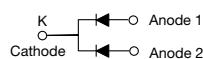


## High Current Density Surface Mount Ultrafast Rectifiers

### eSMP® Series



### TO-277A (SMPC)



### 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 available
  - Automotive ordering code: base P/NHM3
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 x 2.0 A
$V_{RRM}$	100 V, 150 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
Package	TO-277A (SMPC)
Diode variations	Common cathode

### TYPICAL APPLICATIONS

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

### 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 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

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

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

ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage per diode	$I_F = 1.0 \text{ A}$	$T_A = 25^\circ\text{C}$	$V_F^{(1)}$	0.84	-	V	
	$I_F = 2.0 \text{ A}$			0.93	1.05		
	$I_F = 1.0 \text{ A}$	$T_A = 125^\circ\text{C}$		0.68	-		
	$I_F = 2.0 \text{ A}$			0.77	0.85		
Reverse current per diode	Rated $V_R$	$T_A = 25^\circ\text{C}$	$I_R^{(2)}$	-	5	$\mu\text{A}$	
		$T_A = 125^\circ\text{C}$		6.4	25		
Maximum reverse recovery time per diode	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		$t_{rr}$	20	25	ns	
Typical reverse recovery time per diode	$I_F = 1.0 \text{ A}, dI/dt = 50 \text{ A}/\mu\text{s}, V_R = 30 \text{ V}, I_{rr} = 0.1 I_{RM}$			24	-		
Typical softness factor ( $t_b/t_a$ ) per diode	$I_F = 2 \text{ A}, dI/dt = 200 \text{ A}/\mu\text{s}, V_R = 200 \text{ V}, I_{rr} = 0.1 I_{RM}$ $T_A = 125^\circ\text{C}$	$S$		0.3	-	-	
Typical reverse recovery current per diode		$I_{RM}$		5.4	-	A	
Typical stored charge per diode		$Q_{rr}$		88	-	nC	
Typical junction capacitance per diode	4.0 V, 1 MHz		$C_J$	21	-	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 ( $T_A = 25^\circ\text{C}$ unless otherwise specified)				
PARAMETER	SYMBOL	UH4PBC	UH4PCC	UNIT
Typical thermal resistance per diode	$R_{\theta JA}^{(1)}$	60		$^\circ\text{C}/\text{W}$
	$R_{\theta JL}$	4		

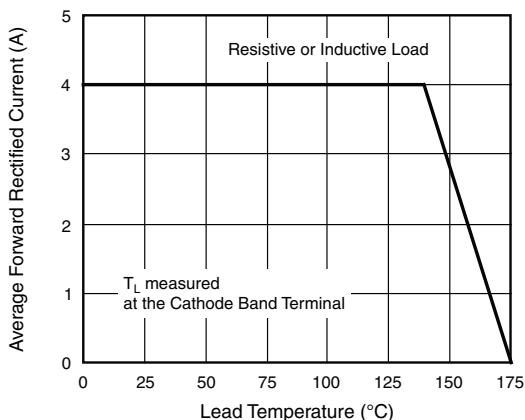
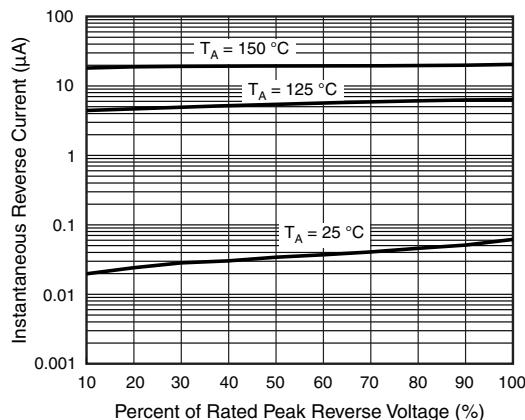
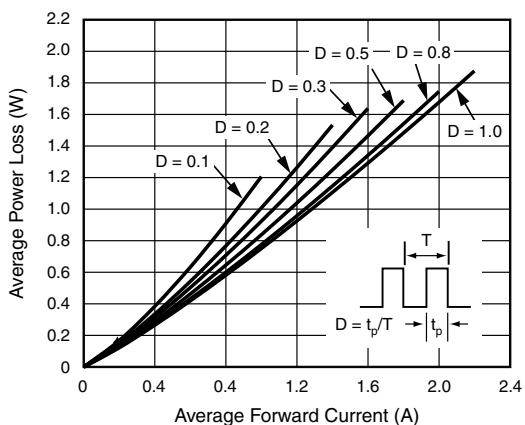
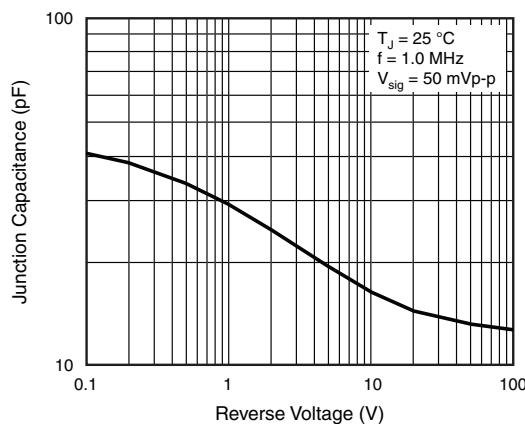
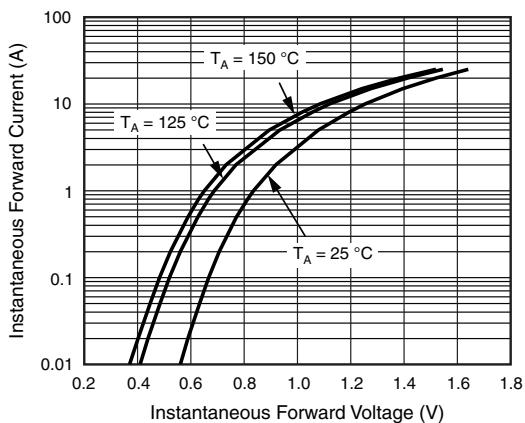
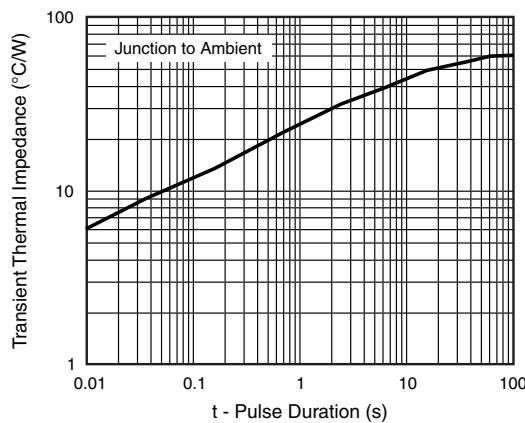
**Note**

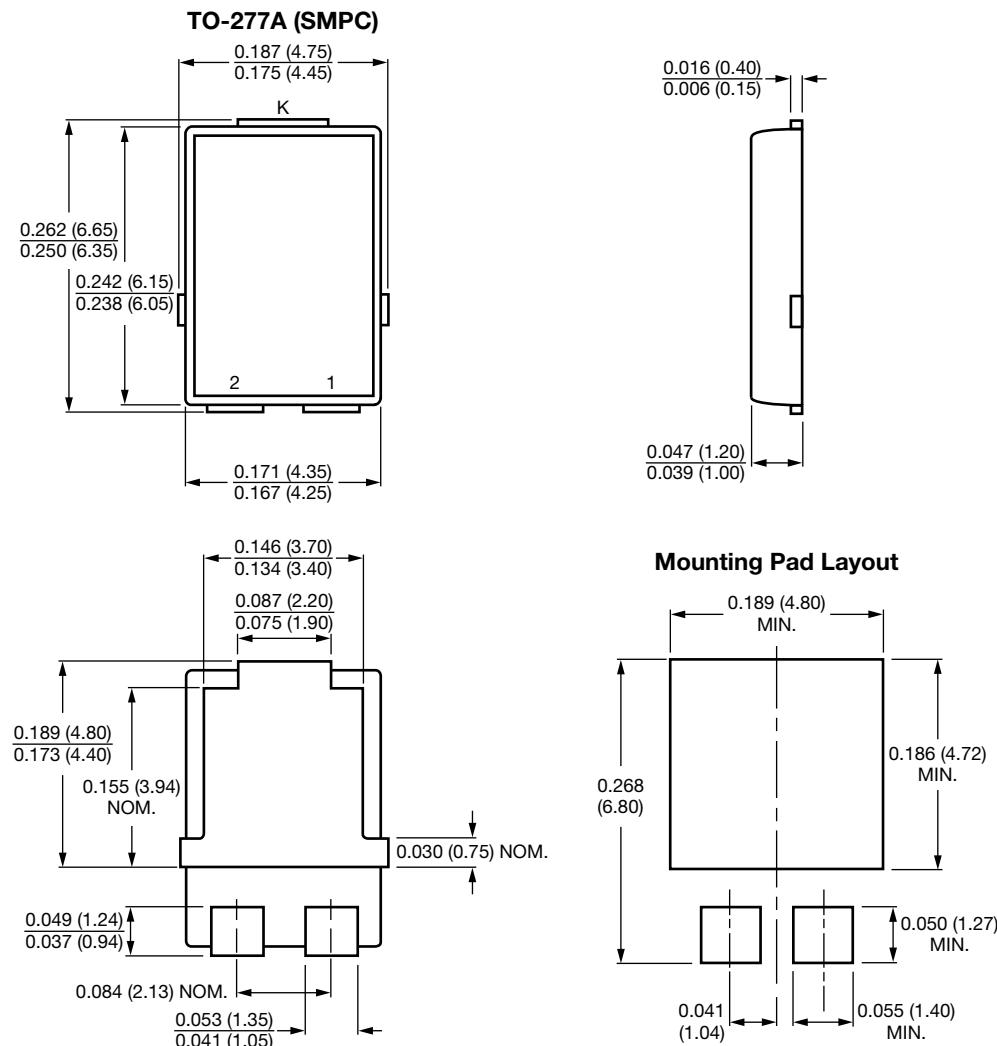
(1) Units mounted on recommended PCB 1 oz. pad layout

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH4PCC-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH4PCC-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH4PCCHM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
UH4PCCHM3/87A <sup>(1)</sup>	0.10	87A	6500	13" diameter plastic tape and reel
UH4PCCHM3_A/H <sup>(1)</sup>	0.10	H	1500	7" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

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


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