

400W Transient Voltage Suppressor

Description

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

Features

- For surface mounted applications
- Excellent clamping capability
- 400 W peak pulse power capability with a 10/1000 μ s Waveform.
- V_{RWM} 3.3-75V
- Low profile package and low inductance
- Typical IR less than 1uA above 12V
- Fast response time: typically less than 1.0ps from 0V to V_{BR} min.

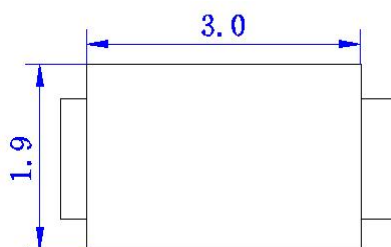
Applications

- computer system
- domestic appliance
- video input

Mechanical Characteristics

- Package: SMF/SOD-123FL
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0 .RoHS compliant
- Moisture Sensitivity: Meet MSL 1
- Terminal: Solder plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Weight: 0.017g(approximate)

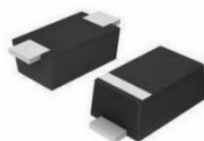
Dimensions & Symbol(Unit: mm Max)



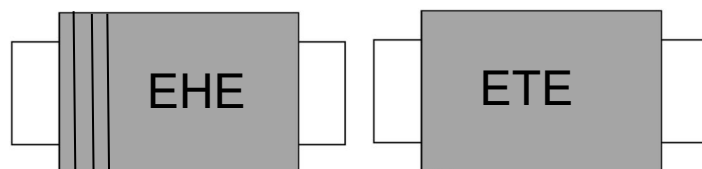
Bi-directional



Un-directional



Marking Information



EHE: P4SMFT5.0A Marking code

ETE: P4SMFT5.0CA Marking code

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
P4SMFT3.3A	/	EHD	/	3.3	200	5.2	6	10	8.0	50.00
P4SMFT5.0A	P4SMFT5.0CA	EHE	ETE	5.0	400	6.40	7.00	10	9.2	43.48
P4SMFT6.0A	P4SMFT6.0CA	EHG	ETG	6.0	400	6.67	7.37	10	10.3	38.84
P4SMFT6.5A	P4SMFT6.5CA	EHK	ETK	6.5	250	7.22	7.98	10	11.2	35.72
P4SMFT7.0A	P4SMFT7.0CA	EHM	ETM	7.0	100	7.78	8.60	10	12.0	33.34
P4SMFT7.5A	P4SMFT7.5CA	EHP	ETP	7.5	50	8.33	9.21	1	12.9	31.01
P4SMFT8.0A	P4SMFT8.0CA	HER	ETR	8.0	25	8.89	9.83	1	13.6	29.42
P4SMFT8.5A	P4SMFT8.5CA	EHT	ETT	8.5	10	9.44	10.40	1	14.4	27.78
P4SMFT9.0A	P4SMFT9.0CA	EHV	ETV	9.0	5	10.00	11.10	1	15.4	25.98
P4SMFT10A	P4SMFT10CA	EHX	ETX	10.0	2.5	11.10	12.30	1	17.0	23.53
P4SMFT11A	P4SMFT11CA	EHZ	ETZ	11.0	2.5	12.20	13.50	1	18.2	21.98
P4SMFT12A	P4SMFT12CA	EIE	EUE	12.0	2.5	13.30	14.70	1	19.9	20.11
P4SMFT13A	P4SMFT13CA	EIG	EUG	13.0	1	14.40	15.90	1	21.5	18.61
P4SMFT14A	P4SMFT14CA	EIK	EUK	14.0	1	15.60	17.20	1	23.2	17.25
P4SMFT15A	P4SMFT15CA	EIM	EUM	15.0	1	16.70	18.50	1	24.4	16.40
P4SMFT16A	P4SMFT16CA	EIP	EUP	16.0	1	17.80	19.70	1	26.0	15.39
P4SMFT17A	P4SMFT17CA	EIR	EUR	17.0	1	18.90	20.90	1	27.6	14.50
P4SMFT18A	P4SMFT18CA	EIT	EUT	18.0	1	20.00	22.10	1	29.2	13.70
P4SMFT20A	P4SMFT20CA	EIV	EUV	20.0	1	22.20	24.50	1	32.4	12.35
P4SMFT22A	P4SMFT22CA	EIX	EUX	22.0	1	24.40	26.90	1	35.5	11.27
P4SMFT24A	P4SMFT24CA	EIZ	EUZ	24.0	1	26.70	29.50	1	38.9	10.29
P4SMFT26A	P4SMFT26CA	EJE	EVE	26.0	1	28.90	31.90	1	42.1	9.51
P4SMFT28A	P4SMFT28CA	EJG	EVG	28.0	1	31.10	34.40	1	45.4	8.82
P4SMFT30A	P4SMFT30CA	EJK	EVK	30.0	1	33.30	36.80	1	48.4	8.27
P4SMFT33A	P4SMFT33CA	EJM	EVM	33.0	1	36.70	40.60	1	53.3	7.51
P4SMFT36A	P4SMFT36CA	EJP	EVP	36.0	1	40.00	44.20	1	58.1	6.89
P4SMFT40A	P4SMFT40CA	EJR	EVR	40.0	1	44.40	49.10	1	64.5	6.21
P4SMFT43A	P4SMFT43CA	EJT	EVT	43.0	1	47.80	52.80	1	69.4	5.77
P4SMFT45A	P4SMFT45CA	EJV	EVV	45.0	1	50.00	55.30	1	72.7	5.51
P4SMFT48A	P4SMFT48CA	EJX	EVX	48.0	1	53.30	58.90	1	77.4	5.17
P4SMFT51A	P4SMFT51CA	EJZ	EVZ	51.0	1	56.70	62.70	1	82.4	4.86

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
P4SMFT54A	P4SMFT54CA	ERE	EWE	54.0	1	60.00	66.30	1	87.1	4.60
P4SMFT58A	P4SMFT58CA	ERG	EWG	58.0	1	64.4	71.20	1	93.6	4.28
P4SMFT60A	P4SMFT60CA	ERK	EWK	60.0	1	66.7	73.70	1	96.8	4.14
P4SMFT64A	P4SMFT64CA	ERM	EWM	64.0	1	71.10	78.60	1	103.0	3.89
P4SMFT70A	P4SMFT70CA	ERP	EWP	70.0	1	77.8	86.00	1	113.0	3.54
P4SMFT75A	P4SMFT75CA	ERR	EWR	75.0	1	83.3	92.10	1	121.0	3.31
P4SMFT43A	P4SMFT43CA	EJT	EVT	43.0	1	47.8	52.80	1	69.4	5.77
P4SMFT45A	P4SMFT45CA	EJV	EVV	45.0	1	50.00	55.30	1	72.7	5.51
P4SMFT48A	P4SMFT48CA	EJX	EVX	48.0	1	53.30	58.90	1	77.4	5.17
P4SMFT51A	P4SMFT51CA	EJZ	EVZ	51.0	1	56.70	62.70	1	82.4	4.86
P4SMFT54A	P4SMFT54CA	ERE	EWE	54.0	1	60.00	66.30	1	87.1	4.60
P4SMFT58A	P4SMFT58CA	ERG	EWG	58.0	1	64.4	71.20	1	93.6	4.28
P4SMFT60A	P4SMFT60CA	ERK	EWK	60.0	1	66.7	73.70	1	96.8	4.14
P4SMFT64A	P4SMFT64CA	ERM	EWM	64.0	1	71.10	78.60	1	103.0	3.89
P4SMFT70A	P4SMFT70CA	ERP	EWP	70.0	1	77.80	86.00	1	113.0	3.54
P4SMFT75A	P4SMFT75CA	ERR	EWR	75.0	1	83.30	92.10	1	121.0	3.31

Notes:

① Surge waveform: 10/1000μs

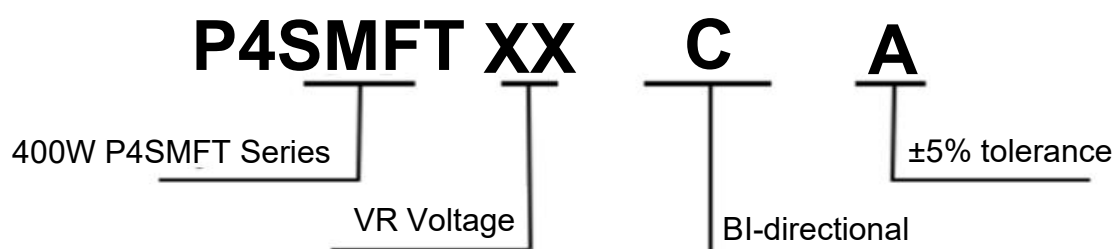
V_R : Stand-off Voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown Voltage

V_C: Clamping Voltage -- Peak voltage measured across the suppressor at a specified I_{pp}

I_R: Reverse Leakage Current

Part number code

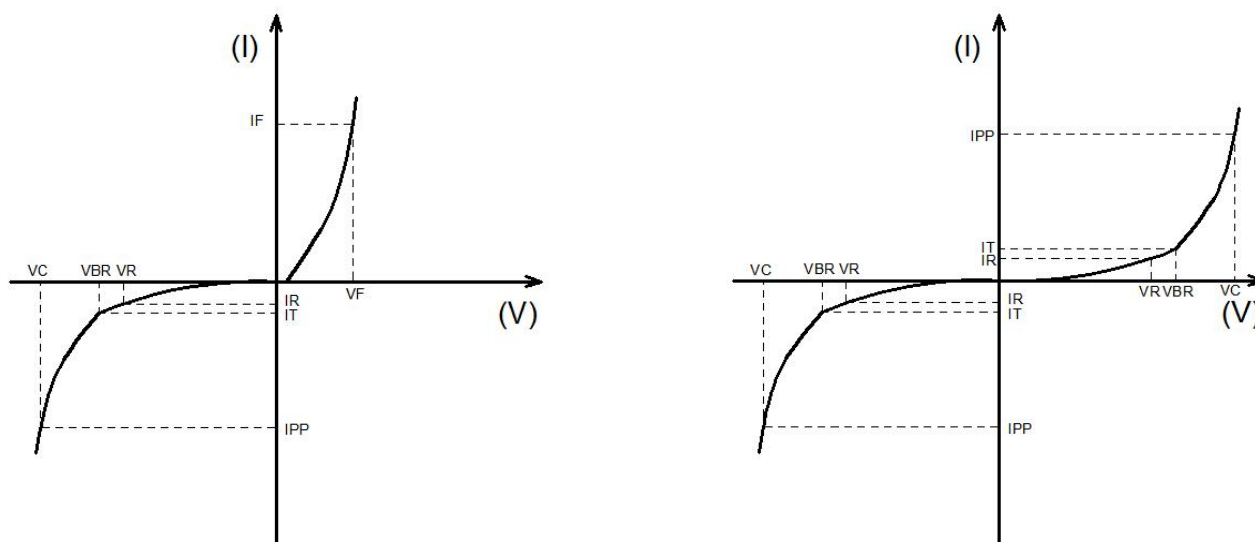


Absolute Maximum Ratings($T=25^{\circ}\text{C}$, $\text{RH}=45\%-75\%$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000 μs waveform	P_{PP}	400	W
Steady state power dissipation at $T_L=75^{\circ}\text{C}$	$P_{M(AV)}$	1.0	W
Operating junction temperature range	T_j	-55 to +125	$^{\circ}\text{C}$
Storage temperature range	T_{stg}	-55 to +150	$^{\circ}\text{C}$

Ratings And V-I Characteristics Curves ($T=25^{\circ}\text{C}$, 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

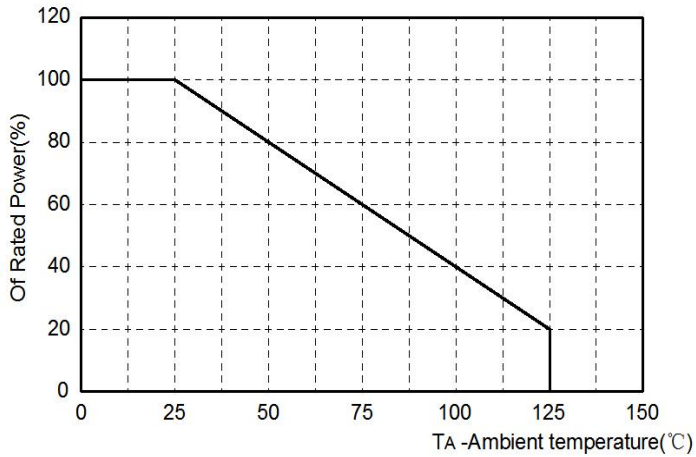


FIG3: Pulse Waveform

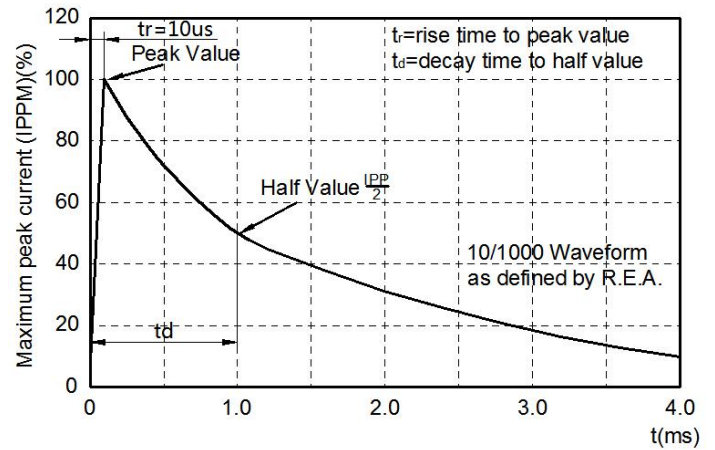


FIG4: Peak Pulse Power Rating Curve

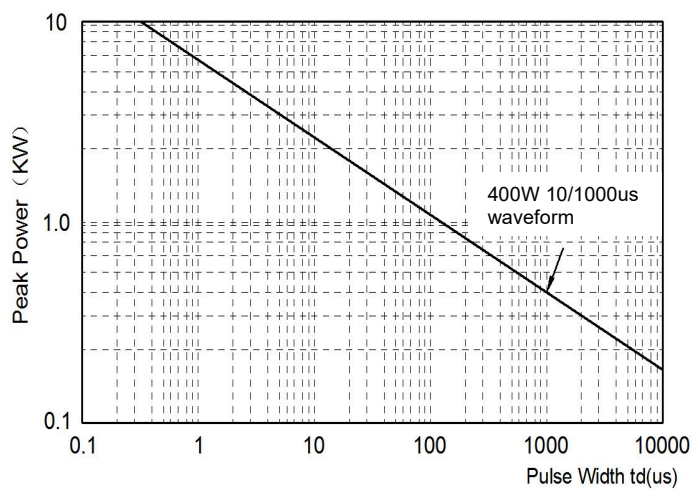
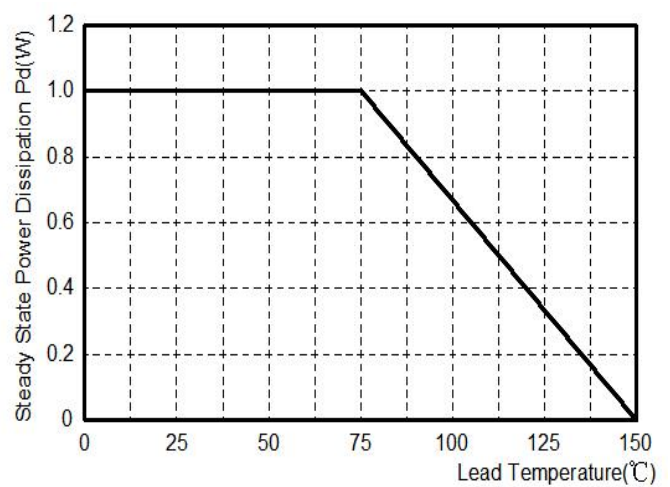
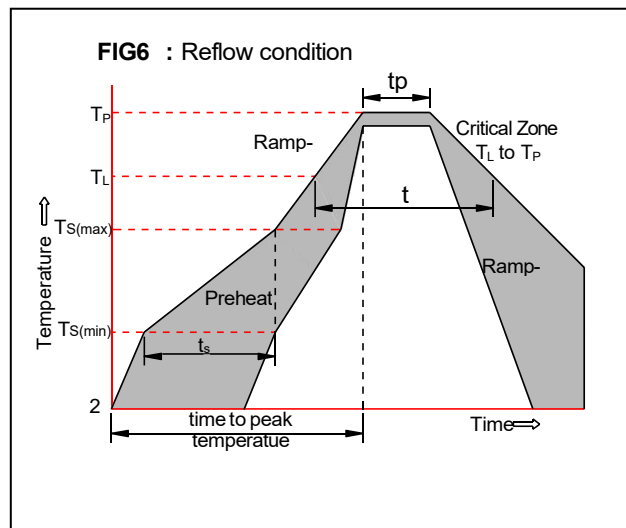


FIG5: Steady State Power Dissipation

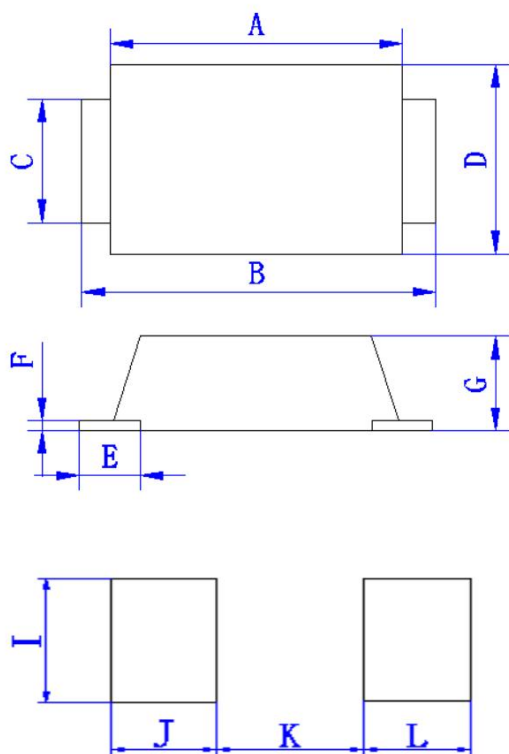


Soldering parameters

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) (ts)	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

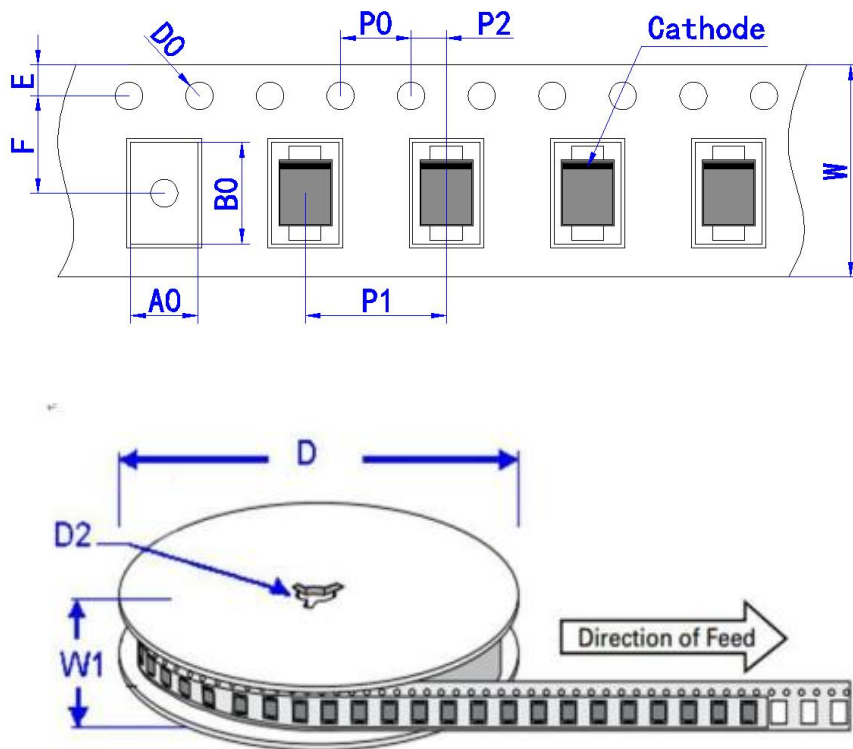


Package mechanical data & Suggested Land Pattern



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

Contact information