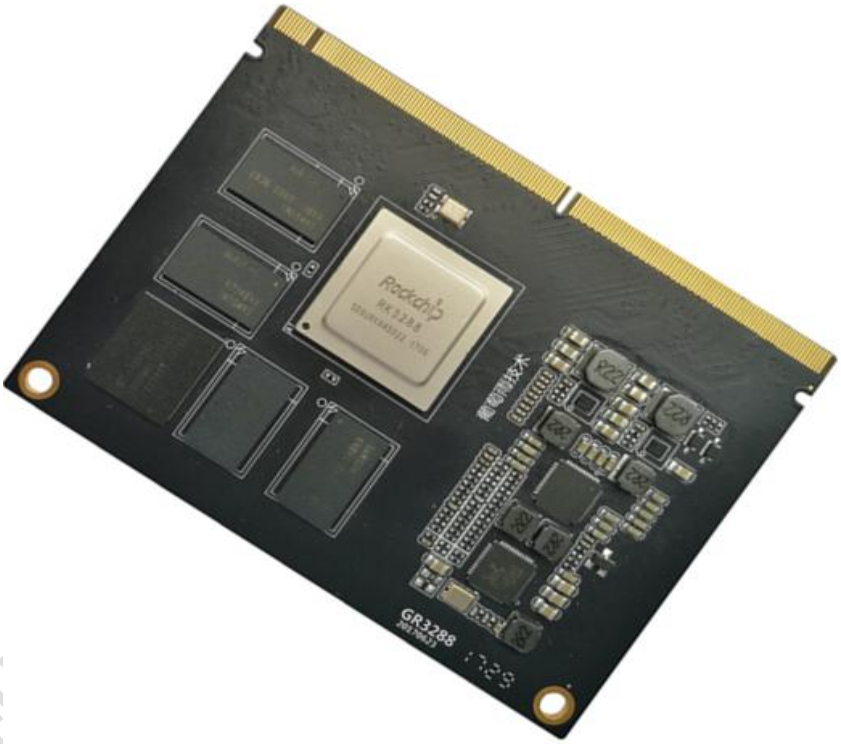
GR3288 Immersion Gold MXM SOM

Introduction



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Attention:

The manuals of development platform 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 notes

Version	Release Date	Author	Description
Rev.01	2017-7-20	David	Revision

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Chapter 1 GR3288 System-On-Module Introduction

1.1 Product Introduction

GR3288 gold finger system on module (SOM) is quad core based on Rockchip RK3288(A17 quad core) chipset which designed by Shenzhen Graperain Technology Co., Ltd.

GR3288 SOM takes Rockchip RK3288 CPU and frequency band top to 1.8GHz, integrates Mali-T760 MP4 graphics processor, and supports OpenGL ES1.1/2.0/3.0，OpenVG1.1，OpenCL，Directx11, which supports 4K x 2K (H.264) and 10 bits H.265 video decoding. And its AnTuTu benchmark more than 50,000.

GR3288 SOM takes strong RK3288 CPU, 2GB/4GB DDR3 and 8GB/16GB/32GB eMMC, independent power management system, strong ability to extend the network, and rich display interfaces, which supports Android 5.1, Linux, Ubuntu operating system that making its performance run to the extreme.

GR3288 development board takes gold finger SOM + carrier board. SOM is easy to install and fixed, strong extensibility, which up to 313 PIN and run to 1.8Ghz. The SOM takes 8-layer immersion gold PCB, which is of the best electrical properties and anti-interference characteristic. And this design makes the board works stable.

GR3288 SOM Features

- The best size: 82 x 60 mm
- Takes ACT8846 PMU to ensure it works stable
- Supports kinds of eMMC, 8GB eMMC as default
- Takes two-channel DDR3, 2GB as default and 4GB optional
- Supports power sleep wake up
- Supports Android 5.1, Linux, Ubuntu operating system
- Supports the gigabit Ethernet
- Supports HDMI 2.0
- Supports rich display interfaces, and drive 2K display

1.2 Features Parameter

Structure Parameter	
Appearance	Gold finger
SOM size	82mm*60mm*1.2mm

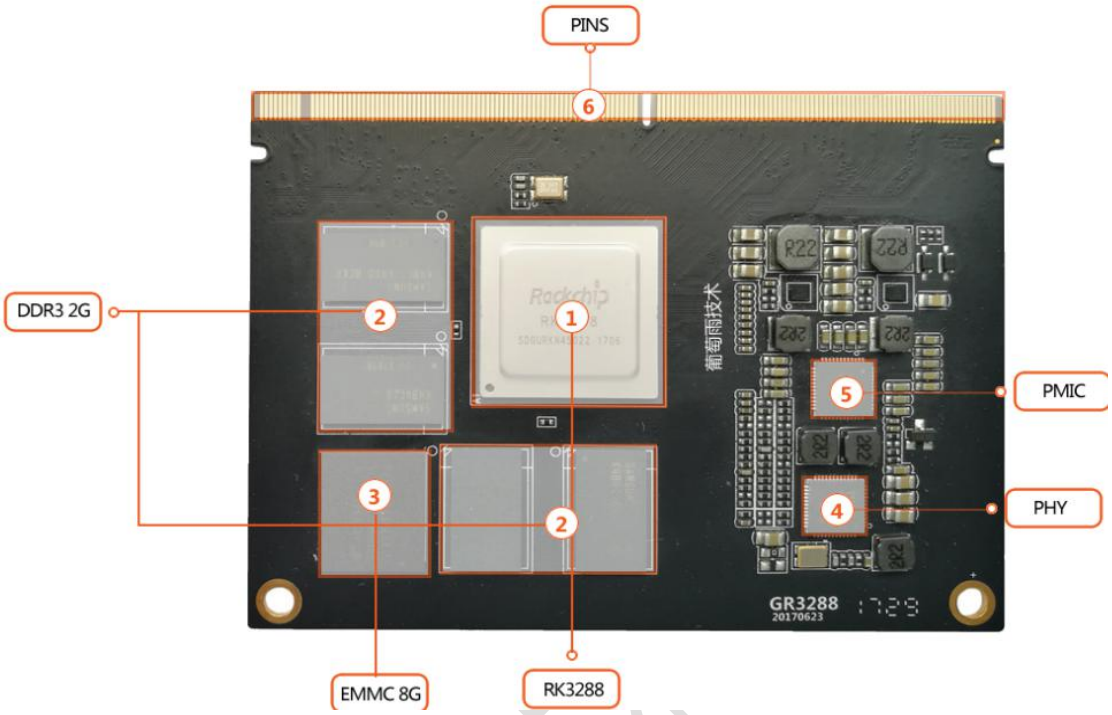
Pin num.	313 PIN
Layer	8-layer

System Configuration	
CPU	Rockchip RK3288
Frequency	Cortex A17 quad core 1.8GHz
RAM	2GB as default，and 4GB for optional
eMMC	4GB/8GB/16GB/32GB eMMC for optional, 8GB as default
Power IC	ACT8846
Image processing	Mali-T760 MP4, support OpenGL ES 1.1/2.0/3.0, Openvg1.1, OpenCL, Directx11 Integrated high performance 2D accelerate hardware Support 4K H.264 and 10bits H.265 video decoder, 1080P multi-form video decoder
Ethernet	RTL8211E the gigabit Ethernet PHY

Interfaces Parameter	
Display	Double LVDS, MIPI , eDP output
Touch	Capacitive touch, can use USB or serial to extend resistive touch
Audio	AC97/IIS/PCM , support record and play
SD	2 channel SDIO output
eMMC	Onboard eMMC
Ethernet	Gigabit Ethernet
USB HOST	1 channel HOST2.0/1.1, 1 channel HOST2.O
USB OTG	1 channel OTG2.0
UART	4 channel UART, support flow control uart
PWM	2 channel PWM output
IIC	5 channel IIC output
SPI	2 channel SPI output
ADC	3 channel ADC
Camera	1 channel BT656/BT601, 2 channel MIPI
HDMI	HDMI2.0, HD audio and video output, audio and video output simultaneously
MIPI	1 channel MIPI RX, 1channel MIPI TX, 1channel MIPI RX/TX
LVDS	Double channel lvds
eDP	Support

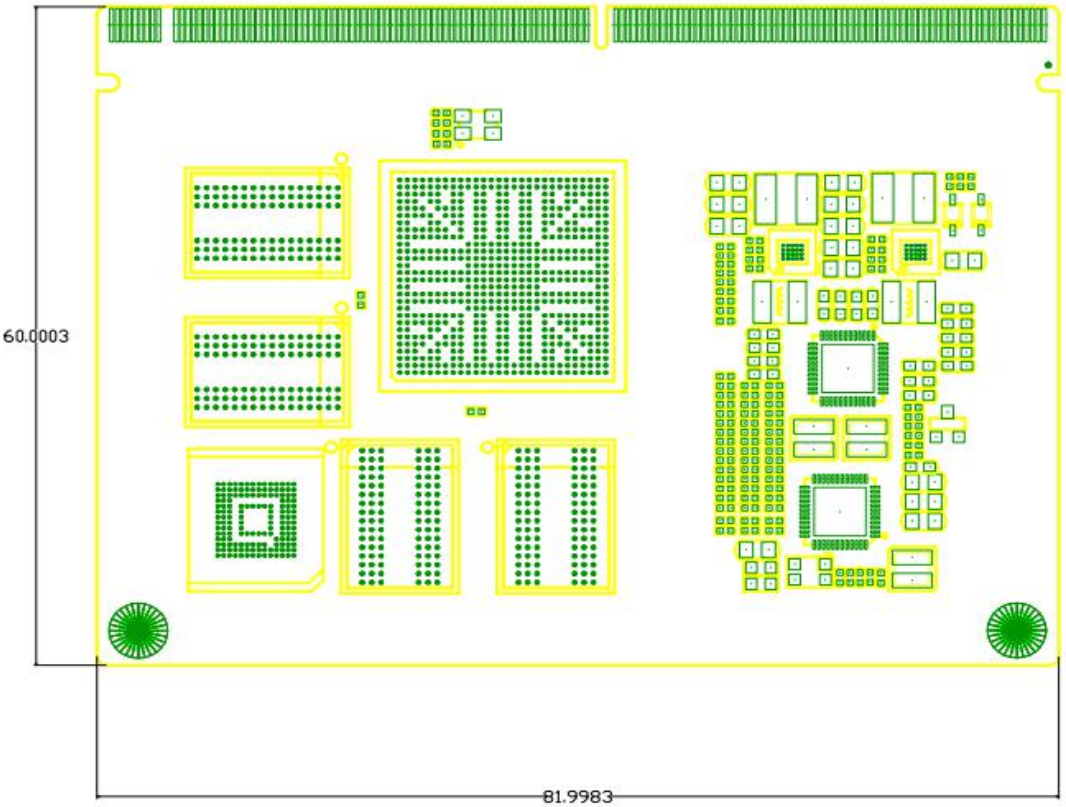
Electrical Features	
Input Voltage	5V
Output Voltage	5V
Storage Temp.	-40~80 degree
Working Temp.	-30~70 degree

1.3 GR3288 SOM Appearance



1.4 GR3288 SOM Structure

Structure and PIN Array



1.5 GR3288 Development Board Appearance

More information, please reference GR3288 development board hardware introduction in pdf.

Chapter 2 Pin Definition

2.1 SOM PIN Definition

SOM PIN Definition			
Back pin	Signal	Front pin num.	Signal
1	GND	2	GND
3	GND	4	FLASH0_WRN
5	GND	6	FLASH0_CS0
7	FLASH0_RDY	8	FLASH0_CS1
9	FLASH0_RND	10	FLASH0_CS3
11	FLASH0_ALE	12	GPIO0_A7_U
13	FLASH0_CLE	14	GPIO0_C2_U
15	GPIO0_D3_D	16	GND
17	VCC18_DVP	18	RTC_CLKOUT
19	VCC28_DVP	20	VCCIO_WL
21	I2C3_SCL	22	VCCIO_WL
23	I2C3_SDA	24	UART0_RX
25	CIF_PDN0	26	UART0_TX
27	CIF_PDN1	28	UART0_CTS
29	CIF_D2	30	UART0_RTS
31	CIF_D3	32	GND
33	CIF_D4	34	SDIO0_D0
35	CIF_D5	36	SDIO0_D1
37	CIF_D6	38	SDIO0_D2
39	CIF_D7	40	SDIO0_D3
41	CIF_D8	42	SDIO0_CMD
43	CIF_D9	44	SDIO0_CLK
45	CIF_VSYNC	46	GND
47	CIF_HREF	48	BT_WAKE
49	CIF_CLK	50	WIFI_REG_ON
51	CIF_CLKOUT	52	BT_RST
53	CIF_D0	54	WIFI_HOST_WAKE
55	CIF_D1	56	BT_HOST_WAKE
57	VCC_EEUSE	58	WORK_LED
59	PWR_INT	60	POWER_LED
61	IR_INT	62	HUB_RST
63	PWM1	64	I2C1_SDA
65	LED_CTL	66	I2C1_SCL
67	RTC_INT	68	SPI2_CLK
69	GPIO8_A0_U	70	SPI2_CSN0
71	GPIO7_A5_D	72	GPIO8_B0_D

73	UART3_RX	74	GPIO8_B1_D
75	UART3_TX	76	XNN233_PWM
77	GPIO7_B1	78	PHONE_CTL
79	CPU_DET	80	DVP_PWR
81	SDMMC_PWR	82	OTG_VBUS_DRV
83	CIF_POWER	84	PMU_GPIO0_B5_D
85	HP_DET	86	HOST_VBUS_DRV
87	HDMI_CED	88	BS_JTAG_TMS
89	GPIO7_B5_U	90	BS_JTAG_TDI
91	I2C4_SDA_TP	92	BS_JTAG_TCK
93	I2C4_SCL_TP	94	BS_JTAG_TDO
95	I2C5_SDA_HDMI	96	EFUSE_PWR
97	I2C5_SCL_HDMI	98	TX_HPD
99	ATX8_RST	100	OGT_ID
101	UART2_RX	102	OTG_DET
103	UART2_TX	104	GND
105	GND	106	HOST2_DM
107	RECOVER	108	HOST2_DP
109	ADC_IN2	110	GND
111	ADC_IN0	112	HOST1_DM
113	GND	114	HOST1_DP
115	SDMMC_D0	116	GND
117	SDMMC_D1	118	OTG_DM
119	SDMMC_D2	120	OTG_DP
121	SDMMC_D3	122	GND
123	SDMMC_CLK	124	HSIC_DATA
125	SDMMC_CMD	126	HSIC_STROBE
127	SDMMC_DET	128	GND
129	GND	130	LCD_D0
131	LCD_D12	132	LCD_D1
133	LCD_D13	134	LCD_D2
135	LCD_D15	136	LCD_D3
137	LCD_D14	138	LCD_D10
139	LCD_D22	140	LCD_D11
141	LCD_D23	142	LCD_D4
143	LCD_D17	144	LCD_D5
145	LCD_D16	146	LCD_D6
147	LCD_D21	148	LCD_D7
149	LCD_D20	150	LCD_D8
151	LCD_CLK	152	LCD_D9
153	LCD_HSYNC	154	GND
155	LCD_VSYNC	156	LCD_D18
157	LCD_DED	158	LCD_D19

159	GND	160	GND
161	GND	162	GND
163	MIPI_TX/RX_D3N	164	MIPI_TX_D3P
165	MIPI_TX/RX_D3P	166	MIPI_TX_D3N
167	MIPI_TX/RX_D2N	168	MIPI_TX_D2P
169	MIPI_TX/RX_D2P	170	MIPI_TX_D2N
171	MIPI_TX/RX_CLKP	172	MIPI_TX_CLKP
173	MIPI_TX/RX_CLKN	174	MIPI_TX_CLKN
175	MIPI_TX/RX_D1P	176	MIPI_TX_D1P
177	MIPI_TX/RX_D1N	178	MIPI_TX_D1N
179	MIPI_TX/RX_D0P	180	MIPI_TX_D0P
181	MIPI_TX/RX_D0N	182	MIPI_TX_D0N
183	GND	184	GND
185	I2S_SCLK	186	MIPI_RX_D3P
187	I2S_LRCK_RX	188	MIPI_RX_D3N
189	I2S_LRCK_TX	190	MIPI_RX_D2P
191	I2S_SDI	192	MIPI_RX_D2N
193	I2S_SDO0	194	MIPI_RX_CLKP
195	I2S_SDO1	196	MIPI_RX_CLKN
197	I2S_SDO2	198	MIPI_RX_D1P
199	I2S_SDO3	200	MIPI_RX_D1N
201	I2S_MCLK	202	MIPI_RX_D0P
203	I2C2_SDA_AUDIO	204	MIPI_RX_D0N
205	I2C2_SCL_AUDIO	206	GND
207	SPDIF_TX	208	TX_D2+
209	GND	210	TX_D2-
211	VCC_18	212	TX_D1+
213	VCC_18	214	TX_D1-
215	VCC_18	216	TX_D0+
217	VCC_18	218	TX_D0-
219	VCC_IO	220	TX_C+
221	VCC_IO	222	TX_C-
223	VCC_IO	224	GND
225	VCC_IO	226	EDPAUXP
227	VCC_IO	228	EDPAUXN
229	VCC_IO	230	EDP_TX3P
231	VCC_IO	232	EDP_TX3N
233	VCC_IO	234	EDP_TX2P
235	GND	236	EDP_TX2N
237	GND	238	EDP_TX1P
239	GND	240	EDP_TX1N
241	GND	242	EDP_TX0P
243	GND	244	EDP_TX0N

245	GND	246	GND
247	VCCA_33	248	UART1_RX
249	VCCA_33	250	UART1_TX
251	VCC_LAN	252	UART1_CTS
253	LED1_AD1	254	UART1_RTS
255	LED0_AD0	256	SPI0_CLK
257	GND	258	SPI0_CSN0
259	MDI3-	260	SPI0_TXD
261	MDI3+	262	SPI0_RXD
263	MDI2-	264	SPI0_CSN1
265	MDI2+	266	GPIO5_C1_D
267	MDI1-	268	GPIO5_C2_D
269	MDI1+	270	GPIO5_C3_D
271	MDI0-	272	POWER_ON
273	MDI0+	274	PWR_EN_SYS
275	GND	276	PWR_EN
277	GND	278	RESET
279	VCC_SYS	280	I2C0_SDA_PMIC
281	VCC_SYS	282	I2C0_SCL_PMIC
283	VCC_SYS	284	GND
285	VCC_SYS	286	GND
287	VCC_SYS	288	GND
289	VCC_SYS	290	GND
291	VCC_SYS	292	GND
293	VCC_SYS	294	GND
295	VCC_SYS	296	GND
297	VCC_SYS	298	GND
299	VCC_SYS	300	GND
301	VCC_SYS	302	GND
303	VCC_SYS	304	GND
305	VCC_SYS	306	GND
307	VCC_SYS	308	GND
309	VCC_SYS	310	GND
311	VCC_SYS	312	GND
313	GND		

Chapter 3 Hardware Design

3.1 Design Reference

Take 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 S5P6818)
G3288 SOM (Rockchip RK3288, stamp hole)
G3128 SOM (Rockchip RK3128, gold finger)
GR3288 SOM (Rockchip RK3288, gold finger)
G3399 SOM (Rockchip RK3399, gold finger)
M9 SOM (Qualcomm 8916)

4.2 Development Board Series

G4418 development board (Samsung S5P4418)
G6818 development board (Samsung S5P6818)
G3288 development board (Rockchip RK3288, stamp hole)
G3128 development board (Rockchip RK3128, gold finger)
GR3288 development board (Rockchip RK3288, gold finger)
G3399 development board (Rockchip RK3399, gold finger)
M9 development board (Qualcomm 8916)

4.3 Single Board Computer (SBC) Series

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

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