

PT4471—24V

100 Watt 30 Amp Programmable
Isolated DC-DC Converter

Power Trends Products
from Texas Instruments



SLTS093

(Revised 6/30/2000)



Patent pending on package assembly

Features

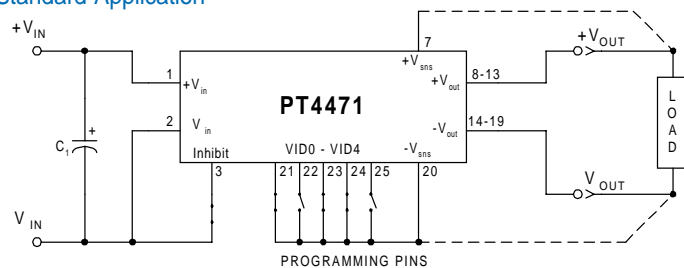
- Input Range: 18V to 36V
- Programmable Output:
1.3V to 3.5V
- Temp Range: -40° to +100°C
- 1500 VDC Isolation
- 88% Efficiency
- Remote On/Off
- Differential Remote Sense
- N+1 Current Sharing
- Over-Current Protection
- Over-Temperature Protection
- Over-Voltage Protection
- Solderable Copper Case

Description

The PT4471 Excalibur™ module combines state-of-the-art power conversion technology with un-paralleled flexibility. Operating off a standard 24V telecom input, the PT4471 provides a full 100W output at load currents up to 30A, and over the programmable output voltage range of 1.3V to 3.5V.

The PT4471 features high efficiencies, ultra-fast transient response, and the capability for true N+1 current sharing. This product also includes output short circuit and over-temperature protection.

Standard Application



- C₁ = Optional 33μF, 50V electrolytic capacitor
- Programming pins, VID0–VID4, are shown configured for V_O = 3.3V
- For normal operation, pin 3 (Inhibit) must be connected to -V_{IN}.
- For operation in N+1 configuration, consult the related application note.
- Pins 6 & 26 are used for N+1 configurations only.

Specifications

Characteristics (T _a =25°C unless noted)	Symbols	Conditions (V _{in} =24V, V _O =3.3V unless noted)	PT4471			
			Min	Typ	Max	Units
Output Current	I _O	Over V _{in} range	0	—	30	A
Current Limit	I _{CL}	V _{in} = 18V	—	35	—	A
Current Sharing		with PT4495 current booster	—	—	±10	%
Input Voltage Range	V _{in}	I _O = 0 to max I _O	18	24	36	V
Output Voltage Tolerance	ΔV _O	Over V _{in} Range T _A = -40 to +100°C Case	—	±1.0	±2.0	%V _O
Line Regulation	Reg _{line}	Over V _{in} range @ max I _O	—	±0.1	±1.0	%V _O
Load Regulation	Reg _{load}	0 to 100% of I _O max	—	±0.5	±1.0	%V _O
V _O Ripple/Noise	V _n	I _O = I _O max	V _O > 2.0V V _O ≤ 2.0V	60	75	mV _{pp}
				45	55	
Transient Response	t _{tr}	50% to 75% I _O max @ 0.1A/μs	—	N/A	—	μSec
		V _O over/undershoot (no ext caps)	—	1.0	—	%V _O
		50% to 100% I _O max @ 1.0A/μs	—	75	—	μSec
		V _O over/undershoot (no ext. caps)	—	5	—	%V _O
V _O Rise Time	V _{otr}	At turn-on	—	—	10	mSec
Efficiency	η	I _O =15A	—	88.5	—	%
Switching Frequency	f _o	—	—	300	—	kHz
Remote On/Off	Off On	Open or 2.5 to 5.1 VDC above -V _{in} Short or 0 to 0.8 VDC above -V _{in}				
Over-Voltage Protection	OVP	Shutdown and latch off	—	125	—	%V _O
Isolation	—	—	1500	—	—	VDC
Maximum Operating Temperature Range	T _c	Measured at center of case	-40	—	+100	°C
Over-Temperature Shutdown Point	OTP	Case temperature - Auto reset	—	+105	—	°C
Reliability	MTBF	Per Bellcore TR-332 50% stress, t = 40°C, ground benign	1.4	—	—	10 ⁶ Hrs
Mechanical Shock	—	Per Mil-STD-883D, Method 2002.3, 1mS, Half-sine, mounted to a fixture	—	TBD	—	G's
Mechanical Vibration	—	Per Mil-STD-883D, Method 2007.2, 20-2000Hz, Soldered in a PC board	—	TBD	—	G's
Weight	—	—	—	90	—	grams

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Pin-Out Information

Pin	Function	Pin	Function
1	+V _{in}	14	-V _{out}
2	-V _{in}	15	-V _{out}
3	Inhibit	16	-V _{out}
4	Do not connect	17	-V _{out}
5	Do not connect	18	-V _{out}
6	Sync	19	-V _{out}
7	+V _{sense}	20	-V _{sense}
8	+V _{out}	21	VID0
9	+V _{out}	22	VID1
10	+V _{out}	23	VID2
11	+V _{out}	24	VID3
12	+V _{out}	25	VID4
13	+V _{out}	26	Share

Programming Information

VID3	VID2	VID1	VID0	VID4=1 V _{out}	VID4=0 V _{out}
1	1	1	1	2.0V	1.30V
1	1	1	0	2.1V	1.35V
1	1	0	1	2.2V	1.40V
1	1	0	0	2.3V	1.45V
1	0	1	1	2.4V	1.50V
1	0	1	0	2.5V	1.55V
1	0	0	1	2.6V	1.60V
1	0	0	0	2.7V	1.65V
0	1	1	1	2.8V	1.70V
0	1	1	0	2.9V	1.75V
0	1	0	1	3.0V	1.80V
0	1	0	0	3.1V	1.85V
0	0	1	1	3.2V	1.90V
0	0	1	0	3.3V	1.95V
0	0	0	1	3.4V	2.00V
0	0	0	0	3.5V	2.05V

Logic 0 = Pin 20 potential (remote sense gnd)
Logic 1 = Open circuit (no pull-up resistors)
VID4 may not be changed while the unit is operating.

Ordering Information

PT 4471□ = 1.3 to 3.5 Volts

(For dimensions and PC board layout, see
Package Styles 1200, 1210 and 1215.)

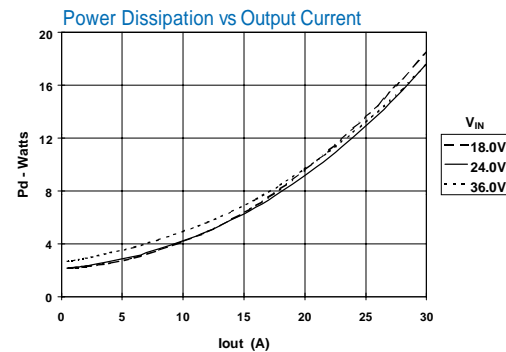
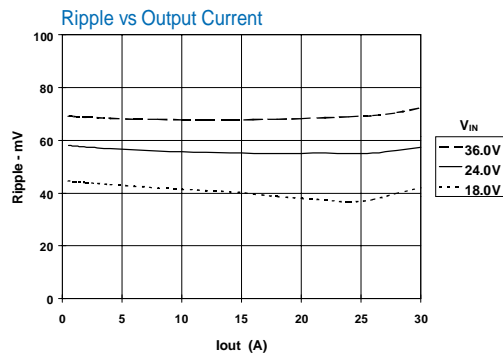
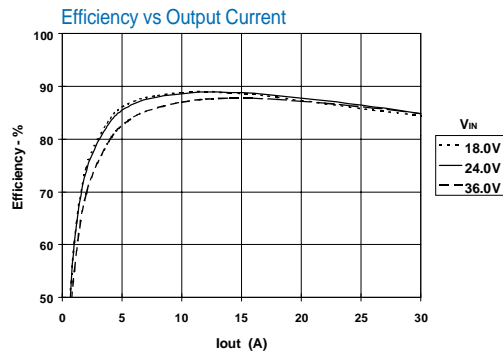
PT Series Suffix (PT1234X)

Case/Pin
Configuration

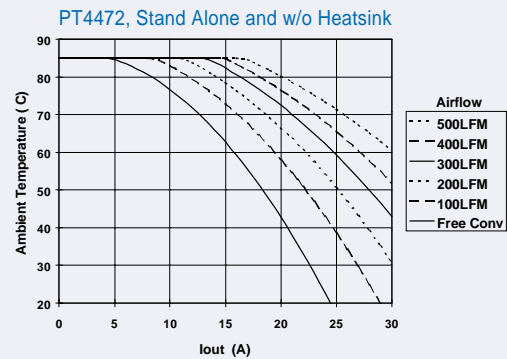
Vertical Through-Hole	N
Horizontal Through-Hole	A
Horizontal Surface Mount	C

TYPICAL CHARACTERISTICS

PT4471, V_O = 3.3V (See Note A)



Safe Operating Area, V_{in} = 24V, V_O = 3.3V (See Note B)



Note A: All data listed in the above graphs has been developed from actual products tested at 25°C. This data is considered typical data for the DC-DC Converter.
Note B: SOA curves represent operating conditions at which the temperature of the metal case is at or below the maximum specified 100°C

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