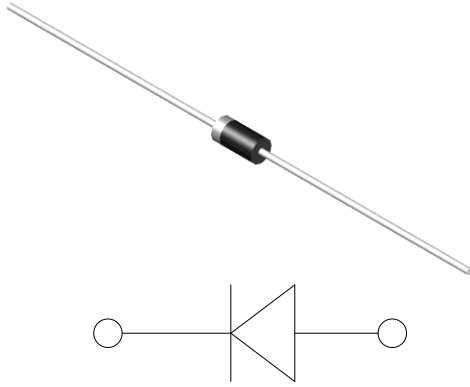


Transient Voltage Suppressor Diodes



Features

- Excellent clamping capability
- Low dynamic impedance
- Solder dip 275 °C max. 7 s, per JESD 22-B106

Mechanical Data

- **Package:** DO-204AL(DO-41)
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** Color band denotes cathode end

■ Maximum Ratings (Ta=25 °C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | Max |
|---|-----------------------------------|------|----------------|
| Peak power dissipation, with a 10/1000us waveform ⁽¹⁾ | P _{PPM} | W | 400 |
| Peak pulse current, with a 10/1000us waveform ⁽¹⁾ | I _{PPM} | A | See Next Table |
| Power dissipation, on infinite heat sink at TL= 75°C | P _D | W | 1.5 |
| Peak forward surge current, 8.3 ms single half sine-wave unidirectional only ⁽²⁾ | I _{FSM} | A | 40 |
| Operating junction and storage temperature range | T _J , T _{STG} | °C | -55 to +150 |

■ Electrical Characteristics (Ta=25 °C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | VALUE |
|---|-----------------|------|---------|
| Maximum instantaneous forward voltage at 25A for unidirectional only ⁽³⁾ | V _{FM} | V | 3.5/5.0 |

■ Thermal Characteristics (Ta=25 °C Unless otherwise specified)

| PARAMETER | SYMBOL | UNIT | Conditions | VALUE |
|-----------------------------|-------------------|------|---------------------|-------|
| Thermal Resistance(Typical) | R _{θJ-A} | °C/W | Junction to ambient | 100 |
| | R _{θJ-L} | °C/W | Junction to lead | 66 |

Notes:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25 °C per Fig.2.
- (2) Measured on 8.3ms single half sine-wave or equivalent square wave, duty cycle=4 pulses per minute maximum.
- (3) VF=3.5V Max for devices of VBR≤220v and VF=5.0v Max for devices of VBR > 220v.

■ Ordering Information (Example)

| PREFERRED P/N | PACKAGE CODE | UNIT WEIGHT(g) | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| P4KE SERIES | D1 | Approximate 0.30 | 5000 | 5000 | 50000 | Tape |
| P4KE SERIES | C1 | Approximate 0.30 | 1000 | 1000 | 50000 | Bulk |

■Electrical Characteristics (T_a=25℃ Unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V _{BR} @I _T | | | Maximum Reverse Leakage I _R @ V _{WM} (μA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Surge Current I _{PP} (A) | Maximum Clamping Voltage V _c @ I _{PP} (V) |
|----------------------|---------------------|---|---------|------------------------|---|---|--|---|
| | | Min (V) | Max (V) | I _T (mA) | | | | |
| P4KE6.8 | P4KE6.8C | 6.12 | 7.48 | 10 | 1000 | 5.5 | 37.0 | 10.8 |
| P4KE6.8A | P4KE6.8CA | 6.45 | 7.14 | 10 | 1000 | 5.8 | 38.1 | 10.5 |
| P4KE7.5 | P4KE7.5C | 6.75 | 8.25 | 10 | 500 | 6.1 | 34.2 | 11.7 |
| P4KE7.5A | P4KE7.5CA | 7.13 | 7.88 | 10 | 500 | 6.4 | 35.4 | 11.3 |
| P4KE8.2 | P4KE8.2C | 7.38 | 9.02 | 10 | 200 | 6.6 | 32.0 | 12.5 |
| P4KE8.2A | P4KE8.2CA | 7.79 | 8.61 | 10 | 200 | 7.0 | 33.1 | 12.1 |
| P4KE9.1 | P4KE9.1C | 8.29 | 10.0 | 1.0 | 50 | 7.4 | 29.0 | 13.8 |
| P4KE9.1A | P4KE9.1CA | 8.65 | 9.55 | 1.0 | 50 | 7.8 | 29.9 | 13.4 |
| P4KE10 | P4KE10C | 9.00 | 11.0 | 1.0 | 10 | 8.1 | 26.7 | 15.0 |
| P4KE10A | P4KE10CA | 9.50 | 10.5 | 1.0 | 10 | 8.6 | 27.6 | 14.5 |
| P4KE11 | P4KE11C | 9.90 | 12.1 | 1.0 | 5.0 | 8.9 | 24.7 | 16.2 |
| P4KE11A | P4KE11CA | 10.5 | 11.6 | 1.0 | 5.0 | 9.4 | 25.6 | 15.6 |
| P4KE12 | P4KE12C | 10.8 | 13.2 | 1.0 | 5.0 | 9.7 | 23.1 | 17.3 |
| P4KE12A | P4KE12CA | 11.4 | 12.6 | 1.0 | 5.0 | 10.2 | 24.0 | 16.7 |
| P4KE13 | P4KE13C | 11.7 | 14.3 | 1.0 | 5.0 | 10.5 | 21.1 | 19.0 |
| P4KE13A | P4KE13CA | 12.4 | 13.7 | 1.0 | 5.0 | 11.1 | 22.0 | 18.2 |
| P4KE15 | P4KE15C | 13.5 | 16.5 | 1.0 | 5.0 | 12.1 | 18.2 | 22.0 |
| P4KE15A | P4KE15CA | 14.3 | 15.8 | 1.0 | 5.0 | 12.8 | 18.9 | 21.2 |
| P4KE16 | P4KE16C | 14.4 | 17.6 | 1.0 | 5.0 | 12.9 | 17.0 | 23.5 |
| P4KE16A | P4KE16CA | 15.2 | 16.8 | 1.0 | 5.0 | 13.6 | 17.8 | 22.5 |
| P4KE18 | P4KE18C | 16.2 | 19.8 | 1.0 | 5.0 | 14.5 | 15.1 | 26.5 |
| P4KE18A | P4KE18CA | 17.1 | 18.9 | 1.0 | 5.0 | 15.3 | 15.9 | 25.2 |
| P4KE20 | P4KE20C | 18.0 | 22.0 | 1.0 | 5.0 | 16.2 | 13.7 | 29.1 |
| P4KE20A | P4KE20CA | 19.0 | 21.0 | 1.0 | 5.0 | 17.1 | 14.4 | 27.7 |
| P4KE22 | P4KE22C | 19.8 | 24.2 | 1.0 | 5.0 | 17.8 | 12.5 | 31.9 |
| P4KE22A | P4KE22CA | 20.9 | 23.1 | 1.0 | 5.0 | 18.8 | 13.1 | 30.6 |
| P4KE24 | P4KE24C | 21.6 | 26.4 | 1.0 | 5.0 | 19.4 | 11.5 | 34.7 |
| P4KE24A | P4KE24CA | 22.8 | 25.2 | 1.0 | 5.0 | 20.5 | 12.0 | 33.2 |
| P4KE27 | P4KE27C | 24.3 | 29.7 | 1.0 | 5.0 | 21.8 | 10.2 | 39.1 |
| P4KE27A | P4KE27CA | 25.7 | 28.4 | 1.0 | 5.0 | 23.1 | 10.7 | 37.5 |
| P4KE30 | P4KE30C | 27.0 | 33.0 | 1.0 | 5.0 | 24.3 | 9.20 | 43.5 |
| P4KE30A | P4KE30CA | 28.5 | 31.5 | 1.0 | 5.0 | 25.6 | 9.70 | 41.4 |
| P4KE33 | P4KE33C | 29.7 | 36.3 | 1.0 | 5.0 | 26.8 | 8.40 | 47.7 |
| P4KE33A | P4KE33CA | 31.4 | 34.7 | 1.0 | 5.0 | 28.2 | 8.80 | 45.7 |
| P4KE36 | P4KE36C | 32.4 | 39.6 | 1.0 | 5.0 | 29.1 | 7.70 | 52.0 |
| P4KE36A | P4KE36CA | 34.2 | 37.8 | 1.0 | 5.0 | 30.8 | 8.00 | 49.9 |

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V _{BR} @I _T | | | Maximum Reverse Leakage I _R @ V _{WM} (μA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Surge Current IPP (A) | Maximum Clamping Voltage Vc @ IPP (V) |
|-------------------|------------------|---|---------|---------|---|---|---------------------------------------|---------------------------------------|
| | | Min (V) | Max (V) | IT (mA) | | | | |
| P4KE39 | P4KE39C | 35.1 | 42.9 | 1.0 | 5.0 | 31.6 | 7.10 | 56.4 |
| P4KE39A | P4KE39CA | 37.1 | 41.0 | 1.0 | 5.0 | 33.3 | 7.40 | 53.9 |
| P4KE43 | P4KE43C | 38.7 | 47.3 | 1.0 | 5.0 | 34.8 | 6.50 | 61.9 |
| P4KE43A | P4KE43CA | 40.9 | 45.2 | 1.0 | 5.0 | 36.8 | 6.70 | 59.3 |
| P4KE47 | P4KE47C | 42.3 | 51.7 | 1.0 | 5.0 | 38.1 | 5.90 | 67.8 |
| P4KE47A | P4KE47CA | 44.7 | 49.4 | 1.0 | 5.0 | 40.2 | 6.20 | 64.8 |
| P4KE51 | P4KE51C | 45.9 | 56.1 | 1.0 | 5.0 | 41.3 | 5.40 | 73.5 |
| P4KE51A | P4KE51CA | 48.5 | 53.6 | 1.0 | 5.0 | 43.6 | 5.70 | 70.1 |
| P4KE56 | P4KE56C | 50.4 | 61.6 | 1.0 | 5.0 | 45.4 | 5.00 | 80.5 |
| P4KE56A | P4KE56CA | 53.2 | 58.8 | 1.0 | 5.0 | 47.8 | 5.20 | 77.0 |
| P4KE62 | P4KE62C | 55.8 | 68.2 | 1.0 | 5.0 | 50.2 | 4.50 | 89.0 |
| P4KE62A | P4KE62CA | 58.9 | 65.1 | 1.0 | 5.0 | 53.0 | 4.70 | 85.0 |
| P4KE68 | P4KE68C | 61.2 | 74.8 | 1.0 | 5.0 | 55.1 | 4.10 | 98.0 |
| P4KE68A | P4KE68CA | 64.6 | 71.4 | 1.0 | 5.0 | 58.1 | 4.30 | 92.0 |
| P4KE75 | P4KE75C | 67.5 | 82.5 | 1.0 | 5.0 | 60.7 | 3.70 | 108.0 |
| P4KE75A | P4KE75CA | 71.3 | 78.8 | 1.0 | 5.0 | 64.1 | 3.90 | 103.0 |
| P4KE82 | P4KE82C | 73.8 | 90.2 | 1.0 | 5.0 | 66.4 | 3.40 | 118.0 |
| P4KE82A | P4KE82CA | 77.9 | 86.1 | 1.0 | 5.0 | 70.1 | 3.50 | 113.0 |
| P4KE91 | P4KE91C | 81.9 | 100 | 1.0 | 5.0 | 73.3 | 3.10 | 131.0 |
| P4KE91A | P4KE91CA | 86.5 | 95.5 | 1.0 | 5.0 | 77.8 | 3.20 | 125.0 |
| P4KE100 | P4KE100C | 90 | 110 | 1.0 | 5.0 | 81.0 | 2.80 | 144.0 |
| P4KE100A | P4KE100CA | 95 | 105 | 1.0 | 5.0 | 85.5 | 2.90 | 137.0 |
| P4KE110 | P4KE110C | 99 | 121 | 1.0 | 5.0 | 89.2 | 2.50 | 158.0 |
| P4KE110A | P4KE110CA | 105 | 116 | 1.0 | 5.0 | 94.0 | 2.60 | 152.0 |
| P4KE120 | P4KE120C | 108 | 132 | 1.0 | 5.0 | 97.2 | 2.30 | 173.0 |
| P4KE120A | P4KE120CA | 114 | 126 | 1.0 | 5.0 | 102.0 | 2.40 | 165.0 |
| P4KE130 | P4KE130C | 117 | 143 | 1.0 | 5.0 | 105.0 | 2.10 | 187.0 |
| P4KE130A | P4KE130CA | 124 | 137 | 1.0 | 5.0 | 111.0 | 2.30 | 179.0 |
| P4KE150 | P4KE150C | 135 | 165 | 1.0 | 5.0 | 121.0 | 1.90 | 215.0 |
| P4KE150A | P4KE150CA | 143 | 158 | 1.0 | 5.0 | 128.0 | 1.90 | 207.0 |
| P4KE160 | P4KE160C | 144 | 176 | 1.0 | 5.0 | 130.0 | 1.70 | 230.0 |
| P4KE160A | P4KE160CA | 152 | 168 | 1.0 | 5.0 | 136.0 | 1.80 | 219.0 |
| P4KE170 | P4KE170C | 153 | 187 | 1.0 | 5.0 | 138.0 | 1.60 | 244.0 |
| P4KE170A | P4KE170CA | 162 | 179 | 1.0 | 5.0 | 145.0 | 1.70 | 234.0 |
| P4KE180 | P4KE180C | 162 | 198 | 1.0 | 5.0 | 146.0 | 1.60 | 258.0 |
| P4KE180A | P4KE180CA | 171 | 189 | 1.0 | 5.0 | 154.0 | 1.60 | 246.0 |

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V _{BR} @I _T | | | Maximum Reverse Leakage I _R @ V _{WM} (μA) | Working Peak Reverse Voltage V _{RWM} (V) | Maximum Reverse Surge Current IPP (A) | Maximum Clamping Voltage Vc @ I _{PP} (V) |
|----------------------|---------------------|---|---------|------------|---|--|--|---|
| | | Min (V) | Max (V) | IT (mA) | | | | |
| P4KE200 | P4KE200C | 180 | 220 | 1.0 | 5.0 | 162.0 | 1.40 | 287.0 |
| P4KE200A | P4KE200CA | 190 | 210 | 1.0 | 5.0 | 171.0 | 1.50 | 274.0 |
| P4KE220 | P4KE220C | 198 | 242 | 1.0 | 5.0 | 175.0 | 1.20 | 344.0 |
| P4KE220A | P4KE220CA | 209 | 231 | 1.0 | 5.0 | 185.0 | 1.20 | 328.0 |
| P4KE250 | P4KE250C | 225 | 275 | 1.0 | 5.0 | 202.0 | 1.10 | 360.0 |
| P4KE250A | P4KE250CA | 237 | 263 | 1.0 | 5.0 | 214.0 | 1.20 | 344.0 |
| P4KE300 | P4KE300C | 270 | 330 | 1.0 | 5.0 | 243.0 | 0.93 | 430.0 |
| P4KE300A | P4KE300CA | 285 | 315 | 1.0 | 5.0 | 256.0 | 1.00 | 414.0 |
| P4KE350 | P4KE350C | 315 | 385 | 1.0 | 5.0 | 284.0 | 0.79 | 505.0 |
| P4KE350A | P4KE350CA | 333 | 368 | 1.0 | 5.0 | 300.0 | 0.83 | 482.0 |
| P4KE400 | P4KE400C | 360 | 440 | 1.0 | 5.0 | 324.0 | 0.70 | 574.0 |
| P4KE400A | P4KE400CA | 380 | 420 | 1.0 | 5.0 | 342.0 | 0.73 | 548.0 |
| P4KE440 | P4KE440C | 396 | 484 | 1.0 | 5.0 | 356.0 | 0.63 | 631.0 |
| P4KE440A | P4KE440CA | 418 | 462 | 1.0 | 5.0 | 376.0 | 0.66 | 602.0 |
| P4KE500 | P4KE500 | 450 | 550 | 1.0 | 5.0 | 406.0 | 0.56 | 720.0 |
| P4KE500A | P4KE500CA | 475 | 525 | 1.0 | 5.0 | 427.5 | 0.58 | 690.0 |
| P4KE520 | P4KE520 | 468 | 572 | 1.0 | 5.0 | 422.2 | 0.53 | 748.8 |
| P4KE520A | P4KE520CA | 494 | 546 | 1.0 | 5.0 | 444.6 | 0.56 | 717.6 |
| P4KE550 | P4KE550 | 495 | 605 | 1.0 | 5.0 | 446.6 | 0.51 | 792.0 |
| P4KE550A | P4KE550CA | 523 | 577 | 1.0 | 5.0 | 470.3 | 0.53 | 759.0 |
| P4KE600 | P4KE600 | 540 | 660 | 1.0 | 5.0 | 487.2 | 0.46 | 864.0 |
| P4KE600A | P4KE600CA | 570 | 630 | 1.0 | 5.0 | 513.0 | 0.48 | 828.0 |

Note:

For bi-directional types having VWM of 10 V and less, the I_R limit is doubled

■ Characteristics (Typical)

FIG1: Peak Pulse Power Rating Curve

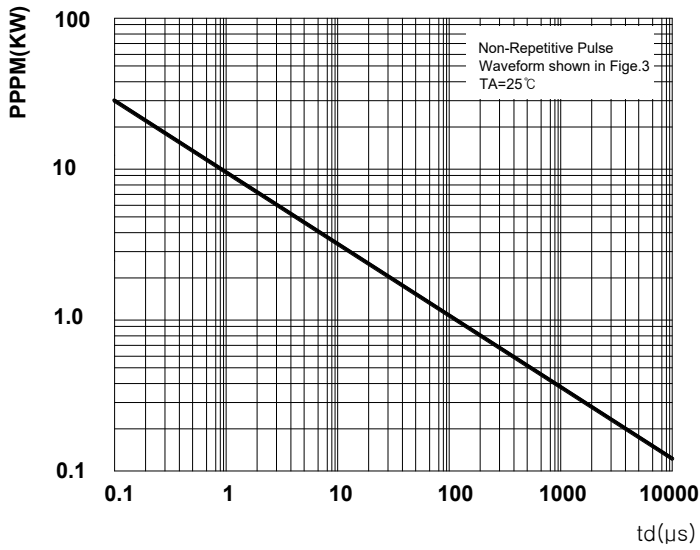


FIG4: Pulse Power or Current vs Initial Junction Temperature

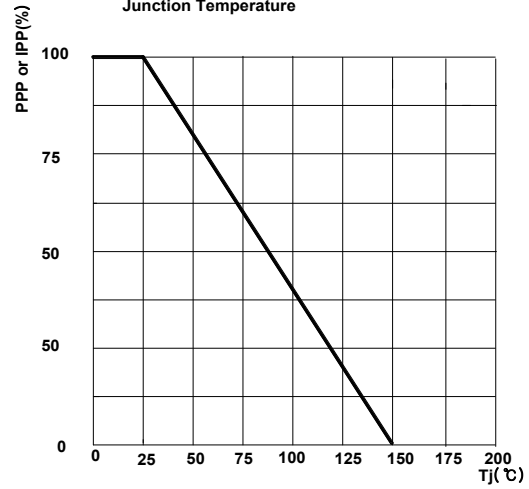


FIG3: Pulse Waveform

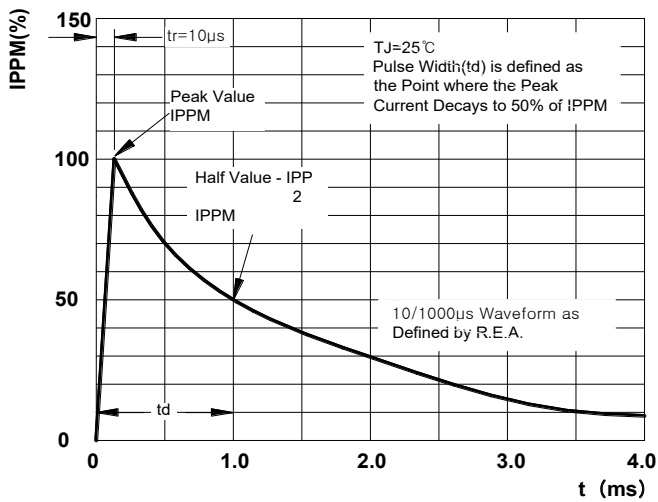


FIG4: Power Derating Curve

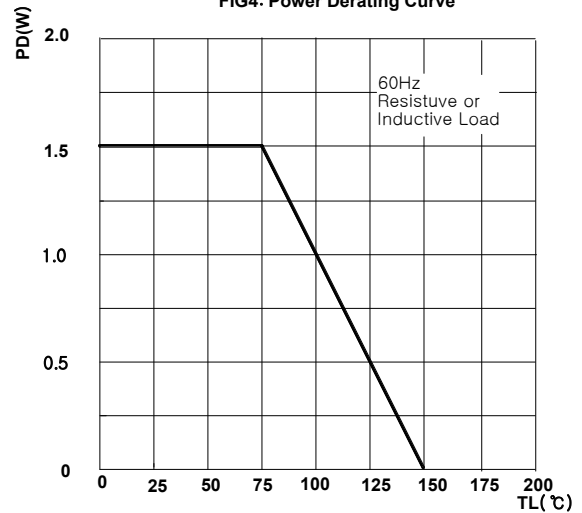


FIG5 : Maxium Non-Repetive Surge Current

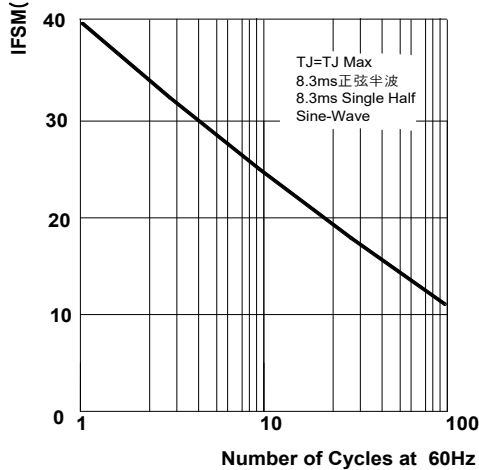
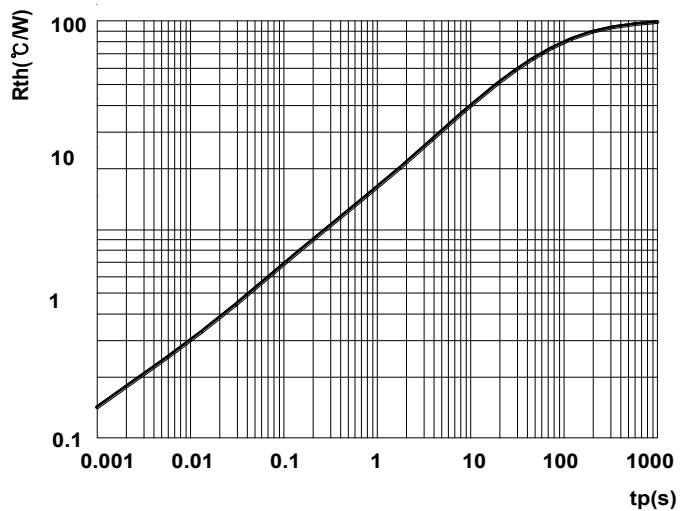
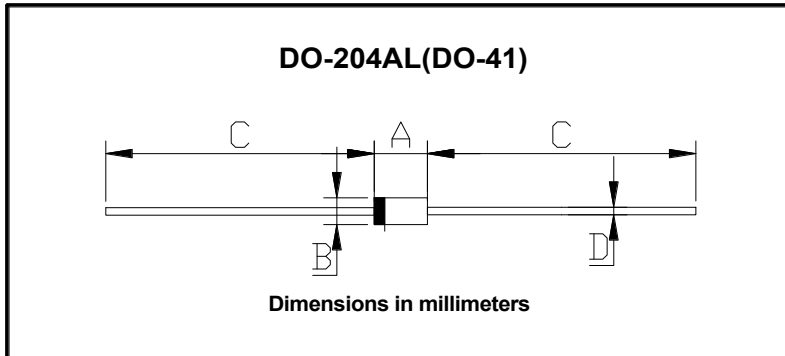


FIG6: Typical Transient Thermal Impedance



■ Outline Dimensions



| DO-204AL(DO-41) | | |
|------------------------|------|------|
| Dim | Min | Max |
| A | 4.22 | 5.21 |
| B | 2.03 | 2.72 |
| C | 25.4 | / |
| D | 0.69 | 0.86 |