

ESH1PB, ESH1PC, ESH1PD

Vishay General Semiconductor

AUTOMOTIVE

Available

RoHS COMPLIANT

HALOGEN

FREE

High Current Density Surface-Mount Ultrafast Rectifiers





LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	1.0 A			
V _{RRM}	100 V, 150 V, 200 V			
I _{FSM}	50 A			
t _{rr}	25 ns			
V _F	0.90 V			
T _J max.	175 °C			
Package	SMP (DO-220AA)			
Circuit configuration	Single			

FEATURES

- Very low profile typical height of 1.0 mm
- · Ideal for automated placement
- Glass passivated pellet chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Low thermal resistance
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of AC/AC and DC/DC converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: SMP (DO-220AA)

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 automotive grade

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

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	ESH1PB	ESH1PC	ESH1PD	UNIT	
Device marking code		PB	PC	PD		
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V	
Maximum average forward rectified current (fig. 1)	I _{F(AV)}	1.0			А	
Peak forward surge current 10 ms single half sine-wave superimposed on rated load	I _{FSM}	50			Α	
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +175			°C	

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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT			
Maximum instantaneous forward voltage	$I_F = 0.7 A$	T _J = 25 °C	V _F ⁽¹⁾	0.86	V		
	I _F = 1 A			0.90			
Maximum reverse current at rated V _R voltage		T _J = 25 °C	I _R ⁽²⁾	1.0	μΑ		
		T _J = 125 °C	'R ` ′	25			
Maximum reverse current	V _R = 20 V	T _J = 150 °C	I _R	50	μA		
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1 \text{ A}, I_{rr} = 0.25 \text{ A}$	t _{rr}	25	ns			
Typical reverse recovery time	$I_F = 1.0 A, V_R = 30 V,$	$T_J = 25 ^{\circ}C$	- t _{rr}	25	ns		
	$dI/dt = 50 A/\mu s, I_{rr} = 10 \% I_{RM}$	T _J = 100 °C		35			
Typical stored charge	$I_F = 1.0 A, V_R = 30 V,$	T _J = 25 °C	Q_{rr}	10	nC		
	$dI/dt = 50 A/\mu s, I_{rr} = 10 \% I_{RM}$	T _J = 100 °C	∀ rr	15	110		
Typical junction capacitance	4.0 V, 1 MHz		CJ	25	pF		

Notes

 $^{(1)}$ Pulse test: 300 μ s pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	ESH1PB	ESH1PC	ESH1PD	UNIT
Typical thermal resistance	R _{0JA} (1)	105			°C/W
	R _{0JM} (2)	15			

Notes

(1) Thermal resistance from junction to ambient on free air

 $^{(2)}$ Mounted on 5 mm x 5 mm pad size from junction to mount

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
ESH1PB-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel		
ESH1PB-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel		
ESH1PBHM3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel		
ESH1PBHM3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel		

Note

(1) Automotive grade

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

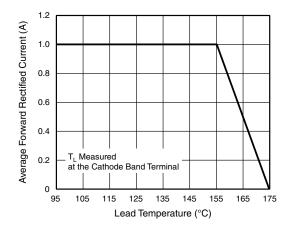
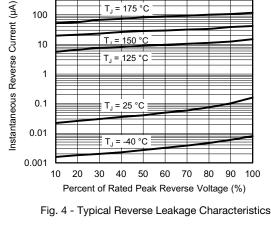


Fig. 1 - Forward Current Derating Curve



1000

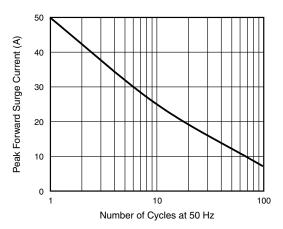


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

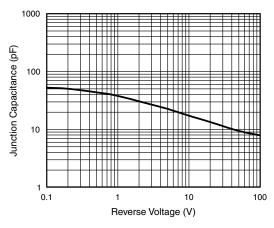


Fig. 5 - Typical Junction Capacitance

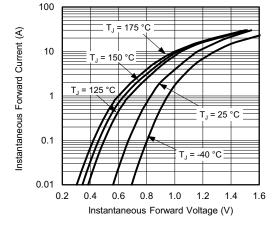


Fig. 3 - Typical Instantaneous Forward Characteristics

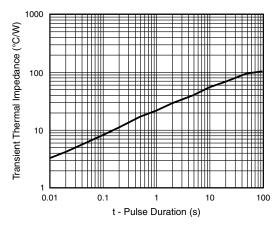


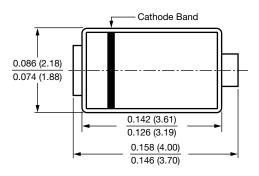
Fig. 6 - Typical Transient Thermal Impedance

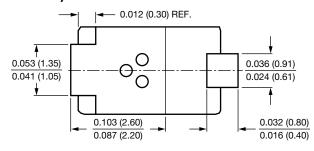
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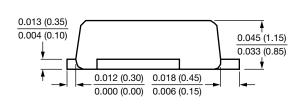
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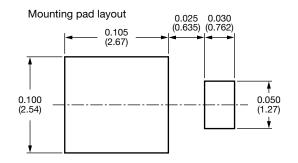
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMP (DO-220AA)











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