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USB Isolator

Description



At present, the USB Killer (USB killer) made for some bad people leads to burning the USB port of the computer device or the host device, and even burning the motherboard. Some electronic enthusiasts use the bare electronic device but may damage the device accidentally by some wrong operation.

When you DIY a new circuit board, but there may be a short circuit or the current is too large, plugged into the computer for testing, causing the USB port to burn down or the motherboard is damaged.



We have created a hardware device that can prevent the USB Killer. Known as USB isolation. Its biggest feature is to prevent accidental surge attacks and prevent short circuits when you use USB properly. It is the protection of your computer, microcontroller, Raspberry Pi and other electronic devices! Protect your computer or the USB port of your development board without affecting your USB device use! When a short circuit condition occurs, a red light will be lit on the USB isolation device, which will remind you that the access device is short-circuited and will not cause damage to your computer.

The USB Isolator is based on ADuM3160 component. The ADuM3160 is a USB port isolator based on Analog Devices, Inc., iCoupler® technology. Combining high speed CMOS and monolithic air core transformer technology, this isolation component provides outstanding performance characteristics and is easily integrated with low and full speed USB-compatible peripheral devices.

Many microcontrollers implement USB so that it presents only the D+ and D- lines to external pins. This is desirable in many cases because it minimizes external components and simplifies the design; however, this presents particular challenges when isolation is required.  [English](#)  [中文 \(简体\)](#)

Because the USB lines must switch between actively driving D+/D- and allowing external resistors to set the state of the bus, the ADuM3160 provides mechanisms for detecting the direction of data flow and control over the state of the output buffers.

Data direction is determined on a packet-by-packet basis.

The ADuM3160 uses the edge detection based iCoupler technology in conjunction with internal logic to implement a transparent, easily configured, upstream-facing port isolator.

Isolating the upstream port provides several advantages in simplicity, power management, and robust operation. The isolator has a propagation delay comparable to that of a standard hub and cable.

It operates with the bus voltage on either side ranging from 4.5 V to 5.5 V, allowing connection directly to VBUSx by internally regulating the voltage to the signaling level.

The ADuM3160 provides isolated control of the pull-up resistor to allow the peripheral to control connection timing. The device draws low enough idle current that a suspend state is not required.

5 kV, reinforced insulation version, the ADuM4160, is available.

Features

- USB 2.0 compatible
- Low and full speed data rate: 1.5 Mbps and 12 Mbps
- Bidirectional communication
- 4.5 V to 5.5 V VBUS operation
- 7 mA maximum upstream supply current at 1.5 Mbps
- 8 mA maximum upstream supply current at 12 Mbps
- 2.3 mA maximum upstream idle current
- Upstream short-circuit protection
- Class 3A contact ESD performance per ANSI/ESD STM5.1-2007
- High common-mode transient immunity: >25 kV/ μ s
- RoHS compliant
- Qualified for automotive applications
- Safety and regulatory approvals
- UL recognition: 2500 V rms for 1 minute per UL 1577
- CSA Component Acceptance Notice #5A
- IEC 60950-1: 600 V rms (basic)
- VDE certificate of conformity
- DIN V VDE V 0884-10 (VDE V 0884-10):2006-12
- VIORM = 560 V peak

Package include

- 1x USB Isolator

Official Tested Devices

- Generic USB Audio Codec
- USB mouse(IBM)
- CP2102 USB-to-TTL converter
- USB1.0 Sandisk Flash Disk
- USB wifi dongle (EDUP)
- USB J-Link program downloader
- USB ST-Link program downloader
- CH340G USB-to-TTL converter

Gallery

