

NTLJS3D9N03C

Product Preview

Power MOSFET

30 V, Single N-Channel, WDFN6

Features

- Small Footprint (4 mm²) for Compact Design
- Low R_{DS(on)} to Minimize Conduction Losses
- These Devices are Pb-Free, Halogen-Free/BFR-Free and are RoHS Compliant

Applications

- Wireless Chargers
- Power Load Switch
- Power Management and Protection
- Battery Management

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	30	V
Gate-to-Source Voltage	V _{GS}	±12	V
Continuous Drain Current R _{θJA} (Notes 1, 3)	Steady State	T _A = 25°C	I _D 17.8 A
		T _A = 85°C	12.8
Power Dissipation R _{θJA} (Notes 1, 3)		T _A = 25°C	P _D 2.40 W
Continuous Drain Current R _{θJA} (Notes 2, 3)	Steady State	T _A = 25°C	I _D 10.7 A
		T _A = 85°C	7.7
Power Dissipation R _{θJA} (Notes 2, 3)		T _A = 25°C	P _D 0.86 W
Pulsed Drain Current	T _A = 25°C, t _p = 10 μs	I _{DM}	TBD A
Single Pulse Drain-to-Source Avalanche Energy (I _L = TBD A _{pk} , L = 0.1 mH) (Note 4)	E _{AS}	TBD	mJ
Operating Junction and Storage Temperature	T _J , T _{stg}	-55 to +150	°C
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 (Note 1)

Parameter	Symbol	Value	Unit
Junction-to-Ambient - Steady State (Note 1)	R _{θJA}	52	°C/W
Junction-to-Ambient - Steady State (Note 2)	R _{θJA}	145	

1. Surface-mounted on FR4 board using 1 in² pad size, 2 oz. Cu pad.
2. Surface-mounted on FR4 board using minimum pad size, 2 oz. Cu pad.
3. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted. Actual continuous current will be limited by thermal & electro-mechanical application board design. R_{θCA} is determined by the user's board design.
4. 100% UIS tested at L = 0.1 mH, I_{AS} = TBD A.

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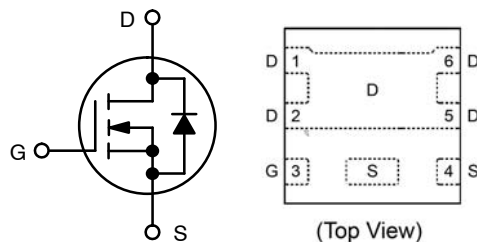


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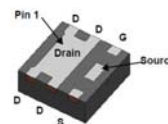
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V _{(BR)DSS}	R _{DS(on)} MAX	I _D MAX
30 V	4.9 mΩ @ 4.5 V	17.8 A
	7.1 mΩ @ 3.3 V	
	10.4 mΩ @ 2.5 V	
	22.7 mΩ @ 1.8 V	

ELECTRICAL CONNECTION



N-CHANNEL MOSFET



WDFN6 (2.05x2.05)
CASE 483AV

MARKING DIAGRAM

YWZZ
AXXX
○

YW = Date Code
ZZ = Assembly Lot Code
A = Assembly Site Code
XXX = Specific Device Code

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 2 of this data sheet.

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	$I_D = 250\ \mu\text{A}$, ref to 25°C		TBD		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 24\text{ V}$	$T_J = 25^\circ\text{C}$		1	μA
			$T_J = 125^\circ\text{C}$		10	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			± 100	μA

ON CHARACTERISTICS (Note 5)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$	0.6		1.1	V
Threshold Temperature Coefficient	V_{GS}/T_J	$I_D = 250\ \mu\text{A}$, ref to 25°C		TBD		mV/ $^\circ\text{C}$
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		3.9	4.9	m Ω
		$V_{GS} = 3.3\text{ V}, I_D = 5\text{ A}$		5.4	7.1	
		$V_{GS} = 2.5\text{ V}, I_D = 4\text{ A}$		8.0	10.4	
		$V_{GS} = 1.8\text{ V}, I_D = 2\text{ A}$		15.1	22.7	
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{ V}, I_D = 10\text{ A}$		TBD		S
Gate Resistance	R_G	$T_A = 25^\circ\text{C}$		3		Ω

CHARGES AND CAPACITANCES

Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}, f = 1.0\text{ MHz}$		1701		pF
Output Capacitance	C_{oss}			627		
Reverse Transfer Capacitance	C_{rss}			55		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		16		nC
Threshold Gate Charge	$Q_{G(TH)}$			TBD		nC
Gate-to-Source Charge	Q_{GS}			3.4		
Gate-to-Drain Charge	Q_{GD}			2.5		

SWITCHING CHARACTERISTICS, $V_{GS} = 4.5\text{ V}$ (Note 6)

Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 4.5\text{ V}, V_{DD} = 15\text{ V}, I_D = 10\text{ A}, R_G = 6\ \Omega$		TBD		ns
Rise Time	t_r			TBD		
Turn-Off Delay Time	$t_{d(off)}$			TBD		
Fall Time	t_f			TBD		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 10\text{ A}$	$T_J = 25^\circ\text{C}$		TBD	TBD	V
			$T_J = 125^\circ\text{C}$		TBD		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = 10\text{ A}$			TBD		ns
Reverse Recovery Charge	Q_{RR}				TBD		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.

5. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

6. Switching characteristics are independent of operating junction temperatures.

DEVICE ORDERING INFORMATION

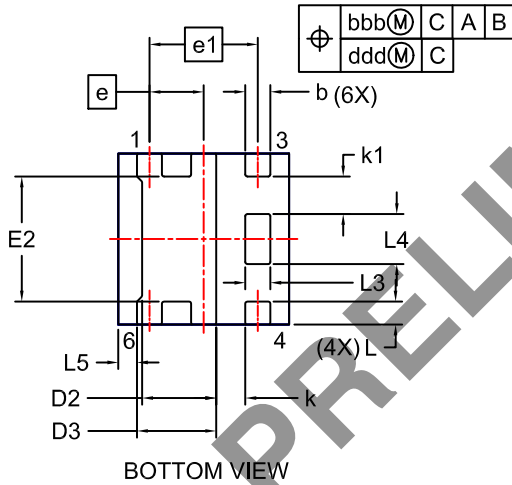
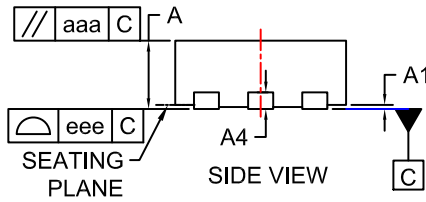
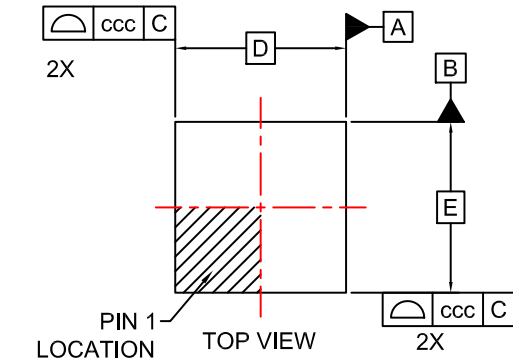
Device	Package	Shipping [†]
NTLJS3D9N03CTAG	WDFN6 (Pb-Free)	3000 / Tape & Reel

[†]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.

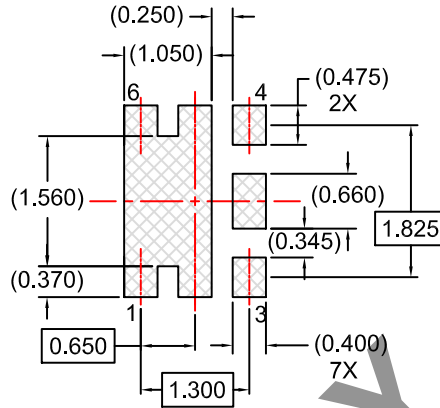
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PACKAGE DIMENSIONS

WDFN6 2.05X2.05, 0.65P
CASE 483AV
ISSUE A



LAND PATTERN RECOMMENDATION



NOTES:

1. CONTROLLING DIMENSION: MILLIMETERS.
2. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.
3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.
4. 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.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.60	0.70	0.80
A1	0.00	-	0.05
A4	(0.20)		
b	0.25	0.30	0.35
D	1.95	2.05	2.15
D2	0.84	0.89	0.94
D3	(0.95)		
E	1.95	2.05	2.15
E2	1.45	1.50	1.55
e	0.65 BSC		
e1	1.30 BSC		
k	(0.35)		
k1	(0.45)		
L	0.18	0.28	0.38
L3	0.25	0.30	0.35
L4	0.55	0.60	0.65
L5	(0.23)		
aaa	0.10		
bbb	0.10		
ccc	0.05		
ddd	0.05		
eee	0.05		

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