

SMDJxx(C)A-AU Series 3000W Transient Voltage Suppressor

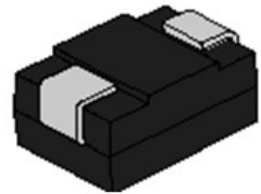
Rev.1.0

DESCRIPTION

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

FEATURES

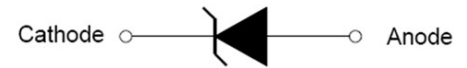
- ✧ Low profile package.
- ✧ Low inductance.
- ✧ Excellent clamping capability.
- ✧ 3000W peak pulse power capability at 10/1000 μ s waveform.
- ✧ Typical I_R less than 5 μ A.
- ✧ Fast response time: typically less than 1.0ps from 0V to V_{BR} min.
- ✧ High temperature to reflow soldering: 260 $^{\circ}$ 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.
- ✧ IEC61000-4-2 (ESD) \pm 30kV (air), \pm 30kV (contact).
- ✧ UL 497B item recognized. (File No.:E480698).
- ✧ For surface mounted applications in order to optimize board space.
- ✧ High reliability application and automotive grade (AEC-Q101 qualified).



SMC



Bi-directional



Uni-directional

Symbol

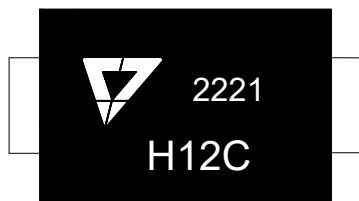
ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}$ C, RH=45%-75%, unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|-------------|----------------|
| Storage and operating junction temperature range | T_{STG}/T_J | -55 to +150 | $^{\circ}$ C |
| Steady state power dissipation at $T_L=75^{\circ}$ C | $P_{M(AV)}$ | 6.5 | W |
| Peak pulse power dissipation at 10/1000 μ s waveform | P_{PP} | 3000 | W |
| Maximum instantaneous forward voltage at 100A for unidirectional only | V_F | 5.0 | V |
| Peak forward surge current, 8.3ms single half sine wave(Note 1) | I_{FSM} | 300 | A |
| Typical thermal resistance junction to lead | $R_{\theta JL}$ | 15 | $^{\circ}$ C/W |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 75 | $^{\circ}$ 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



H12C: Device Marking Code
2221: the 21th week, 2022

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}° |
|-------------|-------------|---------|------|-------|----------------------|--------------|--------|-------|--------------|------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | max(μA) | min(V) | max(V) | mA | max(V) | A |
| SMDJ12A-AU | SMDJ12CA-AU | H12A | H12C | 12.0 | 5 | 13.30 | 14.70 | 1 | 19.9 | 150.8 |
| SMDJ13A-AU | SMDJ13CA-AU | H13A | H13C | 13.0 | 5 | 14.40 | 15.90 | 1 | 21.5 | 139.5 |
| SMDJ14A-AU | SMDJ14CA-AU | H14A | H14C | 14.0 | 5 | 15.60 | 17.20 | 1 | 23.2 | 129.3 |
| SMDJ15A-AU | SMDJ15CA-AU | H15A | H15C | 15.0 | 5 | 16.70 | 18.50 | 1 | 24.4 | 123.0 |
| SMDJ16A-AU | SMDJ16CA-AU | H16A | H16C | 16.0 | 5 | 17.80 | 19.70 | 1 | 26.0 | 115.4 |
| SMDJ17A-AU | SMDJ17CA-AU | H17A | H17C | 17.0 | 5 | 18.90 | 20.90 | 1 | 27.6 | 108.7 |
| SMDJ18A-AU | SMDJ18CA-AU | H18A | H18C | 18.0 | 5 | 20.00 | 22.20 | 1 | 29.2 | 102.7 |
| SMDJ20A-AU | SMDJ20CA-AU | H20A | H20C | 20.0 | 5 | 22.20 | 24.50 | 1 | 32.4 | 92.6 |
| SMDJ22A-AU | SMDJ22CA-AU | H22A | H22C | 22.0 | 5 | 24.40 | 26.90 | 1 | 35.5 | 84.5 |
| SMDJ24A-AU | SMDJ24CA-AU | H24A | H24C | 24.0 | 5 | 26.70 | 29.50 | 1 | 38.9 | 77.1 |
| SMDJ26A-AU | SMDJ26CA-AU | H26A | H26C | 26.0 | 5 | 28.90 | 31.90 | 1 | 42.1 | 71.3 |
| SMDJ28A-AU | SMDJ28CA-AU | H28A | H28C | 28.0 | 5 | 31.10 | 34.40 | 1 | 45.4 | 66.1 |
| SMDJ30A-AU | SMDJ30CA-AU | H30A | H30C | 30.0 | 5 | 33.30 | 36.80 | 1 | 48.4 | 62.0 |
| SMDJ33A-AU | SMDJ33CA-AU | H33A | H33C | 33.0 | 5 | 36.70 | 40.60 | 1 | 53.3 | 56.3 |
| SMDJ36A-AU | SMDJ36CA-AU | H36A | H36C | 36.0 | 5 | 40.00 | 44.20 | 1 | 58.1 | 51.6 |
| SMDJ40A-AU | SMDJ40CA-AU | H40A | H40C | 40.0 | 5 | 44.40 | 49.10 | 1 | 64.5 | 46.5 |
| SMDJ43A-AU | SMDJ43CA-AU | H43A | H43C | 43.0 | 5 | 47.80 | 52.80 | 1 | 69.4 | 43.2 |
| SMDJ45A-AU | SMDJ45CA-AU | H45A | H45C | 45.0 | 5 | 50.00 | 55.30 | 1 | 72.7 | 41.3 |
| SMDJ48A-AU | SMDJ48CA-AU | H48A | H48C | 48.0 | 5 | 53.30 | 58.90 | 1 | 77.4 | 38.8 |
| SMDJ51A-AU | SMDJ51CA-AU | H51A | H51C | 51.0 | 5 | 56.70 | 62.70 | 1 | 82.4 | 36.4 |

ELECTRICAL CHARACTERISTICS (T_A=25°C, continued)

| Part Number | | Marking | | V _R | I _R @V _R | V _{BR} @I _T | | I _T | V _C @I _{PP} | I _{PP} [Ⓞ] |
|-------------|-------------|---------|------|----------------|--------------------------------|---------------------------------|--------|----------------|---------------------------------|------------------------------|
| Uni-Polar | Bi-Polar | Uni | Bi | V | max(μA) | min(V) | max(V) | mA | max(V) | A |
| SMDJ54A-AU | SMDJ54CA-AU | H54A | H54C | 54.0 | 5 | 60.00 | 66.30 | 1 | 87.1 | 34.4 |
| SMDJ58A-AU | SMDJ58CA-AU | H58A | H58C | 58.0 | 5 | 64.40 | 71.20 | 1 | 93.6 | 32.1 |

Ⓞ Surge waveform: 10/1000μs

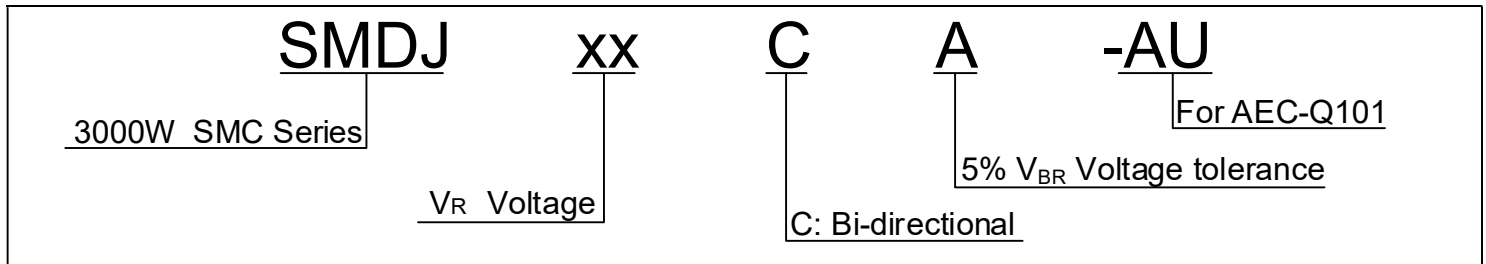
V_R: Stand-off voltage -- Maximum voltage that can be applied

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)

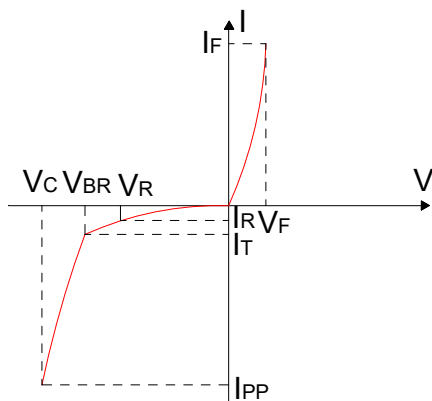


FIG.2: V- I curve characteristics (Bi-directional)

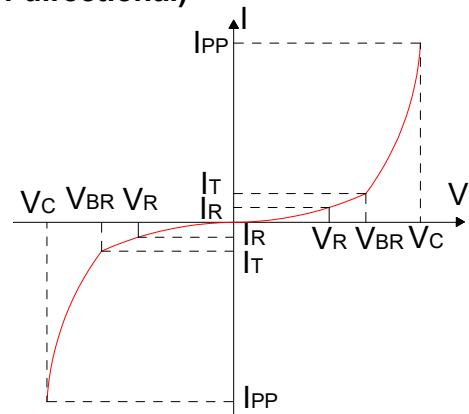


FIG.3: Pulse waveform

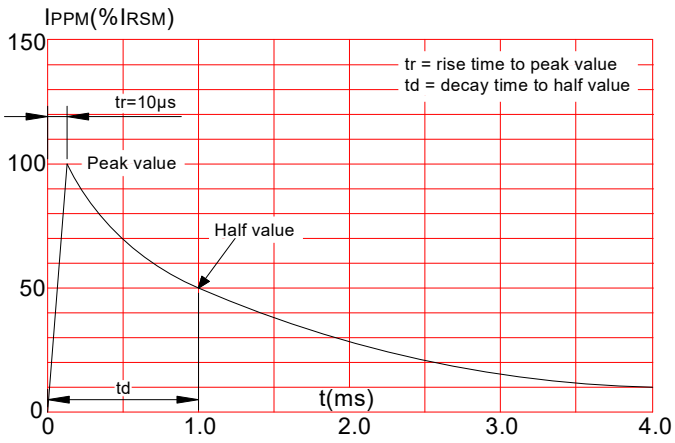


FIG.4: Pulse derating curve

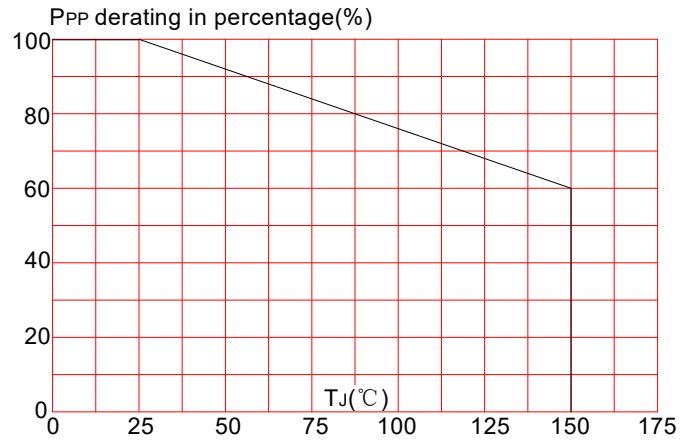
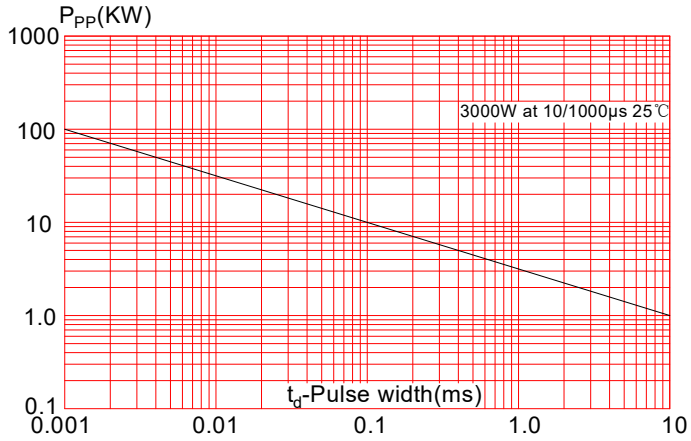
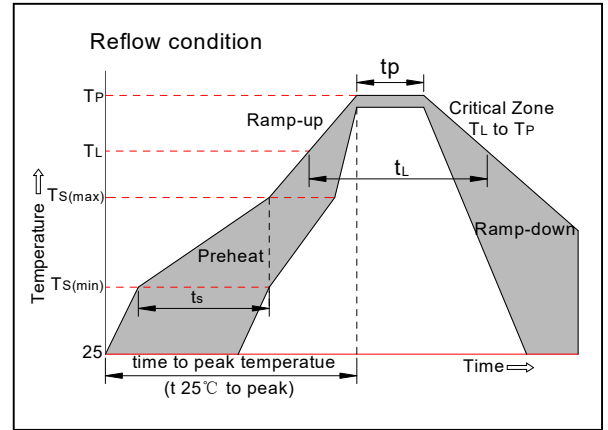


FIG.5: Peak pulse power dissipation vs. pulse width

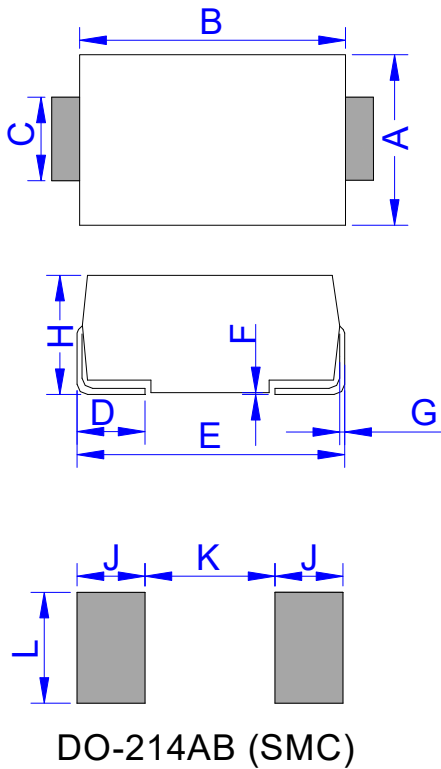


SOLDERING PARAMETERS

| | | |
|---|-----------------------------------|---|
| 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 |

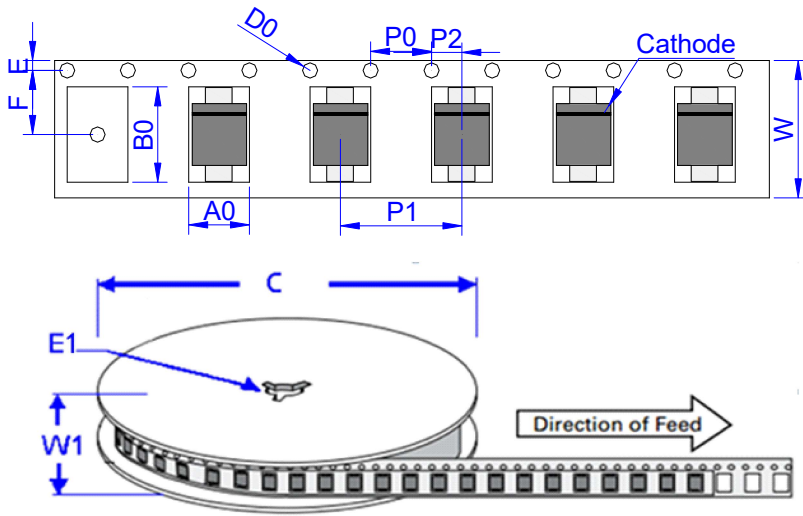


PACKAGE MECHANICAL DATA



| Ref. | Dimensions | | | |
|------|-------------|-------|--------|-------|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 5.75 | 6.25 | 0.226 | 0.246 |
| B | 6.90 | 7.40 | 0.272 | 0.291 |
| C | 2.75 | 3.25 | 0.108 | 0.128 |
| D | 0.95 | 1.52 | 0.037 | 0.060 |
| E | 7.70 | 8.20 | 0.303 | 0.323 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 2.15 | 2.62 | 0.085 | 0.103 |
| J | 2.40 | | 0.094 | |
| K | | 4.20 | | 0.165 |
| L | 3.30 | | 0.130 | |

TAPE AND REEL SPECIFICATION-SMC



| Ref. | Dimensions | |
|------|-------------|----------------|
| | Millimeters | Inches |
| A0 | 6.05 ± 0.3 | 0.238 ± 0.012 |
| B0 | 8.31 ± 0.3 | 0.327 ± 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 | 7.50 ± 0.2 | 0.295 ± 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 | 16.0 ± 0.2 | 0.630 ± 0.008 |
| W1 | 19.7 ± 2.0 | 0.776 ± 0.079 |

| PART No. | UNIT WEIGHT (g/PCS) typ. | REEL (PCS) | PER CARTON (PCS) | DESCRIPTION |
|---------------|-----------------------------|---------------|---------------------|-------------------|
| SMDJxxA/CA-AU | 0.31 | 3,000 | 48,000 | 13 inch reel pack |

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