

## Surface Mount Ultrafast Rectifiers



DO-214AC (SMA)

### 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
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), 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
$I_{FSM}$	30 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 1.0$ A	0.76 V
$T_J$ max.	175 °C

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	UH1B	UH1C	UH1D	UNIT
Device marking code		HB	HC	HD	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30			A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 175			°C

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage <sup>(1)</sup>	$I_F = 0.6\text{ A}$ $I_F = 1.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F$	0.90 0.96	- 1.05	V
	$I_F = 0.6\text{ A}$ $I_F = 1.0\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.70 0.76	- 0.90	
Reverse current <sup>(2)</sup>	rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$	$I_R$	- 7.5	1.0 25	$\mu\text{A}$
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$t_{rr}$	13	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$			21	30	
Typical softness factor ( $t_b/t_a$ )	$I_F = 1.0\text{ A}$ , $di/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 200\text{ V}$	$T_A = 125\text{ }^\circ\text{C}$	S	0.8	-	-
Typical reverse recovery current			$I_{RM}$	2.7	4.0	A
Typical stored charge			$Q_{rr}$	35	-	nC
Typical junction capacitance			$C_J$	17	-	pF

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	UH1B	UH1C	UH1D	UNIT
Typical thermal resistance <sup>(1)</sup>	$R_{\theta JA}$	120			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}$	20			

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

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
UH1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
UH1DHE3/61T <sup>(1)</sup>	0.064	61T	1800	7" diameter plastic tape and reel
UH1DHE3/5AT <sup>(1)</sup>	0.064	5AT	7500	13" diameter plastic tape and reel

**Note:**

(1) Automotive grade AEC Q101 qualified

**RATINGS AND CHARACTERISTICS CURVES**

( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

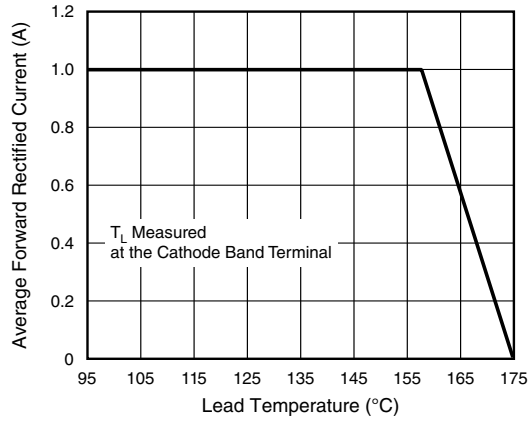


Figure 1. Maximum Forward Current Derating Curve

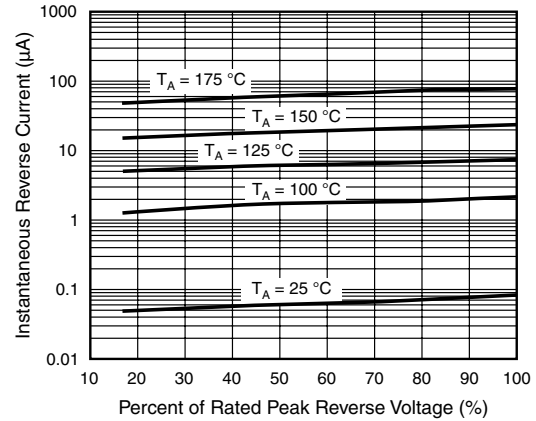


Figure 4. Typical Reverse Characteristics

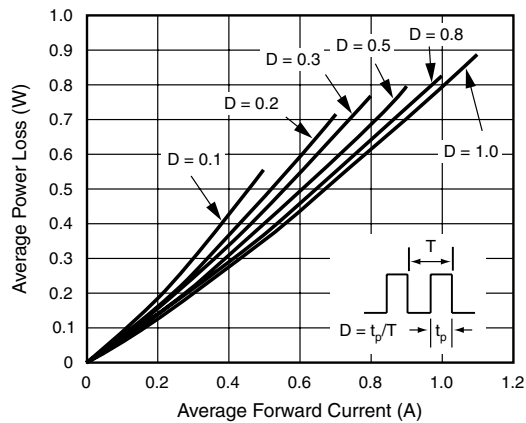


Figure 2. Forward Power Loss Characteristics

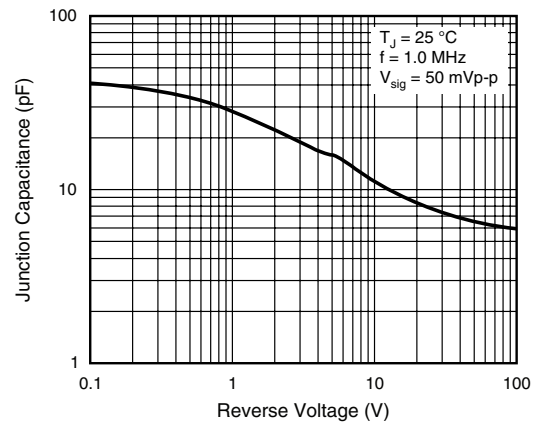


Figure 5. Typical Junction Capacitance

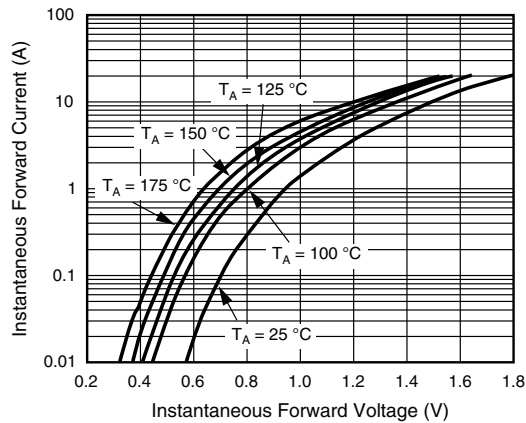


Figure 3. Typical Instantaneous Forward Characteristics

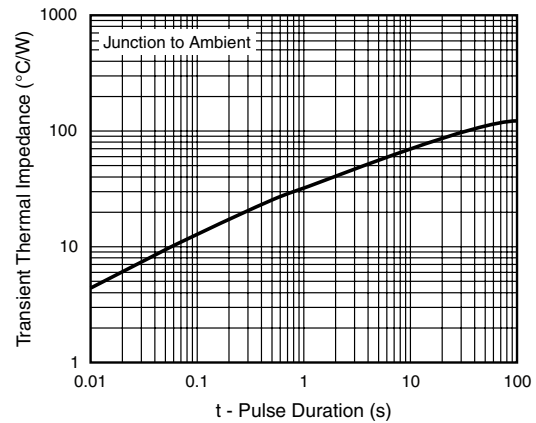
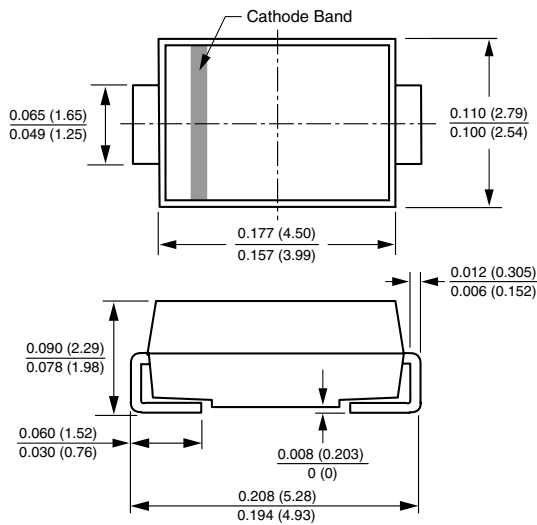


Figure 6. Typical Transient Thermal Impedance

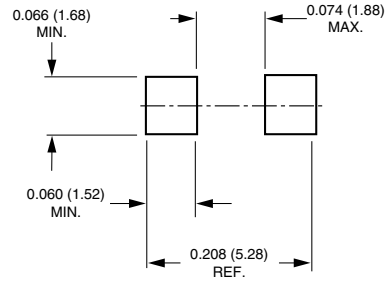


**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

**DO-214AC (SMA)**



**Mounting Pad Layout**





## Disclaimer

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