400W, 5V - 75V Surface Mount Transient Voltage Suppressor

FEATURES

- Unidirectional and bidirectional are available
- Low power loss, high efficiency
- Ideal for automated placement
- Excellent clamping capability
- Meets ISO 7637-2 (Pulse 1/2a/2b/3a/3b)
- IEC-61000-4-2 ESD 30kV(Air), 30kV (Contact)
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- Protect sensitive circuits from damage by high voltage transients
- Lighting, ESD transient voltage protection of IC, system
- Inductive switching load protection of IC, system
- Electrical Fast Transient Immunity protection of IC, system

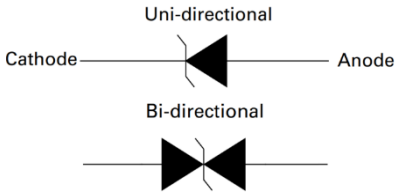
MECHANICAL DATA

- Case: SOD-123W
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin-plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.015g (approximately)

KEY PARAMETERS			
PARAMETER		**VALUE**	**UNIT**
V_{WM}	Uni	5.0 - 75	V
	Bi	6.5 - 64	V
V_{BR}	Uni	6.4 - 92.1	V
	Bi	7.2 - 78.6	V
P_{PPM}		400	W
$T_{J\ MAX}$		175	°C
Package		SOD-123W	

Pb-Free RoHS COMPLIANT HALOGEN FREE

SOD-123W



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
PARAMETER	**SYMBOL**	**VALUE**	**UNIT**
Non-repetitive peak impulse power dissipation with 10/1000us waveform(1)	P_{PPM}	400	W
Steady state power dissipation at T_L = 50°C(2)	P_D	7.9	W
Junction temperature	T_J	-55 to +175	°C
Storage temperature	T_{STG}	-55 to +175	°C

Notes:

1. Non-repetitive current pulse per Fig.6 and derated above T_A = 25°C per Fig.1
2. Units mounted on PCB (5mm x 5mm Cu pad test board)

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance for unidirectional	$R_{\Theta JL}$	15.9	°C/W
Junction-to-ambient thermal resistance for unidirectional	$R_{\Theta JA}$	65.1	°C/W
Junction-to-case thermal resistance for unidirectional	$R_{\Theta JC}$	14.4	°C/W

Thermal Performance Note: Units mounted on PCB (5mm x 5mm Cu pad test board)

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part number (Unidirectional)	Device marking	Breakdown voltage V_{BR}@I_T (V) (Note 1)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum blocking leakage current I_R@V_{WM} (μA) (Note 1)	Maximum peak impulse current I_{PPM} (A) tp =10/1000 μs	Maximum clamping voltage V_C@I_{PPM} (V)
		Min	Max					
SMF4L5.0A	4W05U	6.40	7.00	10	5.0	800	40.1	9.2
SMF4L6.0A	4W06U	6.67	7.37	10	6.0	800	35.9	10.3
SMF4L6.5A	4W6U5	7.22	7.98	10	6.5	500	33.1	11.2
SMF4L7.0A	4W07U	7.78	8.60	10	7.0	200	30.9	12.0
SMF4L7.5A	4W7U5	8.33	9.21	1	7.5	100	28.7	12.9
SMF4L8.0A	4W08U	8.89	9.83	1	8.0	50	27.2	13.6
SMF4L8.5A	4W8U5	9.44	10.4	1	8.5	20	25.7	14.4
SMF4L9.0A	4W09U	10.0	11.1	1	9.0	5	26.4	15.4
SMF4L10A	4W10U	11.1	12.3	1	10	5	23.5	17.0
SMF4L11A	4W11U	12.2	13.5	1	11	1	22.0	18.2
SMF4L12A	4W12U	13.3	14.7	1	12	1	20.1	19.9
SMF4L13A	4W13U	14.4	15.9	1	13	1	18.6	21.5
SMF4L14A	4W14U	15.6	17.2	1	14	1	17.2	23.2
SMF4L15A	4W15U	16.7	18.5	1	15	1	16.4	24.4
SMF4L16A	4W16U	17.8	19.7	1	16	1	15.4	26.0
SMF4L17A	4W17U	18.9	20.9	1	17	1	14.5	27.6
SMF4L18A	4W18U	20.0	22.1	1	18	1	13.7	29.2
SMF4L20A	4W20U	22.2	24.5	1	20	1	12.3	32.4
SMF4L22A	4W22U	24.4	26.9	1	22	1	11.3	35.5
SMF4L24A	4W24U	26.7	29.5	1	24	1	10.3	38.9
SMF4L26A	4W26U	28.9	31.9	1	26	1	9.5	42.1
SMF4L28A	4W28U	31.1	34.4	1	28	1	8.8	45.4
SMF4L30A	4W30U	33.3	36.8	1	30	1	8.3	48.4
SMF4L33A	4W33U	36.7	40.6	1	33	1	7.5	53.3
SMF4L36A	4W36U	40.0	44.2	1	36	1	6.9	58.1
SMF4L40A	4W40U	44.4	49.1	1	40	1	6.2	64.5
SMF4L43A	4W43U	47.8	52.8	1	43	1	5.8	69.4

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part number (Unidirectional)	Device marking	Breakdown voltage V_{BR}@I_T (V) (Note 1)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum blocking leakage current I_R@V_{WM} (μA) (Note 1)	Maximum peak impulse current I_{PPM} (A) tp =10/1000 μs	Maximum clamping voltage V_C@I_{PPM} (V)
		Min	Max					
SMF4L45A	4W45U	50.0	55.3	1	45	1	5.5	72.7
SMF4L48A	4W48U	53.3	58.9	1	48	1	5.2	77.4
SMF4L51A	4W51U	56.7	62.7	1	51	1	4.9	82.4
SMF4L54A	4W54U	60.0	66.3	1	54	1	4.6	87.1
SMF4L58A	4W58U	64.4	71.2	1	58	1	4.3	93.6
SMF4L60A	4W60U	66.7	73.7	1	60	1	4.1	96.8
SMF4L64A	4W64U	71.1	78.6	1	64	1	3.9	103.0
SMF4L70A	4W70U	77.8	86.0	1	70	1	3.5	113.0
SMF4L75A	4W75U	83.3	92.1	1	75	1	3.3	121.0

Notes:

1. Pulse test with PW = 30ms

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

Part number (Bidirectional)	Device marking	Breakdown voltage V_{BR}@I_T (V) (Note 1)		Test current I_T (mA)	Working stand-off voltage V_{WM} (V)	Maximum blocking leakage current I_R@V_{WM} (μA) (Note 1)	Maximum peak impulse current I_{PPM} (A) tp =10/1000 μs	Maximum clamping voltage V_C@I_{PPM} (V)
		Min	Max					
SMF4L6.5CA	4W6U5	7.22	7.98	10	6.5	500	33.1	11.2
SMF4L7.0CA	4W07U	7.78	8.60	10	7.0	200	30.9	12.0
SMF4L7.5CA	4W7U5	8.33	9.21	1	7.5	100	28.7	12.9
SMF4L8.0CA	4W08U	8.89	9.83	1	8.0	50	27.2	13.6
SMF4L8.5CA	4W8U5	9.44	10.4	1	8.5	20	25.7	14.4
SMF4L9.0CA	4W09U	10.0	11.1	1	9.0	5	26.4	15.4
SMF4L10CA	4W10U	11.1	12.3	1	10	5	23.5	17.0
SMF4L11CA	4W11U	12.2	13.5	1	11	1	22.0	18.2
SMF4L12CA	4W12U	13.3	14.7	1	12	1	20.1	19.9
SMF4L13CA	4W13U	14.4	15.9	1	13	1	18.6	21.5
SMF4L14CA	4W14U	15.6	17.2	1	14	1	17.2	23.2
SMF4L15CA	4W15U	16.7	18.5	1	15	1	16.4	24.4
SMF4L16CA	4W16U	17.8	19.7	1	16	1	15.4	26.0
SMF4L17CA	4W17U	18.9	20.9	1	17	1	14.5	27.6
SMF4L18CA	4W18U	20.0	22.1	1	18	1	13.7	29.2
SMF4L20CA	4W20U	22.2	24.5	1	20	1	12.3	32.4
SMF4L22CA	4W22U	24.4	26.9	1	22	1	11.3	35.5
SMF4L24CA	4W24U	26.7	29.5	1	24	1	10.3	38.9
SMF4L26CA	4W26U	28.9	31.9	1	26	1	9.5	42.1
SMF4L28CA	4W28U	31.1	34.4	1	28	1	8.8	45.4
SMF4L30CA	4W30U	33.3	36.8	1	30	1	8.3	48.4
SMF4L33CA	4W33U	36.7	40.6	1	33	1	7.5	53.3
SMF4L36CA	4W36U	40.0	44.2	1	36	1	6.9	58.1
SMF4L40CA	4W40U	44.4	49.1	1	40	1	6.2	64.5
SMF4L43CA	4W43U	47.8	52.8	1	43	1	5.8	69.4
SMF4L45CA	4W45U	50.0	55.3	1	45	1	5.5	72.7
SMF4L48CA	4W48U	53.3	58.9	1	48	1	5.2	77.4
SMF4L51CA	4W51U	56.7	62.7	1	51	1	4.9	82.4
SMF4L54CA	4W54U	60.0	66.3	1	54	1	4.6	87.1
SMF4L58CA	4W58U	64.4	71.2	1	58	1	4.3	93.6
SMF4L60CA	4W60U	66.7	73.7	1	60	1	4.1	96.8
SMF4L64CA	4W64U	71.1	78.6	1	64	1	3.9	103.0

Notes:

1. Pulse test with PW = 30ms

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
SMF4LxA(1)	SOD-123W	10,000 / Tape & Reel
SMF4LxCA(2)	SOD-123W	10,000 / Tape & Reel

Notes:

1. "x" defines voltage from 5V(SMF4L5.0A) to 75V(SMF4L75A) for unidirectional
2. "x" defines voltage from 6.5V(SMF4L6.5CA) to 64V(SMF4L64CA) for bidirectional

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Peak Pulse Power Derating Curve

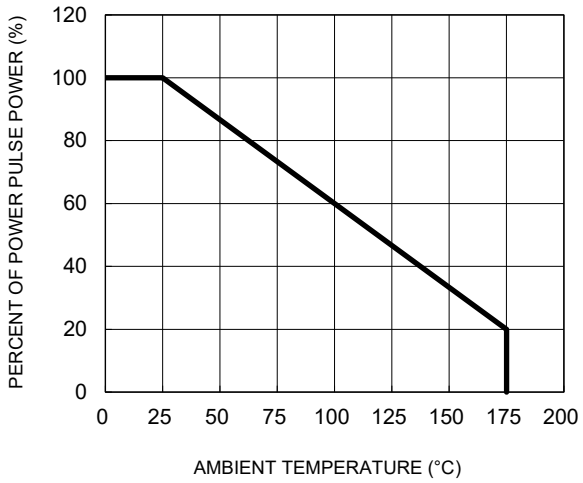


Fig.2 Non-Repetitive Peak Pulse Power vs. Pulse Time

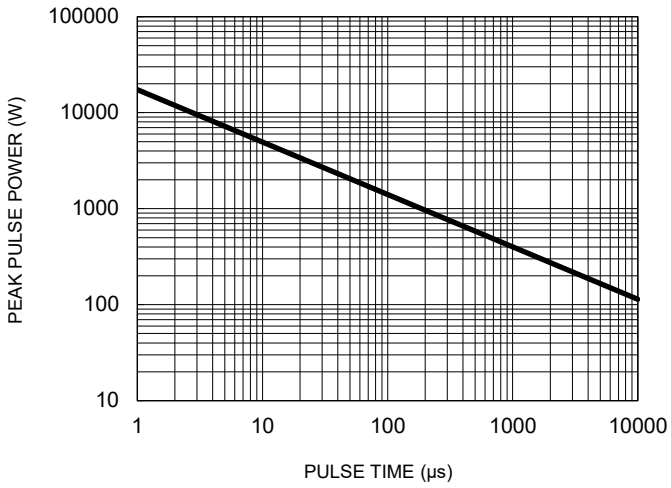


Fig.3 Forward Voltage vs. Peak Forward Current

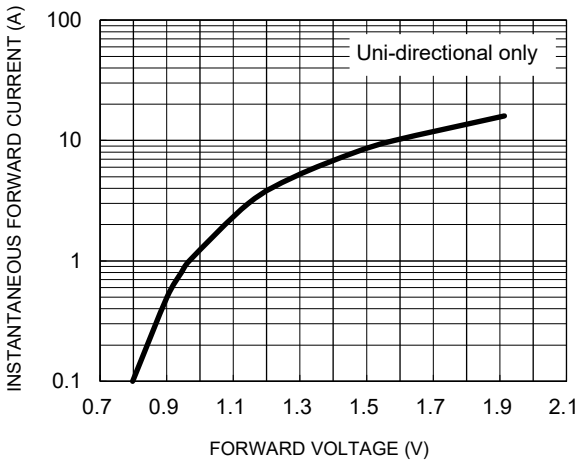


Fig.4 Typical Junction Capacitance

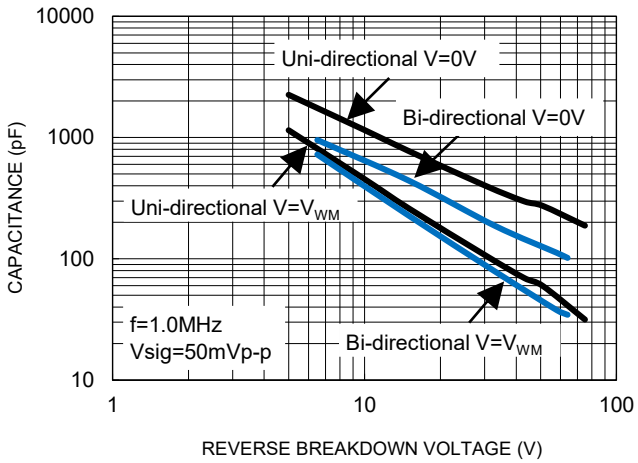
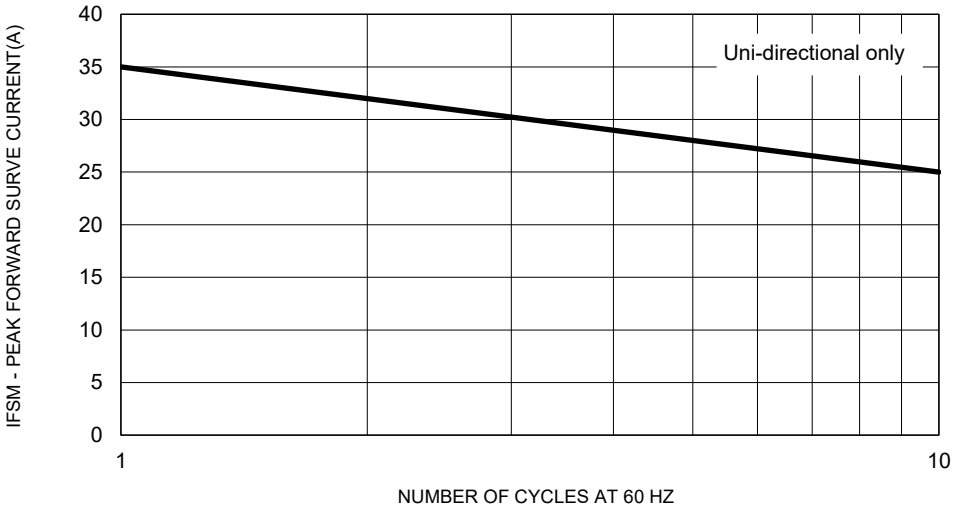


Fig.5 Maximum Non-Repetitive Forward Surge Current



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.6 10/1000μs pulse waveform

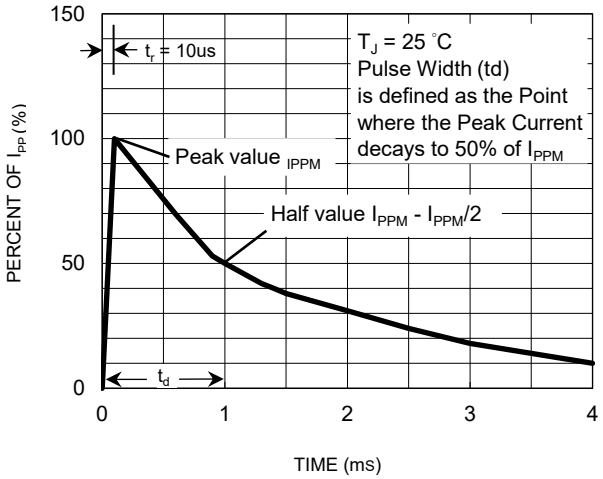
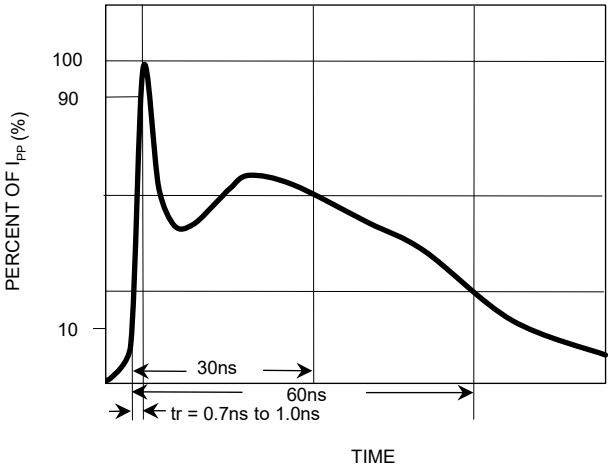
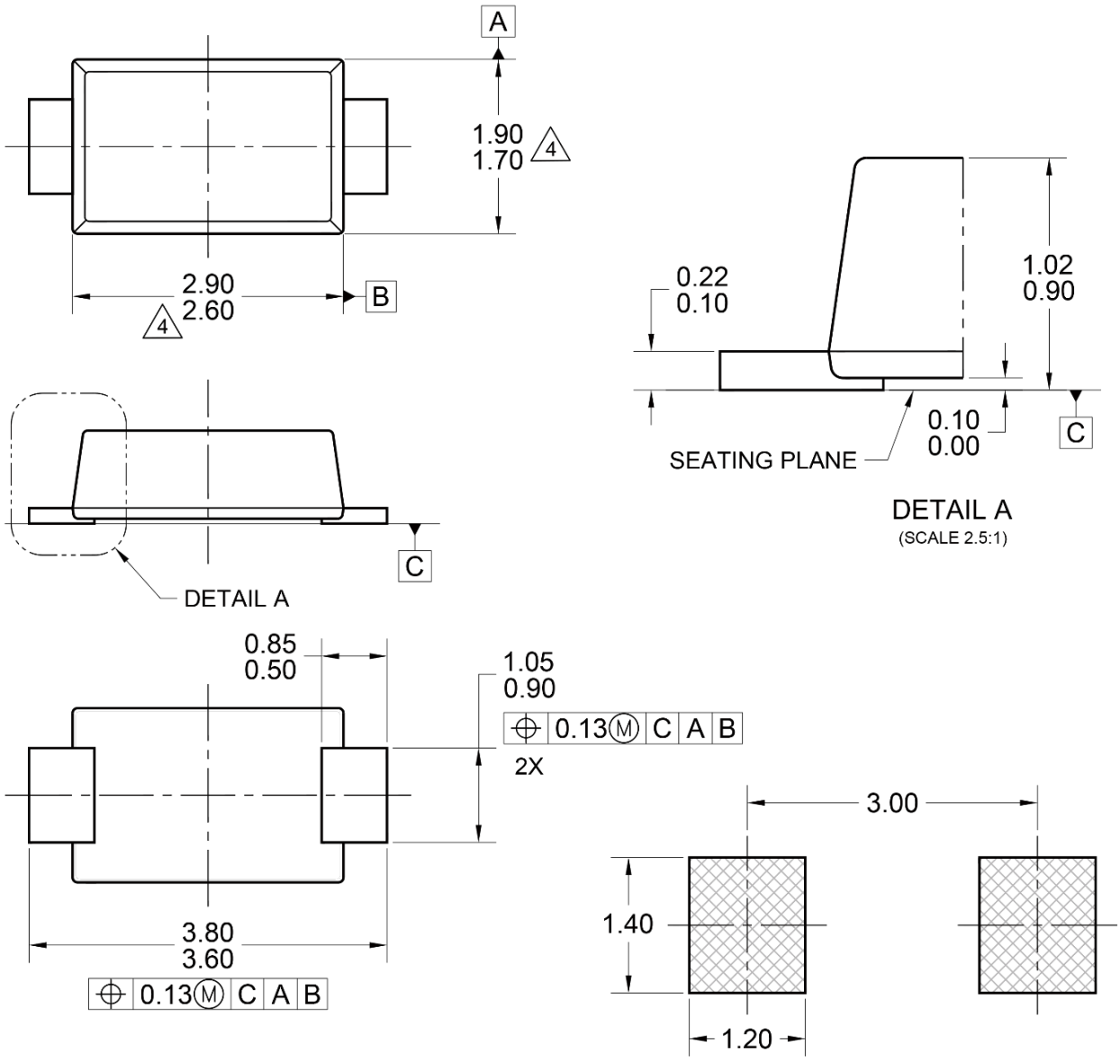


Fig.7 ESD pulse waveform

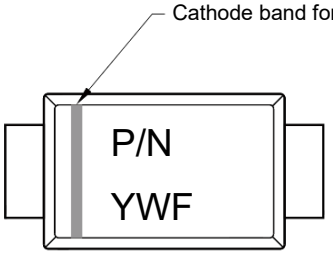


PACKAGE OUTLINE DIMENSIONS

SOD-123W



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

P/N = Device marking
YW = Date code
F = Factory code

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009.
3. PACKAGE OUTLINE REFERENCE: JEDEC DO-219, VARIATION AB, ISSUE C.
4. MODED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH.
5. DWG NO. REF: HQ2SD07-SOD123W-037 REV A.

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