

# 1V5KE6V8(C)A - 1V5KE440(C)A 1500 W Transient Voltage Suppressors

## Features

- Glass-Passivated Junction
- 1500 W Peak Pulse Power Capability at 1.0 ms
- Excellent Clamping Capability
- Low Incremental Surge Resistance
- Fast Response Time; Typically  
 $< 1.0$  ps from 0 V to BV for Uni-directional,  
 $5.0$  ns for Bidirectional
- Typical  $I_R$ :  $1.0$   $\mu$ A Above 10 V
- UL Certified: UL #E210467

## Applications

- Bi-directional Types Use CA Suffix
- Electrical Characteristics apply in both directions



## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Symbol    | Parameter                                                                                             | Value       | Units            |
|-----------|-------------------------------------------------------------------------------------------------------|-------------|------------------|
| $P_{PPM}$ | Peak Pulse Power Dissipation $t_P = 1$ ms                                                             | 1500        | W                |
| $I_{PPM}$ | Peak Pulse Current                                                                                    | see table   | A                |
| $I_{FSM}$ | Non-Repetitive Peak Forward Surge Current<br>Superimposed on Rated Load (JEDEC Method) <sup>(1)</sup> | 200         | A                |
| $T_{stg}$ | Storage Temperature Range                                                                             | -55 to +175 | $^\circ\text{C}$ |
| $T_J$     | Operating Junction Temperature                                                                        | -55 to +175 | $^\circ\text{C}$ |

### Note:

1. Measured on 8.3 ms single half-sine wave; duty cycle = 4 pulses per minute maximum.

## Thermal Characteristics

| Symbol | Parameter                                                              | Value | Units |
|--------|------------------------------------------------------------------------|-------|-------|
| $P_D$  | Power Dissipation<br>.375 inch lead length at $T_A = 75^\circ\text{C}$ | 5.0   | W     |

**Electrical Characteristics** $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Uni-directional<br>Bi-directional<br>(C) Device | Reverse<br>Stand-Off<br>Voltage<br>$V_{RWM}$ (V) | Breakdown<br>Voltage $V_{BR}$<br>(V) |       | Test<br>Current $I_T$<br>(mA) | Clamping<br>Voltage at<br>$I_{PPM}$ $V_C$ (C) | Peak Pulse<br>Current<br>$I_{PPM}$ (A) | Reverse<br>Leakage<br>$V_{RWM}$ $I^R$<br>( $\mu\text{A}$ ) <sup>(2)</sup> |
|-------------------------------------------------|--------------------------------------------------|--------------------------------------|-------|-------------------------------|-----------------------------------------------|----------------------------------------|---------------------------------------------------------------------------|
|                                                 |                                                  | Min.                                 | Max.  |                               |                                               |                                        |                                                                           |
| 1V5KE6V8(C)A                                    | 5.80                                             | 6.45                                 | 7.14  | 10                            | 10.5                                          | 143                                    | 1000                                                                      |
| 1V5KE7V5(C)A                                    | 6.40                                             | 7.13                                 | 7.88  | 10                            | 11.3                                          | 133                                    | 500                                                                       |
| 1V5KE8V2(C)A                                    | 7.02                                             | 7.79                                 | 8.61  | 10                            | 12.1                                          | 124                                    | 200                                                                       |
| 1V5KE9V1(C)A                                    | 7.78                                             | 8.65                                 | 9.55  | 1                             | 13.4                                          | 112                                    | 50                                                                        |
| 1V5KE10(C)A                                     | 8.55                                             | 9.50                                 | 10.5  | 1                             | 14.5                                          | 103                                    | 10                                                                        |
| 1V5KE11(C)A                                     | 9.40                                             | 10.5                                 | 11.6  | 1                             | 15.6                                          | 96.2                                   | 5                                                                         |
| 1V5KE12(C)A                                     | 10.2                                             | 11.4                                 | 12.6  | 1                             | 16.7                                          | 90.0                                   | 5                                                                         |
| 1V5KE13(C)A                                     | 11.1                                             | 12.4                                 | 13.7  | 1                             | 18.2                                          | 82.0                                   | 5                                                                         |
| 1V5KE15(C)A                                     | 12.8                                             | 14.3                                 | 15.8  | 1                             | 21.2                                          | 71.0                                   | 5                                                                         |
| 1V5KE16(C)A                                     | 13.6                                             | 15.2                                 | 16.8  | 1                             | 22.5                                          | 67.0                                   | 5                                                                         |
| 1V5KE18(C)A                                     | 15.3                                             | 17.1                                 | 18.9  | 1                             | 26.2                                          | 59.5                                   | 5                                                                         |
| 1V5KE20(C)A                                     | 17.1                                             | 19.0                                 | 21.0  | 1                             | 27.7                                          | 54.2                                   | 5                                                                         |
| 1V5KE22(C)A                                     | 18.8                                             | 20.9                                 | 23.1  | 1                             | 30.6                                          | 49.0                                   | 5                                                                         |
| 1V5KE24(C)A                                     | 20.5                                             | 22.8                                 | 25.2  | 1                             | 33.2                                          | 45.2                                   | 5                                                                         |
| 1V5KE27(C)A                                     | 23.1                                             | 25.7                                 | 28.4  | 1                             | 37.5                                          | 40.0                                   | 5                                                                         |
| 1V5KE30(C)A                                     | 25.6                                             | 28.5                                 | 31.5  | 1                             | 41.4                                          | 36.2                                   | 5                                                                         |
| 1V5KE33(C)A                                     | 28.2                                             | 31.4                                 | 34.7  | 1                             | 45.7                                          | 33.0                                   | 5                                                                         |
| 1V5KE36(C)A                                     | 30.8                                             | 34.2                                 | 37.8  | 1                             | 49.9                                          | 30.1                                   | 5                                                                         |
| 1V5KE39(C)A                                     | 33.3                                             | 37.1                                 | 41.0  | 1                             | 53.9                                          | 28.0                                   | 5                                                                         |
| 1V5KE43(C)A                                     | 36.8                                             | 40.9                                 | 45.2  | 1                             | 59.3                                          | 25.3                                   | 5                                                                         |
| 1V5KE47(C)A                                     | 40.2                                             | 44.7                                 | 49.4  | 1                             | 64.8                                          | 23.2                                   | 5                                                                         |
| 1V5KE51(C)A                                     | 43.6                                             | 48.5                                 | 53.6  | 1                             | 70.1                                          | 21.4                                   | 5                                                                         |
| 1V5KE56(C)A                                     | 47.8                                             | 53.2                                 | 58.8  | 1                             | 77.0                                          | 19.5                                   | 5                                                                         |
| 1VKE62(C)A                                      | 53.0                                             | 58.9                                 | 65.1  | 1                             | 85.0                                          | 17.7                                   | 5                                                                         |
| 1V5KE68(C)A                                     | 58.1                                             | 64.6                                 | 71.4  | 1                             | 92.0                                          | 16.3                                   | 5                                                                         |
| 1V5KE75(C)A                                     | 64.1                                             | 71.3                                 | 78.8  | 1                             | 104.0                                         | 14.6                                   | 5                                                                         |
| 1V5KE82(C)A                                     | 70.1                                             | 77.9                                 | 86.1  | 1                             | 113.0                                         | 13.3                                   | 5                                                                         |
| 1V5KE91(C)A                                     | 77.8                                             | 86.5                                 | 95.5  | 1                             | 125.0                                         | 12.0                                   | 5                                                                         |
| 1V5KE100(C)A                                    | 85.5                                             | 95.0                                 | 105.0 | 1                             | 137.0                                         | 11.0                                   | 5                                                                         |
| 1V5KE110(C)A                                    | 94.0                                             | 106.0                                | 116.0 | 1                             | 152.0                                         | 9.9                                    | 5                                                                         |
| 1V5KE120(C)A                                    | 102.0                                            | 114.0                                | 126.0 | 1                             | 165.0                                         | 9.1                                    | 5                                                                         |
| 1V5KE130(C)A                                    | 111.0                                            | 124.0                                | 137.0 | 1                             | 179.0                                         | 8.4                                    | 5                                                                         |
| 1V5KE150(C)A                                    | 128.0                                            | 143.0                                | 158.0 | 1                             | 207.0                                         | 7.2                                    | 5                                                                         |
| 1V5KE160(C)A                                    | 136.0                                            | 152.0                                | 168.0 | 1                             | 219.0                                         | 6.8                                    | 5                                                                         |

**Electrical Characteristics** (continuous) $T_A = 25^\circ\text{C}$  unless otherwise noted.

| Uni-directional<br>Bi-directional<br>(C) Device | Reverse<br>Stand-Off<br>Voltage<br>$V_{RWM}(V)$ | Breakdown<br>Voltage<br>$V_{BR}(V)$ |       | Test<br>Current<br>$I_T(mA)$ | Clamping<br>Voltage at<br>$I_{PPM} V_C(C)$ | Peak Pulse<br>Current<br>$I_{PPM} (A)$ | Reverse<br>Leakage<br>$V_{RWM}$<br>$I_R(\mu A)^{(2)}$ |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------|-------|------------------------------|--------------------------------------------|----------------------------------------|-------------------------------------------------------|
|                                                 |                                                 | Min.                                | Max.  |                              |                                            |                                        |                                                       |
| 1V5KE170(C)A                                    | 145.0                                           | 162.0                               | 179.0 | 1                            | 234.0                                      | 6.4                                    | 5                                                     |
| 1V5KE180(C)A                                    | 154.0                                           | 171.0                               | 189.0 | 1                            | 246.0                                      | 6.1                                    | 5                                                     |
| 1V5KE200(C)A                                    | 171.0                                           | 190.0                               | 210.0 | 1                            | 274.0                                      | 5.5                                    | 5                                                     |
| 1V5KE220(C)A                                    | 185.0                                           | 209.0                               | 231.0 | 1                            | 328.0                                      | 4.6                                    | 5                                                     |
| 1V5KE250(C)A                                    | 214.0                                           | 237.0                               | 263.0 | 1                            | 344.0                                      | 4.5                                    | 5                                                     |
| 1V5KE300(C)A                                    | 256.0                                           | 285.0                               | 315.0 | 1                            | 414.0                                      | 3.8                                    | 5                                                     |
| 1V5KE350(C)A                                    | 300.0                                           | 333.0                               | 368.0 | 1                            | 482.0                                      | 3.2                                    | 5                                                     |
| 1V5KE400(C)A                                    | 342.0                                           | 380.0                               | 420.0 | 1                            | 548.0                                      | 2.8                                    | 5                                                     |
| 1V5KE440(C)A                                    | 376.0                                           | 418.0                               | 462.0 | 1                            | 602.0                                      | 2.6                                    | 5                                                     |

**Note:**2. For bi-directional parts with  $V_{RWM} < 10\text{ V}$ , the  $I_R$  maximum limit is doubled.

## Typical Performance Characteristics

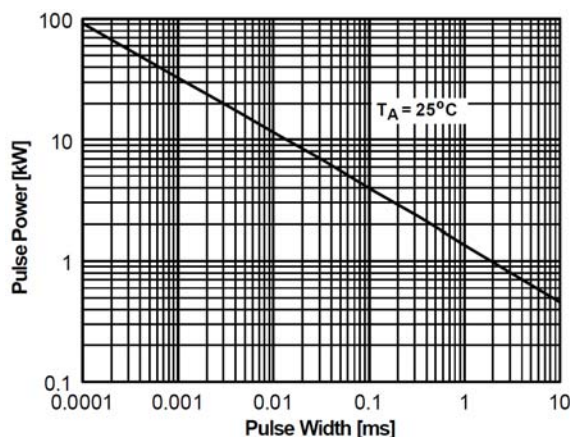


Figure 1. Peak Pulse Power Rating Curve

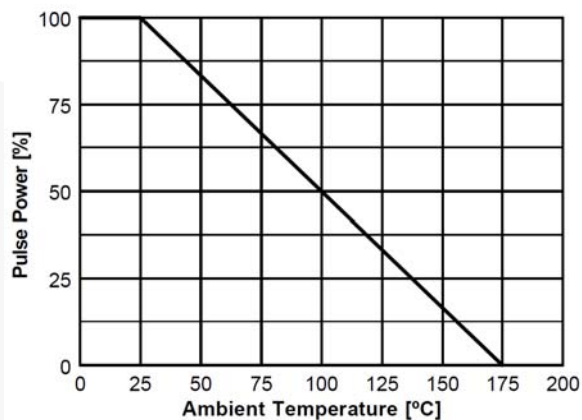


Figure 2. Pulse Derating Curve

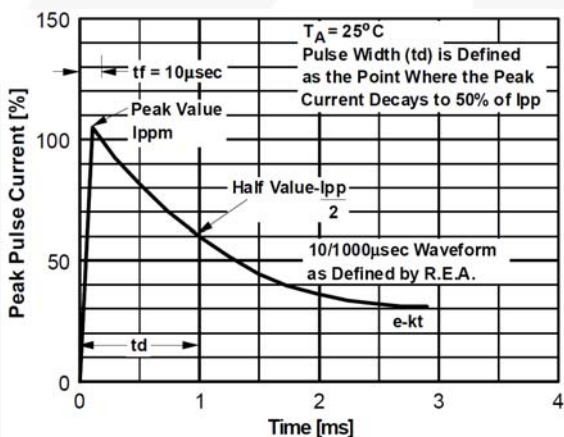


Figure 3. Pulse Waveform

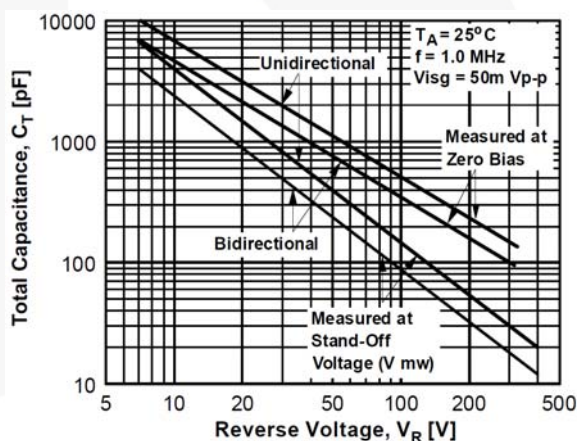


Figure 4. Total Capacitance

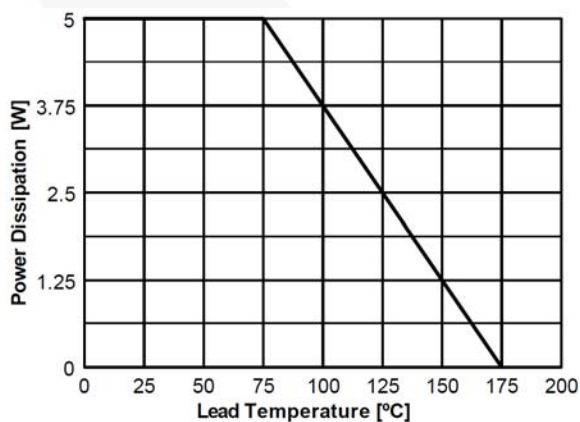


Figure 5. Steady State Power Derating Curve

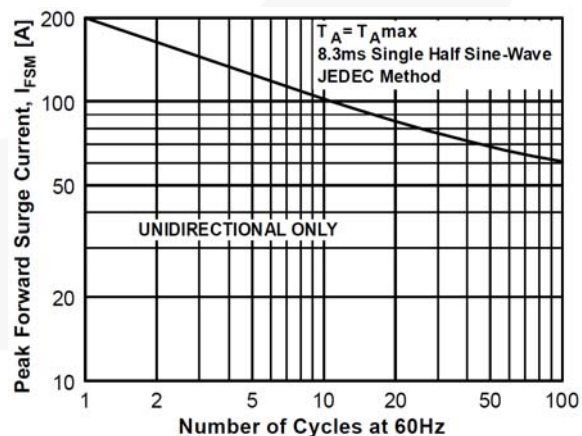


Figure 6. Non-Repetitive Surge Current

## Physical Dimension

## DO-201AE

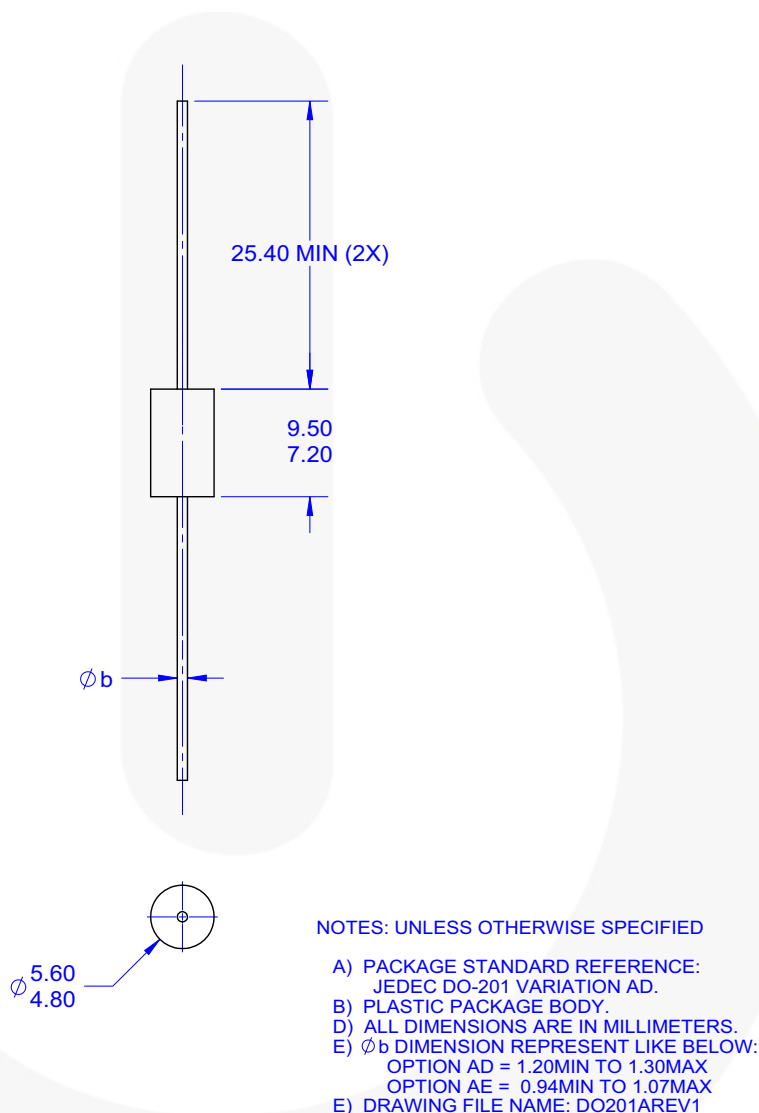


Figure 7. AXIAL LEADED; JEDEC DO201; OPTION AD (ACTIVE)

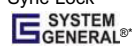
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