

# STEUSB2071 USB2.0 RF Isolated Interface



## THE ULTIMATE USB2.0 HIGH SPEED I/O INTERFACE!

- ✓ Pass USB2.0 high speed data, at full speed, while maintaining the full isolation of your chamber or screen room
- ✓ Full support for 4G LTE and other 700 to 900 MHz bands
- ✓ Easy and convenient single hole mount for an RF tight installation on any chamber or screen room environment
- ✓ Automatic USB DC power detection and LED indication
- ✓ Rugged milled aluminum construction for optimal shielding and RF isolation
- ✓ Solid milled port savers prevent connector damage from robust duty cycles and cable tension abuse

### THE ULTIMATE HIGH SPEED USB2.0 SOLUTION!

Low pass filters used to be simple. With 802.11xx devices operating at 2.4 GHz or 5.0 GHz, with cellular devices operating at GSM, UMTS, CDMS and other PCS frequencies, and with the goal to pass USB2.0 high speed data at 480 Mbit/s, the typical RF Test Enclosure low pass filter was designed to notch out anything above 1 GHz.

However, a number of vendors seem to have forgotten about 4G LTE and a number of services in the 26 UMTS bands! We took a long hard look at the requirements for a quality USB2.0 RF Filtered I/O, and here it is, the Ramsey Electronics® STEUSB2071.

### 700 MHz TO 6 GHz!

All you have to do is look at LTE coverage maps for any of the major carriers and you will see that there is probably a cell site at 700 Mhz in your back yard. That doesn't make it easy when you're trying to maintain complete isolation from these signals. It's not just LTE in the US, 9 of the 26 UMTS operating bands fall below 900 MHz. So much for the typical 1 GHz to 6 GHz low pass filter!

### ULTIMATE DESIGN!

When it comes to testing your DUT in an isolated RF environment, there is little tolerance for variables. Likewise, when we designed this Filtered I/O, we spared no expense to assure you that you had the best possible filter available. First, we took a good look at isolation. We wanted to tightly notch the passband as close to -80 dB as we could, while passing USB2.0 at its full speed. To accomplish this, shielding was paramount and we designed the filter to be built inside a solid finely milled block of aluminum.

Then we looked at the mounting and installation process. The typical vendor filter has multiple perimeter mounting holes whose centers and pattern need to be precisely matched to the mounting surface. Not only does this require a mounting template, but also requires exact multiple-hole drilling or milling. And even with tightly spaced perimeter mounting holes, unless installed and bonded to a perfect mounting surface, there will be RF egress and ingress. If such a unit was mounted on a painted or powder coat surface, the entire surface would need to be burnished to remove the paint, or the leakage would be even worse.

To solve this we designed and machined the filter around a single-hole mount! The entire filter can be installed on your RF Test Enclosure, or your screen room I/O panel with one single 1" hole. With the customized flange nut and and matching EMI RF gasket, the filter is 100% bonded to your mounting surface. Then we added integral solid milled tension surrounds on both sides of the device to accommodate the duty cycle of repetitive lab insertions and connections as well as accidental test cable over-tensions, to put an end to broken USB connectors! It simply doesn't get any better than that.



Solid milled USB connector protection!

## AUTOMATIC USB POWER DETECTION!

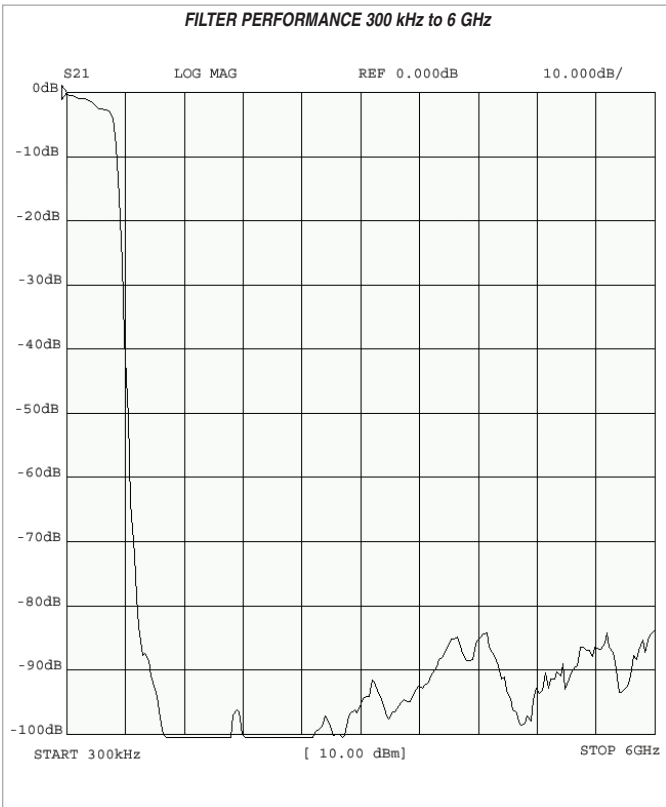


During the design we put ourselves in your shoes. What would we want if we were connecting a USB device through an I/O interface? Beyond the RF characteristics above, the question of USB power was the first thing that came up. How do you know if you're providing DC power to the DUT? How do you know if the DUT is providing DC power through the filter? Sounds simple, but it's not easy to check real-time. We designed an automatic 5VDC detector into the filter, when there is power present, a filter front panel LED indicator is illuminated. Once again, it doesn't get any better... or easier than that.

## COMMON SENSE CABLE CONFIGURATION!

Next up was the often confusing USB cable types and device configuration. We made it both simple and proper. The outside connection to the USB interface is a standard USB-B receptacle while the internal interface connection, inside the test chamber, is a standard USB-A receptacle.

Therefore, cable wise, the USB interface is transparent to the circuit and emulates nothing more than a simple short USB extension cable. No adapters, no special cables, and it operates just as though it wasn't there! And so it is entirely transparent to you, we even provide a heavy double shielded USB cable with dual ferrite cores with the Filter to connect your computer, laptop, or equipment.



SPECIFICATIONS	
Product Part Number:	STEUSB2071
UPC	871183005966
Outside Dimensions:	3.55"H x 2.2"W x 1.25"D (90.17mmH x 55.88mmW x 31.75mmD)
Weight:	.75 lbs (.34kg)
Construction:	Milled aluminum
Mounting:	Single 1" OD hole with provided EMI RF collar gasket, and 1"-20 UNF custom flange nut (.400"/11mm max panel)
External USB Connection:	USB-B receptacle (requires standard USB-B device plug)
Internal USB Connection:	USB-A receptacle (requires standard USB-A computer plug)
Port Savers:	Solid aluminum connector surrounds to prevent connector damage
USB Cable Provided:	3m goldplate double shielded USB-A/USB-B with dual ferrite cores
Availability:	In-stock for immediate delivery
Available Versions:	STE RF Test Enclosure installed option Individual stand-alone accessory for customer installation OEM bulk (Contact Ramsey Electronics®)
DATA LINES D+ AND D-	
Impedance:	90 ohm
Insertion Loss, 100 MHz:	<0.1 dB
Insertion Loss, 250 MHz:	<0.8 dB
Insertion Loss, 350 MHz:	<2.4 dB
Insertion Loss, 480 MHz:	<3.3 dB
Insertion Loss, 700 MHz - 740 MHz:	>74 dB
Insertion Loss, 741 MHz - 6 GHz:	>81 dB
DC POWER LINES +5VDC AND RETURN	
Maximum Current:	2A
DC Resistance:	0.1 ohm
Insertion Loss, 10 MHz - 50 MHz:	>40 dB
Insertion Loss, 51 MHz - 6 GHz:	>80 dB
Automatic Power Detection:	Front panel LED illumination

*Note: Specifications are average achieved and certified final test measurement values. Subject to change and revisions. Not responsible for typographical errors and omissions.*

## RF ISOLATION... CAN ONLY BE AS EFFECTIVE AS YOUR WORST I/O!

As the leading manufacturer of RF Shielded Test Enclosures for more than 2 decades, we have been around to watch the advancement of data communications requirements within the RF isolated world. How things have changed!

Back when RS-232/RS422/RS-485 were the only communications standards, an RF isolated I/O was a simple low-pass filter. A 1000 pF filter could nicely provide >68 dB RF isolation at those data speeds. But then came USB, where the data speed increased and therefore, the filter values decreased, to allow the appropriate USB passbands to be achieved. USB1.1 could get away with 100 pF which lowered the effective RF isolation to <43 dB. Then to allow USB2.0 to properly handshake and at least get near the 480Mbit/s speed, the filter value had to be reduced to 10 pF, which provided an almost negligible 9 dB RF isolation.

Today, if you have 10 pF low pass filtered D-Subs in your enclosure for use with USB2.0, you don't have an Isolated Test Enclosure, you have a Non-Isolated Test Enclosure!

With our STEUSB2071 USB2.0 I/O interface, you can achieve full 480Mbit/s data throughput while maintaining greater than 80 dB RF isolation, all the way up to 6 GHz! Looking for other state-of-the-art RF isolated interfaces? Check these out!



Gigabit PoE Ethernet

10GbE PoE Ethernet



HDMI 4K Video



Global Power Interface



**RAMSEY ELECTRONICS®**  
590 Fishers Station Drive, Victor NY USA (585) 924-4560

www.ramseytest.com