

## 4A, 200V - 1000V High Efficient Surface Mount Rectifier

### FEATURES

- AEC-Q101 qualified
- Glass passivated chip junction
- High surge current capability
- Quickly recovery time for high efficient
- Wettable flank
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

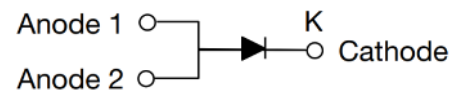
### APPLICATIONS

- 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: 0.106g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_F$	4	A
$V_{RRM}$	200 - 1000	V
$I_{FSM}$	100	A
$T_{JMAX}$	175, 150	°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	TUAU 4DH	TUAU 4GH	TUAU 4JH	TUAU 4KH	TUAU 4MH	UNIT
Marking code on the device		AU4D	AU4G	AU4J	AU4K	AU4M	
Repetitive peak reverse voltage	$V_{RRM}$	200	400	600	800	1000	V
Reverse voltage, total rms value	$V_{R(RMS)}$	140	280	420	560	700	V
Forward current	$I_F$	4					A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	100					A
	$t = 1.0\text{ms}$	170					
Junction temperature	$T_J$	-55 to +175			-55 to +150		°C
Storage temperature	$T_{STG}$	-55 to +175			-55 to +150		°C

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>UNIT</b>
Junction-to-lead thermal resistance	$R_{\theta JL}$	5.1	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	45	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	7.7	°C/W

**Thermal Performance Note:** Units mounted on PCB (16mm x 16mm Cu pad test board)

<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>

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Forward voltage <sup>(1)</sup>	TUAU4DH	$I_F = 2\text{A}, T_J = 25^\circ\text{C}$	$V_F$	0.81	-	V
		$I_F = 4\text{A}, T_J = 25^\circ\text{C}$		0.88	0.9	V
		$I_F = 2\text{A}, T_J = 125^\circ\text{C}$		0.68	-	V
		$I_F = 4\text{A}, T_J = 125^\circ\text{C}$		0.76	-	V
	TUAU4GH	$I_F = 2\text{A}, T_J = 25^\circ\text{C}$		0.91	-	V
		$I_F = 4\text{A}, T_J = 25^\circ\text{C}$		1.01	1.3	V
		$I_F = 2\text{A}, T_J = 125^\circ\text{C}$		0.74	-	V
		$I_F = 4\text{A}, T_J = 125^\circ\text{C}$		0.85	-	V
	TUAU4JH	$I_F = 2\text{A}, T_J = 25^\circ\text{C}$		1.12	-	V
		$I_F = 4\text{A}, T_J = 25^\circ\text{C}$		1.28	1.7	V
		$I_F = 2\text{A}, T_J = 125^\circ\text{C}$		0.88	-	V
		$I_F = 4\text{A}, T_J = 125^\circ\text{C}$		1.04	-	V
	TUAU4KH TUAU4MH	$I_F = 2\text{A}, T_J = 25^\circ\text{C}$		1.18	-	V
		$I_F = 4\text{A}, T_J = 25^\circ\text{C}$		1.36	1.9	V
		$I_F = 2\text{A}, T_J = 125^\circ\text{C}$		0.89	-	V
		$I_F = 4\text{A}, T_J = 125^\circ\text{C}$		1.05	-	V
Reverse current @ rated $V_R$ <sup>(2)</sup>	TUAU4DH TUAU4GH TUAU4JH TUAU4KH TUAU4MH	$T_J = 25^\circ\text{C}$	$I_R$	-	5	$\mu\text{A}$
	TUAU4DH TUAU4GH TUAU4JH	$T_J = 125^\circ\text{C}$		7	-	$\mu\text{A}$
	TUAU4KH TUAU4MH			18	-	$\mu\text{A}$
Junction capacitance	TUAU4DH TUAU4GH TUAU4JH	1MHz, $V_R = 4.0\text{V}$	$C_J$	62	-	pF
	TUAU4KH TUAU4MH			33	-	pF
Reverse recovery time	TUAU4DH TUAU4GH TUAU4JH	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{rr} = 0.25\text{A}$	$t_{rr}$	-	50	ns
	TUAU4KH TUAU4MH			-	75	

**Notes:**

- Pulse test with PW = 0.3ms

2. Pulse test with PW = 30ms

<b>ORDERING INFORMATION</b>		
<b>ORDERING CODE<sup>(1)</sup></b>	<b>PACKAGE</b>	<b>PACKING</b>
TUAU4xH	TO-277A (SMPC4.6U)	6,000 / Tape & Reel

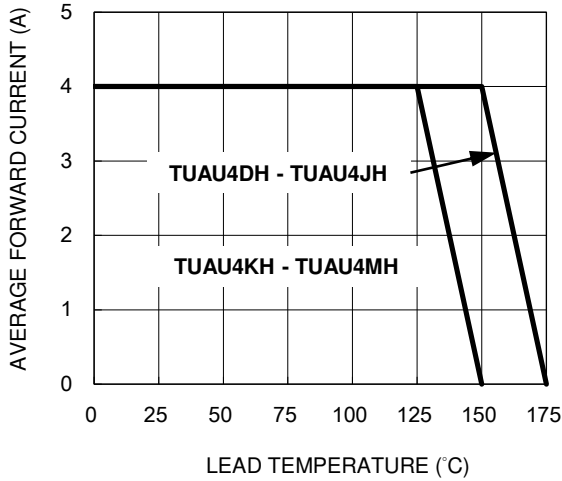
**Notes:**

1. “x” define voltage from 200V(TUAU4DH) to 1000V(TUAU4MH)

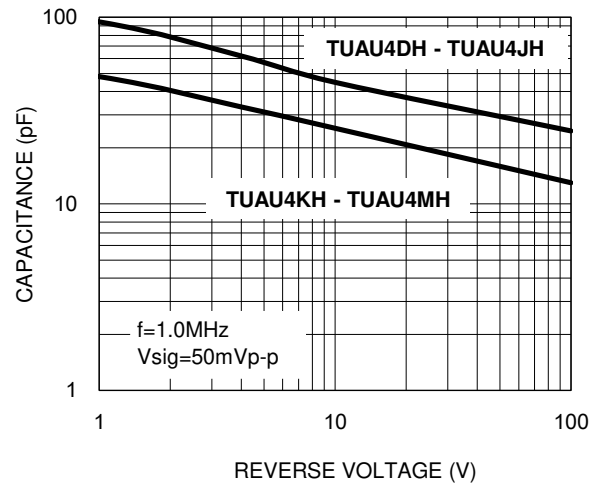
**CHARACTERISTICS CURVES**

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

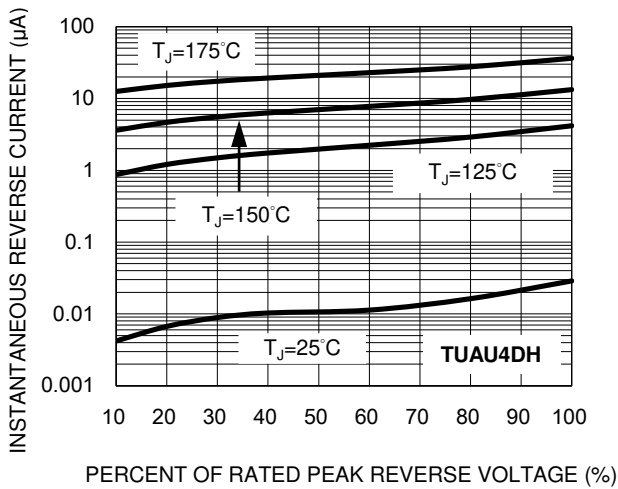
**Fig.1 Forward Current Derating Curve**



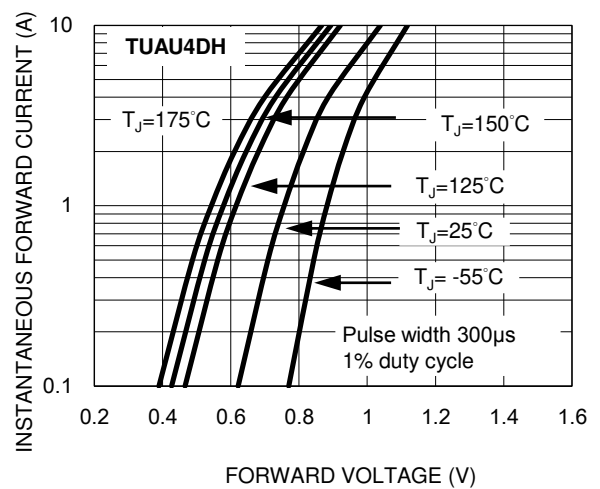
**Fig.2 Typical Junction Capacitance**



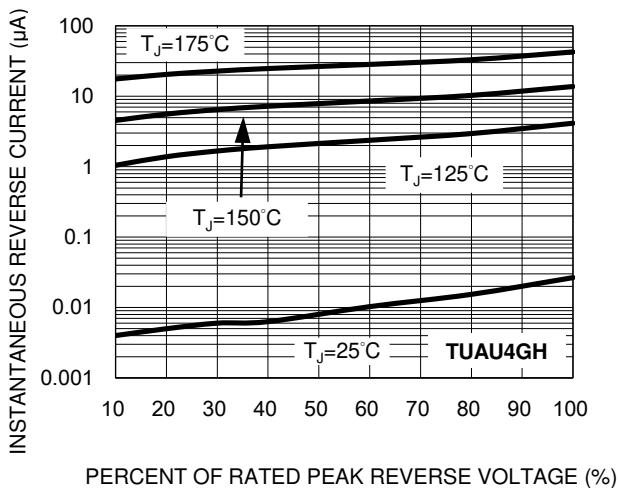
**Fig.3 Typical Reverse Characteristics**



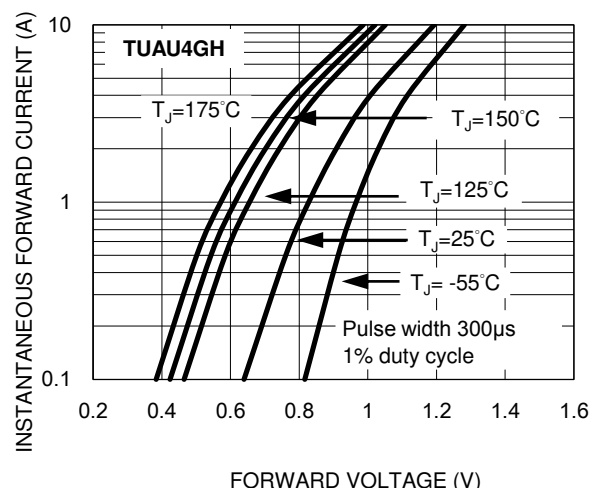
**Fig.4 Typical Forward Characteristics**



**Fig.5 Typical Reverse Characteristics**



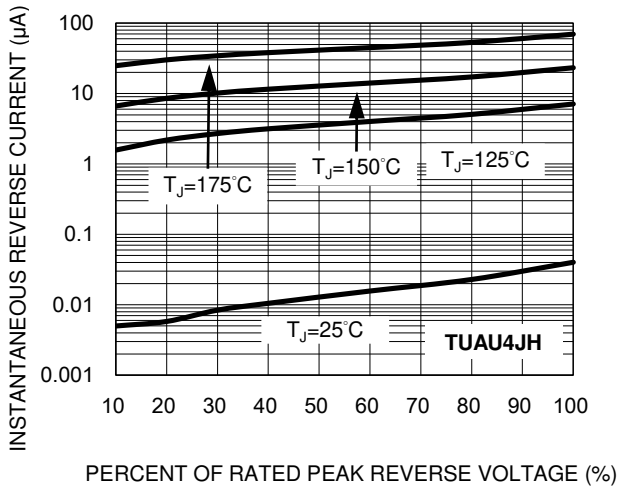
**Fig.6 Typical Forward Characteristics**



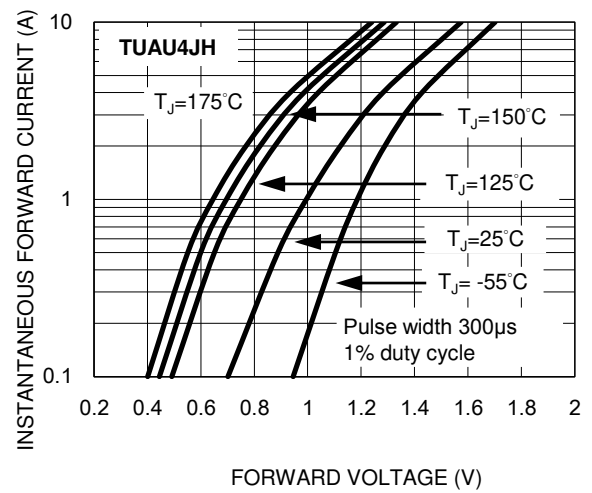
**CHARACTERISTICS CURVES**

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

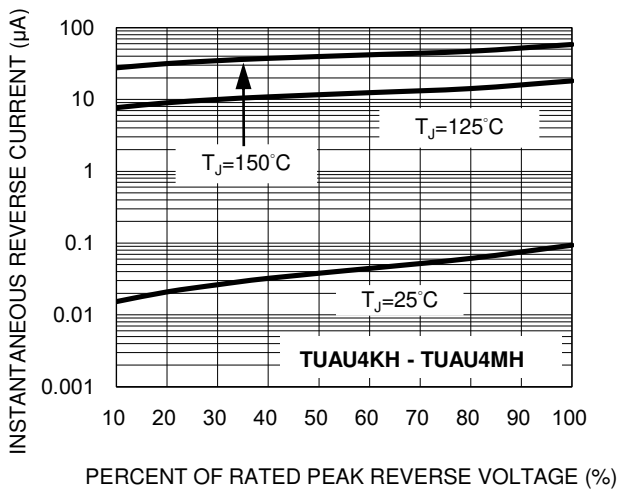
**Fig.7 Typical Reverse Characteristics**



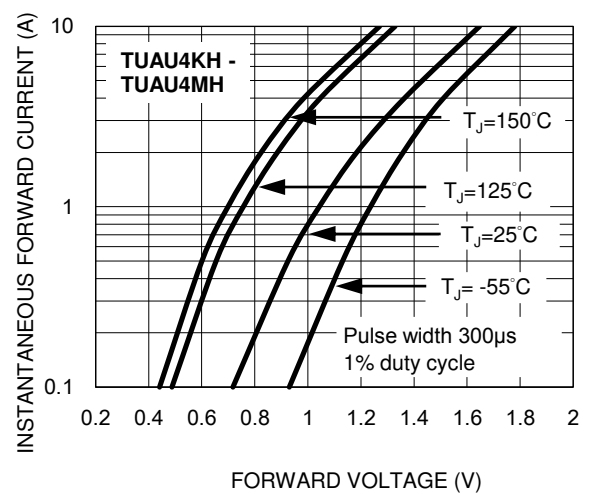
**Fig.8 Typical Forward Characteristics**



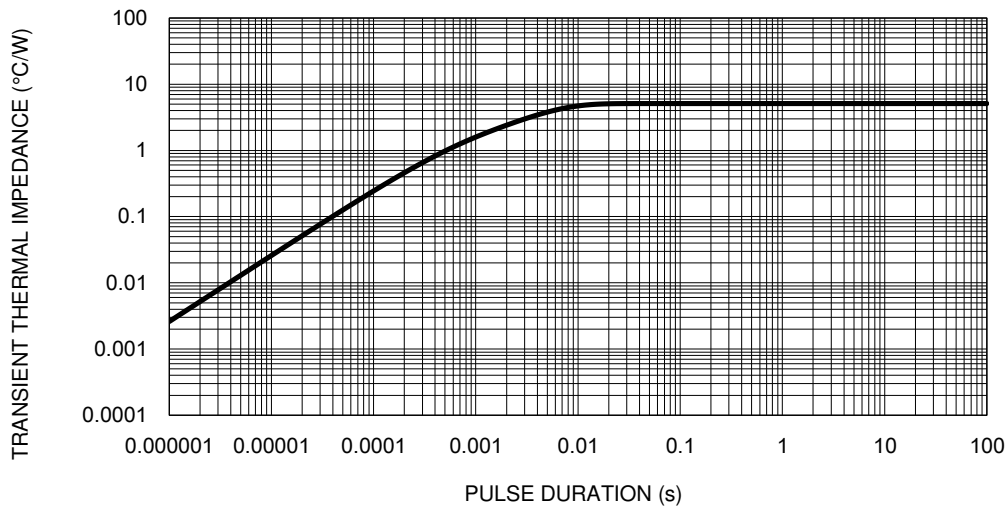
**Fig.9 Typical Reverse Characteristics**



**Fig.10 Typical Forward Characteristics**

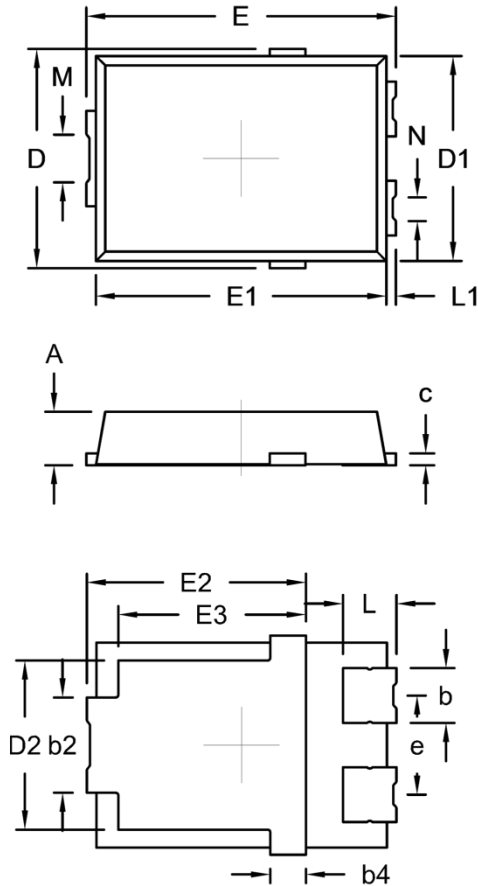


**Fig.11 Typical Transient Thermal Impedance**



**PACKAGE OUTLINE DIMENSIONS**

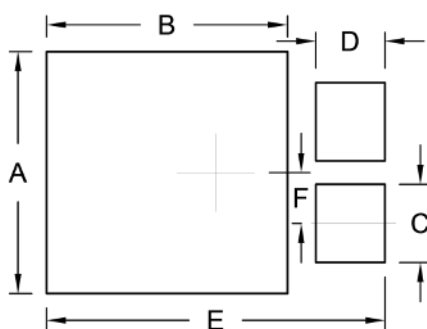
TO-277A (SMPC4.6U)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	1.00	1.20	0.039	0.047
b	1.05	1.35	0.041	0.053
b2	1.90	2.20	0.075	0.087
b4	0.75 (NOM.)		0.030 (NOM.)	
c	0.15	0.40	0.006	0.016
D	4.45	4.75	0.175	0.187
D1	4.25	4.35	0.167	0.171
D2	3.40	3.70	0.134	0.146
E	6.35	6.65	0.250	0.262
E1	6.05	6.15	0.238	0.242
E2	4.40	4.80	0.173	0.189
E3	3.94 (NOM.)		0.155 (NOM.)	
e	2.08 (NOM.)		0.082 (NOM.)	
L	0.94	1.24	0.037	0.049
L1	0.05	0.35	0.002	0.014
M	0.65	1.15	0.026	0.045
N	0.25	0.75	0.010	0.030

Package body size D1 and E1 do not include mold flash  
Mold flash shall not exceed 0.1mm per side

**SUGGESTED PAD LAYOUT**

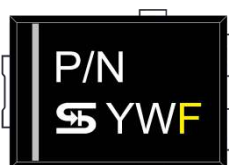


Symbol	Unit (mm)	Unit (inch)
A	4.95	0.195
B	4.95	0.195
C	1.60	0.063
D	1.42	0.056
E	6.95	0.274
F	1.04	0.041

Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

**MARKING DIAGRAM**



P/N = Marking Code  
YW = Date Code  
F = Factory Code

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