

# Surface Mount XClampR™ Transient Voltage Suppressors

High Temperature Stability and High Reliability Conditions



DO-218AB

| PRIMARY CHARACTERISTICS       |                       |
|-------------------------------|-----------------------|
| $V_{WM}$                      | 24 V                  |
| $V_{BR}$                      | 26.7 ~ 29.5           |
| $V_{CL}$ max.                 | 26 V                  |
| $P_{PPM}$ (10/1000 $\mu$ s)   | 7700 W <sup>(1)</sup> |
| $P_{PPM}$ (10/10 000 $\mu$ s) | 4600 W <sup>(2)</sup> |
| $T_J$ max.                    | 175 °C                |
| Polarity                      | Bidirectional         |
| Package                       | DO-218AB              |

## Notes

(1) Equivalent  $I_{PPM}$  with conventional 7700 W TVS

(2) Equivalent  $I_{PPM}$  with conventional 4600 W TVS

## TYPICAL APPLICATIONS

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lightning, especially for automotive load dump protection application withstanding 24 V jumper-start voltage test for 12 V powertrain. May need to connect in series with one conventional TVS to address in applications for various stand-off voltages and clamping voltages.

## FEATURES

- XClampR™ extremely low clamping voltage
- $I_{PPM}$  = 120 A with a 10/10 000  $\mu$ 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 245 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
FREE

## MECHANICAL DATA

**Case:** DO-218AB

Molding compound meets UL 94 V-0 flammability rating

Base P/NHM3 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

HM3 suffix meet JESD 201 class 2 whisker test

**Polarity:** no cathode marking on bidirectional types

| MAXIMUM RATINGS ( $T_A$ = 25 °C unless otherwise noted)     |                                 |                          |                     |      |
|-------------------------------------------------------------|---------------------------------|--------------------------|---------------------|------|
| PARAMETER                                                   |                                 | SYMBOL                   | VALUE               | UNIT |
| Device marking code                                         |                                 |                          | X5A24C              |      |
| Peak pulse power dissipation                                | with 10/1000 $\mu$ s waveform   | $P_{PPM}$                | 7700 <sup>(1)</sup> | W    |
|                                                             | with 10/10 000 $\mu$ s waveform |                          | 4600 <sup>(1)</sup> | W    |
| Peak pulse current with a 10/10 000 $\mu$ s waveform, fig.4 |                                 | $I_{PPM}$ <sup>(2)</sup> | 120                 | A    |
| Operating junction and storage temperature range            |                                 | $T_J, T_{STG}$           | -55 to +175         | °C   |

## Notes

(1) The peak pulse power at equivalent  $I_{PPM}$  with conventional TVS

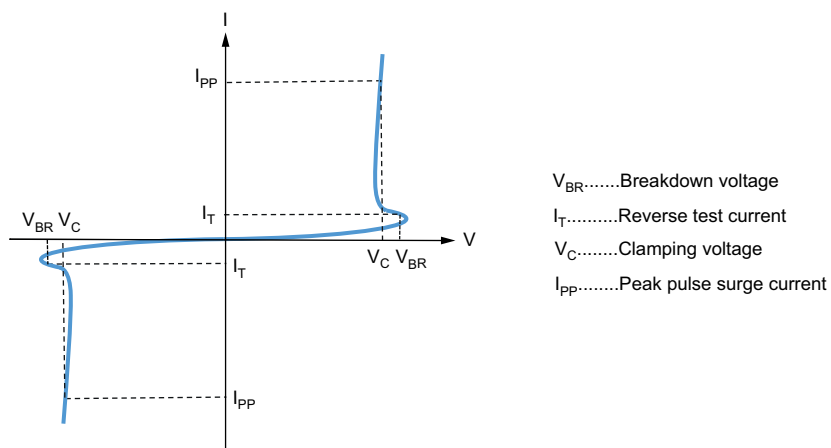
(2) Non-repetitive current pulse and derated above  $T_A$  = 25 °C

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

| DEVICE TYPE | BREAKDOWN VOLTAGE $V_{BR}$ (V) AT $I_T$ |      | TEST CURRENT $I_T$ (mA) | STAND-OFF VOLTAGE $V_{WM}$ (V) | MAX. REVERSE LEAKAGE AT $V_{WM}$ $I_D$ ( $\mu\text{A}$ ) | MAX. PEAK PULSE CURRENT AT 10/10 000 $\mu\text{s}$ WAVEFORM (A) | CLAMPING VOLTAGE AT $I_{PPM}$ $V_C$ (V) |      |
|-------------|-----------------------------------------|------|-------------------------|--------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------|------|
|             | MIN.                                    | MAX. |                         |                                |                                                          |                                                                 | MIN.                                    | MAX. |
| XLD5A24CA   | 26.7                                    | 29.5 | 5                       | 24                             | 1.0                                                      | 120                                                             | 18                                      | 26   |

**ORDERING INFORMATION** (Example)

| PREFERRED P/N                 | UNIT WEIGHT (g) | PREFERRED PACKAGE CODE | BASE QUANTITY | DELIVERY MODE                      |
|-------------------------------|-----------------|------------------------|---------------|------------------------------------|
| XLD5A24CAHM3/I <sup>(1)</sup> | 2.505           | I                      | 750           | 13" diameter plastic tape and reel |

**Note**<sup>(1)</sup> AEC-Q101 qualified**I - V CURVE CHARACTERISTICS**

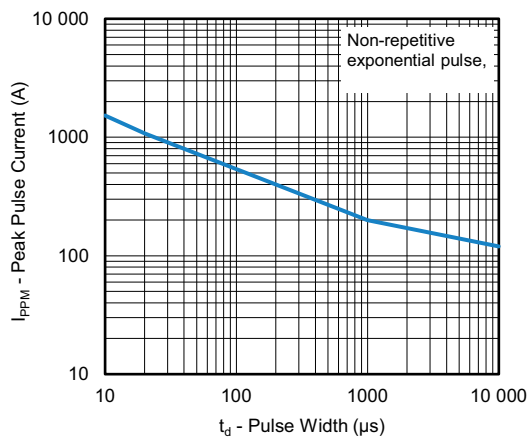
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Peak Pulse Current Rating Curve

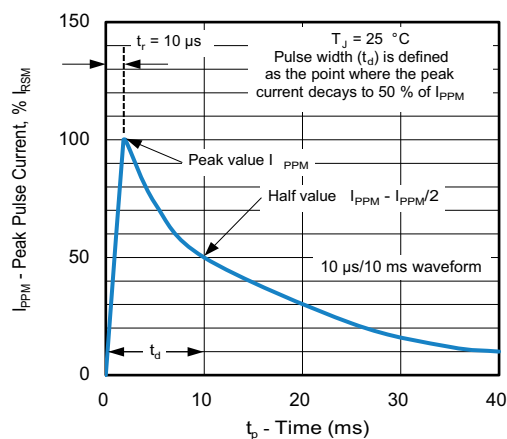


Fig. 4 - Pulse Waveform

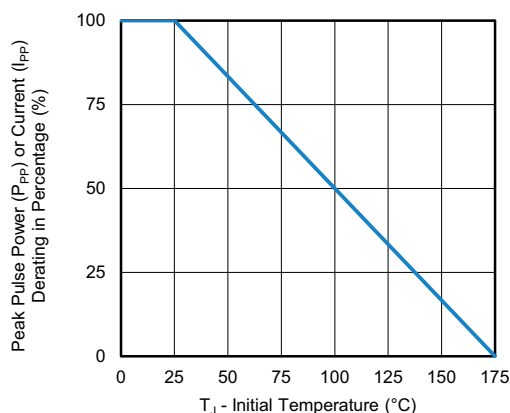


Fig. 2 - Peak Pulse Current vs. Initial Junction Temperature

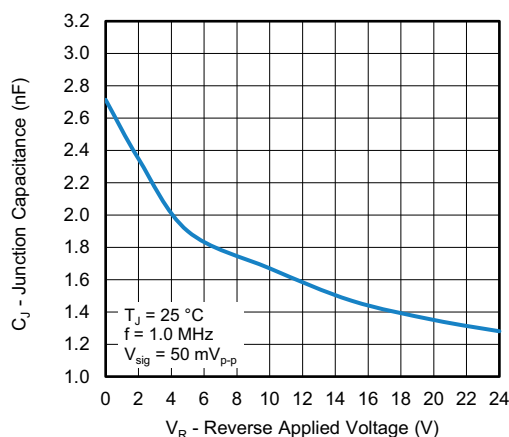


Fig. 5 - Typical Junction Capacitance

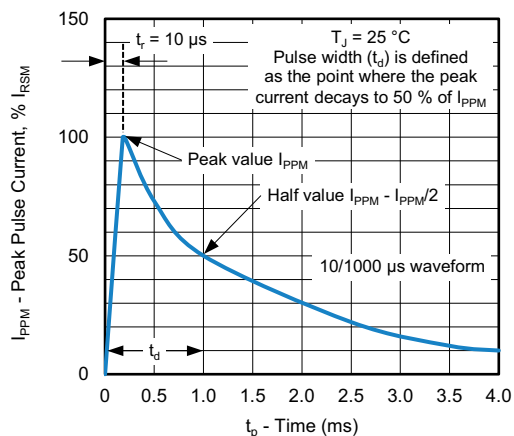


Fig. 3 - Pulse Waveform

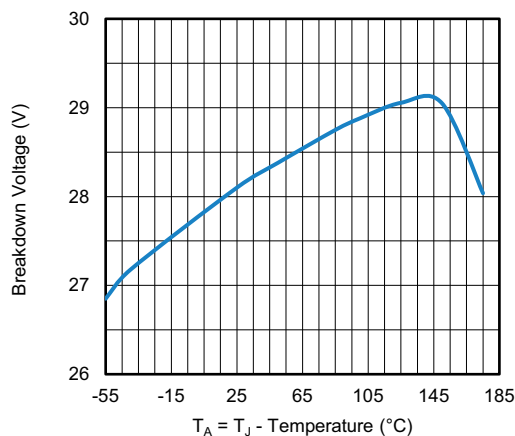
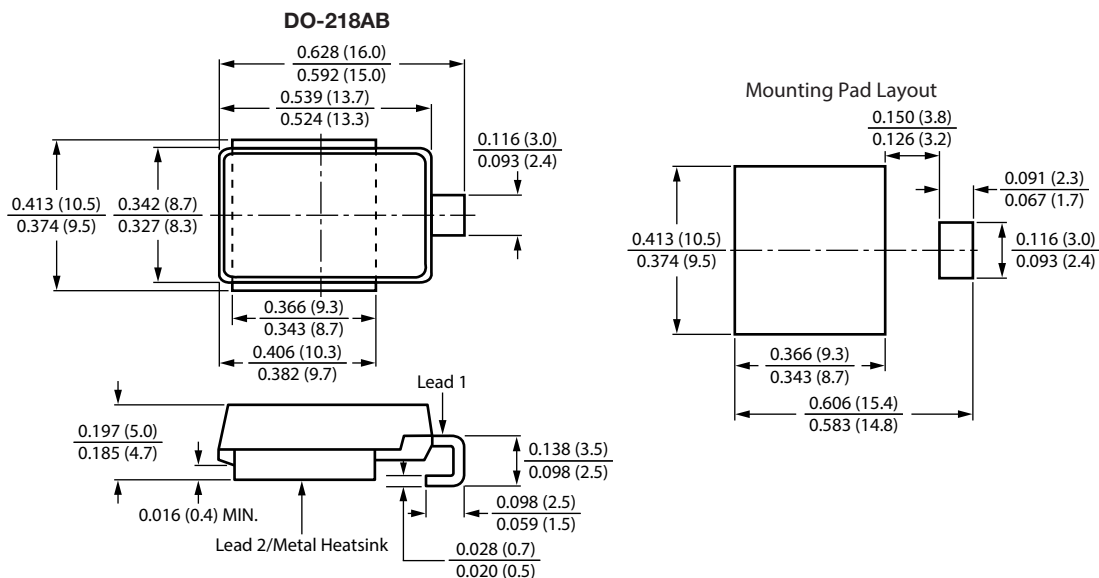


Fig. 6 - Typical Breakdown Voltage vs. Temperature Curve

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




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