

Power TVS in DO-201AD

Features

- 1500Watts peak pulse power (10/1000 μ s)
- Class passivated junction
- High accuracy, 5% tolerance
- Uni and Bidirectional unit
- Low clamping voltage
- Low Leakage current
- Very fast response time



Mechanical Data

- **Case:** DO-201AD (plastic package).
Lead free; RoHS compliant
- **Molding Compound Flammability Rating:**
UL 94 V-0
- **Terminals:** High temperature soldering guaranteed:
260 °C/10 sec. at terminals

Applications

- Computers
- Telecom systems
- Industrial equipments
- Consumer electronic applications
- Other VCC bus and I/O interfaces

Absolute Maximum Ratings

Ratings at 25 °C, ambient temperature unless otherwise specified

| Parameter | Symbols | Value | Unit |
|-------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|------|
| Peak power dissipation with a 10/1000us waveform ⁽¹⁾ (Fig. 1) | P _{PPM} | 1500 | W |
| Peak pulse current with a 10/1000us waveform ⁽¹⁾ | I _{PPM} | See Next Table | A |
| Steady state power dissipation at T _L =75°C, lead lengths 0.375" (9.5mm) ⁽²⁾ | P _{M(AV)} | 6.5 | W |
| Peak forward surge current 8.3ms single half sine-wave ⁽³⁾ | I _{FSM} | 200 | A |
| Maximum instantaneous forward voltage @ 50A for unidirectional only ⁽⁴⁾ | V _F | 3.5/5.0 | V |
| Typical thermal resistance junction-to-lead | R _{θJL} | 20 | °C/W |
| Typical thermal resistance junction-to-ambient | R _{θJA} | 75 | °C/W |
| Operating junction and storage temperature range | T _J , T _{STG} | -55 to +150 | °C |

Notes:1.Non-repetitive current pulse, per Fig.3 and derated above T_A=25°C per Fig. 2

2. Mounted on copper pad area of 1.6 x 1.6" (40 x 40mm) per Fig. 5

3. Meas ed on 8.3ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

4. V_F=3.5 V for devices of V_(BR) < 220V, and V_F=5.0 Volt max. for devices of V_(BR)>220V

Electrical Characteristics

($T_A=25^{\circ}\text{C}$, Unless otherwise specified.)

| Device type | | Breakdown voltage $V_{(BR)}$ (Volts) ⁽¹⁾ | | Test current at I_T (mA) | Stand-off voltage V_{WM} (Volts) | Maximum reverse leakage at V_{WM} $I_D^{(4)}$ (μA) | Maximum peak pulse current $I_{PPM}^{(2)}$ (A) | Maximum clamping voltage at I_{PPM} V_C (Volts) | Maximum temperature coefficient of V_{BR} (% / $^{\circ}\text{C}$) |
|-------------|------------|-----------------------------------------------------|------|----------------------------|------------------------------------|-------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------|
| | | Min. | Max. | | | | | | |
| 1.5KE6.8A | 1.5KE6.8CA | 6.45 | 7.14 | 10 | 5.80 | 1000 | 143 | 10.5 | 0.057 |
| 1.5KE7.5A | 1.5KE7.5CA | 7.13 | 7.88 | 10 | 6.40 | 500 | 133 | 11.3 | 0.061 |
| 1.5KE8.2A | 1.5KE8.2CA | 7.79 | 8.61 | 10 | 7.02 | 200 | 124 | 12.1 | 0.065 |
| 1.5KE9.1A | 1.5KE9.1CA | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 112 | 13.4 | 0.068 |
| 1.5KE10A | 1.5KE10CA | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 103 | 14.5 | 0.073 |
| 1.5KE11A | 1.5KE11CA | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 96.2 | 15.6 | 0.075 |
| 1.5KE12A | 1.5KE12CA | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 89.8 | 16.7 | 0.078 |
| 1.5KE13A | 1.5KE13CA | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 82.4 | 18.2 | 0.081 |
| 1.5KE15A | 1.5KE15CA | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 70.8 | 21.2 | 0.084 |
| 1.5KE16A | 1.5KE16CA | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 66.7 | 22.5 | 0.086 |
| 1.5KE18A | 1.5KE18CA | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 59.5 | 25.2 | 0.088 |
| 1.5KE20A | 1.5KE20CA | 19.0 | 21.0 | 1.0 | 17.1 | 1.0 | 54.2 | 27.7 | 0.090 |
| 1.5KE22A | 1.5KE22CA | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 49.0 | 30.6 | 0.092 |
| 1.5KE24A | 1.5KE24CA | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 45.2 | 33.2 | 0.094 |
| 1.5KE27A | 1.5KE27CA | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 40.0 | 37.5 | 0.096 |
| 1.5KE30A | 1.5KE30CA | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 36.2 | 41.4 | 0.097 |
| 1.5KE33A | 1.5KE33CA | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 32.8 | 45.7 | 0.098 |
| 1.5KE36A | 1.5KE36CA | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 30.1 | 49.9 | 0.099 |
| 1.5KE39A | 1.5KE39CA | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 27.8 | 53.9 | 0.100 |
| 1.5KE43A | 1.5KE43CA | 40.9 | 45.2 | 1.0 | 36.8 | 1.0 | 25.3 | 59.3 | 0.101 |
| 1.5KE47A | 1.5KE47CA | 44.7 | 49.4 | 1.0 | 40.2 | 1.0 | 23.1 | 64.8 | 0.101 |
| 1.5KE51A | 1.5KE51CA | 48.5 | 53.6 | 1.0 | 43.6 | 1.0 | 21.4 | 70.1 | 0.102 |
| 1.5KE56A | 1.5KE56CA | 53.2 | 58.8 | 1.0 | 47.8 | 1.0 | 19.5 | 77.0 | 0.103 |
| 1.5KE62A | 1.5KE62CA | 58.9 | 65.1 | 1.0 | 53.0 | 1.0 | 17.6 | 85.0 | 0.104 |
| 1.5KE68A | 1.5KE68CA | 64.6 | 71.4 | 1.0 | 58.1 | 1.0 | 16.3 | 92.0 | 0.104 |
| 1.5KE75A | 1.5KE75CA | 71.3 | 78.8 | 1.0 | 64.1 | 1.0 | 14.6 | 104 | 0.105 |
| 1.5KE82A | 1.5KE82CA | 77.9 | 86.1 | 1.0 | 70.1 | 1.0 | 13.3 | 113 | 0.105 |
| 1.5KE91A | 1.5KE91CA | 86.5 | 95.5 | 1.0 | 77.8 | 1.0 | 12.0 | 125 | 0.106 |
| 1.5KE100A | 1.5KE100CA | 95.0 | 105 | 1.0 | 85.5 | 1.0 | 10.9 | 137 | 0.106 |
| 1.5KE110A | 1.5KE110CA | 105 | 116 | 1.0 | 94.0 | 1.0 | 9.9 | 152 | 0.107 |
| 1.5KE120A | 1.5KE120CA | 114 | 126 | 1.0 | 102 | 1.0 | 9.1 | 165 | 0.107 |
| 1.5KE130A | 1.5KE130CA | 124 | 137 | 1.0 | 111 | 1.0 | 8.4 | 179 | 0.107 |
| 1.5KE150A | 1.5KE150CA | 143 | 158 | 1.0 | 128 | 1.0 | 7.2 | 207 | 0.106 |
| 1.5KE160A | 1.5KE160CA | 152 | 168 | 1.0 | 136 | 1.0 | 6.8 | 219 | 0.108 |
| 1.5KE170A | 1.5KE170CA | 162 | 179 | 1.0 | 145 | 1.0 | 6.4 | 234 | 0.108 |
| 1.5KE180A | 1.5KE180CA | 171 | 189 | 1.0 | 154 | 1.0 | 6.1 | 246 | 0.108 |

| Device type | | Breakdown voltage $V_{(BR)}$ (Volts) ⁽¹⁾ | | Test current at I_T (mA) | Stand-off voltage V_{WM} (Volts) | Maximum reverse leakage at V_{WM} I_D ⁽⁴⁾ (μA) | Maximum peak pulse current I_{PPM} ⁽²⁾ (A) | Maximum clamping voltage at I_{PPM} V_C (Volts) | Maximum temperature coefficient of V_{BR} (% / $^{\circ}C$) |
|-------------|------------|-----------------------------------------------------|-------|----------------------------|------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------|
| | | Min. | Max. | | | | | | |
| 1.5KE200A | 1.5KE200CA | 190 | 210 | 1.0 | 171 | 1.0 | 5.5 | 274 | 0.108 |
| 1.5KE220A | 1.5KE220CA | 209 | 231 | 1.0 | 185 | 1.0 | 4.6 | 328 | 0.108 |
| 1.5KE250A | 1.5KE250CA | 237 | 263 | 1.0 | 214 | 1.0 | 4.4 | 344 | 0.110 |
| 1.5KE300A | 1.5KE300CA | 285 | 315 | 1.0 | 256 | 1.0 | 3.6 | 414 | 0.110 |
| 1.5KE350A | 1.5KE350CA | 333 | 368 | 1.0 | 300 | 1.0 | 3.1 | 482 | 0.110 |
| 1.5KE400A | 1.5KE400CA | 380 | 420 | 1.0 | 342 | 1.0 | 2.7 | 548 | 0.110 |
| 1.5KE440A | 1.5KE440CA | 418 | 462 | 1.0 | 376 | 1.0 | 2.5 | 602 | 0.110 |
| 1.5KE480A | 1.5KE480CA | 456 | 504 | 1.0 | 408 | 1.0 | 2.3 | 658 | 0.110 |
| 1.5KE510A | 1.5KE510CA | 485 | 535 | 1.0 | 434 | 1.0 | 2.1 | 698 | 0.110 |
| 1.5KE530A | 1.5KE530CA | 503.5 | 556.5 | 1.0 | 450 | 1.0 | 2.1 | 725 | 0.110 |
| 1.5KE540A | 1.5KE540CA | 513 | 567 | 1.0 | 459 | 1.0 | 2.0 | 740 | 0.110 |
| 1.5KE550A | 1.5KE550CA | 522.5 | 577.5 | 1.0 | 467 | 1.0 | 2.0 | 760 | 0.110 |

- Notes: 1. $V_{(BR)}$ measured after I_T applied for 300 μs , I_T =square wave pulse or equivalent
 2. Surge current waveform per Fig. 3 and derate per Fig. 2
 3. For bidirectional types with V_R of 10 volts and less, the I_D limit is doubled
 4. All terms and symbols are consistent with ANSI/IEEE CA62.35
 5. For parts without A, the V_{BR} is $\pm 10\%$

Typical Characteristics ($T_{amb} = 25^{\circ}C$ unless otherwise specified)



Fig.3 Pulse Waveform

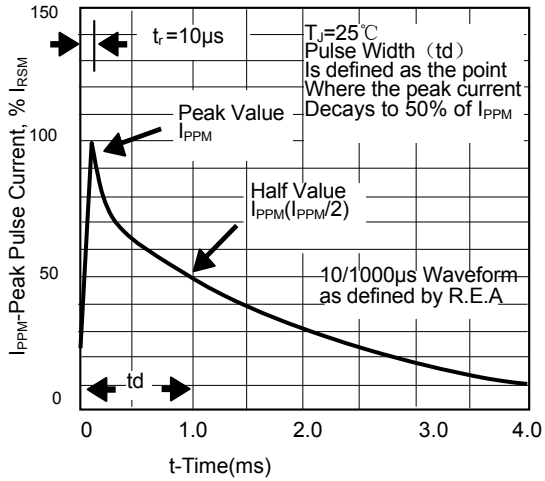


Fig.4 Typical Junction Capacitance

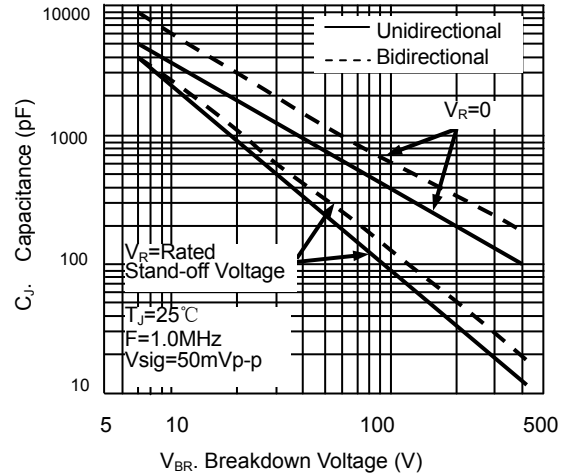


Fig.5 Steady State Power Derating Curve

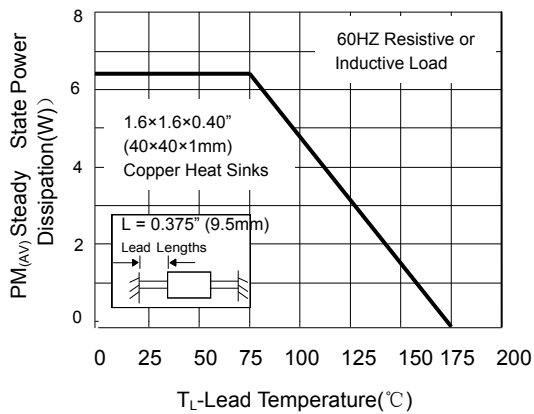


Fig.6 Max. Non-Repetitive Peak Forward Surge Current Unidirectional Only

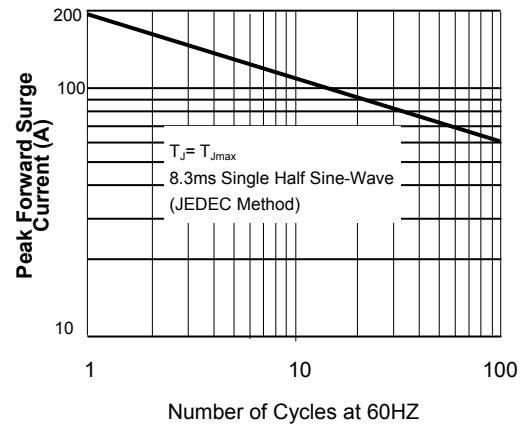


Fig.7 Incremental Clamping Voltage Curve (Unidirectional)

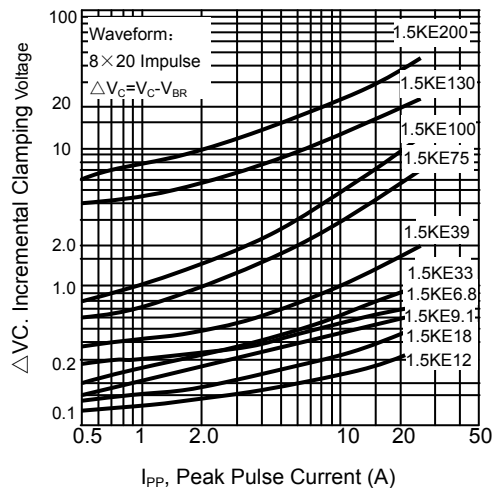


Fig.8 Incremental Clamping Voltage Curve (Bidirectional)

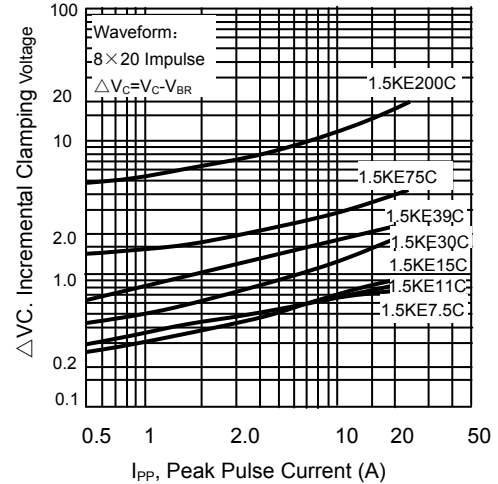


Fig.9 Instantaneous Forward Voltage Characteristics Curve

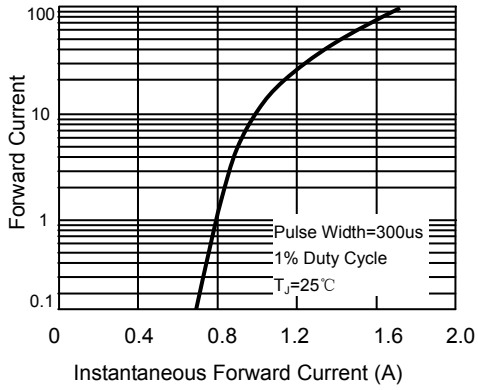


Fig.10 Breakdown Voltage Temperature Coefficient Curve



Fig.11 Typical Transient Thermal Impedance Thermal Impedance



Package Dimensions



Part number system



Ordering information

| Order code | Package | Packaging option | Base quantity | Packaging specification |
|--------------|----------|------------------|---------------|-------------------------|
| 1.5KExxA(CA) | DO-201AD | Tape and BOX | 1000pcs | EIA STD RS-481 |

Revision history

| Date | Revision | Changes |
|-------------|----------|-----------------|
| 23-May-2012 | 1.0 | Initial release |

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