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S5U1S65K01H4100
Camera Board
Technical Manual

SEIKO EPSON CORPORATION

Rev.1.0

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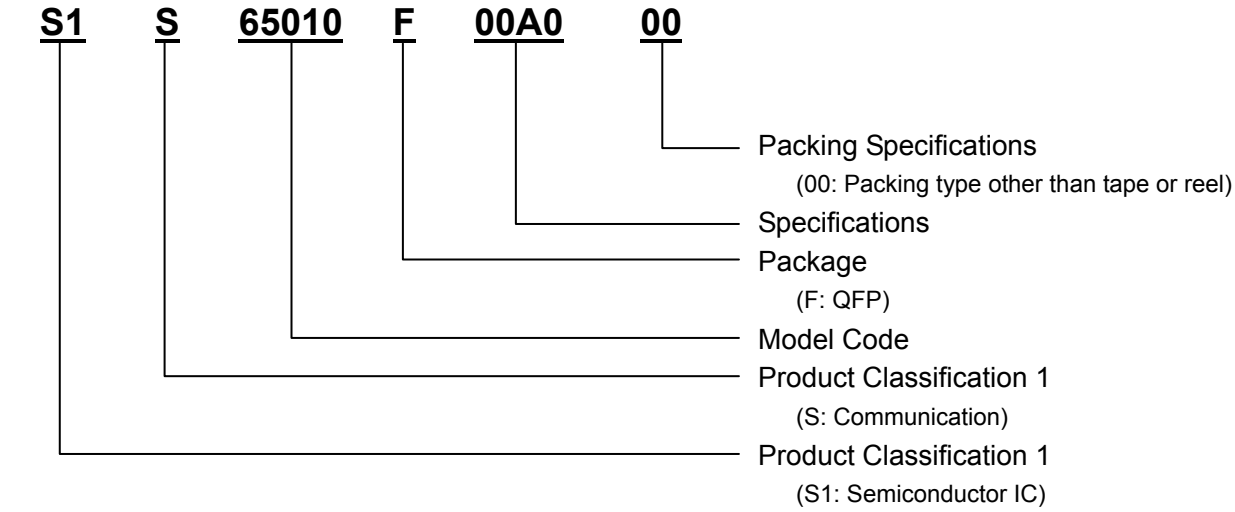
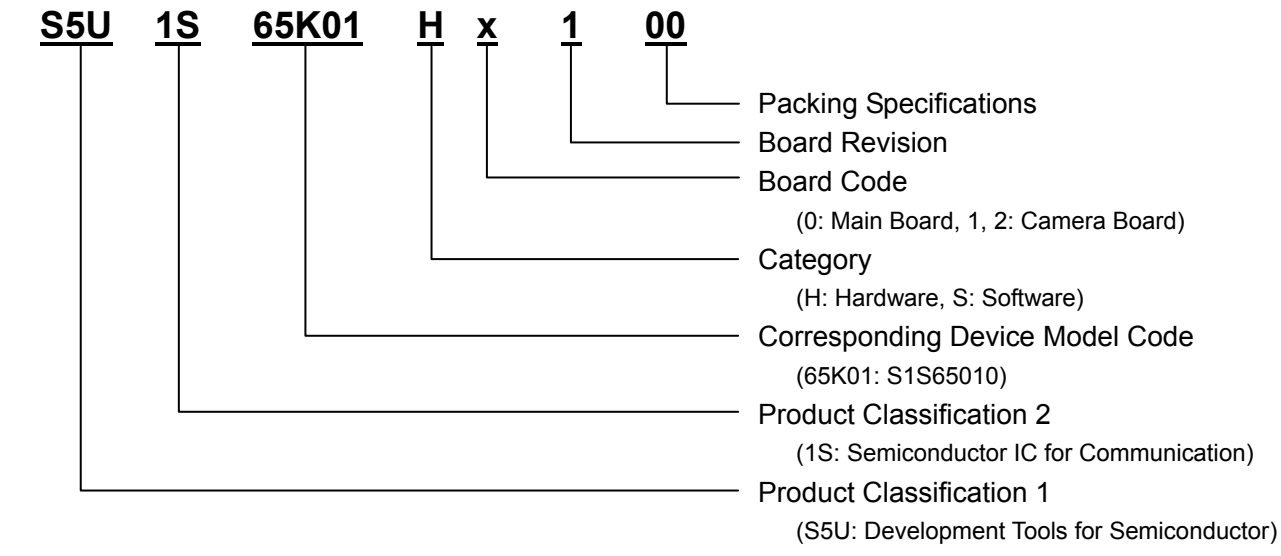
Configuration of product number

●DEVICES



●Evaluation Board



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1. OVERVIEW

This product is an evaluation board used when it connects with the S65K series evaluation board and the network camera and the drive recorder are constructed.

It connects with the board that mounts SEIKO EPSON S1S65010 or S2S65A00 and it uses it.

2. COMPONENTS

2.1 Main Parts

CAMERA	CMOS Camera Module (TOKO TMV1320)
Audio CODEC	Monaural CODEC (ASAHIKASEI AK4631)
Main Board I/F	Preparation of the connector of 40/16pin for S65K series evaluation board joint
Audio I/F	Speaker, MIC, Line Input, Line Output

2.2 Block Diagram

The following figure gives block diagram for camera board. This board provides three (mutually exclusive) connectors for connecting a CMOS camera module.

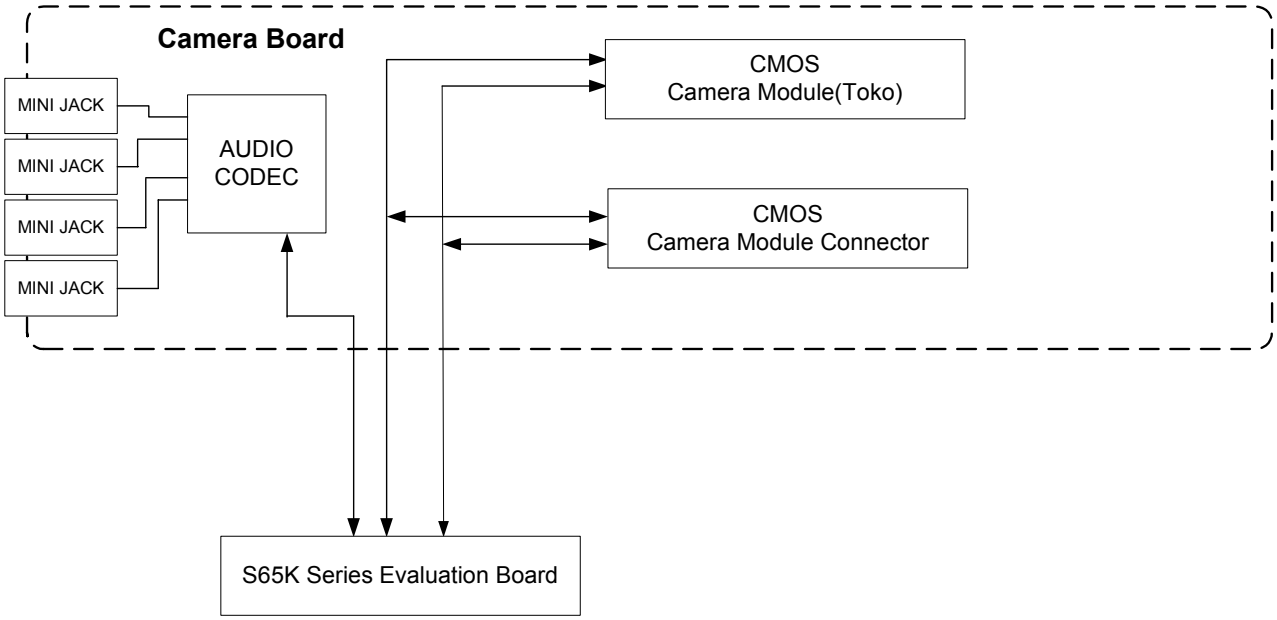

Fig.2.1 Block Diagram

3. MECHANICAL SPECIFICATIONS

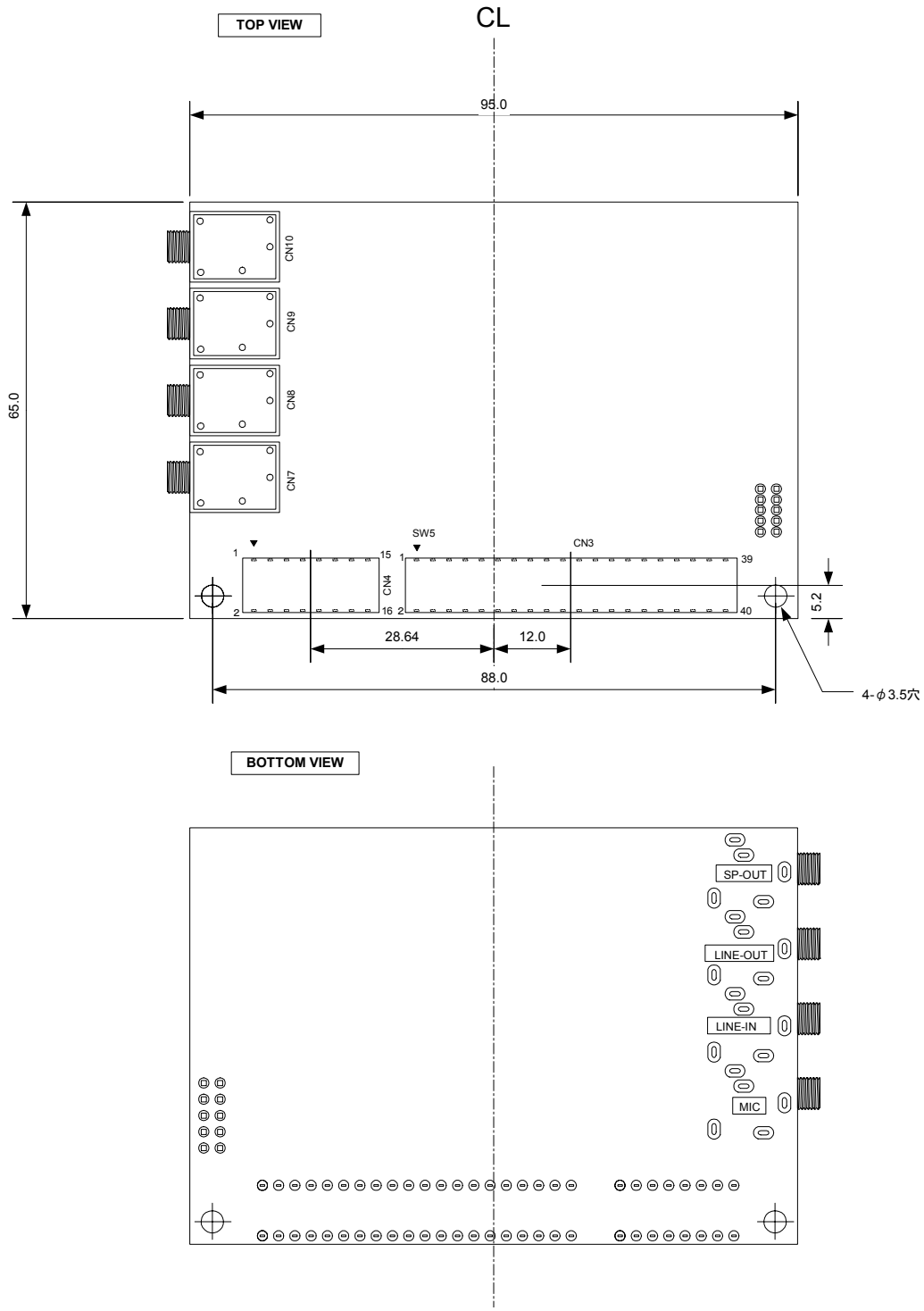

Fig.3.1 Camera Board Dimensions

4. EXTERNAL PINS

4.1 Interface Connectors

The following Figure shows the locations of the external interface connectors on the camera board. The Tables in the following four subsections list their pin assignments.

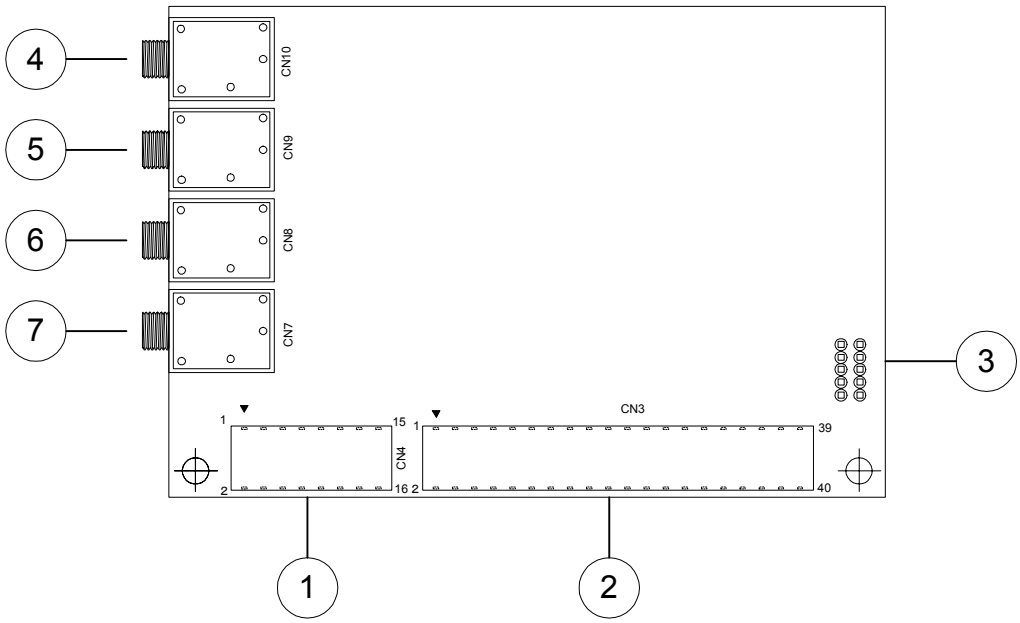

Fig.4.1 Camera Board Interface Connector Layout

4.1.1 Main Board Interfaces

① 5V, Reset (CN3 : HIF3H-16DB-2.54S)

① in Fig.4.1

Pin Number	Function	Pin Number	Function
1	5V	2	5V
3	NC	4	NC
5	NC	6	NC
7	NC	8	NC
9	NC	10	NC
11	NC	12	NC
13	RESET#	14	GND
15	GND	16	GND

② Camera interface and expansion connector (CN1: HIF3H-40DB-2.54DS)

② in Fig.4.1

②-1 S1S65010 Evaluation Board (S5U1S65K01H0x00) case of joint

Pin Number	Function	Pin Number	Function
1	GND	2	GND
3	CAMDATA0	4	CAMDATA1
5	CAMDATA2	6	CAMDATA3
7	CAMDATA4	8	CAMDATA5
9	CAMDATA6	10	CAMDATA7
11	CMCLKOUT	12	CMCLKIN
13	CMVREF	14	CMHREF
15	CAMVDD	16	CAMVDD
17	I2C_SDA	18	I2C_SCL
19	3.3V	20	3.3V
21	GPIOA0	22	GPIOA1
23	GPIOA2 (TXD1/SPI_SS)	24	GPIOA3 (RXD1/SPI_SCLK)
25	GPIOA4 (SPI_MISO)	26	GPIOA5 (SPI_MOSI)
27	GPIOA6	28	GPIOA7
29	GPIOB0 (I2S0_WS)	30	GPIOB1 (I2S0_SCK)
31	GPIOB2 (I2S0_SD)	32	GPIOB3 (I2S1_SD)
33	GPIOB4 (Timer1out)	34	GPIOB5
35	GPIOB6	36	GPIOB7
37	GPIOD0	38	GPIOD1
39	GND	40	GND

②-2 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN7 case of joint

Pin Number	Function	Pin Number	Function
1	GND	2	GND
3	CAMDATA0	4	CAMDATA1
5	CAMDATA2	6	CAMDATA3
7	CAMDATA4	8	CAMDATA5
9	CAMDATA6	10	CAMDATA7
11	CMCLKOUT	12	CMCLKIN
13	CMVREF	14	CMHREF
15	CAMVDD	16	CAMVDD
17	I2C_SDA	18	I2C_SCL
19	3.3V	20	3.3V
21	NC	22	NC
23	GPIOC4 (TXD3/SPI_SS)	24	GPIOC5 (RXD3/SPI_SCLK)
25	NC	26	SPI_MOSI
27	NC	28	NC
29	GPIOB0 (I2S0_WS)	30	GPIOB1 (I2S_SCK)
31	GPIOB2 (I2S_SDO)	32	GPIOB3 (I2S_SDI)
33	GPIOB4 (TimerA0out)	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	GND

②-3 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN8 case of joint

Pin Number	Function	Pin Number	Function
1	GND	2	GND
3	CAMDATA0	4	CAMDATA1
5	CAMDATA2	6	CAMDATA3
7	CAMDATA4	8	CAMDATA5
9	CAMDATA6	10	CAMDATA7
11	CMCLKOUT	12	CMCLKIN
13	CMVREF	14	CMHREF
15	CAMVDD	16	CAMVDD
17	I2C_SDA	18	I2C_SCL
19	3.3V	20	3.3V
21	NC	22	NC
23	NC	24	NC
25	NC	26	NC
27	NC	28	NC
29	NC	30	NC
31	NC	32	NC
33	NC	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	GND

4.1.2 Serial (RS232-C) Interface (CN6: XG8W-1031)

③ in Fig.4.1

Pin Number	Function	Pin Number	Function
1	NC	2	RXD
3	TXD	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	NC

4.1.3 Audio Interface Connectors (CN7 to CN10: A2PA-3PGG)

These are for a microphone, a speaker, and line I/O.

④ to ⑦ in Fig.4.1

Connector	Function	Note
CN7	Microphone input	⑦
CN8	Line input	⑥
CN9	Line output	⑤
CN10	Speaker output	④

4.1.4 Camera Module Connectors (CN1 CN2, and CN5)

This board provides three (mutually exclusive) connectors for connecting a CMOS camera module.

Connector	Function	Product Number
CN1	TMV1320	086262022340829+ (Kyocera-elco)
CN2	TMV1303	AXK730127G (MATSUSHITA)
CN5	General purpose	8526-4500PL (3M)

5. FUNCTIONAL DESCRIPTION

Fig.5.1 show component locations on the board. The following nine subsections describe their functions.

- Please do not turn on SW1 and SW3 together.
- Please do not turn on SW1[2:1] and SW2 together.

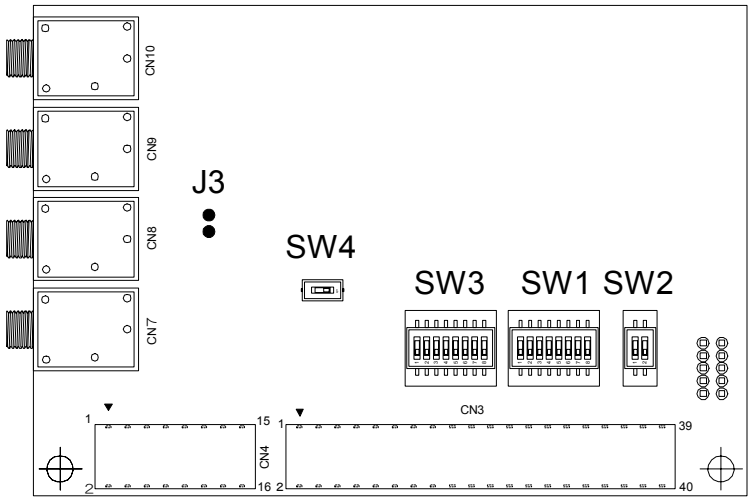

Fig.5.1 Camera Board (Top View)

5.1 GPIOB DIP Switches (SW1)

It is possible to control the LED by GPIOB from S1S65010, S2S65A00 evaluation board. It is the switch that joints the LED and GPIOB.

Table 5.1 S1S65010 Evaluation Board (S5U1S65K01H0x00) case of joint

Pin Number	Abbreviation	Function		Notes
		0 (OFF)	1 (ON)	
1	LED7	No connecting	GPIOB7	
2	LED6	No connecting	GPIOB6	
3	LED5	No connecting	GPIOB5	
4	LED4	No connecting	GPIOB4	
5	LED3	No connecting	GPIOB3	
6	LED2	No connecting	GPIOB2	
7	LED1	No connecting	GPIOB1	
8	LED0	No connecting	GPIOB0	

Table 5.2 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN7 case of joint

Pin Number	Abbreviation	Function		Note
		0 (OFF)	1 (ON)	
1	LED7	No Connecting		
2	LED6	No Connecting		
3	LED5	No Connecting		
4	LED4	No Connecting	GPIOB4	
5	LED3	No Connecting	GPIOB3	
6	LED2	No Connecting	GPIOB2	
7	LED1	No Connecting	GPIOB1	
8	LED0	No Connecting	GPIOB0	

Table 5.3 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN8 case of joint

Pin Number	Abbreviation	Function		Note
		0 (OFF)	1 (ON)	
1	LED7	No Connecting		
2	LED6			
3	LED5			
4	LED4			
5	LED3			
6	LED2			
7	LED1			
8	LED0			

It is not possible the control of the LED on the camera board from CN8 of the S2S65A00 evaluation board.

5.2 UART DIP Switches (SW2)

It is the switch that joints RS232C IC on the camera board and UART of the S1S65010/S2S6500 evaluation board.

Table 5.4 S1S65010 Evaluation Board (S5U1S65K01H0x00) case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting	UART Lite TXD	
2	No Connecting	UART Lite RXD	

Table 5.5 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN7 case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting	UART TXD3	
2	No Connecting	UART RXD3	

Table 5.6 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN8 case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting		
2			

5.3 AUDIO CODEC DIP Switches (SW3)

It is the switch that joints Audio CODEC IC on the camera board and I2S,SPI of the S1S65010/S2S6500 evaluation board.

Table 5.7 S1S65010 Evaluation Board (S5U1S65K01H0x00) case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting	SPI_SS	
2	No Connecting	SPI_SCLK	
3	No Connecting	SPI_MOSI	
4	No Connecting	TIMER1OUT	
5	No Connecting	I2S0_SD	
6	No Connecting	I2S1_SD	
7	No Connecting	I2S0_WS	
8	No Connecting	I2S0_SCK	

Table 5.8 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN7 case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting	SPI_SS	
2	No Connecting	SPI_SCLK	
3	No Connecting	SPI_MOSI	
4	No Connecting	TIMERA0OUT	
5	No Connecting	I2S_SDO	
6	No Connecting	I2S_SDI	
7	No Connecting	I2S_WS	
8	No Connecting	I2S_SCLK	

Table 5.9 S2S65A00 Evaluation Board (S5U2S65A00H0x00) CN8 case of joint

Pin Number	Function		Note
	0 (OFF)	1 (ON)	
1	No Connecting		
2			
3			
4			
5			
6			
7			
8			

5.4 Camera's I2C address DIP Switches (SW4)

It is the switch of the I2 C address binding of a camera module. Sample software is using address 0x90.
ON:0x90
OFF:0xB8

5.5 AUDIO CODEC clock input (J3)

J3 selects of the clock source of AUDIO CODEC AK4631. Sample software is using Timer Out of the main board for the clock. In the case that the crystal oscillator on the board is used it does J3 the short and please make bit4 of SW3 the open. The frequency of the crystal oscillator is 12.288MHz.

6. PARTS LISTS

The following Table lists the major parts on the camera board—that is, all parts except resistors and capacitors.

Table 6.1 Camera Board Parts

PARTS NO	PARTS NAME	STANDARD		QTY
	PCB			1
U1	IC	TC74VHC05FT	TOHSHIBA	1
U2		ADM3222ARUZ	Analog Devices	1
U3		AK4631VN	Asahi-Kasei	1
SW1,SW3	SWITCH	CHS-08B	COPAL	2
SW2		CHS-02B	COPAL	1
SW4		CHS-01B	COPAL	1
CN1	CONNECTOR	086262022340829+	KYOCERA-elco	1
CN2		AXK730127G	Matsushita	1
CN3		HIF3H-40DB-2.54DS	HIROSE	1
CN4		HIF3H-16DB-2.54DS	HIROSE	1
CN7, CN8, CN9, CN10	Mini JACK	A2PA-3PGG		4
FL1	FILTER	NFM18PC105R0J3	MURATA	1
LED1, LED2, LED3, LED4, LED5, LED6, LED7, LED8	LED	SML-310MTT86	ROHM	8
X1	OSC	SG-310SCF 12.288MHz	EPSON TOYOCOM	1

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1.0	2007/07/18	First Edition	T.Suzuki

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