AUTOMOTIVE GRADE

Available



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# Vishay General Semiconductor

# Surface-Mount Ultrafast Plastic Rectifier



**SMB (DO-214AA)** 



### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	2.0 A				
$V_{RRM}$	100 V, 150 V, 200 V				
t <sub>rr</sub>	25 ns				
$V_F$ at $I_F = 2 A$	0.93 V				
T <sub>J</sub> max.	175 °C				
Package	SMB (DO-214AA)				
Circuit configuration	Single				

#### **FEATURES**

- Glass passivated pellet chip junction
- · Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- · High forward surge capability
- Meets MSL level 1, per J-STD-020,
- LF maximum peak of 260 °C
- AEC-Q101 qualified available
  - Automotive ordering code: base P/NHE3
- Material categorization: for definitions of compliance please see www.vishav.com/doc?99912

#### **TYPICAL APPLICATIONS**

For use in high frequency rectification and freewheeling application in switching mode converter and inverter for both consumer and automotive.

### **MECHANICAL DATA**

Case: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade Base P/NHE3\_X - RoHS-compliant, 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

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	ESH2B	ESH2C	ESH2D	UNIT
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	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 (fig. 1)	I <sub>F(AV)</sub>	2.0		А	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	60		А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175			°C

# ESH2B, ESH2C, ESH2D

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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT	
Maximum instantaneous forward voltage	I <sub>F</sub> = 2 A		V <sub>F</sub> <sup>(1)</sup>	0.93	V	
Maximum DC reverse current		T <sub>A</sub> = 25 °C	I_	2.0	μΑ	
at rated DC blocking voltage		T <sub>A</sub> = 125 °C	I <sub>R</sub>	50		
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1 \text{ A}, I_{rr} = 0.25 \text{ A}$		t <sub>rr</sub>	25	ns	
Typical reverse recovery time	$I_F = 2 A, V_R = 30 V,$	T <sub>J</sub> = 25 °C	- t <sub>rr</sub>	35	ns	
	dI/dt = 50 A/ $\mu$ s, I <sub>rr</sub> = 10 % I <sub>RM</sub> $T_J$ =	T <sub>J</sub> = 100 °C		55		
Typical stored charge	IF = 2 7 4 7 R = 00 1,	T <sub>J</sub> = 25 °C	Q <sub>rr</sub>	20	nC	
		T <sub>J</sub> = 100 °C		35		
Typical junction capacitance	4.0 V, 1 MHz		CJ	30	pF	

#### Note

 $<sup>^{(1)}\,</sup>$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	ESH2B	ESH2C	ESH2D	UNIT
Typical thormal resistance	R <sub>0</sub> JA (1)	65			°C/W
Typical thermal resistance	R <sub>0JL</sub> (1)	20			C/VV

#### Note

(1) Units mounted on PCB with 8.0 mm x 8.0 mm land areas

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
ESH2D-E3/52T	0.096	52T	750	7" diameter plastic tape and reel		
ESH2D-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel		
ESH2DHE3_A/H (1)	0.096	Н	750	7" diameter plastic tape and reel		
ESH2DHE3_A/I (1)	0.096	I	3200	13" diameter plastic tape and reel		

## Note

(1) AEC-Q101 qualified



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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

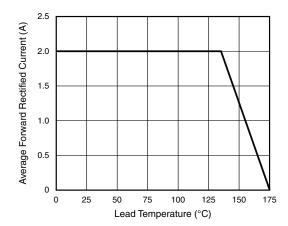


Fig. 1 - Maximum Forward Current Derating Curve

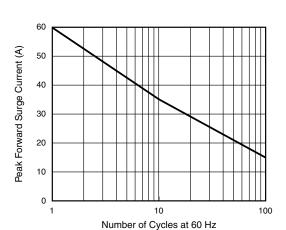


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

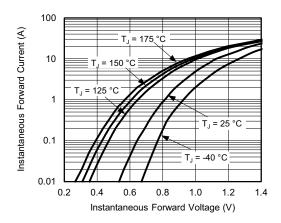


Fig. 3 - Typical Instantaneous Forward Characteristics

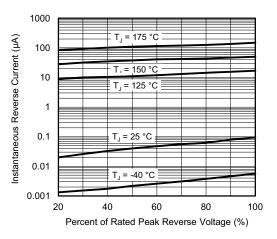


Fig. 4 - Typical Reverse Leakage Characteristics

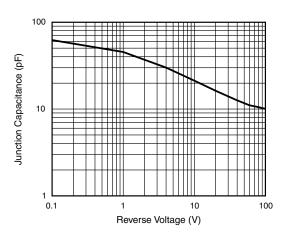


Fig. 5 - Typical Junction Capacitance

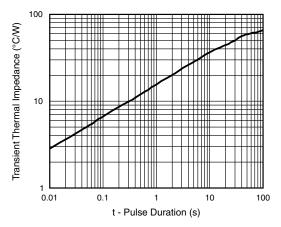


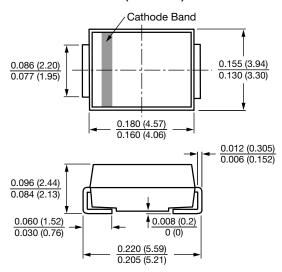
Fig. 6 - Typical Transient Thermal Impedance



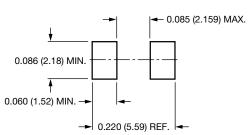
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

#### SMB (DO-214AA)



## **Mounting Pad Layout**





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