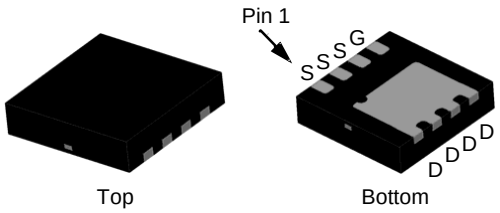
MOSFET – N-Channel, POWERTRENCH®

100 V, 4.4 A, 60 mΩ

FDM3622

V_{DS}	$r_{DS(on)}$ MAX	I_D MAX
100 V	60 mΩ @ 10 V	4.4 A
	80 mΩ @ 6.0 V	



WDFN8 3.3x3.3, 0.65P
(MLP 3x3)
CASE 511DH

General Description

This N−Channel MOSFET is produced using **onsemi**'s advanced POWERTRENCH process that has been especially tailored to minimize the on−state resistance and yet maintain low gate charge for superior switching performance.

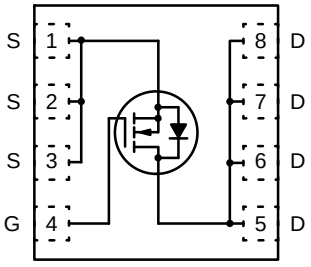
Features

- Max $r_{DS(on)}$ = 60 mΩ at V_{GS} = 10 V, I_D = 4.4 A
- Max $r_{DS(on)}$ = 80 mΩ at V_{GS} = 6.0 V, I_D = 3.8 A
- Low Miller Charge
- Low QRR Body Diode
- Optimized efficiency at high frequencies
- UIS Capability (Single Pulse and Repetitive Pulse)
- This Device is Pb−Free, Halide Free and is RoHS Compliant

MARKING DIAGRAM

&Z = Assembly Plant Code
&2 = 2−Digit Date Code
&K = 2−Digits Lot Run Traceability Code
FDM3622 = Specific Device Code

PIN ASSIGNMENT



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 (Note 1a) − Pulsed	 4.4 20	A
E_{AS}	Single Pulse Avalanche Energy (Note 3)	54	mJ
P_D	Power Dissipation (Note 1a) (Note 1b)	 2.1 0.9	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 (T_A = 25°C, unless otherwise noted)

Symbol	Parameter	Ratings	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case (Note 1)	3.0	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	60	

ORDERING INFORMATION

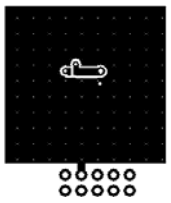
See detailed ordering and shipping information on page 5 of this data sheet.

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

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	100	–	–	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 80 V, V_{GS} = 0 V	–	–	1	μA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 100°C	–	–	250	
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	–	4	V
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 4.4 A	–	44	60	mΩ
		V_{GS} = 6.0 V, I_D = 3.8 A	–	56	80	
		V_{GS} = 10 V, I_D = 4.4 A, T_J = 150°C	–	92	120	
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz	–	820	1090	pF
C_{oss}	Output Capacitance		–	125	170	pF
C_{rss}	Reverse Transfer Capacitance		–	35	55	pF
Rg	Gate Resistance	V_{DS} = 15 mV, f = 1 MHz	0.1	3.1	6.2	Ω
SWITCHING CHARACTERISTICS						
$t_{d(on)}$	Turn−On Delay Time	V_{DD} = 50 V, I_D = 4.4 A, V_{GS} = 10 V, R_{GEN} = 24 Ω	–	11	20	ns
t_r	Rise Time		–	25	40	ns
$t_{d(off)}$	Turn−Off Delay Time		–	35	56	ns
t_f	Fall Time		–	26	42	ns
Q_g	Total Gate Charge	V_{GS} = 10 V, V_{DD} = 50 V, I_D = 4.4 A	–	13	17	nC
Q_{gs}	Gate to Source Gate Charge		–	3.6	–	nC
Q_{gd}	Gate to Drain “Miller” Charge		–	3.4	–	nC
DRAIN−SOURCE CHARACTERISTICS						
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 4.4 A	–	–	1.25	V
		V_{GS} = 0 V, I_S = 2.2 A	–	–	1.0	V
t_{rr}	Reverse Recovery Time	I_F = 4.4 A, di/dt = 100 A/μs	–	–	56	ns
Q_{rr}	Reverse Recovery Charge		–	–	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.

1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 oz copper pad on a 1.5x1.5 in. board of FR−4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user’s board design.
   (a) $R_{\theta JA}$ = 60°C/W when mounted on a 1 in^2 pad of 2 oz copper, 1.5’x1.5’x0.062’ thick PCB.
   (b) $R_{\theta JA}$ = 135°C/W when mounted on a minimum pad of 2 oz copper.



a. 60°C/W when mounted on a 1 in^2 pad of 2 oz copper.

b. 135°C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0%.
3. E_{AS} of 54 mJ is based on starting T_J = 25°C; N−ch: L = 3 mH, I_{AS} = 6 A, V_{DD} = 100 V, V_{GS} = 10 V.

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

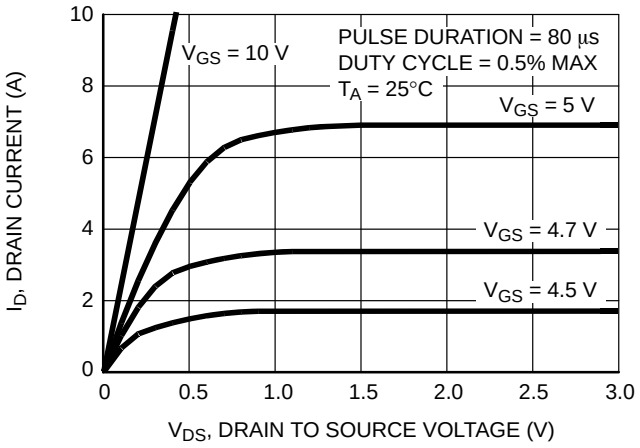


Figure 1. On−Region Characteristics

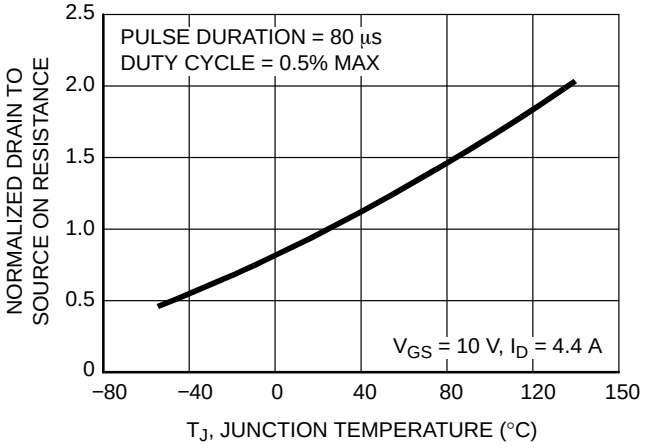


Figure 2. Normalized On−Resistance vs. Junction Temperature

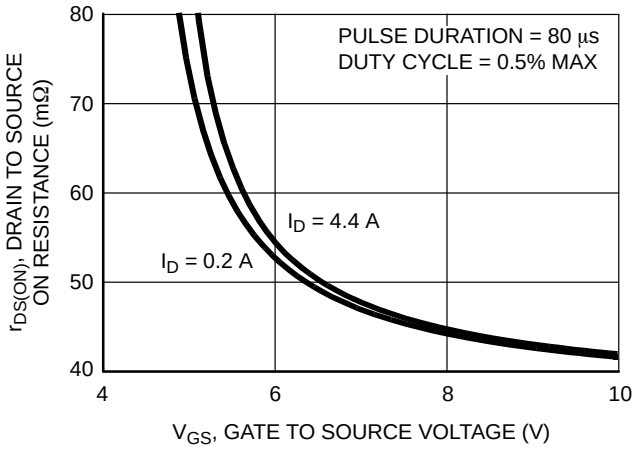


Figure 3. On−Resistance vs. Gate to Source Voltage

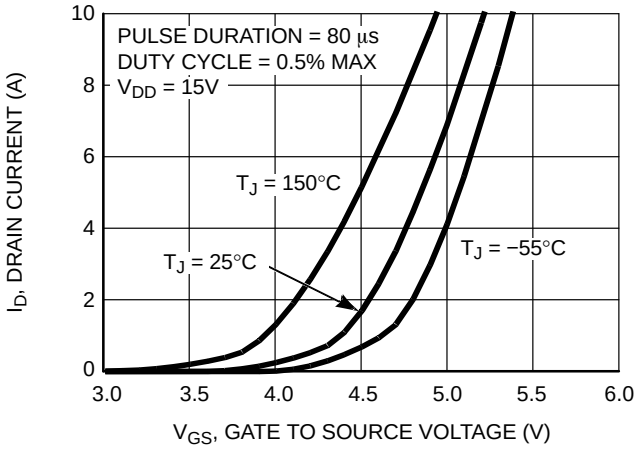


Figure 4. Transfer Characteristics

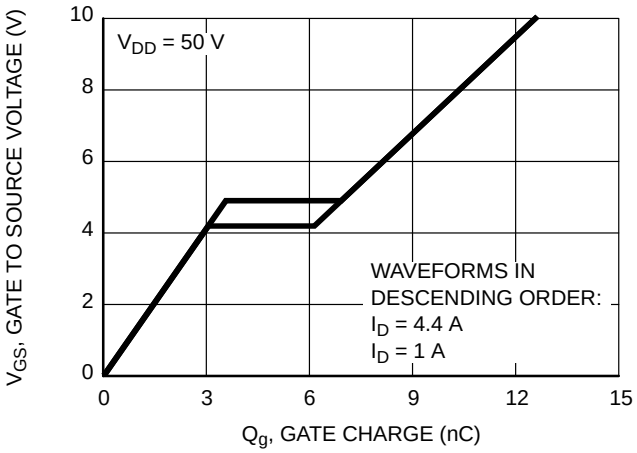


Figure 5. Gate Charge Characteristics

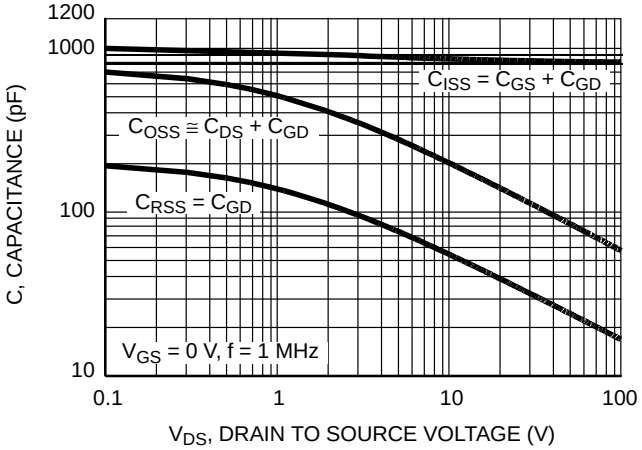


Figure 6. Capacitance vs. Drain to Source Voltage

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

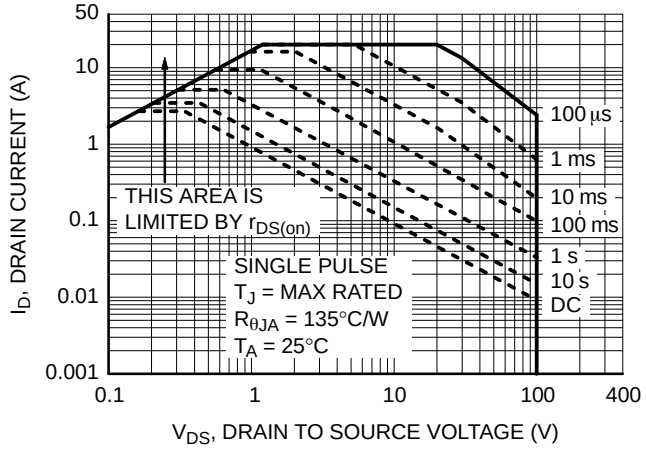


Figure 7. Forward Bias Safe Operating Area

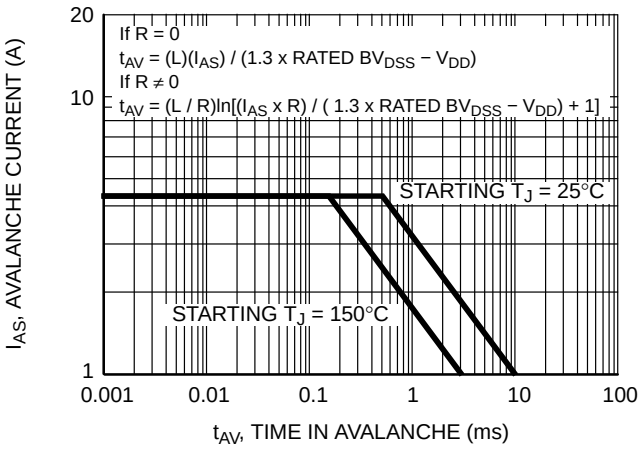


Figure 8. Uncalamped Inductive Switching Capability

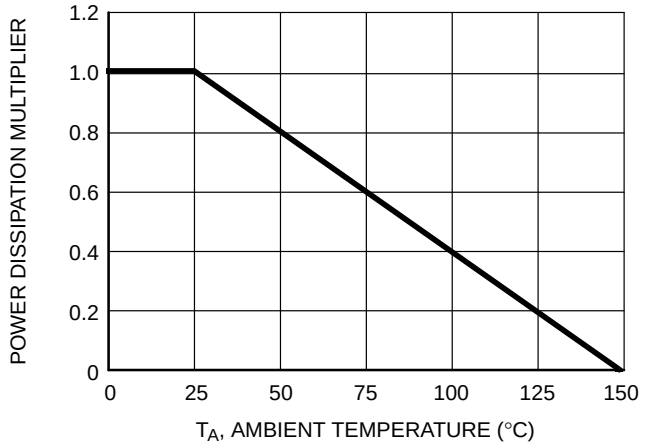


Figure 9. Normalized Power Dissipation vs. Ambient Temperature

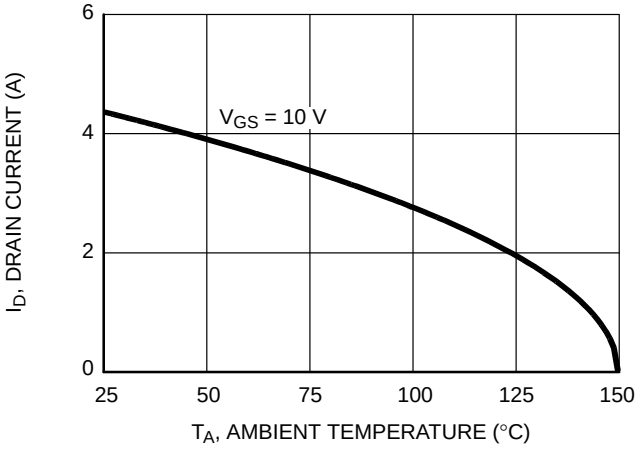


Figure 10. Maximum Continuous Drain Current vs. Ambient Temperature

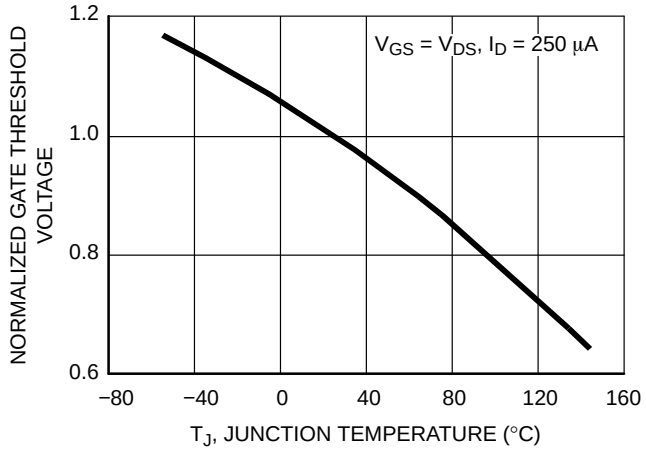


Figure 11. Normalized Gate Threshold Voltage vs. Junction Temperature

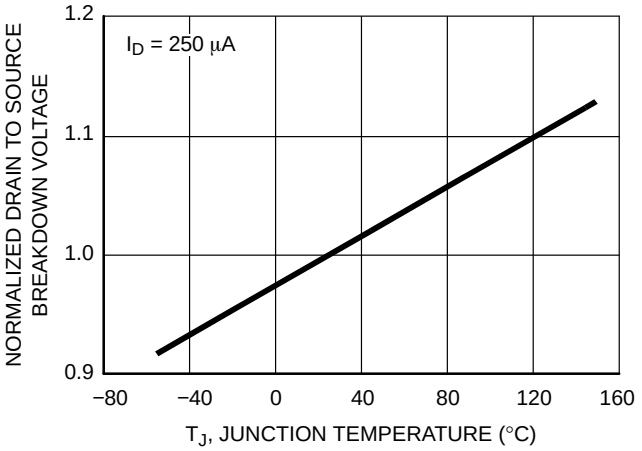


Figure 12. Normalized Drain to Source Breakdown Voltage vs. Junction Temperature

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

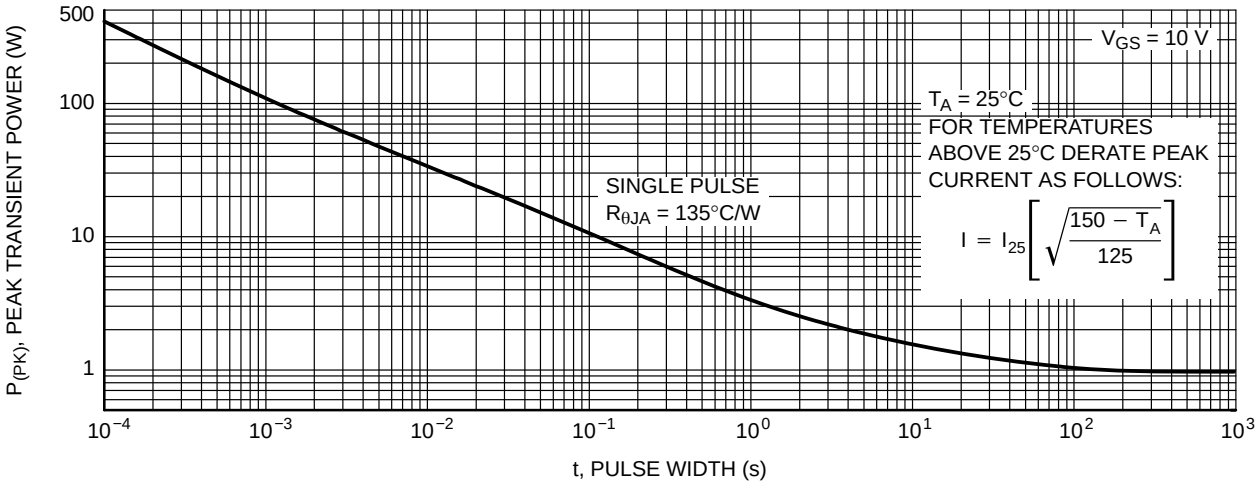


Figure 13. Peak Current Capability

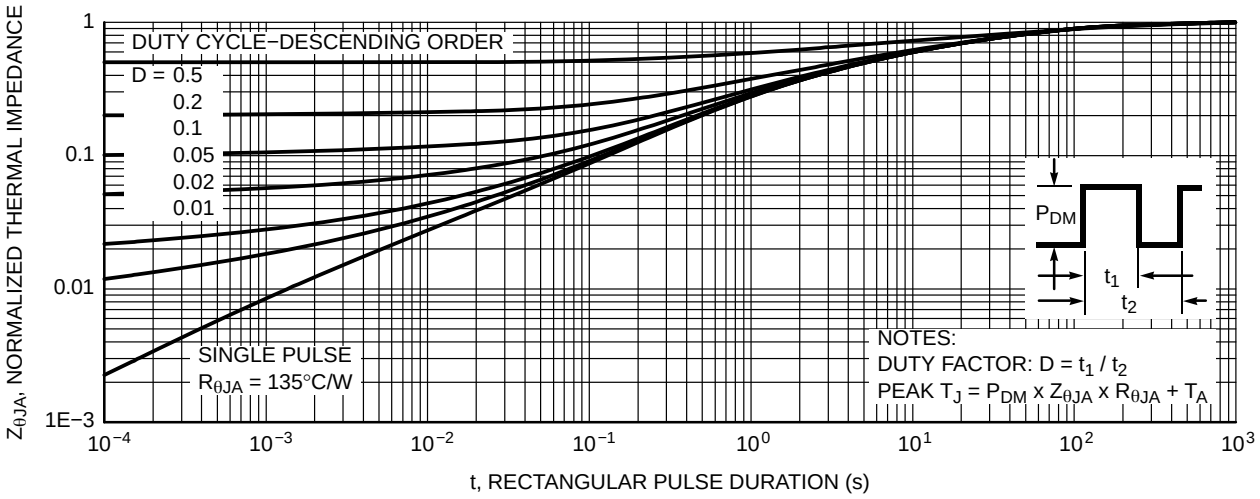


Figure 14. Transient Thermal Response Curve

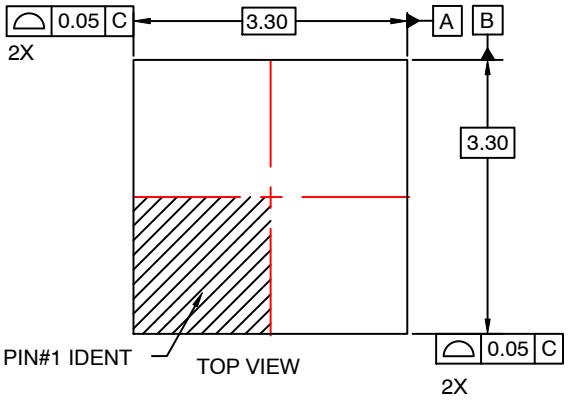
PACKAGE MARKING AND ORDERING INFORMATION

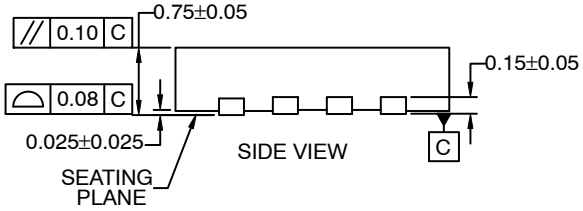
Device	Device Marking	Package	Reel Size	Tape Width	Shipping†
FDM3622	FDM3622	WDFN8 3.3x3.3, 0.65P (MLP 3x3) (Pb−Free, Halide Free)	13”	12 mm	3000 / Tape & Reel

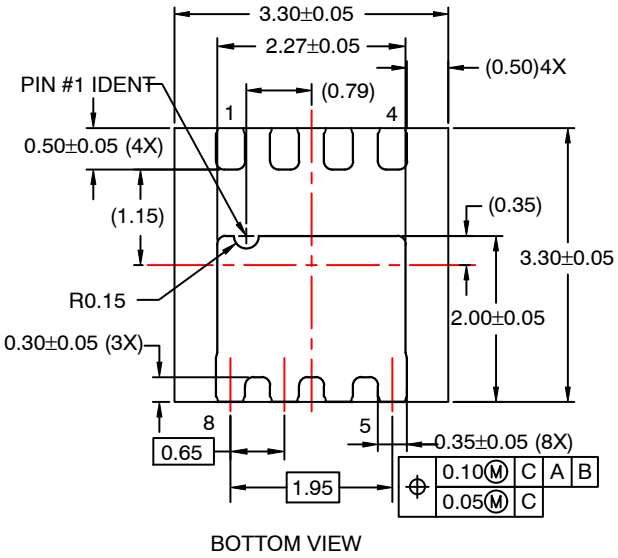
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

WDFN8 3.3x3.3, 0.65P
CASE 511DH
ISSUE O

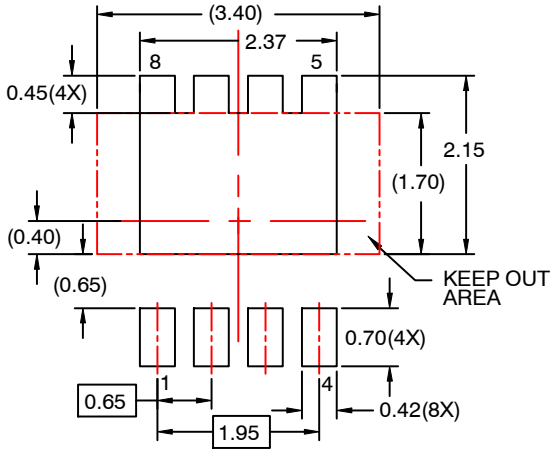
DATE 31 JUL 2016







BOTTOM VIEW



RECOMMENDED LAND PATTERN

NOTES:

A. DOES NOT CONFORM TO JEDEC REGISTRATION MO−229

B. DIMENSIONS ARE IN MILLIMETERS.

C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 2009.

D. LAND PATTERN RECOMMENDATION IS EXISTING INDUSTRY LAND PATTERN.

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DESCRIPTION:	**WDFN8 3.3X3.3, 0.65P**	**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