FEATURES

- **400 Watts Peak Pulse Power per Line (tp = 10/1000μs)**
- **Low Inductance**
- **Excellent Clamp ng Capability**
- **Unidirectional & Bidirectional Configurations**
- **Low Leakage Current: < 1μA (Typical)**
- **Fast Response Time**
- **Available in Multiple Voltages**
- **RoHS Compliant**

VOLTAGE RANGE

5.0 to 100 Volts

400 Watts Peak Power

- "GK" represents the brand name
- "XXX" represents the periodic code
- "YYY" represents the product type marking

MECHANICAL DATA

- **Case: JEDEC SOD-123FL**
- **Terminals: Solder plated, solderable per MIL-STD-750 Method 202**
- **Polarity: For uni-directional types the band by laser denotes the cathode, which is positive with respect to the anode under normal TVS operation**

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Rating 25℃ ambient temperature uniess otherwies specified.
Single phase half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

PARAMETER	SYMBOL	UNIT	Conditions	Max
Peak power dissipation(1) (2) (Fig.1)	P_{PPM}	W	with a 10/1000us waveform	400
Peak pulse current(1)	I_{PPM}	A	with a 10/1000us waveform	(See Next Table)
Power dissipation, on infinite heat sink	P_D	W	TL=75℃	1.0
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only (3)	I_{FSM}	A		30
Operating junction and storage temperature range	T_J, T_{STG}	℃		-55 to +150
Thermal resistance	$R_{\theta JL}$	℃/W	Between junction and lead	40
	$R_{\theta JA}$		Between junction and Ambient	180

Notes:

(1). Non repetitive current pulse，per Fig2 and derated above TA=25℃ per Fig3.

(2). T_L=30℃ unless otherwise noted , V_F ≤1.25V@200mA.

(3). Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum

(4).Thermal resistance from junction to ambient and from junction to lead mounted on P.C.B. with 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad areas

DEVICES FOR BIDIRECTIONAL APPLICATIONS

- 1. For bi-directional use C suffix for Types .
- 2. Electrical characteristics apply in both directions.

RATING AND CHARACTERISTIC CURVES

FIG.1-PEAK PULSE POWER DERATING CURVE

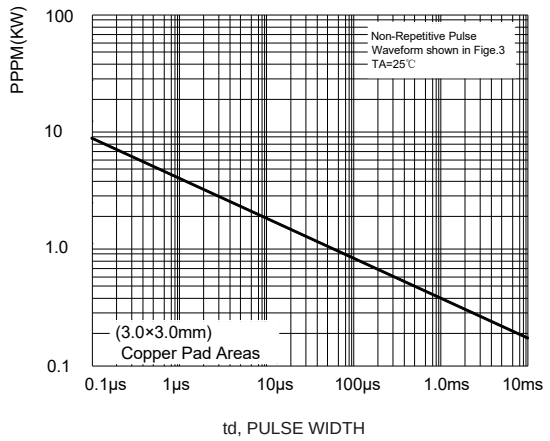


FIG.2-PULSE DERATING CURVE

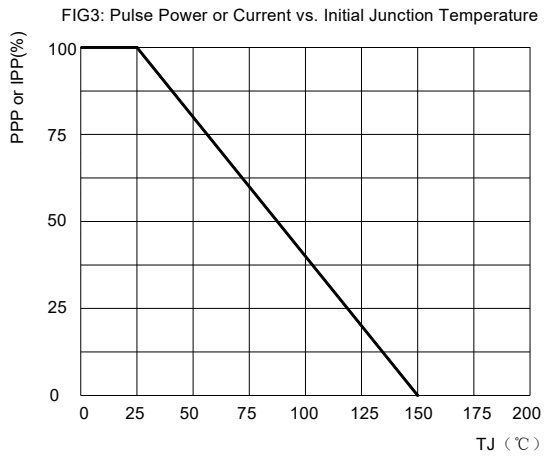


FIG.3-PULSE WAVE FORM

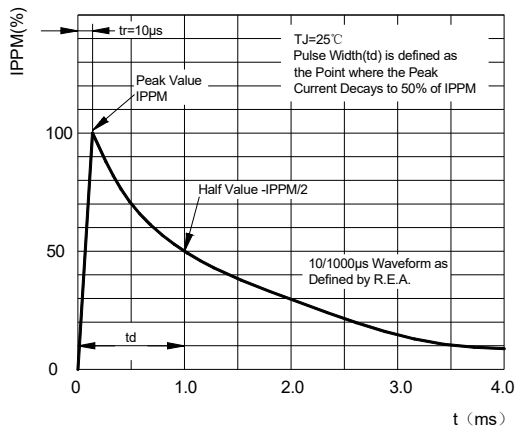
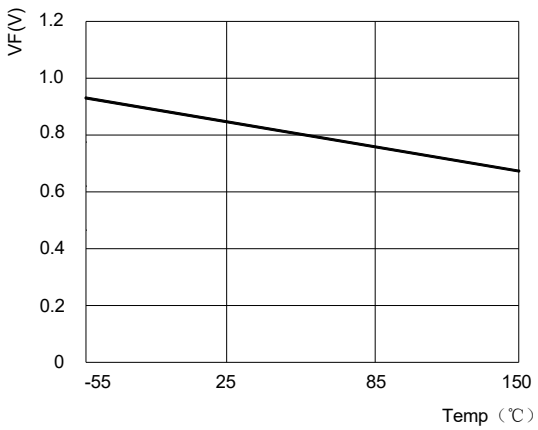


FIG4: Forward Voltage Curve

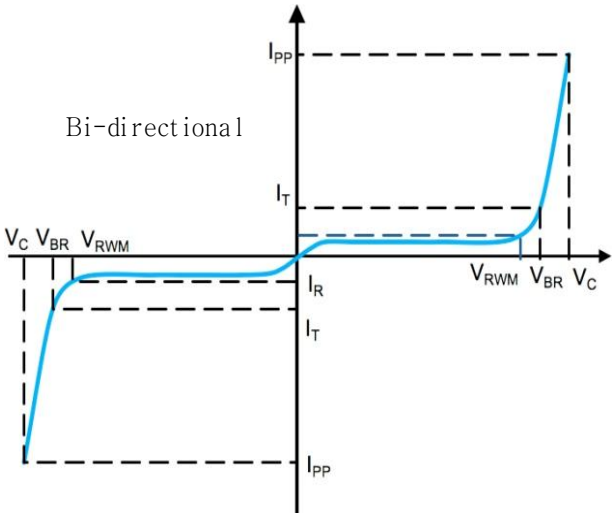


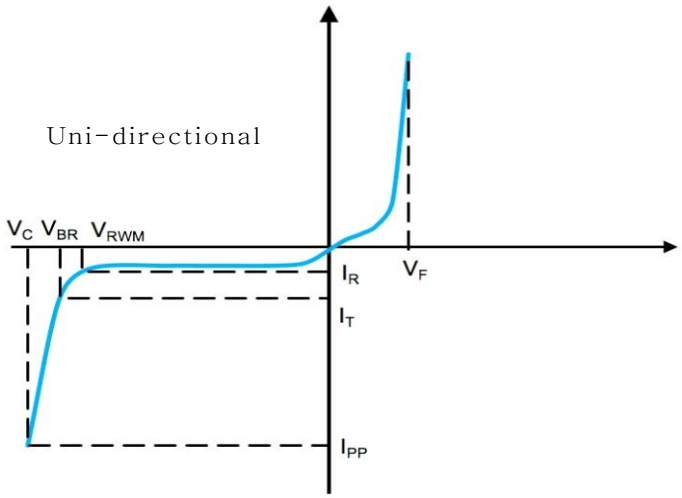
Part Number		Marking		Breakdown Voltage V_{BR}@I_T			Maximum Reverse Leakage I_R @ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP} (2) (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
Uni	Bi	Uni	Bi	Min(V)	Max (V)	I_T(1)(mA)				
SM4F5.0A	SM4F5.0CA	F5.0A	F5.0CA	6.40	7.07	10	800	5.0	43.38	9.2
SM4F6.0A	SM4F6.0CA	F6.0A	F6.0CA	6.67	7.37	10	800	6.0	38.83	10.3
SM4F6.5A	SM4F6.5CA	F6.5A	F6.5CA	7.22	7.98	10	500	6.5	35.71	11.2
SM4F7.0A	SM4F7.0CA	F7.0A	F7.0CA	7.78	8.60	10	200	7.0	33.33	12.0
SM4F7.5A	SM4F7.5CA	F7.5A	F7.5CA	8.33	9.21	1	100	7.5	31.01	12.9
SM4F8.0A	SM4F8.0CA	F8.0A	F8.0CA	8.89	9.83	1	50	8.0	29.41	13.6
SM4F8.5A	SM4F8.5CA	F8.5A	F8.5CA	9.44	10.40	1	10	8.5	27.78	14.4
SM4F9.0A	SM4F9.0CA	F9.0A	F9.0CA	10.00	11.10	1	5	9.0	25.97	15.4
SM4F10A	SM4F10CA	F10A	F10CA	11.10	12.30	1	2.5	10.0	23.52	17.0
SM4F11A	SM4F11CA	F11A	F11CA	12.20	13.50	1	2.5	11.0	21.98	18.2
SM4F12A	SM4F12CA	F12A	F12CA	13.30	14.70	1	2.5	12.0	20.1	19.9
SM4F13A	SM4F13CA	F13A	F13CA	14.40	15.90	1	1.0	13.0	18.6	20.0
SM4F14A	SM4F14CA	F14A	F14CA	15.60	17.20	1	1.0	14.0	17.24	23.2
SM4F15A	SM4F15CA	F15A	F15CA	16.70	18.50	1	1.0	15.0	16.4	24.4
SM4F16A	SM4F16CA	F16A	F16CA	17.80	19.70	1	1.0	16.0	15.38	26.0
SM4F17A	SM4F17CA	F17A	F17CA	18.90	20.90	1	1.0	17.0	14.5	27.6
SM4F18A	SM4F18CA	F18A	F18CA	20.00	22.10	1	1.0	18.0	13.7	29.2
SM4F19A	SM4F19CA	F19A	F19CA	21.10	23.30	1	1.0	19.0	13.08	30.6
SM4F20A	SM4F20CA	F20A	F20CA	22.20	24.50	1	1.0	20.0	12.34	32.4
SM4F22A	SM4F22CA	F22A	F22CA	24.40	26.90	1	1.0	22.0	11.26	35.5
SM4F24A	SM4F24CA	F24A	F24CA	26.70	29.50	1	1.0	24.0	10.28	38.9
SM4F26A	SM4F26CA	F26A	F26CA	28.90	31.90	1	1.0	26.0	9.5	42.1
SM4F28A	SM4F28CA	F28A	F28CA	31.10	34.40	1	1.0	28.0	8.82	45.4

Part Number		Marking		Breakdown Voltage V_{BR}@I_T			Maximum Reverse Leakage I_R @ V_{RWM} (μA)	Working Peak Reverse Voltage V_{RWM} (V)	Maximum Reverse Surge Current I_{PP} (2) (A)	Maximum Clamping Voltage Vc @ I_{PP} (V)
Uni	Bi	Uni	Bi	Min(V)	Max (V)	I_T(1)(mA)				
SM4F30A	SM4F30CA	F30A	F30CA	33.30	36.80	1	1.0	30.0	8.26	48.4
SM4F33A	SM4F33CA	F33A	F33CA	36.70	40.60	1	1.0	33.0	7.5	53.3
SM4F36A	SM4F36CA	F36A	F36CA	40.00	44.20	1	1.0	36.0	6.88	58.1
SM4F40A	SM4F40CA	F40A	F40CA	44.40	49.10	1	1.0	40.0	6.2	64.5
SM4F43A	SM4F43CA	F43A	F43CA	47.80	52.80	1	1.0	43.0	5.76	69.4
SM4F45A	SM4F45CA	F45A	F45CA	50.00	55.30	1	1.0	45.0	5.5	72.7
SM4F48A	/	F48A	/	53.30	58.90	1	1.0	48.0	5.16	77.4
SM4F51A	/	F51A	/	56.70	62.70	1	1.0	51.0	4.86	82.4
SM4F54A	/	F54A	/	60.00	66.30	1	1.0	54.0	4.6	87.1
SM4F58A	/	F58A	/	64.40	71.20	1	1.0	58.0	4.28	93.6
SM4F60A	/	F60A	/	66.70	73.70	1	1.0	60.0	4.14	96.8
SM4F64A	/	F64A	/	71.10	78.60	1	1.0	64.0	3.88	103.0
SM4F70A	/	F70A	/	77.80	86.00	1	1.0	70.0	3.54	113.0
SM4F75A	/	F75A	/	83.30	92.10	1	1.0	75.0	3.3	121.0
SM4F78A	/	F78A	/	86.70	95.80	1	1.0	78.0	3.18	126.0
SM4F80A	/	F80A	/	88.80	97.60	1	1.0	80.0	3.1	129.0
SM4F85A	/	F85A	/	94.40	104.00	1	1.0	85.0	2.92	137.0
SM4F90A	/	F90A	/	100.00	111.00	1	1.0	90.0	2.74	146.0
SM4F100A	/	F100A	/	111.00	123.00	1	1.0	100.0	2.46	162.0

Notes:
(1) t_p≤50ms Pulse test: t_p≤50ms.

I-V Curve Characteristics



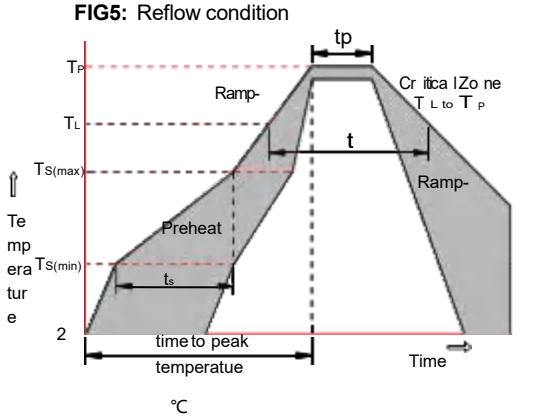


P_{PPM}	Peak Pulse Power Dissipation - Max power dissipation
V_{RWM}	Reverse Stand-off Voltage - Maximum voltage that can be applied to TVS without operation
V_{BR}	Breakdown Voltage – Maximum voltage that flows though the TVS at a specified current (I_T)
V_C	Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (peak impulse current)
I_R	Reverse Leakage Current – Current measured at V_R
V_F	Forward Voltage Drop for Uni-directional

Soldering parameters

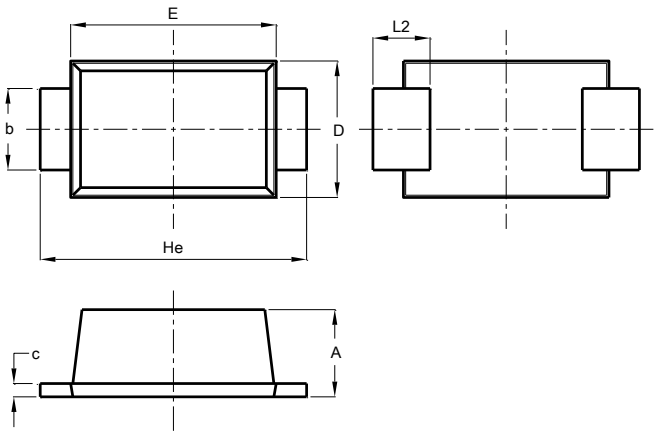
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

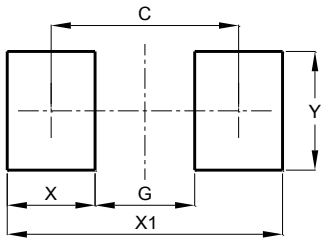
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOD123FL



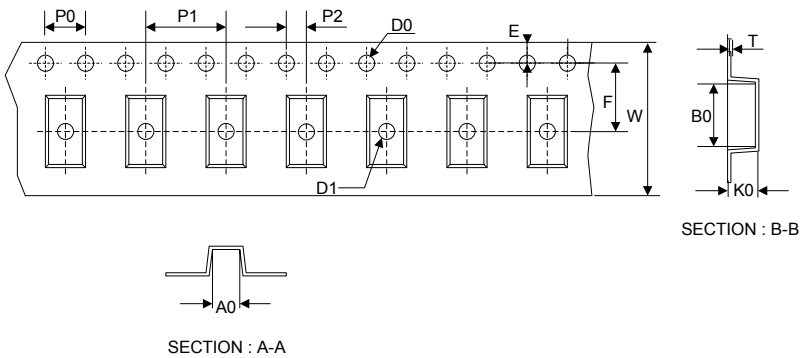


SOD123FL		
Dim	**Min**	**Max**
A	1.00	1.20
b	0.80	1.10
c	0.12	0.20
D	1.75	1.95
E	2.60	2.90
He	3.55	3.80
L2	0.50	0.85
All Dimensions in mm		

Dimensions	Value (in mm)
C	3.25
G	2.00
X	1.25
X1	4.50
Y	1.50

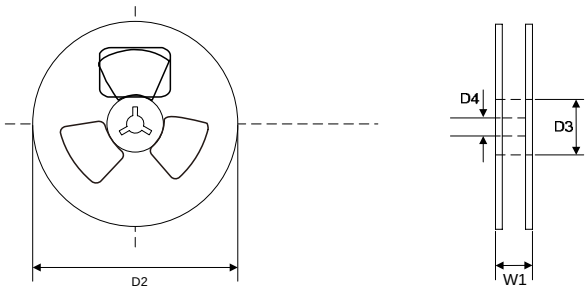
Tape & rell specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
D0	1.55±0.15
D1	1.00±0.20
E	1.75±0.20
F	3.50±0.25
W	8.00±0.20
A0	1.85±0.20
B0	3.95±0.20
K0	1.30±0.20
T	0.21±0.10

7” Reel



D2	178.0±5.0
D3	55.0Min.
D4	10.0±2.5
W1	11.5±2.5
Quantity: 3000PCS	