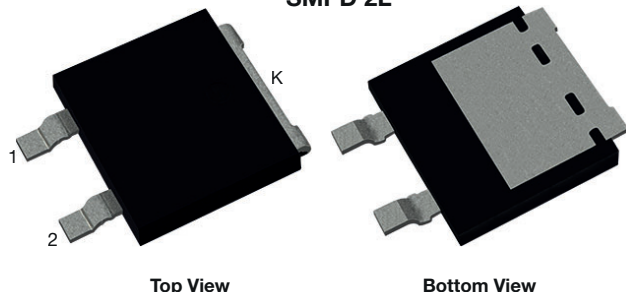


## Surface-Mount ESD Capability Rectifiers

### eSMP® Series SMPD 2L



### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
$V_{RRM}$	400 V, 600 V
$I_{FSM}$	125 A
$V_F$ at $I_F = 12$ A ( $T_J = 125$ °C)	0.96 V
$I_R$	20 $\mu$ A
$T_J$ max.	175 °C
Package	SMPD 2L
Circuit configuration	Single

### FEATURES

- Creepage and clearance distance 3.6 mm minimum
- Very low profile - typical height of 1.7 mm
- Ideal for automated placement
- Oxide planar chip junction
- Low forward voltage drop
- ESD capability
- AEC-Q101 qualified available
- Meets MSL level 1, per J-STD-020, LF maximum peak 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



### 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 suffix meets JESD 201 class 2 whisker test, HM3 suffix meets JESD 201 class 2 whisker test

**Polarity:** as marked

MAXIMUM RATINGS (T <sub>J</sub> = 25 °C unless otherwise noted)				
PARAMETER	SYMBOL	SE12DTG	SE12DTJ	UNIT
Device code		SE12DTG	SE12DTJ	
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	400	600	V
Maximum DC forward current	I <sub>F</sub> <sup>(1)</sup>	12		A
	I <sub>F</sub> <sup>(2)</sup>	3.2		
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	125		A
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175		°C

### Notes

(1) With heatsink

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



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 6 A	T <sub>J</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.95	-	V
	I <sub>F</sub> = 12 A			1.04	1.15	
	I <sub>F</sub> = 6 A	T <sub>J</sub> = 125 °C		0.85	-	
	I <sub>F</sub> = 12 A			0.96	1.10	
Reverse current	Rated V <sub>R</sub>	T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	20	μA
		T <sub>J</sub> = 125 °C		27	150	
Typical reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	3000	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	90	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Thermal resistance	$R_{\theta JA}^{(1)(2)}$	60	75	$^{\circ}\text{C/W}$
	$R_{\theta JC}^{(3)}$	1.6	2	

**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) Thermal resistance junction-to-ambient to follow JEDEC® 51-2A, device mounted on FR4 PCB, 2 oz., standard footprint

(3) Thermal resistance junction-to-mount to follow JEDEC® 51-14 transient dual interface test method (TDIM)

IMMUNITY TO ELECTRICAL STATIC DISCHARGE TO THE FOLLOWING STANDARDS ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
STANDARD	TEST TYPE	TEST CONDITIONS	SYMBOL	CLASS	VALUE
AEC-Q101-001	Human body model (contact mode)	$C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$	$V_C$	H3B	$> 8\text{ kV}$

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE12DTJ-M3/I	0.52	I	2000 / reel	13" diameter plastic tape and reel
SE12DTJHM3/I <sup>(1)</sup>	0.52	I	2000 / reel	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified



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

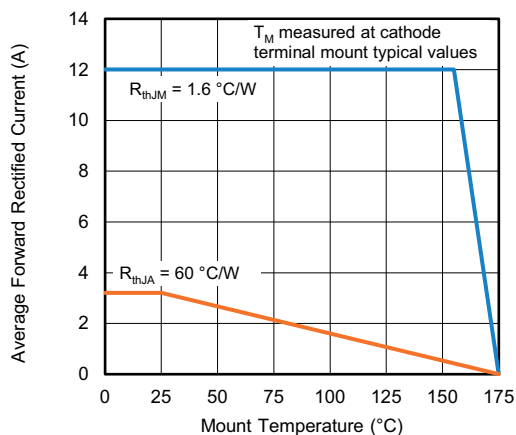


Fig. 1 - Forward Current Derating Curve

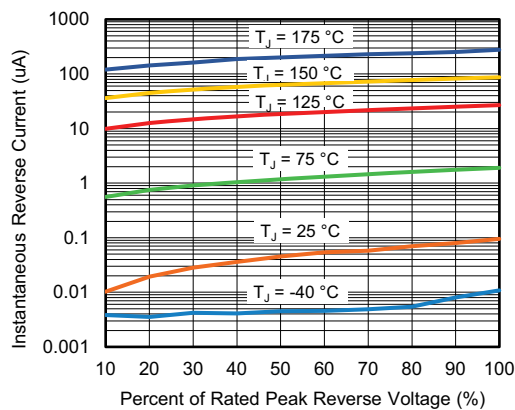


Fig. 4 - Typical Reverse Leakage Characteristics

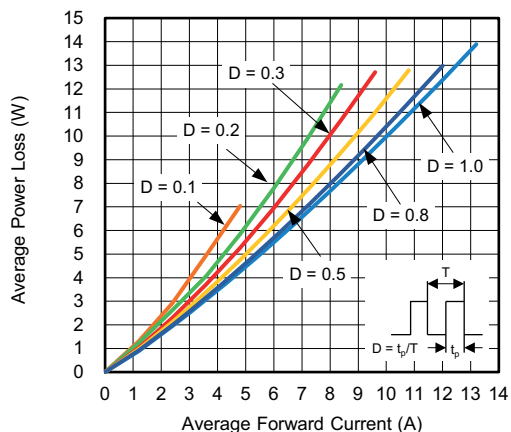


Fig. 2 - Forward Power Loss Characteristics

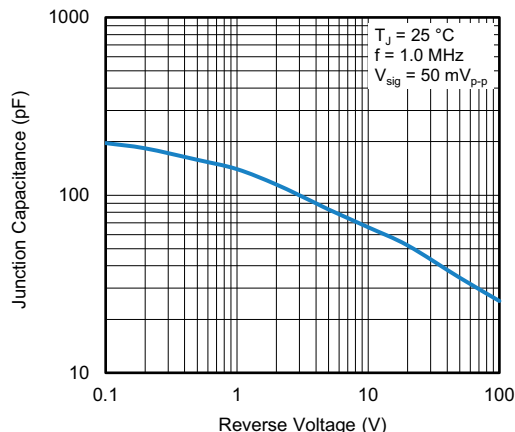


Fig. 5 - Typical Junction Capacitance

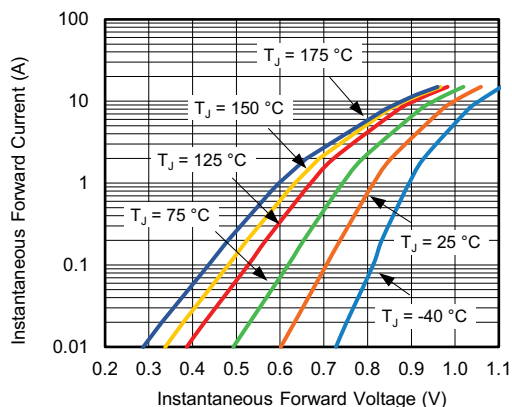


Fig. 3 - Typical Instantaneous Forward Characteristics

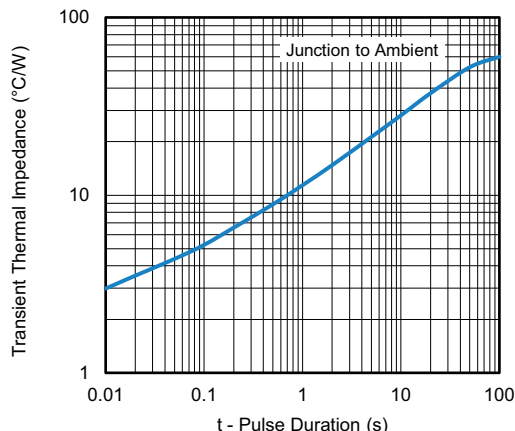
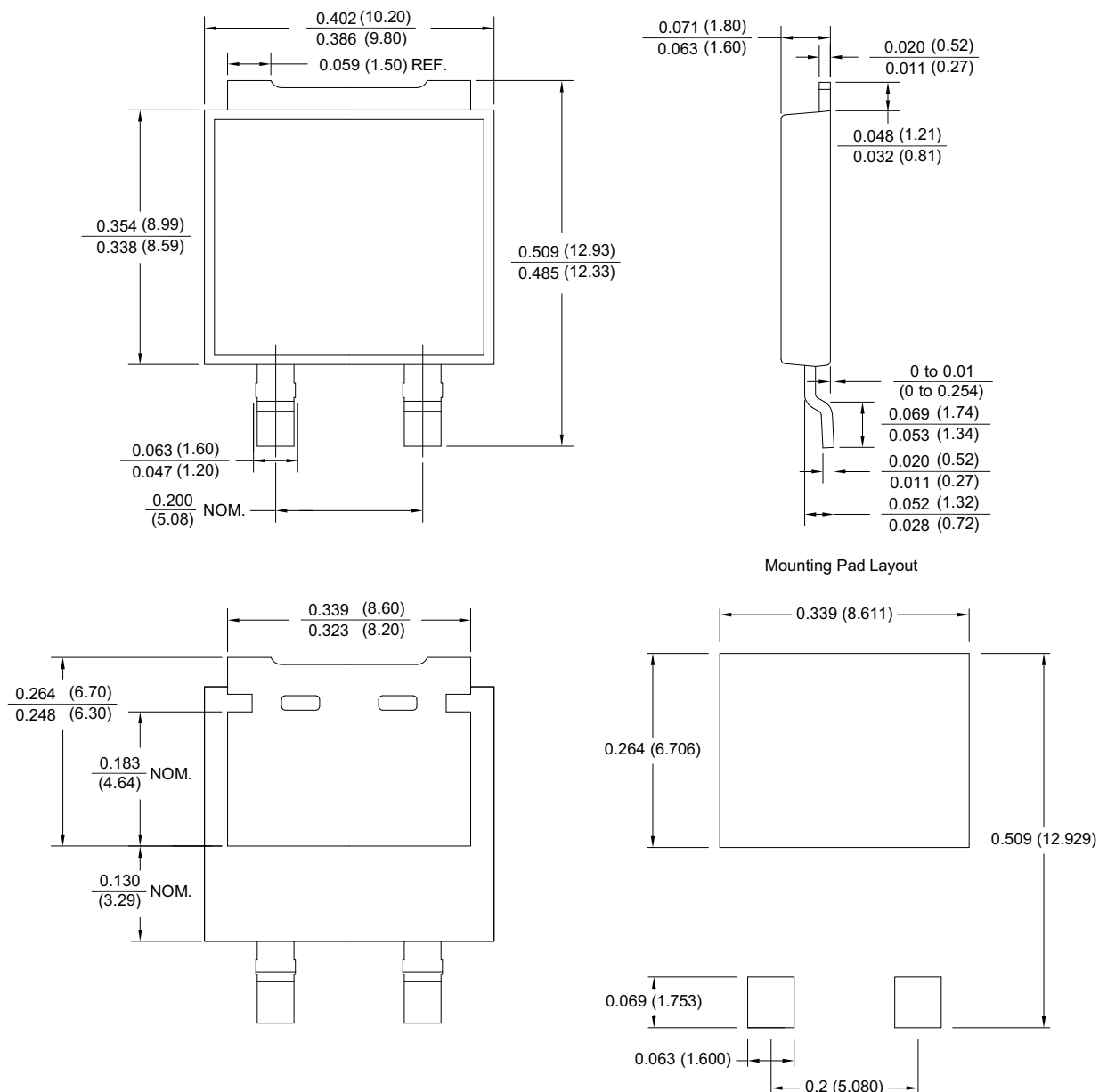


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPD 2L



Note

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



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