

## FEATURES

- | Low profile package
- | Ideal for automated placement
- | 400 Watt peak pulse power capability with a 10/1000µs waveform
- | For surface mounted applications to optimize board space
- | Excellent clamping capability
- | Very fast response time
- | Low incremental surge resistance
- | Meet AEC-Q101 Requirements



DO-214AC(SMA)



Schematic Symbol

## APPLICATIONS

- | Power supply protection
- | Automotive application
- | Industrial application
- | Power management

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MAXIMUM RATINGS ( $T_A=25^{\circ}\text{C}$ )

| Parameter                                                                                       | Symbol    | Value | Unit  |
|-------------------------------------------------------------------------------------------------|-----------|-------|-------|
| Peak Pulse Power Dissipation on 10/1000µs waveform (Note1, Note2).                              | $P_{PPM}$ | 400   | Watts |
| Steady State Power Dissipation at $T_L=75^{\circ}\text{C}$ , Lead lengths.375" (9.5mm) ( Note2) | $P_D$     | 3.3   | Watts |

**Notes :** 1.Non-repetitive current pulse,  $T_A=25^{\circ}\text{C}$ .

2.Mounted on 5.0mm x 5.0mm (0.03mm thick) Copper Pads to each terminal.

## THERMAL CONSIDERATIONS

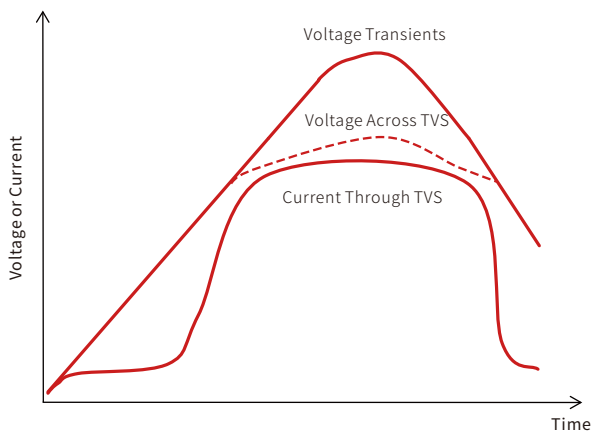
| Parameter                              | Symbol          | Value       | Unit                 |
|----------------------------------------|-----------------|-------------|----------------------|
| Operating Junction Temperature         | $T_J$           | -55 to +150 | $^{\circ}\text{C}$   |
| Storage Temperature Range              | $T_{STG}$       | -55 to +150 | $^{\circ}\text{C}$   |
| Junction to Ambient on printed circuit | $R_{\theta JA}$ | 120         | $^{\circ}\text{C/W}$ |

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

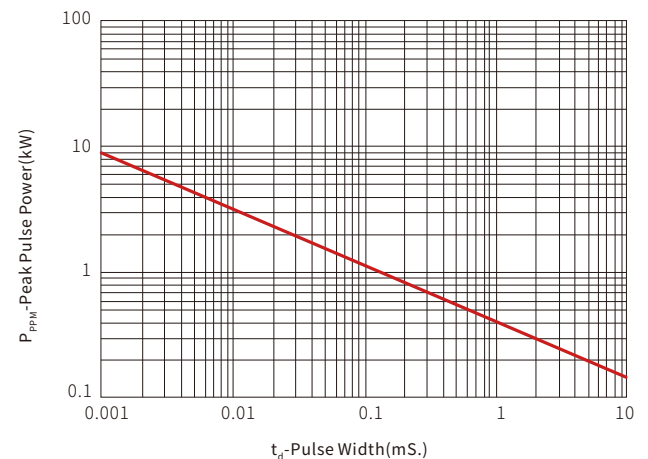
| Part Number | Device Marking Code | Reverse Stand-off Voltage | Breakdown Voltage Min.@ $I_T$ | Breakdown Voltage Max.@ $I_T$ | Test Current | Maximum Clamping Voltage @ $I_{PP}$ | Peak Pulse Current | Reverse Leakage @ $V_{RWM}$ |
|-------------|---------------------|---------------------------|-------------------------------|-------------------------------|--------------|-------------------------------------|--------------------|-----------------------------|
|             |                     | $V_{RWM}$ (V)             | $V_{BR}$ (V)                  | $V_{BR}$ (V)                  | $I_T$ (mA)   | $V_C$ (V)                           | $I_{PP}$ (A)       | $I_R$ (uA)                  |
| TPSVA40B12  | XEA                 | 12.0                      | 13.3                          | 14.7                          | 1.0          | 19.9                                | 20.1               | 1.0                         |

## CHARACTERISTIC CURVES

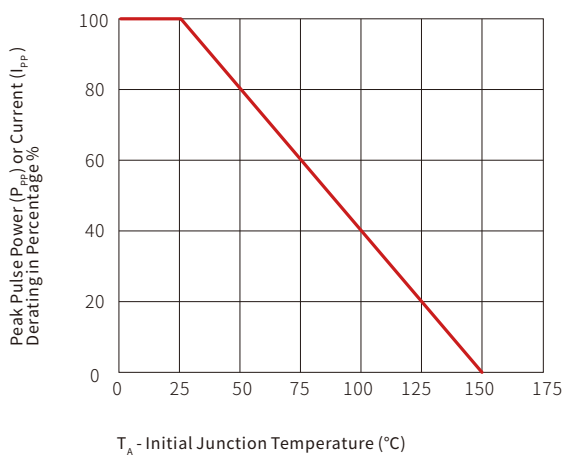
TVS Transients Clamping Waveform



Peak Pulse Power Rating Curve

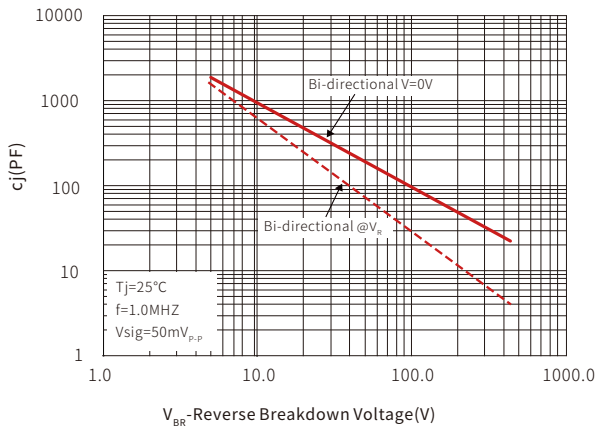
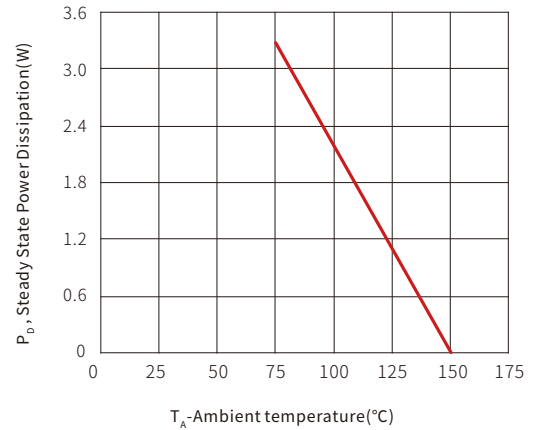


Pulse Derating Curve



Pulse Waveform



**Typical Junction Capacitance**

**Steady State Power Dissipation Derating Curve**


## SOLDERING PARAMETERS

| Reflow Condition                                               |                                          | Lead-free assembly |
|----------------------------------------------------------------|------------------------------------------|--------------------|
| Pre Heat                                                       | Temperature Max (T <sub>s(min)</sub> )   | 150°C              |
|                                                                | Temperature Max (T <sub>s(max)</sub> )   | 200°C              |
|                                                                | Time (min to max) (t <sub>s</sub> )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp (T <sub>L</sub> ) to peak) |                                          | 3°C/second max     |
| T <sub>s(max)</sub> to T <sub>L</sub> - Ramp-up Rate           |                                          | 3°C/second max     |
| Reflow                                                         | Temperature (T <sub>L</sub> ) (Liquidus) | 217°C              |
|                                                                | Time (min to max) (t <sub>L</sub> )      | 60 – 150 seconds   |
| Peak Temperature (T <sub>p</sub> )                             |                                          | 260°C              |
| Time within 5°C of actual peak Temperature (t <sub>p</sub> )   |                                          | 20 – 40 seconds    |
| Ramp-down Rate                                                 |                                          | 6°C/second max     |
| Time 25°C to peak Temperature (T <sub>p</sub> )                |                                          | 8 minutes max.     |
| Do not exceed                                                  |                                          | 260°C              |

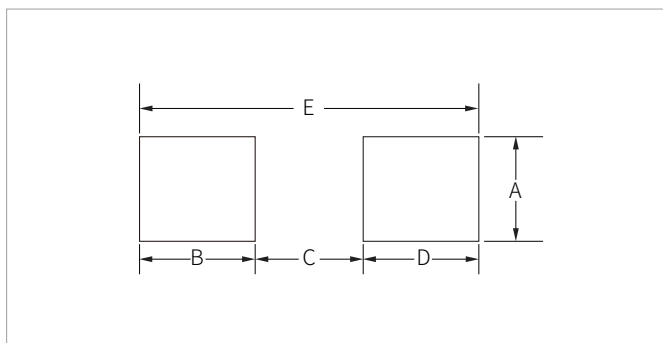


## DO-214AC(SMA) PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 1.20        | 1.60 | 0.047  | 0.063 |
| B    | 4.20        | 4.60 | 0.165  | 0.181 |
| C    | 2.40        | 2.80 | 0.094  | 0.110 |
| D    | 2.00        | 2.40 | 0.079  | 0.094 |
| E    | 0.76        | 1.52 | 0.030  | 0.060 |
| F    | 0.02        | 0.20 | 0.001  | 0.008 |
| G    | 4.85        | 5.25 | 0.191  | 0.207 |
| H    | 0.15        | 0.30 | 0.006  | 0.012 |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Millimeters |      | Inches   |       |
|------|-------------|------|----------|-------|
|      | Min.        | Max. | Min.     | Max.  |
| A    | 1.63        | -    | 0.064    | -     |
| B    | 1.45        | -    | 0.057    | -     |
| C    | -           | 2.80 | -        | 0.090 |
| D    | 1.45        | -    | 0.057    | -     |
| E    | 5.28REF     |      | 0.208REF |       |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| TPSVA40B12  | DO-214AC(SMA)     | 5000PCS  | 13"       |

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