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Vishay Semiconductor/Diodes Division
V20DL45-M3/I

For any questions, you can email us directly:
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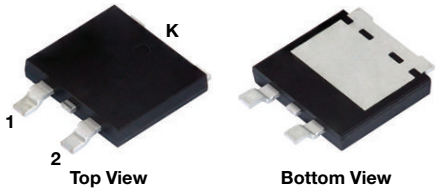
V20DL45-M3, V20DL45HM3

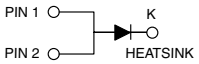
Vishay General Semiconductor

Low-Voltage Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.31 V at I_F = 5 A

TMBS® eSMP® Series
TO-263AC (SMPD)





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/doc?99912

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	
$I_{F(AV)}$	20 A
V_{RRM}	45 V
I_{FSM}	160 A
V_F at I_F = 20 A (T_A = 125 °C)	0.50 V
T_J max.	150 °C
Package	TO-263AC (SMPD)
Diode variations	Single die

MECHANICAL DATA

Case: TO-263AC (SMPD)
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
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 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V20DL45-M3, V20DL45HM3**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	45	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ (1)	20	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	160	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C

Note
(1) With heatsink

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)	0.42	-	V
	I_F = 10 A			0.48	-	
	I_F = 20 A			0.55	0.64	
	I_F = 5 A	T_A = 125 °C		0.31	-	
	I_F = 10 A			0.38	-	
	I_F = 20 A			0.50	0.58	
Reverse current	V_R = 45 V	T_A = 25 °C	I_R (2)	-	2.5	mA
		T_A = 125 °C		20	50	

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	V20DL45-M3, V20DL45HM3	UNIT
Typical thermal resistance	$R_{\theta JC}$	1.6	°C/W
	$R_{\theta JA}$ (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
V20DL45-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel
V20DL45HM3/I (1)	0.54	I	2000/reel	13" diameter plastic tape and reel
V20DL45HM3_A/I (1)	0.54	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)

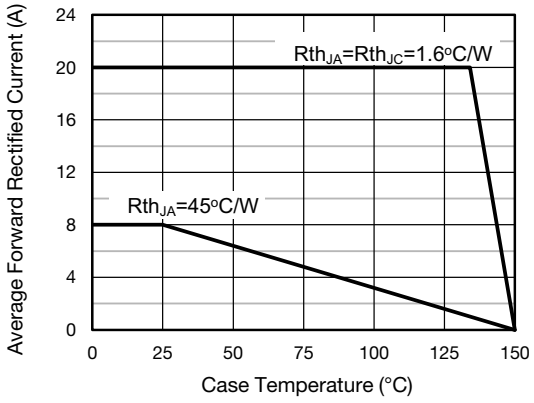


Fig. 1 - Forward Current Derating Curve

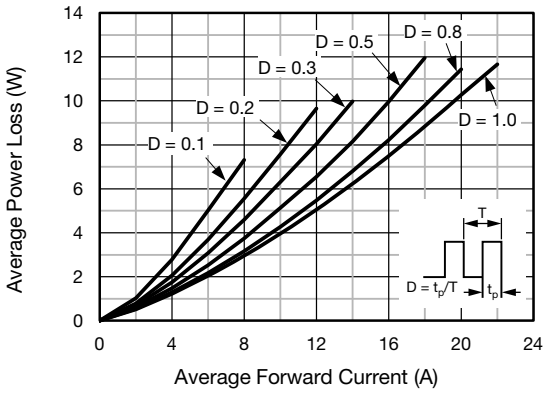


Fig. 2 - Forward Power Loss Characteristics

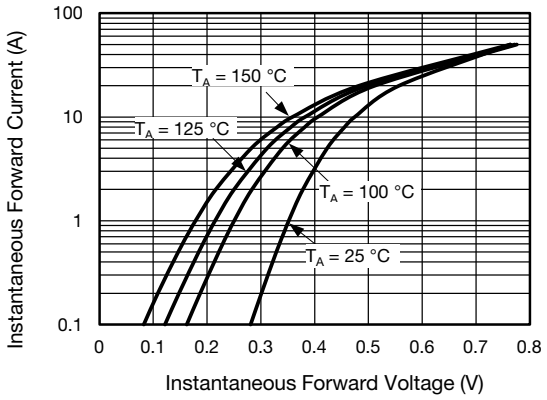


Fig. 3 - Typical Instantaneous Forward Characteristics

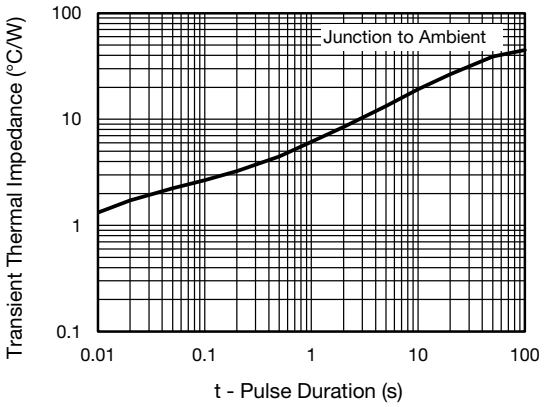


Fig. 6 - Typical Transient Thermal Impedance

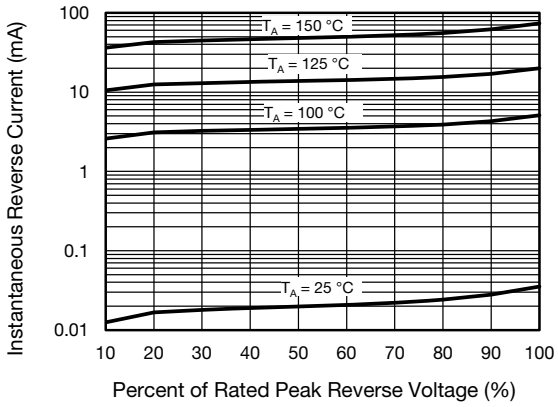


Fig. 4 - Typical Reverse Characteristics

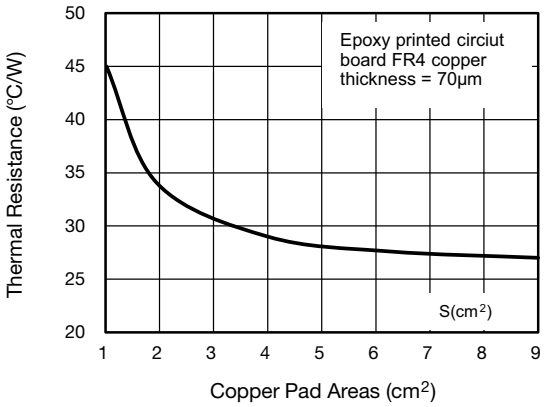


Fig. 7 - Thermal Resistance Junction-to-Ambient vs. Copper Pad Areas

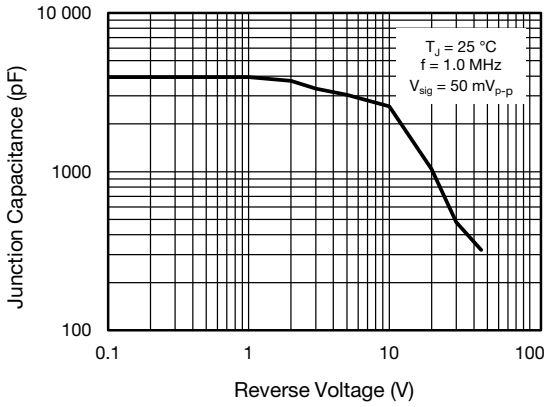
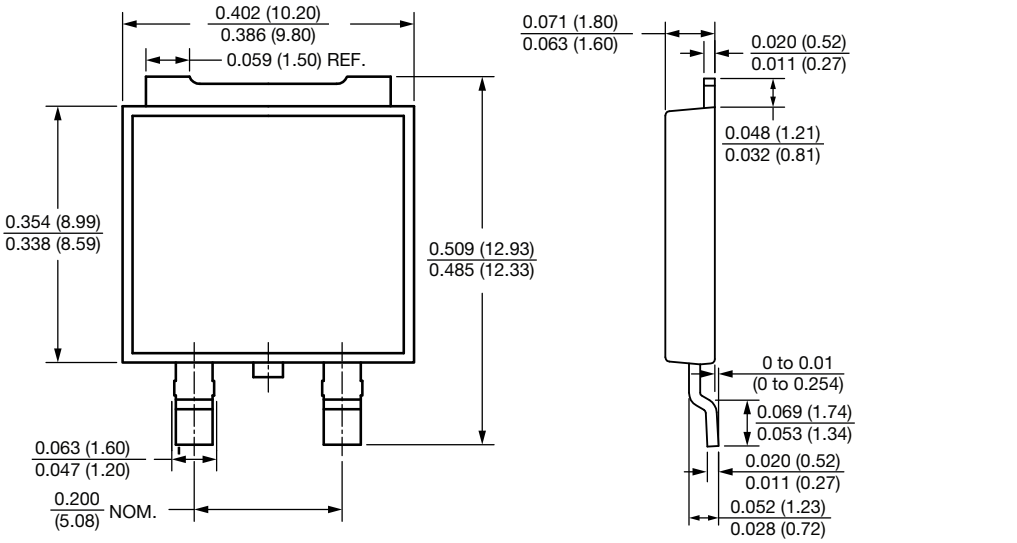


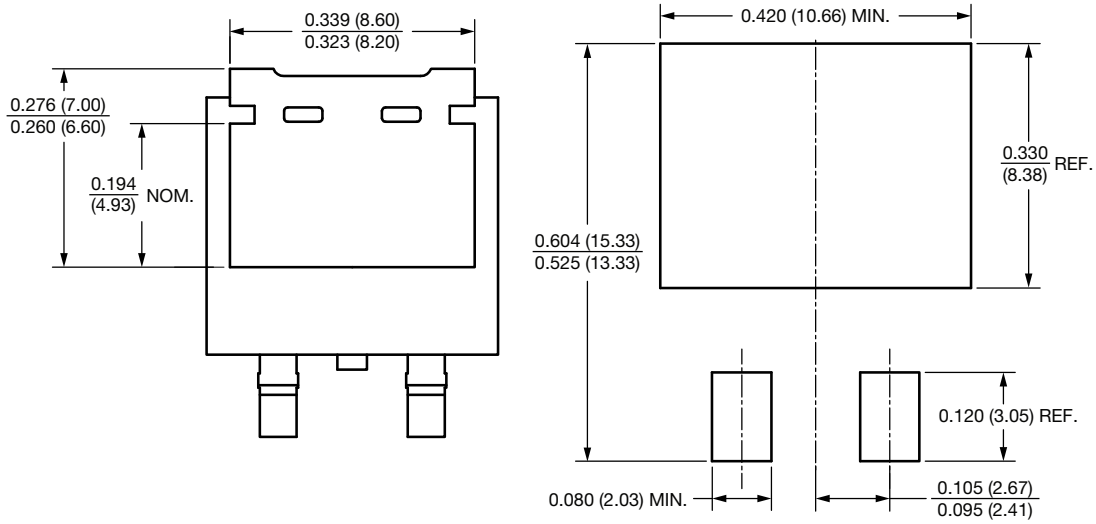
Fig. 5 - Typical Junction Capacitance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-263AC (SMPD)



Mounting Pad Layout



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