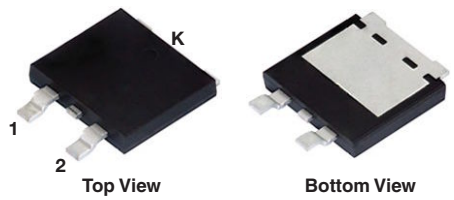
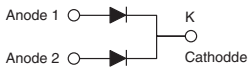
Dual High Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

eSMP® Series



Top View Bottom View

SMPD (TO-263AC)



FEATURES

- Very low profile - typical height of 1.7 mm
- 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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

TYPICAL APPLICATIONS

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 5.0 A
V_{RRM}	170 V
I_{FSM}	100 A
V_F at I_F = 5.0 A (T_A = 125 °C)	0.67 V
T_J max.	175 °C
Package	SMPD (TO-263AC)
Circuit configurations	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, 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 meets JESD 201 class 2 whisker test

Polarity: As marked

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER		SYMBOL	V10D170C	UNIT
Device marking code			V10D170C	
Maximum repetitive peak reverse voltage		V_{RRM}	170	V
Maximum average forward rectified current (fig. 1)	per device	$I_{F(AV)}$	10	A
	per diode		5	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	100	A
Operating junction temperature range		T_J (1)	-40 to +175	°C
Storage temperature range		T_{STG}	-55 to +175	°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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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage per diode	I_F = 2.5 A	T_A = 25 °C	V_F (1)	0.75	-	V
	I_F = 5 A			0.82	0.9	
	I_F = 2.5 A	T_A = 125 °C		0.6	-	
	I_F = 5 A			0.67	0.74	
Reverse current at rated V_R per diode	V_R = 140 V	T_A = 25 °C	I_R (2)	0.001	-	mA
		T_A = 125 °C		0.5	-	mA
	V_R = 170 V	T_A = 25 °C		-	0.05	mA
		T_A = 125 °C		1	3	mA
Typical junction capacitance	4.0 V, 1 MHz		C_J	280	-	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 noted)			
PARAMETER	SYMBOL	V10D170C	UNIT
Typical thermal resistance per device	$R_{\theta JC}$ (1)	2.5	°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: $dP_D/dT_J < 1/R_{\theta JA}$ - junction-to-mount

(3) Free air, without heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V10D170C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
V10D170CHM3/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 °C unless otherwise noted)

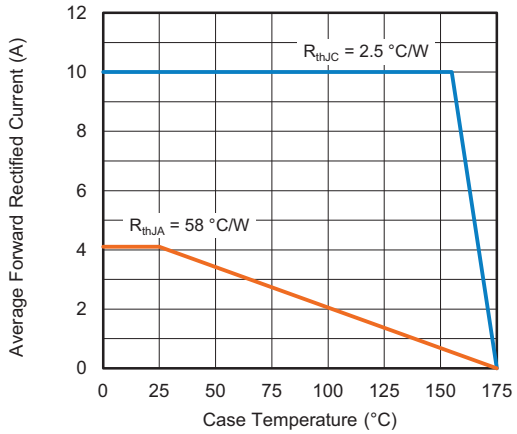

Fig. 1 - Forward Current Derating Curve

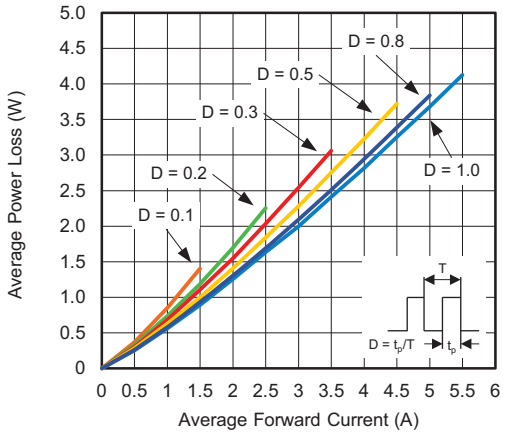

Fig. 2 - Forward Power Loss Characteristics

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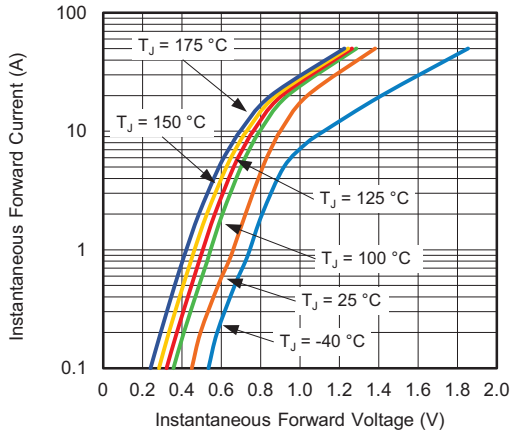

Fig. 3 - Typical Instantaneous Forward Characteristics

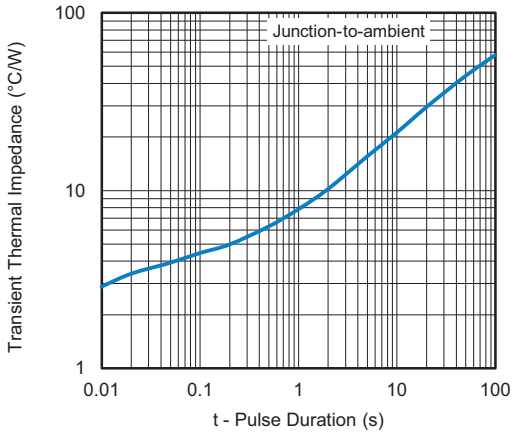

Fig. 6 - Typical Transient Thermal Impedance

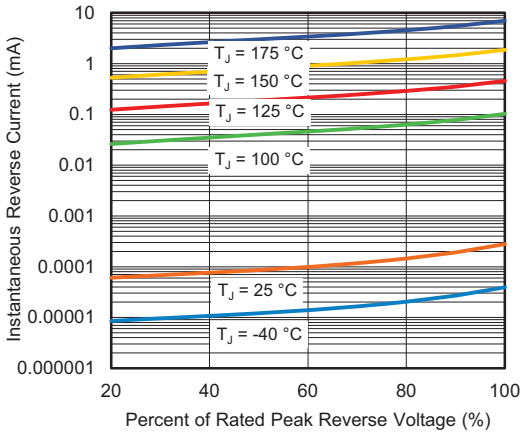

Fig. 4 - Typical Reverse Characteristics

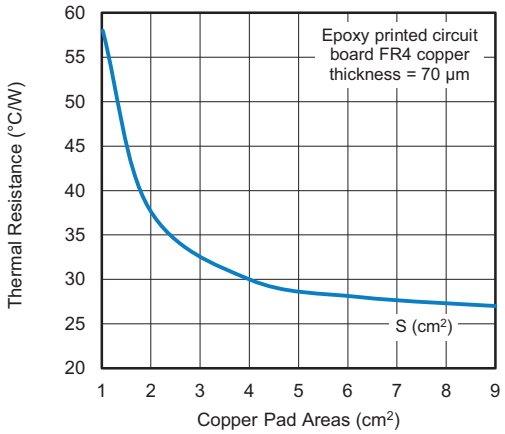

Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

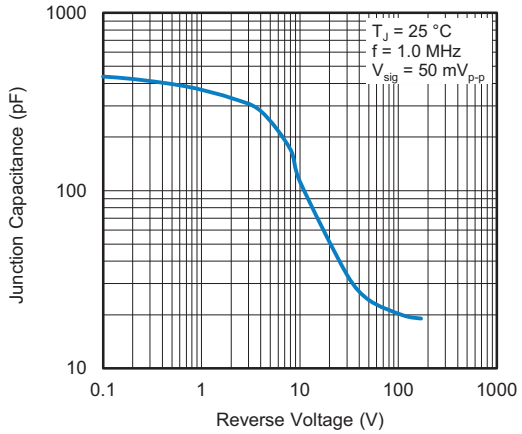

Fig. 5 - Typical Junction Capacitance

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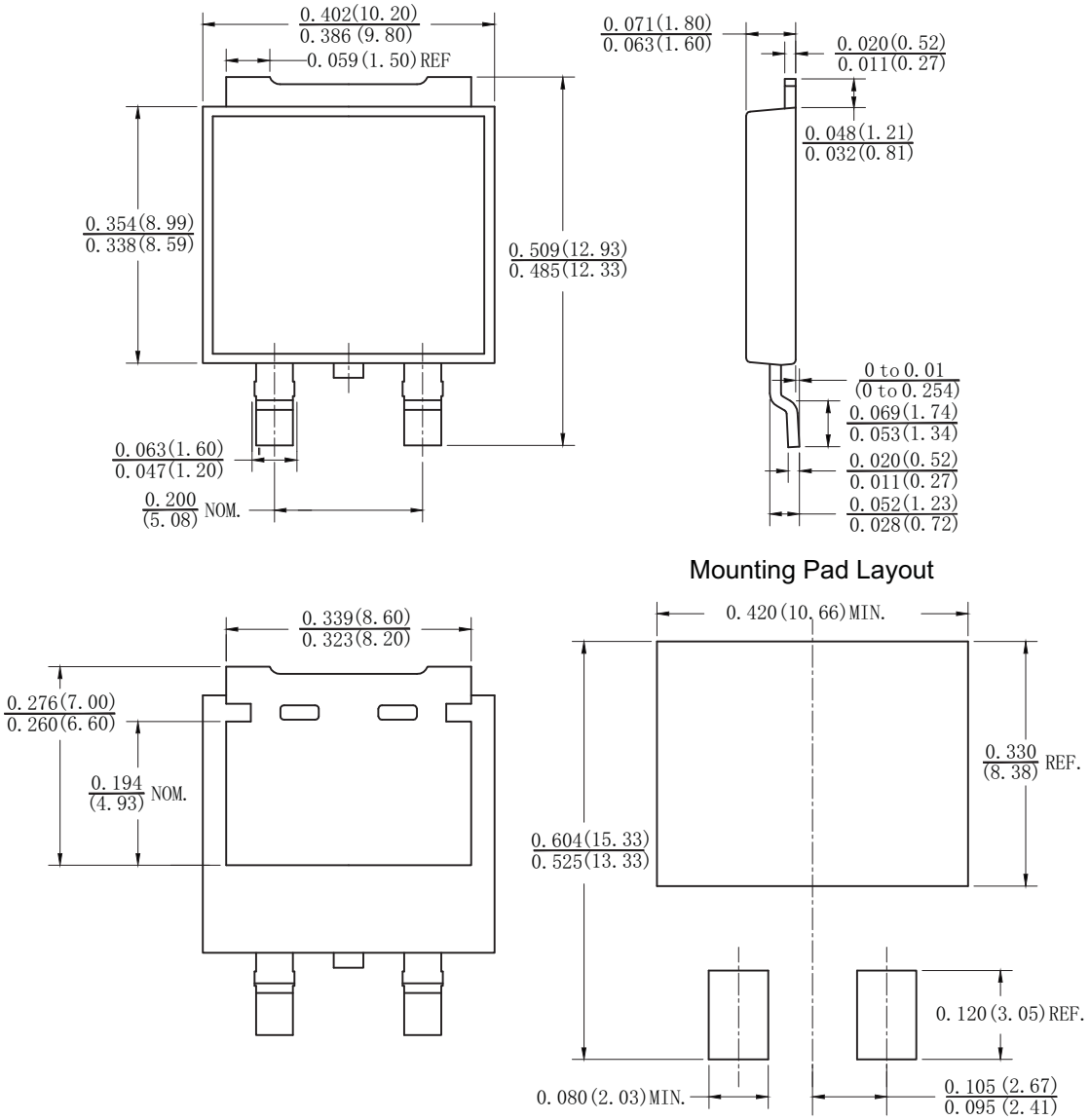
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD (TO-263AC)



Mounting Pad Layout

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