Features

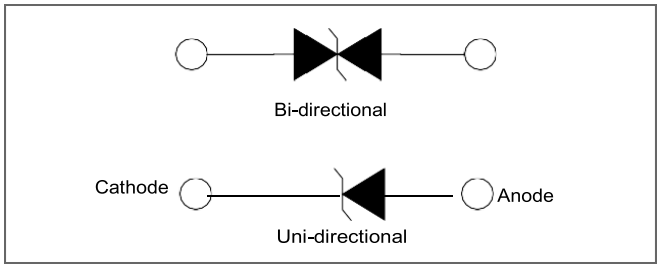
RoHS Compliant

- 1500W 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 components are ideal for the protection of I/O Interfaces, V_{CC} bus and other vulnerable 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}	1500	W
Power Dissipation on Infinite Heat Sink at T_L=50°C	P_D	6.5	W
Peak Forward Surge Current, 8.3ms Single Half Sine Wave (Note 1)	I_{FSM}	200	A
Maximum Instantaneous Forward Voltage at 50A for Unidirectional Only	V_F	3.5/5	V
Operating Temperature Range	T_J	-65 to 150	°C
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	15	°C/W
Typical Thermal Resistance Junction to Ambient	$R_{\theta JL}$	75	°C/W

AGENCY	AGENCY FILE NUMBER
	Pending

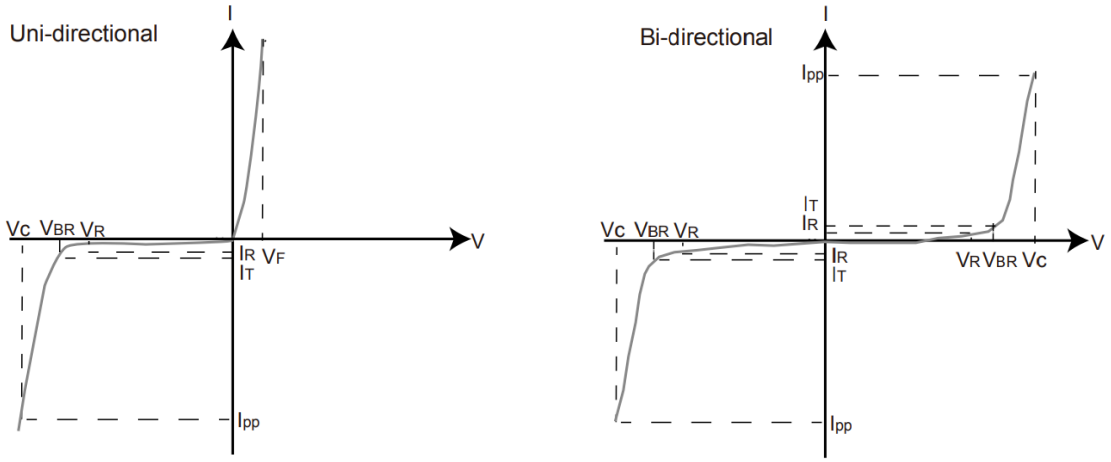
Notes:

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	Key Marking BI	Reverse Stand off Voltage V_R (Volts)	Breakdown Voltage V_{BR} (Volts) @ I_T MIN	Breakdown Voltage V_{BR} (Volts) @ I_T MAX	Test Current I_T (mA)	Maximum Clamping Voltage V_C @ I_{pp} (V)	Maximum Peak Pulse Current I_{pp} (A)	Maximum Reverse Leakage I_R @ V_R (μA)	Maximum Temperature coefficient of VBR (%/C)	Agency Approval
TPSMC11A-VR	TPSMC11CA-VR	AC011	AC011	11.0	12.20	13.50	1	18.2	82.5	1	0.074	
TPSMC12A-VR	TPSMC12CA-VR	AC012	AC012	12.0	13.30	14.70	1	19.9	75.4	1	0.075	
TPSMC13A-VR	TPSMC13CA-VR	AC013	AC013	13.0	14.40	15.90	1	21.5	69.8	1	0.076	
TPSMC14A-VR	TPSMC14CA-VR	AC014	AC014	14.0	15.60	17.20	1	23.2	64.7	1	0.080	
TPSMC15A-VR	TPSMC15CA-VR	AC015	AC015	15.0	16.70	18.50	1	24.4	61.5	1	0.083	
TPSMC16A-VR	TPSMC16CA-VR	AC016	AC016	16.0	17.80	19.70	1	26.0	57.7	1	0.084	
TPSMC17A-VR	TPSMC17CA-VR	AC017	AC017	17.0	18.90	20.90	1	27.6	54.4	1	0.085	
TPSMC18A-VR	TPSMC18CA-VR	AC018	AC018	18.0	20.00	22.10	1	29.2	51.4	1	0.088	
TPSMC20A-VR	TPSMC20CA-VR	AC020	AC020	20.0	22.20	24.50	1	32.4	46.3	1	0.091	
TPSMC22A-VR	TPSMC22CA-VR	AC022	AC022	22.0	24.40	26.90	1	35.5	42.3	1	0.092	
TPSMC24A-VR	TPSMC24CA-VR	AC024	AC024	24.0	26.70	29.50	1	38.9	38.6	1	0.092	
TPSMC26A-VR	TPSMC26CA-VR	AC026	AC026	26.0	28.90	31.90	1	42.1	35.7	1	0.093	
TPSMC28A-VR	TPSMC28CA-VR	AC028	AC028	28.0	31.10	34.40	1	45.4	33.1	1	0.094	
TPSMC30A-VR	TPSMC30CA-VR	AC030	AC030	30.0	33.30	36.80	1	48.4	31.0	1	0.096	
TPSMC33A-VR	TPSMC33CA-VR	AC033	AC033	33.0	36.70	40.60	1	53.3	28.2	1	0.097	
TPSMC36A-VR	TPSMC36CA-VR	AC036	AC036	36.0	40.00	44.20	1	58.1	25.9	1	0.098	
TPSMC40A-VR	TPSMC40CA-VR	AC040	AC040	40.0	44.40	49.10	1	64.5	23.3	1	0.099	
TPSMC43A-VR	TPSMC43CA-VR	AC043	AC043	43.0	47.80	52.80	1	69.4	21.7	1	0.100	
TPSMC45A-VR	TPSMC45CA-VR	AC045	AC045	45.0	50.00	55.30	1	72.7	20.6	1	0.101	
TPSMC48A-VR	TPSMC48CA-VR	AC048	AC048	48.0	53.30	58.90	1	77.4	19.4	1	0.101	
TPSMC51A-VR	TPSMC51CA-VR	AC051	AC051	51.0	56.70	62.70	1	82.4	18.2	1	0.101	
TPSMC54A-VR	TPSMC54CA-VR	AC054	AC054	54.0	60.00	66.30	1	87.1	17.3	1	0.102	
TPSMC58A-VR	TPSMC58CA-VR	AC058	AC058	58.0	64.40	71.20	1	93.6	16.1	1	0.103	
TPSMC60A-VR	TPSMC60CA-VR	AC060	AC060	60.0	66.70	73.70	1	96.8	15.5	1	0.103	
TPSMC64A-VR	TPSMC64CA-VR	AC064	AC064	64.0	71.10	78.60	1	103.0	14.6	1	0.104	
TPSMC70A-VR	TPSMC70CA-VR	AC070	AC070	70.0	77.80	86.00	1	113.0	13.3	1	0.105	
TPSMC75A-VR	TPSMC75CA-VR	AC075	AC075	75.0	83.30	92.10	1	121.0	12.4	1	0.106	
TPSMC78A-VR	TPSMC78CA-VR	AC078	AC078	78.0	86.70	95.80	1	126.0	11.9	1	0.106	
TPSMC85A-VR	TPSMC85CA-VR	AC085	AC085	85.0	94.40	104.00	1	137.0	11.0	1	0.106	
TPSMC90A-VR	TPSMC90CA-VR	AC090	AC090	90.0	100	111	1	145.4	10.3	1	0.107	
TPSMC100A-VR	TPSMC100CA-VR	AC100	AC100	100.0	111	123	1	159.9	9.4	1	0.107	
TPSMC110A-VR	TPSMC110CA-VR	AC110	AC110	110.0	122	135	1	175.5	8.6	1	0.107	
TPSMC120A-VR	TPSMC120CA-VR	AC120	AC120	120.0	133	147	1	191.1	7.9	1	0.108	
TPSMC130A-VR	TPSMC130CA-VR	AC130	AC130	130.0	144	159	1	206.7	7.3	1	0.108	
TPSMC150A-VR	TPSMC150CA-VR	AC150	AC150	150.0	167	185	1	240.5	6.2	1	0.108	
TPSMC160A-VR	TPSMC160CA-VR	AC160	AC160	160.0	178	197	1	256.1	5.9	1	0.108	
TPSMC170A-VR	TPSMC170CA-VR	AC170	AC170	170.0	189	209	1	271.7	5.5	1	0.108	
TPSMC180A-VR	TPSMC180CA-VR	AC180	AC180	180.0	201	222	1	288.6	5.2	1	0.108	
TPSMC188A-VR	TPSMC188CA-VR	AC188	AC188	188.0	209	231	1	300.3	5.0	1	0.11	
TPSMC200A-VR	TPSMC200CA-VR	AC200	AC200	200.0	224	247	1	321.1	4.7	1	0.11	

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_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)

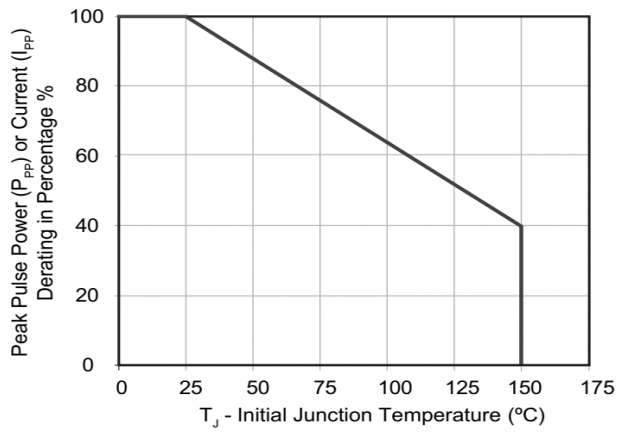


Figure 1. Peak pulse power derating curve

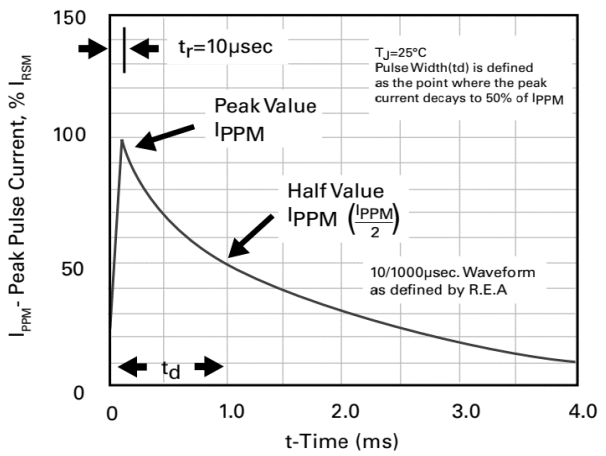


Figure2. Pulse waveform

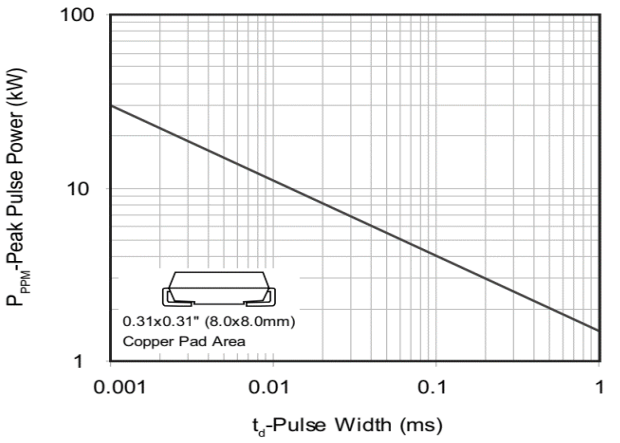


Figure 3. Peak pulse power rating curve

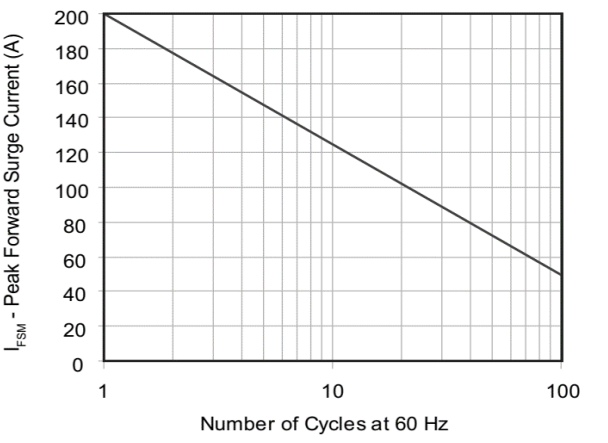
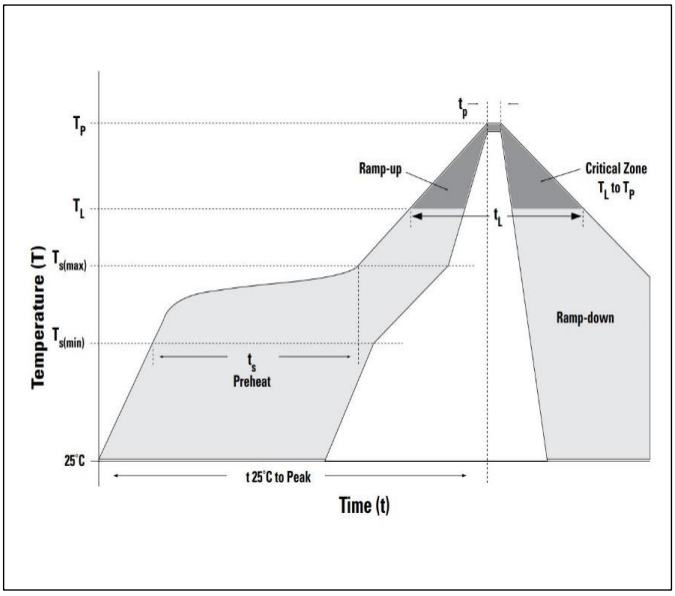


Figure 4. Maximum non-repetitive surge current

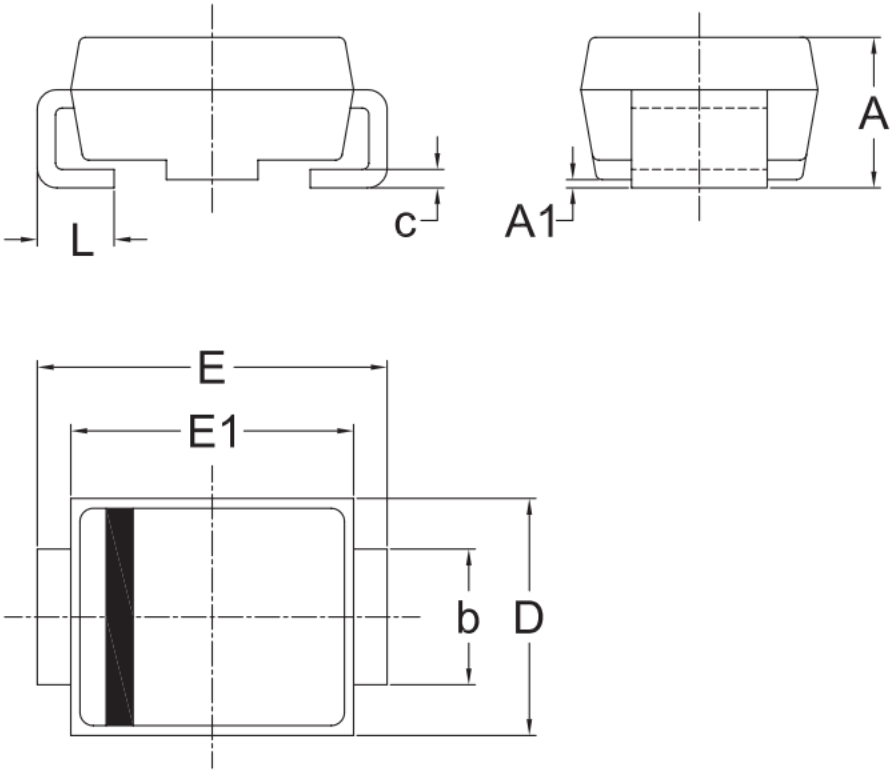
Soldering Parameters

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

Soldering profile



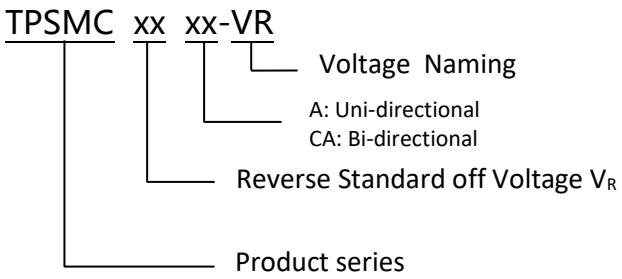
Dimensions



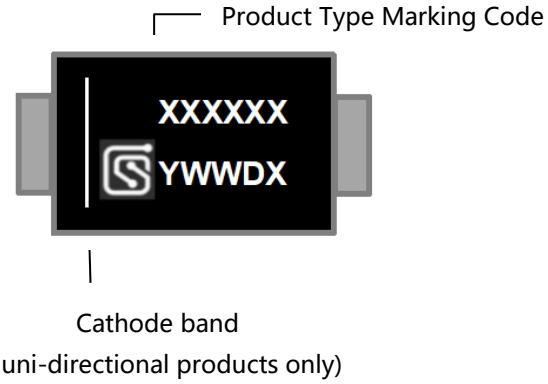
UNIT		A	A1	b	c	D	E	E1	L
mm	Max	2.83	0.30	3.10	0.25	6.15	8.15	7.05	1.60
	Min	2.33	0.00	2.80	0.15	5.85	7.65	6.75	0.90

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

Part Numbering



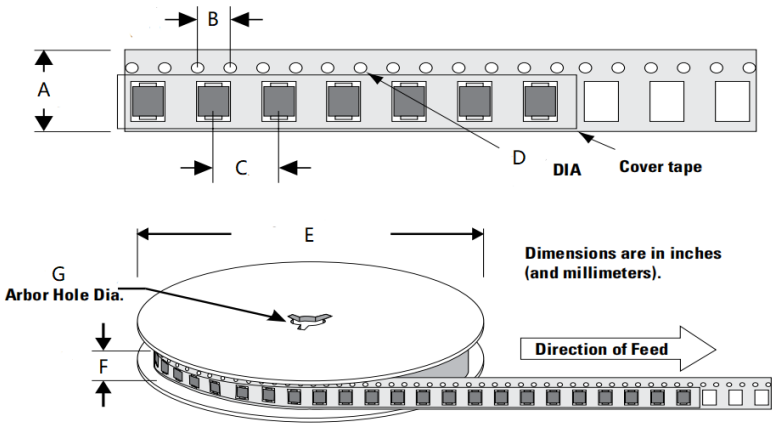
Part Marking

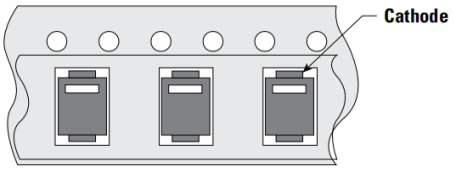


Packing

Part number	Package name	Small packing quantity	Packing method
TPSMCXXXX-VR	DO-214AB	3000	Tape & Reel

Tape and Reel Specification





Symbol	Millimeter
A	16.00±0.10
B	4.00±0.10
C	8.00±0.10
D	1.55±0.05
E	330.20±2.00
F	19.70±2.00
G	13.30±0.30

Revision history of Specification

Version	Change Items	Effective Date
1.0	Initial Release	13-Aug-2021