

# G3288 Development Board Hardware Manual



**Shenzhen Graperain Technology Co., Ltd.**

[www.graperain.com](http://www.graperain.com)

## Copyright Statement

Copyrights of this manual belong to Shenzhen Graperain Technology Co., Ltd. and all rights are reserved. Any companies or individuals are not allowed to extract part or all of this manual, and violators will be prosecuted under law.

### **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](http://www.graperain.com) or contact our company sales representative, there would be no further notice.

Shenzhen Graperain Technology Co., Ltd.

## Release Note

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

Shenzhen GraperaIn Technology Co., Ltd.

## 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](mailto: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](mailto: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 Introduction.....	6
1.1 G3288 development board brief Introduction.....	6
1.2 Characteristics Parameter.....	6
1.3 G3288 Development Board Appearance.....	8
1.4 G3288 SOM Appearance.....	8
Chapter 2. G3288 Development Board Hardware Resource.....	9
2.1 G3288 Development Board Hardware Resource Brief.....	9
2.2 G3288 SOM PIN Definition.....	10
Chapter 3. Hardware Design.....	13
Chapter 4. Product Portfolio.....	14
4.1 System on Module Series.....	14
4.2 Development Board Series.....	14
4.3 Single Board Computer (SBC) Series.....	14

Shenzhen Graperain Technology Co., Ltd.

## Chapter 1. G3288 Development Board Brief Introduction

### 1.1 G3288 development board brief Introduction

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

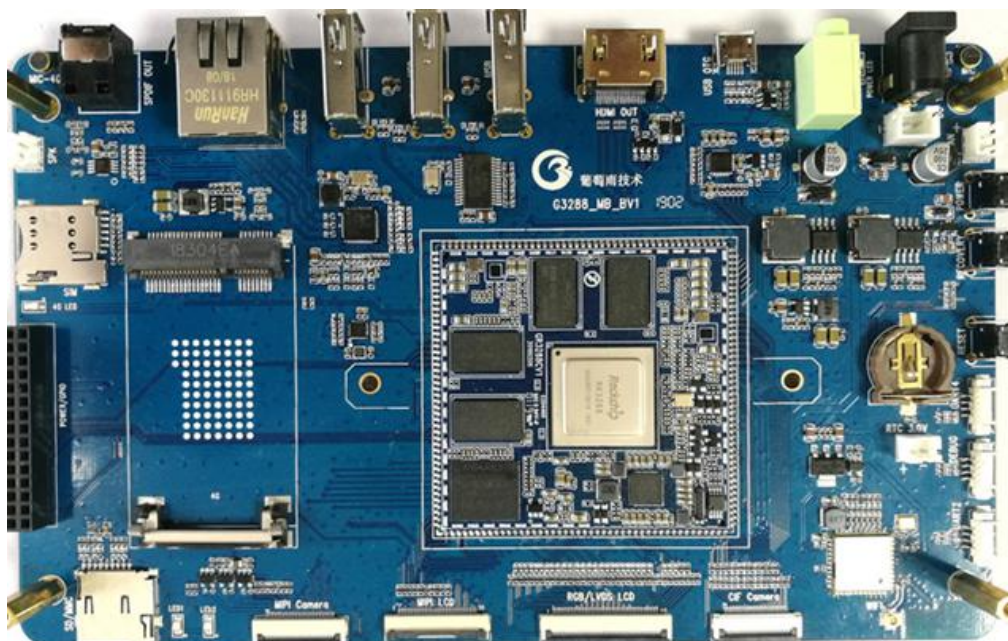
System Configuration	
CPU	Rockchip RK3288
Dominant Frequency	Cortex A17 quad core 1.8GHz
RAM	Standard version 2GB, 4GB optional
Storage	4GB/8GB/16GB/32GB emmc optional, standard version
Power IC	ACT8846
Graphics and Video Processors	Mali-T760 MP4, supports OpenGL ES 1.1/2.0/3.0, Openvg1.1, OpenCL, Directx11, 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°C
Operating Temperature	-20~70°C



### 1.3 G3288 Development Board Appearance



G3288 Development Board Front View

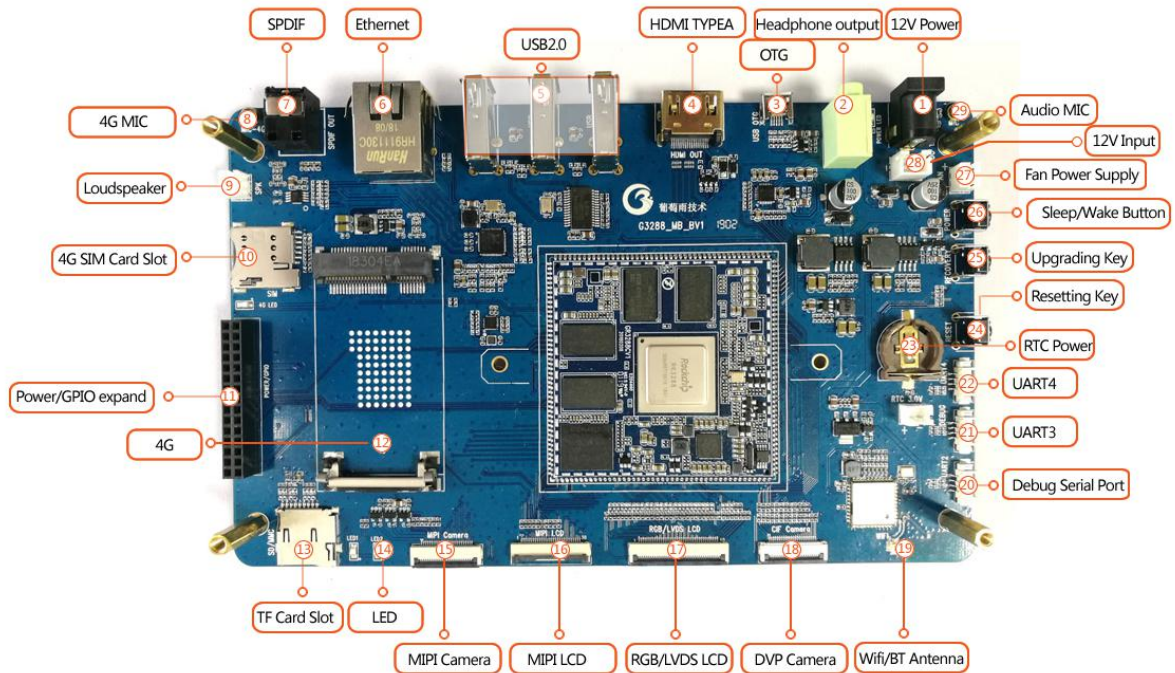
### 1.4 G3288 SOM Appearance

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

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

## 2.2 G3288 SOM PIN Definition

<b>G3288 SOM PIN Definition</b>			
<b>PIN #</b>	<b>Signal</b>	<b>PIN #</b>	<b>Signal</b>
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	HDMI CEC
23	LVDS D8P		
<b>G3288 SOM PIN Definition</b>			
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		
<b>G3288 SOM PIN</b>			
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		
<b>G3288 SOM PIN</b>			
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.

Shenzhen Graperain Technology Co., Ltd.

## 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](http://www.graperain.com)