

## FEATURES

- | Plastic package
- | Glass passivated chip junction in DO-41 Package
- | 400W peak pulse power capability on 10/1000us waveform
- | Excellent clamping capability
- | Low zener impedance
- | Fast response time: typically less than 1.0ps from 0 Volts to  $V_{BR}$  Min
- | Typical IR less than 1uA above 12V
- | Polarity: Color band denoted cathode except bidirectional
- | Mounting Position: Any



DO-41



Bi-directional



Uni-directional

### Schematic Symbol

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MAXIMUM RATINGS AND CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ )

| Parameter   | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Peak pulse power dissipation at 10/1000 $\mu$ s waveform                        | $P_{PP}$        | 400         | W                         |
| Steady state power dissipation at $T_L = 75^\circ\text{C}$                      | $P_D$           | 1.5         |                           |
| Peak Pulse Current of on 10/1000us waveform(Note1)                              | $I_{PPM}$       | See Table   | A                         |
| Peak forward surge current, 8.3ms single half sine-wave for unidirectional only | $I_{FSM}$       | 40          |                           |
| Typical thermal resistance, junction to ambient                                 | $R_{\theta JA}$ | 100         | $^\circ\text{C}/\text{W}$ |
| Operating junction and storage temperature range                                | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$          |

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

| Part Number |           | Marking Code |           | V <sub>R</sub> | V <sub>BR</sub> @I <sub>T</sub> |         | I <sub>T</sub> | V <sub>C</sub> @I <sub>PP</sub> | I <sub>PP</sub> <sup>①</sup> | I <sub>R</sub> @V <sub>R</sub> |
|-------------|-----------|--------------|-----------|----------------|---------------------------------|---------|----------------|---------------------------------|------------------------------|--------------------------------|
| Uni-Polar   | Bi-Polar  | Uni-Polar    | Bi-Polar  | V              | Min(V)                          | Max (V) | mA             | V                               | A                            | Max(μA)                        |
| P4KE6.8A    | P4KE6.8CA | P4KE6.8A     | P4KE6.8CA | 5.8            | 6.45                            | 7.14    | 10.0           | 10.5                            | 39.0                         | 1000.0                         |
| P4KE7.5A    | P4KE7.5CA | P4KE7.5A     | P4KE7.5CA | 6.4            | 7.13                            | 7.88    | 10.0           | 11.3                            | 36.3                         | 500.0                          |
| P4KE8.2A    | P4KE8.2CA | P4KE8.2A     | P4KE8.2CA | 7.02           | 7.79                            | 8.61    | 10.0           | 12.1                            | 33.9                         | 200.0                          |
| P4KE9.1A    | P4KE9.1CA | P4KE9.1A     | P4KE9.1CA | 7.78           | 8.65                            | 9.55    | 1.0            | 13.4                            | 30.6                         | 50.0                           |
| P4KE10A     | P4KE10CA  | P4KE10A      | P4KE10CA  | 8.55           | 9.5                             | 10.5    | 1.0            | 14.5                            | 28.3                         | 10.0                           |
| P4KE11A     | P4KE11CA  | P4KE11A      | P4KE11CA  | 9.4            | 10.5                            | 11.6    | 1.0            | 15.6                            | 26.3                         | 5.0                            |
| P4KE12A     | P4KE12CA  | P4KE12A      | P4KE12CA  | 10.2           | 11.4                            | 12.6    | 1.0            | 16.7                            | 24.6                         | 5.0                            |
| P4KE13A     | P4KE13CA  | P4KE13A      | P4KE13CA  | 11.1           | 12.4                            | 13.7    | 1.0            | 18.2                            | 22.5                         | 1.0                            |
| P4KE15A     | P4KE15CA  | P4KE15A      | P4KE15CA  | 12.8           | 14.3                            | 15.8    | 1.0            | 21.2                            | 19.3                         | 1.0                            |
| P4KE16A     | P4KE16CA  | P4KE16A      | P4KE16CA  | 13.6           | 15.2                            | 16.8    | 1.0            | 22.5                            | 18.2                         | 1.0                            |
| P4KE18A     | P4KE18CA  | P4KE18A      | P4KE18CA  | 15.3           | 17.1                            | 18.9    | 1.0            | 25.5                            | 16.1                         | 1.0                            |
| P4KE20A     | P4KE20CA  | P4KE20A      | P4KE20CA  | 17.1           | 19.0                            | 21.0    | 1.0            | 27.7                            | 14.8                         | 1.0                            |
| P4KE22A     | P4KE22CA  | P4KE22A      | P4KE22CA  | 18.8           | 20.9                            | 23.1    | 1.0            | 30.6                            | 13.4                         | 1.0                            |
| P4KE24A     | P4KE24CA  | P4KE24A      | P4KE24CA  | 20.5           | 22.8                            | 25.2    | 1.0            | 33.2                            | 12.3                         | 1.0                            |
| P4KE27A     | P4KE27CA  | P4KE27A      | P4KE27CA  | 23.1           | 25.7                            | 28.4    | 1.0            | 37.5                            | 10.9                         | 1.0                            |
| P4KE30A     | P4KE30CA  | P4KE30A      | P4KE30CA  | 25.6           | 28.5                            | 31.5    | 1.0            | 41.4                            | 9.9                          | 1.0                            |
| P4KE33A     | P4KE33CA  | P4KE33A      | P4KE33CA  | 28.2           | 31.4                            | 34.7    | 1.0            | 45.7                            | 9.0                          | 1.0                            |
| P4KE36A     | P4KE36CA  | P4KE36A      | P4KE36CA  | 30.8           | 34.2                            | 37.8    | 1.0            | 49.9                            | 8.2                          | 1.0                            |
| P4KE39A     | P4KE39CA  | P4KE39A      | P4KE39CA  | 33.3           | 37.1                            | 41.0    | 1.0            | 53.9                            | 7.6                          | 1.0                            |
| P4KE43A     | P4KE43CA  | P4KE43A      | P4KE43CA  | 36.8           | 40.9                            | 45.2    | 1.0            | 59.3                            | 6.9                          | 1.0                            |
| P4KE47A     | P4KE47CA  | P4KE47A      | P4KE47CA  | 40.2           | 44.7                            | 49.4    | 1.0            | 64.8                            | 6.3                          | 1.0                            |
| P4KE51A     | P4KE51CA  | P4KE51A      | P4KE51CA  | 43.6           | 48.5                            | 53.6    | 1.0            | 70.1                            | 5.8                          | 1.0                            |
| P4KE56A     | P4KE56CA  | P4KE56A      | P4KE56CA  | 47.8           | 53.2                            | 58.8    | 1.0            | 77.0                            | 5.3                          | 1.0                            |
| P4KE62A     | P4KE62CA  | P4KE62A      | P4KE62CA  | 53.0           | 58.9                            | 65.1    | 1.0            | 85.0                            | 4.8                          | 1.0                            |

| Part Number |           | Marking Code |           | $V_R$ | $V_{BR}@I_T$ |         | $I_T$ | $V_C@I_{PP}$ | $I_{PP}^{①}$ | $I_R@V_R$ |
|-------------|-----------|--------------|-----------|-------|--------------|---------|-------|--------------|--------------|-----------|
| Uni-Polar   | Bi-Polar  | Uni-Polar    | Bi-Polar  | V     | Min(V)       | Max (V) | mA    | V            | A            | Max(μA)   |
| P4KE68A     | P4KE68CA  | P4KE68A      | P4KE68CA  | 58.1  | 64.6         | 71.4    | 1.0   | 92.0         | 4.5          | 1.0       |
| P4KE75A     | P4KE75CA  | P4KE75A      | P4KE75CA  | 64.1  | 71.3         | 78.8    | 1.0   | 103.0        | 4.0          | 1.0       |
| P4KE82A     | P4KE82CA  | P4KE82A      | P4KE82CA  | 70.1  | 77.9         | 86.1    | 1.0   | 113.0        | 3.6          | 1.0       |
| P4KE91A     | P4KE91CA  | P4KE91A      | P4KE91CA  | 77.8  | 86.5         | 95.5    | 1.0   | 125.0        | 3.3          | 1.0       |
| P4KE100A    | P4KE100CA | P4KE100A     | P4KE100CA | 85.5  | 95.0         | 105.0   | 1.0   | 137.0        | 3.0          | 1.0       |
| P4KE110A    | P4KE110CA | P4KE110A     | P4KE110CA | 94.0  | 105.0        | 116.0   | 1.0   | 152.0        | 2.7          | 1.0       |
| P4KE120A    | P4KE120CA | P4KE120A     | P4KE120CA | 102.0 | 114.0        | 126.0   | 1.0   | 165.0        | 2.5          | 1.0       |
| P4KE130A    | P4KE130CA | P4KE130A     | P4KE130CA | 111.0 | 124.0        | 137.0   | 1.0   | 179.0        | 2.3          | 1.0       |
| P4KE150A    | P4KE150CA | P4KE150A     | P4KE150CA | 128.0 | 143.0        | 158.0   | 1.0   | 207.0        | 2.0          | 1.0       |
| P4KE160A    | P4KE160CA | P4KE160A     | P4KE160CA | 136.0 | 152.0        | 168.0   | 1.0   | 219.0        | 1.9          | 1.0       |
| P4KE170A    | P4KE170CA | P4KE170A     | P4KE170CA | 145.0 | 162.0        | 179.0   | 1.0   | 234.0        | 1.8          | 1.0       |
| P4KE180A    | P4KE180CA | P4KE180A     | P4KE180CA | 154.0 | 171.0        | 189.0   | 1.0   | 246.0        | 1.7          | 1.0       |
| P4KE200A    | P4KE200CA | P4KE200A     | P4KE200CA | 171.0 | 190.0        | 210.0   | 1.0   | 274.0        | 1.5          | 1.0       |
| P4KE220A    | P4KE220CA | P4KE220A     | P4KE220CA | 185.0 | 209.0        | 231.0   | 1.0   | 328.0        | 1.3          | 1.0       |
| P4KE250A    | P4KE250CA | P4KE250A     | P4KE250CA | 214.0 | 237.0        | 263.0   | 1.0   | 344.0        | 1.2          | 1.0       |
| P4KE300A    | P4KE300CA | P4KE300A     | P4KE300CA | 256.0 | 285.0        | 315.0   | 1.0   | 414.0        | 1.0          | 1.0       |
| P4KE350A    | P4KE350CA | P4KE350A     | P4KE350CA | 300.0 | 332.0        | 368.0   | 1.0   | 482.0        | 0.85         | 1.0       |
| P4KE400A    | P4KE400CA | P4KE400A     | P4KE400CA | 342.0 | 380.0        | 420.0   | 1.0   | 548.0        | 0.75         | 1.0       |
| P4KE440A    | P4KE440CA | P4KE440A     | P4KE440CA | 376.0 | 418.0        | 462.0   | 1.0   | 602.0        | 0.68         | 1.0       |
| P4KE480A    | P4KE480CA | P4KE480A     | P4KE480CA | 408.0 | 456.0        | 504.0   | 1.0   | 658.0        | 0.61         | 1.0       |
| P4KE510A    | P4KE510CA | P4KE510A     | P4KE510CA | 434.0 | 485.0        | 535.0   | 1.0   | 698.0        | 0.57         | 1.0       |
| P4KE530A    | P4KE530CA | P4KE530A     | P4KE530CA | 451.0 | 503.5        | 556.5   | 1.0   | 725.0        | 0.55         | 1.0       |
| P4KE540A    | P4KE540CA | P4KE540A     | P4KE540CA | 459.0 | 513.0        | 567.0   | 1.0   | 740.0        | 0.54         | 1.0       |
| P4KE550A    | P4KE550CA | P4KE550A     | P4KE550CA | 467.0 | 522.5        | 577.5   | 1.0   | 760.0        | 0.52         | 1.0       |
| P4KE600A    | P4KE600CA | P4KE600A     | P4KE600CA | 510.0 | 570.0        | 630.0   | 1.0   | 828.0        | 0.48         | 1.0       |

Note:

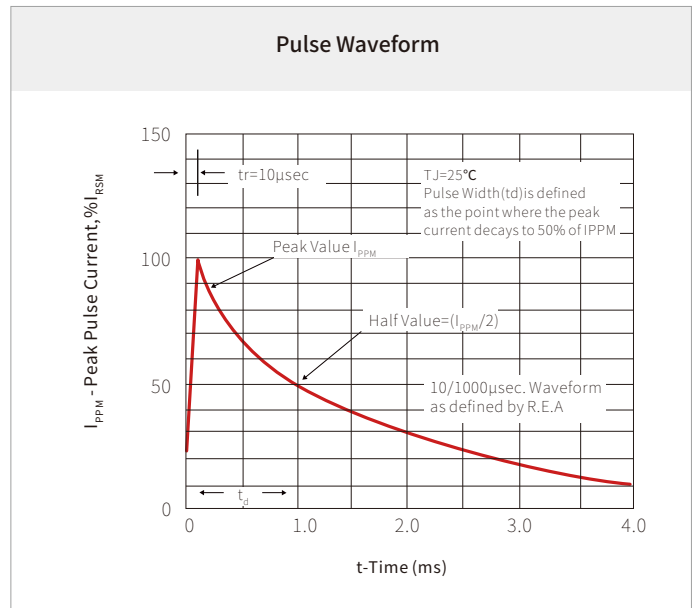
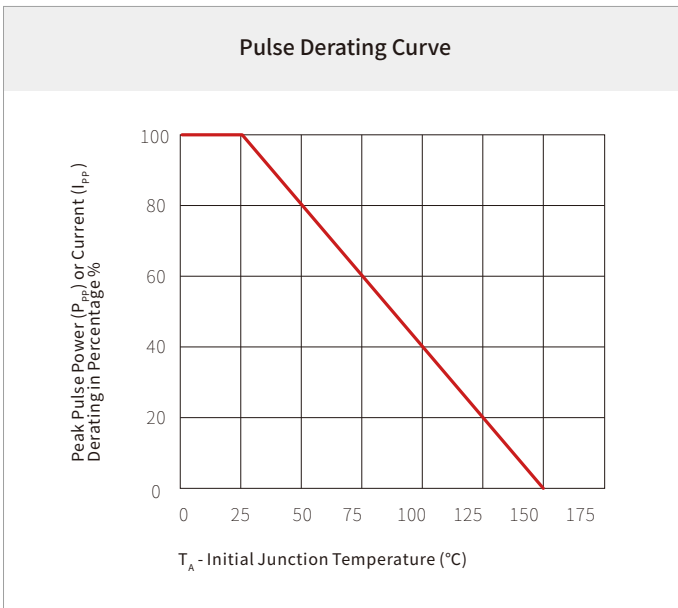
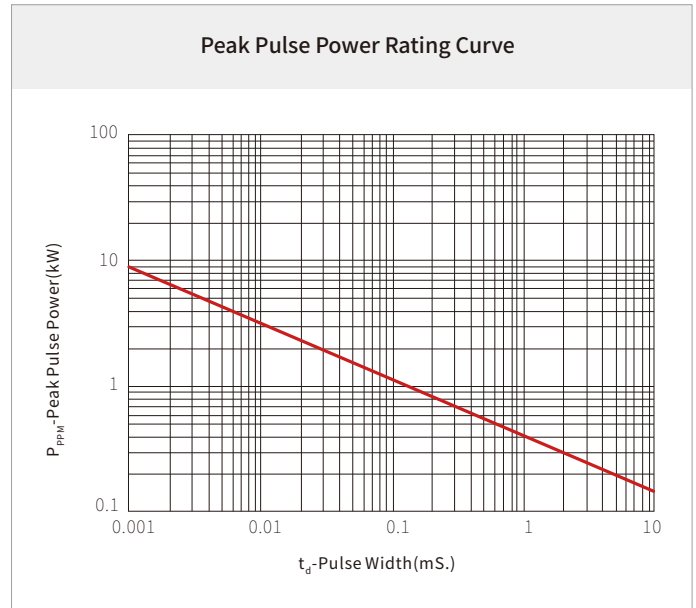
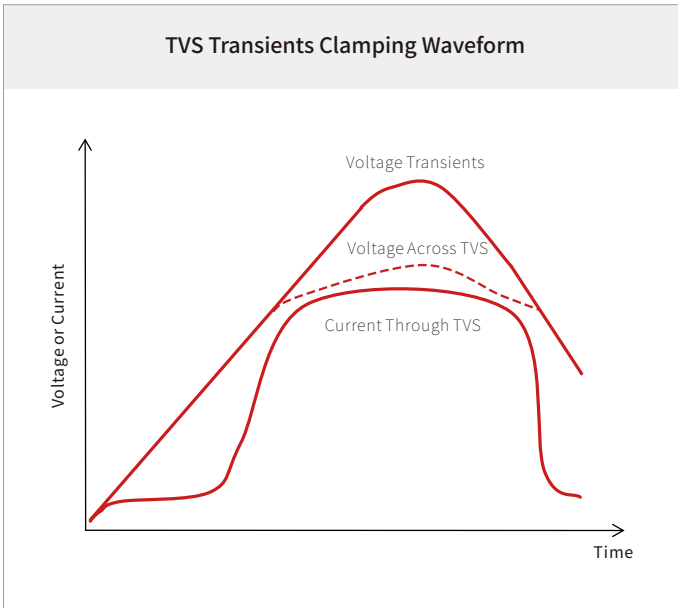
① Surge waveform: 10/1000μs

 $V_R$ : Stand-off voltage -- Maximum voltage that can be applied

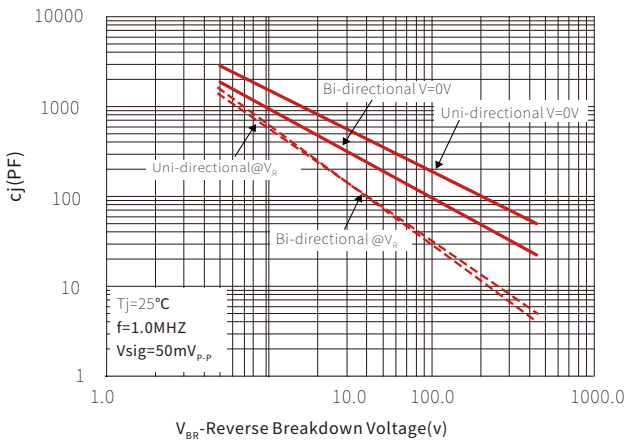
 $V_{BR}$ : Breakdown voltage

 $V_C$ : Clamping voltage -- Peak voltage measured across the suppressor at a specified  $I_{PP}$ 
 $I_R$ : Reverse leakage current

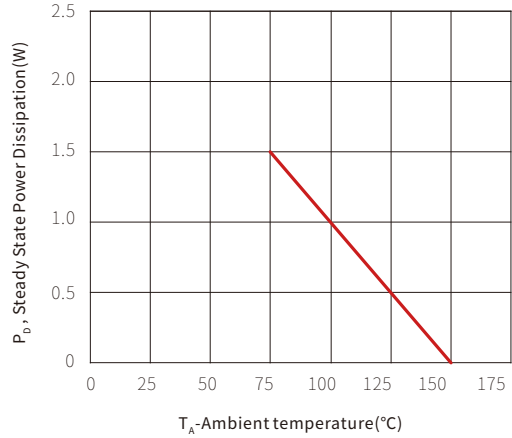
# CHARACTERISTIC CURVES



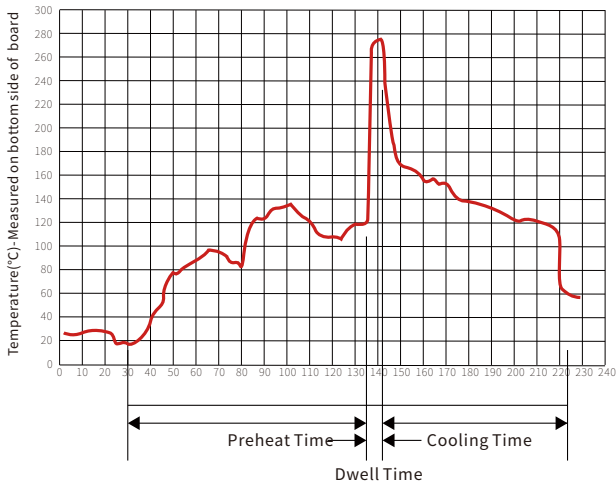
**Typical Junction Capacitance**



**Steady State Power Dissipation Derating Curve**

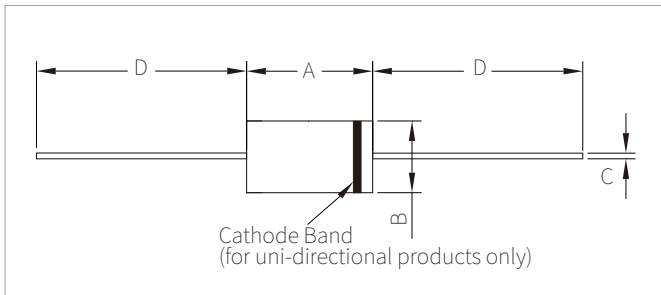


## WAVE SOLDERING



| Wave Parameter         |                  | Lead-free assembly |
|------------------------|------------------|--------------------|
| Pre Heat               | Temperature Min  | 100°C              |
|                        | Temperature Max  | 150°C              |
|                        | Time(min to max) | 60 – 180 secs      |
| Solder pot Temperature |                  | 280°C Max          |
| Solder Dwell Time      |                  | 2-5 seconds        |

## DO-41 PACKAGE INFORMATION



| Ref. | Millimeters |      | Inches |       |
|------|-------------|------|--------|-------|
|      | Min.        | Max. | Min.   | Max.  |
| A    | 4.10        | 5.20 | 0.160  | 0.205 |
| B    | 2.00        | 2.70 | 0.080  | 0.107 |
| C    | 0.71        | 0.86 | 0.028  | 0.034 |
| D    | 25.40       | -    | 1.000  | -     |

## ORDERING INFORMATION

| Part Number | Component Package | Per Carton | Description |
|-------------|-------------------|------------|-------------|
| P4KExxA/CA  | DO-41             | 5000pcs    | Box         |

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**By QR Code**

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