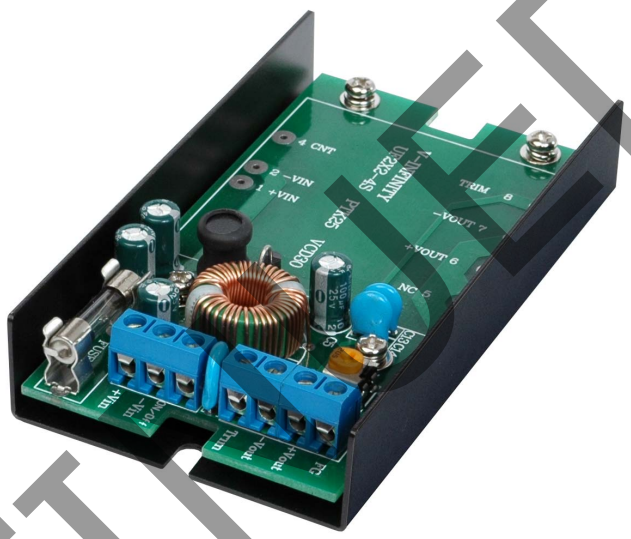
V-INFINITY
a division of CUI INC

date 04/2010

PART NUMBER: UF224 **DESCRIPTION:** Converter Kit



features

- **Designed for easy application of board-mount DC-DC Converters**
- **Provides a PCB to mount the converter**
- **Includes screw terminals for input and output connections**
- **Includes all mounting hardware**
- **Can be DIN rail mounted with (Optional) mounting adapter**
- **Includes following features:**
  - **o Input fuse**
  - **o Input transient protection**
  - **o Input reversal protection**
  - **o Meet EN55022 class B conducted emissions***
  - **o Output trimming capable with (Optional) trim potentiometer - must be purchased seperately and installed onboard.**

***tested at 25°C**

Description

The UF224 kit is a value added item designed to facilitate easy application of 2"X2" sized board mount DC-DC converters. It includes all components needed to use the converter, removing the need to procure PCB, metal frame, mounting hardware, filtering and protection components. For basic operations, only the converter needs to be selected and procured separately. For additional output adjustment, a seperate trim potentiometer can be purchased and installed onboard. UF224S kits are designed for single-output converters.

Model Number	Input Voltage	Voltage Protection Threshold	Input Fuse[3]	Applicable V-INFINITY DC-DC Converters[1]	Applicable V-INFINITY DC-DC Converters[2]
UF224S18	9-18VDC	20V	5A	VCD30-D12-SXX	VCQ15-Q24-SXX
					PTK15-Q24-SXX
UF224S36	9-36VDC	39V	3A	VCD30-D24-SXX	VCQ15-Q48-SXX
				VCQ15-Q24-SXX	PTK15-Q48-SXX
				PTK25-D24-SXX	
				PTK15-Q24-SXX	
UF224S75	9-75VDC	82V	1A	VCD30-D48-XXX	
				VCQ15-Q48-SXX	
				PTK25-D24-SXX	
				PTK15-Q48-SXX	

Notes:

1. The acceptable input voltage is the range suitable for the U-frame Kit only. It is OK to use a converter with a wider input range as long as the input voltage applied does not exceed the kit's acceptable input voltage range.
2. These converters actually have input ranges that exceed the respective U-frame kit's input range but are still acceptable for use as long as the Kit's Acceptable Input Voltage range is not exceeded.
3. Use 5mm X 20mm fast blow type fuse.

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PIN ASSIGNMENTS

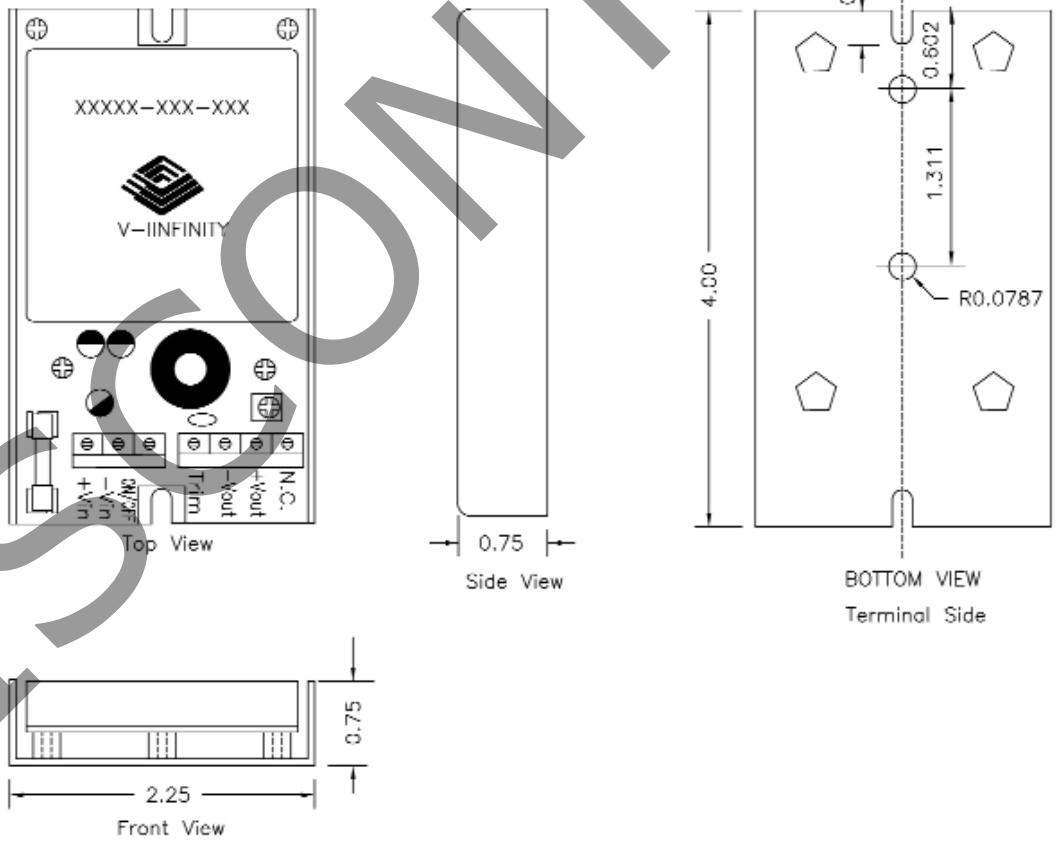
+Vin:	+ Input	+Vout:	+ Output
-Vin:	- Input	-Vout:	- Output
On/Off:	Remote control to turn output On/Off	N.C.:	No connection
Trim:	Output fine tuning		

Environment Conditions

Operating temperature range	-25 ~ 70°C
Storage temp range	-25 ~ 85°C
Humidity	10 ~ 90% RH, non-condensing

Parts List

1. PCB assembly - partially completed
2. U-frame
3. 4x M3 machine screws



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Assembly Instructions:

1. Select appropriate converter and UF224 kit according to the model configurations table.
2. Locate the partially completed assembly
3. Remove the 4x M3 screws and take out PCB
4. If output trimming is needed, install a top-mount 5KΩ trim pot. Available from Digikey, part # 3306F-502-ND or 307UC502E-ND.
5. Insert and solder converter. Trim off excess leads as needed.
6. For DIN rail applications, secure the DIN rail adapter Kit (optional, model # VDRP-03). Skip this step for non-DIN rail mounting applications.
7. Secure PCB assembly to the U-frame with the 4x M3 screws.
8. Connect input wires and output leads.

Application Notes:

1. Input voltage

It is important to ensure the input voltage measured at the converter input pins is within the range for that converter. Make sure wire losses and voltage ripples are accounted for. One possible problem is driving the converter with a linear unregulated power supply. For example, if the average voltage measured by a DMM is 9V, with a voltage ripple of 3Vpp, the actual input can swing from 7.5V to 10.5V. This will be outside the range of a 9-18V converter and it may not function properly. On the other end, make sure the actual input voltage does not exceed the highest voltage allowed by either the U-frame kit or the converter.

2. Lead wires

Make sure the input and output wires are of adequate AWG size to minimize voltage drop, and ensure the voltage across the input terminals is above the converter's rated minimum voltage at all times. It is recommended to have the wire pairs twisted, respectively for the input pair and the output pair, so as to minimize noise pickup.

3. Input current

The input voltage source must be able to provide enough current to the converter, or it may not start up or operate properly. A typical symptom is not starting or unusually low output voltage. In general, it is recommended to be able to provide at least:

$$\textbf{Ipeak = 150\%*Pout/(}\eta\textbf{*Vmin)}$$

where Pout is the maximum output power, Vmin is the minimum input voltage and η is the converter's efficiency. As an example, for PTK15-Q24-S5 to operate with 10~36V input, 15W output and an efficiency of 78%, the minimum source current is recommended to be:

$$\textbf{Ipeak = 150\% * 15 / (78\% * 10) = 2.88A.}$$

4. Input fuse

For various protection functions, a fast-acting input fuse has been installed with the following current ratings:

UF224S18	5.0A
UF224S36	3.0A
UF224S72	1.0A

However, if the input range is well defined, the standard fuse may be replaced with a smaller fuse. The fuse should be chosen to allow for the maximum current at the lowest input voltage, as shown in this equation:

$$\textbf{Ipeak = 150\%*Pout/(}\eta\textbf{*Vmin)}$$

As an example, consider a 15W converter with 75% efficiency. If the actual input voltage range is 16~28V, the maximum input current is Ipeak = 150%*15/(75% * 16) = 1.875A.

The preinstalled fuse can be replaced with a 2A fuse in this situation.

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5. Input OVP

To suppress voltage transients of short durations, the kit includes a Zener diode. For converter inputs of up to 18V, the Zener diode used has a rated breakdown voltage of 20V. For converter inputs of up to 36V, the Zener diode has a rated voltage of 39V. For inputs up to 72V, the Zener voltage rated is 82V. Notice, however, that these Zener diodes can only dissipate a small amount of power. It is necessary to ensure the input voltage does not exceed the maximum rated converter input. Otherwise the converter and the Zener diode may suffer permanent damage.

6. Input reversal

If the input voltage is reversed for any reason, the built-in protection circuits in the UF224 kit will limit the reverse voltage to one diode drop or no more than 1V. The input fuse will open and thus remove power from the converter. Check the wiring and make corrections as needed. The input fuse will need to be replaced. Make sure the new fuse is of the same type and rating.

7. Output trimming (optional)

The UF224 Kit provides the space and pads for a trimming potentiometer. To adjust the output voltage, install a 5KΩ potentiometer, (Digikey part # 3306F-502-ND or 307UC502E-ND or equivalent). The potentiometer is not needed if no trimming function is desired. Please note that only converters listed in the Model Configurations table can achieve output trimming.

8. Output OCP and short-circuit

Output overload and short circuit protections are provided by the converter itself only. Please see the converter datasheet for reference.

9. Output OVP

Output over-voltage protection is provided by the converter itself only. Refer to converter datasheet.

10. Output On/Off control

The converter output can be enabled or disabled through the On/Off pin. Refer to converter data sheet.

11. Isolation

The input and output of the converter are electrically isolated. The isolation voltage rating is the same as that of the converter. Refer to converter data sheet.

12. Input filtering and EMI interference

The UF224 kit has built-in components for input filtering, leading to reduced current ripple and the associated EMI interference. The kits are designed to meet EN55022 class B conducted standards. If the entire system powered by this converter kit needs to pass an EMI standard, it is recommended to have entire system tested against that standard.

13. Output filtering

The UF224 kit has a small output capacitor to help reduce ripple and noise.

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All specifications typical at nominal line, full load and 25°C unless otherwise noted.

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