1.5SMCJ5.0 ... 1.5SMCJ170CA

SMD Transient Voltage Suppresssor Diodes
SMD Spannungs-Begrenzer-Dioden

P_{PPM} = 1500 W
$P_{M(AV)}$ = 5.0 W
T_{jmax} = 150°C
V_{WM} = 5.0 ... 170 V
V_{BR} = 6.8 ... 200 V

Version 2021-11-17

SMC
~ DO-214AB

SPICE Model & **STEP** File [1])


unidir. (_ or A)


bidir. (C or CA)

Marking
V_{BR} only. Cathode mark only at unidirectional types

Nur V_{BR}. Kathoden-Markierung nur bei unidirektionalen Typen

HS Code 85411000

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

Features
Uni- and Bidirectional versions
Peak pulse power of 1500 W (10/1000 µs waveform)
Very fast response time
Further available:
1.5SMC220...550CA
having V_{BR} = 220 ... 550 V
Compliant to RoHS (exemp. 7a), REACH, Conflict Minerals [1])

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

Besonderheiten
Uni- und Bidirektionale Versionen
1500 W Impuls-Verlustleistung (10/1000 µs Strom-Impuls)
Sehr schnelle Ansprechzeit
Auch erhältlich:
1.5MC220...550CA
mit V_{BR} = 220 ... 550V
Konform zu RoHS (Ausn. 7a), REACH, Konfliktmineralien [1])

Mechanical Data [1]) / **Mechanische Daten [1])**

Taped and reeled	3000 / 13	Gegurtet auf Rolle
Weight approx.	0.21 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)			P_{PPM}	1500 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])
Typ. thermal resistance junction to ambient – Typ. Wärmewiderstand Sperrschicht–Umgebung Typ. Thermal resistance junction to terminal – Typ. Wärmewiderstand Sperrschicht–Anschluss			R_{thA} R_{thT}	33 K/W [5]) 10 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 50 mm² copper pads at each terminal
Montage auf Leiterplatte mit 50 mm² Kupferbelag (Lötpad) an jedem Anschluss

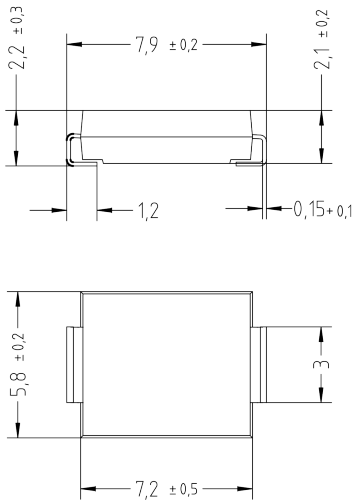
Characteristics (T_j = 25°C) **Kennwerte (T_j = 25°C)**

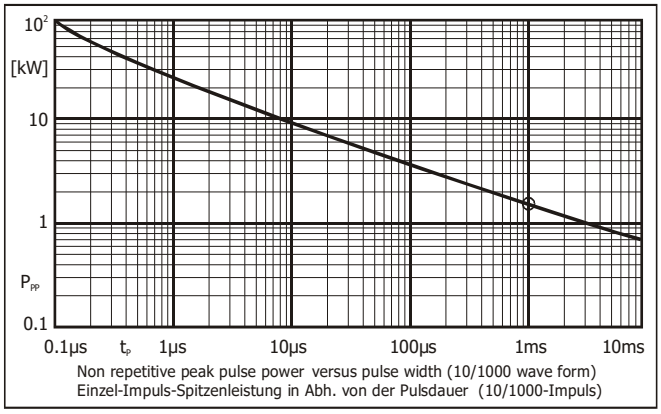
Type / Typ [1] [Q]) -Q [A]) -AQ [2])		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V_{WM}	Breakdown voltage at I_T = 1 mA Abbruch-Spannung bei I_T = 1 mA *) I_T = 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I_{PPM} (10/1000 µs)	
unidirectional	bidirectional	V_{WM} [V]	I_D [µA]	V_{BR} min [V]	V_{BR} max [V]	V_C [V]	I_{PPM} [A]
1.5SMCJ5.0	1.5SMCJ5.0C	5.0	800	6.4 *)	7.8 *)	10.3	146
1.5SMCJ5.0A	1.5SMCJ5.0CA	5.0	800	6.4 *)	7.2 *)	9.2	163
1.5SMCJ6.5	1.5SMCJ6.5C	6.5	500	7.2 *)	8.8 *)	12.3	122
1.5SMCJ6.5A	1.5SMCJ6.5CA	6.5	500	7.2 *)	8.0 *)	11.2	134
1.5SMCJ7.0	1.5SMCJ7.0C	7.0	200	7.8 *)	9.5 *)	13.3	113
1.5SMCJ7.0A	1.5SMCJ7.0CA	7.0	200	7.8 *)	8.7 *)	12.0	125
1.5SMCJ7.5	1.5SMCJ7.5C	7.5	100	8.3	10.1	14.3	105
1.5SMCJ7.5A	1.5SMCJ7.5CA	7.5	100	8.3	9.2	12.9	116
1.5SMCJ8.0	1.5SMCJ8.0C	8.0	50	8.9	10.9	15.0	100
1.5SMCJ8.0A	1.5SMCJ8.0CA	8.0	50	8.9	9.9	13.6	110
1.5SMCJ8.5	1.5SMCJ8.5C	8.5	10	9.4	11.5	15.9	94.3
1.5SMCJ8.5A	1.5SMCJ8.5CA	8.5	10	9.4	10.4	14.4	104.2
1.5SMCJ9.0	1.5SMCJ9.0C	9.0	5	10.0	12.2	16.9	88.8
1.5SMCJ9.0A	1.5SMCJ9.0CA	9.0	5	10.0	11.1	15.4	97.4
1.5SMCJ10	1.5SMCJ10C	10	5	11.1	13.5	18.8	79.8
1.5SMCJ10A [A])	1.5SMCJ10CA [A])	10	5	11.1	12.3	17.0	88.2
1.5SMCJ11	1.5SMCJ11C	11	5	12.2	14.9	20.1	74.6
1.5SMCJ11A [A])	1.5SMCJ11CA [A])	11	5	12.2	13.5	18.2	82.4
1.5SMCJ12	1.5SMCJ12C	12	5	13.3	16.2	22.0	68.2
1.5SMCJ12A [A])	1.5SMCJ12CA [A])	12	5	13.3	14.8	19.9	75.4
1.5SMCJ13	1.5SMCJ13C	13	5	14.4	17.6	23.8	63.0
1.5SMCJ13A [A])	1.5SMCJ13CA [A])	13	5	14.4	16.0	21.5	69.8
1.5SMCJ14	1.5SMCJ14C	14	5	15.6	19.0	25.8	58.1
1.5SMCJ14A [A])	1.5SMCJ14CA [A])	14	5	15.6	17.3	23.2	64.7
1.5SMCJ15	1.5SMCJ15C	15	5	16.7	20.4	26.9	55.8
1.5SMCJ15A [A])	1.5SMCJ15CA [A])	15	5	16.7	18.6	24.4	61.5
1.5SMCJ16	1.5SMCJ16C	16	5	17.8	21.7	28.8	52.1
1.5SMCJ16A [A])	1.5SMCJ16CA [A])	16	5	17.8	19.8	26.0	57.7
1.5SMCJ17	1.5SMCJ17C	17	5	18.9	23.1	30.5	49.2
1.5SMCJ17A [A])	1.5SMCJ17CA [A])	17	5	18.9	21.0	27.6	54.3
1.5SMCJ18	1.5SMCJ18C	18	5	20.0	24.4	32.2	46.6
1.5SMCJ18A [A])	1.5SMCJ18CA [QA])	18	5	20.0	22.2	29.2	51.4
1.5SMCJ20	1.5SMCJ20C	20	5	22.2	27.1	35.8	41.9
1.5SMCJ20A [A])	1.5SMCJ20CA [QA])	20	5	22.2	24.6	32.4	46.3
1.5SMCJ22	1.5SMCJ22C	22	5	24.4	29.8	39.4	38.1
1.5SMCJ22A [QA])	1.5SMCJ22CA [QA])	22	5	24.4	27.1	35.5	42.3
1.5SMCJ24	1.5SMCJ24C	24	5	26.7	32.6	43.0	34.9
1.5SMCJ24A [QA])	1.5SMCJ24CA [QA])	24	5	26.7	29.6	38.9	38.6
1.5SMCJ26	1.5SMCJ26C	26	5	28.9	35.3	46.6	32.2
1.5SMCJ26A [QA])	1.5SMCJ26CA [QA])	26	5	28.9	32.1	42.1	35.6
1.5SMCJ28	1.5SMCJ28C	28	5	31.1	37.9	50.0	30.0
1.5SMCJ28A [QA])	1.5SMCJ28CA [QA])	28	5	31.1	34.5	45.4	33.0
1.5SMCJ30	1.5SMCJ30C	30	5	33.3	40.1	53.5	28.0
1.5SMCJ30A [QA])	1.5SMCJ30CA [QA])	30	5	33.3	36.9	48.4	31.0
1.5SMCJ33	1.5SMCJ33C	33	5	36.7	44.8	59.0	25.4
1.5SMCJ33A [QA])	1.5SMCJ33CA [QA])	33	5	36.7	40.7	53.3	28.1
1.5SMCJ36	1.5SMCJ36C	36	5	40.0	48.4	64.3	23.3
1.5SMCJ36A [QA])	1.5SMCJ36CA [QA])	36	5	40.0	44.4	58.1	25.8
1.5SMCJ40	1.5SMCJ40C	40	5	44.4	54.2	71.4	21.0
1.5SMCJ40A [QA])	1.5SMCJ40CA [QA])	40	5	44.4	49.3	64.5	23.3

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

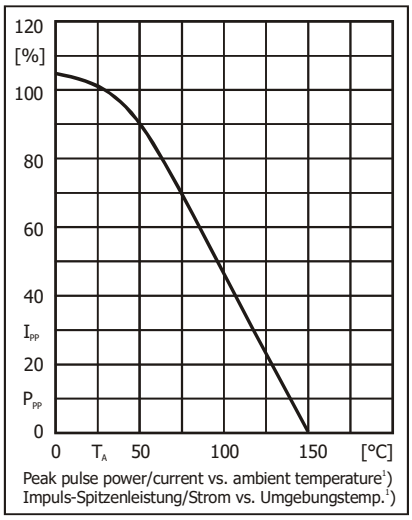
Type [1] Typ [Q]) -Q [A]) -AQ [2])		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V_{WM}	Breakdown voltage at I_T = 1 mA Abbruch-Spannung bei I_T = 1 mA *) I_T = 10 mA		Max. clamping voltage Max. Begrenzer-Spannung at / bei I_{PPM} (10/1000 µs)	
unidirectional	bidirectional	V_{WM} [V]	I_D [µA]	V_{BR} min [V]	V_{BR} max [V]	V_C [V]	I_{PPM} [A]
1.5SMCJ43	1.5SMCJ43C	43	5	47.8	58.3	76.7	19.6
1.5SMCJ43A [QA])	1.5SMCJ43CA [QA])	43	5	47.8	53.1	69.4	21.6
1.5SMCJ45	1.5SMCJ45C	45	5	50.0	61.0	80.3	18.7
1.5SMCJ45A [A])	1.5SMCJ45CA [A])	45	5	50.0	55.5	72.7	20.6
1.5SMCJ48	1.5SMCJ48C	48	5	53.3	65.0	85.5	17.5
1.5SMCJ48A [A])	1.5SMCJ48CA [A])	48	5	53.3	59.2	77.4	19.4
1.5SMCJ51	1.5SMCJ51C	51	5	56.7	69.2	91.1	16.5
1.5SMCJ51A [A])	1.5SMCJ51CA [A])	51	5	56.7	62.9	82.4	18.2
1.5SMCJ54	1.5SMCJ54C	54	5	60.0	73.2	96.3	15.6
1.5SMCJ54A [A])	1.5SMCJ54CA [A])	54	5	60.0	66.6	87.1	17.2
1.5SMCJ58	1.5SMCJ58C	58	5	64.4	78.6	103	14.6
1.5SMCJ58A [A])	1.5SMCJ58CA [A])	58	5	64.4	71.5	93.6	16.0
1.5SMCJ60	1.5SMCJ60C	60	5	66.7	81.4	107	14.0
1.5SMCJ60A [A])	1.5SMCJ60CA [A])	60	5	66.7	74.0	96.8	15.5
1.5SMCJ64	1.5SMCJ64C	64	5	71.1	86.7	114	13.2
1.5SMCJ64A [A])	1.5SMCJ64CA [A])	64	5	71.1	78.9	103	14.6
1.5SMCJ70	1.5SMCJ70C	70	5	77.8	94.9	125	12.0
1.5SMCJ70A [A])	1.5SMCJ70CA [A])	70	5	77.8	86.4	113	13.3
1.5SMCJ75	1.5SMCJ75C	75	5	83.3	102	134	11.2
1.5SMCJ75A [A])	1.5SMCJ75CA [A])	75	5	83.3	92.5	121	12.4
1.5SMCJ78	1.5SMCJ78C	78	5	86.7	106	139	10.8
1.5SMCJ78A [A])	1.5SMCJ78CA [A])	78	5	86.7	96.2	126	11.9
1.5SMCJ85	1.5SMCJ85C	85	5	94.4	115	151	9.9
1.5SMCJ85A	1.5SMCJ85CA	85	5	94.4	105	137	10.9
1.5SMCJ90	1.5SMCJ90C	90	5	100	122	160	9.4
1.5SMCJ90A	1.5SMCJ90CA	90	5	100	111	146	10.3
1.5SMCJ100	1.5SMCJ100C	100	5	111	135	179	8.4
1.5SMCJ100A	1.5SMCJ100CA	100	5	111	123	162	9.3
1.5SMCJ110	1.5SMCJ110C	110	5	122	149	196	7.7
1.5SMCJ110A	1.5SMCJ110CA	110	5	122	135	177	8.5
1.5SMCJ120	1.5SMCJ120C	120	5	133	162	214	7.0
1.5SMCJ120A	1.5SMCJ120CA	120	5	133	148	193	7.8
1.5SMCJ130	1.5SMCJ130C	130	5	144	176	231	6.5
1.5SMCJ130A	1.5SMCJ130CA	130	5	144	160	209	7.2
1.5SMCJ150	1.5SMCJ150C	150	5	167	204	268	5.6
1.5SMCJ150A	1.5SMCJ150CA	150	5	167	185	243	6.2
1.5SMCJ160	1.5SMCJ160C	160	5	178	217	287	5.2
1.5SMCJ160A	1.5SMCJ160CA	160	5	178	198	259	5.8
1.5SMCJ170	1.5SMCJ170C	170	5	189	231	304	4.9
1.5SMCJ170A	1.5SMCJ170CA	170	5	189	210	275	5.5
1.5SMC220 ... 1.5MC550CA		**V_{WM} = 175 ... 495V**					

Dimensions - Maße [mm]

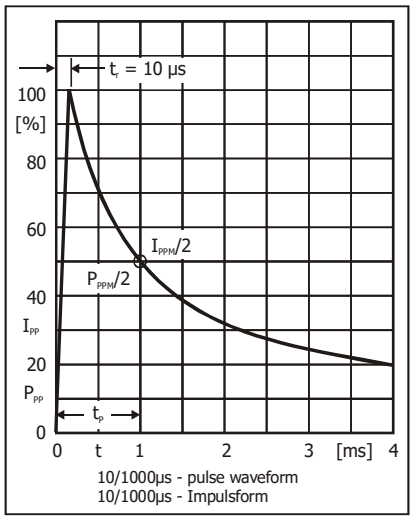




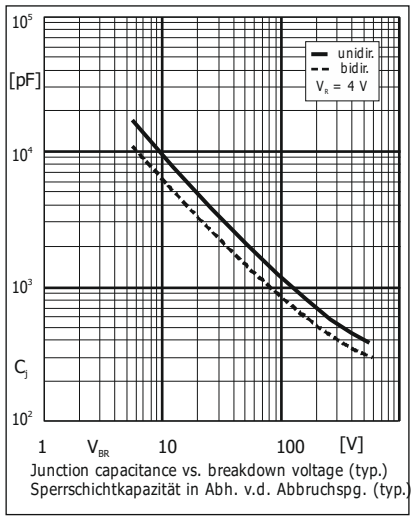
Non repetitive peak pulse power versus pulse width (10/1000 wave form)
Einzel-Impuls-Spitzenleistung in Abh. von der Pulsdauer (10/1000-Impuls)



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.)

TVS diodes having breakdown voltage V_{BR} = 220 ... 550 V:
please refer to datasheet 1.5SMC220 ... 550CA
TVS-Dioden mit Abbruchspannung V_{BR} = 220 ... 550 V:
siehe Datenblatt 1.5SMC220 ... 550CA

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