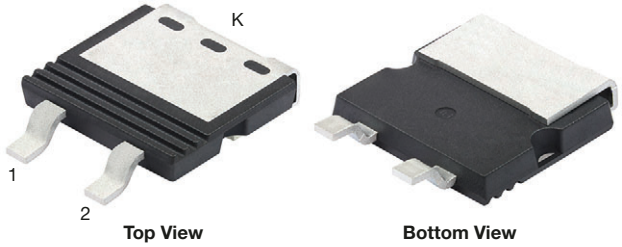
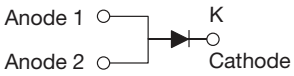
High-Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier

Ultra Low V_F = 0.43 V at I_F = 5.0 A

eSMP® Series
eCool SMPD





FEATURES

- Top side cool
- Trench MOS Schottky technology
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available:
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE

LINKS TO ADDITIONAL RESOURCES

3D Models | Packages | Marking

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	30 A
V_{RRM}	120 V
I_{FSM}	430 A
V_F at I_F = 30 A (T_J = 125 °C)	0.67 V
T_J max.	150 °C
Package	eCool SMPD
Circuit configuration	Single

TYPICAL APPLICATIONS

For use in high frequency DC/DC converters, switching power supplies, freewheeling diodes, OR-ing diode, and reverse battery protection in commercial, industrial, and automotive application.

MECHANICAL DATA

Case: eCool SMPD

Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant
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	V30C120	UNIT
Device marking code		V30C120	
Maximum repetitive peak reverse voltage	V_{RRM}	120	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$ (1)	30	A
	$I_{F(AV)}$ (2)	8.7	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	430	A
Operating junction temperature range	T_J (3)	-40 to +150	°C
Storage temperature range	T_{STG}	-55 to +150	

Notes

(1) Mounted on 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 = 5 A	T_J = 25 °C	V_F (1)	0.51	-	V
	I_F = 15 A			0.67	-	
	I_F = 30 A			0.86	0.91	
	I_F = 5 A	T_J = 125 °C		0.43	-	
	I_F = 15 A			0.57	-	
	I_F = 30 A			0.67	0.72	
Reverse current at rated V_R	V_R = 90 V	T_J = 25 °C	I_R (2)	0.006	-	mA
		T_J = 125 °C		4	-	
	V_R = 120 V	T_J = 25 °C		-	0.47	
		T_J = 125 °C		8	25	
Typical junction capacitance	4.0 V, 1 MHz		C_J	2200	-	pF

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	TYP.	MAX.	UNIT
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	26.5	34	°C/W
	$R_{\theta JC}$ (3)	0.9	1.2	

Notes

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

(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

V	30	C	120	H	M3
1	2	3	4	5	6

1 - Vishay TMBS product

2 - Current rating (30 = 30 A)

3 - Package type (C = eCool SMPD package)

4 - Voltage rating (120 = 120 V)

5 - Quality grade (H = AEC-Q101 qualified, - = industry grade)

6 - Material / Environment category
(M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free)

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
V30C120-M3/I	0.66	I	2000/reel	13" diameter plastic tape and reel
V30C120HM3/I (1)	0.66	I	2000/reel	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

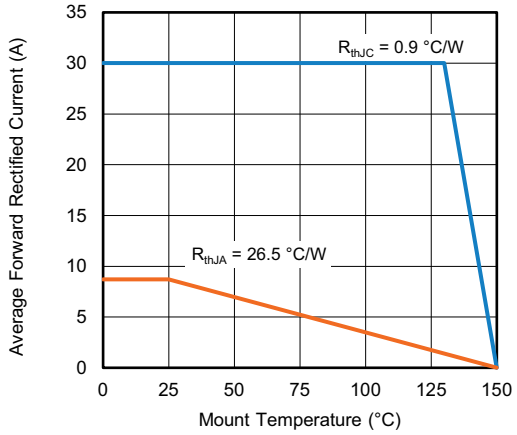


Fig. 1 - Maximum Forward Current Derating Curve

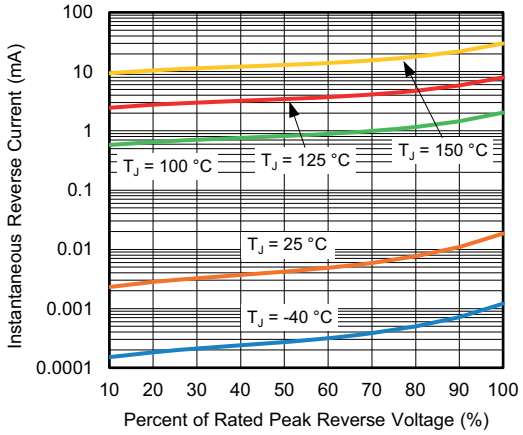


Fig. 4 - Typical Reverse Leakage Characteristics

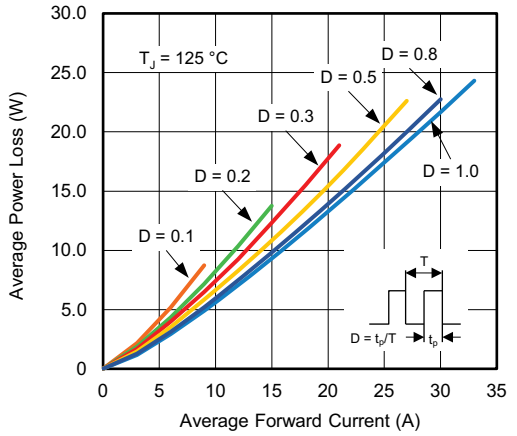


Fig. 2 - Average Power Loss Characteristics

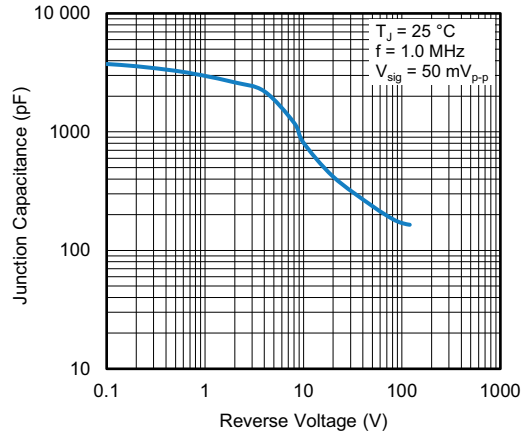


Fig. 5 - Typical Junction Capacitance

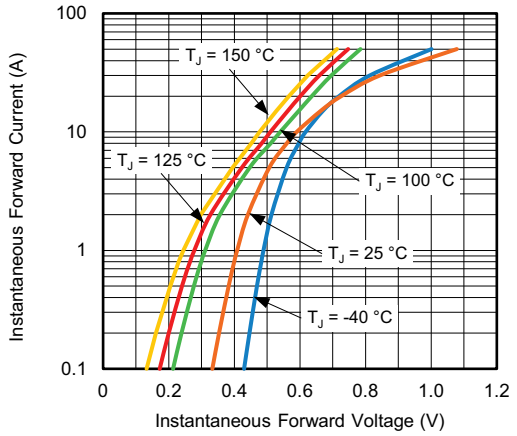


Fig. 3 - Typical Instantaneous Forward Characteristics

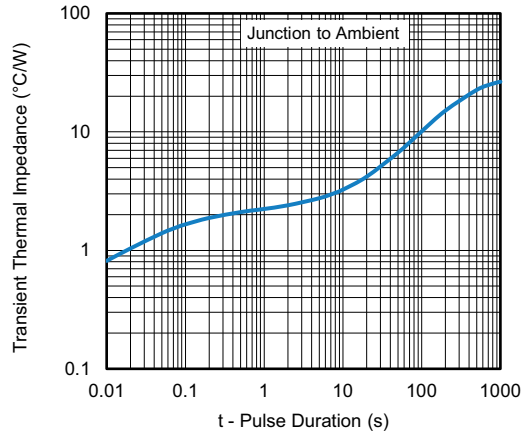
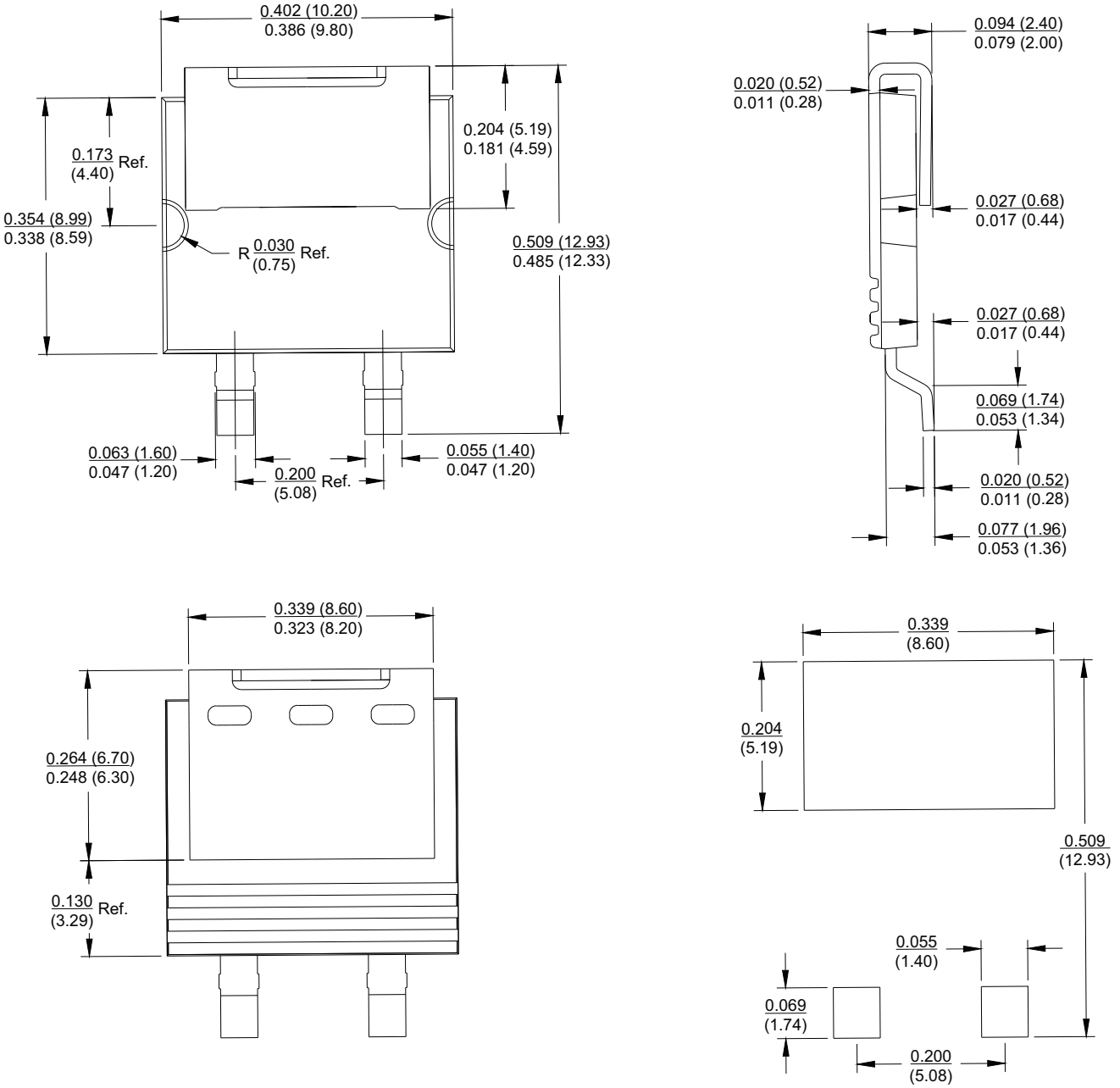


Fig. 6 - Typical Transient Thermal Impedance

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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