V10P10

Vishay General Semiconductor

High Current Density Surface Mount TMBS[®] (Trench MOS Barrier Schottky) Rectifier Ultra Low

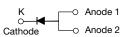
 V_{F} = 0.453 V at I_{F} = 5 A

eSMP[®] Series

www.vishay.com



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	10 A			
V _{RRM}	100 V			
I _{FSM}	180 A			
E _{AS}	100 mJ			
V _F at I _F = 10 A	0.574 V			
T _J max.	150 °C			
Package	SMPC (TO-277A)			
Circuit configuration	Single			

FEATURES

- Very low profile typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- · Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available
 Automotive ordering code; base P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters, and polarity protection applications.

MECHANICAL DATA

Case: SMPC (TO-277A)

Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified

("_X" denotes revision code e.g. A, B,....)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 and HM3 suffix meet JESD 201 class 2 whisker test

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	V10P10	UNIT		
Device marking code		V1010			
Maximum repetitive peak reverse voltage	V _{RRM}	100	V		
Maximum average forward rectified current (fig. 1)	I _{F(AV)}	10	А		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	180	А		
Non-repetitive avalanche energy at $I_{AS} = 2.0 \text{ A}, T_J = 25 \text{ °C}$	E _{AS}	100	mJ		
Peak repetitive reverse current at $t_p = 2 \ \mu s$, 1 kHz, $T_J = 38 \ ^\circ C \pm 2 \ ^\circ C$	I _{RRM}	1.0	А		
Operating junction temperature range	T _J ⁽¹⁾	-40 to +150	°C		
Storage temperature range	T _{STG}	-55 to +150	°C		

Note

⁽¹⁾ The heat generated must be less than the thermal conductivity from junction to ambient: $dP_D/dT_J < 1/R_{\theta JA}$

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ROHS COMPLIANT

HALOGEN

V10P10



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ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS SYMBO		SYMBOL	TYP.	MAX.	UNIT	
Breakdown voltage	I _R = 1 mA	T _A = 25 °C	V _{BR}	100 (minimum)	-	V	
Instantaneous forward voltage	I _F = 5 A	T _A = 25 °C	V _F ⁽¹⁾	0.512	-	V	
	I _F = 10 A			0.625	0.68		
	I _F = 5 A	T _A = 125 °C		0.453	-		
	I _F = 10 A			0.574	0.62		
Reverse current	V _R = 70 V	T _A = 25 °C	T _A = 25 °C		7.1	-	μA
	v _R = 70 v	T _A = 125 °C	I _R ⁽²⁾	4.5	-	mA	
	V 100 V	T _A = 25 °C		30.4	150	μA	
	V _R = 100 V	T _A = 125 °C		10.4	20	mA	

Notes

 $^{(1)}\,$ Pulse test: 300 μs pulse width, 1 $\,\%$ duty cycle

⁽²⁾ Pulse test: Pulse width \leq 40 ms

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise specified)				
PARAMETER	SYMBOL	V10P10	UNIT	
Typical thermal resistance	R _{θJA} (1)	60	°C/W	
	R _{θJL}	3	0/10	

Note

 $^{(1)}\,$ Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
V10P10-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel	
V10P10-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel	
V10P10HM3_A/H ⁽¹⁾	0.10	Н	1500	7" diameter plastic tape and reel	
V10P10HM3_A/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel	

Note

(1) AEC-Q101 qualified



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RATINGS AND CHARACTERISTICS CURVES ($T_A = 25$ °C unless otherwise specified)

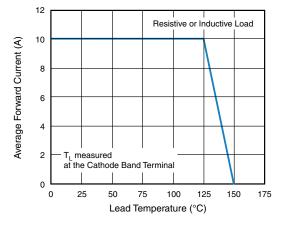


Fig. 1 - Maximum Forward Current Derating Curve

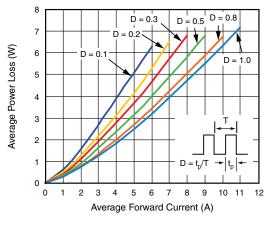


Fig. 2 - Forward Power Loss Characteristics

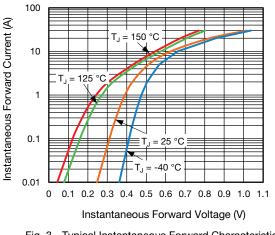


Fig. 3 - Typical Instantaneous Forward Characteristics

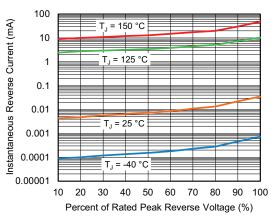
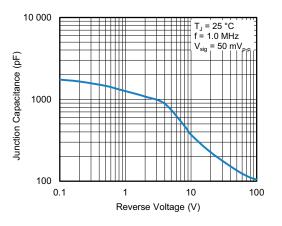


Fig. 4 - Typical Reverse Characteristics





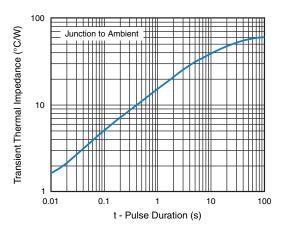


Fig. 6 - Typical Transient Thermal Impedance

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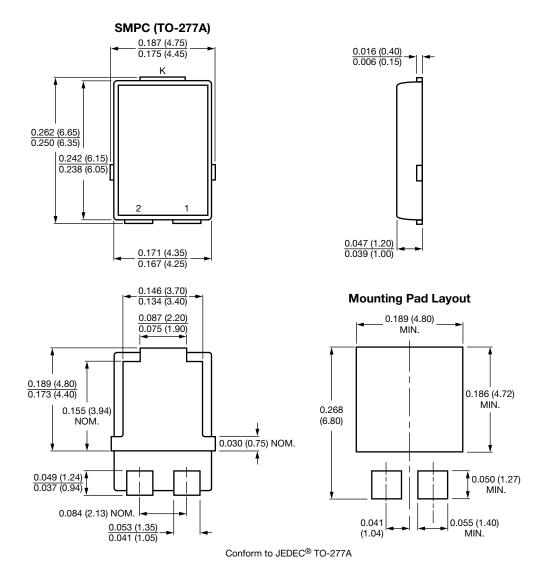
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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