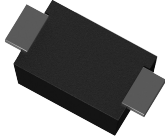


<b>SMF5.0 ... SMF220CA</b> <b>SMD Transient Voltage Suppressor Diodes</b> <b>SMD Spannungs-Begrenzer-Dioden</b>	<b>P<sub>PPM</sub> = 200 W</b> <b>P<sub>M(AV)</sub> = 1 W</b> <b>T<sub>jmax</sub> = 150°C</b>	<b>V<sub>WM</sub> = 5.0 ... 220 V</b> <b>V<sub>BR</sub> = 6.8 ... 260 V</b>
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Version 2021-08-30

**SOD-123FL**  
~ SMF



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



unidir. (A)



bidir. (CA)

**Marking**

V<sub>WM</sub> only. Cathode unidir. types only  
Nur V<sub>WM</sub>. Kathode nur unidir. 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 200 W (10/1000 μs waveform)
- Very fast response time
- Low profile package
- Compliant to RoHS (exemp. 7a) REACH, Conflict Minerals <sup>1)</sup>

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

- Taped and reeled 3000 / 7"
- Weight approx. 0.02 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: in AEC-Q101 Qualifikation <sup>1)</sup>

**Besonderheiten**

- Uni- und Bidirektionale Versionen
- 200 W Impuls-Verlustleistung (10/1000 μs Strom-Impuls)
- Sehr schnelle Ansprechzeit
- Flache Bauform
- 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 "CA"), electrical characteristics apply in both directions.  
Für bidirektionale Dioden (mit Suffix "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 pulse 8/20 μs pulse	P <sub>PPM</sub>	200 W <sup>3)</sup> 1000 W <sup>3)</sup>
Steady state power dissipation Verlustleistung im Dauerbetrieb	T <sub>A</sub> = 50°C T <sub>A</sub> = 25°C	P <sub>M(AV)</sub>	0.5 W <sup>4)</sup> 1.0 W <sup>5)</sup>
ESD immunity (air discharge) – ESD-Festigkeit (Luftentladung) ESD immunity (contact discharge) – ESD-Festigkeit (Kontaktentladung)	IEC 61000-4-2	V <sub>PP</sub>	± 30 kV <sup>6)</sup>
Peak forward surge current Stoßstrom in Fluss-Richtung	Half sine-wave Sinus-Halbwelle 60 Hz (8.3 ms)	I <sub>FSM</sub>	20 A <sup>7)</sup>

**Characteristics**

**Kennwerte**

Max. instantaneous forward voltage – Augenblickswert der Durchlass-Spannung	I <sub>F</sub> = 10 A	V <sub>F</sub>	< 3.5 V <sup>7)</sup>
Junction temperature – Sperrschichttemperatur Storage temperature – Lagerungstemperatur		T <sub>j</sub> T <sub>s</sub>	-50...+150°C -50...+150°C
Typ. thermal resistance junction to ambient Typ. Wärmewiderstand Sperrschicht-Umgebung		R <sub>thA</sub>	180 K/W <sup>4)</sup> 125 K/W <sup>5)</sup>

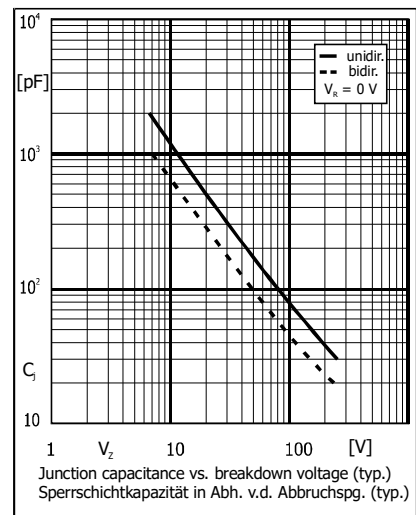
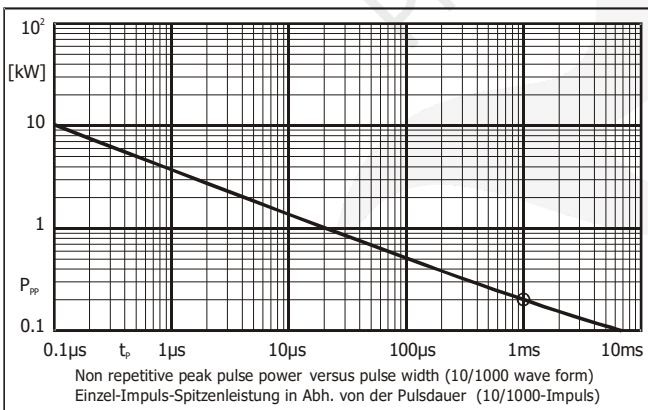
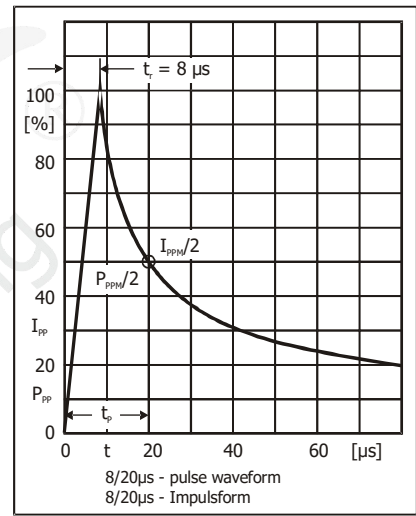
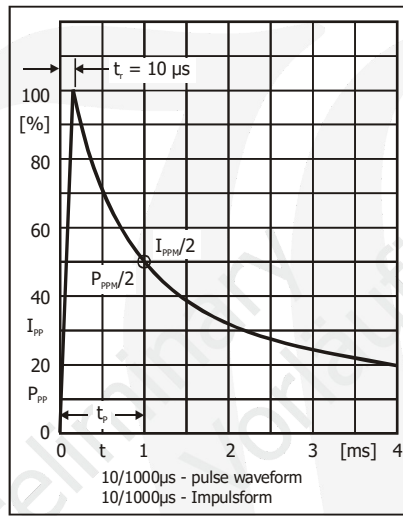
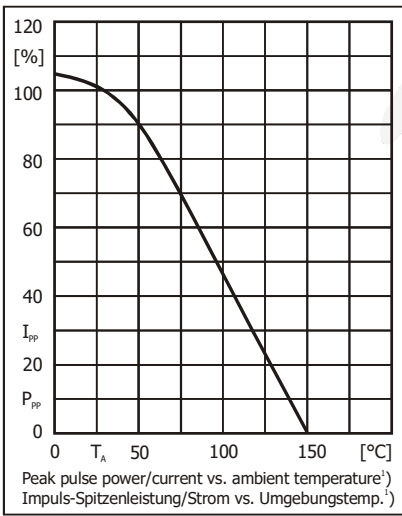
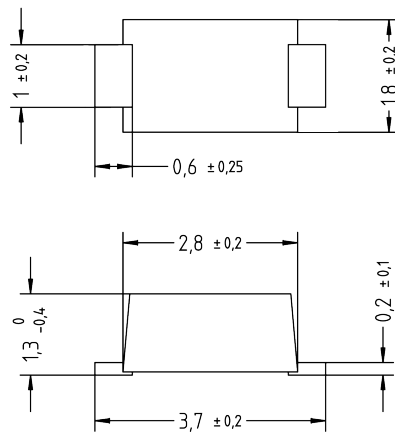
1 Please note the [detailed information on our website](#) or at the beginning of the data book  
Bitte beachten Sie die [detaillierten Hinweise auf unserer Internetseite](#) bzw. am Anfang des Datenbuches  
2 T<sub>A</sub> = 25°C unless otherwise specified – T<sub>A</sub> = 25°C wenn nicht anders angegeben  
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 Mounted on P. C. board with 5x5 mm<sup>2</sup> copper pads – Montage auf Leiterplatte mit 5x5 mm<sup>2</sup> Lötpad je Anschluss  
5 Mounted on P. C. board with 50x50 mm<sup>2</sup> copper pads – Montage auf Leiterplatte mit 50x50 mm<sup>2</sup> Lötpad je Anschluss  
6 Defined for -Q/-AQ parts only – Nur definiert für -Q/-AQ Bauteile  
7 Unidirectional diodes only – Nur für unidirektionale Dioden

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

Type Typ		Stand-off voltage Sperrspannung	Max. rev. current Max. Sperrstrom at / bei V <sub>WM</sub> <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		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]
SMF5.0A	SMF5.0CA	5.0	400	6.4 *)	7.0 *)	9.2	21.74
SMF6.0A	SMF6.0CA	6.0	400	6.6 *)	7.4 *)	10.3	19.42
SMF6.5A	SMF6.5CA	6.5	250	7.2 *)	8.0 *)	11.2	17.86
SMF7.0A	SMF7.0CA	7.0	100	7.7 *)	8.6 *)	12.0	16.67
SMF7.5A	SMF7.5CA	7.5	50	8.3	9.2	12.9	15.50
SMF8.0A	SMF8.0CA	8.0	25	8.8	9.8	13.6	14.71
SMF8.5A	SMF8.5CA	8.5	10	9.4	10.4	14.4	13.89
SMF9.0A	SMF9.0CA	9.0	5	10.0	11.1	15.4	12.99
SMF10A	SMF10CA	10	2.5	11.1	12.3	17.0	11.76
SMF11A	SMF11CA	11	2.5	12.2	13.5	18.2	10.99
SMF12A	SMF12CA	12	2.5	13.3	14.7	19.9	10.05
SMF13A	SMF13CA	13	1	14.4	15.9	21.5	9.30
SMF14A/-O	SMF14CA	14	1	15.6	17.2	23.2	8.62
SMF15A	SMF15CA	15	1	16.7	18.5	24.4	8.20
SMF16A/-O	SMF16CA	16	1	17.8	19.7	26.0	7.69
SMF17A	SMF17CA	17	1	18.9	20.9	27.6	7.25
SMF18A	SMF18CA/-O	18	1	20.0	22.1	29.2	6.85
SMF19A	SMF19CA	19	1	21.1	23.3	30.6	6.54
SMF20A	SMF20CA	20	1	22.2	24.5	32.4	6.17
SMF22A	SMF22CA	22	1	24.4	26.9	35.5	5.63
SMF24A	SMF24CA	24	1	26.7	29.5	38.9	5.14
SMF26A/-O	SMF26CA/-O	26	1	28.9	31.9	42.1	4.75
SMF28A	SMF28CA	28	1	31.1	34.4	45.4	4.41
SMF30A	SMF30CA	30	1	33.3	36.8	48.4	4.13
SMF33A/-O	SMF33CA	33	1	36.7	40.6	53.3	3.75
SMF36A	SMF36CA	36	1	40.0	44.2	58.1	3.44
SMF40A	SMF40CA	40	1	44.4	49.1	64.5	3.10
SMF43A	SMF43CA	43	1	47.8	52.8	69.4	2.88
SMF45A	SMF45CA	45	1	50.0	55.3	72.7	2.75
SMF48A	SMF48CA	48	1	53.3	58.9	77.4	2.58
SMF51A	SMF51CA	51	1	56.7	62.7	82.4	2.43
SMF54A	SMF54CA	54	1	60.0	66.3	87.1	2.30
SMF58A	SMF58CA	58	1	64.4	71.2	93.6	2.14
SMF60A	SMF60CA	60	1	66.7	73.7	96.8	2.07
SMF64A	SMF64CA	64	1	71.1	78.6	103.0	1.94
SMF70A	SMF70CA	70	1	77.8	86.0	113.0	1.77
SMF75A	SMF75CA	75	1	83.3	92.1	121.0	1.65
SMF78A	SMF78CA	78	1	86.7	95.8	126.0	1.59
SMF80A	SMF80CA	80	1	88.8	97.6	129.0	1.55
SMF85A	SMF85CA	85	1	94.4	104.0	137.0	1.46
SMF90A	SMF90CA	90	1	100.0	111.0	146.0	1.37
SMF100A	SMF100CA	100	1	111.0	123.0	162.0	1.23
SMF110A	SMF110CA	110	1	122.0	135.0	177.0	1.13
SMF120A	SMF120CA	120	1	133.0	147.0	193.0	1.04
SMF130A	SMF130CA	130	1	144.0	159.0	209.0	0.96
SMF140A	SMF140CA	140	1	155.0	171.0	224.0	0.89
SMF150A	SMF150CA	150	1	167.0	185.0	243.0	0.82
SMF160A	SMF160CA	160	1	178.0	197.0	259.0	0.77
SMF170A	SMF170CA	170	1	189.0	209.0	275.0	0.73
SMF180A	SMF180CA	180	1	200.0	220.0	292.0	0.68
SMF190A	SMF190CA	190	1	211.0	232.0	308.0	0.65
SMF200A	SMF200CA	200	1	224.0	247.0	321.0	0.62
SMF220A	SMF220CA	220	1	246.0	272.0	356.0	0.56

1 For bi-directional types having V<sub>WM</sub> ≤ 10V, the reverse current limit is doubled  
 Bidirektionale Typen mit V<sub>WM</sub> ≤ 10V haben die doppelte Sperrstromgrenze

**Dimensions – Maße [mm]**



**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