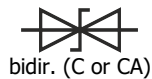
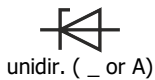


<b>P4KE6.8 ... P4KE440CA</b> <b>Transient Voltage Suppressor Diodes</b> <b>Spannungs-Begrenzer-Dioden</b>	<b>P<sub>PPM</sub> = 400W</b> <b>P<sub>M(AV)</sub> = 1.0 W</b> <b>T<sub>jmax</sub> = 175°C</b>	<b>V<sub>WM</sub> = 5.0 ... 376 V</b> <b>V<sub>BR</sub> = 6.8 ... 440 V</b>
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Version 2021-07-07



SPICE Model & STEP File <sup>1)</sup>



**Marking**

V<sub>BR</sub> only. Cathode mark only at unidirectional types

Nur V<sub>BR</sub>. Kathoden-Markierung nur bei unidirektionalen Typen

**HS Code** 85411000

**Typical Applications**

- Over-voltage protection
- ESD protection
- Free-wheeling diodes
- Commercial grade
- Suffix -Q: AEC-Q101 compliant <sup>1)</sup>
- Suffix -AQ: in AEC-Q101 qualification <sup>1)</sup>

**Features**

- Uni- and Bidirectional versions
- Peak pulse power of 400 W (10/1000 μs waveform)
- Very fast response time
- Compliant to RoHS (exemp. 7a) REACH, Conflict Minerals <sup>1)</sup>

**Mechanical Data <sup>1)</sup>**

- Taped in ammo pack 4000
- Weight approx. 0.4 g
- Case material UL 94V-0
- Solder & assembly conditions 260°C/10s
- MSL N/A



**Typische Anwendungen**

- Schutz gegen Überspannung
- ESD-Schutz
- Freilauf-Dioden
- Standardausführung
- Suffix -Q: AEC-Q101 konform <sup>1)</sup>
- Suffix -AQ: in AEC-Q101 Qualifikation <sup>1)</sup>

**Besonderheiten**

- Uni- und Bidirektionale Versionen
- 400 W Impuls-Verlustleistung (10/1000 μs Strom-Impuls)
- Sehr schnelle Ansprechzeit
- Konform zu RoHS (Ausn. 7a) REACH, Konfliktminerale <sup>1)</sup>

**Mechanische Daten <sup>1)</sup>**

- Gegurtet in Ammo-Pack
- Gewicht ca. 0.4 g
- Gehäusematerial UL 94V-0
- Löt- und Einbaubedingungen

For bidirectional types (add suffix "C" or "CA"), electrical characteristics apply in both directions.

Für bidirektionale Dioden (ergänze Suffix "C" oder "CA") gelten die elektrischen Werte in beiden Richtungen.

**Maximum ratings <sup>2)</sup>**

**Grenzwerte <sup>2)</sup>**

Peak pulse power dissipation – Impuls-Verlustleistung	10/1000 μs	P <sub>PPM</sub>	400 W <sup>3)</sup>
Steady state power dissipation – Verlustleistung im Dauerbetrieb	T <sub>A</sub> = 75°C	P <sub>M(AV)</sub>	1 W <sup>4)</sup>
Peak forward surge current, half sine-wave – Stoßstrom, Sinus-Halbwellen	60 Hz (8.3 ms)	I <sub>FSM</sub>	40 A <sup>5)</sup>
Operating junction temperature – Sperrschichttemperatur		T <sub>j</sub>	-50...+175°C
Storage temperature – Lagerungstemperatur		T <sub>s</sub>	-50...+175°C

**Characteristics**

**Kennwerte**

Max. instantaneous forward voltage Augenblickswert der Durchlass-Spannung	I <sub>F</sub> = 25 A T <sub>j</sub> = 25°C	V <sub>BR</sub> ≤ 200 V V <sub>BR</sub> > 200 V	V <sub>F</sub>	< 3.0 V <sup>5)</sup> < 6.5 V <sup>5)</sup>
Typ. thermal resistance junction to ambient – Typ. Wärmewiderstand Sperrschicht – Umgebung			R <sub>thA</sub>	45 K/W <sup>4)</sup>
Typ. thermal resistance junction to lead – Typ. Wärmewiderstand Sperrschicht – Anschlussdraht			R <sub>thL</sub>	15 K/W

1 Please note the [detailed information on our website](#) or at the beginning of the data book  
 Bitte beachten Sie die [detaillierten Hinweise auf unserer Internetseite](#) bzw. am Anfang des Datenbuches

2 T<sub>A</sub> = 25°C unless otherwise specified – T<sub>A</sub> = 25°C wenn nicht anders angegeben

3 Non-repetitive pulse see curve I<sub>pp</sub> = f(t) / P<sub>pp</sub> = f(t)  
 Höchstzulässiger Spitzenwert eines einmaligen Impulses, siehe Kurve I<sub>pp</sub> = f(t) / P<sub>pp</sub> = f(t)

4 Valid, if leads are kept at ambient temperature at a distance of 10 mm from case  
 Gültig, wenn die Anschlussdrähte in 10 mm Abstand vom Gehäuse auf Umgebungstemperatur gehalten werden

5 Unidirectional diodes only – Nur für unidirektionale Dioden

**Characteristics (T<sub>j</sub> = 25°C)**
**Kennwerte (T<sub>j</sub> = 25°C)**

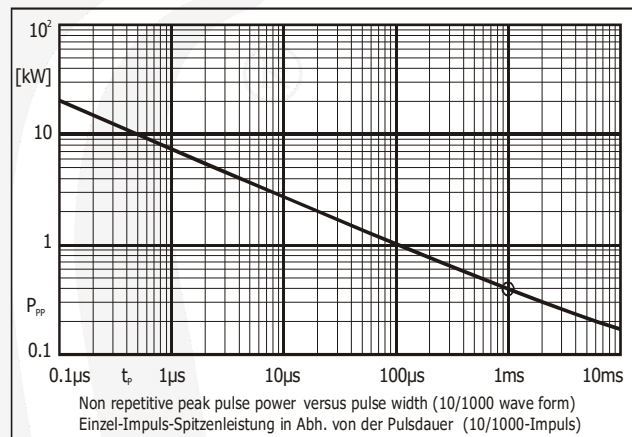
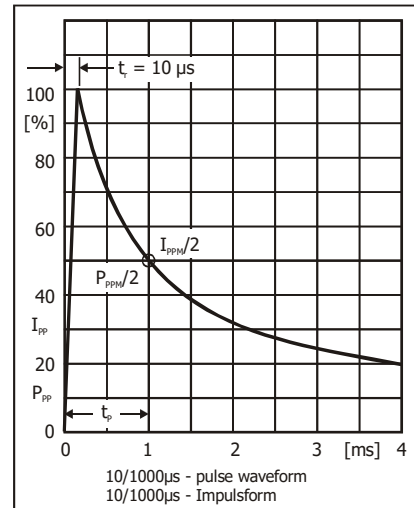
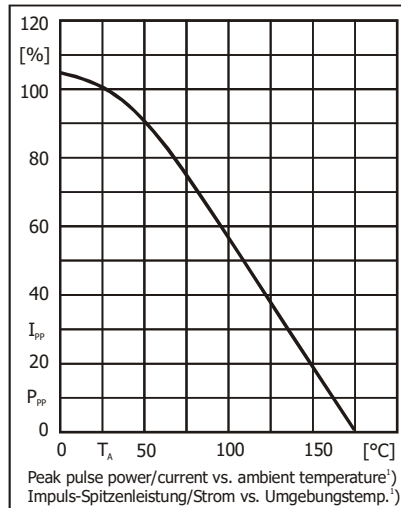
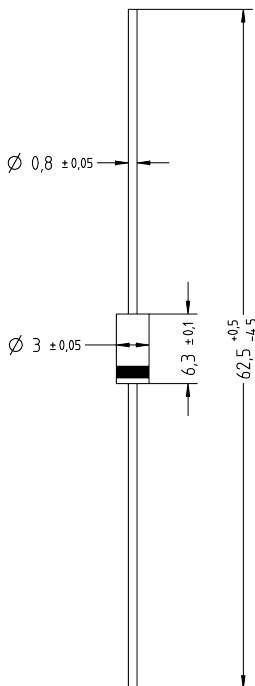
Type Typ	<sup>1)</sup>	Breakdown voltage at I <sub>T</sub> = 1 mA Abbruch-Spannung bei I <sub>T</sub> = 1 mA *) at / bei I <sub>T</sub> = 10 mA		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V <sub>WM</sub>	Max. clamping voltage Max. Begrenzer-Spannung at / bei I <sub>PPM</sub> (10/1000 μs)	
unidirectional	bidirectional	V <sub>BR</sub> [V]		V <sub>WM</sub> [V]	I <sub>D</sub> [μA]	V <sub>C</sub> [V]	I <sub>PPM</sub> [A]
P4KE6.8	P4KE6.8C	6.8 ± 10%	6.12...7.48 *)	5.5	1000	10.8	38.0
P4KE6.8A	P4KE6.8CA	6.8 ± 5%	6.45...7.14 *)	5.8	1000	10.5	40.0
P4KE7.5	P4KE7.5C	7.5 ± 10%	6.75...8.25 *)	6.0	500	11.7	35.0
P4KE7.5A	P4KE7.5CA	7.5 ± 5%	7.13...7.88 *)	6.4	500	11.3	37.0
P4KE8.2	P4KE8.2C	8.2 ± 10%	7.38...9.02 *)	6.6	200	12.5	33.0
P4KE8.2A	P4KE8.2CA	8.2 ± 5%	7.79...8.61 *)	7.0	200	12.1	34.0
P4KE9.1	P4KE9.1C	9.1 ± 10%	8.19...10.0	7.3	50	13.8	30.0
P4KE9.1A	P4KE9.1CA	9.1 ± 5%	8.65...9.55	7.7	50	13.4	31.0
P4KE10	P4KE10C	10 ± 10%	9.0...11.0	8.1	10	15.0	28.0
P4KE10A	P4KE10CA	10 ± 5%	9.5...10.5	8.5	10	14.5	29.0
P4KE11	P4KE11C	11 ± 10%	9.9...12.1	8.9	5	16.2	26.0
P4KE11A	P4KE11CA	11 ± 5%	10.5...11.6	9.4	5	15.6	27.0
P4KE12	P4KE12C	12 ± 10%	10.8...13.2	9.7	5	17.3	24.0
P4KE12A	P4KE12CA	12 ± 5%	11.4...12.6	10.2	5	16.7	25.0
P4KE13	P4KE13C	13 ± 10%	11.7...14.3	10.5	5	19.0	22.0
P4KE13A	P4KE13CA	13 ± 5%	12.4...13.7	11.1	5	18.2	23.0
P4KE15	P4KE15C	15 ± 10%	13.5...16.5	12.1	5	22.0	19.0
P4KE15A	P4KE15CA	15 ± 5%	14.3...15.8	12.8	5	21.2	21.0
P4KE16	P4KE16C	16 ± 10%	14.4...17.6	12.9	5	23.5	17.8
P4KE16A	P4KE16CA	16 ± 5%	15.2...16.8	13.6	5	22.5	18.6
P4KE18	P4KE18C	18 ± 10%	16.2...19.8	14.5	5	26.5	16.0
P4KE18A	P4KE18CA	18 ± 5%	17.1...18.9	15.3	5	25.2	16.5
P4KE20	P4KE20C	20 ± 10%	18.0...22.0	16.2	5	29.1	14.0
P4KE20A	P4KE20CA	20 ± 5%	19.0...21.0	17.1	5	27.7	15.0
P4KE22	P4KE22C	22 ± 10%	19.8...24.2	17.8	5	31.9	13.0
P4KE22A	P4KE22CA	22 ± 5%	20.9...23.1	18.8	5	30.6	13.7
P4KE24	P4KE24C	24 ± 10%	21.6...26.4	19.4	5	34.7	12.0
P4KE24A	P4KE24CA	24 ± 5%	22.8...25.2	20.5	5	33.2	12.6
P4KE27	P4KE27C	27 ± 10%	24.3...29.7	21.8	5	39.1	10.7
P4KE27A	P4KE27CA	27 ± 5%	25.7...28.4	23.1	5	37.5	11.0
P4KE30	P4KE30C	30 ± 10%	27.0...33.0	24.3	5	43.5	9.6
P4KE30A	P4KE30CA	30 ± 5%	28.5...31.5	25.6	5	41.4	10.0
P4KE33	P4KE33C	33 ± 10%	29.7...36.3	26.8	5	47.7	8.8
P4KE33A	<b>P4KE33CA</b> <sup>^)</sup>	33 ± 5%	31.4...34.7	28.2	5	45.7	9.0
P4KE36	P4KE36C	36 ± 10%	32.4...39.6	29.1	5	52.0	8.0
P4KE36A	P4KE36CA	36 ± 5%	34.2...37.8	30.8	5	49.9	8.4
P4KE39	P4KE39C	39 ± 10%	35.1...42.9	31.6	5	56.4	7.4
P4KE39A	<b>P4KE39CA</b> <sup>^)</sup>	39 ± 5%	37.1...41.0	33.3	5	53.9	7.7
P4KE43	P4KE43C	43 ± 10%	38.7...47.3	34.8	5	61.9	6.7
P4KE43A	P4KE43CA	43 ± 5%	40.9...45.2	36.8	5	59.3	7.0
P4KE47	P4KE47C	47 ± 10%	42.3...51.7	38.1	5	67.8	6.2
P4KE47A	P4KE47CA	47 ± 5%	44.7...49.4	40.2	5	64.8	6.4
P4KE51	P4KE51C	51 ± 10%	45.9...56.1	41.3	5	73.5	5.7
P4KE51A	P4KE51CA	51 ± 5%	48.5...53.6	43.6	5	70.1	6.0

1 Footnotes see last page – Fußnoten siehe letzte Seite

**Characteristics (T<sub>j</sub> = 25°C)****Kennwerte (T<sub>j</sub> = 25°C)**

Type Typ	<sup>1)</sup> <sup>2)</sup> -Q <sup>3)</sup> -AQ	Breakdown voltage at I <sub>T</sub> = 1 mA Abbruch-Spannung bei I <sub>T</sub> = 1 mA *) at / bei I <sub>T</sub> = 10 mA		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V <sub>WM</sub>	Max. clamping voltage Max. Begrenzer-Spannung at / bei I <sub>PPM</sub> (10/1000 μs)	
unidirectional	bidirectional	V <sub>BR</sub> [V]		V <sub>WM</sub> [V]	I <sub>D</sub> [μA]	V <sub>C</sub> [V]	I <sub>PPM</sub> [A]
P4KE56	P4KE56C	56 ± 10%	50.4...61.6	45.4	5	81	5.2
P4KE56A	P4KE56CA	56 ± 5%	53.2...58.8	47.8	5	77	5.4
P4KE62	P4KE62C	62 ± 10%	55.8...68.8	50.2	5	89	4.7
P4KE62A	P4KE62CA	62 ± 5%	58.9...65.1	53.0	5	85	5.0
P4KE68	P4KE68C	68 ± 10%	61.2...74.8	55.1	5	98	4.2
P4KE68A	P4KE68CA	68 ± 5%	64.6...71.4	58.1	5	92	4.5
P4KE75	P4KE75C	75 ± 10%	67.5...82.5	60.7	5	108	3.8
P4KE75A	P4KE75CA	75 ± 5%	71.3...78.8	64.1	5	103	4.0
P4KE82	P4KE82C	82 ± 10%	73.8...90.2	66.4	5	118	3.5
P4KE82A	P4KE82CA	82 ± 5%	77.9...86.1	70.1	5	113	3.7
P4KE91	P4KE91C	91 ± 10%	81.9...100	73.7	5	131	3.2
P4KE91A	P4KE91CA	91 ± 5%	86.5...95.5	77.8	5	125	3.3
P4KE100	P4KE100C	100 ± 10%	90.0...110	81.0	5	144	2.9
P4KE100A	P4KE100CA	100 ± 5%	95.0...105	85.5	5	137	3.0
P4KE110	P4KE110C	110 ± 10%	99.0...121	89.2	5	158	2.6
P4KE110A	P4KE110CA	110 ± 5%	105...116	94.0	5	152	2.7
P4KE120	P4KE120C	120 ± 10%	108...132	97.2	5	173	2.4
P4KE120A	P4KE120CA	120 ± 5%	114...126	102	5	165	2.5
P4KE130	P4KE130C	130 ± 10%	117...143	105	5	187	2.2
P4KE130A	P4KE130CA	130 ± 5%	124...137	111	5	179	2.3
P4KE150	P4KE150C	150 ± 10%	135...165	121	5	215	1.9
P4KE150A	P4KE150CA	150 ± 5%	143...158	128	5	207	2.0
P4KE160	P4KE160C	160 ± 10%	144...176	130	5	230	1.8
P4KE160A	P4KE160CA	160 ± 5%	152...168	136	5	219	1.9
P4KE170	P4KE170C	170 ± 10%	153...187	138	5	244	1.7
P4KE170A	P4KE170CA	170 ± 5%	162...179	145	5	234	1.8
P4KE180	P4KE180C	180 ± 10%	162...198	146	5	258	1.6
P4KE180A	P4KE180CA	180 ± 5%	171...189	154	5	246	1.7
P4KE200	P4KE200C	200 ± 10%	180...220	162	5	287	1.4
P4KE200A	P4KE200CA	200 ± 5%	190...210	171	5	274	1.5
P4KE220	P4KE220C	220 ± 10%	198...242	175	5	344	1.2
P4KE220A	P4KE220CA	220 ± 5%	209...231	185	5	328	1.3
P4KE250	P4KE250C	250 ± 10%	225...275	202	5	360	1.1
P4KE250A	P4KE250CA	250 ± 5%	237...263	214	5	344	1.2
P4KE300	P4KE300C	300 ± 10%	270...330	243	5	430	0.97
P4KE300A	P4KE300CA	300 ± 5%	285...315	256	5	414	1.0
P4KE350	P4KE350C	350 ± 10%	315...385	284	5	504	0.83
P4KE350A	P4KE350CA	350 ± 5%	332...368	300	5	482	0.87
P4KE400	P4KE400C	400 ± 10%	360...440	324	5	574	0.73
P4KE400A	P4KE400CA	400 ± 5%	380...420	342	5	548	0.76
P4KE440	P4KE440C	440 ± 10%	396...484	356	5	631	0.66
P4KE440A	P4KE440CA	440 ± 5%	418...462	376	5	602	0.69

1 Footnotes see last page – Fußnoten siehe letzte Seite

**Dimensions – Maße [mm]**


The range 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  $\pm 5\%$  for the breakdown voltage.

e.g.: P4KE51C = bidirectional diode,  $V_{BR} = 51 \text{ V}$  ( $\pm 10\%$ ),  $V_{WM} \geq 41.3 \text{ V}$  at  $I_D = 5 \mu\text{A}$   
 P4KE9.1A = unidirectional diode,  $V_{BR} = 9.1 \text{ V}$  ( $\pm 5\%$ ),  $V_{WM} \geq 7.7 \text{ V}$  at  $I_D = 50 \mu\text{A}$

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

**Disclaimer:** See data book page 2 or [website](#)  
**Haftungsausschluss:** Siehe Datenbuch Seite 2 oder [Internet](#)

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  
 2 <sup>2)</sup> Available in -Q. Ordering code e. g. P4KE43A-Q – <sup>^)</sup> Available in -AQ. Ordering code e. g. P4KE43CA-AQ  
<sup>3)</sup> Erhältlich in -Q. Bestellnummer z. B. P4KE43A-Q – <sup>^)</sup> Erhältlich in -AQ. Bestellnummer z. B. P4KE43CA-AQ