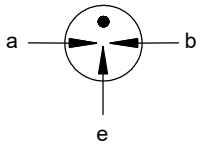
Gas Discharge Tubes (GDT) 3R-5SQ (2000~3600V)

Description

3R-5SQ Gas Discharge Tubes (GDT) series provides high levels of protection against fast rising transients caused by lightning disturbances. Offered in a miniature surface mount package, it has a surge rating of 3KA 8/20μs.

3R-5SQ GDTs are high voltage (2000-3000V) components designed for surge protection and high isolation applications. It is also suitable for applications for which bias voltage or signal levels of several hundred volts are normally present. 3R-5SQ GDTs can be used in conjunction with MOVs (Metal Oxide Varistors) to provide superior protection performance for AC applications.

Electrical symbol



a = Tip
b = Ring
e = Auxiliary
(Center electrode)

Features

- Excellent response to fast rising transients
- 8/20μs Impulse current capability: 3KA
- Non-Radioactive
- Ultra Low capacitance (<1.0pF)
- Size: 8.0mm(L)*5.0mm(W)*5.0mm(H)
- Storage and operational temperature: -40~+125°C

Applications

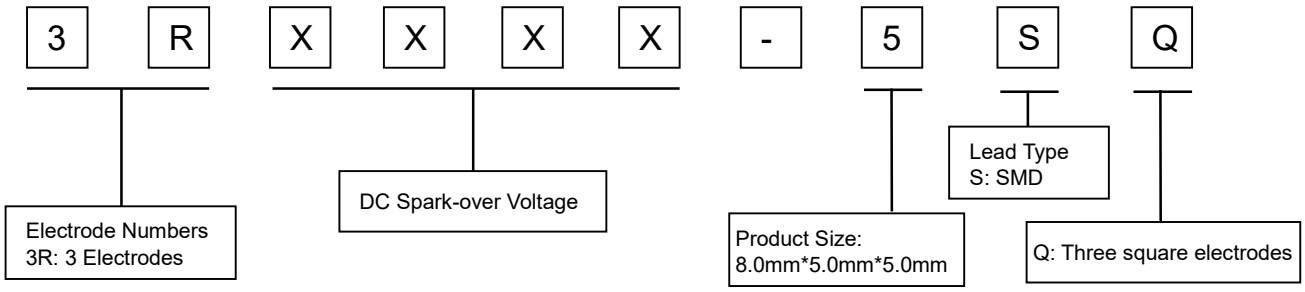
Automotive:

- On-board chargers
- Vehicle charging stations

Others:

- LED lighting
- Power supply
- Photovoltaic
- Air conditioning

Part Number Code



Gas Discharge Tubes (GDT) 3R-5SQ (2000~3600V)

Electrical Characteristics

Model	3R2000-5SQ	3R2500-5SQ	3R3000-5SQ	3R3600-5SQ	Units
DC Spark-over Voltage [1) 2)] at 100V/S					
V_{a-b}	2000±20%	2500±20%	3000±20%	3600±20%	V
V_{a-e}, V_{b-e}	800~1250	1000~1600	1200~1900	1450~2300	V
Impulse Spark-over Voltage [3)] at 1KV/μS					
Arrester Only	<3500	<4000	<4500	<5000	V
With auxiliary circuit [4)]	<1800	<2000	<2500	<3000	V
Front of wave spark-over voltage [3)] at 1.2/50 μs, 6 kV					
Arrester Only	<4000	<4500	<5000	<5500	V
With auxiliary circuit [4)]	<1800	<2000	<2500	<3000	V
Service life [3)]					
Normal Impulse discharge current 8/20μs ±5 times	3	3	3	3	KA
Impulse Discharge Current 1.2/50μS ,12Ω [5)] 80 times	10	10	10	10	KV
Alternating Discharge Current 50Hz,1S 10 times	1	1	1	1	A
Glow Voltage [3)] at 10mA	~300	~300	~300	~300	V
Arc Voltage [3)] at 1A	~35	~35	~35	~35	V
AC withstand voltage [3)] at 5mA, 1minute	1000	1300	1600	1900	V
Insulation Resistance [3)] at DC 500V	>1	>1	>1	>1	GΩ
Capacitance [3)] at 1MHz	<1.0	<1.0	<1.0	<1.0	pF
Weight	~0.72	~0.72	~0.72	~0.72	g
Operation and storage temperature	-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)	40/125/21	40/125/21	40/125/21	40/125/21	
Marking	Without				
Surface treatment	Matte-tin plated				

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) Tip electrode (a) to ring electrode (b).
4) See page 5.
5) Tested at AC220V with MOVs.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311.

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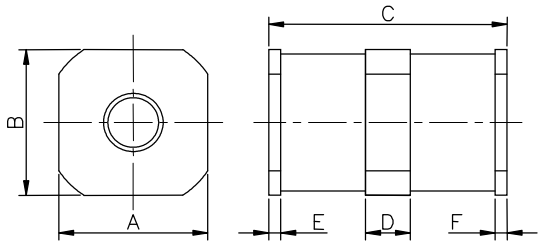
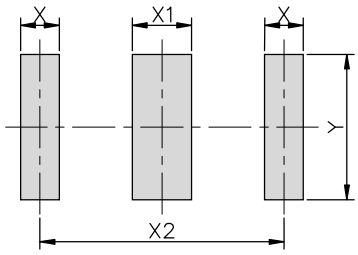
Dimensions



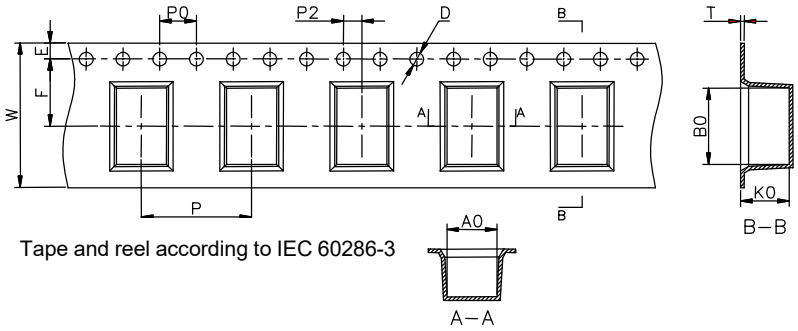


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	5.0±0.2	0.165±0.008
B	5.0±0.2	0.165±0.008
C	8.0±0.2	0.323±0.008
D	1.5±0.3	0.039±0.012
E	0.5±0.2	0.020±0.008
F	0.5±0.2	0.020±0.008
X	1.3	0.051
X1	2.0	0.079
X2	8.2	0.323
Y	5.0	0.197

Packaging Information

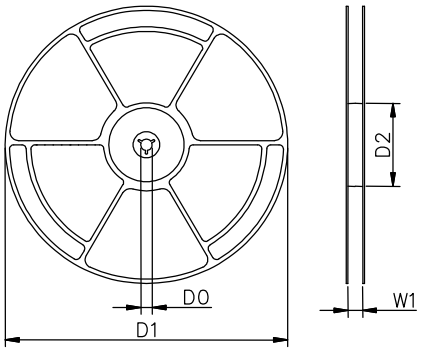
Tape Specifications

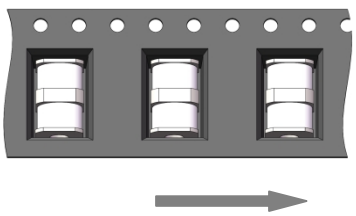


Tape and reel according to IEC 60286-3

Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	5.4±0.1	0.213±0.004
B0	9±0.1	0.331±0.004
K0	5.3±0.1	0.209±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.4±0.1	0.016±0.004
D0	13.3±0.15	0.524±0.006
D1	330±2	12.992±0.079
D2	100+1/-2	3.937+0.039/-0.079
W1	16.5±0.4	0.65±0.016

Reel Specifications





Direction of Unreeling

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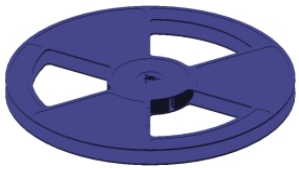
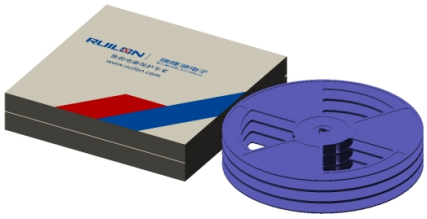
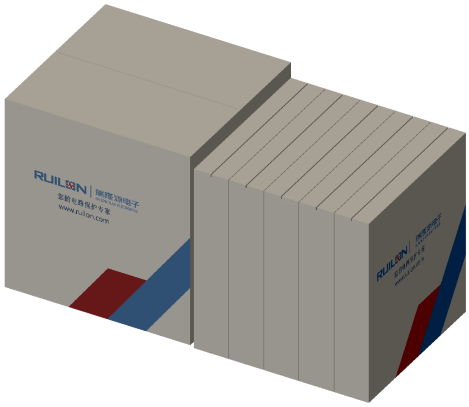
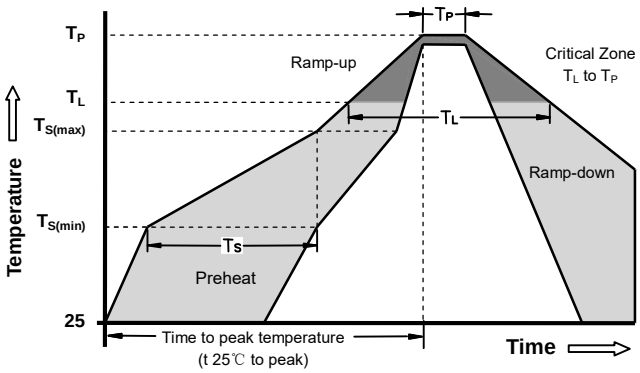
	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=1,000pcs	1 Inner Box=3 reels=3,000pcs	1Carton=5 Inner boxes=15,000pcs
Photos			

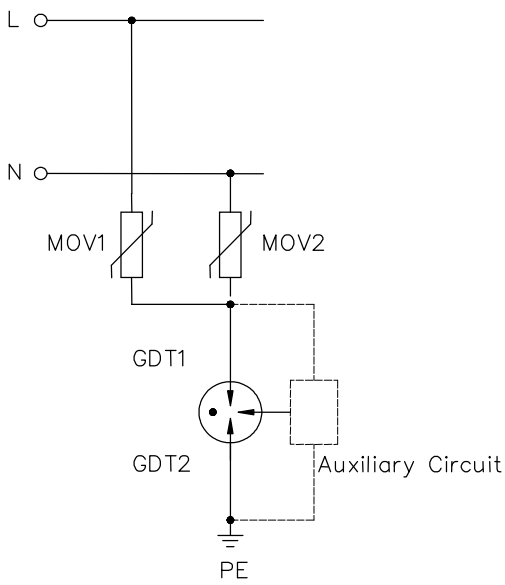
Soldering Parameters - Reflow Soldering (Surface Mount Devices)



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 (Liquids 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) (Liquids)**	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

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC spark-over voltage.

Application Circuit



Terms and definitions

NO.	Item	Definitions
1	**Gas discharge tube(GDT)**	A gap, or several gaps, in an enclosed discharge medium, other than air at atmospheric pressure, designed to protect apparatus or personnel, or both, from high transient voltages. Also referred to as "gas tube surge arrester".
2	**DC Spark-over Voltage**	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	**Impulse Spark-over Voltage**	The highest voltage which appears across the terminals of a gas discharge tube in the period between the application of an impulse of given wave-shape and the time when current begins to flow.
5	**Arc voltage**	Voltage drop across the GDT during arc current flow.
6	**Glow voltage**	Peak value of voltage drop across the GDT when a glow current is flowing.
7	**Impulse discharge current 8/20μs**	Current impulse with a nominal virtual front time of 8 μs and a nominal time to half-value of 20 μs.
8	**Alternating Discharge Current**	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	**Insulation Resistance**	Insulation resistance shall be measured from each terminal to every other terminal of the GDT. The test is performed with DC500V.
10	**Capacitance**	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.