



# Datasheet

## Gas Discharge Tube (GDT)

Series / Models	2RS-8T25 Series
Product Code	10.12.74.XXXX
Version	A1
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File Number	SP-GDT-276

## Version History

Version	Date	Page	Description	Author
A0	2025-03-11	/	Initial draft	Xia Wu
A1	2025-12-12	Page 4	Update Electrical Characteristics	Xia Wu

## Description

Gas discharge tubes (GDT) are generally in a high insulation resistance state, equivalent to an open circuit, which has almost no impact on the normal operation of the circuit. When transient overvoltage occurs in the circuit and the voltage amplitude exceeds the breakdown voltage of the GDT, the gas inside the GDT is ionized, causing the GDT to quickly conduct and limit the overvoltage to a lower level, thereby protecting electronic devices or circuit components connected in parallel from high voltage impact damage. After the overvoltage disappears, the GDT immediately returns to a high insulation resistance state, and the circuit resumes normal operation.

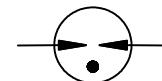
The 2RS-8T25 series is a small and ultra-thin GDT that can easily adapt to various compact electronic device layouts, greatly saving space and bringing higher flexibility to design. The low residual voltage characteristic ensures that after completing discharge protection, the residual voltage in the circuit is negligible, minimizing the potential impact on the precision electronic components at the back end and providing reliable guarantees for the stable operation of the equipment. It can also be perfectly combined with MOVs, and this composite design achieves complementary advantages, further enhancing the overall protective performance and being able to cope with more complex and harsh application environments.

## Features

- █ Excellent response to fast rising transients
- █ Stable breakdown voltage
- █ GHz working frequency
- █ 8/20 $\mu$ s Impulse current capability: 10KA
- █ Non-Radioactive
- █ Ultra Low capacitance (<2pF)
- █ Ultra-thin, size:  $\Phi$ 8\*2.5 mm



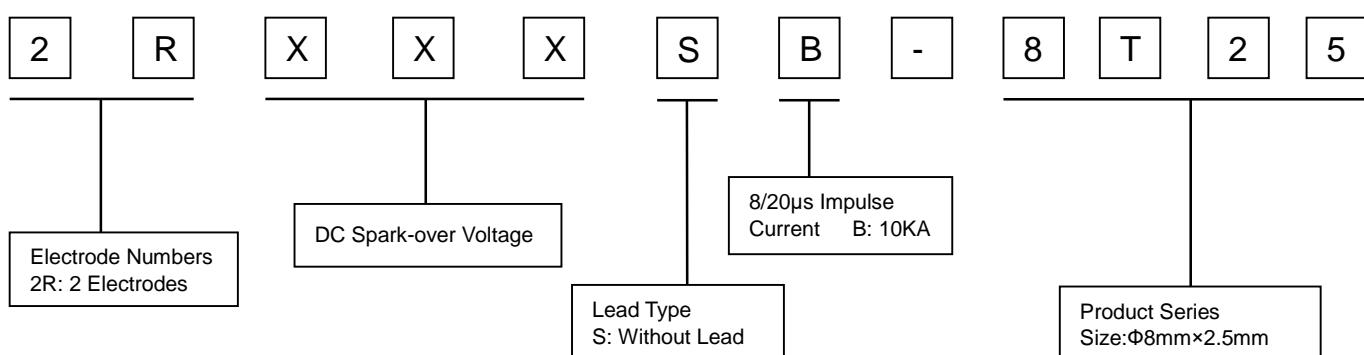
## Electrical symbol



## Applications

- █ Telecom CPE
- █ Communication equipment
- █ Surge Protective Devices
- █ High density PCB assemblies
- █ Combine with MOVs to form a composite component

## Part Number Code



## Electrical Characteristics

Model		2R090SB-8T25	2R230SB-8T25	2R350SB-8T25	Units
<b>DC Spark-over Voltage</b> <sup>1) 2)</sup>	at 100V/S	90±30%	230±30%	350±30%	V
<b>Impulse Spark-over Voltage</b>	at 100V/μS	<500	<600	<500	V
	at 1KV/μS	<600	<700	<600	V
<b>Front of wave spark-over voltage</b>	at 1.2/50 μs, 6 kV	<800	<850	<750	V
<b>Service life</b>					
Nominal impulse discharge current	8/20μs	±5 times	10	10	KA
Max. impulse discharge current	8/20μs	1 time	20	20	KA
Impulse discharge current	10/350μs	2 times	2	2	KA
Alternating Discharge Current	50Hz,1S	10 times	5	5	A
Impulse life	10/1000μS	300 times	100	100	A
<b>Glow Voltage</b>	at 10mA	~60	~135	~135	V
<b>Arc Voltage</b>	at 1A	~10	~15	~15	V
<b>Insulation Resistance</b>		>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage		50	100	100	V <sub>DC</sub>
<b>Capacitance</b>	at 1MHz	<2	<2	<2	pF
<b>Weight</b>		~0.65	~0.65	~0.65	g
<b>Operation temperature</b>		-40~+125	-40~+125	-40~+125	°C
<b>Recommended storage</b> <sup>3)</sup>					
Temperature		+5~+35	+5~+35	+5~+35	°C
Humidity		45~80	45~80	45~80	%
Period		≤ 2	≤ 2	≤ 2	years
<b>Climatic category (IEC60068-1)</b>		40/125/21	40/125/21	40/125/21	
<b>Certifications</b> <sup>4)</sup>					
 UL 1449	E508408	◎	◎	◎	
 CSA C22.2 No. 269	E508408	◎	◎	◎	
 EN 61643-311 IEC 61643-311	R50655662	--	--	--	
<b>Marking</b>	without				
<b>Surface treatment</b>	Matte-tin plated				
<b>Moisture sensitivity level</b> <sup>5)</sup>	1				

## Gas Discharge Tube(GDT)

## 2RS-8T25 Series

Model	2R470SB-8T25	2R600SB-8T25	2R800SB-8T25	Units
<b>DC Spark-over Voltage</b> <sup>1) 2)</sup> at 100V/S	470±30%	600±20%	800±20%	V
<b>Impulse Spark-over Voltage</b> at 100V/μS	<600	<750	<1000	V
at 1KV/μS	<700	<850	<1100	V
<b>Front of wave spark-over voltage</b> at 1.2/50 μs, 6 kV	<850	<1000	<1300	V
<b>Service life</b>				
Nominal impulse discharge current 8/20μs ±5 times	10	10	10	KA
Max. impulse discharge current 8/20μs 1 time	20	20	20	KA
Impulse discharge current 10/350μs 2 times	2	2	2	KA
Alternating Discharge Current 50Hz,1S 10 times	5	5	5	A
Impulse life 10/1000μS 300 times	100	100	100	A
1.2/50μS, 2Ω 40 times	20	20	20	KV
1.2/50μS, 12Ω 80 times	20	20	20	KV
<b>Glow Voltage</b> at 10mA	~160	~180	~180	V
<b>Arc Voltage</b> at 1A	~18	~18	~18	V
<b>AC withstand voltage</b> at 5mA 1minute	--	--	--	V
<b>Insulation Resistance</b>	>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage	100	100	100	V <sub>DC</sub>
<b>Capacitance</b> at 1MHz	<2	<2	<2	pF
<b>Weight</b>	~1.1	~1.1	~1.1	g
<b>Operation temperature</b>	-40~+125	-40~+125	-40~+125	°C
<b>Recommended storage</b> <sup>3)</sup>				
Temperature	+5~+35	+5~+35	+5~+35	°C
Humidity	45~80	45~80	45~80	%
Period	≤ 2	≤ 2	≤ 2	years
<b>Climatic category (IEC60068-1)</b>	40/125/21	40/125/21	40/125/21	
<b>Certifications</b> <sup>4)</sup>				
 UL 1449 E508408	◎	◎	◎	
 CSA C22.2 No. 269 E508408	◎	◎	◎	
 EN 61643-311 IEC 61643-311 R50655662	--	--	--	
<b>Marking</b>	without			
<b>Surface treatment</b>	Matte-tin plated			
<b>Moisture sensitivity level</b> <sup>5)</sup>	1			

## Gas Discharge Tube(GDT)

## 2RS-8T25 Series

Model	2R1000S-8T25	2R1200S-8T25	2R1500S-8T25	Units
<b>DC Spark-over Voltage</b> <sup>1) 2)</sup> at 100V/S	1000±20%	1200±20%	1500±20%	V
<b>Impulse Spark-over Voltage</b> at 100V/μS	<1200	<1500	<1800	V
at 1KV/μS	<1300	<1600	<2000	V
<b>Front of wave spark-over voltage</b> at 1.2/50 μs, 6 kV	<1500	<1800	<2300	V
<b>Service life</b>				
Nominal impulse discharge current 8/20μs ±5 times	10	10	10	KA
Max. impulse discharge current 8/20μs 1 time	20	20	20	KA
Impulse discharge current 10/350μs 2 times	2	2	2	KA
Alternating Discharge Current 50Hz,1S 10 times	5	5	5	A
Impulse life 10/1000μS 300 times	100	100	100	A
1.2/50μS, 2Ω 40 times	20	20	20	KV
1.2/50μS, 12Ω 80 times	20	20	20	KV
<b>Glow Voltage</b> at 10mA	~200	~200	~200	V
<b>Arc Voltage</b> at 1A	~18	~18	~20	V
<b>AC withstand voltage</b> at 5mA 1minute	500	500	750	V
<b>Insulation Resistance</b>	>1	>1	>1	GΩ
Insulation Resistance Measuring Voltage	100	100	100	V <sub>DC</sub>
<b>Capacitance</b> at 1MHz	<2	<2	<2	pF
<b>Weight</b>	~1.1	~1.1	~1.1	g
<b>Operation temperature</b>	-40~+125	-40~+125	-40~+125	°C
<b>Recommended storage</b> <sup>3)</sup>				
Temperature	+5~+35	+5~+35	+5~+35	°C
Humidity	45~80	45~80	45~80	%
Period	≤ 2	≤ 2	≤ 2	years
<b>Climatic category (IEC60068-1)</b>	40/125/21	40/125/21	40/125/21	
<b>Certifications</b> <sup>4)</sup>				
 UL 1449 E508408	◎	--	◎	
 CSA C22.2 No. 269 E508408	◎	--	◎	
 EN 61643-311 IEC 61643-311 R50655662	◎	--	--	
<b>Marking</b>	without			
<b>Surface treatment</b>	Matte-tin plated			
<b>Moisture sensitivity level</b> <sup>5)</sup>	1			

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

2) In ionized mode.

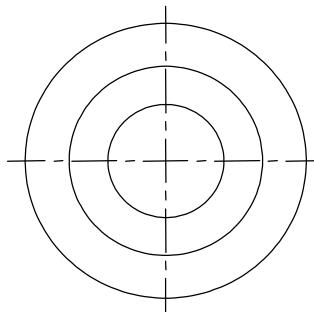
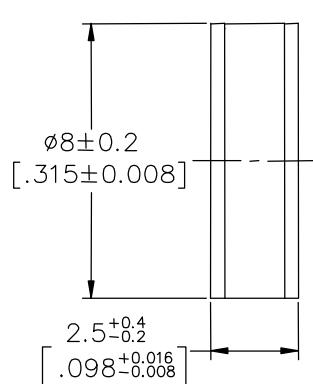
3) Specified in terms of corrosion against tin plating.

4) “◎” indicates that the product has passed the certification, “--” indicates that the product is not certified.

5) Tests according to JEDEC J-STD-020.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T18802.311, GB/T 9043.

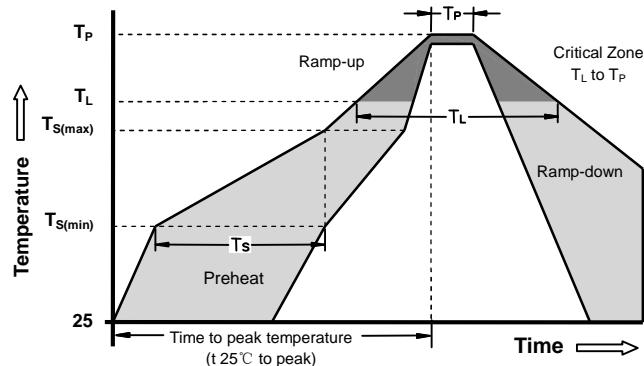
## Dimensions(Unit: mm/inch)



## Packaging Information

Packing bulk: 1000 PCS per package

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



Reflow Condition		Pb - Free assembly
Pre Heat	-Temperature Min (Ts(min))	150°C
	-Temperature Max (Ts(max))	200°C
	- Time (min to max) (ts)	60 -180 Seconds
Average ramp up rate (Liquids TempTl) to peak		3°C/second max
Reflow	Ts(max) to Tl - Ramp-up Rate	5°C/second max
	- Temperature (Tl) (Liquids)	217°C
	- Time (min to max) (ts)	60 -150 Seconds
	Peak Temperature (Tp)	260 +0/-5°C
Time within 5°C of actual peak Temperature (tp)		10- 30 Seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (Tp)		8 minutes Max
Do not exceed		260°C

## Terms and definitions

NO.	Item	Definitions
1	<b>Gas discharge tube(GDT)</b>	A 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	<b>DC Spark-over Voltage</b>	The voltage at which the gas discharge tube sparks over with slowly increasing d.c. voltage.
3	<b>Impulse Spark-over Voltage</b>	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.
5	<b>Arc voltage</b>	Voltage drop across the GDT during arc current flow.
6	<b>Glow voltage</b>	Peak value of voltage drop across the GDT when a glow current is flowing.
7	<b>Impulse discharge current 8/20μs</b>	Current impulse with a nominal virtual front time of 8μs and a nominal time to half-value of 20 μs.
8	<b>Alternating Discharge Current</b>	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	<b>Insulation Resistance</b>	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.
10	<b>Capacitance</b>	The capacitance shall be measured once at 1 MHz between all terminals unless otherwise specified.

## Cautions

- | Do not operate gas discharge tubes in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the gas discharge tubes.
- | Gas discharge tubes may become hot in the event of longer periods of current stress (burn risk). In the event of overload the connectors may fail or the component may be destroyed.
- | Gas discharge tubes must be handled with care and must not be dropped.
- | Do not continue to use damaged gas discharge tubes.
- | The shown SMD pad dimensions represent a safe way to mount the arrester and are a recommendation of the manufacturer. During the reflow process it must be assured that no solder material reduces the insulation distance between the pads below the arrester.
- | SMD gas discharge tubes should be soldered within 24 month after shipment.
- | The electrical characteristics described in this datasheet are only typical characteristics, and all of these characteristics have been confirmed through testing and inspection. If the customer's usage requirements are different from this or have special requirements, please contact Ruilongyuan Electronics Co., Ltd. If protection failure or circuit damage occurs as a result, our company is not responsible for it.
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