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Surface Mount Ultrafast Rectifier



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
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds AC/AC and DC/DC converters in high temperature conditions for both consumer and automotive applications.

MECHANICAL DATA

Case: DO-214AC (SMA)

Molding compound meets UL 94 V-0 flammability rating
 Base P/N-E3 - RoHS-compliant, commercial grade
 Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified
 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

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix 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



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I _F = 0.6 A	T _A = 25 °C	V _F ⁽¹⁾	0.90	-	V
	I _F = 1.0 A			0.96	1.05	
	I _F = 0.6 A	T _A = 125 °C		0.70	-	
	I _F = 1.0 A			0.76	0.90	
Reverse current	Rated V _R	T _A = 25 °C	I _R ⁽²⁾	-	1.0	μA
		T _A = 125 °C		7.5	25	
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}	13	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}			21	30	
Typical softness factor (t _b /t _a)	I _F = 1.0 A, dI/dt = 200 A/μs, V _R = 200 V	T _A = 125 °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 μs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	UH1B	UH1C	UH1D	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	120			°C/W
	R _{θJM} ⁽¹⁾	20			

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
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 ⁽¹⁾	0.064	61T	1800	7" diameter plastic tape and reel
UH1DHE3/5AT ⁽¹⁾	0.064	5AT	7500	13" diameter plastic tape and reel
UH1DHE3_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
UH1DHE3_A/I ⁽¹⁾	0.064	I	7500	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)

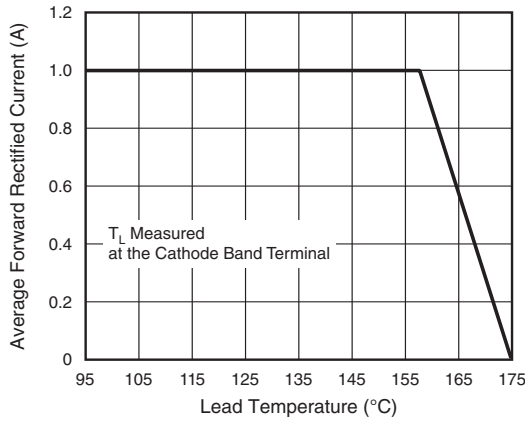


Fig. 1 - Maximum Forward Current Derating Curve

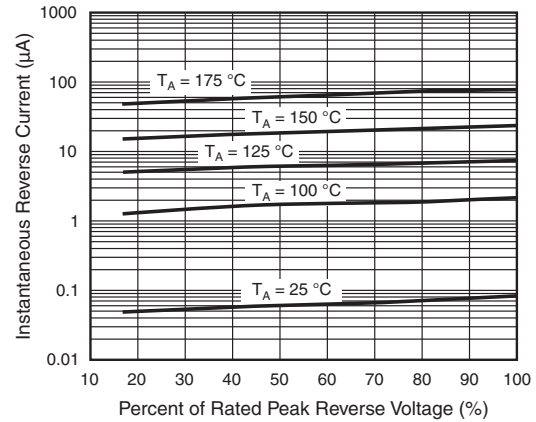


Fig. 4 - Typical Reverse Characteristics

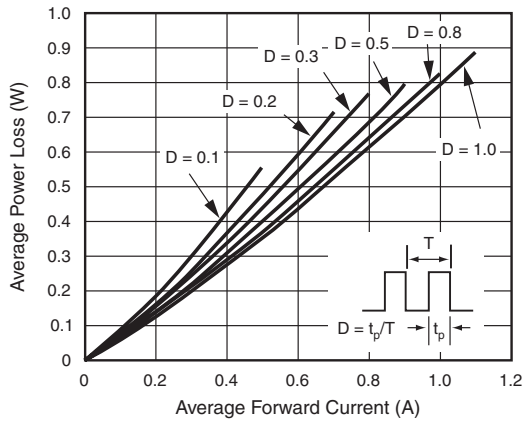


Fig. 2 - Forward Power Loss Characteristics

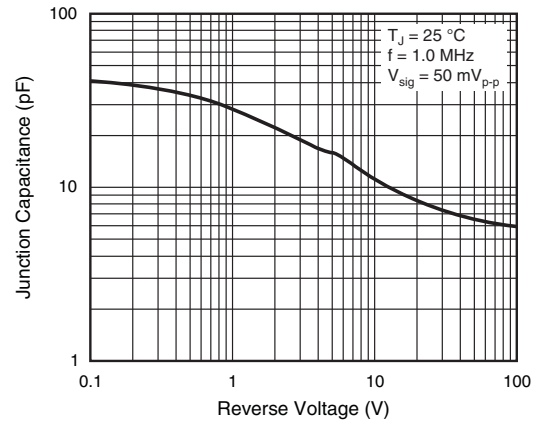


Fig. 5 - Typical Junction Capacitance

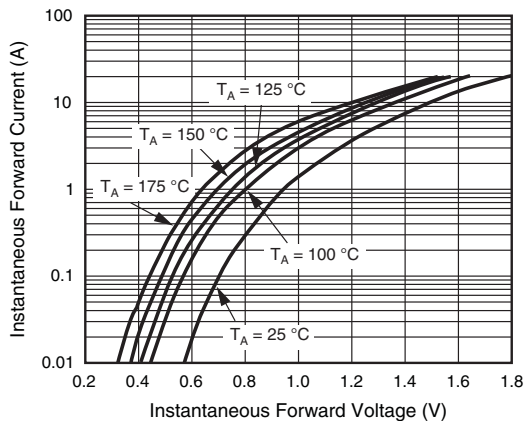


Fig. 3 - Typical Instantaneous Forward Characteristics

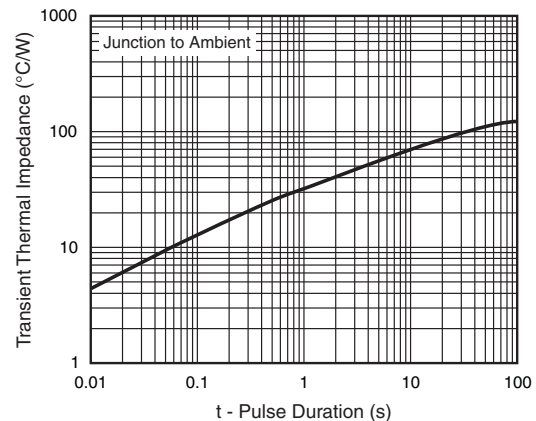
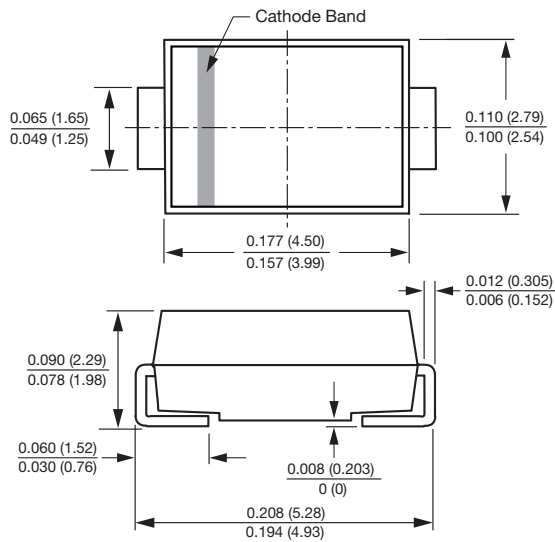


Fig. 6 - Typical Transient Thermal Impedance

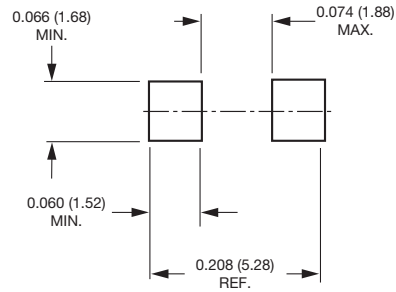


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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