TEXAS INSTRUMENTS

Unleash the beast within: TI's 1394b High-speed Serial Bus Solutions

A comprehensive selection of 1394b performance and support

As communications among computers, peripherals and consumer electronics become ever faster, system manufacturers are increasingly turning to the IEEE 1394b (FireWire) serial bus. For advanced communications among these systems, 1394b offers a number of advantages, including higher bit rates, ease of interface, longer transfer distances, flexible topologies and the ability to handle isochronous or asynchronous data.

Manufacturers are also turning to Texas Instruments for the industry's largest selection of 1394b solutions. TI's advanced technology delivers outstanding performance in discrete products for 1394b physical and link layer control, as well as integrated products that combine both layers in a single device. In-depth expertise in 1394 connectivity assures that TI solutions are interoperable and reliable, and comprehensive support makes it easier for customers to design systems and get them into production fast.

Discrete 1394b PHYs

As the leading supplier of discrete physical layer controllers (PHYs), TI provides high-performance, flexible devices that are used in PC environments and other demanding applications such as storage, industrial automation, machine vision, professional photography and video.

For developers who need to go longer distances with the new cable media specified by 1394b, TI offers the TSB41BA3B PHY. This three-port PHY, handling speeds up to S400 (400 megabits per second [Mbps]), can be paired with an additional equalizer for communications over CAT5 or coaxial cable at up to 100 meters, and with optical fiber over the same distances.

TI's TSB81BA3D PHY has become the de facto standard for 1394b, offering performance and flexibility for interoperability across multiple platforms and peripherals. The TSB81BA3D is the first fully compliant 1394b cable PHY supporting up to S800 (800 Mbps). The device also provides three bilingual ports capable of operating in both 1394a beta mode and 1394a data strobe mode for backward compatibility legacy 1394a devices. Each port is configurable to operate in bilingual, 1394b beta-only, or 1394a mode (S400, S200, S100).

Discrete 1394b LINK

TSB82AA2B OHCI-Lynx™ integrated circuits provide a 1394b link layer controller (LINK) that enables PC and embedded system manufacturers to rescale designs and take advantage of high-speed serial peripheral communications. Compliant with Open Host Controller Interface (OHCI) 1.1+ requirements, the device connects 1394b to 32- and 64-bit Peripheral Component Interconnect (PCI) buses. As the first fully compliant 1394b OHCI LINK with support for speeds up to S800, the TSB82AA2B supports all peripheral classes and provides interoperability across multiple platforms.

Integrated PHY-LINK devices

TI's integrated 1394b solutions were the first to combine 1394b physical and link layers in the same device to address industry requirements for smaller form factors and greater integration. These low-power devices save components, board space, routing and other costs for PC and consumer electronics manufacturers.

PCI. TI offers two PCI-based integrated 1394b OHCI controllers supporting speeds up to S800 through bilingual ports that also operate in 1394a mode. For notebooks and other applications needing a minimum footprint, TI's TSB83AA22C provides an integrated two-port 1394b controller in a very small 7 mm × 7 mm package. For desktops and add-in cards where ease of layout is a concern, the TSB83AA23 provides an additional bilingual port in a 12 mm × 12 mm package. For desktops and add-in cards, where ease of layout is a concern, the TSB83AA23 provides three bilingual ports in a 12x12mm package.

PCI Express. The XIO2213 is TI's second generation of integrated devices offering a PCI Express-based integrated 1394b controller. Compliant with PCI Express Base Specification 1.1, the XIO2213 is capable of using a 100-MHz differential PCIe common reference clock or a single-ended 125-MHz reference clock. A built-in adaptive equalizer on the PCIe receiver significantly improves jitter tolerance, allowing for longer traces while software-programmable and hardware-autonomous power-management features aid with lower power applications. The XIO2213 also integrates the TSB81BA3D PHY with three S800 bilingual ports and is available in 7 mm × 7 mm and 12 mm × 12 mm packages, providing options for compact space or ease of layout.

Outstanding reliability and support

All of TI's 1394b solutions are certified by the Windows Hardware Quality Laboratory (WHQL), ensuring performance and interoperability. TI also makes available licensed 1394b drivers from Unibrain that are free to all TI 1394b customers. You can download drivers from ***www.unibrain.com***.

For more information

To find out more about TI's line of high-performance 1394b solutions – or about our 1394 products in general – visit ***www.ti.com/1394*** or call **972-644-5580**. Learn how our 1394b technology can help launch your next design.

1394b delivers high performance

The IEEE 1394b high-speed interconnection builds on earlier 1394 successes in enabling simple, low-cost connectivity of high-bandwidth data in real time between many types of electronic equipment. The newer version of the standard retains 1394a's ease of use, power management, support for up to 63 nodes and guarantees of isochronous bandwidth for time-critical data. Improvements that make 1394b technology even better for home networking and high-speed data transfer include:
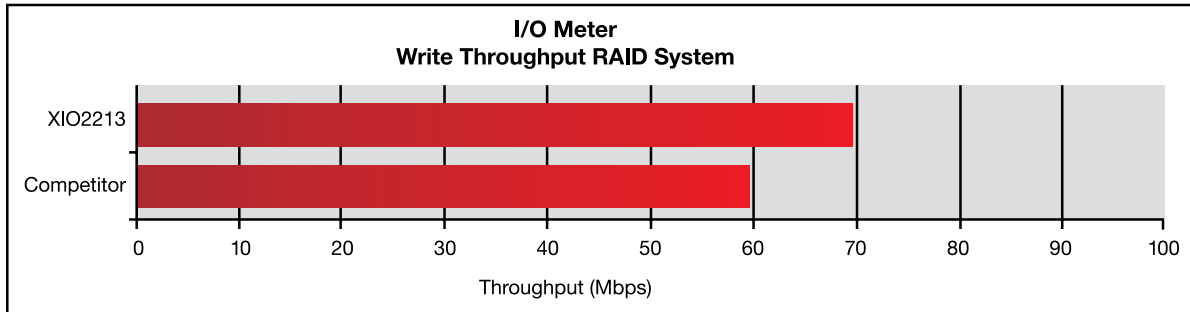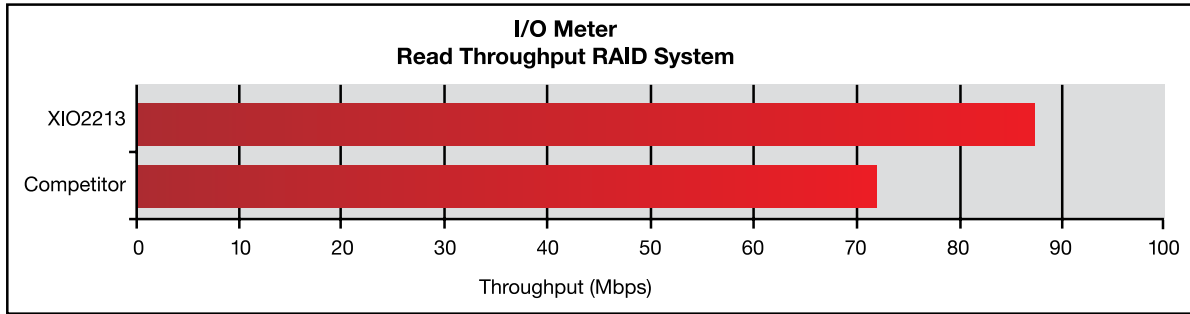
- Faster speeds ranging from 800 to 3,200 Mbps
- More cable options, including shielded and unshielded twisted pair (STP, CAT5), plastic and glass optical fiber (POF, GOF)
- Longer distances of up to 50 m with POF, 100 m with Coax CAT5, and 100 m with GOF plus additional equalization
- More efficient, with BOSS arbitration that enables overlapped pipelining of data
- More user-friendly, with a loop-free build that allows any topology and redundancy
- TI's bilingual ports communicate in both 1394a and 1394b modes

In addition, 1394b compares well with other peripheral buses in performance and versatility. With its peer-to-peer operation, 1394b requires little host processor overhead, unlike the master-slave configuration of USB. The result is low latency and much greater overall throughput. And in contrast with eSATA, with its high-bandwidth rating, 1394b supports expansion and requires no bus power, while also winning in throughput at hard disk drive (HDD) speeds.

Building on an established position as a leading 1394/FireWire supplier, TI offers a WHQL-certified solution for every 1394b requirement. Fully licensed Unibrain drivers are available for free for all of TI's 1394b offerings.

1394b selection at a glance

Device type	Device number	Bilingual (1394a/b) ports	Speed (Mbps)	Host interface
Discrete PHY	TSB43BA3B	3	S400	–
	TSB81BA3D	3	S800	–
Discrete LINK	TSB82AA2B	–	S800	PCI
Integrated	TSB83AA22C	2	S800	PCI
PHY-LINK	TSB83AA23	3	S800	PCI
	XIO2213	3	S800	PCI Express

**I/O Meter
Read Throughput RAID System**

	Throughput (Mbps)
XIO2213	(bar to ~87)
Competitor	(bar to ~72)

Throughput (Mbps): 0 10 20 30 40 50 60 70 80 90 100

**I/O Meter
Write Throughput RAID System**

	Throughput (Mbps)
XIO2213	(bar to ~69)
Competitor	(bar to ~59)

Throughput (Mbps): 0 10 20 30 40 50 60 70 80 90 100

TI Worldwide Technical Support

Internet

TI Semiconductor Product Information Center Home Page
support.ti.com
TI Semiconductor KnowledgeBase Home Page
support.ti.com/sc/knowledgebase

Product Information Centers

Americas
Phone	+1(972) 644-5580
Fax	+1(972) 927-6377
Internet/Email	support.ti.com/sc/pic/americas.htm

Europe, Middle East, and Africa
Phone
European Free Call	00800-ASK-TEXAS
	(00800 275 83927)
International	+49 (0) 8161 80 2121
Russian Support	+7 (4) 95 98 10 701

Note: The European Free Call (Toll Free) number is not active in all countries. If you have technical difficulty calling the free call number, please use the international number above.

Fax	+(49) (0) 8161 80 2045
Internet	support.ti.com/sc/pic/euro.htm

Japan
Fax	International	+81-3-3344-5317
	Domestic	0120-81-0036
Internet/Email	International	support.ti.com/sc/pic/japan.htm
	Domestic	www.tij.co.jp/pic

Asia
Phone
International	+91-80-41381665
Domestic	Toll-Free Number
Australia	1-800-999-084
China	800-820-8682
Hong Kong	800-96-5941
India	1-800-425-7888
Indonesia	001-803-8861-1006
Korea	080-551-2804
Malaysia	1-800-80-3973
New Zealand	0800-446-934
Philippines	1-800-765-7404
Singapore	800-886-1028
Taiwan	0800-006800
Thailand	001-800-886-0010
Fax	+886-2-2378-6808
Email	tiasia@ti.com or ti-china@ti.com
Internet	support.ti.com/sc/pic/asia.htm

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