

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

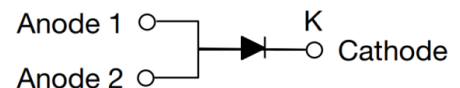
APPLICATIONS

- 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

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	$I_F = 2\text{A}, T_J = 25^\circ\text{C}$	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 ⁽²⁾	TUAU4DH TUAU4GH TUAU4JH TUAU4KH TUAU4MH	$T_J = 25^\circ\text{C}$	I_R	-	5	μA
	TUAU4DH TUAU4GH TUAU4JH	$T_J = 125^\circ\text{C}$		7	-	μA
	TUAU4KH TUAU4MH			18	-	μA
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:

1. 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

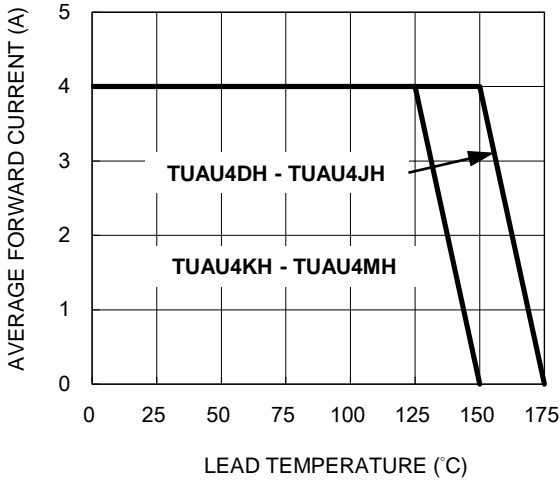


Fig.2 Typical Junction Capacitance

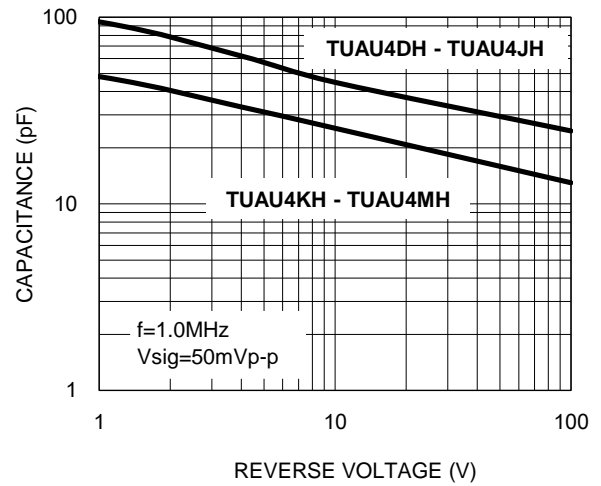


Fig.3 Typical Reverse Characteristics

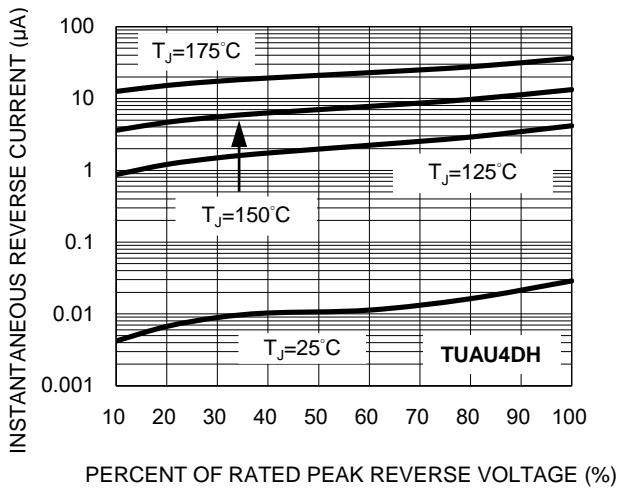


Fig.4 Typical Forward Characteristics

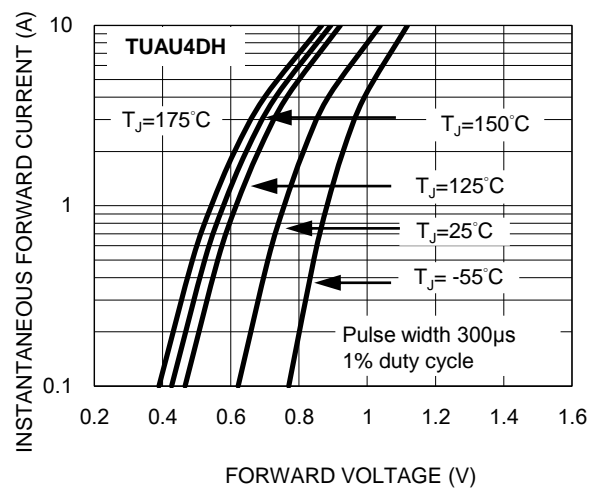


Fig.5 Typical Reverse Characteristics

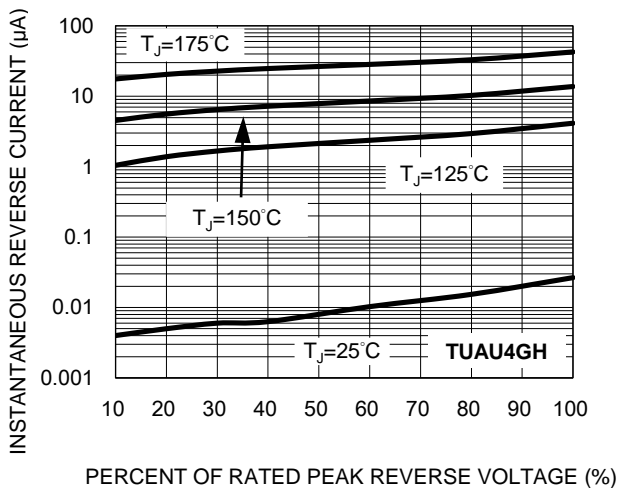
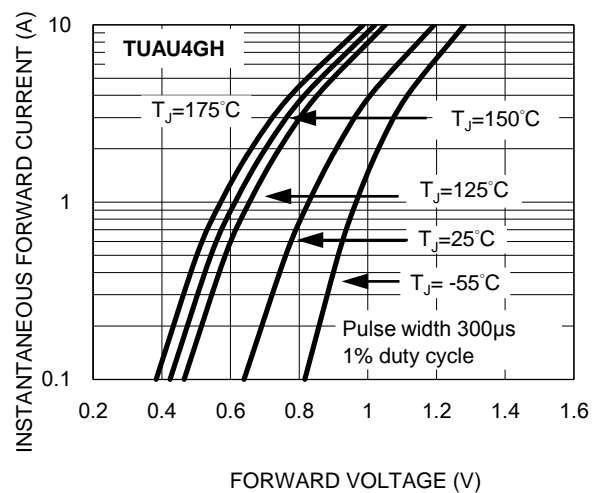


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Typical Reverse Characteristics

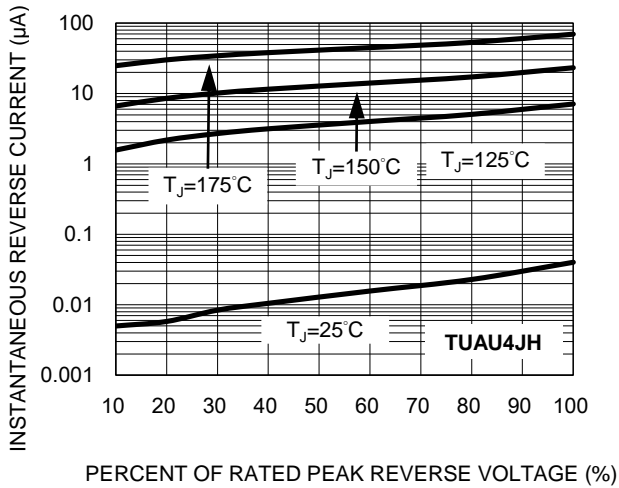


Fig.8 Typical Forward Characteristics

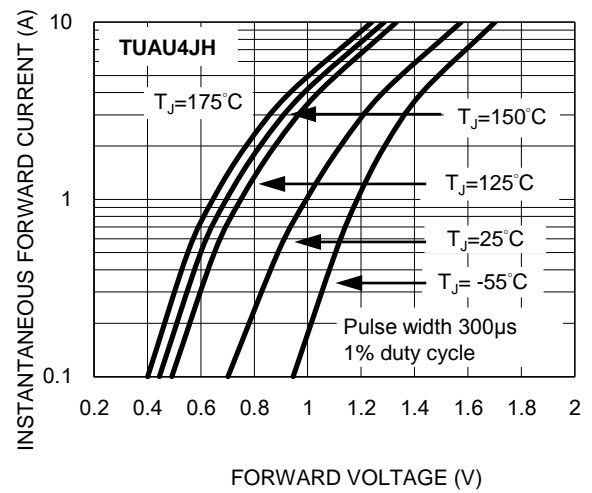


Fig.9 Typical Reverse Characteristics

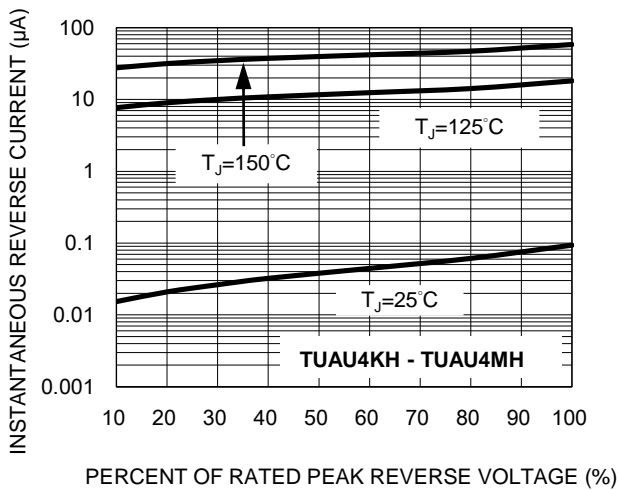


Fig.10 Typical Forward Characteristics

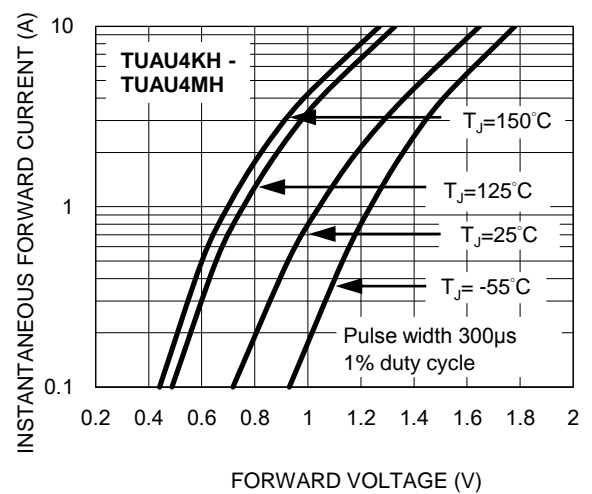
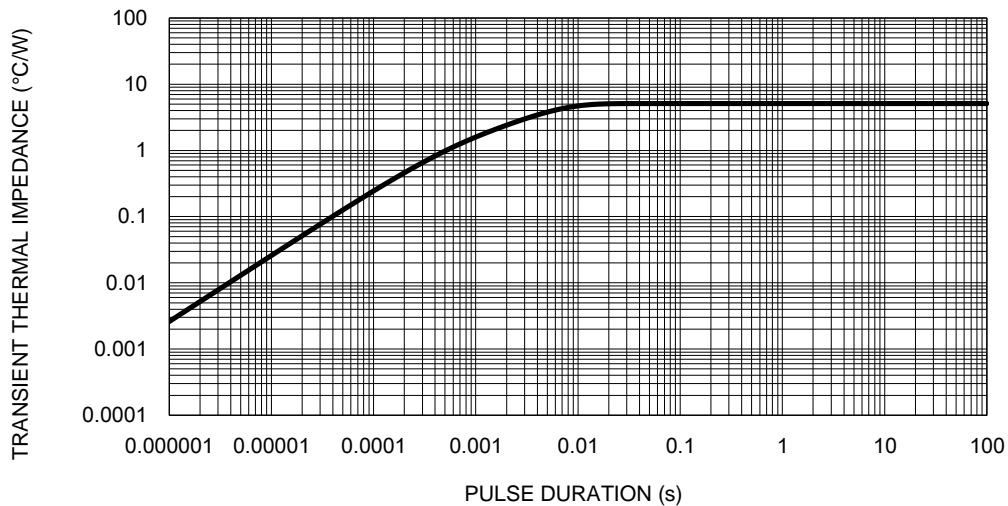
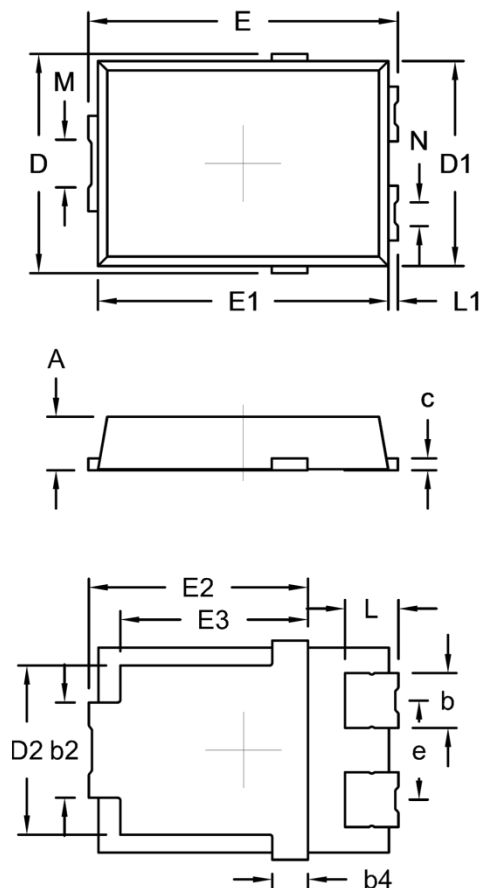


Fig.11 Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

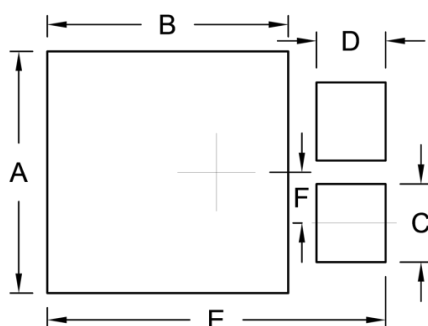
TO-277A (SMPC4.6U)



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



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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