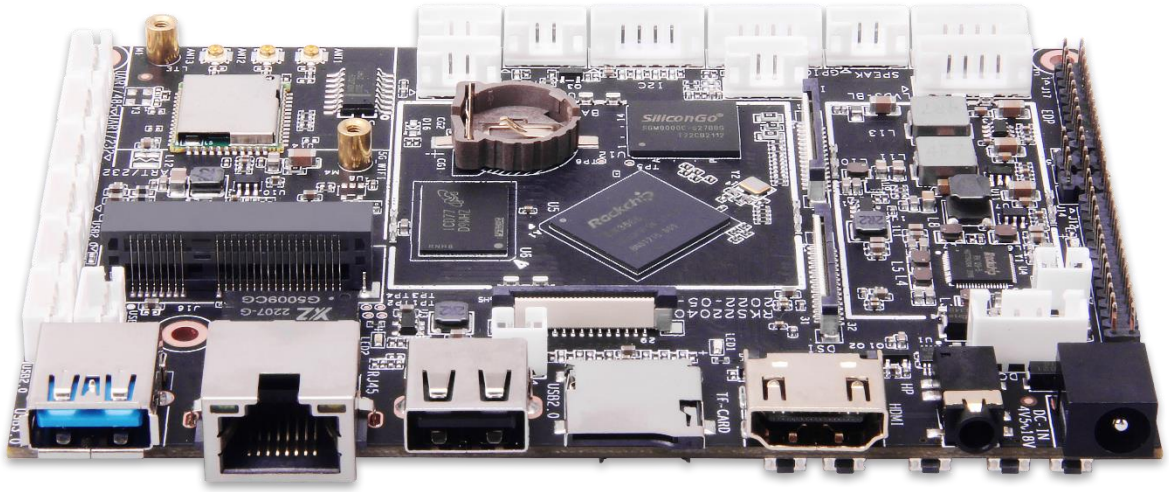
DS3566

硬件用户指南



技术支持:

Geniatech

目录

1 简介

DS3566 是一款具有以下新功能的 Android 定制板:

(I) 四核 ARM Cortex-A55 CPU，最高达@ 1.8GHz

(II) ARM Mali-G52 GPU，支持 OpenGL ES1.1/2.0/3.2、OpenCL2.0 和 Vulkan 1.1

(III) NPU: 神经网络加速引擎，处理性能高达 0.8 TOPS

(IV) 支持 Android 11.0 / Linux Debian

(V) 支持 2GB/4GB/8GB LPDDR4, 8~128GB eMMc, 外部拓展 TF/SATA3.0/USB 存储

(VI) 外设接口：USB2.0 * 1, USB3.0 * 1, RJ45 * 1, 耳机* 1, TF 卡槽 * 1, SIM 卡槽 * 1,

DC IN * 1

(VII) 显示接口：HDMI OUT * 1, LVDS * 1, eDP * 1

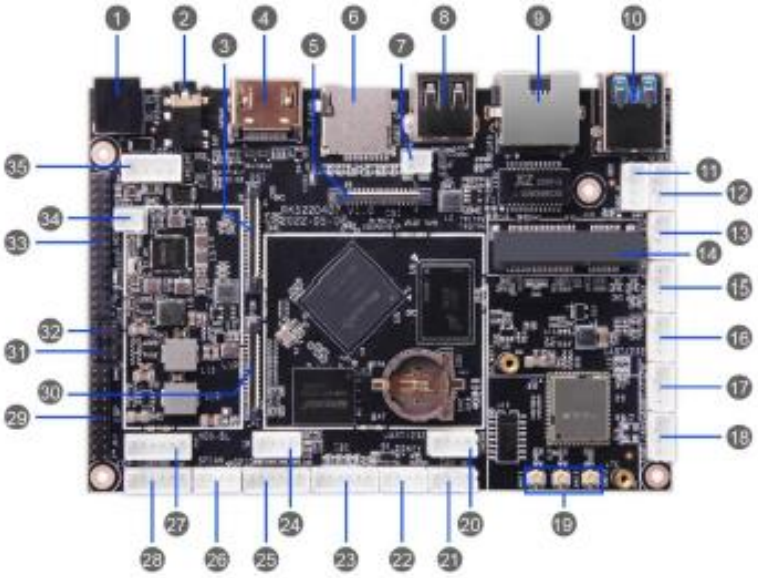
(VIII) 内置：MIPI CSI * 1, MIPI DSI * 1, Mini PCIe * 1, USB2.0 * 4, 扬声器 r * 1, MIC * 1, PDM * 1, I2C * 1, CAN * 1, UART * 4, GPIO * 8

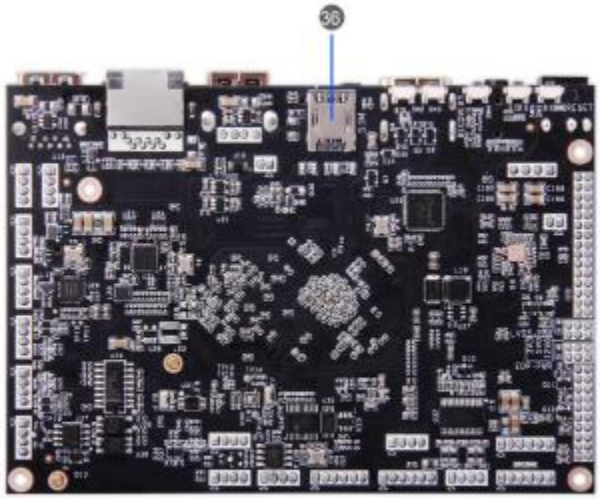
(IX) 网络： WIFI5(2.4G+5.8G), BT4.0, GIGA 以太网 * 1，支持硬件 WDT & RTC + 1*SATA3.0 + 1*Speaker (最大 2*5W8Ω)

(X) 支持宽电压 9~24V 电源输入, 标准 EMC 和 ESD 设计保护

(XI) 专为智能快递柜、智能商用展示、智能自动售货机、数字广告牌、智能家居等应用场景设计。

1.1 主板概览

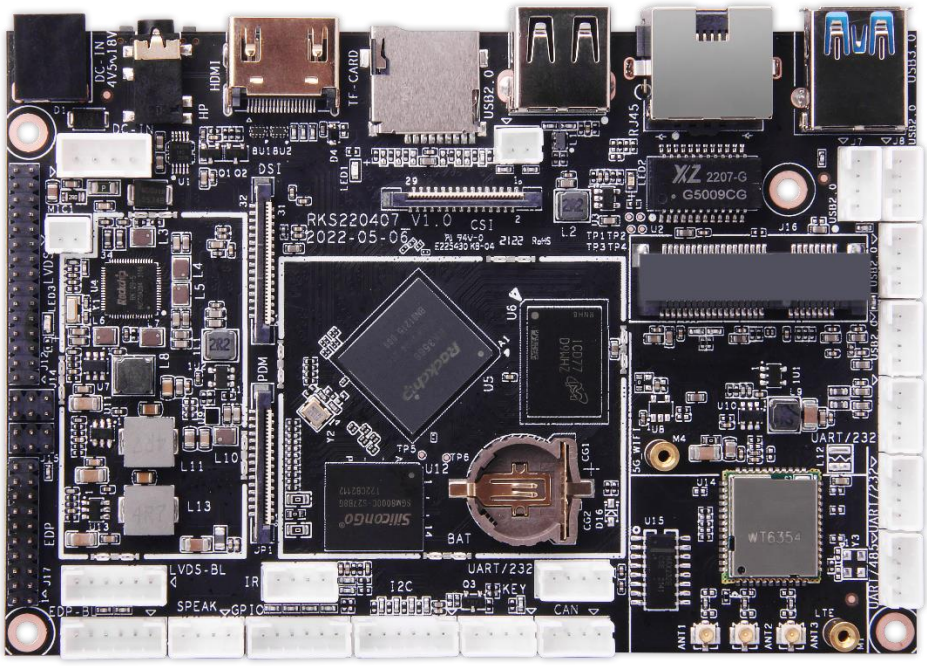


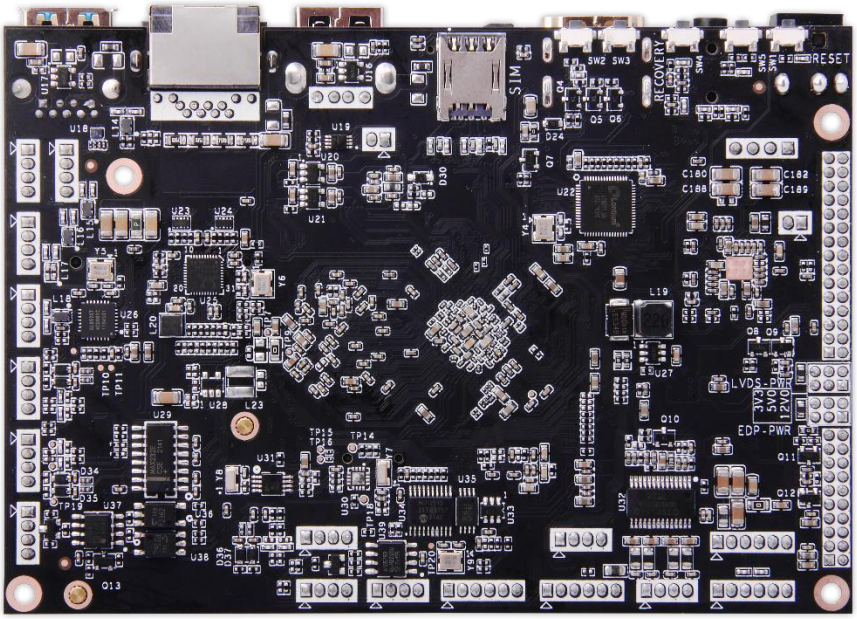


No.	Name	Description
1	DC IN	4.5V~18V input
2	3.5mm Slot	Headphone * 1
3	FPC Slot	MIPI DSI *1
4	HDMI OUT	*1
5	FPC Slot	MIPI CSI*1
6	TF Card Slot	*1
7	PH2.0 Slot	2 Pin, GPIO * 2
8	USB2.0 Slot	*1
9	RJ45	*1 (1000M Ethernet)
10	USB3.0 Slot	*1
11	PH2.0 Slot	4 Pin, USB2.0 *3
12	PH2.0 Slot	
13	PH2.0 Slot	
14	Mini PCIe	*1, for 4G LTE
15	PH2.0 Slot	4 Pin, USB2.0 * 1
16	PH2.0 Slot	4 Pin, UART/RS-232*1
17	PH2.0 Slot	4 Pin, UART/RS-232*1
18	PH2.0 Slot	4 Pin, UART/RS-485*1
19	IPEX	*3，WIFI&BT Antenna
20	PH2.0 Slot	4 Pin, UART/RS-232*1
21	PH2.0 Slot	4 Pin, CAN*1
22	PH2.0 Slot	4 Pin, External button board
23	PH2.0 Slot	4 Pin,I2C*1
24	PH2.0 Slot	4 Pin, External IR board
25	PH2.0 Slot	6 Pin, GPIO*6
26	PH2.0 Slot	4 Pin, Speaker*1(Max to 2*10W)
27	PH2.0 Slot	6 Pin, LVDS Panel backlight
28	PH2.0 Slot	6 Pin, eDP Panel backlight
29	eDP Panel Slot	*1
30	FPC Slot	PDM*1
31	eDP Panel voltage switch	3.3V/5V/12V
32	LVDS Panel voltage switch	3.3V/5V/12V
33	LVDS Panel Slot	*1
34	PH2.0 Slot	2 Pin, MIC IN * 1
35	PH2.0 Slot	4 Pin, DC IN*1(4.5V~18V input)
36	SIM Card Slot	*1

2 主板视图

实物图：


DC-IN
HDMI
TF-CARD
USB2.0
RJ45
USB3.0
DSI
RKS220407_V1.0
2022-05-06
CSI
PDM
LVDS
EDP
LVDS-BL
SPEAK
IR
GPIO
I2C
BAT
UART/232
KEY
CAN
5G WIFI
LTE


SIM
RECOVERY
RESET
LVDS-PWR
EDP-PWR

3 启动指引

3.1 准备条件

首次启动 DS3566 主板前，你需要准备一下工具：

- DS3566 主板
- Geniatech 单独销售的 DS3566 主板兼容电源。
- Geniatech 单独销售的 DS3566 主板兼容红外遥控器。
- 支持最大分辨率高达 2560x1600@60Hz 的 LVDS 或 eDP 液晶显示器。
- 将电路板连接到 LCD 的 LVDS-LVDS 电缆或 eDP-eDP 电缆。
- 带 USB 接口的计算机键盘/鼠标。

3.2 首次启动

要启动该板，请按照以下简单步骤操作：

步骤 1：将 LVDS/eDP 电缆连接到 DS3566 连接器（标记位）和液晶显示器。

步骤 2：将键盘连接到主板的 USB 连接器上，或者将鼠标连接到 USB 连接器上（以任意顺序连接即可，也可以通过外部 USB 集线器连接）。

步骤 3：将电源连接到标记位的电源连接器。

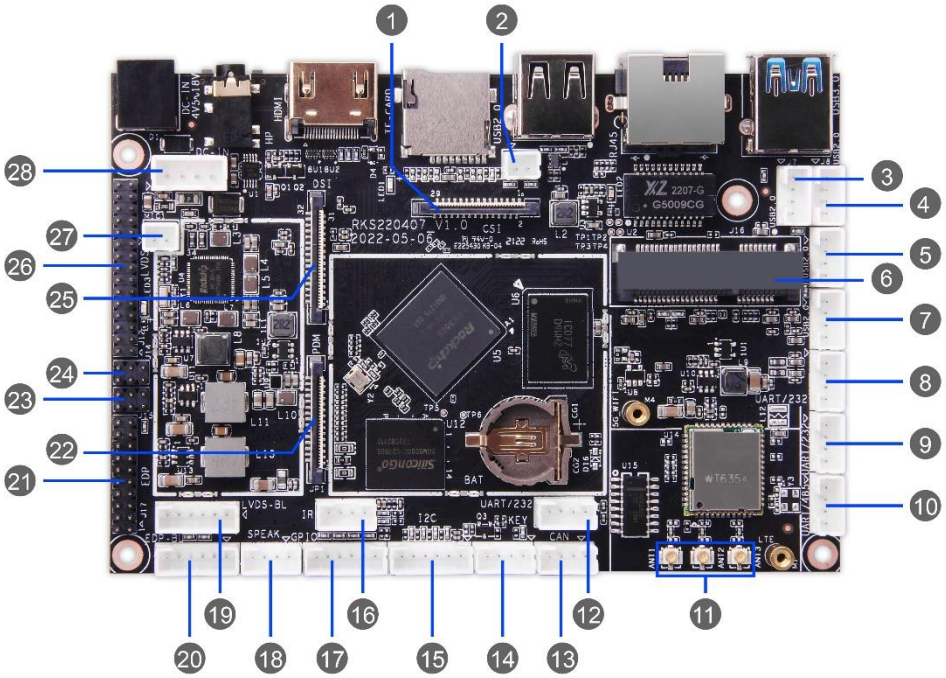
打开电源（插入电源适配器），切换电源开关，然后板子会启动，你会看到带有 Android 的启动标志。

请注意，由于 Android 的初始化，第一次启动需要几分钟。后续启动时间应该更快。

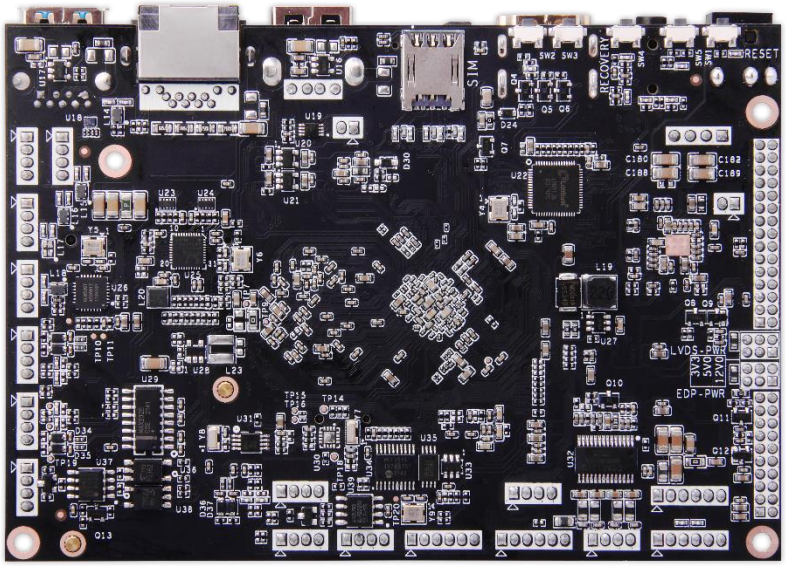
4. DS3566 概览

4.1 产品图

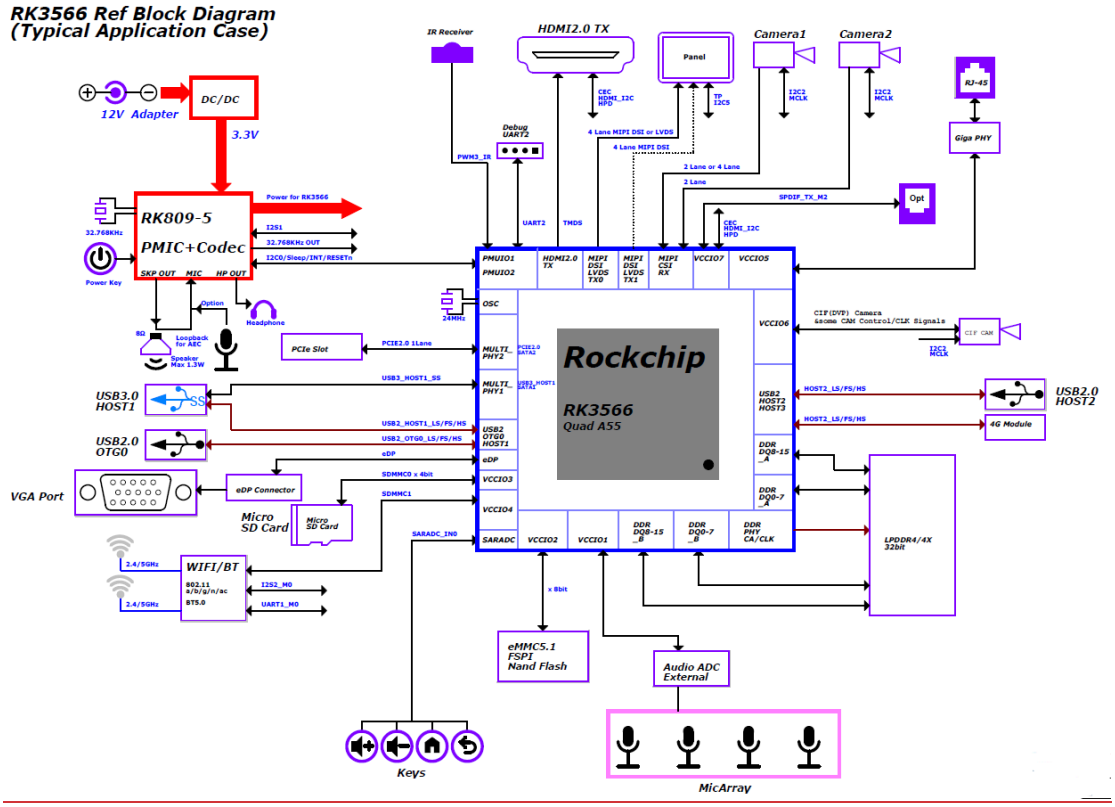
正面：



背面：



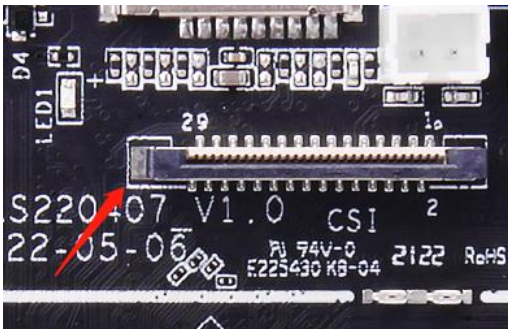
方框图:


RK3566 Ref Block Diagram
(Typical Application Case)
IR Receiver
HDMI2.0 TX
Panel
Camera1
Camera2
RJ-45
Giga PHY
DC/DC
12V Adapter
3.3V
RK809-5
PMIC+Codec
Power Key
Debug UART2
Opt
Option
Headphone
PCIe Slot
Rockchip
RK3566
Quad A55
USB3.0 HOST1
USB2.0 OTG0
USB2.0 HOST2
4G Module
VGA Port
eDP Connector
Micro SD Card
WIFI/BT
LPDDR4/4X 32bit
eMMC5.1 FSPI Nand Flash
Audio ADC External
Keys
MicArray

4.2 内部连接器、接头盒跳线

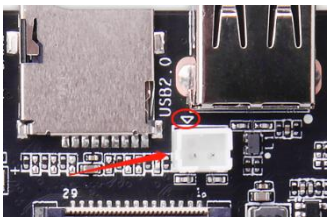
CSI(J9)

No.	功能	属性	描述
1	NC		
2	VCC2V8	Power	Output(2.8V)
3	VDD1V2	Power	Output(1.2V)
4	VCC1V8	Power	Output(1.8V)
5	NC		
6	GND	Ground	
7	VCC2V8	Power	Output(2.8V)
8	GND		
9	SDA	Input/Output	I2C Data Signal
10	SCL	Input/Output	I2C Clock Signal
11	RESET	Output	Reset Signal
12	PDN	Output	Power down control signal
13	GND	Ground	
14	MCLK	Output	Main Clock Signal
15	GND	Ground	
16	DP3	Input/Output	mipi data channel3 +
17	DN3	Input/Output	mipi data channel3 -
18	GND	Ground	
19	DP2	Input/Output	mipi data channel2 +
20	DN2	Input/Output	mipi data channel2 -
21	GND	Ground	
22	DP1	Input/Output	mipi data channel1 +
23	DN1	Input/Output	mipi data channel1 -
24	GND	Ground	
25	CLKP	Input/Output	mipi clock signal +
26	CLKN	Input/Output	mipi clock signal -
27	GND	Ground	
28	DP0	Input/Output	mipi data channel0 +
29	DN0	Input/Output	mipi data channel0 -
30	GND	Ground	



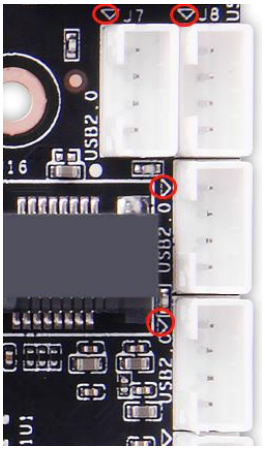
2J1

No.	功能	属性	描述
1	GPIO1	Input	Cashbox check
2	GPIO2	Output	Cashbox Control



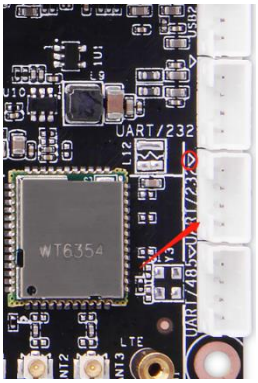
USB Slot (J7/J8/J11/J13)

No.	功能	属性	描述
1	VCC	POWER	Output 5V
2	DM	Input/Output	USB2.0 data -
3	DP	Input/Output	USB2.0 data +
4	GND	Ground	



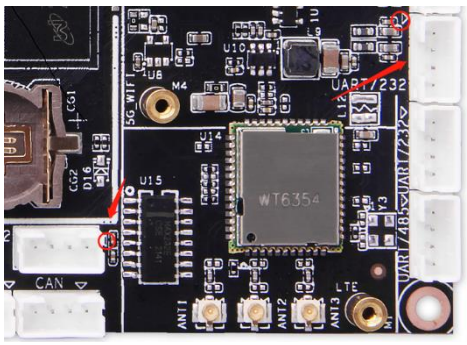
Debug(2J4)

No.	功能	属性	描述
1	VCC	POWER	Output 5V or 3.3V
2	TX	Output	UART TX
3	RX	Input	UART RX
4	GND	Ground	



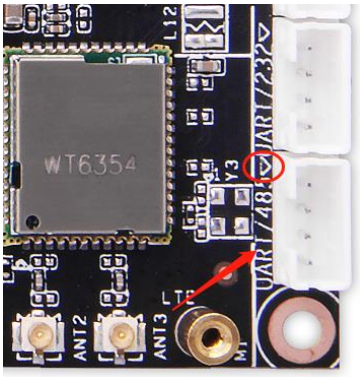
UART Or RS-232(2J3/2J6)

No.	功能	属性	描述
1	VCC	POWER	Output 5V or 3.3V
2	TX	Output	TX
3	RX	Input	RX
4	GND	Ground	



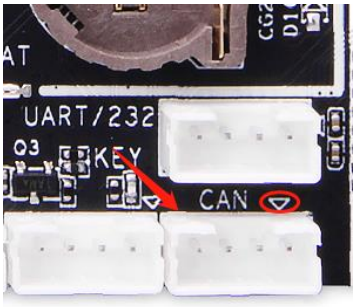
RS-485(2J5)

No.	功能	属性	描述
1	VCC	POWER	Output 5V or 3.3V
2	RS-485A	Input/Output	Data signal
3	RS-485B	Input/Output	Data signal
4	GND	Ground	



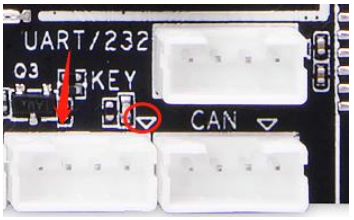
CAN Bus(2J8)

No.	功能	属性	描述
1	VCC	POWER	Output 5V or 3.3V
2	TX	Output	CAN TX
3	RX	Input	CAN RX
4	GND	Ground	



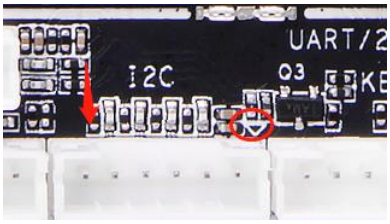
KeyPad(J22)

No.	功能	属性	描述
1	KEY_PWR	Input	Control the power
2	GND	Ground	
3	LED	Output	Control LED
4	GND	Ground	

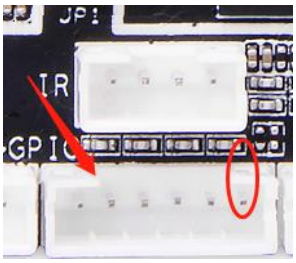


I2C for TP(J21)

No.	功能	属性	描述
1	VCC	Power	Output 3.3V
2	RESET	Input/Output	Reset
3	INT	Input/Output	Interrupt
4	SDA	Input/Output	I2C Data Signal
5	SCL	Input/Output	I2C Clock Signal
6	GND	Ground	

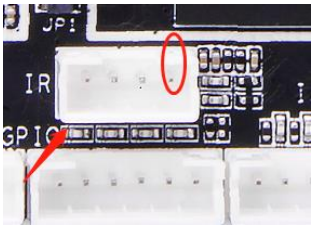


GPIO(J20)



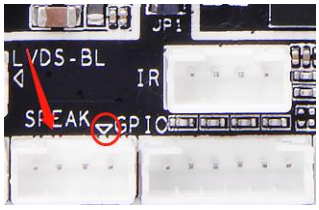
No.	功能	属性	描述
1	VCC	Power	Output 5V/3.3V
2	GPIO1	Input/Output	
3	GPIO2	Input/Output	
4	GPIO3	Input/Output	
5	GPIO4	Input/Output	
6	GND	Ground	

IR RX(2J7)



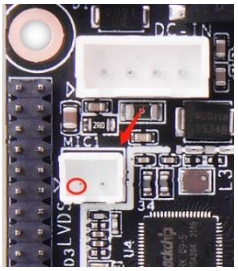
No.	功能	属性	描述
1	VCC	Power	Output 3.3V
2	IR-IN	Input	IR Receive
3	RST	Input/Output	Reset signal
4	GND	Ground	

SPEAKER(JSPK1)



No.	功能	属性	描述
1	AL+	Output	Audio left channel+
2	AL-	Output	Audio left channel-
3	AR-	Output	Audio right channel-
4	AR+	Output	Audio right channel+

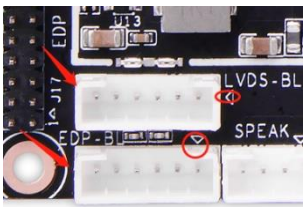
MIC(MIC1)



No.	功能	属性	描述
1	MIC_IN	Input	Microphone input
2	GND	Ground	

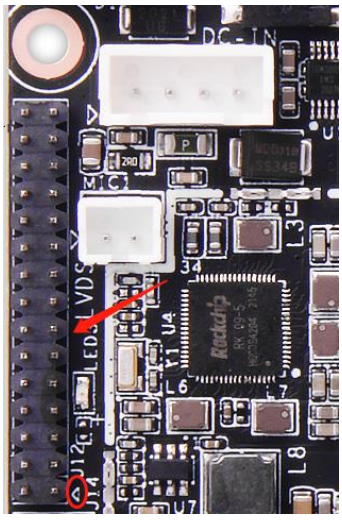
BACKLIGHT(J18/J19)

No.	功能	属性	描述
1	VCC	Power	Output 12V
2	VCC	Power	Output 12V
3	EN	Output	Back light Control ON/OFF
4	ADJ	Output	Back light adjust brightness
5	GND	Ground	
6	GND	Ground	



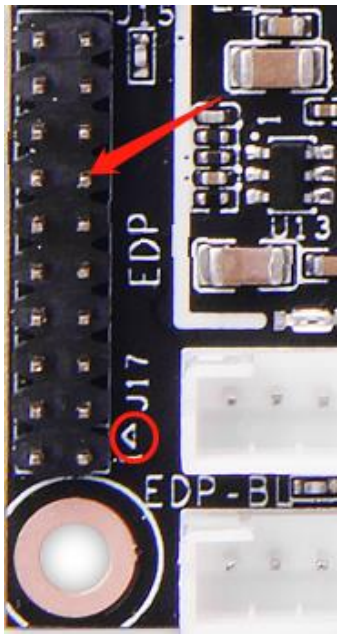
LVDS(J12)

No.	功能	属性	描述
1	VDD	POWER	Output 12V/5V/3.3V
2	VDD		
3	VDD		
4	GND	Ground	
5	GND		
6	GND		
7	LVDS0_DN0	Output	Channel 0 D0 data signal
8	LVDS0_DP0	Output	
9	LVDS0_DN1	Output	Channel 0 D1 data signal
10	LVDS0_DP1	Output	
11	LVDS0_DN2	Output	Channel 0 D2 data signal
12	LVDS0_DP2	Output	
13	GND	Ground	
14	GND	Ground	
15	LVDS0_CLKN	Output	Channel 0 Clock data signal
16	LVDS0_CLKP	Output	
17	LVDS0_DN3	Output	Channel 0 D3 data signal
18	LVDS0_DP3	Output	
19	LVDS1_DN0	Output	Channel 1 D0 data signal
20	LVDS1_DP0	Output	
21	LVDS1_DN1	Output	Channel 1 D1 data signal
22	LVDS1_DP1	Output	
23	LVDS1_DN2	Output	Channel 1 D2 data signal
24	LVDS1_DP2	Output	
25	GND	Ground	
26	GND	Ground	
27	LVDS1_CLKN	Output	Channel 1 Clock data signal
28	LVDS1_CLKP	Output	



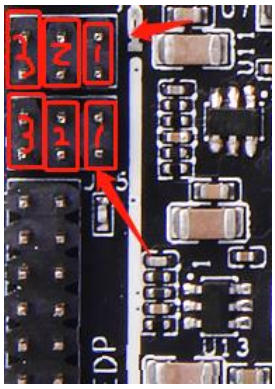
29	LVDS1_DN3	Output	Channel 1 D3 data signal
30	LVDS1_DP3	Output	

eDP(J17)



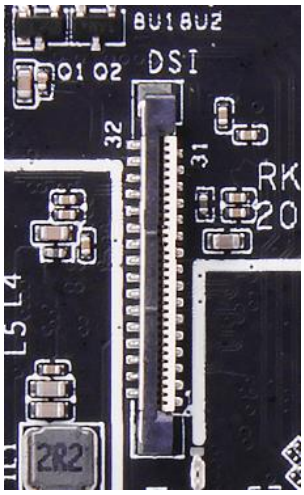
No.	功能	属性	描述
1	VDD	POWER	Output 12V/5V/3.3V
2	VDD		
3	GND	Ground	
4	GND		
5	DO-	Output	Lane0 data signal
6	DO+	Output	
7	D1-	Output	Lane1 data signal
8	D1+	Output	
9	D2-	Output	Lane2 data signal
10	D2+	Output	
11	D3-	Output	Lane3 data signal
12	D3+	Output	
13	GND	Ground	
14	GND	Ground	
15	AUX-	Output	AUX Channel signal
16	AUX+	Output	
17	GND	Ground	
18	GND	Ground	
19	HPD	Output	Hotplug
20	VCC	POWER	Output 3.3V

PANEL POWER()



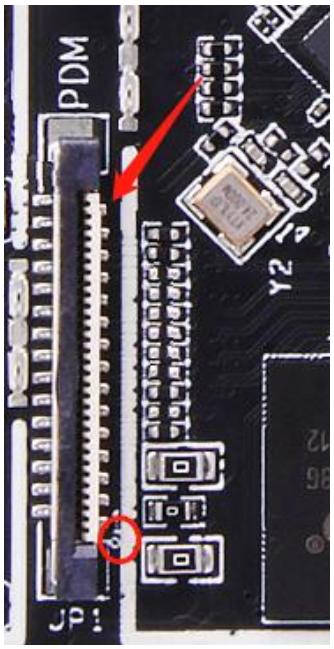
No.	功能	属性	描述
1	VCC1	POWER	Output 3.3V
2	VCC2	POWER	Output 5V
3	VCC3	POWER	Output 12V

MIPI DSI(J10)



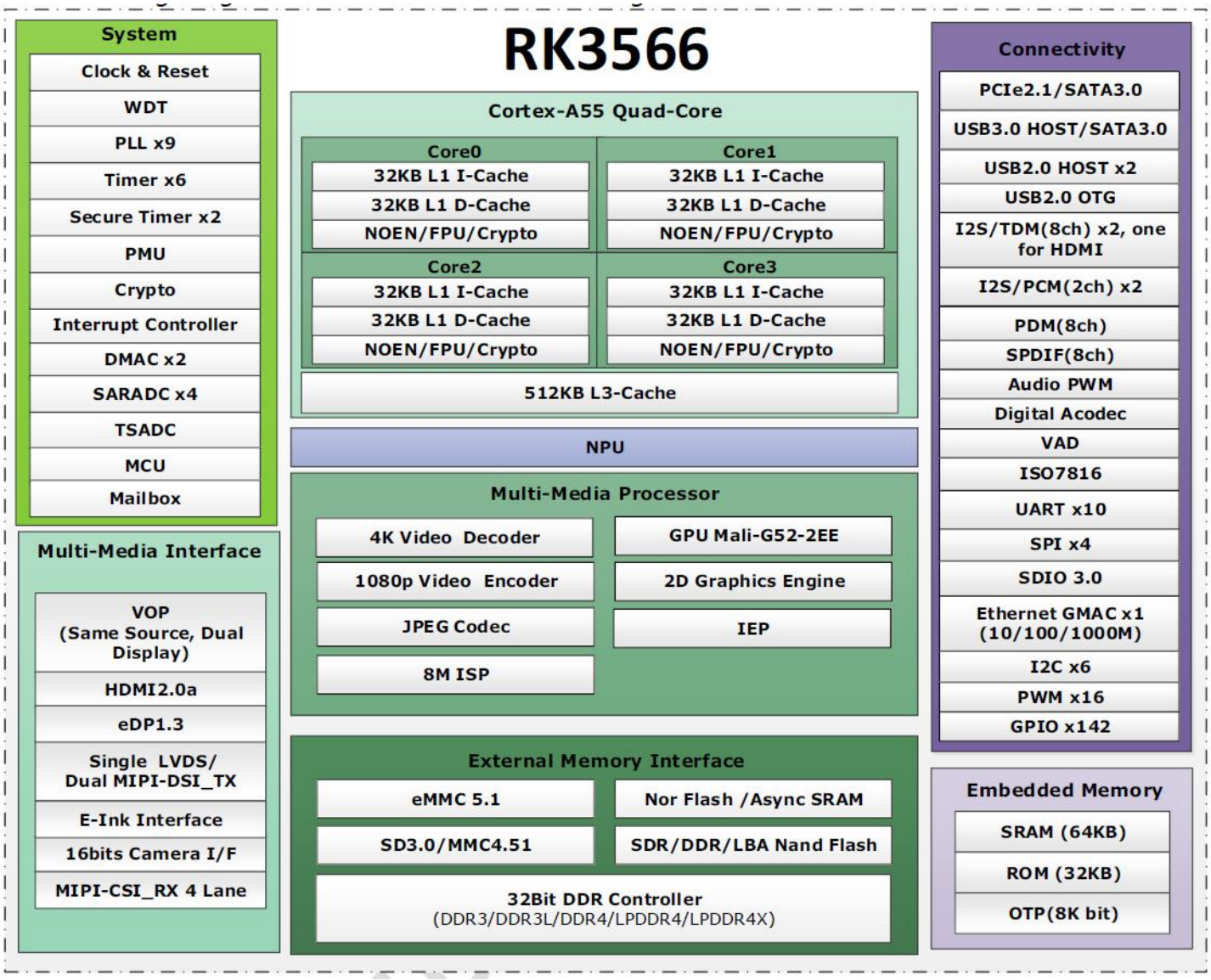
No.	功能	属性	描述
1	VDD+	POWER	Output +5V
2	VDD+	POWER	
3	VDD+	POWER	
4	NC		
5	VDD-	POWER	Output -5V
6	VDD-	POWER	
7	VDD-	POWER	
8	VDD-	POWER	
9	GND	Ground	
10	GND	Ground	
11	DP2	Output	MIPI Lane 2 Signal
12	DN2	Output	
13	GND	Ground	
14	DP1	Output	MIPI Lane 1 Signal
15	DN1	Output	
16	GND	Ground	
17	CLKP	Output	MIPI Clock Signal
18	CLKN	Output	
19	GND	Ground	
20	DP0	Output	MIPI Lane 0 Signal
21	DN0	Output	
22	GND	Ground	
23	DP3	Output	MIPI Lane 3 Signal
24	DN3	Output	
25	GND	Ground	
26	ID	Output	
27	RST	Output	Reset
28	NC		
29	VCC1	POWER	Output 1.8V
30	VCC2	POWER	Output 3.3V
31	VCC2	POWER	
32	NC		

PDM(JP1)


PDM
JP1

VCCIO_ACODEC
VCC5V0_SYS
VCC_3V3
JP1
VCC_5V_0
VCCIO
GND1
GND2
GND3
GND4
GND5
GND6
GND7
GND8
VCC_5V_1
GND0
VCC_3V3
Codec_EN/GPIO_A_d
I2S_MCLK
I2S_SCLK_RX/PDM_CLK1
I2S_SCLK_TX
I2S_LRCK_RX/PDM_CLK0
I2S_LRCK_TX
I2S_SDO0
I2S_SDO1
I2S_SDO2
I2S_SDO3
I2S_SDI0/PDM_SDI0
I2S_SDI1/PDM_SDI1
I2S_SDI2/PDM_SDI2
I2S_SDI3/PDM_SDI3
PA_EN/GPIO_B_d
I2C_SDA
I2C_SCL
M_GND1
M_GND2
1 Pin
Connector of
Audio Extended Board
(Mainboard Side)
DigitalAudio_FPC_CON
FPC30_P0R5_B_V
I2S1_SDO0_M0_CON
I2S1_SDO2_M0/I2S1_SDI2_M0/PDM_SDI2_M0_CON
I2S1_SDI0_M0/PDM_SDI0_M0_CON
I2S1_SDO2_M0/I2S1_SDI2_M0/PDM_SDI2_M0_CON
I2C2_SDA_M1
HP_DET_L_GPIO3_C2
I2S1_MCLK_M0_CON
I2S1_SCLK_RX_M0/PDM_CLK1_M0_CON
I2S1_SCLK_TX_M0_CON
I2S1_LRCK_RX_M0/PDM_CLK0_M0_CON
I2S1_LRCK_TX_M0_CON
I2S1_SDO1_M0/I2S1_SDI3_M0/PDM_SDI3_M0_CON
I2S1_SDO3_M0/I2S1_SDI1_M0/PDM_SDI1_M0_CON
I2S1_SDO3_M0/I2S1_SDI1_M0/PDM_SDI1_M0_CON
I2S1_SDO1_M0/I2S1_SDI3_M0/PDM_SDI3_M0_CON
PA_EN_H_GPIO3_C3
I2C2_SCL_M1

4.3 系统方框图


RK3566
System
Clock & Reset
WDT
PLL x9
Timer x6
Secure Timer x2
PMU
Crypto
Interrupt Controller
DMAC x2
SARADC x4
TSADC
MCU
Mailbox
Multi-Media Interface
VOP (Same Source, Dual Display)
HDMI2.0a
eDP1.3
Single LVDS/ Dual MIPI-DSI_TX
E-Ink Interface
16bits Camera I/F
MIPI-CSI_RX 4 Lane
Cortex-A55 Quad-Core
Core0
32KB L1 I-Cache
32KB L1 D-Cache
NOEN/FPU/Crypto
Core1
32KB L1 I-Cache
32KB L1 D-Cache
NOEN/FPU/Crypto
Core2
32KB L1 I-Cache
32KB L1 D-Cache
NOEN/FPU/Crypto
Core3
32KB L1 I-Cache
32KB L1 D-Cache
NOEN/FPU/Crypto
512KB L3-Cache
NPU
Multi-Media Processor
4K Video Decoder
GPU Mali-G52-2EE
1080p Video Encoder
2D Graphics Engine
JPEG Codec
IEP
8M ISP
External Memory Interface
eMMC 5.1
Nor Flash /Async SRAM
SD3.0/MMC4.51
SDR/DDR/LBA Nand Flash
32Bit DDR Controller
(DDR3/DDR3L/DDR4/LPDDR4/LPDDR4X)
Connectivity
PCIe2.1/SATA3.0
USB3.0 HOST/SATA3.0
USB2.0 HOST x2
USB2.0 OTG
I2S/TDM(8ch) x2, one for HDMI
I2S/PCM(2ch) x2
PDM(8ch)
SPDIF(8ch)
Audio PWM
Digital Acodec
VAD
ISO7816
UART x10
SPI x4
SDIO 3.0
Ethernet GMAC x1 (10/100/1000M)
I2C x6
PWM x16
GPIO x142
Embedded Memory
SRAM (64KB)
ROM (32KB)
OTP(8K bit)