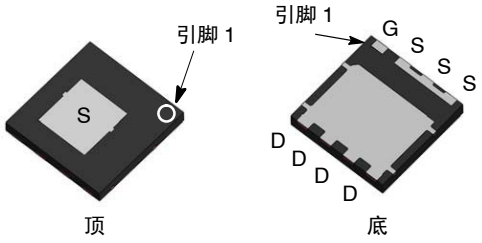
MOSFET – N-Channel, POWERTRENCH®, DUAL COOL® 88

150 V, 99 A, 6.5 mΩ

FDMT800150DC

V_{DS}	$r_{DS(on)}$ MAX	I_D MAX
150 V	6.5 mΩ @ 10 V	99 A
	8.4 mΩ @ 6 V	



PQFN8 8X8, 2P
(Dual Cool 88)
CASE 483AQ

概述

此 N 沟道 MOSFET 采用 **onsemi** 先进的 POWERTRENCH 工艺生产。先进的硅技术和 DUAL COOL 封装技术完美融合，可在提供最小 $r_{DS(on)}$ 的同时通过极低的结至环境热阻保持卓越的开关性能。

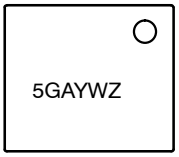
特性

- 最大值 $r_{DS(on)}$ = 6.5 mΩ (V_{GS} = 10 V, I_D = 15 A)
- 最大值 $r_{DS(on)}$ = 8.4 mΩ (V_{GS} = 6 V, I_D = 13 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
- 薄型 8x8 mm MLP 封装
- MSL1 强健封装设计
- 100% 经过 UIL 测试
- 此器件不含铅, 无卤, 符合 RoHS 标准

应用

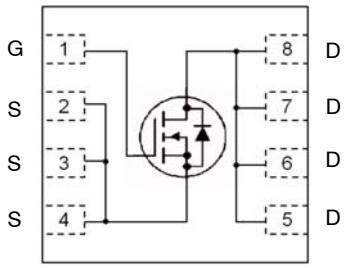
- OringFET / 负载开关
- 同步整流
- DC–DC 转换

MARKING DIAGRAM



5G	= Device Code
A	= Assembly Plant Code
YW	= Date Code
Z	= Traceability Code

ELECTRICAL CONNECTION



N-Channel MOSFET

ORDERING INFORMATION

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

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				150	V
V_{GS}	栅极—源极电压				±20	V
I_D	漏极电流	— 连接	T_C = 25°C	(注 5)	99	A
		— 连续	T_C = 100°C	(注 5)	62	
		— 连续	T_A = 25°C	(注 1a)	15	
		— 脉冲		(注 4)	561	
E_{AS}	单脉冲雪崩能量			(注 3)	1093	mJ
P_D	功耗		T_C = 25°C		156	W
	功耗		T_A = 25°C	(注 1a)	3.2	
T_J, T_{STG}	工作和保存结温范围				–55 to +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。

热特性

符号	参数		额定值	单位
$R_{\theta JC}$	结至外壳热阻	(顶部源极)	1.6	°C/W
$R_{\theta JC}$	结至外壳热阻	(底部源极)	0.8	
$R_{\theta JA}$	结至环境热阻	(注 1a)	38	
$R_{\theta JA}$	结至环境热阻	(注 1b)	81	
$R_{\theta JA}$	结至环境热阻	(注 1i)	15	
$R_{\theta JA}$	结至环境热阻	(注 1j)	21	
$R_{\theta JA}$	结至环境热阻	(注 1k)	9	

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						
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，参考 25°C	–	110	–	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						
$V_{GS(th)}$	栅极至源极阈值电压	V_{GS} = V_{DS}, I_D = 250 μA	2.0	3.0	4.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	栅极至源极阈值电压温度系数	I_D = 250 μA，参考 25°C	–	–12	–	mV/°C
$r_{DS(on)}$	漏极至源极静态导通电阻	V_{GS} = 10 V, I_D = 15 A	–	5.4	6.5	mΩ
		V_{GS} = 6 V, I_D = 13 A	–	6.6	8.4	
		V_{GS} = 10 V, I_D = 15 A, T_J = 125°C	–	11	13	
g_{FS}	正向跨导	V_{DS} = 5 V, I_D = 15 A	–	48	–	S
动态特性						
C_{iss}	输入电容	V_{DS} = 75 V, V_{GS} = 0 V, f = 1 MHz	–	5860	8205	pF
C_{oss}	输出电容		–	520	730	pF
C_{rss}	反向传输电容		–	17	30	pF
R_g	栅极阻抗		0.1	1.4	3.5	Ω
开关特性						
$td_{(on)}$	导通延迟时间	V_{DD} = 75 V, I_D = 15 A, V_{GS} = 10 V, R_{GEN} = 6 Ω	–	31	50	ns
t_r	上升时间		–	16	29	ns
$t_{d(off)}$	关断延迟时间		–	41	66	ns
t_f	下降时间		–	9.3	19	ns
$Q_{g(TOT)}$	总栅极电荷	V_{GS} = 0 V 至 10 V, V_{DD} = 75 V, I_D = 15 A	–	77	108	nC
		V_{GS} = 0 V 至 6 V, V_{DD} = 75 V, I_D = 15 A	–	49	69	
Q_{gs}	栅极—源极电荷	V_{DD} = 75 V, I_D = 15 A	–	25	–	nC
Q_{gd}	栅极—漏极“米勒”电荷		–	14	–	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 = 2.9 A (注 2)	–	0.7	1.1	V
		V_{GS} = 0 V, I_S = 15 A (注 2)	–	0.8	1.2	
t_{rr}	反向恢复时间	I_F = 15 A, di/dt = 100 A/μs	–	103	165	ns
Q_{rr}	反向恢复电荷		–	233	373	nC

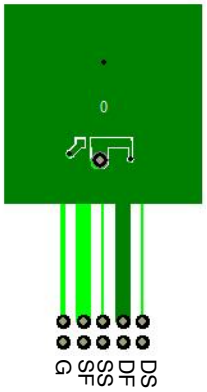
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
(参考译文)
除非另有说明，“电气特性”表格中列出的是所列测试条件下的产品性能参数。如果在不同条件下运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

热特性

符号	参数	额定值	单位
$R_{\theta JC}$	结至外壳热阻 (顶部源极)	1.6	°C/W
$R_{\theta JC}$	结至外壳热阻 (底部源极)	0.8	
$R_{\theta JA}$	结至环境热阻 (注 1a)	38	
$R_{\theta JA}$	结至环境热阻 (注 1b)	81	
$R_{\theta JA}$	结至环境热阻 (注 1c)	26	
$R_{\theta JA}$	结至环境热阻 (注 1d)	34	
$R_{\theta JA}$	结至环境热阻 (注 1e)	14	
$R_{\theta JA}$	结至环境热阻 (注 1f)	16	
$R_{\theta JA}$	结至环境热阻 (注 1g)	26	
$R_{\theta JA}$	结至环境热阻 (注 1h)	60	
$R_{\theta JA}$	结至环境热阻 (注 1i)	15	
$R_{\theta JA}$	结至环境热阻 (注 1j)	21	
$R_{\theta JA}$	结至环境热阻 (注 1k)	9	
$R_{\theta JA}$	结至环境热阻 (注 1l)	11	

注：

1. $R_{\theta JA}$ 通过安装在 FR-4 电路板上的器件确定，该电路板使用指定的 2 oz 铜焊盘，如下图所示。 $R_{\theta JA}$ 由用户的电路板设计确定。



a）38°C/W (安装于 a 1 平方英寸 2 oz 铜焊盘)

b）81°C/W (安装于最小 2 oz 铜焊盘)

c）静止空气，20.9 x 10.4 x 12.7 mm 铝质散热器，1 平方英寸 2 oz 铜焊盘

d）静止空气，20.9 x 10.4 x 12.7 mm 铝质散热器，最小 2 oz 铜焊盘

e）静止空气，45.2 x 41.4 x 11.7 mm Aavid Thermalloy 器件号 10-L41B-11 散热器，1 平方英寸 2 oz 铜焊盘

f）静止空气，45.2 x 41.4 x 11.7 mm Aavid Thermalloy 器件号 10-L41B-11 散热器，最小 2 oz 铜焊盘

g）200FPM 气流，无散热器，1 平方英寸 2 oz 铜焊盘

h）200FPM 气流，无散热器，最小 2 oz 铜焊盘

i）200FPM 气流，20.9 x 10.4 x 12.7 mm 铝质散热器，1 平方英寸 2 oz 铜焊盘

j）200FPM 气流，20.9 x 10.4 x 12.7 mm 铝质散热器，最小 2 oz 铜焊盘

k）200FPM 气流，45.2 x 41.4 x 11.7 mm Aavid Thermalloy 器件号 10-L41B-11 散热器，1 平方英寸 2 oz 铜焊盘

l）200FPM 气流， 45.2 x 41.4 x 11.7 mm Aavid Thermalloy 器件号 10-L41B-11 散热器，最小 2 oz 铜焊盘

2. 脉冲测试：脉冲宽度：< 300 ms，占空比：< 2.0%。
3. E_{AS} 为 1093 mJ，基于起始 T_J = 25°C；N-ch：L = 3 mH、I_{AS} = 27 A、V_{DD} = 150 V、V_{GS} = 10 V。100% 经过测试 (L = 0.1 mH、I_{AS} = 86 A。)
4. 有关脉冲编号的更多详情，请参考图 11 中的 SOA 图形。
5. 计算得到的连续电流仅限于最大结温，实际连续电流将受限于散热以及电气机械应用的电路板设计。

典型特性 (T_J = 25°C，除非另有说明。)

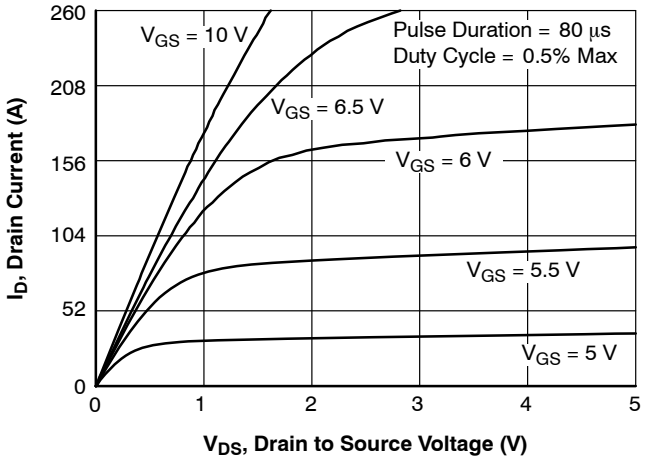


图 1. 通态区域特性

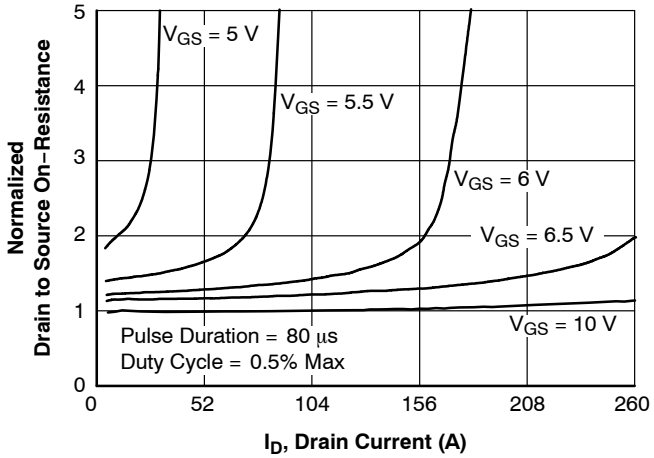


图 2. 标准化导通电阻与漏极电流和栅极电压的关系

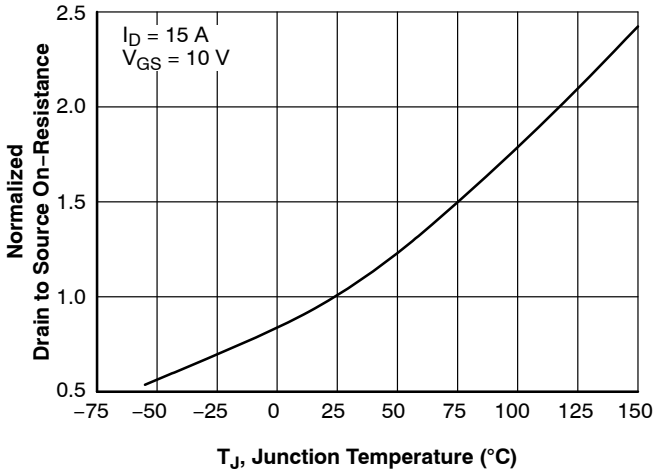


图 3. 标准化导通电阻与结温的关系

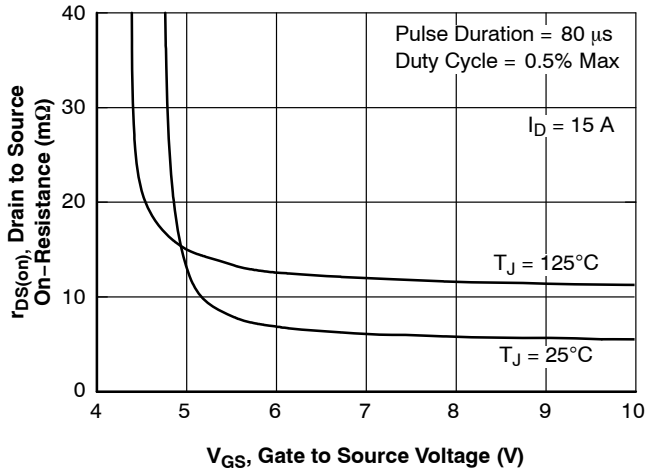


图 4. 导通电阻与栅极—源极电压的关系

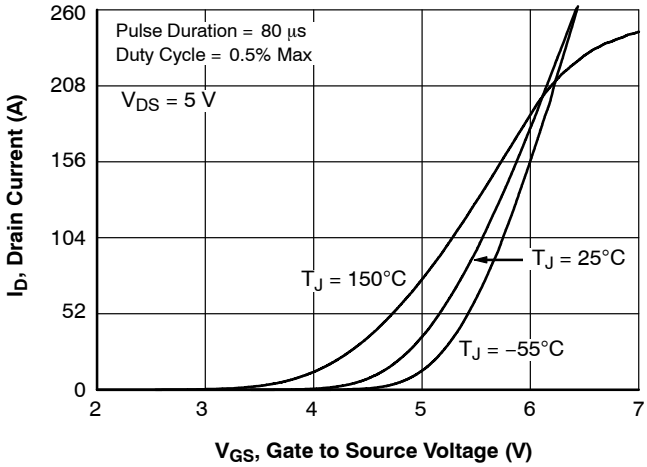


图 5. 传输特性

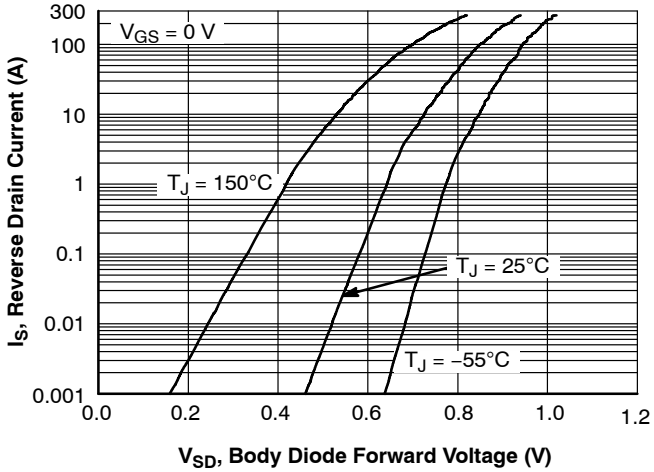


图 6. 源极—漏极二极管正向电压与源极电流的关系

典型特性 (T_J = 25°C，除非另有说明。) (continued)

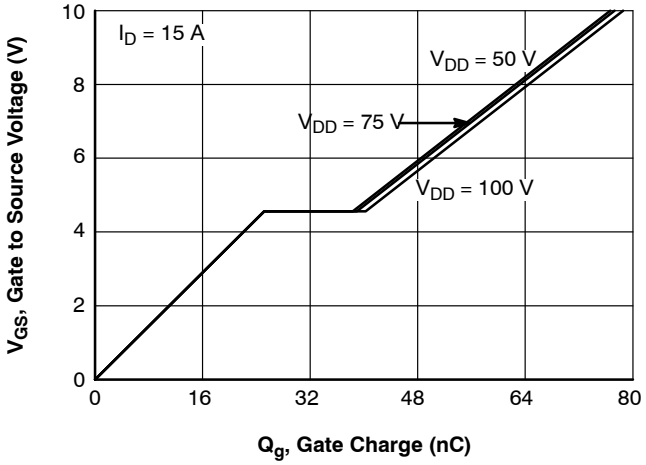


图 7. 栅极电荷特性

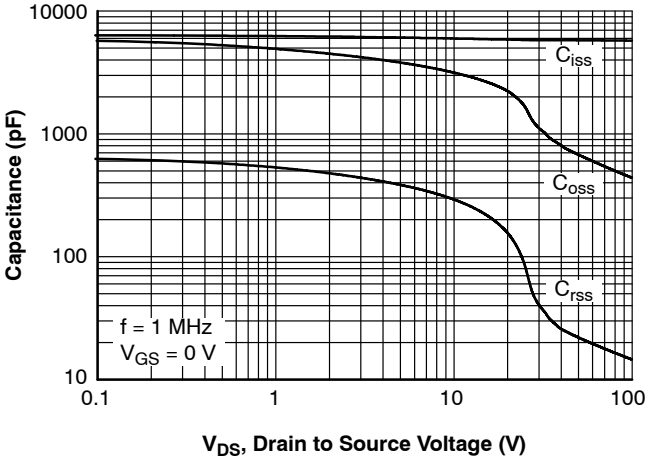


图 8. 电容与漏极—源极电压的关系

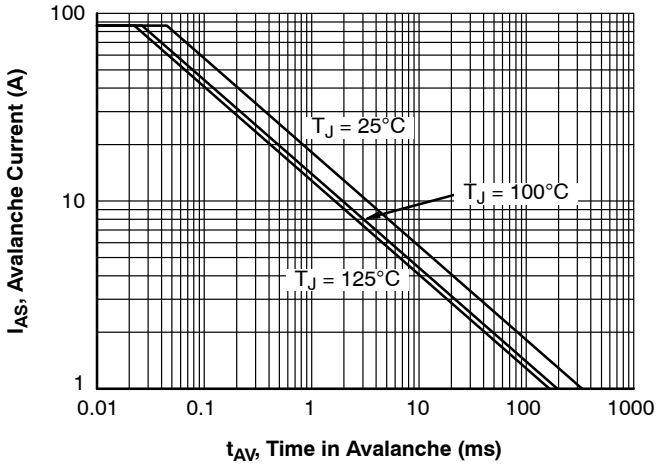


图 9. 非箝位电感开关能力

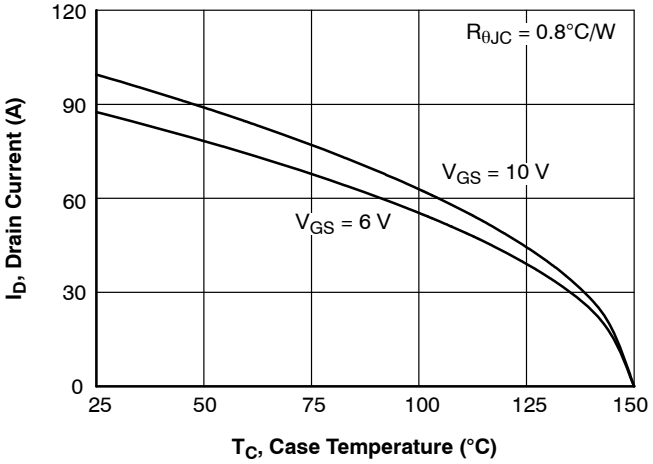


图 10. 最大连续漏极电流与壳温的关系

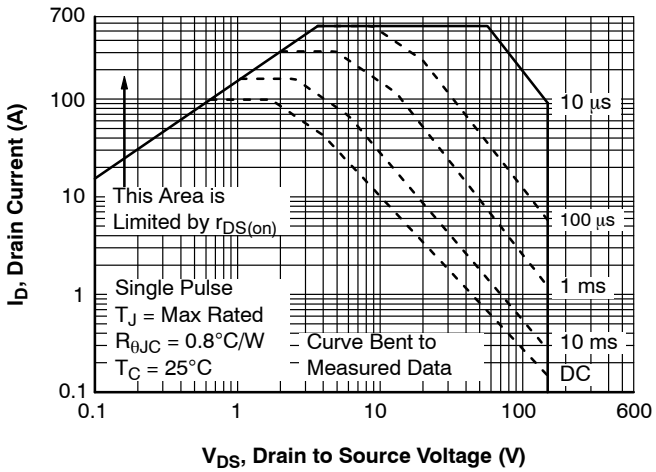


图 11. 正向偏压安全工作区

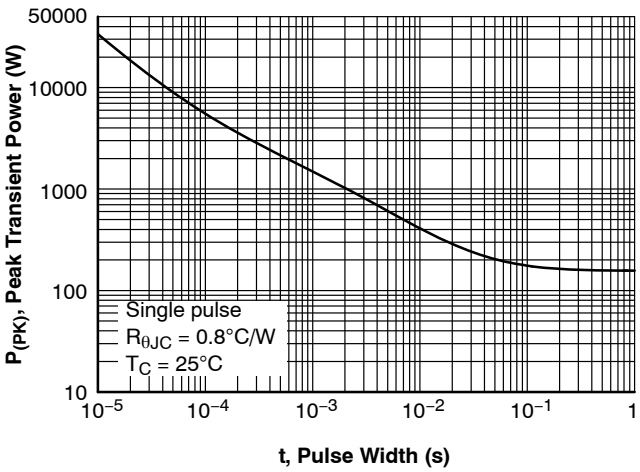


图 12. 单个脉冲最大功耗

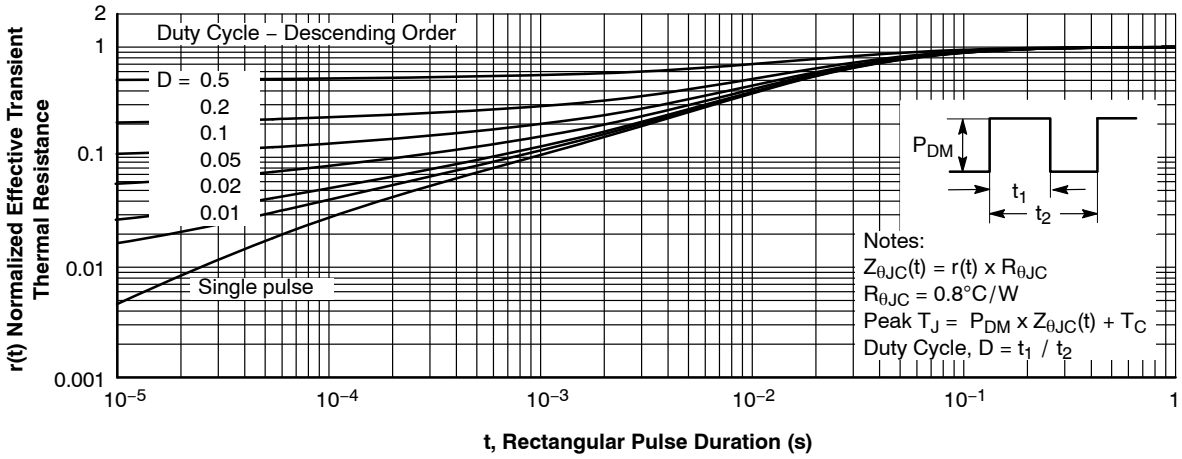


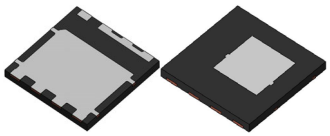
图 13. 结至外壳瞬态热响应曲线

封装标识与定购信息

器件标识	器件	封装形式	卷盘大小	透明封带宽度	Shipping†
800150DC	FDMT800150DC	PQFN8 8X8, 2P, DUAL COOL 88		13.3 mm	3000 颗/卷

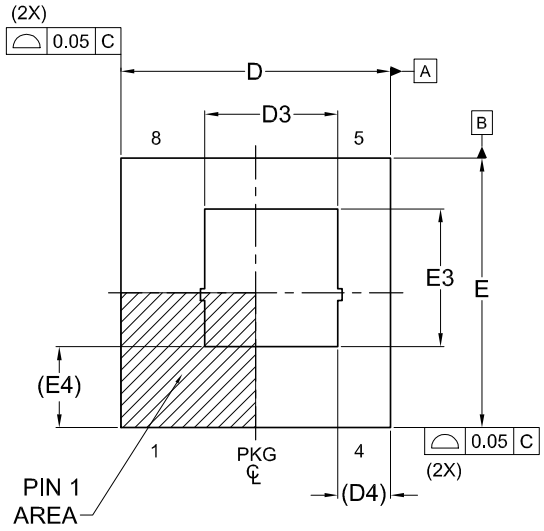
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

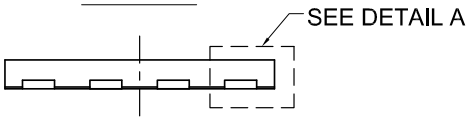


PQFN8 8X8, 2P
CASE 483AQ
ISSUE B

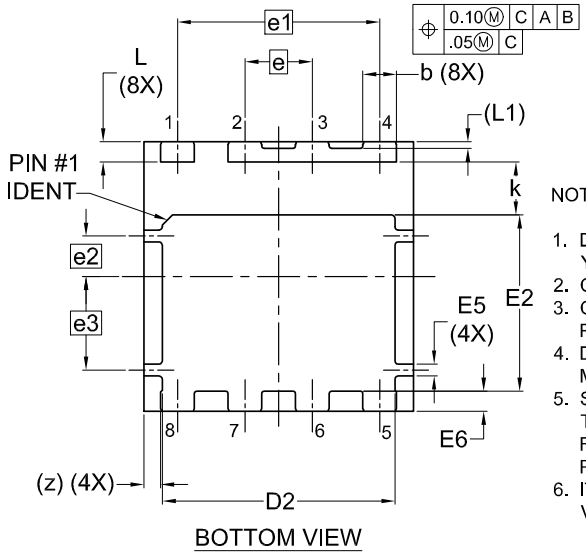
DATE 24 OCT 2022



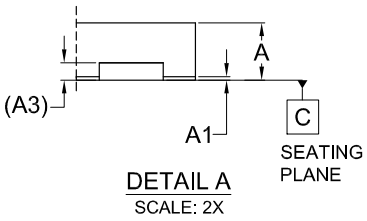
TOP VIEW



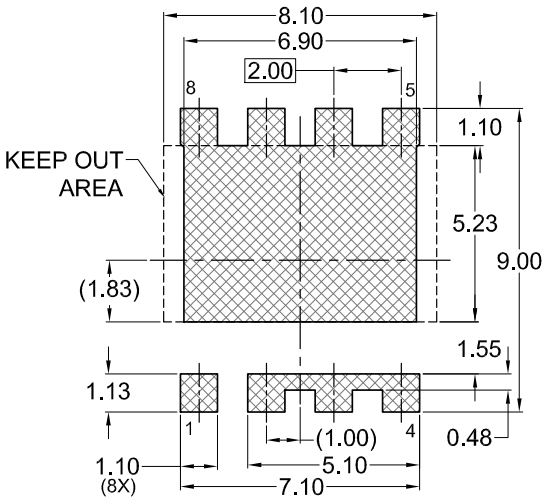
FRONT VIEW



BOTTOM VIEW



DETAIL A
SCALE: 2X



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.

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.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.75	0.85	0.95
A1	0.00	-	0.05
A3	0.25 REF		
b	0.90	1.00	1.10
D	7.90	8.00	8.10
D2	6.80	6.90	7.00
D3	3.68	3.86	4.03
D4	1.56 REF		
E	7.90	8.00	8.10
E2	5.13	5.23	5.33
E3	3.99	4.09	4.19
E4	2.41 REF		
E5	0.35 REF		
E6	0.60 REF		
e	2.00 BSC		
e1	6.00 BSC		
e2	1.20 BSC		
e3	2.78 BSC		
k	1.48	1.58	1.68
L	0.50	0.60	0.70
L1	0.20 REF		
z	0.50 REF		

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DESCRIPTION:	**PQFN8 8X8, 2P**	**PAGE 1 OF 1**

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
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