

CXD4960ER-W GVIF2 Deserializer Board

[GVI-4960]

(Board Model Number: NV017-C)

Hardware Specification

Rev. 1.0

NetVision Co., Ltd.

Update History

Revision	Date	Description	
1.0	27 July 2020	New File (Equivalent to Japanese version 2)	H. Suzuki

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1. Overview

This document is a hardware specification of GVIF2 deserializer board; GVI-4960 (board model number: NV017-C). This board converts serial video signals transmitted by SONY company's GVIF2 standard to MIPI signals, and is used connecting to our SVM-06 / SVM-MIPI board. This board has an additional GVIF2 output connector for daisy-chain connection compared to the previous GVIF2 deserializer board (NV017-A).

【Figure 1】 Block Diagram

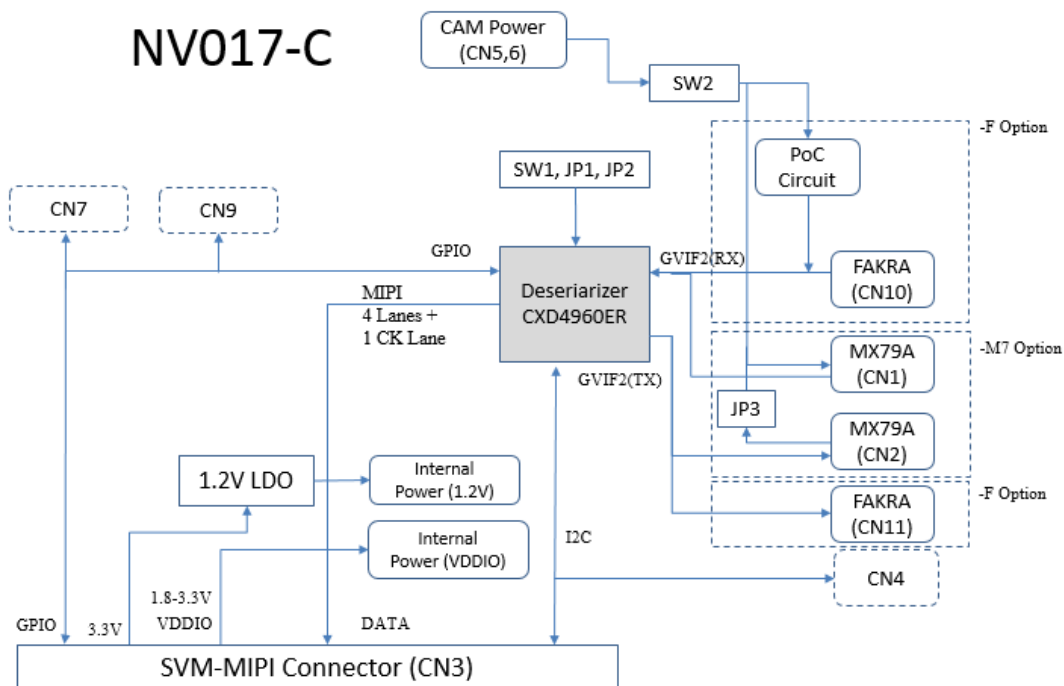
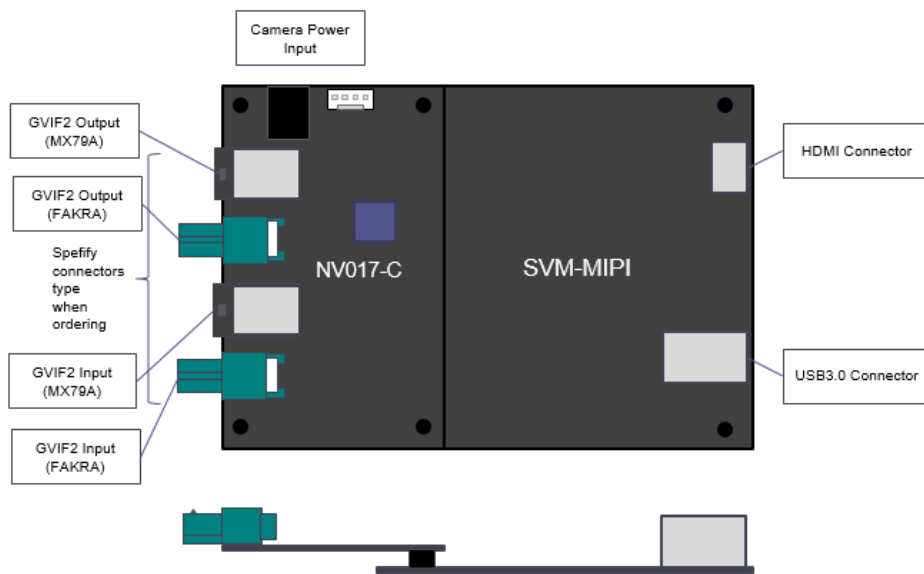


Figure1 shows the block diagram of the board. This board is mounted SONY's deserializer IC CXD4960ER, which converts GVIF2 signals to MIPI, enables CXD4960 register settings and I2C / GPIO back-channel communication through the GVIF2 signal line in combination with the SVM-06 / SVM-MIPI board. The MIPI signal output connector is a common interface of our SV series, so can be used by directly connecting to SVM-06 / SVM-MIPI. The board can be mounted a single-ended transfer connector and a differential transfer connector of FAKRA standard as input the GVIF2 signals, so it is ideal for connection with automotive cameras. In case of the FAKRA connector, In the case of FAKRA connectors, the input (RX) side port also supports power supply superimposing (PoC). Please select connector specifications when ordering.

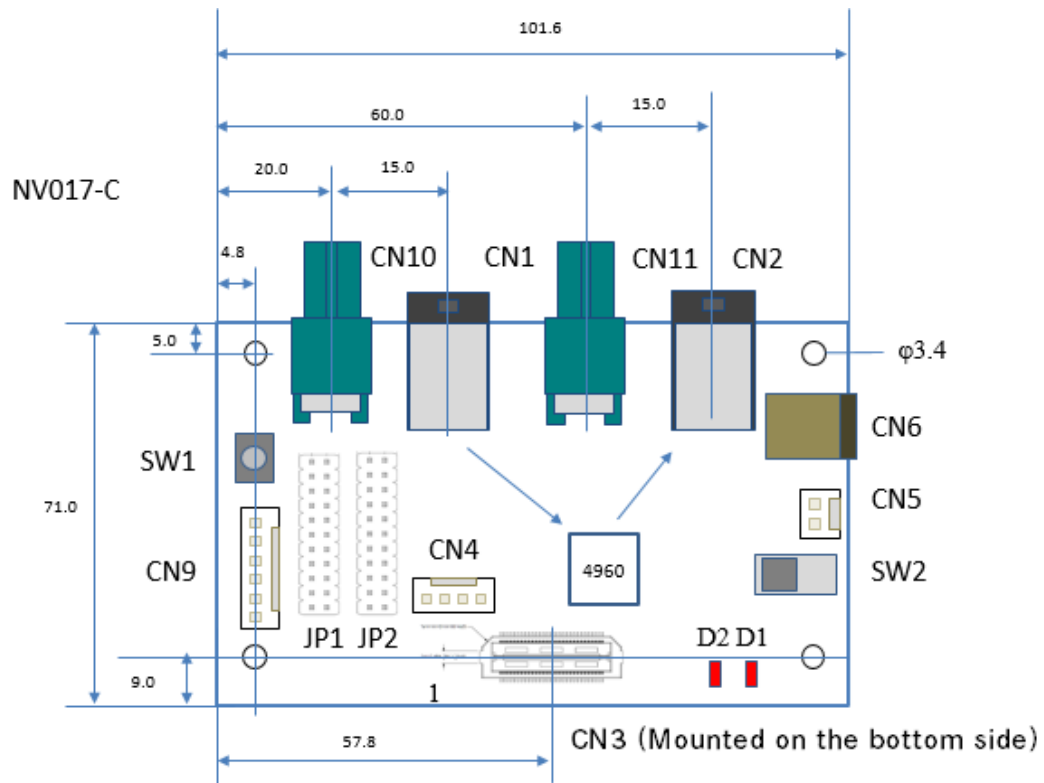
Figure2 shows the board connection image of this board and SVM-MIPI. As shown, both boards are connected with a 60-pin connector (CN3). Since the screw hole positions are common, they can be fixed with spacers or the like. Note that the connector position of the GVIF2 port is different from that of the previous board (NV017-A).

【Figure 2】 Board Connection Image



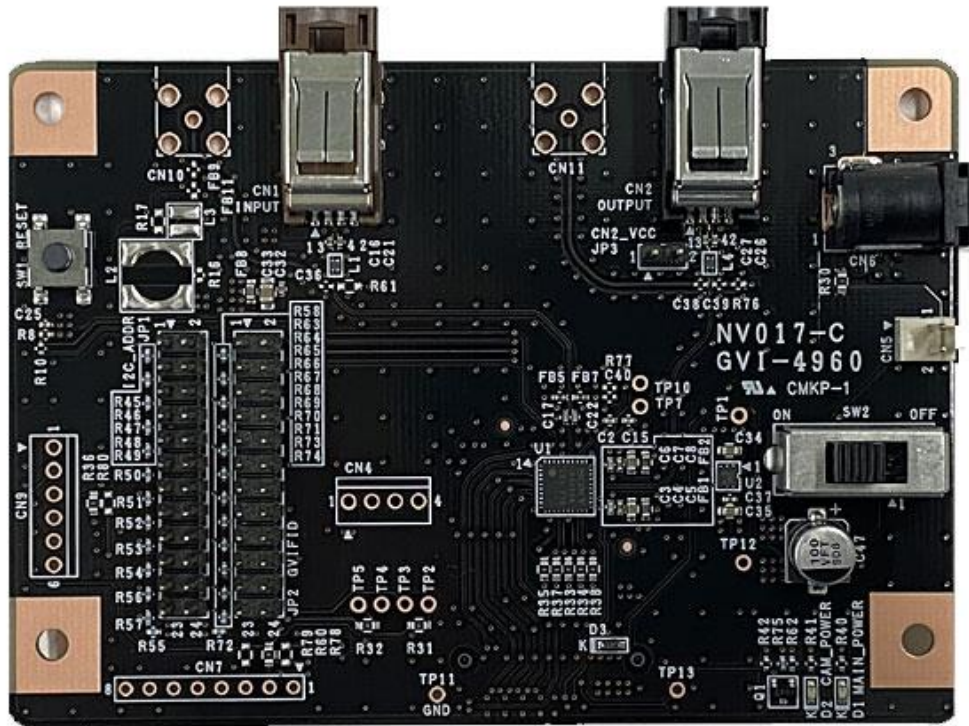
2. Board Shape

2.1. Connector Arrangement Diagram



- CN4, CN9 are not mounted as standard
- CN1-2, CN10-11 can be specified at ordering.
- Detailed part dimensions are not reflected in the drawing.

2.2. Board Photo



This photo is a board with -M7 specification (GVI-4960-M7)

3. Details

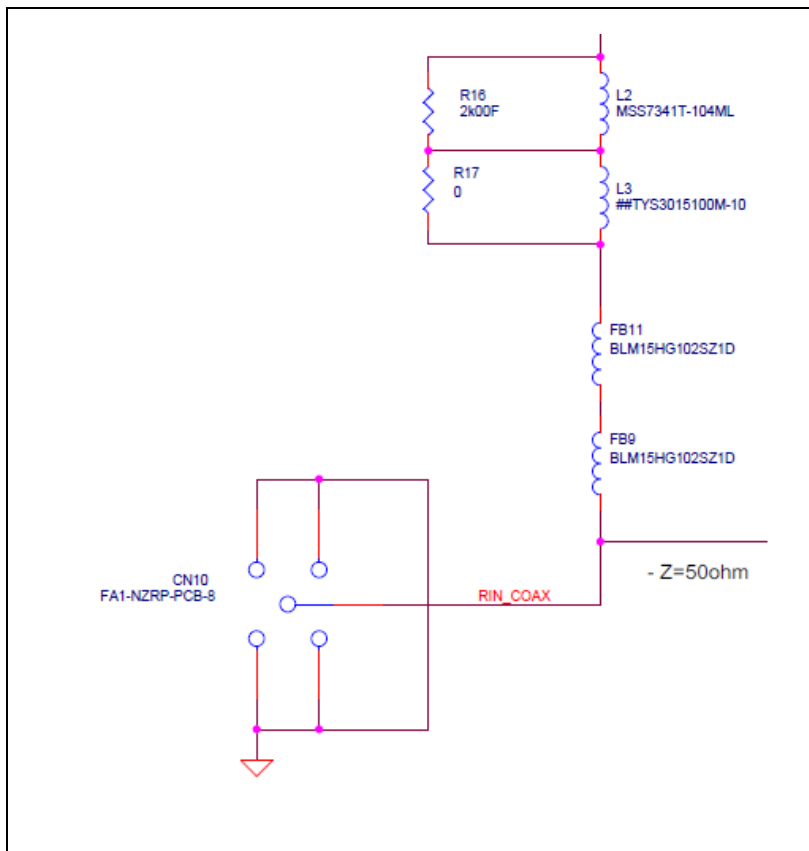
3.1. GVIF2 Input

The deserializer IC CXD4960 has only one input system (G2RX_SDP/N, G2RX_BCDP/N), and the input connectors are switched depending on the mounting state of the component.

In case of differential connectors, C36, C40, R61, and R77 are not mounted, and CN1, C16, C21, L1 and FB7 are mounted. In case of coaxial connectors (FAKRA), L1 and FB7 are not mounted, and CN10, C36, C40, R61 and R77 are mounted. For coaxial connectors, PoC filter circuits (FB9, FB11, L2, R16 and R17) are also mounted. The C22 is mounted with 180 pF for differential connectors and with 100 nF for coaxial connectors.

3.2. PoC Circuits

With a coaxial cable, power can be superimposed on the cable by Power over Coax (PoC) circuit. The PoC circuit is shown below. However, please note that the transmission performance of the PoC Circuit is also affected by the circuit to which it is connected and therefore the operation of all cameras cannot be guaranteed. With a differential cable, the PoC circuit cannot be used.



3.3. GVIF2 Output

The deserializer IC CXD4960 has only one output system (G2TX_SDP/N), and the output connectors are switched depending on the mounting state of the component. When GVIF2 output is not performed, connector CN2 / CN11 is not used.

In case of differential connectors, C38, C39, and R76 are not mounted, and CN2, C26, and C27 are mounted. In case of coaxial connectors, C26 and C27 are not mounted, and CN11, C38, C39, and R76 are mounted.

3.4. Power System

The power supply of the deserializer IC CXD4960 (core power supply and IO power supply) is supplied from the connected board (SVM-MIPI, etc.) via CN3. The core power supply is 1.2V, and the 1.2V regulator (LDO) on the board supplies power to the deserializer. The 3.3V power supply is directly connected to the CN3 pin, so a stable 3.3V power supply should be provided when connecting to a board other than the SVM-MIPI. The IO power supply corresponds to 1.8V and 3.3V and supplies the VDDIO voltage of CN3.

In addition, this board is capable of outputting a camera power supply (VCAM) to a differential cable or FAKRA cable. This VCAM power is supplied from either CN5 or CN6 connector and is fed to the coaxial cable via a PoC circuit when using the FAKRA connector. With differential cables, the VCAM is connected to a specific pin on the cable. The VCAM power supply and the internal power supply of this board are DC-separated through a capacitor, so the order of turning on the internal power supply and VCAM power supply does not matter.

3.5. I2C bus, GVIFID

The deserializer IC CXD4960 has an I2C bus, which allows you to change the register settings of the IC and perform I2C communication with the serializer and target devices through a GVIF2 cable. The I2C bus of CXD4960 is pulled-up to the IO voltage (VDDIO) at 4.7k Ω , and is directly connected to the SVM-MIPI connector, so this enables I2C communication from a PC using SVM-MIPI standard features. At the same time, since the I2C bus is directly connected to the I2C I/O connector (CN4) on the board, mounting CN4 enables connection with an external device and operation from an external master.

The I2C address of the CXD4960 can be changed to 11 types by the jumper JP1. For details, refer to Jumper Settings section. Similarly, GVIFID can be changed to 11 types by the jumper JP2.

3.6. Connector List

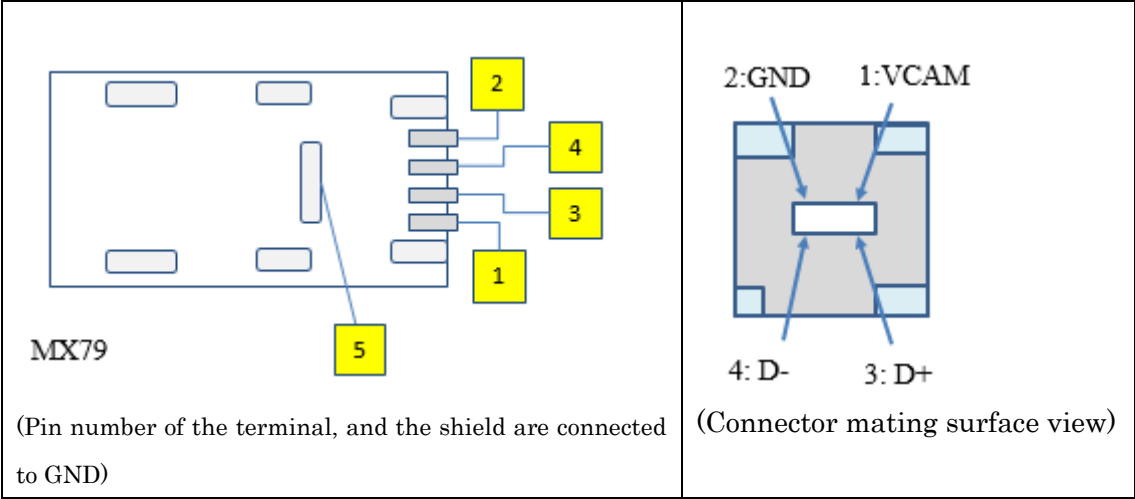
CN#	Mounted State	Description	Model Number
CN1	specified at ordering	GVIF2 input (differential)	MX79A04HQ2
CN2	specified at ordering	GVIF2 output (differential)	MX79A04HQ2
CN3		for SVM-MIPI connection	QTH-030-01-L-D-A
CN4	un-mounted	I2C input / output	171825-4
CN5		Camera Power input 1	22-04-1021
CN6		Camera Power input 2	PJ-202A
CN7	un-mounted	Expansion connector	A2-6PA-2.54DSA(71)
CN9	un-mounted	Expansion connector	171825-6
CN10	specified at ordering	GVIF2 input (coaxial)	FA1-NZRP-PCB-8
CN11	specified at ordering	GVIF2 output (coaxial)	FA1-NZRP-PCB-8

- Mounted State applies to NV017-C.
- The expansion connectors (CN7, CN9) are for board-to-board communication in multi-board input systems, and for future expansion.
- The camera power input connectors (CN5, CN6) are used to input DC power to the target device (camera) as needed. Input power from one of the connectors, depending on the applications or systems. The camera power only goes out to the GVIF2 connector and is not used inside this board. The required power supply capacity depends on the target device. The input voltage of the camera power supply must not exceed 16V.
- The I2C input/output connector (CN4) is directly connected to the I2C bus of the deserializer IC (CXD4960).

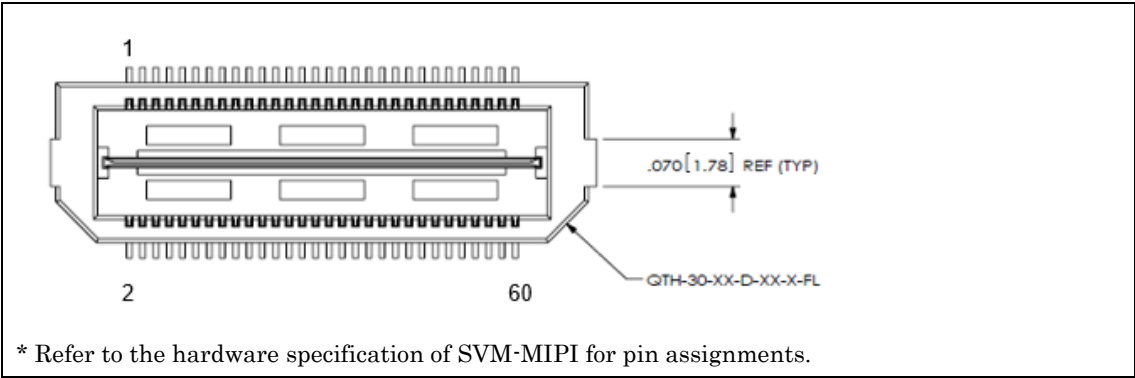
3.7. Connector Details

Parts starting with ## in the schematic indicate unimplemented parts.

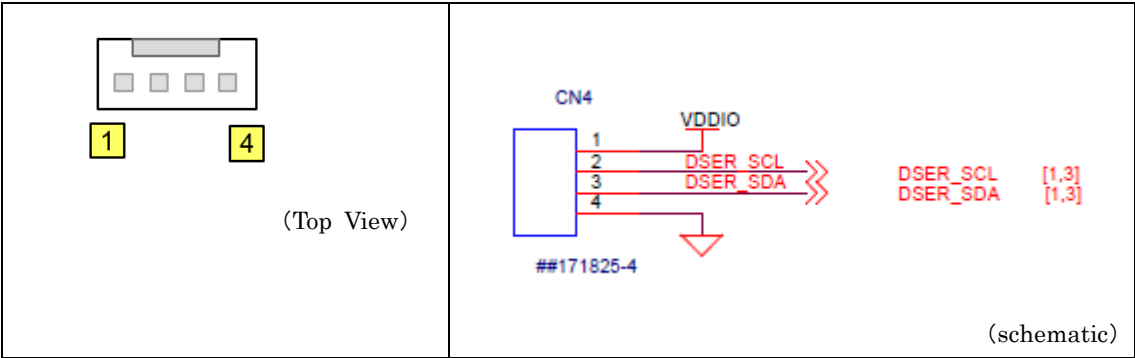
•CN1, CN2 (MX79A04HQ2)



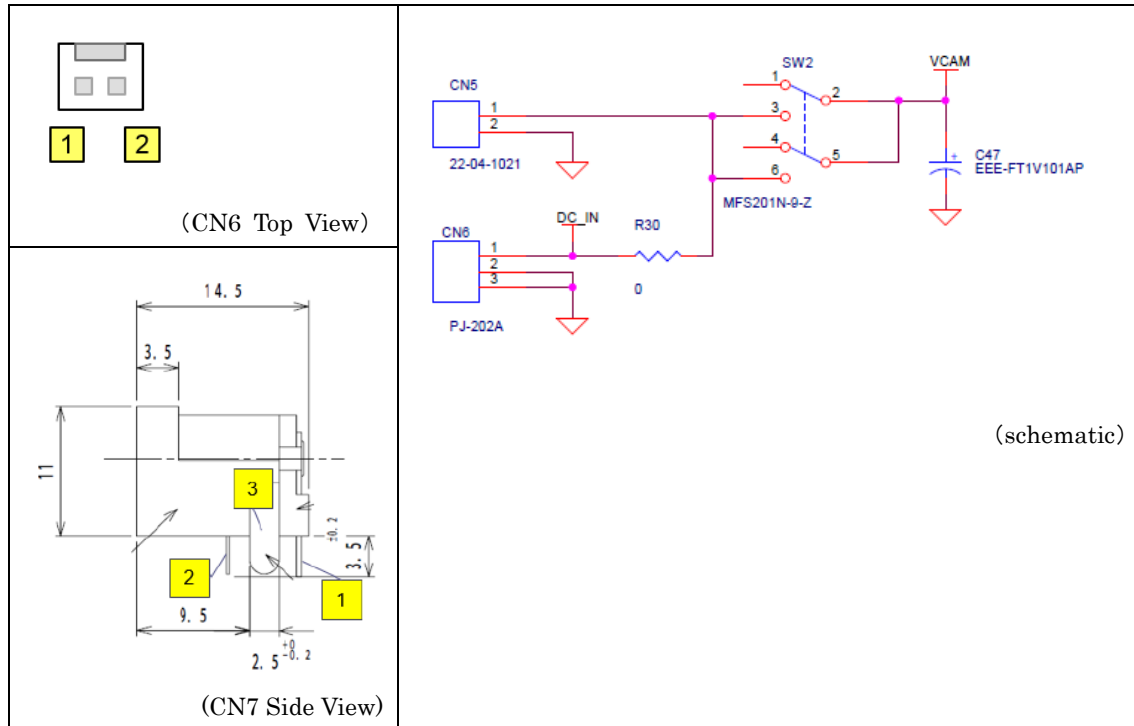
•CN3 (QTH-030-01-L-D-A)



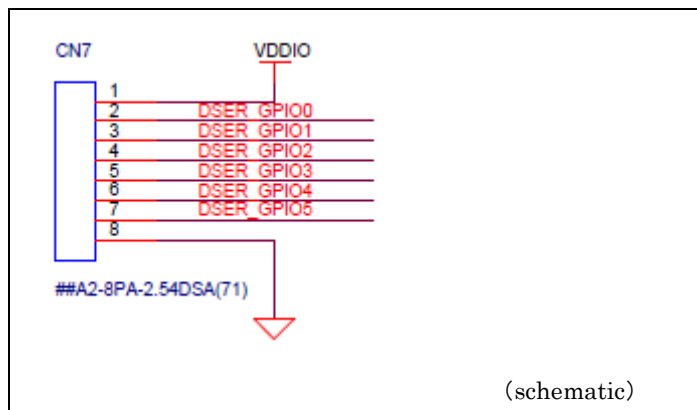
•CN4 (171825-4 / TE Connectivity)



• CN5 (22-04-1021 / Molex), CN6(PJ-202A)

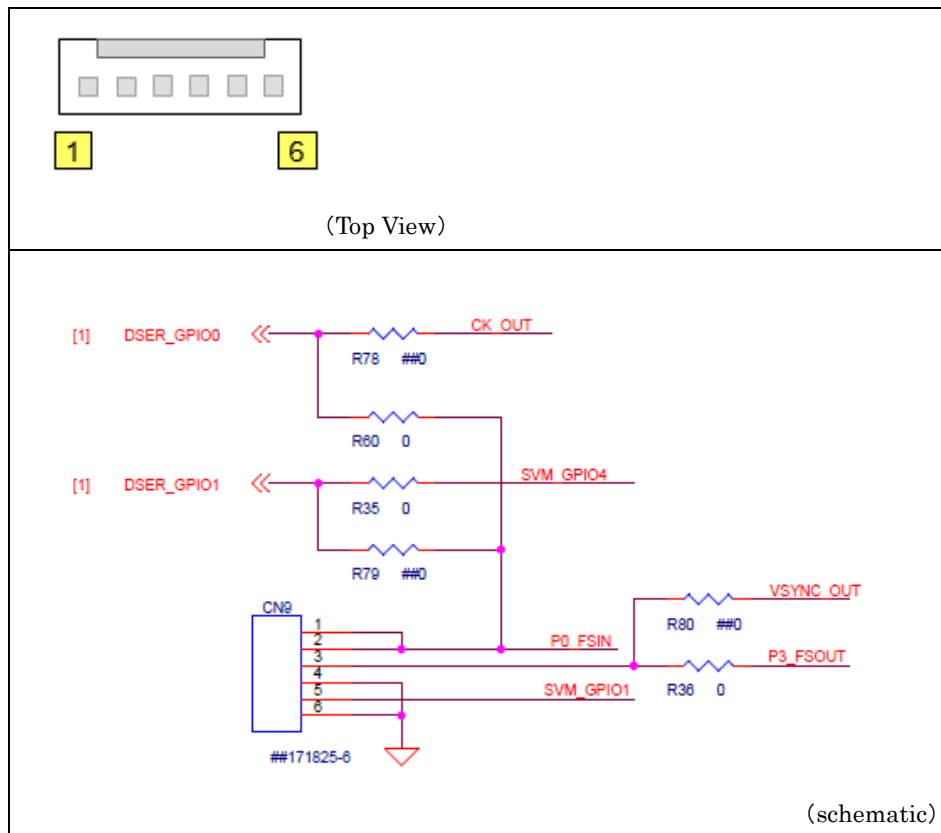


• CN7 (A2-8PA-2.54DSA(71) / HRS)



- DSER_GPIO0-5: Connects to IO #0-5 of the deserializer CXD4960.

•CN9 (171825-6 / TE Connectivity)



- P0_FSIN: Connects to #2 pin of CN3.
- P3_FSOUT: Connects to #10 pin of CN3.
- SVM_GPIO1: Connects to #4 pin of CN3.
- SVM_GPIO4: Connects to #22 pin of CN3.
- VSYNC_OUT: Connects to #43 pin of CN3, and TP13 on this board.
- CK_OUT: Connects to #49 pin of CN3.
- DSER_GPIO0-1: Connects to IO #0-1 of the deserializer CXD4960.

3.8. Switch

This board is mounted SW1 as reset switch. While pressed, the CE pin of CXD4960 is set L.

3.9. Jumper Settings

• JP1

JP1 is a jumper that specifies the I2C address of the CXD4960. With a jumper pin, select one in the table below.

Short-circuited pins	I2C address (7 bit)
1-2	0b0100000 (0x20)
3-4	0b0100001 (0x21)
(omitted)	
21-22	0b0101010 (0x2A)

The default is the 3-4 short-circuit state.

• JP2

JP2 is a jumper that specifies GVIFID of CXD4960. With a jumper pin, select one in the table below.

Short-circuited pins	GVIFID
1-2	0b01100000 (0x60)
3-4	0b01100001 (0x61)
(omitted)	
21-22	0b01101010 (0x6A)

The default is the 1-2 short-circuit state.

3.10. LED Indicator

This board is mounted 2 LEDs. Each function is shown in the table below.

LED#	Name	description
D1	MAIN_POWER	When power (3.3V) is being supplied, lights up.
D2	CAM_POWER	When camera power (VCAM) is being supplied, lights up.

4. Specifications

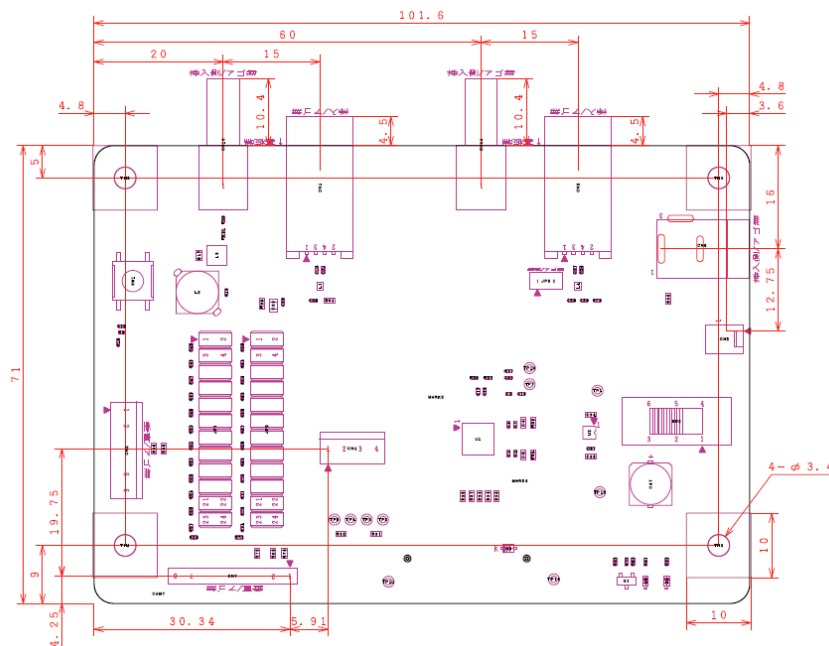
Item	Value	Description
Board Dimensions	71.0 x 101.6 mm	Value without connector
Power for Deserializer	DC +3.3V	Via CN3, It is supplied from the capture board SVM-06 / SVM-MIPI (3.3V), The core power supply is lowered voltage to 1.2V by LDO on the board.
IO Power	DC +3.3V / 1.8V	It is supplied from the capture board SVM-06 / SVM-MIPI (VDDIO).
Power for Camera	DC +16V / 300mA or less	It is supplied from CN5 or CN8 connector. It can support AC adapter by mounting CN6.
Image Input	GVIF2 standard	FAKRA Coaxial Connectors, supports PoC.
Image Output	MIPI CSI-2 1-4 Lanes + CLK	Output to CN3. The interface supports SVM-MIPI etc. The number of lanes can be set from 1 to 4.
Serial Communication	I2C	I2C bus output to CN3 and CN4

- The above specifications are applicable to model number NV017-C only.
- When connecting to an SVM-06 / SVM-MIPI board, the SVM board must be set to Continuous Clock.

5. Appendix

5.1. Board Dimensional Drawing

(Top Side / Part View)



(Bottom Side / Part View)

