深圳海视通科技有限公司

PE3519AV100　PCBA USER MANUAL

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Editor：

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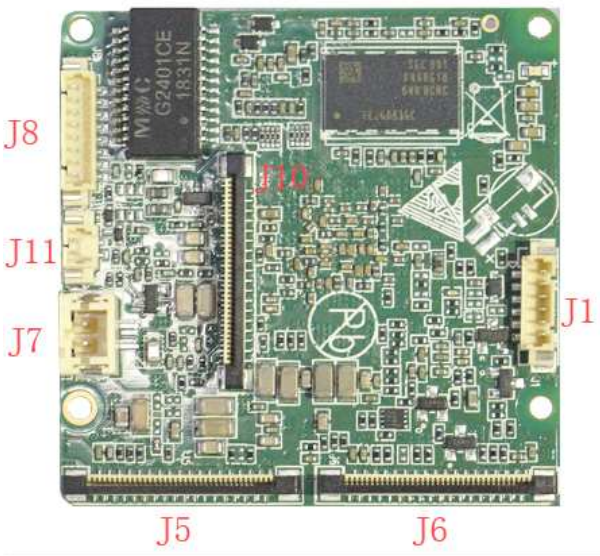
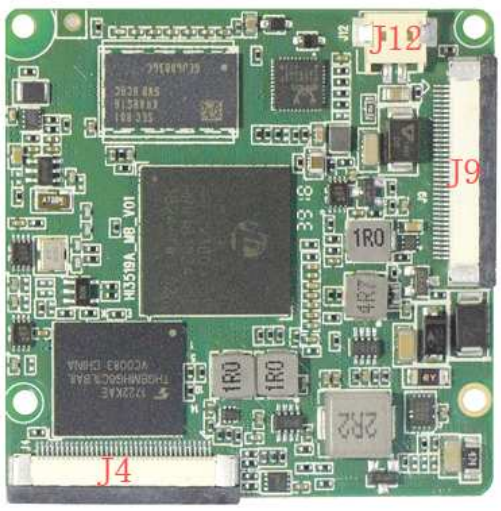
1 Preface

1.1 Abstract

Hi3519av100_MB board is a codec core board developed for Hi3519av100 media processing chip. it is used to show customers the powerful multimedia function and rich peripheral interface of Hi3519av100 chip. at the same time, we provides PCBA to customers with product hardware based on Hi3519av100 chip, which is applied to panoramic splicing (up to 5 channels) and AI products, shortens the development cycle of customer products and reduces the development cost and risk of customers. A brief description of the PCBA interface is provided below:

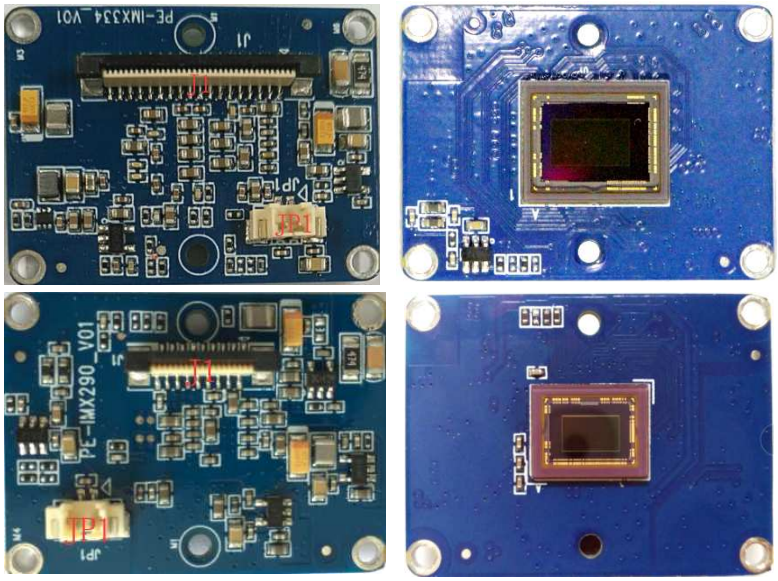
Main board





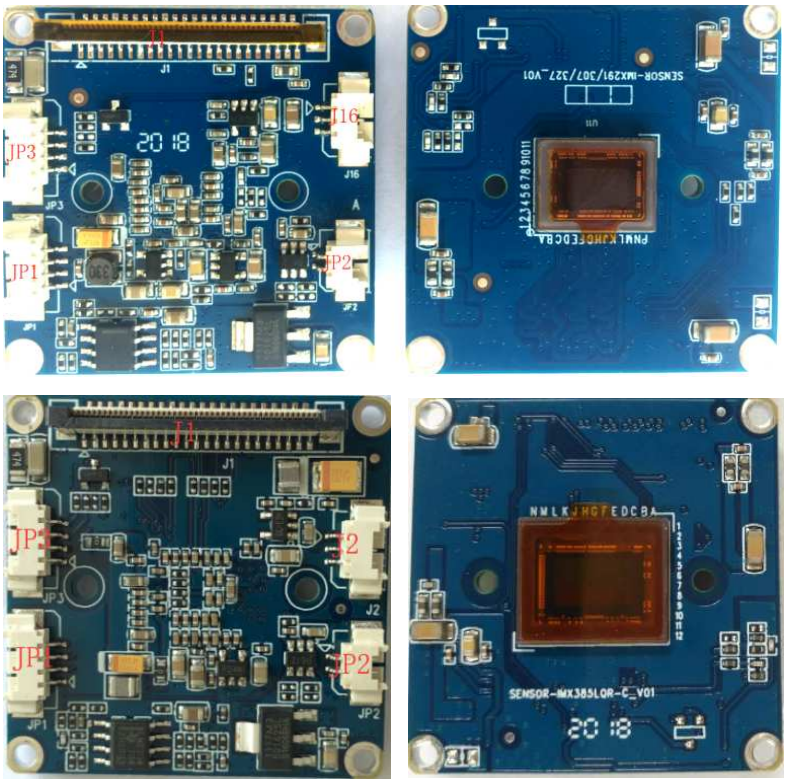
Interface No	Discription
J1	UART0、UART2 debug serial port
J4	Sensor input 1
J5	Sensor input 2
J6	Sensor input 3
J7	Power in DC12V@1A or above
J8	10/100/1000M adaptive RJ45
J9	Multi_function extended interface 1 (include SDIO、GPIO、USB2.0、Audio、UART*2)
J10	Multi_function extended interface 2 (include HDMI、USB3.0/PCIE、I2S)
J11	Photosensitive diode or photosensitive sensor interface
J12	Radiator fan interface

Sensor board(IMX334,IMX290)



Interface NO	Discription
J1	Sensor output
JP1	ICR interface

Sensor board(IMX291,IMX385)



Interface NO	Discription
J1	Sensor output
JP1	DC-IRIS interface
JP2	ICR control interface
JP3	Infrared,photosenstive control signal interface
J16/J2	DC-IRIS PWM control interface

1.2 Hardware resource

1.2.1 HI3519AV100 main feature

1) Processor core

- Dual-core ARM Cortex A53@1.4GHz, 32KB I-Cache, 32KB D-Cache /256KB L2 cache.

- Support Neon acceleration, integrated FPU Processing Unit.

2) DSP

- Integrated Tensilica Vision P6 DSP@630MHz.
- 32KB I-Cache/32KB I-RAM/512KB Data RAM.
- 0.3Tops neural network performance.

3) NNIE

- Support AlexNet、VGG、ResNet、GoogLeNet.
- Support Faster R-CNN、SSD、YoLoV2 and so on,Multiple target detection neural networks.
- 2.0Tops neural network performance.

4) CV Hardware Acceleration Engine

- Support IVE2.1 Intelligent operators, support feature pointdetection,optical flow,Computer Morphology Processing.
- Built-in binocular depth computing hardware acceleration, processing capacity 720@30fps.

5) ISP and image processing

- ISP supports multiplexing, multi-processing sensor video input.
- Support 3A (AE/AWB/AF) function, 3A parameter user adjustable.
- Support for defixed noise (FPN) .
- Supporttwo frames exposure of WDR and Local Tone Mapping, support for stronglight suppression and backlihgt compensation.
- Support for bad point correction,lens shadow correction.
- Support multi-level 3D denoising,provides excellent low illumination effect,romove motion trailing noise.
- Support 3D-LUT color conditioning.
- Support image dynamic contrast enhancement and edge enhancement processing.
- Support color correction(CAC) and remove purple edge.
- Support for defog.
- Support 6-Dof digital anti-shake and Rolling-shutter correction.

- Support for geometric correction of lens distortion and fish-eye correction.
- Coding pre-processing OSD overlay support up to 8 regions.

6) Codec

- H.265/H.264 maximum resolution for codec up to: 8192 x 8192.
- 3840 x 2160@60fps + 720p@30fps encode, 3840 x 2160@60fps decode, 3840 x 2160@30fps encode + 3840 x 2160@30fps decode.
- JPEG maximum resolution for codec up to: 8192 x 8192.
- JPEG the maximum decoding capability: 16M(4608 x 3456)@30fps.

6) Video input/output

- The maximum resolution support to 32M(7680*4320).
- Support BT.656,BT.1120 video input.
- Sensor serial input maximum support to 5 channel , support 1x12Lane/8Lane+4lane/4x2Lane +4Lane so on multiple work modes.
- Support virtual input by MIPI up to 1-4 channel YUV.
- Support HDMI2.0 4K@60fps output.

1.2.2 Core board hardware resource

SoC		HI3519AV100	
Memory	Flash	☐NAND ☐NOR ☑eMMC	☐1GB ☐2GB ☐4GB ☑8GB
	RAM	☐DDR3 ☑DDR4 ☐LPDDR4	☑2GB ☐4GB ☐8GB
RJ45 interface		8p 1.25mm wafer connector, support10/100/1000M adaptive	
Video input interface		3x36p 0.5mm FPC connector,support maximum 5 channel video input	
Debugging interface		6p 1.25mm wafer connector, for system and DSP debugging	
Light sensitive		2p 1.25mm wafer connector, support light sensitive diode or	

interface	light sensor
Heat dissipation fan interface	2p 1.50mm wafer connector
Bus extension interface	1x36p 0.5mm FPC connector, support I2S0 、HDMI 、USB3.0/PCIE Bus
Function interface	1x36p 0.5mm FPC connector, support SDIO、GPIO、audio、USB2.0、UART
RTC	☑Internal RTC ☐External RTC
Firmware encryption	☑Support ☐Not support
Temperature sensor	☑NTC resistor ☐Not support
Watchdog	☑Internal ☐External
Board size	50*50mm

1.2.3 Sensor board resource

CMOS	IMX290 2MPixel CMOS sensor (2lane Mode)
	IMX334 8MPixel CMOS sensor (4lane Mode)
	IMX385 2MPixel CMOS sensor (4lane Mode)
	IMX327 2MPixel CMOS sensor (4lane Mode)
ICR port	2pin wafer ICR Interface
Data port	36pin FPC connector/18pin FPC connector

1.3 Development component list

Item	Spec.	Quantity

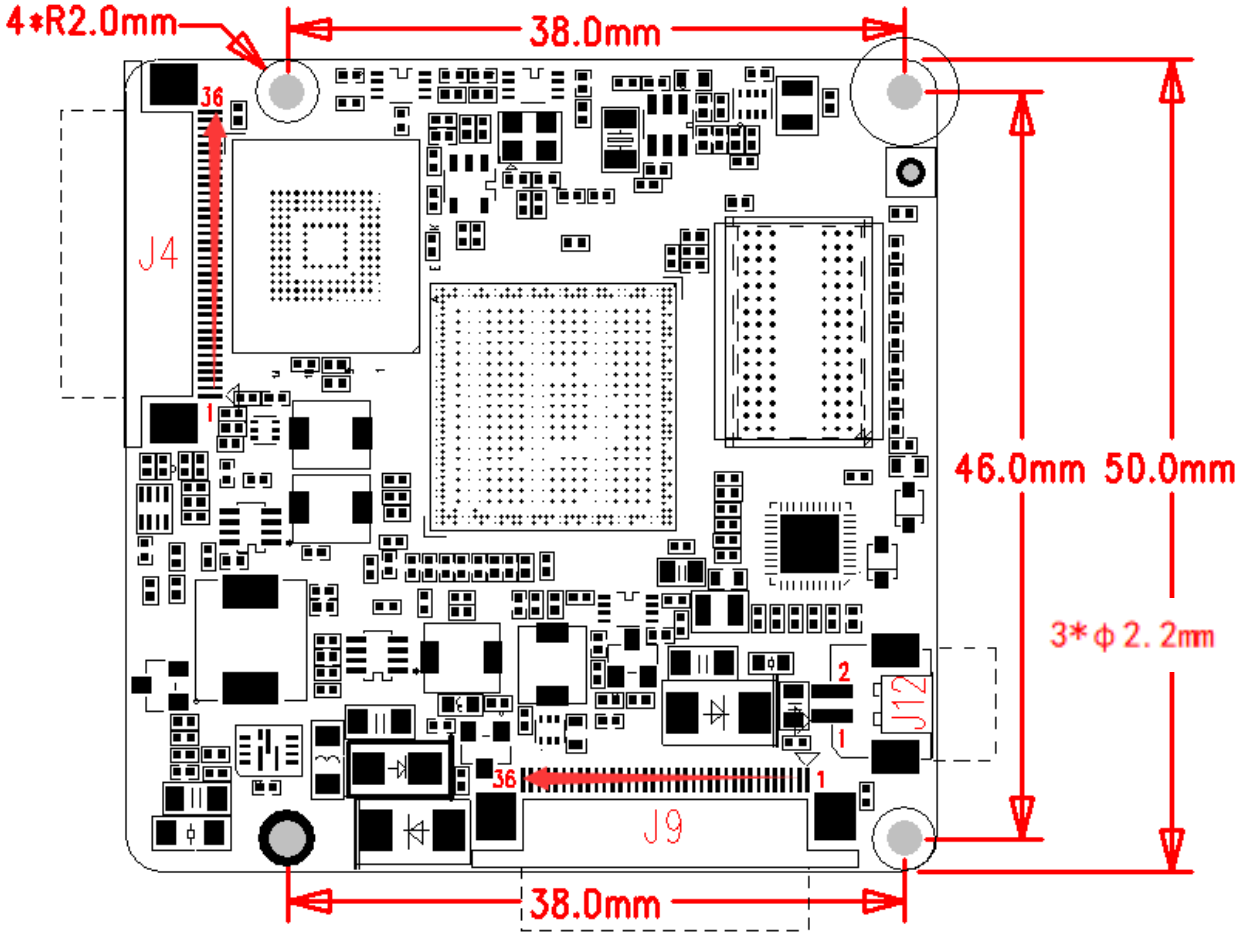
Core-Board	PE3559AV100_MB_V02	1
CMOS Board (Optional)	PE-IMX290_V01	8 (For Panoramic camera)
	PE-IMX334_V01	4 (For Panoramic camera)
	Sensor-IMX385_V01	1 (For AI camera)
	Sensor-IMX327_V01	1 (For AI camera)
Cables	LVDS36P/FPC36P/Network/Uart	To Be Define

2 Hardware introduce

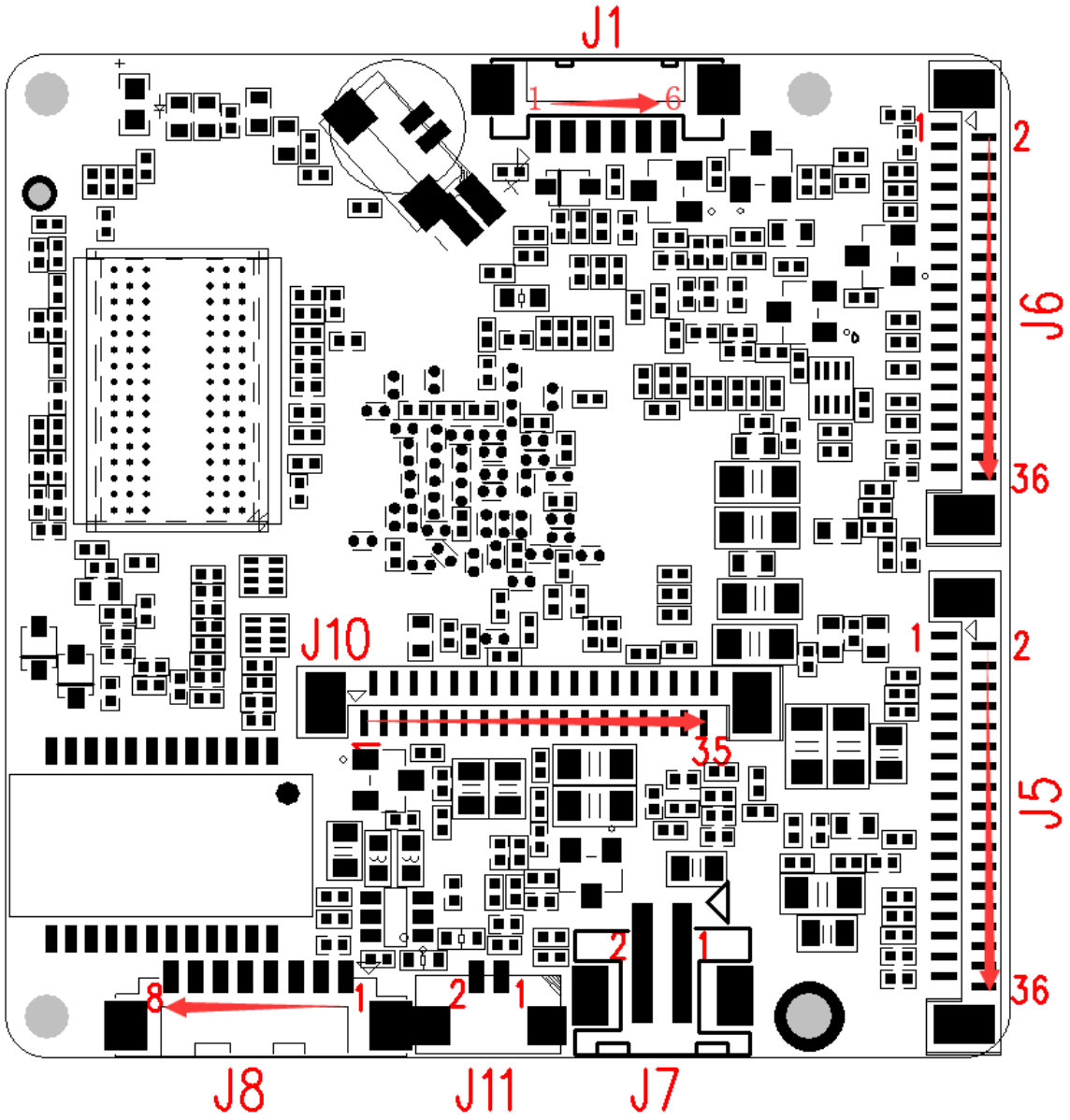
2.1 PE3519AV100 hardware introduce

2.1.1 Structure and interface

PCBA （top view）



PCBA （bottom view）



sheet 2-1 Interface introduction

J6 connector ---3rd SENSOR （Spec.-FPC36p_0.5mm_Vertical）					
Pin No./Name		Function	Pin No./Name		Function
PIN1	5V0_SEN	5.0V Output(500mA)	PIN2	GND	Digital GND
PIN3	3V3_SEN	3.3V Output(500mA)	PIN4	IRC3	ICR control signal
PIN5	I2C6_SCL	I2C6 Clock signal	PIN6	I2C6_SDA	I2C6 Data signal

PIN7	SEN_VS2	CMOS Vertical sync	PIN8	SEN_HS2	CMOS Horizontal sync
PIN9	SEN_RST2	CMOS reset signal	PIN10	SEN_CLK2_B	CMOS Main clock B
PIN11	GND	Digital GND	PIN12	MIPI2_D3N	MIPI Data 3-
PIN13	MIPI2_D3P	MIPI Data 3+	PIN14	MIPI2_D1N	MIPI Data 1-
PIN15	MIPI2_D1P	MIPI Data 1+	PIN16	MIPI2_CK1N	MIPI clock 1-
PIN17	MIPI2_CK1P	MIPI clock 1+	PIN18	GND	Digital GND
PIN19	GND	Digital GND	PIN20	MIPI2_CK0P	MIPI clock 0+
PIN21	MIPI2_CK0N	MIPI clock 0-	PIN22	MIPI2_D0P	MIPI Data 0+
PIN23	MIPI2_D0N	MIPI Data 0-	PIN24	MIPI2_D2P	MIPI Data 2+
PIN25	MIPI2_D2N	MIPI Data 2-	PIN26	GND	Digital GND
PIN27	SEN_CLK2_A	CMOS Main clock A	PIN28	SEN_RST2	ICR control signal
PIN29	SEN_HS2	CMOS Horizontal sync	PIN30	SEN_VS2	CMOS Vertical sync
PIN31	I2C5_SDA	I2C5 Data signal	PIN32	I2C5_SCL	I2C5 Clock signal
PIN33	IRC3	ICR control signal	PIN34	3V3_SEN	3.3V Output(500mA)
PIN35	GND	Digital GND	PIN36	5V0_SEN	5.0V Output(500mA)

J5 connector---2nd SENSOR (Spec.-FPC36p_0.5mm_Vertical)

Pin No./Name		Function	Pin No./Name		Function
PIN1	5V0_SEN	5.0V Output(500mA)	PIN2	GND	Digital GND
PIN3	3V3_SEN	3.3V Output(500mA)	PIN4	IRC2	ICR control signal
PIN5	I2C4_SCL	I2C4 Clock signal	PIN6	I2C4_SDA	I2C4 Data signal
PIN7	SEN_VS1	CMOS Vertical sync	PIN8	SEN_HS1	CMOS Horizontal sync
PIN9	SEN_RST1	CMOS reset signal	PIN10	SEN_CLK1_B	CMOS Main clock B
PIN11	GND	Digital GND	PIN12	MIPI1_D3N	MIPI Data 3-
PIN13	MIPI1_D3P	MIPI Data 3+	PIN14	MIPI1_D1N	MIPI Data 1-
PIN15	MIPI1_D1P	MIPI Data 1+	PIN16	MIPI1_CK1N	MIPI clock 1-
PIN17	MIPI1_CK1P	MIPI clock 1+	PIN18	GND	Digital GND

PIN19	GND	Digital GND	PIN20	MIPI1_CK0P	MIPI clock 0+
PIN21	MIPI1_CK0N	MIPI clock 0-	PIN22	MIPI1_D0P	MIPI Data 0+
PIN23	MIPI1_D0N	MIPI Data 0-	PIN24	MIPI1_D2P	MIPI Data 2+
PIN25	MIPI1_D2N	MIPI Data 2-	PIN26	GND	Digital GND
PIN27	SEN_CLK1_A	CMOS Main clock A	PIN28	SEN_RST1	CMOS reset signal
PIN29	SEN_HS1	CMOS Horizontal sync	PIN30	SEN_VS1	CMOS Vertical sync
PIN31	I2C3_SDA	I2C3 Data signal	PIN32	I2C3_SCL	I2C3 Clock signal
PIN33	IRC2	ICR control signal	PIN34	3V3_SEN	3.3V Output(500mA)
PIN35	GND	Digital GND	PIN36	5V0_SEN	5.0V Output(500mA)

J4 连接器---1st SENSOR （规格.-FPC36p_0.5mm_Horizontal)

Pin No./Name		Function	Pin No./Name		Function
PIN1	5V0_SEN	5.0V Output(500mA)	PIN2	GND	Digital GND
PIN3	3V3_SEN	3.3V Output(500mA)	PIN4	IRC1	ICR control signal
PIN5	I2C1_SCL	I2C1 Clock signal	PIN6	I2C1_SDA	I2C1 Data signal
PIN7	SEN_VS0	CMOS Vertical sync	PIN8	SEN_HS0	CMOS Horizontal sync
PIN9	SEN_RST0	CMOS reset signal	PIN10	SEN_CLK0	CMOS Main clock
PIN11	GND	Digital GND	PIN12	MIPI0_D2N	MIPI Data 2-
PIN13	MIPI0_D2P	MIPI Data 2+	PIN14	MIPI0_D0N	MIPI Data 0-
PIN15	MIPI0_D0P	MIPI Data 0+	PIN16	MIPI0_CK0N	MIPI clock 0-
PIN17	MIPI0_CK0P	MIPI clock 0+	PIN18	GND	Digital GND
PIN19	GND	Digital GND	PIN20	N/A	N/A
PIN21	N/A	N/A	PIN22	MIPI0_D1P	MIPI Data 1+
PIN23	MIPI0_D1N	MIPI Data 1-	PIN24	MIPI0_D3P	MIPI Data 3+
PIN25	MIPI0_D3N	MIPI Data 3-	PIN26	GND	Digital GND
PIN27	IRIS_PWM	DC-IRIS_PWM	PIN28	N/A	N/A
PIN29	N/A	N/A	PIN30	N/A	N/A

PIN31	12C2_SDA	I2C2 Data signal	PIN32	12C2_SCL	I2C2 Clock signal
PIN33	N/A	N/A	PIN34	3V3_SEN	3.3V Output(500mA)
PIN35	GND	Digital GND	PIN36	5V0_SEN	5.0V Output(500mA)

J8 connector---Network port (Spec.-wafer_8p_1.25mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	TX0+	RJ45-1	PIN2	TX0-	RJ45-2
PIN3	TX1+	RJ45-3	PIN4	TX1-	RJ45-6
PIN5	TX2+	RJ45-4	PIN6	TX2-	RJ45-5
PIN7	TX3+	RJ45-7	PIN8	TX3-	RJ45-8
J1 connector---Debugging (Spec.-wafer_6p_1.25mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	UART2_TX_1V8	UART TX signal	PIN2	UART2_RX_1V8	UART RX signal
PIN3	UART0_TX_3V3	UART TX signal	PIN4	UART0_RX_3V3	UART RX signal
PIN5	GND	Digital GND	PIN6	3V3	3.3V Output
J7 connector--- (Spec.Power supply-wafer_2p_2.0mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	DC12V_IN	DC12V Input	PIN2	GND	Power Ground
J12 connector---Heat dissiption Fan (Spec.-wafer_2p_1.5mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	FAN+	FAN positive	PIN2	FAN-	FAN negative
J11 connector--- Light sensor (Spec.-wafer_2p_1.5mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	CDS+	Photodiode +	PIN2	CDS-	Photodiode -

J9 connector--- Multiple function (Spec.-FPC36p_0.5mm_Horizontal)

Pin No./Name		Signal Level	Pin No./Name		Signal Level
PIN1	SDO_VOUT	3.3V/1.8V	PIN19	Uart5-TXD	1.8V
PIN2	GND	0V	PIN20	GPIO1_7	1.8V
PIN3	SDO_CLK	3.3V/1.8V	PIN21	GPIO1_6	1.8V
PIN4	SDO_D3	3.3V/1.8V	PIN22	PTZ_PWR_EN	1.8V (GPIO8_6)
PIN5	SDO_D2	3.3V/1.8V	PIN23	GPIO1_2	1.8V
PIN6	SDO_D1	3.3V/1.8V	PIN24	GPIO11_5	1.8V
PIN7	SDO_D0	3.3V/1.8V	PIN25	ALARM OUT	1.8V (GPIO2_2)
PIN8	SDO_CMD	3.3V/1.8V	PIN26	FACTORY RESET	1.8V (GPIO2_3)
PIN9	SDO_DET	3.3V	PIN27	LED1(100M)	3.3V
PIN10	GND	0V	PIN28	LED2(1000M)	3.3V
PIN11	USB_DP0	standard	PIN29	ALARM IN	1.8V (GPIO8_7)
PIN12	USB_DM0	standard	PIN30	AC_OUTL	-
PIN13	USBPWR_EN	1.8V	PIN31	AC_OUTR	-
PIN14	Uart3-RTSN	1.8V	PIN32	GND	0V
PIN15	Uart3-CTSN	1.8V	PIN33	AC_INOL	-
PIN16	Uart3-TXD	1.8V	PIN34	AC_INOR	-
PIN17	Uart3-RXD	1.8V	PIN35	GND	0V
PIN18	Uart5-RXD	1.8V	PIN36	5V0(250mA)	5.0V

J10 Connector--- (Spec.-FPC36p_0.5mm_Vertical) **(Green unit is the default function)**

Pin No./Name		Signal Level	Function 1	Function 2	Function 3
PIN1	HDMI_TX2P	standard	HDMI_TX2P	N/A	N/A
PIN2	HDMI_TX2N	standard	HDMI_TX2N	N/A	N/A
PIN3	GND	0.0V	GND	N/A	N/A
PIN4	HDMI_TX1P	standard	HDMI_TX1P	N/A	N/A

PIN5	HDMI_TX1N	standard	HDMI_TX1N	N/A	N/A
PIN6	HDMI_TX0P	standard	HDMI_TX0P	N/A	N/A
PIN7	HDMI_TX0N	standard	HDMI_TX0N	N/A	N/A
PIN8	GND	0.0V	GND	N/A	N/A
PIN9	HDMI_TXCP	standard	HDMI_TXCP	N/A	N/A
PIN10	HDMI_TXCN	standard	HDMI_TXCN	N/A	N/A
PIN11	HDMI_CEC	3.3V	HDMI_CEC	N/A	N/A
PIN12	HDMI_SDA	5.0V	HDMI_SDA	N/A	N/A
PIN13	HDMI_SCL	5.0V	HDMI_SCL	N/A	N/A
PIN14	HDMI_HPLUG	5.0V	HDMI_HPLUG	N/A	N/A
PIN15	5V0	5.0V	5V0	5V0	5V0
PIN16	GND	0.0V	GND	GND	GND
PIN17	PCIE_REFCLKP	standard	PCIE_REFCLKP	N/A	N/A
PIN18	PCIE_REFCLKM	standard	PCIE_REFCLKM	N/A	N/A
PIN19	GND	0.0V	GND	GND	GND
PIN20	PCIE_TX0P	standard	USB3_TX0P	PCIE_TX0P	N/A
PIN21	PCIE_TX0M	standard	USB3_TX0M	PCIE_TX0M	N/A
PIN22	PCIE_RX0P	standard	USB3_RX0P	PCIE_RX0P	N/A
PIN23	PCIE_RX0M	standard	USB3_RX0M	PCIE_RX0M	N/A
PIN24	GND	0.0V	GND	GND	GND
PIN25	USB3_DP	standard	USB3_DP	N/A	N/A
PIN26	USB3_DM	standard	USB3_DM	N/A	N/A
PIN27	USB_PWR_EN	1.8V	GPIO9_0	USB_PWR_EN	N/A
PIN28	PCIE_CLK_REQ	3.3V	PCIE_CLK_REQ	N/A	N/A
PIN29	PCIE_RSTN_1V8	1.8V	GPIO2_1	JTAG_TCK	UART7_TXD
PIN30	I2C0_SCL	1.8V	I2C0_SCL	N/A	N/A
PIN31	I2C0_SDA	1.8V	I2C0_SDA	N/A	N/A
PIN32	I2S0_MCLK	1.8V	GPIO2_0	JTAG_TRSTN	I2S0_MCLK

PIN33	I2S0_WS	1.8V	GPIO2_5	I2S0_WS	UART8_TXD
PIN34	I2S0_BCLK	1.8V	GPIO2_4	JTAG_TDI	I2S0_BCLK
PIN35	I2S0_SD_TX	1.8V	GPIO2_6	I2S0_SD_TX	UART8_RTSN
PIN36	I2S0_SD_RX	1.8V	GPIO2_7	I2S0_SD_RX	UART8_CTSN

2.1.2 Bus line list

Table 2-3 BUS map

<table>
<tr><td colspan="2">BUS Item</td><td>ADDR</td><td colspan="4">Function</td></tr>
<tr><td>I2C1</td><td rowspan="2">SPI0</td><td>TBD</td><td>FOR 1st sensor</td><td rowspan="6">＞3 CH</td><td>FOR 1st sensor</td><td rowspan="6">≤3 CH</td></tr>
<tr><td>I2C2</td><td>TBD</td><td>N/A</td><td>N/A</td></tr>
<tr><td>I2C3</td><td rowspan="2">SPI1</td><td>TBD</td><td>FOR 2nd sensor</td><td>FOR 2nd sensor</td></tr>
<tr><td>I2C4</td><td>TBD</td><td>FOR 3rd sensor</td><td>N/A</td></tr>
<tr><td>I2C5</td><td rowspan="2">SPI2</td><td>TBD</td><td>FOR 4th sensor</td><td>FOR 3rd sensor</td></tr>
<tr><td>I2C6</td><td>TBD</td><td>FOR 5th sensor</td><td>N/A</td></tr>
<tr><td colspan="2">I2C0</td><td>TBD</td><td colspan="4">I2S BUS</td></tr>
<tr><td colspan="2">UART0</td><td>NULL</td><td colspan="4">System Debug</td></tr>
<tr><td colspan="2">UART1</td><td>NULL</td><td colspan="4">N/A</td></tr>
<tr><td colspan="2">UART2</td><td>NULL</td><td colspan="4">DSP Debug</td></tr>
<tr><td colspan="2">UART3</td><td>NULL</td><td colspan="4">FOR RS485</td></tr>
<tr><td colspan="2">UART5</td><td>NULL</td><td colspan="4">To be define</td></tr>
<tr><td colspan="2">USB3.0</td><td>NULL</td><td colspan="4">To be define</td></tr>
<tr><td colspan="2">USB2.0</td><td>NULL</td><td colspan="4">To be define</td></tr>
<tr><td colspan="2">HDMI</td><td>NULL</td><td colspan="4">To be define</td></tr>
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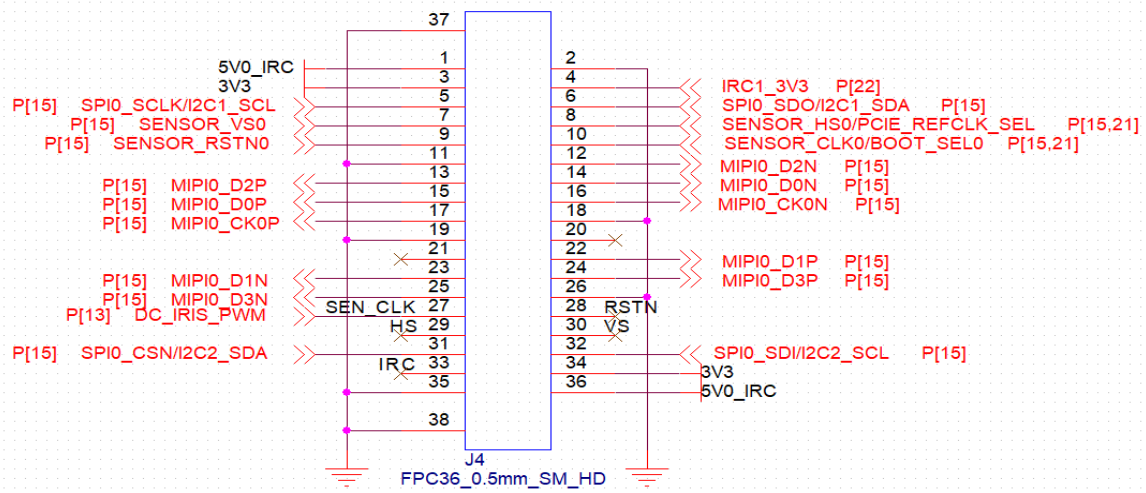
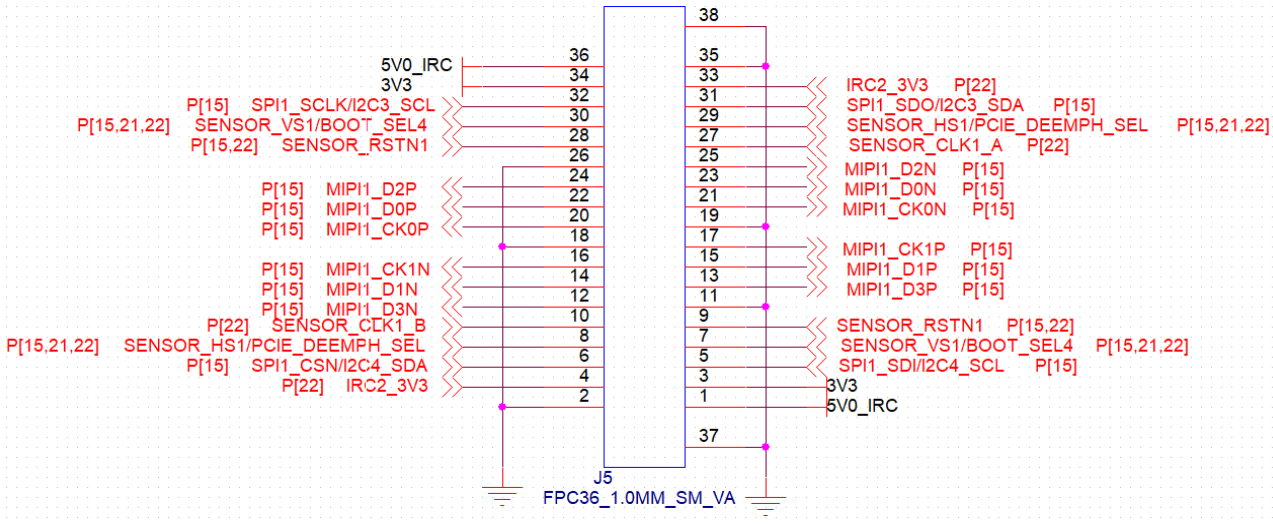
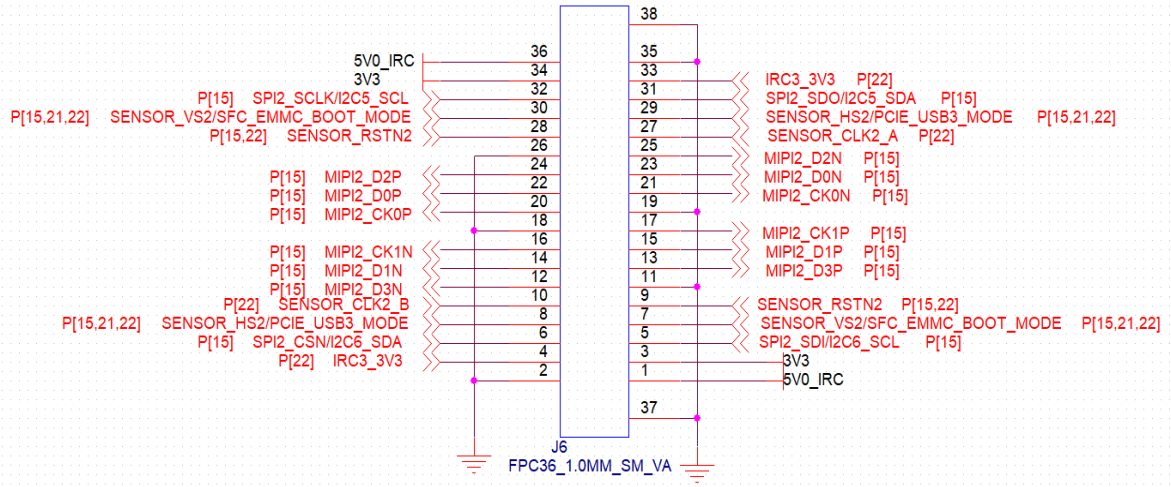
2.1.3 Interface schematic



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17
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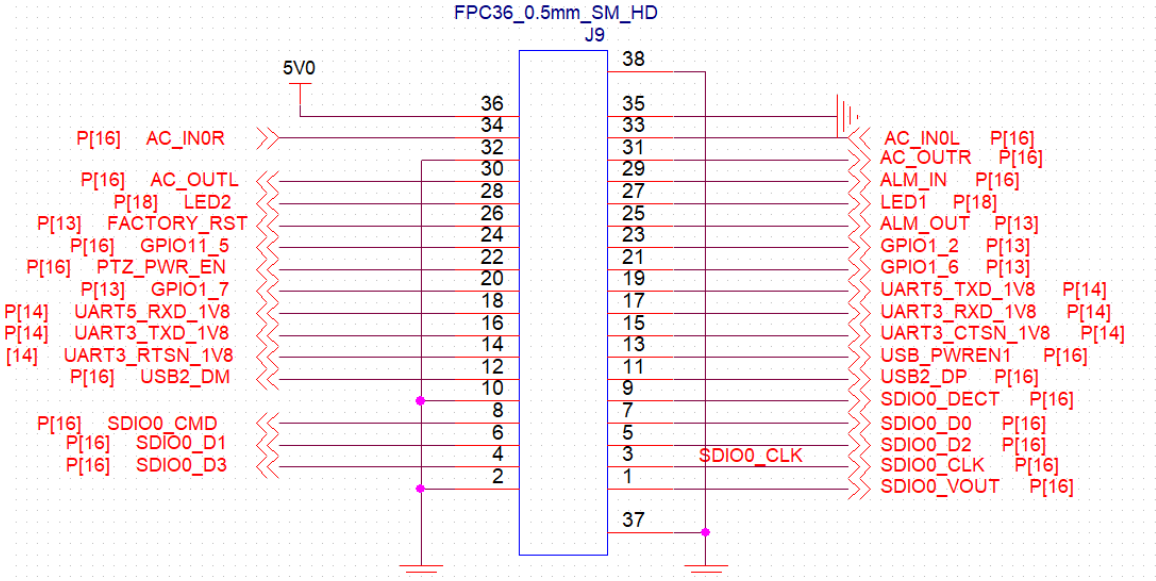
13
11
9
7
5
3
1
37
5V0_IRC
3V3
P[15] SPI2_SCLK/I2C5_SCL
P[15,21,22] SENSOR_VS2/SFC_EMMC_BOOT_MODE
P[15,22] SENSOR_RSTN2
P[15] MIPI2_D2P
P[15] MIPI2_D0P
P[15] MIPI2_CK0P
P[15] MIPI2_CK1N
P[15] MIPI2_D1N
P[15] MIPI2_D3N
P[22] SENSOR_CLK2_B
P[15,21,22] SENSOR_HS2/PCIE_USB3_MODE
P[15] SPI2_CSN/I2C6_SDA
P[22] IRC3_3V3
IRC3_3V3 P[22]
SPI2_SDO/I2C5_SDA P[15]
SENSOR_HS2/PCIE_USB3_MODE P[15,21,22]
SENSOR_CLK2_A P[22]
MIPI2_D2N P[15]
MIPI2_D0N P[15]
MIPI2_CK0N P[15]
MIPI2_CK1P P[15]
MIPI2_D1P P[15]
MIPI2_D3P P[15]
SENSOR_RSTN2 P[15,22]
SENSOR_VS2/SFC_EMMC_BOOT_MODE P[15,21,22]
SPI2_SDI/I2C6_SCL P[15]
3V3
5V0_IRC
J6
FPC36_1.0MM_SM_VA


FPC36_0.5mm_SM_HD
J9
5V0
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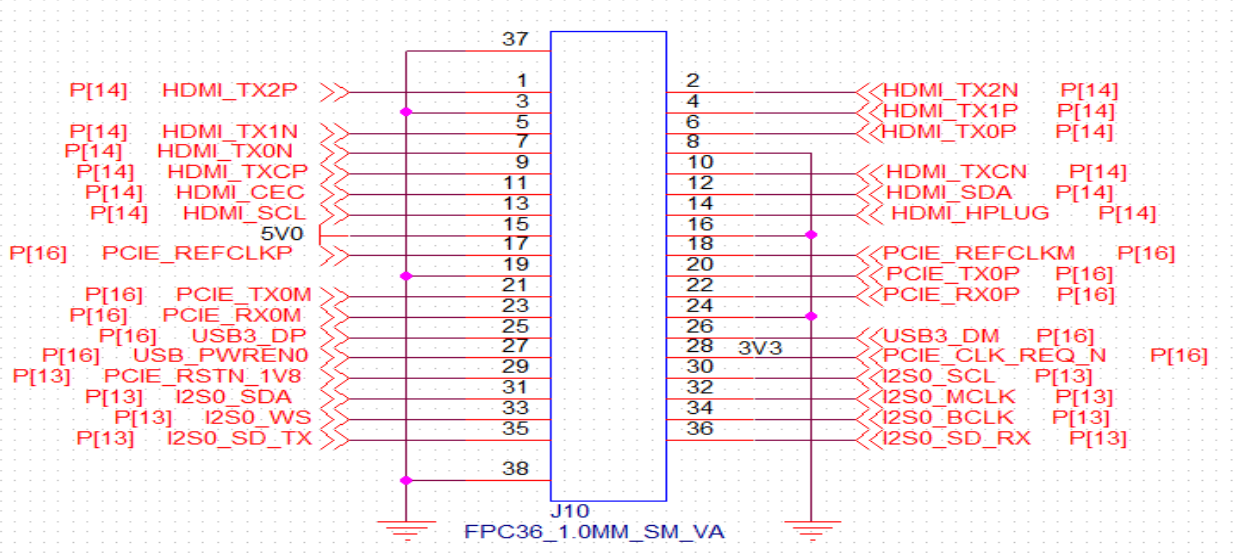
P[16] AC_IN0R
P[16] AC_OUTL
P[18] LED2
P[13] FACTORY_RST
P[16] GPIO11_5
P[16] PTZ_PWR_EN
P[13] GPIO1_7
P[14] UART5_RXD_1V8
P[14] UART3_TXD_1V8
[14] UART3_RTSN_1V8
P[16] USB2_DM
P[16] SDIO0_CMD
P[16] SDIO0_D1
P[16] SDIO0_D3
AC_IN0L P[16]
AC_OUTR P[16]
ALM_IN P[16]
LED1 P[18]
ALM_OUT P[13]
GPIO1_2 P[13]
GPIO1_6 P[13]
UART5_TXD_1V8 P[14]
UART3_RXD_1V8 P[14]
UART3_CTSN_1V8 P[14]
USB_PWREN1 P[16]
USB2_DP P[16]
SDIO0_DECT P[16]
SDIO0_D0 P[16]
SDIO0_D2 P[16]
SDIO0_CLK
SDIO0_CLK P[16]
SDIO0_VOUT P[16]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14
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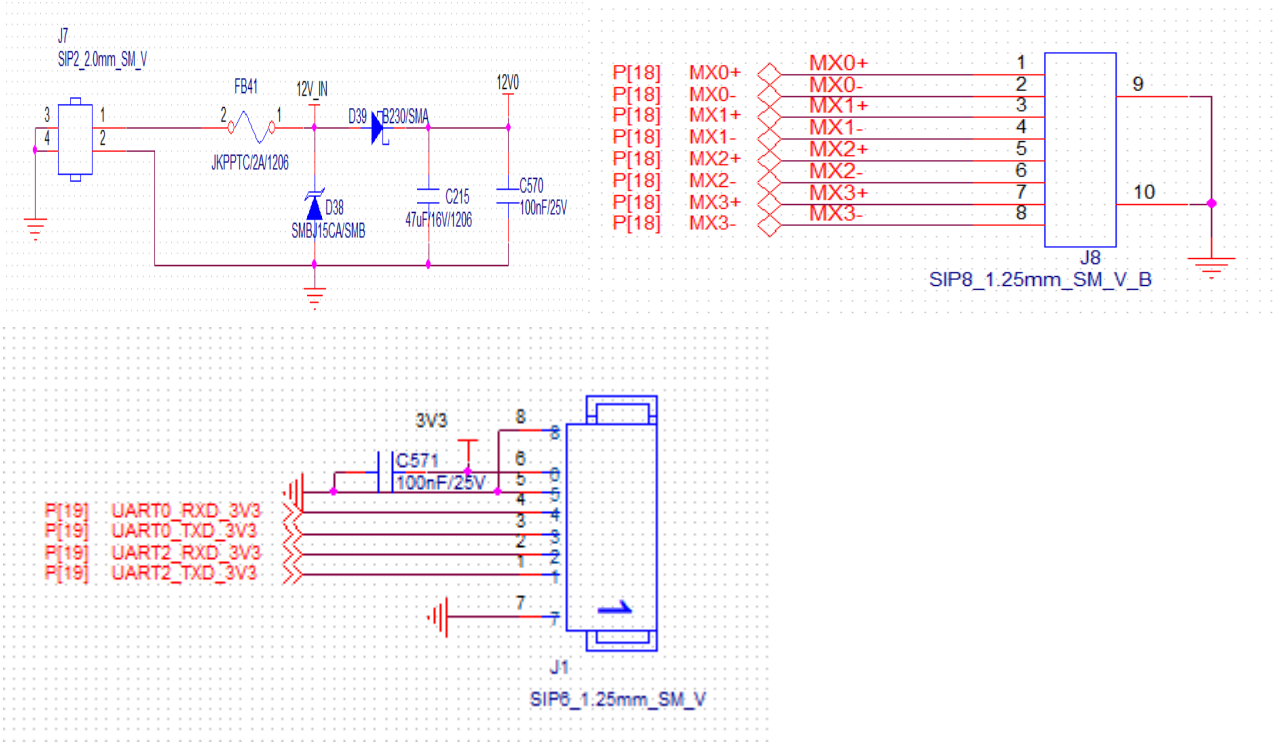
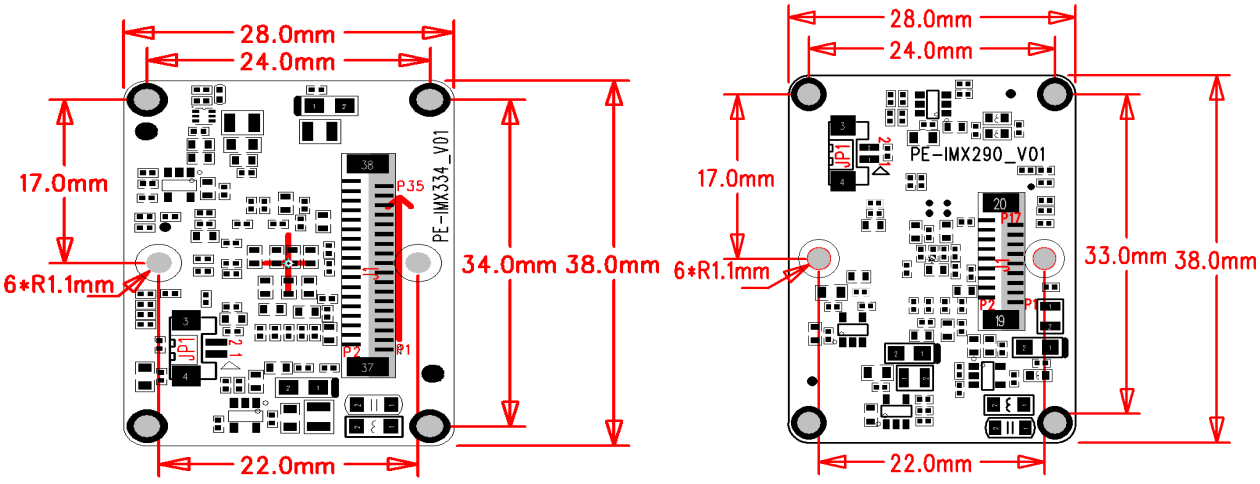
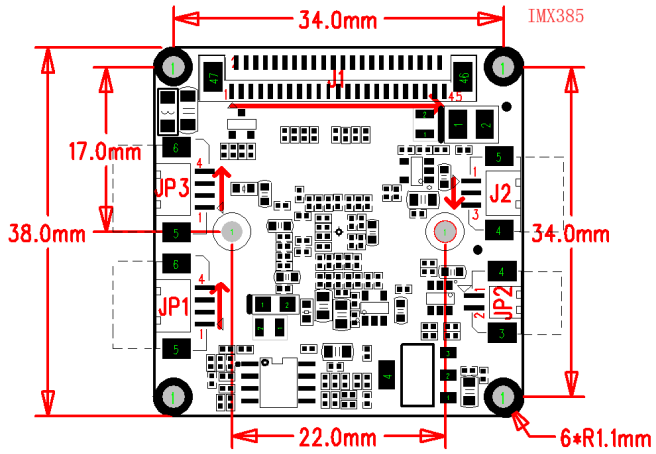
P[14] HDMI_TX2P
P[14] HDMI_TX1N
P[14] HDMI_TX0N
P[14] HDMI_TXCP
P[14] HDMI_CEC
P[14] HDMI_SCL
5V0
P[16] PCIE_REFCLKP
P[16] PCIE_TX0M
P[16] PCIE_RX0M
P[16] USB3_DP
P[16] USB_PWREN0
P[13] PCIE_RSTN_1V8
P[13] I2S0_SDA
P[13] I2S0_WS
P[13] I2S0_SD_TX
HDMI_TX2N P[14]
HDMI_TX1P P[14]
HDMI_TX0P P[14]
HDMI_TXCN P[14]
HDMI_SDA P[14]
HDMI_HPLUG P[14]
PCIE_REFCLKM P[16]
PCIE_TX0P P[16]
PCIE_RX0P P[16]
3V3
USB3_DM P[16]
PCIE_CLK_REQ_N P[16]
I2S0_SCL P[13]
I2S0_MCLK P[13]
I2S0_BCLK P[13]
I2S0_SD_RX P[13]
J10
FPC36_1.0MM_SM_VA

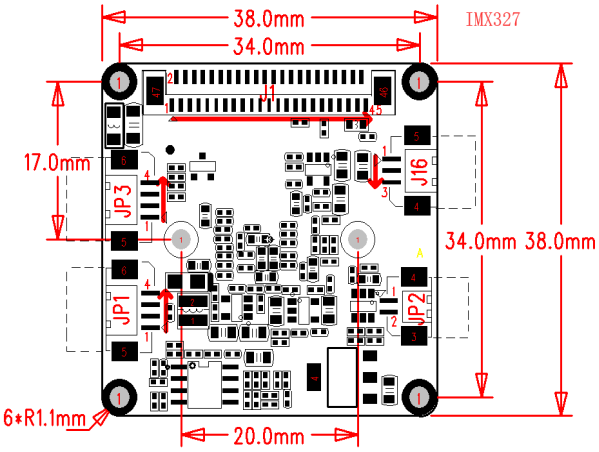


2.2 CMOS board introduction

2.2.1 Structure and Spec







Item	IMX334	IMX290	IMX385	IMX327
Resolution	8MP	2MP	2MP	2MP
Board size	28*38	28*38	38*38	38*38
ICR Hole Pitch	22mm	22mm	22mm	22mm
Working Temp	-30～85℃	-30～85℃	-30～85℃	-30～85℃

2.2.2 Interface introduction

IMX334-J1 connector (Spec.-FPC36p_0.5mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	5V0_SEN	5.0V Output(500mA)	PIN2	GND	Digital GND
PIN3	3V3_SEN	3.3V Output(500mA)	PIN4	IRC	ICR control signal
PIN5	I2C_SCL	I2C Clock signal	PIN6	I2C_SDA	I2C Data signal
PIN7	SEN_VS	CMOS Vertical sync	PIN8	SEN_HS	CMOS Horizontal sync
PIN9	SEN_RST	CMOS reset signal	PIN10	SEN_CLK_A	CMOS Main clock A
PIN11	GND	Digital GND	PIN12	MIPI_D2N	MIPI Data 2-
PIN13	MIPI_D2P	MIPI Data 2+	PIN14	MIPI_D0N	MIPI Data 0-
PIN15	MIPI_D0P	MIPI Data 0+	PIN16	MIPI_CKON	MIPI clock 0-
PIN17	MIPI_CK0P	MIPI clock 0+	PIN18	GND	Digital GND

PIN19	GND	Digital GND	PIN20	N/A	N/A
PIN21	N/A	N/A	PIN22	MIPI_D1P	MIPI Data 1+
PIN23	MIPI_D1N	MIPI Data 1-	PIN24	MIPI_D3P	MIPI Data 3+
PIN25	MIPI_D3N	MIPI Data 3-	PIN26	GND	Digital GND
PIN27	N/A	N/A	PIN28	N/A	N/A
PIN29	N/A	N/A	PIN30	N/A	N/A
PIN31	N/A	N/A	PIN32	N/A	N/A
PIN33	N/A	N/A	PIN34	3V3_SEN	3.3V Output(500mA)
PIN35	GND	Digital GND	PIN36	5V0_SEN	5.0V Output(500mA)

IMX290-J1 connector (Spec.-FPC18p_0.5mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	5V0_SEN	5.0V Output(500mA)	PIN2	GND	Digital GND
PIN3	3V3_SEN	3.3V Output(500mA)	PIN4	IRC	ICR control signal
PIN5	I2C_SCL	I2C Clock signal	PIN6	I2C_SDA	I2C Data signal
PIN7	SEN_VS	CMOS Vertical sync	PIN8	SEN_HS	CMOS Horizontal sync
PIN9	SEN_RST	CMOS reset signal	PIN10	SEN_CLK_A	CMOS Main clock A
PIN11	GND	Digital GND	PIN12	MIPI_D2N	MIPI Data 2-
PIN13	MIPI_D2P	MIPI Data 2+	PIN14	MIPI_D0N	MIPI Data 0-
PIN15	MIPI_D0P	MIPI Data 0+	PIN16	MIPI_CK0N	MIPI clock 0-
PIN17	MIPI_CK0P	MIPI clock 0+	PIN18	GND	Digital GND

IMX334/290-JP1 connector (Spec.-wafer_2p_1.25mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	ICR+	ICR control+	PIN2	ICR-	ICR control-

IMX385/327-J1 connector (Spec.-FPC45p_0.5mm_Vertical)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	MIPI1_D2M	N/A	PIN2	MIPI1_D2P	N/A
PIN3	GND	Digital GND	PIN4	MIPI1_D0M	N/A
PIN5	MIPI1_D0P	N/A	PIN6	NA	N/A
PIN7	NA	N/A	PIN8	GND	Digital GND
PIN9	MIPI1_D1M	N/A	PIN10	MIPI1_D1P	N/A
PIN11	MIPI1_D3M	N/A	PIN12	MIPI1_D3P	N/A
PIN13	GND	Digital GND	PIN14	MIPI0_D2P	MIPI Data 2+
PIN15	MIPI0_D2M	MIPI Data 2-	PIN16	MIPI0_CKP	MIPI clock +
PIN17	MIPI0_CKM	MIPI clock -	PIN18	GND	Digital GND
PIN19	MIPI0_D3P	MIPI Data 3+	PIN20	MIPI0_D3M	MIPI Data 3-
PIN21	MIPI0_D0P	MIPI Data 0+	PIN22	MIPI0_D0M	MIPI Data 0-
PIN23	GND	Digital GND	PIN24	SEN_CLK	
PIN25	MIPI0_D1M	MIPI Data 1-	PIN26	MIPI0_D1P	MIPI Data 1+
PIN27	SEN_HS	CMOS Horizontal sync	PIN28	N/A	N/A
PIN29	N/A	N/A	PIN30	SPI0_CSN	SPI Chip select
PIN31	SPI0_MISO	SPI0 input data	PIN32	SPI0_MOSI/ I2C0_SDA	SPI0 output data/ Data or addr of I2C
PIN33	SPI0_CLK/ I2C0_SCL	SPI0 output clock/ Clock of I2C	PIN34	N/A	N/A
PIN35	N/A	N/A	PIN36	SEN_VS	CMOS Vertical sync
PIN37	IRIS_PWM	DC-IRIS PWM signal	PIN38	D/N	Day/Night detection
PIN39	IRC	ICR control signal	PIN40	SEN_RSTN	Sensor reset
PIN41	3V3_CCD	3.3V Input	PIN42	GND	Digital GND
PIN43	GND	Digital GND	PIN44	12V0	12.0V Input
PIN45	12V0	12.0V Input			

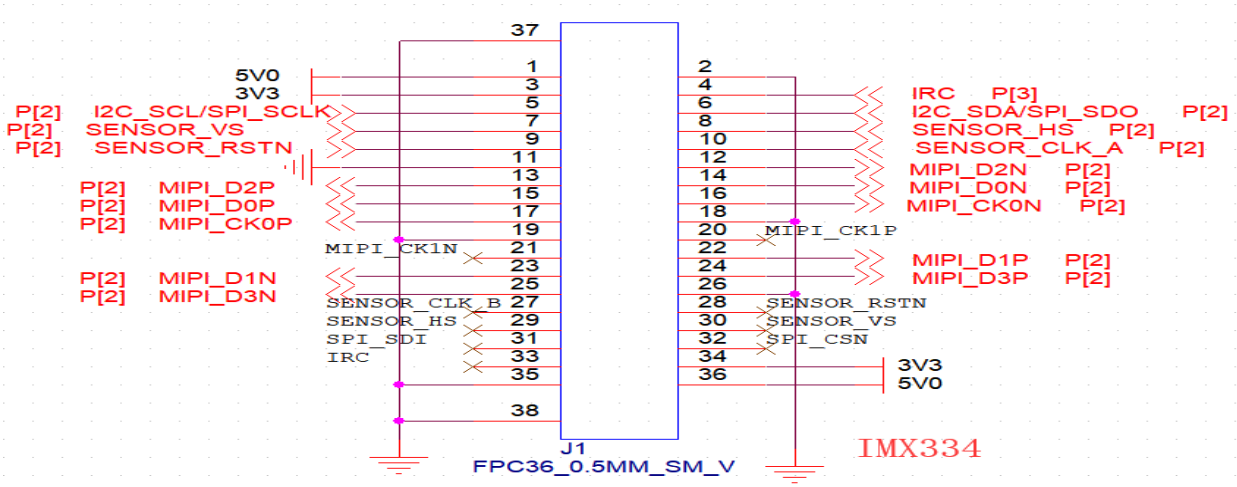
IMX385/327-JP2 connector (Spec.-wafer_2p_1.25mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	ICR+	ICR control+	PIN2	ICR-	ICR control-

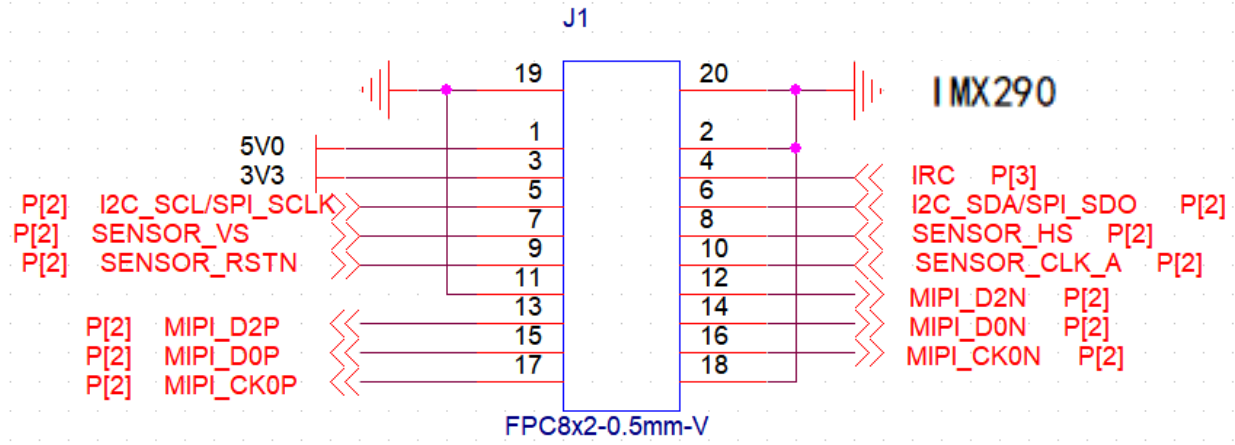
IMX385/327-JP3 connector (Spec.-wafer_4p_1.25mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	12V0	12V Output (300mA)	PIN2	GND	Power GND
PIN3	D/N_DET	Day/Night signal	PIN4	IRC	IR ON/OFF control

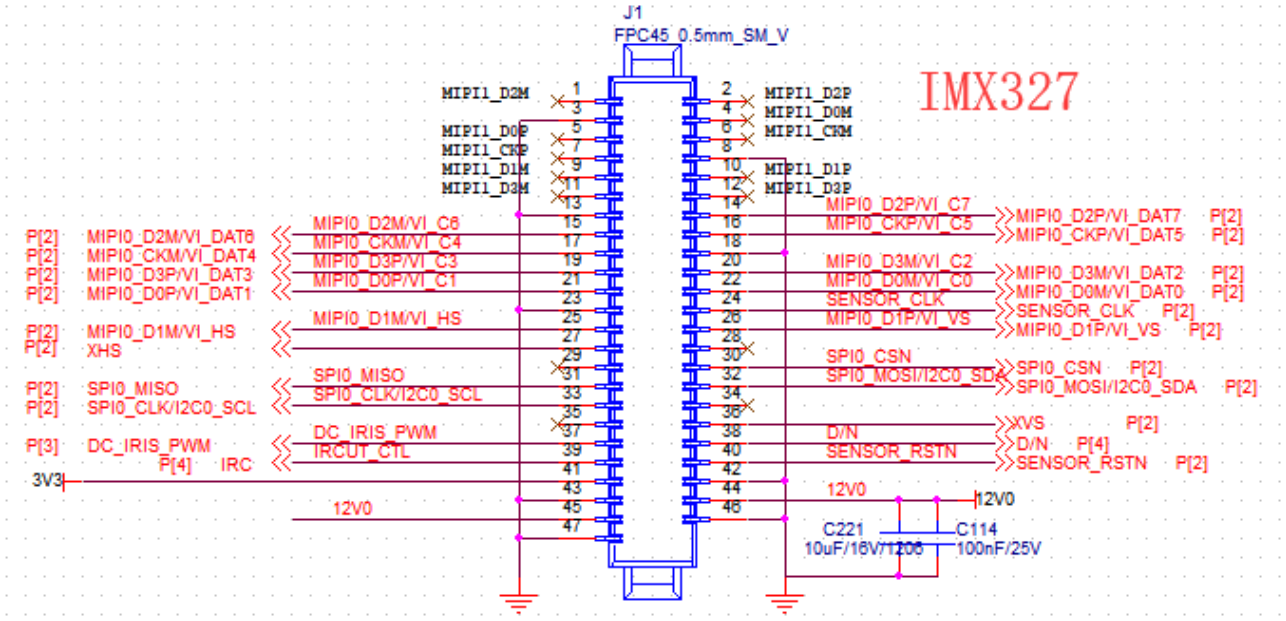
IMX385/327-JP1 connector (Spec.-wafer_4p_1.25mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	DRV-	IRIS Driver -	PIN2	DRV+	IRIS Driver +
PIN3	DMP-	IRIS Damp -	PIN4	DMP+	IRIS Damp +

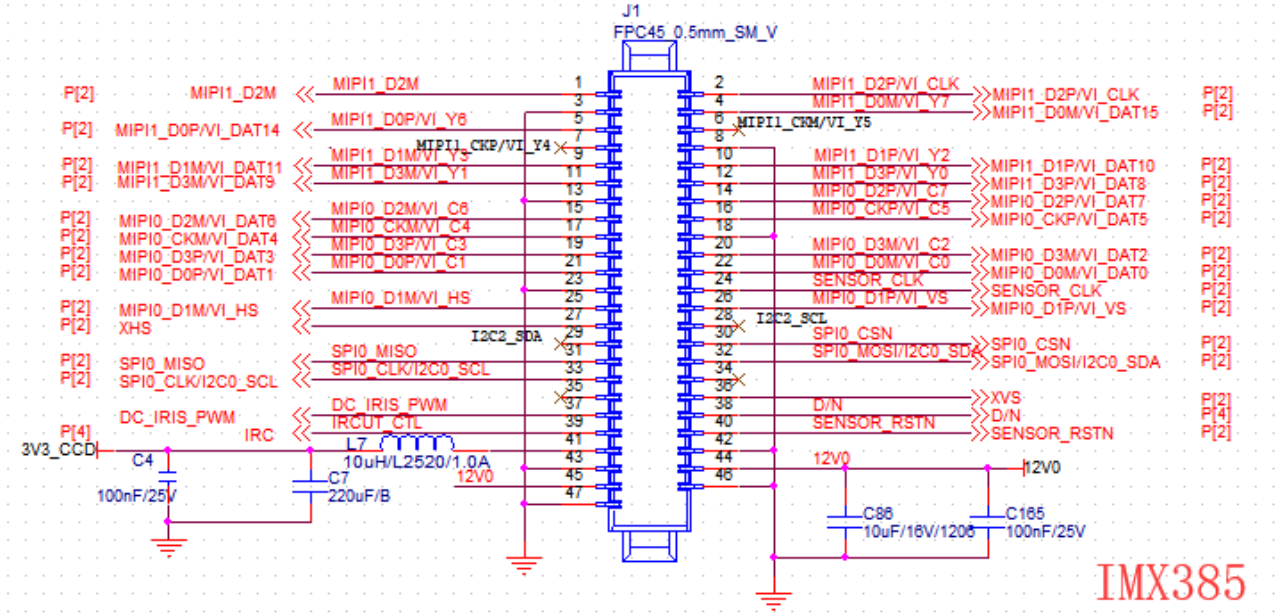
IMX385-J2 CON / IMX327-J16 connector (Spec.-wafer_3p_1.25mm_Horizontal)					
Pin No./Name		Function	Pin No./Name		Function
PIN1	PWM_3V3	IRIS Control (3.3V)	PIN2	GND	Digital GND
PIN3	GND	Digital GND			

2.2.3 Interface schematic






J1
FPC45_0.5mm_SM_V
IMX327
MIPI1_D2M
MIPI1_D0P
MIPI1_CKP
MIPI1_D1M
MIPI1_D3M
MIPI1_D2P
MIPI1_D0M
MIPI1_CKM
MIPI1_D1P
MIPI1_D3P
MIPI0_D2M/VI_C6
MIPI0_CKM/VI_C4
MIPI0_D3P/VI_C3
MIPI0_D0P/VI_C1
MIPI0_D1M/VI_HS
SPI0_MISO
SPI0_CLK/I2C0_SCL
DC_IRIS_PWM
IRCUT_CTL
3V3
12V0
MIPI0_D2P/VI_C7
MIPI0_CKP/VI_C5
MIPI0_D3M/VI_C2
MIPI0_D0M/VI_C0
SENSOR_CLK
MIPI0_D1P/VI_VS
SPI0_CSN
SPI0_MOSI/I2C0_SDA
D/N
SENSOR_RSTN
C221
10uF/16V/1206
C114
100nF/25V


J1
FPC45_0.5mm_SM_V
IMX385
MIPI1_D2M
MIPI1_D0P/VI_Y6
MIPI1_CKP/VI_Y4
MIPI1_D1M/VI_Y3
MIPI1_D3M/VI_Y1
MIPI0_D2M/VI_C6
MIPI0_CKM/VI_C4
MIPI0_D3P/VI_C3
MIPI0_D0P/VI_C1
MIPI0_D1M/VI_HS
I2C2_SDA
SPI0_MISO
SPI0_CLK/I2C0_SCL
DC_IRIS_PWM
IRCUT_CTL
3V3_CCD
C4
100nF/25V
C7
220uF/B
L7
10uH/L2520/1.0A
12V0
MIPI1_D2P/VI_CLK
MIPI1_D0M/VI_Y7
MIPI1_CKM/VI_Y5
MIPI1_D1P/VI_Y2
MIPI1_D3P/VI_Y0
MIPI0_D2P/VI_C7
MIPI0_CKP/VI_C5
MIPI0_D3M/VI_C2
MIPI0_D0M/VI_C0
SENSOR_CLK
MIPI0_D1P/VI_VS
I2C2_SCL
SPI0_CSN
SPI0_MOSI/I2C0_SDA
D/N
SENSOR_RSTN
C86
10uF/16V/1206
C165
100nF/25V

3 Operation manual

3.1 Matters need attention

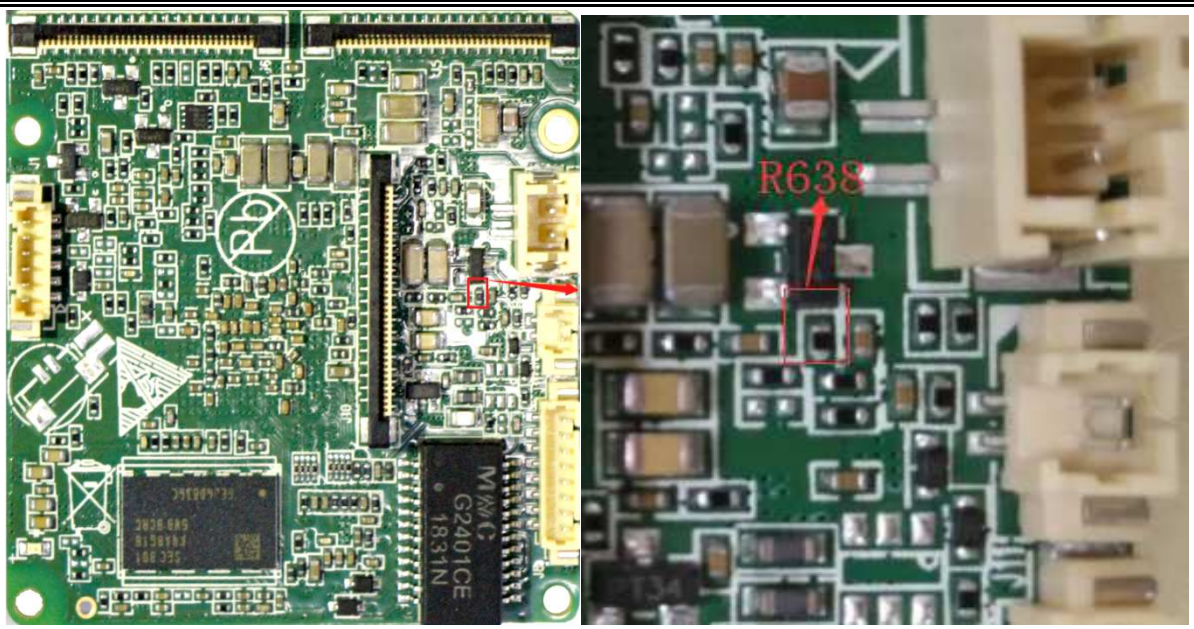
For product testing or application development environments, read the following notes before operating:

- Don’t hot-plug and touch any component in PCBA board when the device is working.
- Each port has the limited capacity of power supply , don’t use it exceed the spec, otherwise it can cause system collapse or even pcb damage.
- Note the voltage level of I/O when use it, don’t excee the spec, otherwise can damage the I/O port.
- SoC and DDR need heat treatment, keep away from heat source and avoid affecting chip performance and life.
- Check each component connection carefully to avoid connecting wrong way and causing work normally or damage the PCBA.
- Prohibit SDIO3.0/VOU1120/LCD multiplexing pin configuring at 1.8V lever.

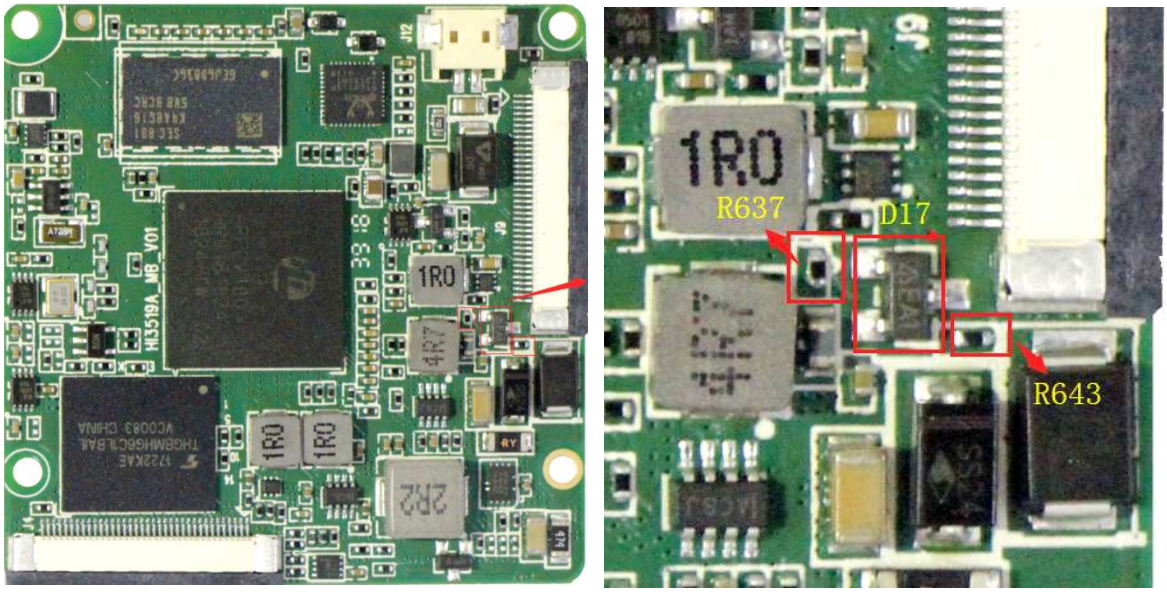
3.2 Core board configuration

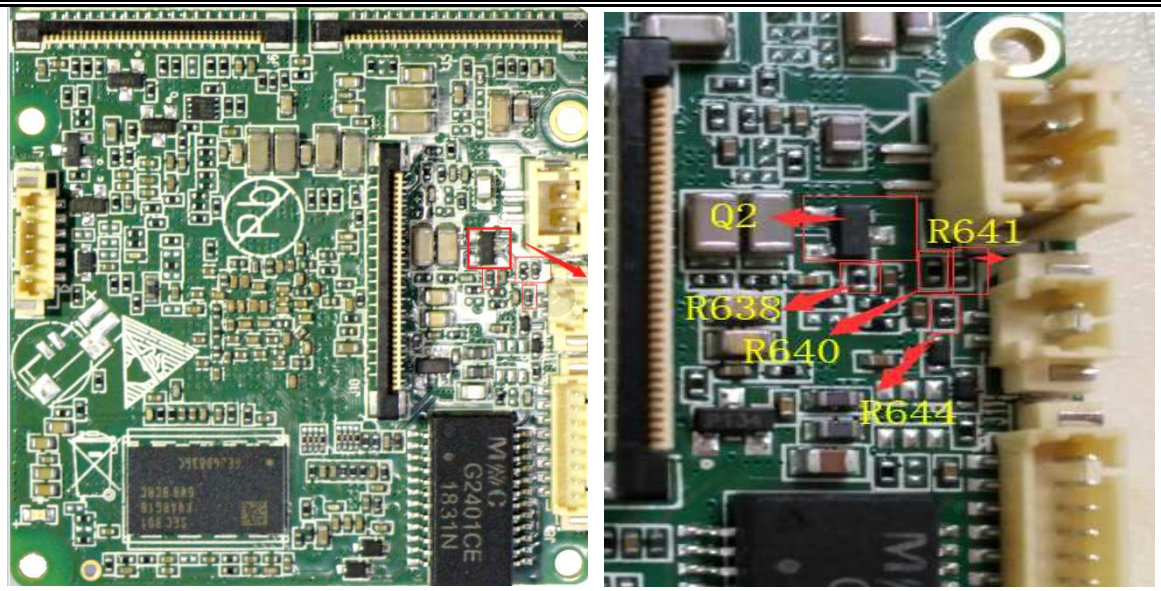
3.2.1 Light sensitive diode/light sensor configuration

1) Use different kind type and brand light sensitive diode, maybe appear different photosensitive effects, this will affect the threshold of the day/nihgt switch, you can adjust the value of R638 to implement the threshold that you need, the location as show below:



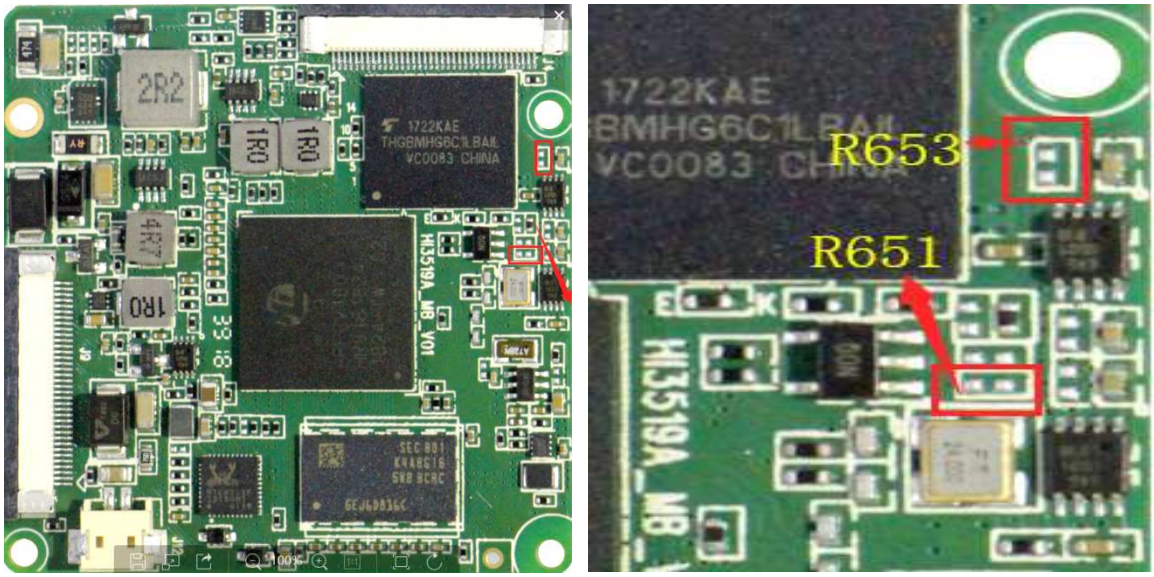
2) If you need to adjust the threshold of day/night switch by software, you can input the light electrical signal sensor by changing the circuit parameter, 同时将 GPIO and configure the GPIO to the ADC function, sample the analog electrical signal into the digital signal,so that implement the threshold management, remove R643/R638/R641/R637/D17/Q2, weld R644/R640 0Ω 0402 SMD resistor, the location as below:





3.2.2 UART2 communication configuration

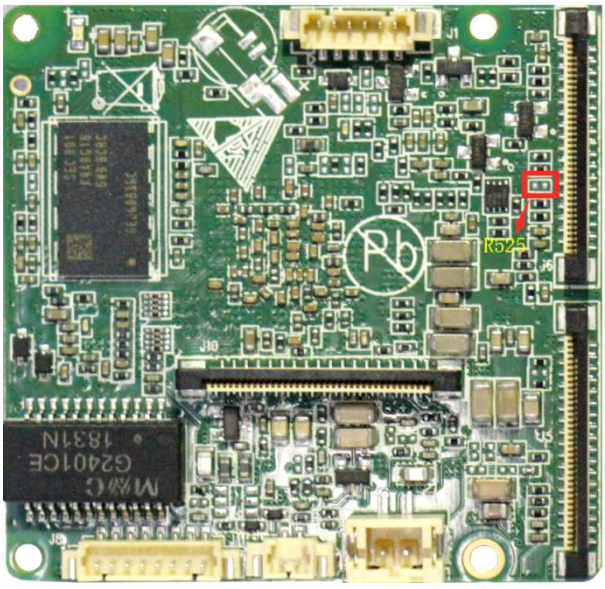
Note:when using the UART2 to debugging the DSP,please weld the R651 and R653,the resistor value is 100R,pay attention to the voltage level of UART2,it is 1.8V,so it need to signal level conversion,make the 1.8V convert to 3.3V,otherwise maybe damage the port,please know.

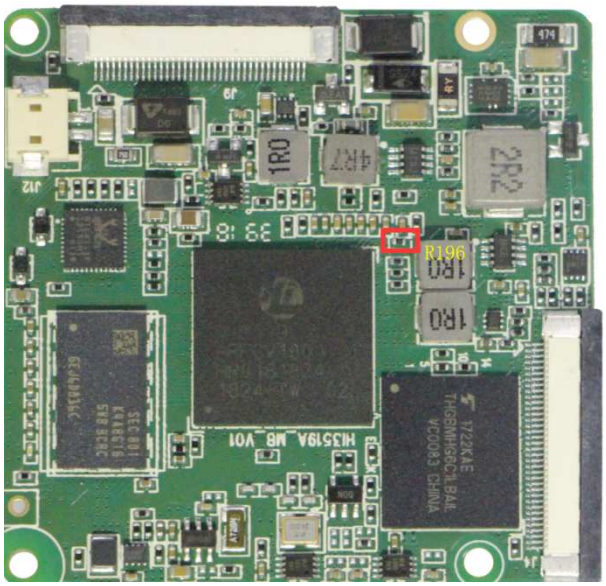


3.2.3 PCIE/USB3.0 output option

Default configuration: USB3.0 output, if use the PCIE function, it need to change the output mode and clock reference mode, processed as below:

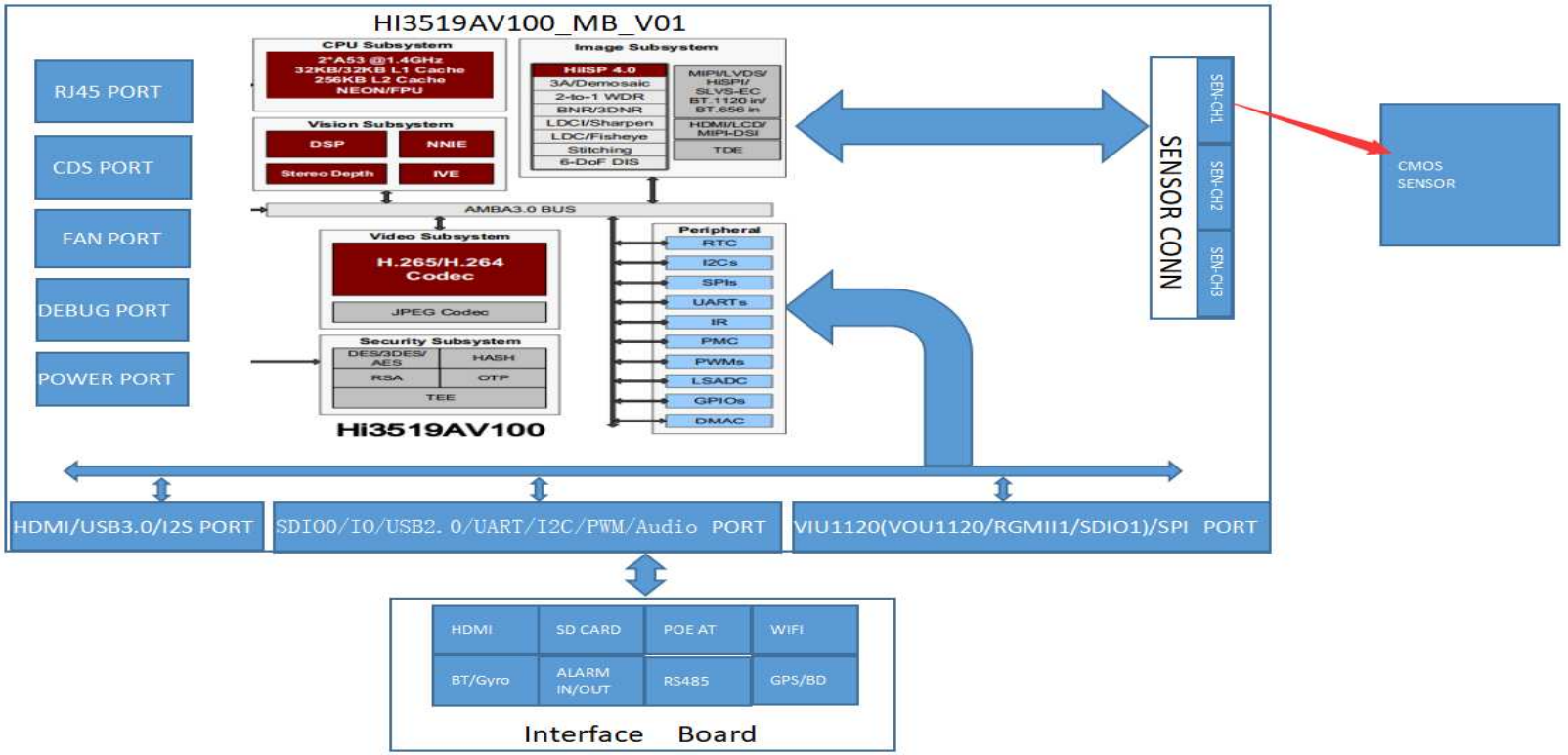
(R525 change the clock source, default internal CRG supply, R196 is the option of PCIE/USB mode, defaultly USB3.0).





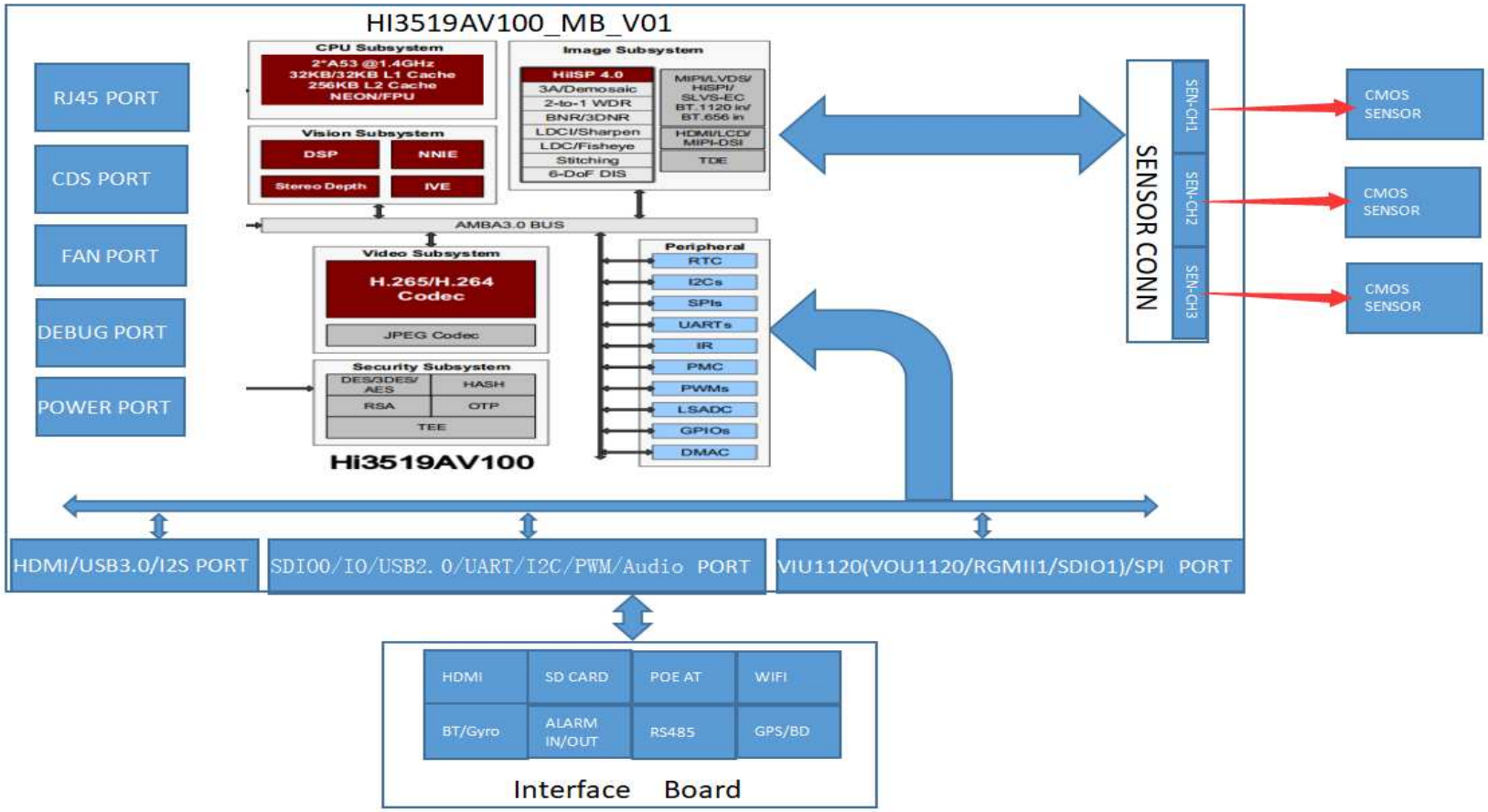
4 Production solutions

4.1 AI camera solution



4.2 Multi camera solution

4.2.1 4lane * 3 solution



4.2.2 2lane * 5 solution