Available on commercial versions

Voidless Hermetically Sealed Bidirectional Transient Voltage Suppressors

Qualified to MIL-PRF-19500/516

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

DESCRIPTION

This series of industry recognized voidless, hermetically sealed bidirectional Transient Voltage Suppressors (TVS) is military qualified to MIL-PRF-19500/516 and is ideal for high-reliability applications where a failure cannot be tolerated. They provide a Working Peak "Standoff" Voltage selection from 5.7 to 152 volts with a 500 watt rating for a 10/1000 μs pulse. They are very robust in hard-glass construction and use internal "*Category 1*" metallurgical bonds. These devices are available as both a non-suffix part and an "A" version providing different voltage tolerances as described in the nomenclature section. These devices are also available in a surface mount MELF package configuration.

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

"B" Package

Also available in:

"B" SQ-MELF Package
(surface mount)
1N6103US – 1N6137US

FEATURES

- High surge current and peak pulse power provides transient voltage protection for sensitive circuits.
- Triple-layer passivation.
- Internal "*Category 1*" metallurgical bonds.
- Voidless hermetically sealed glass package.
- JAN, JANTX, and JANTXV qualified versions are available per MIL-PRF-19500/516.
- *JANS available for 1N6103(A) thru 1N6118(A) per MIL-PRF-19500/516 as well as further options for screening in reference to MIL-PRF-19500 for all others in this series.
  (See part nomenclature for all available options.)
- RoHS compliant versions available (commercial grade only).

APPLICATIONS / BENEFITS

- Military and other high-reliability applications.
- Extremely robust construction.
- Extensive range in working peak "standoff" voltage (V_{WM}) from 5.7 to 152 volts.
- 500 watt peak pulse power (P_{PP}) for a 10/1000 μs pulse.
- ESD and EFT protection per IEC6100-4-2 and IEC61000-4-4 respectively.
- Protection from the secondary effects of lightning per select levels in IEC61000-4-5.
- Flexible axial-leaded mounting terminals.
- Non-sensitive to ESD per MIL-STD-750 method 1020.
- Inherently radiation hard as described in Microsemi "MicroNote 050".

MAXIMUM RATINGS @ T_A = 25 °C unless otherwise noted

Parameters/Test Conditions	Symbol	Value	Unit
Junction and Storage Temperature	T_J and T_{STG}	-55 to +175	°C
Thermal Resistance Junction-to-Lead (1)	$R_{\Theta JL}$	33.5	°C/W
Peak Pulse Power @ 25 ºC (10/1000 μs)	P_{PP}	500	W
Steady-State Power @ T_L = 75 °C (1)	P_D	3.0	W
Steady-State Power @ T_A = 25 °C (2)	P_D	2.0	W
Impulse Repetition Rate	df	0.01	%
Solder Temperature @ 10 s	T_{SP}	260	°C

Notes: 1. At 3/8 inch lead length from body.
2. Steady-state power ratings with reference to ambient are for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where maximum rated T_J is not exceeded (also see figure 4).

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MECHANICAL and PACKAGING

- CASE: Hermetically sealed voidless hard glass with tungsten slugs.
- TERMINALS: Axial-leads are tin/lead over copper. RoHS compliant matte-tin is available on commercial grade only.
- MARKING: Body paint and part number.
- POLARITY: No polarity marking for these bidirectional TVSs.
- TAPE & REEL option: Standard per EIA-296. Consult factory for quantities.
- WEIGHT: Approximately 750 milligrams.
- See Package Dimensions on last page.

PART NOMENCLATURE

Applicable to entire series:

JAN 1N6103 A (e3)

Reliability Level
JAN = JAN Level
JANTX = JANTX Level
JANTXV = JANTXV Level
Blank = commercial

JEDEC type number
See Electrical Characteristics table

RoHS Compliance
e3 = RoHS compliant (available on commercial grade only)
Blank = non-RoHS compliant

Voltage Tolerance
A = Standard
Blank =5% higher V_C, 5% lower min. $V_{(BR)}$ and 5% lower I_{PP}

Applicable to 1N6103(A) thru 1N6118(A) only:

JANS 1N6103 A

Reliability Level
JANS = JANS Level

JEDEC type number
See Electrical Characteristics table

Voltage Tolerance
A = Standard
Blank =5% higher V_C, 5% lower min. $V_{(BR)}$ and 5% lower I_{PP}

Applicable to 1N6119(A) thru 1N6137(A) only:

MSP 1N6119 A (e3)

Reliability Level
MSP (reference JANS)

JEDEC type number
See Electrical Characteristics table

RoHS Compliance
e3 = RoHS compliant
Blank = non-RoHS compliant

Voltage Tolerance
A = Standard
Blank =5% higher V_C, 5% lower min. $V_{(BR)}$ and 5% lower I_{PP}

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SYMBOLS & DEFINITIONS	
Symbol	**Definition**
$V_{(BR)}$	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
V_{WM}	Working Peak Voltage: The maximum peak voltage that can be applied over the operating temperature range. This is also referred to as standoff voltage.
I_D	Maximum Standoff Current: The maximum current that will flow at the specified voltage and temperature.
V_C	Maximum clamping voltage at specified I_{PP} (Peak Pulse Current) at the specified pulse conditions.
P_{PP}	Peak Pulse Power: The peak power dissipation resulting from the peak impulse current I_{PP}.

ELECTRICAL CHARACTERISTICS

INDUSTRY TYPE NUMBER (Note 1)	MINIMUM BREAKDOWN VOLTAGE (Note 1) $V_{(BR)}$ @ $I_{(BR)}$		RATED STANDOFF VOLTAGE V_{WM}	MAXIMUM STANDBY CURRENT I_D @ V_{WM}	MAXIMUM CLAMPING VOLTAGE (Note 1) V_C @ I_{PP}	MAXIMUM PEAK PULSE CURRENT (Note 1) I_{PP}	MAXIMUM TEMP. COEF. OF $V_{(BR)}$ $\alpha_{V(BR)}$
	Volts	mA	V	µA	Volts	Amps	%/°C
†1N6103A	7.13	175	5.7	50	11.2	44.6	.06
†1N6104A	7.79	150	6.2	20	12.1	41.3	.06
†1N6105A	8.65	150	6.9	20	13.4	37.3	.06
†1N6106A	9.50	125	7.6	20	14.5	34.5	.07
†1N6107A	10.45	125	8.4	20	15.6	32.0	.07
†1N6108A	11.40	100	9.1	20	16.9	29.6	.07
†1N6109A	12.35	100	9.9	20	18.2	27.5	.08
†1N6110A	14.25	75	11.4	20	21.0	23.8	.08
†1N6111A	15.20	75	12.2	20	22.3	22.4	.08
†1N6112A	17.10	65	13.7	1	25.1	19.9	.085
†1N6113A	19.0	65	15.2	1	27.7	18.0	.085
†1N6114A	20.9	50	16.7	1	30.5	16.4	.085
†1N6115A	22.8	50	18.2	1	33.3	15.0	.09
†1N6116A	25.7	50	20.6	1	37.4	13.4	.09
†1N6117A	28.5	40	22.8	1	41.6	12.0	.09
†1N6118A	31.4	40	25.1	1	45.7	10.9	.095
1N6119A	34.2	30	27.4	1	49.9	10.0	.095
1N6120A	37.1	30	29.7	1	53.6	9.3	.095
1N6121A	40.9	30	32.7	1	59.1	8.5	.095
1N6122A	44.7	25	35.8	1	64.6	7.7	.095
1N6123A	48.5	25	38.8	1	70.1	7.1	.095
1N6124A	53.2	20	42.6	1	77.0	6.5	.095
1N6125A	58.9	20	47.1	1	85.3	5.9	.100
1N6126A	64.6	20	51.7	1	97.1	5.1	.100
1N6127A	71.3	20	56.0	1	103.1	4.8	.100
1N6128A	77.9	15	62.2	1	112.8	4.4	.100
1N6129A	86.5	15	69.2	1	125.1	4.0	.100
1N6130A	95.0	12	76.0	1	137.6	3.6	.100
1N6131A	104.5	12	86.6	1	151.3	3.3	.100
1N6132A	114.0	10	91.2	1	165.1	3.0	.100
1N6133A	123.5	10	98.8	1	178.8	2.8	.105
1N6134A	142.5	8	114.0	1	206.3	2.4	.105
1N6135A	152.0	8	121.6	1	218.4	2.3	.105
1N6136A	171.0	5	136.8	1	245.7	2.0	.110
1N6137A	190.0	5	152.0	1	273.0	1.8	.110

† Also available in JANS qualification per MIL-PRF-19500/516.

Notes: 1. Part number without the A suffix has 5% higher V_C, 5% lower minimum $V_{(BR)}$, and 5% lower I_{PP}.

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GRAPHS

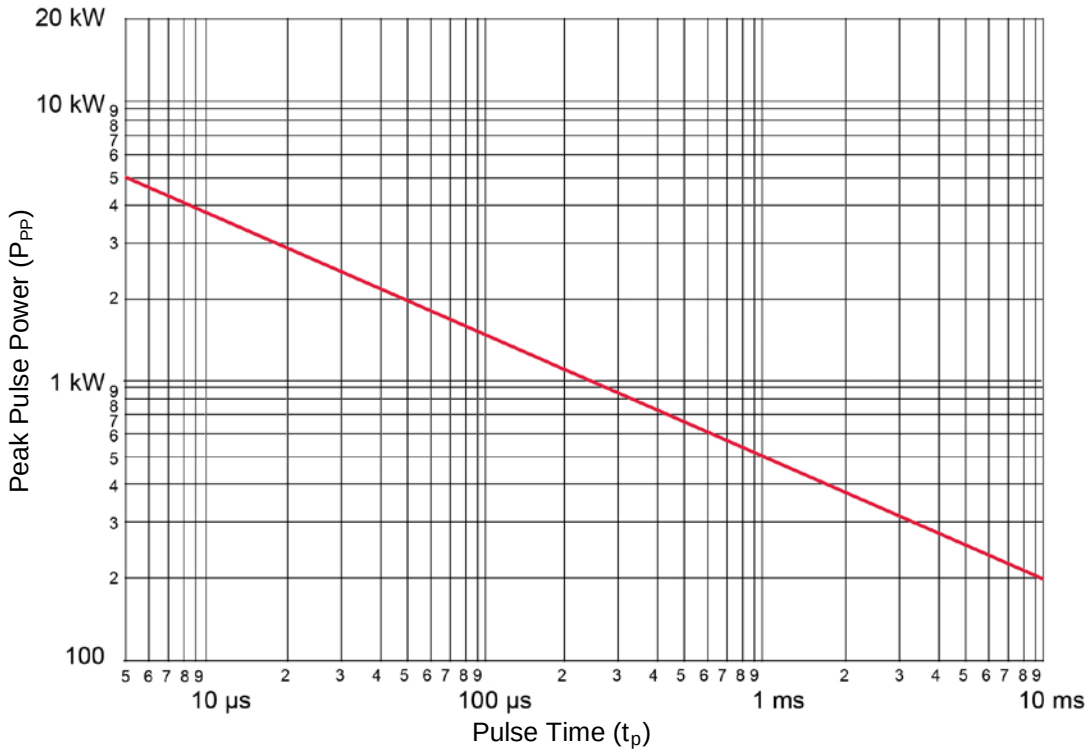

FIGURE 1
Peak Pulse Power vs. Pulse Time

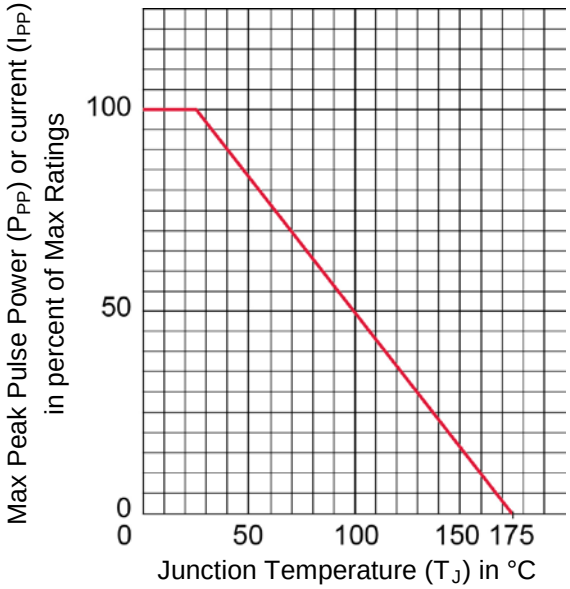

FIGURE 2
Peak Pulse Power vs T_J (prior to impulse)

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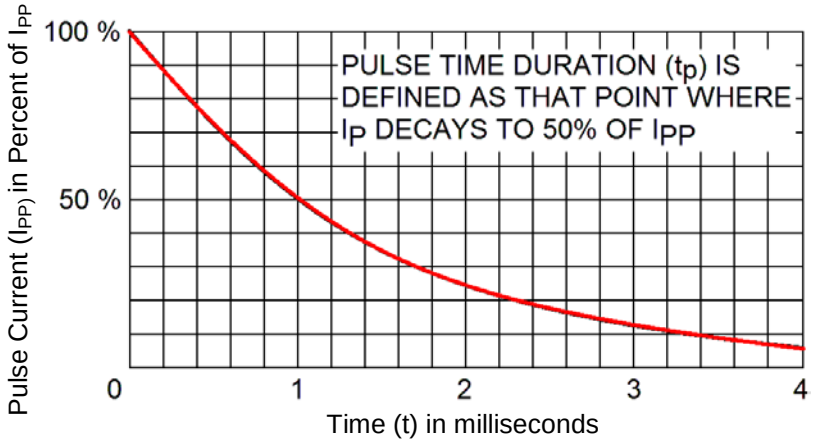

FIGURE 3
Pulse Wave Form

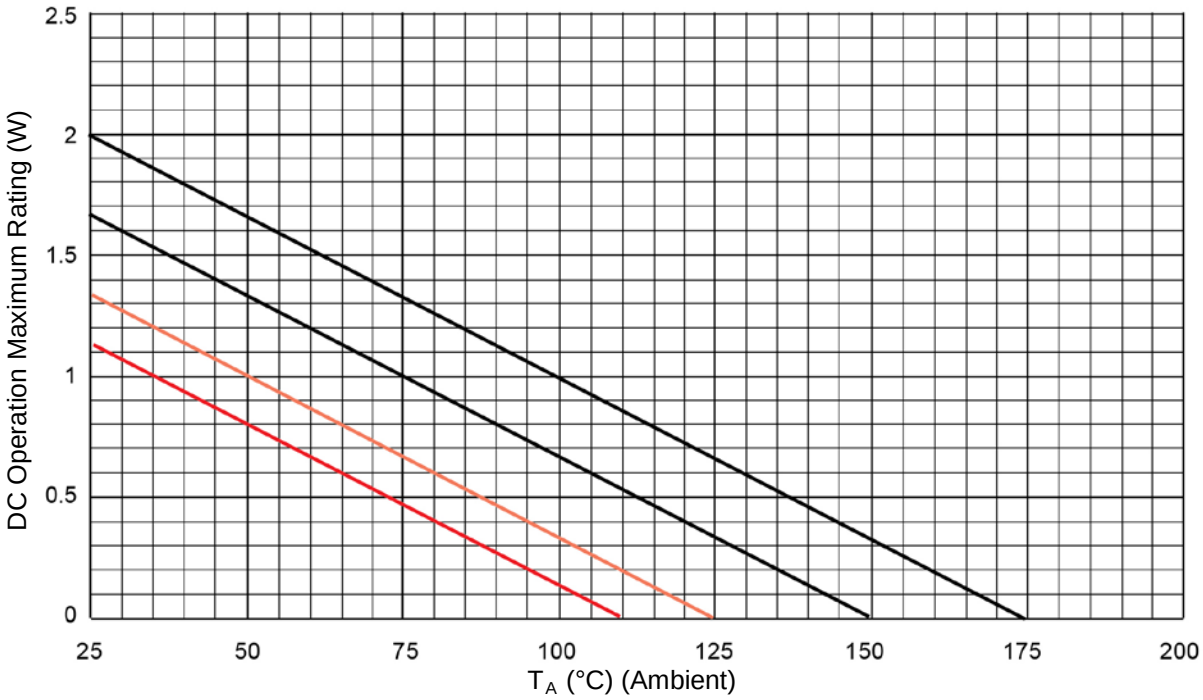

FIGURE 4
Temperature-Power Derating Curve

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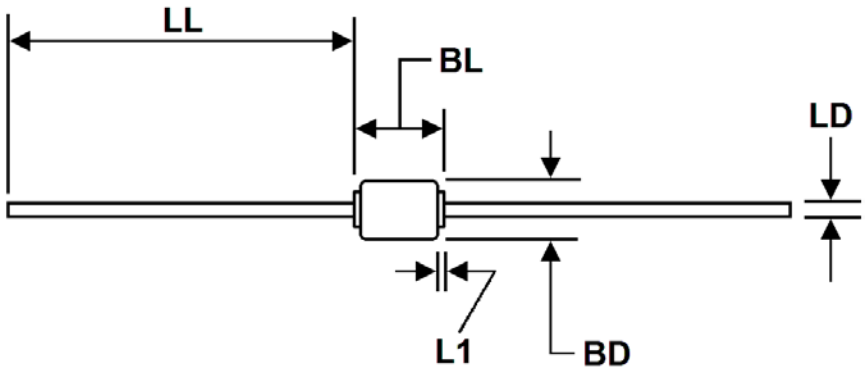
PACKAGE DIMENSIONS



Ltr	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
BD	0.085	0.140	2.16	3.56	3
BL	0.140	0.185	3.56	4.70	
LD	0.026	0.033	0.66	0.84	
LL	1.00	1.30	25.40	33.02	
L1	-	0.030	-	0.76	4

Schematic Symbol

NOTES:

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Dimension BD shall be measured at the largest diameter.
4. Dimension L1 lead diameter uncontrolled in this area.
5. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.

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