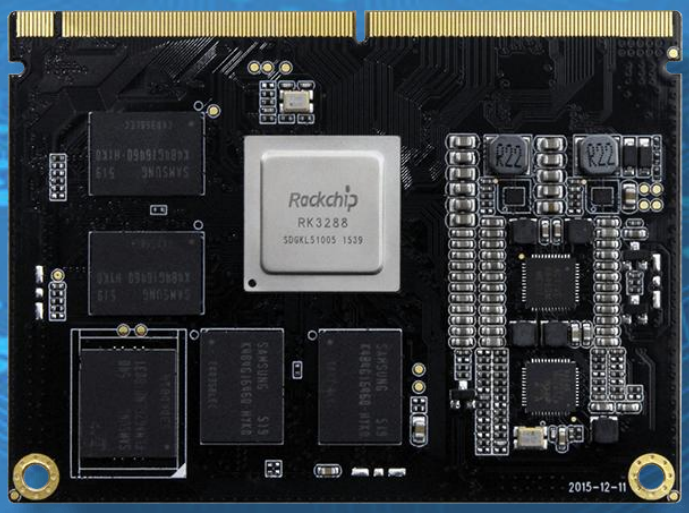
Core-3288J

四核高性能核心板

V1.3



天启智能科技有限公司

www.t-firefly.com

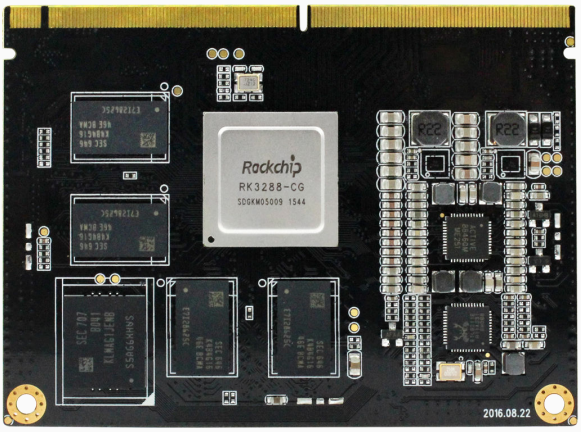
更 新 记 录

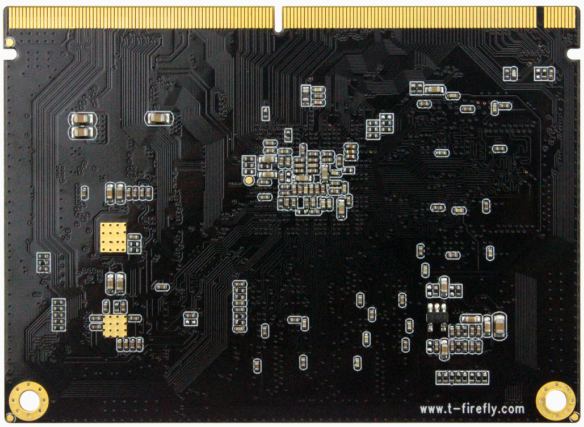
版 本	更新日期	更新内容
V1.0	2017-09-29	原始版本
V1.1	2018-06-08	精简了 V1.0 版本里的“参考设计”相关内容
V1.2	2019-03-25	更新管脚定义
V1.3	2020-09-22	更新接口定义

目　录

一、产品简介

核心板采用 RK3288 四核 Cortex-A17 处理器，主频高达 1.8GHz，核心板采用 6 层工艺板设计，尺寸仅有 82mm x 60mm，具有高性能、低成本、丰富的扩展接口、和体积小等优良特性。可以作为独立的模块嵌入到任何系统中。适合企业嵌入式产品开发，节省开发时间，降低产品开发风险，加快产品上市周期。





全新 Cortex-A17 架构四核处理器

拥有四个 ARM Cortex-A17 核心，最高频率可达 1.8GHz,Cortex-A17 性能相对 Cortex-A9 有 60%提升。

Mali-T760 MP4 图形处理

支持 OpenGL ES1.1/2.0/3.0，OpenVG1.1，OpenCL，Directx11， 并能实现 4Kx2K 的 H.264 和 10bits H.265 视频硬解码，相对 Mail-400 提升 500%。

尺寸小巧，布局紧凑美观

设计尺寸仅有 82mm x 60mm，可节约更多宝贵的空间。

沉金接口，稳固可靠

采用 MXM3.0-314P 接口，引出了芯片的全部，数据传输和扩展性能得到最好发挥，沉浸工艺引脚，耐腐蚀，4 螺柱固定，牢固可靠。

开放资料

配套的源代码、教程、技术资料和开发工具都可在官网下载，并提供开发底板选购，开发和学习变得更加简单方便。

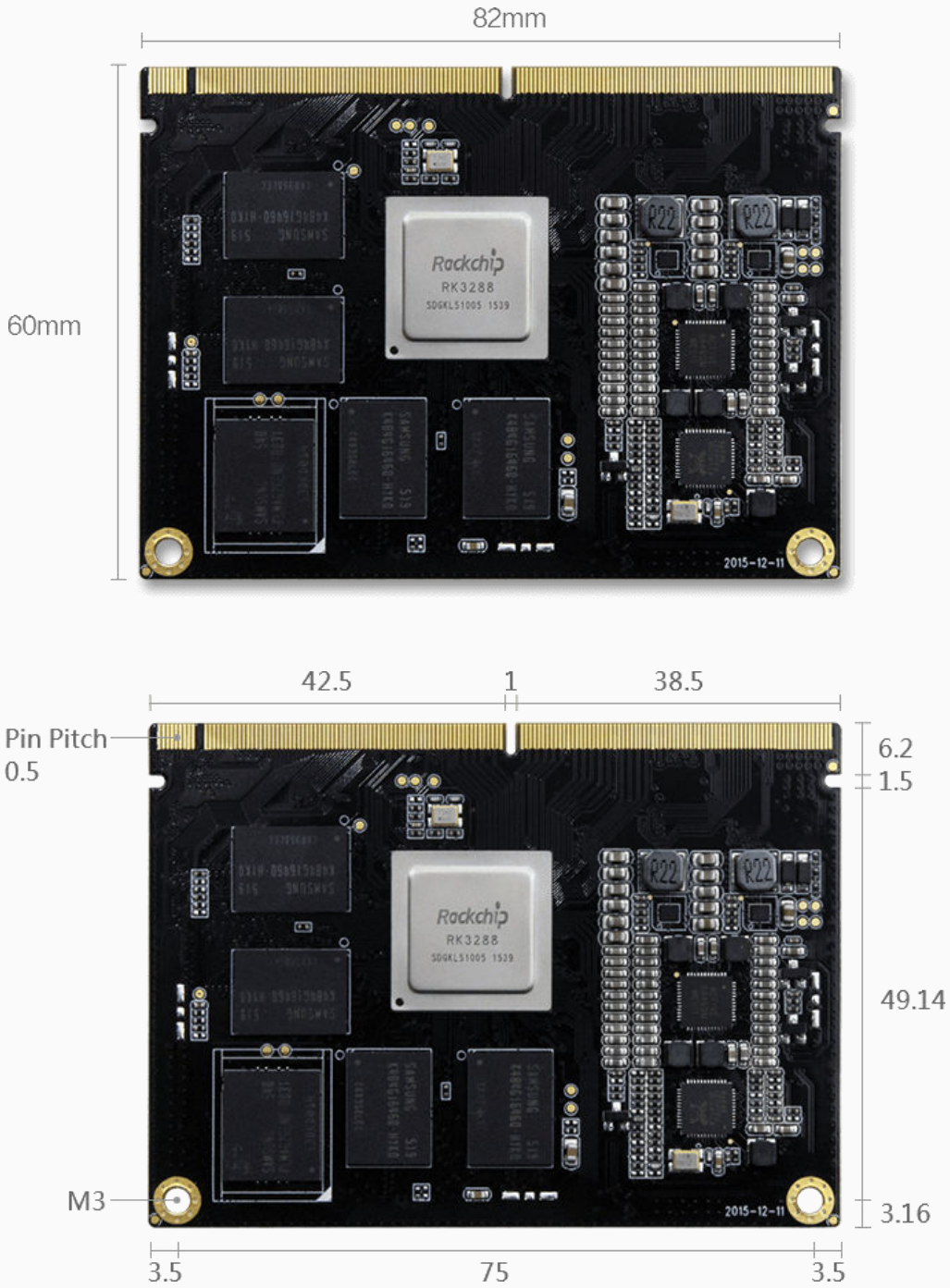
应用广泛

仅需扩展功能底板即可应用到各种行业的产品中：游艺/游戏设备、商显一体设备、医疗健康设备、自动售货机、智能 POS 机、互动打印机、智能机器人、工业电脑

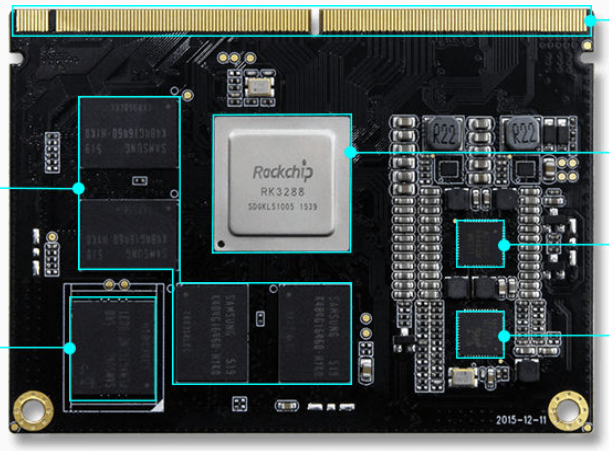
二、规格参数

基 本 参 数	
主控芯片	Rockchip RK3288 (28 纳米 HKMG 制程)
处理器	ARM® Cortex-A17 四核处理器，主频高达 1.8GHz
图形处理器	ARM® Mali-T760 MP4 四核 GPU，支持 AFBC（帧缓冲压缩） 支持 OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, DX11 内嵌高性能 2D 加速硬件
视频处理器	支持 4K 10bits VP9/H265/H264 视频解码，高达 60fps 1080P 多格式视频解码（VC-1, MPEG-1/2/4, VP8) 1080P 视频编码，支持 H.264，VP8 格式 视频后期处理器：反交错、去噪、边缘/细节/色彩优化
电源管理	ACT8846 PMU 电源管理单元
内存	双通道 64Bit DDR3-1333MHz （1GB/2GB/4GB 可选配)
存储器	高速 eMMC 5.1 （8GB/16GB/32GB/128GB 可选配)
系统支持	Android、Linux
硬 件 特 性	
以太网	集成 GMAC 以太网控制器 支持扩展 Realtek RTL8211E 实现 10/100/1000Mbps 以太网
WiFi	带 SDIO 接口，用于扩展 WiFi&蓝牙二合一模块 支持 2.4GHz / 5GHz 双频 WiFi，802.11a/b/g/n/ac 协议
显示	视频输出接口: - 1 x HDMI 2.0，支持 4K@60HZ 输出，支持 HDCP 1.4/2.2 显示屏接口（支持双屏同显、双屏异显）： - 1 x 双通道 MIPI-DSI - 1 x 双通道 LVDS or RGB - 1 x eDP
音频	1 x HDMI 音频输出 1 x SPDIF 数字音频接口，用于音频输出 1 x I2S 用于音频输入输出,（ 支持 8 通道 ）
摄像头	1 x MIPI-CSI 摄像头接口（ 内置硬件 ISP，最高支持 13Mpixel ） 1 x DVP 摄像头接口（最高支持 5Mpixel)
USB	1 x USB 2.0 ， 1 x USB 1.0 ， 1 x USB 2.0 OTG
红外	1 x 红外接收接口（占用 PWM0 引脚)
电源	DC 输入电压 5V
扩展接口	SDMMC、I2C、I2S、SPI、UART、ADC、PWM、GPIO
其他	4 x UART （UART2 默认用作 Debug Serial) 2 x SDIO （SDIO0 用于扩展 WiFi 模块) 1 x SDMMC（用于扩展 TF 卡) 4 x PWM （PWM0 用于红外接收，PWM2~3 与 UART2 复用) 5 x I2C、3 x I2S、2 x SPI、而 GPIO 高达 55 个
外 观 规 格	
核心板尺寸	82mm x 60mm
接口类型	MXM3.0 （314 Pin， 0.5mm 间距)
PCB 规格	板厚 1.2mm , 6 层板设计，沉金工艺
重量	21 克

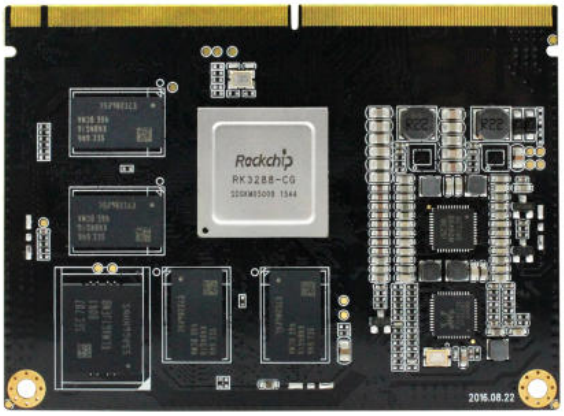
三、核心板尺寸


82mm
60mm
Rockchip
RK3288
2015-12-11
42.5
1
38.5
Pin Pitch
0.5
6.2
1.5
49.14
M3
3.16
3.5
75
3.5

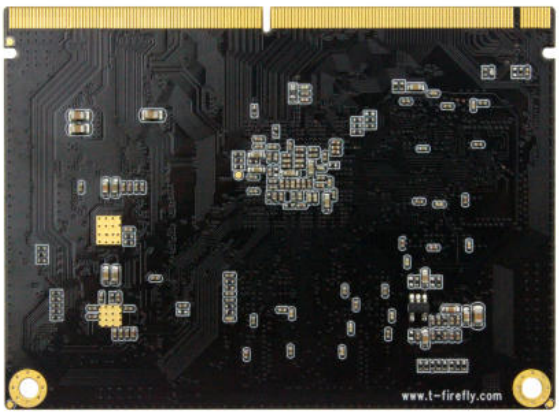
四、核心板接口描述



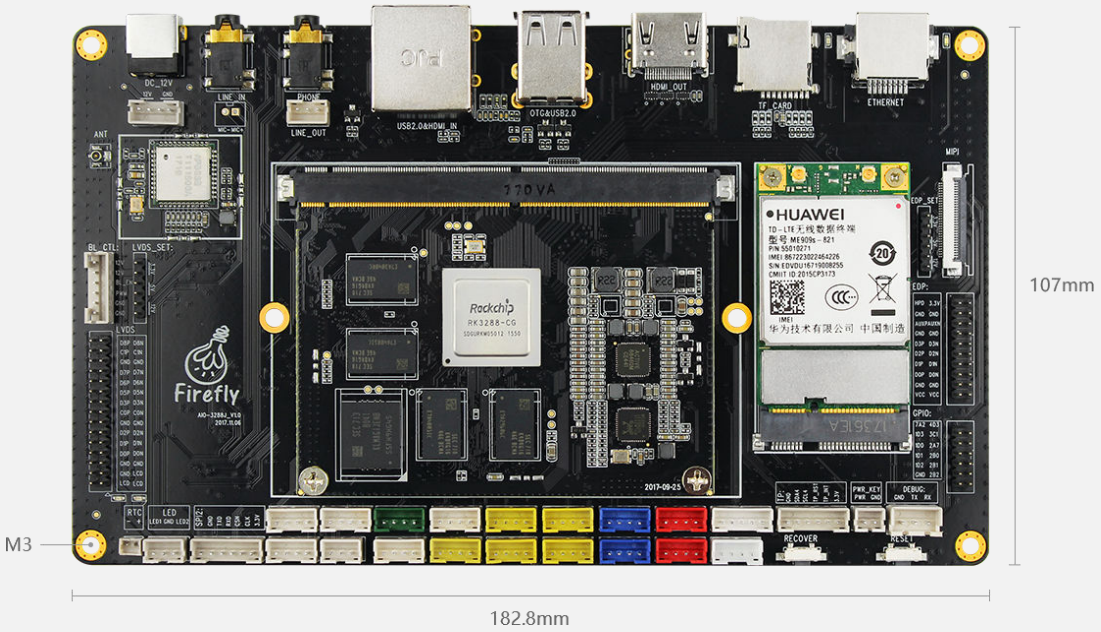
1、3、5、7、9、11 ..... 149、151、153、155、157



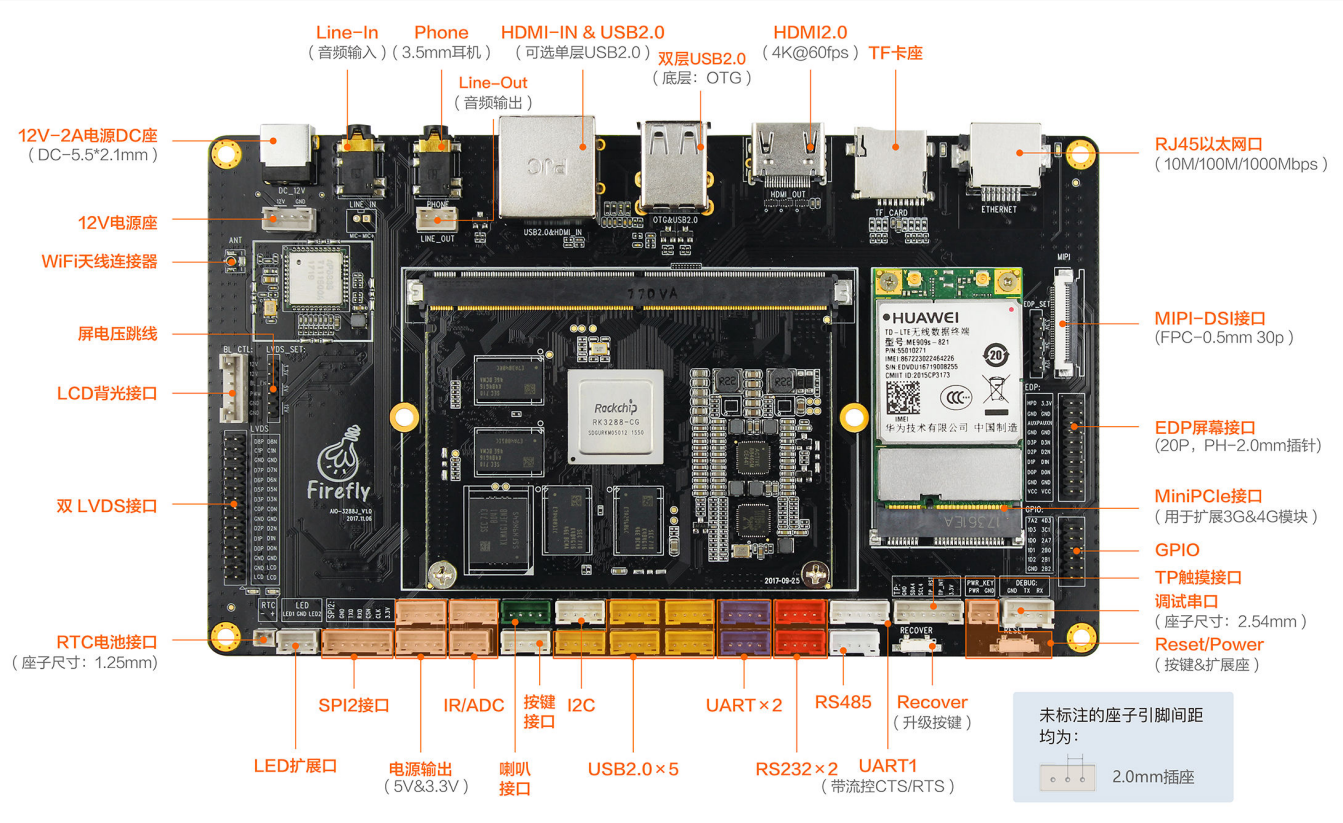
314、312、310、308 ..... 14、12、10、8、6、4、2

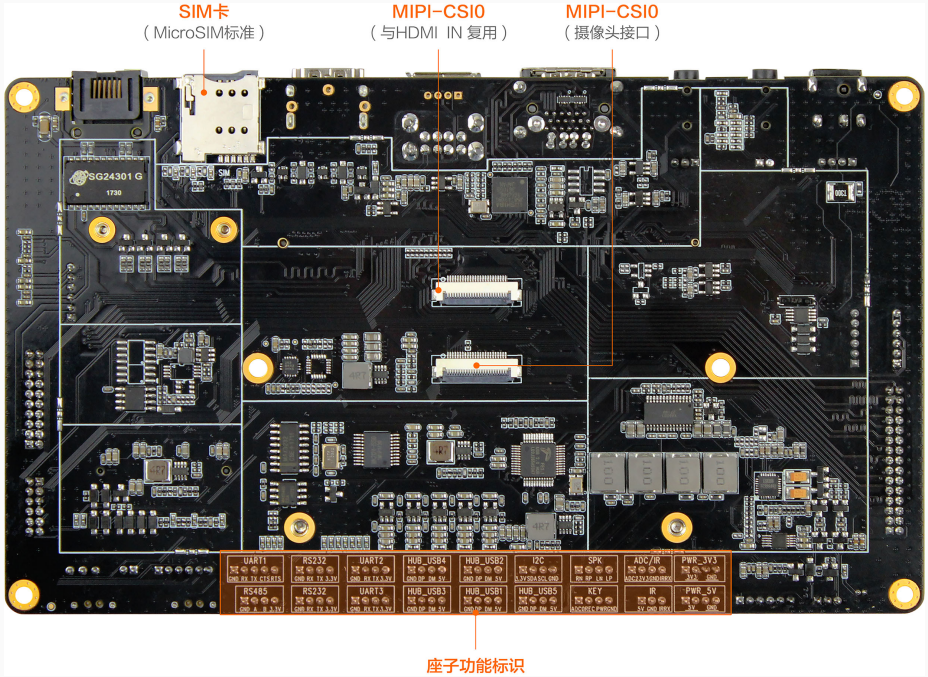


五、主板尺寸



六、主板接口描述


Line-In
（音频输入）
Phone
（3.5mm耳机）
HDMI-IN & USB2.0
（可选单层USB2.0）
双层USB2.0
（底层：OTG）
HDMI2.0
（4K@60fps）
TF卡座
Line-Out
（音频输出）
12V-2A电源DC座
（DC-5.5*2.1mm）
12V电源座
WiFi天线连接器
屏电压跳线
LCD背光接口
双 LVDS接口
RTC电池接口
（座子尺寸：1.25mm）
RJ45以太网口
（10M/100M/1000Mbps）
MIPI-DSI接口
(FPC-0.5mm 30p)
EDP屏幕接口
(20P，PH-2.0mm插针)
MiniPCIe接口
（用于扩展3G&4G模块）
GPIO
TP触摸接口
调试串口
（座子尺寸：2.54mm）
Reset/Power
（按键&扩展座）
SPI2接口
IR/ADC
按键接口
I2C
UART×2
RS485
Recover
（升级按键）
LED扩展口
电源输出
（5V&3.3V）
喇叭接口
USB2.0×5
RS232×2
UART1
（带流控CTS/RTS）
未标注的座子引脚间距均为：
2.0mm插座


SIM卡
（MicroSIM标准）
MIPI-CSI0
（与HDMI IN 复用）
MIPI-CSI0
（摄像头接口）
座子功能标识

七、接口定义

pin	Core board pin definition	Default function	Defualt function description	IO Power domain	Pad type IO Pull
1	GND#1	GND	GND	GND	
3	GND#2	GND	GND	GND	
5	GND#3	GND	GND	GND	
7	FLASH0_RDY/GPIO3_B0_U_1.8V	MIPI_RST	LCD panel reset output	1.8V	I/O UP
9	FLASH0_RDN/GPIO3_B2_U_1.8V	MIPI_PWR	MIPI power enable	1.8V	I/O UP
11	FLASH0_ALE/GPIO3_B3_D_1.8V	FLASH0_ALE	FLASH Address input enable	1.8V	I/O DOWN
13	FLASH0_CLE/GPIO3_B4_D_1.8V	FLASH0_CLE	FLASH Command word input enable	1.8V	I/O DOWN
15	SDIO0_WP/GPIO4_D3_D_1.8V	GPIO4_D3_D	GPIO	1.8V	I/O DOWN
17	VCC18_DVP	1.8V or 2.8V camera power supply	1.8V or 2.8V IN select (Default:1.8V)	1.8V_IN	
19	NC	NC	NC	NC	
21	NC	NC	NC	NC	
23	VCC28_DVP	2.8V camera power supply	2.8V_IN	2.8V_IN	
25	I2C3_SCL/GPIO2_C0_U_2.8V	I2C3_SCL	I2C serial port 3, for camera	1.8V	I/O UP
27	I2C3_SDA/GPIO2_C1_U_2.8V	I2C3_SDA	I2C serial port 3, for camera	1.8V	I/O UP
29	CIF_D10/GPIO2_B6_D_2.8V	CIF_PDN0	Camera Power off terminal	1.8V	I/O DOWN
31	CIF_D11/GPIO2_B7_D_2.8V	LINEIN_DET	LINE_IN detect input	1.8V	I/O DOWN
33	CIF_D2/HOST_D0/TS_D0/GPIO2_A0_D_2.8V	CIF_PDN1	Camera power down control output for rear	1.8V	I/O DOWN
35	CIF_D3/HOST_D1/TS_D1/GPIO2_A1_D_2.8V	CIF_D3	Camera0 interface input pixel data	1.8V	I/O DOWN
37	CIF_D4/HOST_D2/TS_D2/GPIO2_A2_D_2.8V	CIF_D4	Camera0 interface input pixel data	1.8V	I/O DOWN
39	CIF_D5/HOST_D3/TS_D3/GPIO2_A3_D_2.8V	CIF_D5	Camera0 interface input pixel data	1.8V	I/O DOWN
41	CIF_D6/HOST_CKINP/TS_D4/GPIO2_A4_D_2.8V	CIF_D6	Camera0 interface input pixel data	1.8V	I/O DOWN
43	CIF_D7/HOST_CKINN/TS_D5/GPIO2_A5_D_2.8V	CIF_D7	Camera0 interface input pixel data	1.8V	I/O DOWN
45	CIF_D8/HOST_D4/TS_D6/GPIO2_A6_D_2.8V	CIF_D8	Camera0 interface input pixel data	1.8V	I/O DOWN
47	CIF_D9/HOST_D5/TS_D7/GPIO2_A7_D_2.8V	GPIO2_A7_D	GIPO	1.8V	I/O DOWN
49	CIF_VSYNC/HOST_D6/TS_SYNC/GPIO2_B0_D_2.8V	GPIO2_B0_D	GIPO	1.8V	I/O DOWN
51	CIF_HREF/HOST_D7/TS_VALID/GPIO2_B1_D_2.8V	GPIO2_B1_D	GIPO	1.8V	I/O DOWN
53	CIF_CLKIN/HOST_WKACK/GPS_CLK/TS_CLKOUT/GPIO2_B2_D_2.8V	GPIO2_B2_D	GIPO	1.8V	I/O DOWN
55	CIF_CLKOUT/HOST_WKREQ/TS_FAIL/GPIO2_B3_D_2.8V	CIF_CLKOUT	Camera0 interface output work clock	1.8V	I/O DOWN
57	CIF_D0/GPIO2_B4_D_2.8V	CIF_D0	Camera0 interface input pixel data	1.8V	I/O DOWN
59	CIF_D1/GPIO2_B5_D_2.8V	CIF_D1	Camera0 interface input pixel data	1.8V	I/O DOWN
61	EFUSE_VQPS_3.3V	VCC_EFUSE	EFUSE_Power IN	3.3V	
63	GPIO7_A6_U_3.3V	SPK_CTL	Speaker control	3.3V	I/O UP
65	PWM0/GPIO7_A0_D_3.3V	IR_INT	IR receiver input	3.3V	I/O DOWN
67	PWM1/GPIO7_A1_D_3.3V	LCD_BL_PWM1	PWM1 output For LCD Backlight	3.3V	I/O DOWN
69	GPIO7_A2_D_3.3V	GPIO7_A2_D	GPIO	3.3V	I/O DOWN
71	GPIO7_A4_U_3.3V	RTC_INT	RTC interrupt input	3.3V	I/O UP
73	PS2_CLK/GPIO8_A0_U_3.3V	HDMIIN_HPDOUT	HDMI Hot Plug Detection interrupt with 5V tolerance	3.3V	I/O UP
75	GPIO7_A5_D_3.3V	HDMIIN_STBY	HDMI_IN IC Sleep mode	3.3V	I/O DOWN
77	UART3_RX/GPS_MAG/HSADC_D0_T1/GPIO7_A7_U_3.3V	UART3_RX	Uart3 serial port data input,	3.3V	I/O UP
79	UART3_TX/GPS_SIG/HSADC_D1_T1/GPIO7_B0_D_3.3V	UART3_TX	Uart3 serial port data input,	3.3V	I/O DOWN
81	UART3_CTSN/GPS_RFCLK/GPS_CLK_T1/GPIO7_B1_U_3.3V	TP_RST/GPIO7_B1_U	TP_Reset	3.3V	I/O UP
83	UART3_RTSN/GPIO7_B2_U_3.3V	CPU_DET	CPU detect to MCU	3.3V	I/O UP
85	EDP_HOTPLUG/GPIO7_B3_D_3.3V	SDMMC_PWR	SDMMC power enable	3.3V	I/O DOWN
87	ISP_SHUTTEREN/SPI1_CLK/GPIO7_B4_D_3.3V	CIF_PWR	Camera power enable0	3.3V	I/O DOWN
89	ISP_SHUTTERTRIG/SPI1_TXD/GPIO7_B7_D_3.3V	HP_DET	Headphone detect (Headphone plug in:H)	3.3V	I/O DOWN
91	ISP_FLASHTRIGIN/EDPHDMI_CEC_T1/GPIO7_C0_U_3.3V	HDMI_CEC	HDMI CEC communication	3.3V	I/O UP
93	ISP_FLASHTRIGOUT/SPI1_CSN0/GPIO7_B5_U_3.3V	LCD_RST/GPIO7_B5_U	LCD_Reset(MIPI)	3.3V	I/O UP
95	I2C4_SDA/GPIO7_C1_U_3.3V	I2C4_SDA	I2C serial port 4, for TP	3.3V	I/O UP
97	I2C4_SCL/GPIO7_C2_U_3.3V	I2C4_SCL	I2C serial port 4, for TP	3.3V	I/O UP
99	I2C5_SDA/EDPHDMI_I2C_SDA/GPIO7_C3_U_3.3V	I2C5_SDA_HDMI	I2C serial port 5, for HDMI	3.3V	I/O UP
101	I2C5_SCL/EDPHDMI_I2C_SCL/GPIO7_C4_U_3.3V	I2C5_SCL_HDMI	I2C serial port 5, for HDMI	3.3V	I/O UP
103	GPIO7_C5_D_3.3V	HDMI_IN_PWRON	HDMI_IN_IC POWER_EN	3.3V	I/O DOWN
105	UART2_RX/IR_RX/PWM2/GPIO7_C6_U_3.3V	UART2_RX	Uart2 serial port ,for AP debug	3.3V	I/O UP

107	UART2_TX/IR_TX/PWM3/EDPHDMI_CEC/GPIO7_C7_U_3.3V	UART2_TX	Uart2 serial port ,for AP debug	3.3V	I/O UP
109	GND#4	GND	GND	GND	
111	ADC_IN1/RECOVER_1.8V	RECOVER	ADC keyboard input, Core board interiorl pull up Resistor 10K	1.8V	
113	ADC_IN2_1.8V	ADC_IN2	ADC2 input,	1.8V	
115	ADC_IN0_1.8V	ADC_IN0	ADC0 input,	1.8V	
117	GND#5	GND	GND	GND	
119	SDMMC0_D0/JTAG_TMS/GPIO6_C0_U_3.3V	SDMMC_D0	SDMMC0 data port	3.3V	I/O UP
121	SDMMC0_D1/JTAG_TRSTN/GPIO6_C1_U_3.3V	SDMMC_D1	SDMMC0 data port	3.3V	I/O UP
123	SDMMC0_D2/JTAG_TDI/GPIO6_C2_U_3.3V	SDMMC_D2	SDMMC0 data port	3.3V	I/O UP
125	SDMMC0_D3/JTAG_TCK/GPIO6_C3_U_3.3V	SDMMC_D3	SDMMC0 data port	3.3V	I/O UP
127	SDMMC0_CLKOUT/JTAG_TDO/GPIO6_C4_D_3.3V	SDMMC_CLK	SDMMC0 clock output	3.3V	I/O DOWN
129	SDMMC0_CMD/GPIO6_C5_U_3.3V	SDMMC_CMD	SDMMC0 command output	3.3V	I/O UP
131	SDMMC0_DET/GPIO6_C6_U_3.3V	SDMMC_DET	SDMMC0 detect input	3.3V	I/O UP
133	GND#6	GND	GND	GND	
135	LCDC0_D12/LVDS_D5P/TRACE_D12_3.3V	LVDS_D5P	LVDS data lane5+	3.3V	
137	LCDC0_D13/LVDS_D5N/TRACE_D13_3.3V	LVDS_D5N	LVDS data lane5-	3.3V	
139	LCDC0_D15/LVDS_D6N/TRACE_D15_3.3V	LVDS_D6N	LVDS data lane6-	3.3V	
141	LCDC0_D14/LVDS_D6P/TRACE_D14_3.3V	LVDS_D6P	LVDS data lane6+	3.3V	
143	LCDC0_D22/LVDS_CLK1P_3.3V	LVDS_CLK1P	LVDS clock lane1+	3.3V	
145	LCDC0_D23/LVDS_CLK1N_3.3V	LVDS_CLK1N	LVDS clock lane1-	3.3V	
147	LCDC0_D17/LVDS_D7N/TRACE_CTL_3.3V	LVDS_D7N	LVDS data lane7-	3.3V	
149	LCDC0_D16/LVDS_D7P/TRACE_CLK_3.3V	LVDS_D7P	LVDS data lane7+	3.3V	
151	LCDC0_D21/LVDS_D9N_3.3V	LCD_D21	LCDC data output	3.3V	
153	LCDC0_D20/LVDS_D9P_3.3V	LCD_D20	LCDC data output	3.3V	
155	LCDC0_DCLK/GPIO1_D3_D_3.3V	GPIO1_D3_D	GPIO	3.3V	I/O DOWN
157	LCDC0_HSYNC/GPIO1_D0_D_3.3V	GPIO1_D0_D	GPIO	3.3V	I/O DOWN
159	LCDC0_VSYNC/GPIO1_D1_D_3.3V	GPIO1_D1_D	GPIO	3.3V	I/O DOWN
161	LCDC0_DEN/GPIO1_D2_D_3.3V	GPIO1_D2_D	GPIO	3.3V	I/O DOWN
163	GND#7	GND	GND	GND	
165	GND#8	GND	GND	GND	
167	MIPI_TX/RX_D3N_1.8V	MIPI_TX/RX_D3-	MIPI TXRX negative differential data line transceiver output	1.8V	
169	MIPI_TX/RX_D3P_1.8V	MIPI_TX/RX_D3+	MIPI TXRX positive differential data line transceiver output	1.8V	
171	MIPI_TX/RX_D2P_1.8V	MIPI_TX/RX_D2+	MIPI TXRX positive differential data line transceiver output	1.8V	
173	MIPI_TX/RX_D2N_1.8V	MIPI_TX/RX_D2-	MIPI TXRX negative differential data line transceiver output	1.8V	
175	MIPI_TX/RX_CLKP_1.8V	MIPI_TX/RX_CLK+	MIPI TXRX positive differential clock line transceiver output	1.8V	
177	MIPI_TX/RX_CLKN_1.8V	MIPI_TX/RX_CLK-	MIPI TXRX negative differential clock line transceiver output	1.8V	
179	MIPI_TX/RX_D1P_1.8V	MIPI_TX/RX_D1+	MIPI TXRX positive differential data line transceiver output	1.8V	
181	MIPI_TX/RX_D1N_1.8V	MIPI_TX/RX_D1-	MIPI TXRX negative differential data line transceiver output	1.8V	
183	MIPI_TX/RX_D0P_1.8V	MIPI_TX/RX_D0+	MIPI TXRX positive differential data line transceiver output	1.8V	
185	MIPI_TX/RX_D0N_1.8V	MIPI_TX/RX_D0-	MIPI TXRX negative differential data line transceiver output	1.8V	
187	GND#9	GND	GND	GND	
189	I2S_SCLK/GPIO6_A0_D_3.3V	I2S_SCLK	I2S serial clock	3.3V	I/O DOWN
191	I2S_LRCK_RX/GPIO6_A1_D_3.3V	I2S_LRCK_RX	I2S left & right channel signal for receiving serial data, synchronous left & right channel in I2S mode and the beginning of a group of left & right channels in PCM mode	3.3V	I/O DOWN
193	I2S_LRCK_TX/GPIO6_A2_D_3.3V	I2S_LRCK_TX	I2S left & right channel signal for transmitting serial data, synchronous left & right channel in I2S mode and the beginning of a group of left & right channels in PCM mode	3.3V	I/O DOWN
195	I2S_SDI/GPIO6_A3_D_3.3V	I2S_SDI	I2S serial data input	3.3V	I/O DOWN
197	I2S_SDO0/GPIO6_A4_D_3.3V	I2S_SDO0	I2S serial data0 ouput	3.3V	I/O DOWN
199	I2S_SDO1/GPIO6_A5_D_3.3V	I2S_SDO1	I2S serial data1 ouput	3.3V	I/O DOWN
201	I2S_SDO2/GPIO6_A6_D_3.3V	I2S_SDO2	I2S serial data2 ouput	3.3V	I/O DOWN

203	I2S_SDO3/GPIO6_A7_D_3.3V	I2S_SDO3	I2S serial data3 ouput	3.3V	I/O DOWN
205	I2S_CLK/GPIO6_B0_D_3.3V	I2S_MCLK	I2S MCLK, for both I2S0 and I2S1	3.3V	I/O DOWN
207	I2C2_SDA/GPIO6_B1_U_3.3V	I2C2_SDA_AUDIO	I2C serial port 2,for Audio,	3.3V	I/O UP
209	I2C2_SCL/GPIO6_B2_U_3.3V	I2C2_SCL_AUDIO	I2C serial port 2,for Audio,	3.3V	I/O UP
211	SPDIF_TX/GPIO6_B3_D_3.3V	AT18_RST	AT18 Reset	3.3V	I/O DOWN
213	GND#10	GND	GND	GND	
215	VCC_18#1_1.8V	1.8V Power supply(OUT)	Output Voltage 1.8V,Max output current 200mA	1.8V_OUT	
217	VCC_18#2_1.8V	1.8V Power supply(OUT)		1.8V_OUT	
219	VCC_18#3_1.8V	1.8V Power supply(OUT)		1.8V_OUT	
221	VCC_18#4_1.8V	1.8V Power supply(OUT)		1.8V_OUT	
223	VCC_IO#1_3.3V	3.3V Power supply(OUT)	Output Voltage 3.3V,Max output current 500mA	3.3V_OUT	
225	VCC_IO#2_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
227	VCC_IO#3_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
229	VCC_IO#4_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
231	VCC_IO#5_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
233	VCC_IO#6_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
235	VCC_IO#7_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
237	VCC_IO#8_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
239	GND#11	GND	GND	GND	
241	GND#12	GND	GND	GND	
243	GND#13	GND	GND	GND	
245	GND#14	GND	GND	GND	
247	GND#15	GND	GND	GND	
249	GND#16	GND	GND	GND	
251	VCCA_33#1_3.3V	3.3V Power supply(OUT)	Output Voltage 3.3V,Max output current 200mA	3.3V_OUT	
253	VCCA_33#2_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
255	VCC_LAN_3.3V	3.3V Power supply(OUT)		3.3V_OUT	
257	LED_AD1_3.3V	LED1_AD1	Ethernet LED	3.3V	
259	LED_AD0_3.3V	LED0_AD0	Ethernet LED	3.3V	
261	GND#17	GND	GND	GND	
263	MDI3-	MDI3-	In MDI mode, this is the fourth pair in 1000Base-T, i.e., the BI_DD+/- pair. In MDI crossover mode, this pair acts as the BI_DC+/- pair.		
265	MDI3+	MDI3+			
267	MDI2-	MDI2-	In MDI mode, this is the third pair in 1000Base-T, i.e., the BI_DC+/- pair. In MDI crossover mode, this pair acts as the BI_DD+/- pair.		
269	MDI2+	MDI2+			
271	MDI1-	MDI1-	In MDI mode, this is the second pair in 1000Base-T, i.e., the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX.		
273	MDI1+	MDI1+			
275	MDI0-	MDI0-	In MDI mode, this is the first pair in 1000Base-T, i.e., the BI_DA+/- pair, and is the transmit pair in 10Base-T and 100Base-TX. In MDI crossover mode, this pair acts as the BI_DB+/- pair, and is the receive pair in 10Base-T and 100Base-TX.		
277	MDI0+	MDI0+			
279	GND#18	GND	GND	GND	
281	GND#19	GND	GND	GND	
283	VCC_SYS#1	5V System power supply		5.0V_IN	
285	VCC_SYS#2	5V System power supply		5.0V_IN	
287	VCC_SYS#3	5V System power supply		5.0V_IN	
289	VCC_SYS#4	5V System power supply		5.0V_IN	
291	VCC_SYS#5	5V System power supply		5.0V_IN	
293	VCC_SYS#6	5V System power supply		5.0V_IN	
295	VCC_SYS#7	5V System power supply		5.0V_IN	
297	VCC_SYS#8	5V System power supply		5.0V_IN	

299	VCC_SYS#9	5V System power supply	Input Voltage 4.8V-5.5V	5.0V_IN	
301	VCC_SYS#10	5V System power supply		5.0V_IN	
303	VCC_SYS#11	5V System power supply		5.0V_IN	
305	VCC_SYS#12	5V System power supply		5.0V_IN	
307	VCC_SYS#13	5V System power supply		5.0V_IN	
309	VCC_SYS#14	5V System power supply		5.0V_IN	
311	VCC_SYS#15	5V System power supply		5.0V_IN	
313	VCC_SYS#16	5V System power supply		5.0V_IN	
314	VCC_SYS#17	5V System power supply		5.0V_IN	
2	GND#20	GND	GND	GND	
4	FLASH0_WRN/GPIO3_B5_U_1.8V	EFUSE_PWR_EN	EFUSE power enable	1.8V	I/O UP
6	FLASH0_CSN0/GPIO3_B6_U_1.8V	UART_PWR_EN	UART power enable	1.8V	I/O UP
8	FLASH0_CSN1/GPIO3_B7_U_1.8V	3G_PWR_EN	3G power enable	1.8V	I/O UP
10	FLASH0_CSN3/EMMC_RSTNOUT/GPIO3_C1_U_1.8V	GPIO3_C1_U	GPIO	1.8V	I/O UP
12	PMUGPIO0_A7_U_3.3V	WK2124_INT	WK2124 interrupt input	3.3V	I/O UP
14	PMUGPIO0_C2_U_3.3V	WK2124_RST	WK2124 Reset	3.3V	I/O UP
16	GND#21	GND	GND	GND	
18	RTC_CLKOUT	RTC_CLKOUT	RTC_Clock IN (32.768KHz to RK3288)	3.3V	
20	NC	NC	NC	NC	
22	NC	NC	NC	NC	
24	VCCIO_WL#1_1.8V	VCCIO_WL	1.8V_OUT to WIFI,Max output current 200mA	1.8V	
26	VCCIO_WL#2_1.8V	VCCIO_WL		1.8V	
28	UART0_RXD/GPIO4_C0_U_1.8V	UART0_RX	UART0 serial port, for BT module	1.8V	I/O UP
30	UART0_TXD/GPIO4_C1_U_1.8V	UART0_TX	UART0 serial port, for BT module	1.8V	I/O DOWN
32	UART0_CTSN/GPIO4_C2_U_1.8V	UART0_CTS	UART0 serial port, for BT module	1.8V	I/O UP
34	UART0_RTSN/GPIO4_C3_U_1.8V	UART0_RTS	UART0 serial port, for BT module	1.8V	I/O UP
36	GND#22	GND	GND	GND	
38	SDIO0_D0/GPIO4_C4_U_1.8V	SDIO0_D0	sdio0 data0 input and output	1.8V	I/O UP
40	SDIO0_D1/GPIO4_C5_U_1.8V	SDIO0_D1	sdio0 data1 input and output	1.8V	I/O UP
42	SDIO0_D2/GPIO4_C6_U_1.8V	SDIO0_D2	sdio0 data2 input and output	1.8V	I/O UP
44	SDIO0_D3/GPIO4_C7_U_1.8V	SDIO0_D3	sdio0 data3 input and output	1.8V	I/O UP
46	SDIO0_CMD/GPIO4_D0_U_1.8V	SDIO0_CMD	sdio0 command output and reponse input	1.8V	I/O UP
48	SDIO0_CLKOUT/GPIO4_D1_D_1.8V	SDIO0_CLK	sdio0 clock	1.8V	I/O DOWN
50	GND#23	GND	GND	GND	
52	SDIO0_DET/GPIO4_D2_U_1.8V	BT_WAKE	AP wake up BT module	1.8V	I/O UP
54	SDIO0_PWR/GPIO4_D4_D_1.8V	WIFI_REG_ON	WIFI module power enable	1.8V	I/O DOWN
56	SDIO0_BKPWR/GPIO4_D5_D_1.8V	BT_RST	BT Reset	1.8V	I/O DOWN
58	SDIO0_INTN/GPIO4_D6_U_1.8V	WIFI_HOST_WAKE	WIFI module wake up AP	1.8V	I/O UP
60	GPIO4_D7_U_1.8V	BT_HOST_WAKE	BT module wake up AP	1.8V	I/O UP
62	PS2_DATA/GPIO8_A1_U_3.3V	WORK_LED	System working state refers to LED	3.3V	I/O UP
64	SC_DET/GPIO8_A2_U_3.3V	DIY_LED	User Defines LED	3.3V	I/O UP
66	SPI2_CSN1/SC_IO/GPIO8_A3_U_3.3V	COMP_INT	GSEN1 Interrupt	3.3V	I/O UP
68	I2C1_SDA/SC_RST/GPIO8_A4_U_3.3V	I2C1_SDA	I2C serial port 1,for HDMI_IN IC	3.3V	I/O UP
70	I2C1_SCL/SC_CLK/GPIO8_A5_U_3.3V	I2C1_SCL	I2C serial port 1,for HDMI_IN IC	3.3V	I/O UP
72	SPI2_CLK/SC_IO_T1/GPIO8_A6_U_3.3V	SPI2_CLK	spi serial clock	3.3V	I/O DOWN
74	SPI2_CSN0/SC_DET_T1/GPIO8_A7_U_3.3V	SPI2_CSN0	spi chip select signal,low active	3.3V	I/O UP
76	SPI2_RXD/SC_RST_T1/GPIO8_B0_D_3.3V	SPI2_RXD	spi serial data input	3.3V	I/O DOWN
78	SPI2_TXD/SC_CLK_T1/GPIO8_B1_D_3.3V	SPI2_TXD	spi serial data output	3.3V	I/O DOWN
80	TEST_CLKOUT/CLK_27M_T1/PMUGPIO0_C1_D_3.3V	GSEN_INT	GSEN2 Interrupt	3.3V	I/O DOWN
82	OTP_OUT/PMUGPIO0_B2_D_3.3V	PHONE_CTL	Earphone Output_EN_H	3.3V	I/O DOWN
84	PMUGPIO0_B3_D_3.3V	DVP_PWR	Camera power enable1	3.3V	I/O DOWN
86	PMUGPIO0_B4_DV	OTG_VBUS_DRV	USB OTG 5.0V Output EN		I/O DOWN
88	CLK27M_IN/PMUGPIO0_B5_D_3.3V	PWR5V_EN	Device 5.0V Power enable	3.3V	I/O DOWN
90	PMUGPIO0_B6_D_3.3V	HOST_VBUS_DRV	USB HOST 5.0V Output EN	3.3V	I/O DOWN
92	BS_JTAG_TMS_3.3V	BS_JTAG_TMS	JTAG interface TMS input/SWD interface data out	3.3V	I/O UP

94	BS_JTAG_TDI_3.3V	BS_JTAG_TDI	JTAG interface TDI input	3.3V	I/O UP
96	BS_JTAG_TCK_3.3V	BS_JTAG_TCK	JTAG interface clock input/SWD interface clock input	3.3V	I/O UP
98	BS_JTAG_TDO_3.3V	BS_JTAG_TDO	JTAG interface TDO output	3.3V	
100	EFUSE_PWREN/PMUGPIO0_A3_U_3.3V	HDMIIN_INT	HDMI_IN_INT	3.3V	
102	HDMI_HPD_1.8V	TX_HPD	HDMI_out hot plug detect signal	1.8V	
104	OTG_ID_3.3V	OTG_ID	USB_OTG ID		
106	OTG_VBUS_3.3V	OTG_DET	USB plug detect signal_IN	3.3V	
108	GND#24	GND	GND	GND	
110	HOST2_DM_1.8V	HOST2_DM	USB HOST 2.0 Data signal DM		
112	HOST2_DP_1.8V	HOST2_DP	USB HOST 2.0 Data signal DP		
114	GND#25	GND	GND	GND	
116	HOST1_DM_3.3V	HOST1_DM	USB HOST 2.0 Data signal DM		
118	HOST1_DP_3.3V	HOST1_DP	USB HOST 2.0 Data signal DP		
120	GND#26	GND	GND	GND	
122	OTG_DM_3.3V	OTG_DM	USB OTG 2.0 Data signal DM	3.3V	
124	OTG_DP_3.3V	OTG_DP	USB OTG 2.0 Data signal DP	3.3V	
126	GND#27	GND	GND	GND	
128	HSIC_DATA_1.0V	HSIC_DATA	HSIC DATA signal	1.0V	
130	HSIC_STROBE_1.0V	HSIC_STROBE	HSIC STROBE signal	1.0V	
132	GND#28	GND	GND	GND	
134	LCDC0_D0/LVDS_D0P/TRACE_D0_3.3V	LVDS_D0P	LVDS/TTL data lane0+	3.3V	
136	LCDC0_D1/LVDS_D0N/TRACE_D1_3.3V	LVDS_D0N	LVDS/TTL data lane0-	3.3V	
138	LCDC0_D2/LVDS_D1P/TRACE_D2_3.3V	LVDS_D1P	LVDS/TTL data lane1+	3.3V	
140	LCDC0_D3/LVDS_D1N/TRACE_D3_3.3V	LVDS_D1N	LVDS/TTL data lane1-	3.3V	
142	LCDC0_D10/LVDS_CLK0P/TRACE_D10_3.3V	LVDS_CLK0P	LVDS clock lane/TTL data lane0+	3.3V	
144	LCDC0_D11/LVDS_CLK0N/TRACE_D11_3.3V	LVDS_CLK0N	LVDS clock lane/TTL data lane0-	3.3V	
146	LCDC0_D4/LVDS_D2P/TRACE_D4_3.3V	LVDS_D2P	LVDS/TTL data lane2+	3.3V	
148	LCDC0_D5/LVDS_D2N/TRACE_D5_3.3V	LVDS_D2N	LVDS/TTL data lane2-	3.3V	
150	LCDC0_D6/LVDS_D3P/TRACE_D6_3.3V	LVDS_D3P	LVDS/TTL data lane3+	3.3V	
152	LCDC0_D7/LVDS_D3N/TRACE_D7_3.3V	LVDS_D3N	LVDS/TTL data lane3-	3.3V	
154	LCDC0_D8/LVDS_D4P/TRACE_D8_3.3V	LCD_D8	LCDC data output/input	3.3V	
156	LCDC0_D9/LVDS_D4N/TRACE_D9_3.3V	LCD_D9	LCDC data output/input	3.3V	
158	GND#29	GND	GND	GND	
160	LCDC0_D18/LVDS_D8P	LVDS_D8P	LCDC data output/input	3.3V	
162	LCDC0_D19/LVDS_D8N	LVDS_D8N	LCDC data output/input	3.3V	
164	GND#30	GND	GND	GND	
166	GND#31	GND	GND	GND	
168	MIPI_TX_D3P_1.8V	MIPI_TX_D3+	MIPI TX0 positive differential data line transceiver output	1.8V	
170	MIPI_TX_D3N_1.8V	MIPI_TX_D3-	MIPI TX0 negative differential data line transceiver output	1.8V	
172	MIPI_TX_D2P_1.8V	MIPI_TX_D2+	MIPI TX0 positive differential data line transceiver output	1.8V	
174	MIPI_TX_D2N_1.8V	MIPI_TX_D2-	MIPI TX0 negative differential data line transceiver output	1.8V	
176	MIPI_TX_CLKP_1.8V	MIPI_TX_CLK+	MIPI TX0 positive differential clock line transceiver output	1.8V	
178	MIPI_TX_CLKN_1.8V	MIPI_TX_CLK-	MIPI TX0 negative differential clock line transceiver output	1.8V	
180	MIPI_TX_D1P_1.8V	MIPI_TX_D1+	MIPI TX0 positive differential data line transceiver output	1.8V	
182	MIPI_TX_D1N_1.8V	MIPI_TX_D1-	MIPI TX0 negative differential data line transceiver output	1.8V	
184	MIPI_TX_D0P_1.8V	MIPI_TX_D0+	MIPI TX0 positive differential data line transceiver output	1.8V	
186	MIPI_TX_D0N_1.8V	MIPI_TX_D0-	MIPI TX0 negative differential data line transceiver output	1.8V	

188	GND#32	GND	GND	GND	
190	MIPI_RX_D3P_1.8V	MIPI_RX_D3P	MIPI RX0 positive differential data line transceiver output	1.8V	
192	MIPI_RX_D3N_1.8V	MIPI_RX_D3N	MIPI RX0 negative differential data line transceiver output	1.8V	
194	MIPI_RX_D2P_1.8V	MIPI_RX_D2P	MIPI RX0 positive differential data line transceiver output	1.8V	
196	MIPI_RX_D2N_1.8V	MIPI_RX_D2N	MIPI RX0 negative differential data line transceiver output	1.8V	
198	MIPI_RX_CLKP_1.8V	MIPI_RX_CLKP	MIPI RX0 positive differential clock line transceiver output	1.8V	
200	MIPI_RX_CLKN_1.8V	MIPI_RX_CLKN	MIPI RX0 negative differential clock line transceiver output	1.8V	
202	MIPI_RX_D1P_1.8V	MIPI_RX_D1P	MIPI RX0 positive differential data line transceiver output	1.8V	
204	MIPI_RX_D1N_1.8V	MIPI_RX_D1N	MIPI RX0 negative differential data line transceiver output	1.8V	
206	MIPI_RX_D0P_1.8V	MIPI_RX_D0P	MIPI RX0 positive differential data line transceiver output	1.8V	
208	MIPI_RX_D0N_1.8V	MIPI_RX_D0N	MIPI RX0 negative differential data line transceiver output	1.8V	
210	GND#33	GND	GND	GND	
212	HDMI_TX2P_1.8V	TX_D2+	HDMI positive TMDS differential line driver data output	1.8V	
214	HDMI_TX2N_1.8V	TX_D2-	HDMI negative TMDS differential line driver data output	1.8V	
216	HDMI_TX1P_1.8V	TX_D1+	HDMI positive TMDS differential line driver data output	1.8V	
218	HDMI_TX1N_1.8V	TX_D1-	HDMI negative TMDS differential line driver data output	1.8V	
220	HDMI_TX0P_1.8V	TX_D0+	HDMI positive TMDS differential line driver data output	1.8V	
222	HDMI_TX0N_1.8V	TX_D0-	HDMI negative TMDS differential line driver data output	1.8V	
224	HDMI_TXCP_1.8V	TX_C+	HDMI positive TMDS differential line driver clock output	1.8V	
226	HDMI_TXCN_1.8V	TX_C-	HDMI negative TMDS differential line driver clock output	1.8V	
228	GND#34	GND	GND	GND	
230	EDP_AUXP_1.8V	EDP_AUX+	eDP CH-AUX positive differential output	1.8V	
232	EDP_AUXN_1.8V	EDP_AUX-	eDP CH-AUX negative differential output	1.8V	
234	EDP_TX3P_1.8V	EDP_D3+	eDP data lane positive output	1.8V	
236	EDP_TX3N_1.8V	EDP_D3-	eDP data lane negative output	1.8V	
238	EDP_TX2P_1.8V	EDP_D2+	eDP data lane positive output	1.8V	
240	EDP_TX2N_1.8V	EDP_D2-	eDP data lane negative output	1.8V	
242	EDP_TX1P_1.8V	EDP_D1+	eDP data lane positive output	1.8V	
244	EDP_TX1N_1.8V	EDP_D1-	eDP data lane negative output	1.8V	
246	EDP_TX0P_1.8V	EDP_D0+	eDP data lane positive output	1.8V	
248	EDP_TX0N_1.8V	EDP_D0-	eDP data lane negative output	1.8V	
250	GND#35	GND	GND	GND	
252	UART1_RX/TS0_D0/GPIO5_B0_U_1.8V	UART1_RX	UART1 serial port	3.3V	I/O UP
254	UART1_TX/TS0_D1/GPIO5_B1_D_1.8V	UART1_TX	UART1 serial port	3.3V	I/O DOWN
256	UART1_CTSN/TS0_D2/GPIO5_B2_U_1.8V	UART1_CTS	UART1 serial port	3.3V	I/O UP
258	UART1_RTSN/TS0_D3/GPIO5_B3_U_1.8V	UART1_RTS	UART1 serial port	3.3V	I/O UP
260	SPI0_CLK/TS0_D4/UART4_CTSN/GPIO5_B4_U_1.8V	SPI0_CLK	spi serial clock	3.3V	I/O UP
262	SPI0_CSN0/TS0_D5/UART4_RTSN/GPIO5_B5_U_1.8V	SPI0_CSN0	spi chip select signal,low active	3.3V	I/O UP
264	SPI0_TXD/TS0_D6/UART4_TX/GPIO5_B6_D_1.8V	SPI0_TXD	spi serial data output	3.3V	I/O DOWN
266	SPI0_RXD/TS0_D7/UART4_RX/GPIO5_B7_U_1.8V	SPI0_RXD	spi serial data input	3.3V	I/O UP

268	SPIO_CSN1/TSO_SYNC/GPIO5_C0_U_1.8V	HDMIIN_RST	HDMIin reset	3.3V	I/O UP
270	TSO_VALID/GPIO5_C1_D_1.8V	BL_EN/GPIO5_C1_D	LCD panel backlight power enable	3.3V	I/O DOWN
272	TSO_CLK/GPIO5_C2_D_1.8V	LCD_HPD/GPIO5_C2_D	GPIO	3.3V	I/O DOWN
274	TSO_ERR/GPIO5_C3_D_1.8V	TP_INT/GPIO5_C3_D	GPIO	3.3V	I/O DOWN
276	POWER_ON	POWER_ON	Power on Signal Input, To Power key , active low(series connection 51K)		
278	PWR_EN_SYS	PWR_EN_SYS	SYS power enable(MCU to Core board)		
280	PWR_EN	PWR_EN	power enable to Core board		
282	NPOR	RESET	System hardware reset	3.3V	I/O UP
284	PMUGPIOO_B7_U/I2CO_SDA	I2CO_SDA_PMIC	I2C serial port 0,for PMIC, Core board interiorl pull up Resistor 1.5K	3.3V	I/O UP
286	PMUGPIOO_C0_U/I2CO_SCL	I2CO_SCL_PMIC	I2C serial port 0,for PMIC, Core board interiorl pull up Resistor 1.5K	3.3V	I/O UP
288	GND#36	GND	GND	GND	
290	GND#37	GND	GND	GND	
292	GND#38	GND	GND	GND	
294	GND#39	GND	GND	GND	
296	GND#40	GND	GND	GND	
298	GND#41	GND	GND	GND	
300	GND#42	GND	GND	GND	
302	GND#43	GND	GND	GND	
304	GND#44	GND	GND	GND	
306	GND#45	GND	GND	GND	
308	GND#46	GND	GND	GND	
310	GND#47	GND	GND	GND	
312	GND#48	GND	GND	GND	
G6	GND#49	GND	GND	GND	
G5	GND#50	GND	GND	GND	
G4	GND#51	GND	GND	GND	
G3	GND#52	GND	GND	GND	
G2	GND#53	GND	GND	GND	
G1	GND#54	GND	GND	GND	

关于我们

公司简介

天启科技成立于 2009 年，国家高新技术企业，专注于开源智能硬件，人工智能，物联网，数字音频产品的研发设计、生产和销售，同时提供了智能软硬件产品的整体解决方案。开源品牌“Firefly”在互联网上拥有开源社区与网上商城，目前已超过 20 万用 户与 10000 多家的企业用户，为众多科技创业者与初创企业加速研发进程，并提供专业的技术服务。

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