G3288 Development Board Hardware Manual

Shenzhen Graperain Technology Co., Ltd.

www.graperain.com

Copyright Statement

Attention:

The manuals of development platform on sell will be updated from time to time, please download the latest manual from website www.graperain.com or contact our company sales representative, there would be no further notice.

Release Note

Version	Date	Author	Description
Rev.01	2018-12-30	David	Revision

Technical support

Any questions about the manuals, you can call our landline or email us.

Website: http://www.graperain.com

Landline: +86 755 23025312

E-mail: supports@graperain.com

Sales and service network

Shenzhen Graperain Technology Co., Ltd.

Website: http://www.graperain.com

Landline: +86 755 23025312

E-mail: sales@graperain.com

Address: Building D, Huafeng Tech. & Innov. Park Baoan Wisdom Valley, Xixiang, Baoan Dist.Shenzhen, Guangdong. Post code 518101.

Catalogue

Chapter 1. G3288 Development Board Brief

1.1 G3288 development board brief

G3288 development board takes Rockchip RK3288 chip, designed by Shenzhen Graperain Technology Co., Ltd..

G3288 development board includes G3288 system on module and carrier board.

G3288 system on module takes Rockchip RK3288 CPU, its dominant frequency about 1.8GHz, integrated Mali-T760 MP4 graphic processor, it supports OpenGL ES1.1/2.0/3.0, OpenVG1.1, OpenCL, Directx 11, and could come out 4k x 2K H.264 and 10 bits H265 video hardware decoding.

G3288 carrier board PIN out all functions of this chip mostly. Its data transmission and scalability have been extremely good play. Such as 4G onboard, OTG, USB2.0, gigabit ethernet, dual band WIFI, bluetooth, audio input/output, multiple sensors, RGB, LVDS, MIPI, HDMI ect display interfaces and communication interfaces, camera and TF card slot.

G3288 development board supports Android, Linux, and Ubuntu OS, and all of them source code is open, which will be convenient to clients to develop.

G3288 module could be used in commercial display advertisement machine, vending machine, teaching terminal, automatic identification, robot, security monitoring, financial POS, vehicle control terminal, VR and so on directly, which will save time on developing well.

G3288 Development Board Characteristics:

- Size: 186.5mm x 115.6mm
- Strong functions, rich interfaces, and applicable widely
- Supports Android 5.1, Linux, Ubuntu OS, open source code and accelerate R&D cycle
- Product stability and reliability

1.2 Characteristics Parameter

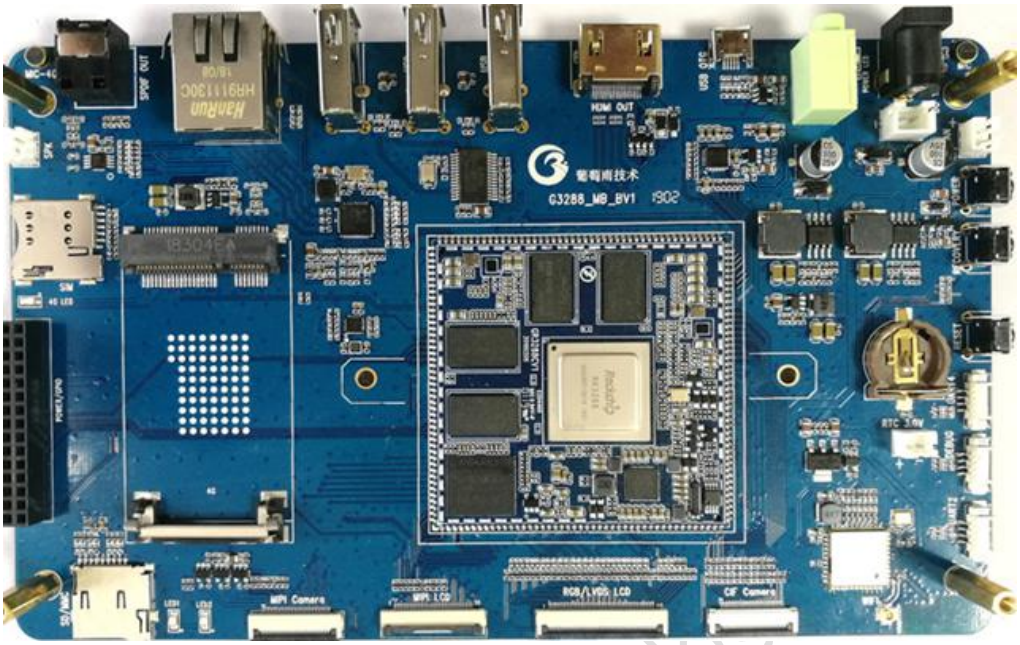
Structure Parameter	
Appearance	Square SOM + carrier board
Size	186.5mm*115.6mm
Layer	G3288 SOM designed in 8 layers /carrier board in 4

System Configuration	
CPU	Rockchip RK3288
Dominant Frequency	Cortex A17 quad core 1.8GHz
RAM	Standard version 2GB, 4GB optional
Storage	4GB/8GB/16GB/32GB emmc optional, standard version
Power IC	ACT8846
Graphics and Video Processors	Mali-T760 MP4, supports OpenGL ES 1.1/2.0/3.0，Openvg1.1,OpenCL，Directx11, embedded high performance 2D speeding up up hardware Supports 4K H.264 and 10bits H.265 video encoding，1080P Multiformat video coding

Interface Parameters	
Display	RGB、dual channels LVDS、MIPI
Touch	Capacitance touch,resistance touch can be extended using USB or
Audio	AC97/IIS/PCM interface，support recording and playback
SD Card	Dual channels SDIO output
eMMC	Onboard eMMC interface, no other PIN out
Ethernet	Gigabit Ethernet
USB	Dual channels HOST2.0
UART	Five channels serials port, supports flowing control
PWM	Dual channels PWM output
IIC	Five channels IIC output
SPI	Single channel SPI output
ADC	Single channel ADC
Camera	Single channel BT656/BT601,Single channel MIPI output
HDMI	Synchronous output of hd audio and video
MIPI	Single channel MIPI TX, single channel MIPI RX/TX
LVDS	Dual LVDS

Electrical Characteristics	
Input Voltage	12V/2A
Output Voltage	12V/5V/3.3V
Storage Temperature	-30~80℃
Operating Temperature	-20~70℃

1.3 G3288 Development Board Appearance



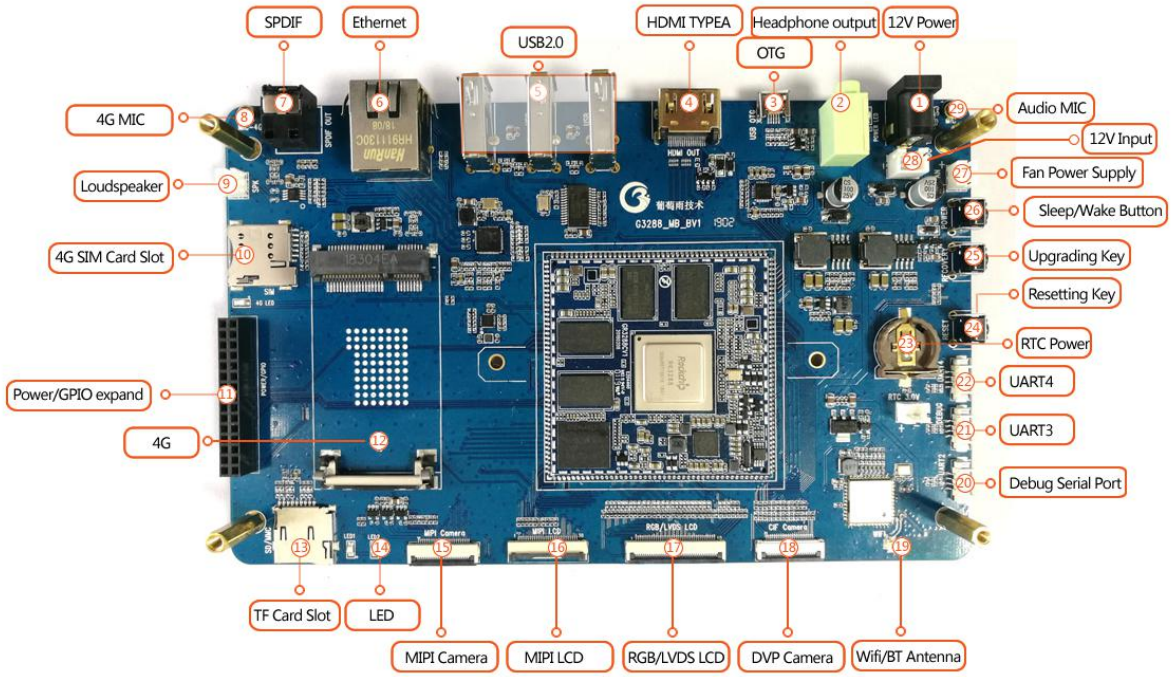
G3288 Development Board Front View

1.4 G3288 SOM Appearance

More information of G3288 SOM, please reference G3288 System on module introduction.

Chapter 2. G3288 Development Board Hardware Resource

2.1 G3288 Development Board Hardware Resource Brief



Hardware Introduction		
Nos.	Name	State
【1】	12V Power	12V input
【2】	Headphone output	Audio headphone output
【3】	OTG	OTG Micro USB
【4】	HDMI TYPEA	HDMI TypeA output
【5】	USB2.0	USB2.0 host
【5】	USB2.0	USB2.0 host
【5】	USB2.0	USB2.0 host
【6】	Gigabit Ethernet	RJ45
【7】	SPDIF	SPDIF output
【8】	4G MIC	4G recording port for communication
【9】	Loudspeaker	Loudspeaker output
【10】	4G SIM Card Slot	4G SIM card slot
【11】	Power/GPIO expand	POWER，GPIO expand port
【12】	4G	4G

【13】	TF Card Slot	TF card slot
【14】	LED	Controllable led
【15】	MIPI Camera	MIPI Camera
【16】	MIPI lcd	MIPI lcd
【17】	RGB/LVDS LCD	RGB，LVDS LCD
【18】	DVP Camera	DVP Camera
【19】	Wifi/BT Antenna	Wifi，BT antenna
【20】	Debug Serial Port	Debug serial port
【21】	UART3	UART3
【22】	UART4	UART4
【23】	RTC Power	RTC power supply
【24】	Resetting Key	Resetting key
【25】	Upgrading Key	Upgrading key
【26】	Sleep/Wake Button	Sleep/wake button
【27】	Fan Power Supply	Fan power supply
【28】	12V Input	12V Input port
【29】	Audio MIC	Audio recording port

2.2 G3288 SOM PIN Definition

G3288 SOM PIN Definition			
PIN #	Signal	PIN #	Signal
1	TOUCH_INT	24	LVDS_D8N
2	IR	25	LVDS_D9P
3	BL_EN	26	LVDS_D9N
4	TOUCH_RST	27	LVDS_CLK1P
5	LVDS_D0P	28	LVDS_CLK1N
6	LVDS_D0N	29	LCDC0_DCLK
7	LVDS_D1P	30	LCDC0_DEN
8	LVDS_D1N	31	LCDC0_HSYNC
9	LVDS_D2P	32	LCDC0_VSYNC
10	LVDS_D2N	33	MIPI_TX_D0P
11	LVDS_D3P	34	MIPI_TX_D0N
12	LVDS_D3N	35	MIPI_TX_D1P
13	LVDS_D4P	36	MIPI_TX_D1N
14	LVDS_D4N	37	MIPI_TX_CLKP
15	LVDS_CLK0P	38	MIPI_TX_CLKN
16	LVDS_CLK0N	39	MIPI_TX_D2P
17	LVDS_D5P	40	MIPI_TX_D2N
18	LVDS_D5N	41	MIPI_TX_D3P

19	LVDS_D6P	42	MIPI_TX_D3N
20	LVDS_D6N	43	I2C5_SDA_HDMI
21	LVDS_D7P	44	I2C5_SCL_HDMI
22	LVDS_D7N	45	HDMII_CEC
23	LVDS_D8P		

G3288 SOM PIN Definition

PIN #	Signal	PIN #	Signal
46	HDMI_HPD	69	CIF_CLKO
47	HDMI_CN	70	CIF_CLKI
48	HDMI_CP	71	CIF_VSYNC
49	HDMI_TX0N	72	CIF_HREF
50	HDMI_TX0P	73	CIF_D7
51	HDMI_TX1N	74	CIF_D6
52	HDMI_TX1P	75	CIF_D5
53	HDMI_TX2NN	76	CIF_D4
54	HDMI_TX2P	77	CIF_D3
55	MIPI_TX/RX_D3	78	CIF_D2
56	MIPI_TX/RX_D3	79	CIF_D1
57	MIPI_TX/RX_D2	80	CIF_D0
58	MIPI_TX/RX_D2	81	PHONE_CTL
59	MIPI_TX/RX_CL	82	SPK_CTL
60	MIPI_TX/RX_CL	83	I2S0_SDI
61	MIPI_TX/RX_D1	84	I2S0_LRCK_RX
62	MIPI_TX/RX_D1	85	I2S0_LRCK_TX
63	MIPI_TX/RX_D0	86	I2S0_SDO0
64	MIPI_TX/RX_D0	87	I2S0_SCLK
65	I2C3_SCL_CAM	88	I2S0_CLK
66	I2C3_SDA_CAM	89	I2C2_SDA_AUDIO
67	CIF_PDN1	90	I2C2_SCL_AUDIO
68	CIF_PDN0		

G3288 SOM PIN

PIN #	Signal	PIN #	Signal
91	HP_DET	114	UART4_TXD
92	WIFI_REG_ON	115	3G_REG_ON
93	WIFI_CLK	116	3G_WAK_IN
94	WIFI_CMD	117	3G_WAK_OUT
95	WIFI_D3	118	PHY_INT
96	WIFI_D2	119	PHY_TXCLK
97	WIFI_D1	120	PHY_RST
98	WIFI_D0	121	MAC_RXCLK
99	RTC_CLKOUT	122	MAC_MDIO
100	GPIO7_A5_D	123	PHY_TXEN
101	UART0_RXD	124	MAC_CLK

102	UART0_TXD	125	MAC_RXDV
103	UART0_CTS	126	MAC_MDC
104	UART0_RTS	127	MAC_RXD1
105	BT_WAKE	128	MAC_RXD0
106	BT_RST	129	PHY_TXD1
107	WIFI_HOST_WA	130	PHY_TXD0
108	BT_HOST_WAKE	131	MAC_RXD3
109	UART1_RX	132	MAC_RXD2
110	UART1_TX	133	PHY_TXD3
111	UART3_RXD	134	PHY_TXD2
112	UART3_TXD	135	PHY_PMEB
113	UART4_RXD		
G3288 SOM PIN			
PIN #	Signal	PIN #	Signal
136	3G_GPIO1	159	VCC+5
137	OUT_VBUS_DRV	160	VCC+5
138	USB_INT	161	GND
139	OTG_DET	162	GND
140	OTG_ID	163	USB5V
141	OTG_DM	164	UART1_CTS
142	OTG_DP	165	UART1_RTS
143	HOST1_DM	166	UART3_CTS
144	HOST1_DP	167	UART3_RTS
145	HOST2_DM	168	VCC_RTC
146	HOST2_DP	169	VCC_IO
147	UART2_RXD	170	SDMMC_PWR
148	UART2_TXD	171	SDMMC_D0
149	GSEN_INT	172	SDMMC_D1
150	COMP_INT	173	SDMMC_D2
151	GRY_INT	174	SDMMC_D3
152	LIGHT_INT	175	SDMMC_CMD
153	I2C1_SDA_SENS	176	SDMMC_CLK
154	I2C1_SCL_SENS	177	SDMMC_DET
155	SPDIF	178	LCDC_BL
156	ADCIN1	179	I2C4_SCL_TP
157	RESET	180	I2C4_SDA_TP
158	PMIC_ON		

Note: More information of G3288 system on module, please reference G3288 system on module introduction.

Chapter 3. Hardware Design

3.1 Design Reference

Taking GR3288 SOM as hardware platform, you could refer to power design, USB design, HDMI design, LVDS design, MIPI design, Audio design, Internet (Network card, WIFI, Bluetooth) design, camera design, and so on. These are open to customers, can refer to our carrier board design.

Chapter 4. Product Portfolio

4.1 System on Module Series

G4418 SOM (Samsung S5P4418)
G6818 SOM (Samsung S5P 6818)
G3288 SOM (Rockchip RK3288)
M9 SOM (Qualcomm 8916)

4.2 Development Board Series

G4418 development board (Samsung S5P4418)
G6818 development board (Samsung S5P 6818)
G3288 development board (Rockchip RK3288)
M9 development board (Qualcomm 8916)

4.3 Single Board Computer (SBC) Series

G4418 single board computer (Samsung S5P4418)
G6818 single board computer (Samsung S5P 6818)
G3288 single board computer (Rockchip RK3288)

Instructions: More information of specifications and other products, please pay attention to website and contact us directly.

www.graperain.com