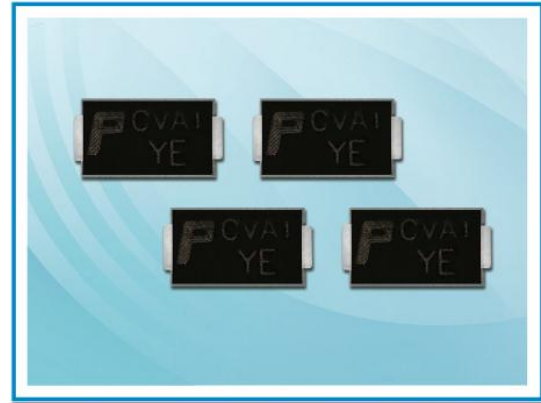


TVS Diode – P4SMA Series

Features

- Plastic package, excellent insulation strength.
- Glass passivated chip junction in SMA package.
- Excellent voltage clamping capability.
- Low Zener impedance.
- 400W peak pulse power capability on 10/1000 μs 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

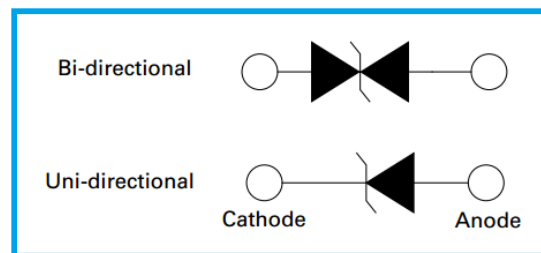


Applications

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

Agency Approval

- UL file no.: E474915



Mechanical and Physical Data

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

Maximum Ratings and Thermal Characteristics

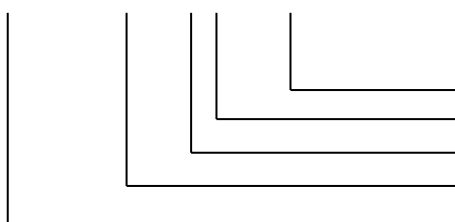
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation on 10/1000μs waveform (Note 1, Fig.1).	P _{PPM}	Min 400	Watt
Peak Pulse Current of 10/1000μs waveform (Note 1, Fig.3).	I _{PPM}	See Table	Amp
Steady State Power Dissipation at TL = 75°C, Lead lengths 0.375", (9.5mm) (Fig.5).	P _{M(AV)}	3.3	Watt
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave Superimposed on Rated Load (Note 2, Fig.6).	I _{FSM}	100	Amp
Operating Junction and Storage Temperature Range.	T _J , T _{STG}	-55~150	°C

Note:

1. Non-repetitive current pulse, per Fig.3 and derated above T_A = 25°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

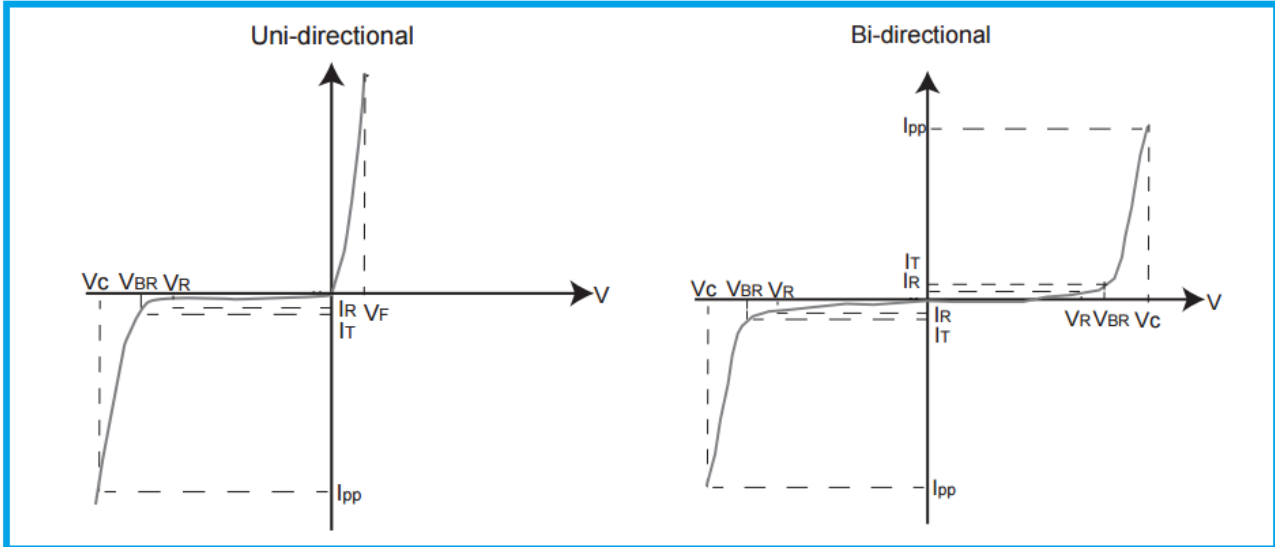
P4SMA □□□ **CA** - □□□



- Packaging Code (T13: Tape with 13" Reel; T7: Tape with 7")
- V_{BR} Voltage tolerance (A: 5%; Blank: 10%)
- C: Bi-directional; Blank: Uni-directional
- Typical Breakdown Voltage
- P4SMA Series (400 W)

TVS Diode – P4SMA 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_{PPM}	Maximum Peak Pulse Current I_{PPM} (A)	Maximum Reverse Leakage I_R (μ A) @ V_R
Uni	Bi	Uni	Bi		Min.	Max.				
P4SMA6.8A	P4SMA6.8CA	6V8A	6V8C	5.80	6.45	7.14	10	10.5	39.0	1000
P4SMA7.5A	P4SMA7.5CA	7V5A	7V5C	6.40	7.13	7.88	10	11.3	36.9	500
P4SMA8.2A	P4SMA8.2CA	8V2A	8V2C	7.02	7.79	8.61	10	12.1	33.9	200
P4SMA9.1A	P4SMA9.1CA	9V1A	9V1C	7.78	8.65	9.55	1	13.4	30.6	50
P4SMA10A	P4SMA10CA	10A	10C	8.55	9.50	10.5	1	14.5	28.3	10
P4SMA11A	P4SMA11CA	11A	11C	9.40	10.5	11.6	1	15.6	26.3	5
P4SMA12A	P4SMA12CA	12A	12C	10.2	11.4	12.6	1	16.7	24.6	5
P4SMA13A	P4SMA13CA	13A	13C	11.1	12.4	13.7	1	18.2	22.5	1
P4SMA15A	P4SMA15CA	15A	15C	12.8	14.3	15.8	1	21.2	19.3	1
P4SMA16A	P4SMA16CA	16A	16C	13.6	15.2	16.8	1	22.5	18.2	1
P4SMA18A	P4SMA18CA	18A	18C	15.3	17.1	18.9	1	25.5	16.1	1
P4SMA20A	P4SMA20CA	20A	20C	17.1	19.0	21.0	1	27.7	14.8	1
P4SMA22A	P4SMA22CA	22A	22C	18.8	20.9	23.1	1	30.6	13.4	1
P4SMA24A	P4SMA24CA	24A	24C	20.5	22.8	25.2	1	33.2	12.3	1
P4SMA27A	P4SMA27CA	27A	27C	23.1	25.7	28.4	1	37.5	10.9	1
P4SMA30A	P4SMA30CA	30A	30C	25.6	28.5	31.5	1	41.4	9.90	1
P4SMA33A	P4SMA33CA	33A	33C	28.2	31.4	34.7	1	45.7	9.00	1

TVS Diode – P4SMA 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.				
P4SMA36A	P4SMA36CA	36A	36C	30.8	34.2	37.8	1	49.9	8.20	1
P4SMA39A	P4SMA39CA	39A	39C	33.3	37.1	41.0	1	53.9	7.60	1
P4SMA43A	P4SMA43CA	43A	43C	36.8	40.9	45.2	1	59.3	6.90	1
P4SMA47A	P4SMA47CA	47A	47C	40.2	44.7	49.4	1	64.8	6.30	1
P4SMA51A	P4SMA51CA	51A	51C	43.6	48.5	53.6	1	70.1	5.80	1
P4SMA56A	P4SMA56CA	56A	56C	47.8	53.2	58.8	1	77.0	5.30	1
P4SMA62A	P4SMA62CA	62A	62C	53.0	58.9	65.1	1	85.0	4.80	1
P4SMA68A	P4SMA68CA	68A	68C	58.1	64.6	71.4	1	92.0	4.50	1
P4SMA75A	P4SMA75CA	75A	75C	64.1	71.3	78.8	1	103.0	4.00	1
P4SMA82A	P4SMA82CA	82A	82C	70.1	77.9	86.1	1	113.0	3.60	1
P4SMA91A	P4SMA91CA	91A	91C	77.8	86.5	95.5	1	125.0	3.30	1
P4SMA100A	P4SMA100CA	100A	100C	85.5	95.0	105.0	1	137.0	3.00	1
P4SMA110A	P4SMA110CA	110A	110C	94.0	105.0	116.0	1	152.0	2.70	1
P4SMA120A	P4SMA120CA	120A	120C	102.0	114.0	126.0	1	165.0	2.50	1
P4SMA130A	P4SMA130CA	130A	130C	111.0	124.0	137.0	1	179.0	2.30	1
P4SMA150A	P4SMA150CA	150A	150C	128.0	143.0	158.0	1	207.0	2.00	1
P4SMA160A	P4SMA160CA	160A	160C	136.0	152.0	168.0	1	219.0	1.90	1
P4SMA170A	P4SMA170CA	170A	170C	145.0	162.0	179.0	1	234.0	1.80	1
P4SMA180A	P4SMA180CA	180A	180C	154.0	171.0	189.0	1	246.0	1.70	1
P4SMA200A	P4SMA200CA	200A	200C	171.0	190.0	210.0	1	274.0	1.50	1
P4SMA220A	P4SMA220CA	220A	220C	185.0	209.0	231.0	1	328.0	1.30	1
P4SMA250A	P4SMA250CA	250A	250C	214.0	237.0	263.0	1	344.0	1.20	1
P4SMA300A	P4SMA300CA	300A	300C	256.0	285.0	315.0	1	414.0	1.00	1
P4SMA350A	P4SMA350CA	350A	350C	300.0	332.0	368.0	1	482.0	0.85	1
P4SMA400A	P4SMA400CA	400A	400C	342.0	380.0	420.0	1	548.0	0.75	1
P4SMA440A	P4SMA440CA	440A	440C	376.0	418.0	462.0	1	602.0	0.68	1
P4SMA480A	P4SMA480CA	480A	480C	408.0	456.0	504.0	1	658.0	0.61	1
P4SMA510A	P4SMA510CA	510A	510C	434.0	485.0	535.0	1	698.0	0.57	1
P4SMA530A	P4SMA530CA	530A	530C	451.0	503.5	556.5	1	725.0	0.55	1
P4SMA540A	P4SMA540CA	540A	540C	459.0	513.0	567.0	1	740.0	0.54	1
P4SMA550A	P4SMA550CA	550A	550C	468.0	522.5	577.5	1	760.0	0.52	1
P4SMA600A	P4SMA600CA	600A	600C	510.0	570.0	630.0	1	828.0	0.48	1

Note:

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

TVS Diode – P4SMA Series

Ratings and Characteristic Curves

Fig 1 - Peak Pulse Power Rating Curve

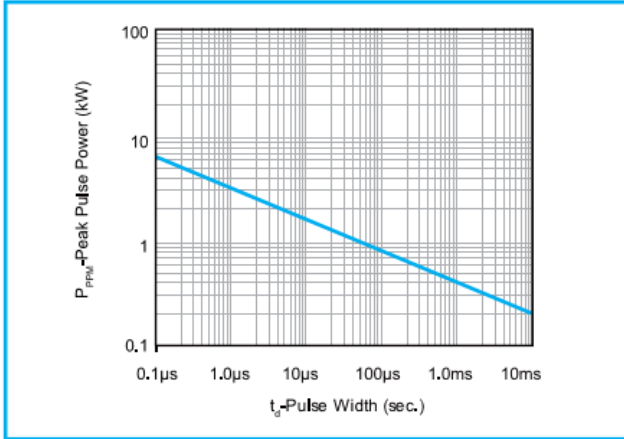


Fig 2 - Pulse Derating Curve

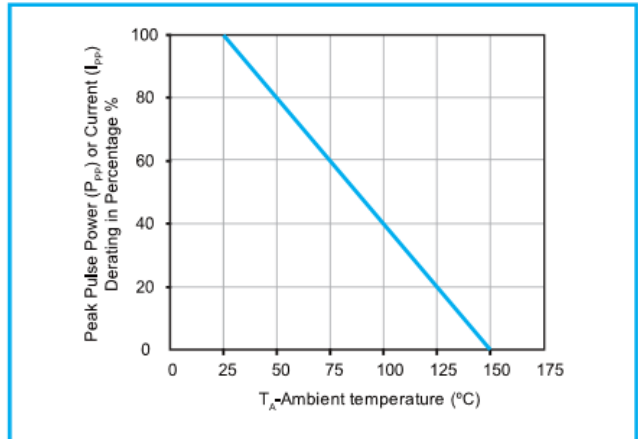


Fig 3 - Pulse Waveform

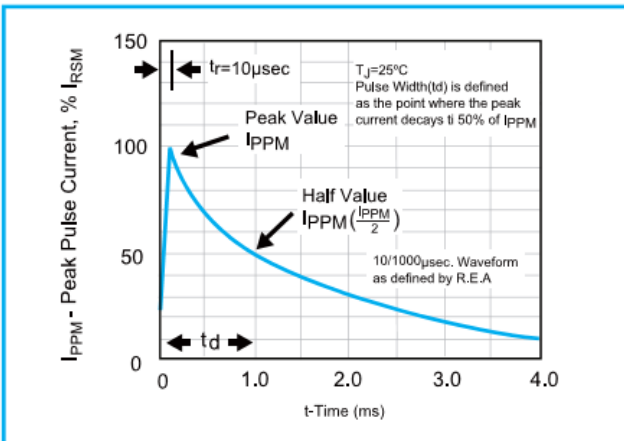


Fig 4 - Typical Junction Capacitance Uni-directional

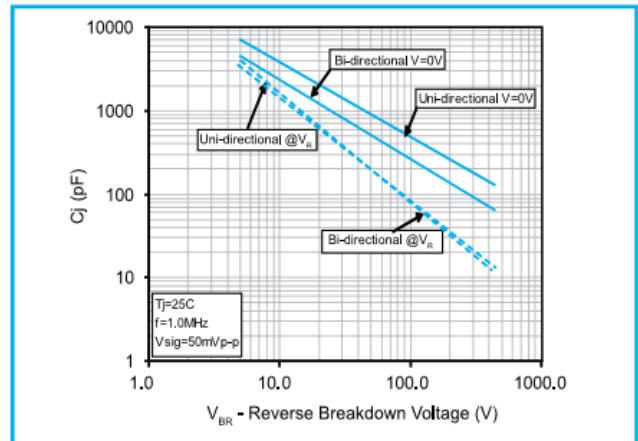


Fig 5 - Steady State Power Dissipation Derating Curve

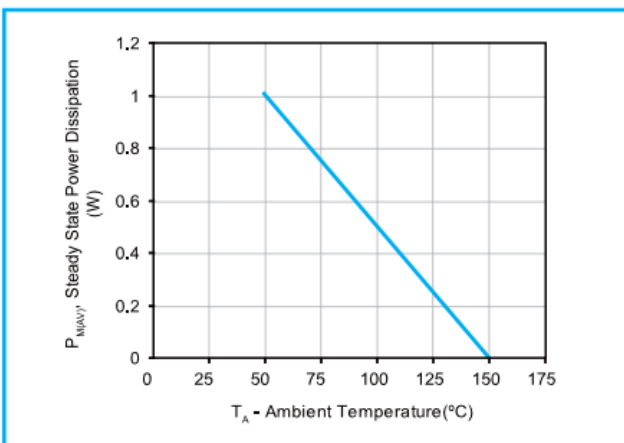
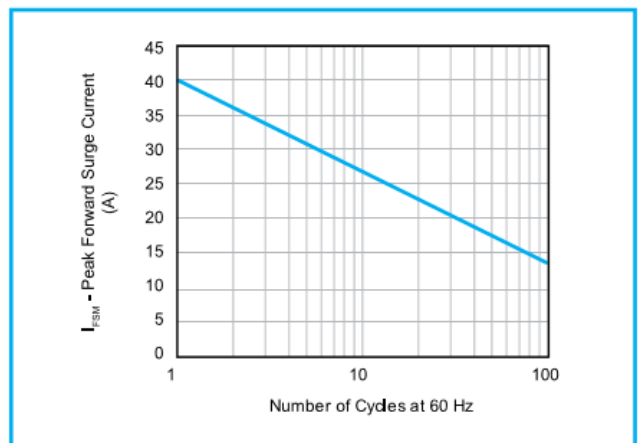
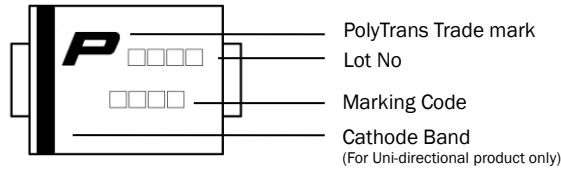


Fig 6 - Maximum Non-Repetitive Forward Surge Current (Uni-directional Only)

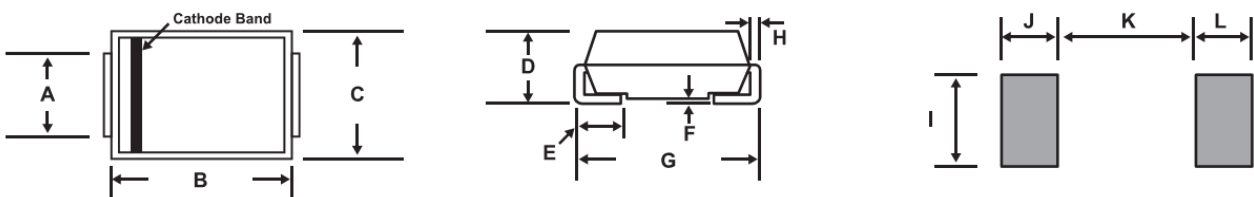


TVS Diode – P4SMA Series

Marking Definitions



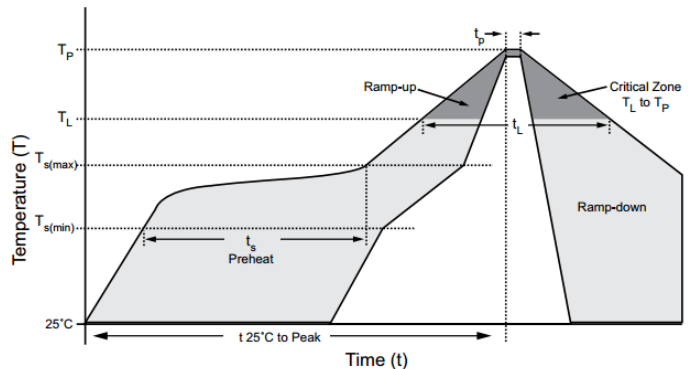
Physical Dimensions



Dimension	Millimeters		Inches	
	Min	Max	Min	Max
A	1.25	1.65	0.049	0.065
B	3.99	4.60	0.157	0.177
C	2.50	2.90	0.100	0.110
D	1.98	2.29	0.078	0.090
E	0.78	1.52	0.030	0.060
F	-	0.203	-	0.008
G	4.93	5.28	0.194	0.208
H	0.152	0.305	0.006	0.012
I	1.80	-	0.070	-
J	2.10	-	0.082	-
K	-	2.30	-	0.090
L	2.10	-	0.082	-

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 – P4SMA Series

Packaging Information

Part Number	Packaging Code	Component Package	Quantity	Packaging Option	Packaging Specification
P4SMA Series	T13	DO-214AC	5000	Tape & Reel - 12mm tape/13" reel	EIA STD RS-481
P4SMA Series	T7	DO-214AC	2000	Tape & Reel - 12mm tape/7" reel	EIA STD RS-481

Tape and Reel Specifications

