



Firefly-RK3288

Specifications

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Company Profile

T-Chip Intelligent Technology Co., Ltd. was founded in 2005. It has more than 10 years of research and development experience in scientific and technological products, has 6 invention patents and more than 30 computer software copyrights, and is a national high-tech enterprise. We focus on the research and development, design, production and sales of open source intelligent hardware, internet of things and digital audio products, and provide the overall solution for intelligent hardware products meanwhile.



Firefly is a brand owned by T-chip Technology. It operates open source products, open source communities and online stores. It has a large number of enterprise users and developer users, and its products are well received by users. Firefly open source products include open source boards, core boards, industry mainboards, etc. The open-source board series is the recommended board card by chip original factory Rockchip and obtain the support of native SDK. The core boards and industrial mainboards are widely used in commercial displays, advertisement integrated machines, intelligent POS, face recognition terminals, internet of things, intelligent cities, etc. At present, there are more than 100,000 users, including over 2,000 enterprise users. And well-known users include ARM, Google, Baidu, Tencent, Alibaba, etc.

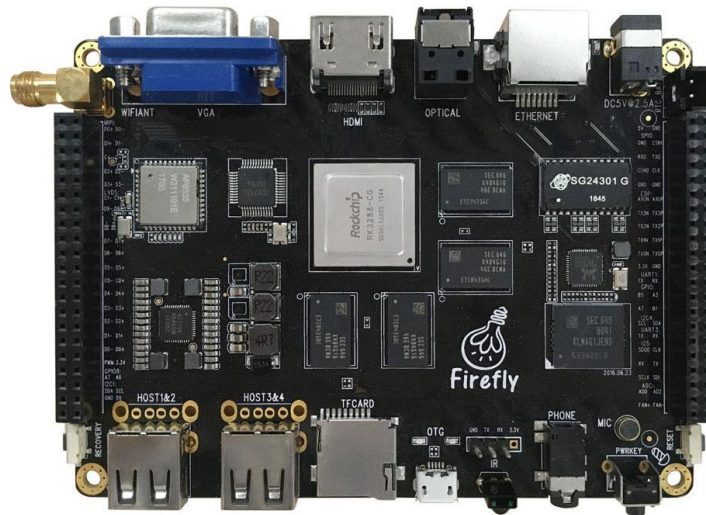
Firefly team has more than 60 research and development members and has the research and development capabilities in schematic design, PCB layout, mainboard production, embedded development, system development, application program development, etc., which accelerates the research and development process for many technology entrepreneurs and start-ups, and provides professional technical services..

" **Make technology more simple, Make life more intelligent** " is the idea of Firefly team. We hope to make the research and development of various technology products efficient and simple, and let intelligent technology integrate in our lives through the open source products and technical services of Firefly.

1. Product Overview

1.1 Overview






Firefly-RK3288 is an mainboard that is elaborately created by the Firefly team, with quad-core ARM Cortex-A17 and Mali-T760 GPU, frequency up to 1.8GHz. Support multiple display interface: dual MIPI, LVDS, HDMI, EDP, VGA, It supports dual view with same contents and dual view with different contents.



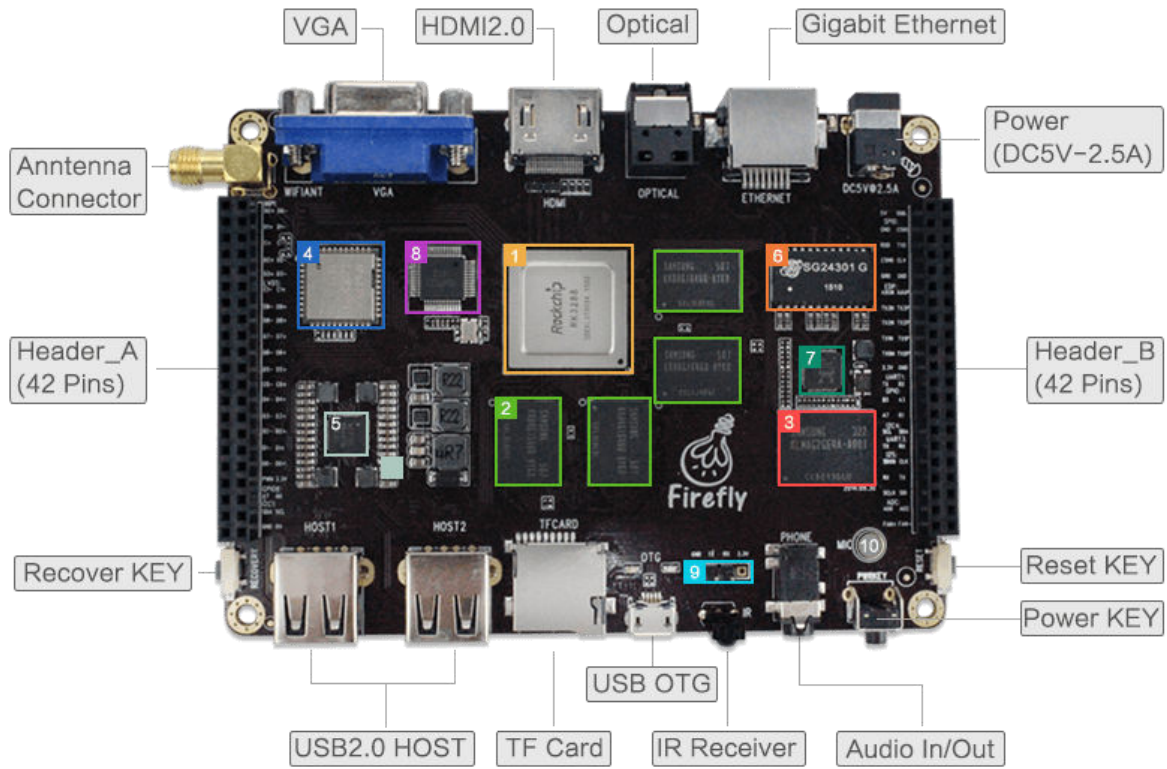
It supports multiple network interfaces: WiFi 2.4GHz/5GHz Dual-Frequency (802.11a/b/g/n/ac protocol), Bluetooth4.1, Gigabit Ethernet, it can be connected to 3G and 4G mobile communication modules through USB interface. Rich extension interfaces: support PWM, PWM, SPI, UART, ADC, I2C, I2S, GPIO.

It supports Android, Linux and Ubuntu , as well as desktop office systems like Phoenix and Flint OS. it is applicable for commercial display advertising machines, mobile POS machines, vending machines and educational terminals with high-definition display, which can reduce the threshold for research and development and shorten the product development cycle.

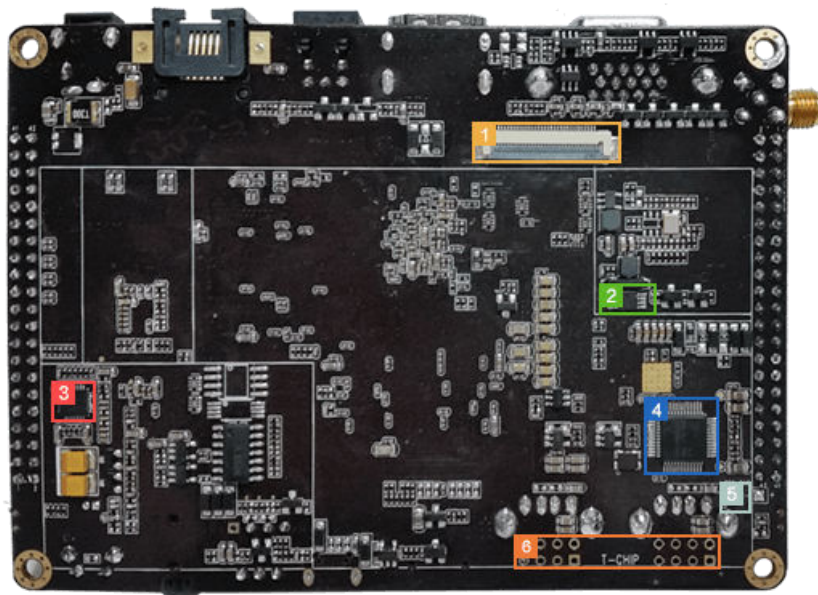
1.2 Application Scenarios

			
Vending machines	Commercial display	Medical equipment	Amusement equipment
			
Mobile POS machines	Interactive printer	smart robot	Industrial PC

2. Interface description



- | | | | | |
|--------------|----------------|--------------------|------------------|---------------|
| 1 RK3288 Soc | 2 2GB/4GB DDR3 | 3 16GB/32GB eMMC | 4 AP6335 WiFi&BT | 5 ACT8846 PMU |
| 6 SG24301 TR | 7 RTL8211E PHY | 8 SDA7123 RGB->VGA | 9 Debug Serial | 10 MIC |

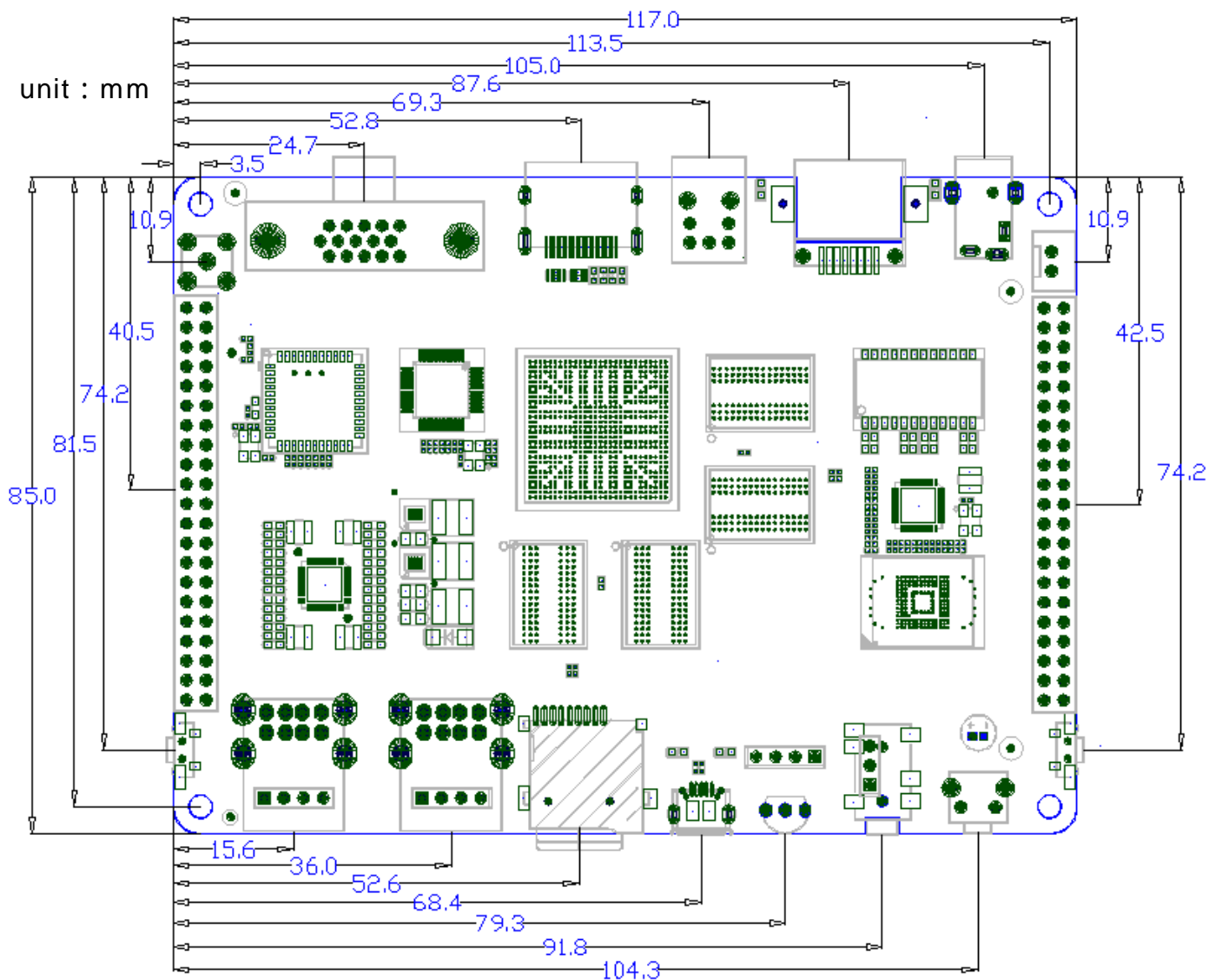


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|-------------------------|---------------|-----------------|
| 1 Camera(MIPI-CSI,13MP) | 2 HYM8563 RTC | 3 ES8323 Codec |
| 4 FB1.1 HUB | 5 RTC_BAT Pad | 6 USB2.0 Header |

3. Hardware Specifications

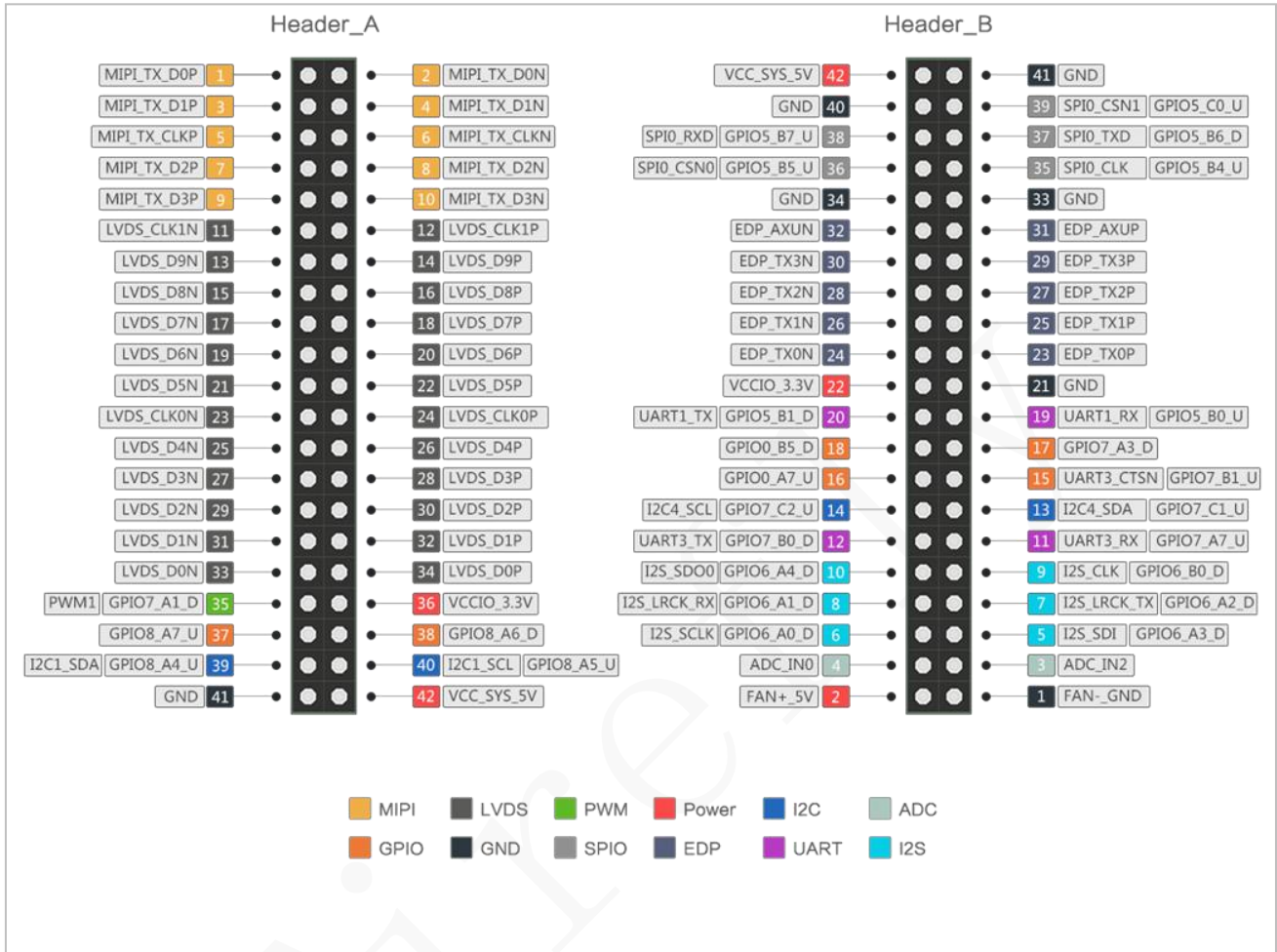
Types	Specifications
CPU	RK3288 (28 nanometer HKMG process) , ARM® Cortex™-A17 Quad-core 1.8GHz
GPU	ARM® Mali-T760 MP4 support OpenGL ES 1.1/2.0 /3.0, OpenVG1.1, OpenCL, Directx11 , Embedded high-performance 2D acceleration hardware Support 4K H.264 and 10bits H.265 video decoding , 1080P multi-format video decoding , Support the encoding of 1080P videos with H.264 , VP8 formats and MVC.
DDR	2GB dual channel (Dual-channel) DDR3
Memory	16 GB high-speed eMMC、 support MicroSD (TF) card
Power	Power Management : ACT8846 PMU
Network	10/100/1000Mbps Ethernet (Realtek RTL8211E)
WiFi	2-in1 WiFi module (AP6335) : Dual-frequency WiFi 2.4GHz/5GHz , support 802.11a/b/g/n/ac 协议 Bluetooth 4.0 (support BLE)
Video	Support multi-channel video high definition output : 1 x HDMI 2.0 , support 4K@60fps output 1 x VGA , support 1080P output 1 x MIPI、 1 x EDP、 2 x LVDS (LCD display interface)
Audio	1 x HDMI audio output 1 x Headset , for audio input / output 1 x SPDIF Digital audio interface , for audio output 1 x MIC for audio input 1 x I2S for audio input / output
Camera	1 x MIPI-CSI camera interface (up to 13Mpixel)
USB	2 x USB2.0 HOST ,1 x USB2.0 OTG , 4 groups of USB2.0 interfaces on the back of the board
Infrared	With a one-way infrared receiver, it has the function of infrared remote control.
LDE	1 x power state LED (blue) , 1 x user-defined LED (green)
Key	1 x Reset , 1 x Power key , 1 x Recovery Key
Debug	1 x Debug serial port , for Development and debugging
Interface	84 Pins header : MIPI、 MIPI-CSI、 Dual LVDS、 EDP、 PWM、 SPI、 UART、 ADC、 GPIO、 I2C、 I2S
Power	DC5V - 2.5A (via DC4.0*1.7mm Jack Socket)
OS	Android、 Linux、 Ubuntu、 Phoenix、 Flint OS
Size	118 mm × 85 mm
Weight	77g

4、PCB Size



5. Interface definition

5.1 GPIO



Header_A:

No.	Definition	No.	Definition
1	TX_DP0	22	LCDC0_D12
2	TX_DN0	23	LCDC0_D11
3	TX_DP1	24	LCDC0_D10
4	TX_DN1	25	LCDC0_D9
5	TX_CLKP	26	LCDC0_D8
6	TX_CLKN	27	LCDC0_D7
7	TX_DP2	28	LCDC0_D6
8	TX_DN2	29	LCDC0_D5
9	TX_DP3	30	LCDC0_D4
10	TX_DN3	31	LCDC0_D3

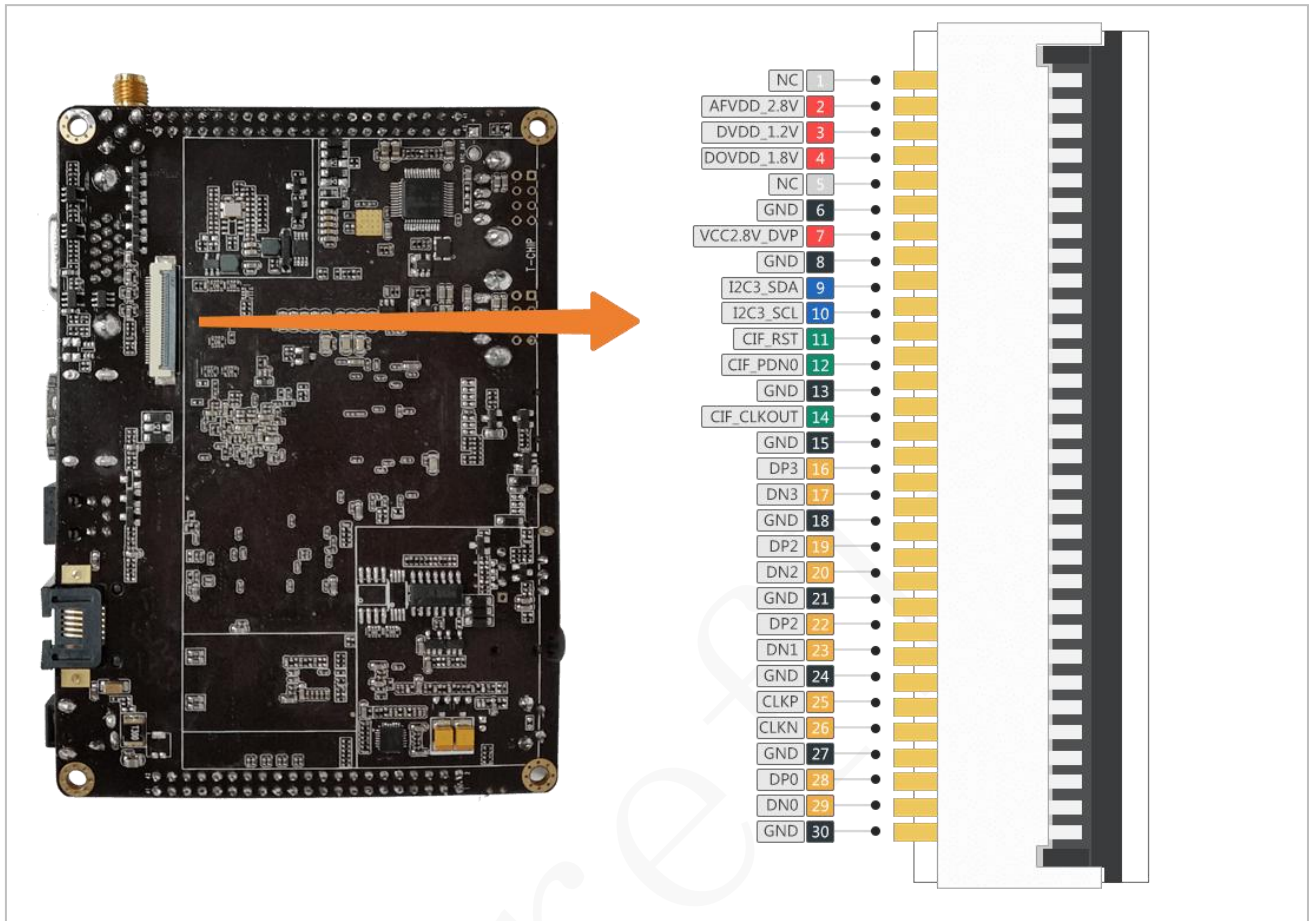


11	LCDC0_D23	32	LCDC0_D2
12	LCDC0_D22	33	LCDC0_D1
13	LCDC0_D21	34	LCDC0_D0
14	LCDC0_D20	35	PWM1
15	LCDC0_D19	36	VCC_IO
16	LCDC0_D18	37	SPI2_CSN0
17	LCDC0_D17	38	SPI2_CLK
18	LCDC0_D16	39	I2C1_SDA
19	LCDC0_D15	40	I2C1_SCL
20	LCDC0_D14	41	GND
21	LCDC0_D13	42	VCC_SYS

Header_B:

No.	Definition	No.	Definition
1	FAN-	22	VCC_IO
2	FAN+	23	EDP_TX0P
3	ADC_IN2	24	EDP_TX0N
4	ADC_IN0	25	EDP_TX1P
5	I2S0_SDI	26	EDP_TX1N
6	I2S0_SCLK	27	EDP_TX2P
7	I2S0_LRCK_TX	28	EDP_TX2N
8	I2S0_LRCK_RX	29	EDP_TX3P
9	I2S0_CLK	30	EDP_TX3N
10	I2S0_SDO0	31	EDP_AXUP
11	UART3_RX	32	EDP_AXUN
12	UART3_TX	33	GND
13	I2C4_SDA_TP	34	GND
14	I2C4_SCL_TP	35	SPI0_CLK
15	GPIO7_B1	36	SPI0_CSN0
16	GPIO0_A7_U	37	SPI0_TXD
17	GPIO7_A3_D	38	SPI0_RXD
18	PMU_GPIO0_B5_D	39	SPI0_CSN1
19	UART1_RX	40	GND
20	UART1_TX	41	GND
21	GND	42	VCC_SYS

5.2 Camera interface



序号	定义	属性	描述
1	NC	16	MIPI_TX/RX_D3P
2	AFVDD_2V8	17	MIPI_TX/RX_D3N
3	DVDD_1V2	18	GND
4	DOVDD_1V8	19	MIPI_TX/RX_D2P
5	NC	20	MIPI_TX/RX_D2N
6	GND	21	GND
7	VCC28_DVP	22	MIPI_TX/RX_D1P
8	GND	23	MIPI_TX/RX_D1N
9	I2C3_SDA	24	GND
10	I2C3_SCL	25	MIPI_TX/RX_CLKP
11	CIF_RST	26	MIPI_TX/RX_CLKN
12	CIF_PDNO	27	GND
13	GND	28	MIPI_TX/RX_D0P
14	CIF_CLKOUT	29	MIPI_TX/RX_D0N
15	GND	30	GND



6. System and sources

Types	Specifications
OS	Android 6.0、Linux、Ubuntu 16.04、u-boot
Programming	Java、C、C++、Kotlin、Shell、Python
Getting sources	Android: https://gitlab.com/T-Firefly/firenow-lollipop Linux: https://bitbucket.org/T-Firefly/firefly-rk3288-kernel.git

7. Electrical Performance

Items		Minimum	Typical	Maximum
Power supply voltage	Voltage	---	5V	---
	Power ripple	---	130mV	---
Supply current (HDMI output only)	Operating current	---	455mA	1200mA
	Stand-by current	---	250mA	---
Supply current (EDP)	Operating current	---	900mA	1700mA
	Stand-by current	---	270mA	---
	Supply current (LCD screen)	---	500mA	650mA
RTC shutdown power consumption	Operating current	≈2.3uA		
Environment	Relative humidity	80%		

8. Appendix

8.1 Source code acquisition

Please visit the official website "Resource Download": ([please click here](#))

8.2 Contact us



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