RoHS
Available on commercial versions

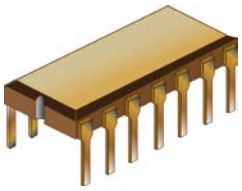
QUAD P-CHANNEL MOSFET
Qualified per MIL-PRF-19500/599

Qualified Levels:
JAN, JANTX, and JANTXV

DESCRIPTION

This 2N7335 device is military qualified up to a JANTXV level for high-reliability applications. Microsemi also offers numerous other products to meet higher and lower power voltage regulation applications.

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



MO-036AB Package

FEATURES

- JEDEC registered 2N7335.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/599.
- RoHS compliant version available (commercial grade only).

APPLICATIONS / BENEFITS

- High Frequency Operation.
- Lightweight.
- ESD to class 1A.

MAXIMUM RATINGS @ T_A = +25 ºC unless otherwise noted.

Parameters / Test Conditions	Symbol	Value	Unit
Operating & Storage Temperature	T_{op}, T_{stg}	-55 to +150	°C
Thermal Resistance, Junction to Ambient 1 die 4 die	$R_{\Theta JA}$	90 50	ºC/W
Thermal Resistance, Junction to Case 1 die	$R_{\Theta JC}$	17	ºC/W
Gate – Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ T_C = +25 °C	I_{D1}	-0.75	A
Continuous Drain Current @ T_C = +100 °C	I_{D2}	-0.50	A
Max. Power Dissipation @ T_C = +25ºC (free air) (1)	P_{D1}	1.4	W
Maximum Drain to Source On State Resistance (1, 2) @ T_J = +25 ºC @ T_J = +150 ºC	MAX $R_{ds(on)}$	 1.4 2.5	Ω
Collector Efficiency	I_S	-0.75	A
Single Pulse Avalanche Energy Capability	E_{AS}	75	mJ
Repetitive Avalanche Energy Capability	E_{AR}	.14	mJ
Rated Avalanche Current (repetitive and nonrepetitive)	I_{AR}	-.075	A
Off-State Current	I_{DM}	-3.0	A (pk)

Notes: 1. Derated Linearly by 11 mW/°C for T_C > +25 °C.
2. V_{GS} = -10 V, I_D = -0.5 A.

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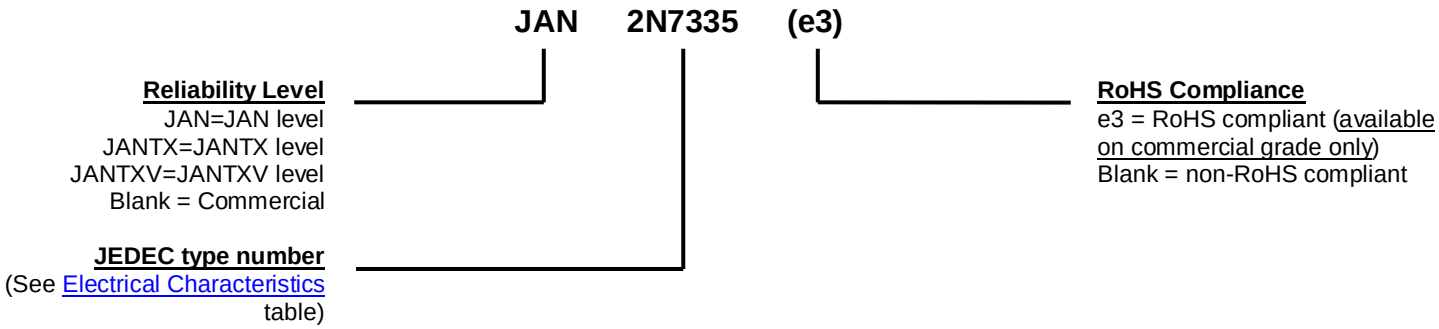
MECHANICAL and PACKAGING

- CASE: Ceramic, lid: alloy 42, Au over Ni plating.
- TERMINALS: Alloy 42, Au over Ni plating, solder dipped.
- MARKING: Manufacturer's ID, part number, date code.
- POLARITY: See package outline.
- WEIGHT: Approx. 1.3 grams.
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

Symbol	Definition
I_D	Drain current.
I_F	Forward current.
T_C	Case temperature.
V_{DD}	Drain supply voltage.
V_{DS}	Drain to source voltage.
V_{GS}	Gate to source voltage.

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

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
OFF CHARACTERTICS				
Drain-Source Breakdown Voltage V_{GS} = 0 V, I_D = -1m A	$V_{(BR)DSS}$	-100		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$, I_D = -0.25mA $V_{DS} \geq V_{GS}$, 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 % of rated V_{DS} V_{GS} = 0 V, V_{DS} = 80 % of rated V_{DS}, T_j = +125 °C	 I_{DSS1} I_{DSS2}		 -25 -0.25	 µA mA
Static Drain-Source On-State Resistance V_{GS} = -10 V, cond. A pulsed per MIL-STD-750, sect. 4, I_D = -0.50 A T_j = +125 °C V_{GS} = -10 V, pulsed per MIL-STD-750, section 4, I_D = -0.50 A	 $r_{DS(on)1}$ $r_{DS(on)2}$		 1.4 2.3	 Ω Ω
Diode Forward Voltage V_{GS} = 0 V, I_D = -0.75 A, pulsed per MIL-STD-750, section 4	V_{SD}		5.5	V

DYNAMIC CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Gate Charge: On-State Gate Charge Gate to Source Charge Gate to Drain Charge	Condition B	 $Q_{g(on)}$ Q_{gs} Q_{gd}		 15 7.0 8.0	nC

SWITCHING CHARACTERISTICS

Parameters / Test Conditions		Symbol	Min.	Max.	Unit
Switching time tests: Turn-on delay time Rinse time Turn-off delay time Fall time	 I_D = -0.75 A, V_{GS} = -10 V, Gate drive impedance = 7.5 Ω, V_{DD} = -50 V	 $t_{d(on)}$ t_r $t_{d(off)}$ t_f		 30 60 70 80	ns
Diode Reverse Recovery Time	di/dt ≤ -100 A/µs, V_{DD} ≤ -30 V, I_D = -.75 A	t_{rr}		200	ns

GRAPHS

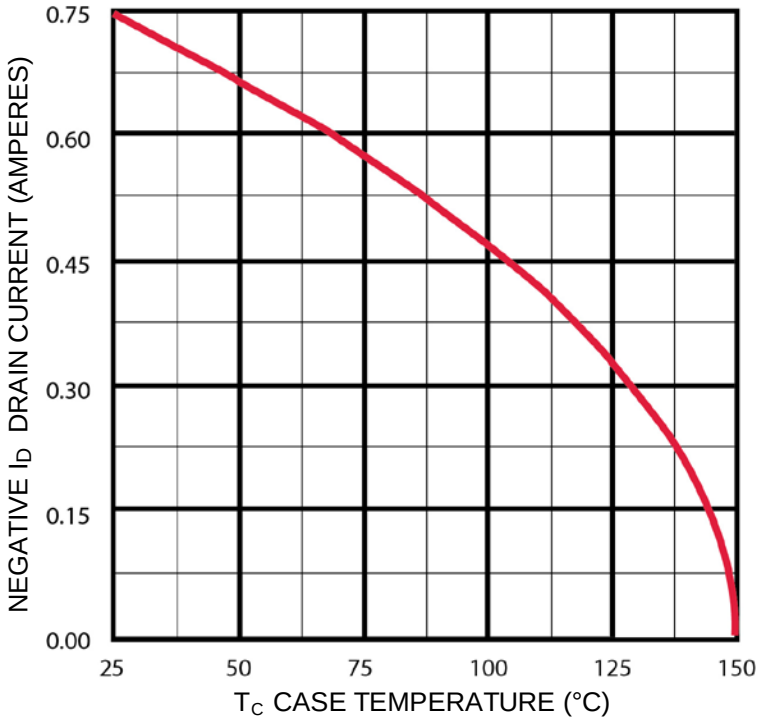


FIGURE 1 – Maximum Drain Current vs. Case Temperature Graph

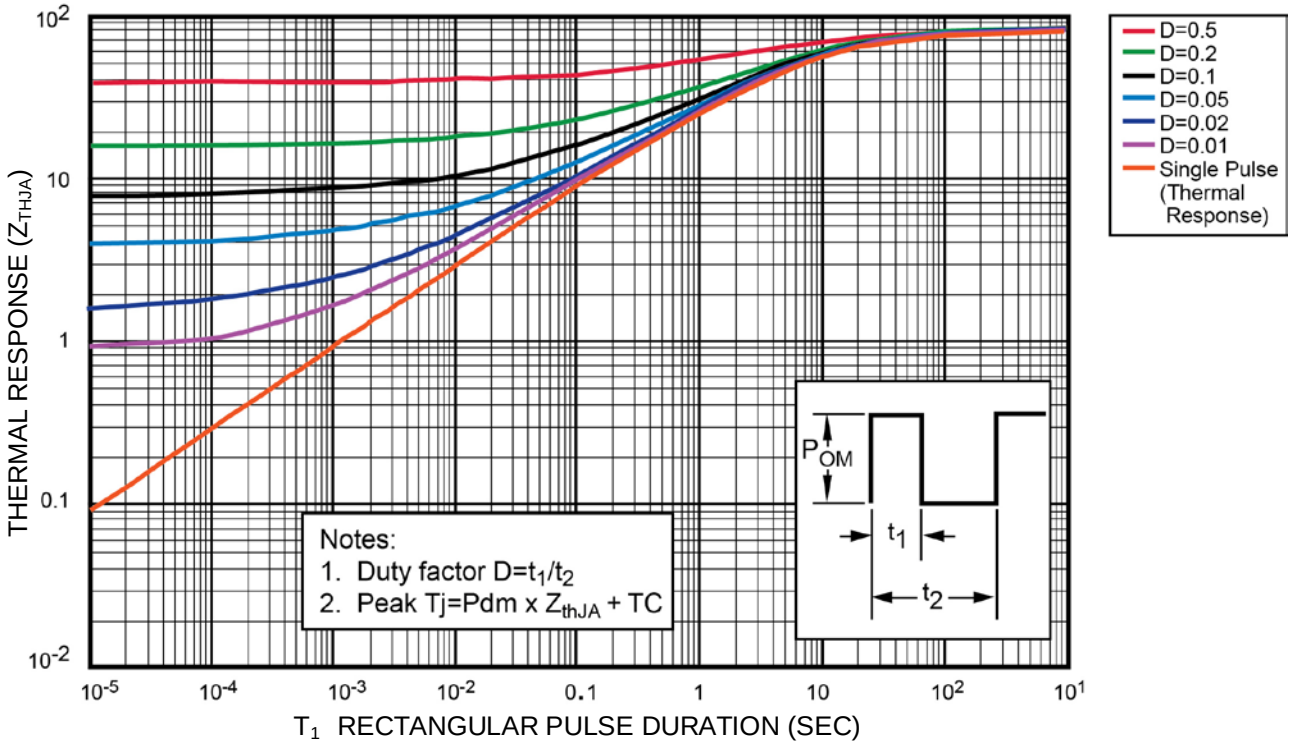


FIGURE 2 – Normalized Transient Thermal Impedance

GRAPHS (continued)

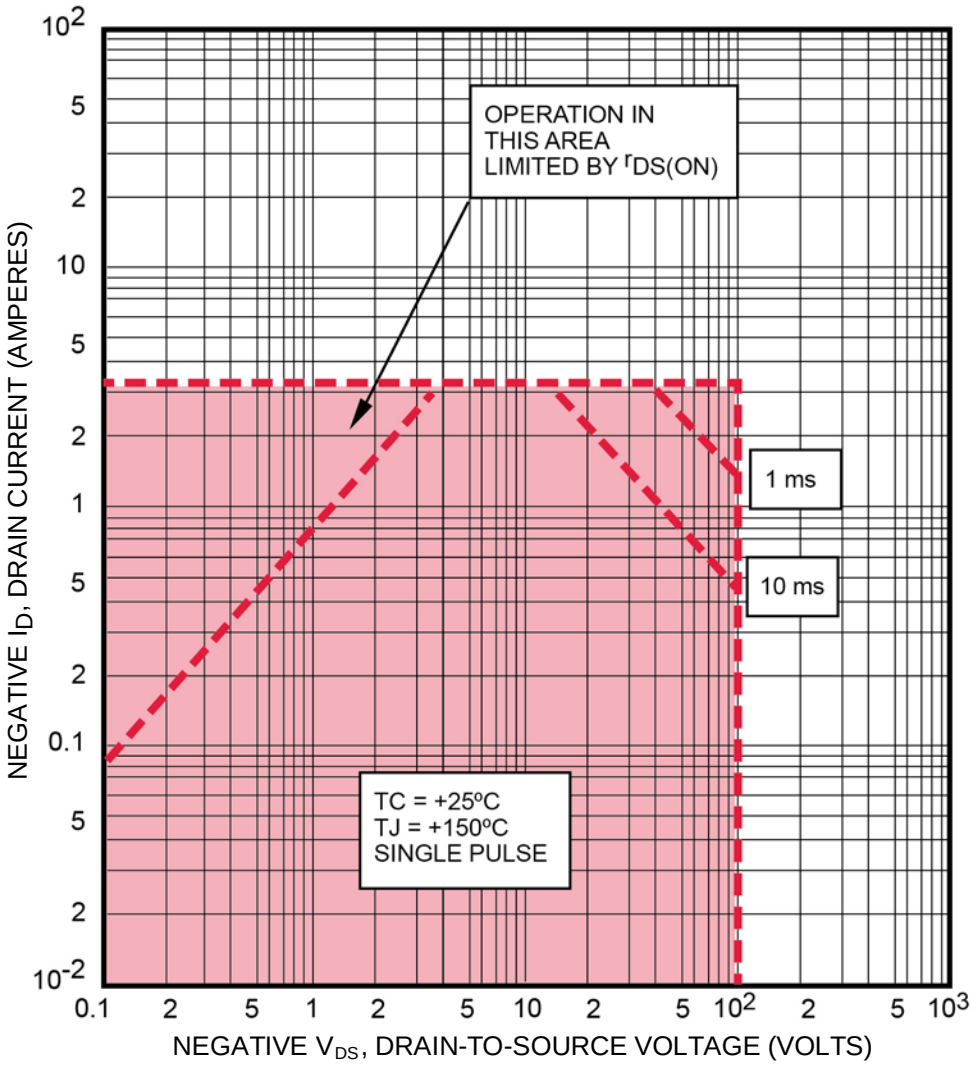
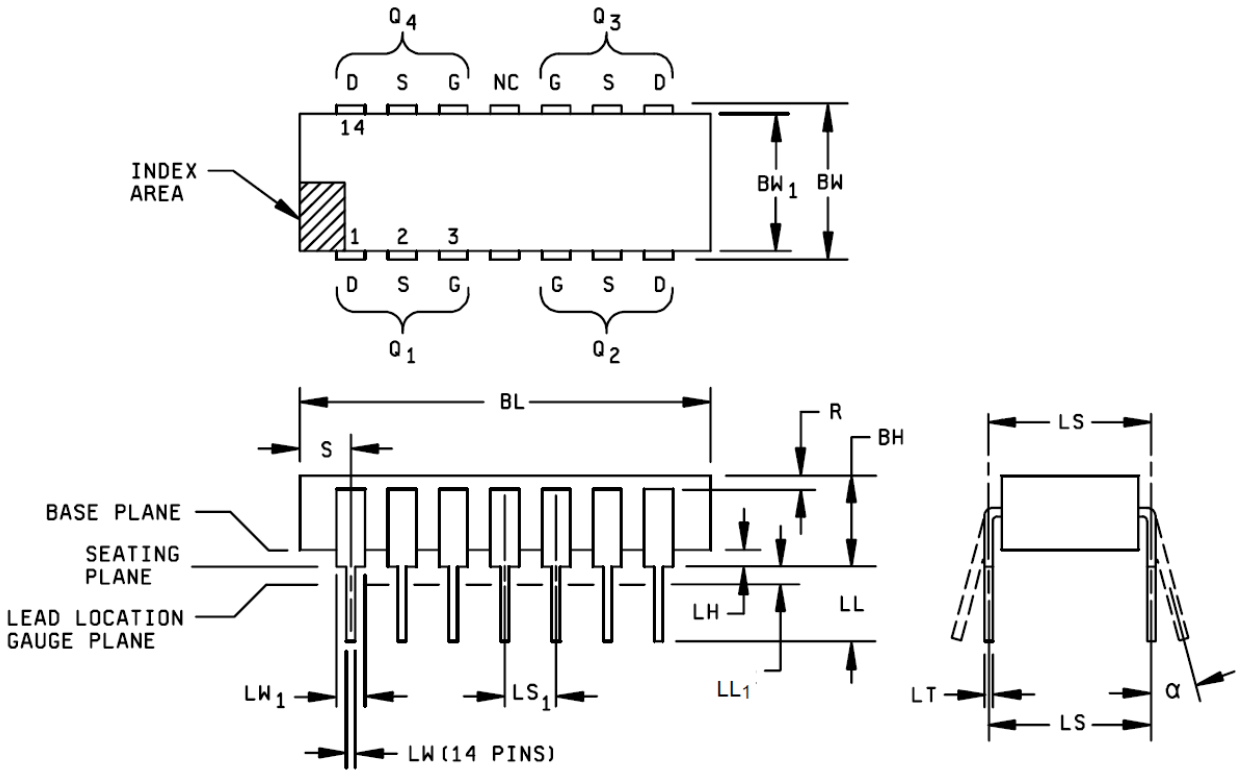


FIGURE 3 – Maximum Safe Operating Area

PACKAGE DIMENSIONS



Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BH	.105	.175	2.67	4.45	11
BL	.690	.770	17.53	19.56	
BW	.290	.325	7.37	8.26	
BW_1	.280	.310	7.11	7.87	10
LH	.025	.055	0.64	1.40	11
LT	.008	.012	0.203	0.305	
LW	.015	.021	0.381	0.533	
LW_1	.038	.060	0.97	1.52	

Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
LS	.300 TP		7.62 TP		5, 6
LS1	.100 TP		2.54 TP		5, 6
LL	.125	.175	3.18	4.45	11
LL_1	.000	.030	0.00	0.76	
α	0°	15°	0°	15°	7
R	.010		0.25		
S	.030	.095	0.76	2.41	
N	14		14		8

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Refer to applicable symbol list.
4. Dimensioning and tolerancing in accordance with ASME Y14.5.
5. Leads within +/- .005 inch (0.13 mm) radius of True Position (TP) at gauge plane with maximum material condition and unit installed.
6. LS_1 and LS applies in zone LL_1 when unit installed.
7. α applies to spread leads prior to installation.
8. N is the number of terminal positions.
9. Outlines on which the seating plane is coincident with the base plane ($A_1 = 0$), terminals lead standoffs are not required, and LW1 may equal LW along any part of the lead above the seating/base plane.
10. BW_1 does not include particles of package materials.
11. This dimension shall be measured with the device seated in the seating plane gauge JEDEC Outline No. GS-3.

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