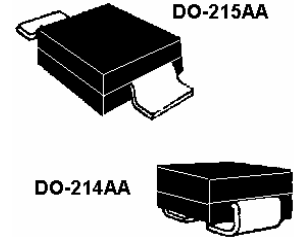


**UNIDIRECTIONAL LOW VOLTAGE
SURFACE MOUNT TRANSIENT
VOLTAGE SUPPRESSOR**

DESCRIPTION

The SMBJ2K3.0-5.0 or SMBG2K3.0-5.0 series of surface mount 2000 Watt unidirectional Transient Voltage Suppressors (TVSs) provide low voltage transient protection in a Working Standoff Voltage (V_{WM}) selections from 3.0 to 5.0 volts. Response time of clamping action is virtually instantaneous and may also be used for protection from ESD or EFT per IEC61000-4-2 and IEC61000-4-4, or for inductive switching environments and induced RF. They can also be used for protecting other sensitive components from secondary lightning effects per IEC61000-4-5 and class levels defined herein. Microsemi also offers numerous other TVS products to meet higher and lower power demands and special applications. Also available in military equivalent screening levels by adding a prefix identifier as further described in the Features section. Microsemi also offers numerous other TVS products to meet higher and lower power applications.

APPEARANCE



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

FEATURES

- Suppresses transients up to 2000 watts @ 8/20 μ s (see Figure 1 and 2)
- Fast response
- Optional 100% **screening for avionics grade** is available by adding MA prefix to part number for added 100% temperature cycle -55°C to +125°C (10X) as well as surge (3X) and 24 hours HTRB with post test V_Z & I_R (in the operating direction for unidirectional or both directions for bidirectional)
- Options for screening in accordance with MIL-PRF-19500 for JAN, JANTX, and JANTXV are available by adding MQ, MX, or MV prefixes respectively to part numbers.
- Moisture classification is Level 1 with no dry pack required per IPC/JEDEC J-STD-020B
- RoHS Compliant devices available by adding "e3" suffix
- Consult factory for bidirectional options

APPLICATIONS / BENEFITS

- Selections for 3.0 to 5.0 V Working Peak Standoff (V_{WM}) voltage
- Economical unidirectional TVS series in surface mount with flat handling surface for accurate placement
- Voltage and reverse (leakage) current lowest available
- Protects sensitive components such as IC's, CMOS, Bipolar, BiCMOS, ECL, DTL, T²L, etc.
- Protection from switching transients & induced RF
- Compliant to IEC61000-4-2 and IEC61000-4-4 for ESD and EFT protection respectively
- Secondary lightning protection per IEC61000-4-5 with 42 Ohms source impedance for Class 1

MAXIMUM RATINGS

- Peak Pulse Power dissipation at 25°C: 2000 watts at 8/20 μ s or 300 Watts at 10/1000 μ s (also see Figure 1 and 4)
- Clamping Voltage at 10 Amps @ 8/20 μ s shown on page 2
- Impulse repetition rate (duty factor): 0.01% maximum
- $t_{clamping}$ (0 volts to $V_{(BR)}$ min.): < 100 ps
- Operating and Storage temperature: -65°C to +150°C
- Thermal resistance: 25 °C/W junction to lead, or 90°C/W junction to ambient when mounted on FR4 PC board (1oz Cu) with recommended footprint (see last page)
- Steady-State Power dissipation: 5 watts at $T_L = 25^\circ\text{C}$, or 1.38 watts at $T_A = 25^\circ\text{C}$ when mounted on FR4 PC board with recommended footprint
- Forward Voltage at 25°C: 3.5 Volts maximum @ 30 Amp peak impulse of 8.3 ms half-sine wave (unidirectional only)
- Solder temperatures: 260°C for 10 s (maximum)

MECHANICAL AND PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy body meeting UL94V-0
- FINISH: Tin-Lead or RoHS compliant annealed matte-Tin plating over copper readily solderable per MIL-STD-750, method 2026
- MARKING: Body marked without SMBJ or SMBG part number prefix, e.g. 2K3.0, 2K3.3, 2K4.0, etc.
- POLARITY: Band denotes cathode
- WEIGHT: 0.1 grams (approximate)
- TAPE & REEL option: Standard per EIA-481-1-A with 12 mm tape, 750 per 7 inch reel or 2500 per 13 inch reel (add "TR" suffix to part number)
- See package dimensions on last page

ELECTRICAL CHARACTERISTICS

MICROSEMI PART NUMBER (add SMBJ or SMBG prefix)	BREAKDOWN VOLTAGE Minimum	BREAKDOWN CURRENT	RATED STANDOFF VOLTAGE	MAX STANDBY CURRENT	MAX CLAMPING VOLTAGE	PEAK PULSE CURRENT	TEMPERATURE COEFFICIENT of $V_{(BR)}$
	$V_{(BR)}$	$I_{(BR)}$	V_{WM}	$I_D @ V_{WM}$	$V_C @ I_{PP}$	I_{PP}	$\alpha_{V(BR)}$
	V	mA	V	μA	V	A	% / °C
2K3.0	4.3	50	3.0	1500	5.4	10	+0/-0.05
2K3.3	4.6	50	3.3	700	5.8	10	±0.025
2K4.0	5.0	50	4.0	400	6.3	10	±0.030
2K4.5	5.4	50	4.5	50	6.6	10	±0.040
2K5.0	5.9	50	5.0	5	7.6	10	+0.050

SYMBOLS & DEFINITIONS

Symbol	Definition	Symbol	Definition
V_{WM}	Working Peak (Standoff) Voltage	I_{PP}	Peak Pulse Current
P_{PP}	Peak Pulse Power	V_C	Clamping Voltage
$V_{(BR)}$	Breakdown Voltage	$I_{(BR)}$	Breakdown Current for $V_{(BR)}$
I_D	Standby Current		

GRAPHS

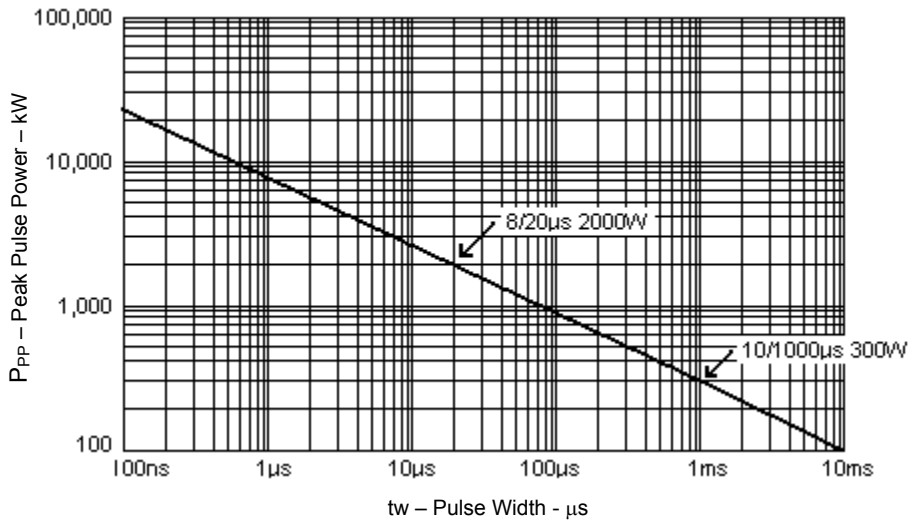
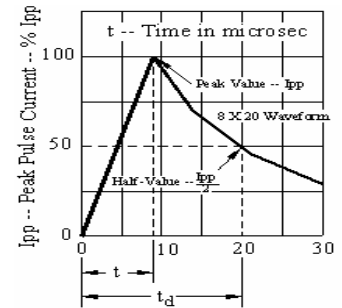


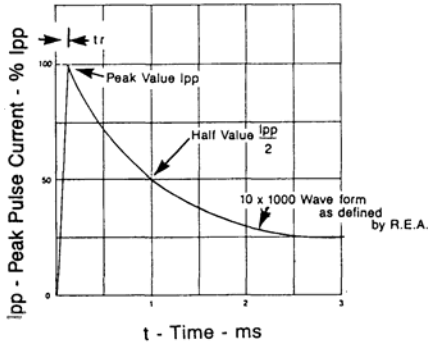
FIGURE 1
Peak Pulse Power vs. Pulse Time



Test waveform parameters: $t_r=8 \mu s$, $t_p=20 \mu s$

FIGURE 2
Pulse Waveform for
8/20 μs Exponential Surge

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Test waveform parameters: $t_r=10 \mu s$, $t_p=1000 \mu s$

FIGURE 3

Pulse Waveform for
10/1000 μs Exponential Surge

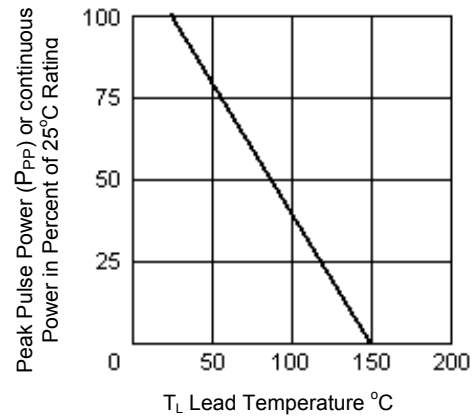
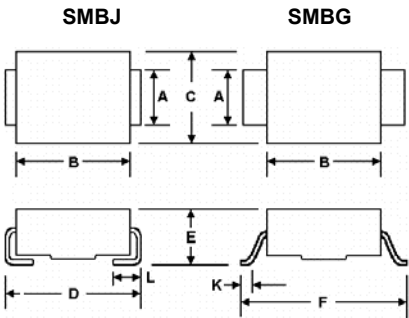
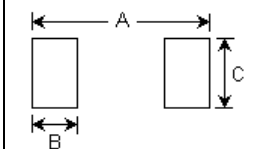


FIGURE 4 - Derating Curve

PACKAGE DIMENSIONS



	A	B	C	D	E	F	K	L
MIN	.077	.160	.130	.205	.077	.235	.015	.030
MAX	.083	.180	.155	.220	.104	.255	.030	.060
DIMENSIONS IN MILLIMETERS								
MIN	1.96	4.06	3.30	5.21	1.95	5.97	.381	.760
MAX	2.10	4.57	3.94	5.59	2.65	6.48	.762	1.520



SMBJ		
	INCHES	mm
A	.260	6.60
B	.085	2.16
C	.110	2.79

SMBG		
	INCHES	mm
A	0.320	8.13
B	0.085	2.16
C	0.110	2.79