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Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

FDBL0090N40

2014 年 11 月

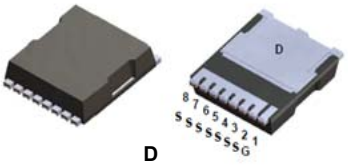
N 沟道 PowerTrench® MOSFET
40 V, 240 A, 0.9 mΩ

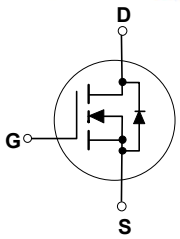
特性

- 典型值 $R_{DS(on)}$ = 0.65 mΩ（V_{GS} = 10 V，I_D = 80 A）
- 典型值 $Q_{g(tot)}$ = 144 nC （V_{GS} = 10 V， I_D = 80 A）
- UIS 能力
- 符合 RoHS 标准

应用

- 工业电机驱动器
- 工业电源
- 工业自动化
- 电动工具
- 电池保护
- 太阳能逆变器
- UPS 和能源逆变器
- 储能
- 负载开关





如需最新封装图纸，请访问 Fairchild 网站：
https://www.fairchildsemi.com/evaluate/package-specifications/packageDetails.html?id=PN_PSOFA-008

MOSFET 最大额定值，T_J = 25 °C 除非另有说明。

符号	参数		额定值	单位
V_{DSS}	Drain-to-Source Voltage		40	V
V_{GS}	栅极至源极电压		±20	V
I_D	漏极电流 - 连续（V_{GS}=10）（注 1）	T_C = 25 °C	240	A
	脉冲漏电流	T_C = 25 °C	见图 4	
E_{AS}	单脉冲雪崩能量	（注 2）	737	mJ
P_D	功耗		357	W
	超过 25 °C 时降额		2.38	W/°C
T_J, T_{STG}	工作和存储温度		-55 至 + 175	°C
$R_{\theta JC}$	结点 - 壳体的热阻		0.42	°C/W
$R_{\theta JA}$	结至环境热阻最大值	（注 3）	43	°C/W

注意：
1: 电流受接合线配置限制。
2: 电感充电期间，起始 T_J = 25 °C， L = 0.36 mH， I_{AS} = 64 A， V_{DD} = 40 V，雪崩时间 V_{DD} = 0 V。
3: $R_{\theta JA}$ 等于结至壳体和壳体至环境热阻之和，其中，壳体热参考定义为漏极引脚的焊料安装表面。$R_{\theta JC}$ 具备设计保证，其中 $R_{\theta JA}$ 由电路板设计确定。此处的最大额定值基于安装在 2oz 铜的 1 in^2 焊盘上。

封装标识与定购信息

器件标识	器件	封装			
FDBL0090N40	FDBL0090N40	MO-299A	-	-	-

电气特性，T_J = 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						
B_{VDSS}	漏极至源极击穿电压	I_D = 250 μA，V_{GS} = 0 V	40	-	-	V
I_{DSS}	漏极至源极漏电流	V_{DS} = 40 V，V_{GS} = 0 V，T_J = 25 °C	-	-	1	μA
		V_{DS} = 40 V，V_{GS} = 0 V，T_J = 175 °C（注 4）	-	-	1	mA
I_{GSS}	栅极至源极漏电流	V_{GS} = ±20 V	-	-	±100	nA
导通特性						
$V_{GS(th)}$	栅极至源极阀值电压	V_{GS} = V_{DS}，I_D = 250 μA	2.0	3.3	4.0	V
$R_{DS(on)}$	漏极至源极导通电阻	I_D = 80 A，V_{GS}= 10 V，T_J = 25 °C	-	0.65	0.90	mΩ
		I_D = 80 A，V_{GS}= 10 V，T_J = 175 °C（注 4）	-	1.10	1.50	mΩ
动态特性						
C_{iss}	输入电容	V_{DS} = 25 V，V_{GS} = 0 V，f = 1 MHz	-	12000	-	pF
C_{oss}	输出电容		-	3260	-	pF
C_{rss}	反向传输电容		-	442	-	pF
R_g	栅极阻抗	f = 1 MHz	-	3.3	-	Ω
$Q_{g(ToT)}$	在 10 V 的栅极总电荷	V_{GS} = 0 至 10 V，V_{DD} = 32 V，I_D = 80 A	-	144	188	nC
$Q_{g(th)}$	阀值栅极电荷	V_{GS} = 0 至 2 V，V_{DD} = 32 V，I_D = 80 A	-	22	26	nC
Q_{gs}	栅极至源极栅极电荷	V_{DD} = 32 V，I_D = 80 A	-	66	-	nC
Q_{gd}	栅极至漏极 “ 米勒 ” 电荷	V_{DD} = 32 V，I_D = 80 A	-	16	-	nC
开关特性						
t_{on}	导通时间	V_{DD} = 20 V，I_D = 80 A，V_{GS} = 10 V，R_{GEN} = 6 Ω	-	-	162	ns
$t_{d(on)}$	导通延迟		-	42	-	ns
t_r	上升时间		-	73	-	ns
$t_{d(off)}$	关断延迟		-	83	-	ns
t_f	下降时间		-	50	-	ns
t_{off}	关断时间		-	-	279	ns
漏极 - 源极二极管特性						
V_{SD}	源极至漏极二极管电压	I_{SD} =80 A，V_{GS} = 0 V	-	-	1.25	V
		I_{SD} = 40 A，V_{GS} = 0 V	-	-	1.2	V
t_{rr}	反向恢复时间	I_F = 80 A，dI_{SD}/dt = 100 A/μs，V_{DD} = 32 V	-	111	129	ns
Q_{rr}	反向恢复电荷		-	178	214	nC

说明：

4: 其最大值根据 T_J = 175 °C 时的设计确定。 在生产中，未对此条件测试产品。

典型特性

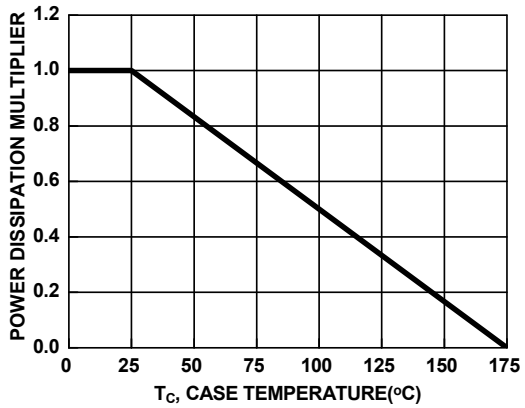


图 1. 标准化功耗与壳体温度的关系

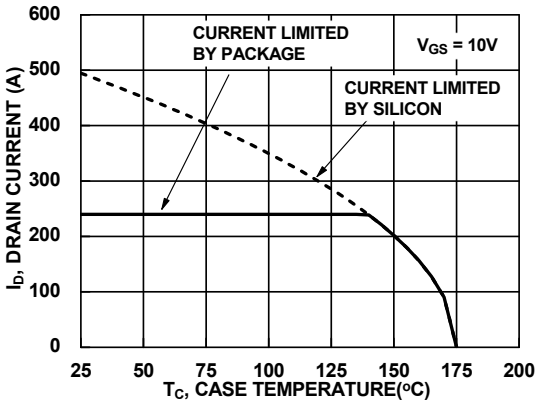


图 2. 最大连续漏电流与壳体温度的关系

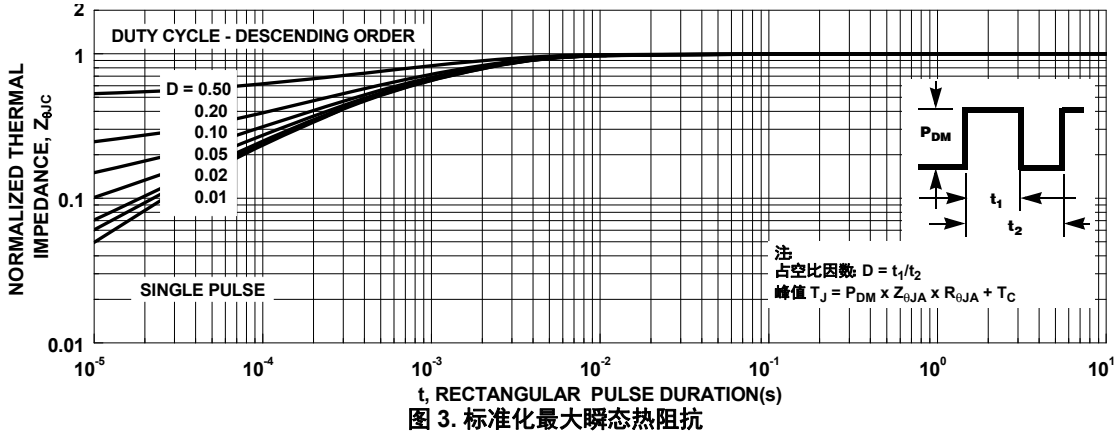


图 3. 标准化最大瞬态热阻抗

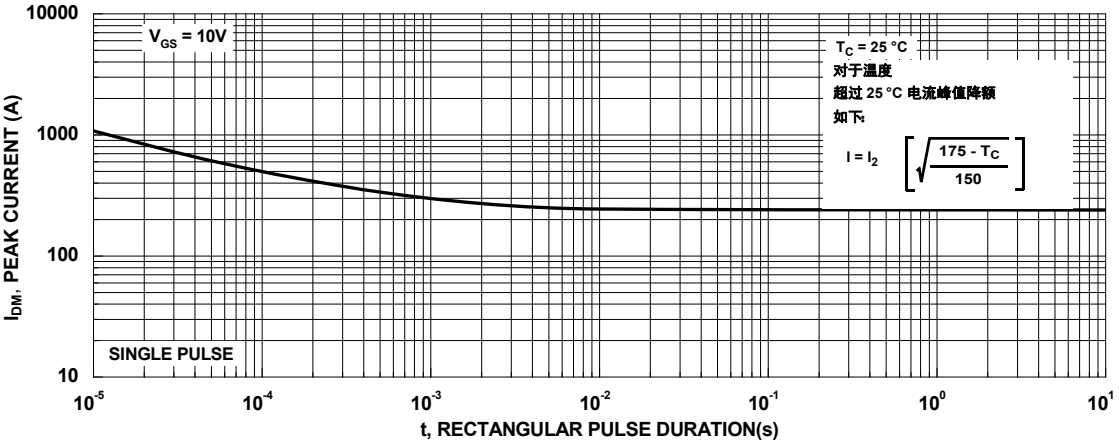


图 4. 峰值电流能力

典型特性

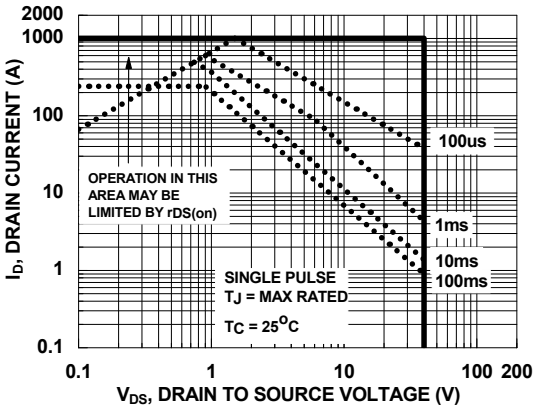
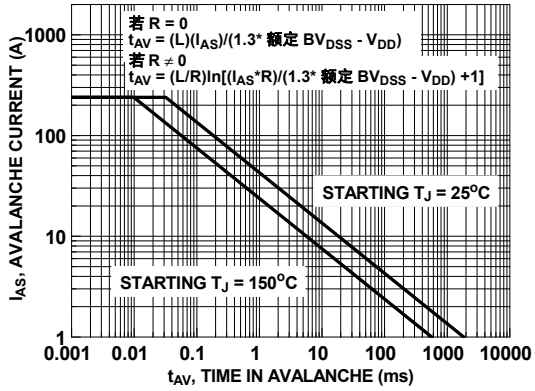


图 5. 正向偏压安全工作区



注：请参考 Fairchild 应用指南 AN7514 和 AN7515

图 6. 非箝位感性开关性能

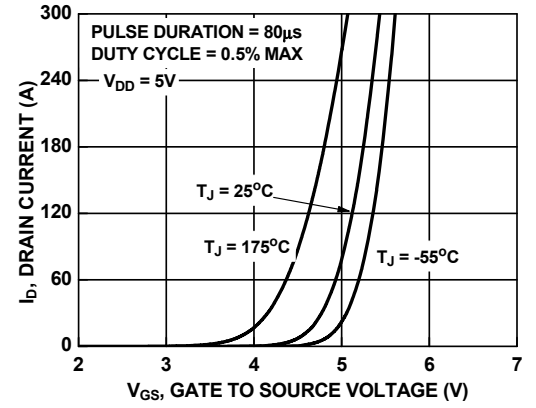


图 7. 传递特性

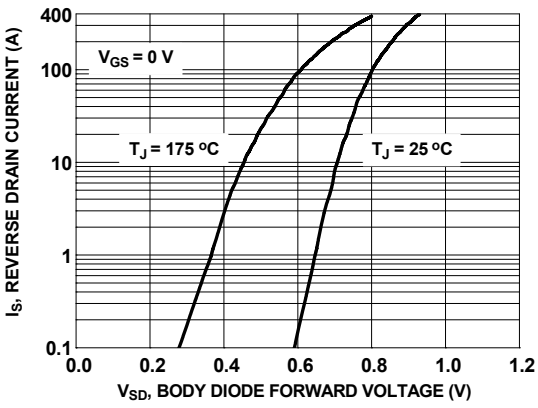


图 8. 正向二极管特性

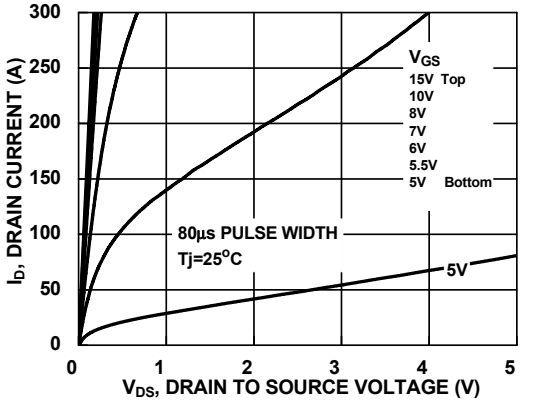


图 9. 饱和特性

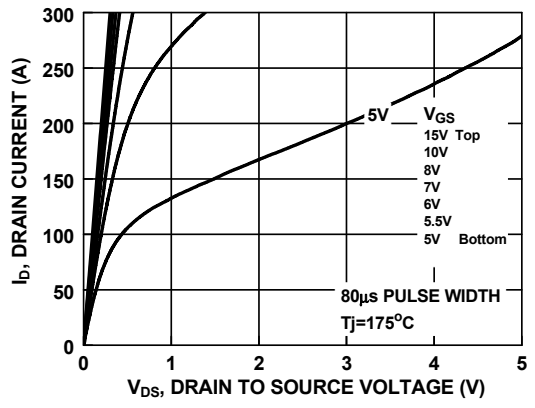


图 10. 饱和特性

典型特性

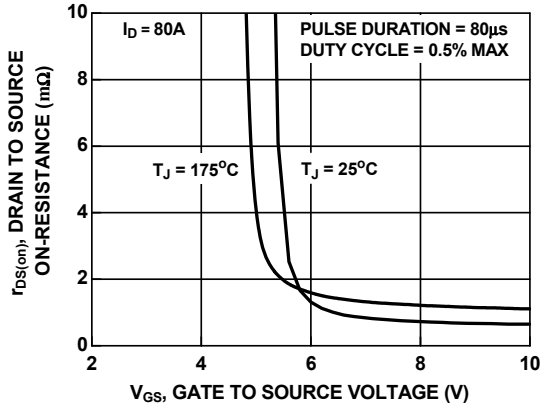


图 11.R_{DSON} 与栅极电压的关系

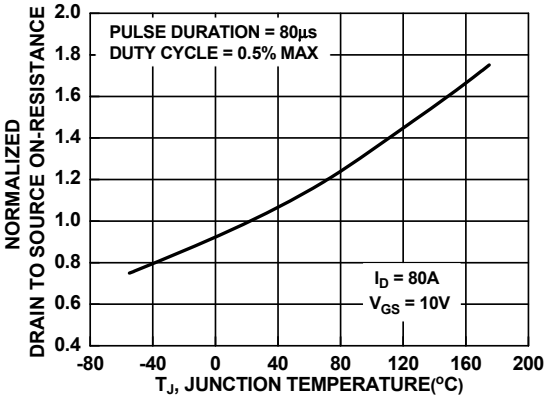


图 12. 标准化 R_{DSON} 与结温的关系

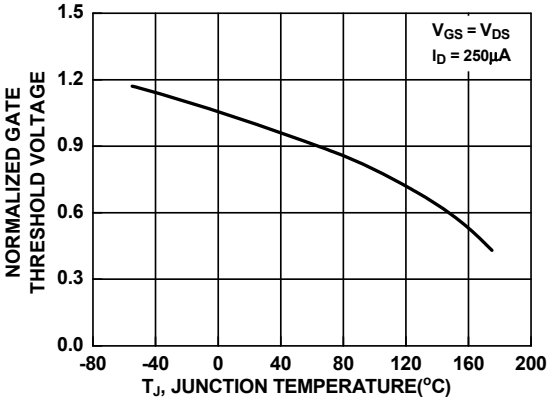


图 13. 标准化栅极阀值电压与温度的关系

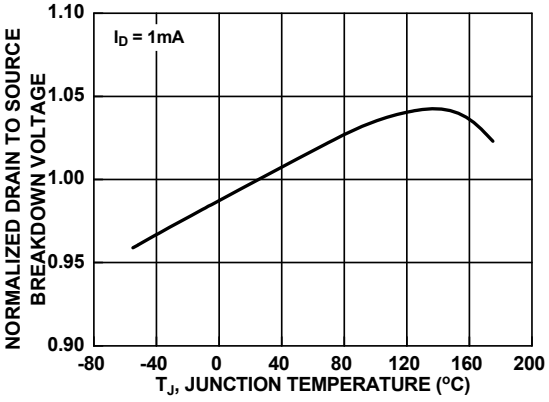


图 14. 标准化漏极至源极击穿电压与结温的关系

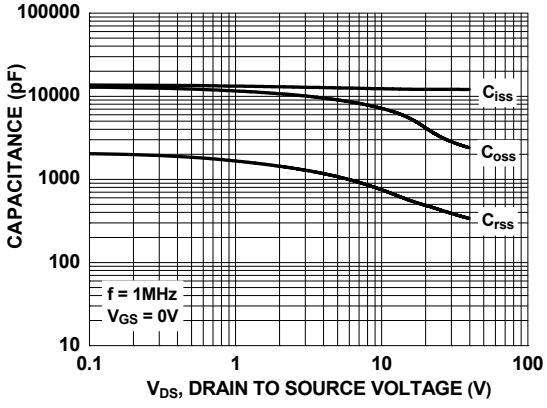


图 15. 电容与漏极－源极电压的关系

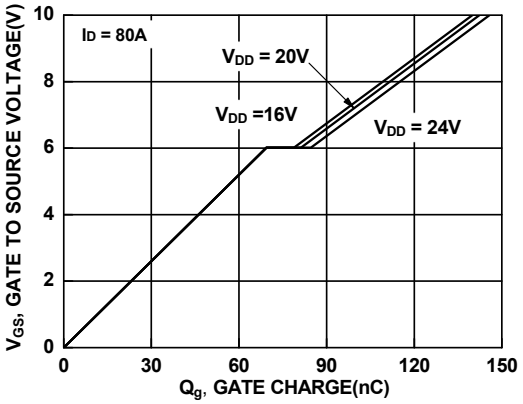
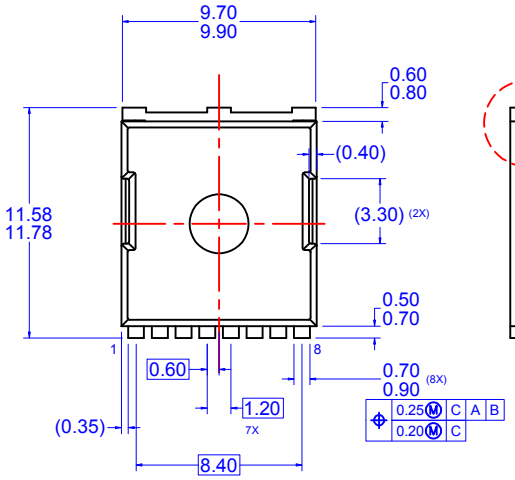
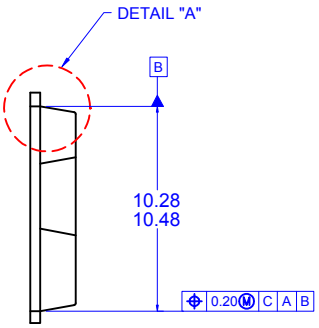
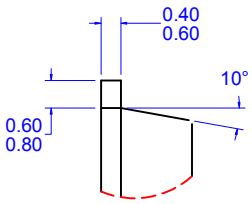


图 16. 栅极电荷与栅极－源极电压的关系

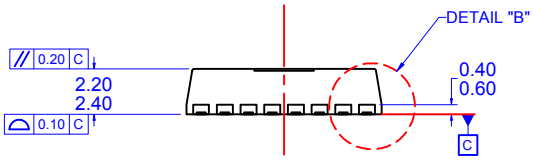


TOP VIEW

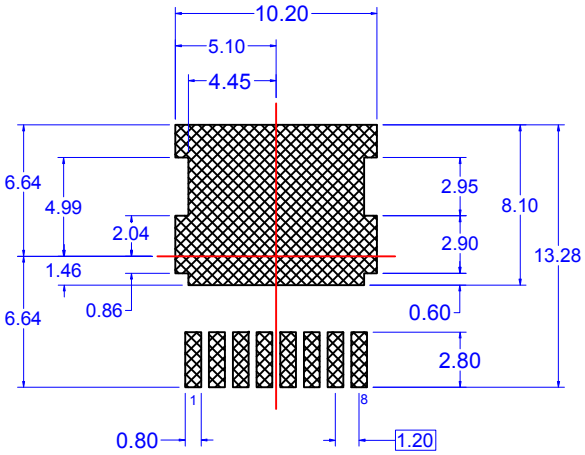




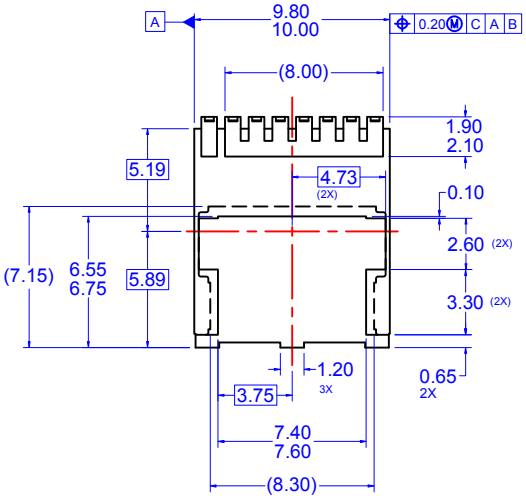
DETAIL "A"



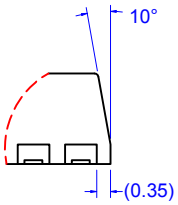
SIDE VIEW



LAND PATTERN
RECOMMENDATION



BOTTOM VIEW



DETAIL "B"

NOTES: UNLESS OTHERWISE SPECIFIED

A) PACKAGE STANDARD REFERENCE: JEDEC MO-299, ISSUE A, DATED NOVEMBER 2009.

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-1994.

E) DRAWING FILE NAME: MKT-PSOF08AREV3

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