

Features

- Fast response time
- Wide temperature range
- High surge current rating
- Low capacitance and insertion loss
- Stable performance throughout life
- Small surface mount package
- RoHS compliant*

Selected as one of the **Top 10** Circuit Protection Devices of 2023 by *Electronic Products*

GDT35 Series - Next-Generation 3-Electrode Gas Discharge Tube Arrestor

General Information

Bourns' new and improved next-generation surface mount 3-electrode GDT surge protection devices have been designed using Bourns' proprietary, advanced computer simulation techniques and offer superb maximum impulse voltage limiting specifications for this class of GDT in a small, environmentally rugged surface mount package. The performance delivered in the Bourns® GDT35 Series helps to significantly heighten protection against induced voltage transients such as lightning and AC induction. Plus, the enhanced level of protection with tighter voltage limiting provided during fast-rising events is designed to reduce stress on downstream components compared to current GDT designs in the same application.

Product Characteristics

Storage Temperature Range	-55 °C to +125 °C
Operating Temperature Range	-55 °C to +125 °C
Climate Category *(IEC 60068-1)*	55 / 125 / 21
Moisture Sensitivity Level (MSL)	1
ESD Classification - HBM	N/A

How to Order

GDT 3 5 - xx - S1 - RP

Description
GDT = Gas Discharge Tube - Next-Generation Series

Electrodes
3 = 3-Electrode

Size
5 = 5 mm Diameter

Voltage

07 = 75 V	23 = 230 V	42 = 420 V
09 = 90 V	25 = 250 V	47 = 470 V
11 = 110 V	30 = 300 V	60 = 600 V
15 = 150 V	35 = 350 V	
20 = 200 V	40 = 400 V	

Package Designator
S1 = 5 x 7.2 mm SMD (Standard)

Packaging Options
RP = Reel Pack (Standard)
BK = Bulk

Additional Information

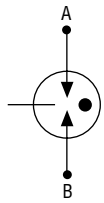
Click these links for more information:

PRODUCT SELECTOR | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

Agency Recognition

Agency	Category	Agency File No.
UL	497B - 4th Edition	E153537

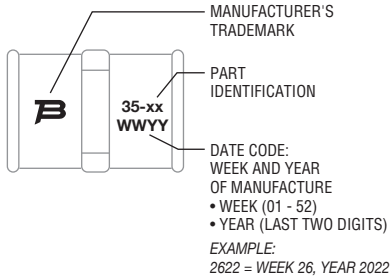
Circuit Diagram



Note: Gas discharge tubes are bidirectional and non-polarized.

Typical Part Marking

Represents total content. Layout may vary.



CALIFORNIA WARNING: Can expose you to lead, a carcinogen and reproductive toxicant. See www.P65Warnings.ca.gov

* RoHS Directive 2015/863, Mar 31, 2015 and Annex.
** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

Specifications are subject to change without notice.
Users should verify actual device performance in their specific applications.
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Applications

- Set top boxes
- Industrial communications
- HVAC controls
- xDSL, POTS, G.Fast
- Antennae

GDT35 Series - Next-Generation 3-Electrode Gas Discharge Tube Arrestor

BOURNS®

Electrical Characteristics

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

Bourns Part No.	Device Specifications (1)								
	DC Sparkover Voltage ±20 % (2) (3) (4)	Impulse Sparkover Voltage (2) (5)		Insulation Resistance (IR) (6)	Glow Voltage	Arc Voltage	Glow to Arc Transition Current	Capacitance	DC Holdover Voltage (8)
	100 V/s	100 V/µs	1 kV/µs	(7)	10 mA	> 1 A		1 MHz	< 150 ms
GDT35-07	75 V	300 V	650 V	> 2 GΩ	~ 70 V	~ 10 V	< 0.5 A	< 0.7 pF (L-G)	52 V
GDT35-09	90 V	350 V	550 V						
GDT35-11	110 V	300 V	510 V						
GDT35-15	150 V	420 V	620 V						135 V
GDT35-20	200 V	480 V	640 V						
GDT35-23	230 V	510 V	640 V						
GDT35-25	250 V	510 V	650 V						
GDT35-30	300 V	660 V	875 V						
GDT35-35	350 V	670 V	810 V						
GDT35-40	400 V	670 V	860 V						
GDT35-42	420 V	850 V	900 V						
GDT35-47	470 V	870 V	990 V						
GDT35-60	600 V	1000 V	1200 V						

Bourns Part No.	Life Ratings (TGC) (9) (10)					
	Max. Surge Current	Nominal Impulse Discharge Current			Nominal AC Discharge Current	
	8/20 µs	8/20 µs	10/350 µs	10/1000 µs	11 Cycles @ 60 Hz	1 Second
GDT35-07	20 kA 1 Operation	14 kA 10 Operations	2 kA 1 Operation	200 A 300 Operations	20 Arms 1 Operation	10 Arms 10 Operations
GDT35-09						
GDT35-11						
GDT35-15						
GDT35-20						
GDT35-23						
GDT35-25						
GDT35-30						
GDT35-35						
GDT35-40						
GDT35-42						
GDT35-47						
GDT35-60						

Notes:

(1) At delivery AQL 0.65 Level II, DIN ISO 2859.

(2) DC and Impulse Sparkover values are in ionized mode @ 25 °C.

(3) Bourns recommends reflowing surface mount devices per *IPC/JEDEC J-STD-020 rev. D*.

(4) Surface mount GDTs may exhibit a temporary increase in the DC Sparkover Voltage after the solder reflow process. The DC Sparkover Voltage will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary increase in DC Sparkover Voltage.

(5) Impulse Sparkover voltage is expressed as a maximum value, with a 99 % probability of measured values within limit.

(6) IR limits after Life Ratings > 100 MΩ.

(7) IR Test Voltage: 50 V for GDT35-07 and GDT35-09, 100 V for GDT35-23 and GDT35-60.

(8) Network applied (per *ITU-T K.12 Edition 9.0, Section 7*).

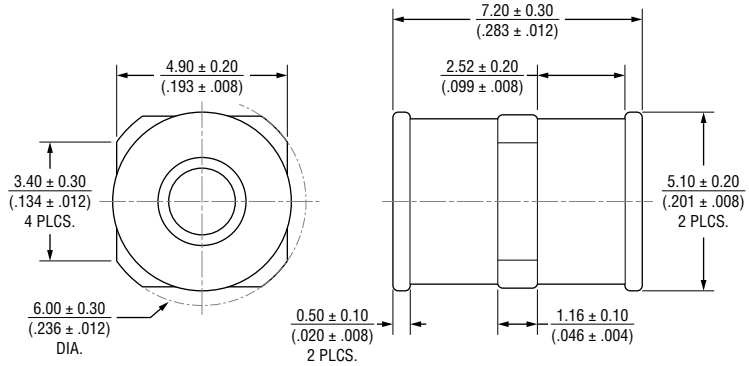
(9) DC Sparkover Voltage limits after Life Ratings may exceed +20 % but will continue to protect without venting (per *ITU-T K.12 Edition 9.0, Section 6*, where applicable).

(10) The rated discharge current corresponds to the Total Ground Current (TGC) - each line to ground.

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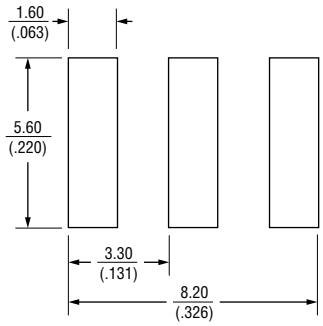
Product Dimensions

Tri-planarity fit



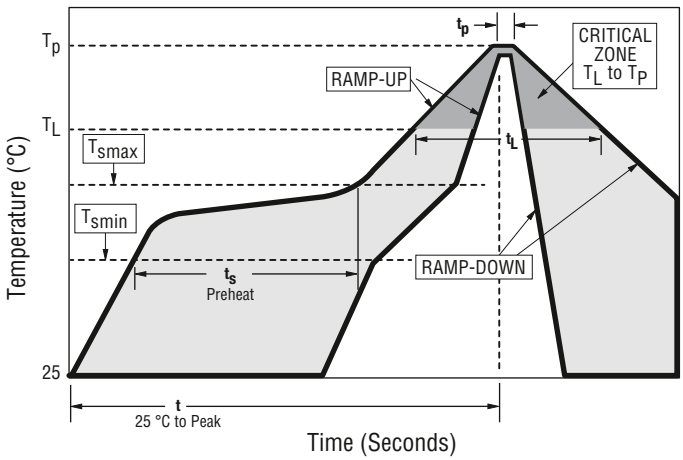
DIMENSIONS: MM / (INCHES)

Recommended Pad Layout



DIMENSIONS: MM / (INCHES)

Soldering Parameters - Reflow Soldering



Reflow Condition		Pb-free Assembly
Preheat	Temperature Min. ($T_{S(min)}$)	150 °C
	Temperature Max. ($T_{S(max)}$)	200 °C
	Time (Min. to Max.) (T_S)	60 – 120 seconds
Average Ramp-up Rate (Liquidus Temperature (T_L) to Peak)		3 °C / second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5 °C / second max.
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Temperature (T_L)	60 – 150 seconds
Peak Temperature (T_p)		260 +0/-5 °C
Time within 5 °C of Actual Peak Temperature (T_p)		10 – 30 seconds
Ramp-down rate		6 °C / second max.
Time from 25 °C to Peak Temperature (T_p)		8 minutes max.
Do Not Exceed		260 ° C

Notes:

Bourns recommends reflowing surface mount devices per *IPC/JEDEC J-STD-020 rev D*.

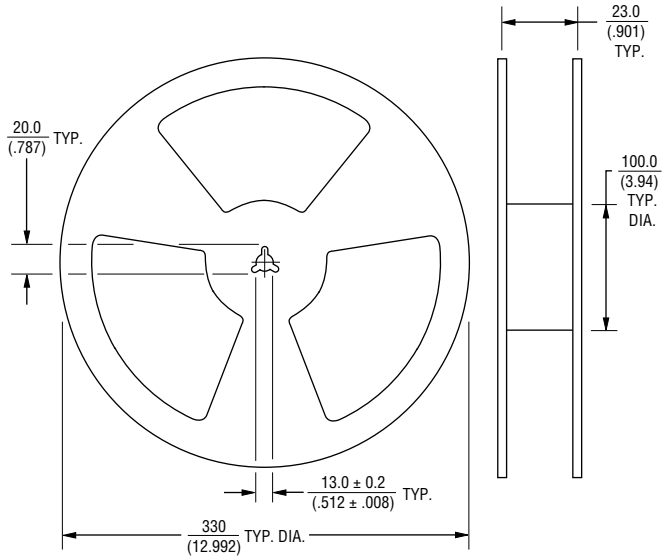
Surface mounted components (SMD) may exhibit a temporary increase in the DC Sparkover Voltage after the solder reflow process. The components should recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC Sparkover Voltage.

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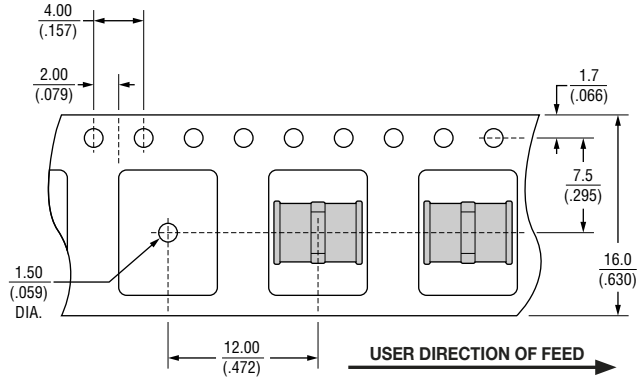
Packaging Specifications

Model	Standard Packaging Quantity		
	Bulk (Bag)	Box	Reel
GDT35-BK	250	1000	—
GDT35-RP	—	—	1000

REEL PACK



Reel is 330 mm in diameter and 23 mm wide.



DIMENSIONS: MM / (INCHES)

TOLERANCES (EXCEPT WHERE NOTED): X.X ± 0.3 (± .012)

X.XX ± 0.15 (± .006)

DEGREES ± 1°

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