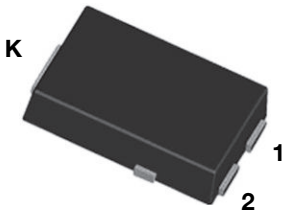
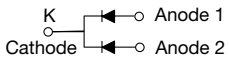
High Current Density Surface-Mount Schottky Barrier Rectifier

eSMP® Series



SMPC (TO-277A)



FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Low forward voltage drop, low power losses
- High efficiency
- Low thermal impedance
- 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

TYPICAL APPLICATIONS

For use in low voltage high frequency inverters, freewheeling, DC/DC converters and polarity protection applications.

MECHANICAL DATA

Case: SMPC (TO-277A)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade
Base P/NHM3_X - halogen-free, RoHS-compliant and AEC-Q101 qualified
("_X" denotes revision code e.g. A, B,.....)

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 6.0 A
V_{RRM}	40 V
I_{FSM}	150 A
E_{AS}	20 mJ
V_F at I_F = 6.0 A	0.40 V
T_J max.	125 °C
Package	SMPC (TO-277A)
Circuit configuration	Common cathode

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

PARAMETER		SYMBOL	SS12P4C	UNIT
Device marking code			S124C	
Maximum repetitive peak reverse voltage		V_{RRM}	40	V
Maximum average forward rectified current (fig. 1) (1)	total device	$I_{F(AV)}$	12	A
	per diode		6.0	
Maximum average forward rectified current (2)	total device	$I_{F(AV)}$	3.5	A
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150	A
Non-repetitive avalanche energy at T_J = 25 °C, L = 60 mH per diode		E_{AS}	20	mJ
Peak repetitive reverse current at t_p = 2 µs, 1 kHz, at T_J = 25 °C per diode		I_{RRM}	1.0	A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +125	°C

Notes

(1) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink
(2) Free air, mounted on recommended copper pad area

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage per diode	I_F = 1 A	T_A = 25 °C	V_F (1)	0.34	-	V
	I_F = 3 A			0.40	-	
	I_F = 6 A			0.46	0.52	
	I_F = 1 A	T_A = 100 °C		0.24	-	
	I_F = 3 A			0.31	-	
	I_F = 6 A			0.40	0.45	
Reverse current per diode	Rated V_R	T_A = 25 °C	I_R (2)	129	500	µA
		T_A = 100 °C		11.9	25	mA
Typical junction capacitance per diode	4.0 V, 1 MHz		C_J	400	-	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**	**SS12P4C**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	100	°C/W
	$R_{\theta JM}$ (2)	3	

Notes

(1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient

(2) Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink. Thermal resistance $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
SS12P4C-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
SS12P4C-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
SS12P4CHM3_A/H (1)	0.10	H	1500	7" diameter plastic tape and reel
SS12P4CHM3_A/I (1)	0.10	I	6500	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

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

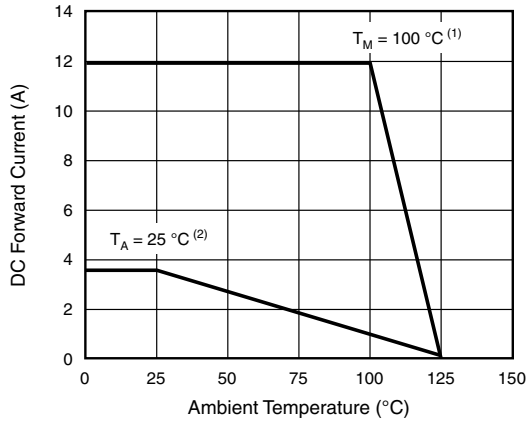

Fig. 1 - Maximum Forward Current Derating Curve

Notes

- Mounted on 30 mm x 30 mm Al PCB with 50 mm x 25 mm x 100 mm fin heat sink, T_M measured at the terminal of cathode band ($R_{\theta JM}$ = 3 °C/W)
- Free air, mounted on recommended copper pad area ($R_{\theta JA}$ = 100 °C/W)

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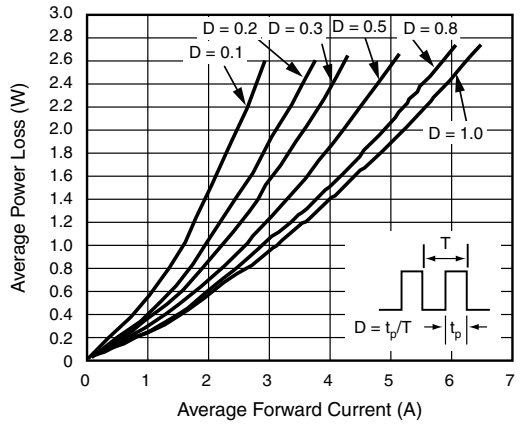

Fig. 2 - Forward Power Loss Characteristics Per Diode

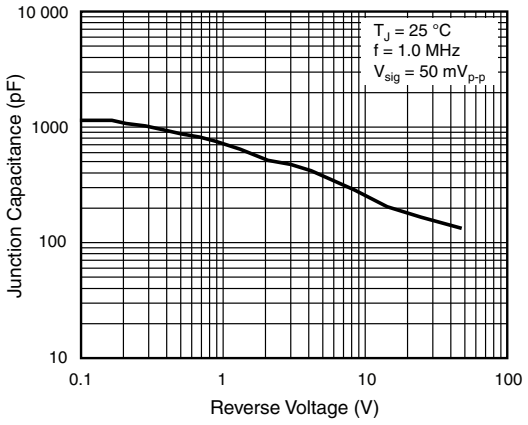

Fig. 5 - Typical Junction Capacitance Per Diode

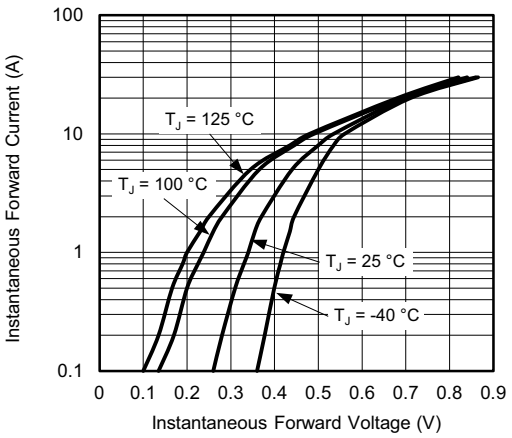

Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

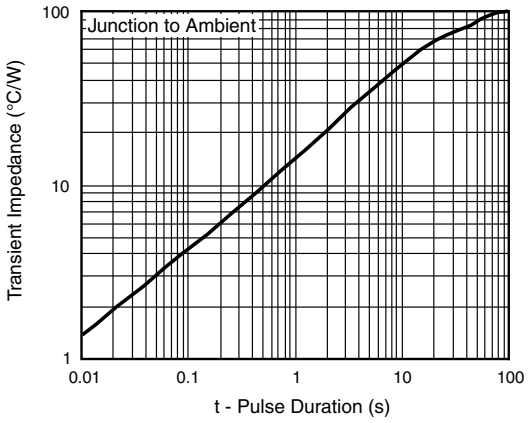

Fig. 6 - Typical Transient Thermal Impedance Per Diode

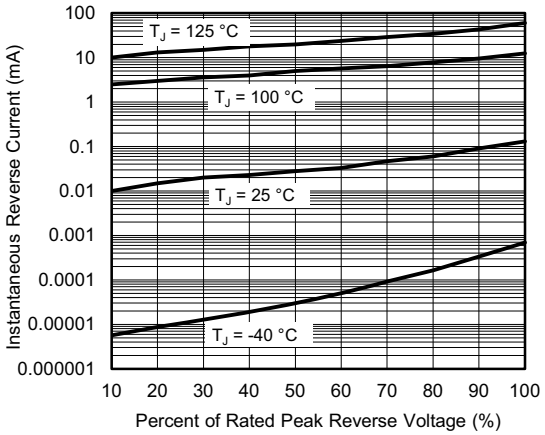

Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

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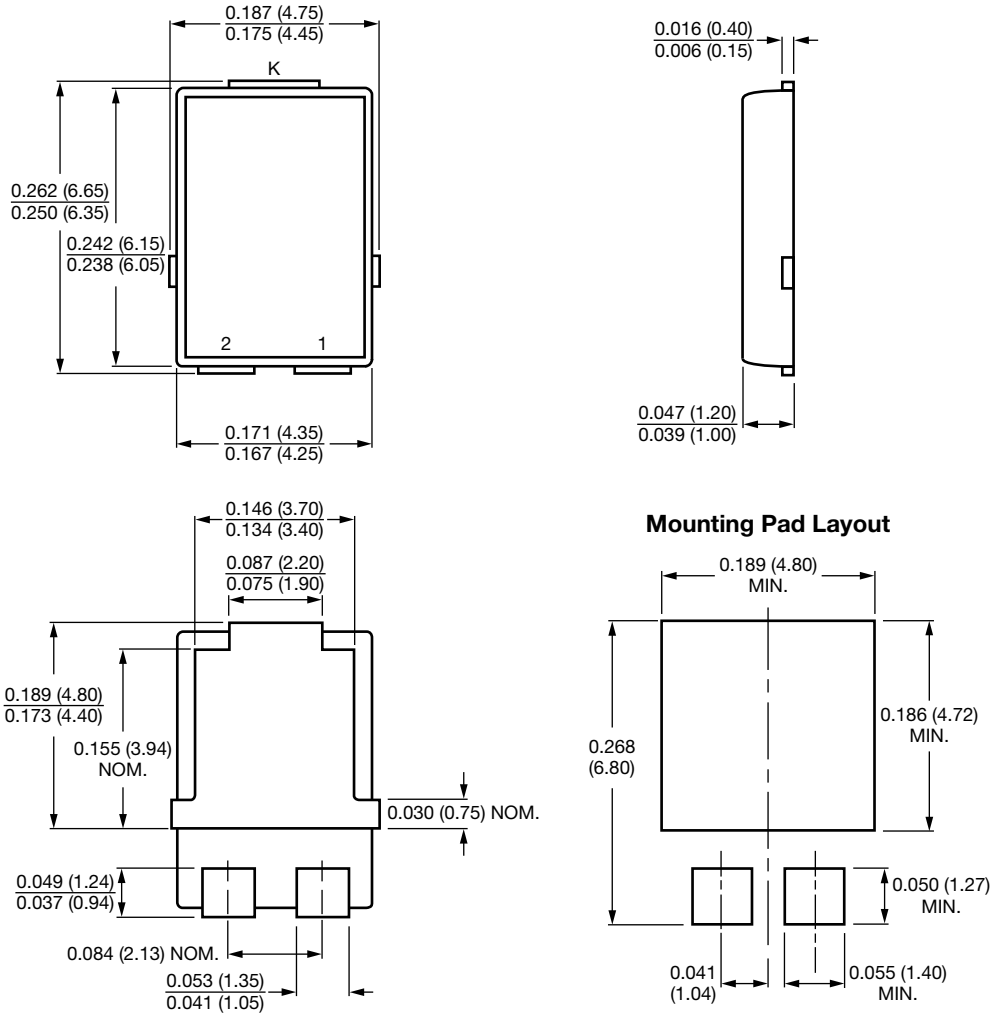

Conform to JEDEC® TO-277A

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