



Datasheet

Gas Discharge Tube (GDT)

Series / Models	SMD5050-1000
Product Code	10.12.20.1020
Version	A0
Date	2025-03-24
File Number	SP-GDT-273

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SMD5050-1000

Version History

Version	Date	Page	Description	Author
A0	2025-03-24	/	Initial draft	Xia Wu

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SMD5050-1000

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 SMD5050-1000 GDT is a high-voltage surface mount package. It is not only small in size and easy to install on various compact printed circuit boards (PCBs), but also has excellent performance. High AC withstand voltage and high insulation resistance ensure that the performance of the circuit will not suffer additional losses under normal operating conditions. The SMD5050-1000 GDT is a high-voltage component designed specifically for surge protection and high isolation applications. It is also suitable for applications where there is typically a bias voltage or signal level of several hundred volts. It can also be combined with MOVs to provide excellent protection performance for AC applications.

Features

- I Voltage Ranges 1000V
- I Excellent response to fast rising transients
- I 8/20μs Impulse current capability: 3KA
- I Non-Radioactive
- I Ultra Low capacitance (<0.8pF)
- I Size: 4.2mm*5mm*5mm

Electrical symbol



Applications

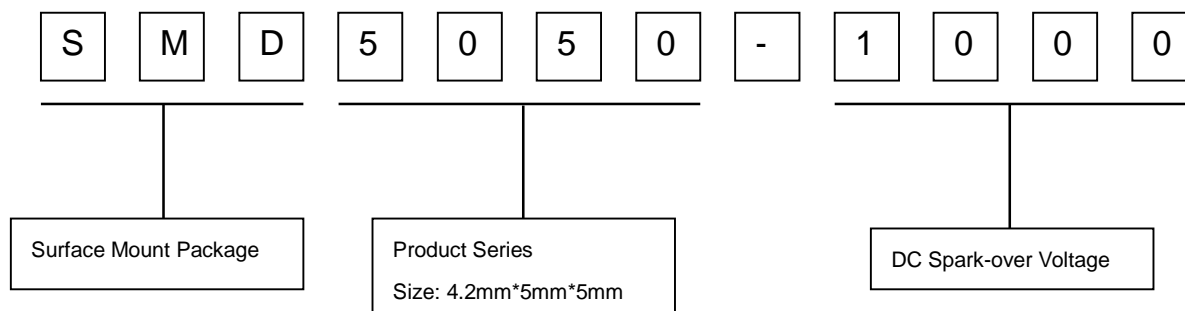
Automotive:

- I On-board chargers
- I Vehicle charging stations

Others:

- I LED lighting
- I Power supply
- I Photovoltaic
- I Air conditioning

Part Number Code



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Electrical Characteristics

DC Spark-over Voltage ^{1) 2)}	at 100V/S	1000±20%	V
Impulse Spark-over Voltage	at 100V/μS	<1500	V
	at 1KV/μS	<1600	V
Service life			
Impulse Discharge Current	8/20μS	±5 times	3
	8/20μS	1 time	5
Alternating Discharge Current	50Hz, 1S	10 times	3
Insulation Resistance	at DC 100V	>1	GΩ
Capacitance	at 1MHz	<0.8	pF
Glow Voltage	at 10mA	~160	V
Arc Voltage	at 1A	~15	V
AC withstand voltage	at 5mA 1Min	500	V
Glow to Arc transition current		<0.3	A
Weight		~0.42	g
Operation temperature		-40~+125	°C
Recommended storage³⁾			
- Temperature		+5~+35°C	
- Humidity		45~80%	
- Period		≤ 2 years	
Climatic category (IEC60068-1)		40/125/21	
Marking		Without	
Surface treatment		Matte-tin plated	
Moisture sensitivity level ⁴⁾		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.

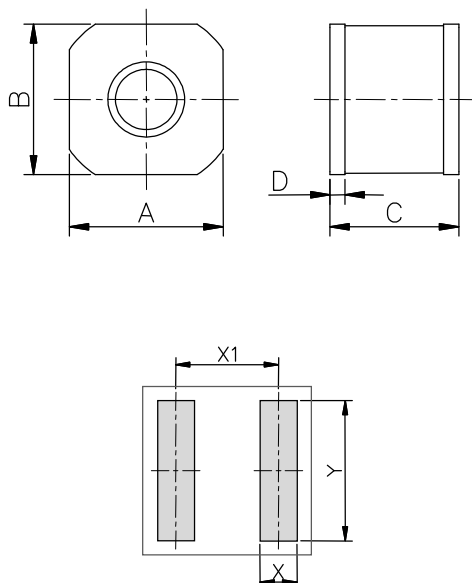
⁴⁾ Tests according to JEDEC J-STD-020.

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

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SMD5050-1000

Dimensions

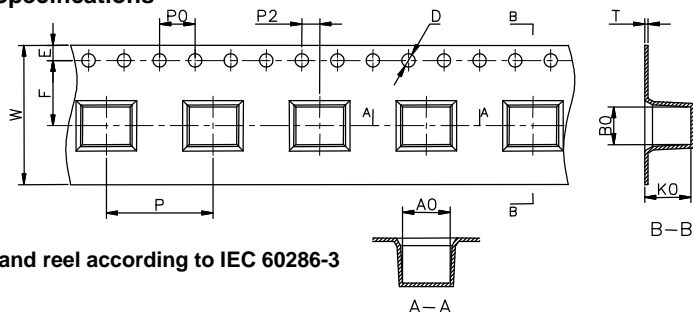


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	5.0±0.2	0.197±0.008
B	5.0±0.2	0.197±0.008
C	4.2±0.3	0.165±0.012
D	0.5±0.1	0.020±0.004
X	1.2	0.047
X1	4.0	0.157
Y	5.5	0.217

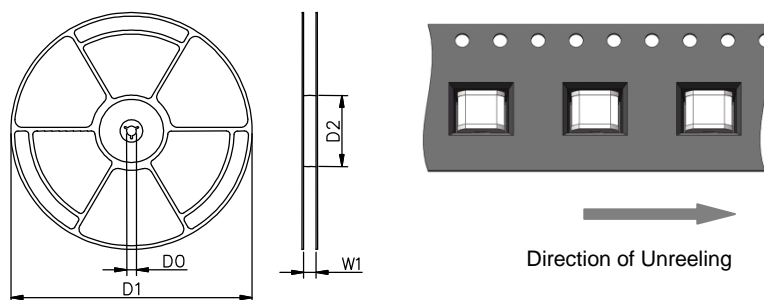
Packaging Information

Tape Specifications



Tape and reel according to IEC 60286-3

Reel Specifications



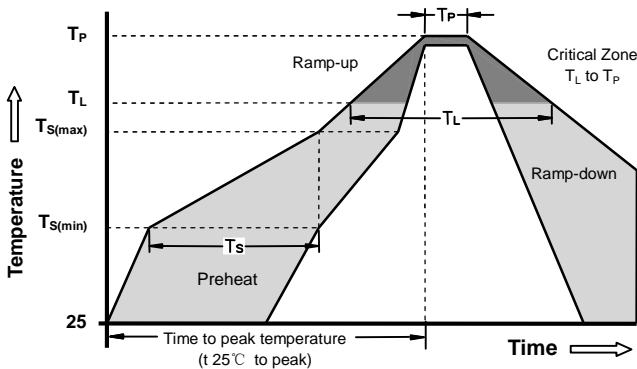
Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	5.3±0.1	0.209±0.004
B0	4.3±0.1	0.169±0.004
K0	5.2±0.1	0.205±0.004
P	12±0.1	0.472±0.004
F	7.5±0.1	0.295±0.004
E	1.75±0.1	0.069±0.004
D	1.5+0.1/-0.0	0.059+0.004/-0.0
P0	4±0.1	0.157±0.004
P2	2±0.1	0.079±0.004
T	0.4±0.1	0.016±0.004
D0	13.3±0.15	0.524±0.006
D1	330±2	12.992±0.079
D2	100+1/-2	3.937+0.039/-0.079
W1	16.5±0.4	0.65±0.016

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SMD5050-1000

	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 (Ts(min))	150°C
	-Temperature Max (Ts(max))	200°C
	- Time (min to max) (ts)	60 -180 Seconds
Average ramp up rate (Liquids Temp TL) to peak		3°C/second max
Ts(max) to TL - Ramp-up Rate		5°C/second max
Reflow	- 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

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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

- I 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.
- I 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.
- I Gas discharge tubes must be handled with care and must not be dropped.
- I Do not continue to use damaged gas discharge tubes.
- I 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.
- I SMD gas discharge tubes should be soldered within 24 month after shipment.
- I 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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