

MOSFET – Power, Dual, N-Channel

40 V, 8.1 mΩ, 49 A

NTMFD5C466N

Features

- Small Footprint (5x6 mm) for Compact Design
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Q_G and Capacitance to Minimize Driver Losses
- These Devices are Pb-Free and are RoHS Compliant

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V_{DSS}	40	V
Gate-to-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current $R_{\theta JC}$ (Notes 1, 2, 3)	Steady State	$T_C = 25^\circ\text{C}$	I_D	49
		$T_C = 100^\circ\text{C}$		35
Power Dissipation $R_{\theta JC}$ (Notes 1, 2)		$T_C = 25^\circ\text{C}$	P_D	38
		$T_C = 100^\circ\text{C}$		19
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2, 3)	Steady State	$T_A = 25^\circ\text{C}$	I_D	14
		$T_A = 100^\circ\text{C}$		10
Power Dissipation $R_{\theta JA}$ (Notes 1 & 2)		$T_A = 25^\circ\text{C}$	P_D	3.0
		$T_A = 100^\circ\text{C}$		1.5
Pulsed Drain Current	$T_A = 25^\circ\text{C}$, $t_p = 10 \mu\text{s}$	I_{DM}	169	A
Operating Junction and Storage Temperature		T_J , T_{stg}	-55 to + 175	°C
Source Current (Body Diode)		I_S	31	A
Single Pulse Drain-to-Source Avalanche Energy ($T_J = 25^\circ\text{C}$, $I_{L(pk)} = 3 \text{ A}$)		E_{AS}	72	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		T_L	260	°C

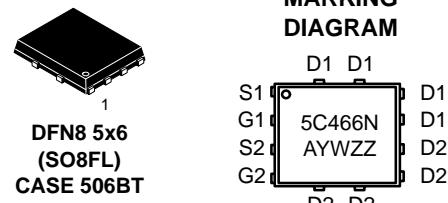
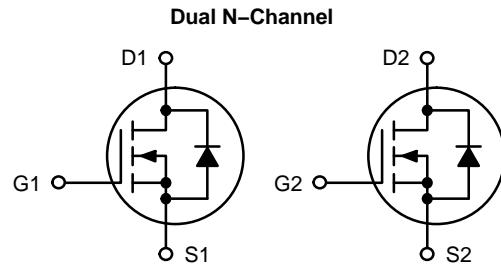
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case – Steady State	$R_{\theta JC}$	4	°C/W
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	49	

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Surface-mounted on FR4 board using a 650 mm², 2 oz. Cu pad.
3. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle.

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ MAX}$	$I_D \text{ MAX}$
40 V	8.1 mΩ @ 10 V	49 A



5C466N = Specific Device Code

A = Assembly Location

Y = Year

W = Work Week

ZZ = Lot Traceability

ORDERING INFORMATION

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

NTMFD5C466N

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain-to-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{GS}} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$		40			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(\text{BR})\text{DSS}}/T_J$				23		$\text{mV}/^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{GS}} = 0 \text{ V}$, $V_{\text{DS}} = 40 \text{ V}$	$T_J = 25^\circ\text{C}$		10		μA
			$T_J = 125^\circ\text{C}$			100	
Gate-to-Source Leakage Current	I_{GSS}	$V_{\text{DS}} = 0 \text{ V}$, $V_{\text{GS}} = 20 \text{ V}$				100	nA
ON CHARACTERISTICS (Note 4)							
Gate Threshold Voltage	$V_{\text{GS}(\text{TH})}$	$V_{\text{GS}} = V_{\text{DS}}$, $I_D = 250 \mu\text{A}$		2.5		3.5	V
Threshold Temperature Coefficient	$V_{\text{GS}(\text{TH})}/T_J$				-6.4		$\text{mV}/^\circ\text{C}$
Drain-to-Source On Resistance	$R_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10 \text{ V}$	$I_D = 15 \text{ A}$		6.75	8.1	$\text{m}\Omega$
CHARGES, CAPACITANCES & GATE RESISTANCE							
Input Capacitance	C_{ISS}	$V_{\text{GS}} = 0 \text{ V}$, $f = 1 \text{ MHz}$, $V_{\text{DS}} = 25 \text{ V}$		650			pF
Output Capacitance	C_{OSS}			320			
Reverse Transfer Capacitance	C_{RSS}			14			
Total Gate Charge	$Q_{\text{G}(\text{TOT})}$	$V_{\text{GS}} = 10 \text{ V}$, $V_{\text{DS}} = 32 \text{ V}$; $I_D = 15 \text{ A}$		11			nC
Threshold Gate Charge	$Q_{\text{G}(\text{TH})}$			2.3			
Gate-to-Source Charge	Q_{GS}			3.6			
Gate-to-Drain Charge	Q_{GD}			1.8			
Plateau Voltage	V_{GP}			4.8			V
SWITCHING CHARACTERISTICS (Note 5)							
Turn-On Delay Time	$t_{\text{d}(\text{ON})}$	$V_{\text{GS}} = 10 \text{ V}$, $V_{\text{DS}} = 32 \text{ V}$, $I_D = 15 \text{ A}$, $R_G = 1.0 \Omega$		9.0			ns
Rise Time	t_r			22			
Turn-Off Delay Time	$t_{\text{d}(\text{OFF})}$			19			
Fall Time	t_f			6.0			
DRAIN-SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	$V_{\text{GS}} = 0 \text{ V}$, $I_S = 15 \text{ A}$	$T_J = 25^\circ\text{C}$		0.9	1.2	V
			$T_J = 125^\circ\text{C}$		0.7		
Reverse Recovery Time	t_{RR}	$V_{\text{GS}} = 0 \text{ V}$, $dI_S/dt = 100 \text{ A}/\mu\text{s}$, $I_S = 15 \text{ A}$		24			ns
Charge Time	t_a			11			
Discharge Time	t_b			13			
Reverse Recovery Charge	Q_{RR}			10			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.

4. Pulse Test: pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
5. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

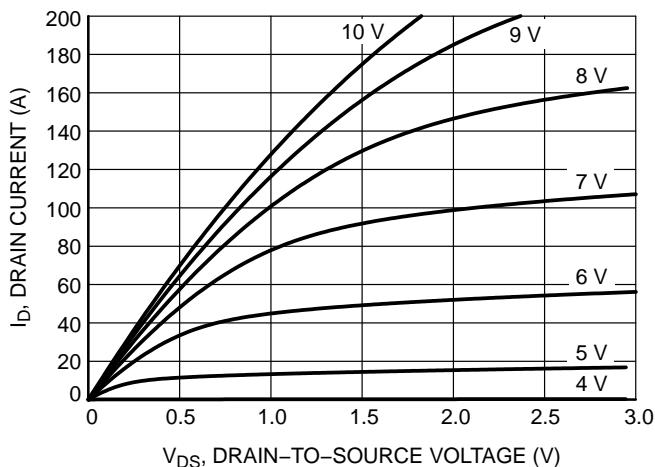


Figure 1. On-Region Characteristics

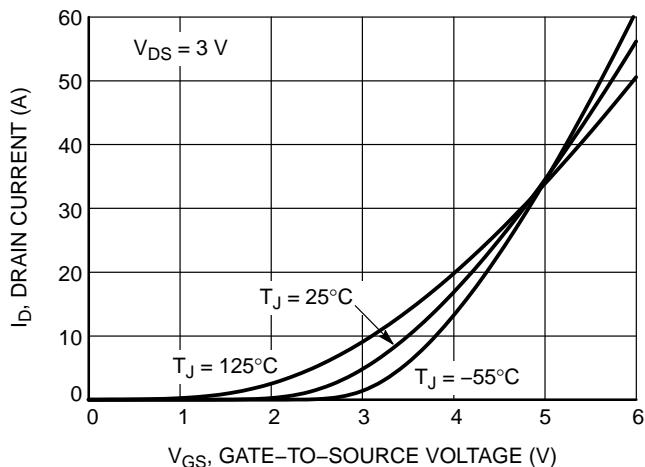


Figure 2. Transfer Characteristics

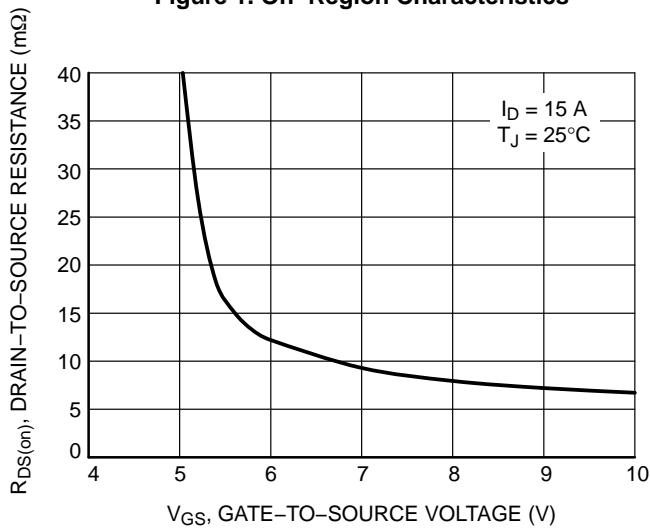


Figure 3. On-Resistance vs. Gate-to-Source Voltage

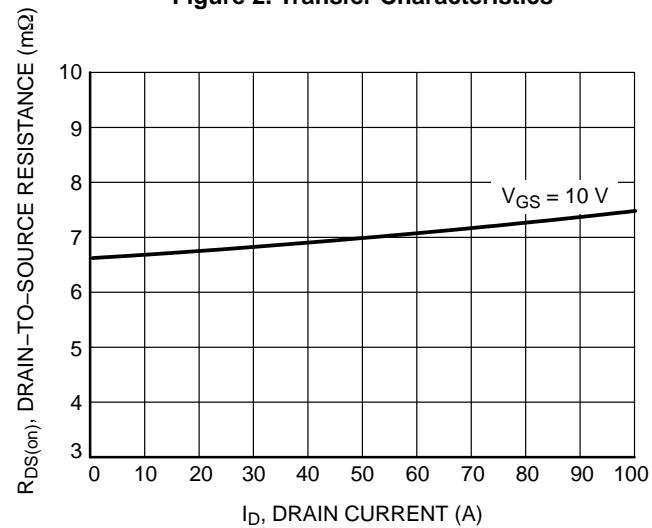


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

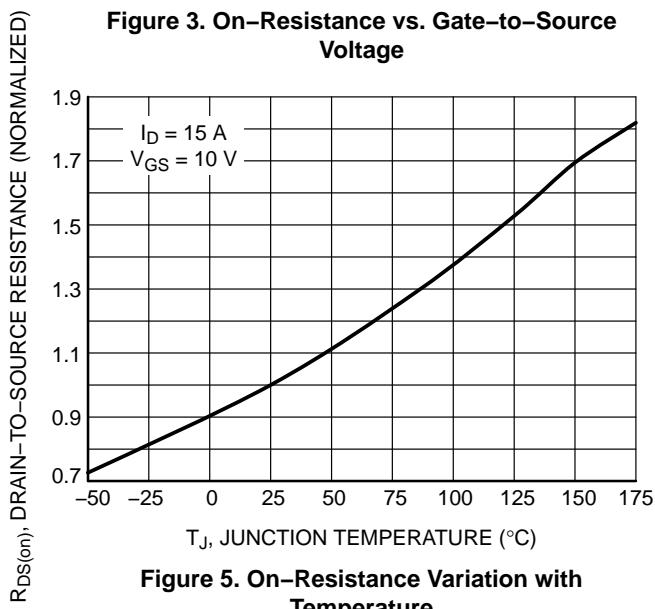


Figure 5. On-Resistance Variation with Temperature

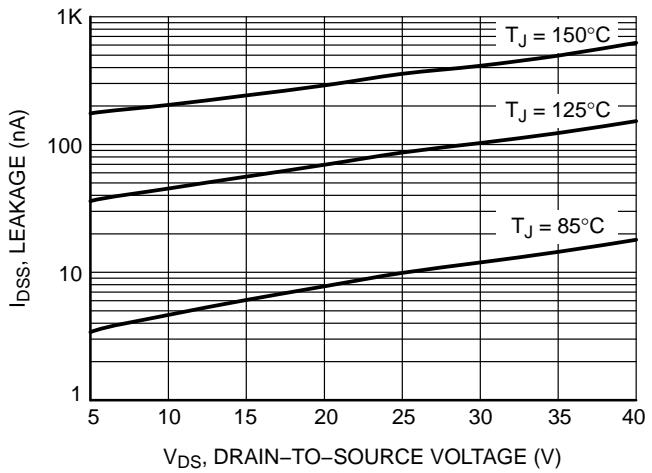
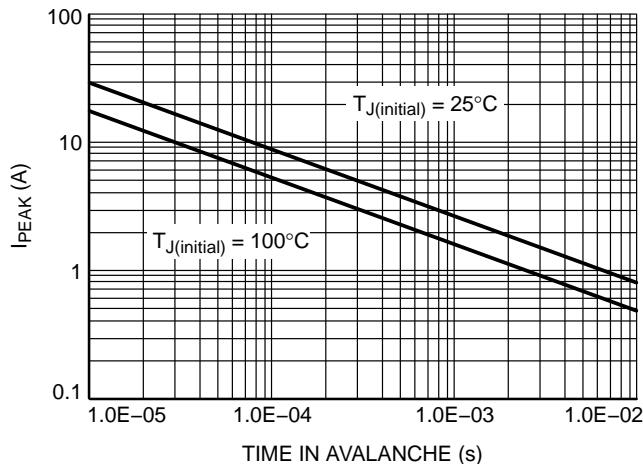
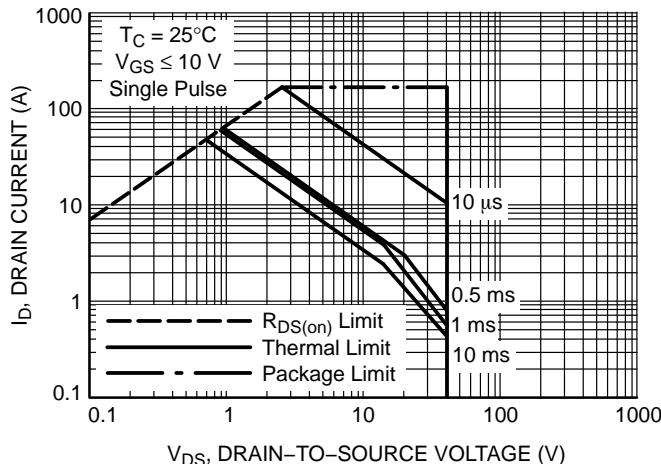
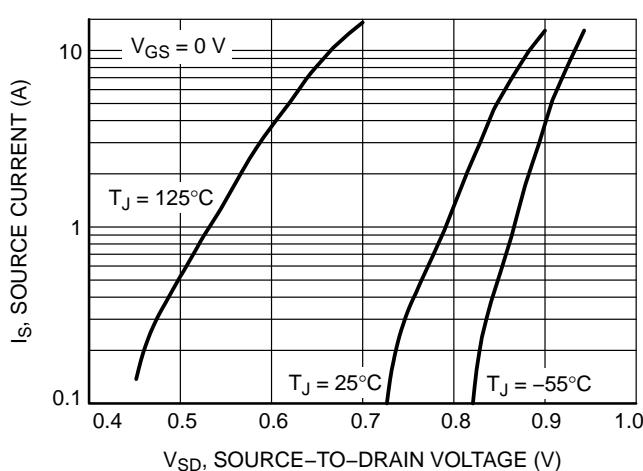
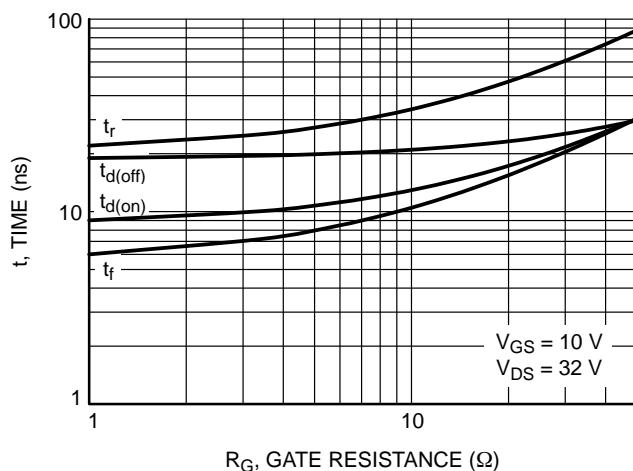
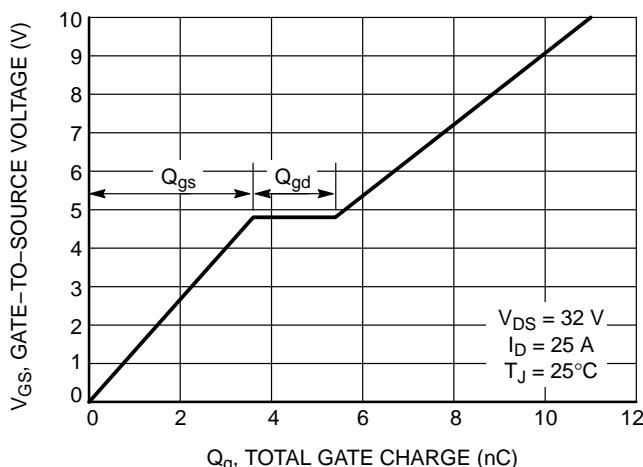
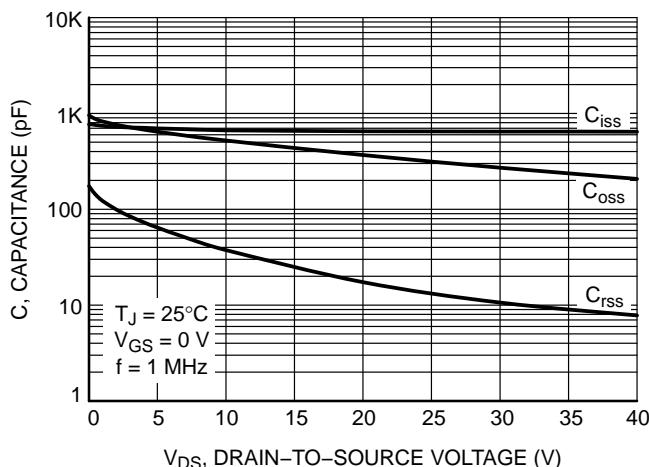


Figure 6. Drain-to-Source Leakage Current vs. Voltage

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS

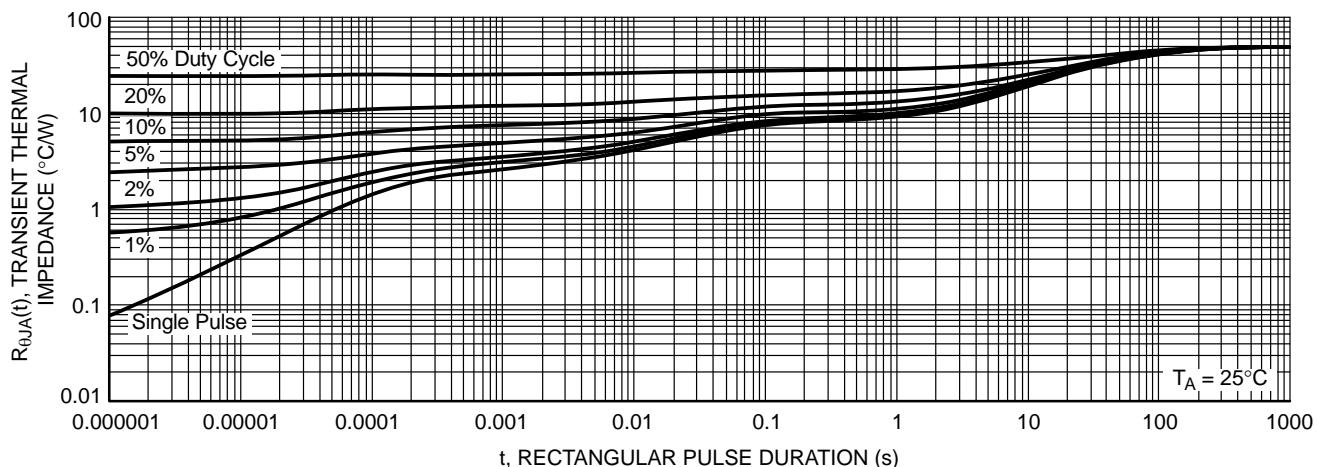


Figure 13. Thermal Response

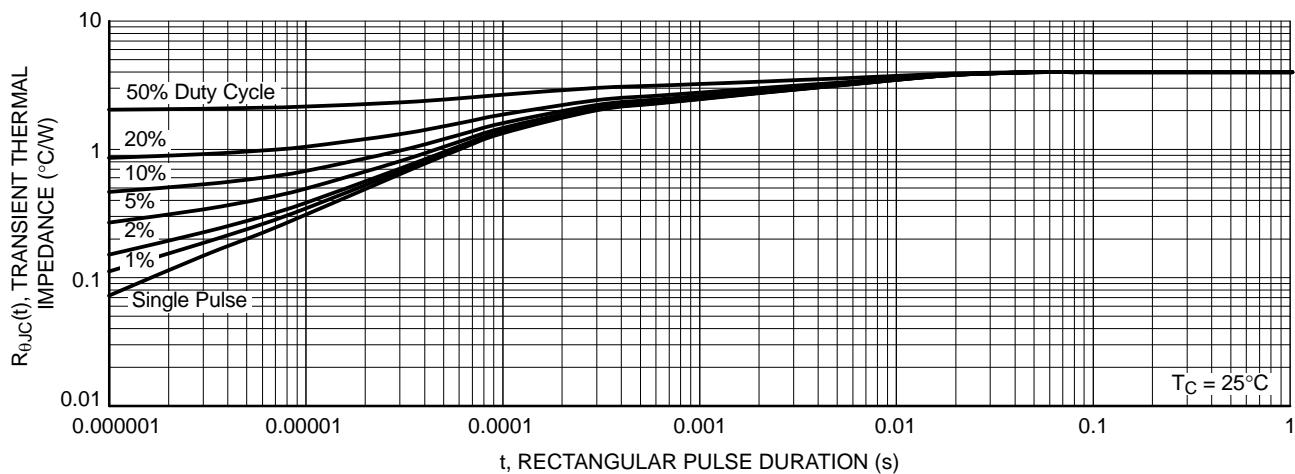


Figure 14. Thermal Response

DEVICE ORDERING INFORMATION

Device	Marking	Package	Shipping [†]
NTMFD5C466NT1G	5C466N	DFN8 (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.



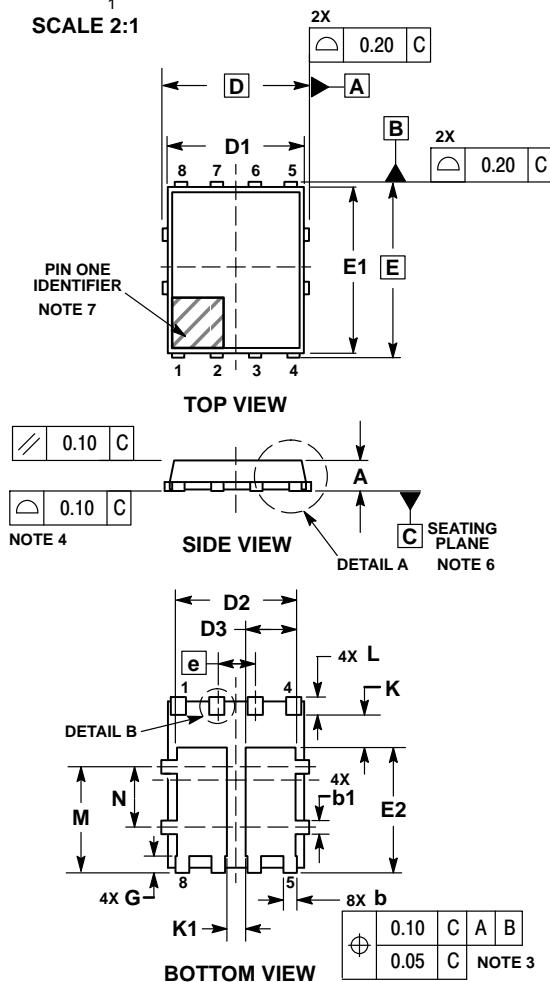
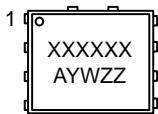
SCALE 2:1

DFN8 5x6, 1.27P Dual Flag (SO8FL-Dual)

CASE 506BT

ISSUE F

DATE 23 NOV 2021

GENERIC
MARKING DIAGRAM*

XXXXXX = Specific Device Code

A = Assembly Location

Y = Year

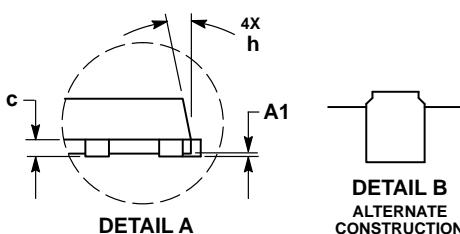
W = Work Week

ZZ = Lot Traceability

*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.

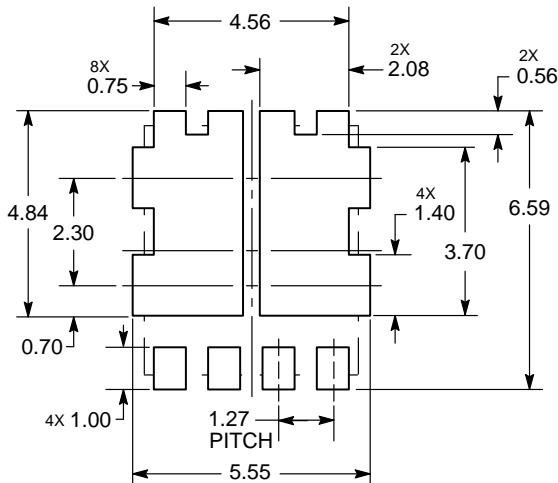
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM THE TERMINAL TIP.
4. PROFILE TOLERANCE APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.
5. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
6. 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.
7. A VISUAL INDICATOR FOR PIN 1 MUST BE LOCATED IN THIS AREA.



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	—	1.10
A1	—	—	0.05
b	0.33	0.42	0.51
b1	0.33	0.42	0.51
c	0.20	—	0.33
D	5.15 BSC	—	—
D1	4.70	4.90	5.10
D2	3.90	4.10	4.30
D3	1.50	1.70	1.90
E	6.15 BSC	—	—
E1	5.70	5.90	6.10
E2	3.90	4.15	4.40
e	1.27 BSC	—	—
G	0.45	0.55	0.65
h	—	—	12°
K	0.51	—	—
K1	0.56	—	—
L	0.48	0.61	0.71
M	3.25	3.50	3.75
N	1.80	2.00	2.20

SOLDERING FOOTPRINT*



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

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DESCRIPTION:	DFN8 5X6, 1.27P DUAL FLAG (SO8FL-DUAL)	PAGE 1 OF 1

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