NTNS3A91PZ

Advance Information

Small Signal MOSFET

–20 V, –214 mA, Single P–Channel, 0.62 x 0.62 x 0.4 mm XLLGA3 Package

ON Semiconductor®

http://onsemi.com

Features

- Single P–Channel MOSFET
- Ultra Small and Thin Package (0.62 x 0.62 x 0.4 mm)
- Low $R_{DS(on)}$ Solution in 0.62 x 0.62 mm Package
- 1.5 V Gate Voltage Rating
- These Devices are Pb–Free, Halogen Free/BFR Free and are RoHS Compliant

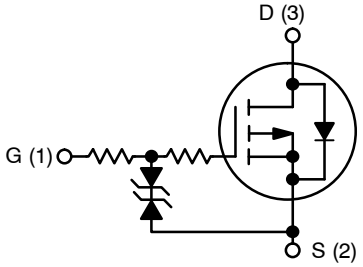
Applications

- Small Signal Load Switch
- Analog Switch
- High Speed Interfacing
- Optimized for Power Management in Ultra Portable Products

MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
–20 V	1.6 Ω @ –4.5 V	–214 mA
	2.4 Ω @ –2.5 V	
	3.3 Ω @ –1.8 V	
	4.5 Ω @ –1.5 V	

P–Channel MOSFET



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

Parameter			Symbol	Value	Units
Drain-to-Source Voltage			V_{DSS}	–20	V
Gate-to-Source Voltage			V_{GS}	±8.0	V
Continuous Drain Current (Note 1)	Steady State	T_A = 25°C	I_D	–214	mA
		T_A = 85°C		–155	
	t ≤ 5 s	T_A = 25°C		–277	
Power Dissipation (Note 1)	Steady State	T_A = 25°C	P_D	125	mW
	t ≤ 5 s	T_A = 25°C		208	
Pulsed Drain Current		t_p = 10 μs	I_{DM}	–643	mA
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	°C
Source Current (Body Diode) (Note 2)			I_S	–208	mA
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)			T_L	260	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

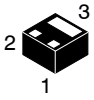
THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Units
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	1000	°C/W
Junction-to-Ambient – t ≤ 5 s (Note 1)	$R_{\theta JA}$	600	

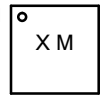
1. Surface Mounted on FR4 Board using the minimum recommended pad size, (or 2 mm^2), 1 oz Cu.
2. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

MARKING DIAGRAM



XLLGA3
CASE 713AA



X = Specific Device Code
M = Date Code

ORDERING INFORMATION

Device	Package	Shipping†
NTNS3A91PZT5G	XLLGA3 (Pb–Free)	8000 / 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.

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

Parameter	Symbol	Test Condition		Min	Typ	Max	Units
OFF CHARACTERISTICS							
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −250 μA		−20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = −20 V	T_J = 25°C			−1.0	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8.0 V				±2.0	μA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −250 μA		−0.4		−1.0	V
Drain-to-Source On Resistance	$R_{DS(on)}$	V_{GS} = −4.5 V, I_D = −100 mA			1.3	1.6	Ω
		V_{GS} = −2.5 V, I_D = −50 mA			1.8	2.4	
		V_{GS} = −1.8 V, I_D = −20 mA			2.3	3.3	
		V_{GS} = −1.5 V, I_D = −10 mA			2.8	4.5	
Source−Drain Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = −10 mA			−0.7	−1.0	V
CHARGES, CAPACITANCES & GATE RESISTANCE							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = −15 V			22		pF
Output Capacitance	C_{OSS}				4.5		
Reverse Transfer Capacitance	C_{RSS}				2.5		
SWITCHING CHARACTERISTICS, VGS = 4.5 V (Note 3)							
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = −4.5 V, V_{DD} = −15 V, I_D = −200 mA, R_G = 2 Ω			41		ns
Rise Time	t_r				97		
Turn-Off Delay Time	$t_{d(OFF)}$				571		
Fall Time	t_f				286		

3. Switching characteristics are independent of operating junction temperatures.

TYPICAL CHARACTERISTICS

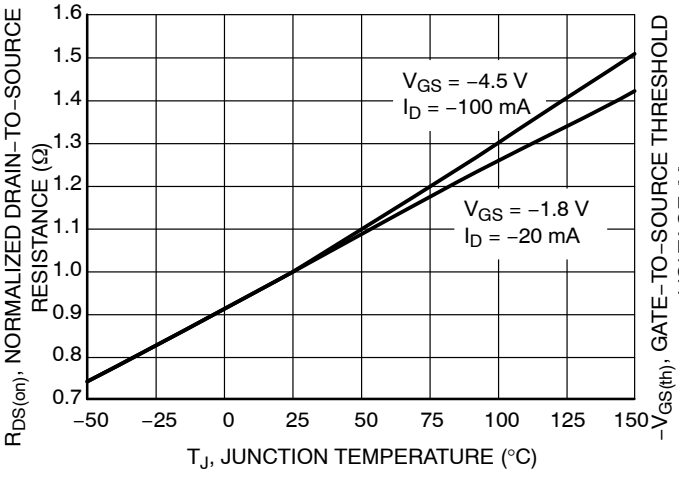


Figure 1. On Resistance Variation with Temperature

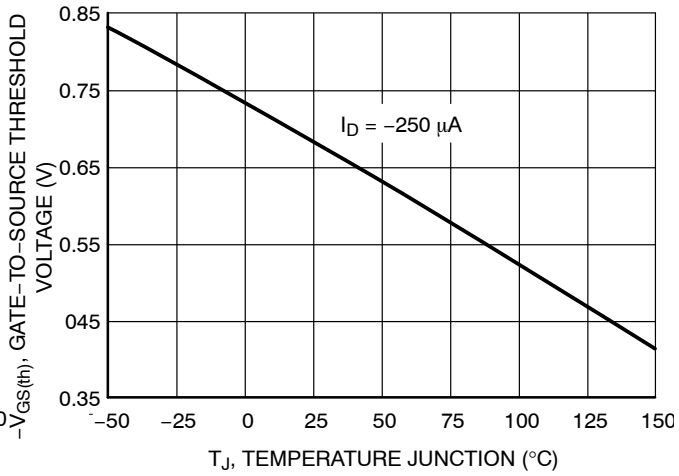
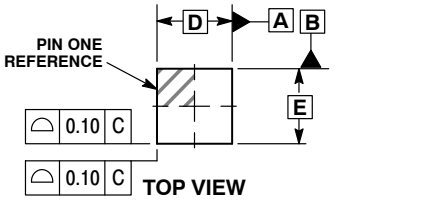
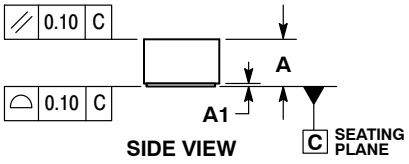


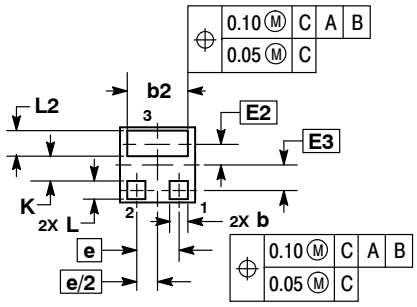
Figure 2. Threshold Voltage

PACKAGE DIMENSIONS

XLLGA3, 0.62x0.62, 0.35P
CASE 713AA
ISSUE O



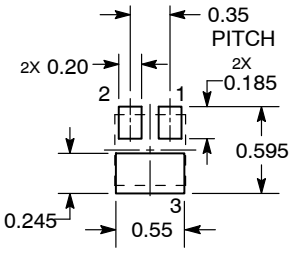




NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.340	0.440
A1	0.000	0.030
b	0.100	0.200
b2	0.400	0.600
D	0.620 BSC	
E	0.620 BSC	
E2	0.175 BSC	
E3	0.205 BSC	
e	0.350 BSC	
K	0.200 REF	
L	0.090	0.210
L2	0.110	0.310

RECOMMENDED SOLDER FOOTPRINT*



DIMENSIONS: 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:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

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Phone: 421 33 790 2910
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For additional information, please contact your local Sales Representative