

1.5KE6.8A(CA) THRU 1.5KE440A(CA)

POWER 1500 W
VOLTAGE 6.8 to 440 V

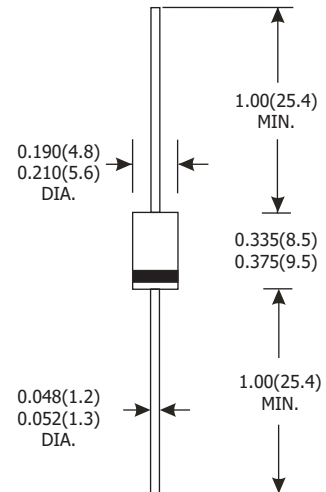
Features

- Underwriters Laboratory recognition under UL standard for safety 497B : Isolated loop circuit protection
- Glass passivated junction
- 1500W peak pulse power capability on 10/1000 μ s waveform, repetition rate(duty cycle) : 0.05%
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Includes 1N6267 thru 1N6303A

Mechanical Data

- Case : JEDEC DO-201AD molded plastic body over passivated junction
- Terminals : Solder plated axial leads, solderable per MIL-STD-750, method 2026
- High temperature soldering guaranteed : 265°C/10 seconds, 0.375"(9.5mm) lead length, 5lbs. (2.3Kg) tension
- Polarity : For uni-directional types the color band denotes cathode, which is positive with respect to the anode under normal TVS operation
- Mounting Position : Any
- Weight : 0.042 ounce, 0.18 gram
- Flammability : Epoxy is rated UL 94V-0

DO-201AD



Dimensions in inches and (millimeters)

Devices For Bidirectional Applications

- For bi-directional use C or CA suffix for types 1.5KE6.8 thru types 1.5KE440 (e.g. 1.5KE6.8C, 1.5KE440CA), electrical characteristics apply in both directions.

Maximum Ratings And Electrical Characteristics

(Ratings at 25°C ambient temperature unless otherwise specified)

| Items | Symbols | Value | Units |
|---|-----------------------------------|----------------|-------|
| Peak power dissipation with a 10/1000 μ s waveform (Note 1. Fig. 1) | PPPM | 1500 | W |
| Peak pulse current with a 10/1000 μ s waveform (Note 1) | IPPM | See next table | A |
| Steady state power dissipation at $T_L=75^\circ\text{C}$ lead length 0.375"(9.5mm) (Note 2) | PM(AV) | 6.5 | W |
| Peak forward surge current, 8.3mm single half sine-wave unidirectional only (Note 3) | IFSM | 200 | A |
| Maximum instantaneous forward voltage at 100A for unidirectional only (Note 4) | V _F | 3.5/5.0 | V |
| Typical thermal resistance junction to lead | R θ JL | 20 | °C/W |
| Typical thermal resistance junction to ambient | R θ JA | 75 | °C/W |
| Operating junction and storage temperature range | T _J , T _{STG} | -55 to +175 | °C |

Notes:

- (1) Non repetitive current pulse, per Fig.3 and derated above $T_A=25^\circ\text{C}$ per Fig.2
- (2) Mounted on copper pads area of 1.6 \times 1.6"(40 \times 40mm) per Fig.5
- (3) Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulse per minute maximum
- (4) V_F=3.5 Volts for 1.5KE220(A) & below; V_F=5.0 Volts for 1.5KE250(A) & above



ELECTRICAL CHARACTERISTICS 1.5KE6.8A(CA) THRU 1.5KE440A(CA)

(TA = 25 °C unless other specified)

| DEC Part Number | JEDEC Type Number | Breakdown Voltage V _{BR} at I _T ⁽¹⁾ (V) | | Test Current I _T (mA) | Stand-off Voltage V _{WM} (V) | Maximum Reverse Leakage at V _{WM} I _D ⁽⁴⁾ (μA) | Maximum Peak Pulse Current IPPM ⁽²⁾ (A) | Maximum Clamping Voltage at IPPM V _c (V) | Maximum Temp. Coefficient of V _{BR} (%/°C) |
|-----------------|-------------------|--|------|----------------------------------|---------------------------------------|---|--|---|---|
| | | Min | Max | | | | | | |
| 1.5KE6.8(C) | 1N6267(C) | 6.12 | 7.48 | 10 | 5.50 | 1000 | 139 | 10.8 | 0.057 |
| 1.5KE6.8(C)A | 1N6267(C)A | 6.45 | 7.14 | 10 | 5.80 | 1000 | 143 | 10.5 | 0.057 |
| 1.5KE7.5(C) | 1N6268(C) | 6.75 | 8.25 | 10 | 6.05 | 500 | 128 | 11.7 | 0.061 |
| 1.5KE7.5(C)A | 1N6268(C)A | 7.13 | 7.88 | 10 | 6.40 | 500 | 133 | 11.3 | 0.061 |
| 1.5KE8.2(C) | 1N6269(C) | 7.38 | 9.02 | 10 | 6.63 | 200 | 120 | 12.5 | 0.065 |
| 1.5KE8.2(C)A | 1N6269(C)A | 7.79 | 8.61 | 10 | 7.02 | 200 | 124 | 12.1 | 0.065 |
| 1.5KE9.1(C) | 1N6270(C) | 8.19 | 10.0 | 1.0 | 7.37 | 50 | 109 | 13.8 | 0.068 |
| 1.5KE9.1(C)A | 1N6270(C)A | 8.65 | 9.55 | 1.0 | 7.78 | 50 | 112 | 13.4 | 0.068 |
| 1.5KE10(C) | 1N6271(C) | 9.00 | 11.0 | 1.0 | 8.10 | 10 | 100 | 15.0 | 0.073 |
| 1.5KE10(C)A | 1N6271(C)A | 9.50 | 10.5 | 1.0 | 8.55 | 10 | 103 | 14.5 | 0.073 |
| 1.5KE11(C) | 1N6272(C) | 9.90 | 12.1 | 1.0 | 8.92 | 5.0 | 92.6 | 16.2 | 0.075 |
| 1.5KE11(C)A | 1N6272(C)A | 10.5 | 11.6 | 1.0 | 9.40 | 5.0 | 96.2 | 15.6 | 0.075 |
| 1.5KE12(C) | 1N6273(C) | 10.8 | 13.2 | 1.0 | 9.72 | 5.0 | 86.7 | 17.3 | 0.076 |
| 1.5KE12(C)A | 1N6273(C)A | 11.4 | 12.6 | 1.0 | 10.2 | 5.0 | 89.8 | 16.7 | 0.078 |
| 1.5KE13(C) | 1N6274(C) | 11.7 | 14.3 | 1.0 | 10.5 | 5.0 | 78.9 | 19.0 | 0.081 |
| 1.5KE13(C)A | 1N6274(C)A | 12.4 | 13.7 | 1.0 | 11.1 | 5.0 | 82.4 | 18.2 | 0.081 |
| 1.5KE15(C) | 1N6275(C) | 13.5 | 16.5 | 1.0 | 12.1 | 1.0 | 68.2 | 22.0 | 0.084 |
| 1.5KE15(C)A | 1N6275(C)A | 14.3 | 15.8 | 1.0 | 12.8 | 1.0 | 70.8 | 21.2 | 0.084 |
| 1.5KE16(C) | 1N6276(C) | 14.4 | 17.6 | 1.0 | 12.9 | 1.0 | 63.8 | 23.5 | 0.086 |
| 1.5KE16(C)A | 1N6276(C)A | 15.2 | 16.8 | 1.0 | 13.6 | 1.0 | 66.7 | 22.5 | 0.086 |
| 1.5KE18(C) | 1N6277(C) | 16.2 | 19.8 | 1.0 | 14.5 | 1.0 | 56.6 | 26.5 | 0.088 |
| 1.5KE18(C)A | 1N6277(C)A | 17.1 | 18.9 | 1.0 | 15.3 | 1.0 | 59.5 | 25.2 | 0.089 |
| 1.5KE20(C) | 1N6278(C) | 18.0 | 22.0 | 1.0 | 16.2 | 1.0 | 51.5 | 29.1 | 0.090 |
| 1.5KE20(C)A | 1N6278(C)A | 19.0 | 21.0 | 1.0 | 17.1 | 1.0 | 54.2 | 27.7 | 0.090 |
| 1.5KE22(C) | 1N6279(C) | 19.8 | 24.2 | 1.0 | 17.8 | 1.0 | 47.0 | 31.9 | 0.092 |
| 1.5KE22(C)A | 1N6279(C)A | 20.9 | 23.1 | 1.0 | 18.8 | 1.0 | 49.0 | 30.6 | 0.092 |
| 1.5KE24(C) | 1N6280(C) | 21.6 | 26.4 | 1.0 | 19.4 | 1.0 | 43.2 | 34.7 | 0.094 |
| 1.5KE24(C)A | 1N6280(C)A | 22.8 | 25.2 | 1.0 | 20.5 | 1.0 | 45.2 | 33.2 | 0.094 |
| 1.5KE27(C) | 1N6281(C) | 24.3 | 29.7 | 1.0 | 21.8 | 1.0 | 38.4 | 39.1 | 0.096 |
| 1.5KE27(C)A | 1N6281(C)A | 25.7 | 28.4 | 1.0 | 23.1 | 1.0 | 40.0 | 37.5 | 0.096 |
| 1.5KE30(C) | 1N6282(C) | 27.0 | 33.0 | 1.0 | 24.3 | 1.0 | 34.5 | 43.5 | 0.097 |
| 1.5KE30(C)A | 1N6282(C)A | 28.5 | 31.5 | 1.0 | 25.6 | 1.0 | 36.2 | 41.4 | 0.097 |
| 1.5KE33(C) | 1N6283(C) | 29.7 | 36.3 | 1.0 | 26.8 | 1.0 | 31.4 | 47.7 | 0.098 |
| 1.5KE33(C)A | 1N6283(C)A | 31.4 | 34.7 | 1.0 | 28.2 | 1.0 | 32.8 | 45.7 | 0.098 |
| 1.5KE36(C) | 1N6284(C) | 32.4 | 39.6 | 1.0 | 29.1 | 1.0 | 28.8 | 52.0 | 0.099 |
| 1.5KE36(C)A | 1N6284(C)A | 34.2 | 37.8 | 1.0 | 30.8 | 1.0 | 30.1 | 49.9 | 0.099 |
| 1.5KE39(C) | 1N6285(C) | 35.1 | 42.9 | 1.0 | 31.6 | 1.0 | 26.6 | 56.4 | 0.100 |
| 1.5KE39(C)A | 1N6285(C)A | 37.1 | 41.0 | 1.0 | 33.3 | 1.0 | 27.8 | 53.9 | 0.100 |
| 1.5KE43(C) | 1N6286(C) | 38.7 | 47.3 | 1.0 | 34.8 | 1.0 | 24.2 | 61.9 | 0.101 |
| 1.5KE43(C)A | 1N6286(C)A | 40.9 | 45.2 | 1.0 | 36.8 | 1.0 | 25.3 | 59.3 | 0.101 |
| 1.5KE47(C) | 1N6287(C) | 42.3 | 51.7 | 1.0 | 38.1 | 1.0 | 22.1 | 67.8 | 0.101 |
| 1.5KE47(C)A | 1N6287(C)A | 44.7 | 49.4 | 1.0 | 40.2 | 1.0 | 23.1 | 64.8 | 0.101 |
| 1.5KE51(C) | 1N6288(C) | 45.9 | 56.1 | 1.0 | 41.3 | 1.0 | 20.4 | 73.5 | 0.102 |
| 1.5KE51(C)A | 1N6288(C)A | 48.5 | 53.6 | 1.0 | 43.6 | 1.0 | 21.4 | 70.1 | 0.102 |
| 1.5KE56(C) | 1N6289(C) | 50.4 | 61.8 | 1.0 | 45.4 | 1.0 | 18.6 | 80.5 | 0.103 |
| 1.5KE56(C)A | 1N6289(C)A | 53.2 | 58.8 | 1.0 | 47.8 | 1.0 | 19.5 | 77.0 | 0.103 |
| 1.5KE62(C) | 1N6290(C) | 55.8 | 68.2 | 1.0 | 50.2 | 1.0 | 16.9 | 89.0 | 0.104 |
| 1.5KE62(C)A | 1N6290(C)A | 58.9 | 65.1 | 1.0 | 53.0 | 1.0 | 17.6 | 85.0 | 0.104 |
| 1.5KE68(C) | 1N6291(C) | 61.2 | 74.8 | 1.0 | 55.1 | 1.0 | 15.3 | 98.0 | 0.104 |
| 1.5KE68(C)A | 1N6291(C)A | 64.6 | 71.4 | 1.0 | 58.1 | 1.0 | 16.3 | 92.0 | 0.104 |
| 1.5KE75(C) | 1N6292(C) | 67.5 | 82.5 | 1.0 | 60.7 | 1.0 | 13.9 | 109 | 0.105 |



ELECTRICAL CHARACTERISTICS 1.5KE6.8A(CA) THRU 1.5KE440A(CA)

(TA = 25 °C unless other specified)

| DEC Part Number | JEDEC Type Number | Breakdown Voltage V(BR) at I _T ⁽¹⁾ (V) | | Test Current I _T (mA) | Stand-off Voltage V _{WM} (V) | Maximum Reverse Leakage at W _M I _D ⁽⁴⁾ (μA) | Maximum Peak Pulse Current I _{PPM} ⁽²⁾ (A) | Maximum Clamping Voltage at I _{PPM} V _C (V) | Maximum Temp. Coefficient of V(BR) (%/°C) |
|-----------------|-------------------|--|-------|----------------------------------|---------------------------------------|--|--|---|---|
| | | Min | Max | | | | | | |
| 1.5KE75(C)A | 1N6292(C)A | 71.3 | 78.8 | 1.0 | 64.1 | 1.0 | 14.6 | 104 | 0.105 |
| 1.5KE82(C) | 1N6293(C) | 73.8 | 90.2 | 1.0 | 66.4 | 1.0 | 12.7 | 118 | 0.105 |
| 1.5KE82(C)A | 1N6293(C)A | 77.9 | 86.1 | 1.0 | 70.1 | 1.0 | 13.3 | 113 | 0.105 |
| 1.5KE91(C) | 1N6294(C) | 81.9 | 100.0 | 1.0 | 73.7 | 1.0 | 11.5 | 131 | 0.106 |
| 1.5KE91(C)A | 1N6294(C)A | 86.5 | 95.5 | 1.0 | 77.8 | 1.0 | 12.0 | 125 | 0.106 |
| 1.5KE100(C) | 1N6295(C) | 90.0 | 110 | 1.0 | 81.0 | 1.0 | 10.4 | 144 | 0.106 |
| 1.5KE100(C)A | 1N6295(C)A | 95.0 | 105 | 1.0 | 85.5 | 1.0 | 10.9 | 137 | 0.106 |
| 1.5KE110(C) | 1N6296(C) | 99.0 | 121 | 1.0 | 89.2 | 1.0 | 9.5 | 158 | 0.107 |
| 1.5KE110(C)A | 1N6296(C)A | 105 | 116 | 1.0 | 94.0 | 1.0 | 9.9 | 152 | 0.107 |
| 1.5KE120(C) | 1N6297(C) | 108 | 132 | 1.0 | 97.2 | 1.0 | 8.7 | 173 | 0.107 |
| 1.5KE120(C)A | 1N6297(C)A | 114 | 126 | 1.0 | 102 | 1.0 | 9.1 | 165 | 0.107 |
| 1.5KE130(C) | 1N6298(C) | 117 | 143 | 1.0 | 105 | 1.0 | 8.0 | 187 | 0.107 |
| 1.5KE130(C)A | 1N6298(C)A | 124 | 137 | 1.0 | 111 | 1.0 | 8.4 | 179 | 0.107 |
| 1.5KE150(C) | 1N6299(C) | 136 | 165 | 1.0 | 121 | 1.0 | 7.0 | 215 | 0.108 |
| 1.5KE150(C)A | 1N6299(C)A | 143 | 158 | 1.0 | 128 | 1.0 | 7.2 | 207 | 0.106 |
| 1.5KE160(C) | 1N6300(C) | 144 | 176 | 1.0 | 130 | 1.0 | 6.5 | 230 | 0.106 |
| 1.5KE160(C)A | 1N6300(C)A | 152 | 168 | 1.0 | 136 | 1.0 | 6.8 | 219 | 0.108 |
| 1.5KE170(C) | 1N6301(C) | 153 | 187 | 1.0 | 138 | 1.0 | 6.1 | 244 | 0.108 |
| 1.5KE170(C)A | 1N6301(C)A | 162 | 179 | 1.0 | 145 | 1.0 | 6.4 | 234 | 0.108 |
| 1.5KE180(C) | 1N6302(C) | 162 | 198 | 1.0 | 146 | 1.0 | 5.8 | 258 | 0.108 |
| 1.5KE180(C)A | 1N6302(C)A | 171 | 189 | 1.0 | 154 | 1.0 | 6.1 | 246 | 0.108 |
| 1.5KE200(C) | 1N6303(C) | 180 | 220 | 1.0 | 162 | 1.0 | 5.2 | 287 | 0.108 |
| 1.5KE200(C)A | 1N6303(C)A | 190 | 210 | 1.0 | 171 | 1.0 | 5.5 | 274 | 0.108 |
| 1.5KE220(C) | | 198 | 242 | 1.0 | 175 | 1.0 | 4.4 | 344 | 0.108 |
| 1.5KE220(C)A | | 209 | 231 | 1.0 | 185 | 1.0 | 4.6 | 328 | 0.108 |
| 1.5KE250(C) | | 225 | 275 | 1.0 | 202 | 1.0 | 4.2 | 360 | 0.110 |
| 1.5KE250(C)A | | 237 | 263 | 1.0 | 214 | 1.0 | 4.4 | 344 | 0.110 |
| 1.5KE300(C) | | 270 | 330 | 1.0 | 243 | 1.0 | 3.5 | 430 | 0.110 |
| 1.5KE300(C)A | | 285 | 315 | 1.0 | 256 | 1.0 | 3.6 | 414 | 0.110 |
| 1.5KE350(C) | | 315 | 385 | 1.0 | 284 | 1.0 | 3.0 | 504 | 0.110 |
| 1.5KE350(C)A | | 333 | 368 | 1.0 | 300 | 1.0 | 3.1 | 482 | 0.110 |
| 1.5KE400(C) | | 360 | 440 | 1.0 | 324 | 1.0 | 2.6 | 574 | 0.110 |
| 1.5KE400(C)A | | 380 | 420 | 1.0 | 342 | 1.0 | 2.7 | 548 | 0.110 |
| 1.5KE440(C) | | 396 | 484 | 1.0 | 356 | 1.0 | 2.4 | 631 | 0.110 |
| 1.5KE440(C)A | | 418 | 462 | 1.0 | 376 | 1.0 | 2.5 | 602 | 0.110 |

Notes:

- (1) Pulse test: t_p ≤ 50ms
- (2) Surge current waveform per Fig. 3 and derate per Fig. 2
- (3) All terms and symbols are consistent with ANSI/IEEE CA62.35
- (4) For bidirectional types with VR10 volts and less the IDlimit is doubled

Application

- This series of Silicon Transient Suppressors is used in applications where large voltage transients can permanently damage voltage-sensitive components.
- The TVS diode can be used in applications where induced lightning on rural or remote transmission lines presents a hazard to electronic circuitry (ref: R.E.A. specification P.E. 60).
- This Transient Voltage Suppressor diode has a pulse power rating of 1500 watts for one millisecond. The response time of TVS diode clamping action is effectively instantaneous (1 x 10⁻⁹seconds bidirectional); therefore, they can protect integrated circuits, MOS devices, hybrids, and other voltage sensitive semiconductors and components. TVS diodes can also be used in series or parallel to increase the peak power ratings.

RATINGS AND CHARACTERISTIC CURVES 1.5KE6.8A(CA) THRU 1.5KE440A(CA)

FIG.1-PEAK PULSE POWER RATING CURVE

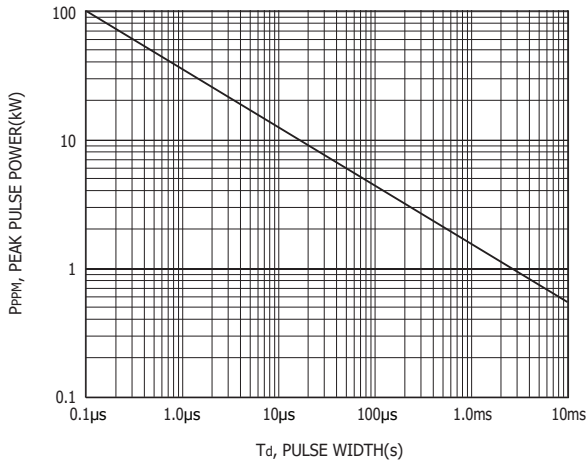


FIG.2-PULSE DERATING CURVE

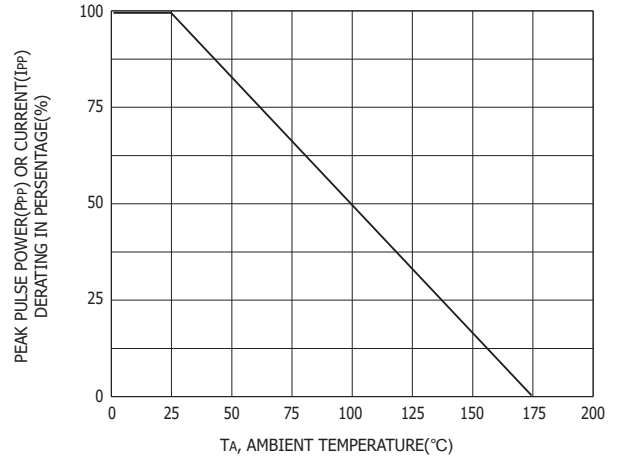


FIG.3-PULSE WAVEFORM

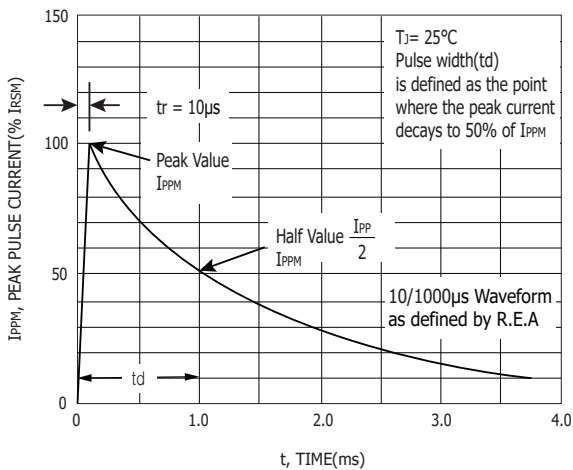


FIG.4-TYPICAL JUNCTION CAPACITANCE

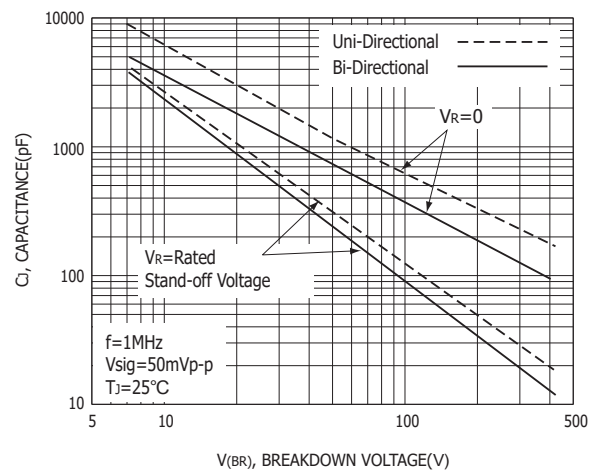


FIG.5-STEADY STATE POWER DERATING CURVE

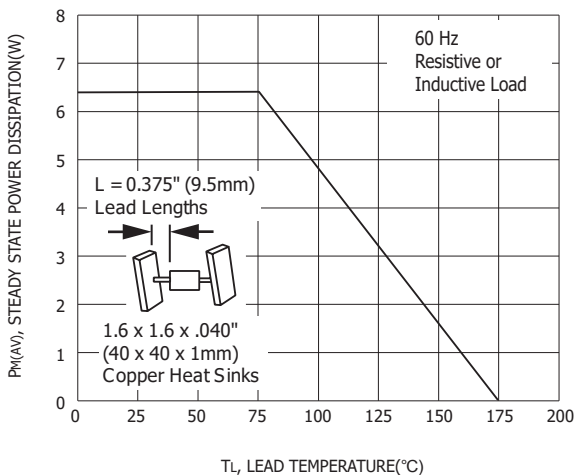


FIG.6-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT UNIDIRECTIONAL ONLY

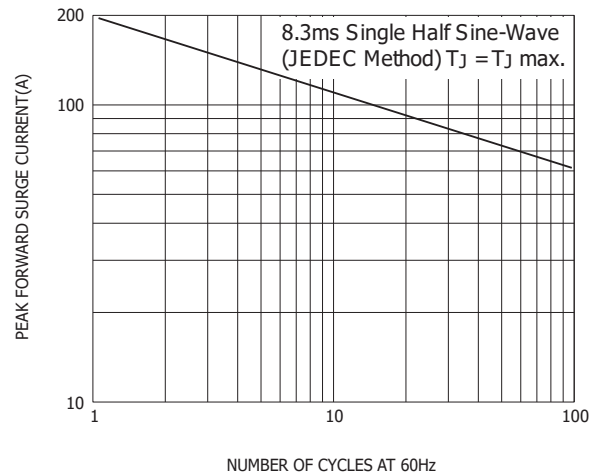


FIG.7-INSTANTANEOUS FORWARD VOLTAGE CHARACTERISTICS CURVE

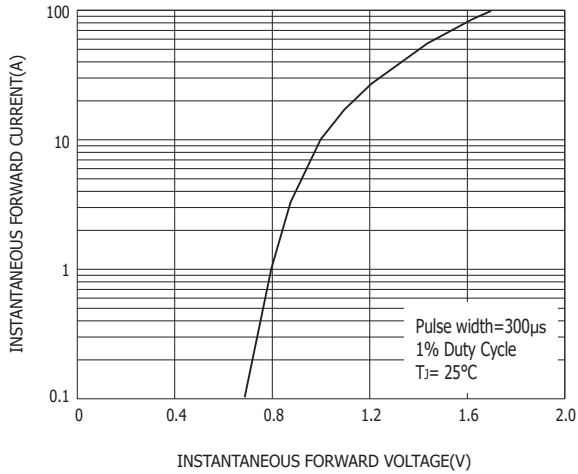


FIG.8-TYPICAL TRANSIENT THERMAL IMPEDANCE

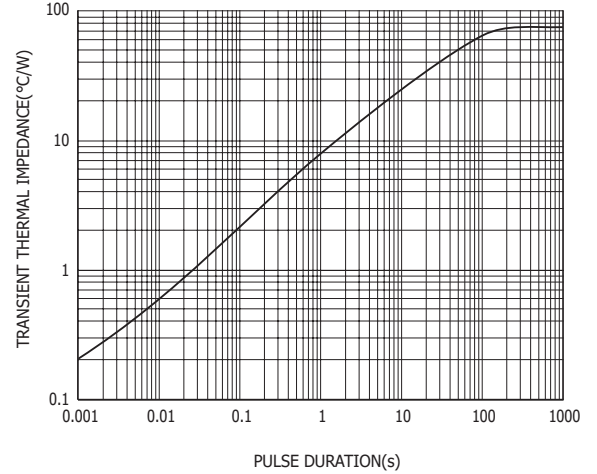


FIG.9-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

