# P6SMAL Series

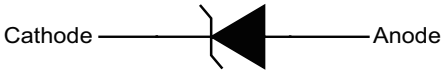
## 600W Transient Voltage Suppressor

Rev.01 - 08 February 2021 Product data sheet

## 1. General description

600W transient voltage suppressor (TVS) in SMA package, designed to protect electronic circuit which induced by lightning surge or other transient voltage situation.




Uni-directional

## 2. Features and benefits

- Peak pulse power 600W @ 10/1000μs waveform
- SMA low profile package: less than 1.1 mm
- Excellent clamping capability
- Low incremental surge resistance
- Surface mount package for easy assembly and board space saving
- Typical $I_R$ < 1μA When $V_R$ > 12V
- Fast response time: Typically less than 1.0ps from 0V to BV min
- IEC 61000-4-2 ESD 30kV (Air), 30kV (Contact)
- EFT protection of data lines in accordance with IEC 61000-4-4
- High temperature to reflow soldering guaranteed: 260°C/10sec
- Meet UL94V-0 flammability classification which guaranteed by mold compound
- Meet MSL level1, per J-STD-020
- Lead free lead finish
- Halogen free and RoHS compliant

## 3. Applications

- Power supply protection
- Industrial application
- Power management
- I/O interface protection

## 4. Ordering information

| Type number | Package name | Orderable part number | Packing method | Small packing quantity | Package version | Package issue date |
|---|---|---|---|---|---|---|
| P6SMALxxxXX | SMAL | P6SMALxxxXX | Tape and reel | 3000 | SMALH | 18-Oct-2020 |
| eg. P6SMAL5.0A | SMAL | P6SMAL5.0AX | Tape and reel | 3000 | SMALH | 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] | 600 | W |
| $P_{M(AV)}$ | steady state power dissipation | on infinite heatsink at $T_a$ = 50 °C | 3 | 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 | 60 | A |
| $V_F$ | forward on-state voltage | $I_F$ = 25 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 | 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 | | | | | |
| P6SMAL5.0A | 5 | 6.4 | 7 | 10 | 9.2 | 65.3 | 400 | 6A005H |
| P6SMAL6.0A | 6 | 6.67 | 7.37 | 10 | 10.3 | 58.3 | 400 | 6A006H |
| P6SMAL6.5A | 6.5 | 7.22 | 7.98 | 10 | 11.2 | 53.6 | 250 | 6A06FH |
| P6SMAL7.0A | 7 | 7.78 | 8.6 | 10 | 12 | 50 | 100 | 6A007H |
| P6SMAL8.0A | 8 | 8.89 | 9.83 | 1 | 13.6 | 44.2 | 50 | 6A008H |
| P6SMAL9.0A | 9 | 10 | 11.1 | 1 | 15.4 | 39 | 10 | 6A009H |
| P6SMAL10A | 10 | 11.1 | 12.3 | 1 | 17 | 35.3 | 5 | 6A010H |
| P6SMAL11A | 11 | 12.2 | 13.5 | 1 | 18.2 | 33 | 1 | 6A011H |
| P6SMAL12A | 12 | 13.3 | 14.7 | 1 | 19.9 | 30.2 | 1 | 6A012H |
| P6SMAL13A | 13 | 14.4 | 15.9 | 1 | 21.5 | 28 | 1 | 6A013H |
| P6SMAL14A | 14 | 15.6 | 17.2 | 1 | 23.2 | 25.9 | 1 | 6A014H |
| P6SMAL15A | 15 | 16.7 | 18.5 | 1 | 24.4 | 24.6 | 1 | 6A015H |
| P6SMAL16A | 16 | 17.8 | 19.7 | 1 | 26 | 23.1 | 1 | 6A016H |
| P6SMAL17A | 17 | 18.9 | 20.9 | 1 | 27.6 | 21.8 | 1 | 6A017H |
| P6SMAL18A | 18 | 20 | 22.1 | 1 | 29.2 | 20.6 | 1 | 6A018H |
| P6SMAL20A | 20 | 22.2 | 24.5 | 1 | 32.4 | 18.6 | 1 | 6A020H |
| P6SMAL22A | 22 | 24.4 | 26.9 | 1 | 35.5 | 16.9 | 1 | 6A022H |
| P6SMAL24A | 24 | 26.7 | 29.5 | 1 | 38.9 | 15.5 | 1 | 6A024H |
| P6SMAL26A | 26 | 28.9 | 31.9 | 1 | 42.1 | 14.3 | 1 | 6A026H |
| P6SMAL28A | 28 | 31.1 | 34.4 | 1 | 45.4 | 13.3 | 1 | 6A028H |
| P6SMAL30A | 30 | 33.3 | 36.8 | 1 | 48.4 | 12.4 | 1 | 6A030H |
| P6SMAL33A | 33 | 36.7 | 40.6 | 1 | 53.3 | 11.3 | 1 | 6A033H |
| P6SMAL36A | 36 | 40 | 44.2 | 1 | 58.1 | 10.4 | 1 | 6A036H |
| P6SMAL40A | 40 | 44.4 | 49.1 | 1 | 64.5 | 9.3 | 1 | 6A040H |
| P6SMAL43A | 43 | 47.8 | 52.8 | 1 | 69.4 | 8.7 | 1 | 6A043H |
| P6SMAL45A | 45 | 50 | 55.3 | 1 | 72.7 | 8.3 | 1 | 6A045H |
| P6SMAL48A | 48 | 53.3 | 58.9 | 1 | 77.4 | 7.8 | 1 | 6A048H |
| P6SMAL51A | 51 | 56.7 | 62.7 | 1 | 82.4 | 7.3 | 1 | 6A051H |
| P6SMAL54A | 54 | 60 | 66.3 | 1 | 87.1 | 6.9 | 1 | 6A054H |
| P6SMAL58A | 58 | 64.4 | 71.2 | 1 | 93.6 | 6.5 | 1 | 6A058H |
| P6SMAL60A | 60 | 66.7 | 73.7 | 1 | 96.8 | 6.2 | 1 | 6A060H |
| P6SMAL64A | 64 | 71.1 | 78.6 | 1 | 103 | 5.9 | 1 | 6A064H |
| P6SMAL70A | 70 | 77.8 | 86 | 1 | 113 | 5.3 | 1 | 6A070H |
| P6SMAL75A | 75 | 83.3 | 92.1 | 1 | 121 | 5 | 1 | 6A075H |
| P6SMAL78A | 78 | 86.7 | 95.8 | 1 | 126 | 4.8 | 1 | 6A078H |
| P6SMAL85A | 85 | 94.4 | 104 | 1 | 137 | 4.4 | 1 | 6A085H |


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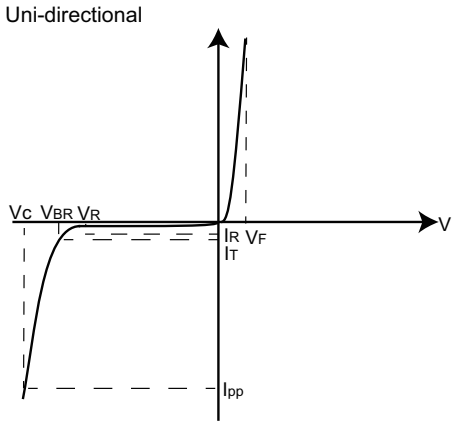



Fig. 1. I-V curve characteristics; Uni-directional

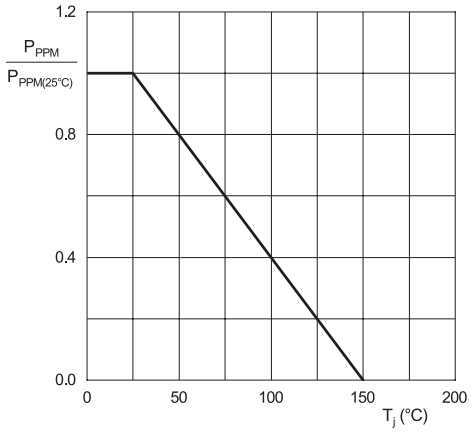



Fig. 2. Peak pulse power derating curve

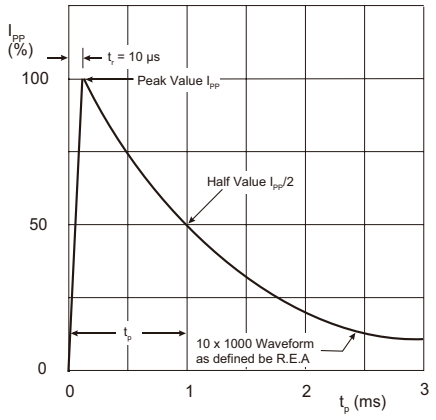



Fig. 3. Pulse waveform

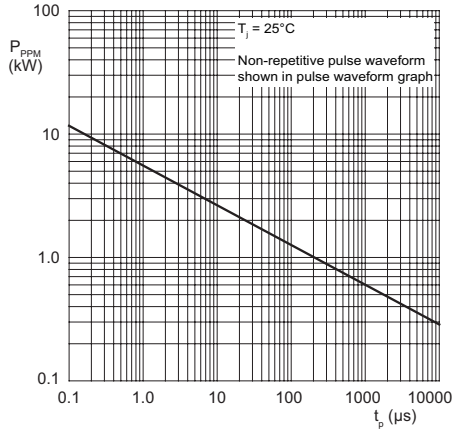



Fig. 4. Pulse rating curve

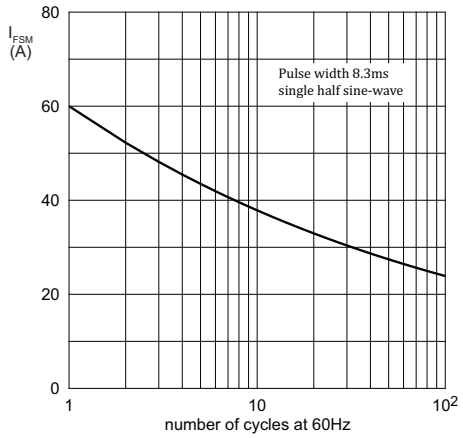



Fig. 5. Maximum non-repetitive surge current

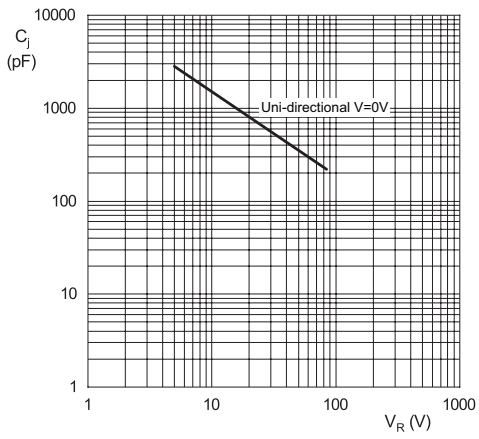



Fig. 6. Typical junction capacitance


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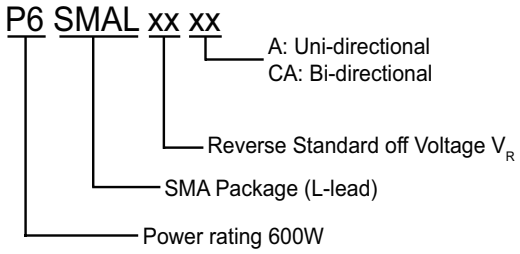



**Fig. 7. Part numbering**

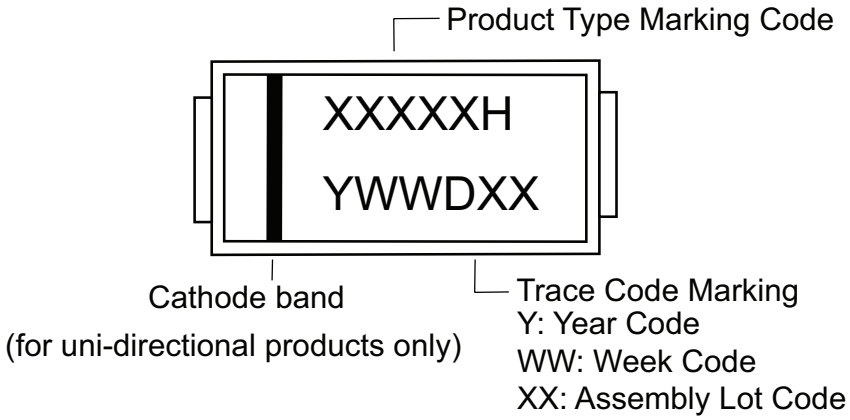
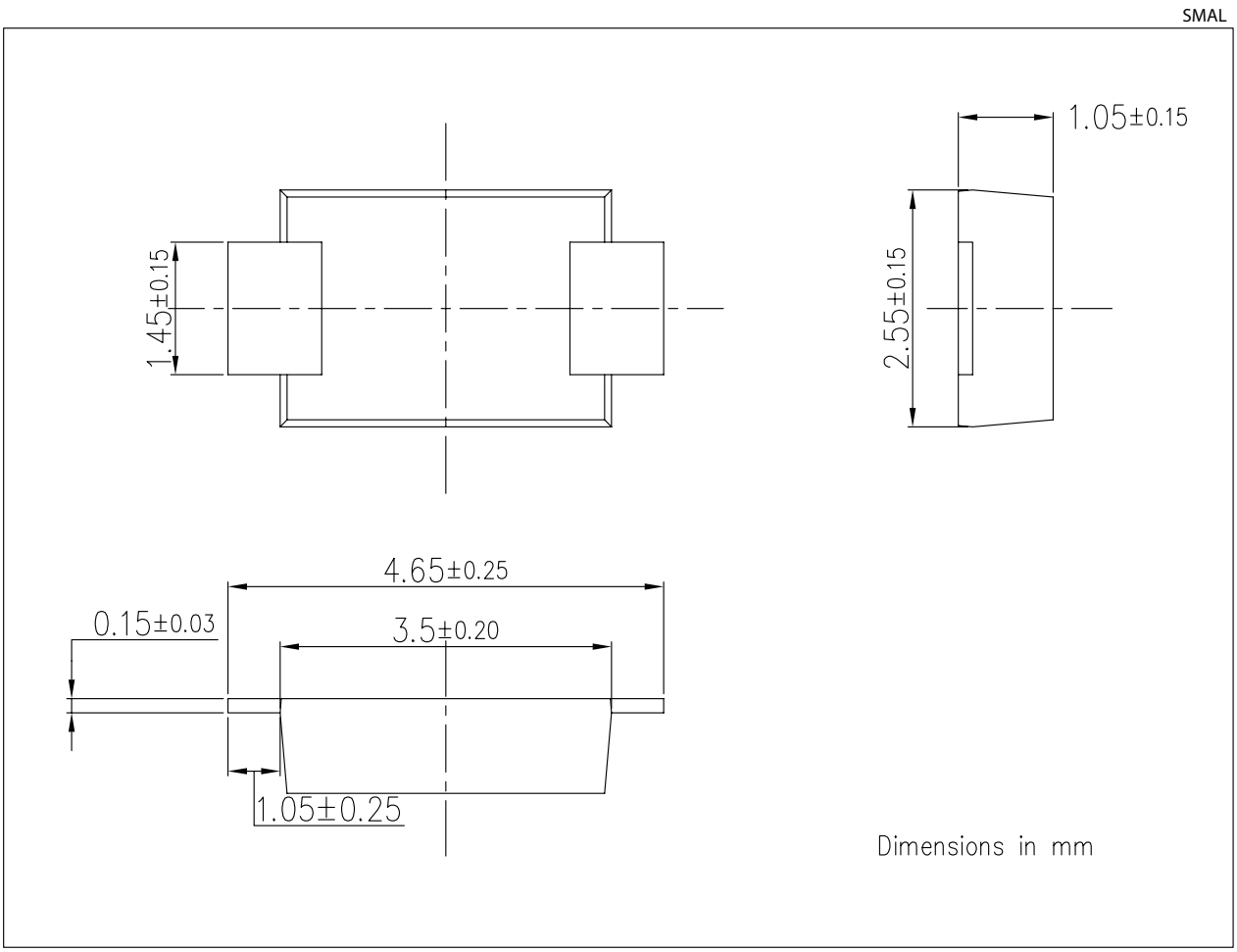



**Fig. 8. Part marking**


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## 7. Package outline





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