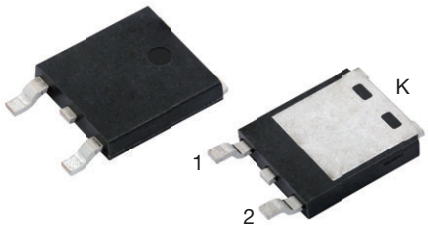
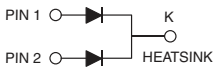
High Current Density Surface Mount Trench MOS Barrier Schottky Rectifier

Ultra Low V_F = 0.44 V at I_F = 5 A

TMBS® eSMP® Series



SlimDPAK



FEATURES

- Very low profile - typical height of 1.3 mm
- Trench MOS Schottky technology
- 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 low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: SlimDPAK
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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	100 V
I_{FSM}	240 A
V_F at I_F = 20 A (T_A = 125 °C)	0.70 V
T_J max.	150 °C
Package	SlimDPAK
Diode variation	Dual common cathode

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)				
PARAMETER		**SYMBOL**	**V40PW10C**	**UNIT**
Device marking code			V40PW10C	
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)	per device	$I_{F(AV)}$ (1)	40	A
	per diode		20	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	240	A
Operating junction and storage temperature range		T_J, T_{STG}	-40 to +150	°C

Note

(1) With infinite heat sink

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 5.0 A	T_A = 25 °C	V_F (1)	0.52	-	V
	I_F = 10 A			0.62	-	
	I_F = 20 A			0.81	0.89	
	I_F = 5.0 A	T_A = 125 °C		0.44	-	
	I_F = 10 A			0.56	-	
	I_F = 20 A			0.70	0.78	
Reverse current	V_R = 70 V	T_A = 25 °C	I_R (2)	0.01	-	mA
		T_A = 125 °C		8.0	-	
	V_R = 100 V	T_A = 25 °C		-	0.5	
		T_A = 125 °C		16	35	
Typical junction capacitance	4.0 V, 1 MHz		C_J	1470	-	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**	**V40PW10C**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	55	°C/W
	$R_{\theta JM}$ (3)	1.5	

Notes

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

(2) Free air, mounted on recommended copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient

(3) Mounted on infinite heat sink; thermal resistance $R_{\theta JM}$ - junction-to-mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V40PW10C-M3/I	0.20	I	4500	13" diameter plastic tape and reel
V40PW10CHM3/I (1)	0.20	I	4500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

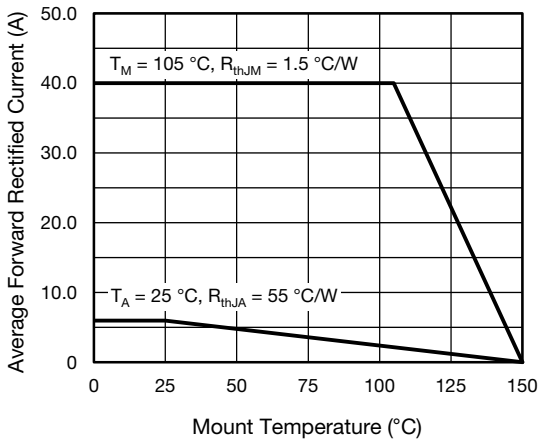


Fig. 1 - Maximum Forward Current Derating Curve

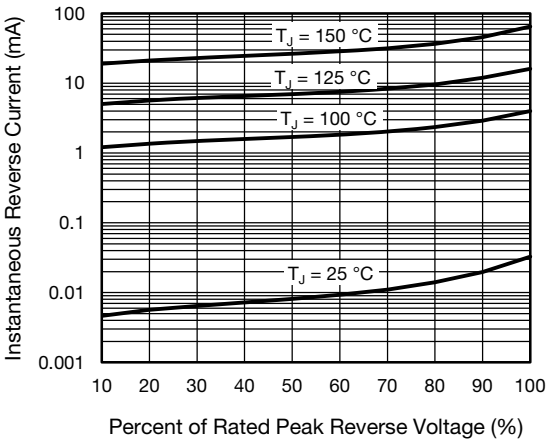


Fig. 4 - Typical Reverse Leakage Characteristics

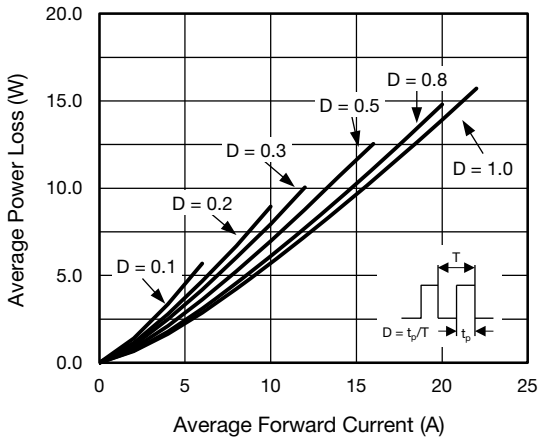


Fig. 2 - Forward Power Loss Characteristics

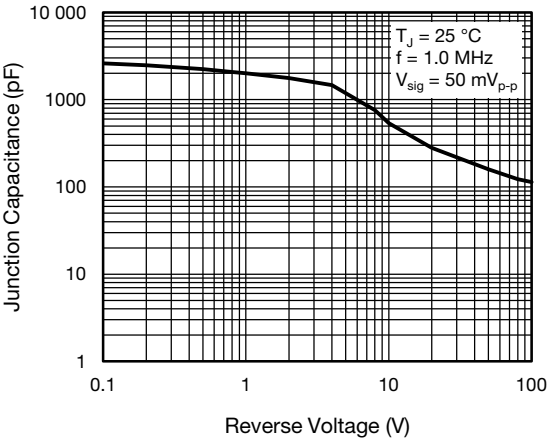


Fig. 5 - Typical Junction Capacitance

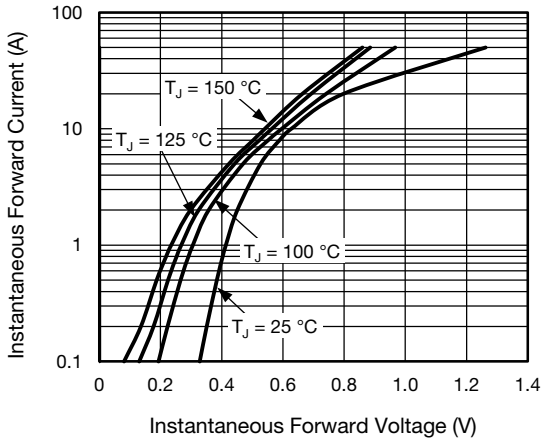


Fig. 3 - Typical Instantaneous Forward Characteristics

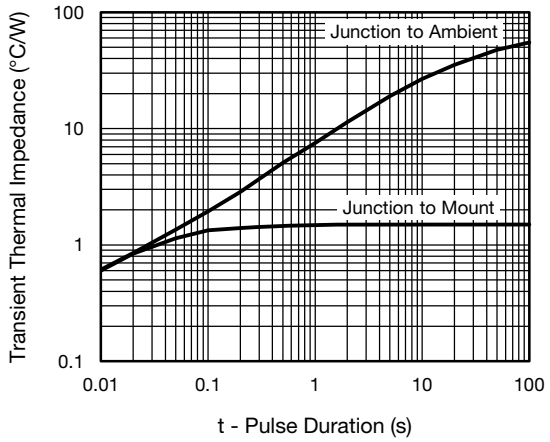


Fig. 6 - Typical Transient Thermal Impedance

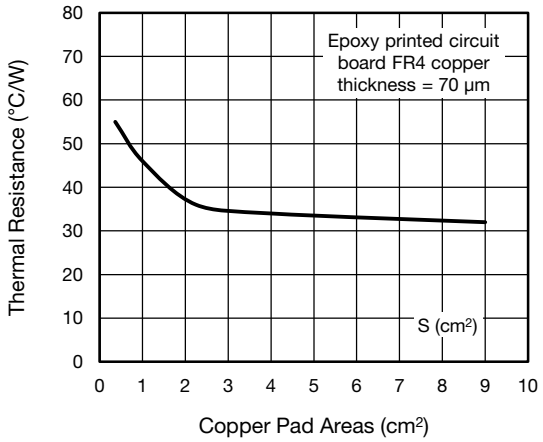
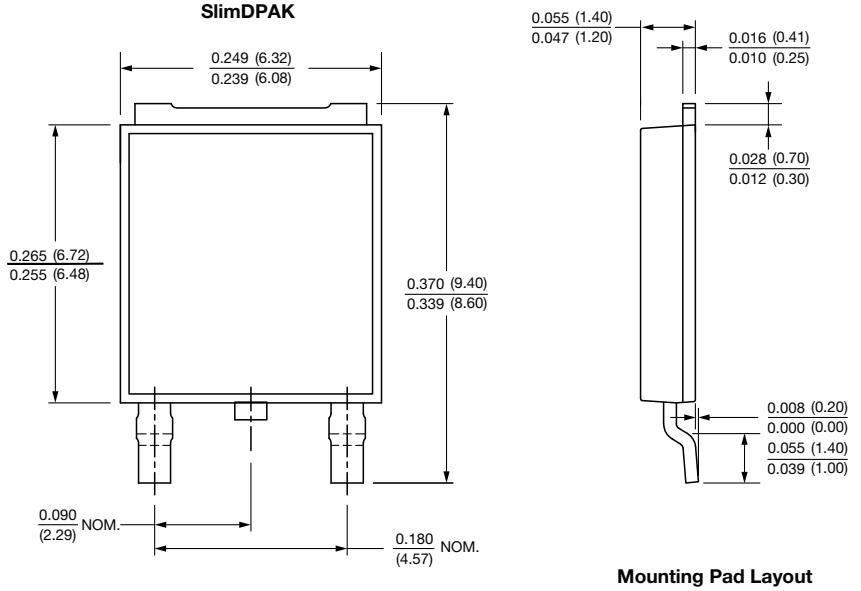


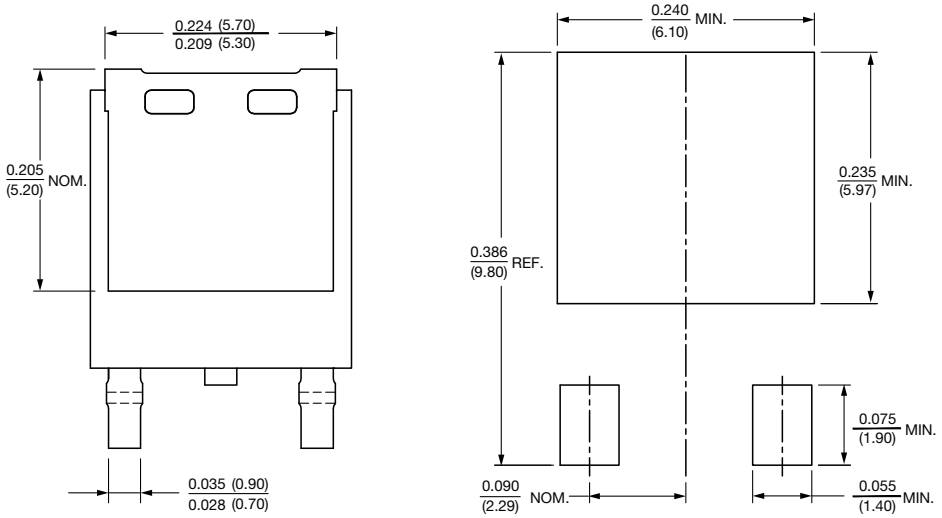
Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SlimDPAK



Mounting Pad Layout



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