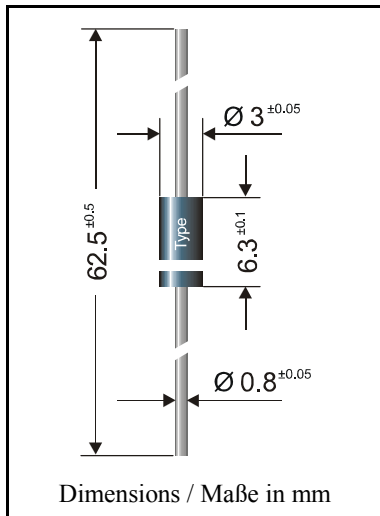


**Unidirectional and bidirectional
Transient Voltage Suppressor Diodes**

**Unidirektionale und bidirektionale
Spannungs-Begrenzer-Dioden**



| | |
|---|-------------------------------|
| Peak pulse power dissipation Impuls-Verlustleistung | 400 W |
| Nominal breakdown voltage Nominale Abbruch-Spannung | 6.8...440 V |
| Plastic case – Kunststoffgehäuse | DO-15 (DO-204AC) |
| Weight approx. – Gewicht ca. | 0.4 g |
| Plastic material has UL classification 94V-0 Gehäusematerial UL94V-0 klassifiziert | |
| Standard packaging taped in ammo pack Standard Lieferform gegurtet in Ammo-Pack | see page 16 siehe Seite 16 |

For bidirectional types (suffix “C” or “CA”), electrical characteristics apply in both directions.
Für bidirektionale Dioden (Suffix “C” oder “CA”) gelten die el. Werte in beiden Richtungen.

Maximum ratings and Characteristics

Kenn- und Grenzwerte

| | | | |
|--|--------------------------|---|--|
| Peak pulse power dissipation (10/1000 μ s waveform) Impuls-Verlustleistung (Strom-Impuls 10/1000 μ s) | $T_A = 25^\circ\text{C}$ | P_{PPM} | 400 W ¹⁾ |
| Steady state power dissipation Verlustleistung im Dauerbetrieb | $T_A = 25^\circ\text{C}$ | $P_{M(AV)}$ | 1 W ²⁾ |
| Peak forward surge current, 60 Hz half sine-wave Stoßstrom für eine 60 Hz Sinus-Halbwelle | $T_A = 25^\circ\text{C}$ | I_{FSM} | 40 A ³⁾ |
| Max. instantaneous forward voltage Augenblickswert der Durchlaßspannung | $I_F = 25\text{ A}$ | $V_{BR} \leq 200\text{ V}$ $V_{BR} > 200\text{ V}$ | $V_F < 3.0\text{ V}^3)$ $V_F < 6.5\text{ V}^3)$ |
| Operating junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur | | T_j T_s | $-50...+175^\circ\text{C}$ $-50...+175^\circ\text{C}$ |
| Thermal resistance junction to ambient air Wärmewiderstand Sperrschicht – umgebende Luft | | R_{thA} | $< 45\text{ K/W}^2)$ |
| Thermal resistance junction to lead Wärmewiderstand Sperrschicht – Anschlußdraht | | R_{thL} | $< 15\text{ K/W}$ |

¹⁾ Non-repetitive current pulse see curve $I_{PPM} = f(t_r)$

Höchstzulässiger Spitzenwert eines einmaligen Strom-Impulses, siehe Kurve $I_{PPM} = f(t_r)$

²⁾ Valid, if leads are kept at ambient temperature at a distance of 10 mm from case

Gültig, wenn die Anschlußdrähte in 10 mm Abstand von Gehäuse auf Umgebungstemperatur gehalten werden

³⁾ Unidirectional diodes only – Nur für unidirektionale Dioden

Maximum ratings

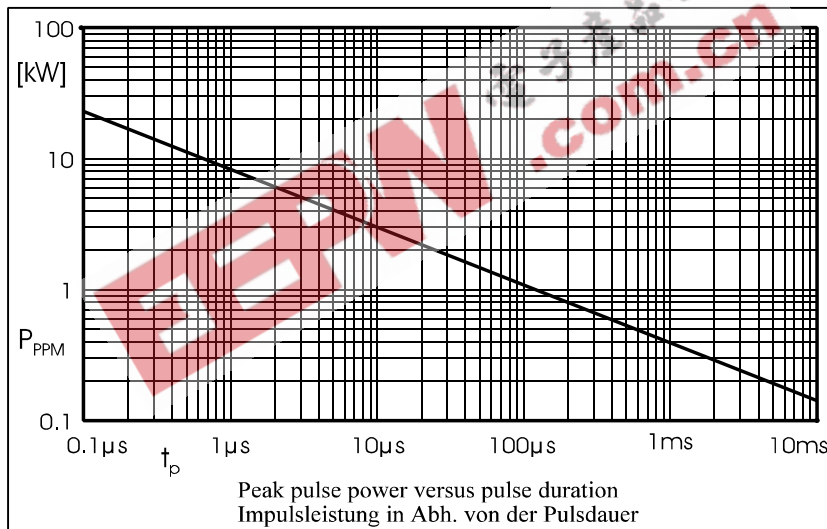
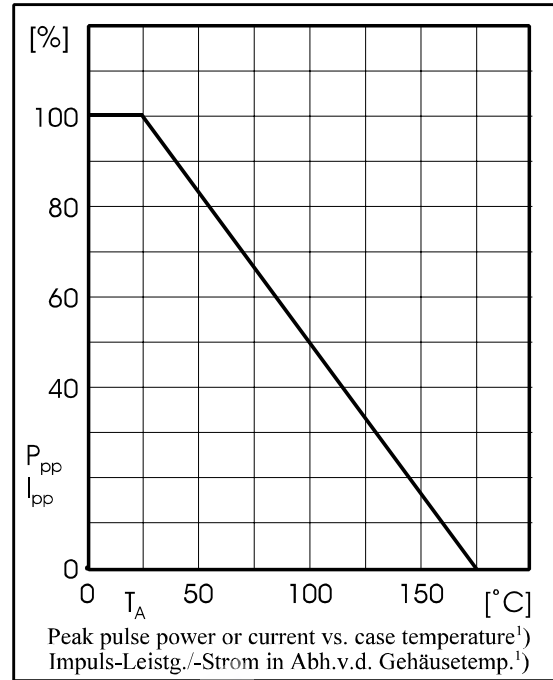
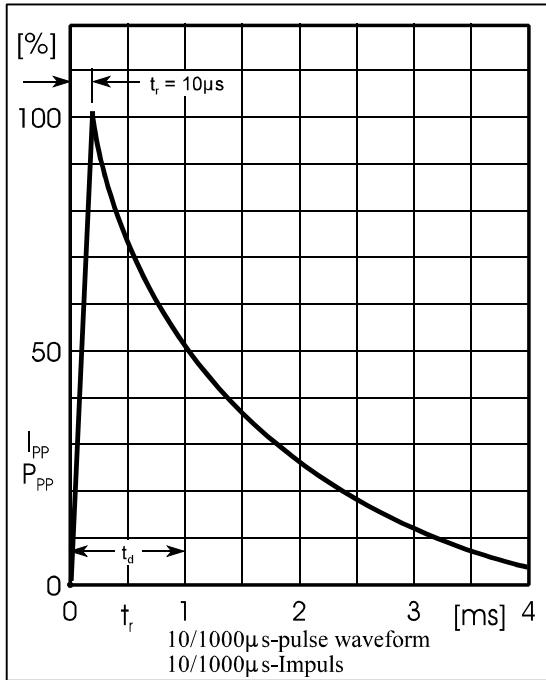
Grenzwerte

| Type Typ | Breakdown voltage at $I_T = 1$ mA Abbruch-Spanng. bei $I_T = 1$ mA *) at / bei $I_T = 10$ mA | | Stand-off voltage Sperrspg. V_{WM} [V] | Max. rev. current Max. Sperrstrom at / bei V_{WM} I_D [μ A] | Max. clamping voltage Max. Begrenzerspanng. at / bei I_{PPM} (10/1000 μ s) V_C [V] I_{PPM} [A] | |
|-------------|--|----------------|---|---|---|------|
| | V_{BR} [V] | | | | | |
| P4 KE6.8 | 6.8 \pm 10% | 6.12...7.48 *) | 5.5 | 1000 | 10.8 | 38.0 |
| P4 KE6.8A | 6.8 \pm 5% | 6.45...7.14 *) | 5.8 | 1000 | 10.5 | 40.0 |
| P4 KE7.5 | 7.5 \pm 10% | 6.75...8.25 *) | 6.0 | 500 | 11.7 | 35.0 |
| P4 KE7.5A | 7.5 \pm 5% | 7.13...7.88 *) | 6.4 | 500 | 11.3 | 37.0 |
| P4 KE8.2 | 8.2 \pm 10% | 7.38...9.02 *) | 6.6 | 200 | 12.5 | 33.0 |
| P4 KE8.2A | 8.2 \pm 5% | 7.79...8.61 *) | 7.0 | 200 | 12.1 | 34.0 |
| P4 KE9.1 | 9.1 \pm 10% | 8.19...10.0 | 7.3 | 50 | 13.8 | 30.0 |
| P4 KE9.1A | 9.1 \pm 5% | 8.65...9.55 | 7.7 | 50 | 13.4 | 31.0 |
| P4 KE10 | 10 \pm 10% | 9.0...11.0 | 8.1 | 10 | 15.0 | 28.0 |
| P4 KE10A | 10 \pm 5% | 9.5...10.5 | 8.5 | 10 | 14.5 | 29.0 |
| P4 KE11 | 11 \pm 10% | 9.9...12.1 | 8.9 | 5 | 16.2 | 26.0 |
| P4 KE11A | 11 \pm 5% | 10.5...11.6 | 9.4 | 5 | 15.6 | 27.0 |
| P4 KE12 | 12 \pm 10% | 10.8...13.2 | 9.7 | 5 | 17.3 | 24.0 |
| P4 KE12A | 12 \pm 5% | 11.4...12.6 | 10.2 | 5 | 16.7 | 25.0 |
| P4 KE13 | 13 \pm 10% | 11.7...14.3 | 10.5 | 5 | 19.0 | 22.0 |
| P4 KE13A | 13 \pm 5% | 12.4...13.7 | 11.1 | 5 | 18.2 | 23.0 |
| P4 KE15 | 15 \pm 10% | 13.5...16.5 | 12.1 | 5 | 22.0 | 19.0 |
| P4 KE15A | 15 \pm 5% | 14.3...15.8 | 12.8 | 5 | 21.2 | 21.0 |
| P4 KE16 | 16 \pm 10% | 14.4...17.6 | 12.9 | 5 | 23.5 | 17.8 |
| P4 KE16A | 16 \pm 5% | 15.2...16.8 | 13.6 | 5 | 22.5 | 18.6 |
| P4 KE18 | 18 \pm 10% | 16.2...19.8 | 14.5 | 5 | 26.5 | 16.0 |
| P4 KE18A | 18 \pm 5% | 17.1...18.9 | 15.3 | 5 | 25.5 | 16.5 |
| P4 KE20 | 20 \pm 10% | 18.0...22.0 | 16.2 | 5 | 29.1 | 14.0 |
| P4 KE20A | 20 \pm 5% | 19.0...21.0 | 17.1 | 5 | 27.7 | 15.0 |
| P4 KE22 | 22 \pm 10% | 19.8...24.2 | 17.8 | 5 | 31.9 | 13.0 |
| P4 KE22A | 22 \pm 5% | 20.9...23.1 | 18.8 | 5 | 30.6 | 13.7 |
| P4 KE24 | 24 \pm 10% | 21.6...26.4 | 19.4 | 5 | 34.7 | 12.0 |
| P4 KE24A | 24 \pm 5% | 22.8...25.2 | 20.5 | 5 | 33.2 | 12.6 |
| P4 KE27 | 27 \pm 10% | 24.3...29.7 | 21.8 | 5 | 39.1 | 10.7 |
| P4 KE27A | 27 \pm 5% | 25.7...28.4 | 23.1 | 5 | 37.5 | 11.0 |
| P4 KE30 | 30 \pm 10% | 27.0...33.0 | 24.3 | 5 | 43.5 | 9.6 |
| P4 KE30A | 30 \pm 5% | 28.5...31.5 | 25.6 | 5 | 41.4 | 10.0 |
| P4 KE33 | 33 \pm 10% | 29.7...36.3 | 26.8 | 5 | 47.7 | 8.8 |
| P4 KE33A | 33 \pm 5% | 31.4...34.7 | 28.2 | 5 | 45.7 | 9.0 |
| P4 KE36 | 36 \pm 10% | 32.4...39.6 | 29.1 | 5 | 52.0 | 8.0 |
| P4 KE36A | 36 \pm 5% | 34.2...37.8 | 30.8 | 5 | 49.9 | 8.4 |
| P4 KE39 | 39 \pm 10% | 35.1...42.9 | 31.6 | 5 | 56.4 | 7.4 |
| P4 KE39A | 39 \pm 5% | 37.1...41.0 | 33.3 | 5 | 53.9 | 7.7 |
| P4 KE43 | 43 \pm 10% | 38.7...47.3 | 34.8 | 5 | 61.9 | 6.7 |
| P4 KE43A | 43 \pm 5% | 40.9...45.2 | 36.8 | 5 | 59.3 | 7.0 |
| P4 KE47 | 47 \pm 10% | 42.3...51.7 | 38.1 | 5 | 67.8 | 6.2 |
| P4 KE47A | 47 \pm 5% | 44.7...49.4 | 40.2 | 5 | 64.8 | 6.4 |
| P4 KE51 | 51 \pm 10% | 45.9...56.1 | 41.3 | 5 | 73.5 | 5.7 |

Maximum ratings

Grenzwerte

| Type Typ | Breakdown voltage at $I_T = 1$ mA Abbruch-Spanng. bei $I_T = 1$ mA *) at / bei $I_T = 10$ mA | | Stand-off voltage Sperrspg. V_{WM} [V] | Max. rev. current Max. Sperrstrom at / bei V_{WM} I_D [μ A] | Max. clamping voltage Max. Begrenzerspanng. at / bei I_{PPM} (10/1000 μ s) V_C [V] I_{PPM} [A] | |
|-------------|--|--------------|---|---|---|---------------|
| | V_{BR} [V] | V_{WM} [V] | | | V_C [V] | I_{PPM} [A] |
| P4 KE51A | 51 \pm 5% | 48.5...53.6 | 43.6 | 5 | 70.1 | 6.0 |
| P4 KE56 | 56 \pm 10% | 50.4...61.6 | 45.4 | 5 | 80.5 | 5.2 |
| P4 KE56A | 56 \pm 5% | 53.2...58.8 | 47.8 | 5 | 77.0 | 5.4 |
| P4 KE62 | 62 \pm 10% | 55.8...68.8 | 50.2 | 5 | 89.0 | 4.7 |
| P4 KE62A | 62 \pm 5% | 58.9...65.1 | 53.0 | 5 | 85.0 | 5.0 |
| P4 KE68 | 68 \pm 10% | 61.2...74.8 | 55.1 | 5 | 98.0 | 4.2 |
| P4 KE68A | 68 \pm 5% | 64.6...71.4 | 58.1 | 5 | 92.0 | 4.5 |
| P4 KE75 | 75 \pm 10% | 67.5...82.5 | 60.7 | 5 | 108 | 3.8 |
| P4 KE75A | 75 \pm 5% | 71.3...78.8 | 64.1 | 5 | 103 | 4.0 |
| P4 KE82 | 82 \pm 10% | 73.8...90.2 | 66.4 | 5 | 118 | 3.5 |
| P4 KE82A | 82 \pm 5% | 77.9...86.1 | 70.1 | 5 | 113 | 3.7 |
| P4 KE91 | 91 \pm 10% | 81.9...100 | 73.7 | 5 | 131 | 3.2 |
| P4 KE91A | 91 \pm 5% | 86.5...95.5 | 77.8 | 5 | 125 | 3.3 |
| P4 KE100 | 100 \pm 10% | 90.0...110 | 81.0 | 5 | 144 | 2.9 |
| P4 KE100A | 100 \pm 5% | 95.0...105 | 85.5 | 5 | 137 | 3.0 |
| P4 KE110 | 110 \pm 10% | 99.0...121 | 89.2 | 5 | 158 | 2.6 |
| P4 KE110A | 110 \pm 5% | 105...116 | 94.0 | 5 | 152 | 2.7 |
| P4 KE120 | 120 \pm 10% | 108...132 | 97.2 | 5 | 173 | 2.4 |
| P4 KE120A | 120 \pm 5% | 114...126 | 102 | 5 | 165 | 2.5 |
| P4 KE130 | 130 \pm 10% | 117...143 | 105 | 5 | 187 | 2.2 |
| P4 KE130A | 130 \pm 5% | 124...137 | 111 | 5 | 179 | 2.3 |
| P4 KE150 | 150 \pm 10% | 135...165 | 121 | 5 | 215 | 1.9 |
| P4 KE150A | 150 \pm 5% | 143...158 | 128 | 5 | 207 | 2.0 |
| P4 KE160 | 160 \pm 10% | 144...176 | 130 | 5 | 230 | 1.8 |
| P4 KE160A | 160 \pm 5% | 152...168 | 136 | 5 | 219 | 1.9 |
| P4 KE170 | 170 \pm 10% | 153...187 | 138 | 5 | 244 | 1.7 |
| P4 KE170A | 170 \pm 5% | 162...179 | 145 | 5 | 234 | 1.8 |
| P4 KE180 | 180 \pm 10% | 162...198 | 146 | 5 | 258 | 1.6 |
| P4 KE180A | 180 \pm 5% | 171...189 | 154 | 5 | 246 | 1.7 |
| P4 KE200 | 200 \pm 10% | 180...220 | 162 | 5 | 287 | 1.4 |
| P4 KE200A | 200 \pm 5% | 190...210 | 171 | 5 | 274 | 1.5 |
| P4 KE220 | 220 \pm 10% | 198...242 | 175 | 5 | 344 | 1.2 |
| P4 KE220A | 220 \pm 5% | 209...231 | 185 | 5 | 328 | 1.3 |
| P4 KE250 | 250 \pm 10% | 225...275 | 202 | 5 | 360 | 1.1 |
| P4 KE250A | 250 \pm 5% | 237...263 | 214 | 5 | 344 | 1.2 |
| P4 KE300 | 300 \pm 10% | 270...330 | 243 | 5 | 430 | 0.97 |
| P4 KE300A | 300 \pm 5% | 285...315 | 256 | 5 | 414 | 1.0 |
| P4 KE350 | 350 \pm 10% | 315...385 | 284 | 5 | 504 | 0.83 |
| P4 KE350A | 350 \pm 5% | 332...368 | 300 | 5 | 482 | 0.87 |
| P4 KE400 | 400 \pm 10% | 360...440 | 324 | 5 | 574 | 0.73 |
| P4 KE400A | 400 \pm 5% | 380...420 | 342 | 5 | 548 | 0.76 |
| P4 KE440 | 440 \pm 10% | 396...484 | 356 | 5 | 631 | 0.66 |
| P4 KE440A | 440 \pm 5% | 418...462 | 376 | 5 | 602 | 0.69 |



The order of type numbers is graded to the international E 24 standard. The standard tolerance of the breakdown voltage for each type is $\pm 10\%$. Suffix “A” denotes a tolerance of $\pm 5\%$.

e.g.: P4KE160C = bidirectional diode, $V_{BR} = 160 \text{ V } (\pm 10\%)$, $V_{WM} \geq 130 \text{ V}$ at $I_D = 5 \mu\text{A}$
 P4KE10A = unidirectional diode, $V_{BR} = 10\text{V } (\pm 5\%)$, $V_{WM} \geq 8.1 \text{ V}$ at $I_D = 10 \mu\text{A}$

Die Abstufung der Typen innerhalb der Reihe entspricht dem internationalen E 24-Standard. Die Toleranz der Arbeitsspannung jedes einzelnen Typs beträgt in der Standardausführung $\pm 10\%$. Suffix “A” kennzeichnet eine Toleranz von $\pm 5\%$.

z.B.: P4KE160C = bidirektionale Diode, $V_{BR} = 160 \text{ V } (\pm 10\%)$, $V_{WM} \geq 130 \text{ V}$ bei $I_D = 5 \mu\text{A}$
 P4KE10A = unidirektionale Diode, $V_{BR} = 10\text{V } (\pm 5\%)$, $V_{WM} \geq 8.1 \text{ V}$ bei $I_D = 10 \mu\text{A}$

¹⁾ Valid, if leads are kept at ambient temperature at a distance of 10 mm from case
 Gültig, wenn die Anschlußdrähte in 10 mm Abstand von Gehäuse auf Umgebungstemperatur gehalten werden