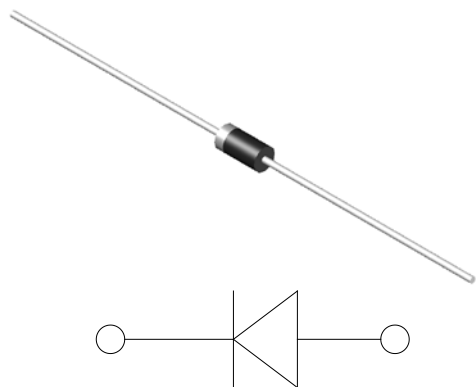


## Transient Voltage Suppressor Diodes



### 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 (T<sub>a</sub>=25°C Unless otherwise specified)

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

### ■Electrical Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| PARAMETER                                                                           | SYMBOL          | UNIT | VALUE   |
|-------------------------------------------------------------------------------------|-----------------|------|---------|
| Maximum instantaneous forward voltage at 25A for unidirectional only <sup>(3)</sup> | V <sub>FM</sub> | V    | 3.5/5.0 |

### ■Thermal Characteristics (T<sub>a</sub>=25°C Unless otherwise specified)

| PARAMETER                   | SYMBOL           | UNIT | Conditions          | VALUE |
|-----------------------------|------------------|------|---------------------|-------|
| Thermal Resistance(Typical) | R <sub>θJA</sub> | °C/W | Junction to ambient | 100   |
|                             | R <sub>θJL</sub> | °C/W | Junction to lead    | 66    |

Notes:

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

### ■Ordering Information (Example)

| PREFERED 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          |



## P4KE SERIES

### ■Electrical Characteristics (T<sub>a</sub>=25℃ Unless otherwise specified)

| Part Number (Uni) | Part Number (Bi) | Breakdown Voltage V <sub>BR</sub> @I <sub>T</sub> |         |         | Maximum Reverse Leakage I <sub>R</sub> @ V <sub>WM</sub> (μA) | Working Peak Reverse Voltage V <sub>RWM</sub> (V) | Maximum Reverse Surge Current I <sub>PP</sub> (A) | Maximum Clamping Voltage V <sub>c</sub> @ I <sub>PP</sub> (V) |
|-------------------|------------------|---------------------------------------------------|---------|---------|---------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------|
|                   |                  | Min (V)                                           | Max (V) | IT (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                                                          |



## P4KE SERIES

### ■Electrical Characteristics (T<sub>a</sub>=25℃ Unless otherwise specified)

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage<br>V <sub>BR</sub> @I <sub>T</sub> |            |            | Maximum<br>Reverse<br>Leakage I <sub>R</sub><br>@ V <sub>WM</sub><br>(μA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> (V) | Maximum<br>Reverse<br>Surge<br>Current IPP<br>(A) | Maximum<br>Clamping<br>Voltage Vc<br>@ I <sub>PP</sub><br>(V) |
|----------------------|---------------------|------------------------------------------------------|------------|------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------|
|                      |                     | Min<br>(V)                                           | Max<br>(V) | IT<br>(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                                                         |



## P4KE SERIES

### ■Electrical Characteristics (T<sub>a</sub>=25℃ Unless otherwise specified)

| Part Number<br>(Uni) | Part Number<br>(Bi) | Breakdown Voltage<br>V <sub>BR</sub> @I <sub>T</sub> |            |            | Maximum<br>Reverse<br>Leakage I <sub>R</sub><br>@ V <sub>WM</sub><br>(μA) | Working<br>Peak<br>Reverse<br>Voltage<br>V <sub>RWM</sub> (V) | Maximum<br>Reverse<br>Surge<br>Current IPP<br>(A) | Maximum<br>Clamping<br>Voltage Vc<br>@ I <sub>PP</sub><br>(V) |
|----------------------|---------------------|------------------------------------------------------|------------|------------|---------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------|
|                      |                     | Min<br>(V)                                           | Max<br>(V) | IT<br>(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<sub>R</sub> limit is doubled



## ■ Characteristics (Typical)

FIG1: Peak Pulse Power Rating Curve

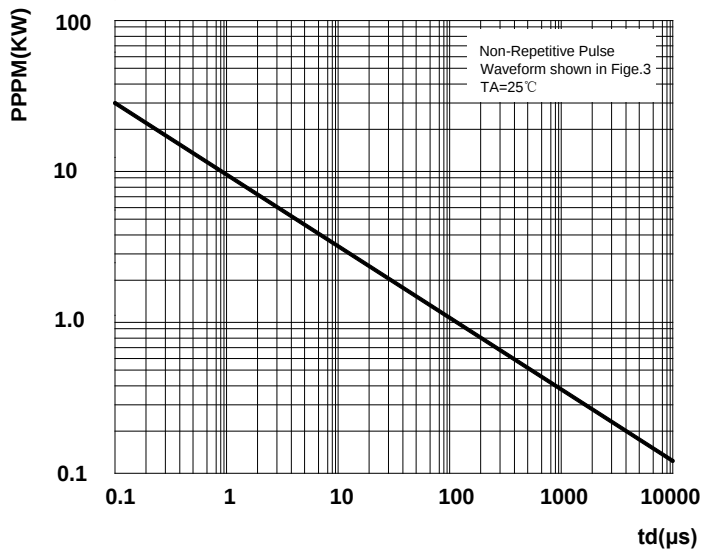


FIG4: Pulse Power or Current vs Initial Junction Temperature

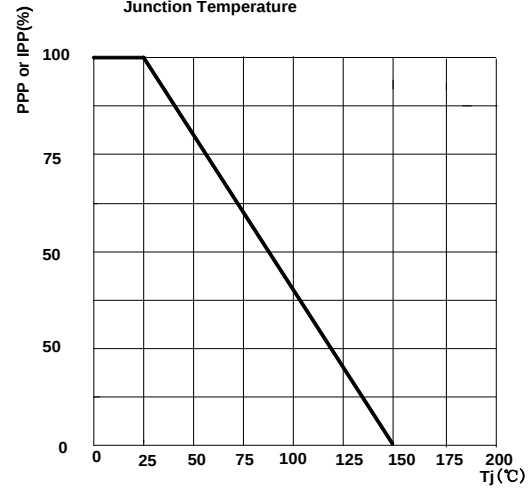


FIG3: Pulse Waveform

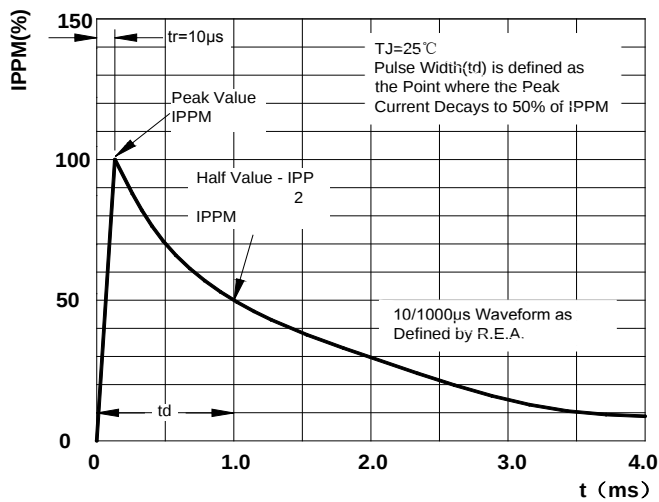


FIG4: Power Derating Curve

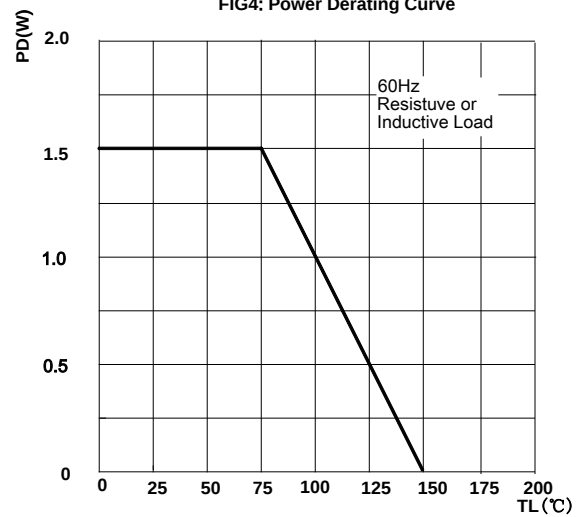


FIG5: Maximum Non-Repetitive Surge Current

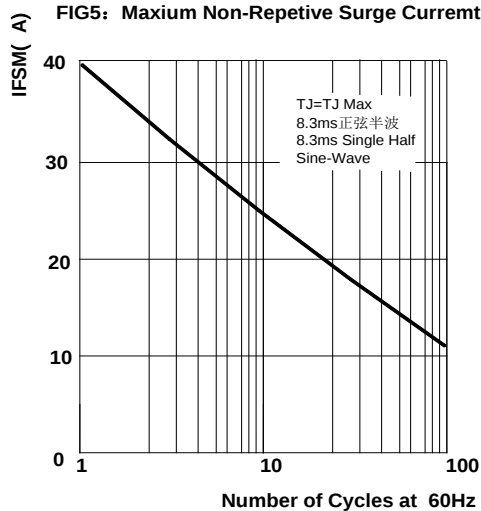
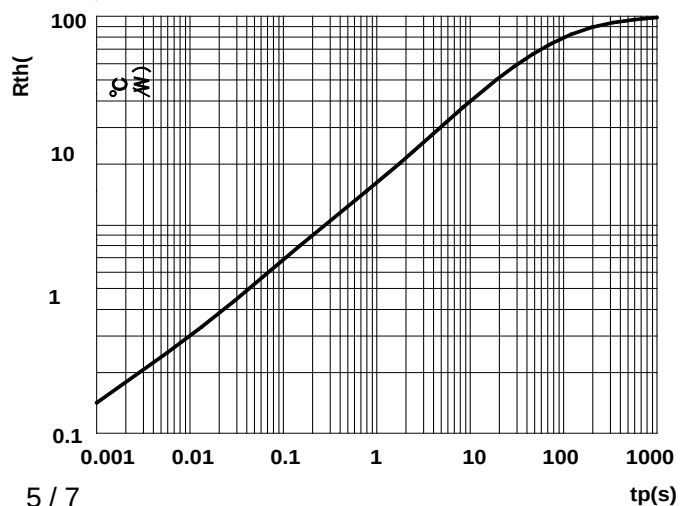
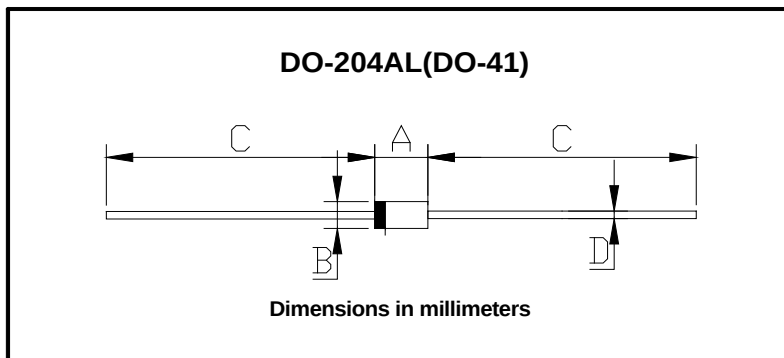


FIG6: Typical Transient Thermal Impedance





## ■ 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 |



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