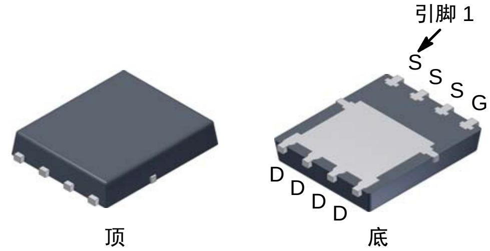
MOSFET – N 沟道, POWERTRENCH®

80 V, 100 A, 3.9 mΩ

FDMS039N08B

V_{DSS}	$R_{DS(on)}$ MAX	I_D MAX
80 V	3.9 mΩ @ 10 V	100 A



PQFN8 5X6, 1.27P
(Power 56)
CASE 483AE

说明

此 N 沟道 MOSFET 采用安森美 (**onsemi**) 先进的 POWERTRENCH 工艺生产，这一先进工艺是专为最大限度地降低导通电阻并保持卓越开关性能而定制的。

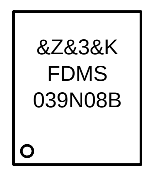
特性

- $R_{DS(on)}$ = 3.2 mΩ (典型值) @ V_{GS} = 10 V，I_D = 50 A
- 低 FOM $R_{DS(on)}$ * Q_G
- 低反向恢复电荷，Q_{rr} = 80 nC
- 软反向恢复体二极管
- 可实现高效同步整流
- 快速开关速度
- 100% 经过 UIL 测试
- This Device is Pb−Free, Halide Free and is RoHS Compliant

应用

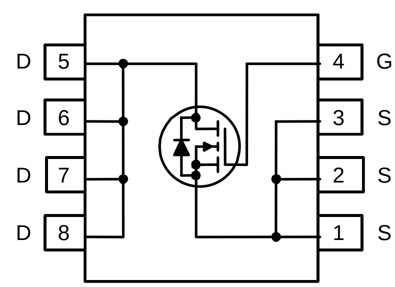
- 用于 ATX / 服务器 / 电信 PSU 的同步整流
- 电池保护电路
- 电机驱动和不间断电源

MARKING DIAGRAM



&Z = Assembly Plant Code
&3 = 3−Digit Date Code
&K = 2−Digits Lot Run Code
FDMS039N08B = Specific Device Code

PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

MOSFET 最大额定值 (T_C = 25°C, 除非另有说明)

单位	单位	FDMS039N08B	单位
V_{DSS}	漏极—源极电压	80	V
V_{GSS}	栅极—源极电压	±20	V
I_D	漏极电流 – 连续 (T_C = 25°C) – 连续 (T_A = 25°C) (说明 1a)	 100 19.4	A
I_{DM}	漏极电流 – 脉冲 (说明 2)	 400	mJ
E_{AS}	单脉冲雪崩能量 (说明 3)	240	mJ
P_D	功耗 (T_C = 25°C) (T_A = 25°C) (说明 1a)	 104 2.5	W
T_J, T_{STG}	工作和存储温度范围	−55 至 +150	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.
(参考译文)
如果电压超过最大额定值表中列出的值范围，器件可能会损坏。如果超过任何这些限值，将无法保证器件功能，可能会导致器件损坏，影响可靠性。

热性能 (T_C = 25°C, 除非另有说明)

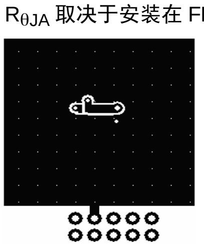
单位	单位	FDMS039N08B	单位
$R_{θJC}$	结至外壳热阻最大值	1.2	°C/W
$R_{θJA}$	结至环境热阻最大值 (说明 1a)	50	

电气特性 (T_C = 25°C 除非另有说明)

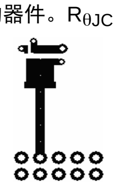
符号	参数	测试条件	最小值	典型值	最大值	单位
关断特性						
BV_{DSS}	漏极-源极击穿电压	I_D = 250 μA, V_{GS} = 0 V	80	–	–	V
ΔBV_{DSS} / ΔT_J	击穿电压温度系数	I_D = 250 μA, 推荐选用 25°C	–	0.04	–	V/°C
I_{DSS}	零栅极电压漏极电流	V_{DS} = 64 V, V_{GS} = 0 V	–	–	1	μA
I_{GSS}	栅极-体漏电流	V_{GS} = ±20 V, V_{DS} = 0 V	–	–	±100	nA
导通特性						
$V_{GS(th)}$	栅极阈值电压	V_{GS} = V_{DS}, I_D = 250 μA	2.5	–	4.5	V
$R_{DS(on)}$	漏极至源极静态导通电阻	V_{GS} = 10 V, I_D = 50 A	–	3.2	3.9	mΩ
g_{FS}	正向跨导	V_{DS} = 10 V, I_D = 50 A	–	100	–	S
动态特性						
C_{iss}	输入电容	V_{DS} = 40 V, V_{GS} = 0 V f = 1 MHz	–	5715	7600	pF
C_{oss}	输出电容		–	881	1170	pF
C_{rss}	反向传输电容		–	15	–	pF
C_{oss}(er)	能量相关输出电容	V_{DS} = 40 V, V_{GS} = 0 V	–	1646	–	pF
$Q_{g(tot)}$	10 V 的栅极电荷总量	V_{DS} = 40 V, I_D = 50 A V_{GS} = 0 V至 10 V (说明 4)	–	77	100	nC
Q_{gs}	栅极-源极栅极电荷		–	34	–	nC
Q_{gs2}	栅极平台电荷阈值		–	13	–	nC
Q_{gd}	栅极-漏极 “米勒” 电荷		–	16	–	nC
ESR	等效串联电阻	f = 1 MHz	–	1.2	–	Ω
开关特性						
$t_{d(on)}$	导通延迟时间	V_{DD} = 40 V, I_D = 50 A V_{GS} = 10 V, R_G = 4.7 Ω (说明 4)	–	42	94	ns
t_r	开通上升时间		–	25	60	ns
$t_{d(off)}$	关断延迟时间		–	48	106	ns
t_f	关断下降时间		–	17	44	ns
漏极-源极二极管特性						
I_S	漏极-源极二极管最大正向连续电流		–	–	100	A
I_{SM}	漏极-源极二极管最大正向脉冲电流		–	–	400	A
V_{SD}	漏极-源极二极管正向电压	V_{GS} = 0 V, I_{SD} = 50 A	–	–	1.3	V
t_{rr}	反向恢复时间	V_{GS} = 0 V, I_{SD} = 50 A, V_{DD} = 40 V dI_F/dt = 100 A/μs	–	68	–	ns
Q_{rr}	反向恢复电荷		–	80	–	nC

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
(参考译文)
除非另有说明，“电气特性”表格中列出的是所列测试条件下的产品性能参数。如果在不同条件下运行，产品性能可能与“电气特性”表格中所列性能参数不一致。

1. $R_{\theta JA}$ 取决于安装在 FR-4 材质 1.5 x 1.5 in. 电路板上 1 in^2 2 盎司焊盘上的器件。$R_{\theta JC}$ 通过设计保证，而 $R_{\theta CA}$ 取决于 用户的电路板设计。



a. 50°C/W，安装于 1 in^2 pad of 2 盎司焊盘。



b. 125°C/W，安装于 最小尺寸的 2 盎司焊盘。

2. 重复额定值：脉冲宽度受限于最大结温。
3. L = 0.3 mH， I_{AS} = 40 A，开始 T_J = 25°C。
4. 本质上独立于工作温度的典型特性。

典型性能特征

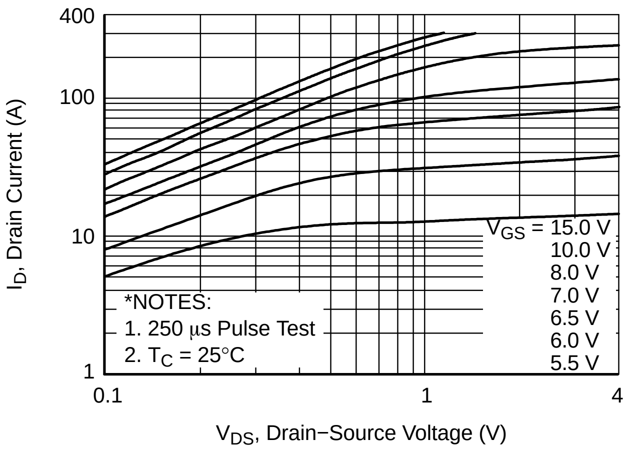


图 1. 导通区域特性

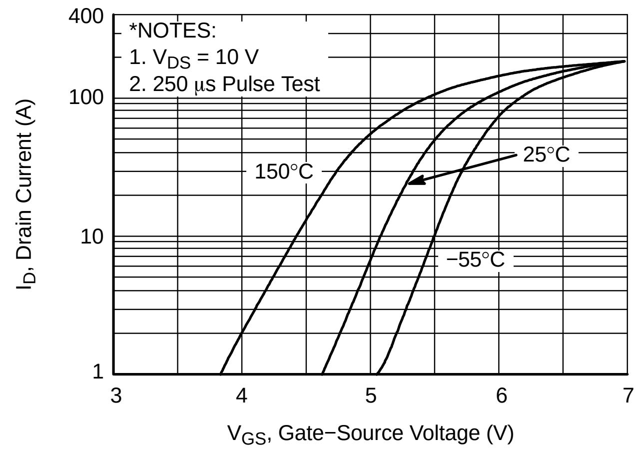


图 2. 传输特性

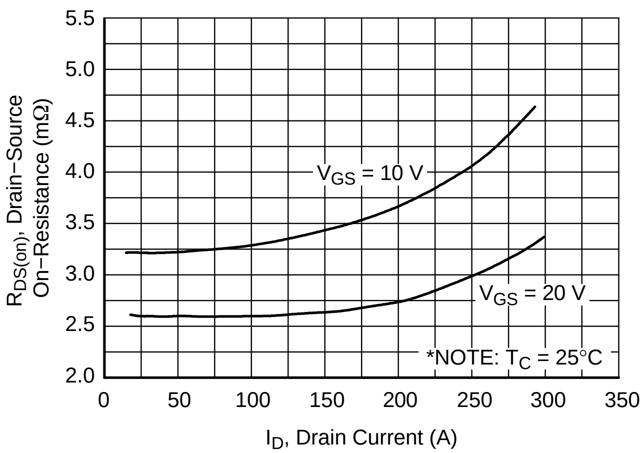


图 3. 导通电阻变化与漏极电流和栅极电压

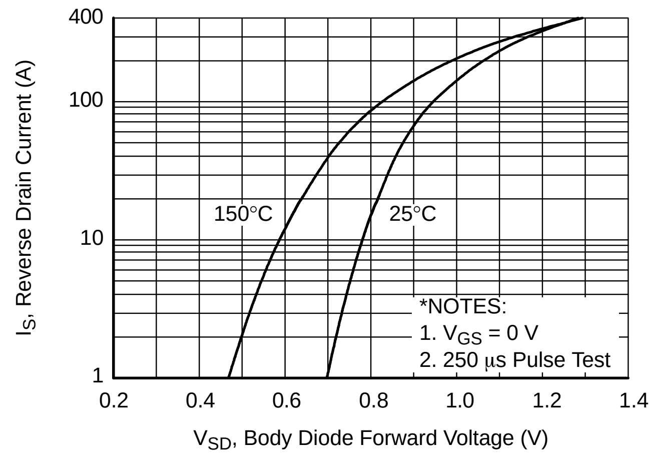


图 4. 体二极管正向电压变化与源极电流和温度

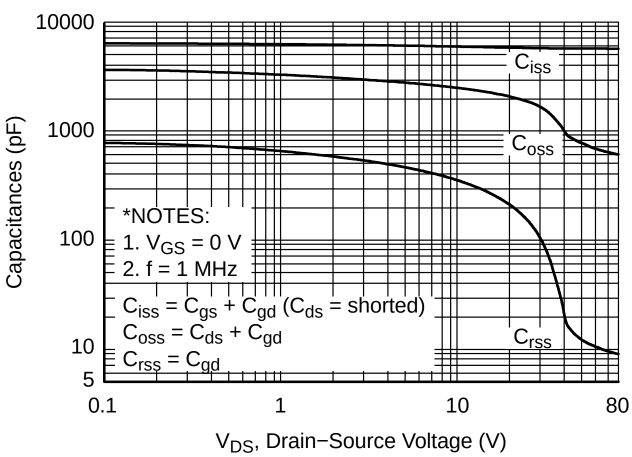


图 5. 电容特性

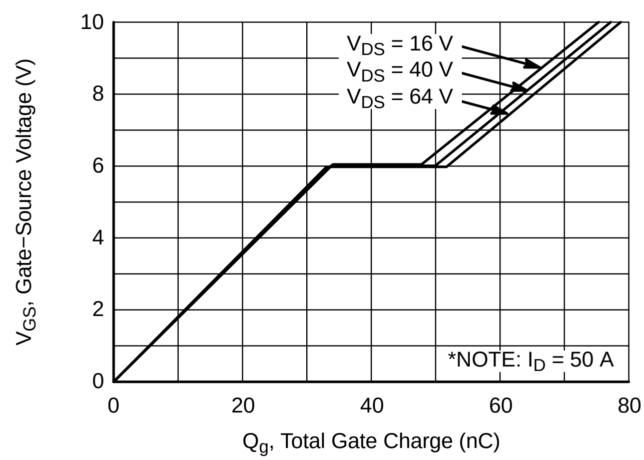


图 6. 栅极电荷

典型性能特征 (接上页)

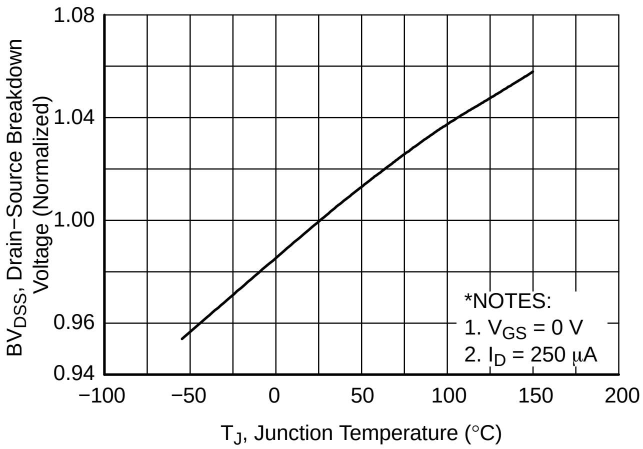


图 7. 击穿电压变化与温度

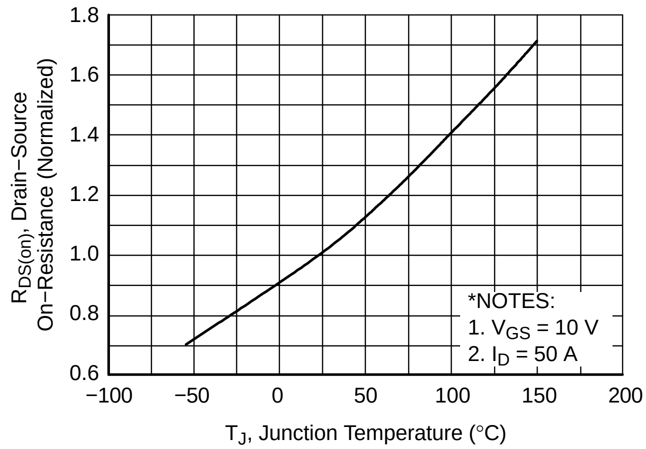


图 8. 导通电阻变化与温度

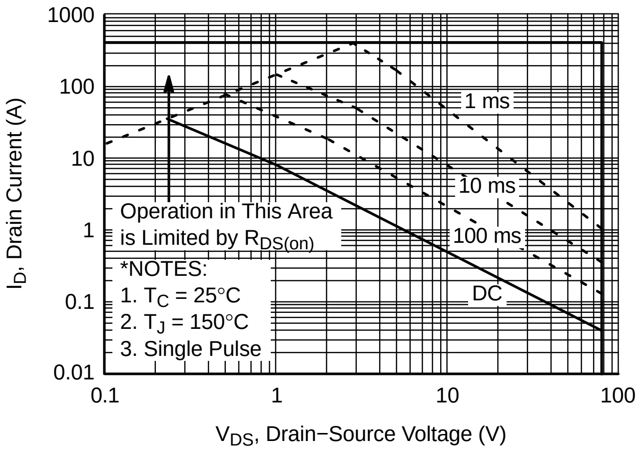


图 9. 最大安全工作区

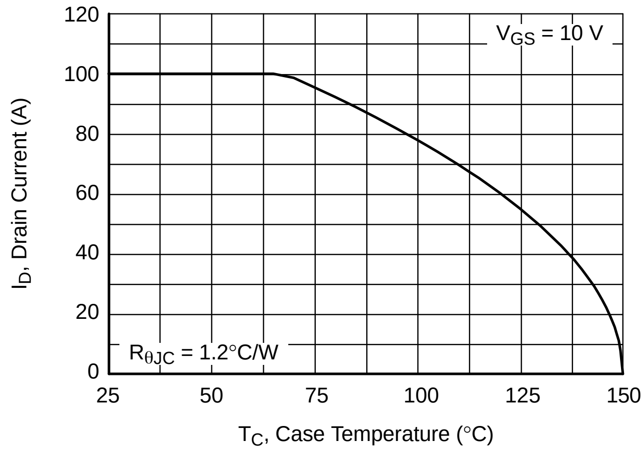


图 10. 最大漏极电流与外壳温

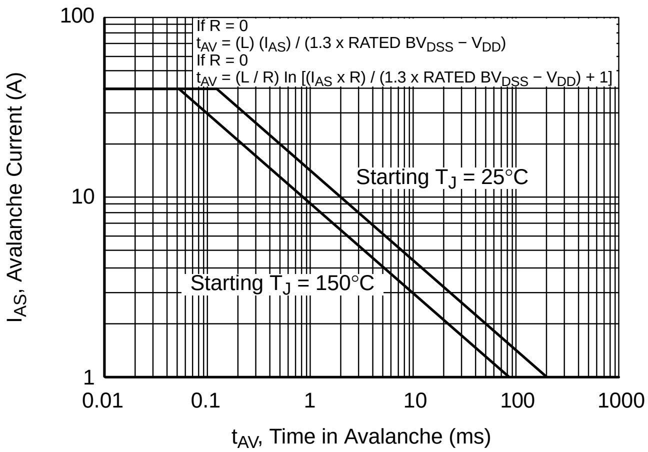


图 11. 非箝位电感开关能力

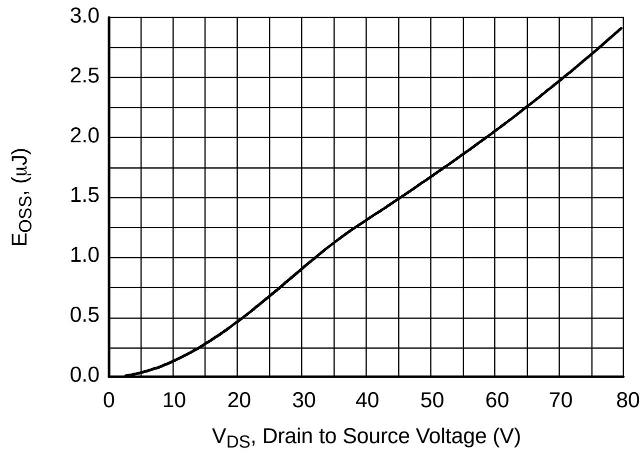


图 12. 输出电容 (Eoss) 与漏极−源极电压

典型性能特征 (接上页)

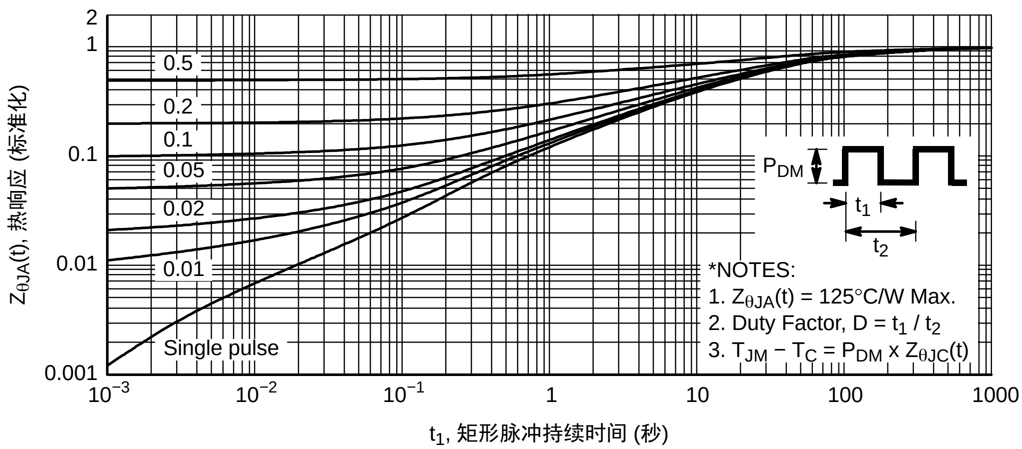


图 13. 瞬态热响应曲线

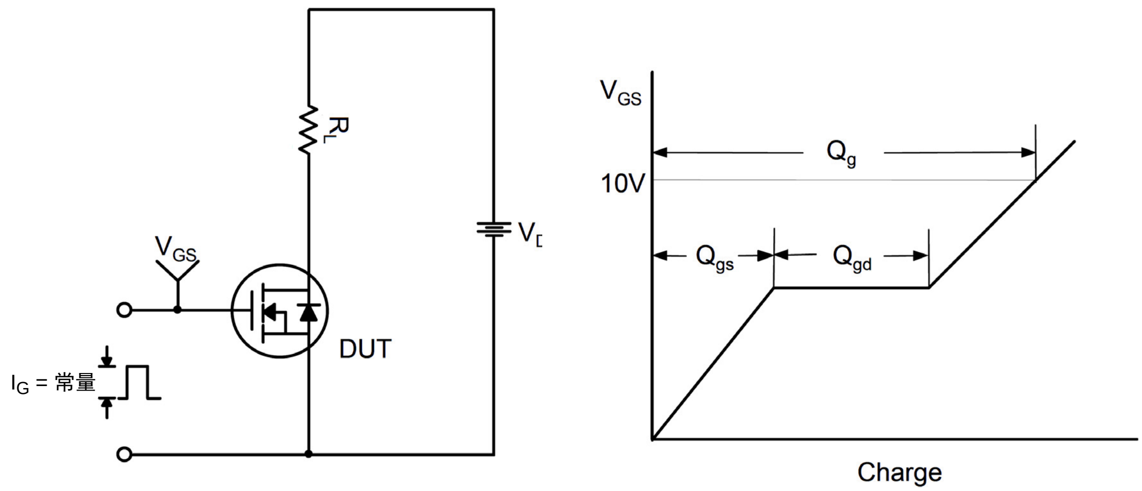


图 14. 栅极电荷测试电路与波形

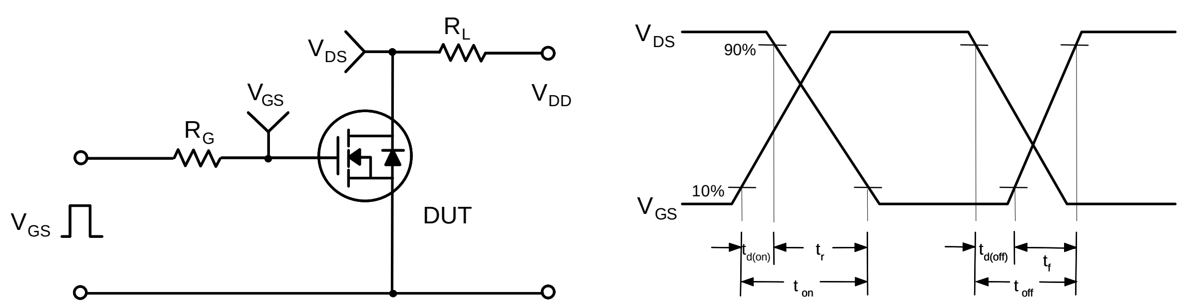


图 15. 阻性开关测试电路与波形

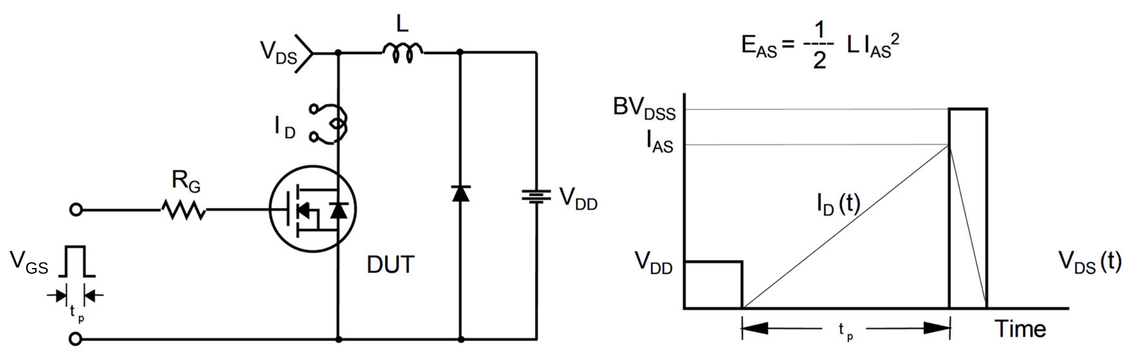


图 16. 非箝位电感开关测试电路与波形

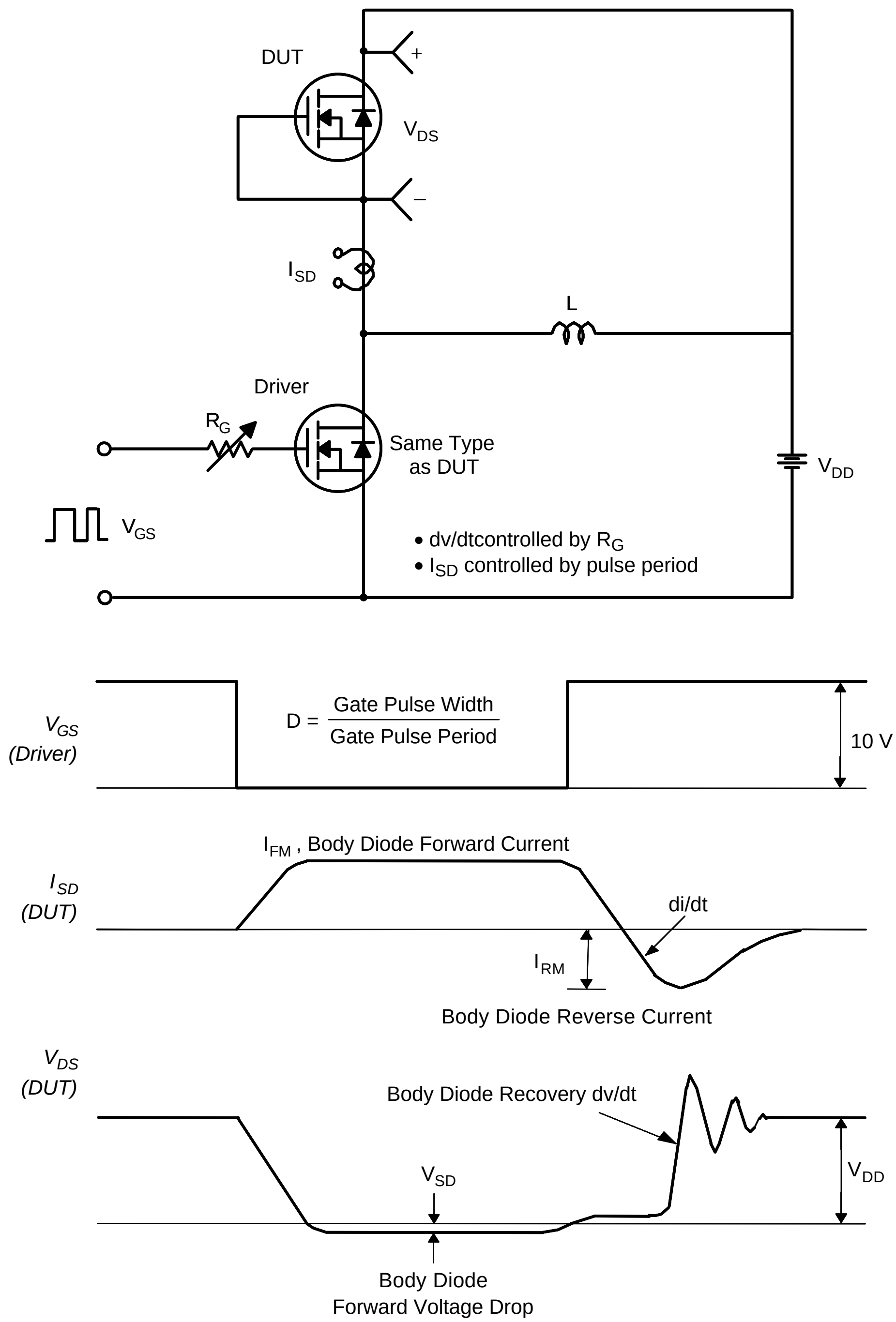
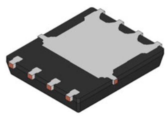


图 17. 二极管恢复 dv/dt 峰值测试电路与波形

封装标识与定购信息

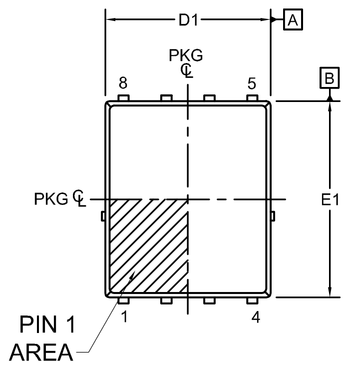
器件	器件标识	封装	卷尺寸	带宽	Shipping†
FDMS039N08B	FDMS039N08B	PQFN8 5X6, 1.27P (Power 56) (Pb−Free, Halide Free)	13”	12 毫米	3000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

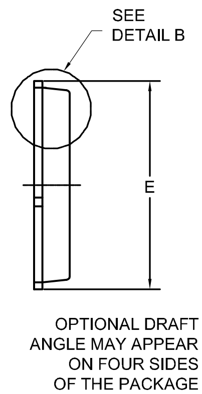


PQFN8 5X6, 1.27P
CASE 483AE
ISSUE C

DATE 21 JAN 2022

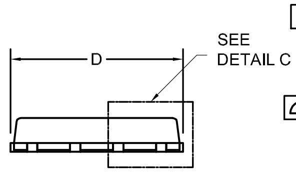


TOP VIEW

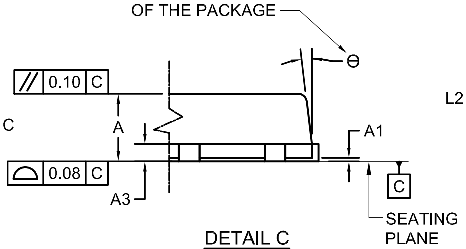


NOTES:

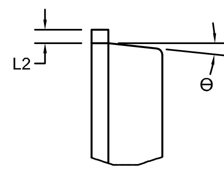
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
4. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
5. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT ON THE PACKAGE BODY.
6. IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP OUT AREA.



SIDE VIEW

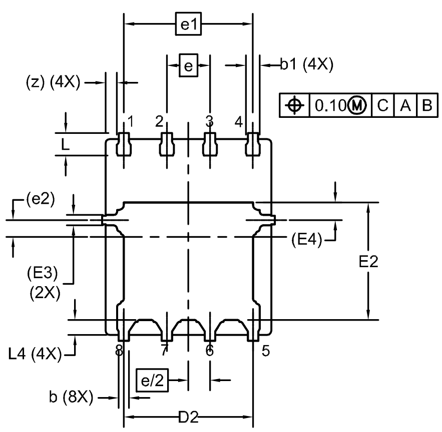


DETAIL C
SCALE: 2:1

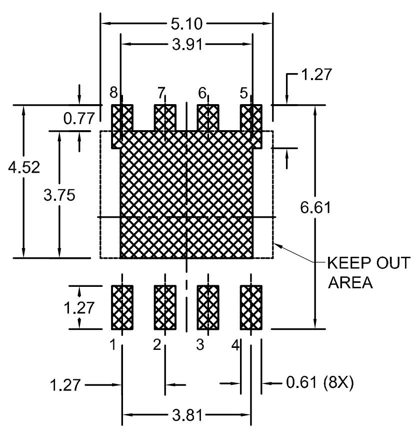


DETAIL B
SCALE: 2:1

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0.00	-	0.05
b	0.21	0.31	0.41
b1	0.31	0.41	0.51
A3	0.15	0.25	0.35
D	4.90	5.00	5.20
D1	4.80	4.90	5.00
D2	3.61	3.82	3.96
E	5.90	6.15	6.25
E1	5.70	5.80	5.90
E2	3.38	3.48	3.78
E3	0.30 REF		
E4	0.52 REF		
e	1.27 BSC		
e/2	0.635 BSC		
e1	3.81 BSC		
e2	0.50 REF		
L	0.51	0.66	0.76
L2	0.05	0.18	0.30
L4	0.34	0.44	0.54
z	0.34 REF		
Θ	0°	-	12°



BOTTOM VIEW



LAND PATTERN
RECOMMENDATION

*FOR ADDITIONAL INFORMATION ON OUR PB-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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DESCRIPTION:	PQFN8 5X6, 1.27P	PAGE 1 OF 1

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales

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