FPD-Link III Deserializer Board
FPI-914A
(Board model number NV012-C)
Hardware Specification

Rev. 1.0

NetVision Co., Ltd.

FPI-914A   Hardware Specification
1.0

Update History

Revision	Date	Note	
1.0	2018/04/11	New file (Equivalent to Japanese version 4)	S. Usuba

Contents

1.　　　Outline

This specification is a hardware specification of NV012-C (FPD-Link III deserializer substrate). NV012-C (hereinafter referred to as this board) converts the video of the serial signal transmitted by the TI company FPD-Link III Standard to a parallel signal, and our SV series (SVM-03/03U/SVI-06 etc.) is a conversion board to connect and use. In addition, the old number of this board, the production model number is "NV012-C", the order type number is "FPI-914A", except for the cover of this specification, it is described as a unified in the production model number.
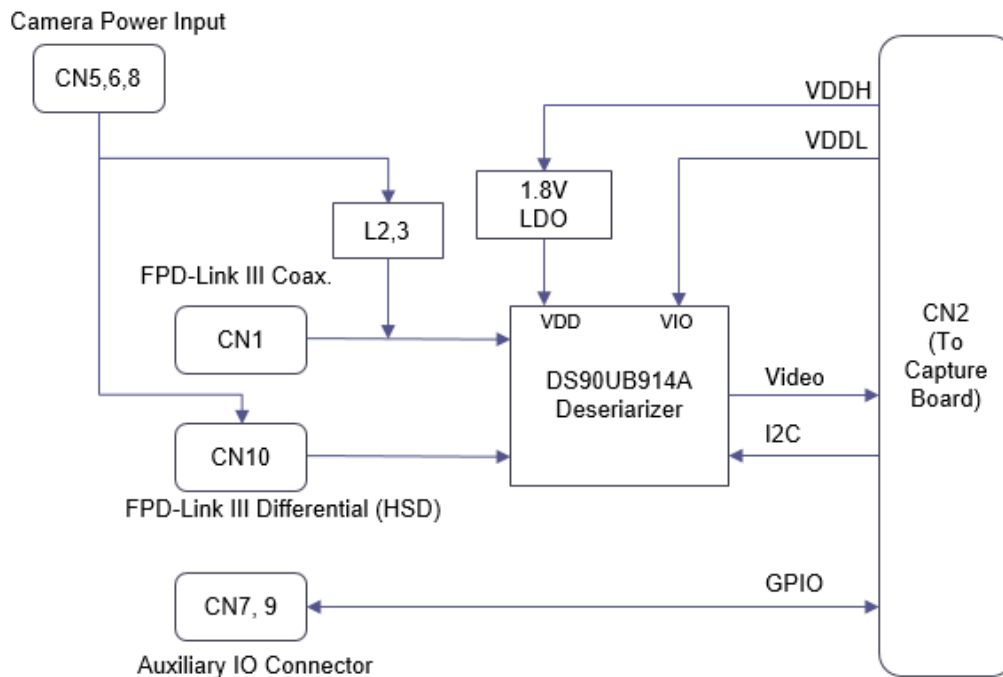
【figure 1】 block diagram

Fig. 1 shows a block diagram of the board. This substrate is equipped with TI company Deserializer IC DS90UB914A-Q1, serial-parallel conversion of FPD-Link III video signal up to 100MHz pixel clock, and I2C communication used the FPD-Link III signal line　is possible. The output connector of the parallel signal has a common interface with the SV series and can be used directly with the SV board. The serial signal input is ideal for connecting with FAKRA standard connectors (single-ended transfer) and automotive cameras.

[Figure 2] shows the board connection image of the substrate and the SVM-03 board. As shown in the figure, both substrates are connected via a 50-pin pin socket (CN2). Since the screw hole position is common on both substrates, it is possible to fix both substrates with a spacer or the like. The arrangement diagram of the connector on this board is shown in Fig. 3. PIN numbers and pin assignments are shown later in the "connector Details section".

【Figure 2】 board connection image
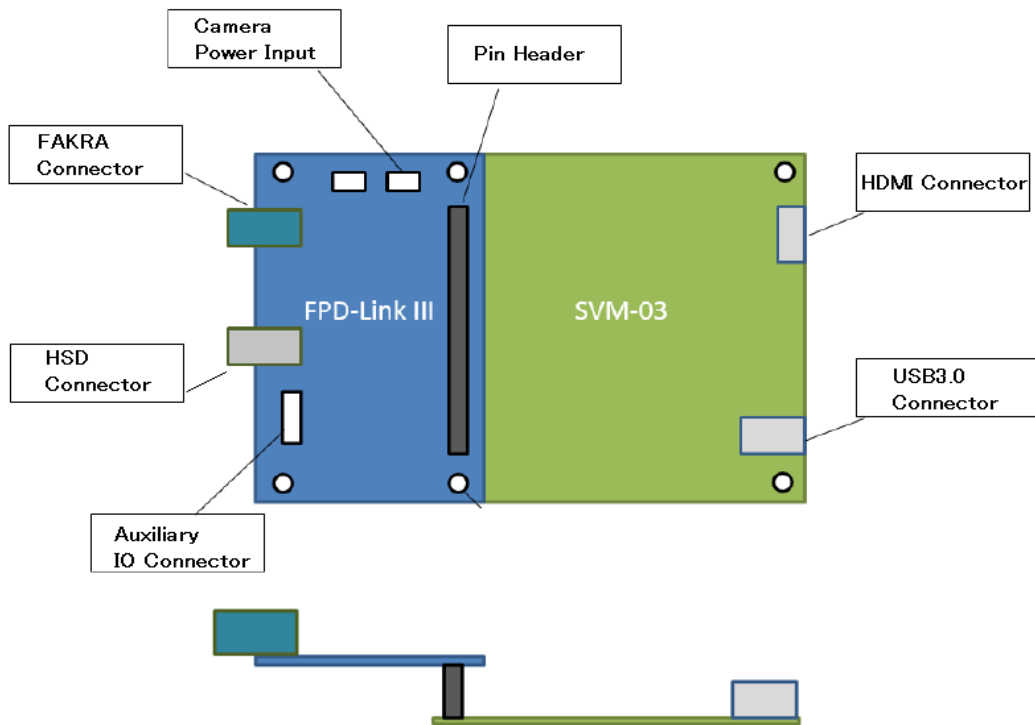
【Figure 3】 Connector arrangement diagram
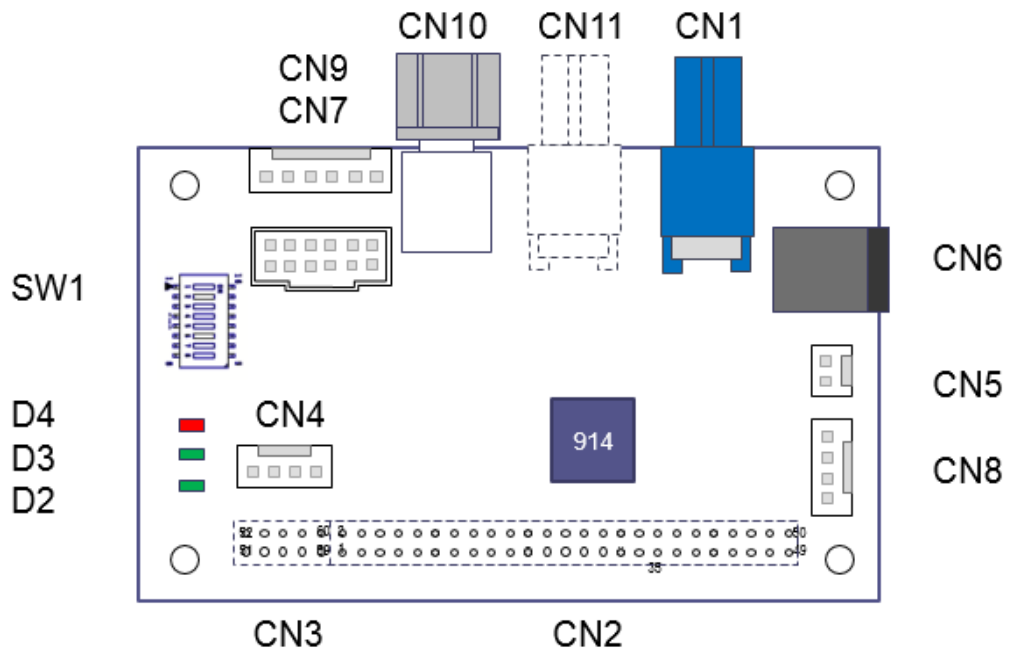
* CN4, CN6, CN7, CN11 not implemented

2. Details

2.1. Power System

This substrate is equipped with a 1.8 v regulator (LDO), which supplies power to the core voltage of the Deserializer IC. The power supply (core voltage, IO voltage) of the IC is supplied from the SV board such as SVM-03 through the connector CN2. At this time, the VDDH and VDDL of the SV board correspond to the core voltage and IO voltage of the board. The VDDH and VDDL are usually set to 3.3 V.

This substrate can also be superimposed on the FPD-Link III cable for camera power. This power supply is supplied from CN5, CN6, or CN8. Because the camera power supply and the IC are divided in a DC through a capacitor, it does not matter the power of the IC and the order of power for the camera.

Figure 4 shows a block diagram of the power system of the board. If you use the DC Jack (CN6) to connect the AC adapter, in preparation for future expansion, this substrate has a DC converter pattern that allows 12v input, and the voltage is switched by the jumper resistor mounted on the substrate. In NV012-C, the jumper is set to the DC Jack side, so you can supply the camera power via the DC Jack by implementing CN6.

【Figure 4】Power system diagram
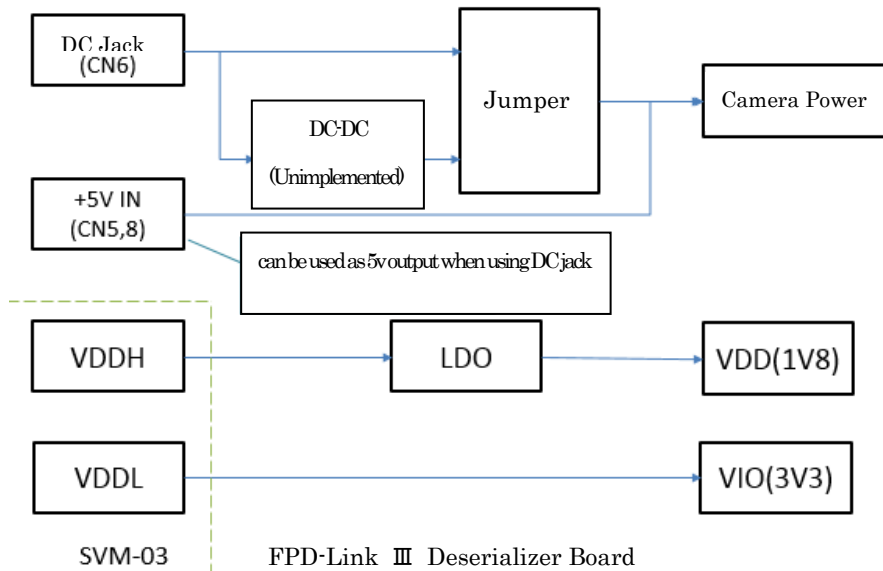
2.2. I2C function

The Deserializer IC (DS90UB914A) of this substrate has an I2C bus, which has an I2C

communication function between the serializer and the target device through the configuration change in the IC and the FPD-Link III cable. In this board, the I2C bus of DS90UB914A is pulled up to the IO voltage at 4.7 kΩ, and because it is directly connected with the connector for the SV series, I2C communication is possible by the standard function of the SV series as it is. At the same time, the I2C bus is directly connected to the I2C input/Output connector (CN4) on the board, allowing connections to external devices and operations from external Masters.

In this board, the DS90UB914A I2C address can be changed two types by DIP switch (SW1). See the DIP Switch Settings section for more information.

2.3.   Connector List

CN#	Implementation State	Description	Model number
CN1		FPD-Link Input (FAKRA Coax)	FA1-NCRP-PCB-8
CN2		Parallel output	C-00086
CN3	Unimplemented	(N/A)	N/A
CN4	Unimplemented	I2C I/O	171825-4
CN5		Camera Power Input 1	22-04-1021
CN6	Unimplemented	Camera Power Input 2	MJ-179P Center +
CN7	Unimplemented	Expansion Connector 1	90130-1212
CN8		Camera Power Input 3	171825-4
CN9		Expansion Connector 2	171825-6
CN10		FPD-Link Input (HSD Differential)	D4S20L-40MA5-B
CN11	Unimplemented	(N/A)	N/A

*   Implementation states apply to NV012-C

The camera Power input connector (CN5, CN6, CN8) inputs the DC power supply to the target device (camera) as needed. Depending on the application or system, enter power from one of the connectors. This camera power is superimposed on the FPD-Link signal line when using CN1, and is output to a specific pin when the CN10 is used. In addition, the camera power is not used inside the NV012-C board and is supplied only to the target device. The required power capacity depends on the characteristics of the target device.

The expansion connector (CN7, CN9) is a connector for inter-board communication and future

expansion in a multi-channel uptake system. The I2C I/O connector (CN4) is directly connected to the DS90UB914A I2C bus.
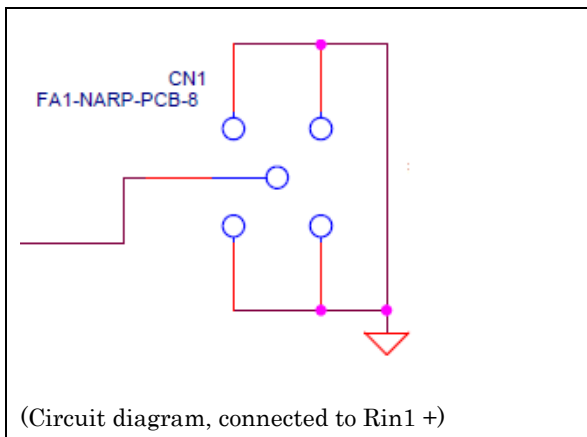
2.4.　　Connector Details

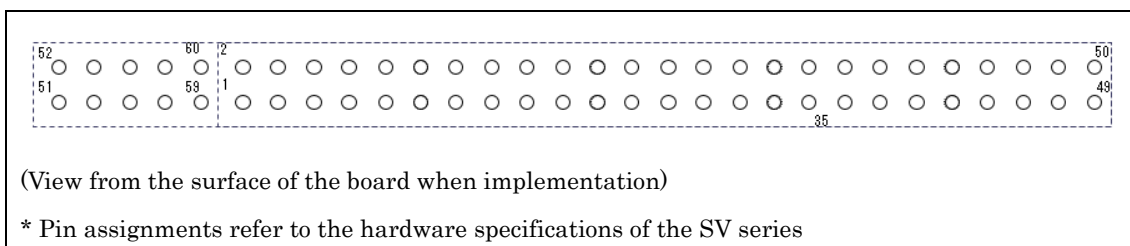Below is a top view of the connector on this board (outline) and pin assignment (excerpts from the schematic).

（Pin assign explanatory notes）

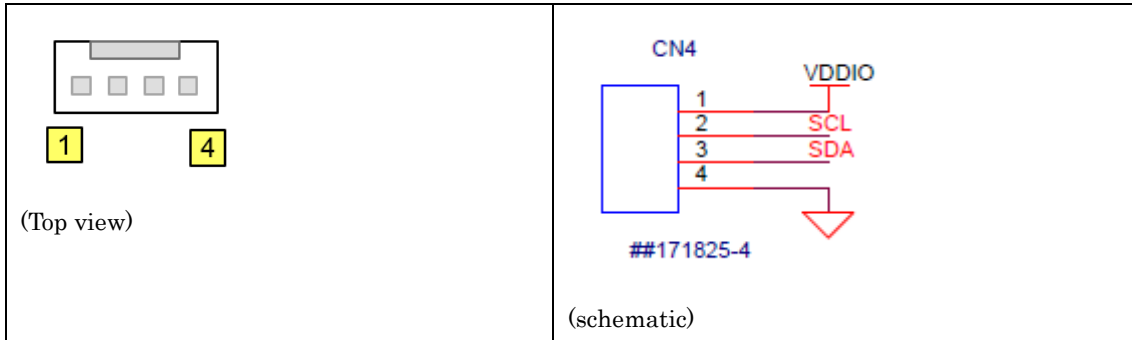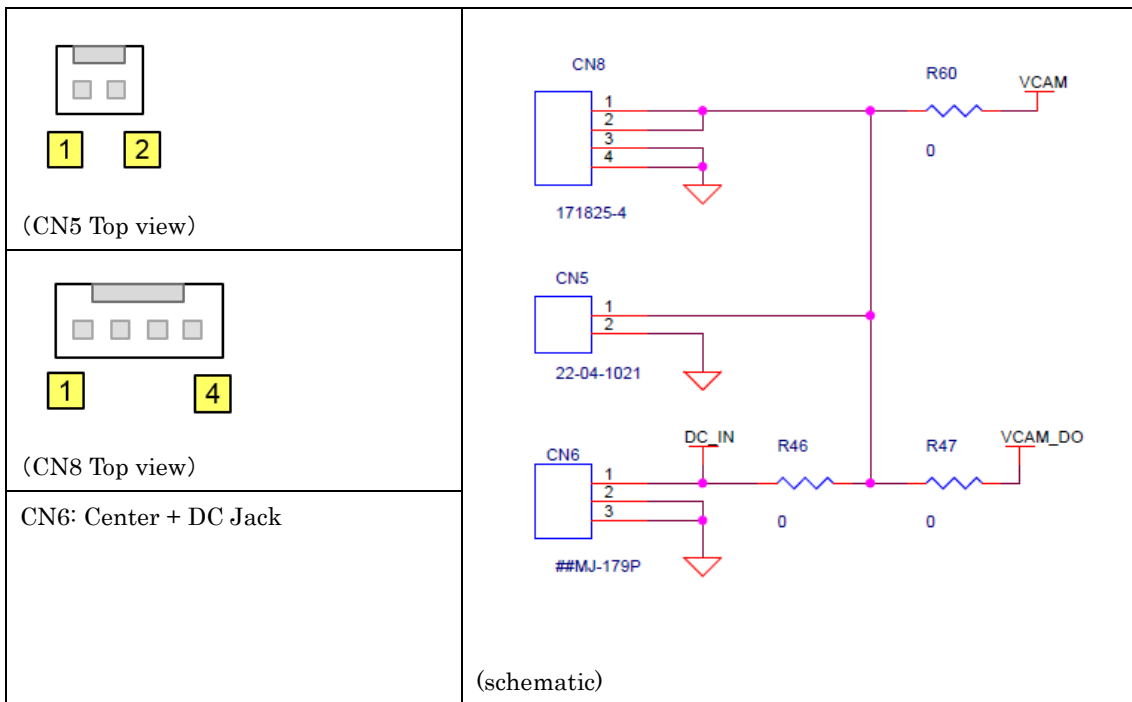| name	Description
VDDIO	IO Power
VCAM	Camera Power
VDDH	SV Board VDDH (CN2 Direct connection)
VCAM_DO	Output of a DC-DC converter(not implemented)
SCL / SDA	I2C signal lines
P0 - P5	General-purpose IO Port for SV Board (CN2 Direct connection)
PC_A/PC_K	Reserve (not used with Photocoupler primary side LED, NV012-C)

・CN1 (FA1-NCRP-PCB-8)

(Circuit diagram, connected to Rin1 +)

・CN2（C-00086 = Right below）、CN3（left below）

(View from the surface of the board when implementation)

* Pin assignments refer to the hardware specifications of the SV series

・CN4 (171825-4 / TE Connectivity)

(Top view)	CN4 VDDIO 1 2 SCL 3 SDA 4 ##171825-4 (schematic)

・CN5 (22-04-1021 / Molex), CN6(MJ-179P / Marushin), CN8(171825-4 / TE Connectivity)

（CN5 Top view）	CN8 R60 VCAM 1 2 3 4 0 171825-4
（CN8 Top view）	CN5 1 2 22-04-1021
CN6: Center + DC Jack	CN6 DC_IN R46 R47 VCAM_DO 1 2 3 0 0 ##MJ-179P (schematic)

・CN7 (90130-1212 / Molex)

(Top view)	VDDH CN7 P0_RSTIN 1 2 P1 3 4 P2 5 6 P3_RSTOUT 7 8 P5 P4 9 10 PC_A 11 12 PC_K ##90130-1212 (schematic)
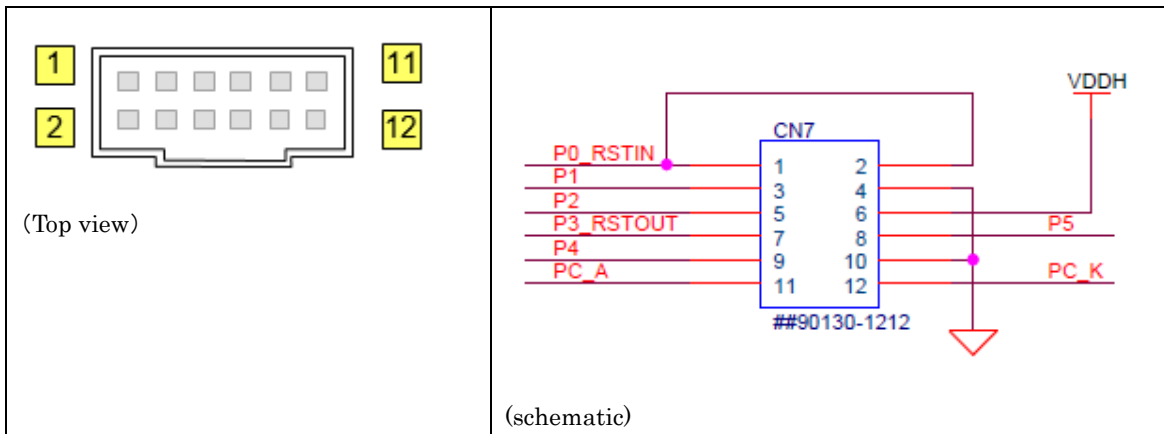
・CN9 (171825-6 / TE Connectivity)

(Top view)

(schematic)
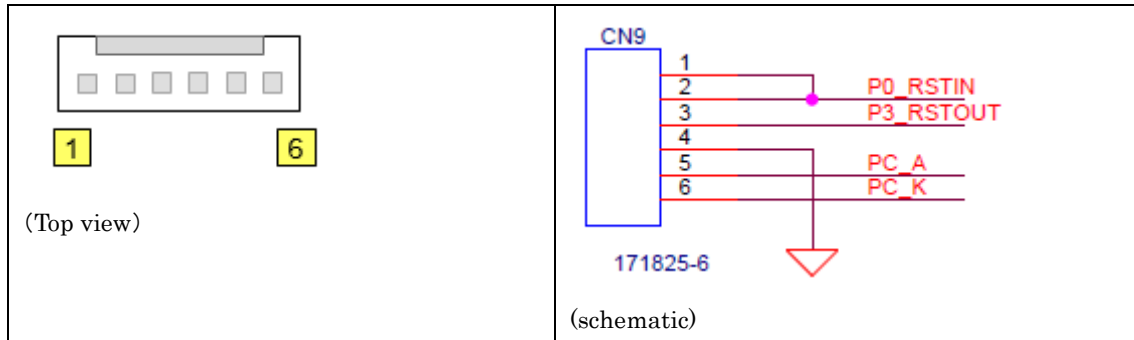
・CN10 (D4S20L-40MA5-B / Rosenberger)

(Top view)

(schematic)
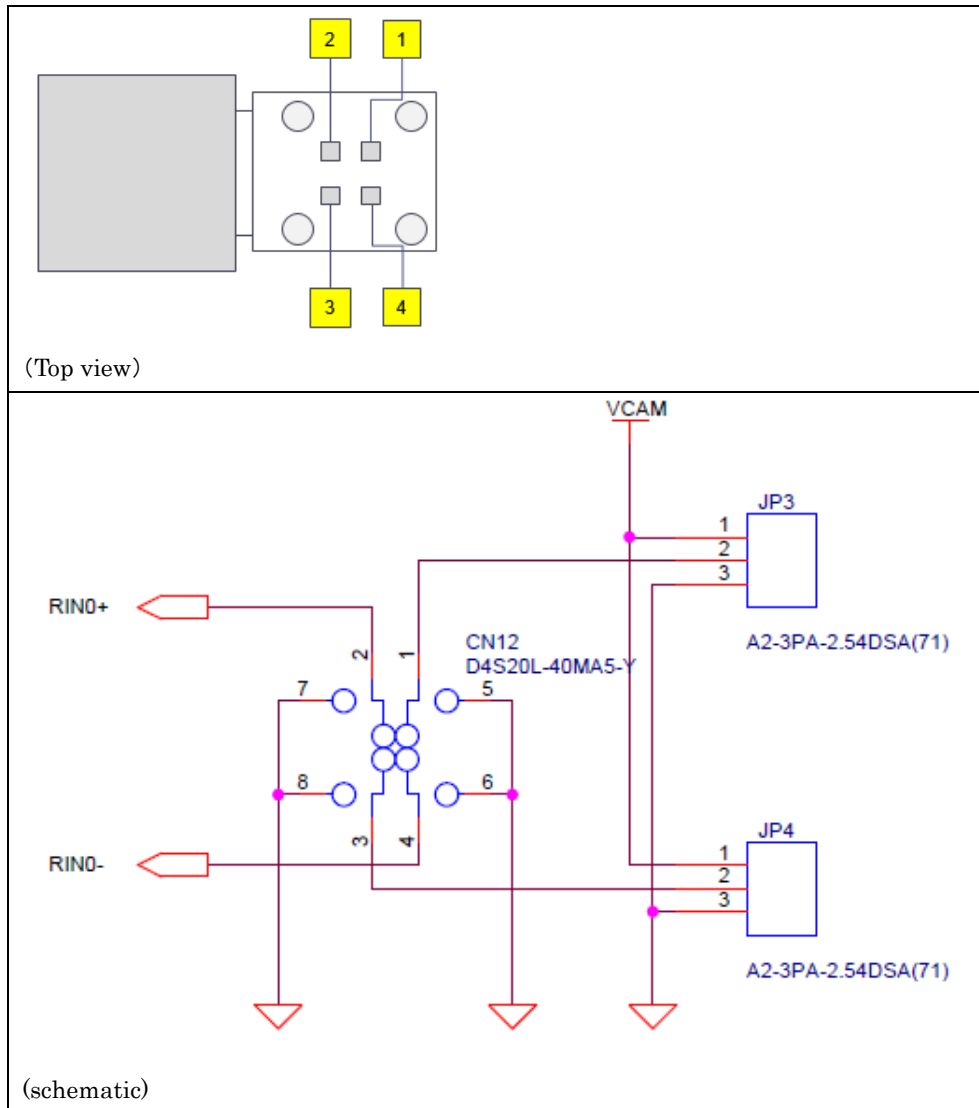
2.5.　　DIP Switch Settings

The 8-bit DIP switch (SW1) is implemented on this substrate, and it is possible to configure the Deserializer function and the I2C address.

SW#	Name	Description
1	IDX0	Specifies the I2C address of the DS90UB914A . ON: I2C Address = 0x60 OFF: I2C Address = 0x61
2	OSS_SEL	When the parallel output is enabled, select the output state. ON: Hi-Z output OFF: Output enabled
3	SEL	Specifies the input connector. ON: Differential input (CN10: Input from HSD connector) OFF: Coaxial input (CN1: Input from FAKRA connector)
4	BISTEN	Set the BIST (Built In Self Test) Mode. ON: BIST Mode Disabled OFF: BIST Mode Enable
5	PDB	Set the power down mode. ON: Power down OFF: Normal operation
6	MODE0	Select device mode.
7	MODE1	See DS90UB914A Data Sheet for each mode detail
8	MODE2	MODE0 | MODE1 | MODE 2 | ON　　 | OFF　　 | OFF　　　 | 10-bit Mode OFF　　 | ON　　 | OFF　　　 | 12-bit High Frequency Mode OFF　　 | OFF　　 | ON　　　 | 12-bit Low Frequency Mode

- As for the default, only BISTEN(4), MODE0(6) are ON.

2.6.　　LED Indicator

Three LEDs are mounted on this board. Each function is shown in the table below.

LED#	Name	Description
D2	PASS	Lights up if there are no transfer errors.
D3	LOCK	If the PLL is locked, it will be lit.
D4	POWER	If the power (VDDH) is supplied, it will be lit.

2.7.　　HSD Power Polarity selection jumper

JP3, JP4 is a jumper that chooses the power output polarity of the HSD connector. If you want to power output to the target through the HSD connector, set the jumper as follows:

Output to HSD	Jumper settings
Pin 1: GND Pin 3: GND (No power output)	JP3: 2-3 Short Circuit JP4: 2-3 Short Circuit
Pin 1: VCAM Pin 3: GND	JP3: 1-2 Short Circuit JP4: 2-3 Short Circuit
Pin 1: GND Pin 3: VCAM	JP3: 2-3 Short Circuit JP4: 1-2 Short Circuit

3.　　Procedure for use

The following procedure describes how to use the board when connected to the SVM-03 board.

・Ensure that the DIP SW on this board is set appropriately.

・Ensure that the target power (VDDH, VDDL) of the SVM-03 is set to 3.3 v.

・Connect the SVM-03 with the board.

・Insert the USB cable into the SVM-03 and connect it to the PC.

・Ensure that the power indicator (D4) on this board is lit.

・Connect the camera to the CN1.

・Supply camera power in CN5 or CN8.

The above items will complete the setup of this board. After that it is the same when you connect a camera to SVM-03. Follow the instructions on how to use SVM-03.

4.　　　Salient Points

Item	Value	Description
Board Dimensions	60.0 x 101.6 mm	Value without connector
Power　　　for Deserializer	DC +3.3V ±5%	Via CN2, supplied from the capture board SVM-03U, etc(VDDH).
IO Power	DC +3.3V / 2.8V ±5%	Via CN2, supplied from the capture board SVM-03U, etc(VDDL).
Camera Power	N/A (about DC +5-9V)	Supplied from CN5 or CN8 connector. If CN6 is implemented, the AC adapter is supported. Supply voltage follows camera
Image Input	FPD-Link III Specifications	Single-ended　(FAKRA　connector)　or differential (HSD connector)
Image Output	Parallel Signal Max. 75 MHz / 12bit 100MHz / 10bit	The interface is the standard specification of our SV series, such as SVM-03

*　The above specifications apply only to model number NV012-C.
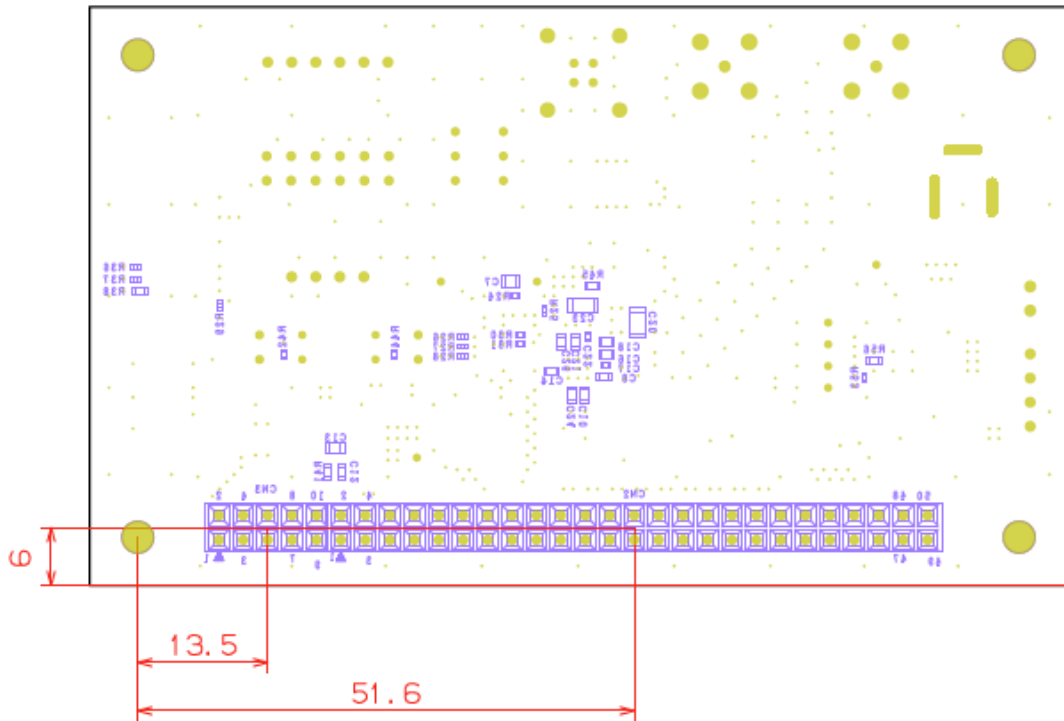
5. Appendix

5.1. Figure of board dimensions

(Parts Face/Part view)
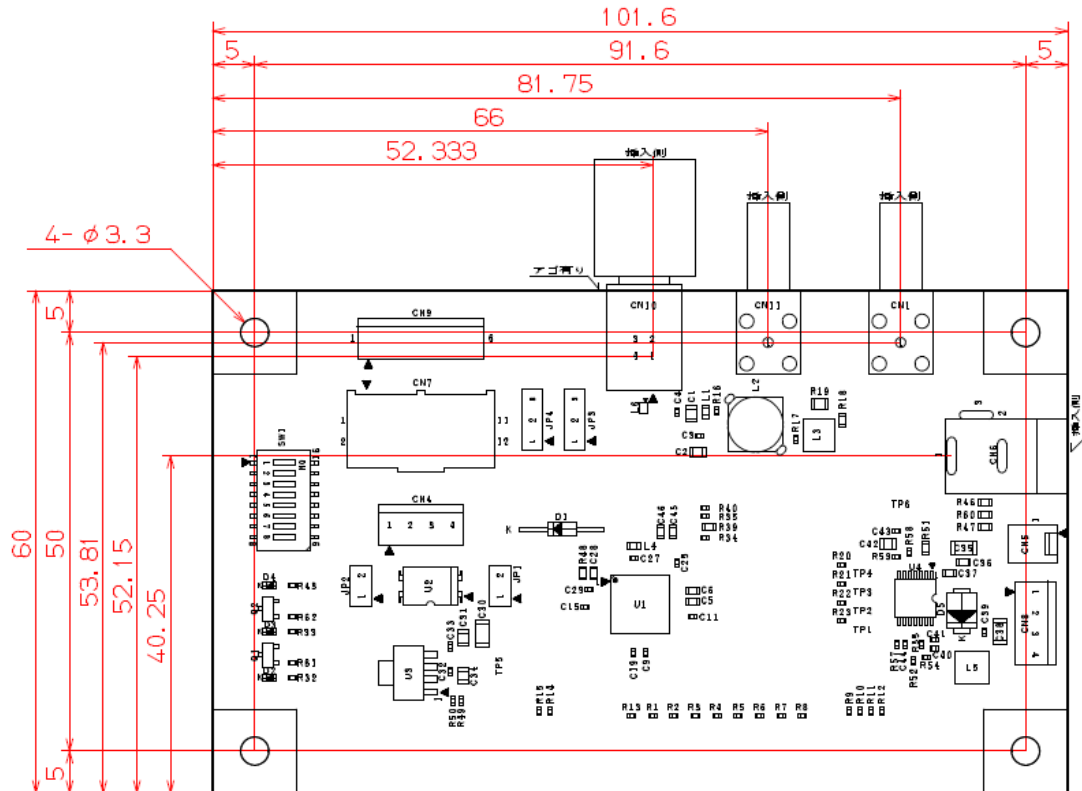
(Solder side/Part view)

5.2. Wiring diagram with 4 CH synchronous uptake system

The following is a reference material.

CN9 Board Wiring Diagram　　　　　**CN8 power supply Wiring Diagram (Reference)**