

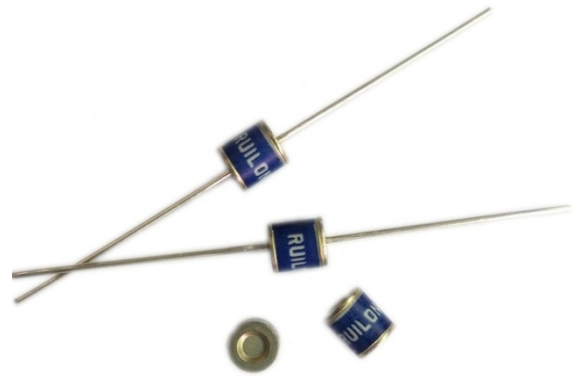
Gas Discharge Tubes (GDT)

2RA-5 Series

Description

GDT is placed in front of, and in parallel with, sensitive telecom equipment such as power lines, communication lines, signal lines and data transmission lines to help protect them from damage caused by transient surge voltages that may result from lightning strikes and equipment switching operations. These devices do not influence the signal in normal operation. However, in the event of an overvoltage surge, such as a lightning strike, the GDT switches to a low impedance state and diverts the energy away from the sensitive equipment.

Our GDT offer a high level of surge protection, a broad voltage range, low capacitance, and many form factors including new surface mount devices, which makes them suitable for applications such as Main Distribution Frame (MDF) modules, high data-rate telecom applications (e.g. ADSL, VDSL), and surge protection on power lines. Their low capacitance also results in less signal distortion. When used in a coordinated circuit protection solution with PolySwitch devices, they can help equipment manufacturers meet stringent safety regulatory standards.



Agency Approvals

Agency	Standards	Certificate No.
	UL497B	E465335
	EN 61643-311 IEC 61643-311	50571931

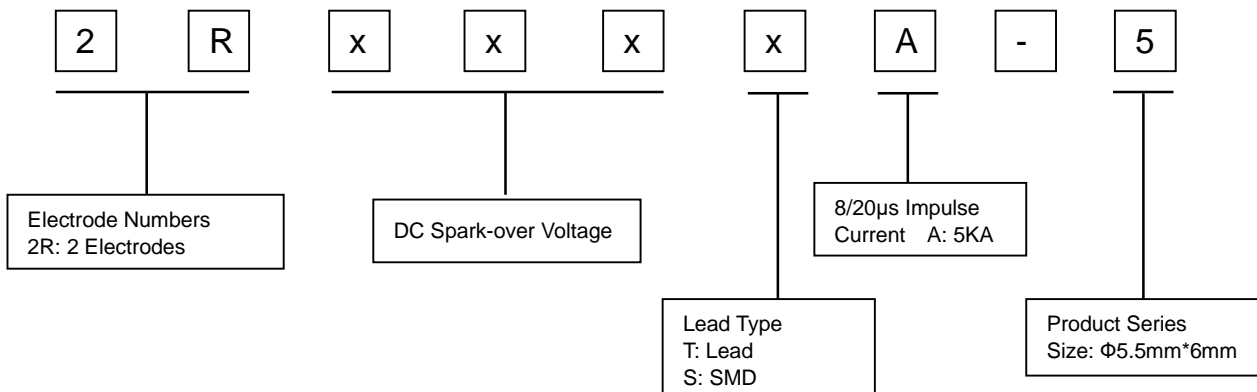
Features

- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20µs Impulse current capability: 5KA
- I Non-Radioactive
- I Ultra Low capacitance (<1pF)
- I Size: Φ5.5mm*6mm
- I Storage and operational temperature: -40~+90°C

Applications

- I CATV equipment
- I Antennas
- I RS 485
- I Telecom Base Station
- I Power Supply AC Main
- I EV power Charging
- I Inverter/Variable
- I Frequency Drivers (VFDs)
- I IEEE 802.3 compliant Ethernet interfaces
- I Broad Band equipment
- I xDSL, ADSL, ADSL2, VDSL, and VDSL2
- I Medical Electronics
- I Test Equipment
- I General Telecom Equipment
- I Renewable Energy

Part Number Code



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2RA-5 Series

Electrical Characteristics

Part Number		DC Spark-over Voltage ^{1) 2)} @100V/S	Impulse Spark-over Voltage		Insulation Resistance ³⁾	Capacitance @1MHz	Glow Voltage @10mA	Arc Voltage @1A	Life Ratings			
			100V/μS	1KV/μS					Impulse Discharge Current @8/20μS		Alternating Discharge Current @50Hz 1S	Impulse Life @10/1000μS
			Max	Max					±5 times	1 time		
DIP	SMD	V	V	V	GΩ	pF	V	V	KA	KA	A	A
2R075TA-5	2R075SA-5	75±20%	500	600	1	1	60	10	5	10	5	100
2R090TA-5	2R090SA-5	90±20%	500	600	1	1	60	10	5	10	5	100
2R150TA-5	2R150SA-5	150±20%	500	600	1	1	60	10	5	10	5	100
2R230TA-5	2R230SA-5	230±20%	600	700	1	1	60	10	5	10	5	100
2R250TA-5	2R250SA-5	250±20%	600	700	1	1	60	10	5	10	5	100
2R300TA-5	2R300SA-5	300±20%	750	850	1	1	60	10	5	10	5	100
2R350TA-5	2R350SA-5	350±20%	800	900	1	1	60	10	5	10	5	100
2R400TA-5	2R400SA-5	400±20%	850	950	1	1	60	10	5	10	5	100
2R420TA-5	2R420SA-5	420±20%	850	950	1	1	60	10	5	10	5	100
2R470TA-5	2R470SA-5	470±20%	900	1000	1	1	60	10	5	10	5	100
2R600TA-5	2R600SA-5	600±20%	1000	1200	1	1	60	10	5	10	5	100
2R800TA-5	2R800SA-5	800±20%	1200	1400	1	1	135	15	5	10	5	100
Glow to Arc transition Current.....					<0.5A							
Weight.....					DIP ~0.82g SMD ~0.55g							
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.....					DIP -Nickel Plated SMD -Matte-tin plated							

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

²⁾ In ionized mode.

³⁾ Insulation Resistance Measuring Voltage:

75V~150V at DC 50V

Other at DC 100V

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

Certifications table

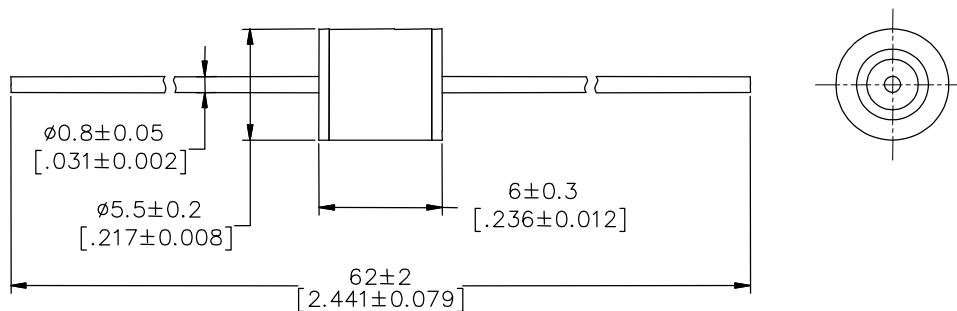
Part Number			
DIP	SMD	UL497B	EN 61643-311 IEC 61643-311
2R075TA-5	2R075SA-5	--	--
2R090TA-5	2R090SA-5	●	--
2R150TA-5	2R150SA-5	●	--
2R230TA-5	2R230SA-5	●	--
2R250TA-5	2R250SA-5	--	--
2R300TA-5	2R300SA-5	●	--
2R350TA-5	2R350SA-5	●	--
2R400TA-5	2R400SA-5	●	--
2R420TA-5	2R420SA-5	●	--
2R470TA-5	2R470SA-5	●	--
2R600TA-5	2R600SA-5	●	●
2R800TA-5	2R800SA-5	--	●

Notes:

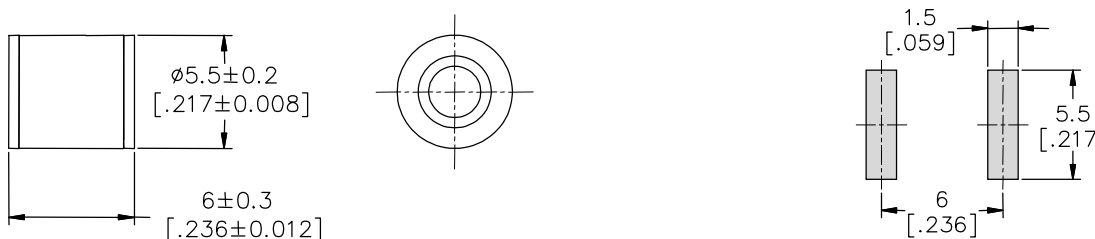
- indicates that the product has passed the certification.
- indicates that the product is not certified.

Dimensions (Unit: mm/inch)

DIP Series (2RxxxTA-5)



SMD Series (2RxxxSA-5)



Recommended Soldering Pad Layout

Gas Discharge Tubes (GDT)

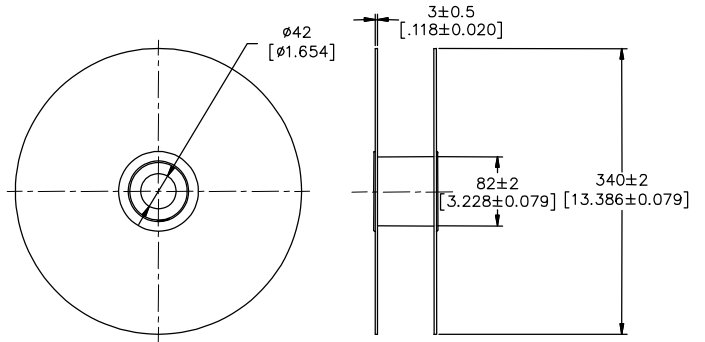
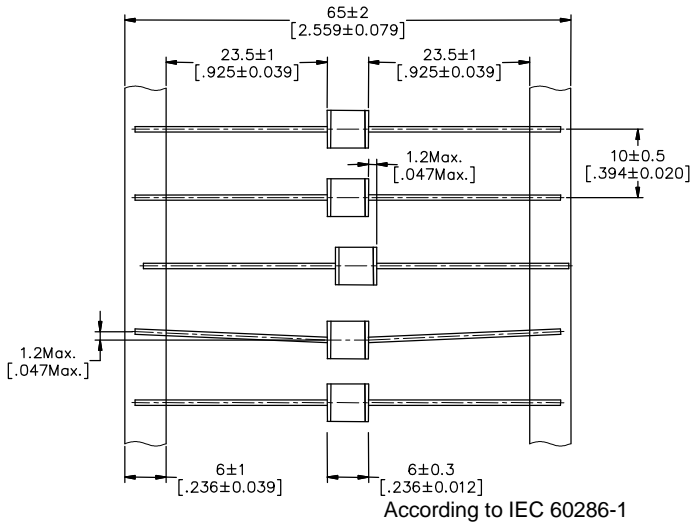
2RA-5 Series

Packaging Information

Axial Packaging (Tape & Reel)

Tape

Reel

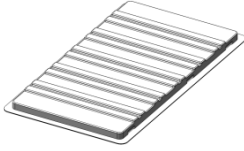
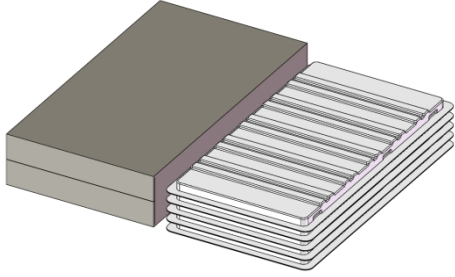
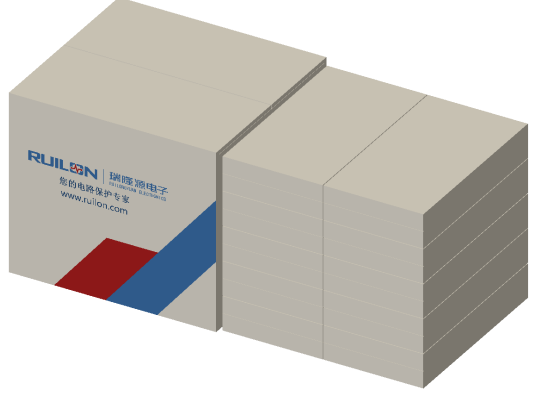


	Reel	Carton
Size	340×78mm	350×350×407mm
Quantity	MPQ/MOQ: 1 reel=1,000pcs	1 Carton=5 reels =5,000pcs
Photos		

Gas Discharge Tubes (GDT)

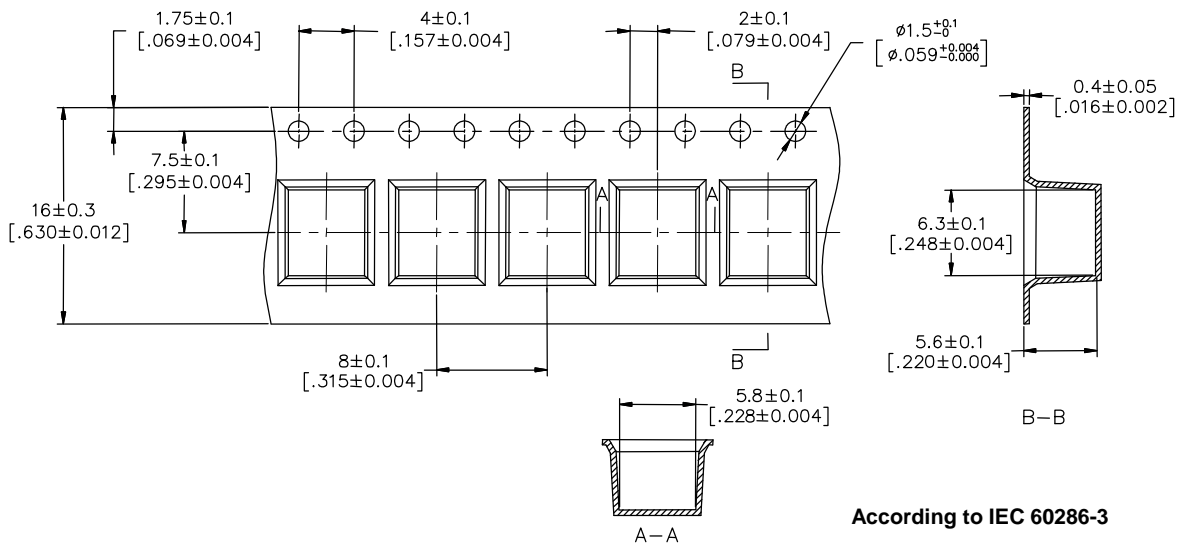
2RA-5 Series

Axial Packaging (Bulk)

	PVC tray	Inner Box	Carton
Size	265×148×10mm	275×150×50mm	315×290×272mm
Quantity	MPQ: 1 tray=100pcs	MOQ: 1 Inner Box=5 trays=500pcs	1 Carton=10 Inner boxes=5,000pcs
Photos			

SMD Packaging (Tape & Reel)

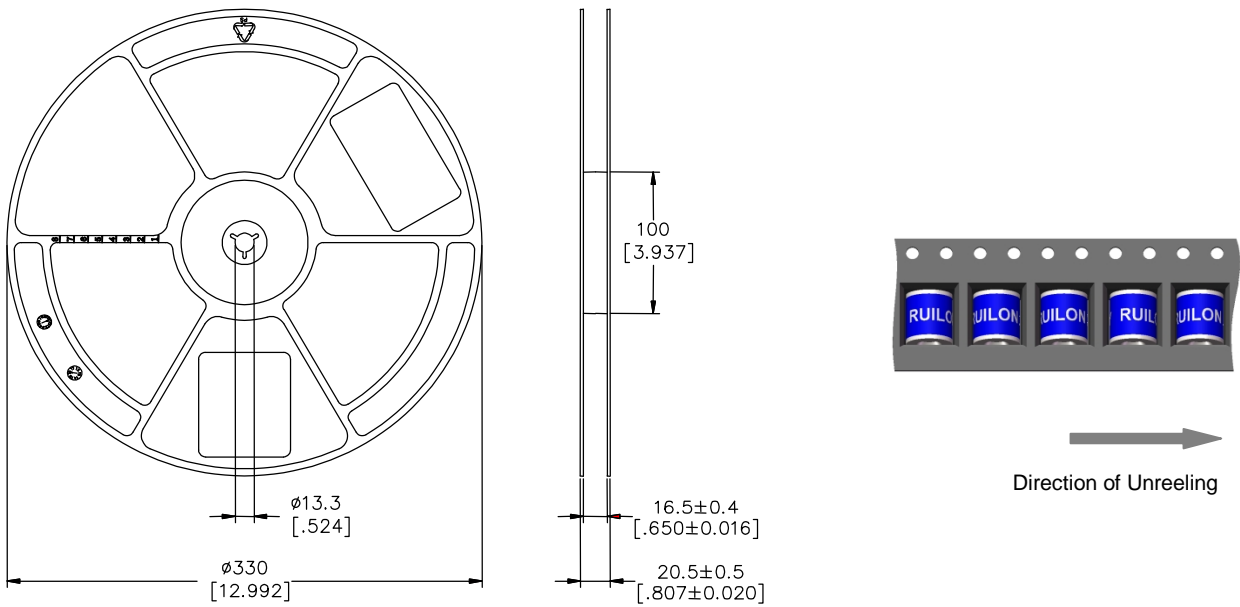
Tape



Gas Discharge Tubes (GDT)

2RA-5 Series

Reel

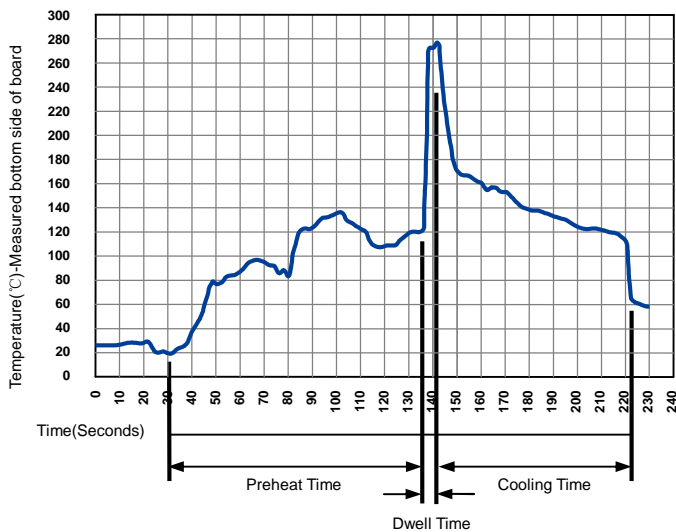


	Reel	Inner Box	Carton
Size	330×20.5mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=1,000pcs	1 Inner Box=3 reels=3,000pcs	1 Carton=5 Inner boxes=15,000pcs
Photos			

Gas Discharge Tubes (GDT)

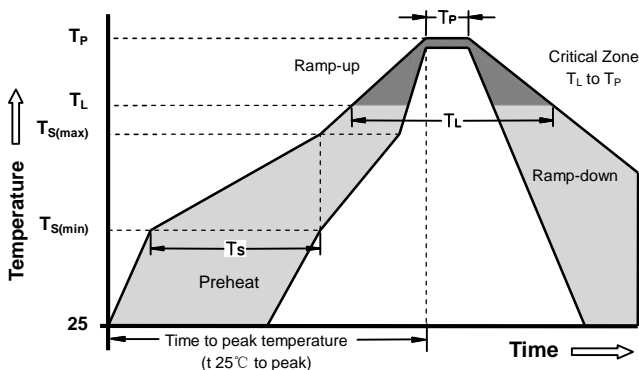
2RA-5 Series

Soldering Parameters - Wave soldering (Thru-Hole Devices)



Wave Soldering Condition		Pb-Free assembly
Preheat	Temperature Min	100°C
	Temperature Max	150°C
	Time (Min to Max)	60-180 Seconds
Solder Pot Temperature		280°C Max
Solder Dwell Time		2-5 Seconds

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Preheat	-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 T_L - 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 μ s and a nominal time to half-value of 20 μ s.
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

- I Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- I 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.
- I If the contacts of the surge arresters are defective, current load can cause sparks and loud noises.
- I Surge arresters must be handled with care and must not be dropped.
- I Do not continue to use damaged surge arresters.
- I 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.
- I SMD surge arresters should be soldered within 24 month after shipment.