Datasheet

Gas Discharge Tube (GDT)

Series / Models	SMD2550 Series
Product Code	10.12.15.XXXX
Version	A0
Date	2025-08-12
File Number	SP-GDT-322

Version History

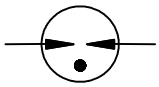
Version	Date	Page	Description	Author
A0	2025-08-12	/	Initial draft	Xia Wu

Description

Gas discharge tubes (GDTs) 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 SMD2550 series is an ultra-thin, small-sized surface mount 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.

Electrical symbol



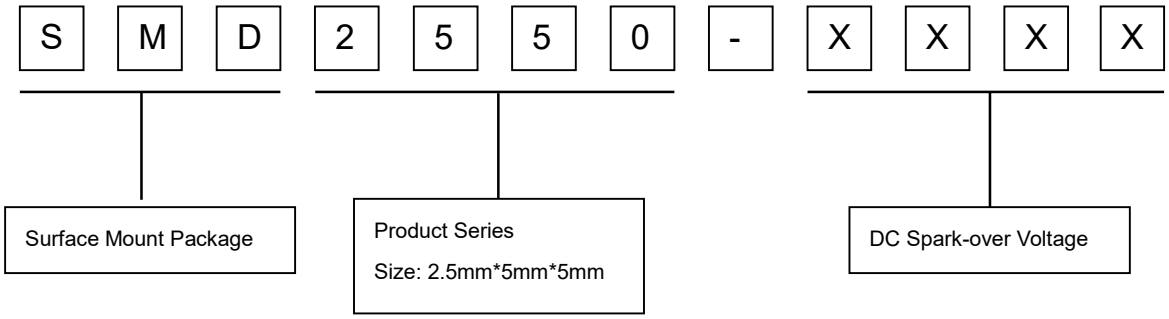
Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 5KA
- Non-Radioactive
- Ultra Low capacitance (<1.5 pF)
- Size: 2.5mm (L) * 5mm (W) * 5mm (H)

Applications

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

Part Number Code

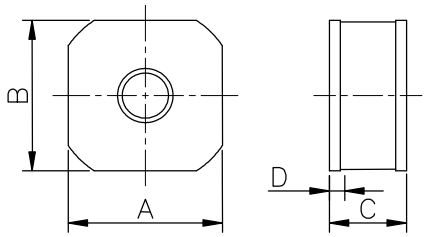


Electrical Characteristics

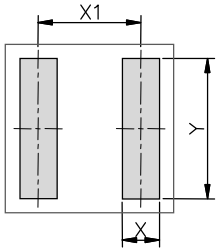
Model			SMD2550-1000	SMD2550-1500	Units
DC Spark-over Voltage [1) 2)]	at 100V/S		1000±20%	1500±20%	V
Impulse Spark-over Voltage	at 100V/μS		<1500	<1800	V
	at 1KV/μS		<1600	<2000	V
Front of wave spark-over voltage	at 1.2/50μS, 6 kV		<2000	<2500	V
Service life (According to IEC 61643-311)					
Nominal impulse discharge current	8/20μS	±5 times	5	5	KA
Max. impulse discharge current	8/20μS	1 time	6	6	KA
Alternating Discharge Current	50Hz,1S	10 times	1	1	A
Impulse life	10/1000μS	300 times	100	100	A
	1.2/50μS, 2Ω [3)]	40 times	6	6	KV
	1.2/50μS, 12Ω [3)]	80 times	6	6	KV
Glow Voltage	at 10mA		~230	~230	V
Arc Voltage	at 1A		~20	~20	V
AC withstand voltage	at 5mA 1minute		500	750	V
Insulation Resistance			>1	>1	GΩ
Insulation Resistance Measuring Voltage			100	100	V_{DC}
Capacitance	at 1MHz		<1.5	<1.5	pF
Weight			~0.23	~0.23	g
Operation and storage temperature			-40~+125	-40~+125	°C
Recommended storage [4)]					
Temperature			+5~+35	+5~+35	°C
Humidity			45~80	45~80	%
Period			≤ 2	≤ 2	years
Climatic category (IEC60068-1)			40/125/21	40/125/21	
Marking			Without		
Surface treatment			Matte-tin plated		
Moisture sensitivity level [5)]			1		

1) At delivery AQL 0.65 level II, DIN ISO 2859.
2) In ionized mode.
3) Tested with MOVs.
4) Specified in terms of corrosion against tin plating.
5) Tests according to JEDEC J-STD-020.
Terms and current waveforms in accordance with ITU-T K. 12, IEC61643-21 and IEC 61643-311.

Dimensions



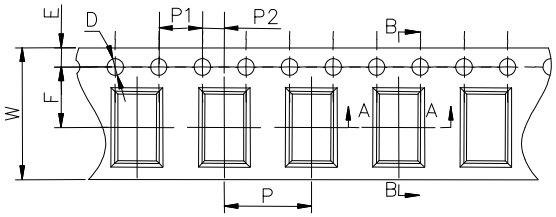
Symbol	Millimeters	Inches
A	5.0±0.2	0.197±0.008
B	5.0±0.2	0.197±0.008
C	2.5±0.2	0.165±0.012
D	0.4±0.1	0.020±0.004
X	1	0.039
X1	2.6	0.102
Y	4	0.157

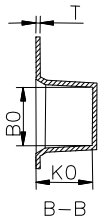


Recommended Soldering Pad Layout

Packaging Information

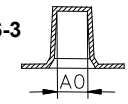
Tape Specifications





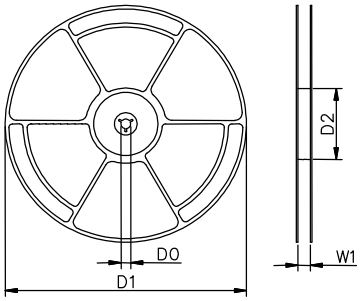
B–B

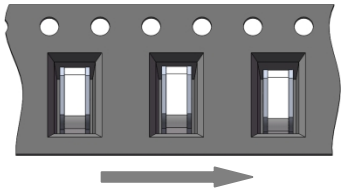
Tape and reel according to IEC 60286-3



A–A

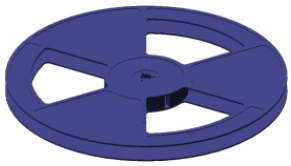
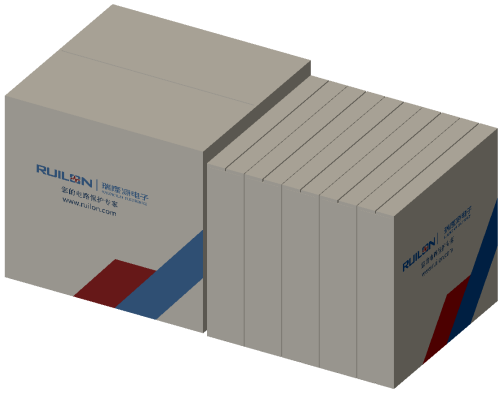
Reel Specifications



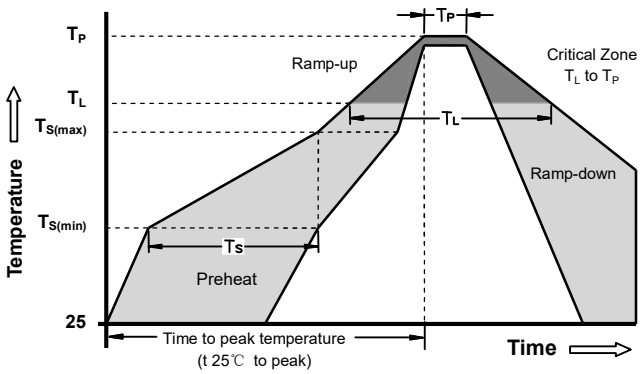


Direction of Unreeling

Symbol	Millimeters	Inches
W	12±0.3	0.472±0.012
A0	2.8±0.1	0.110±0.004
B0	5.3±0.1	0.209±0.004
K0	5.2±0.1	0.205±0.004
P	8±0.1	0.315±0.004
F	5.5±0.1	0.217±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	12.5±0.4	0.492±0.016

	Reel	Inner Box	Carton
Size	330×17mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=1,000pcs	1 Inner Box=3 reels=3,000pcs	1Carton=5 Inner boxes=15,000pcs
Photos			

Soldering Parameters - Reflow Soldering (Surface Mount Devices)



Reflow Condition		Pb - Free assembly
Preheat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 -180 Seconds
Average ramp up rate (Liquids Temp T_L) to peak		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquids)	217°C
	- Time (min to max) (t_s)	60 -150 Seconds
Peak Temperature (T_P)		260 +0/-5°C
Time within 5°C of actual peak Temperature (t_p)		10 - 30 Seconds

Surface mounted components (SMD) may exhibit a temporary increase in the DC spark-over voltage after the solder reflow process. The components will recover within 24 hours. There is no quality defect nor change in protection levels during the temporary change in DC spark-over voltage.

Terms and definitions

NO.	Item	Definitions
1	**Gas discharge tube(GDT)**	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	**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.
5	**Arc voltage**	Voltage drop across the GDT during arc current flow.
6	**Glow voltage**	Peak value of voltage drop across the GDT when a glow current is flowing.
7	**Impulse discharge current 8/20μs**	Current impulse with a nominal virtual front time of 8 μs and a nominal time to half-value of 20 μs.
8	**Alternating Discharge Current**	The rms value of an approximately sinusoidal alternating current passing through the gas discharge tube.
9	**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.
10	**Capacitance**	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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