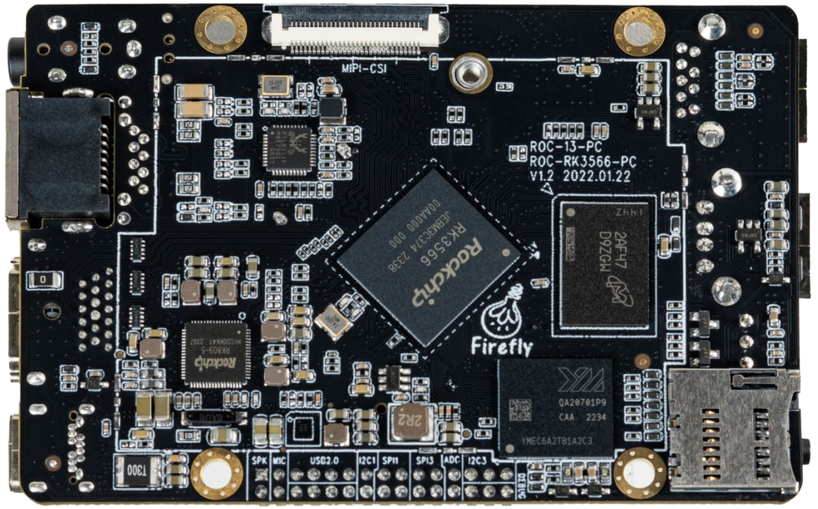
ROC-RK3566-PC

Quad-Core High-Performance Mainboard



V1.2 2024-9-30

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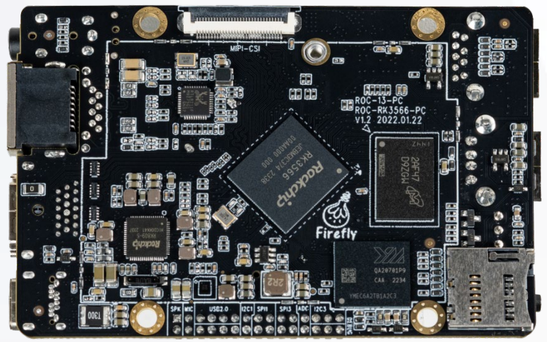
Product features



RK3566 quad-core 64-bit processor

RK3566 quad-core 64-bit Cortex-A55 processor has frequency up to 1.8GHz – the efficiency is greatly improved. With 22nm lithography process, it features low power consumption and high performance.

8GB large RAM

It supports up to 8GB RAM with up to 32Bit width, making data safer and more reliable, and meeting the requirements of running large-memory products application.

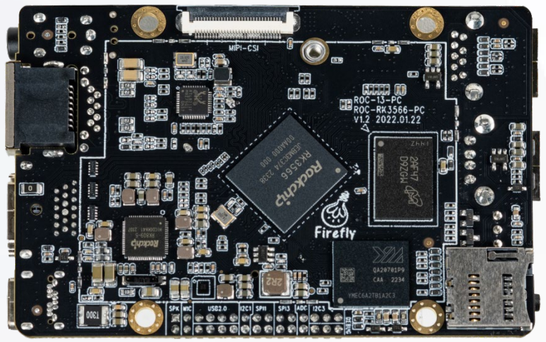
Integrated co-processors

It is integrated with dual-core GPU, high-performance VPU and high-efficiency NPU. The GPU supports OpenGL ES3.2/2.0/1.1, Vulkan1.1. The VPU can achieve 4K@60fps H.265/H.264/VP9 video decoding and 1080P@60fps H.265/ H.264 video encoding. The NPU supports one-click switching of mainstream frameworks like Caffe/TensorFlow.

M.2 interface to expand

The onboard M.2 PCIe2.1 interface can be connected with NVMe SSD, owning the advantages of high-speed reading and writing and large storage.

Product features



Various systems and boot ways supported

It supports to upgrade to Android, Ubuntu, Buildroot + QT, Station OS and other systems, and supports to boot the system via TF card, U disk, EMMC, etc. Diverse supporting systems make entertainment, work, programming learning, creative development all easy.

A variety of interfaces

With HDMI2.0, USB3.0, USB2.0, MIPI-DSI, MIPI-CSI, I2C, SPI, UART, ADC, PWM, GPIO, PCIe, I2S and other interfaces, it can be directly used for external device control and expansion.

Abundant resources for customization

A complete SDK, development documents, examples, technology documents, tutorials and other resources are provided for the users to make a further customization.

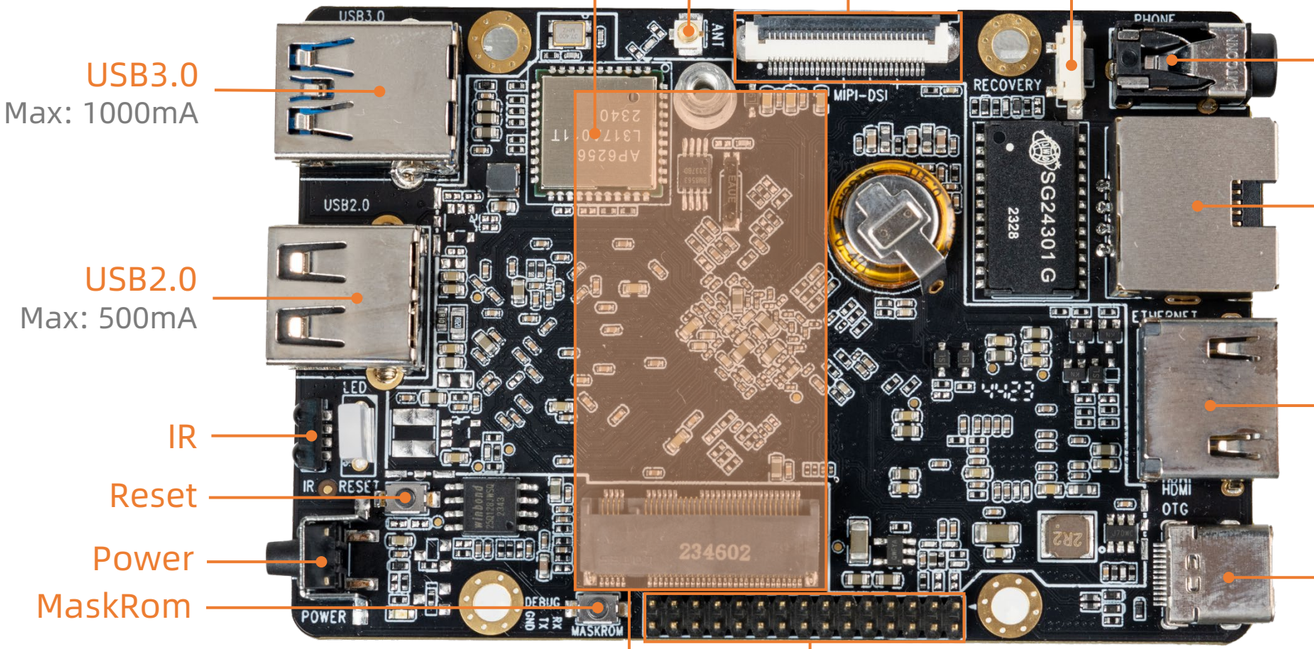
Wide range of application scenarios

It is widely used in scenarios such as audio-visual entertainment hosts, intelligent NVRs, cloud terminals, IoT gateways, industrial control, edge computing, face turnstiles, and in-vehicle central control.

Specifications

Specifications		
Basic Specifications	SOC	RockChip RK3566
	CPU	Quad-core 64-bit Cortex-A55, 22nm lithography process, frequency up to 1.8GHz
	GPU	ARM G52 2EE, supports OpenGL ES 1.1/2.0/3.2. OpenCL 2.0. Vulkan 1.1 Embedded high-performance 2D acceleration hardware
	NPU	1Tops@INT8, integrated high-performance AI accelerator RKNN NPU, Supports one-click switching of Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darkne
	Decoding/ Encoding	Video Decoding: 4K@60fps H.265/H.264/VP9, 1080P@60fps VC-1, VP8, MPEG-1/2/4 Video Encoding: 1080P@100fps H.265, 1080P@60fps H.264
	ISP	Support 8M ISP
	RAM	2GB/4GB/8GB LPDDR4
	Storage	32GB/64GB/128GB eMMC
	Storage Expansion	1 × M.2 PCIe2.1 NVMe SSD (2242), 1 × TF Card
	Power	5V/2A (Power supply through Type-C port, voltage tolerance ± 5%)
	OS	Android, Ubuntu, Buildroot+QT, OpenWRT, Debian
	Size	93.46mm × 60.14mm
	Power consumption	Min: 0.03W(5.0V/6mA), Normal: 2.5W(5.0V/500mA), Max: 5.25W (5.0V/1050mA)
	Environment	Operating Temperature: -20℃ ~ 60℃ Storage Temperature: -20℃ ~ 70℃ Operating Humidity: 10% ~ 90%RH(non-condensing)
Interface Specifications	Ethernet	1 × 1000Mbps Ethernet (RJ45)
	WiFi	2.4GHz/5GHz dual-band WiFi, 802.11a/b/g/n/ac protocol, Bluetooth5.0
	Display	1 × HDMI2.0 (4K@60Hz Output) 1 × MIPI-DSI (Single channel 1920×1080@60fps)
	Audio	1 × HDMI (Audio output) 1 × 3.5mm Audio jack (Support MIC recording, American Standard CTIA) 1 × Speaker (Speaker output, 1.5W 8Ω or 2.5W 4Ω) 1 × Mic (Audio input)
	Camera	1 × MIPI-CSI DPHY (30P-0.5mm, 1×4 lanes or 2×2 lanes, 2.5Gbps/Lane)
	USB	1 × USB3.0 (Maximum current: 1000mA) 1 × USB2.0 (Maximum current: 500mA) 1 × Type-C (USB3.0 OTG/DC 5V/2A)
	Extended interfaces	1 × Double-row pin headers (30Pin-2.0mm) , I2C, SPI, UART, ADC, PWM, GPIOs, I2S

Interface description



WiFi Antenna

2.4GHz/5GHz WiFi/Bluetooth5.0

MIPI-DSI
30P-0.5mm, 1920*1080@60fps(single-channel)

Recovery

USB3.0
Max: 1000mA

USB2.0
Max: 500mA

IR

Reset

Power

MaskRom

3.5mm Audio jack
Support MIC recording, CTIA

RJ45
1000Mbps

HDMI2.0
4K@60Hz

Type-C
OTG/DC 5V

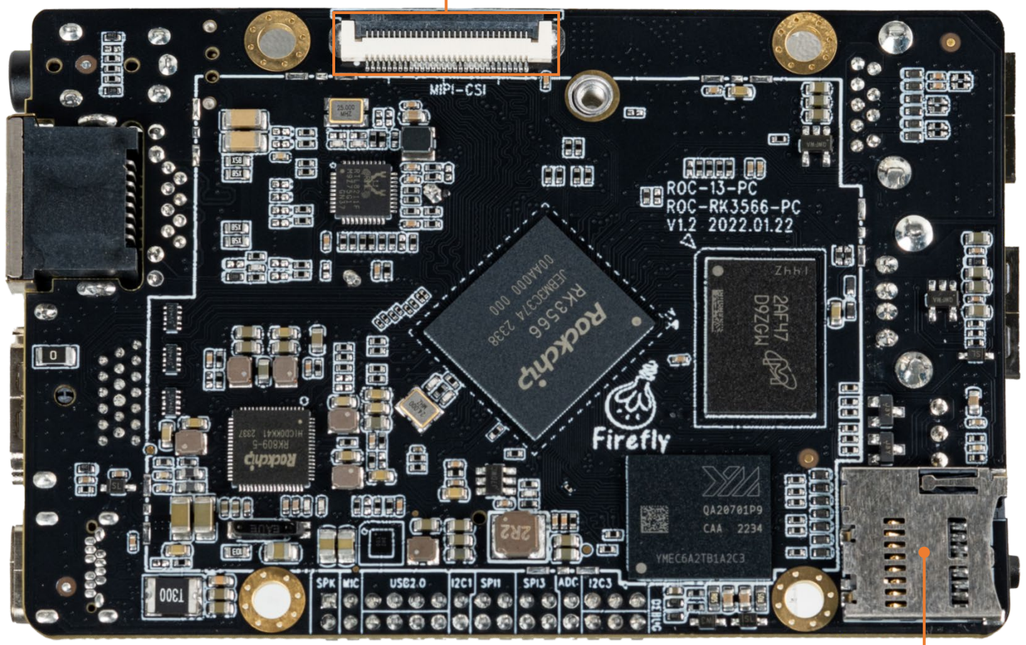
M.2
PCIe2.1 NVMe 2242 SSD

Double-row pin headers
30P-2.0mm
SPK, MIC, USB Host, I2S, I2C, SPI, GPIO, Debug

Interface description

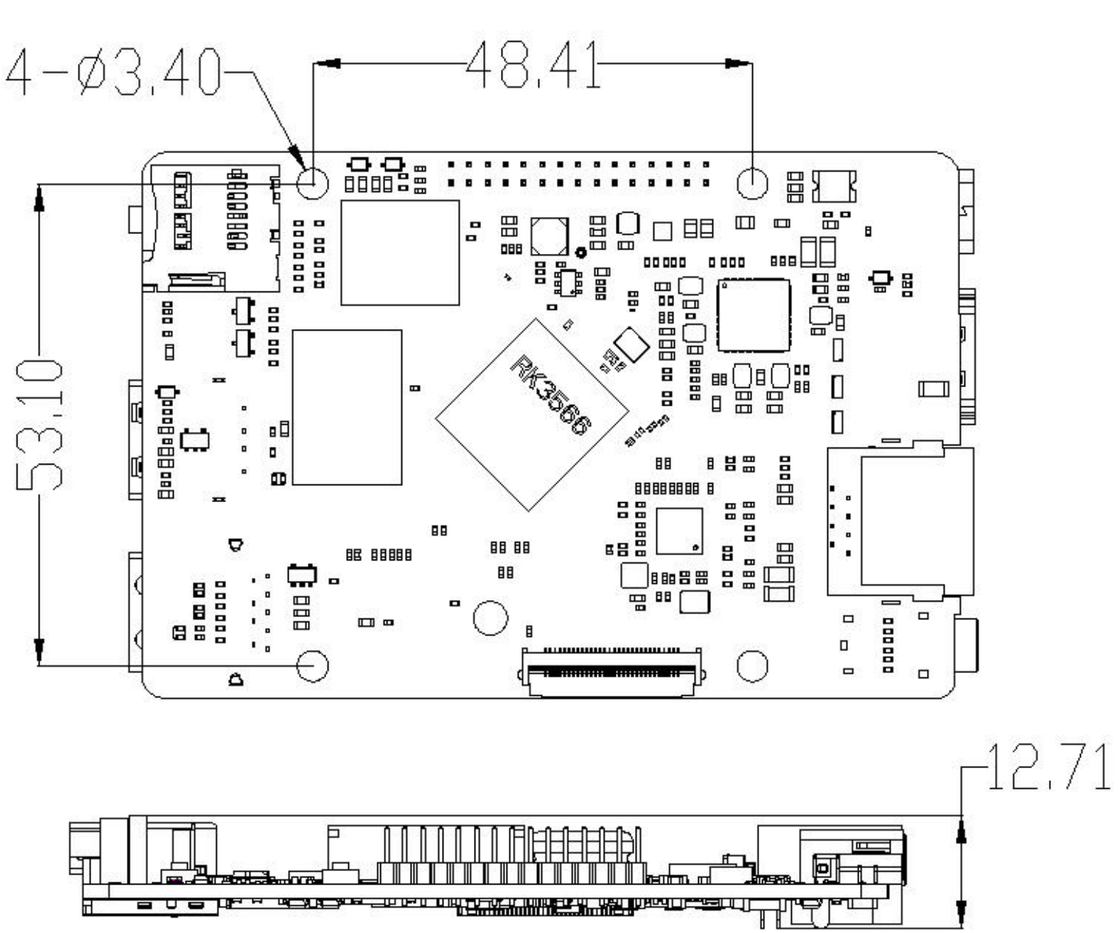
MIPI-CSI DPHY

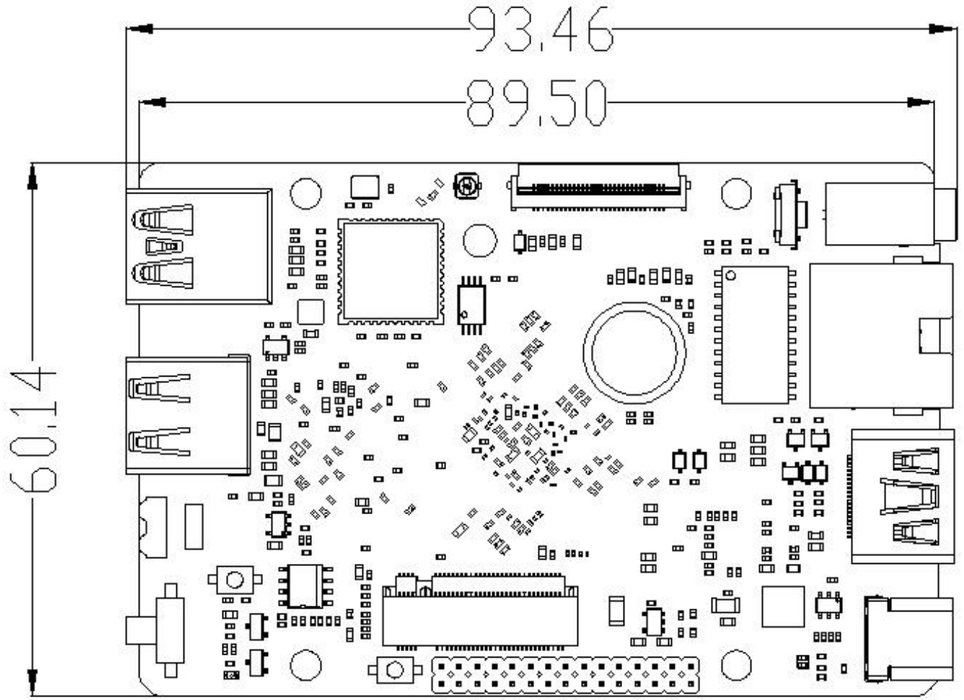
30P-0.5mm, 1*4 lanes or 2*2 lanes



TF Card Slot

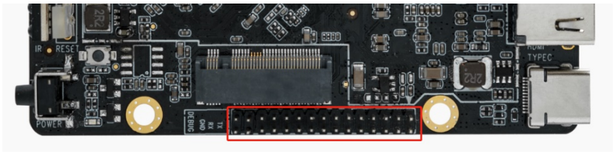
Dimension





Interface definition

1. (J1) Double row (15X2) 30PIN 2.0mm Pitch Expansion Interface (Female)

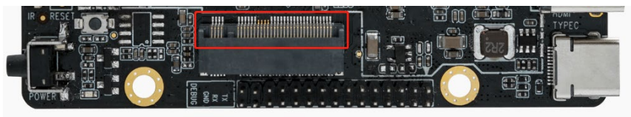


NO.	Definition	Power/V	NO.	Definition	Power/V
1	Speaker Output+【MAX:1.3W】	5.0	2	Speaker Output -【MAX:1.3W】	5
3	MIC1-(MIC_R)【MIC input】	3.3	4	MIC1+(MIC_L)【MIC Input】	3.3
5	GND		6	3.3V Output (MAX:500mA)	3.3
7	USB_HOST3_DP	-	8	GND	
9	USB_HOST3_DM	-	10	I2S3_LRCK_M1 (EDP_HPDIN_M0/SPDIF_TX_M2/SATA2_ACT_LED/ GPIO4_C4_d)	3.3
11	5.0V Output (MAX:500mA)	5.0	12	POWER_KEY Input【Connecting to RK809】	3.3
13	I2C1_SCL (GPIO0_B3_u) Pull-up resistor 2.2K	3.3	14	I2C1_SDA (GPIO0_B4_u) Pull-up resistor 2.2K	3.3
15	SPI1_MISO_M1 (UART5_TX_M1/ I2S1_SDO3_M2/ GPIO3_C2_d)	3.3	16	SPI1_MOSI_M1 (PCIE20_PERSTn_M1 /I2S1_SDO2_M2/ GPIO3_C1_d)	3.3
17	SPI1_CS0_M1 (SDMMC2_D0_M1/ GPIO3_A1_d)	3.3	18	SPI1_CLK_M1 (UART5_RX_M1/I2S1_SCLK_RX_M2/GPIO3_C3_d)	3.3
19	SPI3_MISO_M1 (UART9_TX_M1/I2S3_SDO_M1/PWM12_M1/GPIO4 _C5_d)	3.3	20	SPI3_CS0_M1 (PWM13_M1/UART9_RX_M1/I2S3_SDI_M1/GPIO4 _C6_d)	3.3
21	SPI3_CLK_M1 (I2S3_MCLK_M1/ PWM14_M1/GPIO4_C2_d)	3.3	22	SPI3_MOSI_M1 (PWM15_IR_M1 /I2S3_SCLK_M1/GPIO4_C3_d)	3.3

Interface definition

23	ADC3 Input (Pull-up resistor 10K)	1.8	24	GPIO0_D5_D	1.8
25	I2C3_SDA_M0 (Pull-up resistor 2.2K) (UART3_RX_M0//GPIO1_A0_u)	3.3	26	DEBUG_RX (UART2_RX_M0/GPIO0_D0_u Debug serial port)	3.3
27	I2C3_SCL_M0 (Pull-up resistor 2.2K) (UART3_TX_M0/ GPIO1_A1_u)	3.3	28	DEBUG_TX (UART2_TX_M0/GPIO0_D1_u(Debug serial port))	3.3
29	GND	3.3	30	GND	3.3

2. (J12) M-KEY PCIE Interface (PCIe2.1 x 1)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		2	3.3V Output	3.3
3	GND		4	3.3V Output	3.3
5	NC		6	NC	
7	NC	5.0	8	NC	
9	GND	5.0	10	DAS/DSS	3.3
11	NC	1.8	12	3.3V Output	3.3
13	NC	1.8	14	3.3V Output	3.3
15	GND	1.8	16	3.3V Output	3.3
17	NC	1.8	18	3.3V Output	3.3
19	NC		20	NC	
21	GND		22	NC	

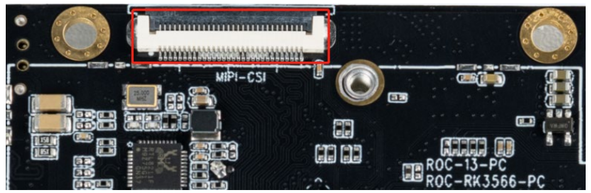
Interface definition

23	NC		24	NC	
25	NC		26	NC	
27	GND		28	NC	
29	NC		30	NC	
31	NC		32	NC	
33	GND		34	NC	
35	NC		36	NC	
37	NC		38	DEVSLP	3.3
39	GND		40	NC	
41	PCIE20_RXN/SATA2_RXN	-	42	NC	
43	PCIE20_RXP/SATA2_RXP	-	44	NC	
45	GND		46	NC	
47	PCIE20_TXN/SATA2_TXN (series capacitance 0.1uF)	-	48	NC	
49	PCIE20_TXP/SATA2_TXP (series capacitance 0.1uF)	-	50	PCIE20_PERSTn_M2 (GPIO1_B2_d)	3.3
51	GND		52	PCIE20_CLKREQn_M2 (GPIO1_B0_d)	3.3
53	PCIE20_REFCLKN	-	54	PCIE20_WAKEn_M2 (GPIO1_B1_d)	3.3
55	PCIE20_REFCLKP	-	56	NC	
57	GND		58	NC	
59	NC		60	NC	

Interface definition

61	NC		62	NC	
63	NC		64	NC	
65	NC		66	NC	
67	NC		68	NC	
69	NC		70	3.3V Output	3.3
71	GND		72	3.3V Output	3.3
73	GND		74	3.3V Output	3.3
75	GND				

3. (J10) MIPI CAMERA 30PIN 0.5mm Pitch

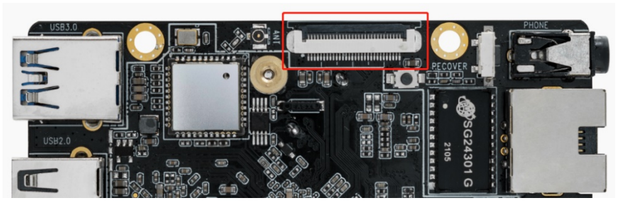


NO.	Definition	Power/V	NO.	Definition	Power/V
1	I2C4_SDA_M0 (GPIO4_B2_d) (Pull-up resistor 2.2K)	1.8	16	GND	
2	I2C4_SCL_M0 (GPIO4_B3_d) (Pull-up resistor 2.2K)	1.8	17	MIPI_CSI_RX_CLK0P	-
3	MIPI_PDN0_CAM (GPIO4_B7_d)	1.8	18	MIPI_CSI_RX_CLK0N	-
4	MIPI_RESET0_CAM (GPIO4_B0_d)	1.8	19	GND	
5	GND		20	MIPI_CSI_RX_D2P	-

Interface definition

6	MIPI_MCLK0 (GPIO4_C0_d)	1.8	21	MIPI_CSI_RX_D2N	-
7	MIPI_PDN1_CAM (GPIO4_B6_d)	1.8	22	GND	
8	MIPI_RESET1_CAM (GPIO4_C1_d)	1.8	23	MIPI_CSI_RX_D3P	-
9	MIPI_MCLK1 (GPIO4_A7_d)	1.8	24	MIPI_CSI_RX_D3N	-
10	GND		25	GND	
11	MIPI_CSI_RX_D0P	-	26	MIPI_CSI_RX_CLK1P	-
12	MIPI_CSI_RX_D0N	-	27	MIPI_CSI_RX_CLK1N	-
13	GND		28	GND	
14	MIPI_CSI_RX_D1P	-	29	5.0V Output	5.0
15	MIPI_CSI_RX_D1N	-	30	5.0V Output	5.0

4. (J6) MIPI_Display_Interface 30PIN 0.5mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	5.0V Output	5.0	16	MIPI_DSI_TX0_D0P	-
2	5.0V Output	5.0	17	MIPI_DSI_TX0_D0N	-
3	5.0V Output	5.0	18	GND	
4	GND		19	MIPI_DSI_TX0_D1P	-

Interface definition

5	GPIO0_A0_d	3.3	20	MIPI_DSI_TX0_D1N	-
6	3.3V Output	3.3	21	GND	
7	I2C2_SDA_M0_TP (GPIO0_B6_u) (Pull-up resistor 2.2K)	3.3	22	MIPI_DSI_TX0_CLKP	-
8	I2C2_SCL_M0_TP (GPIO0_B5_u) (Pull-up resistor 2.2K)	3.3	23	MIPI_DSI_TX0_CLKN	-
9	LCD_EN Output (GPIO0_C7_d)	3.3	24	GND	
10	TP_INT Input (GPIO0_A5_d)	3.3	25	MIPI_DSI_TX0_D2P	-
11	BL_EN Output (GPIO0_C0_d)	3.3	26	MIPI_DSI_TX0_D2N	-
12	LCD_BL PWM4 Output (GPIO0_C3_d)	3.3	27	GND	
13	LCD_RST_L Output (GPIO0_C2_d)	3.3	28	MIPI_DSI_TX0_D3P	-
14	TP_RST_L Output (GPIO0_C5_d)	3.3	29	MIPI_DSI_TX0_D3N	-
15	GND		30	GND	

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