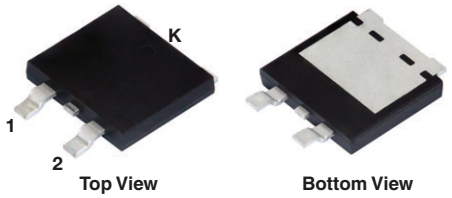
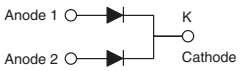
Dual TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.55 V at I_F = 5 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 M3 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

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 10 A
V_{RRM}	120 V
I_{FSM}	120 A
V_F at I_F = 10 A (T_A = 125 °C)	0.65 V
T_J max.	175 °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 meets JESD 201 class 2 whisker test

Polarity: as marked

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

PARAMETER		SYMBOL	V20DM120C	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	120	V
Maximum average forward rectified current (fig. 1)	per device	$I_{F(AV)}$	20	A
	per diode		10	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I_{FSM}	120	A
Voltage rate of change (rated V_R)		dV/dt	10 000	V/µs
Operating junction and storage temperature range		T_J, T_{STG}	-40 to +175	°C

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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 = 5 A	T_A = 25 °C	V_F (1)	0.65	-	V
	I_F = 10 A			0.85	0.93	
	I_F = 5 A	T_A = 125 °C		0.55	-	
	I_F = 10 A			0.65	0.73	
Reverse current at rated V_R per diode	V_R = 90 V	T_A = 25 °C	I_R (2)	23	-	µA
		T_A = 125 °C		1.6	-	mA
	V_R = 120 V	T_A = 25 °C		-	600	µA
		T_A = 125 °C		3	20	mA

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	V20DM120C	UNIT
Typical thermal resistance	per diode	$R_{\theta JC}$	2.8	°C/W
	per device		1.5	
	per device	$R_{\theta JA}$ (1)(2)	48	

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, without heatsink

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SMPD (TO-263AC)	V20DM120C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel
SMPD (TO-263AC)	V20DM120CHM3/I (1)	0.55	I	2000/reel	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 noted)

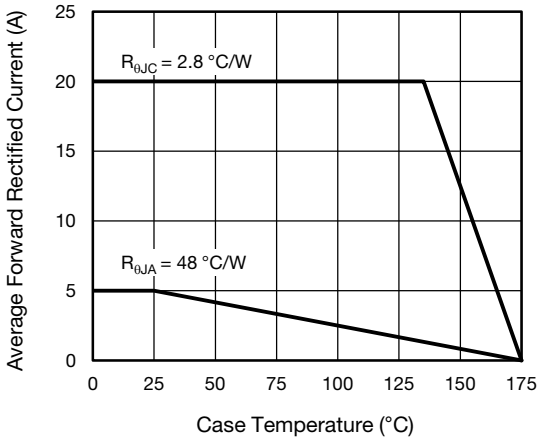


Fig. 1 - Forward Current Derating Curve

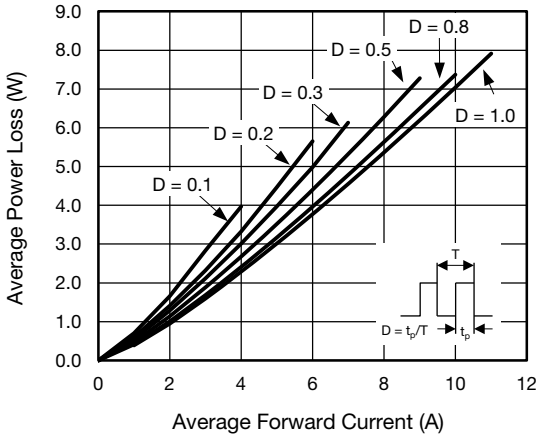


Fig. 2 - Forward Power Loss Characteristics Per Diode

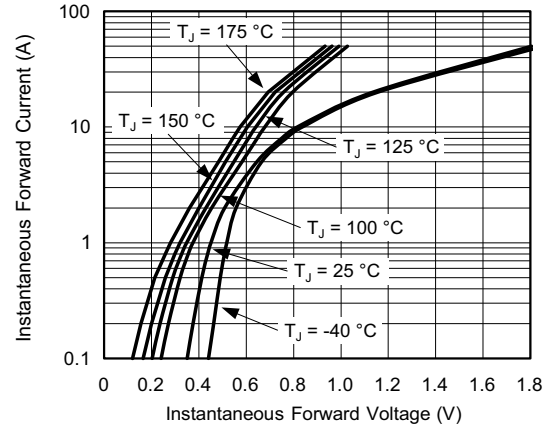


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

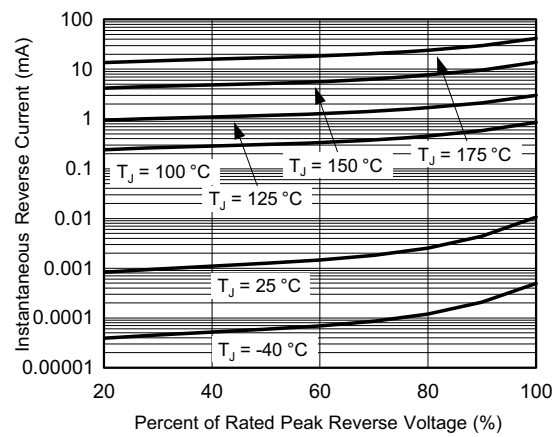


Fig. 4 - Typical Reverse Characteristics Per Diode

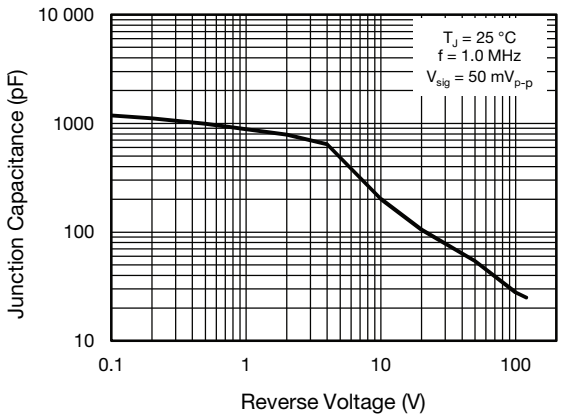


Fig. 5 - Typical Junction Capacitance Per Diode

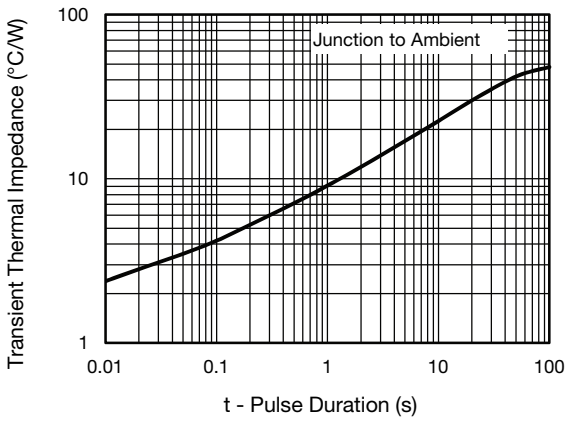


Fig. 6 - Typical Transient Thermal Impedance Per Device

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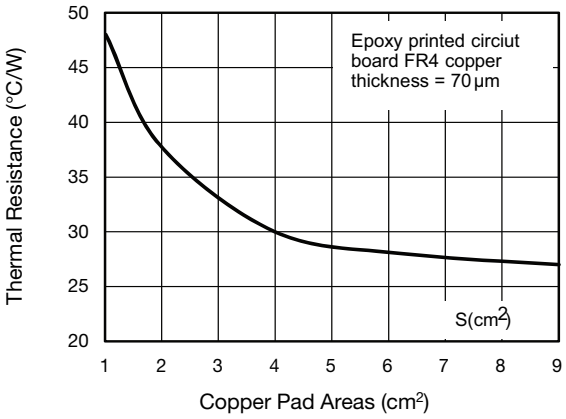
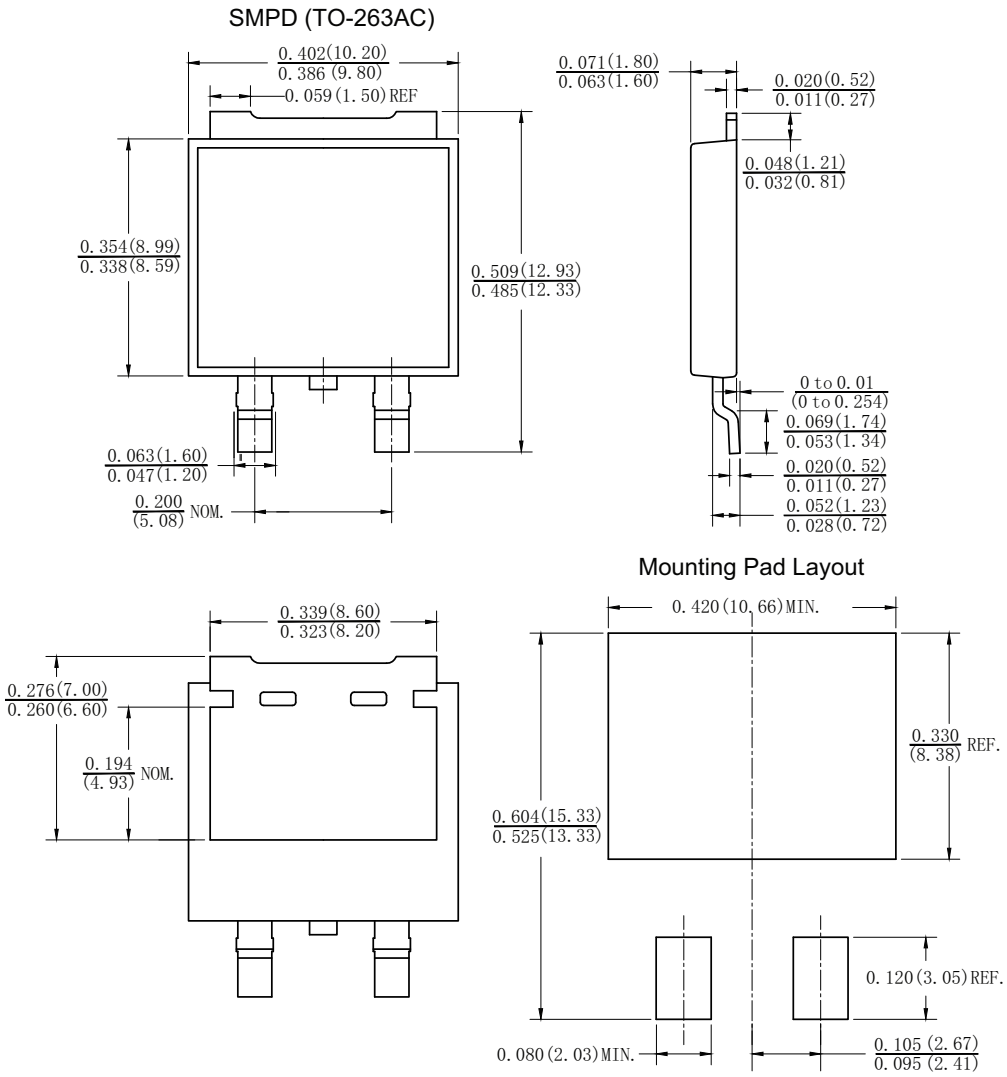


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



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