



**Features**

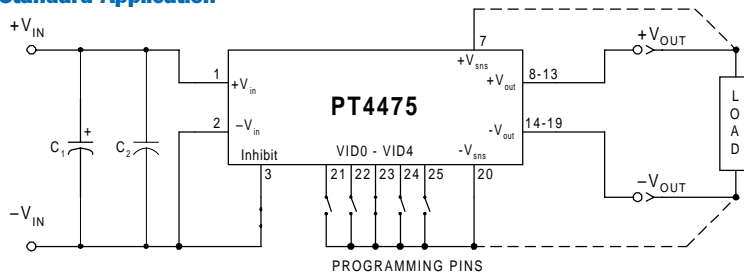
- 18V to 36V Input Range
- -40° to +100°C Operating Temp
- 1500 VDC Isolation
- 88.5% Efficiency
- Programmable Output Voltage 6.5V to 17.5V
- Remote On/Off
- Differential Remote Sense
- N+1 Current Sharing
- Over-Current Protection
- Over-Temperature Protection
- Over-Voltage Protection
- Solderable Copper Case

**Description**

The PT4475 Excalibur™ module combines state-of-the-art power conversion technology with un-paralleled flexibility. Operating off a standard 24V telecom input, the PT4475 provides a full 100W output at load currents up to 8.5A, and over the programmable output voltage range of 6.5V to 17.5V.

The PT4475 features high efficiency, 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**



- C<sub>1</sub> = Optional 33µF, 100V electrolytic capacitor
- C<sub>2</sub> = Optional 1µF, 100V ceramic capacitor
- Programming pins, VID0–VID4, are shown configured for V<sub>o</sub> =12.0V
- For normal operation, pin 3 (Inhibit) must be connected to -V<sub>in</sub>.
- For operation in N+1 configuration, consult the related application note.
- Pins 6 & 26 are used for N+1 configurations only.

**Specifications**

Characteristics (T <sub>a</sub> =25°C unless noted)	Symbols	Conditions (V <sub>in</sub> =24V, V <sub>o</sub> =12.0V unless noted)	PT4475			Units
			Min	Typ	Max	
Output Current	I <sub>o</sub>	Over V <sub>in</sub> range (100W max)	0.1	—	8.5 (1)	A
Current Limit	I <sub>cl</sub>	V <sub>in</sub> = 18V	—	10	—	A
Current Sharing		Single line referenced to -V <sub>sense</sub>	—	—	±10	%
Input Voltage Range	V <sub>in</sub>	I <sub>o</sub> = 0 to I <sub>o</sub> max	18	24	36	V
Output Voltage Tolerance	ΔV <sub>o</sub>	Over V <sub>in</sub> range, I <sub>o</sub> = I <sub>o</sub> max T <sub>a</sub> = -40 to +100°C case	—	±1.0	±2.0	%V <sub>o</sub>
Line Regulation	Reg <sub>line</sub>	Over V <sub>in</sub> range @ max I <sub>o</sub>	—	±0.1	±1.0	%V <sub>o</sub>
Load Regulation	Reg <sub>load</sub>	0 to 100% of I <sub>o</sub> max	—	±0.5	±1.0	%V <sub>o</sub>
V <sub>o</sub> Ripple/Noise	V <sub>n</sub>	I <sub>o</sub> = I <sub>o</sub> max	—	120	150	mV <sub>pp</sub>
Transient Response	t <sub>tr</sub>	50% to 75% I <sub>o</sub> max @ 0.1A/µs V <sub>o</sub> over/undershoot (no ext caps)	—	N/A	—	µSec
		50% to 100% I <sub>o</sub> max @ 1.0A/µs V <sub>o</sub> over/undershoot (no ext. caps)	—	1.0	—	%V <sub>o</sub>
V <sub>o</sub> Rise Time	V <sub>otr</sub>	At turn-on	—	—	10	mSec
Efficiency	η	I <sub>o</sub> = 5A	—	89	—	%
Switching Frequency	f <sub>o</sub>	—	—	300	—	kHz
Remote On/Off	Off On	referenced to -V <sub>in</sub>	+2.5 -0.5	—	+75.0 +0.8	VDC
Over-Voltage Protection	OVP	Shutdown and latch off	—	125	—	%V <sub>o</sub>
Isolation	—	—	1500	—	—	VDC
Operating Temperature Range	T <sub>c</sub>	Measured at center of case	-40	—	+100	°C
Over-Temperature Shutdown	OTP	Case temperature - Auto reset	—	+110	—	°C
Storage Temperature	T <sub>s</sub>	—	-40	—	+125	°C
Reliability	MTBF	Per Bellcore TR-332 50% stress, t = 40°C, ground benign	1.7	—	—	10 <sup>6</sup> Hrs
Mechanical Shock	—	Per Mil-STD-883D, Method 2002.3, 1mS, Half-sine, mounted to a fixture	—	500	—	G's
Mechanical Vibration (Mil-STD-883D, 20-2000Hz)	—	Vertical (Suffix N)	—	10 (2)	—	G's
		Horizontal (Suffixes A, C)	—	20 (2)	—	G's
Weight	—	—	—	90	—	grams

**Notes:** (1) The maximum output current is limited to 8.5A or 100/V<sub>OUT</sub>, whichever is less.  
(2) Only the case pins on the through-hole package types (suffixes N & A) must be soldered. For more information see the applicable package outline drawing.

# PT4475—24V

100-W 8.5-A Programmable Isolated DC/DC Converter

## Pin-Out Information

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

## Programming Information

				VID4=1	VID4=0
VID3	VID2	VID1	VID0	V <sub>out</sub>	V <sub>out</sub>
1	1	1	1	10.0	6.5
1	1	1	0	10.5	6.75
1	1	0	1	11.0	7.0
1	1	0	0	11.5	7.25
1	0	1	1	12.0	7.5
1	0	1	0	12.5	7.75
1	0	0	1	13.0	8.0
1	0	0	0	13.5	8.25
0	1	1	1	14.0	8.5
0	1	1	0	14.5	8.75
0	1	0	1	15.0	9.0
0	1	0	0	15.5	9.25
0	0	1	1	16.0	9.5
0	0	1	0	16.5	9.75
0	0	0	1	17.0	10.0
0	0	0	0	17.5	10.25

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

PT4475□ = +6.5V to 17.5V

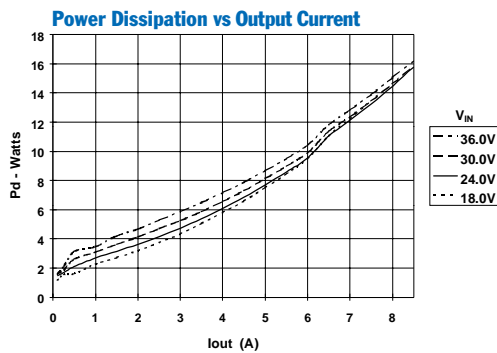
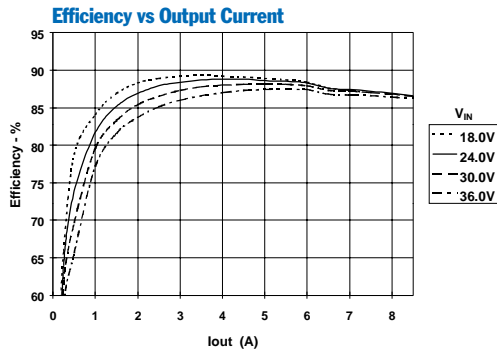
## PT Series Suffix (PT1234 x)

Case/Pin Configuration	Order Suffix	Package Code
Vertical	<b>N</b>	(EKD)
Horizontal	<b>A</b>	(EKA)
SMD	<b>C</b>	(EKC)

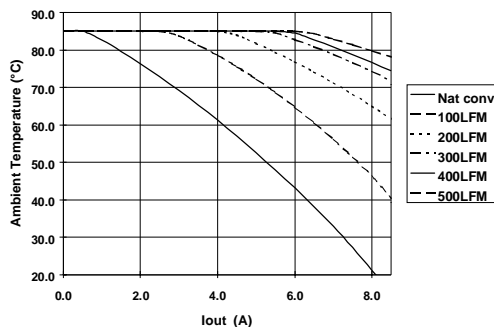
(Reference the applicable package code drawing for the dimensions and PC board layout)

# TYPICAL CHARACTERISTICS

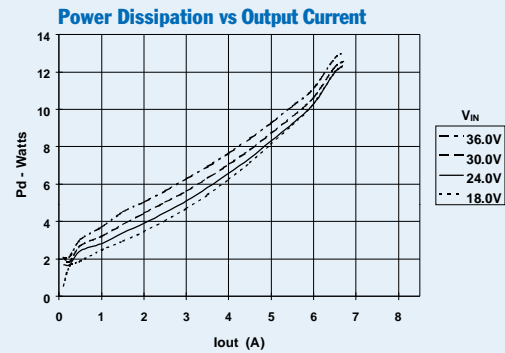
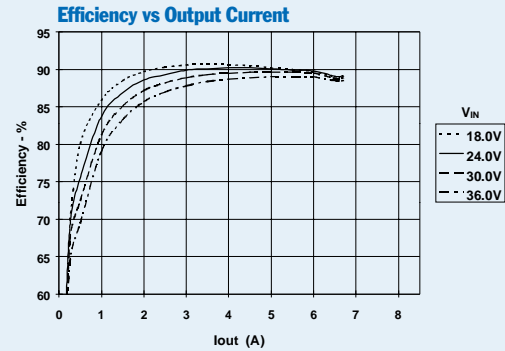
PT4475, V<sub>o</sub> = 12.0V (See Note A)



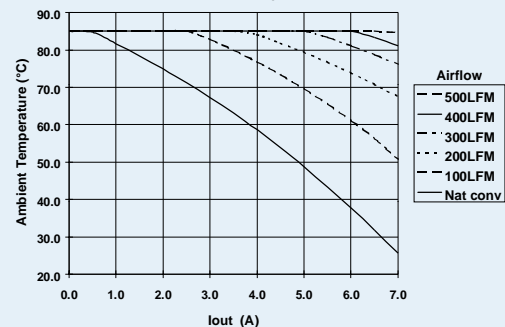
Safe Operating Area, V<sub>o</sub> = 12V (See Note B)



PT4475, V<sub>o</sub> = 15.0V (See Note A)



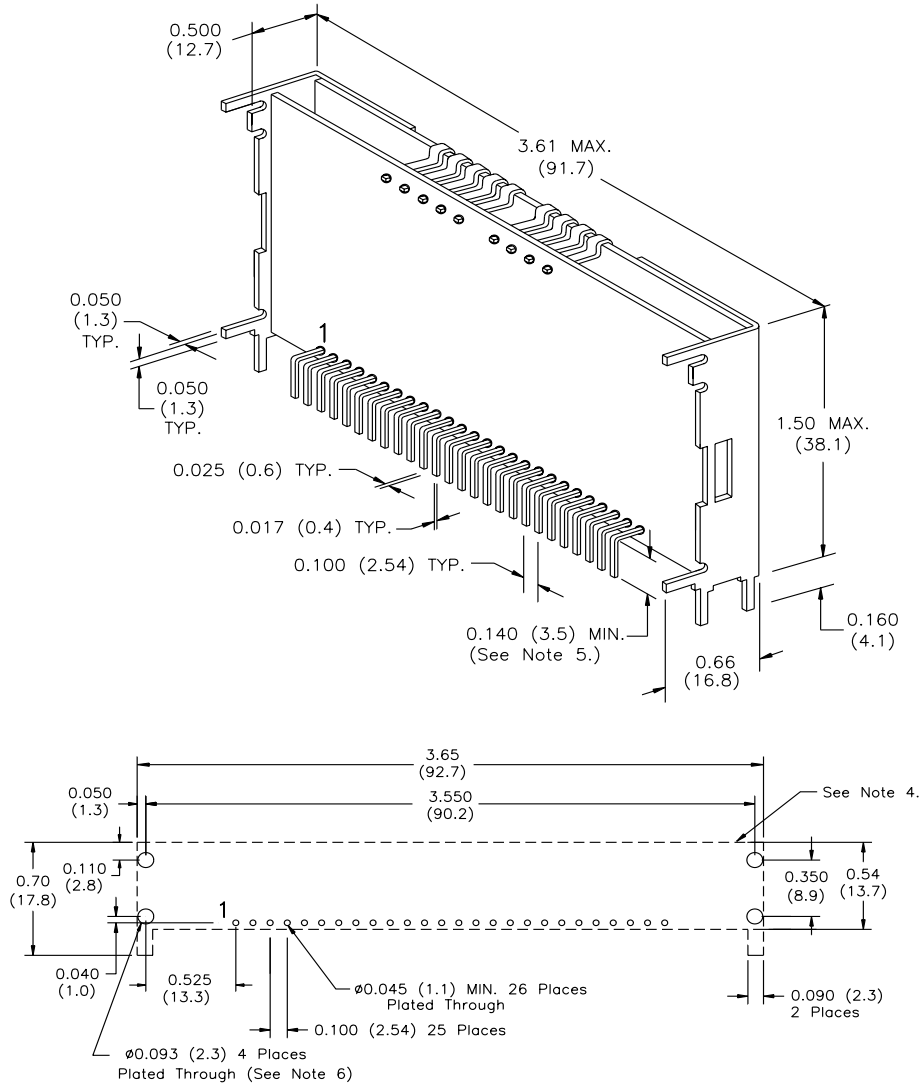
Safe Operating Area, V<sub>o</sub> = 15V (See Note B)



**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

**PACKAGE INFORMATION AND DIMENSIONS**

Vertical Through-Hole Mount (Suffix N)



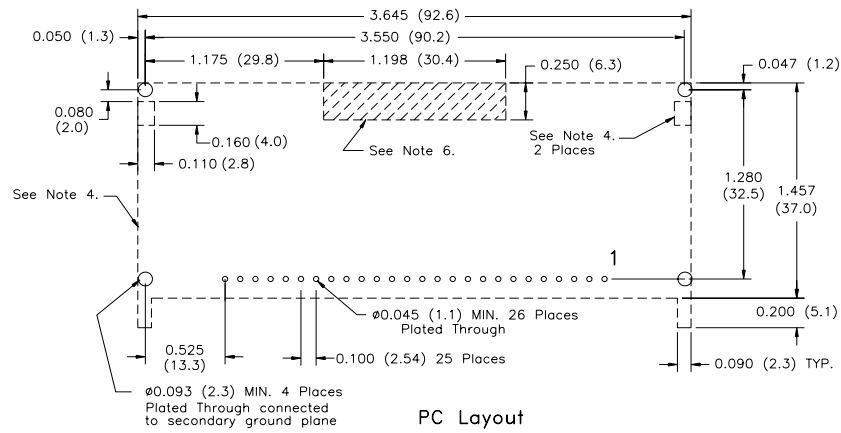
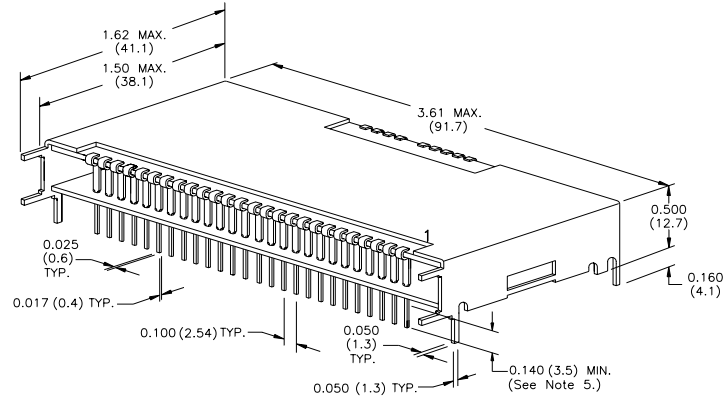
PC Layout

Notes: (Rev. E)

- 1: All dimensions are in inches (mm).
- 2: 2 place decimals are  $\pm 0.030$  ( $\pm 0.8$ mm).
- 3: 3 place decimals are  $\pm 0.010$  ( $\pm 0.3$ mm).
- 4: Recommended mechanical keep out area (dotted line).
- 5: Electrical pin length mounted on printed circuit board seating plane to pin end.
- 6: Option (Electrically connect heatsink pins to secondary ground.)

**PACKAGE INFORMATION AND DIMENSIONS**

Horizontal Through-Hole Mount (Suffix A)



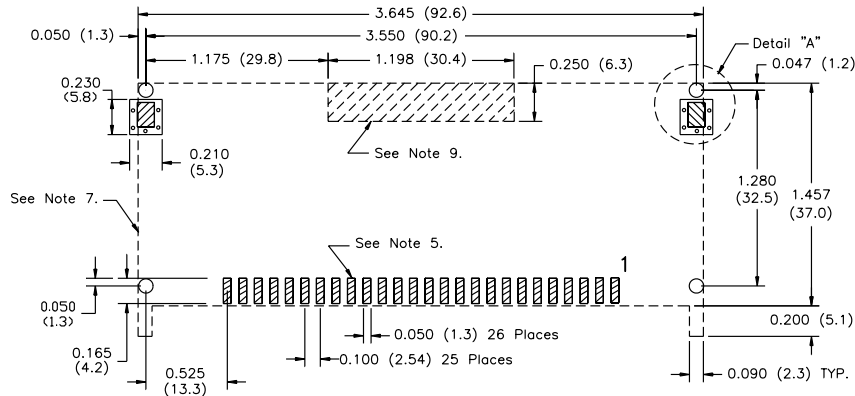
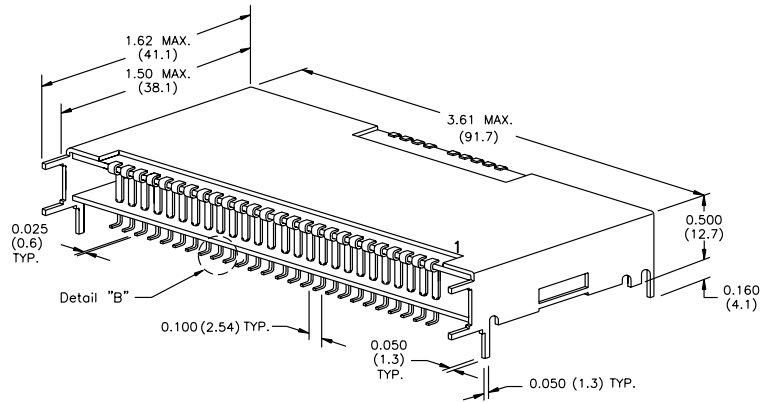
PC Layout

Notes: (Rev. G)

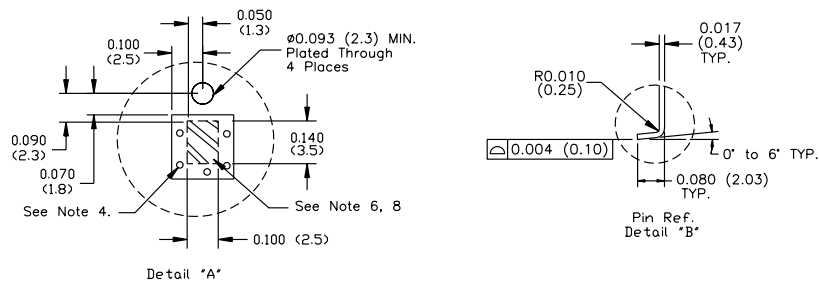
- 1: All dimensions are in inches (mm).
- 2: 2 place decimals are  $\pm 0.030$  ( $\pm 0.8\text{mm}$ ).
- 3: 3 place decimals are  $\pm 0.010$  ( $\pm 0.3\text{mm}$ ).
- 4: Recommended mechanical keep out area (dotted lines).
- 5: Electrical pin length mounted on printed circuit board seating plane to pin end.
- 6: No copper, power or signal traces in this area.

PACKAGE INFORMATION AND DIMENSIONS

Horizontal Surface Mount (Suffix C)



PC Layout



Notes: (Rev. E)

- 1: All dimensions are in inches (mm).
- 2: 2 place decimals are  $\pm 0.030$  ( $\pm 0.8\text{mm}$ ).
- 3: 3 place decimals are  $\pm 0.010$  ( $\pm 0.3\text{mm}$ ).
- 4: Vias are recommended to improve copper adhesion.
- 5: Power pin connections should utilize two or more vias per input, ground and output pin.
- 6: Solder mask openings to copper island for solder joints to mechanical pins.
- 7: Recommended mechanical keep out area (dotted lines).
- 8: Electrically connected case to secondary ground plane.
- 9: No copper, power or signal traces in this area.

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