

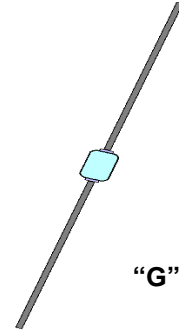
**Voidless-Hermetically-Sealed Unidirectional Transient Suppressors**

ALSO AVAILABLE IN SURFACE MOUNT

**DESCRIPTION**

This series of industry recognized voidless-hermetically-sealed Unidirectional Transient Voltage Suppressor (TVS) designs is military qualified to MIL-PRF-19500/552 and are ideal for high-reliability applications where a failure cannot be tolerated. They provide a Working Peak "Standoff" Voltage selection from 5.0 to 51.6 Volts with 1500 W ratings. They are very robust in hard-glass construction and also use an internal metallurgical bond identified as Category I for high reliability applications. The 1500 W series is military qualified to MIL-PRF-19500/552. These devices are also available in a surface mount MELF package configuration by adding a "US" suffix (see separate data sheet for 1N6469US thru 1N6476AUS). Microsemi also offers numerous other TVS products to meet higher and lower peak pulse power and voltage ratings in both through-hole and surface-mount packages.

**APPEARANCE**



"G" Package

www.Microsemi.com

**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**FEATURES**

- High surge current and peak pulse power provides transient voltage protection for sensitive circuits
- Triple-layer passivation
- Internal "Category I" metallurgical bonds
- Voidless hermetically sealed glass package
- JAN/TX/TXV military qualifications available per MIL-PRF-19500/552 by adding JAN, JANTX, or JANTXV prefix
- Further options for screening in accordance with MIL-PRF-19500 for JANS by using a "MSP" prefix, e.g. MSP6469, MSP6476, etc.
- Surface Mount equivalents are also available in a square-end-cap MELF configuration with a "US" suffix (see separate data sheet)

**APPLICATIONS / BENEFITS**

- Military and other high reliability transient protection
- Extremely robust construction
- Working Peak "Standoff" Voltage ( $V_{WM}$ ) from 5.0 to 51.6 V
- Available as 1500 W Peak Pulse Power ( $P_{PP}$ )
- ESD and EFT protection per IEC61000-4-2 and IEC61000-4-4 respectively
- Secondary lightning protection per select levels in IEC61000-4-5
- Flexible axial-leaded mounting terminals
- Nonsensitive to ESD per MIL-STD-750 Method 1020
- Inherently radiation hard as described in Microsemi MicroNote 050

**MAXIMUM RATINGS**

- Operating & Storage Temperature: -55°C to +175°C
- Peak Pulse Power at 25°C: 1500 Watts @ 10/1000  $\mu$ s (also see Figures 1,2 and 4)
- Impulse repetition rate (duty factor): 0.01%
- Forward Surge Current: 130 Amps @ 8.33 ms one-half sine wave
- Forward Voltage: 1.5 V @ 4 Amps dc and 4.8 V at 100 Amps (pulsed)
- Steady-State Power: 3.0 W @  $T_A = 25^\circ\text{C}$  (see note below and Figure 4)
- Thermal Resistance @ 3/8 inch lead length: 50.0 °C/W
- Solder Temperatures: 260°C for 10 s (maximum)

**MECHANICAL AND PACKAGING**

- CASE: Hermetically sealed voidless hard glass with Tungsten slugs
- TERMINATIONS: Axial-leads are Tin/Lead (Sn/Pb) over copper
- MARKING: Body painted and part number, etc.
- POLARITY: Cathode band
- Tape & Reel option: Standard per EIA-296
- Weight: 1270 mg
- See package dimensions on last page

**NOTE:** Steady-state power ratings with reference to ambient are for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where  $T_{J(MAX)}$  is not exceeded.



1N6461 – 1N6468  
1N6469 – 1N6476

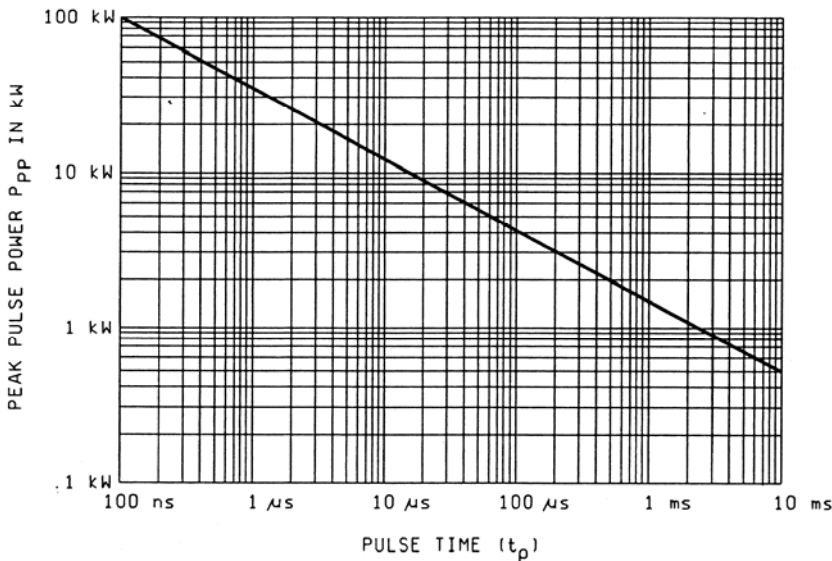
**ELECTRICAL CHARACTERISTICS**

TYPE	BREAK DOWN VOLTAGE V(BR) MIN.	BREAKDOWN CURRENT I <sub>(BR)</sub>	WORKING PEAK VOLTAGE V <sub>WM</sub>	MAX LEAKAGE CURRENT I <sub>D</sub>	MAXIMUM CLAMPING VOLTAGE V <sub>C</sub> @ 10/1000 μs	MAXIMUM PEAK PULSE CURRENT I <sub>PP</sub>		MAXIMUM TEMP. COEF. OF V(BR)
						@8/20 μs	@10/1000 μs	
	Volts	mAdc	Vdc	μAdc	V(pk)	A(pk)	A(pk)	%/°C
1N6469	5.6	50	5	1500	9.0	945	167	-.03, +0.04
1N6470	6.5	50	6	1000	11.0	775	137	0.06
1N6471	13.6	10	12	20	22.6	374	66	0.085
1N6472	16.4	10	15	10	26.5	322	57	0.085
1N6473	27.0	5	24	5	41.4	207	36.5	.096
1N6474	33.0	1	30.5	5	47.5	181	32	.098
1N6475	43.7	1	40.3	5	63.5	135	24	.101
1N6476	54.0	1	51.6	5	78.5	107	19	.103

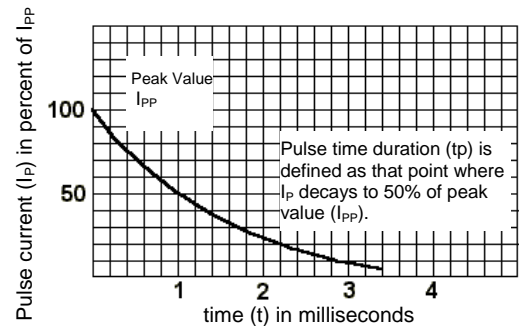
**SYMBOLS & DEFINITIONS**

Symbol	Definition
V <sub>BR</sub>	Minimum Breakdown Voltage: The minimum voltage the device will exhibit at a specified current.
V <sub>WM</sub>	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 <sub>D</sub>	Maximum Standoff Current: The maximum current that will flow at the specified voltage and temperature.
V <sub>C</sub>	Maximum clamping voltage at specified I <sub>PP</sub> (Peak Pulse Current) at the specified pulse conditions.
P <sub>PP</sub>	Peak Pulse Power: The peak power dissipation resulting from the peak impulse current I <sub>PP</sub> .

**GRAPHS**

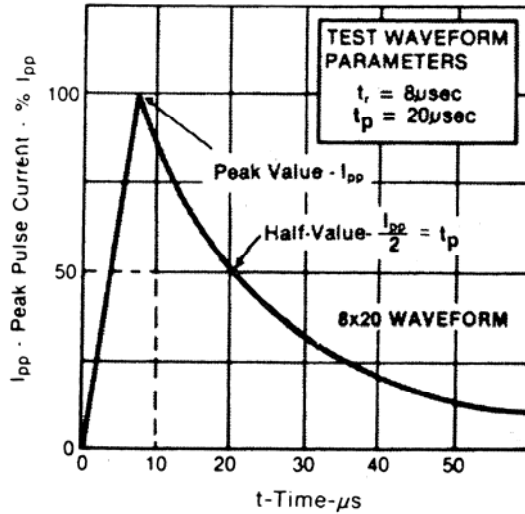


**FIG. 1** – Non-repetitive peak pulse power rating curve  
NOTE: Peak power defined as peak voltage times peak current

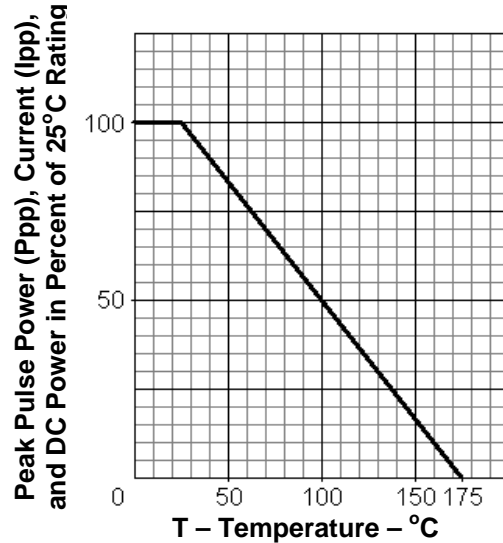


**FIG. 2** Pulse wave form for exponential surge for 10/1000 μs



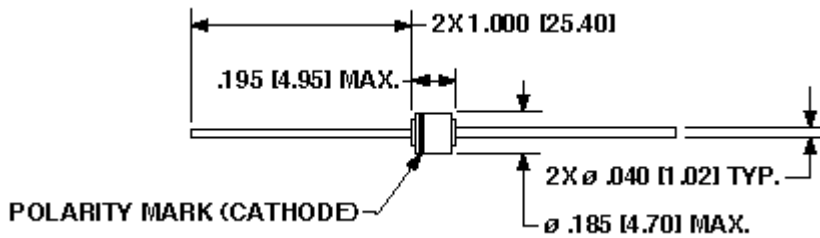


**FIGURE 3**  
8/20  $\mu$ s CURRENT IMPULSE WAVEFORM



**FIGURE 4**  
DERATING CURVE

PACKAGE DIMENSIONS Inches [mm]



**PACKAGE G**

Note: Package G lead dimension diameter is 0.040 inch nominal with  $-.003 +.002$  inch tolerance