



How Accelerating Flash Speeds Drives the Need for 10G USB

Eric Huang

August 13, 2013

The FLASH
X
mimobot
Designer USB Flash Drives



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FlashMemory
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Internal SSD (4)

Product	x Remove	x Remove	x Remove	x Remove
 <p>Crucial M500 960GB SATA 2.5" 7mm (with 9.5mm adapter) Internal Solid State Drive CT960M500SSD1</p> <p style="text-align: center;">\$649⁹⁹</p> <p style="text-align: center;">Free Shipping</p> <p style="text-align: center;">View Details</p>	 <p>Intel SSD DC S3500 Series SSDSC2BB600G401 2.5" MLC Internal Solid State Drive (SSD) - OEM</p> <p style="text-align: center;">\$829⁹⁹ \$799⁹⁹</p> <p style="text-align: center;">Free Shipping</p> <p style="text-align: center;">ADD TO CART</p> <p style="text-align: center;">ADD TO WISH LIST</p>	 <p>Refurbished: OCZ Octane OCT1-25SAT3-1T 2.5" 2Xnm Synchronous Mode Multi-Level Cell (MLC) Internal Solid State Drive (SSD)</p> <p style="text-align: center;">\$1,499⁹⁹</p> <p style="text-align: center;">\$5.99 Shipping</p> <p style="text-align: center;">ADD TO CART</p> <p style="text-align: center;">ADD TO WISH LIST</p>	 <p>OUT OF STOCK</p> <p>Mushkin Enhanced MKNSSDCL960GB-DX 2.5" MLC Internal Solid State Drive (SSD)</p> <p style="text-align: center;">\$999⁹⁹ \$849⁹⁹ <small>Save: 15%</small></p> <p style="text-align: center;">Free Shipping</p> <p style="text-align: center;">AUTO-NOTIFY</p> <p style="text-align: center;">ADD TO WISH LIST</p>	



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Price

- \$500 - \$750 (2)
- \$750 - \$1000 (4)
- \$1250 - \$1500 (1)
- \$3500 - \$4000 (1)

Manufacturer

- Intel (4)
- Crucial (2)
- Mushkin Enhanced (1)
- OCZ Technology (1)

Capacity



★★★★★ (13)

Compare

Crucial M500 960GB SATA 2.5" 7mm (with 9.5mm adapter) Internal Solid State Drive CT960M500SSD1

- 4KB Random Read: Up to 80,000 IOPS
- 4KB Random Write: Up to 80,000 IOPS
- Max Sequential Read: Up to 500MB/s
- Max Sequential Write: Up to 400MB/s

- Model #: CT960M500SSD1
- Item #: N82E16820148696
- Return Policy: Limited Replacement Only Return Policy

from **\$649.99**

Free Shipping

Choose From 2 Sellers

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Compare

Intel SSD DC S3500 Series SSDSC2BB600G401 2.5" 600GB SATA III MLC Internal Solid State Drive (SSD) - OEM

- Sustained Sequential Read: up to 450MB/s
- Sustained Sequential Write: up to 380MB/s
- 4KB Random Read: Up to 72,000 IOPS
- 4KB Random Write: Up to 9,000 IOPS

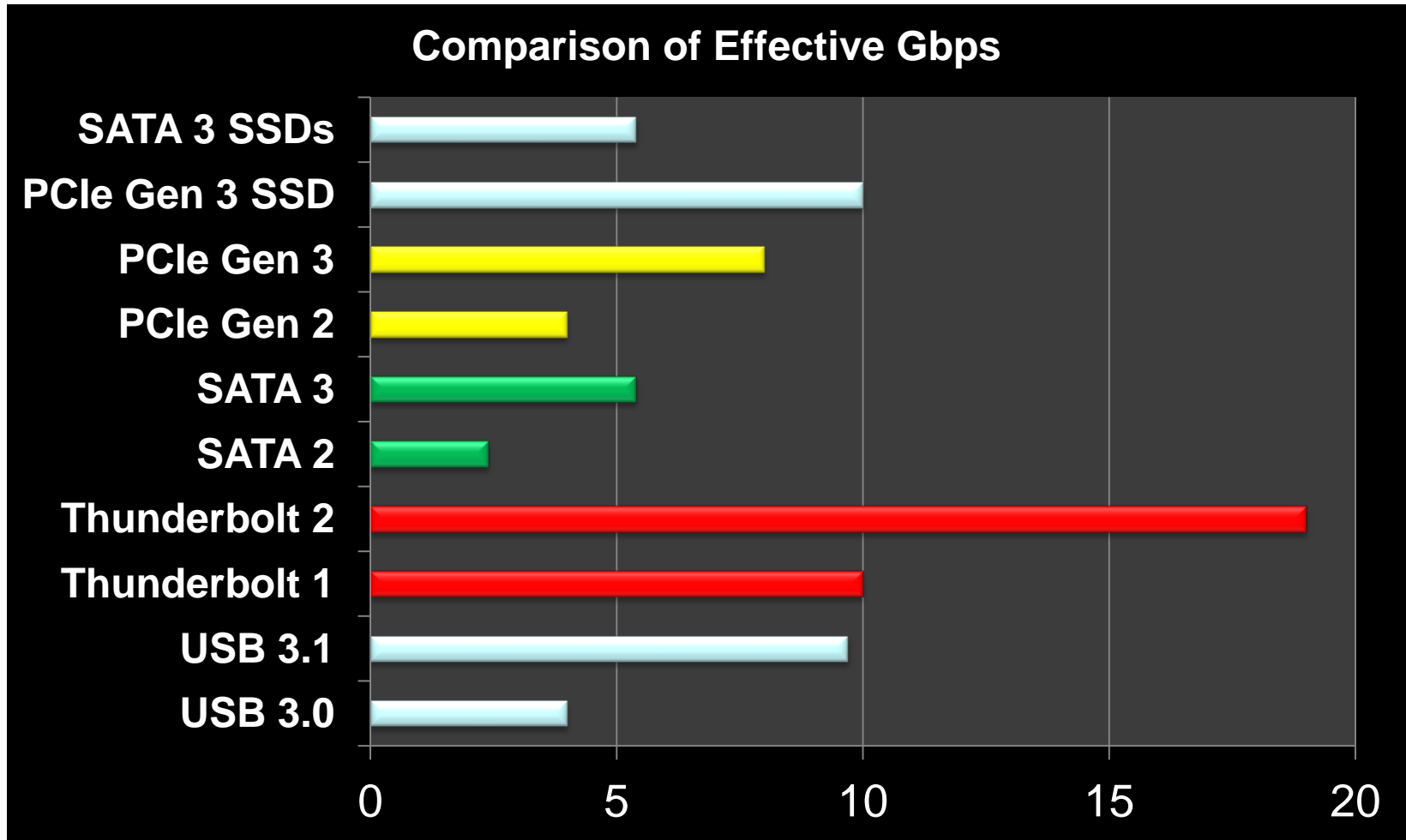
- Model #: SSDSC2BB600G401
- Item #: N82E16820167156
- Return Policy: Limited Replacement Only Return Policy

~~\$829.99~~

\$799.99

Free Shipping

SSDs Designed to Today's Standards





DRAMExchange Flash Spot Prices

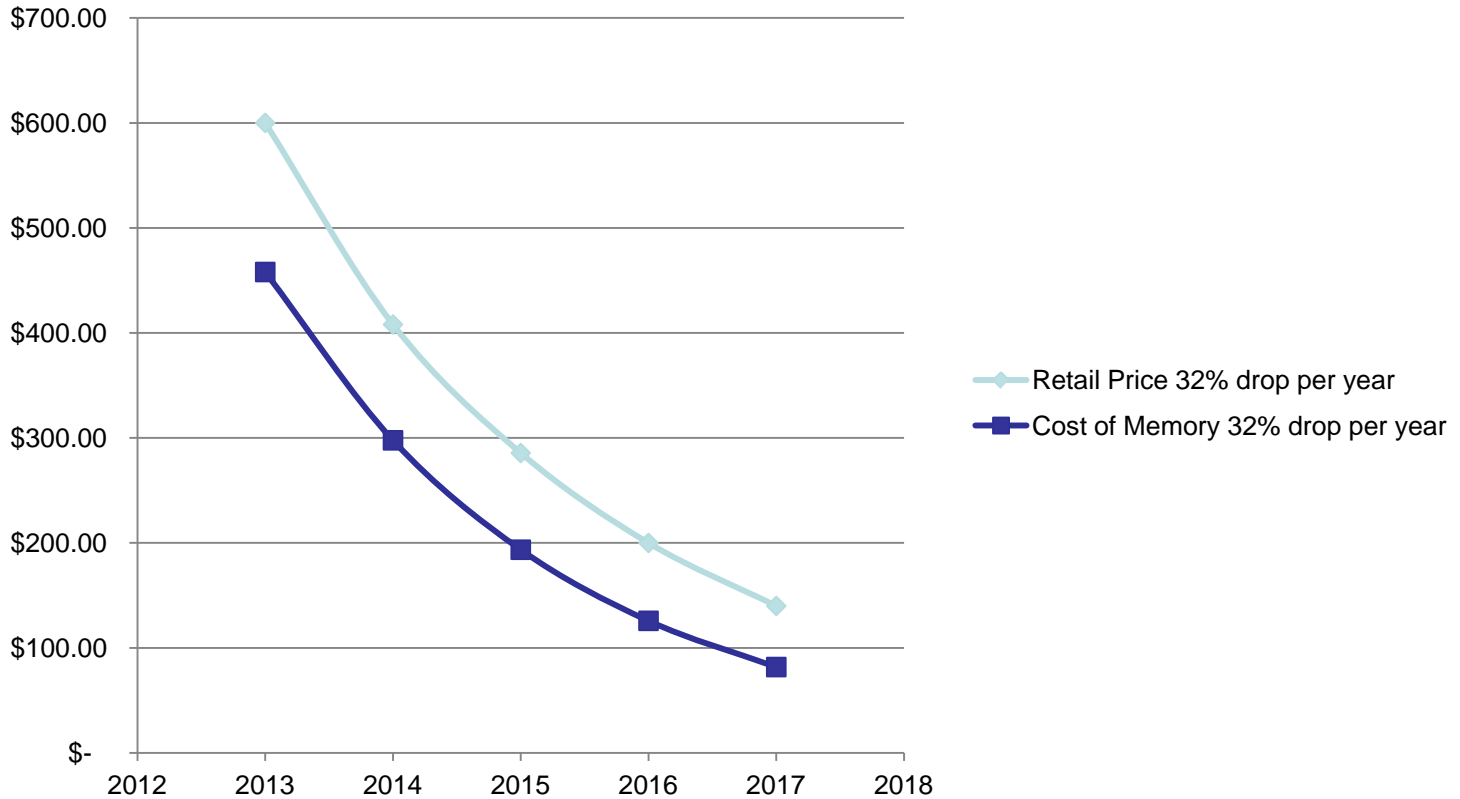
Last Update: Aug. 1 2013, 18:10 (GMT+8) [Early notice was announced at 17:50. \(20 minutes in advance\)](#)

Mode	Item	Daily High	Daily Low	Session High	Session Low	Session Average	Session Change	History	Weekly High	Weekly Low
S	32Gb 4Gx8 SLC	20.70	20.60	20.70	20.60	20.650	0.00 %		20.70	20.60
S	16Gb 2Gx8 SLC	10.30	10.20	10.30	10.20	10.250	0.00 %		10.30	10.20
S	8Gb 1Gx8 SLC	5.25	5.05	5.25	5.05	5.125	0.00 %		5.25	5.05
S	4Gb 512Mx8 SLC	2.78	2.50	2.78	2.50	2.646	0.00 %		2.78	2.50
S	2Gb 256Mx8 SLC	2.75	1.65	2.75	1.65	1.807	0.00 %		2.75	1.65
S	1Gb 128Mx8 SLC	1.95	1.16	1.95	1.16	1.421	0.00 %		2.05	1.16
M	256Gb 32Gx8 MLC	30.60	20.50	30.60	20.50	25.063	0.00 %		30.80	20.50
M	128Gb 16Gx8 MLC	13.20	11.43	13.20	11.43	12.303	-1.13 %		13.20	11.43
M	64Gb 8Gx8 MLC	7.50	3.70	7.50	3.70	5.804	0.00 %		7.50	3.70
M	32Gb 4Gx8 MLC	4.58	3.02	4.58	3.05	3.298	-1.35 %		4.58	3.02
M	16Gb 2Gx8 MLC	5.55	2.83	5.55	2.83	2.976	0.00 %		5.55	2.83
T	256Gb TLC	14.60	14.28	14.60	14.28	14.300	0.00 %		14.60	14.28
T	128Gb TLC	8.40	7.25	8.40	7.25	7.795	0.00 %		8.40	7.25
T	64Gb TLC	3.95	3.70	3.95	3.70	3.793	0.00 %		3.95	3.70
T	32Gb TLC	3.55	3.45	3.55	3.45	3.480	0.00 %		3.55	3.45



1 TB SSD and NAND Flash

**Estimated Retail & Cost
of 1 TB SSD
with 32% Price Erosion/Year**





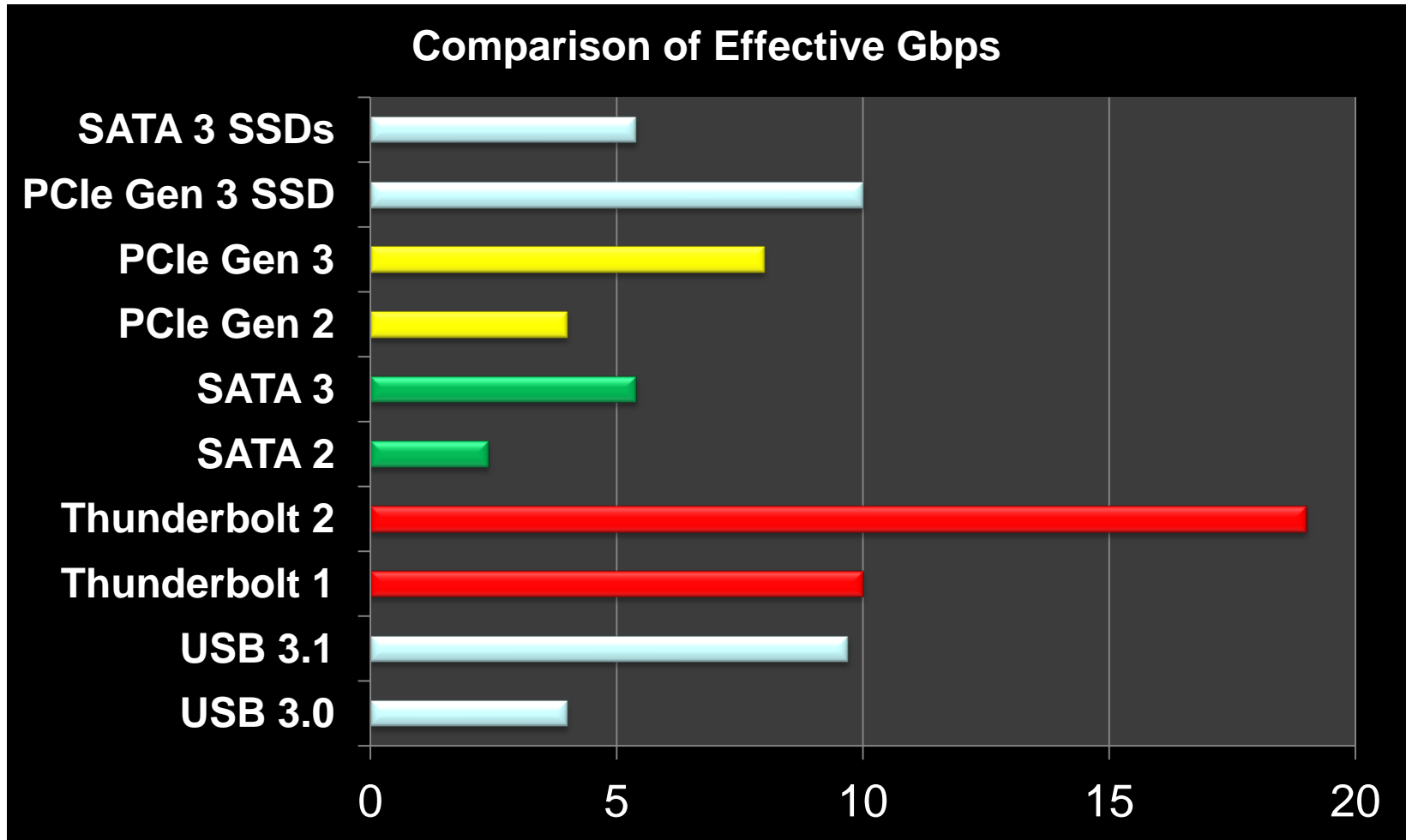
>10 Gbps SSDs Shipping

Samsung Now Mass Producing Industry's First PCI-Express SSD for Ultra-slim Notebook PCs

on

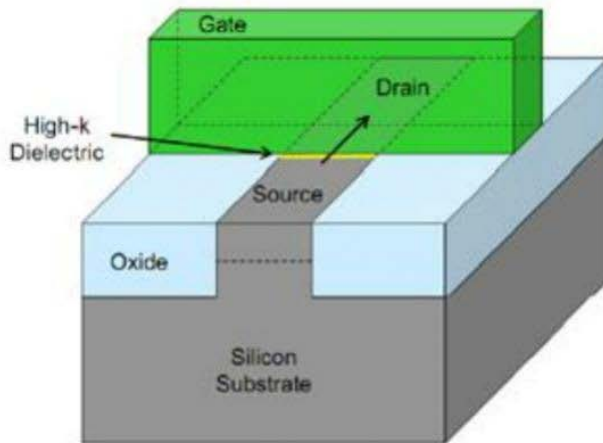


SSDs Designed to Today's Standards



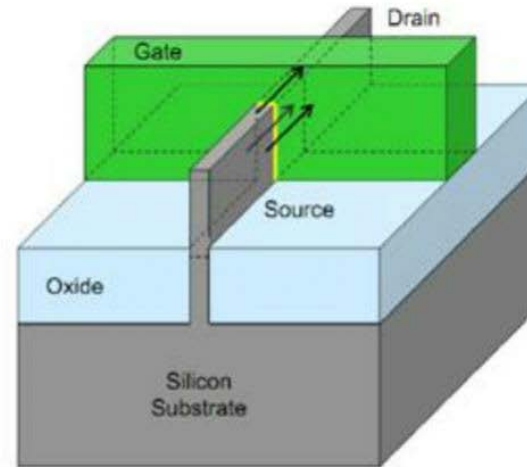
HKMG

Traditional Planar



Traditional 2-D planar transistor form a conducting channel in the silicon region under the gate electrode when in the "on" state

3D FinFET



3-D Tri-Gate transistor form conducting channels on three sides of a vertical fin structure, providing "fully depleted" operation





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Seagate STBD4000400 4TB 64MB Cache SATA 6.0Gb/s 3.5" Internal Hard Drive – Retail Kit

PRODUCT TOUR

4.5 (34) | Write a Review

In stock. Limit 100 per customer.

- 64MB Cache
- 2 years
- Low power consumption
- Total 4TB capacity (1TB per disk)

Like 228 Pin it 3 +1 9 Tweet 2 Email

Qty: 1 ~~\$199.99~~ **\$189.99** Save: \$10.00 (5%) \$7.86 Shipping (restrictions apply)

Protect Your Investment!

- 1-year extended warranty (more options) \$17.99
- 1-year data recovery (more options) \$29.95

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\$649.99	\$829.99 \$799.99	\$1,499.99	\$999.99 \$849.99 Save: 15%	
View Details	Free Shipping	\$5.99 Shipping	Free Shipping	
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	ADD TO WISH LIST	ADD TO WISH LIST	ADD TO WISH LIST	

Monday, April 08, 2013, 05:01 pm

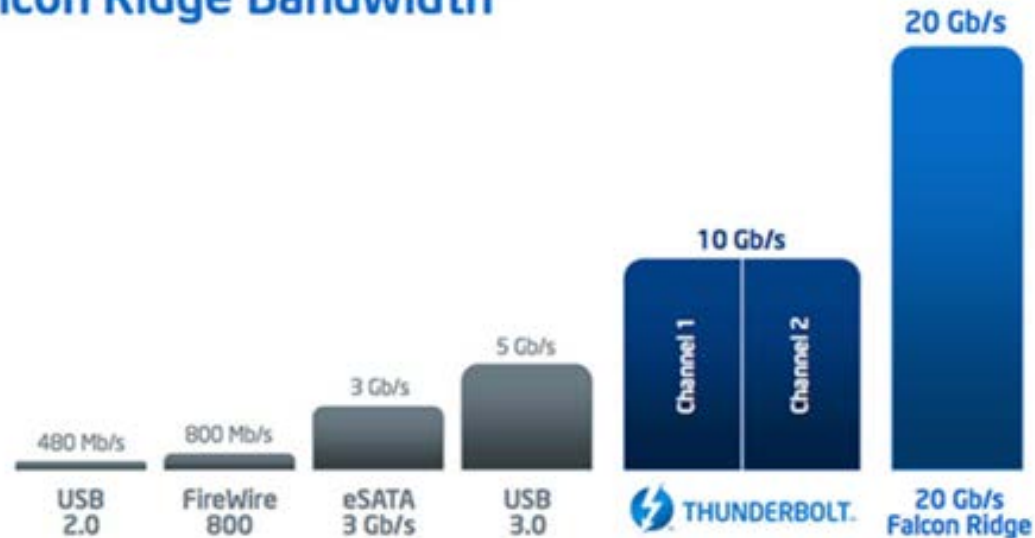


Intel announces next-gen Thunderbolt with 4K resolution support, 20Gbps speeds coming in 2014

By AppleInsider Staff

At the National Association of Broadcasters (NAB) Show in Las Vegas, Nevada, Intel on Monday announced the next-generation of Thunderbolt transfer technology, which promises to bring data transfer speeds up to 20-gigabits per second, a doubling over existing Thunderbolt hardware.

Falcon Ridge Bandwidth





Up to
40 GB/s
PCIe bandwidth

Up to
12 Cores
processing power

New Mac Pro
Up to 2x faster

Current Mac Pro

Floating-Point
Performance

Processor.

The new Mac Pro is muscle through and through, starting with the new-generation Intel Xeon E5 chipset. With configurations offering up to 12 cores of processing power, up to 40GB/s of PCI Express gen 3 bandwidth, and 256-bit-wide floating-point instructions, you'll never be at a loss for speed.



Next-Generation PCIe Flash Storage

Up to
2.5x
faster than SATA
solid-state drive



PCIe flash storage
1250MB/s

SATA flash drive
500MB/s

SATA hard drive
110MB/s

Storage
Performance

Storage.

There's flash storage, and then there's next-generation PCI Express flash storage. We're talking storage that's up to 2.5 times faster than the fastest SATA-based solid-state drive and up to 10 times faster than a 7200-rpm SATA hard drive. Most flash storage systems connect via SATA buses designed for slower spinning hard drives. But we designed the new Mac Pro around new PCI Express-based flash controller technology to deliver the fastest solid-state drives available standard in a desktop computer. So booting up, launching apps, even opening massive files happens in, well, a flash.



Thunderbolt 2

Launching in Q4



Up to
20 Gb/s
data transfer
speeds

Up to
25x
faster than
FireWire 800

Daisy-chain
up to
36
devices

Connect up to
three
4K
displays

Thunderbolt 2.

Thunderbolt is the fastest, most versatile I/O technology there is. And with Mac Pro, we're jumping even further ahead. Thunderbolt 2 delivers twice the throughput, providing up to 20Gb/s of bandwidth to each external device. So you're more than ready for the next generation of high-performance peripherals. You can connect massive amounts of storage, add a PCI expansion chassis, and work with the latest external displays — including 4K desktop displays and peripheral devices capable of broadcast monitoring in 4K. And since each Thunderbolt 2 port allows you to daisy-chain up to six peripherals, you can go all out by plugging in up to 36 external devices via Thunderbolt alone.



Sandisk Thunderbolt 1 Flash Drive Prototype





Fast Internal, Fast External





Optimized for Makers and Users

- System Makers
 - Price
 - Performance
 - Battery
- Consumers
 - Scale to Capacity
 - Easy to Use
 - Scale to Price
 - Scale to Speed

USB 3.0 Faster, Plentiful

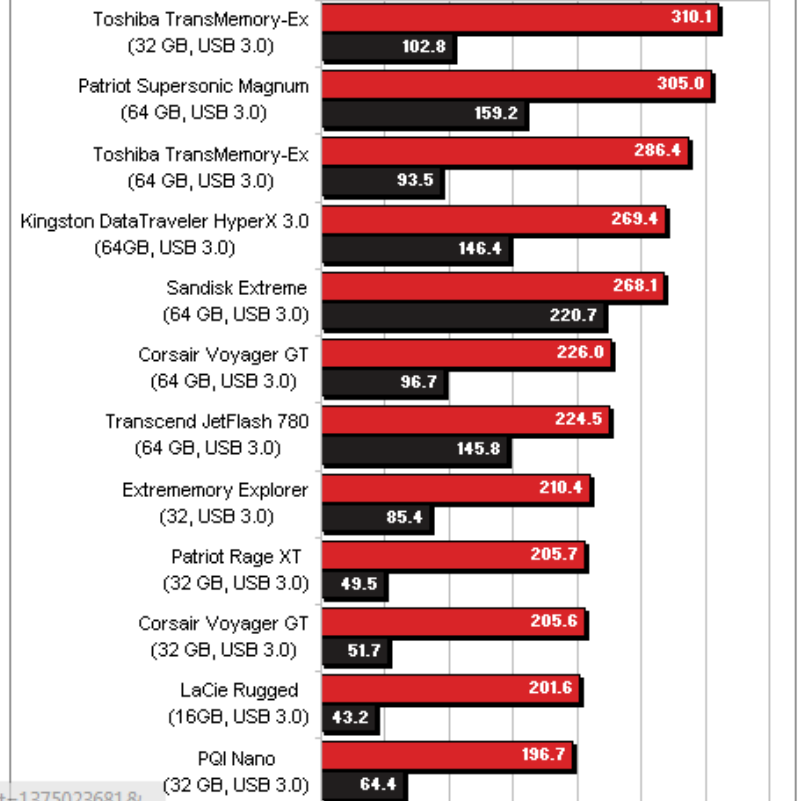


tom's
HARDWARE
THE AUTHORITY ON TECH

CrystalDiskMark 3.0 x64

Sequential Throughput

Test : 1000 MB, Repetition: 5x, order by Read



USB 3.0 in Tablets, Phablets, Phones



- Tablets – Ivy Bridge
- Apps Processors
 - Qualcomm Snapdragon 800
 - Samsung Exynos 5 
 - TI OMAP 5 → Automotive
 - nVidia Tegra 4



ZTE Grand Memo hands-on: a look at Qualcomm's Snapdragon 800 in action (updated)

By Joseph Volpe posted Feb 28th, 2013 at 11:33 AM



ZTE caught us by surprise today, outing a Snapdragon 800-infused version of the [Grand Memo](#) at its [MWC 2013 launch](#). The device, which still features the same 5.7-inch (720p) display, 13 megapixel rear camera and 3,200mAh battery, is nearly indistinguishable from the other variants we've seen. But for this go-round, ZTE's added in Dolby Digital Plus Surround for a superior audio experience and an extra GB of RAM.

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Outlook.com

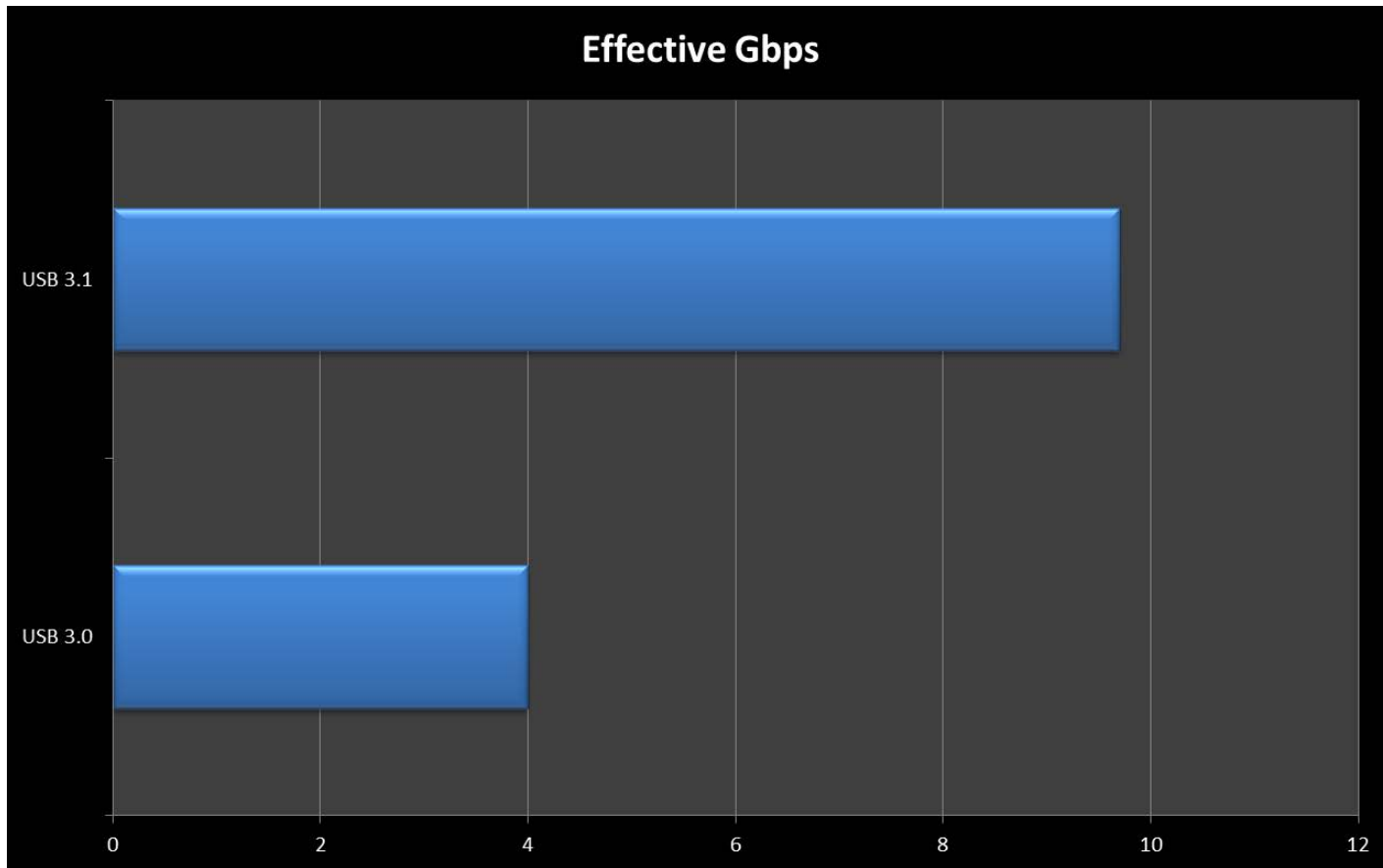
Try it now

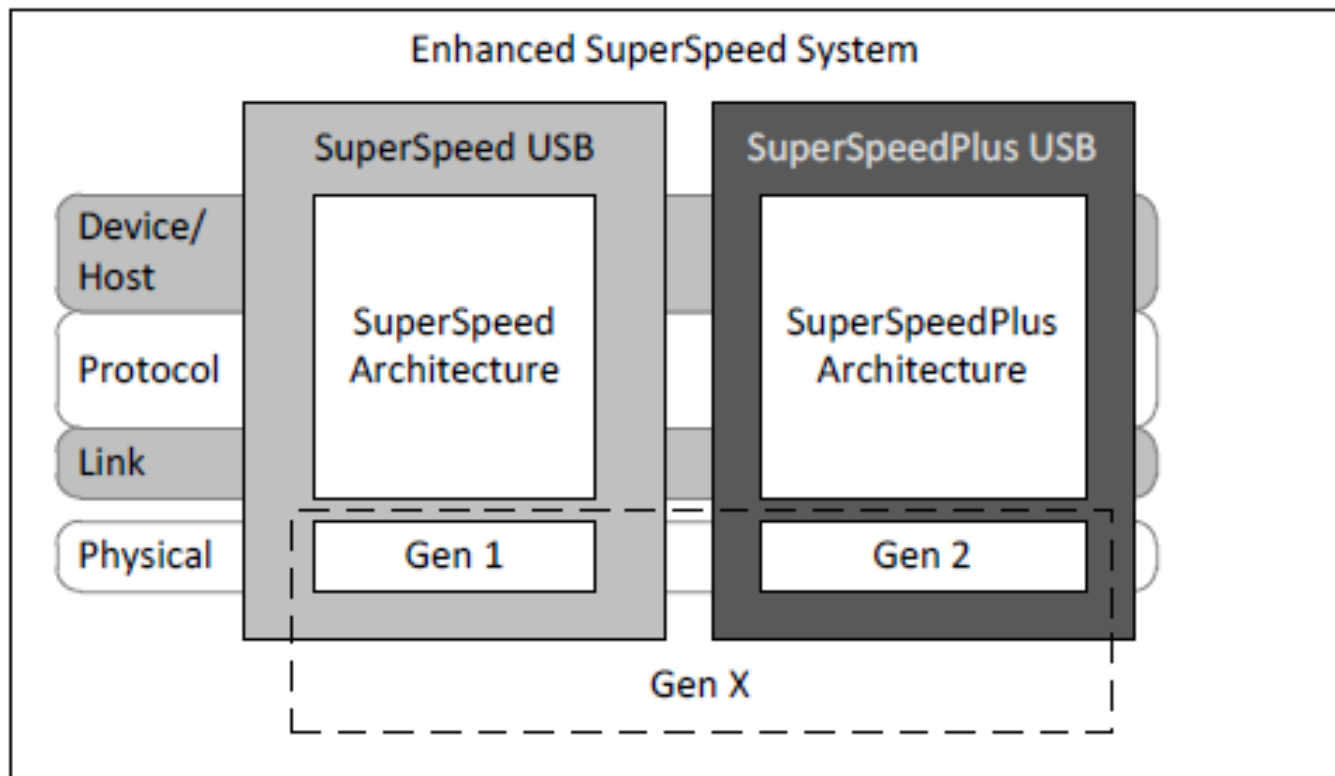


USB 3.1



242% faster





U-3-002

Figure 3-3. USB 3.1 Terminology Reference Model



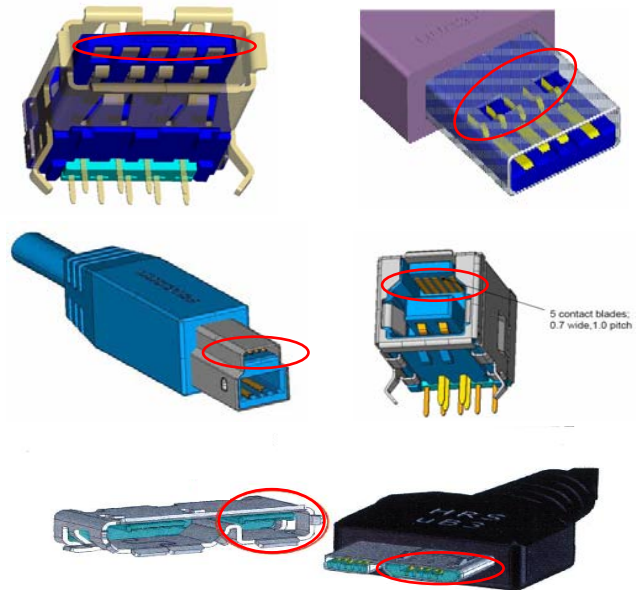
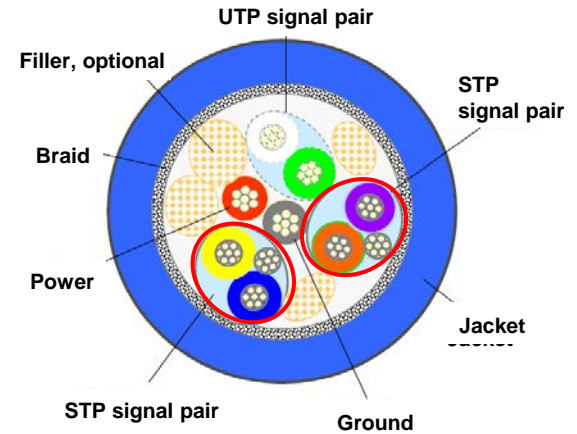
USB Comparison

	USB 3.0	USB Next Gen
Backwards compatible	✓	✓
Raw Data Rates	1.5M, 12M, 480M, 5G	1.5M, 12M, 480M, 5G, 10G
Max Throughput	400MBytes/s	1GBytes/s
New Cables	Yes for 5G	Yes (tighter spec for 10G)
New Connectors	Yes for 5G	Yes (tighter spec for 10G)
Max Cable Length	3 meters for 5G	~1 meter for 10G
Data Encoding	8b/10b	128b/132b
DFE required	No	Yes



Spec Specifics

- 10 Gbps
- Backward Software Compatibility
- Same Connectors
- Backward Compatible to USB 2.0 and 3.0 Products



○ - USB 3.0 Specific

