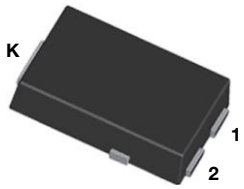
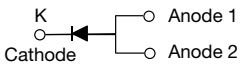
High Current Density Surface Mount TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.28 V at I_F = 5 A

eSMP® Series



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	15 A
V_{RRM}	50 V
I_{FSM}	200 A
V_F at I_F = 15 A (T_A = 125 °C)	0.40 V
T_J max.	150 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

FEATURES

RoHS COMPLIANT
HALOGEN FREE

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Trench MOS Schottky technology
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- 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, and polarity protection applications.

MECHANICAL DATA

Case: SMPC (TO-277A)
Molding compound meets UL 94 V-0 flammability rating Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102
M3 suffix meets JESD 201 class 2 whisker test

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)			
PARAMETER	**SYMBOL**	**V15PL50**	**UNIT**
Device marking code		15L5	
Maximum repetitive peak reverse voltage	V_{RRM}	50	V
Maximum average forward rectified current (fig. 1)	I_F (1)	15	A
	I_F (2)	6.0	
Maximum DC reverse voltage	V_{DC}	35	V
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	200	A
Operating junction and storage temperature range	T_J, T_{STG}	-40 to +150	°C

Notes
(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
(2) Free air, mounted on recommended copper pad area

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)	0.40	-	V
	I_F = 7.5 A			0.42	-	
	I_F = 15 A			0.49	0.57	
	I_F = 5.0 A	T_A = 125 °C		0.28	-	
	I_F = 7.5 A			0.31	-	
	I_F = 15 A			0.40	0.48	
Reverse current	V_R = 35 V	T_A = 25 °C	I_R (2)	35	-	µA
		T_A = 125 °C		20	-	mA
	V_R = 50 V	T_A = 25 °C		-	800	µA
		T_A = 125 °C		35	80	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**	**V15PL50**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	70	°C/W
	$R_{\theta JM}$ (3)	4	

Notes

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

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

(3) Mounted on 30 mm x 30 mm 2 oz. pad PCB; thermal resistance $R_{\theta JM}$ - junction to mount measured at cathode side

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
V15PL50-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
V15PL50-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel

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

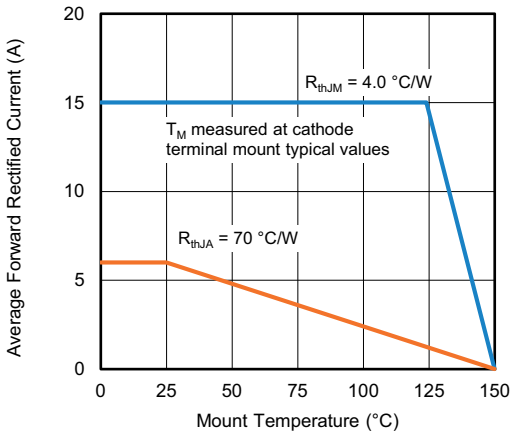


Fig. 1 - Maximum Forward Current Derating Curve

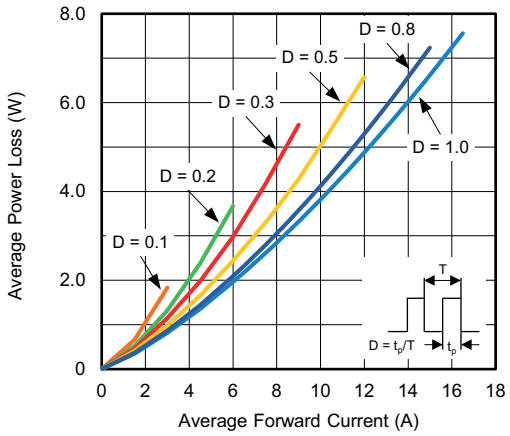


Fig. 2 - Forward Power Loss Characteristics

Notes

(1) Mounted on 30 mm x 30 mm aluminum PCB; T_M measured at the terminal of cathode band ($R_{\theta JM}$ = 4 °C/W)

(2) Free air, mounted on recommended copper pad area ($R_{\theta JA}$ = 70 °C/W)

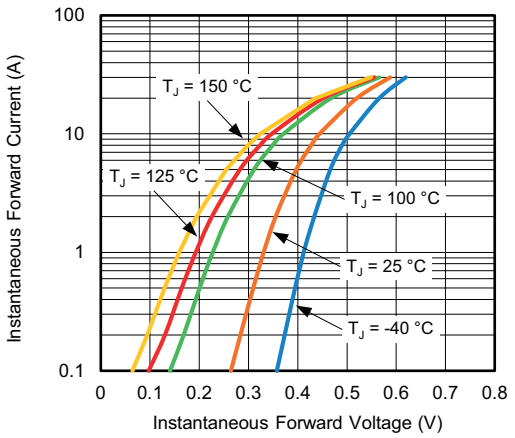


Fig. 3 - Typical Instantaneous Forward Characteristics

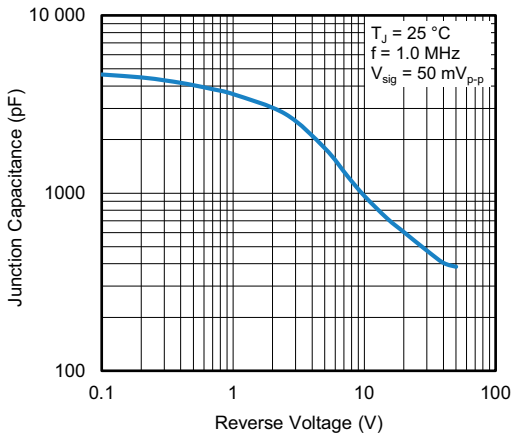


Fig. 5 - Typical Junction Capacitance

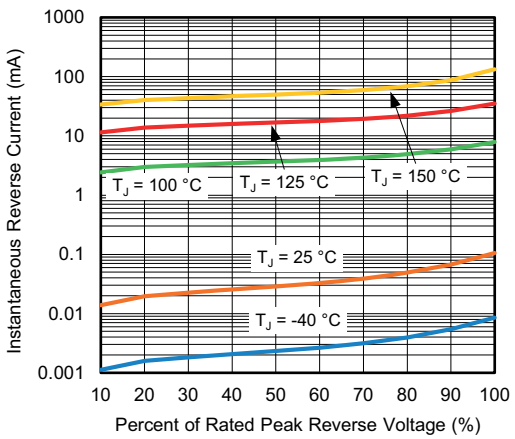


Fig. 4 - Typical Reverse Leakage Characteristics

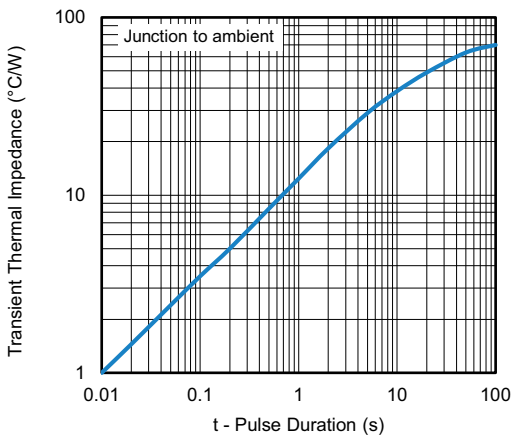
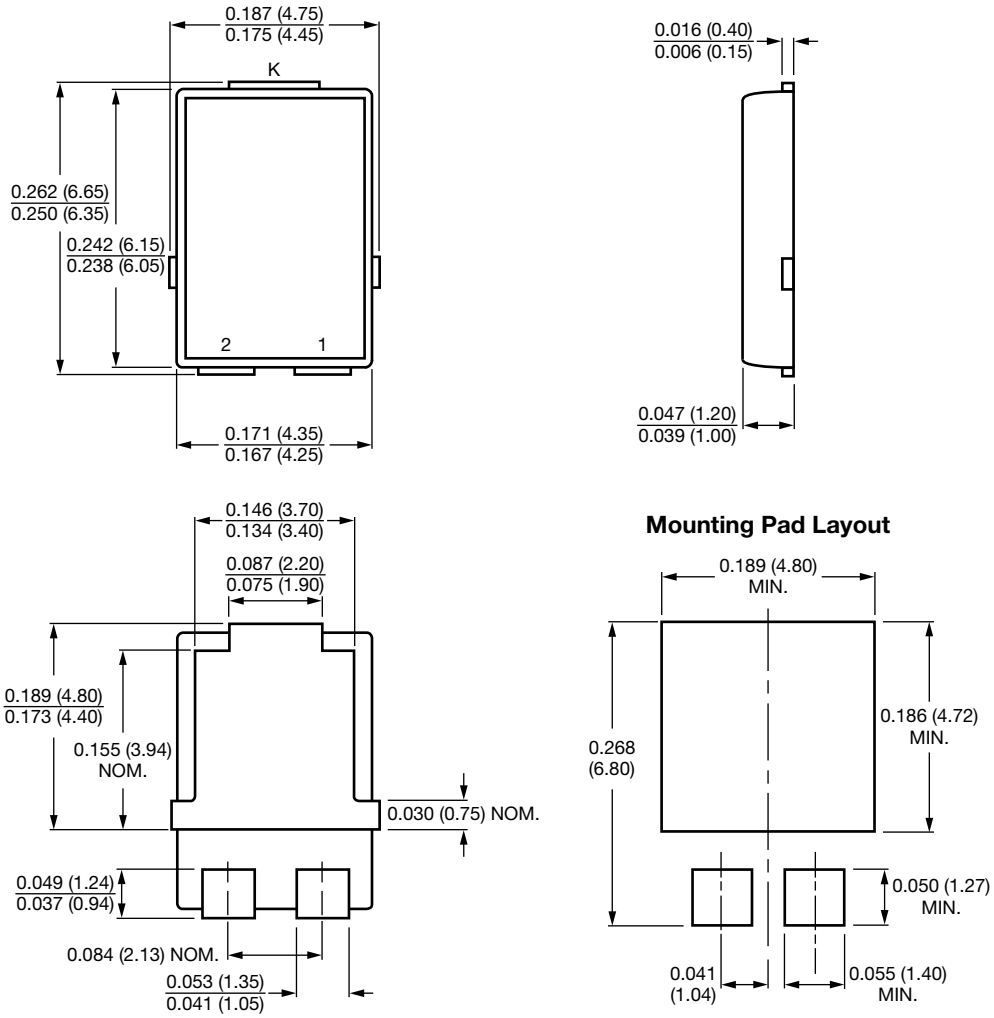


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPC (TO-277A)



Conform to JEDEC® TO-277A

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