



# Gas Discharge Tube

**3RA-5S Series**

## Gas Discharge Tube - 3RA-5S Series

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 and Ruilon offers products that function at 0.5KA-200KA. The breakdown voltages of the devices have a wide range (up to 20% tolerance). Major applications are high frequency telecommunication lines, stations, security systems, HID and high quality Surge Protection Devices (SPD).

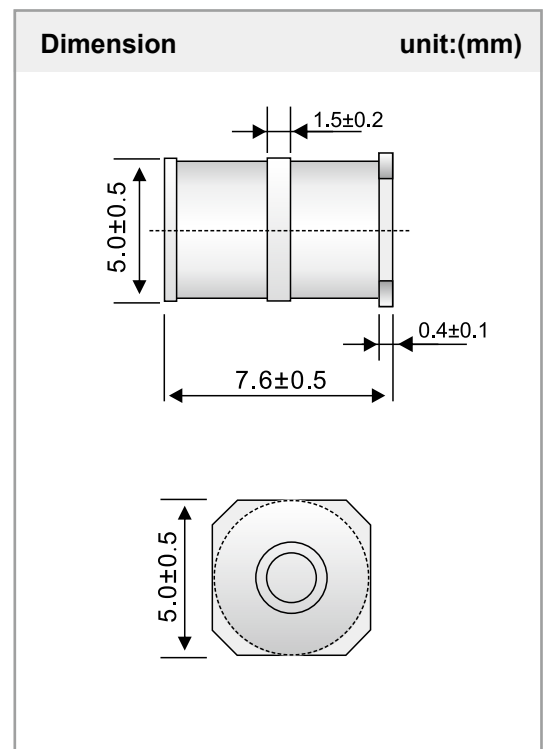


### Features

- Low Capacitance
- RoHS & HF compliant
- Size: 5.0mm\*7.6mm
- DC Spark-over voltage: 75~1100V
- Stable breakdown voltage
- High insulation resistance
- High holdover voltage
- Large absorbing transient current capability
- Storage and operational temperature: -40°C ~ +85°C

### Recommended Applications

- Cable Modem
- xDSL
- Set-Top Box
- Satellite and CATV equipment
- Power supplier
- Consumer electronics
- General telecom equipment



### Product Name

3	R	X	X	X	A	-	5	S
↓		↓			↓	↓		↓
Electrode Numbers		DC Spark-over Voltage			A=5KA	Dimensions		Lead Type
3R : 3 Electrodes						5.0mm*7.6mm		S:SMD

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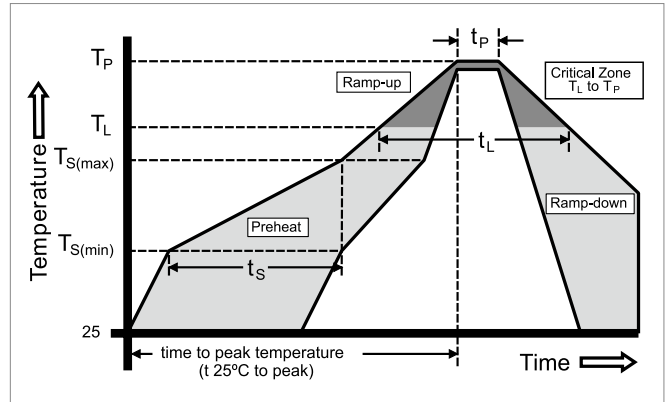
### Electrical Characteristics

Part Number	DC Spark-over Voltage	Max Impulse Breakdown Voltage	Max Impulse Discharge Current (8/20 $\mu$ s)	Nominal Impulse Discharge Current (8/20 $\mu$ s)	Impulse Life (10/1000 $\mu$ s)	Normal Alternating Discharge Current	DC Holdover Voltage	Minimum Insulation Resistance	Maximum Capacitance (1MHz)
	100V/S	1KV/ $\mu$ s	1 time	10 times	100A	50Hz, 1Sec			
	(V)	(V)	(KA)		(Times)	(A)			
3R075A-5S	75 $\pm$ 20%	700	10	5	300	5	52	1	2
3R090A-5S	90 $\pm$ 20%	600	10	5	300	5	52	1	2
3R120A-5S	120 $\pm$ 20%	600	10	5	300	5	80	1	2
3R150A-5S	150 $\pm$ 20%	600	10	5	300	5	80	1	2
3R200A-5S	200 $\pm$ 20%	700	10	5	300	5	135	1	2
3R230A-5S	230 $\pm$ 20%	700	10	5	300	5	135	1	2
3R250A-5S	250 $\pm$ 20%	700	10	5	300	5	135	1	2
3R350A-5S	350 $\pm$ 20%	750	10	5	300	5	135	1	2
3R400A-5S	400 $\pm$ 20%	800	10	5	300	5	135	1	2
3R420A-5S	420 $\pm$ 20%	800	10	5	300	5	135	1	2
3R470A-5S	470 $\pm$ 20%	900	10	5	300	5	135	1	2
3R600A-5S	600 $\pm$ 20%	1000	10	5	300	5	135	1	2
3R800A-5S	800 $\pm$ 20%	1400	10	5	300	5	135	1	2
3R1100A-5S	1100 $\pm$ 20%	1750	10	5	300	5	135	1	2

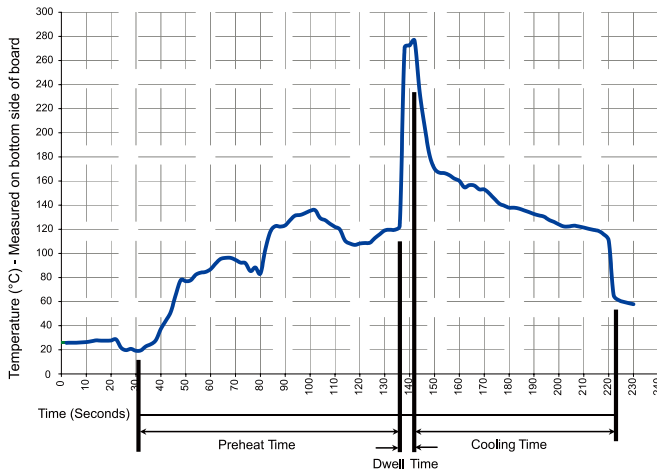
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### Soldering parameters reflow soldering(surface mount devices)

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 secs
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/second max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		5°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_L$ )	60 – 150 seconds
Peak Temperature ( $T_p$ )		260 <sup>+0/-5</sup> °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 ( $T_p$ )		8minutes Max.
Do not exceed		260°C



### Soldering parameters -wave soldering



### Recommended process parameters

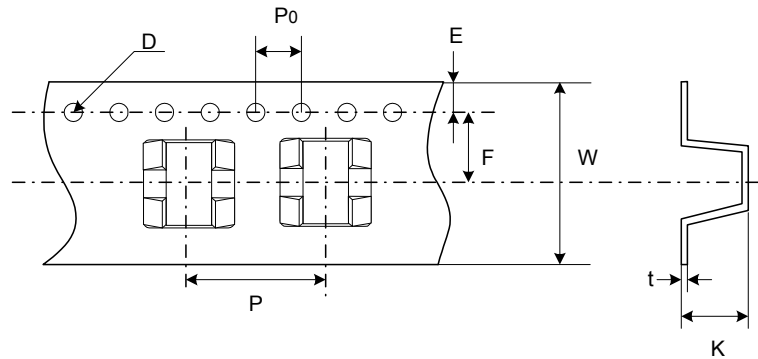
Wave Parameter	Lead-Free Recommendation
Preheat: (Depends on Flux Activation Temperature)	(Typical Industry Recommendation)
Temperature Minimum:	100° C
Temperature Maximum:	150° C
Preheat Time:	60-180 seconds
Solder Pot Temperature:	280° C Maximum
Solder Dwell Time:	2-5 seconds

## Gas Discharge Tube - 3RA-5S Series

Item	Test Condition / Description	Requirement														
DC Breakdown Voltage	The voltage measured at a rise time of 100v/s.	To meet the specified value														
Maximum Impulse Breakdown Voltage	The maximum breakdown voltage at rise times of 100v/us and 1000v/us.															
Maximum Impulse Discharge Current	The maximum current applying a waveform of 8/20us that can be applied across the terminals of the gas tube without causing the gas tube to change more than $\pm 25\%$ from its initial measured DC breakdown voltage. Dwell time between pulses is 3 minutes.															
Alternating Discharge Current	Rated RMS value of AC current at 50Hz, 1 sec. 10 times. Intervals: 3min. DC breakdown voltage may not change more than $\pm 25\%$ from its initial measured DC breakdown voltage. IR > $10^8$ ohms (-20%, +30% for 70 – 90V).															
Impulse Life	The minimum number of impulses of a specified waveform and peak current which a gas tube will conduct without causing the gas tube to change more than $\pm 25\%$ from its initial measured DC breakdown voltage. Dwell time between pulses is 1-2 minutes.															
DC Holdover Voltage	The maximum DC voltage across the two terminals of the gas tube under which it may be expected to return to the high impedance state after the gas tube breakdown.															
Insulation Resistance	<p>The resistance of the gas tube shall be measured each terminal to each other terminal.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">DC Breakdown Voltage (V)</th> <th style="text-align: center;">DC Measuring Voltage (V)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">70</td> <td style="text-align: center;">25</td> </tr> <tr> <td style="text-align: center;">90-150</td> <td style="text-align: center;">50</td> </tr> <tr> <td style="text-align: center;">230-350</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">470-600</td> <td style="text-align: center;">250</td> </tr> <tr> <td style="text-align: center;">800</td> <td style="text-align: center;">500</td> </tr> <tr> <td style="text-align: center;">1000-1600</td> <td style="text-align: center;">1000</td> </tr> </tbody> </table>		DC Breakdown Voltage (V)	DC Measuring Voltage (V)	70	25	90-150	50	230-350	100	470-600	250	800	500	1000-1600	1000
DC Breakdown Voltage (V)	DC Measuring Voltage (V)															
70	25															
90-150	50															
230-350	100															
470-600	250															
800	500															
1000-1600	1000															
Capacitance	The capacitance of a gas tube shall be measured each terminal to each other terminal. Test frequency: 1MHz In measurements involving 3-electrode gas tubes, the terminal not being tested shall be connected to a ground plane.															

## Gas Discharge Tube - 3RA-5S Series

### Packaging Taping



Item	P	PO	W	F	E	D	K	t
Spec(mm)	12.0	4.0	16.0	7.5	1.75	Φ1.55	5.5	0.5
Tolerance	±0.1	±0.1	±0.3	±0.1	±0.1	±0.05	±0.1	±0.05

### SMD Packing (Tape & Reel)

Reel packing (330×330×18mm)	Inner Box (335×345×70mm)
<p>330±4.0</p> <p>&gt;1.5 typ</p> <p>100 typ</p> <p>18 typ</p>	<p>335±2.0</p> <p>345±2.0</p> <p>70±2.0</p>
1000 PCS/ Reel	3000 PCS/ Box

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