

# **MDE Semiconductor, Inc.**

78-150 Calle Tampico, Unit 210, La Quinta, CA., USA 92253 Tel: 760-564-8656 • Fax: 760-564-2414  
1-800-831-4881 Email: sales@mdesemiconductor.com Web: www.mdesemiconductor.com

## **RT100KP SERIES**

**DRAFT**

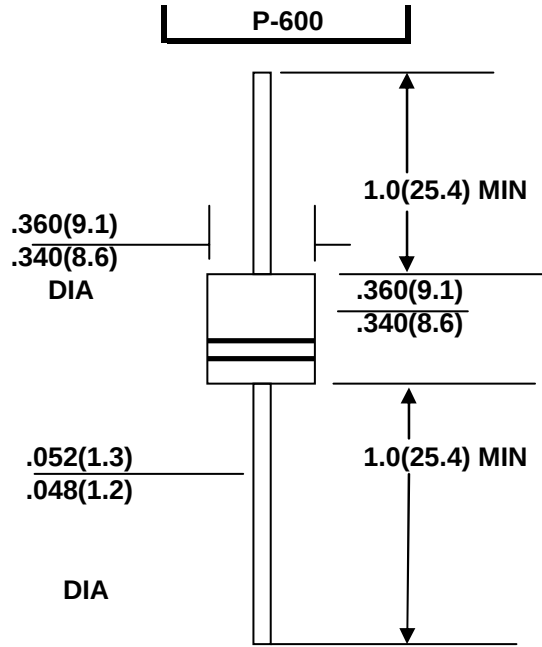
### **GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-28.0 TO 400 Volts 100,000 Watt Peak Pulse Power**

#### **FEATURES**

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
  - Glass passivated junction
  - 100, 000W Peak Pulse Power capability on 6.4/69  $\mu$ s waveform
  - Excellent clamping capability
  - Repetition rate (duty cycle):0.05%
  - Low incremental surge resistance
  - Fast response time: typically less than 1.0 ps from 0 volts to BV
  - High temperature soldering guaranteed: 265°C/10 seconds/.375", (9.5mm) lead length, 5lbs., (2.3kg) tension
- 100 KW Transient Voltage Suppressor (TVS) are designed for aircraft applications requiring high power transient protection. This includes various threats such as "Waveform 4" at 6.4/69  $\mu$ s per RTCA/DO-160E Section22.

#### **MECHANICAL DATA**

Case:Molded plastic over glass passivated junction  
Terminals: Plated Tin Axial leads, solderable per MIL-STD-750, Method 2026  
Polarity: Color band denoted positive end (cathode) except Bipolar  
Mounting Position: Any  
Weight: 0.07 ounce, 2.5 gram



Dimensions in inches (millimeters)

#### **DEVICES FOR BIPOLAR APPLICATIONS**

For Bidirectional use C or CA Suffix for types RT100KP28 thru types RT100KP400  
Electrical characteristics apply in both directions.

#### **MAXIMUM RATINGS AND CHARACTERISTICS**

Ratings at 25°C ambient temperature unless otherwise specified.

| <b>RATING</b>                                                                                         | <b>SYMBOL</b>  | <b>VALUE</b>    | <b>UNITS</b>     |
|-------------------------------------------------------------------------------------------------------|----------------|-----------------|------------------|
| Peak Pulse Power Dissipation on 6.4/69 $\mu$ s waveform                                               | $P_{PPM}$      | Minimum 100,000 | Watts            |
| Peak Pulse Current of on 6.4/69 $\mu$ s waveform                                                      | $I_{PPM}$      | SEE TABLE 1     | Amps             |
| Steady State Power Dissipation at $T_I=75^\circ\text{C}$<br>Lead Lengths.375", (9.5mm)(NOTE 2)        | $P_M(AV)$      | 8.0             | Watts            |
| Peak Forward Surge Current, 8.3ms Sine-Wave<br>Superimposed on Rated Load, (JEDEC Method)<br>(NOTE 3) | $I_{FSM}$      | 400.0           | Amps             |
| Operatings and Storage Temperature Range                                                              | $T_J, T_{STG}$ | -55 to +175     | $^\circ\text{C}$ |

#### **NOTES:**

- 1.Non-repetitive current pulse, per Fig.3 and derated above  $T_a=25^\circ\text{C}$  per Fig.2.
- 2.Mounted on Copper Pad area of 0.8x0.8" (20x20mm) per Fig.5.
- 3.8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum

Certified RoHS Compliant

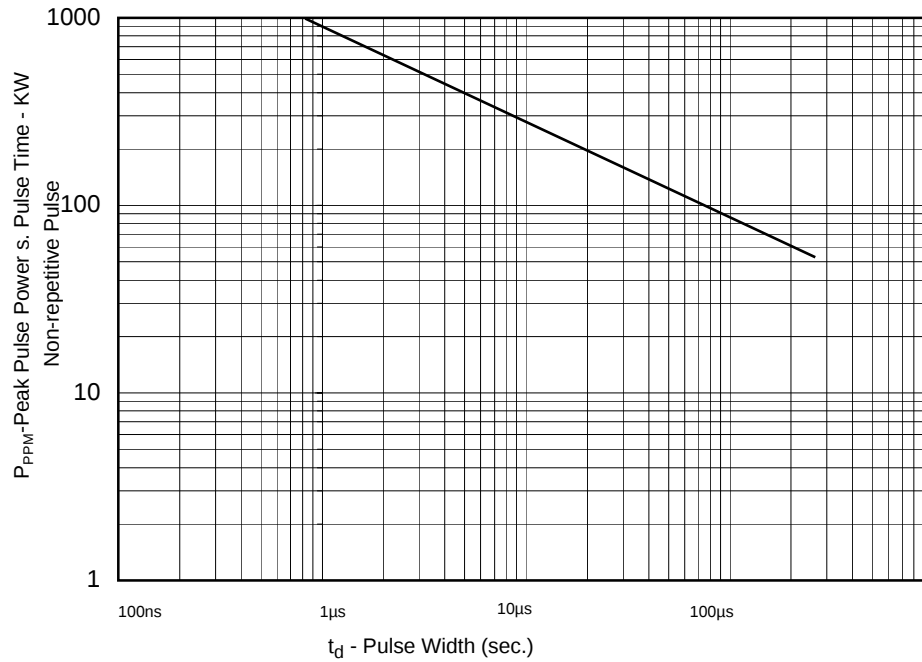
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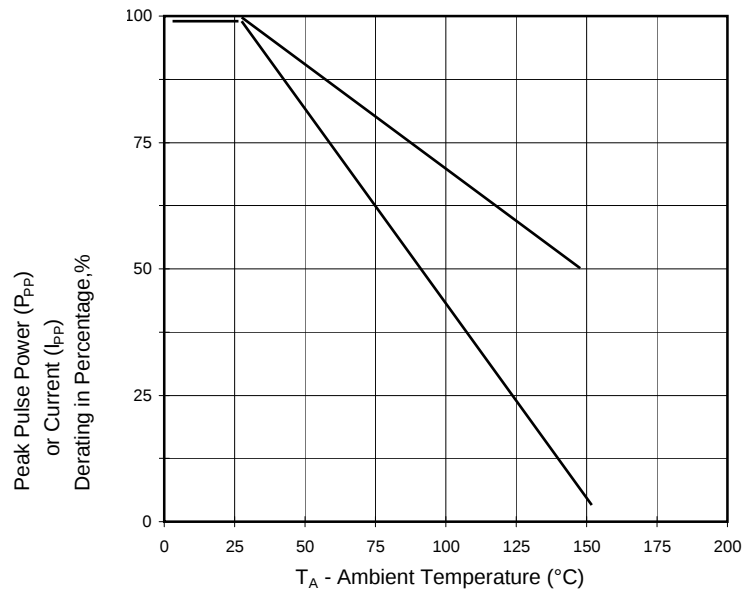
## **RT100KP Series Rating and Characteristic Curves**

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**Fig. 1 - Peak Pulse Power Rating Curve**



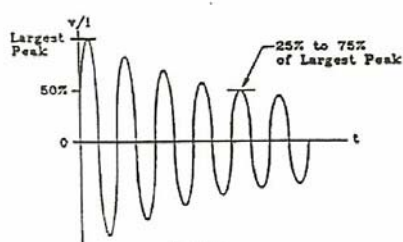
**Fig.2 - Pulse Derating Curve**



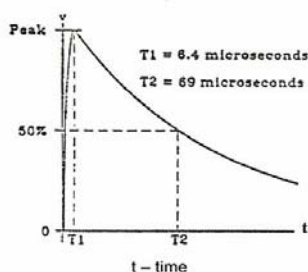
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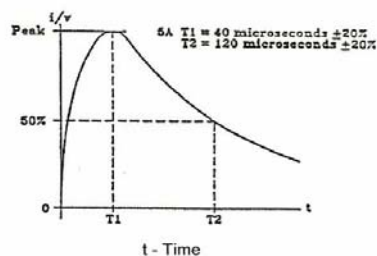
## **RT100KP Series Rating and Installation**



**FIGURE 7 – Waveform 3**



**FIGURE 8 – Waveform 4**



**FIGURE 9 – Waveform 5A**

Note: The 1Mhz damped oscillatory waveform (3) has an effective pulse width of 4  $\mu$ s. Equivalent peak pulse power at each of the pulse widths represented in RRCA/DO-160E for waveforms 3, 4 and 5A (above) has been determined referencing Figure 1.

| WAVEFORM<br>NUMBER | PULSE WIDTH<br>$\mu$ s | PEAK PULSE<br>POWER<br>kW | Peak Pulse Current<br>Conversion Factor *<br>from Rated $I_{PP}$<br>at 6.4/69 $\mu$ s |
|--------------------|------------------------|---------------------------|---------------------------------------------------------------------------------------|
| 3                  | 4                      | 340                       | 3.40x                                                                                 |
| 4                  | 6.4/69                 | 100                       | 1.00x                                                                                 |
| 5A                 | 40/120                 | 70                        | 0.70x                                                                                 |

\* Multiply by the conversion factor shown with reference to the maximum rated  $I_{PP}$  in the Electrical Characteristics Table

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## **100000 Watt TVS**

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| UNI-POLAR   | BI-POLAR     | REVERSE<br>STANDOFF<br>VOLTAGE<br>$V_{RWM}$ (V) | BREAKDOWN<br>VOLTAGE<br>$V_{BR}$ (V)<br>MIN. @ $I_T$ | TEST<br>CURRENT<br>( $I_T$ )<br>mA | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>$V_c$ (V)<br>@ $I_{PP}$ | PEAK<br>PULSE<br>CURRENT<br>$I_{PP}$ (A) | REVERSE<br>LEAKAGE<br>@ $V_{RWM}$ $I_R$<br>( $\mu A$ ) |
|-------------|--------------|-------------------------------------------------|------------------------------------------------------|------------------------------------|-----------------------------------------------------------|------------------------------------------|--------------------------------------------------------|
| RT100KP28A  | RT100KP28CA  | 28.00                                           | 31.28                                                | 50                                 | 50.0                                                      | 2018.0                                   | 5000                                                   |
| RT100KP30A  | RT100KP30CA  | 30.00                                           | 33.51                                                | 50                                 | 55.2                                                      | 1827.8                                   | 5000                                                   |
| RT100KP33A  | RT100KP33CA  | 33.00                                           | 36.9                                                 | 50                                 | 58.5                                                      | 1722.3                                   | 5000                                                   |
| RT100KP36A  | RT100KP36CA  | 36.00                                           | 40.2                                                 | 50                                 | 61.8                                                      | 1632.7                                   | 5000                                                   |
| RT100KP39A  | RT100KP39CA  | 39.00                                           | 43.6                                                 | 20                                 | 67.2                                                      | 1501.5                                   | 2000                                                   |
| RT100KP42A  | RT100KP42CA  | 42.00                                           | 46.9                                                 | 10                                 | 72.0                                                      | 1401.2                                   | 1000                                                   |
| RT100KP43A  | RT100KP43CA  | 43.00                                           | 48.0                                                 | 10                                 | 73.0                                                      | 1382.3                                   | 1000                                                   |
| RT100KP45A  | RT100KP45CA  | 45.00                                           | 50.3                                                 | 5                                  | 77.4                                                      | 1303.7                                   | 250                                                    |
| RT100KP48A  | RT100KP48CA  | 48.00                                           | 53.6                                                 | 5                                  | 81.6                                                      | 1236.4                                   | 150                                                    |
| RT100KP51A  | RT100KP51CA  | 51.00                                           | 57.0                                                 | 5                                  | 86.4                                                      | 1167.8                                   | 50                                                     |
| RT100KP54A  | RT100KP54CA  | 54.00                                           | 60.3                                                 | 5                                  | 91.4                                                      | 1103.9                                   | 20                                                     |
| RT100KP58A  | RT100KP58CA  | 58.00                                           | 64.8                                                 | 5                                  | 92.4                                                      | 1091.9                                   | 20                                                     |
| RT100KP60A  | RT100KP60CA  | 60.00                                           | 67.0                                                 | 5                                  | 102.0                                                     | 989.3                                    | 15                                                     |
| RT100KP64A  | RT100KP64CA  | 64.00                                           | 71.5                                                 | 5                                  | 104.0                                                     | 970.0                                    | 10                                                     |
| RT100KP66A  | RT100KP66CA  | 66.00                                           | 73.7                                                 | 5                                  | 107.0                                                     | 943.0                                    | 10                                                     |
| RT100KP70A  | RT100KP70CA  | 70.00                                           | 78.2                                                 | 5                                  | 109.0                                                     | 925.7                                    | 10                                                     |
| RT100KP71A  | RT100KP71CA  | 71.00                                           | 79.3                                                 | 5                                  | 111.5                                                     | 904.8                                    | 10                                                     |
| RT100KP72A  | RT100KP72CA  | 72.00                                           | 80.4                                                 | 5                                  | 114.0                                                     | 885.1                                    | 10                                                     |
| RT100KP75A  | RT100KP75CA  | 75.00                                           | 83.8                                                 | 5                                  | 119.4                                                     | 845.1                                    | 10                                                     |
| RT100KP78A  | RT100KP78CA  | 78.00                                           | 87.1                                                 | 5                                  | 129.0                                                     | 782.2                                    | 10                                                     |
| RT100KP84A  | RT100KP84CA  | 84.00                                           | 93.8                                                 | 5                                  | 139.2                                                     | 724.9                                    | 10                                                     |
| RT100KP90A  | RT100KP90CA  | 90.00                                           | 100.5                                                | 5                                  | 146.4                                                     | 689.3                                    | 10                                                     |
| RT100KP96A  | RT100KP96CA  | 96.00                                           | 107.2                                                | 5                                  | 156.0                                                     | 646.7                                    | 10                                                     |
| RT100KP102A | RT100KP102CA | 102.00                                          | 113.9                                                | 5                                  | 165.6                                                     | 609.4                                    | 10                                                     |
| RT100KP108A | RT100KP108CA | 108.00                                          | 120.6                                                | 5                                  | 175.2                                                     | 575.8                                    | 10                                                     |
| RT100KP120A | RT100KP120CA | 120.00                                          | 134.0                                                | 5                                  | 194.4                                                     | 519.1                                    | 10                                                     |
| RT100KP132A | RT100KP132CA | 132.00                                          | 147.4                                                | 5                                  | 213.0                                                     | 473.9                                    | 10                                                     |
| RT100KP144A | RT100KP144CA | 144.00                                          | 160.8                                                | 5                                  | 223.2                                                     | 452.2                                    | 10                                                     |
| RT100KP150A | RT100KP150CA | 150.00                                          | 167.6                                                | 5                                  | 233.4                                                     | 432.2                                    | 10                                                     |
| RT100KP156A | RT100KP156CA | 156.00                                          | 174.3                                                | 5                                  | 245.0                                                     | 411.9                                    | 10                                                     |
| RT100KP160A | RT100KP160CA | 160.00                                          | 178.7                                                | 5                                  | 252.6                                                     | 399.6                                    | 10                                                     |
| RT100KP168A | RT100KP168CA | 168.00                                          | 187.7                                                | 5                                  | 272.4                                                     | 370.3                                    | 10                                                     |
| RT100KP170A | RT100KP170CA | 170.00                                          | 189.9                                                | 5                                  | 275.0                                                     | 367.0                                    | 10                                                     |
| RT100KP180A | RT100KP180CA | 180.00                                          | 201.1                                                | 5                                  | 290.4                                                     | 347.3                                    | 10                                                     |
| RT100KP198A | RT100KP198CA | 198.00                                          | 221.2                                                | 5                                  | 319.8                                                     | 315.3                                    | 10                                                     |
| RT100KP216A | RT100KP216CA | 216.00                                          | 241.3                                                | 5                                  | 348.6                                                     | 289.4                                    | 10                                                     |
| RT100KP240A | RT100KP240CA | 240.00                                          | 268.1                                                | 5                                  | 387.0                                                     | 260.7                                    | 10                                                     |
| RT100KP258A | RT100KP258CA | 258.00                                          | 288.2                                                | 5                                  | 416.4                                                     | 242.4                                    | 10                                                     |
| RT100KP260A | RT100KP260CA | 260.00                                          | 290.4                                                | 5                                  | 416.0                                                     | 242.4                                    | 10                                                     |
| RT100KP270A | RT100KP270CA | 270.00                                          | 301.6                                                | 5                                  | 436.2                                                     | 231.4                                    | 10                                                     |
| RT100KP280A | RT100KP280CA | 280.00                                          | 312.8                                                | 5                                  | 464.0                                                     | 217.4                                    | 10                                                     |
| RT100KP288A | RT100KP288CA | 288.00                                          | 321.7                                                | 5                                  | 469.9                                                     | 214.8                                    | 10                                                     |
| RT100KP300A | RT100KP300CA | 300.00                                          | 333.0                                                | 5                                  | 483.0                                                     | 206.5                                    | 10                                                     |
| RT100KP350A | RT100KP350CA | 350.00                                          | 389.0                                                | 5                                  | 564.0                                                     | 176.5                                    | 10                                                     |
| RT100KP400A | RT100KP400CA | 400.00                                          | 444.0                                                | 5                                  | 644.0                                                     | 153.1                                    | 10                                                     |

For bidirectional type having  $V_{RWM}$  of 40 volts and less, the  $I_R$  limit is double

For parts without A , the  $V_{BR}$  is  $\pm 10\%$

**Certified RoHS Compliant**