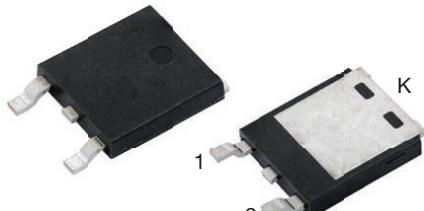


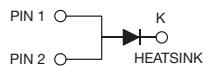
High Current Density Surface-Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low $V_F = 0.49$ V at $I_F = 5$ A

eSMP® Series



SlimDPAK (TO-252AE)



LINKS TO ADDITIONAL RESOURCES



AUTOMOTIVE GRADE
Available



RoHS
COMPLIANT
HALOGEN
FREE

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

TYPICAL APPLICATIONS

For use in low voltage high frequency DC/DC converters, freewheeling diodes, and polarity protection applications.

MECHANICAL DATA

Case: SlimDPAK (TO-252AE)

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	120 V
I_{FSM}	200 A
V_F at $I_F = 20$ A ($T_A = 125$ °C)	0.72 V
T_J max.	150 °C
Package	SlimDPAK (TO-252AE)
Circuit configuration	Single

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	V20PW12	UNIT
Device marking code		V20PW12	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$ ⁽¹⁾	20	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Operating junction temperature range	T_J ⁽²⁾	-40 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Notes

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

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Maximum Instantaneous forward voltage	$I_F = 5.0 \text{ A}$	$T_A = 25^\circ\text{C}$	0.54	-	V
	$I_F = 10 \text{ A}$		0.68	-	
	$I_F = 20 \text{ A}$		0.94	1.02	
	$I_F = 5.0 \text{ A}$	$T_A = 125^\circ\text{C}$	0.49	-	
	$I_F = 10 \text{ A}$		0.60	-	
	$I_F = 20 \text{ A}$		0.72	0.80	
Reverse current	$V_R = 90 \text{ V}$	$T_A = 25^\circ\text{C}$	0.05	-	mA
		$T_A = 125^\circ\text{C}$	8	-	
	$V_R = 120 \text{ V}$	$T_A = 25^\circ\text{C}$	-	0.8	
		$T_A = 125^\circ\text{C}$	16	40	
Typical junction capacitance	4.0 V, 1 MHz	C_J	1350	-	pF

Notes

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

(2) Pulse test: pulse width $\leq 5 \text{ ms}$

 THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	V20PW12	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	55	°C/W
	$R_{\theta JM}$ (3)	2.0	

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
V20PW12-M3/I	0.20	I	4500	13" diameter plastic tape and reel
V20PW12HM3/I ⁽¹⁾	0.20	I	4500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

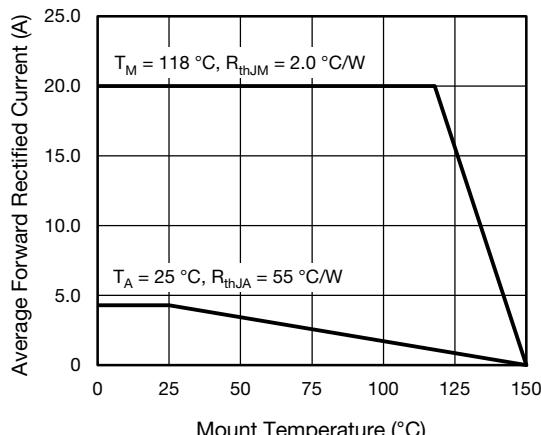
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

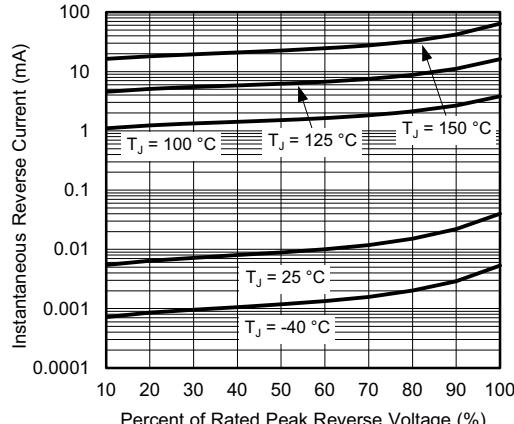


Fig. 4 - Typical Reverse Leakage Characteristics

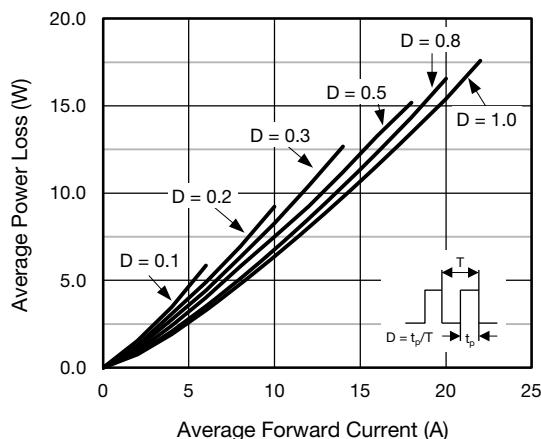


Fig. 2 - Forward Power Loss Characteristics

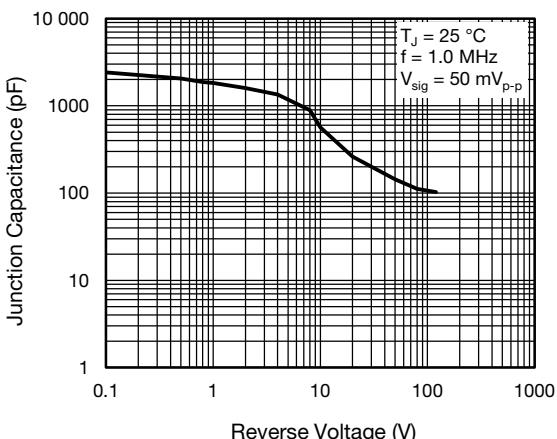


Fig. 5 - Typical Junction Capacitance

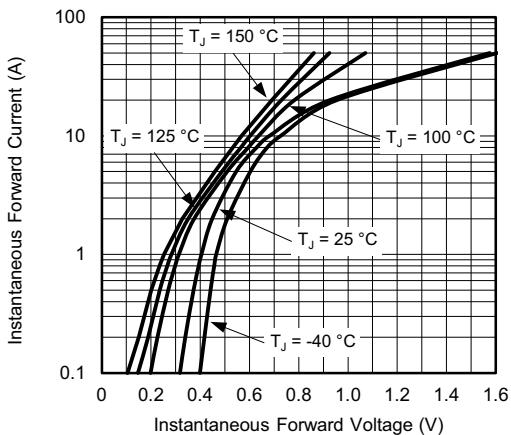


Fig. 3 - Typical Instantaneous Forward Characteristics

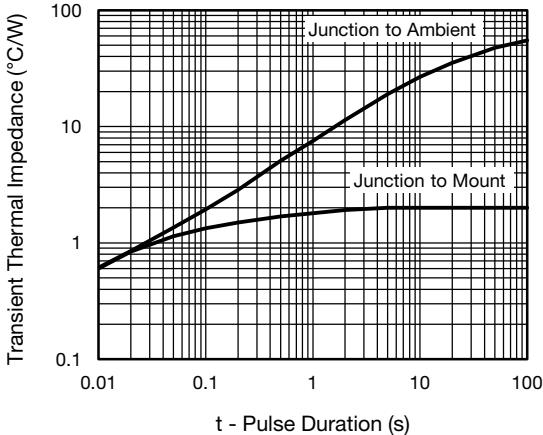


Fig. 6 - Typical Transient Thermal Impedance

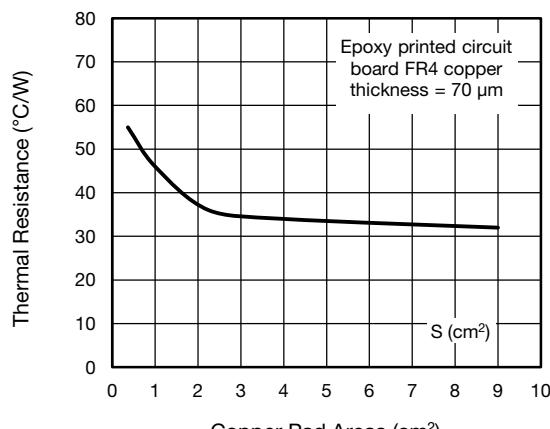
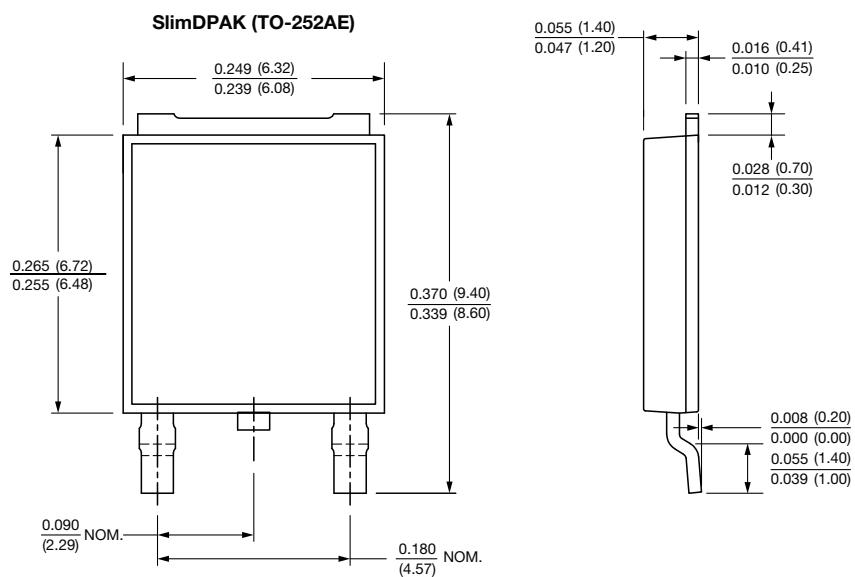
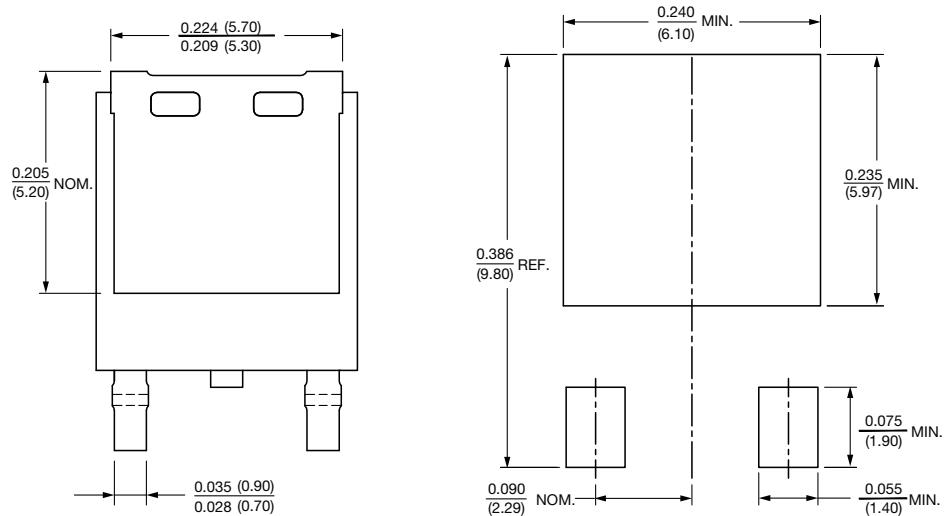


Fig. 7 - Typical Resistance Junction to Ambient vs. Copper Pad Areas

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Mounting Pad Layout



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