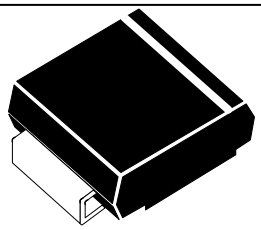
WSxxP6SMB(-B)-AT

Automotive Load Dump Protection TVS

Features

- 600 watts Peak Pulse Power (10/1000μs)
- Unidirectional and Bidirectional Protection
- Fast Response Time: Typically < 1ns
- Excellent Clamping Capability
- Built-in Strain relief
- Low inductance
- Low profile package
- IEC 61000-4-2 (ESD) ±30kV(air), ±30kV(contact)
- MSL: Level 1
- AEC-Q101 compliant



SMB
(JEDEC DO-214AA)

Mechanical Characteristics

- JEDEC DO-214AA package
- Molding compound flammability rating: UL 94V-0
- Marking: Marking Code
- RoHS Compliant

Applications

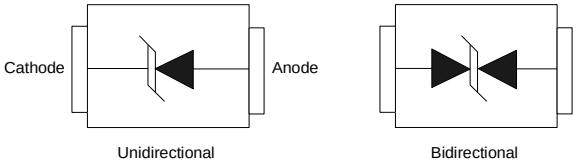
- Auto power system
- Car audio and video
- Automotive instrument
- Car GPS
- Can-bus

Absolute Maximum Rating (T_A=25℃ unless otherwise noted)			
Rating	**Symbol**	**Value**	**Units**
Peak Pulse Power (tp =10/1000μs) (see Note1&2)	P_{PPM}	600	Watts
Peak pulse current (10/1000μs) (see Note2)	I_{PPM}	See Electrical Characteristics	A
Power Dissipation on infinite heat sink T_L = 50 °C (Fig4)	P_D	5.0	W
Operating Junction Temperature range	T_J	-65 to + 150	℃
Storage Temperature range	T_{STG}	-65 to + 150	℃

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

Note2: Peak Pulse Power or Current Derated above T_A=25℃ Per Fig. 2 and Non-Repetitive Current Pulse, Per Fig.3.

Pin Configuration



Electrical Characteristics (TA=25℃ unless otherwise noted)

Part Number		Marking		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage $V_{BR}@I_T$ (Volts)		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)
UNI-POLAR	BI-POLAR	UNI-POLAR	BI-POLAR		MIN	MAX				
WS5.0P6SMB-AT	WS5.0P6SMB-B-AT	BPUY	BPVZ	5.0	6.40	7.07	10	9.2	65.2	800
WS6.0P6SMB-AT	WS6.0P6SMB-B-AT	BQUY	BQVZ	6.0	6.67	7.37	10	10.3	58.3	800
WS6.5P6SMB-AT	WS6.5P6SMB-B-AT	BQUP	BQVP	6.5	7.22	7.98	10	11.2	53.6	500
WS7.0P6SMB-AT	WS7.0P6SMB-B-AT	BRUY	BRVZ	7.0	7.78	8.60	10	12.0	50.0	200
WS7.5P6SMB-AT	WS7.5P6SMB-B-AT	BRUP	BRVP	7.5	8.33	9.21	1	12.9	46.5	100
WS8.0P6SMB-AT	WS8.0P6SMB-B-AT	BSUY	BSVZ	8.0	8.89	9.83	1	13.6	44.1	50
WS8.5P6SMB-AT	WS8.5P6SMB-B-AT	BSUP	BSVP	8.5	9.44	10.40	1	14.4	41.7	20
WS9.0P6SMB-AT	WS9.0P6SMB-B-AT	BTUY	BTVZ	9.0	10.00	11.10	1	15.4	39.0	10
WS10P6SMB-AT	WS10P6SMB-B-AT	BYLY	BZLZ	10	11.10	12.30	1	17.0	35.3	5
WS12P6SMB-AT	WS12P6SMB-B-AT	BYLM	BZLM	12	13.30	14.7	1	19.9	30.2	5
WS13P6SMB-AT	WS13P6SMB-B-AT	BYLN	BZLN	13	14.40	15.90	1	21.5	27.9	1
WS14P6SMB-AT	WS14P6SMB-B-AT	BYLO	BZLO	14	15.60	17.20	1	23.2	25.9	1
WS15P6SMB-AT	WS15P6SMB-B-AT	BYLP	BZLP	15	16.70	18.50	1	24.4	24.6	1
WS16P6SMB-AT	WS16P6SMB-B-AT	BYLQ	BZLQ	16	17.80	19.70	1	26.0	23.1	1
WS17P6SMB-AT	WS17P6SMB-B-AT	BYLR	BZLR	17	18.90	20.90	1	27.6	21.7	1
WS18P6SMB-AT	WS18P6SMB-B-AT	BYLS	BZLS	18	20.00	22.10	1	29.2	20.5	1
WS20P6SMB-AT	WS20P6SMB-B-AT	BYMY	BZMZ	20	22.20	24.50	1	32.4	18.5	1
WS22P6SMB-AT	WS22P6SMB-B-AT	BYMM	BZMM	22	24.40	26.90	1	35.5	16.9	1
WS24P6SMB-AT	WS24P6SMB-B-AT	BYMO	BZMO	24	26.70	29.50	1	38.9	15.4	1
WS26P6SMB-AT	WS26P6SMB-B-AT	BYMQ	BZMQ	26	28.90	31.90	1	42.1	14.3	1
WS28P6SMB-AT	WS28P6SMB-B-AT	BYMS	BZMS	28	31.10	34.40	1	45.4	13.2	1
WS30P6SMB-AT	WS30P6SMB-B-AT	BYNY	BZNZ	30	33.30	36.80	1	48.4	12.4	1
WS33P6SMB-AT	WS33P6SMB-B-AT	BYNN	BZNN	33	36.70	40.60	1	53.3	11.3	1
WS36P6SMB-AT	WS36P6SMB-B-AT	BYNQ	BZNQ	36	40.00	44.20	1	58.1	10.3	1
WS40P6SMB-AT	WS40P6SMB-B-AT	BYOY	BZOZ	40	44.40	49.10	1	64.5	9.3	1
WS43P6SMB-AT	WS43P6SMB-B-AT	BYON	BZON	43	47.80	52.80	1	69.4	8.6	1
WS45P6SMB-AT	WS45P6SMB-B-AT	BYOP	BZOP	45	50.00	55.30	1	72.7	8.3	1
WS48P6SMB-AT	WS48P6SMB-B-AT	BYOS	BZOS	48	53.30	58.90	1	77.4	7.8	1
WS51P6SMB-AT	WS51P6SMB-B-AT	BYPL	BZPL	51	56.70	62.70	1	82.4	7.3	1
WS54P6SMB-AT	WS54P6SMB-B-AT	BYPO	BZPO	54	60.00	66.30	1	87.1	6.9	1
WS58P6SMB-AT	WS58P6SMB-B-AT	BYPS	BZPS	58	64.40	71.20	1	93.6	6.4	1

Electrical Characteristics (Cont.)

Part Number		Marking		Reverse Stand off Voltage V_{RWM} (Volts)	Breakdown Voltage $V_{BR}@I_T$ (Volts)		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)
UNI-POLAR	BI-POLAR	UNI-POLAR	BI-POLAR		MIN	MAX				
WS60P6SMB-AT	WS60P6SMB-B-AT	BYQY	BZQZ	60	66.70	73.70	1	96.8	6.2	1
WS64P6SMB-AT	WS64P6SMB-B-AT	BYQO	BZQO	64	71.10	78.60	1	103	5.8	1
WS70P6SMB-AT	WS70P6SMB-B-AT	BYRY	BZRZ	70	77.80	86.00	1	113	5.3	1
WS75P6SMB-AT	WS75P6SMB-B-AT	BYRP	BZRP	75	83.30	92.10	1	121	5.0	1
WS78P6SMB-AT	WS78P6SMB-B-AT	BYRS	BZRS	78	86.70	95.80	1	126	4.8	1
WS85P6SMB-AT	WS85P6SMB-B-AT	BYSP	BZSP	85	94.40	104	1	137	4.4	1
WS90P6SMB-AT	WS90P6SMB-B-AT	BYTY	BZTZ	90	100	111	1	146	4.1	1
WS100P6SMB-AT	WS100P6SMB-B-AT	BLYY	BLZZ	100	111	123	1	162	3.7	1
WS110P6SMB-AT	WS110P6SMB-B-AT	BLLY	BLLZ	110	122	135	1	177	3.4	1
WS120P6SMB-AT	WS120P6SMB-B-AT	BLMY	BLMZ	120	133	147	1	193	3.1	1
WS130P6SMB-AT	WS130P6SMB-B-AT	BLNY	BLNZ	130	144	159	1	209	2.9	1
WS150P6SMB-AT	WS150P6SMB-B-AT	BLPY	BLPZ	150	167	185	1	243	2.5	1
WS160P6SMB-AT	WS160P6SMB-B-AT	BLQY	BLQZ	160	178	197	1	259	2.3	1
WS170P6SMB-AT	WS170P6SMB-B-AT	BLRY	BLRZ	170	189	209	1	275	2.2	1
WS180P6SMB-AT	WS180P6SMB-B-AT	BLSY	BLSZ	180	201	222	1	292	2.1	1
WS200P6SMB-AT	WS200P6SMB-B-AT	BMYY	BMZZ	200	224	247	1	324	1.9	1
WS220P6SMB-AT	WS220P6SMB-B-AT	BMMY	BMMZ	220	246	272	1	356	1.7	1
WS250P6SMB-AT	WS250P6SMB-B-AT	BMPY	BMPZ	250	279	309	1	405	1.5	1
WS300P6SMB-AT	WS300P6SMB-B-AT	BNYY	BNZZ	300	335	371	1	486	1.3	1
WS350P6SMB-AT	WS350P6SMB-B-AT	BNPY	BNPZ	350	391	432	1	567	1.1	1
WS400P6SMB-AT	WS400P6SMB-B-AT	BOYY	BOZZ	400	447	494	1	648	0.9	1
WS440P6SMB-AT	WS440P6SMB-B-AT	BOOY	BOOZ	440	492	543	1	713	0.9	1
WS450P6SMB-AT	WS450P6SMB-B-AT	BOPY	BOPZ	450	503.5	556.5	1	725	0.8	1
WS460P6SMB-AT	WS460P6SMB-B-AT	BOQY	BOQZ	460	513	567	1	740	0.8	1

Typical Characteristics

Figure 1: Peak Pulse Power Rating Curve

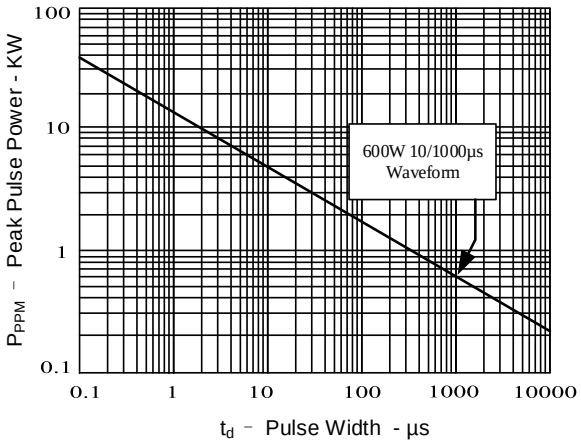


Figure 2: Pulse Derating Curve

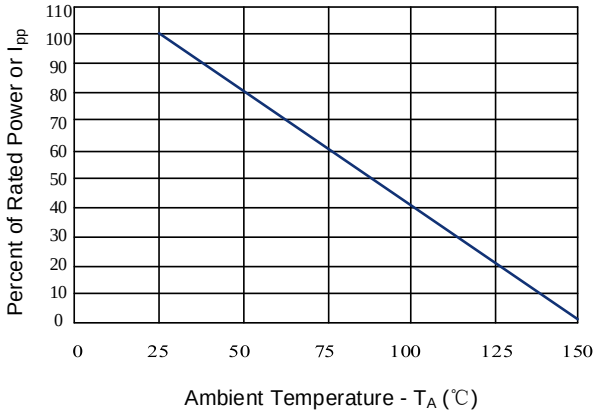


Figure 3: Pulse Waveform

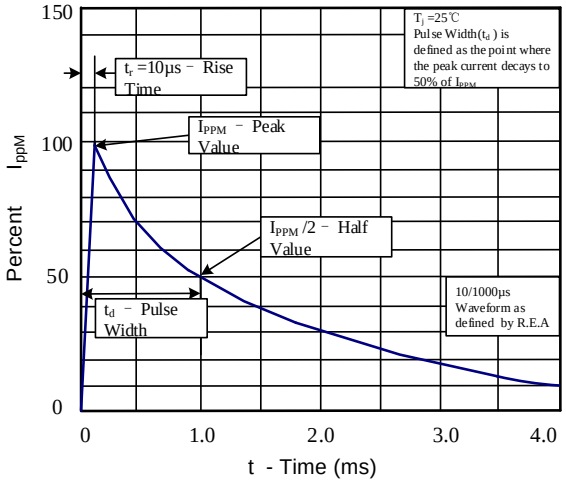
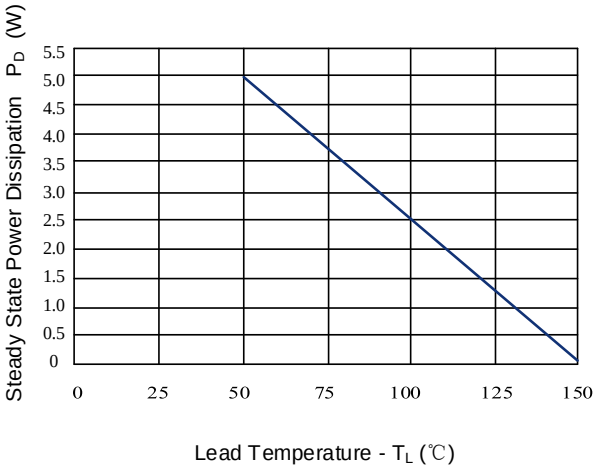


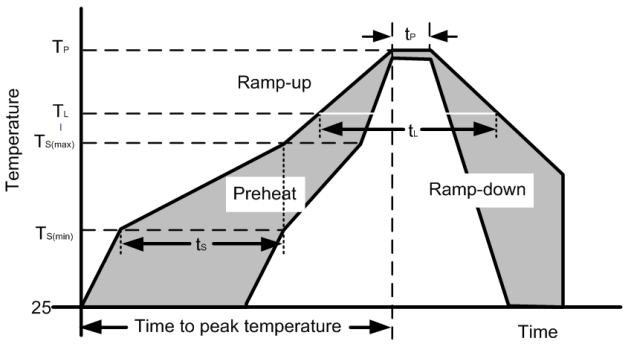
Figure 4: Steady State Power Dissipation Derating Curve



Note: The above typical parameters or typical characteristics are only indicative and do not make specific guarantees. If detailed values are required, additional communication and provision are required.

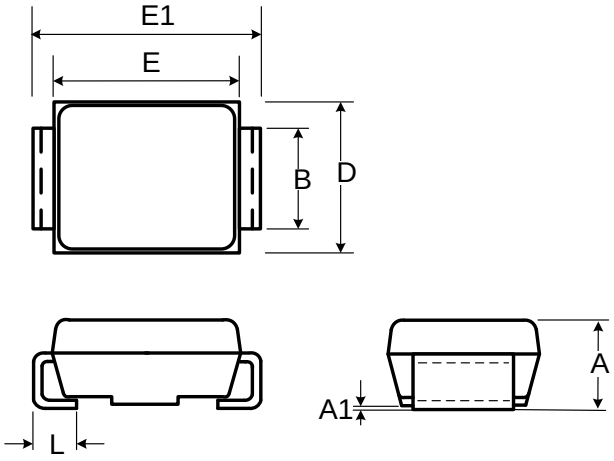
Soldering Parameters

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
Ts(max) to TL - 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 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

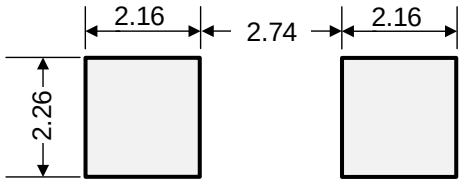


Outline Drawing – SMB(DO-214AA)

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

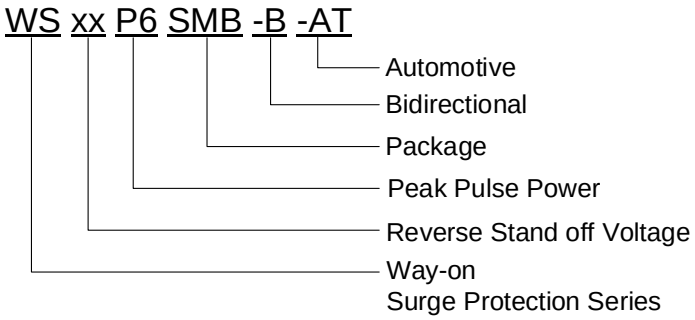


Recommended Solder Pad Layout

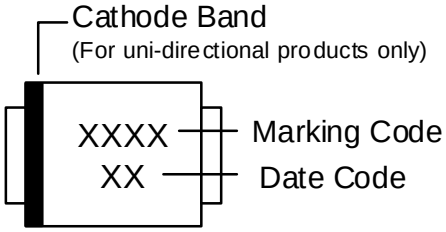


Dimensions in mm

Part Numbering System



Part Marking System

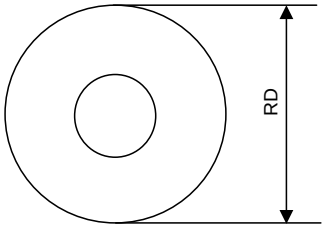


Package Information

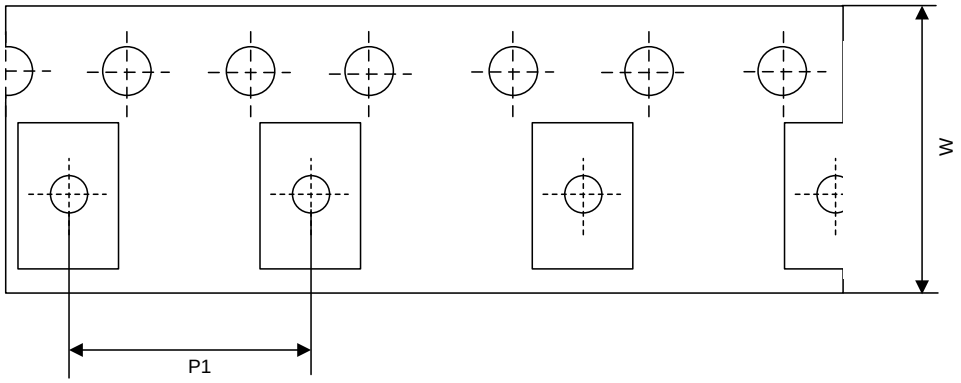
Package Type	Description	Quantity（pcs）
SMB(DO-214AA)	Tape & Reel -12mm/13″ tape	3000

Tape and Reel Information

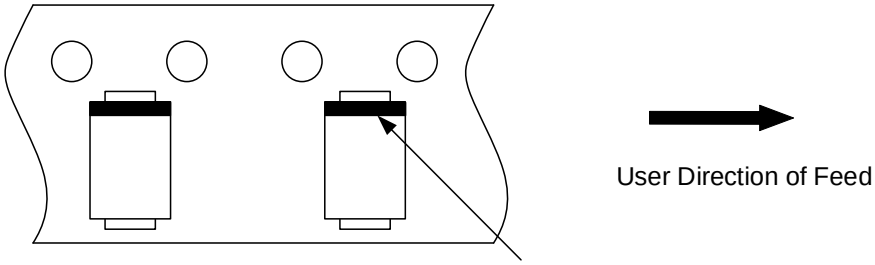
Reel Dimensions



Tape Dimensions



Quadrant Assignments for PIN1 Orientation in tape



User Direction of Feed

Top View

Uni-directional products only

RD	Reel Dimensions	13 inch
W	Overall width of the carrier tape	12 mm
P1	Pitch between successive cavity centers	8 mm

Contact Information

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Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. WAYON shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and WAYON assumes no responsibility for the application of the product.

WAYON strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, WAYON cannot guarantee that the information provided in the product specification is entirely accurate and error-free. WAYON shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications. WAYON reserves the right to revise or update the product specification and the products at any time without prior notice, and the user's continued use of the product specification is considered an acceptance of these revisions and updates. Prior to purchasing and using the product, users should verify the above information with WAYON to ensure that the product specification is the most current, effective, and complete. If users are particularly concerned about product parameters, please consult WAYON in detail or request relevant product test reports. Any data not explicitly mentioned in the product specification shall be subject to separate agreement.

Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. WAYON shall assume no responsibility for any consequences resulting from such usage.

Users should also comply with relevant laws, regulations, policies, and standards when using the product specification. Users are responsible for the risks and liabilities arising from the use of the product specification and must ensure that it is not used for illegal purposes. Additionally, users should respect the intellectual property rights related to the product specification and refrain from infringing upon any third-party legal rights. WAYON shall assume no responsibility for any disputes or controversies arising from the above-mentioned issues in any form.