P6SMA SERIES

Transient Voltage Suppressor

Description

P6SMA Series transient voltage suppressors are excellent overvoltage protective devices.
The Series is designed specifiCIly to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

SMA (DO-214AC)

Features

- Excellent clamping Cpability
- Low leakage current
- High surge Cpability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:
- typiCIly less than 1.0ps from 0 Volts to VBR min

Mechanical Characteristics

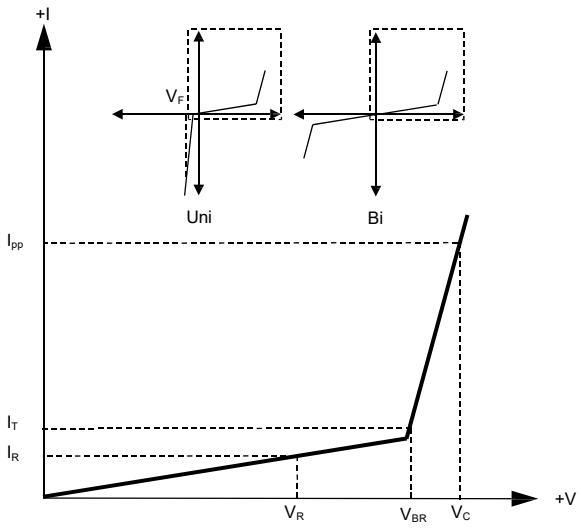
- Package: SMA plastic package.
- Lead Finish: Matte Tin
- Cse Material: Epoxy Molding Compound.
- UL Flammability ClassifiCtion Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Telecom
- Computer
- Industrial electronic
- Consumer electronic

Electrical Parameters

Parameter	Definition
C_J	Junction Cpacitance - typiCl Cpacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that Cn be applied while maintaining off state



Revised: 2022/04/08

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Value	Units	Remarks
Peak Pulse Power Dissipation	P_{PPM}	600	W	(Note1)(Note2)
Steady State Power Dissipation	P_D	3.3	W	(Note3)
Peak Forward Surge Current	I_{FSM}	60	A	(Note4)
Maximum Instantaneous Forward Voltage at 50A	V_{FM}	3.5/5	V	(Note5)
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	30	℃/W	
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	℃/W	
Operating Temperature Range	T_J	-55 to 150	℃	
Storage Temperature Range	T_{STG}	-55 to 150	℃	

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 5×5mm to each terminal.

Notes3: Infinite HeatSink at T_L=50°C

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

Notes5: For UnidirectionalOnly, VFM<3.5V for VBR ≤200V and VFM<5.0V for VBR≥201V.

Electrical Characteristics (TA=25°C unless otherwise)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T(V)		Test Current I_T(mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi		Min	Max				
P6SMA6.8A	P6SMA6.8CA	6V8A	6V8C	5.80	6.45	7.14	10	10.5	58.1	1000
P6SMA7.5A	P6SMA7.5CA	7V5A	7V5C	6.40	7.13	7.88	10	11.3	54.0	500
P6SMA8.2A	P6SMA8.2CA	8V2A	8V2C	7.02	7.79	8.61	10	12.1	50.4	200
P6SMA9.1A	P6SMA9.1CA	9V1A	9V1C	7.78	8.65	9.55	1	13.4	45.5	50
P6SMA10A	P6SMA10CA	10A	10C	8.55	9.50	10.50	1	14.5	42.1	10
P6SMA11A	P6SMA11CA	11A	11C	9.40	10.50	11.60	1	15.6	39.1	5
P6SMA12A	P6SMA12CA	12A	12C	10.20	11.40	12.60	1	16.7	36.5	5
P6SMA13A	P6SMA13CA	13A	13C	11.10	12.40	13.70	1	18.2	33.5	1
P6SMA15A	P6SMA15CA	15A	15C	12.80	14.30	15.80	1	21.2	28.8	1
P6SMA16A	P6SMA16CA	16A	16C	13.60	15.20	16.80	1	22.5	27.1	1
P6SMA18A	P6SMA18CA	18A	18C	15.30	17.10	18.90	1	25.5	24.2	1
P6SMA20A	P6SMA20CA	20A	20C	17.10	19.00	21.00	1	27.7	22.0	1
P6SMA22A	P6SMA22CA	22A	22C	18.80	20.90	23.10	1	30.6	19.9	1
P6SMA24A	P6SMA24CA	24A	24C	20.50	22.80	25.20	1	33.2	18.4	1
P6SMA27A	P6SMA27CA	27A	27C	23.10	25.70	28.40	1	37.5	16.3	1
P6SMA30A	P6SMA30CA	30A	30C	25.60	28.50	31.50	1	41.4	14.7	1
P6SMA33A	P6SMA33CA	33A	33C	28.20	31.40	34.70	1	45.7	13.3	1
P6SMA36A	P6SMA36CA	36A	36C	30.80	34.20	37.80	1	49.9	12.2	1

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

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage	Breakdown Voltage V_{BR} @ I_T(V)		Test Current I_T(mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi	V_R (V)	Min	Max				
P6SMA39A	P6SMA39CA	39A	39C	33.30	37.10	41.00	1	53.9	11.3	1
P6SMA43A	P6SMA43CA	43A	43C	36.80	40.90	45.20	1	59.3	10.3	1
P6SMA47A	P6SMA47CA	47A	47C	40.20	44.70	49.40	1	64.8	9.4	1
P6SMA51A	P6SMA51CA	51A	51C	43.60	48.50	53.60	1	70.1	8.7	1
P6SMA56A	P6SMA56CA	56A	56C	47.80	53.20	58.80	1	77.0	7.9	1
P6SMA58A	P6SMA58CA	58A	58C	52.78	55.10	60.90	1	79.8	7.7	1
P6SMA62A	P6SMA62CA	62A	62C	53.00	58.90	65.10	1	85.0	7.2	1
P6SMA68A	P6SMA68CA	68A	68C	58.10	64.60	71.40	1	92.0	6.6	1
P6SMA75A	P6SMA75CA	75A	75C	64.10	71.30	78.80	1	103.0	5.9	1
P6SMA82A	P6SMA82CA	82A	82C	70.10	77.90	86.10	1	113.0	5.4	1
P6SMA91A	P6SMA91CA	91A	91C	77.80	86.50	95.50	1	125.0	4.9	1
P6SMA100A	P6SMA100CA	100A	100C	85.50	95.00	105.00	1	137.0	4.5	1
P6SMA110A	P6SMA110CA	110A	110C	94.00	105.00	116.00	1	152.0	4.0	1
P6SMA120A	P6SMA120CA	120A	120C	102.00	114.00	126.00	1	165.0	3.7	1
P6SMA130A	P6SMA130CA	130A	130C	111.00	124.00	137.00	1	179.0	3.4	1
P6SMA150A	P6SMA150CA	150A	150C	128.00	143.00	158.00	1	207.0	2.9	1
P6SMA160A	P6SMA160CA	160A	160C	136.00	152.00	168.00	1	219.0	2.8	1
P6SMA170A	P6SMA170CA	170A	170C	145.00	162.00	179.00	1	234.0	2.6	1
P6SMA180A	P6SMA180CA	180A	180C	154.00	171.00	189.00	1	246.0	2.5	1
P6SMA200A	P6SMA200CA	200A	200C	171.00	190.00	210.00	1	274.0	2.2	1
P6SMA220A	P6SMA220CA	220A	220C	185.00	209.00	231.00	1	328.0	1.9	1

Rating And Characteristic Curves (TA=25°C unless otherwise noted)

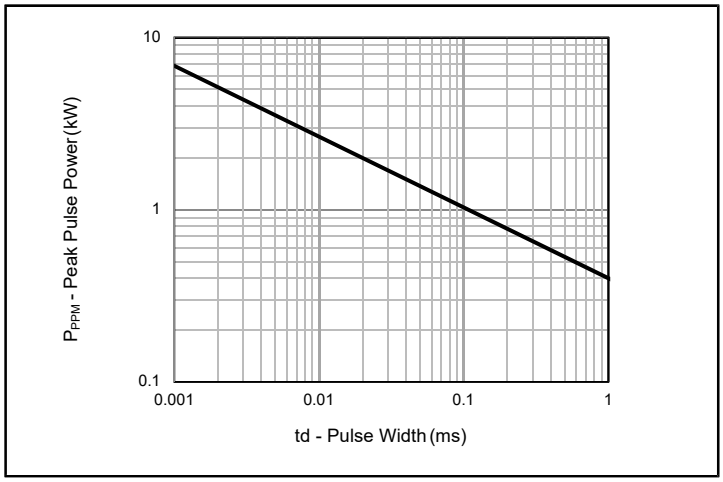


Fig.1 - Peak Pulse Power Rating

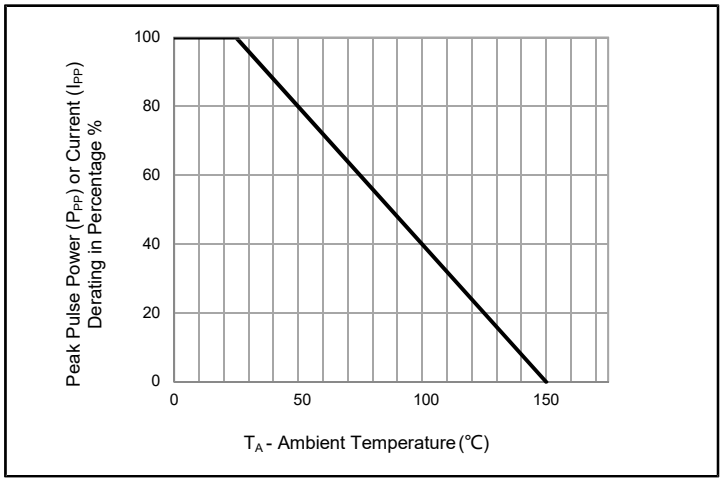


Fig.2 - Pulse Derating Curve

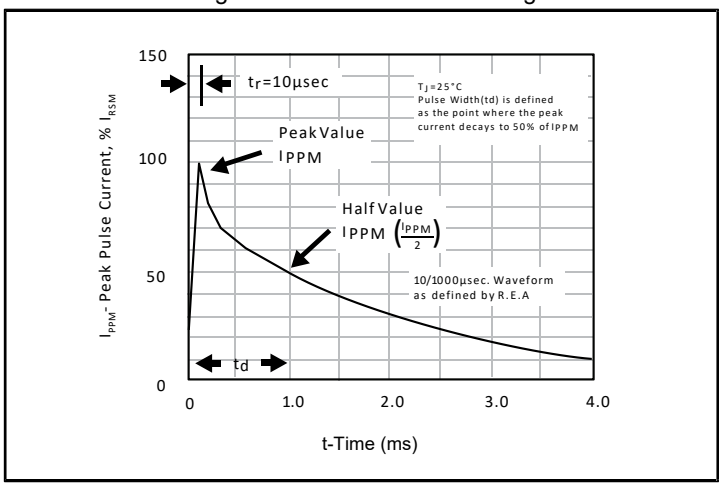


Fig.3 - Pulse Waveform

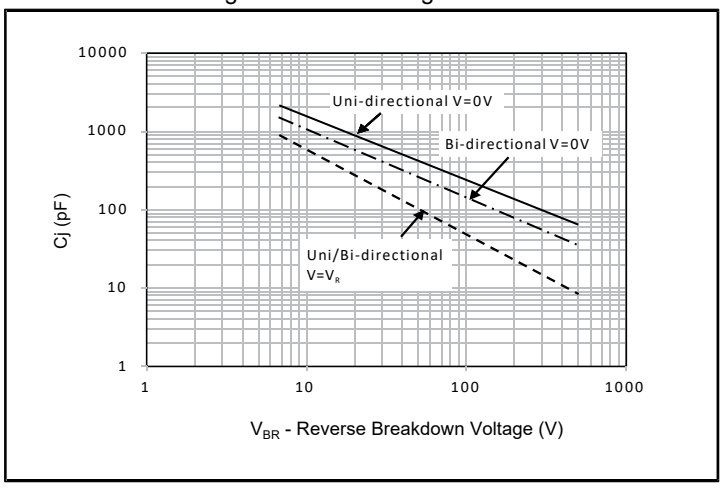


Fig.4 - Typical Junction Capacitance

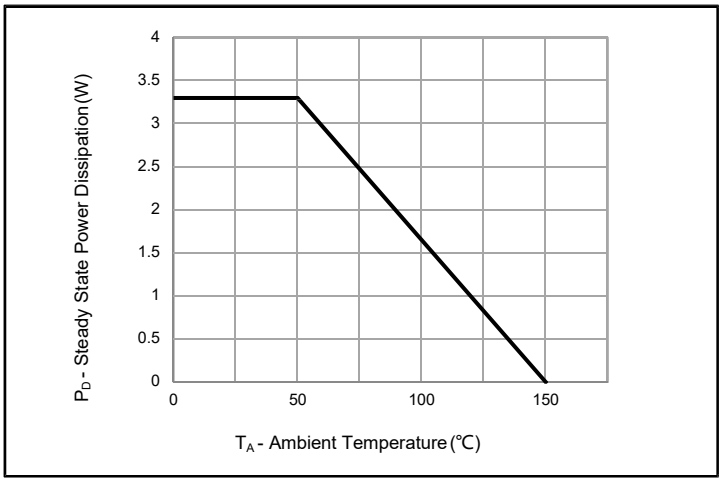


Fig.5 - Steady State Power Dissipation Derating Curve

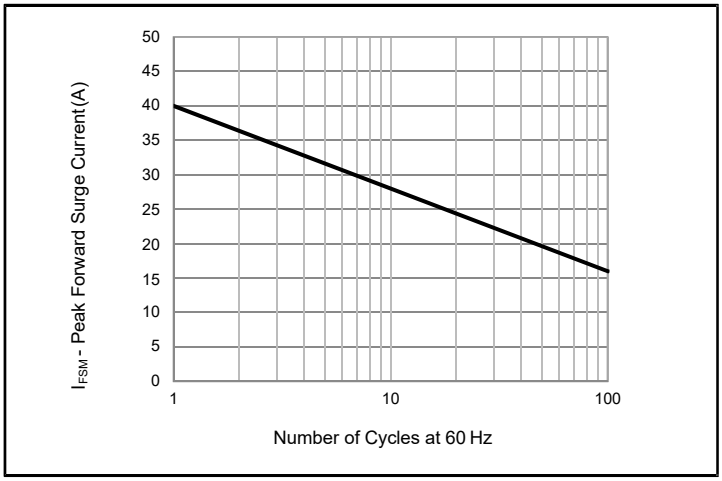
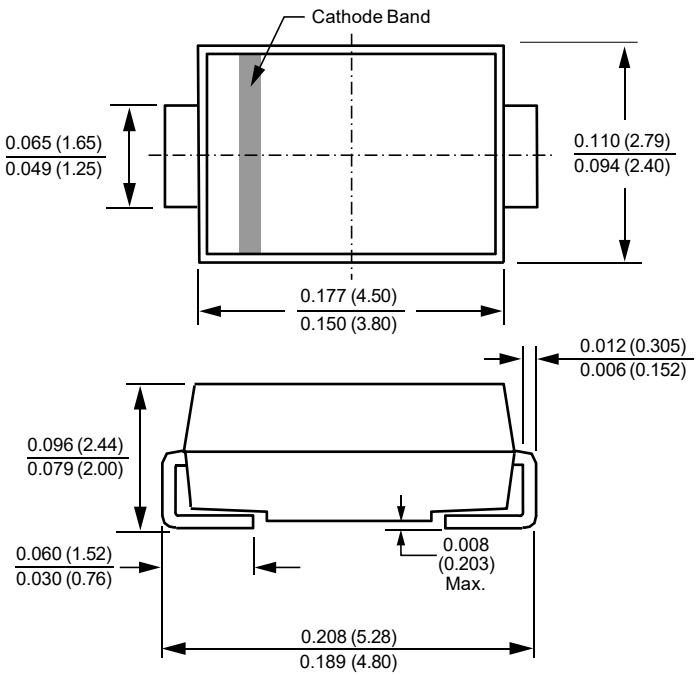


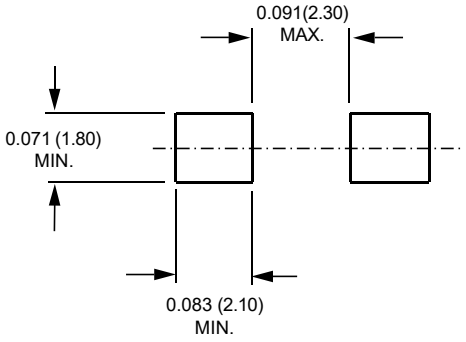
Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

Package Outline Dimensions in inches (millimeters)

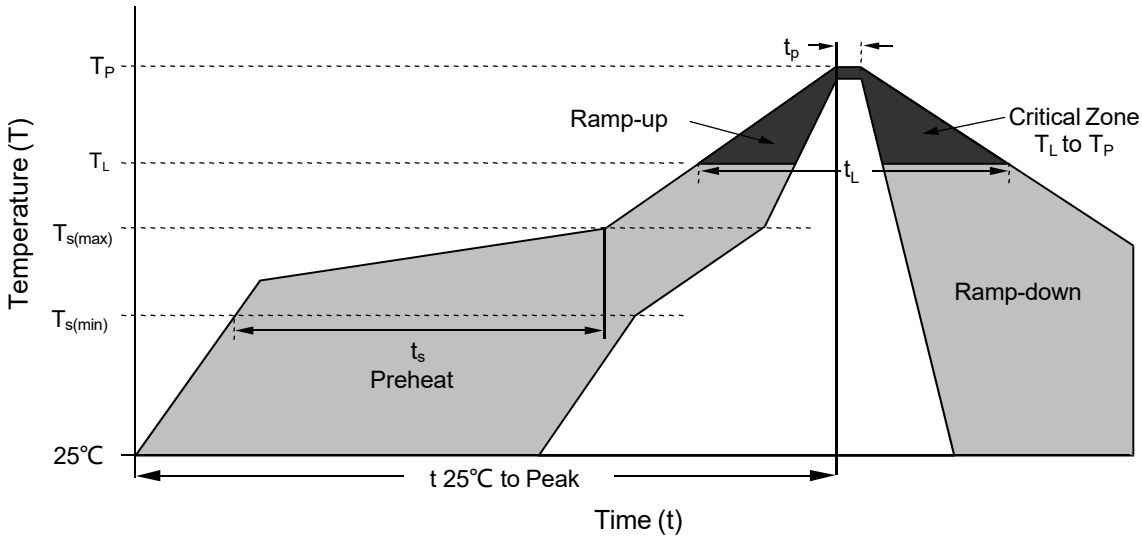
SMA (DO-214AC)



Mounting Pad Layout

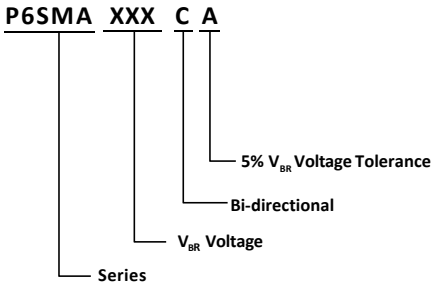


Soldering Parameters

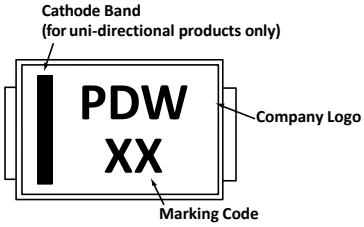


Reflow Condition		Lead-free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{S(max)}$ to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Time (t_L)	60 – 150 secs
Peak Temperature (T_P)		$260^{+0/-5\ °C}$
Time within 5°C of actual peak Temperature (t_p)		20 – 40 secs
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (t)		8 minutes Max.
Do not exceed		260°C

Part Numbering System



Part Marking System



Summary of Packing Options

Package	Packing Description	Packing Quantity
SMA	Tape/Reel,7" reel	1800
	Tape/Reel,13" reel	7500

Tape and Reel Specification