

MOSFET – Power, Single N-Channel, STD Gate, SO8FL

40 V, 0.6 mΩ, 384 A

NVMFWS0D63N04XM

Features

- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Capacitance to Minimize Driver Losses
- Small Footprint (5x6 mm) for Compact Design
- AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Motor Drive
- Battery Protection
- Synchronous Rectification

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

Symbol	Parameter	Value	Unit	
V_{DSS}	Drain-to-Source Voltage	40	V	
V_{GS}	Gate-to-Source Voltage	DC ±20	V	
I_D	Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	384	A
		$T_C = 100\text{ }^\circ\text{C}$	271	
P_D	Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	157	W
I_D	Continuous Drain Current $R_{\theta JA}$	$T_C = 25\text{ }^\circ\text{C}$	60	A
		$T_C = 100\text{ }^\circ\text{C}$	42	
I_{DM}	Pulsed Drain Current	$T_C = 25\text{ }^\circ\text{C}$, $t_p = 10\text{ }\mu\text{s}$	900	A
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 to 175		$^\circ\text{C}$
I_S	Source Current (Body Diode)	131		A
E_{AS}	Single Pulse Avalanche Energy	$I_{PK} = 26.5\text{ A}$	585	mJ
T_L	Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	260		$^\circ\text{C}$

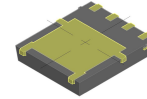
Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Note 2)	0.95	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Notes 1, 2)	39	

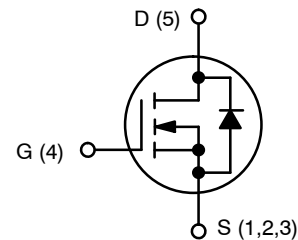
1. Surface mounted on FR4 board using 650 mm², 2 oz Cu pad.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
40 V	0.6 mΩ @ $V_{GS} = 10\text{ V}$	384 A

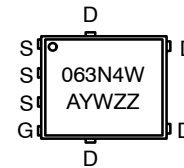


DFNW5 (SO-8FL)
CASE 507BA

N-CHANNEL MOSFET



MARKING DIAGRAM



063N4W = 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.

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

Symbol	Parameter	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}, T_J = 25\text{ }^\circ\text{C}$	40			V
$\Delta V_{(BR)DSS}/\Delta T_J$	Drain-to-Source Breakdown Voltage Temperature Coefficient	$I_D = 1\text{ mA}$, Referenced to $25\text{ }^\circ\text{C}$		15		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 40\text{ V}, T_J = 25\text{ }^\circ\text{C}$			10	μA
		$V_{DS} = 40\text{ V}, T_J = 125\text{ }^\circ\text{C}$			100	
I_{GSS}	Gate-to-Source Leakage Current	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$			100	nA

ON CHARACTERISTICS

$R_{DS(on)}$	Drain-to-Source On Resistance	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 25\text{ }^\circ\text{C}$		0.54	0.6	m Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 230\text{ }\mu\text{A}, T_J = 25\text{ }^\circ\text{C}$	2.5		3.5	V
$\Delta V_{GS(TH)}/\Delta T_J$	Gate Threshold Voltage Temperature Coefficient	$V_{GS} = V_{DS}, I_D = 230\text{ }\mu\text{A}$		-7.24		mV/ $^\circ\text{C}$
g_{FS}	Forward Trans-conductance	$V_{DS} = 5\text{ V}, I_D = 30\text{ A}$		174		S

CHARGES, CAPACITANCES & GATE RESISTANCE

C_{ISS}	Input Capacitance	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		5862		pF
C_{OSS}	Output Capacitance			3760		
C_{RSS}	Reverse Transfer Capacitance			50		
$Q_{G(TOT)}$	Total Gate Charge	$V_{DD} = 32\text{ V}, I_D = 50\text{ A}, V_{GS} = 10\text{ V}$		92.2		nC
$Q_{G(TH)}$	Threshold Gate Charge			17.2		
Q_{GS}	Gate-to-Source Charge			25.8		
Q_{GD}	Gate-to-Drain Charge			17.4		
R_G	Gate Resistance	$f = 1\text{ MHz}$		0.60		Ω

SWITCHING CHARACTERISTICS

$t_{d(ON)}$	Turn-On Delay Time	Resistive Load, $V_{GS} = 0/10\text{ V}, V_{DD} = 32\text{ V},$ $I_D = 50\text{ A}, R_G = 0\text{ }\Omega$		28		ns
t_r	Rise Time			9		
$t_{d(OFF)}$	Turn-Off Delay Time			47		
t_f	Fall Time			7.3		

SOURCE TO DRAIN DIODE CHARACTERISTICS

V_{SD}	Forward Diode Voltage	$I_S = 30\text{ A}, V_{GS} = 0\text{ V}, T_J = 25\text{ }^\circ\text{C}$		0.78		V
		$I_S = 30\text{ A}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$		0.63		
t_{RR}	Reverse Recovery Time	$V_{GS} = 0\text{ V}, I_S = 50\text{ A},$ $di/dt = 100\text{ A}/\mu\text{s}, V_{DD} = 32\text{ V}$		83		ns
t_a	Charge Time			47		
t_b	Discharge Time			36		
Q_{RR}	Reverse Recovery Charge			246		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.

NVMFWS0D63N04XM

TYPICAL CHARACTERISTICS

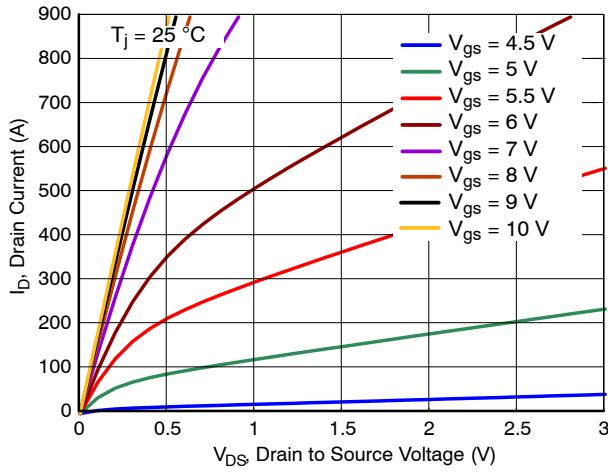


Figure 1. On-Region Characteristics

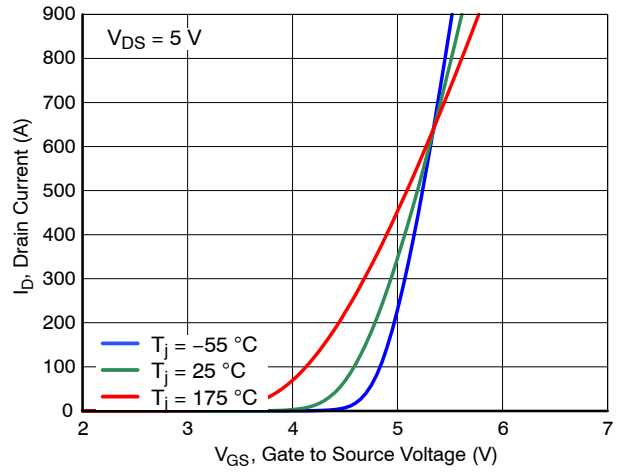


Figure 2. Transfer Characteristics

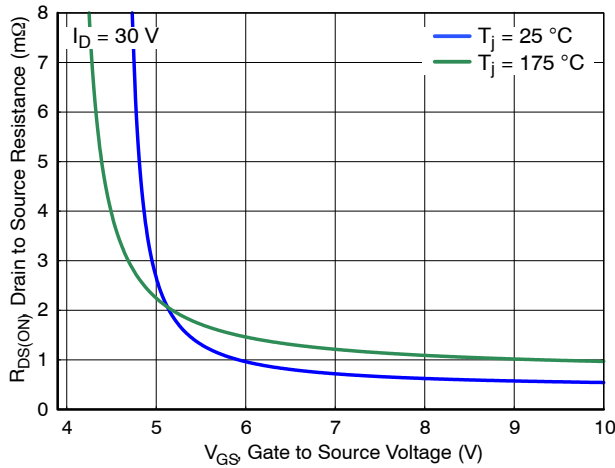


Figure 3. On-Resistance vs. Gate Voltage

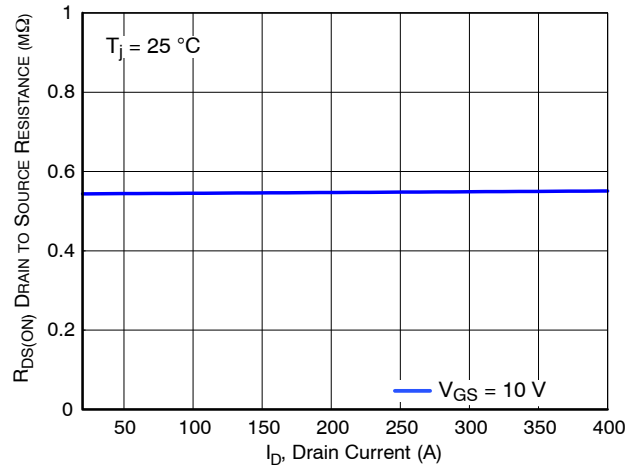


Figure 4. On-Resistance vs. Drain Current

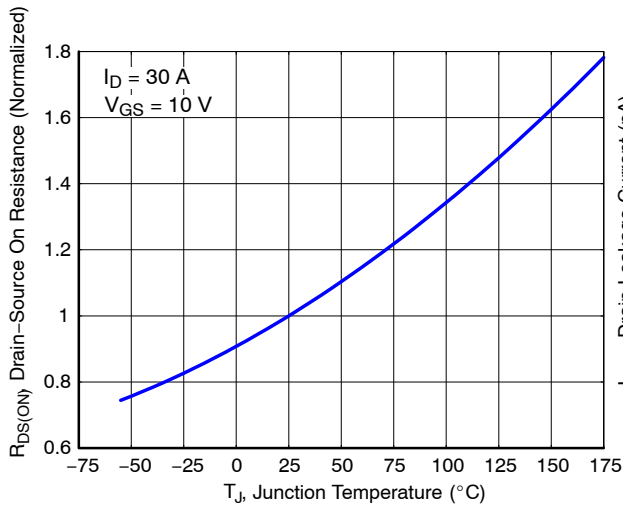


Figure 5. Normalized On-Resistance vs. Junction Temperature

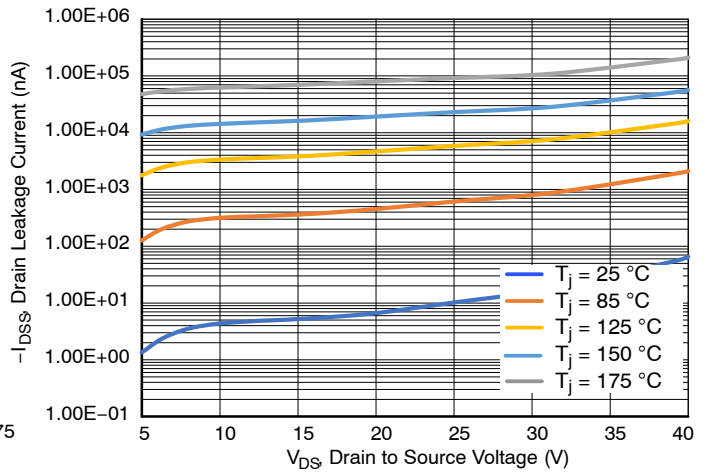


Figure 6. Drain-to-Source Leakage Current vs. Drain Voltage

NVMFWS0D63N04XM

TYPICAL CHARACTERISTICS (continued)

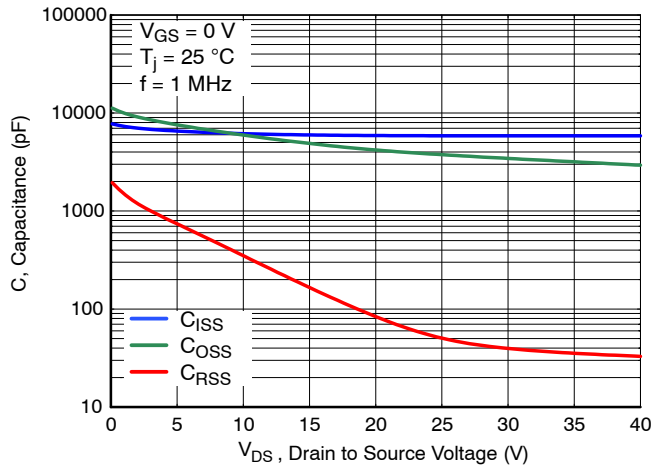


Figure 7. Capacitance Characteristics

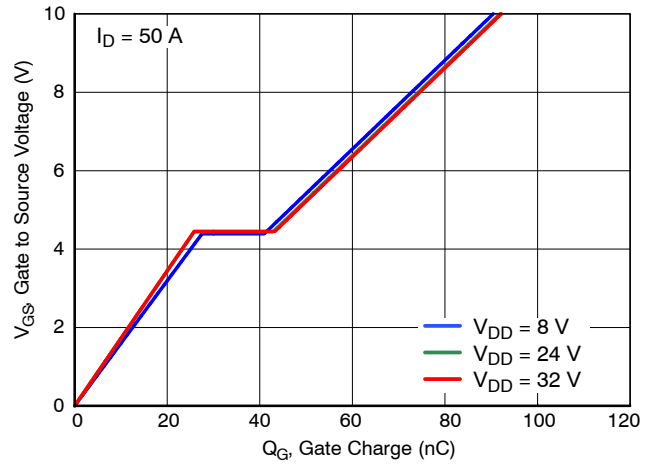


Figure 8. Gate Charge Characteristics

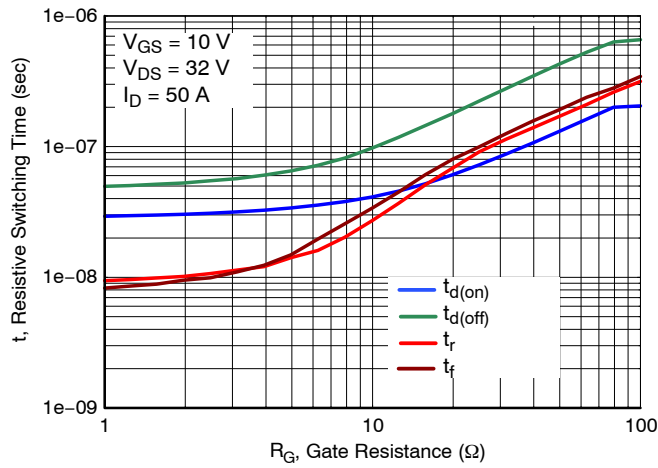


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

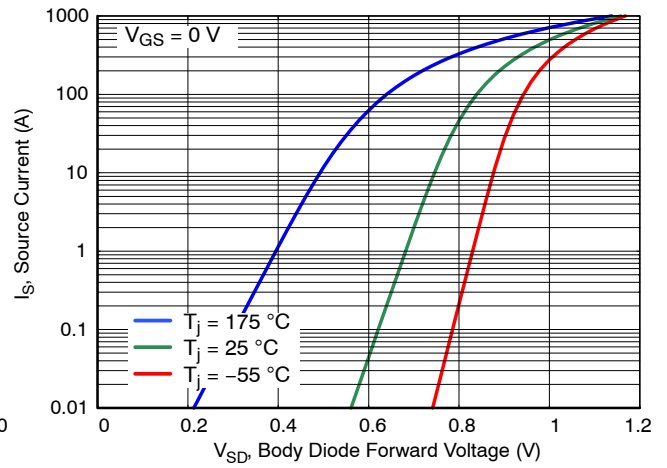


Figure 10. Diode Forward Voltage vs. Current

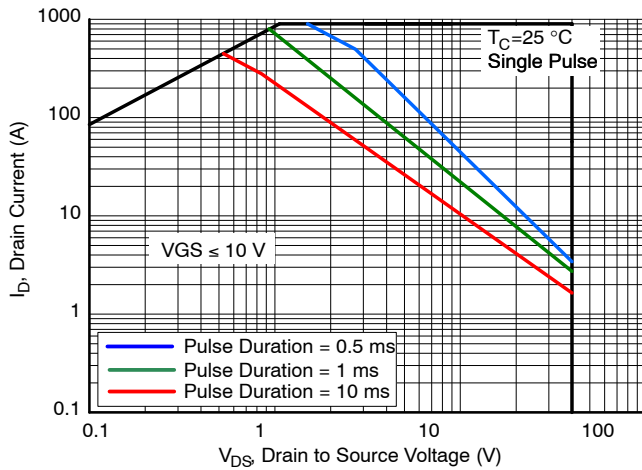


Figure 11. Safe Operating Area (SOA)

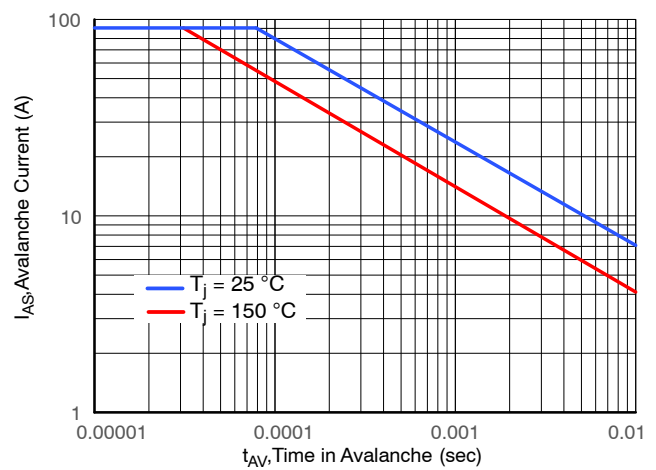


Figure 12. Avalanche Current vs. Pulse Time (UIS)

NVMFWS0D63N04XM

TYPICAL CHARACTERISTICS (continued)

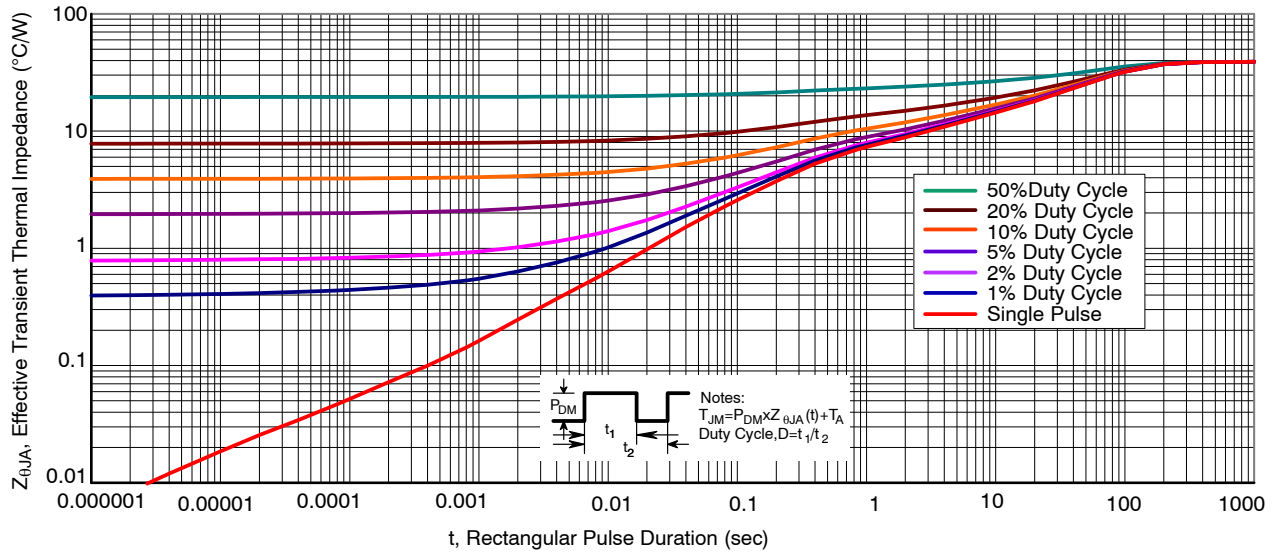


Figure 13. Thermal Characteristics

ORDERING INFORMATION

Device	Marking	Package	Shipping†
NVMFWS0D63N04XMT1G	063N4W	DFNW5 (Pb-Free)	1,500 / Tape & Reel
NVMFWS0D63N04XMET1G	063N4W	DFNW5 (Pb-Free)	1,500 / Tape & Reel

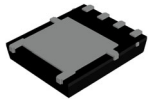
† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

NVMFWS0D63N04XM

REVISION HISTORY

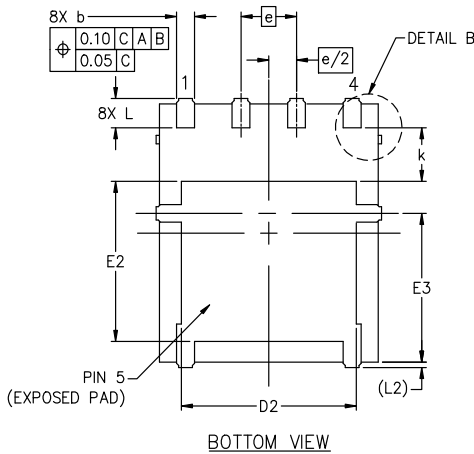
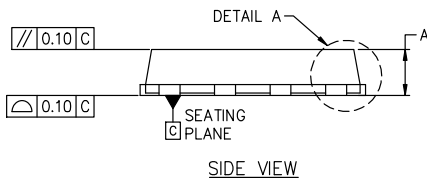
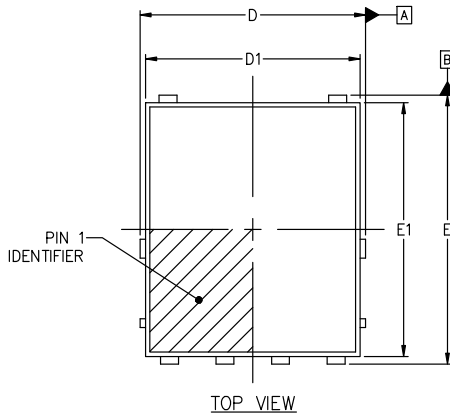
Revision	Description of Changes	Date
2	Addition of NVMFWS0D63N04XMET1G OPN in the data sheet.	2/27/2026

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.



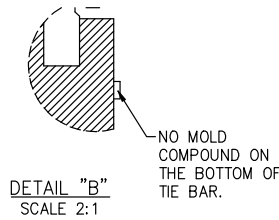
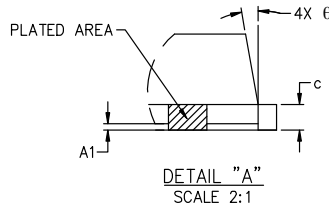
**DFNW5 4.90x5.90x1.00, 1.27P
CASE 507BA
ISSUE C**

DATE 19 SEP 2024

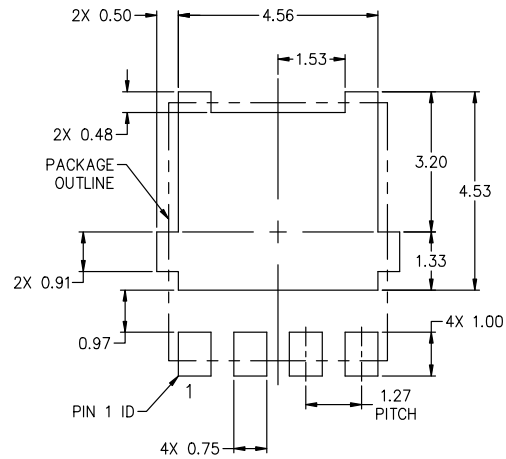


NOTES:

1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5M-2018.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR GATE BURRS.
4. THIS PACKAGE CONTAINS WETTABLE FLANK DESIGN FEATURES TO AID IN FILLET FORMATION ON THE LEADS DURING MOUNTING.



DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	---	0.05
b	0.33	0.41	0.51
c	0.23	0.28	0.33
D	5.00	5.15	5.30
D1	4.70	4.90	5.10
D2	3.80	4.00	4.20
E	6.00	6.15	6.30
E1	5.70	5.90	6.10
E2	3.45	3.65	3.85
E3	3.00	3.40	3.80
e	1.27 BSC		
k	1.20	1.35	1.50
L	0.51	0.57	0.71
L2	0.15 REF.		
theta	0°	6°	12°



RECOMMENDED MOUNTING FOOTPRINT*
*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ONSEMI SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

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.

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DESCRIPTION:	DFNW5 4.90x5.90x1.00, 1.27P	PAGE 1 OF 1

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