

## Gas Discharge Tube (GDT) Data Sheet

### Features

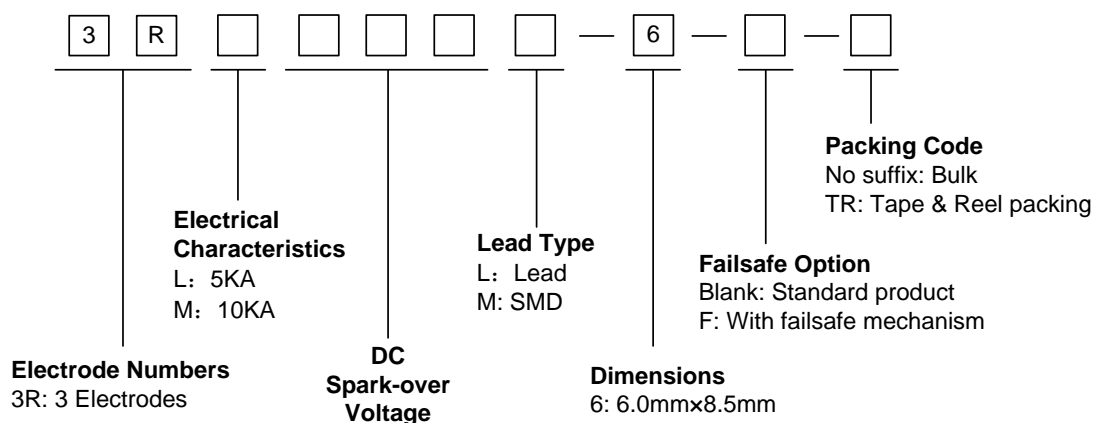
- Provide ultra-fast response to surge voltage from slow-rising surge of 100V/s to rapid-rising surge of 1KV/μs
- Stable breakdown voltage
- High insulation resistance
- Low capacitance (≤2pF)
- High holdover voltage
- Large absorbing transient current capability
- Micro-Gap Design
- Size: 6.0mm\*8.5mm
- Storage and operating temperature: -40°C ~ +85°C
- Meets MSL level 1, per J-STD-020
- Safety certification: E244458



### Applications

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

### Part Number Code



### Marking

**B** : BrightKing Logo  
 3RL090-6 : Device Marking Code  
 YXXX : Date Code

**Dimensions**

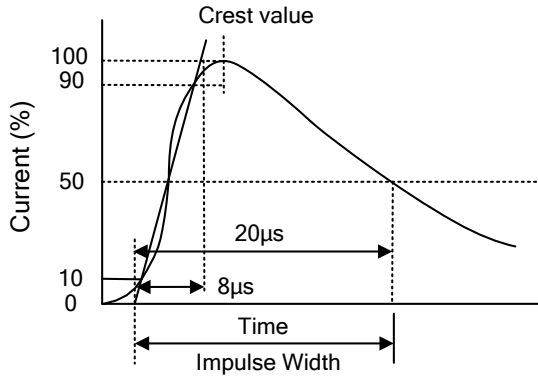
L Type	Symbol	Dimension (mm)	
		Spec.	Tolerance
	D	6.0	+0.2, -0.5
	T	8.5	±0.5
	T1	15.0	Max.
	L	16.0	Max.
L-F Type	S	3.8	±0.3
	d	0.8	±0.1
	R1	7.8	±0.4
	R2	6.3	±0.3
M Type	D	6.0	±0.2
	T	8.5	±0.5
	B	1.0	±0.1
	B1	1.5	±0.2

## 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/ $\mu$ s	8/20 $\mu$ s 10times	50Hz, 1sec	10/1000 $\mu$ s 100A	Test Voltage	(G $\Omega$ )	1MHz	
		(V)	(V)	(KA)	(A)	(times)	DC(V)		(pF)	
3RL075L-6	3RL075M-6	75 $\pm$ 20%	750	5.0	5.0	200	25	1.0	2.0	3RL075-6
3RL090L-6	3RL090M-6	90 $\pm$ 20%	750	5.0	5.0	200	50	1.0	2.0	3RL090-6
3RL150L-6	3RL150M-6	150 $\pm$ 20%	800	5.0	5.0	200	100	1.0	2.0	3RL150-6
3RL230L-6	3RL230M-6	230 $\pm$ 20%	800	5.0	5.0	200	100	1.0	2.0	3RL230-6
3RL250L-6	3RL250M-6	250 $\pm$ 20%	800	5.0	5.0	200	100	1.0	2.0	3RL250-6
3RL300L-6	3RL300M-6	300 $\pm$ 20%	900	5.0	5.0	200	100	1.0	2.0	3RL300-6
3RL350L-6	3RL350M-6	350 $\pm$ 20%	900	5.0	5.0	200	100	1.0	2.0	3RL350-6
3RL470L-6	3RL470M-6	470 $\pm$ 20%	950	5.0	5.0	200	250	1.0	2.0	3RL470-6
3RL600L-6	3RL600M-6	600 $\pm$ 20%	1300	5.0	5.0	200	250	1.0	2.0	3RL600-6
3RM075L-6	3RM075M-6	75 $\pm$ 20%	750	10	10	300	25	1.0	2.0	3RM075-6
3RM090L-6	3RM090M-6	90 $\pm$ 20%	750	10	10	300	50	1.0	2.0	3RM090-6
3RM150L-6	3RM150M-6	150 $\pm$ 20%	800	10	10	300	100	1.0	2.0	3RM150-6
3RM230L-6	3RM230M-6	230 $\pm$ 20%	800	10	10	300	100	1.0	2.0	3RM230-6
3RM250L-6	3RM250M-6	250 $\pm$ 20%	800	10	10	300	100	1.0	2.0	3RM250-6
3RM300L-6	3RM300M-6	300 $\pm$ 20%	900	10	10	300	100	1.0	2.0	3RM300-6
3RM350L-6	3RM350M-6	350 $\pm$ 20%	900	10	10	300	100	1.0	2.0	3RM350-6
3RM470L-6	3RM470M-6	470 $\pm$ 20%	950	10	10	300	250	1.0	2.0	3RM470-6
3RM600L-6	3RM600M-6	600 $\pm$ 20%	1300	10	10	300	250	1.0	2.0	3RM600-6

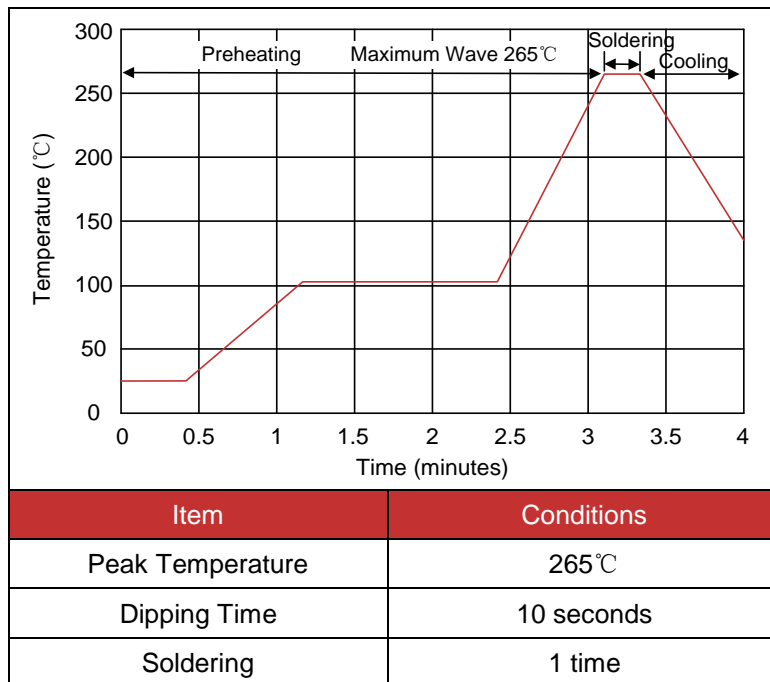
## Electrical Ratings

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.	To meet the specified value
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.	

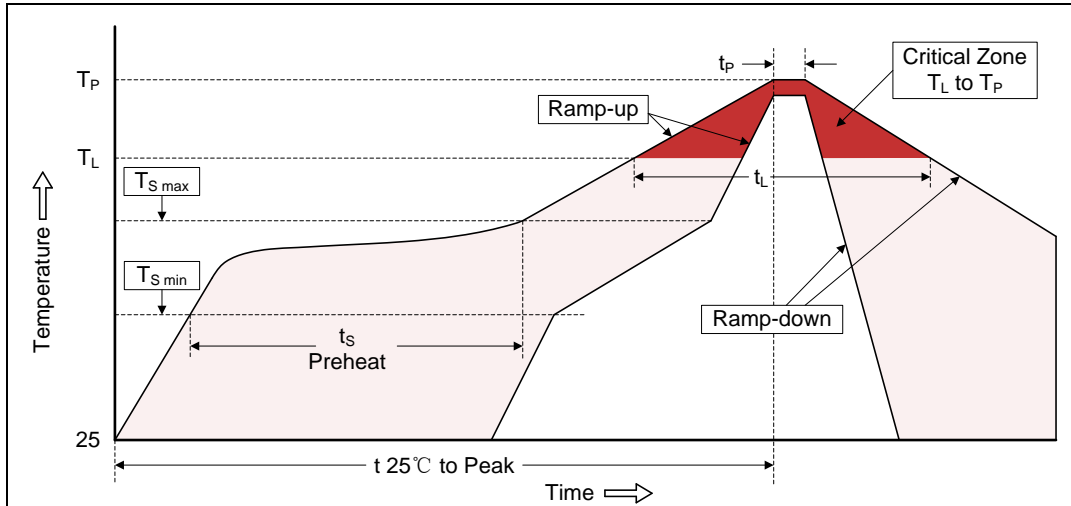
<p>Impulse Discharge Current</p>	<p>Maximum surge current that can be applied through center electrode with 8/20<math>\mu</math>s waveform, for 10 times with 3min interval time, which will be equally divided between each side electrode to center electrode, without causing the DC breakdown voltage to change more than 25% from its initial measured value.</p> 	
<p>Alternating Discharge Current</p>	<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. IR &gt; 10<sup>8</sup> ohms (-20%, +30% for 70~90V).</p>	
<p>Insulation Resistance</p>	<p>The resistance of gas tube shall be measured between each side electrodes and center electrode.</p>	
<p>Capacitance</p>	<p>The capacitance of gas tube shall be measured between each side electrodes and center electrode. Test frequency: 1MHz</p>	

**Recommended Soldering Conditions**

Wave Soldering



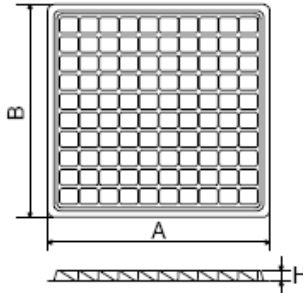
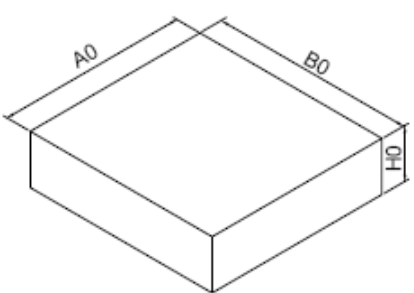
Reflow Soldering



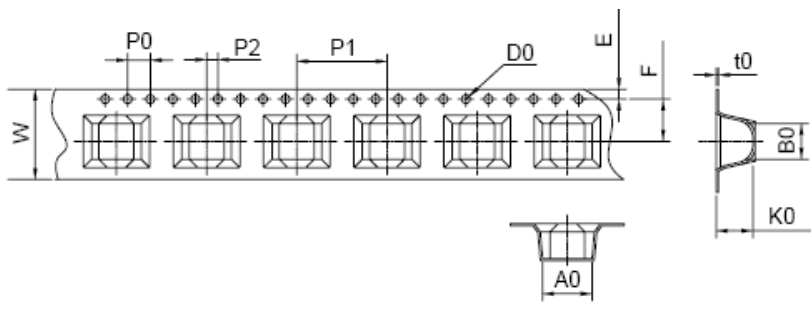
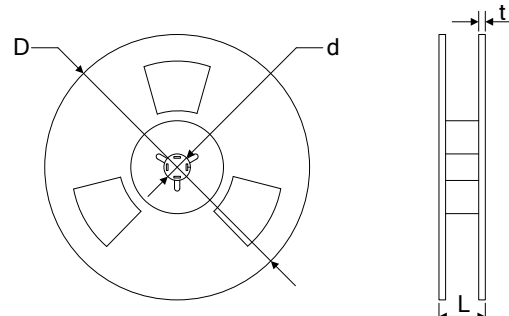
Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	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**

**Axial Packing (Bulk)**

Skin packing	Symbol	Dimension (mm)		
		Spec.	Tolerance	
	A	217.0	±2.0	
	B	207.0	±2.0	
	H	10.3	±0.5	
	Quantity: 100pcs			
Inner box		A0	225.0	±2.0
		B0	210.0	±2.0
		H0	60.0	±2.0
	Quantity: 500pcs			

**SMD Packing (Tape & Reel)**

Tape	Symbol	Dimension (mm)			
		Spec.	Tolerance		
	W	16.00	±0.20		
	P0	4.00	±0.10		
	P1	16.00	±0.10		
	P2	2.00	±0.10		
	D0	1.55	±0.05		
	E	1.75	±0.10		
	F	7.50	±0.10		
	A0	8.80	±0.10		
	K0	6.20	±0.10		
	B0	6.35	±0.10		
	t0	0.50	±0.05		
	Reel		D	330.00	±2.00
			d	13.00	±0.50
			L	20.00	±2.00
t			2.00	±0.20	
Quantity: 600pcs					

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