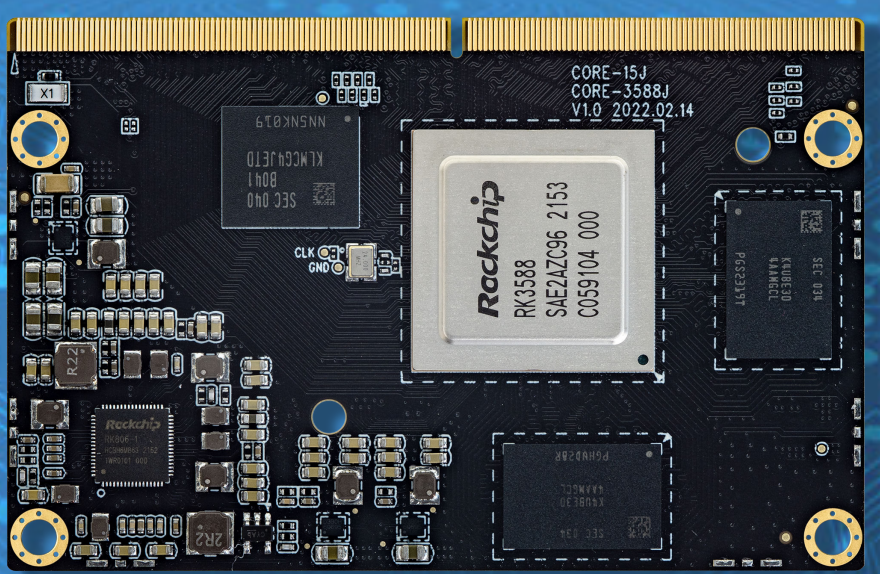
Core-3588J

8K AI Core Board

V1.0



T-CHIP INTELLIGENCE TECHNOLOGY CO.,LTD.

www.t-firefly.com

Update history

Version	Date	Details
V1.0	2022-03-22	initial version

Firefly

Directory

1. Overview……4

2. Technical Parameter……8

3. Dimensions……9

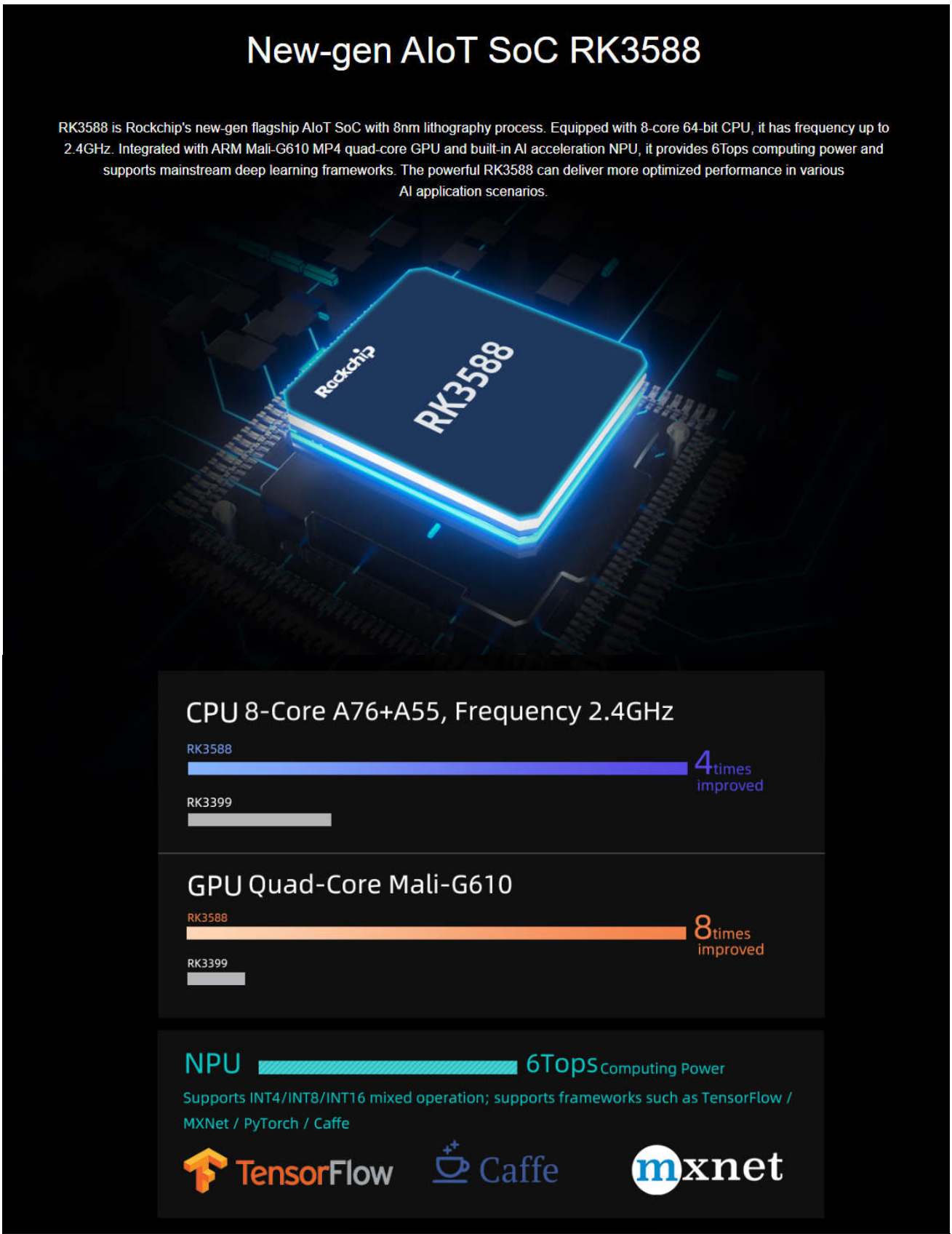
4. Interface definition……10

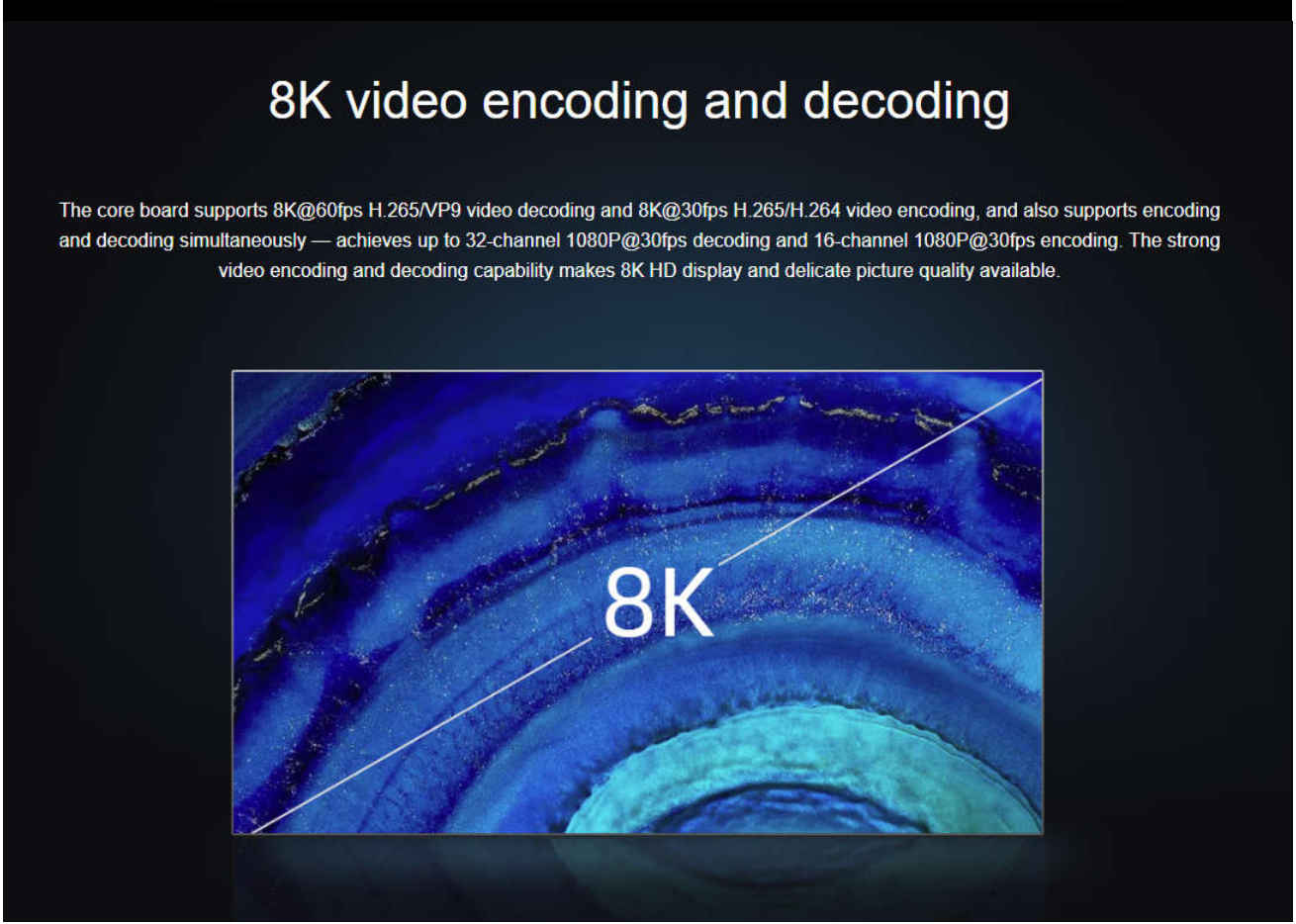
5. About us ……12

Firefly

Overview

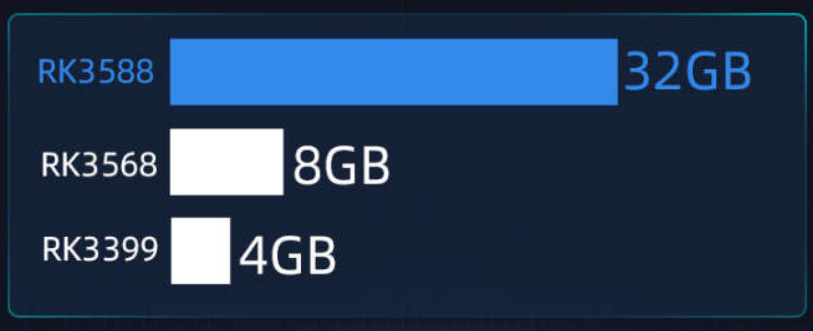
Powered by Rockchip RK3588 new-gen 8-core 64-bit processor, the core board can be configured with up to 32GB RAM. Capable of 8K video encoding and decoding, it provides abundant interfaces supporting multiple hard disks, Gigabit Ethernet, WiFi6, 5G/4G expansion and a variety of video input and output. It also supports various operating systems. This core board can be used in ARM PC, edge computing, cloud server, smart NVR and other fields.





Super-large 32GB RAM

Up to 32GB of super-large RAM can be configured, which exceeds the limit of the previous RAM and delivers a faster response speed. It can meet the application requirements of products with large RAM and large storage.

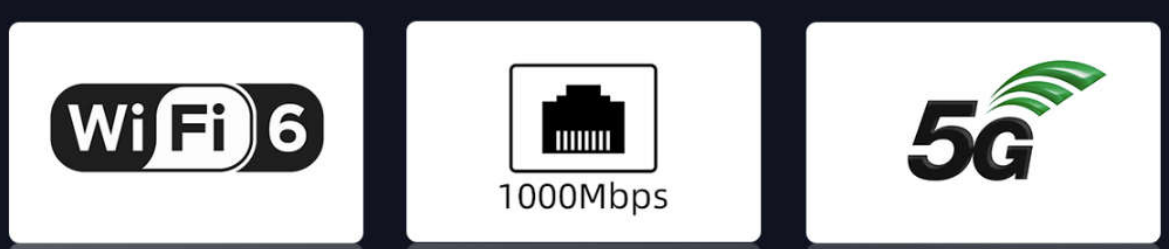


Multi-channel input and output

With HDMI 2.1/eDP1.3/MIPI-DSI/DP1.4/BT.1120 multi-channel video output and HDMI RX2.0/MIPI-CSI/DVP video input interfaces, it supports multi-channel 8K video output and 4K video input — up to seven-screen output with different displays can be achieved. The integrated 48MP ISP with HDR&3DNR supports dual MIPI-CSI camera input.

Strong network communication capability

Integrated with PCIe3.0/GMAC/SDIO3.0/USB3.0, it can be extended to multi-channel Gigabit Ethernet, WiFi 6/Bluetooth, 5G/4G LTE, enabling network communication have a higher speed.

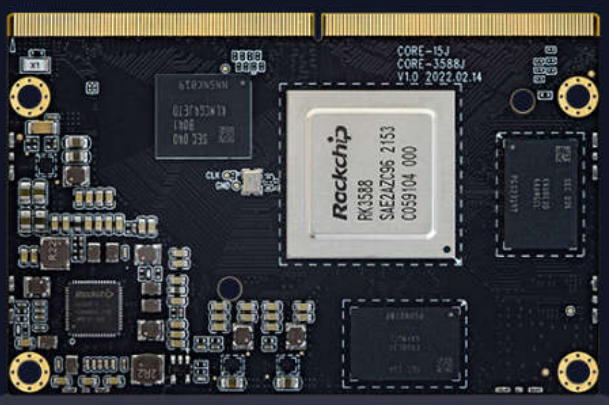


Multiple hard disks, Massive capacity

It supports expansion of multiple PCIe3.0/SATA3.0 SSD/HDD mass storage devices at the same time, making it a reality that the device can be easily expanded with TB storage capacity.

More interfaces for more possibilities

It's equipped with PCIE3.0, SATA3.0, I2S, I2C, CAN, UART, SPDIF, SDIO3.0, MIPI-CSI, MIPI-DSI, USB3.0, USB2.0, SPI, GPIO and other expansion interfaces.

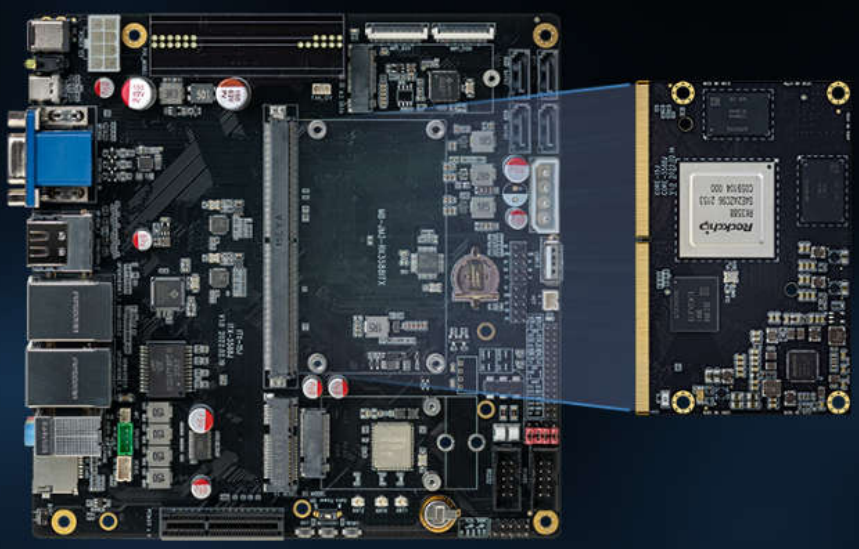


PCIE 3.0 | SATA 3.0 | UART | CAN | SPDIF

SDIO 3.0 | GPIO | MIPI-DSI | MIPI-CSI | USB 3.0

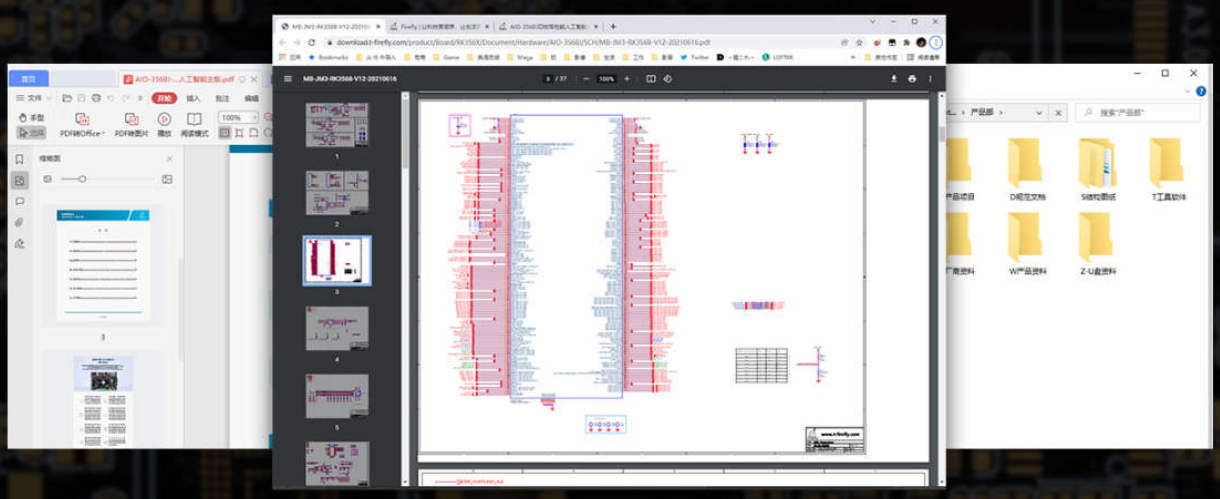
High-performance ITX mainboard

The core board, with standard MXM3.0-314P interface, which is small in size, can be combined with a backplane to form a complete high-performance ITX mainboard with richer expansion interfaces, which can be directly applied to various smart products to accelerate the product development process.



Backplane reference design is provided

Backplane reference design and complete technical information are provided, so users can efficiently proceed secondary development to quickly create independent and controllable products.

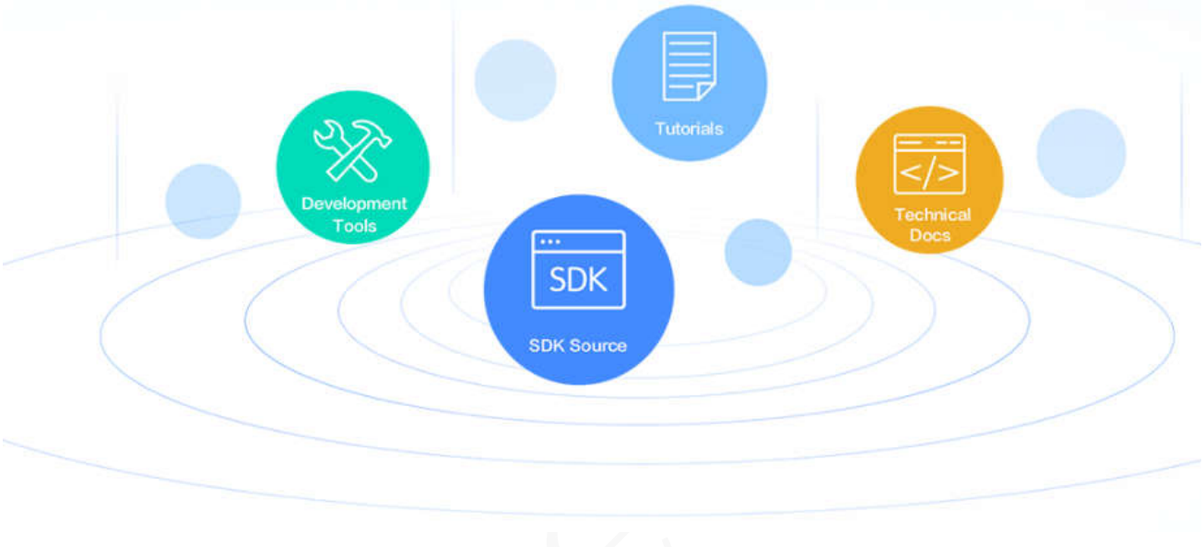


Supports various operating systems

Android 12.0, Ubuntu Desktop version and Server version, Debian11, Buildroot, Kylin and UOS are supported. And it supports RTLinux, delivering excellent real-time performance. Also, UEFI Boot is available. The stable and reliable operation provides a safe and stable system environment for product research and production.

Abundant resources

SDK, tutorials, tech docs and dev tools are provided, making development simpler and more convenient.



A wide range of applications

The core board can be used in edge computing, cloud server, ARM PC, smart NVR, intelligent cockpit, smart video wall, AR/VR, high-end tablet, multi-lens camera, smart car and other fields.The core board can be used in edge computing, cloud server, ARM PC, smart NVR, intelligent cockpit, smart video wall, AR/VR,
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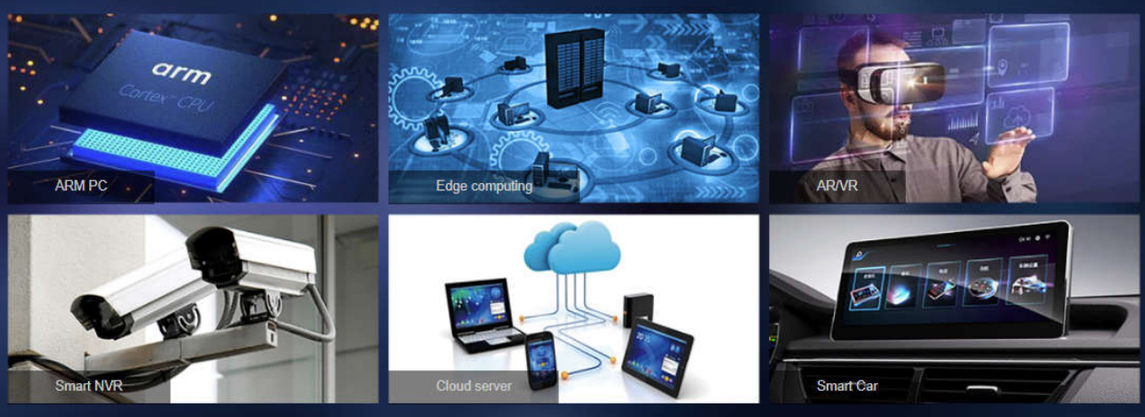


Technical parameters

Basic Specifications

SOC	RockChip RK3588
CPU	8-core 64-bit (4×Cortex-A76+4×Cortex-A55) , 8nm lithography process, frequency up to 2.4GHz
GPU	ARM Mali-G610 MP4 quad-core GPU Supports OpenGL ES3.2 / OpenCL 2.2 / Vulkan1.1, 450 GFLOPS
NPU	NPU computing power is up to 6 TOPS, Supports INT4/INT8/INT16 mixed operation, Supports framework switching of TensorFlow / MXNet / PyTorch / Caffe / etc.
ISP	Integrated 48MP ISP with HDR&3DNR
VPU	Video decoding: 8K@60fps H.265/VP9/AVS2 8K@30fps H.264 AVC/MVC 4K@60fps AV1 1080P@60fps MPEG-2/-1/VC-1/VP8 Video encoding: 8K@30fps encoding, Supports H.265 / H.264 * Achieves up to 32-channel 1080P@30fps decoding and 16-channel 1080P@30fps encoding
RAM	4GB/8GB/16GB 64bit LPDDR4/LPDDR4x/LPDDR5 (Up to 32GB optional)
Storage	16GB/32GB/64GB/128GB eMMC

Hardware Specifications

Network	Integrated with PCIe3.0/GMAC/SDIO3.0/USB3.0, it can be extended to multi-channel Gigabit Ethernet, WiFi 6/Bluetooth, 5G/4G LTE
Display	Video output: 1 × HDMI2.1 (8K@60fps or 4K@120fps) 1 × HDMI2.0 (4K@60fps) 2 × MIPI-DSI (4K@60fps) 2 × DP1.4 (8K@30fps, multiplexed with USB3.0) 2 × eDP1.3 (4K@60Hz) 1 × BT.1120 (1080@60fps) Video input: 1 × HDMI-IN (4K@60fps) , supports HDCP 2.3 1 × MIPI CSI (4 lanes) or 2×MIPI CSI (2 lanes) 2 × MIPI DC (4-lane DPHY v2.0 or 3-lane CPHY V1.1) 1 × DVP camera (up to 150MHz input data) * Supports multi-channel 8K video output and 4K video input, up to seven-screen output with different displays
Audio	2 × 8-channel I2S 2 × 2-channel I2S 2 × SPDIF 2 × 8-channel PDM (supports multi-MIC array) 1 × Dual-channel digital audio codec (16-bit DAC) 1 × VAD
PCIE	PCIe3.0 (2×2 lanes, 1×4 lanes, 4×1 lane) 3 × PCIE2.0(1 lane)
SATA	3 × SATA3.0
USB	3 × USB3.0, 4 × USB2.0 Host 2 × USB2.0 OTG
Power	4V (error±5%)
Other Interfaces	9 × I2C, 10 × UART, 5 × SPI, 7 × ADC , 16 × PWM , 1 × SDMMC, GPIO

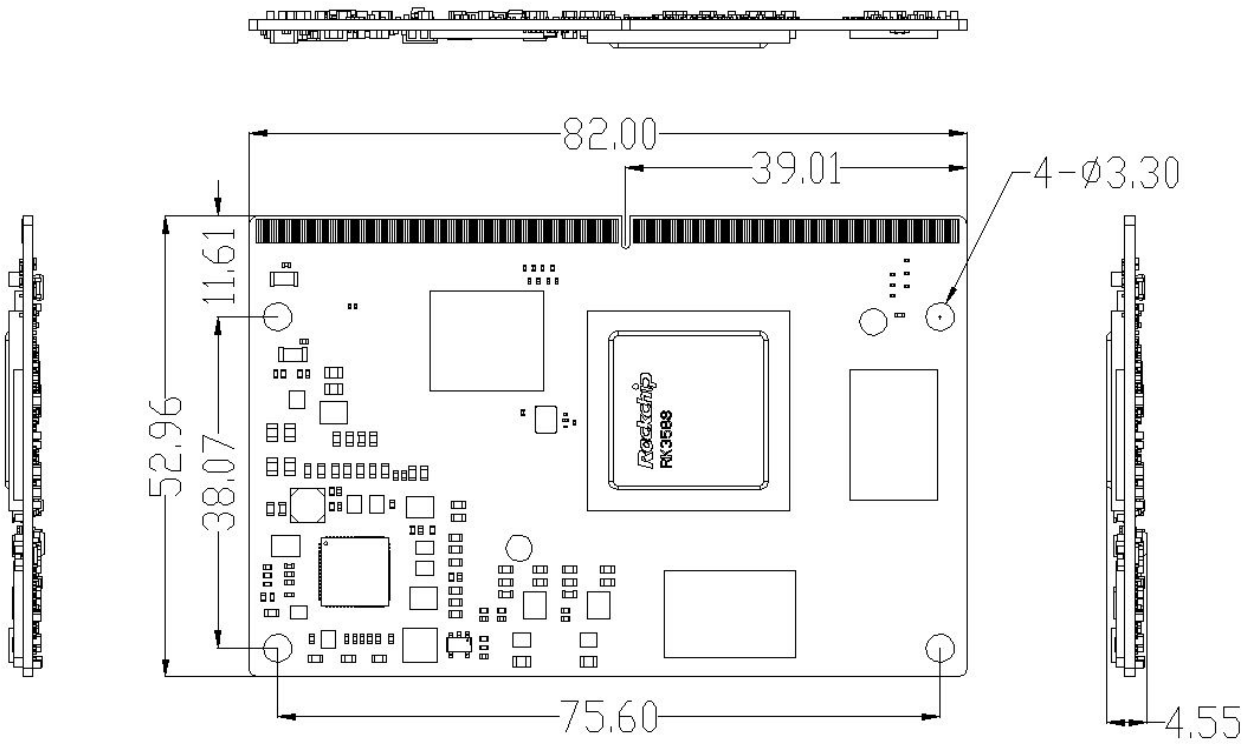
OS/Software

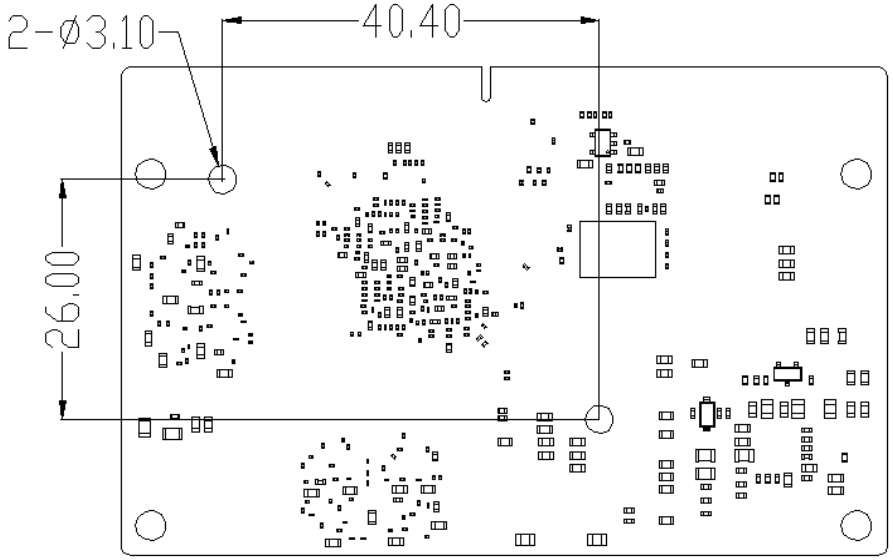
OS	Android: Android 12.0 Linux: Ubuntu Desktop, Ubuntu Server, Debian11, Buildroot, RTLinux, Kylin Linux, UOS. Supports UEFI Boot

General

Size	82 mm × 53 mm
Interface Type	MXM3.0 (314 PIN, 0.5mm pitch)
PCB	10-layer design, immersion gold technology
Heat Dissipation	Heat sink installation hole pitch: 45mm
Power Consumption	Idle: ≈1.35W (12V/110mA) Typical: ≈4.8W (12V/400mA) Max: ≈20W (12V/1700mA)
Environment	Operating Temperature: -20℃-60℃, Storage Temperature: -20℃-70℃, Storage Humidity: 10%-80%

Dimensions


82.00
39.01
4-Ø3.30
11.61
52.96
38.07
75.60
4.55
Rockchip
RK3588

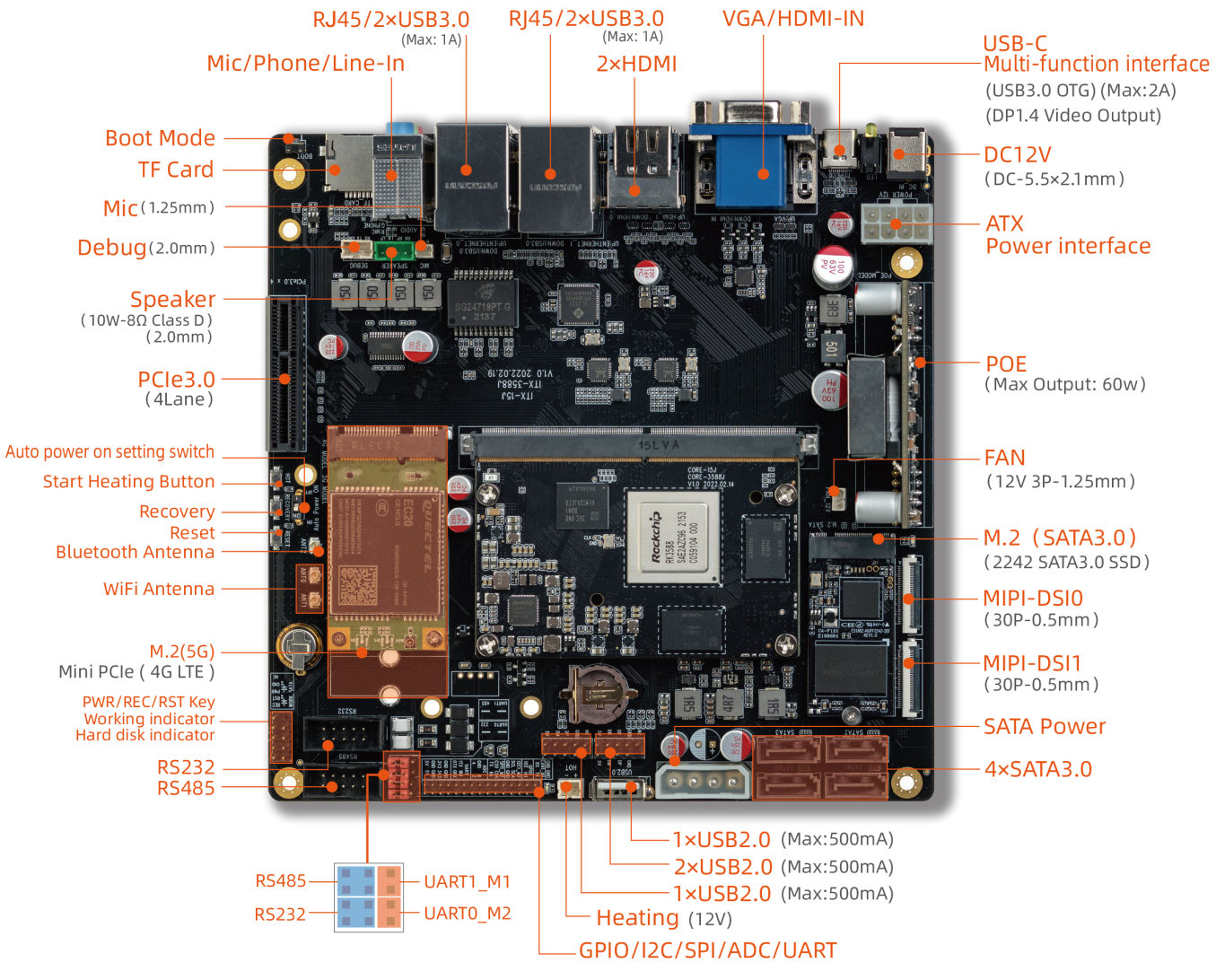

2-Ø3.10
40.40
26.00

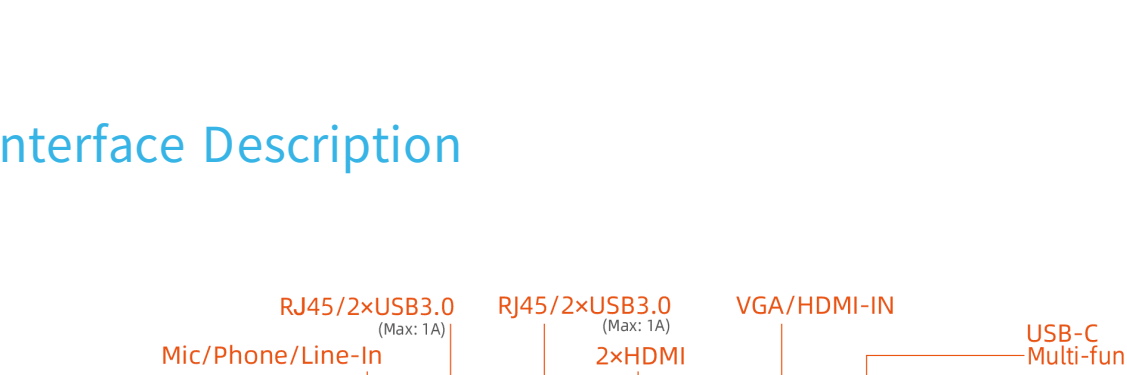
Interface Definition

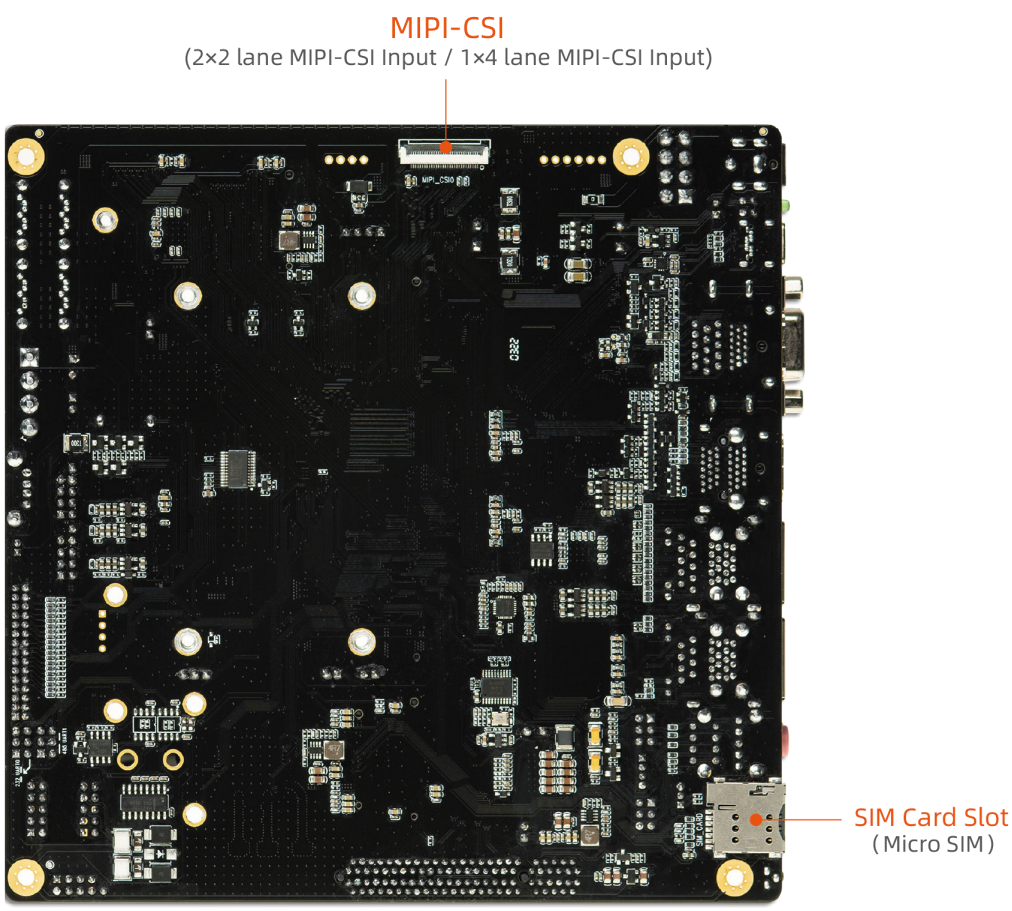
Part A	PIN	CORE-3868J pin definition	RK3588 Pin NO.	Pad type	IO Pull	Function for Main BOARD/EMB-3M3-RK3588J	Default function description	IO Power domain
1	VCC4V0_SYS			P		VCC4V0_CORE	Input Voltage 4.0V	4.0V
2				P				4.0V
3				P				4.0V
4				P				4.0V
5	GND			G		GND	GND	GND
6				G				GND
7				G				GND
8	VCC_1V8_S0			P		VCC_1V8_S0	1.8V Output 2Pin2X3A Total Max 600mA	1.8V
9	VCC_3V3_S0			P		VCC_3V3_S0	3.3V Output 2Pin2X3A Total Max 600mA	3.3V
10	VCC_1V8_S0			P		VCC_1V8_S0	1.8V Output Max 200mA	1.8V
11				P				1.8V
12	SARADC_IN3		M31	I	UP	SARADC_IN3	Battery voltage detection	1.8V
13	I2S0_8CH_SDO3/I2S0_8CH_SDI3/PDM0_SDI2_M2/I2C5_SCL_M4/UART9_RX_M1/SPI1_MI_M0/SPI1_CLK_M0/GPIO1_D2_d		F28	I/O	DOWN	SPI1_CLK_M0/UART9_TX_M1/I2C5_SCL_M4/I2S0_8CH_SDI3/I2S0_8CH_SDO3/PDM0_SDI2_M2/GPIO1_D2_d	SPI1_CLK_M0/UART9_TX_M1/I2C5_SCL_M4	1.8V
14	PDM0_SDI0_M0/SPI1_CS1_M0/GPIO1_D5_d		G26	I/O	DOWN	HDMIRX_DET_L	HDMIRX DETECT Active L	1.8V
15	SLEEP_REQ_CLK_OUT/GPIO0_B5_d		A29	I/O	DOWN	HOST_WAKE_HOST_H	HOST WAKE HOST H	1.8V
16	I2S1_SDI0_M1/GPIU_AY5/UART3_RTS_M1/PWM2_M0/SPI2_CS0_M0/GPI_HPDIN_M1/PWM2_M0/GPIO4_A7_d		P30	I/O	UP	HOST_WAKE_BT_H	HOST WAKE BT_H Active H	1.8V
17	I2S1_SDO0_M1/GPIU_AY6/UART3_CTS_M1/SPI2_CS1_M0/GPIO4_B0_d		P33	I/O	DOWN	BT_WAKE_HOST_H	BT WAKE HOST_H Active H	1.8V
18	I2S1_SDO1_M1/GPIU_AY7/UART3_RTS/PWM5_M1/SPI0_CLK_M0/PCIE30_PRSNT_L/GPIO4_B1_d		T29	I/O	UP	BT_REG_ON_H	BT_REG_ON Active H	1.8V
19	I2S1_SDO2_M1/CPU_BIG1_AY5/I2C1_SDA_M2/CAN2_TX_M1/HDMI_TX2_SCL_M3/UART2_CTS_M3/DATA_MP_SWITCH/GPIO2_D5_d		V28	I/O	UP	I2C1_SDA_M2_TP	I2C1 SDA for TP Core board Pull up resistance 2.2K	1.8V
20	I2S1_SDO3_M1/PDM0_SDI2_M1/PWM3_IR_M0/I2C1_SCL_M2/CAN2_RX_M1/HDMI_TX2_SDA_M3/UART2_RTS_M3/PERSTN_M0/GPIO2_D6_d		V29	I/O	UP	I2C1_SCL_M2_TP	I2C1 SCL for TP Core board Pull up resistance 2.2K	1.8V
21	PDM0_CLK1_M1/PWM2_M0/UART5_RX_M0/SCSI_SDA_M0/SPI0_MO_M0/I2C_HPDIN_M1/HPCSN_M1/GPIO4_B2_d		R30	I/O	DOWN	WIFI_REG_ON_H	WIFI_REG_ON Active H	1.8V
22	I2TCPU_AY5/PDM0_SDI3_M1/GPIO0_D3_d		U33	I/O	UP	I2C_INT_L	TYPEC I2C_INT Active L	1.8V
23	I2S0_8CH_SDO0/I2S0_8CH_SDI0/PDM0_SDI3_M2/I2C2_SDA_M4/UART8_RX_M1/GPIO4_B3_d		E29	I/O	DOWN	UART8_RX_M1 BT	UART8_RX_M1 for BT	1.8V
24	I2S0_8CH_SDO1/I2S0_8CH_SDI1/PDM0_SDI0_M2/I2C2_SCL_M4/UART8_RX_M0/SPI1_MO_M0/SPI1_CLK_M0/GPIO4_B4_d		A25	I/O	DOWN	UART8_TX_M1 BT	UART8_TX_M1 for BT	1.8V
25	HDMI_TX0_HPD_M0/SPI2_MO_M0/GPIO2_A1_d		B26	I/O	DOWN	HDMITX0_HPDIN_M0	HDMITX0_HPD_IN Active H	1.8V
26	I2OP_POST_EMPTY_M0/UART9_RX_M0/SPI3_MI_M0/PWM2_M0/SPI0_CLK_M0/GPIO3_B2_d		A26	I/O	DOWN	UART9_RTSN_M1 BT	UART9_RTSN_M1 for BT	1.8V
27	I2OP_FULL_M0/UART9_TX_M0/SPI3_MO_M0/PWM2_M0/SPI0_CS0_M0/GPIO3_B3_d		A27	I/O	DOWN	UART9_CTSN_M1 BT	UART9_CTSN_M1 for BT	1.8V
28	PDM1_CLK0_M0/PCIE30X1_3_PERSTN_M2/UART7_RX_M2/SPI4_MI_M0/GPIO1_B4_d		E24	I/O	UP	PCIEX1_0_PERSTN_M1_L	PCIEX1_0_PERSTN_M1 Active L	1.8V
29	PDM1_SDI0_M0/PCIE30X1_1_PERSTN_M2/PWM1_IR_M3/SPI2_CS0_M0/GPIO1_D1_d		C25	I/O	UP	MIPI_CAM0_PDN_L	MIPI_CAM0_PDN Active L	1.8V
30	HDMI_TX1_SCL_M0/SPI2_MI_M0/GPIO2_A2_d		B25	I/O	DOWN	VGA_HPD_H	VGA_HPD Active H	1.8V
31	HDMI_TX1_SDA_M0/SPI2_CS0_M0/GPIO2_A3_d		A24	I/O	DOWN	VGA_I2C_SCL_M0	VGA_I2C_SCL Active H	1.8V
32	PCIE30X2_2_CLKREQN_M2/GPIO1_C7_d		E25	I/O	UP	PCIEX1_C_CLKREQN_M1_L	PCIEX1_C_CLKREQN_M1 Active L	1.8V
33	PDM1_SDI2_M0/PCIE30X4_WAKEN_M3/SPI0_MI50_M0/GPIO3_B1_d		D25	I/O	DOWN	MIPI_CAM0_PWREN_H	MIPI_CAM0_PWREN Active H	1.8V
34	PDM1_SDI3_M0/PCIE30X4_PERSTN_M3/SPI0_MO_M0/GPIO3_B0_d		D26	I/O	DOWN	MIPI_CAM1_PWREN_H	MIPI_CAM1_PWREN Active H	1.8V
35	I2S0_8CH_SDO2/I2S0_8CH_SDI2/PDM0_SDI1_M2/I2C4_SDA_M2/UART6_RX_M0/SPI3_MI_M0/GPIO1_B2_d		D24	I/O	DOWN	SPI1_CS0_M0/UART6_RX_M0/I2C4_SDA_M2/I2S0_8CH_SDI2/I2S0_8CH_SDO2/PDM0_SDI1_M2/GPIO1_B2_d	SPI1_CS0_M0/UART6_RX_M0/I2C4_SDA_M2	1.8V
36	PDM0_SDI0_M1/PCIE30X4_CLKREQN_M3/SPI2_CS1_M0/GPIO1_B0_d		C27	I/O	UP	RESETB_CAM	RESETB_CAM	1.8V
37	I2S0_8CH_SDO3/I2S0_8CH_SDI3/PDM0_SDI2_M2/I2C5_SCL_M4/UART9_RX_M1/SPI1_MI_M0/SPI1_CLK_M0/GPIO1_D2_d		F26	I/O	DOWN	SPI1_MOSI_M0/UART9_TX_M1/I2C7_SCL_M2	SPI1_MOSI_M0/UART9_TX_M1/I2C7_SCL_M2	1.8V
38	PDM0_SDI0_M0/SPI1_CS1_M0/GPIO1_D5_d		F27	I/O	DOWN	SPI1_MOSI_M0/GPIU_AY4/UART9_RTS_M1/PWM1_M1/SPI1_CS1_M0/GPIO1_D5_d	SPI1_MOSI_M0/UART9_TX_M1/I2C7_SDA_M2	1.8V
39	PDM0_CLK0_M0/I2C4_SDA_M2/PWM3_IR_M3/GPIO1_D0_d		D29	I/O	DOWN	PWM15_M2	PWM15_M2	1.8V
40	PDM0_SDI1_M0/I2C4_SCL_M2/GPIO1_D4_d		D28	I/O	DOWN	I2S0_LRCK_TX	I2S0_LRCK_TX	1.8V
41	I2S0_SDO0/GPIO2_D0_d		C28	I/O	DOWN	I2S0_SDO	I2S0_SDO	1.8V
42	I2S0_SDI0/GPIO2_D1_d		C29	I/O	DOWN	I2C_INT_L	RTC IC_INT Active L	1.8V
43			E31	I/O	DOWN	I2S0_SCLK_TX	I2S0_SCLK_TX	1.8V
44	I2S0_MCLK/GPIO2_D2_d		E30	I/O	DOWN	I2S0_SDO	I2S0_SDO	1.8V
45	I2S0_MCLK/GPIO2_D3_d		F30	I/O	DOWN	I2S0_MCLK	I2S0_MCLK	1.8V
46	GND			G		GND	GND	GND
47	PCIE30_2_REFCLKP		G31			PCIE30_2_REFCLKP	PCIE30_2_REFCLKP	1.8V
48	PCIE30_2_REFCLKN		G32			PCIE30_2_REFCLKN	PCIE30_2_REFCLKN	1.8V
49	PCIE30_2_TXP3/SATA3_2_TXP/USB3_2_SSTXP		H30			PCIE30_2_TXP3/SATA3_2_TXP	PCIE30_2_TXP3/SATA3_2_TXP	1.8V
50	PCIE30_2_TXN3/SATA3_2_TXN/USB3_2_SSTXN		H29			PCIE30_2_TXN3/SATA3_2_TXN	PCIE30_2_TXN3/SATA3_2_TXN	1.8V
51	PCIE30_2_RXP3/SATA3_2_RXP/USB3_2_SSRXP		J31			PCIE30_2_RXP3/SATA3_2_RXP	PCIE30_2_RXP3/SATA3_2_RXP	1.8V
52	PCIE30_2_RXN3/SATA3_2_RXN/USB3_2_SSRXN		J30			PCIE30_2_RXN3/SATA3_2_RXN	PCIE30_2_RXN3/SATA3_2_RXN	1.8V
53	GND			G		GND	GND	GND
54	SPI2_CS1_M2/I2C3_SCL_M1/UART5_RX_M1/GPIO3_B5_d		L30	I/O	True-Hold	WTD_INT_L	RTC IC_INT Active L	1.8V
55	I2S1_MCLK_M1/UART4_TCK_M0/I2C5_SCL_M3/CAN1_TX_M1/PWM1_IR_M1/SPI2_CLK_M1/GPIO3_B6_d		P29	I/O	DOWN	UART2_TX_M0_DEBUG	UART2_TX_M0_DEBUG	1.8V
56	I2S1_SDI3_M1/UART4_TCTL_M0/I2C5_SDA_M3/UART2_RX_M0/PCIE30X1_1_WAKEN_M3/GPIO3_B7_d		P28	I/O	DOWN	UART2_RX_M0_DEBUG	RCIN_M0_DEBUG	1.8V
57	GMAC1_MCLKIN/I2S1_MCLK_M1/GPIO3_C0_d		T28	I/O	DOWN	GMA0I3_INTPMEB_1V8	GMA0I3_INTPMEB	1.8V
58	PDM0_CLK0_M1/PWM1_M0/I2C2_SDA_M3/CAN0_RX_M0/SPI0_MO50_M0/GPIO3_C1_d		T31	I/O	DOWN	GMAC1_INTPMEB_1V8	GMAC1_INTPMEB	1.8V
59	I2S1_SDI2_M2/PWM0_M0/I2C2_SDA_M0/I2S0_8CH_SDI0_M2/GPIO3_C2_d		V31	I/O	DOWN	I2C6_SDA_M0	I2C6_SDA_M0	1.8V
60	I2S1_SDI1_M2/PWM0_M0/I2C2_SCL_M0/UART1_CTSN_M0/PWM7_IR_M3/SPI3_MO_M0/GPIO3_B4_d		W31	I/O	DOWN	I2C6_SCL_M0	I2C6_SCL_M0	1.8V
61	GMAC0_MCLKIN/I2S2_MCLK_M1/UART2_CTSN/GPIO3_B4_d		A20	I/O	DOWN	GMAC1_TXD1	GMAC1_TXD1.core board series resistance 0R	3.3V
62	GMAC0_RXD3/I2S0_8CH_MCLK_M2/SPI1_CS1_M1/UART5_RX_M0/GPIO2_A6_d		AC32	I/O	UP	GMAC0_RXD2	GMAC0_RXD2	1.8V
63	GMAC0_RXD2/I2S0_8CH_SCLK_M2/SPI1_CS0_M1/UART5_TX_M0/GPIO2_A5_d		AC33	I/O	UP	GMAC0_RXD1	GMAC0_RXD1	1.8V
64	GMAC0_RXD1/I2C3_SCL_M1/UART1_CTSn_M0/SPI1_MI50_M0/GPIO2_A4_d		AD32	I/O	DOWN	GMAC0_RXD0	GMAC0_RXD0	1.8V
65	GMAC0_RXD0/I2C3_SDA_M1/UART1_RTSn_M0/SPI1_MO50_M0/GPIO2_A3_d		AD33	I/O	DOWN	GMAC1_TXD0	GMAC1_TXD0.core board series resistance 0R	3.3V
66	GMAC0_RXCLK/I2S0_D2_M2/SPI1_CS0_M2/UART5_CTSN_M0/GPIO2_A2_d		AE32	I/O	UP	GMAC0_RXCLK	GMAC0_RXCLK	1.8V
67	GMAC0_RXDV/I2S0_D1_M2/SPI1_MI_M2/UART5_RTSN_M0/GPIO2_A1_d		AE33	I/O	UP	GMAC0_RXDV	GMAC0_RXDV_CRS	1.8V
68	GMAC1_MCLKIN/I2S0_D3_M2/SPI1_MO_M2/UART1_CTSN_M1/PWM15_IR_M2/GPIO3_B3_d		AF34	I/O	DOWN	GMAC1_MCLKOUT	GMAC1_MCLKOUT.core board series resistance 0R	3.3V
69	GMAC1_MDC/MDIO_TE/I2C3_SDA_M4/UART1_RTSn_M1/PCIE30X1_1_WAKEN_M0/GPIO4_B6_d		Y30	I/O	DOWN	GMAC1_MDIO	GMAC1_MDIO	3.3V
70	GMAC1_MDC/MDIO_TE/I2C3_SCL_M4/UART1_RTSn_M1/PWM14_IR_M3/GPIO4_B5_d		Y31	I/O	DOWN	GMAC1_MDC	GMAC1_MDC	3.3V
71	GMAC1_PPS_REF_CLK/HDMI_TX1_HPD_M1/I2C3_SCL_M3/UART3_RTS_M2/PCIE30X1_0_WAKEN_M2/GPIO4_A6_d		AA28	I/O	DOWN	GMAC1_RSTN_L	GMAC1_RESET. Active L	3.3V
72	GMAC1_PPS_REF_CLK/HDMI_TX1_CEC_M1/I2C3_SDA_M3/UART3_CTS_M2/PCIE30X1_0_PERSTN_M2/GPIO4_A5_d		AA29	I/O	DOWN	GMAC1_RSTN_L	MIPI TE_RESET GMAC1_MCLK INPUT/OUTPUT core board series resistance 0R	3.3V
73	GMAC1_MCLKIN/OUT/I2S2_LRCK_M1/CAN1_TX_M2/UART3_RX_M1/PWM8_IR_M0/GPIO4_A7_d		AA30	I/O	UP	GMAC1_TXD3	GMAC1_TXD3_M1. core board series resistance 0R	3.3V
74	GMAC1_TXD3/I2S0_D0_M1/I2S3_SCLK/AUDIOPWM_LINKFS/I2S1_D1_M2/CAN1_RX_M2/UART3_TX_M1/SPI3_MO_M1/GPIO4_A4_d		AA31	I/O	UP	GMAC1_TXD2	GMAC1_TXD2.core board series resistance 0R	3.3V
75	GMAC1_TXD2/I2S0_D0_M1/I2S3_SDO/AUDIOPWM_LRFSPDIF_D2/I2S1_D0_M2/UART3_RX_M1/SPI3_MI_M1/GPIO4_A3_d		AA29	I/O	UP	GMAC1_TXD2	GMAC1_TXD2.core board series resistance 0R	3.3V
76	GMAC1_TXD1/I2S0_D1_M1/I2S3_SDI/AUDIOPWM_PINTSPDIF_D1/I2S1_MCLK_M2/UART3_TX_M1/SPI3_CS0_M1/GPIO4_A2_d		AD29	I/O	UP	GMAC1_TXEN	GMAC1_TXEN.core board series resistance 0R	3.3V
77	GMAC1_TXD0/I2S0_D2_M1/I2S3_MCLK_M1/UART3_CTSN/GPIO4_A1_d		AC30	I/O	UP	GMAC1_TXD1	GMAC1_TXD1.core board series resistance 0R	3.3V
78	GMAC1_TXCLK/I2S0_D3_M1/I2S3_LRCK/AUDIOPWM_RPUARTR_RTSN_M1/GPIO4_A0_d		AD28	I/O	DOWN	GMAC1_TXCLK	GMAC1_TXCLK.core board series resistance 0R	3.3V
79	GMAC1_RXD3/I2S0_8CH_SCLK_M1/SPI4_MO_M1/UART7_TX_M2/GPIO2_C6_d		AD29	I/O	UP	GMAC1_RXD3	GMAC1_RXD3	3.3V
80	GMAC1_RXD2/I2S0_8CH_SDO3_M1/SPI4_MI_M1/UART7_RX_M2/GPIO2_C5_d		AC29	I/O	UP	GMAC1_RXD2	GMAC1_RXD2.core board series resistance 0R	3.3V
81	GMAC1_RXD1/I2S0_8CH_SDO2_M1/SPI4_CS0_M1/UART6_TX_M2/GPIO2_C4_d		AD30	I/O	DOWN	GMAC1_RXD1	GMAC1_RXD1.core board series resistance 0R	3.3V
82	GMAC1_RXD0/I2S0_8CH_SDI2_M1/SPI4_CS1_M1/UART6_RX_M2/GPIO2_C3_d		AD31	I/O	DOWN	GMAC1_RXD0	GMAC1_RXD0.core board series resistance 0R	3.3V
83	GMAC1_RXCLK/I2S0_D0_M2/SPI4_CLK_M1/UART6_CTSN_M2/GPIO2_C2_d		AE31	I/O	UP	GMAC1_RXCLK	GMAC1_RXCLK	3.3V
84	GMAC1_RXDV_CRS/MIPI_CAM4/RK_CLK_M1/UART3_TX_M2/PWM2_M1/SPI3_CS0_M1/GPIO3_B1_d		AH29	I/O	DOWN	GMAC1_RXDV_CRS	GMAC1_RXDV_CRS	3.3V
85	GMAC1_RXER/I2S0_D1_M2/SPI4_CS1_M2/UART6_CTSN_M1/GPIO2_C1_d		AD27	I/O	UP	GMAC1_RXD2	GMAC1_RXD2	3.3V
86	GMAC1_RXER/I2S0_D3_M1/I2S3_SDI/AUDIOPWM_PINTSPDIF_D3/I2S1_MCLK_M1/SPI4_CS0_M2/GPIO3_A5_d		AE27	I/O	UP	GMAC1_RXD3	GMAC1_RXD3	3.3V
87	GMAC1_MDIO_TE/I2C3_SDA_M2/UART1_CTSn_M2/SPI2_CS1_M2/GPIO3_A7_d		AH27	I/O	DOWN	GMAC1_MDIO_INT	GMAC1_MDIO_INT	3.3V
88	I2C_SCL_M0/PWM15_IR_M1/GPIO1_D7_d		AH28	I/O	DOWN	HDMI_TX_CN_H	HDMI_TX_CN_DRIVER_RST	3.3V
89	I2C_SDA_M0/PWM14_IR_M1/GPIO1_D6_d		AM29	I/O	DOWN	I2S1_LRCK_MX_BT	I2S1_LRCK_MX_BT	3.3V
90	I2S1_SCLK_M0/SPI2_CS0_M1/GPIO3_A0_d		AL30	I/O	DOWN	I2S1_SCLK_MX_BT	I2S1_SCLK_MX_BT	3.3V
91	I2S1_SDI0_M0/SPI2_CS1_M1/GPIO3_A1_d		AL29	I/O	DOWN	UART5_TX_M2	UART5_TX_M2	3.3V
92	I2S1_SDO0_M0/SPI2_MI_M1/GPIO3_A2_d		AM30	I/O	DOWN	UART5_RX_M2	UART5_RX_M2	3.3V
93	I2S1_SDO1_M0/SPI2_MO_M1/GPIO3_A3_d		AM27	I/O	DOWN	TYPEC0_SBU2_DC	TYPEC0_SBU2_DC	3.3V
94	I2S1_SDO2_M0/SPI2_CS0_M2/I2C1_SCL_M0/CAN2_TX_M0/UART2_CTSn_M1/GPIO3_A4_d		AL27	I/O	DOWN	TYPEC0_SBU1_DC	TYPEC0_SBU1_DC	3.3V
95	I2S1_SDO3_M0/SPI2_CS1_M2/I2C1_SDA_M0/CAN2_RX_M0/UART2_RTSn_M1/GPIO3_A6_d		AK27	I/O	DOWN	I2S1_SDI_MX_BT	I2S1_SDI_MX_BT	3.3V
96	I2C_SCL_M4/PWM13_IR_M3/GPIO4_B7_d		AL26	I/O	UP	PCIE30X4_CLKREQN_M1_L	PCIE30X4_CLKREQN_M1_L Core board Pull up resistance 2.2K	1.8V
97	I2C_SDA_M4/PWM12_IR_M3/GPIO4_C0_d		AM25	I/O	UP	PCIE30X4_PRSNT_L/GPIO4_B3	PCIE30X4_PRSNT_L/GPIO4_B3	3.3V
98	MIPI_CAM4_CLK_M0/SPI3_CS1_M1/I2C5_SDA_M2/UART1_CTSn_M3/PWM15_IR_M3/GPIO4_C1_d		AL24	I/O	UP	I2S1_SDO_MX_BT	I2S1_SDO_MX_BT	3.3V
99	I2C_SDA_M3/SPI3_CS0_M2/UART1_RTSn_M3/GPIO4_C2_d		AK25	I/O	UP	CAN1_RX_M3/GPIO4_B2	CAN1_RX_M3/GPIO4_B2	3.3V
100	BT1120_D1/SPI3_MO_M2/I2C4_SDA_M3/UART1_RTSn_M2/PWM11_IR_M3/GPIO4_C3_d		A23?	I/O	DOWN	PCIE30X4_PERSTN_M1_L	PCIE30X4_PERSTN_M1_L Core board Pull up resistance 2.2K	1.8V
101	CIF_D0/BT1120_D2/SPI3_MI_M2/I2C4_SCL_M3/UART1_CTSn_M2/PWM10_IR_M3/GPIO4_C4_d		A22	I/O	DOWN	CAN1_TX_M3/GPIO4_B1	CAN1_TX_M3/GPIO4_B1	3.3V
102	CIF_D1/PCIE30X4_CLKREQN_M0/HDMI_TX2_SCL_M2/I2C5_SCL_M5/UART9_RX_M2/GPIO4_C5_d		A21	I/O	DOWN	GMA0I3_RSTN_L_GPIO3_C7	GMA0I3_RSTN_L_GPIO3_C7	1.8V
103	CIF_D2/PCIE30X1_2_WAKEN_M0/HDMI_TX2_SDA_M2/I2C5_SDA_M5/UART9_TX_M2/GPIO4_C6_d		AH24	I/O	UP	HDMI1_TX_CN_H	HDMI1_TX_CN_H	1.8V
104	SARADC_IN5		AL17			SARADC_IN5	SARADC_IN5	1.8V
105	SARADC_IN4		AL16			SARADC_IN4	SARADC_IN4	1.8V
106	SARADC_IN1		AM17			SARADC_VP_HOOK	SARADC_VP_HOOK	1.8V
107	SARADC_IN2		AK16			SARADC_IN2	SARADC_IN2 BOOT_SARADC_IN2	1.8V
108	SARADC_IN0_BOOT		AM16			BOOT_SARADC_IN0	core board pull up resistance 100K BOOT MODE : FSPI SLAVE,M1-M-FSPI_M0 EMMC-SD Card,c200	1.8V
109	SARADC_IN1		AL15			SARADC_KEY_RECOVERY	SARADC_KEY_RECOVERY	1.8V
110	TYPEC0_USB20_VBUSDET		AM14	I		TYPEC0_USB20_VBUSDET	TYPEC0_USB20_VBUSDET	3.3V
111	TYPEC0_USB20_OTG_ID		AL14	I		TYPEC0_USB20_OTG_ID	TYPEC0_USB20_OTG_ID	3.3V
112	TYPEC0_USB20_OTG_ID		AK6	I		TYPEC0_USB20_OTG_ID	TYPEC0_USB20_OTG_ID	1.8V
113	TYPEC1_USB20_VBUSDET		AL6	I		TYPEC1_USB20_VBUSDET	TYPEC1_USB20_VBUSDET	3.3V
114	TYPEC0_SBU2/DP_ALTN		AM15			TYPEC0_SBU2	TYPEC0_SBU2	1.8V
115	TYPEC0_SBU1/DP_ALTP		AL5			TYPEC0_SBU1	TYPEC0_SBU1	1.8V
116	GND			G		GND	GND	GND
117	TYPEC1_USB20_OTG_DM		AM12			TYPEC0_OTG_DM	TYPEC0_OTG_DM	3.3V
118	TYPEC1_USB20_OTG_DP		AL12			TYPEC0_OTG_DP	TYPEC0_OTG_DP	3.3V
119	TYPEC1_SBU2/DP1_ALTN		AM10			DP1_ALTN	DP1_ALTN	1.8V
120	TYPEC1_SBU1/DP1_ALTP		AL10			DP1_ALTP	DP1_ALTP	1.8V
121	TYPEC1_USB20_OTG_DP		AK9			TYPEC1_OTG_DP	TYPEC1_OTG_DP	3.3V
122	TYPEC1_USB20_OTG_DM		AK8			TYPEC1_OTG_DM	TYPEC1_OTG_DM	3.3V
123	USB20_HOST1_DM		AM7			USB20_HOST1_DM	USB20_HOST1_DM	3.3V
124	USB20_HOST1_DP		AL7			USB20_HOST1_DP	USB20_HOST1_DP	3.3V
125	USB20_HOST0_DM		AM9			USB20_HOST0_DM	USB20_HOST0_DM	3.3V
126	USB20_HOST0_DP		AK9			USB20_HOST0_DP	USB20_HOST0_DP	3.3V
127	GND			G		GND	GND	GND
128	HDMI_RX_D2P		AJ5	I		HDMI_RX_D2P	HDMI_RX_D2P	3.3V
129	HDMI_RX_D2N		AJ4	I		HDMI_RX_D2N	HDMI_RX_D2N	3.3V
130	HDMI_RX_D1P		AH6	I		HDMI_RX_D1P	HDMI_RX_D1P	3.3V
131	HDMI_RX_D1N		AH5	I		HDMI_RX_D1N	HDMI_RX_D1N	3.3V
132	HDMI_RX_D0P		AG5	I		HDMI_RX_D0P	HDMI_RX_D0P	3.3V
133	HDMI_RX_D0N		AG4	I		HDMI_RX_D0N	HDMI_RX_D0N	3.3V
134	HDMI_RX_CLKP		AF5	I		HDMI_RX_CLKP	HDMI_RX_CLKP	3.3V
135	HDMI_RX_CLKN		AF4	I		HDMI_RX_CLKN	HDMI_RX_CLKN	3.3V
136	GND			G		GND	GND	GND
137	MIPI_CAM0_CLK_M2/PCIE30X2_CLKREQN_M3/HDMI_RX_SCL_M2/I2C6_SDA_M2/UART1_CTSn_M1/PWM15_IR_M3/GPIO1_D7_d		F25	I/O	UP	MIPI_CAM4_CLK_OUT	MIPI_CAM4_CLK_OUT	1.8V
138	MIPI_CAM0_CLK_M1/PCIE30X2_PERSTN_M3/HDMI_RX_CEC_M2/I2C6_SCL_M2/UART1_RTSn_M1/PWM14_IR_M3/GPIO1_D6_d		F31	I/O	UP	I2C5_SCL_M4/UART1_RX_M1	I2C5_SCL_M4/UART1_RX_M1	1.8V
139	MIPI_CAM0_CLK_M0/SPI3_CS1_M0/I2C5_SDA_M4/UART1_TX_M1/SPI4_MI_M0/GPIO1_D4_d		F24	I/O	UP	MIPI_CAM3_CLKOUT	MIPI_CAM3_CLKOUT	1.8V
140	MIPI_CAM3_CLK_M0/SPI3_CS1_M0/I2C5_SDA_M4/UART1_TX_M1/SPI4_MI_M0/GPIO1_D4_d		E26	I/O	UP	I2C5_SCL_M3/UART1_TX_M1	I2C5_SCL_M3/UART1_TX_M1 100KOMADMC_DET Input, Active L core board pull up resistance 100K	1.8V
141	SARADC_DETIGPIO40_ad_w		P31	I/O	UP	SDMMC_DET_L	HDMI_RX_SDA_M1	3.3V
142	GMA0I7_PPSCLK/PCIE30X2_BUTTON_RSTN/UART1_RX_M1/GPIO4_C7_d		V27	I/O	DOWN	TP0_RST_L	TP RESET.Active L	1.8V
143	GMA0I7_PPSCLK/GPIO4_D0_d		Y29	I/O	DOWN	TP0_INT_L	TP INT. Active L	1.8V
144	CIF_D10/PCIE30X2_WAKEN_M3/HDMI_RX_SDA_M2/I2C7_SDA_M4/UART1_RTSn_M3/PWM11_IR_M3/GPIO4_D1_d		AG24	I/O	DOWN	HDMI_RX_SDA_M1	HDMI_RX_SDA_M1	3.3V
145	CIF_D11/PCIE30X2_PERSTN_M3/HDMI_RX_SCL_M1/I2C7_SCL_M4/UART1_CTSn_M3/PWM10_IR_M3/GPIO4_D2_d		AG25	I/O	DOWN	HDMITX1_SCL_M1	HDMI_RX_SCL_M1	3.3V
146	CIF_D12/PCIE30X1_2_PERSTN_M0/HDMI_RX_CEC_M1/I2C1_SCL_M3/UART2_RTSn_M2/SPI3_CS1_M3/GPIO4_D3_d		AG23	I/O	DOWN	HDMI_RX_CEC	HDMI_RX_CEC	3.3V
147	CIF_D13/PCIE30X4_PERSTN_M0/HDMI_TX1_SCL_M1/I2C1_SDA_M3/UART2_CTSn_M2/SPI4_CS1_M3/GPIO4_D4_d		AG26	I/O	UP	HDMITX1_SCL_M1	HDMITX1_SCL_M1	3.3V
148	CIF_D14/PCIE30X1_2_CLKREQN_M1/HDMI_TX1_SDA_M1/I2C1_SDA_M4/UART2_RTSn_M2/SPI4_CS0_M3/GPIO4_D5_d		AH25	I/O	UP	HDMITX1_SDA_M1	HDMITX1_SDA_M1	3.3V
149	CIF_D15/PCIE30X1_2_WAKEN_M1/HDMI_TX1_CEC_M1/I2C1_SCL_M4/UART2_CTSn_M2/SPI4_CS0_M2/GPIO4_D6_d		AG27	I/O	DOWN	HDMITX1_CEC_M1	HDMITX1_CEC_M1	3.3V
150	BT1120_D7/SPI3_MO_M1/I2C4_SDA_M1/UART1_RTSn_M0/PWM9_IR_M3/GPIO4_D7_d		AH26	I/O	DOWN	HDMITX1_CEC_M0	HDMITX1_CEC_M0	3.3V
151	BT1120_D6/SPI3_MI_M1/I2C4_SCL_M1/UART1_CTSn_M0/PWM8_IR_M3/GPIO5_A0_d		AJ25	I/O	UP	HDMITX1_SDA_M0	HDMITX1_SDA_M0	3.3V
152	BT1120_D5/SPI3_CS0_M1/I2C3_SDA_M1/UART1_RTSn_M0/PWM7_IR_M3/GPIO5_A1_d		AJ28	I/O	UP	HDMITX1_SCL_M0	HDMITX1_SCL_M0	3.3V
153	GMA0I2_TXEN/I2S2_SDI_M1/UART3_RX_M0/PWM6_IR_M3/SPI3_CS1_M0/GPIO5_A2_d		AE28	I/O	DOWN	SPK_CTL_H	SPK_CTL.Active H	3.3V
154	GMA0I2_TXCLK/I2S2_SDO_M1/UART3_TX_M0/SPI3_MO_M0/GPIO5_A3_d		AC31	I/O	DOWN	LCDN_BL_EN	MIPI BL ENABLE	1.8V

Part B	PIN	CORE-3868J pin definition	RK3588 Pin NO.	Pad type	IO Pull	Function for Main BOARD/EMB-3M3-RK3588J	Default function description	IO Power domain
1	VCC4V0_SYS			P		VCC4V0_CORE	Input Voltage 4.0V	4.0V
2				P				4.0V
3				P				4.0V
4				P				4.0V
5	GND			G		GND	GND	GND
6				G				GND
7				G				GND
8	VCC_3V3_S3			P		VCC_3V3_S3	3.3V Output 2Pin2X3A Total Max 600mA	3.3V
9	VCC_1V8_S3			P		VCC_1V8_S3	1.8V Output 2Pin2X3A Total Max 400mA	1.8V
10	VCCA_3V3_S0			P		VCCA_3V3_S0	3.3V Output Max 300mA	3.3V
11	PWRON_L		AL16			PWRON_L	RK806-1 POWER EN, Active L	3.3V
12	VDC_EXT		AK16			VDC_EXT	RK806-1 VDD_NVCC Auto Power ON	3~5V
13	PMIC_EXT_EN_OUT					PMIC_EXT_EN_OUTPUT	PMIC EXT EN_OUTPUT, Active H	1.8V
14	VCC5V_PMIC			

Interface Description







About us

T-Chip Intelligent Technology (Zhongshan) Co., Ltd. , established in 2005, has more than ten years of technological product research and development capabilities, and has nearly 100 patents and software copyrights. As a national high-tech enterprise, we focus on the research and development, production and sales of open source smart hardware, Internet of Things, and digital audio products, while also provide overall solutions with smart hardware products.

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Firefly team has more than 70 R&D members, with excellent research and development capabilities of schematic design, PCB layout, board mass production, embedded development, system development, application development and so on. We accelerate the research and development process for many technology entrepreneurs and start-ups, and provide professional technical services.

Make technology simpler, Make life smarter - is the idea of Firefly team. We hope that through Firefly's open source products and technical services, the research and development of various technological products will become efficient and simple, and intelligent technology can be integrated into life.

Firefly is committed to providing enterprise customers with long-term stable and reliable industrial products and services, and continuously creating value for customers.

Business Communication

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Shopping Mall

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