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

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.

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

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_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)	$I_{F(AV)}$ (1)	2.5		A
	$I_{F(AV)}$ (2)	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

(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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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 1.5 A	T_A = 25 °C	V_F (1)	0.85	-	V
	I_F = 3.0 A			0.95	1.05	
	I_F = 1.5 A	T_A = 125 °C		0.65	-	
	I_F = 3.0 A			0.75	0.90	
Reverse current	Rated V_R	T_A = 25 °C	I_R (2)	-	5	μA
		T_A = 125 °C		15	100	
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_A = 25 °C	t_{rr}	14	25	ns
Typical reverse recovery time	I_F = 1.0 A, dI/dt = 50 A/μs, V_R = 30 V, I_{rr} = 0.1 I_{RM}			23	40	
Typical softness factor (t_b/t_a)	I_F = 3.0 A, dI/dt = 200 A/μs, V_R = 200 V	T_A = 125 °C	S	0.2	-	
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 ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**UH3B**	**UH3C**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	95		°C/W
	$R_{\theta JM}$ (1)	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	H	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_A = 25 °C unless otherwise noted)

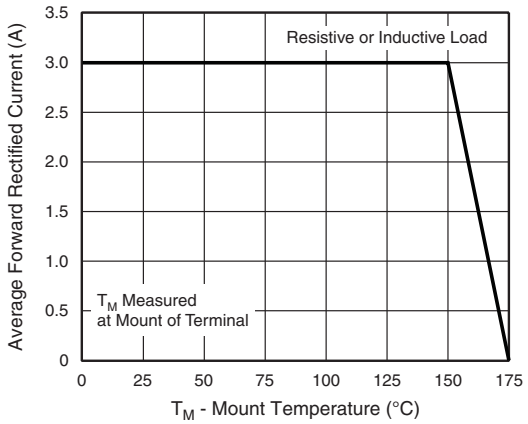

Fig. 1 - Maximum Forward Current Derating Curve

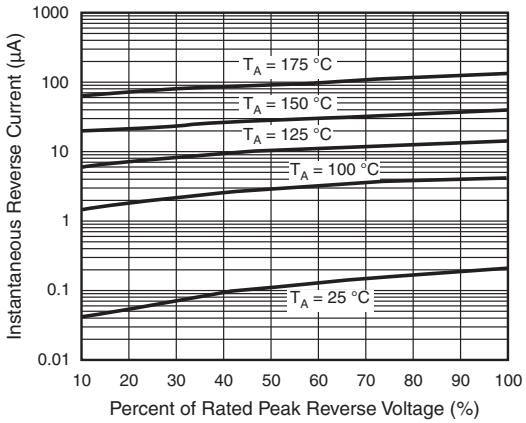

Fig. 4 - Typical Reverse Characteristics

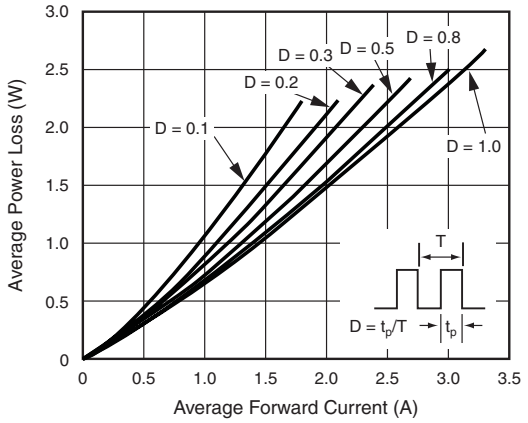

Fig. 2 - Forward Power Loss Characteristics

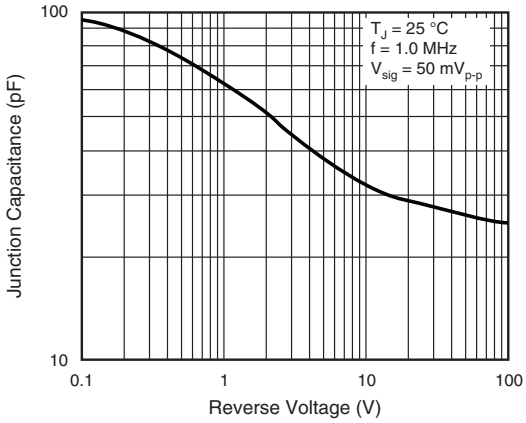

Fig. 5 - Typical Junction Capacitance

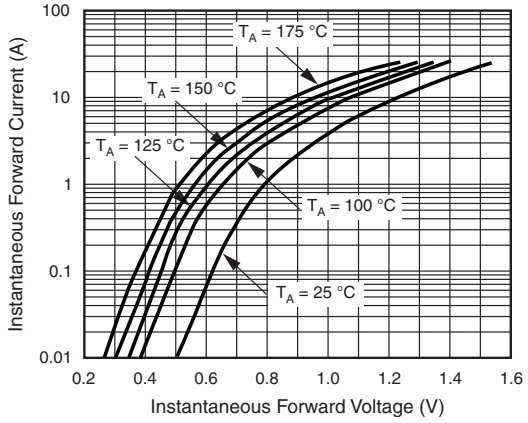

Fig. 3 - Typical Instantaneous Forward Characteristics

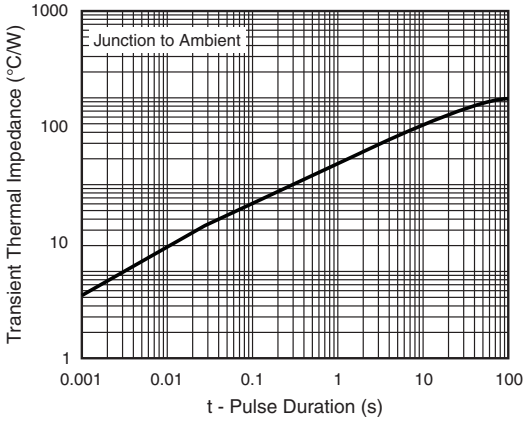

Fig. 6 - Typical Transient Thermal Impedance

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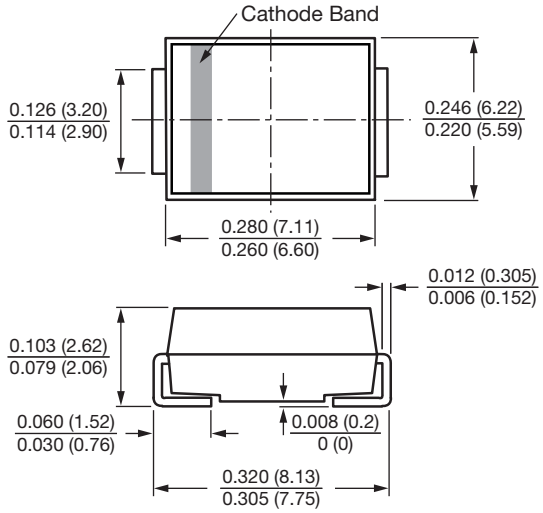
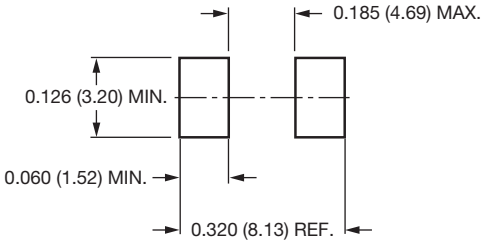
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMC (DO-214AB)



Mounting Pad Layout



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