

Why USB 3.0?

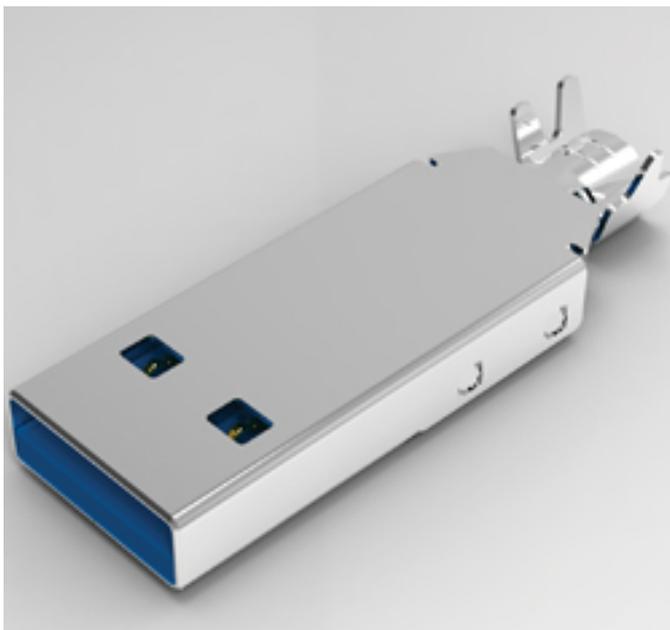
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Why USB 3.0?

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According to the Universal Serial Bus-Implementers Forum (USB-IF), the standards body controlling the USB specification, the USB connector is the most popular form of interconnect in the consumer electronics marketplace today -- based on broad proliferation, versatility and ease of use. This interconnect clearly found its place in the PC and PC peripheral arena and can be found in nearly every consumer device produced in the last decade¹.

As newer consumer devices and computer peripherals become more memory intensive, the need for much higher data transfer rates is more evident than ever. This is mainly driven by consumers' needs for sustained or improved device interaction time -- whether they are downloading pictures or video to a computer, or uploading media to a mobile device. In addition, the need for optimized power efficiency, to charge and power various devices, such as cell phones or external hard drives, has equally gained attention.



With these requirements in mind, there was a glaring need for a new USB specification. In November 2008, USB-IF officially released the SuperSpeed USB 3.0 specification. These consumer needs also spurred the development of Tyco Electronics' USB 3.0 interconnect, which has retained all the great features of previous generations of USB interconnects while improving upon them in the areas of performance and power management.

How Fast is USB 3.0?

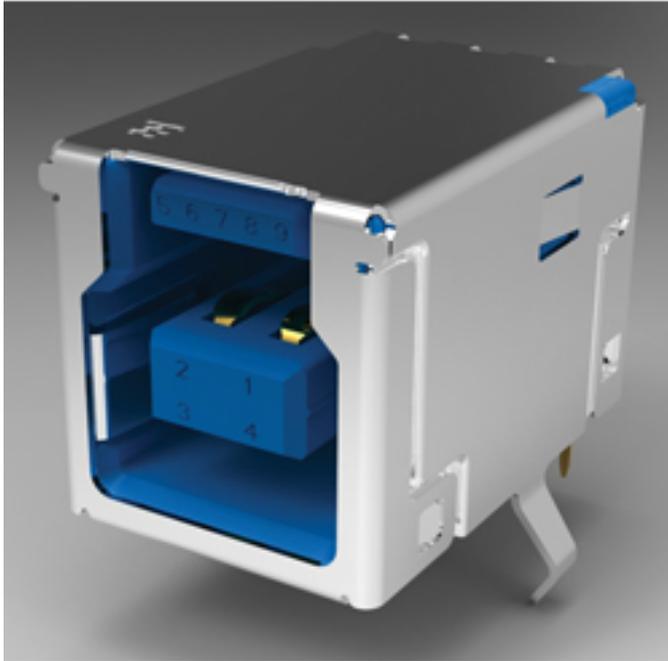
Named SuperSpeed USB for a reason, the USB 3.0 connector brings a 10x performance increase over the previous USB 2.0 specification, and is capable of supporting data transfer rates up to 5 Gbps. These performance enhancements not only increase the data transfer rates of your standard peripheral devices, such as external storage devices, printers and scanners, but also open up the possibility for

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using USB 3.0 in applications such as high definition audio/video equipment and rich-media devices. Users can now download a 25-GB HD movie in 70 seconds versus the 13.9 minutes required by USB 2.0. The USB 3.0 connector also offers faster sync-go time that minimizes user wait requirements.

Furthermore, USB 3.0 interconnect supports full duplex data transfer, meaning that data can flow in both directions (PC - Device & Device - PC) at the same time. This differs from the half duplex data transfer capability of USB 2.0, where data could only flow in one direction at a time. Additionally, the USB 3.0 connector is also capable of reading and writing data simultaneously.



Higher Power Capacity and More

Efficient Power Management

As mentioned previously, the popularity of charging and powering devices through USB interconnects has driven the need for greater power and better power management through the USB interface. This need has been fulfilled by the increase in the USB 3.0 power specification, which now allows for the unit load of 150 mA (which is a 50 percent increase over the minimum unit load of USB 2.0) up to six unit loads (which is 900 mA, an 80 percent increase over USB 2.0 at a registered maximum of 500 mA). This means that USB 3.0 has up to 80 percent more power based on the configuration of the device. This allows more devices to be powered without an external power supply and allows devices previously charged using USB to be powered more quickly.

The power efficiency is accomplished by the elimination of device polling and the lower active and idle power requirements. With the elimination of device polling, it enables the device to alert the host when it's ready to be used without the host continually checking if it's ready. In addition, the minimum device operating voltage for USB 3.0 has also dropped to 4V from the 4.4V minimum of USB 2.0, resulting in lower power consumption.

USB 3.0 Compatibility and Product Simplification

Product offerings within the USB 3.0 family are fully backward compatible with USB

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2.0 solutions. In addition, there is forward compatibility as the USB 2.0 Standard Type A Receptacle will accept a USB 3.0 Standard Type A Plug. This enables users to continue to use their USB 2.0 devices with USB 3.0 devices -- in most cases.

In order to simplify the USB types, the USB 3.0 interconnect only offers two styles, standard and micro; the USB 2.0 Mini and Micro styles were consolidated into the Micro USB 3.0. This simplification will reduce consumer confusion on the type of interconnect needed for their device.

Tyco Electronics and USB 3.0

Tyco Electronics, a voting member of USB-IF, leveraging our global circuits and design expertise, plans to offer a full line of certified USB 3.0 product solutions. This portfolio includes various configurations of Standard A and B style plugs and receptacles; powered B plugs and receptacles; Micro B and AB plugs and receptacles; and cable assemblies. Various stacked and combination variations are expected to round out the Tyco Electronics USB 3.0 portfolio. For more information, visit www.te.com/products/usb [1].

¹ Universal Serial Bus 3.0 Specification, Revision 1.0

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[1] <http://www.te.com/products/usb>