

# 1500W Transient Voltage Suppressor

1.5KE20A-1500W

COMCHIP

SMD Diodes Specialist

## 1.5KE-G Series

Stand-off Voltage: 6.8 ~ 440V

Power Dissipation: 1500 Watts

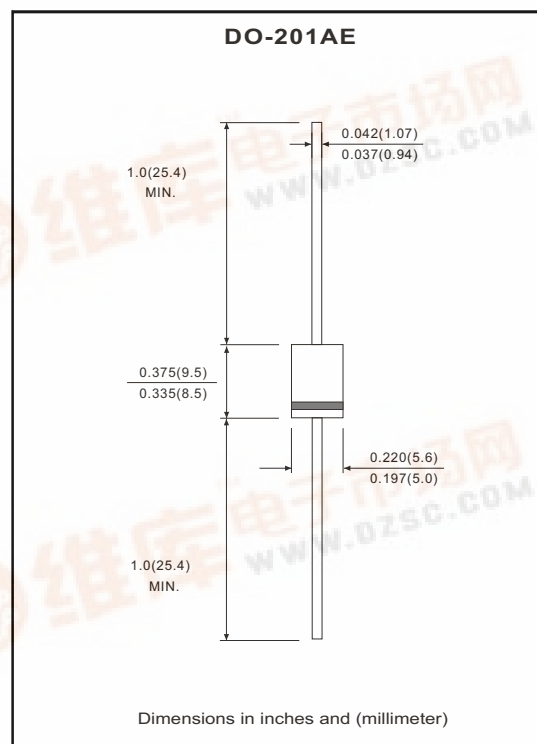
RoHS Device

### Features

- Plastic package has underwriters laboratory flammability classification 94V-0
- 1500W, 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°C/10S/0.375"(9.5mm) lead  
length/5lbs.,(2.3KG) tension

### Mechanical Data

- Case: Molded plastic DO-201AE
- Terminals: Axial leads, solderable per MIL-STD-202, Method 208
- Polarity: Color band denotes cathode except bipolar
- Weight: 1.2 gram



### Maximum Ratings and Electrical Characteristics

| Parameter                                                                                                        | Symbol         | Value        | Unit               |
|------------------------------------------------------------------------------------------------------------------|----------------|--------------|--------------------|
| Peak power dissipation at $T_A=25^{\circ}\text{C}$<br>$T_P=1\text{mS}$ (Note 1)                                  | $P_{PK}$       | Maximum 1500 | W                  |
| Steady state power dissipation at $T_L=75^{\circ}\text{C}$<br>Lead length 0.375" (9.5mm) (Note 2)                | $P_D$          | 5.0          | W                  |
| Peak forward surge current, 8.3mS single<br>half sine-wave superimposed on rated load<br>(JEDEC method) (Note 3) | $I_{FSM}$      | 200          | A                  |
| Operating junction and storage temperature<br>range                                                              | $T_J, T_{STG}$ | -55 to +175  | $^{\circ}\text{C}$ |

NTOES:

- (1) Non-repetitive current pulse, per fig.3 and derated above  $T_A=25^{\circ}\text{C}$  per fig. 2.
- (2) Mounted on copper land area of 0.79in<sup>2</sup>(20mm<sup>2</sup>).
- (3) 8.3mS single half-sine wave, duty cycle=4 pulses per minute maximum.
- (4) For bidirectional use C suffix for 10% tolerance, CA suffix for 5% tolerance.

# 1500W Transient Voltage Suppressor

1.5KE15KE20A-G (1.5KE)



SMD Diodes Specialist

## RATING AND CHARACTERISTIC (1.5KE-G Series)

| Part No.       | Breakdown Voltage   |      |                       | Working Peak Reverse Voltage<br>V <sub>RWM</sub> (V) | Maximum Reverse Leakage at V <sub>RWM</sub><br>I <sub>R</sub> (μA) | Maximum Reverse Current<br>I <sub>RSM</sub> (A) | Maximum Clamping Voltage<br>V <sub>RWM</sub> (V) | Maximum Temperature Coefficient of V <sub>BR</sub> (% C) |
|----------------|---------------------|------|-----------------------|------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|----------------------------------------------------------|
|                | V <sub>BR</sub> (V) |      | @ I <sub>T</sub> (mA) |                                                      |                                                                    |                                                 |                                                  |                                                          |
|                | MIN.                | MAX. |                       |                                                      |                                                                    |                                                 |                                                  |                                                          |
| 1.5KE6.8(C)-G  | 6.12                | 7.48 | 10                    | 5.50                                                 | 1000                                                               | 139.0                                           | 10.8                                             | 0.057                                                    |
| 1.5KE6.8(C)A-G | 6.45                | 7.14 | 10                    | 5.80                                                 | 1000                                                               | 143.0                                           | 10.5                                             | 0.057                                                    |
| 1.5KE7.5(C)-G  | 6.75                | 8.25 | 10                    | 6.05                                                 | 500                                                                | 128.0                                           | 11.7                                             | 0.061                                                    |
| 1.5KE7.5(C)A-G | 7.13                | 7.88 | 10                    | 6.40                                                 | 500                                                                | 132.0                                           | 11.3                                             | 0.061                                                    |
| 1.5KE8.2(C)-G  | 7.38                | 9.02 | 10                    | 6.63                                                 | 200                                                                | 120.0                                           | 12.5                                             | 0.065                                                    |
| 1.5KE8.2(C)A-G | 7.79                | 8.00 | 10                    | 7.02                                                 | 200                                                                | 124.0                                           | 12.1                                             | 0.065                                                    |
| 1.5KE9.1(C)-G  | 8.19                | 10.0 | 1.0                   | 7.37                                                 | 50                                                                 | 109.0                                           | 13.8                                             | 0.068                                                    |
| 1.5KE9.1(C)A-G | 8.65                | 9.55 | 1.0                   | 7.78                                                 | 50                                                                 | 112.0                                           | 13.4                                             | 0.068                                                    |
| 1.5KE10(C)-G   | 9.00                | 11.0 | 1.0                   | 8.10                                                 | 10                                                                 | 100.0                                           | 15.0                                             | 0.073                                                    |
| 1.5KE10(C)A-G  | 9.50                | 10.5 | 1.0                   | 8.55                                                 | 10                                                                 | 103.0                                           | 14.5                                             | 0.073                                                    |
| 1.5KE11(C)-G   | 9.90                | 12.1 | 1.0                   | 8.92                                                 | 5.0                                                                | 93.0                                            | 16.2                                             | 0.075                                                    |
| 1.5KE11(C)A-G  | 10.5                | 11.6 | 1.0                   | 9.40                                                 | 5.0                                                                | 96.0                                            | 15.6                                             | 0.075                                                    |
| 1.5KE12(C)-G   | 10.8                | 13.2 | 1.0                   | 9.72                                                 | 5.0                                                                | 87.0                                            | 17.3                                             | 0.078                                                    |
| 1.5KE12(C)A-G  | 11.4                | 12.6 | 1.0                   | 10.2                                                 | 5.0                                                                | 90.0                                            | 16.7                                             | 0.078                                                    |
| 1.5KE13(C)-G   | 11.7                | 14.3 | 1.0                   | 10.5                                                 | 5.0                                                                | 79.0                                            | 19.0                                             | 0.081                                                    |
| 1.5KE13(C)A-G  | 12.4                | 13.7 | 1.0                   | 11.1                                                 | 5.0                                                                | 82.0                                            | 18.2                                             | 0.081                                                    |
| 1.5KE15(C)-G   | 13.5                | 16.5 | 1.0                   | 12.1                                                 | 5.0                                                                | 68.0                                            | 22.0                                             | 0.084                                                    |
| 1.5KE15(C)A-G  | 14.3                | 15.8 | 1.0                   | 12.8                                                 | 5.0                                                                | 71.0                                            | 21.2                                             | 0.084                                                    |
| 1.5KE16(C)-G   | 14.4                | 17.6 | 1.0                   | 12.9                                                 | 5.0                                                                | 64.0                                            | 23.5                                             | 0.086                                                    |
| 1.5KE16(C)A-G  | 15.2                | 16.8 | 1.0                   | 13.6                                                 | 5.0                                                                | 67.0                                            | 22.5                                             | 0.086                                                    |
| 1.5KE18(C)-G   | 16.2                | 19.8 | 1.0                   | 14.5                                                 | 5.0                                                                | 56.5                                            | 26.5                                             | 0.088                                                    |
| 1.5KE18(C)A-G  | 17.1                | 18.9 | 1.0                   | 15.3                                                 | 5.0                                                                | 59.5                                            | 25.2                                             | 0.088                                                    |
| 1.5KE20(C)-G   | 18.0                | 22.0 | 1.0                   | 16.2                                                 | 5.0                                                                | 51.5                                            | 29.1                                             | 0.090                                                    |
| 1.5KE20(C)A-G  | 19.0                | 21.0 | 1.0                   | 17.1                                                 | 5.0                                                                | 54.0                                            | 27.7                                             | 0.090                                                    |
| 1.5KE22(C)-G   | 19.8                | 24.2 | 1.0                   | 17.8                                                 | 5.0                                                                | 47.0                                            | 31.9                                             | 0.092                                                    |
| 1.5KE22(C)A-G  | 20.9                | 23.1 | 1.0                   | 18.8                                                 | 5.0                                                                | 49.0                                            | 30.6                                             | 0.092                                                    |
| 1.5KE24(C)-G   | 21.6                | 26.4 | 1.0                   | 19.4                                                 | 5.0                                                                | 43.0                                            | 34.7                                             | 0.094                                                    |
| 1.5KE24(C)A-G  | 22.8                | 25.2 | 1.0                   | 20.5                                                 | 5.0                                                                | 45.0                                            | 33.2                                             | 0.094                                                    |
| 1.5KE27(C)-G   | 24.3                | 29.7 | 1.0                   | 21.8                                                 | 5.0                                                                | 38.2                                            | 39.1                                             | 0.096                                                    |
| 1.5KE27(C)A-G  | 25.7                | 28.4 | 1.0                   | 23.1                                                 | 5.0                                                                | 403.0                                           | 37.5                                             | 0.096                                                    |
| 1.5KE30(C)-G   | 27.0                | 33.0 | 1.0                   | 24.3                                                 | 5.0                                                                | 34.5                                            | 43.5                                             | 0.097                                                    |
| 1.5KE30(C)A-G  | 28.5                | 31.5 | 1.0                   | 25.6                                                 | 5.0                                                                | 36.0                                            | 41.4                                             | 0.097                                                    |
| 1.5KE33(C)-G   | 29.7                | 36.3 | 1.0                   | 26.8                                                 | 5.0                                                                | 31.5                                            | 47.7                                             | 0.098                                                    |
| 1.5KE33(C)A-G  | 31.4                | 34.7 | 1.0                   | 28.2                                                 | 5.0                                                                | 33.0                                            | 45.7                                             | 0.098                                                    |
| 1.5KE36(C)-G   | 32.4                | 39.6 | 1.0                   | 29.1                                                 | 5.0                                                                | 29.0                                            | 52.0                                             | 0.099                                                    |
| 1.5KE36(C)A-G  | 34.2                | 37.8 | 1.0                   | 30.8                                                 | 5.0                                                                | 30.0                                            | 49.0                                             | 0.099                                                    |
| 1.5KE39(C)-G   | 35.1                | 42.9 | 1.0                   | 31.6                                                 | 5.0                                                                | 26.5                                            | 56.4                                             | 0.100                                                    |
| 1.5KE39(C)A-G  | 37.1                | 41.0 | 1.0                   | 33.3                                                 | 5.0                                                                | 28.0                                            | 53.9                                             | 0.100                                                    |
| 1.5KE43(C)-G   | 38.7                | 47.3 | 1.0                   | 34.8                                                 | 5.0                                                                | 24.0                                            | 61.9                                             | 0.101                                                    |
| 1.5KE43(C)A-G  | 40.9                | 45.2 | 1.0                   | 36.8                                                 | 5.0                                                                | 25.3                                            | 59.3                                             | 0.101                                                    |
| 1.5KE47(C)-G   | 42.3                | 51.7 | 1.0                   | 36.1                                                 | 5.0                                                                | 22.2                                            | 67.8                                             | 0.101                                                    |
| 1.5KE47(C)A-G  | 44.7                | 49.4 | 1.0                   | 40.2                                                 | 5.0                                                                | 23.2                                            | 64.8                                             | 0.101                                                    |
| 1.5KE51(C)-G   | 45.9                | 56.1 | 1.0                   | 41.3                                                 | 5.0                                                                | 20.4                                            | 73.5                                             | 0.102                                                    |
| 1.5KE51(C)A-G  | 48.5                | 53.6 | 1.0                   | 43.6                                                 | 5.0                                                                | 21.4                                            | 70.1                                             | 0.102                                                    |
| 1.5KE56(C)-G   | 50.4                | 61.8 | 1.0                   | 45.4                                                 | 5.0                                                                | 18.6                                            | 80.5                                             | 0.103                                                    |
| 1.5KE56(C)A-G  | 53.2                | 58.8 | 1.0                   | 47.8                                                 | 5.0                                                                | 19.5                                            | 77.0                                             | 0.103                                                    |
| 1.5KE62(C)-G   | 55.8                | 68.2 | 1.0                   | 50.2                                                 | 5.0                                                                | 16.9                                            | 89.0                                             | 0.104                                                    |
| 1.5KE62(C)A-G  | 58.9                | 65.1 | 1.0                   | 53.0                                                 | 5.0                                                                | 17.7                                            | 85.0                                             | 0.104                                                    |

REV:A

# 1500W Transient Voltage Suppressor

1.5KE15KE20A-G (1.5KE15)



SMD Diodes Specialist

## RATING AND CHARACTERISTIC (1.5KE-G Series)

| Part No.       | Breakdown Voltage   |       |                      | Working Peak Reverse Voltage<br>V <sub>RWM</sub> (V) | Maximum Reverse Leakage at V <sub>RWM</sub><br>I <sub>r</sub> (μA) | Maximum Reverse Current<br>I <sub>RSM</sub> (A) | Maximum Clamping Voltage<br>V <sub>RWM</sub> (V) | Maximum Temperature Coefficient of V <sub>BR</sub> (%C) |
|----------------|---------------------|-------|----------------------|------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|---------------------------------------------------------|
|                | V <sub>BR</sub> (V) |       | @I <sub>T</sub> (mA) |                                                      |                                                                    |                                                 |                                                  |                                                         |
|                | MIN.                | MAX.  |                      |                                                      |                                                                    |                                                 |                                                  |                                                         |
| 1.5KE68(C)-G   | 61.2                | 74.8  | 1.0                  | 55.1                                                 | 5.0                                                                | 15.3                                            | 98.0                                             | 0.104                                                   |
| 1.5KE68(C)A-G  | 64.6                | 71.4  | 1.0                  | 58.1                                                 | 5.0                                                                | 16.3                                            | 92.0                                             | 0.104                                                   |
| 1.5KE75(C)-G   | 67.5                | 82.5  | 1.0                  | 60.7                                                 | 5.0                                                                | 13.9                                            | 108.0                                            | 0.105                                                   |
| 1.5KE75(C)A-G  | 71.3                | 78.8  | 1.0                  | 64.1                                                 | 5.0                                                                | 14.6                                            | 103.0                                            | 0.105                                                   |
| 1.5KE82(C)-G   | 73.8                | 90.2  | 1.0                  | 66.4                                                 | 5.0                                                                | 12.7                                            | 118.0                                            | 0.105                                                   |
| 1.5KE82(C)A-G  | 77.9                | 86.1  | 1.0                  | 70.1                                                 | 5.0                                                                | 13.3                                            | 113.0                                            | 0.105                                                   |
| 1.5KE91(C)-G   | 81.9                | 100.0 | 1.0                  | 73.7                                                 | 5.0                                                                | 11.4                                            | 131.8                                            | 0.106                                                   |
| 1.5KE91(C)A-G  | 86.5                | 95.5  | 1.0                  | 77.8                                                 | 5.0                                                                | 12.0                                            | 125.0                                            | 0.106                                                   |
| 1.5KE100(C)-G  | 90.0                | 110.0 | 1.0                  | 81.0                                                 | 5.0                                                                | 10.4                                            | 144.0                                            | 0.106                                                   |
| 1.5KE100(C)A-G | 95.0                | 105.0 | 1.0                  | 85.5                                                 | 5.0                                                                | 11.0                                            | 137.0                                            | 0.106                                                   |
| 1.5KE110(C)-G  | 99.0                | 121.0 | 1.0                  | 89.2                                                 | 5.0                                                                | 9.5                                             | 158.0                                            | 0.107                                                   |
| 1.5KE110(C)A-G | 106.0               | 116.0 | 1.0                  | 94.0                                                 | 5.0                                                                | 9.9                                             | 152.0                                            | 0.107                                                   |
| 1.5KE120(C)-G  | 108.0               | 132.0 | 1.0                  | 97.2                                                 | 5.0                                                                | 8.7                                             | 173.0                                            | 0.107                                                   |
| 1.5KE120(C)A-G | 114.0               | 126.0 | 1.0                  | 102.0                                                | 5.0                                                                | 9.1                                             | 165.0                                            | 0.107                                                   |
| 1.5KE130(C)-G  | 117.0               | 143.0 | 1.0                  | 106.0                                                | 5.0                                                                | 8.0                                             | 187.0                                            | 0.107                                                   |
| 1.5KE130(C)A-G | 124.0               | 137.0 | 1.0                  | 111.0                                                | 5.0                                                                | 8.4                                             | 179.0                                            | 0.107                                                   |
| 1.5KE150(C)-G  | 136.0               | 165.0 | 1.0                  | 121.0                                                | 5.0                                                                | 7.0                                             | 215.0                                            | 0.108                                                   |
| 1.5KE150(C)A-G | 143.0               | 158.0 | 1.0                  | 128.0                                                | 5.0                                                                | 7.2                                             | 207.0                                            | 0.108                                                   |
| 1.5KE160(C)-G  | 144.0               | 176.0 | 1.0                  | 130.0                                                | 5.0                                                                | 6.5                                             | 230.0                                            | 0.108                                                   |
| 1.5KE160(C)A-G | 152.0               | 168.0 | 1.0                  | 136.0                                                | 5.0                                                                | 6.8                                             | 219.0                                            | 0.108                                                   |
| 1.5KE170(C)-G  | 153.0               | 187.0 | 1.0                  | 138.0                                                | 5.0                                                                | 6.2                                             | 244.0                                            | 0.108                                                   |
| 1.5KE170(C)A-G | 162.0               | 179.0 | 1.0                  | 145.0                                                | 5.0                                                                | 6.4                                             | 234.0                                            | 0.108                                                   |
| 1.5KE180(C)-G  | 162.0               | 198.0 | 1.0                  | 146.0                                                | 5.0                                                                | 5.8                                             | 258.0                                            | 0.108                                                   |
| 1.5KE180(C)A-G | 171.0               | 189.0 | 1.0                  | 154.0                                                | 5.0                                                                | 6.1                                             | 246.0                                            | 0.108                                                   |
| 1.5KE200(C)-G  | 180.0               | 220.0 | 1.0                  | 162.0                                                | 5.0                                                                | 5.2                                             | 287.0                                            | 0.108                                                   |
| 1.5KE200(C)A-G | 190.0               | 210.0 | 1.0                  | 171.0                                                | 5.0                                                                | 5.5                                             | 274.0                                            | 0.108                                                   |
| 1.5KE220(C)-G  | 196.0               | 242.0 | 1.0                  | 175.0                                                | 5.0                                                                | 4.40                                            | 344.0                                            | 0.108                                                   |
| 1.5KE220(C)A-G | 209.0               | 231.0 | 1.0                  | 185.0                                                | 5.0                                                                | 4.60                                            | 328.0                                            | 0.108                                                   |
| 1.5KE250(C)-G  | 225.0               | 275.0 | 1.0                  | 202.0                                                | 5.0                                                                | 4.20                                            | 360.0                                            | 0.110                                                   |
| 1.5KE250(C)A-G | 237.0               | 263.0 | 1.0                  | 214.0                                                | 5.0                                                                | 4.40                                            | 344.0                                            | 0.110                                                   |
| 1.5KE300(C)-G  | 270.0               | 330.0 | 1.0                  | 243.0                                                | 5.0                                                                | 3.20                                            | 430.0                                            | 0.110                                                   |
| 1.5KE300(C)A-G | 285.0               | 315.0 | 1.0                  | 256.0                                                | 5.0                                                                | 3.60                                            | 414.0                                            | 0.110                                                   |
| 1.5KE350(C)-G  | 315.0               | 385.0 | 1.0                  | 284.0                                                | 5.0                                                                | 3.00                                            | 504.0                                            | 0.110                                                   |
| 1.5KE350(C)A-G | 333.0               | 368.0 | 1.0                  | 300.0                                                | 5.0                                                                | 3.10                                            | 482.0                                            | 0.110                                                   |
| 1.5KE400(C)-G  | 360.0               | 440.0 | 1.0                  | 324.0                                                | 5.0                                                                | 2.60                                            | 574.0                                            | 0.110                                                   |
| 1.5KE400(C)A-G | 380.0               | 420.0 | 1.0                  | 342.0                                                | 5.0                                                                | 2.70                                            | 548.0                                            | 0.110                                                   |
| 1.5KE440(C)-G  | 396.0               | 484.0 | 1.0                  | 356.0                                                | 5.0                                                                | 2.4                                             | 631.0                                            | 0.110                                                   |
| 1.5KE440(C)A-G | 418.0               | 462.0 | 1.0                  | 376.0                                                | 5.0                                                                | 2.50                                            | 602.0                                            | 0.110                                                   |

### NOTES:

1. V<sub>BR</sub> measured after I<sub>T</sub> applied for 300μS, I<sub>T</sub>=square wave pulse or equivalent.
2. Surge current wave form per fig.3 and derated per fig.2.
3. V<sub>F</sub>=3.5V at I<sub>F</sub>=50A (P6KE6.8-G thru P6KE91A-G)  
V<sub>F</sub>=5.0V at I<sub>F</sub>=50A (p6KE100-G thru P6KE400A-G on ½ square or equivalent sine wave.  
P<sub>W</sub>=8.3mS, duty cycle=4 pulses per minute max..
4. For bipolar types having V<sub>RWM</sub> of 10 Volts and under, the I<sub>R</sub> limit is doubled.

REV:A

# 1500W Transient Voltage Suppressor

1.5KE20A-15KE210

**COMCHIP**

SMD Diodes Specialist

## RATING AND CHARACTERISTIC CURVES (1.5KE-G Series)

Fig.1 Peak Pulse Power Rating Curve

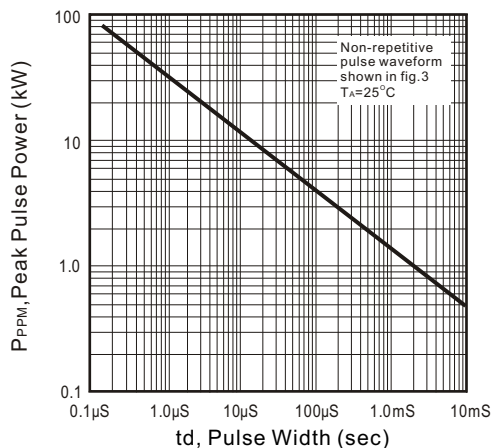


Fig.2 Pulse Derating Curve

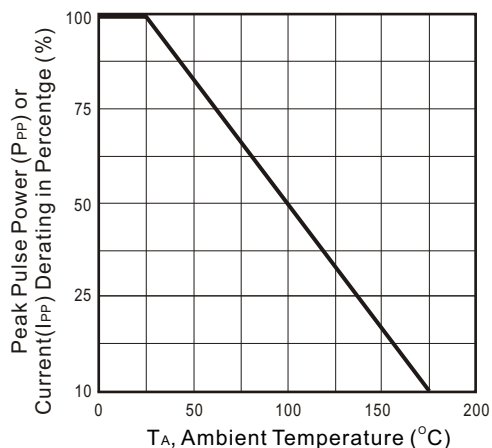


Fig.3 Pulse Wave Form

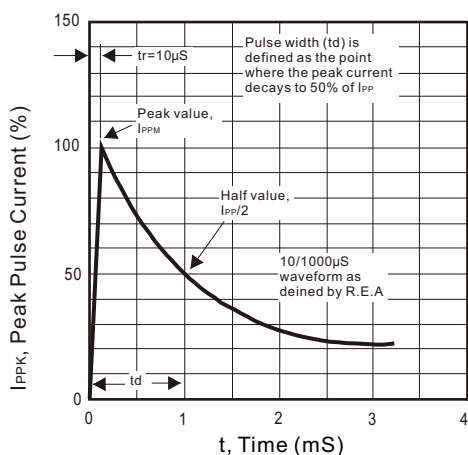


Fig.4 Typical Junction Capacitance Unidirectional

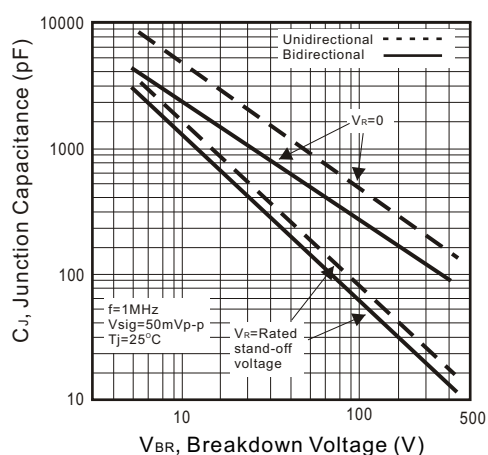


Fig.5 Steady State Power Derating Curve

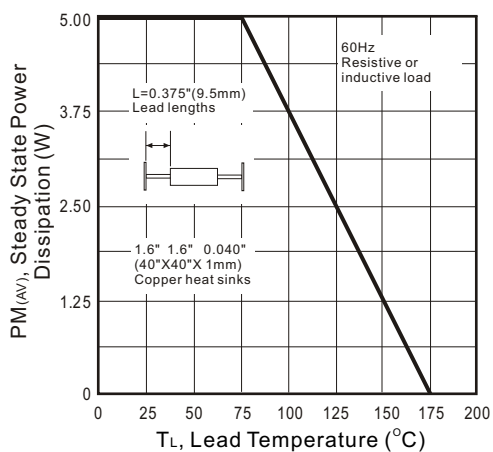
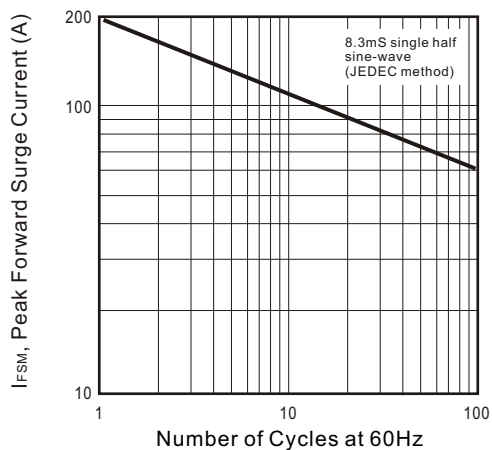


Fig.6 Maximum Non-repetitive Forward Surge Current Unidirectional



## RATING AND CHARACTERISTIC CURVES (1.5KE-G Series)

Fig.7 Incremental Clamping Voltage Curve Unidirectional

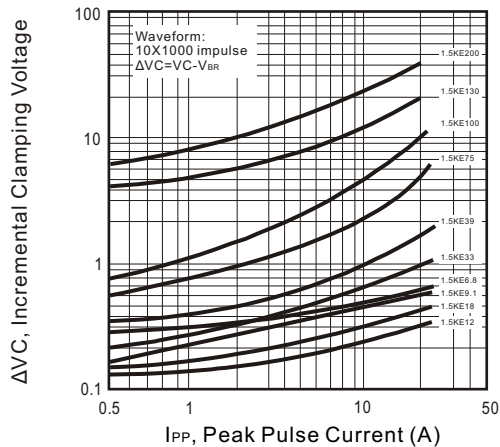


Fig.8 Incremental Clamping Voltage Curve Unidirectional

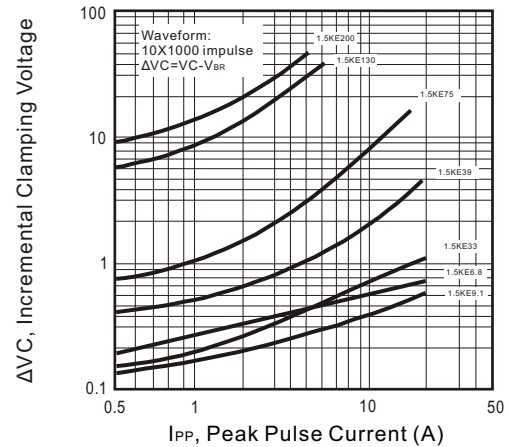


Fig.9 Incremental Clamping Voltage Curve Bidirectional

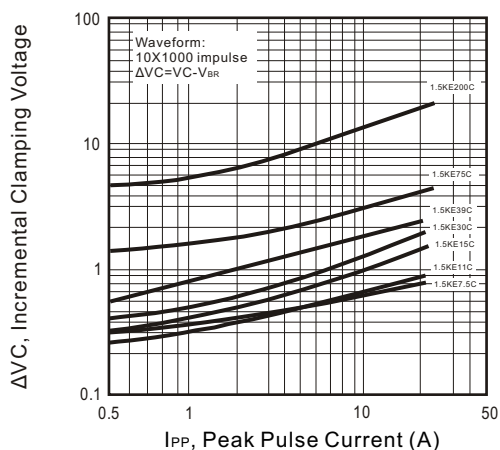


Fig.10 Incremental Clamping Voltage Curve Bidirectional

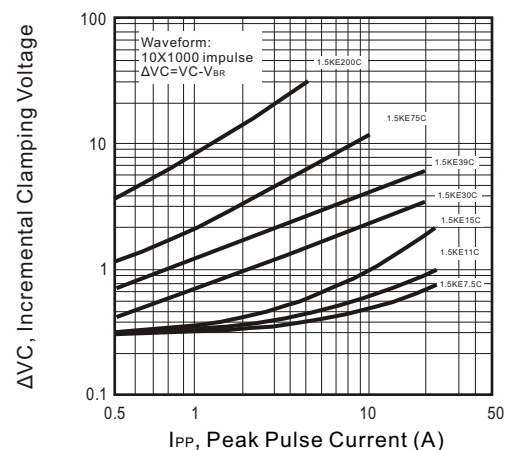


Fig.11 Instantaneous Forward Voltage Characteristics Curve

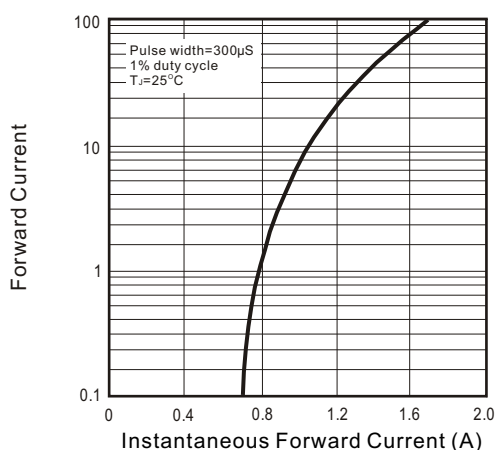


Fig.12 Breakdown Voltage Temperature Coefficient Curve

