

MAX9296A GMSL2 Deserializer Board

[GMI-9296A]

(Board Model Number: NV019-A)

Hardware Specification

Rev. 1.0

NetVision Co., Ltd.

Update History

Revision	Date	Note	
1.0	2020/04/09	New File(Equivalent to Japanese version 1.0)	H. Suzuki

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1. Overview

This document is a hardware specification of the GMI-9296A “MAX9296A GMSL2 deserializer board” (board model number: NV019-A). GMI-9296A board converts serial video signals transmitted by Maxim's GMSL standard to MIPI signals and connects to our SVM-06 board. This board cannot be connected to the SVM-MIPI board when a 120-pin connector is mounted, but it can be connected by changing the mounting of the connector. Please contact us for details.

【Figure 1】 Block Diagram

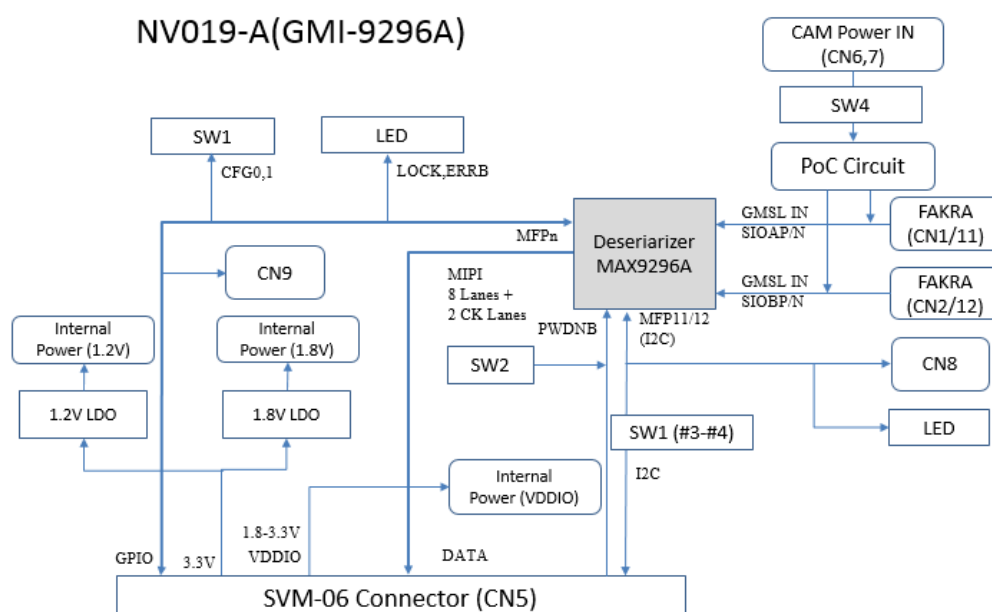
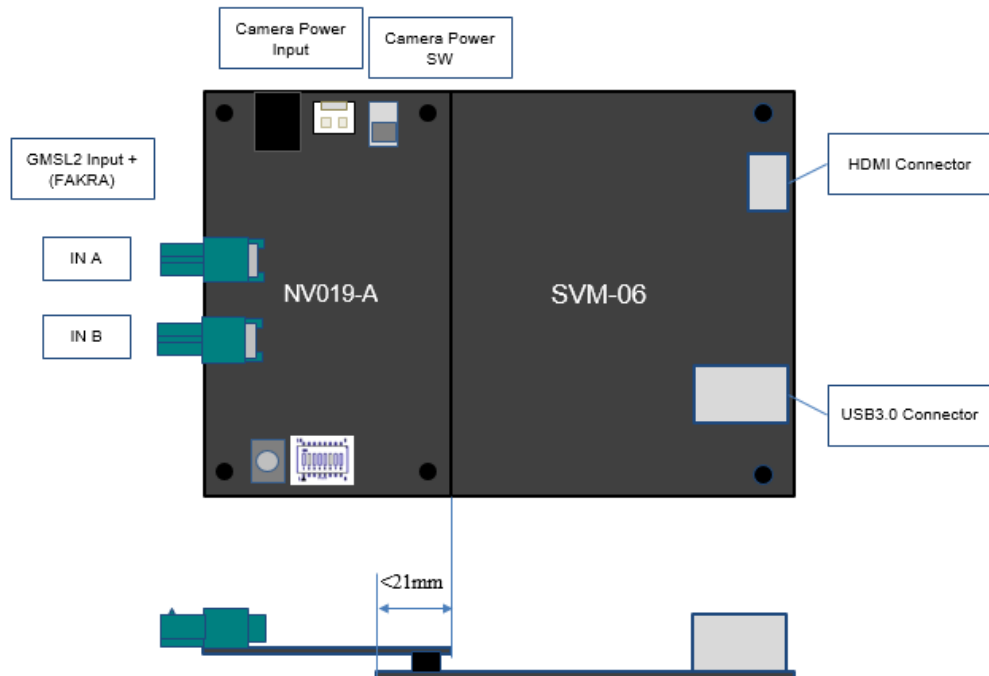


Fig. 1 shows the block diagram of the board. This board is equipped with the maxim company Deserializer IC MAX9296A, which converts GMSL2 signals to MIPI, enables MAX9296A register settings and I2C back-channel communication through the GMSL2 signal line in combination with the SVM-06 board. The MIPI signal output connector is a common interface of our SV series, and can be used by directly connecting to SVM-06 etc. This implements the FAKRA standard connector (single-ended transfer) as input for GMSL signals, and PoC circuit, so it is ideal for connection to automotive cameras. Since two FAKRA connectors are installed as inputs, two channels of GMSL2 signals can be input simultaneously.

Fig. 2 shows the board connection image of this board and SVM-06. As shown, both boards are connected with a 120-pin connector (CN5). Since the screw hole positions are common, they can be fixed with a spacer or the like.

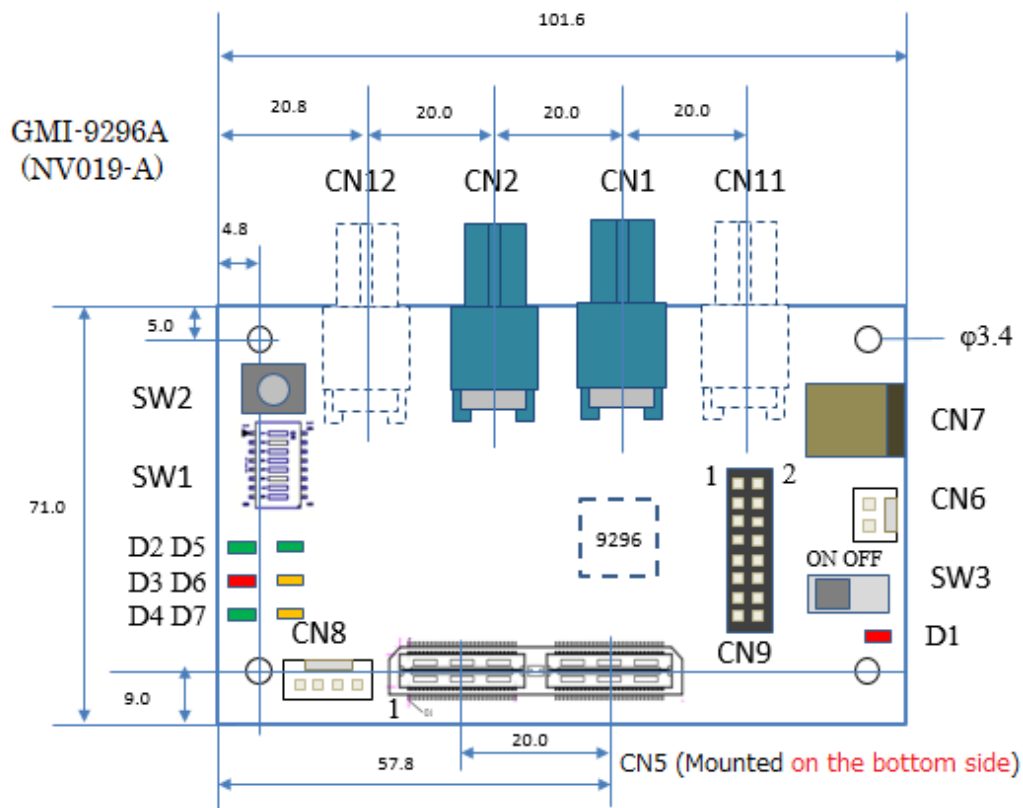
【Figure 2】 Board Connection Image



2. The Shape of The Board

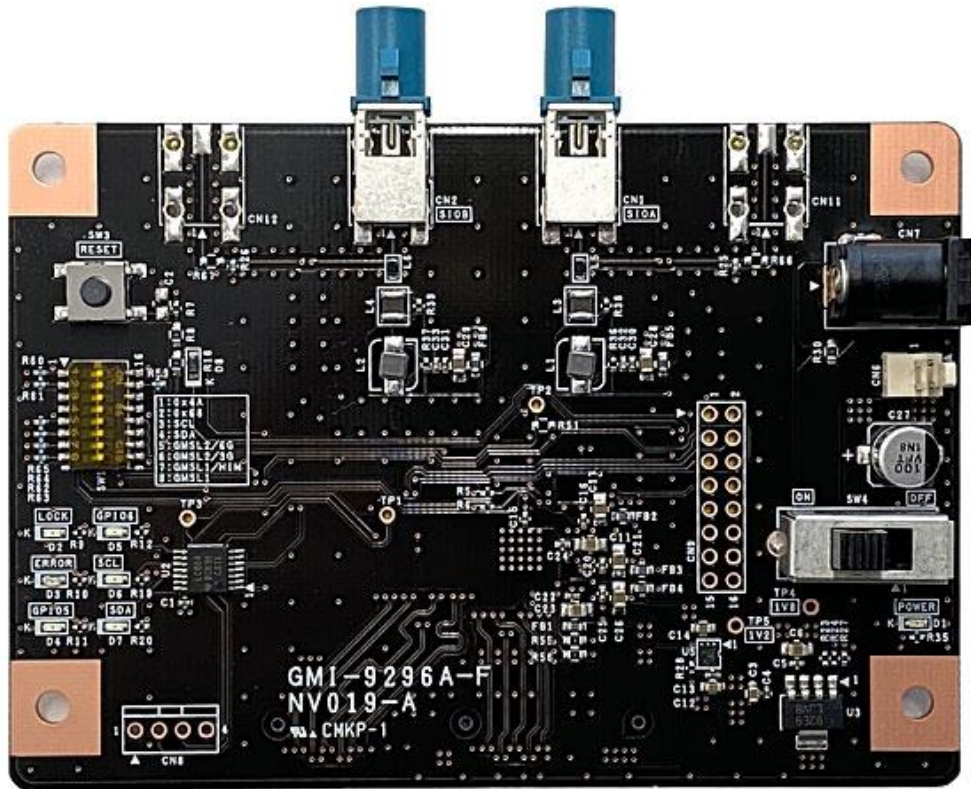
2.1. Connector Arrangement Diagram

【Figure 3】 Connector Arrangement Diagram



* CN8, CN9, CN11, CN12 are not mounted as standard

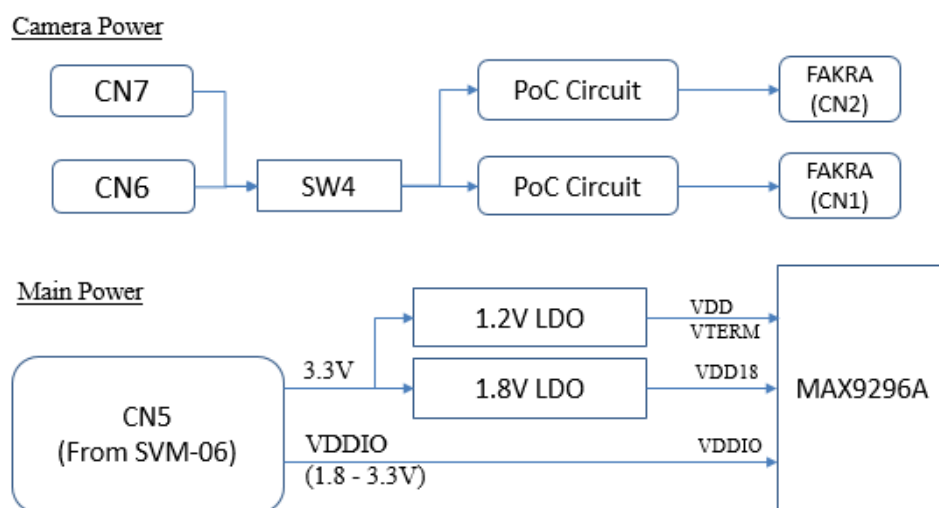
2.2. The Photo of The Board



3. Details

3.1. Power System

【Figure 4】 Power System Diagram



The power supply system of this board is divided into two types: camera power supply (VCAM) supplied to the camera through PoC (Power on Coax) circuit and main power supply to drive IC. The camera power is input from CN6 or CN7 (DC jack) and overlaps the GMSL signal line (CN1-CN2 core wire) through PoC filter. Since it is separated from the main power supply, there is no restriction on the power supply order. The power supply of the camera can be turned ON / OFF by switch SW4 on the board.

Main power is supplied from the connected capture board such as SVM-06 through CN5. This board requires three power supplies of 1.8V, 1.2V, and IO power supply. As shown in Fig. 5, the 1.8V and 1.2V power supplies are generated by the LDO on the board. Because need to supply 1.2V to the MAX9296A VDD power supply, set REG_ENABLE and REG_MNL as described in the device data sheet when operating.

3.2. Serial (I2C) Communication

The deserializer IC (MAX9296A) on this board has an I2C bus, which allows you to change the register settings of the IC and perform serial communication with the serializer and target devices through a GMSL cable.

【Figure 5】 Serial Bus Part Block Diagram



Fig. 5 shows a block diagram of the serial bus part on the board. The serial bus can be connected to the I2C bus of SVM-06 through switch SW1, Since he SVM-06 board only supports I2C. When controlling I2C with SVM-06, set SW1 # 3 and # 4 to ON. When performing I2C communication from outside, set SW1 # 3 and # 4 to OFF and use connector CN4. The IO voltage of the serial bus is linked with VDDIO (IO voltage of SVM-06).

3.3. MIPI CSI-2 Output

The MAX9296A has a 2-port MIPI CSI-2 output, and all lanes on this board are connected to the 120pin connector CN5. The port A of the MIPI output corresponds to 61pin - 120pin of CN5, and the port B corresponds to 1pin - 60pin. Normally use the output of port A, because SVM-06 supports input from 61 - 120 pin.

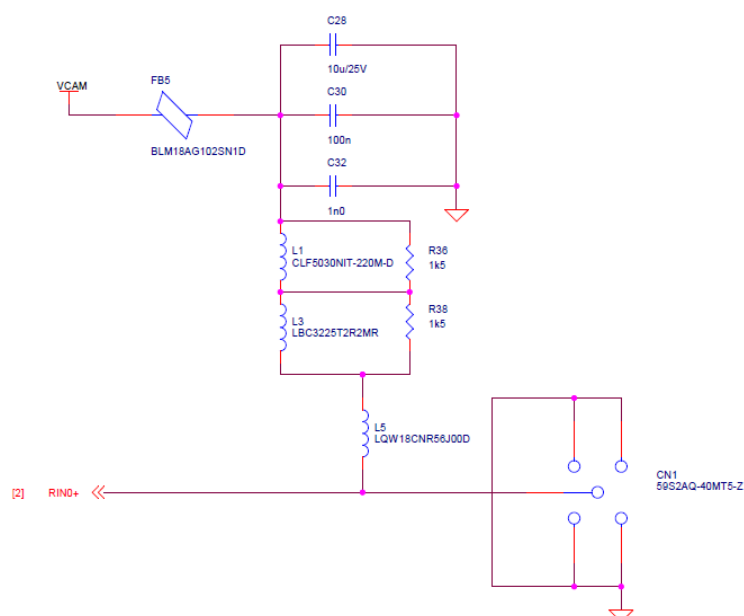
The following table shows the MAX9296A output and CN5 MIPI input lane assignments. Lane polarity is in phase.

Port	MAX9296A	SVM-MIPI	CN5
A	CKA	MIPI_CLK1	73,75
A	DA1	MIPI_D1	61,63
A	DA3	MIPI_D2	79,81
A	DA0	MIPI_D3	67,79
A	DA2	MIPI_D4	85,87
B	CKB	MIPI_CLK2	13,15
B	DB3	MIPI_D5	1,3
B	DB1	MIPI_D6	19,21
B	DB2	MIPI_D7	7,9
B	DB0	MIPI_D8	25,27

3.4. PoC Circuit

The GMSL2 input of the board has a PoC (Power on Coax) filter circuit. The figure below shows the circuit diagram of the PoC filter.

【Figure 6】 PoC Filter Circuit Diagram



3.5. Connector List

CN #	Implementation State	Description	Model Number
CN1		GMSL2 Input+	59S2AQ-40MT5-Z
CN2		(Coax)	(FAKRA)
CN5		MIPI Output Connect to SVM-06	QTH-060-01-L-D-A
CN6		Camera power input 1	22-04-1021
CN7		Camera power input 2	PJ-202A 2.1mm、Center+
CN8	Unimplemented	I2C Input and Output	171825-4
CN9	Unimplemented	GPIO Input and Output	PRPC008DAAN-RC
CN11	Unimplemented	GMSL2 Input-	59S2AQ-40MT5-Z
CN12			(FAKRA)

- Implementation states apply to the board.
- CN11 and CN12 are not used for coaxial cable input.

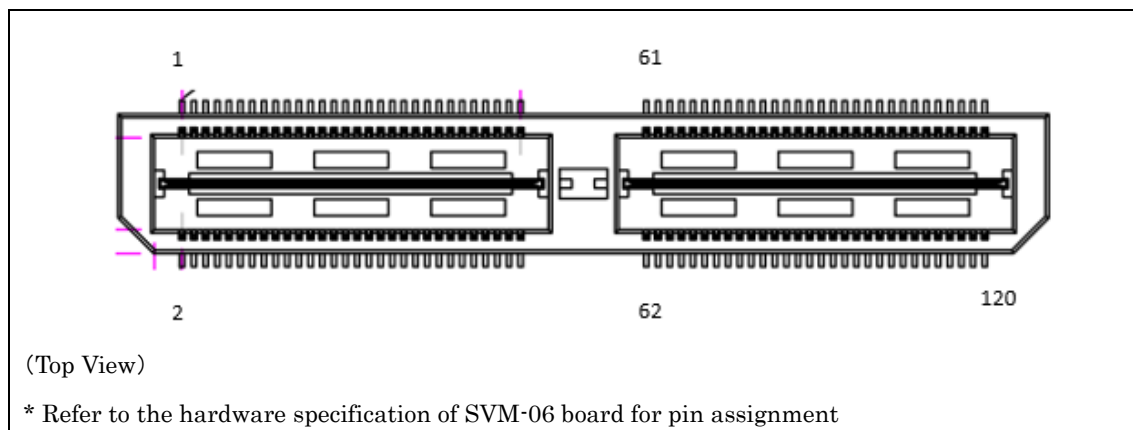
3.6. Connector Details

The top view of the connector on this board (outline) and pin assignments (excerpted from the circuit diagram) are shown below. Parts starting with ## in the circuit diagram indicate unimplemented parts.

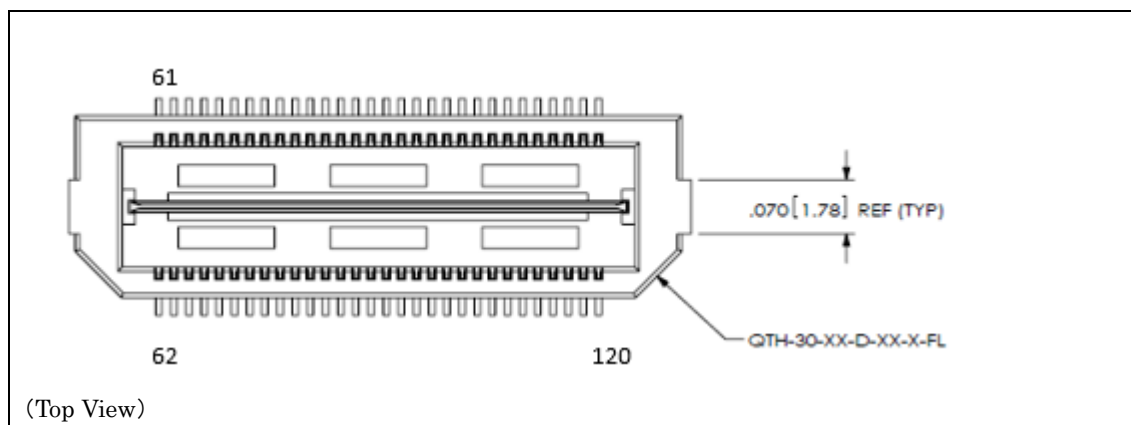
(Signal Name)

Name	Description
VDDIO	IO Power
VCAM	Camera Power
TX_SCL / RX_SDA	Serial Signal Lines
DSER_MFPn	Directly connected to GPIO pin of CN5 Connected to MAX9296A MFPn pins through jumper resistors
SVM_VSYNC	VSYNCOUT signal line of CN5 (SVM-06 connector)
SVM_CKOUT	CKOUT signal line of CN5

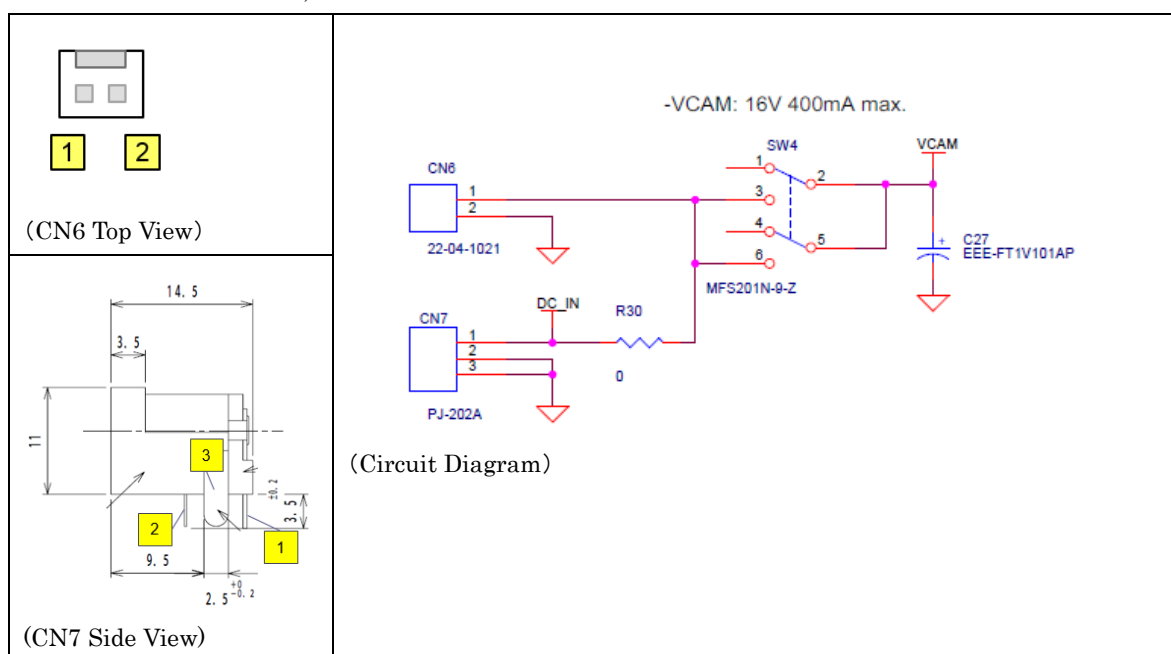
•CN5 (QTH-060-01-L-D-A)



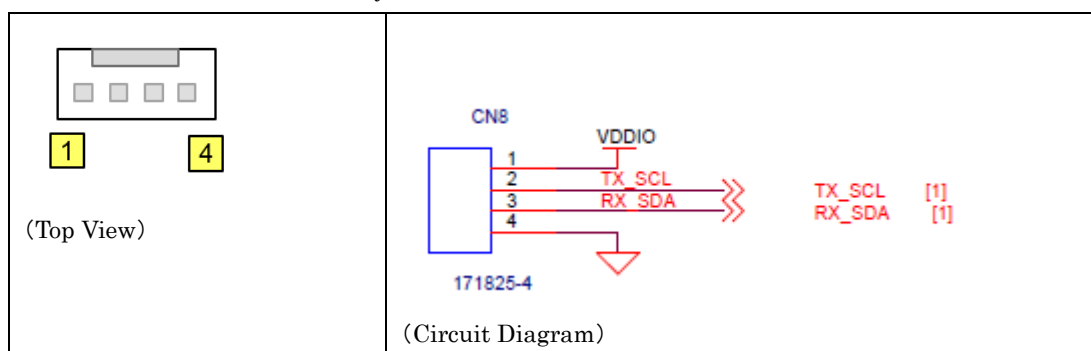
•CN5 (in the case of implementing QTH-030-01-L-D-A)



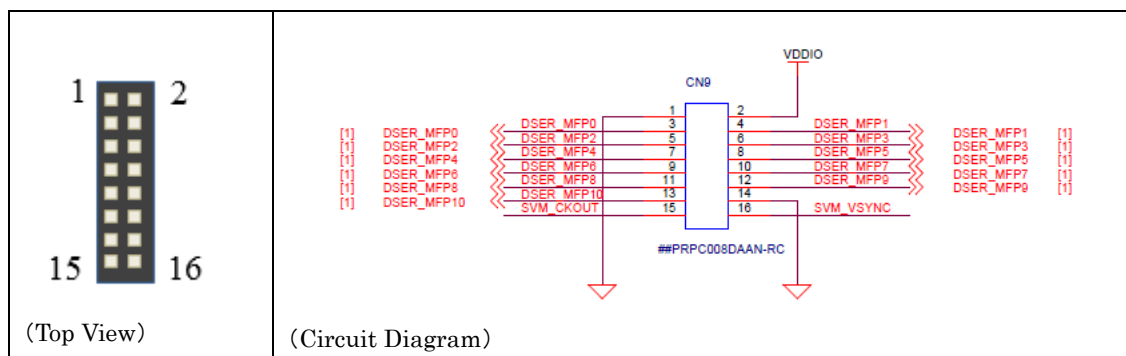
•CN6 (22-04-1021 / Molex), CN7(PJ-202A)



•CN8 (171825-4 / TE Connectivity)



•CN9 (PRPC008DAAN-RC)



3.7. Switch Settings

This board is mounted the 8-bit DIP switch (SW1) and the push switch (SW3), and can set the deserializer function and I2C address. Refer to the MAX9296A data sheet for details on the operation of each function.

- SW1

SW #	Name	Description
1	ADDR0	ADDR0 ADDR1 I2C Address
2	ADDR1	OFF OFF 0x48 ON OFF 0x4A OFF ON 0x68
3	SCL	ON: Connect I2C bus of CN3 and I2C bus of deserializer
4	SDA	OFF: Disconnect the I2C bus
5	CFG1	SW#5 #6 #7 #8
6		ON OFF OFF OFF GMSL2, 6Gbps
7		OFF ON OFF OFF GMSL2, 3Gbps
8		ON OFF ON OFF GMSL1, HIM Enabled ON OFF OFF ON GMSL1, HIM Disabled (CXTTP = Fixed with COAX)

As for the default, only SW # 3, # 4, # 5 is ON.

- SW2

While pressed, the PWDNB pin of the MAX9296A is set L.

- SW4

Switches the camera power (VCAM) ON / OFF.

3.8. LED Indicator

This board is mounted 7 LEDs. Each function is shown in the table below.

LED #	Name	Description
D1	POWER	When power (3.3V) is supplied, lights up.
D2	LOCK	When the MFP1 / LOCK pin is H, lights up.
D3	ERR	When the MFP4/ERRB pin is L, lights up.
D4	GPIO0	When the MFP0/GPIO0 pin is H, lights up.
D5	GPIO6	When the MFP6/GPIO6 pin is H, lights up.
D6	SCL	When the SCL pin is L, lights up.
D7	SDA	When the SDA pin is L, lights up.

3.9. GPIO

In this board, the MFPn pin of the deserializer IC (MAX9296A) is connected to the GPIOn of connector CN5 (refer to the circuit diagram for pin numbers) via a jumper resistor, enabling control with the SVM-06 board. Also, GPIO connection can be disconnected by removing R48-58.

4. Specifications

Item	Value	Description
Board Dimensions	71.0 x 101.6 mm	Value without connector
Power for Deserializer	DC +3.3V	Via CN3, supplied from the capture board SVM-06 (3.3V), etc.
IO Power	DC +3.3V or 1.8V	Via CN3, supplied from the capture board SVM-06 (VDDIO), etc.
Camera Power	DC +5 - 16V Max.400mA	Supplied from CN5 or CN6 connector, but cannot connect both at the same time PoC output from FAKRA connector Power supply voltage depends on connected camera
Image Input	GMSL2 single-ended input 1 – 2 systems	Refer to MAX9296A data sheet for supported serializers. CN1-CN2 FAKRA standard connector available as single-ended input

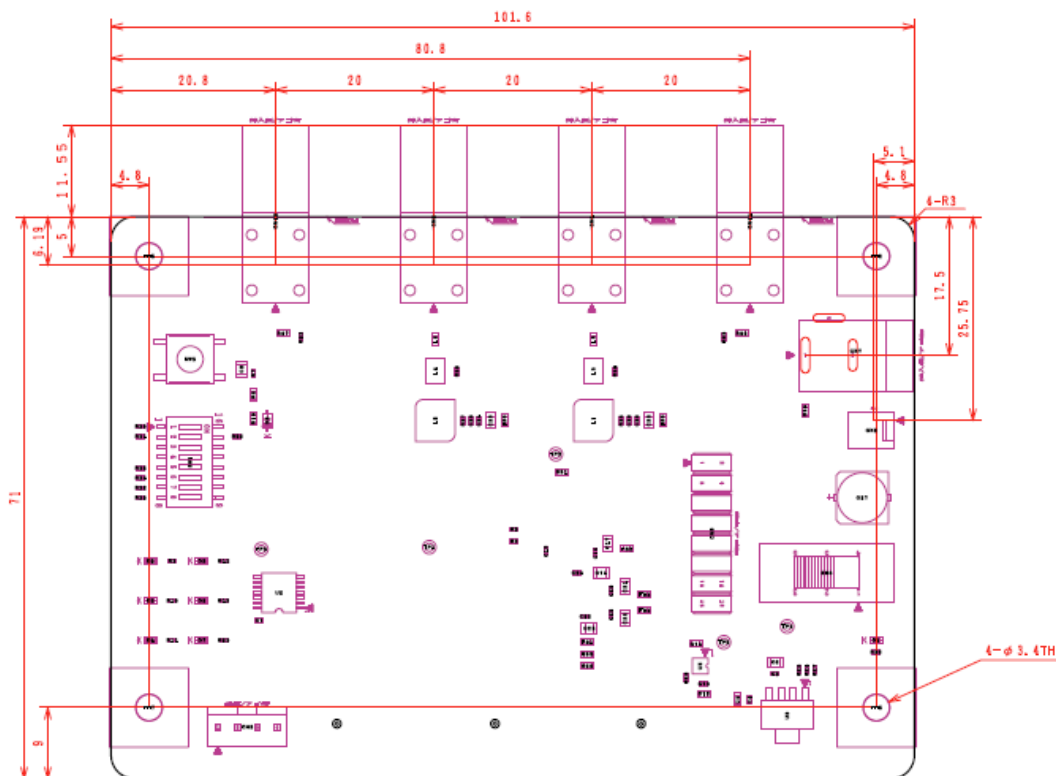
Image Output	MIPI CSI-2 4+1lanes x 2 systems The pixel format etc. follow the setting of MAX9296A	Interface conforms to SVM-06
Serial communication	I2C	I2C bus is directly connected to CN4

- The above specifications apply only to model number GMI-9296A (NV019-A).
- When connecting to the SVM-MIPI, you need to set SVM-MIPI to Continuous Clock.

5. Appendix

5.1. Figure of Board Dimensions

(Top Side / Part View)



- The lower two fixing holes are connected to GND. The upper two are not connected.

(Bottom Side / Part View)

