

6A, 200V - 1000V High Efficient Surface Mount Rectifier

FEATURES

- AEC-Q101 qualified
- Glass passivated chip junction
- Low power loss, high efficiency
- Fast switching for high efficiency
- Ideal for automated placement
- Wettable flank
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

KEY PARAMETERS

PARAMETER	VALUE	UNIT
I_F	6	A
V_{RRM}	200 - 1000	V
I_{FSM}	140	A
$T_{J\ MAX}$	175, 150	°C
Package	TO-277A (SMPC4.6U)	
Configuration	Single die	

APPLICATIONS

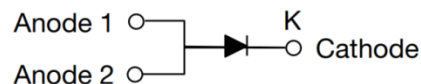
- Switch Mode Power Supply
- Inverters and Converters
- Freewheeling diodes



TO-277A (SMPC4.6U)

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: 0.104g (approximately)



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

PARAMETER	SYMBOL	TUAU 6DH	TUAU 6GH	TUAU 6JH	TUAU 6KH	TUAU 6MH	UNIT
Marking code on the device		AU6DH	AU6GH	AU6JH	AU6KH	AU6MH	
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	6					A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	140					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	$R_{\theta JL}$	6	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	50	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	9	°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⁾	TUAU6DH	I _F = 3A, T _J = 25°C	V _F	0.82	-	V
		I _F = 6A, T _J = 25°C		0.89	1.00	V
		I _F = 3A, T _J = 125°C		0.68	-	V
		I _F = 6A, T _J = 125°C		0.76	-	V
	TUAU6GH TUAU6JH	I _F = 3A, T _J = 25°C		1.05	-	V
		I _F = 6A, T _J = 25°C		1.17	1.30	V
		I _F = 3A, T _J = 125°C		0.84	-	V
		I _F = 6A, T _J = 125°C		0.98	1.21	V
	TUAU6KH TUAU6MH	I _F = 3A, T _J = 25°C		1.29	-	V
		I _F = 6A, T _J = 25°C		1.48	1.70	V
		I _F = 3A, T _J = 125°C		0.94	-	V
		I _F = 6A, T _J = 125°C		1.12	-	V
Reverse current @ rated V _R ⁽²⁾		T _J = 25°C	I _R	-	5	μA
		T _J = 125°C		-	100	μA
Junction capacitance	TUAU6DH TUAU6GH TUAU6JH	1MHz, V _R = 4.0V	C _J	64	-	pF
	TUAU6KH TUAU6MH			43	-	pF
Reverse recovery time	TUAU6DH TUAU6GH TUAU6JH	I _F = 0.5A, I _R = 1.0A I _{rr} = 0.25A	t _{rr}	-	50	ns
	TUAU6KH TUAU6MH			-	75	ns

Notes:

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

ORDERING INFORMATION

ORDERING CODE ⁽¹⁾	PACKAGE	PACKING
TUAU6xH	TO-277A (SMPC4.6U)	6,000 / Tape & Reel

Notes:

1. "x" defines voltage from 200V(TUAU6DH) to 1000V(TUAU6MH)

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

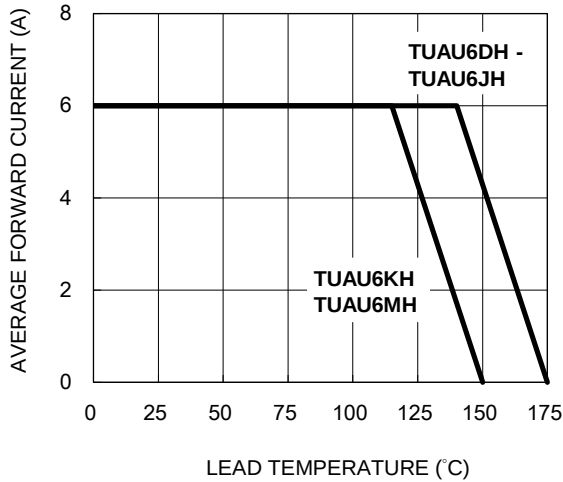


Fig.2 Typical Junction Capacitance

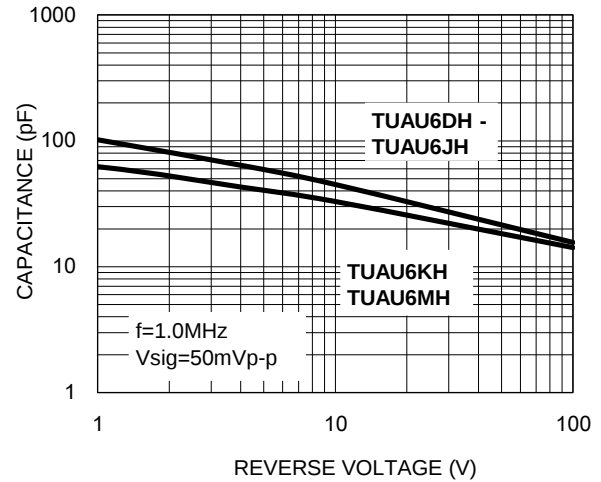


Fig.3 Typical Reverse Characteristics

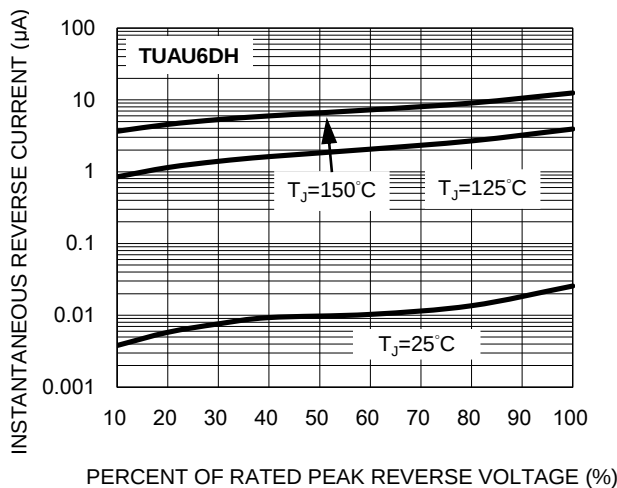


Fig.4 Typical Forward Characteristics

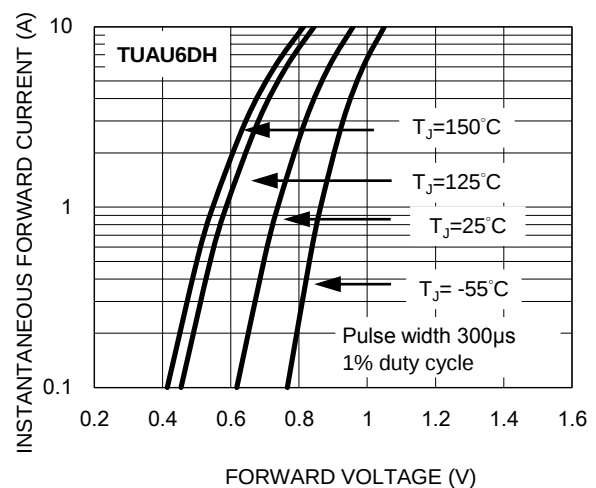


Fig.5 Typical Reverse Characteristics

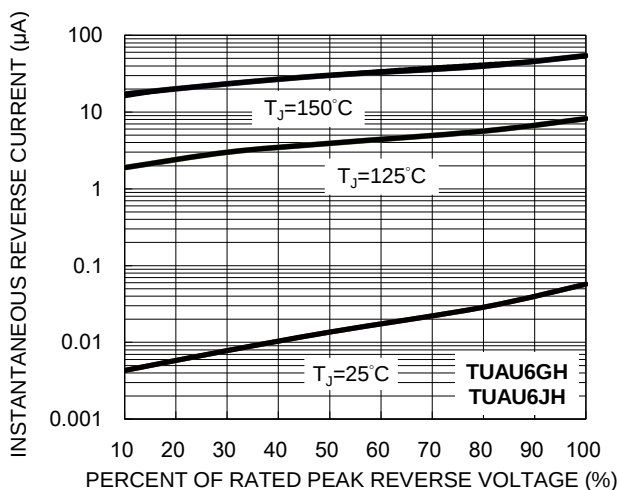
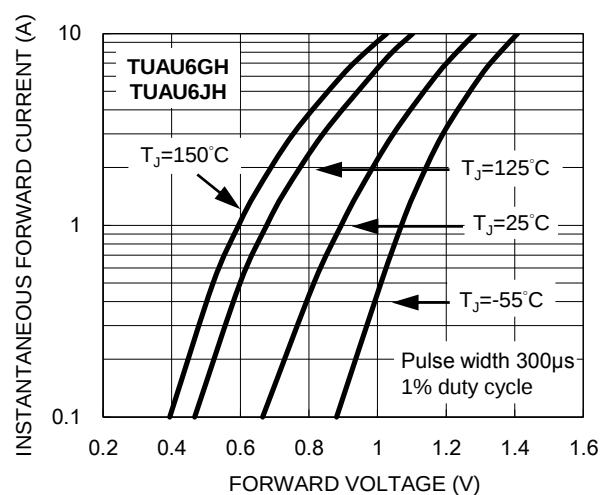


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.7 Typical Reverse Characteristics

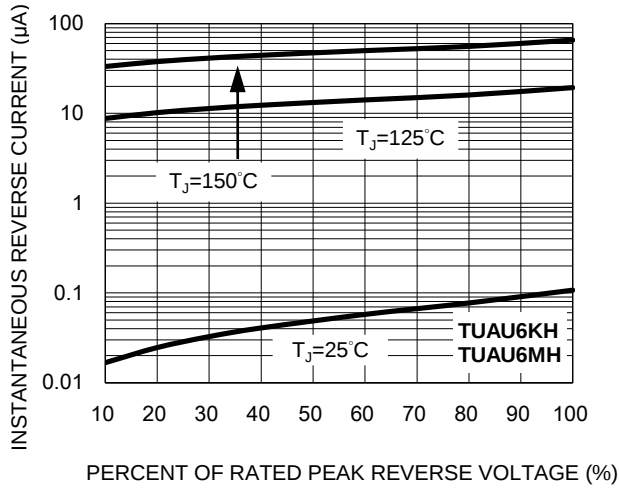


Fig.8 Typical Forward Characteristics

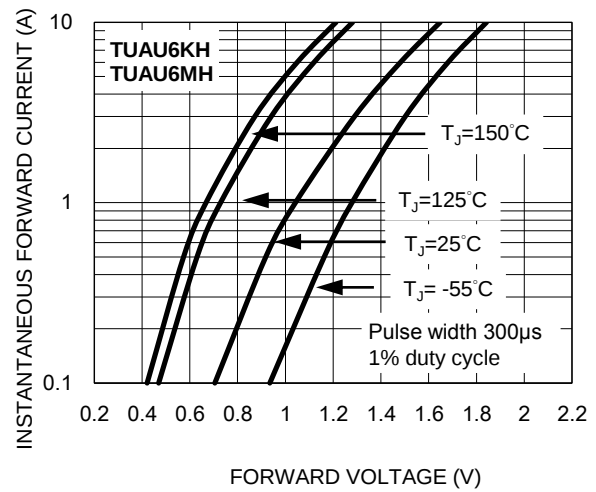
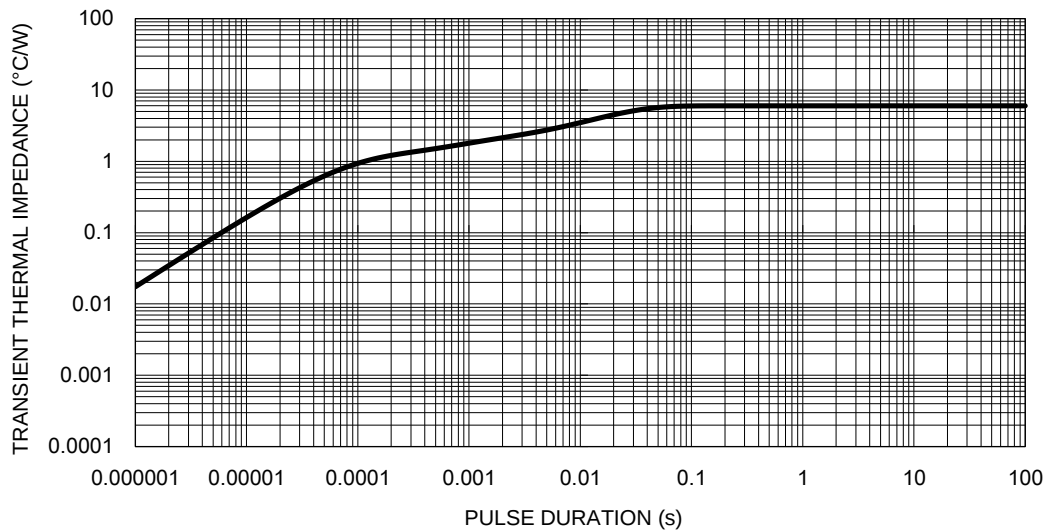
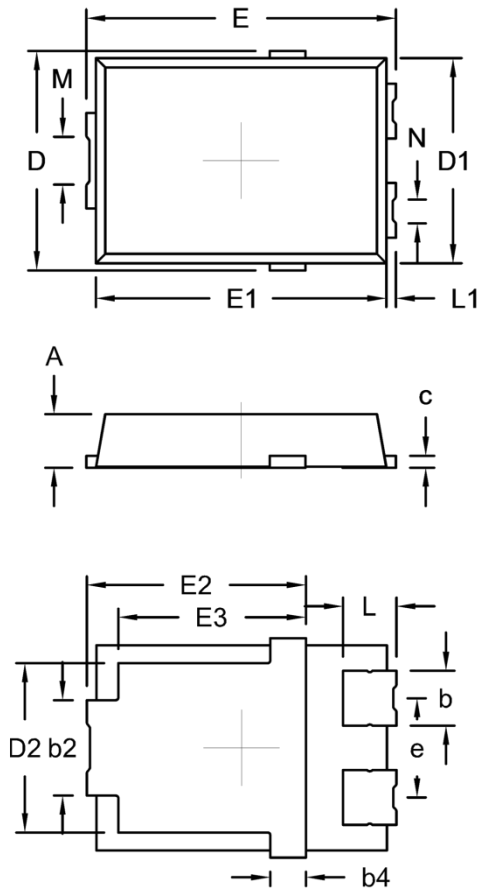


Fig.9 Typical Transient Thermal Impedance



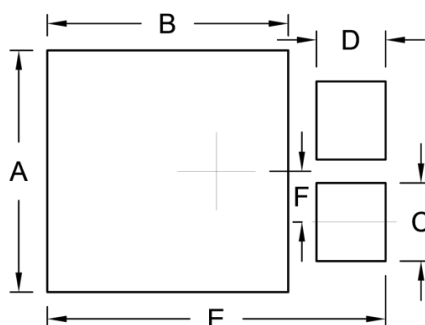
PACKAGE OUTLINE DIMENSIONS

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
YWF = Date Code
F = Factory Code

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