# Gas Discharge Tubes(GDT) SMD4532 Series

## 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. SMD4532 Gas Discharge Tubes (GDT) series has a surge rating of 2kA, 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.

SMD4532 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.

## Agency Approvals

| Agency | Standards | Certificate No. |
|---|---|---|
| | UL497B | E465335 |
| | EN 61643-311<br>IEC 61643-311 | 50569381 |

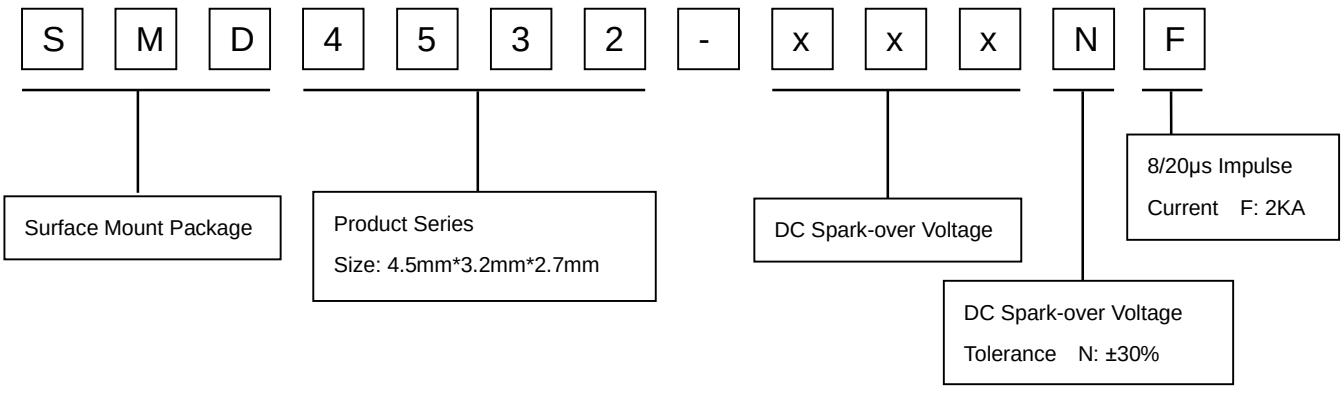
## Features

- Excellent response to fast rising transients
- Stable breakdown voltage
- GHz working frequency
- 8/20μs Impulse current capability: 2KA
- Surface Mount package
- Non-Radioactive
- Ultra Low capacitance(<0.5pF) and insertion loss
- Lead-free compliant
- RoHS and REACH compliant
- Very Small Size(EIA 1812)
- Storage and operational temperature: -40~+90°C

## Applications

- Communication equipment
- CATV equipment
- Test equipment
- Data lines
- Power supplies
- Telecom SLIC protection
- Broadband equipment
- ADSL equipment, including ADSL2+
- XDSL equipment
- Satellite and CATV equipment
- General telecom equipment

## Part Number Code



## Electrical Characteristics

| Part Number | DC Spark-over Voltage [1) 2)] @100V/S | Impulse Spark-over Voltage | | Insulation Resistance [3)] | Capacitance @1MHz | Glow Voltage @10mA | Arc Voltage @1A | Life Ratings | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100V/μS | 1KV/μS | | | | | Impulse Discharge Current @8/20μS | | Alternating Discharge Current @50Hz 1S | Impulse Withstanding Voltage Capacity @10/700μS, 40W ±5 times | Impulse Life @10/1000μS 10A |
| | | Max | Max | Min | Max | Typ. | Typ. | Nominal ±5 times | Max 1 time | Nominal 5 times | | Min |
| | V | V | V | GΩ | pF | V | V | KA | KA | A | KV | Times |
| SMD4532-070NF | 70±30% | 500 | 600 | 1 | 0.5 | 60 | 10 | 2 | 3 | 2 | 6 | 100 |
| SMD4532-075NF | 75±30% | 500 | 600 | 1 | 0.5 | 60 | 10 | 2 | 3 | 2 | 6 | 100 |
| SMD4532-090NF | 90±30% | 500 | 600 | 1 | 0.5 | 60 | 10 | 2 | 3 | 2 | 6 | 100 |
| SMD4532-120NF | 120±30% | 500 | 600 | 1 | 0.5 | 60 | 10 | 2 | 3 | 2 | 6 | 100 |
| SMD4532-150NF | 150±30% | 500 | 600 | 1 | 0.5 | 60 | 10 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-200NF | 200±30% | 600 | 700 | 1 | 0.5 | 60 | 10 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-230NF | 230±30% | 600 | 700 | 1 | 0.5 | 60 | 10 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-300NF | 300±30% | 700 | 800 | 1 | 0.5 | 60 | 10 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-350NF | 350±30% | 750 | 800 | 1 | 0.5 | 60 | 10 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-400NF | 400±30% | 800 | 850 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-420NF | 420±30% | 800 | 850 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-470NF | 470±30% | 800 | 900 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-500NF | 500±30% | 850 | 950 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-600NF | 600±30% | 900 | 1000 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |
| SMD4532-800NF | 800±30% | 1200 | 1400 | 1 | 0.5 | 135 | 15 | 2 | 3 | 1 | 6 | 100 |

| | |
|---|---|
| Glow to Arc transition Current..... | <0.2A |
| Weight……..... | ~0.20g |
| Operation and storage temperature…..... | -40~+90°C |
| Climatic category (IEC 60068-1)……..... | 40/90/21 |
| Marking……..... | Without |
| Surface treatment……..... | Matte-tin plated |

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

[2)] In ionized mode.

[3)] Insulation Resistance Measuring Voltage:

75V~150V at DC 50V

Other at DC 100V

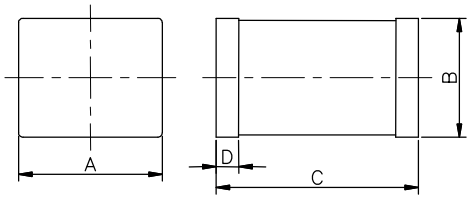
Terms in accordance with ITU-T Rec. K.12, IEC 61643-311, GB/T18802.311, GB/T 9043.

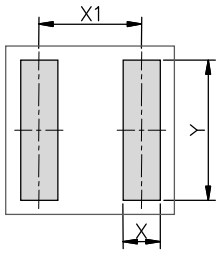
## Certifications table

| Part Number | UL497B | EN 61643-311<br>IEC 61643-311 |
|---|---|---|
| SMD4532-070NF | -- | -- |
| SMD4532-075NF | ● | -- |
| SMD4532-090NF | ● | -- |
| SMD4532-120NF | -- | -- |
| SMD4532-150NF | ● | -- |
| SMD4532-200NF | ● | -- |
| SMD4532-230NF | ● | -- |
| SMD4532-300NF | ● | -- |
| SMD4532-350NF | ● | -- |
| SMD4532-400NF | ● | -- |
| SMD4532-420NF | -- | -- |
| SMD4532-470NF | ● | -- |
| SMD4532-500NF | -- | -- |
| SMD4532-600NF | ● | ● |
| SMD4532-800NF | -- | -- |

Notes:
1. ● indicates that the product has passed the certification.
2. -- indicates that the product is not certified.

## Dimensions



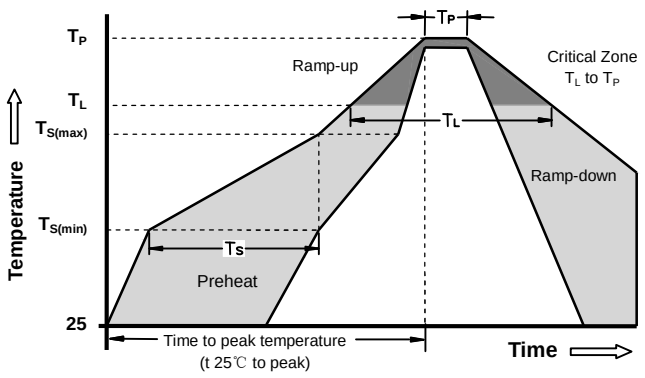

Recommended Soldering Pad Layout

| Symbol | Millimeters | Inches |
|---|---|---|
| **A** | 3.2±0.2 | 0.126±0.008 |
| **B** | 2.7±0.2 | 0.106±0.008 |
| **C** | 4.5±0.3 | 0.177±0.012 |
| **D** | 0.5±0.1 | 0.020±0.004 |
| **X** | 1.5 | 0.059 |
| **X1** | 4.5 | 0.177 |
| **Y** | 4.2 | 0.165 |

## 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. |

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

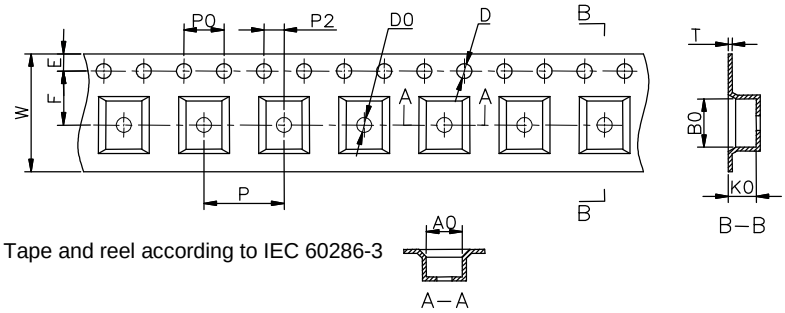



| Reflow Condition | | Pb - Free assembly |
|---|---|---|
| **Preheat** | **-Temperature Min ($T_{s(min)}$)** | 150°C |
| | **-Temperature Max ($T_{s(max)}$)** | 200°C |
| | **- Time (min to max) ($t_s$)** | 60 -180 Seconds |
| **Average ramp up rate ( Liquids Temp $T_L$) to peak** | | 3°C/second max |
| **$T_{S(max)}$ 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 |
| **Ramp-down Rate** | | 6°C/second max |
| **Time 25°C to peak Temperature ($T_P$)** | | 8 minutes Max |
| **Do not exceed** | | 260°C |

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.

## Packaging Information

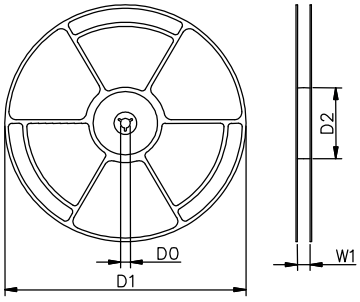
### Tape Specifications

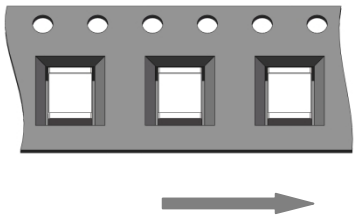



Tape and reel according to IEC 60286-3

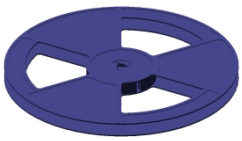
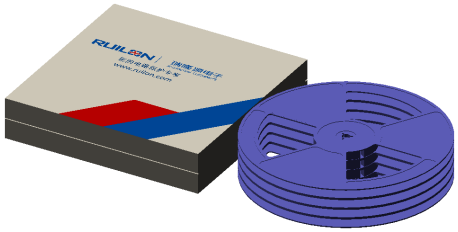
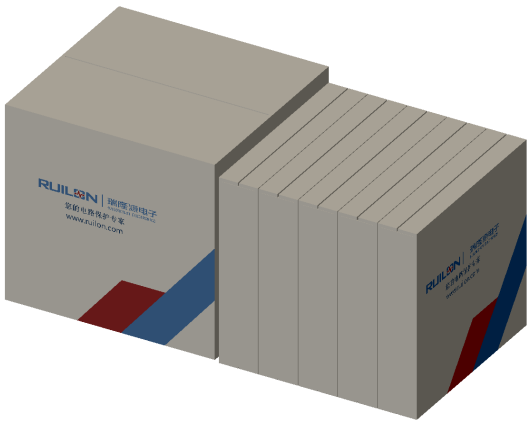
| Symbol | Millimeters | Inches |
|---|---|---|
| W | 12±0.3 | 0.472±0.012 |
| A0 | 3.5±0.1 | 0.138±0.004 |
| B0 | 5.3±0.1 | 0.209±0.004 |
| K0 | 2.9±0.1 | 0.114±0.004 |
| P | 8.0±0.1 | 0.315±0.004 |
| F | 5.5±0.1 | 0.217±0.004 |
| E | 1.75±0.1 | 0.069±0.004 |
| D | 1.5+0.1/-0.0 | 0.059+0.004/-0.0 |
| P0 | 4±0.1 | 0.157±0.004 |
| P2 | 2±0.1 | 0.079±0.004 |
| T | 0.35±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 | 12.5±0.4 | 0.492±0.016 |

### Reel Specifications



Direction of Unreeling

| | Reel | Inner Box | Carton |
|---|---|---|---|
| Size | 330×17mm | 340×333×70mm | 375×353×380mm |
| Quantity | MPQ/MOQ:<br>1 reel=2,500pcs | 1 Inner Box=4 reels=10,000pcs | 1Carton=5 Inner boxes=50,000pcs |
| Photos |  |  |  |

## Cautions and warnings

- Do not operate surge arresters in power supply networks, whose maximum operating voltage exceeds the minimum spark-over voltage of the surge arresters.
- Surge arresters 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.
- Surge arresters must be handled with care and must not be dropped.
- Do not continue to use damaged surge arresters.
- 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 surge arresters should be soldered within 24 month after shipment.