

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.

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)	$I_{F(AV)}$ ⁽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



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)		T _A = 125 °C	S	0.2	-	
Typical reverse recovery current	I _F = 3.0 A, di/dt = 200 A/μs, V _R = 200 V		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 _{θJA} ⁽¹⁾	95		°C/W
	R _{θJM} ⁽¹⁾	12		

Note

- (1) Free air, mounted on recommended copper pad area. Thermal resistance R_{θJA} - junction to ambient, R_{θJM} - 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

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

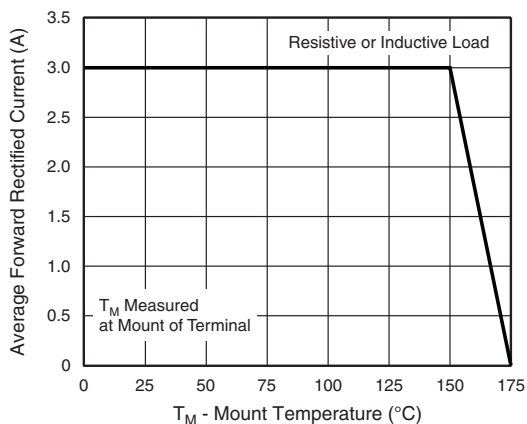


Fig. 1 - Maximum Forward Current Derating Curve

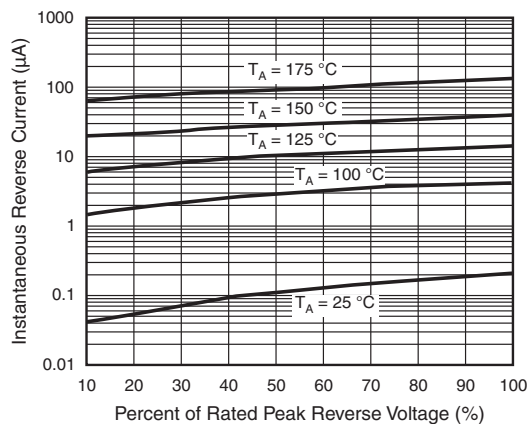


Fig. 4 - Typical Reverse Characteristics

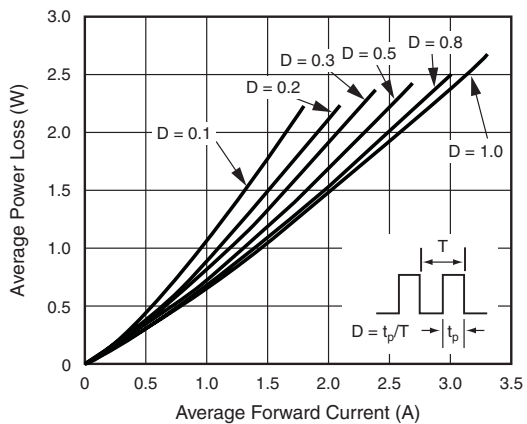


Fig. 2 - Forward Power Loss Characteristics

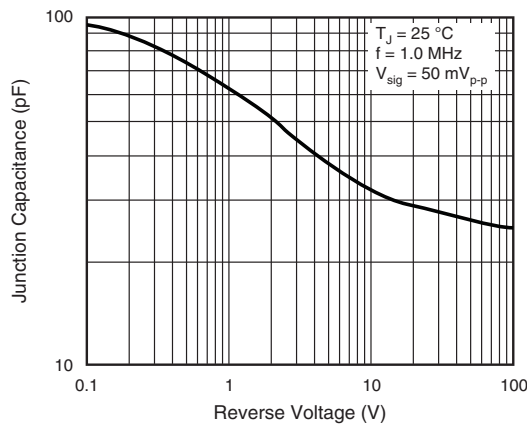


Fig. 5 - Typical Junction Capacitance

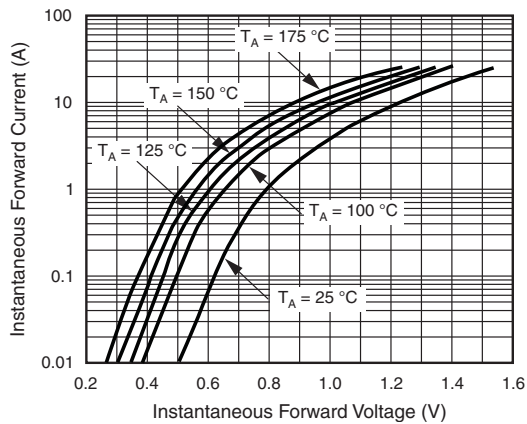


Fig. 3 - Typical Instantaneous Forward Characteristics

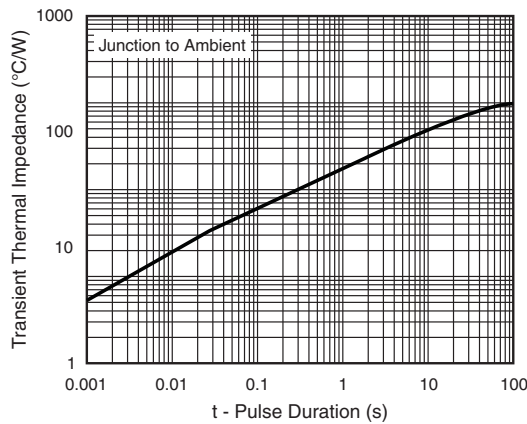
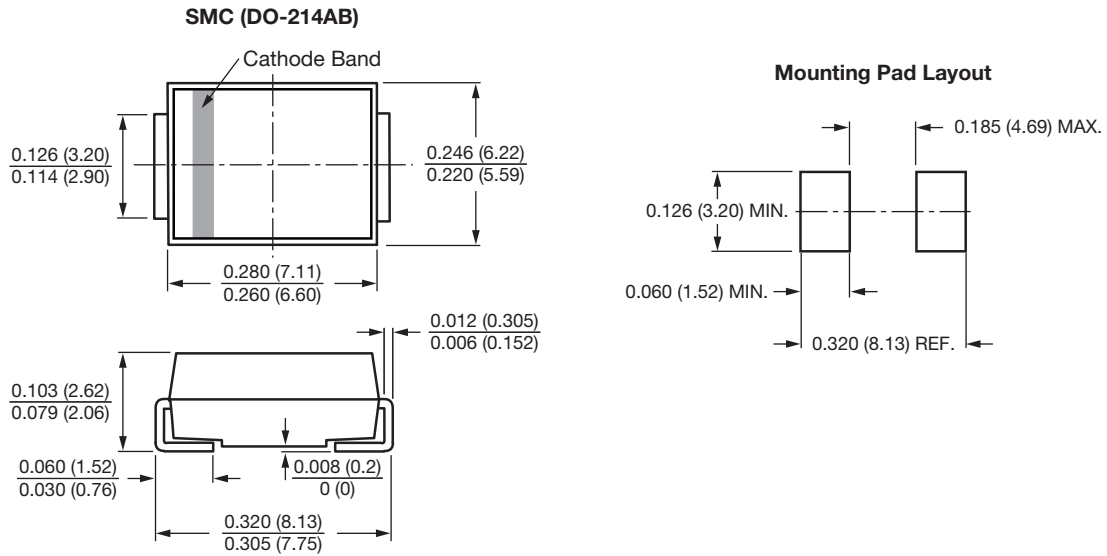


Fig. 6 - Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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