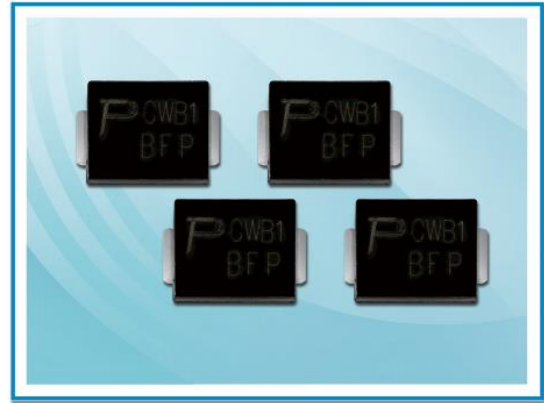


TVS Diode – TPSMCJ Series

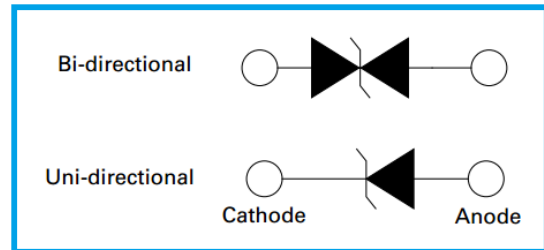
Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SMC package.
- Excellent voltage clamping capability.
- Automotive grade AEC-Q101 qualified.
- Low Zener impedance.
- 1500W peak pulse power capability on 10/1000µs waveform.
- Typical leakage current less than 1µA above 13V.
- Very fast response time, typically less than 1.0ps from 0 volt to V_{BR} minimum.
- High temperature soldering guaranteed: 265°C/10 sec.
- MSL: JEDEC-J-STD-020, Level 1



Applications

- I/O interface, V_{CC} bus
- Telecom / Automotive
- Industrial and consumer electronic applications.
- Relay and electromagnetic valve surge absorption.



Mechanical and Physical Data

- Case: JEDEC SMC molded plastic.
- Surface mount device, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denoted cathode except bidirectional.

Maximum Ratings and Thermal Characteristics

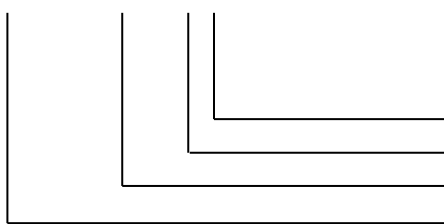
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000µs waveform (Note 1, Fig.1).	P_{PPM}	Min 1500	Watt
Peak Pulse Current of 10/1000µs waveform (Note 1, Fig.3).	I_{PPM}	See Table	Amp
Steady State Power Dissipation at $T_L = 75^\circ\text{C}$, Lead lengths 0.375", (9.5mm) (Fig.5).	$P_{M(AV)}$	6.5	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I_{FSM}	200	Amp
Operating Junction and Storage Temperature Range.	T_J, T_{STG}	-55~150	$^\circ\text{C}$

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above $T_A = 25^\circ\text{C}$ per Fig.2.
2. 8.3ms single half sine wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

Part Number Code

TPSMCJ □□□ **C A**



- V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
- C: Bi-directional; Blank: Uni-directional
- Reverse Stand-Off Voltage or Typical Breakdown Voltage
- Automotive TPSMCJ Series (1500W)

TVS Diode – TPSMCJ Series

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation – Maximum power dissipation

V_R Stand-off Voltage – Maximum voltage that can be applied to the TVS without operation

V_{BR} Breakdown Voltage – Maximum voltage that flows through the TVS at a specified test current (I_T)

V_C Clamping Voltage – Peak voltage measured across the TVS at a specified I_{PPM} (Peak Impulse Current)

I_R Reverse Leakage Current – Current measured at V_R

V_F Forward Voltage Drop for Uni-directional

Electrical Characteristics

Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
TPSMCJ5.0A	TPSMCJ5.0CA	GDET	BDET	5.0	6.40	7.00	10	9.2	163.04	800
TPSMCJ6.0A	TPSMCJ6.0CA	GDGT	BDGT	6.0	6.67	7.37	10	10.3	145.63	800
TPSMCJ6.5A	TPSMCJ6.5CA	GDKT	BDKT	6.5	7.22	7.98	10	11.2	133.93	500
TPSMCJ7.0A	TPSMCJ7.0CA	GDMT	BDMT	7.0	7.78	8.60	10	12.0	125.00	200
TPSMCJ7.5A	TPSMCJ7.5CA	GDPT	BDPT	7.5	8.33	9.21	1	12.9	116.28	100
TPSMCJ8.0A	TPSMCJ8.0CA	GDRT	BDRT	8.0	8.89	9.83	1	13.6	110.29	50
TPSMCJ8.5A	TPSMCJ8.5CA	GDIT	BDIT	8.5	9.44	10.40	1	14.4	104.17	20
TPSMCJ9.0A	TPSMCJ9.0CA	GDVT	BDVT	9.0	10.00	11.10	1	15.4	97.40	10
TPSMCJ10A	TPSMCJ10CA	GDXT	BDXT	10.0	11.10	12.30	1	17.0	88.24	5
TPSMCJ11A	TPSMCJ11CA	GDZT	BDZT	11.0	12.20	13.50	1	18.2	82.42	1
TPSMCJ12A	TPSMCJ12CA	GEET	BEET	12.0	13.30	14.70	1	19.9	75.38	1
TPSMCJ13A	TPSMCJ13CA	GEGT	BEGT	13.0	14.40	15.90	1	21.5	69.77	1
TPSMCJ14A	TPSMCJ14CA	GEKT	BEKT	14.0	15.60	17.20	1	23.2	64.66	1
TPSMCJ15A	TPSMCJ15CA	GEMT	BEMT	15.0	16.70	18.50	1	24.4	61.48	1
TPSMCJ16A	TPSMCJ16CA	GEPT	BEPT	16.0	17.80	19.70	1	26.0	57.69	1
TPSMCJ17A	TPSMCJ17CA	GERT	BERT	17.0	18.90	20.90	1	27.6	54.35	1
TPSMCJ18A	TPSMCJ18CA	GETT	BETT	18.0	20.00	22.10	1	29.2	51.37	1

TVS Diode – TPSMCJ Series

Part Number		Marking		Reverse Stand Off Voltage V_R (V)	Breakdown Voltage V_{BR} (V) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C (V) @ I_{PP}	Maximum Peak Pulse Current I_{PP} (A)	Maximum Reverse Leakage I_R (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
TPSMCJ19A	TPSMCJ19CA	GEBT	BEBT	19.0	21.10	23.30	1	30.8	48.73	1
TPSMCJ20A	TPSMCJ20CA	GEVT	BEVT	20.0	22.20	24.50	1	32.4	46.30	1
TPSMCJ22A	TPSMCJ22CA	GEXT	BEXT	22.0	24.40	26.90	1	35.5	42.25	1
TPSMCJ24A	TPSMCJ24CA	GEZT	BEZT	24.0	26.70	29.50	1	38.9	38.56	1
TPSMCJ26A	TPSMCJ26CA	GFET	BFET	26.0	28.90	31.90	1	42.1	35.63	1
TPSMCJ28A	TPSMCJ28CA	GFGT	BFGT	28.0	31.10	34.40	1	45.4	33.04	1
TPSMCJ30A	TPSMCJ30CA	GFKT	BFKT	30.0	33.30	36.80	1	48.4	30.99	1
TPSMCJ33A	TPSMCJ33CA	GFMT	BFMT	33.0	36.70	40.60	1	53.3	28.14	1
TPSMCJ36A	TPSMCJ36CA	GFPT	BFPT	36.0	40.00	44.20	1	58.1	25.82	1
TPSMCJ40A	TPSMCJ40CA	GFRT	BFRT	40.0	44.40	49.10	1	64.5	23.15	1
TPSMCJ43A	TPSMCJ43CA	GFTT	BFTT	43.0	47.80	52.80	1	69.4	21.61	1
TPSMCJ45A	TPSMCJ45CA	GFVT	BFVT	45.0	50.00	55.30	1	72.7	20.63	1
TPSMCJ48A	TPSMCJ48CA	GFXT	BFXT	48.0	53.30	58.90	1	77.4	19.38	1
TPSMCJ51A	TPSMCJ51CA	GFZT	BFZT	51.0	56.70	62.70	1	82.4	18.20	1
TPSMCJ54A	TPSMCJ54CA	GGET	BGET	54.0	60.00	66.30	1	87.1	17.22	1
TPSMCJ58A	TPSMCJ58CA	GGGT	BGGT	58.0	64.40	71.20	1	93.6	16.03	1
TPSMCJ60A	TPSMCJ60CA	GGKT	BGKT	60.0	66.70	73.70	1	96.8	15.50	1
TPSMCJ64A	TPSMCJ64CA	GGMT	BGMT	64.0	71.10	78.60	1	103.0	14.56	1
TPSMCJ70A	TPSMCJ70CA	GGPT	BGPT	70.0	77.80	86.00	1	113.0	13.27	1
TPSMCJ75A	TPSMCJ75CA	GGRT	BGRT	75.0	83.30	92.10	1	121.0	12.40	1
TPSMCJ78A	TPSMCJ78CA	GGTT	BGTT	78.0	86.70	95.80	1	126.0	11.90	1
TPSMCJ80A	TPSMCJ80CA	GGBT	BGBT	80.0	88.80	97.60	1	129.6	11.57	1
TPSMCJ85A	TPSMCJ85CA	GGVT	BGVT	85.0	94.40	104.0	1	137.0	10.95	1
TPSMCJ90A	TPSMCJ90CA	GGXT	BGXT	90.0	100.00	111.00	1	146.0	10.27	1
TPSMCJ100A	TPSMCJ100CA	GGZT	BGZT	100.0	111.00	123.00	1	162.0	9.26	1
TPSMCJ110A	TPSMCJ110CA	GHET	BHET	110.0	122.0	135.0	1	177.0	8.5	1
TPSMCJ120A	TPSMCJ120CA	GHGT	BHGT	120.0	133.0	147.0	1	193.0	7.8	1
TPSMCJ130A	TPSMCJ130CA	GHKT	BHKT	130.0	144.0	159.0	1	209.0	7.2	1
TPSMCJ150A	TPSMCJ150CA	GHMT	BHMT	150.0	167.0	185.0	1	243.0	6.2	1
TPSMCJ160A	TPSMCJ160CA	GHPT	BHPT	160.0	178.0	197.0	1	259.0	5.8	1
TPSMCJ170A	TPSMCJ170CA	GHRT	BHRT	170.0	189.0	209.0	1	275.0	5.5	1
TPSMCJ180A	TPSMCJ180CA	GHTT	BHTT	180.0	201.0	222.0	1	292.0	5.1	1
TPSMCJ190A	TPSMCJ190CA	GHUT	BHUT	190.0	209.0	243.0	1	308.0	4.8	1
TPSMCJ200A	TPSMCJ200CA	GHVT	BHVT	200.0	224.0	247.0	1	324.0	4.6	1
TPSMCJ220A	TPSMCJ220CA	GHXT	BHXT	220.0	246.0	272.0	1	356.0	4.2	1
TPSMCJ250A	TPSMCJ250CA	GHZT	BHZT	250.0	279.0	309.0	1	405.0	3.7	1
TPSMCJ300A	TPSMCJ300CA	GJET	BJET	300.0	335.0	371.0	1	486.0	3.1	1
TPSMCJ350A	TPSMCJ350CA	GJGT	BJGT	350.0	391.0	432.0	1	567.0	2.6	1
TPSMCJ400A	TPSMCJ400CA	GJKT	BJKT	400.0	447.0	494.0	1	648.0	2.3	1
TPSMCJ440A	TPSMCJ440CA	GJMT	BJMT	440.0	492.0	543.0	1	713.0	2.1	1

.Note:

1. For bi-directional type having V_R of 10 volts and less, the I_R limit is double.

TVS Diode – TPSCMJ Series

Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

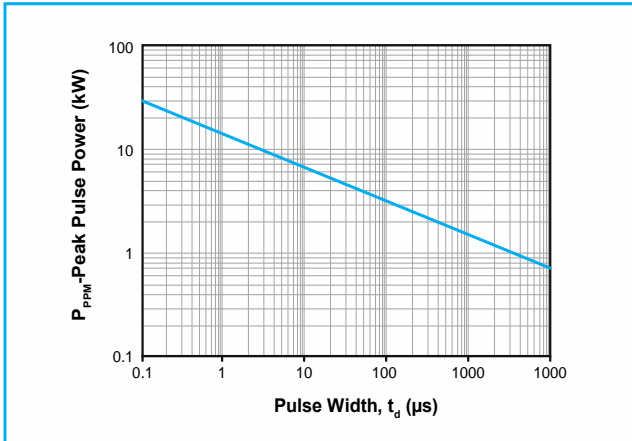


Fig 2 - Pulse Derating Curve

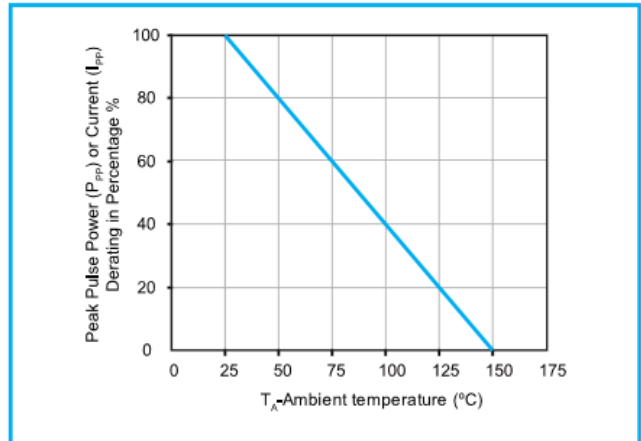


Fig 3 - Pulse Waveform

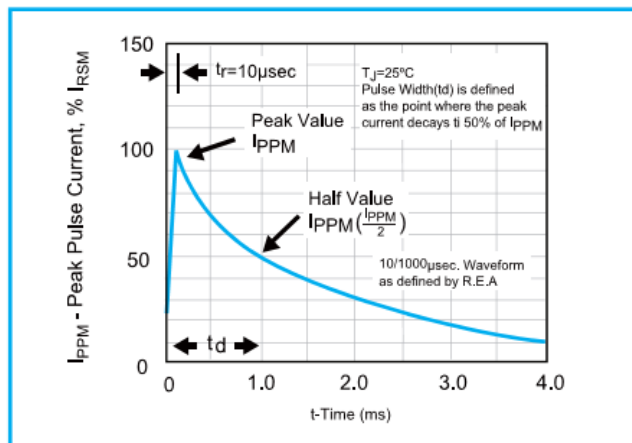


Fig 4 - Typical Junction Capacitance Uni-directional

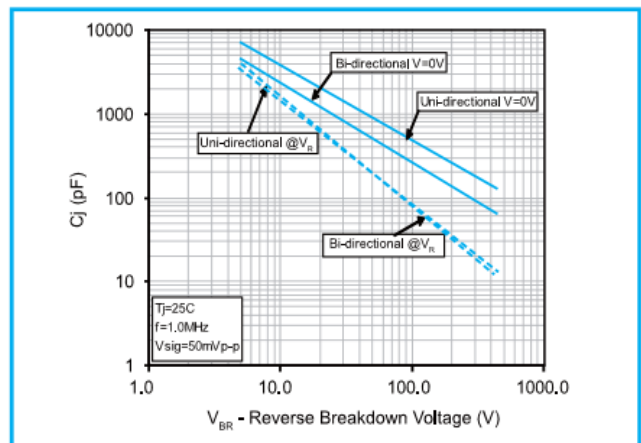


Fig 5 - Steady State Power Dissipation Derating Curve

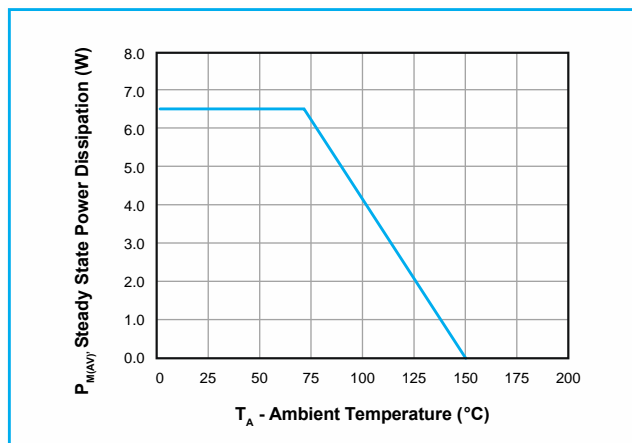
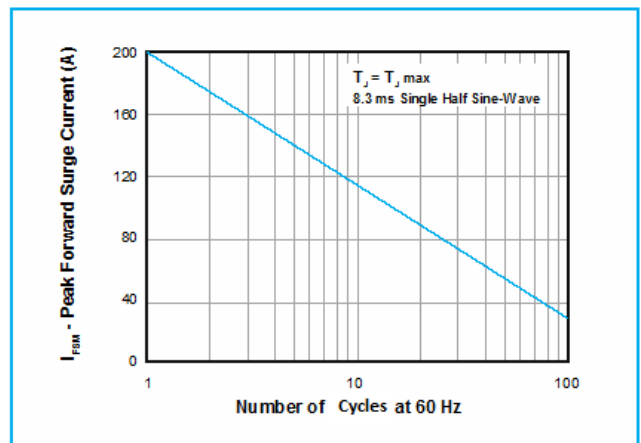
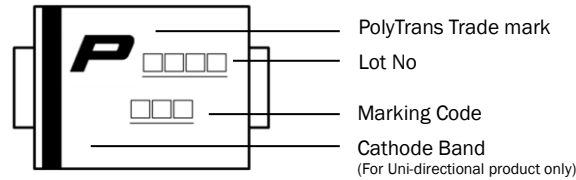


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

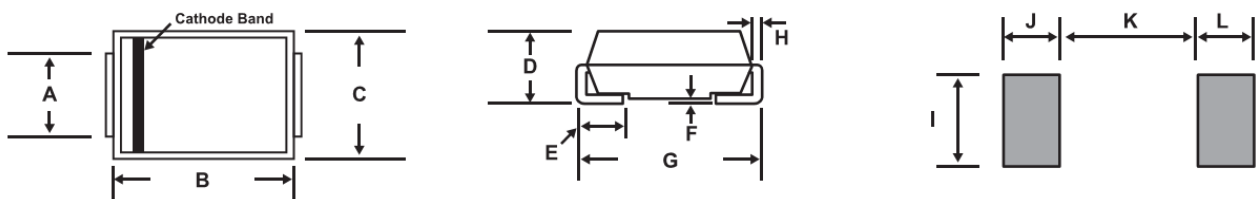


TVS Diode – TPSMCJ Series

Marking Definitions



Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	2.90	3.20	0.114	0.126
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.20	2.80	0.087	0.110
E	0.76	1.52	0.030	0.060
F	-	0.20	-	0.008
G	7.75	8.13	0.305	0.320
H	0.15	0.31	0.006	0.012
I	3.30	-	0.129	-
J	2.40	-	0.094	-
K	-	4.20	-	0.165
L	2.40	-	0.094	-

Lead Free Reflow Soldering Recommendations

Preheat	
- Temperature Min (T_{s_min})	150°C
- Temperature Max (T_{s_max})	200°C
- Time (T_{s_min} to T_{s_max})	60-180 seconds
- Average Ramp-Up Rate	1~3°C/second
Peak Temperature	260°C max.
Time within 5°C of actual Peak Temperature (t_p)	40 seconds max.
Ramp-Down Rate	6 °C /second max.



Note: If the soldering temperatures exceed the recommended profile, devices may not meet the performance requirements.

TVS Diode – TPSMCJ Series

Packaging Information

Part Number	Component Package	Quantity	Packaging Option	Packaging Specification
TPSMCJ Series	DO-214AB	3000	Tape & Reel - 16mm tape/13" reel	EIA STD RS-481

Tape and Reel Specifications

