

# Surface Mount XClampR™ Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



SMC (DO-214AB)



**RoHS**  
COMPLIANT  
HALOGEN  
FREE

## FEATURES

- XClampR™ extremely low clamping voltage
- $I_{PPM} = 180$  A with a 10/1000  $\mu$ s waveform
- $T_J = 175$  °C capability suitable for high reliability and automotive requirement
- Bidirectional
- Low leakage current
- AEC-Q101 qualified
  - Automotive ordering code: base P/NHM3
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- UL recognition for safety 497B with file number E136766
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

## MECHANICAL DATA

**Case:** SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant, and industrial grade

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**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meet JESD 201 class 2 whisker test

**Polarity:** no marking on bidirectional types

| PRIMARY CHARACTERISTICS     |                       |
|-----------------------------|-----------------------|
| $V_{WM}$                    | 24 V                  |
| $V_{BR}$                    | 26.7 V to 29.5 V      |
| $V_{CL}$ max.               | 24 V                  |
| $P_{PPM}$ (10/1000 $\mu$ s) | 7000 W <sup>(1)</sup> |
| $T_J$ max.                  | 175 °C                |
| Polarity                    | Bidirectional         |
| Package                     | SMC (DO-214AB)        |

### Note

<sup>(1)</sup> Equivalent  $I_{PPM}$  with conventional 7 KW TVS

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switch and lightning on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, automotive, and telecommunication. May need to connect in series with one conventional TVS to address in applications for various stand-off voltages and clamping voltages.

| MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)   |                          |             |      |
|-----------------------------------------------------------|--------------------------|-------------|------|
| PARAMETER                                                 | SYMBOL                   | VALUE       | UNIT |
| Peak pulse current with a 10/1000 $\mu$ s waveform, fig.1 | $I_{PPM}$ <sup>(1)</sup> | 180         | A    |
| Maximum working stand-off voltage                         | $V_{WM}$                 | 24          | V    |
| Operating junction and storage temperature range          | $T_J, T_{STG}$           | -55 to +175 | °C   |

### Note

<sup>(1)</sup> Non-repetitive current pulse and derated above  $T_A = 25$  °C

| ELECTRICAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted) |                     |                                            |      |                            |                                   |
|--------------------------------------------------------------------|---------------------|--------------------------------------------|------|----------------------------|-----------------------------------|
| DEVICE TYPE                                                        | DEVICE MARKING CODE | BREAKDOWN VOLTAGE<br>$V_{BR}$ (V) AT $I_T$ |      | TEST CURRENT<br>$I_T$ (mA) | STAND-OFF VOLTAGE $V_{WM}$<br>(V) |
|                                                                    |                     | MIN.                                       | MAX. |                            |                                   |
| XMC7K24CA                                                          | C7BZ                | 26.7                                       | 29.5 | 1.0                        | 24                                |

| ADDITIONAL CHARACTERISTICS ( $T_A = 25$ °C unless otherwise noted)   |                     |               |          |      |      |      |         |
|----------------------------------------------------------------------|---------------------|---------------|----------|------|------|------|---------|
| PARAMETER                                                            | TEST CONDITIONS     |               | SYMBOL   | MIN. | TYP. | MAX. | UNIT    |
| Clamping voltage for 10/1000 $\mu$ s exponentially decaying waveform | at $I_{PP} = 180$ A |               | $V_{CL}$ | 18   | -    | 24   | V       |
| Reverse leakage current                                              | Rated $V_{WM}$      | $T_J = 25$ °C | $I_R$    | -    | -    | 1.0  | $\mu$ A |



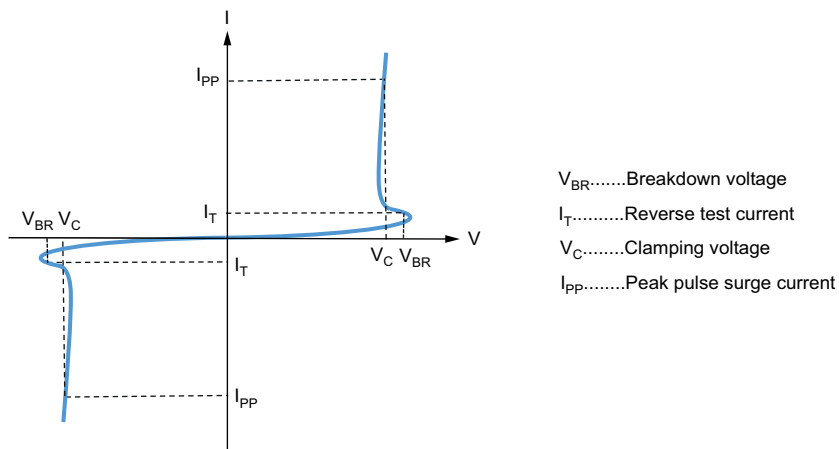
| ORDERING INFORMATION (Example) |                 |                        |               |                                    |
|--------------------------------|-----------------|------------------------|---------------|------------------------------------|
| PREFERRED P/N                  | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
| XMC7K24CA-M3/H                 | 0.261           | H                      | 850           | 7" diameter plastic tape and reel  |
| XMC7K24CA-M3/I                 | 0.261           | I                      | 3500          | 13" diameter plastic tape and reel |
| XMC7K24CAHM3/H <sup>(1)</sup>  | 0.261           | H                      | 850           | 7" diameter plastic tape and reel  |
| XMC7K24CAHM3/I <sup>(1)</sup>  | 0.261           | I                      | 3500          | 13" diameter plastic tape and reel |

Note

<sup>(1)</sup> AEC-Q101

qualified

I - V CURVE CHARACTERISTICS



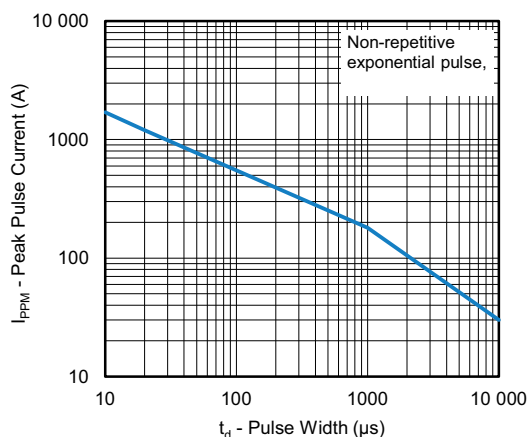
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Current Rating Curve

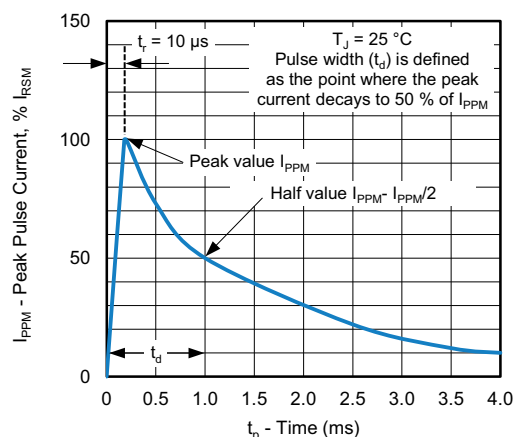


Fig. 3 - Pulse Waveform

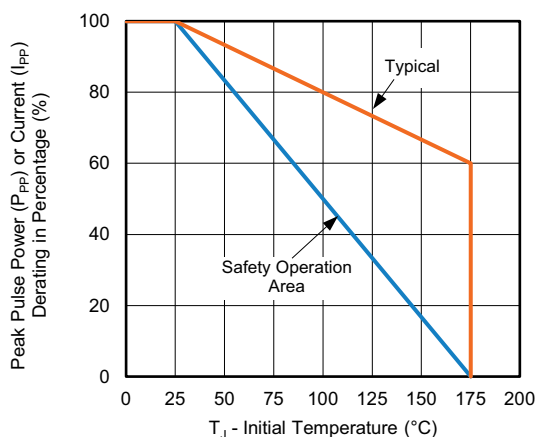


Fig. 2 - Peak Pulse Current vs. Initial Junction Temperature

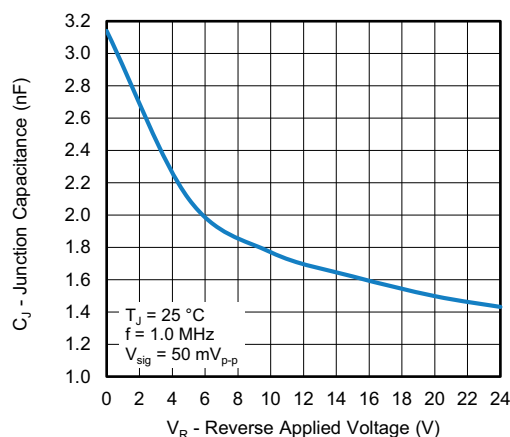


Fig. 4 - Typical Junction Capacitance

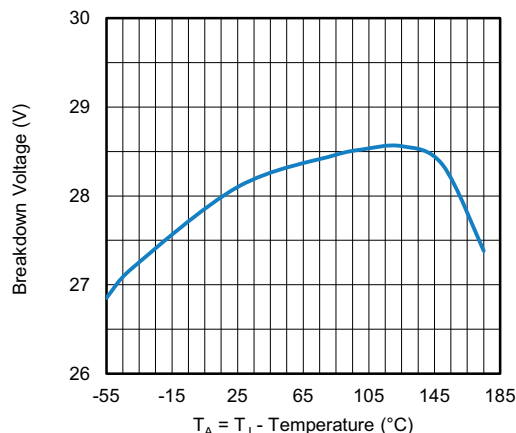
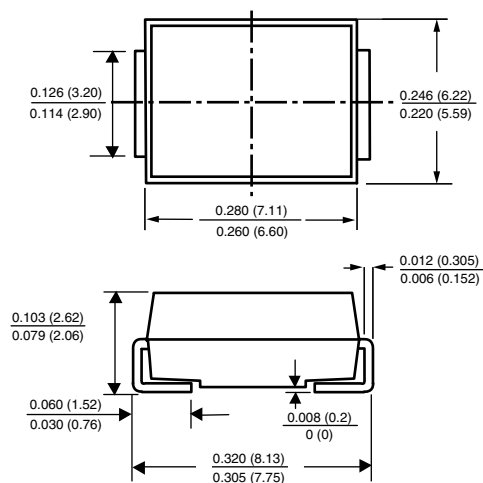


Fig. 5 - Typical Breakdown Voltage vs. Temperature Curve

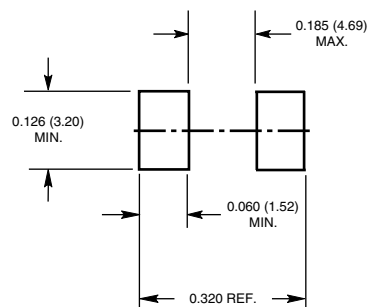


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**SMC (DO-214AB)**



**Mounting Pad Layout**





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