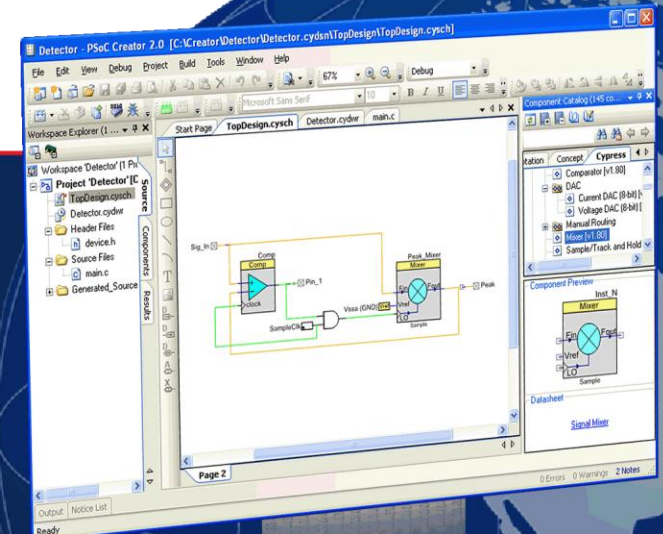




Quick Presentation: HX3: USB 3.0 Hub Controller



Get Eight Ports and Advanced USB Charging
With HX3, a Highly Interoperable Four-Port Hub

Take Advantage of USB 3.0



USB 3.0¹ is 10x faster than USB 2.0²

Transfers a 25GB high-definition movie in 70 seconds versus 14 minutes for USB 2.0

Streams high-definition video without the need for compression

USB 3.0 is 3x more power-efficient than USB 2.0

Consumes only one-third of the average power to transfer the same data

Saves more power when the system is idle using the Link Power Management³ feature

USB 3.0 provides 80% more bus power than USB 2.0

Provides 4.5 W over a USB cable, enough to power a hard disk drive

Charges portable devices 1.8x faster than USB 2.0⁴

USB 3.0 is proliferating

All new PCs support USB 3.0; soon TVs, tablets and smartphones will

More than 1,000 products are USB 3.0 certified and shipping in volume

Take advantage of USB 3.0 in your next hub design

¹ A USB standard that supports 5-Gbps SuperSpeed (SS) operation – 10x faster than USB 2.0

² A USB standard that supports 480-Mbps Hi-Speed (HS), 12-Mbps Full-Speed (FS) and 1.5-Mbps Low-Speed (LS) operation

³ A new power management technique introduced by the USB 3.0 standard

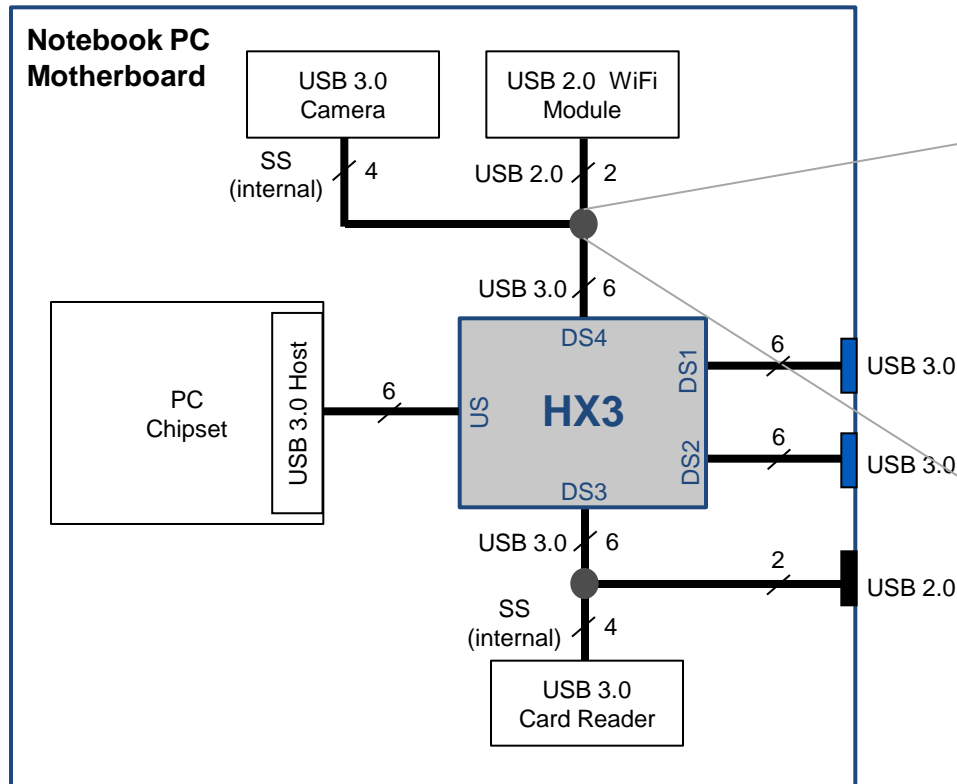
⁴ USB 3.0 charges with 900 mA; USB 2.0 charges with 500 mA

HX3's Shared Link Splits 1 Port into 2

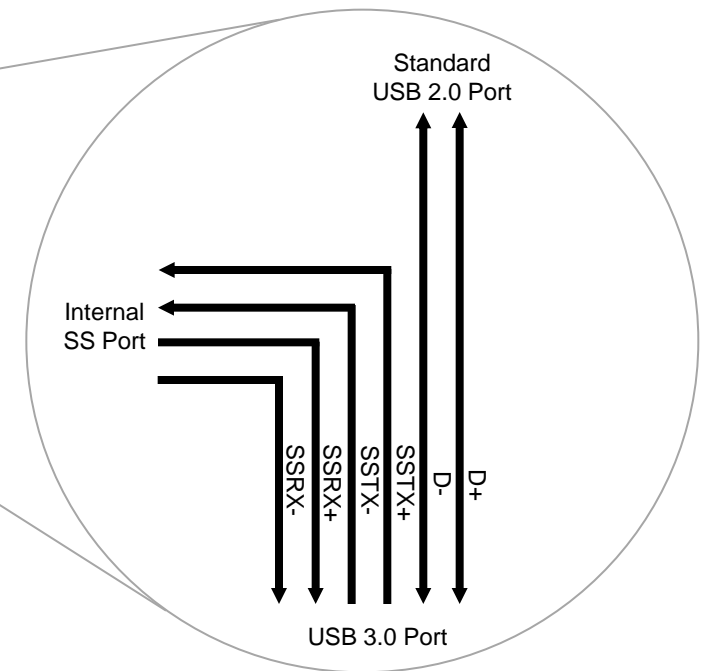
Use Shared Link to double the number of USB ports

Shared Link allows each USB 3.0 Downstream Port to be split into an internal SS port and a standard USB 2.0 port

Example: Shared Link Provides Six USB Ports in a Notebook



USB 3.0 Port Split into SS Port and Standard USB 2.0 Port



HX3's Shared Link feature creates eight Downstream Ports from a four-port USB 3.0 Hub

HX3 Makes USB 3.0 Compliance Easier

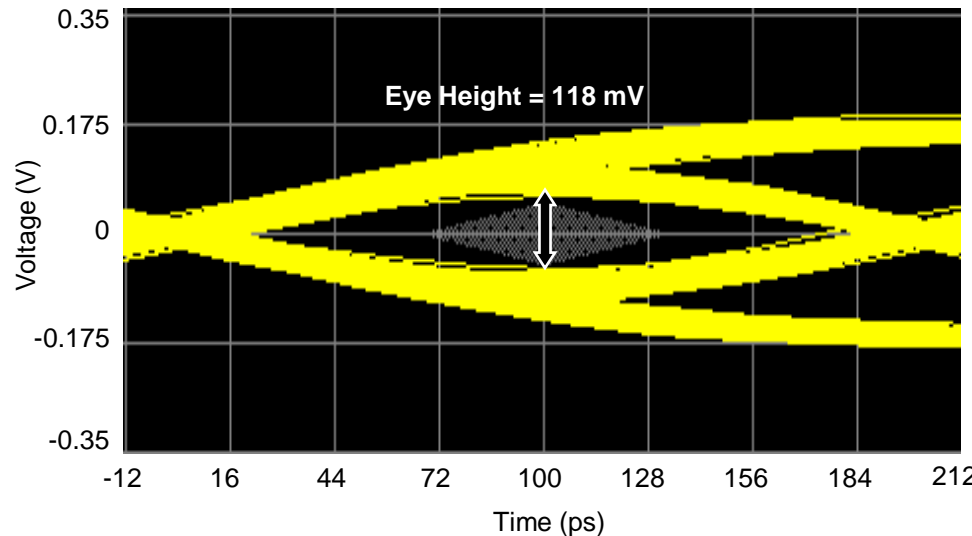


Improve USB 3.0 signal quality with HX3's configurable USB 3.0 PHY

TX amplitude¹ adjustment: four levels to correct signal attenuation and to reduce cross talk between adjacent ports

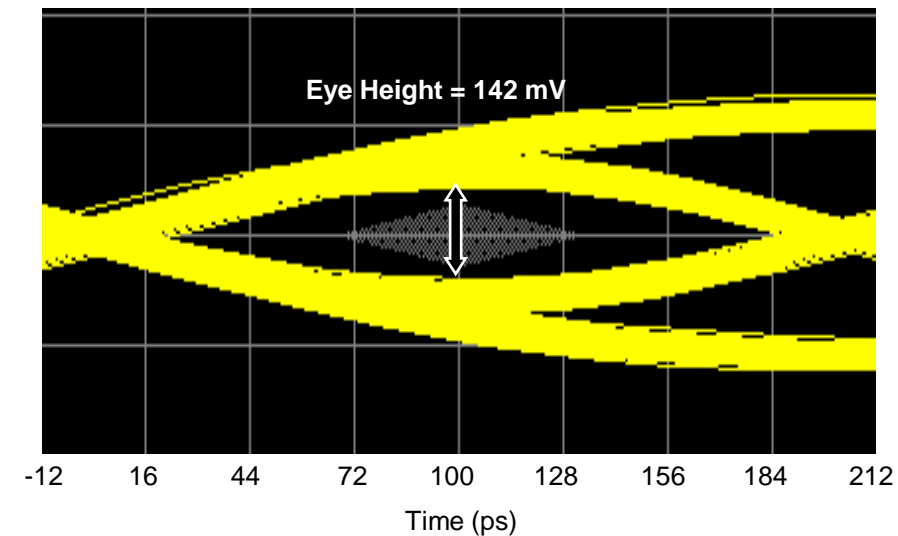
De-emphasis² adjustment: sixteen levels to compensate for a distorted USB 3.0 signal

USB 3.0 Eye Diagram With Default PHY Configuration



An eye height³ with low margin may fail USB compliance

USB 3.0 Eye Diagram With +20% TX Amplitude Adjustment



An eye height with 20% more margin

Pass USB compliance easily with HX3's configurable USB 3.0 PHY

¹ The maximum value of a transmitted signal, expressed in volts

² The decrease of the low-frequency content of a transmitted signal, expressed in dB

³ The vertical opening of the SS eye expressed in volts; USB 3.0 spec = 100 mV

HX3 Supports Many Charging Standards

Charge multiple portable Devices with HX3

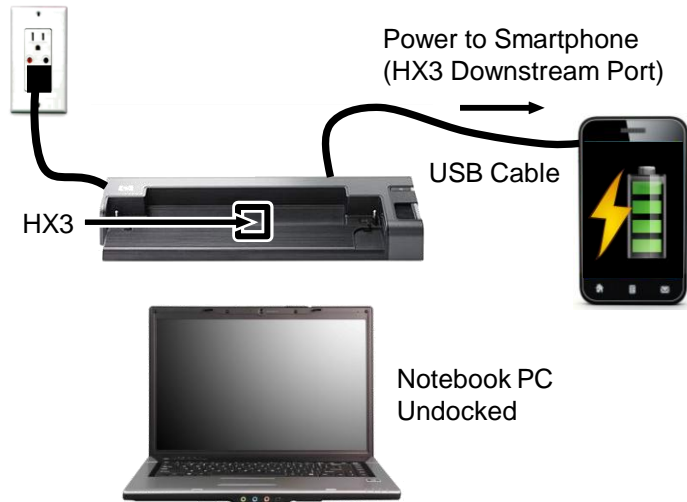
HX3 supports BC v1.2, YD/T 1591-2006¹ and Apple Charging Standard

Use special charging modes

Ghost Charge: Charges a portable Device without the need for a Host connected to the US port

ACA-Dock: Charges a smartphone or tablet supporting USB On-the-Go² (OTG)

Example: Notebook PC Docking Station With Ghost Charge



Charge a smartphone without docking the notebook

Example: Tablet Docking Station With ACA-Dock



Provide power to both Upstream and Downstream Ports

¹ A USB battery charging standard defined by the Chinese Ministry of Information and Industry

² A USB-IF specification that requires portable Devices to function as a Host when connected to Devices and to function as a Device when connected to a Host

HX3: USB 3.0 Hub

Applications

Docking stations for notebook PCs and tablets
 PC motherboards, servers
 Digital TV, monitors
 Retail hub boxes
 Printers, scanners
 Set-top boxes, home gateways, network routers
 Game consoles

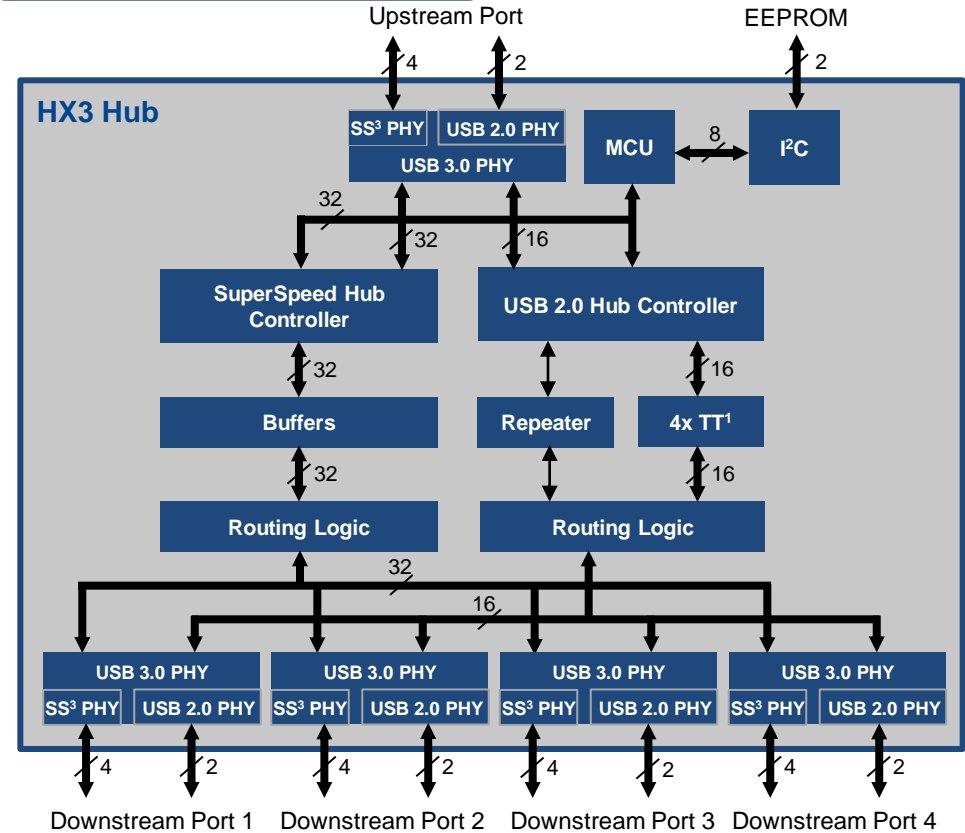
Features

USB 3.0-compliant four-port Hub controller
 USB-IF certified (Test ID: 330000047)
 WHQL certified for Windows 7, Window 8, Windows 8.1
 Shared Link™: Supports simultaneous USB 2.0 and SuperSpeed Devices on the same port
 Ghost Charge™: Enables USB charging while the Hub is disconnected from a USB Host
 Charging Standard support:
 USB-IF Battery Charging v1.2, Apple Charging Standard
 Charging an OTG Host in an ACA-Dock
 Programming of external EEPROM via USB
 Configurable USB 3.0 & USB 2.0 PHY. Drives 11" trace
 68-QFN (8x8x1.0 mm), 88-QFN (10x10x1.0 mm)
 100-BGA (6x6x1.0 mm)

Collateral

Datasheet: [HX3 Datasheet](#)
 Application Note: [HX3 Hardware Design Guide](#)
 Kits: [CY4609, CY4603, CY4613](#)
 Configuration Utility: [Blaster Plus²](#)

Block Diagram



Availability

Production: Now







¹ Transaction Translator

² A Cypress GUI-based PC application for setting HX3 configuration parameters

³ SuperSpeed

HX3 vs. Competition's Solutions



	 CYUSB33xx	 USB553x	 TUSB8040a1	 GL3521	 uPD720210	 VL811+
Features						
Number of DS Ports	4 & 8	4 & 7	4	4	4	4
BC v1.2	Yes	Yes	Yes	Yes	Yes	Yes
Ghost Charge	Yes	Yes	No	Yes	No	No
Shared Link	Yes	No	No	No	No	No
Apple Charging	Yes	Yes	No	Yes	No	No
ACA–Dock Support	Yes	No	No	No	No	No
Active Power (mW)¹	735	1557	999	1687	707	500
Standby Power (mW)	40	49	88	21	20	NA
On-chip Regulator	No	No	No	5 V/3.3 V	5 V/3.3 V	5 V/3.3 V
Config. Options²	I²C Slave, I²C EEPROM	SMBus Slave, SPI EEPROM	SMBus Slave, I²C EEPROM	SPI EEPROM	SPI EEPROM	SPI EEPROM
ISP³	Yes	Yes	Yes	Yes	No	Yes
Packages/Size (mm²)	100-BGA/36 68-QFN/64	64-QFN/81	81-QFN/100	88-QFN/100	76-QFN/81	88-QFN/100

¹ Active power with four SS devices connected on the DS port with data transfer

² Options for loading or storing Hub-specific configuration settings

³ Cypress's In-System Programming (ISP) feature that programs an external EEPROM connected to HX3 through USB