

CXD4960ER-W GVIF2 Deserializer Board
(GVI-4960 / NV017-D)
Hardware Specification

Rev. 2.0

NetVision Co., Ltd.

Update History

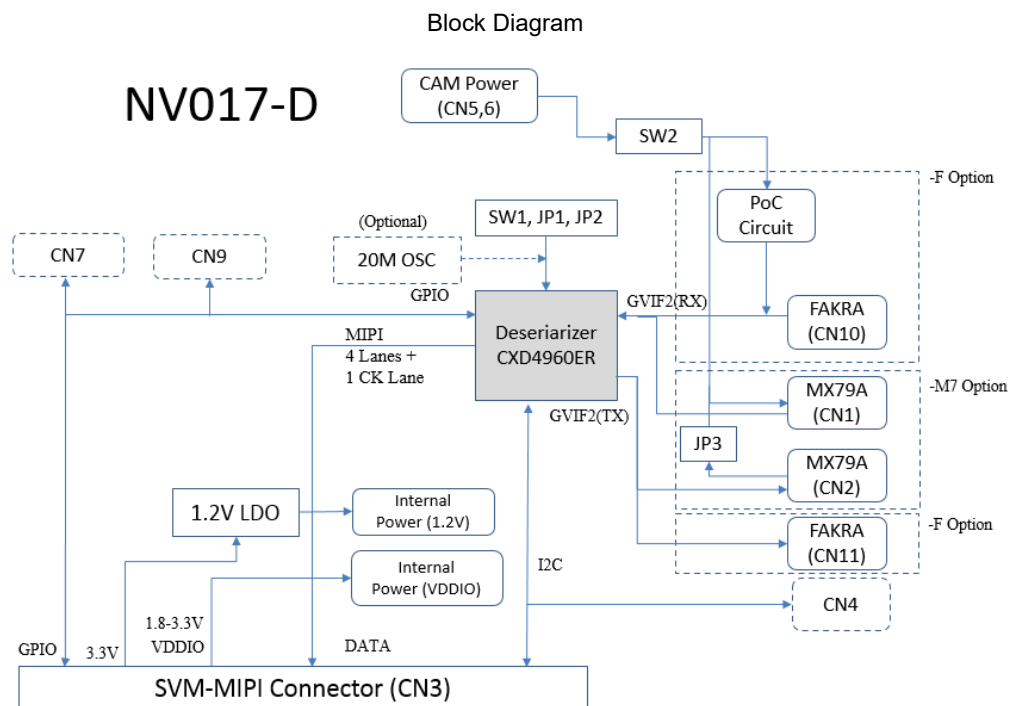
| Revision | Date | Description | |
|----------|--------------|---|------------|
| 1.0 | 8 Apr. 2022 | New File (Equivalent to Japanese version 3) | H. Suzuki |
| 2.0 | 22 Nov. 2023 | GVI-4960-F photo added. | Y. Mishima |
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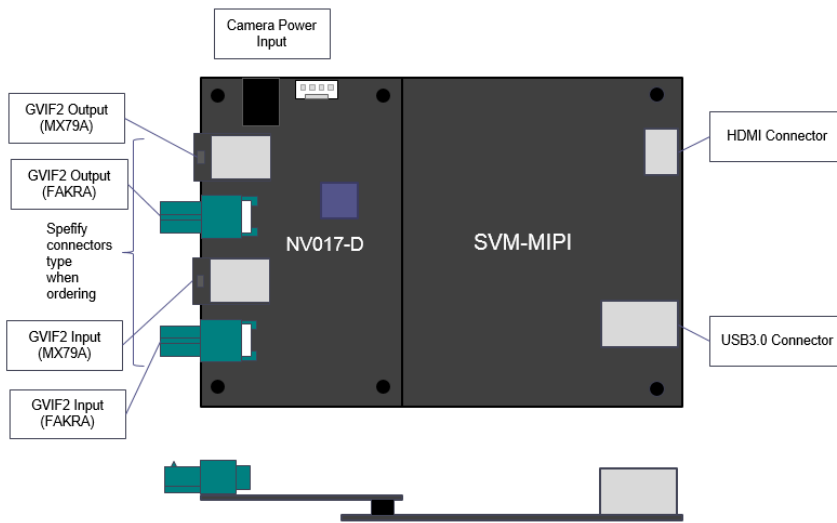
1. Overview

This document is a hardware specification of GVI-4960 / NV017-D (GVIF2 deserializer board). This board converts serial video signals transmitted by SONY GVIF2 standard to MIPI signals, and this is used connecting to our SVM-06 / SVM-MIPI board. Compared to the previous version of the GVIF2 deserializer Board (NV017-C), this board has a pattern for mounting an oscillator for the system clock and an ESD protection element. However, the oscillator for the system clock is not mounted in the standard specifications.



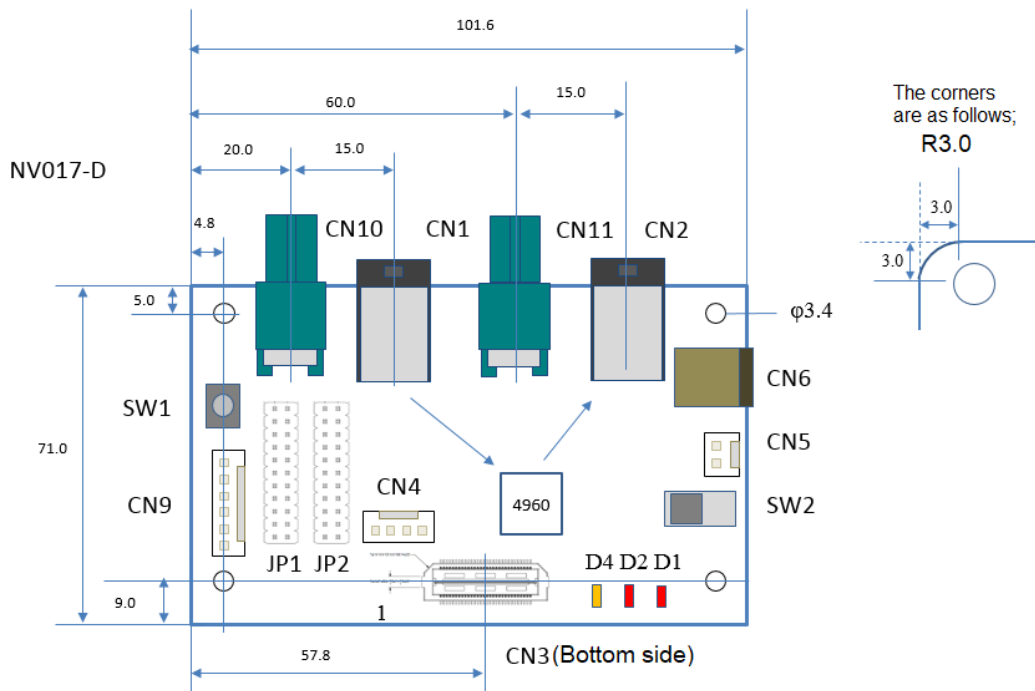
The above figure is the block diagram of the board. This board is mounted SONY deserializer IC CXD4960ER-W, which converts GVIF2 signals to MIPI, enables register settings of CXD4960 and I2C / GPIO back-channel communication through the GVIF2 signal line in combination with the SVM-06 / SVM-MIPI. The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

Board Connection Image



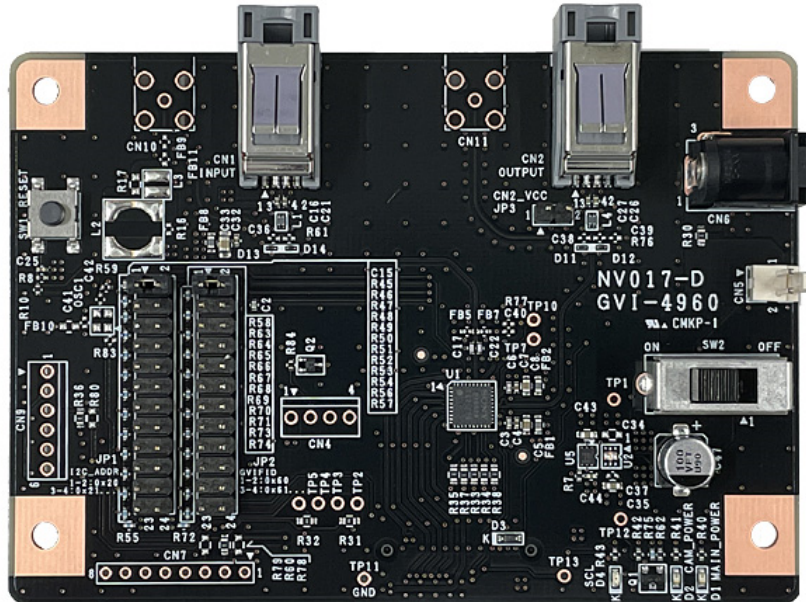
2. Board Shape

2.1. Connector Arrangement Diagram

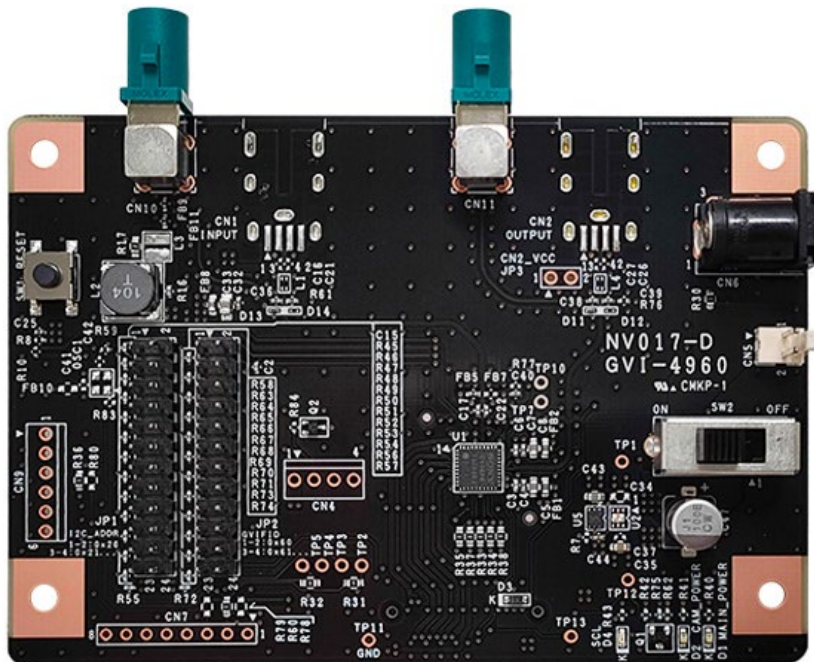


- CN4, CN9 are not mounted as standard. CN1-2, CN10-11 should be specified at ordering.
- Detailed part dimensions are not reflected in the drawing.

2.2. Board Photo



This photo is - M specification board (GVI-4960-M7) which is mounted MX79A connectors.



This photo is - M specification board (GVI-4960-M7) which is mounted MX79A connectors.

3. Details

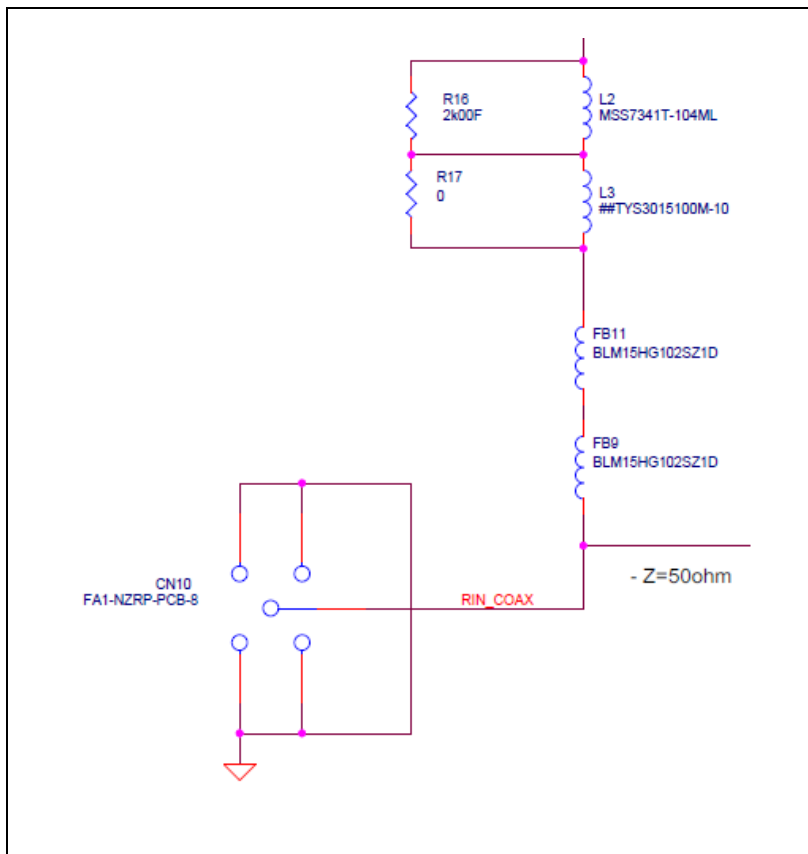
3.1. GVIF2 Input

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

In case of a differential connector, C36, C40, R61, and R77 are not mounted, and CN1, C16, C21, L1 and FB7 are mounted. In case of a coaxial connector (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 a differential connector and with 100 nF for a coaxial connector. Refer to the schematic for details.

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 we cannot guarantee the operation of all cameras. 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 connector is switched depending on the mounting state of the component. When GVIF2 output is not needed, connector CN2 / CN11 are not used.

In case of a differential connector, C38, C39, and R76 are not mounted, and CN2, C26, and C27 are mounted. In case of a coaxial connector, C26 and C27 are not mounted, and CN11, C38, C39, and R76 are mounted. Refer to the schematic for details

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-06, 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 other than SVM-06. The IO power supply supports 1.8V and 3.3V, and supplies from 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-06 connector, so this enables I2C communication from a PC using SVM-06 standard function. 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 I2C operation from an external master.

The I2C address of 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-06 / 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 | A2-8PA-2.54DSA(71) |
| CN9 | un-mounted | Expansion connector | 171825-6 |
| CN10 | specified at ordering | GVIF2 input (coaxial) | 0734035120 |
| CN11 | specified at ordering | GVIF2 output (coaxial) | 0734035120 |

- Mounted state applies to NV017-D.

- The expansion connectors (CN7, CN9) are for board-to-board communication in multi-board input systems, and for future expansion.

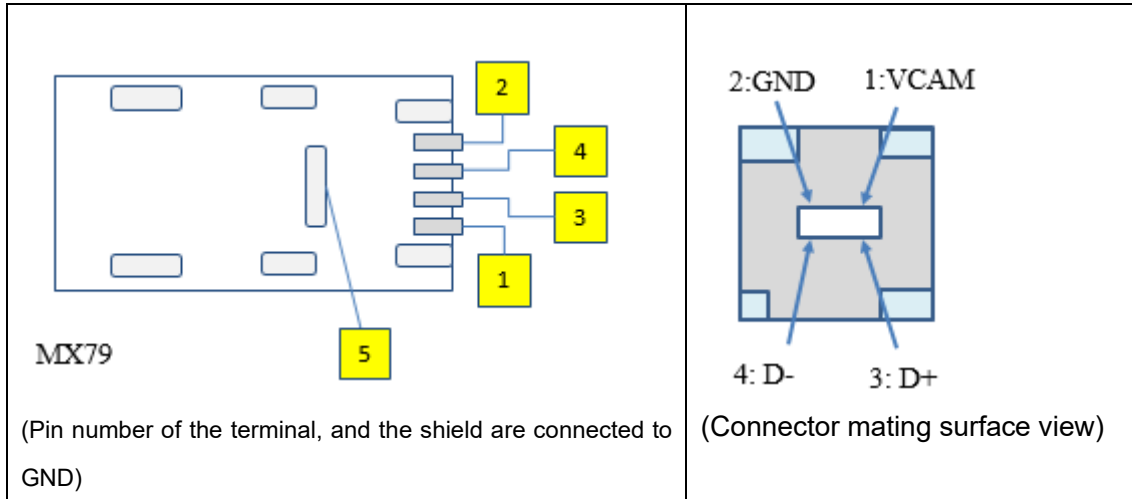
- The camera power input connectors (CN5, CN6) are used to input DC power to the target device (camera) as needed. Input power from either one of the connectors, depending on the applications or systems. The camera power only goes out to the GVIF2 connector and is not used inside this board. The required 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

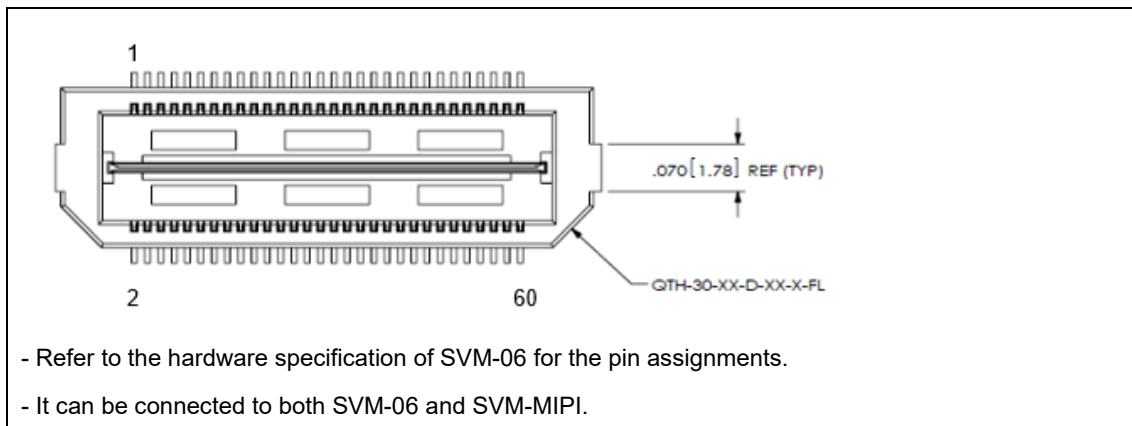
Parts starting with ## in the schematic indicate un-mounted parts.

•CN1, CN2 (MX79A04HQ2)

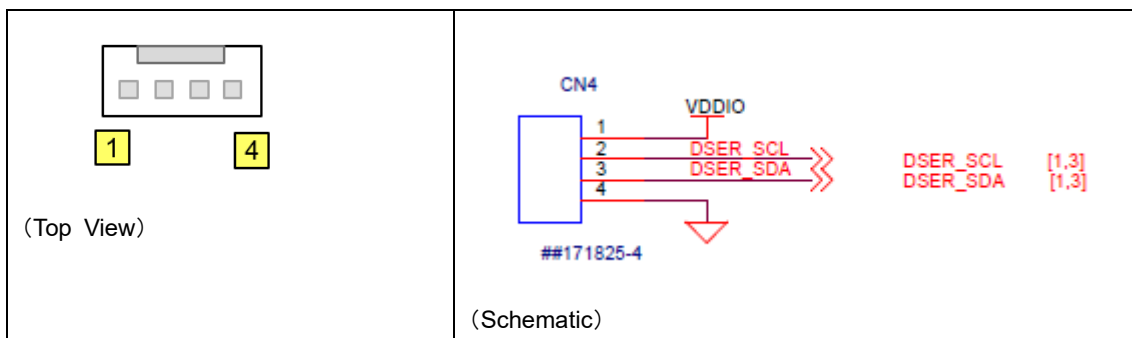


- The key type of the connector to be mounted should be specified at ordering.

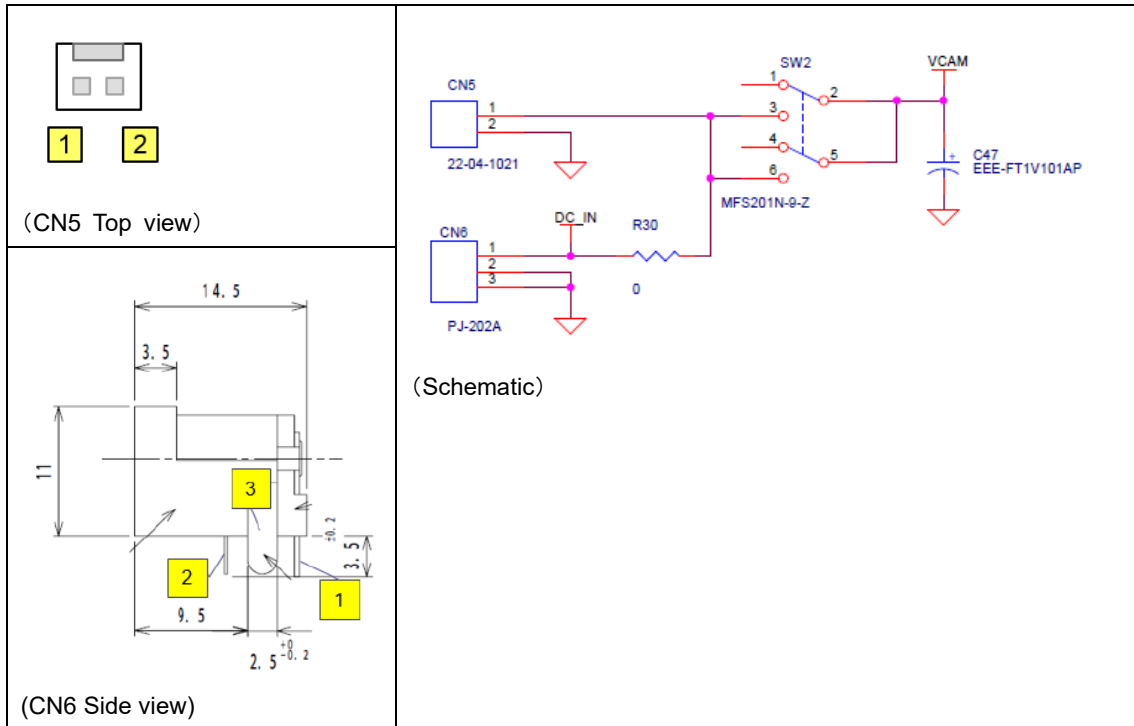
•CN3 (QTH-030-01-L-D-A)



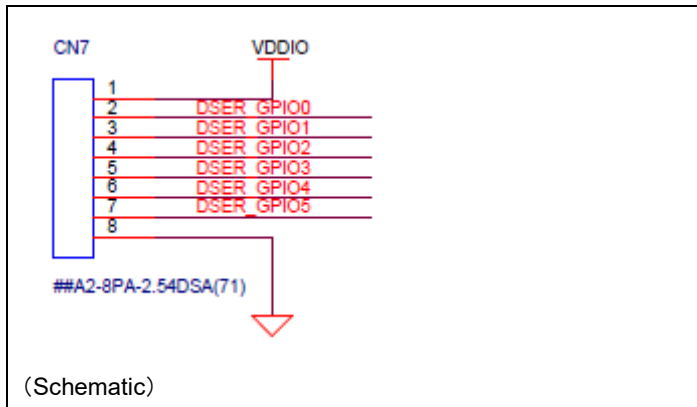
•CN4 (171825-4 / TE Connectivity)



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

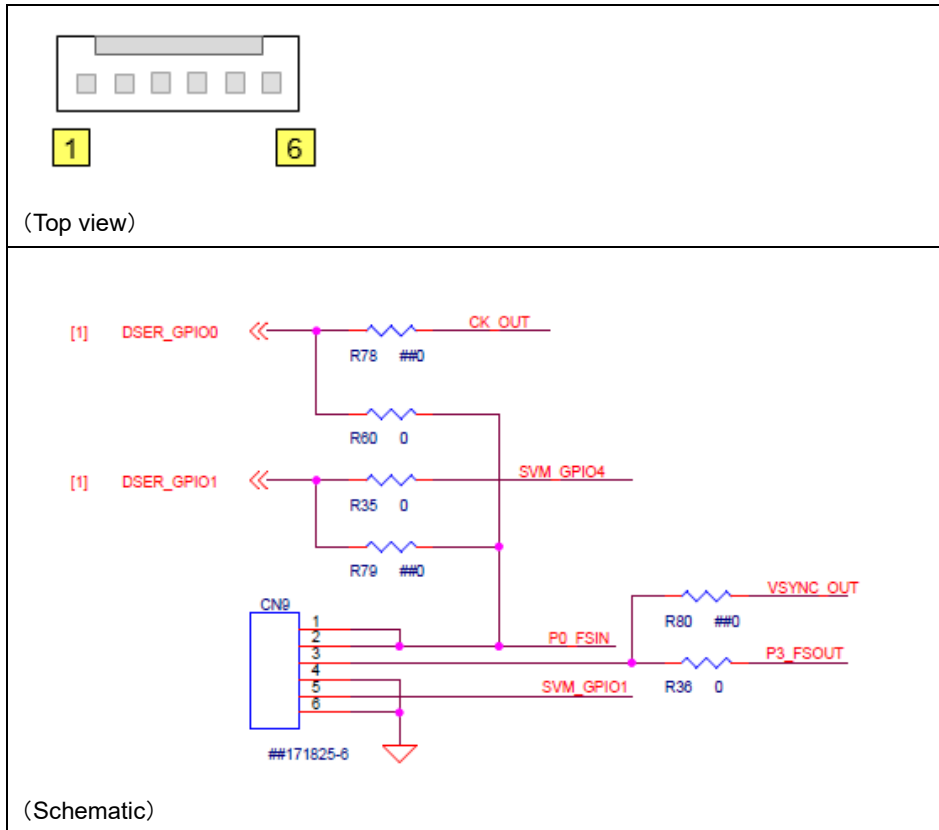


• CN7 (A2-8PA-2.54DSA(71) / HRS)



- 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 has a reset switch SW1. When SW1 is pushed, the CE pin of CXD4960 is set to L state.

3.9. Jumper Settings

- JP1

JP1 is a jumper that specifies the I2C address of CXD4960. With a jumper pin, select one in the table below. When mounting the oscillator for the system clock, 13-14 short (0x26) or 15-16 short (0x27).

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

The default setting is 3-4 short-circuited.

- JP2

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

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

The default setting is 1-2 short-circuited.

3.10. LED Indicator

This board has 3 LEDs. Each function is shown in the table below.

| LED# | Name | Description |
|------|------------|---|
| D1 | MAIN_POWER | When 3.3V power is being supplied, lights up. |
| D2 | CAM_POWER | When camera power (VCAM) is being supplied, lights up. |
| D4 | SCL | When the SCL pin of the deserializer CXD4960 is L, lights up. |

4. Specifications

| Item | Value | Description |
|------------------------|-------------------------------|---|
| Board Dimensions | 71.0 x 101.6 mm | Value without connectors |
| Power for Deserializer | DC +3.3V | Via CN3 It is supplied from our SVM-06 / SVM-MIPI (3.3V output), The core power supply is lowered voltage to 1.2V by LDO on the board. |
| IO Power | DC +3.3V / 1.8V | Via CN3 It is supplied from our 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. |
| Images Input | GVI2 standard | MX79A connector or FAKRA connector In case of FAKRA, PoC is supported. |
| Images Output | MIPI CSI-2 1-4 Lanes + CLK | Output to CN3. The interface supports SVM-06 etc. The number of lanes can be set from 1 to 4. |
| Serial Communication | I2C | I2C bus outputs to CN3 and CN4 |

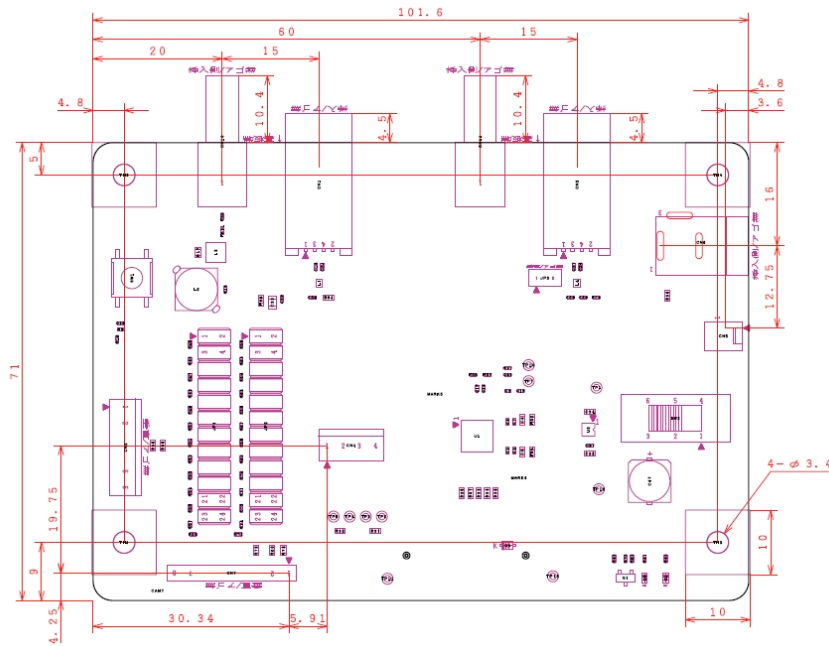
- The above specifications are applicable to model number NV017-D only.

- When connecting to 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)

