ENERGY-IMX8MP-Kit Energy Storage Board

Product Specification

Version No.：1.0
2024.07

Technical Support

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Information update and access

1、 Information Updating

Product-related information will be constantly improved and updated. When you use these contents, please make sure that it is up to date.

2、Update Notification

Qiyang product information updates will be notified via WeChat public account, so stay tuned!

3、How to obtain information

After purchasing, please contact the relevant sales staff of our company to obtain it.

Version Record

Version No.	Hardware Platform	Description	Date
V1.00	ENERGY-IMX8MP-MB V1.00	Initial Version	2024-07

Contents

Caution: This manual mainly introduces the hardware interfaces on the development board.

I. Preface

1.1. Company Profile:

Zhejiang Qiyang Intelligent Technology Co., Ltd., established in 2007, which locates in Hangzhou, Zhejiang, PRC. It is a high-end technological enterprise that specializes in exploitation, fabrication, and selling embedded computer mainboards . With 10 years of experiences, Qiyang has established the completed service chain from the design concept to mass production successfully.

The R&D team is organized by 30 more technical engineers. Qiyang focus on providing functional embedded hardware, software tool and customization solutions. It has been applied to Industrial Control, Internet of Things, New Retail, Smart Medical, Electricity Device, Environmental Surveillance, Charging Pile etc.

With the growth of the business, Qiyang has set up an SMT factory in Zhuji, Zhejiang province, which is 5000 ㎡, with a 2xSMT production line. The SMT factory performs the ISO9001 Quality Management System strictly. Relying on the solid production ability, the SMT factory's annual capacity is about a million sets, which totally guarantee the delivery date.

Qiyang has a thorough sales marketing network, professional sales ,and after-sales team to provide full technical support and service. The business has spread over 120 countries and areas, it helps the clients to introduce the products into the market efficiently and successfully.The combination and extension of research and development, production capacity, and market, that provide a solid foundation for Qiyang to provide specialized, globalized embedded hardware and software.

We offer:

I.Software/Hardware Mainboard

Based on the CPU solution from NXP,Rockchip,MTK,Renesas,TI,Atmel,Cirrus Logic etc, Qiyang provides the ARM development kit/system on module/industrial board and periphery products, paired tools and software for the user do further exploitation.

2.Customization Service

Fully taking the advantage of the technical accumulation on the ARM platform and Linux, Android, Ubuntu OS, Qiyang provides the efficient OEM/ODM service to the users.

**Sincerely thanks for using Qiyang's product, we will try our best to offer you the technical supports! **

1.2. ENERGY-IMX8MP-Kit product suggestion:

1. Please read the instructions firstly, before using the single board computer;
2. Before using, please check the packing list and see whether there is a missing file in the CD;
3. Please understand the basic structure and composition of development board, including the hardware resource allocation etc.;
4. ENERGY-IMX8MP-Kit energy storage development board supports batch order.

II. Product Description

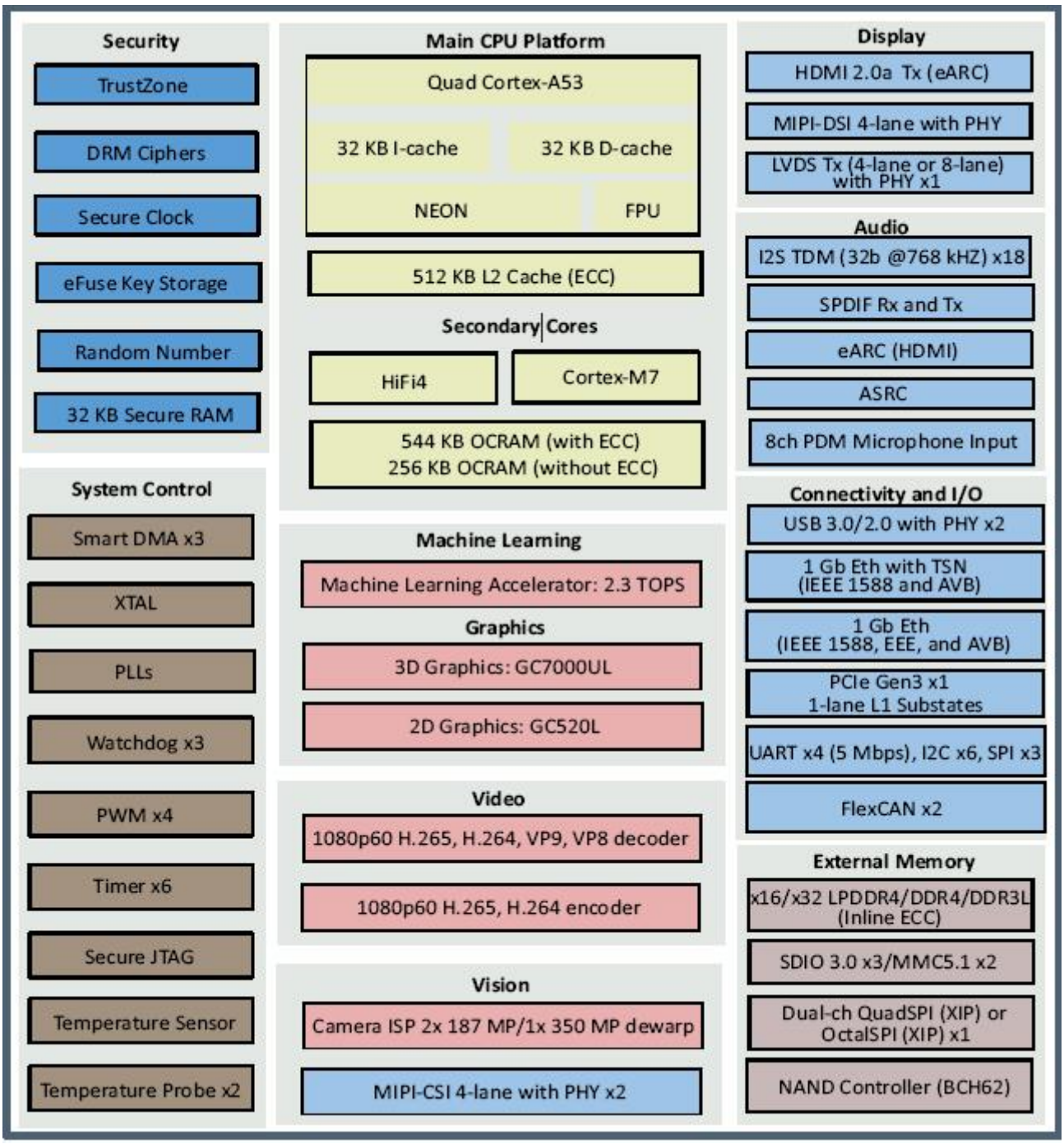
2.1. Chipset Outline

ENERGY-IMX8MP-Kit energy storage board, it adopts NXP IMX8MPlus series processor, the i.MX 8M Plus family focuses on neural processing unit (NPU) and vision system, advance multimedia, and industrial automation with high reliability.
The i.MX 8M Plus is a powerful quad Arm® Cortex®-A53 processor with speed up to 1.8 GHz integrated with an NPU of 2.3 TOPS that greatly accelerate machine learning inference. The vision engine is composed of two camera inputs and an HDR-capable Image.Signal Processor (ISP) capable of 375 MPixels/s.

The advanced multimedia capabilities include 1080p60 video encode and decode H.265 and H.264. A 3D and 2D graphic acceleration supporting 1 GPixel/s, OpenVG 1.1, Open GL ES3.1, Vulkan, and Open CL 1.2 FP. Multiple audio and microphone interfaces for Immersive Audio and Voice systems.

For industrial applications, real time control is enabled by an integrated 800 MHz Arm® Cortex®-M7. Robust control networks are possible via CAN-FD interfaces. And a dual Gb Ethernet, one supporting Time Sensitive Networking (TSN), drive gateway applications with low latency.

IMX8MP Processor Block Diagram:



Detailed Parameters:

CORE	CPU	Quad Arm®Cortex®-A53 1.6GHz 32 KB L1 Instruction Cache，32 KB L1 Data Cache 512 KB unified L2 cache Support of 64-bit Armv8-A architecture
	MCU	Arm®Cortex®-M7 800MHz 32 KB L1 Instruction Cache，32 KB L1 Data Cache 256 KB TCM contains DTCM，ITCM（128KB+128KB)
Storage	On-chip Memory	Boot ROM (256 KB) On-chip RAM (512KB + 32KB) with ECC support
	External Storage	16/32-bit DRAM Interface:LPDDR4-4000,DDR4-3200,DDR3L-1600 8-bit NandFlash, including support for RAW MLC/SLC devices, BCH ECC up to 64bit, and ONFi3.2 compliance (clock rates up to 100MHz and data rates up to 200MB/Sec.) EMMC 5.1 FLASH SPI NOR FLASH FlexSPI Flash with support for XIP (for Cortex®-M7 in low-power mode) and support for either one Octal SPI, or parallel read mode of two identical Quad SPI FLASH devices. It also supports both Serial NOR and Serial NAND flash using the FlexSPI.
On-chip Unit	GPU	GC7000UL with OpenCL and Vulkan support Supports OpenGL ES 1.1, 2.0, 3.0, OpenCL 1.2, Vulkan GC520L for 2D acceleration
	NPU	2.3 TOP/s
	ISP	It includes 2xISP, to support dual camera input ISP with 375 Mpixel/s, to support 12MP@30fps, 4kp45, or 2x 1080p80 ISP supports 375 Mpixel/s, it could support 12MP@30fps, 4kp45, or 2x 1080p80
	VPU	Video Decoding 1080p60 HEVC/H.265 Main, Main 10 (up to level 5.1) 1080p60 VP9 Profile 0, 2 1080p60 VP8 1080p60 AVC/H.264 Baseline, Main, High decoder Video Encoding 1080p60 AVC/H.264 encoder 1080p60 HEVC/H.265 encoder
Display Controller	LCDIF	Total three LCDIF controller, 1-ch HDMI, 1-ch LVDS, 1-ch MIPI DSI Support 8-bit/16-bit/18-bit/32-bit color depth When using 2-ch, it could support 1080p60 When using 3-ch display, it supports 1x1080p60 + 2x720p60 The highest resolution is 3840x2160p30
Display	HDMI	HDMI 2.0a, HDCP 2.2 and HDCP 1.4 encryption technology

Port		Pixel : 740x480p60, 720x480p60, 1280x720p60, 1920x1080p60 Support HDMI 2.1 eARC
	LVDS	Dual-channel LVDS Single channel supports 1366x768p60，PCLK=80MHz Dual-channel supports 1366x768P60 to 1080p60,PCLK
	MIPI DSI	Compliance with MIPI-DSI V1.2 Highest resolution: 1080p60,24-bit RGB Support biggest channel 4LANE HS:80-1.5Gbps/LANE,LP:10Mbps
Video Input	MIPI CSI	Support 2*4-lane MIPI CSI camera input When using 1*ISP, support MIPI CSI 1, PCLK=400MHz (Normal), bandwidth 80-1.5Gbps/lane. When using 2*ISP, support MIPI CIS 1&2: PCLK=266MHZ(normal), bandwidth 80-1.5Gbps/LANE, when only using two data LANE, the rate support 1.5Gbps/lane Support formats RAW8, RAW10, RAW14, YCbCr420, YCbCR422
Audio		Audio DSP, working frequency 800MHz SPDIF IN &OUT 6-ch SAI, support I2S, AC97, TDM BCLK=49.152MHz 8 kHz to 384kHz sampling rate Support audio sampling rate conversion from 1/16 to 8x Support 8-ch PDM MIC input
Interface	PCIE	PCIE3.0*1, XX1-LANE, 8GT/S encoding format 128b/130b, backward compatible with encoding format 8b/10b
	USB	USB3.0*2, also support USB2.0, bandwidth 5Gbps
	ENET	RGMII&RMII*2, both support EEE, AVB, IEEE1588, ENET support TSN
	uSDHC	uSDHC*3 uSDHC1&uSDHC3 support EMMC5.1, support HS400 DDR mode, Maximum 400MB/S SDIO/SD 3.01 conforms to SDR mode, 200MHZ clock rate is up to 100MB/S Support SDXC
	CAN/CANFD	CAN/CANFD*2
	UART	UART*4 The baud rate of fast mode is up to 4.15 Mbit/s. Low-speed mode(IR) baud rate 115.2 Kbit/s UART2&A53 DEBUG UART4&M7 DEBUG
	I2C	I2C*6 Standard mode: 100Kbit/S Fast mode: 400Kbit/S
	SPI	SPI*3

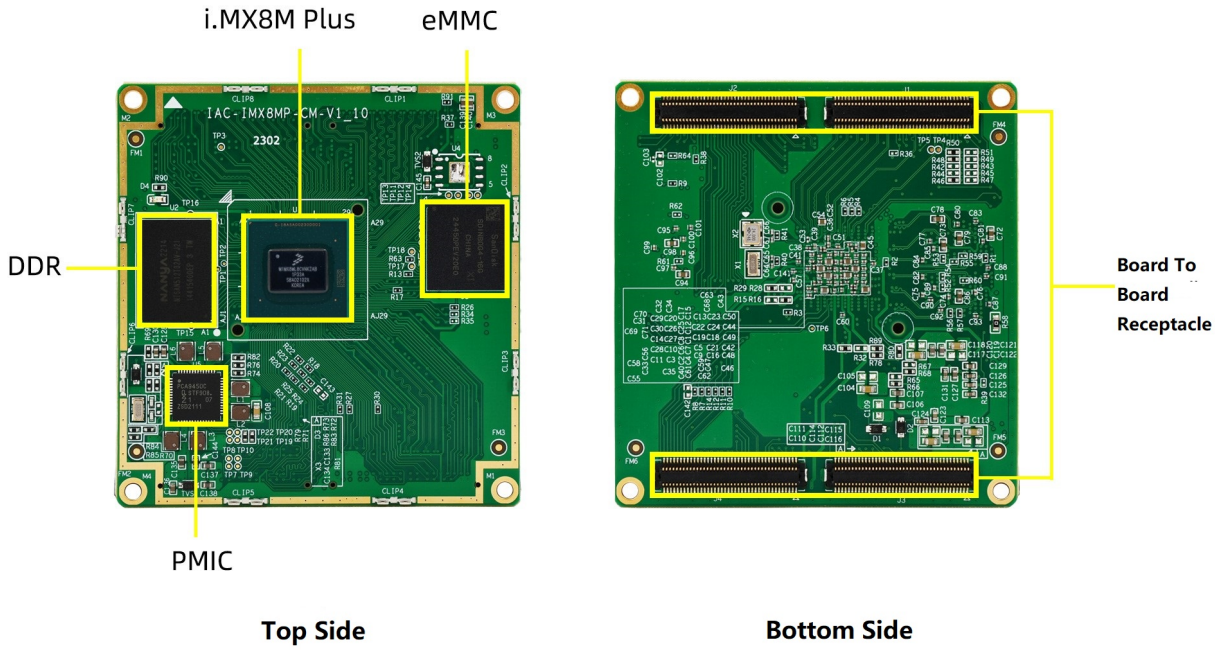
2.2. Hardware Resources

Hardware Resources	CPU	NXP i.MX8M Plus，
	Core	Quad ARM® Cortex™-A53 + Cortex-M7，i.MX8M Plus, up to 1.6GHz、Cortex®-M7 @800 MHz
	GPU	GC7000UL with OpenCL and Vulkan support Support16 GFLOPS (high accuracy) OpenGL ES 3.0/3.1,Vulkan,OpenCL 1.2FP,OpenVG1.1
	VPU	Support 1080p60,h.265/4,VP8,VP9 video decoding Support 1080p60,h.265/4 video encoding
	NPU	Neural processor unit: 2.3 TOPS in max.
	ISP	Dual image signal processor (ISP): resolution up to 12MP, input rate up to 375M pixels/s
	RAM	4GB LPDDR4 (8GB LPDDR4 optional)
	Flash	16GB eMMC (32GB eMMC, 64GB eMMC optional)
	PMIC	NXP PCA9450 PMU
	Ethernet	2x Network chipset adopts RGMII mode to support 10M/100M/1000Mbps Ethernet perfectly
		2x USB network chipset, 10/100Mbps Ethernet
	Connectivity	1xCortex-A53 RS232 debug UART, baud rate: 115200
		1x RS232, isolated, baud rate:1200bps~115200bps
		5x RS485, isolated, baud rate: 1200bps~115200bps
		3x CAN2.0, CAN-FD supported, isolated, baud rate range: 125k~1M
	Display	1x dual channel LVDS display interface, resolution up to 1920x1080@60
	Input	1xResistive Touch Panel
	USB	1x USB-HOST (USB3.0)
		1xUSB-OTG (USB2.0) Type-c
	IO	16xDI, opto-isolated, every 4xDI uses one public GND, input voltage range 0V~36V, reverse voltage≤40V
		4xDO, relay output, the contact current supports 1A in max.
	AD	4x AI (12bit,1%),0~5V (Non-isolated)
		4xADC, to connect external NTC temperature sensor (Accuracy±1℃)
	Expansion	1x M.2 (B-KEY), to connect 5G module, MICRO SIM card socket
	Storage	1x TF card socket
		1x M.2 (M-KEY), to connect SSD (512GB/1T) externally
	Others	Reset Circuit, Watchdog, RTC, Power Indicator, System Indicator

	Power Input	Std. DC 24V, to support DC9V~32V
Electrical Property	Layer/Size	SOM Size: 60mm*63mm *10mm, 8-layer high precision immersion gold process
		Carrier Board Size: 232mm*143mm, 4-layer high precision immersion gold process
	Power Consumption	Whole board is about 12W (Non-loaded)
	Operation Temperature	-20℃ ~ +70℃
	Storage Temperature	-40℃ ~ +85℃
	Humidity	10%~90%RH（Non-condensing）
	SOM Options	Std. option1: 2GB DDR/16GB eMMC（-40℃ ~ +85℃）
		Std. option 2:GB DDR/8GB eMMC（0℃ ~ +70℃）

2.3.SOM Resources:

IAC-IMX8MP-CM adopts 8-layer PCB with high precision immersion gold process, high TG board material, with reliable electrical properties and anti-interference; It has integrated with CPU, LPDDR4, eMMC, PMIC, etc; It adopts the board-to-board receptacle to draw out 200 more signals pins which is fully expand the i.MX8MPlus hardware resources, the users can redesign the carrier board by referring to the pin definition.



Pic. 2

◆Onboard with NXP i.MX8MPlus processor;

◆Onboard with 4GB LPDDR4, 16GB eMMC (Std. Option)

◆Onboard with 8-layer PCB high precision immersion gold process;

◆SOM size: 60mm*63mm, it suits for various application fields.

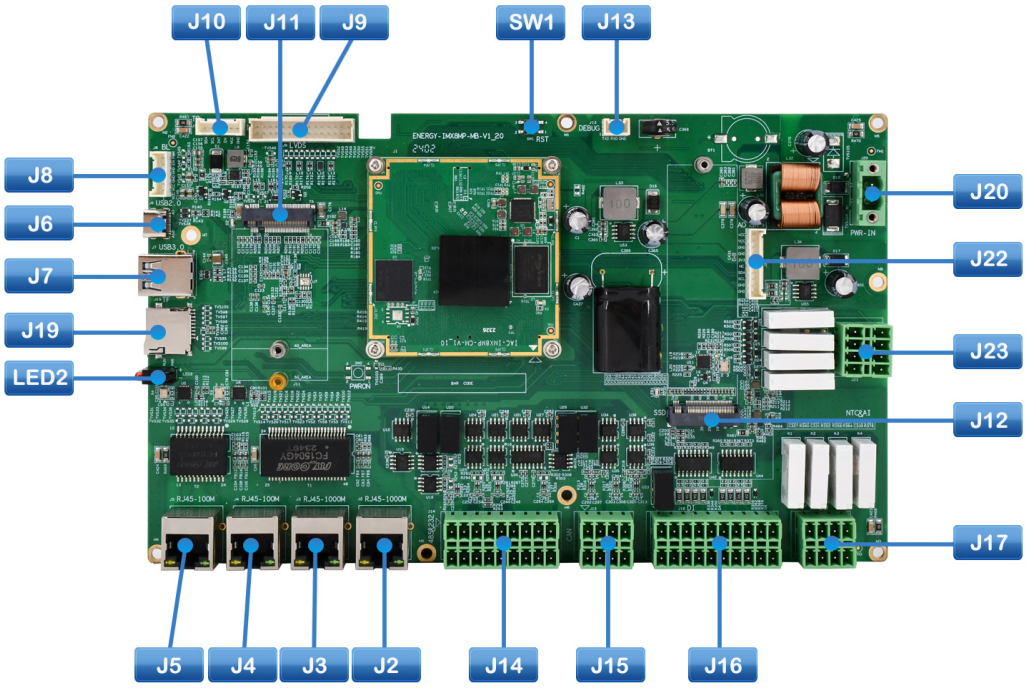
◆SOM adopts 4x80Pin board to board receptacle to draw out the SOM resources;

◆It adopts 5VDC, onboard with PMIC;

SOM board has drawn out the pin definition, more details, please refer to the carrier board connectors' function;

III. Carrier Board Functional Description

Top Side



3.1. Basic Functions

Label	Functions
J20	DC24V
J11	M.2 B-KEY（To connect 4G/5G module）
J8	LVDS Backlight
J15	CAN
J12	M.2 M-KEY（To connect SSD module）
J16	DI
J13	Cortex-A53 Debug UART（RS232 Level）
J14	RS485 & RS232
J15	CAN
J22	AO
J10	I2C（Resistive Touch Panel）
J9	LVDS
BT1	RTC Battery socket
SW1	Reset Switch
SW2	ON\OFF KEY
J2	10/100/1000Mbps Ethernet Port
J3	10/100/1000Mbps Ethernet Port
J4	10/100Mbps Ethernet Port
J5	10/100Mbps Ethernet Port
J17	RELAY
J7	USB3.0 HOST
J6	Type-C
J19	TF Socket

J18	NAT&AI
S1	SIM Socket（Bottom Side）

3.2.PIN Definition

J1A: PIN Definition from SOM

Multiplexing GPIO	Signal Name	PIN#	PIN#	Signal Name	Multiplexing GPIO
	BOOT_MODE0	1	2	BOOT_MODE1	
GPIO1_IO12	GPIO_SSD_nPERST	3	4	NC	GPIO1_IO07
GPIO1_IO15	GPIO_SSD_nCLKREQ	5	6	GPIO_RS485_DIR3	GPIO1_IO06
GPIO1_IO10	PWR_DET	7	8	GPIO_RS485_DIR2	GPIO1_IO05
GPIO1_IO09	GPIO_SSD_nPEWAKE	9	10	GPIO_RS485_DIR1	GPIO1_IO14
GPIO1_IO08	PWM1_OUT	11	12	GPIO_RS485_DIR5	GPIO1_IO13
GPIO1_IO11	NC	13	14	GPIO_RS485_DIR4	GPIO1_IO00
GPIO1_IO01	GPIO_HUB_nRST	15	16	GND	
	GND	17	18	NC	
	USB1_D_N	19	20	NC	
	USB1_D_P	21	22	GND	
	USB1_ID	23	24	NC	
	USB1_VBUS	25	26	NC	
	USB2_ID	27	28	GND	
	USB2_VBUS	29	30	USB2_RX_N	
	USB2_D_N	31	32	USB2_RX_P	
	USB2_D_P	33	34	GND	
	GND	35	36	USB2_TX_N	
	NC	37	38	USB2_TX_P	
	NC	39	40	GND	
	NC	41	42	PCIE_RX_N	

	NC	43	44	PCIE_RX_P	
	GND	45	46	GND	
	PCIE_REF_CLK_N	47	48	PCIE_TX_N	
	PCIE_REF_CLK_P	49	50	PCIE_TX_P	
	GND	51	52	GND	
	NC	53	54	NC	
	NC	55	56	NC	
	GND	57	58	GND	
	NC	59	60	NC	
	NC	61	62	NC	
	GND	63	64	GND	
	NC	65	66	NC	
	NC	67	68	NC	
	GND	69	70	GND	
	NC	71	72	NC	
	NC	73	74	NC	
	GND	75	76	GND	
	NC	77	78	NC	
	NC	79	80	NC	

J1B: PIN Definition from SOM

Multiplexing GPIO	Signal Name	PIN#	PIN#	Signal Name	Multiplexing GPIO
	NC	1	2	NC	
	NC	3	4	NC	
	GND	5	6	GND	

	NC	7	8	NC	
	NC	9	10	NC	
	GND	11	12	GND	
	NC	13	14	NC	
	NC	15	16	NC	
	GND	17	18	GND	
	NC	19	20	NC	
	NC	21	22	NC	
	GND	23	24	GND	
	NC	25	26	NC	
	NC	27	28	NC	
	GND	29	30	GND	
GPIO2_IO2	GPIO_DIN3_4	31	32	LVDS0_D0_P	
GPIO2_IO3	GPIO_DIN3_3	33	34	LVDS0_D0_N	
GPIO2_IO4	GPIO_DIN3_2	35	36	GND	
GPIO2_IO5	GPIO_DIN3_1	37	38	LVDS0_D1_P	
GPIO2_IO6	GPIO_DIN4_4	39	40	LVDS0_D1_N	
GPIO2_IO7	GPIO_DIN4_3	41	42	GND	
GPIO2_IO8	GPIO_DIN4_2	43	44	LVDS0_CLK_P	
GPIO2_IO9	GPIO_DIN4_1	45	46	LVDS0_CLK_N	
GPIO2_IO1	GPIO_DIN2_4	47	48	GND	
	GND	49	50	LVDS0_D2_P	
GPIO2_IO0	GPIO_DIN2_3	51	52	LVDS0_D2_N	
	GND	53	54	GND	
GPIO2_IO10	GPIO_DIN2_2	55	56	LVDS0_D3_P	
GPIO2_IO11	GPIO_DIN2_1	57	58	LVDS0_D3_N	

	GND	59	60	GND	
GPIO2_IO15	SD2_DATA0	61	62	GPIO_BL_PWR_EN	GPIO3_IO16
GPIO2_IO16	SD2_DATA1	63	64	GPIO_SSD_PWR_EN	GPIO3_IO14
GPIO2_IO17	SD2_DATA2	65	66	CPU_ONOFF	
GPIO2_IO18	SD2_DATA3	67	68	GPIO_RUN_LED	GPIO5_IO3
GPIO2_IO14	SD2_CMD	69	70	GPIO_BL_EN	GPIO5_IO4
	GND	71	72	GPIO_TSC_nINT	GPIO5_IO5
GPIO2_IO13	SD2_CLK	73	74	GND	
	GND	75	76	VCC_SD1	
GPIO2_IO20	SD2_WP	77	78	VCC_SD_3V3	
GPIO2_IO12	SD2_nCD	79	80	VCC_SD_3V3	

J1C: PIN Definition from SOM

Multiplexing GPIO	Signal Name	PIN#	PIN#	Signal Name	Multiplexing GPIO
	GND	1	2	GND	
GPIO3_IO25	GPIO_5G_ON_OFF	3	4	CAN2_RXD	GPIO4_IO27
	GND	5	6	GND	
GPIO3_IO19	GPIO_5G_W_DIS	7	8	CAN1_RXD	GPIO4_IO25
GPIO3_IO20	GPIO_5G_RST	9	10	CAN1_TXD	GPIO4_IO22
	GND	11	12	GND	
GPIO3_IO24	GPIO_DO1	13	14	GPIO_WDT_EN	GPIO4_IO24
GPIO3_IO21	GPIO_DO2	15	16	GPIO_WDT_FEED	GPIO4_IO21
GPIO3_IO23	GPIO_DO3	17	18	GPIO_CAN3_nINT 1	GPIO4_IO23
GPIO3_IO22	GPIO_DO4	19	20	CAN2_TXD	GPIO4_IO26

	GND	21	22	GND	
GPIO5_IO2	GPIO_DIN1_4	23	24	NC	
	GND	25	26	NC	
GPIO4_IO29	GPIO_DIN1_3	27	28	GND	
GPIO4_IO30	GPIO_DIN1_2	29	30	HDMI_DDC_SCL	
GPIO4_IO28	GPIO_DIN1_1	31	32	HDMI_DDC_SDA	
	GND	33	34	GPIO_ENET0_nRST	
GPIO5_IO0	GPIO_CAN3_nINT0	35	36	GPIO_ENET1_nRST	
GPIO5_IO1	GPIO_UART_nINT	37	38	GND	
GPIO4_IO31	GPIO_UART_nRST	39	40	NC	
	GND	41	42	NC	
GPIO5_IO8	ECSPI1_MISO	43	44	GND	
GPIO5_IO7	ECSPI1_MOSI	45	46	NC	
GPIO5_IO9	ECSPI1_SS0	47	48	NC	
GPIO5_IO6	ECSPI1_SCLK	49	50	GND	
	GND	51	52	NC	
GPIO5_IO12	ECSPI2_MISO	53	54	NC	
GPIO5_IO11	ECSPI2_MOSI	55	56	GND	
GPIO5_IO13	ECSPI2_SS0	57	58	NC	
GPIO5_IO10	ECSPI2_SCLK	59	60	NC	
	GND	61	62	GND	
GPIO1_IO26	ENET_RD0	63	64	ENET_TD0	GPIO1_IO21
GPIO1_IO27	ENET_RD1	65	66	ENET_TD1	GPIO1_IO20
GPIO1_IO28	ENET_RD2	67	68	ENET_TD2	GPIO1_IO19

GPIO1_IO29	ENET_RD3	69	70	ENET_TD3	GPIO1_IO18
GPIO1_IO24	ENET_RX_CTL	71	72	ENET_TX_CTL	GPIO1_IO22
	GND	73	74	GND	
GPIO1_IO25	ENET_RXC	75	76	ENET_TXC	GPIO1_IO23
	GND	77	78	GND	
GPIO1_IO16	ENET_MDC	79	80	ENET_MDIO	GPIO1_IO17

J1D: PIN Definition from SOM

Multiplexing GPIO	Signal Name	PIN#	PIN#	Signal Name	Multiplexing GPIO
	VCC_SYS_5V0	1	2	VCC_SYS_5V0	
	VCC_SYS_5V0	3	4	VCC_SYS_5V0	
	VCC_SYS_5V0	5	6	VCC_SYS_5V0	
	VCC_SYS_5V0	7	8	VCC_SYS_5V0	
	VCC_SYS_5V0	9	10	VCC_SYS_5V0	
	GND	11	12	GND	
	GND	13	14	GND	
	GND	15	16	GND	
	GND	17	18	GND	
	GND	19	20	GND	
	GND	21	22	GND	
	VDD_3V3	23	24	VDD_1V8	
	VDD_3V3	25	26	VDD_1V8	
	VDD_3V3	27	28	GND	
	GND	29	30	WDT_nRST	
	CLK_OUT_32K	31	32	PMIC_nRST	

	GND	33	34	GND	
GPIO5_IO23	UART1_TXD	35	36	UART2_TXD	GPIO5_IO25
GPIO5_IO22	UART1_RXD	37	38	UART2_RXD	GPIO5_IO24
GPIO5_IO27	UART3_TXD	39	40	GPIO_ADC_CH	GPIO5_IO29
GPIO5_IO26	UART3_RXD	41	42	GPIO_TEMP_nCS	GPIO5_IO28
	GND	43	44	GND	
GPIO5_IO19	GPIO_TEMP_SDA	45	46	I2C2_SDA	GPIO5_IO17
GPIO5_IO18	GPIO_TEMP_SCL	47	48	I2C2_SCL	GPIO5_IO16
	GND	49	50	GND	
GPIO5_IO21	I2C4_SDA	51	52	NC	
GPIO5_IO20	I2C4_SCL	53	54	NC	
	GND	55	56	NC	
GPIO4_IO20	GPIO_ENET0_nINT	57	58	NC	
	GND	59	60	GND	
GPIO4_IO15	ENET1_TD3	61	62	ENET1_RD3	GPIO4_IO9
GPIO4_IO14	ENET1_TD2	63	64	ENET1_RD2	GPIO4_IO8
GPIO4_IO13	ENET1_TD1	65	66	ENET1_RD1	GPIO4_IO7
GPIO4_IO12	ENET1_TD0	67	68	ENET1_RD0	GPIO4_IO6
GPIO4_IO16	ENET1_TX_CTL	69	70	ENET1_RX_CTL	GPIO4_IO10
GPIO4_IO19	GPIO_ENET1_nINT	71	72	ENET1_RX_ER	GPIO4_IO18
	GND	73	74	GND	
GPIO4_IO17	ENET1_TXC	75	76	ENET1_RXC	GPIO4_IO11
	GND	77	78	GND	
GPIO4_IO4	ENET1_MDC	79	80	ENET1_MDIO	GPIO4_IO5

J16：DI

Signal Name	PIN#	PIN#	Signal Name
DIN1_1	1	2	DIN3_1
DIN1_2	3	4	DIN3_2
DIN1_3	5	6	DIN_3_3
DIN1_4	7	8	DIN3_4
GND_DNIN1_I/F	9	10	GND_DIN3_I/F
DIN2_1	11	12	DIN4_1
DIN2_2	13	14	DIN4_2
DIN2_3	15	16	DIN4_3
DIN2_4	17	18	DIN4_4
GND_DIN2_I/F	19	20	GND_DIN4_I/F

J13: Cortex-A53 Debug UART (RS232 level)

PIN #	Signal Name
1	TXD
2	RXD
3	GND

J14:RS485 & RS232

Signal Name	PIN#	PIN#	Signal Name
RS485_CH1_A	1	2	RS485_CH2_A
RS485_CH1_B	3	4	RS485_CH2_B
SHELL_EARTH	5	6	SHELL_EARTH
RS485_CH3_A	7	8	RS485_CH4_A
RS485_CH3_B	9	10	RS485_CH4_B
SHELL_EARTH	11	12	SHELL_EARTH

COM_RXD(232)	13	14	RS485_CH5_A
COM_TXD(232)	15	16	RS485_CH5_B
GND_ISO_C	17	18	SHELL_EARTH

J15: CAN

Signal Name	PIN#	PIN#	Signal Name
CAN1_H	1	2	SHELL_EARTH
CAN1_L	3	4	SHELL_EARTH
CAN2_H	5	6	CAN3_H
CAHN2_L	7	8	CAN3_L

J12:I2C (Resistive Touch Panel)

PIN#	Signal Name
1	I2C2_SDA
2	I2C_SCL
3	GPIO_TSC_nINT
4	VCC_EXT_3V3
5	GND

J22:AO

Signal Name	PIN#	PIN#	Signal Name
VCC_EXT_PWR	1	2	VCC_EXT_3V3
VCC_EXT_PWR	3	4	I2C4_SDA
NC	5	6	I2C4_SCL
GND	7	8	GND
GND	9	10	GND

J8: LVDS Backlight

PIN#	Signal Name
1	VCC_BL
2	VCC_BL
3	GND
4	GND
5	BL_EN
6	BL_PWM

J17: RELAY

Signal Name	PIN#	PIN#	Signal Name
RELAY2_OUT1	1	2	RELAY1_OUT1
RELAY2_OUT2	3	4	RELAY1_OUT2
RELAY3_OUT1	5	6	RELAY4_OUT1
RELAY3_OUT2	7	8	RELAY4_OUT2

J9: LVDS

Signal Name	PIN#	PIN#	Signal Name
VCC_LVDS_LCD	1	2	VCC_LVDS_LCD
GND	3	4	VCC_LVDS_LCD
GND	5	6	GND
LVDS0_TX0_P	7	8	LVDS0_TX0_N
LVDS0_TX1_P	9	10	LVDS0_TX1_N
LVDS0_TX2_P	11	12	LVDS0_TX2_N
GND	13	14	GND
LVDS0_CLK0_P	15	16	LVDS0_CLK0_N
LVDS0_TX3_P	17	18	LVDS0_TX3_N
LVDS1_TX0_P	19	20	LVDS1_TX0_N

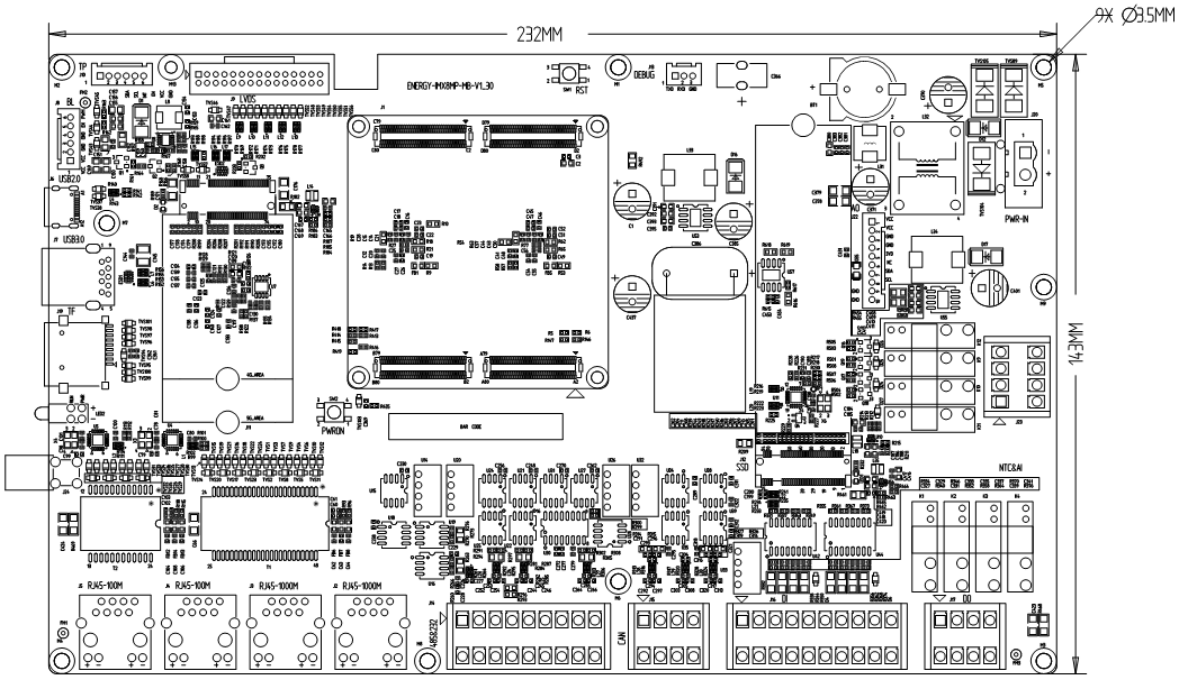
LVDS1_TX1_P	21	22	LVDS1_TX1_N
LVDS1_TX2_P	23	24	LVDS1_TX2_N
GND	25	26	GND
LVDS1_CLK1_P	27	28	LVDS1_CLK1_N
LVDS1_TX3_P	29	30	LVDS1_TX3_N

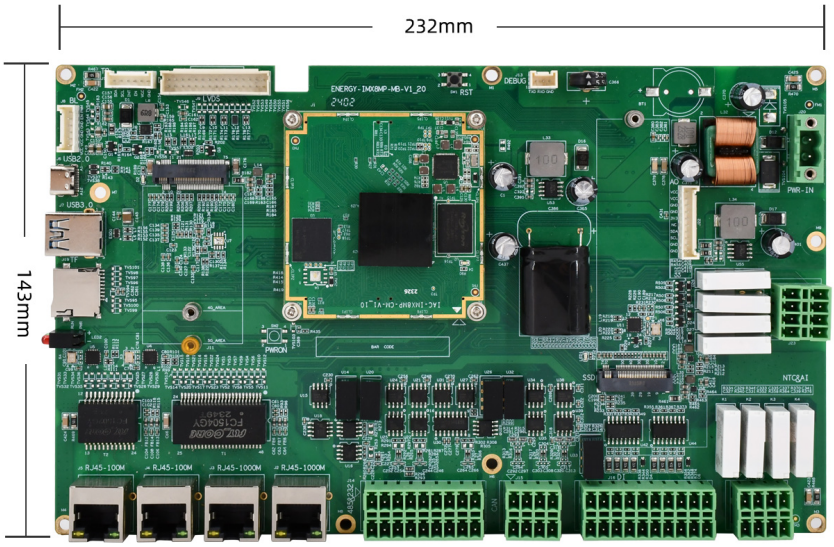
J18:NAT&AI

Signal Name	PIN#	PIN#	Signal Name
TEMP_NTC4	1	2	GND
TEMP_NTC3	3	4	GND
TEMP_NTC2	5	6	GND
TEMP_NTC1	7	8	GND
0~5V AD4	9	10	GND
0~5V AD3	11	12	GND
0~5V AD2	13	14	GND
0~5V AD1	15	16	GND

IV. Size & Structure

Unit:mm , if needs the datasheet of the board to board receptacle ,please send email: supports@qiyangtech.com;





V. Electrical Property

Item	Parameters
Operation Temperature	-20℃ ~ +70℃
Storage Temperature	-40℃ ~ +85℃
Humidity	10%~90%, non-condensing
SOM Size	60mm*63mm, 8-layer high precision immersion gold process
Carrier Board Size	232mm*143mm, 4-layer high precision immersion gold process
Whole Board Power Consumption	12W (Non-loaded)
Power Input	DC 24V

VI. Remark

1. Before connecting to LCD, please confirm LCD power specification.

2. Please use the original connecting accessories to avoid damaging the main board.

3. We ensure offering communication technology support through E-mail, telephone for lifelong technical support service.

4. We ensure offering 6-months repair service for free, if malfunction occurs in warranty because of quality problem. Under that circumstance, please contact our retailer or our company with purchase receipt within warranty period, we are willing to repair or replace.

5. Under these circumstances, we do not offer repair for free:

● Over warranty time;

● Do not attach purchase receipt;

● Liquid inlet, damp or mold;

● Malfunction and damage is not due to product quality but drops, intense sharking, arbitrarily modify, disoperation after purchase;

● Damage of force majeure.

6. We reserve intellectual property for the software and hardware technical data of **ENERGY-IMX8MP-KIT**; users can only use them for teaching, testing, researching. Shall not be engaged in any commercial purpose. Shall not distribute them on the Internet. Shall not intercept, modify them to tamper copyright.

7. We accept batch order; we can offer technical support and service.

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