

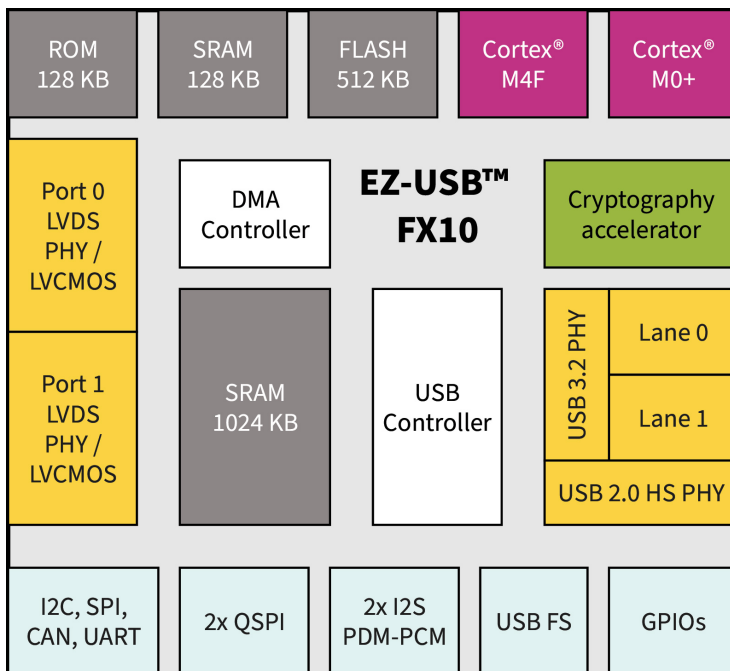
EZ-USB™ FX10

USB 10Gbps peripheral controller

USB 10Gbps to high-bandwidth LVDS/LVCMOS data interface with dual-core ARM® Cortex® CPU and direct USB-C support

Infineon's EZ-USB™ FX10 extends the legacy of EZ-USB™ FX3, the industry's gold standard for USB peripheral controller, to the next level with the latest ultra-fast USB 10Gbps and LVDS interfaces increasing the total bandwidth up to 3x than its predecessor.

The EZ-USB™ FX10 is a family of USB 10Gbps peripheral controllers targeting the next-generation USB applications in camera, video, imaging, and data acquisition markets. EZ-USB™ FX10 consists of dual ARM® Cortex®-M4 and M0+ core CPUs, a 512 KB flash, an 128 KB SRAM, an 128 KB ROM, seven serial communication blocks (SCBs), a cryptography accelerator, and a high bandwidth data subsystem providing DMA data transfers between LVDS/ LVCMOS and USB ports at speeds up to 10Gbps. An additional 1 MB SRAM is included in the high bandwidth data subsystem to provide buffering for USB data. EZ-USB™ FX10 also supports USB Type-C plug orientation detection and flip-mux function without the need for external logic.



Key features

USB 3.2 Gen2 device port

- Integrated PHY: 10Gbps, 5Gbps, 480 Mbps
- USB-C plug orientation detection and correction

Dual-core CPU

- 150 MHz ARM® Cortex®-M4F
- 100 MHz ARM® Cortex®-M0+

Memory subsystem

- 512 KB flash
- 1024 KB + 128 KB SRAM

Dual mode high bandwidth data interface

- LVDS / SubLVDS: up to 16 RX data lanes @1.25 Gbps
- LVCMOS: up to 32-bit data bus @ 160 MHz DDR RX

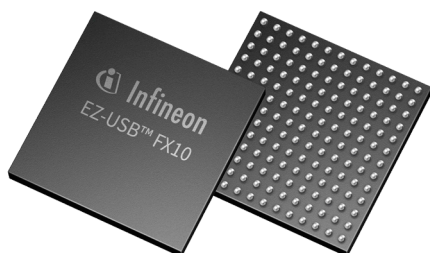
Peripheral I/O ports

- 2x Quad-SPI (QSPI)
- 7 serial communication blocks (I2C, SPI, CAN, UART)
- USB full-speed (12 Mbps) device
- 2x I2S/PDM-PCM and GPIOs

Cryptography accelerator

Package

- 10 mm x 10 mm, 169-ball, 0.75 mm ball pitch

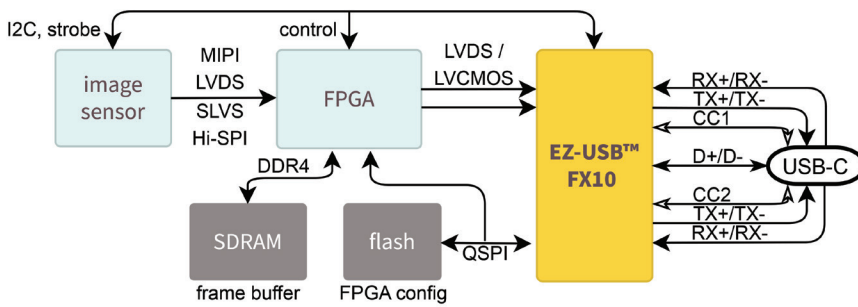


PRODUCT BRIEF

Application example: machine vision camera

The ultra-fast 10Gbps performance allows uncompressed 4K videos to be transmitted at 60 frame-per-second. Both USB 10Gbps lanes of EZ-USB™ FX10 can be connected directly to a USB-C receptacle without a mux.

The controller can automatically detect the plug orientation, transfer data to the active lane, and correct the polarity of each USB 10Gbps differential pair. An FPGA is connected between a high-speed image sensor and EZ-USB™ FX10 to perform image acquisition and processing, and transfers images to the controller via LVDS or LVCMOS connection. For LVDS mode, each lane can support up to 1.25 Gbps. For LVCMOS mode, the 32-bit data bus can deliver 10Gbps throughput with DDR clocking. EZ-USB™ FX10 DMA fabric allows maximum USB 10Gbps bandwidth to be used with auto header and trailer insertion.



Key benefits

- 300% performance improvement from predecessor
- Smaller PCB footprint and optimized BOM cost
 - 10X10 BGA package
 - USB-C direct connection without a high-speed signal mux
- Integrated FLASH
- Quick start development
 - Firmware jumpstart with configuration utility
 - USB Video Class, UVC, firmware ready
 - USB3 Vision firmware ready
 - DVK with standard FMC for quick connection to FPGA boards
- All-in-one programming and debugging accessory board
- Application notes for hardware and software

EZ-USB™ FX10 part detail

Part number	USB-C	LVDS	LVCMOS	QSPI	Crypto	FLASH [KB]	SRAM [KB]
CYUSB4011-BZXI	✓	✓	✓			n/a	1024
CYUSB4012-BZXI			✓			256	512
CYUSB4013-BZXI	✓	✓	✓	✓		512	1024
CYUSB4014-BZXI	✓	✓	✓	✓	✓	512	1024



www.infineon.com

Published by
Infineon Technologies AG
Am Campeon 1-15, 85579 Neubiberg
Germany

© 2023 Infineon Technologies AG
All rights reserved.

Public

Date: 10/2023

Please note!

This Document is for information purposes only and any information given herein shall in no event be regarded as a warranty, guarantee or description of any functionality, conditions and/or quality of our products or any suitability for a particular purpose. With regard to the technical specifications of our products, we kindly ask you to refer to the relevant product data sheets provided by us. Our customers and their technical departments are required to evaluate the suitability of our products for the intended application.

We reserve the right to change this document and/or the information given herein at any time.

Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office (www.infineon.com).

Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.