

# GR3399 Gold Finger System on Module Introduction



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.

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

**Release notes**

Version	Release Date	Author	Description
Rev.01	2016-9-20	David	Revision

深圳葡萄雨技术有限公司

## 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: Room 329, Building A, Huafeng Tech. & Innov. Park Baoan Wisdom Valley,  
Xixiang, Baoan Dist. Shenzhen, Guangdong. Post code 518101.

## Catalogue

Copyright Statement.....	2
Chapter 1 GR3399 System on Module Introduction.....	6
1.1 GR3399 Brief Introduction.....	6
1.2 Feature Parameter.....	6
1.3 GR3399 System on Module Appearance.....	8
1.4 GR3399 System on Module Structure.....	9
1.5 GR3399 Development Board Appearance.....	9
Chapter 2 Pin Definition.....	10
2.1 GR3399 System on Module Definition.....	10
Chapter 3 Hardware Design.....	14
3.1 Hardware Design Reference.....	14
Chapter 4 Product Portfolio.....	15
4.1 System on Module ( SOM) Series.....	15
4.2 Development Board ( Dev. Board)Series.....	15
4.3 Single Board Computer (SBC) Series.....	15

## Chapter 1 GR3399 System on Module Introduction

### 1.1 GR3399 Brief Introduction

GR3399 gold finger system on module bases on Rockchip rk3399 ( 64bit) chip platform, which designed by Shenzhen Graperain Technology Co., Ltd..

GR3399 takes Rockchip 64 bit RK3399 which is “ server- class”. It takes dual “ server-class” Cortex-A72 + quad core Cortex-A53 architecture, main frequency 2.0GHz, and this new kernel performance enhanced 100%, compared with A15/A17/A57.

Integrated ARM Mali-T860 MP4 graphics processor, supports OpenGL ES1.1/2.0/3.0/3.1, OpenVG1.1, OpenCL, Directx11, AFBC ( Frame Buffer Compression ), such powerful GPU supports more H.265HEVC and VP9, H.265 code, and 4K HDR, when it used to be computer vision, learning machine, 4K 3D practical application.

Have dual MIPI-CSI interface and dual ISP, PCIe, USB3.0, USB2.0, TypeC and so on.

Besides GR3399 platform takes powerful performance RK3399, it equip 2GB/4GB DDR3, 8GB/16GB/32GB eMMC high-speed storage, and standalone power management system, and powerful network scalability, and abundant display interfaces, and Android 7.1, Linux, Debian OS.

Characteristic of GR3399 gold fingers system on module

- Best size: Only 82mm x 60mm
- Take RK808 PMU to insure it works stability.
- Support many brands eMMC, and default 8GB eMMC.
- Take two-channel DDR3, default 2GB, and 4GB optional
- Support power dormant awakening
- Support Android 7.1, Linux, Debian OS
- Support gigabit Ethernet
- Abundant display interfaces

### 1.2 Feature Parameter

Structure Parameter	
Appearance	Gold finger
System on Module Dimension	82mm*60mm*1.2mm
Pin Quantity	313 PIN
Layer	8 layers

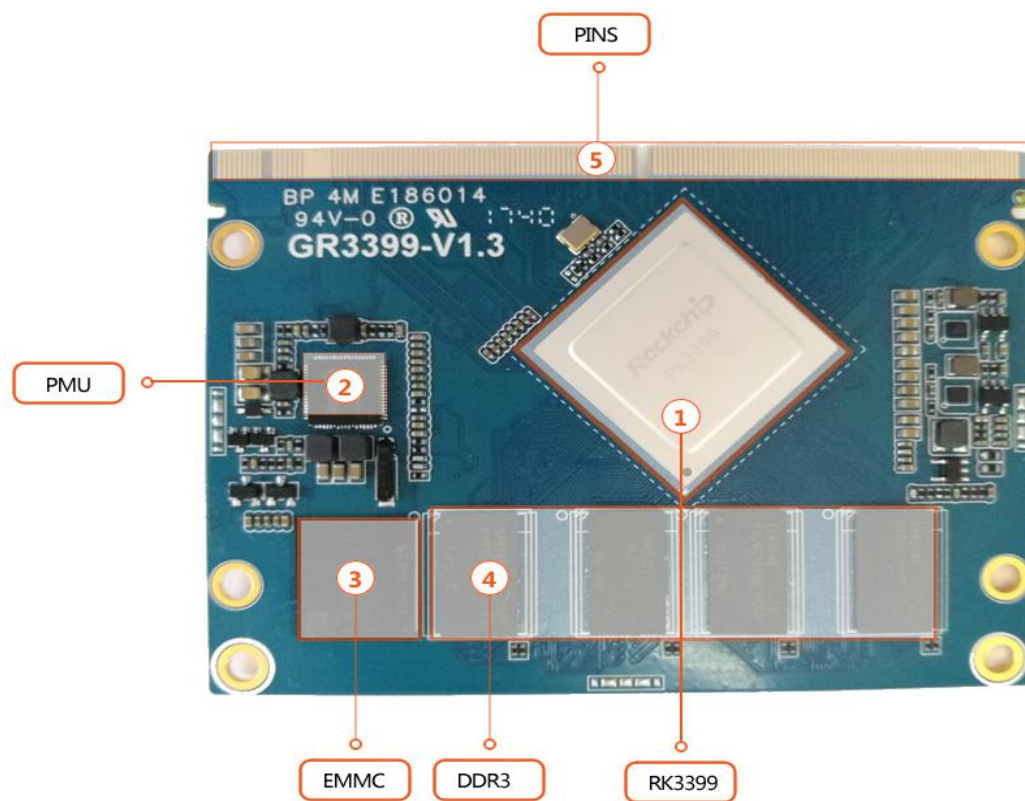
System Configuration	
CPU	Rockchip RK3399
Frequency	Cortex A53 quad core 1.4GHz + dual core A72 (2GHz)
RAM	default 2GB, 4GB optional
Storage	4GB/8GB/16GB/32GB eMMC optional, default 8GB
Power IC	RK808, support dynamic frequency;
Graph and Video Processor	Mali-T860 MP4, quad core GPU OpenGL ES 1.1/2.0/3.0/3.1, Openvg1.1,OpenCL, Directx11 4K VP9 and 4K 10bits H265/H.264 video decoding, up 60 fps 1080P multi-format video decoding 1080P video decoding, such as H.264, VP8 format

Interfaces Parameter	
Display	Dual LVDS、MIPI, eDP output
Ethernet	RTL8211E gigabit Ethernet PHY
Touch	Capacitive touch, supports USB serial ports extension touch
Audio	AC97/IIS/PCM, supports record and play
SD Slot	Dual channels SDIO output
eMMC	Onboard eMMC interface, no pin output any more
Ethernet	The gigabit Ethernet
USB HOST	Two channels HOST 2.0, one channel HOST 3.0
USB TYPEC	One channel
UART	Five channels serials, and supports flow control serial port,
PWM	Two channels PWM output
IIC	Six channels IIC output
SPI	One channel SPI output
ADC	Five channels ADC
Camera	One channel BT656/BT601, two channels MIPI output
HDMI	HDMI output, and audio output synchronization
MIPI	One channel MIPI RX, one channel MIPI TX, one channel MIPI
eDP	Support

Electrical Features	
Input Voltage	3.3V/5A
Output Voltage	1.8V
Storage Temp.	-30~80℃
Working Temp.	-20~70 ℃



### 1.3 GR3399 System on Module Appearance

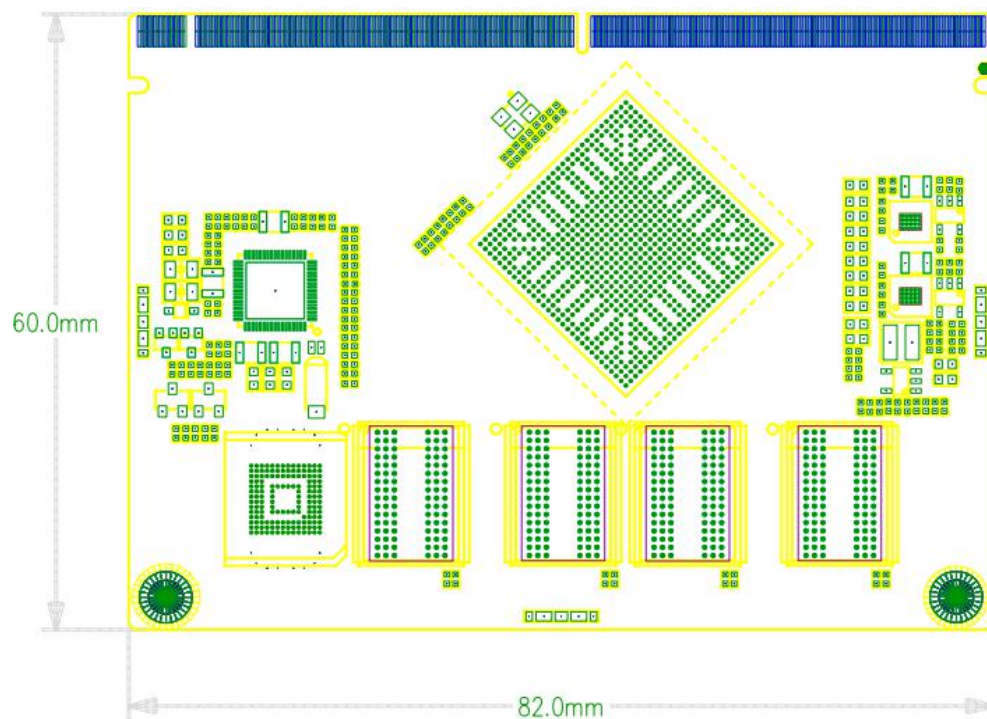


Front of GR3399 system on module



## 1.4 GR3399 System on Module Structure

Structure and Dimension



## 1.5 GR3399 Development Board Appearance

More information, please reference GR3399 development board introduction in pdf.

## Chapter 2 Pin Definition

### 2.1 GR3399 System on Module Definition

GR3399 System on Module PIN Definition			
Back Pins	Signal	Front Pins	Signal
1	GND	2	VCC SYS
3	GND	4	VCC SYS
5	GND	6	VCC SYS
7	GND	8	VCC SYS
9	GND	10	VCC SYS
11	GND	12	VCC SYS
13	GND	14	VCC SYS
15	RESET L	16	VCC SYS
17	POWER KEY	18	VCC SYS
19	VCC CHARGE EN	20	VCC SYS
21	PMIC EXT EN	22	VCC SYS
23	VCC 3V0	24	VCC SYS
25	VCC 3V0	26	VCC SYS
27	VCC SDIO	28	VCC3V3 S5
29	VCC SDIO	30	VCC3V3 S5
31	VCC3V3 S0	32	GND
33	VCC3V3 S0	34	GND
35	VCC3V3 S7	36	GND
37	VCC3V3 S7	38	GND
39	VCC1V8 DVP	40	GND
41	VCC1V8 CODEC	42	GND
43	VCC1V8 CODEC	44	EDPAUXN
45	VCC 1V5	46	EDPAUXP
47	VCC 1V5	48	GND
49	VCC1V8 S3	50	EDP_TX0N
51	VCC1V8 S3	52	EDP_TX0P
53	VCC 1V8	54	GND
55	VCC 1V8	56	EDP_TX1N
57	VCC RTC	58	EDP_TX1P
59	VCC EFUSE	60	GND
61	MAC TXD3	62	EDP_TX2P
63	MAC TXEN	64	EDP_TX2N
65	MAC CRS	66	GND
67	MAC TXD1	68	EDP_TX3P
69	MAC RXER/INT	70	EDP_TX3N
71	MAC TXD2	72	GND
73	MAC MCLK	74	GPIO2_B4/DVP_PDN0_H



75	MAC_RXD3	76	GPIO2_B1/I2C6_SDA/CIF_HRE
77	MAC_TXD0	78	GPIO2_B0/I2C7_SCL/CIF_VSY
79	MAC_RXDV	80	GPIO2_A0/I2C2_SDA/CIF_D0
81	MAC_RXD0	82	GPIO2_A1/I2C2_SCL/CIF_D1
83	MAC_COL/PMEB	84	GPIO2_A2/CIF_D2
85	MAC_RXCLK	86	GPIO2_A3/CIF_D3
87	MAC_TXCLK	88	GPIO2_A4/CIF_D4
89	MAC_MDC	90	GPIO2_A5/CIF_D5
91	MAC_RXD1	92	GPIO2_A6/CIF_D6
93	MAC_RXD2	94	GPIO2_A7/I2C7_SDA/CIF_D7
95	MAC_MDIO	96	GPIO2_B2/I2C6_SCL/CIF_CLKI
97	GND	98	GPIO2_B3/CIF_CLKO
99	PCIE_TX2P	100	GND
101	PCIE_TX2N	102	SPI1_CLK
103	GND	104	SPI1_RXD
105	PCIE_RX2_P	106	SPI1_TXD
107	PCIE_RX2_N	108	SPI1_CSN0
109	GND	110	GPIO0_B5
111	PCIE_TX3N	112	GPIO0_A2
113	PCIE_TX3P	114	GPIO1_C6
115	GND	116	TOUCH_INT_L
117	PCIE_RX3_P	118	LCD_EN_H
119	PCIE_RX3_N	120	GPIO1_D0
121	GND	122	I2C4_SCL
123	PCIE_REF_CLKP	124	I2C4_SDA
125	PCIE_REF_CLKN	126	GPIO1_A1
127	GND	128	SPK_CTL_H
129	PCIE_TX0N	130	GPIO1_A0
131	PCIE_TX0P	132	GPIO0_B0
133	GND	134	GPIO1_C7
135	PCIE_RX0_N	136	GPIO1_A3
137	PCIE_RX0_P	138	GPIO1_A4
139	GND	140	IR_RX
141	PCIE_TX1N	142	GND
143	PCIE_TX1P	144	RTC_CLK_OUT
145	GND	146	GND
147	PCIE_RX1_N	148	HOST1_DP
149	PCIE_RX1_P	150	HOST1_DM
151	GND	152	GND
153	ADC_IN0	154	HOST0_DM
155	ADC_IN1	156	HOST0_DP
157	ADC_IN2	158	GND
159	ADC_IN4	160	TYPEC0_U2VBUSDET



161	ADKEY_IN	162	USB3_SSTXN
163	GND	164	USB3_SSTXP
165	USB3_DP	166	GND
167	USB3_DM	168	USB3_SSRXP
169	GND	170	USB3_SSRXN
171	TYPEC0_DM	172	GND
173	TYPEC0_DP	174	TYPEC0_TX2N
175	GND	176	TYPEC0_TX2P
177	TYPEC0_SBU2_DC	178	GND
179	TYPEC0_SBU2_DC	180	TYPEC0_RX2P
181	GND	182	TYPEC0_RX2N
183	TYPEC0_SBU2	184	GND
185	TYPEC0_SBU1	186	TYPEC0_TX1N
187	GND	188	TYPEC0_TX1P
189	TYPEC0_RX1N	190	GND
191	TYPEC0_RX1P	192	HDMI_TX2P
193	GND	194	HDMI_TX2N
195	MIPI_TX0_D0P	196	GND
197	MIPI_TX0_D0N	198	HDMI_TX1P
199	GND	200	HDMI_TX1N
201	MIPI_TX0_D1P	202	GND
203	MIPI_TX0_D1N	204	HDMI_TX0P
205	GND	206	HDMI_TX0N
207	MIPI_TX0_CLKP	208	GND
209	MIPI_TX0_CLKN	210	HDMI_TXCP
211	GND	212	HDMI_TXCN
213	MIPI_TX0_D2N	214	GND
215	MIPI_TX0_D2P	216	MIPI_RX0_D0N
217	GND	218	MIPI_RX0_D0P
219	MIPI_TX0_D3P	220	GND
221	MIPI_TX0_D3N	222	MIPI_RX0_D1N
223	GND	224	MIPI_RX0_D1P
225	MIPI_TX1/RX1_D3N	226	GND
227	MIPI_TX1/RX1_D3P	228	MIPI_RX0_CLKN
229	GND	230	MIPI_RX0_CLKP
231	MIPI_TX1/RX1_D2N	232	GND
233	MIPI_TX1/RX1_D2P	234	MIPI_RX0_D2N
235	GND	236	MIPI_RX0_D2P
237	MIPI_TX1/RX1_CLKN	238	GND
239	MIPI_TX1/RX1_CLKP	240	MIPI_RX0_D3N
241	GND	242	MIPI_RX0_D3P
243	MIPI_TX1/RX1_D1N	244	GND
245	MIPI_TX1/RX1_D1P	246	BT_REG_ON_H



247	GND	248	WIFI_HOST_WAKE_L
249	MIPI_TX1/RX1_D0N	250	WIFI_REG_ON_H
251	MIPI_TX1/RX1_D0P	252	BT_HOST_WAKE_L
253	GND	254	GPIO0_B4
255	SDMMC0_CLK	256	CHG_CC_INT_L
257	SDMMC0_PWR_H	258	UART0_RTS
259	SDMMC0_DET_L	260	UART0_TXD
261	SDMMC0_CMD	262	UART0_CTS
263	SDMMC0_D0	264	UART0_RXD
265	SDMMC0_D1	266	DVP_PDN1_H
267	SDMMC0_D2	268	CAMERA_RST_L
269	SDMMC0_D3	270	CABC_EN
271	SDIO0_CMD	272	BT_WAKE_L
273	SDIO0_D0	274	GPIO4_C6/PWM1_D
275	SDIO0_D1	276	GPIO4_B3
277	SDIO0_D2	278	PORT_HPD
279	SDIO0_D3	280	SPDIF_TX
281	SDIO0_CLK	282	PCIE_CLKREG
283	RTC_CLK0_WIFI	284	GPIO4_D2
285	GND	286	I2C1_SDA
287	I2S_CLK	288	I2C1_SCL
289	I2S0_LRCK_RX	290	GPIO4_A5
291	I2S0_SCLK	292	HP_DET_H
293	HDMIIN_PWREN18/I2S1	294	VCC5V0_HOST_EN
295	HDMIIN_STBY/I2S1_SDI	296	UART2DBG_RX
297	GPIO3_D4/I2S0_SDI1	298	UART2DBG_TX
299	HDMIIN_PWREN33/I2S1	300	LCD_RST_H
301	HDMIIN_RST/I2S1_LRCK	302	LCD_BL_PWM
303	I2S0_SDI0	304	I2C_SDA_HDMI
305	GPIO3_D5/I2S0_SDO2	306	HDMI_CEC
307	I2S0_SDO0	308	I2C_SCL_HDMI
309	GPIO3_D6/I2S0_SDO1	310	GND
311	I2S0_LRCK_TX	312	GND
313	GND		

## Chapter 3 Hardware Design

### 3.1 Hardware Design Reference

Take GR3399 SOM as hardware platform, you could refer to power design, USB design, HDMI design, eDP design, MIPI design, PCIe design, TypeC design, Audio design, Internet ( Network card, WIFI, Bluetooth ) design, camera design, and so on. The company would share design of development board, and part of power line and layout.

深圳葡萄雨技术有限公司



## Chapter 4 Product Portfolio

### 4.1 System on Module ( SOM) Series

G4418 System on module ( Samsung S5P4418 )

G6818 System on module ( Samsung S5P 6818)

G3128 System on module (Rockchip RK3128)

G3288 System on module (Rockchip RK3288)

G3399 System on module (Rockchip RK3399)

M9 System on module (Qualcomm 8916)

### 4.2 Development Board ( Dev. Board)Series

G4418 development board ( Samsung S5P4418 )

G6818 development board ( Samsung S5P 6818 )

G3128 development board ( Rockchip RK3128 )

G3288 development board ( Rockchip RK3288 )

GR3399 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 )

GR3399 single board computer( Rockchip RK3399 )

Instructions: More information of specifications and other products, please pay attention to website and contact us directly. Web: [www.graperain.com](http://www.graperain.com)