MOSFET - Power, Single P-Channel, WDFN8
-100 V, 120 mΩ, -13 A

NTTFS115P10M5

ON Semiconductor®

www.onsemi.com

Features
- Small Footprint (3.3 x 3.3 mm) for Compact Design
- These Devices are non−ESD Protected
- These Devices are Pb−Free and are RoHS Compliant

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
−100 V	120 mΩ @ −10 V	−13 A
	254 mΩ @ −6 V	

MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

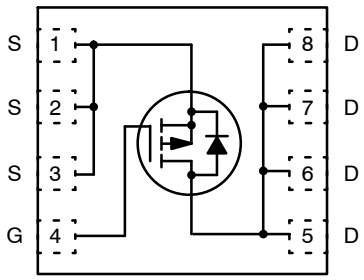
Parameter			Symbol	Value	Unit
Drain−to−Source Breakdown Voltage			$V_{(BR)DSS}$	−100	V
Gate−to−Source Voltage			V_{GS}	±20	V
Continuous Drain Current $R_{\theta JC}$ (Note 2)	Steady State	T_C = 25°C	I_D	−13	A
		T_C = 100°C		−8.0	
Power Dissipation $R_{\theta JC}$ (Note 2)		T_C = 25°C	P_D	41	W
		T_C = 100°C		16	
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2)	Steady State	T_A = 25°C	I_D	−2.0	A
		T_A = 100°C		−1.1	
Power Dissipation $R_{\theta JA}$ (Notes 1, 2)		T_A = 25°C	P_D	0.9	W
		T_A = 100°C		0.3	
Pulsed Drain Current	T_A = 25°C, t_p = 10 μs		I_{DM}	−137	A
Operating Junction and Storage Temperature Range			T_J, T_{stg}	−55 to +150	°C
Source Current (Body Diode)			I_S	−34	A
Single Pulse Drain−to−Source Avalanche Energy ($I_{L(pk)}$ = −9.1 A)			E_{AS}	41	mJ
Lead Temperature Soldering Reflow for Soldering Purposes (1/8″ from case for 10 s)			T_L	260	°C

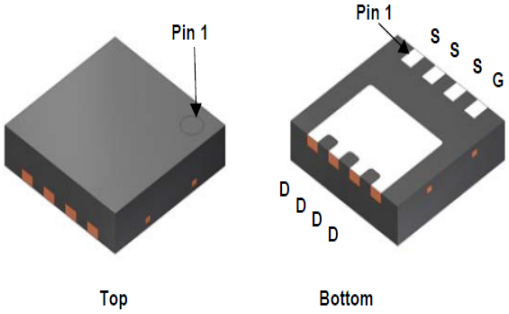
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction−to−Case − Steady State (Note 2)	$R_{\theta JC}$	3.0	°C/W
Junction−to−Ambient − Steady State (Note 2)	$R_{\theta JA}$	134	

1. Surface−mounted on FR4 board using a 1 in^2 pad size, 1 oz Cu pad.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.





WDFN8
CASE 511DH

ORDERING INFORMATION
See detailed ordering, marking and shipping information on page 5 of this data sheet.

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

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA		−100			V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	I_D = 250 μA, ref to 25°C			−67		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = −80 V	T_J = 25°C			−1	μA
			T_J = 125°C			−100	
Gate−to−Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V				±100	nA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −45 μA		−2.0	−3.0	−4.0	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$	I_D = 250 μA, ref to 25°C			6.2		mV/°C
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = −10 V	I_D = −2.4 A		97	120	mΩ
		V_{GS} = −6 V	I_D = −1.6 A		127	254	
Forward Transconductance	g_{FS}	V_{DS} = −10 V, I_D = −2.1 A			5.5		S
Gate−Resistance	R_G	T_A = 25°C			3.5		Ω
CHARGES & CAPACITANCES							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = −50 V			637		pF
Output Capacitance	C_{OSS}				93.5		
Reverse Transfer Capacitance	C_{RSS}				4.5		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −6 V, V_{DS} = −50 V, I_D = −2.4 A			5.7		nC
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −10 V, V_{DS} = −50 V, I_D = −2.4 A			9.2		
Gate−to−Source Charge	Q_{GS}				3.0		
Gate−to−Drain Charge	Q_{GD}				1.3		
Plateau Voltage	V_{GP}				4.4		V
SWITCHING CHARACTERISTICS (Note 3)							
Turn−On Delay Time	$t_{d(ON)}$	V_{GS} = −10 V, V_{DS} = −50 V, I_D = −2.4 A, R_G = 2.5 Ω			8.7		ns
Rise Time	t_r				2.1		
Turn−Off Delay Time	$t_{d(OFF)}$				13.4		
Fall Time	t_f				4.1		
DRAIN−SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = −2.4 A	T_J = 25°C		0.84	1.2	V
			T_J = 125°C		0.71		
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dIs/dt = 300 A/μs, I_S = −1.2 A			28.7		ns
Reverse Recovery Charge	Q_{RR}				87.6		nC
Charge Time	t_a				18.4		ns
Discharge Charge	t_b				10.4		ns

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.

3. Switching characteristics are independent of operating junction temperatures.
4. Pulse Test: Pulse Width < 300 μs. Duty Cycle < 2%.
5. Maximum current for pulses as long as 1s is higher but is independent on pulse duration or duty cycles.

TYPICAL CHARACTERISTICS

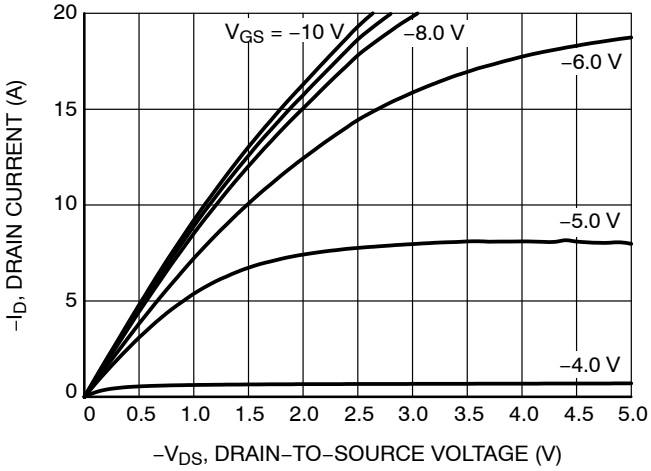


Figure 1. On−Region Characteristics

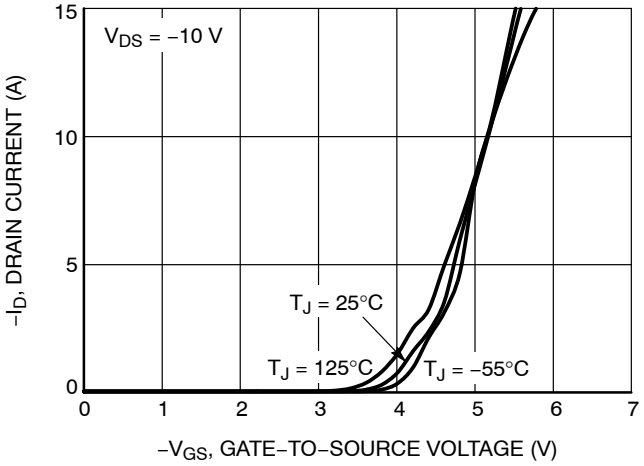


Figure 2. Transfer Characteristics

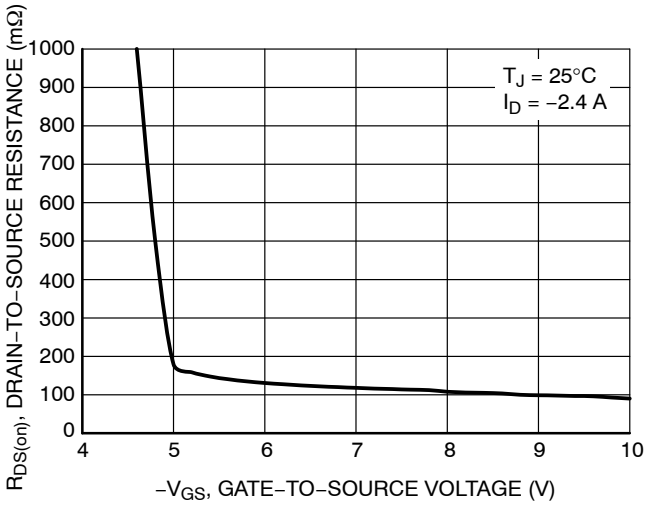


Figure 3. On−Resistance vs. Gate−to−Source Voltage

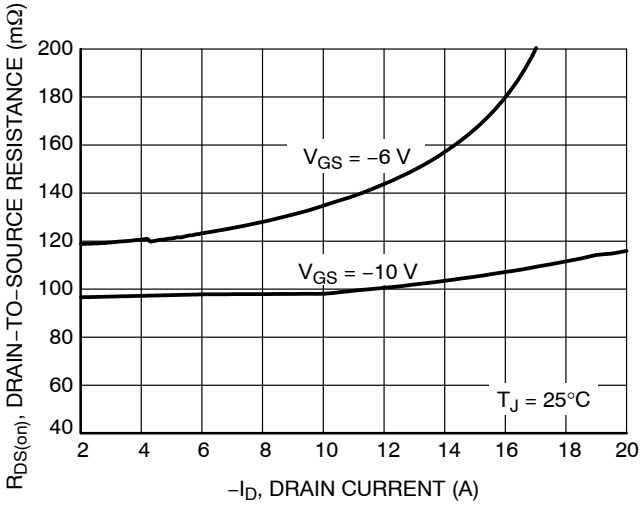


Figure 4. On−Resistance vs. Drain Current and Gate Voltage

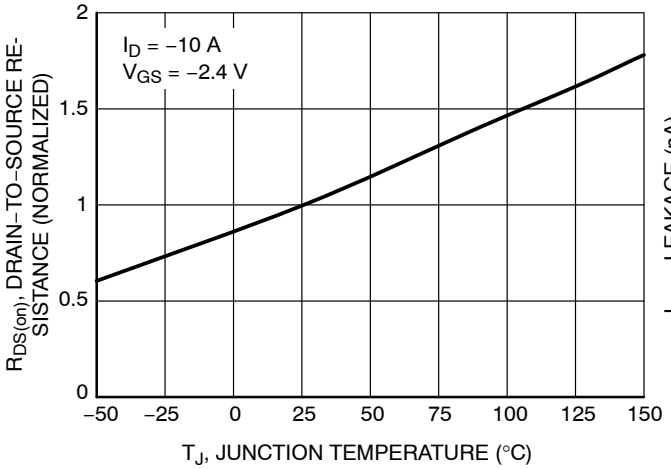


Figure 5. On−Resistance Variation with Temperature

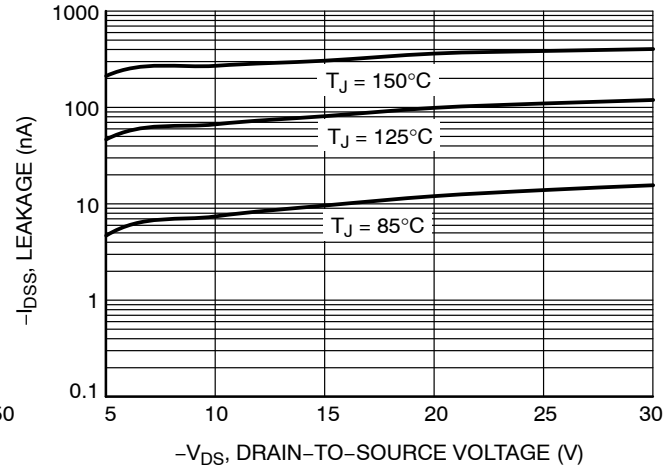


Figure 6. Drain−to−Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS

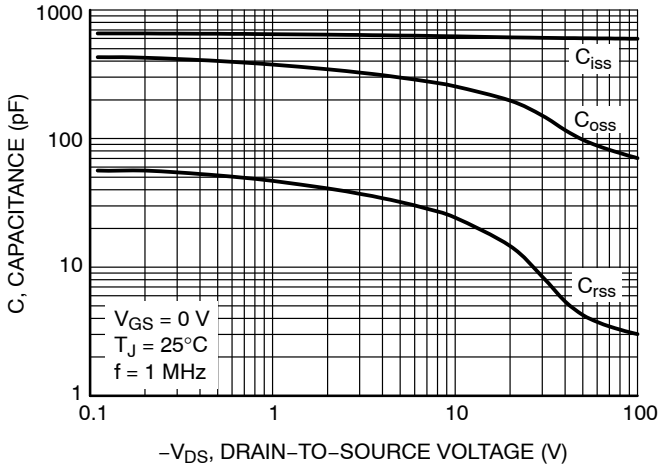


Figure 7. Capacitance Variation

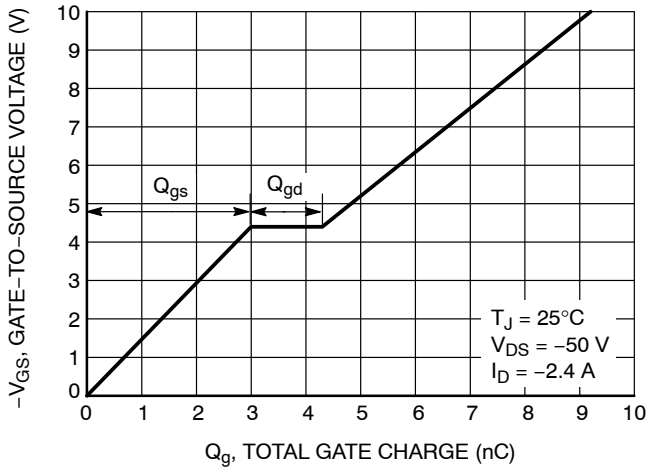


Figure 8. Gate−to−Source vs. Total Charge

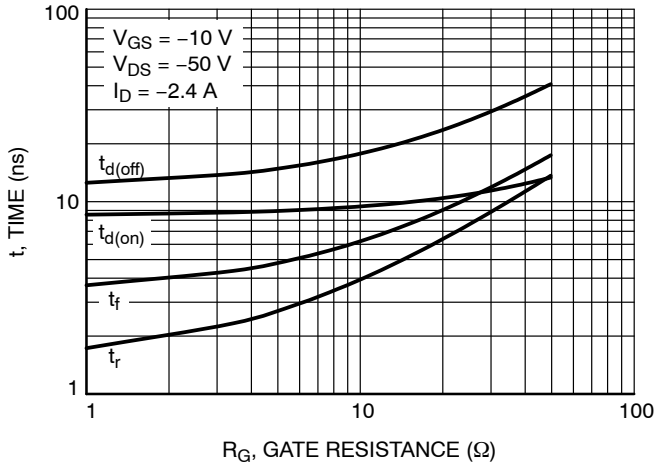


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

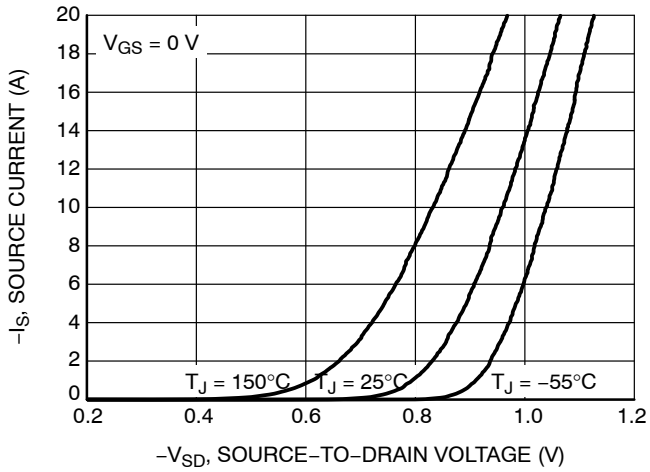


Figure 10. Diode Forward Voltage vs. Current

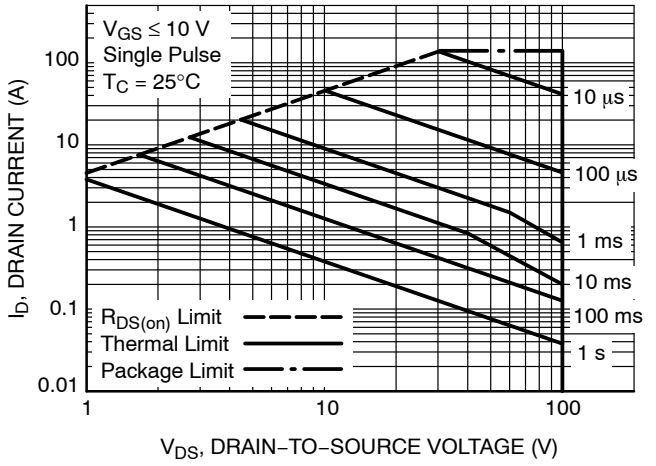


Figure 11. Maximum Rated Forward Biased Safe Operating Area

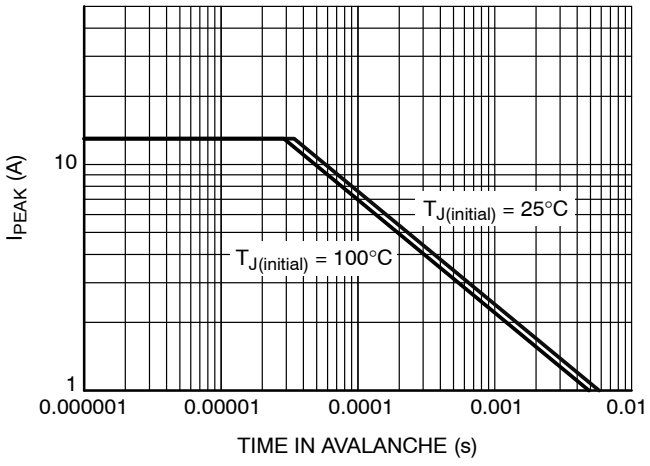


Figure 12. I_{PEAK} vs. Time in Avalanche

TYPICAL CHARACTERISTICS

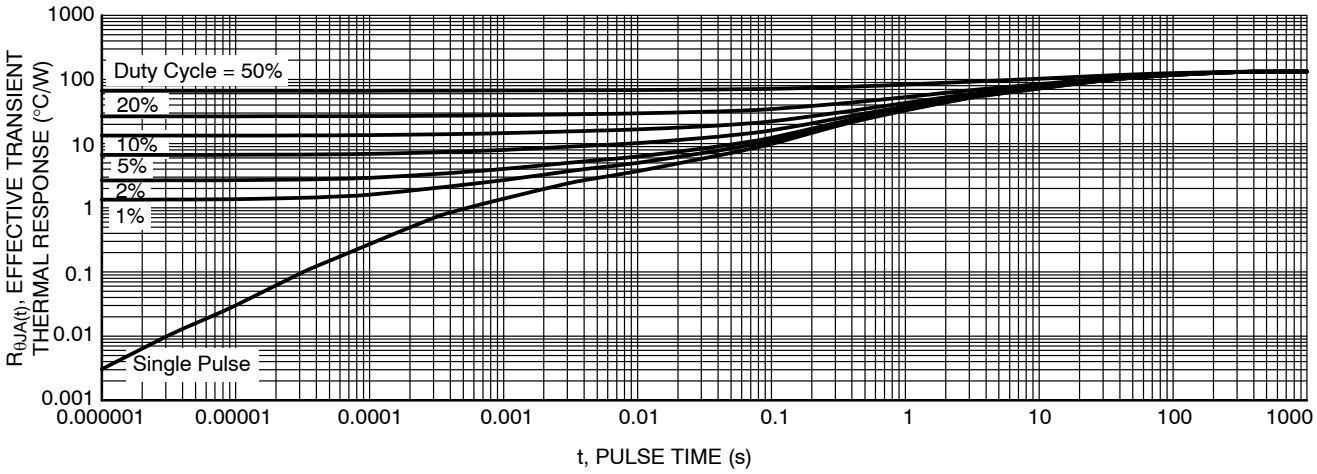


Figure 13. Thermal Response

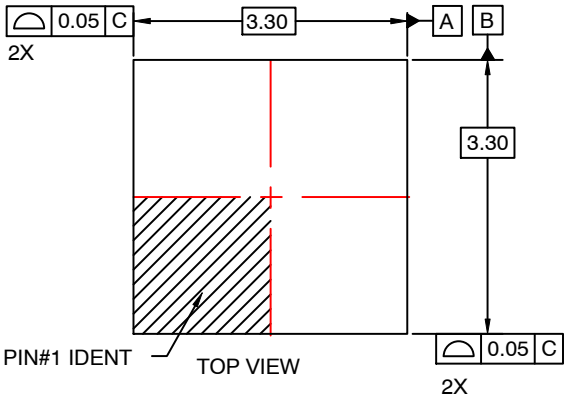
DEVICE ORDERING AND MARKING INFORMATION

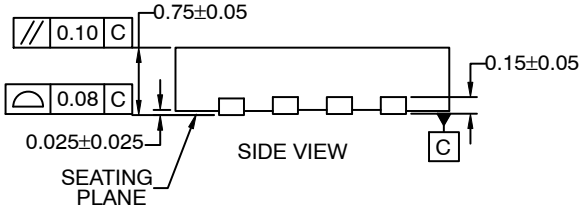
Device	Device Marking	Package	Reel Size	Tape Width	Shipping†
NTTFS115P10M5	115P10M5	WDFN8 (Pb−Free)	13”	12 mm	3000 / Tape & Reel

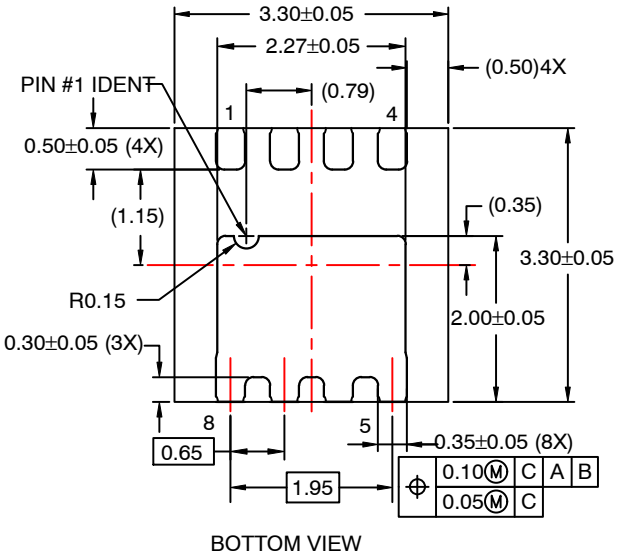
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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

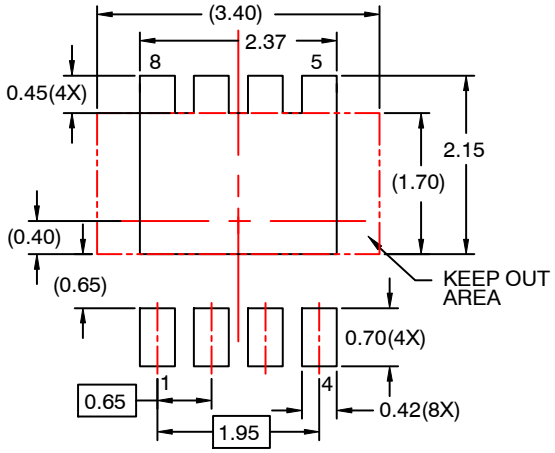
DATE 31 JUL 2016







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**

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