



The DNA of tech.™

# DID YOU KNOW?

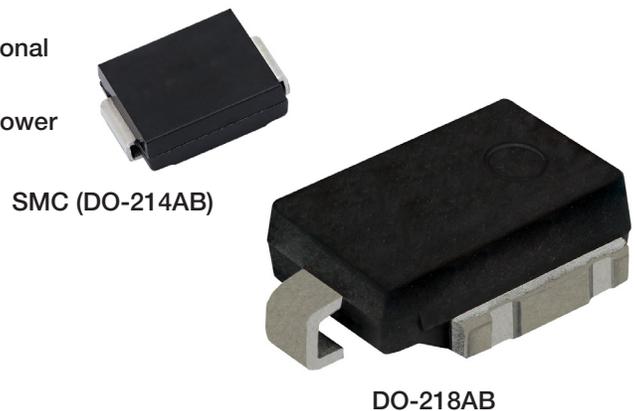
## INDUSTRY-FIRST SNAPBACK TYPE XClampR™ TVS

### What Are the Key Features of XClampR™ TVS?

- Designed to protect sensitive electronic equipment against voltage transients induced by inductive load switching and lightning
- With their low clamping voltage, the XClampR TVS offer high peak pulse currents in the SMC (DO-214AB) and DO-218AB packages
- For applications with stand-off voltages greater than 24 V - such as 48 V belt starter (BSG) and integrated starter (ISG) generators in mild hybrid electric vehicles (HEV) - the devices can be paired with a standard TVS

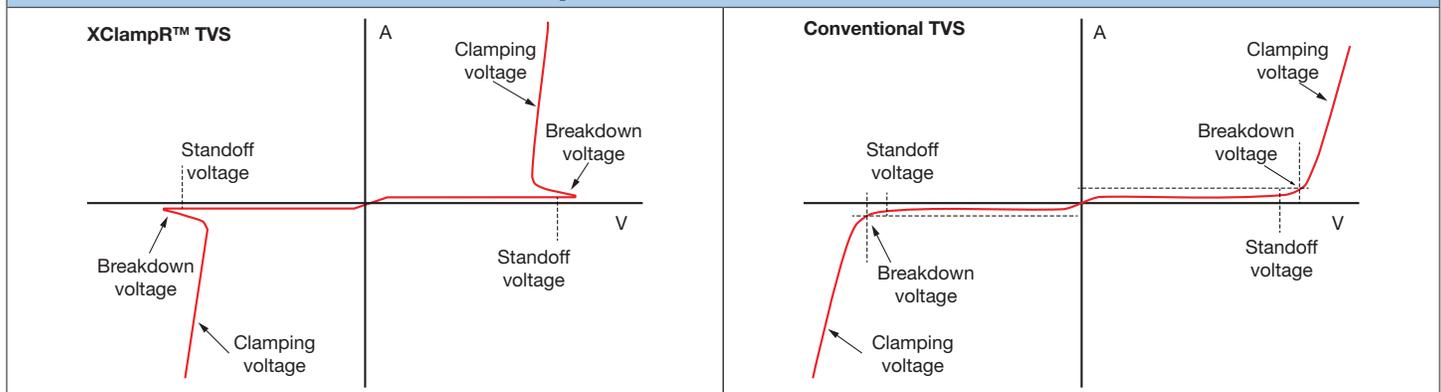
### What Are the Key Benefits of XClampR TVS?

- High peak pulse power dissipation
- 180 A at 10/1000  $\mu$ s, equivalent to a 7 kW power rating of conventional TVS, in the SMC (DO-214AB)
- 120A and 180 A at 10/10 000  $\mu$ s, equivalent to a 4.6kW and 7 kW power rating of conventional TVS respectively, in the DO-218AB
- Low clamping voltage
  - Down to 24 V maximum in the SMC (DO-214AB)
  - Down to 26 V maximum in the DO-218AB
- Wide operating temperature range of -55 °C to +175 °C
- Suitable for high reliability applications
  - Available in AEC-Q101 qualified versions
  - Extremely stable breakdown voltage from 26.7 V to 29.5 V over their entire operating temperature range



### Why Choose XClampR TVS?

#### TYPICAL OPERATION CURVE OF XClampR TVS AND CONVENTIONAL TVS



XClampR TVS is a snapback type TVS with an extremely low clamping voltage ratio for suppressing transient voltage to a lower clamping voltage, compared to conventional TVS.



The DNA of tech.™

# DID YOU KNOW?

## INDUSTRY-FIRST SNAPBACK TYPE XClampR™ TVS

### Overvoltage Protection Types

<p><b>Clamping protection</b></p>	<table border="1"> <thead> <tr> <th>Circuit Type</th> <th>ABD TVS, Zener, MOV</th> </tr> </thead> <tbody> <tr> <td>Advantage</td> <td> <ul style="list-style-type: none"> <li>No electrical short</li> <li>Accurate voltage protection control</li> </ul> </td> </tr> <tr> <td>Disadvantage</td> <td> <ul style="list-style-type: none"> <li>High power derating device required</li> </ul> </td> </tr> </tbody> </table>	Circuit Type	ABD TVS, Zener, MOV	Advantage	<ul style="list-style-type: none"> <li>No electrical short</li> <li>Accurate voltage protection control</li> </ul>	Disadvantage	<ul style="list-style-type: none"> <li>High power derating device required</li> </ul>
Circuit Type	ABD TVS, Zener, MOV						
Advantage	<ul style="list-style-type: none"> <li>No electrical short</li> <li>Accurate voltage protection control</li> </ul>						
Disadvantage	<ul style="list-style-type: none"> <li>High power derating device required</li> </ul>						
<p><b>CROW-BAR protection</b></p>	<table border="1"> <thead> <tr> <th>Circuit Type</th> <th>Gas Discharge Tube Type Surge Arrestor, Thyristor, Load Switch</th> </tr> </thead> <tbody> <tr> <td>Advantage</td> <td> <ul style="list-style-type: none"> <li>No electrical short (load switch type)</li> <li>Simple and small device required (GDT, thyristor)</li> </ul> </td> </tr> <tr> <td>Disadvantage</td> <td> <ul style="list-style-type: none"> <li>Intermittence time</li> <li>Fuse blowout (thyristor type)</li> <li>Circuit reset</li> <li>Big capacitor and polarity protection diode required for power backup (load switch)</li> </ul> </td> </tr> </tbody> </table>	Circuit Type	Gas Discharge Tube Type Surge Arrestor, Thyristor, Load Switch	Advantage	<ul style="list-style-type: none"> <li>No electrical short (load switch type)</li> <li>Simple and small device required (GDT, thyristor)</li> </ul>	Disadvantage	<ul style="list-style-type: none"> <li>Intermittence time</li> <li>Fuse blowout (thyristor type)</li> <li>Circuit reset</li> <li>Big capacitor and polarity protection diode required for power backup (load switch)</li> </ul>
Circuit Type	Gas Discharge Tube Type Surge Arrestor, Thyristor, Load Switch						
Advantage	<ul style="list-style-type: none"> <li>No electrical short (load switch type)</li> <li>Simple and small device required (GDT, thyristor)</li> </ul>						
Disadvantage	<ul style="list-style-type: none"> <li>Intermittence time</li> <li>Fuse blowout (thyristor type)</li> <li>Circuit reset</li> <li>Big capacitor and polarity protection diode required for power backup (load switch)</li> </ul>						
<p><b>Snapback protection</b></p>	<table border="1"> <thead> <tr> <th>Circuit Type</th> <th>ABD TVS, Zener, MOV</th> </tr> </thead> <tbody> <tr> <td>Advantage</td> <td> <ul style="list-style-type: none"> <li>No electrical short</li> <li>No intermittent time</li> <li>Accurate voltage protection control</li> </ul> </td> </tr> <tr> <td>Disadvantage</td> <td> <ul style="list-style-type: none"> <li>None</li> </ul> </td> </tr> </tbody> </table>	Circuit Type	ABD TVS, Zener, MOV	Advantage	<ul style="list-style-type: none"> <li>No electrical short</li> <li>No intermittent time</li> <li>Accurate voltage protection control</li> </ul>	Disadvantage	<ul style="list-style-type: none"> <li>None</li> </ul>
Circuit Type	ABD TVS, Zener, MOV						
Advantage	<ul style="list-style-type: none"> <li>No electrical short</li> <li>No intermittent time</li> <li>Accurate voltage protection control</li> </ul>						
Disadvantage	<ul style="list-style-type: none"> <li>None</li> </ul>						



The DNA of tech.™

# DID YOU KNOW? INDUSTRY-FIRST SNAPBACK TYPE XClampR™ TVS

## The Key Specifications

<b>XClampR™ TRANSIENT VOLTAGE SUPPRESSORS</b>			
<b>PART NUMBER</b>	<a href="#"><u>XLD5A24CA</u></a>	<a href="#"><u>XLD8A24CA</u></a>	<a href="#"><u>XMC7K24CA</u></a>
Maximum working stand-off voltage	24 V	24 V	24 V
Breakdown voltage	26.7 V to 29.5 V	26.7 V to 29.5 V	26.7 V to 29.5 V
Maximum clamping voltage	26 V	26 V	24 V
Peak pulse power (10/1000 μs)	7700 W <sup>(1)</sup>	11 000 W <sup>(1)</sup>	7000 W <sup>(1)</sup>
Peak pulse current (10/1000 μs)	200 A	300 A	180 A
Peak pulse power (10/10 000 μs)	4600 W <sup>(1)</sup>	7000 W <sup>(1)</sup>	1100 W <sup>(1)</sup>
Peak pulse current (10/10 000 μs)	120 A	180 A	30 A
Maximum reverse leakage current	1.0 μA	1.0 μA	1.0 μA
Maximum operating junction temperature	175 °C	175 °C	175 °C
Polarity	Bidirectional	Bidirectional	Bidirectional
Package	DO-218AB	DO-218AB	SMC (DO-214AB)

### Note

<sup>(1)</sup> Equivalent I<sub>PPM</sub> with conventional TVS