

MYD-Y6ULX-V2 Development Board

- MYC-Y6ULX-V2 CPU Module as Controller Board
- 528Hz NXP i.MX 6UL/6ULL ARM Cortex-A7 Processors
- 1.0mm pitch 140-pin Stamp Hole Expansion Interface for Board-to-Board Connections
- 256MB DDR3 SDRAM, 256MB Nand Flash or 4GB eMMC Flash
- 2 x USB2.0 Host, 1 x USB2.0 OTG, 2 x 10/100 Mbps Ethernet, CAN, RS485, TF, LCD, Camera, Audio...
- Onboard SDIO based WiFi Module with External Antennas
- Mini-PCIe Slot for Optional USB based 4G LTE Module
- Optional 4.3- or 7-inch LCD/TSP and Camera Module
- Ready-to-Run Linux 5.4.3



Figure 1-1 MYD-Y6ULX Development Board

Description

The [MYD-Y6ULX-V2 development board](#) is a complete evaluation platform for NXP's [i.MX 6UltraLite / 6ULL](#) processor family, which can operate at 528 MHz and features the most efficient [ARM Cortex-A7](#) core, providing various memory interfaces and enhancing the flexibility and convenience of the board to connect peripheral devices. The board is ready to run Linux and supports industrial operating temperature range from -40 to +85 Celsius.

The [MYD-Y6ULX-V2 development board](#) employs the [MYC-Y6ULX-V2 CPU Module](#) as the controller board by populating the CPU Module on its base board through 1.0mm pitch 140-pin stamp hole interface. The MYC-Y6ULX-V2 CPU Module is mounted with a shield cover and integrated with core components including

i.MX 6UltraLite / 6ULL processor, 256MB DDR3, 256MB Nand Flash or optional 4GB eMMC and Ethernet PHY. The base board has extended rich peripherals through connectors and headers like Serial ports, USB, Ethernet, CAN, Micro SD card, WiFi module, LCD/Touch screen, Camera, Audio as well as an optional Mini PCIe interface for USB based 4G LTE module. It is a versatile platform and solid reference design delivered with necessary cable accessories detailed documentations ideal for prototype and evaluation based on i.MX 6UL/6ULL solutions.

MYIR offers three models of MYD-Y6ULX development boards with mainly different features as shown in below table. User can select model according to their own requirement.

MYD-Y6ULX-V2	MYD-Y6ULG2-V2-256N256D-50-I	MYD-Y6ULY2-V2-256N256D-50-C/I	MYD-Y6ULY2-V2-4E512D-50-C/I
MYC-Y6ULX-V2	MYC-Y6ULG2-V2-256N256D-50-I	MYC-Y6ULY2-V2-256N256D-50-C/I	MYC-Y6ULY2-V2-4E512D-50-C/I
Processor	MCIMX6G2CVM05AB	MCIMX6Y2DVM05AA	MCIMX6Y2DVM05AA
RAM	256MB DDR3	256MB DDR3	512MB DDR3
Flash	256MB Nand Flash	256MB Nand Flash	4GB eMMC
WiFi	Support	Support	Cannot support Reuse SDIO with eMMC
Working Temp.	-40 to +85 Celsius	0 to +70 Celsius or -40 to +85 Celsius	0 to +70 Celsius or -40 to +85 Celsius
	WiFi Module can only support -20 to +65 Celsius.		

Table 1-1 Five Models of MYD-6ULX-V2 (default configurations)

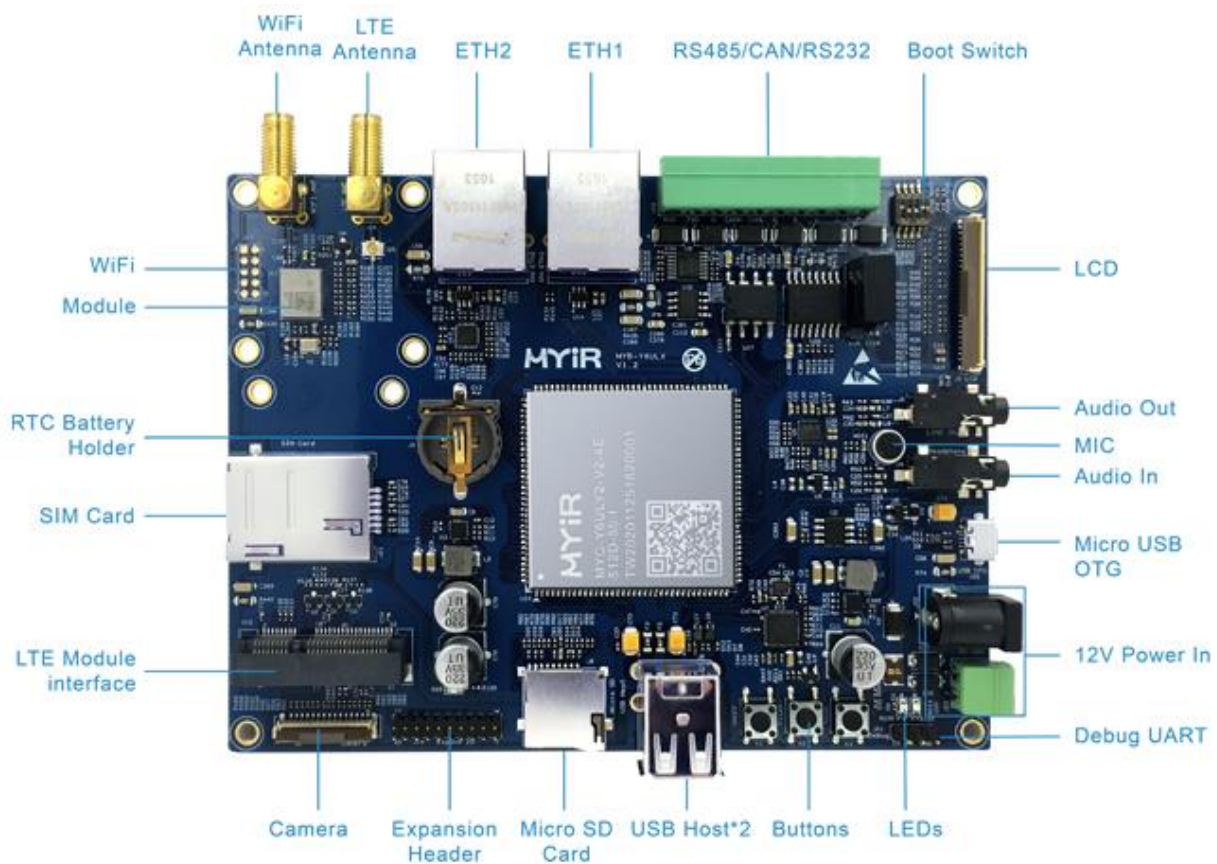


Figure 1-2 MYD-Y6ULX-V2 Development Board Interface Diagram

Hardware Specification

The [MYC-Y6ULX-V2 CPU Module](#) is using the 14 x 14mm, 0.8 mm ball pitch, 289 MAPBGA package 528 MHz i.MX 6UltraLite / i.MX 6ULL ARM Cortex-A7 application processor which provides multiple compatible options of G0, G1, G2, G3, Y0, Y1 and Y2 sub family. The MCIMX6G2CVM05AB and MCIMX6Y2DVM05AA are optional as the default part with the board.

Expanding the i.MX 6 series, the i.MX 6UltraLite is a high performance, ultra-efficient processor family featuring an advanced implementation of a single ARM® Cortex®-A7 core, which operates at speeds up to 696 MHz. The i.MX 6UltraLite applications processor includes an integrated power management module that reduces the complexity of external power supply and simplifies power sequencing. Each processor in this family provides various memory interfaces, including 16-bit LPDDR2, DDR3, DDR3L, raw and managed NAND flash, NOR flash, eMMC, Quad SPI and a wide range of other interfaces for connecting peripherals such as WLAN, Bluetooth™, GPS, displays and camera sensors.

Feature	MCIMX6G0	MCIMX6G1	MCIMX6G2	MCIMX6G3
Speed	528 MHz	528 MHz, 696 MHz	528 MHz, 696 MHz	528 MHz
Cache	32 KB-I, 32 KB-D	32 KB-I, 32 KB-D 128 KB L2	32 KB-I, 32 KB-D 128 KB L2	32 KB-I, 32 KB-D 128 KB L2
OCRAM	128 KB	128 KB	128 KB	128 KB
DRAM	16-bit LP-DDR2, DDR3/DDR3L	16-bit LP-DDR2, DDR3/DDR4L	16-bit LP-DDR2, DDR3/DDR5L	16-bit LP-DDR2, DDR3/DDR6L
eFuse	512-bit	1024-bit	1536-bit	2048-bit
NAND (BCH40)	Yes	Yes	Yes	Yes
EBI	Yes	Yes	Yes	Yes
Ethernet	10/100-Mbit/s x 1	10/100-Mbit/s x 1	10/100-Mbit/s x 2	10/100-Mbit/s x 2
USB	OTG, HS/FS x 1	OTG, HS/FS x 2	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	0	1	2	2
Security	Basic	TRNG, Crypto Engine (AES/TDES/SHA), Secure Boot	TRNG, Crypto Engine (AES/TDES/SHA), Secure Boot	TRNG, Crypto Engine (AES with DPA/TDES/SHA/RSA), Secure Boot, tamper monitor, PCI4.0 pre-certification, OTF DRAM encryption
Graphic	None	None	PxP	PxP
CSI	None	None	24-bit Parallel CSI	24-bit Parallel CSI
LCD	None	None	24-bit Parallel LCD	24-bit Parallel LCD
Quad SPI	1	1	1	1
SDIO	2	2	2	2
UART	4	8	8	8
I2C	2	4	4	4
SPI	2	4	4	4
I2S/SAI	1	3	3	3
S/PDIF	1	1	1	1
Timer/PWM	Timer x 2, PWM x 4	Timer x 4, PWM x 8	Timer x 4, PWM x 8	Timer x 4, PWM x 8
12-bit ADC	1 x 10-ch.	1 x 10-ch.	2 x 10-ch.	2 x 10-ch.

Table 1-2 i.MX 6UltraLite Device Options

The i.MX 6ULL is a power efficient and cost optimized applications processor family featuring an advanced implementation of a single ARM Cortex-A7 core, which operates at speeds up to 900 MHz. The i.MX 6ULL applications processor includes an integrated power management module that reduces the complexity of an external power supply and simplifies power sequencing. Each processor in this family provides various memory interfaces, including 16-bit LPDDR2, DDR3, DDR3L, raw and managed NAND flash, NOR flash, eMMC, Quad SPI and a wide range of other interfaces for connecting peripherals such as WLAN, Bluetooth®, GPS, displays and camera sensors.

Feature	MCIMX6Y0	MCIMX6Y1	MCIMX6Y2
Core	ARM® Cortex-A7	ARM® Cortex-A7	ARM® Cortex-A7
Speed	528 MHz	528 MHz	528 MHz
Cache	32 KB-I, 32 KB-D	32 KB-I, 32 KB-D 128 KB L2	32 KB-I, 32 KB-D 128 KB L2
OCRAM	128 KB	128 KB	128 KB
DRAM	16-bit LP-DDR2, DDR3/DDR3L	16-bit LP-DDR2, DDR3/DDR4L	16-bit LP-DDR2, DDR3/DDR5L
eFuse	256-bit	256-bit	256-bit
NAND (BCH40)	Yes	Yes	Yes
EBI	Yes	Yes	Yes
Ethernet	10/100-Mbit/s x 1	10/100-Mbit/s x 1	10/100-Mbit/s x 2
USB	OTG, HS/FS x 1	OTG, HS/FS x 2	OTG, HS/FS x 2
CAN	0	1	2
Graphic	None	None	PxP
CSI	None	None	16-bit Parallel CSI
LCD	None	None	24-bit Parallel LCD
Quad SPI	1	1	1
SDIO	2	2	2
UART	4	8	8
I2C	2	4	4
SPI	2	4	4
I2S/SAI	1	3	3
ESAI	1	1	1
S/PDIF	1	1	1
Timer/PWM	Timer x 2, PWM x 4	Timer x 4, PWM x 8	Timer x 4, PWM x 8
12-bit ADC	1 x 10-ch.	1 x 10-ch.	2 x 10-ch.
Security	None	AES-128, HAB	AES-128, HAB
Temperature	-40°C to 105°C (Tj)	-40°C to 105°C (Tj)	0°C to 90°C (Tj)

Table 1-3 i.MX 6ULL Device Options

Mechanical Parameters

- Dimensions: 105mm x 140mm (base board), 37mm x 39mm (CPU Module)
- PCB Layers: 4-layer design (base board), 10-layer design (CPU Module)
- Power supply: +12V/1.5A (base board), +3.3V/0.3A (CPU Module)
- Working temperature: 0~70 Celsius (commercial grade) or -40~85 Celsius (industrial grade)

The MYD-Y6ULX-V2 Controller Board ([MYC-Y6ULX-V2 CPU Module](#))

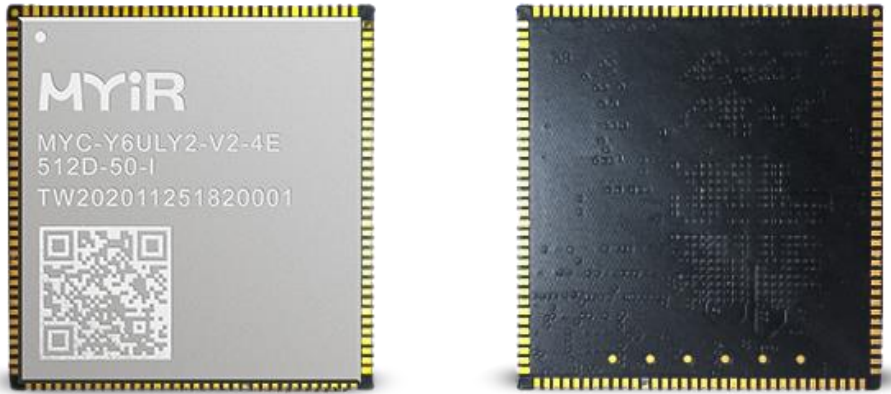


Figure 1-3 [MYC-Y6ULX-V2 CPU Module](#) (delivered with shield cover)

Processor

- 528MHz NXP i.MX 6UltraLite / i.MX 6ULL ARM Cortex-A7 processor (MCIMX6G2CVM05A or MCIMX6Y2DVM05A by default)

Memory

- 256MB DDR3 SDRAM (supports up to 1GB)
- 256MB Nand Flash (4GB eMMC Flash is optional)

Peripherals and Signals Routed to Pins

[MYC-Y6ULX-V2 Pinouts Description](#)

- One 10/100M Ethernet PHY
- 1.0mm pitch 140-pin stamp hole expansion interface
 - 2 x 10/100Mbps Ethernet
 - 8 x Serial ports
 - 4 x I2C
 - 2 x CAN
 - 4 x SPI
 - 8 x ADC
 - 8 x PWM
 - 3 x I2S
 - 1 x Parallel Camera Sensor Interface
 - 1 x JTAG
 - 1 x 24-bit LCD interface
 - Up to 97 x GPIOs

Note: the peripheral signals brought out to the expansion interface are listed in maximum number. Some signals are reused. Please refer to the processor datasheet.

The MYD-Y6ULX-V2 Base Board

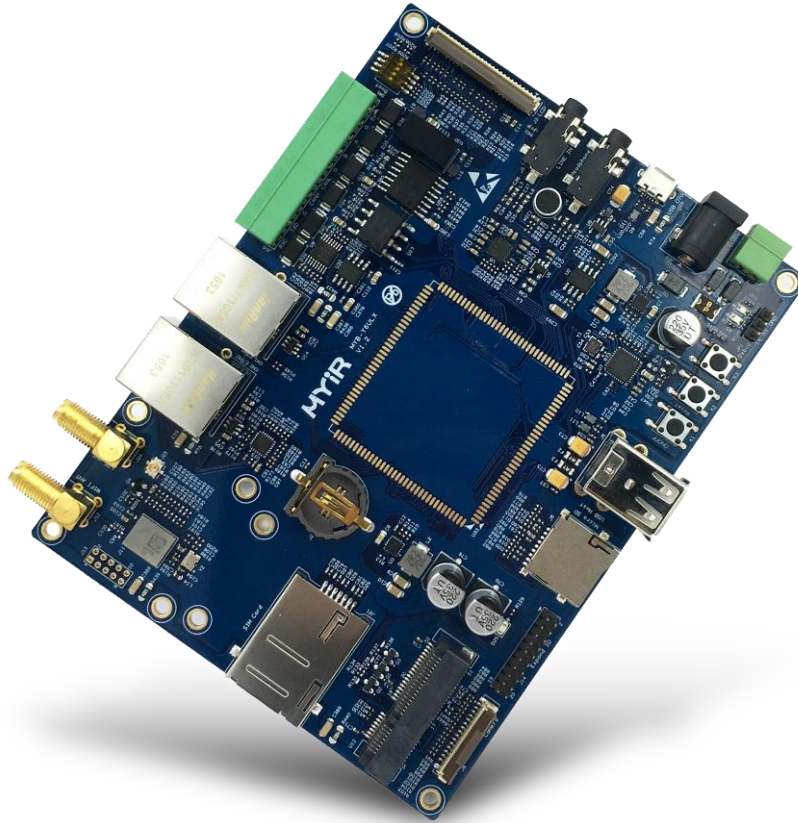


Figure 1-4 MYD-Y6ULX-V2 Base Board

- Serial ports
 - 1 x Debug serial port (TTL)
 - 1 x RS485 serial port (with isolation)
 - 1 x 3-wire RS232 serial port (with isolation)
- USB
 - 2 x USB2.0 Host ports
 - 1 x Micro USB2.0 OTG ports
- 1 x Mini PCIe interface (for optional USB based 4G LTE module)
- 1 x SIM card socket
- 1 x SDIO based WiFi module
- 2 x External antenna interfaces (one for WiFi module and one for 4G LTE module)
- 2 x 10/100 Mbps Ethernet interfaces
- 1 x Camera interface
- 1 x CAN interface (with isolation)
- 1 x Micro SD card slot
- 1 x LCD interface (16-bit true color, supports optional 4.3-inch and 7-inch TFT LCD)
- Battery backed RTC
- Audio input/output port (3.5mm jack)
- 3 x Buttons (1 x Reset button, 1 x User button, 1 x ON/OFF button)
- 2 x LEDs (1 x power indicator LED, 1 x user-defined LED)
- 1 x 2.0mm 20-pin male expansion connector
 - 1 x SPI
 - 1 x I2C
 - 2 x UART
 - 10 x GPIO

Function Block Diagram

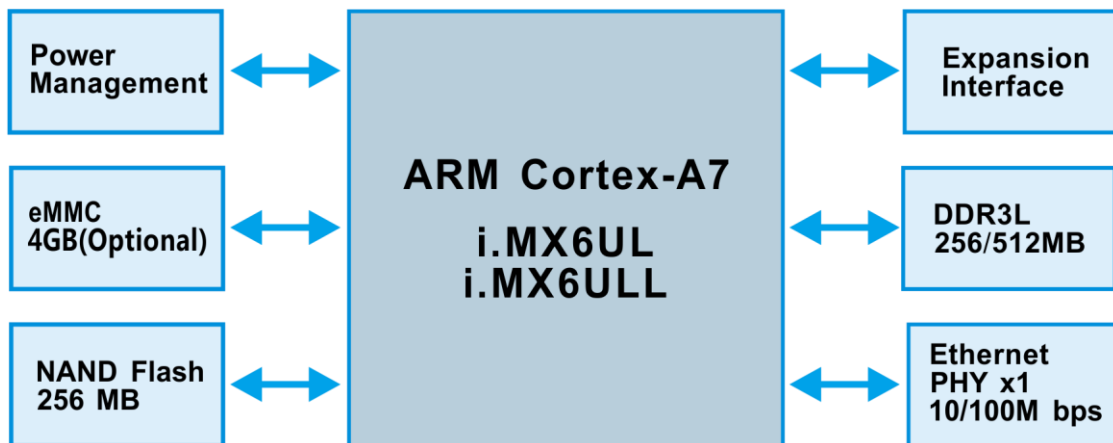


Figure 1-5 MYC-Y6ULX-V2 Function Block Diagram

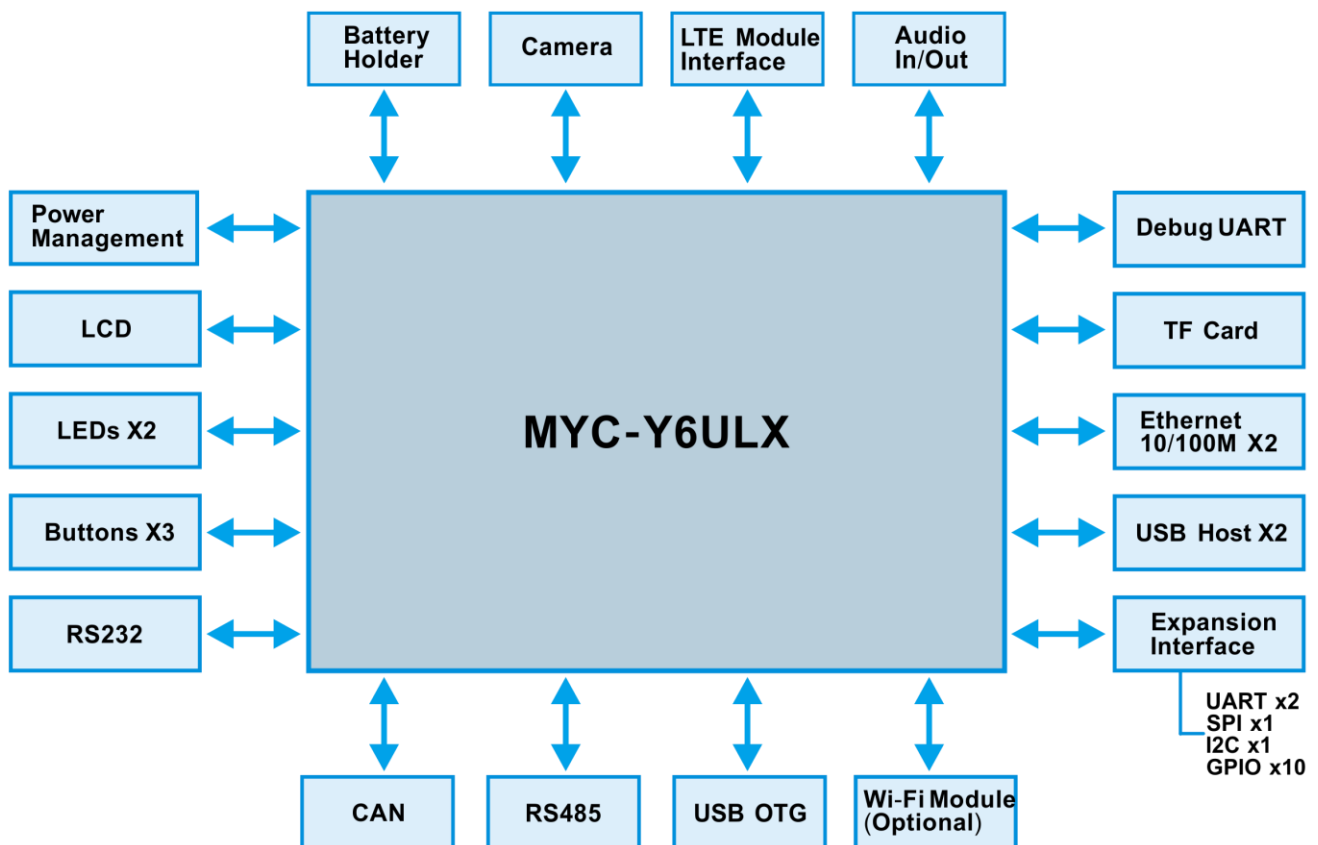


Figure 1-6 MYD-Y6ULX-V2 Function Block Diagram

Dimension Chart of MYD-Y6ULX-V2

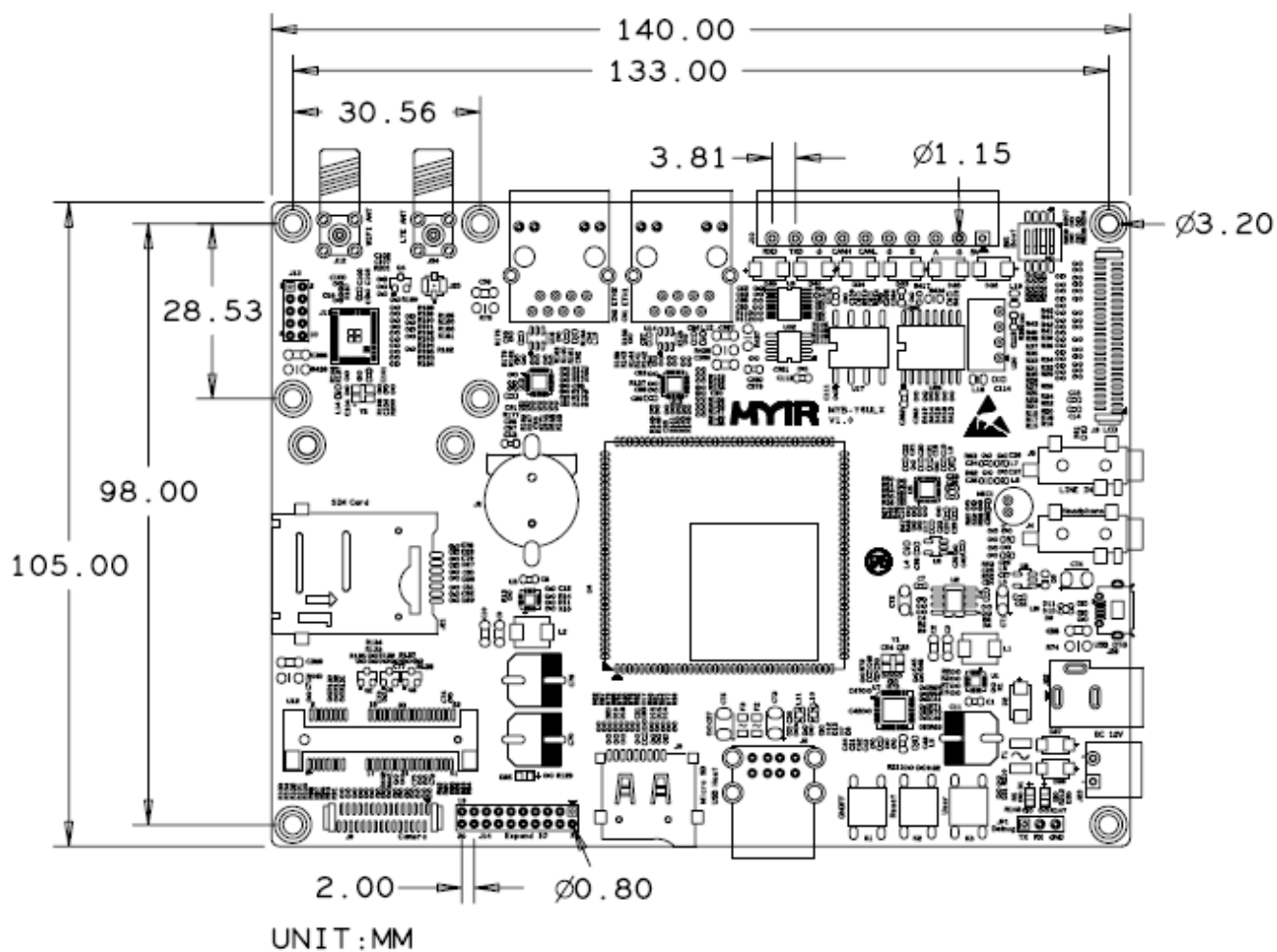


Figure 1-7 Dimension Chart of MYD-Y6ULX-V2

Software Features

The MYD-Y6ULX-V2 development board supports running Linux Operating System and is provided with software packages. Software features are summarized as below:

Item	Features	Description
Bootstrap program	U-boot-2020	The primary bootstrap (source code)
Kernel	Version	Linux 5.4.3 (source code)
Linux Drivers	USB	HOST and OTG driver (source code)
	Ethernet	Ethernet driver (source code)
	MMC	MMC/eMMC/TF card driver (source code)
	NandFlash	Nand Flash driver (source code)
	eMMC	eMMC driver (source code)
	WiFi	WiFi Module driver (SDIO signal, source code)
	4G LTE	4G LTE Module driver (USB signal, source code)
	Camera	Camera driver (source code, supports MYIR's MY-CAM011B)
	LCD Controller	LCD driver (source code, supports MYIR's 4.3- and 7- inch LCD)
	Touch Panel	Resistive and Capacitive touch screen driver (source code)
	RTC	RTC driver (source code)
	GPIO Button	Button driver (source code)
	GPIO LED	LED driver (source code)
	GPIO KEY	KEY driver (source code)
	UART	UART driver (source code)
	CAN	CAN driver (source code)
	RS485	RS485 driver (source code)
	Audio	Audio (wm8904) driver (source code)
	UART	UART driver (source code)
	SPI	SPI driver (source code)
I2C	I2C driver (source code)	
File System	Yocto	Yocto3.0, including QT5.13 (source code)
Compiler Tool Chain	Linaro GCC 4.9 hf	Binary file
	MetaToolchain	Built by Yocto, GCC 5.3 (Binary file)
	Applications Tool Chain	Built by Yocto, GCC 5.3 (Binary file)

Table 1-4 Software Features of MYD-Y6ULX-V2