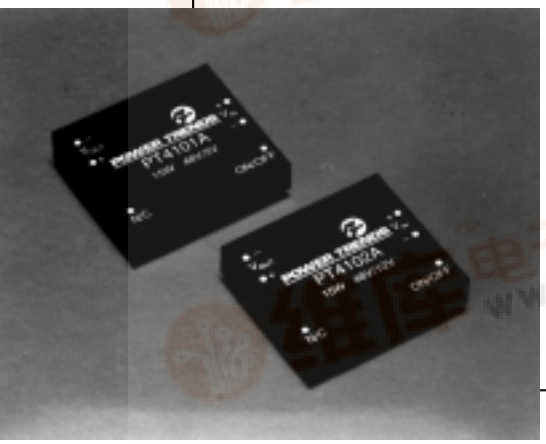
Revised 3/1/99

PT4100 Series 48V

48V 15 WATT ISOLATED DC-DC CONVERTER

Application Notes
Mechanical Outline
Product Selector Guide



- -40°C to +85°C Operating Temperature Range
- 1500 VDC Isolation
- Power Density 15 Watts/in³
- Wide Input Voltage Range 36V to 75V
- 82% Efficiency
- Small Footprint
- Fast Transient Response
- UL Approved

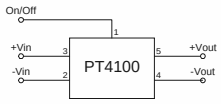
Power Trends' PT4100 series of Isolated 48V DC-DC Converters advance the state-of-the-art for board-mounted converters by employing high switching frequencies greater than 650 KHz and planar magnetics and surface-mount construction. They feature the industry's smallest footprint, a power density of 15 Watts/in³, and operate at 82% efficiency. They are designed for Telecom, Industrial, Computer, Medical, and other distributed power applications requiring input-to-output isolation and an industrial temperature range.

Specifications

Characteristics (T_a=25°C unless noted)	Symbols	Conditions		PT4100 SERIES Min	Typ	Max	Units
Output Current	I_o	Over V_{in} range	V_o = 3.3V	0	—	4.0	A
			V_o = 5V	0	—	3.0	A
			V_o = 12V	0	—	1.25	A
			V_o = 15V	0	—	1.0	A
Current Limit	I_{cl}	V_{in} = 36V	V_o = 5V	—	4.00	—	A
			V_o = 12V	—	1.75	—	A
			V_o = 15V	—	1.4	—	A
On/Off Standby Current	$I_{in\ standby}$	V_{in} = 48V, Pin 1 = -V_{in}		—	7	10	mA
Short Circuit Current	I_{sc}	V_{in} = 48V	V_o = 5V	—	5.5	—	A
			V_o = 12V	—	3.5	—	A
			V_o = 15V	—	2.0	—	A
Inrush Current	I_{ir}	V_{in} = 48V @ max I_o		—	0.6	1.0	A
	t_{ir}	On start-up		—	1.0	5.0	mSec
Input Voltage Range	V_{in}	I_o = 0.1 to max I_o		36.0	48.0	75.0	V
Output Voltage Tolerance	ΔV_o	Over V_{in} Range T_A= -40°C to +85°C		—	±1.0	±2.0	%V_o
Ripple Rejection	RR	Over V_{in} range @ 120 Hz		—	60	—	dB
Line Regulation	Reg_{line}	Over V_{in} range @ max I_o		—	±0.2	±1.0	%V_o
Load Regulation	Reg_{load}	10% to 100% of I_o max		—	±0.4	±1.0	%V_o
V_o Ripple/Noise	V_n	V_{in}=48V, I_o=3.0A,	V_o=5V	—	75	100	mV_{pp}
		V_{in}=48V, I_o=1.25A,	V_o=12V	—	120	150	mV_{pp}
		V_{in}=48V, I_o=1.0A,	V_o=15V	—	100	200	mV_{pp}
Transient Response	t_{tr}	50% load change		—	100	200	µSec
		V_o over/undershoot		—	3.0	5.0	%V_o
Efficiency	η	V_{in}=48V, I_o=3.0A, V_o=5V		—	80	—	%
		V_{in}=48V, I_o=1.25A, V_o=12V		—	81	—	%
		V_{in}=48V, I_o=1A, V_o=15V		—	82	—	%
Switching Frequency	f_o	Over V_{in} and I_o,	V_o=5V	800	850	900	kHz
			V_o=12V/15V	600	650	700	kHz
Recommended Operating Temperature Range	T_a	V_{in} = 48V @ max I_o Free air convection, (40-60LFM)		-40	—	+85*	°C
		200 LFM	PT4110	0	—	+70	°C
Thermal Resistance	θ_{ja}	Free Air Convection, (40-60LFM)		—	14	—	°C/W
Case Temperature	T_c	@ Thermal shutdown		—	—	100	°C
Storage Temperature	T_s	—		-40	—	110	°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, Soldered in a PCB		—	10	—	G's
Weight	—	—		—	28	—	grams
Isolation	—	—		1500	—	—	V
Capacitance	—	—		—	1100	—	pF
Resistance	—	—		10	—	—	MΩ
Flammability	—	Materials meet UL 94V-0					
Remote On/Off	On	Open or 2.5 to 7.0 VDC above -V_{in}					
	Off	Short or 0 to 0.8 VDC above -V_{in}					

* See thermal derating curves

Standard Application



Pin-Out Information

Pin	Function
1	Remote ON/OFF
2	-V_{in}
3	+V_{in}
4	-V_{out}
5	+V_{out}
6	Do not connect

Ordering Information

Through-Hole

PT4101A = 5 Volts
PT4102A = 12 Volts
PT4103A = 15 Volts
PT4110A = 3.3 Volts
PT4117A = 5.2 Volts

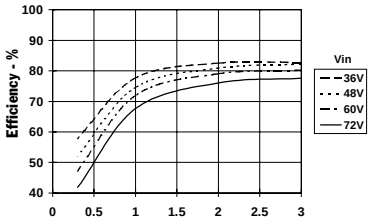
Surface Mount

PT4101C = 5 Volts
PT4102C = 12 Volts
PT4103C = 15 Volts
PT4110C = 3.3 Volts
PT4117C = 5.2 Volts

(For dimensions and PC board layout, see Package Style 700.)

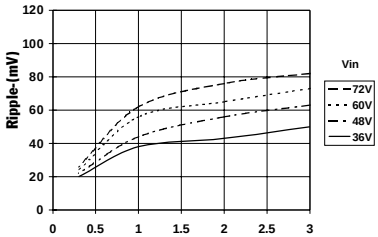
PT4101, 5.0 VDC (See Note 1)

Efficiency vs Output Current



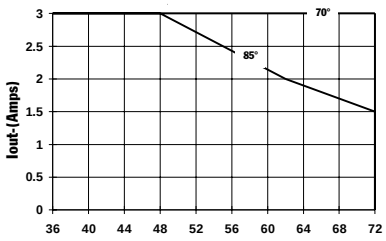
Iout-(Amps)

Ripple vs Output Current



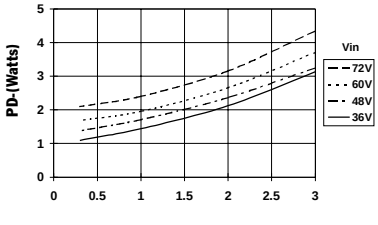
Iout-(Amps)

Thermal Derating (T_a) (See Note 2)



Vin-(Volts)

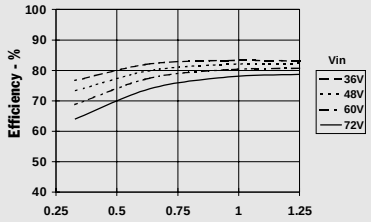
Power Dissipation vs Output Current



Iout-(Amps)

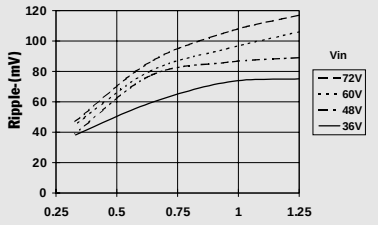
PT4102, 12.0 VDC (See Note 1)

Efficiency vs Output Current



Iout-(Amps)

Ripple vs Output Current

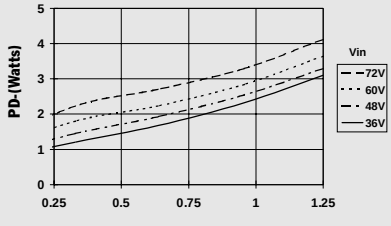


Iout-(Amps)

Thermal Derating (T_a) (See Note 2)

Vin-(Volts)

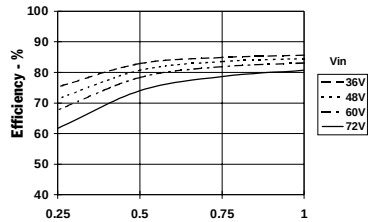
Power Dissipation vs Output Current



Iout-(Amps)

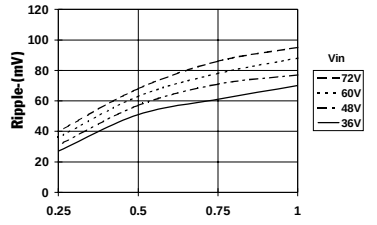
PT4103, 15.0 VDC (See Note 1)

Efficiency vs Output Current



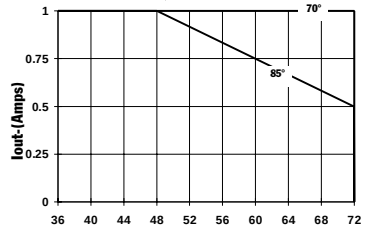
Iout-(Amps)

Ripple vs Output Current



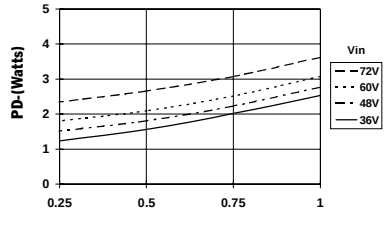
Iout-(Amps)

Thermal Derating (T_a) (See Note 2)



Vin-(Volts)

Power Dissipation vs Output Current



Iout-(Amps)

Note 1: *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.*
Note 2: *Thermal derating graphs are developed in free air convection cooling of 40-60 LFM.*

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