

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 or P/NHM3
- 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/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHM3_X - halogen-free, 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

E3, M3, HE3, and HM3 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, 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
Package	SMC (DO-214AB)
Diode variations	Single

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

PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 1.5\text{ A}$	$V_F^{(1)}$	0.85	-	V
	$I_F = 3.0\text{ A}$		0.95	1.05	
	$I_F = 1.5\text{ A}$		0.65	-	
	$I_F = 3.0\text{ A}$		0.75	0.90	
Reverse current	Rated V_R	$I_R^{(2)}$	-	5	μA
			15	100	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{rr} = 0.25\text{ A}$	t_{rr}	14	25	ns
Typical reverse recovery time	$I_F = 1.0\text{ A}$, $dI/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$, $I_{rr} = 0.1\text{ I}_{RM}$		23	40	
Typical softness factor (t_p/t_a)	$I_F = 3.0\text{ A}$, $dI/dt = 200\text{ A}/\mu\text{s}$, $V_R = 200\text{ V}$	S	0.2	-	
Typical reverse recovery current		I_{RM}	5.0	7.0	A
Typical stored charge		Q_{rr}	60	-	nC
Typical junction capacitance		C_J	42	-	pF
	4.0 V, 1 MHz				

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	$R_{\theta JA}^{(1)}$	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
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_A/H ⁽¹⁾	0.236	H	850	7" diameter plastic tape and reel
UH3DHE3_A/I ⁽¹⁾	0.236	I	3500	13" diameter plastic tape and reel
UH3D-M3/57T	0.236	57T	850	7" diameter plastic tape and reel
UH3D-M3/9AT	0.236	9AT	3500	13" diameter plastic tape and reel
UH3DHM3_A/H ⁽¹⁾	0.236	H	850	7" diameter plastic tape and reel
UH3DHM3_A/I ⁽¹⁾	0.236	I	3500	13" diameter plastic tape and reel

Note

(1) AEC-101 qualified

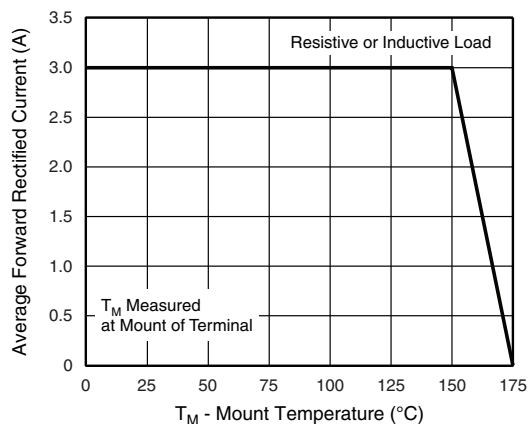
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

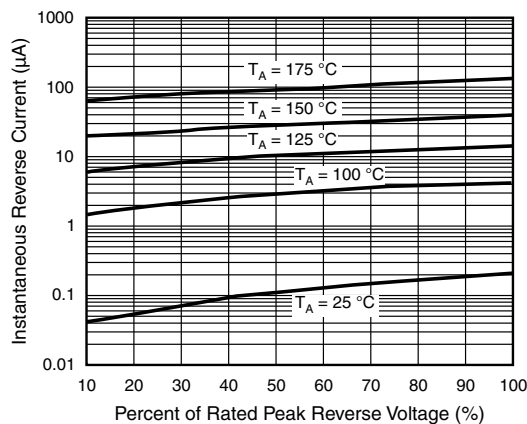


Fig. 4 - Typical Reverse Characteristics

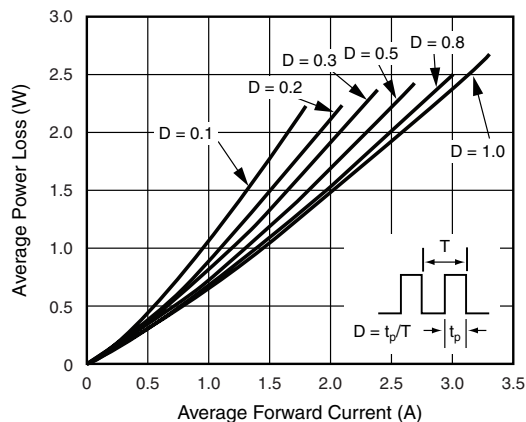


Fig. 2 - Forward Power Loss Characteristics

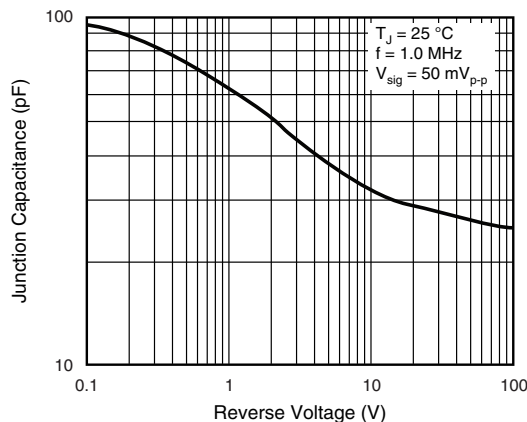


Fig. 5 - Typical Junction Capacitance

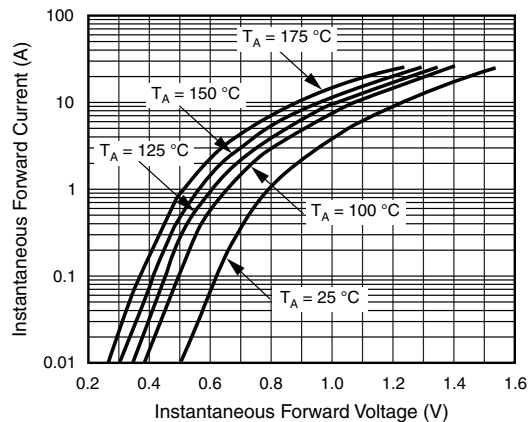


Fig. 3 - Typical Instantaneous Forward Characteristics

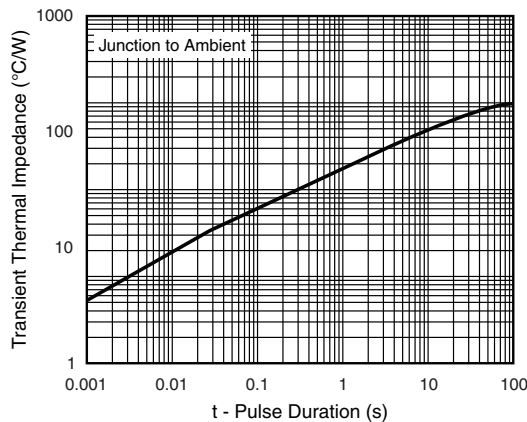
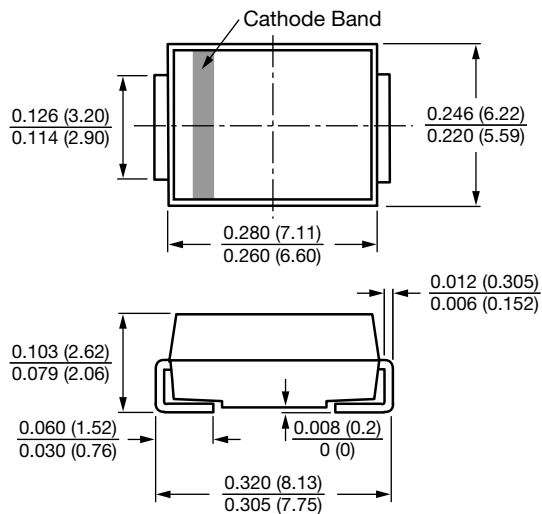


Fig. 6 - Typical Transient Thermal Impedance

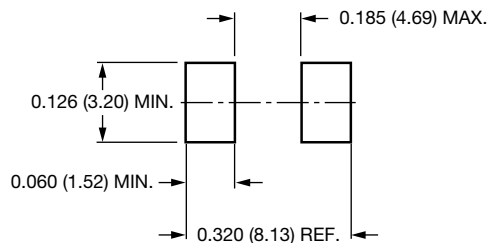


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMC (DO-214AB)



Mounting Pad Layout





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