

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

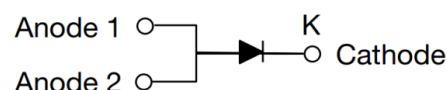
MECHANICAL DATA

- 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
$T_{J\ MAX}$	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	$t = 8.3\text{ms}$	I_{FSM}					A
	$t = 1.0\text{ms}$						
Junction temperature	T_J	-55 to +175			-55 to +150		°C
Storage temperature	T_{STG}	-55 to +175			-55 to +150		°C

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
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)

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

PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage ⁽¹⁾	TUAU4DH	I _F = 2A, T _J = 25°C	V _F	0.81	-	V
		I _F = 4A, T _J = 25°C		0.88	0.9	V
		I _F = 2A, T _J = 125°C		0.68	-	V
		I _F = 4A, T _J = 125°C		0.76	-	V
	TUAU4GH	I _F = 2A, T _J = 25°C		0.91	-	V
		I _F = 4A, T _J = 25°C		1.01	1.3	V
		I _F = 2A, T _J = 125°C		0.74	-	V
		I _F = 4A, T _J = 125°C		0.85	-	V
	TUAU4JH	I _F = 2A, T _J = 25°C		1.12	-	V
		I _F = 4A, T _J = 25°C		1.28	1.7	V
		I _F = 2A, T _J = 125°C		0.88	-	V
		I _F = 4A, T _J = 125°C		1.04	-	V
	TUAU4KH TUAU4MH	I _F = 2A, T _J = 25°C		1.18	-	V
		I _F = 4A, T _J = 25°C		1.36	1.9	V
		I _F = 2A, T _J = 125°C		0.89	-	V
		I _F = 4A, T _J = 125°C		1.05	-	V
Reverse current @ rated V _R ⁽²⁾	TUAU4DH TUAU4GH TUAU4JH TUAU4KH TUAU4MH	T _J = 25°C	I _R	-	5	μA
	TUAU4DH TUAU4GH TUAU4JH	T _J = 125°C		7	-	μA
	TUAU4KH TUAU4MH			18	-	μA
Junction capacitance	TUAU4DH TUAU4GH TUAU4JH	1MHz, V _R = 4.0V	C _J	62	-	pF
	TUAU4KH TUAU4MH			33	-	pF
Reverse recovery time	TUAU4DH TUAU4GH TUAU4JH	I _F = 0.5A , I _R = 1.0A I _{rr} = 0.25A	t _{rr}	-	50	ns
	TUAU4KH TUAU4MH			-	75	

Notes:

- Pulse test with PW = 0.3ms

2. Pulse test with PW = 30ms

ORDERING INFORMATION		
ORDERING CODE ⁽¹⁾	PACKAGE	PACKING
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

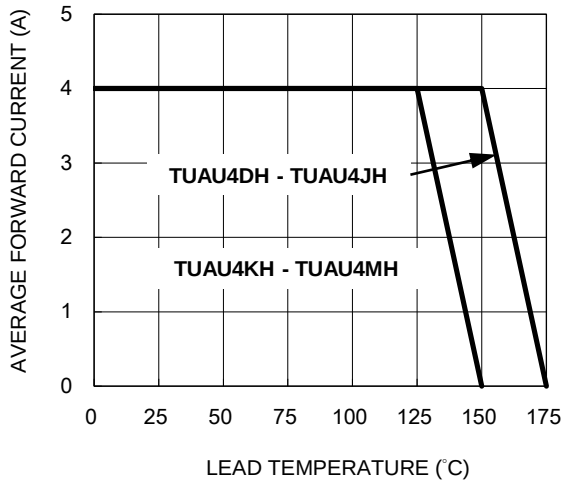


Fig.2 Typical Junction Capacitance

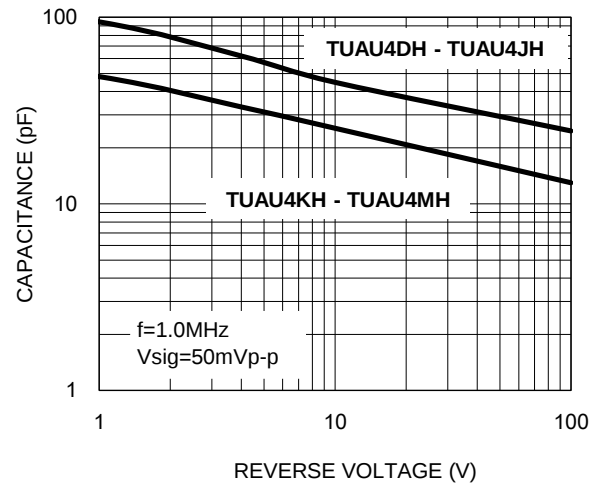


Fig.3 Typical Reverse Characteristics

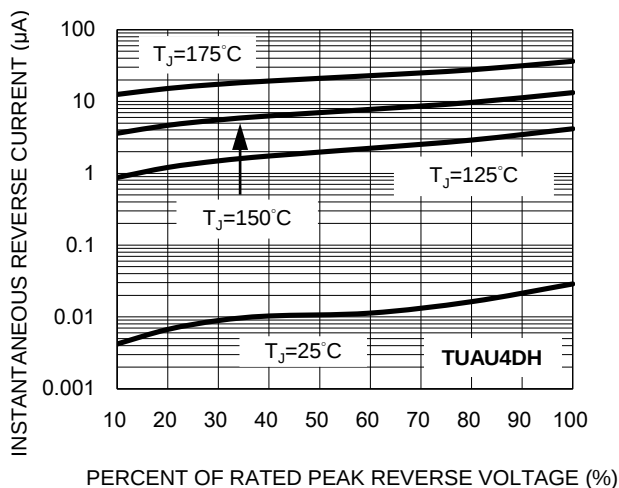


Fig.4 Typical Forward Characteristics

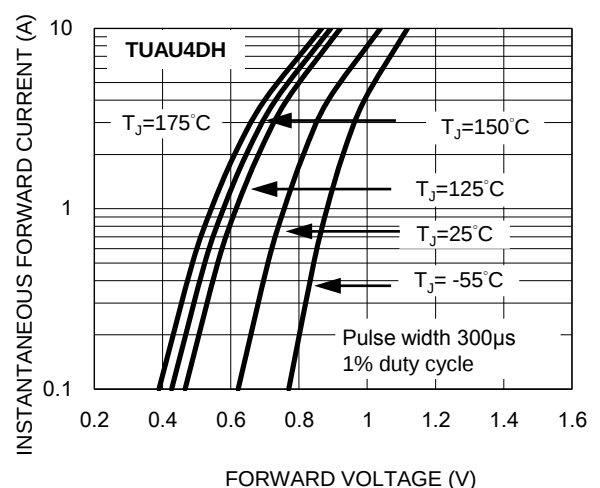


Fig.5 Typical Reverse Characteristics

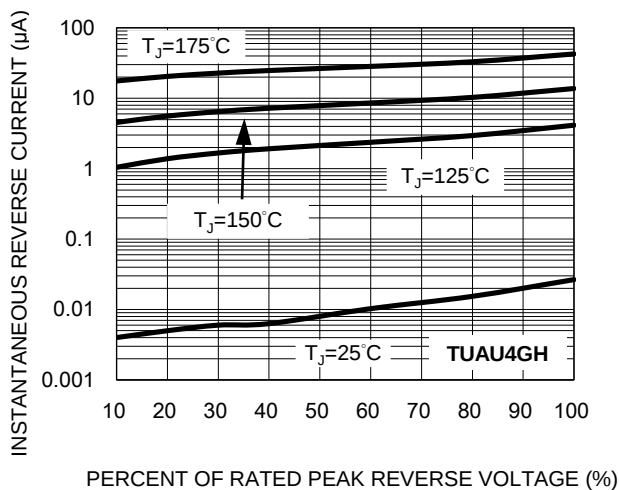
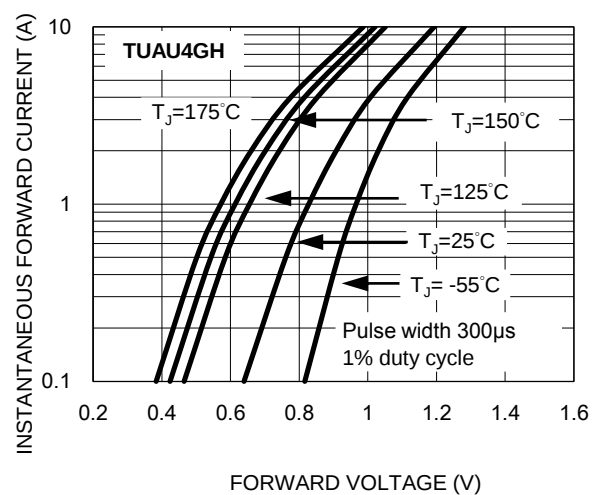


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Typical Reverse Characteristics

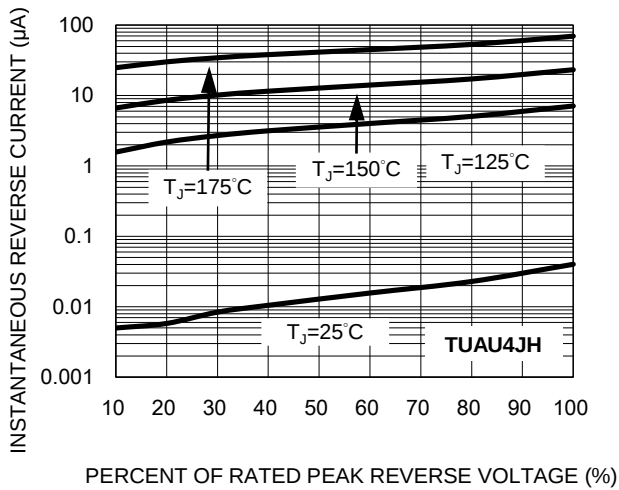


Fig.8 Typical Forward Characteristics

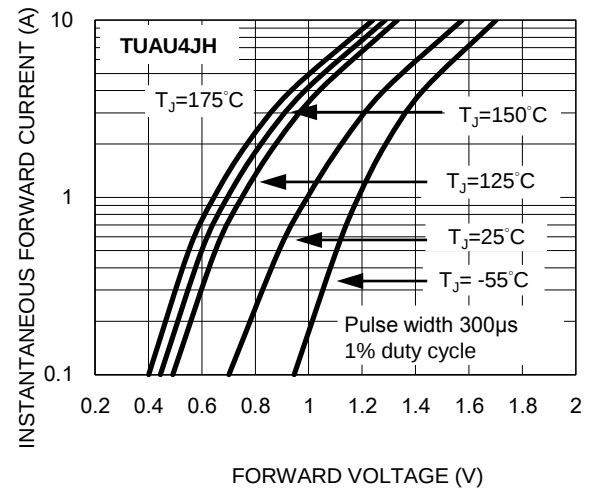


Fig.9 Typical Reverse Characteristics

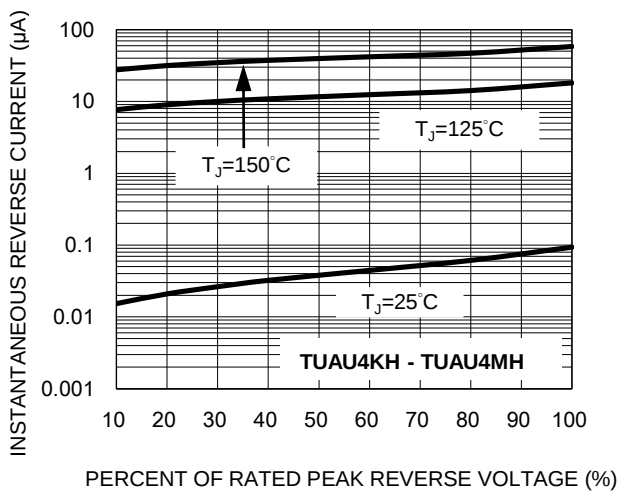


Fig.10 Typical Forward Characteristics

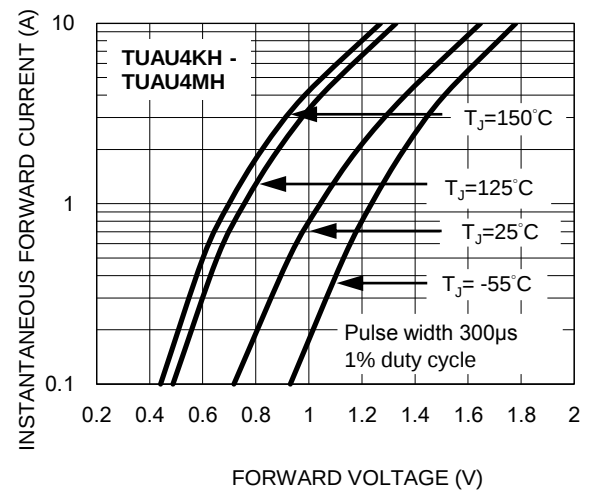
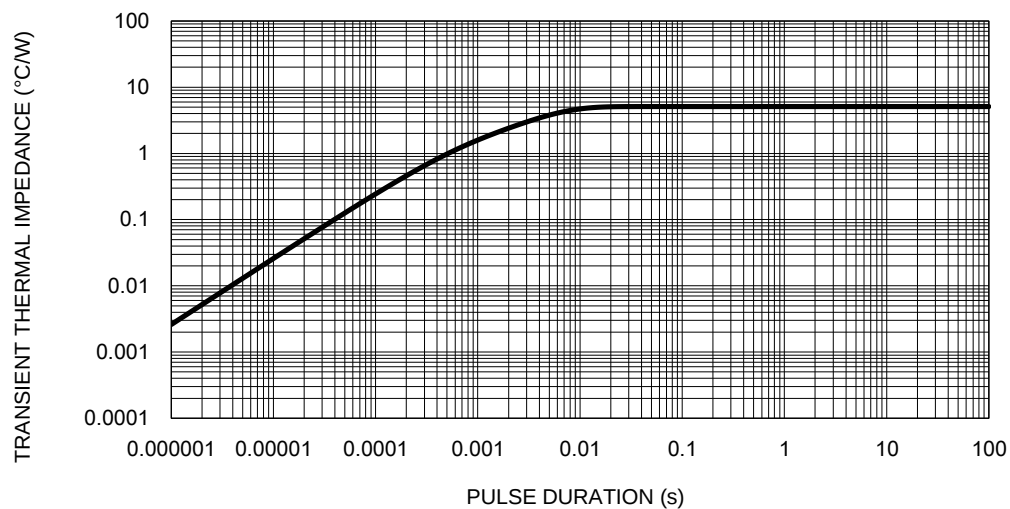
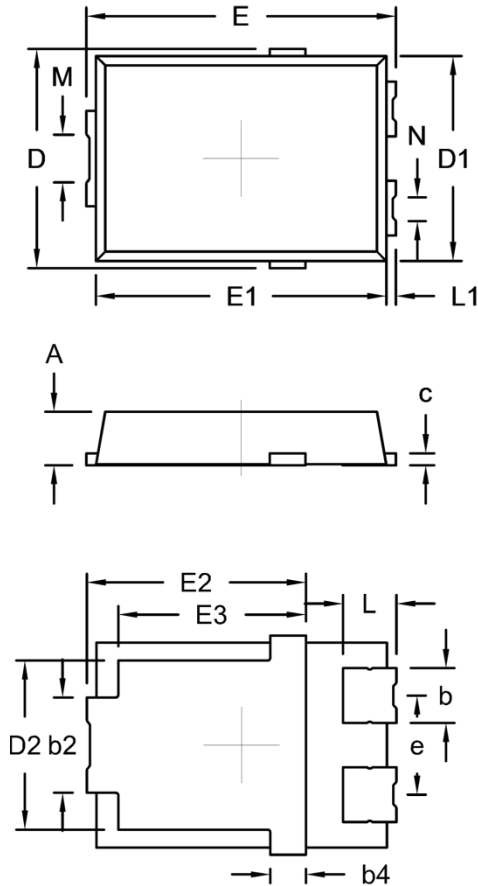


Fig.11 Typical Transient Thermal Impedance



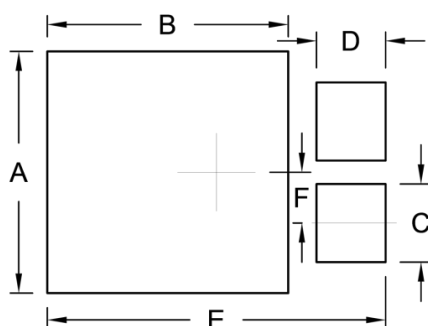
PACKAGE OUTLINE DIMENSIONS

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



Notes:

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

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

MARKING DIAGRAM



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

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Purchasers are solely responsible for the choice, selection, and use of TSC products and TSC assumes no liability for application assistance or the design of Purchasers' products.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.