

MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



TSS



MOV



GDT



PLED

TPSMF4LX.XA(CA)-MS

Product specification

General Description

Transient voltage suppression diodes, also known as TVS diodes, are protective electronic parts that protect electrical equipment from voltage spikes introduced by wires.

Applications

- computersystem
- domesticappliance
- videoinput

Features

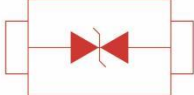
- Forsurfacemountedapplications
- Excellentclampingcapability
- 400Wpeakpulsepowercapabilitywitha10/1000μs Waveform.
- V_{RWM} 3.3-75V
- Lowprofilepackageandlowinductance
- TypicalIRlessthan1uAabove12V
- Fastresponsetime:typicallylessthan1.0psfrom0V to V_{BRmin} .

Mechanical Characteristics

- Package:SMF/SOD-123FL
- CaseMaterial:MoldedPlastic.ULFlammability ClassificationRating94V-0.RoHScompliant
- MoistureSensitivity:MeetMSL1
- Terminal: Solderplated,solderableper MIL-STD-750,Method2026
- Polarity:Colorbanddenotescathodeexcept bi-directionalmodels
- Weight:0.017g(approximate)

Pinning and Marking

SOD-123FL	PIN CONFIGURATION
	
Unipolar	

SOD-123FL	PIN CONFIGURATION
	
Bipolar	

Orderinginformation

P/N	PKG	QTY
TPSMF4LX.XA(CA)-MS	SOD-123FL	3000

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ^①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
TPSMF4L3.3A-MS	/	EHD	/	3.3	200	5.2	6	10	8.0	50.00
TPSMF4L5.0A-MS	TPSMF4L5.0CA-MS	EHE	ETE	5.0	400	6.40	7.00	10	9.2	43.48
TPSMF4L6.0A-MS	TPSMF4L6.0CA-MS	EHG	ETG	6.0	400	6.67	7.37	10	10.3	38.84
TPSMF4L6.5A-MS	TPSMF4L6.5CA-MS	EHK	ETK	6.5	250	7.22	7.98	10	11.2	35.72
TPSMF4L7.0A-MS	TPSMF4L7.0CA-MS	EHM	ETM	7.0	100	7.78	8.60	10	12.0	33.34
TPSMF4L7.5A-MS	TPSMF4L7.5CA-MS	EHP	ETP	7.5	50	8.33	9.21	1	12.9	31.01
TPSMF4L8.0A-MS	TPSMF4L8.0CA-MS	HER	ETR	8.0	25	8.89	9.83	1	13.6	29.42
TPSMF4L8.5A-MS	TPSMF4L8.5CA-MS	EHT	ETT	8.5	10	9.44	10.40	1	14.4	27.78
TPSMF4L9.0A-MS	TPSMF4L9.0CA-MS	EHV	ETV	9.0	5	10.00	11.10	1	15.4	25.98
TPSMF4L10A-MS	TPSMF4L10CA-MS	EHX	ETX	10.0	2.5	11.10	12.30	1	17.0	23.53
TPSMF4L11A-MS	TPSMF4L11CA-MS	EHZ	ETZ	11.0	2.5	12.20	13.50	1	18.2	21.98
TPSMF4L12A-MS	TPSMF4L12CA-MS	EIE	EUE	12.0	2.5	13.30	14.70	1	19.9	20.11
TPSMF4L13A-MS	TPSMF4L13CA-MS	EIG	EUG	13.0	1	14.40	15.90	1	21.5	18.61
TPSMF4L14A-MS	TPSMF4L14CA-MS	EIK	EUK	14.0	1	15.60	17.20	1	23.2	17.25
TPSMF4L15A-MS	TPSMF4L15CA-MS	EIM	EUM	15.0	1	16.70	18.50	1	24.4	16.40
TPSMF4L16A-MS	TPSMF4L16CA-MS	EIP	EUP	16.0	1	17.80	19.70	1	26.0	15.39
TPSMF4L17A-MS	TPSMF4L17CA-MS	EIR	EUR	17.0	1	18.90	20.90	1	27.6	14.50
TPSMF4L18A-MS	TPSMF4L18CA-MS	EIT	EUT	18.0	1	20.00	22.10	1	29.2	13.70
TPSMF4L20A-MS	TPSMF4L20CA-MS	EIV	EUV	20.0	1	22.20	24.50	1	32.4	12.35
TPSMF4L22A-MS	TPSMF4L22CA-MS	EIX	EUX	22.0	1	24.40	26.90	1	35.5	11.27
TPSMF4L24A-MS	TPSMF4L24CA-MS	EIZ	EUZ	24.0	1	26.70	29.50	1	38.9	10.29
TPSMF4L26A-MS	TPSMF4L26CA-MS	EJE	EVE	26.0	1	28.90	31.90	1	42.1	9.51
TPSMF4L28A-MS	TPSMF4L28CA-MS	EJG	EVG	28.0	1	31.10	34.40	1	45.4	8.82
TPSMF4L30A-MS	TPSMF4L30CA-MS	EJK	EVK	30.0	1	33.30	36.80	1	48.4	8.27
TPSMF4L33A-MS	TPSMF4L33CA-MS	EJM	EVM	33.0	1	36.70	40.60	1	53.3	7.51
TPSMF4L36A-MS	TPSMF4L36CA-MS	EJP	EVP	36.0	1	40.00	44.20	1	58.1	6.89
TPSMF4L40A-MS	TPSMF4L40CA-MS	EJR	EVR	40.0	1	44.40	49.10	1	64.5	6.21
TPSMF4L43A-MS	TPSMF4L43CA-MS	EJT	EVT	43.0	1	47.80	52.80	1	69.4	5.77
TPSMF4L45A-MS	TPSMF4L45CA-MS	EJV	EVV	45.0	1	50.00	55.30	1	72.7	5.51
TPSMF4L48A-MS	TPSMF4L48CA-MS	EJX	EVX	48.0	1	53.30	58.90	1	77.4	5.17
TPSMF4L51A-MS	TPSMF4L51CA-MS	EJZ	EVZ	51.0	1	56.70	62.70	1	82.4	4.86

Electrical Characteristics (T=25℃)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERE	EWE	54.0	1	60.00	66.30	1	87.1	4.60
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERG	EWG	58.0	1	64.4	71.20	1	93.6	4.28
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERK	EWK	60.0	1	66.7	73.70	1	96.8	4.14
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERM	EWM	64.0	1	71.10	78.60	1	103.0	3.89
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERP	EWP	70.0	1	77.8	86.00	1	113.0	3.54
TPSMF4L51A-MS	TPSMF4L51CA-MS	ERR	EWR	75.0	1	83.3	92.10	1	121.0	3.31

Notes:

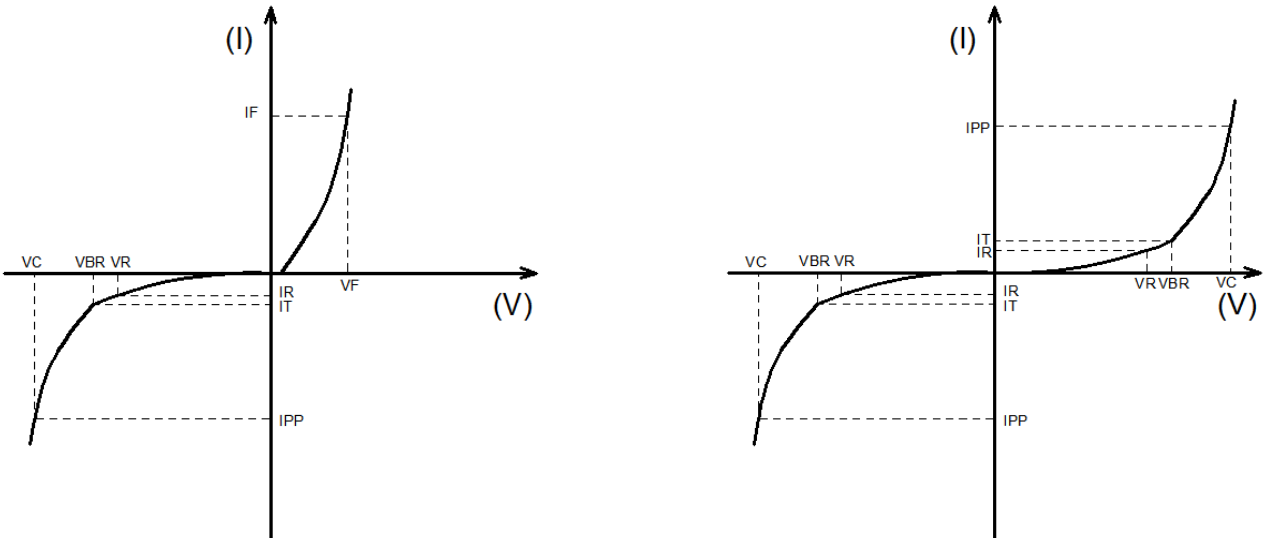
- ① Surge waveform: 10/1000μs
- V_R: Stand-off Voltage--Maximum voltage that can be applied
- V_{BR}: Breakdown Voltage
- V_C: Clamping Voltage--Peak voltage measured across the suppressor at specified I_{pp}
- I_R: Reverse Leakage Current

Absolute Maximum Ratings(T=25℃, RH=45%-75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000μs waveform	P _{PP}	400	W
Steady state power dissipation at T _L =75℃	P _{M(AV)}	1.0	W
Operating junction temperature range	T _j	-55 to +125	℃
Storage temperature range	T _{stg}	-55 to +150	℃

Ratings And V-I Characteristics Curves (T=25℃, unless otherwise noted)

FIG1: V-I cure characteristics



Symbol	Parameter
I_F	Mean Forward Current
V_F	Maximum Forward Voltage @ I_F
V_R	Peak Reverse Working Voltage
I_R	Reverse Leakage Current @ V_R
V_{BR}	Breakdown Voltage @ I_T
I_T	Test Current
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}

Typical Characteristics

FIG2: Pulse Derating Curve

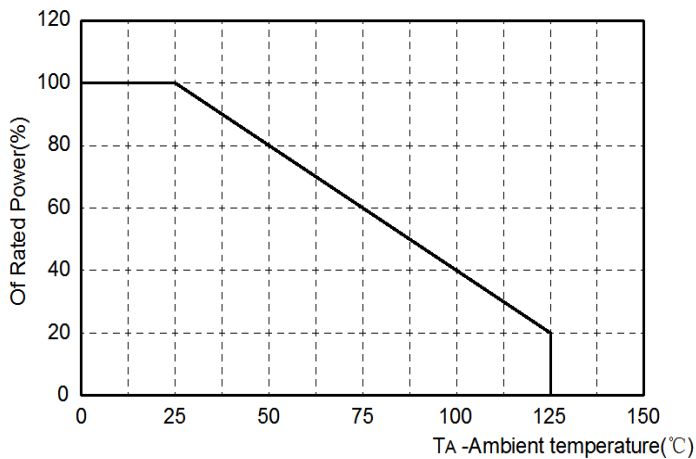


FIG3: Pulse Waveform

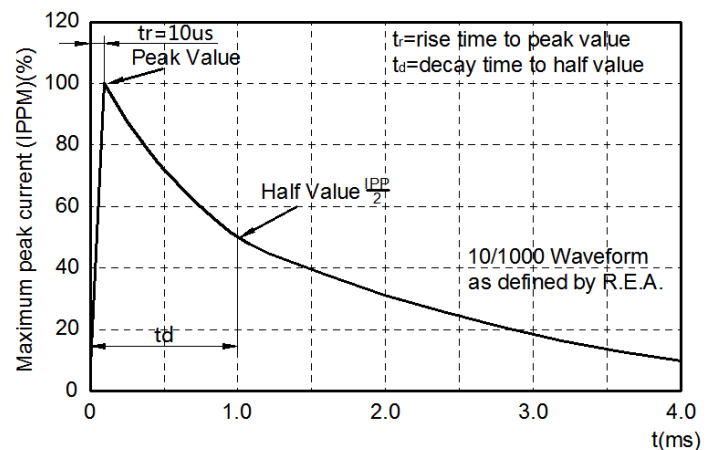


FIG4: Peak Pulse Power Rating Curve

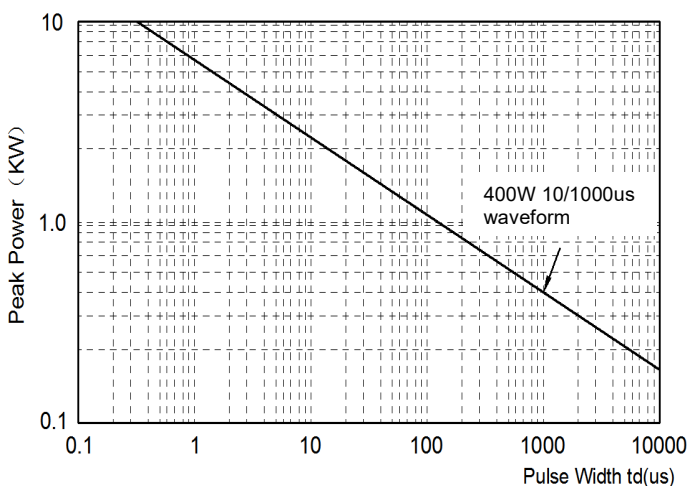
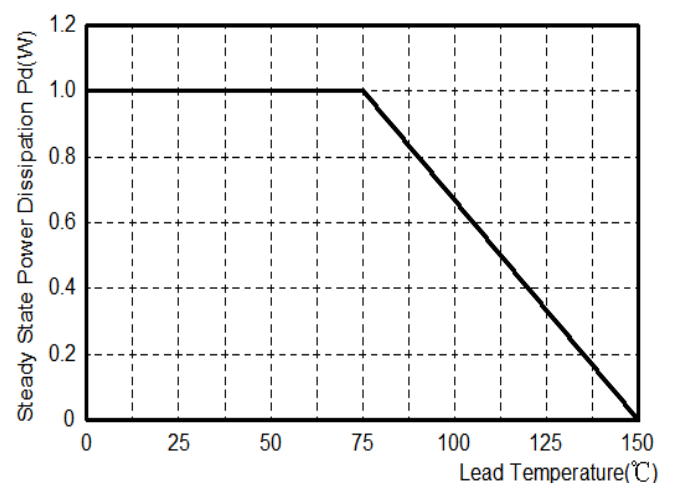
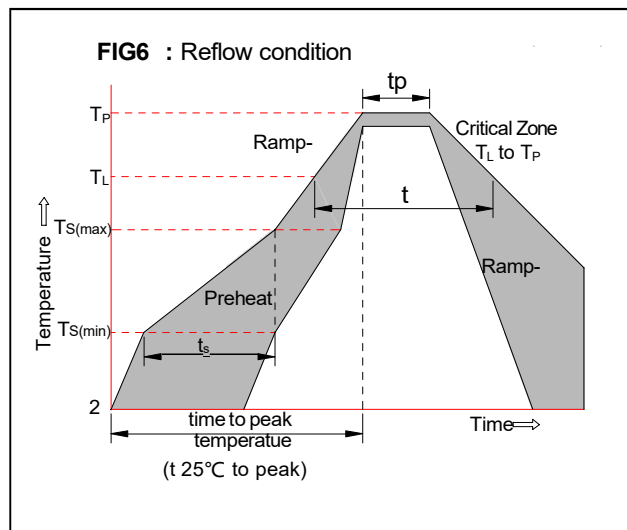


FIG5: Steady State Power Dissipation

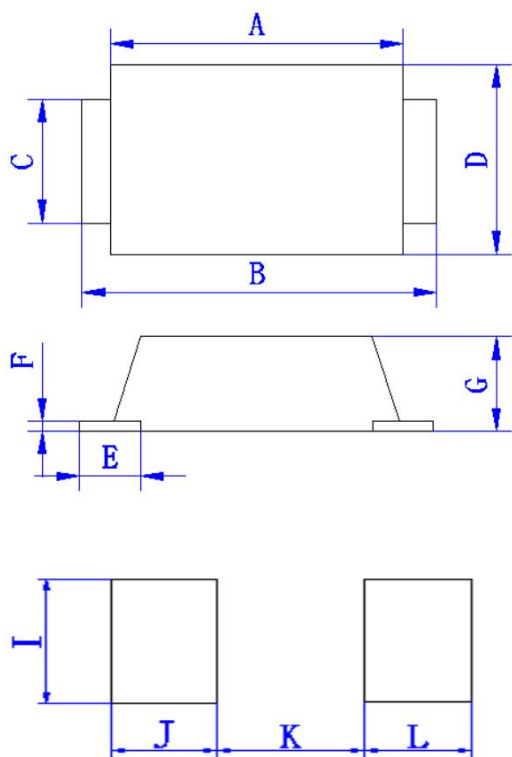


Soldering parameters

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

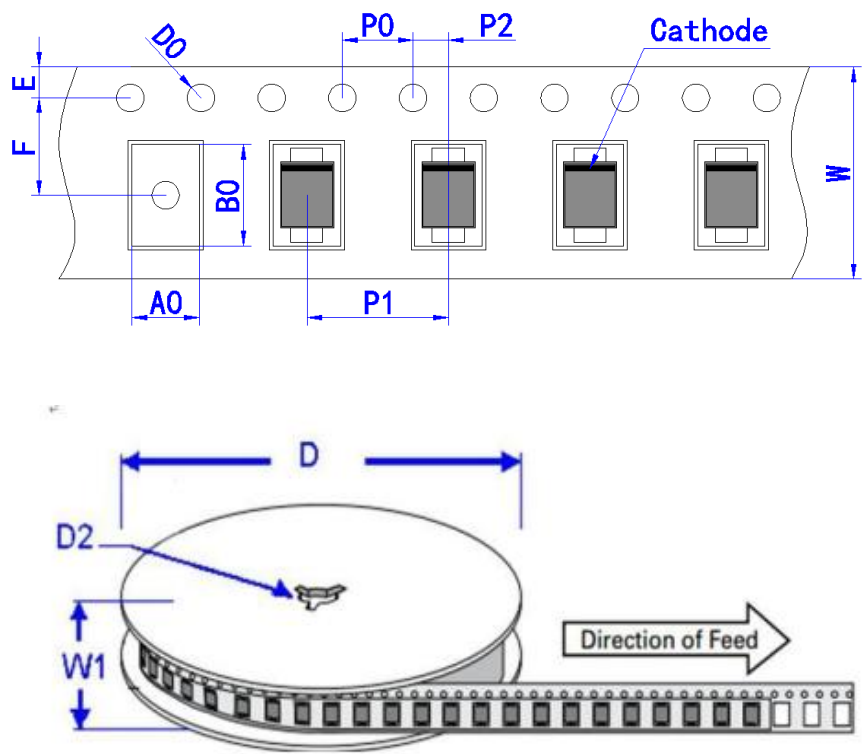


Package mechanical data & Suggested Land Pattern



Ref.(mm)	Millimeters	
	Min.	Max.
A	2.5	3.0
B	3.4	4.0
C	0.7	1.1
D	1.5	1.9
E	0.45	0.95
F	0.05	0.26
G	0.9	1.1
I	1.2	
J	0.85	
K		2.3
L	0.85	

Tape & reel specification - SOD-123FL



Ref.	Millimeters
A0	2.15±0.20
B0	3.95±0.20
C	178.00
D0	1.55±0.10
E	1.75±0.20
E1	13.50±1.00
F	3.50±0.10
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
W	8.00±0.30
W1	9.00±4.00
D	177.8±4.00
D2	13.5±0.2

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