

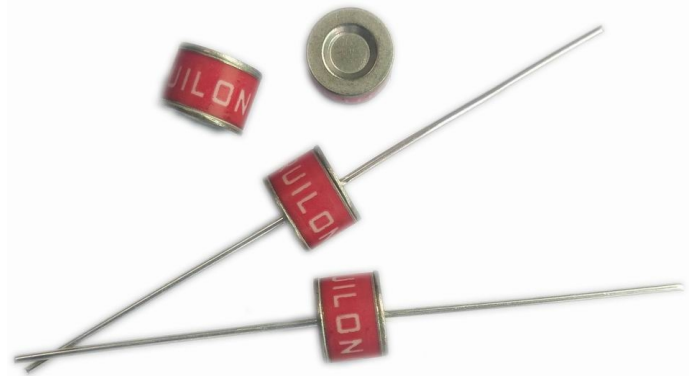
Gas Discharge Tubes(GDT)

2R-8(1000~4500V)




Description

2R-8 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 10KA/5KA8/20μs.

2R-8 GDTs are high voltage (1000-4500V) 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. 2R-8 GDTs can be used in conjunction with MOVs (Metal Oxide Varistors) to provide superior protection performance for AC applications.



Agency Approvals

| Agency | Standards | Certificate No. |
|--|-------------------------------|------------------------|
|  | UL1449 | E479668 |
|  | UL1449 | E508408 |
|  | EN 61643-311 IEC 61643-311 | J50571931 J50637276 |

Features

- I Voltage Ranges 1000V to 4500V
- I Excellent response to fast rising transients
- I 8/20μs Impulse current capability: 10KA/5KA
- I Non-Radioactive
- I Ultra Low capacitance (<1.5pF)
- I Size: Φ8mm*6mm
- I Storage and operational temperature: -40~+125°C

Applications

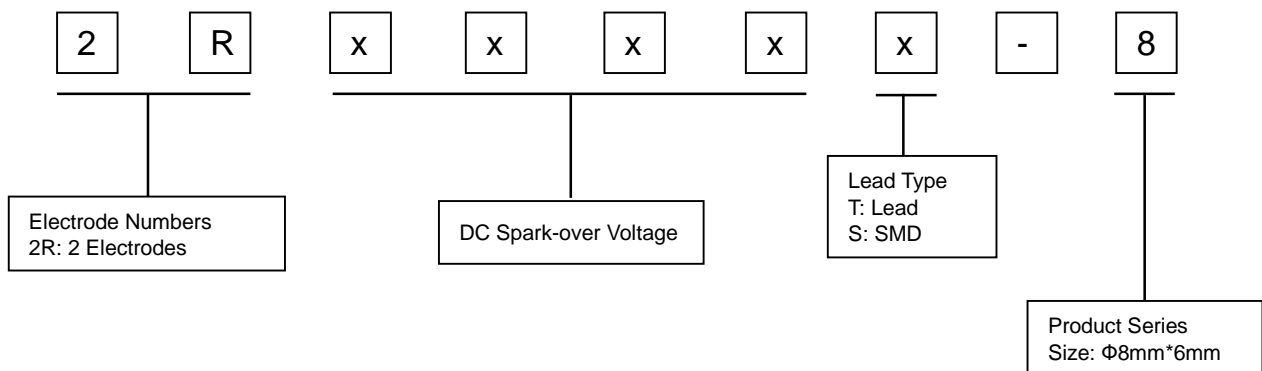
Automotive:

- 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 ^{1) 2)} @100V/S | Impulse Spark-over Voltage | | Insulation Resistance ³⁾ | Capacitance @1MHz | Glow Voltage @10mA | Arc Voltage @1A | AC withstand voltage @5mA 1Min | Life Ratings | | |
|--|-----------|---|----------------------------|--------|-------------------------------------|--|--------------------|-----------------|--------------------------------|-----------------------------------|--------|--|
| | | | 100V/μS | 1KV/μS | | | | | | Impulse Discharge Current @8/20μS | | Alternating Discharge Current @50Hz 1S |
| | | | Max | Max | | | | | | ±5 times | 1 time | 5 times |
| DIP | SMD | V | V | V | GΩ | pF | V | V | V | KA | KA | A |
| 2R1000T-8 | 2R1000S-8 | 1000±20% | 1400 | 1500 | 1 | 1.5 | 160 | 15 | 500 | 10 | 15 | 5 |
| 2R1200T-8 | 2R1200S-8 | 1200±20% | 1700 | 1800 | 1 | 1.5 | 160 | 15 | 600 | 10 | 15 | 5 |
| 2R1400T-8 | 2R1400S-8 | 1400±20% | 1900 | 2000 | 1 | 1.5 | 235 | 18 | 700 | 10 | 15 | 5 |
| 2R1500T-8 | 2R1500S-8 | 1500±20% | 2100 | 2300 | 1 | 1.5 | 235 | 18 | 750 | 10 | 15 | 5 |
| 2R1600T-8 | 2R1600S-8 | 1600±20% | 2300 | 2500 | 1 | 1.5 | 235 | 18 | 800 | 10 | 15 | 5 |
| 2R1800T-8 | 2R1800S-8 | 1800±20% | 2600 | 2800 | 1 | 1.5 | 235 | 18 | 900 | 10 | 15 | 5 |
| 2R2000T-8 | 2R2000S-8 | 2000±20% | 2800 | 3000 | 1 | 1.5 | 235 | 18 | 1000 | 5 | 10 | 2.5 |
| 2R2400T-8 | 2R2400S-8 | 2400±20% | 3500 | 3700 | 1 | 1.5 | 260 | 30 | 1200 | 5 | 10 | 2.5 |
| 2R2500T-8 | 2R2500S-8 | 2500±20% | 3600 | 3800 | 1 | 1.5 | 260 | 30 | 1300 | 5 | 10 | 2.5 |
| 2R2700T-8 | 2R2700S-8 | 2300~3240 | 3700 | 3900 | 1 | 1.5 | 260 | 30 | 1500 | 5 | 10 | 2.5 |
| 2R3000T-8 | 2R3000S-8 | 3000±20% | 3800 | 4000 | 1 | 1.5 | 260 | 30 | 1600 | 5 | 10 | 2.5 |
| 2R3600T-8 | 2R3600S-8 | 3600±20% | 4400 | 4600 | 1 | 1.5 | 260 | 30 | 1900 | 5 | 10 | 2.5 |
| 2R4000T-8 | 2R4000S-8 | 4000±20% | 4800 | 5000 | 1 | 1.5 | 280 | 35 | 2100 | 5 | 10 | 2.5 |
| 2R4500T-8 | 2R4500S-8 | 4500±20% | 5800 | 6000 | 1 | 1.5 | 280 | 35 | 2300 | 5 | 10 | 2.5 |
| Glow to Arc transition Current..... | | | | | | ~0.5A | | | | | | |
| Weight..... | | | | | | DIP ~1.2g SMD ~0.95g | | | | | | |
| Operation and storage temperature..... | | | | | | -40~+125°C | | | | | | |
| Climatic category (IEC 60068-1)..... | | | | | | 40/125/21 | | | | | | |
| Marking, red negative..... | | | | | | RUILON XXX Y XXX -Nominal voltage Y -Year of production | | | | | | |
| Surface treatment..... | | | | | | DIP -Nickel Plated SMD -Matte-tin plated | | | | | | |

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

²⁾ In ionized mode.

³⁾ Insulation Resistance Measuring Voltage at DC 100V.

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

Gas Discharge Tubes(GDT)

2R-8(1000~4500V)

Certifications table

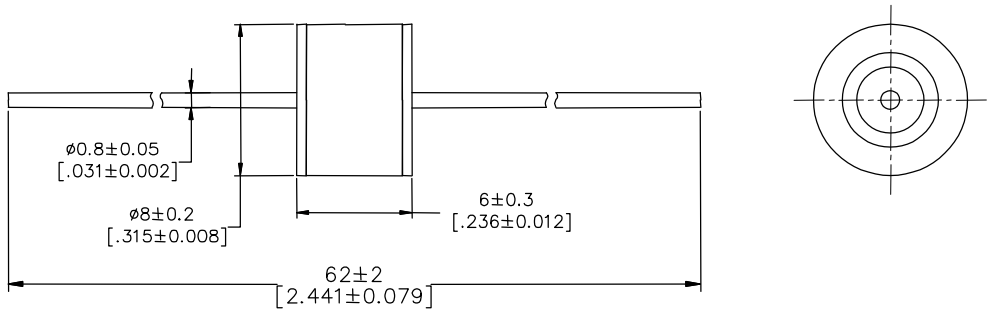
| Part Number | | | | |
|-------------|-----------|----------------|----------------|-------------------------------|
| DIP | SMD | UL1449 E479668 | UL1449 E508408 | EN 61643-311 IEC 61643-311 |
| -- | 2R1000S-8 | ● | -- | -- |
| 2R1000T-8 | -- | ● | -- | ● |
| 2R1200T-8 | 2R1200S-8 | -- | -- | -- |
| 2R1400T-8 | 2R1400S-8 | ● | -- | -- |
| -- | 2R1500S-8 | -- | ● | -- |
| 2R1500T-8 | -- | -- | ● | ● |
| 2R1600T-8 | 2R1600S-8 | ● | -- | -- |
| 2R1800T-8 | 2R1800S-8 | -- | -- | -- |
| 2R2000T-8 | 2R2000S-8 | ● | -- | ● |
| 2R2400T-8 | 2R2400S-8 | ● | -- | -- |
| 2R2500T-8 | 2R2500S-8 | ● | -- | ● |
| 2R2700T-8 | 2R2700S-8 | ● | -- | -- |
| 2R3000T-8 | 2R3000S-8 | ● | -- | ● |
| 2R3600T-8 | 2R3600S-8 | ● | -- | ● |
| 2R4000T-8 | 2R4000S-8 | ● | -- | -- |
| 2R4500T-8 | 2R4500S-8 | ● | -- | -- |

Notes:

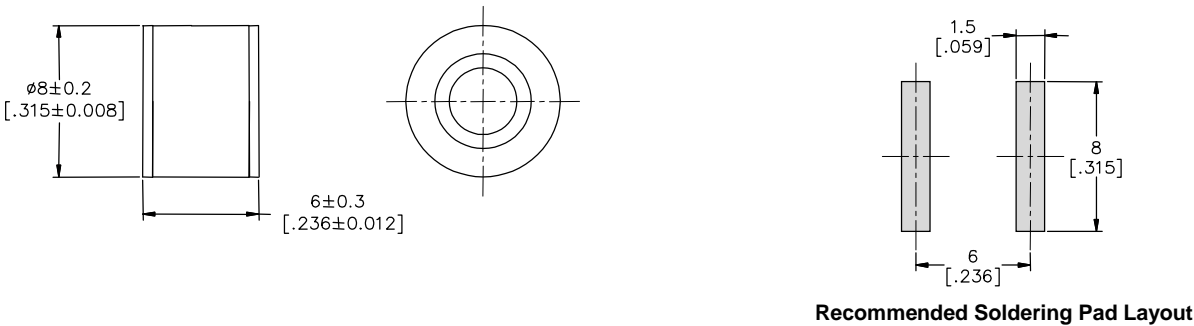
- indicates that the product has passed the certification.
- indicates that the product is not certified.

Dimensions (Unit: mm/inch)

DIP Series (2RxxxxT-8)



SMD Series (2RxxxxS-8)



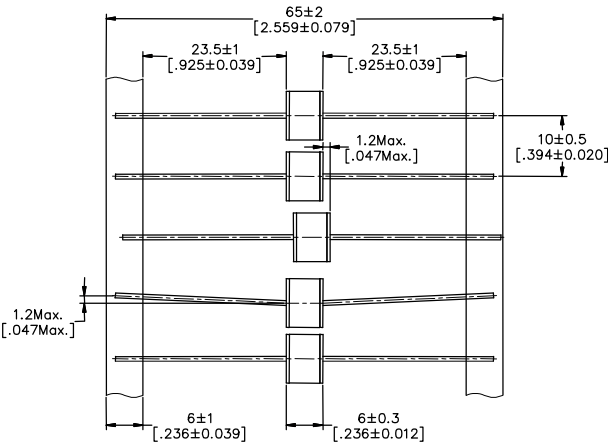
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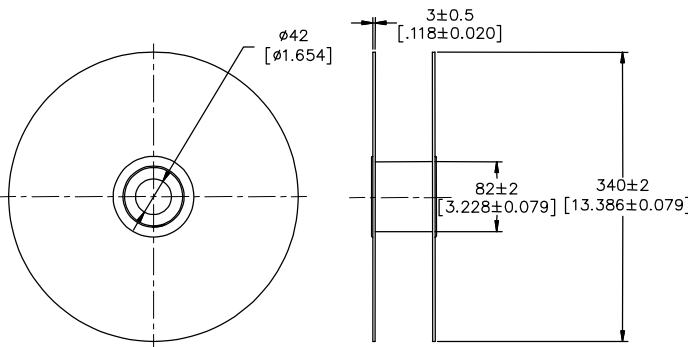
Packaging Information

Axial Packaging (Tape & Reel)

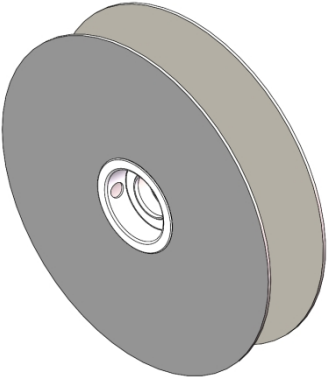
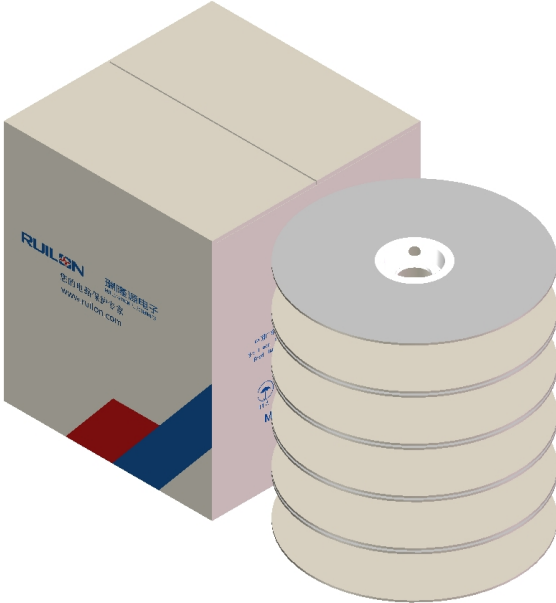
Tape



Reel



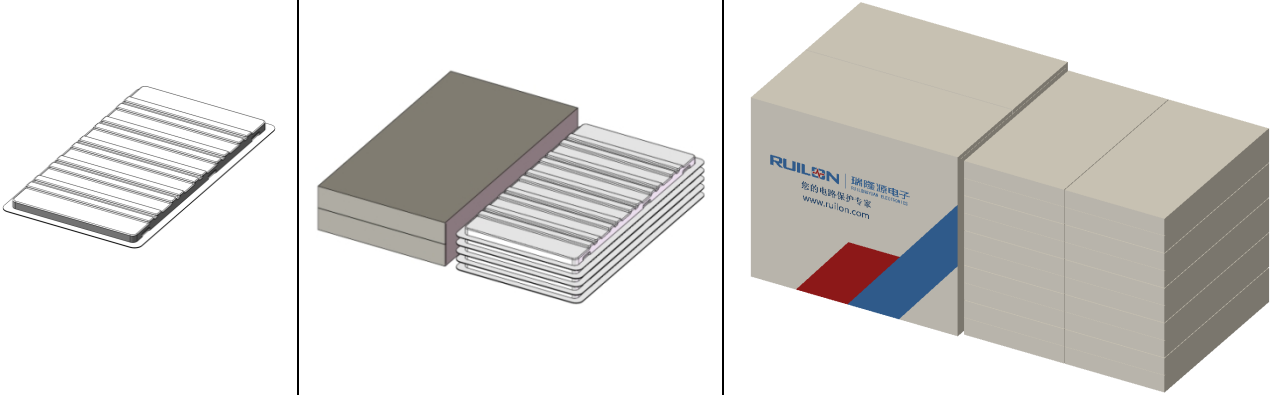
According to IEC 60286-1

| | Reel | Carton |
|----------|---|--|
| Size | 340×78mm | 350×350×407mm |
| Quantity | MPQ/MOQ: 1 reel=800pcs | 1 Carton=5 reels =4,000pcs |
| Photos |  |  |

Gas Discharge Tubes(GDT)

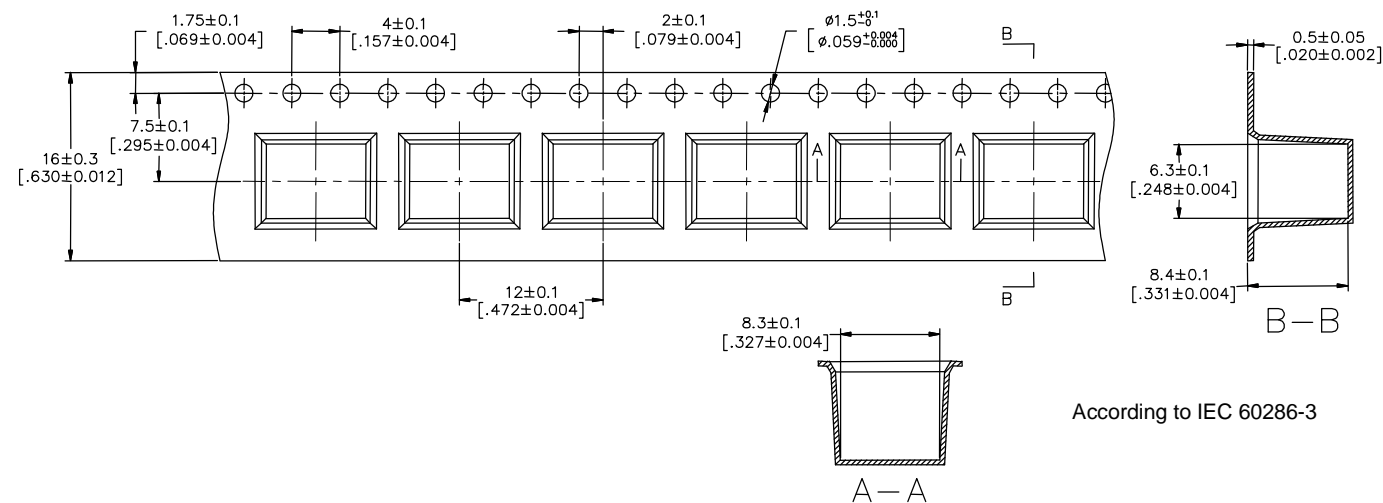
2R-8(1000~4500V)

Axial Packaging (Bulk)

| | PVC tray | Inner Box | Carton |
|----------|---|---------------------------------|----------------------------------|
| Size | 265×148×10mm | 275×150×50mm | 315×290×272mm |
| Quantity | MPQ: 1 tray=100pcs | MOQ: 1 Inner Box=5 trays=500pcs | 1 Carton=10 Inner boxes=5,000pcs |
| Photos |  | | |

SMD Packaging (Tape & Reel)

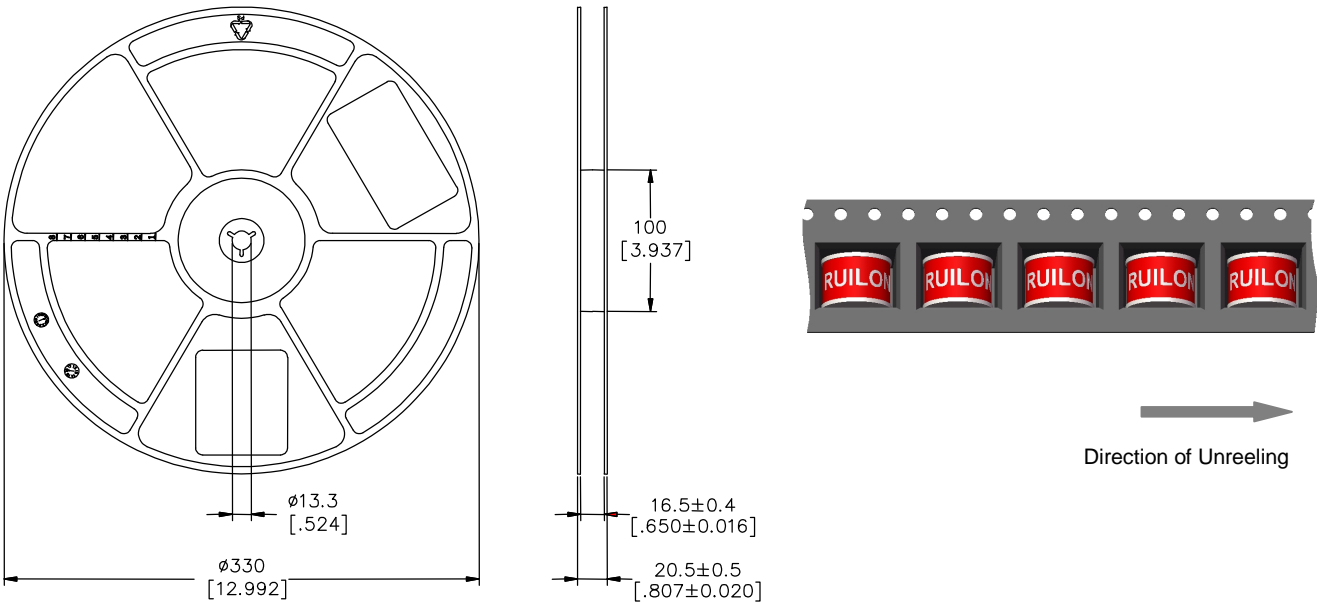
Tape



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Reel

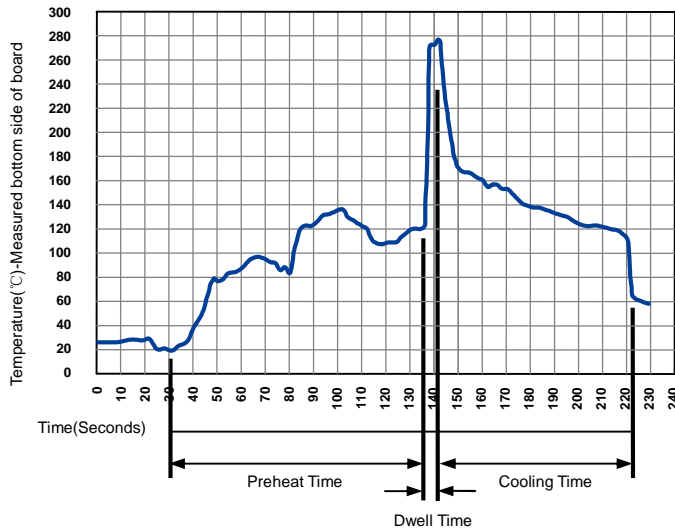


| | Reel | Inner Box | Carton |
|----------|------------------------|------------------------------|---------------------------------|
| Size | 330×20.5mm | 340×333×70mm | 375×353×380mm |
| Quantity | MPQ/MOQ: 1 reel=500pcs | 1 Inner Box=3 reels=1,500pcs | 1 Carton=5 Inner boxes=7,500pcs |
| Photos | | | |

Gas Discharge Tubes(GDT)

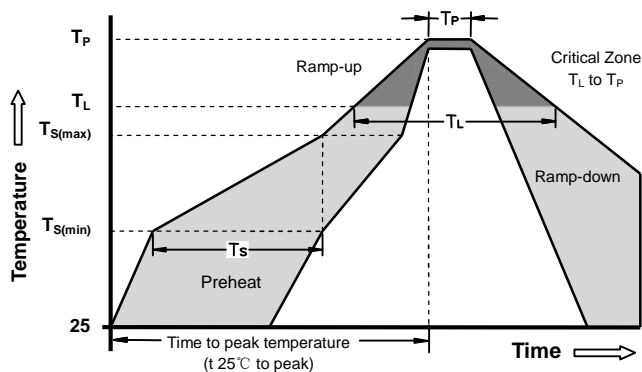
2R-8(1000~4500V)

Soldering Parameters - Wave soldering (Thru-Hole Devices)



| Wave Soldering Condition | | Pb-Free assembly |
|--------------------------|-------------------|------------------|
| Preheat | Temperature Min | 100°C |
| | Temperature Max | 150°C |
| | Time (Min to Max) | 60-180 Seconds |
| Solder Pot Temperature | | 280°C Max |
| Solder Dwell Time | | 2-5 Seconds |

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 |

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.

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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. |