

## SMD Type 400 W

### ■ Features

1. Glass passivated chip
2. 400W peak pulse power capability with a 10/1000  $\mu$ s waveform, repetitive rate (duty cycle): 0.01%
3. Excellent clamping capability
4. Very fast response time
5. Low clamping voltage
6. Low leakage current
7. Meets MSL level 1, per J-STD-020, LF maximum peak of 260°C
8. Halogen free and RoHS compliant
9. AEC Q101 qualified



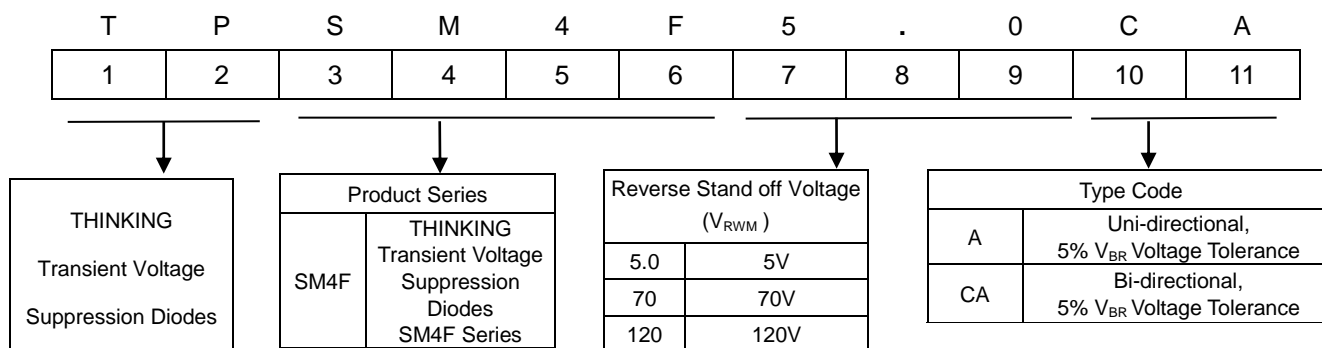
### ■ Recommended Applications

1. I/O interface
2. VCC BUS
3. Low frequency signal transmission line

### ■ Mechanical Data

1. Case: SOD-123FL, molded plastic
2. Epoxy : UL 94V-0 rate flame retardant
3. Terminals: Solderable per MIL-STD-750, method 2026
4. Polarity: Color band denotes cathode end
5. Mounting Position: Any

### ■ Part Number Code

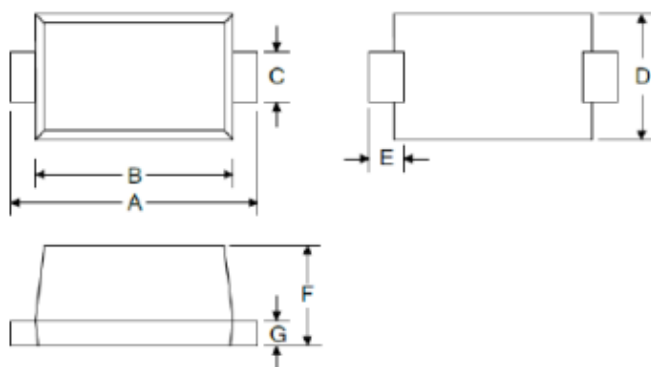


# Transient Voltage Suppression Diodes: TP5M4F Series

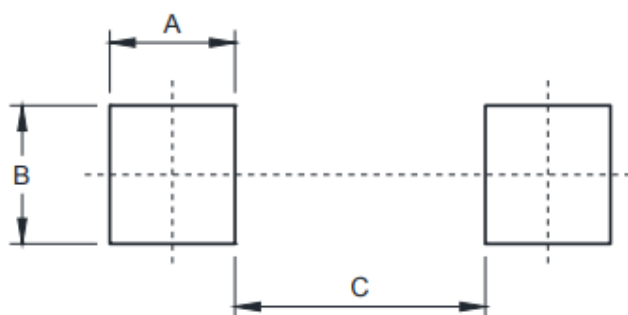
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### Structures and Dimensions



Symbol	Dimensions in millimeters	
	Min	Max
A	3.50	3.90
B	2.60	3.00
C	0.90	1.10
D	1.60	2.00
E	0.80 Typ.	
F	0.90	1.40
G	0.12	0.22



Symbol	Unit (mm)	Unit (inch)
A	1.0	0.039
B	1.1	0.043
C	2.0	0.079

### Maximum Rating ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak power dissipation with a 10/1000 $\mu\text{s}$ waveform (Note 1,2)	$P_{PPM}$	400	W
Peak forward surge current, 8.3ms single half sine wave on rated load (Note 3)	$I_{FSM}$	40	A
Power dissipation on infinite heatsink at $T_L=75^\circ\text{C}$	$P_D$	1.0	W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	220	$^\circ\text{C/W}$
Typical thermal resistance junction to lead	$R_{\theta JL}$	100	$^\circ\text{C/W}$
Operating junction and storage temperature range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

Notes : (1) Non-repetitive current pulse, per Fig. 3 and derated above  $T_A=25^\circ\text{C}$  per Fig. 2

(2) Mounted on 5.0 x 5.0mm copper pad to each terminal

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

# Transient Voltage Suppression Diodes: TPSM4F Series



## SMD Type 400 W

### ■ Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage VRWM (V)	Breakage Voltage VBR @ IT		Test Current IT (mA)	Maximum Clamping Voltage VC @ Ipp (V)	Maximum Peak Pulse Current Ipp(A)	Maximum Reverse Leakage IR @VRWM (μA)	Marking Code	
			Min( V )	Max( V )					Uni	Bi
TPSM4F5.0A	TPSM4F5.0CA	5	6.4	7	10	9.2	43.5	800	4AE	4WE
TPSM4F6.0A	TPSM4F6.0CA	6	6.7	7.4	10	10.3	38.8	800	4AG	4WG
TPSM4F6.5A	TPSM4F6.5CA	6.5	7.2	8	10	11.2	35.7	500	4AK	4WK
TPSM4F7.0A	TPSM4F7.0CA	7	7.8	8.6	10	12	33.3	200	4AM	4WM
TPSM4F7.5A	TPSM4F7.5CA	7.5	8.3	9.2	1	12.9	31	100	4AP	4WP
TPSM4F8.0A	TPSM4F8.0CA	8	8.9	9.8	1	13.6	29.4	50	4AR	4WR
TPSM4F8.5A	TPSM4F8.5CA	8.5	9.4	10.4	1	14.4	27.8	10	4AT	4WT
TPSM4F9.0A	TPSM4F9.0CA	9	10	11	1	15.4	26	5	4AV	4WV
TPSM4F10A	TPSM4F10CA	10	11.1	12.3	1	17	23.5	1	4AX	4WX
TPSM4F11A	TPSM4F11CA	11	12.2	13.5	1	18.2	22	1	4AZ	4WZ
TPSM4F12A	TPSM4F12CA	12	13.3	14.7	1	19.9	20.1	1	4BE	4XE
TPSM4F13A	TPSM4F13CA	13	14.4	15.9	1	21.5	18.6	1	4BG	4XG
TPSM4F14A	TPSM4F14CA	14	15.6	17.2	1	23.2	17.2	1	4BK	4XK
TPSM4F15A	TPSM4F15CA	15	16.7	18.5	1	24.4	16.4	1	4BM	4XM
TPSM4F16A	TPSM4F16CA	16	17.8	19.7	1	26	15.4	1	4BP	4XP
TPSM4F17A	TPSM4F17CA	17	18.9	20.9	1	27.6	14.5	1	4BR	4XR
TPSM4F18A	TPSM4F18CA	18	20	22.1	1	29.2	13.7	1	4BT	4XT
TPSM4F20A	TPSM4F20CA	20	22.2	24.5	1	32.4	12.3	1	4BV	4XV
TPSM4F22A	TPSM4F22CA	22	24.4	26.9	1	35.5	11.3	1	4BX	4XX
TPSM4F24A	TPSM4F24CA	24	26.7	29.5	1	38.9	10.3	1	4BZ	4XZ
TPSM4F26A	TPSM4F26CA	26	28.9	31.9	1	42.1	9.5	1	4CE	4YE
TPSM4F28A	TPSM4F28CA	28	31.1	34.4	1	45.4	8.8	1	4CG	4YG
TPSM4F30A	TPSM4F30CA	30	33.3	36.8	1	48.4	8.3	1	4CK	4YK
TPSM4F33A	TPSM4F33CA	33	36.7	40.6	1	53.3	7.5	1	4CM	4YM
TPSM4F36A	TPSM4F36CA	36	40	44.2	1	58.1	6.9	1	4CP	4YP
TPSM4F40A	TPSM4F40CA	40	44.4	49.1	1	64.5	6.2	1	4CR	4YR
TPSM4F43A	TPSM4F43CA	43	47.8	52.8	1	69.4	5.8	1	4CT	4YT
TPSM4F45A	TPSM4F45CA	45	50	55.3	1	72.7	5.5	1	4CV	4YV

# Transient Voltage Suppression Diodes: TPSM4F Series



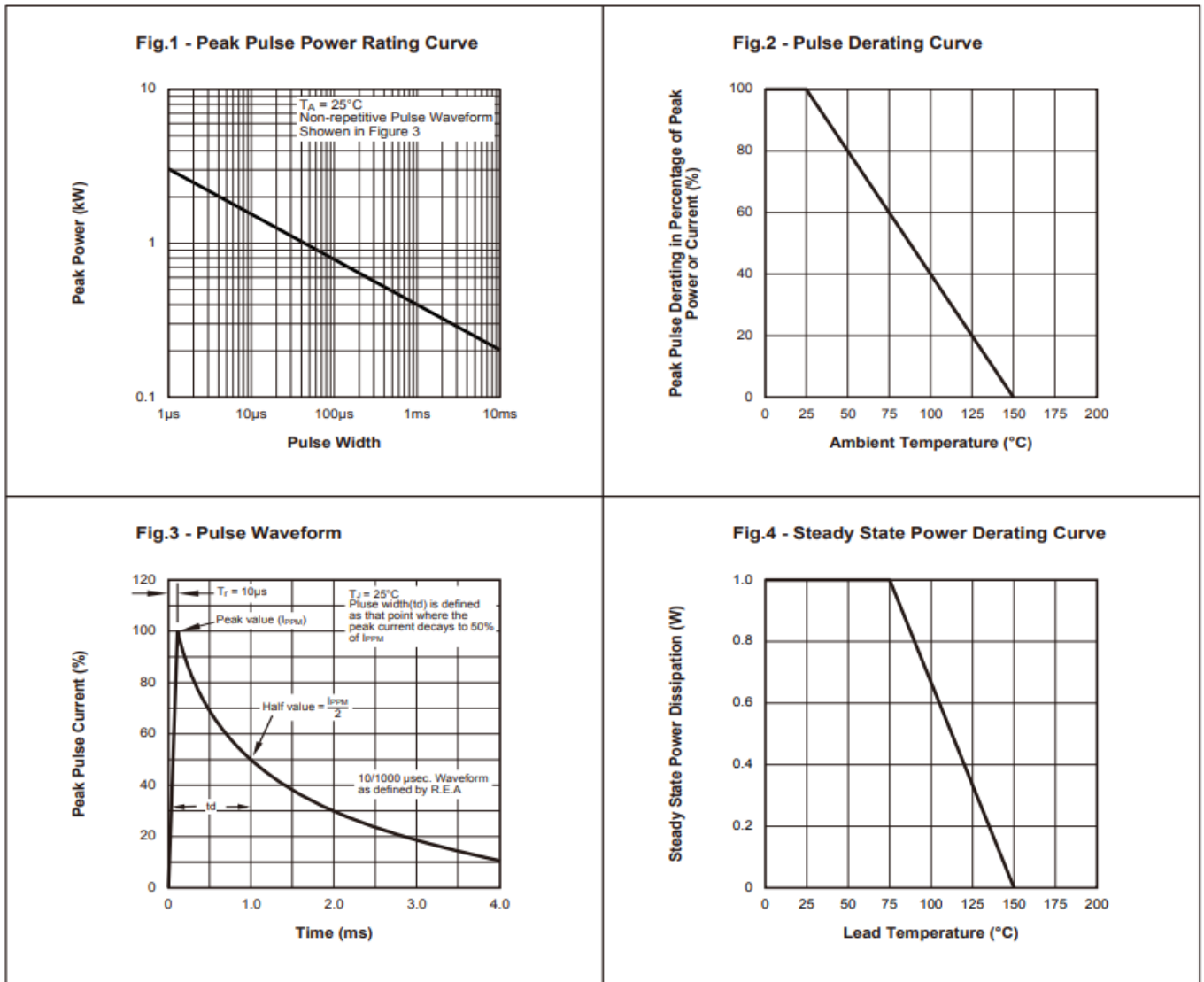
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### ■ Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

Part No. (Uni)	Part No. (Bi)	Reverse Stand off Voltage	Breakage Voltage VBR @ IT		Test Current IT ( mA )	Maximum Clamping Voltage VC @ Ipp	Maximum Peak Pulse Current Ipp(A)	Maximum Reverse Leakage IR @VRWM	Marking Code	
			VRWM ( V )	Min( V )					Max( V )	Uni
TPSM4F48A	TPSM4F48CA	48	53.3	58.9	1	77.4	5.2	1	4CX	4YX
TPSM4F51A	TPSM4F51CA	51	56.7	62.7	1	82.4	4.9	1	4CZ	4YZ
TPSM4F54A	TPSM4F54CA	54	60	66.3	1	87.1	4.6	1	4RE	4ZE
TPSM4F58A	TPSM4F58CA	58	64.4	71.2	1	93.6	4.3	1	4RG	4ZG
TPSM4F60A	TPSM4F60CA	60	66.7	73.7	1	96.8	4.1	1	4RK	4ZK
TPSM4F64A	TPSM4F64CA	64	71.1	78.6	1	103	3.9	1	4RM	4ZM
TPSM4F70A	TPSM4F70CA	70	77.8	86	1	113	3.5	1	4RP	4ZP
TPSM4F75A	TPSM4F75CA	75	83.3	92.1	1	121	3.3	1	4RR	4ZR
TPSM4F78A	TPSM4F78CA	78	86.7	95.8	1	126	3.2	1	4RT	4ZT
TPSM4F85A	TPSM4F85CA	85	94.4	104	1	137	2.2	1	4RV	4ZV
TPSM4F90A	TPSM4F90CA	90	100	111	1	146	2.1	1	4RX	4ZX
TPSM4F100A	TPSM4F100CA	100	111	123	1	162	1.9	1	4RZ	4ZZ
TPSM4F110A	TPSM4F110CA	110	122	135	1	177	1.7	1	4SE	4VE
TPSM4F120A	TPSM4F120CA	120	133	147	1	193	1.6	1	4SG	4VG
TPSM4F130A	TPSM4F130CA	130	144	159	1	209	1.4	1	4SK	4VK
TPSM4F150A	TPSM4F150CA	150	167	185	1	243	1.2	1	4SM	4VM
TPSM4F160A	TPSM4F160CA	160	178	197	1	259	1.2	1	4SP	4VP
TPSM4F170A	TPSM4F170CA	170	189	209	1	275	1.09	1	4SR	4VR
TPSM4F180A	TPSM4F180CA	180	201	222	1	292	1.4	1	4ST	4VT
TPSM4F200A	TPSM4F200CA	200	224	247	1	324	1.2	1	4SV	4VV

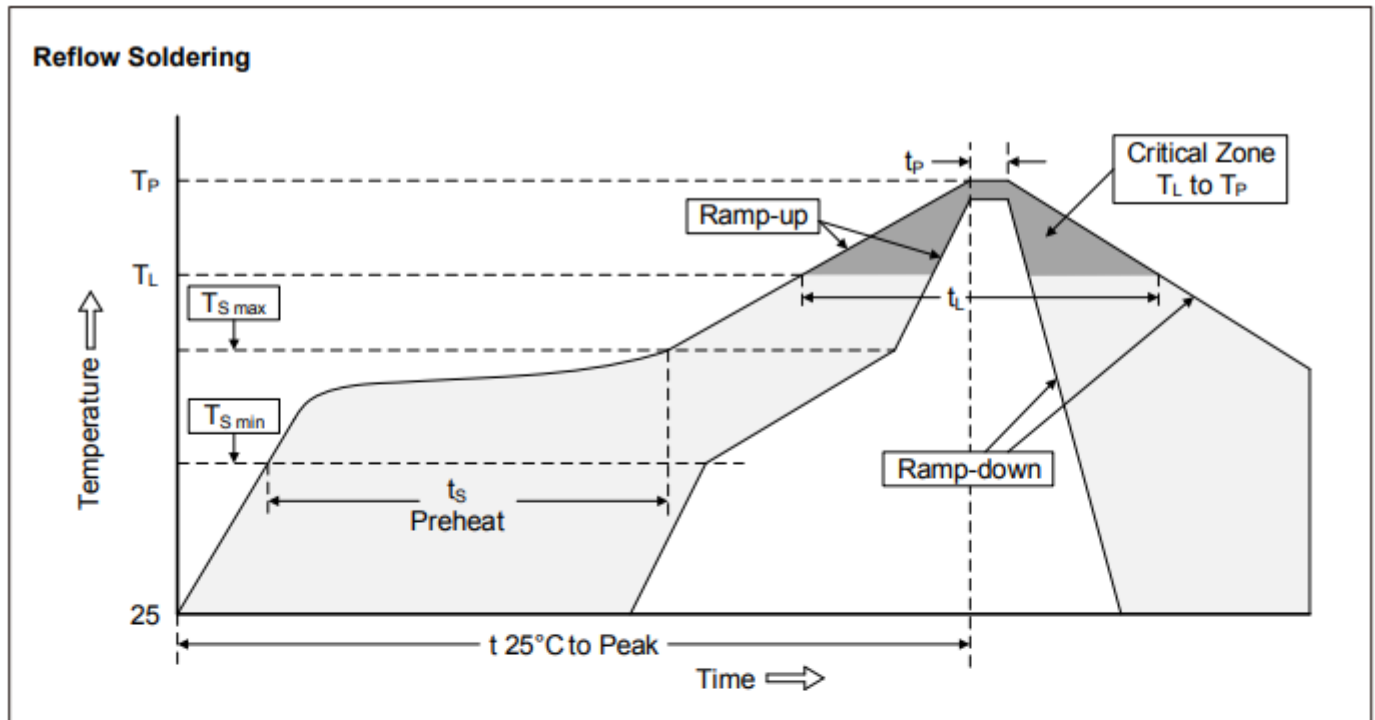
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### ■ Rate and Characteristic Curve ( $T_A=25^\circ\text{C}$ unless otherwise noted)



## SMD Type 400 W

### IR-reflow soldering profile



### Recommended Conditions

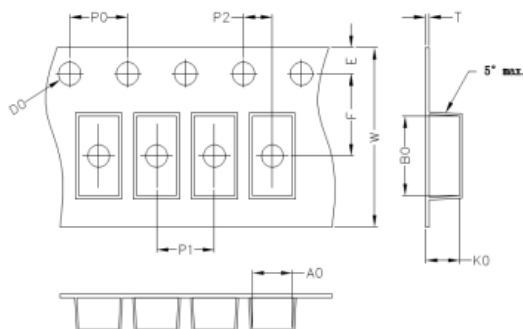
Profile Feature	Pb-Free Assembly
Average ramp-up rate ( $T_L$ to $T_P$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{S\ min}$ )	150°C
-Temperature Max ( $T_{S\ max}$ )	200°C
-Time (min to max) ( $t_s$ )	60-180 seconds
$T_{S\ max}$ to $T_L$	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature ( $T_L$ )	217°C
-Time ( $t_L$ )	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.

# Transient Voltage Suppression Diodes: TP5M4F Series

## SMD Type 400 W



### ■ Packaging



Symbol	A0	B0	K0	D0	E	F
Unit (mm)	2.15±0.1	3.95±0.1	13.5±0.1	1.5±0.1	1.75±0.1	3.5±0.1
Symbol	P0	P1	P2	T	W	
Unit (mm)	4.0±0.1	4.0±0.1	2.0±0.1	0.25±0.1	8.0±0.3	

### ■ Quantity

Series Type	Packaging option	Base quantity	Packaging specification
TP5M4F	Tape and reel	3000/reel	EIA STD RS-481

### ■ Warehouse Storage Conditions of product

- Storage Condition:
  1. Storage Temperature: ≤25°C
  2. Relative Humidity: 50%~80%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year.