

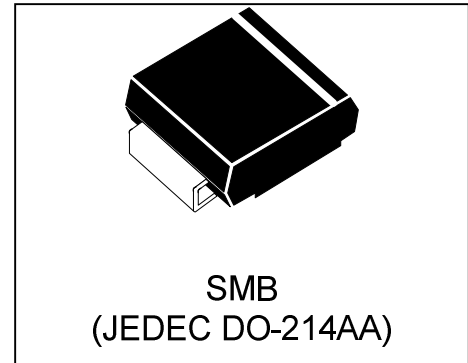


WSxxP10SMB(-B)

Power Transient Voltage Suppressor

Features

- 1000 watts Peak Pulse Power (10/1000 μ s)
- Unidirectional and Bidirectional Protection
- Fast Response Time : Typically < 1ns
- Excellent Clamping Capability
- Built-in Strain relief
- Low inductance
- Low profile package
- High temperature solder:260 $^{\circ}$ C/10 seconds at terminal



Mechanical Characteristics

- JEDEC DO-214AA package
- Molding compound flammability rating:
UL 94V-0
- Marking : Marking Code
- Packaging : Tape and Reel per EIA 481
- RoHS Compliant

Applications

- I/O Interfaces
- Power lines
- Automotive and Telecommunication
- Computers & Consumer Electronics
- Industrial Electronics

Absolute Maximum Rating			
Rating	Symbol	Value	Units
Peak Pulse Power ($t_p = 10/1000\mu s$) (see Note1,2& 3)	P_{PPM}	1000	Watts
Peak pulse current (10/1000 μ s) (see Note2&3)	I_{PPM}	See Electrical Characteristics	A
Peak Forward surge current (see Note4&5)	I_{FSM}	300	A
Power Dissipation on infinite heat sink $T_L = 50^{\circ}C$ (Fig5)	P_D	6.5	W
Operating Junction Temperature range	T_J	-55 to + 150	$^{\circ}C$
Storage Temperature range	T_{STG}	-55 to + 150	$^{\circ}C$

Note1: Peak Pulse Power Rating as Pulse Width ,per Fig1.

Note2: Peak Pulse Power or Current Derated above $T_A=25^{\circ}C$ Per Fig. 2 and Non-Repetitive Current Pulse, Per Fig.3.

Note3: Mounted on 5.0x5.0mm² copper pad to each terminal.

Note4: 8.3ms Single Half Sine Wave or Equivalent Square Wave.

Note5: Maximum Forward Surge Current only for Unidirectional Device per Fig6.

Electrical Characteristics

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage $V_{BR}(\text{Volts})@I_T$		Test Current I_T (mA)	Maximum Clamping Voltage $V_c@I_{PP}$ (Volts)	Maximum Peak Pulse Current I_{pp} (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ (μ A)
			MIN	MAX				
UNI-POLAR	BI-POLAR							
WS5.0P10SMB	WS5.0P10SMB-B	5.0	6.40	7.07	10	9.2	108.7	800
WS6.0P10SMB	WS6.0P10SMB-B	6.0	6.67	7.37	10	10.3	97.09	800
WS6.5P10SMB	WS6.5P10SMB-B	6.5	7.22	7.98	10	11.2	89.29	500
WS7.0P10SMB	WS7.0P10SMB-B	7.0	7.78	8.60	10	12.0	83.33	200
WS7.5P10SMB	WS7.5P10SMB-B	7.5	8.33	9.21	1	12.9	77.52	100
WS8.0P10SMB	WS8.0P10SMB-B	8.0	8.89	9.83	1	13.6	73.53	50
WS8.5P10SMB	WS8.5P10SMB-B	8.5	9.44	10.40	1	14.4	69.44	20
WS9.0P10SMB	WS9.0P10SMB-B	9.0	10.00	11.10	1	15.4	64.94	10
WS10P10SMB	WS10P10SMB-B	10	11.10	12.30	1	17.0	58.82	10
WS11P10SMB	WS11P10SMB-B	11	12.20	13.50	1	18.2	54.95	1
WS12P10SMB	WS12P10SMB-B	12	13.30	14.7	1	19.9	50.25	1
WS13P10SMB	WS13P10SMB-B	13	14.40	15.90	1	21.5	46.51	1
WS14P10SMB	WS14P10SMB-B	14	15.60	17.20	1	23.2	43.10	1
WS15P10SMB	WS15P10SMB-B	15	16.70	18.50	1	24.4	40.98	1
WS16P10SMB	WS16P10SMB-B	16	17.80	19.70	1	26.0	38.46	1
WS17P10SMB	WS17P10SMB-B	17	18.90	20.90	1	27.6	36.23	1
WS18P10SMB	WS18P10SMB-B	18	20.00	22.10	1	29.2	34.25	1
WS20P10SMB	WS20P10SMB-B	20	22.20	24.50	1	32.4	30.86	1
WS22P10SMB	WS22P10SMB-B	22	24.40	26.90	1	35.5	28.17	1
WS24P10SMB	WS24P10SMB-B	24	26.70	29.50	1	38.9	25.71	1
WS26P10SMB	WS26P10SMB-B	26	28.90	31.90	1	42.1	23.75	1
WS28P10SMB	WS28P10SMB-B	28	31.10	34.40	1	45.4	22.03	1
WS30P10SMB	WS30P10SMB-B	30	33.30	36.80	1	48.4	20.66	1
WS33P10SMB	WS33P10SMB-B	33	36.70	40.60	1	53.3	18.76	1
WS36P10SMB	WS36P10SMB-B	36	40.00	44.20	1	58.1	17.21	1
WS40P10SMB	WS40P10SMB-B	40	44.40	49.10	1	64.5	15.50	1
WS43P10SMB	WS43P10SMB-B	43	47.80	52.80	1	69.4	14.41	1
WS45P10SMB	WS45P10SMB-B	45	50.00	55.30	1	72.7	13.76	1

Electrical Characteristics (Cont.)

Part Number		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage $V_{BR}(\text{Volts})@I_T$		Test Current I_T (mA)	Maximum Clamping Voltage $V_C@I_{PP}$ (Volts)	Maximum Peak Pulse Current I_{pp} (Amps)	Maximum Reverse Leakage $I_R@V_{RWM}$ (μA)
			MIN	MAX				
UNI-POLAR	BI-POLAR							
WS48P10SMB	WS48P10SMB-B	48	53.30	58.90	1	77.4	12.92	1
WS51P10SMB	WS51P10SMB-B	51	56.70	62.70	1	82.4	12.14	1
WS54P10SMB	WS54P10SMB-B	54	60.00	66.30	1	87.1	11.48	1
WS58P10SMB	WS58P10SMB-B	58	64.40	71.20	1	93.6	10.68	1
WS60P10SMB	WS60P10SMB-B	60	66.70	73.70	1	96.8	10.33	1
WS64P10SMB	WS64P10SMB-B	64	71.10	78.60	1	103	9.71	1
WS70P10SMB	WS70P10SMB-B	70	77.80	86.00	1	113	8.85	1
WS75P10SMB	WS75P10SMB-B	75	83.30	92.10	1	121	8.26	1
WS78P10SMB	WS78P10SMB-B	78	86.70	95.80	1	126	7.94	1
WS85P10SMB	WS85P10SMB-B	85	94.40	104	1	137	7.30	1
WS90P10SMB	WS90P10SMB-B	90	100	111	1	146	6.85	1
WS100P10SMB	WS100P10SMB-B	100	111	123	1	162	6.17	1
WS110P10SMB	WS110P10SMB-B	110	122	135	1	177	5.65	1
WS120P10SMB	WS120P10SMB-B	120	133	147	1	193	5.18	1
WS130P10SMB	WS130P10SMB-B	130	144	159	1	209	4.78	1
WS150P10SMB	WS150P10SMB-B	150	167	185	1	243	4.12	1
WS160P10SMB	WS160P10SMB-B	160	178	197	1	259	3.86	1
WS170P10SMB	WS170P10SMB-B	170	189	209	1	275	3.64	1
WS180P10SMB	WS180P10SMB-B	180	201	222	1	292	3.42	1
WS190P10SMB	WS190P10SMB-B	190	211	233	1	308	3.25	1
WS200P10SMB	WS200P10SMB-B	200	224	247	1	324	3.09	1
WS220P10SMB	WS220P10SMB-B	220	246	272	1	356	2.81	1
WS250P10SMB	WS250P10SMB-B	250	279	309	1	405	2.47	1
WS300P10SMB	WS300P10SMB-B	300	335	371	1	486	2.06	1
WS350P10SMB	WS350P10SMB-B	350	391	432	1	567	1.76	1
WS400P10SMB	WS400P10SMB-B	400	447	494	1	648	1.54	1
WS440P10SMB	WS440P10SMB-B	440	492	543	1	713	1.40	1

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

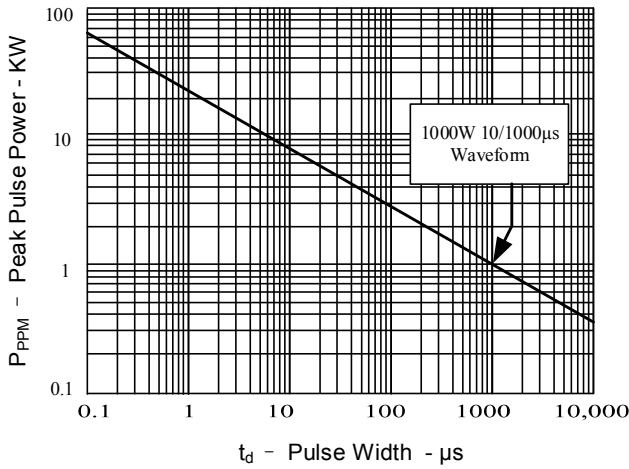


Figure 2: Pulse Derating Curve

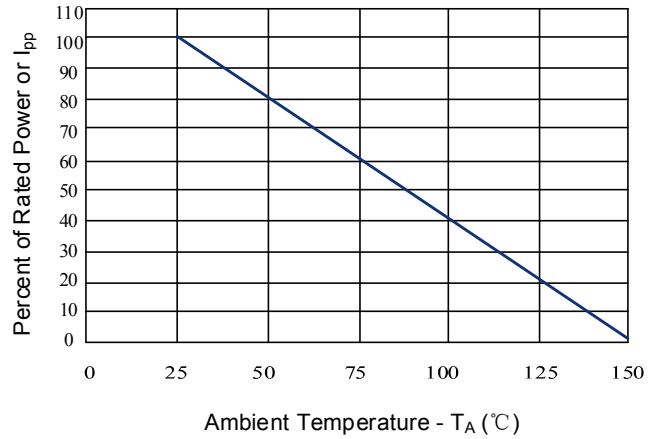


Figure 3: Pulse Waveform

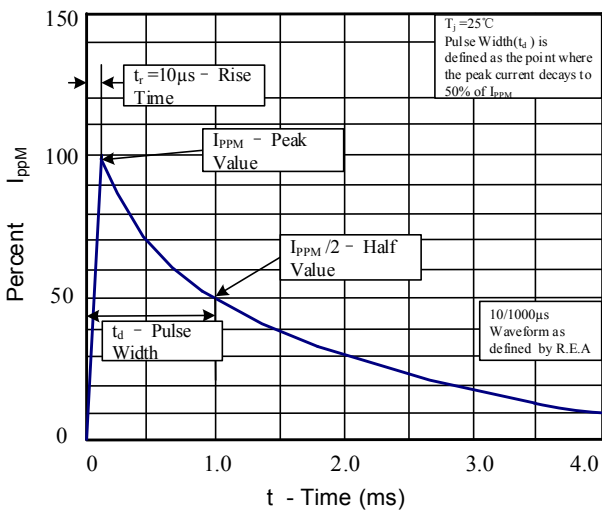


Figure 4: Typical Junction Capacitance

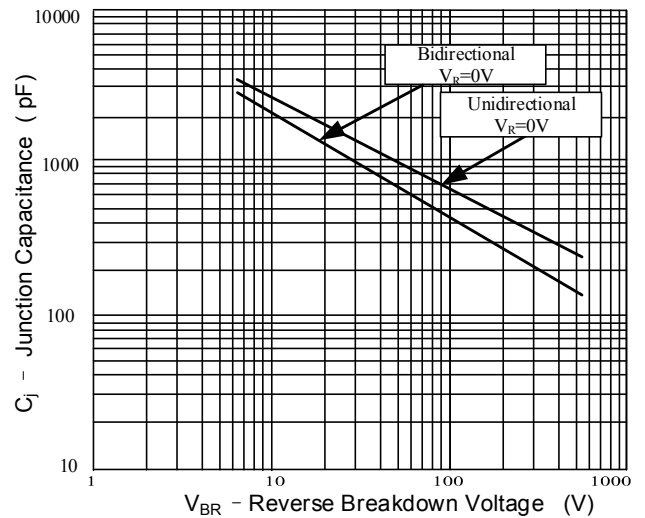


Figure 5: Steady State Power Dissipation Derating Curve

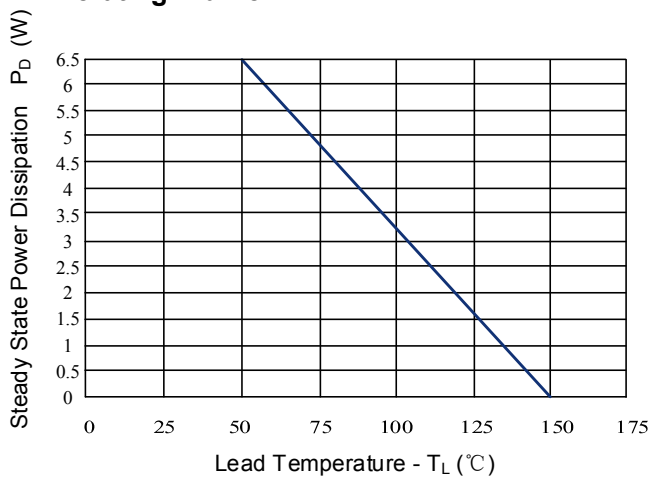
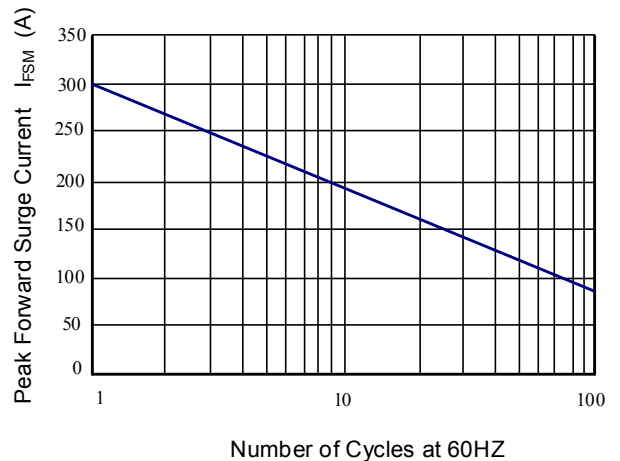
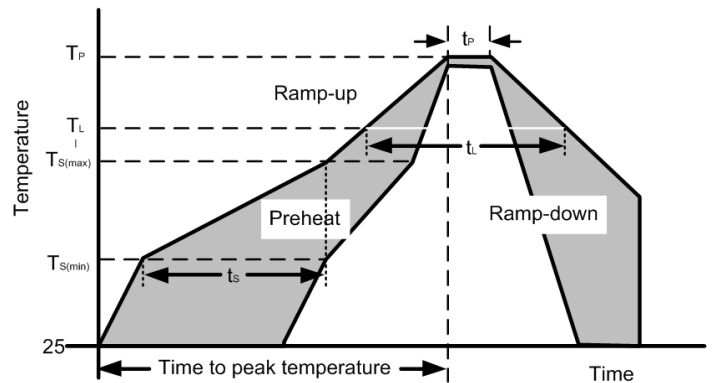


Figure 6: Maximum Non-Repetitive Forward Surge Current Only Unidirectional



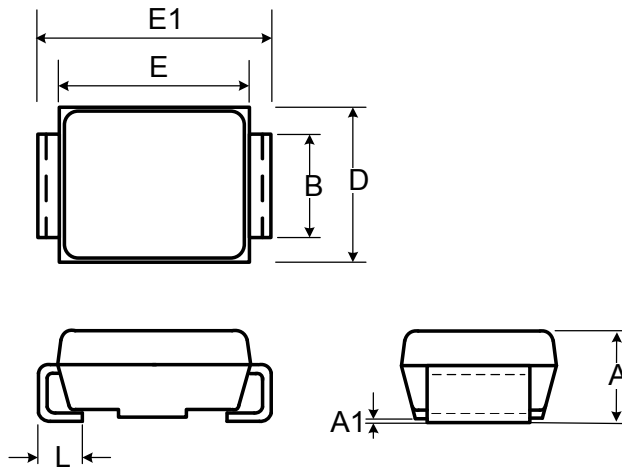
Soldering Parameters

Reflow Condition		
Pre Heat	Temperature min ($T_{s(min)}$)	150°C
	Temperature max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60-190 s
Average ramp up rate (Liquidus Temp) (T_L) to peak		3°C/s max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/s max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60-150 s
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20-40 s
Ramp-down Rate		5°C/s max
Time 25°C to peak Temperature (T_P)		8 minutes max
Do not exceed		260°C

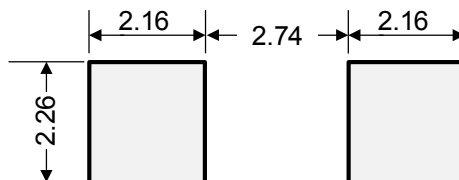


Outline Drawing – SMB(DO-214AA)

Ref. (mm)	Millimeters	
	Min.	Max.
A	2.130	2.600
A1	-	0.300
B	1.900	2.200
E	4.100	4.750
E1	5.210	5.590
D	3.300	3.940
L	0.760	1.520

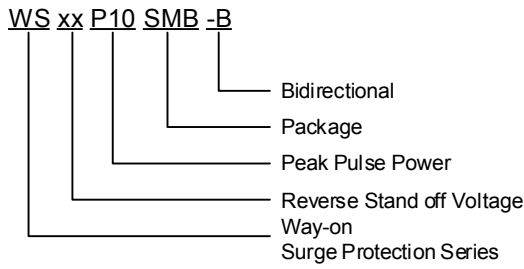


Recommended Solder Pad Layout

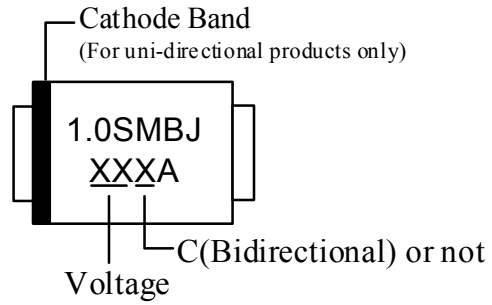


Dimensions in mm

Part Numbering System



Part Marking System



Package Information

Package Type	Description	Quantity (pcs)	Standard
SMB(DO-214AA)	Tape & Reel -12mm/13" tape	3000	EIA-481-D

Contact Information

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 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.
 Users should verify actual device performance in their specific applications.*

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