10A, 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

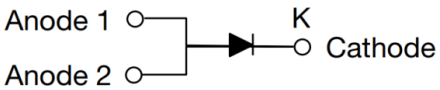
MECHANICAL DATA

- 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: 0.114g (approximately)

KEY PARAMETERS		
PARAMETER	**VALUE**	**UNIT**
I_F	10	A
V_{RRM}	200 - 1000	V
I_{FSM}	150	A
$T_{J\,MAX}$	175, 150	°C
Package	TO-277A (SMPC4.6U)	
Configuration	Single die	

Pb-Free RoHS COMPLIANT HALOGEN FREE

TO-277A (SMPC4.6U)



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)								
PARAMETER		**SYMBOL**	**TUAU 10DH**	**TUAU 10GH**	**TUAU 10JH**	**TUAU 10KH**	**TUAU 10MH**	**UNIT**
Marking code on the device			AU10D	AU10G	AU10J	AU10K	AU10M	
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	10					A
Surge peak forward current single half sine-wave superimposed on rated load	t = 8.3ms	I_{FSM}	150					A
	t = 1.0ms		520					
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	$R_{\Theta JL}$	5.0	°C/W
Junction-to-ambient thermal resistance	$R_{\Theta JA}$	45	°C/W
Junction-to-case thermal resistance	$R_{\Theta JC}$	7.6	°C/W

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

ELECTRICAL SPECIFICATIONS (T_A = 25°C unless otherwise noted)

PARAMETER		CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage[1]	TUAU10DH	I_F = 5A, T_J = 25°C	V_F	0.82	-	V
		I_F = 10A, T_J = 25°C		0.89	1.0	V
		I_F = 5A, T_J = 125°C		0.67	-	V
		I_F = 10A, T_J = 125°C		0.76	-	V
	TUAU10GH	I_F = 5A, T_J = 25°C		0.95	-	V
		I_F = 10A, T_J = 25°C		1.06	1.3	V
		I_F = 5A, T_J = 125°C		0.76	-	V
		I_F = 10A, T_J = 125°C		0.88	-	V
	TUAU10JH	I_F = 5A, T_J = 25°C		1.17	-	V
		I_F = 10A, T_J = 25°C		1.34	1.7	V
		I_F = 5A, T_J = 125°C		0.89	-	V
		I_F = 10A, T_J = 125°C		1.06	-	V
	TUAU10KH TUAU10MH	I_F = 5A, T_J = 25°C		1.32	-	V
		I_F = 10A, T_J = 25°C		1.51	1.9	V
		I_F = 5A, T_J = 125°C		1.01	-	V
		I_F = 10A, T_J = 125°C		1.21	-	V
Reverse current @ rated V_R[2]	TUAU10DH TUAU10GH TUAU10JH TUAU10KH TUAU10MH	T_J = 25°C	I_R	-	5	μA
	TUAU10DH TUAU10GH TUAU10JH	T_J = 125°C		12	-	μA
	TUAU10KH TUAU10MH			25	-	μA
Junction capacitance	TUAU10DH TUAU10GH TUAU10JH	1MHz, V_R = 4.0V	C_J	135	-	pF
	TUAU10KH TUAU10MH			43	-	pF
Reverse recovery time	TUAU10DH TUAU10GH TUAU10JH	I_F = 0.5A , I_R = 1.0A I_{rr} = 0.25A	t_{rr}	-	50	ns
	TUAU10KH TUAU10MH			-	80	

Notes:

1. Pulse test with PW = 0.3ms

2. Pulse test with PW = 30ms

ORDERING INFORMATION		
ORDERING CODE(1)	**PACKAGE**	**PACKING**
TUAU10xH	TO-277A (SMPC4.6U)	6,000 / Tape & Reel

Notes:

1. "x" define voltage from 200V(TUAU10DH) to 1000V(TUAU10MH)

CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.1 Forward Current Derating Curve

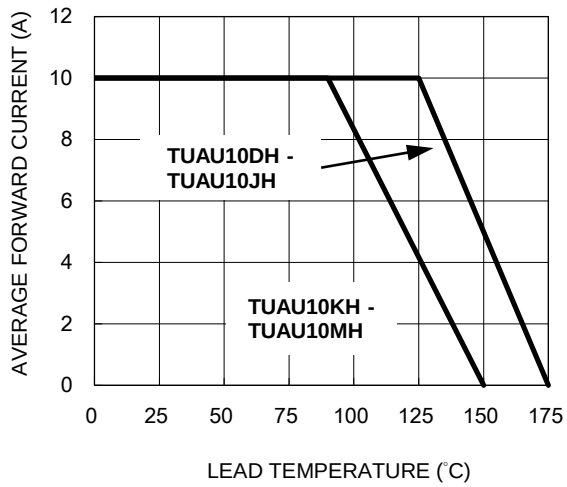


Fig.2 Typical Junction Capacitance

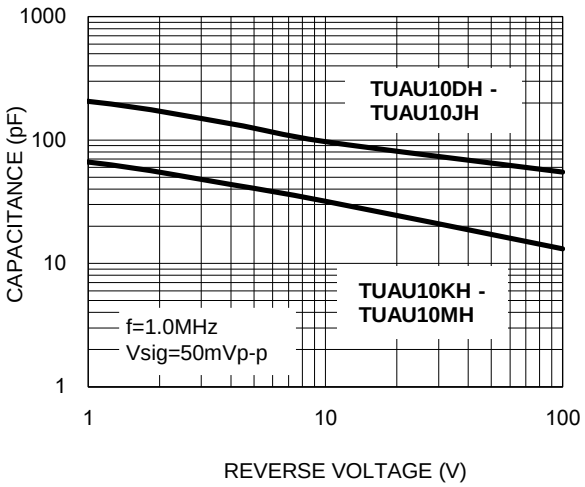


Fig.3 Typical Reverse Characteristics

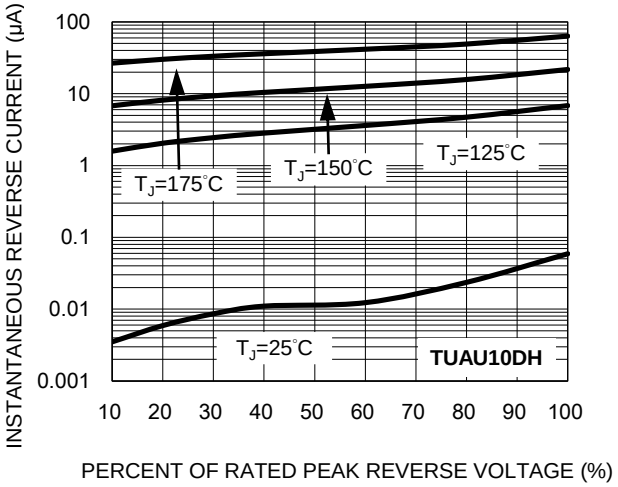


Fig.4 Typical Forward Characteristics

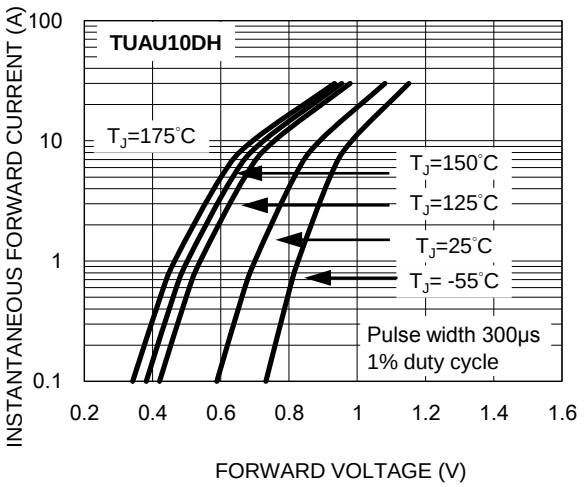


Fig.5 Typical Reverse Characteristics

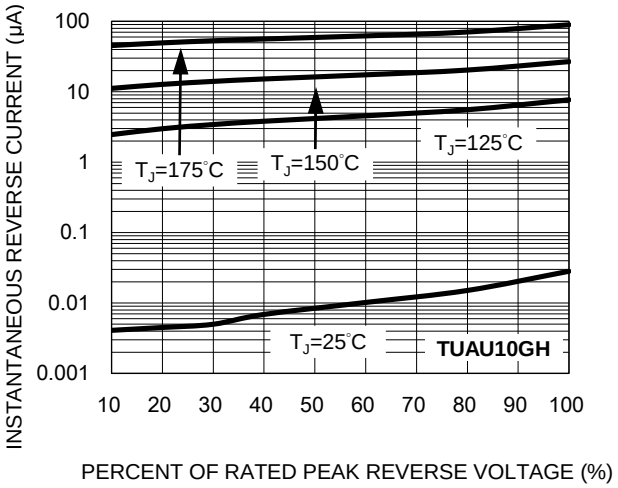
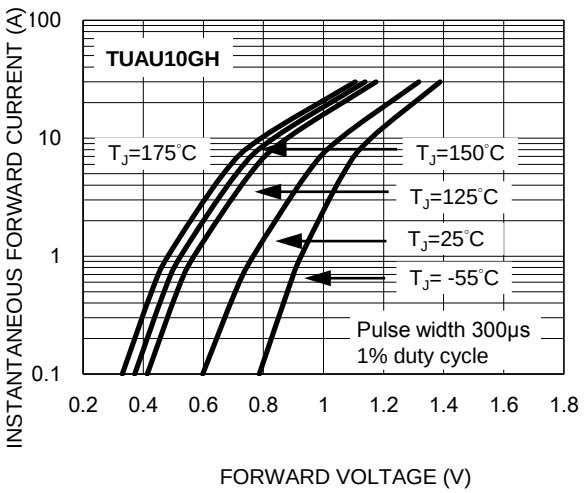


Fig.6 Typical Forward Characteristics



CHARACTERISTICS CURVES

(T_A = 25°C unless otherwise noted)

Fig.7 Typical Reverse Characteristics

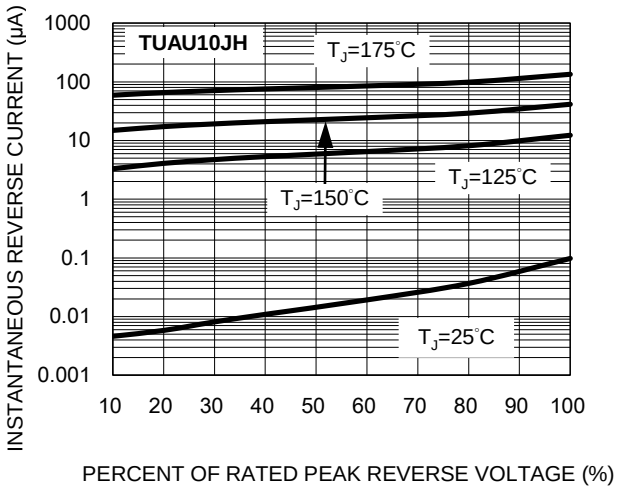


Fig.8 Typical Forward Characteristics

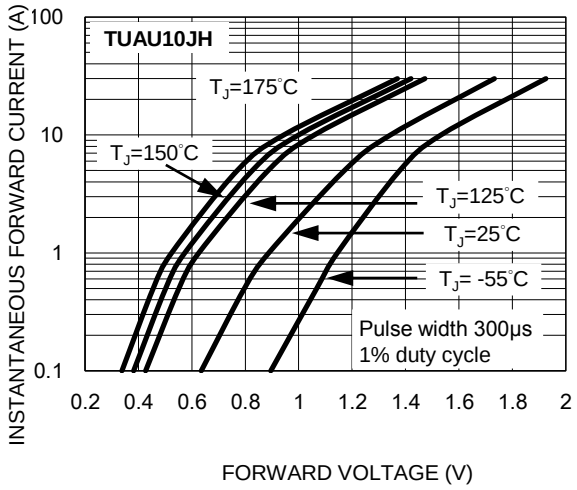


Fig.9 Typical Reverse Characteristics

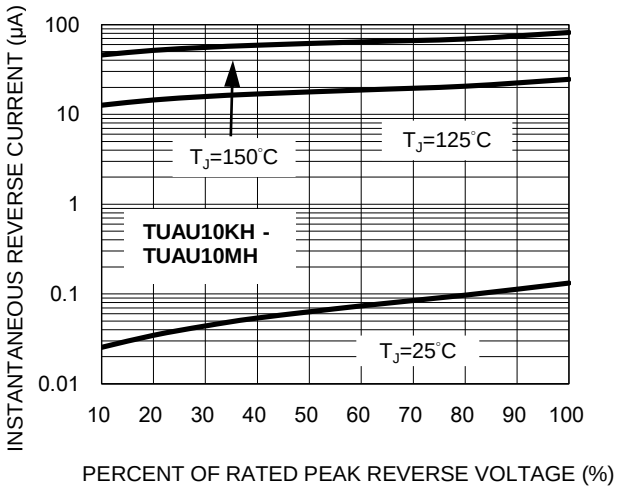


Fig.10 Typical Forward Characteristics

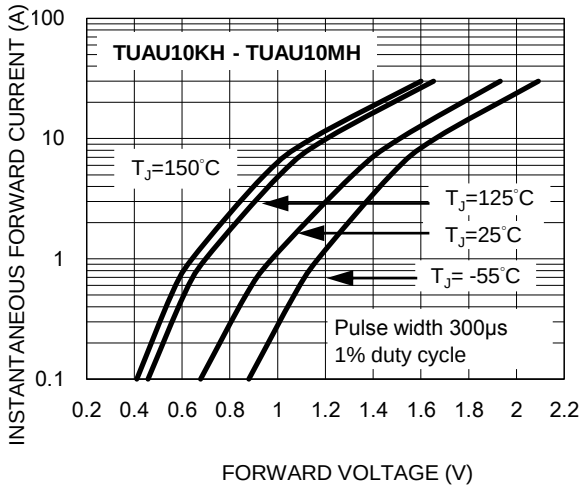
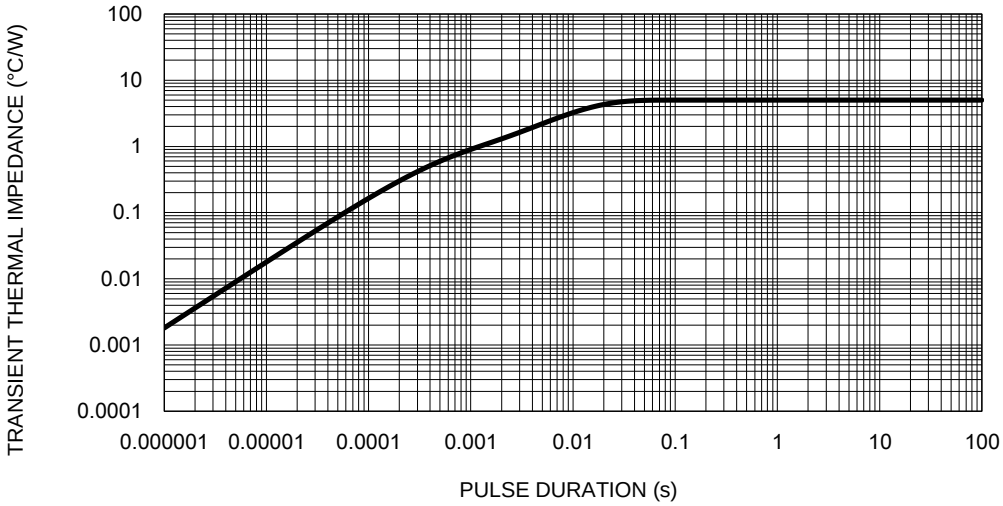
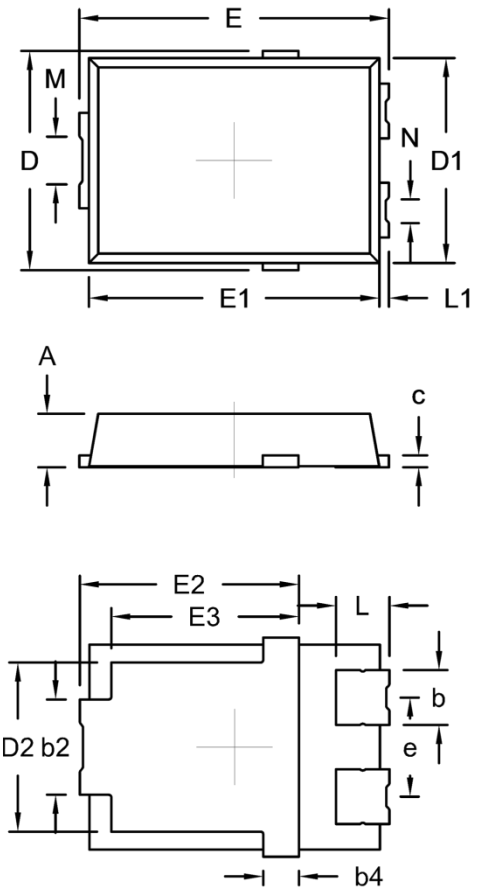


Fig.11 Typical Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS

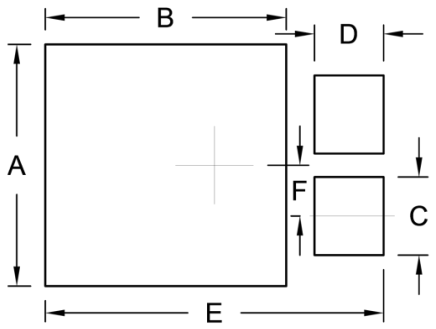
TO-277A (SMPC4.6U)



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

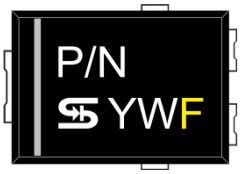
SUGGESTED PAD LAYOUT



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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