

PT42/4300 Series

3-7 Watt 48V-Input
Isolated DC/DC Converter

SLTS023B

(Revised 1/3/2002)

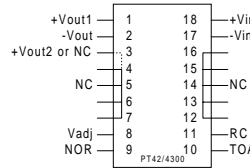
- Wide Input Voltage Range: 38V to 72V
- 83% Efficiency
- 1,500 VDC Isolation
- 18 Pin DIP Package
- 3.5 Million Hour MTBF
- Meets FCC/EN55022 Class A
- UL and CSA approved
- No External Components Required
- Adjustable Output Voltage

The PT4200 series of isolated DC/DC converters advance the state-of-the-art for board-mounted converters by employing

high switching frequencies, thick-film technology and a high degree of silicon integration. The high reliability and very low package height makes these converters ideal for Telecom and Datacom applications requiring input-to-output isolation with board spacing down to 0.6".

The PT4200 series is offered in a unique molded through-hole or SMD-DIP package with single output voltages of 2V, 3.3V, 5V, and 12V, dual outputs of $\pm 5V$, $+5V/+3.3V$, and $\pm 12V$.

Package (Top View)



Specifications

Characteristics ($T_a = 25^\circ\text{C}$ unless noted)	Symbols	Conditions	PT42/4300 SERIES				
			Min	Typ	Max	Units	
Output Current	I_o	Over V_{in} range	$V_o = 2V, 3.3V$ $V_o = 5V$ $V_o = 12V$	0 0 0	— — —	1.5 1.2 0.6	A A A
Current Limit	I_{cl}	$V_{in} = 48V$	$V_o = 2V$ $V_o = 3.3V$ $V_o = 5V$ $V_o = 12V$	2.0 1.7 1.4 0.7	— — — —	3.3 3.3 2.4 1.2	A A A A
On/Off Standby Current	$I_{in\ standby}$	$V_{in} = 48V$, Pin 11 = $-V_{in}$		—	0.5	—	mA
Short Circuit Current	I_{sc}	$V_{in} = 48V$	$V_o = 2V$ $V_o = 3.3V$ $V_o = 5V$ $V_o = 12V$	— — — —	2.8 2.4 1.9 1.2	— — — —	A A A A
Inrush Current	I_{ir} t_{ir}	$V_{in} = 48V$ @ max I_o On start-up		— —	0.6 1.0	1.0 5.0	A mSec
Input Voltage Range	V_{in}	Over I_o Range		38 (1)	48	72	V
Output Voltage Tolerance	ΔV_o	Over I_o Range		—	± 4	—	% V_o
Idling Voltage	V_o	$I_o = 0A$	$V_o = 2V$ $V_o = 3.3V$ $V_o = 5V$ $V_o = 12V$	— — — —	2.7 3.65 5.6 14.3	3.0 4.0 6.0 17	V V V V
Ripple Rejection	RR	Over V_{in} range @ 120 Hz		—	60	—	dB
Line Regulation	Reg_{line}	Over V_{in} range @ max I_o		—	± 0.5	—	% V_o
Load Regulation	Reg_{load}	10% to 100% of I_o max		—	± 3	—	% V_o
V_o Ripple/Noise	V_n	$V_{in} = 48V$, $I_o = I_o\ max$		—	30	70	mV _{pp}
Transient Response	t_{tr}	50% load change V_o over/undershoot		— —	100 3.0	300 5.0	μSec % V_o
Efficiency	η	$V_{in} = 48V$, $I_o = 1.5A$, $V_o = 2V$ $V_{in} = 48V$, $I_o = 1.5A$, $V_o = 3.3V$ $V_{in} = 48V$, $I_o = 1.2A$, $V_o = 5V$ $V_{in} = 48V$, $I_o = 0.6A$, $V_o = 12V$		— — — —	73 79 80 83	— — — —	% % % %
Switching Frequency	f_o	Over V_{in} and I_o		—	485	—	kHz
Operating Temperature	T_a	$V_{in} = 48V$ @ max I_o Free air convection, (40-60LFM)		-40	—	+85	$^\circ\text{C}$
Pin Temperature	T_p	@ Pin1		—	—	95	$^\circ\text{C}$
Storage Temperature	T_s	—		-55	—	+125	$^\circ\text{C}$
Mechanical Shock	—	Per Mil-STD-202F, Method 213B, 6mS half-sine, mounted to a PCB		—	50	—	G's
Mechanical Vibration	—	Per Mil-STD-202F, Method 204D, 10-500Hz, mounted to a PCB		—	10	—	G's
Weight	—	—		—	20	—	grams
Isolation	—	—		1500	—	—	VDC
Flammability	—	Materials meet UL 94V-0		—	—	—	—

Notes: (1) The minimum input voltage is adjustable. See the specific application note on the PT4200/4205/4300 Series.

Pin-Out Information

Pin	Function
1	V_{out1}
2	V_{out} return
3	V_{out2} or N/C
4	Do not connect
5	Do not connect
6	Do not connect
7	Do not connect
8*	V_{adj}
9*	Nominal output voltage resistor
10	Turn-on/off input voltage adjust
11	Remote on/off
12	Do not connect
13	Do not connect
14	Do not connect
15	Do not connect
16	Do not connect
17	$-V_{in}$
18	$+V_{in}$

* Please note that when the V_{out} adjust is not used, pin 8 must be connected to pin 9.

Ordering Information

Through-Hole

PT4201A = 2V/1.5A
PT4202A = 3.3V/1.5A
PT4203A = 5V/1.2A
PT4204A = 12V/0.6A
PT4301A = $\pm 5V/1A$
PT4302A = $+5.2V/1A$,
 $+3.3V/1A$
PT4303A = $\pm 12V/0.25A$

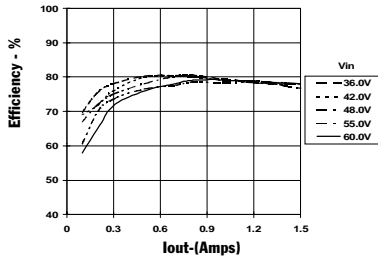
Surface Mount

PT4201C = 2V/1.5A
PT4202C = 3.3V/1.5A
PT4203C = 5V/1.2A
PT4204C = 12V/0.6A
PT4301C = $\pm 5V/1A$
PT4302C = $+5.2V/1A$,
 $+3.3V/1A$
PT4303C = $\pm 12V/0.25A$

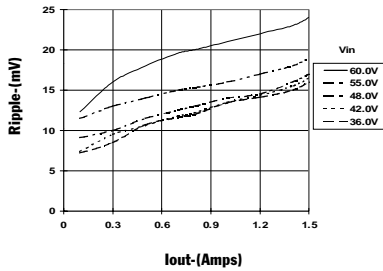
(For dimensions and PC board layout, see Package Style 900.)

PT4202 3.3V (See Note A)

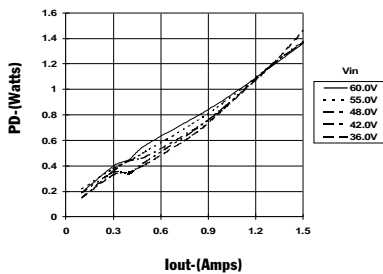
Efficiency vs Output Current



Ripple vs Output Current

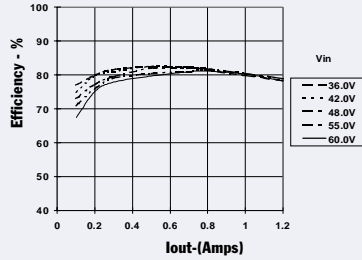


Power Dissipation vs Output Current

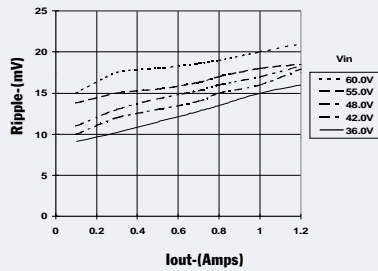


PT4203 5.0V (See Note A)

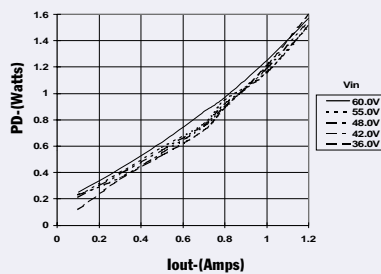
Efficiency vs Output Current



Ripple vs Output Current

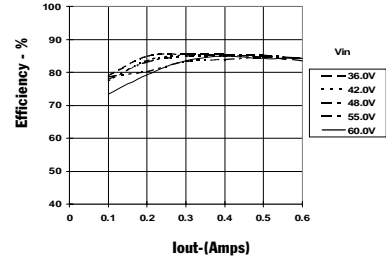


Power Dissipation vs Output Current

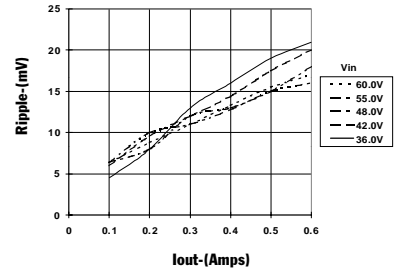


PT4204 12.0V (See Note A)

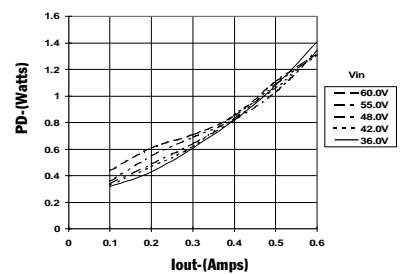
Efficiency vs Output Current



Ripple vs Output Current



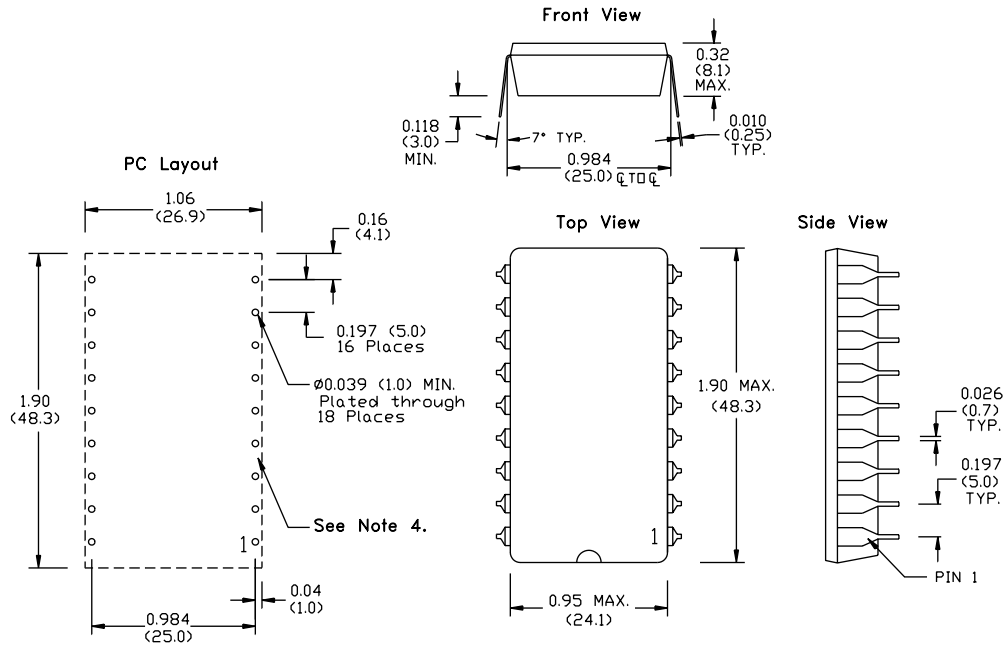
Power Dissipation vs Output Current



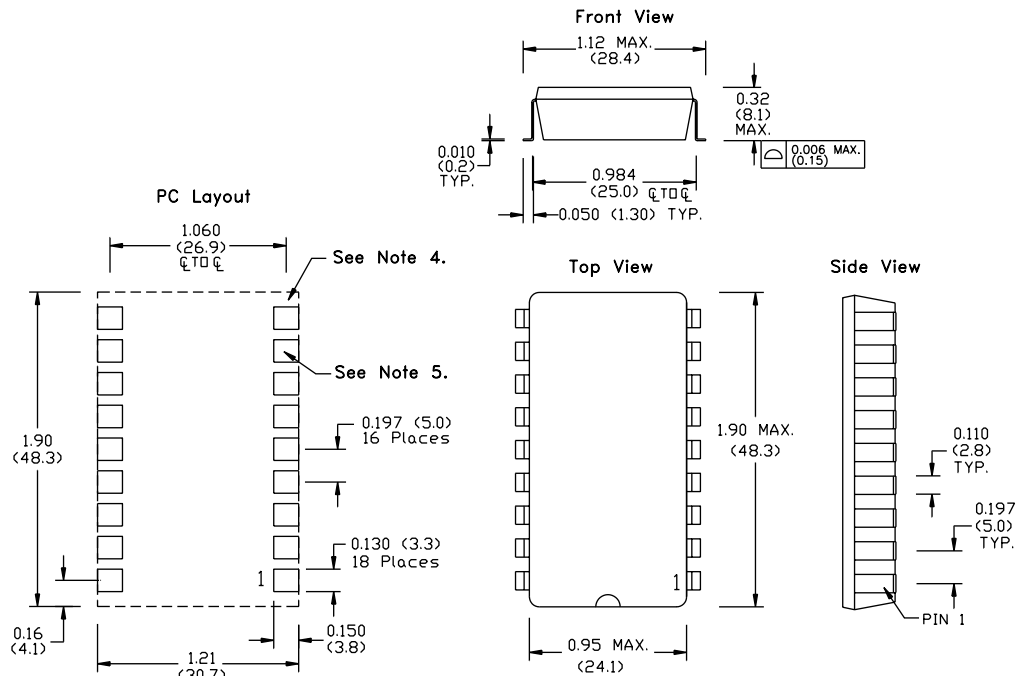
Note A: All data listed in the above graphs, except for derating data, has been developed from actual products tested at 25°C. This data is considered typical data for the DC-DC Converter.

PACKAGE INFORMATION AND DIMENSIONS

Horizontal Through-Hole Mount (Suffix A)



Surface Mount (Suffix C)



Notes: (Rev. A)

- 1: All dimensions are in inches (mm).
- 2: 2 place decimals are \pm 0.030 (\pm 0.8mm).
- 3: 3 place decimals are \pm 0.010 (\pm 0.3mm).
- 4: Recommended mechanical keep out area.
- 5: Power pin connections should utilize two or more vias per input, ground and output pin.

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265