

# SODJ\*\*\***(C)**A-SH

## SURFACE MOUNT TRANSIENT VOLTAGE SUPPRESSOR

### 200 Watt Peak Pulse Power

#### Features

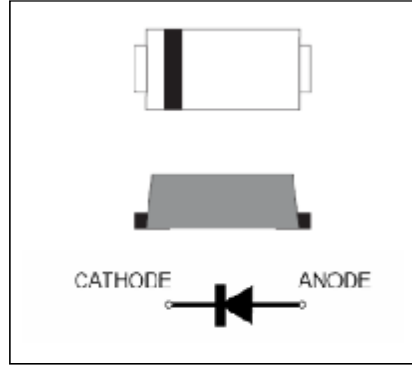
- \* For surface mounted applications in order to optimize board space
- \* Low profile package
- \* Excellent clamping capability
- \* IEC61000-4-2 ESD 15kV Air,8kV contact compliance
- \* Protects one I/O line
- \* Lead-free parts meet RoHS requirements
- \* Suffix "-SH" indicates Halogen-free part, ex.SODJ5.0A-SH.

#### Applications

- \* Personal digital assistants (PDA)
- \* Cellular handsets & Accessories
- \* Portable devices
- \* Portable instrumentation
- \* Handhelds and notebooks
- \* Digital cameras

#### Mechanical data

- \* **Epoxy** : UL94-V0 rated flame retardant
- \* **Case** : Molded plastic, SOD123-FL/MINI SMA
- \* **Terminals** :Tin Plated, solderable per MIL-STD-750,Method 2026
- \* **Polarity** : Indicated by cathode band
- \* **Mounting Position** : Any
- \* **Weight** : Approximated 0.0155 gram



We declare that the material of product is Halogen free (green epoxy compound)

#### 1.Maximum ratings and Electrical Characteristics (AT T =25 AoC unless otherwise noted)

PARAMETER	SYMBOL	VALUE	UNITS
Peak Power Dissipation at T <sub>A</sub> =25°C, T <sub>P</sub> =1ms(Note 1)	P <sub>PPM</sub>	Minimum 200	Watts
Steady State Power Dissipation at T <sub>L</sub> =75°C(Note 2)	P <sub>M(AV)</sub>	0.5	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load(JECED Method) (Note 3)	I <sub>FSM</sub>	20	Amps
Operating Temperature Range	T <sub>J</sub>	-55 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +175	°C

#### NOTES:

1. Non-repetitive current pulse, per Fig. 3 and derated above T<sub>A</sub>=25°C per Fig. 2.
2. 8.0mm<sup>2</sup> (.013mm thick) land areas
3. 8.3ms single half sine-wave, duty cycle= 4 pulses per minutes maximum.

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UNI-DIRECTIONAL PART NUMBER	BI-DIRECTIONAL PART NUMBER	REVERSE STAND-OFF VOLTAGE VRWM (V)	BREAKDOWN VOLTAGE VBR (V) MIN. @IT	BREAKDOWN VOLTAGE VBR (V) MAX. @IT	TEST CURRENT IT (mA)	MAXIMUM CLAMPING VOLTAGE @IPP VC (V)	REVERSE LEAKAGE @VRWM IR (uA)	Device Marking Code	
								Uni	Bi
SODJ5.0A-SH	SODJ5.0CA-SH	5	6.4	7	10	9.2	400	KE	AE
SODJ6.0A-SH	SODJ6.0CA-SH	6	6.67	7.37	10	10.3	400	KG	AG
SODJ6.5A-SH	SODJ6.5CA-SH	6.5	7.22	7.98	10	11.2	250	KK	AK
SODJ7.0A-SH	SODJ7.0CA-SH	7	7.78	8.6	10	12	100	KM	AM
SODJ7.5A-SH	SODJ7.5CA-SH	7.5	8.33	9.21	1	12.9	50	KP	AP
SODJ8.0A-SH	SODJ8.0CA-SH	8	8.89	9.83	1	13.6	25	KR	AR
SODJ8.5A-SH	SODJ8.5CA-SH	8.5	9.44	10.4	1	14.4	10	KT	AT
SODJ9.0A-SH	SODJ9.0CA-SH	9	10	11.1	1	15.4	5	KV	AV
SODJ10A-SH	SODJ10CA-SH	10	11.1	12.3	1	17	2.5	KX	AX
SODJ11A-SH	SODJ11CA-SH	11	12.2	13.5	1	18.2	2.5	KZ	AZ
SODJ12A-SH	SODJ12CA-SH	12	13.3	14.7	1	19.9	2.5	LE	BE
SODJ13A-SH	SODJ13CA-SH	13	14.4	15.9	1	21.5	1	LG	BG
SODJ14A-SH	SODJ14CA-SH	14	15.6	17.2	1	23.2	1	LK	BK
SODJ15A-SH	SODJ15CA-SH	15	16.7	18.5	1	24.4	1	LM	BM
SODJ16A-SH	SODJ16CA-SH	16	17.8	19.7	1	26	1	LP	BP
SODJ17A-SH	SODJ17CA-SH	17	18.9	20.9	1	27.6	1	LR	BR
SODJ18A-SH	SODJ18CA-SH	18	20	22.1	1	29.2	1	LT	BT
SODJ20A-SH	SODJ20CA-SH	20	22.2	24.5	1	32.4	1	LV	BV
SODJ22A-SH	SODJ22CA-SH	22	24.4	26.9	1	35.5	1	LX	BZ
SODJ24A-SH	SODJ24CA-SH	24	26.7	29.5	1	38.9	1	LZ	BZ
SODJ26A-SH	SODJ26CA-SH	26	28.9	31.9	1	42.1	1	ME	CE
SODJ28A-SH	SODJ28CA-SH	28	31.1	34.4	1	45.4	1	MG	CG
SODJ30A-SH	SODJ30CA-SH	30	33.3	36.8	1	48.4	1	MK	CK
SODJ33A-SH	SODJ33CA-SH	33	36.7	40.6	1	53.3	1	MM	CM
SODJ36A-SH	SODJ36CA-SH	36	40	44.2	1	58.1	1	MP	CP
SODJ40A-SH	SODJ40CA-SH	40	44.4	49.1	1	64.5	1	MR	CR
SODJ43A-SH	SODJ43CA-SH	43	47.8	52.8	1	69.4	1	MT	CT
SODJ45A-SH	SODJ45CA-SH	45	50	55.3	1	72.7	1	MV	CV
SODJ48A-SH	SODJ48CA-SH	48	53.3	58.9	1	77.4	1	MX	CX
SODJ51A-SH	SODJ51CA-SH	51	56.7	62.7	1	82.4	1	MZ	CZ
SODJ54A-SH	SODJ54CA-SH	54	60	66.3	1	87.1	1	NE	DE
SODJ58A-SH	SODJ58CA-SH	58	64.4	71.2	1	93.6	1	NG	DG
SODJ60A-SH	SODJ60CA-SH	60	66.7	73.7	1	96.8	1	NK	DK
SODJ64A-SH	SODJ64CA-SH	64	71.1	78.6	1	103	1	NM	DM
SODJ70A-SH	SODJ70CA-SH	70	77.8	86	1	113	1	NP	DP
SODJ75A-SH	SODJ75CA-SH	75	83.3	92.1	1	121	1	NR	DR
SODJ78A-SH	SODJ78CA-SH	78	86.7	95.8	1	126	1	NT	DT
SODJ85A-SH	SODJ85CA-SH	85	94.4	104	1	137	1	NV	DV
SODJ90A-SH	SODJ90CA-SH	90	100	111	1	146	1	NX	DX
SODJ100A-SH	SODJ100CA-SH	100	111	123	1	162	1	NZ	DZ
SODJ110A-SH	SODJ110CA-SH	110	122	135	1	177	1	PE	EE
SODJ120A-SH	SODJ120CA-SH	120	133	147	1	193	1	PG	EG
SODJ130A-SH	SODJ130CA-SH	130	144	159	1	209	1	PK	EK
SODJ150A-SH	SODJ150CA-SH	150	167	185	1	243	1	PM	EM
SODJ160A-SH	SODJ160CA-SH	160	178	197	1	259	1	PP	EP
SODJ170A-SH	SODJ170CA-SH	170	189	209	1	275	1	PR	ER

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## 2.Ratings and Characteristic Curves ( TA = 25°C unless otherwise noted )

Fig. 1-Peak Pulse Power Rating Curve

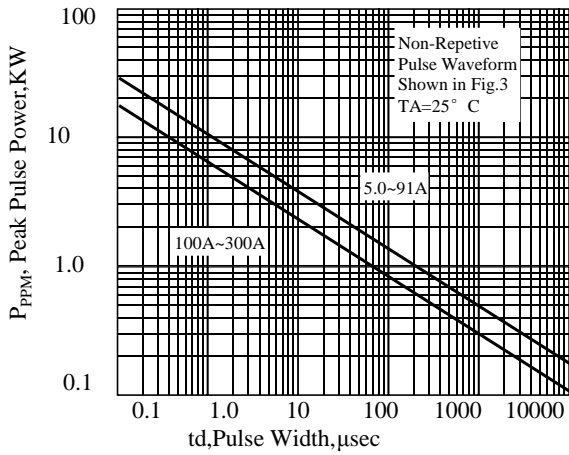


Fig. 2-Power Derating Curve

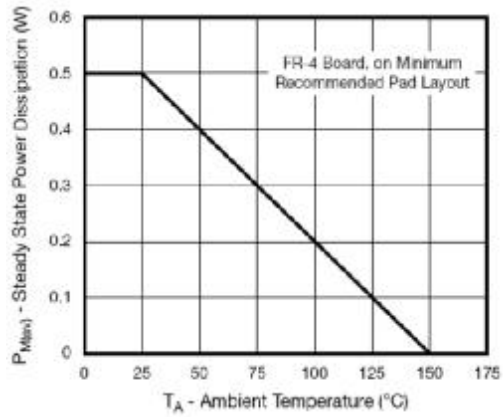


Fig. 3-Pulse Waveform

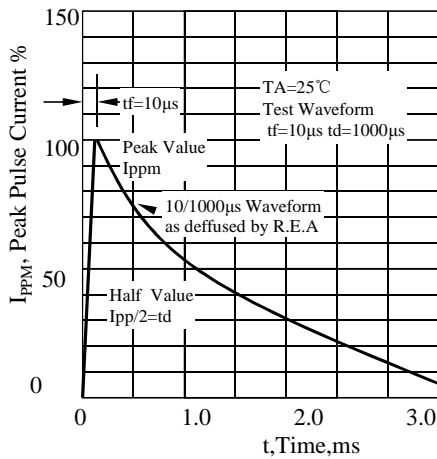


Fig. 4-Typical Junction Capacitance Unidirectional

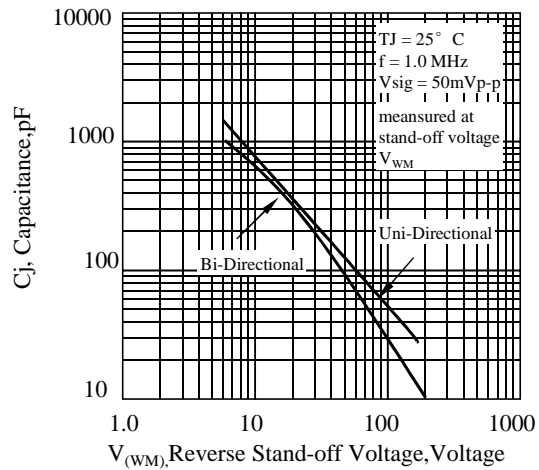


Fig 5. - typical transient thermal impedance

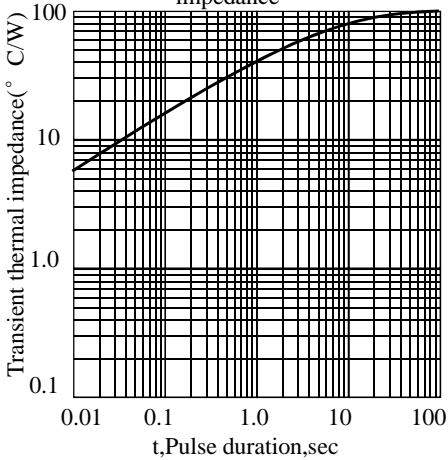
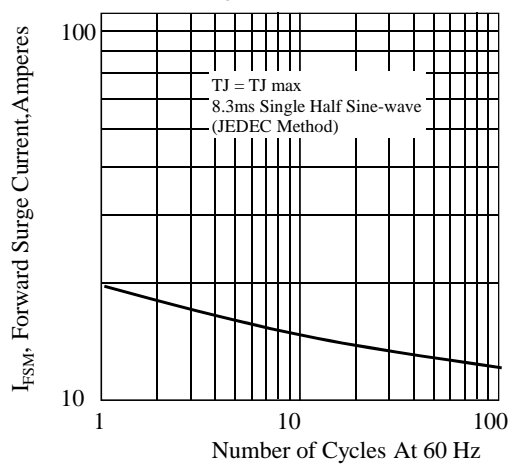


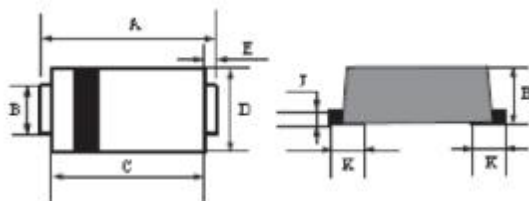
Fig. 6-Maximum Non-Repetitive Peak Forward Surge Current Unidirectional



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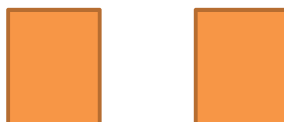
### 3. dimension:

SOD123-FL



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	3.5	3.9	0.138	0.159
B	0.75	0.95	0.029	0.037
C	2.6	3.0	0.103	0.119
D	1.6	2.0	0.063	0.079
E	0.45Typ		0.018Typ	
H	0.9	1.2	0.036	0.047
J	0.12	0.22	0.005	0.009
K	0.8Typ		0.032Typ	

Suggested solder pad layout

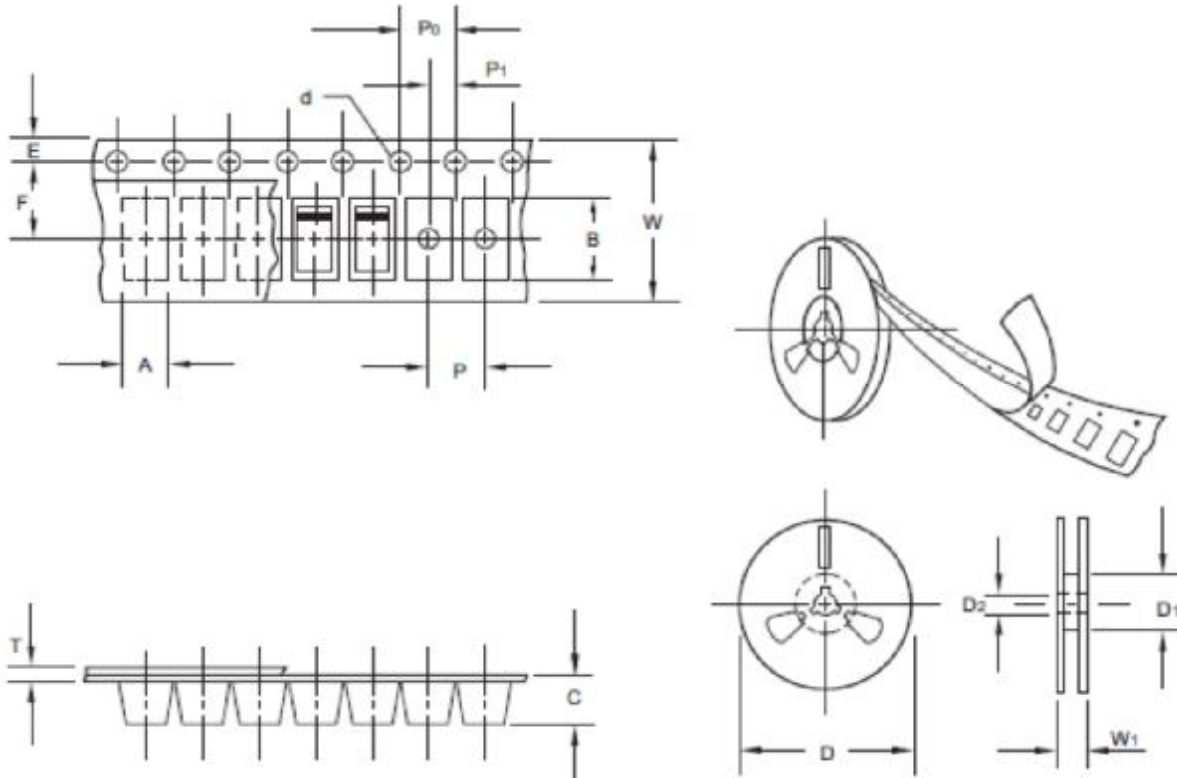


Dimensions in inches and (millimeters)

PACKAGE	A	B	C
SOD123-FL	0.044(1.10)	0.040(1.00)	0.079(2.00)

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### 4.Packing information



Item	Symbol	tolerance	SOD123-FL
Carrier width	A	0.1	2.00
Carrier length	B	0.1	3.85
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D <sub>1</sub>	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D <sub>1</sub>	min	62.00
Feed hole diameter	D <sub>2</sub>	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P <sub>0</sub>	0.1	4.00
Embossment center	P <sub>1</sub>	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W <sub>1</sub>	1.0	11.40

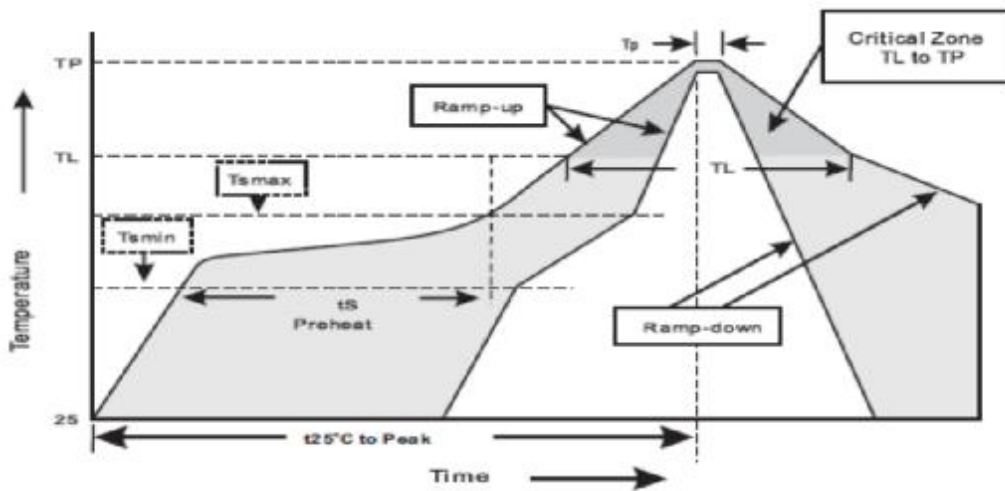
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Reel packing

PACKAGE	REEL SIZE	REEL (PCS)	COMPONENT SPACING (mm)	BOX (pcs)	INNER BOX (mm)	REEL DIA. (mm)	CARTON SIZE (mm)	CARTON (PCS)	APPOX. GROSS WEIGHT (kg)
SOD123-FL	7"	3,000	4.0	30,000	183*183*123	178	382*262*387	240,000	8.7

### 5.Suggested thermal profile for soldering process

1. Storage environment : Temperature=5~40°C Humidity=55±25%
2. Reflow soldering of surface-mount device



3. Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat	
- Temperature Min(T <sub>smin</sub> )	150°C
- Temperature Max(T <sub>smax</sub> )	200°C
- Time(min to max)(t <sub>s</sub> )	60~120sec
T <sub>smax</sub> to T <sub>L</sub>	
- Ramp-up Rate	<3sec
Time maintained above:	
- Temperature (T <sub>L</sub> )	217°C
- Time(t <sub>L</sub> )	60-260sec
Peak Temperature(T <sub>P</sub> )	255 -0/+5°C
Time within 5°C of actual Peak Temperature(T <sub>P</sub> )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes

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### 6.High reliability test capabilities

Item Test	Condition	Reference
Solder Resistance	at 260±5°C for 10±2sec immerse body into solder 1/16" ± 1/32"	MIL-STD-750D METHOD-2031
Solderability	at 245±5°C for 5 sec	MIL-STD-202F METHOD-208
High Temperature Reverse Bias	V <sub>R</sub> =80% rate at T <sub>j</sub> =150°C for 168hrs	MIL-STD-750D METHOD-1038
Forward Operation Life	Rated average rectifier current T <sub>A</sub> =25°C for 500hrs	MIL-STD-750D METHOD-1027
Intermittent Operation Life	T <sub>A</sub> =25°C , I <sub>F</sub> =I <sub>o</sub> On state:power on for 5 min. Off state:power off for 5 min. on and off for 500 cycles	MIL-STD-750D METHOD-1036
Pressure Cooker	15P <sub>SIG</sub> at T <sub>A</sub> =121°C for 4hrs	JESD22-A102
Temperature Cycling	-55°C to +125°C dwelled for 30 min. and transferred for 5min. Total 10 cycles	MIL-STD-750D METHOD-1051
Thermal Shock	0°C for 5min. Rise to 100°C for 5min. Total 10 cycles	MIL-STD-750D METHOD-1056
Forward Surge	8.3ms single half sine-wave superimposed on rated load,one surge	MIL-STD-750D METHOD-4066-2
Humidity	at T <sub>A</sub> =85°C , RH=85% for 1000hrs	MIL-STD-750D METHOD-1021
High Temperature Storage Life	at 175°C for 1000hrs	MIL-STD-750D METHOD-1031

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### 7. Update Record

版次	更新记录	更新作者	更新日期
1	第一版	周杰	2012.12.12
2	因为所有SOD123系列均为无卤塑料，所以取消印字下划线	周杰	2013.01.04
3	将封装SOD-123S修正为SOD123-FL	周杰	2013.03.20