



## Surface Mount Ultrafast Rectifier

### eSMP® Series



DO-220AA (SMP)

### FEATURES

- Very low profile - typical height of 1.0 mm
- 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
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### 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	0.75 V
$T_J$ max.	175 °C

### MECHANICAL DATA

**Case:** DO-220AA (SMP)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-M3 - halogen-free, RoHS compliant, and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

M3 suffix meets JESD 201 class 1A whisker test

**Polarity:** Color band denotes cathode end

### 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.

### MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	UH1PB	UH1PC	UH1PD	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 10 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

## UH1PB, UH1PC, UH1PD

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ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	$I_F = 0.6\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.88	-	V
	$I_F = 1.0\text{ A}$			0.95	1.05	
	$I_F = 0.6\text{ A}$	$T_A = 125\text{ }^\circ\text{C}$		0.69	-	
	$I_F = 1.0\text{ A}$			0.75	0.85	
Reverse current	Rated $V_R$	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	1.0	$\mu\text{A}$
		$T_A = 125\text{ }^\circ\text{C}$		5.0	25	
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$t_{rr}$	19	25	ns
	$I_F = 1.0\text{ A}$ , $dI/dt = 50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1 I_{RM}$			27	40	
Typical softness factor ( $t_b/t_a$ )	$I_F = 1.0\text{ A}$ , $dI/dt = 200\text{ A}/\mu\text{s}$ , $V_R = 200\text{ V}$	$T_A = 125\text{ }^\circ\text{C}$	S	0.4	-	-
Maximum reverse recovery current			$I_{RM}$	3.7	5.5	A
Typical stored charge			$Q_{rr}$	48	-	nC
Typical junction capacitance			$C_J$	16	-	pF

## Notes

- (1) Pulse test: 300  $\mu\text{s}$  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	UH1PB	UH1PC	UH1PD	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	120			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(1)}$	20			

## Note

- (1) Free air, mounted on recommended copper pad area. Thermal resistance  $R_{\theta JA}$  - junction to ambient,  $R_{\theta JM}$  junction to mount at the terminal cathode band

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH1PD-M3/84A	0.024	84A	3000	7" diameter plastic tape and reel
UH1PD-M3/85A	0.024	85A	10 000	13" diameter plastic tape and reel



**RATINGS AND CHARACTERISTICS CURVES**

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

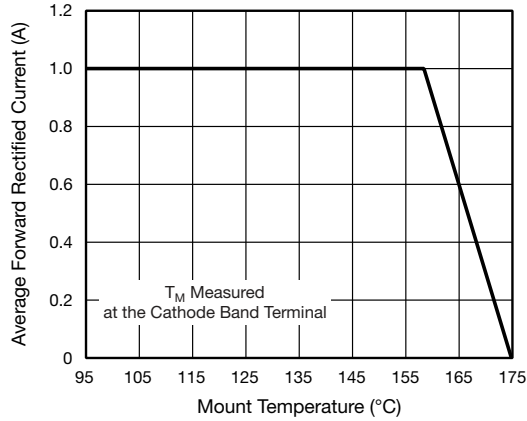


Fig. 1 - Maximum Forward Current Derating Curve

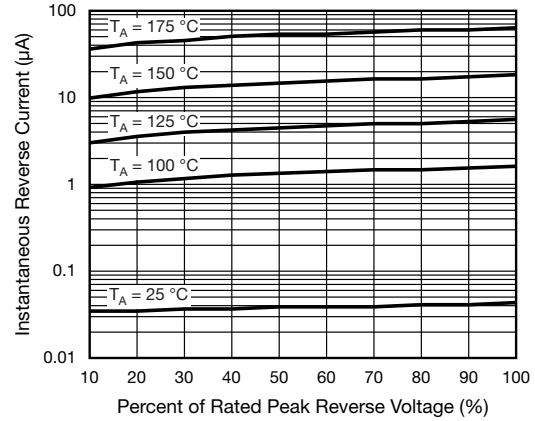


Fig. 4 - Typical Reverse Characteristics

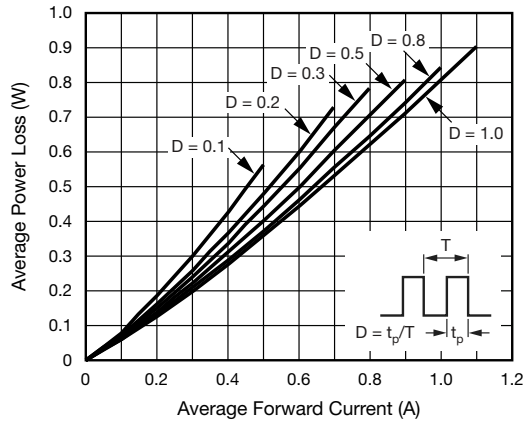


Fig. 2 - Forward Power Loss Characteristics

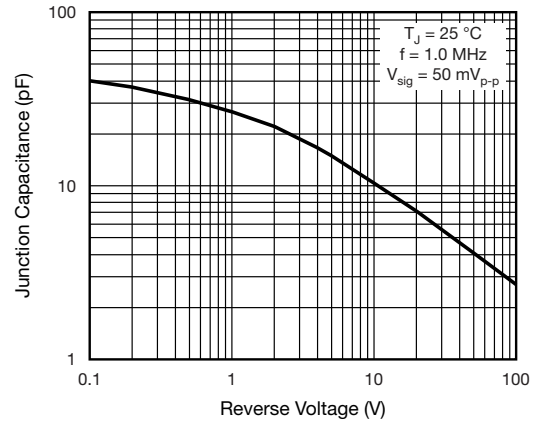


Fig. 5 - Typical Junction Capacitance

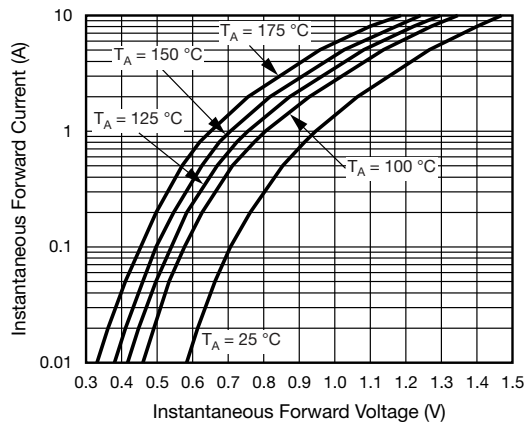


Fig. 3 - Typical Instantaneous Forward Characteristics

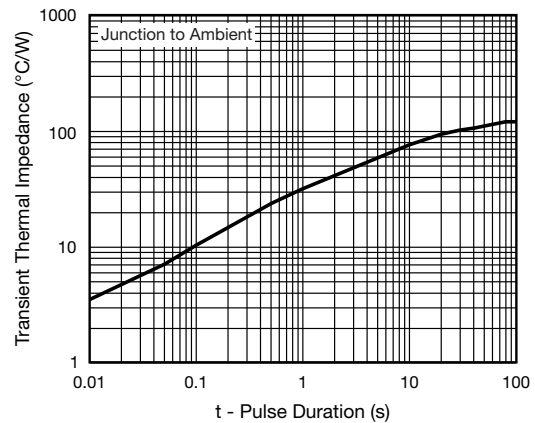


Fig. 6 - Typical Transient Thermal Impedance

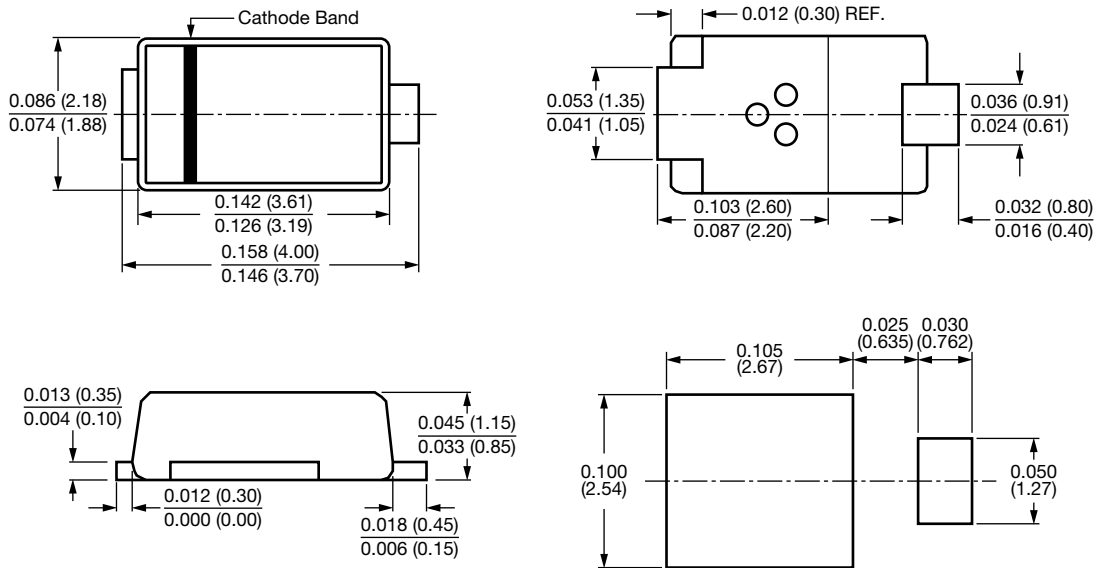
# UH1PB, UH1PC, UH1PD

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

### DO-220AA (SMP)





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