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P6KE6V8(C)A - P6KE440(C)A 600 W Transient Voltage Suppressors

Features

- Glass-Passivated Junction
- 600 W Peak Pulse Power Capability at 1.0 ms
- Excellent Clamping Capability
- Low Incremental Surge Resistance
- Fast Response Time; Typically
< 1.0 ps from 0 V to BV for
Uni-directional and 5.0 ns for Bi-directional
- Typical $I_R < 1.0$ mA Above 10 V

Applications

- Devices for Bipolar Applications
- Bi-directional Types Use CA Suffix
- Electrical Characteristics Apply in Both Directions



DO-15

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ON UNIDIRECTIONAL DEVICES ONLY. NO

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Symbol | Parameter | Value | Units |
|-----------|---|-------------|------------------|
| P_{PPM} | Peak Pulse Power Dissipation at $t_P = 1$ ms | 600 | W |
| I_{PPM} | Peak Pulse Current | see table | A |
| P_D | Power Dissipation 0.375-inch Lead Length at $T_A = 75^\circ\text{C}$ | 5.0 | W |
| I_{FSM} | Non-Repetitive Peak Forward Surge Current Superimposed on Rated Load (JEDEC Method) ⁽¹⁾ | 100 | A |
| T_{stg} | Storage Temperature Range | -65 to +175 | $^\circ\text{C}$ |
| T_J | Operating Junction Temperature | 175 | $^\circ\text{C}$ |

Note:

1. Measured on 8.3 ms single half-sine wave; duty cycle = 4 pulses per minute maximum.

Electrical Characteristics

Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Uni-directional Bi-directional (C) Device | Reverse Stand-off Voltage V_{RWM} (V) | Breakdown Voltage V_{BR} (V) | | Test Current I_T (mA) | Clamping Voltage @ I_{PPM} V_C (V) | Peak Pulse Current I_{PPM} (A) | Reverse Leakage V_{RWM} I_R (μA) ⁽²⁾ | Temperature Coefficient V_{BR} (%/°C) |
|---|---|--------------------------------------|------|-------------------------------|--|--|---|---|
| | | Min. | Max. | | | | | |
| P6KE6V8(C)A | 5.80 | 6.45 | 7.14 | 10 | 10.5 | 57.1 | 1000 | 0.057 |
| P6KE7V5(C)A | 6.40 | 7.13 | 7.88 | 10 | 11.3 | 53.1 | 500 | 0.061 |
| P6KE8V2(C)A | 7.02 | 7.79 | 8.61 | 10 | 12.1 | 50.0 | 200 | 0.065 |
| P6KE9V1(C)A | 7.78 | 8.65 | 9.55 | 1 | 13.4 | 45.0 | 50 | 0.068 |
| P6KE10(C)A | 8.55 | 9.50 | 10.5 | 1 | 14.5 | 41.0 | 10 | 0.073 |
| P6KE11(C)A | 9.40 | 10.5 | 11.6 | 1 | 15.6 | 38.0 | 5 | 0.075 |
| P6KE12(C)A | 10.2 | 11.4 | 12.6 | 1 | 16.7 | 36.0 | 5 | 0.078 |
| P6KE13(C)A | 11.1 | 12.4 | 13.7 | 1 | 18.2 | 33.0 | 5 | 0.081 |
| P6KE15(C)A | 12.8 | 14.3 | 15.8 | 1 | 21.2 | 28.0 | 5 | 0.084 |
| P6KE16(C)A | 13.6 | 15.2 | 16.8 | 1 | 22.5 | 27.0 | 5 | 0.086 |
| P6KE18(C)A | 15.3 | 17.1 | 18.9 | 1 | 25.2 | 24.0 | 5 | 0.088 |
| P6KE20(C)A | 17.1 | 19.0 | 21.0 | 1 | 27.7 | 22.0 | 5 | 0.090 |
| P6KE22(C)A | 18.8 | 20.9 | 23.1 | 1 | 30.6 | 20.0 | 5 | 0.092 |
| P6KE24(C)A | 20.5 | 22.8 | 25.2 | 1 | 33.2 | 18.1 | 5 | 0.094 |
| P6KE27(C)A | 23.1 | 25.7 | 28.4 | 1 | 37.5 | 16.0 | 5 | 0.096 |
| P6KE30(C)A | 25.6 | 28.5 | 31.5 | 1 | 41.4 | 14.5 | 5 | 0.097 |
| P6KE33(C)A | 28.2 | 31.4 | 34.7 | 1 | 45.7 | 13.2 | 5 | 0.098 |
| P6KE36(C)A | 30.8 | 34.2 | 37.8 | 1 | 49.9 | 12.0 | 5 | 0.099 |
| P6KE39(C)A | 33.3 | 37.1 | 41.0 | 1 | 53.9 | 11.2 | 5 | 0.100 |
| P6KE43(C)A | 36.8 | 40.9 | 45.2 | 1 | 59.3 | 10.1 | 5 | 0.101 |
| P6KE47(C)A | 40.2 | 44.7 | 49.4 | 1 | 64.8 | 9.3 | 5 | 0.101 |
| P6KE51(C)A | 43.6 | 48.5 | 53.6 | 1 | 70.1 | 8.6 | 5 | 0.102 |
| P6KE56(C)A | 47.8 | 53.2 | 58.8 | 1 | 77.0 | 7.8 | 5 | 0.103 |
| P6KE62(C)A | 53.0 | 58.9 | 65.1 | 1 | 85.0 | 7.1 | 5 | 0.104 |
| P6KE68(C)A | 58.1 | 64.6 | 71.4 | 1 | 92.0 | 6.5 | 5 | 0.104 |
| P6KE75(C)A | 64.1 | 71.3 | 78.8 | 1 | 103.0 | 5.8 | 5 | 0.105 |
| P6KE82(C)A | 70.1 | 77.9 | 86.1 | 1 | 113.0 | 5.3 | 5 | 0.105 |
| P6KE91(C)A | 77.8 | 86.5 | 95.5 | 1 | 125.0 | 4.8 | 5 | 0.106 |

Electrical Characteristics (continued)Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted.

| Uni-directional Bi-directional (C) Device | Reverse Stand-off Voltage V_{RWM} (V) | Breakdown Voltage V_{BR} (V) | | Test Current I_T (mA) | Clamping Voltage @ I_{PPM} V_C (V) | Peak Pulse Current I_{PPM} (A) | Reverse Leakage V_{RWM} I_R (μA) ⁽²⁾ | Temperature Coefficient V_{BR} (%/ $^\circ\text{C}$) |
|---|---|--------------------------------------|-------|-------------------------------|--|--|---|---|
| | | Min. | Max. | | | | | |
| P6KE100(C)A | 85.5 | 95.0 | 105.0 | 1 | 137.0 | 4.4 | 5 | 0.106 |
| P6KE110(C)A | 94.0 | 105.0 | 116.0 | 1 | 152.0 | 4.0 | 5 | 0.107 |
| P6KE120(C)A | 102.0 | 114.0 | 126.0 | 1 | 165.0 | 3.6 | 5 | 0.107 |
| P6KE130(C)A | 111.0 | 124.0 | 137.0 | 1 | 179.0 | 3.4 | 5 | 0.107 |
| P6KE150(C)A | 128.0 | 143.0 | 158.0 | 1 | 207.0 | 2.9 | 5 | 0.108 |
| P6KE160(C)A | 136.0 | 152.0 | 168.0 | 1 | 219.0 | 2.7 | 5 | 0.108 |
| P6KE170(C)A | 145.0 | 162.0 | 179.0 | 1 | 234.0 | 2.6 | 5 | 0.108 |
| P6KE180(C)A | 154.0 | 171.0 | 189.0 | 1 | 246.0 | 2.4 | 5 | 0.108 |
| P6KE200(C)A | 171.0 | 190.0 | 210.0 | 1 | 274.0 | 2.2 | 5 | 0.108 |
| P6KE220(C)A | 185.0 | 209.0 | 231.0 | 1 | 328.0 | 1.9 | 5 | 0.108 |
| P6KE250(C)A | 214.0 | 237.0 | 263.0 | 1 | 344.0 | 1.8 | 5 | 0.110 |
| P6KE300(C)A | 256.0 | 285.0 | 315.0 | 1 | 414.0 | 1.5 | 5 | 0.110 |
| P6KE350(C)A | 300.0 | 332.0 | 368.0 | 1 | 482.0 | 1.3 | 5 | 0.110 |
| P6KE400(C)A | 342.0 | 380.0 | 420.0 | 1 | 548.0 | 1.1 | 5 | 0.110 |
| P6KE440(C)A | 376.0 | 418.0 | 462.0 | 1 | 602.0 | 1.0 | 5 | 0.110 |

Note:2. For bi-directional parts with $V_{RWM} < 10$ V, the I_R maximum limit is doubled.

Typical Performance Characteristics



Figure 1. Peak Pulse Power Rating Curve



Figure 2. Pulse Derating Curve



Figure 3. Pulse Waveform



Figure 4. Total Capacitance - Uni-directional



Figure 5. Steady-State Power Derating Curve



Figure 6. Non-Repetitive Surge Current

Physical Dimensions

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Figure 7. AXIAL LEADED, JEDEC DO204, VARIATION AC (ACTIVE)

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