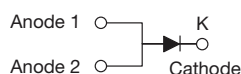
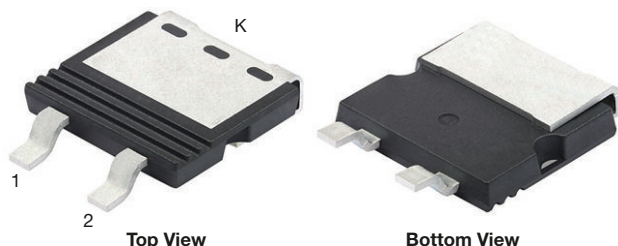


Surface-Mount High Voltage Rectifier

eSMP® Series eCool SMPD



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	40 A
V_{RRM}	600 V
I_{FSM}	405 A
V_F at $I_F = 40$ A ($T_J = 125$ °C)	0.87 V
I_R	5 μ A
T_J max.	175 °C
Package	eCool SMPD
Circuit configuration	Single

FEATURES

- Top side cool
- Ideal for automated placement
- Creepage distance 4.3 mm minimum
- Oxide planar chip junction
- Low forward voltage drop
- AEC-Q101 qualified
- 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

- On board charger (OBC)
- Charging stations
- Bridge function

MECHANICAL DATA

Case: eCool SMPD

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 meets JESD 201 class 2 whisker test

Polarity: as marked

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	SE40CLJ	UNIT
Device marking code		SE40CLJ	V
Maximum repetitive peak reverse voltage	V_{RRM}	600	V
Maximum DC forward current (Fig.1)	$I_F^{(1)}$	40	A
	$I_F^{(2)}$	8.4	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	405	A
Operating junction and storage temperature range	$T_J, T_{STG}^{(3)}$	-55 to +175	°C

Notes

- (1) With infinite heatsink
- (2) Free air, mounted on FR4 PCB, 2 oz., standard footprint with top side aluminum cooling
- (3) 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 _J = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 20 A	T _J = 25 °C	V _F ⁽¹⁾	0.88	-	V
	I _F = 40 A			0.98	1.1	
	I _F = 20 A	T _J = 125 °C		0.76	-	
	I _F = 40 A			0.87	-	
Reverse current	Rated V _R	T _J = 25 °C	I _R ⁽²⁾	-	5	μA
		T _J = 125 °C		17	300	
Typical reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	0.28	-	μs
Typical junction capacitance	4.0 V, 1 MHz		C _J	188	-	pF

Notes(1) Pulse test: 300 μs 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	SE40CLJ	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)(2)}$	24.5	$^{\circ}\text{C/W}$
	$R_{\theta JC}^{(3)}$	0.7	

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 with top-side aluminum cooling heatsink size L 35 mm x W 20 mm x H 10 mm

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

ORDERING INFORMATION TABLE

Device code	S	E	40	C	L	J	H	M3
	①	②	③	④	⑤	⑥	⑦	⑧
①	- Vishay standard recovery product							
②	- Oxide planar chip technology							
③	- Current rating (40 = 40 A)							
④	- Package type (C = eCool SMPD package)							
⑤	- Process type (L = low V_F)							
⑥	- Voltage rating (D = 200 V, G = 400 V, J = 600 V)							
⑦	- Quality grade (H = AEC-Q101 qualified, - = industry grade)							
⑧	- Material / Environment category							
	(M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)							

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
SE40CLJ-M3/I	0.66	I	1500 / reel	13" diameter plastic tape and reel
SE40CLJHM3/I ⁽¹⁾	0.66	I	1500 / reel	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

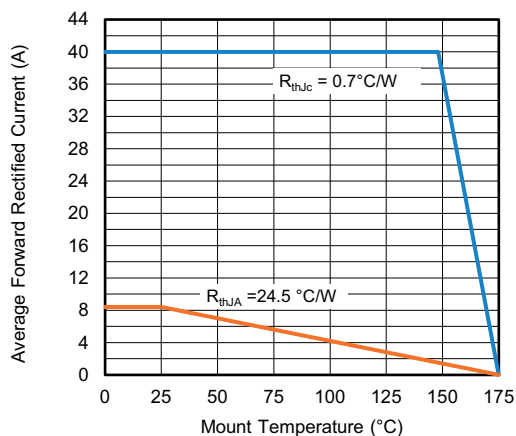
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Forward Current Derating Curve

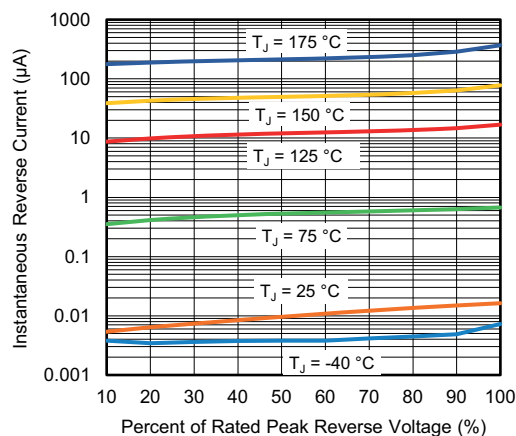


Fig. 4 - Typical Reverse Leakage Characteristics

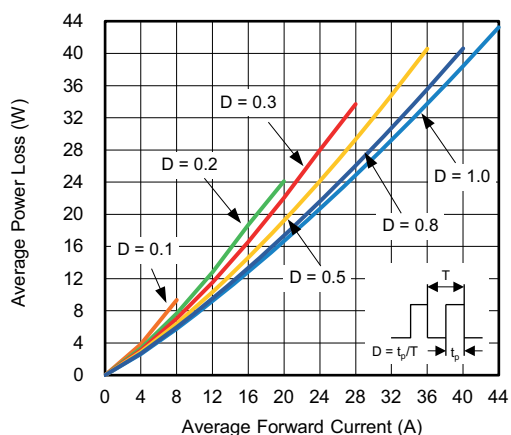


Fig. 2 - Forward Power Loss Characteristics

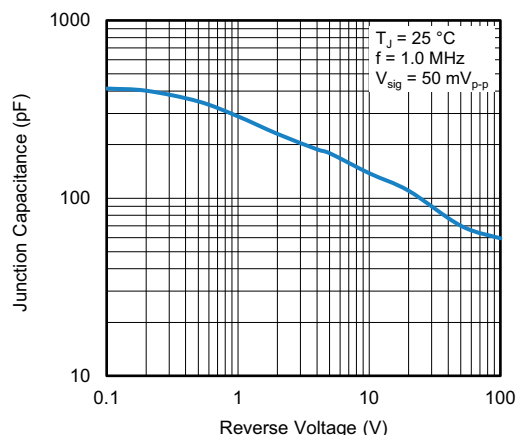


Fig. 5 - Typical Junction Capacitance

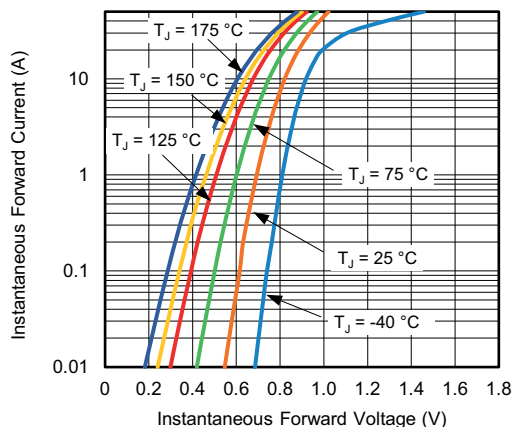


Fig. 3 - Typical Instantaneous Forward Characteristics

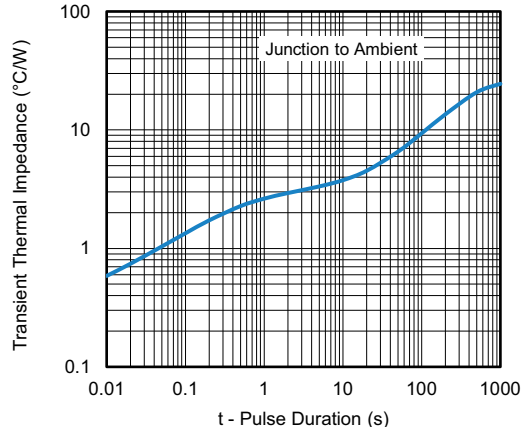
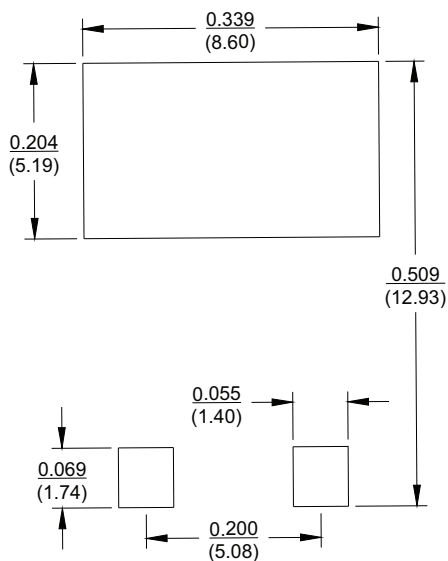
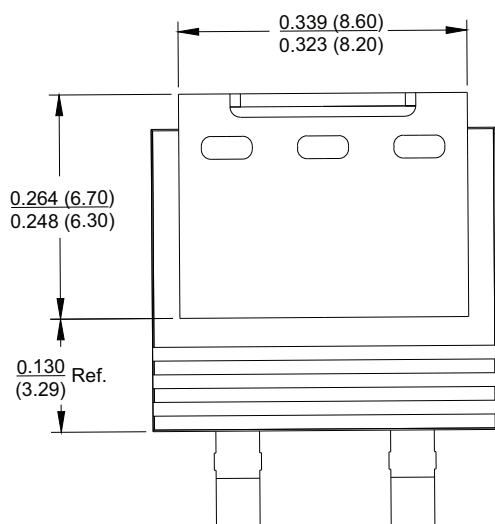
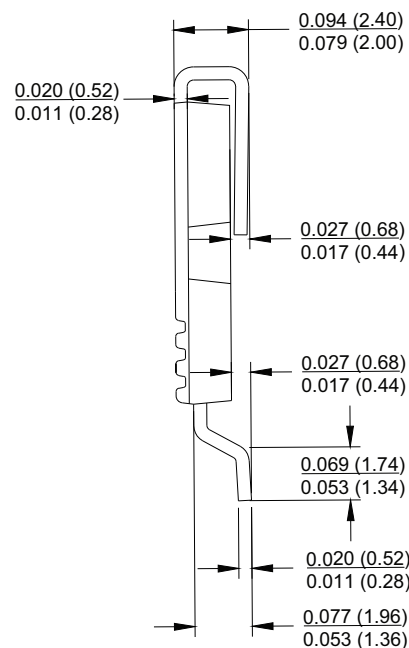
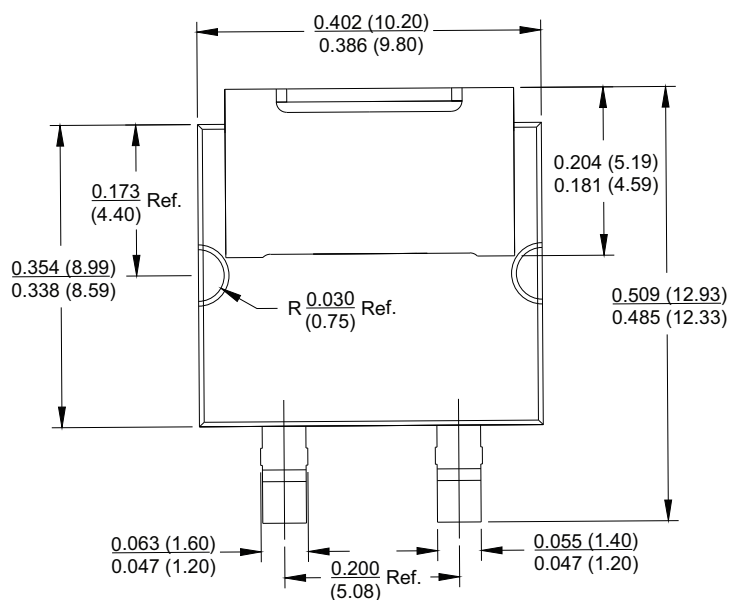


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

eCool SMPD



Note

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



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