

- 15W Output Power ⁽¹⁾
- Input Voltage Range:
36V to 75V
- 1500 VDC Isolation
- Low-Profile
- Current Limit
- Short-Circuit Protection
- Over-Temperature Shutdown
- UL1950 recognized
- CSA 22.2 950 certified
- Meets EN60950

The PT4100—48V series of dc/dc converters provide up to 18 Watts/in³ of isolated power in a single low-profile module. Designed to operate from a standard 48V telecom bus, these modules employ switching frequencies of up to 850kHz, planar magnetics, and surface-mount construction. They are designed for Telecom, Industrial, Computer, Medical, and other distributed power applications that require input-to-output isolation.

Specifications

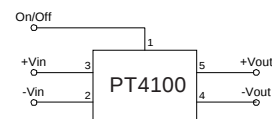
Characteristics (T _a =25°C unless noted)	Symbols	Conditions	PT4100—48V SERIES				Units
			Min	Typ	Max		
Output Current	I _o	Over V _{in} range V _o = 3.3V V _o = 5V V _o = 12V V _o = 15V	0 0 0 0	— — — —	4.0 ⁽¹⁾ 3.0 1.25 1.0		A
On/Off Standby Current	I _{in standby}	V _{in} = 48V, Pin 1 = -V _{in}	—	7	10		mA
Short Circuit Current	I _{sc}	V _{in} = 48V V _o ≤ 5.2V V _o = 12V V _o = 15V	— — — —	5.5 3.5 2.0	— — —		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}	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
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 =4.0A, V _o =3.3V V _{in} =48V, I _o =3.0A, V _o =5V V _{in} =48V, I _o =1.25A, V _o =12V V _{in} =48V, I _o =1.0A, V _o =15V	— — — —	70 75 120 100	90 100 150 200		mV _{pp}
Transient Response	t _{tr}	50% load change V _o over/undershoot	— —	100 3.0	200 5.0		μSec % V _o
Efficiency	η	V _{in} =48V, I _o =4.0A, V _o =3.3V V _{in} =48V, I _o =3.0A, V _o =5V V _{in} =48V, I _o =1.25A, V _o =12V V _{in} =48V, I _o =1A, V _o =15V	— — — —	75 80 81 82	— — — —		%
Switching Frequency	f _o	Over V _{in} and I _o , V _o ≤5.2V V _o =12V/15V	800 600	850 650	900 700		kHz
Recommended Operating Temperature Range	T _a	V _{in} = 48V @ max I _o Free air convection, (40-60LFM) PT4110 with 200 LFM airflow	-40 0	— —	+85 ⁽²⁾ +70 ⁽¹⁾		°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 Capacitance	—	—	1500	—	—		V
Resistance	—	—	10	1100	—		pF MΩ
Flammability	—	Materials meet UL 94V-0	—	—	—		
Remote On/Off	On ⁽³⁾ Off	Referenced to -V _{in}	2.5 0	— —	7.0 0.8		V

Notes: (1) The PT4110 is limited to 13.2W output over the temperature range of 0–70°C with 200LFM airflow.

(2) See thermal derating curves

(3) If pin 2 is left open, the converter will operate when input power is applied

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

(1) PT4110A = 3.3 Volts

PT4117A = 5.2 Volts

Surface Mount

PT4101C = 5 Volts

PT4102C = 12 Volts

PT4103C = 15 Volts

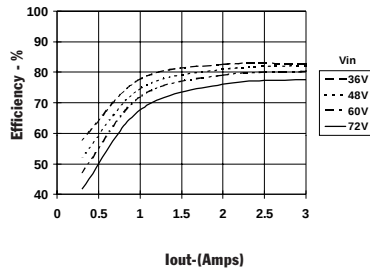
(1) PT4110C = 3.3 Volts

PT4117C = 5.2 Volts

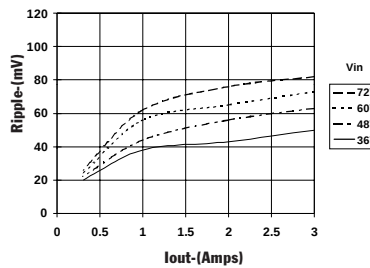
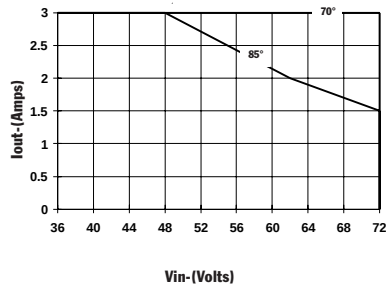
(For dimensions and PC board layout, see Package Style 710.)

PT4101, 5.0 VDC (See Note A.)

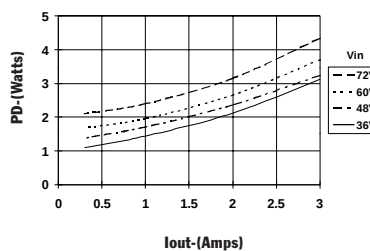
Efficiency vs Output Current



Ripple vs Output Current

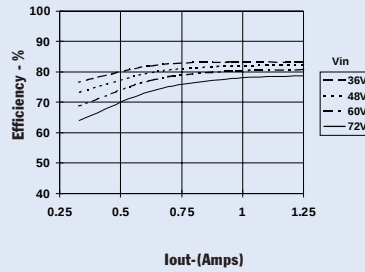
Thermal Derating (T_a) (See Note B.)

Power Dissipation vs Output Current

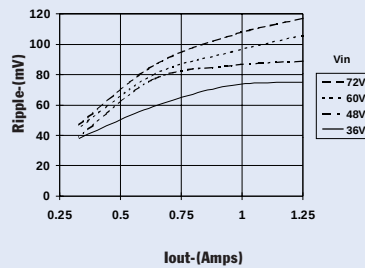
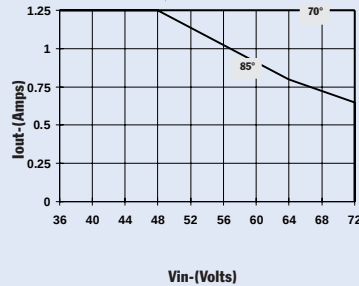


PT4102, 12.0 VDC (See Note A.)

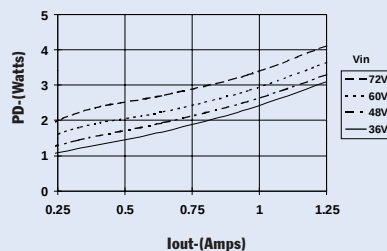
Efficiency vs Output Current



Ripple vs Output Current

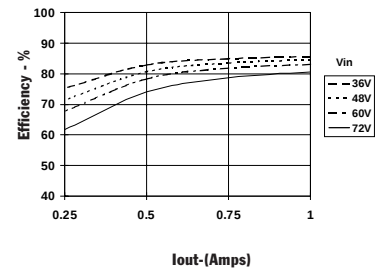
Thermal Derating (T_a) (See Note B.)

Power Dissipation vs Output Current

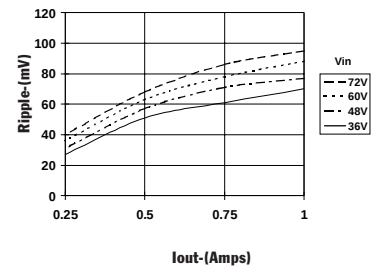
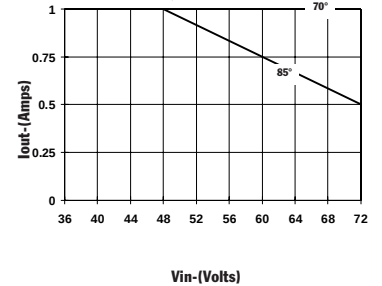


PT4103, 15.0 VDC (See Note A.)

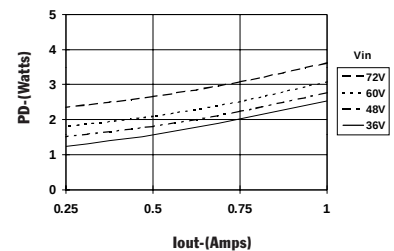
Efficiency vs Output Current



Ripple vs Output Current

Thermal Derating (T_a) (See Note B.)

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

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
PT4101C	OBSOLETE	DIP MODULE	EGE	6		TBD	Call TI	Call TI	-40 to 85		

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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