

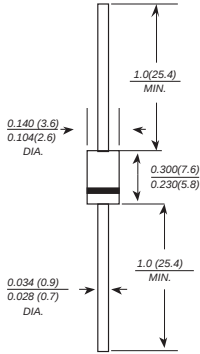


# P6KE6.8 THRU P6KE440CA

## GLASS PASSIVAED JUNCTION TRANSIENT VOLTAGE SUPPRESSOR

Breakdown Voltage:6.8-440 Volts Peak Pulse Power:600 Watts

### DO-15



Dimensions in inches and (millimeters)

### FEATURE

- ◆ 600w peak pulse power capability
- ◆ Excellent clamping capability
- ◆ Low incremental surge resistance
- ◆ Fast response time:typically less than 1.0ps from 0v to  $V_{BR}$  for unidirectional and 5.0ns for bidirectional types.
- ◆ High temperature soldering guaranteed:  
265°C/10S/9.5mm lead length at 5 lbs tension

### MECHANICAL DATA

**Case:** JEDEC DO-15 molded plastic body over passivated junction

**Terminals:** Plated axial leads, solderable per MIL-STD 750, method 2026

**Polarity:** Color band denotes cathode except for bidirectional types

**Mounting Position:** Any

**Weight:** 0.014 ounce,0.40 grams

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

For bidirectional use suffix C or CA for types P6KE6.8 thru P6KE440 (e.g. P6KE6.8CA,P6KE440CA)  
Electrical characteristics apply in both directions.

### MAXIMUM RATINGS AND CHARACTERISTICS

Ratings at 25°C ambient temperature unless otherwise specified.

|                                                                               | SYMBOLS | VALUE        | UNITS |
|-------------------------------------------------------------------------------|---------|--------------|-------|
| Peak power dissipation (Note 1)                                               | Pppm    | Minimum 600  | Watts |
| Peak pulse reverse current (Note 1, Fig.3)                                    | Ippm    | See Table 1  | Amps  |
| Steady state power dissipation (Note 2)                                       | PM(AV)  | 5.0          | Watts |
| Peak forward surge current (Note 3)                                           | IFSM    | 100          | Amps  |
| Maximum instantaneous forward voltage at 50A for unidirectional only (Note 4) | VF      | 3.5/5.0      | Volts |
| Operating junction and storage temperature range                              | TSTG,TJ | -55 to + 175 | °C    |

#### Notes:

- 1.10/1000ms waveform non-repetitive current pulse,per Fig.3 and derated above  $T_a=25^{\circ}\text{C}$  per Fig.2
2. $T_L=75^{\circ}\text{C}$ ,lead lengths 9.5mm,Mounted on copper pad area of (40x40mm)Fig.5
- 3.Measured on 8.3ms single half sine-wave or equivalent square wave,duty cycle=4 pulses per minute maximum.
- 4.VF=3.5V max.for devices of  $V_{(BR)}\leq 200\text{V}$ ,and VF=5.0V max.for devices of  $V_{(BR)}>200\text{V}$



## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Device Type | Breakdown Voltage<br>V <sub>(BR)</sub><br>(Volts)(NOTES 1) |      | Test<br>Current<br>I <sub>T</sub> (mA) | Stand-off<br>Voltage<br>V <sub>WM</sub><br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>I <sub>D</sub> (NOTE3)(mA) | Maximum<br>Peak Puls<br>Reverse Current<br>I <sub>PPM</sub> (NOTE2)<br>(Amps) | Maximum<br>Clamping<br>Voltage at<br>I <sub>PPM</sub><br>V <sub>C</sub> (Volts) | Maximum<br>Temperature<br>Coefficient<br>of V <sub>(BR)</sub><br>(%/°C) |
|-------------|------------------------------------------------------------|------|----------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|             | MIN                                                        | MAX  |                                        |                                                    |                                                                                   |                                                                               |                                                                                 |                                                                         |
| P6KE6.8     | 6.12                                                       | 7.48 | 10.0                                   | 5.50                                               | 1000.0                                                                            | 55.6                                                                          | 10.8                                                                            | 0.057                                                                   |
| P6KE6.8A    | 6.45                                                       | 7.14 | 10.0                                   | 5.80                                               | 1000.0                                                                            | 57.1                                                                          | 10.5                                                                            | 0.057                                                                   |
| P6KE7.5     | 6.75                                                       | 8.25 | 1.0                                    | 6.05                                               | 500.0                                                                             | 51.3                                                                          | 11.7                                                                            | 0.061                                                                   |
| P6KE7.5A    | 7.13                                                       | 7.88 | 1.0                                    | 6.40                                               | 500.0                                                                             | 53.1                                                                          | 11.3                                                                            | 0.061                                                                   |
| P6KE8.2     | 7.38                                                       | 9.02 | 1.0                                    | 6.63                                               | 200.0                                                                             | 48.0                                                                          | 12.5                                                                            | 0.065                                                                   |
| P6KE8.2A    | 7.79                                                       | 8.61 | 1.0                                    | 7.02                                               | 200.0                                                                             | 49.6                                                                          | 12.1                                                                            | 0.065                                                                   |
| P6KE9.1     | 8.19                                                       | 10.0 | 1.0                                    | 7.37                                               | 50.0                                                                              | 43.5                                                                          | 13.8                                                                            | 0.068                                                                   |
| P6KE9.1A    | 8.65                                                       | 9.55 | 1.0                                    | 7.78                                               | 50.0                                                                              | 44.8                                                                          | 13.4                                                                            | 0.068                                                                   |
| P6KE10      | 9.00                                                       | 11.0 | 1.0                                    | 8.10                                               | 10.0                                                                              | 40.0                                                                          | 15.0                                                                            | 0.073                                                                   |
| P6KE10A     | 9.50                                                       | 10.5 | 1.0                                    | 8.55                                               | 10.0                                                                              | 41.4                                                                          | 14.5                                                                            | 0.073                                                                   |
| P6KE11      | 9.90                                                       | 12.1 | 1.0                                    | 8.92                                               | 5.0                                                                               | 37.0                                                                          | 16.2                                                                            | 0.075                                                                   |
| P6KE11A     | 10.5                                                       | 11.6 | 1.0                                    | 9.40                                               | 5.0                                                                               | 38.5                                                                          | 15.6                                                                            | 0.075                                                                   |
| P6KE12      | 10.8                                                       | 13.2 | 1.0                                    | 9.72                                               | 5.0                                                                               | 34.7                                                                          | 17.3                                                                            | 0.078                                                                   |
| P6KE12A     | 11.4                                                       | 12.6 | 1.0                                    | 10.2                                               | 5.0                                                                               | 35.9                                                                          | 16.7                                                                            | 0.078                                                                   |
| P6KE13      | 11.7                                                       | 14.3 | 1.0                                    | 10.5                                               | 5.0                                                                               | 31.6                                                                          | 19.0                                                                            | 0.081                                                                   |
| P6KE13A     | 12.4                                                       | 13.7 | 1.0                                    | 11.1                                               | 5.0                                                                               | 33.0                                                                          | 18.2                                                                            | 0.081                                                                   |
| P6KE15      | 13.5                                                       | 16.5 | 1.0                                    | 12.1                                               | 5.0                                                                               | 27.3                                                                          | 22.0                                                                            | 0.084                                                                   |
| P6KE15A     | 14.3                                                       | 15.8 | 1.0                                    | 12.8                                               | 5.0                                                                               | 28.3                                                                          | 21.2                                                                            | 0.084                                                                   |
| P6KE16      | 14.4                                                       | 17.6 | 1.0                                    | 12.9                                               | 5.0                                                                               | 25.5                                                                          | 23.5                                                                            | 0.086                                                                   |
| P6KE16A     | 15.2                                                       | 16.8 | 1.0                                    | 13.6                                               | 5.0                                                                               | 26.7                                                                          | 22.5                                                                            | 0.086                                                                   |
| P6KE18      | 16.2                                                       | 19.8 | 1.0                                    | 14.5                                               | 5.0                                                                               | 22.6                                                                          | 26.5                                                                            | 0.088                                                                   |
| P6KE18A     | 17.1                                                       | 18.9 | 1.0                                    | 15.3                                               | 5.0                                                                               | 23.8                                                                          | 25.2                                                                            | 0.088                                                                   |
| P6KE20      | 18.0                                                       | 22.0 | 1.0                                    | 16.2                                               | 5.0                                                                               | 20.6                                                                          | 29.1                                                                            | 0.090                                                                   |
| P6KE20A     | 19.0                                                       | 21.0 | 1.0                                    | 17.1                                               | 5.0                                                                               | 21.7                                                                          | 27.7                                                                            | 0.090                                                                   |
| P6KE22      | 19.8                                                       | 24.2 | 1.0                                    | 17.8                                               | 5.0                                                                               | 18.8                                                                          | 31.9                                                                            | 0.092                                                                   |
| P6KE22A     | 20.9                                                       | 23.1 | 1.0                                    | 18.8                                               | 5.0                                                                               | 19.6                                                                          | 30.6                                                                            | 0.092                                                                   |
| P6KE24      | 21.6                                                       | 26.4 | 1.0                                    | 19.4                                               | 5.0                                                                               | 17.3                                                                          | 34.7                                                                            | 0.094                                                                   |
| P6KE24A     | 22.8                                                       | 25.2 | 1.0                                    | 20.5                                               | 5.0                                                                               | 18.1                                                                          | 33.2                                                                            | 0.094                                                                   |
| P6KE27      | 24.3                                                       | 29.7 | 1.0                                    | 21.8                                               | 5.0                                                                               | 15.3                                                                          | 39.1                                                                            | 0.096                                                                   |
| P6KE27A     | 25.7                                                       | 28.4 | 1.0                                    | 23.1                                               | 5.0                                                                               | 16.0                                                                          | 37.5                                                                            | 0.096                                                                   |
| P6KE30      | 27.0                                                       | 33.0 | 1.0                                    | 24.3                                               | 5.0                                                                               | 13.8                                                                          | 43.5                                                                            | 0.097                                                                   |
| P6KE30A     | 28.5                                                       | 31.5 | 1.0                                    | 25.6                                               | 50.                                                                               | 14.5                                                                          | 41.4                                                                            | 0.097                                                                   |
| P6KE33      | 29.7                                                       | 36.3 | 1.0                                    | 26.8                                               | 5.0                                                                               | 12.6                                                                          | 47.7                                                                            | 0.098                                                                   |
| P6KE33A     | 31.4                                                       | 34.7 | 1.0                                    | 28.2                                               | 5.0                                                                               | 13.1                                                                          | 45.7                                                                            | 0.098                                                                   |
| P6KE36      | 32.4                                                       | 39.6 | 1.0                                    | 29.1                                               | 5.0                                                                               | 11.5                                                                          | 52.0                                                                            | 0.099                                                                   |
| P6KE36A     | 34.2                                                       | 37.8 | 1.0                                    | 30.8                                               | 5.0                                                                               | 12.0                                                                          | 49.9                                                                            | 0.099                                                                   |
| P6KE39      | 35.1                                                       | 42.9 | 1.0                                    | 31.6                                               | 5.0                                                                               | 10.6                                                                          | 56.4                                                                            | 0.100                                                                   |
| P6KE39A     | 37.1                                                       | 41.0 | 1.0                                    | 33.3                                               | 5.0                                                                               | 11.1                                                                          | 53.9                                                                            | 0.100                                                                   |
| P6KE43      | 38.7                                                       | 47.3 | 1.0                                    | 34.8                                               | 5.0                                                                               | 9.7                                                                           | 61.9                                                                            | 0.101                                                                   |
| P6KE43A     | 40.9                                                       | 45.2 | 1.0                                    | 36.8                                               | 5.0                                                                               | 10.1                                                                          | 59.3                                                                            | 0.101                                                                   |
| P6KE47      | 42.3                                                       | 51.7 | 1.0                                    | 38.1                                               | 5.0                                                                               | 8.8                                                                           | 67.8                                                                            | 0.101                                                                   |
| P6KE47A     | 44.7                                                       | 49.4 | 1.0                                    | 40.2                                               | 5.0                                                                               | 9.3                                                                           | 64.8                                                                            | 0.101                                                                   |
| P6KE51      | 45.9                                                       | 56.1 | 1.0                                    | 41.3                                               | 5.0                                                                               | 8.2                                                                           | 73.5                                                                            | 0.102                                                                   |
| P6KE51A     | 48.5                                                       | 53.6 | 1.0                                    | 43.6                                               | 5.0                                                                               | 8.6                                                                           | 70.1                                                                            | 0.102                                                                   |
| P6KE56      | 50.4                                                       | 61.6 | 1.0                                    | 45.4                                               | 5.0                                                                               | 7.5                                                                           | 80.5                                                                            | 0.103                                                                   |
| P6KE56A     | 53.2                                                       | 58.8 | 1.0                                    | 47.8                                               | 5.0                                                                               | 7.8                                                                           | 77.0                                                                            | 0.103                                                                   |



## ELECTRICAL CHARACTERISTICS (at TA=25°C unless otherwise noted)

| Device Type | Breakdown Voltage<br>V <sub>(BR)</sub><br>(Volts)(NOTES 1) |      | Test<br>Current<br>I <sub>T</sub> (mA) | Stand-off<br>Voltage<br>V <sub>WM</sub><br>(Volts) | Maximum<br>Reverse<br>Leakage<br>at V <sub>WM</sub><br>I <sub>D</sub> (NOTE3)(mA) | Maximum<br>Peak Puls<br>Reverse Current<br>I <sub>PPM</sub> (NOTE2)<br>(Amps) | Maximum<br>Clamping<br>Voltage at<br>I <sub>PPM</sub><br>V <sub>C</sub> (Volts) | Maximum<br>Temperature<br>Coefficient<br>of V <sub>(BR)</sub><br>(%/ °C) |
|-------------|------------------------------------------------------------|------|----------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|             | MIN                                                        | MAX  |                                        |                                                    |                                                                                   |                                                                               |                                                                                 |                                                                          |
| P6KE62      | 55.8                                                       | 68.2 | 1.0                                    | 50.2                                               | 5.0                                                                               | 6.7                                                                           | 89.0                                                                            | 0.104                                                                    |
| P6KE62A     | 58.9                                                       | 65.1 | 1.0                                    | 53.0                                               | 5.0                                                                               | 7.1                                                                           | 85.0                                                                            | 0.104                                                                    |
| P6KE68      | 61.2                                                       | 74.8 | 1.0                                    | 55.1                                               | 5.0                                                                               | 6.1                                                                           | 98.0                                                                            | 0.104                                                                    |
| P6KE68A     | 64.6                                                       | 71.4 | 1.0                                    | 58.1                                               | 5.0                                                                               | 6.5                                                                           | 92.0                                                                            | 0.104                                                                    |
| P6KE75      | 67.5                                                       | 82.5 | 1.0                                    | 60.7                                               | 5.0                                                                               | 5.6                                                                           | 108                                                                             | 0.105                                                                    |
| P6KE75A     | 71.3                                                       | 78.8 | 1.0                                    | 64.1                                               | 5.0                                                                               | 5.8                                                                           | 103                                                                             | 0.105                                                                    |
| P6KE82      | 73.8                                                       | 90.2 | 1.0                                    | 66.4                                               | 5.0                                                                               | 5.1                                                                           | 118                                                                             | 0.105                                                                    |
| P6KE82A     | 77.9                                                       | 86.1 | 1.0                                    | 70.1                                               | 5.0                                                                               | 5.3                                                                           | 113                                                                             | 0.105                                                                    |
| P6KE91      | 81.9                                                       | 100  | 1.0                                    | 73.7                                               | 5.0                                                                               | 4.6                                                                           | 131                                                                             | 0.106                                                                    |
| P6KE91A     | 86.5                                                       | 95.5 | 1.0                                    | 77.8                                               | 5.0                                                                               | 4.8                                                                           | 125                                                                             | 0.106                                                                    |
| P6KE100     | 90.0                                                       | 110  | 1.0                                    | 81.0                                               | 5.0                                                                               | 4.2                                                                           | 144                                                                             | 0.106                                                                    |
| P6KE100A    | 95.0                                                       | 105  | 1.0                                    | 85.5                                               | 5.0                                                                               | 4.4                                                                           | 137                                                                             | 0.106                                                                    |
| P6KE110     | 99.0                                                       | 121  | 1.0                                    | 89.2                                               | 5.0                                                                               | 3.8                                                                           | 158                                                                             | 0.107                                                                    |
| P6KE110A    | 105                                                        | 116  | 1.0                                    | 94.0                                               | 5.0                                                                               | 3.9                                                                           | 152                                                                             | 0.107                                                                    |
| P6KE120     | 108                                                        | 132  | 1.0                                    | 97.2                                               | 5.0                                                                               | 3.5                                                                           | 173                                                                             | 0.107                                                                    |
| P6KE120A    | 114                                                        | 126  | 1.0                                    | 102                                                | 5.0                                                                               | 3.6                                                                           | 165                                                                             | 0.107                                                                    |
| P6KE130     | 117                                                        | 143  | 1.0                                    | 105                                                | 5.0                                                                               | 3.2                                                                           | 187                                                                             | 0.107                                                                    |
| P6KE130A    | 124                                                        | 137  | 1.0                                    | 111                                                | 5.0                                                                               | 3.4                                                                           | 179                                                                             | 0.107                                                                    |
| P6KE150     | 135                                                        | 165  | 1.0                                    | 121                                                | 5.0                                                                               | 2.8                                                                           | 215                                                                             | 0.108                                                                    |
| P6KE150A    | 143                                                        | 158  | 1.0                                    | 128                                                | 5.0                                                                               | 2.9                                                                           | 207                                                                             | 0.108                                                                    |
| P6KE160     | 144                                                        | 176  | 1.0                                    | 130                                                | 5.0                                                                               | 2.6                                                                           | 230                                                                             | 0.108                                                                    |
| P6KE160A    | 152                                                        | 168  | 1.0                                    | 136                                                | 5.0                                                                               | 2.7                                                                           | 219                                                                             | 0.108                                                                    |
| P6KE170     | 153                                                        | 187  | 1.0                                    | 138                                                | 5.0                                                                               | 2.5                                                                           | 244                                                                             | 0.108                                                                    |
| P6KE170A    | 162                                                        | 179  | 1.0                                    | 145                                                | 5.0                                                                               | 2.6                                                                           | 234                                                                             | 0.108                                                                    |
| P6KE180     | 162                                                        | 198  | 1.0                                    | 146                                                | 5.0                                                                               | 2.3                                                                           | 258                                                                             | 0.108                                                                    |
| P6KE180A    | 171                                                        | 189  | 1.0                                    | 154                                                | 5.0                                                                               | 2.4                                                                           | 246                                                                             | 0.108                                                                    |
| P6KE200     | 180                                                        | 220  | 1.0                                    | 162                                                | 5.0                                                                               | 2.1                                                                           | 287                                                                             | 0.108                                                                    |
| P6KE200A    | 190                                                        | 210  | 1.0                                    | 171                                                | 5.0                                                                               | 2.2                                                                           | 274                                                                             | 0.108                                                                    |
| P6KE220     | 198                                                        | 242  | 1.0                                    | 175                                                | 5.0                                                                               | 1.7                                                                           | 344                                                                             | 0.108                                                                    |
| P6KE220A    | 209                                                        | 231  | 1.0                                    | 185                                                | 5.0                                                                               | 1.8                                                                           | 328                                                                             | 0.108                                                                    |
| P6KE250     | 225                                                        | 275  | 1.0                                    | 202                                                | 5.0                                                                               | 1.7                                                                           | 360                                                                             | 0.110                                                                    |
| P6KE250A    | 237                                                        | 263  | 1.0                                    | 214                                                | 5.0                                                                               | 1.7                                                                           | 344                                                                             | 0.110                                                                    |
| P6KE300     | 270                                                        | 330  | 1.0                                    | 243                                                | 5.0                                                                               | 1.4                                                                           | 430                                                                             | 0.110                                                                    |
| P6KE300A    | 285                                                        | 315  | 1.0                                    | 256                                                | 5.0                                                                               | 1.4                                                                           | 414                                                                             | 0.110                                                                    |
| P6KE350     | 315                                                        | 385  | 1.0                                    | 284                                                | 5.0                                                                               | 1.2                                                                           | 504                                                                             | 0.110                                                                    |
| P6KE350A    | 332                                                        | 368  | 1.0                                    | 300                                                | 5.0                                                                               | 1.2                                                                           | 482                                                                             | 0.110                                                                    |
| P6KE400     | 360                                                        | 440  | 1.0                                    | 324                                                | 5.0                                                                               | 1.0                                                                           | 574                                                                             | 0.110                                                                    |
| P6KE400A    | 380                                                        | 420  | 1.0                                    | 342                                                | 5.0                                                                               | 1.1                                                                           | 548                                                                             | 0.110                                                                    |
| P6KE440     | 396                                                        | 484  | 1.0                                    | 356                                                | 5.0                                                                               | 0.95                                                                          | 631                                                                             | 0.110                                                                    |
| P6KE440A    | 418                                                        | 462  | 1.0                                    | 376                                                | 5.0                                                                               | 1.0                                                                           | 602                                                                             | 0.110                                                                    |

### NOTES:

1. V<sub>(BR)</sub> measured after I<sub>T</sub> applied for 300ms, I<sub>T</sub>=square wave pulse or equivalent
2. Surge current waveform per Fig.3 and derated per Fig.2
3. For bidirectional types having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled
4. All items and symbols are consistent with ANSI/IEEE C62.35



## RATINGS AND CHARACTERISTIC CURVES P6KE6.8 THUR P6KE440CA

FIG. 1-PEAK PULSE POWER RATING CURVE

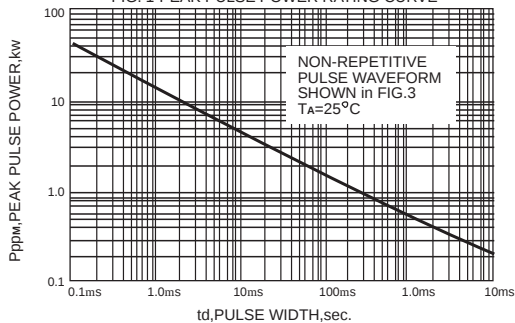


FIG. 2-PULSE DERATING CURVE

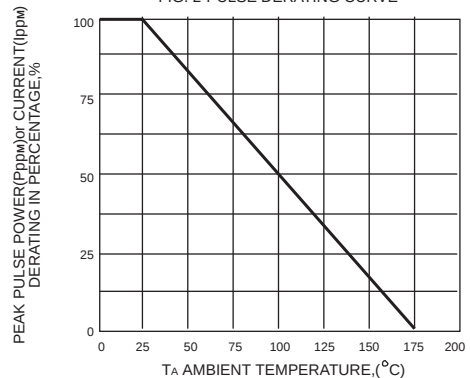


FIG. 3-PULSE WAVEFORM

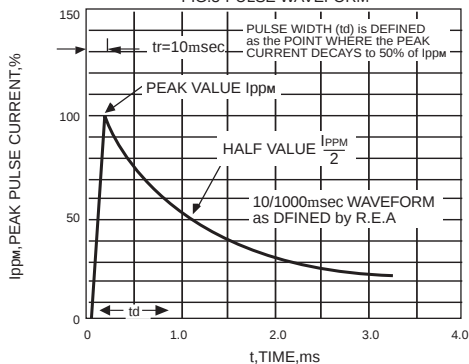


FIG. 4-TYPICAL JUNCTIONAL CAPACITANCE UNIDIRECTIONAL

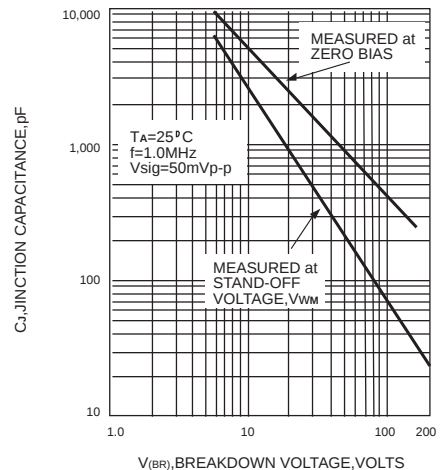


FIG. 5-STEADY STATE POWER DERATING CURVE

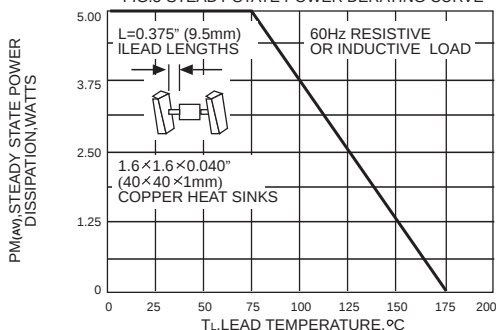


FIG. 6-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

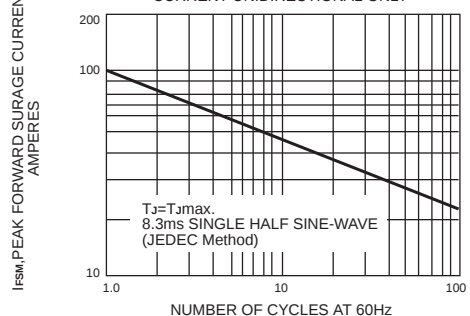


FIG. 7-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

