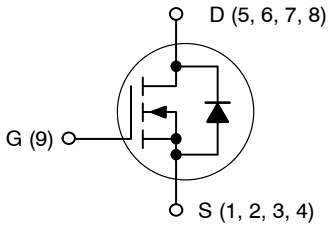
MOSFET - Power, Single N-Channel, Source Down, WDFN9

80 V, 4 mΩ, 102 A

Product Preview

NTTFSSH4D0N08XL

$V_{(BR)DSS}$	$R_{DS(ON)}$ MAX	I_D MAX
80 V	4 mΩ @ 10 V	102 A
	6 mΩ @ 4.5 V	



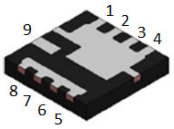
N−CHANNEL MOSFET

Features

- Advanced Source−Down Package Technology (3.3 x 3.3 mm) with Excellent Thermal Conduction
- Ultra Low $R_{DS(on)}$ to Improve System Efficiency
- Low Q_G and Capacitance to Minimize Driving and Switching Losses
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- High Switching Frequency DC−DC Conversion
- Synchronous Rectifier



WDFN9
CASE 511EB

MARKING DIAGRAM

XXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week

ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

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

Parameter		Symbol	Value	Unit
Drain−to−Source Voltage		V_{DSS}	80	V
Gate−to−Source Voltage		V_{GS}	±20	V
Continuous Drain Current (Note 1)	T_C = 25°C	I_D	102	A
	T_C = 100°C		72	
Power Dissipation (Notes 1, 2)	T_C = 25°C	P_D	102	W
Pulsed Drain Current	T_C = 25°C, t_p = 10 μs	I_{DM}	668	A
Pulsed Source Current (Body Diode)		I_{SM}	668	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to +175	°C
Source Current (Body Diode)		I_S	155	A
Single Pulse Avalanche Energy (I_{PK} = TBD A)		E_{AS}	TBD	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.

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

This document contains information on a product under development. **onsemi** reserves the right to change or discontinue this product without notice.

THERMAL CHARACTERISTICS

Parameter	Symbol	Max	Unit
Thermal Resistance, Junction−to−Case	$R_{\theta JC}$	1.47	°C/W
Thermal Resistance, Junction−to−Ambient	$R_{\theta JA}$	60	

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 1 mA, T_J = 25°C	80			V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	I_D = 1 mA, Referenced to 25°C		31		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80 V, T_J = 25°C			10	μA
		V_{DS} = 80 V, T_J = 125°C			250	
Gate−to−Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = 20 V			100	nA
ON CHARACTERISTICS						
Drain−to−Source On Resistance	$R_{DS(ON)}$	V_{GS} = 10 V, I_D = 23 A		3.3	4	mΩ
		V_{GS} = 4.5 V, I_D = 18 A		4.8	6	
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 115 μA, T_J = 25°C	1.5		2.1	V
Gate Threshold Voltage Temperature Coefficient	$\Delta V_{GS(TH)}/\Delta T_J$	V_{GS} = V_{DS}, I_D = 115 μA		−6.3		mV/°C
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 23 A		120		S
CHARGES, CAPACITANCES & GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, V_{DS} = 40 V, f = 1 MHz		3420		pF
Output Capacitance	C_{OSS}			550		
Reverse Transfer Capacitance	C_{RSS}			18		
Output Charge	Q_{OSS}			45		nC
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DD} = 40 V; I_D = 23 A		22		
		V_{GS} = 10 V, V_{DD} = 40 V; I_D = 23 A		47		
Threshold Gate Charge	$Q_{G(TH)}$			7		
Gate−to−Source Charge	Q_{GS}			11		
Gate−to−Drain Charge	Q_{GD}			5		
Gate Plateau Voltage	V_{GP}			3.2		V
Gate Resistance	R_G	f = 1 MHz		0.4		Ω
SWITCHING CHARACTERISTICS						
Turn−On Delay Time	$t_{d(ON)}$	Resistive Load, V_{GS} = 0/10 V, V_{DD} = 40 V, I_D = 23 A, R_G = 2.5 Ω		18		ns
Rise Time	t_r			7		
Turn−Off Delay Time	$t_{d(OFF)}$			40		
Fall Time	t_f			5		
SOURCE−TO−DRAIN DIODE CHARACTERISTICS						
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = 23 A, T_J = 25°C		0.82		V
		V_{GS} = 0 V, I_S = 23 A, T_J = 125°C		0.66		

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
SOURCE−TO−DRAIN DIODE CHARACTERISTICS						
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, I_S = 23 A, dI/dt = 1000 A/μs, V_{DD} = 40 V		19		ns
Charge Time	t_a			11		
Discharge Time	t_b			8		
Reverse Recovery Charge	Q_{RR}			116		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.

ORDERING INFORMATION

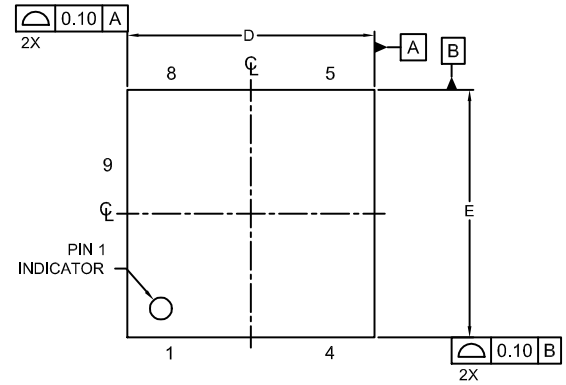
Device	Marking	Package	Shipping†
NTTFSSH4D0N08XLTWG	TBD	WDFN9 (Pb−Free)	3000 / Tape & Reel

†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.

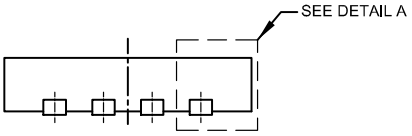
NTTFSSH4D0N08XL

PACKAGE DIMENSIONS

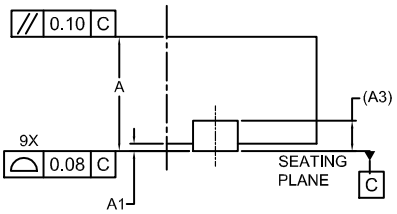
WDFN9 3.3x3.3, 0.65P
CASE 511EB
ISSUE B



TOP VIEW



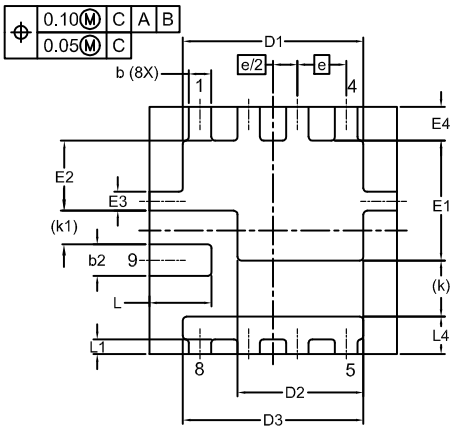
FRONT VIEW



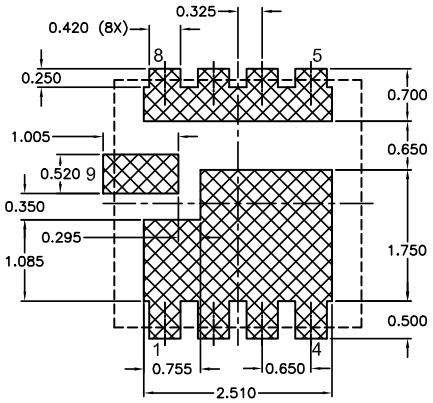
DETAIL A
SCALE: 2:1

NOTES:
1. CONTROLLING DIMENSION: MILLIMETERS
2. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
3. DIMENSIONS D1, D2, E1 AND E2 DO NOT INCLUDE MOLD FLASH.
4. SEATING PLANE IS DEFINED BY THE TERMINALS. "A1" IS DEFINED AS THE DISTANCE FROM THE SEATING PLANE TO THE LOWEST POINT OF THE PACKAGE BODY.

UNIT IN MILLIMETER			
DIM	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A3		0.20 REF	
b	0.25	0.30	0.35
b2	0.37	0.42	0.47
D	3.20	3.30	3.40
D1	2.31	2.41	2.51
D2	1.58	1.68	1.78
D3	2.31	2.41	2.51
E	3.20	3.30	3.40
E1	1.50	1.60	1.70
E2	0.84	0.94	1.04
E3	0.20	0.25	0.30
E4	0.35	0.45	0.55
e		0.650 BSC	
e/2		0.325 BSC	
k		0.75 REF	
k1		0.45 REF	
L	0.73	0.83	0.93
L1	0.10	0.20	0.30
L4	0.40	0.50	0.60



BOTTOM VIEW



LAND PATTERN
RECOMMENDATION

*FOR ADDITIONAL INFORMATION ON OUR PB−FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

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

◊