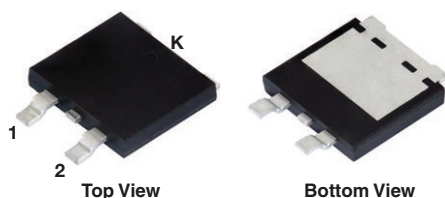


Dual High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.46\text{ V}$ at $I_F = 2.5\text{ A}$

eSMP® Series SMPD (TO-263AC)



FEATURES

- Trench MOS Schottky technology
- Very low profile - typical height of 1.7 mm
- Ideal for automated placement
- 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/doc299912

AUTOMOTIVE
GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



3D Models

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection in commercial, industrial, and automotive application.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2 x 5 A
V_{RRM}	100 V
I_{FSM}	70 A
V_F at $I_F = 5\text{ A}$ ($T_J = 125\text{ °C}$)	0.57 V
T_J max.	150 °C
Package	SMPD (TO-263AC)
Circuit configuration	Common cathode

MECHANICAL DATA

Case: SMPD (TO-263AC)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-M3 - halogen-free, RoHS-compliant

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

Polarity: as marked

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)

PARAMETER	SYMBOL	V10D103C	UNIT
Device marking code		V10D103C	
Maximum repetitive peak reverse voltage	V_{RRM}	100	V
Maximum average forward rectified current	$I_{F(AV)}$ ⁽¹⁾	10	A
per device (fig. 1)		5	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	70	A
Operating junction temperature range	T_J ⁽²⁾	-40 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	

Notes

⁽¹⁾ Mounted on infinite heatsink

⁽²⁾ The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$

ELECTRICAL CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	$I_F = 2.5\text{ A}$	$V_F^{(1)}$	0.52	-	V
	$I_F = 5\text{ A}$		0.63	0.69	
	$I_F = 2.5\text{ A}$		0.46	-	
	$I_F = 5\text{ A}$		0.57	0.62	
Reverse current at rated V_R per diode	$V_R = 70\text{ V}$	$I_R^{(2)}$	0.003	-	mA
	$T_J = 25\text{ }^{\circ}\text{C}$		-	-	
	$T_J = 125\text{ }^{\circ}\text{C}$		2	-	
	$V_R = 100\text{ V}$		-	0.23	
Typical junction capacitance	$T_J = 25\text{ }^{\circ}\text{C}$	C_J	5	13	pF
	$T_J = 125\text{ }^{\circ}\text{C}$		560	-	
Typical junction capacitance		4.0 V, 1 MHz			

Notes

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width $\leq 5\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	V10D103C	UNIT
Typical thermal resistance per device	$R_{\theta JC}^{(1)}$	2.5	$^{\circ}\text{C/W}$
	$R_{\theta JA}^{(2)(3)}$	58	

Notes

- (1) Mounted on infinite heatsink
(2) The heat generated must be less than the thermal conductivity from junction-to-ambient: $dP_D/dT_J < 1/R_{\theta JA}$
(3) Free air, without heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10D103C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V10D103CHM3/I ⁽¹⁾	0.55	I	2000/reel	13" diameter plastic tape and reel

Note

- (1) AEC-Q101 qualified

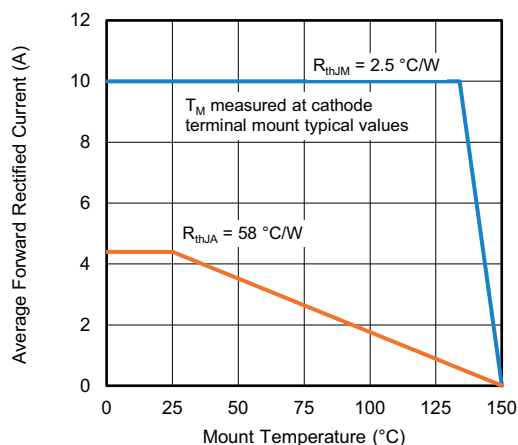
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

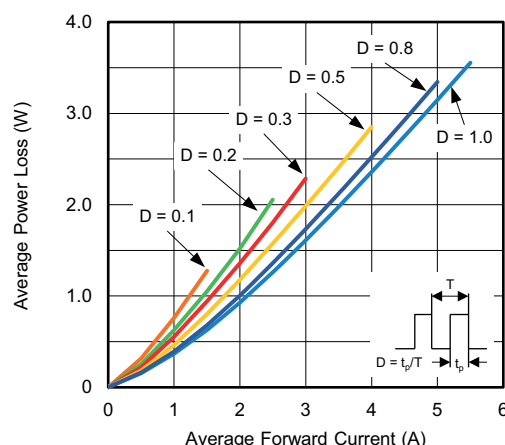


Fig. 2 - Average Power Loss Characteristics

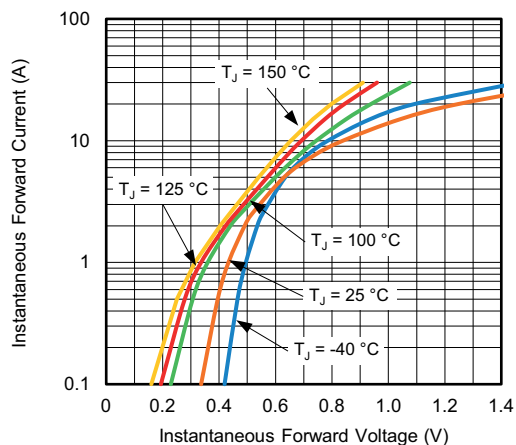


Fig. 3 - Typical Instantaneous Forward Characteristics

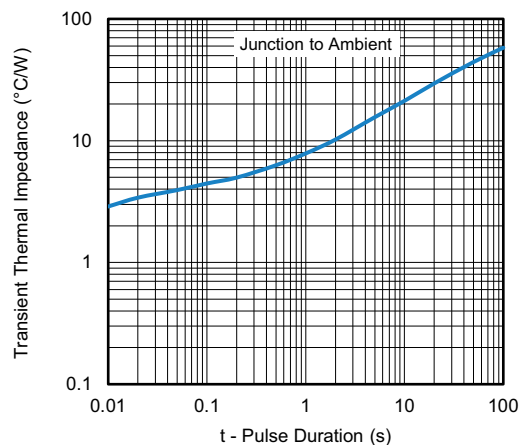


Fig. 6 - Typical Transient Thermal Impedance

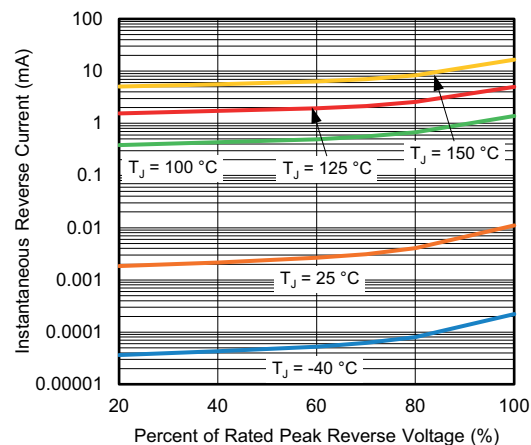


Fig. 4 - Typical Reverse Leakage Characteristics

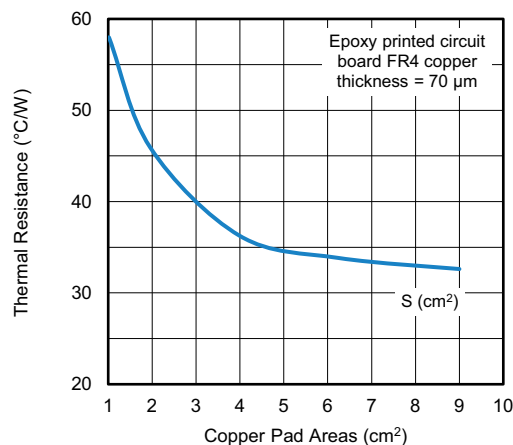


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

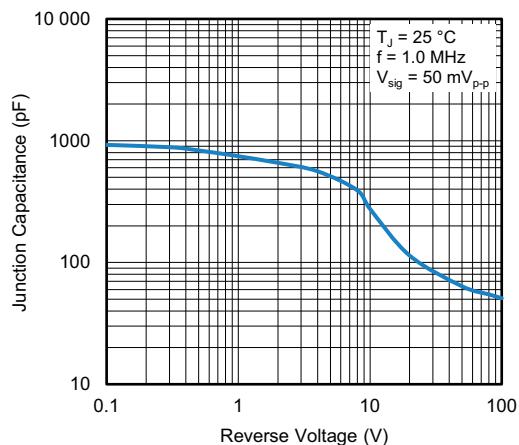
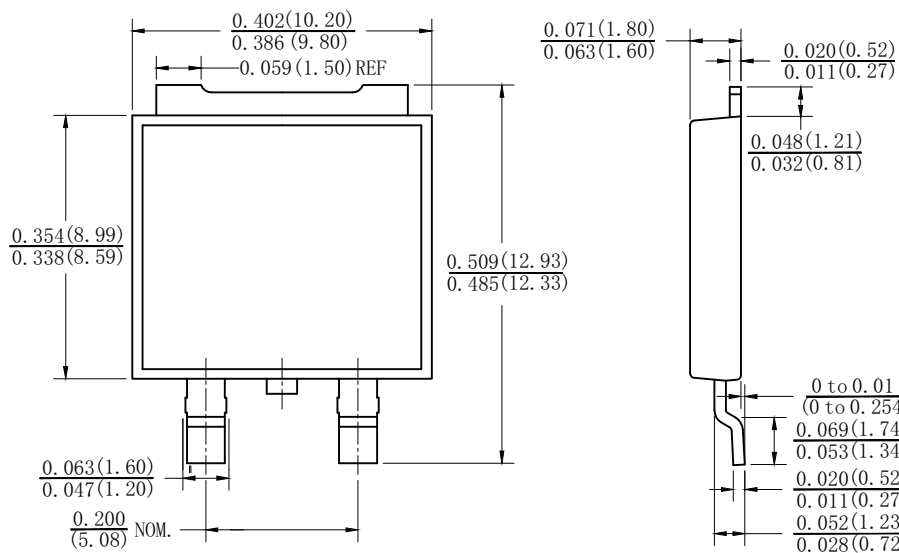
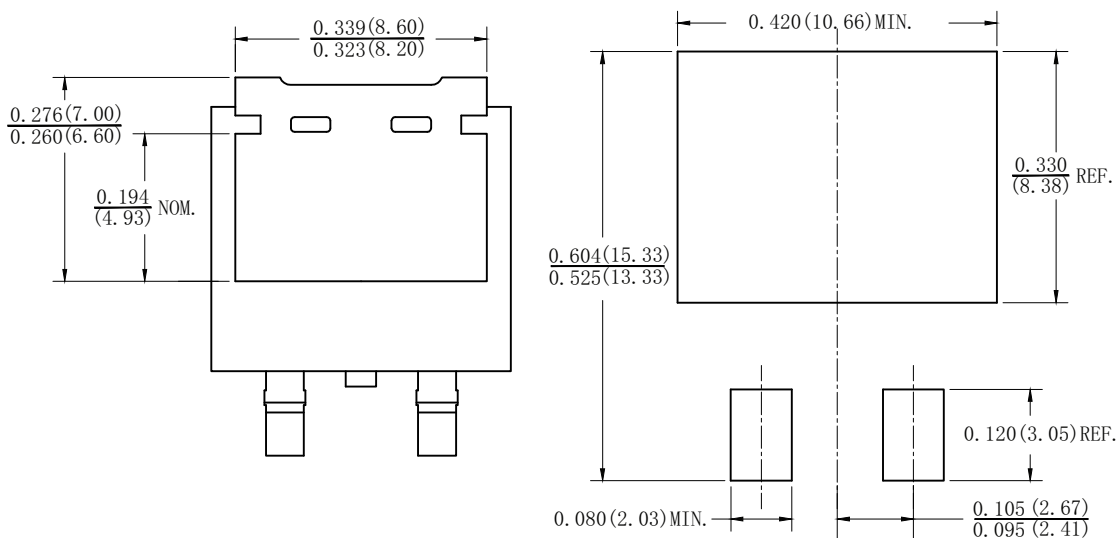


Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)

Mounting Pad Layout




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