

Features

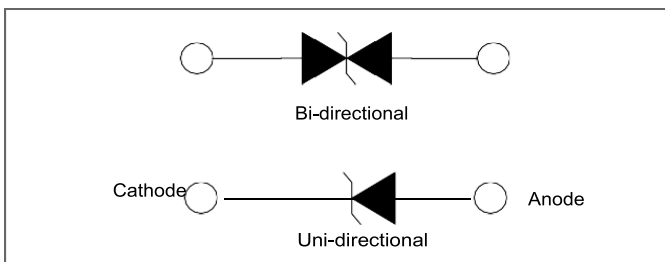
- 600W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1, per J-STD-020, lead-frame maximum peak of 260°C
- High reliability application and automotive grade AEC Q101 qualified



Applications

TVS devices are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Telecom, Computer, Industrial and Consumer electronic applications.

Function Diagram



Maximum Ratings and Thermal Characteristics (T _A =25°C unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at T _A =25°C by 10/1000μs Waveform (Fig.3)	P _{PPM}	600	W
Power Dissipation on Infinite Heat Sink at T _L =50°C	P _D	5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I _{FSM}	100	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only(Note 2)	V _F	3.5	V
Operating Temperature Range	T _J	-55 to 150	°C
Storage Temperature Range	T _{STG}	-55 to 175	°C
Typical Thermal Resistance Junction to Lead	R _{θJL}	20	°C/W
Typical Thermal Resistance Junction to Ambient	R _{θJA}	100	°C/W

AGENCY	AGENCY FILE NUMBER
	Pending

Notes:

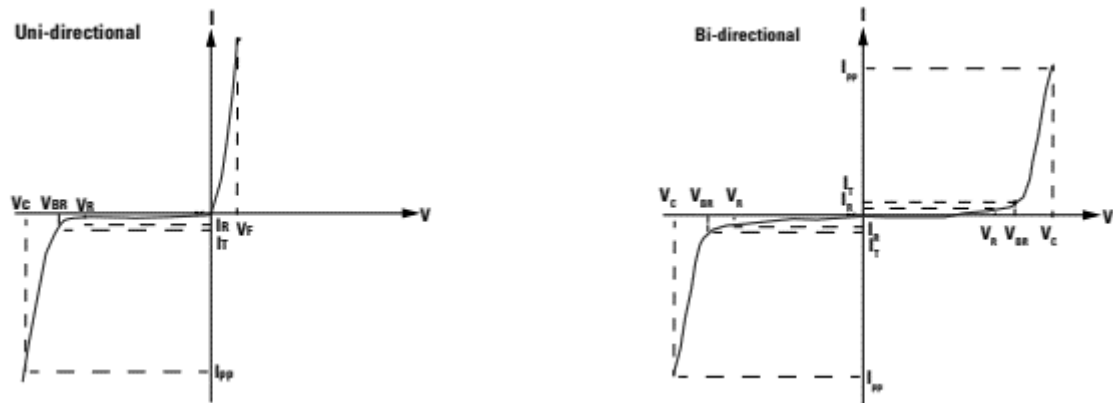
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

Characteristics (T = 25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Key Marking UNI BI		Typical IR @ 150°C (μA)	Reverse Stand off Voltage V _R (Volts)	Breakdown Voltage V _{BR} (Volts) @ I _T		Test Current I _T (mA)	Maximum Clamping Voltage V _C @ I _{nn} (V)	Maximum Peak Pulse Current I _{pp} (A)	Maximum Reverse Leakage I _R @ V _R (μA)	Maximum Temperature coefficient of V _{BR} (%/°C)	Agency Approval 
						MIN	MAX						
TPSMB6.8A	TPSMB6.8CA	AB06E	AB06E	800	5.80	6.45	7.14	10	10.5	58.1	800	0.048	
TPSMB7.5A	TPSMB7.5CA	AB07F	AB07F	500	6.40	7.13	7.88	10	11.3	54.0	500	0.052	
TPSMB8.2A	TPSMB8.2CA	AB08T	AB08T	200	7.02	7.79	8.61	10	12.1	50.4	200	0.058	
TPSMB9.1A	TPSMB9.1CA	AB09O	AB09O	50	7.78	8.65	9.55	1	13.4	45.5	50	0.063	
TPSMB10A	TPSMB10CA	AB010	AB010	20	8.55	9.50	10.50	1	14.5	42.1	10	0.066	
TPSMB11A	TPSMB11CA	AB011	AB011	8	9.40	10.50	11.60	1	15.6	39.1	5	0.069	
TPSMB12A	TPSMB12CA	AB012	AB012	8	10.20	11.40	12.60	1	16.7	36.5	5	0.071	
TPSMB13A	TPSMB13CA	AB013	AB013	8	11.10	12.40	13.70	1	18.2	33.5	1	0.074	
TPSMB15A	TPSMB15CA	AB015	AB015	8	12.80	14.30	15.80	1	21.2	28.8	1	0.076	
TPSMB16A	TPSMB16CA	AB016	AB016	8	13.60	15.20	16.80	1	22.5	27.1	1	0.080	
TPSMB18A	TPSMB18CA	AB018	AB018	8	15.30	17.10	18.90	1	25.5	24.2	1	0.083	
TPSMB20A	TPSMB20CA	AB020	AB020	8	17.10	19.00	21.00	1	27.7	22.0	1	0.085	
TPSMB22A	TPSMB22CA	AB022	AB022	8	18.80	20.90	23.10	1	30.6	19.9	1	0.088	
TPSMB24A	TPSMB24CA	AB024	AB024	8	20.50	22.80	25.20	1	33.2	18.4	1	0.091	
TPSMB27A	TPSMB27CA	AB027	AB027	8	23.10	25.70	28.40	1	37.5	16.3	1	0.092	
TPSMB30A	TPSMB30CA	AB030	AB030	8	25.60	28.50	31.50	1	41.4	14.7	1	0.093	
TPSMB33A	TPSMB33CA	AB033	AB033	8	28.20	31.40	34.70	1	45.7	13.3	1	0.094	
TPSMB36A	TPSMB36CA	AB036	AB036	8	30.80	34.20	37.80	1	49.9	12.2	1	0.096	
TPSMB39A	TPSMB39CA	AB039	AB039	8	33.30	37.10	41.00	1	53.9	11.3	1	0.097	
TPSMB43A	TPSMB43CA	AB043	AB043	8	36.80	40.90	45.20	1	59.3	10.3	1	0.098	
TPSMB47A	TPSMB47CA	AB047	AB047	8	40.20	44.70	49.40	1	64.8	9.4	1	0.099	
TPSMB51A	TPSMB51CA	AB051	AB051	8	43.60	48.50	53.60	1	70.1	8.7	1	0.100	
TPSMB56A	TPSMB56CA	AB056	AB056	8	47.80	53.20	58.80	1	77.0	7.9	1	0.101	
TPSMB58A	TPSMB58CA	AB058	AB058	8	52.78	55.10	60.90	1	79.8	7.7	1	0.101	
TPSMB62A	TPSMB62CA	AB062	AB062	8	53.00	58.90	65.10	1	85.0	7.2	1	0.102	
TPSMB64A	TPSMB64CA	AB064	AB064	8	54.40	60.80	67.20	1	86.90	7.0	1	0.102	
TPSMB68A	TPSMB68CA	AB068	AB068	8	58.10	64.60	71.40	1	92.0	6.6	1	0.103	
TPSMB75A	TPSMB75CA	AB075	AB075	8	64.10	71.30	78.80	1	103.0	5.9	1	0.104	
TPSMB82A	TPSMB82CA	AB082	AB082	8	70.10	77.90	86.10	1	113.0	5.4	1	0.105	
TPSMB91A	TPSMB91CA	AB091	AB091	8	77.80	86.50	95.50	1	125.0	4.9	1	0.106	
TPSMB100A	TPSMB100CA	AB100	AB100	-	85.50	95.00	105.00	1	137.0	4.5	1	0.106	
TPSMB110A	TPSMB110CA	AB110	AB110	-	94.00	105.00	116.00	1	152.0	4.0	1	0.107	
TPSMB120A	TPSMB120CA	AB120	AB120	-	102.00	114.00	126.00	1	165.0	3.7	1	0.107	
TPSMB130A	TPSMB130CA	AB130	AB130	-	111.00	124.00	137.00	1	179.0	3.4	1	0.107	
TPSMB150A	TPSMB150CA	AB150	AB150	-	128.00	143.00	158.00	1	207.0	2.9	1	0.108	
TPSMB160A	TPSMB160CA	AB160	AB160	-	136.00	152.00	168.00	1	219.0	2.8	1	0.108	
TPSMB170A	TPSMB170CA	AB170	AB170	-	145.00	162.00	179.00	1	234.0	2.6	1	0.108	
TPSMB180A	TPSMB180CA	AB180	AB180	-	154.00	171.00	189.00	1	246.0	2.5	1	0.108	
TPSMB200A	TPSMB200CA	AB200	AB200	-	171.00	190.00	210.00	1	274.0	2.2	1	0.108	
TPSMB210A	TPSMB210CA	AB210	AB210	-	179.60	199.50	220.50	1	288.0	2.1	1	0.110	
TPSMB220A	TPSMB220CA	AB220	AB220	-	185.00	209.00	231.00	1	328.0	1.9	1	0.110	
TPSMB250A	TPSMB250CA	AB250	AB250	-	214.00	237.00	263.00	1	344.0	1.8	1	0.110	

Part Number (Uni)	Part Number (Bi)	Key Marking		Typical IR @ 150°C (μ A)	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T		Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{nn} (V)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μ A)	Maximum Temperature coefficient of V_{BR} (%/C)	Agency Approval 
		UNI	BI			MIN	MAX						
TPSMB300A	TPSMB300CA	AB300	AB300	-	256.00	285.00	315.00	1	414.0	1.5	1	0.110	
TPSMB350A	TPSMB350CA	AB350	AB350	-	300.00	332.00	368.00	1	482.0	1.3	1	0.112	
TPSMB400A	TPSMB400CA	AB400	AB400	-	342.00	380.00	420.00	1	548.0	1.1	1	0.112	
TPSMB440A	TPSMB440CA	AB440	AB440	-	376.00	418.00	462.00	1	602.0	1.0	1	0.112	
TPSMB480A	TPSMB480CA	AB480	AB480	-	408.00	456.00	504.00	1	658.0	0.9	1	0.112	
TPSMB510A	TPSMB510CA	AB510	AB510	-	434.00	485.00	535.00	1	698.0	0.9	1	0.112	
TPSMB520A	TPSMB520CA	AB520	AB520	-	443.00	494.50	545.50	1	718.0	0.9	1	0.112	
TPSMB530A	TPSMB530CA	AB530	AB530	-	451.00	503.50	556.50	1	725.0	0.8	1	0.112	
TPSMB540A	TPSMB540CA	AB540	AB540	-	460.00	513.00	567.00	1	740.0	0.8	1	0.112	
TPSMB550A	TPSMB550CA	AB550	AB550	-	468.00	522.50	577.50	1	760.0	0.8	1	0.112	
TPSMB600A	TPSMB600CA	AB600	AB600	-	511.00	570.00	630.00	1	828.0	0.8	1	0.112	
TPSMB650A	TPSMB650CA	AB650	AB650	-	553.00	617.50	682.50	1	897.0	0.8	1	0.112	

I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation -- Max 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

Ratings and Characteristic Curves (T = 25°C unless otherwise noted)

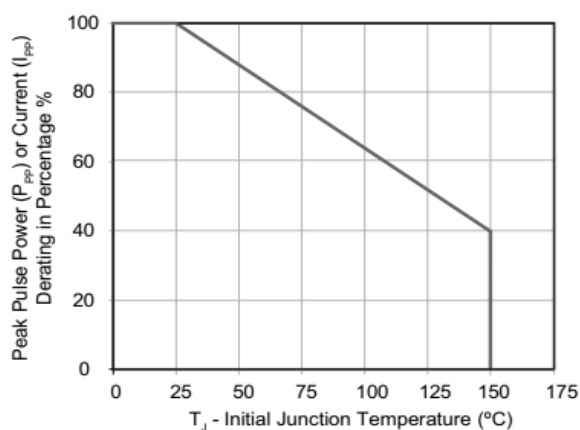


Figure 1. Peak pulse power derating curve

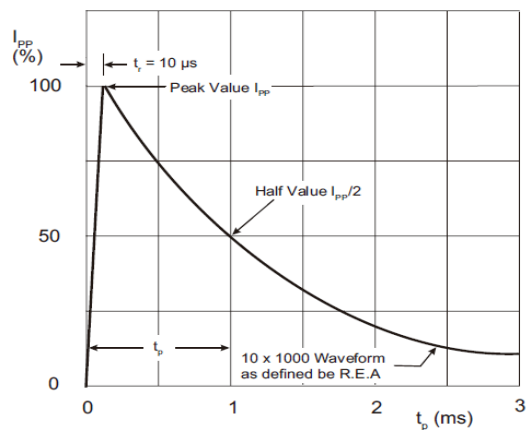


Figure 2. Pulse waveform

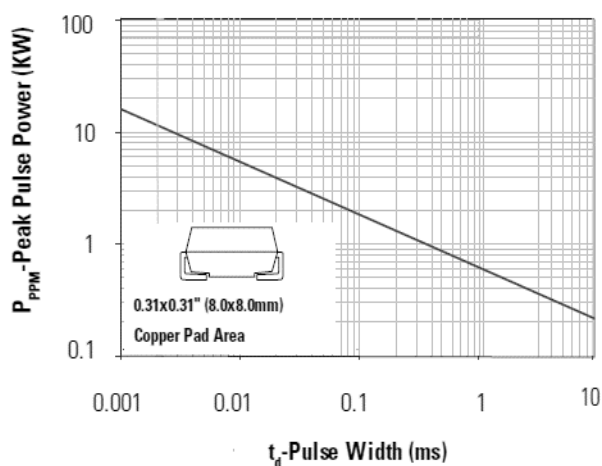


Figure 3. Peak pulse power rating curve

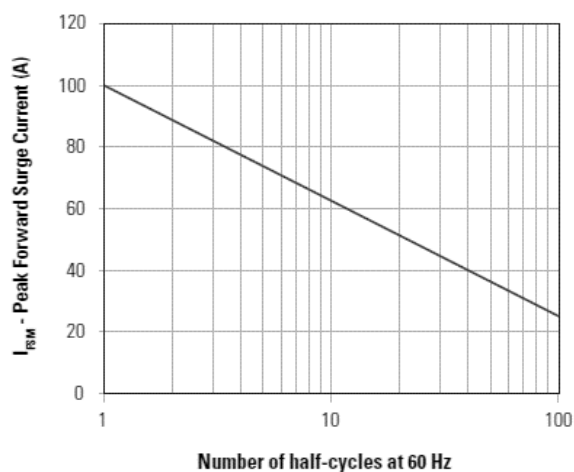
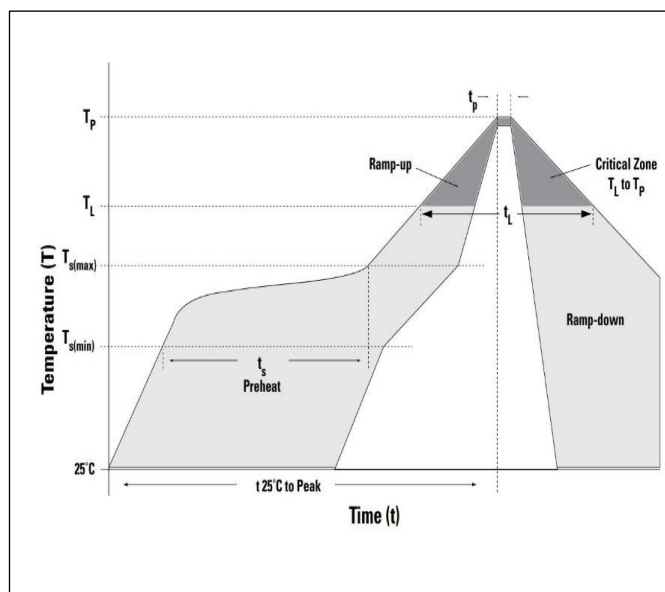
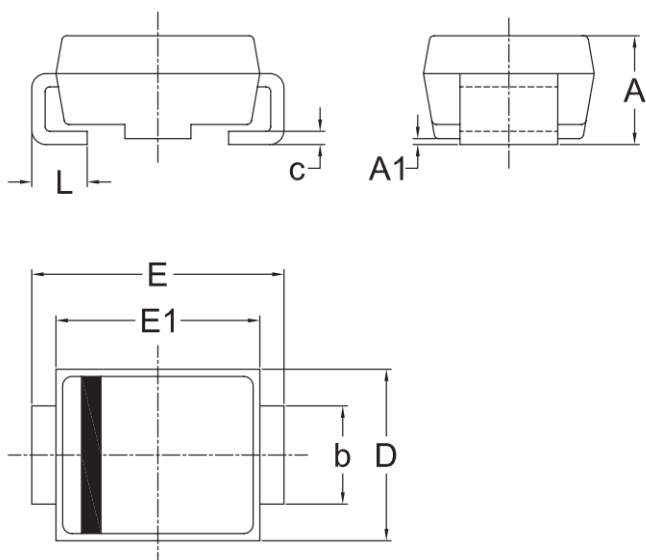


Figure 4. Maximum non-repetitive surge current

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_A) to peak)		3°C/second max
$T_{s(max)}$ to T_A - Ramp-up Rate		3°C/second max
Reflow	- Temperature (T_A) (Liquidus)	217°C
	- Time (min to max) (t_s)	60 – 150 seconds
Peak Temperature (T_p)		260 ^{+0/-5} °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		260°C

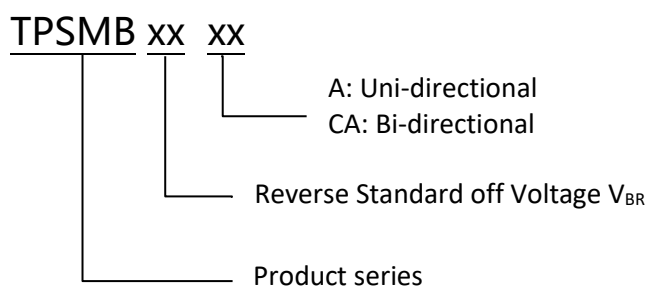


Dimensions

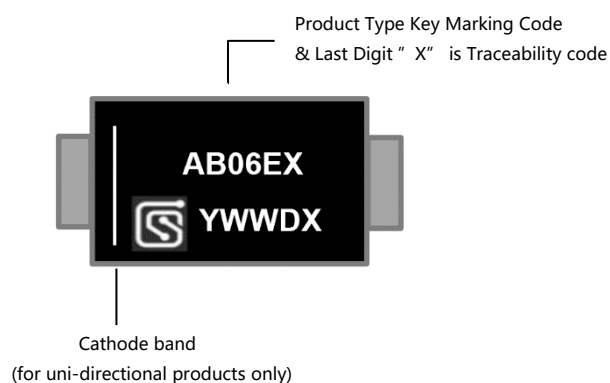


unit		A	A1	b	c	D	E	E1	L
mm	max	2.61	0.30	2.30	0.31	3.94	5.70	4.70	1.52
	min	1.99	0.10	1.70	0.15	3.30	5.05	4.06	0.76

Part Numbering



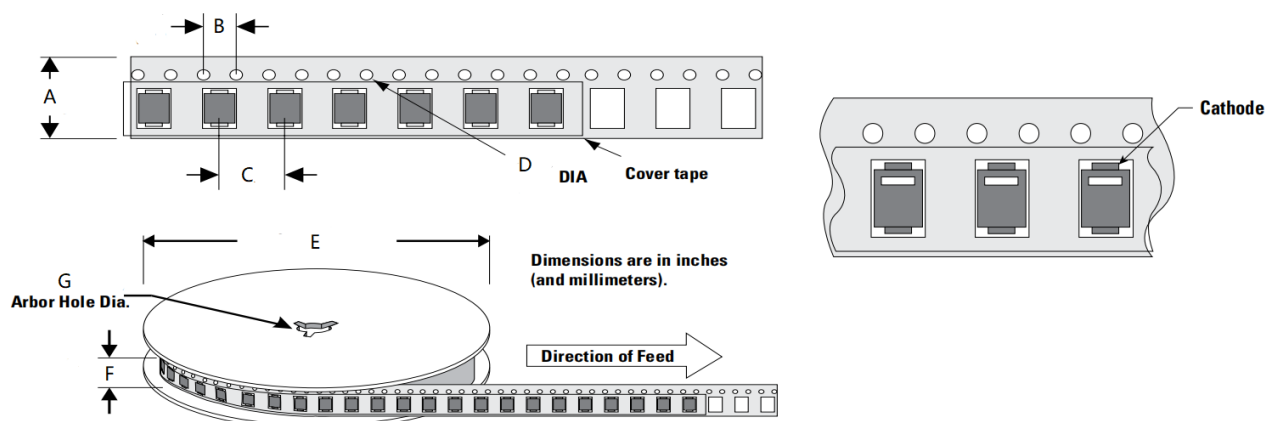
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
TPSMBXXXX	DO-214AA	3000	Tape & Reel

Tape and Reel Specification



Symbol	Millimeter
A	12.00±0.10
B	4.00±0.10
C	8.00±0.10
D	1.55±0.05
E	330.20±2.00
F	15.70±2.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-Aug-2021
1.1	Add New Voltage Devices	10-Oct-2022
1.2	Add New Voltage Devices	10-Dec-2023