# MYC-C7Z010/20-V2 CPU Module

*- Xilinx XC7Z010/20 Dual-core ARM Cortex-A9 Processor with Xilinx 7-series FPGA logic*
*- 1GB DDR3 SDRAM (2 x 512MB, 32-bit), 4GB eMMC, 32MB QSPI Flash*
*- On-board Gigabit Ethernet PHY*
*- Two 0.8mm pitch 140-pin Board-to-Board Expansion Connectors*
*- Ready-to-Run Linux 5.4.0*

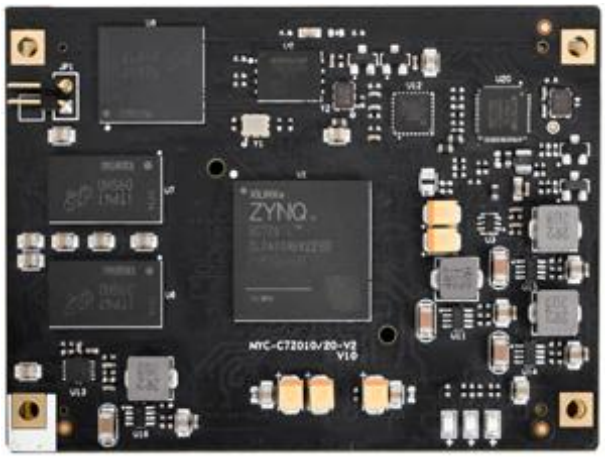

*Figure 1-1 MYC-C7Z010/20-V2 Top-view*

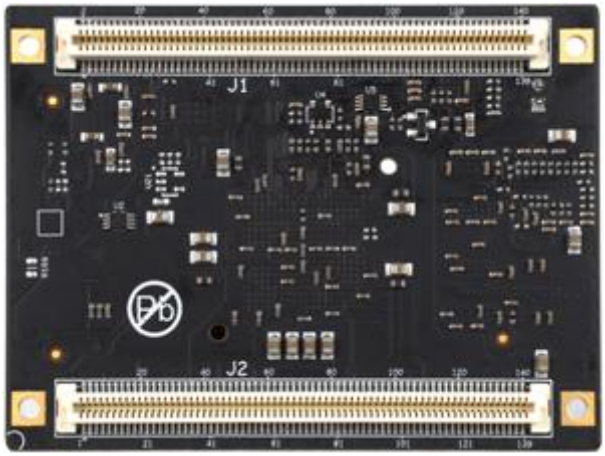

*Figure 1-2 MYC-C7Z010/20-V2 CPU Bottom-view*

The MYC-C7Z010/20-V2 CPU Module is a Linux-ready ZYNQ-based SOM (System on Module) available for either Xilinx XC7Z010 or XC7Z020 device. It integrates Xilinx's Dual Cortex-A9 + FPGA All Programmable SoC device, 1GB DDR3 SDRAM, 4GB eMMC, 32MB quad SPI Flash, a Gigabit Ethernet PHY, a USB PHY and external watchdog. Two 0.8mm pitch 140-pin board-to-board connectors provide a large number of I/O signals for ARM peripherals and FPGA I/Os to enable your base board extension. It is ideal for your next embedded design, thus helping you reduce development effort and speed up your time to market.

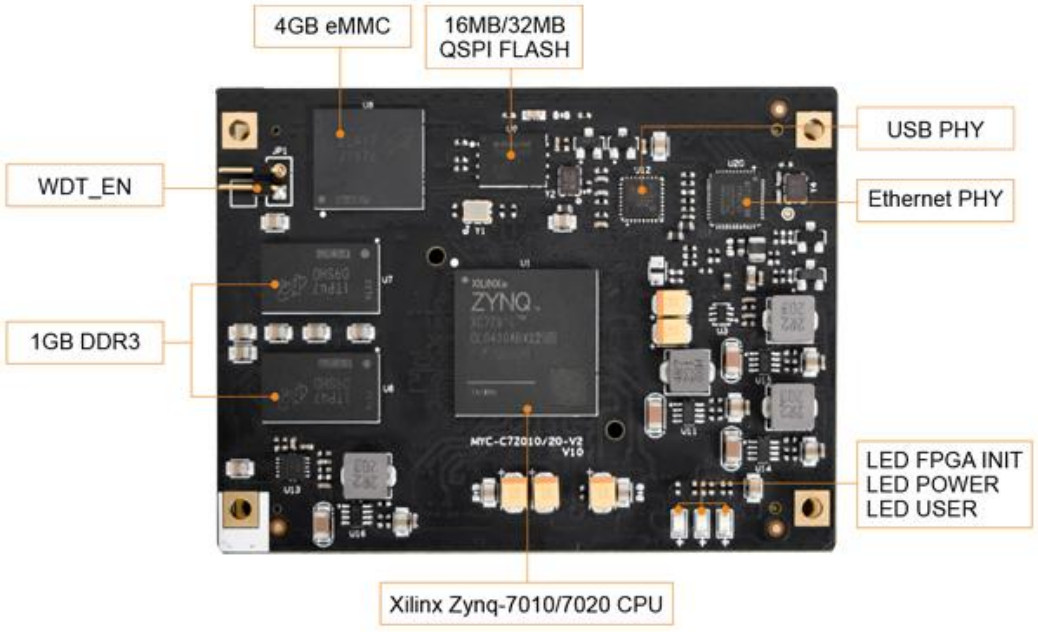


*Figure 1-3 MYC-C7Z010/20-V2 CPU Module*

The MYC-C7Z010/20-V2 CPU Module is the core board of MYD-C7Z010/20-V2 development board which is an excellent platform for evaluation and prototype based on MYIR's MYC-C7Z010/20-V2 CPU module. It takes full features of the Zynq-7010 and 7020 SoC and has extended rich peripherals to the base board including four USB Host ports, RS232 serial port, Gigabit Ethernet, CAN, LCD and HDMI. It has one XADC header to allow you take advantage of Xilinx XADC; it has three PMoD headers to meet your I/O needs with PMoDs (only for 7020); it also has a low-pin count FMC connector to allow various FMC cards for custom I/O options. Typical applications are Industrial Automation, Test & measurement, Medical Equipment, Intelligent Video Surveillance, etc.

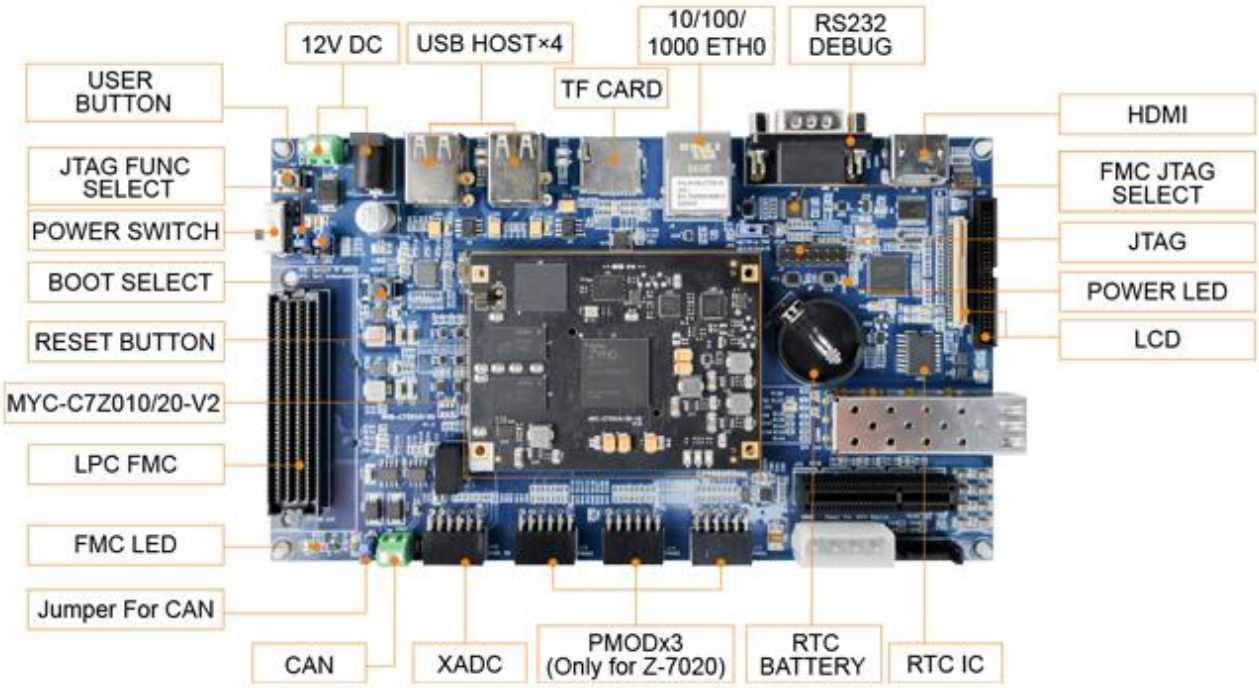


*Figure 1-4 MYD-C7Z010/20 Development Board*

***Hardware Specification***

The Zynq™-7000 family of devices combines the software programmability of a Processor with the hardware programmability of an FPGA, resulting in unrivaled levels of system performance, flexibility, scalability while providing system benefits in terms of power reduction, lower cost with fast time to market. Unlike traditional SoC processing solutions, the flexible programmable logic of the Zynq-7000 devices enables optimization and differentiation, allowing designers to add peripherals and accelerators to adapt to a broad base of applications.

The Zynq-7000 AP SoC leverages the 28nm scalable optimized programmable logic used in Xilinx's 7 series FPGAs. Each device is designed to meet unique requirements across many use cases and applications. The Z-7010, Z-7015, and Z-7020 leverage the Artix®-7 FPGA programmable logic and offer lower power and lower cost for high-volume applications. The Z-7030, Z-7035, Z-7045, and Z-7100 are based on the Kintex®-7 FPGA programmable logic for higher-end applications that require higher performance and high I/O throughput.

| | Z-7010 | Z-7015 | Z-7020 | Z-7030 | Z-7035 | Z-7045 | Z-7100 |
|---|---|---|---|---|---|---|---|
| Processor Core | Dual ARM® Cortex™-A9 MPCore™ with CoreSight™ | | | | | | |
| Processor Extensions | NEON™ & Single / Double Precision Floating Point for each processor | | | | | | |
| L1 Cache | 32 KB Instruction, 32 KB Data per processor | | | | | | |
| L2 Cache | 512 KB | | | | | | |
| On-Chip Memory | 256 KB | | | | | | |
| Memory Interfaces | DDR3, DDR3L, DDR2, LPDDR2, 2x Quad-SPI, NAND, NOR | | | | | | |
| Peripherals | 2x USB 2.0 (OTG), 2x Tri-mode Gigabit Ethernet, 2x SD/SDIO | | | | | | |
| Logic Cells | 28K Logic Cells | 74K Logic Cells | 85K Logic Cells | 125K Logic Cells | 275K Logic Cells | 350K Logic Cells | 444K Logic Cells |
| BlockRAM (Mb) | 240 KB | 380 KB | 560 KB | 1,060 KB | 2,000 KB | 2,180 KB | 3,020 KB |
| DSP Slices | 80 | 160 | 220 | 400 | 900 | 900 | 2,020 |
| Transceiver Count | | 4 (6.25 Gb/s) | | up to 4 (12.5 Gb/s) | up to 16 (12.5 Gb/s) | up to 16 (12.5 Gb/s) | up to 16 (10.3125 Gb/s) |

*Table 1-1 ZYNQ-7000 Devices*

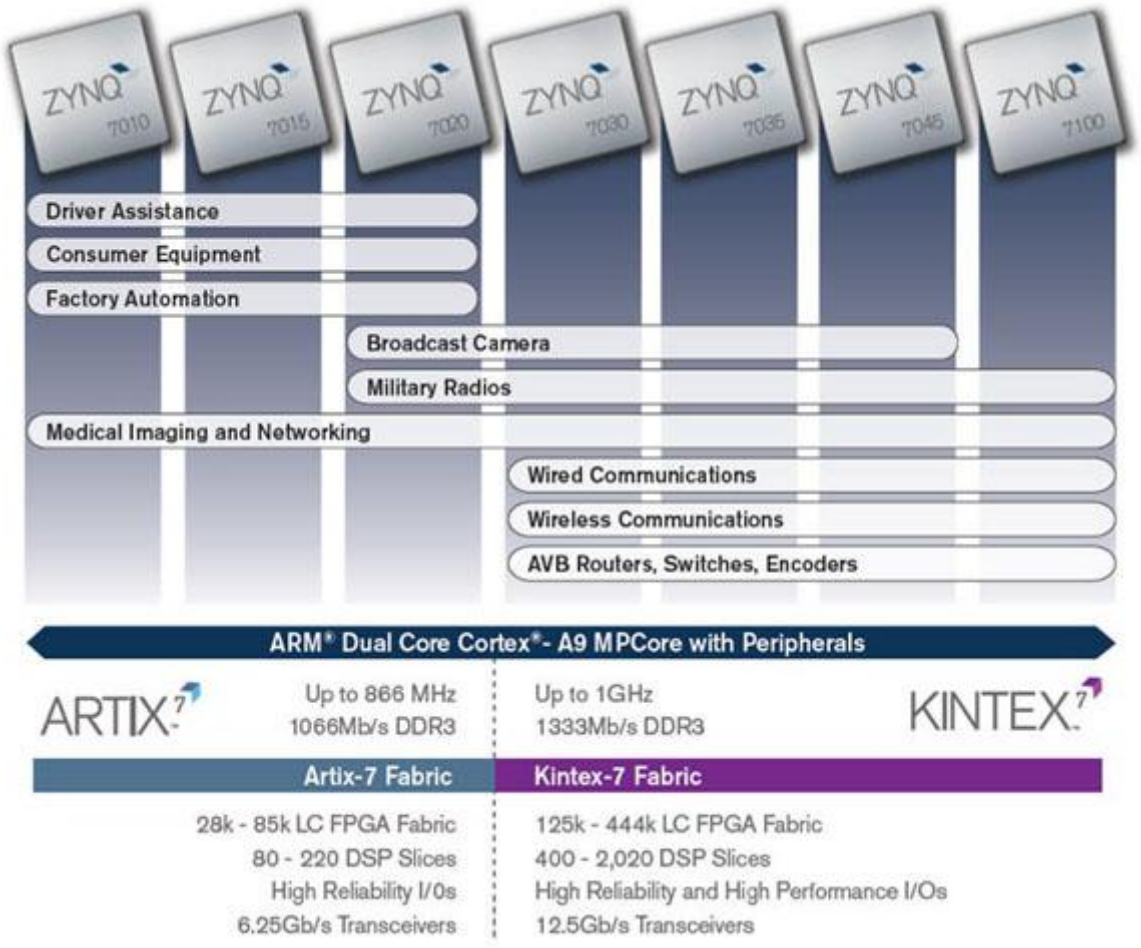


*Figure 1-5 Zynq-7000 Devices*

**Mechanical Parameters**

- ✓ Dimensions: 75mm x 55mm (10-layer PCB design)
- ✓ Power supply: 5V/0.5A
- ✓ Working temp.: 0~70 Celsius (commercial grade) or -40~85 Celsius (industrial grade)

**SoC**

- ✓ Xilinx XC7Z010-1CLG400C (Zynq-7010) or XC7Z020-1CLG400C (Zynq-7020)
  - 667MHz ARM® dual-core Cortex™-A9 MPCore processor (up to 866MHz)
  - Integrated Artix-7 class FPGA subsystem
  with 28K logic cells, 17,600 LUTs, 80 DSP slices (for XC7Z010)
  with 85K logic cells, 53,200 LUTs, 220 DSP slices (for XC7Z020)
  - NEON™ & Single / Double Precision Floating Point for each processor
  - Supports a Variety of Static and Dynamic Memory Interfaces

**Memory**

- ✓ 1GB DDR3 SDRAM (512MB*2）
- ✓ 4GB eMMC
- ✓ 32MB QSPI Flash (16MB is optional)

### Peripherals and Signals Routed to Pins

✓ 10/100/1000M Ethernet PHY (YT8531SH)
✓ External watchdog
✓ Three LEDs
- One blue LED for power indicator
- One red LED for FPGA program done indicator
- One green user LED

✓ Two 0.8mm pitch 140-pin board-to-board expansion connectors bring out below signals:
- One Gigabit Ethernet
- One USB OTG 2.0
- Two Serial ports
- Two I2C
- Two CAN BUS

** Serial ports, I2C and CAN signals will be reused in PS part, or implemented through PL pins*

- Two SPI (can be implemented through PL pins)
- ADC (one independent differential ADC, 16-channel ADC brought out through PL pins)
- One SDIO

***Function Block Diagram***

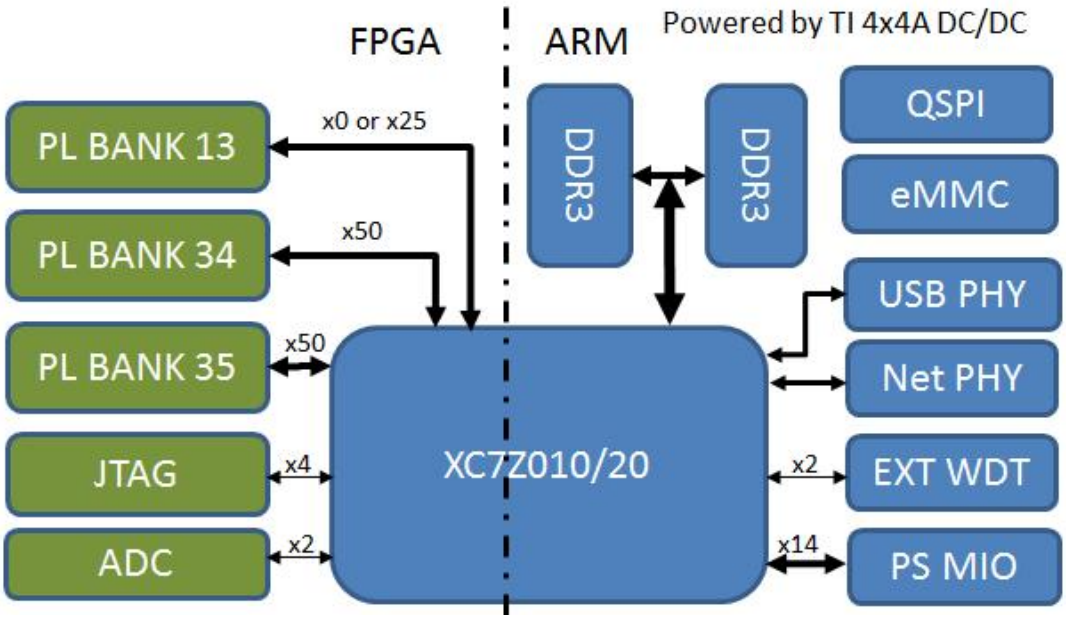


*Figure 1-6 MYC-C7Z010/20-V2 Function Block Diagram*

***Dimension Chart***

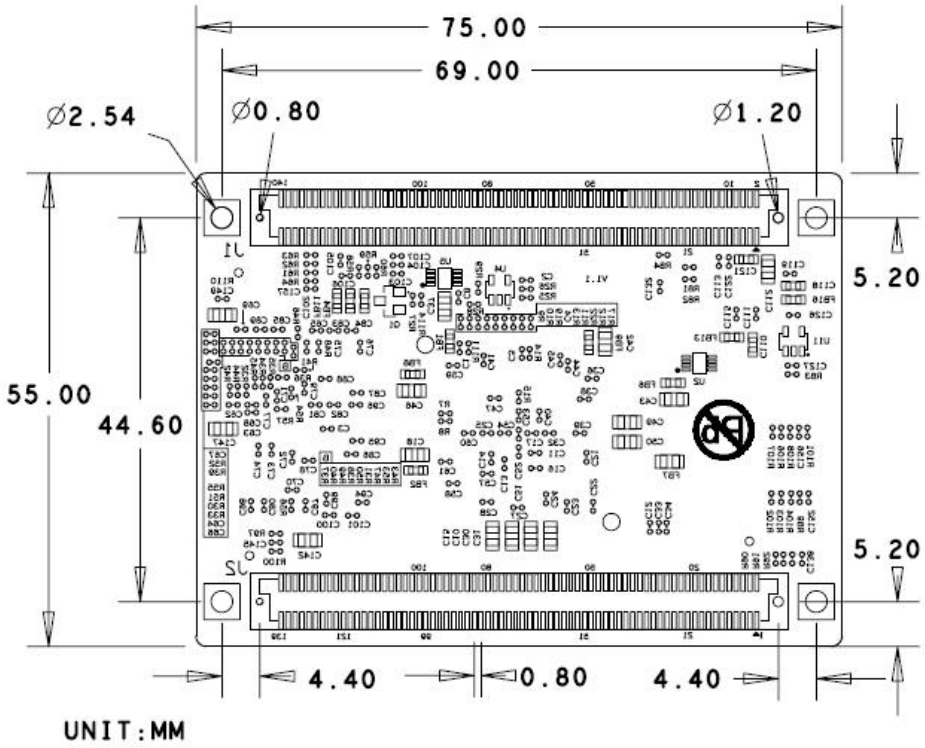


*Figure 1-7 Dimensions of MYC-C7Z010/20-V2*

***Expansion Connectors***

The MYC-C7Z010/20-V2 CPU Module is using two 0.8mm pitch 140-pin board-to-board female connectors for extension. Please refer to the file "MYC-C7Z010/020 Pin description Table" to know the signals routed to the connectors.

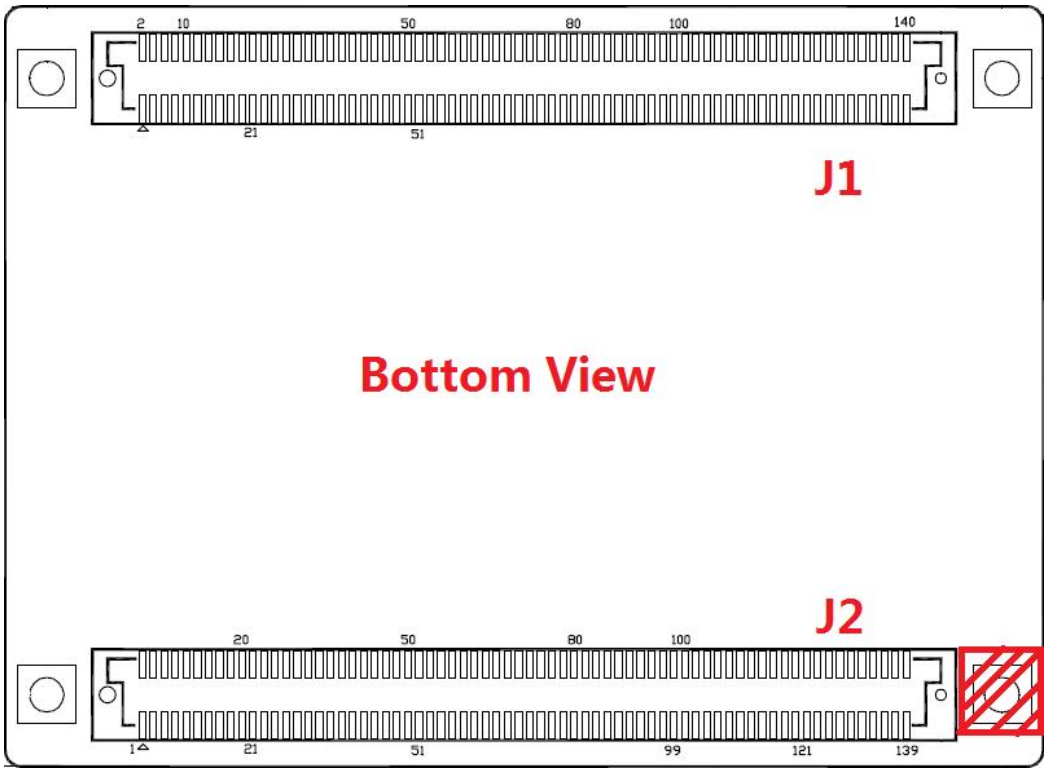


*Figure 1-8 Expansion Connectors of MYC-C7Z010/20-V2*

**Software Features**

The MYC-C7Z010/20-V2 CPU Module is capable of running Linux 4.14.0. MYIR provides software package in product disk along with the goods delivery. The software package features as below:

| Item | Features | Description | Remark |
|---|---|---|---|
| Cross compiler | gcc 9.2.0 | arm-xilinx-linux-gnueabi-gcc (GCC) 9.2.0 | |
| Boot program | BOOT.BIN | First boot program including FSBL, bitstream | Source code provided |
| | u-boot | Secondary boot program | Source code provided |
| Linux Kernel | Linux 5.4.0 | Customized kernel for MYD-C7Z010/20-V2 | Source code provided |
| Drivers | USB Host | USB Host driver | Source code provided |
| | Ethernet | Gigabit Ethernet driver | Source code provided |
| | MMC/SD/TF | MMC/SD/TF card driver | Source code provided |
| | CAN | CAN driver | Source code provided |
| | LCD Controller | XYLON LCD driver | Source code provided |
| | HDMI | HDMI (SII902X chip) driver | Source code provided |
| | Button | Button driver | Source code provided |
| | UART | UART driver | Source code provided |
| | LED | LED driver | Source code provided |
| | GPIO | GPIO driver | Source code provided |
| | QSPI | QSPI Flash S25FL256S driver | Source code provided |
| | RTC | DS3231 RTC driver | Source code provided |
| | Resistive Touch | TSC2007 resistive touch screen driver | Source code provided |
| | Capacitive Touch | FT5X0X capacitive touch screen driver | Source code provided |
| | ADC | ADC driver | Source code provided |
| File System | Ramdisk | Ramdisk system image | |
| | Rootfs.tar | Tar file | |

*Table 1-2 Linux Software Package Features*

**Order Information**

| Item | Part No. | Packing List |
|---|---|---|
| MYC-C7Z020-V2 CPU Module | MYC-C7Z010-V2-4E1D-667-C | ➢ One MYC-C7Z010-V2 CPU Module (for Zynq-7010) |
| | MYC-C7Z010-V2-4E1D-667-I | |
| | MYC-C7Z020-V2-4E1D-766-C | ➢ One MYC-C7Z020-V2 CPU Module (for Zynq-7020) |
| | MYC-C7Z020-V2-4E1D-766-I | |
| MYD-C7Z020-V2 Development Board | MYD-C7Z010-V2-4E1D-667-C | - One MYD-C7Z010-V2 or MYD-C7Z020-V2 board (includes one CPU module MYC-C7Z010/20-V2 mounted on the base board)<br>- One 1.5m cross Ethernet cable<br>- One DB9 UART to USB cable<br>- One HDMI cable<br>- One 12V/1.25A Power adapter<br>- One 16GB TF Card |
| | MYD-C7Z010-V2-4E1D-667-I | |
| | MYD-C7Z020-V2-4E1D-766-C | |
| | MYD-C7Z020-V2-4E1D-766-I | |
| Note: Customer may have used V1 version (MYC-C7Z010/20) before, V2 version is fully compatible with V1 version but using different Ethernet PHY chip. | | |

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