

**ALSO
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MOUNT**

Microsemi Corp.

The diode experts.

SCOTTSDALE, AZ
For more information call:
(602) 941-6300

**1N6267 thru
1N6303A
and 1.5KE6.8 thru
1.5KE400A**

FEATURES

- ECONOMICAL
- 1500 WATTS PEAK PULSE POWER DISSIPATION
- STAND OFF VOLTAGES FROM 5.5V - 171V
- UNIPOLAR OR BIPOLAR
- AVAILABLE IN CHIP FORM FOR HYBRID APPLICATION
- MULTI-CHIP BIDIRECTIONAL CELLS AVAILABLE

DESCRIPTION

This defines a series of silicon Transient Suppressors designed to protect voltage sensitive components from high energy voltage transients. TAZ devices have become very important as a consequence of their high surge capability, extremely fast response time, and low incremental surge resistance (R_s).

To characterize TAZ, a minimum voltage at low current conditions (V_{BR}), and a maximum clamping voltage (V_C), at a maximum peak pulse current are specified. In addition, a maximum clamping ratio is indicated. The maximum leakage current at the rated stand-off voltage is also provided to assure low power consumption under normal conditions.

APPLICATION

This TAZ series has a peak pulse power rating of 1500 watts for one millisecond. It can protect integrated circuits, hybrids, CMOS, MOS, and other voltage sensitive components in a broad range of applications such as telecommunications, power supplies, computers, automotive, and industrial equipment.

MAXIMUM RATINGS

1500 Watts of Peak Pulse Power Dissipation at 25°C.

$t_{clamping}$ (0 Volts to $V_{(BR)}$ Min.):

Unidirectional $< 1 \times 10^{-12}$ Seconds; Bidirectional $< 5 \times 10^{-9}$ Seconds.

Operating and Storage Temperature -65°C to +175°C.

Forward Surge Rating 200 Amps, 1/20 Second at 25°C.

Steady State Power Dissipation 5.0 W @ $T_1 = 75^\circ\text{C}$.

(Not Applicable in Chip Form).

ELECTRICAL CHARACTERISTICS

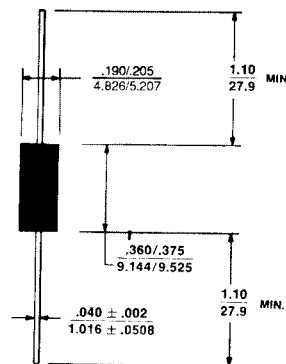
Clamping Factor: 1.33 @ full rated power

1.20 @ 50% rated power

The Clamping Factor is defined as: The ratio of the actual V_C (Clamping Voltage) to the actual $V_{(BR)}$ (Breakdown Voltage) as measured on a specific device.

**TRANSIENT
ABSORPTION ZENER**

**UNIDIRECTIONAL
AND
BIDIRECTIONAL**



All dimensions in **INCH**
m. m.

MECHANICAL CHARACTERISTICS

CASE: Molded

WEIGHT: 1.5 Grams (Approx.)

POLARITY: Positive Terminal
Marked with Band

1N6267 thru 1N6303A and 1.5KE6.8 thru 1.5KE400A ELECTRICAL CHARACTERISTICS @ 25°C

| Industry Type Number | JEDEC Type Number | Rated Stand-off Voltage V _{WM} | Breakdown Voltage (V _{BR}) VOLTS | | | Maximum Clamping Voltage V _C VOLTS | Maximum Reverse Leakage I _R μA | Rated Peak Pulse Current I _{pp} A | Maximum Temperature Coefficient α ±% |
|----------------------|-------------------|--|--|--------|----------|--|--|---|---|
| | | | MIN | MAX | # 1T mil | | | | |
| 1.5KE6.8 | 1N5908 | 5.0 | 6.0 | .057 | 7.6 | 300 | 30. | -.057 | |
| 1.5KE6.8A | 1N6267 | 5.0 | 6.12 | 7.48 | 10 | 100 | 139.0 | -.057 | |
| 1.5KE7.5 | 1N6268 | 5.80 | 6.45 | 7.14 | 10 | 100 | 143.0 | -.057 | |
| 1.5KE7.5A | 1N6269 | 6.05 | 6.75 | 8.25 | 10 | 11.7 | 500 | -.061 | |
| 1.5KE8.0 | 1N6270 | 6.0 | 7.13 | 7.88 | 10 | 11.3 | 500 | -.061 | |
| 1.5KE8.0A | 1N6271 | 6.63 | 7.36 | 9.02 | 10 | 12.5 | 200 | -.065 | |
| 1.5KE8.0B | 1N6272 | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 200 | -.065 | |
| 1.5KE9.1 | 1N5911 | 7.37 | 8.19 | 10.00 | 1 | 13.8 | 50 | -.068 | |
| 1.5KE9.1A | 1N6273 | 7.78 | 8.65 | 9.55 | 1 | 15.5 | 100 | -.073 | |
| 1.5KE10 | 1N6274 | 8.10 | 9.00 | 11.00 | 1 | 15.0 | 10 | -.073 | |
| 1.5KE10A | 1N6275 | 8.55 | 9.50 | 10.50 | 1 | 14.5 | 10 | -.075 | |
| 1.5KE11 | 1N6276 | 8.92 | 9.90 | 12.10 | 1 | 16.2 | 5 | -.075 | |
| 1.5KE11A | 1N6277 | 9.50 | 10.50 | 11.60 | 1 | 15.6 | 5 | -.081 | |
| 1.5KE12 | 1N6278 | 9.72 | 10.80 | 13.70 | 1 | 17.3 | 5 | -.081 | |
| 1.5KE12A | 1N6279 | 10.20 | 11.40 | 12.60 | 1 | 16.7 | 5 | -.084 | |
| 1.5KE13 | 1N6280 | 10.50 | 11.70 | 14.30 | 1 | 18.0 | 5 | -.084 | |
| 1.5KE13A | 1N6281 | 11.10 | 12.40 | 13.70 | 1 | 18.2 | 5 | -.086 | |
| 1.5KE15 | 1N6282 | 12.10 | 13.50 | 16.50 | 1 | 22.0 | 5 | -.084 | |
| 1.5KE15A | 1N6283 | 12.80 | 14.30 | 15.80 | 1 | 21.2 | 5 | -.086 | |
| 1.5KE16 | 1N6284 | 12.90 | 14.40 | 17.60 | 1 | 22.5 | 5 | -.086 | |
| 1.5KE16A | 1N6285 | 13.60 | 15.20 | 16.80 | 1 | 22.5 | 5 | -.088 | |
| 1.5KE18 | 1N6277 | 14.50 | 16.20 | 19.80 | 1 | 26.5 | 5 | -.088 | |
| 1.5KE18A | 1N6278 | 15.30 | 17.10 | 18.90 | 1 | 25.2 | 5 | -.088 | |
| 1.5KE20 | 1N6279 | 16.20 | 18.00 | 22.00 | 1 | 29.1 | 5 | -.090 | |
| 1.5KE20A | 1N6280 | 17.10 | 19.00 | 21.00 | 1 | 27.7 | 5 | -.092 | |
| 1.5KE22 | 1N6279 | 17.80 | 19.80 | 24.20 | 1 | 31.9 | 5 | -.092 | |
| 1.5KE22A | 1N6280 | 18.80 | 20.90 | 23.10 | 1 | 30.6 | 5 | -.094 | |
| 1.5KE24 | 1N6281 | 19.40 | 21.60 | 26.40 | 1 | 34.7 | 5 | -.094 | |
| 1.5KE24A | 1N6282 | 20.50 | 22.80 | 25.20 | 1 | 33.2 | 5 | -.096 | |
| 1.5KE27 | 1N6281 | 21.80 | 24.30 | 29.70 | 1 | 39.1 | 5 | -.096 | |
| 1.5KE27A | 1N6282 | 23.10 | 25.70 | 28.40 | 1 | 37.5 | 5 | -.096 | |
| 1.5KE30 | 1N6282 | 24.30 | 27.00 | 33.00 | 1 | 43.5 | 5 | -.097 | |
| 1.5KE30A | 1N6283 | 25.60 | 28.50 | 31.50 | 1 | 41.4 | 5 | -.097 | |
| 1.5KE33 | 1N6283 | 26.80 | 29.70 | 36.30 | 1 | 47.7 | 5 | -.098 | |
| 1.5KE33A | 1N6284 | 28.20 | 31.40 | 34.70 | 1 | 45.9 | 5 | -.099 | |
| 1.5KE36 | 1N6284 | 29.00 | 32.40 | 39.60 | 1 | 52.0 | 5 | -.100 | |
| 1.5KE36A | 1N6285 | 30.80 | 34.20 | 37.80 | 1 | 49.9 | 5 | -.100 | |
| 1.5KE39 | 1N6285 | 31.60 | 35.10 | 42.90 | 1 | 56.4 | 5 | -.100 | |
| 1.5KE39A | 1N6286 | 33.30 | 37.10 | 41.00 | 1 | 53.9 | 5 | -.101 | |
| 1.5KE43 | 1N6286 | 34.80 | 38.70 | 47.30 | 1 | 61.9 | 5 | -.101 | |
| 1.5KE43A | 1N6287 | 36.80 | 40.90 | 45.20 | 1 | 59.3 | 5 | -.101 | |
| 1.5KE47 | 1N6287 | 38.10 | 42.30 | 51.70 | 1 | 67.8 | 5 | -.101 | |
| 1.5KE51A | 1N6287A | 40.20 | 44.70 | 49.40 | 1 | 73.5 | 5 | -.102 | |
| 1.5KE51A | 1N6288 | 41.30 | 45.90 | 56.10 | 1 | 80.1 | 5 | -.102 | |
| 1.5KE51A | 1N6289 | 43.60 | 48.50 | 53.60 | 1 | 70.7 | 5 | -.103 | |
| 1.5KE56 | 1N6289 | 45.80 | 50.80 | 61.80 | 1 | 81.80 | 5 | -.103 | |
| 1.5KE56A | 1N6290 | 47.80 | 53.20 | 58.80 | 1 | 77.0 | 5 | -.103 | |
| 1.5KE57 | 1N6290 | 50.70 | 55.80 | 68.20 | 1 | 89.0 | 5 | -.104 | |
| 1.5KE62A | 1N6290A | 53.00 | 58.90 | 65.10 | 1 | 85.0 | 5 | -.104 | |
| 1.5KE66 | 1N6291 | 55.10 | 61.20 | 74.80 | 1 | 98.0 | 5 | -.104 | |
| 1.5KE68A | 1N6291A | 58.10 | 64.60 | 71.40 | 1 | 92.0 | 5 | -.104 | |
| 1.5KE75 | 1N6292 | 60.70 | 67.50 | 82.50 | 1 | 108.0 | 5 | -.105 | |
| 1.5KE75A | 1N6293 | 64.10 | 71.30 | 78.00 | 1 | 103.0 | 5 | -.105 | |
| 1.5KE82 | 1N6293 | 66.40 | 73.80 | 90.20 | 1 | 118.0 | 5 | -.105 | |
| 1.5KE82A | 1N6293A | 70.10 | 77.90 | 86.10 | 1 | 113.0 | 5 | -.105 | |
| 1.5KE91 | 1N6294 | 73.70 | 81.90 | 100.00 | 1 | 131.0 | 5 | -.106 | |
| 1.5KE91A | 1N6294A | 77.80 | 86.50 | 95.50 | 1 | 125.0 | 5 | -.106 | |
| 1.5KE100 | 1N6295 | 81.00 | 90.00 | 110.00 | 1 | 144.0 | 5 | -.106 | |
| 1.5KE100A | 1N6295A | 85.50 | 95.00 | 105.00 | 1 | 137.0 | 5 | -.106 | |
| 1.5KE110 | 1N6296 | 89.20 | 99.10 | 121.00 | 1 | 158.0 | 5 | -.107 | |
| 1.5KE110A | 1N6296A | 94.00 | 105.00 | 116.00 | 1 | 152.0 | 5 | -.107 | |
| 1.5KE120 | 1N6297 | 97.20 | 108.00 | 132.00 | 1 | 173.0 | 5 | -.107 | |
| 1.5KE120A | 1N6297A | 102.00 | 114.00 | 126.00 | 1 | 165.0 | 5 | -.107 | |
| 1.5KE130 | 1N6298 | 105.00 | 117.00 | 143.00 | 1 | 187.0 | 5 | -.107 | |
| 1.5KE130A | 1N6298A | 111.00 | 124.00 | 137.00 | 1 | 179.0 | 5 | -.107 | |
| 1.5KE150 | 1N6299 | 121.00 | 135.00 | 165.00 | 1 | 215.0 | 5 | -.108 | |
| 1.5KE150A | 1N6299A | 128.00 | 143.00 | 158.00 | 1 | 207.0 | 5 | -.108 | |
| 1.5KE160 | 1N6300 | 130.00 | 144.00 | 176.00 | 1 | 230.0 | 5 | -.108 | |
| 1.5KE160A | 1N6300A | 136.00 | 152.00 | 168.00 | 1 | 219.0 | 5 | -.108 | |
| 1.5KE170 | 1N6303 | 138.00 | 153.00 | 187.00 | 1 | 244.0 | 5 | -.108 | |
| 1.5KE170A | 1N6303A | 145.00 | 162.00 | 179.00 | 1 | 234.0 | 5 | -.108 | |
| 1.5KE180 | 1N6302 | 146.00 | 162.00 | 198.00 | 1 | 258.0 | 5 | -.108 | |
| 1.5KE180A | 1N6302A | 154.00 | 171.00 | 189.00 | 1 | 246.0 | 5 | -.108 | |
| 1.5KE200 | 1N6303 | 162.00 | 180.00 | 220.00 | 1 | 287.0 | 5 | -.108 | |
| 1.5KE200A | 1N6303A | 171.00 | 190.00 | 210.00 | 1 | 274.0 | 5 | -.108 | |
| 1.5KE220 | 175 | 198 | 242 | 344 | 5 | 4.3 | 0.110 | | |
| 1.5KE220A | 185 | 209 | 231 | 328 | 5 | 4.6 | 0.110 | | |
| 1.5KE250 | 202 | 225 | 275 | 360 | 5 | 5.0 | 0.110 | | |
| 1.5KE250A | 214 | 237 | 263 | 344 | 5 | 5.0 | 0.110 | | |
| 1.5KE300 | 243 | 270 | 330 | 430 | 5 | 5.0 | 0.111 | | |
| 1.5KE300A | 256 | 285 | 315 | 414 | 5 | 5.0 | 0.111 | | |
| 1.5KE350 | 284 | 315 | 385 | 504 | 5 | 4.0 | 0.111 | | |
| 1.5KE350A | 300 | 332 | 368 | 482 | 5 | 4.0 | 0.111 | | |
| 1.5KE400 | 324 | 360 | 440 | 574 | 5 | 4.0 | 0.111 | | |
| 1.5KE400A | 342 | 380 | 420 | 548 | 5 | 4.0 | 0.111 | | |

V_F at 100 amps peak, 8.3 ms sine wave equals 3.5 volts max. (unidirectional only). For Bidirectional part number add C or CA as suffix (e.g., 1.5KE33C or 1.5KE33CA). For Bidirectional types having V_{WM} of 8 volts and under, the I_D leakage current is doubled. 1N62XX or 1N5908 not available as bidirectional. For bipolar capacitance will be .5 that shown in Fig. 2 for zero bias.

SYMBOLS AND ABBREVIATIONS

- V_{WM} = Rated Stand-off Voltage
- I_{pp} = Peak Pulse Current
- P_{pp} = Peak Pulse Power
- V_{C(MAX)} = Maximum Clamping Voltage
- V_{BR} = Breakdown Voltage
- I_T = Test Current
- I_D = Reverse Leakage

NOTE 1: Normal selection criteria for TAZ devices is by rated stand-off voltage (V_{WM}) and should be equal or greater than DC or continuous peak operating voltage.
NOTE 2: TAZ devices are tested to maximum peak pulse current (I_{pp}) with clamping voltage monitored. This surge capability is one of the most significant electrical characteristics of the device and should be considered as part of customer quality inspections.

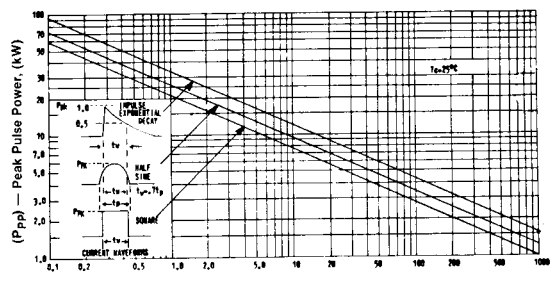
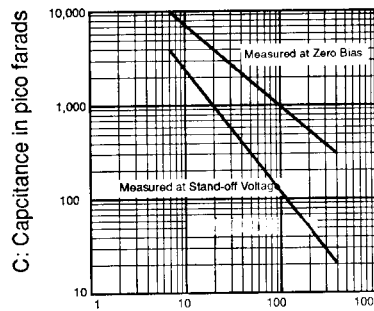


FIGURE 1
PEAK PULSE POWER VS. PULSE TIME (T_w) IN μs



BV: Breakdown Voltage in Volts

FIGURE 2
TYPICAL CAPACITANCE VS.
BREAKDOWN VOLTAGE

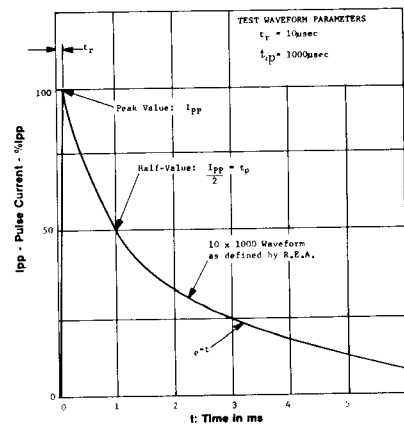


FIGURE 3 PULSE WAVE FORM

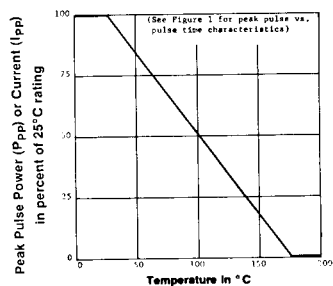


FIGURE 4 DERATING CURVE