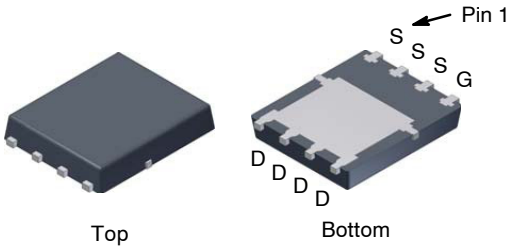
MOSFET – N-Channel, Shielded Gate, POWERTRENCH®

100 V, 81 A, 8 mΩ

FDMS86103L, FDMS86103L-NC



PQFN8 5x6, 1.27P
(Power 56)
CASE 483AE

General Description

This N-Channel MOSFET is produced using **onsemi**'s advanced POWERTRENCH process that incorporates Shielded Gate technology. This process has been optimized for the on-state resistance and yet maintain superior switching performance.

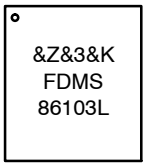
Features

- Shielded Gate MOSFET Technology
- Max $R_{DS(on)}$ = 8 mΩ at V_{GS} = 10 V, I_D = 12 A
- Max $R_{DS(on)}$ = 11 mΩ at V_{GS} = 4.5 V, I_D = 10 A
- Advanced Package and Silicon Combination for Low $R_{DS(on)}$ and High Efficiency
- MSL1 Robust Package Design
- 100% UIL Tested
- RoHS Compliant

Applications

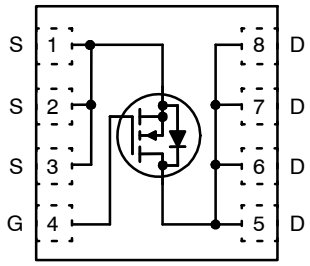
- DC-DC Conversion

MARKING DIAGRAM



&Z	= Assembly Plant Code
&3	= 3-Digit Date Code Format
&K	= 2-Digits Lot Run Traceability Code
FDMS86103L	= Specific Device Code

PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

MOSFET MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Symbol	Parameter	Ratings	Unit
V_{DS}	Drain to Source Voltage	100	V
V_{GS}	Gate to Source Voltage	±20	V
I_D	Drain Current: – Continuous T_C = 25 °C (Note 5) – Continuous T_C = 100 °C (Note 5) – Continuous T_A = 25 °C – Pulsed (Note 4)	 81 51 12 414	A
E_{AS}	Single Pulse Avalanche Energy (Note 3)	312	mJ
P_D	Power Dissipation T_C = 25 °C T_A = 25 °C	 104 2.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	−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.

THERMAL CHARACTERISTICS

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.2	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	50	

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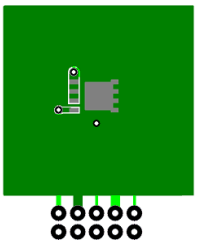
ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	100			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C		68		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V, V_{GS} = 0 V			1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} = ±20 V, V_{DS} = 0 V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 250 μA	1.0	1.9	3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C		−7		mV/°C
$R_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 12 A		6.4	8	mΩ
		V_{GS} = 4.5 V, I_D = 10 A		8.4	11	
		V_{GS} = 10 V, I_D = 12 A, T_J = 125 °C		10.6	14	
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 12 A		59		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz		2790	3710	pF
C_{oss}	Output Capacitance			469	625	pF
C_{rss}	Reverse Transfer Capacitance			22	35	pF
R_g	Gate Resistance		0.1	1.3		Ω
SWITCHING CHARACTERISTICS						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 50 V, I_D = 12 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		13	23	ns
t_r	Rise Time			7.2	15	ns
$t_{d(off)}$	Turn-Off Delay Time			35	57	ns
t_f	Fall Time			6	13	ns
Q_g	Total Gate Charge	V_{GS} = 0 V to 10 V, V_{DD} = 50 V, I_D = 12 A		43	60	nC
Q_g	Total Gate Charge	V_{GS} = 0 V to 5 V, V_{DD} = 50 V, I_D = 12 A		23	32	nC
Q_{gs}	Gate to Source Charge	V_{DD} = 50 V, I_D = 12 A		7.5		nC
Q_{gd}	Gate to Drain “Miller” Charge			7		nC
DRAIN-SOURCE DIODE CHARACTERISTICS						
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 2 A (Note 2)		0.70	1.2	V
		V_{GS} = 0 V, I_S = 12 A (Note 2)		0.78	1.3	
t_{rr}	Reverse Recovery Time	I_F = 12 A, di/dt = 100 A/μs		57	90	ns
Q_{rr}	Reverse Recovery Charge			68	108	nC

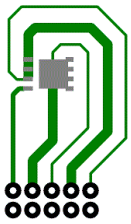
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

NOTES:

1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user’s board design.



a) 50 °C/W when mounted on a 1 in^2 pad of 2 oz copper.



b) 125 °C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0%.
3. Starting T_J = 25 °C, L = 1 mH, I_{AS} = 25 A, V_{DD} = 90 V, V_{GS} =10 V.
4. Pulsed I_D please refer to Figure 11 SOA graph for more details.
5. Computed continuous current limited to Max Junction Temperature only, actual continuous current will be limited by thermal & electro-mechanical application board design.

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TYPICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

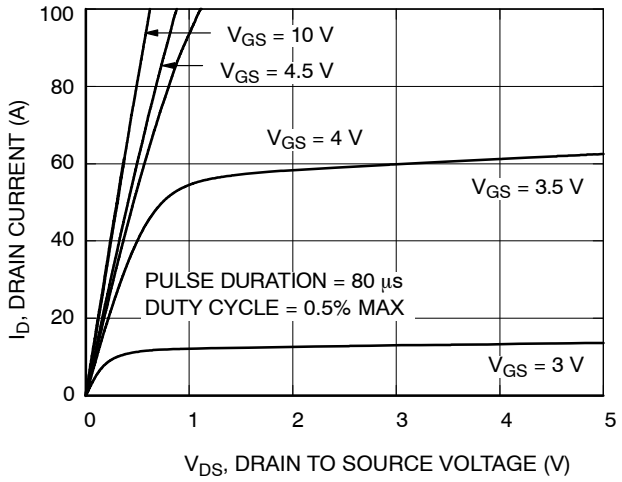


Figure 1. On-Region Characteristics

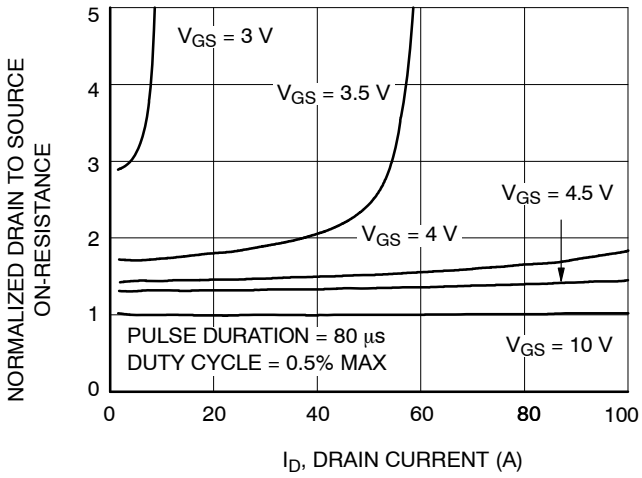


Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage

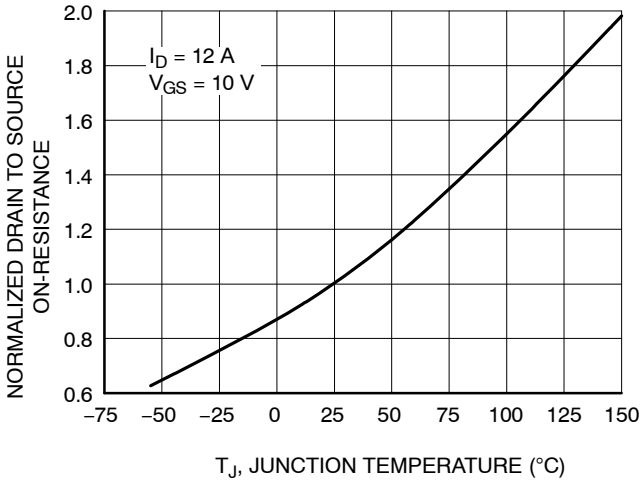


Figure 3. Normalized On-Resistance vs. Junction Temperature

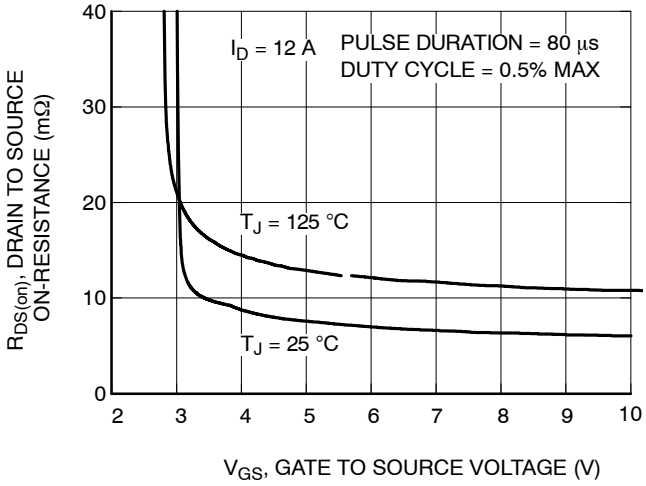


Figure 4. On-Resistance vs. Gate to Source Voltage

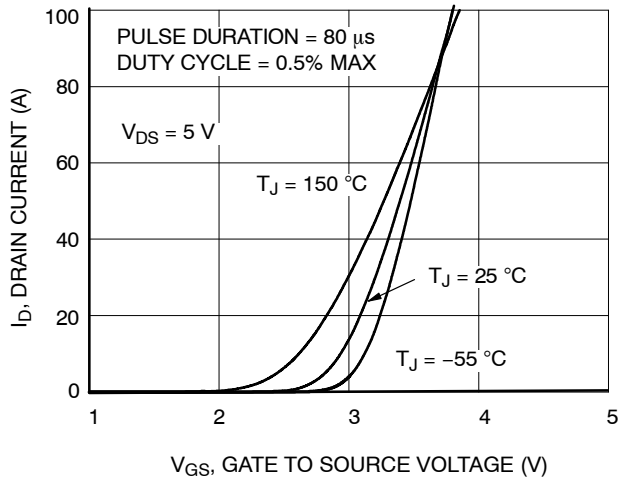


Figure 5. Transfer Characteristics

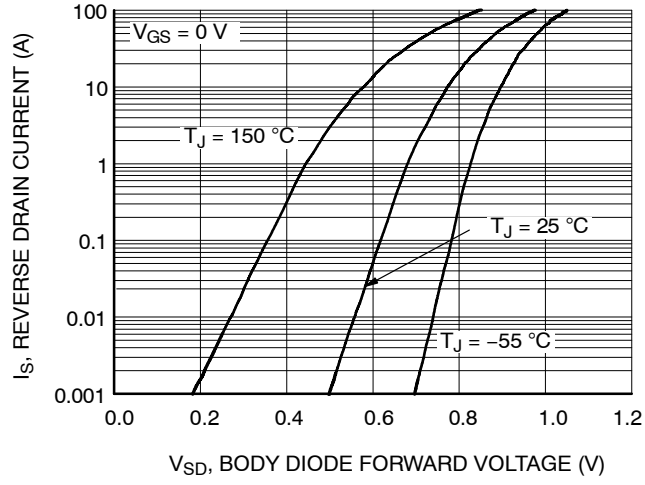


Figure 6. Source to Drain Diode Forward Voltage vs. Source Current

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TYPICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted) (continued)

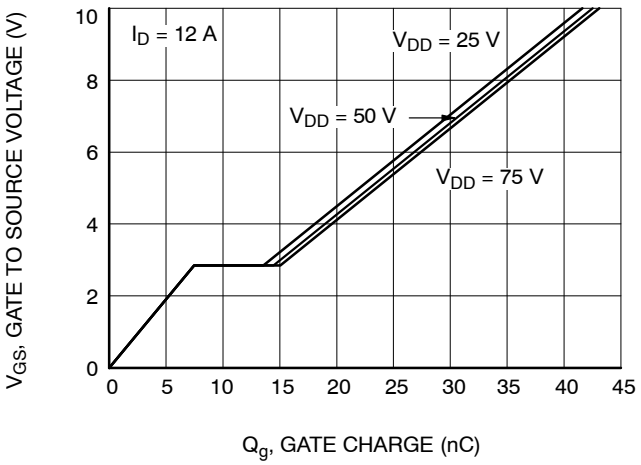


Figure 7. Gate Charge Characteristics

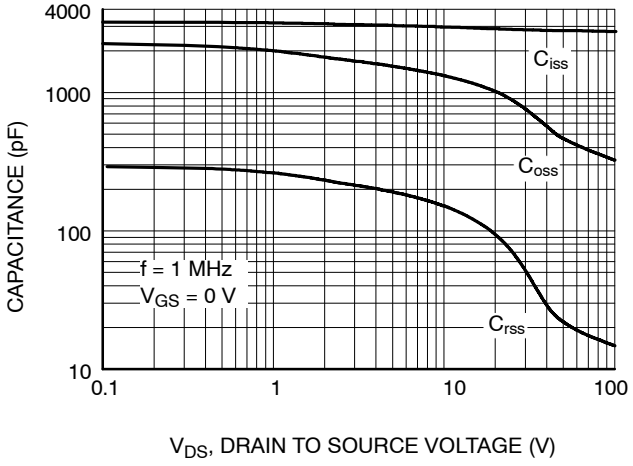


Figure 8. Capacitance vs. Drain to Source Voltage

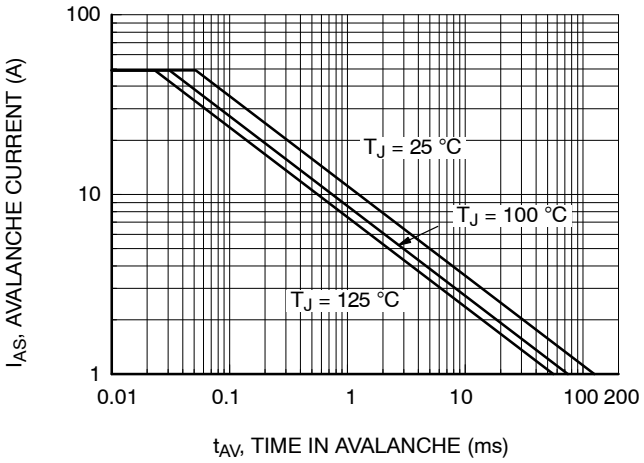


Figure 9. Unclamped Inductive Switching Capability

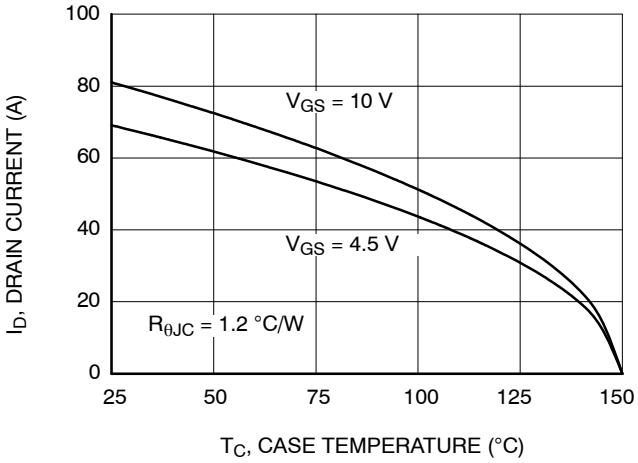


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

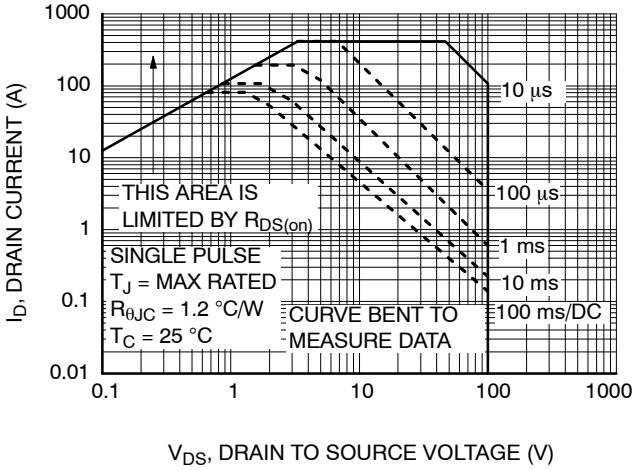


Figure 11. Forward Bias Safe Operating Area

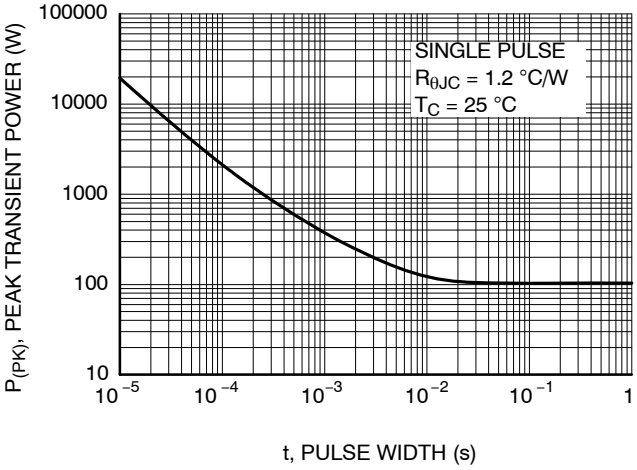


Figure 12. Single Pulse Maximum Power Dissipation

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TYPICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted) (continued)

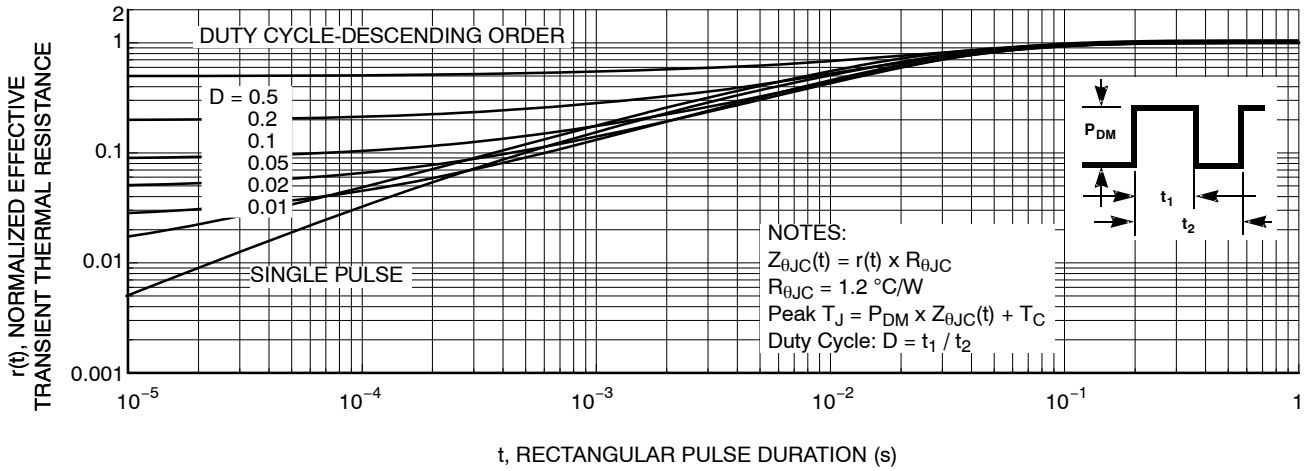


Figure 13. Junction-to-Ambient Transient Thermal Response Curve

PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package	Reel Size	Tape Width	Shipping†
FDMS86103L	FDMS86103L	Power 56 (PQFN8)	13”	12 mm	3,000 / Tape & Reel
FDMS86103L-NC					

† 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.

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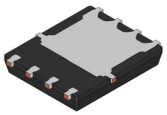
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REVISION HISTORY

Revision	Description of Changes	Date
2	Document converted to **onsemi** format. Added FDMS86103L-NC device.	9/29/2026

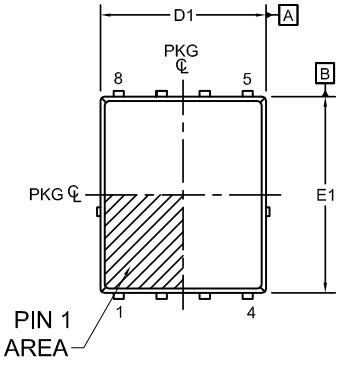
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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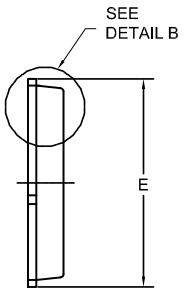


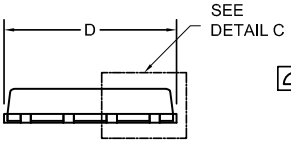
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CASE 483AE
ISSUE C

DATE 21 JAN 2022

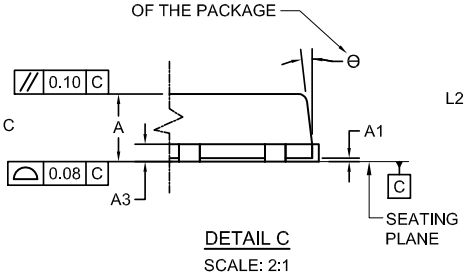


TOP VIEW

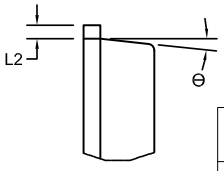




SIDE VIEW



DETAIL C
SCALE: 2:1

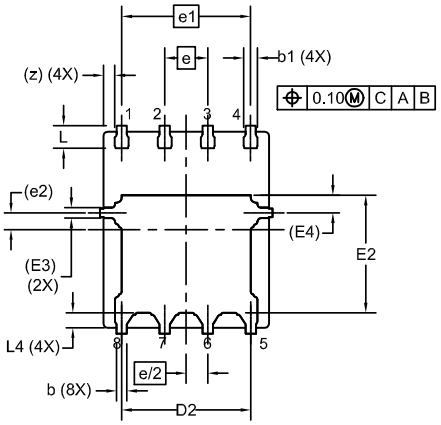


DETAIL B
SCALE: 2:1

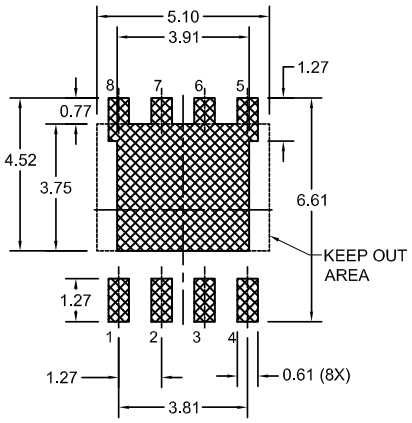
NOTES:

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	0.90	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
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DESCRIPTION:	**PQFN8 5X6, 1.27P**		**PAGE 1 OF 1**

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Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

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