

NTNUS3171PZ

Product Preview

Small Signal MOSFET

-20 V, -180 mA, Single P-Channel,
1.0 x 0.6 mm SOT-1123 Package



ON Semiconductor®

http://onsemi.com

Features

- Single P-Channel MOSFET
- Offers a Low $R_{DS(on)}$ Solution in the Ultra Small 1.0 x 0.6 mm Package
- 1.5 V Gate Voltage Rating
- Ultra Thin Profile (< 0.5 mm) Allows It to Fit Easily into Extremely Thin Environments such as Portable Electronics.
- This is a Pb-Free Device

Applications

- High Side Switch
- High Speed Interfacing
- Optimized for Power Management in Ultra Portable Equipment

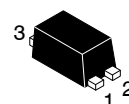
MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	-20	V
Gate-to-Source Voltage			V_{GS}	± 8	V
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^\circ\text{C}$	I_D	-140	mA
		$T_A = 85^\circ\text{C}$		-100	
	$t \leq 5 \text{ s}$	$T_A = 25^\circ\text{C}$		-180	
Power Dissipation (Note 1)	Steady State	$T_A = 25^\circ\text{C}$	P_D	-125	mW
	$t \leq 5 \text{ s}$			-200	
Pulsed Drain Current			I_{DM}	-600	mA
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Source Current (Body Diode) (Note 2)			I_S	-200	mA
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T_L	260	$^\circ\text{C}$

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.

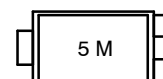
1. Surface-mounted on FR4 board using the minimum recommended pad size, 1 oz Cu.
2. Pulse Test: pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$

$V_{(BR)DSS}$	$R_{DS(ON)} \text{ MAX}$	$I_D \text{ Max}$
-20 V	3.5 Ω @ -4.5 V	-0.18 A
	4.0 Ω @ -2.5 V	
	5.5 Ω @ -1.8 V	
	7.0 Ω @ -1.5 V	



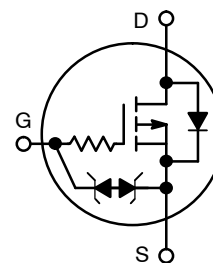
SOT-1123
CASE 524AA

MARKING DIAGRAM



- 5 = Specific Device Code
(Rotated 90° Clockwise)
M = Date Code

P-Channel MOSFET



ORDERING INFORMATION

Device	Package	Shipping†
NTNUS3171PZT5G	SOT-1123 (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 Specification Brochure, BRD8011/D.

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

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THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Ambient – Steady State (Note 3)	$R_{\theta JA}$	1000	°C/W
Junction-to-Ambient – $t = 5$ s (Note 3)	$R_{\theta JA}$	600	

3. Surface-mounted on FR4 board using the minimum recommended pad size, 1 oz Cu.

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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = -5.0\text{ V}$ $T_J = 25^\circ\text{C}$			-50	nA
		$V_{GS} = 0\text{ V}, V_{DS} = -5.0\text{ V}$ $T_J = 85^\circ\text{C}$			-100	
		$V_{GS} = 0\text{ V}, V_{DS} = -16\text{ V}$ $T_J = 25^\circ\text{C}$			-200	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 5.0\text{ V}$			± 100	nA

ON CHARACTERISTICS (Note 4)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\ \mu\text{A}$	-0.4	-0.7	-1.0	V
Drain-to-Source On Resistance	$R_{DS(ON)}$	$V_{GS} = -4.5\text{ V}, I_D = -100\text{ mA}$		2.0	3.5	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -50\text{ mA}$		2.6	4.0	
		$V_{GS} = -1.8\text{ V}, I_D = -20\text{ mA}$		3.4	5.5	
		$V_{GS} = -1.5\text{ V}, I_D = -10\text{ mA}$		4.0	7.0	
		$V_{GS} = -1.2\text{ V}, I_D = -1.0\text{ mA}$		6.0		
Forward Transconductance	g_{FS}	$V_{DS} = -5.0\text{ V}, I_D = -125\text{ mA}$		0.26		S
Source-Drain Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -200\text{ mA}$	-0.5		-1.4	V

CHARGES, CAPACITANCES AND GATE RESISTANCE

Input Capacitance	C_{ISS}	$f = 1\text{ MHz}, V_{GS} = 0\text{ V}$ $V_{DS} = -15\text{ V}$		13.5		pF
Output Capacitance	C_{OSS}			3.8		
Reverse Transfer Capacitance	C_{RSS}			2.0		

SWITCHING CHARACTERISTICS, $V_{GS} = 4.5\text{ V}$ (Note 4)

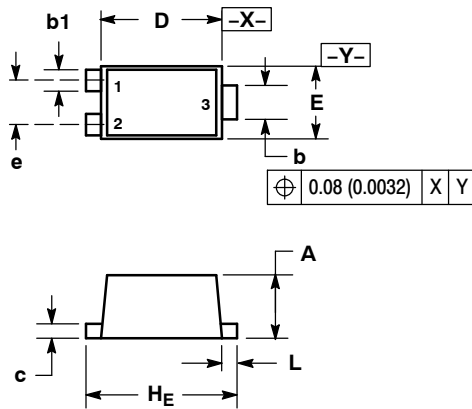
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = -4.5\text{ V}, V_{DD} = -15\text{ V},$ $I_D = -200\text{ mA}, R_G = 2.0\ \Omega$		26		ns
Rise Time	t_r			46		
Turn-Off Delay Time	$t_{d(OFF)}$			196		
Fall Time	t_f			145		

4. Switching characteristics are independent of operating junction temperatures

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PACKAGE DIMENSIONS

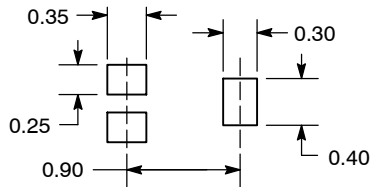
SOT-1123
CASE 524AA-01
ISSUE B



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETERS.
 3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.34	0.37	0.40	0.013	0.015	0.016
b	0.15	0.22	0.28	0.006	0.009	0.011
b1	0.10	0.15	0.20	0.004	0.006	0.008
c	0.07	0.12	0.17	0.003	0.005	0.007
D	0.75	0.80	0.85	0.030	0.031	0.033
E	0.55	0.60	0.65	0.022	0.024	0.026
e	0.35	---	0.40	0.014	---	0.016
H _E	0.95	1.00	1.05	0.037	0.039	0.041
L	0.05	0.10	0.15	0.002	0.004	0.006

SOLDERING 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.

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