Diotec Semiconductor

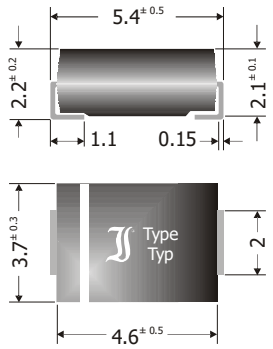
P6SMBJ5.0 ... P6SMBJ170CA

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 2018-09-18

~ 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: in AEC-Q101 qualification [1])

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

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

Mechanische Daten [1])

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	$V_{BR} \le$ 200 V	V_F	< 3.0 V [4])
Thermal resistance junction to ambien – Wärmewiderstand Sperrschicht – Umgebung Thermal resistance junction to terminal – 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

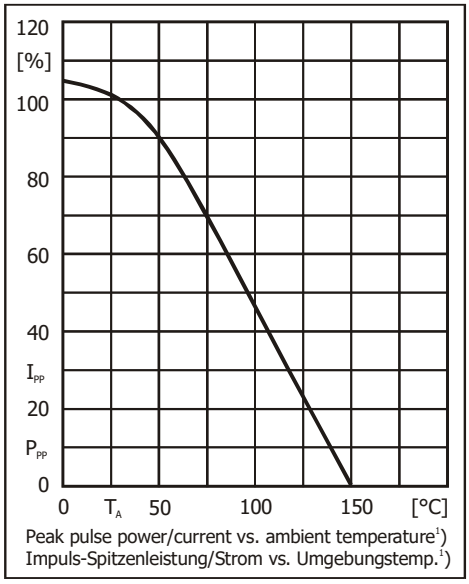
Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

Type Typ		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]
P6SMBJ5.0	P6SMBJ5.0C	5.0	800	6.4 *)	7.8 *)	10.3	58.3
P6SMBJ5.0A	P6SMBJ5.0CA	5.0	800	6.4 *)	7.0 *)	9.2	65.2
P6SMBJ6.0	P6SMBJ6.0C	6.0	800	6.7 *)	8.2 *)	11.4	52.6
P6SMBJ6.0A	P6SMBJ6.0CA	6.0	800	6.7 *)	7.4 *)	10.3	58.3
P6SMBJ6.5	P6SMBJ6.5C	6.5	500	7.2 *)	8.8 *)	12.3	48.8
P6SMBJ6.5A	P6SMBJ6.5CA	6.5	500	7.2 *)	8.0 *)	11.2	53.6
P6SMBJ7.0	P6SMBJ7.0C	7.0	200	7.8 *)	9.5 *)	13.3	45.1
P6SMBJ7.0A	P6SMBJ7.0CA	7.0	200	7.8 *)	8.7 *)	12.0	50.0
P6SMBJ7.5	P6SMBJ7.5C	7.5	100	8.3	10.1	14.3	42.0
P6SMBJ7.5A	P6SMBJ7.5CA	7.5	100	8.3	9.2	12.9	46.5
P6SMBJ8.0	P6SMBJ8.0C	8.0	50	8.9	10.9	15.0	40.0
P6SMBJ8.0A	P6SMBJ8.0CA	8.0	50	8.9	9.9	13.6	44.1
P6SMBJ8.5	P6SMBJ8.5C	8.5	10	9.4	11.5	15.9	37.7
P6SMBJ8.5A	P6SMBJ8.5CA	8.5	10	9.4	10.4	14.4	41.7
P6SMBJ9.0	P6SMBJ9.0C	9.0	5	10.0	12.2	16.9	35.5
P6SMBJ9.0A	P6SMBJ9.0CA	9.0	5	10.0	11.1	15.4	39.0
P6SMBJ10	P6SMBJ10C	10	5	11.1	13.5	18.8	31.9
P6SMBJ10A	P6SMBJ10CA	10	5	11.1	12.3	17.0	35.3
P6SMBJ11	P6SMBJ11C	11	5	12.2	14.9	20.1	29.9
P6SMBJ11A	P6SMBJ11CA	11	5	12.2	13.5	18.2	33.0
P6SMBJ12	P6SMBJ12C	12	5	13.3	16.2	22.0	27.3
P6SMBJ12A	P6SMBJ12CA	12	5	13.3	14.8	19.9	30.2
P6SMBJ13	P6SMBJ13C	13	5	14.4	17.6	23.8	25.2
P6SMBJ13A	P6SMBJ13CA/-Q	13	5	14.4	16.0	21.5	27.9
P6SMBJ14	P6SMBJ14C	14	5	15.6	19.0	25.8	23.3
P6SMBJ14A	P6SMBJ14CA	14	5	15.6	17.3	23.2	25.9
P6SMBJ15	P6SMBJ15C	15	5	16.7	20.4	26.9	22.3
P6SMBJ15A	P6SMBJ15CA	15	5	16.7	18.6	24.4	24.6
P6SMBJ16	P6SMBJ16C	16	5	17.8	21.7	28.8	20.8
P6SMBJ16A	P6SMBJ16CA	16	5	17.8	19.8	26.0	23.1
P6SMBJ17	P6SMBJ17C	17	5	18.9	23.1	30.5	19.7
P6SMBJ17A	P6SMBJ17CA	17	5	18.9	21.0	27.6	21.7
P6SMBJ18	P6SMBJ18C	18	5	20.0	24.4	32.2	18.6
P6SMBJ18A	P6SMBJ18CA	18	5	20.0	22.2	29.2	20.5
P6SMBJ20	P6SMBJ20C	20	5	22.2	27.1	35.8	16.8
P6SMBJ20A	P6SMBJ20CA	20	5	22.2	24.6	32.4	18.5
P6SMBJ22	P6SMBJ22C	22	5	24.4	29.8	39.4	15.2
P6SMBJ22A	P6SMBJ22CA	22	5	24.4	27.1	35.5	16.9
P6SMBJ24	P6SMBJ24C	24	5	26.7	32.6	43.0	14.0
P6SMBJ24A	P6SMBJ24CA	24	5	26.7	29.6	38.9	15.4
P6SMBJ26	P6SMBJ26C	26	5	28.9	35.3	46.6	12.9
P6SMBJ26A	P6SMBJ26CA	26	5	28.9	32.1	42.1	14.3
P6SMBJ28	P6SMBJ28C	28	5	31.1	37.9	50.0	12.0
P6SMBJ28A	P6SMBJ28CA	28	5	31.1	34.5	45.4	13.2
P6SMBJ30	P6SMBJ30C	30	5	33.3	40.1	53.5	11.2
P6SMBJ30A	P6SMBJ30CA	30	5	33.3	36.9	48.4	12.4
P6SMBJ33	P6SMBJ33C	33	5	36.7	44.8	59.0	10.2

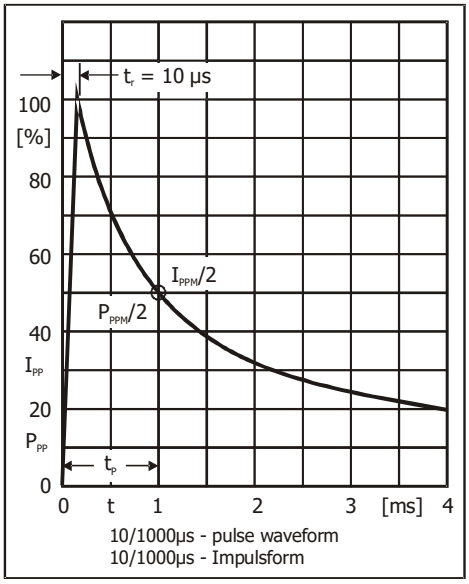
1 Bi-directional types with $V_{WM} \leq 10V$ have double reverse current limit – Bidirektionale Typen mit $V_{WM} \leq 10V$ haben die doppelte Sperrstromgrenze

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

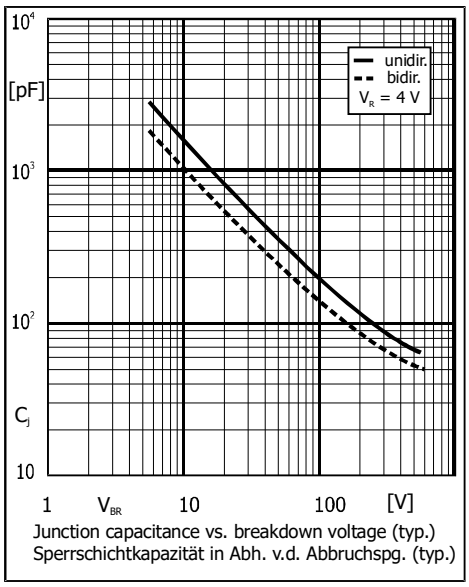
Type Typ		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V_{WM})	Breakdown voltage at Abbruch-Spannung bei I_T = 1 mA | *) 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I_{PPM} (10/1000 µs)	
unidirectional	bidirectional	V_{WM} [V]	I_D [µA]	V_{BR} min [V]	V_{BR} max [V]	V_C [V]	I_{PPM} [A]
P6SMBJ33A	P6SMBJ33CA	33	5	36.7	40.7	53.3	11.3
P6SMBJ36	P6SMBJ36C	36	5	40.0	48.4	64.3	9.3
P6SMBJ36A	P6SMBJ36CA/-AQ	36	5	40.0	44.4	58.1	10.3
P6SMBJ40	P6SMBJ40C	40	5	44.4	54.2	71.4	8.4
P6SMBJ40A	P6SMBJ40CA	40	5	44.4	49.3	64.5	9.3
P6SMBJ43	P6SMBJ43C	43	5	47.8	58.3	76.7	7.8
P6SMBJ43A	P6SMBJ43CA	43	5	47.8	53.1	69.4	8.6
P6SMBJ45	P6SMBJ45C	45	5	50.0	61.0	80.3	7.5
P6SMBJ45A	P6SMBJ45CA	45	5	50.0	55.5	72.7	8.3
P6SMBJ48	P6SMBJ48C	48	5	53.3	65.0	85.5	7.0
P6SMBJ48A	P6SMBJ48CA	48	5	53.3	59.2	77.4	7.8
P6SMBJ51	P6SMBJ51C	51	5	56.7	69.2	91.1	6.6
P6SMBJ51A	P6SMBJ51CA	51	5	56.7	62.9	82.4	7.3
P6SMBJ54	P6SMBJ54C	54	5	60.0	73.2	96.3	6.2
P6SMBJ54A	P6SMBJ54CA	54	5	60.0	66.6	87.1	6.9
P6SMBJ58	P6SMBJ58C	58	5	64.4	78.6	103	5.8
P6SMBJ58A	P6SMBJ58CA	58	5	64.4	71.5	93.6	6.4
P6SMBJ60	P6SMBJ60C	60	5	66.7	81.4	107	5.6
P6SMBJ60A	P6SMBJ60CA	60	5	66.7	74.0	96.8	6.2
P6SMBJ64	P6SMBJ64C	64	5	71.1	86.7	114	5.3
P6SMBJ64A	P6SMBJ64CA	64	5	71.1	78.9	103	5.8
P6SMBJ70	P6SMBJ70C	70	5	77.8	94.9	125	4.8
P6SMBJ70A	P6SMBJ70CA	70	5	77.8	86.4	113	5.3
P6SMBJ75	P6SMBJ75C	75	5	83.3	102	134	4.5
P6SMBJ75A	P6SMBJ75CA	75	5	83.3	92.5	121	5.0
P6SMBJ78	P6SMBJ78C	78	5	86.7	106	139	4.3
P6SMBJ78A	P6SMBJ78CA	78	5	86.7	96.2	126	4.8
P6SMBJ85	P6SMBJ85C	85	5	94.4	115	151	4.0
P6SMBJ85A	P6SMBJ85CA	85	5	94.4	105	137	4.4
P6SMBJ90	P6SMBJ90C	90	5	100	122	160	3.8
P6SMBJ90A	P6SMBJ90CA	90	5	100	111	146	4.1
P6SMBJ100	P6SMBJ100C	100	5	111	135	179	3.4
P6SMBJ100A	P6SMBJ100CA	100	5	111	123	162	3.7
P6SMBJ110	P6SMBJ110C	110	5	122	149	196	3.1
P6SMBJ110A	P6SMBJ110CA	110	5	122	135	177	3.4
P6SMBJ120	P6SMBJ120C	120	5	133	162	214	2.8
P6SMBJ120A	P6SMBJ120CA	120	5	133	148	193	3.1
P6SMBJ130	P6SMBJ130C	130	5	144	176	231	2.6
P6SMBJ130A	P6SMBJ130CA	130	5	144	160	209	2.9
P6SMBJ150	P6SMBJ150C	150	5	167	204	268	2.2
P6SMBJ150A	P6SMBJ150CA	150	5	167	185	243	2.5
P6SMBJ160	P6SMBJ160C	160	5	178	217	287	2.1
P6SMBJ160A	P6SMBJ160CA	160	5	178	198	259	2.3
P6SMBJ170	P6SMBJ170C	170	5	189	231	304	2.0
P6SMBJ170A	P6SMBJ170CA/-Q	170	5	189	210	275	2.2
P6SMB220 ... P6SMB550CA		**V_{WM} = 175 ... 495 V**					



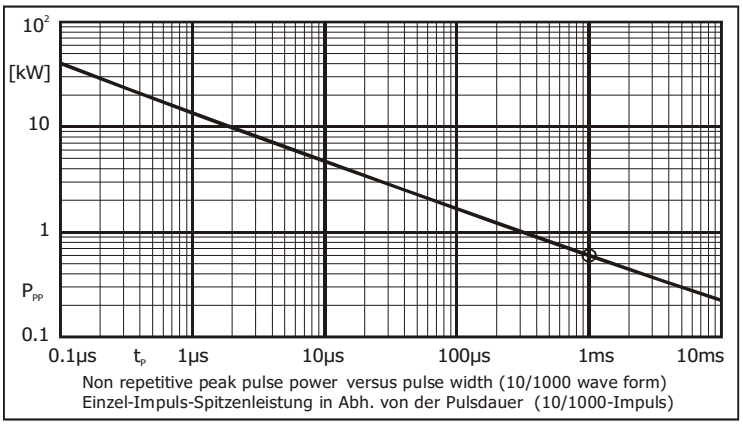
Peak pulse power/current vs. ambient temperature[1])
Impuls-Spitzenleistung/Strom vs. Umgebungstemp.[1])



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

