



# Cypress Roadmap: USB

## Q1 2018



# USB Portfolio

	Device	Hub	Bridge	Host	Storage	Type-C
USB 3.1	<b>CYUSB301x FX3</b> 32-Bit Bus to USB 3.1 Gen 1 ARM9, 512KB RAM <b>FX3PD</b> USB 3.1 Gen 2 Type-C Peripheral Controller Contact Sales	<b>CYUSB33xx HX3</b> USB 3.1 Gen 1, Shared Link™ <sup>1</sup> BC 1.2 <sup>2</sup> , Ghost Charge™ <sup>3</sup> <b>CYUSB333x HX3C</b> 4 Ports: 1 Type-C, 3 Type-A USB PD, Billboard, BC1.2 <sup>2</sup> <b>NEW HX3PD Q318</b> USB 3.1 Gen 2 Type-C Hub with PD Contact Sales	<b>CYUSB306x CX3</b> CSI-2 <sup>4</sup> to USB 3.1 Gen 1 4 CSI-2 <sup>4</sup> Lanes, 1 Gbps/Lane <b>CYUSB361x GX3</b> USB 3.1 Gen 1 to GigE Energy Efficient Ethernet		<b>CYUSB303x FX3S</b> 16-Bit Bus to USB 3.1 Gen 1 RAID <sup>5</sup> , Dual SDXC <sup>6</sup> /eMMC <sup>7</sup> <b>CYUSB302x SD3</b> USB 3.1 Gen 1 SD Reader SDXC <sup>6</sup> /eMMC <sup>7</sup> , RAID <sup>5</sup>	<b>CYPD1xxx CCG1</b> USB Type-C Port Controller 1 PD Port, 5 Profiles, 100 W <b>CYPD2xxx CCG2</b> USB Type-C Cable Controller 1 PD Port, Termination, ESD <b>CYPD3xxx CCG3</b> USB Type-C Port Controller 20-V, Crypto, Billboard
	USB 2.0	<b>CY7C6801x/53 FX2LP</b> 16-Bit Bus to USB 2.0 8051, 16KB RAM <b>CY7C68003 TX2UL</b> ULP <sup>9</sup> PHY 13, 19.2, 24, 26 MHz <b>CYUSB201x FX2G2</b> 32-Bit Bus to USB 2.0 ARM9 512KB RAM	<b>CY7C656x4 HX2VL</b> 4 Ports 4 Transaction Translators <b>CY7C656x1 HX2LP</b> 4 Ports, Industrial Grade 1 Transaction Translator		<b>CYWB016xBB Bay™</b> HS USB OTG Dual SDXC <sup>6</sup> /eMMC <sup>7</sup>	<b>CYWB0x2xABS Arroyo™, Astoria™</b> 16-Bit Bus to USB 2.0 8051, Dual SD/eMMC <sup>7</sup> <b>CY7C6803x NX2LP</b> NAND Flash to USB 2.0 8051, 15KB RAM <b>CY7C683xx AT2LP</b> Parallel ATA to USB 2.0 8051
USB 1.1		<b>CY7C638xx enCoRe™ II</b> M8C MCU, 20 GPIOs SPI, 8KB Flash <b>CY7C64215 enCoRe III</b> M8C MCU, 50 GPIOs, ADC I <sup>2</sup> C/SPI, 16KB Flash <b>CY7C643xx enCoRe V</b> M8C MCU, 36 GPIOs, ADC I <sup>2</sup> C/SPI, 32KB Flash		<b>CY7C6521x USB-Serial</b> UART/SPI/I <sup>2</sup> C to USB 2 Channels, CapSense® <b>CY7C65213 USB-to-UART (Gen 2)</b> 3 Mbps, 8 GPIOs <b>CY7C65210/7 USB Billboard</b> ARM Cortex M0 1 or 2 UART/SPI/I <sup>2</sup> C channels	<b>SL811HS</b> FS USB Host/Device 256Byte RAM <b>CY7C67300 EZ-Host</b> 4 Ports, FS USB OTG 32 GPIOs <b>CY7C67200 EZ-OTG™</b> 2 Ports, FS USB OTG 25 GPIOs	<b>NEW CYPD270x Q218 CMG1</b> USB Type-C EMCA Controller 1 PD Port, Short Protection Type-C products apply to any USB speed

<sup>1</sup> Simultaneous USB 2.0 and SuperSpeed traffic on the same port  
<sup>2</sup> Battery Charging specification v1.2

<sup>3</sup> Enables USB charging without host connection  
<sup>4</sup> Camera Serial Interface v2.0

<sup>5</sup> Redundant array of independent disks  
<sup>6</sup> SD extended capacity

<sup>7</sup> Embedded Multimedia Card  
<sup>8</sup> Display Serial Interface  
<sup>9</sup> UTMI low-pin interface

Status Availability

Concept	Development	Sampling	Production
		QYY	QYY



# EZ-PD CCG2

## USB Type-C and PD Port Controller

### Applications

USB Type-C Electronically Marked Cabled Assembly (EMCA) and powered accessories

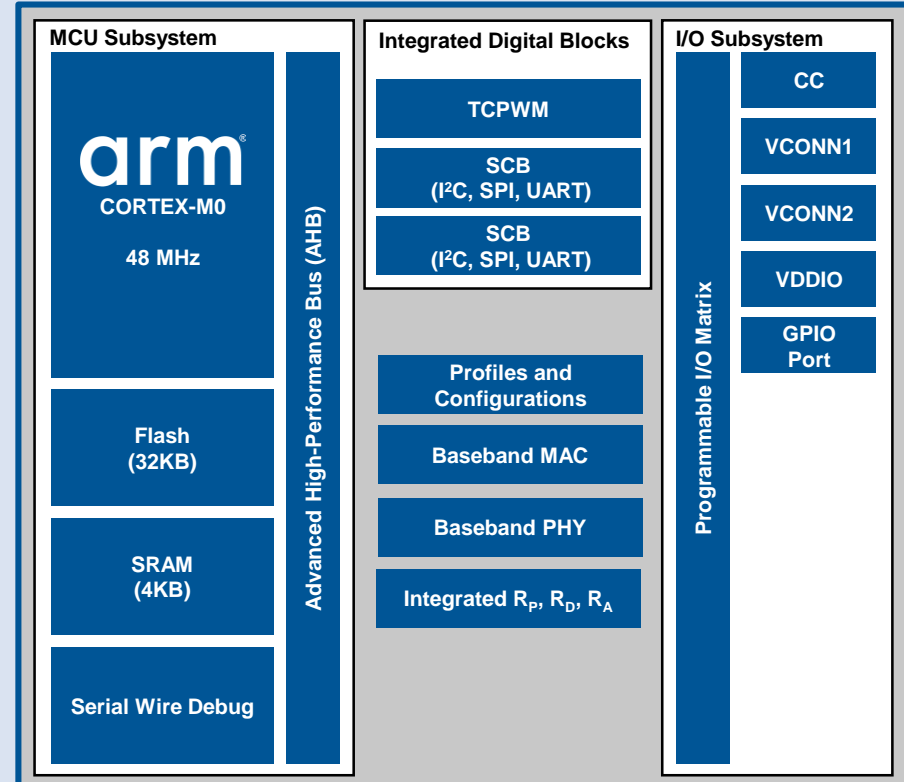
### Features

- **32-bit MCU Subsystem**
  - 48-MHz ARM® Cortex® -M0 CPU with 32KB Flash and 4KB SRAM
- **Integrated Digital Blocks**
  - Integrated timer/counter/pulse-width modulators (TCPWMs)
  - Two SCBs<sup>1</sup> configurable to I<sup>2</sup>C, SPI or UART modes
- **Type-C Support**
  - Integrated transceiver, supporting one Type-C port
  - Integrated termination resistors ( $R_P$ ,  $R_D$ ,  $R_A$ )<sup>2</sup>
- **Power Delivery (PD) Support**
  - Standard power profiles
- **Low-Power Operation**
  - Two independent  $V_{CONN}$  rails with integrated isolation
  - Independent supply voltage pin for GPIO
  - 2.7–5.5-V operation; Sleep: 2.0 mA; Deep Sleep: 2.5  $\mu$ A
- **System-Level ESD on CC and VDD Pins**
  - $\pm 8$ -kV Contact,  $\pm 15$ -kV Air Gap IEC61000-4-2 Level 4C
- **Packages**
  - 20-ball CSP (3.3 mm<sup>2</sup>) with 0.4-mm ball pitch, 14-pin DFN (2.5 x 3.5 mm) with 0.6-mm pin pitch and 24-pin QFN (4 mm<sup>2</sup>) with 0.55-mm pin pitch

### Collateral

**Datasheet:** [CCG2 Datasheet](#)  
**Reference Design Kit:** [CCG2 RDK](#)  
**Evaluation Kit:** [CCG3 EVK](#)

### CCG2: USB Type-C Port Controller With PD



### Availability

**Production:** Now

<sup>1</sup> Serial communication block configurable as UART, SPI or I<sup>2</sup>C

<sup>2</sup> Termination resistors:  $R_P$  read as a DFP,  $R_D$  as a UFP,  $R_A$  as an EMCA

# EZ-PD CCG3

## USB Type-C and PD Port Controller

### Applications

Accessories and power adapters

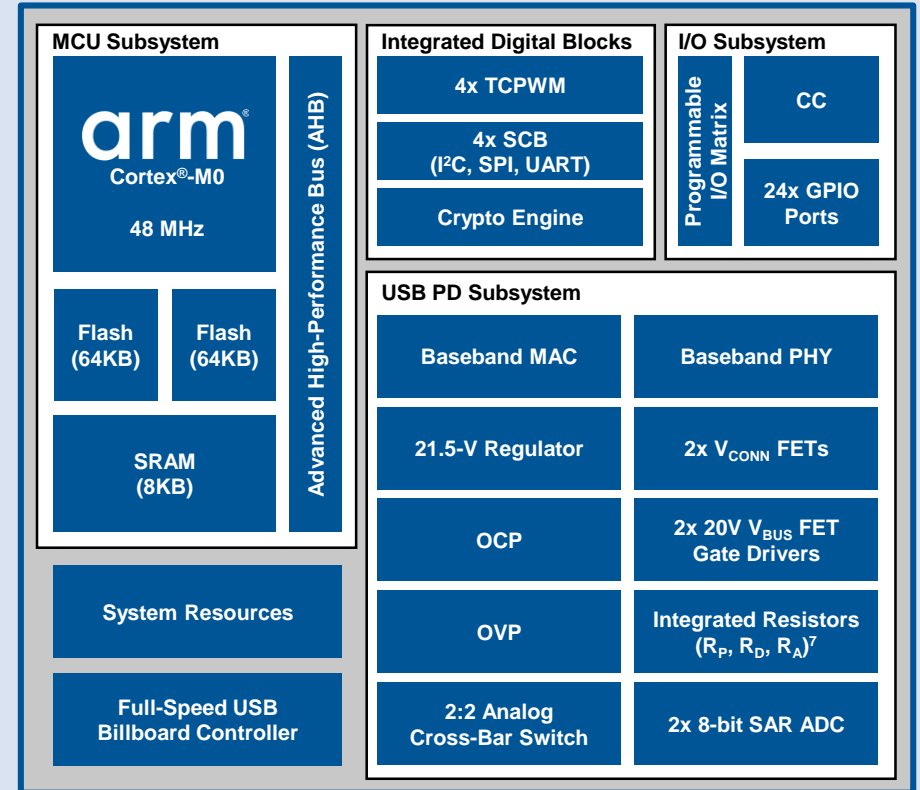
### Features

- **One Type-C Port with Integrated Transceiver**
  - Alternate Modes<sup>1</sup>, Crypto Engine<sup>2</sup> for USB Authentication<sup>3</sup>
- **Power Delivery (PD) Support for Standard Power Profiles**
- **Integrated Digital Blocks for  $V_{BUS}$  Power and MUX Interface**
  - 4 timers/counters/pulse-width modulators (TCPWM), 24x GPIOs
  - 4 serial communication blocks (SCBs) configurable as master/slave I<sup>2</sup>C, SPI or UART
  - USB Billboard Controller<sup>4</sup> with Billboard Device Class<sup>5</sup> support
- **Integrated Analog Blocks for Overvoltage (OVP) and Overcurrent Protection (OCP)**
  - 21.5-V OVP and OCP; 2:2 cross-bar switch
- **32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-M0 CPU with MCU Subsystem**
  - 2x64KB Flash for fail-safe updates over CC, I<sup>2</sup>C or USB interfaces
- **Low-Power Operation**
  - 2x  $V_{BUS}$  Gate Drivers<sup>6</sup>, for consumer and provider power paths
  - 2x high-voltage (5–21.5 V, 25 V, maximum)  $V_{BUS}$  voltage inputs
  - Sleep: 2.0 mA; Deep Sleep: 2.5  $\mu$ A with wake-on-I<sup>2</sup>C or wake-on-CC
- **System-Level ESD on CC/ $V_{CONN}$ ,  $V_{BUS}$ , and SBU Pins**
  - $\pm$ 8-kV Contact,  $\pm$ 15-kV Air Gap IEC61000-4-2 Level 4C
- **Packages**
  - 42-ball (8.38 mm<sup>2</sup>) CSP, 40-pin (36 mm<sup>2</sup>) QFN and 32-pin (25 mm<sup>2</sup>) QFN

### Collateral

Datasheet: [CCG3 Datasheet](#)

### CCG3: USB Type-C Port Controller



### Availability

Production: Now

<sup>1</sup> Mode of operation in which the data lines are repurposed to transmit non-USB data

<sup>2</sup> The encryption hardware and software required to implement USB Authentication

<sup>3</sup> A USB-IF specification that defines the authentication protocol for Type-C accessories

<sup>4</sup> A USB Device controller that informs the USB Host of the supported Alternate Modes

<sup>5</sup> A specification that defines the method for a USB Device to communicate the supported Alternate Modes

<sup>6</sup> Circuits to control the gates of external power Field-Effect Transistors (FETs) on  $V_{BUS}$  (5-20 V)

<sup>7</sup> Termination resistors:  $R_P$  read as a DFP,  $R_D$  as a UFP,  $R_A$  as an EMCA

# EZ-PD CCG4/4M

## Dual-Port USB Type-C and PD Port Controller

### Applications

Notebooks, tablets, monitors, docking stations

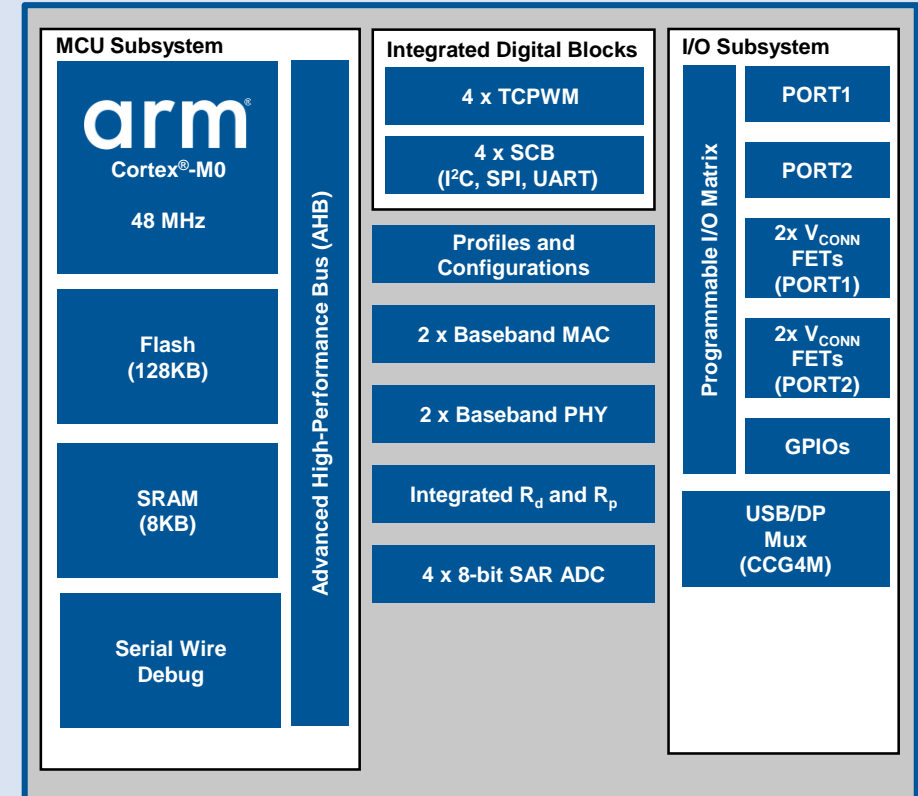
### Features

- **Integrated USB Type-C Transceivers Support Two Type-C Ports**
  - Integrated 2x 1-W  $V_{CONN}$  FETs and 2x FET control signals, per port programmable  $R_p$ <sup>1</sup> and removable  $R_p$ , and  $R_D$ <sup>2</sup> terminations
  - Supports dead battery mode operation
  - Integrated SuperSpeed USB/DisplayPort (DP) Mux (CCG4M)
- **Increased Flash Enables Fail-Safe Bootup**
  - Integrates 128KB Flash to store dual FW images for fail-safe boot
- **Integrated Digital Blocks for Inter-Chip Communications**
  - Four serial communication blocks (SCBs) master or slave configurable to I<sup>2</sup>C, SPI or UART
  - SCBs interconnect CCG4 with embedded controller, two alternate muxes and Thunderbolt controller (optional)
- **Integrated Blocks for Overvoltage (OVP) and Overcurrent Protection (OCP)**
  - Four 8-bit SAR ADCs configurable for OVP and OCP
- **Low-Power Operation**
  - 2.7–V to 5.5-V operation and independent supply voltage for GPIO; Sleep: 2.0 mA; Deep Sleep: 2.5  $\mu$ A with wake-on-I<sup>2</sup>C or wake-on-configuration channel (CC)
- **System-Level ESD on CC Pins**
  - $\pm$ 8-kV Contact,  $\pm$ 15-kV Air Gap IEC61000-4-2 Level 4C
- **32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-M0 CPU with MCU Subsystem**
  - 128KB Flash, upgradable over CC lines or I<sup>2</sup>C interface
- **Packages**
  - 40-pin QFN, 96-ball BGA (CCG4M)

### Collateral

Datasheet: [CCG4 Datasheet](#)

### CCG4/4M: USB Type-C Port Controller



### Availability

Production: Now

<sup>1</sup> Termination resistor read as a DFP

<sup>2</sup> Termination resistor read as a UFP

# EZ-PD CCG3PA

## USB Type-C and PD Port Controller

### Applications

Power adapters, chargers, power banks

### Features

- **Integrated Type-C and Power Delivery (PD) Transceiver**
  - Integrated high-voltage 30-V-tolerant LDO to power CCG3PA
  - Four timers/counters/pulse-width modulators (TCPWMs), 12x GPIOs
  - Two serial communication blocks (SCBs) for configurable master/slave I<sup>2</sup>C, SPI or UART
- **Integrated Analog**
  - Configurable V<sub>BUS</sub> overvoltage (OVP) and overcurrent (OCP) protection
  - Integrated error amplifier<sup>1</sup> with analog out for V<sub>BUS</sub> control
  - Low side current sense<sup>2</sup> capable of detecting 100mA change
  - Minimum 25-V-tolerant CC pins and FET control GPIOs
  - Two legacy charge-detect block (BC 1.2, Apple Charging 2.4A, QC 4.0 and Samsung AFC<sup>3</sup>)
- **32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-M0 CPU with 64KB Flash**
- **Low-Power Operation**
  - High-voltage (5–30 V, 30 V maximum) V<sub>BUS</sub> voltage inputs
  - Sleep: ~3.5 mA; Deep Sleep: 50 µA with wake-on-I<sup>2</sup>C or CC
- **System-Level ESD on CC / V<sub>CONN</sub>, V<sub>BUS</sub>, and SBU Pins**
  - ±8-kV Contact, ±15-kV Air Gap IEC61000-4-2 Level 4C
- **Packages**
  - 24-QFN (16 mm<sup>2</sup>), 16-SOIC (60 mm<sup>2</sup>)

### Collateral

Datasheet: [CCG3PA Datasheet](#)

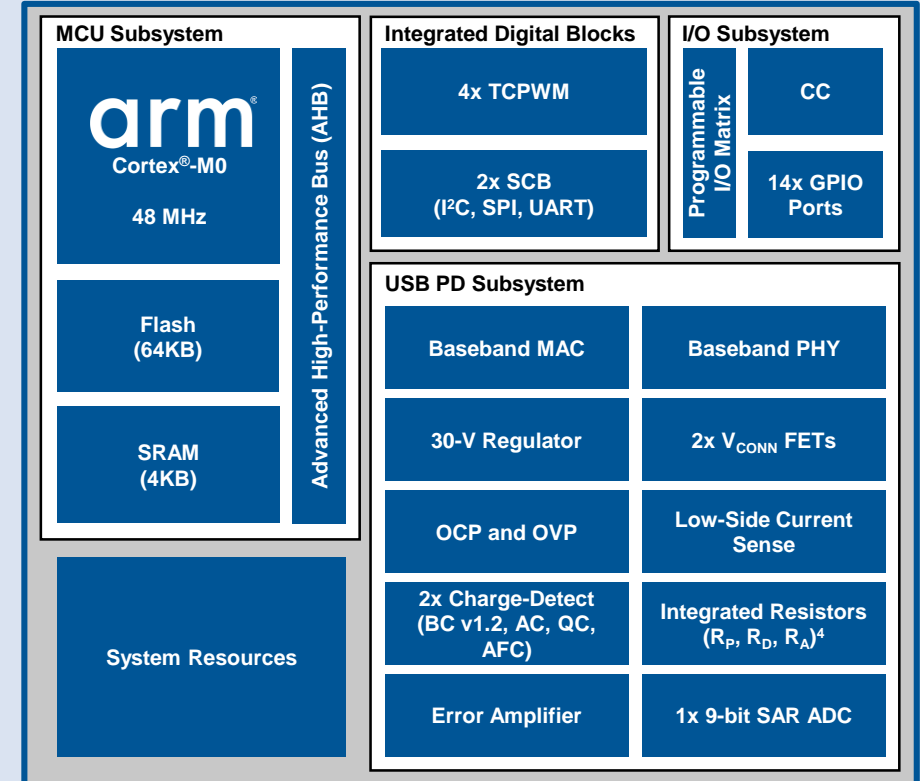
<sup>1</sup> Analog feedback voltage control circuit to control V<sub>BUS</sub>

<sup>2</sup> Circuit to measure the current flowing on the V<sub>BUS</sub>

<sup>3</sup> Adaptive Fast Charging

<sup>4</sup> Termination resistors: R<sub>p</sub> read as a DFP, R<sub>d</sub> as a UFP, R<sub>A</sub> as an EMCA

### CCG3PA: USB Type-C Port Controller



### Availability

Production: Now

# EZ-PD CCG5

## Dual-Port USB Type-C and PD Port Controller

### Applications

Notebooks, docks, Thunderbolt devices

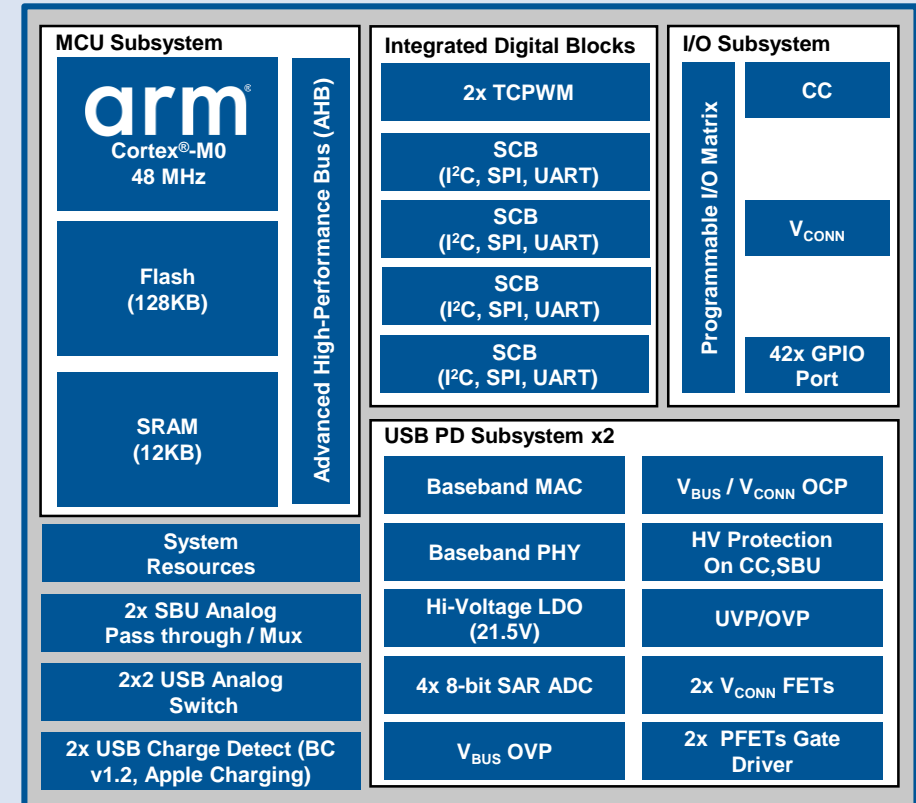
### Features

- **Integrated Type-C Transceiver for Two Type-C USB PD 3.0-Compliant Ports**
  - Support for Thunderbolt, DisplayPort (DP), HDMI Alt Mode and USB platforms
  - USC1<sup>1</sup>-compliant Interface with WHQL<sup>2</sup>-certified driver
  - Support for UEFI<sup>3</sup> driver with Microsoft capsule firmware download
- **Integrated Analog**
  - Integrated high-voltage LDO and 4x  $V_{CONN}$  FETs supporting up to 500 mA
  - Integrated 2x2 USB analog switch; integrated SBU analog pass with high-voltage tolerance
  - Integrated 2x USB Charger Detect (BC 1.2, Apple Charging, QC 4.0 and Samsung AFC<sup>4</sup>)
  - Integrated Type-C termination resistors ( $R_P$ ,  $R_D$ ,  $R_{DB}$ )<sup>5</sup>
  - 25-V tolerance on CC1/2 and SBU pins
- **ARM<sup>®</sup> Cortex<sup>®</sup>-M0 CPU with 128KB Flash and 12KB SRAM**
  - 4x serial communication blocks (SCB) - I<sup>2</sup>C, SPI or UART
  - Firmware upgradable over SWD/I<sup>2</sup>C interfaces
  - Supports Dead Battery mode operation
  - Overvoltage protection (OVP) with 2 $\mu$ s response time; integrated  $V_{BUS}/V_{CONN}$  overcurrent protection (OCP)
- **System-Level ESD on CC/ $V_{CONN}$ ,  $V_{BUS}$ , and SBU Pins**
  - $\pm 8$ -kV Contact,  $\pm 15$ -kV Air Discharge IEC61000-4-2 Level 4C
- **Packages**
  - 2-Port in 96-BGA (6 mm<sup>2</sup>), 1-Port in 40-QFN (6 mm<sup>2</sup>)

### Collateral

Datasheet: [CCG5 Datasheet](#)

### CCG5: USB Type-C Port Controller



### Availability

Production: Now

<sup>1</sup> USB Type-C Connector System Software Interface    <sup>2</sup> Windows Hardware Quality Labs    <sup>3</sup> Unified Extensible Firmware Interface    <sup>4</sup> Adaptive Fast Charging    <sup>5</sup> Termination resistors:  $R_P$  read as a DFP,  $R_D$  as a UFP,  $R_{DB}$  as UFP in Dead-Battery scenario

# EZ-PD CMG1

## USB Type-C Passive EMCA Controller

### Applications

USB-C EMCA

### Features

- USB-C PD Controller, PD 3.0 Transceiver
- $V_{BUS}$ -to-CC Short Protection
- $V_{BUS}$ -to- $V_{CONN}$  Short Protection
- Power from  $V_{CONN}$  Range 3.0–5.5-V
- Termination Resistor  $R_A$
- Supports  $R_A$  Weakening to Reduce Power Consumption
- Configurable 40-byte Storage for Configuration Over Type-C Interface
- Integrated Oscillator Eliminating the Need for External Clock
- Power Operation
  - 2.7–5.5-V operation ( $V_{CONN}$  pin)
  - Active: 7.5 mA
  - Sleep: 1 mA
- System-Level ESD on CC,  $V_{CONN}$  Pins
  - $\pm 8$ -kV contact,  $\pm 15$ -kV Air Gap IEC61000-4-2 level 4C
- Packages
  - 9-ball WLCSP (1.95 mm<sup>2</sup>)
  - Supports industrial temperature range (-40°C to +85°C)

### Collateral

Preliminary Datasheet: [CMG1 Datasheet](#)

### CMG1: Passive EMCA Controller

#### USB PD Subsystem

$V_{BUS}$ -to-CC  
Short Protection

$V_{BUS}$ -to- $V_{CONN1}$   
Short Protection,  
 $R_A$

$V_{BUS}$ -to- $V_{CONN2}$   
Short Protection,  
 $R_A$

EMCA Protocol Engine

USB Type-C Physical Layer

#### Storage

40-Byte Storage for  
Configuration

#### System Resources

Oscillator

Reset

VREF

IREF

### Availability

Samples: Now      Production: Q2 2018



# EZ-USB FX3

## USB 3.1 Gen 1 Peripheral Controller

### Applications

Industrial cameras, medical and machine vision cameras, 3-D and 1080p full HD and 4K Ultra HD (UHD) cameras, document and fingerprint scanners, videoconferencing and data acquisition systems, video capture cards and HDMI converters, protocol and logic analyzers, USB test tools and software-designed radios (SDRs)

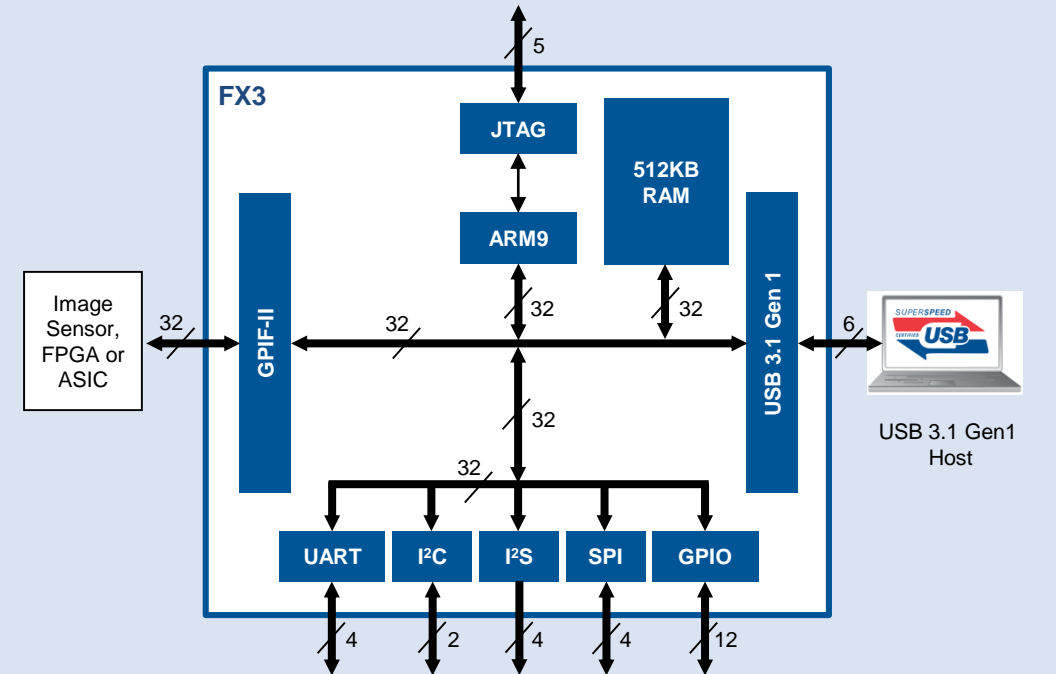
### Features

- **USB 3.1 Gen 1-Compliant Peripheral Controller**
  - USB-IF-certified (TID: 340800007)
  - Up to 32 USB endpoints
- **Fully Accessible 32-bit, 200-MHz ARM® 926EJ Core**
  - 512KB of embedded SRAM for code space and buffers
- **32-bit, 100-MHz, flexible GPIF II Interface**
  - Other peripheral interfaces such as I<sup>2</sup>C, I<sup>2</sup>S, UART, SPI and 12 GPIOs
  - Unused I/O pins can be used as GPIOs
  - 19.2-MHz crystal or 19.2-MHz, 26-MHz, 38.4-MHz and 52-MHz clock input
- **Flexible Clock Options**
- **Packages**
  - 121-ball BGA (10 mm<sup>2</sup>), 131-ball WLCSP (4.7 x 5.1 mm)

### Collateral

**Datasheet:** [FX3 Datasheet](#)  
**Development Kit:** [FX3 SuperSpeed Explorer Kit](#)  
**Software Development Kit:** [EZ-USB FX3 SDK](#)

### FX3: USB 3.1 Gen 1 Peripheral Controller



### Availability

**Production:** Now

# EZ-USB FX3S

## USB 3.1 Gen 1 RAID<sup>1</sup>-on-Chip

### Applications

Servers, routers, mobile storage, USB Flash drives, POS terminals, automatic teller machines (ATM), SDIO expanders and data logging devices

### Features

- **USB 3.1 Gen 1-Compliant Peripheral Controller**
  - USB-IF-certified (TID: 340800007)
  - Up to 32 USB endpoints
- **Fully Accessible 32-bit, 200-MHz ARM<sup>®</sup> 926EJ Core**
  - 512KB of embedded SRAM for code space and buffers
- **32-bit, 100-MHz, Flexible GPIF II Interface**
  - Other peripheral interfaces such as I<sup>2</sup>C, I<sup>2</sup>S, UART, SPI and 12 GPIOs
  - Unused I/O pins can be used as GPIOs
- **Two SDXC<sup>2</sup>, eMMC<sup>3</sup> 4,4, or SDIO 3.0 Interfaces**
  - Support RAID0 or RAID1 configurations
- **Flexible Clock Options**
  - 19.2-MHz crystal or 19.2-MHz, 26-MHz, 38.4-MHz and 52-MHz clock input
- **Packages**
  - 121-ball BGA (10 mm<sup>2</sup>), 131-ball WLCSP (4.7 x 5.1 mm)

### Collateral

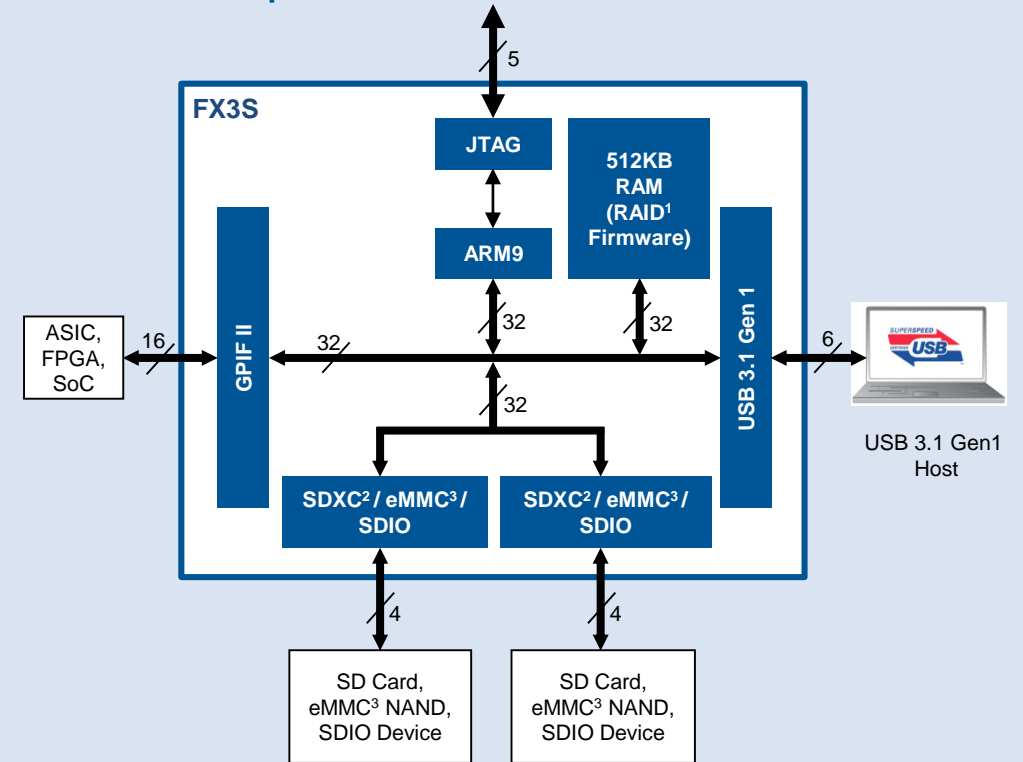
**Datasheet:** [FX3S Datasheet](#)  
**Kit:** [FX3S RAID<sup>1</sup>-on-Chip Boot Disk Kit](#)  
**Software Development Kit:** [EZ-USB FX3 SDK](#)

<sup>1</sup> Redundant array of independent disks

<sup>2</sup> SD extended capacity

<sup>3</sup> Embedded Multimedia Card

### FX3S: RAID<sup>1</sup>-on-Chip



### Availability

**Production:** Now

# EZ-USB CX3

## MIPI<sup>1</sup> CSI-2 to USB 3.1 Gen 1 Bridge

### Applications

Industrial, medical and machine vision cameras, 1080p full HD and 4K Ultra HD (UHD) cameras, document scanners, fingerprint scanners, game consoles, videoconferencing systems, notebook PCs, tablets and image acquisition systems

### Features

- **USB 3.1 Gen 1-Compliant Peripheral Controller**
  - Up to 32 USB endpoints
- **Fully Accessible 32-bit, 200-MHz ARM<sup>®</sup> 926EJ core**
  - 512KB of embedded SRAM for code space and buffers
- **Four-Lane MIPI<sup>1</sup> Camera Serial Interface v2.0 (CSI-2) Input**
  - Camera Control Interface (CCI) for image sensor configuration
  - Other peripheral interfaces such as I<sup>2</sup>C, UART, SPI and 12 GPIOs
- **Supports Industry-Standard Video Data Formats**
  - RAW8/10/12/14<sup>2</sup>, YUV422/444<sup>3</sup>, RGB888/666/565<sup>4</sup>
- **Supports Uncompressed Streaming Video**
  - 4K UHD at 15 fps, 1080p at 30 fps, 720p at 60 fps
- **Packages**
  - 121-ball BGA (10 x 10 x 1.7 mm)

### Collateral

**Datasheet:** [CX3 Datasheet](#)  
**Reference Design Kit:** [CX3 Reference Design Kit](#)  
**Software Development Kit:** [EZ-USB FX3 SDK](#)

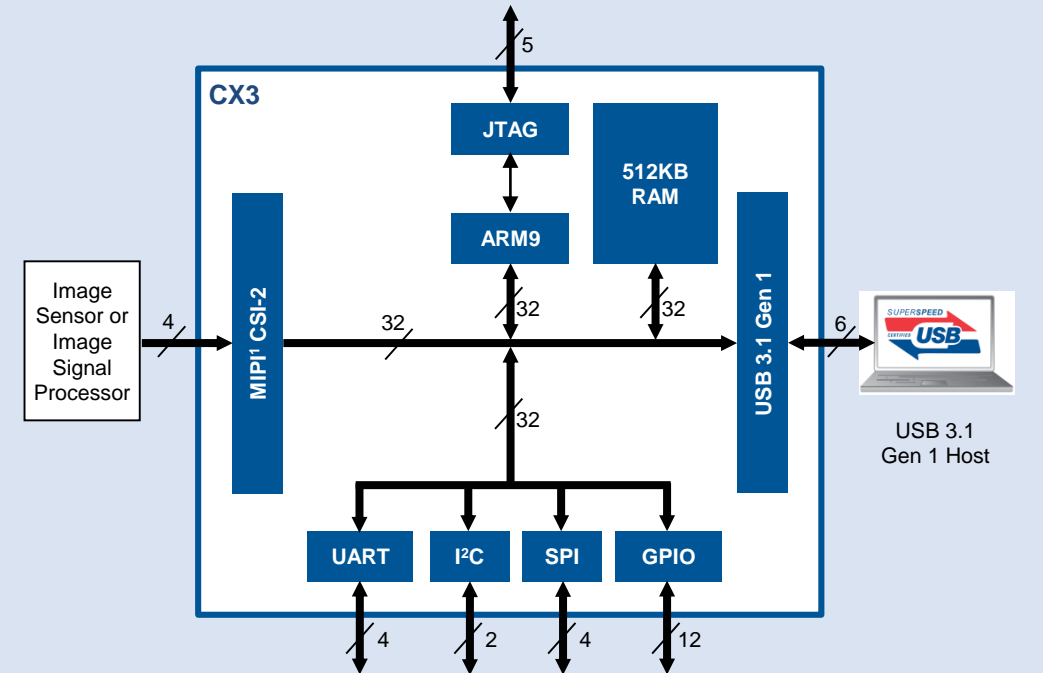
<sup>1</sup> Mobile Industry Processor Interface

<sup>3</sup> Video format for luminance and chrominance components

<sup>2</sup> Video format for raw video data

<sup>4</sup> Video format for red, green and blue pixel components

### CX3: MIPI<sup>1</sup> CSI-2 to USB 3.1 Gen 1 Bridge



### Availability

**Production:** Now

# EZ-USB GX3

## USB 3.1 Gen 1 to GigE<sup>1</sup> Bridge

### Applications

USB dongles, docking stations and port replicators, network printers and security cameras, ultrabooks and home gateways, game consoles and portable media players, DVRs, IP set-top boxes and IP TVs and other embedded systems

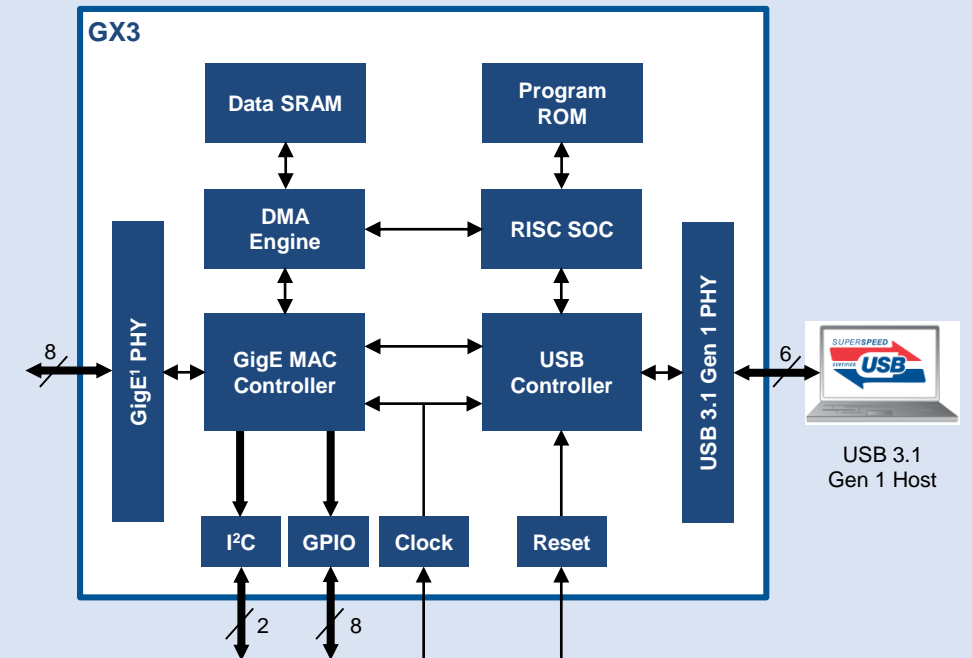
### Features

- **One-Chip USB 3.1 Gen 1 to 10/100/1000M GigE Bridge**
  - Integrates USB 3.1 Gen 1 PHY and GigE PHY
  - Integrates USB 3.1 Gen 1 Controller and GigE MAC<sup>2</sup>
  - Needs only a 25-MHz crystal to drive both USB and GigE1 PHY
- **IEEE 802.3az<sup>3</sup> Support for Low-Power Idle State**
  - Supports dynamic cable length and power adjustment
  - Offers multiple power management wake-on-LAN<sup>4</sup> features
- **Supports Optional EEPROM to Store USB Descriptors**
  - Integrates on-chip power-on-reset (POR) circuitry
- **Packages**
  - 68-QFN (8 x 8 x 0.85 mm)

### Collateral

**Datasheet:** [GX3 Datasheet](#)  
**Reference Design Kit:** [GX3 Reference Design Kit](#)  
**Software & Drivers:** [GX3 Drivers](#)

### GX3: USB 3.1 Gen 1 to GigE<sup>1</sup> Bridge



### Availability

**Production:** Now

<sup>1</sup> Gigabit Ethernet

<sup>2</sup> Media access controller that provides the address to an Ethernet node

<sup>3</sup> A new-energy efficient Ethernet standard

<sup>4</sup> An Ethernet standard that allows a computer to be turned on by a network message

# EZ-USB HX3

## USB 3.1 Gen 1 Hub

### Applications

Docking stations for notebook PCs and tablets, PC motherboards, servers, televisions and monitors, retail hub boxes, printers and scanners, set-top boxes, home gateways, routers and game consoles

### Features

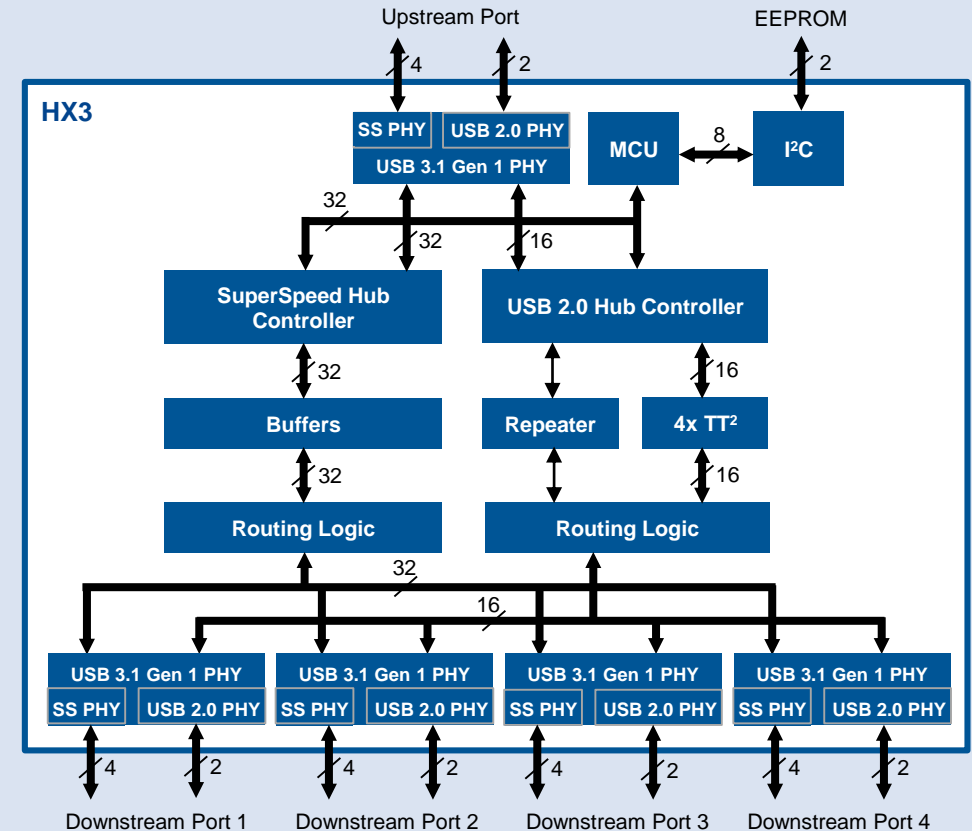
- **USB 3.1 Gen 1-Compliant Four-Port Hub Controller**
  - USB-IF certified (Test ID: 330000047)
  - WHQL certified for Windows 7, Windows 8, Windows 8.1
- **Shared Link™**
  - Supports simultaneous USB 2.0 and USB SuperSpeed (SS) devices on the same port
- **Ghost Charge™**
  - Enables USB charging while the hub is disconnected from a USB Host
- **Charging Standard support**
  - USB-IF Battery Charging (BC) v1.2, Apple Charging Standard
  - Charging an OTG Host in an ACA-Dock
- **Programming of External EEPROM via USB**
- **Configurable USB SS and USB 2.0 PHY (drives 11" trace)**
- **Packages**
  - 68-QFN (8 x 8 x 1.0 mm), 88-QFN (10 x 10 x 1.0 mm), 100-BGA (6 x 6 x 1.0 mm)

### Collateral

**Datasheet:** [HX3 Datasheet](#)  
**Kit:** [CY4609](#), [CY4603](#), [CY4613](#)  
**Configuration Utility:** [Blaster Plus](#)<sup>1</sup>  
**App Notes:** [HX3 Hardware Design Guide \(AN91378\)](#)

<sup>1</sup> A Cypress GUI-based PC application for setting HX3 configuration parameters <sup>2</sup> Transaction translator

### HX3: USB 3.1 Gen 1 Hub



### Availability

**Production:** Now

# EZ-USB HX3C

## USB 3.1 Gen 1 Type-C PD Hub

### Applications

USB Type-C charging hubs, adapters and accessories, docking stations for notebook PCs and tablets, televisions and monitors, PC motherboards and servers, set-top boxes, home gateways and routers

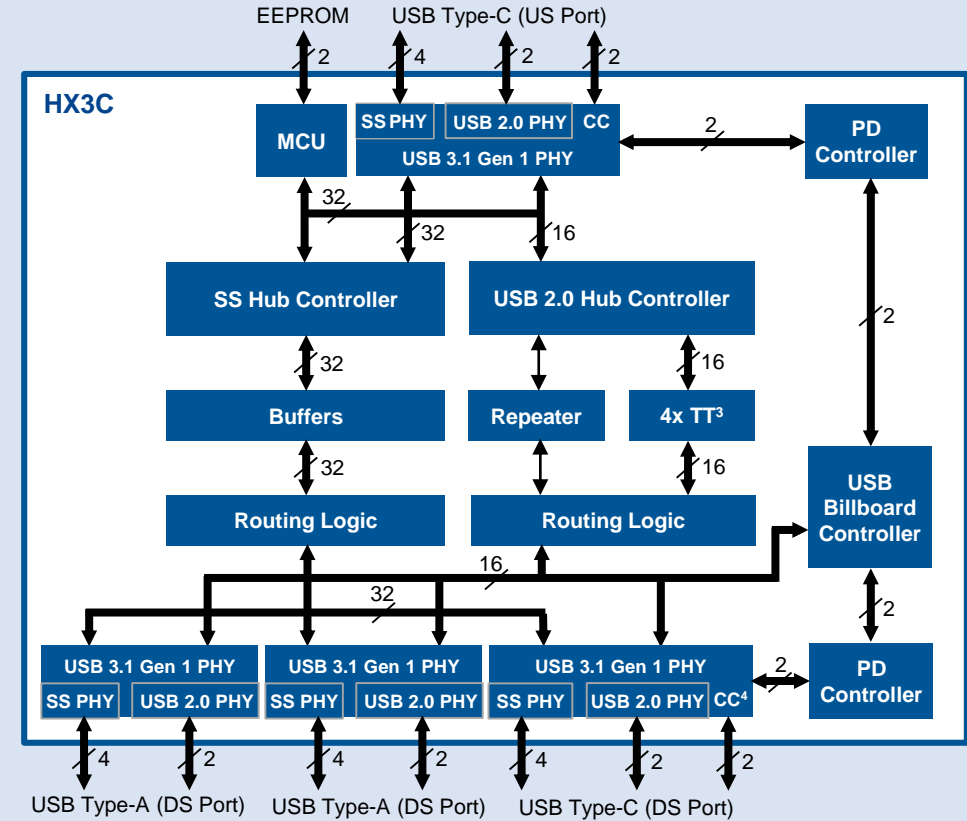
### Features

- **USB 3.1 Gen 1-Compliant Hub Controller with Type-C and PD**
  - Upstream (US): Type-C, Downstream (DS): 1 Type-C and 2 Type-A ports
- **Integrated Type-C Transceivers, Supporting Two Type-C Ports**
  - Integrated termination resistors ( $R_P$  and  $R_D$ )<sup>1</sup>
  - Integrated USB Billboard Controller<sup>2</sup>
- **Charging Support**
  - USB PD, BC v1.2, Apple Charging Standard
  - PD policy engine configures power profiles dynamically
- **Ghost Charge™**
  - Charging DS without US connection
- **Firmware Upgradable Over USB**
- **System-Level ESD on Configuration Channel (CC) Pins**
  - 8 kV Contact, 15 kV Air
- **Configurable USB SS and USB 2.0 PHY (drives 11" trace)**
- **Packages**
  - 121-ball BGA (10 mm x 10 mm, 0.8 mm ball-pitch)

### Collateral

**Datasheet:** [HX3C Datasheet](#)  
**Reference Design:** [HX3C Type-C Monitor/Dock Reference Design](#)

### HX3C: USB 3.1 Gen 1 Type-C PD Hub



### Availability

**Production:** Now

<sup>1</sup> Termination resistors:  $R_P$  read as a DFP,  $R_D$  as a UFP <sup>2</sup> A USB Device controller that is used to implement the USB Billboard Device Class <sup>3</sup> Transaction Translator  
Informs the USB Host of the supported Alternate Modes as well as any failures

# EZ-USB HX3PD

## USB 3.1 Gen 2 Type-C Hub with Power Delivery

### Applications

Notebook/tablet docking stations, monitor docks, multi-function USB Type-C peripherals

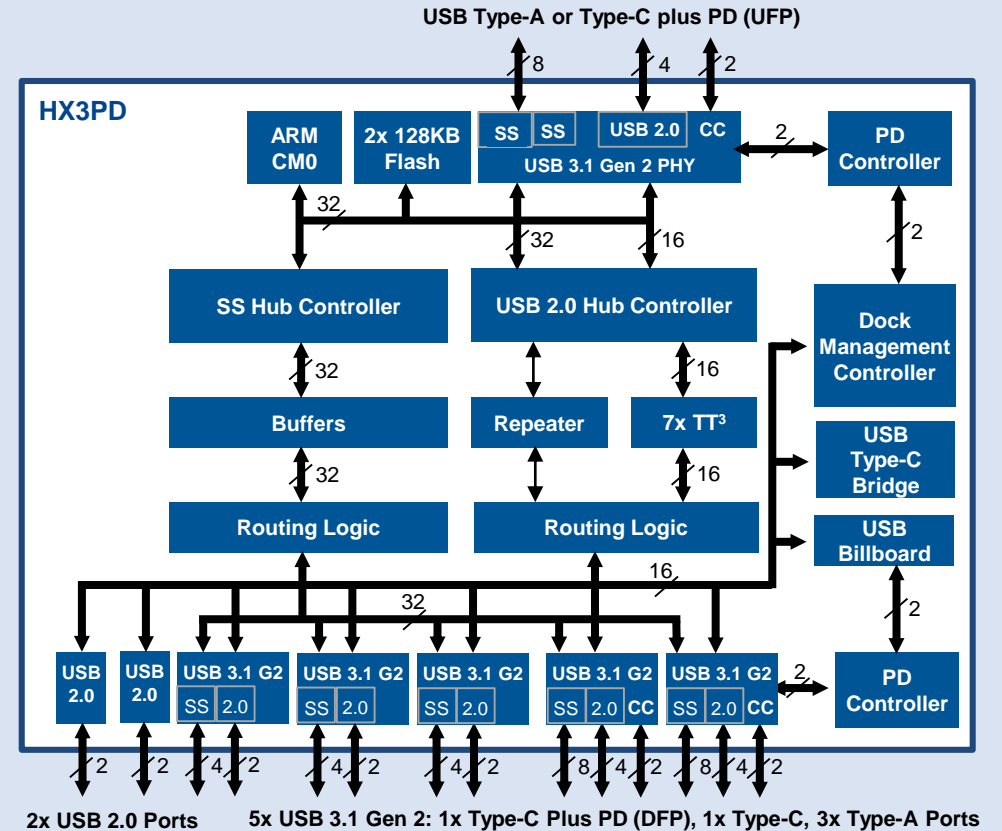
### Features

- **USB 3.1 Gen 2-Compliant Hub Controller with Type-C and PD**
- **Upstream (US) ports:**
  - 10 Gbps; Type-A or Type-C plus PD (UFP)
- **Downstream (DS) ports:**
  - 7 ports: 5x 10 Gbps, 2x 480 Mbps
  - 2 Type-C ports: 1 PD port (DFP), 1 Type-C only
- **Integrated Type-C Transceivers and Dual-PHY for Type-C plug orientation correction**
  - Integrated termination resistors ( $R_P$  and  $R_D$ )<sup>1</sup>
  - Integrated USB Billboard Controller<sup>2</sup>, USB Type-C Bridge Controller
  - Integrated  $V_{CONN}$  FETs and ADC for overvoltage and overcurrent protection
- **Charging Support**
  - USB PD, BC v1.2, Apple Charging Standard, QC 4.0, Samsung AFC
  - USB PD policy engine configures power profiles dynamically
- **Ghost Charge™:** Charging DS without US connection
- **Dock Management Controller for secured firmware download**
  - Firmware upgradable over USB
- **System-Level ESD on Configuration Channel (CC) Pins:** 8 kV Contact, 15 kV Air
- **Package:** 192-ball BGA (12 mm x 12 mm x 1 mm, 0.8-mm ball-pitch)

### Collateral

**Datasheet:** [HX3PD Datasheet](#)  
**Kit:** [HX3PD Evaluation Kit](#)

### HX3PD: USB 3.1 Gen 1 Type-C PD Hub



### Availability

**Samples:** Q1 2018      **Production:** Q3 2018

<sup>1</sup> Termination resistors:  $R_P$  read as a DFP,  $R_D$  as a UFP    <sup>2</sup> A USB Device controller that is used to implement the USB Billboard Device Class    <sup>3</sup> Transaction Translator  
Informs the USB Host of the supported Alternate Modes as well as any failures



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