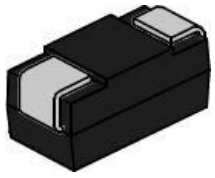
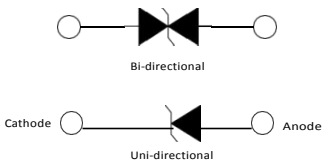
# 600 W, TVS in SMA

## 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.

SMA



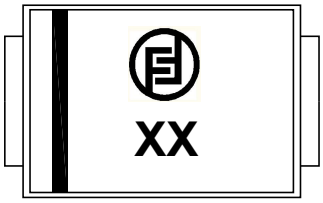



Symbol

## Features

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

## Marking Information




XX = Device Marking Code
Bar denotes Cathode
(for unidirectional only)

## Absolute Maximum Ratings ($T_A$=25°C unless otherwise specified)

| Parameter | mbol | Value | Unit |
|---|---|---|---|
| Storage and operating junction temperature range | $T_{STG}$/ $T_J$ | -55 to +15 | ℃ |
| Steady state power dissipation at $T_L$=75℃ | $P_{M(AV)}$ | 5.0 | W |
| Peak pulse power dissipation at 10/1000μs waveform | $P_{PP}$ | 600 | 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） | $I_{FSM}$ | 60 | A |
| Typical thermal resistance junction to lead | $R_{\theta JL}$ | 30 | ℃/W |
| Typical thermal resistance junction to ambient | $R_{\theta JA}$ | 120 | ℃/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

## Electrical Characteristics ($T_A$=25°C unless otherwise specified)

| 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 |
| SMA6J5.0A | SMA6J5.0CA | KE | AE | 5.0 | 120 | 6.40 | 7.00 | 10 | 9.2 | 65.2 |
| SMA6J6.0A | SMA6J6.0CA | KG | AG | 6.0 | 120 | 6.67 | 7.37 | 10 | 10.3 | 58.3 |
| SMA6J6.5A | SMA6J6.5CA | KK | AK | 6.5 | 120 | 7.22 | 7.98 | 10 | 11.2 | 53.6 |
| SMA6J7.0A | SMA6J7.0CA | KM | AM | 7.0 | 50 | 7.78 | 8.60 | 10 | 12.0 | 50.0 |
| SMA6J7.5A | SMA6J7.5CA | KP | AP | 7.5 | 50 | 8.33 | 9.21 | 1 | 12.9 | 46.5 |
| SMA6J8.0A | SMA6J8.0CA | KR | AR | 8.0 | 20 | 8.89 | 9.83 | 1 | 13.6 | 44.1 |
| SMA6J8.5A | SMA6J8.5CA | KT | AT | 8.5 | 10 | 9.44 | 10.40 | 1 | 14.4 | 41.7 |
| SMA6J9.0A | SMA6J9.0CA | KV | AV | 9.0 | 5 | 10.00 | 11.10 | 1 | 15.4 | 39.0 |
| SMA6J10A | SMA6J10CA | KX | AX | 10.0 | 2 | 11.10 | 12.30 | 1 | 17.0 | 35.3 |
| SMA6J11A | SMA6J11CA | KZ | AZ | 11.0 | 1 | 12.20 | 13.50 | 1 | 18.2 | 33.0 |
| SMA6J12A | SMA6J12CA | LE | BE | 12.0 | 1 | 13.30 | 14.70 | 1 | 19.9 | 30.2 |
| SMA6J13A | SMA6J13CA | LG | BG | 13.0 | 1 | 14.40 | 15.90 | 1 | 21.5 | 27.9 |
| SMA6J14A | SMA6J14CA | LK | BK | 14.0 | 1 | 15.60 | 17.20 | 1 | 23.2 | 25.9 |
| SMA6J15A | SMA6J15CA | LM | BM | 15.0 | 1 | 16.70 | 18.50 | 1 | 24.4 | 24.6 |
| SMA6J16A | SMA6J16CA | LP | BP | 16.0 | 1 | 17.80 | 19.70 | 1 | 26.0 | 23.1 |
| SMA6J17A | SMA6J17CA | LR | BR | 17.0 | 1 | 18.90 | 20.90 | 1 | 27.6 | 21.8 |
| SMA6J18A | SMA6J18CA | LT | BT | 18.0 | 1 | 20.00 | 22.10 | 1 | 29.2 | 20.6 |
| SMA6J20A | SMA6J20CA | LV | BV | 20.0 | 1 | 22.20 | 24.50 | 1 | 32.4 | 18.6 |
| SMA6J22A | SMA6J22CA | LX | BX | 22.0 | 1 | 24.40 | 26.90 | 1 | 35.5 | 16.9 |
| SMA6J24A | SMA6J24CA | LZ | BZ | 24.0 | 1 | 26.70 | 29.50 | 1 | 38.9 | 15.4 |
| SMA6J26A | SMA6J26CA | ME | CE | 26.0 | 1 | 28.90 | 31.90 | 1 | 42.1 | 14.3 |

| 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 | V | A |
| SMA6J28A | SMA6J28CA | MG | CG | 28.0 | 1 | 31.10 | 34.40 | 1 | 45.4 | 13.2 |
| SMA6J30A | SMA6J30CA | MK | CK | 30.0 | 1 | 33.30 | 36.80 | 1 | 48.4 | 12.4 |
| SMA6J33A | SMA6J33CA | MM | CM | 33.0 | 1 | 36.70 | 40.60 | 1 | 53.3 | 11.3 |
| SMA6J36A | SMA6J36CA | MP | CP | 36.0 | 1 | 40.00 | 44.20 | 1 | 58.1 | 10.4 |
| SMA6J40A | SMA6J40CA | MR | CR | 40.0 | 1 | 44.40 | 49.10 | 1 | 64.5 | 9.3 |
| SMA6J43A | SMA6J43CA | MT | CT | 43.0 | 1 | 47.80 | 52.80 | 1 | 69.4 | 8.7 |
| SMA6J45A | SMA6J45CA | MV | CV | 45.0 | 1 | 50.00 | 55.30 | 1 | 72.7 | 8.3 |
| SMA6J48A | SMA6J48CA | MX | CX | 48.0 | 1 | 53.30 | 58.90 | 1 | 77.4 | 7.8 |
| SMA6J51A | SMA6J51CA | MZ | CZ | 51.0 | 1 | 56.70 | 62.70 | 1 | 82.4 | 7.3 |
| SMA6J54A | SMA6J54CA | NE | DE | 54.0 | 1 | 60.00 | 66.30 | 1 | 87.1 | 6.9 |
| SMA6J58A | SMA6J58CA | NG | DG | 58.0 | 1 | 64.40 | 71.20 | 1 | 93.6 | 6.4 |
| SMA6J60A | SMA6J60CA | NK | DK | 60.0 | 1 | 66.70 | 73.70 | 1 | 96.8 | 6.2 |
| SMA6J64A | SMA6J64CA | NM | DM | 64.0 | 1 | 71.10 | 78.60 | 1 | 103.0 | 5.8 |
| SMA6J70A | SMA6J70CA | NP | DP | 70.0 | 1 | 77.80 | 86.00 | 1 | 113.0 | 5.3 |
| SMA6J75A | SMA6J75CA | NR | DR | 75.0 | 1 | 83.30 | 92.10 | 1 | 121.0 | 5.0 |
| SMA6J78A | SMA6J78CA | NT | DT | 78.0 | 1 | 86.70 | 95.80 | 1 | 126.0 | 4.8 |
| SMA6J85A | SMA6J85CA | NV | DV | 85.0 | 1 | 94.4 | 104.0 | 1 | 137.0 | 4.4 |
| SMA6J100A | SMA6J100CA | NZ | DZ | 100.0 | 1 | 111.0 | 123.0 | 1 | 162.0 | 3.7 |
| SMA6J110A | SMA6J110CA | PE | EE | 110.0 | 1 | 122.0 | 135.0 | 1 | 177.0 | 3.4 |
| SMA6J120A | SMA6J120CA | PG | EG | 120.0 | 1 | 133.0 | 147.0 | 1 | 193.0 | 3.1 |

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

# Typical Performance Characteristics ($T_A$=25℃ unless otherwise Specified)

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

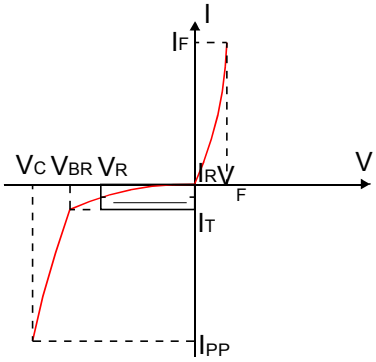



**FIG.2:V- I curve characteristics (Bi-directional)**

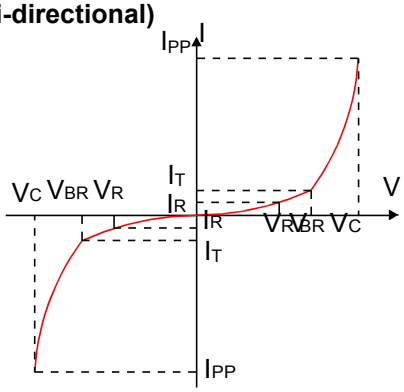



**FIG.3: Pulse waveform**

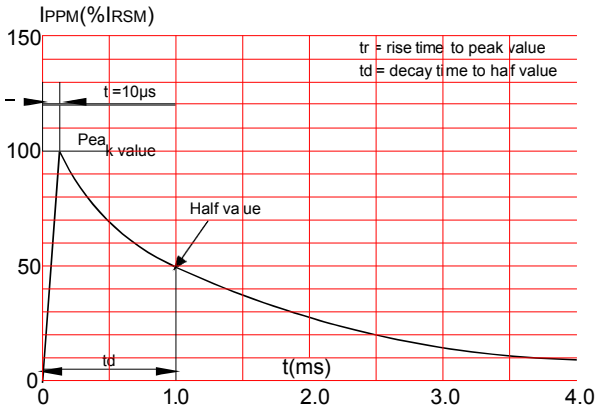
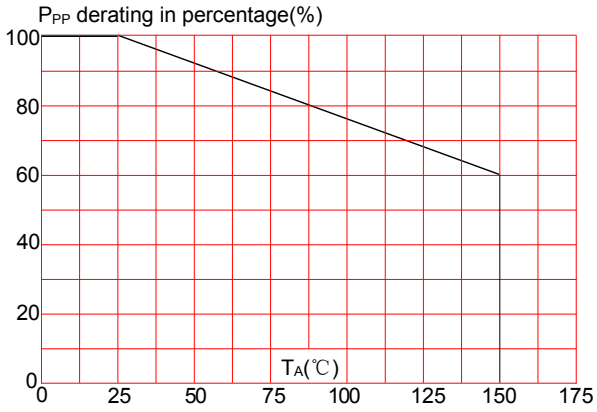
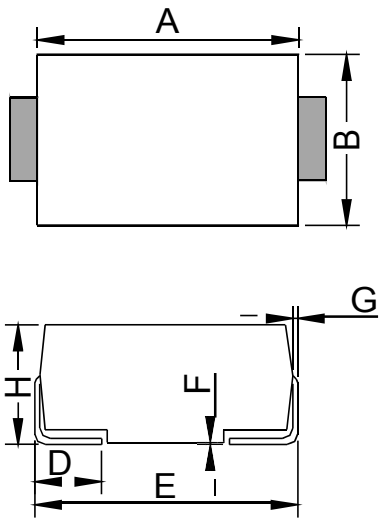



**FIG.4: Pulse derating curve**

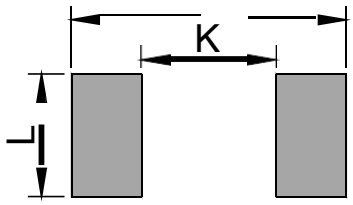


## DO-214AC(SMA) Package Outline Drawing




| Ref. | Dimensions | | | |
|---|---|---|---|---|
| | Millimeters | | Inches | |
| | Min. | Max. | Min. | Max. |
| A | 4.25 | 4.65 | 0.167 | 0.183 |
| B | 2.50 | 2.90 | 0.098 | 0.114 |
| C | 1.35 | 1.65 | 0.053 | 0.065 |
| D | 0.76 | 1.52 | 0.030 | 0.060 |
| E | 4.93 | 5.28 | 0.194 | 0.208 |
| F | 0.051 | 0.203 | 0.002 | 0.008 |
| G | 0.15 | 0.31 | 0.006 | 0.012 |
| H | 1.98 | 2.41 | 0.078 | 0.095 |
| J | 6.50 | | 0.256 | |
| K | | 2.30 | | 0.090 |
| L | 1.70 | | 0.067 | |

## Suggested Land Pattern




## Contact Information

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