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2015年3月

FDMS86350ET80

N 沟道 PowerTrench[®] MOSFET 80 V、198 A、2.4 mΩ

特性

- 扩展额定 T_J 至 175°C
- 最大值 r_{DS(on)} = 2.4 mΩ (V_{GS} = 10 V、I_D = 25 A)
- 最大值 r_{DS(on)} = 3.2 mΩ (V_{GS} = 8 V、I_D = 22 A)
- 低 r_{DS(on)} 和高效的先进硅封装
- MSL1 耐用封装设计
- 100% 经过 UIL 测试
- 符合 RoHS 标准

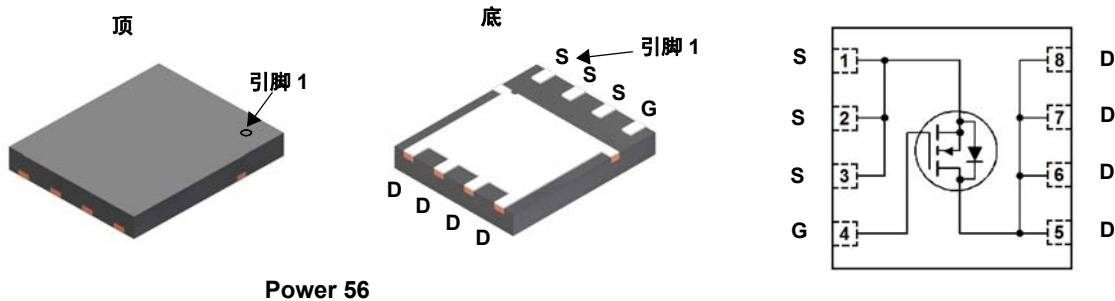


概述

此 N 沟道 MOSFET 器件采用 Fairchild 先进的 PowerTrench[®] 工艺生产，这一先进工艺是专为最大限度地降低通态阻抗并保持卓越的开关性能而定制的。

应用

- 初级端 MOSFET
- 同步整流器
- 负载开关
- 电机控制开关



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}	漏极-源极电压	80	V
V _{GS}	栅极-源极电压	±20	V
I _D	漏极电流 - 连续	T _C = 25 °C (说明 5)	198
	- 连续	T _C = 100 °C (说明 5)	140
	- 连续	T _A = 25 °C (说明 1a)	25
	- 脉冲	(说明 4)	693
E _{AS}	单脉冲耐受能量	(说明 3)	864
P _D	功耗	T _C = 25 °C	187
	功耗	T _A = 25 °C (说明 1a)	3.3
T _J , T _{STG}	工作和存储结温范围	-55 至 +175	°C

热性能

R _{θJC}	结点 - 壳体的热阻	0.8	°C/W
R _{θJA}	结至环境热阻 (说明 1a)	45	

封装标识与订购信息

器件标识	器件	封装	卷尺寸	带宽	数量
FDMS86350ET	FDMS86350ET80	Power 56	13 "	12 mm	3000 个

电气特性 $T_J = 25^\circ\text{C}$, 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
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关断特性

BV_{DSS}	漏极-源极击穿电压	$I_D = 250\ \mu\text{A}, V_{GS} = 0\ \text{V}$	80			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	击穿电压温度系数	$I_D = 250\ \mu\text{A}$, 参考温度为 25°C		45		$\text{mV}/^\circ\text{C}$
I_{DSS}	零栅极电压漏极电流	$V_{DS} = 64\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA
I_{GSS}	栅极-源极漏电流	$V_{GS} = \pm 20\ \text{V}, V_{DS} = 0\ \text{V}$			± 100	nA

导通特性

$V_{GS(th)}$	栅源极阈值电压	$V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$	2.5	3.8	4.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	栅源极阈值电压温度系数	$I_D = 250\ \mu\text{A}$, 参考温度为 25°C		-12		$\text{mV}/^\circ\text{C}$
$r_{DS(on)}$	漏极至源极静态导通电阻	$V_{GS} = 10\ \text{V}, I_D = 25\ \text{A}$		2.0	2.4	m Ω
		$V_{GS} = 8\ \text{V}, I_D = 22\ \text{A}$		2.5	3.2	
		$V_{GS} = 10\ \text{V}, I_D = 25\ \text{A}, T_J = 125^\circ\text{C}$		3.1	3.8	
g_{FS}	正向跨导	$V_{DS} = 5\ \text{V}, I_D = 25\ \text{A}$		70		S

动态特性

C_{iss}	输入电容	$V_{DS} = 40\ \text{V}, V_{GS} = 0\ \text{V},$ $f = 1\ \text{MHz}$		8030		pF
C_{oss}	输出电容			1370		pF
C_{rss}	反向传输电容			31		pF
R_g	栅极阻抗		0.1	1.1	3	Ω

Switching Characteristics

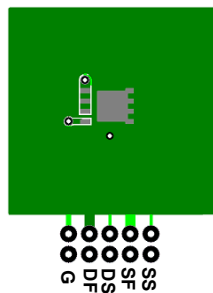
$t_{d(on)}$	导通延迟时间	$V_{DD} = 40\ \text{V}, I_D = 25\ \text{A},$ $V_{GS} = 10\ \text{V}, R_{GEN} = 6\ \Omega$		50	80	ns	
t_r	上升时间			34	55	ns	
$t_{d(off)}$	关断延迟时间			40	65	ns	
t_f	下降时间			11	20	ns	
Q_g	总栅极电荷		$V_{GS} = 0\ \text{V}$ 至 $10\ \text{V}$		110	155	nC
Q_g	总栅极电荷		$V_{GS} = 0\ \text{V}$ 至 $8\ \text{V}$	$V_{DD} = 40\ \text{V},$ $I_D = 25\ \text{A}$	90	127	nC
Q_{gs}	栅源极电荷			46		nC	
Q_{gd}	栅极-漏极“米勒”电荷			23		nC	

漏极-源极二极管特性

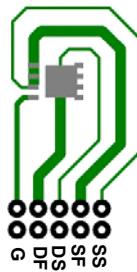
V_{SD}	源极-漏极二极管正向电压	$V_{GS} = 0\ \text{V}, I_S = 2.1\ \text{A}$ (说明 2)		0.71	1.2	V
		$V_{GS} = 0\ \text{V}, I_S = 25\ \text{A}$ (说明 2)		0.79	1.3	
t_{rr}	反向恢复时间	$I_F = 25\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		63	101	ns
Q_{rr}	反向恢复电荷			62	100	nC

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 in² 2 盎司铜焊盘上的器件。 $R_{\theta CA}$ 取决于用户的电路板设计。



a. $45^\circ\text{C}/\text{W}$, 安装于
1 in² 2 盎司铜焊盘。



b. $115^\circ\text{C}/\text{W}$, 安装于
最小尺寸的 2 盎司铜焊盘。

2. 脉冲测试: 脉宽 < 300 μs , 占空比 < 2.0%。

3. 864 mJ E_{AS} 是基于开始温度 $T_J = 25^\circ\text{C}$, $L = 3\ \text{mH}$, $I_{AS} = 24\ \text{A}$, $V_{DD} = 80\ \text{V}$, $V_{GS} = 10\ \text{V}$, 且 100% 经过测试 ($L = 0.1\ \text{mH}$, $I_{AS} = 74\ \text{A}$)。

4. 有关脉冲 ID, 请参考图 11 SOA 曲线获取更多详情。

5. 计算的连续电流仅限制于最大结温, 实际连续电流受到高温和机电应用电路板设计的限制。

典型特性 $T_J = 25^\circ\text{C}$, 除非另有说明。

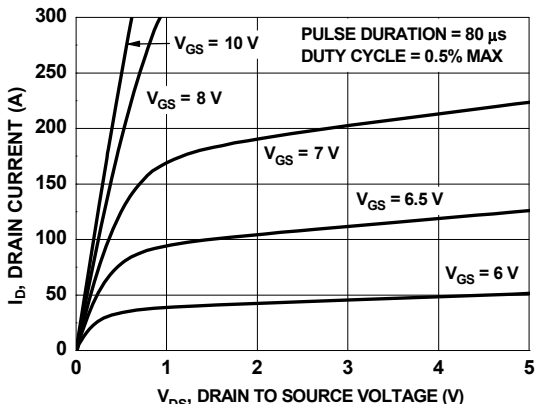


图 1. 导通区特性

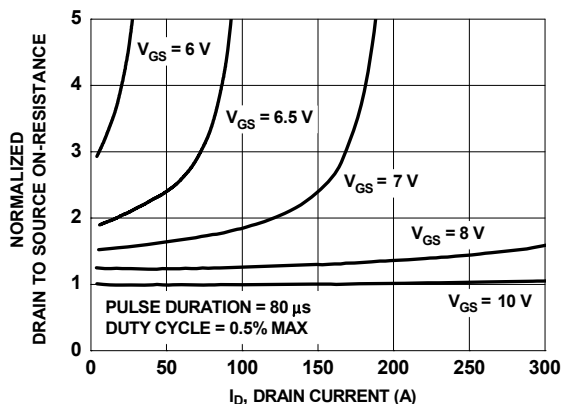


图 2. 标准化导通电阻与漏极电流和栅极电压

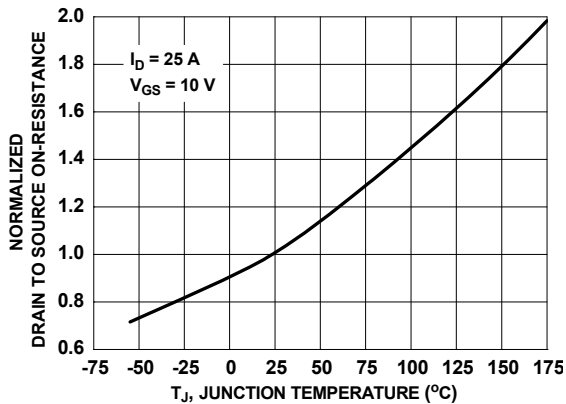


图 3. 标准化导通电阻与结温

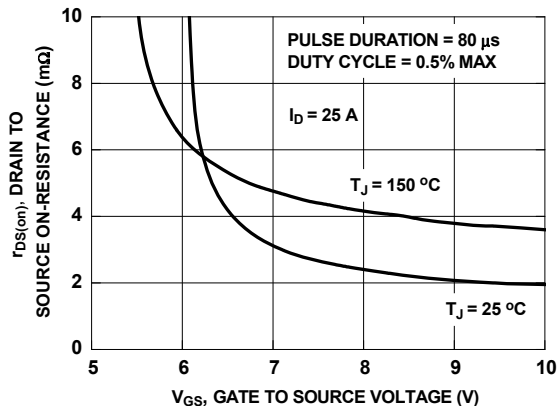


图 4. 导通电阻与栅源极电压

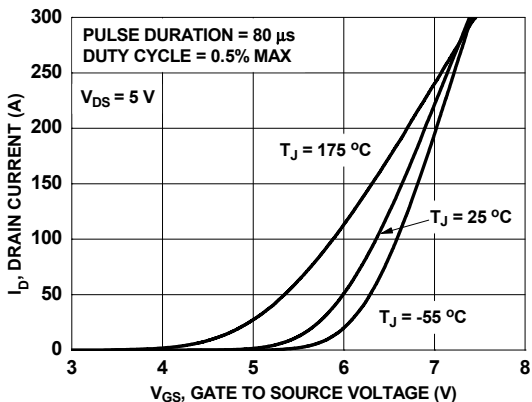


图 5. 转移特性

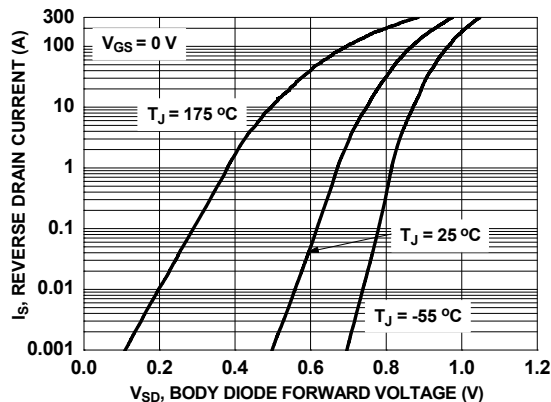


图 6. 源漏极二极管正向电压与源极电流

典型特性 $T_J = 25^\circ\text{C}$, 除非另有说明。

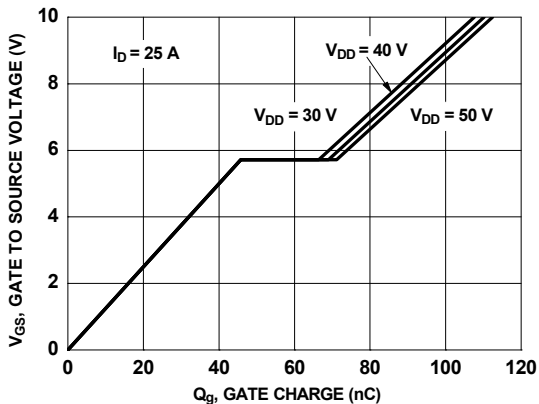


图 7. 栅极电荷特性

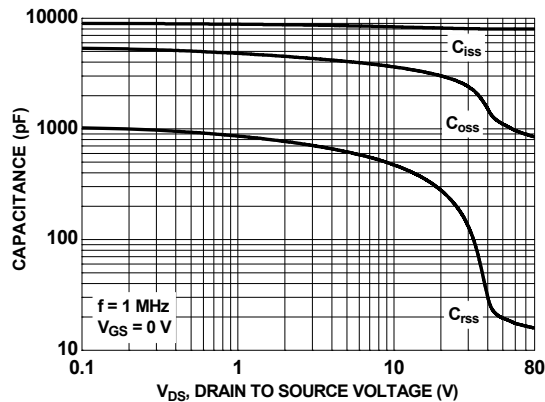


图 8. 电容与漏源极电压

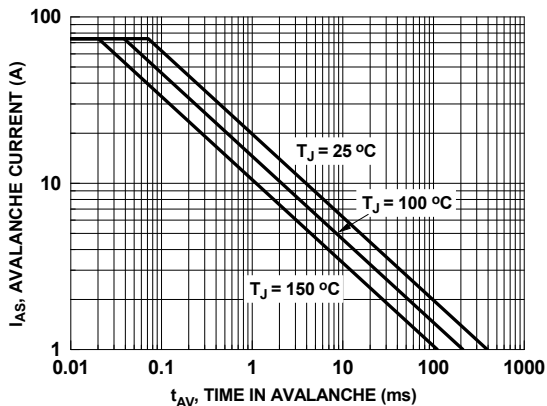


图 9. 未箝位感性开关性能

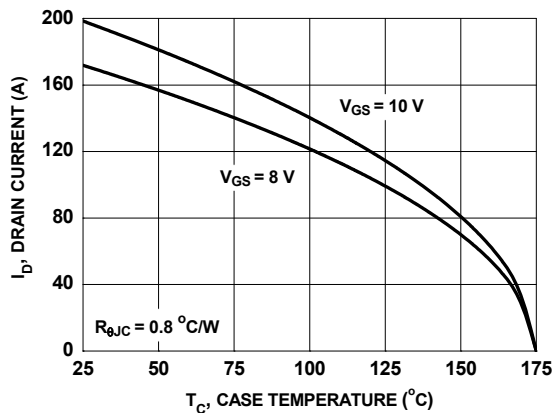


图 10. 最大连续漏电流与壳温

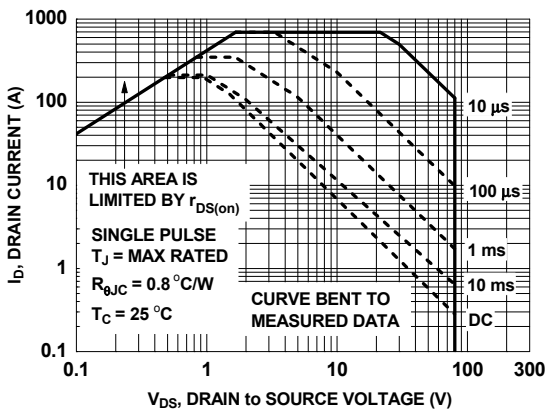


图 11. 正向偏置安全工作区

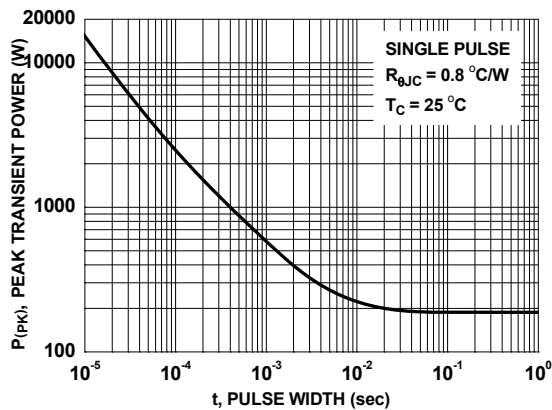


图 12. 单脉冲最大功耗

典型特性 $T_J = 25\text{ }^\circ\text{C}$, 除非另有说明。

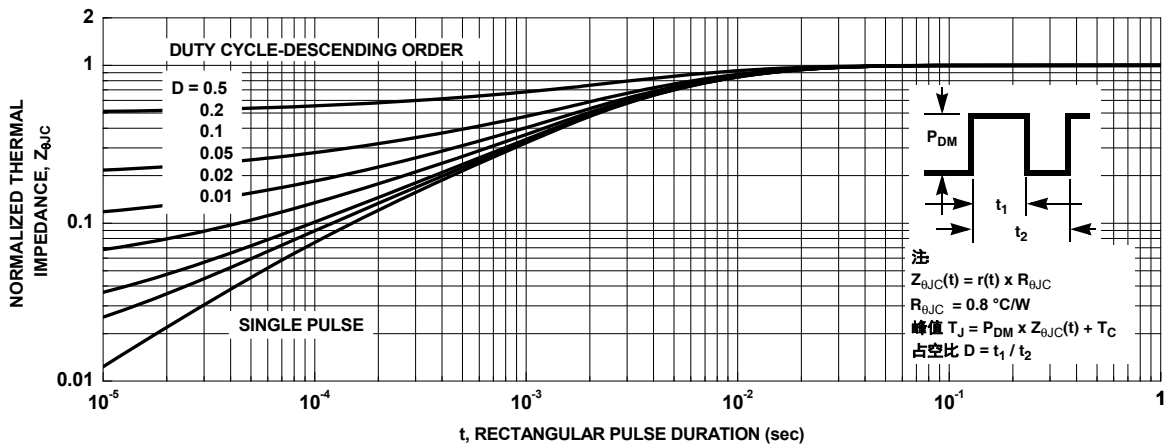
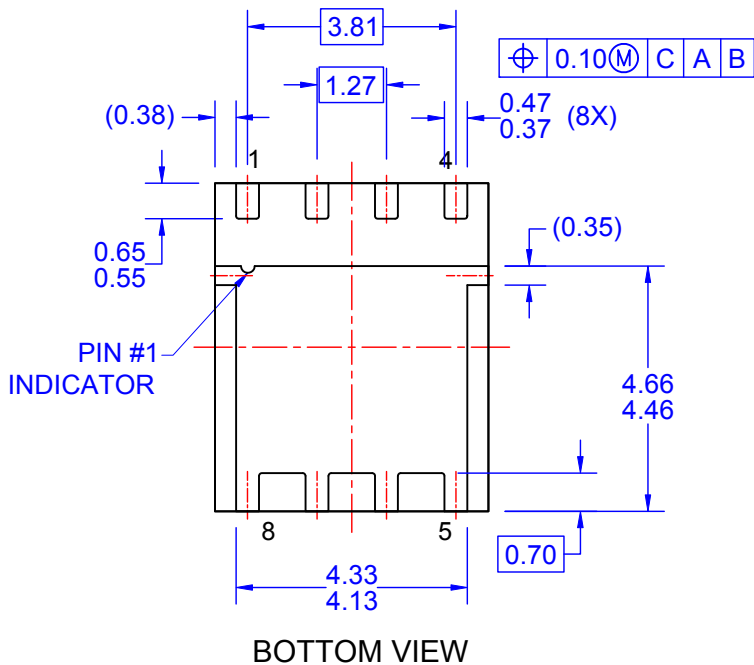
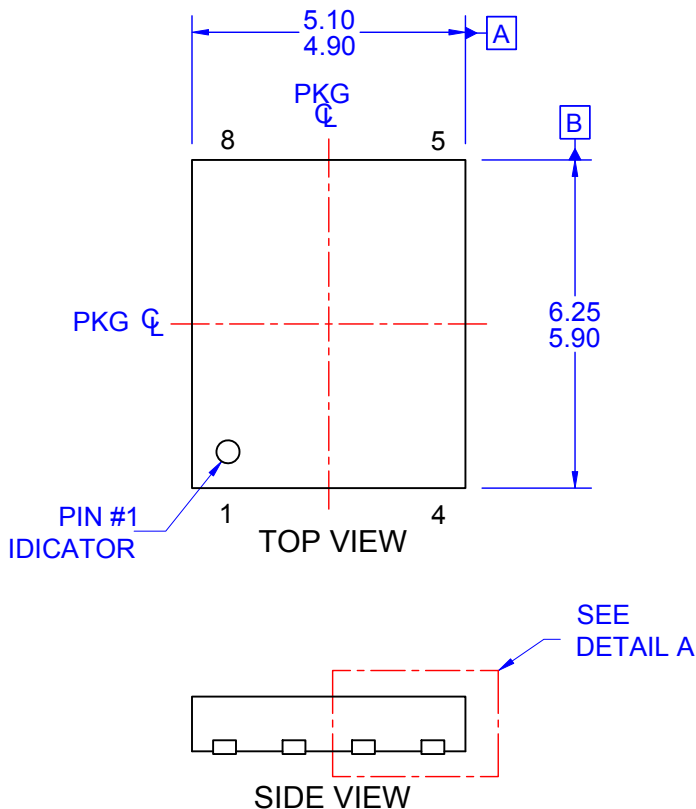


图 13. 结到壳瞬态热响应曲线



- 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



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