

# **MDE Semiconductor, Inc.**

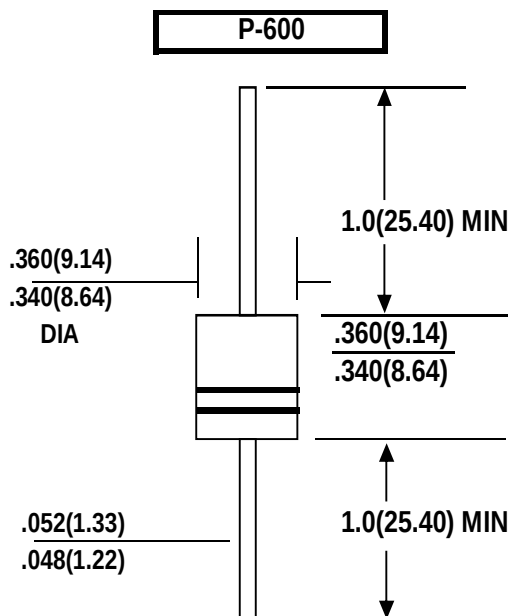
201 Shipyard Way, Unit C, Newport Beach, CA., USA 92663 Tel : 760-564-8656 • Fax : 760-564-2414  
1-800-831-4881 Email: sales@mdesemiconductor.com Web: www.mdesemiconductor.com

## **RT100KP SERIES**

### **GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-28.0 TO 400 Volts 100000 Watt Peak Pulse Power**

#### **FEATURES**

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Glass passivated junction
- 100000W Peak Pulse Power capability on 6.4/6.9 $\mu$ 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
- 100KW Transient Voltage Suppressor (TVS) are designed for aircraft applications requiring high power transient protection. This includes various treats such as "Waveform 4" at 6.4/69  $\mu$ s per RTCA/DO-160E Section 22



#### **MECHANICAL DATA**

Case: Molded plastic over glass passivated junction  
Terminals: Matte Tin Plated 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 RT1000KP400  
Electrical characteristics apply in both directions.

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

Ratings at 25°C ambient temperature unless otherwise specified.

| RATING                                                                                    | SYMBOL         | VALUE          | UNITS            |
|-------------------------------------------------------------------------------------------|----------------|----------------|------------------|
| Peak Pulse Power Dissipation on 6.4/6.9 $\mu$ s waveform                                  | $P_{PPM}$      | Minimum 100000 | 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)   | $P_M(AV)$      | 8.0            | Watts            |
| Peak Forward Surge Current, 8.3ms Sine-Wave<br>Superimposed on Rated Load, (JEDEC Method) | $I_{FSM}$      | 400.0          | Amps             |
| Operating and Storage Temperature Range                                                   | $T_J, T_{STG}$ | -55 to +175    | $^\circ\text{C}$ |

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## **100000 Watt TVS**

| 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                                 | 58.0                                                      | 1715.0                                   | 5000                                                   |
| RT100KP30A  | RT100KP30CA  | 30.00                                           | 33.51                                                | 50                                 | 64.0                                                      | 1553.0                                   | 5000                                                   |
| RT100KP33A  | RT100KP33CA  | 33.00                                           | 36.9                                                 | 50                                 | 67.8                                                      | 1463.0                                   | 5000                                                   |
| RT100KP36A  | RT100KP36CA  | 36.00                                           | 40.2                                                 | 50                                 | 71.7                                                      | 1387.0                                   | 5000                                                   |
| RT100KP39A  | RT100KP39CA  | 39.00                                           | 43.6                                                 | 20                                 | 77.7                                                      | 1275.0                                   | 2000                                                   |
| RT100KP42A  | RT100KP42CA  | 42.00                                           | 46.9                                                 | 10                                 | 83.5                                                      | 1190.0                                   | 1000                                                   |
| RT100KP43A  | RT100KP43CA  | 43.00                                           | 48.0                                                 | 10                                 | 84.5                                                      | 1184.0                                   | 1000                                                   |
| RT100KP45A  | RT100KP45CA  | 45.00                                           | 50.3                                                 | 5                                  | 88.5                                                      | 1130.0                                   | 250                                                    |
| RT100KP48A  | RT100KP48CA  | 48.00                                           | 53.6                                                 | 5                                  | 94.3                                                      | 1061.0                                   | 150                                                    |
| RT100KP51A  | RT100KP51CA  | 51.00                                           | 57.0                                                 | 5                                  | 101.0                                                     | 990.0                                    | 50                                                     |
| RT100KP54A  | RT100KP54CA  | 54.00                                           | 60.3                                                 | 5                                  | 106.0                                                     | 943.0                                    | 20                                                     |
| RT100KP58A  | RT100KP58CA  | 58.00                                           | 64.8                                                 | 5                                  | 114.0                                                     | 878.0                                    | 20                                                     |
| RT100KP60A  | RT100KP60CA  | 60.00                                           | 67.0                                                 | 5                                  | 118.0                                                     | 848.0                                    | 15                                                     |
| RT100KP64A  | RT100KP64CA  | 64.00                                           | 71.5                                                 | 5                                  | 126.0                                                     | 795.0                                    | 10                                                     |
| RT100KP66A  | RT100KP66CA  | 66.00                                           | 73.7                                                 | 5                                  | 128.4                                                     | 776.0                                    | 10                                                     |
| RT100KP70A  | RT100KP70CA  | 70.00                                           | 78.2                                                 | 5                                  | 138.0                                                     | 725.0                                    | 10                                                     |
| RT100KP71A  | RT100KP71CA  | 71.00                                           | 79.3                                                 | 5                                  | 133.0                                                     | 723.0                                    | 10                                                     |
| RT100KP72A  | RT100KP72CA  | 72.00                                           | 80.4                                                 | 5                                  | 136.8                                                     | 708.0                                    | 10                                                     |
| RT100KP75A  | RT100KP75CA  | 75.00                                           | 83.8                                                 | 5                                  | 147.0                                                     | 680.0                                    | 10                                                     |
| RT100KP78A  | RT100KP78CA  | 78.00                                           | 87.1                                                 | 5                                  | 153.0                                                     | 655.0                                    | 10                                                     |
| RT100KP84A  | RT100KP84CA  | 84.00                                           | 93.8                                                 | 5                                  | 167.0                                                     | 579.0                                    | 10                                                     |
| RT100KP90A  | RT100KP90CA  | 90.00                                           | 100.5                                                | 5                                  | 178.0                                                     | 563.0                                    | 10                                                     |
| RT100KP96A  | RT100KP96CA  | 96.00                                           | 107.2                                                | 5                                  | 187.0                                                     | 516.0                                    | 10                                                     |
| RT100KP102A | RT100KP102CA | 102.00                                          | 113.9                                                | 5                                  | 198.0                                                     | 487.0                                    | 10                                                     |
| RT100KP108A | RT100KP108CA | 108.00                                          | 120.6                                                | 5                                  | 210.0                                                     | 460.0                                    | 10                                                     |
| RT100KP120A | RT100KP120CA | 120.00                                          | 134.0                                                | 5                                  | 235.0                                                     | 426.0                                    | 10                                                     |
| RT100KP132A | RT100KP132CA | 132.00                                          | 147.4                                                | 5                                  | 256.0                                                     | 378.0                                    | 10                                                     |
| RT100KP144A | RT100KP144CA | 144.00                                          | 160.8                                                | 5                                  | 267.0                                                     | 361.0                                    | 10                                                     |
| RT100KP150A | RT100KP150CA | 150.00                                          | 167.6                                                | 5                                  | 296.0                                                     | 338.0                                    | 10                                                     |
| RT100KP156A | RT100KP156CA | 156.00                                          | 174.3                                                | 5                                  | 306.0                                                     | 328.0                                    | 10                                                     |
| RT100KP160A | RT100KP160CA | 160.00                                          | 178.7                                                | 5                                  | 315.0                                                     | 318.0                                    | 10                                                     |
| RT100KP168A | RT100KP168CA | 168.00                                          | 187.7                                                | 5                                  | 326.0                                                     | 314.0                                    | 10                                                     |
| RT100KP170A | RT100KP170CA | 170.00                                          | 189.9                                                | 5                                  | 334.0                                                     | 300.0                                    | 10                                                     |
| RT100KP180A | RT100KP180CA | 180.00                                          | 201.1                                                | 5                                  | 354.0                                                     | 283.0                                    | 10                                                     |
| RT100KP198A | RT100KP198CA | 198.00                                          | 221.2                                                | 5                                  | 382.0                                                     | 267.0                                    | 10                                                     |
| RT100KP216A | RT100KP216CA | 216.00                                          | 241.3                                                | 5                                  | 417.0                                                     | 245.0                                    | 10                                                     |
| RT100KP240A | RT100KP240CA | 240.00                                          | 268.1                                                | 5                                  | 460.0                                                     | 221.0                                    | 10                                                     |
| RT100KP258A | RT100KP258CA | 258.00                                          | 288.2                                                | 5                                  | 510.0                                                     | 198.0                                    | 10                                                     |
| RT100KP260A | RT100KP260CA | 260.00                                          | 290.4                                                | 5                                  | 512.0                                                     | 196.0                                    | 10                                                     |
| RT100KP270A | RT100KP270CA | 270.00                                          | 301.6                                                | 5                                  | 523.0                                                     | 184.0                                    | 10                                                     |
| RT100KP280A | RT100KP280CA | 280.00                                          | 312.8                                                | 5                                  | 552.0                                                     | 181.0                                    | 10                                                     |
| RT100KP288A | RT100KP288CA | 288.00                                          | 321.7                                                | 5                                  | 563.0                                                     | 177.0                                    | 10                                                     |
| RT100KP300A | RT100KP300CA | 300.00                                          | 333.0                                                | 5                                  | 590.0                                                     | 170.0                                    | 10                                                     |
| RT100KP350A | RT100KP350CA | 350.00                                          | 389.0                                                | 5                                  | 690.0                                                     | 145.0                                    | 10                                                     |
| RT100KP400A | RT100KP400CA | 400.00                                          | 444.0                                                | 5                                  | 787.0                                                     | 127.0                                    | 10                                                     |

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

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

Certified RoHS Compliant

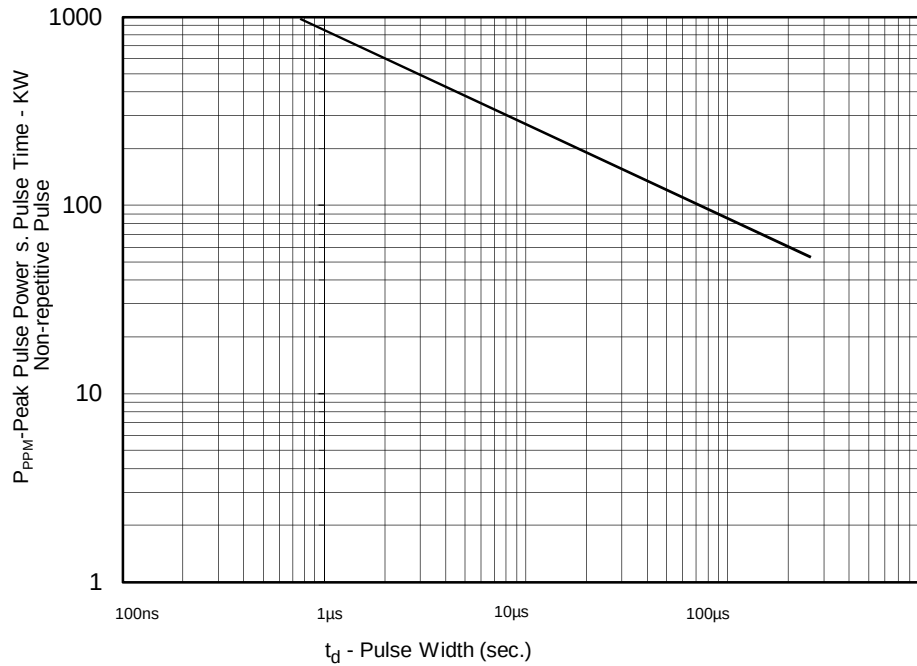
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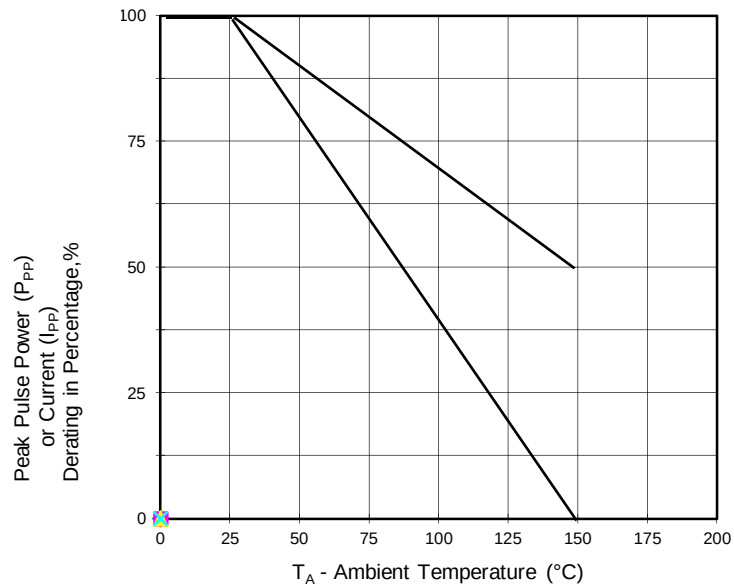
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## **RT100KP Series Rating and Characteristic Curves**

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



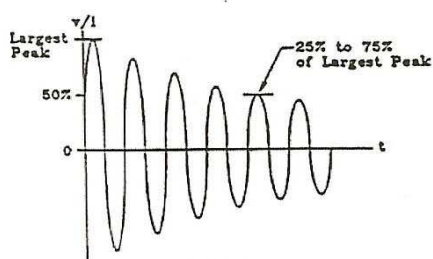
**Fig.2 - Pulse Derating Curve**



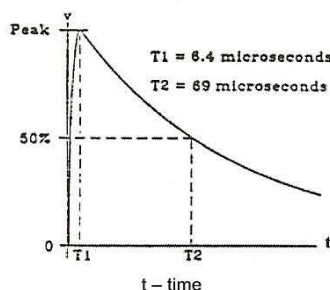
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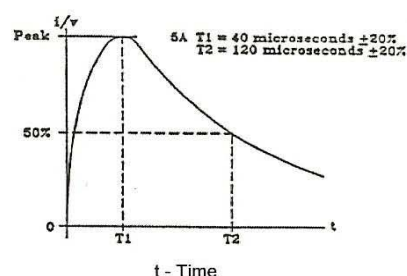
## **RT100KP Series Rating and Characteristic Curves**



t - time  
Note: frequency is 1MHz  
**FIGURE 7 – Waveform 3**



t - time  
**FIGURE 8 – Waveform 4**



t - Time  
**FIGURE 9 – Waveform 5A**

**Note: The 1 Mhz 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 the RTCA/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.**