NEW PRODUCT BRIEF

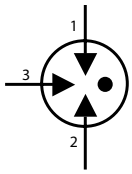
Bourns® Model GDT35 Series Next-Generation 3-Electrode GDT

INTRODUCTION

Bourns® Model GDT35 Series next generation surface mount 3-electrode Gas Discharge Tube (GDT) achieves state-of-the-art performance, representing the latest in GDT technology. The next-generation series continues the Bourns tradition of quality, innovation and design in GDT overvoltage surge arrestors. This next-generation GDT provides significant improvements in protection from voltage transients caused by lightning and accidental contact with AC power lines. With improvements driven by computer modeling simulations, the Model GDT35 Series provides an enhanced level of voltage limiting during fast rising events, resulting in less stress on downstream components. In addition, the new series has superior current handling capabilities and a wide operating temperature range.

Bourns® next-generation Model GDT35 Series low capacitance and insertion loss make it an ideal solution for the protection of high speed information and communication technology (ICT) equipment as well industrial communication. The next-generation series is RoHS compliant* and UL recognized.

CIRCUIT DIAGRAM



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

APPLICATIONS

- POTS, ADSL, VDSL, VDSL2
- Industrial communications
- Video surveillance systems
- Antennae
- Sensors and actuators
- Current limited AC & DC power lines
- Surge Protection Devices (SPDs)

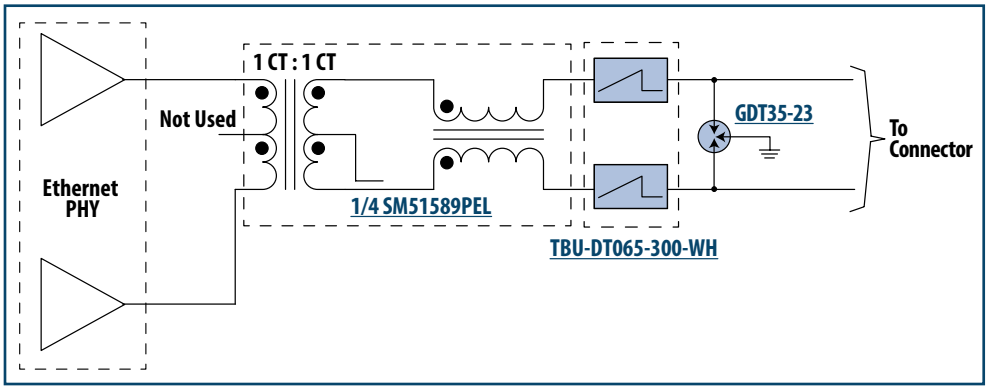
FEATURES

- -55 °C to + 125 °C operation
- Fast response time
- High surge current rating
- Low capacitance and insertion loss
- Stable performance throughout life
- UL recognized
- RoHS compliant*

BENEFITS

- Long service life
- Supports high data rates
- Suitable for exposed circuits
- Enhanced voltage protection

WHY FASTER IS BETTER



Gas tube devices are traditionally used as primary stage protectors in a multi-staged protection topology. In the circuit diagram shown above, the next-generation Model GDT35-23 gas tube is used in conjunction with a Model TBU-DT065-300-WH transient blocking unit high-speed protector (TBU® HSP) to protect a sensitive Ethernet PoE transceiver in an environment with exposure to induced lightning transients.

When the TBU® device senses an overcurrent event produced by a surge flowing to the Model SM51589PEL transformer (POE+) module and current exceeds the TBU® device's trigger, it operates in approximately 1 µs transitioning to a high impedance state limiting passing power. With the TBU® device safely disconnecting the transformer and PoE transceiver from the surge, the GDT will be triggered by the rising voltage to switch on, limiting the voltage applied to the TBU® device to a safe level.

In this example, the best-in-class impulse voltage rating on the next-generation Model GDT35-23 provides an excellent design margin against the 650 V voltage withstand rating of the TBU® High-Speed Protector.

HOW TO ORDER

GDT 3 5 - xx - S1 - RP

Description
- GDT = Gas Discharge Tube

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

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

Bourns® Model GDT35 Series Next-Generation 3-Electrode GDT

ELECTRICAL CHARACTERISTICS

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

Device Specifications [1]									
Model	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						
GDT35-20	200 V	480 V	640 V						135 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						

Life Ratings TGC (Total Ground Current) [9][10]						
Model	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 A_{rms} 1 Operation	10 A_{rms} 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) R 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 (each line to ground).

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