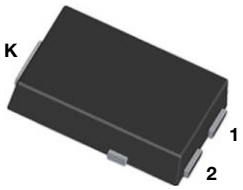
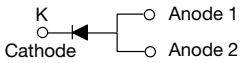
High Current Density Surface-Mount High Voltage Schottky Rectifiers

eSMP® Series



SMPC (TO-277A)



LINKS TO ADDITIONAL RESOURCES

3D Models | Marking | Packages

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	20 A
V_{RRM}	100 V
I_{FSM}	310
V_F at I_F = 20 A (T_J = 125 °C)	0.65 V
T_J max.	175 °C
Package	SMPC (TO-277A)
Circuit configuration	Single

FEATURES

AUTOMOTIVE GRADE Available

RoHS COMPLIANT HALOGEN FREE

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Guardring for overvoltage protection
- High barrier technology, T_J = 175 °C maximum
- Low leakage current
- Enhanced for high surge endurance
- Meets MSL level 1, per J-STD-020
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters, or polarity protection application.

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 - halogen-free, RoHS-compliant, and AEC-Q101 qualified

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

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

PARAMETER		SYMBOL	SS20PH102	UNIT
Device marking code			20H102	
Maximum repetitive peak reverse voltage		V_{RRM}	100	V
Maximum average forward rectified current (fig. 1)		$I_{F(AV)}$ (1)	20	A
		$I_{F(AV)}$ (2)	3.8	
Non-repetitive peak forward surge current	8.3 ms half sine-wave superimposed on rated load	I_{FSM}	310	A
	100 µs square pulse		1070	
Operating junction temperature range		T_J	-40 to +175	°C
Storage temperature range		T_{STG}	-55 to +175	°C

Note

(1) Mounted on 30 mm x 30 mm pad areas aluminum PCB
(2) Free air, mounted on recommended copper pad area, 2 oz, FR4 PCB
(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_A = 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)	0.64	-	V
	I_F = 10 A			0.72	-	
	I_F = 20 A			0.80	0.85	
	I_F = 5 A	T_J = 125 °C		0.51	-	
	I_F = 10 A			0.58	-	
	I_F = 20 A			0.65	0.69	
Reverse current	V_R = 70 V	T_J = 25 °C	I_R (2)	0.0001	-	mA
		T_J = 125 °C		0.3	-	
	V_R = 100 V	T_J = 25 °C		-	0.006	
		T_J = 125 °C		0.6	1.3	
Typical junction capacitance	4.0 V, 1 MHz		C_J	460	-	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 specified)			
PARAMETER	**SYMBOL**	**SS20PH102**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)(2)	75	°C/W
	$R_{\theta JM}$ (3)	4	

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 copper pad area; thermal resistance $R_{\theta JA}$ - junction to ambient

(3) Mounted on 30 mm x 30 mm aluminum PCB; thermal resistance $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION TABLE

Device code

SS	20	P	H	10	2	H	M3
1	2	3	4	5	6	7	8

1 - Vishay planar Schottky product

2 - Current rating (20 = 20 A)

3 - Package type (P = SMPC (TO-277A))

4 - Process type option (H = low I_R)

5 - Voltage rating (10 = 100 V)

6 - Planar Schottky generation option (2 = Gen 2)

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

8 - Material / environmental 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**
SS20PH102-M3/H	0.10	H	1500	7" diameter plastic tape and reel
SS20PH102-M3/I	0.10	I	6500	13" diameter plastic tape and reel
SS20PH102HM3/H (1)	0.10	H	1500	7" diameter plastic tape and reel
SS20PH102HM3/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 specified)

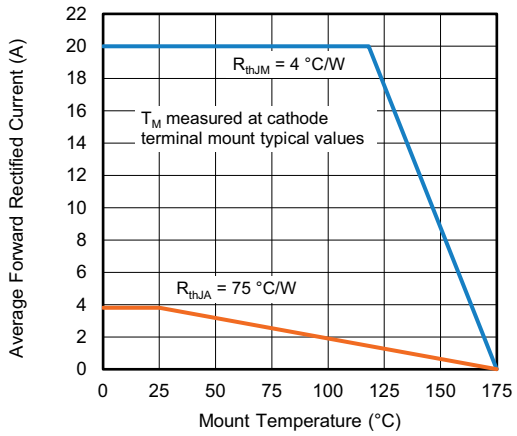


Fig. 1 - Maximum Forward Current Derating Curve

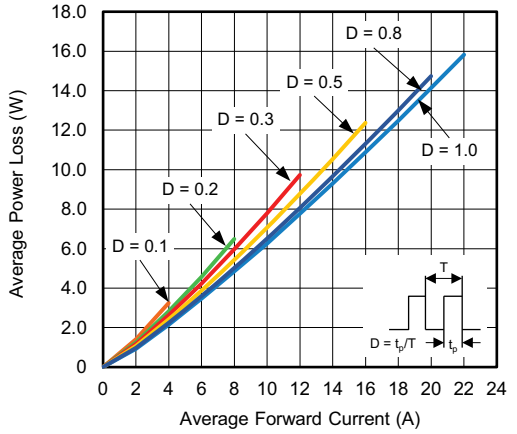


Fig. 2 - Forward Power Loss Characteristics

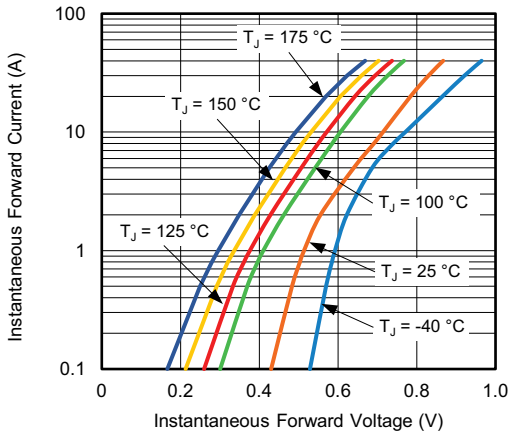


Fig. 3 - Typical Instantaneous Forward Characteristics

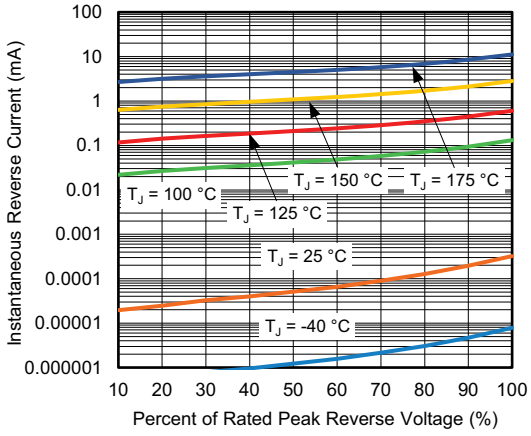


Fig. 4 - Typical Reverse Characteristics

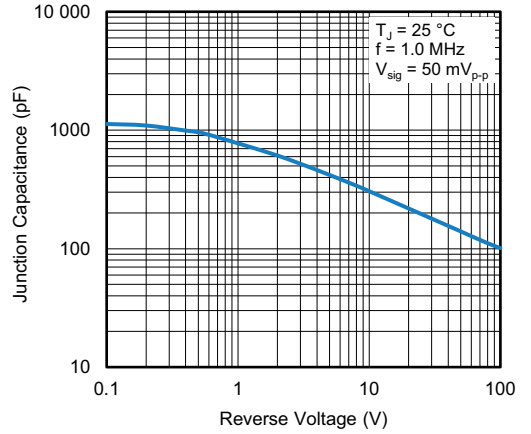


Fig. 5 - Typical Junction Capacitance

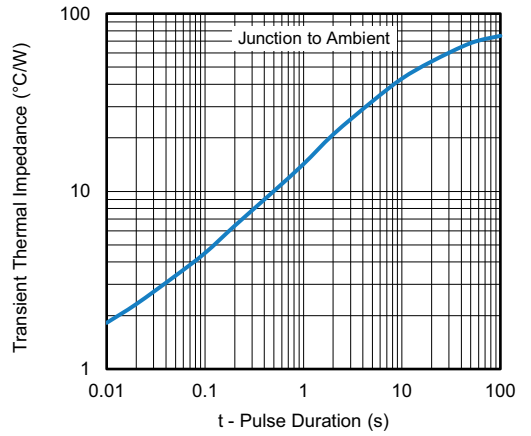
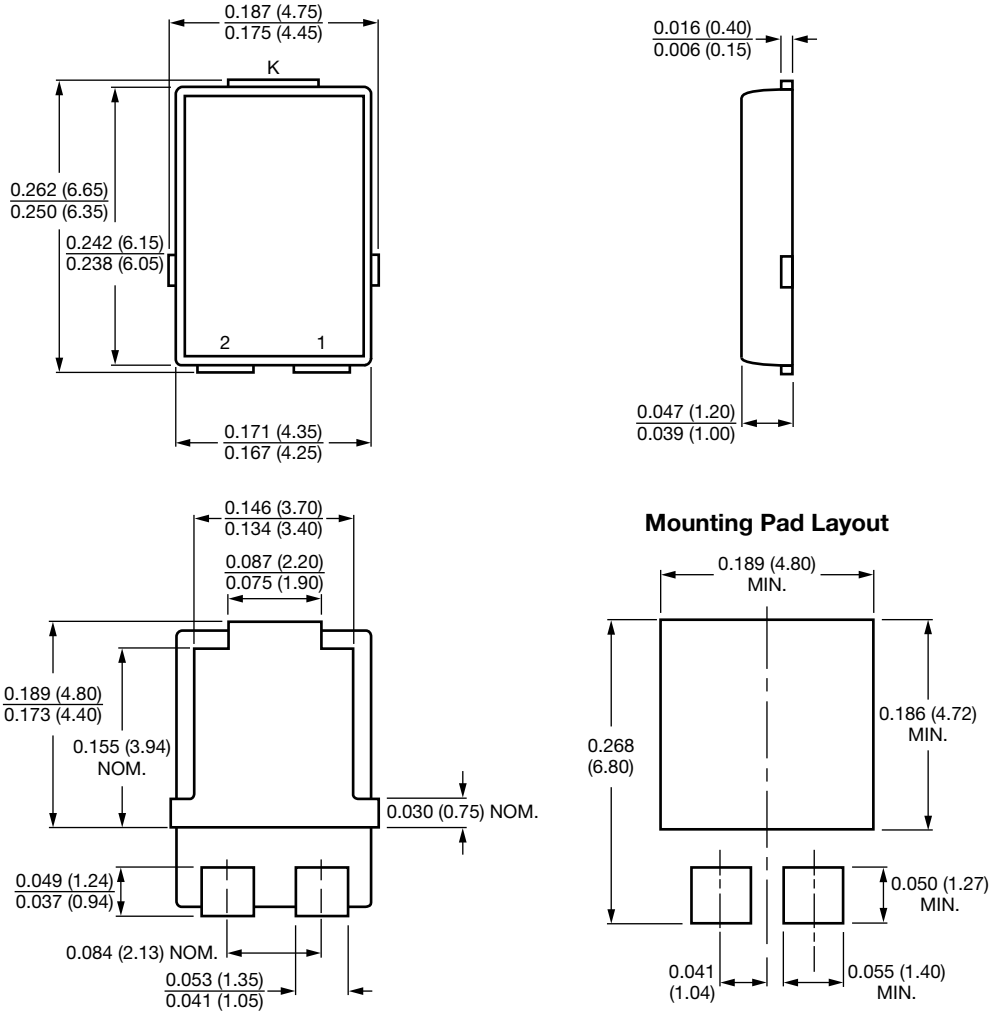


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMPC (TO-277A)



Conform to JEDEC® TO-277A

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