



## FZ3 Card Overview



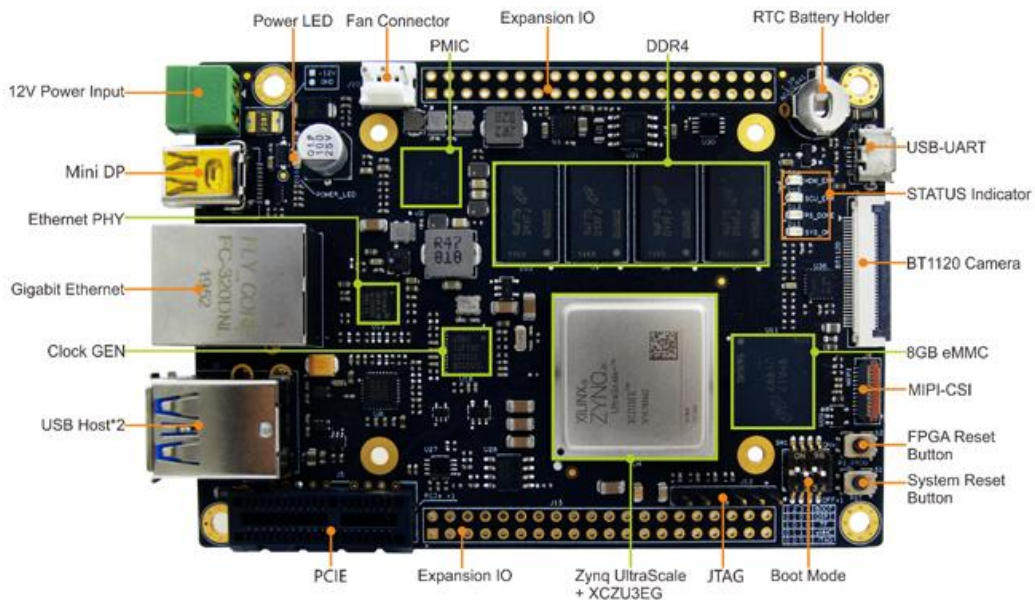
- ✓ Xilinx Zynq UltraScale+ ZU3EG MPSoC based on 1.2 GHz Quad Arm Cortex-A53 and 600MHz Dual Cortex-R5 Cores
- ✓ 4GB DDR4 SDRAM (64-bit, 2400MHz)
- ✓ 8GB eMMC Flash, 32MB QSPI Flash, 32KB EEPROM
- ✓ USB 2.0, USB 3.0, Gigabit Ethernet, TF, DisplayPort (DP), PCIe, MIPI-CSI, BT1120, USB-UART, JTAG...
- ✓ Computing Power up to 1.2TOPS, MobileNet up to 100FPS
- ✓ Ready-to-Run PetaLinux 2020.1
- ✓ Supports Xilinx Vitis Software Development Platform
- ✓ Supports Baidu's PaddlePaddle Deep Learning AI Framework



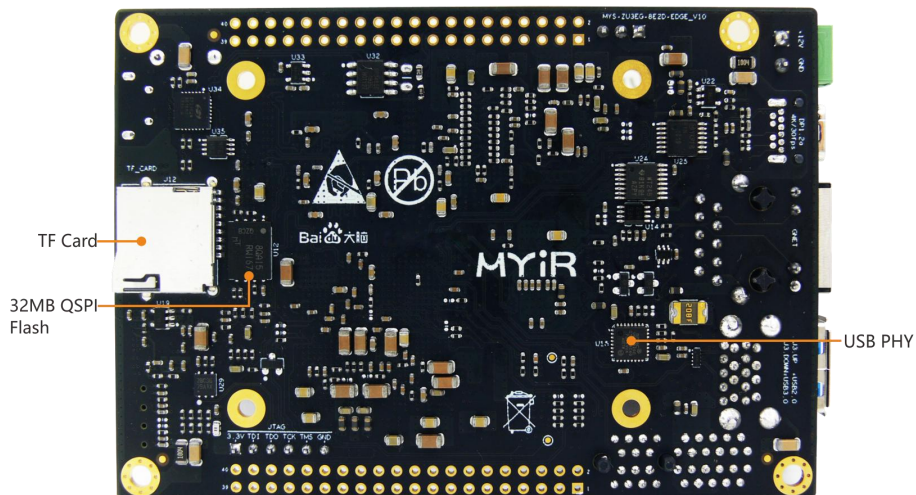
The **FZ3 Card** is a powerful deep learning accelerator card based on **Xilinx Zynq UltraScale+ ZU3EG MPSoC** which features a 1.2 GHz quad-core ARM Cortex-A53 64-bit application processor, a 600MHz dual-core real-time ARM Cortex-R5 processor, a Mali400 embedded GPU and rich FPGA fabric. Besides, it integrates **4GB DDR4, 8GB eMMC, 32MB QSPI Flash and 32KB EEPROM** as well as many peripherals including **USB 2.0, USB 3.0, Gigabit Ethernet, TF, DisplayPort (DP), PCIe interface, MIPI-CSI, BT1120 camera, USB-UART, JTAG, IO expansion interfaces, etc.** The rich resources enable users to integrate intelligent hardware easily.

The **FZ3 Card** is able to run **PetaLinux 2020.1** and provided complete BSP. It can support **Xilinx Vitis Software development platform**. It can also support **PaddlePaddle deep learning AI framework** which is fully compatible to use **Baidu Brain's AI development tools like EasyDL, AI Studio and EasyEdge** to enable developers and engineers to quickly leverage Baidu-proven technology or deploy self-defined models, enabling faster deployment. Typical applications are AI camera, AI computing device, robotics, intelligent car, intelligent electronic scale, patrol UAV and other embedded intelligent applications.

MYIR provides **FZ3 Kit** which contains the **FZ3 Card** with installed radiator and some necessary accessories including one power adaptor, one 16GB TF card, one mini USB cable and one mini DP to HDMI cable. It helps users start their development rapidly when getting the kit out-of-box right away.



*FZ3 Card Top-View*



*FZ3 Card Bottom-View*



Get Started with FZ3 Kit - Deep Learning

FZ3 Kit

### Hardware Specification

Zynq® UltraScale+™ MPSoC devices provide 64-bit processor scalability while combining real-time control with soft and hard engines for graphics, video, waveform, and packet processing. Built on a common real-time processor and programmable logic equipped platform, three distinct variants include dual application processor (CG) devices, quad application processor and GPU (EG) devices, and video codec (EV) devices.

	CG Devices	EG Devices	EV Devices
Application Processor	Dual-core ARM® Cortex™-A53 MPCore™ up to 1.3GHz	Quad-core ARM Cortex-A53 MPCore up to 1.5GHz	Quad-core ARM Cortex-A53 MPCore up to 1.5GHz
Real-Time Processor	Dual-core ARM Cortex-R5 MPCore up to 533MHz	Dual-core ARM Cortex-R5 MPCore up to 600MHz	Dual-core ARM Cortex-R5 MPCore up to 600MHz
Graphics Processor		Mali™-400 MP2	Mali™-400 MP2
Video Codec			H.264 / H.265
Programmable Logic	103K–600K System Logic Cells	103K–1143K System Logic Cells	192K–504K System Logic Cells
Applications	<ul style="list-style-type: none"> <li>• Sensor Processing &amp; Fusion</li> <li>• Motor Control</li> <li>• Low-cost Ultrasound</li> <li>• Traffic Engineering</li> </ul>	<ul style="list-style-type: none"> <li>• Flight Navigation</li> <li>• Missile &amp; Munitions</li> <li>• Military Construction</li> <li>• Secure Solutions</li> <li>• Networking</li> <li>• Cloud Computing Security</li> <li>• Data Center</li> <li>• Machine Vision</li> <li>• Medical Endoscopy</li> </ul>	<ul style="list-style-type: none"> <li>• Situational Awareness</li> <li>• Surveillance/Reconnaissance</li> <li>• Smart Vision</li> <li>• Image Manipulation</li> <li>• Graphic Overlay</li> <li>• Human Machine Interface</li> <li>• Automotive ADAS</li> <li>• Video Processing</li> <li>• Interactive Display</li> </ul>

Zynq UltraScale+ MPSoCs

The Zynq UltraScale+ family provides footprint compatibility to enable users to migrate designs from one device to another. Any two packages with the same footprint identifier code (last letter and number sequence) are footprint compatible. MYiR is using the **XCZU3EG-1SFVC784I** MPSoC for FZ3 CARD by default, the C784 package covers the widest footprint compatibilities that enable users to select devices among CG, EG and EV.





The FZ3 Deep Learning Accelerator Card takes full advantages of the Xilinx Zynq UltraScale+ ZU3EG MPSoC. The main features are listed in below table.

Item	Features
SoC	Xilinx Zynq UltraScale+ XCZU3EG-1SFVC784I (ZU3EG, 784 Pin Package) MPSoC - 1.2 GHz 64 bit Quad-core ARM® Cortex™-A53 - 600MHz Dual-core ARM® Cortex™-R5 processor - ARM Mali™-400MP Graphics Processor - 16nm FinFET+ FPGA fabric
Memory	4GB DDR4 SDRAM (64bit, 2400MHz)
Storage	8GB eMMC 32MB QSPI Flash 32KB EEPROM TF card interface
Communications	1 x PCIe 2.1 interface (1-lane) 1 x 10/100/1000Mbps Ethernet 1 x USB 3.0 Host, 1 x USB 2.0 Host 1 x USB-UART debug interface
Display	1 x Mini DisplayPort (DP), 4K/30fps, 2-lane
Camera	1 x MIPI-CSI, FPC_25PIN 4-lane 1 x BT1120, FPC_32PIN 16-bit
User I/O	Brought out via two 2.54mm pitch 2x20-pin IO Expansion Interfaces 2 x USB2.0 Host, 1 x CAN, 1 x RS485, 4 x PS_MIO, PL_IO (12 pairs x HD_IO, 8 pairs x HP_IO)
Dimensions	100mm x 70mm (12-layer PCB design)
Power supply	DC 12V/2A
Working Temp.	-45~85 Celsius
Others	1 x 2.54mm pitch 6-pin JTAG interface 2 x Buttons (1x FPGA Reset, 1 x System Reset) 5 x LEDs (1 x Power LED, Status_LED: 2 x RED, 2 x Green)
Software	Supports PetaLinux, Provided with PaddlePaddle deep learning AI framework
Target Applications	Evaluation and Prototyping for XCZU3EG Zynq UltraScale+ MPSoC AI Camera AI Computing Box AI Robot Smart car Intelligent electronic scale Patrol UAV

*Features of FZ3 Card*



**Software Features**

The [FZ3 Card](#) is able to run **PetaLinux 2020.1** and provided with complete BSP. The features are as following:

Item	Features	Description	Source code provided
<b>Tool chains</b>	gcc8.3.0	gcc version 8.3.0	
	gcc 9.2.0	aarch64-none-elf-gcc version 9.2.0	
<b>Bootloader</b>	boot.bin	First boot program including FSBL and u-boot2020.01	Yes
<b>Linux Kernel</b>	Linux 5.4.0	Customized kernel for FZ3 Card	Yes
	USB2.0/3.0 Host	USB2.0/3.0 Host driver	Yes
	Ethernet	Gigabit Ethernet driver	Yes
	MMC/SD/TF	MMC/SD/TF card driver	Yes
	Qspi flash	Qspi flash driver	Yes
	CAN	CAN driver	Yes
	DP	DP driver	Yes
	I2C	I2C driver	Yes
	UART	UART driver	Yes
	Watchdog	Watchdog driver	Yes
	GPIO	GPIO driver	Yes
	LED	LED driver	Yes
	Button	Button driver	Yes
MIPI	MIPI camera driver	Yes	
<b>Application</b>	LED	LED example	Yes
	CAN	CAN example	Yes
	Net	Socket example	Yes
	QT-Camera	MIPI Camera example	Yes
<b>File system</b>	Ramdisk	Ramdisk system image	
	Rootfs	Buildroot making including Qt	Yes
<b>Petalinux</b>	Petalinux2020.1	Supports Xilinx Petalinux2020.1 development tool. MYIR provides complete BSP for the FZ3 card. Supports Xilinx Vitis Software Development Platform	

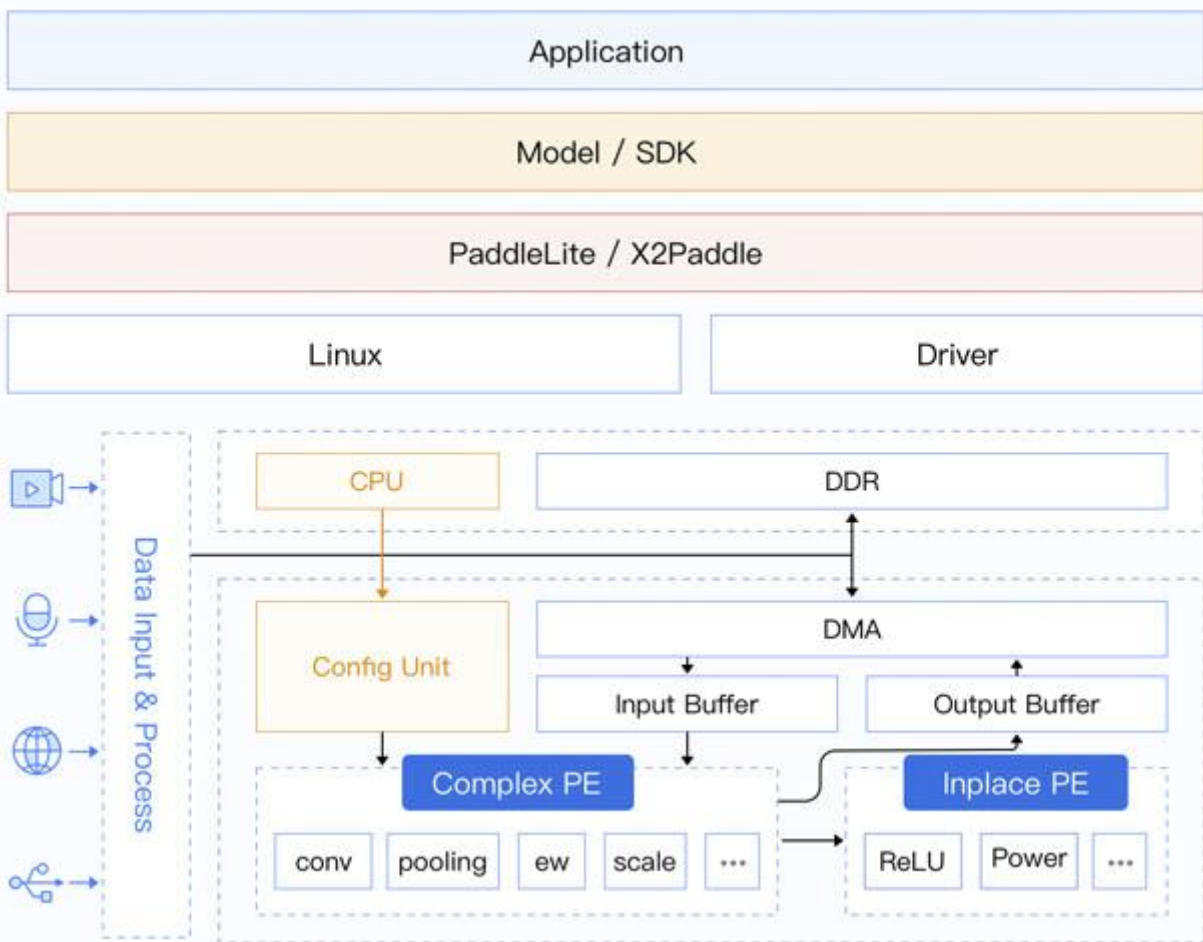
*Features of Linux BSP of FZ3 Card*



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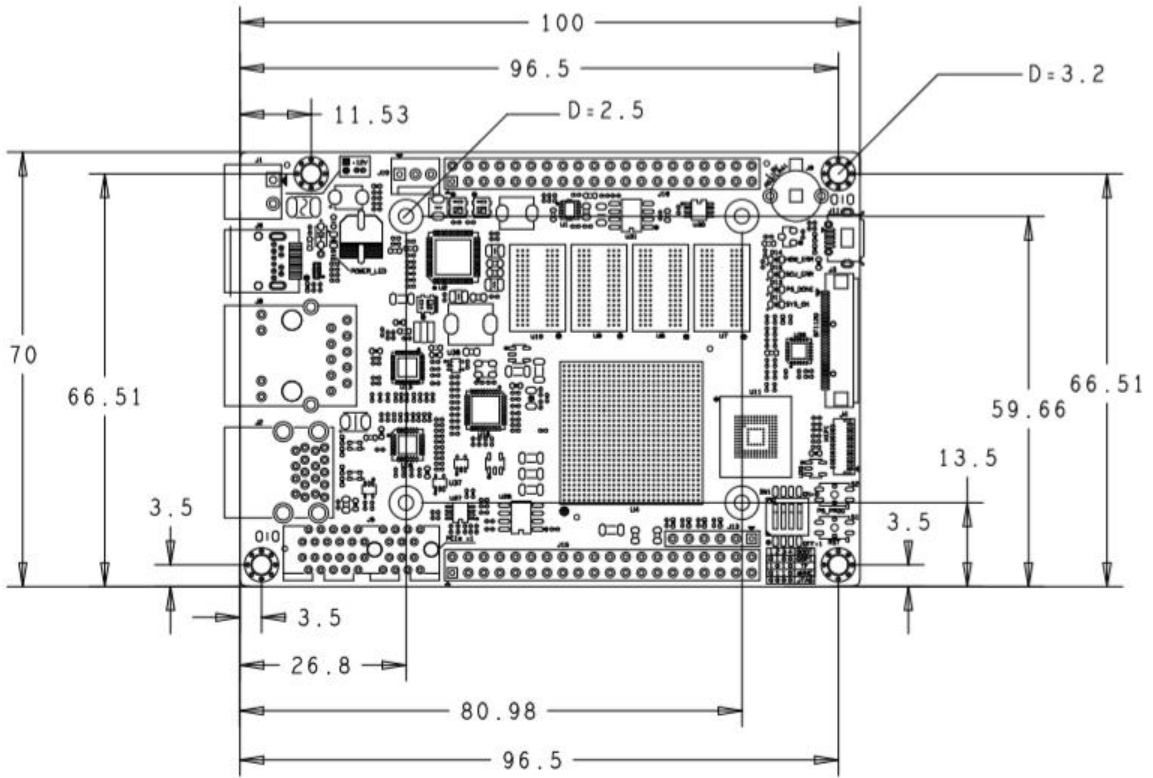
*Baidu Brain's AI Development Tools*



*Software Architecture of FZ3 Card*



**Dimension Chart**




*Dimension Chart of FZ3 Card*





**Order Information**

Item	Packing List
FZ3 Card (Part No.: MYS-ZU3EG-8E4D-EDGE)	✓ FZ3 Deep Learning Accelerator Card (without any accessories, only production recommended)
FZ3 Kit (Part No.: MYS-ZU3EG-8E4D-EDGE-K2)	✓ One FZ3 Card (Installed with active heatsink) ✓ One 12V/2A Power Adapter ✓ One Mini USB Cable ✓ One 16GB TF Card ✓ One Mini DP to HDMI Cable
Active heatsink for FZ3 Card  - 60mm * 52mm * 15mm  - aluminum heatsink with fan  - silicon pad  (Part No.: 2310100091)	
Note: Please contact MYIR to get development resources (including documentations and software BSP) download link after placing your order.	



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