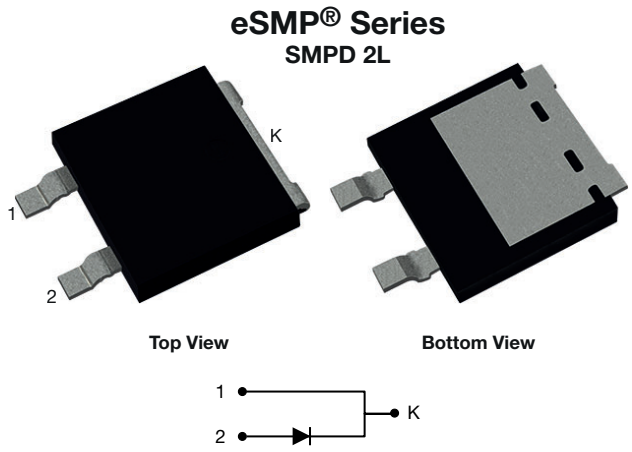
Surface-Mount Low V_F Standard Rectifiers



FEATURES

- Creepage and clearance distance 3.6 mm minimum
- Very low profile - typical height of 1.7 mm
- Low forward voltage drop
- Ideal for automated placement
- Oxide planar chip junction
- AEC-Q101 qualified available
- 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

AUTOMOTIVE GRADE

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

Ultra Librarian EDA / CAD

TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive on board charger (OBC) applications.

MECHANICAL DATA

Case: SMPD 2L

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

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

M3 and HM3 suffix meet JESD 201 class 2 whisker test

Polarity: as marked

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
V_{RRM}	400 V, 600 V
I_{FSM}	165 A
V_F at I_F = 12 A (T_J = 125 °C)	0.83 V
T_J max.	175 °C
Package	SMPD 2L
Circuit configuration	Single

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	SE12DTLG	SE12DTLJ	UNIT
Device marking code		SE12DTLG	SE12DTLJ	
Maximum repetitive peak reverse voltage	V_{RRM}	400	600	V
Maximum DC forward current	I_F (1)	12		A
	I_F (2)	3.6		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I_{FSM}	165		A
Operating junction and storage temperature range	T_J, T_{STG} (3)	-55 to +175		°C

Notes

(1) Mounted on infinite heatsink

(2) Free air, mounted on recommended copper pad area

(3) The heat generated must be less than the thermal conductivity from junction to ambient $dP_D/dT_J < R_{thJA}$

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ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I_F = 6 A	T_J = 25 °C	V_F (1)	0.86	-	V
	I_F = 12 A			0.93	1	
	I_F = 6 A	T_J = 125 °C		0.72	-	
	I_F = 12 A			0.83	0.9	
Reverse current	Rated V_R	T_J = 25 °C	I_R (2)	-	5	µA
		T_J = 125 °C		12	70	
Typical reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	300	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C_J	96	-	pF

Notes

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

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °c unless otherwise noted)				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	57	71	°C/W
	$R_{\theta JM}$ (3)	1.5	1.8	

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, mounted on recommended PCB, 2 oz. pad area; thermal resistance $R_{\theta JA}$ - junction to ambient to follow JEDEC® 51-2A

(3) Mounted on infinite heatsink thermal resistance R_{thJM} - junction to mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE12DTLJ-M3/I	0.51	I	2000/reel	13" diameter plastic tape and reel
SE12DTLJHM3/I (1)	0.51	I	2000/reel	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

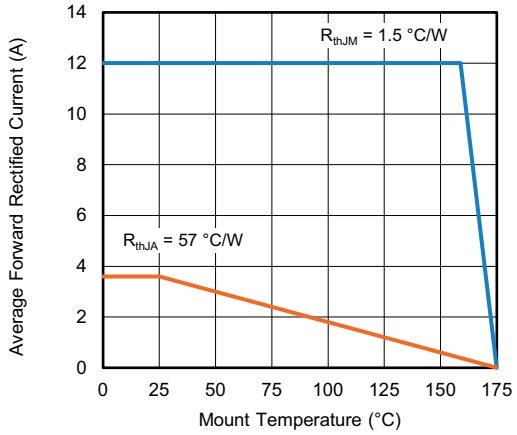

Fig. 1 - Forward Current Derating Curve

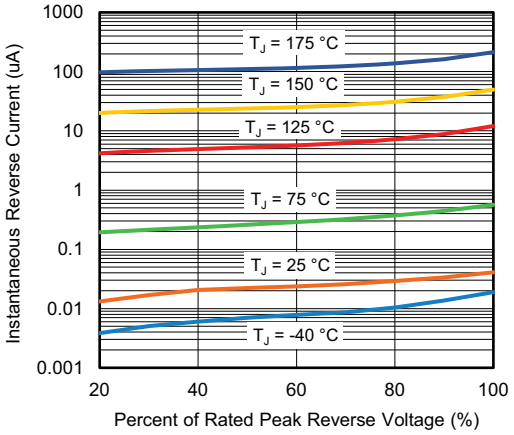

Fig. 4 - Typical Reverse Leakage Characteristics

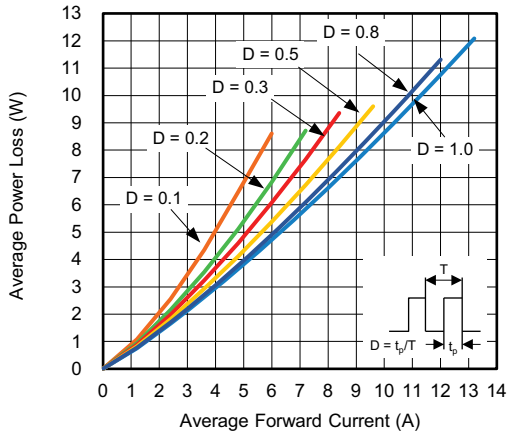

Fig. 2 - Forward Power Loss Characteristics

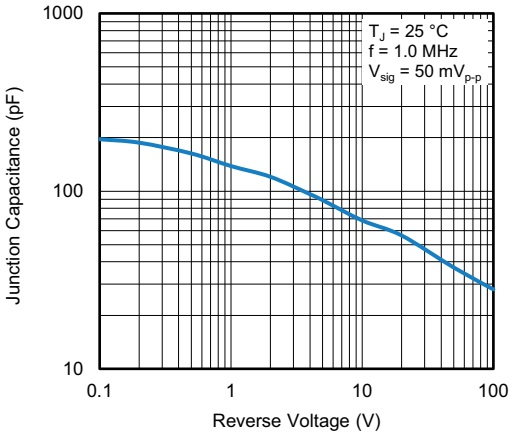

Fig. 5 - Typical Junction Capacitance

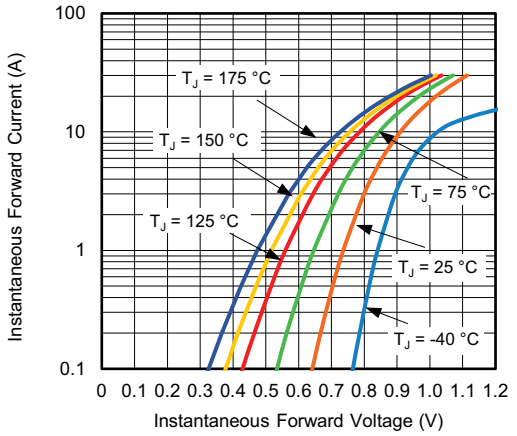

Fig. 3 - Typical Instantaneous Forward Characteristics

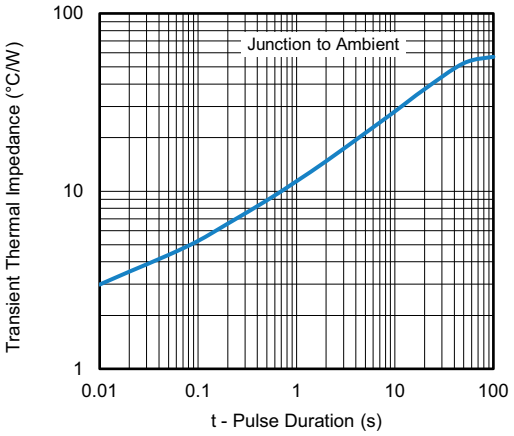

Fig. 6 - Typical Transient Thermal Impedance

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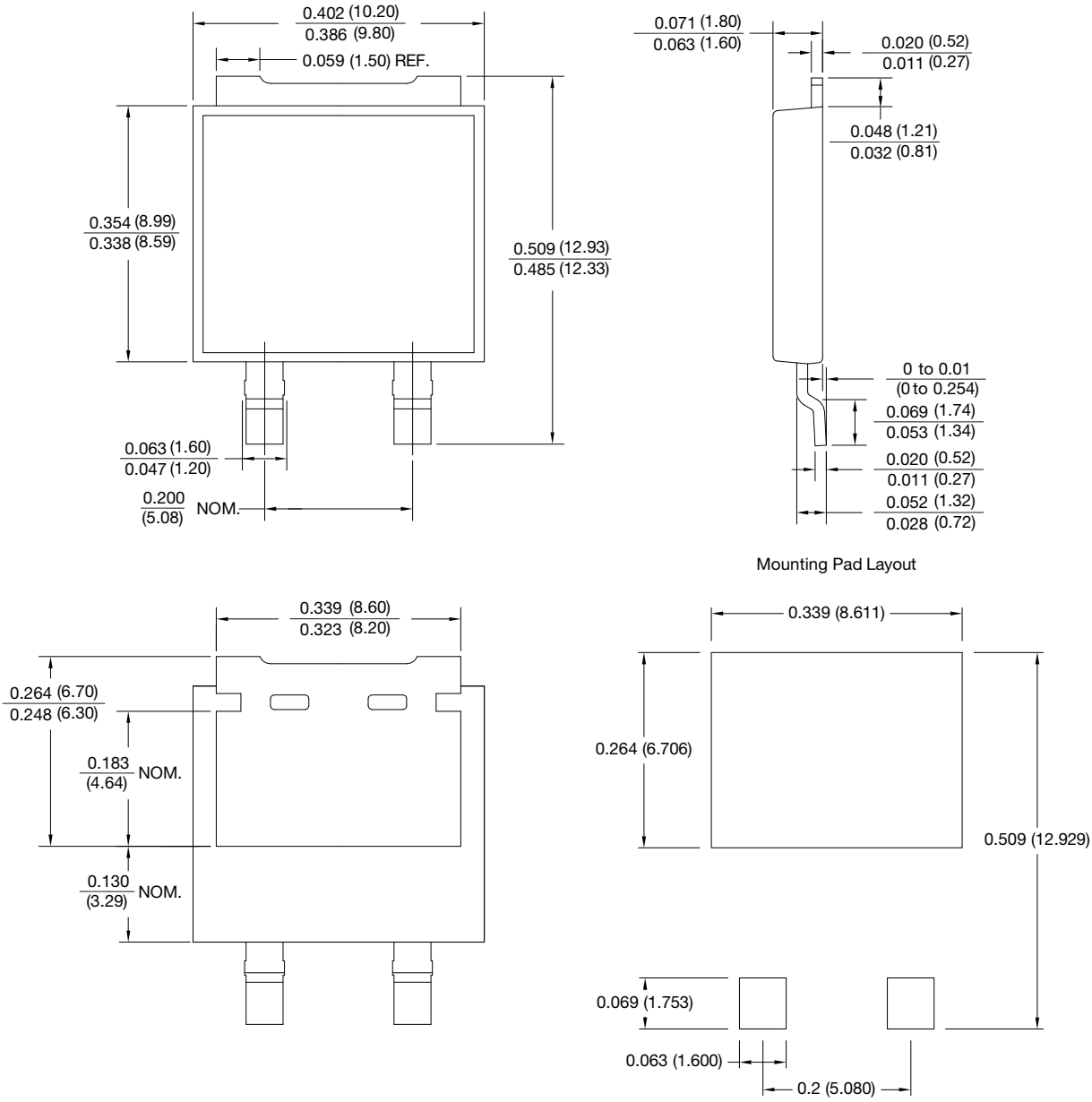
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD 2L



Mounting Pad Layout

Note

- The suggested mounting pad layout is provided for reference only, as actual pad layouts may vary depending on application

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