

Surface Mount Ultrafast Rectifier



DO-214AB (SMC)

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 of ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: DO-214AB (SMC)

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	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V, 150 V, 200 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

MAXIMUM RATINGS ($T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	UH3B	UH3C	UH3D	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)	$I_{F(AV)}$	2.5 ⁽¹⁾ 3.0 ⁽²⁾			A
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:

- (1) Free air, mounted on recommended copper pad area
- (2) Units mounted on P.C.B. with 0.31 x 0.31" (8.0 x 8.0 mm) 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 ⁽¹⁾	$I_F = 1.5\text{ A}$ $I_F = 3.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	V_F	0.85 0.95	- 1.05	V
	$I_F = 1.5\text{ A}$ $I_F = 3.0\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.65 0.75	- 0.90	
Reverse current ⁽²⁾	rated V_R	$T_A = 25\text{ }^\circ\text{C}$ $T_A = 125\text{ }^\circ\text{C}$	I_R	- 15	- 100	μA
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}	14	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$, $di/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1 I_{RM}$			23	40	
Typical softness factor (t_b/t_a)	$I_F = 3.0\text{ A}$, $di/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	$T_A = 125\text{ }^\circ\text{C}$	S	1.0	-	
Typical reverse recovery current			I_{RM}	5.0	7.0	A
Typical stored charge			Q_{rr}	60	-	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J	42	-	pF

Notes:(1) Pulse test: 300 μs 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	UH3B	UH3C	UH3D	UNIT
Typical thermal resistance ⁽¹⁾	$R_{\theta JA}$		95		$^\circ\text{C}/\text{W}$
	$R_{\theta JM}$		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
UH3D-E3/57T	0.236	57T	850	7" diameter plastic tape and reel
UH3D-E3/9AT	0.236	9AT	3500	13" diameter plastic tape and reel
UH3DHE3/57T ⁽¹⁾	0.236	57T	850	7" diameter plastic tape and reel
UH3DHE3/9AT ⁽¹⁾	0.236	9AT	3500	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)

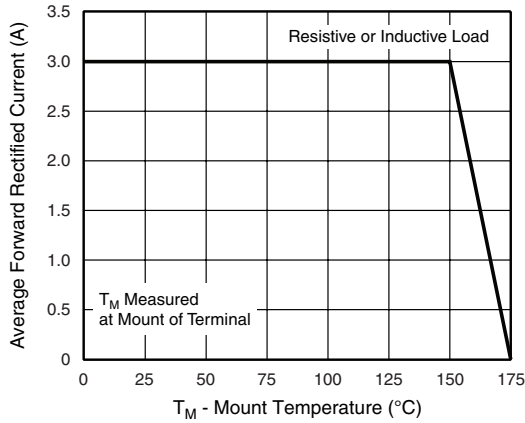


Figure 1. Maximum Forward Current Derating Curve

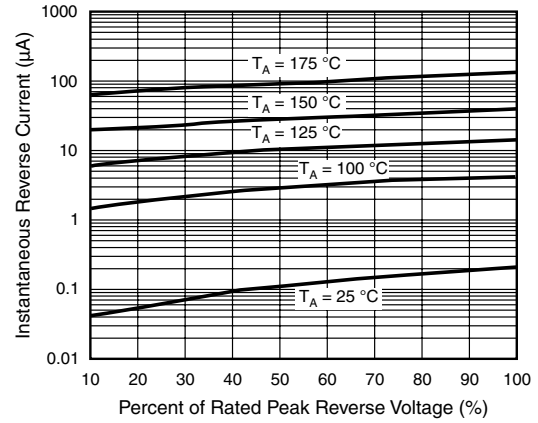


Figure 4. Typical Reverse Characteristics

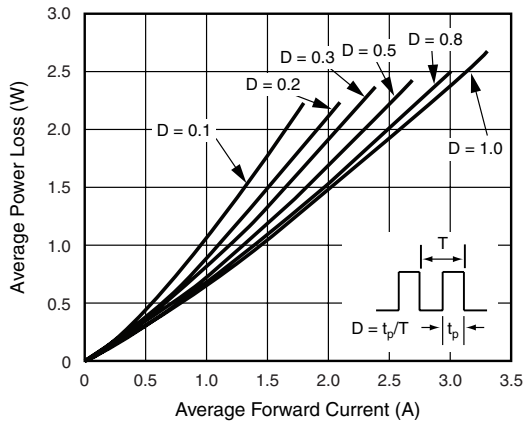


Figure 2. Forward Power Loss Characteristics

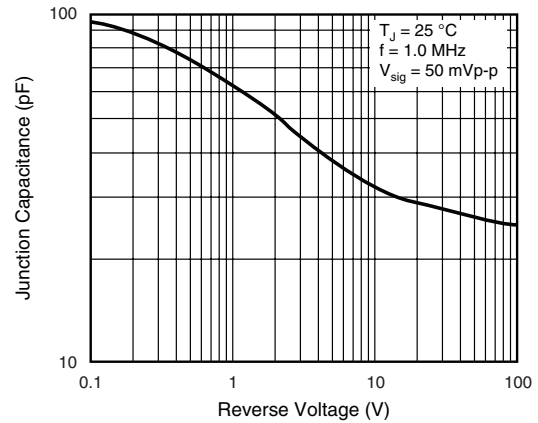


Figure 5. Typical Junction Capacitance

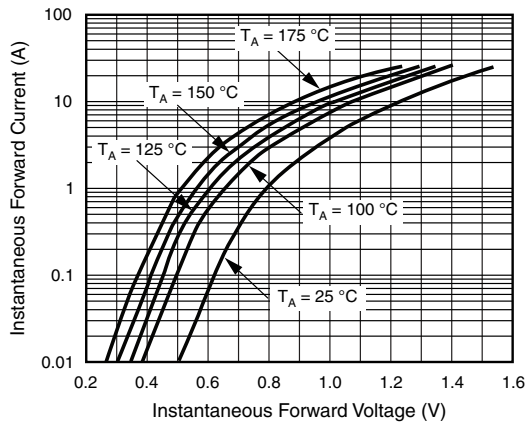


Figure 3. Typical Instantaneous Forward Characteristics

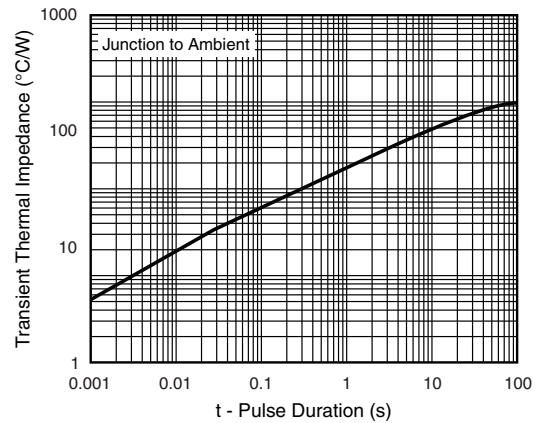
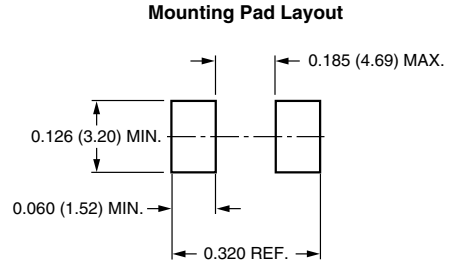
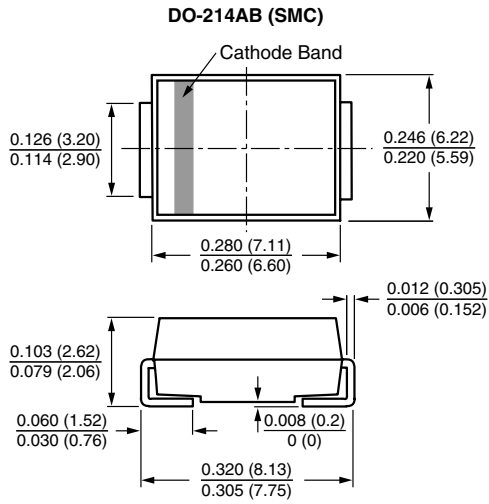


Figure 6. Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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