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

Ultra Low $V_F = 0.30$ V at $I_F = 5.0$ A





ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	2 x 15 A			
V _{RRM}	45 V			
I _{FSM}	200 A			
V _F at I _F = 15 A	0.40 V			
T _J max. 150 °C				
Package	SMPD (TO-263AC)			
Circuit configuration	Common cathode			

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 <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

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

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

("_X" denotes revision code e.g. A, B,....)

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS (T _A = 25 $^{\circ}$ C unless otherwise noted)					
PARAMETER		SYMBOL	V30D45C	UNIT	
Maximum repetitive peak reverse voltage		V _{RRM}	45	V	
Maximum average forward rectified current (fig. 1)	per device	I _{F(AV)}	30	^	
	per diode		15	A	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load		I _{FSM}	200	А	
Operating junction and storage temperature range		T _J , T _{STG}	-40 to +150	°C	

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AUTOMOTIVE GRADE Available



COMPLIANT

HALOGEN

V30D45C



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ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	I _F = 5.0 A	T _A = 25 °C	V _F ⁽¹⁾	0.42	-	V	
	I _F = 7.5 A			0.44	-		
	I _F = 15 A			0.49	0.57		
	I _F = 5.0 A	T _A = 125 °C		0.30	-		
	I _F = 7.5 A			0.33	-		
	I _F = 15 A			0.40	0.48		
Reverse current per diode	V _B = 45 V	T _A = 25 °C	I _R (2)	-	1500	μA	
	$v_{\rm R} = 45 V$	T _A = 125 °C		12	50	mA	

Notes

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

⁽²⁾ Pulse test: pulse width \leq 5 ms

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)					
PARAMETER		SYMBOL	V30D45C	UNIT	
Typical thermal resistance	per diode	R _{θJC}	1.6		
	per device		0.9	°C/W	
	per device	R _{0JA} (1)(2)	45		

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)							
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE			
V30D45C-M3/I	0.55	I	2000/reel	13" diameter plastic tape and reel			
V30D45CHM3_A/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)

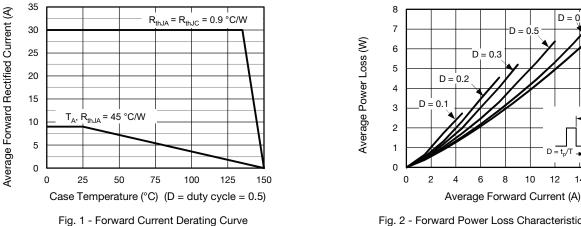


Fig. 2 - Forward Power Loss Characteristics Per Diode

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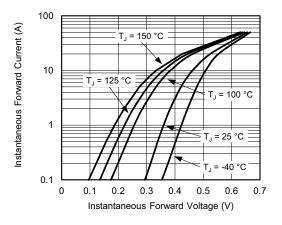
D = 0.8

12 14 16 18

D 1.0

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Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

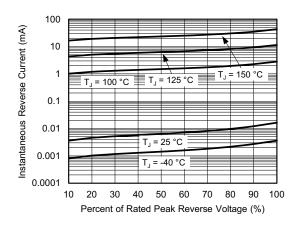


Fig. 4 - Typical Reverse Characteristics Per Diode

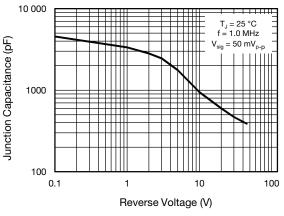


Fig. 5 - Typical Junction Capacitance Per Diode

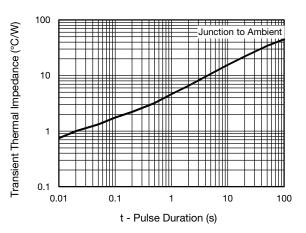


Fig. 6 - Typical Transient Thermal Impedance Per Diode

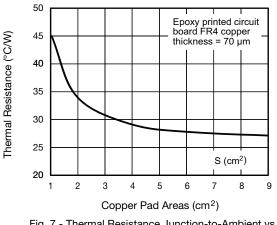


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

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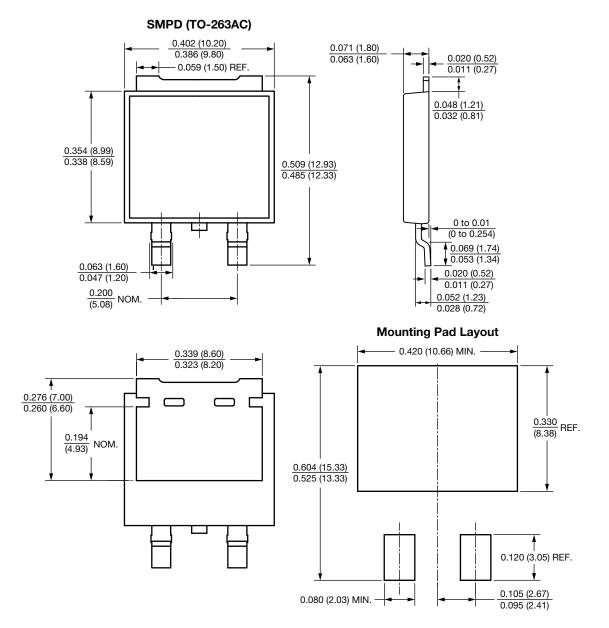
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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