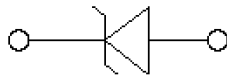
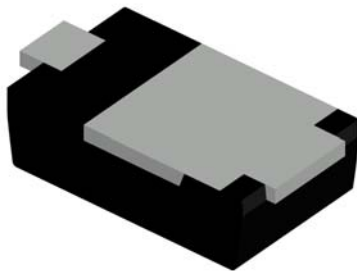


## Surface Mount Transient Voltage Suppressor

### Uni-directional



### Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 400 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
- High temperature soldering guaranteed: 260 °C/10 s at terminals
- Meets MSL level 1
- Component in accordance to RoHS

### Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication.

### Mechanical Date

- **Package:** SOD-123HE  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Polarity:** For uni-directional types the band denotes cathode end

### ■Maximum Ratings ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	Max
Peak power dissipation <sup>(1)</sup> <sup>(2)</sup> (Fig.1)	$P_{PPM}$	W	with a 10/1000us waveform	400
Peak pulse current <sup>(1)</sup>	$I_{PPM}$	A	with a 10/1000us waveform	(See Next Table)
Power dissipation, on infinite heat sink	$P_D$	W	$T_L=75^\circ\text{C}$	0.4
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(3)</sup>	$I_{FSM}$	A		20
Maximum instantaneous forward voltage	VF	V	IF=1A	1.5
Operating junction temperature range	$T_J$	$^\circ\text{C}$		-55 to +150
Storage temperature range	$T_{STG}$	$^\circ\text{C}$		-55 to +150
Thermal resistance <sup>(3)</sup>	$R_{\theta JL}$	$^\circ\text{C/W}$	Between junction and lead	30
	$R_{\theta JA}$		Between junction and Ambient	120



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Notes:

- (1). Non repetitive current pulse, per Fig2 and derated above TA=25°C per Fig3.
- (2). Measured on 8.3 ms single half sine-wave or equivalent square wave, duty cycle = 4 pulses per minute maximum
- (3). 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

## ■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SM4FE SERIES	F1	0.024	3000	24000	96000	7" reel

## ■ Electrical Characteristics (TA=25°C unless otherwise noted)

Part Number	Marking	Breakdown Voltage $V_{BR}@I_T$			Maximum Reverse Leakage $I_R^{(3)}$ @ $V_{RWM}$ ( $\mu A$ )	Working Peak Reverse Voltage $V_{RWM}$ (V)	Maximum Reverse Surge Current $I_{PP}^{(2)}$ (A)	Maximum Clamping Voltage $V_c$ @ $I_{PP}$ (V)
		Min(V)	Max (V)	$I_T^{(1)}$ (mA)				
SM4FE5.0A	E5.0A	6.4	7.07	10	800	5	43.38	9.2
SM4FE6.0A	E6.0A	6.67	7.37	10	800	6	38.83	10.3
SM4FE6.5A	E6.5A	7.22	7.98	10	500	6.5	35.71	11.2
SM4FE7.0A	E7.0A	7.78	8.6	10	200	7	33.33	12
SM4FE7.5A	E7.5A	8.33	9.21	1	100	7.5	31.01	12.9
SM4FE8.0A	E8.0A	8.89	9.83	1	50	8	29.41	13.6
SM4FE8.5A	E8.5A	9.44	10.4	1	10	8.5	27.78	14.4
SM4FE9.0A	E9.0A	10	11.1	1	5	9	25.97	15.4
SM4FE10A	E10A	11.1	12.3	1	2.5	10	23.52	17
SM4FE11A	E11A	12.2	13.5	1	2.5	11	21.98	18.2
SM4FE12A	E12A	13.3	14.7	1	2.5	12	20.1	19.9
SM4FE13A	E13A	14.4	15.9	1	1	13	18.6	20
SM4FE14A	E14A	15.6	17.2	1	1	14	17.24	23.2
SM4FE15A	E15A	16.7	18.5	1	1	15	16.4	24.4
SM4FE16A	E16A	17.8	19.7	1	1	16	15.38	26
SM4FE17A	E17A	18.9	20.9	1	1	17	14.5	27.6
SM4FE18A	E18A	20	22.1	1	1	18	13.7	29.2
SM4FE19A	E19A	21.1	23.3	1	1	19	13.08	30.6
SM4FE20A	E20A	22.2	24.5	1	1	20	12.34	32.4
SM4FE22A	E22A	24.4	26.9	1	1	22	11.26	35.5
SM4FE24A	E24A	26.7	29.5	1	1	24	10.28	38.9
SM4FE26A	E26A	28.9	31.9	1	1	26	9.5	42.1
SM4FE28A	E28A	31.1	34.4	1	1	28	8.82	45.4
SM4FE30A	E30A	33.3	36.8	1	1	30	8.26	48.4
SM4FE33A	E33A	36.7	40.6	1	1	33	7.5	53.3
SM4FE36A	E36A	40	44.2	1	1	36	6.88	58.1
SM4FE40A	E40A	44.4	49.1	1	1	40	6.2	64.5
SM4FE43A	E43A	47.8	52.8	1	1	43	5.76	69.4
SM4FE45A	E45A	50	55.3	1	1	45	5.5	72.7
SM4FE48A	E48A	53.3	58.9	1	1	48	5.16	77.4
SM4FE51A	E51A	56.7	62.7	1	1	51	4.86	82.4
SM4FE54A	E54A	60	66.3	1	1	54	4.6	87.1
SM4FE58A	E58A	64.4	71.2	1	1	58	4.28	93.6
SM4FE60A	E60A	66.7	73.7	1	1	60	4.14	96.8



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SM4FE64A	E64A	71.1	78.6	1	1	64	3.88	103
SM4FE70A	E70A	77.8	86	1	1	70	3.54	113
SM4FE75A	E75A	83.3	92.1	1	1	75	3.3	121
SM4FE78A	E78A	86.7	95.8	1	1	78	3.18	126
SM4FE80A	E80A	88.8	97.6	1	1	80	3.1	129
SM4FE85A	E85A	94.4	104	1	1	85	2.92	137
SM4FE90A	E90A	100	111	1	1	90	2.74	146
SM4FE100A	E100A	111	123	1	1	100	2.46	162

**Notes:**

- (1)  $t_p \leq 50\text{ms}$  Pulse test:  $t_p \leq 50\text{ms}$ .
- (2) Surge current waveform per Fig. 2 and derated per Fig.3.
- (3) For bi-directional types having  $V_{RWM}$  of 10 V and less, the  $I_R$  limit is doubled.

## ■ Characteristics(Typical)

FIG1: Peak Pulse Power Rating Curve

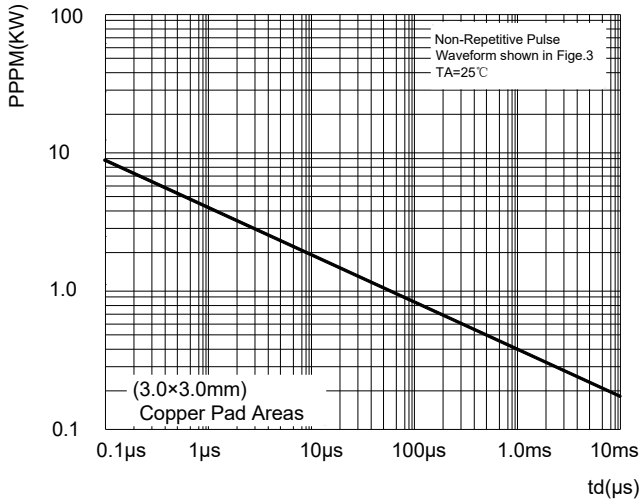


FIG2: Pulse Waveform

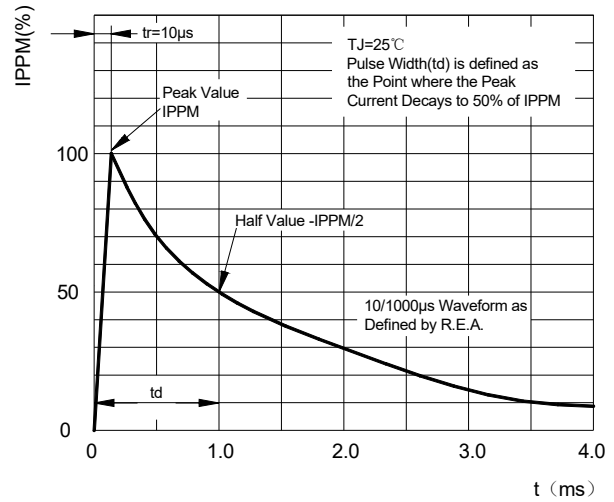


FIG3: Pulse Power or Current vs. Initial Junction Temperature

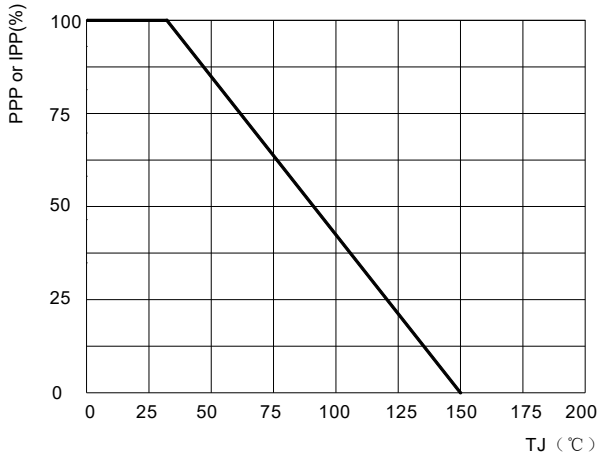
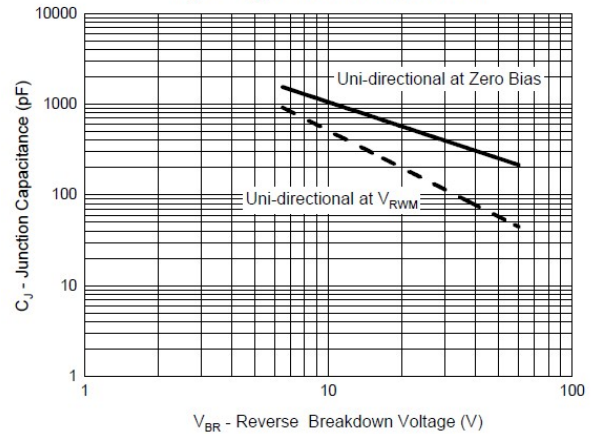


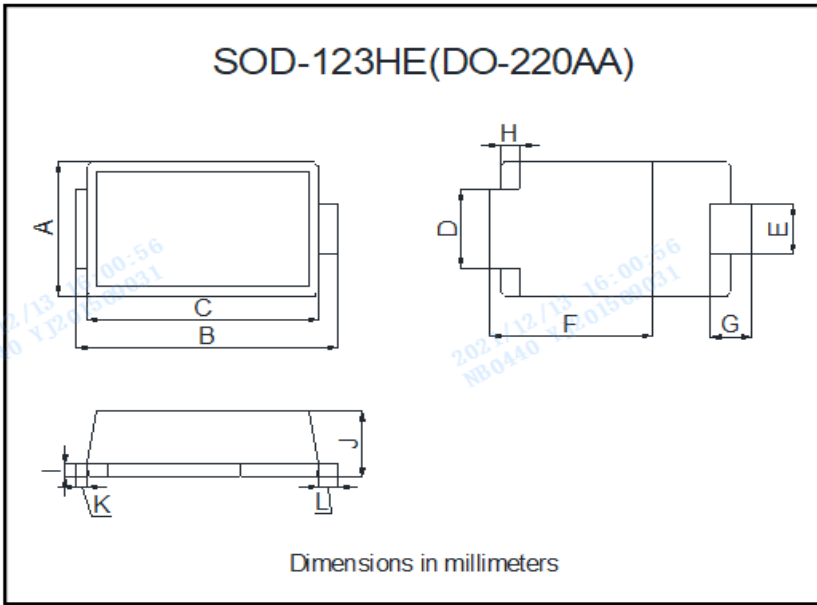
Fig.4 - Typical Junction Capacitance





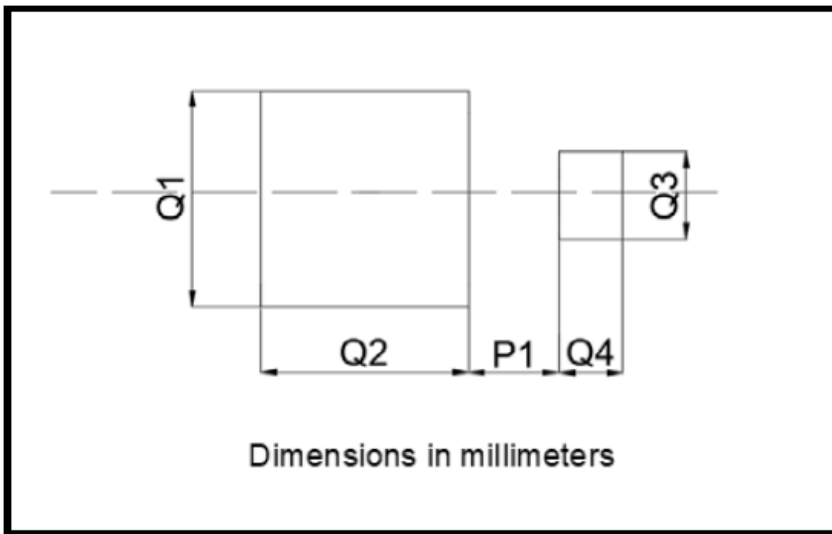
# SM4FE SERIES

## ■ Outline Dimensions



SOD-123HE(DO-220AA)		
Dim	Min	Max
A	1.88	2.18
B	3.70	4.00
C	3.19	3.61
D	1.05	1.35
E	0.61	0.91
F	2.20	2.60
G	0.40	0.80
H	0.30 REF	
I	0.10	0.30
J	0.85	1.15
K	0.00	0.30
L	0.15	0.45

## ■ Suggested pad layout



Dim	Millimeters
P1	0.64
Q1	2.54
Q2	2.67
Q3	1.27
Q4	0.76



## SM4FE SERIES

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