

## Gas Discharge Tube (GDT) Data Sheet

### Features

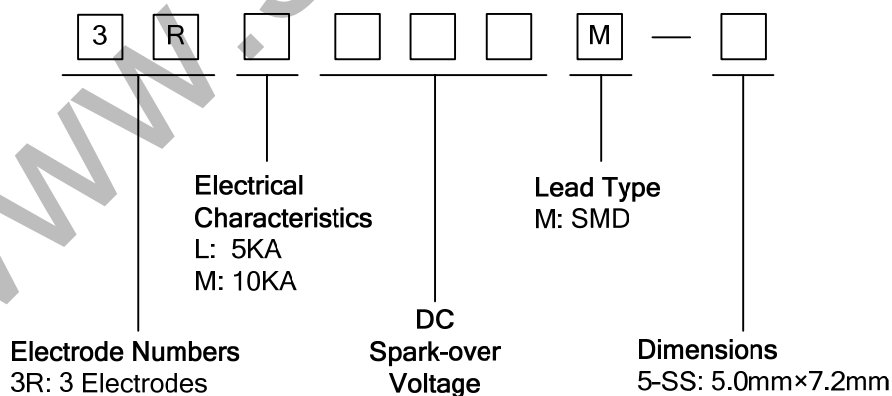
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/ $\mu$ s.
- Stable breakdown voltage.
- High insulation resistance.
- Low capacitance ( $\leq 2$ pF)
- High holdover voltage
- Large absorbing transient current capability.
- Micro-Gap Design
- Size: 5.0mm\*7.2mm
- Storage and operational temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458



### Applications

- Repeaters, Modems.
- Telephone Interface, Line cards.
- Data communication equipment.
- Line test equipment

### Part Number Code



### Marking

**B** : BrightKing Logo  
 3RL090-S : Device Marking Code  
 YXXX : Date Code

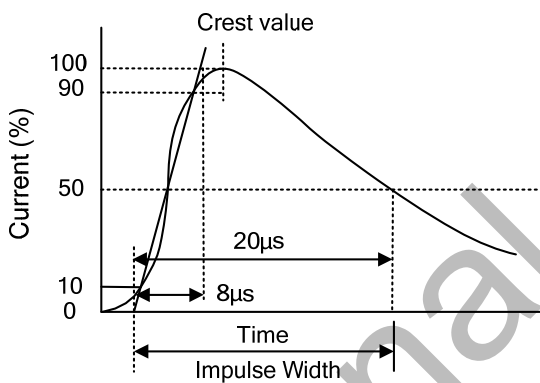
**Dimensions**

Symbol	Dimension (mm)	
	Spec.	Tolerance
D	5.0	±0.1
T	7.2	±0.3
B	0.4	±0.1
B1	1.5	±0.2
d	4.8	±0.1

**Electrical Characteristics**

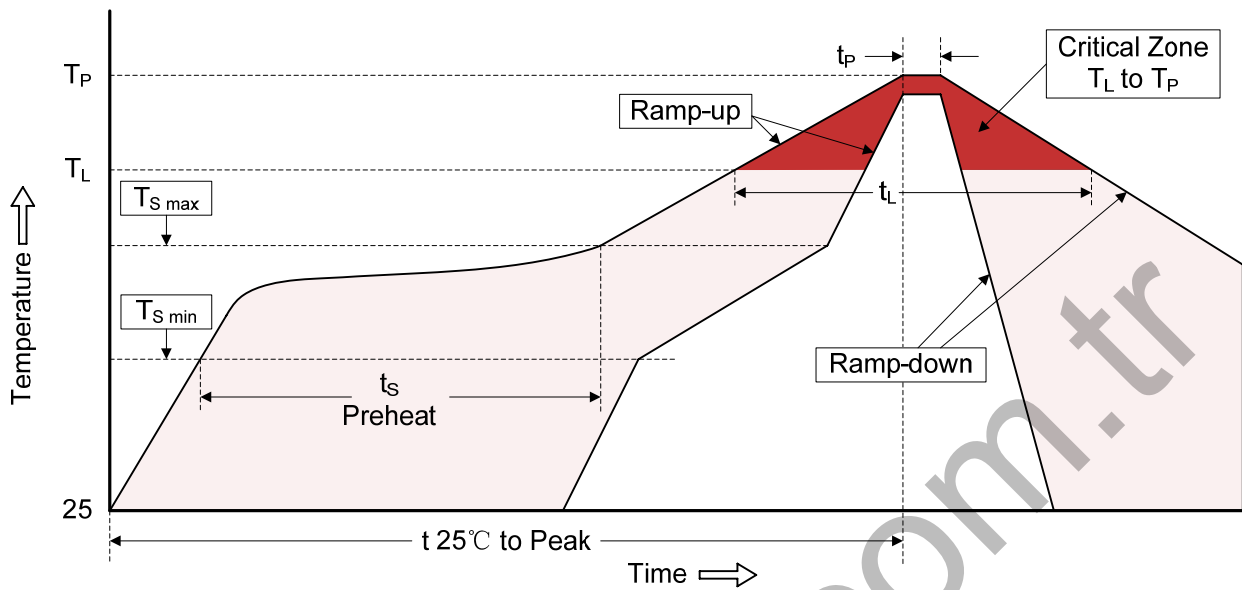
Part Number	DC Spark-over Voltage	Maximum Impulse Spark-over Voltage	Nominal Impulse Discharge Current	Alternating Discharge Current	Impulse Life	Minimum Insulation Resistance		Maximum Capacitance	Device Marking Code
	100V/s	1000V/μs	8/20μs 10times	50Hz, 1sec	10/1000μs 100A	Test Voltage	(GΩ)	1MHz	
	(V)	(V)	(KA)	(A)	(times)	DC(V)		(pF)	
3RL075M-5-SS	75±20%	700	5	5	300	25	1.0	2.0	3RL075-S
3RL090M-5-SS	90±20%	600	5	5	300	50	1.0	2.0	3RL090-S
3RL120M-5-SS	120±20%	600	5	5	300	50	1.0	2.0	3RL120-S
3RL150M-5-SS	150±20%	600	5	5	300	100	1.0	2.0	3RL150-S
3RM200M-5-SS	200±20%	600	10	10	300	100	1.0	2.0	3RM200-S
3RM230M-5-SS	230±20%	650	10	10	300	100	1.0	2.0	3RM230-S
3RM250M-5-SS	250±20%	650	10	10	300	100	1.0	2.0	3RM250-S
3RM300M-5-SS	300±20%	800	10	10	300	100	1.0	2.0	3RM300-S
3RM350M-5-SS	350±20%	800	10	10	300	100	1.0	2.0	3RM350-S
3RM400M-5-SS	400±20%	900	10	10	300	100	1.0	2.0	3RM400-S
3RM420M-5-SS	420±20%	900	10	10	300	250	1.0	2.0	3RM420-S
3RM470M-5-SS	470±20%	900	10	10	300	250	1.0	2.0	3RM470-S
3RM600M-5-SS	600±20%	1000	10	10	300	250	1.0	2.0	3RM600-S

**Electrical Ratings**

Items	Test Condition/Description	Requirement
DC Spark-over Voltage	The voltage is measured with voltage ramp $dv/dt=100V/s$ . Test is between each side electrode and center electrode.	
Maximum Impulse Spark-over Voltage	The maximum impulse spark-over voltage is measured with voltage ramp $dv/dt=1000V/\mu s$ . Test is between each side electrode and center electrode.	
Impulse Discharge Current	<p>Maximum surge current that can be applied through center electrode with <math>8/20\mu s</math> 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.</p>  <p>The graph shows a current waveform starting at 0% at time 0, rising to a peak of 100% current. The time from the start to the peak is labeled as 8μs (Crest value). The time from the start to the point where the current has decayed to 50% is labeled as 20μs (Impulse Width). The y-axis is labeled 'Current (%)' with values 0, 10, 50, 90, 100. The x-axis is labeled 'Time'.</p>	To meet the specified value
Alternating Discharge Current	<p>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 <math>\pm 25\%</math> from its initial value. Test is between each side electrode and center electrode.</p> <p><math>IR &gt; 10^8</math> ohms (-20%, +30% for 70~90V).</p>	
Insulation Resistance	The resistance of gas tube shall be measured between each side electrodes and center electrode.	
Capacitance	<p>The capacitance of gas tube shall be measured between each side electrodes and center electrode.</p> <p>Test frequency: 1MHz</p>	

**Recommended Soldering Conditions**

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat -Temperature Min ( $T_{S\ min}$ ) -Temperature Max ( $T_{S\ max}$ ) -Time (min to max) ( $t_s$ )	150°C 200°C 60-180 seconds
$T_{S\ max}$ to $T_L$ -Ramp-up Rate	3°C/second max.
Time maintained above: -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

**Packaging**

Tape	Symbol	Dimension (mm)		
		Spec.	Tolerance	
	W	16.00	±0.20	
	P0	4.00	±0.10	
	P1	12.00	±0.20	
	P2	2.00	±0.10	
	D0	1.55	±0.05	
	E	1.75	±0.10	
	F	7.50	±0.10	
	A0	7.40	±0.10	
	K0	5.50	±0.10	
	B0	5.40	±0.10	
	t0	0.50	±0.10	
	Reel	D	330.00	±1.00
	d	13.00	±0.50	
	L	20.00	±0.50	
t	2.00	±0.20		
Quantity: 900pcs				