

Gas Discharge Tubes (GDT)

2R-8TH Series

Description

RUILON 2R-8TH Gas Discharge Tubes (GDT) series is a flat product made of patented technology and advanced welding technology, which greatly reduces the installation space in use.

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. 2RB-8TH Gas Discharge Tubes (GDT) series has a surge rating of 10kA/5KA, 8/20 μ s. 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.



Agency Approvals

Agency	Standards	Certificate No.
	UL1449	E508408

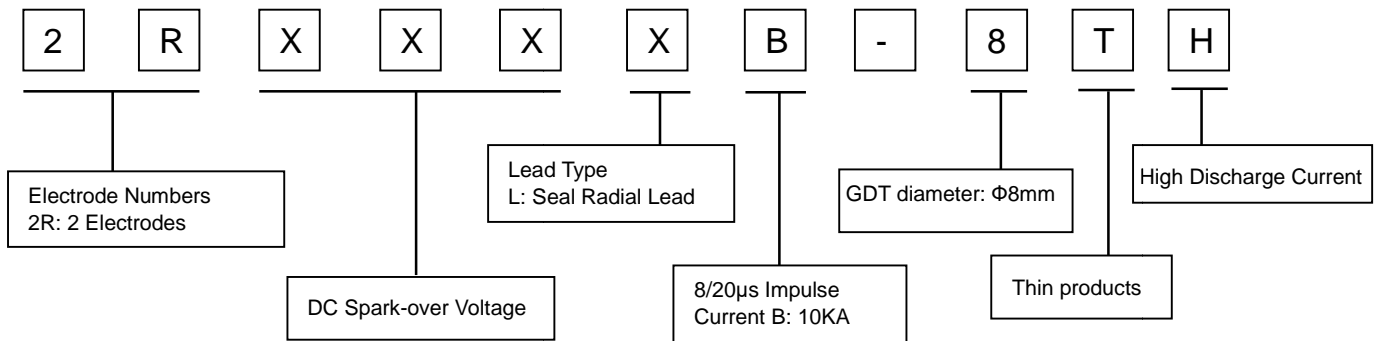
Features

- I Patented technology
- I Occupy smaller PCB area
- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20 μ s Impulse current capability: 10KA / 5KA
- I Non-Radioactive
- I Ultra Low capacitance (<3 pF)
- I GDT diameter: Φ 8mm
- I Storage and operational temperature: -40~+125°C

Applications

- I Telecom CPE
- I Communication equipment
- I Surge Protective Devices
- I High density PCB assemblies







Part Number Code



Gas Discharge Tubes (GDT)



2R-8TH Series

Electrical Characteristics

Model		2R090LB-8TH	2R230LB-8TH	2R350LB-8TH	2R470LB-8TH	2R600LB-8TH	Units
DC Spark-over Voltage ¹⁾²⁾	at 100V/S	90±30%	230±30%	350±30%	470±30%	600±30%	V
Impulse Spark-over Voltage	at 100V/μS	<500	<600	<500	<600	<750	V
	at 1KV/μS	<600	<700	<600	<700	<850	V
Front of wave spark-over voltage	at 1.2/50 μs, 6 kV	<800	<850	<750	<850	<1000	V
Service life (According to IEC 61643-311)							
Nominal impulse discharge current	8/20μs ±5 times	10	10	10	10	10	KA
Maximum discharge current	8/20μs 1 time	12	12	12	12	12	KA
Impulse discharge current	10/350μs 2 times	2	2	2	2	2	KA
Alternating Discharge Current	50Hz, 1S 10 times	5	5	5	5	5	A
Impulse Life	10/1000μS 300 times	100	100	100	100	100	A
Glow Voltage	at 10mA	~60	~135	~135	~160	~180	V
Arc Voltage	at 1A	~10	~15	~15	~18	~18	V
Insulation Resistance		>1	>1	>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage		50	100	100	100	100	V _{DC}
Capacitance	at 1MHz	<3	<3	<3	<3	<3	pF
Weight		~1.1	~1.1	~1.1	~1.1	~1.1	g
Operation and storage temperature		-40~+125	-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)		40/125/21	40/125/21	40/125/21	40/125/21	40/125/21	
Agency Approvals UL1449 (E508408)		⊙	⊙	⊙	⊙	⊙	
Marking, Laser marking		RUILON 2R090LB-8TH 	RUILON 2R230LB-8TH 	RUILON 2R350LB-8TH 	RUILON 2R470LB-8TH 	RUILON 2R600LB-8TH 	
Surface treatment	Body	Epoxy resin coating					
	Wire	Tin plated					

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Model	2R800LB-8TH	2R1000L-8TH	2R1500L-8TH	Units
DC Spark-over Voltage ^{1) 2)} at 100V/S	800±20%	1000±20%	1500±20%	V
Impulse Spark-over Voltage at 100V/μS	<1000	<1200	<1800	V
	at 1KV/μS	<1100	<1300	V
Front of wave spark-over voltage at 1.2/50 μs, 6 kV	<1250	<1500	<2300	V
According to IEC 61643-311				
Nominal impulse discharge current 8/20μs ±5 times	10	10	10	KA
Maximum discharge current 8/20μs 1 time	12	12	12	KA
Impulse discharge current 10/350μs 2 times	2	2	2	KA
According to IEC 61643-11				
Maximum continuous operating voltage at 50/60Hz U_c	255	275	320	Vrms
Nominal impulse discharge current 8/20μs 15 times I_n	5	5	5	KA
Maximum discharge current 8/20μs 1 time I_{max}	10	10	10	KA
Impulse discharge current 10/350μs 5 times I_{imp}	1	1	1	KA
Follow current at 50/60Hz I_f	100	100	100	A
Glow Voltage at 10mA	~180	~200	~200	V
Arc Voltage at 1A	~18	~18	~20	V
AC withstand voltage at 5mA 1minute	--	500	800	V
Insulation Resistance	>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage	100	100	100	V _{DC}
Capacitance at 1MHz	<3	<3	<3	pF
Weight	~1.1	~1.1	~1.1	g
Operation and storage temperature	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)	40/125/21	40/125/21	40/125/21	
Agency Approvals UL1449 (E508408) 	©	--	--	
Marking, Laser marking	RUILON 2R800LB-8TH  DAC	RUILON 2R1000L-8TH DAC	RUILON 2R1500L-8TH DAC	
Surface treatment	Body	Epoxy resin coating		
	Wire	Tin plated		

Gas Discharge Tubes (GDT)

2R-8TH Series

Model		2R2000L-8TH	2R2500L-8TH	2R3000L-8TH	2R3600L-8TH	Units
DC Spark-over Voltage ¹⁾²⁾	at 100V/S	2000±20%	2500±20%	3000±20%	3600±20%	V
Impulse Spark-over Voltage	at 100V/μS	<2400	<3000	<3600	<4300	V
	at 1KV/μS	<2500	<3200	<3800	<4500	V
Front of wave spark-over voltage	at 1.2/50 μs, 6 kV	<3000	<3300	<4000	<4800	V
Service life (According to IEC 61643-311)						
Nominal impulse discharge current	8/20μs ±5 times	5	5	4	4	KA
Maximum discharge current	8/20μs 1 time	10	10	5	5	KA
Alternating Discharge Current	50Hz, 1S 10 times	2.5	2.5	1	1	A
Glow Voltage	at 10mA	~250	~250	~250	~250	V
Arc Voltage	at 1A	~30	~30	~30	~30	V
AC withstand voltage	at 5mA 1minute	1050	1300	1600	1900	V
Insulation Resistance						
Insulation Resistance Measuring Voltage		500	500	500	500	V _{DC}
Capacitance	at 1MHz	<3	<3	<3	<3	pF
Weight		~1.1	~1.1	~1.1	~1.1	g
Operation and storage temperature		-40~+125	-40~+125	-40~+125	-40~+125	°C
Climatic category (IEC60068-1)		40/125/21	40/125/21	40/125/21	40/125/21	
Agency Approvals		--	--	--	--	
Marking, Laser marking		RUILON 2R2000L-8TH	RUILON 2R2500L-8TH	RUILON 2R3000L-8TH	RUILON 2R3600L-8TH	
Surface treatment	Body	Epoxy resin coating				
	Wire	Tin plated				

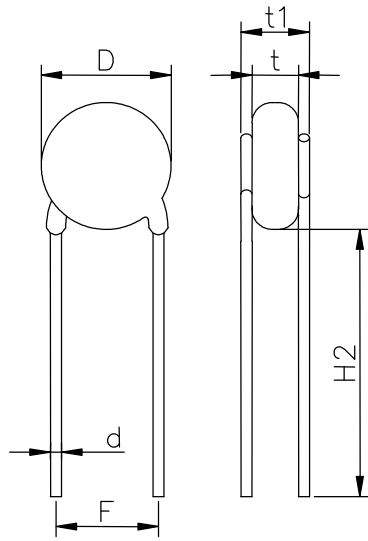
¹⁾ At delivery AQL 0.65 level II, DIN ISO 2859.

²⁾ In ionized mode.

Gas Discharge Tubes (GDT)

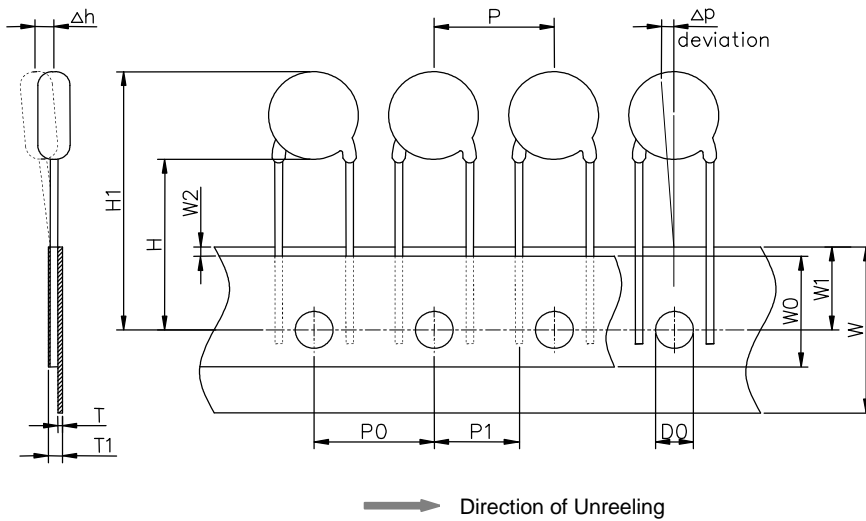
2R-8TH Series

Dimensions



Symbol	Millimeters	Inches
D	$\Phi 9 \pm 0.5$	$\phi 0.354 \pm 0.020$
d	$\Phi 0.75 \pm 0.1$	$\phi 0.030 \pm 0.004$
F	7.5 ± 0.5	0.295 ± 0.020
H2	15 Min	0.591 Min
t	4 ± 1.5	0.157 ± 0.059
t1	5 ± 1.5	0.197 ± 0.059

Packaging Information



➔ Direction of Unreeling

Packing and dimensions according to IEC 60286-2

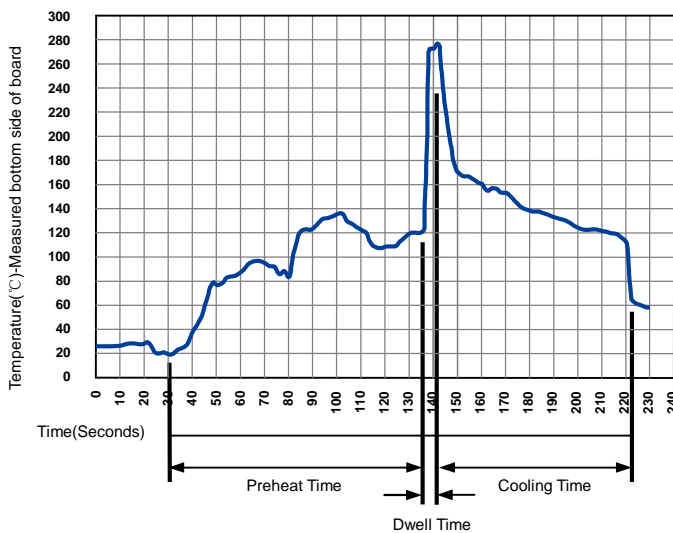
Symbol	Millimeters	Inches
P	12.7 ± 1.0	0.5 ± 0.039
P0	12.7 ± 0.3	0.5 ± 0.012
P1	8.95 ± 0.7	0.352 ± 0.028
H	$18 + 2 / - 0$	$0.709 + 0.079 / - 0$
H1	33 Max	1.299 Max
T	0.9 Max	0.035 Max
T1	1.7 Max	0.067 Max
W	$18 + 1 / - 0.5$	$0.709 + 0.039 / - 0.020$
W0	5.0 Min	0.197 Min
W1	$9 + 0.75 / - 0.5$	$0.354 + 0.030 / - 0.020$
W2	3.0 Max	0.118 Max
D0	$\Phi 4 \pm 0.2$	$\Phi 0.157 \pm 0.008$
Δh	2.0 Max	0.08 Max
Δp	1.3 Max	0.051 Max

Gas Discharge Tubes (GDT)

2R-8TH Series

	Inner Box	Carton
Size	335×265×40mm	550×350×240mm
Quantity	MPQ/MOQ: 1 Inner Box=1,000pcs	1Carton=10 Inner Box=10,000pcs
Photos		

Soldering Parameters - Wave soldering (Thru-Hole Devices)

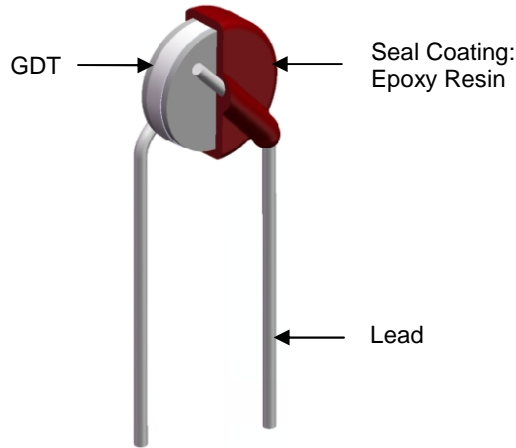


Wave Soldering Condition		Pb-Free assembly
Preheat	Temperature Min	100°C
	Temperature Max	150°C
	Time (Min to Max)	60-180 Seconds
Solder Pot Temperature		280°C Max
Solder Dwell Time		2-5 Seconds

Gas Discharge Tubes (GDT)

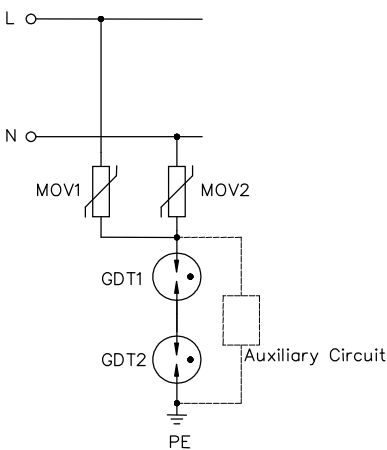
2R-8TH Series

Construction (L Series)



Application Circuit

Use for AC1500V withstand voltage



Symbol	Model
MOV1	14D471
MOV2	14D471
GDT1	2R1500L-8TH
GDT2	2R1500L-8TH

Electrical Characteristics (With auxiliary circuit)		
DC Spark-over Voltage	at 100V/S	2400~3600V
Impulse Spark-over Voltage	at 100V/μS	<2000V
	at 1KV/μS	<2300V
Front of wave spark-over voltage	at 1.2/50 μs, 6 kV	<2500V
AC withstand voltage	at 5mA 1minute	1500V
Service life		
Nominal impulse discharge current	8/20μs ±5 times	10KA
Maximum discharge current	8/20μs 1 times	15KA
Alternating Discharge Current	50Hz,1S 10 times	3KA

1.2/50 μs, 6 kV Waveform (+)

1.2/50 μs, 6 kV Waveform (-)



Terms and definitions

NO.	Item	Definitions
1	Gas discharge tube(GDT)	Gap, or several gaps, in an enclosed discharge medium, other than air at atmospheric pressure, designed to protect apparatus or personnel, or both, from high transient voltages. Also referred to as "gas tube surge arrester".
2	DC Spark-over Voltage	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	Impulse Spark-over Voltage	The highest voltage which appears across the terminals of a gas discharge tube in the period between the application of an impulse of given wave-shape and the time when current begins to flow.
4	Impulse discharge current 8/20μs	Current impulse with a nominal virtual front time of 8 μ s and a nominal time to half-value of 20 μ s.
5	Impulse discharge current 10/350μs	Current impulse with a nominal virtual front time of 10 μ s and a nominal time to half-value of 350 μ s.
6	1,2/50 voltage impulse	Voltage impulse with a nominal virtual front time of 1,2 μ s and a nominal time to half-value of 50 μ s.
7	Maximum continuous operating voltage U_c	Maximum r.m.s. voltage, which may be continuously applied to the GDT's mode of protection.
8	Nominal discharge current I_n	Crest value of the current through the GDT having a current waveshape of 8/20.
9	Maximum discharge current I_{max}	Crest value of a current through the SPD having an 8/20 waveshape and magnitude according to the manufacturers specification. I_{max} is equal to or greater than I_n .
10	Impulse discharge current for class I test I_{imp}	Crest value of a discharge current through the SPD with specified charge transfer Q and specified energy W/R in the specified time.
11	Follow current I_f	Peak current supplied by the electrical power system and flowing through the SPD after a discharge current impulse.
12	Insulation Resistance	Insulation resistance shall be measured from each terminal to every other terminal of the GDT. The test is performed with DC50V when normal spark-over Voltage 70~150V, others with DC100V.
13	Capacitance	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.
14	Class I tests	Tests carried out with the impulse discharge current I_{imp} , with an 8/20 current impulse with a crest value equal to the crest value of I_{imp} , and with a 1,2/50 voltage impulse.
15	Class II tests	Tests carried out with the nominal discharge current I_n , and the 1,2/50 voltage impulse.

Cautions and warnings

- I Surge arresters must not be operated directly in power supply networks.
- I Surge arresters may become hot in case of longer periods of current stress (danger of burning).
- I If the contacts of the surge arresters are defective, current stress can lead to the formation of sparks and loud noises.
- I Surge arresters may be used only within their specified values. In case of overload, the head contacts may fail or the component may be destroyed.
- I Damaged surge arresters must not be re-used.