

# MDE Semiconductor, Inc.

78-150 Calle Tampico, Unit 210, La Quinta, CA. U.S.A. 92253 Tel: 760-564-8656 • Fax: 760-564-2414

## 3KP SERIES

### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-5.0 TO 180 Volts 3000 Watt Peak Pulse Power

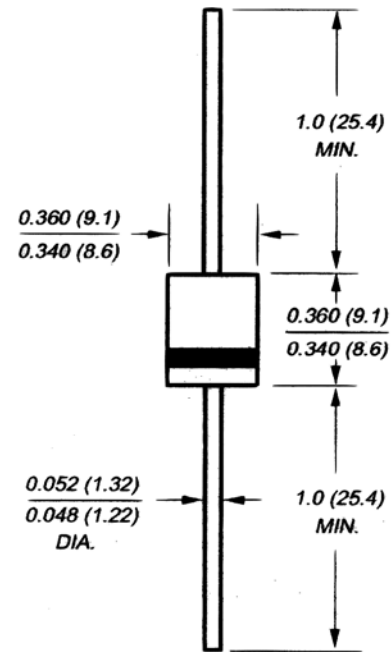
#### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- Glass passivated junction
- 3000W Peak Pulse Power capability on 10/1000  $\mu$ s waveform
- Glass passivated junction
- Low incremental surge resistance
- Excellent clamping capability
- Repetition rate (duty cycle): 0.05%
- Fast response time: typically less than 1.0 ps from 0 volts to BV
- Typical IR less than 1 $\mu$ A above 10V
- High temperature soldering guaranteed: 265°C/10 seconds/ .375", (9.5mm) lead length, 5lbs., (2.3kg) tension

#### MECHANICAL DATA

Case: Molded plastic over glass passivated junction  
 Terminals: 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 ounces, 2.1 grams

**Case Style P600**



*Dimensions in inches and (millimeters)*

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types 3KP5.0 thru types 3KP180 (e.g. 3KP5.0C, 3KP180CA)  
 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 10/1000 $\mu$ s waveform (NOTE 1, Fig.1)                                   | $P_{ppm}$      | Minimum 3000 | Watts      |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform (Note 1, Fig 3)  | $I_{ppm}$      | SEE TABLE 1  | Amps       |
| Steady State Power Dissipation at $T_L = 75^\circ C$<br>Lead lengths .375", 9.5mm (Note 2)                 | $P_{m(AV)}$    | 8.0          | Watts      |
| Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note 3) | $I_{FSM}$      | 250          | Amps       |
| Operating and Storage Temperature Range  | $T_j, T_{stg}$ | -55 +175     | $^\circ C$ |

**NOTES:**

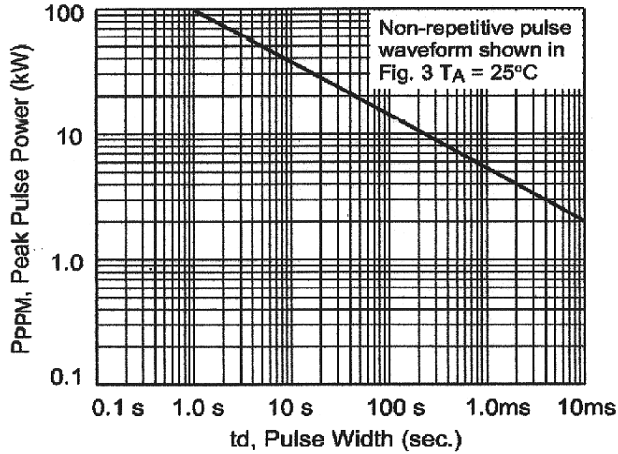
1. Non-repetitive current pulse, per Fig.3 and derated above  $T_a=25^\circ C$  per Fig.2.
2. Mounted on Copper Pad area of 0.8x0.8" (20x20mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

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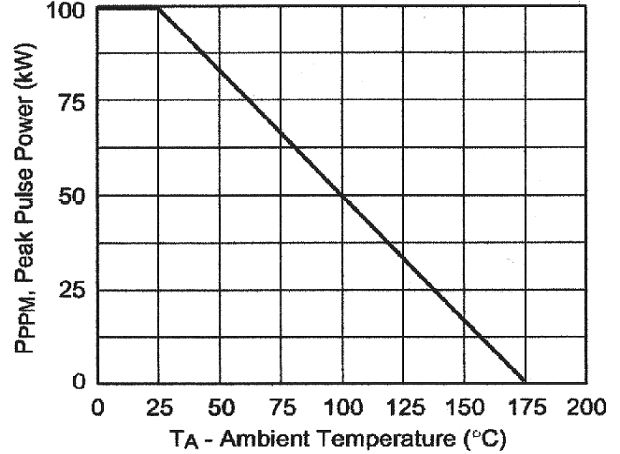
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## RATING AND CHARACTERISTIC CURVES 3KP SERIES

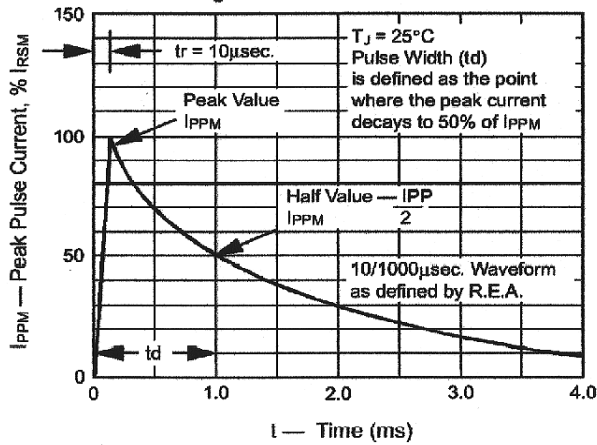
**Fig. 1 - Peak Pulse Power Rating Curve**



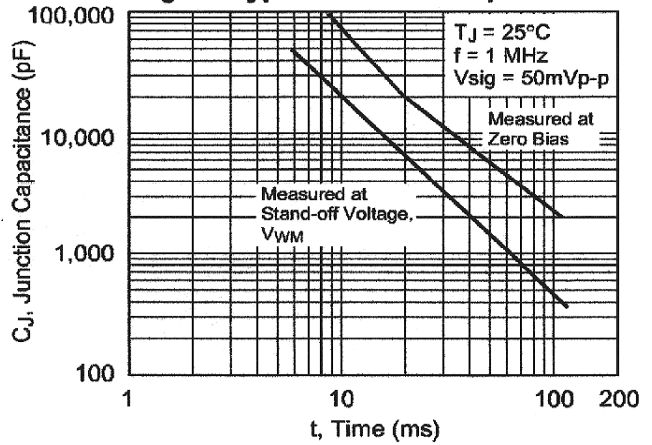
**Fig. 2 - Pulse Derating Curve**



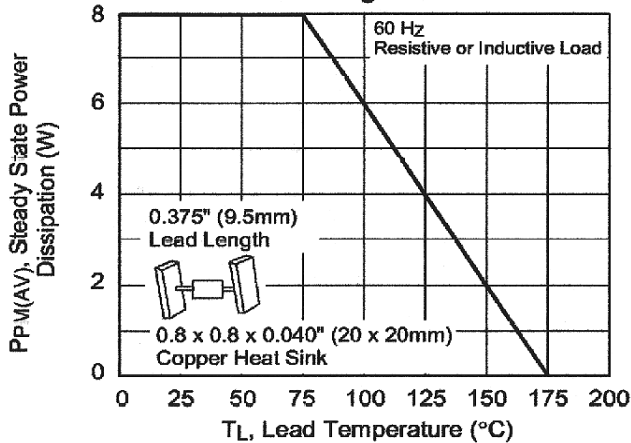
**Fig. 3 - Pulse Waveform**



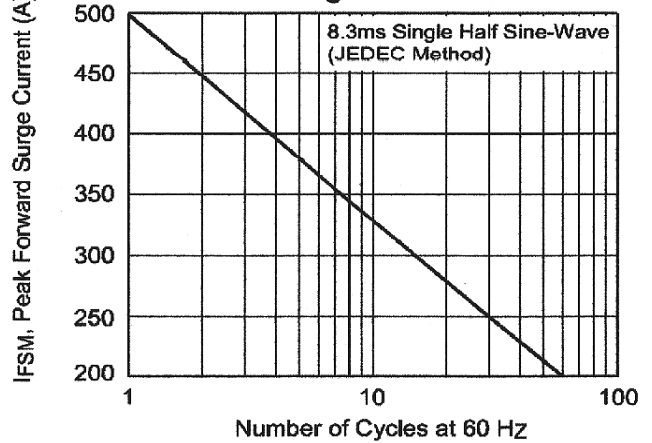
**Fig. 4 - Typical Junction Capacitance**



**Fig. 5 - Steady State Power Derating Curve**



**Fig. 6 - Maximum Non-repetitive Forward Surge Current**



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## **3000 Watt TVS**

| UNI-DIRECTIONAL PART NUMBER | REVERSE STANDOFF VOLTAGE VRWM (V) | BREAKDOWN VOLTAGE VBR (V) MIN. @ IT | BREAKDOWN VOLTAGE VBR (V) MAX. @ IT | TEST CURRENT (It) mA | MAXIMUM CLAMPING VOLTAGE @Ipp Vc (V) | PEAK PULSE CURRENT Ipp (A) | REVERSE LEAKAGE @ VRWM IR (μA) |
|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|--------------------------------------|----------------------------|--------------------------------|
| 3KP5.0                      | 5.00                              | 6.40                                | 7.30                                | 50                   | 9.6                                  | 312.5                      | 2000                           |
| 3KP5.0A                     | 5.00                              | 6.40                                | 7.00                                | 50                   | 9.2                                  | 323.0                      | 2000                           |
| 3KP6.0                      | 6.00                              | 6.67                                | 8.15                                | 50                   | 11.4                                 | 263.2                      | 2000                           |
| 3KP6.0A                     | 6.00                              | 6.67                                | 7.37                                | 50                   | 10.3                                 | 291.3                      | 2000                           |
| 3KP6.5                      | 6.50                              | 7.22                                | 8.82                                | 50                   | 12.3                                 | 243.9                      | 1000                           |
| 3KP6.5A                     | 6.50                              | 7.22                                | 7.98                                | 50                   | 11.2                                 | 267.9                      | 1000                           |
| 3KP7.0                      | 7.00                              | 7.78                                | 9.51                                | 50                   | 13.3                                 | 225.6                      | 400                            |
| 3KP7.0A                     | 7.00                              | 7.78                                | 8.60                                | 50                   | 12.0                                 | 250.0                      | 400                            |
| 3KP7.5                      | 7.50                              | 8.33                                | 10.20                               | 5                    | 14.3                                 | 209.8                      | 200                            |
| 3KP7.5A                     | 7.50                              | 8.33                                | 9.21                                | 5                    | 12.9                                 | 232.6                      | 200                            |
| 3KP8.0                      | 8.00                              | 8.89                                | 10.90                               | 5                    | 15.0                                 | 220.0                      | 100                            |
| 3KP8.0A                     | 8.00                              | 8.89                                | 9.83                                | 5                    | 13.6                                 | 220.6                      | 100                            |
| 3KP8.5                      | 8.50                              | 9.44                                | 11.50                               | 5                    | 15.9                                 | 188.8                      | 50                             |
| 3KP8.5A                     | 8.50                              | 9.44                                | 10.40                               | 5                    | 14.4                                 | 208.4                      | 50                             |
| 3KP9.0                      | 9.00                              | 10.00                               | 12.20                               | 5                    | 16.9                                 | 177.4                      | 20                             |
| 3KP9.0A                     | 9.00                              | 10.00                               | 11.10                               | 5                    | 15.4                                 | 194.8                      | 20                             |
| 3KP10                       | 10.00                             | 11.10                               | 13.60                               | 5                    | 18.8                                 | 159.6                      | 15                             |
| 3KP10A                      | 10.00                             | 11.10                               | 12.30                               | 5                    | 17.0                                 | 176.4                      | 15                             |
| 3KP11                       | 11.00                             | 12.20                               | 14.90                               | 5                    | 20.1                                 | 149.2                      | 10                             |
| 3KP11A                      | 11.00                             | 12.20                               | 13.50                               | 5                    | 18.2                                 | 184.8                      | 10                             |
| 3KP12                       | 12.00                             | 13.30                               | 16.30                               | 5                    | 22.0                                 | 136.4                      | 10                             |
| 3KP12A                      | 12.00                             | 13.30                               | 14.70                               | 5                    | 19.9                                 | 150.6                      | 10                             |
| 3KP13                       | 13.00                             | 14.40                               | 17.60                               | 5                    | 23.8                                 | 126.0                      | 10                             |
| 3KP13A                      | 13.00                             | 14.40                               | 15.90                               | 5                    | 21.5                                 | 139.4                      | 10                             |
| 3KP14                       | 14.00                             | 15.60                               | 19.10                               | 5                    | 25.8                                 | 116.2                      | 10                             |
| 3KP14A                      | 14.00                             | 15.60                               | 17.20                               | 5                    | 23.2                                 | 129.4                      | 10                             |
| 3KP15                       | 15.00                             | 16.70                               | 20.40                               | 5                    | 26.9                                 | 111.6                      | 10                             |
| 3KP15A                      | 15.00                             | 16.70                               | 18.50                               | 5                    | 24.4                                 | 123.0                      | 10                             |
| 3KP16                       | 16.00                             | 17.80                               | 21.80                               | 5                    | 28.8                                 | 104.2                      | 10                             |
| 3KP16A                      | 16.00                             | 17.80                               | 19.70                               | 5                    | 26.0                                 | 115.4                      | 10                             |
| 3KP17                       | 17.00                             | 18.90                               | 23.10                               | 5                    | 30.5                                 | 98.4                       | 10                             |
| 3KP17A                      | 17.00                             | 18.90                               | 20.90                               | 5                    | 27.6                                 | 106.6                      | 10                             |
| 3KP18                       | 18.00                             | 20.00                               | 24.40                               | 5                    | 32.2                                 | 93.2                       | 10                             |
| 3KP18A                      | 18.00                             | 20.00                               | 22.10                               | 5                    | 29.2                                 | 102.8                      | 10                             |
| 3KP20                       | 20.00                             | 22.20                               | 27.10                               | 5                    | 35.8                                 | 83.8                       | 10                             |
| 3KP20A                      | 20.00                             | 22.20                               | 24.50                               | 5                    | 32.4                                 | 92.6                       | 10                             |
| 3KP22                       | 22.00                             | 24.40                               | 29.80                               | 5                    | 39.4                                 | 76.2                       | 10                             |
| 3KP22A                      | 22.00                             | 24.40                               | 26.90                               | 5                    | 35.5                                 | 84.4                       | 10                             |
| 3KP24                       | 24.00                             | 26.70                               | 32.60                               | 5                    | 43.0                                 | 69.8                       | 10                             |
| 3KP24A                      | 24.00                             | 26.70                               | 29.50                               | 5                    | 38.9                                 | 44.2                       | 10                             |
| 3KP26                       | 26.00                             | 28.90                               | 35.30                               | 5                    | 46.6                                 | 64.4                       | 10                             |
| 3KP26A                      | 26.00                             | 28.90                               | 31.90                               | 5                    | 42.1                                 | 41.2                       | 10                             |
| 3KP28                       | 28.00                             | 31.10                               | 38.00                               | 5                    | 50.1                                 | 60.0                       | 10                             |
| 3KP28A                      | 28.00                             | 31.10                               | 34.40                               | 5                    | 45.4                                 | 66.0                       | 10                             |
| 3KP30                       | 30.00                             | 33.30                               | 40.70                               | 5                    | 53.5                                 | 56.0                       | 10                             |
| 3KP30A                      | 30.00                             | 33.30                               | 36.80                               | 5                    | 48.4                                 | 62.0                       | 10                             |
| 3KP33                       | 33.00                             | 36.70                               | 44.90                               | 5                    | 59.0                                 | 50.4                       | 10                             |
| 3KP33A                      | 33.00                             | 36.70                               | 40.60                               | 5                    | 53.3                                 | 56.2                       | 10                             |

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|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|--------------------------------------|----------------------------|--------------------------------|
| 3KP36                       | 36.00                             | 40.00                               | 48.90                               | 5                    | 64.3                                 | 46.6                       | 10                             |
| 3KP36A                      | 36.00                             | 40.00                               | 44.20                               | 5                    | 58.1                                 | 51.6                       | 10                             |
| 3KP40                       | 40.00                             | 44.40                               | 54.30                               | 5                    | 71.4                                 | 42.0                       | 10                             |
| 3KP40A                      | 40.00                             | 44.40                               | 49.10                               | 5                    | 64.5                                 | 46.4                       | 10                             |
| 3KP43                       | 43.00                             | 47.80                               | 58.40                               | 5                    | 76.7                                 | 39.2                       | 10                             |
| 3KP43A                      | 43.00                             | 47.80                               | 52.80                               | 5                    | 69.4                                 | 43.2                       | 10                             |
| 3KP45                       | 45.00                             | 50.00                               | 61.10                               | 5                    | 80.3                                 | 37.4                       | 10                             |
| 3KP45A                      | 45.00                             | 50.00                               | 55.30                               | 5                    | 72.7                                 | 41.2                       | 10                             |
| 3KP48                       | 48.00                             | 53.30                               | 65.20                               | 5                    | 85.5                                 | 35.0                       | 10                             |
| 3KP48A                      | 48.00                             | 53.30                               | 58.90                               | 5                    | 77.4                                 | 38.8                       | 10                             |
| 3KP51                       | 51.00                             | 56.70                               | 69.30                               | 5                    | 91.1                                 | 37.0                       | 10                             |
| 3KP51A                      | 51.00                             | 56.70                               | 62.70                               | 5                    | 82.4                                 | 36.4                       | 10                             |
| 3KP54A                      | 54.00                             | 60.00                               | 73.30                               | 5                    | 96.3                                 | 31.2                       | 10                             |
| 3KP54A                      | 54.00                             | 60.00                               | 66.30                               | 5                    | 87.1                                 | 34.4                       | 10                             |
| 3KP58                       | 58.00                             | 64.40                               | 78.70                               | 5                    | 103.0                                | 29.2                       | 10                             |
| 3KP58A                      | 58.00                             | 64.40                               | 71.20                               | 5                    | 93.6                                 | 32.0                       | 10                             |
| 3KP60                       | 60.00                             | 66.70                               | 81.50                               | 5                    | 107.0                                | 28.0                       | 10                             |
| 3KP60A                      | 60.00                             | 66.70                               | 73.70                               | 5                    | 96.8                                 | 31.0                       | 10                             |
| 3KP64                       | 64.00                             | 71.10                               | 86.90                               | 5                    | 114.0                                | 26.4                       | 10                             |
| 3KP64A                      | 64.00                             | 71.10                               | 78.60                               | 5                    | 103.0                                | 29.2                       | 10                             |
| 3KP70                       | 70.00                             | 77.80                               | 95.10                               | 5                    | 125.0                                | 24.0                       | 10                             |
| 3KP70A                      | 70.00                             | 77.80                               | 86.00                               | 5                    | 113.0                                | 26.6                       | 10                             |
| 3KP75                       | 75.00                             | 83.30                               | 102.00                              | 5                    | 134.0                                | 22.4                       | 10                             |
| 3KP75A                      | 75.00                             | 83.30                               | 92.10                               | 5                    | 121.0                                | 24.8                       | 10                             |
| 3KP78                       | 78.00                             | 86.70                               | 106.00                              | 5                    | 139.0                                | 21.6                       | 10                             |
| 3KP78A                      | 78.00                             | 86.70                               | 95.80                               | 5                    | 126.0                                | 22.8                       | 10                             |
| 3KP85                       | 85.00                             | 94.40                               | 115.00                              | 5                    | 151.0                                | 19.8                       | 10                             |
| 3KP85A                      | 85.00                             | 94.40                               | 104.00                              | 5                    | 137.0                                | 20.8                       | 10                             |
| 3KP90                       | 90.00                             | 100.00                              | 122.00                              | 5                    | 160                                  | 18.8                       | 10                             |
| 3KP90A                      | 90.00                             | 100.00                              | 111.00                              | 5                    | 146                                  | 20.6                       | 10                             |
| 3KP100                      | 100.00                            | 111.00                              | 136.00                              | 5                    | 179                                  | 16.6                       | 10                             |
| 3KP100A                     | 100.00                            | 111.00                              | 123.00                              | 5                    | 162                                  | 18.6                       | 10                             |
| 3KP110                      | 110.00                            | 122.00                              | 149.00                              | 5                    | 196                                  | 15.4                       | 10                             |
| 3KP110A                     | 110.00                            | 122.00                              | 135.00                              | 5                    | 177                                  | 16.8                       | 10                             |
| 3KP120                      | 120.00                            | 133.00                              | 163.00                              | 5                    | 214                                  | 14.0                       | 10                             |
| 3KP120A                     | 120.00                            | 133.00                              | 147.00                              | 5                    | 193                                  | 15.6                       | 10                             |
| 3KP130                      | 130.00                            | 144.00                              | 176.00                              | 5                    | 230                                  | 13.0                       | 10                             |
| 3KP130A                     | 130.00                            | 144.00                              | 159.00                              | 5                    | 209                                  | 14.4                       | 10                             |
| 3KP150                      | 150.00                            | 167.00                              | 204.00                              | 5                    | 268                                  | 11.2                       | 10                             |
| 3KP150A                     | 150.00                            | 167.00                              | 185.00                              | 5                    | 243                                  | 12.4                       | 10                             |
| 3KP160                      | 160.00                            | 178.00                              | 218.00                              | 5                    | 287                                  | 10.4                       | 10                             |
| 3KP160A                     | 160.00                            | 178.00                              | 197.00                              | 5                    | 259                                  | 11.6                       | 10                             |
| 3KP170                      | 170.00                            | 189.00                              | 231.00                              | 5                    | 304                                  | 9.8                        | 10                             |
| 3KP170A                     | 170.00                            | 189.00                              | 209.00                              | 5                    | 275                                  | 11.0                       | 10                             |
| 3KP180                      | 180.00                            | 200.00                              | 244.00                              | 5                    | 320                                  | 9.4                        | 10                             |
| 3KP180A                     | 180.00                            | 200.00                              | 233.00                              | 5                    | 289                                  | 10.4                       | 10                             |

For Bidirectional type having Vrwm of 10volts and less, the IR limit is double.