

3A, 600V Ultra Fast Surface Mount Rectifier

FEATURES

- Planar technology
- Low power loss, high efficiency
- Ideal for automated placement
- Wettable flank
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free

APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- Lighting application
- Snubber
- Freewheeling application

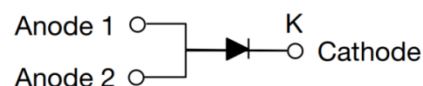
MECHANICAL DATA

- 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: 0.101g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	3	A
V_{RRM}	600	V
I_{FSM}	55	A
$T_{J\ MAX}$	175	°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	VALUE	UNIT
Repetitive peak reverse voltage		V_{RRM}	600	V
Reverse voltage, total rms value		$V_{R(RMS)}$	420	V
Forward current		I_F	3	A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	I_{FSM}	55	A
	$t = 1.0\text{ms}$		110	
Junction temperature		T_J	-55 to +175	°C
Storage temperature		T_{STG}	-55 to +175	°C

THERMAL PERFORMANCE

PARAMETER	SYMBOL	TYP	UNIT
Junction-to-lead thermal resistance ⁽¹⁾	$R_{\theta JL}$	2.0	°C/W
Junction-to-ambient thermal resistance ⁽²⁾	$R_{\theta JA}$	48	°C/W
Junction-to-case thermal resistance ⁽²⁾	$R_{\theta JC}$	9.5	°C/W

Thermal Performance Notes:

1. With ideal heat sink
2. 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⁾	$I_F = 1.5\text{A}, T_J = 25^\circ\text{C}$	V_F	1.18	-	V
	$I_F = 3.0\text{A}, T_J = 25^\circ\text{C}$		1.30	1.5	V
	$I_F = 1.5\text{A}, T_J = 125^\circ\text{C}$		0.93	-	V
	$I_F = 3.0\text{A}, T_J = 125^\circ\text{C}$		1.08	-	V
Reverse current @ rated V_R ⁽²⁾	$T_J = 25^\circ\text{C}$	I_R	-	2	μA
	$T_J = 125^\circ\text{C}$		2	-	μA
Junction capacitance	1MHz, $V_R = 4.0\text{V}$	C_J	17	-	pF
Reverse recovery time	$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$	t_{rr}	-	25	ns
	$I_F = 1.0\text{A}, di/dt = 50\text{A}/\mu\text{s}, V_R = 30\text{V}$		29	-	
Reverse recovery current	$I_F = 3.0\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_R = 400\text{V}$	I_{RM}	2.2	-	A
Reverse recovery charge		Q_{rr}	81	-	nC
Reverse recovery time		t_{rr}	49	-	ns

Notes:

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

ORDERING INFORMATION

ORDERING CODE	PACKAGE	PACKING
PUUP3J	TO-277A (SMPC4.6U)	6,000/ Tape & Reel

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

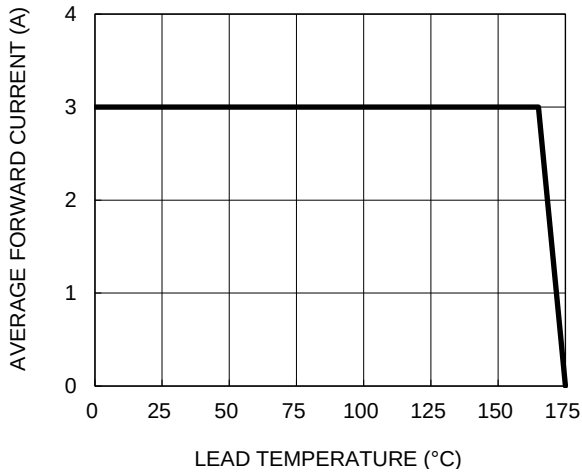


Fig.2 Typical Junction Capacitance

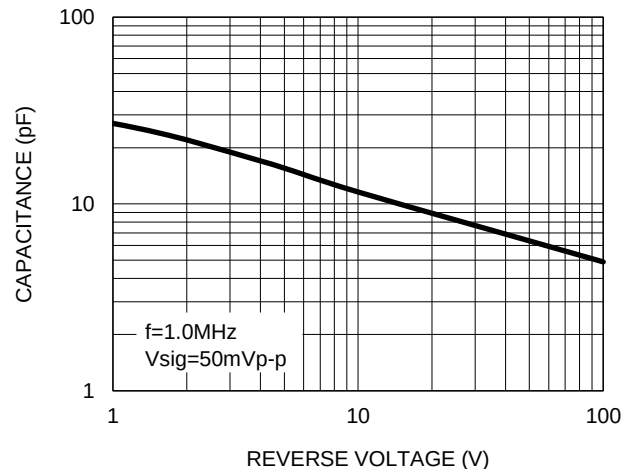


Fig.3 Typical Reverse Characteristics

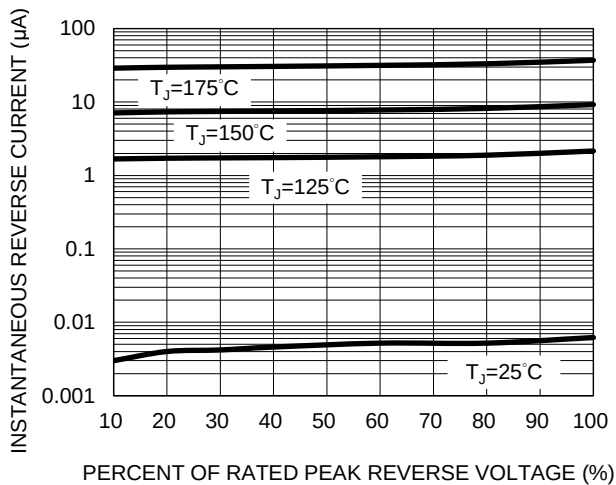


Fig.4 Typical Forward Characteristics

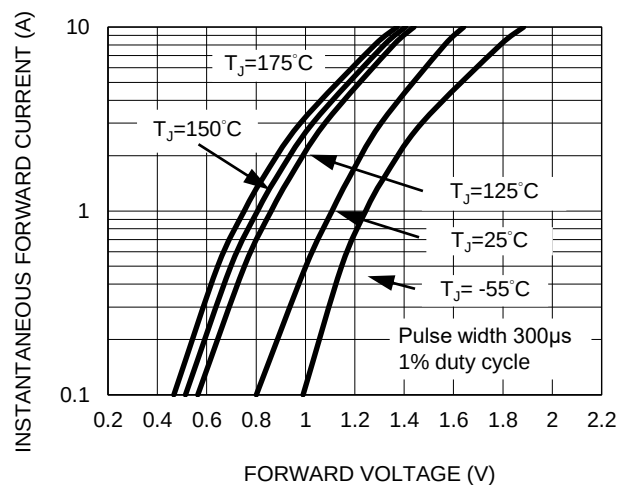
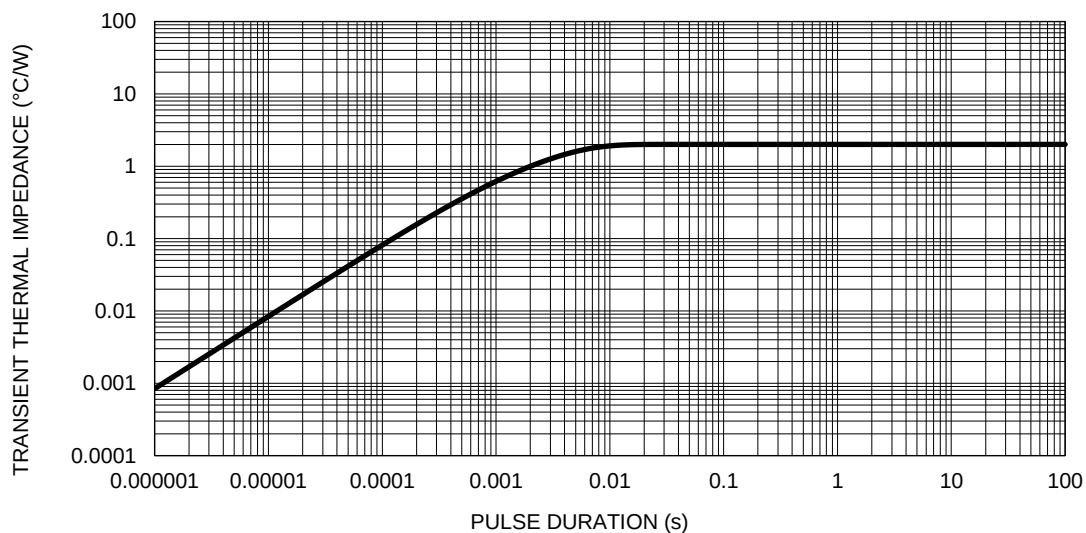
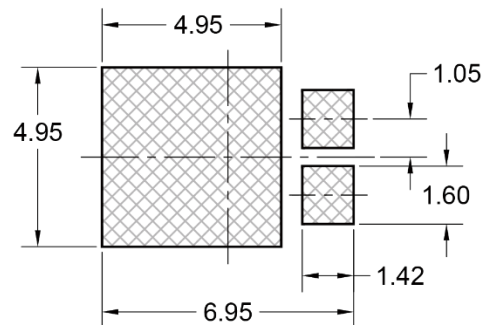
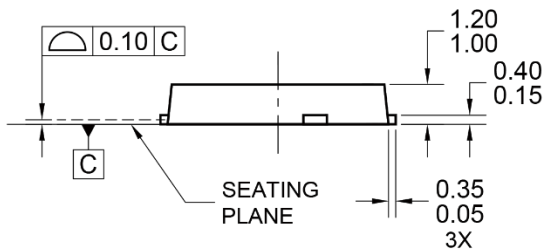
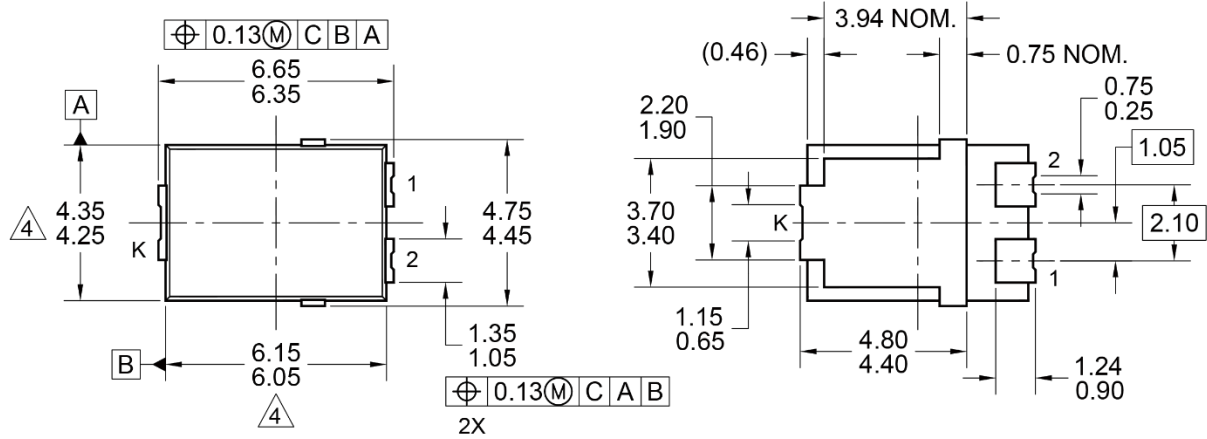


Fig.5 Typical Transient Thermal Impedance

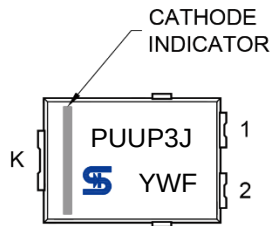


PACKAGE OUTLINE DIMENSIONS

TO-277A (SMPC4.6U)



SUGGESTED PAD LAYOUT
(REFERENCE ONLY)



MARKING DIAGRAM

YW = DATE CODE
F = FACTORY CODE

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
3. PACKAGE OUTLINE REFERENCE: JEDEC TO-277 ISSUE A.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD LASH, PROTRUSIONS OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-SMPC4.6U-031 REV A.

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