

# MDE Semiconductor, Inc.

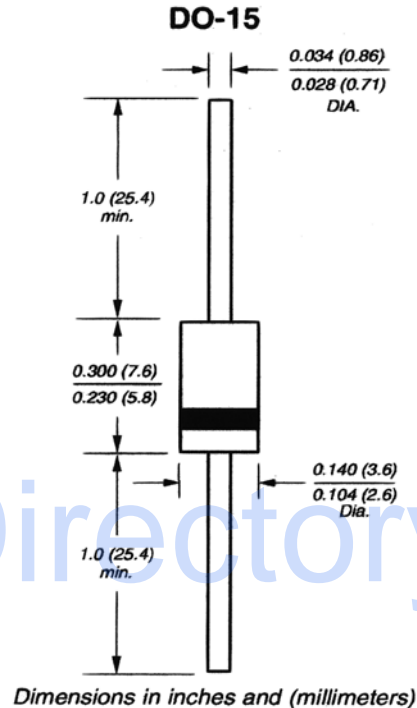
78-150 Calle Tampico, Unit 210, La Quinta, CA. U.S.A. 92253 Tel: 760-564-8656 • Fax: 760-564-2414

## P6KE SERIES

### GLASS PASSIVATED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR VOLTAGE-6.8 TO 440 Volts 600 Watt Peak Power 5.0 Watt Steady State

#### FEATURES

- Plastic package has Underwriters Laboratory Flammability Classification 94 V-O
- Glass passivated chip junction in DO-15 (DO-204AC) package
- 600W surge capability at 10/1000  $\mu$ s
- Low zenen impedance
- Excellent clamping capability
- Fast response time: typically less than 1.0 ps from 0 volts to BV min.
- 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: JEDEC DO-15 Molded plastic  
 Terminals: Plated Axial leads, solderable per MIL-STD-750, Method 2026  
 Polarity: Color band denoted positive end (cathode) except Bipolar  
 Mounting Position: Any  
 Weight: 0.015 ounces, 0.4 grams

#### DEVICES FOR BIPOLAR APPLICATIONS

For Bidirectional use C or CA Suffix for types P6KE6.80 thru types P6KE440 (e.g. P6KE6.8C, P6KE440CA)  
 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 at TA = 25 °C, TP = 1ms (NOTE 1)  | P <sub>ppm</sub>                  | Minimum 600 | Watts |
| Peak Pulse Current of on 10/1000 $\mu$ s waveform (Note 1)   | I <sub>ppm</sub>                  | SEE TABLE 1 | Amps  |
| Steady State Power Dissipation at TL = 75°C Lead lengths .375", 9.5mm (Note 2)                             | P <sub>m(AV)</sub>                | 1.0         | Watts |
| Peak Forward Surge Current, 8.3ms Single Half Sine-wave Superimposed on Rated Load, (JEDEC Method)(Note 3) | I <sub>FSM</sub>                  | 40          | Amps  |
| Operatings and Storage Temperature Range   | T <sub>j</sub> , T <sub>stg</sub> | -55 +175    | °C    |

**NOTES:**

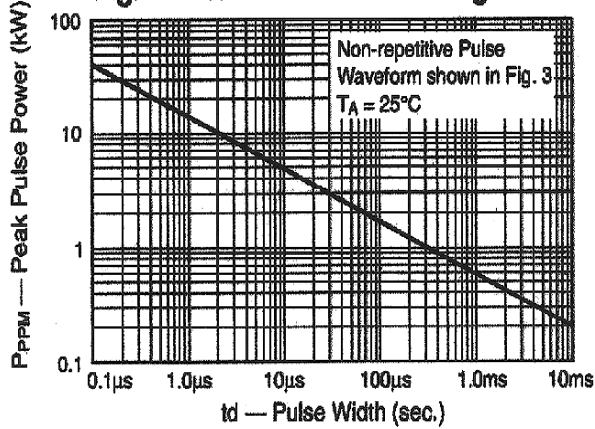
1. Non-repetitive current pulse, per Fig.3 and derated above Ta=25 °C per Fig.2.
2. Mounted on Copper Pad area of 1.6x1.6" (40x40mm) per Fig.5.
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle=4 pulses per minutes maximum.

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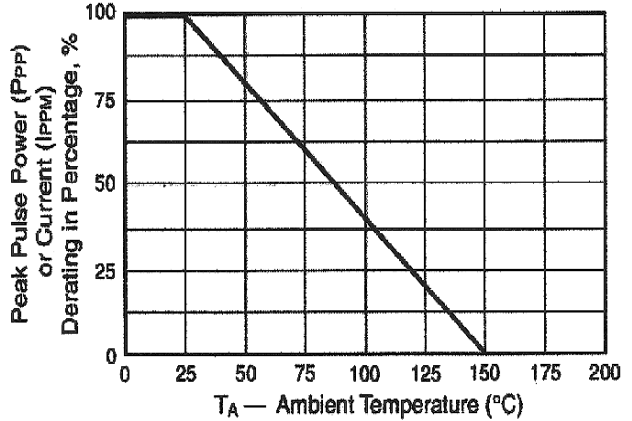
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## RATING AND CHARACTERISTIC CURVES P6KE SERIES

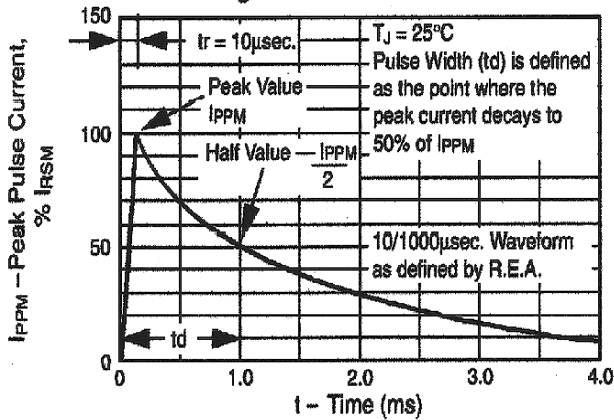
**Fig. 1 – Peak Pulse Power Rating Curve**



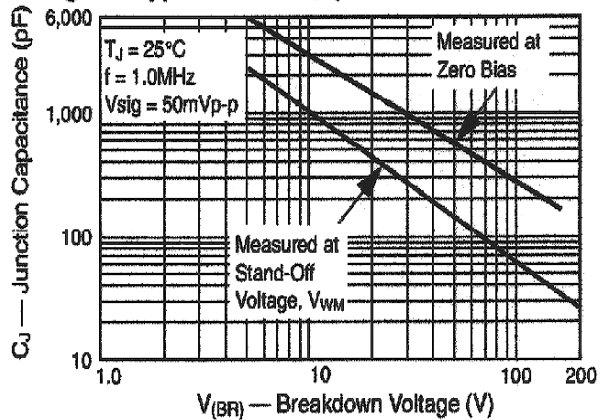
**Fig. 2 – Pulse Derating Curve**



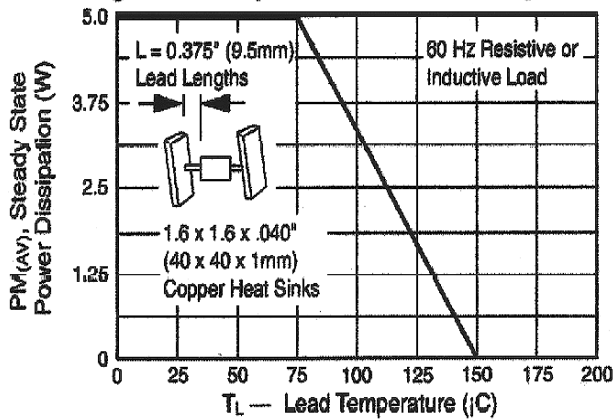
**Fig. 3 – Pulse Waveform**



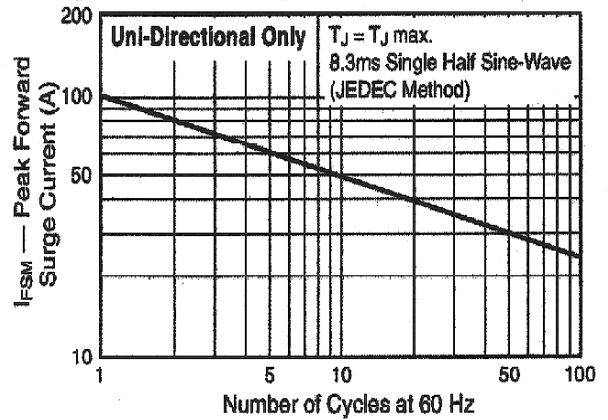
**Fig. 4 – Typ. Junction Capacitance Uni-Directional**



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



**Fig. 6 - Max. Non-Repetitive Forward Surge Current**



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## 600 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) |
|-----------------------------|-----------------------------------|-------------------------------------|-------------------------------------|----------------------|--------------------------------------|----------------------------|--------------------------------|
| P6KE6.8                     | 5.50                              | 6.12                                | 7.48                                | 10                   | 10.8                                 | 56.5                       | 1000                           |
| P6KE6.8.0A                  | 5.80                              | 6.45                                | 7.14                                | 10                   | 10.5                                 | 58.1                       | 1000                           |
| P6KE7.5                     | 6.05                              | 6.75                                | 8.25                                | 10                   | 11.7                                 | 52.1                       | 500                            |
| P6KE7.5A                    | 6.40                              | 7.13                                | 7.88                                | 10                   | 11.3                                 | 54.0                       | 500                            |
| P6KE8.2                     | 6.63                              | 7.38                                | 9.02                                | 10                   | 12.5                                 | 48.8                       | 200                            |
| P6KE8.2A                    | 7.02                              | 7.79                                | 8.61                                | 10                   | 12.1                                 | 50.4                       | 200                            |
| P6KE9.1                     | 7.37                              | 8.19                                | 10.00                               | 10                   | 13.8                                 | 44.2                       | 50                             |
| P6KE9.1A                    | 7.78                              | 8.65                                | 9.55                                | 10                   | 13.4                                 | 45.5                       | 50                             |
| P6KE10                      | 8.10                              | 9.00                                | 11.00                               | 1                    | 15.0                                 | 40.7                       | 10                             |
| P6KE10A                     | 8.55                              | 9.50                                | 10.50                               | 1                    | 14.5                                 | 42.1                       | 10                             |
| P6KE11                      | 8.92                              | 9.90                                | 12.10                               | 1                    | 16.2                                 | 37.7                       | 5                              |
| P6KE11A                     | 9.40                              | 10.50                               | 11.60                               | 1                    | 15.6                                 | 39.1                       | 5                              |
| P6KE12                      | 9.72                              | 10.80                               | 13.20                               | 1                    | 17.3                                 | 35.3                       | 1                              |
| P6KE12A                     | 10.20                             | 11.40                               | 12.60                               | 1                    | 16.7                                 | 36.5                       | 1                              |
| P6KE13                      | 10.50                             | 11.70                               | 14.30                               | 1                    | 19.0                                 | 32.1                       | 1                              |
| P6KE13A                     | 11.10                             | 12.40                               | 13.70                               | 1                    | 18.2                                 | 33.5                       | 1                              |
| P6KE15                      | 12.10                             | 13.50                               | 16.50                               | 1                    | 22.0                                 | 27.7                       | 1                              |
| P6KE15A                     | 10.00                             | 14.30                               | 15.80                               | 1                    | 21.2                                 | 28.8                       | 1                              |
| P6KE16                      | 12.80                             | 14.40                               | 17.60                               | 1                    | 23.5                                 | 26.0                       | 1                              |
| P6KE16A                     | 12.90                             | 15.20                               | 16.80                               | 1                    | 22.5                                 | 27.1                       | 1                              |
| P6KE18                      | 13.60                             | 16.20                               | 19.80                               | 1                    | 26.5                                 | 23.0                       | 1                              |
| P6KE18A                     | 14.50                             | 17.10                               | 18.90                               | 1                    | 25.2                                 | 24.2                       | 1                              |
| P6KE20                      | 15.30                             | 18.00                               | 22.00                               | 1                    | 29.1                                 | 21.0                       | 1                              |
| P6KE20A                     | 17.10                             | 19.00                               | 21.00                               | 1                    | 27.7                                 | 22.0                       | 1                              |
| P6KE22                      | 17.80                             | 19.80                               | 24.20                               | 1                    | 31.9                                 | 19.1                       | 1                              |
| P6KE22A                     | 18.80                             | 20.90                               | 23.10                               | 1                    | 30.6                                 | 19.9                       | 1                              |
| P6KE24                      | 19.40                             | 21.60                               | 26.40                               | 1                    | 34.7                                 | 17.6                       | 1                              |
| P6KE24A                     | 20.50                             | 22.80                               | 25.20                               | 1                    | 33.2                                 | 18.4                       | 1                              |
| P6KE27                      | 21.80                             | 24.30                               | 29.70                               | 1                    | 39.1                                 | 15.6                       | 1                              |
| P6KE27A                     | 23.10                             | 25.70                               | 28.40                               | 1                    | 37.5                                 | 16.3                       | 1                              |
| P6KE30                      | 24.30                             | 27.00                               | 33.00                               | 1                    | 43.5                                 | 14.0                       | 1                              |
| P6KE30A                     | 25.60                             | 28.50                               | 31.50                               | 1                    | 41.4                                 | 14.7                       | 1                              |
| P6KE33                      | 26.80                             | 29.70                               | 36.30                               | 1                    | 47.7                                 | 12.8                       | 1                              |
| P6KE33A                     | 28.20                             | 31.40                               | 34.70                               | 1                    | 45.7                                 | 13.3                       | 1                              |
| P6KE36                      | 29.10                             | 32.40                               | 39.60                               | 1                    | 52.0                                 | 11.7                       | 1                              |
| P6KE36A                     | 30.80                             | 34.20                               | 37.80                               | 1                    | 49.9                                 | 12.2                       | 1                              |
| P6KE39                      | 31.60                             | 35.10                               | 42.90                               | 1                    | 56.4                                 | 10.8                       | 1                              |
| P6KE39A                     | 33.30                             | 37.10                               | 41.00                               | 1                    | 53.9                                 | 11.3                       | 1                              |
| P6KE43                      | 34.80                             | 38.70                               | 47.30                               | 1                    | 61.9                                 | 9.9                        | 1                              |
| P6KE43A                     | 36.80                             | 40.90                               | 45.20                               | 1                    | 59.3                                 | 10.3                       | 1                              |
| P6KE47                      | 38.10                             | 42.30                               | 51.70                               | 1                    | 67.8                                 | 9.0                        | 1                              |
| P6KE47A                     | 40.20                             | 44.70                               | 49.40                               | 1                    | 64.8                                 | 9.4                        | 1                              |
| P6KE51                      | 41.30                             | 45.90                               | 56.10                               | 1                    | 73.5                                 | 8.3                        | 1                              |
| P6KE51A                     | 43.60                             | 48.50                               | 53.60                               | 1                    | 70.1                                 | 8.7                        | 1                              |
| P6KE56                      | 45.40                             | 50.40                               | 61.60                               | 1                    | 80.5                                 | 7.6                        | 1                              |
| P6KE56A                     | 47.80                             | 53.20                               | 58.80                               | 1                    | 77.0                                 | 7.9                        | 1                              |
| P6KE62                      | 50.20                             | 55.80                               | 68.20                               | 1                    | 89.0                                 | 6.9                        | 1                              |
| P6KE62A                     | 53.00                             | 58.90                               | 65.10                               | 1                    | 85.0                                 | 7.2                        | 1                              |
| P6KE68                      | 55.10                             | 61.20                               | 74.80                               | 1                    | 98.0                                 | 6.2                        | 1                              |
| P6KE68A                     | 58.10                             | 64.60                               | 71.40                               | 1                    | 92.0                                 | 6.6                        | 1                              |

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|-----------------------------|-----------------------------------|---------------------------|-------------------|----------------------|--------------------------------------|----------------------------|-------------------|---------|
|                             |                                   | MIN. @ IT                 | VBR (V) MAX. @ IT |                      |                                      |                            | VRWM              | IR (µA) |
| P6KE75                      | 60.70                             | 67.50                     | 82.50             | 1                    | 108.0                                | 5.6                        | 5                 |         |
| P6KE75A                     | 64.10                             | 71.30                     | 78.80             | 1                    | 103.0                                | 5.9                        | 5                 |         |
| P6KE82                      | 66.40                             | 73.80                     | 90.20             | 1                    | 118.0                                | 5.2                        | 5                 |         |
| P6KE82A                     | 70.10                             | 77.90                     | 86.10             | 1                    | 113.0                                | 5.4                        | 5                 |         |
| P6KE91                      | 73.70                             | 81.90                     | 100.00            | 1                    | 131.0                                | 4.70                       | 5                 |         |
| P6KE91A                     | 77.80                             | 86.50                     | 95.50             | 1                    | 125.0                                | 4.9                        | 5                 |         |
| P6KE100                     | 81.00                             | 90.00                     | 110.00            | 1                    | 144.0                                | 4.2                        | 5                 |         |
| P6KE100A                    | 85.50                             | 95.00                     | 105.00            | 1                    | 137.0                                | 4.5                        | 5                 |         |
| P6KE110                     | 89.20                             | 99.00                     | 121.00            | 1                    | 158.0                                | 3.9                        | 5                 |         |
| P6KE110A                    | 94.00                             | 105.00                    | 116.00            | 1                    | 152.0                                | 4.0                        | 5                 |         |
| P6KE120                     | 97.20                             | 108.00                    | 132.00            | 1                    | 173.0                                | 3.5                        | 5                 |         |
| P6KE120A                    | 102.00                            | 114.00                    | 126.00            | 1                    | 165.0                                | 3.7                        | 5                 |         |
| P6KE130A                    | 105.00                            | 117.00                    | 143.00            | 1                    | 187.0                                | 3.3                        | 5                 |         |
| P6KE130A                    | 111.00                            | 124.00                    | 137.00            | 1                    | 179.0                                | 3.4                        | 5                 |         |
| P6KE150                     | 121.00                            | 135.00                    | 165.00            | 1                    | 215.0                                | 2.8                        | 5                 |         |
| P6KE150A                    | 128.00                            | 143.00                    | 158.00            | 1                    | 207.0                                | 2.9                        | 5                 |         |
| P6KE160                     | 130.00                            | 144.00                    | 176.00            | 1                    | 230.0                                | 2.7                        | 5                 |         |
| P6KE160A                    | 136.00                            | 152.00                    | 168.00            | 1                    | 219.0                                | 2.8                        | 5                 |         |
| P6KE170                     | 138.00                            | 153.00                    | 187.00            | 1                    | 244.0                                | 2.5                        | 5                 |         |
| P6KE170A                    | 145.00                            | 162.00                    | 179.00            | 1                    | 234.0                                | 2.6                        | 5                 |         |
| P6KE180                     | 146.00                            | 162.00                    | 198.00            | 1                    | 258.0                                | 2.4                        | 5                 |         |
| P6KE180A                    | 154.00                            | 171.00                    | 189.00            | 1                    | 246.0                                | 2.5                        | 5                 |         |
| P6KE200                     | 162.00                            | 180.00                    | 220.00            | 1                    | 287.0                                | 2.1                        | 5                 |         |
| P6KE200A                    | 171.00                            | 190.00                    | 210.00            | 1                    | 274.0                                | 2.2                        | 5                 |         |
| P6KE220                     | 175.00                            | 198.00                    | 242.00            | 1                    | 344.0                                | 1.8                        | 5                 |         |
| P6KE220A                    | 185.00                            | 209.00                    | 231.00            | 1                    | 328.0                                | 1.9                        | 5                 |         |
| P6KE250                     | 202.00                            | 225.00                    | 275.00            | 1                    | 360.0                                | 1.7                        | 5                 |         |
| P6KE250A                    | 214.00                            | 237.00                    | 263.00            | 1                    | 344.0                                | 1.8                        | 5                 |         |
| P6KE300                     | 243.00                            | 270.00                    | 330.00            | 1                    | 430.0                                | 1.4                        | 5                 |         |
| P6KE300A                    | 256.00                            | 285.00                    | 315.00            | 1                    | 414.0                                | 1.5                        | 5                 |         |
| P6KE350                     | 284.00                            | 315.00                    | 385.00            | 1                    | 504.0                                | 1.2                        | 5                 |         |
| P6KE350A                    | 300.00                            | 333.00                    | 368.00            | 1                    | 482.0                                | 1.3                        | 5                 |         |
| P6KE400                     | 324.00                            | 360.00                    | 440.00            | 1                    | 574.0                                | 1.1                        | 5                 |         |
| P6KE400A                    | 342.00                            | 380.00                    | 420.00            | 1                    | 548.0                                | 1.1                        | 5                 |         |
| P6KE440                     | 356.00                            | 396.00                    | 484.00            | 1                    | 631.0                                | 1                          | 5                 |         |
| P6KE440A                    | 376.00                            | 418.00                    | 462.00            | 1                    | 602.0                                | 1                          | 5                 |         |

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