

# 2R-E Series

## Gas Discharge Tubes



### Description

GDT (Gas Discharge Tubes) is placed in front of, and in parallel with, sensitive telecom equipment such as power lines, communication lines, signal lines and data transmission lines to help protect them from damage caused by transient surge voltages that may result from lightning strikes and equipment switching operations. These devices do not influence the signal in normal operation. However, in the event of an overvoltage surge, such as a lightning strike, the GDT switches to a low impedance state and diverts the energy away from the sensitive equipment. Our GDTs offer a high level of surge protection, a broad voltage range, low capacitance, and many form factors including new surface mount devices, which makes them suitable for applications such as Main Distribution Frame (MDF) modules, high data-rate telecom applications (e.g. ADSL, VDSL), and surge protection on power lines. Their low capacitance also results in less signal distortion. When used in a coordinated circuit protection solution with PolySwitch devices, they can help equipment manufacturers meet stringent safety regulatory standards.

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

| Agency | Agency File Number |
|--------|--------------------|
|        | E527857            |

### Features

- Stable breakdown voltage
- High insulation resistance
- High current rating
- Low capacitance ( $\leq 0.5\text{pF}$ )
- Stable performance over life
- Large absorbing transient current capability
- Fast response time
- RoHS compliant
- Standard Size: 3.2mm\*1.6mm\*1.6mm
- Meets MSL level 1, per J-STD-020
- Storage and operating temperature:  $-40^{\circ}\text{C} \sim +90^{\circ}\text{C}$

### 2 Electrode GDT Graphical Symbol



### Application

- Repeaters, Modems
- Subscriber protection
- Telephone Interface, Line cards
- Data communication equipment
- Line test equipment
- Branch exchange
- Subscriber protection
- Alarm system
- Tuner
- Antenna protection

# 2R-E Series

## Gas Discharge Tubes

### Electrical Characteristics ( $T_A=25^\circ\text{C}$ unless otherwise noted)

| Part Number | Device Marking Code | DC Spark-over Voltage | Maximum Impulse Spark-over Voltage | Nominal Impulse Discharge Current  | Minimum Insulation Resistance |            | Maximum Capacitance | Agency Approvals<br> |
|-------------|---------------------|-----------------------|------------------------------------|------------------------------------|-------------------------------|------------|---------------------|---|
|             |                     | 100V/s (V)            | 1000V/ $\mu\text{s}$ (V)           | 8/20 $\mu\text{s}$ , 10 times (kA) | Test Voltage                  | G $\Omega$ | 1MHz (pF)           |   |
| 2R090SM-E   | None                | 90 $\pm$ 30%          | 750                                | 0.5                                | 50VDC                         | 1          | 0.5                 | ✓   |
| 2R150SM-E   | None                | 150 $\pm$ 30%         | 750                                | 0.5                                | 50VDC                         | 1          | 0.5                 | ✓   |
| 2R200SM-E   | None                | 200 $\pm$ 30%         | 850                                | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R230SM-E   | None                | 230 $\pm$ 30%         | 850                                | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R300SM-E   | None                | 300 $\pm$ 30%         | 900                                | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R350SM-E   | None                | 350 $\pm$ 30%         | 950                                | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R400SM-E   | None                | 400 $\pm$ 30%         | 1000                               | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R420SM-E   | None                | 420 $\pm$ 30%         | 1000                               | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |
| 2R470SM-E   | None                | 470 $\pm$ 30%         | 1100                               | 0.5                                | 100VDC                        | 1          | 0.5                 | ✓   |

### Test Methods and Results

| Items                              | Test Method   | Standard                    |
|------------------------------------|---|-----------------------------|
| DC Spark-over Voltage              | measured with voltage ramp $dv/dt=100\text{V/s}$ .  | To meet the specified value |
| Maximum Impulse Spark-over Voltage | measured with voltage ramp $dv/dt=1000\text{V}/\mu\text{s}$ .                                   | To meet the specified value |
| Impulse Discharge Current          | applied between two electrodes, 5 positive and 5 negative surges, with 3 minutes interval time, | To meet the specified value |
| Insulation Resistance              | measured between two electrodes.  | To meet the specified value |
| Capacitance                        | measured between two electrodes. Test frequency: 1MHz   | To meet the specified value |

### Soldering Parameters (Reflow Soldering)

|   |                                   |                                       |
|---|-----------------------------------|---------------------------------------|
| <b>Reflow Condition</b>   |                                   | Pb-Free Assembly                      |
| <b>Pre Heat</b>   | -Temperature Min ( $T_{S\ min}$ ) | 150 $^\circ\text{C}$                  |
|   | -Temperature Max ( $T_{S\ max}$ ) | 200 $^\circ\text{C}$                  |
|   | -Time (min to max) ( $t_s$ )      | 60-180 secs                           |
| <b>Average ramp-up rate(Liquidus Temp (<math>T_L</math>) to peak</b>                          |                                   | 3 $^\circ\text{C}/\text{second}$ max. |
| <b><math>T_{S\ (max)}</math> to <math>T_L</math>-Ramp-up Rate</b>                             |                                   | 3 $^\circ\text{C}/\text{second}$ max. |
| <b>Reflow</b>   | -Temperature ( $T_L$ ) (Liquidus) | 217 $^\circ\text{C}$                  |
|   | -Time (min to max) ( $t_L$ )      | 60-150 seconds                        |
| <b>Peak Temperature (<math>T_P</math>)</b>  |                                   | 260 $^\circ\text{C}$                  |
| <b>Time within 5<math>^\circ\text{C}</math> of actual Peak Temperature (<math>t_p</math>)</b> |                                   | 20-40 seconds                         |
| <b>Ramp-down Rate</b>   |                                   | 6 $^\circ\text{C}/\text{second}$ max. |
| <b>Time 25<math>^\circ\text{C}</math> to Peak Temperature</b>                                 |                                   | 8 minutes max.                        |
| <b>Do not exceed</b>  |                                   | 260 $^\circ\text{C}$                  |



