

- 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

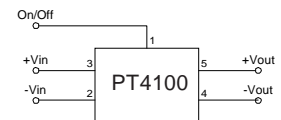
The PT4100—48V series of dc/dc converters provide up to 18 Watts/in³ of isolated power in a single low-profile module. Designed to operate from a standard 48V telecom bus, these modules employ switching frequencies of up to 850kHz, planar magnetics, and surface-mount construction. They are designed for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

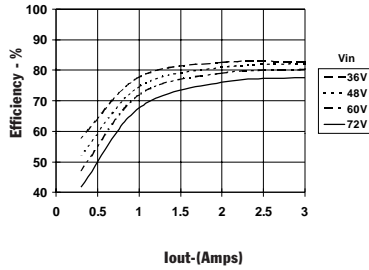
- PT4101A = 5 Volts
 PT4102A = 12 Volts
 PT4103A = 15 Volts
 (1) PT4110A = 3.3 Volts
 PT4117A = 5.2 Volts

Surface Mount

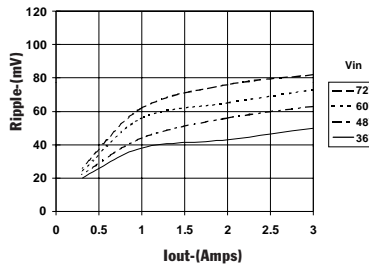
- PT4101C = 5 Volts
 PT4102C = 12 Volts
 PT4103C = 15 Volts
 (1) PT4110C = 3.3 Volts
 PT4117C = 5.2 Volts
 (For dimensions and PC board layout, see Package Style 710.)

PT4101, 5.0 VDC (See Note A.)

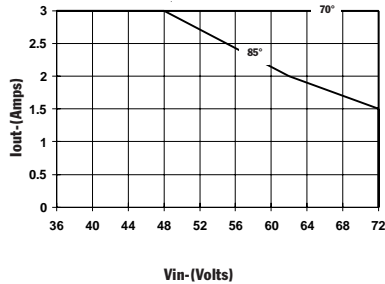
Efficiency vs Output Current



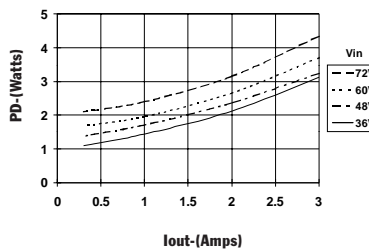
Ripple vs Output Current



Thermal Derating (T_a) (See Note B.)

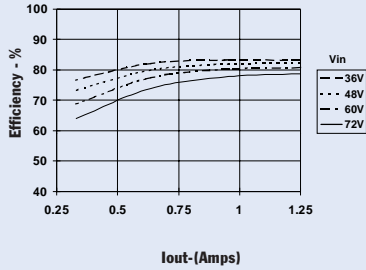


Power Dissipation vs Output Current

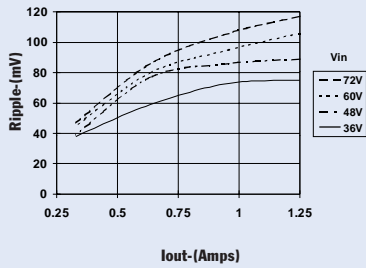


PT4102, 12.0 VDC (See Note A.)

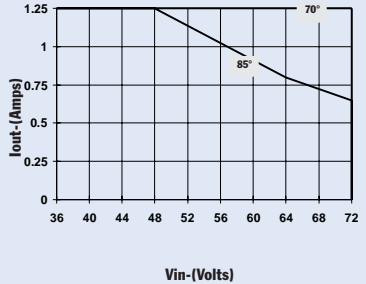
Efficiency vs Output Current



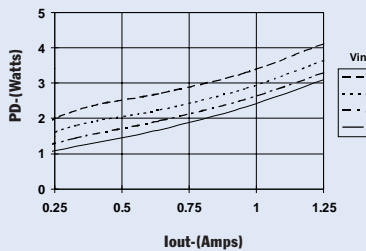
Ripple vs Output Current



Thermal Derating (T_a) (See Note B.)

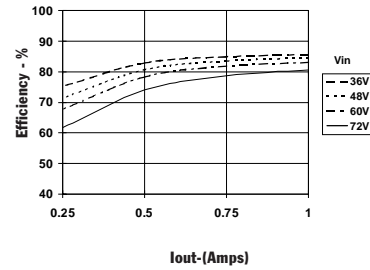


Power Dissipation vs Output Current

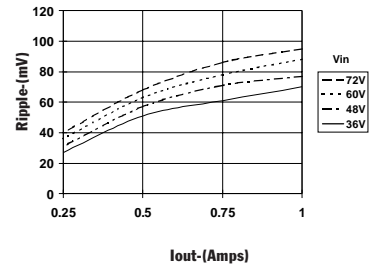


PT4103, 15.0 VDC (See Note A.)

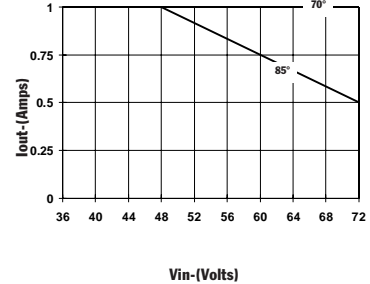
Efficiency vs Output Current



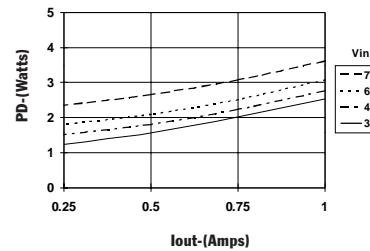
Ripple vs Output Current



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	MSL Peak Temp ⁽³⁾
PT4101A	NRND	DIP MOD ULE	EGD	6	16	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT4101C	NRND	DIP MOD ULE	EGE	6	16	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM
PT4102A	NRND	DIP MOD ULE	EGD	6	16	Pb-Free (RoHS)	Call TI	N / A for Pkg Type
PT4102C	NRND	DIP MOD ULE	EGE	6	16	Pb-Free (RoHS)	Call TI	Level-1-215C-UNLIM

⁽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.

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