

## Surface Mount Ultrafast Rectifier


**SMC (DO-214AB)**

### 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 [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
 COMPLIANT  
**HALOGEN**  
**FREE**  
 Available

### 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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	3.0 A
$V_{RRM}$	100 V, 150 V
$I_{FSM}$	80 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 3.0$ A	0.75 V
$T_J$ max.	175 °C
Package	SMC (DO-214AB)
Diode variations	Single

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

#### Notes

<sup>(1)</sup> Free air, mounted on recommended copper pad area

<sup>(2)</sup> Units mounted on PCB with 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad area



ELECTRICAL CHARACTERISTICS (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>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.85	-	V
	I <sub>F</sub> = 3.0 A			0.95	1.05	
	I <sub>F</sub> = 1.5 A	T <sub>A</sub> = 125 °C		0.65	-	
	I <sub>F</sub> = 3.0 A			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	μA
		T <sub>A</sub> = 125 °C		15	100	
Maximum reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A	T <sub>A</sub> = 25 °C	t <sub>rr</sub>	14	25	ns
Typical reverse recovery time	I <sub>F</sub> = 1.0 A, dI/dt = 50 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>			23	40	
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )		T <sub>A</sub> = 125 °C	S	0.2	-	
Typical reverse recovery current	I <sub>F</sub> = 3.0 A, dI/dt = 200 A/μs, V <sub>R</sub> = 200 V		I <sub>RM</sub>	5.0	7.0	A
Typical stored charge			Q <sub>rr</sub>	60	-	nC
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	42	-	pF

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width ≤ 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<sub>θJA</sub> - junction to ambient, R<sub>θJM</sub> - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH3CHE3_A/H <sup>(1)</sup>	0.236	H	850	7" diameter plastic tape and reel
UH3CHE3_A/I <sup>(1)</sup>	0.236	I	3500	13" diameter plastic tape and reel

**Note**

- (1) AEC-Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

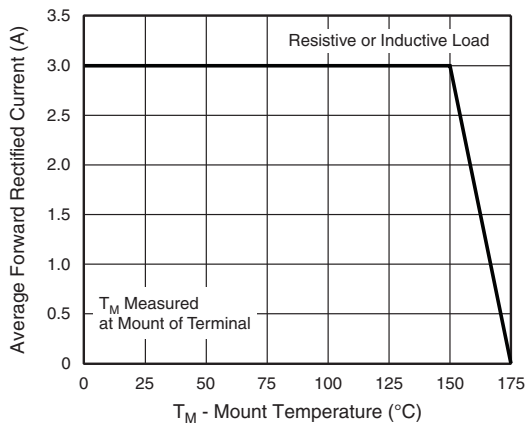


Fig. 1 - Maximum Forward Current Derating Curve

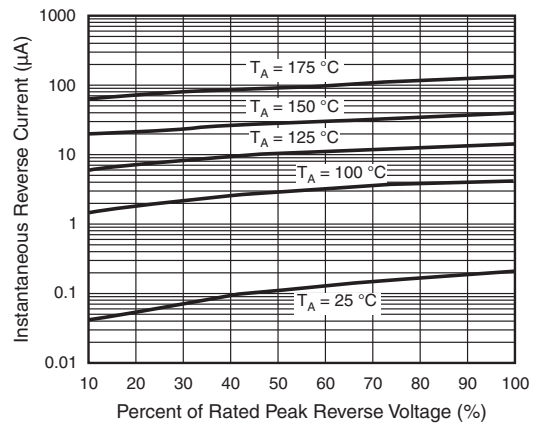


Fig. 4 - Typical Reverse Characteristics

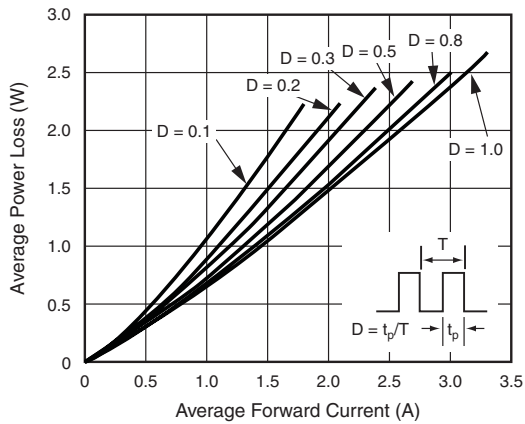


Fig. 2 - Forward Power Loss Characteristics

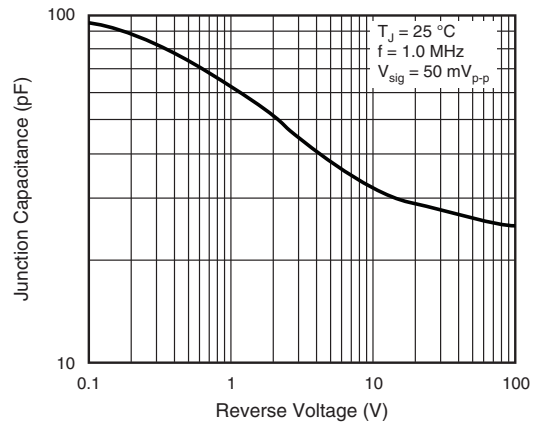


Fig. 5 - Typical Junction Capacitance

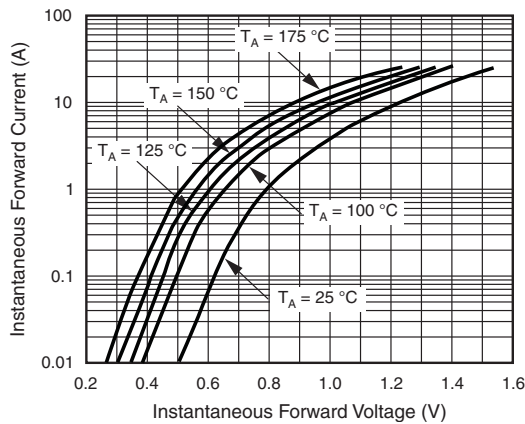


Fig. 3 - Typical Instantaneous Forward Characteristics

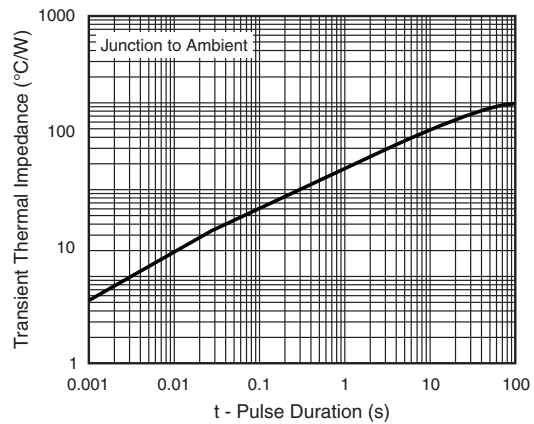
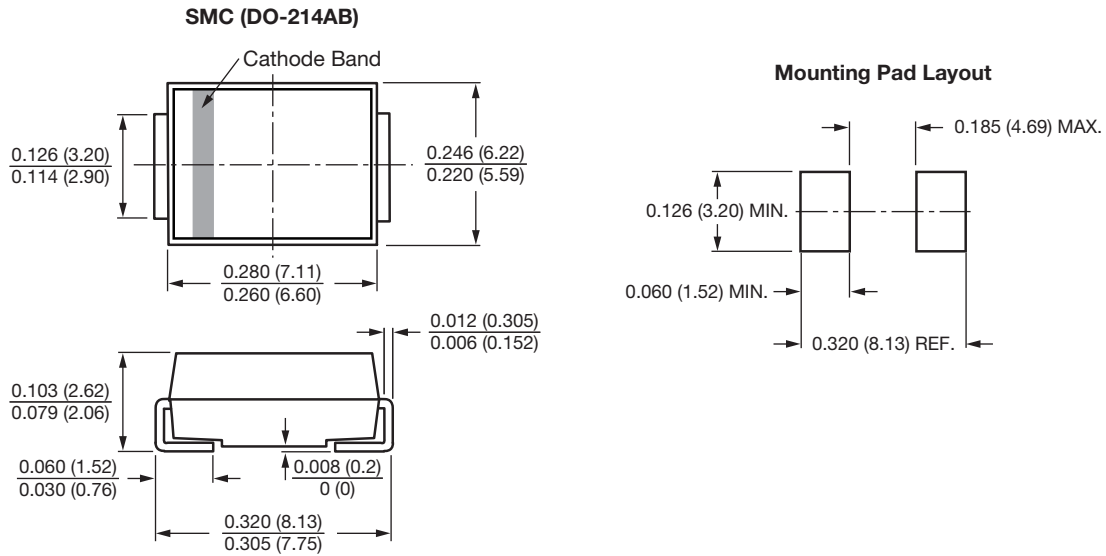


Fig. 6 - Typical Transient Thermal Impedance



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





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