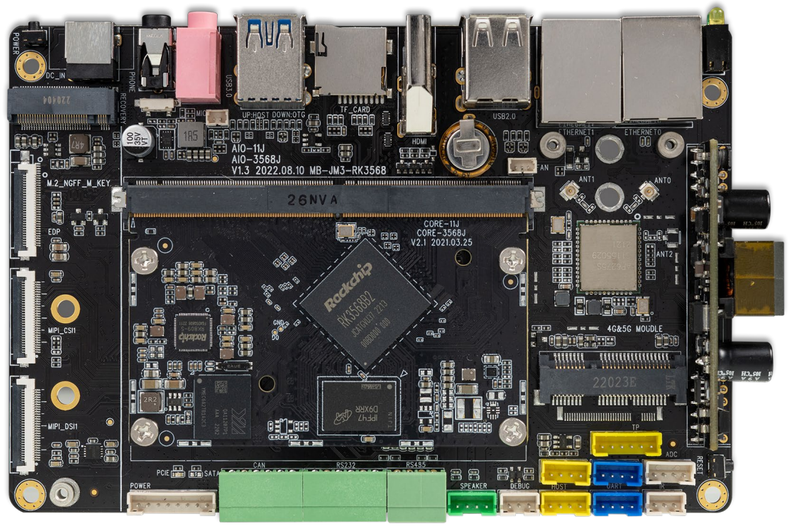
AIO-3568J

Quad-Core High-Performance AI Mainboard



V1.3 2024-9-9

T-CHIP INTELLIGENCE TECHNOLOGY

Product features

Quad-core 64-bit processor

Adopt Quad-core 64bit Cortex-A55 RK3568B2, up to 2.0GHz, 22nm lithography process

8 GB large RAM

Up to 8GB RAM
meeting the requirements of running large-memory products

4K H.265 Video Decoder

Support 4K@60fps H.265/VP9 video decoding, 1080P@100fps H.265 video encoding. The computing power can reach 1TOPs

Dual Gigabit Ethernet

Support Dual 1000Mbps (RJ45), 2.4GHz/5GHz dual-band WiFi6 and BT5.0
Scalable 5G/4G LTE

Operating systems

Support Android, Ubuntu, Buildroot
It enables stable operation and customization for industries

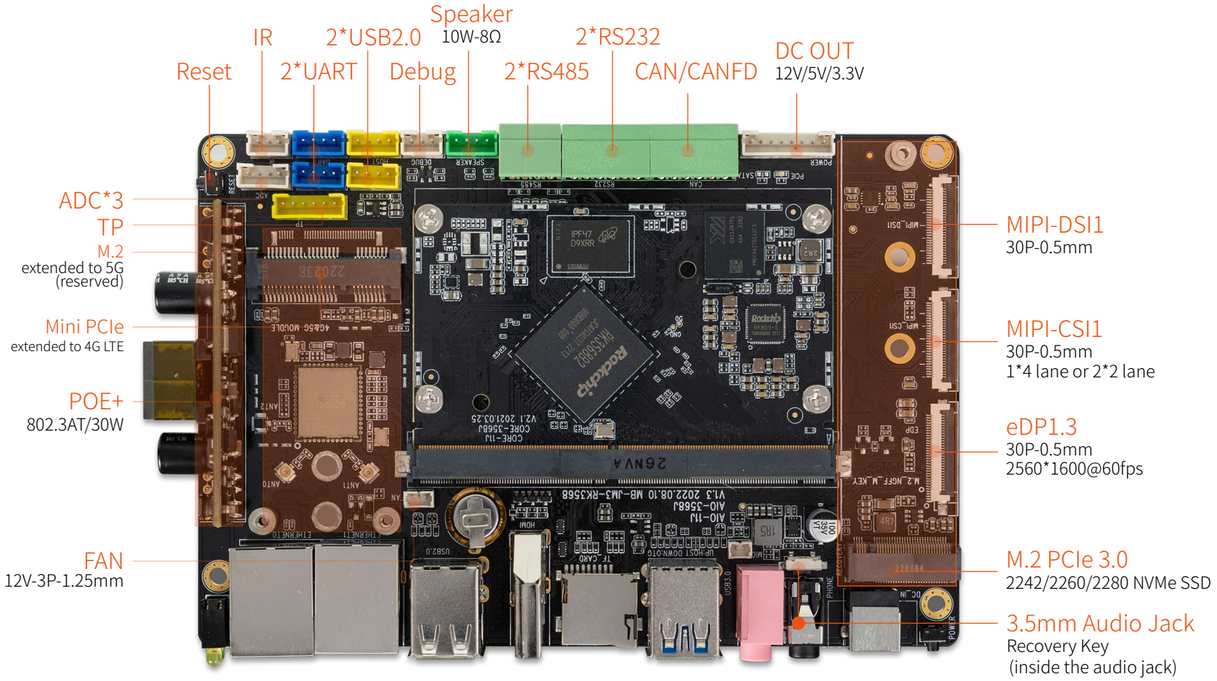
A variety of interfaces

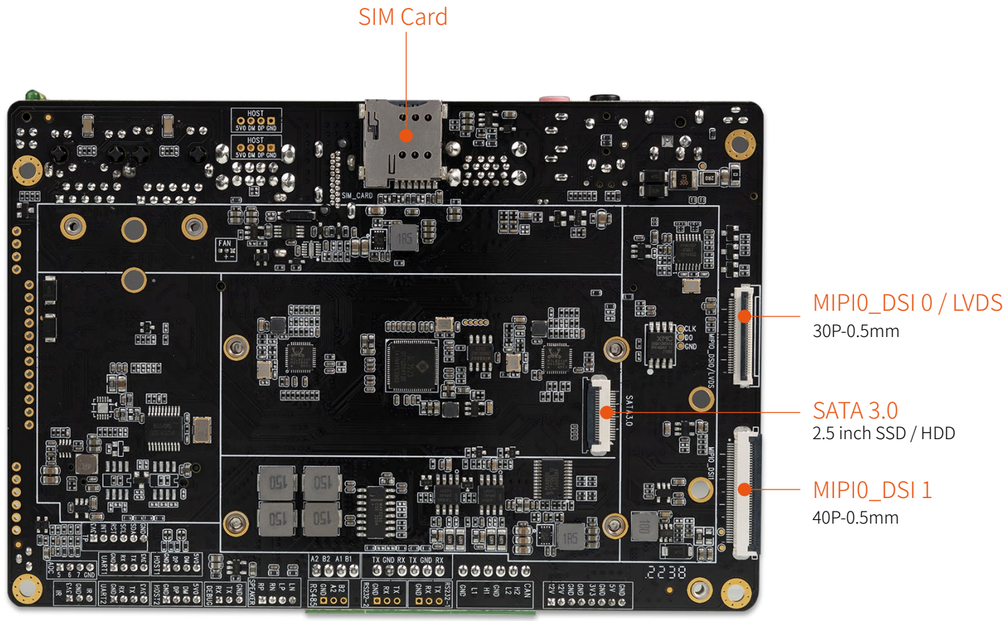
It has PCIE3.0, USB3.0, USB2.0, MIPI-CSI, MIPI-DSI, RS232, RS485 and other expansion interfaces

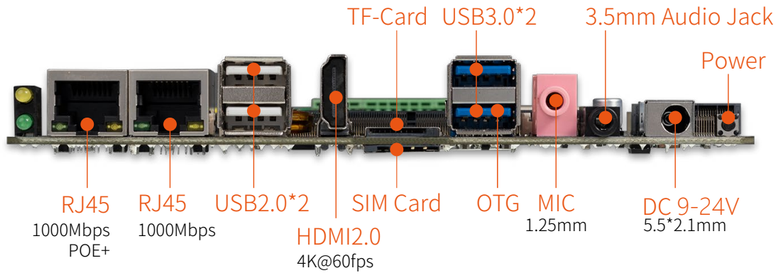
Specifications

Specifications		
Basic Specifications	SOC	RK3568B2
	CPU	Quad-core 64-bit Cortex-A55 processor, 22nm lithography process, frequency up to 2.0GHz
	GPU	ARM G52 2EE，Support OpenGL ES 1.1/2.0/3.2, OpenCL 2.0 and Vulkan 1.1，Built-in high-performance 2D acceleration hardware
	NPU	1Tops@INT8 RKNN NPU AI accelerator, Support one-click switching of Caffe/TensorFlow/TFLite/ONNX/PyTorch/Keras/Darknet
	VPU	4K@60fps H.265/H.264/VP9 video decoding,1080P@60fps H.265/H.264 video encoding
	RAM	2GB/4GB/8GB LPDDR4
	Storage	16GB/32GB/64GB/128GB eMMC, 16MB SPI Flash
	Storage Expansion	M.2 PCIe3.0 NVMe SSD (2242/2260/2280), 2.5 " SATA3.0 HDD/SSD (7mm thick), 1 × TF Card
	Power	DC 12V (5.5 × 2.1mm, support 9V~24V wide voltage input)
	Power Consumption	Min: 0.3W(12V/25mA), Normal: 4.8W(12V/400mA), Max: 7W(12V/583mA)
	OS	Android, Ubuntu
	Dimension	150.0mm × 103.8mm × 21.0mm
	Environment	Operating Temperature: -20℃ ~ 60℃, Storage Temperature: -20℃ ~ 70℃, Storage humidity: 10% ~ 90%RH (non-condensing)
Interface Specifications	Ethernet	2 × Gigabit Ethernet (1000Mbps/RJ45), Among them, LAN (PoE) port supports POE+ (802.3 AT, output power 30W) power supply
	Wireless	2.4GHz/5GHz dual-band WiFi6 (802.11a/b/g/n/ac/ax), 5G(M.2)/4G LTE (Mini PCIe), Bluetooth5.0
	Video output	1 × HDMI2.0 (4K@60Hz), 1 × MIPI DSI (1920×1080@60fps or dual channel 1 × MIPI DSI 2560×1440@60fps), 1 × eDP1.3 (2560×1600@60fps) * Support up to three-screen output with different displays
	Camera	1 × MIPI CSI (single channel 4Lanes or dual channel 2 Lanes)
	Audio	1 × HDMI, 1 × 3.5mm Audio jack (Mic recording not supported), 1 × Mic, 1 × Speaker (10W 8Ω/Class D)
	USB	2 × USB3.0 (Max: 1A), 2 × USB 2.0 (Max: 500mA), 2 × USB2.0 HOST Wafer (Max: 500mA)
	Extended Interface	1 × M.2 PCIe3.0 , 1 × SATA 3.0, 2 × RS232, 2 × RS485, 2 × UART, 2 × CANFD/CAN, 1 × Debug

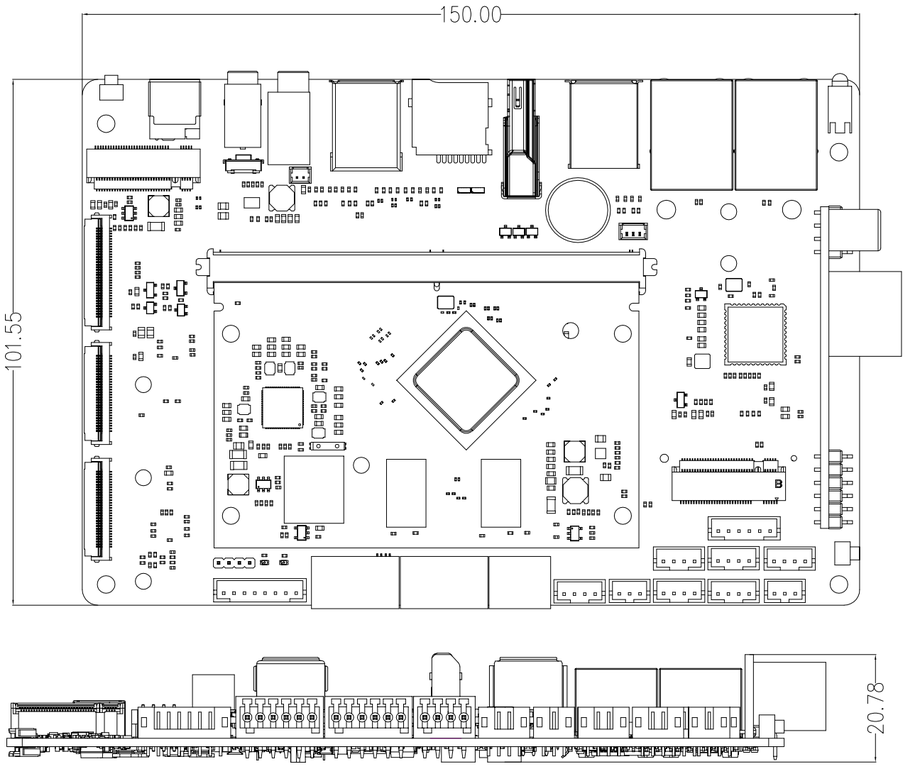
Interface description

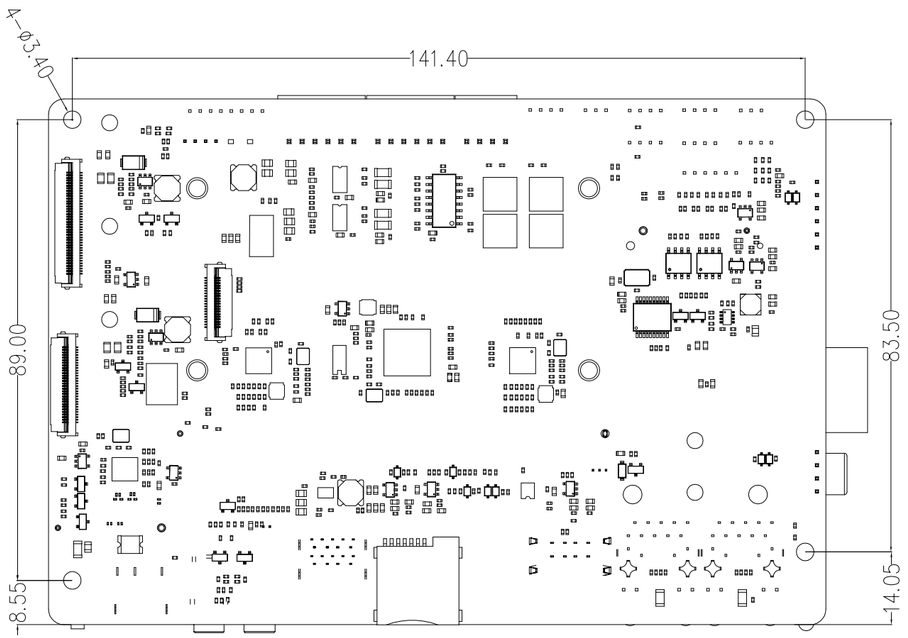






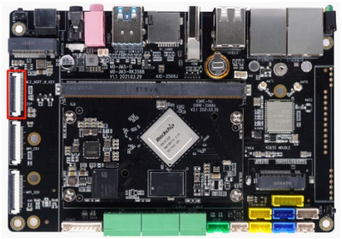
Dimension





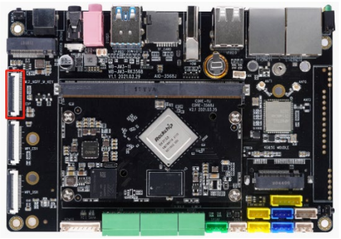
Interface Definition

1.(J9) EDP_Display_Interface: 30 PIN 0.5mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	NC		16	GND	
2	GND		17	EDP_HPD (PWM3_IR/EDP_HPDIN_M1/PCIE30X1_WAKEn_M0/MCU_JTAG_TMS/GPIO0_C2_d)	3.3V
3	EDP_TX_D1N	-	18	GND	
4	EDP_TX_D1P	-	19	GND	
5	GND		20	GND	
6	EDP_TX_D0N	-	21	GND	
7	EDP_TX_D0P	-	22	EDP_BL_EN (2S1_SCLK_RX_M0/PDM_CLK1_M0_CON/SPDIF_TX_M0/GPIO1_A4_D)	*3.3V*
8	GND		23	EDP_BL_PWM14_M0 (PWM14_M0/VOP_PWM_M1/GMAC1_MDC_M0/UART7_TX_M1/PDM_CLK1_M2/GPIO3_C4_d)	*3.3V*
9	EDP_TX_AUXP	-	24	NC	
10	EDP_TX_AUXN	-	25	NC	
11	GND		26	SYS_12V (12V Output)	*12V*
12	VCC_LCD (3.3V Output)	3.3	27	SYS_12V (12V Output)	*12V*
13	VCC_LCD (3.3V Output)	3.3	28	SYS_12V (12V Output)	*12V*
14	NC		29	SYS_12V (12V Output)	*12V*
15	GND		30	NC	

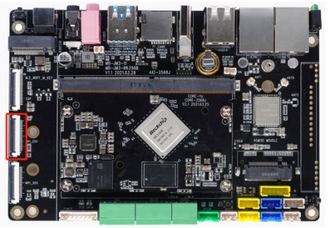
2.(J10) EDP_Display_Interface: 5 PIN 0.5mm Pitch ---Default NC



NO.	Definition	Power/V	NO.	Definition	Power/V
1	EDP_TX_D3N	-	19	NC	
2	EDP_TX_D3P	-	20	GND	
3	GND		21	GND	
4	NC		22	EDP_HPD (PWM3_IR/EDP_HPDIN_M1/PCIE30X1_WAKEn_M0/MCU_JTAG_TMS/GPIO0_C2_d)	*3.3V*
5	EDP_TX_D2N	-	23	GND	
6	EDP_TX_D2P	-	24	GND	
7	GND		25	GND	
8	EDP_TX_D1N	-	26	GND	
9	EDP_TX_D1P	-	27	EDP_BL_EN (2S1_SCLK_RX_M0/PDM_CLK1_M0_CON/SPDIF_TX_M0/GPIO1_A4_D)	*3.3V*
10	GND		28	EDP_BL_PWM14_M0 PWM14_M0/VOP_PWM_M1/GMAC1_MDC_M0/UART7_TX_M1/PDM_CLK1_M2/GPIO3_C4_d)	*3.3V*
11	EDP_TX_D0N	-	29	NC	
12	EDP_TX_D0P	-	30	NC	
13	GND		31	SYS_12V (12V Output)	*12V*
14	EDP_TX_AUXP	-	32	SYS_12V (12V Output)	*12V*
15	EDP_TX_AUXN	-	33	SYS_12V (12V Output)	*12V*
16	GND		34	SYS_12V(12V Output)	*12V*
17	VCC_LCD (3.3V Output)	3.3V	35	NC	

18	VCC_LCD (3.3V Output)	3.3V			

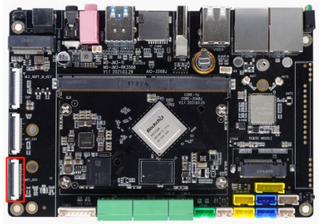
3.(J14) MIPI CAMERA: 30 PIN 0.5 Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	I2C4_SDA_M0 (I2C4_SDA_M0/EBC_VCOM/GMAC1_RXER_M1/SPI3_MOSI_M0/I2S2_SDI_M1/GPIO4_B2_d)	1.8V	16	GND	
2	I2C4_SCL_M0 (I2C4_SCL_M0/EBC_GDOE/ETH1_REFCLKO_25M_M1/SPI3_CLK_M0/I2S2_SDO_M1/GPIO4_B3_d)	1.8V	17	MIPI_CSI_RX_CLK0P	-
3	MIPI_PDN0_CAM 【I2C Extended GPIO】	1.8V	18	MIPI_CSI_RX_CLK0N	-
4	MIPI_RESET0_CAM 【I2C Extended GPIO】	1.8V	19	GND	
5	GND		20	MIPI_CSI_RX_D2P	-
6	CIF_CLKOUT (CIF_CLKOUT/EBC_GDCLK/PWM11_IR_M1/GPIO4_C0_d)	1.8V	21	MIPI_CSI_RX_D2N	-
7	MIPI_PDN1_CAM 【I2C Extended GPIO】	1.8V	22	GND	
8	MIPI_RESET1_CAM 【I2C Extended GPIO】	1.8V	23	MIPI_CSI_RX_D3P	-
9	MIPI_MCLK1 (REFCLK_OUT/GPIO0_A0_d)	1.8V	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	VCC5V0_SYS (5.0V Output)	5.0V
15	MIPI_CSI_RX_D1N	-	30	VCC5V0_SYS (5.0V Output)	5.0V

4. (J5401)MIPI_Display_Interface: 30 PIN 0.5 Pitch



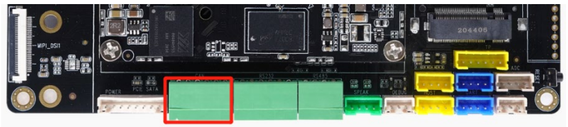
NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC5V0_SYS (5.0V Output)	5.0V	16	MIPI_DSI_TX1_D0P	-
2	VCC5V0_SYS (5.0V Output)	5.0V	17	MIPI_DSI_TX1_D0N	-
3	VCC5V0_SYS (5.0V Output)	5.0V	18	GND	
4	GND		19	MIPI_DSI_TX1_D1P	-
5	I2C_ID2	3.3V	20	MIPI_DSI_TX1_D1N	-
6	VCC3V3_S (3.3V Output)	3.3V	21	GND	
7	SDA_TP【The core board has a pull-up resistor of 2.2K】 (I2C4_SDA_M0/EBC_VCOM/GMAC1_RXER_M1/SPI3_MOSI_M0/I2S2_SDI_M1/GPIO4_B2_d)	1.8V	22	MIPI_DSI_TX1_CLKP	-
8	I2C4_SCL_M0 【The core board has a pull-up resistor of 2.2K】 (I2C4_SCL_M0/EBC_GDOE/ETH1_REFCLKO_25M_M1/SPI3_CLK_M0/I2S2_SDO_M1/GPIO4_B3_d)	1.8V	23	MIPI_DSI_TX1_CLKN	-
9	LCD1_TP_PWREN 【I2C Extended GPIO】	3.3V	24	GND	
10	LCD1_TP_INT【Pull-up resistor 10K】 (PWM2_M0/NPUAVS/UART0_TX/MCU_JTAG_TDI/GPIO0_C1_d)	3.3V	25	MIPI_DSI_TX1_D2P	-
11	GPIO1_B2_D (I2S1_SDO3_M0/I2S1_SDI1_M0/PDM_SDI1_M0_CON/GPIO1_B2_D)	3.3V	26	MIPI_DSI_TX1_D2N	-

12	LCD1_BL_PWM5 (PWM5/SPI0_CS1_M0/UART0_RTSn/GPIO0_C4_d)	3.3V	27	GND	
13	LCD1_RST_L (PWM13_M1/SPI3_CS0_M1/SATA0_ACT_LED/UART9_RX_M1/I2S3_SDI_M1/GPIO4_C6_d)	3.3V	28	MIPI_DSI_TX1_D3P	-
14	LCD1_TP_RST 【I2C Extended GPIO】 【Pull-up resistor 10K】	3.3V	29	MIPI_DSI_TX1_D3N	-
15	GND		30	GND	

5. (J8)POWER: 8 PIN 2.0mm Pitch wafer

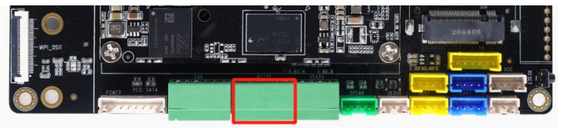
NO.	Definition	Power/V	NO.	Definition	Power/V
1	SYS_12V（12V Output)	12V	5	VCC3V3_SYS（3.3V Output)	3.3V
2	SYS_12V（12V Output)	12V	6	GND	
3	GND		7	VCC5V0_SYS（5.0V Output)	5.0V
4	GND		8	GND	

6. (J33)CAN: 6 PIN 2.54mm Pitch seat (GREEN)



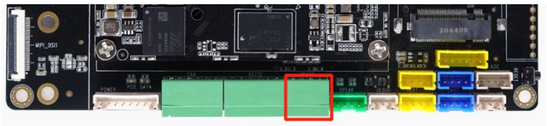
NO.	Definition	Power/V	NO.	Definition	Power/V
1	CAN_VSS_1		4	CAN_VSS_2	
2	CANL_1	-	5	CANL_2	-
3	CANH_1	-	6	CANH_2	-

7. (J5)RS232: 6 PIN 2.54mm Pitch seat (GREEN)



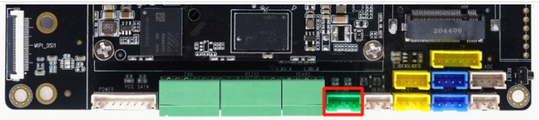
NO.	Definition	Power/V	NO.	Definition	Power/V
1	RS232_TX2	+/-10V	4	RS232_TX1	+/-10V
2	GND		5	GND	
3	RS232_RX2	+/-10V	6	RS232_RX1	+/-10V

8. (J35)RS485: 4 PIN 2.54mm Pitch seat (GREEN)



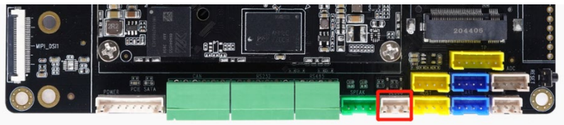
NO.	Definition	Power/V	NO.	Definition	Power/V
1	RS485_A_2	-	3	RS485_A_1	-
2	RS485_B_2	-	4	RS485_B_1	-

9. (J26)SPEAKER: 4 PIN 2.0mm Pitch wafer (GREEN)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	SPK_RP	12V	3	SPK_LP	12V
2	SPK_RN	12V	4	SPK_LN	12V

10. (J27)DEBUG: 3 PIN 2.0mm Pitch wafer

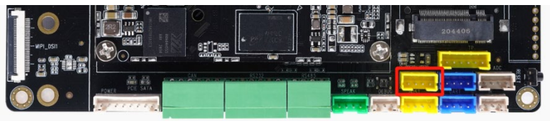


NO.	Definition	Power/V	NO.	Definition	Power/V
1	UART2_RXD	3.3V	3	GND	
2	UART2_TXD	3.3V			

11. (J37)TP: 6 PIN 2.0mm Pitch wafer (YELLOW)

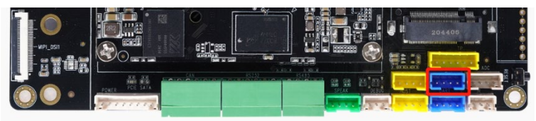
NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC3V3_TP_2（3.3V Output)	3.3V	4	I2C1_SCL_TP 【The core board has a pull-up resistor of 2.2K】 (I2C1_SCL/CAN0_TX_M0/PCIE30X1_BUTTONRSTn/MCU_JTAG_TDO/GPIO0_B3_u)	3.3V
2	EDP_TP_INT The board has a pull-up resistor of 10K (LCDC_D10/VOP_BT1120_D2/GMAC1_TXD3_M0/I2S3_SCLK_M0/SDMMC2_D2_M1/GPIO3_A3_d)	3.3V	5	I2C1_SDA_TP 【The core board has a pull-up resistor of 2.2K】 (I2C1_SDA/CAN0_RX_M0/PCIE20_BUTTONRSTn/MCU_JTAG_TCK/GPIO0_B4_u)	3.3V
3	EDP_TP_RESET The board has a pull-up resistor of 10K (LCDC_D12/VOP_BT1120_D4/GMAC1_RXD3_M0/I2S3_SDO_M0/SDMMC2_CMD_M1/GPIO3_A5_d)	3.3V	6	GND	

12.(J29)USB_HOST 4 PIN 2.0mm Pitch wafer (YELLOW)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	HUB_USB1_DM	-
2	HUB_USB1_DP	-	4	VCC5V0_USB20_HOST4 (5.0V Output)	5.0V

13. (J22)UART: 4 PIN 2.0mm Pitch wafer (BLUE)



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	UART_TXC	-
2	UART_RXC	-	4	VCC3V3_SYS (3.3V Output)	3.3V

14.ADC: 4 PIN 2.0mm Pitch wafer (J28)

NO.	Definition	Power/V	NO.	Definition	Power/V
1	ADC5 Input The board has a pull-up resistor of 10K	1.8V	3	ADC7 Input The board has a pull-up resistor of 10K	1.8V
2	ADC6 Input The board has a pull-up resistor of 10K	1.8V	4	GND	

15. (J24)USB_HOST: 4 PIN 2.0mm Pitch wafer (YELLOW)

NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	HUB_USB2_DM	-
2	HUB_USB2_DP	-	4	VCC5V0_USB20_HOST3 (5.0V Output)	5.0V

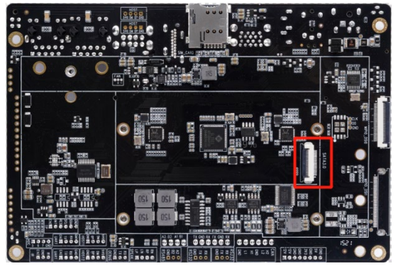
16. (J23)UART: 4 PIN 2.0mm Pitch wafer (BLUE)

NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		3	UART_TXD	-
2	UART_RXD	-	4	VCC3V3_SYS (3.3V Output)	3.3V

17.(J30)IR: 3 PIN 2.0mm Pitch wafer

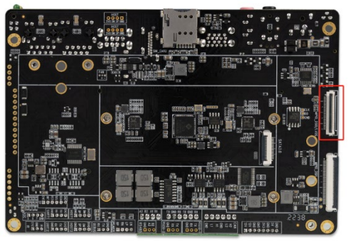
NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC_IR (3.3V Output)	3.3V	3	PWM7_IR Input The board has a pull-up resistor of 10K (PWM7_IR/SPI0_CS0_M0/PCIE30X2_PERSTn_M0/GPIO0_C6_d)	3.3V
2	GND				

18. (J32)STAT3.0_Interface: 20 PIN



NO.	Definition	Power/V	NO.	Definition	Power/V
1	GND		11	VCC5V0_SATA (5.0V Output)	5.0V
2	SATA2_TXP On-board series capacitance 10nF	-	12	VCC5V0_SATA (5.0V Output)	5.0V
3	SATA2_TXN On-board series capacitance 10nF	-	13	VCC5V0_SATA (5.0V Output)	5.0V
4	GND		14	VCC5V0_SATA (5.0V Output)	5.0V
5	SATA2_RXN On-board series capacitance 10nF	-	15	GND	
6	SATA2_RXP On-board series capacitance 10nF	-	16	GND	
7	GND		17	GND	
8	SATA2_LED (EDP_HPDIN_M0/SPDIF_TX_M2/SATA2_ACT_LED/PCIE30X2_PERSTn_M2/I2S3_LRCK_M1/GPIO4_C4_d)	3.3V	18	VCC12V_SATA (12V Output)	12V
9	GND		19	VCC12V_SATA (12V Output)	12V
10	GND		20	VCC12V_SATA (12V Output)	12V

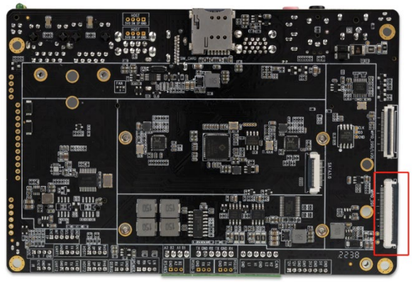
19.(J5400) MIPI_Display_Interface/LVDS: 30 PIN 0.5 Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC5V0_SYS（5.0V Output)	5.0V	16	MIPI_DSI_TX0_D0P/LVDS_TX0_D0P	-
2	VCC5V0_SYS（5.0V Output)	5.0V	17	MIPI_DSI_TX0_D0N/LVDS_TX0_D0N	-
3	VCC5V0_SYS（5.0V Output)	5.0V	18	GND	
4	GND		19	MIPI_DSI_TX0_D1P/LVDS_TX0_D1P	-
5	I2C_ID	3.3V	20	MIPI_DSI_TX0_D1N/LVDS_TX0_D1N	-
6	VCC3V3_S（3.3V Output)	3.3V	21	GND	
7	I2C1_SDA_TP 【The core board has a pull-up resistor of 2.2K】 (CAN0_RX_M0/PCIE20_BUTTONRSTn/MCU_JTAG_TCK/GPIO0_B4_u)	3.3V	22	MIPI_DSI_TX0_CLKP/LVDS_TX0_CLKP	-
8	I2C1_SCL_TP 【The core board has a pull-up resistor of 2.2K】 (CAN0_TX_M0/PCIE30X1_BUTTONRSTn/MCU_JTAG_TDO/GPIO0_B3_u)	3.3V	23	MIPI_DSI_TX0_CLKN/LVDS_TX0_CLKN	-
9	LCD0_PWR_EN/GPIO0_C7 (HDMITX_CEC_M1/PWM0_M1/UART0_CTSn/GPIO0_C7_d)	3.3V	24	GND	
10	TP_INT_L_GPIO0_B5【The board has a pull-up resistor of 10K】 (I2C2_SCL_M0/SPI0_CLK_M0/PCIE20_WAKEn_M0/PWM1_M1/GPIO0_B5_u)	3.3V	25	MIPI_DSI_TX0_D2P/LVDS_TX0_D2P	-
11	BL_EN0 (PWM12_M1/SPI3_MISO_M1/SATA1_ACT_LED/UART9_TX_M1/I2S3_SDO_M1/GPIO4_C5_d)	3.3V	26	MIPI_DSI_TX0_D2N/LVDS_TX0_D2N	-
12	LCD0_BL_PWM4 (PWM4/VOP_PWM_M0/PCIE30X1_PERSTn_M0/MCU_JTAG_TRSTn/GPIO0_C3_d)	3.3V	27	GND	
13	LCD0_RST_L_GPIO0_C5 (PWM6/SPI0_MISO_M0/PCIE30X2_WAKEn_M0/GPIO0_C5_d)	3.3V	28	MIPI_DSI_TX0_D3P/LVDS_TX0_D3P	-

14	TP_RST_L_GPIO0_B6【The board has a pull-up resistor of 10K】(I2C2_SDA_M0/SPI0_MOSI_M0/PCIE20_PERSTn_M0/PWM2_M1/GPIO0_B6_U)	3.3V	29	MIPI_DSI_TX0_D3N/LVDS_TX0_D3N	-
15	GND		30	GND	

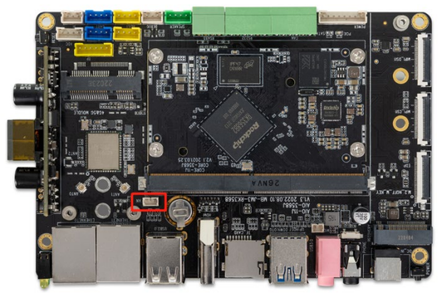
20.(U17) MIPI_Display_Interface 40 PIN 0.5 Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	VCC3V3_TP_1（3.3V Output)	3.3V	21	MIPI_DSI_TX1_D3P	-
2	NC		22	GND	
3	LCD1_TP_RST 【I2C Extended GPIO】【Pull-up resistor 10K】	3.3V	23	NC	
4	LCD1_TP_INT【Pull-up resistor 10K】(PWM2_M0/NPUAVS/UART0_TX/MCU_JTAG_TDI/GPIO0_C1_d)	3.3V	24	NC	
5	SDA_TP【2.2K has been pulled up on the core board】(I2C4_SDA_M0/EBC_VCOM/GMAC1_RXER_M1/SPI3_MOSI_M0/I2S2_SDI_M1/GPIO4_B2_d)	1.8V	25	LCD1_RST_L（PWM13_M1/SPI3_CS0_M1/SATA0_ACT_LED/UART9_RX_M1/I2S3_SDI_M1/GPIO4_C6_d）	3.3V
6	SCL_TP【2.2K has been pulled up on the core board】(I2C4_SCL_M0/EBC_GDOE/ETH1_REFCLKO_25M_M1/SPI3_CLK_M0/I2S2_SDO_M1/GPIO4_B3_d)	1.8V	26	NC	
7	GND		27	NC	
8	MIPI_DSI_TX1_D0N	-	28	VCC_LCD1V8_1（1.8V Output)	1.8V

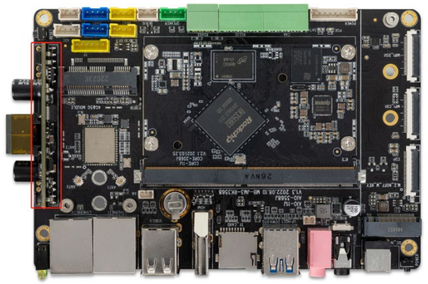
9	MIPI_DSI_TX1_D0P	-	29	NC	
10	GND		30	AVEE_-5V5_1 (-5.5V Output)	-5.5V
11	MIPI_DSI_TX1_D1N	-	31	AVEE_-5V5_1 (-5.5V Output)	-5.5V
12	MIPI_DSI_TX1_D1P	-	32	NC	
13	GND		33	AVDD_5V5_1 (+5.5V Output)	5.5V
14	MIPI_DSI_TX1_CLKN	-	34	AVDD_5V5_1 (+5.5V Output)	5.5V
15	MIPI_DSI_TX1_CLKP	-	35	VCC_LEDK_1	
16	GND		36	VCC_LEDK_1	
17	MIPI_DSI_TX1_D2N	-	37	VCC_LEDK_1	
18	MIPI_DSI_TX1_D2P	-	38	VCC_LEDA_1	36V
19	GND		39	VCC_LEDA_1	36V
20	MIPI_DSI_TX1_D3N	-	40	VCC_LEDA_1	36V

21. (J3)FAN: 3 PIN 1.25mm Pitch wafer



NO.	Definition	Power/V	NO.	Definition	Power/V
1	FAN-	12V	3	NC	
2	FAN+	12V			

22. (U4)POE(30W): 10 PIN 2.54mm Pitch



NO.	Definition	Power/V	NO.	Definition	Power/V
1	NC		6	POW_VA2 (POE module Input)	44~57V
2	NC		7	GND	
3	POW_VA1 (POE module Input)	44~57V	8	GND	
4	POW_VB1 (POE module Input)	44~57V	9	POE_12V (POE module 12V Output)	12V
5	POW_VB2 (POE module Input)	44~57V	10	POE_12V (POE module 12V Output)	12V

T-CHIP INTELLIGENCE TECHNOLOGY

Contact Us
(+86)18688117175

E-mail
global@t-firefly.com

Website
https://en.t-firefly.com/

Address
Room 2101, Hongyu Building, #57 Zhongshan 4Rd, East District, Zhongshan, Guangdong, China.