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## QUAD N-CHANNEL MOSFET

Qualified per MIL-PRF-19500/597

Qualified Levels:  
JAN, JANTX, and  
JANTXV

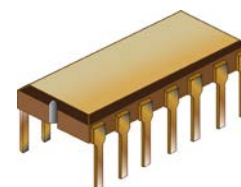
### DESCRIPTION

This 2N7334 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>.

### FEATURES

- JEDEC registered 2N7334 number.
- JAN, JANTX, and JANTXV qualifications are available per MIL-PRF-19500/597.
- RoHS compliant versions available (commercial grade only).



**MO-036AB  
Package**

### APPLICATIONS / BENEFITS

- High frequency operation.
- Lightweight.
- ESD rated to class 1A.

### MAXIMUM RATINGS @ T<sub>A</sub> = +25 °C unless otherwise noted.

Parameters / Test Conditions	Symbol	Value	Unit
Operating & Storage Temperature	T <sub>op</sub> , T <sub>stg</sub>	-55 to +150	°C
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	90	°C/W
1 die		50	
4 die			
Gate – Source Voltage	V <sub>GS</sub>	± 20	V
Continuous Drain Current @ T <sub>C</sub> = +25 °C	I <sub>D1</sub>	1.0	A
Continuous Drain Current @ T <sub>C</sub> = +100 °C	I <sub>D2</sub>	0.6	A
Max. Power Dissipation @ T <sub>C</sub> = +25 °C (free air) <sup>(1)</sup>	P <sub>T</sub>	1.4	W
Maximum Drain to Source On State Resistance <sup>(1, 2)</sup>	MAX R <sub>ds(on)</sub>		Ω
@ T <sub>J</sub> = +25 °C		0.70	
@ T <sub>J</sub> = +150 °C		1.4	
Collector Efficiency	I <sub>S</sub>	1.0	A
Single Pulse Avalanche Energy Capability	E <sub>AS</sub>	75	MJ
Repetitive Avalanche Energy Capability	E <sub>AR</sub>	.14	MJ
Rated Avalanche Current (repetitive and nonrepetitive)	I <sub>AR</sub>	1.0	A
Off-State Current	I <sub>DM</sub>	4.0	A (pk)

- Notes:**
1. Derated linearly 11 mW/°C for T<sub>C</sub> > +25 °C.
  2. The following formula derives the maximum theoretical I<sub>D</sub> limit. I<sub>D</sub> is limited by package and internal wires and may also be limited by pin diameter:

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

3. I<sub>DM</sub> = 4 x I<sub>D1</sub> as calculated in note 2.

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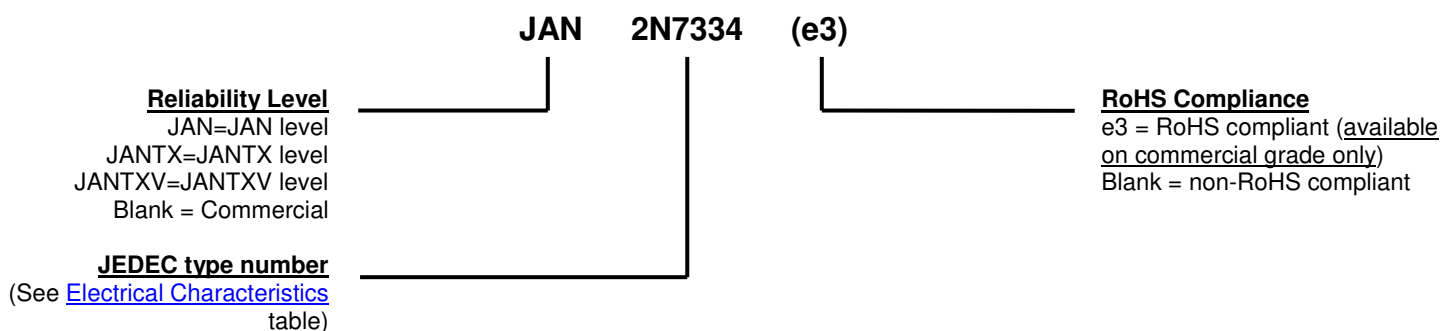
#### Website:

[www.microsemi.com](http://www.microsemi.com)

### MECHANICAL and PACKAGING

- CASE: Ceramic, lid: alloy 42, Au over Ni plating.
- TERMINALS: Alloy 42, Au over Ni plating, solder dipped. RoHS compliant without solder dipping on commercial grade only.
- MARKING: Manufacturer's ID, part number, date code.
- 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 @  $T_A = +25\text{ }^{\circ}\text{C}$ , unless otherwise noted**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS</b>				
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}$ , $I_D = 1\text{ mA}$	$V_{(BR)DSS}$	100		V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{ mA}$ $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{ mA}$ , $T_j = +125\text{ }^{\circ}\text{C}$ $V_{DS} \geq V_{GS}$ , $I_D = 0.25\text{ mA}$ , $T_j = -55\text{ }^{\circ}\text{C}$	$V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	2.0 1.0	4.0 5.0	V
Gate Current $V_{GS} = \pm 20\text{ V}$ , $V_{DS} = 0\text{ V}$ $V_{GS} = \pm 20\text{ V}$ , $V_{DS} = 0\text{ V}$ , $T_j = +125\text{ }^{\circ}\text{C}$	$I_{GSS1}$ $I_{GSS2}$		$\pm 100$ $\pm 200$	nA
Drain Current $V_{GS} = 0\text{ V}$ , $V_{DS} = 80\%$ of rated $V_{DS}$ $V_{GS} = 0\text{ V}$ , $V_{DS} = 80\%$ of rated $V_{DS}$ , $T_j = +125\text{ }^{\circ}\text{C}$	$I_{DSS1}$ $I_{DSS2}$		25 0.25	$\mu\text{A}$ mA
Static Drain-Source On-State Resistance $V_{GS} = 10\text{ V}$ , $I_D = 0.60\text{ A}$ $V_{GS} = 10\text{ V}$ , $I_D = 1.0\text{ A}$ $T_j = +125\text{ }^{\circ}\text{C}$ $V_{GS} = 10\text{ V}$ , $I_D = 0.60\text{ A}$	$r_{DS(on)1}$ $r_{DS(on)2}$ $r_{DS(on)3}$		0.70 0.80 1.4	$\Omega$ $\Omega$ $\Omega$
Diode Forward Voltage $V_{GS} = 0\text{ V}$ , $I_D = 1.0\text{ A}$	$V_{SD}$		1.5	V

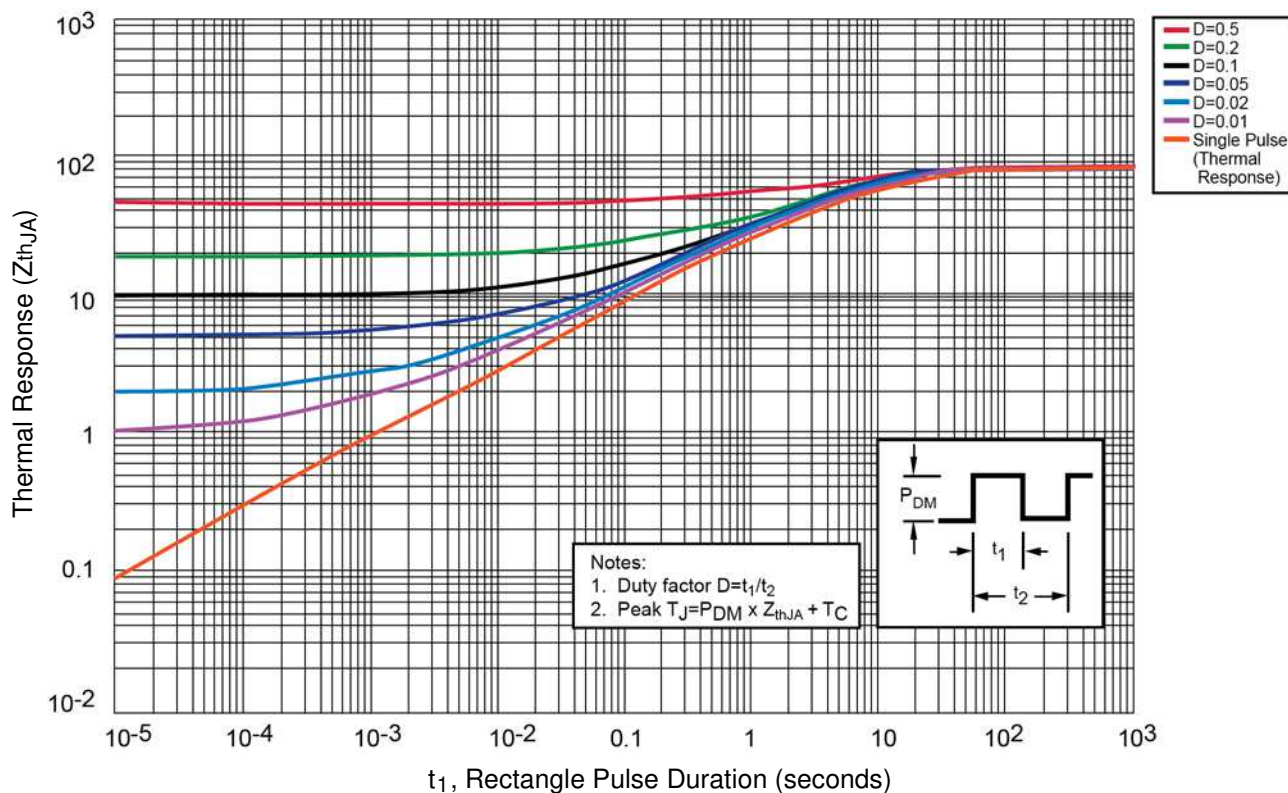
**DYNAMIC CHARACTERISTICS**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Gate Charge: Condition B				
On-State Gate Charge	$Q_{g(on)}$		15	nC
Gate to Source Charge	$Q_{gs}$		7.5	
Gate to Drain Charge	$Q_{gd}$		7.5	

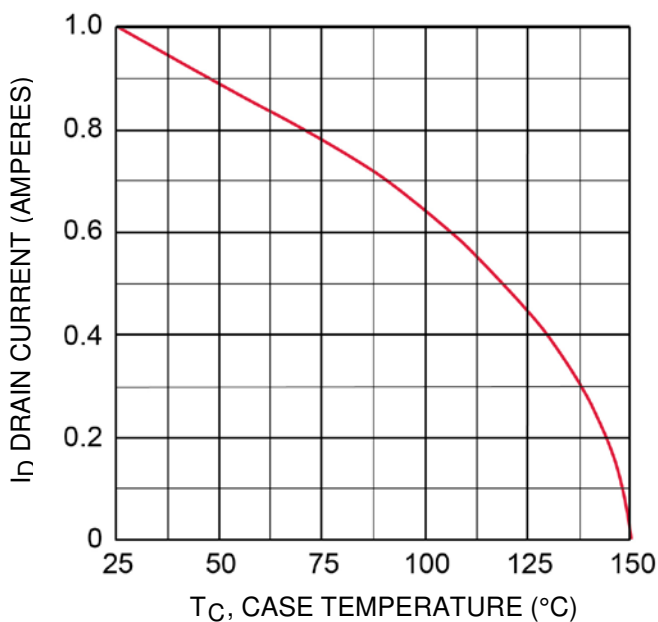
**SWITCHING CHARACTERISTICS**

Parameters / Test Conditions	Symbol	Min.	Max.	Unit
Switching time tests:				
Turn-on delay time $I_D = 1.0\text{ A}$ , $V_{GS} = 10\text{ V}$ ,	$t_{d(on)}$		20	ns
Rinse time Gate drive impedance = $7.5\text{ }\Omega$ ,	$t_r$		25	
Turn-off delay time $V_{DD} = 50\text{ V}$	$t_{d(off)}$		40	
Fall time	$t_f$		40	
Diode Reverse Recovery Time $di/dt = 100\text{ A}/\mu\text{s}$ , $V_{DD} \leq 30\text{ V}$ , $I_D = 1.0\text{ A}$	$t_{rr}$		200	ns

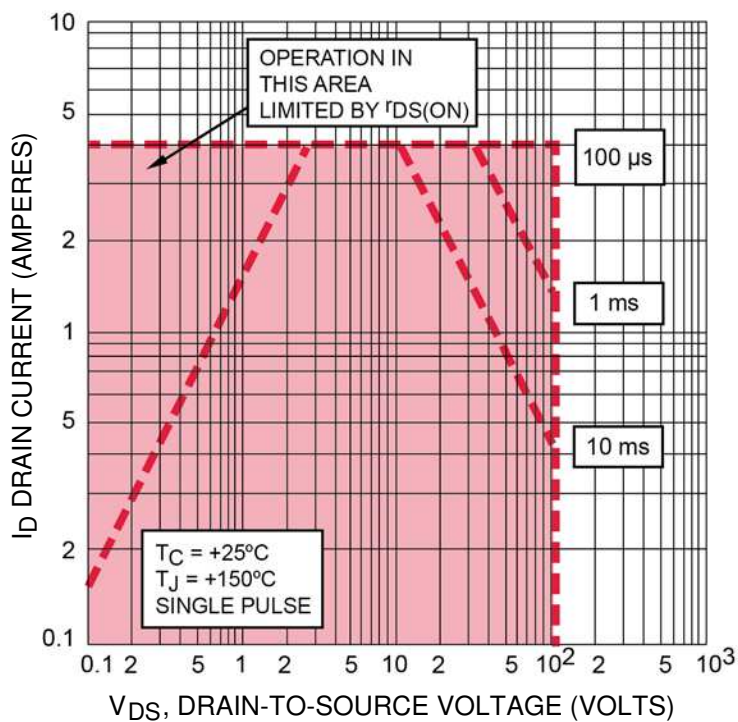
GRAPHS

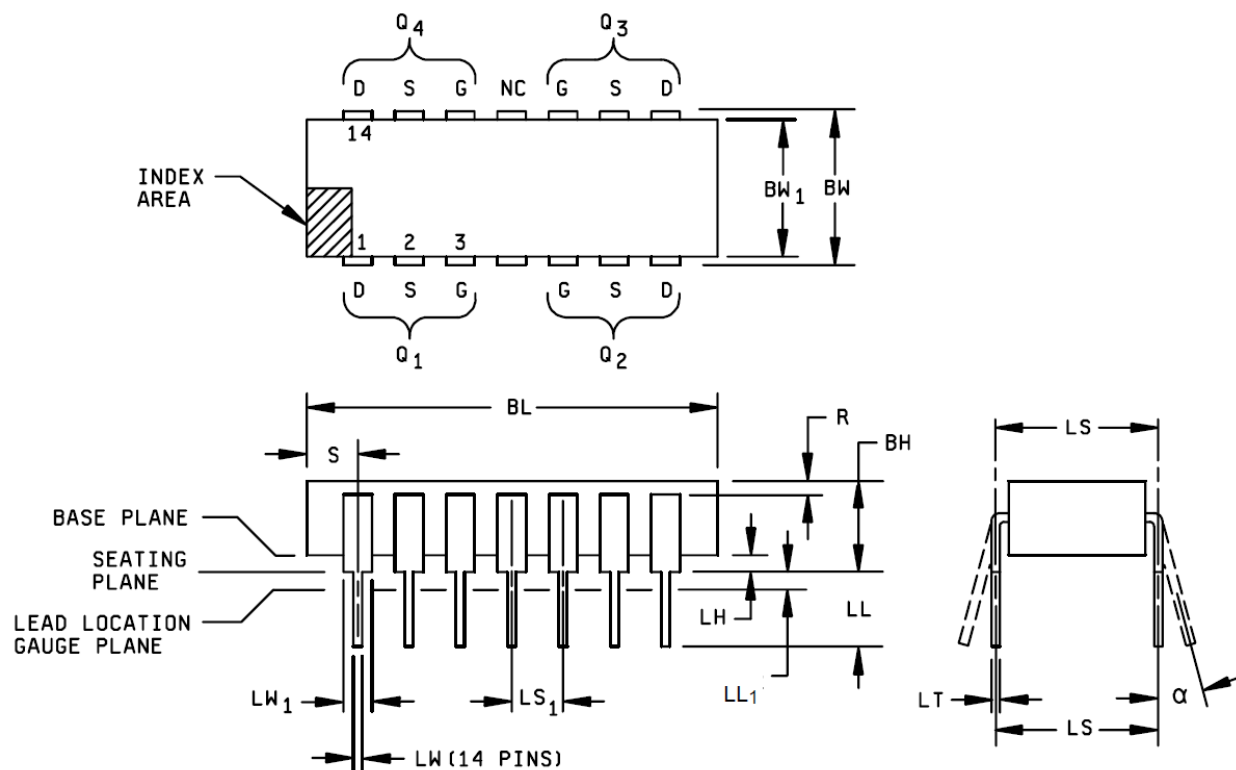


**FIGURE 1 – Thermal Response Curves**



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

**GRAPHS (continued)**

**FIGURE 3 - Maximum Safe Operating Area**

**PACKAGE DIMENSIONS**


Symbol	Dimensions				Notes
	Inch		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 <sub>1</sub>	.280	.310	7.11	7.87	10
LH	.025	.055	0.64	1.40	9, 11
LT	.008	.012	0.203	0.305	
LW	.015	.021	0.381	0.533	9
LW <sub>1</sub>	.038	.060	0.97	1.52	

Symbol	Dimensions				Notes
	Inch		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 <sub>1</sub>	.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:**

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