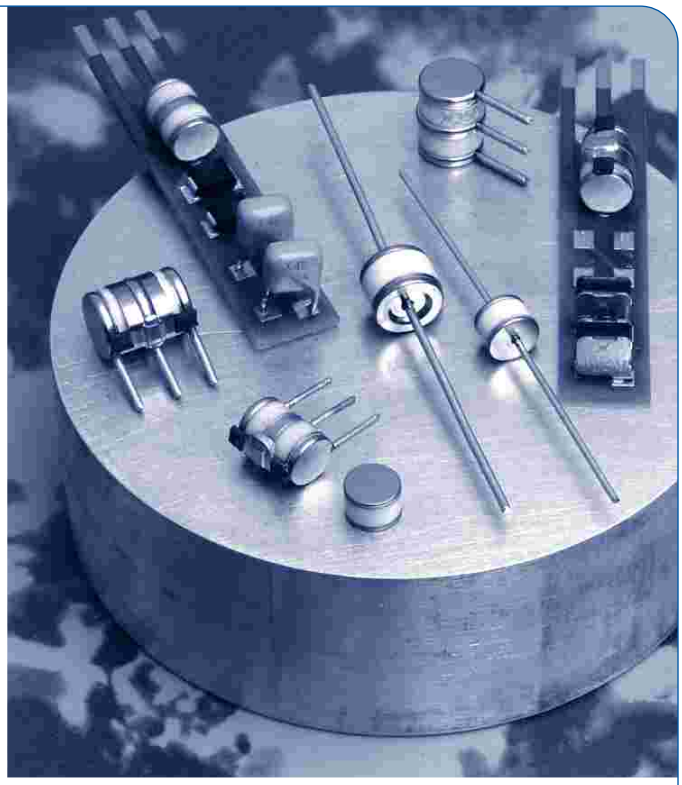
Gas Discharge Tubes

Raychem Circuit Protection continues to expand its overvoltage circuit protection product with the addition of GDTs (ceramic gas discharge tubes), which are targeted for telecom equipment and surge protection module designers, compliance engineers, and design engineers.

GDTs are commonly used to help protect sensitive telecom equipment such as power lines, communication lines, signal lines and data transmission lines from damage caused by transient surge voltages that typically result from lightning strikes and equipment switching operations. GDTs are placed in front of, and in parallel with, the sensitive equipment acting as a high impedance component while not influencing the signal in normal operation. 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. Due to their low capacitance, the GDTs introduce much less signal distortion than other overvoltage protection technologies.

Raychem Circuit Protection GDTs offer a higher level of protection, compared with typical GDTs, due to their fast and accurate break-over voltage, making 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. Raychem Circuit Protection GDTs, when used with Raychem Circuit Protection's PolySwitch™ resettable devices, SiBar™ devices, (Thyristor surge protection devices) and ROV devices (Metal Oxide Varistors), can help equipment meet the most stringent 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, pase stations
- Industrial and consumer electronics, such as
  - Power supplies
  - Surge protectors
  - Alarm system

Figure G1 - Two electrode devices for ungrounded circuits

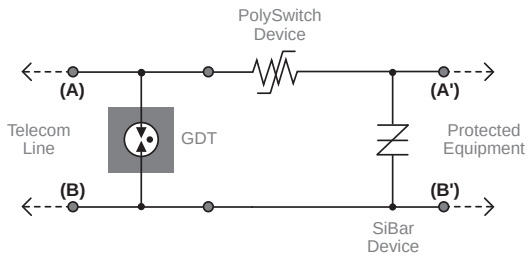


Figure G2 - Three electrode devices for grounded circuits

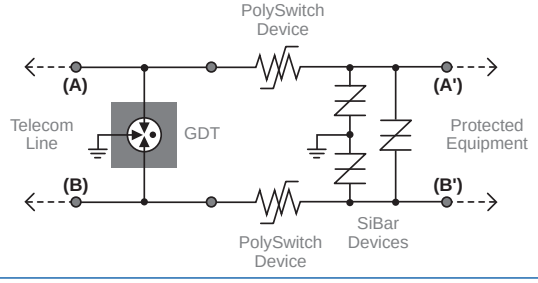
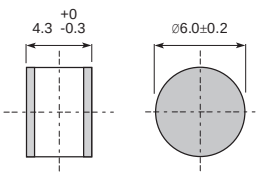


Table G1 - Two Electrode Configurations for Gas Discharge Tubes

GTCx26 Miniature Two Electrode Series

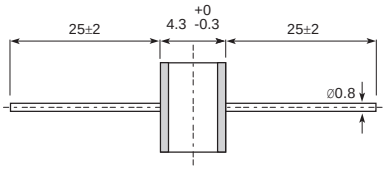
Symbol:

Figure 1: without leads



Body : Nickel Plated
Units : mm

Figure 2: with leads



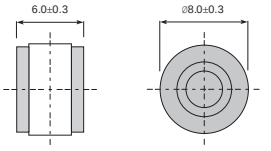
Body : Nickel Plated
Leads : Tin Plated
Units : mm

Part Number	DC Sparkover Voltage @ 100V/s	Impulse Sparkover Voltage @ 100V/µs	Impulse Sparkover Voltage @ 1kV/µs	Insulation Resistance @ 100V	Capacitance @ 1MHz	DC Holdover Voltage Per ITU K.12	Impulse Life 10/1000µs, 50A	Impulse Discharge Current 8/20µs Single	Impulse Discharge Current 8/20µs Repeat 10 times (5 times each polarity)	AC Discharge Current, 50Hz Single Hit, 9 Cycles	AC Discharge Current, 50Hz 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

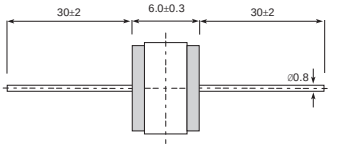
Symbol:

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 @ 100V/s	Impulse Sparkover Voltage @ 100V/µs	Impulse Sparkover Voltage @ 1kV/µs	Insulation Resistance @ 100V	Capacitance @ 1MHz	DC Holdover Voltage Per ITU K.12	Impulse Life 10/1000µs, 50A	Impulse Discharge Current 8/20µs Single Hit	Impulse Discharge Current 8/20µs Repeat 10 times (5 times each polarity)	AC Discharge Current, 50Hz Single Hit, 9 Cycles	AC Discharge Current, 50Hz 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 $50V_{DC}$

† Insulation Resistance measured at $250V_{DC}$

UL497B File # E179610

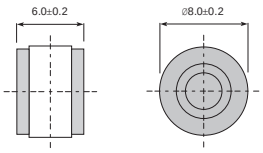
RoHS compliant, ELV compliant

Table G2 - Two Electrode Configurations for Gas Discharge Tubes

GTCx28-xxxx-P15 High Surge Two Electrode Series

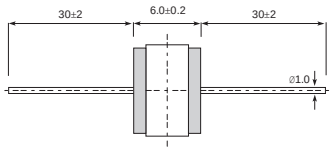
Symbol:

Figure 1: without leads



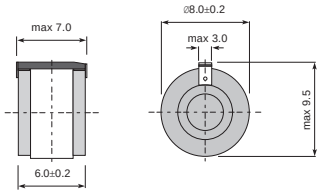
Body : Nickel Plated
Units : mm

Figure 2: with leads



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Figure 3: with fail-short mechanism



Fail-Short Operation Time@ 25°C:
50HZ 0.7A: 210s
2.0A: 60s
7.0A: < 6s

Body : Nickel Plated
Units : mm

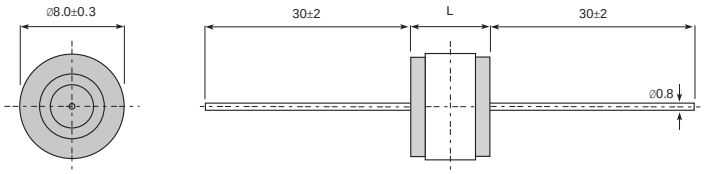
Part Number	DC Sparkover Voltage @ 100V/s	Impulse Sparkover Voltage @ 100V/µs	Impulse Sparkover Voltage @ 1kV/µs	Insulation Resistance @ 100V_{DC}	Capacitance @ 1MHz	DC Holdover Voltage Per ITU K.12	Impulse Life 10/1000µs, 100A	Impulse Discharge Current 8/20µs Single Hit	Impulse Discharge Current 8/20µs Repeat 10 times (5 times each polarity)	AC Discharge Current, 50Hz Single, 9 Cycles	AC Discharge Current, 50Hz Repeat 10 times (1s interval)
GTCN28-900M-P15 GTCA28-900M-P15	72 – 108 V	≤ 450V	≤ 500V	≥ 10,000MΩ*	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-151M-P15 GTCA28-151M-P15	120 – 180V	≤ 500V	≤ 600V	≥ 10,000MΩ*	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-231M-P15 †GTCN28-231M-P15-FS GTCA28-231M-P15	184 – 280V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 1.5pF ≤ 3.5pF ≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-251M-P15 GTCA28-251M-P15	200 – 300V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A
GTCN28-351M-P15 GTCA28-351M-P15	280 – 420V	≤ 700V	≤ 800V	≥ 10,000MΩ	≤ 1.5pF	≤ 52V	300 times	20kA	15kA	90A	20A

* Insulation Resistance measured at 500V_{DC}
† FS device is also available in RoHS compliant versions

GTCA28-xxxx-P0x High Voltage Two Electrode Series

Symbol:

Figure 1: without leads



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Part Number	DC Sparkover Voltage @ 100V/s	Impulse Sparkover Voltage @ 100V/µs	Insulation Resistance @ 1000V_{DC}	Capacitance @ 1MHz	Impulse Life 10/1000µs, 500A	Impulse Discharge Current 8/20µs Single Hit	Impulse Discharge Current 8/20µs Repeat 10 times (5 times each polarity)	AC Discharge Current, 50Hz Single, 9 Cycles	AC Discharge Current, 50Hz Repeat 10 times (1s interval)	Dimension L 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
†††GTCA28-312M-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

‡ Insulation Resistance measured at 250V_{DC}
** Insulation Resistance measured at 500V_{DC}
†† DC Sparkover Voltage measured at 5kV/s
‡‡ Measured with 8/20µs,100A impulse.

Note: *** GTCA28-272L-P03
UL1414: File# E223034
††† GTCA28-312M-P03
UL414Y2: File# E223034
Measured with 1KV/µs

RoHS compliant, ELV compliant

Table G3 - Three Electrode Configurations for Gas Discharge Tubes

GTCx36 Miniature Three Electrode Series

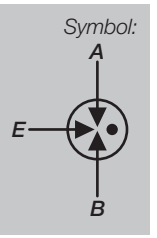
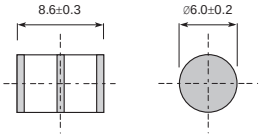
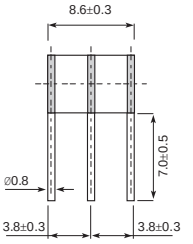


Figure 1: without leads



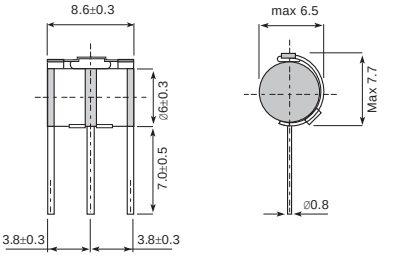
Body : Nickel Plated
Units : mm

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

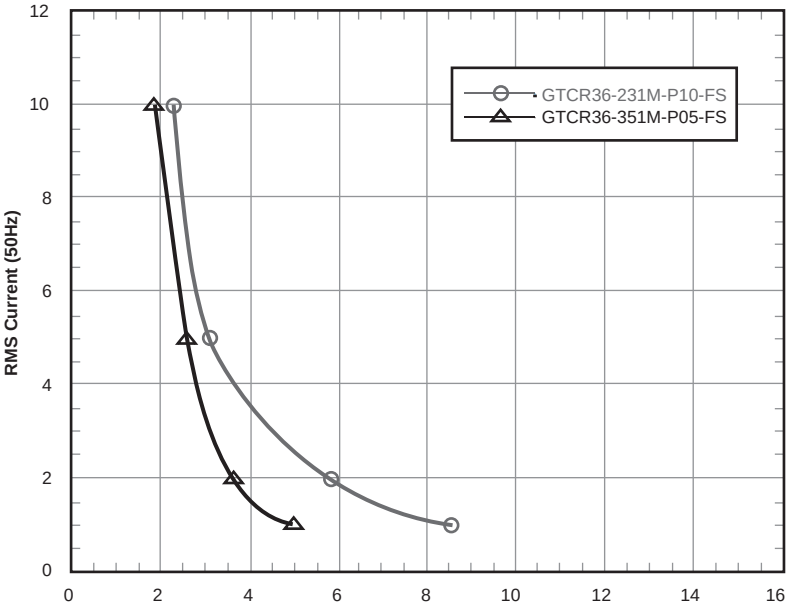
Part Number	DC Sparkover Voltage (A-E) (B-E) @ 100V/s	Impulse Sparkover Voltage (A-E) (B-E) @ 100/µs	Impulse Sparkover Voltage (A-E) (B-E) @ 1kV/µs	Insulation Resistance @ 100V	Capacitance Per @ 1MHz	DC Holdover Voltage ITU K.12	Impulse Life (A+B-E) Repeat 10 times 10/1000µs, 100A	Impulse Discharge Current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

* Insulation Resistance measured at $50V_{DC}$

† FS device is also available in RoHS compliant versions

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.

RoHS compliant, ELV compliant

Table G4 - Three Electrode Configurations for Gas Discharge Tubes

GTCx37 Three Electrode 7.5mm Diameter Series

Symbol:

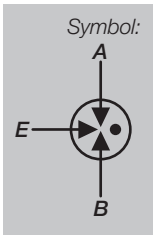
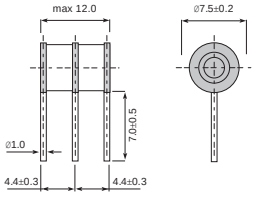
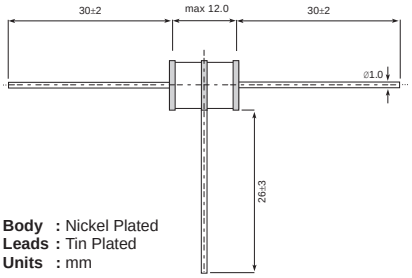


Figure 1: with radial leads



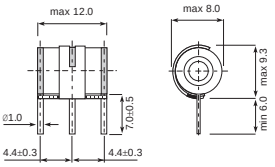
Body : Nickel Plated
Leads : Tin Plated
Units : mm

Figure 2: with T-shape leads



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Figure 3: with fail-short mechanism

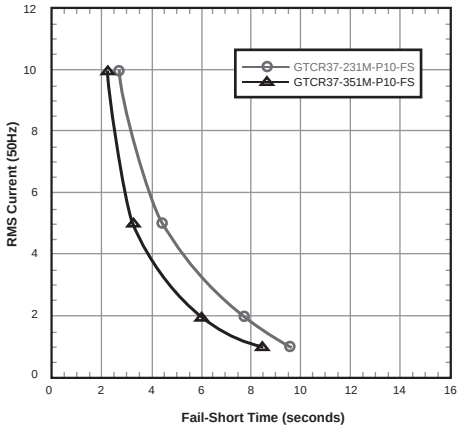


Body : Nickel Plated
Leads : Tin Plated
Units : mm

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

* Insulation Resistance measured at $50V_{DC}$
† FS device is also available in RoHS compliant versions
‡ 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.

RoHS compliant, ELV compliant

Table G5 - Three Electrode Configurations for Gas Discharge Tubes

GTCx38 Three Electrode P Series

Symbol:

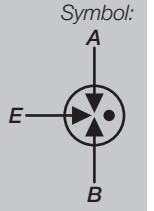
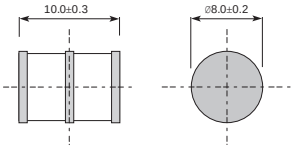
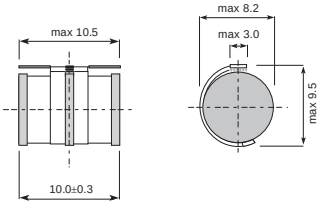


Figure 1: without leads



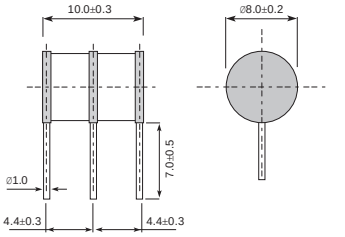
Body : Nickel Plated
Units : mm

Figure 2: without leads with fail-short mechanism



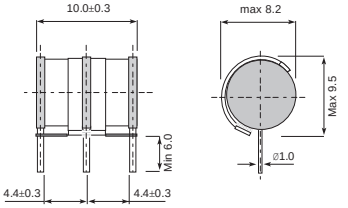
Body : Nickel Plated
Units : mm

Figure 3: with leads



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Figure 4: with leads and fall-short mechanism

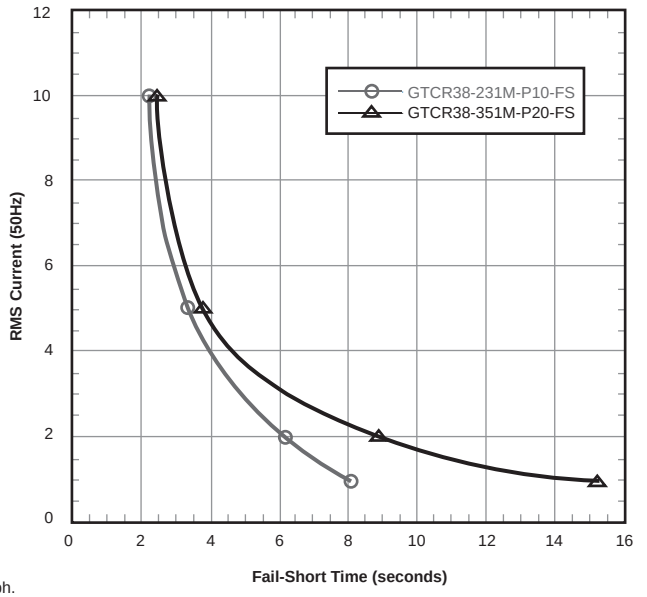


Body : Nickel Plated
Leads : Tin Plated
Units : mm

Part Number	DC Sparkover Voltage (A-E) (B-E) @ 100V/s	Impulse Sparkover Voltage (A-E) (B-E) @ 1kV/µs	Insulation Resistance @ 100V	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)
†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 †GTCR38-351M-P20-FS	280 - 420V	≤ 900V	≥ 10,000MΩ	≤ 3.0pF	≤ 80V	300 times	20kA	20A

† FS device is also available in RoHS compliant versions

Figure G5 - Typical Fail-short Performance for GTCx38 Series



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

RoHS compliant, ELV compliant

Table G6 - Three Electrode Configurations for Gas Discharge Tubes

GTCx38 Three Electrode Q Series

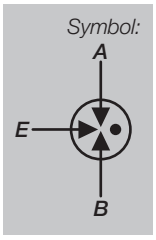
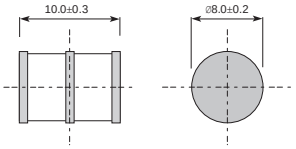
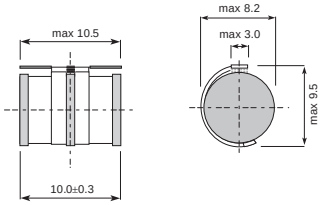


Figure 1: without leads



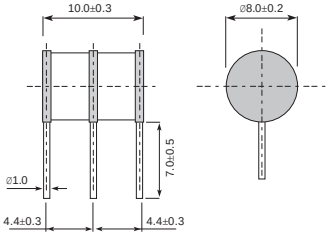
Body : Nickel Plated
Units : mm

Figure 2: without leads with fail-short mechanism



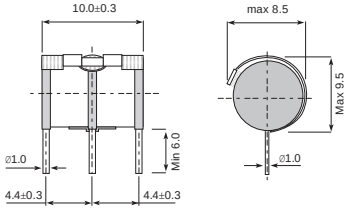
Body : Nickel Plated
Units : mm

Figure 3: with leads



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Figure 4: with leads and fail-short mechanism



Body : Nickel Plated
Leads : Tin Plated
Units : mm

Part Number	DC Sparkover Voltage (A-E) (B-E) @ 100V/s	Impulse Sparkover Voltage (A-E) (B-E) @ 100V/µs	Impulse Sparkover Voltage (A-E) (B-E) @ 1kV/µs	Insulation Resistance @ 100V_{DC}	Capacitance Per @ 1MHz	DC Holdover Voltage 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)*
GTCN38-900M-Q10 †GTCN38-900M-Q10-FS GTCR38-900M-Q10 †GTCR38-900M-Q10-FS	72-108V	≤ 450V	≤ 500V	≥ 10,000MΩ	≤ 3.0pF	≤ 52V	300 times	10kA	10A
GTCN38-151M-Q10 †GTCN38-151M-Q10-FS GTCR38-151M-Q10 †GTCR38-151M-Q10-FS	120-180V	≤ 500V	≤ 600V	≥ 10,000MΩ	≤ 3.0pF	≤ 52V	300 times	10kA	10A
GTCN38-231M-Q10 †GTCN38-231M-Q10-FS GTCR38-231M-Q10 †GTCR38-231M-Q10-FS	184-280V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCN38-251M-Q10 †GTCN38-251M-Q10-FS GTCR38-251M-Q10 †GTCR38-251M-Q10-FS	200-300V	≤ 600V	≤ 700V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCN38-351M-Q10 †GTCN38-351M-Q10-FS GTCR38-351M-Q10 †GTCR38-351M-Q10-FS	280-420V	≤ 900V	≤ 900V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCN38-421M-Q10 †GTCN38-421M-Q10-FS GTCR38-421M-Q10 †GTCR38-421M-Q10-FS	300-500V	≤ 900V	≤ 1000V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A
GTCN38-501M-Q10 †GTCN38-501M-Q10-FS GTCR38-501M-Q10 †GTCR38-501M-Q10-FS	400-600V	≤ 1100V	≤ 1200V	≥ 10,000MΩ	≤ 3.0pF	≤ 135V	300 times	10kA	10A

* For typical fail-short performance refer to Figure G5

† FS device is also available in RoHS compliant versions

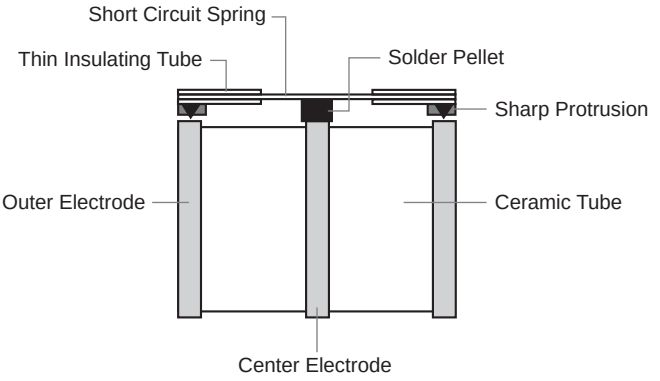
UL497B File # E179610

RoHS compliant, ELV compliant

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

- B = Bulk (packaged in bags), only available upon request (no -B at the end means: packaged in Trays)
- 05 = Surge rating: 8x20µs 5kA 10 times
- P = Product Family Designator
- M = Tolerance of 20% on DC Switch Voltage
- 351 = DC Switch Voltage of 350V (at 100V/s)
- 6 = 6mm diameter
- 2 = 2 electrode device
- Lead Configuration
  - N = No leads
  - A = Axial Leads
- C = Ceramic
- GT = Gas Tube

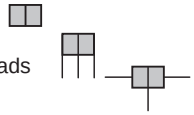
Part Numbering System for Gas Discharge Tubes ... Cont'd

Three Electrode GDT

Example Part Number: GTCR38-231M-P10-FS:

GT C R 3 8 - 231 M - P 10 - FS

- FS = with Fail-Short mechanism
- 10 = Surge rating: 8x20µs 10kA 10 times
- P = Product Family Designator
- M = Tolerance of 20% on DC Switch Voltage
- 231 = DC Switch Voltage of 230V (at 100V/s)
- 8 = 8mm diameter
- 3 = 3 electrode device
- Lead Configuration
  - N = No leads
  - A = Axial Leads
  - T = T-shape Leads



- C = Ceramic
- GT = Gas Tube

Marking Reference Guide

Example

35 P15 GN

- GN = Year and Week of Manufacture (G = first half of 2004,
  N = Week 14) per Raychem Circuit Protection lot number system
- P15 = Product Family + Surge current 15kA (8x20µs 10hits)
- 35 = Voltage Designator (35 = 350V)
- = Raychem Symbol

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.