

## Gas Discharge Tubes (GDT)

## SMD5542 (2000~4000V)

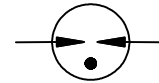
### Description

SMD5542 Gas Discharge Tubes (GDT) series provides high levels of protection against fast rising transients caused by lightning disturbances. Offered in a miniature surface mount package, it has a surge rating of 3KA 8/20 $\mu$ s.

SMD5542 GDTs are high voltage (2000-4000V) components designed for surge protection and high isolation applications. It is also suitable for applications for which bias voltage or signal levels of several hundred volts are normally present. SMD5542 GDTs can be used in conjunction with MOVs (Metal Oxide Varistors) to provide superior protection performance for AC applications.



### Electrical symbol



### Features

- I Voltage Ranges 2000V to 4000V
- I Excellent response to fast rising transients
- I 8/20 $\mu$ s Impulse current capability: 3KA
- I Non-Radioactive
- I Ultra Low capacitance (<0.5pF)
- I Size: 5.5mm\*4.2mm\*4.2mm
- I Storage and operational temperature: -40~+125 $^{\circ}$ C

### Applications

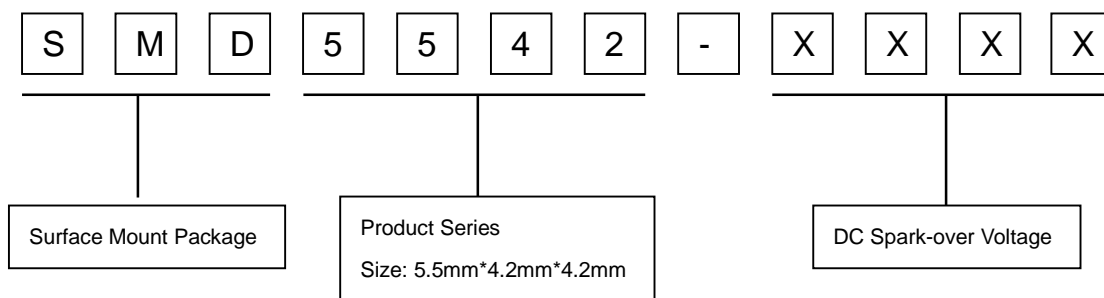
#### Automotive:

- 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

Part Number	DC Spark-over Voltage <sup>1) 2)</sup> @100V/S	Impulse Spark-over Voltage		Insulation Resistance <sup>3)</sup>	Capacitance @1MHz	Glow Voltage @10mA	Arc Voltage @1A	AC withstand voltage @5mA 1Min	Life Ratings			
		100V/μS	1KV/μS						Impulse Discharge Current @8/20μS		Impulse Discharge Current @1.2/50μS 12Ω <sup>4)</sup>	Alternating Discharge Current @50Hz 1S
		Max	Max						±5 times	1 time		
		V	V						V	GΩ	pF	V
SMD5542-2000	2000±20%	3300	3500	1	0.5	260	25	1000	3	5	10	1
SMD5542-2500	2500±20%	3800	4000	1	0.5	260	25	1300	3	5	10	1
SMD5542-3000	3000±20%	4300	4500	1	0.5	260	30	1600	3	5	10	1
SMD5542-3600	3600±20%	4800	5000	1	0.5	260	30	1900	3	5	10	1
SMD5542-4000	4000±20%	5800	6000	1	0.5	260	35	2100	3	5	10	1

Glow to Arc transition Current..... ~0.3A

Weight..... ~0.3g

Operation and storage temperature..... -40~+125°C

Climatic category (IEC 60068-1)..... 40/125/21

Marking..... Without

Surface treatment..... Matte-tin plated

<sup>1)</sup> At delivery AQL 0.55 level II, DIN ISO 2859.

<sup>2)</sup> In ionized mode.

<sup>3)</sup> Insulation Resistance Measuring Voltage at DC 500V.

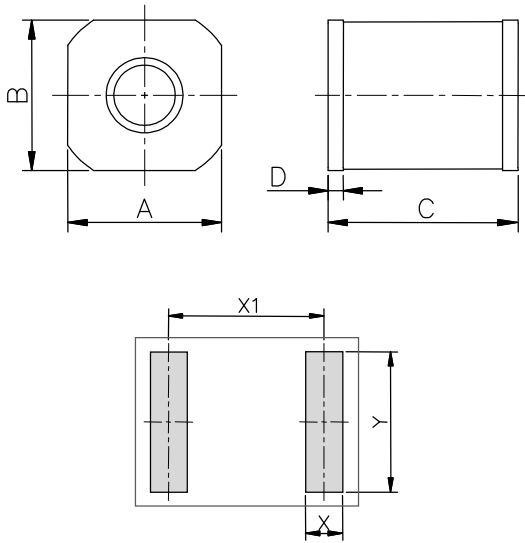
<sup>4)</sup> Tested at AC220V with varistor.

Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T 18802.311.

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### Dimensions

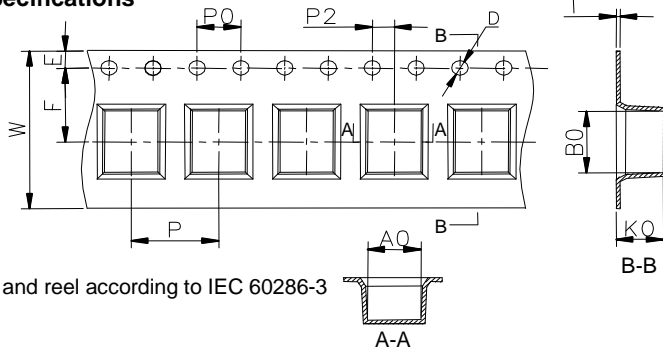


Recommended Soldering Pad Layout

Symbol	Millimeters	Inches
A	4.2±0.2	0.165±0.008
B	4.2±0.2	0.165±0.008
C	5.5±0.3	0.217±0.012
D	0.4±0.1	0.016±0.004
X	1.1	0.043
X1	5	0.197
Y	4.5	0.177

### Packaging Information

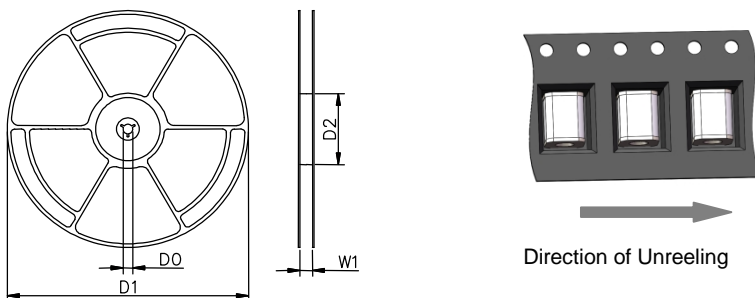
#### Tape Specifications



Tape and reel according to IEC 60286-3

Symbol	Millimeters	Inches
W	16±0.3	0.630±0.012
A0	4.6+0.2/-0.1	0.181+0.008/-0.004
B0	5.85+0.3/-0.1	0.230+0.012/-0.004
K0	4.6±0.1	0.181±0.004
P	8.0±0.1	0.315±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	0.35±0.05	0.014±0.002
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

#### Reel Specifications

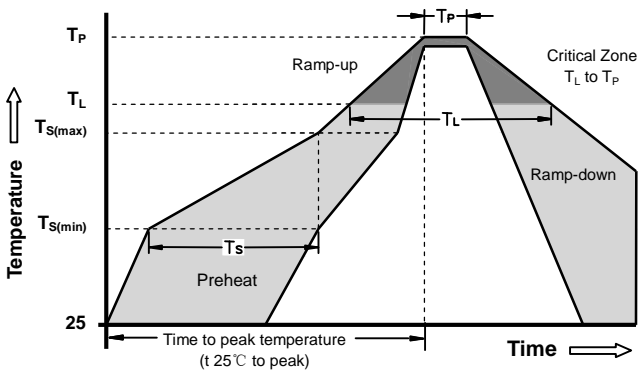


### Gas Discharge Tubes (GDT)

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	Reel	Inner Box	Carton
Size	330×17mm	340×333×70mm	375×353×380mm
Quantity	MPQ/MOQ: 1 reel=1,500pcs	1 Inner Box=3 reels=4,500pcs	1Carton=5 Inner boxes=22,500pcs
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 $T_L$ - 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
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature ( $T_P$ )		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 8/20<math>\mu</math>s</b>	Current impulse with a nominal virtual front time of 8 $\mu$ s and a nominal time to half-value of 20 $\mu$ s.
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.