# USB-ISO - USB 2.0 compliant, 1000VDC USB Low/Full Speed isolator

## Users Manual

All boards produced by Olimex are ROHS compliant

**Rev. B, March 2010**

# INTRODUCTION

USB-ISO is USB Low/Full speed USB 2.0 compliant port isolator with 1000V isolation voltage. This device is very useful as protects your PC computer USB host from over-voltages, ESD shock. USB-ISO provides 1000VDC isolation and this way you can connect to your PC programmers and debuggers which work directly with targets at high voltages like 220V mains power supply etc. Even if your target is not connected to high voltage, USB-ISO is additional protection for your valuable computer, laptop etc. USB-ISO may work with or without external power supply, if no external power supply it generates with isolated DC-DC converter 5V isolated voltage for your USB device by taking power from your USB host, if your USB deveice needs more power than your USB host can provide, there is external power supply option you can connect any power supply adapter which provides power supply from +8 to +15VDC and USB-ISO internal DC-DC will convert it to 5VDC for the USB device. Note that in this case the external power supply should be ISOLATED as this DC-DC converter is not isolated and the external power supply will be directly connected to your USB programmer/debugger etc! Just your PC side will be isolated.

# USB-ISO FEATURES

- USB isolation 1000VDC between USB host and USB device
- Fully USB 2.0 Compliant
- Low and full speed data rate: 1.5 Mbps and 12 Mbps
- Bidirectional communication
- Short-circuit protection for xD+ and xD− lines
- Class 3A contact ESD performance per ANSI/ESD STM5.1-2007
- High common-mode transient immunity: >25 kV/µs
- USB_DEVICE connector- which is USB-A type and have to be connected to the PC USB host.
- USB_HOST connector which is USB-B type and have to be connected to the USB device like USB JTAG, programmer, debugger etc
- Power Jack for external power supply with +8-15VDC, **note this power jack is not isolated from the USB_HOST connector**
- DC-DC converter supply isolated voltage to the USB_HOST from the USB_DEVICE if no external power supply is present
- dimensions 41.5x36.5 mm (1.634x1.437")

## ELECTROSTATIC WARNING

The USB-ISO board is shipped in protective anti-static packaging. The board must not be subject to high electrostatic potentials. General practice for working with static sensitive devices should be applied when working with this board.

## BOARD USE REQUIREMENTS

**Cables:** You need two 1.8 meter USB A-B cable to connect to the PC and to your USB isolated device. Note these cables should be with LOW resistance (under 1 ohm) and good insulation, on the market there are cheap cables with HIGH resistance (above 1 ohm) and poor insulation which are not good for USB connection and cause signal fading and lost of communication packets.

## SAFETY AND REGULATORY APPROVALS:

The USB isolator component used in USB-ISO have the following regulatory approvals:

- UL recognition: 5000 V rms for 1 minute per
  - UL 1577 (pending)
- CSA Component Acceptance Notice #5A
  - IEC 60601-1: 125 V rms (reinforced)
  - IEC 60950-1: 380 V rms (reinforced)
- VDE certificate of conformity (pending)
  - DIN V VDE V 0884-10 (VDE V 0884-10):2006-12
  - VIORM = 846 V peak

## POWER SUPPLY CIRCUIT

USB-ISO can take power from two sources:

- External Power Jack +8-15 V DC
- +5V from USB_HOST, in this case maximum current available depend on the maximum current which PC USB host can provide and may be in 100-500mA range

# CONNECTOR DESCRIPTIONS

## USB_DEVICE

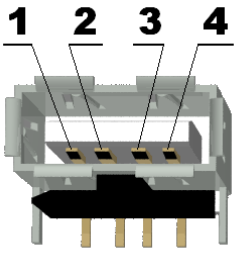
This connector is used to connect to the PC USB host

| Pin # | Signal Name |
|---|---|
| 1 | +5V_USB_DEV |
| 2 | DEV_D- |
| 3 | DEV_D+ |
| 4 | GND_DEV |


## USB_HOST

This connector is used to connect to you USB device – programmer, debugger etc which you want to isolate from your PC.

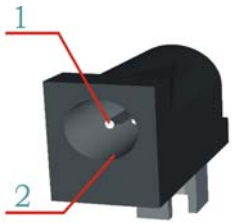
| Pin # | Signal Name |
|---|---|
| 1 | HOST_PWR |
| 2 | HOST_D- |
| 3 | HOST_D+ |
| 4 | GND_HOST |



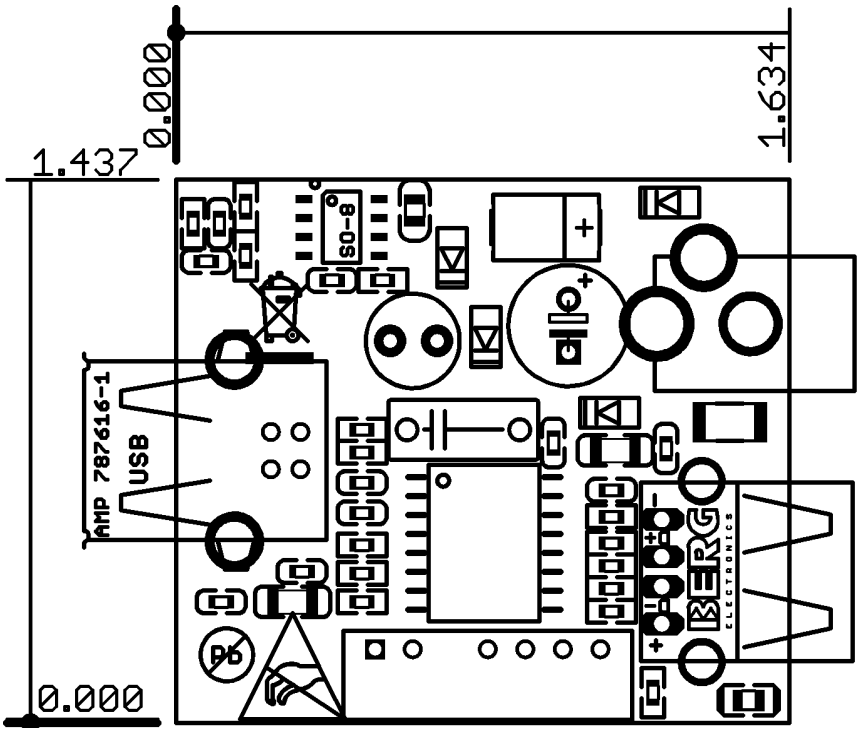

## PWR_JACK

This connector is for additional power supply to USB device.

| Pin # | Signal Name |
|---|---|
| 1 | Power Input |
| 2 | GND_HOST |



## MECHANICAL DIMENSIONS




All measures are in inches.

# ORDER CODE

USB-ISO – assembled and tested

How to order?
You can order to us directly or by any of our distributors.
Check our web www.olimex.com/dev for more info.

**Revision history:**

| | | |
|---|---|---|
| REV. A | - create | October 2009 |
| REV. B | - edited by TU | March 2010 |

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