

## Features

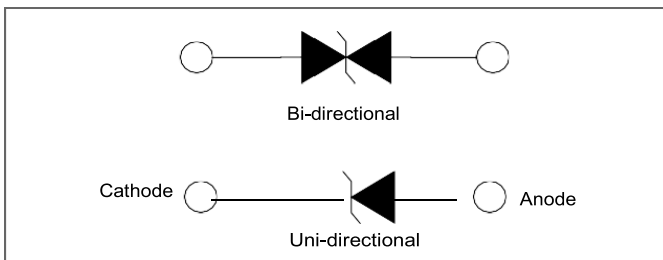
- 600W peak pulse power capability at 10/1000 $\mu$ s waveform, repetition rate (duty cycles):0.01%
- Excellent clamping capability
- Typical failure mode is a short circuit condition for current events exceeding component rating
- Plastic package is flammability rated V-0 per UL-94
- Meet MSL level1,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

**RoHS**  
 Compliant



## 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 ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)			
Parameter	Symbol	Value	Unit
Peak Pulse Power Dissipation at $T_A=25^{\circ}\text{C}$ by 10/1000 $\mu$ s Waveform (Fig.3)	$P_{PPM}$	600	W
Power Dissipation on Infinite Heat Sink at $T_L=50^{\circ}\text{C}$	$P_D$	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	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 175	$^{\circ}\text{C}$
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	20	$^{\circ}\text{C}/\text{W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	100	$^{\circ}\text{C}/\text{W}$


AGENCY	AGENCY FILE NUMBER
	Pending

### Notes:

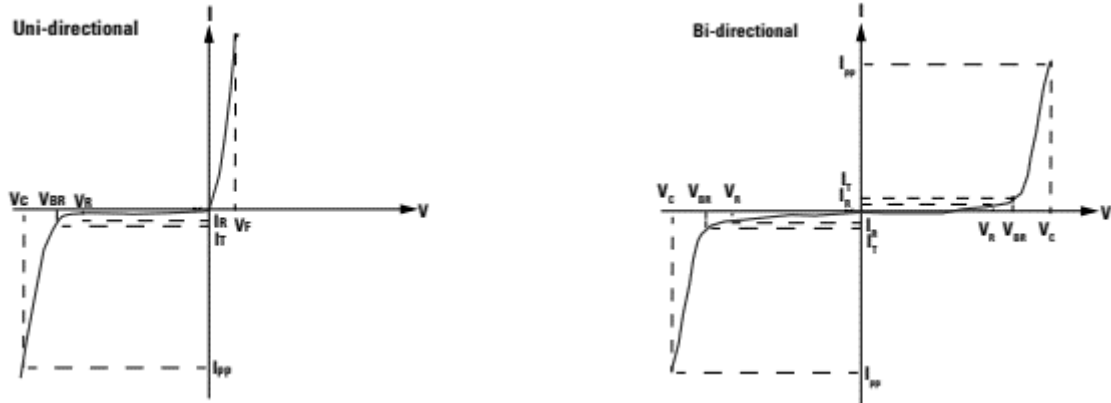
1. Measured on 8.3ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle=4 per minute maximum.

**Characteristics (T = 25°C unless otherwise noted)**

Part Number (Uni)	Part Number (Bi)	Key Marking		Typical IR @ 150°C (μA)	Reverse Stand off Voltage V <sub>R</sub> (Volts)	Breakdown Voltage V <sub>BR</sub> (Volts) @ I <sub>T</sub>		Test Current I <sub>T</sub> (mA)	Maximum Clamping Voltage V <sub>C</sub> @ I <sub>nn</sub> (V)	Maximum Peak Pulse Current I <sub>pp</sub> (A)	Maximum Reverse Leakage I <sub>R</sub> @ V <sub>R</sub> (μA)	Maximum Temperature coefficient of V <sub>BR</sub> (%/C)	Agency Approval 
		UNI	BI			MIN	MAX						
TPSMB7.5A	-	AB07F	-	500	6.40	7.13	7.88	10	11.3	54.0	500	0.052	
TPSMB8.2A	-	AB08T	-	200	7.02	7.79	8.61	10	12.1	50.4	200	0.058	
TPSMB9.1A	-	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 ( $\mu$ 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 $I_R$ @ $V_R$ ( $\mu$ A)	Maximum Temperature coefficient of $V_{BR}$ (%/C)	Agency Approval 
		UNI	BI			MIN	MAX						
TPSMB300A-A	TPSMB300CA-A	AB300	AB300	-	256.00	285.00	315.00	1	414.0	1.5	1	0.110	
TPSMB350A-A	TPSMB350CA-A	AB350	AB350	-	300.00	332.00	368.00	1	482.0	1.3	1	0.112	
TPSMB400A-A	TPSMB400CA-A	AB400	AB400	-	342.00	380.00	420.00	1	548.0	1.1	1	0.112	
TPSMB440A-A	TPSMB440CA-A	AB440	AB440	-	376.00	418.00	462.00	1	602.0	1.0	1	0.112	
TPSMB480A-A	TPSMB480CA-A	AB480	AB480	-	408.00	456.00	504.00	1	658.0	0.9	1	0.112	
TPSMB510A-A	TPSMB510CA-A	AB510	AB510	-	434.00	485.00	535.00	1	698.0	0.9	1	0.112	
TPSMB520A-A	TPSMB520CA-A	AB520	AB520	-	443.00	494.50	545.50	1	718.0	0.9	1	0.112	
TPSMB530A-A	TPSMB530CA-A	AB530	AB530	-	451.00	503.50	556.50	1	725.0	0.8	1	0.112	
TPSMB540A-A	TPSMB540CA-A	AB540	AB540	-	460.00	513.00	567.00	1	740.0	0.8	1	0.112	
TPSMB550A-A	TPSMB550CA-A	AB550	AB550	-	468.00	522.50	577.50	1	760.0	0.8	1	0.112	
-	TPSMB600CA-A	-	AB600	-	511.00	570.00	630.00	1	828.0	0.8	1	0.112	
-	TPSMB650CA-A	-	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

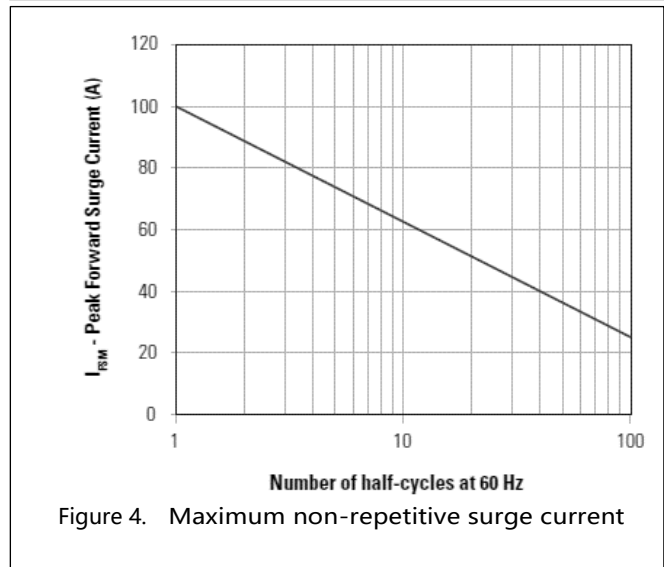
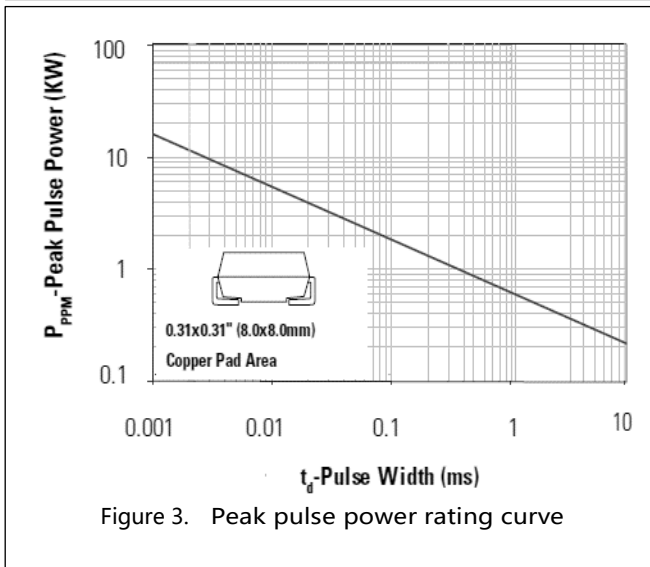
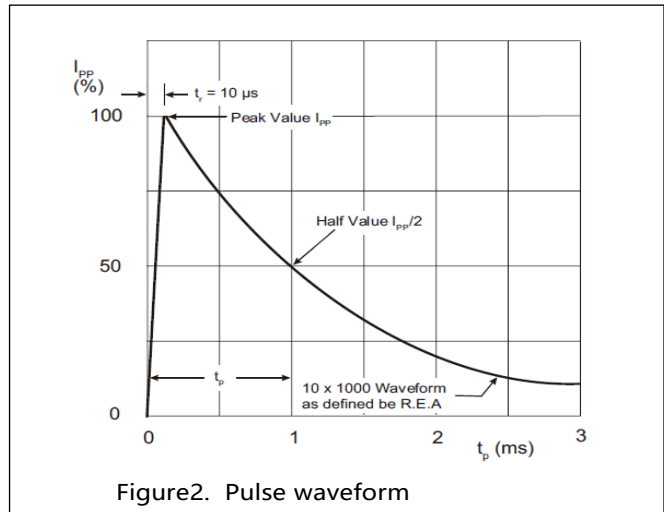
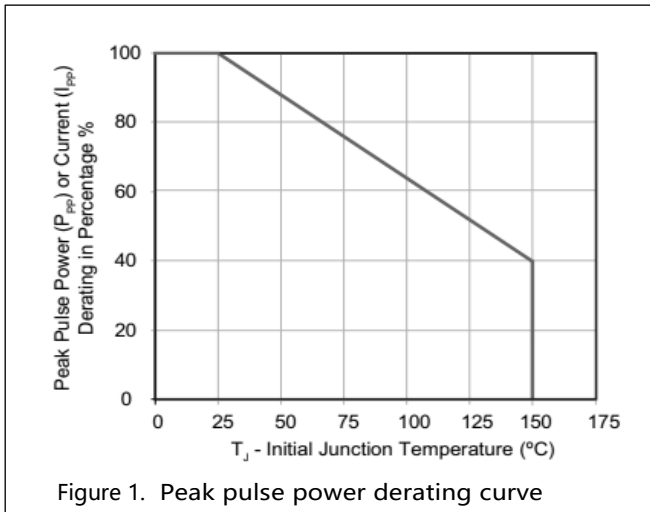
$V_{BR}$  Breakdown Voltage -- Maximum voltage that flows though the TVS at a specified test current ( $I_r$ )

$V_C$  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

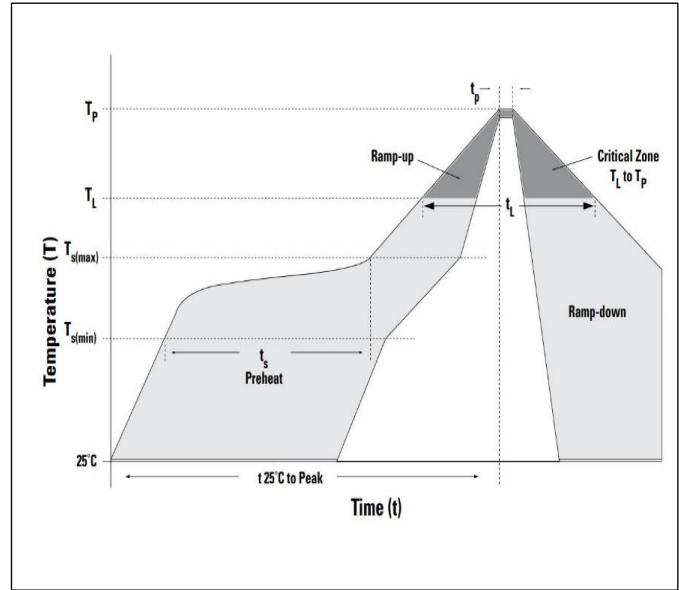
Ratings and Characteristic Curves (T = 25°C unless otherwise noted)



Soldering Parameters

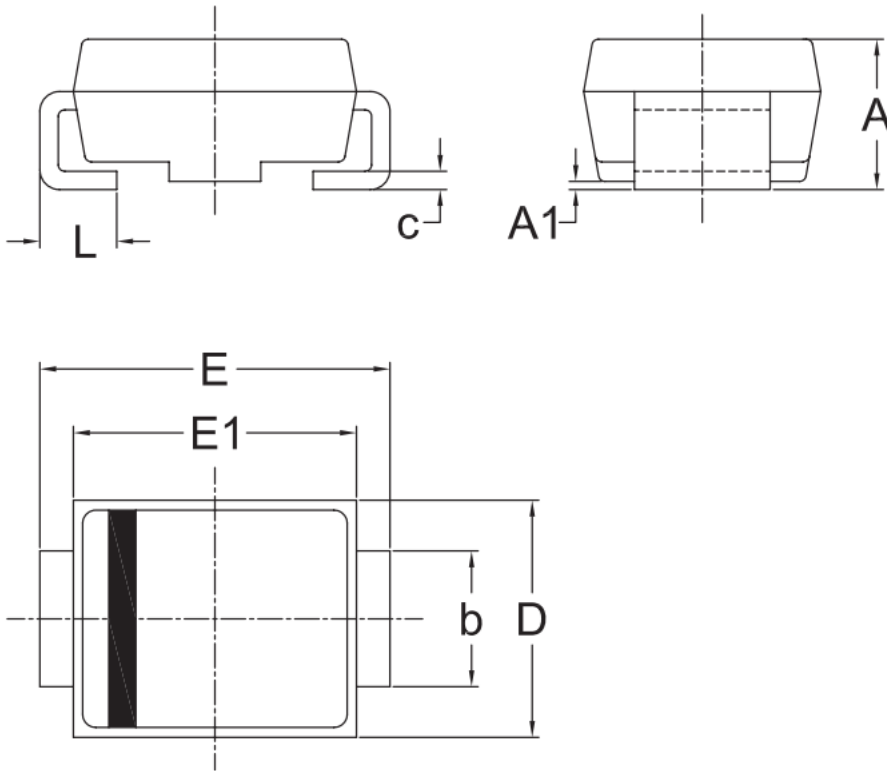
Soldering profile

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 <sup>+0/-5</sup> °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





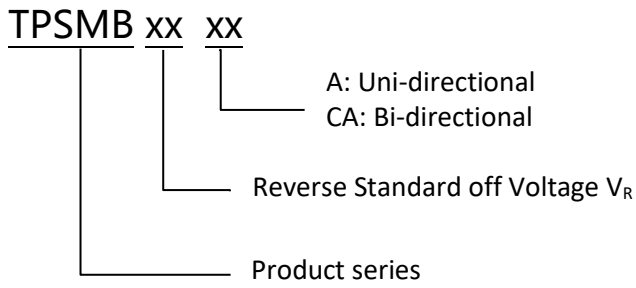
Dimensions



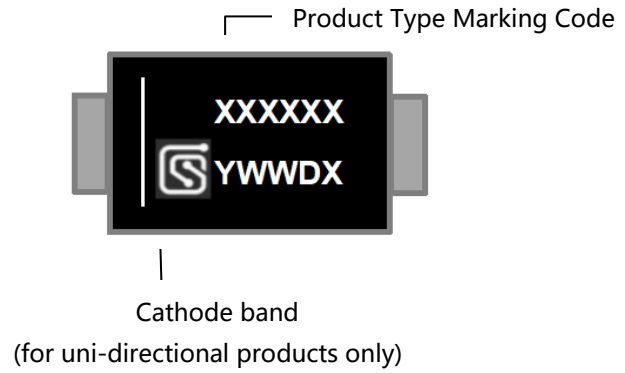
UNIT	A	A1	b	c	D	E	E1	L	
mm	Max	2.50	0.30	2.15	0.25	3.75	5.54	4.65	1.50
	Min	2.00	0.00	1.85	0.15	3.45	5.04	4.35	0.80

Remark: Dimensions D and E1 do not include mold flash & gate remain.

Part Numbering



Part Marking

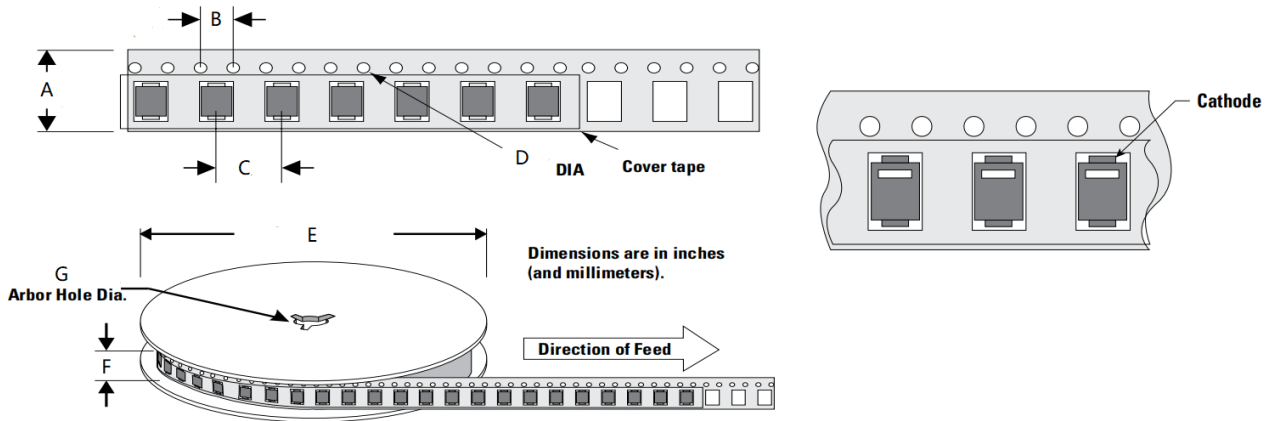


Packing

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

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