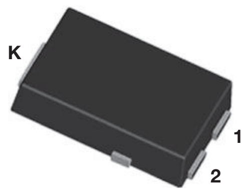
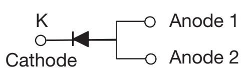
High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.50 V at I_F = 5 A

eSMP® Series



SMPC (TO-277A)



FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT
HALOGEN FREE

- 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

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

DESIGN SUPPORT TOOLS

click logo to get started

3D Models Available

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	100 V
I_{FSM}	180 A
V_F at I_F = 10 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	V10PM10	UNIT
Device marking code		10M10	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum DC forward current	$I_{F(AV)}$ (1)	10	A
	$I_{F(AV)}$ (2)	4	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	180	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 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 5 A	T_A = 25 °C	V_F (1)	0.57	-	V
	I_F = 10 A			0.68	0.75	
	I_F = 5 A	T_A = 125 °C		0.50	-	
	I_F = 10 A			0.60	0.66	
Reverse current	V_R = 70 V	T_A = 25 °C	I_R (2)	0.01	-	mA
		T_A = 125 °C		2.0	-	
	V_R = 100 V	T_A = 25 °C		-	0.12	
		T_A = 125 °C		4	14	
Typical junction capacitance	4.0 V, 1 MHz		C_J	1180	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 5 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise specified)			
PARAMETER	**SYMBOL**	**V10PM10**	**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**
V10PM10-M3/H	0.10	H	1500	7" diameter plastic tape and reel
V10PM10-M3/I	0.10	I	6500	13" diameter plastic tape and reel
V10PM10HM3/H (1)	0.10	H	1500	7" diameter plastic tape and reel
V10PM10HM3/I (1)	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

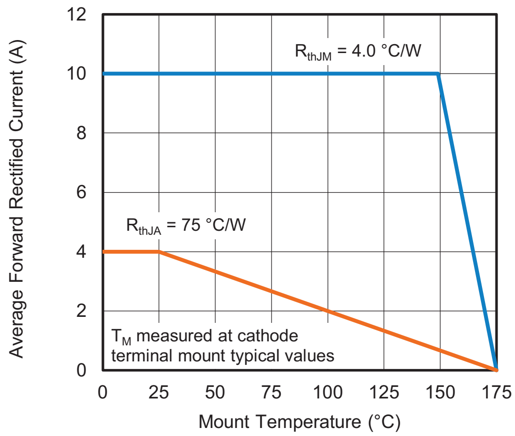


Fig. 1 - Maximum Forward Current Derating Curve

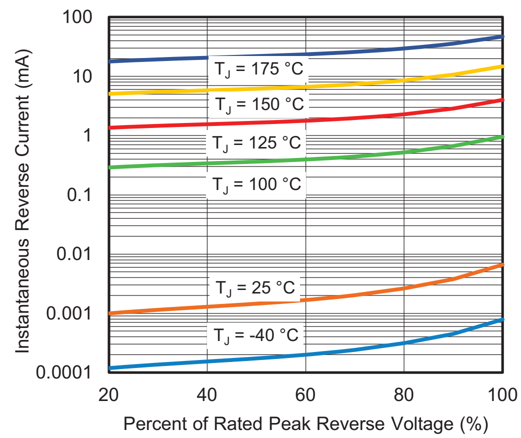


Fig. 4 - Typical Reverse Characteristics

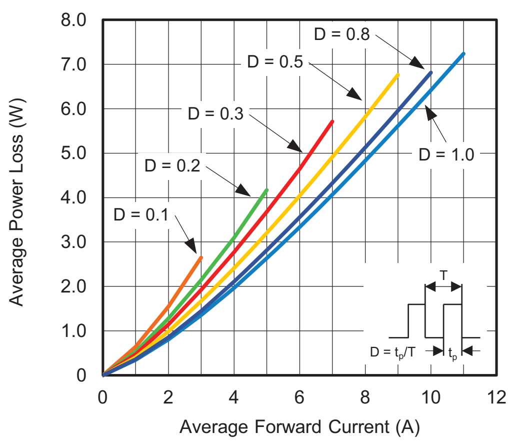


Fig. 2 - Forward Power Loss Characteristics

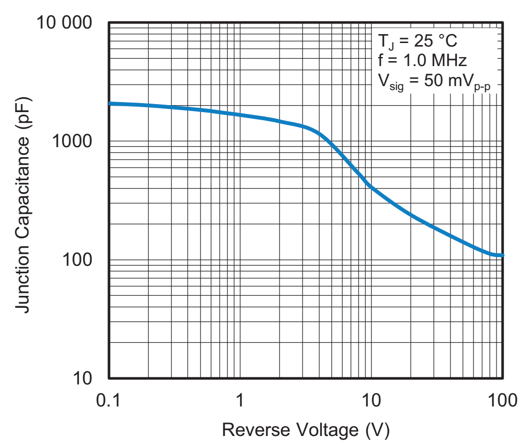


Fig. 5 - Typical Junction Capacitance

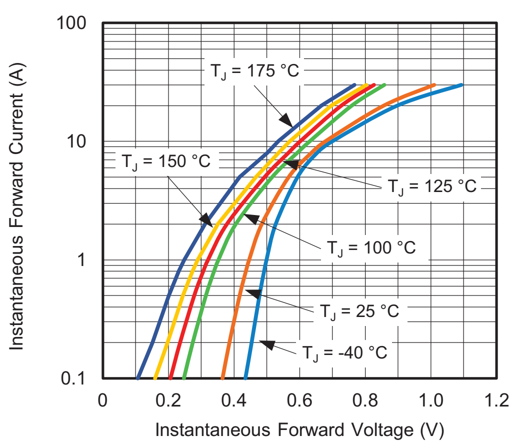


Fig. 3 - Typical Instantaneous Forward Characteristics

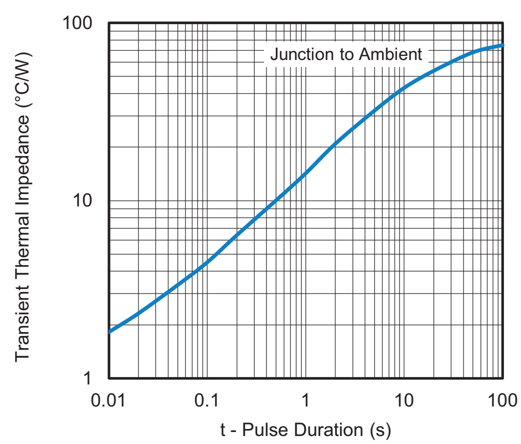
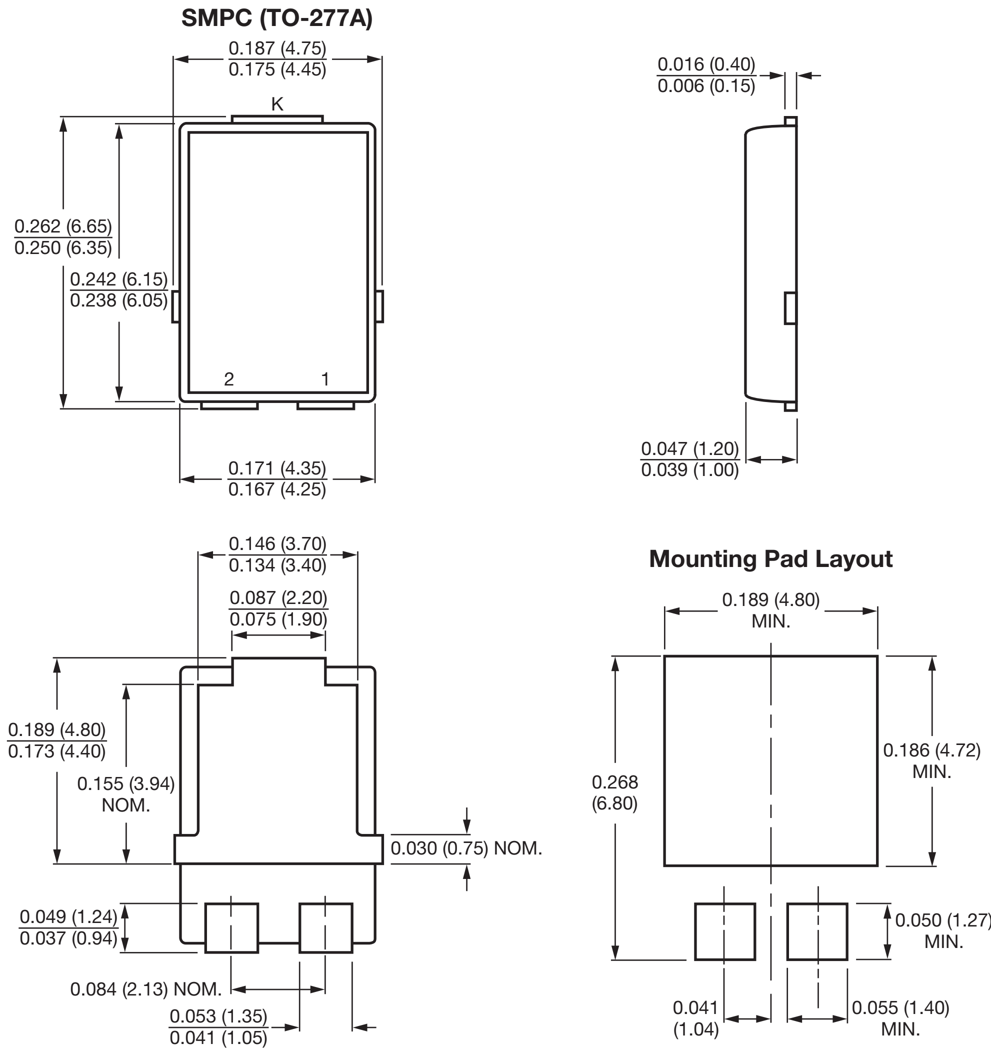


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A

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