



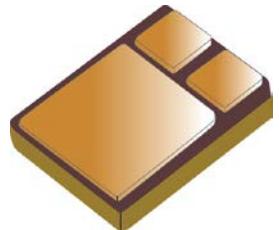
## P-CHANNEL MOSFET

Qualified per **MIL-PRF-19500/595**

**Qualified Levels:**  
JAN, JANTX, and  
JANTXV

### DESCRIPTION

This 2N7236U switching transistor is military qualified up to the JANTXV level for high-reliability applications. This device is also available in a TO-254AA leaded package. Microsemi also offers numerous other transistor products to meet higher and lower power ratings with various switching speed requirements in both through-hole and surface-mount packages.



**Important:** For the latest information, visit our website <http://www.microsemi.com>.

### FEATURES

- Surface mount equivalent of JEDEC registered 2N7236 number.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/595.  
(See [part nomenclature](#) for all available options.)
- RoHS compliant by design.

### APPLICATIONS / BENEFITS

- Low-profile design.
- Military and other high-reliability applications.

**U (SMD-1 or  
TO-267AB)  
Package**

Also available in:

**TO-254AA package**



### MAXIMUM RATINGS @ $T_A = +25^\circ\text{C}$ unless otherwise stated

Parameters / Test Conditions	Symbol	Value	Unit
Operating & Storage Junction Temperature Range	$T_J$ & $T_{\text{stg}}$	-55 to +150	°C
Thermal Resistance Junction-to-Case	$R_{\text{ejc}}$	1.0	°C/W
Total Power Dissipation @ $T_A = +25^\circ\text{C}$ @ $T_C = +25^\circ\text{C}$ <sup>(1)</sup>	$P_T$	4 125	W
Gate-Source Voltage, dc	$V_{GS}$	± 20	V
Drain Current, dc @ $T_C = +25^\circ\text{C}$ <sup>(2)</sup>	$I_{D1}$	-18	A
Drain Current, dc @ $T_C = +100^\circ\text{C}$ <sup>(2)</sup>	$I_{D2}$	-11	A
Off-State Current (Peak Total Value) <sup>(3)</sup>	$I_{DM}$	-72	A (pk)
Source Current	$I_S$	-18	A

**NOTES:**

1. Derate linearly by 1.0 W/°C for  $T_C > +25^\circ\text{C}$ .
2. The following formula derives the maximum theoretical  $I_D$  limit.  $I_D$  is limited by package and internal wires and may also be limited by pin diameter:

$$I_D = \sqrt{\frac{T_J(\text{max}) - T_C}{R_{\text{ejc}} \times R_{DS(\text{on})} @ T_J(\text{max})}}$$

3.  $I_{DM} = 4 \times I_{D1}$  as calculated in note 2.

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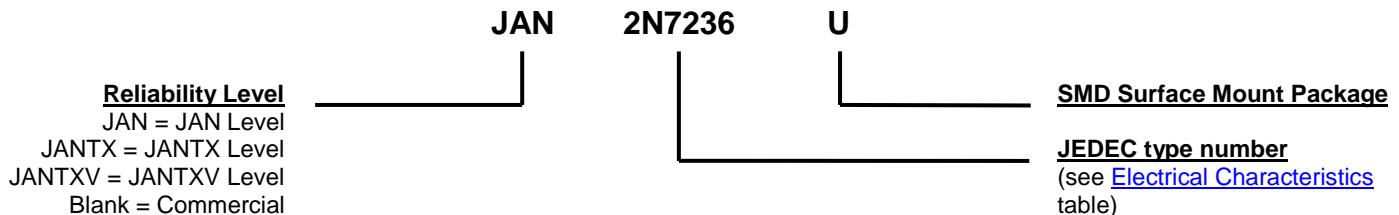
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**MECHANICAL and PACKAGING**

- CASE: Ceramic and gold over nickel plated steel.
- TERMINALS: Gold over nickel plated tungsten/copper.
- MARKING: Manufacturer's ID, part number, and date code.
- WEIGHT: 0.9 grams.
- See [Package Dimensions](#) on last page.

**PART NOMENCLATURE**

**SYMBOLS & DEFINITIONS**

Symbol	Definition
$di/dt$	Rate of change of diode current while in reverse-recovery mode, recorded as maximum value.
$I_F$	Forward current
$R_G$	Gate drive impedance
$V_{DD}$	Drain supply voltage
$V_{DS}$	Drain source voltage, dc
$V_{GS}$	Gate source voltage, dc

**ELECTRICAL CHARACTERISTICS @  $T_A = +25^\circ\text{C}$ , unless otherwise noted**

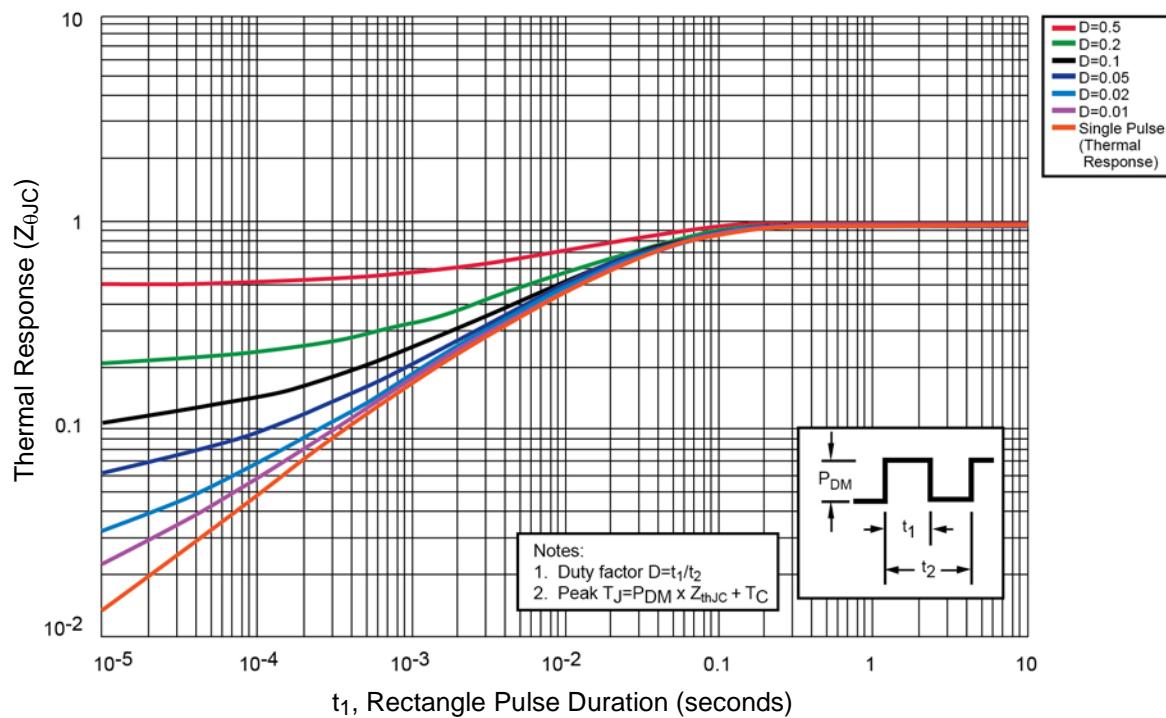
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Drain-Source Breakdown Voltage $V_{GS} = 0 \text{ V}$ , $I_D = 1.0 \text{ mA}$	$V_{(BR)DSS}$	-100		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$ , $I_D = -0.25 \text{ mA}$ $V_{DS} \geq V_{GS}$ , $I_D = -0.25 \text{ mA}$ , $T_J = +125^\circ\text{C}$ $V_{DS} \geq V_{GS}$ , $I_D = -0.25 \text{ mA}$ , $T_J = -55^\circ\text{C}$	$V_{GS(\text{th})1}$ $V_{GS(\text{th})2}$ $V_{GS(\text{th})3}$	-2.0 -1.0 -5.0	-4.0 -5.0	V
Gate Current $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$ $V_{GS} = \pm 20 \text{ V}$ , $V_{DS} = 0 \text{ V}$ , $T_J = +125^\circ\text{C}$	$I_{GSS1}$ $I_{GSS2}$		$\pm 100$ $\pm 200$	nA
Drain Current $V_{GS} = 0 \text{ V}$ , $V_{DS} = -80 \text{ V}$	$I_{DSS1}$		-25	$\mu\text{A}$
Drain Current $V_{GS} = 0 \text{ V}$ , $V_{DS} = -100 \text{ V}$ , $T_J = +125^\circ\text{C}$	$I_{DSS2}$		-1.0	mA
Drain Current $V_{GS} = 0 \text{ V}$ , $V_{DS} = -80 \text{ V}$ , $T_J = +125^\circ\text{C}$	$I_{DSS3}$		-0.25	mA
Static Drain-Source On-State Resistance $V_{GS} = 10 \text{ V}$ , $I_D = -11.0 \text{ A}$ pulsed	$r_{DS(\text{on})1}$		0.20	$\Omega$
Static Drain-Source On-State Resistance $V_{GS} = -10 \text{ V}$ , $I_D = -18.0 \text{ A}$ pulsed	$r_{DS(\text{on})2}$		0.22	$\Omega$
Static Drain-Source On-State Resistance $T_J = +125^\circ\text{C}$ $V_{GS} = -10 \text{ V}$ , $I_D = -11.0 \text{ A}$ pulsed	$r_{DS(\text{on})3}$		0.34	$\Omega$
Diode Forward Voltage $V_{GS} = 0 \text{ V}$ , $I_D = -18.0 \text{ A}$ pulsed	$V_{SD}$		-5.0	V

**DYNAMIC CHARACTERISTICS**

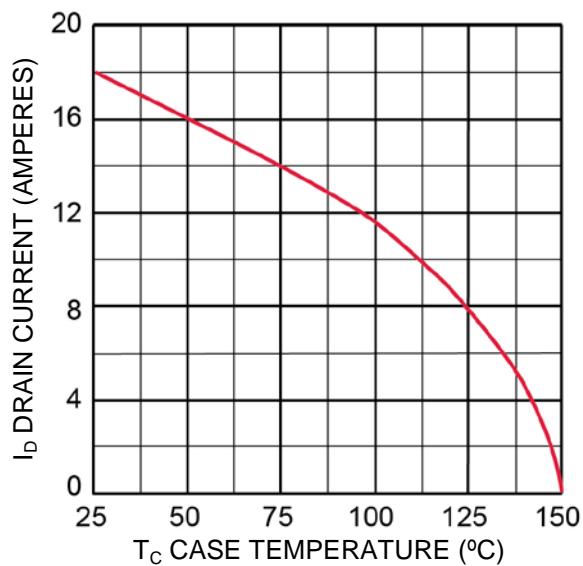
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Gate Charge:				
On-State Gate Charge $V_{GS} = -10 \text{ V}$ , $I_D = -18.0 \text{ A}$ , $V_{DS} = -50 \text{ V}$	$Q_{g(\text{on})}$		60	nC
Gate to Source Charge $V_{GS} = -10 \text{ V}$ , $I_D = -18.0 \text{ A}$ , $V_{DS} = -50 \text{ V}$	$Q_{gs}$		13	nC
Gate to Drain Charge $V_{GS} = -10 \text{ V}$ , $I_D = -18.0 \text{ A}$ , $V_{DS} = -50 \text{ V}$	$Q_{gd}$		35.2	nC

**ELECTRICAL CHARACTERISTICS @  $T_A = +25^\circ\text{C}$ , unless otherwise noted (continued)**
**SWITCHING CHARACTERISTICS**

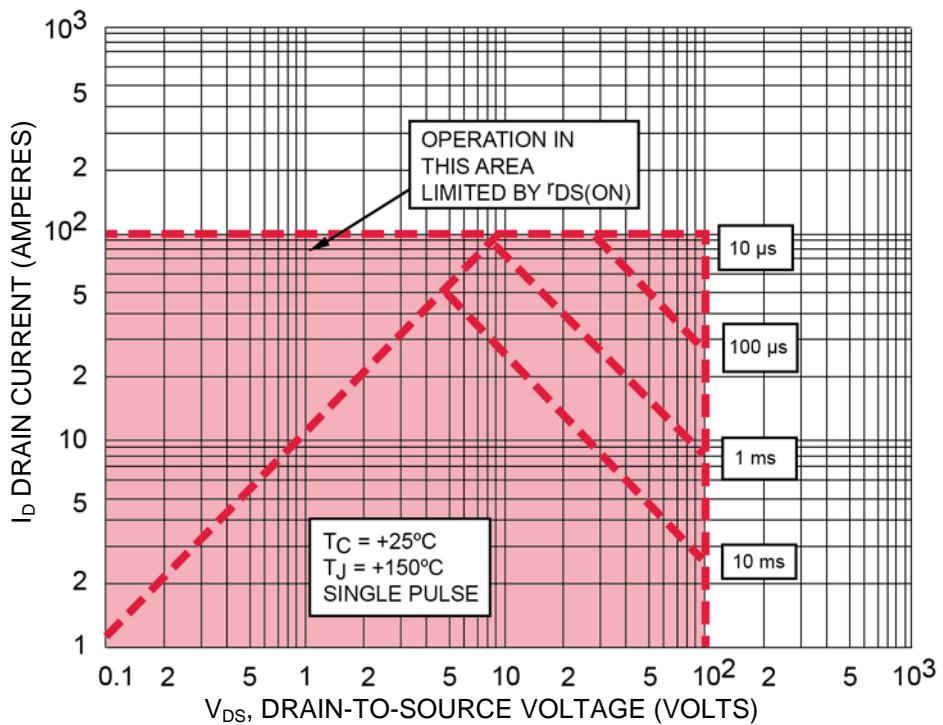
Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Turn-on delay time $I_D = -11.0 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_G = 9.1 \Omega$ , $V_{DD} = -50 \text{ V}$	$t_{d(on)}$		35	ns
Rinse time $I_D = -11.0 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_G = 9.1 \Omega$ , $V_{DD} = -50 \text{ V}$	$t_r$		85	ns
Turn-off delay time $I_D = -11.0 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_G = 9.1 \Omega$ , $V_{DD} = -50 \text{ V}$	$t_{d(off)}$		85	ns
Fall time $I_D = -11.0 \text{ A}$ , $V_{GS} = -10 \text{ V}$ , $R_G = 9.1 \Omega$ , $V_{DD} = -50 \text{ V}$	$t_f$		65	ns
Diode Reverse Recovery Time $di/dt \leq 100 \text{ A}/\mu\text{s}$ , $V_{DD} \leq 30 \text{ V}$ , $I_F = -18.0 \text{ A}$	$t_{rr}$		280	ns

**GRAPHS**


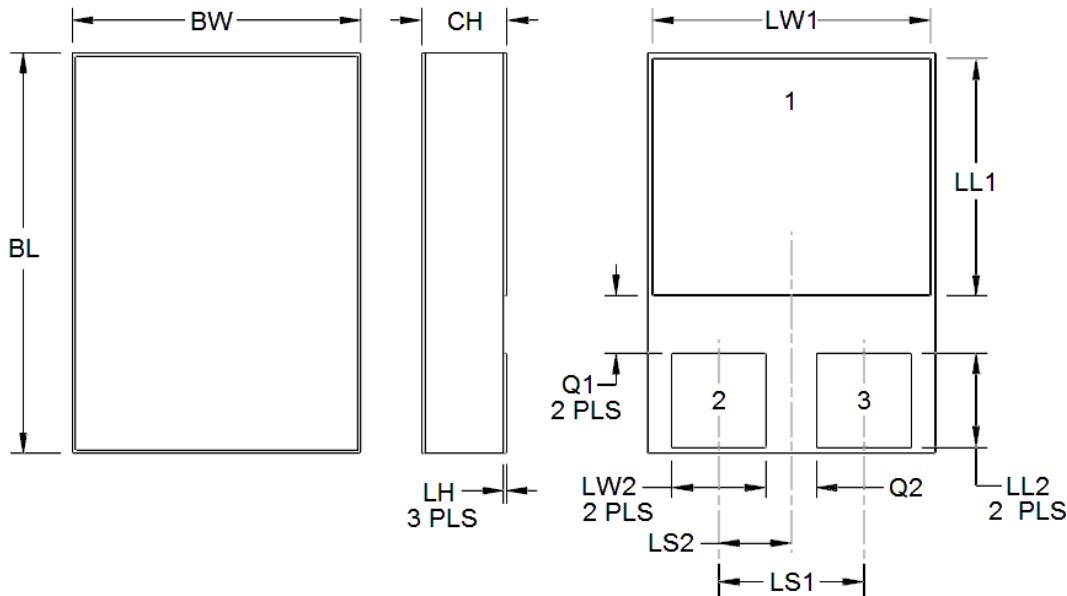
**FIGURE 1**  
Thermal Impedance Curves



**FIGURE 2**  
Maximum Drain Current vs Case Temperature Graphs

**GRAPHS (continued)**


**FIGURE 3**  
Maximum Safe Operating Area

**PACKAGE DIMENSIONS**

**NOTES:**

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. The lid shall be electrically isolated from the drain, gate and source.
4. In accordance with ASME Y14.5M, diameters are equivalent to  $\Phi x$  symbology.

Symbol	DIMENSIONS			
	INCH		MILLIMETERS	
	Min	Max	Min	Max
<b>BL</b>	.620	.630	15.75	16.00
<b>BW</b>	.445	.455	11.30	11.56
<b>CH</b>	-	.142	-	3.60
<b>LH</b>	.010	.020	.026	.050
<b>LL1</b>	.410	.420	10.41	10.67
<b>LL2</b>	.152	.162	3.86	4.11
<b>LS1</b>	.210 BSC		5.33 BSC	
<b>LS2</b>	.105 BSC		2.67 BSC	
<b>LW1</b>	.370	.380	9.40	9.65
<b>LW2</b>	.135	.145	3.43	3.68
<b>Q1</b>	.030	-	0.76	-
<b>Q2</b>	.035	-	0.89	-
<b>Term 1</b>	Drain			
<b>Term 2</b>	Gate			
<b>Term 3</b>	Source			