

## 3-Electrode Gas Discharge Tube (GDT)

### QX3E8 Series

#### Description

Gas discharge Tubes (GDT) are classical components for protecting the installations of the telecommunications. It is essential that IT and telecommunications systems -with their high-grade but sensitive electronic circuits - be protected by arresters. They are thus fitted at the input of the power supply system together with varistors and at the connection points to telecommunication lines. They have become equally indispensable for protecting base stations in mobile telephone systems as well as extensive cable television (CATV) networks with their repeaters and distribution systems.

These protective components are also indispensable in other sectors, In AC power transmission systems, they are often used with current-limiting varistors, In customer premises equipment such as DSL modems, WLAN routers, TV sets and cable modems In air-conditioning equipment, the integral black-box concept offers graduated protection by combining arresters with varistors, PTC, diodes and inductor.

#### Features

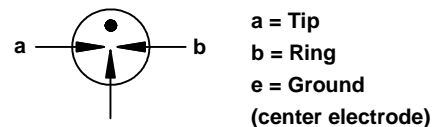
- u Non-Radioactive
- u RoHS compliant
- u Low insertion loss
- u Excellent response to fast rising transients
- u Ultra low capacitance
- u 20KA surge capability tested with 8/20µs pulse as defined by IEC 61000-4-5
- u Available with thermal failsafe option (add 'F' suffix to part number)

#### Applications

- u Communication equipment
- u CATV equipment
- u Test equipment
- u Data lines
- u Power supplies
- u Telecom SLIC protection
- u Broadband equipment
- u ADSL equipment, including ADSL2+
- u XDSL equipment
- u Satellite and CATV equipment
- u Consumer electronics



#### Schematic Symbol



#### Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E466847

#### Product Characteristics

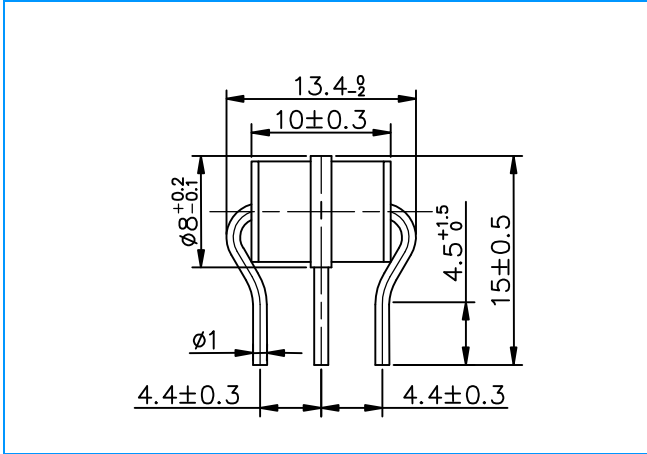
<b>Materials</b>	Nickel-plated with Tinplated wires	
<b>Product Marking</b>	<b>XXXH</b> XXX -Nominal voltage H -20KA	
<b>Glow to Arc Transition Current</b>	~1 Amps	
<b>Glow Voltage</b>	~70 Volts	
<b>Storage and Operational Temperature</b>	-40 to +90°C	
<b>Weight</b>	<b>QX3E8-XXXHM</b>	~2.0g
	<b>QX3E8-XXXHMF</b>	~2.3g
	<b>QX3E8-XXXHP</b>	~2.1g
	<b>QX3E8-XXXH</b>	~1.8g

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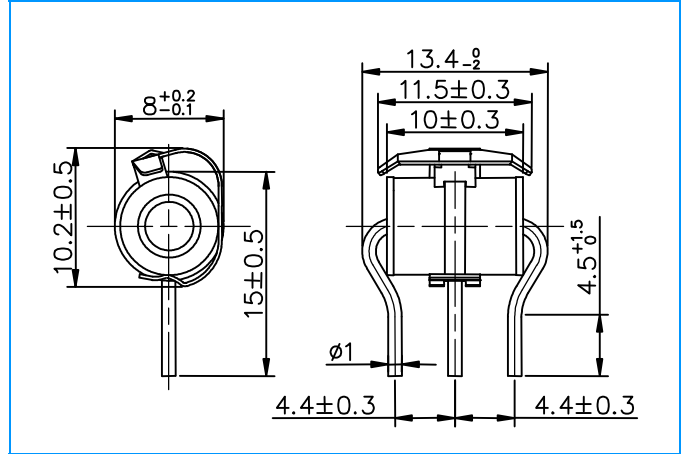
#### QX3E8 Series

#### Dimensions (Unit: mm)

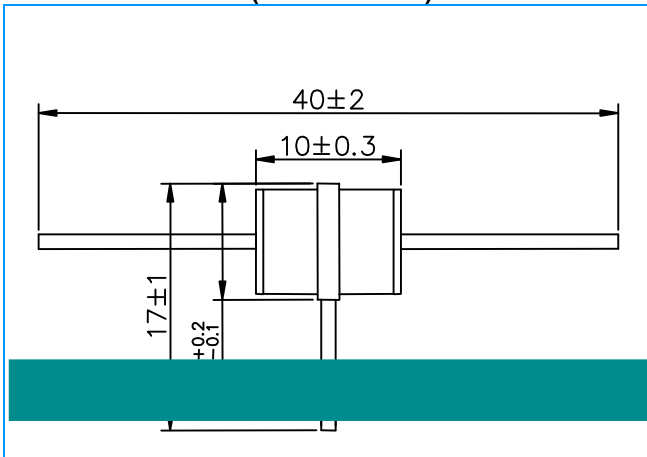
Radial Leaded Devices (QX3E8-XXXHM)



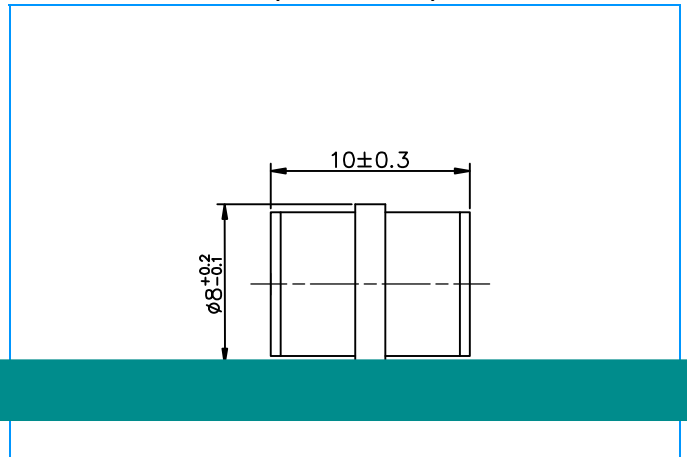
Radial Leaded Devices with Fail-Safe (QX3E8-XXXHMF)



"T" Leaded Devices (QX3E8-XXXHP)



Without wire Devices (QX3E8-XXXH)



#### Electrical Characteristics

Part Number	Marking	DC Spark-over Voltage	Maximum Impulse Spark-over Voltage		Minimum Insulation Resistance	Maximum Capacitance	Arc Voltage	Service Life			
			@100V/μs	@1KV/μs				Nominal Impulse Discharge Current	Max Impulse Discharge	Nominal Alternating Discharge Current	Impulse Life
QX3E8-75HM QX3E8-75HMF QX3E8-75HP QX3E8-75H	75H	75V±20%	500V	600V	1 GΩ (at 25V)	1.5pF	~15V	20KA	25KA	20A	200A
QX3E8-90HM QX3E8-90HMF QX3E8-90HP QX3E8-90H	90H	90V±20%	500V	600V	1 GΩ (at 50V)	1.5pF	~15V	20KA	25KA	20A	200A

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#### Electrical Characteristics

Part Number	Marking	DC Spark-over Voltage	Maximum Impulse Spark-over Voltage		Minimum Insulation Resistance	Maximum Capacitance	Arc Voltage	Service Life			
								Nominal Impulse Discharge Current	Max Impulse Discharge Current	Nominal Alternating Discharge Current	Impulse Life
								@8/20 $\mu$ s <sup>4)</sup> ±5 times	@8/20 $\mu$ s <sup>4)</sup> 1 time	@50Hz <sup>4)</sup> 1 Sec 10 times	@10/1000 $\mu$ s <sup>4)</sup> 300 times
		@100V/S	@100V/ $\mu$ s	@1KV/ $\mu$ s		@1MHz	@1A				
QX3E8-150HM QX3E8-150HMF QX3E8-150HP QX3E8-150H	150H	150V±20%	500V	600V	1 G $\Omega$ (at 50V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-230HM QX3E8-230HMF QX3E8-230HP QX3E8-230H	230H	230V±20%	600V	700V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-250HM QX3E8-250HMF QX3E8-250HP QX3E8-250H	250H	250V±20%	600V	700V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-300HM QX3E8-300HMF QX3E8-300HP QX3E8-300H	300H	300V±20%	800V	900V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-350HM QX3E8-350HMF QX3E8-350HP QX3E8-350H	350H	350V±20%	800V	900V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-420HM QX3E8-420HMF QX3E8-420HP QX3E8-420H	420H	420V±20%	900V	1000V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-470HM QX3E8-470HMF QX3E8-470HP QX3E8-470H	470H	470V±20%	900V	1000V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-600HM QX3E8-600HMF QX3E8-600HP QX3E8-600H	600H	600V±20%	1100V	1200V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A
QX3E8-800HM QX3E8-800HMF QX3E8-800HP QX3E8-800H	800H	800V±20%	1200V	1400V	1 G $\Omega$ (at 100V)	1.5pF	~25V	20KA	25KA	20A	200A

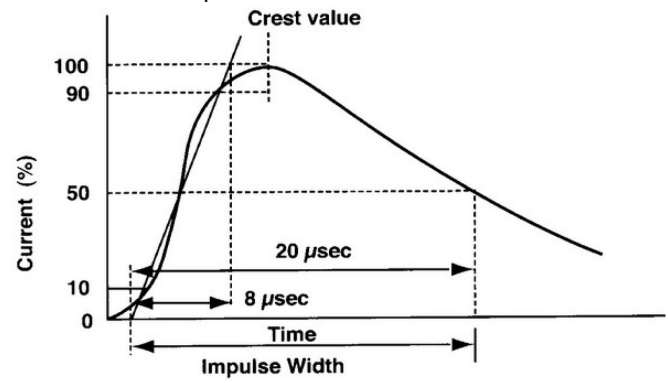
**Notes:**

- 1). Terms in accordance with ITU-T K.12 and GB/T 9043-2008
- 2). At delivery AQL 0.65 level II, DIN ISO 2859
- 3). Tip or ring electrode to center electrode
- 4). Total current through center electrode, half value through tip respectively ring electrode

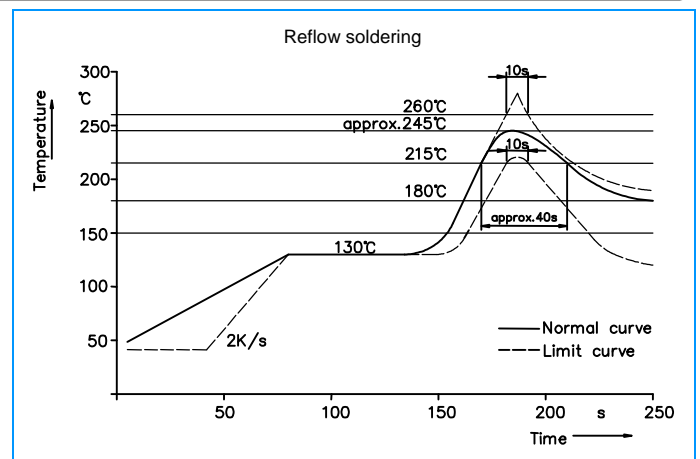
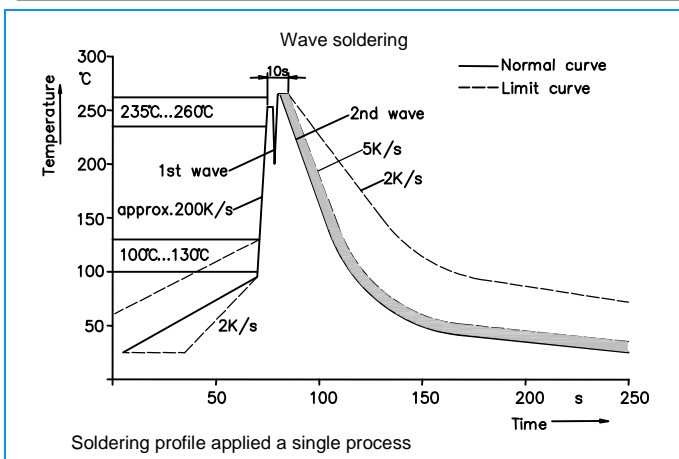
### 3-Electrode Gas Discharge Tube (GDT)

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#### Electrical Rating

Item	Test Condition / Description	Requirement
<b>DC Spark-over Voltage</b>	The voltage is measured with a slowly rate of rise $dv / dt=100V/s$	To meet the specified value
<b>Impulse Spark-over Voltage</b>	The maximum impulse spark-over voltage is measured with a rise time of $dv / dt=100V/\mu s$ or $1KV/\mu s$	
<b>Insulation Resistance</b>	The resistance of gas tube shall be measured each terminal each other terminal, please see above spec.	
<b>Capacitance</b>	The capacitance of gas tube shall be measured each terminal to each other terminal. Test frequency :1MHz	
<b>Nominal Impulse Discharge Current</b>	The maximum current applying a waveform of 8/20 $\mu s$ that can be applied across the terminals of the gas tube. One hour after the test is completed, re-testing of the DC spark-over voltage does not exceed $\pm 30\%$ of the nominal DC spark-over voltage. Dwell time between pulses is 3 minutes. 	
<b>Nominal Alternating Discharge Current</b>	Rated RMS value of AC current at 50Hz, 1 sec. 10 times. Intervals: 3min. The DC spark-over voltage does not exceed $\pm 30\%$ of the nominal DC spark-over voltage. $IR > 10^8 ohms$ .	

#### Recommended soldering profile



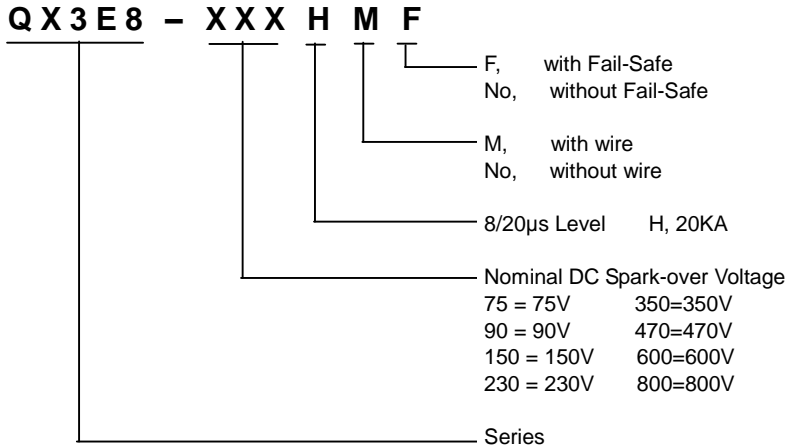
#### Soldering Parameters - Hand Soldering

Solder Iron Temperature: 350°C  $\pm 5^\circ C$   
Heating Time: 5 seconds max.

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#### Part Numbering

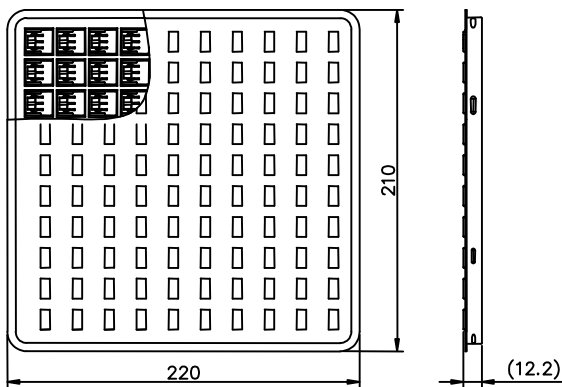


#### Packaging

Part Number	Description	Quantity
QX3E8-XXXHM	100PCS per Tray, 10 Trays / Inner Carton	1000
QX3E8-XXXHMF	100PCS per Tray, 10 Trays / Inner Carton	1000
QX3E8-XXXHP	50PCS per Tray, 10 Trays / Inner Carton	500
QX3E8-XXXH	100PCS per Tray, 10 Trays / Inner Carton	1000

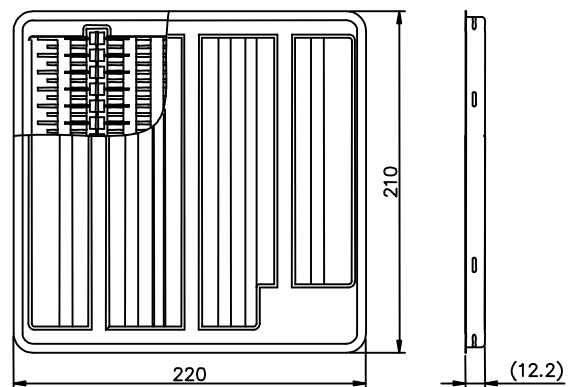
#### Tray Dimension (Unit: mm)

Used in QX3E8-XXXHM, QX3E8-XXXHMF, QX3E8-XXXH



#### Tray Dimension (Unit: mm)

Used in QX3E8-XXXHP



#### Cautions and warnings

- ⚠ Gas discharge tubes (GDT) must not be operated directly in power supply networks.
- ⚠ Gas discharge tubes (GDT) may become hot in case of longer periods of current stress (danger of burning).
- ⚠ Gas discharge tubes (GDT) may be used only within their specified values. In the event of overload, the head contacts may fail or the component may be destroyed.
- ⚠ Damaged Gas discharge tubes (GDT) must not be re-used.