# P1KSMBJ Series

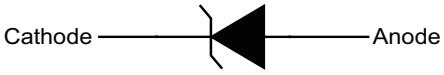
## 1000W Transient Voltage Suppressor

Rev.01 - 07 May 2022 Product data sheet

## 1. General description

P1KSMBJ series, 1000W transient voltage suppressor (TVS) in SMB package, designed to protect electronic circuits against damage induced by lightning surges or other transient voltage events.


Bi-directional




Uni-directional

## 2. Features and benefits

- Peak pulse power 1000W @ 10/1000μs waveform
- Excellent clamping capability
- Surface mount package for easy assembly and PCB space-saving
- Typical $I_R$ < 1μA when $V_{BR}$ min > 12V
- Fast response time: typically < 1.0ps from 0V to $V_{BR}$ minimum
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- Guaranteed high temperature for reflow soldering: 260°C/10sec
- Mold compound complies to UL94V-0 flammability classification
- Meets MSL level 1, per J-STD-020
- Pb-free lead finish
- Halogen free and RoHS compliant

## 3. Applications

- Power supplies
- Industrial applications
- Power management circuits
- I/O interfaces

## 4. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|---|---|---|---|---|---|---|
| P1KSMBJxxxXX | SMB | P1KSMBJxxxXXJ | Tape and reel | 3000 | SMBJ | 18-Oct-2020 |
| eg. P1KSMBJ6.8CA | SMB | P1KSMBJ6.8CAJ | Tape and reel | 3000 | SMBJ | 18-Oct-2020 |

## 5. Absolute maximum ratings

*In accordance with the Absolute Maximum Rating System (IEC 60134).*
*$T_j$ = 25 °C unless otherwise specified.*

| Symbol | Parameter | Conditions | Values | Unit |
|---|---|---|---|---|
| **Absolute maximum rating** | | | | |
| $P_{PPM}$ | peak pulse power | [1] | 1000 | W |
| $P_{M(AV)}$ | steady state power dissipation | on infinite heatsink at $T_a$ = 50 °C | 6.5 | W |
| $I_{FSM}$ | peak forward surge current | $t_p$ = 8.3 ms; single half sine-wave pulse; duty cycle = 4 pulses per minute maximum; unidirectional units only | 200 | A |
| $V_F$ | forward on-state voltage | $I_F$ = 50 A; unidirectional units only | 3.5 | V |
| $T_{stg}$ | storage temperature range | | -65 to 150 | °C |
| $T_j$ | operating temperature range | | -65 to 150 | °C |

[1] In accordance with IEC 61643-321 (10/1000 μs current waveform).

## 6. Characteristics

*$T_j$ = 25 °C unless otherwise specified.*

| PN (Uni) | PN (Bi) | Reverse Stand off Voltage $V_R$ (V) | Breakdown Voltage $V_{BR}$ @ $I_T$ (V) | | Test current $I_T$ (mA) | Max. Clamping Voltage $V_C$ @ $I_{pp}$ (V) | Max. Peak Pulse Current $I_{pp}$ (A) | Maximum Reverse Leakage $I_R$ @ $V_R$ (µA) | Marking | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Min | Max | | | | | Uni | Bi |
| P1KSMBJ6.8A | P1KSMBJ6.8CA | 5.8 | 6.45 | 7.14 | 10 | 10.5 | 95.2 | 900 | 1B06EJ | 1B06EJ |
| P1KSMBJ7.5A | P1KSMBJ7.5CA | 6.4 | 7.13 | 7.88 | 10 | 11.3 | 88.5 | 400 | 1B07FJ | 1B07FJ |
| P1KSMBJ8.2A | P1KSMBJ8.2CA | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 82.6 | 180 | 1B08tJ | 1B08tJ |
| P1KSMBJ9.1A | P1KSMBJ9.1CA | 7.78 | 8.65 | 9.55 | 1 | 13.4 | 74.6 | 45 | 1B09oJ | 1B09oJ |
| P1KSMBJ10A | P1KSMBJ10CA | 8.55 | 9.5 | 10.5 | 1 | 14.5 | 69 | 8 | 1B010J | 1B010J |
| P1KSMBJ11A | P1KSMBJ11CA | 9.4 | 10.5 | 11.6 | 1 | 15.6 | 64.1 | 4 | 1B011J | 1B011J |
| P1KSMBJ12A | P1KSMBJ12CA | 10.2 | 11.4 | 12.6 | 1 | 16.7 | 59.9 | 1 | 1B012J | 1B012J |
| P1KSMBJ13A | P1KSMBJ13CA | 11.1 | 12.4 | 13.7 | 1 | 18.2 | 54.9 | 1 | 1B013J | 1B013J |
| P1KSMBJ15A | P1KSMBJ15CA | 12.8 | 14.3 | 15.8 | 1 | 21.2 | 47.2 | 1 | 1B015J | 1B015J |
| P1KSMBJ16A | P1KSMBJ16CA | 13.6 | 15.2 | 16.8 | 1 | 22.5 | 44.4 | 1 | 1B016J | 1B016J |
| P1KSMBJ18A | P1KSMBJ18CA | 15.3 | 17.1 | 18.9 | 1 | 25.5 | 39.2 | 1 | 1B018J | 1B018J |
| P1KSMBJ20A | P1KSMBJ20CA | 17.1 | 19 | 21 | 1 | 27.7 | 36.1 | 1 | 1B020J | 1B020J |
| P1KSMBJ22A | P1KSMBJ22CA | 18.8 | 20.9 | 23.1 | 1 | 30.6 | 32.7 | 1 | 1B022J | 1B022J |
| P1KSMBJ24A | P1KSMBJ24CA | 20.5 | 22.8 | 25.2 | 1 | 33.2 | 30.1 | 1 | 1B024J | 1B024J |
| P1KSMBJ27A | P1KSMBJ27CA | 23.1 | 25.7 | 28.4 | 1 | 37.5 | 26.7 | 1 | 1B027J | 1B027J |
| P1KSMBJ30A | P1KSMBJ30CA | 25.6 | 28.5 | 31.5 | 1 | 41.4 | 24.2 | 1 | 1B030J | 1B030J |
| P1KSMBJ33A | P1KSMBJ33CA | 28.2 | 31.4 | 34.7 | 1 | 45.7 | 21.9 | 1 | 1B033J | 1B033J |
| P1KSMBJ36A | P1KSMBJ36CA | 30.8 | 34.2 | 37.8 | 1 | 49.9 | 20 | 1 | 1B036J | 1B036J |
| P1KSMBJ39A | P1KSMBJ39CA | 33.3 | 37.1 | 41 | 1 | 53.9 | 18.6 | 1 | 1B039J | 1B039J |
| P1KSMBJ43A | P1KSMBJ43CA | 36.8 | 40.9 | 45.2 | 1 | 59.3 | 16.9 | 1 | 1B043J | 1B043J |
| P1KSMBJ47A | P1KSMBJ47CA | 40.2 | 44.7 | 49.4 | 1 | 64.8 | 15.4 | 1 | 1B047J | 1B047J |
| P1KSMBJ51A | P1KSMBJ51CA | 43.6 | 48.5 | 53.6 | 1 | 70.1 | 14.3 | 1 | 1B051J | 1B051J |
| P1KSMBJ56A | P1KSMBJ56CA | 47.8 | 53.2 | 58.8 | 1 | 77 | 13 | 1 | 1B056J | 1B056J |
| P1KSMBJ62A | P1KSMBJ62CA | 53 | 58.9 | 65.1 | 1 | 85 | 11.8 | 1 | 1B062J | 1B062J |
| P1KSMBJ68A | P1KSMBJ68CA | 58.1 | 64.6 | 71.4 | 1 | 92 | 10.9 | 1 | 1B068J | 1B068J |
| P1KSMBJ75A | P1KSMBJ75CA | 64.1 | 71.3 | 78.8 | 1 | 103 | 9.7 | 1 | 1B075J | 1B075J |
| P1KSMBJ82A | P1KSMBJ82CA | 70.1 | 77.9 | 86.1 | 1 | 113 | 8.8 | 1 | 1B082J | 1B082J |
| P1KSMBJ91A | P1KSMBJ91CA | 77.8 | 86.5 | 95.5 | 1 | 125 | 8 | 1 | 1B091J | 1B091J |
| P1KSMBJ100A | P1KSMBJ100CA | 85.5 | 95 | 105 | 1 | 137 | 7.3 | 1 | 1B100J | 1B100J |

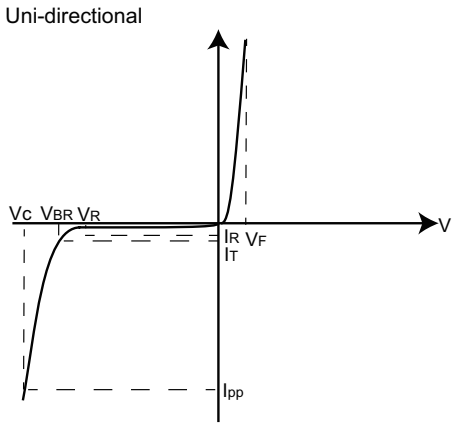



Fig. 1. I-V curve characteristics; Uni-directional

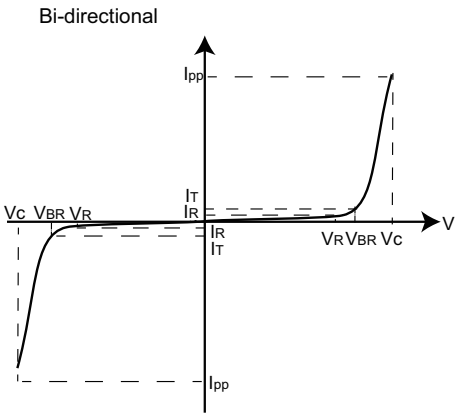



Fig. 2. I-V curve characteristics; Bi-directional

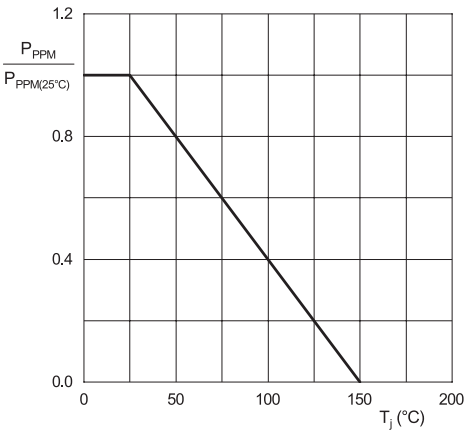



Fig. 3. Peak pulse power derating curve

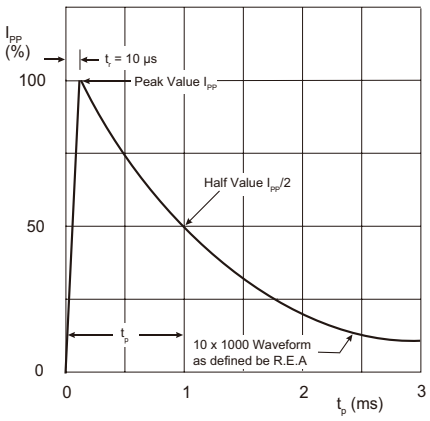



Fig. 4. Pulse waveform

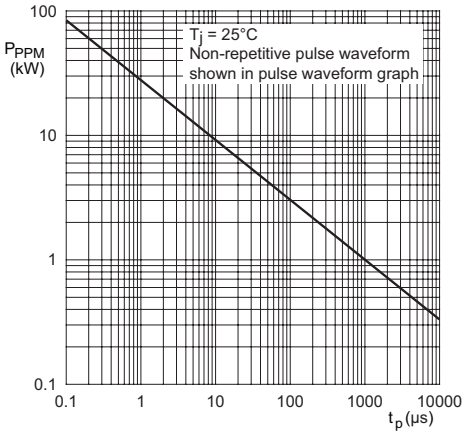



Fig. 5. Peak pulse power rating curve

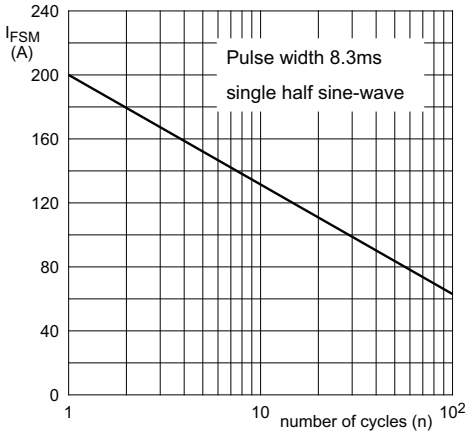



Fig. 6. Maximum non-repetitive surge current Uni-directional only

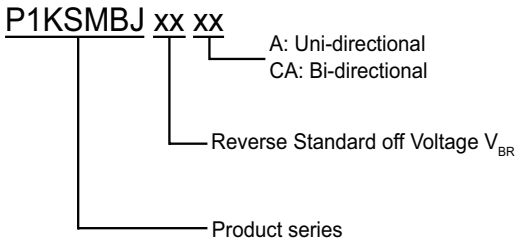



**Fig. 8. Part numbering**

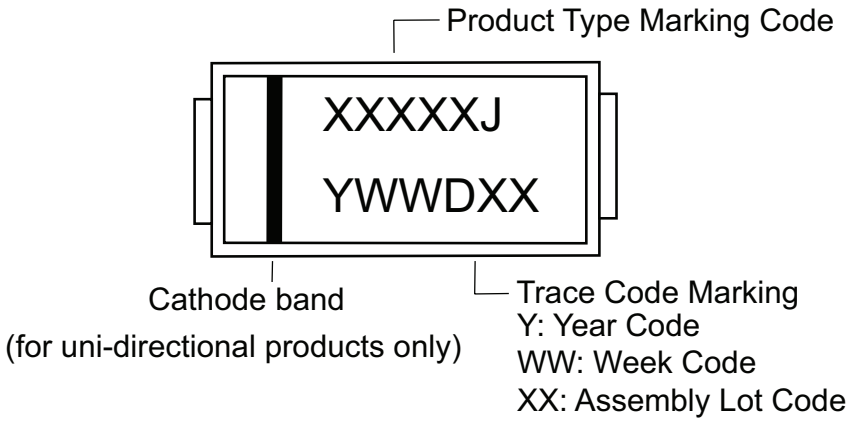
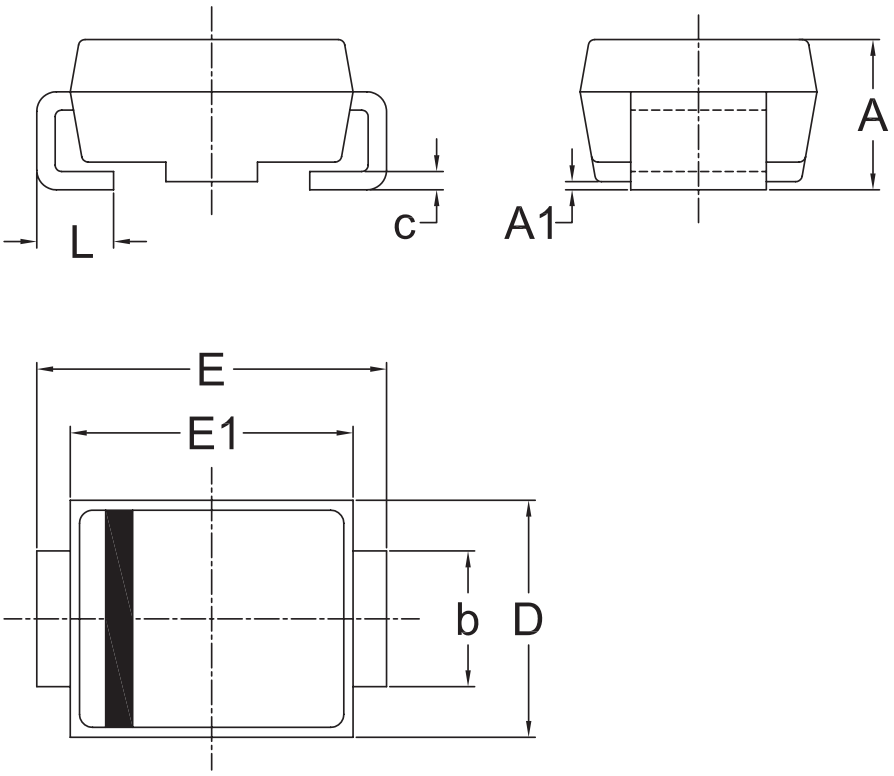



**Fig. 9. Part marking**

## 7. Package outline

SMB




| UNIT | | A | A1 | b | c | D | E | E1 | L |
|---|---|---|---|---|---|---|---|---|---|
| mm | Max | 2.50 | 0.30 | 2.15 | 0.25 | 3.75 | 5.54 | 4.65 | 1.50 |
| | Min | 2.00 | 0.00 | 1.85 | 0.15 | 3.45 | 5.04 | 4.35 | 0.80 |

Remark: Dimensions D and E1 do not include mold flash & gate remain.

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|---|---|---|
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| Preliminary [short] data sheet | Qualification | This document contains data from the preliminary specification. |
| Product [short] data sheet | Production | This document contains the product specification. |

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
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