

## Transient Voltage Suppressor Diodes

### Features

- For surface mounted applications
- Low-profile package
- Ideal for automated placement
- Available in Unidirectional and Bidirectional
- 400 W peak pulse power capability with a 10/1000  $\mu$ s waveform
- Low incremental surge resistance, excellent clamping capability
- Very fast response time
  - High temperature soldering guaranteed: 260 °C/10 s at terminals
- Meets MSL level 1
- Component in accordance to RoHS

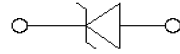
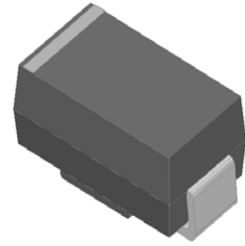
### Typical Applications

Use in sensitive electronics protection against voltage transients induced by inductive load switching and lighting on ICs, MOSFET, signal lines of sensor units for consumer, computer, industrial, telecommunication.

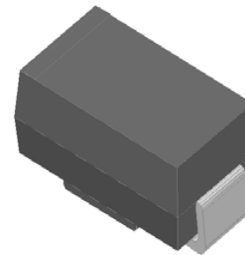
### Mechanical Data

- **Package:** DO-214AC (SMA)  
Molding compound meets UL 94 V-0 flammability rating, RoHS-compliant, halogen-free
- **Terminals:** Matte tin plated leads, solderable per J-STD-002B and JESD22-B102D
- **Polarity:** For uni-directional types the band denotes cathode end, no marking on bi-directional types

#### Uni-directional



#### Bi-directional



### ■Maximum Ratings ( $T_A=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Max
Peak power dissipation, with a 10/1000 $\mu$ s waveform <sup>(1) (2)</sup> (Fig.1)	$P_{PPM}$	W	400
Peak pulse current, with a 10/1000 $\mu$ s waveform <sup>(1)</sup>	$I_{PPM}$	A	See Next Table
Power dissipation, on infinite heat sink at $T_L=75^\circ\text{C}$	$P_D$	W	1.0
Peak forward surge current, 8.3 ms single half sine-wave unidirectional only <sup>(2)</sup>	$I_{FSM}$	A	40
Operating junction and storage temperature range	$T_J, T_{STG}$	$^\circ\text{C}$	-55 to +150

### ■Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	VALUE
Maximum instantaneous forward voltage @ at 25A for unidirectional only <sup>(3)</sup>	$V_F$	V	3.5/5.0
Maximum instantaneous forward voltage @ at 1A for unidirectional only	$V_F$	V	1.5

### ■Thermal Characteristics ( $T_A=25^\circ\text{C}$ Unless otherwise specified)

PARAMETER	SYMBOL	UNIT	Conditions	VALUE
Thermal resistance(Typical)	$R_{\theta JL}$	$^\circ\text{C/W}$	junction to lead	30
	$R_{\theta JA}$	$^\circ\text{C/W}$	junction to ambient	120

Notes:

- (1) Non-repetitive current pulse, per Fig. 3 and derated above  $T_A = 25^\circ\text{C}$  per Fig.2.
- (2) Mounted on 0.2 x 0.2" (5.0 x 5.0 mm) copper pads to each terminal
- (3)  $V_F < 3.5\text{V}$  for devices of  $V_{BR} < 200\text{V}$  and  $V_F < 5.0\text{V}$  for devices of  $V_{BR} > 201\text{V}$

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

Part Number (Uni)	Part Number (Bi)	V <sub>BR</sub> @I <sub>T</sub> Breakdown Voltage			I <sub>R</sub> @V <sub>WM</sub> Maximum Reverse Leakage I <sub>R</sub> <sup>(3)</sup> (μA)	V <sub>RWM</sub> Working Peak Reverse Voltage V <sub>RWM</sub> (V)	IPP Maximum Surge Current IPP <sup>(2)</sup> (A)	Maximum Clamping Voltage V <sub>c</sub> @ I <sub>PP</sub> (V)
		Min(V)	Max (V)	IT <sup>(1)</sup> (mA)				
P4SMA6.8A	P4SMA6.8CA	6.46	7.14	10	1000	5.8	38.1	10.5
P4SMA7.5A	P4SMA7.5CA	7.13	7.88	10	500	6.4	35.4	11.3
P4SMA8.2A	P4SMA8.2CA	7.79	8.61	10	200	7.0	33.0	12.1
P4SMA9.1A	P4SMA9.1CA	8.65	9.56	1	50	7.8	29.8	13.4
P4SMA10A	P4SMA10CA	9.50	10.50	1	10	8.6	27.6	14.5
P4SMA11A	P4SMA11CA	10.45	11.55	1	5	9.4	25.6	15.6
P4SMA12A	P4SMA12CA	11.40	12.60	1	5	10.2	23.9	16.7
P4SMA13A	P4SMA13CA	12.35	13.65	1	5	11.1	22.0	18.2
P4SMA15A	P4SMA15CA	14.25	15.75	1	5	12.8	18.8	21.2
P4SMA16A	P4SMA16CA	15.20	16.80	1	5	13.6	17.7	22.5
P4SMA18A	P4SMA18CA	17.10	18.90	1	5	15.3	15.8	25.2
P4SMA20A	P4SMA20CA	19.00	21.00	1	5	17.1	14.4	27.7
P4SMA22A	P4SMA22CA	20.90	23.10	1	5	18.8	13.0	30.6
P4SMA24A	P4SMA24CA	22.80	25.20	1	5	20.5	12.0	33.2
P4SMA27A	P4SMA27CA	25.65	28.35	1	5	23.1	10.6	37.5
P4SMA30A	P4SMA30CA	28.50	31.50	1	5	25.6	9.6	41.4
P4SMA33A	P4SMA33CA	31.35	34.65	1	5	28.2	8.7	45.7
P4SMA36A	P4SMA36CA	34.20	37.80	1	5	30.8	8.0	49.9
P4SMA39A	P4SMA39CA	37.05	40.95	1	5	33.3	7.4	53.9
P4SMA43A	P4SMA43CA	40.85	45.15	1	5	36.8	6.7	59.3
P4SMA47A	P4SMA47CA	44.65	49.35	1	5	40.2	6.1	64.8
P4SMA51A	P4SMA51CA	48.45	53.55	1	5	43.6	5.7	70.1
P4SMA56A	P4SMA56CA	53.20	58.80	1	5	47.8	5.2	77.0
P4SMA62A	P4SMA62CA	58.90	65.10	1	5	53.0	4.7	85.0
P4SMA68A	P4SMA68CA	64.60	71.40	1	5	58.1	4.3	92.0
P4SMA75A	P4SMA75CA	71.25	78.75	1	5	64.1	3.9	103.0
P4SMA82A	P4SMA82CA	77.90	86.10	1	5	70.1	3.5	113.0
P4SMA91A	P4SMA91CA	86.45	95.55	1	5	77.8	3.2	125.0
P4SMA100A	P4SMA100CA	95.00	105.00	1	5	85.5	2.9	137.0
P4SMA110A	P4SMA110CA	104.50	115.50	1	5	94.0	2.6	152.0
P4SMA120A	P4SMA120CA	114.00	126.00	1	5	102.0	2.4	165.0
P4SMA130A	P4SMA130CA	123.50	136.50	1	5	111.0	2.2	179.0
P4SMA150A	P4SMA150CA	142.50	157.50	1	5	128.0	1.9	207.0
P4SMA160A	P4SMA160CA	152.00	168.00	1	5	136.0	1.8	219.0
P4SMA170A	P4SMA170CA	161.50	178.50	1	5	145.0	1.7	234.0
P4SMA180A	P4SMA180CA	171.00	189.00	1	5	154.0	1.6	246.0

## ■ Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	$V_{BR@I_T}$ Breakdown Voltage $V_{BR@I_T}$			$I_R@V_{WM}$ Maximum Reverse Leakage $I_R^{(3)}$ ( $\mu\text{A}$ )	$V_{RWM}$ Working Peak Reverse Voltage $V_{RWM}$ (V)	IPP Maximum Reverse Surge Current IPP <sup>(2)</sup> (A)	Maximum Clamping Voltage $V_c$ @ $I_{PP}$ (V)
		Min(V)	Max (V)	$I_T^{(1)}$ (mA)				
P4SMA200A	P4SMA200CA	190.00	210.00	1	5	171.0	1.4	274.0
P4SMA220A	P4SMA220CA	209.00	231.00	1	5	185.0	1.2	328.0
P4SMA250A	P4SMA250CA	237.50	262.50	1	5	214.0	1.1	344.0
P4SMA300A	P4SMA300CA	285.00	315.00	1	5	256.0	0.9	414.0
P4SMA350A	P4SMA350CA	332.50	367.50	1	5	299.3	0.8	482.0
P4SMA380A	P4SMA380CA	361.00	399.00	1	5	324.9	0.7	524.4
P4SMA400A	P4SMA400CA	380.00	420.00	1	5	342.0	0.7	552.0
P4SMA440A	P4SMA440CA	418.00	462.00	1	5	376.2	0.6	607.2
P4SMA500A	P4SMA500CA	475.00	525.00	1	5	427.5	0.6	690.0
P4SMA520A	P4SMA520CA	494.00	546.00	1	5	444.6	0.5	717.6
P4SMA550A	P4SMA550CA	522.50	577.50	1	5	470.3	0.5	759.0
P4SMA600A	P4SMA600CA	570.00	630.00	1	5	513.0	0.5	828.0

### 备注: Notes:

- (1)  $t_p \leq 50\text{ms}$  Pulse test:  $t_p \leq 50\text{ms}$
- (2) Surge current waveform per Fig. 3 and derated per Fig.2.
- (3) For bi-directional types having VWM of 10 V and less, the  $I_R$  limit is doubled

## ■ Characteristics(Typical)

FIG1: Peak Pulse Power Rating Curve

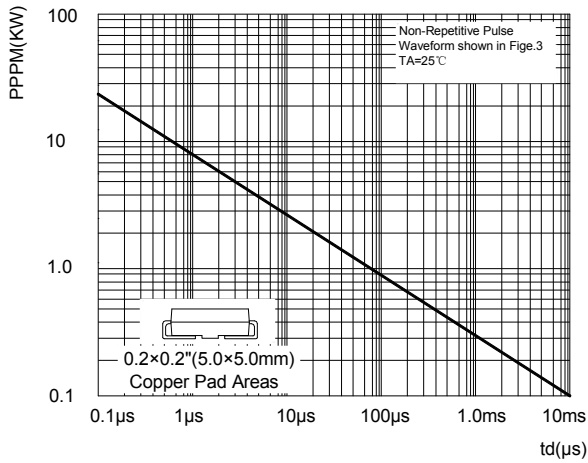


FIG2: Pulse Power or Current vs. Initial Junction Temperature

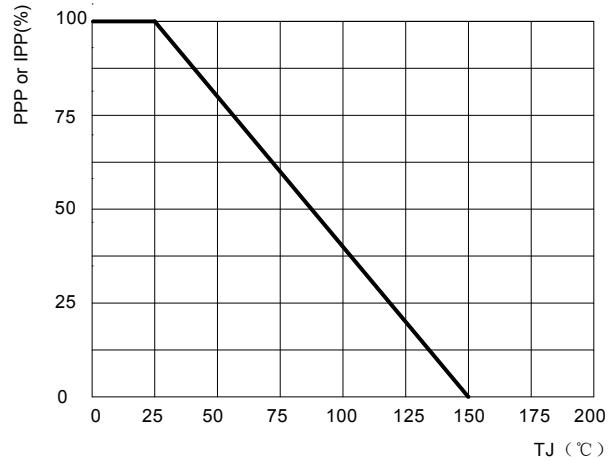


FIG3: Pulse Waveform

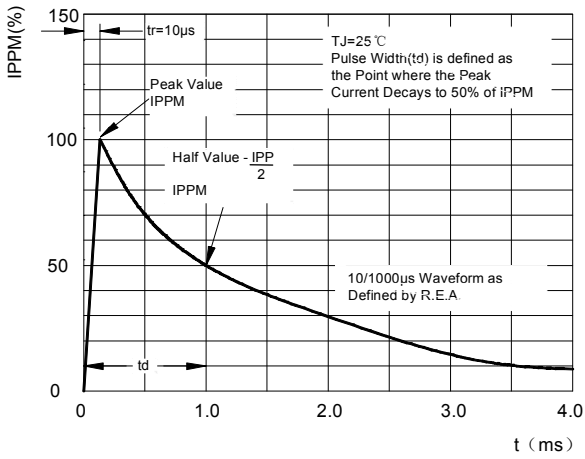


FIG4: Typical Transient Thermal Impedance

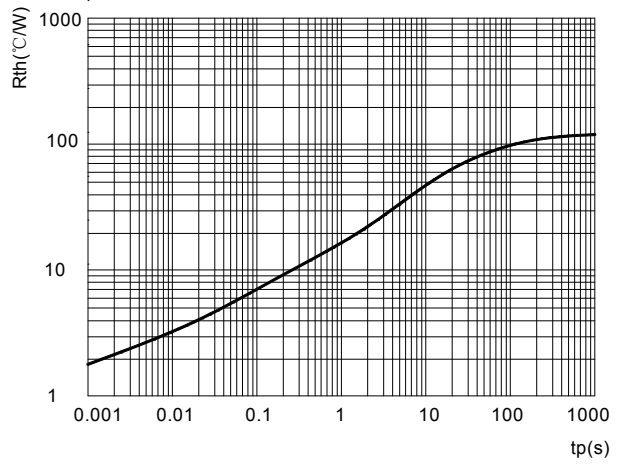
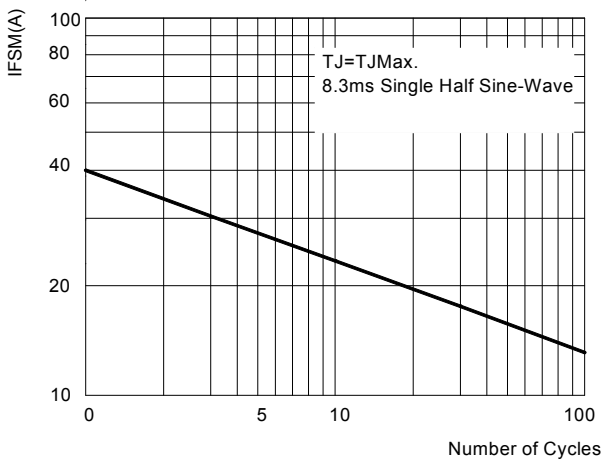


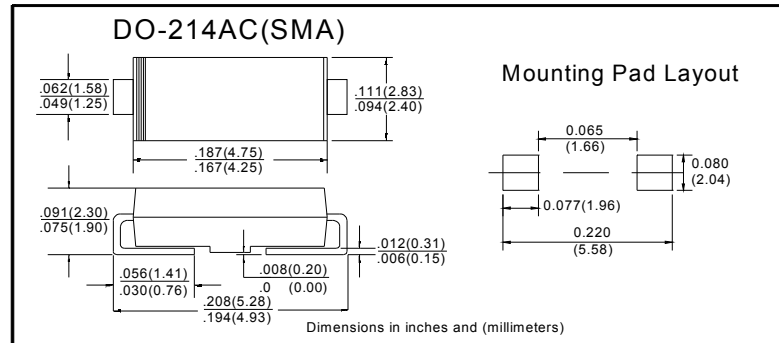
FIG5: Maximum Non-Repetitive Surge Current



## ■ Ordering Information (Example)

PREFERED	PACKAGE CODE	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
P4SMA Series	SMA	5000	10000	80000	13" reel

## ■ Outline Dimensions



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