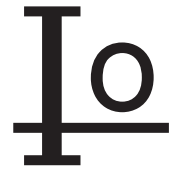


# 1.5KE SERIES

1500 WATT PEAK POWER TRANSIENT VOLTAGE SUPPRESSORS



## FEATURES

- \* 1500 Watts Surge Capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time: Typically less than 1.0ps from 0 volt to BV min.
- \* Typical  $I_R$  less than  $1\mu A$  above 10V
- \* High temperature soldering guaranteed:  $260^\circ C$  / 10 seconds / .375"(9.5mm) lead length, 5lbs.(2.3kg) tension

## MECHANICAL DATA

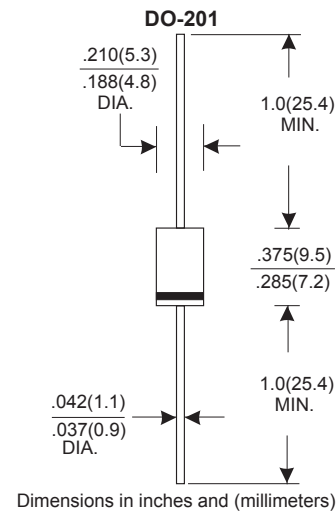
- \* Case: Molded plastic
- \* Epoxy: UL 94V-0 rate flame retardant
- \* Lead: Axial leads, solderable per MIL-STD-202, method 208 guaranteed
- \* Polarity: Color band denotes cathode end
- \* Mounting position: Any
- \* Weight: 1.20 grams

## VOLTAGE RANGE

6.8 to 440 Volts

1500 Watts Peak Power

5.0 Watts Steady State



## MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating  $25^\circ C$  ambient temperature unless otherwise specified.  
Single phase half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| RATINGS   | SYMBOL         | VALUE        | UNITS      |
|---|----------------|--------------|------------|
| Peak Power Dissipation at $T_A=25^\circ C$ , $T_P=1ms$ (NOTE 1)   | $P_{PK}$       | Minimum 1500 | Watts      |
| Steady State Power Dissipation at $T_L=75^\circ C$<br>Lead Length .375"(9.5mm) (NOTE 2)                         | $P_D$          | 5.0          | Watts      |
| Peak Forward Surge Current at 8.3ms Single Half Sine-Wave<br>superimposed on rated load (JEDEC method) (NOTE 3) | $I_{FSM}$      | 200          | Amps       |
| Operating and Storage Temperature Range   | $T_J, T_{STG}$ | -55 to +175  | $^\circ C$ |

### NOTES:

1. Non-repetitive current pulse per Fig. 3 and derated above  $T_A=25^\circ C$  per Fig. 2.
2. Mounted on Copper Pad area of 0.8" X 0.8" (20mm X 20mm) per Fig.5.
3. 8.3ms single half sine-wave, duty cycle = 4 pulses per minute maximum.

## DEVICES FOR BIPOLAR APPLICATIONS

1. For Bidirectional use C or CA Suffix for types 1.5KE6.8 thru 1.5KE440.
2. Electrical characteristics apply in both directions.

## RATING AND CHARACTERISTIC CURVES (1.5KE SERIES)

FIG.1-PEAK PULSE POWER DERATING CURVE

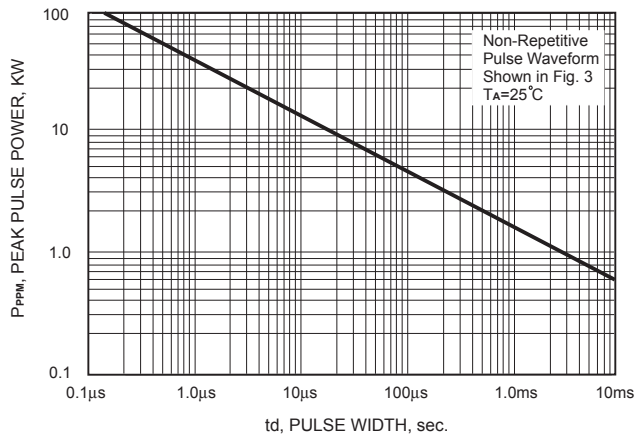


FIG.2-PULSE DERATING CURVE

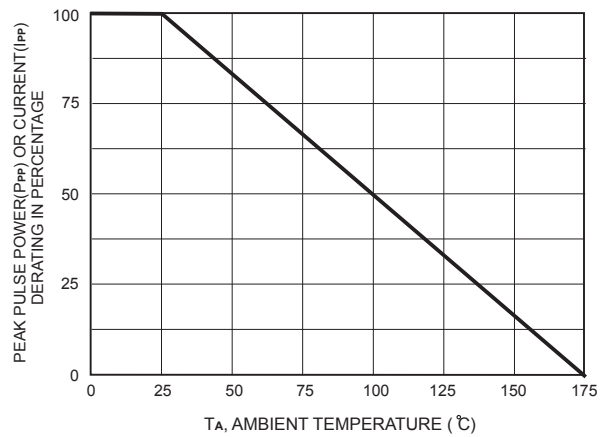


FIG.3-PULSE WAVE FORM

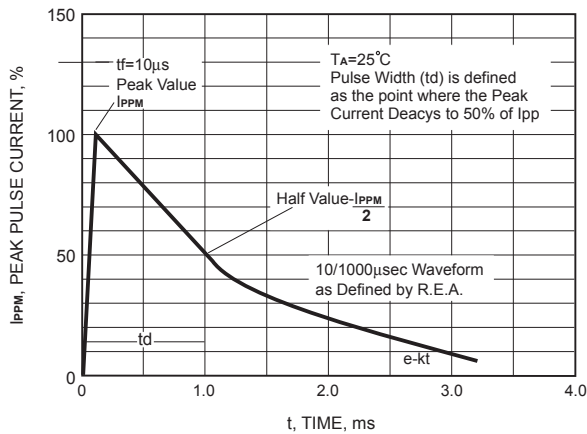


FIG.4-TYPICAL JUNCTION CAPACITANCE

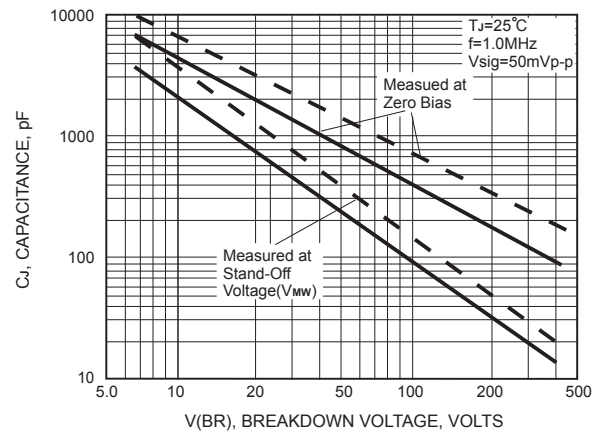


FIG.5-STEADY STATE POWER DERATING CURVE

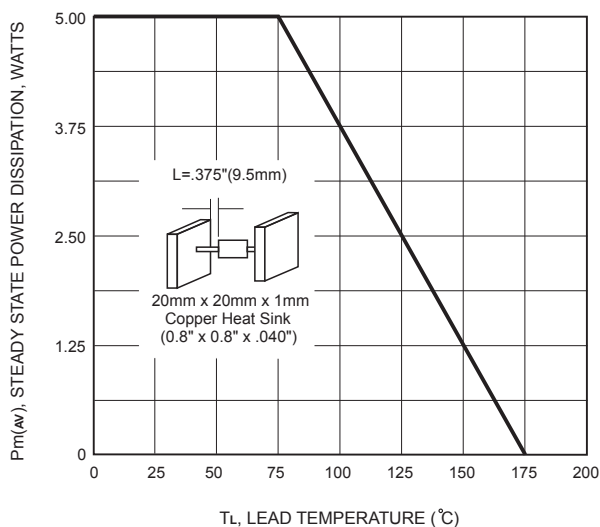
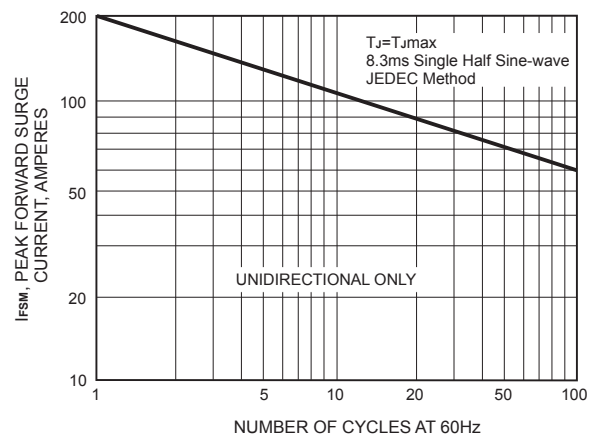


FIG.6-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT, UNIDIRECTIONAL



# 1500 Watt Axial Lead TVS

| UNI<br>DIRECTIONAL<br>PART<br>NUMBER | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VRB (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR(μA) |
|--------------------------------------|---|---|---|-------------------------------|---|-------------------------------------|--|
| 1.5KE6.8                             | 5.50  | 6.12  | 7.48  | 10                            | 10.8  | 140.7                               | 1000                                   |
| 1.5KE6.8A                            | 5.80  | 6.45  | 7.14  | 10                            | 10.5  | 144.8                               | 1000                                   |
| 1.5KE7.5                             | 6.05  | 6.75  | 8.25  | 10                            | 11.7  | 129.9                               | 500                                    |
| 1.5KE7.5A                            | 6.40  | 7.13  | 7.88  | 10                            | 11.3  | 134.5                               | 500                                    |
| 1.5KE8.2                             | 6.63  | 7.38  | 9.02  | 10                            | 12.5  | 121.6                               | 200                                    |
| 1.5KE8.2A                            | 7.02  | 7.79  | 8.61  | 10                            | 12.1  | 125.6                               | 200                                    |
| 1.5KE9.1                             | 7.37  | 8.19  | 10.00                                       | 1                             | 13.8  | 110.1                               | 50                                     |
| 1.5KE9.1A                            | 7.78  | 8.65  | 9.50  | 1                             | 13.4  | 113.4                               | 50                                     |
| 1.5KE10                              | 8.10  | 9.00  | 11.00                                       | 1                             | 15.0  | 101.3                               | 10                                     |
| 1.5KE10A                             | 8.55  | 9.50  | 10.50                                       | 1                             | 14.5  | 104.8                               | 10                                     |
| 1.5KE11                              | 8.92  | 9.90  | 12.10                                       | 1                             | 16.2  | 93.8                                | 5                                      |
| 1.5KE11A                             | 9.40  | 10.50                                       | 11.60                                       | 1                             | 15.6  | 97.4                                | 5                                      |
| 1.5KE12                              | 9.72  | 10.80                                       | 13.20                                       | 1                             | 17.3  | 87.9                                | 5                                      |
| 1.5KE12A                             | 10.20                                       | 11.40                                       | 12.60                                       | 1                             | 16.7  | 91.0                                | 5                                      |
| 1.5KE13                              | 10.50                                       | 11.70                                       | 14.30                                       | 1                             | 19.0  | 80.0                                | 5                                      |
| 1.5KE13A                             | 11.10                                       | 12.40                                       | 13.70                                       | 1                             | 18.2  | 83.5                                | 5                                      |
| 1.5KE15                              | 12.10                                       | 13.50                                       | 16.50                                       | 1                             | 22.0  | 69.1                                | 5                                      |
| 1.5KE15A                             | 12.80                                       | 14.30                                       | 15.80                                       | 1                             | 21.2  | 71.7                                | 5                                      |
| 1.5KE16                              | 12.90                                       | 14.40                                       | 17.60                                       | 1                             | 23.5  | 64.7                                | 5                                      |
| 1.5KE16A                             | 13.60                                       | 15.20                                       | 16.80                                       | 1                             | 22.5  | 67.6                                | 5                                      |
| 1.5KE18                              | 14.50                                       | 16.20                                       | 19.80                                       | 1                             | 26.5  | 57.4                                | 5                                      |
| 1.5KE18A                             | 15.30                                       | 17.10                                       | 18.90                                       | 1                             | 25.2  | 60.3                                | 5                                      |
| 1.5KE20                              | 16.20                                       | 18.00                                       | 22.00                                       | 1                             | 29.1  | 52.2                                | 5                                      |
| 1.5KE20A                             | 17.10                                       | 19.00                                       | 21.00                                       | 1                             | 27.7  | 54.9                                | 5                                      |
| 1.5KE22                              | 17.80                                       | 19.80                                       | 24.20                                       | 1                             | 31.9  | 47.6                                | 5                                      |
| 1.5KE22A                             | 18.80                                       | 20.90                                       | 23.10                                       | 1                             | 30.6  | 49.7                                | 5                                      |
| 1.5KE24                              | 19.40                                       | 21.60                                       | 26.40                                       | 1                             | 34.7  | 43.8                                | 5                                      |
| 1.5KE24A                             | 20.50                                       | 22.80                                       | 25.20                                       | 1                             | 33.2  | 45.8                                | 5                                      |
| 1.5KE27                              | 21.80                                       | 24.30                                       | 29.70                                       | 1                             | 39.1  | 38.9                                | 5                                      |
| 1.5KE27A                             | 23.10                                       | 25.70                                       | 28.40                                       | 1                             | 37.5  | 40.5                                | 5                                      |
| 1.5KE30                              | 24.30                                       | 27.00                                       | 33.00                                       | 1                             | 43.5  | 34.9                                | 5                                      |
| 1.5KE30A                             | 25.60                                       | 28.50                                       | 31.50                                       | 1                             | 41.4  | 36.7                                | 5                                      |
| 1.5KE33                              | 26.80                                       | 29.70                                       | 36.30                                       | 1                             | 47.7  | 31.9                                | 5                                      |
| 1.5KE33A                             | 28.20                                       | 31.40                                       | 34.70                                       | 1                             | 45.7  | 33.3                                | 5                                      |
| 1.5KE36                              | 29.10                                       | 32.40                                       | 39.60                                       | 1                             | 52.0  | 29.2                                | 5                                      |
| 1.5KE36A                             | 30.80                                       | 34.20                                       | 37.80                                       | 1                             | 49.9  | 30.5                                | 5                                      |
| 1.5KE39                              | 31.60                                       | 35.10                                       | 42.90                                       | 1                             | 56.4  | 27.0                                | 5                                      |
| 1.5KE39A                             | 33.30                                       | 37.10                                       | 41.00                                       | 1                             | 53.9  | 28.2                                | 5                                      |
| 1.5KE43                              | 34.80                                       | 38.70                                       | 47.30                                       | 1                             | 61.9  | 24.6                                | 5                                      |
| 1.5KE43A                             | 36.80                                       | 40.90                                       | 45.20                                       | 1                             | 59.3  | 25.6                                | 5                                      |
| 1.5KE47                              | 38.10                                       | 42.30                                       | 51.70                                       | 1                             | 67.8  | 22.4                                | 5                                      |
| 1.5KE47A                             | 40.20                                       | 44.70                                       | 49.40                                       | 1                             | 64.8  | 23.5                                | 5                                      |
| 1.5KE51                              | 41.30                                       | 45.90                                       | 56.10                                       | 1                             | 73.5  | 20.7                                | 5                                      |
| 1.5KE51A                             | 43.60                                       | 48.50                                       | 53.60                                       | 1                             | 70.1  | 21.7                                | 5                                      |
| 1.5KE56                              | 45.40                                       | 50.40                                       | 61.60                                       | 1                             | 80.5  | 18.9                                | 5                                      |
| 1.5KE56A                             | 47.80                                       | 53.20                                       | 58.80                                       | 1                             | 77.0  | 19.7                                | 5                                      |
| 1.5KE62                              | 50.20                                       | 55.80                                       | 68.20                                       | 1                             | 89.0  | 17.1                                | 5                                      |
| 1.5KE62A                             | 53.00                                       | 58.90                                       | 65.10                                       | 1                             | 85.0  | 17.9                                | 5                                      |
| 1.5KE68                              | 55.10                                       | 61.20                                       | 74.80                                       | 1                             | 98.0  | 15.5                                | 5                                      |
| 1.5KE68A                             | 58.10                                       | 64.60                                       | 71.40                                       | 1                             | 92.0  | 16.5                                | 5                                      |
| 1.5KE75                              | 60.70                                       | 67.50                                       | 82.50                                       | 1                             | 108.0   | 14.1                                | 5                                      |
| 1.5KE75A                             | 64.10                                       | 71.30                                       | 78.80                                       | 1                             | 103.0   | 14.8                                | 5                                      |

# 1500 Watt Axial Lead TVS

| UNI<br>DIRECTIONAL<br>PART<br>NUMBER | REVERSE<br>STAND-OFF<br>VOLTAGE<br>VRWM (V) | BREAKDOWN<br>VOLTAGE<br>VBR (V)<br>MIN. @IT | BREAKDOWN<br>VOLTAGE<br>VRB (V)<br>MAX. @IT | TEST<br>CURRENT<br>IT<br>(mA) | MAXIMUM<br>CLAMPING<br>VOLTAGE<br>@Ipp Vc (V) | PEAK<br>PULSE<br>CURRENT<br>Ipp (A) | REVERSE<br>LEAKAGE<br>@ VRWM<br>IR( $\mu$ A) |
|--------------------------------------|---|---|---|-------------------------------|---|-------------------------------------|--|
| 1.5KE82                              | 66.40                                       | 73.80                                       | 90.20                                       | 1                             | 118.0   | 12.9                                | 5  |
| 1.5KE82A                             | 70.10                                       | 77.90                                       | 86.10                                       | 1                             | 113.0   | 13.5                                | 5  |
| 1.5KE91                              | 73.70                                       | 81.90                                       | 100.00                                      | 1                             | 131.0   | 11.6                                | 5  |
| 1.5KE91A                             | 77.80                                       | 86.50                                       | 95.50                                       | 1                             | 125.0   | 12.2                                | 5  |
| 1.5KE100                             | 81.00                                       | 90.00                                       | 110.00                                      | 1                             | 144.0   | 10.6                                | 5  |
| 1.5KE100A                            | 85.50                                       | 95.00                                       | 105.00                                      | 1                             | 137.0   | 11.1                                | 5  |
| 1.5KE110                             | 89.20                                       | 99.00                                       | 121.00                                      | 1                             | 158.0   | 9.6                                 | 5  |
| 1.5KE110A                            | 94.00                                       | 105.00                                      | 116.00                                      | 1                             | 152.0   | 10.0                                | 5  |
| 1.5KE120                             | 97.20                                       | 108.00                                      | 132.00                                      | 1                             | 173.0   | 8.7                                 | 5  |
| 1.5KE120A                            | 102.00                                      | 114.00                                      | 126.00                                      | 1                             | 165.0   | 9.2                                 | 5  |
| 1.5KE130                             | 105.00                                      | 117.00                                      | 143.00                                      | 1                             | 187.0   | 8.1                                 | 5  |
| 1.5KE130A                            | 111.00                                      | 124.00                                      | 137.00                                      | 1                             | 179.0   | 8.5                                 | 5  |
| 1.5KE150                             | 121.00                                      | 135.00                                      | 165.00                                      | 1                             | 215.0   | 7.1                                 | 5  |
| 1.5KE150A                            | 128.00                                      | 143.00                                      | 158.00                                      | 1                             | 207.0   | 7.3                                 | 5  |
| 1.5KE160                             | 130.00                                      | 144.00                                      | 176.00                                      | 1                             | 230.0   | 6.9                                 | 5  |
| 1.5KE160A                            | 136.00                                      | 152.00                                      | 168.00                                      | 1                             | 219.0   | 6.9                                 | 5  |
| 1.5KE170                             | 138.00                                      | 153.00                                      | 187.00                                      | 1                             | 244.0   | 6.2                                 | 5  |
| 1.5KE170A                            | 145.00                                      | 162.00                                      | 179.00                                      | 1                             | 234.0   | 6.5                                 | 5  |
| 1.5KE180                             | 146.00                                      | 162.00                                      | 198.00                                      | 1                             | 258.0   | 5.9                                 | 5  |
| 1.5KE180A                            | 154.00                                      | 171.00                                      | 189.00                                      | 1                             | 246.0   | 6.2                                 | 5  |
| 1.5KE200                             | 162.00                                      | 180.00                                      | 220.00                                      | 1                             | 287.0   | 5.3                                 | 5  |
| 1.5KE200A                            | 171.00                                      | 190.00                                      | 210.00                                      | 1                             | 274.0   | 5.5                                 | 5  |
| 1.5KE220                             | 175.00                                      | 198.00                                      | 242.00                                      | 1                             | 344.0   | 4.4                                 | 5  |
| 1.5KE220A                            | 185.00                                      | 209.00                                      | 231.00                                      | 1                             | 328.0   | 4.6                                 | 5  |
| 1.5KE250                             | 202.00                                      | 225.00                                      | 275.00                                      | 1                             | 360.0   | 4.2                                 | 5  |
| 1.5KE250A                            | 214.00                                      | 237.00                                      | 263.00                                      | 1                             | 344.0   | 4.4                                 | 5  |
| 1.5KE300                             | 243.00                                      | 270.00                                      | 330.00                                      | 1                             | 430.0   | 3.5                                 | 5  |
| 1.5KE300A                            | 256.00                                      | 285.00                                      | 315.00                                      | 1                             | 414.0   | 3.7                                 | 5  |
| 1.5KE350                             | 284.00                                      | 315.00                                      | 385.00                                      | 1                             | 504.0   | 3.0                                 | 5  |
| 1.5KE350A                            | 300.00                                      | 332.00                                      | 368.00                                      | 1                             | 482.0   | 3.2                                 | 5  |
| 1.5KE400                             | 324.00                                      | 360.00                                      | 440.00                                      | 1                             | 574.0   | 2.6                                 | 5  |
| 1.5KE400A                            | 342.00                                      | 380.00                                      | 420.00                                      | 1                             | 548.0   | 2.8                                 | 5  |
| 1.5KE440                             | 356.00                                      | 396.00                                      | 484.00                                      | 1                             | 631.0   | 2.4                                 | 5  |
| 1.5KE440A                            | 376.00                                      | 418.00                                      | 462.00                                      | 1                             | 600.0   | 2.5                                 | 5  |

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