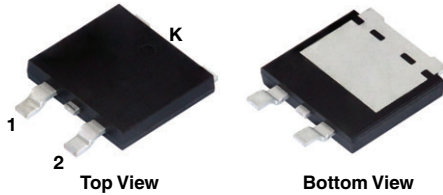
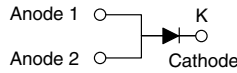


## Surface-Mount Low $V_F$ Standard Rectifiers

### eSMP® Series SMPD (TO-263AC)



#### SE12DX



### LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	12 A
$V_{RRM}$	400 V, 600 V
$I_{FSM}$	165 A
$V_F$ at $I_F = 12$ A ( $T_A = 125$ °C)	0.83 V
$T_J$ max.	175 °C
Package	SMPD (TO-263AC)
Circuit configuration	Single

### FEATURES

- Very low profile - typical height of 1.7 mm
- Low forward voltage drop
- 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](http://www.vishay.com/doc?99912)



**RoHS  
COMPLIANT  
HALOGEN  
FREE**

### TYPICAL APPLICATIONS

General purpose, power line polarity protection, in both consumer and automotive applications.

### MECHANICAL DATA

#### Case: SMPD (TO-263AC)

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

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)				
PARAMETER	SYMBOL	SE12DLG	SE12DLJ	UNIT
Device marking code		SE12DLG	SE12DLJ	
Maximum repetitive peak reverse voltage	$V_{RRM}$	400	600	V
Maximum DC forward current	$I_F^{(1)}$	12		A
	$I_F^{(2)}$	3.7		
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  $dP_D/dT_J < R_{thJA}$



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.86	-	V
	$I_F = 12\text{ A}$			0.93	1	
	$I_F = 6\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.72	-	
	$I_F = 12\text{ A}$			0.83	0.9	
Reverse current	Rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	5	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		12	70	
Typical reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	300	-	ns
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	96	-	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	SE12DLG	SE12DLJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	55		$^\circ\text{C/W}$
	$R_{\theta JM}^{(3)}$	1.5		

**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<sup>®</sup> 51-2A  
(3) Mounted on infinite heatsink thermal resistance  $R_{\theta JM}$  - junction to mount to follow JEDEC<sup>®</sup> 51-14 transient dual interface test method (TDIM)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE12DLJ-M3/I	0.54	I	2000/reel	13" diameter plastic tape and reel
SE12DLJHM3/I <sup>(1)</sup>	0.54	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)

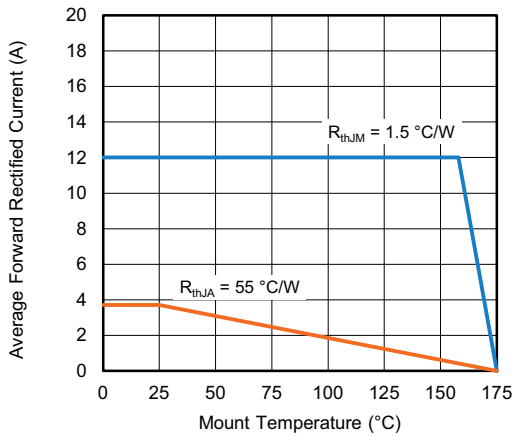


Fig. 1 - Forward Current Derating Curve

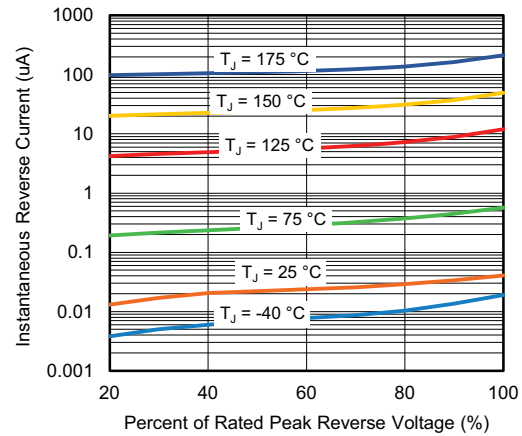


Fig. 4 - Typical Reverse Leakage Characteristics

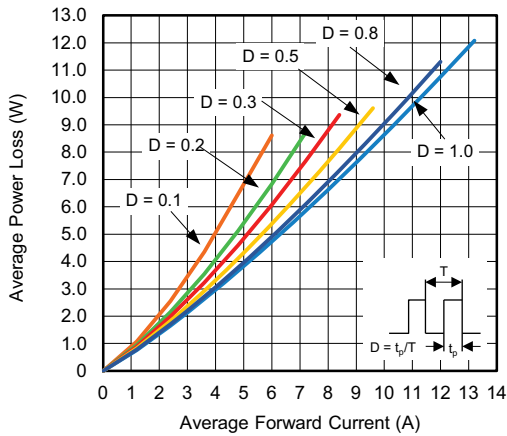


Fig. 2 - Forward Power Loss Characteristics

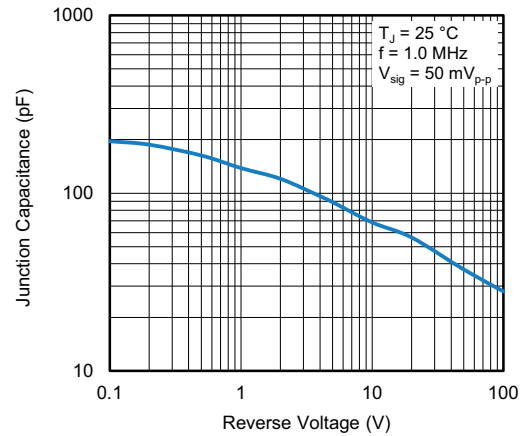


Fig. 5 - Typical Junction Capacitance

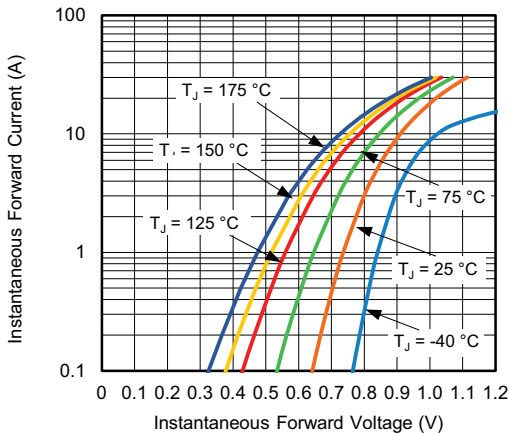


Fig. 3 - Typical Instantaneous Forward Characteristics

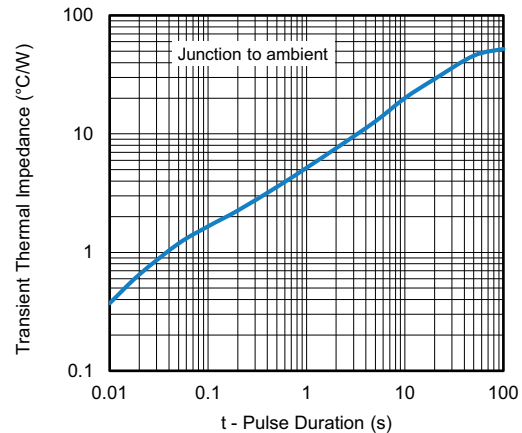
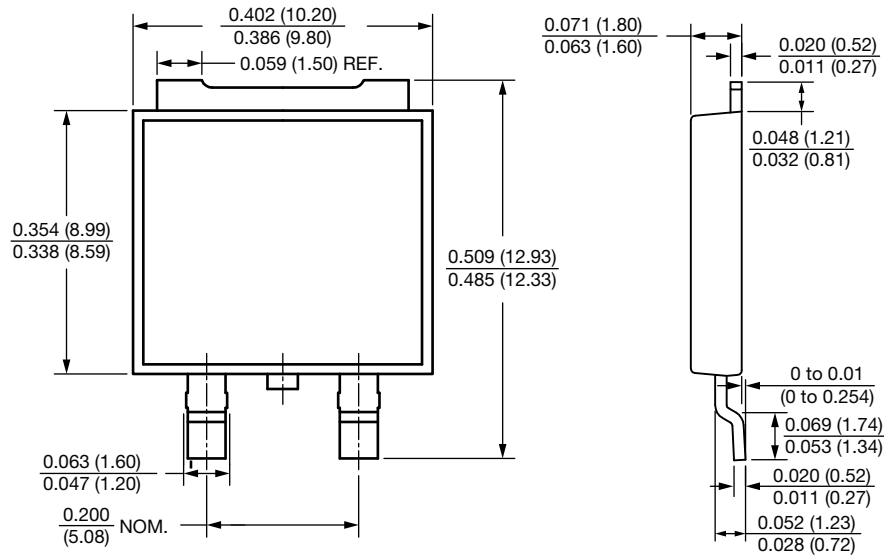


Fig. 6 - Typical Transient Thermal Impedance

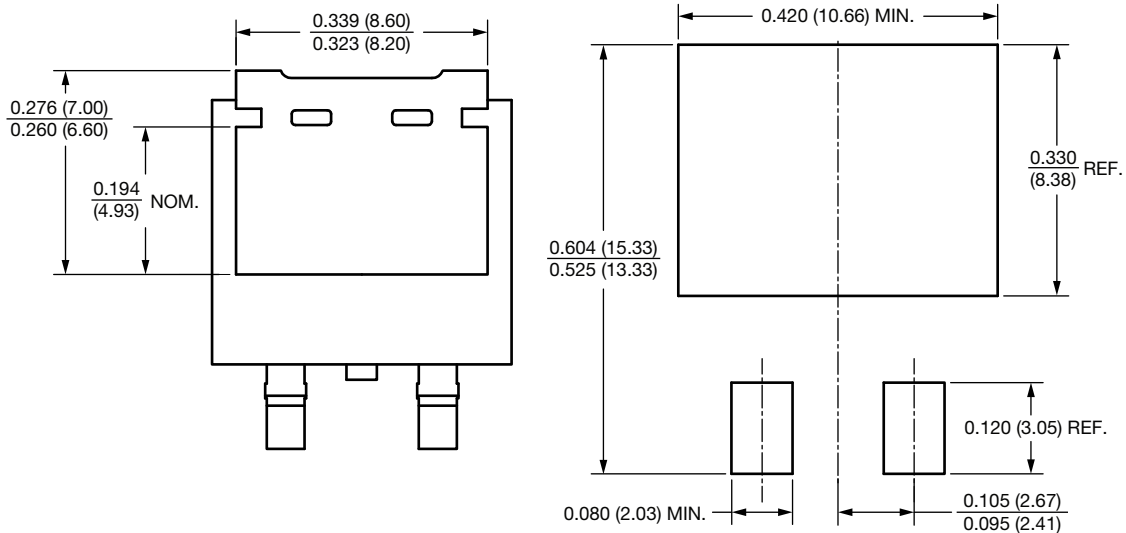


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### SMPD (TO-263AC)



#### Mounting Pad Layout





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