

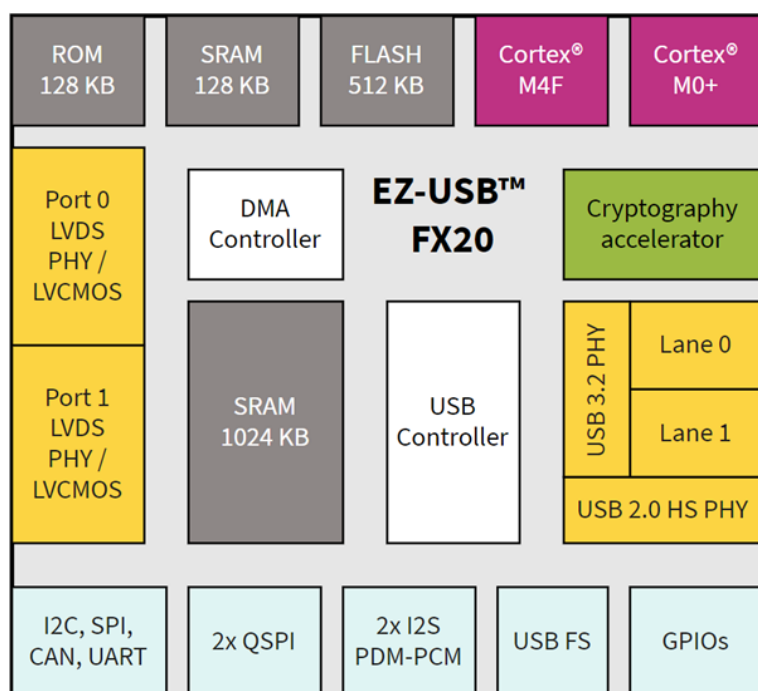
EZ-USB™ FX20

USB 20Gbps peripheral controller

USB 20Gbps to high-bandwidth LVDS/LVCMOS data interface with dual-core ARM® Cortex® CPU

Infineon's EZ-USB™ FX20 extends the legacy of EZ-USB™ FX3, the industry's gold standard for USB peripheral controller, with faster GPIF and LVDS interfaces increasing the total bandwidth to max out USB 20Gbps.

The EZ-USB™ FX20 is a general-purpose peripheral controllers capable of transferring data over two lanes of 10 Gbps pipes from an existing USB-C cable providing 20 Gbps total bandwidth for the new-generation USB applications in camera, video, imaging, and data acquisition markets. EZ-USB™ FX20 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 20Gbps. An additional 1 MB SRAM is included in the high bandwidth data subsystem to provide buffering for USB data.



Key features

USB 3.2 Gen 2 x2 device port

- Integrated PHY: 20 Gbps (10 Gbps x2), 10 Gbps, 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

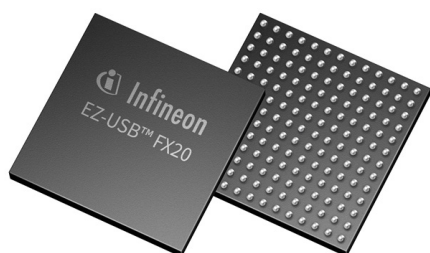
Peripheral I/O ports

- 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

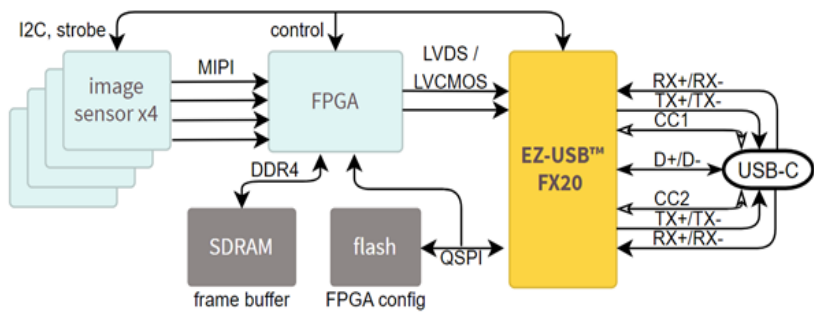
- 10 mm x 10 mm, 169-ball, 0.75 mm ball pitch



PRODUCT BRIEF

Application example: machine vision camera

The 20 Gbps performance allows four uncompressed 4K video streams to be transmitted at 120 frame-per-second. Both USB 10Gbps lanes of EZ-USB™ FX20 can be connected directly to a USB-C cable which can support all data transfer combinations including Gen 2x2 (20 Gbps), Gen 2x1 (10 Gbps), Gen 1x2 (10 Gbps) and Gen 1x1 (5 Gbps). The controller can automatically detect the plug orientation, transfer data to the active lane or both lanes, and correct the polarity of each USB 10Gbps differential pair. An FPGA is connected between four high-speed image sensors and EZ-USB™ FX20 to perform image acquisition and processing, and transfers images to the controller via LVDS or LVC MOS connection. For LVDS mode, each lane can support up to 1.25 Gbps for total of 20 Gbps bandwidth. For LVC MOS mode, the 32-bit data bus can deliver 10 Gbps throughput with DDR clocking. EZ-USB™ FX20 DMA fabric allows maximum USB 20Gbps bandwidth to be used with auto header and trailer insertion.



Key benefits

- 600% 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™ FX20 part detail

Part number	USB-C	LVDS	LVC MOS	QSPI	Crypto	FLASH [KB]	SRAM [KB]
CYUSB4022	✓	✓				512	1024
CYUSB4024	✓	✓	✓	✓	✓	512	1024



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