



Features

- Balanced Mini-TRIGARD™ (5 mm diameter, 7.3 mm length)
- Ideal for board level protection of broad-band circuits
- Symmetrical breakdown voltage (L-L, L-G)
- Leadless, surface mount for economical assembly
- High surge current rating, low insertion loss
- Stable breakdown throughout life
- RoHS compliant* versions available

2038 Series Miniature Symmetrical 3-Electrode Surface Mount Gas Discharge Tube

Bourns offers a symmetrical surface mount (SM) 3-electrode GDT surge protection device. The industry-leading quality and features of the Bourns® miniature-TRIGARD™ series GDT continue in the 2038 symmetrical version. The 2038 series is ideal for board level protection of high bandwidth applications such as xDSL, cable broadband and high speed Ethernet, due to its symmetrical turn on characteristics as well as high energy-handling capability, long and stable life performance and low capacitance of less than 1 pF. The 2038 series' breakdown voltages are nearly equal line to line as well as line to ground. Typical 3-electrode GDT line-line breakdown voltages are 1.8-2 times higher than the line to ground breakdown voltage. Bourns® Gas Discharge Tubes (GDT) are designed to prevent damage from transient disturbances by acting as a "crowbar" in creating a virtual short-to-ground circuit during conduction. When an electrical surge exceeds the defined breakdown voltage level of the GDT, the device becomes ionized and rapid conduction takes place. When the surge passes and the system voltage returns to normal levels, the GDT returns to its high-impedance (off) state.

Characteristics

Test Methods per ITU-T (CCITT) K.12 and IEEE C62.31

Characteristic	Model No.				
	2038-15-SM	2038-20-SM	2038-23-SM	2038-30-SM	2038-35-SM
DC Sparkover $\pm 20\%$ @ 100 V/s L1/L2 to Grnd and Line 1 to Line 2	150 V	200 V	230 V	300 V	350 V
Typical Impulse Sparkover L1/L2 to Grnd and Line 1 to Line 2 100V/ μ s 1000V/ μ s	350 V 500 V	425 V 575 V	450 V 600 V	500 V 650 V	600 V 750 V

Characteristic	Model No.				
	2038-42-SM	2038-47-SM	2038-60-SM	2038-80-SM	2038-110-SM
DC Sparkover $\pm 20\%$ @ 100 V/s L1/L2 to Grnd and Line 1 to Line 2	420 V	470 V	600 V	800 V	1100 V
Typical Impulse Sparkover L1/L2 to Grnd and Line 1 to Line 2 100V/ μ s 1000V/ μ s	675 V 850 V	750 V 950 V	850 V 1100 V	1150 V 1400 V	1500 V 1700 V

Impulse Transverse Delay	100 V/ μ s	< 75 ns
Insulation Resistance (IR)	100 V	> $10^{10} \Omega$
Glow Voltage	10 mA	~ 70 V
Arc Voltage	1 A	~ 10 V
Glow-Arc Transition Current		< 0.5 A
Capacitance	1 MHz	< 1 pF
DC Holdover Voltage ¹	135 V	< 150 ms
Impulse Discharge Current	10000 A, 8/20 μ s ²	1 operation min.
	5000 A, 8/20 μ s	> 10 operations
	200 A, 10/1000 μ s	> 300 operations
	200 A, 10/700 μ s	> 500 operations
	10 A, 10/1000 μ s	> 1500 operations
Alternating Discharge Current	10 Arms, 1 s ²	1 operation min.
	5 Arms, 1 s	> 10 operations
Operating Temperature		-40 to +90 °C

Notes:

- UL Recognition pending.
- The rated discharge current for Mini-TRIGARD™ GDTs is the total current equally divided between each line to ground.
- Sparkover limits after life $\pm 25\%$. IR $> 10^8 \Omega$ (+30 %, -25 % for 2038-60, -80 and -110).
- Operating characteristics per RUS PE-80 and Telcordia GR 1361 available on request.
- At delivery AQL 0.65 Level II, DIN ISO 2859.

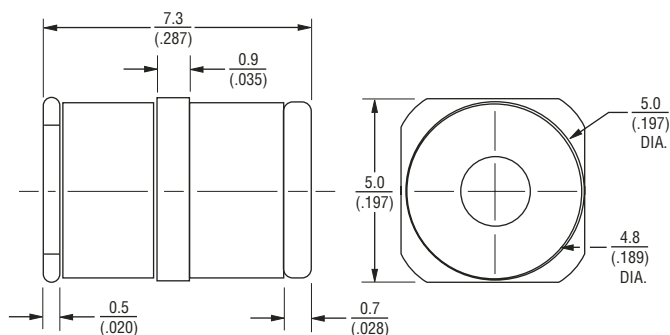
¹ Network applied.

² DC Sparkover may exceed $\pm 25\%$ but will continue to protect without venting.

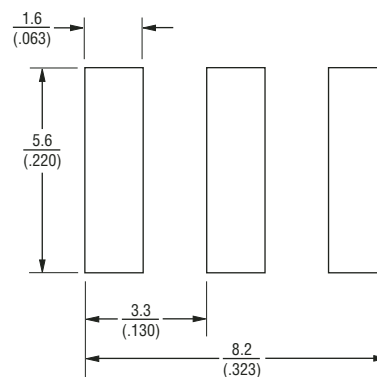
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Product Dimensions



Recommended Pad Layout



$$\text{DIMENSIONS} = \frac{\text{MILLIMETERS}}{(\text{INCHES})}$$

How To Order

2038 - xx - SM - RP LF

Model Number Designator

Voltage (Divided by 10)

Surface Mount

Packaging Options*

Blank = Bulk Packaging (Standard)

RP = Reelpack - 1000 pcs./reel (Optional)

RP2 = Reelpack - 1000 pcs./reel (Optional)

Lead Free Option

Blank = Standard Product

LF = Lead Free / RoHS Compliant Product

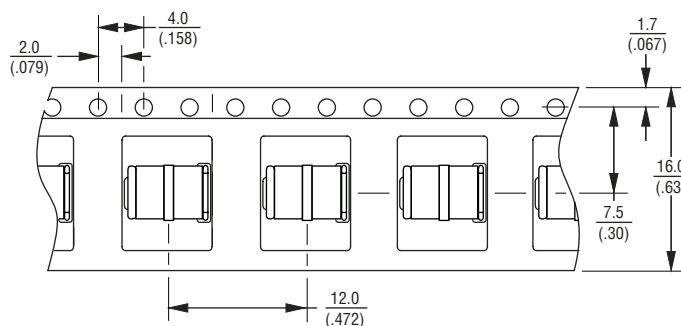
*The optional -RP & -RP2 reelpacks contain 1000 pcs./reel.

The reels are 330 mm (13 inches) in diameter. The -RP reelpack is 18 mm (0.71 inches) wide. The -RP2 reelpack is 26 mm (1.02 inches) wide.

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The Model 2038-xx-SM ships standard bulk pack, 100 pieces per bag.

-RP



The technical drawing illustrates a mechanical component with three main views:

- Front View (Top):** Shows four cross-shaped features arranged horizontally. Key dimensions include:
 - Overall width: 12.0 (.472)
 - Distance from left edge to first feature center: 1.75 (.069)
 - Feature width: 4.0 (.158)
 - Feature depth: 11.50 (.453)
 - Feature thickness: 1.50 (.059) DIA.
 - Feature height: 24.00 (.945)
 - Total height: 22.25 (.876)
- Side View (Bottom Left):** Shows the profile of the component with a 3° taper. Dimensions include:
 - Base width: 5.50 ± 0.10 (.217 ± .004)
 - Feature width: 3.15 ± 0.10 (.124 ± .004)
 - Feature height: 5.70 ± 0.10 (.225 ± .004)
 - Feature depth: 9.35 ± 0.10 (.368 ± .004)
- Cross Section A-A (Right):** A detailed view of the internal structure showing a 3° angle and various tolerances:
 - Internal width: 4.35 ± 0.10 (.171 ± .004)
 - Internal height: 7.85 ± 0.10 (.309 ± .004)
 - Internal depth: 14.90 ± 0.10 (.587 ± .004)
 - Internal thickness: .41 (.016)

$$\text{DIMENSIONS} = \frac{\text{MILLIMETERS}}{(\text{INCHES})}$$

TOLERANCES: $\frac{.13}{(.005)}$ UNLESS OTHERWISE NOTED



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