MYD-IMX28X Development Board

- MYC-IMX28X CPU Module as Controller Board
- Two 1.27mm pitch 80-pin SMT Connectors for Board-to-Board Connections
- 454MHz Freescale i.MX28 Series ARM926EJ-S Processors
- 128MB DDR2 SDRAM, 256MB Nand Flash, 128KB SPI Data Flash
- Serial ports, USB Host, OTG, RS485, TF, Audio, LCD
- Two Ethernet for i.MX287 and One Ethernet for i.MX283
- Two CAN for i.MX287
- Optional 4.3 or 7 inch LCD/TSP
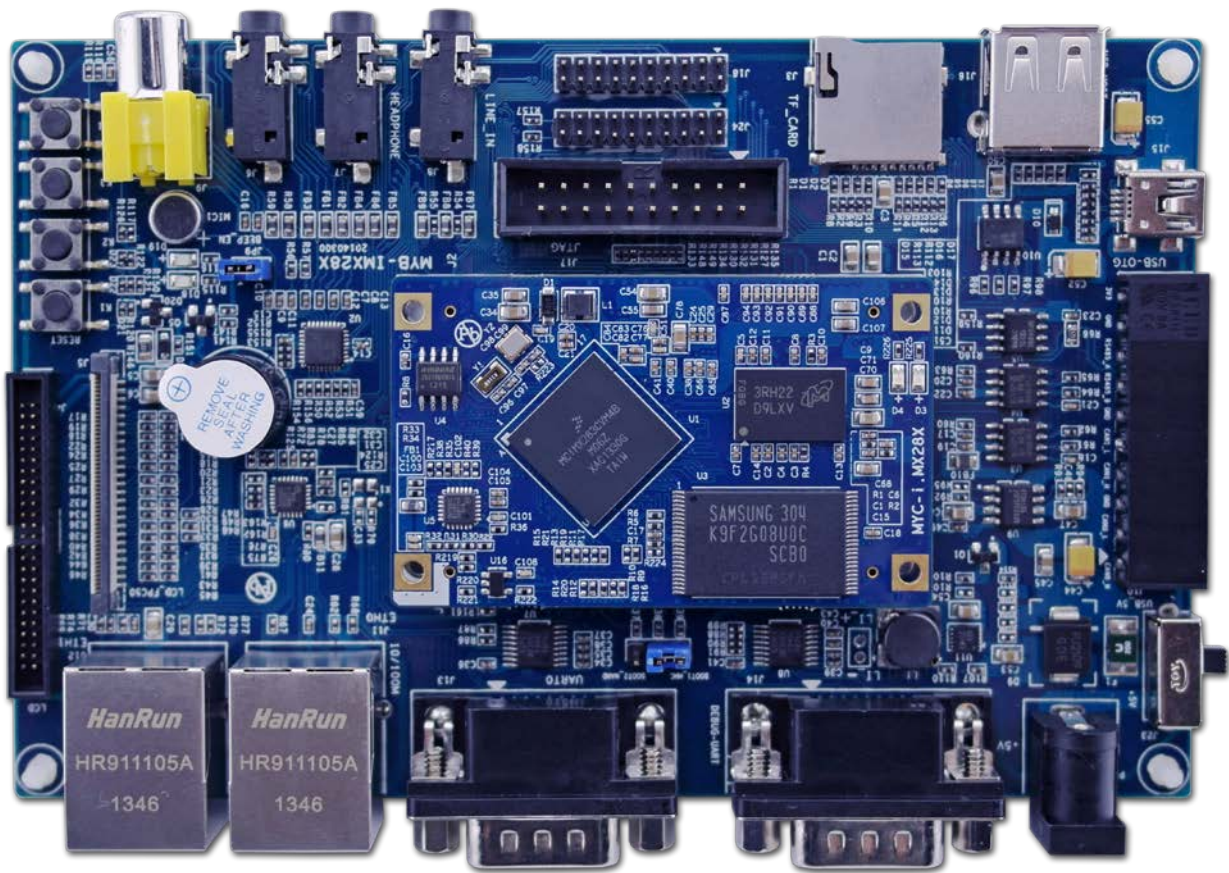- Ready-to-Run Linux 2.6.35 Development Kit

Figure 1-1 MYD-IMX28X Development Board

Description

The MYD-IMX28X Development Board designed by MYIR is a cost-effective and power-efficient ARM Evaluation Kit (EVK) for Freescale i.MX28 family of multimedia applications processors which has an ARM926EJ-S Core, with speed up to 454 MHz. The board can support running Linux operating system, which allows developers to use it as an i.MX28 reference platform to quickly start their own design. The board takes full features of the i.MX28 ARM processor and has exposed a comprehensive set of peripherals and connectivity options to make the board suitable for smart gateways, human-machine interfaces (HMIs), handheld devices, scanners, portable medical, experimental education and more other industrial applications.

The MYD-IMX28X Development Board is using the MYC-IMX28X CPU module as the heart of the system which is

an ARM9-based system-on-module (SOM) integrated with the i.MX28 processor, 128MB DDR2 SDRAM, 256MB Nand Flash and Ethernet PHY. It is connected to the base board through two 1.27mm pitch 80-pin connectors. The base board has extended many peripherals and interfaces through headers and connectors, featuring 1 x RS232, 1, Debug, 2 x USB ports, up to 2 x Ethernet, 2 x CAN, 1 x RS485, TF, Audio, LCD, JTAG, etc.
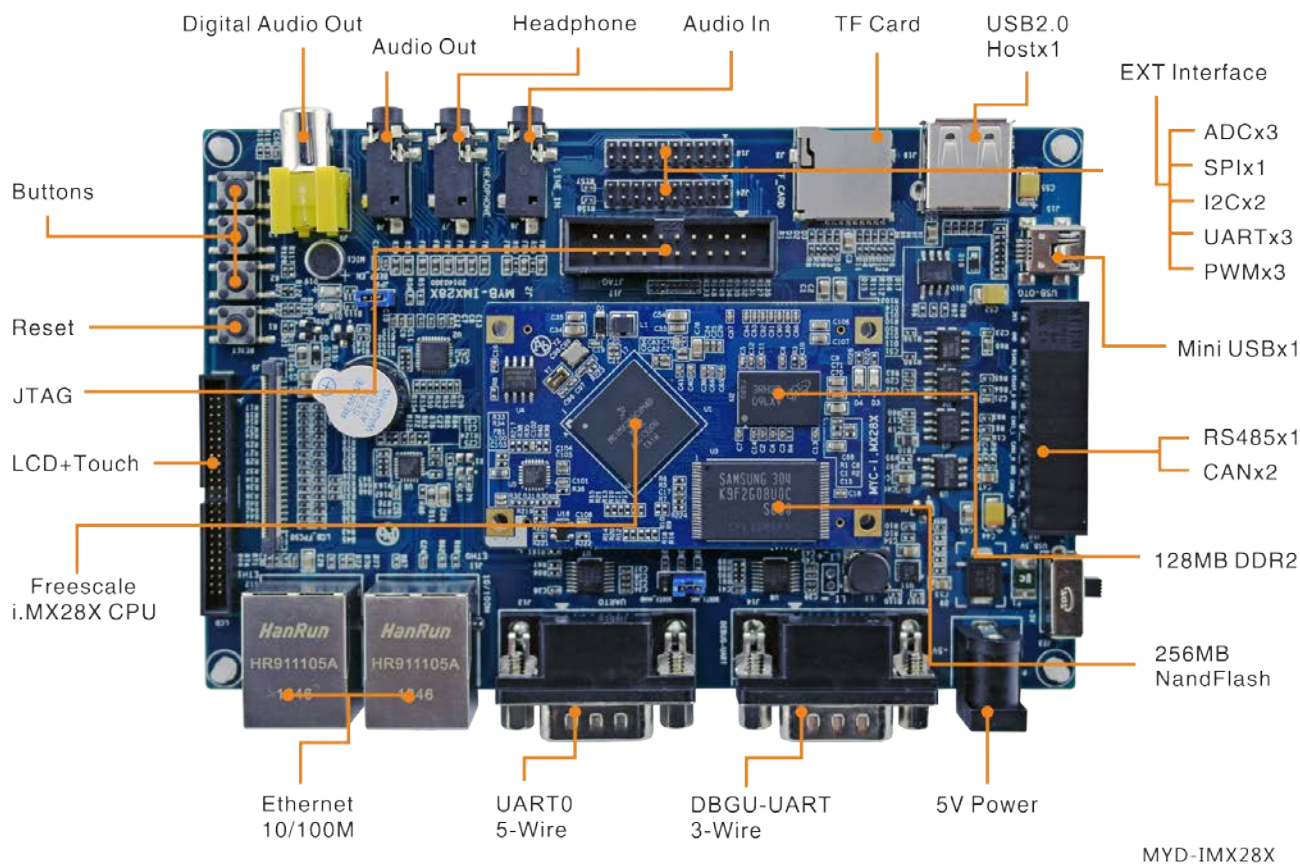

Figure 1-2 MYD-IMX28X Development Board Interface Diagram

MYIR offers the board with i.MX283 or i.MX287 ARM9 CPU by default; user can integrate a different MYC-IMX28X CPU module on the same base board, thus making two variants of i.MX28 evaluation boards.

- *MYD-IMX283 Development Board* – with *MYC-IMX283 CPU Module* for Freescale *i.MX283*
- *MYD-IMX287 Development Board* – with *MYC-IMX287 CPU Module* for Freescale *i.MX287*

The MYD-IMX283 and MYD-IMX287 boards only have a few differences as described in below table 1-1:

Model	MYD-IMX283	MYD-IMX287
Processor	i.MX283	i.MX287
CAN	0	2
Ethernet	1	2

Table 1-1 Differences of MYD-IMX283 and MYD-IMX287

The MYD-IMX28X board comes with Linux2.6.35 software packages, detailed documents, necessary cable accessories as well as optional 4.3- and 7-inch LCD (with touch screen) to provide a complete Freescale i.MX28 starter kit and enable a quickly start of evaluation of i.MX28 family applications processors.

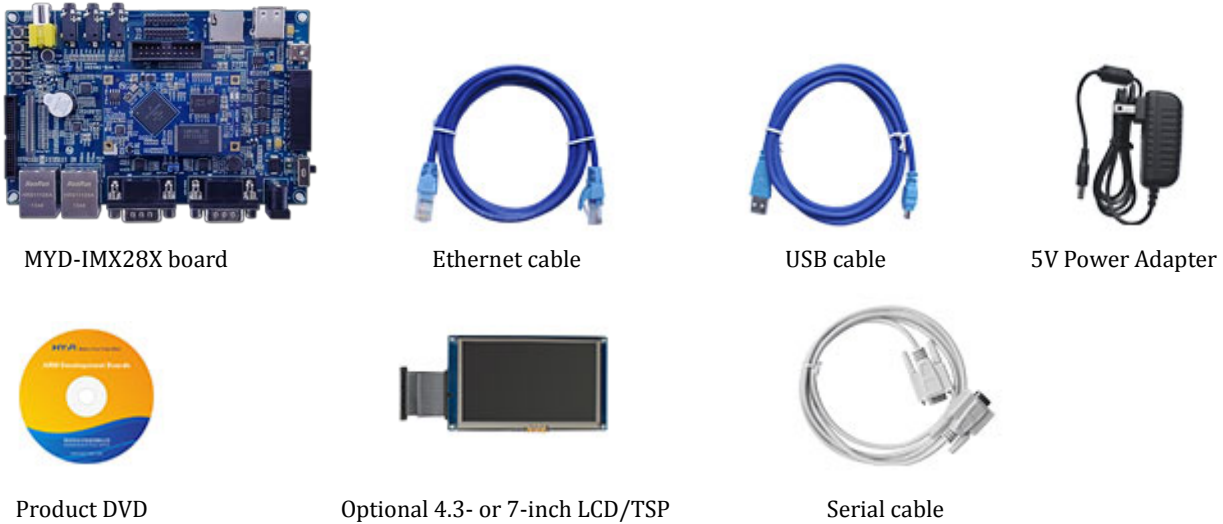The MYD-IMX28X Development Kit includes following items:

MYD-IMX28X board	Ethernet cable	USB cable	5V Power Adapter
Product DVD	Optional 4.3- or 7-inch LCD/TSP	Serial cable	

Figure 1-3 MYD-IMX28X Development Kit

Hardware Specification

The i.MX28 is a low-power, high-performance applications processor optimized for the general embedded industrial and consumer markets. The core of the i.MX28 is Freescale's fast, power-efficient implementation of the ARM926EJ-S™ core, with speeds of up to 454 MHz.

The device is suitable for a wide range of applications, including the following:
• Human-machine interface (HMI) panels: industrial, home
• Industrial drive, PLC, I/O control display, factory robotics display, graphical remote controls
• Handheld scanners and printers
• Patient-monitoring, portable medical devices
• Smart energy meters, energy gateways
• Media phones, media gateways

The integrated power management unit (PMU) on the i.MX28 is composed of a triple output DC-DC switching converter and multiple linear regulators. These provide power sequencing for the device and its I/O peripherals such as memories and SD cards, as well as provide battery charging capability for Li-Ion batteries.

The i.MX28 processor includes an additional 128-Kbyte on-chip SRAM to make the device ideal for eliminating external RAM in applications with small footprint RTOS.

The i.MX28 supports connections to various types of external memories, such as mobile DDR, DDR2 and LV-DDR2, SLC and MLC NAND Flash.

The i.MX28 can be connected to a variety of external devices such as high-speed USB2.0 OTG, CAN, 10/100 Ethernet, and SD/SDIO/MMC.

Family Comparison				
Feature	**i.MX280**	**i.MX283**	**i.MX286**	**i.MX287**
Temp. ranges	-20°C to +70°C -40°C to +85°C	-20°C to +70°C -40°C to +85°C	-20°C to +70°C -40°C to +85°C	-40°C to +85°C
LCD	-	Y	Y	Y
Ethernet	X1	X1	X1	X2
L2 Switch	-	-	-	Y
CAN	-	-	X2	X2
SDIO*	X4	X4	X4	X4
SPI*	X4	X4	X4	X4
S/PDIF Tx	-	-	Y	Y
* Represents maximum available. Some pins are shared with other interfaces				

Table 1-2 i.MX28 Family Comparison

The MYD-IMX28X has a CPU Module MYC-IMX28X integrated with Freescale i.MX28 processor, DDR2 SDRAM, Nand Flash, Data Flash and Ethernet PHY on it, which exposes many of these features to the user in support of developing specific solutions. The CPU Module can be mounted directly onto the base board through two 1.27mm pitch 80-pin expansion connectors. This board is characterized as follows:

Mechanical Parameters
- Dimensions: 140mm x 90mm (base board), 62mm x 38mm (CPU Module)
- PCB Layers: 4-layer design (base board), 6-layer design (CPU Module)
- Power supply: +5V
- Working temperature: -20~70 Celsius (commercial grade) or -40~85 Celsius (industrial grade)

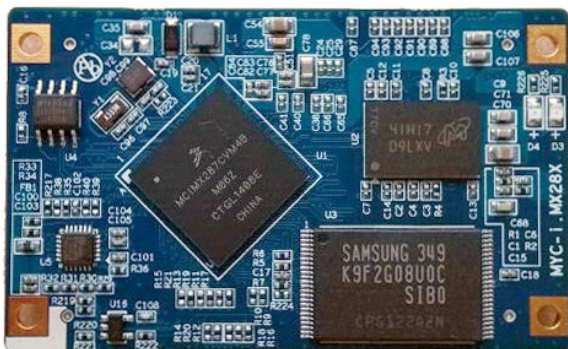**The MYD-IMX28X Controller Board (MYC-IMX28X CPU Module)**
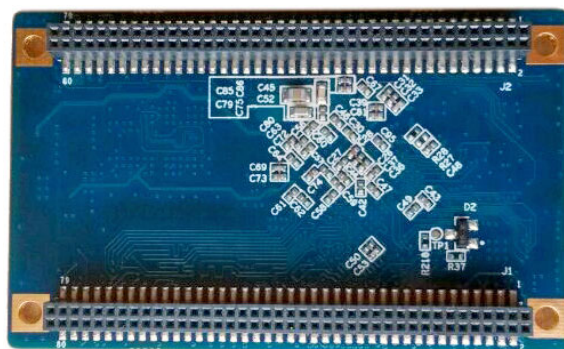

Figure 1-4 MYC-IMX28X Top-view

Figure 1-5 MYC-IMX28X Bottom-view

Processor

- Freescale i.MX283, i.MX287 Applications processor
  - Up to 454MHz ARM926EJ-STM core with 16KB/32KB I and D Cache
  - 128 kbytes of integrated low-power on-chip SRAM
  - 128Kbytes of integrated mask-programmable on-chip ROM
  - 1280 bits of on-chip one-time-programmable(OCOTP)ROM
  - 16-bit mobile DDR(mDDR)(1.8V),DDR2(1.8V)and LV-DDR2(1.5V),up to 205MHz DDR clock frequency with voltage overdrive
  - Support for up to eight NAND Flash memory devices with up to 20-bit BCH ECC

Memory

- 128MB DDR2 SDRAM
- 256MB Nand Flash
- 128KB SPI Data Flash

Peripherals and Signals Routed to Pins

- On-board Ethernet PHY
- One power indicator (Red LED)
- One user LED (Blue)
- Two 1.27mm pitch 2 x 40-pin SMT female expansion connectors can carry out interfaces below
  - Ethernet (two for i.MX287, one for i.MX283)
  - 2 x USB2.0 OTG ports
  - Up to 4 x Serial ports
  - 1 x I2C
  - 2 x SPI
  - Up to 8 x ADC (one high-speed ADC, seven low-resolution ADC)
  - Up to 5 x PWM
  - 1 x SDIO
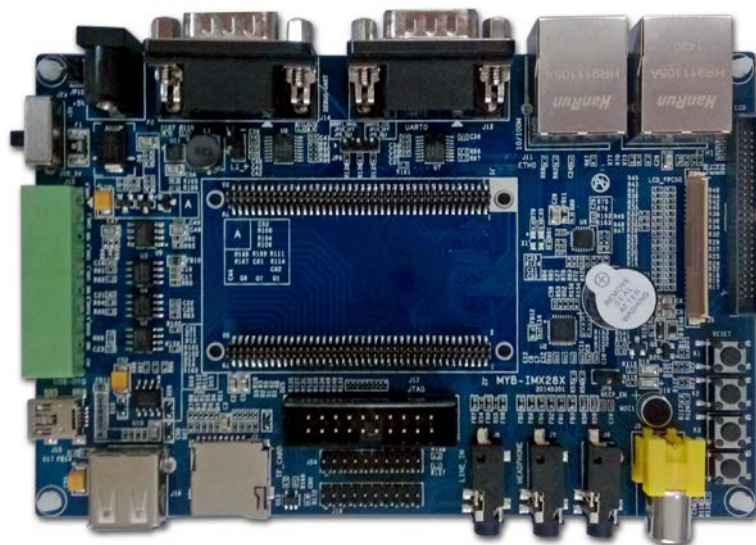
The MYD-IMX28X Base Board

Figure 1-6 MYD-IMX28X Base Board

- Serial ports
    - 1 x 3-wire RS232 Debug serial port (DB9)
    - 1 x 5-wire RS232 serial port (UART0)
    - 1 x RS485
- USB
    - 1 x USB2.0 Host port
    - 1 x USB2.0 OTG port
- 10/100Mbps Ethernet interfaces (two for i.MX287, one for i.MX283)
- 2 x CAN interface (only for i.MX287)
- 1 x TF card slot
- 1 x LCD interface (16-bit true color, supports optional 4.3-inch and 7-inch TFT LCD)
- 1 x 4-wire resistive touch screen interface
- 1 x Audio input port (3.5mm jack)
- 1 x Audio output port (3.5mm jack)
- 1 x Headphone output port (3.5mm jack)
- 1 x Mic In interface
- 1 x Buzzer
- 1 x 2.54mm pitch 20-pin JTAG interface
- 4 x Buttons (1 x Reset button, 3 x User buttons)
- 2 x User LEDs (Blue)
- 2 x 2.0mm 20-pin expansion connectors
    - 3 x ADC (one high-speed ADC, two low-resolution ADC)
    - 1 x SPI
    - 2 x I2C
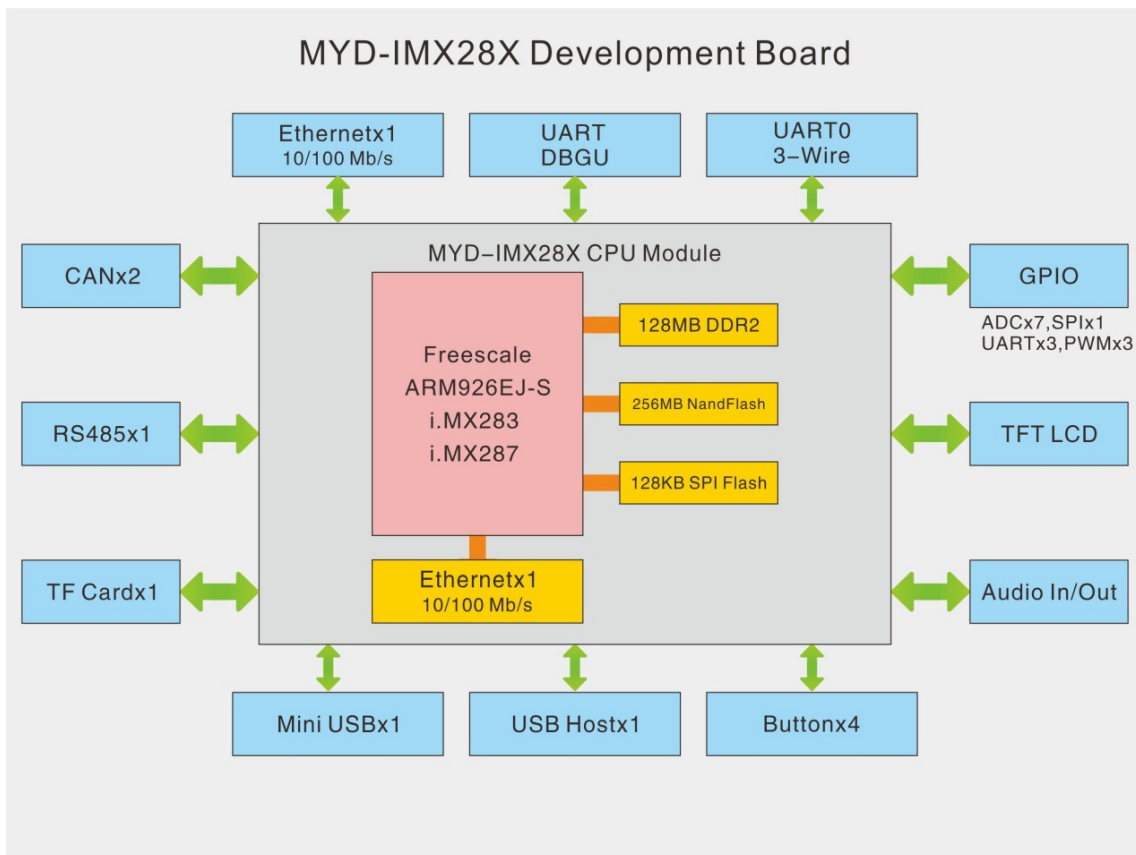   - 3 x UART
    - 3 x PWM

Function Block Diagram

Figure 1-7 Function Block Diagram of MYD-IMX28X
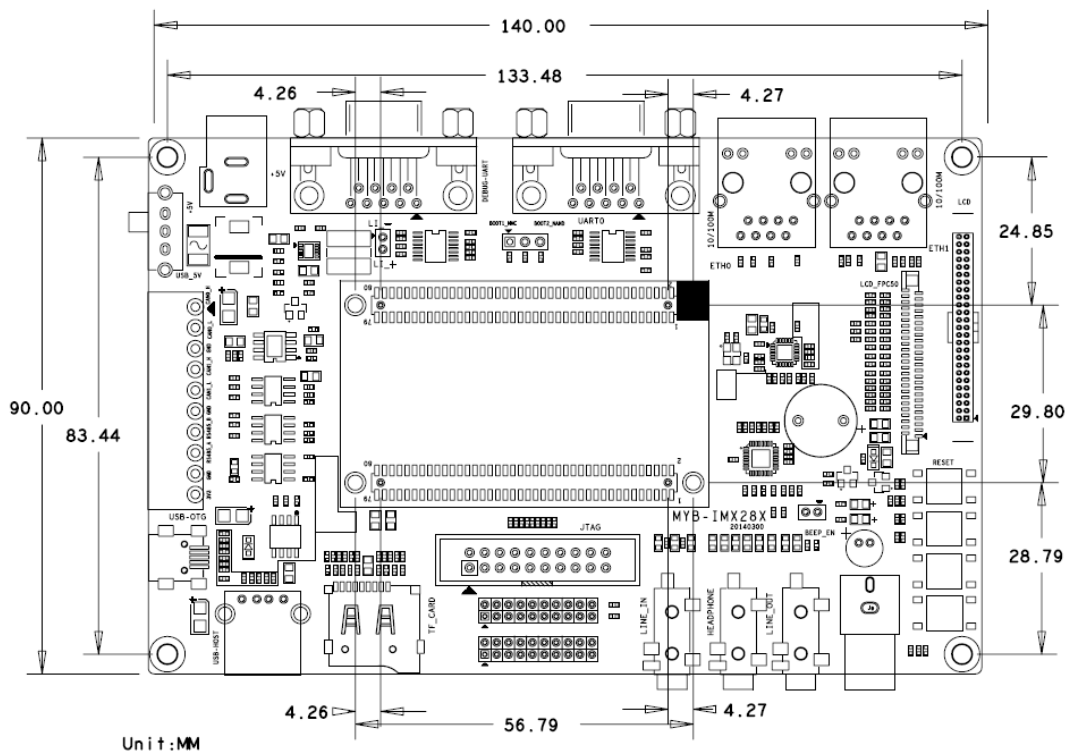
Dimension Chart of MYD-IMX28X

Figure 1-8 Dimension Chart of MYD-IMX28X

Software Features

MYIR's i.MX28 Starter Kit MYD-IMX28X supports for Linux and is provided with software packages. Many peripheral drivers are in source code to help accelerate customers' designs with a stable and reliable hardware and software platform. The software features are summarized as below:

Category	Item	Description	Source Code Availability
Bootloader	U-boot	Responsible for system initialization and boot kernel, include TCPIP.	YES
	bootlets	Boot kernel	YES
Kernel	Linux 2.6.35	Designed for MYD-IMX28X hardware	YES
Drivers	USB Host	USB Host driver, support OHCI and EHCI	YES
	USB Device	USB Device driver	YES
	Ethernet	Ethernet driver	YES
	MMC/SD	MMC/SD driver	YES
	NAND Flash	NAND Flash/SmartMedia driver	YES
	I2C	I2C driver	YES
	SPI	SPI driver	YES
	Audio	SGTL5000 driver	YES
	LCD Controller	LCD driver, for 4.3 inch, 7 inch	YES
	RTC	RTC clock driver	YES
	TouchScreen	4-wire resistive touch screen driver	YES
	PWM	PWM (Pulse Width Modulation) driver	YES
	UART	Serial driver	YES
	CAN	CAN driver	YES
	PMU	Power Management Unit river	YES
	GPIO	LED driver and GPIO input and output	YES
Demo	UART	UART test program	YES
	I2C	I2C test program	YES
	SPI	SPI Flashtest program	YES
	CAN	CAN communication experiment using canutils	YES
	NET	Socket-based network client / server program	YES
	SD Card	SD test program	YES
	LED&Key&Buzz	LED, Key and buzzer demo	YES
	RTC	RTC clock testing experiment	YES
	Audio	Audio play demo	YES
	LCD	Framebuffer colorbar based LCD test program	YES
	TouchScreen	Screen calibration test	YES
	Qt	Qt Kit and Qt demo	YES

Order Information

Product Item	Part No.	Packing List
MYD-IMX283 Development Board (commercial grade)	MYD-IMX283	➢ One MYD-IMX28X Development Board
MYD-IMX283-I Development Board (industrial grade)	MYD-IMX283-I	➢ One Net cable
MYD-IMX287-I Development Board (industrial grade)	MYD-IMX287-I	➢ One USB cable
MYC-IMX283 CPU Module (commercial grade)	MYC-IMX283	➢ One Serial cable
MYC-IMX283-I CPU Module (industrial grade)	MYC-IMX283-I	➢ One 5V/2A Power adapter ➢ One Product DVD
MYC-IMX287-I CPU Module (industrial grade)	MYC-IMX287-I	**Add-on Options**
MY-LCD43TP 4.3-inch LCD Module with resistive touch	MY-LCD43TP	➢ MYC-IMX28X CPU Module
MY-LCD70TP 7-inch LCD Module with resistive touch	MY-LCD70TP	➢ MY-LCD43TP 4.3-inch LCD Module ➢ MY-LCD70TP 7-inch LCD Module
MY-LCD70TP 7-inch LCD Module with capacitive touch	MY-LCD70TP-C	➢ MY-LCD70TP-C 7-inch LCD Module

Remark:

1. *One MYD-IMX28X Development Board includes one CPU module MYC-IMX28X mounted on the base board. If you need more CPU module, you can order extra ones.*
2. *For Price information, please contact MYIR.*
3. *The boards of commercial grade can work in -20~70 Celsius and the boards of industrial grade can work in -40 to 85 Celsius.*
4. *We accept custom design based on the MYD-IMX28X, whether reducing, adding or modifying the existing hardware according to customer's requirement.*

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