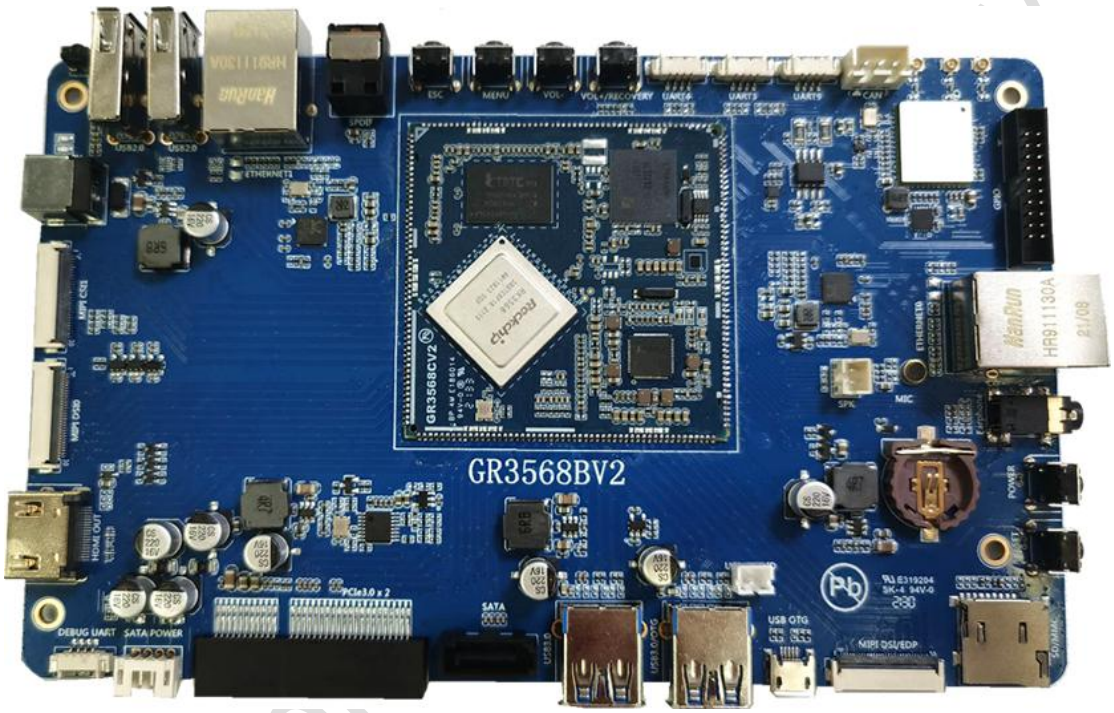
G3568 Development Board Brief Introduction



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Release Notes

Version	Release Date	Author	Description
Rev.01	2021-09-06	RXS	Revision

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Chapter 1 G3568 Development Board Brief Introduction

1.1 Brief Introduction

G3568 development board is based on Rockchip RK3568(64bit quad core) platform, which is designed by Shenzhen Graperain Technology Co., Ltd. RK3568 is 22nm Cortex-A55, frequency up to 2.0GHz. Cortex-A55 provides up to 100% performance improvement compared to the previous A15/A17 core design.

RK3568 is integrated with ARM G52 2EE graphics processor.

- Support OpenGL ES1.1/2.0/3.2, OpenCL 2.0, Vulkan 1.1, embedded high-performance 2D acceleration hardware.
- Support 4K 60fps H.265/H.264/VP9 video decoding, 1080P 100fps H.265/H.264 video encoding.
- Support 8M ISP, support HDR, NPU support 0.8T computing power.

Such powerful GPU and NPU can be applied to many applications, such as computer vision, machine learning, 4K 3D rendering, etc.

Other interfaces: MIPI-CSI, dual MIPI-DSI, EDP, HDMI, PCIe, SATA, CAN, USB3.0, USB2.0, OTG and others.

In addition to the powerful RK3568, G3568 development board is also equipped with 2GB/4GB LPDDR4, 8GB/16GB/32GB eMMC, independent power management system, powerful network expansion capability, rich display interfaces. It supports Android11, Linux, Debian.

G3568 development board consists of stamp hole system on module and carrier board. 8-layer PCB designed system on module has 208 pins, can run up to 2.0GHz frequency.

G3568 development board has rich function expansion interfaces, which can effectively improve the scalability of industry customization. G3568 supports PCIe3.0 1x2/2x1 Lane and PCIE2.1 1x1 Lane at the same time, meeting the expansion requirements of 4G/5G, wifi6, multiple network ports, NPU, etc. RK3568 supports 3x SATA3.0, solves various USB expanding to SATA instability problems of traditional AP processor. RK3568 supports up to 4 USB ports, 1xUSB3.0/USB2.0 HOST + 1xUSB3.0/USB2.0 OTG + 1xUSB2.0 HOST + 1xUSB2.0 HOST. RK3568 also supports dual Gigabit Ethernet ports to meet the multi-network port requirements of industrial control and IoT gateways.

G3568 development board features:

- Size: 180mm*110.5mm, can be used in final product.
- Powerful functions, rich interfaces, wide applications.

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- Supports android11, Linux, Ubuntu, Debian. Source code open, accelerate develop time.
- Stable and reliable board.

1.2 Specifications

Parameters	
Shape	Stamp hole SOM + carrier board
Size	180mm*110.5mm
Layer	SOM 8-layer/carrier board 4-layer

Systems Configuration	
CPU	Rockchip RK3568
Frequency	Cortex A55 quad core 2.0GHz
RAM	Standard 2GB,4GB/8GB Optional
eMMC	standard 8GB, 8GB/16GB/32GB eMMC optional
Power IC	RK809
Graphics and video processor	ARM Mali- G52 2EE GPU OpenGL ES 1.1/2.0/3.2, OpenCL 2.0,Vulkan 1.1 4K VP9, 4K 10bits H265/H.264 video decoding, up to 60 fps 1080P multi-format video decoding 1080Pvideo decoding, H.264,VP8 form

Interface Parameters	
Display	MIPI, eDP output
Ethernet	RTL8211F Gigabit Ethernet PHY
Audio	IIS/PCM, support record and play
SD	2 channel SDIO output
eMMC	Onboard eMMC
Ethernet	2 x Gigabit Ethernet
USB HOST	2 channel HOST2.0,1 channel HOST3.0
USB3.0 OTG	1 channel
UART	10 channel,Support serial port with flow control
PWM	12 channel PWM output
IIC	6 channel IIC output
SPI	3 channel SPI output
ADC	5 channel ADC
Camera	1 channel MIPI input

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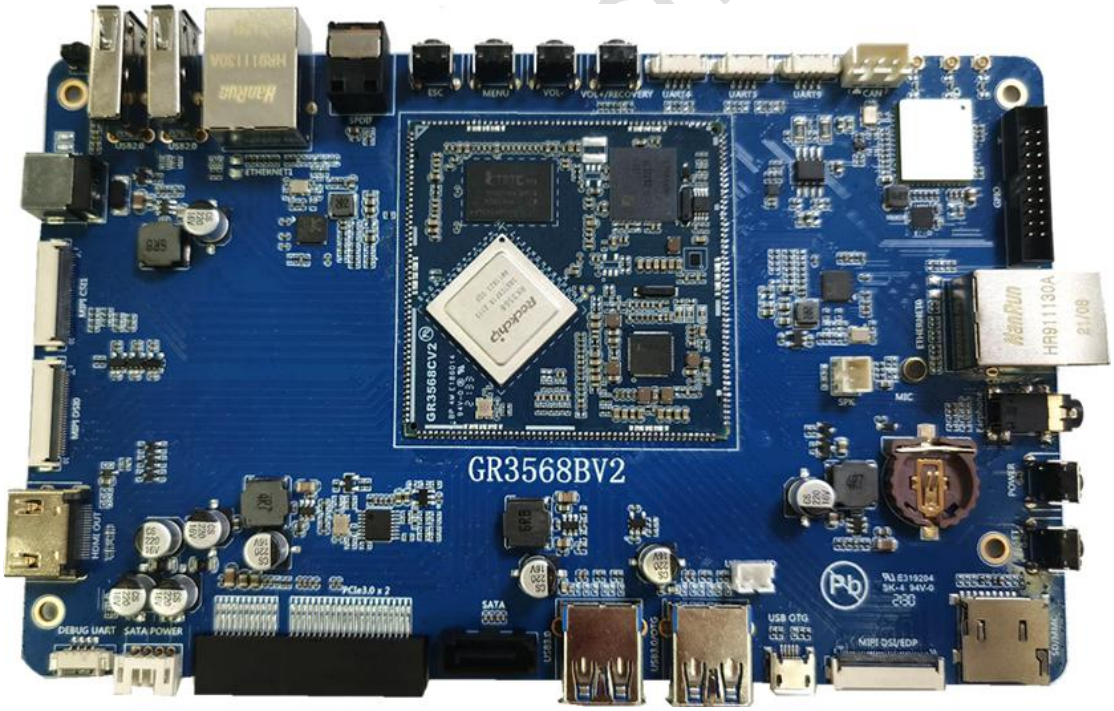
HDMI	High-definition audio and video output, audio and video synchronous output
MIPI	1 channel MIPI RX, 2 channel MIPI TX
eDP	Support
PCIE	Support PCIe3.0 1x2/2x1 Lane, PCIe2.1 x1
SATA	Support 3 channel SATA3.0
CAN	Support 3 channel CAN

Electrical characteristics	
Input Voltage	12V
Output Voltage	12V/5V/3.3V
Storage temperature	-30~80 degree
Working temperature	-20~70 degree

1.3 Development Board Appearance



Development board front side

1.4 System on Module Appearance

Please refer to *G3568 Stamp Hole System on Module Introduction.pdf*.

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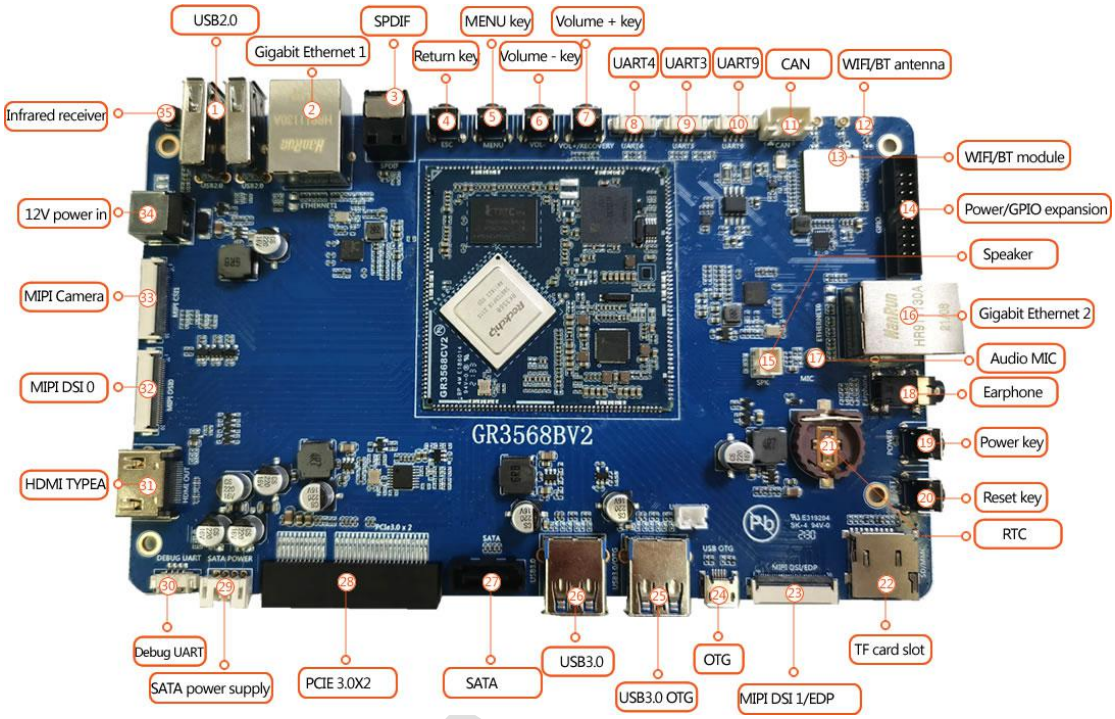
Chapter 2 Development Board Hardware Interfaces

2.1 Hardware Interfaces Description



Interfaces details		
Number	Name	Description
【1】	USB2.0	USB2.0 host
【2】	Gigabit Ethernet 1	RJ45
【3】	SPDIF	SPDIF
【4】	Return key	Return key
【5】	MENU key	MENU key
【6】	Volume - key	Volume - key
【7】	Volume + key	Volume + key
【8】	UART4	UART4
【9】	UART3	UART3
【10】	UART9	UART9
【11】	CAN	CAN
【12】	WIFI/BT antenna	WIFI,BT antenna
【13】	WIFI/BT module	WIFI,BT module

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【14】	Power/Gpio expansion	POWER,GPIO
【15】	Speaker	Speaker
【16】	Gigabit Ethernet 2	RJ45
【17】	Audio MIC	Microphone input
【18】	Earphone	Earphone output
【19】	Power key	Sleep/awake key
【20】	Reset key	Reset key
【21】	RTC	RTC
【22】	TF card slot	TF card slot
【23】	MIPI DSI1/EDP	MIPI DSI 1, EDP LCD display
【24】	OTG	USB OTG
【25】	USB3.0 OTG	USB3.0 OTG, share data with OTG
【26】	USB3.0	USB3.0 HOST
【27】	SATA	SATA hard disk
【28】	PCIE 3.0x2	PCIE 3.0x2
【29】	SATA power supply	SATA power supply interface
【30】	Debug port	Debug port
【31】	HDMI TYPEA	HDMI TYPEA output
【32】	MIPI DSI 0	MIPI LCD display
【33】	MIPI camera	MIPI camera
【34】	12V power connector	12V power supply interface
【35】	Infrared receiver	Infrared receiver

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2.2 System on Module Pin Definition

PIN No.	Pin Signal	IO Voltage
1	GND	
2	GPIO4_A4	1.8v
3	GPIO4_A5	1.8v
4	GPIO3_D6	1.8v
5	GPIO3_D7	1.8v
6	GPIO4_A6	1.8v
7	GPIO4_A0	1.8v
8	ETH1_REFCLKO_25M_M0	3.3v
9	GPIO0_B7	3.3v
10	HDMITX_SDA	3.3v
11	HDMITX_CEC_M0	3.3v
12	HDMITX_SCL	3.3v
13	HDMI_TX_HPDIN	
14	TP_RST_L_GPIO0_B6	3.3v
15	I2C1_SDA_TP	3.3v
16	TP_INT_L_GPIO0_B5	3.3v
17	I2C1_SCL_TP	3.3v
18	USB2_HOST2_DM	
19	USB2_HOST2_DP	
20	USB2_HOST3_DM	
21	USB2_HOST3_DP	
22	PCIE30X2_PERSTN_M1	3.3v
23	PCIE30X2_CLKREQN_M1	3.3v
24	PCIE30X2_WAKEN_M1	3.3v
25	PCIE30X2_PRSNT_L_GPIO2_D7	3.3v
26	PCIECLKIC_OE_H_GPIO3_A7	3.3v

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PIN No.	Pin Signal	IO Voltage
27	UART2_TX_M0_DEBUG	3.3v
28	UART2_RX_M0_DEBUG	3.3v
29	PWM7_IR	3.3v
30	WORKING_LEDEN_H_GPIO0_C0	3.3v
31	MIPI_CSI_RX_D3P	
32	MIPI_CSI_RX_D3N	
33	MIPI_CSI_RX_D2P	
34	MIPI_CSI_RX_D2N	
35	MIPI_CSI_RX_CLK1P	
36	MIPI_CSI_RX_CLK1N	
37	MIPI_CSI_RX_CLK0P	
38	MIPI_CSI_RX_CLK0N	
39	MIPI_CSI_RX_D1P	
40	MIPI_CSI_RX_D1N	
41	MIPI_CSI_RX_D0P	
42	MIPI_CSI_RX_D0N	
43	MIPI_DSI_TX0_D3P/LVDS_TX0_D3P	
44	MIPI_DSI_TX0_D3N/LVDS_TX0_D3N	
45	MIPI_DSI_TX0_D2P/LVDS_TX0_D2P	
46	MIPI_DSI_TX0_D2N/LVDS_TX0_D2N	
47	MIPI_DSI_TX0_CLKP/LVDS_TX0_CLKP	
48	MIPI_DSI_TX0_CLKN/LVDS_TX0_CLKN	
49	MIPI_DSI_TX0_D1P/LVDS_TX0_D1P	
50	MIPI_DSI_TX0_D1N/LVDS_TX0_D1N	
51	MIPI_DSI_TX0_D0P/LVDS_TX0_D0P	
52	MIPI_DSI_TX0_D0N/LVDS_TX0_D0N	
53	REFCLK_OUT_CAM	3.3v

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54	HDMI_TXCLKN_PORT	

PIN No.	Pin Signal	IO Voltage
55	HDMI_TXCLKP_PORT	
56	HDMI_TX0N_PORT	
57	HDMI_TX0P_PORT	
58	HDMI_TX1N_PORT	
59	HDMI_TX1P_PORT	
60	HDMI_TX2N_PORT	
61	HDMI_TX2P_PORT	
62	PCIE30_REFCLKN_IN	
63	PCIE30_REFCLKP_IN	
64	PCIE30_RX1N	
65	PCIE30_RX1P	
66	PCIE30_RX0N	
67	PCIE30_RX0P	
68	PCIE30_TX1N	
69	PCIE30_TX1P	
70	PCIE30_TX0N	
71	PCIE30_TX0P	
72	PCIE20_REFCLKN	
73	PCIE20_REFCLKP	
74	SATA2_RXN	
75	SATA2_RXP	
76	SATA2_TXN	
77	SATA2_TXP	
78	RESETN	3.3v
79	RK809_32KOUT_WIFI	
80	USB3_HOST1_SSTXP	
81	USB3_HOST1_SSTXN	

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82	USB3_HOST1_SSRXP	

PIN No.	Pin Signal	IO Voltage
83	USB3_HOST1_SSRXN	
84	USB3_OTG0_SSTXP	
85	USB3_OTG0_SSTXN	
86	USB3_OTG0_SSRXP	
87	USB3_OTG0_SSRXN	
88	USB3_OTG0_DM	
89	USB3_OTG0_DP	
90	USB3_HOST1_DM	
91	USB3_HOST1_DP	
92	USB3_OTG0_VBUSDET	
93	USB3_OTG0_ID	
94	DSI_TX1_D3N/EDP_TX_D3N	
95	DSI_TX1_D3P/EDP_TX_D3P	
96	DSI_TX1_D2N/EDP_TX_D2N	
97	DSI_TX1_D2P/EDP_TX_D2P	
98	DSI_TX1_D1N/EDP_TX_D1N	
99	DSI_TX1_D1P/EDP_TX_D1P	
100	DSI_TX1_D0N/EDP_TX_D0N	
101	DSI_TX1_D0P/EDP_TX_D0P	
102	DSI_TX1_CLKN/EDP_TX_AUXN	
103	DSI_TX1_CLKP/EDP_TX_AUXP	
104	GND	
105	GND	
106	VCC3V3_SYS	
107	VCC3V3_SYS	
108	SDMMC0_DET_L	3.3v
109	SDMMC0_D3	3.3v

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110	SDMMC0_D2	3.3v

PIN No.	Pin Signal	IO Voltage
111	SDMMC0_D1	3.3v
112	SDMMC0_D0	3.3v
113	SDMMC0_CMD/CAN0_TX_M1	3.3v
114	SDMMC0_CLK/CAN0_RX_M1	3.3v
115	EXT_EN	
116	GPIO0_A7	3.3v
117	GPIO0_D4	1.8v
118	GPIO0_C3	3.3v
119	SARADC_VIN0_KEY/RECOVERY	0v-1.8v
120	SARADC_VIN1	0v-1.8v
121	RK809_PWRON	
122	HPR_OUT	
123	HPL_OUT	
124	SPKP_OUT	
125	SPKN_OUT	
126	MIC1_INP	
127	MIC1_INN	
128	VCC_RTC	
129	GMAC0_RXCLK	1.8v
130	GMAC0_RXD0	1.8v
131	GMAC0_RXD1	1.8v
132	GMAC0_RXD2	1.8v
133	GMAC0_RXD3	1.8v
134	GMAC0_RXDV_CRS	1.8v
135	GMAC0_TXEN	1.8v
136	GMAC0_TXD0	1.8v
137	GMAC0_TXD1	1.8v

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138	GMAC0_TXD2	1.8v

PIN No.	Pin Signal	IO Voltage
139	GMAC0_TXD3	1.8v
140	GMAC0_TXCLK	1.8v
141	UART8_RX_M0	1.8v
142	UART8_TX_M0	1.8v
143	UART8_RTSN_M0	1.8v
144	UART8_CTSN_M0	1.8v
145	GMAC0_MDC	1.8v
146	GMAC0_MCLKINOUT	1.8v
147	GMAC0_MDIO	1.8v
148	ETH0_REFCLKO_25M	1.8v
149	I2C3_SCL_M0	3.3v
150	I2C3_SDA_M0	3.3v
151	GMAC1_INT/PMEB_GPIO2_D0	3.3v
152	GMAC1_RSTN_GPIO2_D1	3.3v
153	GMAC0_INT/PMEB_GPIO2_D2	3.3v
154	GMAC0_RSTN_GPIO2_D3	3.3v
155	GPIO1_A4	3.3v
156	GPIO0_A5	3.3v
157	GPIO0_A6	3.3v
158	GPIO0_C1	3.3v
159	GPIO4_C6	3.3v
160	GPIO4_C5	3.3v
161	GPIO4_C4	3.3v
162	GPIO4_C3	3.3v
163	GPIO4_C2	3.3v
164	UART3_TX_M1	3.3v
165	UART3_RX_M1	3.3v

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166	GPIO3_D5	1.8v

PIN No.	Pin Signal	IO Voltage
167	GPIO3_D4	1.8v
168	GPIO3_D3	1.8v
169	GPIO3_D2	1.8v
170	GPIO3_D1	1.8v
171	GPIO3_D0	1.8v
172	SPDIF_TX_M1	3.3v
173	GPIO3_C7	1.8v
174	GPIO3_C6	1.8v
175	GPIO3_C4	3.3v
176	GPIO3_C3	3.3v
177	HP_DET_L_GPIO3_C2	3.3v
178	GSENSOR_INT_L_GPIO3_C1	3.3v
179	BT_WAKE_HOST_H_GPIO3_A1	3.3v
180	HOST_WAKE_BT_H_GPIO3_A2	3.3v
181	BT_REG_ON_H_GPIO3_A0	3.3v
182	GPIO3_B6	3.3v
183	GPIO3_B5	3.3v
184	UART4_TX_M1	3.3v
185	UART4_RX_M1	3.3v
186	I2S3_SDI_M0	3.3v
187	I2S3_LRCK_M0	3.3v
188	I2S3_SCLK_M0	3.3v
189	I2S3_SDO_M0	3.3v
190	GPIO4_C0	1.8v
191	GPIO4_C1	1.8v
192	GPIO4_B7	1.8v
193	GPIO4_B6	1.8v

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194	GPIO4_B5	1.8v

PIN No.	Pin Signal	IO Voltage
195	GPIO4_B4	1.8v
196	GPIO4_B3	1.8v
197	GPIO0_C5	3.3v
198	GPIO0_C4	3.3v
199	GPIO0_C2	3.3v
200	GPIO0_C7	3.3v
201	GPIO4_A3	1.8v
202	GPIO4_A2	1.8v
203	GPIO4_A1	1.8v
204	GPIO4_B0	1.8v
205	GPIO4_A7	1.8v
206	GPIO4_B1	1.8v
207	GPIO4_B2	1.8v
208	GND	

Note: more details of G3568 system on module, please refer to *G3568 System on Module Introduction.pdf*.

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Chapter 3 Hardware Design

3.1 Design Reference

If use G3568 platform for product design and development, related to power supply, USB3.0, HDMI, eDP, MIPI, audio, network (Ethernet, WIFI, Bluetooth), camera, PCIE, SATA, CAN etc., can refer to our carrier board design. The circuit and layout of those parts are open to customers.

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Chapter 4 Product Portfolio

4.1 System on Module Series

G4418 SOM(Samsung S5P4418)
G6818 SOM(Samsung S5P6818)
G3288 SOM(Rockchip RK3288, stamp hole)
G3399 SOM(Rockchip RK3399, stamp hole)
G3568 SOM(Rockchip RK3568, stamp hole)
GR30 SOM(Rockchip PX30, stamp hole)
GR3288 SOM (Rockchip RK3288 Immersion Gold MXM)
GR3128 SOM(Rockchip RK3128 Immersion Gold MXM)
GR3399 SOM(Rockchip RK3399 Immersion Gold MXM)
M9 SOM(Snapdragon 8916,8953)

4.2 Development Board Series

G4418 development board (Samsung S5P4418)
G6818 development board (Samsung S5P6818)
G3288 development board (Rockchip RK3288 stamp hole)
G3399 development board (Rockchip RK3399 stamp hole)
G3568 development board (Rockchip RK3568 stamp hole)
GR30 development board (Rockchip PX30 stamp hole)
GR3288 development board (Rockchip RK3288 Immersion Gold MXM)
GR3399 development board (Rockchip RK3399 Immersion Gold MXM)

4.3 Single Board Computer (SBC) Series

G4418 single board computer (Samsung S5P4418)
G6818 single board computer (Samsung S5P6818)
G3128 single board computer (Rockchip RK3128)
G3288 single board computer (Rockchip RK3288)
G3399 single board computer (Rockchip RK3399)

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