Gas Discharge Tubes (GDT) 3RA-5S Series

Description

Gas discharge tubes (GDT) use noble gasses enclosed in ceramic tubes to provide an alternate circuit path for voltage spikes. The ceramic envelope and with nickel connectors allow for high loads. 3RA-5S Gas Discharge Tubes (GDT) series has a surge rating of 5kA, 8/20μs.Offered in a Squared Surface Mount package, which helps to make pick and place on PCB process easier.

This GDT series is perfectly suited for broadband equipment applications. The GDT's low off-state capacitance is compatible with high bandwidth applications and this capacitance loading value does not vary if the voltage across the GDT changes.

3RA-5S Gas Discharge Tube (GDT) series are specifically designed for protection of electrical, multimedia, and communication equipment against over voltage transients in surface mount assembly applications.

Agency Approvals

Agency	Standards	Certificate No.
	UL497B	E465335

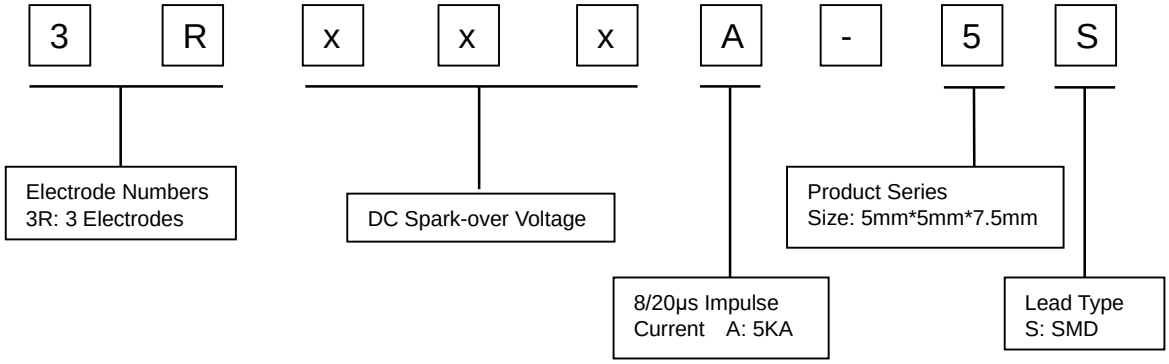
Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 5KA
- Surface Mount package
- Non-Radioactive
- Ultra Low capacitance (<1pF)
- High insulation resistance
- Size: 5mm*5mm*7.5mm
- Storage and operational temperature: -40~+90°C

Applications

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

Part Number Code



Gas Discharge Tubes (GDT) 3RA-5S Series

Electrical Characteristics

Part Number	DC Spark-over Voltage [1) 2) 3)] @100V/S	Impulse Spark-over Voltage [3)]		Insulation Resistance [4)]	Capacitance @1MHz	Glow Voltage @10mA	Arc Voltage @1A	Life Ratings			
		100V/μS	1KV/μS					Impulse Discharge Current @8/20μs [5)]		Alternating Discharge Current @50Hz 1S [5)]	Impulse Life @10/1000μS
		Max	Max	Min	Max	Typical	Typical	±5 times	1 time	10 times	100 times
	V	V	V	GΩ	pF	V	V	KA	KA	A	A
3R075A-5S	75±20%	500	600	1	1	60	10	5	10	5	200
3R090A-5S	90±20%	500	600	1	1	60	10	5	10	5	200
3R150A-5S	150±20%	500	600	1	1	60	10	5	10	5	200
3R200A-5S	200±20%	600	700	1	1	60	10	5	10	5	200
3R230A-5S	230±20%	600	700	1	1	60	10	5	10	5	200
3R250A-5S	250±20%	600	700	1	1	60	10	5	10	5	200
3R350A-5S	350±20%	800	900	1	1	60	10	5	10	5	200
3R400A-5S	400±20%	850	950	1	1	135	15	5	10	5	200
3R420A-5S	420±20%	850	950	1	1	135	15	5	10	5	200
3R470A-5S	470±20%	900	1000	1	1	135	15	5	10	5	200
3R600A-5S	600±20%	1100	1200	1	1	135	15	5	10	5	200
3R800A-5S	800±20%	1400	1500	1	1	135	15	5	10	5	200

Glow to Arc transition Current…….....	~0.5A
Weight…….....	~0.8g
Operation and storage temperature…….....	-40~+90°C
Climatic category (IEC 60068-1)…….....	40/90/21
Marking, blue negative…….....	**RUILON** **xxx Y** xxx -Nominal voltage Y -Year of production
Surface treatment…….....	Matte-tin plated

1) At delivery AQL 0.65 level II, DIN ISO 2859

2) In ionized mode

3) Tip or ring electrode to center electrode

4) Insulation Resistance Measuring Voltage:
75V~150V at DC 50V
Other at DC 100V

5) Total current through center electrode, half value through tip respectively ring electrode.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T18802.311, GB/T 9043.

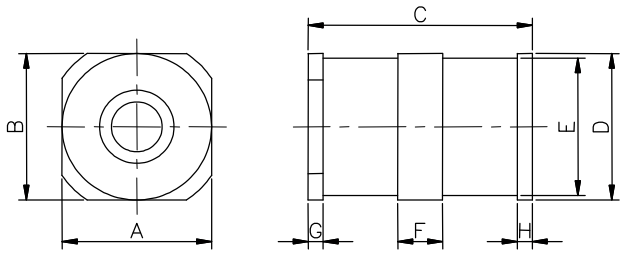
Certifications table

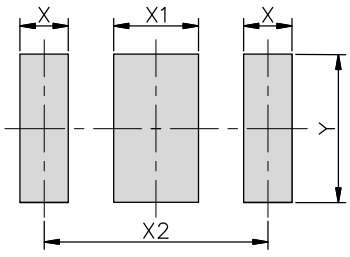
Part Number	UL497B
3R075A-5S	●
3R090A-5S	●
3R150A-5S	●
3R200A-5S	--
3R230A-5S	--
3R250A-5S	--
3R350A-5S	--
3R400A-5S	--
3R420A-5S	--
3R470A-5S	--
3R600A-5S	--
3R800A-5S	--

Notes:

1. ● indicates that the product has passed the certification.
2. -- indicates that the product is not certified.

Dimensions



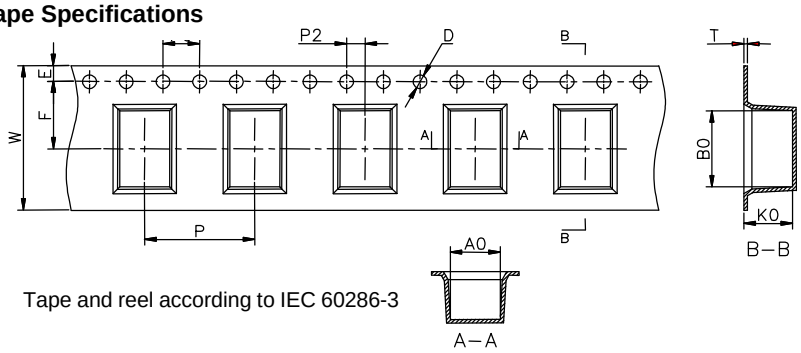


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	5.0±0.2	0.197±0.008
B	5.0±0.2	0.197±0.008
C	7.5±0.3	0.295±0.012
D	Φ5.0±0.2	Φ0.197±0.008
E	Φ4.7±0.1	Φ0.185±0.004
F	1.5±0.1	0.059±0.004
G	0.4±0.1	0.016±0.004
H	0.4±0.1	0.016±0.004
X	1.6	0.063
X1	2.8	0.110
X2	7.4	0.291
Y	5.0	0.197

Packaging Information

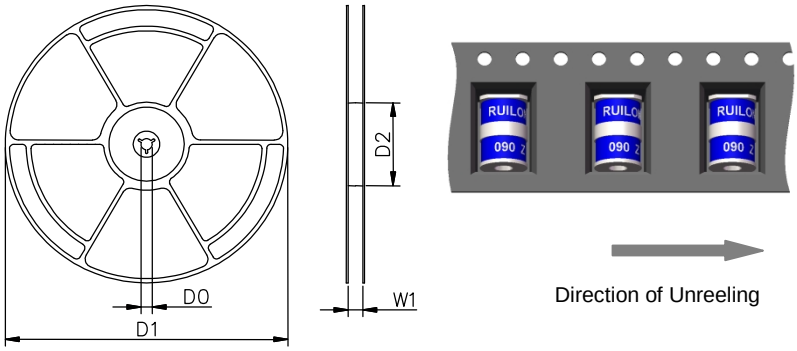
Tape Specifications

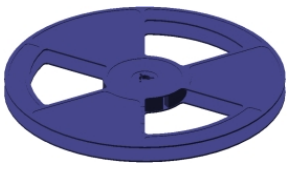
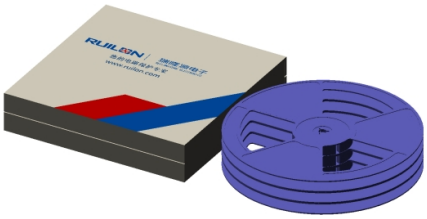
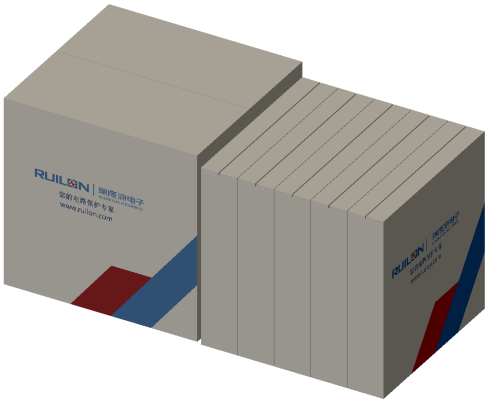


Tape and reel according to IEC 60286-3

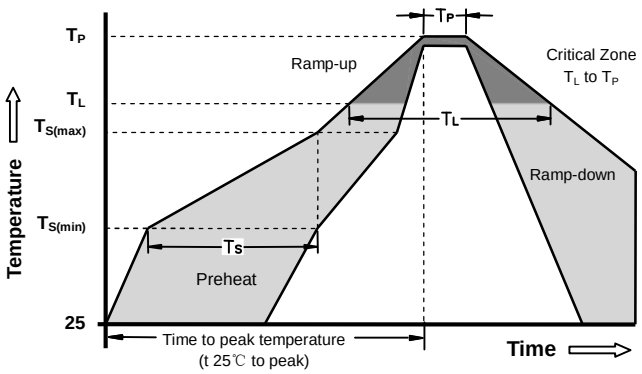
Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	5.4±0.1	0.213±0.004
B0	8.4±0.1	0.331±0.004
K0	5.3±0.1	0.209±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.4±0.1	0.016±0.004
D0	13.3±0.15	0.524±0.006
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



	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.

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 DC50V when normal spark-over Voltage 70~150V, others with DC100V.
10	Capacitance	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

Cautions and warnings

- Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- Surge arresters may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- Surge arresters must be handled with care and must not be dropped.
- Do not continue to use damaged surge arresters.
- The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- SMD surge arresters should be soldered within 24 month after shipment.