Diotec Semiconductor

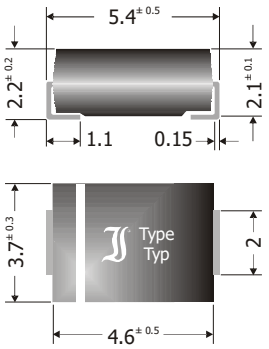
P6SMBJ5.0 ... P6SMBJ170CA

SMD Transient Voltage Suppressor Diodes
SMD Spannungs-Begrenzer-Dioden

P_{PPM} = 600 W V_{WM} = 5.0 ... 170 V
$P_{M(AV)}$ = 5.0 W V_{BR} = 6.8 ... 200 V
T_{jmax} = 150°C

Version 2018-12-12

SMB
~ DO-214AA



Dimensions - Maße [mm]

Type Code = V_{WM}. Cathode mark only at unidirectional types

Typ-Code = V_{WM}. Kathoden-Markierung nur bei unidirektionalen Typen

Typical Applications
Over-voltage protection
ESD protection
Free-wheeling diodes
Commercial grade
Suffix -Q: AEC-Q101 compliant [1])
Suffix -AQ: AEC-Q101 qualified [1])

Typische Anwendungen
Schutz gegen Überspannung
ESD-Schutz
Freilauf-Dioden
Standardausführung
Suffix -Q: AEC-Q101 konform [1])
Suffix -AQ: AEC-Q101 qualifiziert [1])

Features
Uni- and Bidirectional versions
Peak pulse power of 600 W (10/1000 µs waveform)
Very fast response time
Further available: P6SMB220...550CA having V_{BR} = 220 ... 550 V
Compliant to RoHS, REACH, Conflict Minerals [1])

Besonderheiten
Uni- und Bidirektionale Versionen
600 W Impuls-Verlustleistung (10/1000 µs Strom-Impuls)
Sehr schnelle Ansprechzeit
Auch erhältlich: P6SMB220...550CA mit V_{BR} = 220 ... 550V
Konform zu RoHS, REACH, Konfliktmineralien [1])

Mechanical Data [1])		**Mechanische Daten [1])**
Taped and reeled	3000 / 13"	Gegurtet auf Rolle
Weight approx.	0.1 g	Gewicht ca.
Case material	UL 94V-0	Gehäusematerial
Solder & assembly conditions	260°C/10s MSL = 1	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 [2]) — **Grenzwerte [2])**

Peak pulse power dissipation (10/1000 µs waveform) Impuls-Verlustleistung (Strom-Impuls 10/1000 µs)		T_A = 25°C	P_{PPM}	600 W [3])
Steady state power dissipation – Verlustleistung im Dauerbetrieb		T_T = 75°C	$P_{M(AV)}$	5 W
Peak forward surge current Stoßstrom in Fluss-Richtung	Half sine-wave Sinus-Halbwelle	60 Hz (8.3 ms)	I_{FSM}	100 A [4])
Junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur			T_j T_S	-50...+150°C -50...+150°C

Characteristics — **Kennwerte**

Max. instantaneous forward voltage Augenblickswert der Durchlass-Spannung	I_F = 25 A V_{BR} ≤ 200 V	V_F	< 3.0 V [4])
Typ. thermal resistance junction to ambient – Typ. Wärmewiderstand Sperrschicht-Umgebung Typ. thermal resistance junction to terminal – Typ. Wärmewiderstand Sperrschicht-Anschluss		R_{thA} R_{thT}	45 K/W [5]) 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_A = 25°C unless otherwise specified – T_A = 25°C wenn nicht anders angegeben
3 Non-repetitive pulse see curve I_{PP} = f (t) / P_{PP} = f (t)
Höchstzulässiger Spitzenwert eines einmaligen Impulses, siehe Kurve I_{PP} = f (t) / P_{PP} = f (t)
4 Unidirectional diodes only – Nur für unidirektionale Dioden
5 Mounted on P.C. board with 25 mm² copper pads at each terminal
Montage auf Leiterplatte mit 25 mm² Kupferbelag (Lötpad) an jedem Anschluss

Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

Type Typ **P6SMBJ...**		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V_{WM} [1])	Breakdown voltage at Abbruch-Spannung bei I_T = 1 mA | *) 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I_{PPM} (10/1000 µs)	
unidirectional	bidirectional	V_{WM} [V]	I_D [µA]	V_{BR} min [V]	V_{BR} max [V]	V_C [V]	I_{PPM} [A]
5.0	5.0C	5.0	800	6.4 *)	7.8 *)	10.3	58.3
5.0A	5.0CA	5.0	800	6.4 *)	7.0 *)	9.2	65.2
6.0	6.0C	6.0	800	6.7 *)	8.2 *)	11.4	52.6
6.0A	6.0CA	6.0	800	6.7 *)	7.4 *)	10.3	58.3
6.5	6.5C	6.5	500	7.2 *)	8.8 *)	12.3	48.8
6.5A	6.5CA	6.5	500	7.2 *)	8.0 *)	11.2	53.6
7.0	7.0C	7.0	200	7.8 *)	9.5 *)	13.3	45.1
7.0A	7.0CA	7.0	200	7.8 *)	8.7 *)	12.0	50.0
7.5	7.5C	7.5	100	8.3	10.1	14.3	42.0
7.5A	7.5CA	7.5	100	8.3	9.2	12.9	46.5
8.0	8.0C	8.0	50	8.9	10.9	15.0	40.0
8.0A	8.0CA	8.0	50	8.9	9.9	13.6	44.1
8.5	8.5C	8.5	10	9.4	11.5	15.9	37.7
8.5A	8.5CA	8.5	10	9.4	10.4	14.4	41.7
9.0	9.0C	9.0	5	10.0	12.2	16.9	35.5
9.0A/-AQ	9.0CA/-AQ	9.0	5	10.0	11.1	15.4	39.0
10	10C	10	5	11.1	13.5	18.8	31.9
10A	10CA	10	5	11.1	12.3	17.0	35.3
11	11C	11	5	12.2	14.9	20.1	29.9
11A/-Q/-AQ	11CA/-AQ	11	5	12.2	13.5	18.2	33.0
12	12C	12	5	13.3	16.2	22.0	27.3
12A/-AQ	12CA/-AQ	12	5	13.3	14.8	19.9	30.2
13	13C	13	5	14.4	17.6	23.8	25.2
13A/-AQ	13CA/-Q/-AQ	13	5	14.4	16.0	21.5	27.9
14	14C	14	5	15.6	19.0	25.8	23.3
14A/-AQ	14CA/-AQ	14	5	15.6	17.3	23.2	25.9
15	15C	15	5	16.7	20.4	26.9	22.3
15A/-Q/-AQ	15CA/-AQ	15	5	16.7	18.6	24.4	24.6
16	16C	16	5	17.8	21.7	28.8	20.8
16A/-AQ	16CA/-Q/-AQ	16	5	17.8	19.8	26.0	23.1
17	17C	17	5	18.9	23.1	30.5	19.7
17A/-AQ	17CA/-AQ	17	5	18.9	21.0	27.6	21.7
18	18C	18	5	20.0	24.4	32.2	18.6
18A/-AQ	18CA/-AQ	18	5	20.0	22.2	29.2	20.5
20	20C	20	5	22.2	27.1	35.8	16.8
20A/-AQ	20CA/-AQ	20	5	22.2	24.6	32.4	18.5
22	22C	22	5	24.4	29.8	39.4	15.2
22A/-AQ	22CA/-AQ	22	5	24.4	27.1	35.5	16.9
24	24C	24	5	26.7	32.6	43.0	14.0
24A/-Q/-AQ	24CA/-Q/-AQ	24	5	26.7	29.6	38.9	15.4
26	26C	26	5	28.9	35.3	46.6	12.9
26A/-AQ	26CA/-AQ	26	5	28.9	32.1	42.1	14.3
28	28C	28	5	31.1	37.9	50.0	12.0
28A/-AQ	28CA/-Q/-AQ	28	5	31.1	34.5	45.4	13.2
30	30C	30	5	33.3	40.1	53.5	11.2
30A/-Q/-AQ	30CA/-Q/-AQ	30	5	33.3	36.9	48.4	12.4
33	33C	33	5	36.7	44.8	59.0	10.2

1 Bi-directional types with $V_{WM} \leq 10V$ have double reverse current limit – Bidirektionale Typen mit $V_{WM} \leq 10V$ haben die doppelte Sperrstromgrenze

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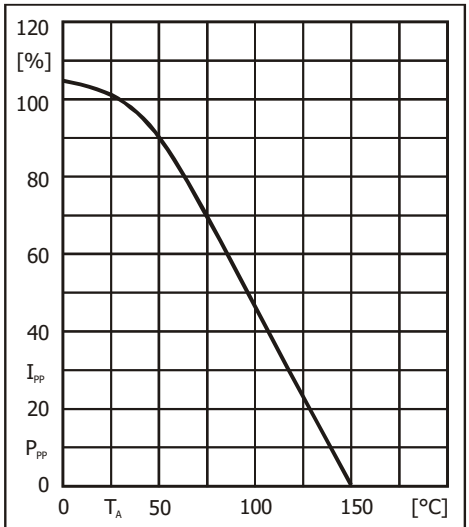
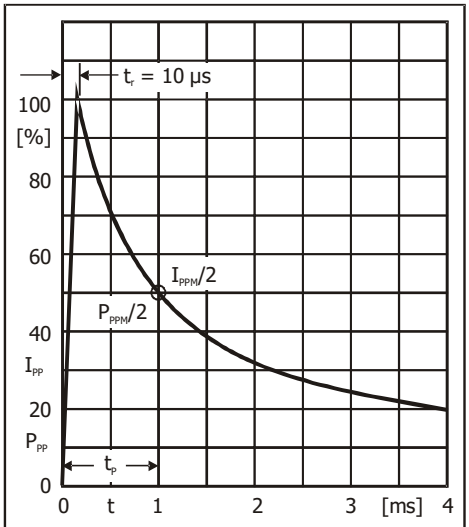
Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

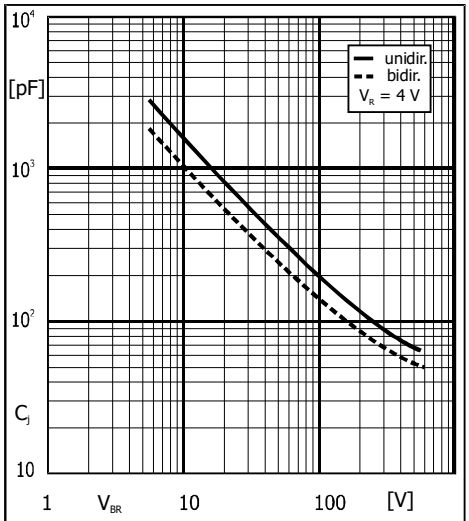
Type Typ **P6SMBJ...**		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V_{WM})	Breakdown voltage at Abbruch-Spannung bei I_T = 1 mA | *) 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I_{PPM} (10/1000 µs)	
unidirectional	bidirectional	V_{WM} [V]	I_D [µA]	V_{BR} min [V]	V_{BR} max [V]	V_C [V]	I_{PPM} [A]
33A/-Q/-AQ	33CA/-Q/-AQ	33	5	36.7	40.7	53.3	11.3
36	36C	36	5	40.0	48.4	64.3	9.3
36A/-Q/-AQ	36CA/-Q/-AQ	36	5	40.0	44.4	58.1	10.3
40	40C	40	5	44.4	54.2	71.4	8.4
40A/-Q/-AQ	40CA/-Q/-AQ	40	5	44.4	49.3	64.5	9.3
43	43C	43	5	47.8	58.3	76.7	7.8
43A/-Q/-AQ	43CA/-Q/-AQ	43	5	47.8	53.1	69.4	8.6
45	45C	45	5	50.0	61.0	80.3	7.5
45A/-AQ	45CA/-AQ	45	5	50.0	55.5	72.7	8.3
48	48C	48	5	53.3	65.0	85.5	7.0
48A/-AQ	48CA/-AQ	48	5	53.3	59.2	77.4	7.8
51	51C	51	5	56.7	69.2	91.1	6.6
51A/-AQ	51CA/-AQ	51	5	56.7	62.9	82.4	7.3
54	54C	54	5	60.0	73.2	96.3	6.2
54A/-AQ	54CA/-AQ	54	5	60.0	66.6	87.1	6.9
58	58C	58	5	64.4	78.6	103	5.8
58A/-AQ	58CA/-AQ	58	5	64.4	71.5	93.6	6.4
60	60C	60	5	66.7	81.4	107	5.6
60A/-Q/-AQ	60CA/-AQ	60	5	66.7	74.0	96.8	6.2
64	64C	64	5	71.1	86.7	114	5.3
64A/-AQ	64CA/-AQ	64	5	71.1	78.9	103	5.8
70	70C	70	5	77.8	94.9	125	4.8
70A/-AQ	70CA/-Q/-AQ	70	5	77.8	86.4	113	5.3
75	75C	75	5	83.3	102	134	4.5
75A/-AQ	75CA/-AQ	75	5	83.3	92.5	121	5.0
78	78C	78	5	86.7	106	139	4.3
78A/-AQ	78CA/-AQ	78	5	86.7	96.2	126	4.8
85	85C	85	5	94.4	115	151	4.0
85A/-AQ	85CA/-AQ	85	5	94.4	105	137	4.4
90	90C	90	5	100	122	160	3.8
90A/-AQ	90CA/-AQ	90	5	100	111	146	4.1
100	100C	100	5	111	135	179	3.4
100A/-AQ	100CA/-AQ	100	5	111	123	162	3.7
110	110C	110	5	122	149	196	3.1
110A/-AQ	110CA/-AQ	110	5	122	135	177	3.4
120	120C	120	5	133	162	214	2.8
120A/-AQ	120CA/-AQ	120	5	133	148	193	3.1
130	130C	130	5	144	176	231	2.6
130A/-Q/-AQ	130CA/-AQ	130	5	144	160	209	2.9
150	150C	150	5	167	204	268	2.2
150A/-Q/-AQ	150CA/-AQ	150	5	167	185	243	2.5
160	160C	160	5	178	217	287	2.1
160A/-AQ	160CA/-AQ	160	5	178	198	259	2.3
170	170C	170	5	189	231	304	2.0
170A/-AQ	170CA/-AQ	170	5	189	210	275	2.2
P6SMB220 ... P6SMB550CA		**V_{WM} = 175 ... 495 V**					



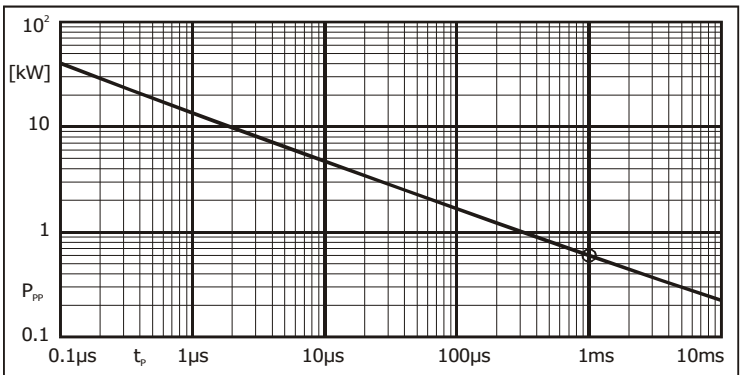
Peak pulse power/current vs. ambient temperature[1])
Impuls-Spitzenleistung/Strom vs. Umgebungstemp.[1])



10/1000µs - pulse waveform
10/1000µs - Impulsform



Junction capacitance vs. breakdown voltage (typ.)
Sperrschichtkapazität in Abh. v.d. Abbruchspg. (typ.)



Non repetitive peak pulse power versus pulse width (10/1000 wave form)
Einzel-Impuls-Spitzenleistung in Abh. von der Pulsdauer (10/1000-Impuls)

TVS diodes having **breakdown voltage V_{BR} = 220 ... 550 V:**
Please refer to datasheet **P6SMB220 ... 550CA**

TVS-Dioden mit **Abbruchspannung V_{BR} = 220 ... 550 V:**
siehe Datenblatt **P6SMB220 ... 550CA**

Disclaimer: See data book page 2 or website
Haftungssauschluss: Siehe Datenbuch Seite 2 oder Internet

1 Mounted on P.C. board with 50 mm² copper pads at each terminal
Montage auf Leiterplatte mit 50 mm² Kupferbelag (Lötpad) an jedem Anschluss

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