P4SMF Series

Description

The P4SMF series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events. They have excellent clamping capability, high surge capability, low zener impedance and fast response time. The P4SMF series is supplied in YINT Semiconductor's exclusive, cost-effective, highly reliable and is ideally suited for use in communication systems, automotive, numerical controls, process controls, medical equipment, business machines, power supplies and many other industrial/consumer Applications.

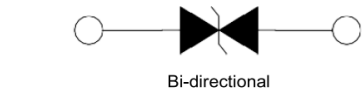
Uni-directional

Bi-directional

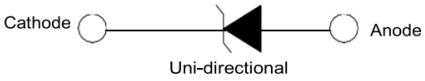
Features

- Case: SOD123FL
- Excellent clamping capability
- 400 W peak pulse power capability with a 10/1000 μs waveform
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Fast response time: typically less than 1.0ps from 0 Volts to VB min.
- IEC61000-4-2 (ESD) ±30kV (air), ±30kV (contact).

Functional Diagram



Bi-directional



Uni-directional

Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Maximum Ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at TA=25ºC by 10/1000μs Waveform	P_{PK}	400	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	1	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave[1]	I_{FSM}	30	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V_F	3.5	V
Operating Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

NOTES:

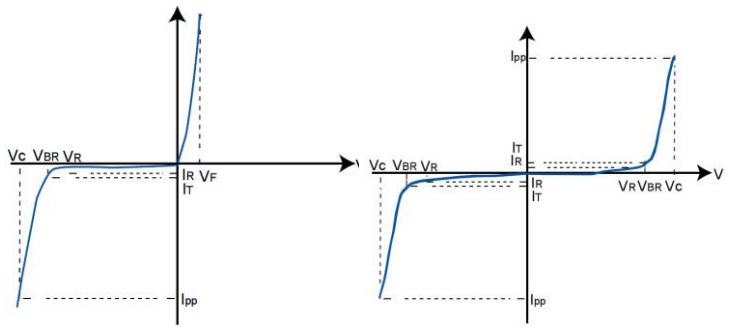
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Electrical characteristics (TA = 25 °C unless otherwise noted)

Part Number (Bi)	Part Number (Uni)	MARKING		Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts)@I_T		Test Current I_T(mA)	Maximum Reverse Leakage I_R @ V_R(μA)	Maximum Peak Pulse Current Ipp(A)	Maximum Clamping Voltage V_C @I_{PP}(V)
		BI	UNI		Min .V	Max .V				
P4SMF5.0CA	P4SMF5.0A	TE	HE	5.0	6.40	7.00	10	800	40.1	9.2
P4SMF6.0CA	P4SMF6.0A	TG	HG	6.0	6.67	7.37	10	800	35.9	10.3
P4SMF6.5CA	P4SMF6.5A	TK	HK	6.5	7.22	7.98	10	500	33.1	11.2
P4SMF7.0CA	P4SMF7.0A	TM	HM	7.0	7.78	8.60	10	200	30.9	12.0
P4SMF7.5CA	P4SMF7.5A	TP	HP	7.5	8.33	9.21	1	100	28.7	12.9
P4SMF8.0CA	P4SMF8.0A	TR	HR	8.0	8.89	9.83	1	50	27.2	13.6
P4SMF8.5CA	P4SMF8.5A	TT	HT	8.5	9.44	10.40	1	20	25.7	14.4
P4SMF9.0CA	P4SMF9.0A	TV	HV	9.0	10.00	11.10	1	5	26.4	15.4
P4SMF10CA	P4SMF10A	TX	HX	10	11.10	12.30	1	5	23.5	17.0
P4SMF11CA	P4SMF11A	TZ	HZ	11	12.20	13.50	1	1	22.0	18.2
P4SMF12CA	P4SMF12A	UE	IE	12	13.30	14.70	1	1	20.1	19.9
P4SMF13CA	P4SMF13A	UG	IG	13	14.40	15.90	1	1	18.6	21.5
P4SMF14CA	P4SMF14A	UK	IK	14	15.60	17.20	1	1	17.2	23.2
P4SMF15CA	P4SMF15A	UM	IM	15	16.70	18.50	1	1	16.4	24.4
P4SMF16CA	P4SMF16A	UP	IP	16	17.80	19.70	1	1	15.4	26.0
P4SMF17CA	P4SMF17A	UR	IR	17	18.90	20.90	1	1	14.5	27.6
P4SMF18CA	P4SMF18A	UT	IT	18	20.00	22.10	1	1	13.7	29.2
P4SMF20CA	P4SMF20A	UV	IV	20	22.20	24.50	1	1	12.3	32.4
P4SMF22CA	P4SMF22A	UX	IX	22	24.40	26.90	1	1	11.3	35.5
P4SMF24CA	P4SMF24A	UZ	IZ	24	26.70	29.50	1	1	10.3	38.9
P4SMF26CA	P4SMF26A	VE	JE	26	28.90	31.90	1	1	9.5	42.1
P4SMF28CA	P4SMF28A	VG	JG	28	31.10	34.40	1	1	8.8	45.4
P4SMF30CA	P4SMF30A	VK	JK	30	33.30	36.80	1	1	8.3	48.4
P4SMF33CA	P4SMF33A	VM	JM	33	36.70	40.60	1	1	7.5	53.3
P4SMF36CA	P4SMF36A	VP	JP	36	40.00	44.20	1	1	6.9	58.1
P4SMF40CA	P4SMF40A	VR	JR	40	44.40	49.10	1	1	6.2	64.5
P4SMF43CA	P4SMF43A	VT	JT	43	47.80	52.80	1	1	5.8	69.4
P4SMF45CA	P4SMF45A	VV	JV	45	50.00	55.30	1	1	5.5	72.7
P4SMF48CA	P4SMF48A	VX	JX	48	53.30	58.90	1	1	5.2	77.4
P4SMF51CA	P4SMF51A	VZ	JZ	51	56.70	62.70	1	1	4.9	82.4
P4SMF54CA	P4SMF54A	WE	KE	54	60.00	66.30	1	1	4.6	87.1
P4SMF58CA	P4SMF58A	WG	KG	58	64.40	71.20	1	1	4.3	93.6
P4SMF60CA	P4SMF60A	WK	KK	60	66.70	73.70	1	1	4.1	96.8
P4SMF64CA	P4SMF64A	WM	KM	64	71.10	78.60	1	1	3.9	103.0
P4SMF70CA	P4SMF70A	WP	KP	70	77.80	86.00	1	1	3.5	113.0
P4SMF75CA	P4SMF75A	WR	KR	75	83.30	92.10	1	1	3.3	121.0

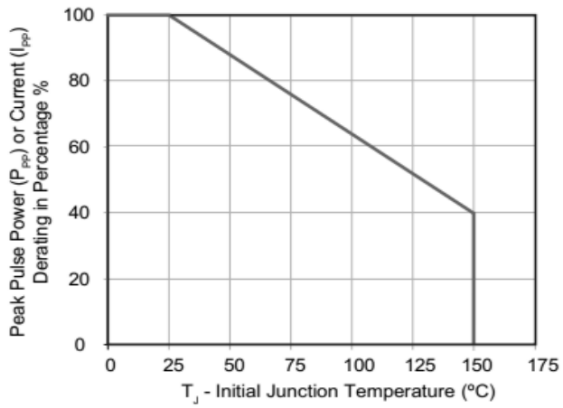
P4SMF78CA	P4SMF78A	WT	KT	78	86.70	95.80	1	1	3.2	126.0
P4SMF85CA	P4SMF85A	WV	KV	85	94.40	104.0	1	1	2.9	137.0

I-V Curve characteristics

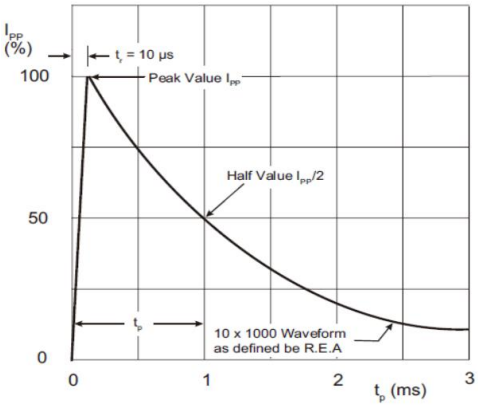


Symbol	Parameter
I_{PP}	Maximum Reverse Peak Pulse Current
V_C	Clamping Voltage @ I_{PP}
V_{RWM}	Working Peak Reverse Voltage
I_R	Maximum Reverse Leakage Current @V_{RWM}
V_{BR}	Breakdown Voltage @ I_T(Test Current)

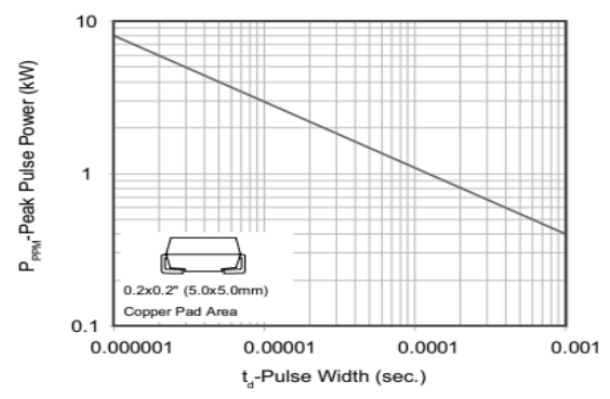
Rating & Characteristic Curves



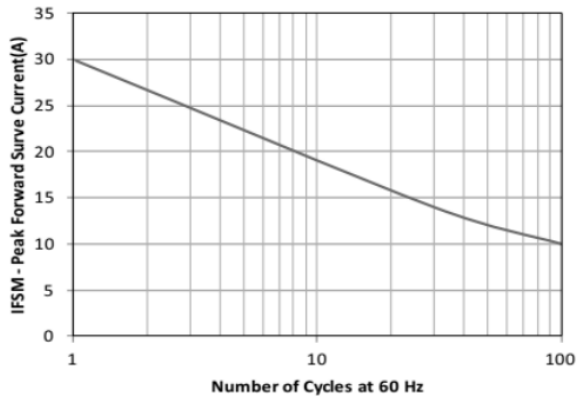
1.Peak pulse power derating curve



2. Pulse waveform

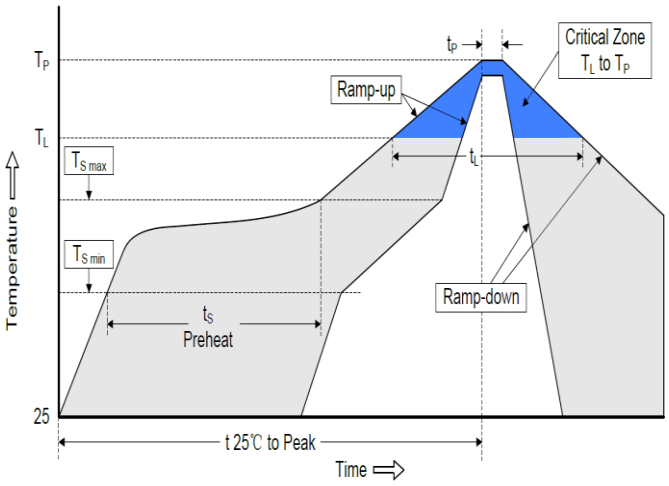


3. Peak pulse power rating curve



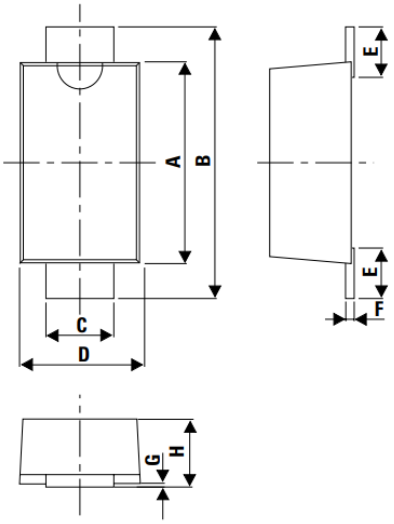
4. Maximum non-repetitive surge current

Soldering parameters



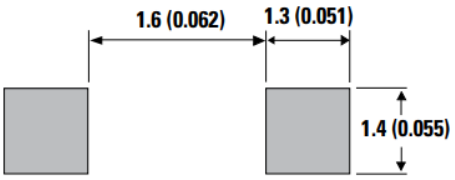
Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max)(t_S)	 150°C 200°C 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3°C/second max.
Time maintained above: - Temperature (T_L) - Time (t_L)	 217°C 60-150 seconds
Peak Temperature (T_P)	260°C
Time within 5°C of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

Package outline dimensions in millimeters

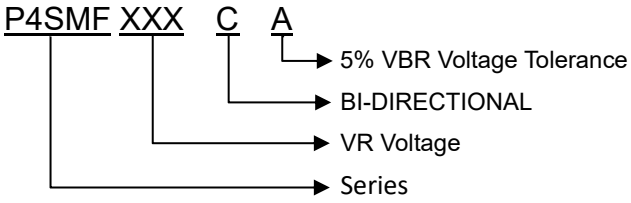


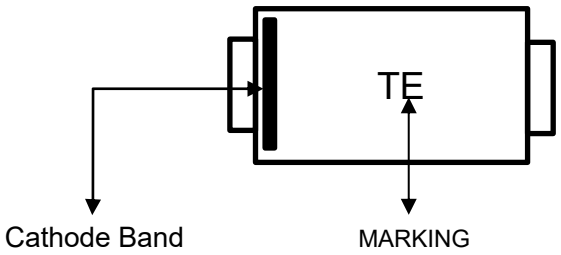
Dimensions	Millimeter	
	Min	Max
A	2.50	3.10
B	3.40	3.90
C	0.70	1.20
D	1.50	2.00
E	0.35	0.90
F	0.05	0.26
G	0.00	0.10
H	0.90	1.25

Mounting Pad Layout



Part number code & Marking code





(for Uni-directional products only)

Disclaimer

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.