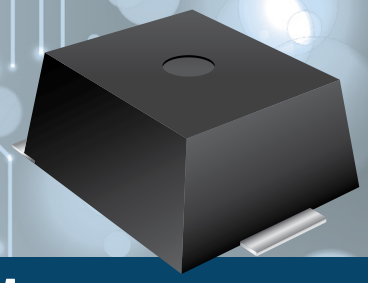


# NEW PRODUCT BRIEF

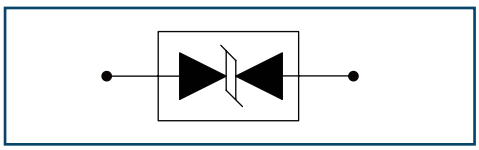
# Bourns® Model PTVS1-240C-M

## Bidirectional High Current Power Transient Voltage Suppressor (PTVS) Diode

## INTRODUCTION

The Bourns® Model PTVS1-240C-M is the industry's first bidirectional PTVSDiode capable of handling a 240 V repetitive standoff voltage and 1 kA of surge current (8/20 µs) in a compact SMD package. This is the highest power density PTVS device currently available in a surface mount package, and along with its advanced features, the Model PTVS1-240C-M is an excellent protection solution for a broad range of high power applications, especially in systems that employ high voltage DC bus architectures. These systems commonly experience high current switching transients and dynamic load behaviors where snubbing is needed or protection of bus-powered subsystems is required.

## DEVICE SYMBOL



## MARKET TRENDS

Systems with higher voltages are becoming more prevalent in applications installed to enhance safety. These systems, by their definition, cannot fail and require reliable and powerful protection solutions. Along with the need for reliable protection, these critical designs are continually increasing in power density. As a result, these new designs need products capable of scaling, with changing dimensional requirements, while also maintaining or improving capabilities. The Bourns® Model PTVS1-240C-M satisfies these trend requirements by delivering a high standoff voltage in a compact, space-saving surface mount package.

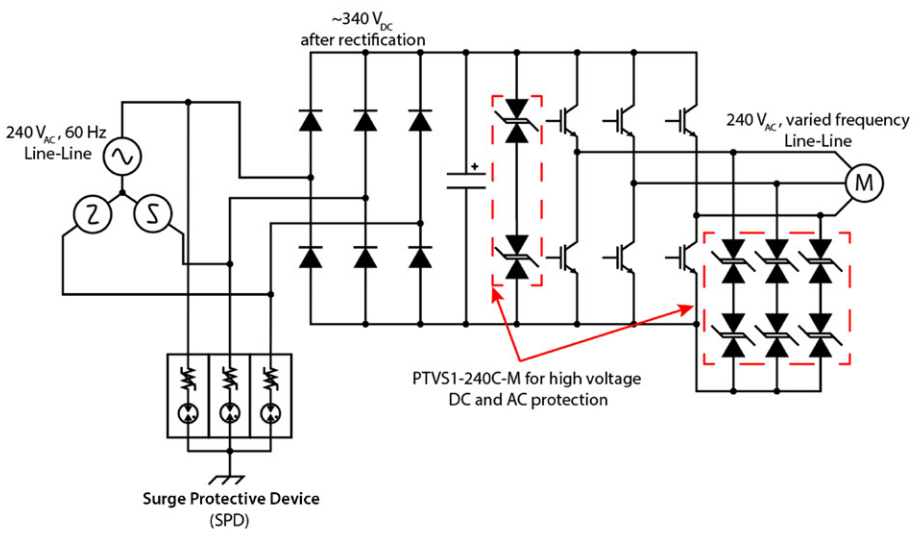
**RoHS Directive 2015/863, Mar 31, 2015 and Annex.*

## FEATURES

- 1 kA, 8/20 µs surge-handling capability
- Working voltage $V_{WM}$= 240 V
- Surface mount package
- Stable breakdown voltage over temperature - $T_C$ of $V_{(BR)}$ ~ 0.1 %/°C
- UL recognized
- RoHS compliant*, halogen free**

## BENEFITS

- Tight clamping voltage over surge
- Low surge current derating overtemperature
- Bidirectional TVS diode absorbs large pulses in both positive and negative directions
- Surface mount package allows for easy placement and meets space-constrained design needs




*Schematic for a Variable Frequency Drive (VFD) with series-connected Model PTVS1-240C-M used for DC and AC high-voltage protection.*

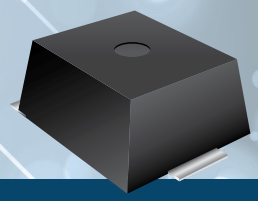
## APPLICATIONS

The Bourns® Model PTVS1-240C-M is designed for high reliability with power density and high voltage clamping in mind. The device's SMD package has significantly less lead inductance and footprint size than a traditional through-hole solution, while also boasting a tight clamping voltage of 340 V for a 1 kA, 8/20 µs surge event.

With a repetitive standoff voltage of 240 V, the Model PTVS1-240C-M offers AC mains single/three-phase and rectified voltage levels that help reduce the number of components compared to previous low voltage clamping TVS diode solutions. Multiple PTVS1-240C-M devices can also be placed together to provide a compact and increased-reliability protection solution for higher voltage applications. For example, two Model PTVS1-240C-M devices can be placed in series to protect a 240 VAC three-phase system as shown in the example provided on the next page.. In comparison, traditional surface mount TVS diodes with standard repetitive standoff voltages of 86 V typically require a total of six diodes. This is a 66 % reduction in the total component count when employing the Bourns® Model PTVS1-240C-M PTVS diodes.

The Model PTVS1-240C-M also provides a stable breakdown voltage over temperature, with a typical temperature coefficient of 0.1 %/ C°.

NEW PRODUCT BRIEF



# Bourns® Model PTVS1-240C-M

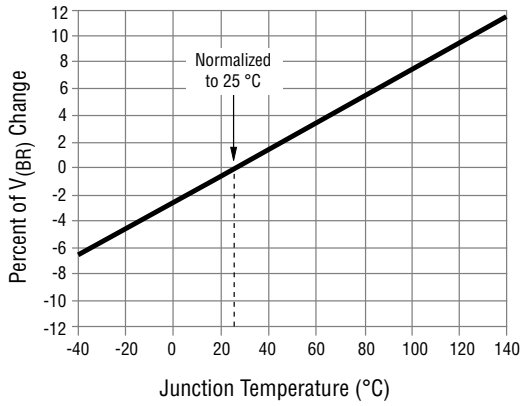
## Bidirectional High Current Power Transient Voltage Suppressor (PTVS) Diode

## Electrical Characteristics (@ $T_A$ = 25 °C Unless Otherwise Noted)

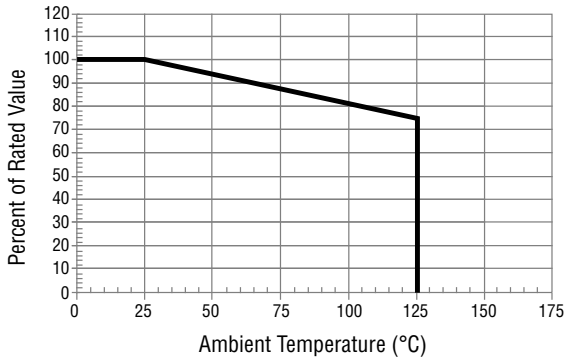
| Parameter | | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_D$ | Standby Current | $V_D = V_{WM}$ | | | 10 | μA |
| $V_{(BR)}$ | Breakdown Voltage | $I_{BR}$ = 10 mA | 266 | | 295 | V |
| $V_C$ | Clamping Voltage (1) | $I_{PP}$ = 1 kA, 8/20 μs | | 340 | | V |
| | | $I_{PP}$ = 100 A, 10/1000 μs | | 295 | | V |
| $V_{(BR)}$ | Temperature Coefficient | | | 0.1 | | %/°C |
| C | Capacitance | F = 10 kHz, $V_d$ = 1 Vrms | | 0.95 | | nF |

Note: (1) $V_C$ measured at the time which is coincident with the peak surge current.

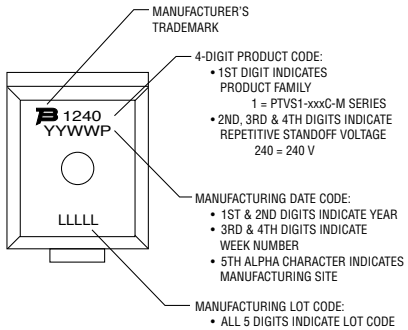
## Typical $V_{BR}$ vs. Junction Temperature




## Typical 8/20 µs Surge Current Derating




## Typical Part Marking




## How To Order

**PTVS 1 - 240 C-M**

Series
PTVS = Power TVS High Current Diode

Peak Current Rating
1 = 1 kA

Repetitive Standoff Voltage
240 = 240 V

Suffix
C = Bidirectional Device
M = Surface Mount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