Vishay General Semiconductor

## Surface Mount TRANSZORB<sup>®</sup> **Transient Voltage Suppressors**



SMB (DO-214AA)

PRIMARY CHARACTERISTICS					
V <sub>BR</sub> (bi-directional)	6.4 V to 231 V				
V <sub>BR</sub> (uni-directional)	6.4 V to 231 V				
V <sub>WM</sub>	5.0 V to 188 V				
P <sub>PPM</sub>	600 W				
I <sub>FSM</sub> (uni-directional only)	100 A				
T <sub>J</sub> max.	150 °C				
Polarity	Uni-directional, bi-directional				
Package	SMB (DO-214AA)				

## **DEVICES FOR BI-DIRECTION APPLICATIONS**

For bi-directional devices use CA suffix (e.g. SMBJ10CA). Electrical characteristics apply in both directions.

### FEATURES

- Low profile package
- · Ideal for automated placement
- Glass passivated chip junction
- · Available in uni-directional and bi-directional
- . 600 W peak pulse power capability with a 10/1000 µs waveform, repetitive rate (duty cycle): 0.01 %
- Excellent clamping capability
- Very fast response time
- Low incremental surge resistance
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

## **TYPICAL APPLICATIONS**

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, and telecommunication.

## **MECHANICAL DATA**

Case: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial arade

Base P/NHE3\_X - RoHS-compliant and AEC-Q101 gualified Base P/NHM3\_X - halogen-free, RoHS-compliant, and AEC-Q101 qualified

("\_X" denotes revision code e.g. A, B, ...)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3, M3, HE3, and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: for uni-directional types the band denotes cathode end, no marking on bi-directional types

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	VALUE	UNIT			
Peak pulse power dissipation with a 10/1000 $\mu s$ waveform $^{(1)(2)}$ (fig. 1)	P <sub>PPM</sub>	600	W			
Peak pulse current with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	I <sub>PPM</sub>	See next table	А			
Peak forward surge current 8.3 ms single half sine-wave uni-directional only <sup>(2)</sup>	I <sub>FSM</sub>	100	A			
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C			

Notes

 $^{(1)}$  Non-repetitive current pulse, per fig. 3 and derated above  $T_A$  = 25 °C per fig. 2

<sup>(2)</sup> Mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pads to each terminal

Revision: 24-Jan-2019 Document Number: 88392 For technical questions within your region: DiodesAmericas@vishay.com, DiodesAsia@vishay.com, DiodesEurope@vishay.com THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE. THE PRODUCTS DESCRIBED HEREIN AND THIS DOCUMENT

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## Vishay General Semiconductor

Device trype MODIFIED "BBD1260  Device trype (D)  BREAKDOWN (P)  TEST (URREN) (mA)  STAND-OFF Volt AGE (MA)  MAXIMUM PA    MAXIMUMA KI  KI <th colspan="8"><b>ELECTRICAL CHARACTERISTICS</b> (T<sub>A</sub> = 25 °C unless otherwise noted)</th>	<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)									
UNI  BI  MIN.  MAX.  Composition  Page May  Proc May <th>MODIFIED</th> <th>co</th> <th>DE</th> <th>VOLT V<sub>BR</sub> A (</th> <th>TAGE T I<sub>T</sub> <sup>(1)</sup> V)</th> <th></th> <th>VOLTAGE V<sub>WM</sub></th> <th>REVERSE LEAKAGE AT V<sub>WM</sub></th> <th>PEAK PULSE SURGE CURRENT</th> <th>CLAMPING VOLTAGEAT I<sub>PPM</sub></th>	MODIFIED	co	DE	VOLT V <sub>BR</sub> A (	TAGE T I <sub>T</sub> <sup>(1)</sup> V)		VOLTAGE V <sub>WM</sub>	REVERSE LEAKAGE AT V <sub>WM</sub>	PEAK PULSE SURGE CURRENT	CLAMPING VOLTAGEAT I <sub>PPM</sub>
(*)SMB.06.A  KG  KG  KG  KG  AF  7.27  10  6.0  800  58.3  11.2    (*)SMB.05.A  KK  AK  X.22  7.98  10  6.5  500  53.6  11.2    (*)SMB.30.A  KP  AP  8.39  9.21  1.0  7.5  100  46.5  12.9    (*)SMB.30.A  KR  AR  8.69  9.83  1.0  8.0  50  44.1  13.6    (*)SMB.30.A  KT  AT  9.44  10.4  1.0  8.5  20  41.7  14.4    (*)SMB.31A  KX  AX  11.1  1.0  9.0  15.4  (*)SMB.31A  KX  AX  11.1  1.0  1.0  1.0  2.0  3.0  18.2    (*)SMB.31A  LK  CLG  1.44  1.0  1.0  1.0  2.1  2.6.0    (*)SMB.31A  LK  BM  16.7  1.8.5  1.0  16  1.0  2.3.1	()									
(*ISMBJ0.5A)  KK  AK  7.22  7.98  10  6.5  500  53.6  11.2    (*ISMBJ7.5A)  KP  AP  8.33  9.21  1.0  7.5  100  46.5  12.9    (*ISMBJ5.0A)  KR  AR  8.88  9.83  1.0  8.0  50  44.1  13.6    (*ISMBJ5.0A)  KY  AT  9.44  10.4  1.0  8.0  50  44.1  13.6    (*ISMBJ5.0A)  KV  AV  10.0  11.1  10.0  9.0  10  39.0  15.4    (*ISMBJ10A)  KZ  AZ  12.2  13.5  1.0  11  5.0  33.0  18.2    (*ISMBJ13A)  LG  LG  14.4  15.9  1.0  13  1.0  27.9  21.5    (*ISMBJ15A)  LK  BK  15.6  1.0  1.0  1.0  24.6  24.4    (*ISMBJ15A)  LK  BK  15.6  1.0  21.7 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>										
(*)SMBJ7.6A  KM  KM  RM  7.76  8.60  10  7.0  200  50.0  12.0    (*)SMBJ7.6A  KP  AP  8.33  9.21  1.0  7.5  100  46.5  12.9    (*)SMBJ8.6A  KT  AT  9.44  10.4  1.0  8.5  20  41.7  14.4    (*)SMBJ10A  KX  AX  11.0  10  39.0  15.4    (*)SMBJ11A  KZ  KZ  12.2  13.5  1.0  11  5.0  33.3  17.0    (*)SMBJ11A  KZ  KZ  12.2  1.3  1.0  12  5.0  30.2  19.9    (*)SMBJ16A  LG  LG  1.44  15.9  1.0  13  1.0  27.9  21.5    (*)SMBJ16A  LM  BK  16.7  1.0  15  1.0  24.6  24.4    (*)SMBJ16A  LM  BK  10.7  10.1  16  10.2  27.6  (*)SMBJ2A										
(*)SMBJ8.0A  KP  AP  8.33  9.21  1.0  7.5  100  46.5  12.9    (*)SMBJ8.0A  KR  AR  8.89  9.83  1.0  8.0  50  44.1  13.6    (*)SMBJ8.0A  KV  AV  10.0  11.1  10.0  8.5  20  41.7  14.4    (*)SMBJ0.0A  KV  AV  10.0  11.1  10.0  10  39.0  15.4    (*)SMBJ1.0A  KZ  AZ  11.1  12.3  1.0  10  35.3  17.0    (*)SMBJ1.3A  LG  BE  13.3  14.7  1.0  14  1.0  27.9  21.5    (*)SMBJ1.3A  LM  BM  16.7  18.5  1.0  15  1.0  24.6  24.4    (*)SMBJ1.3A  LW  BM  17.8  10.0  21.7  22.9  22.2  (*)SMBJ1.3  24.0  (*)SMBJ2.4  24.8  (*)SMBJ2.4  24.8  (*)SMBJ2.4  24.2  24.5										
(*)SMBJ8.0A  KR  AR  8.89  9.83  1.0  8.0  50  44.1  13.6    (*)SMBJ8.5A  KT  AT  9.44  10.4  10.0  8.5  20  41.7  14.4    (*)SMBJ0.0A  KV  AV  10.0  11.1  1.0  9.0  10  38.3  17.0    (*)SMBJ1AA  KZ  KX  AX  11.1  12.3  1.0  11  5.0  33.3  17.0    (*)SMBJ1AA  LE  BE  13.3  14.7  1.0  12  5.0  30.2  19.9    (*)SMBJ1AA  LK  BK  15.6  17.2  1.0  14  1.0  25.9  22.2    (*)SMBJ16A  LM  BM  16.7  18.5  1.0  16  1.0  21.7  27.6    (*)SMBJ16A  LV  LV  22.2  24.5  1.0  20  1.0  18  1.0  20.5  29.2    (*)SMBJ2AA  LZ  BZ						-				
(+)SMBJ9.0A  KT  AT  9.44  10.4  1.0  8.5  20  41.7  14.4    (+)SMBJ9.0A  KV  AV  10.0  11.1  1.0  9.0  10  39.0  15.4    (+)SMBJ10A  KX  AX  11.1  12.3  1.0  10  5.0  33.0  18.2    (+)SMBJ12A  LE  BE  13.3  14.7  1.0  12  5.0  33.0  18.2    (+)SMBJ13A  LG  LG  14.4  15.9  1.0  13  1.0  27.9  21.5    (+)SMBJ15A  LM  BM  16.7  18.5  1.0  16  1.0  22.1  22.2  22.2  22.2  22.2  22.2  22.2  22.2  22.2  22.2  22.1  22.1  22.1  22.1  22.1  22.1  22.1  22.1  22.1  23.1  22.6  22.2  22.1  1.0  18.5  32.4  11.3  32.4  11.3  33.2  36.							7.5			12.9
(*)SMBJ0A  KV  AV  10.0  11.1  1.0  9.0  10  39.0  15.4    (*)SMBJ10A  KX  AX  11.1  12.3  1.0  10  5.0  36.3  17.0    (*)SMBJ1A  KZ  KZ  12.2  13.5  1.0  11  5.0  36.3  17.0    (*)SMBJ1A  LE  BE  13.3  14.7  1.0  12  5.0  30.2  19.9    (*)SMBJ1AA  LE  BE  13.3  14.7  1.0  14  1.0  25.9  23.2    (*)SMBJ6A  LM  BK  15.6  17.2  1.0  16  1.0  24.6  24.4    (*)SMBJAA  LT  BT  20.0  22.1  1.0  18  10  20.5  29.2    (*)SMBJAA  LV  LV  22.2  24.5  1.0  24  1.0  18.5  32.4    (*)SMBJAA  LZ  BZ  26.7  29.5  1.0  24										
(PSMBJ10A  KX  AX  11.1  12.3  1.0  10  5.0  35.3  17.0    (PSMBJ11A  KZ  KZ  12.2  13.5  1.0  11  5.0  30.2  19.9    (PSMBJ13A  LG  LG  14.4  15.9  1.0  13  1.0  27.9  21.5    (PSMBJ1AA  LK  BK  15.6  1.0  14  1.0  25.9  23.2    (PSMBJ1AA  LK  BK  15.6  1.0  15  1.0  24.6  24.4    (PSMBJ1AA  LK  BK  16.7  18.5  1.0  16  1.0  23.1  26.0    (PSMBJ0A  LP  LM  17.8  19.7  1.0  18  1.0  20.5  29.2    (PSMBJ2A  LZ  BZ  26.7  29.5  1.0  22  1.0  16.9  35.5    (PSMBJ2A  MG  MG  31.1  34.4  1.0  26  1.0  14.3					10.4				41.7	
(PSMBJ11A  KZ  KZ  122  13.5  1.0  11  5.0  33.0  18.2    (PSMBJ12A  LE  BE  13.3  14.7  1.0  12  5.0  30.2  19.9    (PSMBJ13A  LG  LG  IG  14.4  15.6  1.0  13  1.0  27.9  21.5    (PSMBJ13A  LK  BK  15.6  17.2  1.0  14  1.0  25.9  23.2    (PSMBJ13A  LF  LR  BK  15.7  1.0  16  1.0  23.1  26.0    (PSMBJ13A  LF  LR  LR  18.9  20.0  21.1  1.0  18  1.0  20.5  29.2    (PSMBJ2AA  LV  LV  22.0  24.5  1.0  24  1.0  18.5  32.4    (PSMBJ2AA  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (PSMBJ2AA  LZ  BZ  26.7			AV	10.0	11.1	1.0	9.0	10	39.0	15.4
(+)SMBJ12A  LE  BE  13.3  14.7  1.0  12  5.0  30.2  19.9    (+)SMBJ13A  LG  LG  14.4  15.9  1.0  13  1.0  27.9  21.5    (+)SMBJ15A  LM  BK  15.6  1.7.2  1.0  14  1.0  25.9  23.2    (+)SMBJ15A  LM  BK  16.7  18.5  1.0  15  1.0  24.6  24.4    (+)SMBJ17A  LR  LR  IR  18.9  20.9  1.0  17  1.0  21.7  27.6    (+)SMBJ2A  LT  BT  20.0  22.1  1.0  18  1.0  20.5  29.2    (+)SMBJ2A  LX  BX  24.4  26.9  1.0  26  1.0  16.9  35.5    (+)SMBJ3A  MK  CK  33.3  36.8  1.0  24  1.0  14.3  42.1    (+)SMBJ3A  MK  CK  33.3  36.8 <t< td=""><td><sup>(+)</sup>SMBJ10A</td><td></td><td></td><td>11.1</td><td></td><td>1.0</td><td>10</td><td>5.0</td><td>35.3</td><td>17.0</td></t<>	<sup>(+)</sup> SMBJ10A			11.1		1.0	10	5.0	35.3	17.0
H9MBJ13A  LG  LG  14.4  15.9  1.0  13  1.0  27.9  21.5    (hSMBJ14A  LK  BK  15.6  17.2  1.0  14  1.0  25.9  23.2    (hSMBJ15A  LM  BM  16.5  1.0  15  1.0  24.6  24.4    (hSMBJ16A  LP  LM  17.8  19.7  1.0  16  1.0  23.1  26.0    (hSMBJ17A  LR  LR  18.9  20.9  1.0  17  1.0  21.7  27.6    (hSMBJ2A  LV  UV  22.2  24.5  1.0  20  1.0  18.5  32.4    (hSMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (hSMBJ3A  ME  CE  28.9  31.9  1.0  28  1.0  13.2  45.4    (hSMBJ3A  MM  CK  33.3  36.8  1.0  33  1.0	<sup>(+)</sup> SMBJ11A	KZ	KZ	12.2	13.5	1.0	11	5.0	33.0	18.2
(+)SMBJ14A  LK  BK  15.6  17.2  1.0  14  1.0  25.9  23.2    (+)SMBJ15A  LM  BM  16.7  18.5  1.0  15  1.0  24.6  24.4    (+)SMBJ15A  LP  LM  18.9  20.9  1.0  16  1.0  23.1  26.0    (+)SMBJ17A  LR  LR  18.9  20.9  1.0  17  1.0  21.7  27.6    (+)SMBJ17A  LR  LR  18.9  20.9  1.0  18  1.0  21.7  27.6    (+)SMBJ2A  LT  BX  24.4  26.9  1.0  22  1.0  18.5  32.4    (+)SMBJ2A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ3A  MG  MG  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ3A  MM  CM  36.7  40.6  1.0 <t< td=""><td><sup>(+)</sup>SMBJ12A</td><td>LE</td><td>BE</td><td>13.3</td><td>14.7</td><td>1.0</td><td>12</td><td>5.0</td><td>30.2</td><td>19.9</td></t<>	<sup>(+)</sup> SMBJ12A	LE	BE	13.3	14.7	1.0	12	5.0	30.2	19.9
(H)SMBJ15A  LM  BM  16.7  18.5  1.0  15  1.0  24.6  24.4    (H)SMBJ16A  LP  LM  17.8  19.7  1.0  16  1.0  23.1  26.0    (H)SMBJ17A  LR  LR  18.9  20.9  1.0  17  1.0  21.7  27.6    (H)SMBJ2A  LV  LV  22.2  24.5  1.0  20  1.0  18  1.0  20.5  29.2    (H)SMBJ2A  LV  BX  24.4  26.9  1.0  22  1.0  16.9  35.5    (H)SMBJ2A  ME  CE  28.9  31.9  1.0  26  1.0  13.2  45.4    (H)SMBJ3A  ME  CE  28.9  31.3  36.8  1.0  30  1.0  13.2  45.4    (H)SMBJ3A  ME  CK  33.3  36.8  1.0  33  1.0  11.3  53.3    (H)SMBJ3A  MP  CP  40		LG	LG	14.4	15.9	1.0	13	1.0	27.9	21.5
(H)SMBJ16A  LP  LM  17.8  19.7  1.0  16  1.0  23.1  26.0    (H)SMBJ17A  LR  LR  18.9  20.9  1.0  17  1.0  21.7  27.6    (H)SMBJ18A  LT  BT  20.0  22.1  1.0  18  1.0  20.5  29.2    (H)SMBJ2A  LV  LV  22.2  24.5  1.0  20  1.0  18.5  32.4    (H)SMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (H)SMBJ2A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (H)SMBJ3A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (H)SMBJ3A  MR  CK  33.3  1.0  11.3  53.3    (H)SMBJ3A  MR  CR  44.4  49.1  1.0  46  1.0  9.3  6	<sup>(+)</sup> SMBJ14A	LK	BK	15.6	17.2	1.0	14	1.0	25.9	23.2
(H)SMBJ17A  LR  LR  18  20.9  1.0  17  1.0  21.7  27.6    (H)SMBJ18A  LT  BT  20.0  22.1  1.0  18  1.0  20.5  29.2    (H)SMBJ20A  LV  LV  22.2  24.5  1.0  20  1.0  18.5  32.4    (H)SMBJ2A  LX  BX  24.4  26.9  1.0  22  1.0  16.9  35.5    (H)SMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (H)SMBJ3A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (H)SMBJ3A  MM  CK  33.3  36.8  1.0  33  1.0  11.3  55.3    (H)SMBJ3A  MR  CR  44.4  49.1  1.0  40  1.0  83.3  72.7    (H)SMBJ3A  MV  MV  50.0  55.3  1.0  43	(+)SMBJ15A	LM	BM	16.7	18.5	1.0	15	1.0	24.6	24.4
(H)SMBJ17A  LR  LR  18  20.9  1.0  17  1.0  21.7  27.6    (H)SMBJ18A  LT  BT  20.0  22.1  1.0  18  1.0  20.5  29.2    (H)SMBJ20A  LV  LV  22.2  24.5  1.0  20  1.0  18.5  32.4    (H)SMBJ2A  LX  BX  24.4  26.9  1.0  22  1.0  16.9  35.5    (H)SMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (H)SMBJ3A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (H)SMBJ3A  MM  CK  33.3  36.8  1.0  33  1.0  11.3  55.3    (H)SMBJ3A  MR  CR  44.4  49.1  1.0  40  1.0  83.3  72.7    (H)SMBJ3A  MV  MV  50.0  55.3  1.0  43	<sup>(+)</sup> SMBJ16A	LP	LM	17.8	19.7	1.0	16	1.0	23.1	26.0
(+)SMBJ20A  LV  LV  22.2  24.5  1.0  20  1.0  18.5  32.4    (+)SMBJ2A  LX  BX  24.4  26.9  1.0  22  1.0  16.9  35.5    (+)SMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (+)SMBJ26A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  11.3  53.3    (+)SMBJ3A  MM  CM  36.7  40.6  1.0  33  1.0  10.3  58.1    (+)SMBJ3A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ4A  MZ  MZ  56.7  62.7  1.0		LR	LR	18.9	20.9	1.0	17	1.0	21.7	27.6
(+)SMBJ20A  LV  LV  22.2  24.5  1.0  20  1.0  18.5  32.4    (+)SMBJ2A  LX  BX  24.4  26.9  1.0  22  1.0  16.9  35.5    (+)SMBJ2A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (+)SMBJ26A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  11.3  53.3    (+)SMBJ3A  MM  CM  36.7  40.6  1.0  33  1.0  10.3  58.1    (+)SMBJ3A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ4A  MZ  MZ  56.7  62.7  1.0	<sup>(+)</sup> SMBJ18A	LT	BT	20.0	22.1	1.0	18	1.0	20.5	29.2
(+)SMBJ24A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (+)SMBJ26A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ28A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ30A  MM  CM  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ4AA  MX  MX  53.3  58.9  1.0  48  1.0  7.3  7.7    (+)SMBJ51A  MZ  56.7  62.7  1.0  51 <t< td=""><td></td><td>LV</td><td>LV</td><td></td><td></td><td>1.0</td><td>20</td><td>1.0</td><td></td><td>32.4</td></t<>		LV	LV			1.0	20	1.0		32.4
(+)SMBJ24A  LZ  BZ  26.7  29.5  1.0  24  1.0  15.4  38.9    (+)SMBJ26A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ28A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ30A  MM  CM  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ4AA  MX  MX  53.3  58.9  1.0  48  1.0  7.3  7.7    (+)SMBJ51A  MZ  56.7  62.7  1.0  51 <t< td=""><td>(+)SMBJ22A</td><td>LX</td><td>BX</td><td>24.4</td><td>26.9</td><td>1.0</td><td>22</td><td>1.0</td><td>16.9</td><td>35.5</td></t<>	(+)SMBJ22A	LX	BX	24.4	26.9	1.0	22	1.0	16.9	35.5
(+)SMBJ26A  ME  CE  28.9  31.9  1.0  26  1.0  14.3  42.1    (+)SMBJ28A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  33  1.0  11.3  53.3    (+)SMBJ30A  MM  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ43A  MV  MV  50.0  55.3  1.0  45  1.0  8.3  72.7    (+)SMBJ5A  MZ  MZ  56.7  62.7  1.0  54  1.0  6.9  87.1    (+)SMBJ5A  NE  NE  60.0  66.3  1.0		LZ	BZ	26.7			24	1.0		
(+)SMBJ28A  MG  MG  31.1  34.4  1.0  28  1.0  13.2  45.4    (+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ33A  MM  CM  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ33A  MP  CP  40.0  44.2  1.0  36  1.0  10.3  58.1    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ44A  MX  MX  53.3  58.9  1.0  448  1.0  7.3  82.4    (+)SMBJ54A  MZ  MZ  56.7  62.7  1.0  51  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  <		ME								
(+)SMBJ30A  MK  CK  33.3  36.8  1.0  30  1.0  12.4  48.4    (+)SMBJ33A  MM  CM  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ46A  MP  CP  40.0  44.2  1.0  36  1.0  10.3  58.1    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ48A  MX  MX  53.3  58.9  1.0  448  1.0  7.8  77.7    (+)SMBJ51A  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ58A  NE  NE  60.0  66.3  1.0  54  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
(+)SMBJ33A  MM  CM  36.7  40.6  1.0  33  1.0  11.3  53.3    (+)SMBJ36A  MP  CP  40.0  44.2  1.0  36  1.0  10.3  58.1    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  T7.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ45A  MV  MV  50.0  55.3  1.0  445  1.0  8.3  72.7    (+)SMBJ48A  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ60A  NK  NK  66.7  73.7  1.0 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>										
(+)SMBJ36A  MP  CP  40.0  44.2  1.0  36  1.0  10.3  58.1    (+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ45A  MV  MV  50.0  55.3  1.0  45  1.0  8.3  72.7    (+)SMBJ48A  MX  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ51A  MZ  56.7  62.7  1.0  51  1.0  6.9  87.1    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  58  1.0  6.4  93.6    (+)SMBJ6AA  NK  NK  66.7  73.7  1.0  60  1.0  5.8  103    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75										
(+)SMBJ40A  MR  CR  44.4  49.1  1.0  40  1.0  9.3  64.5    (+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ45A  MV  MV  50.0  55.3  1.0  45  1.0  8.3  72.7    (+)SMBJ48A  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ51A  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  75  1.0  5.0  121    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0										
(+)SMBJ43A  MT  CT  47.8  52.8  1.0  43  1.0  8.6  69.4    (+)SMBJ45A  MV  MV  50.0  55.3  1.0  45  1.0  8.3  72.7    (+)SMBJ48A  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ51A  MZ  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78 </td <td></td>										
(+)SMBJ45A  MV  MV  50.0  55.3  1.0  45  1.0  8.3  72.7    (+)SMBJ48A  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ51A  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ58A  NG  NG  64.4  71.2  1.0  58  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  4.8  126    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0<					-		-	-		
(+)SMBJ48A  MX  MX  53.3  58.9  1.0  48  1.0  7.8  77.4    (+)SMBJ51A  MZ  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ58A  NG  NG  64.4  71.2  1.0  58  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.0  121    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85 <td></td>										
(+)SMBJ51A  MZ  MZ  56.7  62.7  1.0  51  1.0  7.3  82.4    (+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ58A  NG  NG  64.4  71.2  1.0  58  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ64A  NM  NM  71.1  78.6  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  75  1.0  5.0  121    (+)SMBJ78A  NR  NR  83.3  92.1  1.0  75  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ100A  NZ  NZ  1111  123  1.0  100 <td></td>										
(+)SMBJ54A  NE  NE  60.0  66.3  1.0  54  1.0  6.9  87.1    (+)SMBJ58A  NG  NG  64.4  71.2  1.0  58  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ100A  NZ  NZ  111  123  1.0							-			
(+)SMBJ58A  NG  NG  64.4  71.2  1.0  58  1.0  6.4  93.6    (+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ64A  NM  NM  71.1  78.6  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  NZ  NZ  111  123  1.0  110										
(+)SMBJ60A  NK  NK  66.7  73.7  1.0  60  1.0  6.2  96.8    (+)SMBJ64A  NM  NM  71.1  78.6  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ120A  PE  PE  122  135  1.0  110										
(+)SMBJ64A  NM  NM  71.1  78.6  1.0  64  1.0  5.8  103    (+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  NZ  NZ  111  123  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120										
(+)SMBJ70A  NP  NP  77.8  86.0  1.0  70  1.0  5.3  113    (+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  NZ  NZ  111  123  1.0  110  1.0  3.4  177    (+)SMBJ120A  PE  PE  122  135  1.0  110  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130								-		
(+)SMBJ75A  NR  NR  83.3  92.1  1.0  75  1.0  5.0  121    (+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.4  177    (+)SMBJ10A  PE  PE  122  135  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130										
(+)SMBJ78A  NT  NT  86.7  95.8  1.0  78  1.0  4.8  126    (+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  NZ  NZ  111  123  1.0  110  1.0  3.4  177    (+)SMBJ120A  PE  PE  122  135  1.0  110  1.0  3.1  193    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ160A  PP  PP  178  197  1.0  160										
(+)SMBJ85A  NV  NV  94.4  104  1.0  85  1.0  4.4  137    (+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  PE  PE  122  135  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170										
(+)SMBJ90A  NX  NX  100  111  1.0  90  1.0  4.1  146    (+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ100A  PE  PE  122  135  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ100A  NZ  NZ  111  123  1.0  100  1.0  3.7  162    (+)SMBJ10A  PE  PE  122  135  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ110A  PE  PE  122  135  1.0  110  1.0  3.4  177    (+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ120A  PG  PG  133  147  1.0  120  1.0  3.1  193    (+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ130A  PK  PK  144  159  1.0  130  1.0  2.9  209    (+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ150A  PM  PM  167  185  1.0  150  1.0  2.5  243    (+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ160A  PP  PP  178  197  1.0  160  1.0  2.3  259    (+)SMBJ170A  PR  PR  189  209  1.0  170  1.0  2.2  275										
(+)SMBJ170A PR PR 189 209 1.0 170 1.0 2.2 275	()									
	SMBJ188A	PS	PS	209	209	1.0	188	1.0	2.0	328

#### Notes

<sup>(1)</sup> Pulse test:  $t_p \le 50 \text{ ms}$ 

<sup>(2)</sup> Surge current waveform per fig. 3 and derate per fig. 2

 $^{(3)}$  For bi-directional types having  $V_{WM}$  of 10 V and less, the  $I_{D}$  limit is doubled

<sup>(4)</sup> All terms and symbols are consistent with ANSI/IEEE C62.35

 $^{(5)}\,$  For the bi-directional SMBJ5.0CA, the maximum  $V_{BR}$  is 7.25 V

<sup>(6)</sup>  $V_F = 3.5 V \text{ max.}$  at  $I_F = 50 \text{ A}$  (uni-directional only)

(+) Underwriters laboratory recognition for the classification of protectors (QVGQ2) under the UL standard for safety 497B and file number E136766 for both uni-directional and bi-directional devices

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Vishay General Semiconductor

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	VALUE	UNIT			
Typical thermal resistance, junction to ambient <sup>(1)</sup>	$R_{ ext{ heta}JA}$	100	°C/W			
Typical thermal resistance, junction to lead	R <sub>θJL</sub> 20					

Note

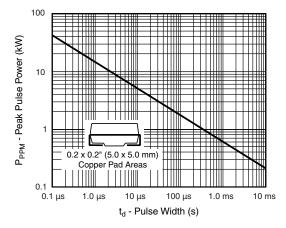
<sup>(1)</sup> Mounted on minimum recommended pad layout

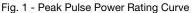
ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
SMBJ5.0A-E3/52	0.096	0.096 52		7" diameter plastic tape and reel		
SMBJ5.0A-M3/52	0.090	52	750	7 diameter plastic tape and reel		
SMBJ5.0A-E3/5B	0.096 5B	3200	13" diameter plastic tape and reel			
SMBJ5.0A-M3/5B	0.090	38	3200	15 diameter plastic tape and reel		
SMBJ5.0AHE3_A/H <sup>(1)</sup>	0.096	Н	750	7" diameter plastic tape and reel		
SMBJ5.0AHM3_A/H <sup>(1)</sup>	0.090	П	750	7 diameter plastic tape and reel		
SMBJ5.0AHE3_A/I <sup>(1)</sup>	0.096	Ι	3200	13" diameter plastic tape and reel		
SMBJ5.0AHM3_A/I <sup>(1)</sup>	0.090			15 diameter plastic tape and reel		

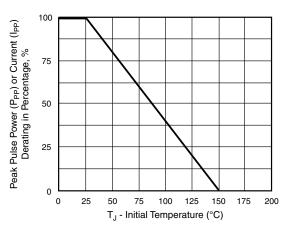
Note

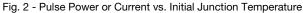
<sup>(1)</sup> AEC-Q101 qualified

### RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)









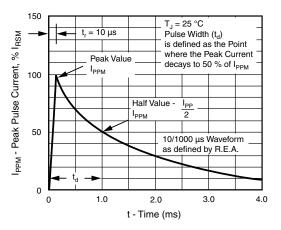


Fig. 3 - Pulse Waveform

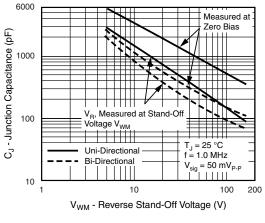


Fig. 4 - Typical Junction Capacitance

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Document Number: 88392

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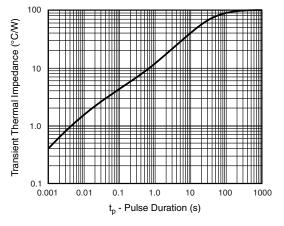


Fig. 5 - Typical Transient Thermal Impedance

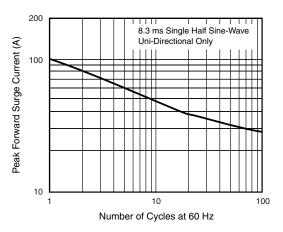
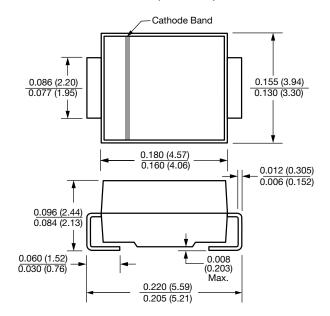
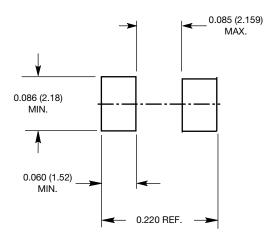


Fig. 6 - Maximum Non-Repetitive Peak Forward Surge Current

### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



SMB (DO-214AA)



#### Mounting Pad Layout



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