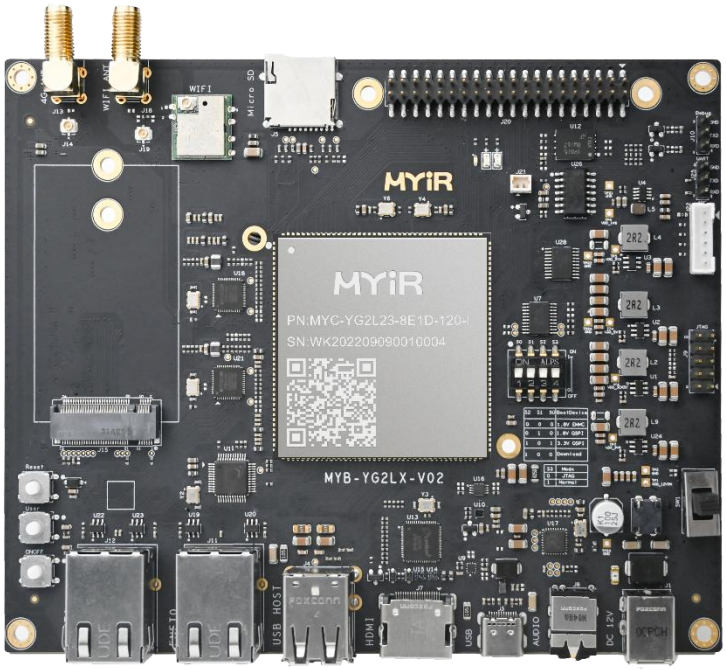
MYiR 米尔电子
Make Your Idea Real

MYD-YG2LX Development Board

Overview

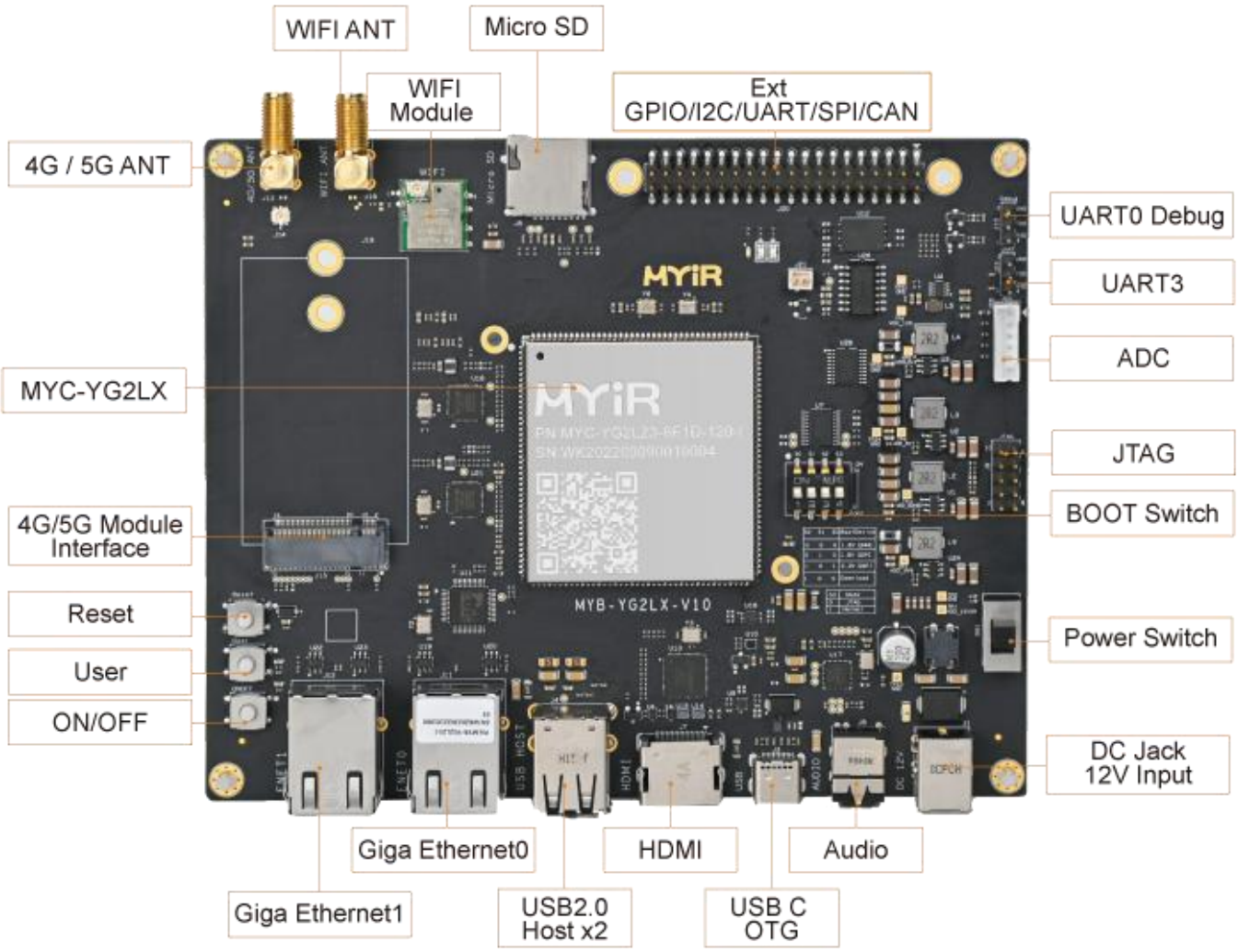


- ✓ *MYC-YG2LX CPU Module as Controller Board*
- ✓ *RENESAS RZ/G2L Processor based on 1.2GHz Dual ARM Cortex-A55 and 200MHz Cortex-M33 Cores*
- ✓ *1GB/2GB DDR4, 8GB eMMC Flash, 32KB EEPROM*
- ✓ *UARTs, 2 x USB 2.0 HOST, 1 x USB 2.0 OTG, 2 x Gigabit Ethernet, WiFi, 4G/5G LTE, Micro SD card Slot*
- ✓ *Camera Interface (MIPI-CSI), LVDS, RGB, Audio Input/Output*
- ✓ *Supports Running Linux 5.10 OS*
- ✓ *Optional 7-inch LCD Modules, Camera Module and RPI Module*

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836

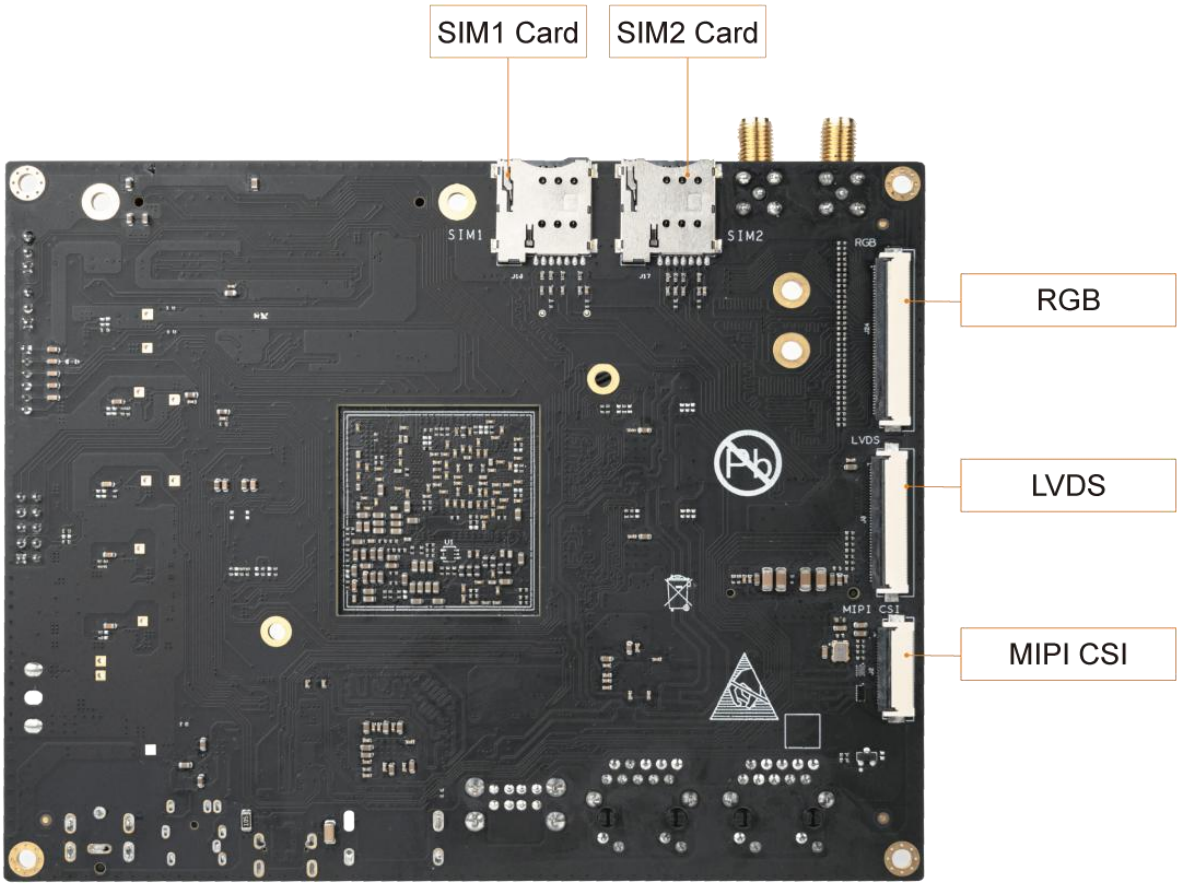
The MYD-YG2LX Development Board consists of a compact CPU Module MYC-YG2LX and a base board to provide a complete evaluation platform for RENESAS RZ/G2L Processors which features dual-core Arm Cortex-A55 operating at up to 1.2GHz, an embedded Cortex-M33 core operating at up to 200MHz, ARM Mali-G31 based 3D Graphics and Video CODEC Engine. Typical applications are industrial HMI, medical, industrial automation, power, display and control terminal and other scenarios which require rich performance and low power.

The MYC-YG2LX CPU Module is populated on the MYD-YG2LX base board through 1.0mm pitch 222-pin stamp-hole (Castellated-Hole) interface. It is a highly-integrated SoM which combines the RZ/G2L processor, 1GB/2GB DDR4, 8GB eMMC, 32KB EEPROM and a PMIC chip. The base board has brought out rich peripherals through connectors and headers such as four Serial ports, two Gigabit Ethernet, two USB 2.0 HOST and one USB 2.0 OTG, one Micro SD card slot, one M.2 Socket for USB based 4G/5G LTE Module with two SIM card holders, one USB2.0 based WiFi module, one GPIO/I2C/UART/SPI/CAN extension header, Audio input/output, MIPI-CSI camera interface as well as HDMI, LVDS and RGB video output interfaces.



MYD-YG2LX Development Board (Top-view)

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836



MYD-YG2LX Development Board (Bottom-view)

The MYD-YG2LX is running Linux OS. MYIR provides abundant software resources including image files, kernel and driver source code, application demos and compilation tools to enable users to start their development rapidly and easily.

The MYD-YG2LX Development Board is delivered with one Quick Start Guide, one USB to TTL serial cable and one 12V/2A power adapter. MYIR also offers MY-CAM003M MIPI Camera Module, MY-WIREDCOM RPI Module (RS232/RS485/CAN), MY-LCD70TP-C 7 inch LCD Module and MY-LVDS070C LCD Module as add-on options for the board.

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836

Hardware Specification

The MYC-YG2LX CPU Module populated on the MYD-YG2LX Development Board is using the 15 x 15mm, 0.5 mm ball pitch, 456pin LFBGA package, 1.2 GHz RZ/G2L (R9A07G044L23GBG) MPU which belongs to the RENESAS RZ/G2L product group and features dual-core Arm Cortex-A55 (1.2 GHz) CPUs and Single-core Arm Cortex-M33 (200 MHz) CPU, with 3D graphics and video CODEC engine. And the microprocessor also comes with 16-bit DDR4-1600/DDR3L-1333 dynamic Random access memory, camera interface (MIPI-CSI/Parallel-IF), display interface (MIPI-DSI/Parallel-IF), and USB2.0 Interface, SDHI interface, CAN interface, Gigabit Ethernet interface, making it ideal for applications such as entry-class industrial human-machine interfaces (HMIs) and embedded devices with video capabilities.

Function		RZ/G2L	RZ/G2LC	RZ/G2UL
Cortex-A55*1	Dual	✓	✓	—
	Single	✓	✓	✓
Cortex-M33		✓	✓	✓/—*2
3D Graphics (Arm Mali-G31)		✓	✓	—
Video Codec (H.264)		✓	—	—
Display Interface		MIPI DSI or Parallel	MIPI DSI	Parallel
Camera Interface		MIPI CSI-2 or Parallel	MIPI CSI-2	MIPI CSI-2
Gigabit Ethernet		2ch	1ch	2ch
12-bit A/D Converter		8ch	—	1ch
Package (PBGA)		551pin, 21mm□ (0.8mm pitch) 456pin, 15mm□ (0.5mm pitch)	361pin, 13mm□ (0.5mm pitch)	361pin, 13mm□ (0.5mm pitch)

***1: The maximum operating frequency of Cortex-A55 is 1.2GHz for RZ/G2L, RZ/G2LC, and 1.0GHz for RZ/G2UL.**

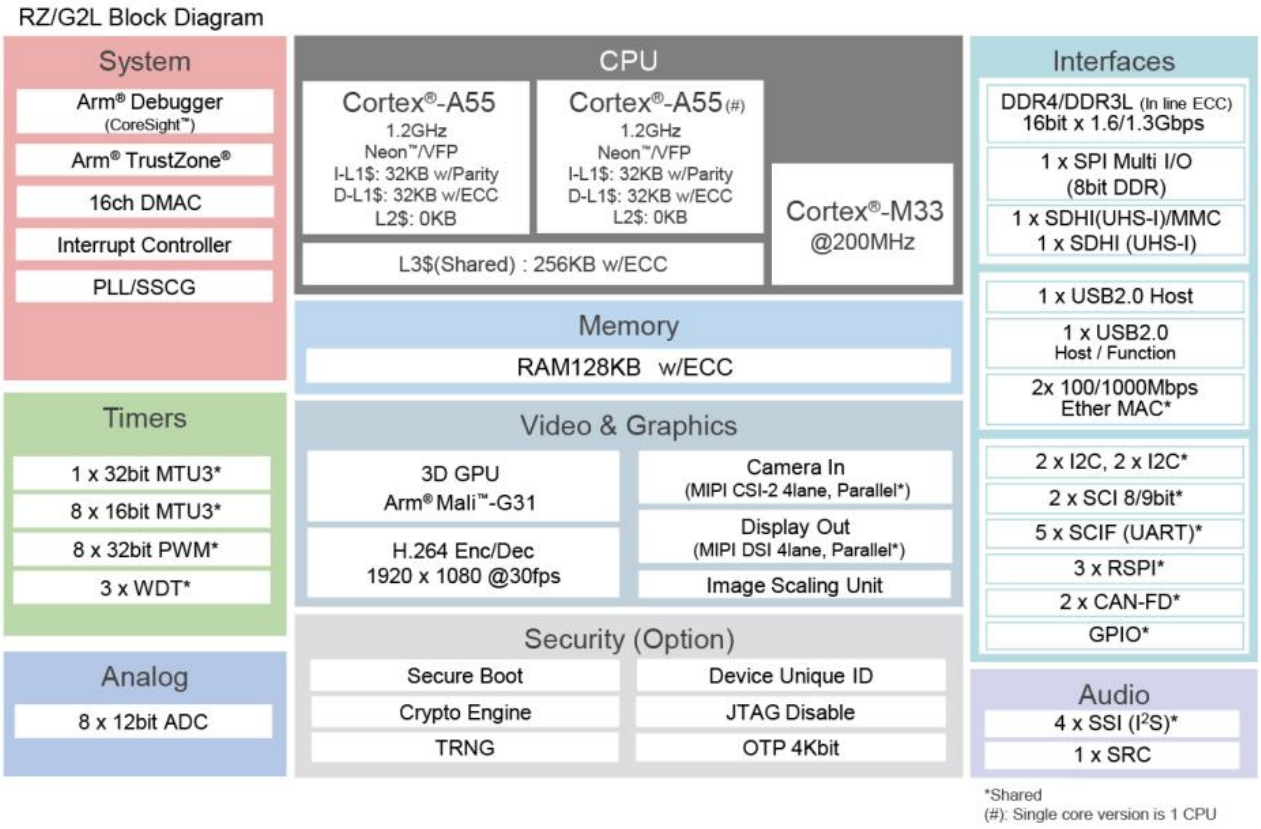
***2: RZ/G2UL Cortex-M33 is optional.**

RZ/G2L Group Function Differences

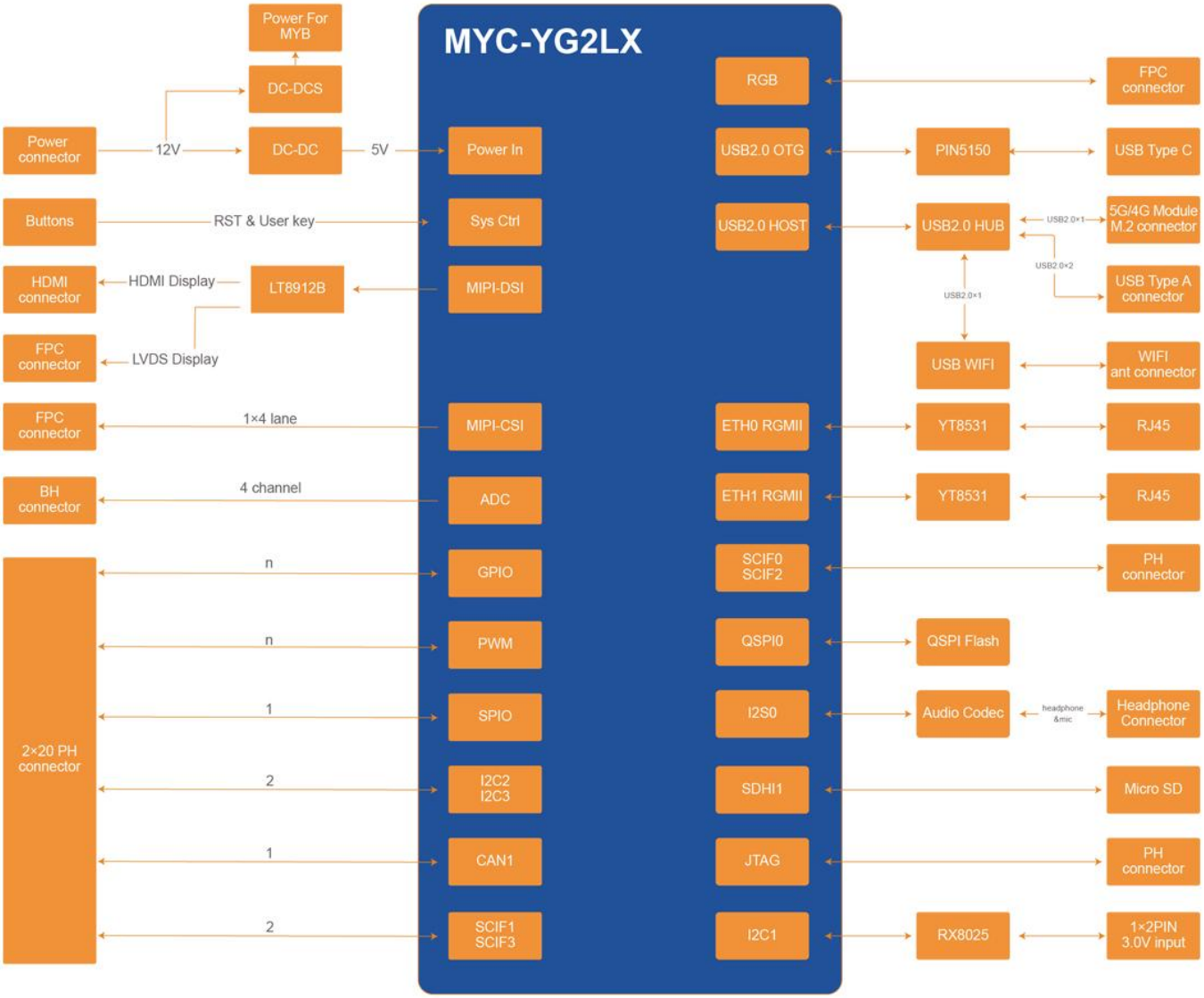
Product Group	RZ/G2L			
Part No.	R9A07G044L24GBG	R9A07G044L14GBG	R9A07G044L23GBG	R9A07G044L13GBG
Arm Cortex-A55	2	1	2	1
Arm Cortex-M33	1	1	1	1
3D Graphics (Arm Mali-G31)	✓	✓	✓	✓
Video Codec (H.264)	✓	✓	✓	✓
Display Interface	1x MIPI DSI or 1x Digital Parallel output	1x MIPI DSI or 1x Digital Parallel output	1x MIPI DSI or 1x Digital Parallel output	1x MIPI DSI or 1x Digital Parallel output
Camera Interface	1x MIPI CSI-2 or 1x Digital Parallel input	1x MIPI CSI-2 or 1x Digital Parallel input	1x MIPI CSI-2 or 1x Digital Parallel input	1x MIPI CSI-2 or 1x Digital Parallel input
Gigabit Ethernet	2ch	2ch	2ch	2ch
12-bit A/D Converter	8ch	8ch	8ch	8ch
Package	LFBGA	LFBGA	LFBGA	LFBGA
Pin Count	551pin	551pin	456pin	456pin
Package Information	21mm x 21mm 0.8mm pitch	21mm x 21mm 0.8mm pitch	15mm x 15mm 0.5mm pitch	15mm x 15mm 0.5mm pitch

RZ/G2L Product Group

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836



RZ/G2L Processor Block Diagram



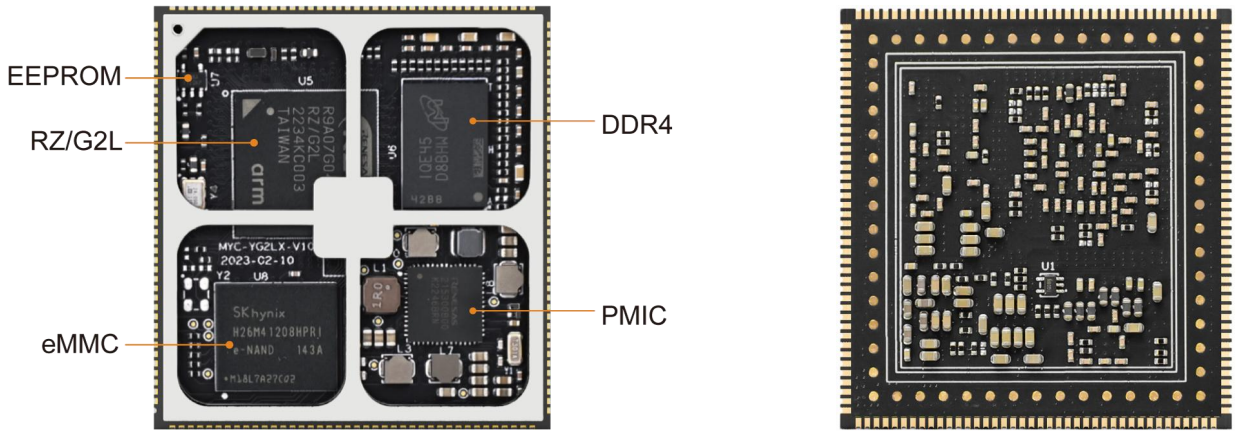
MYD-YG2LX Development Board Function Block Diagram

The MYD-YG2LX Development Board is using the MYC-YG2LX CPU Module as core controller board. It takes full features of RZ/G2L processor and the main features are characterized as below:

Mechanical Parameters

- Dimensions: 150mm x 120mm (base board), 43mm x 45mm (CPU Module)
- PCB Layers: 6-layer design (base board), 10-layer design (CPU Module)
- Power supply: +12V/2A Power supply (base board), 5V/1A (CPU Module)
- Working temperature: -40~85 Celsius (industrial grade)
  (WiFi Module: -20~70 Celsius)

The MYD-YG2LX Controller Board (MYC-YG2LX CPU Module)



MYC-YG2LX CPU Module (Top-view and Bottom-view)

Processor

- RENESAS RZ/G2L processor (R9A07G044L23GBG)
  - 1.2 GHz Dual-core ARM Cortex-A55
  - 200 MHz ARM Cortex-M33
  - 3D graphics functions (Arm Mali-G31)
  - Video codec (H.264)

Memory

- 1GB/2GB DDR4 (supports optional 4GB)
- 8GB eMMC (supports optional 4GB/16GB/32GB)
- 32KB EEPROM

Peripherals and Signals Routed to Pins

- Power Management IC (RAA215300)
- 1.0mm pitch 222-pin Stamp Hole Expansion Interface
  - 2 x RGMII
  - 2 x USB2.0
  - 5 x SCIF
  - 2 x SCI
  - 2 x CAN
  - 4 x I2C
  - 3 x SPI
  - 8 x ADC
  - 1 x MIPI-DSI
  - 1 x RGB
  - 1x MIPI-CSI
  - 1 x Parallel CSI
  - 4x SSI
  - 1x SRC
  - Up to 118 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 and the CPU Module pinout description file.

The MYD-YG2LX Development Board Base Board

- 1 x Power Jack
- 1 x Power Switch
- Serial ports
  - 1 x Debug UART (TTL)
  - 3 x TTL serial ports
- USB
  - 2 x USB2.0 Host ports
  - 1 x USB 2.0 OTG port (Type-C)
  - 1 x M.2 socket for USB based 4G/5G LTE Module
  - 1 x USB based WiFi Module
- 2 x SIM card slots
- 1 x Micro SD card slot
- Ethernet
  - 2 x 10/100/1000 Mbps Ethernet interface (RJ45)
- 1 x Micro SD card slot
- 1 x JTAG Interface
- 2 x Antenna Interfaces (one for WiFi and one for 4G/5G)
- Video Input
  - 1 x MIPI-CSI Interface (0.5mm pitch 24-pin FPC connector)

  Supports MYIR's MY-CAM003M Camera Module through J2
- Video Output
  - 1 x HDMI Output Interface
  - 1 x RGB Display interface (J24, 40-pin 0.5mm pitch FPC connector)

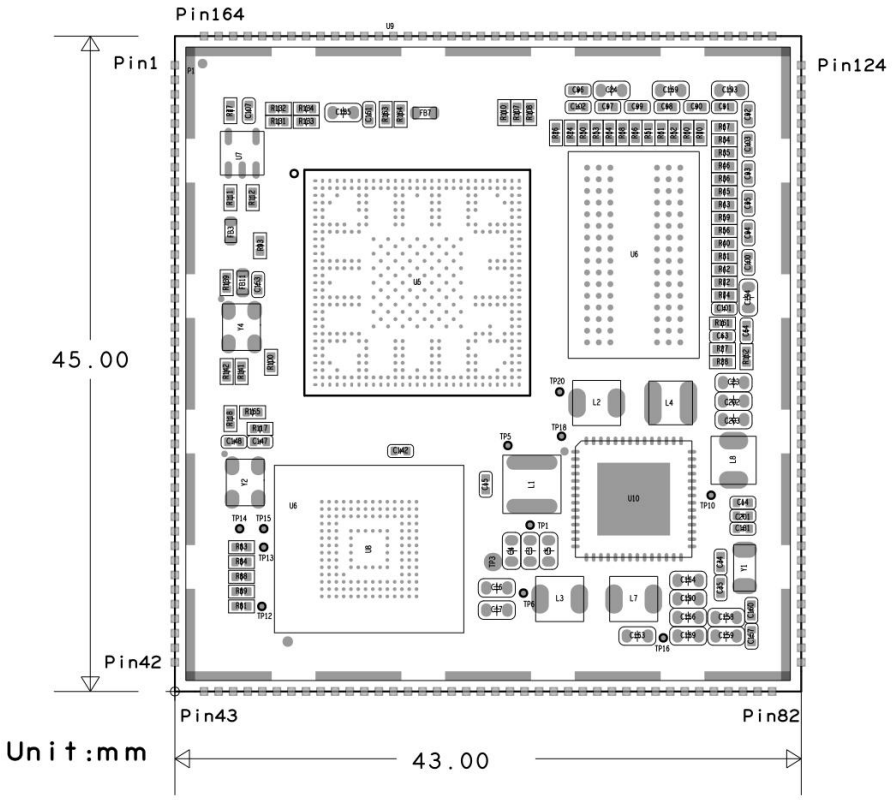
  Supports MYIR's MY-LCD70TP-C LCD Module with Capacitive Touch Screen through the LCD interface
  - 1 x LVDS Display interface (J6, 30-pin 0.5mm pitch FPC connector)

  Supports MYIR's MY-LVDS070C LCD Module with Capacitive Touch Screen through the LCD interface
- Audio Input and Output Interface
- 1 x 2.54mm 2 x 20-pin male expansion header

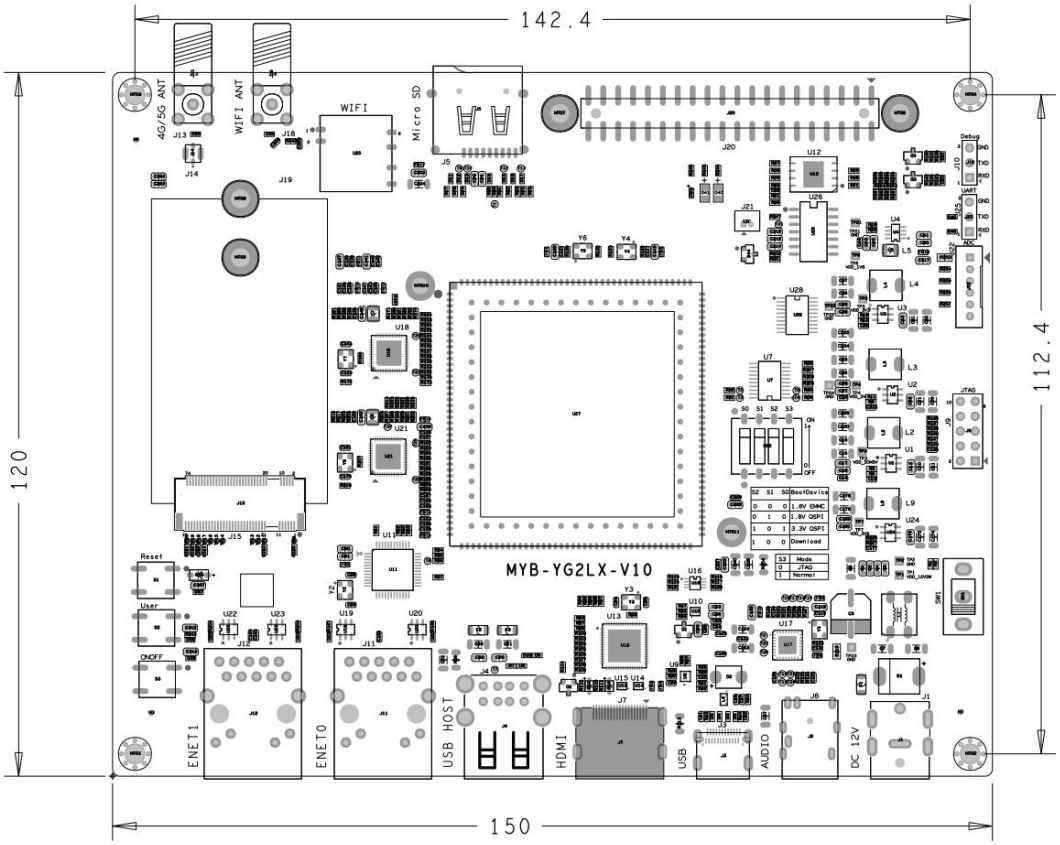
  (J20, GPIO/I2C/UART/SPI/CAN, compatible with Raspberry PI standard 40-pin extension interface)

  Supports MYIR's MY-WIREDCOM RPI Module through J20 to extend RS485, RS232 and CAN functions
- 3 x Buttons (one for Reset, one for Power On/Off and one for User)

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836



MYC-YG2LX Dimensions Chart



MYD-YG2LX Base Board Dimensions Chart

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836

Software Features

The MYD-YG2LX Development Board supports Linux OS and comes with complete software package. The following are a summary of the software features:

Item	Feature	Description	Source Code
Bootloader	trusted-firmware-a	fsbl boot	YES
	U-boot	second boot program based on uboot_2021.10	YES
Linux kernel	Linux kernel	Customized base on official kernel_5.10.83 version	YES
Device driver	PMIC	RAA215300A2GNP driver	YES
	QSPI	W25Q128JVEIQ driver	YES
	USB Host	USB Host driver	YES
	USB OTG	USB OTG driver	YES
	I2C	I2C bus driver	YES
	SPI	SPI bus driver	YES
	Ethernet	YT8531SH driver	YES
	SDHI	eMMC/SD card storage driver	YES
	HDMI	LT8912 driver	YES
	LVDS	LT8912 driver	YES
	RGB	RGB driver	YES
	Audio	SGTL5000 audio driver	YES
	4G/5G	4G/5G driver	YES
	PWM	PWM control	YES
	ADC	ADC driver	YES
	RTC	RTC driver	YES
	GPIO	Generic GPIO driver	YES
	UART	RS232/RS485/TTL driver	YES
	CAN	CAN driver	YES
	Camera(MIPI)	OV5640 camera driver	YES
	WiFi	FG6188EUFX-05 driver	YES
File system	myir-image-core	image without GUI interface built with Yocto	YES
	myir-image-full	full-featured image built with Yocto	YES
	myir-image-ubuntu-xfce	image with xfce desktop system built with Ubuntu 20.04 (available later)	YES
Application DEMO	Charging pile application	Refer to State Grid charging pile program to implement Modbus protocol, IEC104 platform communication protocol and charging demonstration interface. Integrating the features into MEasyHMI V2.0 for demonstration through full image.	YES

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836

	PLC controller	Porting open source Ethercat host IGH; Use Linux real-time patch PREEMPT-RT or XENOMAI (real-time response speed and real-time jitter time measured data), to write a console application and control the EtherCAT slave station and servo motor by command.	YES
	Engineering machinery scene	Four AHD cameras capture four channels of videos to display on screen. The analog instrument information is displayed on screen. The videos and instrument information are displayed with split-screen presentation. Integrating the features into MEasyHMI V2.0 for demonstration through full image.	YES

MYD-YG2LX Software Features

MYIR Electronics Limited
Website: www.myirtech.com E-Mail: sales@myirtech.com Tel: +86-755-22984836