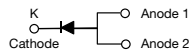


## High Current Density Surface Mount Ultrafast High Voltage Rectifier

### eSMP™ Series



### TO-277A (SMPC)



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	6.0 A
$V_{RRM}$	600 V
$I_{FSM}$	80 A
$t_{rr}$	25 ns
$V_F$ at $I_F = 6.0$ A	1.3 V
$T_J$ max.	175 °C

### FEATURES

- Very low profile - typical height of 1.1 mm
- Ideal for automated placement
- Oxide planar chip junction
- Ultrafast recovery time
- Soft recovery characteristics
- Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- **Halogen-free according to IEC 61249-2-21 definition**
- Find out more about Vishay's Automotive Grade Product requirements at: [www.vishay.com/applications](http://www.vishay.com/applications)

AUTOMOTIVE  
GRADE  
Available



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

### TYPICAL APPLICATIONS

For use in high voltage, high frequency power factor corrections, switching mode power supplies, freewheeling diodes and secondary dc-to-dc rectification application.

### MECHANICAL DATA

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

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

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

MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)			
PARAMETER	SYMBOL	UH6PJ	UNIT
Device marking code		H6PJ	
Maximum repetitive peak reverse voltage	$V_{RRM}$	600	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	6.0	A
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

ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	1.6	-	V
	I <sub>F</sub> = 6.0 A			1.9	3.0	
	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 125 °C		1.1	-	
	I <sub>F</sub> = 6.0 A			1.3	1.8	
Reverse current	V <sub>R</sub> = 600 V	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10	μA
		T <sub>A</sub> = 125 °C		46	200	
Maximum reverse recovery time	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>	23	25	ns
	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>			33	45	
Typical softness factor (t <sub>b</sub> /t <sub>a</sub> )	I <sub>F</sub> = 6 A, di/dt = 200 A/μs, V <sub>R</sub> = 400 V, T <sub>J</sub> = 125 °C		S	0.3	-	-
Typical reverse recovery current			I <sub>RM</sub>	6.5	-	A
Typical stored charge			Q <sub>rr</sub>	150	-	nC
Typical forward recovery time	I <sub>F</sub> = 6 A, di/dt = 48 A/μs, V <sub>F</sub> = 1.1 x V <sub>F</sub> max.		t <sub>fr</sub>	150	-	ns
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	30	-	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 noted)			
PARAMETER	SYMBOL	UH6PJ	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	90	°C/W
	R <sub>θJL</sub> <sup>(2)</sup>	5	

**Notes**

(1) Units mounted on recommended P.C.B. 1 oz. pad layout

(2) With heatsink

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
UH6PJ-M3/86A	0.10	86A	1500	7" diameter plastic tape and reel
UH6PJ-M3/87A	0.10	87A	6500	13" diameter plastic tape and reel
UH6PJHM3/86A <sup>(1)</sup>	0.10	86A	1500	7" diameter plastic tape and reel
UH6PJHM3/87A <sup>(1)</sup>	0.10	87A	6500	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)

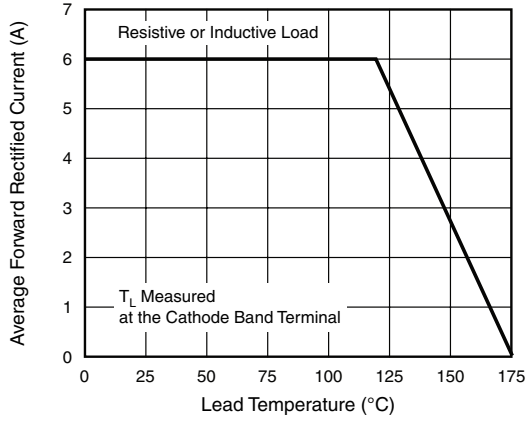


Fig. 1 - Maximum Forward Current Derating Curve

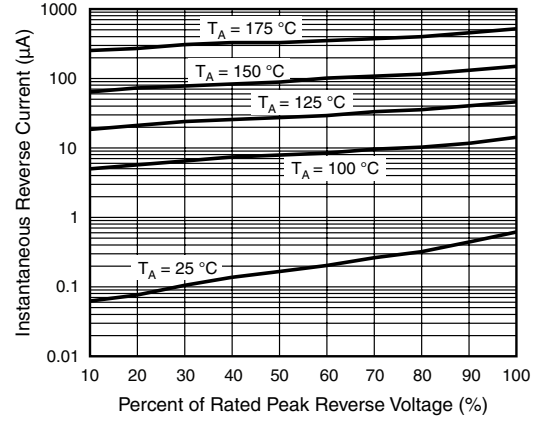


Fig. 4 - Typical Reverse Characteristics

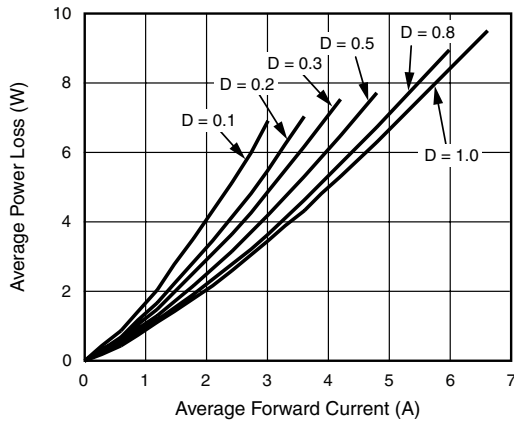


Fig. 2 - Forward Power Loss Characteristics

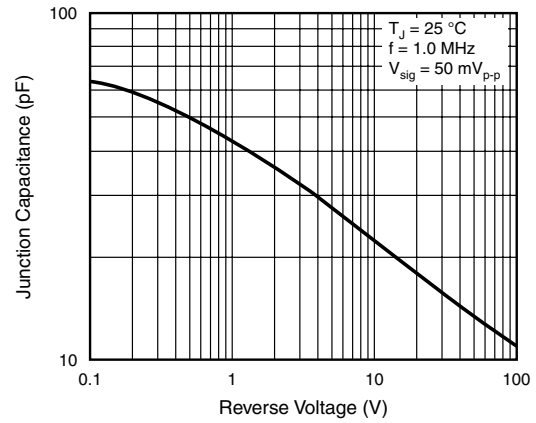


Fig. 5 - Typical Junction Capacitance

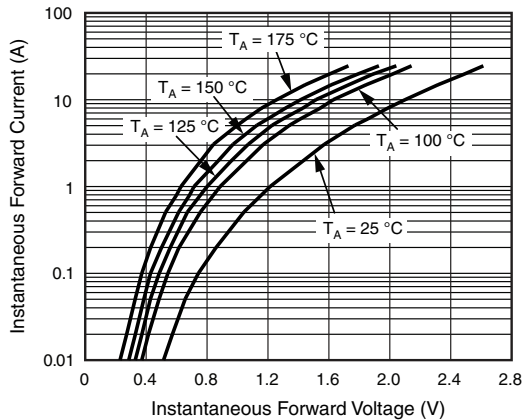
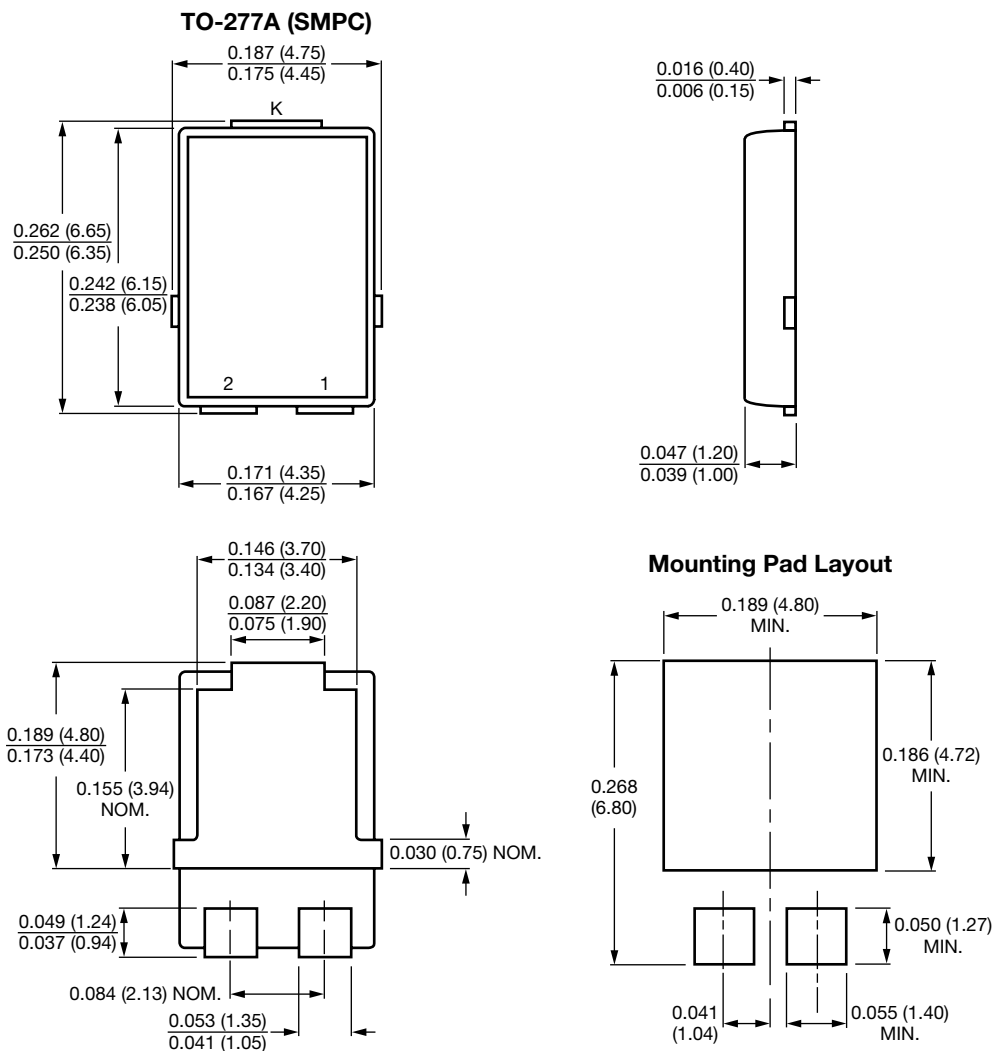


Fig. 3 - Typical Instantaneous Forward Characteristics

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)



Conform to JEDEC TO-277A



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