MOSFET - Power, Single N-Channel, μ8FL

100 V, 72 mΩ, 16 A

NTTFS080N10G

ON Semiconductor®

www.onsemi.com

Features

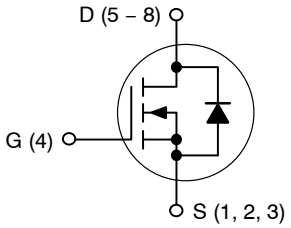
- Wide SOA for Linear Mode Operation
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- High Peak UIS Current Capability for Ruggedness
- Small Footprint (3.3 x 3.3 mm) for Compact Design
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Typical Applications

- 48 V Hot Swap System, Load Switch, Soft−Start, E−Fuse

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
100 V	72 mΩ @ 10 V	16 A

N−Channel



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

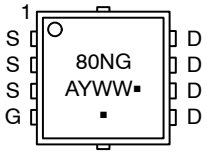
Parameter			Symbol	Value	Unit
Drain−to−Source Voltage			V_{DSS}	100	V
Gate−to−Source Voltage			V_{GS}	±20	V
Continuous Drain Current $R_{\theta JC}$ (Note 2)	Steady State	T_C = 25°C	I_D	16	A
		T_C = 100°C		11	
Power Dissipation $R_{\theta JC}$ (Note 2)	Steady State	T_C = 25°C	P_D	39	W
		T_C = 100°C		19	
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2)	Steady State	T_A = 25°C	I_D	4.1	A
		T_A = 100°C		2.8	
Power Dissipation $R_{\theta JA}$ (Notes 1, 2)	Steady State	T_A = 25°C	P_D	2.5	W
		T_A = 100°C		1.2	
Pulsed Drain Current	T_A = 25°C, t_p = 10 μs		I_{DM}	125	A
Operating Junction and Storage Temperature Range			T_J, T_{stg}	−55 to +175	°C
Source Current (Body Diode)			I_S	32	A
Single Pulse Drain−to−Source Avalanche Energy ($I_{L(pk)}$ = 5.2 A, L = 3 mH)			E_{AS}	40	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.

1. Surface−mounted on FR4 board using a 1 in^2, 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
(μ8FL)
CASE 511AB

MARKING DIAGRAM



80NG	= Specific Device Code
A	= Assembly Location
Y	= Year
WW	= Work Week
▪	= Pb−Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 5 of this data sheet.

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Value	Unit
Junction−to−Case − Steady State (Note 2)	$R_{\theta JC}$	3.8	°C/W
Junction−to−Ambient − Steady State (Note 2)	$R_{\theta JA}$	60	

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

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, referenced to 25°C			87.6		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 = 150°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 = 22 μA		2.0		4.0	V
Negative Treshold Temperature Coefficient	$V_{GS(TH)}/T_J$	I_D = 22 μA, referenced to 25°C			−9.37		mV/°C
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 4 A			60	72	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 4 A			6		S
Gate−Resistance	R_G	T_A = 25°C			0.53		Ω
CHARGES AND CAPACITANCES							
Input Capacitance	C_{iss}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = 50 V			560.5		pF
Output Capacitance	C_{oss}				64		
Reverse Transfer Capacitance	C_{rss}				9		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 10 V, V_{DS} = 50 V, I_D = 4 A			8.6		nC
Threshold Gate Charge	$Q_{G(TH)}$				1.7		
Gate−to−Source Charge	Q_{GS}				3.2		
Gate−to−Drain Charge	Q_{GD}				2		
Output Charge	Q_{OSS}	V_{GS} = 10 V, V_{DS} = 50 V			6.1		
SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 50 V, I_D = 4 A, R_G = 4.7 Ω			8.4		ns
Rise Time	t_r				3		
Turn−Off Delay Time	$t_{d(off)}$				11.9		
Fall Time	t_f				2.8		
DRAIN−SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = 4 A	T_J = 25°C		0.83	1.2	V
			T_J = 125°C		0.70		
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dI_S/dt = 300 A/μs, I_S = 2 A			17		ns
Reverse Recovery Charge	Q_{RR}				37		nC
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dI_S/dt = 1000 A/μs, I_S = 2 A			14		ns
Reverse Recovery Charge	Q_{RR}				60.5		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.

3. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
4. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

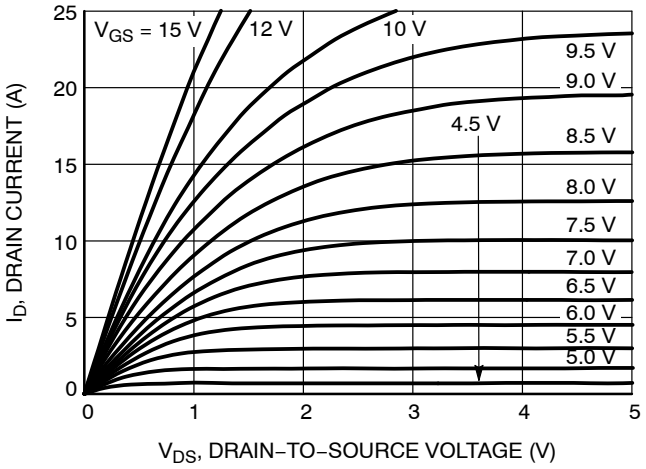


Figure 1. On−Region Characteristics

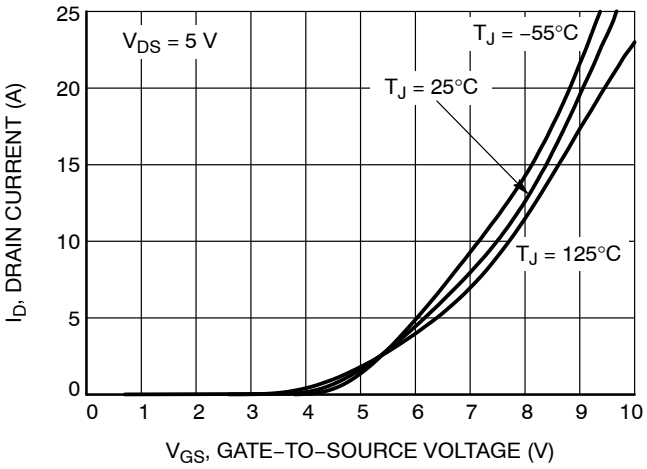


Figure 2. Transfer Characteristics

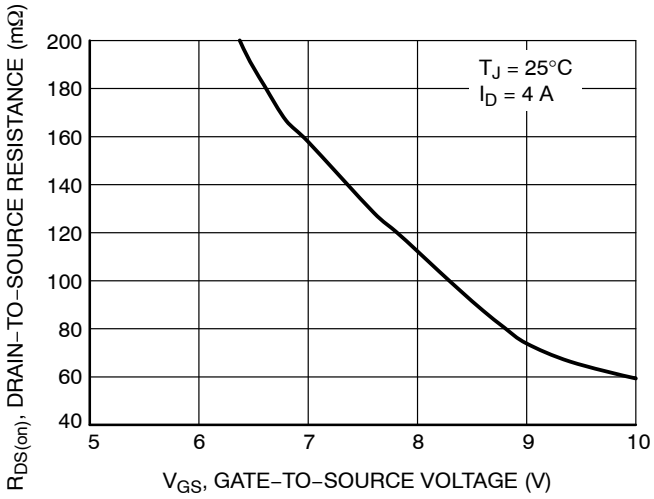


Figure 3. On−Resistance vs. Gate−to−Source Voltage

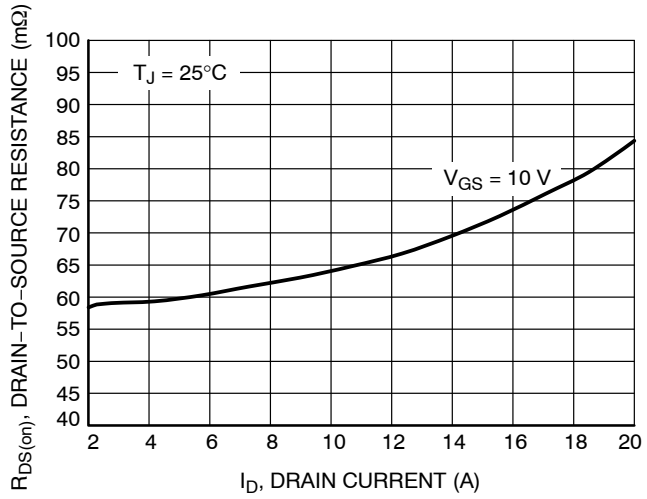


Figure 4. On−Resistance vs. Drain Current

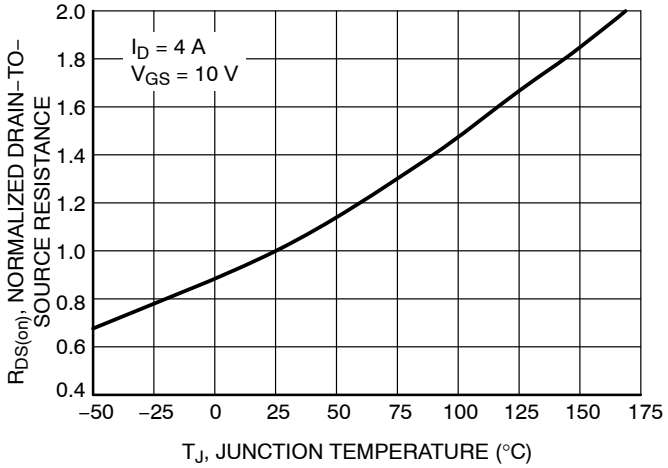


Figure 5. On−Resistance Variation with Temperature

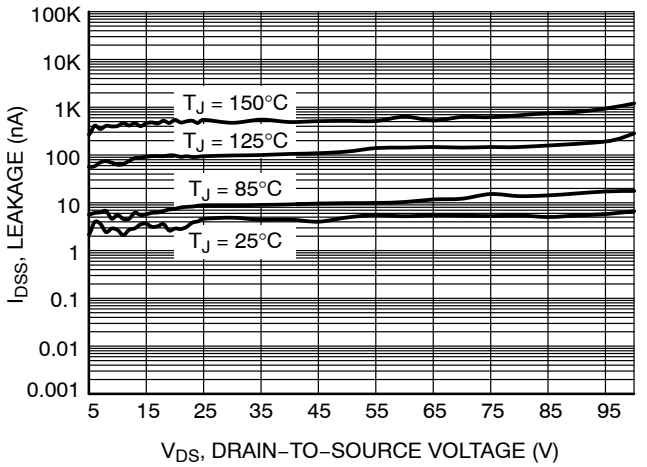


Figure 6. Drain−to−Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS

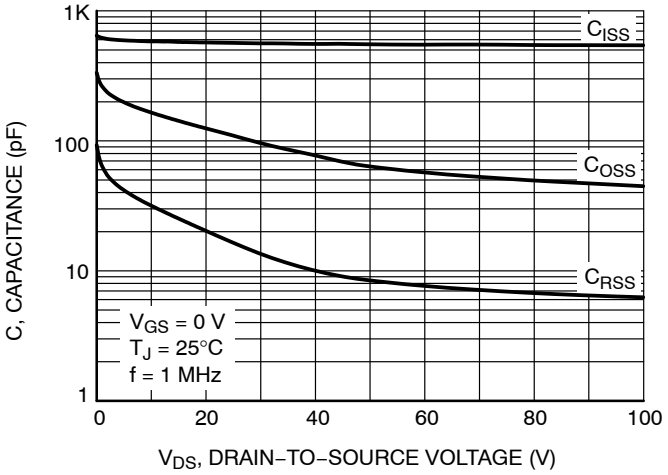


Figure 7. Capacitance Variation

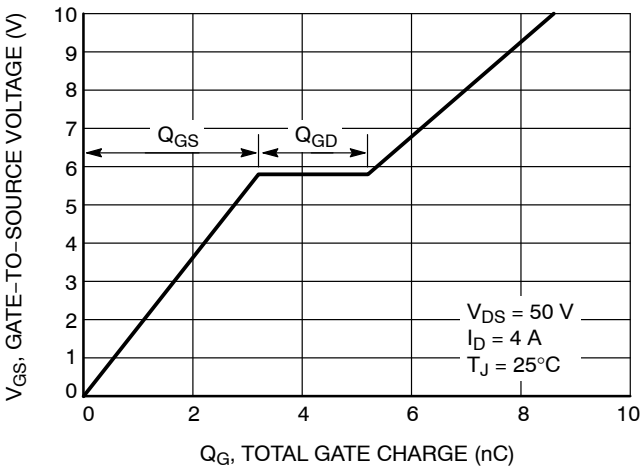


Figure 8. Gate−to−Source Voltage vs. Total Charge

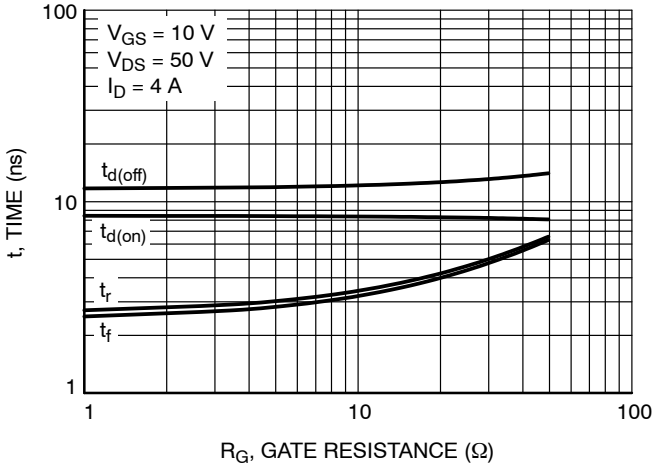


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

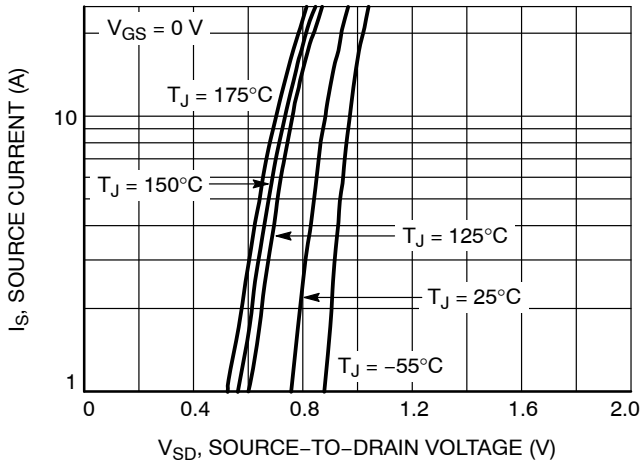


Figure 10. Diode Forward Voltage vs. Current

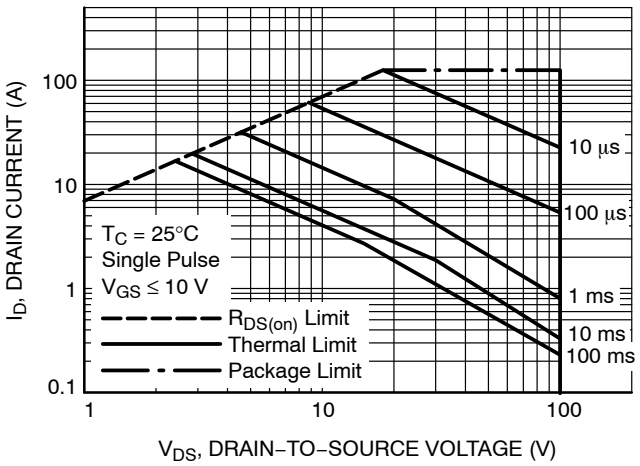


Figure 11. Maximum Rated Forward Biased Safe Operating Area

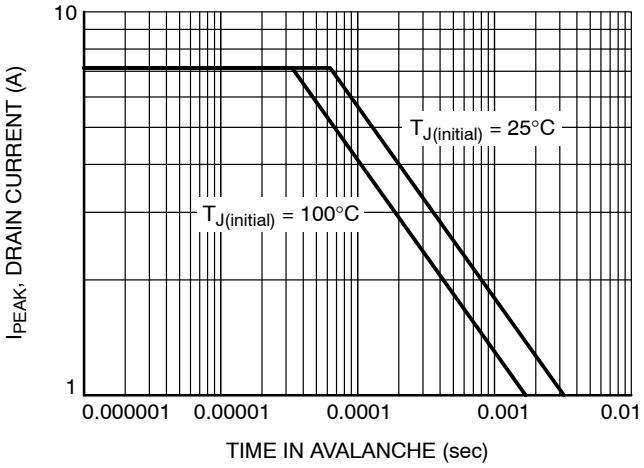


Figure 12. Maximum Drain Current vs. Time in Avalanche

TYPICAL CHARACTERISTICS

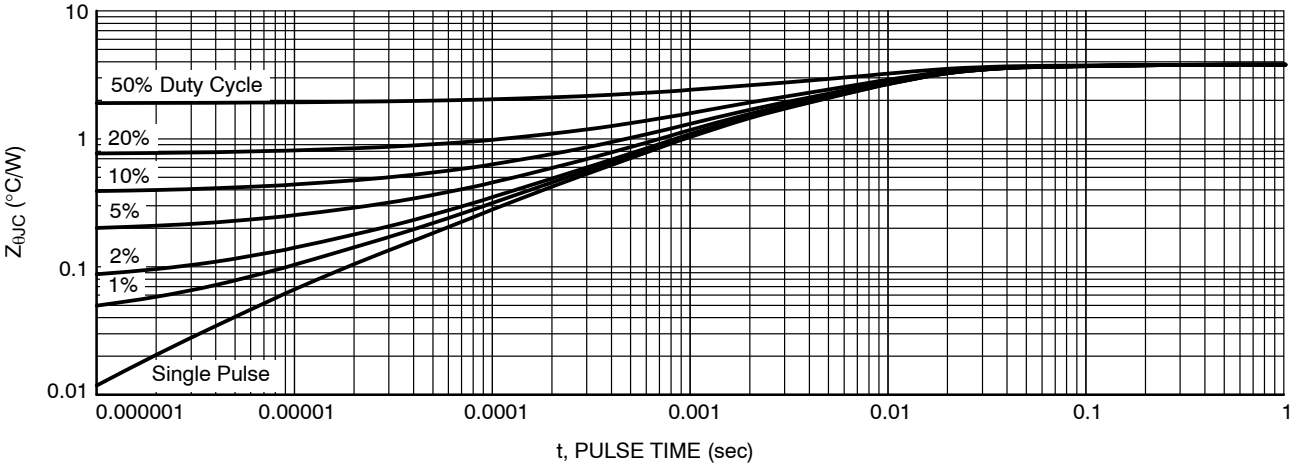


Figure 13. Junction−to−Ambient Transient Thermal Response

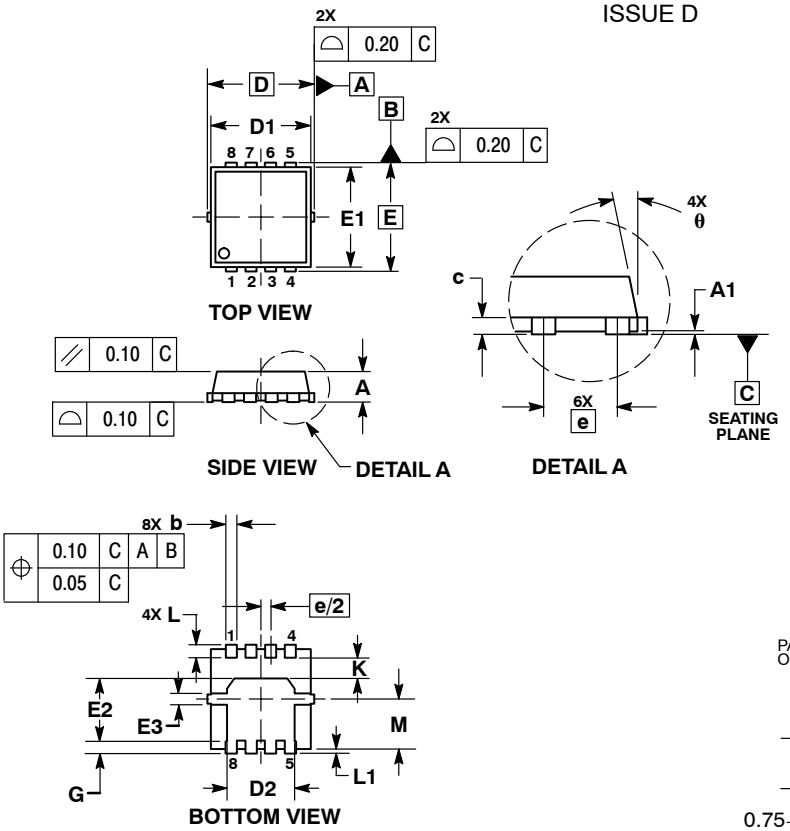
DEVICE ORDERING INFORMATION

Device	Marking	Package	Shipping†
NTTFS080N10G	80NG	μ8FL (Pb−Free)	1500 / 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.

PACKAGE DIMENSIONS

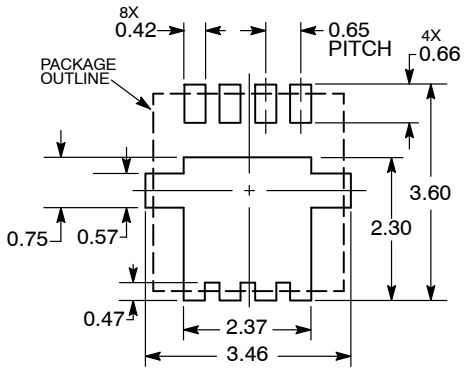
WDFN8 3.3x3.3, 0.65P
CASE 511AB
ISSUE D



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00	---	0.05	0.000	---	0.002
b	0.23	0.30	0.40	0.009	0.012	0.016
c	0.15	0.20	0.25	0.006	0.008	0.010
D	3.30 BSC			0.130 BSC		
D1	2.95	3.05	3.15	0.116	0.120	0.124
D2	1.98	2.11	2.24	0.078	0.083	0.088
E	3.30 BSC			0.130 BSC		
E1	2.95	3.05	3.15	0.116	0.120	0.124
E2	1.47	1.60	1.73	0.058	0.063	0.068
E3	0.23	0.30	0.40	0.009	0.012	0.016
e	0.65 BSC			0.026 BSC		
G	0.30	0.41	0.51	0.012	0.016	0.020
K	0.65	0.80	0.95	0.026	0.032	0.037
L	0.30	0.43	0.56	0.012	0.017	0.022
L1	0.06	0.13	0.20	0.002	0.005	0.008
M	1.40	1.50	1.60	0.055	0.059	0.063
θ	0 °	---	12 °	0 °	---	12 °

SOLDERING FOOTPRINT*



DIMENSION: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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