

High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.45$ V at $I_F = 5$ A



FEATURES

- Very low profile - typical height of 1.1 mm
- 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 www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

DESIGN SUPPORT TOOLS

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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 - halogen-free, RoHS-compliant and AEC-Q101 qualified

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	100 V
I_{FSM}	220 A
V_F at $I_F = 15$ A (125 °C)	0.61 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V15PM10	UNIT
Device marking code		15M10	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum DC forward current	$I_{F(AV)}^{(1)}$	15	A
	$I_{F(AV)}^{(2)}$	4.4	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	220	A
Operating junction temperature range	T_J ⁽³⁾	-40 to +175	°C
Storage temperature range	T_{STG}	-55 to +175	°C

Notes

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB

(2) Free air, mounted on recommended pad area

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 5 \text{ A}$	$T_A = 25^\circ\text{C}$	0.52	-	V
	$I_F = 7.5 \text{ A}$		0.57	-	
	$I_F = 15 \text{ A}$		0.69	0.75	
	$I_F = 5 \text{ A}$	$T_A = 125^\circ\text{C}$	0.45	-	
	$I_F = 7.5 \text{ A}$		0.50	-	
	$I_F = 15 \text{ A}$		0.61	0.66	
Reverse current	$V_R = 70 \text{ V}$	$T_A = 25^\circ\text{C}$	0.02	-	mA
		$T_A = 125^\circ\text{C}$	3	-	
	$V_R = 100 \text{ V}$	$T_A = 25^\circ\text{C}$	-	0.4	
		$T_A = 125^\circ\text{C}$	6	18	
Typical junction capacitance	4.0 V, 1 MHz	C_J	1600	-	pF

Notes

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width $\leq 5 \text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)			
PARAMETER	SYMBOL	V15PM10	UNIT
Typical thermal resistance	$R_{\theta,JA}^{(1)(2)}$	75	°C/W
	$R_{\theta,JM}^{(3)}$	4	

Notes

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

(2) Free air, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta,JA}$ - junction to ambient

(3) Units mounted on 30 mm x 30 mm aluminum PCB, thermal resistance $R_{\theta,JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V15PM10-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V15PM10-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V15PM10HM3/H ⁽¹⁾	0.10	H	1500	7" diameter plastic tape and reel
V15PM10HM3/I ⁽¹⁾	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

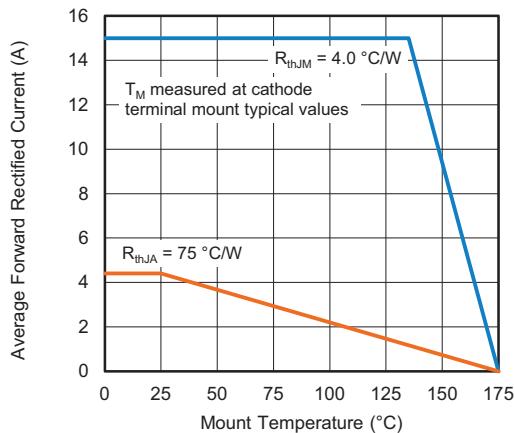
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise specified)


Fig. 1 - Maximum Forward Current Derating Curve

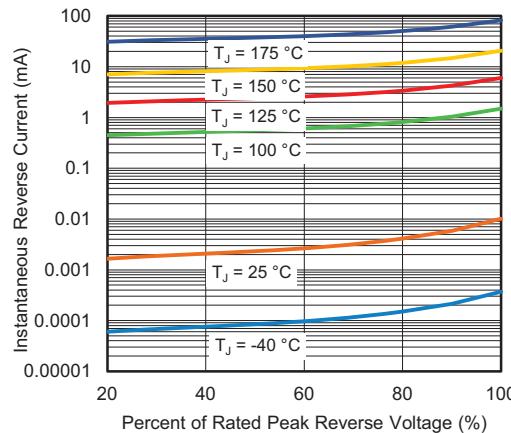


Fig. 4 - Typical Reverse Characteristics

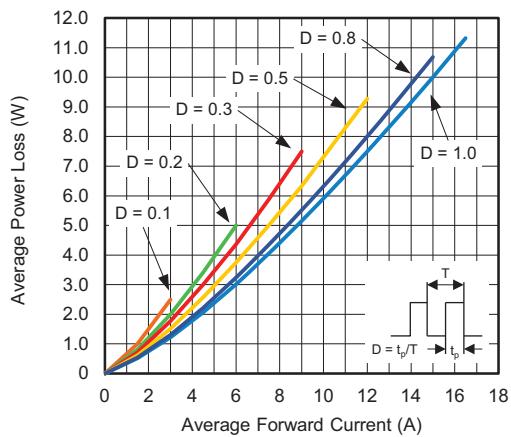


Fig. 2 - Forward Power Loss Characteristics

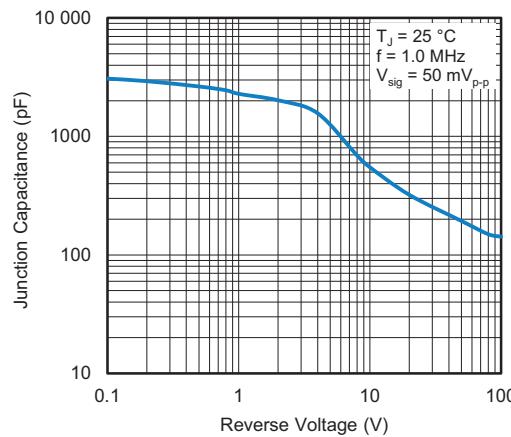


Fig. 5 - Typical Junction Capacitance

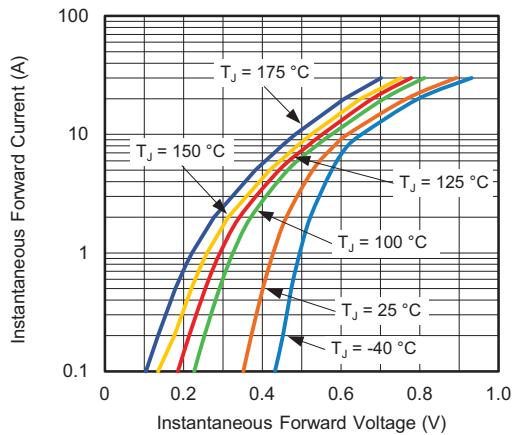


Fig. 3 - Typical Instantaneous Forward Characteristics

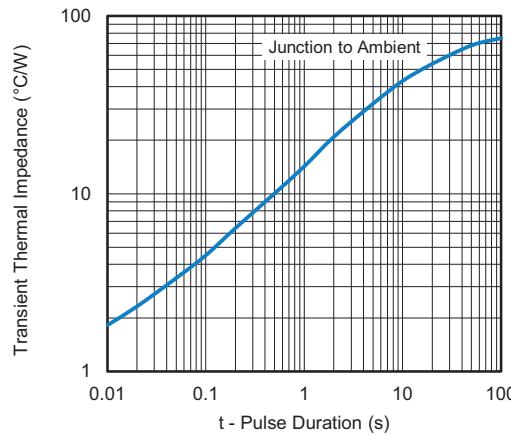
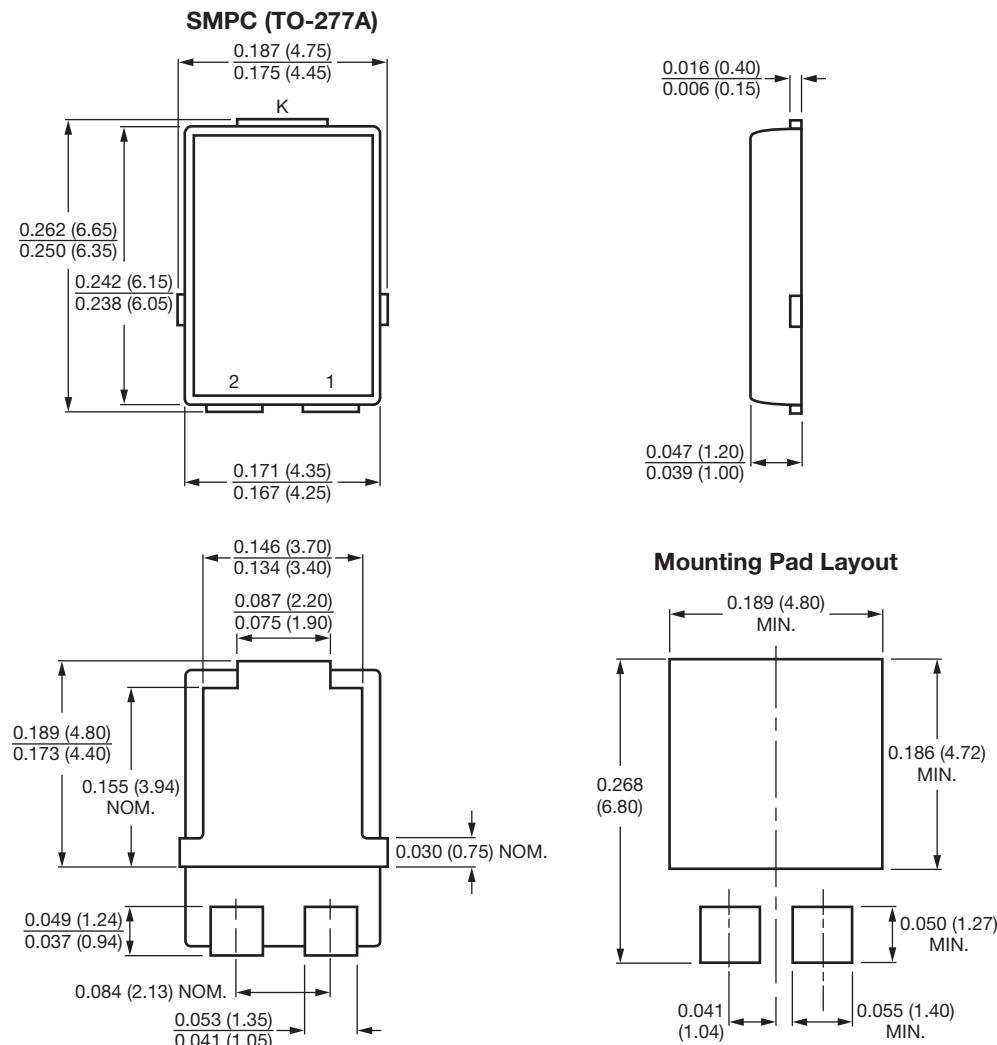


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)


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