RoHS Compliant

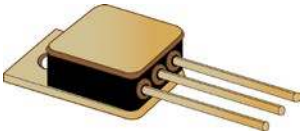
P-CHANNEL MOSFET

Qualified per MIL-PRF-19500/595

Qualified Levels: JAN, JANTX, and JANTXV

DESCRIPTION

This 2N7236 switching transistor is military qualified up to the JANTXV level for high-reliability applications. This device is also available in a low profile U surface mount 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.



TO-254AA Package

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

FEATURES

- 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.

Also available in:

"U" (SMD-1 or TO-267AB) package
(surface mount)
2N7236U

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.

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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, date code, BeO.
- WEIGHT: 6.5 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE

JAN **2N7236**

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
Blank = Commercial

JEDEC type number
(see Electrical Characteristics table)

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

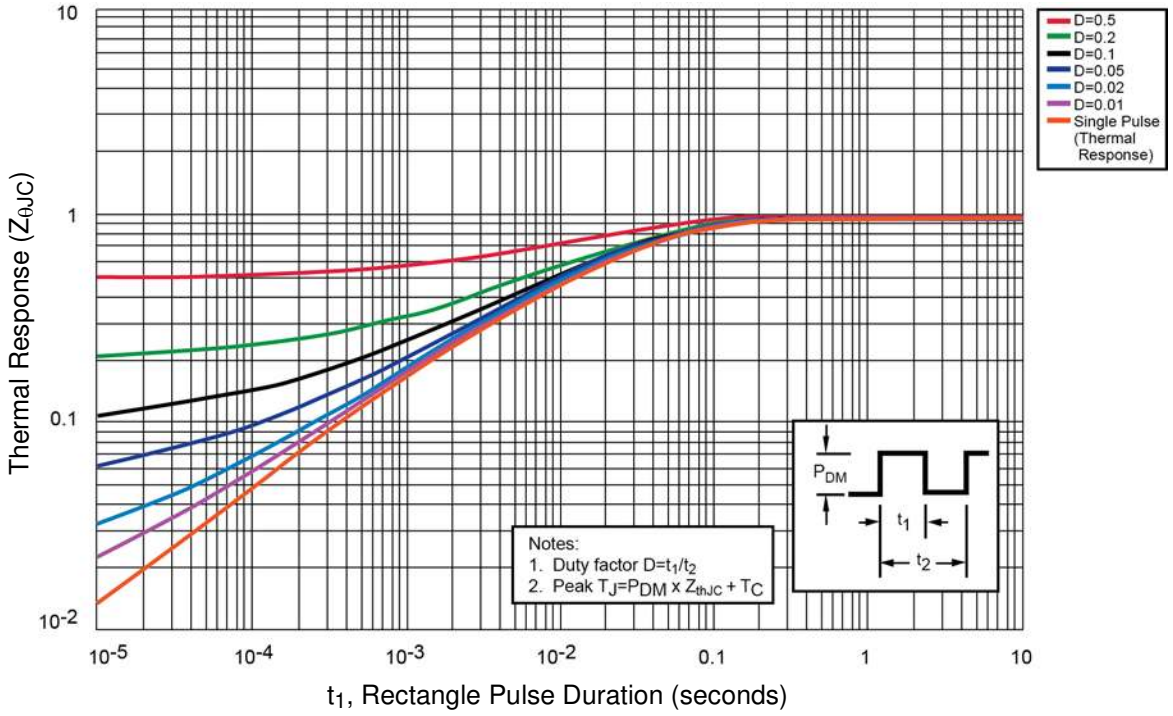


FIGURE 1
Thermal Impedance Curves

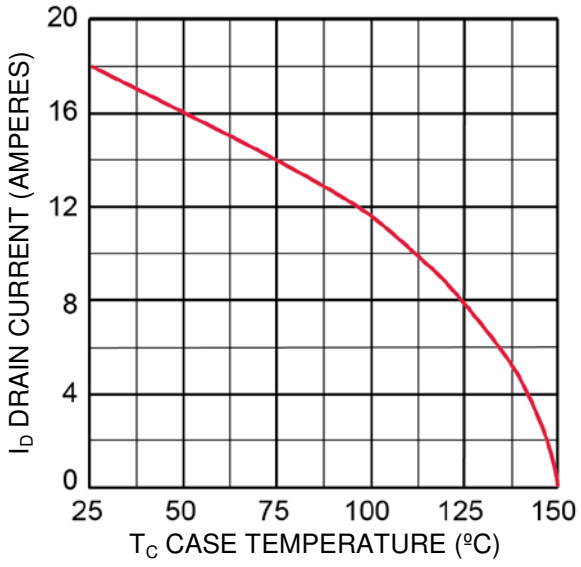


FIGURE 2
Maximum Drain Current vs Case Temperature Graphs

GRAPHS (continued)

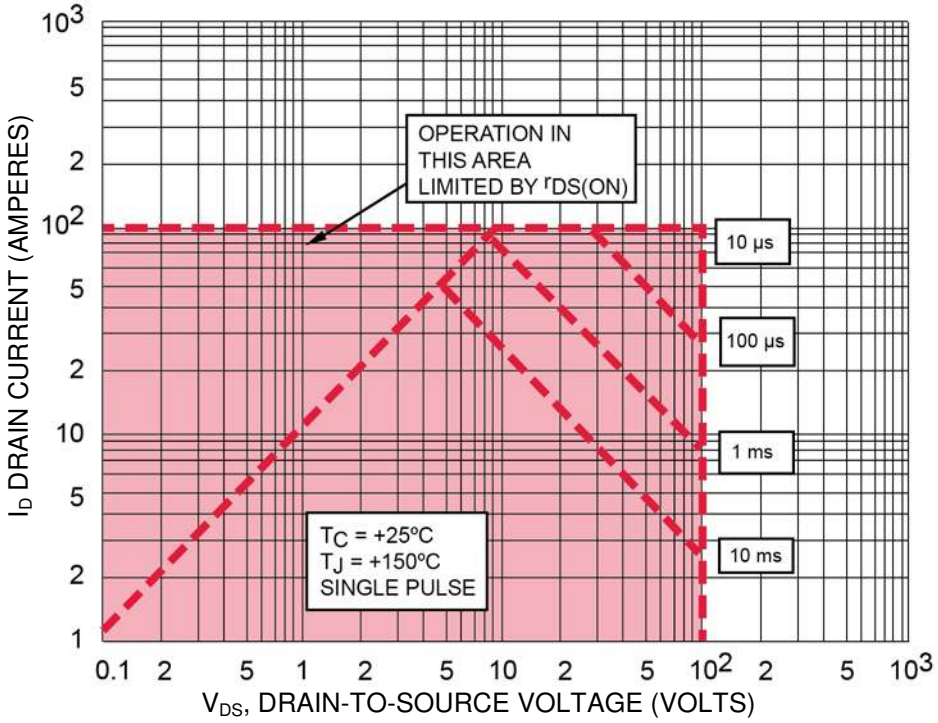
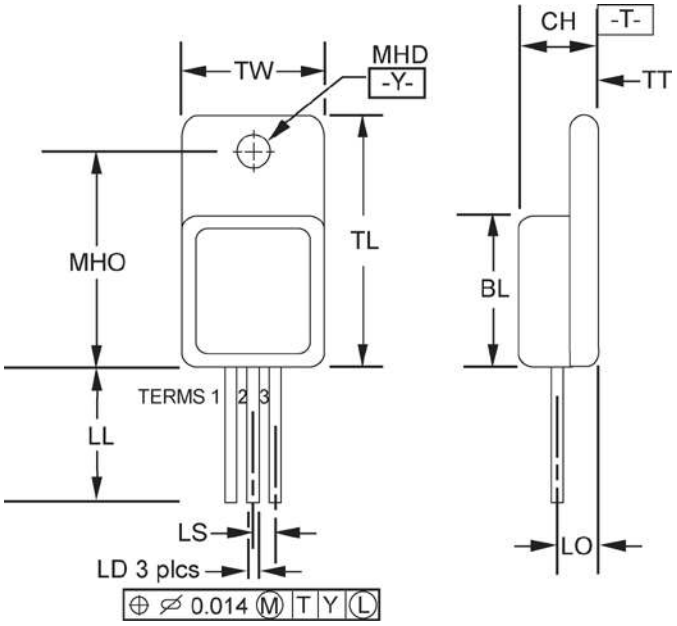


FIGURE 3
Maximum Safe Operating Area

PACKAGE DIMENSIONS



NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Protrusion thickness of ceramic eyelets included in dimension LL.
4. All terminals are isolated from case.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

Ltr	Dimensions				Notes
	Inch		Millimeters		
	Min	Max	Min	Max	
BL	.535	.545	13.59	13.84	
CH	.249	.260	6.32	6.60	
LD	.035	.045	0.89	1.14	
LL	.510	.570	12.95	14.48	3
LO	.150 BSC		3.81 BSC		
LS	.150 BSC		3.81 BSC		
MHD	.139	.149	3.53	3.78	
MHO	.665	.685	16.89	17.40	
TL	.790	.800	20.07	20.32	4
TT	.040	.050	1.02	1.27	4
TW	.535	.545	13.59	13.84	
Term 1	Drain				
Term 2	Source				
Term 3	Gate				