



GK7202V300 Datasheet

Version 1.1

Hunan Guoke Microelectronics Co., Ltd.

Version History

Version	Note
V1.0	
V1.1	Supplementary hardware features

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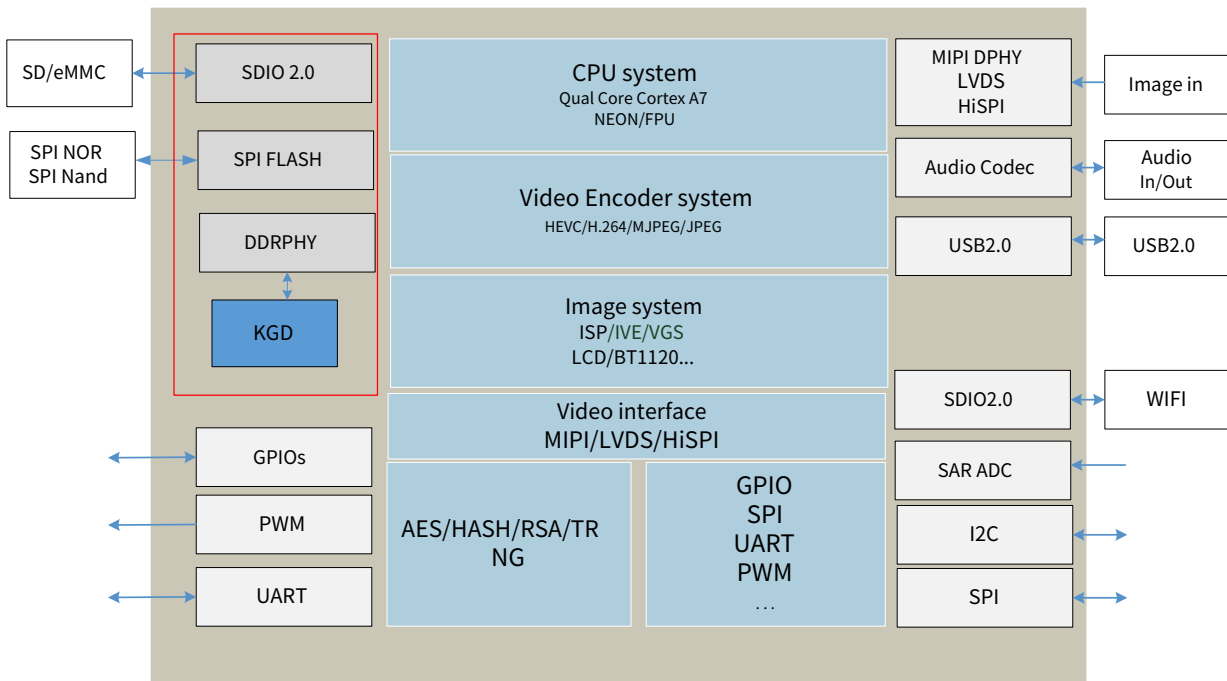
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1 Overview

The GK7202V300 chip is a new generation consumer Camera SOC chip launched by Guoke for the consumer Camera market that supports ISP and H.265 encoding. piece.

The chip integrates a dedicated ISP, has efficient video encoding processing performance, supports H.265 encoding, and meets various differentiated business needs of customers. set It has RTC, POR, Audio codec and rich peripheral interfaces to help customers reduce BOM costs. Through low-power CPU and low-power architecture, it helps

Power customers to reduce power consumption.



picture1-1:GK7202V300Functional block diagram

2. Key Features

CPU

- ARM Cortex A7 @ 900MHz
- 32KB I-Cache, 32KB D-Cache, 128KB L2 Cache
- Integrated multimedia acceleration engine-NEONand hardwareJavaaccelerate
- Integrated hardware floating point coprocessor

Storage interface and startup

- Embed512Mb DDR2
- highest support1200Mbps
- supportSPI Nor Flash,Maximum capacity256MB
- supportSPI Nand Flash,Maximum capacity1GB
- supporteMMC 4.5, maximum support2TBcapacity
- You can choose fromSPI NororSPI NandoreMMCstart up

video encoding

- supportH.265/H.264video encoding
 - The maximum supported resolution is2304x1296
- supportMJPEG/JPEGcoding
- supportCBR/VBR/FIXQP/AVBR/QPMAP/CVBR

audio codec

- Support software codec, supportG.711,G.726,ADPCM
- Support audio3A(AEC/ANR/AGC)

Video and graphics processing

- Supports multiple application analysis
- Support video, graphicsPQpromote

-supportISP

safe handling

- Supports algorithms such as AES/RSA
- Support HASH
- supportOTP
- supportTRNG

Audio and video interface

- video input
 - supportMIPI,LVDS,HiSPlinterface
 - Support various mainstream HDsensor
- video output
 - supportLCDoutput
 - supportBT656/BT1120output
- audio port
 - supportmic/line inenter
 - supportline outoutput
 - supportI2S

Peripherals and others

- support oneUSB2.0 Host/Deviceinterface
- support oneSDIO2.0andSD2.0Card
- support10M/100MEthernet, built-inEPHY
- Support fourPWM
- Support threeUARTinterface
- Support dual channelSAR ADC

- multipleI2Cinterface; multipleGPIOinterface
- supportSPIinterface
- Built-in high precisionRTC

Physical specifications

- Operating Voltage
 - CoreVoltage:0.9v
 - IOVoltage:3.3v
 - SDRAMVoltage:1.8v
- Package:
 - QFN 9mm*9mm,88pins

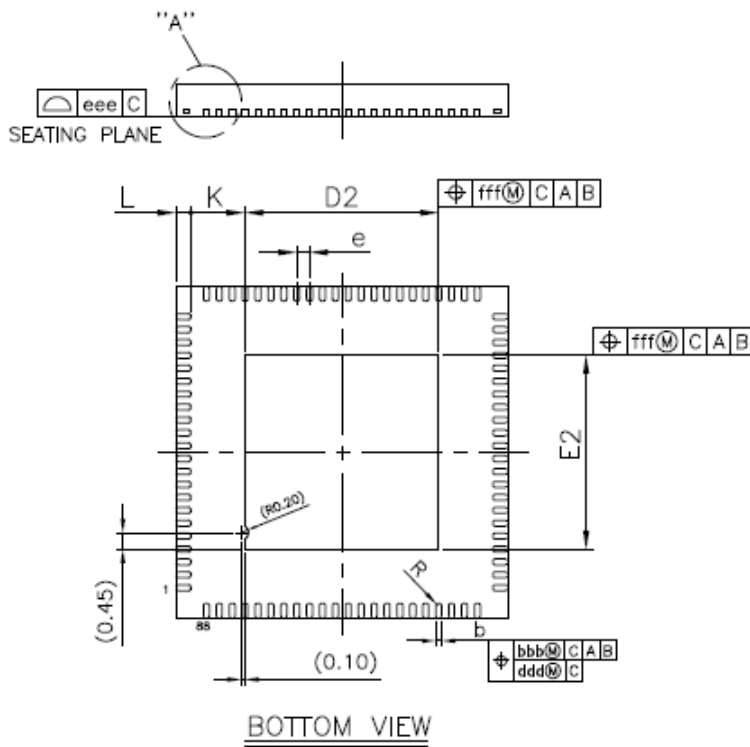
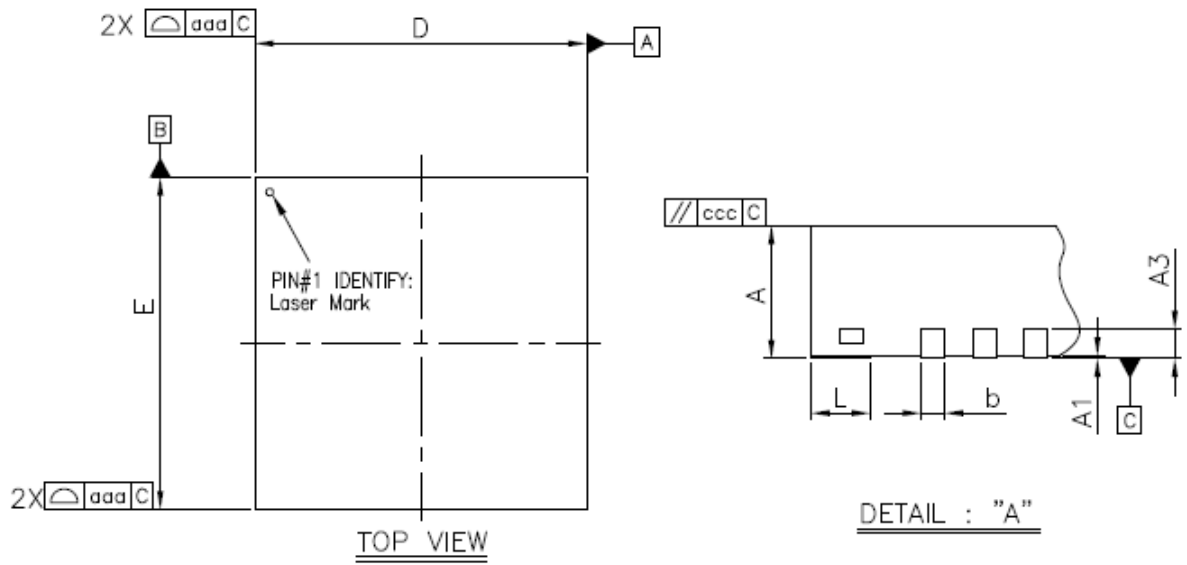


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3. Package and pin distribution

3.1. Encapsulation

The GK7202V300 chip is packaged in QFN. The package size is 9mm×9mm, the pin pitch is 0.35mm, and the total number of pins is 88. Please refer to the figure for detailed packaging.



picture3-1GK7202V300 chip package diagram

Table 3-1 GK7202V300 chip packaging parameters

Symbol	Dimension in mm			Dimension in inch		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.90	0.95	0.033	0.035	0.037
A1	0.00	0.02	0.05	0.000	0.001	0.002
A3	0.20 REF			0.008 REF		
b	0.11	0.16	0.21	0.004	0.006	0.008
D	8.90	9.00	9.10	0.350	0.354	0.358
E	8.90	9.00	9.10	0.350	0.354	0.358
D2	5.16	5.26	5.36	0.203	0.207	0.211
E2	5.16	5.26	5.36	0.203	0.207	0.211
e	0.35 BSC			0.014 BSC		
L	0.30	0.40	0.50	0.012	0.016	0.020
K	0.20	---	---	0.008	---	---
R	0.055	---	0.105	0.002	---	0.004
aaa	0.10			0.004		
bbb	0.07			0.003		
ccc	0.10			0.004		
ddd	0.05			0.002		
eee	0.08			0.003		
fff	0.10			0.004		

NOTE:

1. CONTROLLING DIMENSION : MILLIMETER

2. REFERENCE DOCUMENT: JEDEC MO-220.

3.2. Pin distribution

PIN 1		88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67
		PWR_RSTN	LSADC_CH0	LSADC_CH1	JTAG_ID0	JTAG_ID1	DVDD33	JTAG_TMS	JTAG_TCK	JTAG_TRSTN	VDD	VDDIO_DDR	VDD	AVDD33_DDR_PLL	VDDIO_DDR	UART0_RXD	UART0_TXD	GPI00_0	PWM1	PWM0	SYS_RSTN_OUT	SFC_MOSI_IO0	SFC_CLK
1	PWR_SEQ	<h1>GK7202V300</h1>																				SFC_HOLD_IO3	66
2	PWR_BUTTON																					SFC_CSN	65
3	PWR_WAKEUP																					SFC_MISO_IO1	64
4	AVDD_BAT																					SFC_WP_IO2	63
5	RTC_XIN																					VDD	62
6	RTC_XOUT																					SDIO0_CARD_DETECT	61
7	AVDD33_PLL																					SDIO0_CDATA1	60
8	AVDD_PLL																					DVDD3318_FLASH	59
9	XIN																					SDIO0_CDATA0	58
10	XOUT																					SDIO0_CCLK_OUT	57
11	DVDD3318_OSC_LCD																					SDIO0_CCMD	56
12	LCD_DATA0																					SDIO0_CDATA3	55
13	LCD_DATA1																					SDIO0_CDATA2	54
14	LCD_DATA2																					VDD	53
15	LCD_DATA3																					USB_DM	52
16	VDD																					USB_DP	51
17	LCD_DATA4																					AVDD33_AC_U2	50
18	LCD_DATA5																					AC_OUTL	49
19	LCD_DATA6																					AC_MICBIAS	48
20	DVDD3318_LCD																					AC_INL	47
21	LCD_DATA7																					AC_INR	46
22	LCD_CLK																					AC_VREF	45
		LCD_HS	LCD_DE	LCD_VS	DVDD33	GPI05_1	GPI05_0	I2C2_SCL	I2C2_SDA	DVDD3318_SENSOR	I2CO_SDA	I2CO_SCL	SENSOR_CLK	SENSOR_RSTN	VDD	AVDD3318_MIPIRX	MIPI_RX_CHOP	MIPI_RX_CHON	MIPI_RX_D0P	MIPI_RX_D0N	MIPI_RX_D2P	MIPI_RX_D2N	AVSS_AC
		23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44

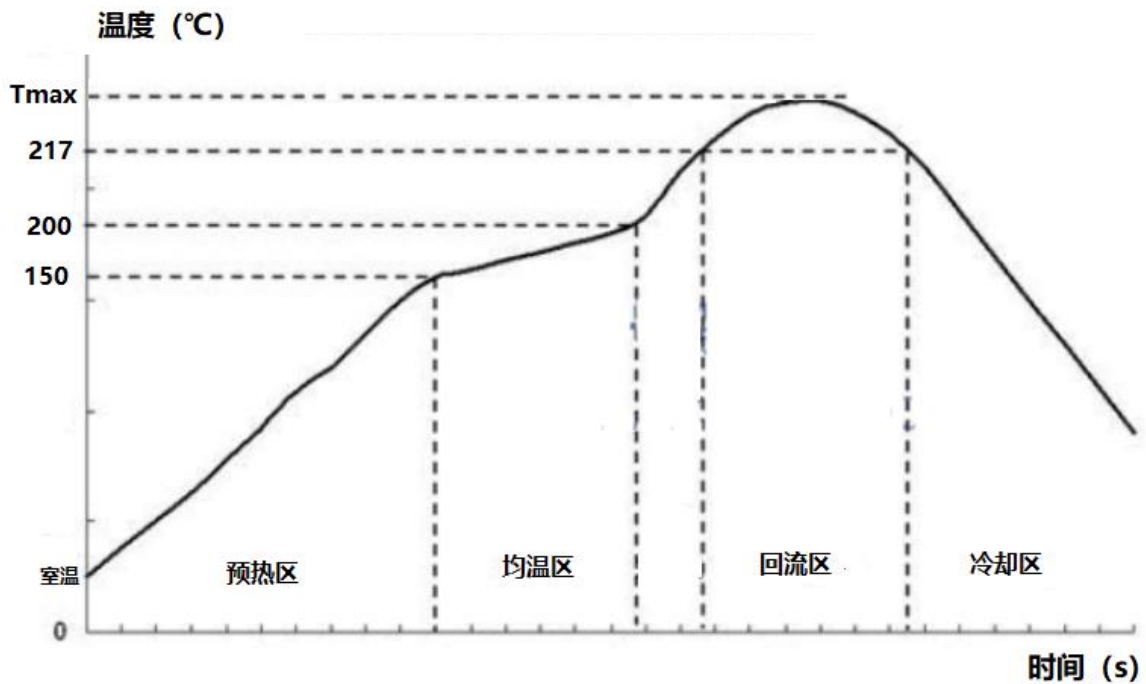
picture3-2GK7202V300 pin distribution diagram

4. Hardware features

4.1 Welding process recommendations

4.1.1 Lead-free reflow soldering process parameter requirements

The lead-free reflow soldering process curve is as shown in the figure4-1shown.



picture4-1.Lead-free reflow soldering process curve

Lead-free reflow soldering process parameters are as shown in the table4-1shown.

surface4-1Lead-free reflow soldering process parameters

welding area	time	Heating rate	peak temperature	cooling rate
Preheating zone (room temperature ~150°C)	60~150s	≤2.0°C/s	-	-

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Uniform temperature zone (150~200°C)	60~120s	<1.0°C/s	-	-
Return area (>217°C)	60~90s	-	Tmax=230-260°C	-
cooling zone (Tmax~180°C)	-	-	-	1.0°C/s ≤ Slope ≤ 4.0°C/s

Lead-free reflow soldering process parameter description:

Preheating zone: temperature ranges from room temperature to 150°C, the temperature rise rate is controlled at 2°C/s. Around, the time in this temperature zone is 60~150s. Uniform temperature zone: the temperature is given by 150°C~200°C, the temperature rises steadily and slowly, and the temperature rise rate is less than 1°C/s, and the time in this area is controlled at 60~120s (Note: This area must be heated slowly, otherwise it will easily lead to poor welding).

Reflow zone: temperature is given by 217°C~Tmax~217°C, the entire interval time is controlled at 60~90s. The reflow time is 60~90s. As a goal, for some boards with large heat capacity that cannot meet the time requirements, the reflow time can be relaxed to 120s. Cooling zone: temperature is given by Tmax~180°C, the maximum temperature drop rate cannot exceed 4°C/s. The temperature rises from room temperature to Tmax. The total time should not exceed 6 minutes. This reflow soldering curve is only a recommended value, and the client needs to make corresponding adjustments based on actual production conditions.

4.2 Moisture sensitive parameters

This chapter stipulates the usage principles of (moisture sensitive products) and the terms involved are explained as follows:

- Floor life: The maximum time the product is allowed to remain in the workshop (environment <30°C/60%RH, after unpacking the moisture-proof packaging to reflow Before)
- Desiccant (Desiccant): A material used to absorb moisture and keep it dry
- Humidity Indicator Card (HIC): Humidity indicator card
- Moisture sensitivity level (MSL): Moisture sensitivity level
- Moisture Barrier Bag (MBB): Moisture-proof packaging bag
- Solder Reflow: Reflow soldering
- Shelf Life: Normal storage time after moisture-proof packaging

[Moisture Sensitivity Level]

The moisture sensitivity level of this product is 3 class.

4.2.1 Product moisture-proof packaging

4.2.1.1 Packaging Information

Dry vacuum packaging materials include:

- Humidity indicator card (HIC)
- Moisture-proof bag (MBB)
- Desiccant

picture4-2Schematic diagram of dry vacuum packaging materials



4.2.1.2Moisture sensitive product incoming inspection

used in production (SMT) before, after opening the vacuum bag:

- ifHICThe maximum indication point has changed (not blue or earthy), the product must refer to the table4-3conductrebake.
- ifHICmiddle10%RH dotIf it is blue or khaki, it means the product is very dry and can be vacuum sealed after just replacing the moisture-proof agent.

4.2.2Storage and use

[Storage environment]

It is recommended that the product be stored in vacuum packaging and stored in $-30^{\circ}\text{C}/60\% \text{RH}$Down.

[shelf life] (Normal storage time after moisture-proof packaging)

Storage environment$-30^{\circ}\text{C}/60\% \text{RH}$Next, vacuum packaging for storage,shelf life(storage period) no less than12months.

[floor life]

Under environmental conditions $\le 30^{\circ}\text{C}/60\%\text{RH}$, floor life See below.

surface4-2 floor lifeReference table

MSL	Floor life(out of bag) at factory ambient $\le 30^{\circ}\text{C}/60\%\text{RH}$ or as stated
1	Unlimited at $\le 30^{\circ}\text{C}/85\%\text{RH}$
2	1 year
2a	4 weeks
3	168 hours
4	72 hours
5	48 hours
5a	24 hours
6	Mandatory bake before use, must be reflowed within the time limit specified on the label

[Use of moisture-sensitive products]

- Products in $\le 30^{\circ}\text{C}/60\%\text{RH}$ Continuous or cumulative exposure under 2 hours, it is recommended to bake. Then vacuum dry and package.
- Products in $\le 30^{\circ}\text{C}/60\%\text{RH}$ The cumulative exposure does not exceed 2 hours, you don't need to bake, but it is necessary to replace the desiccant with a new one and carry out vacuum drying and packaging.

For storage and usage principles not mentioned in this article, please refer directly to **JEDEC J-STD-033A**.

4.2.3 Re-bake

[Scope of use]

Needs to be re-baked (moisture sensitive products)

[Re-baking reference table]

surface4-3 Re-Bake Reference Sheet

Body thickness	level	bake@ 125°C	bake@ $90^{\circ}\text{C} \le 5\%\text{RH}$	bake@ $40^{\circ}\text{C} \le 5\%\text{RH}$
$\le 1.4\text{mm}$	2a	3 hours	11 hours	5 days
	3	7 hours	23 hours	9 days
	4	7 hours	23 hours	9 days



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Body thickness	level	bake@125°C	bake@90°C≤5%RH	bake@40°C≤5%RH
	5	7 hours	24 hours	10 days
	5a	10 hours	24 hours	10 days
≤2.0mm	2a	16 hours	2 days	22 days
	3	17 hours	2 days	23 days
	4	20 hours	3 days	28 days
	5	25 hours	4 days	35 days
	5a	40 hours	6 days	56 days
≤4.5mm	2a	48 hours	7 days	67 days
	3	48 hours	8 days	67 days
	4	48 hours	10 days	67 days
	5	48 hours	10 days	67 days
	5a	48 hours	10 days	67ays
Remark	<p>What this table shows is the minimum baking time necessary after getting damp. When re-baking, low-temperature baking is preferred.</p> <p>For details, please refer toJEDEC</p>			

5. Electrical performance

5.1. Extreme working conditions

Permanent damage may occur if the chip is operated beyond its maximum rating under extreme operating conditions. Functional operation should be limited to the conditions given in the "Recommended Operating Conditions" section. Working under extreme operating conditions for extended periods of time may affect equipment reliability. The chip junction temperature exceeds the destructive junction temperature, which may cause physical damage to the chip.

surface5-1Extreme working conditions (VSS=0V)

parameter	symbol	scope	unit
voltage	0V9	-0.2 to +1.17	V
	1V8	- 0.2 to +2.16	
	3V3	- 0.2 to +3.96	
destructive junction temperature	T _J	125	°C

5.2. Recommended working conditions

surface5-2Recommended working conditions

parameter	symbol	Require			unit
		minimum value	Typical value	maximum value	
voltage	0V9	TBB	0.9	TBD	V
	1V8	TBD	1.8	1.89	
	3V3	2.97	3.3	3.63	
Chip ambient temperature	T _A	0	-	70	°C
Chip junction temperature	T _J	0	-	105	°C

5.3. DC electrical parameters

The DC electrical parameters of GK7202V300 are as follows shown

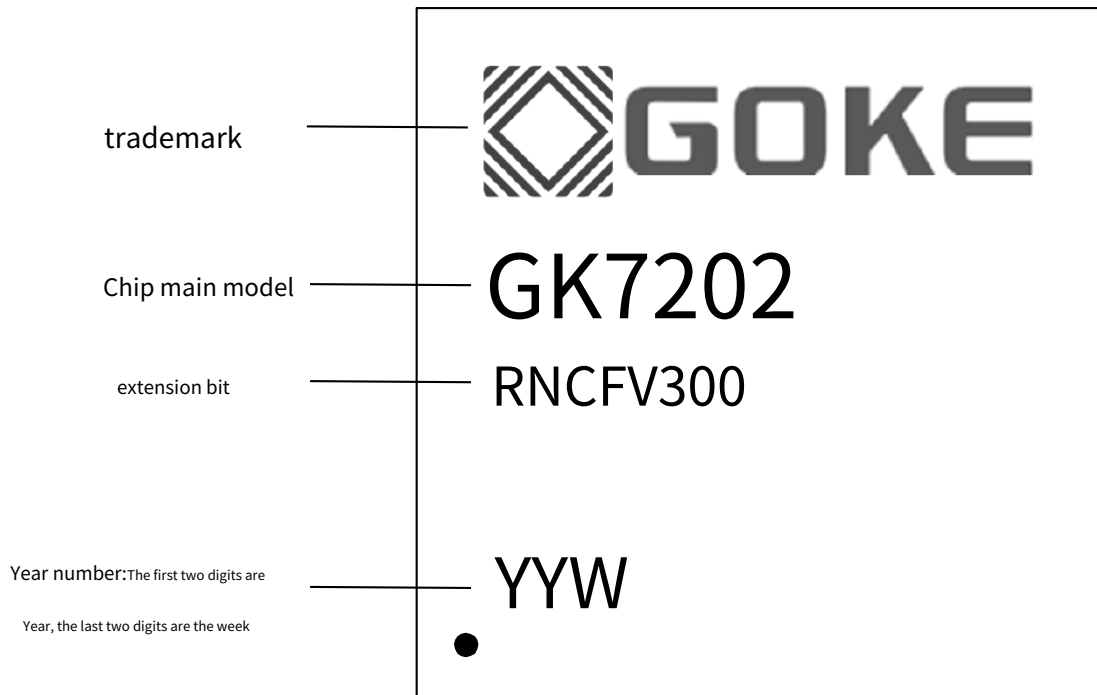
parameter	symbol	condition	minimum value	Typical value	maximum value	unit
High level output voltage	V _{OH}	IO voltage=3.3V	2.4	-	-	V
Low level output voltage	V _{OL}		-	-	0.4	
High level input voltage	V _{IH}		2	-	-	
low level input voltage	V _{IL}		-	-	0.8	

table 5-3DC electrical parameters

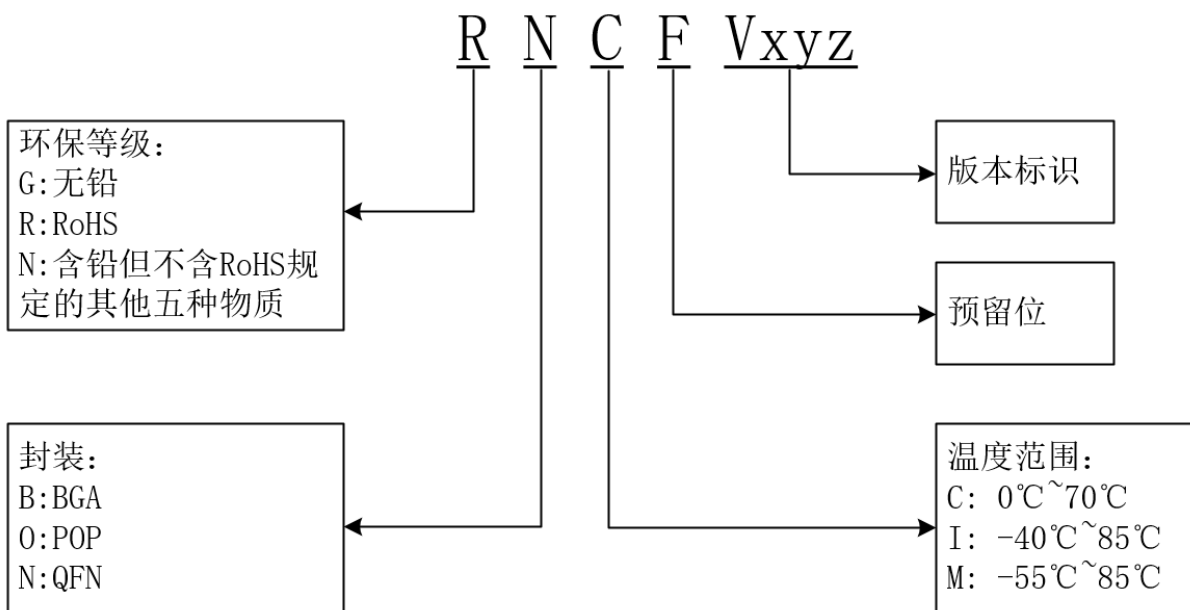
6. Ordering Information

Chip identification and definition

Chip identification:



Extension bit definition:





GK7202V300

7.RoHSillustrate

The GK7202V300 products provided by Guoke to customers are all RoHS products, that is, they are all Lead-free (lead-free) products.