

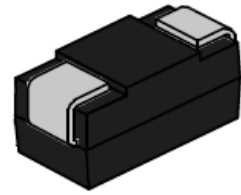


SM05KxxC Series Transient Voltage Suppressor

Rev.1.2

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



Bi-directional

Symbol

FEATURES:

- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ High peak pulse capability at 1.2/50 μ s-8/20 μ s@2 Ω waveform.
- ✧ Typical I_R less than 1 μ A.
- ✧ 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).

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 |
| Steady state power dissipation at $T_L=75^{\circ}$ C | $P_{M(AV)}$ | 5.0 | W |
| Peak pulse current at 1.2/50 μ s-8/20 μ s@2 Ω waveform | I_{PP} | 500 | 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 |

MARKING



05K15C : Device Marking Code
2009: In ninth week, 2020

ELECTRICAL CHARACTERISTICS(T_A=25°C)

| Part Number | Marking | V _R | I _{R@V_R} | V _{BR@I_T} | | I _T | V _{C@I_{PP}} | V _{C@I_{PP}} | I _{PP} ^① |
|-------------|---------|----------------|------------------------------|-------------------------------|--------|----------------|-------------------------------|-------------------------------|------------------------------|
| | | | | min(V) | max(V) | | | | |
| Bi-polar | Bi | V | max(μA) | min(V) | max(V) | mA | typ(V) | max(V) | A |
| SM05K15C | 05K15C | 15 | 1 | 16.7 | 18.5 | 1 | 22 | 32 | 500 |
| *SM05K18C | 05K18C | 18 | 1 | 20.0 | 22.3 | 1 | 25 | 37 | 500 |
| *SM05K20C | 05K20C | 20 | 1 | 22.0 | 24.5 | 1 | 27 | 40 | 500 |
| *SM05K30C | 05K30C | 30 | 1 | 33.3 | 38.0 | 1 | 39 | 48 | 500 |

① Surge waveform: 1.2/50μs-8/20μs@2Ω

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

☆ : Products with negative resistance

ORDERING INFORMATION

| | | |
|--|---|--|
| <p>SM05K</p> <p>Surface mount 1.2/50μs-8/20μs@2Ω 500A</p> | <p>15</p> <p>V_R Voltage</p> | <p>C</p> <p>C: Bi-directional</p> |
|--|---|--|

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

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

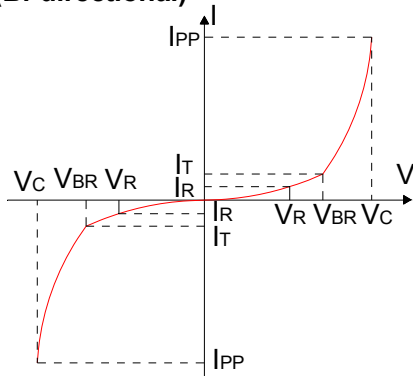


FIG.2:V- I curve characteristics (Bi-directional with negative resistance)

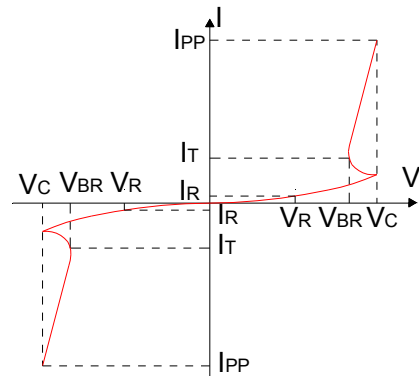


FIG.3: Pulse waveform

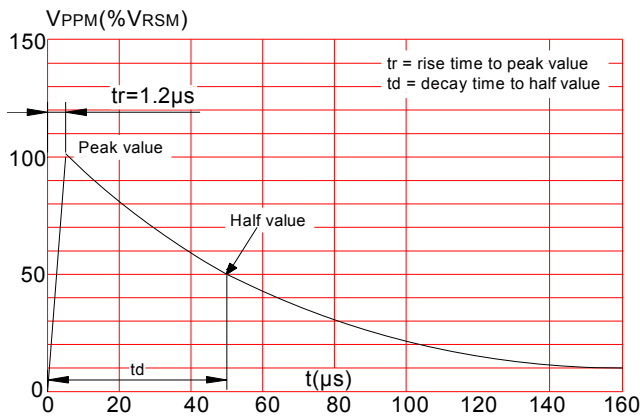


FIG.4: Pulse waveform

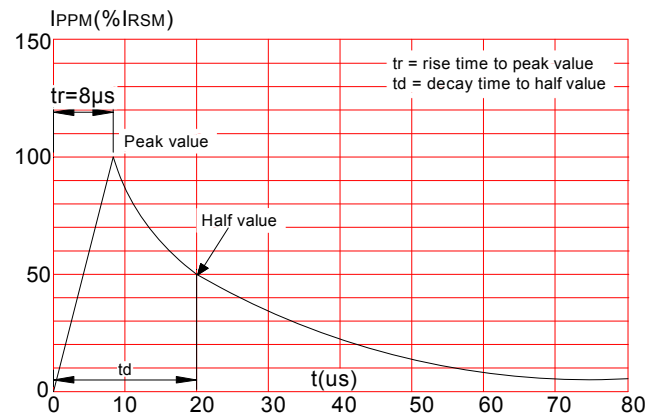
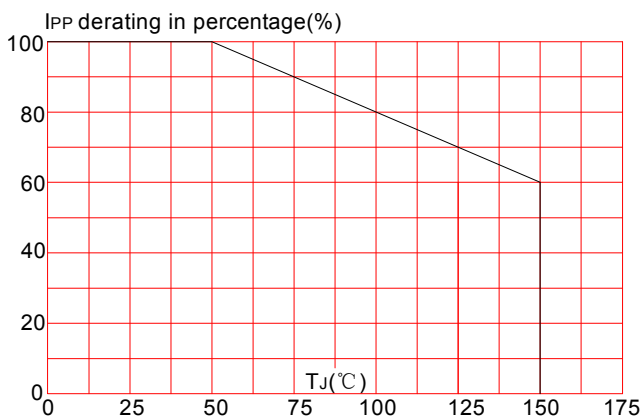
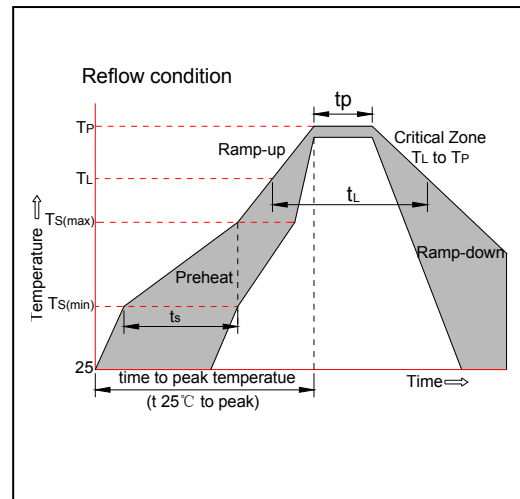


FIG.5: Pulse derating curve(8/20 μs)

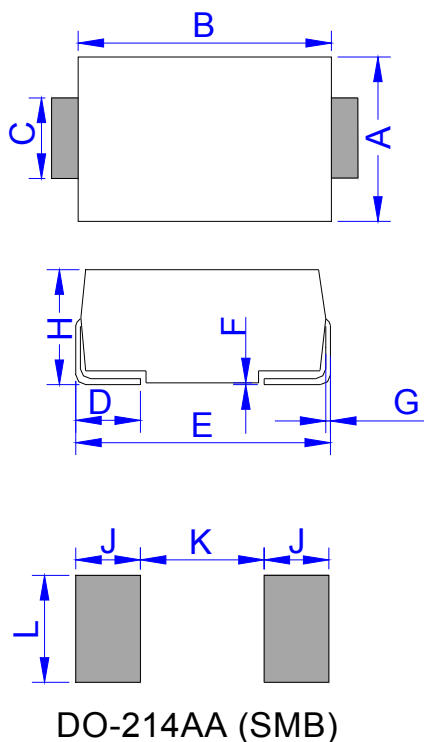


SOLDERING PARAMETERS

| | | |
|---|-----------------------------------|---|
| 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) (ts) | 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 |

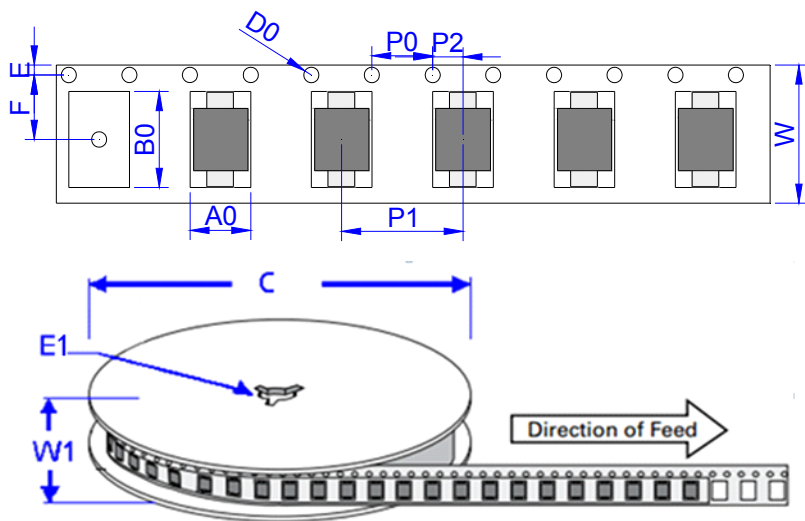


PACKAGE MECHANICAL DATA



| 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 |
|----------|-----------------------------|---------------|---------------------|-------------------|
| SM05KxxC | 0.098 | 3,000 | 48,000 | 13 inch reel pack |

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