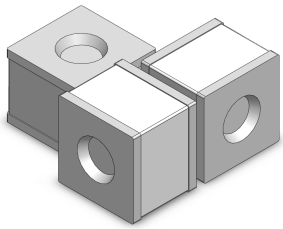
Surface Mount 2-Electrode Gas Discharge Tube (GDT)

QX2E5-SMD Series

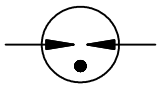
Description

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.



Schematic Symbol



Agency Approvals

- Non-Radioactive
- RoHS compliant
- Low insertion loss
- Excellent response to fast rising transients
- Ultra low capacitance
- 5KA surge capability tested with 8/20μs pulse as defined by IEC 61000-4-5

Applications

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

Product Characteristics

Materials	Dull Tin-plated
Product Marking	Without
Glow to Arc Transition Current	< 0.5 Amps
Glow Voltage	~60 Volts
Storage and Operational Temperature	-40 to +90°C
Weight	~0.5g

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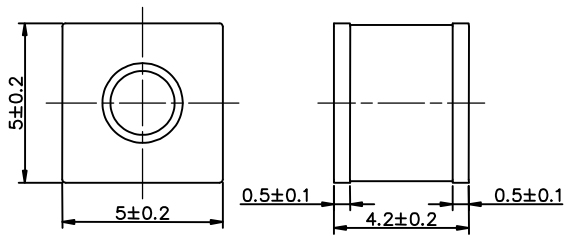
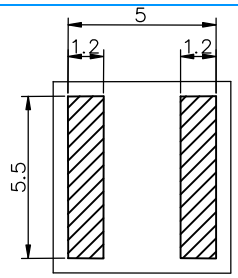
Device Dimensions (Unit: mm)





Recommended pad outline

Electrical Characteristics

Part Number	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
	@100V/S	@100V/μs	@1KV/μs		@1MHz	@1A	@8/20μs ±5 times	@8/20μs 1 time	@50Hz 1 Sec 10 times	@10/1000μs 300Times
QX2E5-90LSMD	90±20%	500V	650V	1GΩ (at 50V)	1.0pF	~15V	5KA	10KA	5A	100A
QX2E5-150LSMD	150±20%	500V	650V	1GΩ (at 50V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-200LSMD	200±20%	500V	650V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-230LSMD	230±20%	600V	700V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-300LSMD	300±20%	700V	800V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-350LSMD	350±20%	700V	800V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-400LSMD	400±20%	800V	950V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-470LSMD	470±20%	900V	1000V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-600LSMD	600±20%	1100V	1200V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-800LSMD	800±20%	1200V	1400V	1GΩ (at 100V)	1.0pF	~20V	5KA	10KA	5A	100A
QX2E5-1000LSMD	1000±20%	1600V	1800V	1GΩ (at 100V)	0.8pF	~15V	3KA	4KA	3A	100A
QX2E5-1500LSMD	1500±20%	2300V	2500V	1GΩ (at 100V)	0.8pF	~15V	2KA	3KA	2A	100A
QX2E5-2000LSMD	2000±20%	2800V	3000V	1GΩ (at 100V)	0.8pF	~20V	2KA	3KA	2A	100A
QX2E5-2500LSMD	2500±20%	3300V	3600V	1GΩ (at 100V)	0.8pF	~20V	2KA	3KA	2A	100A
QX2E5-2700LSMD	2700±20%	3500V	3800V	1GΩ (at 100V)	0.8pF	~20V	2KA	3KA	2A	100A
QX2E5-3000LSMD	3000±20%	3800V	4000V	1GΩ (at 100V)	0.8pF	~20V	2KA	3KA	2A	100A
QX2E5-3600LSMD	3600±20%	4700V	5000V	1GΩ (at 100V)	0.8pF	~20V	2KA	3KA	2A	100A

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

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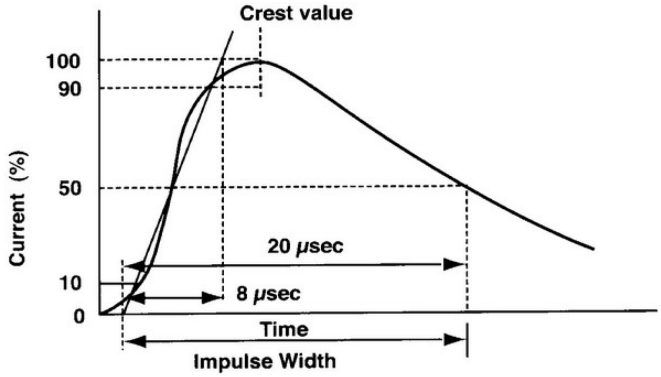
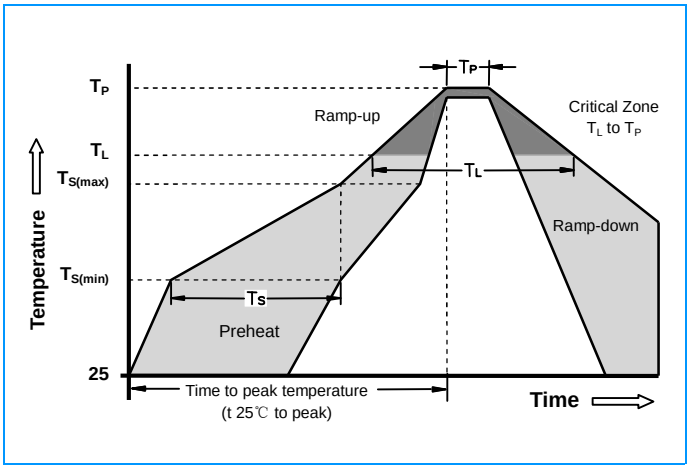
Electrical Rating

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

Recommended soldering profile



Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquidus Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		10 - 30 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max
Do not exceed		260°C

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QX2E5-SMD Series

Part Numbering

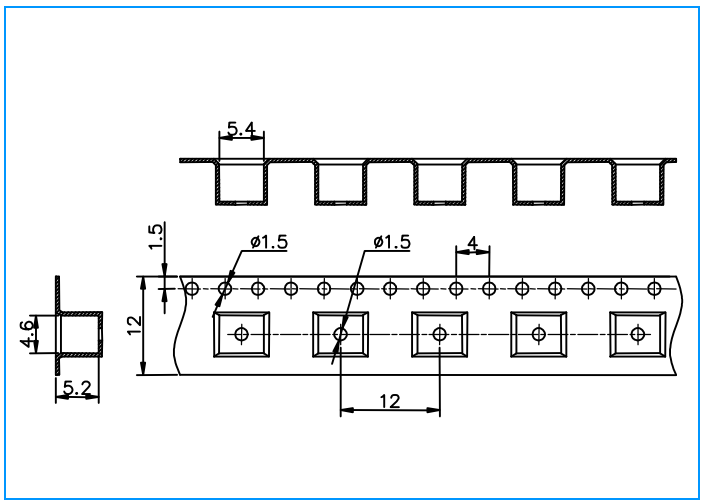
QX2E5 – XXX L SMD

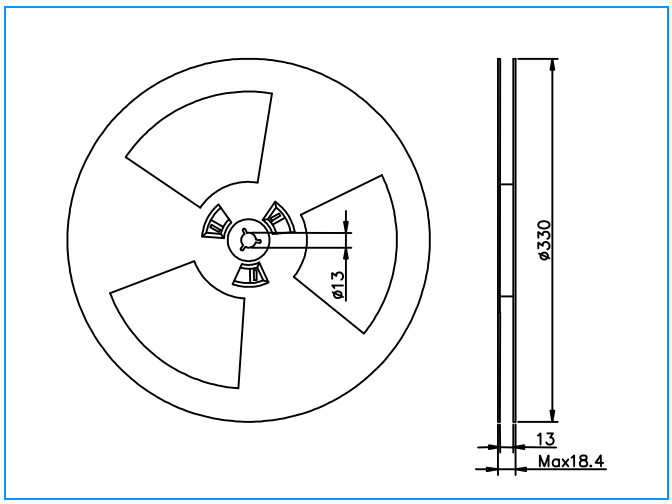
- SMD, Surface Mount
- 8/20μs Level L, 5KA /3KA/2KA
- Nominal DC Spark-over Voltage

90 = 90V	400=400V	1500=1500V	3600=3600V
150 = 150V	470=470V	2000=2000V	
200 = 200V	600=600V	2500=2500V	
230 = 350V	800=800V	2700=2700V	
350=350V	1000=1000V	3000=3000V	

- Series

Tape and Reel Dimensions Unit: mm





Packaging

Part Number	Packaging Option	Quantity
QX2E5-XXXLSMD	Tape & Reel -12mm tape/13″Reel	1000

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.