Features

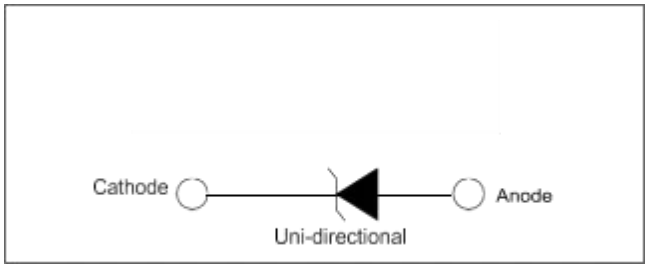
RoHS Compliant

- 3000W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycles):0.01%
- Low clamping capability U-nCLAMP™
- 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

This low clamp TVS series are ideal for the transient voltage clamp protection of I/O Interfaces, DC power line bus and other circuits used in Automotive BMS 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 TA =25°C by 10/ 1000μs Waveform (Fig.2	P_{PPM}	3000	W
Power Dissipation on Infinite Heat Sink at T L=50OC	PD	6.5	W
Peak Forward Surge Current, 8.3 ms Single Half Sine Wave (Note 1)	I_{FSM}	300	A
Maximum Instantaneous Forward Voltage at 10A for Unidirectional Only(Note 2)	VF	8	V
Operating Temperature Range	TJ	-55 to 150	°C
Storage Temperature Range	TSTG	-55 to 150	°C

AGENCY	AGENCY FILE NUMBER
	Pending

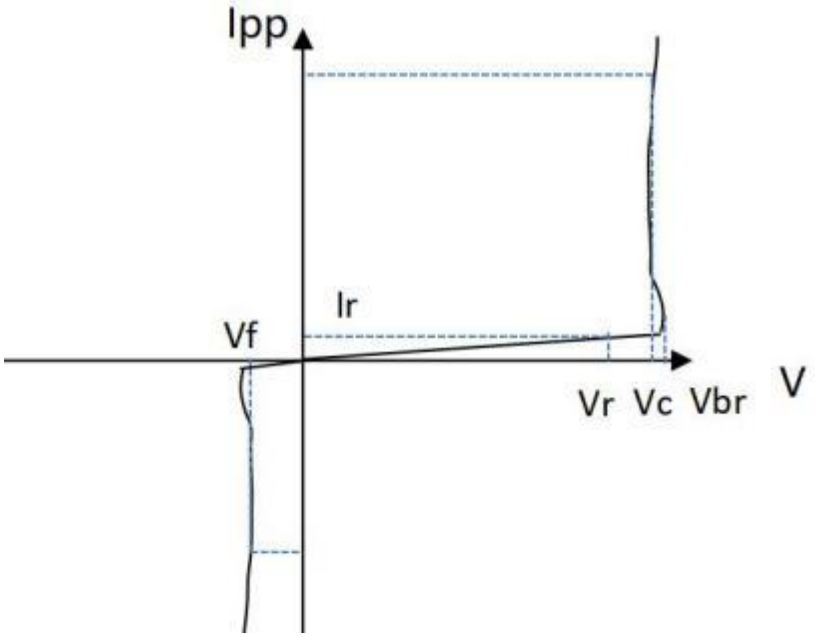
Notes:

1. Measured on 8.3 ms single half sine wave or equivalent square wave for unidirectional device only, duty cycle= 4 per minute maximum.
2. VF < 8V for stacked-die parts.

Characteristics (T = 25°C unless otherwise noted)

Part Number (Uni)	Key Marking UNI	Reverse Stand off Voltage VR (Volts)	Breakdown Voltage VBR (Volts) @ IT MIN	MAX	Test Current IT (mA)	Maximum Clamping Voltage VC @10/1000uS Ipp (V)	Maximum Clamping Voltage VC @8/20uS Ipp (V)	Maximum Reverse Leakage IR @ VR (μA)	Agency Approval
TPSMD75A-VBR-Un	AD075n	64.1	71.3	78.8	1	85V/35.3A	90V/350A	1	
TPSMD82A-VBR-Un	AD082n	70.1	77.9	86.1	1	95V/31.6A	100V/314A	1	
TPSMD91A-VBR-Un	AD091n	77.8	86.5	95.5	1	105V/28.6A	110V/286A	1	

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)

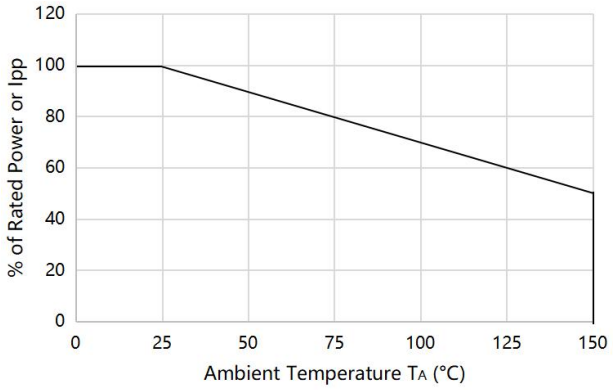


Figure 1. Peak pulse power derating curve

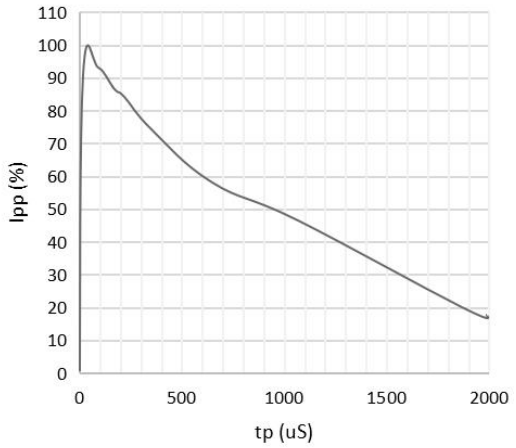


Figure2. Pulse waveform

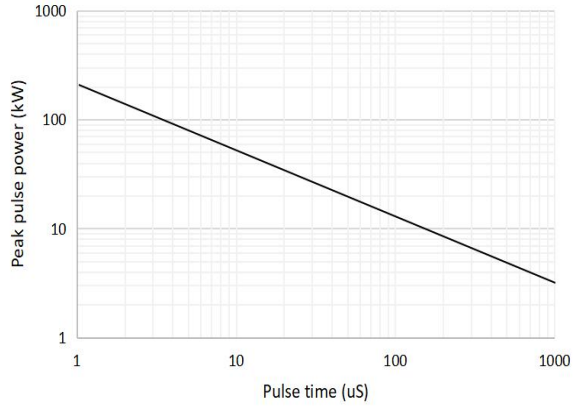


Figure 3. Peak pulse power rating curve

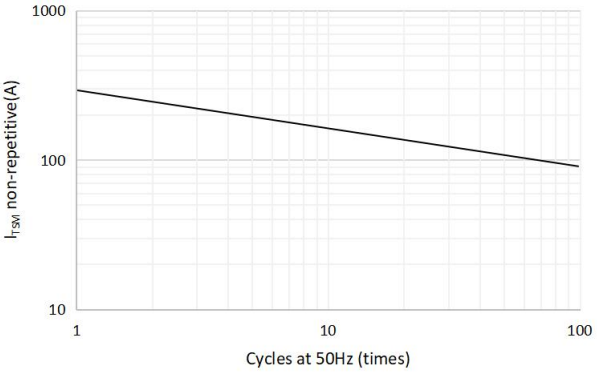


Figure 4. Maximum non-repetitive surge current

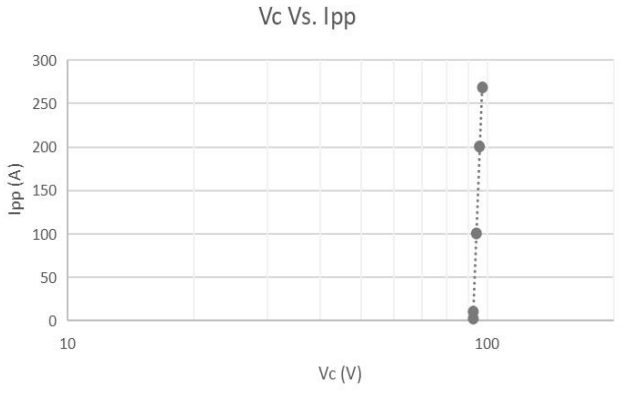


Figure 5. TPSMD91A-VBR-Un Typical Vc Vs. Ipp (8/20uS)

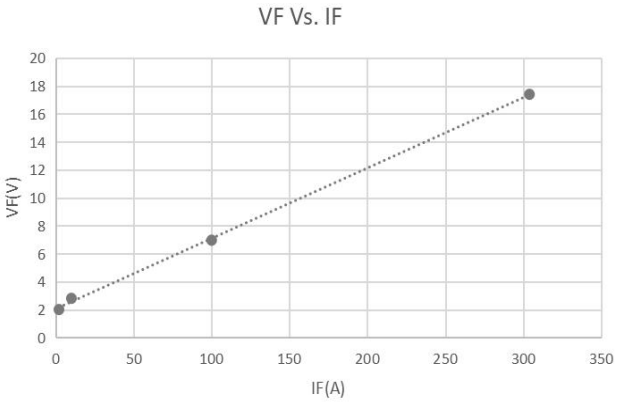
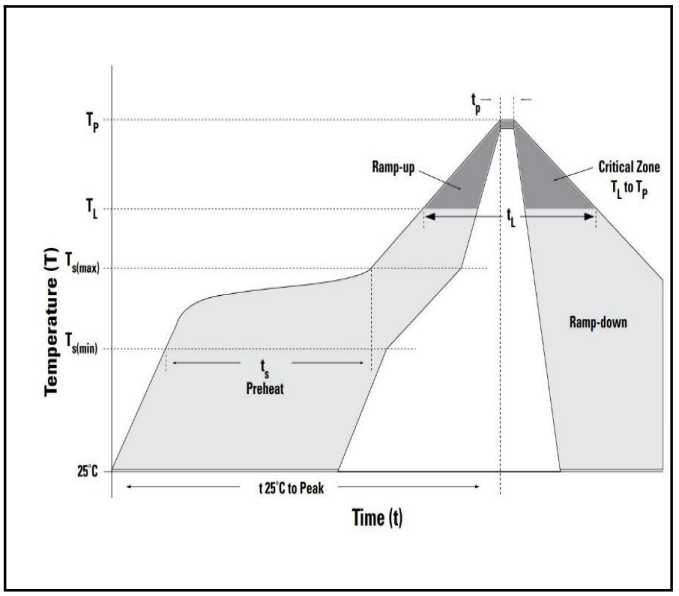


Figure 6. Typical VF Vs. IF (8/20uS)

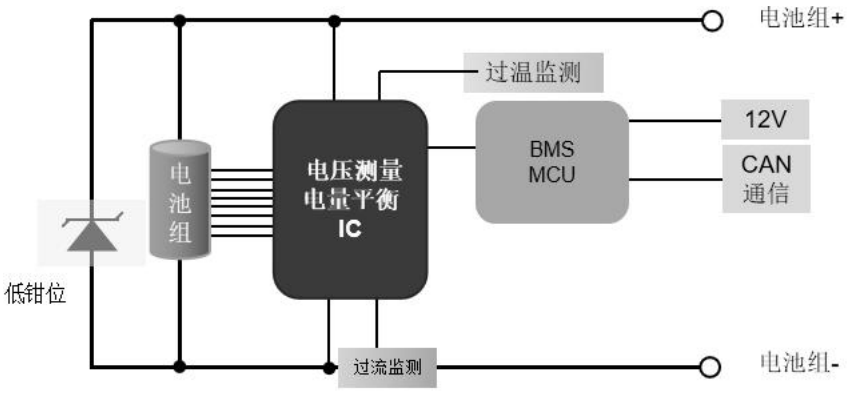
Soldering Parameters

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 – 120 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 act ual 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

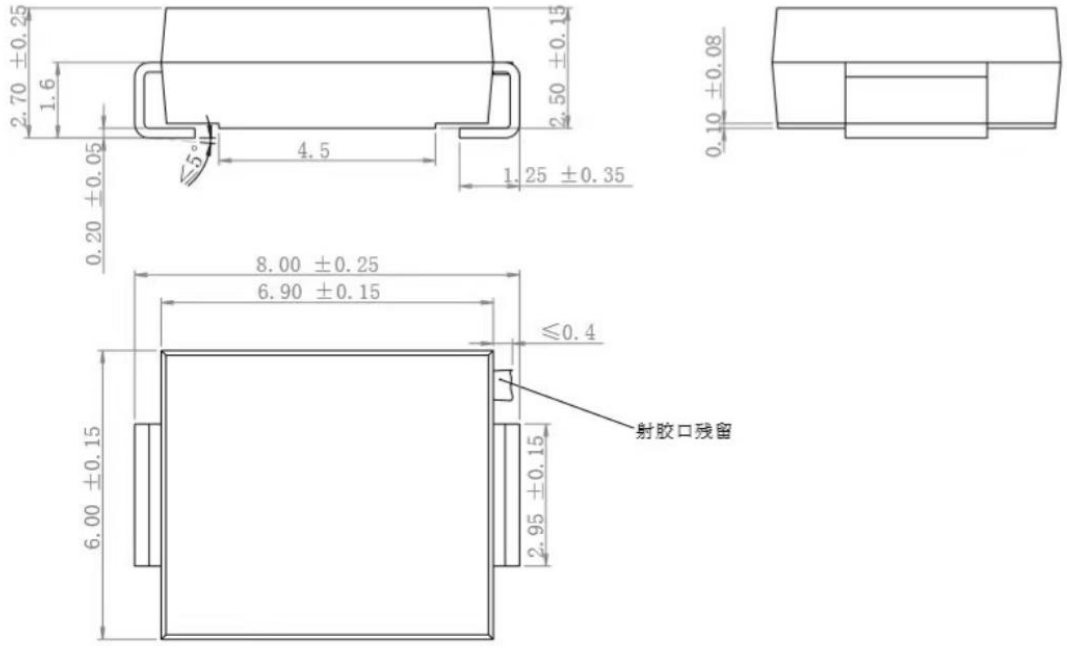


Typical Application



Dimensions

unit: mm

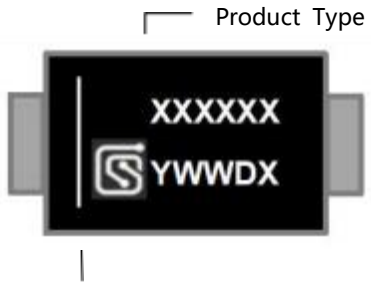


Part Numbering

TPSMD xx xx-VBR-Un

- Uni and Low clamp
- VBR voltage
- Voltage V_{BR}
- Product series

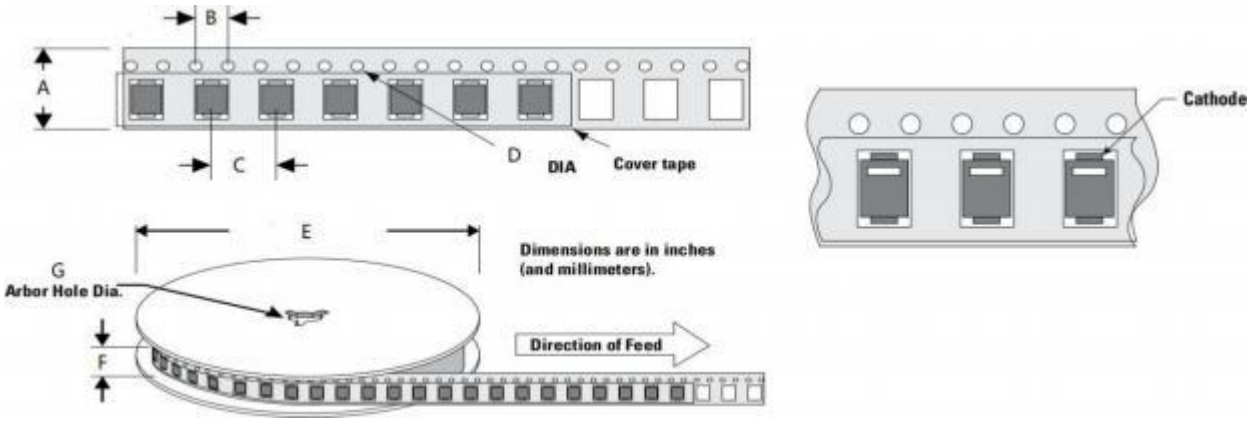
Part Marking



Packing

Part number	Package name	Small packing quantity	Packing method
TPSMDXXXX -VBR-Un	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	3-23-2023