

# Gas Discharge Tube Three Electrode Q Series

Overvoltage Protection Device

Raychem Circuit Protection Products

PRODUCT: GTCx38-xxxx-Q10

DOCUMENT: SCD 25913  
REV LETTER: C  
REV DATE: MAY 25, 2007  
PAGE NO.: 1 OF 7

**Specification Status: Released**

## GENERAL DESCRIPTION

### 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

- Crowbar device with low arc-voltage
- Low capacitance and insertion loss
- High accuracy spark-over voltages for high precision designs
- Tested per ITU K.12 recommendations
- Optional Fail-Short mechanism
- Non-radioactive materials

## APPLICATIONS

- Telecommunications:
  - MDF modules, xDSL equipment, RF system protection
- Industrial Electronics and Commercial Electronics, such as
  - Power Supplies, Surge Protectors, Alarm systems

## MATERIALS INFORMATION

**ROHS Compliant**  
Devices without Fail-Short

Directive 2002/95/EC  
Compliant

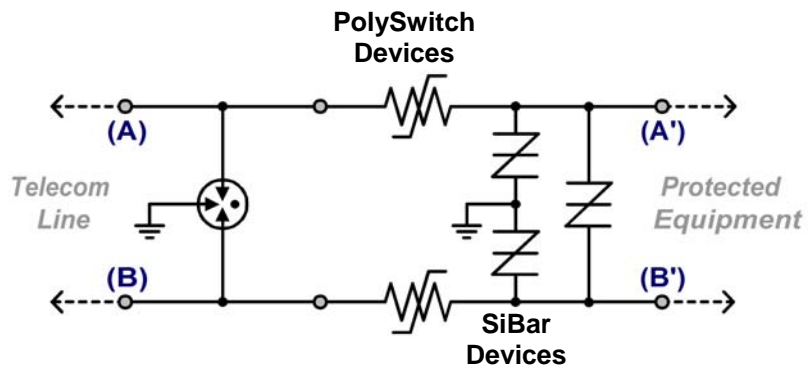
**ELV Compliant**  
Devices with Fail-Short "-FS"

Directive 2000/53/EC  
Compliant

## SYMBOL



## TYPICAL APPLICATION SCHEMATIC



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**Overvoltage Protection Device**

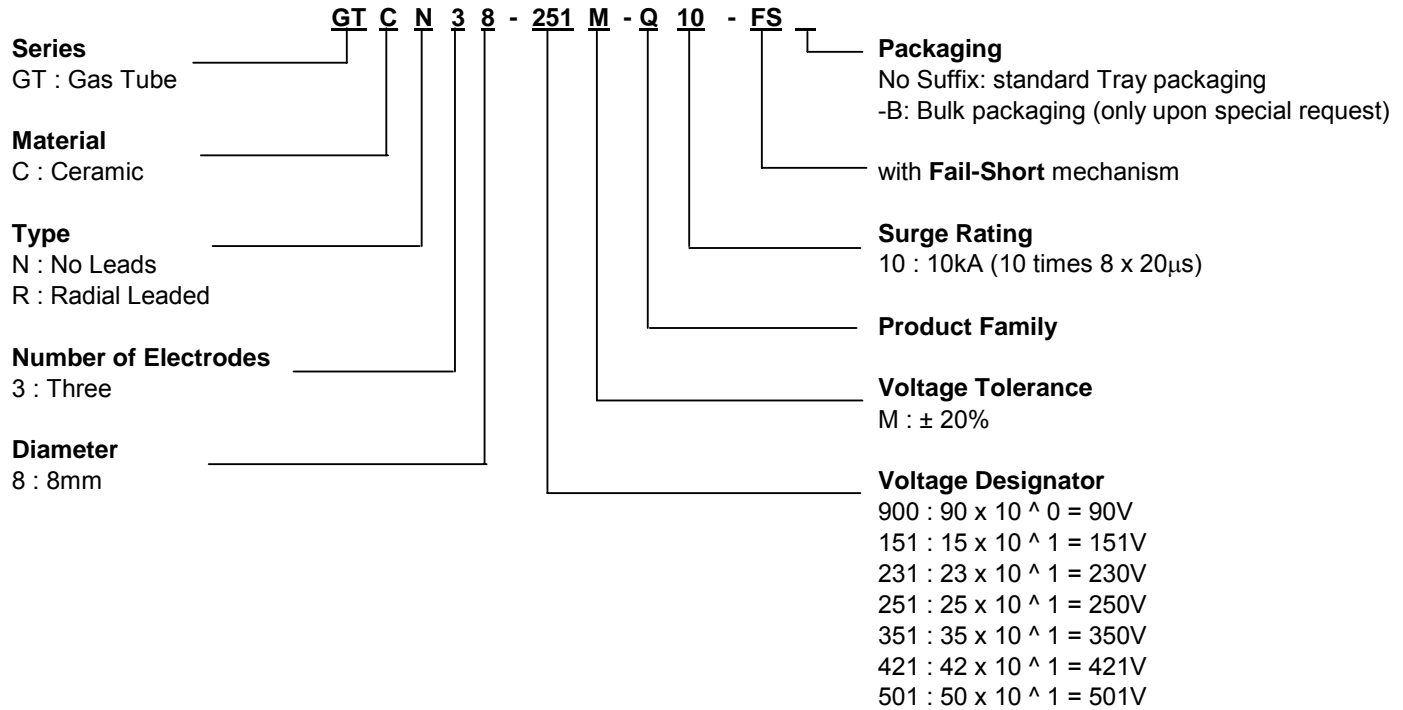
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REV LETTER: C  
REV DATE: MAY 25, 2007  
PAGE NO.: 2 OF 7

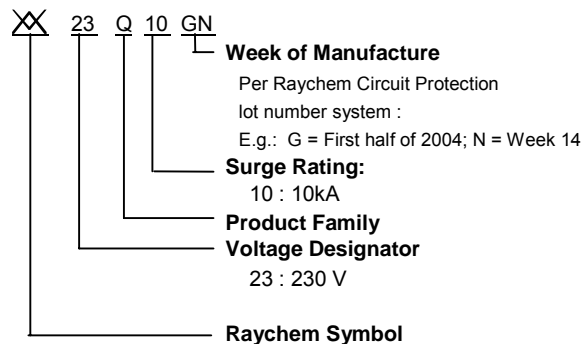
## PART NUMBERING

### EXAMPLE:



## DEVICE MARKING

### EXAMPLE : GTCR38-231M-Q10



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**GENERAL CHARACTERISTICS**

No Radioactive Material

Storage temperature:

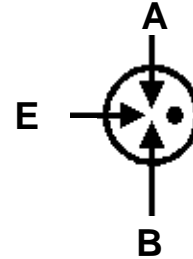
Devices without Fail-Short Mechanism: -40°C ... +90°C  
Devices with Fail-Short Mechanism: -20°C ... +65°C

Operating temperature:

Devices without Fail-Short Mechanism: -40°C ... +90°C  
Devices with Fail-Short Mechanism: -20°C ... +65°C

Body: Nickel Plated

Leads: Tin Plated



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REV DATE: MAY 25, 2007  
PAGE NO.: 4 OF 7

### DEVICE RATINGS AND CHARACTERISTICS

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 8/20 $\mu$ s (A + B - E)	AC Discharge Current, 50Hz (A + B - E)
	@ 100V/s	@ 100V/ $\mu$ s	@ 1kV/ $\mu$ s	@ 100V <sub>DC</sub>	@ 1MHz	Per ITU K.12	10/1000 $\mu$ s, 200A	Repeat 10 times (5 times each polarity)	Repeat 5 times (1s interval)
GTCN38-900M-Q10 GTCN38-900M-Q10-FS GTCR38-900M-Q10 GTCR38-900M-Q10-FS	72-108	$\leq 450$	$\leq 500V$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 52V$	300 times	10kA	10A
GTCN38-151M-Q10 GTCN38-151M-Q10-FS GTCR38-151M-Q10 GTCR38-151M-Q10-FS	120 - 180	$\leq 500$	$\leq 600$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 52V$	300 times	10kA	10A
GTCN38-231M-Q10 GTCN38-231M-Q10-FS GTCR38-231M-Q10 GTCR38-231M-Q10-FS	184 - 280V	$\leq 600$	$\leq 700V$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 135V$	300 times	10kA	10A
GTCN38-251M-Q10 GTCN38-251M-Q10-FS GTCR38-251M-Q10 GTCR38-251M-Q10-FS	200 - 300V	$\leq 600$	$\leq 700V$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 135V$	300 times	10kA	10A
GTCN38-351M-Q10 GTCN38-351M-Q10-FS GTCR38-351M-Q10 GTCR38-351M-Q10-FS	280 - 420V	$\leq 900$	$\leq 900V$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 135V$	300 times	10kA	10A
GTCN38-421M-Q10 GTCN38-421M-Q10-FS GTCR38-421M-Q10 GTCR38-421M-Q10-FS	300 - 500	$\leq 900$	$\leq 1000$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 135V$	300 times	10kA	10A
GTCN38-501M-Q10 GTCN38-501M-Q10-FS GTCR38-501M-Q10 GTCR38-501M-Q10-FS	400 - 600	$\leq 1100$	$\leq 1200$	$\geq 10,000M\Omega$	$\leq 3.0pF$	$\leq 135V$	300 times	10kA	10A

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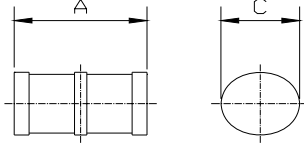
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REV LETTER: C  
REV DATE: MAY 25, 2007  
PAGE NO.: 5 OF 7

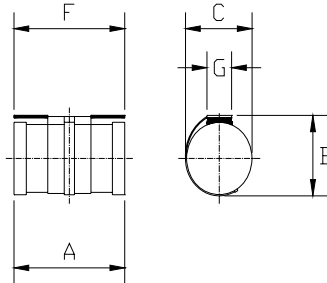
## DIMENSIONS

No Leads, no Fail-Short mechanism  
(GTCN38-xxxx-Q10)



		A		C	
		MIN	MAX	MIN	MAX
mm:		9.7	10.3	7.8	8.2
in*:		0.38	0.41	0.31	0.32

No Leads, with Fail-Short mechanism  
(GTCN38-xxxx-10-FS)



		A		B		C		F		G	
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
mm:		9.7	10.3	--	9.5	--	8.2	--	10.5	--	3.0
in*:		0.38	0.41	--	0.37	--	0.32	--	0.41	--	0.12

- Rounded off approximation

\* R

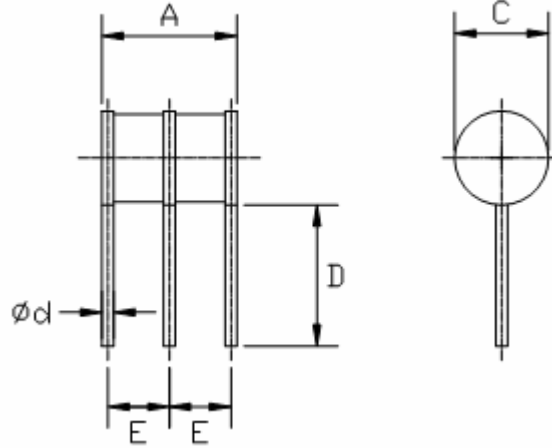
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PAGE NO.: 6 OF 7

Radial Leads, no Fail-Short mechanism  
(GTCR38-xxxx-Q10)

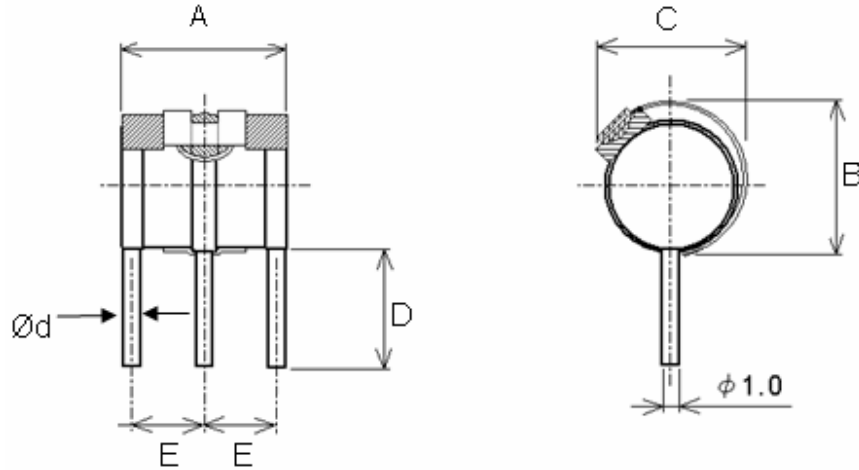


mm:  
in\*:

A		C		D		E		Ød
MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	NOM
9.7	10.3	7.8	8.2	6.5	7.5	4.1	4.7	1.0
0.38	0.41	0.31	0.32	0.26	0.30	0.16	0.19	0.04

\* Rounded off approximation

Radial Leads, with Fail-Short mechanism  
(GTCR38-xxxxQ10-FS)



mm:  
in\*:

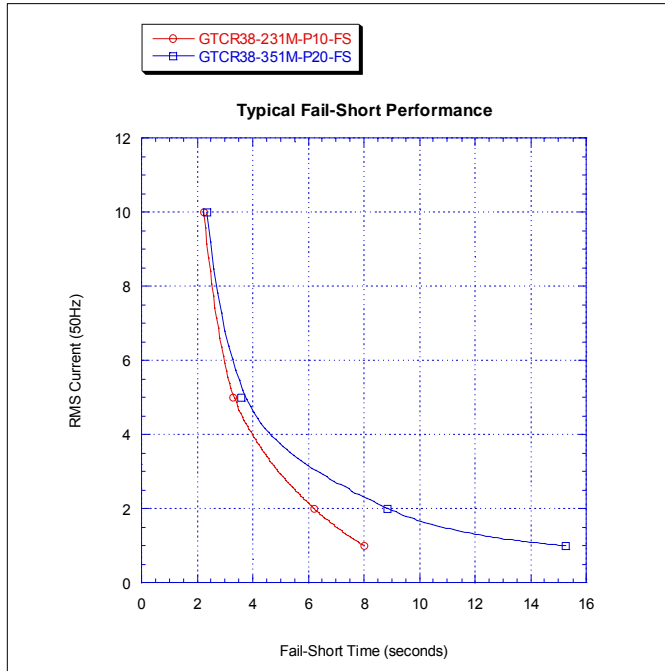
A		B		C		D		E		Ød
MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	NOM
9.7	10.3	--	9.5	--	8.5	6.0	--	4.1	4.7	1.0
0.38	0.41	--	0.37	--	0.34	0.24	--	0.16	0.19	0.04

\* Rounded off approximation

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**FAIL-SHORT MECHANISM RESPONSE TIME** (Graph represents typical values)



**Note: Both electrodes simultaneously powered, each with the AC current value in the graph**

**PACKAGING**

Packaging	Bulk* ( vacuum bags)	Tray	Standard Box
Quantity	200	100	1,000**

\* Standard packaging is in trays.  
Bulk packaging is only available upon request.

\*\* 5 bags or 10 trays

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