

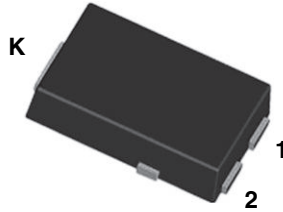


**THE DATASHEET OF  
UH4PDC-M3/86A**

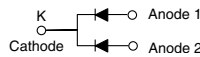


# High Current Density Surface Mount Ultrafast Rectifiers

## eSMP® Series



### TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 2.0 A
$V_{RRM}$	100 V, 150 V, 200 V
$I_{FSM}$	40 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 2.0$ A	0.77 V
$T_J$ max.	175 °C

## TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer computer, automotive, and telecommunication applications.

MAXIMUM RATINGS ( $T_A = 25$ °C unless otherwise noted)					
PARAMETER	SYMBOL	UH4PBC	UH4PCC	UH4PDC	UNIT
Device marking code		H4BC	H4CC	H4DC	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	V
Maximum average forward rectified current (fig. 1)	total device	4.0			A
	per diode	2.0			
Peak forward surge current 10 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	40			A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 175			°C

## FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- 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](http://www.vishay.com/doc?99912)

AUTOMOTIVE  
GRADE  
Available



RoHS  
COMPLIANT  
HALOGEN  
FREE

## MECHANICAL DATA

**Case:** TO-277A (SMPC)

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

Base P/NHM3 - halogen-free, RoHS-compliant, and automotive grade

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

M3 suffix meets JESD 201 class 1A whisker test, HM3 suffix meets JESD 201 class 2 whisker test



ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	I <sub>F</sub> = 1.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.84	-	V
	I <sub>F</sub> = 2.0 A			0.93	1.05	
	I <sub>F</sub> = 1.0 A	T <sub>A</sub> = 125 °C		0.68	-	
	I <sub>F</sub> = 2.0 A			0.77	0.85	
Reverse current per diode	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	5	μA
		T <sub>A</sub> = 125 °C		6.4	25	
Maximum reverse recovery time per diode	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A		t <sub>rr</sub>	20	25	ns
Typical reverse recovery time per diode	I <sub>F</sub> = 1.0 A, di/dt = 50 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>			24	-	
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> ) per diode			S	0.3	-	-
Typical reverse recovery current per diode	I <sub>F</sub> = 2 A, di/dt = 200 A/μs, V <sub>R</sub> = 200 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>		I <sub>RM</sub>	5.4	-	A
Typical stored charge per diode	T <sub>A</sub> = 125 °C		Q <sub>rr</sub>	88	-	nC
Typical junction capacitance per diode	4.0 V, 1 MHz		C <sub>J</sub>	21	-	pF

**Notes**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle  
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise specified)					
PARAMETER	SYMBOL	UH4PBC	UH4PCC	UH4PDC	UNIT
Typical thermal resistance per diode	R <sub>θJA</sub> <sup>(1)</sup>	60			°C/W
	R <sub>θJL</sub>	4			

**Note**

- (1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH4PDC-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDC-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH4PDCHM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
UH4PDCHM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel

**Note**

- (1) Automotive grade

**RATINGS AND CHARACTERISTICS CURVES**

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

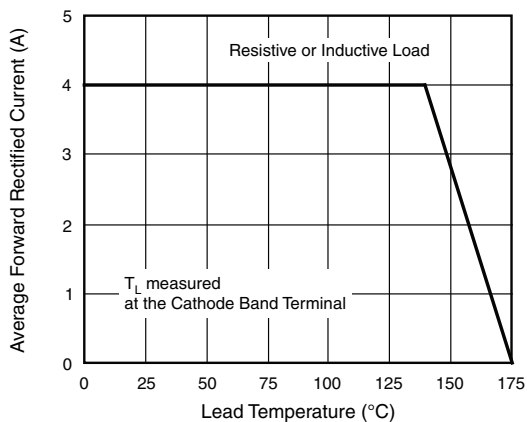


Fig. 1 - Maximum Forward Current Derating Curve

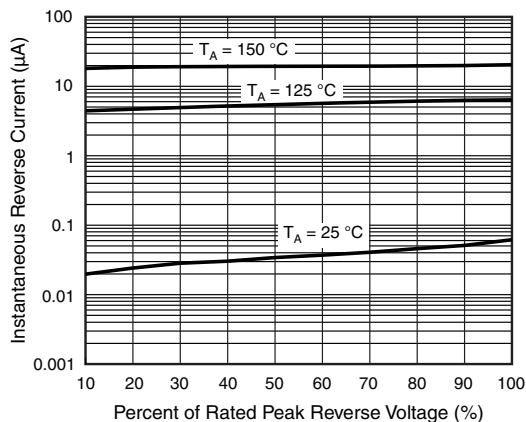


Fig. 4 - Typical Reverse Leakage Characteristics Per Diode

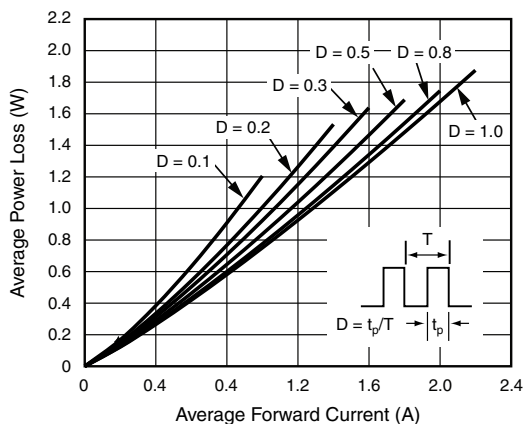


Fig. 2 - Forward Power Loss Characteristics Per Diode

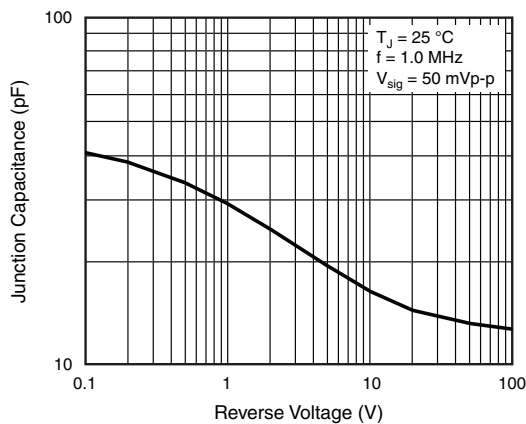


Fig. 5 - Typical Junction Capacitance Per Diode

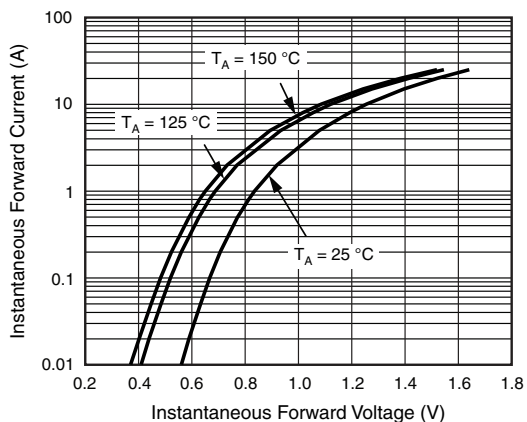


Fig. 3 - Typical Instantaneous Forward Characteristics Per Diode

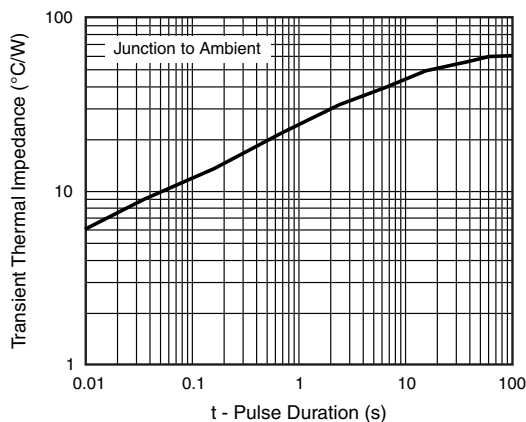
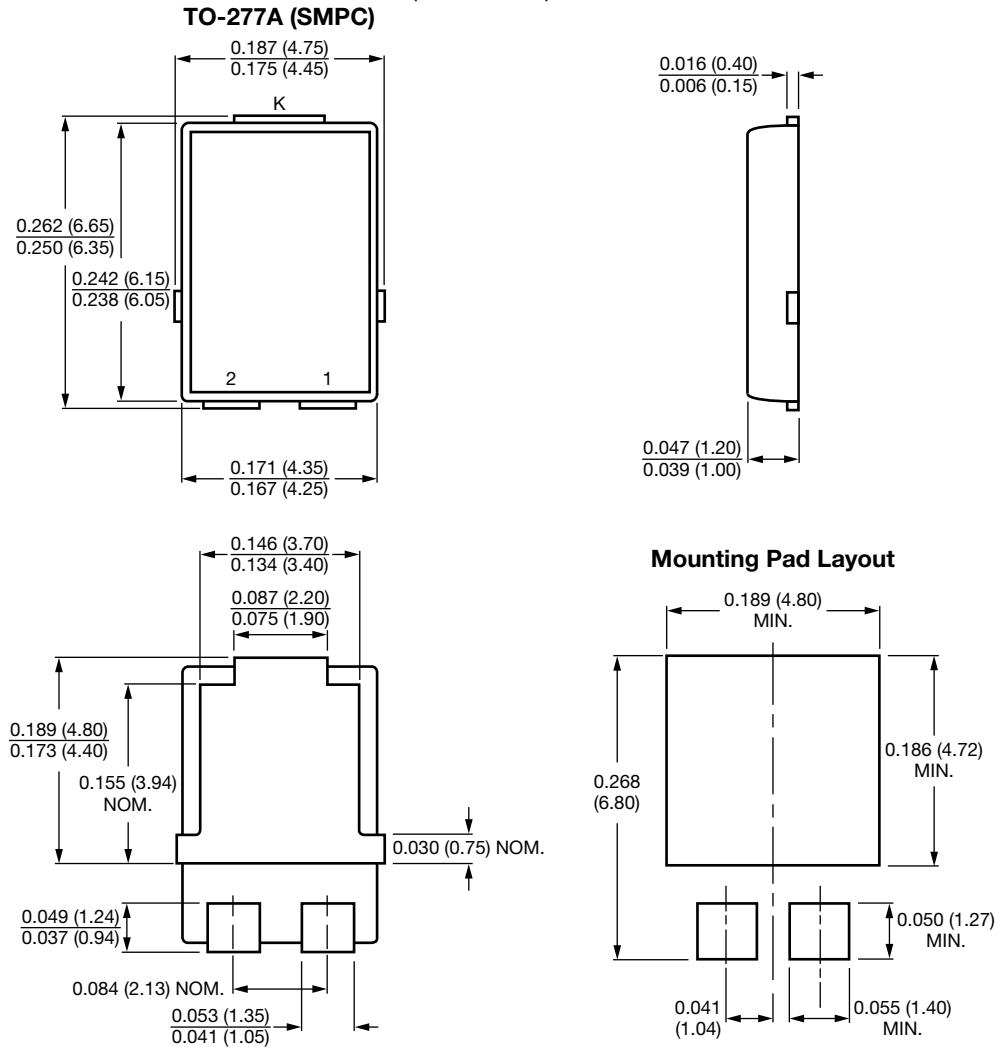


Fig. 6 - Typical Transient Thermal Impedance Per Diode



### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



Conform to JEDEC TO-277A



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