

# 3R-5S Series

## Gas Discharge Tubes



### Description

GDT (Gas Discharge Tubes) 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 GDTs 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.

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File Number
	E527857

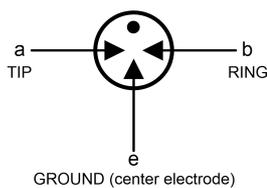
### Features

- Stable breakdown voltage
- High insulation resistance
- High current rating
- Low capacitance ( $\leq 1.5\text{pF}$ )
- Stable performance over life
- Large absorbing transient current capability
- Fast response time
- RoHS compliant
- Standard Size: 5.0mm\*7.2mm
- Meets MSL level 1, per J-STD-020
- Storage and operating temperature:  $-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$

### Application

- Repeaters, Modems
- Subscriber protection
- Telephone Interface, Line cards
- Data communication equipment
- Line test equipment
- Branch exchange
- Subscriber protection
- Alarm system
- Tuner
- Antenna protection

### 3 Electrode GDT Graphical Symbol



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### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

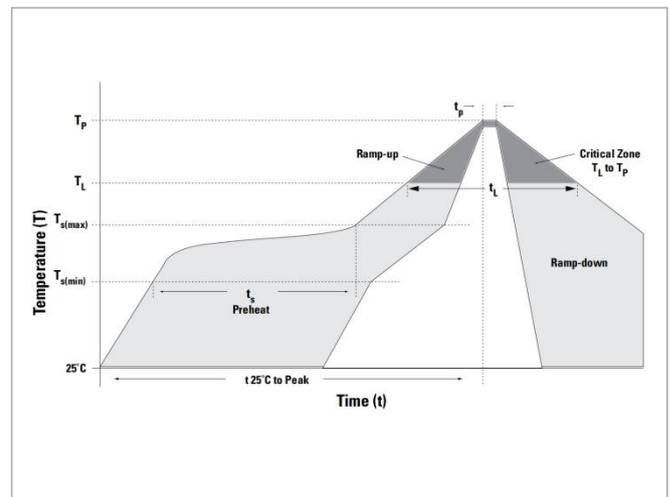
Part Number	Device Marking Code	DC Spark-over Voltage	Maximum Impulse Spark-over Voltage	Nominal Impulse Discharge Current	Alternating Discharge Current	Impulse Life	Minimum Insulation Resistance		Maximum Capacitance	Agency Approvals 
		100V/s (V)	1000V/ $\mu\text{s}$ (V)	8/20 $\mu\text{s}$ , 10 times (kA)	50Hz, 1sec (A)	10/1000 $\mu\text{s}$ , 100A	Test Voltage	G $\Omega$	1MHz (pF)	
3R075LM-5S	075	75 $\pm$ 20%	600	5	5	300 times	25VDC	1	1.5	✓
3R090LM-5S	090	90 $\pm$ 20%	600	5	5	300 times	50VDC	1	1.5	✓
3R150LM-5S	150	150 $\pm$ 20%	600	5	5	300 times	100VDC	1	1.5	✓
3R230LM-5S	230	230 $\pm$ 20%	700	5	5	300 times	100VDC	1	1.5	✓
3R250LM-5S	250	250 $\pm$ 20%	700	5	5	300 times	100VDC	1	1.5	✓
3R300LM-5S	300	300 $\pm$ 20%	800	5	5	300 times	100VDC	1	1.5	✓
3R350LM-5S	350	350 $\pm$ 20%	900	5	5	300 times	100VDC	1	1.5	✓
3R400LM-5S	400	400 $\pm$ 20%	950	5	5	300 times	100VDC	1	1.5	✓
3R470LM-5S	470	470 $\pm$ 20%	1000	5	5	300 times	250VDC	1	1.5	✓
3R600LM-5S	600	600 $\pm$ 20%	1200	5	5	300 times	250VDC	1	1.5	✓

### Test Methods and Results

Items	Test Method	Standard
DC Spark-over Voltage	measured with voltage ramp $dv/dt=100\text{V/s}$ .	To meet the specified value
Maximum Impulse Spark-over Voltage	measured with voltage ramp $dv/dt=1000\text{V}/\mu\text{s}$ .	To meet the specified value
Impulse Discharge Current	applied through center electrode with 8/20 $\mu\text{s}$ waveform, for 10 times with 3min interval time, which will be equally divided between each side electrode to center electrode, without causing the DC breakdown voltage to change more than 25% from its initial measured value.	To meet the specified value
Alternating Discharge Current	Rated RMS value of AC current at 50Hz, 1 sec. for 10 times with interval time 3 min. DC spark-over voltage shall not change more than $\pm 25\%$ from its initial value. Test is between each side electrode and center electrode.	To meet the specified value
Insulation Resistance	measured between each side electrodes and center electrode.	To meet the specified value
Capacitance	measured between each side electrodes and center electrode. Test frequency: 1MHz	To meet the specified value

### Soldering Parameters (Reflow Soldering)

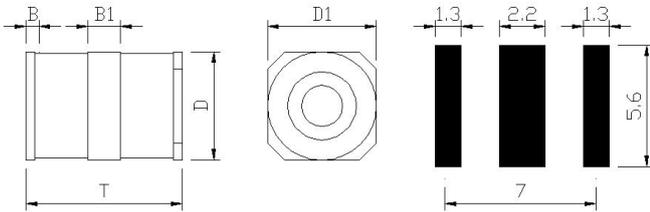
<b>Reflow Condition</b>	Pb-Free Assembly	
<b>Pre Heat</b>	-Temperature Min ( $T_{S \text{ min}}$ )	150 $^\circ\text{C}$
	-Temperature Max ( $T_{S \text{ max}}$ )	200 $^\circ\text{C}$
	-Time (min to max) ( $t_s$ )	60-180 secs
<b>Average ramp-up rate(Liquidus Temp (<math>T_L</math>) to peak</b>	3 $^\circ\text{C}$ /second max.	
<b><math>T_{S \text{ (max)}}</math> to <math>T_L</math>-Ramp-up Rate</b>	3 $^\circ\text{C}$ /second max.	
<b>Reflow</b>	-Temperature ( $T_L$ ) (Liquidus)	217 $^\circ\text{C}$
	-Time (min to max) ( $t_L$ )	60-150 seconds
<b>Peak Temperature (<math>T_P</math>)</b>	260 $^\circ\text{C}$	
<b>Time within 5<math>^\circ\text{C}</math> of actual Peak Temperature (<math>t_p</math>)</b>	20-40 seconds	
<b>Ramp-down Rate</b>	6 $^\circ\text{C}$ /second max.	
<b>Time 25<math>^\circ\text{C}</math> to Peak Temperature</b>	8 minutes max.	
<b>Do not exceed</b>	260 $^\circ\text{C}$	



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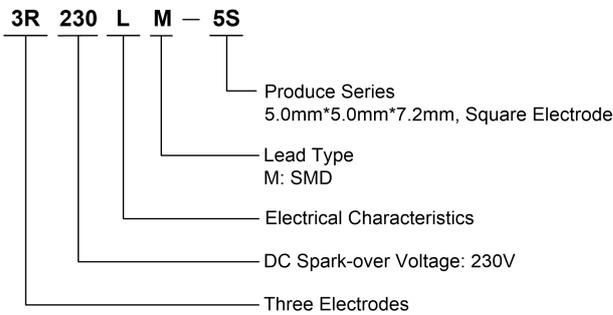
## Gas Discharge Tubes

### Dimensions

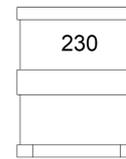


Symbol	Millimeters	Inches
<b>D</b>	5.0±0.2	0.197±0.008
<b>D1</b>	5.0±0.2	0.197±0.008
<b>T</b>	7.2±0.3	0.283±0.012
<b>B</b>	0.4±0.2	0.016±0.008
<b>B1</b>	1.5±0.2	0.059±0.008

### Part Numbering System

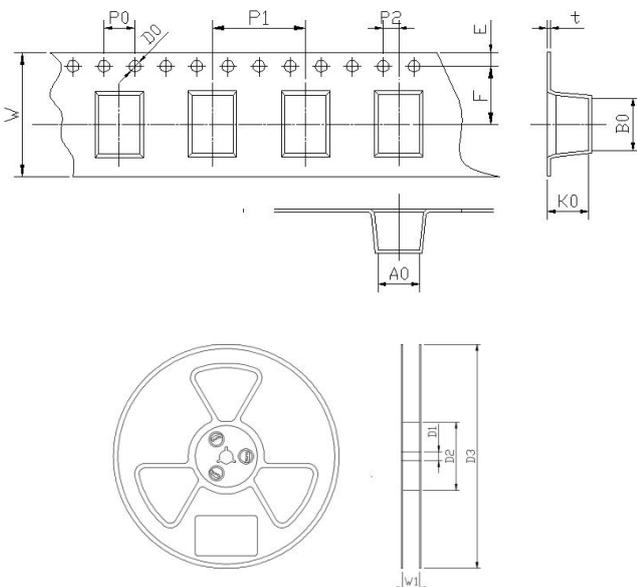


### Part Marking System



### Packaging Specification

Part number	Quantity	Packaging Option
3RxxxLM-5S	1000	Tape & Reel - 16mm tape/13" reel



Symbol	Millimeters	Inches
<b>W</b>	16.0±0.2	0.630±0.008
<b>P0</b>	4.0±0.1	0.157±0.004
<b>P1</b>	12.0±0.2	0.472±0.008
<b>P2</b>	2.0±0.1	0.079±0.004
<b>D0</b>	1.55±0.1	0.061±0.004
<b>E</b>	1.75±0.1	0.069±0.004
<b>F</b>	7.5±0.1	0.295±0.004
<b>A0</b>	5.3±0.1	0.209±0.004
<b>K0</b>	5.3±0.1	0.209±0.004
<b>B0</b>	7.6±0.1	0.299±0.004
<b>t</b>	0.4±0.1	0.016±0.004
<b>D1</b>	13.3±1.0	0.524±0.039
<b>D2</b>	100.0±2.0	3.937±0.079
<b>D3</b>	330.0±2.0	12.992±0.079
<b>W1</b>	16.5±0.5	0.650±0.020

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