

## Gas Discharge Tubes(GDT)

## 3RB-5S Series

### Description

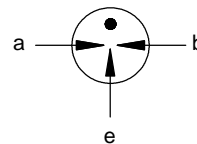
Gas discharge tubes (GDT) use noble gasses enclosed in ceramic tubes to provide an alternate circuit path for voltage spikes. The ceramic envelope and with nickel connectors allow for high loads. 3RB-5S Gas Discharge Tubes (GDT) series has a surge rating of 10kA, 8/20 $\mu$ s. Offered in a Squared Surface 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.

3RB-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.



### Electrical symbol



a = Tip  
b = Ring  
e = Ground  
(center electrode)

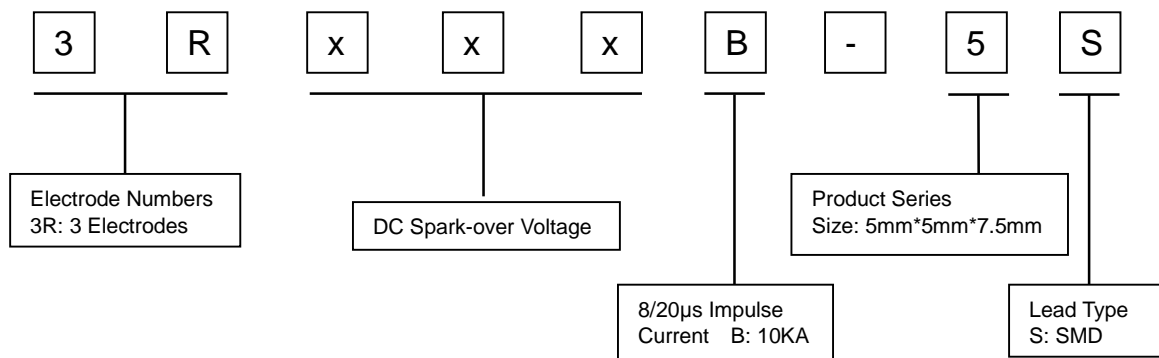
### Features

- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20 $\mu$ s Impulse current capability: 10KA
- I Surface Mount package
- I Non-Radioactive
- I Ultra Low capacitance (<1pF)
- I High insulation resistance
- I Lead-free compliant
- I RoHS and REACH compliant
- I Size: 5mm\*5mm\*7.5mm
- I Storage and operational temperature: -40~+90°C

### Applications

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

### Part Number Code



## Electrical Characteristics

Part Number	DC Spark-over Voltage <sup>1) 2) 3)</sup> @100V/S	Impulse Spark-over Voltage <sup>3)</sup>		Insulation Resistance <sup>4)</sup>	Capacitance @1MHz	Life Ratings			
		100V/ $\mu$ S	1KV/ $\mu$ S			Impulse Discharge Current @8/20 $\mu$ s <sup>5)</sup>		AC Discharge Current @50Hz 1S <sup>5)</sup>	Impulse Life @10/1000 $\mu$ S 200A <sup>5)</sup>
		Max	Max			Nominal $\pm$ 5 times	Max 1 time	Nominal 5 times	Min
		V	V			G $\Omega$	pF	KA	KA
3R075B-5S	75 $\pm$ 20%	500	600	1	1	10	12	10	300
3R090B-5S	90 $\pm$ 20%	500	600	1	1	10	12	10	300
3R150B-5S	150 $\pm$ 20%	500	600	1	1	10	12	10	300
3R200B-5S	200 $\pm$ 20%	600	700	1	1	10	12	10	300
3R230B-5S	230 $\pm$ 20%	600	700	1	1	10	12	10	300
3R250B-5S	250 $\pm$ 20%	600	700	1	1	10	12	10	300
3R350B-5S	350 $\pm$ 20%	800	900	1	1	10	12	10	300
3R400B-5S	400 $\pm$ 20%	850	950	1	1	10	12	10	300
3R420B-5S	420 $\pm$ 20%	850	950	1	1	10	12	10	300
3R470B-5S	470 $\pm$ 20%	900	1000	1	1	10	12	10	300

Glow Voltage at 10mA..... ~60V

Arc Voltage at 1A..... ~10V

Glow to Arc transition Current..... ~0.3A

Weight..... ~0.8g

Operation and storage temperature..... -40~+90°C

Climatic category (IEC 60068-1)..... 40/90/21

Marking, red negative.....

**xxx Y**  
xxx -Nominal voltage  
Y -Year of production

Surface treatment..... Matte-tin plated

<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859

<sup>2)</sup> In ionized mode

<sup>3)</sup> Tip or ring electrode to center electrode

<sup>4)</sup> Insulation Resistance Measuring Voltage:

75V at DC 25V

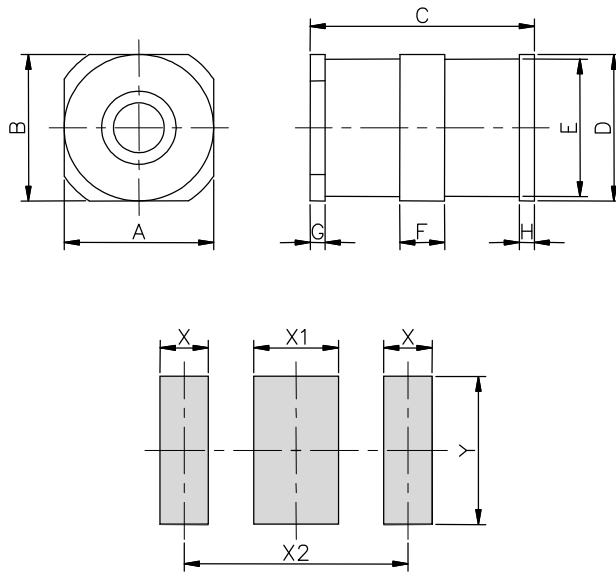
90V~150V at DC 50V

Other at DC 100V

<sup>5)</sup> 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/T 9043.

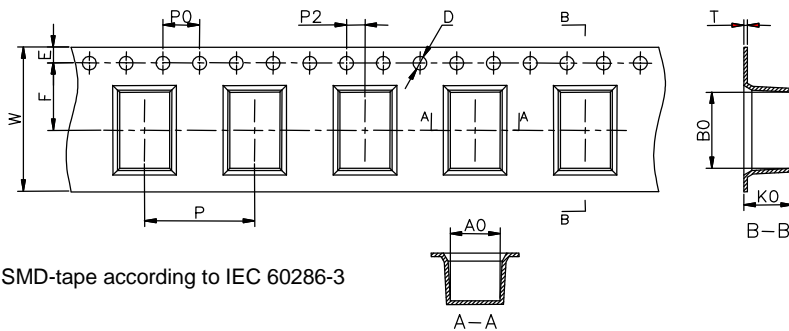
Dimensions



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

Recommended Soldering Pad Layout

Taping and Reel Specifications



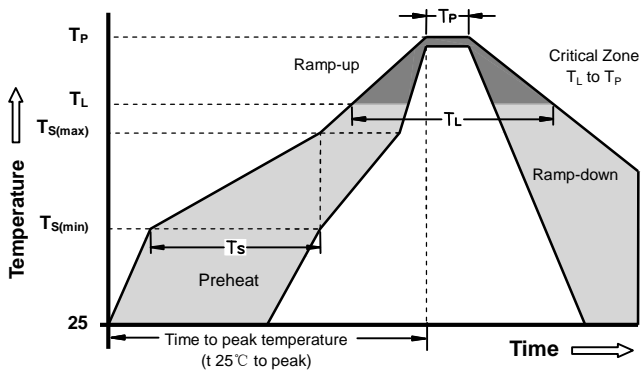
SMD-tape according to IEC 60286-3

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

Packaging Quantity:

- 1,000 PCS per reel (13")
- 3 reels per inner box
- 3,000 PCS per inner box

**Soldering Parameters - Reflow Soldering (Surface Mount Devices)**



<b>Reflow Condition</b>		Pb - Free assembly
<b>Pre Heat</b>	-Temperature Min ( $T_{s(min)}$ )	150°C
	-Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (min to max) ( $t_s$ )	60 -180 Seconds
<b>Average ramp up rate ( Liquids Temp <math>T_L</math> ) to peak</b>		3°C/second max
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		5°C/second max
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquids)	217°C
	- Time (min to max) ( $t_s$ )	60 -150 Seconds
<b>Peak Temperature (<math>T_P</math>)</b>		260 +0/-5°C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		10 - 30 Seconds
<b>Ramp-down Rate</b>		6°C/second max
<b>Time 25°C to peak Temperature (<math>T_P</math>)</b>		8 minutes Max
<b>Do not exceed</b>		260°C