



USB-ISOLATOR TRU-ISO™ Rugged USB Isolator

FEATURES

- Tru-Iso™ signal isolation up to 4kV upstream to downstream
- Upstream host port isolated from the downstream port
- Advanced EFT, Lightning, and ESD protection at $\pm 20\text{kV}$ on all signal pins (air and contact)
- Full-speed USB 2.0 device, USB 3.1 and 1.1 compatible
- Rugged, industrial grade ($-40\text{ }^{\circ}\text{C}$ to $85\text{ }^{\circ}\text{C}$) operation
- Downstream port capable of low-speed (1.5 Mbps) and full-speed (12 Mbps) transfers aggregate
- LED status indicator for power from upstream port
- Compact, low profile enclosure, provision for DIN-rail mounting
- High retention USB connectors
- Max working isolation is 863 Volts peak (V_{orm})
- Embedded miniature USB headers in parallel with type B and type A USB connectors (both upstream and downstream)



FACTORY OPTIONS

- OEM (board only) option for flexibility in embedded applications
- High retention external power connection with screw terminals

FUNCTIONAL DESCRIPTION

This product utilizes a high-performance, low-power USB 2.0 isolator with an operating temperature rated for industrial grade environments. Being able to operate at industrial grade temperatures, the USB-ISOLATOR offers its functionality to a wider range of user applications that many competitors' isolators can't provide.

Careful attention has been paid to the isolation design, including extensive keep-out zones and hand-routed circuit paths, as well as component and material selection. Robust EFT, Lightning, and ESD protection at $\pm 20\text{kV}$ on all signal pins (air and contact).

Our Tru-Iso™ products are designed under IPC-2221B, UL1577, and UL60950-1. The circuit is isolated with a $\geq 300\text{mil}$ gap between all signal and plane layers (upstream to downstream port). These gaps are rated under IPC-2221B at 1500V (upstream to downstream).

Our circuit uses a chip-level high-frequency DC-DC isolator which is rated at 5000Vrms for 1 minute under UL 1577. This isolation component has an over 50 year isolation lifespan even if the isolation voltage potential is in excess of 846 volts AC. Under UL60950-1 the card design meets or exceeds the DC-DC isolator specification.

The USB-ISOLATOR has an LED that indicates the presence of power from the upstream port. It can be powered from the USB upstream host port providing up to 380mA of isolated power to the downstream port. External power *can* be used if the downstream port needs more current with our optional medical grade external isolated supply. The USB-ISOLATOR uses a smart switch DC jack to automatically switch between upstream power or external power upon insertion of the power supply plug.

The Type A and Type B USB connectors on the board feature a high retention design that complies with the class 1, Div II minimum withdrawal requirement of over 3 pounds of force (15 Newtons). This connector has an orange color-coded insulator to quickly differentiate it from standard USB connectors. Using these USB connectors increases reliability and ensures a tight connection. For embedded OEM type applications, both ports (upstream and downstream) have an alternative miniature USB header in parallel with the standard port connector. This method facilitates the smallest possible footprint to be occupied by the hub and associated cables.

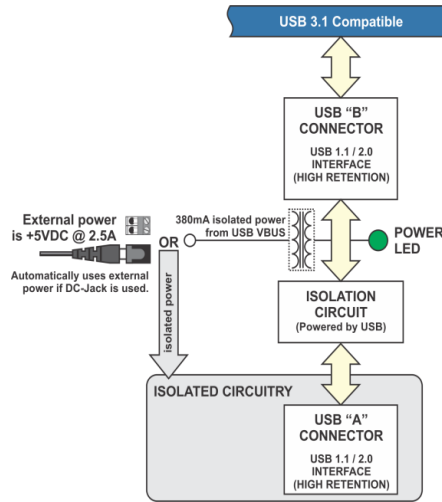
The USB-ISOLATOR is designed to be used in rugged industrial environments but is small enough to fit nicely onto any desk or testing station. The module's enclosure is 2.5" x 3.5" x 1".

ACCESSORIES

Available accessories include the MP104-DIN for DIN rail mounting the USB-ISOLATOR, as well as an assortment of USB embedded cables.

SOFTWARE

No software is provided or needed with this board. There is no need to install any drivers to use the USB-ISOLATOR. It will enumerate as a Generic Hub which uses the USB Hub Class Driver that is built in Windows OS or Linux, et al.



BLOCK DIAGRAM

SPECIFICATIONS

Bus Type(s): USB 2.0 / 1.1 (USB 3.1 compatible)
Full / Low speed

Environmental

Operating Temp.: -40° to +85°C
Storage Temp.: -40° to +85°C
Humidity: 5-95% non-condensing
Board Dimension: 2.350 x 2.381 inches
Enclosure Dimension: 2.5 x 2.5 x 1.0 inches
2.5 x 3.5 x 1.0 inches w/mounts
Weight: 97.4 grams (in enclosure)
29 grams (-OEM version)
Ext. Power Supply: 0° to +40°C (4kV isolation)

Power

Power Required: No external power required
6mA min, up to 500mA from host
when self-powered depending on
downstream load
Downstream: 380mA available when self-powered.
External Power: If external power supply is used,
available downstream current is
limited by external supply capacity

Isolation

ESD Protection ±20kV on all signal pins (IEC 61000-
4-2 Level 4)
Tru-Iso™ IPC-2221B, UL60590-1, UL1577
4000 V isolation meets EN60601
Up- to Downstream 1500 V peak (AC or DC)
Max Transient Iso. 4000 V rms
Max Work Isolation 863 V peak

Ordering Guide

USB-ISOLATOR Industrial USB 2.0 Isolator in rugged
enclosure (includes 6' high-quality USB
2.0 cable)
PWR-ISO-5V Isolated medical grade external power
adaptor 5VDC @ 2.5A

Model Options

-OEM Board only version (no enclosure)
-ST Screw terminals instead of DC jack for
high-retention external power
connection (-OEM version only)
-ST requires use of external power

Optional Accessories

MP104-DIN DIN rail mounting provision
CUSB-EMB 6 inch embedded micro-fit to micro-fit
USB cable (used to connect from the
HUB micro-fit OEM connectors to
ACCES' OEM USB I/O boards)
CUSB-EMB-HDR 30 inch USB cable with 1x5 standard
(0.1 inch spacing) header connector to
embedded micro-fit (-OEM only)
CUSB-EMB-HDRM 30 inch USB cable with 1x5 metric
(2mm spacing) header connector to
embedded micro-fit (-OEM only)



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US

sales@assured-systems.com

Sales: +1 347 719 4508
Support: +1 347 719 4508

1309 Coffeen Ave
Ste 1200
Sheridan
WY 82801
USA

EMEA

sales@assured-systems.com

Sales: +44 (0)1785 879 050
Support: +44 (0)1785 879 050

Unit A5 Douglas Park
Stone Business Park
Stone
ST15 0YJ
United Kingdom

VAT Number: 120 9546 28
Business Registration Number: 07699660