

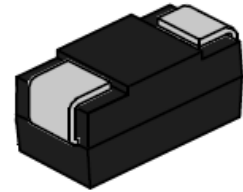


P6SMBxx(C)AS Series 600W Transient Voltage Suppressor

Rev.1.1

DESCRIPTION:

TVS diodes can be used in a wide range of applications which like consumer electronic products, automotive industries, munitions, telecommunications, aerospace industries, and intelligent control systems.



SMB



FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 600W peak pulse power capability at 10/1000 μ s waveform.
- ✧ Typical I_R less than 1 μ A above 12V.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature to reflow soldering: 260 $^{\circ}$ C/40s at terminals.
- ✧ Plastic package has underwriters laboratory flammability 94V-0.
- ✧ Meets MSL level 1, per J-STD-020, LF maximum peak of 260 $^{\circ}$ C.
- ✧ Terminal: solder plated, solderable per J-STD-002.
- ✧ For surface mounted applications in order to optimize board space.
- ✧ IEC61000-4-2 (ESD) \pm 30kV (air), \pm 30kV (contact).



Bi-directional



Uni-directional

Symbol

ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}$ C, RH=45%-75%, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|-------------|----------------|
| Operating junction and storage temperature range | T_J/T_{STG} | -55 to +150 | $^{\circ}$ C |
| Peak pulse power dissipation at 10/1000 μ s waveform | P_{PP} | 600 | W |
| Steady state power dissipation at $T_L=75^{\circ}$ C | $P_{M(AV)}$ | 5.0 | W |
| Maximum instantaneous forward voltage at 50A for unidirectional | V_F | 5.0 | V |
| Peak forward surge current, 8.3ms single half sine wave(Note 1) | I_{FSM} | 100 | A |
| Typical thermal resistance junction to lead | $R_{\theta JL}$ | 20 | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 100 | $^{\circ}$ C/W |

Notes:

1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum

MARKING



6V8CS: Device Marking Code
1921: the 21th week, 2019

ELECTRICAL CHARACTERISTICS($T_A=25^{\circ}\text{C}$)

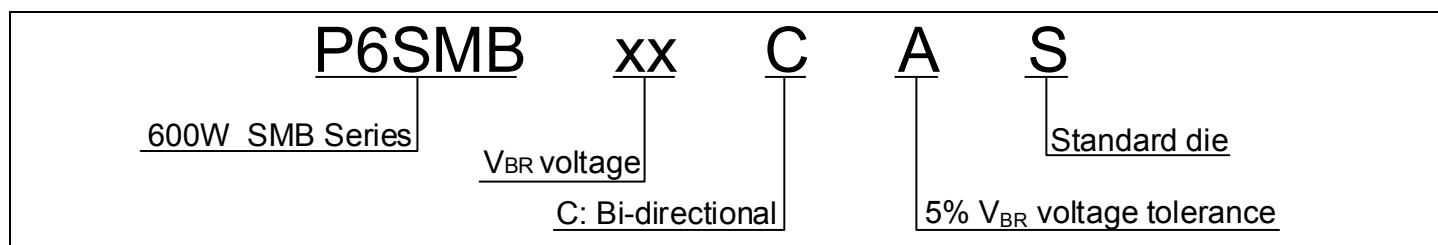
| Part Number | | Marking | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{\text{①}}$ |
|-------------|-------------|---------|-------|-------|----------------------|--------------|--------|-------|--------------|---------------------|
| Uni-polar | Bi-polar | Uni | Bi | V | max(μA) | min(V) | max(V) | mA | max(V) | A |
| P6SMB6.8AS | P6SMB6.8CAS | 6V8AS | 6V8CS | 5.8 | 150 | 6.45 | 7.14 | 10 | 10.5 | 58.1 |
| P6SMB7.5AS | P6SMB7.5CAS | 7V5AS | 7V5CS | 6.4 | 120 | 7.13 | 7.88 | 10 | 11.3 | 54.0 |
| P6SMB8.2AS | P6SMB8.2CAS | 8V2AS | 8V2CS | 7.02 | 50 | 7.79 | 8.61 | 10 | 12.1 | 50.4 |
| P6SMB9.1AS | P6SMB9.1CAS | 9V1AS | 9V1CS | 7.78 | 20 | 8.65 | 9.55 | 1 | 13.4 | 45.5 |
| P6SMB10AS | P6SMB10CAS | 10AS | 10CS | 8.55 | 10 | 9.50 | 10.50 | 1 | 14.5 | 42.1 |
| P6SMB11AS | P6SMB11CAS | 11AS | 11CS | 9.4 | 5 | 10.50 | 11.60 | 1 | 15.6 | 39.1 |
| P6SMB12AS | P6SMB12CAS | 12AS | 12CS | 10.2 | 2 | 11.40 | 12.60 | 1 | 16.7 | 36.5 |
| P6SMB13AS | P6SMB13CAS | 13AS | 13CS | 11.1 | 1 | 12.40 | 13.70 | 1 | 18.2 | 33.5 |
| P6SMB15AS | P6SMB15CAS | 15AS | 15CS | 12.8 | 1 | 14.30 | 15.80 | 1 | 21.2 | 28.8 |
| P6SMB16AS | P6SMB16CAS | 16AS | 16CS | 13.6 | 1 | 15.20 | 16.80 | 1 | 22.5 | 27.1 |
| P6SMB18AS | P6SMB18CAS | 18AS | 18CS | 15.3 | 1 | 17.10 | 18.90 | 1 | 25.2 | 24.2 |
| P6SMB20AS | P6SMB20CAS | 20AS | 20CS | 17.1 | 1 | 19.00 | 21.00 | 1 | 27.7 | 21.7 |
| P6SMB22AS | P6SMB22CAS | 22AS | 22CS | 18.8 | 1 | 20.90 | 23.10 | 1 | 30.6 | 19.7 |
| P6SMB24AS | P6SMB24CAS | 24AS | 24CS | 20.5 | 1 | 22.80 | 25.20 | 1 | 33.2 | 18.4 |
| P6SMB27AS | P6SMB27CAS | 27AS | 27CS | 23.1 | 1 | 25.70 | 28.40 | 1 | 37.5 | 16.3 |
| P6SMB30AS | P6SMB30CAS | 30AS | 30CS | 25.6 | 1 | 28.50 | 31.50 | 1 | 41.4 | 14.7 |
| P6SMB33AS | P6SMB33CAS | 33AS | 33CS | 28.2 | 1 | 31.40 | 34.70 | 1 | 45.7 | 13.3 |
| P6SMB36AS | P6SMB36CAS | 36AS | 36CS | 30.8 | 1 | 34.20 | 37.80 | 1 | 49.9 | 12.2 |
| P6SMB39AS | P6SMB39CAS | 39AS | 39CS | 33.3 | 1 | 37.10 | 41.00 | 1 | 53.9 | 11.3 |
| P6SMB43AS | P6SMB43CAS | 43AS | 43CS | 36.8 | 1 | 40.90 | 45.20 | 1 | 59.3 | 10.3 |
| P6SMB47AS | P6SMB47CAS | 47AS | 47CS | 40.2 | 1 | 44.70 | 49.40 | 1 | 64.8 | 9.4 |
| P6SMB51AS | P6SMB51CAS | 51AS | 51CS | 43.6 | 1 | 48.50 | 53.60 | 1 | 70.1 | 8.7 |
| P6SMB56AS | P6SMB56CAS | 56AS | 56CS | 47.8 | 1 | 53.20 | 58.80 | 1 | 77.0 | 7.9 |

ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, continued)

| Part Number | | Marking | | V_R | $I_R@V_R$ | $V_{BR}@I_T$ | | I_T | $V_C@I_{PP}$ | $I_{PP}^{①}$ |
|-------------|-------------|---------|-------|-------|----------------------|--------------|--------|-------|--------------|--------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | max(μA) | min(V) | max(V) | mA | max(V) | A |
| P6SMB62AS | P6SMB62CAS | 62AS | 62CS | 53.0 | 1 | 58.90 | 65.10 | 1 | 85.0 | 7.2 |
| P6SMB68AS | P6SMB68CAS | 68AS | 68CS | 58.1 | 1 | 64.60 | 71.40 | 1 | 92.0 | 6.6 |
| P6SMB75AS | P6SMB75CAS | 75AS | 75CS | 64.1 | 1 | 71.30 | 78.80 | 1 | 103.0 | 5.9 |
| P6SMB82AS | P6SMB82CAS | 82AS | 82CS | 70.1 | 1 | 77.90 | 86.10 | 1 | 113.0 | 5.4 |
| P6SMB91AS | P6SMB91CAS | 91AS | 91CS | 77.8 | 1 | 86.50 | 95.50 | 1 | 125.0 | 4.9 |
| P6SMB100AS | P6SMB100CAS | 100AS | 100CS | 85.5 | 1 | 95.00 | 105.0 | 1 | 137.0 | 4.5 |
| P6SMB110AS | P6SMB110CAS | 110AS | 110CS | 94.0 | 1 | 105.0 | 116.0 | 1 | 152.0 | 4.0 |
| P6SMB120AS | P6SMB120CAS | 120AS | 120CS | 102 | 1 | 114.0 | 126.0 | 1 | 165.0 | 3.7 |

① Surge waveform: 10/1000 μs V_R : Stand-off voltage -- Maximum voltage that can be applied V_{BR} : Breakdown voltage V_C : Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP} I_R : Reverse leakage current

ORDERING INFORMATION



RATINGS AND V-I CHARACTERISTICS CURVES (T_A=25°C, unless otherwise noted)

FIG.1:V- I curve characteristics (Uni-directional)

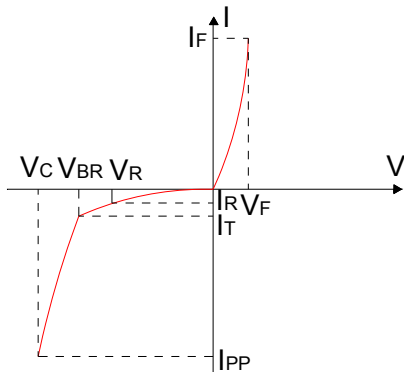


FIG.2:V- I curve characteristics (Bi-directional)

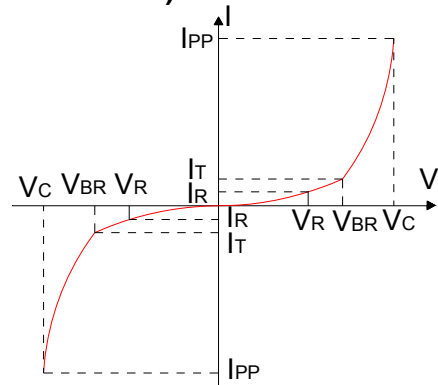


FIG.3: Pulse waveform

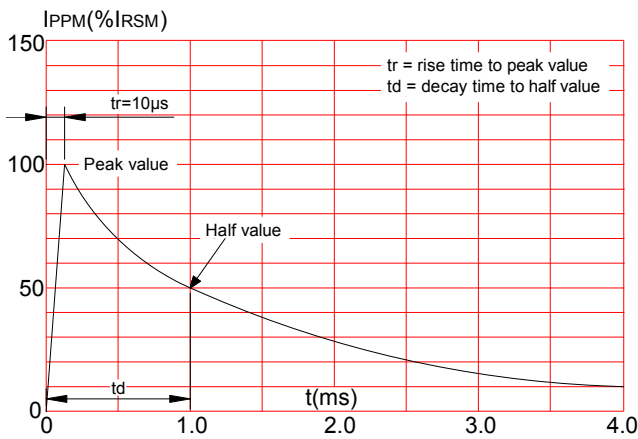
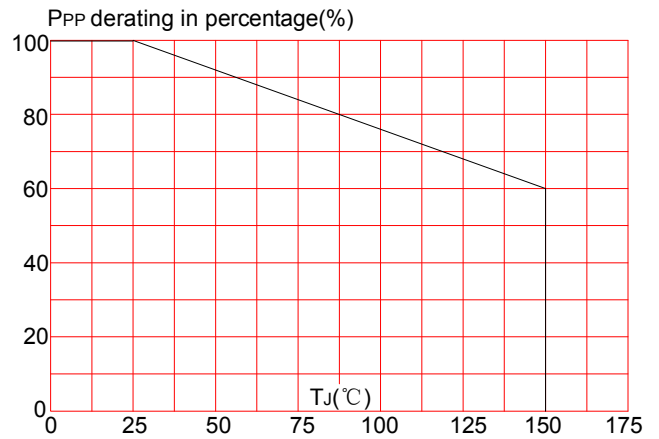
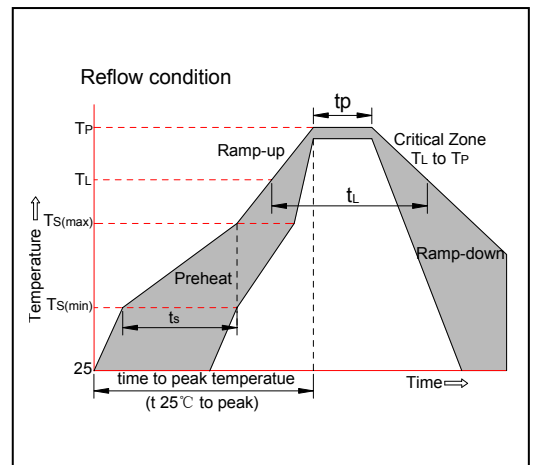


FIG.4: Pulse derating curve

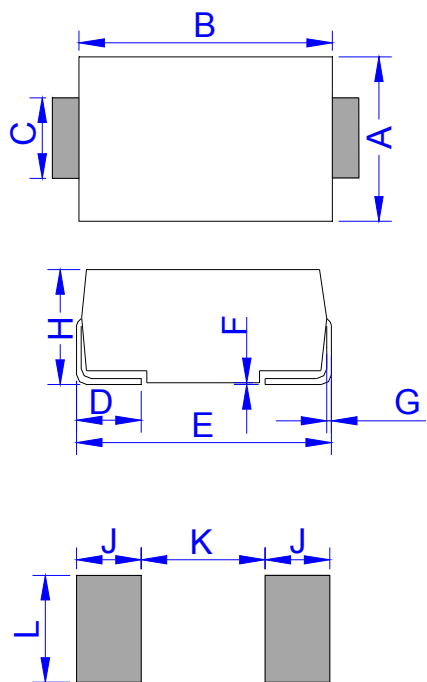


SOLDERING PARAMETERS

| Reflow Condition | | Pb-Free assembly (see figure at right) |
|---|---|---|
| Pre Heat | -Temperature Min (T _{s(min)}) | +150°C |
| | -Temperature Max(T _{s(max)}) | +200°C |
| | -Time (Min to Max) (t _s) | 60-180 secs. |
| Average ramp up rate (Liquidus Temp (T _L)to peak) | | 3°C/sec. Max |
| T _{s(max)} to T _L - Ramp-up Rate | | 3°C/sec. Max |
| Reflow | -Temperature(T _L)(Liquidus) | +217°C |
| | -Temperature(t _L) | 60-150 secs. |
| Peak Temp (T _p) | | +260(+0/-5)°C |
| Time within 5°C of actual Peak Temp (t _p) | | 20-40secs. |
| Ramp-down Rate | | 6°C/sec. Max |
| Time 25°C to Peak Temp (T _p) | | 8 min. Max |
| Do not exceed | | +260°C |



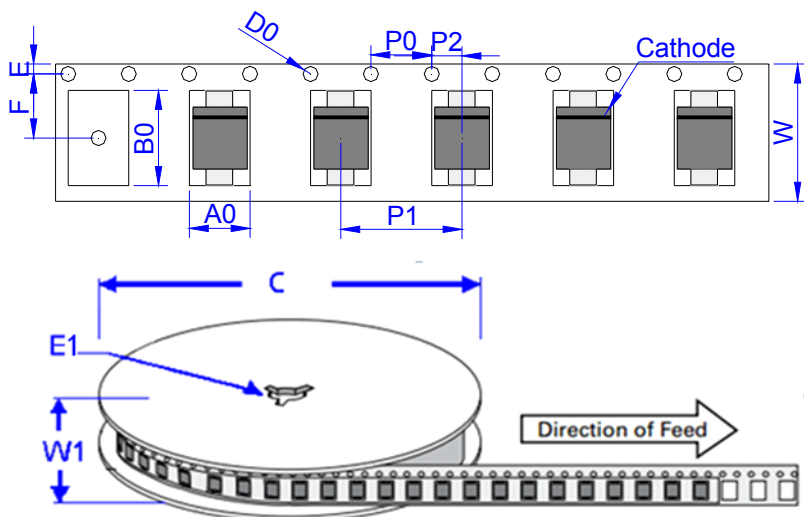
PACKAGE MECHANICAL DATA



DO-214AA (SMB)

| Ref. | Dimensions | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 3.30 | 3.94 | 0.130 | 0.155 |
| B | 4.30 | 4.80 | 0.169 | 0.189 |
| C | 1.90 | 2.20 | 0.075 | 0.087 |
| D | 0.95 | 1.52 | 0.037 | 0.060 |
| E | 5.20 | 5.60 | 0.205 | 0.220 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 2.10 | 2.40 | 0.083 | 0.094 |
| J | 2.20 | | 0.087 | |
| K | | 2.60 | | 0.102 |
| L | 2.30 | | 0.091 | |

TAPE AND REEL SPECIFICATION-SMB



| Ref. | Dimensions | |
|------|-------------|----------------|
| | Millimeters | Inches |
| A0 | 3.76 ± 0.3 | 0.148 ± 0.012 |
| B0 | 5.69 ± 0.3 | 0.224 ± 0.012 |
| C | 330.0 | 13.0 |
| D0 | 1.55 ± 0.1 | 0.061 ± 0.004 |
| E | 1.75 ± 0.2 | 0.069 ± 0.008 |
| E1 | 13.3 ± 0.3 | 0.524 ± 0.012 |
| F | 5.5 ± 0.2 | 0.217 ± 0.008 |
| P0 | 4.00 ± 0.2 | 0.157 ± 0.008 |
| P1 | 8.00 ± 0.2 | 0.3145 ± 0.008 |
| P2 | 2.00 ± 0.2 | 0.079 ± 0.008 |
| W | 12.0 ± 0.2 | 0.472 ± 0.008 |
| W1 | 15.7 ± 2.0 | 0.618 ± 0.079 |

| PART No. | UNIT WEIGHT (g/PCS) typ. | REEL (PCS) | PER CARTON (PCS) | DESCRIPTION |
|---------------|-----------------------------|---------------|---------------------|-------------------|
| P6SMBxxAS/CAS | 0.098 | 3,000 | 48,000 | 13 inch reel pack |

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