



# SHANGHAI SUNRISE ELECTRONICS CO

## P6KE6.8 THRU P6KE440CA

TRANSIENT VOLTAGE SUPPRESSOR

**BREAKDOWN VOLTAGE: 6.8-440V**

**PEAK PULSE POWER: 600W**

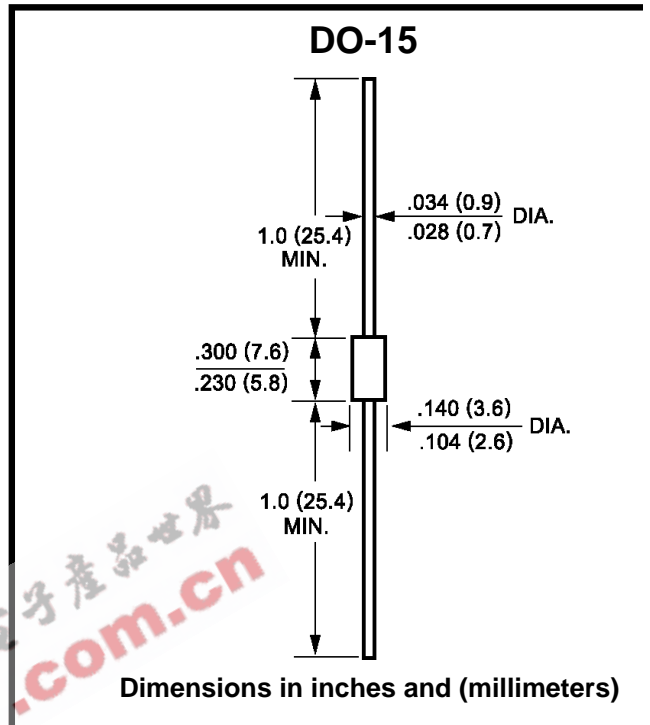
TECHNICAL  
SPECIFICATION

### FEATURES

- 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

- Terminal: Plated axial leads solderable per MIL-STD 202E, method 208C
- Case: Molded with UL-94 Class V-O recognized flame retardant epoxy
- Polarity: Color band denotes cathode except for unidirectional types.
- Mounting position: Any



### MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

(Ratings at 25°C ambient temperature unless otherwise specified)

| RATINGS   | SYMBOL                            | VALUE        |
|---|-----------------------------------|--------------|
| Peak power dissipation (Note 1)   | P <sub>ppm</sub>                  | Minimum 600  |
| Peak pulse reverse current (Note 1)   | I <sub>ppm</sub>                  | See Table    |
| Steady state power dissipation (Note 2)                                       | P <sub>m(av)</sub>                | 2.0          |
| Peak forward surge current (Note 3)   | I <sub>FSM</sub>                  | 100          |
| Maximum instantaneous forward voltage at 50A for unidirectional only (Note 4) | V <sub>F</sub>                    | 3.5/5.0      |
| Operating junction and storage temperature range                              | T <sub>STG</sub> , T <sub>J</sub> | -55 to + 175 |

Notes:

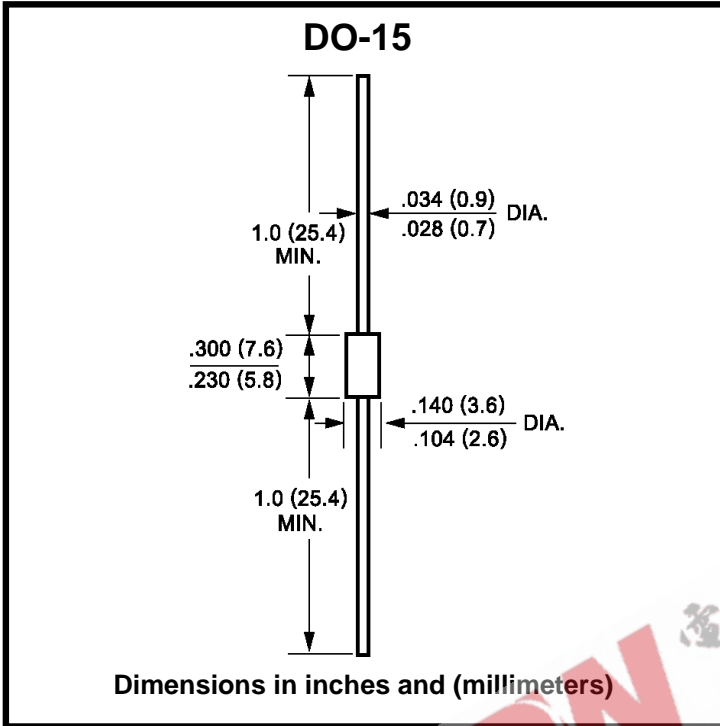
1. 10/1000μS waveform non-repetitive current pulse, and derated above Ta=25°C
2. Tl=75°C, lead length 9.5mm, Mounted on copper pad area of (20x20mm)
3. Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per min
4. V<sub>F</sub>=3.5V max. for devices of V<sub>(BR)</sub> ≤ 200V, and V<sub>F</sub>=5.0V max. for devices of V<sub>(BR)</sub> > 200V

### DEVICES FOR BIDIRECTIONAL APPLICATIONS

1. Suffix 'A' denotes 5% tolerance device, no suffix 'A' denotes 10% tolerance device.
2. For bidirectional use 'C' or 'CA' suffix for types P6KE6.8 thru types P6KE440A (e.g. P6KE7.5C, P6KE440CA), for unidirectional don't use 'C' suffix after types.
3. For bidirectional devices having V<sub>WM</sub> of 10 volts and less, the I<sub>D</sub> limit is doubled.
4. Electrical characteristics apply in both directions.

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**TECHNICAL  
SPECIFICATION**



UNITS

W

A

W

A

V

°C

ute maximum.

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# ELECTRICAL CHARACTERISTICS

( at  $T_A=25^{\circ}\text{C}$  unless otherwise noted )

| Device Type | Breakdown Voltage $V_{(BR)}$ (Volts) (NOTE 1) |      | Test Current $I_T$ (mA) | Stand-off Voltage $V_{WM}$ (Volts) | Maximum Reverse Leakage at $V_{WM} I_D(\mu\text{A})$ (NOTE 3) | Maximum Peak Pulse Reverse Current $I_{ppm}$ (Amps) (NOTE 2) | Maximum Clamping Voltage at $I_{ppm} V_C$ (Volts) | Maximum Temperature Coefficient of $V_{(BR)}$ ( $\%/^{\circ}\text{C}$ ) |
|-------------|---|------|-------------------------|------------------------------------|---|--|---|---|
|             | MIN   | MAX  |                         |                                    |   |  |   |   |
| P6KE6.8     | 6.12  | 7.48 | 10                      | 5.50                               | 1000  | 58   | 10.8  | 0.057   |
| P6KE6.8A    | 6.45  | 7.14 | 10                      | 5.80                               | 1000  | 57   | 10.5  | 0.057   |
| P6KE7.5     | 6.75  | 8.25 | 1.0                     | 6.05                               | 500   | 51   | 11.7  | 0.061   |
| P6KE7.5A    | 7.13  | 7.88 | 1.0                     | 6.40                               | 500   | 53   | 11.3  | 0.061   |
| P6KE8.2     | 7.38  | 9.02 | 1.0                     | 6.63                               | 200   | 48   | 12.5  | 0.065   |
| P6KE8.2A    | 7.79  | 8.61 | 1.0                     | 7.02                               | 200   | 50   | 12.1  | 0.065   |
| P6KE9.1     | 8.19  | 10.0 | 1.0                     | 7.37                               | 50  | 44   | 13.8  | 0.068   |
| P6KE9.1A    | 8.65  | 9.55 | 1.0                     | 7.78                               | 50  | 45   | 13.4  | 0.068   |
| P6KE10      | 9.00  | 11.0 | 1.0                     | 8.10                               | 10  | 44   | 15.0  | 0.073   |
| P6KE10A     | 9.50  | 10.5 | 1.0                     | 8.55                               | 10  | 41   | 14.5  | 0.073   |
| P6KE11      | 9.90  | 12.1 | 1.0                     | 8.92                               | 5.0   | 37   | 16.2  | 0.075   |
| P6KE11A     | 10.5  | 11.6 | 1.0                     | 9.40                               | 5.0   | 38   | 15.6  | 0.075   |
| P6KE12      | 10.8  | 13.2 | 1.0                     | 9.72                               | 5.0   | 35   | 17.3  | 0.078   |
| P6KE12A     | 11.4  | 12.6 | 1.0                     | 10.2                               | 5.0   | 36   | 16.7  | 0.078   |
| P6KE13      | 11.7  | 14.3 | 1.0                     | 10.5                               | 5.0   | 32   | 19.0  | 0.081   |
| P6KE13A     | 12.4  | 13.7 | 1.0                     | 11.1                               | 5.0   | 33   | 18.2  | 0.081   |
| P6KE15      | 13.5  | 16.5 | 1.0                     | 12.1                               | 5.0   | 27   | 22.0  | 0.084   |
| P6KE15A     | 14.3  | 15.8 | 1.0                     | 12.8                               | 5.0   | 28   | 21.2  | 0.084   |
| P6KE16      | 14.4  | 17.6 | 1.0                     | 12.9                               | 5.0   | 26   | 23.5  | 0.086   |
| P6KE16A     | 15.2  | 16.8 | 1.0                     | 13.6                               | 5.0   | 27   | 22.5  | 0.086   |
| P6KE18      | 16.2  | 19.8 | 1.0                     | 14.5                               | 5.0   | 23   | 26.5  | 0.088   |
| P6KE18A     | 17.1  | 18.9 | 1.0                     | 15.3                               | 5.0   | 24   | 25.2  | 0.088   |
| P6KE20      | 18.0  | 22.0 | 1.0                     | 16.2                               | 5.0   | 21   | 29.1  | 0.090   |
| P6KE20A     | 19.0  | 21.0 | 1.0                     | 17.1                               | 5.0   | 22   | 27.7  | 0.090   |
| P6KE22      | 19.8  | 24.2 | 1.0                     | 17.8                               | 5.0   | 19   | 31.9  | 0.092   |
| P6KE22A     | 20.9  | 23.1 | 1.0                     | 18.8                               | 5.0   | 20   | 30.6  | 0.092   |
| P6KE24      | 21.6  | 26.4 | 1.0                     | 19.4                               | 5.0   | 17   | 34.7  | 0.094   |
| P6KE24A     | 22.8  | 25.2 | 1.0                     | 20.5                               | 5.0   | 18   | 33.2  | 0.094   |
| P6KE27      | 24.3  | 29.7 | 1.0                     | 21.8                               | 5.0   | 15   | 39.1  | 0.096   |
| P6KE27A     | 25.7  | 28.4 | 1.0                     | 23.1                               | 5.0   | 16   | 37.5  | 0.096   |
| P6KE30      | 27.0  | 33.0 | 1.0                     | 24.3                               | 5.0   | 14   | 43.5  | 0.097   |
| P6KE30A     | 28.5  | 31.5 | 1.0                     | 25.6                               | 5.0   | 14.4   | 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   | 13.2   | 45.7  | 0.098   |
| P6KE36      | 32.4  | 39.6 | 1.0                     | 29.1                               | 5.0   | 11.6   | 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   | 11.2   | 53.9  | 0.100   |
| P6KE43      | 38.7  | 47.3 | 1.0                     | 34.8                               | 5.0   | 9.6  | 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   | 8.9  | 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   | 7.4  | 80.5  | 0.103   |
| P6KE56A     | 53.2  | 58.8 | 1.0                     | 47.8                               | 5.0   | 7.8  | 77.0  | 0.103   |

# ELECTRICAL CHARACTERISTICS

( at  $T_A=25^{\circ}\text{C}$  unless otherwise noted )

| Device Type | Breakdown Voltage $V_{(BR)}$<br>(Volts)<br>(NOTE 1) |      | Test Current $I_T$ (mA) | Stand-off Voltage $V_{WM}$<br>(Volts) | Maximum Reverse Leakage at $V_{WM}$ $I_D$ ( $\mu\text{A}$ )<br>(NOTE 3) | Maximum Peak Pulse Reverse Current $I_{ppm}$<br>(Amps)<br>(NOTE 2) | Maximum Clamping Voltage at $I_{ppm}$ $V_C$<br>(Volts) | Maximum Temperature Coefficient of $V_{(BR)}$ ( $\%/^{\circ}\text{C}$ ) |
|-------------|---|------|-------------------------|---------------------------------------|---|--|--|---|
|             | MIN   | MAX  |                         |                                       |   |  |  |   |
| P6KE62      | 55.8  | 68.2 | 1.0                     | 50.2                                  | 5.0   | 6.8  | 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   | 5.5  | 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   | 4.5  | 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   | 4.0  | 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   | 3.3  | 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   | 1.75   | 344  | 0.108   |
| P6KE220A    | 209   | 231  | 1.0                     | 185                                   | 5.0   | 1.83   | 328  | 0.108   |
| P6KE250     | 225   | 275  | 1.0                     | 202                                   | 5.0   | 1.67   | 360  | 0.110   |
| P6KE250A    | 237   | 263  | 1.0                     | 214                                   | 5.0   | 1.75   | 344  | 0.110   |
| P6KE300     | 270   | 330  | 1.0                     | 243                                   | 5.0   | 1.40   | 430  | 0.110   |
| P6KE300A    | 285   | 315  | 1.0                     | 256                                   | 5.0   | 1.45   | 414  | 0.110   |
| P6KE350     | 315   | 385  | 1.0                     | 284                                   | 5.0   | 1.20   | 504  | 0.110   |
| P6KE350A    | 332   | 368  | 1.0                     | 300                                   | 5.0   | 1.25   | 482  | 0.110   |
| P6KE400     | 360   | 440  | 1.0                     | 324                                   | 5.0   | 1.05   | 574  | 0.110   |
| P6KE400A    | 380   | 420  | 1.0                     | 342                                   | 5.0   | 1.10   | 548  | 0.110   |
| P6KE440     | 396   | 484  | 1.0                     | 356                                   | 5.0   | 0.99   | 631  | 0.110   |
| P6KE440A    | 418   | 462  | 1.0                     | 376                                   | 5.0   | 1.04   | 602  | 0.110   |

**NOTES:**

1.  $V_{(BR)}$  measured after  $I_T$  applied for 300 $\mu\text{s}$ ,  $I_T$ =square wave pulse or equivalent
2. Surge current waveform and derated
3. For bidirectional types having  $V_{WM}$  of 10 volts and less, the  $I_D$  limit is doubled