



## Features

- Balanced Mini-TRIGARD™ Series (5 mm diameter, 7.3 mm length)
- Ideal for board level protection of broadband circuits
- Leadless, surface mount for economical assembly
- Stable breakdown throughout life
- High surge current rating, low insertion loss
- Recognized per UL 497B (File: [E153537](#))
- RoHS compliant\* version available

## 2036-xx-SM Precision Gas Discharge Tube Surge Protector

Bourns now offers a surface mount (SM) 3-electrode Gas Discharge Tube (GDT) surge protection device. The high quality and outstanding features of the Bourns® miniature 2036 TRIGARD™ series GDT continue in this new SM version for 'pick and place' manufacturing techniques. The 2036 SM device is ideal for board level protection of high bandwidth applications such as xDSL, cable broadband and high speed Ethernet. It has high energy handling capability, long and stable life performance, low capacitance of less than 2 pF, and measures only 5 mm in diameter. Bourns® GDTs are designed to prevent damage from transient disturbances by acting as a "crowbar" in creating a short-to-ground circuit during conduction. When a voltage transient surge exceeds the defined breakdown voltage level of the GDT, the device becomes ionized and conduction takes place within a fraction of a microsecond. When the surge passes and system voltage returns to normal levels, the GDT returns to its high-impedance (off) state.

### Characteristics

Test Methods per ITU-T K.12, IEEE C62.31 and IEC 61643-311 GDT standards.

| Characteristic                    | Model No.      |         |         |         |         |         |
|-----------------------------------|----------------|---------|---------|---------|---------|---------|
|                                   | 2036-07        | 2036-09 | 2036-15 | 2036-20 | 2036-23 | 2036-25 |
| DC Sparkover $\pm 20\%$ @ 100 V/s | 75 V           | 90 V    | 150 V   | 200 V   | 230 V   | 250 V   |
| Impulse Sparkover <sup>(1)</sup>  | 250 V          | 250 V   | 350 V   | 425 V   | 450 V   | 475 V   |
|                                   | 100 V/ $\mu$ s | 525 V   | 550 V   | 500 V   | 575 V   | 600 V   |
| 1000 V/ $\mu$ s                   |                |         |         |         |         |         |
|                                   |                |         |         |         |         |         |
|                                   |                |         |         |         |         |         |
| Characteristic                    | Model No.      |         |         |         |         |         |
|                                   | 2036-30        | 2036-35 | 2036-40 | 2036-42 | 2036-47 | 2036-60 |
| DC Sparkover $\pm 20\%$ @ 100 V/s | 300 V          | 350 V   | 400 V   | 420 V   | 470 V   | 600 V   |
| Impulse Sparkover <sup>(1)</sup>  | 500 V          | 600 V   | 650 V   | 675 V   | 750 V   | 850 V   |
|                                   | 100 V/ $\mu$ s | 650 V   | 750 V   | 825 V   | 850 V   | 950 V   |
| 1000 V/ $\mu$ s                   |                |         |         |         |         |         |
|                                   |                |         |         |         |         |         |
|                                   |                |         |         |         |         |         |

<sup>(1)</sup> Impulse Sparkover voltage is defined as typical values of distribution.

|  |   |                             |
|--|---|-----------------------------|
| Impulse Transverse Delay .....           | 1000 V/ $\mu$ s.....                          | < 75 ns                     |
| Insulation Resistance (IR) .....         | 100 V (50 V for Model 2036-07 & 2036-09)..... | > 10 <sup>10</sup> $\Omega$ |
| Glow Voltage .....                       | 10 mA.....                                    | ~ 70 V                      |
| Arc Voltage .....                        | 1 A.....                                      | ~ 10 V                      |
| Glow-Arc Transition Current .....        |   | < 0.5 A                     |
| Capacitance.....                         | 1 MHz .....                                   | < 2 pF                      |
| DC Holdover Voltage <sup>(2)</sup> ..... | >135 V, (52 V for Model 2036-07, & -09, ..... | < 150 ms                    |
|  | 80 V for Model 2036-15)                       |                             |
| Impulse Discharge Current.....           | 20000 A, 8/20 $\mu$ s <sup>(3)</sup> .....    | 1 operation minimum         |
|  | 10000 A, 8/20 $\mu$ s.....                    | 10 operations               |
|  | 200 A, 10/1000 $\mu$ s .....                  | 300 operations              |
|  | 2000 A, 10/350 $\mu$ s.....                   | 1 operation                 |
|  | 200 A, 10/700 $\mu$ s .....                   | 500 operations              |
| Alternating Discharge Current .....      | 20 Arms, 1 s <sup>2</sup> .....               | 1 operation minimum         |
|  | 10 Arms, 1 s.....                             | 10 operations               |
| Storage Temperature .....                |   | -55 to +105 °C              |
| Operating Temperature.....               |   | -55 to +105 °C              |
| Climatic Category (IEC 60068-1).....     |   | 55/105/21                   |
| Moisture Sensitivity Level.....          |   | 1                           |
| ESD Classification (HBM).....            |   | N/A                         |

#### Notes:

- **Recognized per UL 497B (File: E153537)**
- No model number marking on tube; date code and voltage only: month year digits, xxxV (e.g. 0209 400V).
- The rated discharge current for Mini-TRIGARD™ GDTs is the total current equally divided between each line to ground.
- Surface Mount (SM) parts may show a temporary increase in DCBD after the solder reflow process. Most devices will recover within 24 hours time. It should be noted that there is no quality defect nor change in protection levels during the temporary change in DCBD.
- Sparkover limits after life  $\pm 25\%$  (-25%, +30% for Model 2036-07, 2036-09 and 2036-60), IR >10<sup>8</sup>  $\Omega$ .
- Operating characteristics per RUS PE-80 and Telcordia GR 1361 available on request.
- Line to Line voltage is approximately 1.8 to 2 times the stated Line to Ground breakdown voltage.
- At delivery AQL 0.65 Level II, DIN ISO 2859.
- Bourns recommends reflowing surface mount devices per IPC/JEDEC J-STD-020 rev D.

<sup>(2)</sup> Network applied.

<sup>(3)</sup> DC Sparkover may exceed  $\pm 25\%$  but will continue to protect without venting.



**WARNING Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex. Specifications are subject to change without notice.

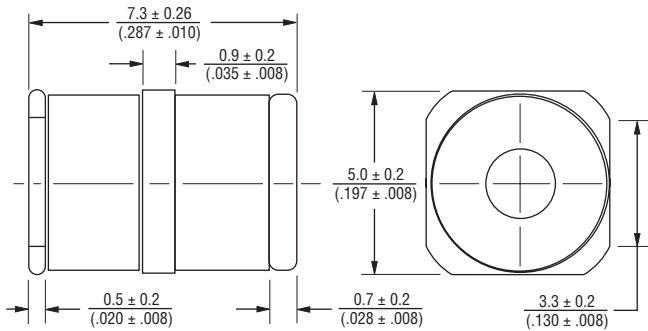
Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# 2036-xx-SM Precision Gas Discharge Tube Surge Protector

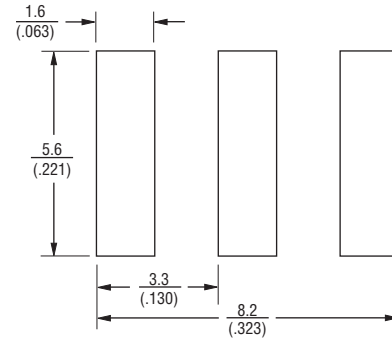


## Product Dimensions



DIMENSIONS: MILLIMETERS/(INCHES)

## Recommended Pad Layout



## How to Order

2036 - xx - SM - RP LF

Model Number Designator

Voltage (Divided by 10)

Surface Mount

Packaging Options

Blank = Bulk Packaging (Standard)

RP = Reelpack (Optional)

RP2 = Reelpack (Optional)

RoHS Compliant Option

Blank = Standard Product

LF = RoHS Compliant Product

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# 2036-xx-SM Precision Gas Discharge Tube Surge Protector

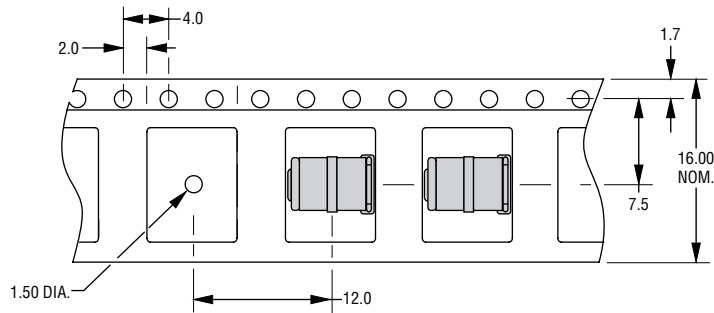


## Packaging Specifications

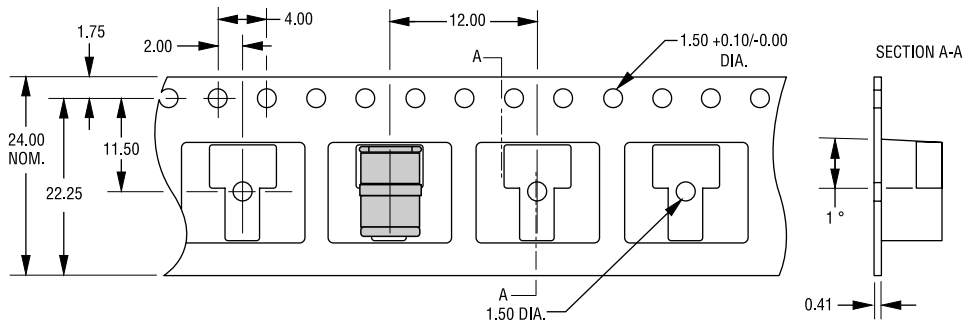
| Model          | Standard Packaging Quantity |      |      |      |
|----------------|-----------------------------|------|------|------|
|                | Bulk (Bag)                  | Tray | Box  | Reel |
| 2036-xx-SM     | 250                         |      | 1000 |      |
| 2036-xx-SM-RP  |                             |      |      | 1000 |
| 2036-xx-SM-RP2 |                             |      |      | 1000 |

The optional -RP & -RP2 reels are 330 mm in diameter and 23 mm wide.

**-RP**



**-RP2**



TOLERANCES:  $\pm 0.13$  UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS: MILLIMETERS

REV. Z – 08/20

Mini-TRIGARD™ is a trademark of Bourns, Inc.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).