NV023-A / GMO-96707
(GMSL Serializer Board)

Hardware Specification

Rev.1.0

NetVision Co., Ltd.

Update History

Revision	Date	Note	
1.0	2 Mar. 2021	New file (Translated Japanese specification ver.3)	H. Suzuki

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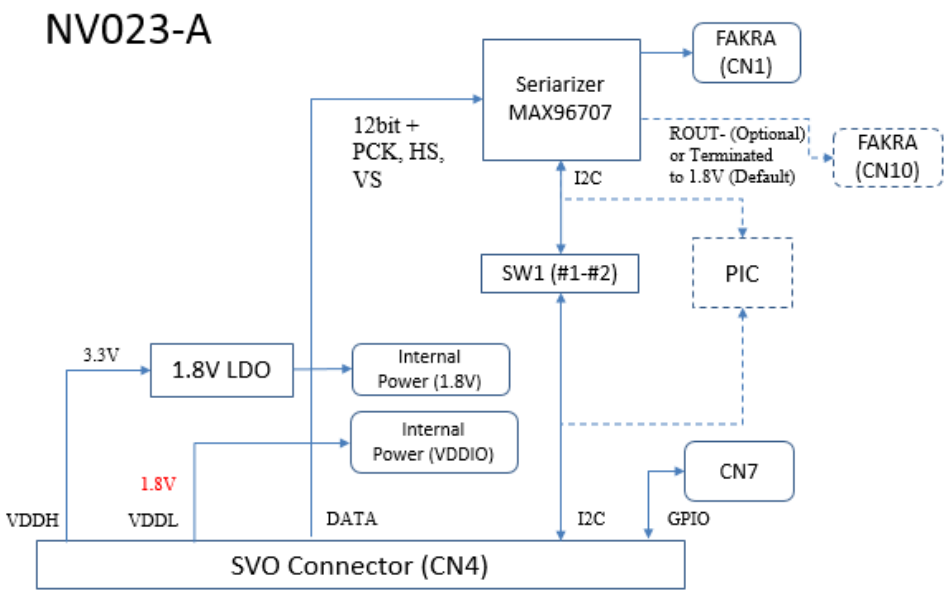
1. Overview

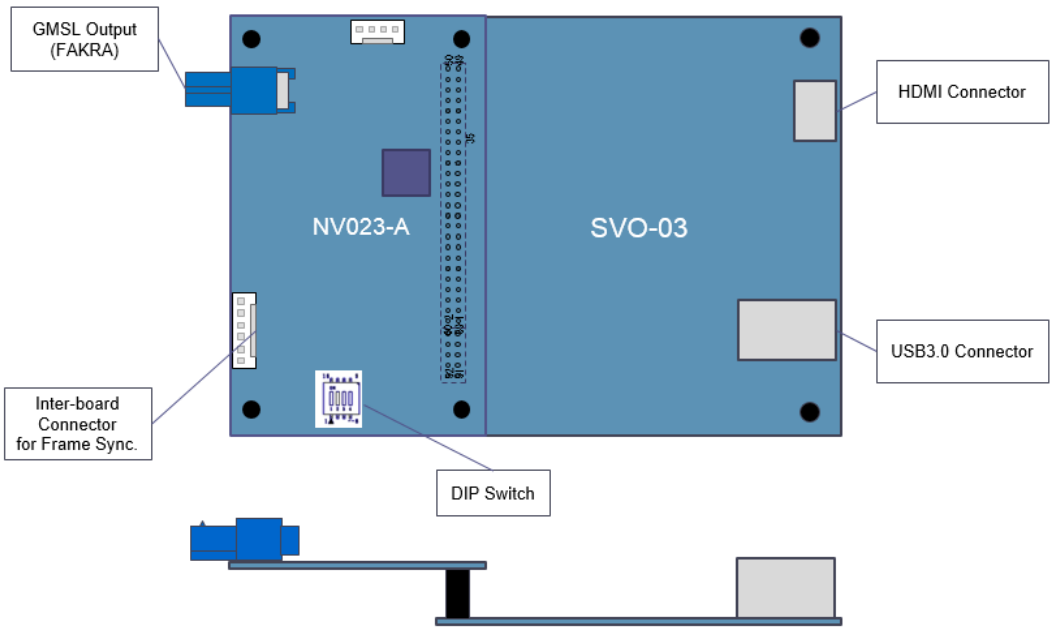
This is a hardware specification of GMO-96707 / NV023-A (GMSL Serializer board). This board is mounted the MAXIM company Serializer MAX96707 and convert a video signal input from in the parallel format to GMSL signal. This board has a FAKRA standard coaxial-output connector and an input connector for connecting with our SVO-03 board. Also this board can be mounted a PIC microcomputer for camera I2C emulation. By combining this board with the SVO-03 board, it can be applied to emulation of GMSL cameras.

Block Diagram



The block diagram of this board is shown above. This board is mounted GMSL serializer MAX96707, and supports video signals of 12bit parallel, maximum pixel clock 116MHz (maximum transfer rate depends on the setting). The input connector of the parallel signal is a common interface with our SV series, and it is possible to use it directly connected with our board such as SVO-03. As the output connector, this is mounted the FAKRA standard connector (single-ended transfer).

Board Connection Image



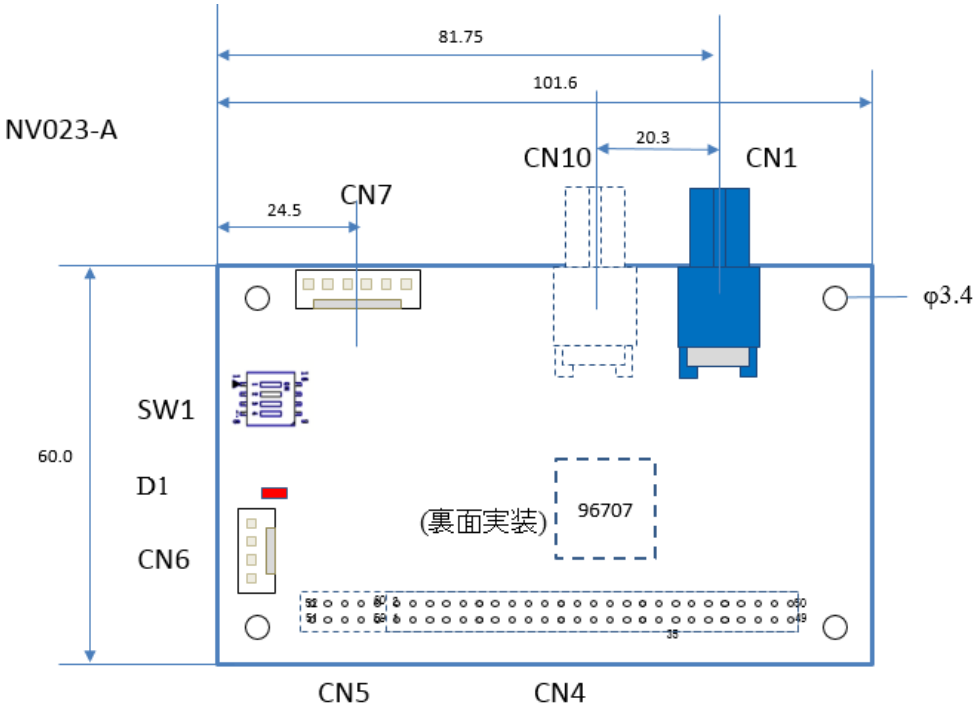
The board connection image of this board and SVO-03 board is shown in the figure above. As shown in the figure, both boards are connected via a 50-pin socket (CN4). Since the screw hole position is common, it is possible to fix them with spacers or the likes.

2. Board shape

2.1. Connector layout diagram

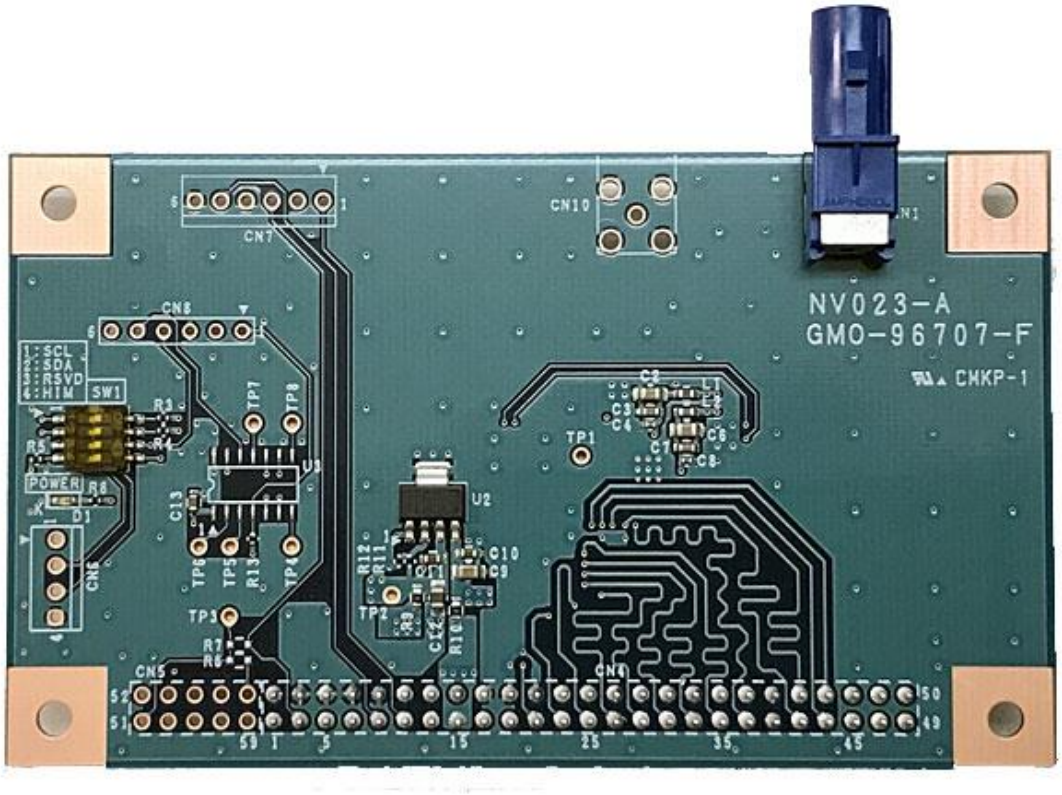
The figure below shows the arrangement of the main connectors on this board. PIN numbers and pin assignments are shown in “Connectors Details” section.

Main connectors layout diagram



* CN5, CN6, CN7, CN8, CN10 are not mounted.

2.2. Board Photo



3. Details

3.1. Connectors List

CN#	Mounted State	Description	Model number
CN1		For GMSL output (coax)	FA1-NCRP-PCB-8 (FAKRA standard)
CN4		For Parallel input and output	C-00086
CN5	Un-mounted		N/A
CN6	Un-mounted	For I2C input and output	171825-4
CN7	Un-mounted	For synchronous wiring	171825-6
CN8	Un-mounted	For ISP	A2-6PA-2.54DSA (71)
CN10	Un-mounted	For GMSL output (differential)	FA1-NCRP-PCB-8 (FAKRA standard)

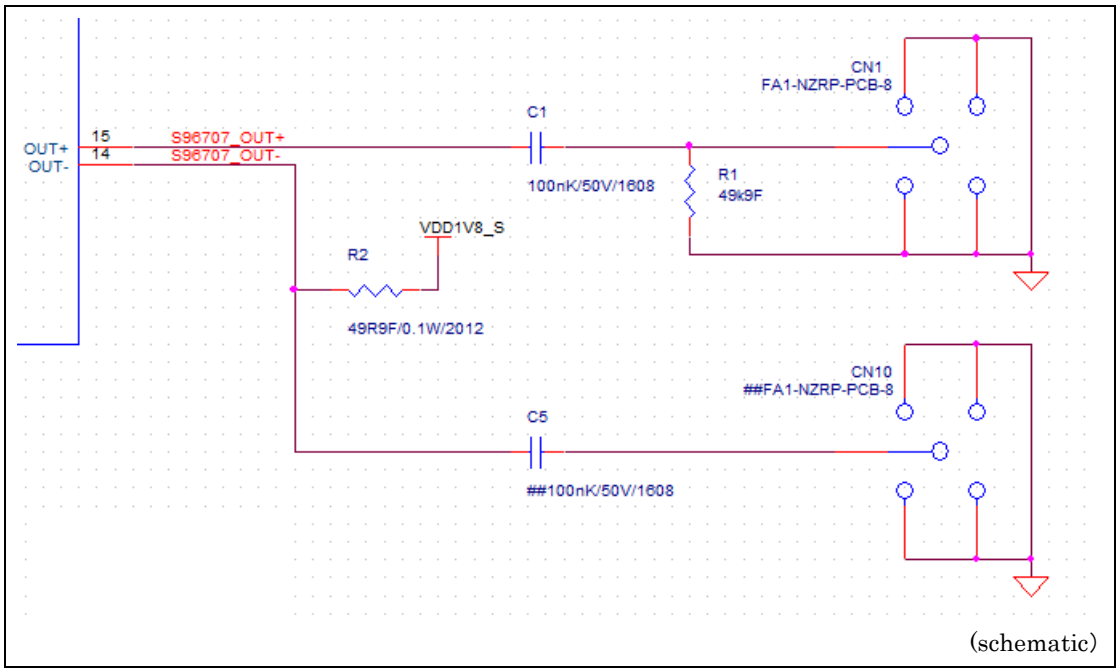
- Synchronous wiring Connector (CN7) is for inter-board communication in the output system using multiple boards, or for future expansion.

- The I2C I/O connector (CN6) is directly connected to MAX96707 I2C bus.

3.2. Connectors Details

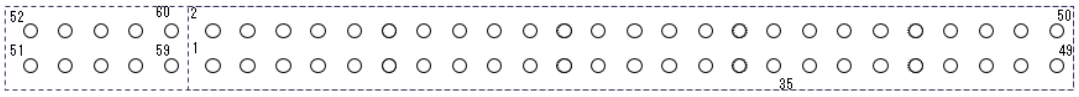
The figures below show the top view (outline) and the pin assignments (excerpts from the schematic).

・CN1, CN10 (FA1-NZRP-PCB-8)



(schematic)

・CN4(C-00086 / Right)、CN5(Left)

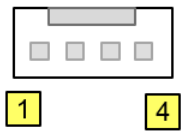


(when mounted, top view)

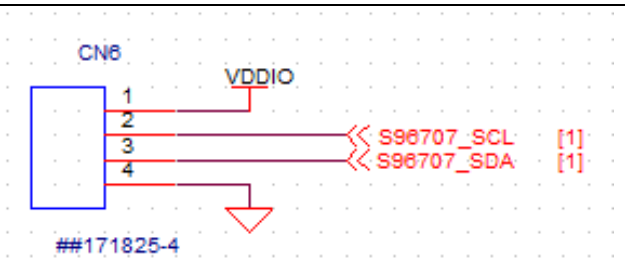
* Refer to our SVO series hardware specification for pin assignment.

- Connected CN4 and SVO board

・CN6 (171825-4 / TE Connectivity)



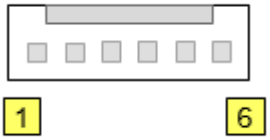
(top view)



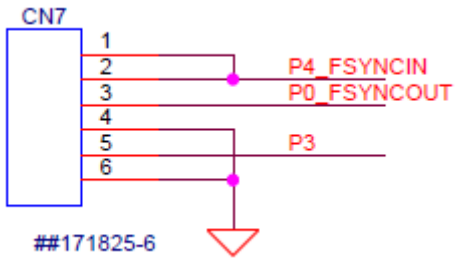
(schematic)

- Directly connected to the MAX96707 I2C bus.
- Not mounted.

・CN7 (171825-6 / TE Connectivity)



(top view)



(schematic)

- P4_FSYNCIN: Connected with P4(11) of CN4
- P0_FSYNCOUT: Connected with P0(3) of CN4
- P3: Connected with P3(9) of CN4

- Not mounted.
- When frame synchronization is needed between multiple SVO-03 boards, synchronous wiring can be performed via this connector. The frame synchronization function is custom.
- For right-angle mounting, mount the connector model 171826-4 on the back side of the board.

3.3. DIP Switch Settings

A 4-bit DIP switch (SW1) is mounted on this board, allowing the initial setting of Serializer MAX96707 and the I2C address setting.

3.3.1. SW1 (MAX96707 / I2C Connection Settings)

SW#	Name	Description
1	I2C_SCL	ON: The I2C bus output to CN2 (SVO side) and the MAX96707 I2C bus are connected. OFF: Both I2C buses are disconnected.
2	I2C_SDA	
3	(Reserved)	(Reserved) Not used.
5	GPO_HIM	ON: Pull up the GPO/HIM pin of MAX96707 with a 30kΩ resistor. OFF: Leave MAX96707 GPO / HIM pin in released.

3.4. I2C Bus

This board has one system of I2C bus, but the I2C bus between the serializer and SVO board (connector CN4 side) can be disconnected to prevent I2C address conflict. By setting #1 and #2 of SW1 to ON, I2C buses of the serializer and SVO board are connected. The serializer's I2C bus is also connected to the connector CN4.

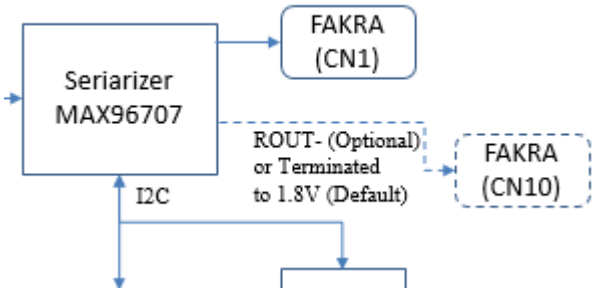
In addition, a PIC microcomputer and a pattern that can be mounted ISP connector are implemented in case the initial setting at board startup or I2C Slave mounting is required. Please refer to Appendix for the schematic around the PIC microcomputer.

3.5. Power Supply

The power supply for this board is supplied from two power supplies (VDDH, VDDL) connected to connector CN2. VDDH is connected to 1.8V LDO, and both 3.3V and 1.8V are used as power supply for IC. Set VDDH voltage of SVO board to 3.3V before power on.

VDDL is used as the IO voltage of the serializer. The serializer (MAX96707) on this board supports only 1.8V IO voltage, so VDDL must be set to 1.8V before connecting.

3.6. Serializer output



OUT1+ terminal of MAX96707 is output to CN1. OUT- terminal is connected to 1.8V through resistance R2 (49.9 Ω). Normally it supports coaxial output using FAKRA connector.

It is also possible to output OUT- terminal to CN10 by changing the mounting of parts. When performing differential output using CN1 and CN10, mount C5 and CN10, and do not mount R2.

4. Specifications

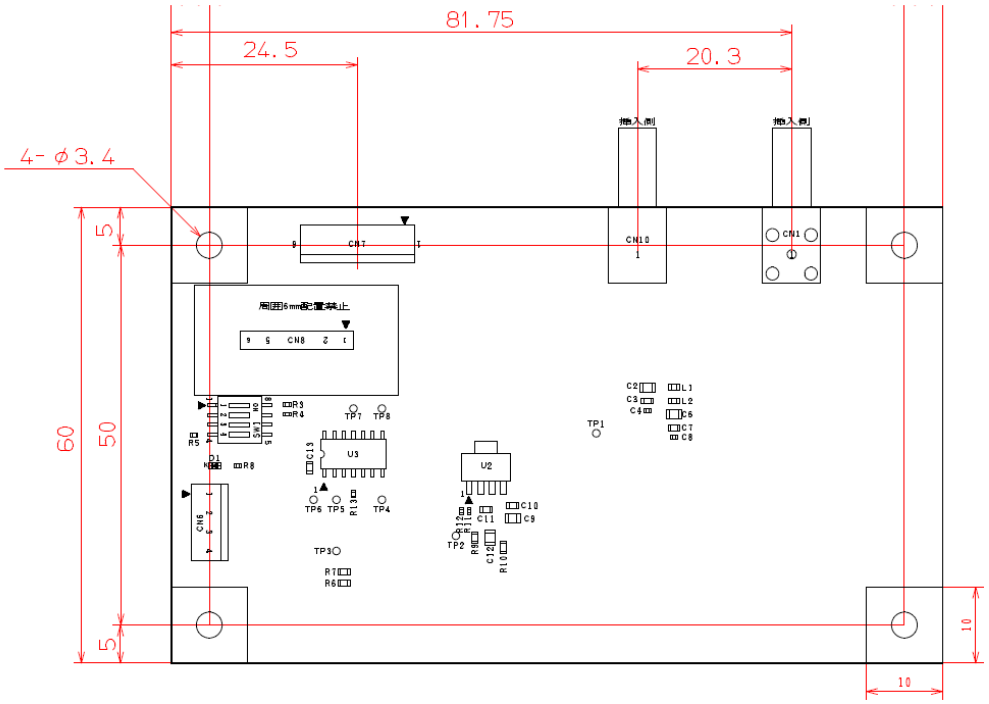
Item	Value	Description
Board Dimensions	101.6 x 60.0 mm	Value without connector
Power for Serializer	DC +3.3V	Via CN2, Supplied from SVO-03 board power supply (VDDH) Stepped down to 1.8V internally
IO Power	DC +1.8V	Via CN2, Supplied from SVO-03 board IO power supply (VDDL)
Image Input	Parallel signal	Input from CN2 Refer to MAX96707 standard for supported formats Connector pin assignment is according to SVO-03
Image Output	GMSL, coaxial (FAKRA connector)	Differential output with FAKRA x2 is also possible by replacing parts
Serial communication	I2C communication	I2C signal is input from CN4(SVO side connector) or CN6. As the application to emulation of I2C communication response of camera, implemented a pattern that can mounted a microcomputer to process I2C data by PIC microcomputer.

- The above specifications apply only to model number NV023-A.
- Do not supply 3.3V to the IO power supply (VDDL).

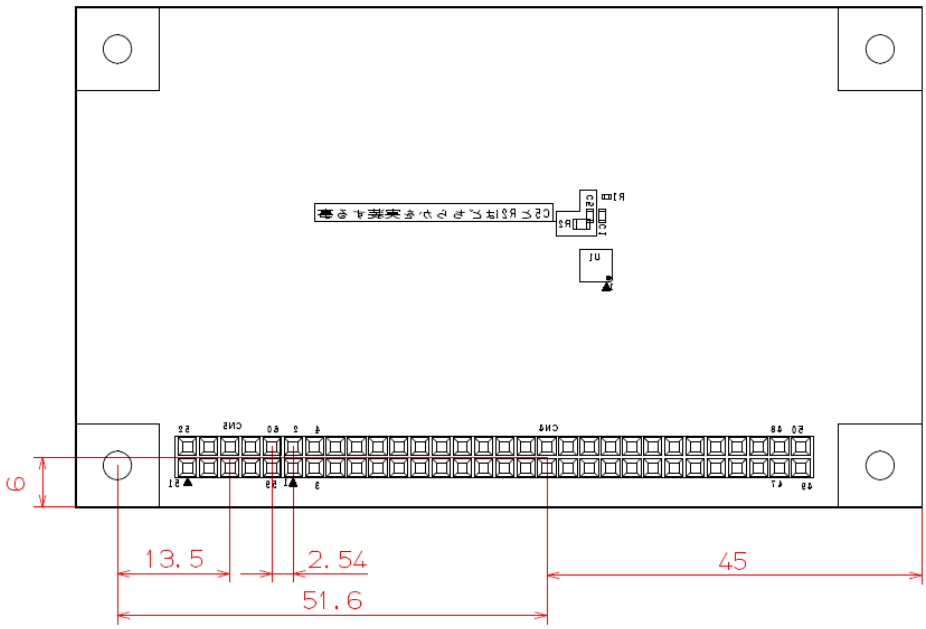
5. Appendix

5.1. Figure of Board Dimensions

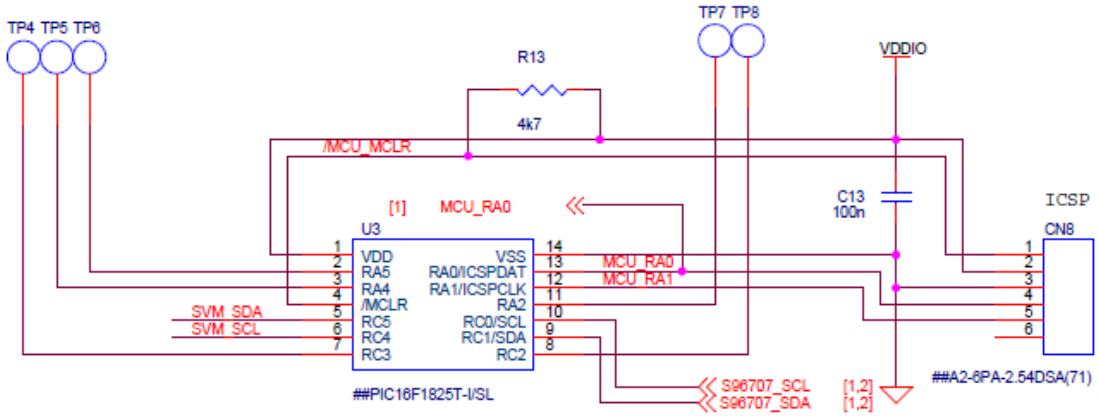
(Top side / Parts view)



(Bottom side / Parts view)



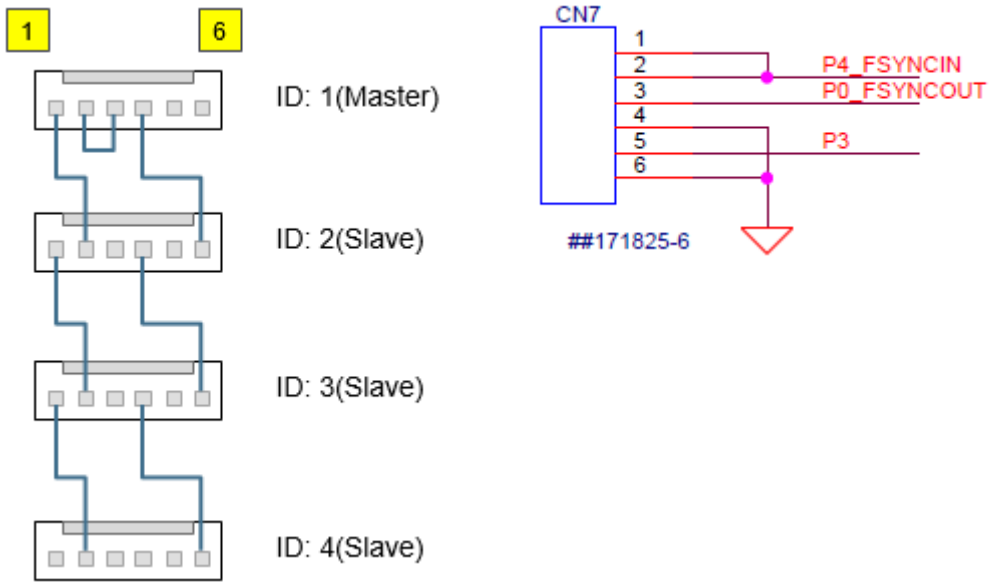
5.2. Schematic Around the PIC Microcomputer.



5.3. Wiring Example in 4ch Synchronous Output System

Multiple-channel synchronous output using the synchronous output function of the SVO is possible through external wiring via CN7.

The following is a reference material for wiring.



- Receptacle model number 171822-6 (TE Connectivity)
- Contact model number 170262-1