



## Surface-Mount Ultrafast Rectifier



SMB (DO-214AA)

Cathode  Anode

### 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

### LINKS TO ADDITIONAL RESOURCES



### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2.0 A
$V_{RRM}$	100 V, 150 V
$I_{FSM}$	50 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 2.0$ A	0.69 V
$T_J$ max.	175 °C
Package	SMB (DO-214AA)
Circuit configuration	Single

### 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:** SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating  
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

HE3 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	UH2B	UH2C	UNIT
Device marking code		HB	HC	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	V
Maximum average forward rectified current (fig. 1) <sup>(1)</sup>	$I_{F(AV)}$	2.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50		A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175		°C

#### Note

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



ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 1.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.79	-	V	
	$I_F = 2.0\text{ A}$			0.87	1.05		
	$I_F = 1.0\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.62	-		
	$I_F = 2.0\text{ A}$			0.69	0.90		
Reverse current	Rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	2.0	$\mu\text{A}$	
		$T_A = 125\text{ }^\circ\text{C}$		10	50		
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$T_A = 25\text{ }^\circ\text{C}$	$t_{rr}$	15	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$				20	35	
Typical softness factor ( $t_b/t_a$ )	$I_F = 2.0\text{ A}$ , $dI/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 200\text{ V}$		$T_A = 125\text{ }^\circ\text{C}$	S	0.3	-	
Typical reverse recovery current				$I_{RM}$	5.0	6.0	A
Typical stored charge				$Q_{rr}$	55	-	nC
Typical junction capacitance				$C_J$	42	-	pF

**Notes**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

THERMAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	UH2B	UH2C	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	105		$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(1)}$	15		

**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
UH2CHE3_A/H <sup>(1)</sup>	0.100	H	750	7" diameter plastic tape and reel
UH2CHE3_A/I <sup>(1)</sup>	0.100	I	3200	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)

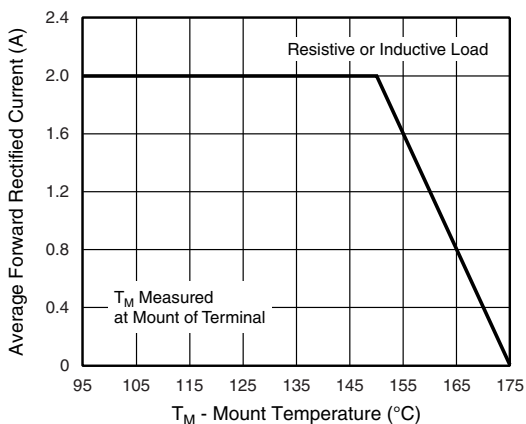


Fig. 1 - Maximum Forward Current Derating Curve

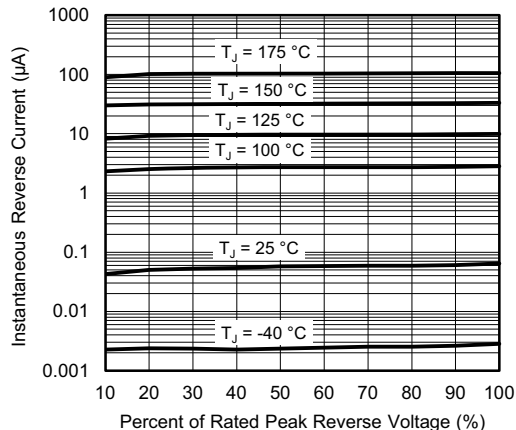


Fig. 4 - Typical Reverse Characteristics

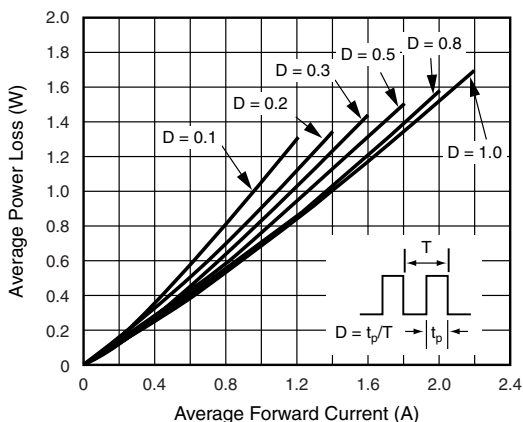


Fig. 2 - Forward Power Loss Characteristics

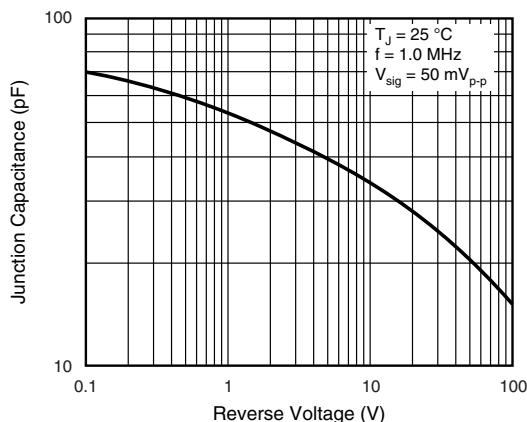


Fig. 5 - Typical Junction Capacitance

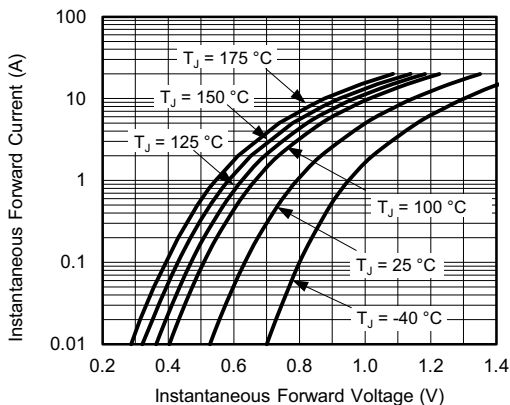


Fig. 3 - Typical Instantaneous Forward Characteristics

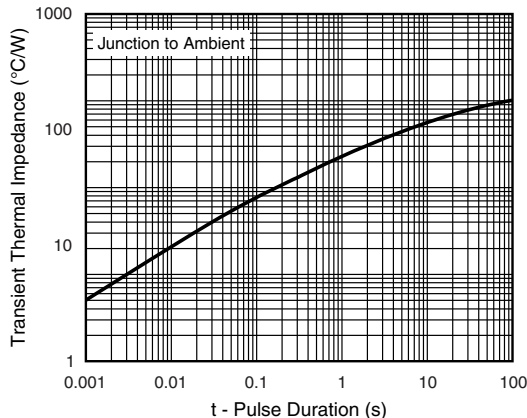
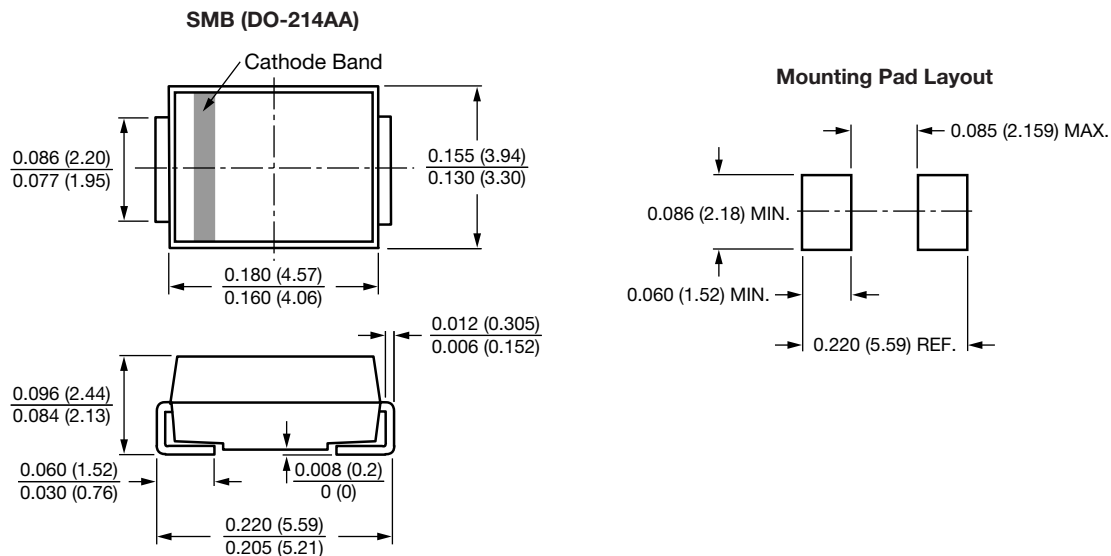


Fig. 6 - Typical Transient Thermal Impedance



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





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