



# 1.5KE SERIES

**V<sub>BR</sub> : 6.8 - 440 Volts**  
**PPK : 1500 Watts**

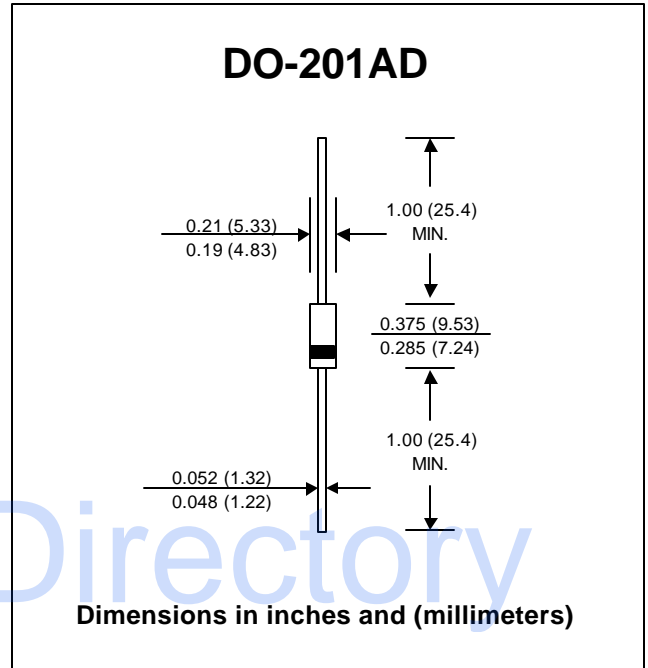
### FEATURES :

- \* 1500W surge capability at 1ms
- \* Excellent clamping capability
- \* Low zener impedance
- \* Fast response time : typically less than 1.0 ps from 0 volt to V<sub>BR(min.)</sub>
- \* Typical I<sub>R</sub> less than 1μA above 10V

### MECHANICAL DATA

- \* Case : DO-201AD Molded plastic
- \* Epoxy : UL94V-O rate flame retardant
- \* Lead : Axial lead solderable per MIL-STD-202, method 208 guaranteed
- \* Polarity : Color band denotes cathode end except Bipolar.
- \* Mounting position : Any
- \* Weight : 1.21 grams

# TRANSIENT VOLTAGE SUPPRESSOR



### DEVICES FOR BIPOLAR APPLICATIONS

For Bi-directional use C or CA Suffix  
Electrical characteristics apply in both directions

### MAXIMUM RATINGS

Rating at 25 °C ambient temperature unless otherwise specified.

| Rating   | Symbol                            | Value         | Unit  |
|--|-----------------------------------|---------------|-------|
| Peak Power Dissipation at Ta = 25 °C, Tp=1ms (Note 1)  | PPK                               | Minimum 1500  | Watts |
| Steady State Power Dissipation at T <sub>L</sub> = 75 °C<br>Lead Lengths 0.375", (9.5mm) (Note 2)          | PD                                | 5.0           | Watts |
| Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) (Note 3) | I <sub>FSM</sub>                  | 200           | Amps. |
| Operating and Storage Temperature Range  | T <sub>J</sub> , T <sub>STG</sub> | - 65 to + 175 | °C    |

### Note :

- (1) Non-repetitive Current pulse, per Fig. 5 and derated above Ta = 25 °C per Fig. 1
- (2) Mounted on Copper Leaf area of 1.57 in<sup>2</sup> (40mm<sup>2</sup>).
- (3) 8.3 ms single half sine-wave, duty cycle = 4 pulses per minutes maximum.



Certificate Number: Q10561

Certificate Number: 517276

## ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE      | Breakdown Voltage @ It<br>( Note 1 ) |      | Working Peak<br>Reverse<br>Voltage | Maximum<br>Reverse Leakage<br>@ VRWM | Maximum<br>Reverse<br>Current | Maximum<br>Clamping<br>Voltage @ IRSM | Maximum<br>Temperature<br>Co-efficient<br>of VBR |       |
|-----------|--------------------------------------|------|------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|--|-------|
|           | VBR (V)                              |      |                                    |                                      |                               |                                       |  | VRWM  |
|           | Axial Lead                           | Min. | Max.                               | (mA)                                 | (V)                           | (µA)                                  | (A)  | (V)   |
| 1.5KE6.8  | 6.12                                 | 7.48 | 10                                 | 5.50                                 | 1000                          | 139                                   | 10.8   | 0.057 |
| 1.5KE6.8A | 6.45                                 | 7.14 | 10                                 | 5.80                                 | 1000                          | 143                                   | 10.5   | 0.057 |
| 1.5KE7.5  | 6.75                                 | 8.25 | 10                                 | 6.05                                 | 500                           | 128                                   | 11.7   | 0.061 |
| 1.5KE7.5A | 7.13                                 | 7.88 | 10                                 | 6.40                                 | 500                           | 132                                   | 11.3   | 0.061 |
| 1.5KE8.2  | 7.38                                 | 9.02 | 10                                 | 6.63                                 | 200                           | 120                                   | 12.5   | 0.065 |
| 1.5KE8.2A | 7.79                                 | 8.61 | 10                                 | 7.02                                 | 200                           | 124                                   | 12.1   | 0.065 |
| 1.5KE9.1  | 8.19                                 | 10.0 | 1.0                                | 7.37                                 | 50                            | 109                                   | 13.8   | 0.068 |
| 1.5KE9.1A | 8.65                                 | 9.55 | 1.0                                | 7.78                                 | 50                            | 112                                   | 13.4   | 0.068 |
| 1.5KE10   | 9.00                                 | 11.0 | 1.0                                | 8.10                                 | 10                            | 100                                   | 15.0   | 0.073 |
| 1.5KE10A  | 9.50                                 | 10.5 | 1.0                                | 8.55                                 | 10                            | 103                                   | 14.5   | 0.073 |
| 1.5KE11   | 9.90                                 | 12.1 | 1.0                                | 8.92                                 | 5.0                           | 93.0                                  | 16.2   | 0.075 |
| 1.5KE11A  | 10.5                                 | 11.6 | 1.0                                | 9.40                                 | 5.0                           | 96.0                                  | 15.6   | 0.075 |
| 1.5KE12   | 10.8                                 | 13.2 | 1.0                                | 9.72                                 | 5.0                           | 87.0                                  | 17.3   | 0.078 |
| 1.5KE12A  | 11.4                                 | 12.6 | 1.0                                | 10.2                                 | 5.0                           | 90.0                                  | 16.7   | 0.078 |
| 1.5KE13   | 11.7                                 | 14.3 | 1.0                                | 10.5                                 | 5.0                           | 79.0                                  | 19.0   | 0.081 |
| 1.5KE13A  | 12.4                                 | 13.7 | 1.0                                | 11.1                                 | 5.0                           | 82.0                                  | 18.2   | 0.081 |
| 1.5KE15   | 13.5                                 | 16.5 | 1.0                                | 12.1                                 | 5.0                           | 68.0                                  | 22.0   | 0.084 |
| 1.5KE15A  | 14.3                                 | 15.8 | 1.0                                | 12.8                                 | 5.0                           | 71.0                                  | 21.2   | 0.084 |
| 1.5KE16   | 14.4                                 | 17.6 | 1.0                                | 12.9                                 | 5.0                           | 64.0                                  | 23.5   | 0.086 |
| 1.5KE16A  | 15.2                                 | 16.8 | 1.0                                | 13.6                                 | 5.0                           | 67.0                                  | 22.5   | 0.086 |
| 1.5KE18   | 16.2                                 | 19.8 | 1.0                                | 14.5                                 | 5.0                           | 56.5                                  | 26.5   | 0.088 |
| 1.5KE18A  | 17.1                                 | 18.9 | 1.0                                | 15.3                                 | 5.0                           | 59.5                                  | 25.2   | 0.088 |
| 1.5KE20   | 18.0                                 | 22.0 | 1.0                                | 16.2                                 | 5.0                           | 51.5                                  | 29.1   | 0.090 |
| 1.5KE20A  | 19.0                                 | 21.0 | 1.0                                | 17.1                                 | 5.0                           | 54.0                                  | 27.7   | 0.090 |
| 1.5KE22   | 19.8                                 | 24.2 | 1.0                                | 17.8                                 | 5.0                           | 47.0                                  | 31.9   | 0.092 |
| 1.5KE22A  | 20.9                                 | 23.1 | 1.0                                | 18.8                                 | 5.0                           | 49.0                                  | 30.6   | 0.092 |
| 1.5KE24   | 21.6                                 | 26.4 | 1.0                                | 19.4                                 | 5.0                           | 43.0                                  | 34.7   | 0.094 |
| 1.5KE24A  | 22.8                                 | 25.2 | 1.0                                | 20.5                                 | 5.0                           | 45.0                                  | 33.2   | 0.094 |
| 1.5KE27   | 24.3                                 | 29.7 | 1.0                                | 21.8                                 | 5.0                           | 38.5                                  | 39.1   | 0.096 |
| 1.5KE27A  | 25.7                                 | 28.4 | 1.0                                | 23.1                                 | 5.0                           | 40.0                                  | 37.5   | 0.096 |
| 1.5KE30   | 27.0                                 | 33.0 | 1.0                                | 24.3                                 | 5.0                           | 34.5                                  | 43.5   | 0.097 |
| 1.5KE30A  | 28.5                                 | 31.5 | 1.0                                | 25.6                                 | 5.0                           | 36.0                                  | 41.4   | 0.097 |
| 1.5KE33   | 29.7                                 | 36.3 | 1.0                                | 26.8                                 | 5.0                           | 31.5                                  | 47.7   | 0.098 |
| 1.5KE33A  | 31.4                                 | 34.7 | 1.0                                | 28.2                                 | 5.0                           | 33.0                                  | 45.7   | 0.098 |
| 1.5KE36   | 32.4                                 | 39.6 | 1.0                                | 29.1                                 | 5.0                           | 29.0                                  | 52.0   | 0.099 |
| 1.5KE36A  | 34.2                                 | 37.8 | 1.0                                | 30.8                                 | 5.0                           | 30.0                                  | 49.9   | 0.099 |
| 1.5KE39   | 35.1                                 | 42.9 | 1.0                                | 31.6                                 | 5.0                           | 26.5                                  | 56.4   | 0.100 |
| 1.5KE39A  | 37.1                                 | 41.0 | 1.0                                | 33.3                                 | 5.0                           | 28.0                                  | 53.9   | 0.100 |
| 1.5KE43   | 38.7                                 | 47.3 | 1.0                                | 34.8                                 | 5.0                           | 24.0                                  | 61.9   | 0.101 |
| 1.5KE43A  | 40.9                                 | 45.2 | 1.0                                | 36.8                                 | 5.0                           | 25.3                                  | 59.3   | 0.101 |
| 1.5KE47   | 42.3                                 | 51.7 | 1.0                                | 38.1                                 | 5.0                           | 22.2                                  | 67.8   | 0.101 |
| 1.5KE47A  | 44.7                                 | 49.4 | 1.0                                | 40.2                                 | 5.0                           | 23.2                                  | 64.8   | 0.101 |
| 1.5KE51   | 45.9                                 | 56.1 | 1.0                                | 41.3                                 | 5.0                           | 20.4                                  | 73.5   | 0.102 |
| 1.5KE51A  | 48.5                                 | 53.6 | 1.0                                | 43.6                                 | 5.0                           | 21.4                                  | 70.1   | 0.102 |
| 1.5KE56   | 50.4                                 | 61.6 | 1.0                                | 45.4                                 | 5.0                           | 18.6                                  | 80.5   | 0.103 |
| 1.5KE56A  | 53.2                                 | 58.8 | 1.0                                | 47.8                                 | 5.0                           | 19.5                                  | 77.0   | 0.103 |
| 1.5KE62   | 55.8                                 | 68.2 | 1.0                                | 50.2                                 | 5.0                           | 16.9                                  | 89.0   | 0.104 |

## ELECTRICAL CHARACTERISTICS

Rating at = 25 °C ambient temperature unless otherwise specified

| TYPE      | Breakdown Voltage @ It<br>( Note 1 ) |      | Working Peak<br>Reverse<br>Voltage | Maximum<br>Reverse Leakage<br>@ VRWM | Maximum<br>Reverse<br>Current | Maximum<br>Clamping<br>Voltage @ IRSM | Maximum<br>Temperature<br>Co-efficient<br>of VBR<br><br>(% / °C) |       |
|-----------|--------------------------------------|------|------------------------------------|--------------------------------------|-------------------------------|---------------------------------------|--|-------|
|           | VBR (V)                              |      |                                    |                                      |                               |                                       |  | VRWM  |
|           | Axial Lead                           | Min. | Max.                               | (mA)                                 | (V)                           | (µA)                                  |  | (A)   |
| 1.5KE62A  | 58.9                                 | 65.1 | 1.0                                | 53.0                                 | 5.0                           | 17.7                                  | 85.0   | 0.104 |
| 1.5KE68   | 61.2                                 | 74.8 | 1.0                                | 55.1                                 | 5.0                           | 15.3                                  | 98.0   | 0.104 |
| 1.5KE68A  | 64.6                                 | 71.4 | 1.0                                | 58.1                                 | 5.0                           | 16.3                                  | 92.0   | 0.104 |
| 1.5KE75   | 67.5                                 | 82.5 | 1.0                                | 60.7                                 | 5.0                           | 13.9                                  | 108  | 0.105 |
| 1.5KE75A  | 71.3                                 | 78.8 | 1.0                                | 64.1                                 | 5.0                           | 14.6                                  | 103  | 0.105 |
| 1.5KE82   | 73.8                                 | 90.2 | 1.0                                | 66.4                                 | 5.0                           | 12.7                                  | 118  | 0.105 |
| 1.5KE82A  | 77.9                                 | 86.1 | 1.0                                | 70.1                                 | 5.0                           | 13.3                                  | 113  | 0.105 |
| 1.5KE91   | 81.9                                 | 100  | 1.0                                | 73.7                                 | 5.0                           | 11.4                                  | 131  | 0.106 |
| 1.5KE91A  | 86.5                                 | 95.5 | 1.0                                | 77.8                                 | 5.0                           | 12.0                                  | 125  | 0.106 |
| 1.5KE100  | 90.0                                 | 110  | 1.0                                | 81.0                                 | 5.0                           | 10.4                                  | 144  | 0.106 |
| 1.5KE100A | 95.0                                 | 105  | 1.0                                | 85.5                                 | 5.0                           | 11.0                                  | 137  | 0.106 |
| 1.5KE110  | 99.0                                 | 121  | 1.0                                | 89.2                                 | 5.0                           | 9.5                                   | 158  | 0.107 |
| 1.5KE110A | 105                                  | 116  | 1.0                                | 94.0                                 | 5.0                           | 9.9                                   | 152  | 0.107 |
| 1.5KE120  | 108                                  | 132  | 1.0                                | 97.2                                 | 5.0                           | 8.7                                   | 173  | 0.107 |
| 1.5KE120A | 114                                  | 126  | 1.0                                | 102                                  | 5.0                           | 9.1                                   | 165  | 0.107 |
| 1.5KE130  | 117                                  | 143  | 1.0                                | 105                                  | 5.0                           | 8.0                                   | 187  | 0.107 |
| 1.5KE130A | 124                                  | 137  | 1.0                                | 111                                  | 5.0                           | 8.4                                   | 179  | 0.107 |
| 1.5KE150  | 135                                  | 165  | 1.0                                | 121                                  | 5.0                           | 7.0                                   | 215  | 0.108 |
| 1.5KE150A | 143                                  | 158  | 1.0                                | 128                                  | 5.0                           | 7.2                                   | 207  | 0.108 |
| 1.5KE160  | 144                                  | 176  | 1.0                                | 130                                  | 5.0                           | 6.5                                   | 230  | 0.108 |
| 1.5KE160A | 152                                  | 168  | 1.0                                | 136                                  | 5.0                           | 6.8                                   | 219  | 0.108 |
| 1.5KE170  | 153                                  | 187  | 1.0                                | 138                                  | 5.0                           | 6.2                                   | 244  | 0.108 |
| 1.5KE170A | 162                                  | 179  | 1.0                                | 145                                  | 5.0                           | 6.4                                   | 234  | 0.108 |
| 1.5KE180  | 162                                  | 198  | 1.0                                | 146                                  | 5.0                           | 5.8                                   | 258  | 0.108 |
| 1.5KE180A | 171                                  | 189  | 1.0                                | 154                                  | 5.0                           | 6.1                                   | 246  | 0.108 |
| 1.5KE200  | 180                                  | 220  | 1.0                                | 162                                  | 5.0                           | 5.2                                   | 287  | 0.108 |
| 1.5KE200A | 190                                  | 210  | 1.0                                | 171                                  | 5.0                           | 5.5                                   | 274  | 0.108 |
| 1.5KE220  | 198                                  | 242  | 1.0                                | 175                                  | 5.0                           | 4.3                                   | 344  | 0.108 |
| 1.5KE220A | 209                                  | 231  | 1.0                                | 185                                  | 5.0                           | 4.6                                   | 328  | 0.108 |
| 1.5KE250  | 225                                  | 275  | 1.0                                | 202                                  | 5.0                           | 5.0                                   | 360  | 0.110 |
| 1.5KE250A | 237                                  | 263  | 1.0                                | 214                                  | 5.0                           | 5.0                                   | 344  | 0.110 |
| 1.5KE300  | 270                                  | 330  | 1.0                                | 243                                  | 5.0                           | 5.0                                   | 430  | 0.110 |
| 1.5KE300A | 285                                  | 315  | 1.0                                | 256                                  | 5.0                           | 5.0                                   | 414  | 0.110 |
| 1.5KE350  | 315                                  | 385  | 1.0                                | 284                                  | 5.0                           | 4.0                                   | 504  | 0.110 |
| 1.5KE350A | 332                                  | 368  | 1.0                                | 300                                  | 5.0                           | 4.0                                   | 482  | 0.110 |
| 1.5KE400  | 360                                  | 440  | 1.0                                | 324                                  | 5.0                           | 4.0                                   | 574  | 0.110 |
| 1.5KE400A | 380                                  | 420  | 1.0                                | 342                                  | 5.0                           | 4.0                                   | 548  | 0.110 |
| 1.5KE440  | 396                                  | 484  | 1.0                                | 356                                  | 5.0                           | 2.38                                  | 631  | 0.110 |
| 1.5KE440A | 418                                  | 462  | 1.0                                | 376                                  | 5.0                           | 2.50                                  | 602  | 0.110 |

**Note:**

- ( 1 ) VBR measured after It applied for 300 µs.. It = square wave pulse or equivalent.
- ( 2 ) VF = 3.5 Vmax., IF = 100 Amps. ( 6.8 Volts thru 91 Volts )  
VF = 5.0 Vmax., IF = 100 Amps. ( 100 Volts thru 440 Volts ) per 1/2 square or equivalent sine wave.  
PW = 8.3 ms, duty cycle = 4 pulses per minute maximum.

## RATING AND CHARACTERISTIC CURVES ( 1.5KE SERIES )

FIG.1 - PULSE DERATING CURVE

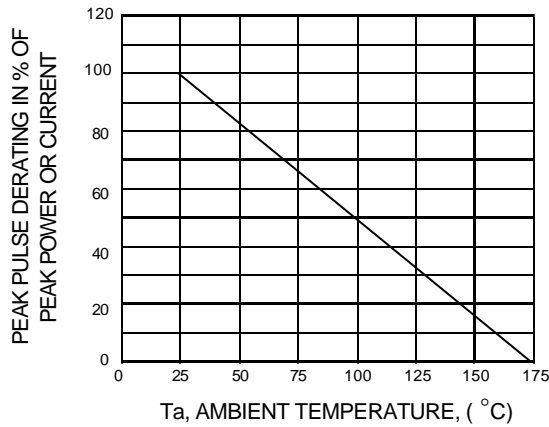


FIG.2 - MAXIMUM NON-REPETITIVE SURGE CURRENT

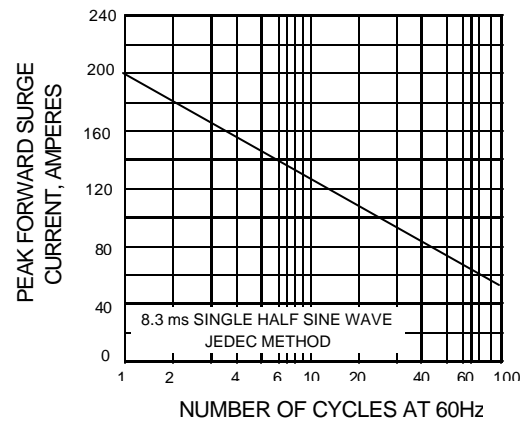


FIG.3 - STEADY STATE POWER DERATING

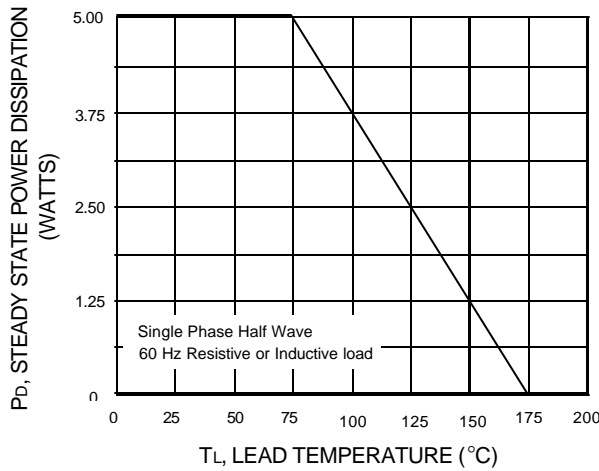


FIG.4 - PULSE RATING CURVE

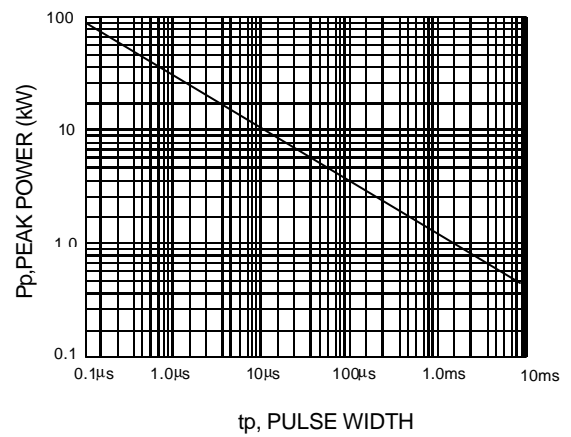


FIG.5 - PULSE WAVEFORM

