

**Description**

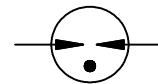
Gas discharge tubes (GDT) use noble gasses enclosed in ceramic tubes to provide an alternate circuit path for voltage spikes. The ceramic envelope and with nickel connectors allow for high loads. SMD5050 Gas Discharge Tubes (GDT) series has a surge rating of 5kA, 8/20µs. Offered in a Squared Surface Mount package, which helps to make pick and place on PCB process easier.

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.

SMD5050 Gas Discharge Tube (GDT) series are specifically designed for protection of electrical, multimedia, and communication equipment against over voltage transients in surface mount assembly applications.



**Electrical symbol**



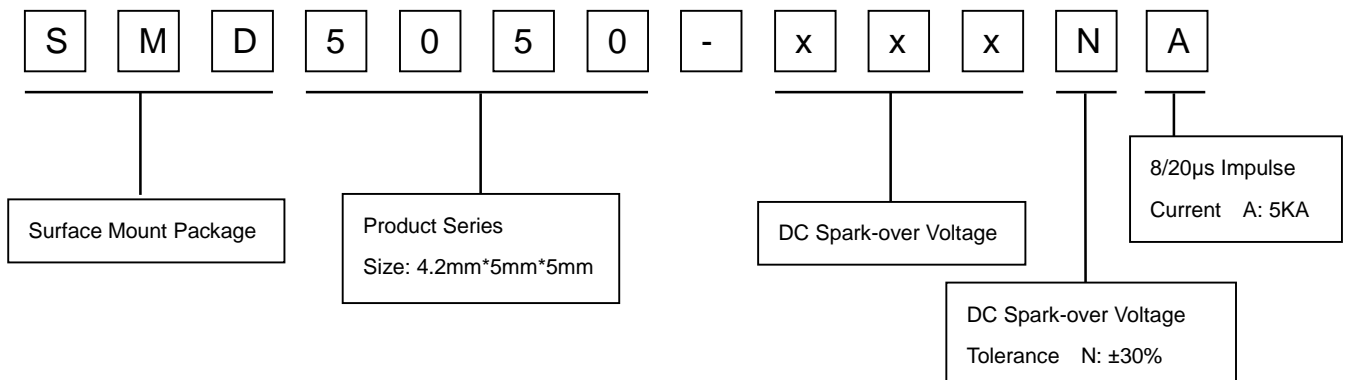
**Features**

- I Excellent response to fast rising transients
- I Stable breakdown voltage
- I GHz working frequency
- I 8/20µs Impulse current capability:5KA
- I Surface Mount package
- I Non-Radioactive
- I Ultra Low capacitance (<0.8pF)
- I Lead-free compliant
- I RoHS and REACH compliant
- I UL 497B Recognized: E465335
- I Size: 4.2mm\*5mm\*5mm
- I Storage and operational temperature: -40~+90°C

**Applications**

- I CATV equipment
- I Antennas
- I RS 485
- I Telecom Base Station
- I Power Supply AC Main
- I EV power Charging
- I Inverter/Variable
- I Frequency Drivers (VFDs)
- I IEEE 802.3 compliant Ethernet interfaces
- I Broad Band equipment
- I xDSL, ADSL, ADSL2, VDSL, and VDSL2
- I Medical Electronics
- I Test Equipment
- I General Telecom Equipment
- I Renewable Energy

**Part Number Code**



## Electrical Characteristics

| Part Number                            | DC Spark-over Voltage <sup>1)2)</sup><br>@100V/S | Impulse Spark-over Voltage |              | Insulation Resistance <sup>3)</sup> | Capacitance<br>@1MHz | Life Ratings                               |            |                                  |                                          |                    |     |
|----------------------------------------|--------------------------------------------------|----------------------------|--------------|-------------------------------------|----------------------|--------------------------------------------|------------|----------------------------------|------------------------------------------|--------------------|-----|
|                                        |                                                  | 100V/ $\mu$ S              | 1KV/ $\mu$ S |                                     |                      | Impulse Discharge Current<br>@8/20 $\mu$ S |            | AC Discharge Current<br>@50Hz 1S | Impulse Life<br>@10/1000 $\mu$ S<br>100A |                    |     |
|                                        |                                                  | Max                        | Max          |                                     |                      | Min                                        | Max        | Nominal<br>$\pm$ 5 times         | Max<br>1 time                            | Nominal<br>5 times | Min |
|                                        |                                                  | V                          | V            |                                     |                      | V                                          | G $\Omega$ | pF                               | KA                                       | KA                 | A   |
| SMD5050-075NA                          | 75 $\pm$ 30%                                     | 500                        | 600          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-090NA                          | 90 $\pm$ 30%                                     | 500                        | 600          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-150NA                          | 150 $\pm$ 30%                                    | 500                        | 600          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-200NA                          | 200 $\pm$ 30%                                    | 600                        | 700          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-230NA                          | 230 $\pm$ 30%                                    | 600                        | 700          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-300NA                          | 300 $\pm$ 30%                                    | 750                        | 850          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-350NA                          | 350 $\pm$ 30%                                    | 800                        | 850          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-400NA                          | 400 $\pm$ 30%                                    | 850                        | 950          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-420NA                          | 420 $\pm$ 30%                                    | 850                        | 950          | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-470NA                          | 470 $\pm$ 30%                                    | 900                        | 1000         | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-600NA                          | 600 $\pm$ 30%                                    | 1100                       | 1200         | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| SMD5050-800NA                          | 800 $\pm$ 30%                                    | 1100                       | 1400         | 1                                   | 0.8                  | 5                                          | 10         | 5                                | 300                                      |                    |     |
| Glow Voltage at 10mA.....              |                                                  |                            |              | ~60V                                |                      |                                            |            |                                  |                                          |                    |     |
| Arc Voltage at 1A.....                 |                                                  |                            |              | ~10V                                |                      |                                            |            |                                  |                                          |                    |     |
| Glow to Arc transition Current.....    |                                                  |                            |              | <0.8A                               |                      |                                            |            |                                  |                                          |                    |     |
| Weight.....                            |                                                  |                            |              | ~0.42g                              |                      |                                            |            |                                  |                                          |                    |     |
| Operation and storage temperature..... |                                                  |                            |              | -40~+90°C                           |                      |                                            |            |                                  |                                          |                    |     |
| Climatic category (IEC 60068-1).....   |                                                  |                            |              | 40/90/21                            |                      |                                            |            |                                  |                                          |                    |     |
| Marking.....                           |                                                  |                            |              | Without                             |                      |                                            |            |                                  |                                          |                    |     |
| Surface treatment.....                 |                                                  |                            |              | Matte-tin plated                    |                      |                                            |            |                                  |                                          |                    |     |

<sup>1)</sup> At delivery AQL 0.65 level II, DIN ISO 2859

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

<sup>3)</sup> Insulation Resistance Measuring Voltage:

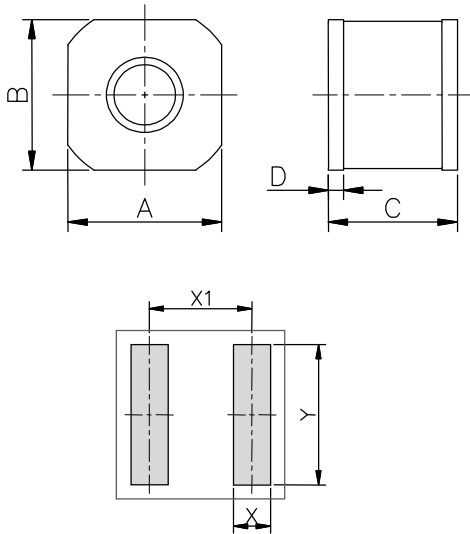
75V at DC 25V

90V~150V at DC 50V

Other at DC 100V

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

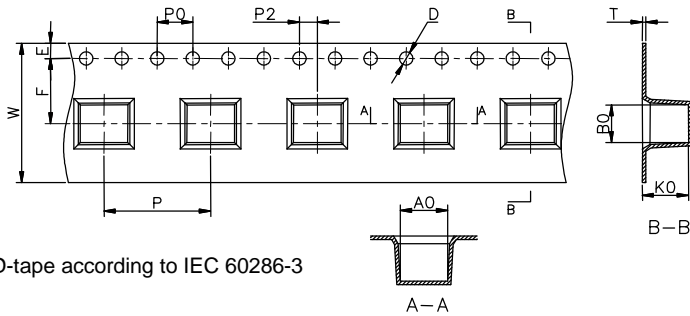
Dimensions



Recommended Soldering Pad Layout

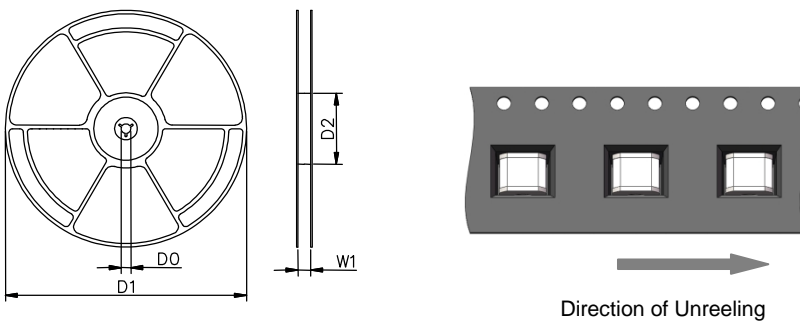
| Symbol | Millimeters | Inches      |
|--------|-------------|-------------|
| A      | 5.0±0.2     | 0.197±0.008 |
| B      | 5.0±0.2     | 0.197±0.008 |
| C      | 4.2±0.3     | 0.165±0.012 |
| D      | 0.5±0.1     | 0.020±0.004 |
| X      | 1.2         | 0.047       |
| X1     | 4.0         | 0.165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

Taping and Reel Specifications



SMD-tape according to IEC 60286-3

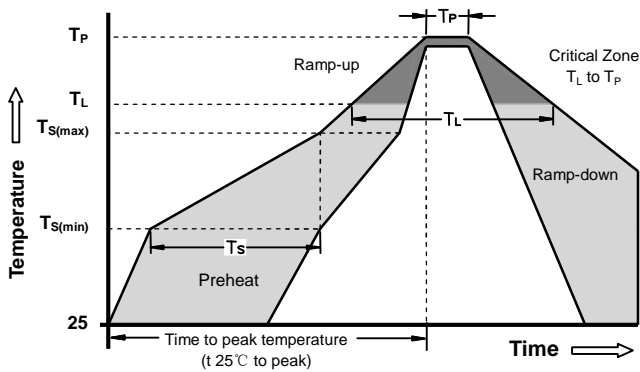
| Symbol | Millimeters  | Inches             |
|--------|--------------|--------------------|
| W      | 16±0.3       | 0.630±0.012        |
| A0     | 5.3±0.1      | 0.209±0.004        |
| B0     | 4.3±0.1      | 0.17±0.004         |
| K0     | 5.2±0.1      | 0.205±0.004        |
| P      | 12±0.1       | 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         |



Packaging Quantity:

- 1,000 PCS per reel (13")
- 3 reels per inner box
- 3,000 PCS per inner box

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



|                                                                      |                                   |                    |
|----------------------------------------------------------------------|-----------------------------------|--------------------|
| <b>Reflow Condition</b>                                              |                                   | Pb - Free assembly |
| <b>Pre Heat</b>                                                      | -Temperature Min ( $T_{s(min)}$ ) | 150°C              |
|                                                                      | -Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                                      | - Time (min to max) ( $t_s$ )     | 60 -180 Seconds    |
| <b>Average ramp up rate ( Liquids Temp <math>T_L</math>) to peak</b> |                                   | 3°C/second max     |
| <b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>    |                                   | 5°C/second max     |
| <b>Reflow</b>                                                        | - Temperature ( $T_L$ ) (Liquids) | 217°C              |
|                                                                      | - Time (min to max) ( $t_s$ )     | 60 -150 Seconds    |
| <b>Peak Temperature (<math>T_P</math>)</b>                           |                                   | 260 +0/-5°C        |
| <b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b> |                                   | 10 - 30 Seconds    |
| <b>Ramp-down Rate</b>                                                |                                   | 6°C/second max     |
| <b>Time 25°C to peak Temperature (<math>T_P</math>)</b>              |                                   | 8 minutes Max      |
| <b>Do not exceed</b>                                                 |                                   | 260°C              |