RoHS Compliant

P-CHANNEL MOSFET

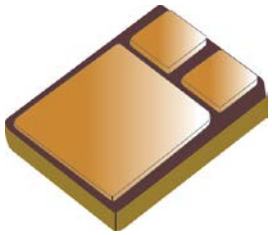
Qualified per MIL-PRF-19500/595

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.



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

Also available in:

TO-254AA package (leaded)
2N7236

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.

MAXIMUM RATINGS @ T_A = +25 ºC unless otherwise stated

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

NOTES:
1. Derate linearly by 1.0 W/ºC for T_C > +25 ºC.
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:

$$I_D = \sqrt{\frac{T_J\,(max) - T_C}{R_{\theta JC} \times R_{DS(on)} @ T_J\,(max)}}$$

3. I_{DM} = 4 x I_{D1} as calculated in note 2.

MSC – Lawrence
6 Lake Street,
Lawrence, MA 01841
Tel: 1-800-446-1158 or
(978) 620-2600
Fax: (978) 689-0803

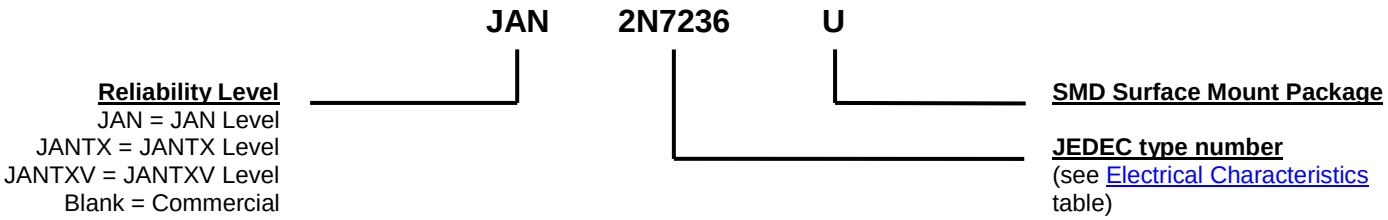
MSC – Ireland
Gort Road Business Park,
Ennis, Co. Clare, Ireland
Tel: +353 (0) 65 6840044
Fax: +353 (0) 65 6822298

Website:
www.microsemi.com

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 °C, unless otherwise noted

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage V_{GS} = 0 V, I_D = 1.0 mA	$V_{(BR)DSS}$	-100		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$, I_D = -0.25 mA $V_{DS} \geq V_{GS}$, I_D = -0.25 mA, T_J = +125 °C $V_{DS} \geq V_{GS}$, I_D = -0.25 mA, T_J = -55 °C	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	-2.0 -1.0	-4.0 -5.0	V
Gate Current V_{GS} = ± 20 V, V_{DS} = 0 V V_{GS} = ± 20 V, V_{DS} = 0 V, T_J = +125 °C	I_{GSS1} I_{GSS2}		±100 ±200	nA
Drain Current V_{GS} = 0 V, V_{DS} = -80 V	I_{DSS1}		-25	µA
Drain Current V_{GS} = 0 V, V_{DS} = -100 V, T_J = +125 °C	I_{DSS2}		-1.0	mA
Drain Current V_{GS} = 0 V, V_{DS} = -80 V, T_J = +125 °C	I_{DSS3}		-0.25	mA
Static Drain-Source On-State Resistance V_{GS} = 10 V, I_D = -11.0 A pulsed	$r_{DS(on)1}$		0.20	Ω
Static Drain-Source On-State Resistance V_{GS} = -10 V, I_D = -18.0 A pulsed	$r_{DS(on)2}$		0.22	Ω
Static Drain-Source On-State Resistance T_J = +125°C V_{GS} = -10 V, I_D = -11.0 A pulsed	$r_{DS(on)3}$		0.34	Ω
Diode Forward Voltage V_{GS} = 0 V, I_D = -18.0 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 V, I_D = -18.0 A, V_{DS} = -50 V	$Q_{g(on)}$		60	nC
Gate to Source Charge V_{GS} = -10 V, I_D = -18.0 A, V_{DS} = -50 V	Q_{gs}		13	nC
Gate to Drain Charge V_{GS} = -10 V, I_D = -18.0 A, V_{DS} = -50 V	Q_{gd}		35.2	nC

ELECTRICAL CHARACTERISTICS @ T_A = +25 °C, unless otherwise noted (continued)

SWITCHING CHARACTERISTICS

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

GRAPHS

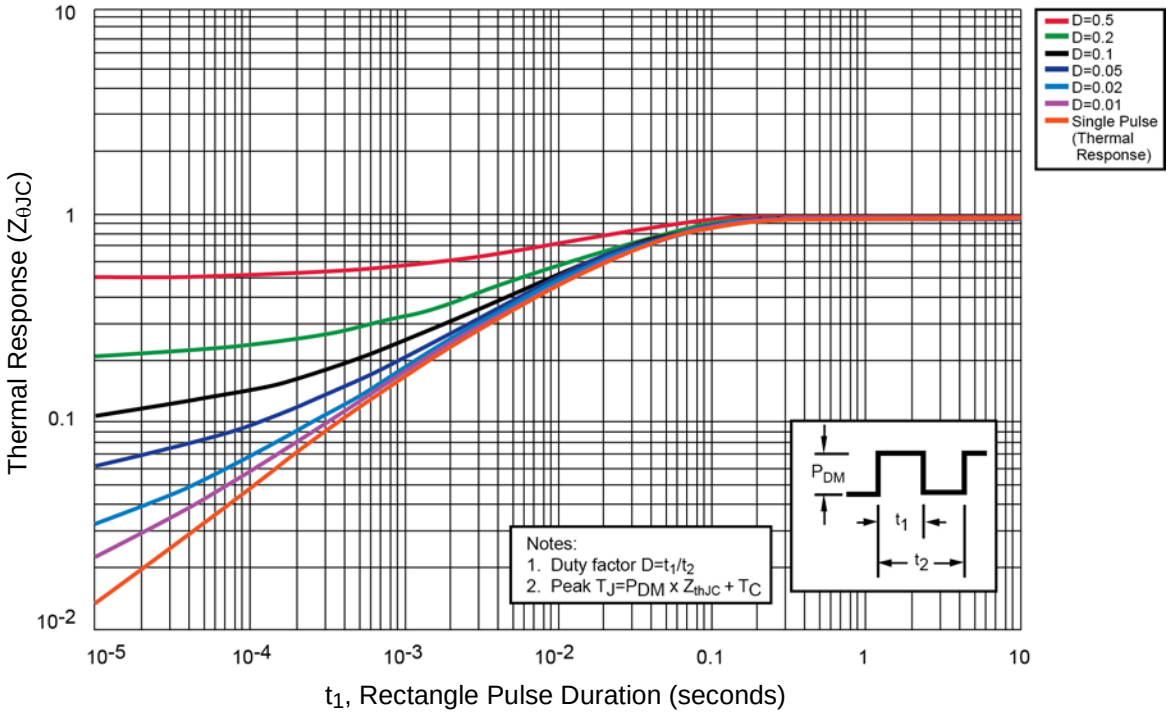


FIGURE 1
Thermal Impedance Curves

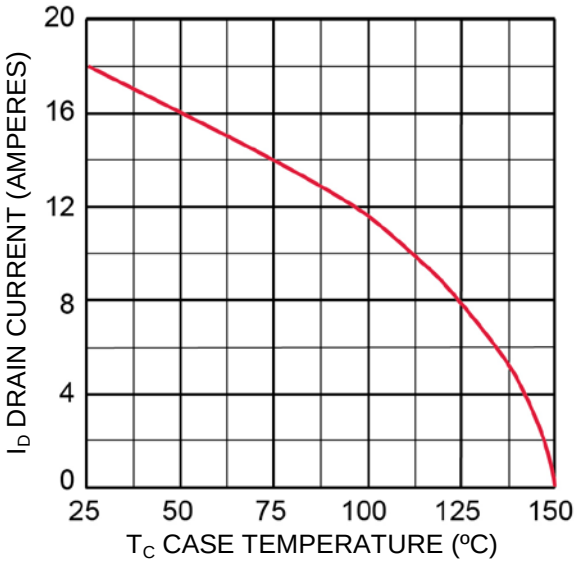


FIGURE 2
Maximum Drain Current vs Case Temperature Graphs

GRAPHS (continued)

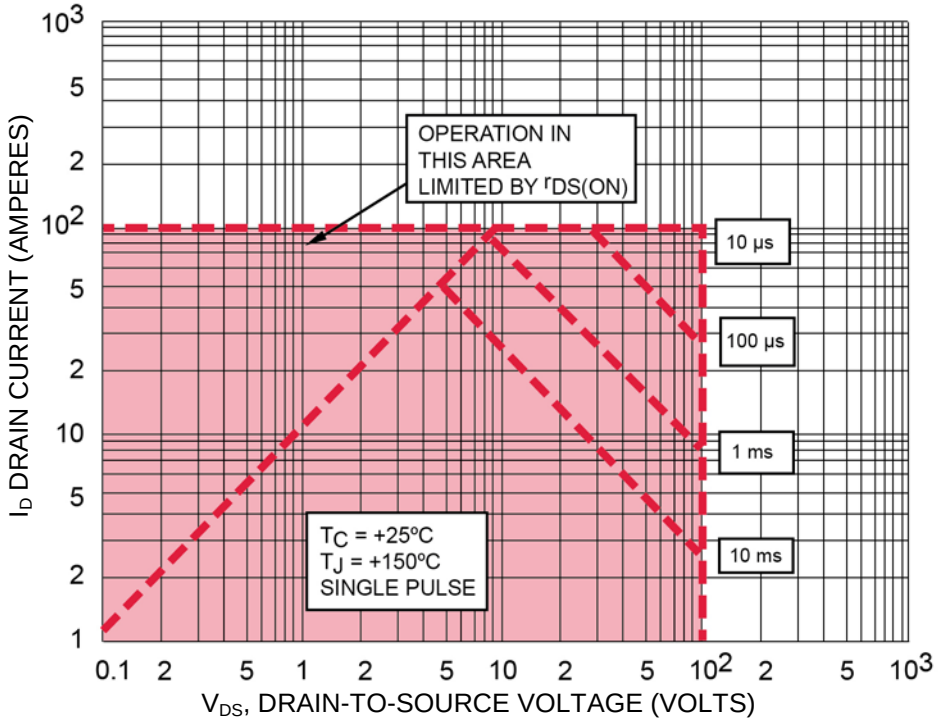
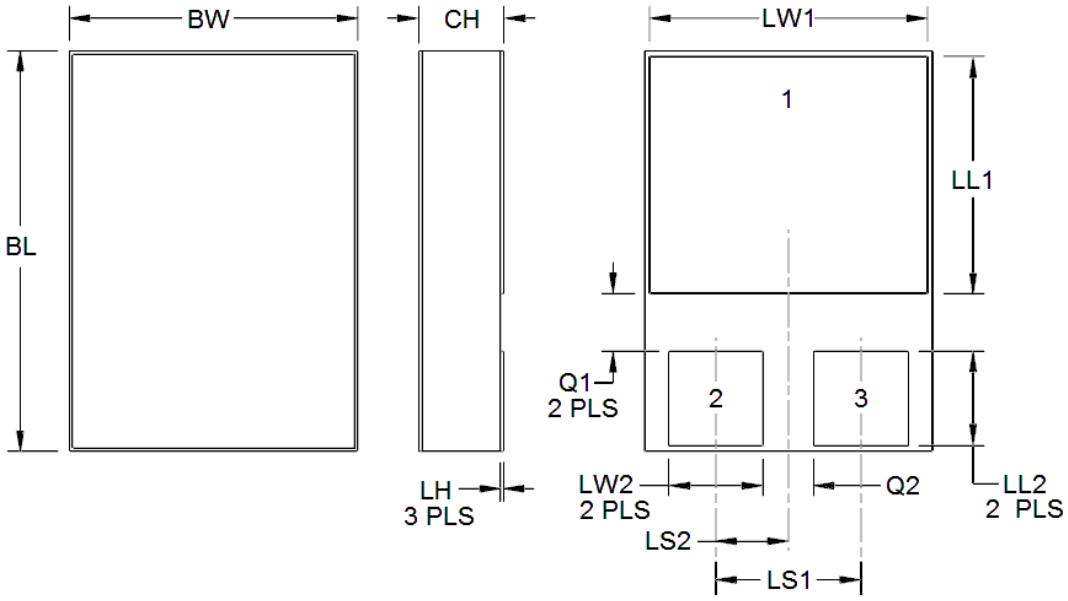


FIGURE 3
Maximum Safe Operating Area

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 Φx symbology.

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