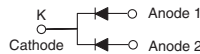


High Current Density Surface Mount Schottky Barrier Rectifier

eSMP® Series



TO-277A (SMPC)



AUTOMOTIVE GRADE


RoHS
COMPLIANT
HALOGEN
FREE

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

MECHANICAL DATA

Case: TO-277A (SMPC)

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
 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	TO-277A (SMPC)
Diode variations	Dual common cathode

TYPICAL APPLICATIONS

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

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	12	A
	per diode	6.0	
Maximum average forward rectified current ⁽²⁾	$I_{F(AV)}$	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

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

Notes

- (3) Pulse test: 300 μs pulse width, 1 % duty cycle
 (4) Pulse test: Pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	SS12P4C	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	100	$^\circ\text{C/W}$
	$R_{\theta JM}^{(2)}$	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
SS12P4CHM3/86A ⁽¹⁾	0.10	86A	1500	7" diameter plastic tape and reel
SS12P4CHM3/87A ⁽¹⁾	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

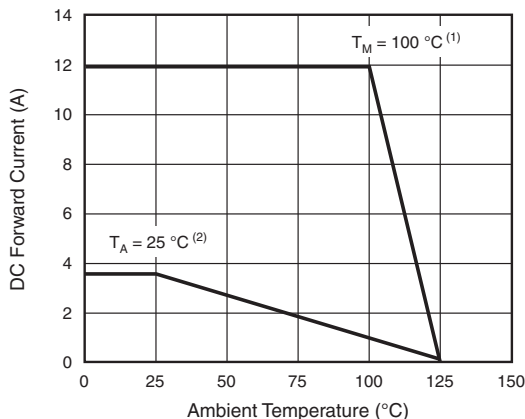
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


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 ($R_{\theta JM} = 3\text{ }^\circ\text{C/W}$)
- Free air, mounted on recommended copper pad area ($R_{\theta JA} = 100\text{ }^\circ\text{C/W}$)

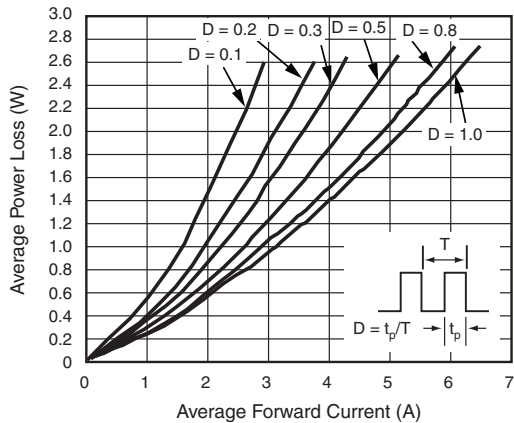


Fig. 2 - Forward Power Loss Characteristics Per Diode

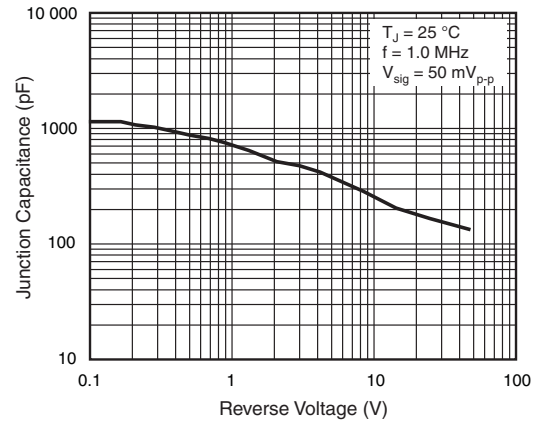


Fig. 5 - Typical Junction Capacitance Per Diode

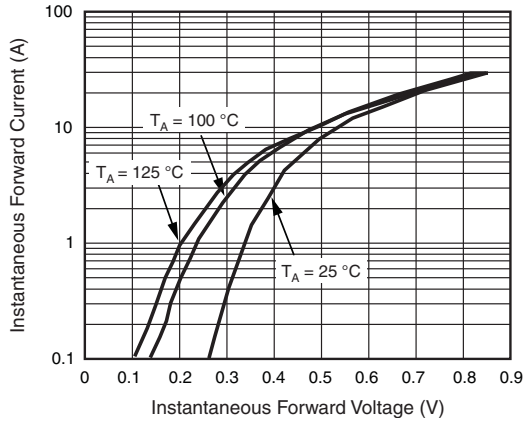


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

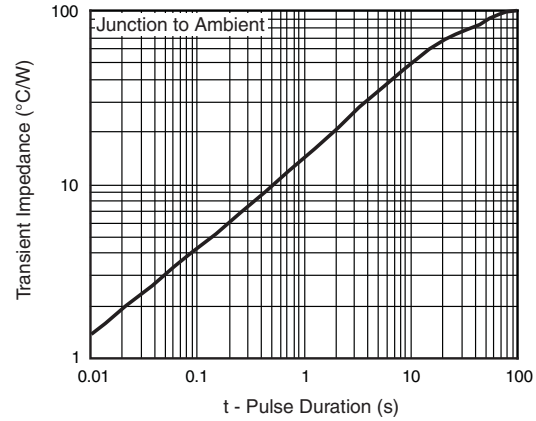


Fig. 6 - Typical Transient Thermal Impedance Per Diode

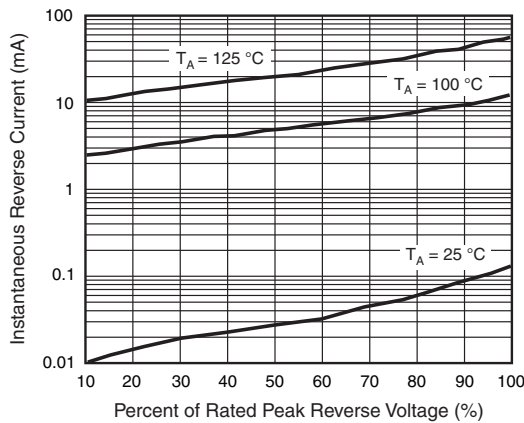
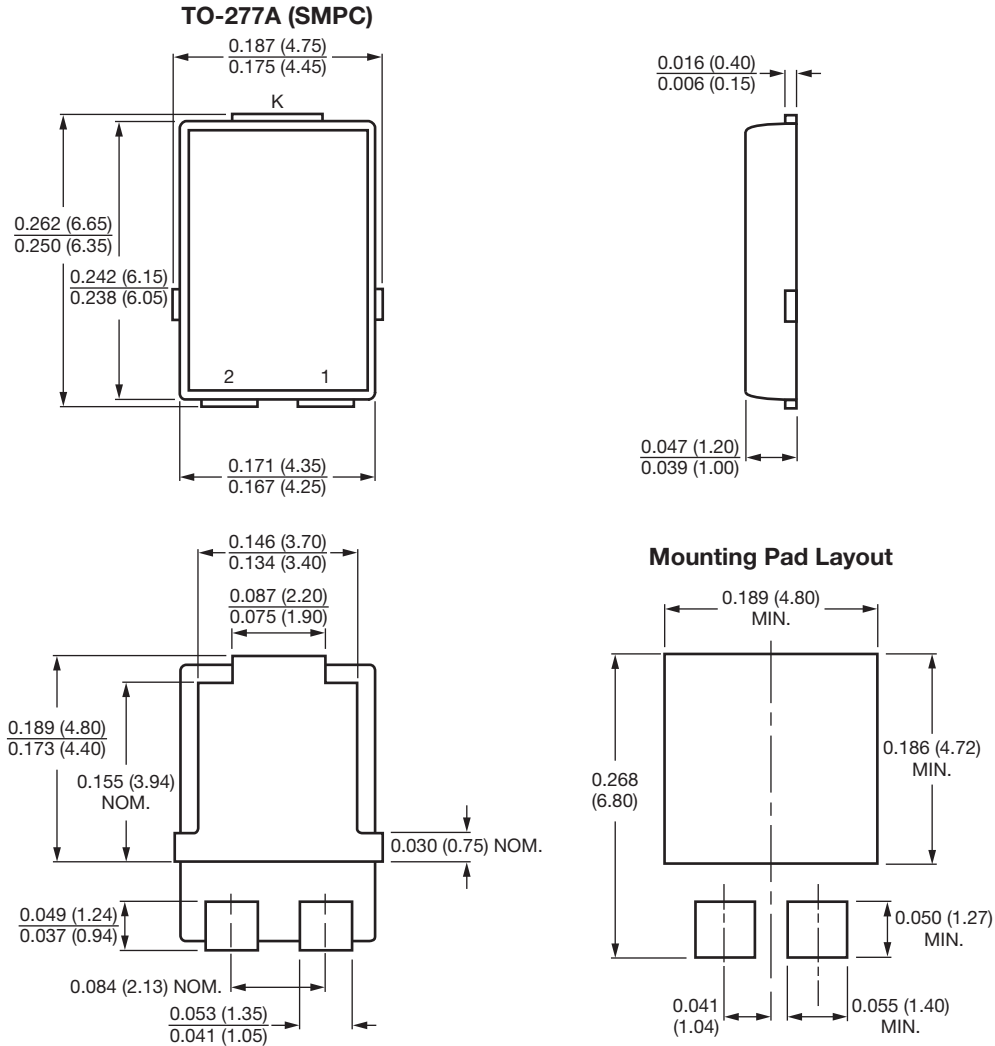


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC® TO-277A



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