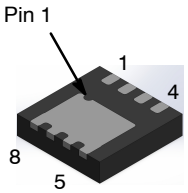
MOSFET – N-Channel Shielded Gate, POWERTRENCH®

150 V, 16 A, 51 mΩ

FDMC86240



WDFN-8
CASE 511DH

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.

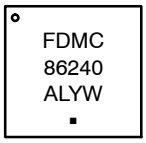
Features

- Shielded Gate MOSFET Technology
- Max $r_{DS(on)}$ = 51 mΩ at V_{GS} = 10 V, I_D = 4.6 A
- Max $r_{DS(on)}$ = 70 mΩ at V_{GS} = 6 V, I_D = 3.9 A
- Low Profile - 1 mm Max in Power 33
- 100% UIL Tested
- ROHS Compliant

Applications

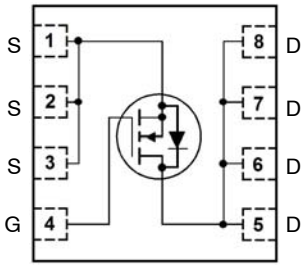
- DC-DC Conversion

FDMC86240 MARKING DIAGRAM



FDMC86240	= Device Code
A	= Assembly Site
L	= Wafer Lot Number
YW	= Year Workweek
▪	= Pb-Free Package

PIN ASSIGNMENT



ORDERING INFORMATION

See detailed ordering and shipping information on page 6 of this data sheet.

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

Symbol	Parameter			Ratings	Unit
V_{DS}	Drain to Source Voltage			−150	V
V_{GS}	Gate to Source Voltage			±20	V
I_D	Drain Current	Continuous	T_C = 25 °C	16	A
		Continuous	T_A = 25 °C (Note 1a)	4.6	
		Pulsed		20	
E_{AS}	Single Pulse Avalanche Energy (Note 3)			34	mJ
P_D	Power Dissipation		T_C = 25 °C	40	W
	Power Dissipation		T_A = 25 °C (Note 1a)	2.3	
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	3.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1a)	53	

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	150			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C		101		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 120 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	2.0	2.9	4.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C		−9		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 4.6 A		44.7	51	mΩ
		V_{GS} = 6 V, I_D = 3.9 A		51.4	70	
		V_{GS} = 10 V, I_D = 4.6 A, T_J = 125 °C		84.5	97	
g_{FS}	Forward Transconductance	V_{DS} = 10 V, I_D = 4.6 A		15		S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 75 V, V_{GS} = 0 V, f = 1 MHz		680	905	pF
C_{oss}	Output Capacitance			79	105	pF
C_{rss}	Reverse Transfer Capacitance			4.3	10	pF
R_g	Gate Resistance			0.5		Ω
SWITCHING CHARACTERISTICS						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 75 V, I_D = 4.6 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		8.2	17	ns
t_r	Rise Time			1.7	10	ns
$t_{d(off)}$	Turn-Off Delay Time			14	26	ns
t_f	Fall Time			3.1	10	ns
$Q_{g(TOT)}$	Total Gate Charge	V_{GS} = 0 V to 10 V, V_{DD} = 75 V, I_D = 4.6 A		11	15	nC
$Q_{g(TOT)}$	Total Gate Charge	V_{GS} = 0 V to 5 V, V_{DD} = 75 V, I_D = 4.6 A		6	9	nC

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

Q_{gs}	Total Gate Charge	V_{DD} = 75 V, I_D = 4.6 A		2.8		nC
Q_{gd}	Gate to Drain “Miller” Charge			2.3		nC

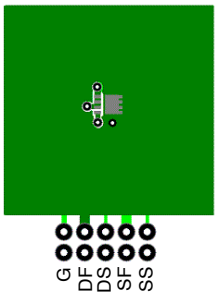
DRAIN-SOURCE DIODE CHARACTERISTICS

V_{SD}	Source-Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 4.6 A (Note 2)		0.79	1.3	V
		V_{GS} = 0 V, I_S = 2 A (Note 2)		0.75	1.2	
t_{rr}	Reverse Recovery Time	I_F = 4.6 A, di/dt = 100 A/μs		58	93	ns
Q_{rr}	Reverse Recovery Charge			63	102	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) 53 °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, N-ch: L = 3 mH, I_{AS} = 4.8 A, V_{DD} = 150 V, V_{GS} = 10 V.

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TYPICAL CHARACTERISTICS

(T_J = 25 °C unless otherwise noted)

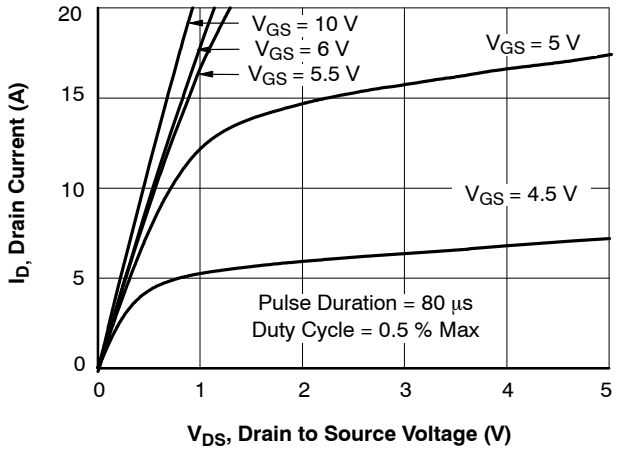


Figure 1. On-Region Characteristics

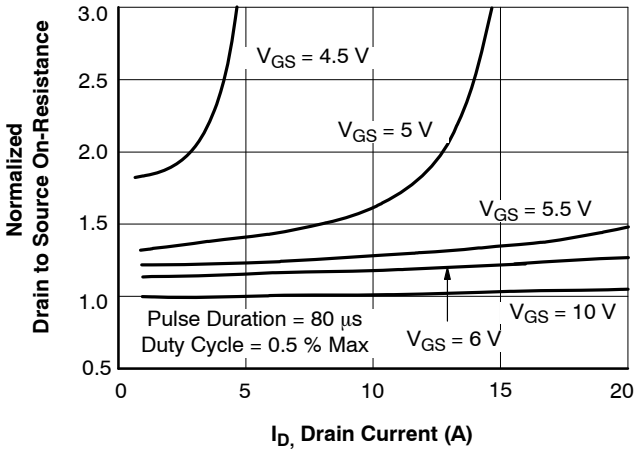


Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage

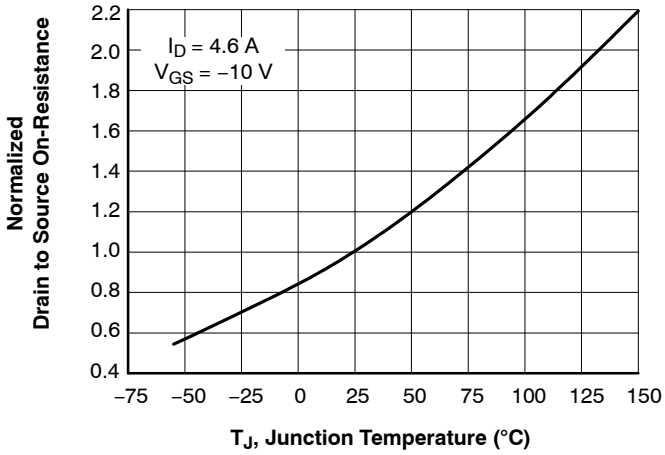


Figure 3. Normalized On-Resistance vs. Junction Temperature

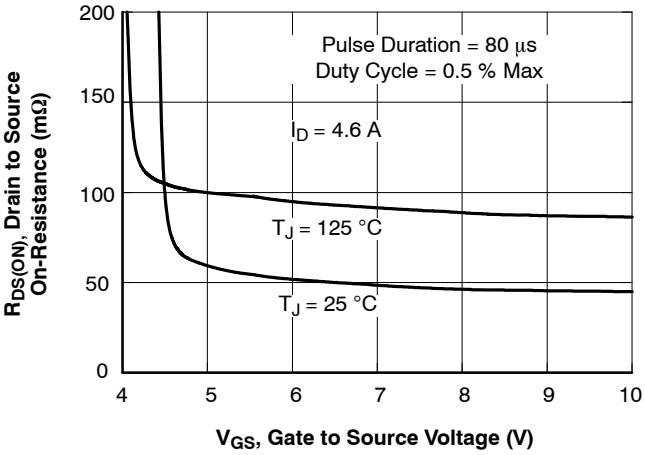


Figure 4. On-Resistance vs. Gate-to-Source Voltage

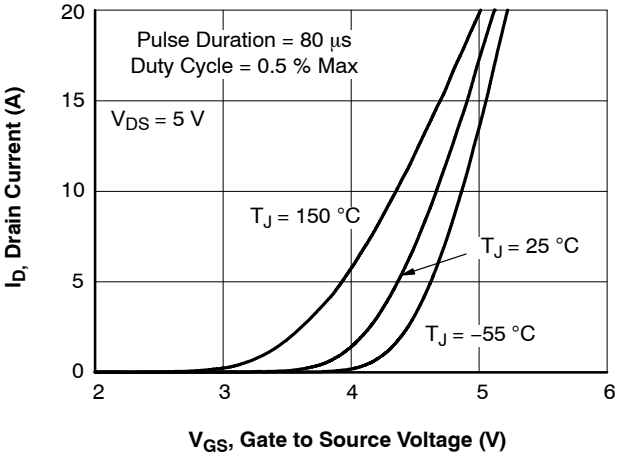


Figure 5. Transfer Characteristics

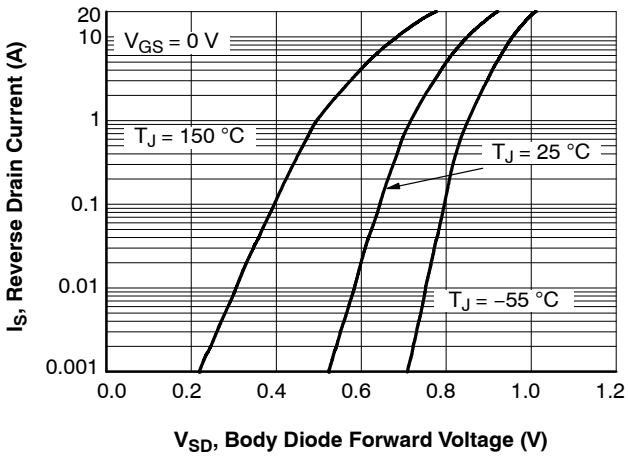


Figure 6. Source-to-Drain Diode Forward Voltage vs. Source Current

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TYPICAL CHARACTERISTICS (continued)

(T_J = 25 °C unless otherwise noted)

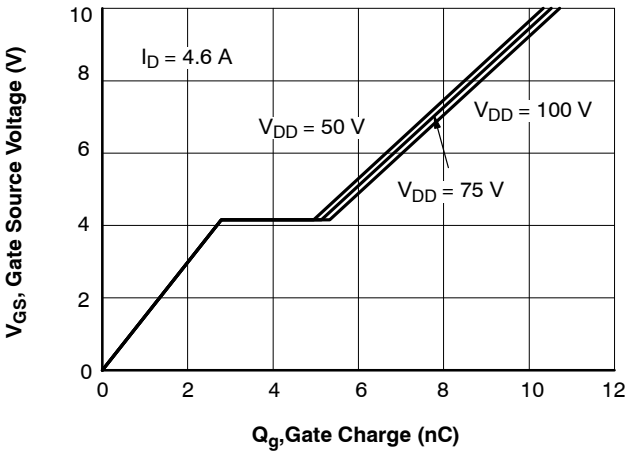


Figure 7. Gate Charge Characteristics

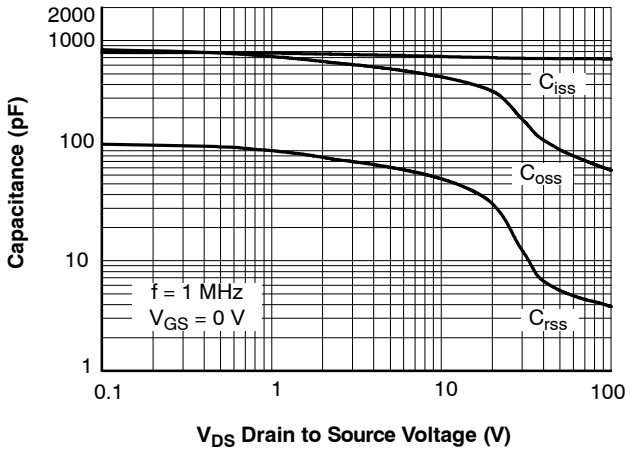


Figure 8. Capacitance vs Drain-to-Source Voltage

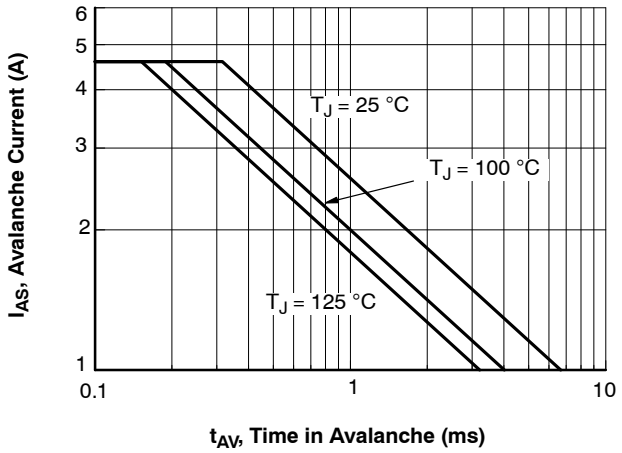


Figure 9. Unclamped Inductive Switching Capability

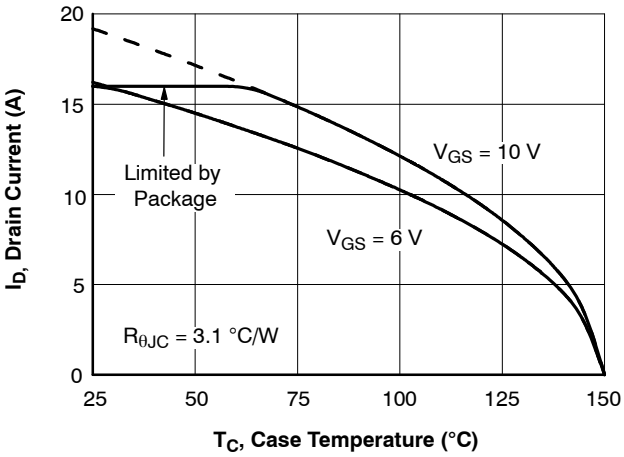


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

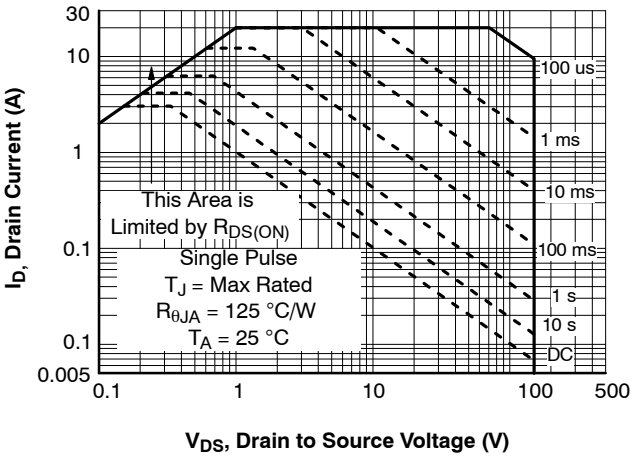


Figure 11. Forward Bias Safe Operating Area

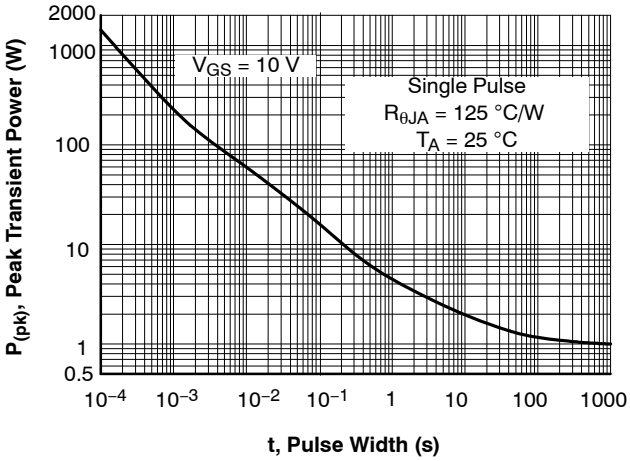


Figure 12. Single Pulse Maximum Power Dissipation

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TYPICAL CHARACTERISTICS (continued)

(T_J = 25 °C unless otherwise noted)

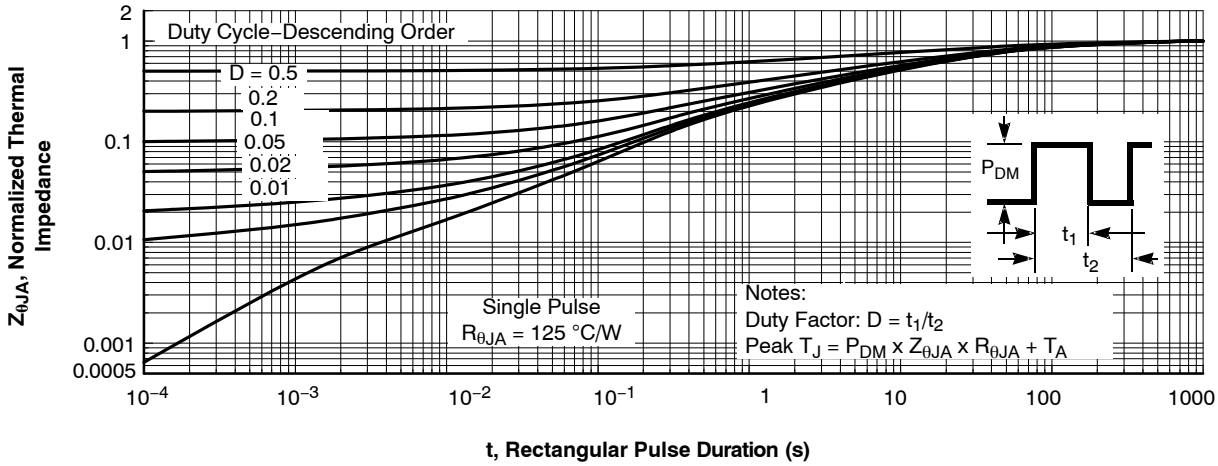


Figure 13. Junction-to-Ambient Transient Thermal Response

PACKAGE MARKING AND ORDERING INFORMATION

Device	Device Marking	Package Type	Reel Size	Tape Width	Shipping†
FDMC86240	FDMC86240	WDFN-8 (Pb-Free, Halide Free)	13”	12 mm	3,000 / 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.

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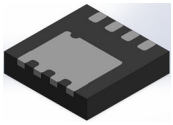
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REVISION HISTORY

Revision	Description of Changes	Date
5	Converted the Data Sheet to **onsemi** format.	12/15/2025
6	Adding Pb dot and Change the Marking Diagram on page 1 to follow onsemi format.	11/3/2026

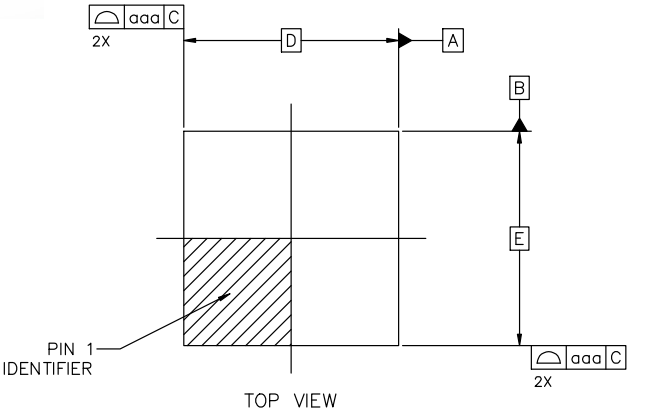
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

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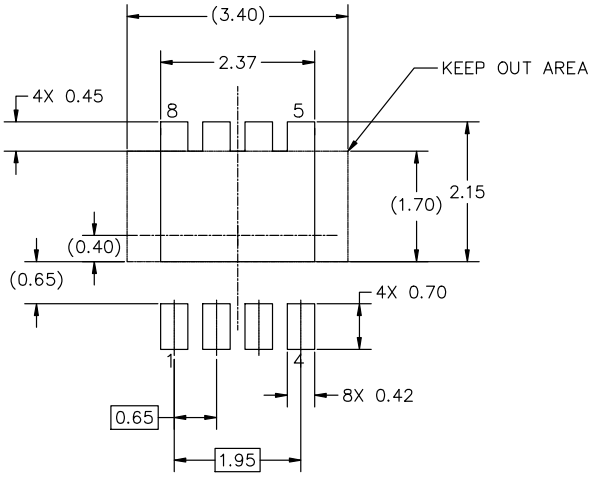
WDFN−8 3.30x3.30x0.75, 0.65P
CASE 511DH
ISSUE A

DATE 04 DEC 2025



NOTES:
1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.025	0.05
A3		0.20 REF	
b	0.30	0.35	0.40
D		3.30 BSC	
D2	2.22	2.27	2.32
E		3.30 BSC	
E2	1.95	2.00	2.05
e		0.65 BSC	
k		0.80 REF	
k1		0.50 REF	
L	0.45	0.50	0.55
L1	0.25	0.30	0.35
TOLERANCE FORM & POSITION			
aaa		0.05	
bbb		0.10	
ccc		0.10	
ddd		0.05	
eee		0.08	



RECOMMENDED MOUNTING FOOTPRINT

* For additional information on our Pb−Free strategy and soldering details, please download the onsemi Soldering and Mounting Techniques reference manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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DESCRIPTION:	**WDFN−8 3.30x3.30x0.75, 0.65P**	**PAGE 1 OF 1**

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

ENTEGRECİ

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Elektronik komponent tedarikinde Entegreci

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Parça koduyla arama

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

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Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.