



# Gas Discharge Tubes

Raychem GDTs (Gas Discharge Tubes) are placed in front of, and in parallel with, sensitive telecom equipment such as power lines, communication lines, signal lines and data transmission lines to help protect them from damage caused by transient surge voltages that may result from lightning strikes and equipment switching operations. These devices do not influence the signal in normal operation. However, in the event of an overvoltage surge, such as a lightning strike, the GDT switches to a low impedance state and diverts the energy away from the sensitive equipment.

Raychem GDTs offer a higher level of protection, compared with typical GDTs, and their fast and accurate break-over voltage makes them suitable for applications such as MDF (Main Distribution Frame) modules, high data-rate telecom applications (e.g. ADSL, VDSL), and surge protection on power lines. Their low capacitance also results in less signal distortion. When used in a coordinated circuit protection solution with PolySwitch devices, SiBar thyristor surge protection devices, and MOV (Metal Oxide Varistor) devices, they can help equipment manufacturers meet stringent safety regulatory standards.



## Benefits

- Helps provide overvoltage fault protection against high energy surges
- Suitable for sensitive equipment due to excellent impulse sparkover response
- Suitable for high-frequency applications
- Highly reliable performance

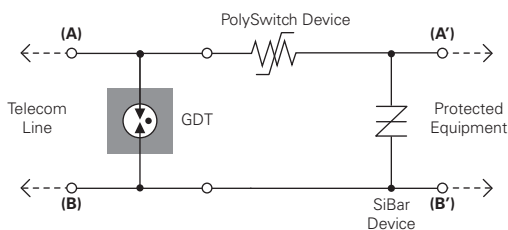
## Features

- RoHS compliant available on all parts
- Crowbar device with low arc-voltage
- Low capacitance and insertion loss
- High accuracy sparkover voltages for high precision designs
- Wide range of voltages and form factors
- Many devices tested per ITU K.12 recommendations
- Optional fail-short mechanism
- Various lead configurations
- Non radioactive materials

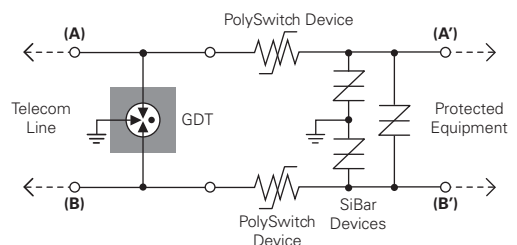
## Applications

- Telecommunications
  - MDF modules, xDSL equipment, RF system protection, antenna, base stations
- Industrial and Consumer electronics, such as
  - Power supplies, Surge protectors, Alarm system

**Figure G1** Two electrode devices for ungrounded circuits

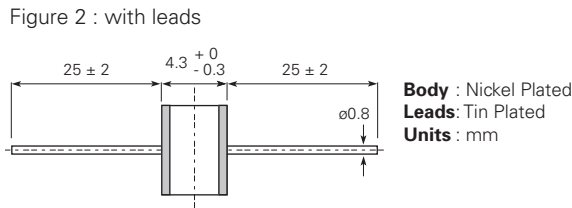
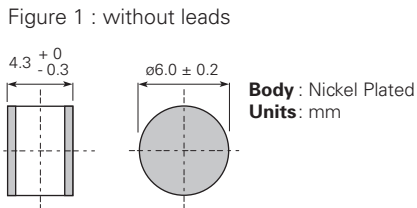


**Figure G2** Three electrode devices for grounded circuits



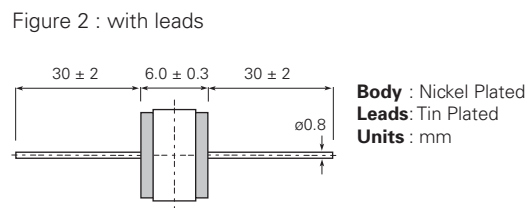
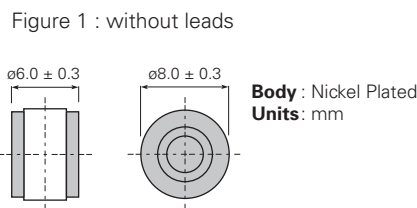
**Table G1 Two Electrode Configurations for Gas Discharge Tubes**

**GTCx26 Miniature Two Electrode Series**



Part Number	DC Sparkover Voltage	Impulse Sparkover Voltage		Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life	Impulse Discharge Current 8/20µs		AC Discharge Current, 50Hz	
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 50A	Single Hit	Repeat 10 times (5 times each polarity)	Single Hit, 9 Cycles	Repeat 10 times (1s interval)
GTCN26-101M-P02-B GTCA26-101M-P02	100V ± 20%	≤ 500V	≤ 700V	≥ 10,000MΩ*	≤ 1.0pF	≤ 52V	300 times	3kA	2.5kA	20A	2.5A
GTCN26-231M-P05-B GTCA26-231M-P05	230V ± 20%	≤ 500V	≤ 700V	≥ 10,000MΩ	≤ 1.0pF	≤ 135V	300 times	10kA	5kA	20A	5A
GTCN26-351M-P05-B GTCA26-351M-P05	350V ± 20%	≤ 600V	≤ 800V	≥ 10,000MΩ	≤ 1.0pF	≤ 135V	300 times	10kA	5kA	20A	5A

**GTCx28-xxxx-P05 Standard Two Electrode Series**



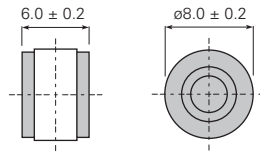
Part Number	DC Sparkover Voltage	Impulse Sparkover Voltage		Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life	Impulse Discharge Current 8/20µs		AC Discharge Current, 50Hz	
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 500A	Single Hit	Repeat 10 times (5 times each polarity)	Single Hit, 9 Cycles	Repeat 10 times (1s interval)
GTCN28-750M-P05 GTCA28-750M-P05	75V ± 20%	≤ 500V	≤ 700V	≥ 10,000MΩ*	≤ 1.0pF	≤ 52V	300 times	10kA	5kA	65A	10A, 5 times
GTCN28-900M-P05 GTCA28-900M-P05	90V ± 20%	≤ 500V	≤ 700V	≥ 10,000MΩ*	≤ 1.0pF	≤ 52V	300 times	10kA	5kA	65A	10A, 5 times
GTCN28-151M-P05 GTCA28-151M-P05	150V ± 20%	≤ 500V	≤ 700V	≥ 10,000MΩ*	≤ 1.0pF	≤ 80V	300 times	10kA	5kA	65A	10A, 5 times
GTCN28-231L-P05 GTCA28-231L-P05	230V ± 15%	≤ 600V	≤ 750V	≥ 10,000MΩ	≤ 1.0pF	≤ 135V	300 times	10kA	5kA	65A	10A, 5 times
GTCN28-251L-P05 GTCA28-251L-P05	250V ± 15%	≤ 600V	≤ 800V	≥ 10,000MΩ	≤ 1.0pF	≤ 135V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-301L-P05 GTCA28-301L-P05	300V ± 15%	≤ 700V	≤ 850V	≥ 10,000MΩ	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-351L-P05 GTCA28-351L-P05	350V ± 15%	≤ 700V	≤ 850V	≥ 10,000MΩ	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-401L-P05 GTCA28-401L-P05	400V ± 15%	≤ 700V	≤ 850V	≥ 10,000MΩ	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-471L-P05 GTCA28-471L-P05	470V ± 15%	≤ 700V	≤ 850V	≥ 10,000MΩ†	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-601L-P05 GTCA28-601L-P05	600V ± 15%	≤ 800V	≤ 1,000V	≥ 10,000MΩ†	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times
GTCN28-801L-P05 GTCA28-801L-P05	800V ± 15%	≤ 1,000V	≤ 1,200V	≥ 10,000MΩ†	≤ 1.0pF	≤ 150V	300 times	10kA	5kA	65A	10A, 10 times

\* Insulation Resistance measured at 50V<sub>DC</sub>  
 † Insulation Resistance measured at 250V<sub>DC</sub>  
 UL497B File # E179610

GTCx28-xxxx-P15 High Surge Two Electrode Series

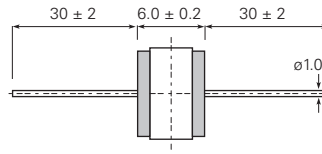


Figure 1 : without leads



Body : Nickel Plated  
Units : mm

Figure 2 : with leads



Body : Nickel Plated  
Leads: Tin Plated  
Units : mm

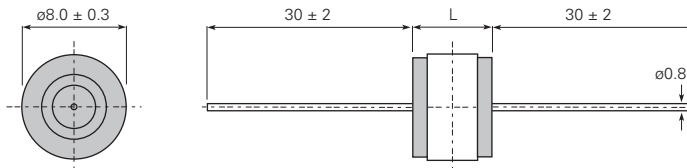
Part Number	DC Sparkover Voltage	Impulse Sparkover Voltage		Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life	Impulse Discharge Current 8/20µs		AC Discharge Current, 50Hz	
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 100A	Single Hit	Repeat 10 times (5 times each polarity)	Single Hit, 9 Cycles	Repeat 10 times (1s interval)
GTCN28-900M-P15	72 – 108 V	≤ 450V	≤ 500V	≥ 10,000MΩ*	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCA28-900M-P15	120 – 180V	≤ 500V	≤ 600V	≥ 10,000MΩ*	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-231M-P15	184 – 280V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCA28-231M-P15	200 – 300V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-251M-P15	280 – 420V	≤ 700V	≤ 800V	≥ 10,000MΩ	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCA28-251M-P15											

\* Insulation Resistance measured at 50V<sub>DC</sub>

GTCA28-xxxx-P0x High Voltage Two Electrode Series



Figure 1 : with leads



Body : Nickel Plated  
Leads: Tin Plated  
Units : mm

Part Number	DC Sparkover Voltage	Impulse Sparkover Voltage	Insulation Resistance	Capacitance	Impulse Life	Impulse Discharge Current 8/20µs		AC Discharge Current, 50Hz		Dimension L
	@ 100V/s	@ 100V/µs	@ 1000V <sub>DC</sub>	@ 1MHz	10/1000µs, 500A	Single Hit	Repeat 10 times (5 times each polarity)	Single Hit, 9 Cycles	Repeat 10 times (1s interval)	Single (mm)
GTCA28-102M-P03	1,000V ± 20%	≤ 1,500V	≥ 10,000MΩ†	≤ 1.0pF	200 times	10kA	3kA	5A	1A	8.0 ± 0.3
GTCA28-152L-P03	1,500V ± 15%	≤ 2,200V	≥ 10,000MΩ‡	≤ 1.0pF	10 times	10kA	3kA	5A	1A	8.5 ± 0.3
GTCA28-212M-P03	2,100V ± 20%	≤ 2,700V	≥ 10,000MΩ‡	≤ 1.0pF	10 times	10kA	3kA	5A	1A	8.5 ± 0.3
GTCA28-242M-P03	2,400V ± 20%	≤ 3,000V	≥ 10,000MΩ	≤ 1.0pF	10 times	10kA	3kA	5A	1A	8.5 ± 0.3
*** GTCA28-272L-P03	2,700V ± 15%††	≤ 3,700V	≥ 10,000MΩ	≤ 1.0pF	300 times**	10kA	3kA	N/A	N/A	8.8 ± 0.3
GTCA28-302M-P01	3,000V ± 20%	≤ 4,000V	≥ 10,000MΩ	≤ 1.0pF	10 times	10kA	1kA	5A	1A	8.5 ± 0.3
††† GTCA28-312L-P03	3,100V ± 15%††	≤ 3,700V‡‡	≥ 10,000MΩ	≤ 1.0pF	300 times**	10kA	3kA	N/A	N/A	8.8 ± 0.3
GTCA28-402M-P01	4,000V ± 20%	≤ 5,000V	≥ 10,000MΩ	≤ 1.0pF	10 times	10kA	1kA	5A	1A	8.5 ± 0.3

Note: All devices UL1449: File #E223033

- † Insulation Resistance measured at 250V<sub>DC</sub>
- ‡ Insulation Resistance measured at 500V<sub>DC</sub>
- \*\* Measured with 8/20µs, 100A impulse
- †† DC Sparkover Voltage measured at 5kV/s
- ‡‡ Measured with 1kV/µs
- \*\*\* GTCA28-272L-P03  
UL1414: File# E223034
- ††† GTCA28-312L-P03  
UL1414Y2: File# E223034

**Table G2 Three Electrode Configurations for Gas Discharge Tubes**

**GTCx36 Miniature Three Electrode Series**

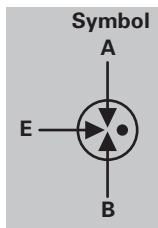
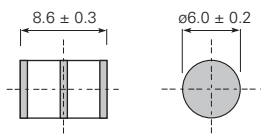
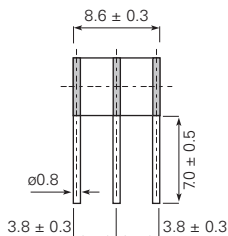


Figure 1 : without leads



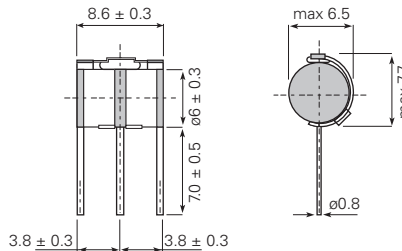
**Body** : Nickel Plated  
**Units** : mm

Figure 2 : with leads



**Body** : Nickel Plated  
**Leads** : Tin Plated  
**Units** : mm

Figure 3 : with leads and fail-short mechanism



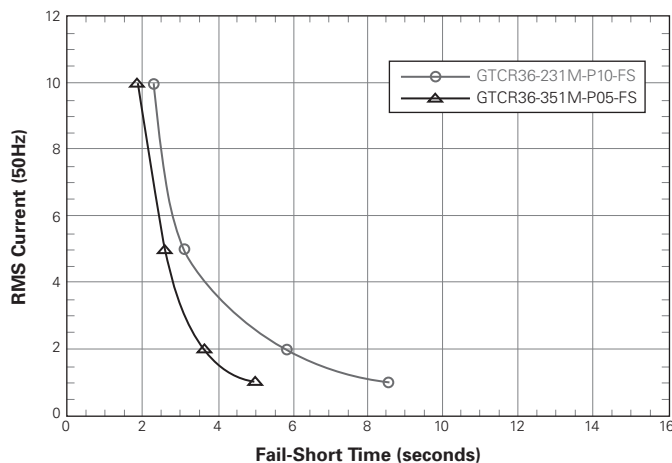
**Body** : Nickel Plated  
**Leads** : Tin Plated  
**Units** : mm

Part Number	DC Sparkover Voltage (A-E) (B-E)	Impulse Sparkover Voltage (A-E) (B-E)		Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life (A+B-E)	Impulse Discharge Current 8/20µs (A+B-E)	AC Discharge Current, 50Hz (A+B-E)
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 100A	Repeat 10 times (5 times each polarity)	Repeat 5 times (1s interval)
GTCN36-900M-P05	90V ± 20%	≤ 700V	≤ 850V	≥ 10,000MΩ*	≤ 3.0pF	≤ 52V	300 times	5kA	5A
GTCR36-900M-P05									
GTCN36-231M-P10	230V ± 20%	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCR36-231M-P10									
GTCN36-351M-P05	350V ± 20%	≤ 650V	≤ 750V	≥ 10,000MΩ	≤ 3.0pF	≤ 150V	300 times	5kA	5A
GTCR36-351M-P05									
GTCR36-351M-P05-FS									

\* Insulation Resistance measured at 50V<sub>DC</sub>  
UL497B File# E179610

**Figure G3 Typical Fail-short Performance for GTCx36 Series**

Both electrodes simultaneously powered, each with the AC current value in the graph.



GTCx37 Three Electrode 7.5mm Diameter Series

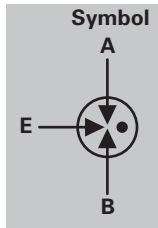
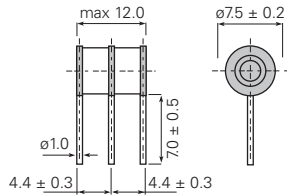
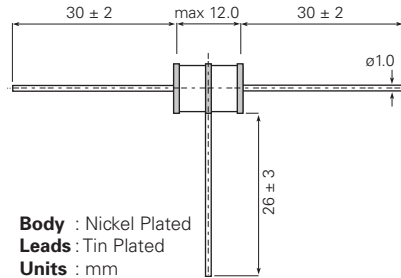


Figure 1 : with radial leads



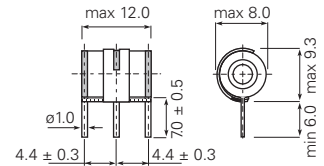
Body : Nickel Plated  
Leads : Tin Plated  
Units : mm

Figure 2 : with T-shape leads



Body : Nickel Plated  
Leads : Tin Plated  
Units : mm

Figure 3 : with fail-short mechanism



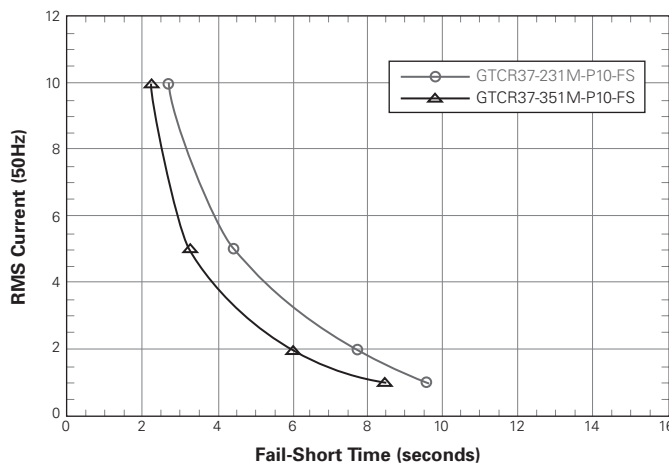
Body : Nickel Plated  
Leads : Tin Plated  
Units : mm

Part Number	DC Sparkover Voltage (A-E) (B-E)	Impulse Sparkover Voltage (A-E) (B-E)		Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life (A+B-E)	Impulse Discharge Current 8/20µs (A+B-E)		AC Discharge Current, 50Hz (A+B-E)	
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 400A	Single Hit	Repeat 10 times (5 times each polarity)	Single 9 Cycles	Repeat 10 times (1s interval)
† GTCR37-900M-P10	90V ± 20%	≤ 700V	≤ 850V	≥ 10,000MΩ*	≤ 3.0pF	≤ 52V	300 times	20kA	10kA	130A	10A
† GTCR37-900M-P10-FS											
† GTCT37-900M-P10											
† GTCR37-151M-P10	150V ± 20%	≤ 700V	≤ 850V	≥ 10,000MΩ*	≤ 3.0pF	≤ 52V	300 times	20kA	10kA	130A	10A
† GTCR37-151M-P10-FS											
† GTCT37-151M-P10											
GTCR37-201N-P10	200V ± 25%	≤ 500V	≤ 650V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	20kA	10kA	130A	10A
GTCR37-201N-P10-FS											
† GTCT37-201N-P10											
† GTCR37-231M-P10	230V ± 20%	≤ 500V	≤ 650V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	20kA	10kA	130A	10A
† GTCR37-231M-P10-FS											
† GTCT37-231M-P10											
† GTCR37-251M-P10	250V ± 20%	≤ 500V	≤ 650V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	20kA	10kA	130A	10A
† GTCR37-251M-P10-FS											
† GTCT37-251M-P10											
† GTCR37-261M-P10	260V ± 20%	≤ 500V	≤ 650V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	20kA	10kA	130A	10A
† GTCR37-261M-P10-FS											
† GTCT37-261M-P10											
† GTCR37-301M-P10	300V ± 20%	≤ 600V	≤ 750V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	20kA	10kA	130A	10A
† GTCR37-301M-P10-FS											
† GTCT37-301M-P10											
† GTCR37-351M-P10	350V ± 20%	≤ 600V	≤ 750V	≥ 10,000MΩ	≤ 3.0pF	≤ 150V	300 times	20kA	10kA	130A	10A
† GTCR37-351M-P10-FS											
† GTCT37-351M-P10											
† GTCR37-401M-P10	400V ± 20%	≤ 700V	≤ 850V	≥ 10,000MΩ	≤ 3.0pF	≤ 150V	300 times	20kA	10kA	130A	10A
† GTCR37-401M-P10-FS											
† GTCT37-401M-P10											
GTCR37-551M-P10	550V ± 20%	≤ 850V	≤ 1,000V	≥ 10,000MΩ	≤ 3.0pF	≤ 150V	300 times	20kA	10kA	130A	10A
GTCR37-551M-P10-FS											
† GTCT37-551M-P10											

\* Insulation Resistance measured at 50V<sub>DC</sub>  
† UL497B File# E179610

Figure G4 Typical Fail-short Performance for GTCx37 Series

Both electrodes simultaneously powered, each with the AC current value in the graph.



**Table G2 Three Electrode Configurations for Gas Discharge Tubes**

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**GTCx38 Three Electrode P Series**

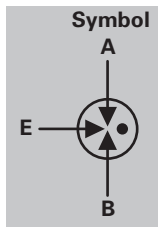


Figure 1 : without leads

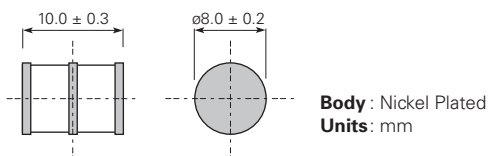


Figure 2 : without leads with fail-short mechanism

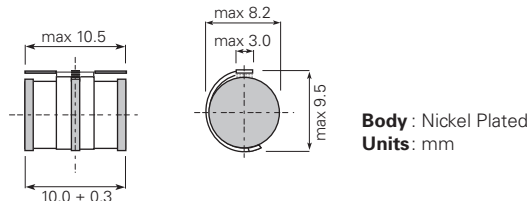


Figure 3 : with leads

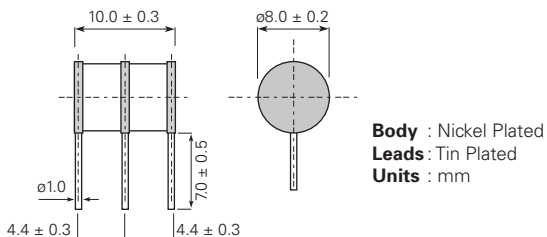
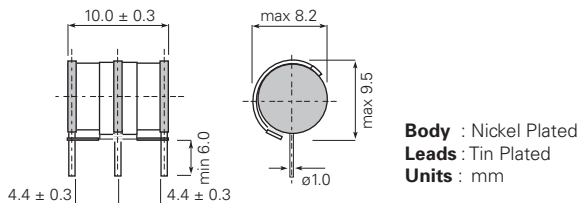


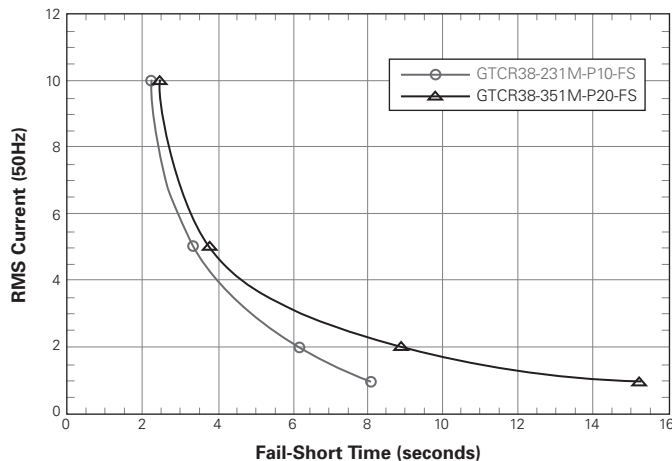
Figure 4 : with leads and fail-short mechanism



Part Number	DC Sparkover Voltage (A-E) (B-E)	Impulse Sparkover Voltage (A-E) (B-E)	Insulation Resistance	Capacitance	DC Holdover Voltage	Impulse Life (A+B-E)	Impulse Discharge Current 8/20µs (A+B-E)	AC Discharge Current, 50Hz (A+B-E)
	@ 100V/s	@ 1kV/µs	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000µs, 200A	Repeat 10 times (5 times each polarity)	Repeat 5 times (1s interval)
GTCR38-231M-P10-FS	184 - 280V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCR38-251M-P10-FS	200 - 300V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCN38-351M-P20								
GTCN38-351M-P20-FS								
GTCR38-351M-P20	280 - 420V	≤ 900V	≥ 10,000MΩ	≤ 3.0pF	≤ 80V	300 times	20kA	20A
GTCR38-351M-P20-FS								

**Figure G5 Typical Fail-short Performance for GTCx38 Series**

Both electrodes simultaneously powered, each with the AC current value in the graph.



GTCx38 Three Electrode Q Series

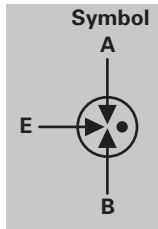


Figure 1 : without leads

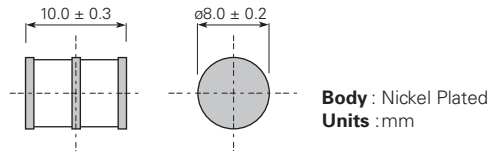


Figure 2 : without leads with fail-short mechanism

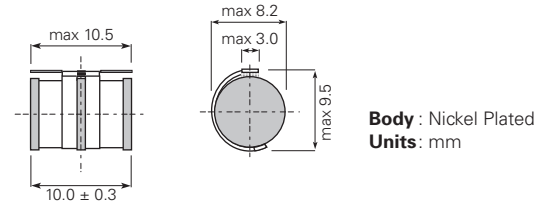


Figure 3 : with leads

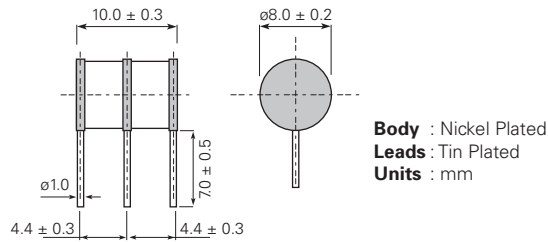
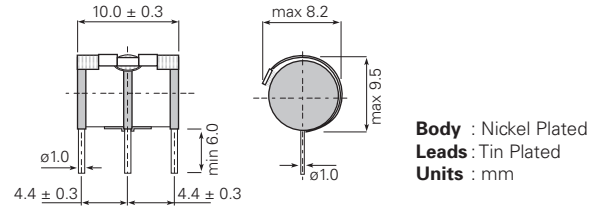


Figure 4 : with leads and fail-short mechanism



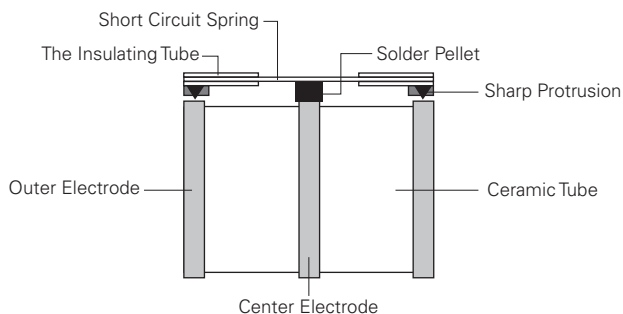
Part Number	DC Sparkover Voltage (A-E) (B-E)		Impulse Sparkover Voltage (A-E) (B-E)		Insulation Resistance @ 100V <sub>DC</sub>	Capacitance @ 1MHz	DC Holdover Voltage Per ITU K.12	Impulse Life (A+B-E) 10/1000µs, 200A	Impulse Discharge Current 8/20µs (A+B-E) Repeat 10 times (5 times each polarity)	AC Discharge Current, 50Hz (A+B-E) Repeat 5 times (1s interval)*
	@ 100V/s	@ 100V/µs	@ 1kV/µs	@ 100V <sub>DC</sub>						
GTCN38-900M-Q10	72 - 108V	≤ 450V	≤ 500V	≥ 10,000MΩ*	≤ 3.0pF	≤ 52V	300 times	10kA	10A	
GTCR38-900M-Q10-FS										
GTCR38-900M-Q10										
GTCN38-151M-Q10	120 - 180V	≤ 500V	≤ 600V	≥ 10,000MΩ*	≤ 3.0pF	≤ 52V	300 times	10kA	10A	
GTCR38-151M-Q10-FS										
GTCR38-151M-Q10										
GTCN38-231M-Q10	184 - 280V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A	
GTCR38-231M-Q10-FS										
GTCR38-231M-Q10										
GTCN38-251M-Q10	200 - 300V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A	
GTCR38-251M-Q10-FS										
GTCR38-251M-Q10										
GTCN38-351M-Q10	280 - 420V	≤ 900V	≤ 1000V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A	
GTCR38-351M-Q10-FS										
GTCR38-351M-Q10										
GTCN38-421M-Q10	300 - 500V	≤ 900V	≤ 1000V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A	
GTCR38-421M-Q10-FS										
GTCR38-421M-Q10										
GTCN38-501M-Q10	400 - 600V	≤ 1100V	≤ 1200V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A	
GTCR38-501M-Q10-FS										
GTCR38-501M-Q10										

\* Insulation Resistance measured at 50V<sub>DC</sub>  
UL497B File # E179610

## Fail-Short Mechanism for Gas Discharge Tubes

### Fail-Short Mechanism

The Fail-Short Mechanism is a short circuit spring mounted onto a solder pellet located at the center electrode of the gas tube. Under normal operating conditions, the pellet is positioned to make the spring float 0.1 – 0.5mm above the outer electrodes. Thin tubes are used to cover the sharp metal protrusions present at each end of the spring.



When a prolonged discharge event causes the gas tube temperature to reach the melting point of the solder, the pellet softens allowing the short circuit spring to activate by forcing the protrusions through the thin insulating tubes causing them to make contact with both outer electrodes. This process results in a permanent short-circuit between all three electrodes creating a low resistance path that conducts the fault current to ground without generating a significant amount of heat.

### Temperature

#### Operation Temperature Range

Models without Fail-Short Mechanism : -40°C/+90°C  
 Models with Fail-Short Mechanism : -20°C/+65°C

#### Storage Temperature Range

Models without Fail-Short Mechanism : -40°C/+90°C  
 Models with Fail-Short Mechanism : -20°C/+65°C

### Packaging

Parts are packed 100 pieces in a plastic tray or 200 pieces in a vacuum bag, ten trays or five bags (1,000 pieces) to a standard box. Standard packaging is in trays. Vacuum bag packaging is available upon request. Add "-B" at the end of the part number for parts packaged in vacuum bags.

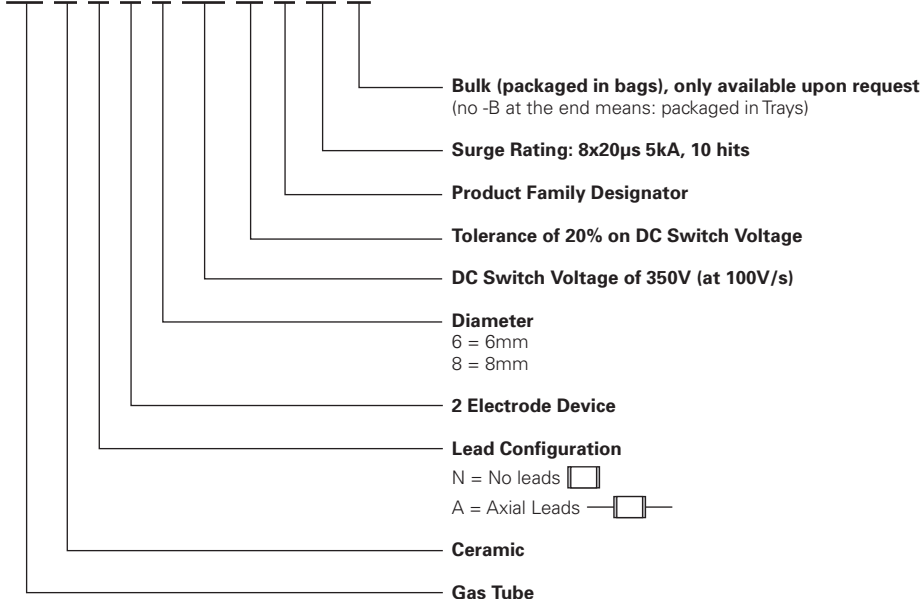
### Installation

Care should be taken when installing Gas Discharge Tubes equipped with Fail-Short Mechanisms into arrester magazines, printed circuit boards, etc. Too much downward pressure may force the short circuit spring through the thin insulation tube creating a shorted condition.

## Part Numbering System for Gas Discharge Tubes

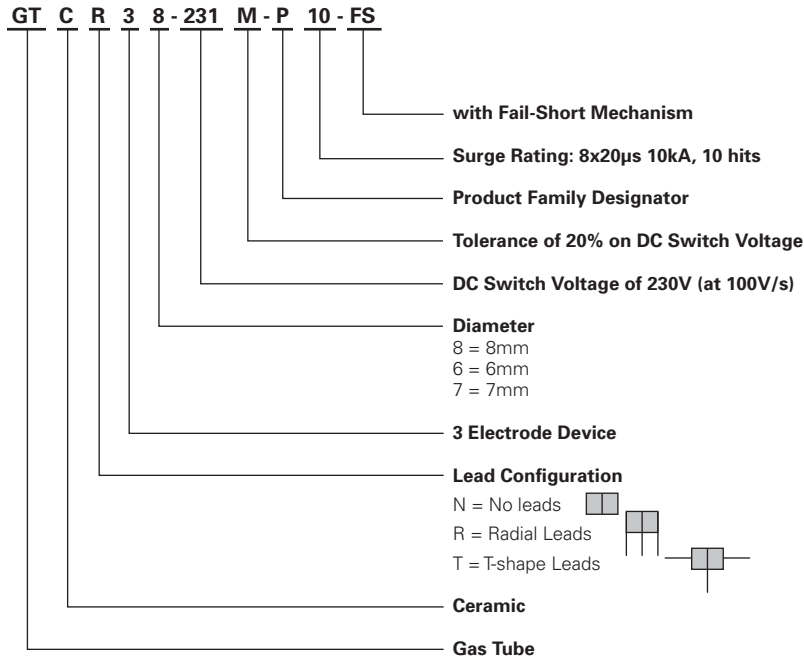
### Two Electrode GDT - Example Part Number: GTCN26-351M-P05-B

**GT C N 2 6 - 351 M - P 05 - B**

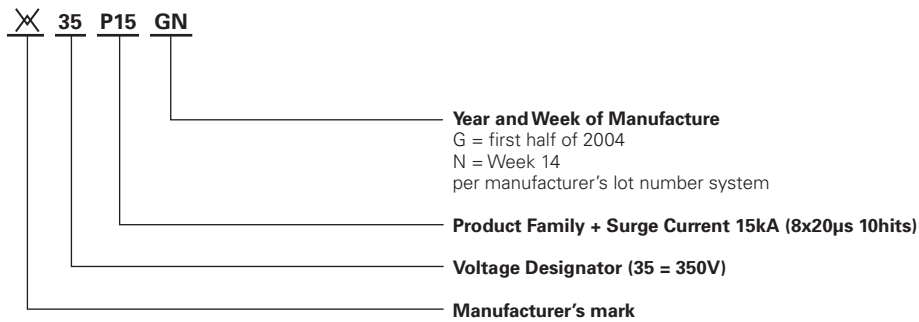




Three Electrode GDT - Example Part Number: GTCR38-231M-P10-FS



Marking Reference Guide - Example



Devices with no leads (GTCNxx-xxxx-xx), are not able to be soldered as their electrodes are Nickel plated. They are meant to be installed by insertion into a magazine clip.



**Warning :**

- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- The devices are intended for protection against occasional overvoltage fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.