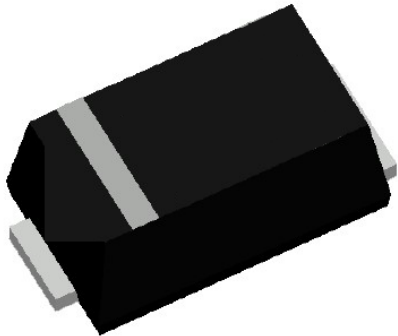


## Surface Mount Transient Voltage Suppressor

### Uni-directional

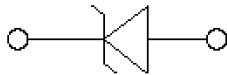


### Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional
- 150 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-323HE  
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<sub>a</sub>=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	Max
Peak power dissipation <sup>(1)</sup> <sup>(2)</sup> (Fig.1)	P <sub>PPM</sub>	W	with a 10/1000us waveform	150
Peak pulse current <sup>(1)</sup>	I <sub>PPM</sub>	A	with a 10/1000us waveform	(See Next Table)
Power dissipation, on infinite heat sink	P <sub>D</sub>	W	TL=75°C	1
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only	I <sub>FSM</sub>	A		20
Maximum instantaneous forward voltage	V <sub>F</sub>	V	I <sub>F</sub> =1A	1.2
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	°C		-55 to +150
Electrostatic Discharge	ESD	KV	IEC61000-4-2 air discharge	±30
Electrostatic Discharge			IEC61000-4-2 contact discharge	
Thermal resistance <sup>(3)</sup>	R <sub>θJL</sub>	°C/W	Between junction and lead	100
	R <sub>θJA</sub>		Between junction and Ambient	300



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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)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SMHE SERIES	F1	Approximate 0.008	3000	120000	7" reel

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

Part Number	Marking Code	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)				
SMHE5.0A	AE	6.4	7.07	10	400	5	16.3	9.2
SMHE6.0A	AG	6.67	7.37	10	400	6	14.56	10.3
SMHE6.5A	AK	7.22	7.98	10	250	6.5	13.39	11.2
SMHE7.0A	AM	7.78	8.6	10	100	7	12.5	12
SMHE7.5A	AP	8.33	9.21	1	50	7.5	11.63	12.9
SMHE8.0A	AR	8.89	9.83	1	25	8	11.03	13.6
SMHE8.5A	AT	9.44	10.4	1	10	8.5	10.42	14.4
SMHE9.0A	AV	10	11.1	1	5	9	9.74	15.4
SMHE10A	AX	11.1	12.3	1	2.5	10	8.82	17
SMHE11A	AZ	12.2	13.5	1	2.5	11	8.24	18.2
SMHE12A	BE	13.3	14.7	1	2.5	12	7.54	19.9
SMHE13A	BG	14.4	15.9	1	1	13	6.98	21.5
SMHE14A	BK	15.6	17.2	1	1	14	6.47	23.2
SMHE15A	BM	16.7	18.5	1	1	15	6.15	24.4
SMHE16A	BP	17.8	19.7	1	1	16	5.77	26
SMHE17A	BR	18.9	20.9	1	1	17	5.43	27.6
SMHE18A	BT	20	22.1	1	1	18	5.13	29.2
SMHE19A	BV	21.1	23.3	1	1	19	4.90	30.6
SMHE20A	BX	22.2	24.5	1	1	20	4.63	32.4
SMHE22A	BZ	24.4	26.9	1	1	22	4.23	35.5
SMHE24A	CE	26.7	29.5	1	1	24	3.86	38.9
SMHE26A	CG	28.9	31.9	1	1	26	3.56	42.1
SMHE28A	CK	31.1	34.4	1	1	28	3.30	45.4
SMHE30A	CM	33.3	36.8	1	1	30	3.10	48.4
SMHE33A	CP	36.7	40.6	1	1	33	2.81	53.3
SMHE36A	CR	40	44.2	1	1	36	2.55	58.1
SMHE40A	CT	44.4	49.1	1	1	40	2.32	64.5
SMHE43A	CV	47.8	52.8	1	1	43	2.16	69.4
SMHE45A	CX	50	55.3	1	1	45	2.06	72.7
SMHE48A	CZ	53.3	58.9	1	1	48	1.94	77.4
SMHE51A	DE	56.7	62.7	1	1	51	1.82	82.4
SMHE54A	DG	60	66.3	1	1	54	1.72	87.1
SMHE58A	DK	64.4	71.2	1	1	58	1.60	93.6



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SMHE60A	DM	66.7	73.7	1	1	60	1.54	96.8
SMHE64A	DP	71.1	78.6	1	1	64	1.45	103
SMHE70A	DR	77.8	86	1	1	70	1.33	113
SMHE75A	DT	83.3	92.1	1	1	75	1.24	121
SMHE78A	DV	86.7	95.8	1	1	78	1.19	126
SMHE80A	DX	88.8	97.6	1	1	80	1.16	129
SMHE85A	DZ	94.4	104	1	1	85	1.09	137
SMHE90A	EG	100	111	1	1	90	1.03	146

**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.

## ■ Characteristics(Typical)

FIG1: Peak Pulse Power Rating Curve

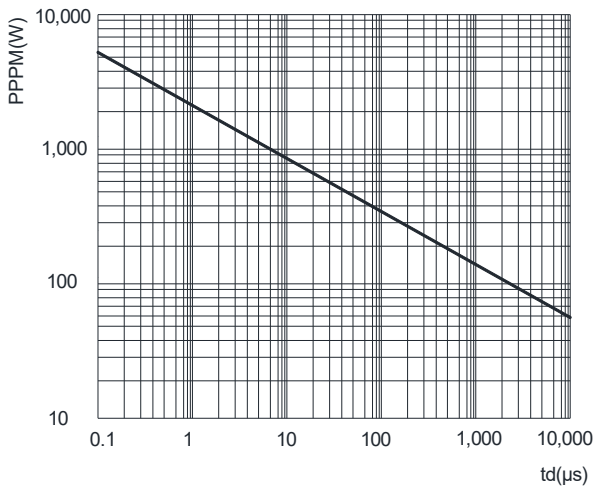


FIG2: Pulse Waveform

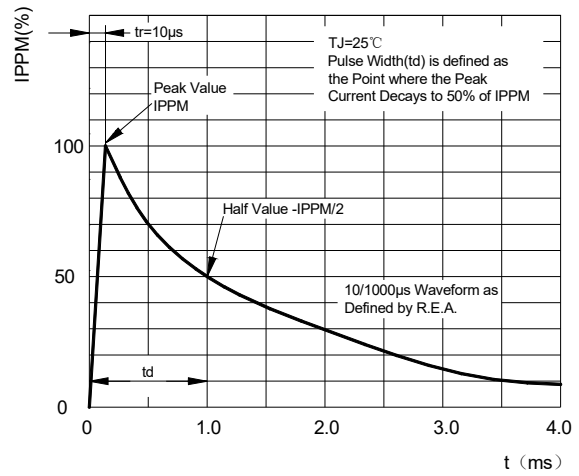


FIG3: Pulse Power or Current vs. Initial Junction Temperature

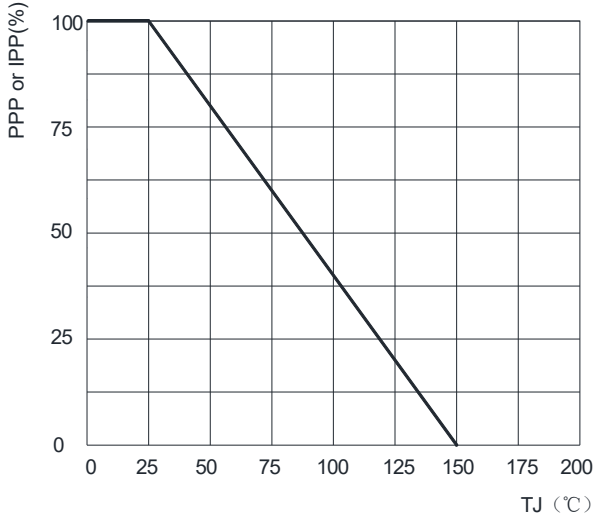
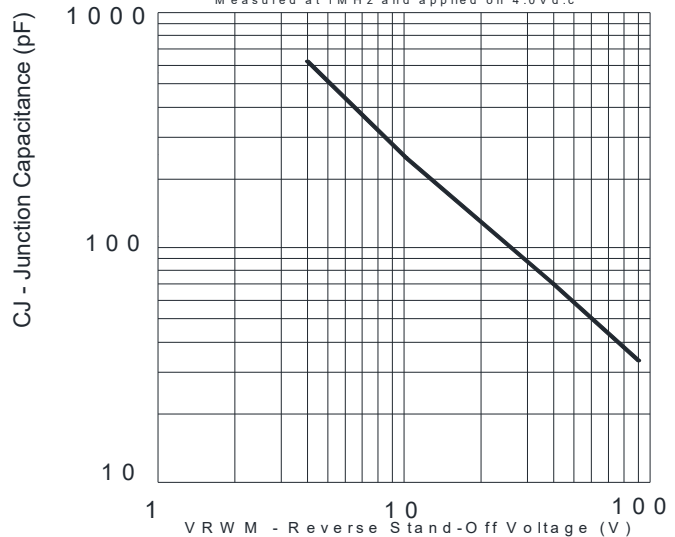


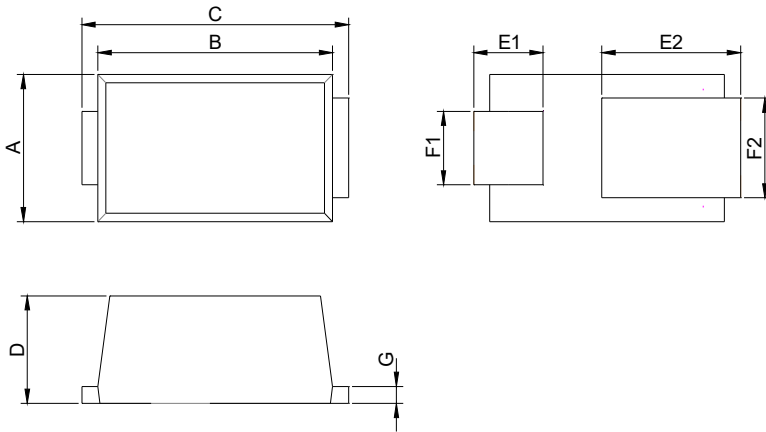
FIG 4: Typical Junction Capacitance  
Measured at 1MHz and applied on 4.0V d.c





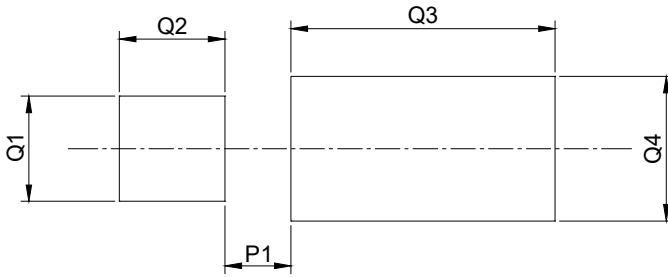
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## ■ Outline Dimensions



SOD-323HE		
Dim	Millimeters	
	Min	Max
A	1.20	1.40
B	2.10	2.30
C	2.30	2.70
D	0.90	1.00
E1	0.55	0.75
E2	1.10	1.50
F1	0.55	0.75
F2	0.78	0.98
G	0.12	0.27

## ■ Suggested pad layout



SOD-323HE	
Dim	Millimeters
P1	0.50
Q1	0.80
Q2	0.80
Q3	2.00
Q4	1.10



## SMHE SERIES

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