HALOGEN

FREE



## Vishay General Semiconductor

## **Surface Mount Ultrafast Rectifier**



**SMC (DO-214AB)** 

PRIMARY CHARACTERISTICS				
I <sub>F(AV)</sub>	3.0 A			
$V_{RRM}$	100 V, 150 V			
I <sub>FSM</sub>	80 A			
t <sub>rr</sub>	25 ns			
V <sub>F</sub> at I <sub>F</sub> = 3.0 A	0.75 V			
T <sub>J</sub> max.	175 °C			
Package	SMC (DO-214AB)			
Diode variations Single				

#### **FEATURES**

- Low profile package
- Ideal for automated placement
- Oxide planar chip junction
- · Ultrafast recovery times for high frequency
- 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 <a href="https://www.vishay.com/doc?99912"><u>www.vishay.com/doc?99912</u></a>

#### **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: SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating Base P/NHE3\_X - 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

HE3 suffix meets JESD 201 class 2 whisker test

Polarity: color band denotes cathode end

MAXIMUM RATINGS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	<b>UH3B</b>	UH3C	UNIT	
Device marking code		НВ	HC		
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	100	150	V	
Maximum average forward rectified current (fig. 1)	I <sub>F(AV)</sub> (1)	2.5		А	
	I <sub>F(AV)</sub> (2)	3.0			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	80		А	
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175		°C	

#### Notes

- (1) Free air, mounted on recommended copper pad area
- $^{(2)}$  Units mounted on PCB with 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad area



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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 1.5 A	T <sub>Δ</sub> = 25 °C	V <sub>E</sub> (1)	0.85	-	V
	I <sub>F</sub> = 3.0 A	1A = 25 C		0.95	1.05	
	I <sub>F</sub> = 1.5 A	'	VF (''	0.65 -		
	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 125 °C		0.75		0.90
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	5	μА
	nateu v <sub>R</sub>	T <sub>A</sub> = 125 °C		15	100	
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A},$ $I_{rr} = 0.25 \text{ A}$	T <sub>A</sub> = 25 °C	25 °C +	14	25	ns
Typical reverse recovery time	$I_F = 1.0 \text{ A}, \text{ dI/dt} = 50 \text{ A/}\mu\text{s}, \ V_R = 30 \text{ V}, I_{rr} = 0.1 I_{RM}$	1A=25 C L	t <sub>rr</sub>	23	40	
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )			S	0.2	-	
Typical reverse recovery current	$I_F = 3.0 \text{ A}, \text{ dI/dt} = 200 \text{ A/}\mu\text{s}, $ $V_R = 200 \text{ V}$	T <sub>A</sub> = 125 °C	I <sub>RM</sub>	5.0	7.0	Α
Typical stored charge	VR = 200 V		Q <sub>rr</sub>	60	-	nC
Typical junction capacitance	4.0 V, 1 MHz		CJ	42	-	pF

#### Notes

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

(2) Pulse test: Pulse width  $\leq$  40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	UH3B UH3C		UNIT	
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	95		°C/W	
	R <sub>θJM</sub> <sup>(1)</sup>	12			

#### Note

 $^{(1)}$  Free air, mounted on recommended copper pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  - junction to mount

ORDERING INFORMATION (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
UH3CHE3_A/H (1)	0.236	Н	850	7" diameter plastic tape and reel	
UH3CHE3_A/I (1)	0.236	I	3500	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)

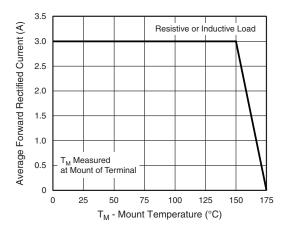


Fig. 1 - Maximum Forward Current Derating Curve

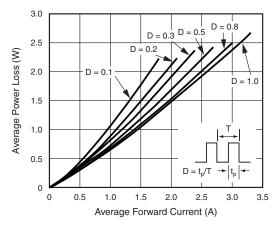


Fig. 2 - Forward Power Loss Characteristics

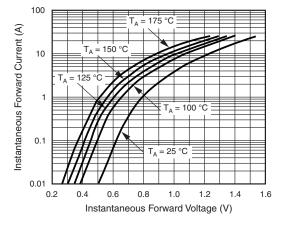


Fig. 3 - Typical Instantaneous Forward Characteristics

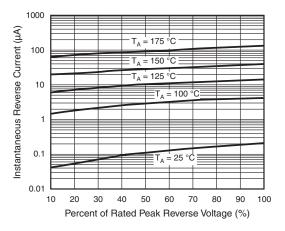


Fig. 4 - Typical Reverse Characteristics

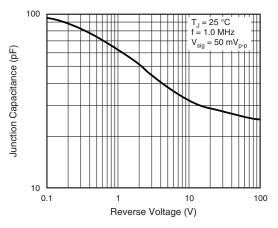


Fig. 5 - Typical Junction Capacitance

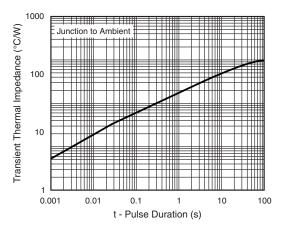


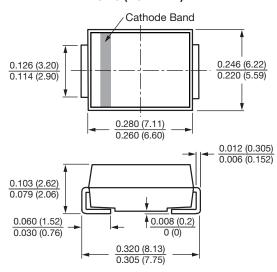
Fig. 6 - Typical Transient Thermal Impedance



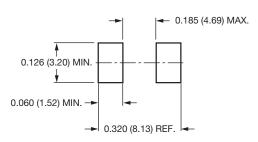
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### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

#### SMC (DO-214AB)



#### **Mounting Pad Layout**





## **Legal Disclaimer Notice**

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