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ESH1B-M3, ESH1C-M3, ESH1D-M3

Vishay General Semiconductor

Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)



RoHS
COMPLIANT
HALOGEN
FREE

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- 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 AC/AC and DC/DC converters in high temperature conditions for both consumer applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F	0.90 V
$T_J \text{ max.}$	175 °C
Package	DO-214AC (SMA)
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum RMS voltage	V_{RMS}	70	105	140	V
Maximum DC blocking voltage	V_{DC}	100	150	200	V
Maximum average forward rectified current at $T_L = 150\text{ °C}$	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load (JEDEC method)	I_{FSM}	50			A
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		V _F ⁽¹⁾	0.87	V	
	I _F = 1 A		V _F	0.90		
Maximum DC reverse current at rated DC blocking voltage			I _R	T _A = 25 °C	1.0	μA
				T _A = 125 °C	25	
Maximum reverse current	V _R = 20 V, T _J = 150 °C		I _R	50	μA	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1 A, I _{rr} = 0.25 A		t _{rr}	25	ns	
Typical reverse recovery time	I _F = 0.6 A, V _R = 30 V, dI/dt = 50 A/μs, I _{rr} = 10 % I _{RM}		t _{rr}	T _J = 25 °C	25	ns
				T _J = 100 °C	35	
Typical stored charge	I _F = 0.6 A, V _R = 30 V, dI/dt = 50 A/μs, I _{rr} = 10 % I _{RM}		Q _{rr}	T _J = 25 °C	10	nC
				T _J = 100 °C	15	
Typical junction capacitance	4.0 V, 1 MHz		C _J	25	pF	

Note

(1) Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	85			°C/W
	R _{θJL} ⁽¹⁾	30			

Note

(1) Units mounted on PCB with 5.0 mm x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ESH1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ESH1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel



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

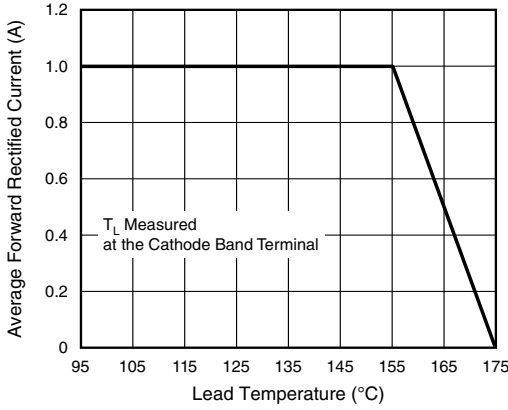


Fig. 1 - Maximum Forward Current Derating Curve

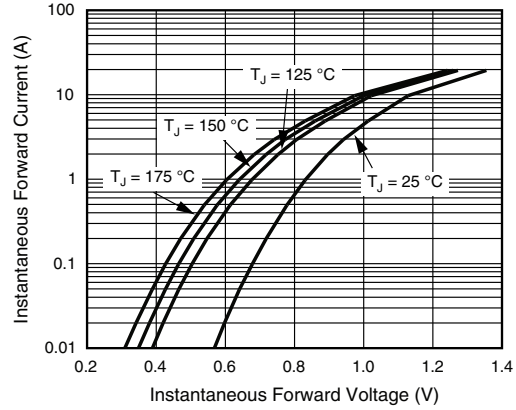


Fig. 4 - Typical Instantaneous Forward Characteristics

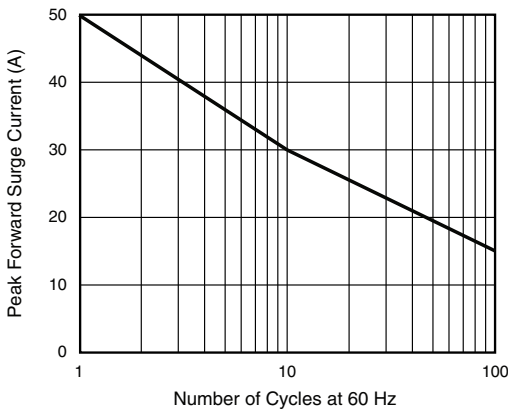


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

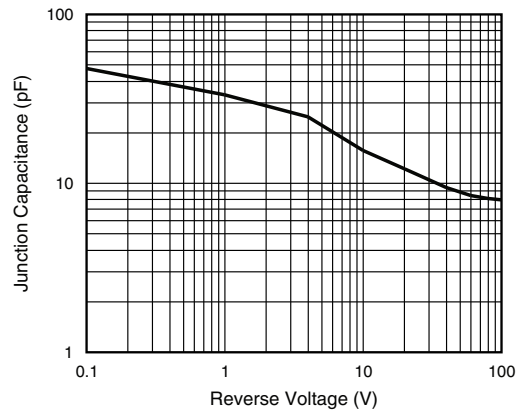


Fig. 5 - Typical Junction Capacitance

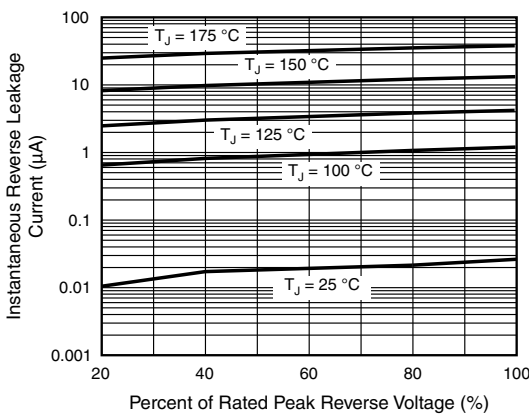


Fig. 3 - Typical Reverse Peak Leakage Characteristics

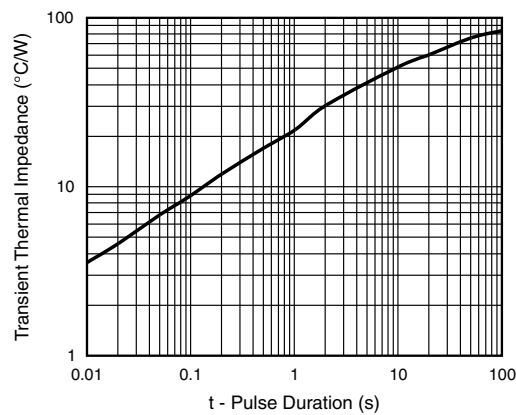


Fig. 6 - Typical Transient Thermal Impedance



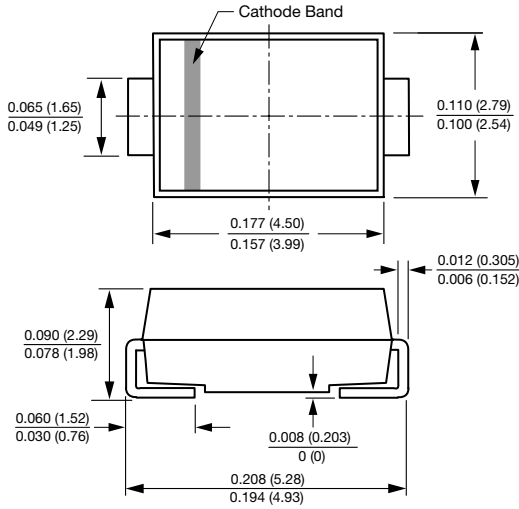
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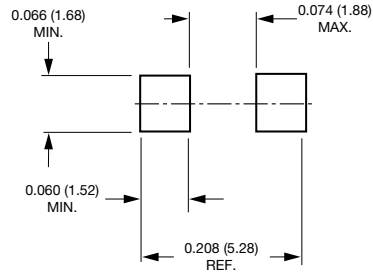
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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