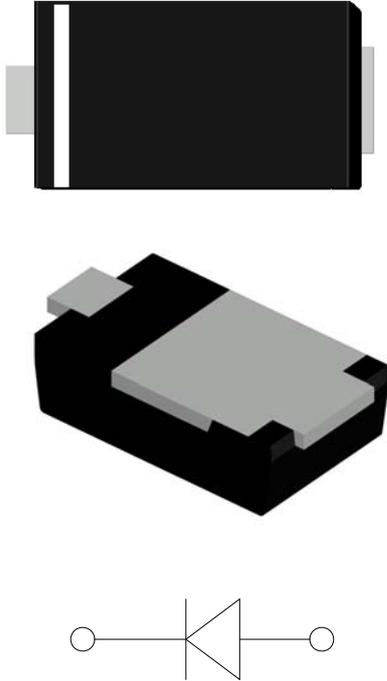


Surface Mount Transient Voltage Suppressors

Uni-directional



Features

- Low-profile package
- Ideal for automated placement
- Available in Uni-directional
- 400 W peak pulse power capability with a 10/1000 μ s waveform
- Excellent clamping capability
- Low incremental surge resistance
- Very fast response time
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- ESD protection of data lines in accordance with IEC 61000-4-2, 30kV(Air),30kV (Contact)
- Part no. with suffix "Q" means AEC-Q101 qualified

Typical Applications

For 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, automotive, and telecommunication.

Mechanical Data

- **Package:** SOD-123HE
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
- **Polarity:** For uni-directional types the band denotes cathode end

■Maximum Ratings (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000us waveform ⁽¹⁾ (Fig.1)	P _{PPM}	W	400
Peak pulse current, with a 10/1000us waveform ⁽¹⁾	I _{PPM}	A	See Next Table
Power dissipation, on infinite heat sink at T _L =75°C	P _D	W	1.5
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only	I _{FSM}	A	40
Operating junction	T _J	°C	-55 to +150
Storage temperature range	T _{STG}	°C	-55 to +150

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ at 1A for unidirectional only ⁽³⁾	V _F	V	1.5



SM4FE SERIES

■Electrical Characteristics (T_a=25°C Unless otherwise specified)

Part Number (Uni)	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} ⁽⁵⁾ (A)	Maximum Clamping Voltage V _c @ I _{PP} (V)
	Min(V)	Max (V)	I _T ⁽⁴⁾ (mA)				
SM4FE5.0AQ	6.40	7.07	10	800	5.0	43.38	9.2
SM4FE6.0AQ	6.67	7.37	10	800	6.0	38.83	10.3
SM4FE6.5AQ	7.22	7.98	10	500	6.5	35.71	11.2
SM4FE7.0AQ	7.78	8.60	1	200	7.0	33.33	12.0
SM4FE7.5AQ	8.33	9.21	1	100	7.5	31.01	12.9
SM4FE8.0AQ	8.89	9.83	1	50	8.0	29.41	13.6
SM4FE8.5AQ	9.44	10.40	1	10	8.5	27.78	14.4
SM4FE9.0AQ	10.00	11.10	1	5	9.0	25.97	15.4
SM4FE10AQ	11.10	12.30	1	2.5	10.0	23.52	17.0
SM4FE11AQ	12.20	13.50	1	2.5	11.0	21.98	18.2
SM4FE12AQ	13.30	14.70	1	2.5	12.0	20.10	19.9
SM4FE13AQ	14.40	15.90	1	1	13.0	18.60	20.0
SM4FE14AQ	15.60	17.20	1	1	14.0	17.24	23.2
SM4FE15AQ	16.70	18.50	1	1	15.0	16.40	24.4
SM4FE16AQ	17.80	19.70	1	1	16.0	15.38	26.0
SM4FE17AQ	18.90	20.90	1	1	17.0	14.50	27.6
SM4FE18AQ	20.00	22.10	1	1	18.0	13.70	29.2
SM4FE19AQ	21.10	23.30	1	1	19.0	13.08	30.6
SM4FE20AQ	22.20	24.50	1	1	20.0	12.34	32.4
SM4FE22AQ	24.40	26.90	1	1	22.0	11.26	35.5
SM4FE24AQ	26.70	29.50	1	1	24.0	10.28	38.9
SM4FE26AQ	28.90	31.90	1	1	26.0	9.50	42.1
SM4FE28AQ	31.10	34.40	1	1	28.0	8.82	45.4
SM4FE30AQ	33.30	36.80	1	1	30.0	8.26	48.4
SM4FE33AQ	36.70	40.60	1	1	33.0	7.50	53.3
SM4FE36AQ	40.00	44.20	1	1	36.0	6.88	58.1
SM4FE40AQ	44.40	49.10	1	1	40.0	6.20	64.5
SM4FE43AQ	47.80	52.80	1	1	43.0	5.76	69.4
SM4FE45AQ	50.00	55.30	1	1	45.0	5.50	72.7
SM4FE48AQ	53.30	58.90	1	1	48.0	5.16	77.4
SM4FE51AQ	56.70	62.70	1	1	51.0	4.86	82.4
SM4FE54AQ	60.00	66.30	1	1	54.0	4.60	87.1
SM4FE58AQ	64.40	71.20	1	1	58.0	4.28	93.6
SM4FE60AQ	66.70	73.70	1	1	60.0	4.14	96.8
SM4FE64AQ	71.10	78.60	1	1	64.0	3.88	103.0
SM4FE70AQ	77.80	86.00	1	1	70.0	3.54	113.0
SM4FE75AQ	83.30	92.10	1	1	75.0	3.30	121.0
SM4FE78AQ	86.70	95.80	1	1	78.0	3.18	126.0



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SM4FE80AQ	88.80	97.60	1	1	80.0	3.10	129.0
SM4FE85AQ	94.40	104.00	1	1	85.0	2.92	137.0
SM4FE90AQ	100.00	111.00	1	1	90.0	2.74	146.0
SM4FE100AQ	111.00	123.00	1	1	100.0	2.46	162.0
SM4FE110AQ	122.00	135.00	1	1	110.0	2.30	177.0
SM4FE120AQ	133.00	147.00	1	1	120.0	2.10	193.0
SM4FE130AQ	144.00	159.00	1	1	130.0	1.92	209.0
SM4FE140AQ	155.00	171.00	1	1	140.0	1.77	226.8
SM4FE150AQ	167.00	185.00	1	1	150.0	1.65	243.0
SM4FE160AQ	178.00	197.00	1	1	160.0	1.55	259.0
SM4FE170AQ	189.00	209.00	1	1	170.0	1.46	275.0
SM4FE180AQ	200.00	220.00	1	1	180.0	1.38	291.6
SM4FE200AQ	224.00	247.00	1	1	200.0	1.24	324.0
SM4FE220AQ	246.00	272.00	1	1	220.0	1.13	356.0

■ Thermal Characteristics (T_a=25°C Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	MAX
Thermal resistance	R _{θJL}	°C/W	junction to lead	50 ²⁾
	R _{θJA}	°C/W	junction to ambient	200 ²⁾

Notes:

- (1) Non-repetitive current pulse, per Fig.3 and derated above T_J= 75°C per Fig.2.
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal.
- (3) V_F<3.5V for devices of V_{BR}<190V
- (4) Pulse test: t_p≤50ms.
- (5) Surge current waveform per Fig.3 and derated per Fig.2.

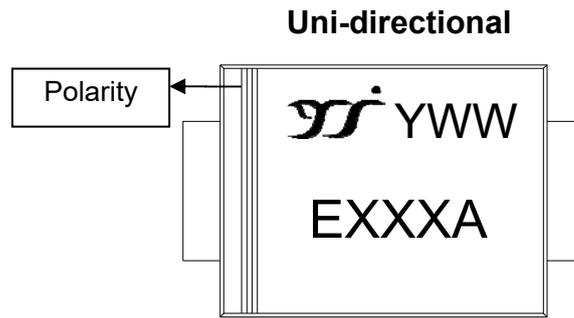
■ Ordering Information (Example)

PREFERRED 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



SM4FE SERIES

■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser printing
3. XXX is marking code, like 220A marking code is 220
4. Body color: Black
5. YWW is date code, "Y" is year. "WW" is week.

For instance:

- The 17th week of 2025, date code is 517
- The 17th week of 2026, date code is 617



SM4FE SERIES

■ Characteristics (Typical)

Fig.1 Peak Pulse Power Rating Curve

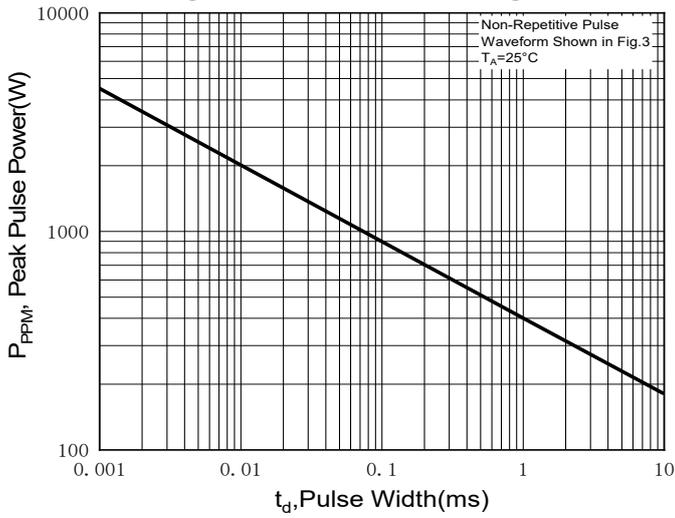


Fig2.Pulse or Current vs.Initial Junction Temperature

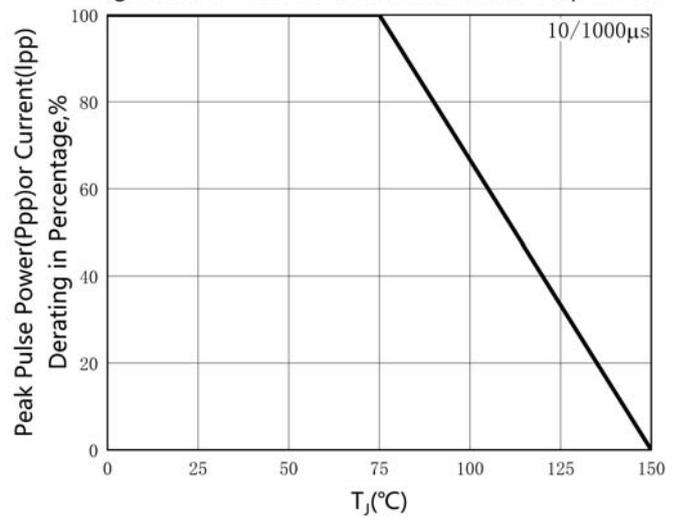


Fig.3 Pulse Waveform

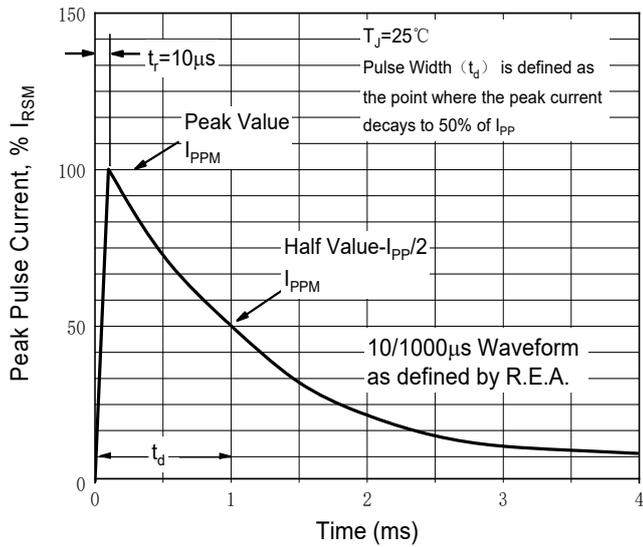


Fig.4 Typical Junction Capacitance

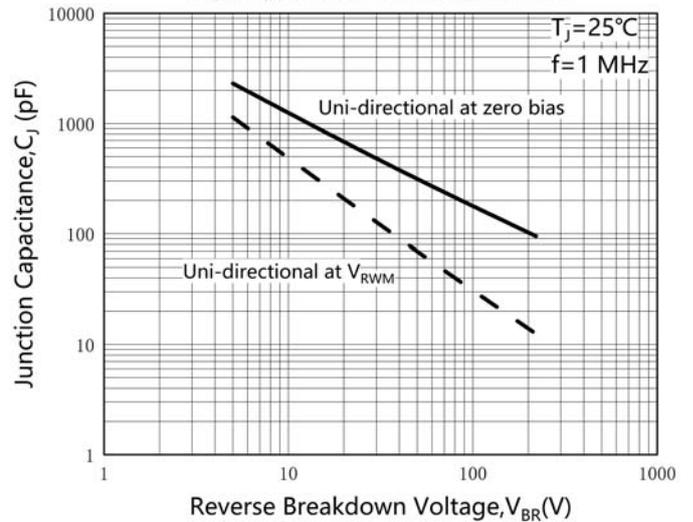


Fig.5 Maximum Non-Repetitive Forward Surge Current

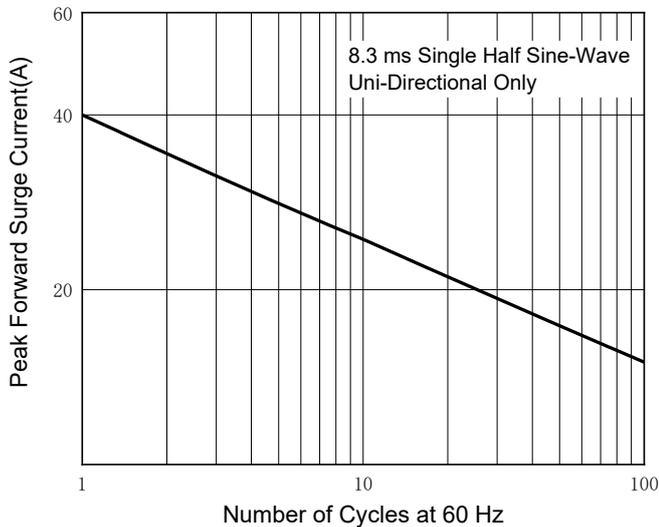
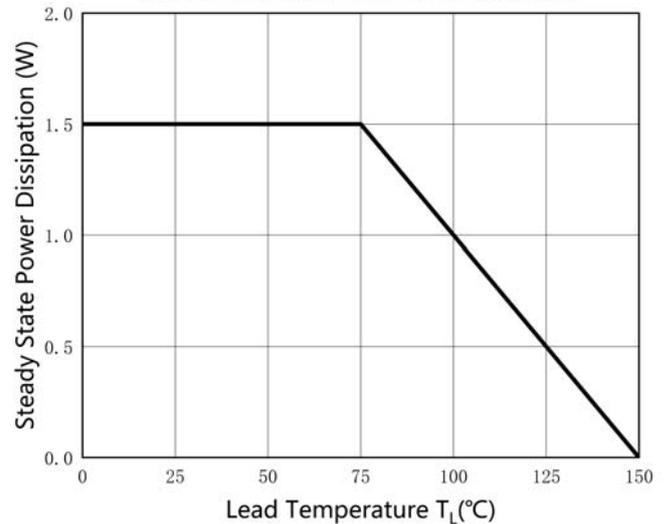


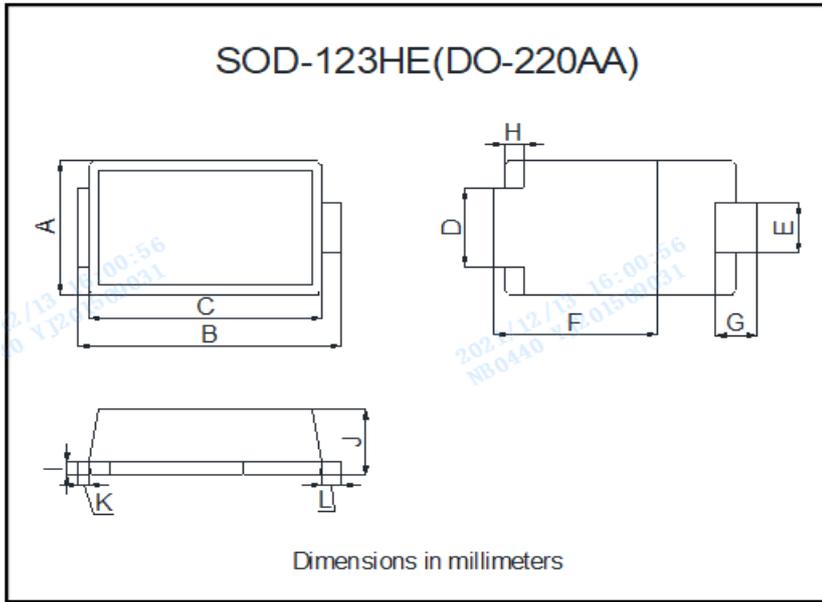
Fig6.Steady State Power Derating curve





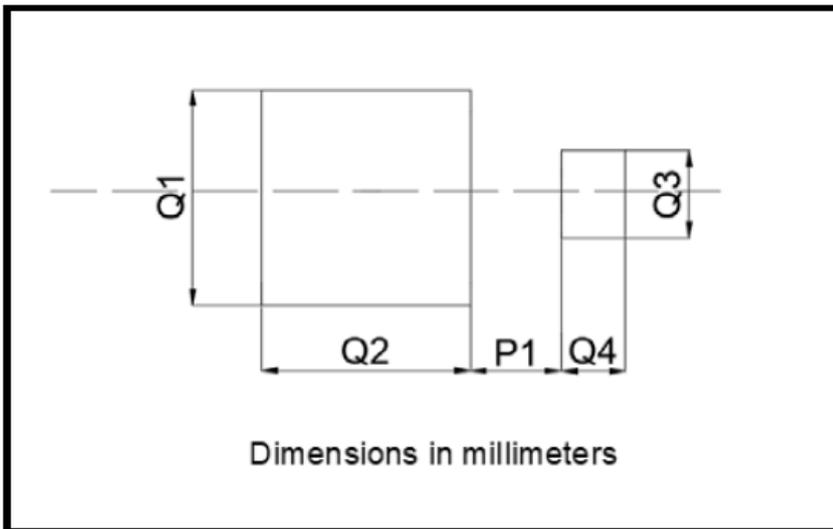
SM4FE SERIES

■ 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



SOD-123HE(DO-220AA)	
Dim	Millimeters
P1	0.64
Q1	2.54
Q2	2.67
Q3	1.27
Q4	0.76



SM4FE SERIES

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