 低 $r_{DS(on)}$ 和高效的先进硅封装
- 下一代先进体二极管技术，专为软恢复设计
- MSL1 耐用封装设计
- 100% 经过 UIL 测试
- 符合 RoHS 标准

概述

本 N 沟道 MOSFET 采用飞兆半导体先进的 PowerTrench® 工艺制造而成，其中集成了栅极屏蔽技术。该工艺经优化以减小导通电阻，却仍保持卓越的开关性能。

应用

- OringFET / 负载开关
- 同步整流
- DC-DC 转换



Power 56

MOSFET 最大额定值 T_A = 25 °C 除非另有说明

符号	参数			额定值	单位
V_{DS}	Drain to Source Voltage			150	V
V_{GS}	栅极－源极电压			±20	V
I_D	漏极电流	- 连续	T_C = 25 °C （注 5）	63	A
		- 连续	T_C = 100°C （注 5）	44	
		- 连续	T_A = 25°C （注 1a）	10	
		- 脉冲	（注 4）	276	
E_{AS}	单脉冲雪崩能量		（注 3）	541	mJ
P_D	功耗		T_C = 25 °C	136	W
	功耗		T_A = 25 °C （注 1a）	3.3	
T_J, T_{STG}	工作和存储结温范围			-55 至 +175	°C

热性能

$R_{\theta JC}$	结 - 壳体的热阻	1.1	°C/W
$R_{\theta JA}$	结至环境热阻最大值 （注 1a）	45	

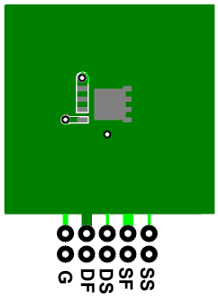
封装标识与定购信息

器件标识	器件	封装	卷尺寸	带宽	数量
FDMS86255ET	FDMS86255ET150	Power 56	13 ”	12 mm	3000 个

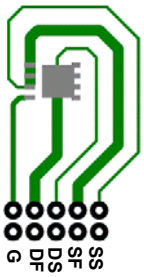
电气特性 TJ = 25°C，除非另有说明

符号	参数	测试条件	最小值	典型值	最大值	单位
关断特性						
BV_{DSS}	漏极－源极击穿电压	I_D = 250 μA, V_{GS} = 0 V	150			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	击穿电压温度系数	I_D = 250 μA （相对 25 °C）		109		mV/°C
I_{DSS}	零栅极电压漏极电流	V_{DS} = 120 V, V_{GS} = 0 V			1	μA
I_{GSS}	栅极－源极漏电流	V_{GS} = ±20 V, V_{DS} = 0 V			±100	nA
导通特性						
$V_{GS(th)}$	栅极－源极阈值电压	V_{GS} = V_{DS}, I_D = 250 μA	2.0	3.0	4.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	栅极－源极阈值电压温度系数	I_D = 250 μA （相对 25 °C）		-11		mV/°C
$r_{DS(on)}$	漏极至源极静态导通电阻	V_{GS} = 10 V, I_D = 10 A		9.5	12.4	mΩ
		V_{GS} = 6 V, I_D = 8 A		11.5	15.5	
		V_{GS} = 10 V, I_D = 10 A, T_J = 125 °C		19	25	
g_{FS}	正向跨导	V_{DS} = 5 V, I_D = 10 A		35		S
动态特性						
C_{iss}	输入电容	V_{DS} = 75 V, V_{GS} = 0 V, f = 1 MHz		3200	4480	pF
C_{oss}	输出电容			291	410	pF
C_{rss}	反向传输电容			11	20	pF
R_g	栅极阻抗		0.1	0.7	2.1	Ω
开关特性						
$t_{d(on)}$	导通延迟时间	V_{DD} = 75 V, I_D = 10 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		21	34	ns
t_r	上升时间			4.5	10	ns
$t_{d(off)}$	关断延迟时间			28	45	ns
t_f	下降时间			6.2	12	ns
Q_g	总栅极电荷	V_{GS} = 0 V 到 10 V; V_{DD} = 75 V, I_D = 10 A		45	63	nC
Q_g	总栅极电荷	V_{GS} = 0 V 到 6 V; V_{DD} = 75 V, I_D = 10 A		29	41	nC
Q_{gs}	栅极－源极电荷	V_{DD} = 75 V, I_D = 10 A		14		nC
Q_{gd}	栅极－漏极 “ 米勒 ” 电荷	V_{DD} = 75 V, I_D = 10 A		8.8		nC
漏极－源极二极管特性						
V_{SD}	源极－漏极二极管正向电压	V_{GS} = 0 V, I_S = 1.9 A （注 2）		0.7	1.2	V
		V_{GS} = 0 V, I_S = 10 A （注 2）		0.8	1.3	
t_{rr}	反向恢复时间	I_F = 10 A, di/dt = 100 A/μs		87	139	ns
Q_{rr}	反向恢复电荷			165	264	nC

注意：
1. $R_{\theta JA}$ 取决于安装在 FR-4 材质 1.5 x 1.5 英寸电路板上 1 英寸 ^{2} 2 盎司铜焊盘上的器件。 $R_{\theta CA}$ 取决于使用者的电路板设计。



a. 45 °C/W 安装于 1 英寸 ^{2} 的 2 盎司铜焊盘。



b. 115 °C/W 安装于最小尺寸的 2 盎司铜焊盘。

2. 脉冲测试：脉宽 < 300 μ，占空比 < 2.0%。
3. 541 mJ 的 E_{AS} 取决于起始 T_J = 25 °C、 L = 3 mH、 I_{AS} = 19 A、 V_{DD} = 150 V、 V_{GS} = 10 V。测试百分比 100%：L = 0.1 mH、 I_{AS} = 60 A。
4. 脉冲 Id 请参见图 11 SOA 曲线。
5. 直流理论值仅受限于最大结温，直流实际值则同时受限于热和机电电路板的设计。

典型特性 T_J = 25 °C 除非另有说明

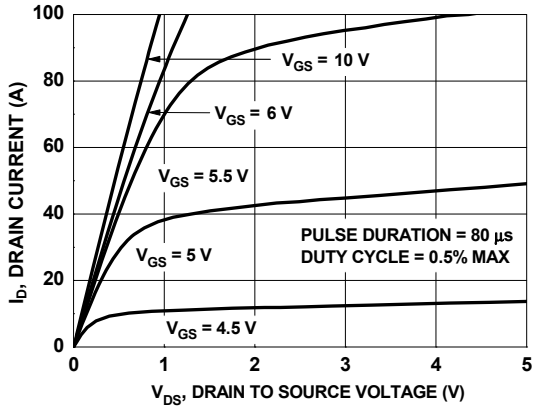


图 1. 导通区域特性

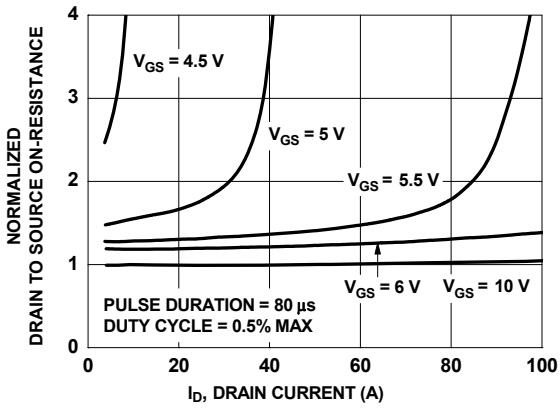


图 2. 标准化导通电阻 vs 漏极电流和栅极电压

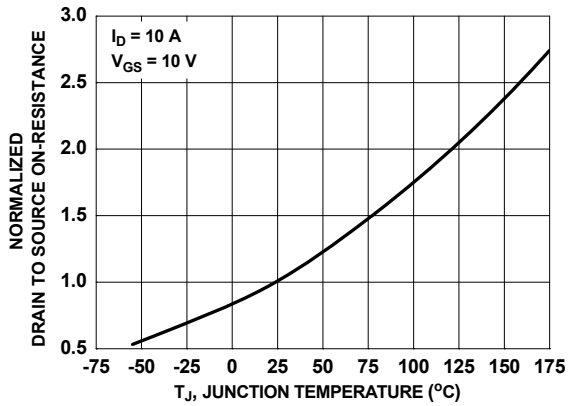


图 3. 标准化导通电阻 vs 结温

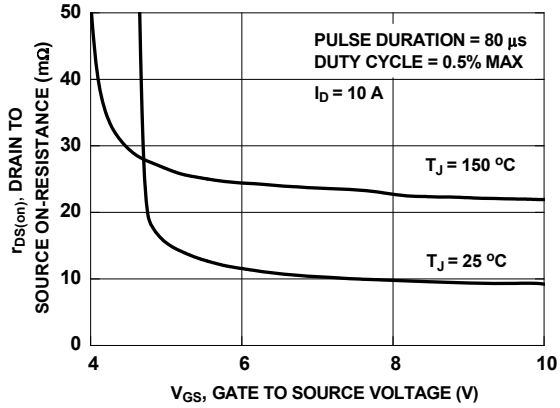


图 4. 导通电阻 vs 栅极一源极电压

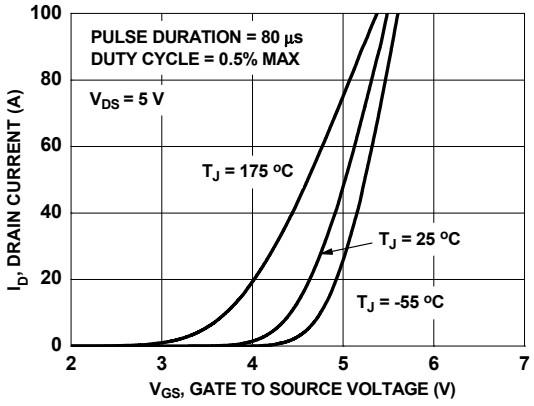


图 5. 转换特性

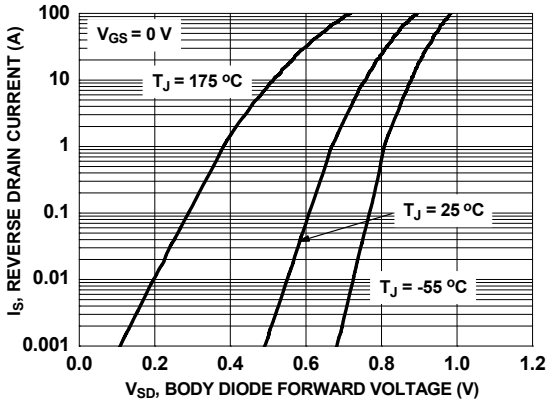


图 6. 源极一漏极二极管正向电压 vs 源极电流

典型特性 T_J = 25 °C 除非另有说明

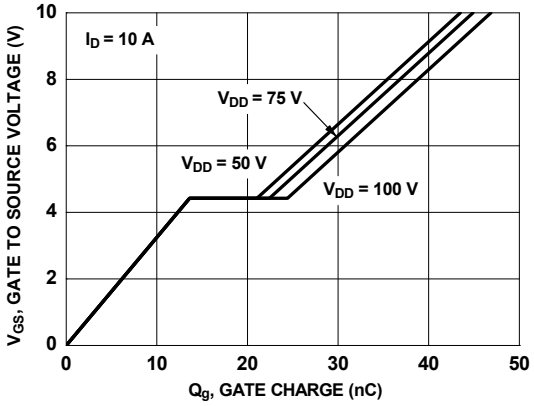


图 7. 栅极电荷特性

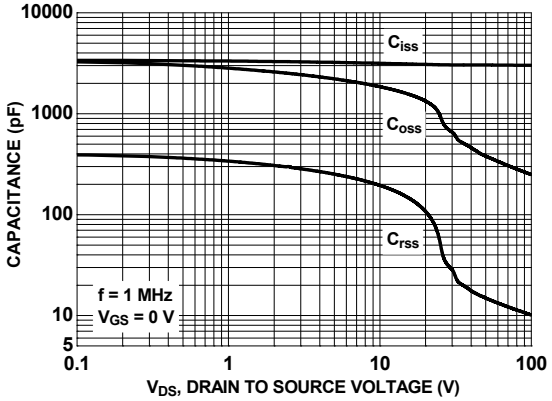


图 8. 电容 vs 漏极－源极电压

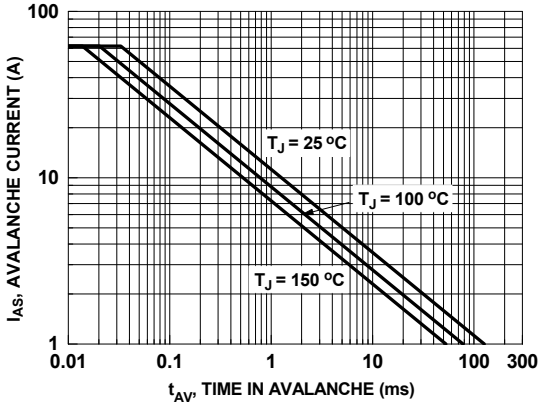


图 9. 非钳位感应开关能力

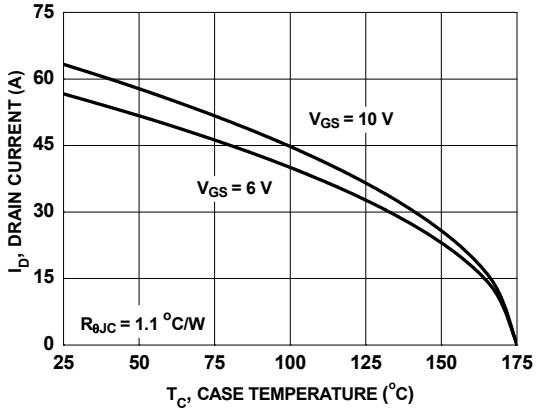


图 10. 最大连续漏极电流 vs 壳体温度

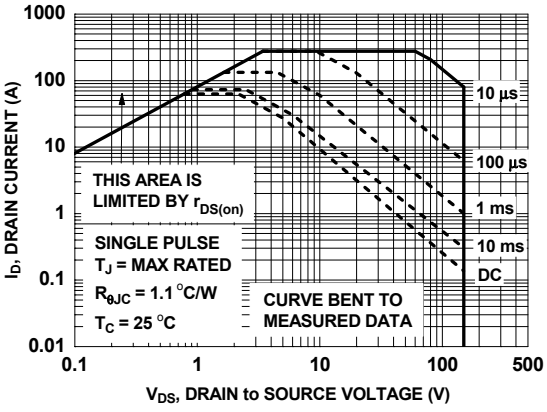


图 11. 正向偏置安全工作区

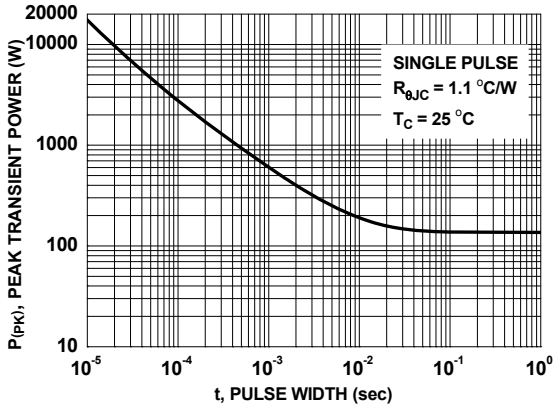


图 12. 单脉冲最大功耗

典型特性 T_J = 25 °C 除非另有说明

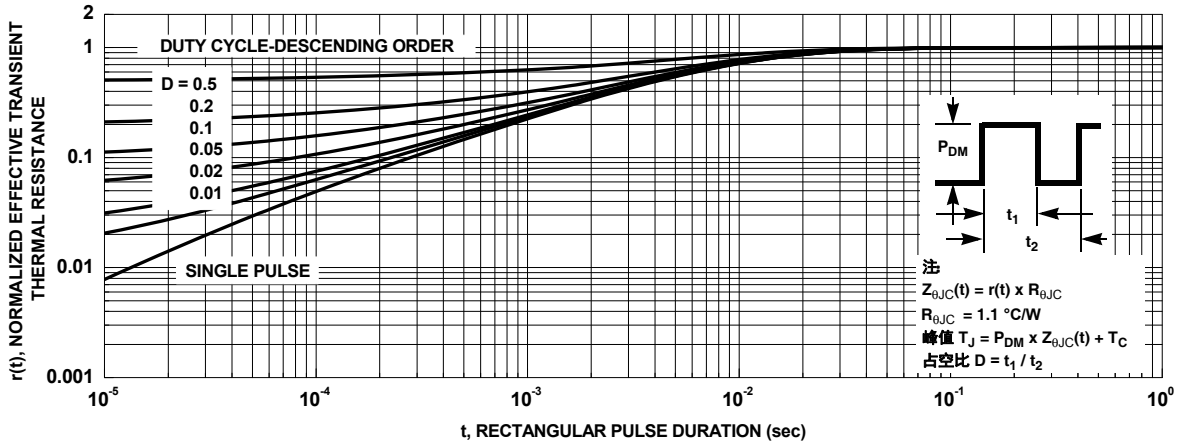
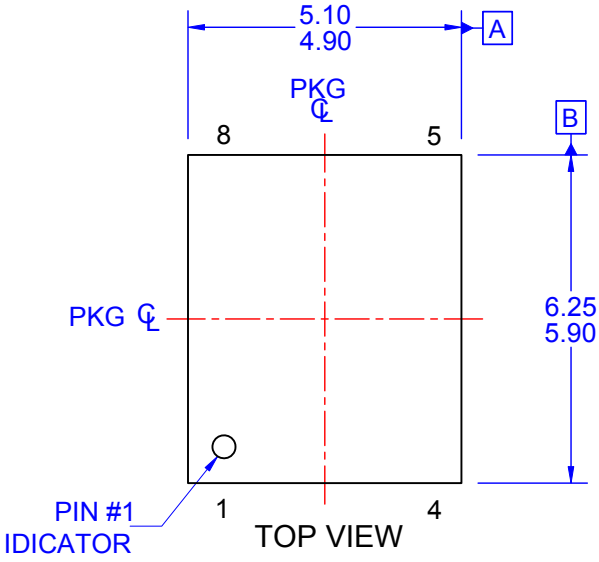
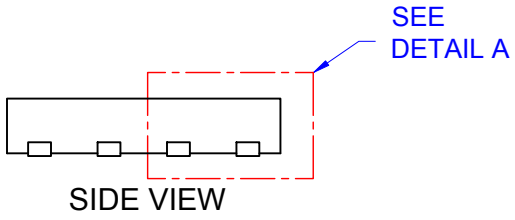
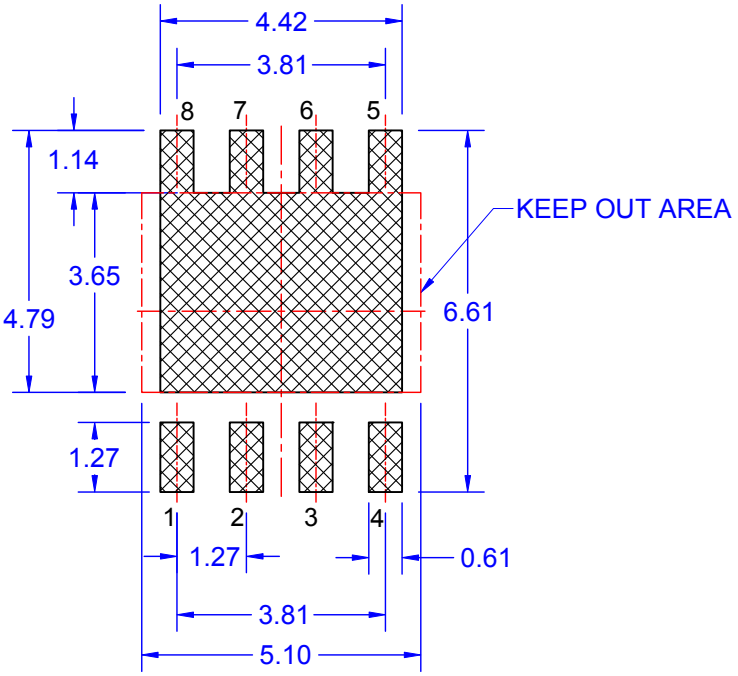
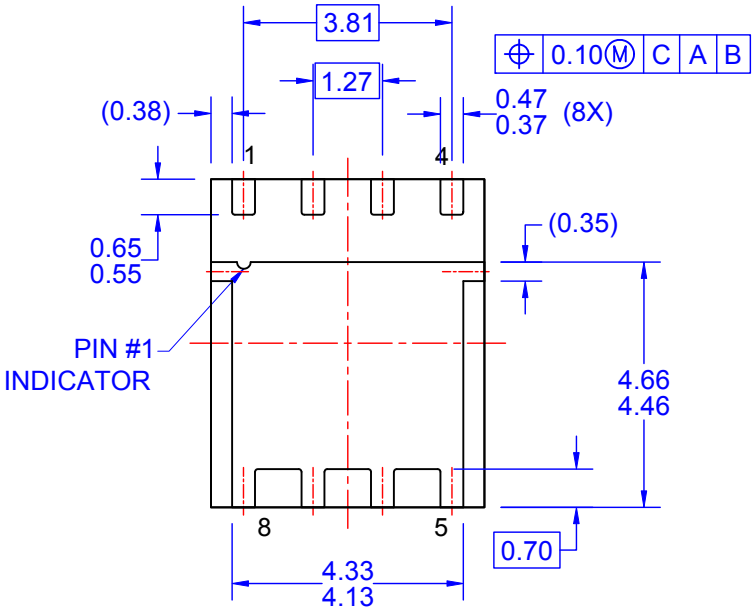


图 13. 瞬态热响应曲线









NOTES: UNLESS OTHERWISE SPECIFIED

A) PACKAGE STANDARD REFERENCE: JEDEC MO-240, ISSUE A, VAR. AA,

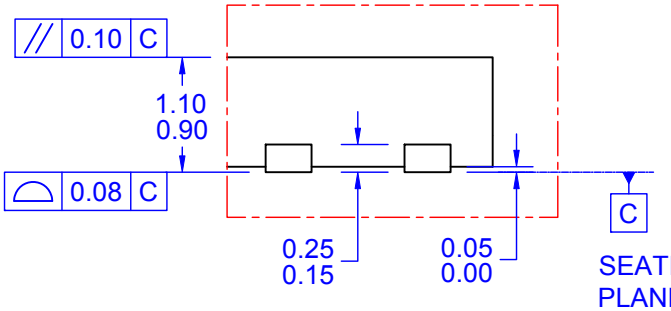
B) ALL DIMENSIONS ARE IN MILLIMETERS.

C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.

D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.

E) IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP OUT AREA.

F) DRAWING FILE NAME: PQFN08JREV3.



DETAIL A

SCALE: 2:1

FAIRCHILD™

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