

## 6A, 200V - 600V Ultra Fast Surface Mount Rectifier

### FEATURES

- AEC-Q101 qualified
- Very low profile, typical height of 1.1mm
- Excellent high temperature stability
- Glass passivated chip junction
- Controlled avalanche characteristics
- Low leakage current
- High forward surge capability
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

### APPLICATIONS

- DC to DC converter
- Automotive application
- Car lighting
- Snubber
- Freewheeling application

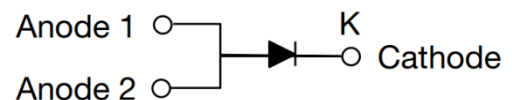
### MECHANICAL DATA

- Case: TO-277A (SMPC4.6U)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.095g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	6	A
$V_{RRM}$	200 - 600	V
$I_{FSM}$	80	A
$T_{JMAX}$	175	°C
Package	TO-277A (SMPC4.6U)	
Configuration	Single die	



TO-277A (SMPC4.6U)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)				
PARAMETER	SYMBOL	TPUH6DH	TPUH6JH	UNIT
Marking code on the device		UH6D	UH6J	
Repetitive peak reverse voltage	$V_{RRM}$	200	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	140	420	V
Forward current	$I_F$	6		A
Surge peak forward current 8.3ms single half sine wave superimposed on rated load	$I_{FSM}$	80		A
Junction temperature	$T_J$	-55 to +175		°C
Storage temperature	$T_{STG}$	-55 to +175		°C

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>UNIT</b>
Junction-to-lead thermal resistance <sup>(1)</sup>	$R_{\theta JL}$	12	°C/W
Junction-to-ambient thermal resistance <sup>(2)</sup>	$R_{\theta JA}$	80	°C/W

**Notes:**

1. Mounted on FR4 PCB with 16mm x 16mm Cu pad area
2. Free air, mounted on recommended pad

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>
Forward voltage <sup>(1)</sup>	TPUH6DH	$I_F = 3\text{A}, T_J = 25^\circ\text{C}$	$V_F$	0.80	-	V
	TPUH6JH			1.98	-	V
	TPUH6DH	$I_F = 6\text{A}, T_J = 25^\circ\text{C}$		0.87	1.05	V
	TPUH6JH			2.45	3.00	V
	TPUH6DH	$I_F = 3\text{A}, T_J = 125^\circ\text{C}$		0.65	-	V
	TPUH6JH			1.23	-	V
	TPUH6DH	$I_F = 6\text{A}, T_J = 125^\circ\text{C}$		0.73	0.90	V
	TPUH6JH			1.59	1.80	V
Reverse current @ rated $V_R$ <sup>(2)</sup>		$T_J = 25^\circ\text{C}$	$I_R$	-	10	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$		-	200	$\mu\text{A}$
Junction capacitance		1MHz, $V_R = 4.0\text{V}$	$C_J$	50	-	pF
Reverse recovery time		$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$	$t_{rr}$	-	25	ns
		$I_F = 1\text{A}, di/dt = -50\text{A}/\mu\text{s}$ $V_R = 30\text{V}$	$t_{rr}$	-	45	ns

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE</b> <sup>(1)</sup>	<b>PACKAGE</b>	<b>PACKING</b>
TPUH6xH	TO-277A (SMPC4.6U)	6,000 / Tape & Reel

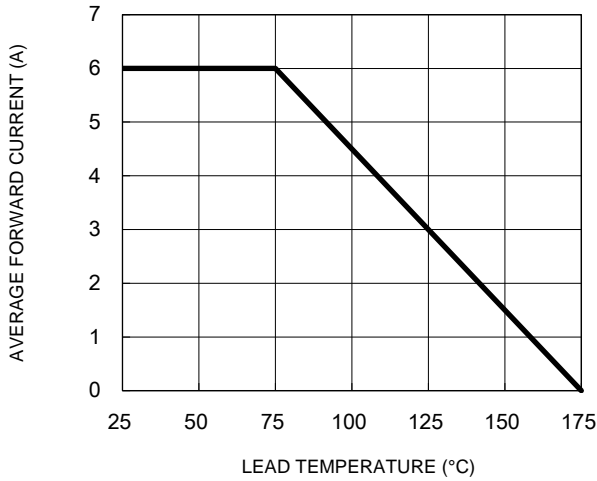
**Notes:**

1. "x" defines voltage from 200V(TPUH6DH) to 600V(TPUH6JH)

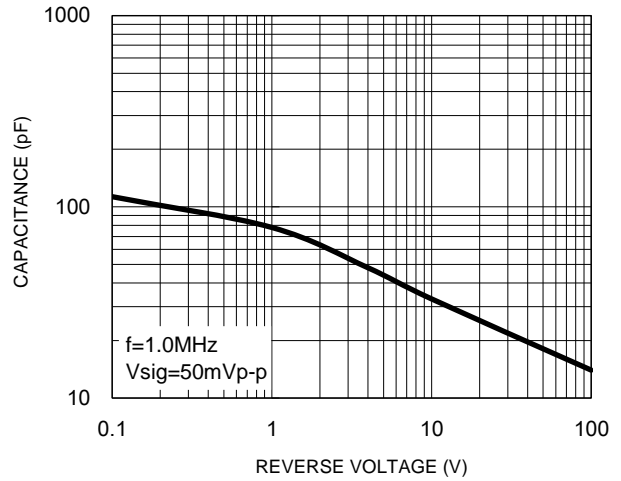
**CHARACTERISTICS CURVES**

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

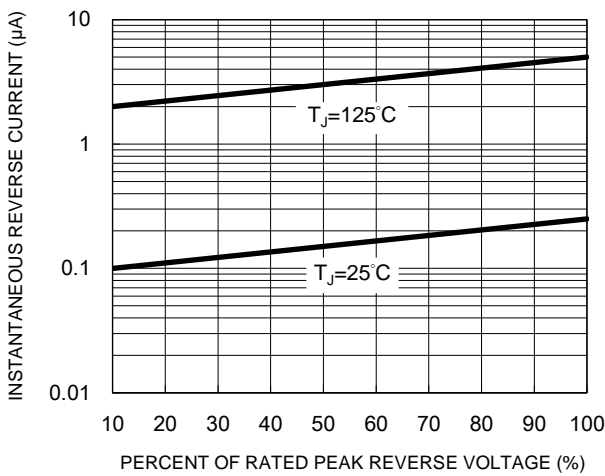
**Fig.1 Forward Current Derating Curve**



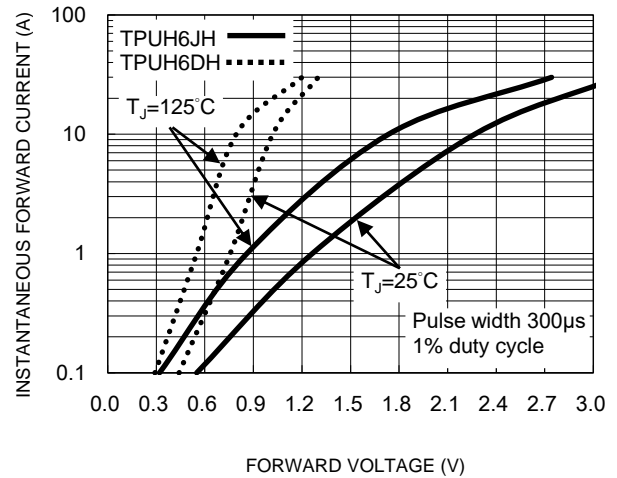
**Fig.2 Typical Junction Capacitance**



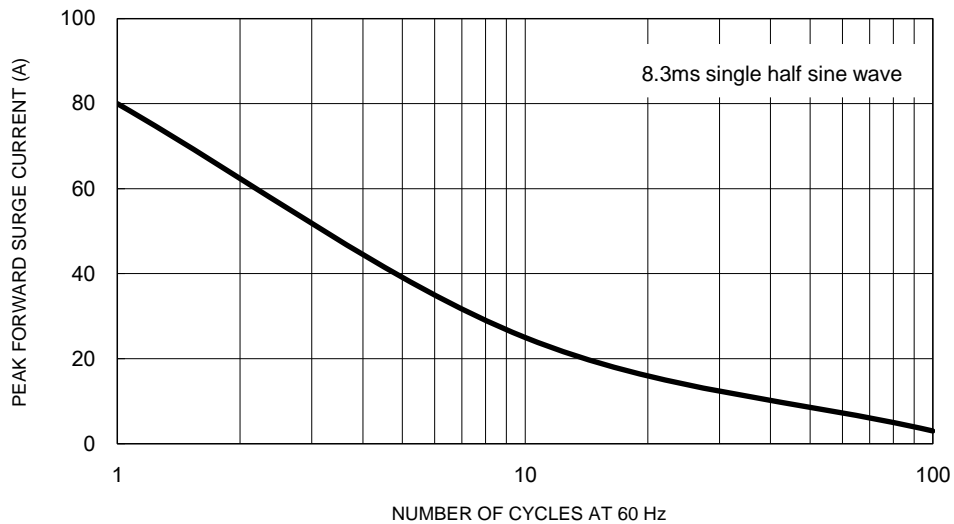
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



**Fig.5 Maximum Non-Repetitive Forward Surge Current**



**CHARACTERISTICS CURVES**

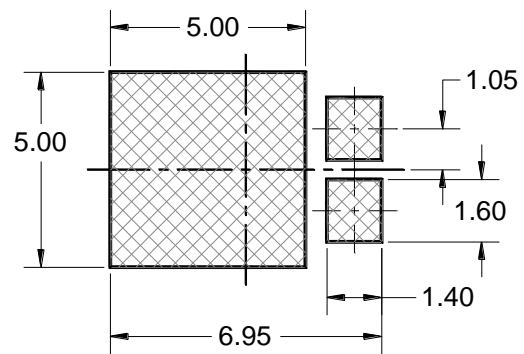
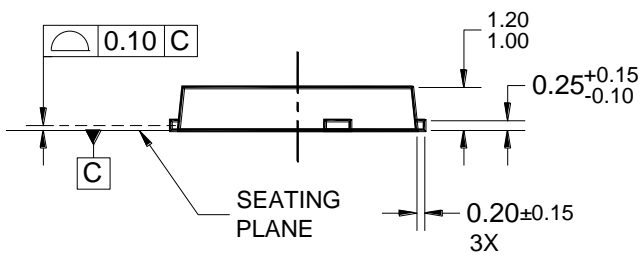
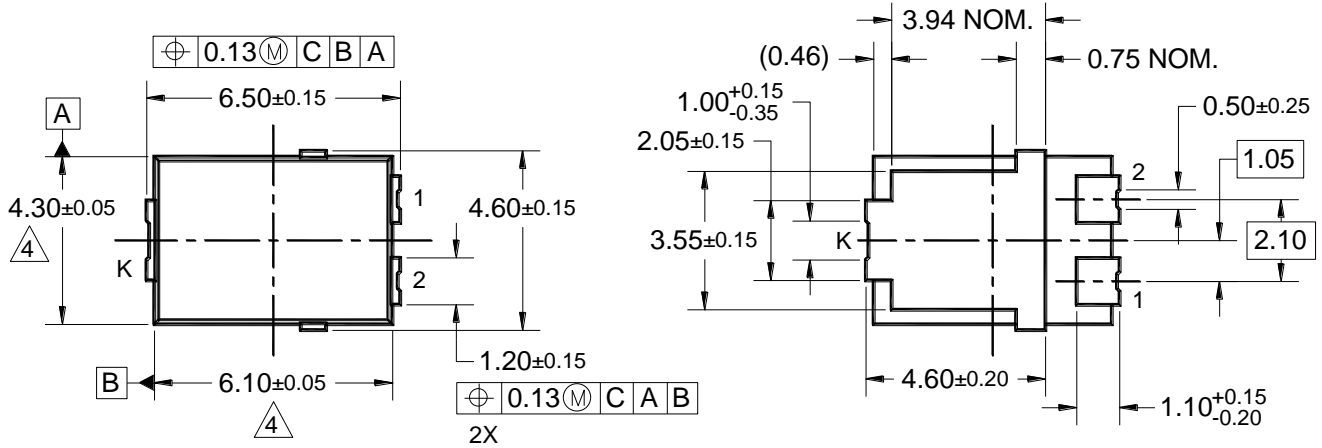
(T<sub>A</sub> = 25°C unless otherwise noted)

**Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram**

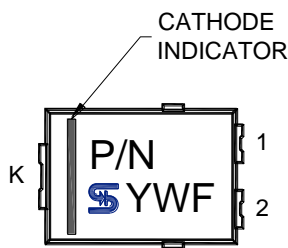


**PACKAGE OUTLINE DIMENSIONS**

**TO-277A (SMPC4.6U)**



**SUGGESTED PAD LAYOUT**



**MARKING DIAGRAM**

**P/N** = MARKING CODE  
**YW** = DATE CODE  
**F** = FACTORY CODE

**NOTES: UNLESS OTHERWISE SPECIFIED**

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-277 ISSUE A.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD LASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SMPC4.6U-031 REV A.

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