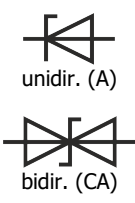


<b>P4SMAJ5.0 ... P4SMAJ170CA</b> <b>SMD Transient Voltage Suppressor Diodes</b> <b>SMD Spannungs-Begrenzer-Dioden</b>	<b>P<sub>PPM</sub> = 400 W</b> <b>P<sub>M(AV)</sub> = 1.0 W</b> <b>T<sub>jmax</sub> = 150°C</b>	<b>V<sub>WM</sub> = 5.0 ... 170 V</b> <b>V<sub>BR</sub> = 6.8 ... 200 V</b>
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Version 2021-08-19



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



**Marking**  
V<sub>WM</sub> only. Cathode mark only at unidirectional types

Nur V<sub>WM</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: AEC-Q101 qualified <sup>1)</sup>

**Features**  
Uni- and Bidirectional versions  
Peak pulse power of 400 W (10/1000 μs waveform)  
Very fast response time  
Further available: P4SMA220...550CA having V<sub>BR</sub> = 220 ... 550 V  
Compliant to RoHS (exemp. 7a) REACH, Conflict Minerals <sup>1)</sup>

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

Taped and reeled	7500 / 13"
Weight approx.	0.07 g
Case material	UL 94V-0
Solder & assembly conditions	260°C/10s
	MSL = 1

**Typische Anwendungen**  
Schutz gegen Überspannung  
ESD-Schutz  
Freilauf-Dioden  
Standardausführung  
Suffix -Q: AEC-Q101 konform <sup>1)</sup>  
Suffix -AQ: AEC-Q101 qualifiziert <sup>1)</sup>

**Besonderheiten**  
Uni- und Bidirektionale Versionen  
400 W Impuls-Verlustleistung (10/1000 μs Strom-Impuls)  
Sehr schnelle Ansprechzeit  
Auch erhältlich: P4SMA220...550CA mit V<sub>BR</sub> = 220 ... 550V  
Konform zu RoHS (Ausn. 7a) REACH, Konfliktmineralien <sup>1)</sup>

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

Gegurtet auf Rolle	
Gewicht ca.	
Gehäusematerial	
Löt- und Einbaubedingungen	

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

Maximum ratings <sup>2)</sup>			Grenzwerte <sup>2)</sup>	
Peak pulse power dissipation (10/1000 μs waveform) Impuls-Verlustleistung (Strom-Impuls 10/1000 μs)	T <sub>A</sub> = 25°C	P <sub>PPM</sub>	400 W <sup>3)</sup>	
Steady state power dissipation – Verlustleistung im Dauerbetrieb	T <sub>T</sub> = 75°C	P <sub>M(AV)</sub>	1 W	
Peak forward surge current Stoßstrom in Fluss-Richtung	Half sine-wave Sinus-Halbwellen 60 Hz (8.3 ms)	I <sub>FSM</sub>	40 A <sup>4)</sup>	
Junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur		T <sub>j</sub> T <sub>s</sub>	-50...+150°C -50...+150°C	

Characteristics			Kennwerte	
Max. instantaneous fwd. voltage – Augenblickswert Durchlass-Spg.	I <sub>F</sub> = 25 A V <sub>BR</sub> ≤ 200 V	V <sub>F</sub>	< 3.5 V <sup>4)</sup>	
Typ. thermal resistance junction to ambient – Typ. Wärmewiderstand Sperrschicht-Umgebung		R <sub>thA</sub>	70 K/W <sup>5)</sup>	
Typ. thermal resistance junction to terminal – Typ. Wärmewiderstand Sperrschicht-Anschluss		R <sub>thT</sub>	30 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 Unidirectional diodes only – Nur für unidirektionale Dioden

5 Mounted on PCB with 25 mm<sup>2</sup> copper pads per terminal – Montage auf Leiterplatte mit 25 mm<sup>2</sup> Lötpad je Anschluss

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

Type Typ	<sup>1)</sup> <sup>Q)</sup> -Q <sup>A)</sup> -AQ <sup>2)</sup>	Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V <sub>WM</sub> <sup>3)</sup>	Breakdown voltage at Abbruch-Spannung bei I <sub>T</sub> = 1 mA   *) 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I <sub>PPM</sub> (10/1000 μs)	
unidirectional	bidirectional	V <sub>WM</sub> [V]	I <sub>D</sub> [μA]	V <sub>BR</sub> min [V]	V <sub>BR</sub> max [V]	V <sub>C</sub> [V]	I <sub>PPM</sub> [A]
P4SMAJ5.0	P4SMAJ5.0C	5.0	800	6.4 *)	7.8 *)	10.3	38.8
P4SMAJ5.0A	P4SMAJ5.0CA	5.0	800	6.4 *)	7.0 *)	9.2	43.5
P4SMAJ6.5	P4SMAJ6.5C	6.5	500	7.2 *)	8.8 *)	12.3	32.5
P4SMAJ6.5A	P4SMAJ6.5CA	6.5	500	7.2 *)	8.0 *)	11.2	35.7
P4SMAJ7.0	P4SMAJ7.0C	7.0	200	7.8 *)	9.5 *)	13.3	30.1
P4SMAJ7.0A	P4SMAJ7.0CA	7.0	200	7.8 *)	8.7 *)	12.0	33.3
P4SMAJ7.5	P4SMAJ7.5C	7.5	100	8.3	10.1	14.3	28.0
P4SMAJ7.5A	P4SMAJ7.5CA	7.5	100	8.3	9.2	12.9	31.0
P4SMAJ8.0	P4SMAJ8.0C	8.0	50	8.9	10.9	15.0	26.7
P4SMAJ8.0A	P4SMAJ8.0CA	8.0	50	8.9	9.9	13.6	29.4
P4SMAJ8.5	P4SMAJ8.5C	8.5	10	9.4	11.5	15.9	25.2
P4SMAJ8.5A	P4SMAJ8.5CA	8.5	10	9.4	10.4	14.4	27.8
P4SMAJ9.0	P4SMAJ9.0C	9.0	5	10.0	12.2	16.9	23.7
P4SMAJ9.0A	P4SMAJ9.0CA	9.0	5	10.0	11.1	15.4	26.0
P4SMAJ10	P4SMAJ10C	10	5	11.1	13.5	18.8	21.3
<b>P4SMAJ10A <sup>A)</sup></b>	<b>P4SMAJ10CA <sup>A)</sup></b>	10	5	11.1	12.3	17.0	23.5
P4SMAJ11	P4SMAJ11C	11	5	12.2	14.9	20.1	19.9
<b>P4SMAJ11A <sup>A)</sup></b>	<b>P4SMAJ11CA <sup>A)</sup></b>	11	5	12.2	13.5	18.2	22.0
P4SMAJ12	P4SMAJ12C	12	5	13.3	16.2	22.0	18.2
<b>P4SMAJ12A <sup>QA)</sup></b>	<b>P4SMAJ12CA <sup>QA)</sup></b>	12	5 / 1 <sup>QA)</sup>	13.3	14.8	19.9	20.1
P4SMAJ13	P4SMAJ13C	13	5	14.4	17.6	23.8	16.8
<b>P4SMAJ13A <sup>A)</sup></b>	<b>P4SMAJ13CA <sup>QA)</sup></b>	13	5	14.4	16.0	21.5	18.6
P4SMAJ14	P4SMAJ14C	14	5	15.6	19.0	25.8	15.5
<b>P4SMAJ14A <sup>A)</sup></b>	<b>P4SMAJ14CA <sup>A)</sup></b>	14	5	15.6	17.3	23.2	17.2
P4SMAJ15	P4SMAJ15C	15	5	16.7	20.4	26.9	14.9
<b>P4SMAJ15A <sup>QA)</sup></b>	<b>P4SMAJ15CA <sup>A)</sup></b>	15	5	16.7	18.6	24.4	16.4
P4SMAJ16	P4SMAJ16C	16	5	17.8	21.7	28.8	13.9
<b>P4SMAJ16A <sup>A)</sup></b>	<b>P4SMAJ16CA <sup>A)</sup></b>	16	5	17.8	19.8	26.0	15.4
P4SMAJ17	P4SMAJ17C	17	5	18.9	23.1	30.5	13.1
<b>P4SMAJ17A <sup>A)</sup></b>	<b>P4SMAJ17CA <sup>A)</sup></b>	17	5	18.9	21.0	27.6	14.5
P4SMAJ18	P4SMAJ18C	18	5	20.0	24.4	32.2	12.4
<b>P4SMAJ18A <sup>QA)</sup></b>	<b>P4SMAJ18CA <sup>A)</sup></b>	18	5	20.0	22.2	29.2	13.7
P4SMAJ20	P4SMAJ20C	20	5	22.2	27.1	35.8	11.2
<b>P4SMAJ20A <sup>A)</sup></b>	<b>P4SMAJ20CA <sup>A)</sup></b>	20	5	22.2	24.6	32.4	12.3
P4SMAJ22	P4SMAJ22C	22	5	24.4	29.8	39.4	10.2
<b>P4SMAJ22A <sup>A)</sup></b>	<b>P4SMAJ22CA <sup>A)</sup></b>	22	5	24.4	27.1	35.5	11.3
P4SMAJ24	P4SMAJ24C	24	5	26.7	32.6	43.0	9.3
<b>P4SMAJ24A <sup>A)</sup></b>	<b>P4SMAJ24CA <sup>A)</sup></b>	24	5	26.7	29.6	38.9	10.3
P4SMAJ26	P4SMAJ26C	26	5	28.9	35.3	46.6	8.6
<b>P4SMAJ26A <sup>A)</sup></b>	<b>P4SMAJ26CA <sup>A)</sup></b>	26	5 / 1 <sup>A)</sup>	28.9	32.1	42.1	9.5
P4SMAJ28	P4SMAJ28C	28	5	31.1	37.9	50.0	8.0
<b>P4SMAJ28A <sup>A)</sup></b>	<b>P4SMAJ28CA <sup>QA)</sup></b>	28	5	31.1	34.5	45.4	8.8
P4SMAJ30	P4SMAJ30C	30	5	33.3	40.1	53.5	7.5
<b>P4SMAJ30A <sup>A)</sup></b>	<b>P4SMAJ30CA <sup>QA)</sup></b>	30	5	33.3	36.9	48.4	8.3
P4SMAJ33	P4SMAJ33C	33	5	36.7	44.8	59.0	6.8
<b>P4SMAJ33A <sup>QA)</sup></b>	<b>P4SMAJ33CA <sup>QA)</sup></b>	33	5	36.7	40.7	53.3	7.5
P4SMAJ36	P4SMAJ36C	36	5	40.0	48.4	64.3	6.2

1 Footnotes see last page – Fußnoten siehe letzte Seite

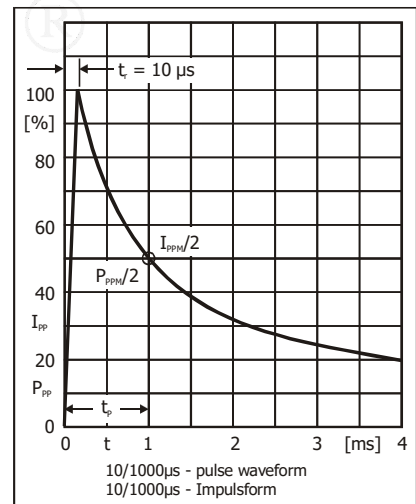
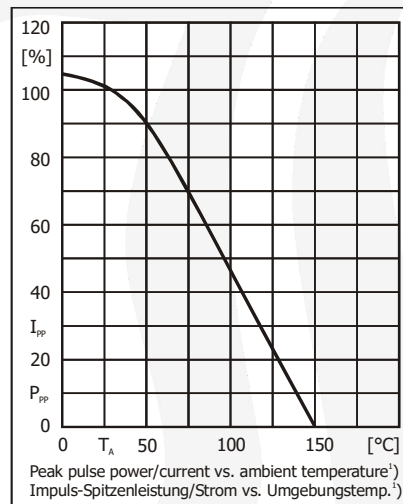
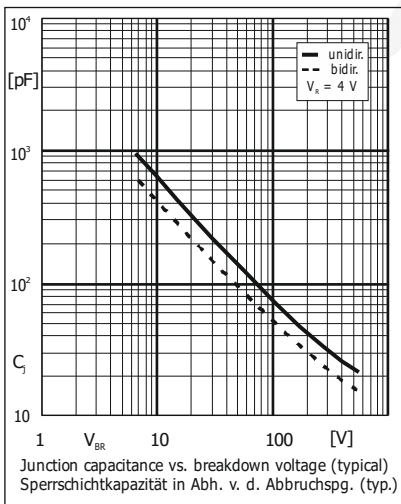
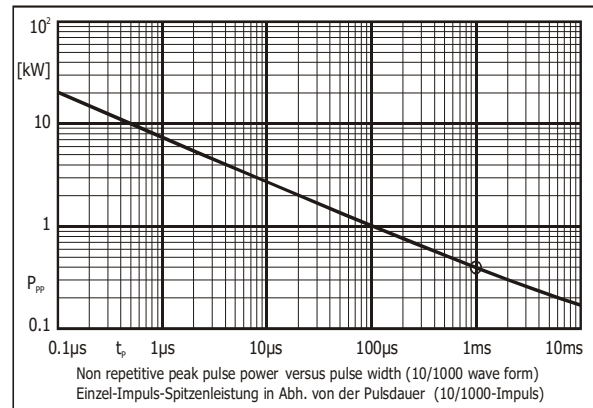
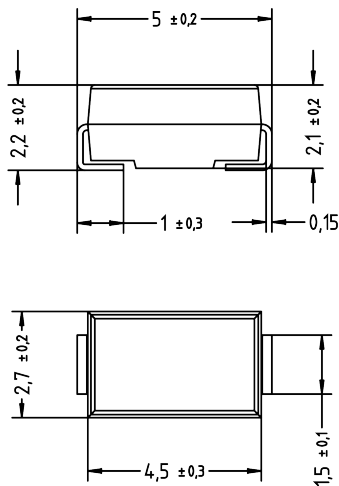
**Characteristics (T<sub>j</sub> = 25°C)**

**Kennwerte (T<sub>j</sub> = 25°C)**

Type Typ	<sup>1)</sup> <sup>Q)</sup> -Q <sup>A)</sup> -AQ <sup>2)</sup>	Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V <sub>WM</sub> <sup>3)</sup>	Breakdown voltage at Abbruch-Spannung bei I <sub>T</sub> = 1 mA   *) 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I <sub>PPM</sub> (10/1000 μs)	
unidirectional	bidirectional	V <sub>WM</sub> [V]	I <sub>D</sub> [μA]	V <sub>BR</sub> min [V]	V <sub>BR</sub> max [V]	V <sub>C</sub> [V]	I <sub>PPM</sub> [A]
<b>P4SMAJ36A</b> <sup>Q A)</sup>	<b>P4SMAJ36CA</b> <sup>Q A)</sup>	36	5	40.0	44.4	58.1	6.9
P4SMAJ40	P4SMAJ40C	40	5	44.4	54.2	71.4	5.6
<b>P4SMAJ40A</b> <sup>Q A)</sup>	<b>P4SMAJ40CA</b> <sup>Q A)</sup>	40	5/5/0.2 <sup>A)</sup>	44.4	49.3	64.5	6.2
P4SMAJ43	P4SMAJ43C	43	5	47.8	58.3	76.7	5.2
<b>P4SMAJ43A</b> <sup>Q A)</sup>	<b>P4SMAJ43CA</b> <sup>Q A)</sup>	43	5	47.8	53.1	69.4	5.8
P4SMAJ45	P4SMAJ45C	45	5	50.0	61.0	80.3	5.0
<b>P4SMAJ45A</b> <sup>A)</sup>	<b>P4SMAJ45CA</b> <sup>A)</sup>	45	5	50.0	55.5	72.7	5.5
P4SMAJ48	P4SMAJ48C	48	5	53.3	65.0	85.5	4.7
<b>P4SMAJ48A</b> <sup>A)</sup>	<b>P4SMAJ48CA</b> <sup>A)</sup>	48	5	53.3	59.2	77.4	5.2
P4SMAJ51	P4SMAJ51C	51	5	56.7	69.2	91.1	4.4
<b>P4SMAJ51A</b> <sup>A)</sup>	<b>P4SMAJ51CA</b> <sup>A)</sup>	51	5	56.7	62.9	82.4	4.9
P4SMAJ54	P4SMAJ54C	54	5	60.0	73.2	96.3	4.2
<b>P4SMAJ54A</b> <sup>A)</sup>	<b>P4SMAJ54CA</b> <sup>A)</sup>	54	5	60.0	66.6	87.1	4.6
P4SMAJ58	P4SMAJ58C	58	5	64.4	78.6	103	3.9
<b>P4SMAJ58A</b> <sup>Q A)</sup>	<b>P4SMAJ58CA</b> <sup>A)</sup>	58	5	64.4	71.5	93.6	4.3
P4SMAJ60	P4SMAJ60C	60	5	66.7	81.4	107	3.7
<b>P4SMAJ60A</b> <sup>A)</sup>	<b>P4SMAJ60CA</b> <sup>A)</sup>	60	5	66.7	74.0	96.8	4.1
P4SMAJ64	P4SMAJ64C	64	5	71.1	86.7	114	3.5
<b>P4SMAJ64A</b> <sup>A)</sup>	<b>P4SMAJ64CA</b> <sup>A)</sup>	64	5	71.1	78.9	103	3.9
P4SMAJ70	P4SMAJ70C	70	5	77.8	94.9	125	3.2
<b>P4SMAJ70A</b> <sup>A)</sup>	<b>P4SMAJ70CA</b> <sup>A)</sup>	70	5	77.8	86.4	113	3.5
P4SMAJ75	P4SMAJ75C	75	5	83.3	102	134	3.0
<b>P4SMAJ75A</b> <sup>A)</sup>	<b>P4SMAJ75CA</b> <sup>A)</sup>	75	5	83.3	92.5	121	3.3
P4SMAJ78	P4SMAJ78C	78	5	86.7	106	139	2.9
<b>P4SMAJ78A</b> <sup>A)</sup>	<b>P4SMAJ78CA</b> <sup>A)</sup>	78	5	86.7	96.2	126	3.2
P4SMAJ85	P4SMAJ85C	85	5	94.4	115	151	2.6
<b>P4SMAJ85A</b> <sup>A)</sup>	<b>P4SMAJ85CA</b> <sup>A)</sup>	85	5	94.4	105	137	2.9
P4SMAJ90	P4SMAJ90C	90	5	100	122	160	2.5
<b>P4SMAJ90A</b> <sup>Q A)</sup>	P4SMAJ90CA	90	5	100	111	146	2.7
P4SMAJ100	P4SMAJ100C	100	5	111	135	179	2.2
P4SMAJ100A	P4SMAJ100CA	100	5	111	123	162	2.5
P4SMAJ110	P4SMAJ110C	110	5	122	149	196	2.0
P4SMAJ110A	P4SMAJ110CA	110	5	122	135	177	2.3
P4SMAJ120	P4SMAJ120C	120	5	133	162	214	1.9
P4SMAJ120A	P4SMAJ120CA	120	5	133	148	193	2.1
P4SMAJ130	P4SMAJ130C	130	5	144	176	231	1.7
P4SMAJ130A	P4SMAJ130CA <sup>Q)</sup>	130	5	144	160	209	1.9
P4SMAJ150	P4SMAJ150C	150	5	167	204	268	1.5
P4SMAJ150A	P4SMAJ150CA	150	5	167	185	243	1.6
P4SMAJ160	P4SMAJ160C	160	5	178	217	287	1.4
P4SMAJ160A	P4SMAJ160CA	160	5	178	198	259	1.5
P4SMAJ170	P4SMAJ170C	170	5	189	231	304	1.3
P4SMAJ170A	P4SMAJ170CA	170	5	189	210	275	1.5
<b>P4SMA220 ... P4SMA550CA</b>		<b>V<sub>WM</sub> = 175 ... 495V</b>					

1 Footnotes see last page – Fußnoten siehe letzte Seite

**Dimensions – Maße [mm]**



TVS diodes having **breakdown voltage  $V_{BR} = 220 \dots 550 \text{ V}$** :  
please refer to datasheet **P4SMA220 ... 550CA**

TVS-Dioden mit **Abbruchspannung  $V_{BR} = 220 \dots 550 \text{ V}$** :  
siehe Datenblatt **P4SMA220 ... 550CA**

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

- 1 Mounted on P.C. board with 25 mm<sup>2</sup> copper pads at each terminal  
Montage auf Leiterplatte mit 25 mm<sup>2</sup> Kupferbelag (Lötpad) an jedem Anschluss
- 2 <sup>2)</sup> Available in -Q. Ordering code e. g. P4SMAJ43A-Q – <sup>\*)</sup> **Available in -AQ. Ordering code e. g. P4SMAJ51CA-AQ**  
<sup>2)</sup> Erhältlich in -Q. Bestellnummer z. B. P4SMAJ43A-Q – <sup>\*)</sup> **Erhältlich in -AQ. Bestellnummer z. B. P4SMAJ51CA-AQ**
- 3 Bi-directional types with  $V_{WM} \leq 10\text{V}$  have double reverse current limit  
Bidirektionale Typen mit  $V_{WM} \leq 10\text{V}$  haben die doppelte Sperrstromgrenze