

12A, 600V High Efficient Surface Mount Rectifier

FEATURES

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

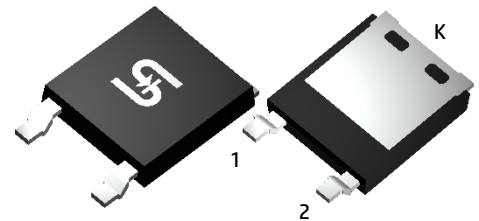
APPLICATIONS

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

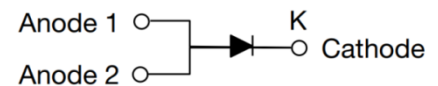
MECHANICAL DATA

- Case: ThinDPAK
- 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: 0.195g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
I_F	12	A
V_{RRM}	600	V
I_{FSM}	220	A
$T_J \text{ MAX}$	175	°C
Package	ThinDPAK	
Configuration	Single die	



ThinDPAK



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	12	A
Surge peak forward current single half sine-wave superimposed on rated load	$t = 8.3\text{ms}$	I_{FSM}	220	A
	$t = 1.0\text{ms}$		445	
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	$R_{\theta JL}$	2.3	°C/W
Junction-to-ambient thermal resistance	$R_{\theta JA}$	11	°C/W
Junction-to-case thermal resistance	$R_{\theta JC}$	1.4	°C/W

Thermal Performance Note: Units mounted on heatsink 2"x 3"x 0.25" Al-plate

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

PARAMETER	CONDITIONS	SYMBOL	TYP	MAX	UNIT
Forward voltage ⁽¹⁾	$I_F = 6\text{A}, T_J = 25^\circ\text{C}$	V_F	1.00	-	V
	$I_F = 12\text{A}, T_J = 25^\circ\text{C}$		1.10	1.3	V
	$I_F = 6\text{A}, T_J = 125^\circ\text{C}$		0.84	-	V
	$I_F = 12\text{A}, T_J = 125^\circ\text{C}$		0.97	-	V
Reverse current @ rated V_R ⁽²⁾	$T_J = 25^\circ\text{C}$	I_R	-	5	μA
	$T_J = 125^\circ\text{C}$		5	-	μA
Junction capacitance	1MHz, $V_R = 4.0\text{V}$	C_J	70	-	pF
Reverse recovery time	$I_F = 0.5\text{A}, I_R = 1.0\text{A}, I_{rr} = 0.25\text{A}$	t_{rr}	-	60	ns
	$I_F = 1.0\text{A}, di/dt = 50\text{A}/\mu\text{s}, V_R = 30\text{V}$		60	-	
Reverse recovery current	$I_F = 15\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_R = 400\text{V}$	I_{RM}	9.1	-	A
Reverse recovery charge		Q_{rr}	787	-	nC
Reverse recovery time		t_{rr}	120	-	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
PHAD12J	ThinDPAK	4,500 / Tape & Reel

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

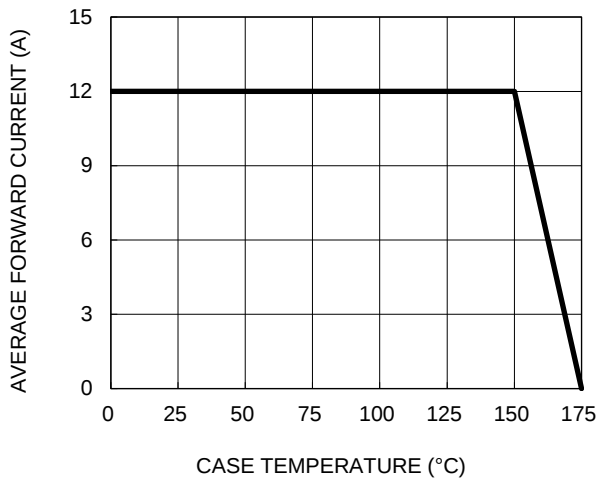


Fig.2 Typical Junction Capacitance

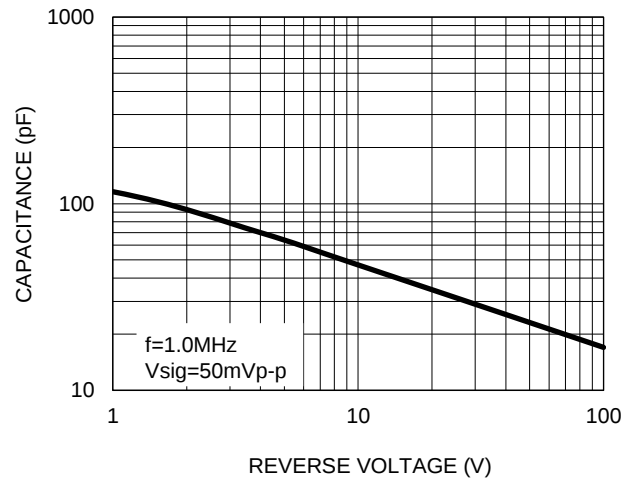


Fig.3 Typical Reverse Characteristics

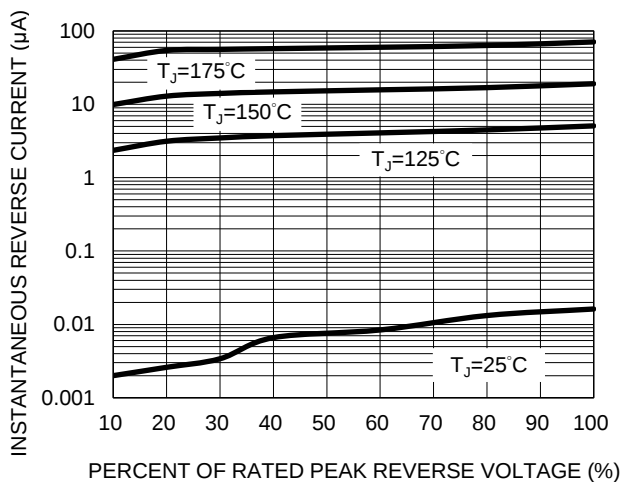


Fig.4 Typical Forward Characteristics

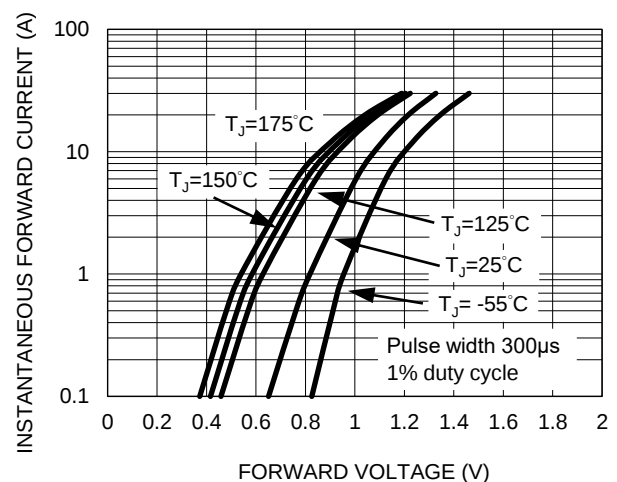
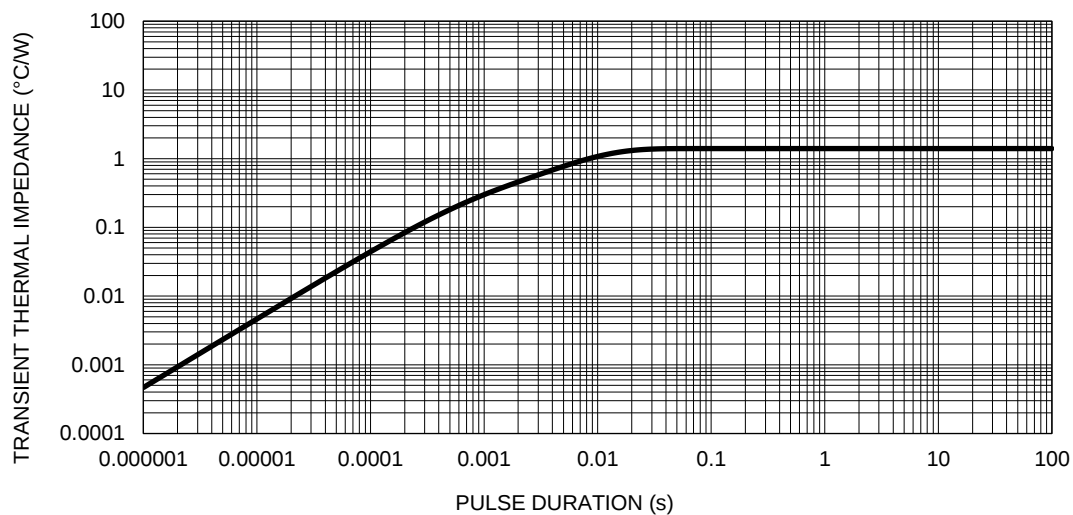
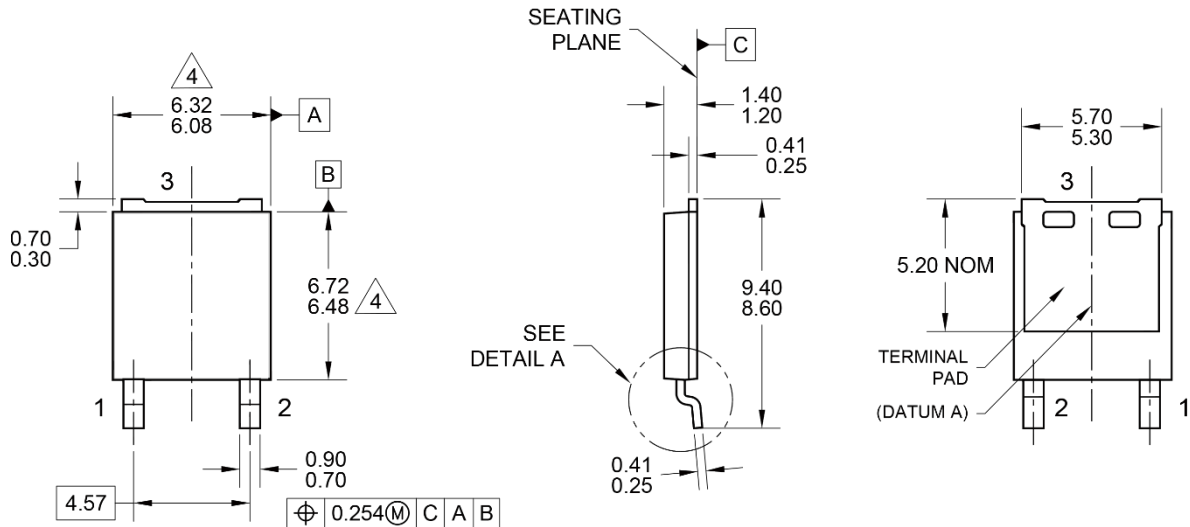


Fig.5 Typical Transient Thermal Impedance

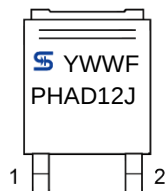


PACKAGE OUTLINE DIMENSIONS

ThinDPAK



SUGGESTED PAD LAYOUT



MARKING DIAGRAM

YWW = 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-252, VARIATION AE, ISSUE F.
4. MOLDED PLASTIC BODY DIMENSIONS DO NOT INCLUDE MOLD FLASH, PROTRUSION, OR GATE BURRS.
5. DWG NO. REF: HQ2SD07-TDPAK-065 REV A.

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