

FPD-Link III Deserializer Board  
FPI-934-F  
(Board Model Number NV012-E)  
Hardware Specification

Rev. 1.0

NetVision Co., Ltd.

## Update History

Revision	Date	Note	
1.0	14 Mar, 2022	New file (Equivalent to Japanese version 1.0)	H. Suzuki

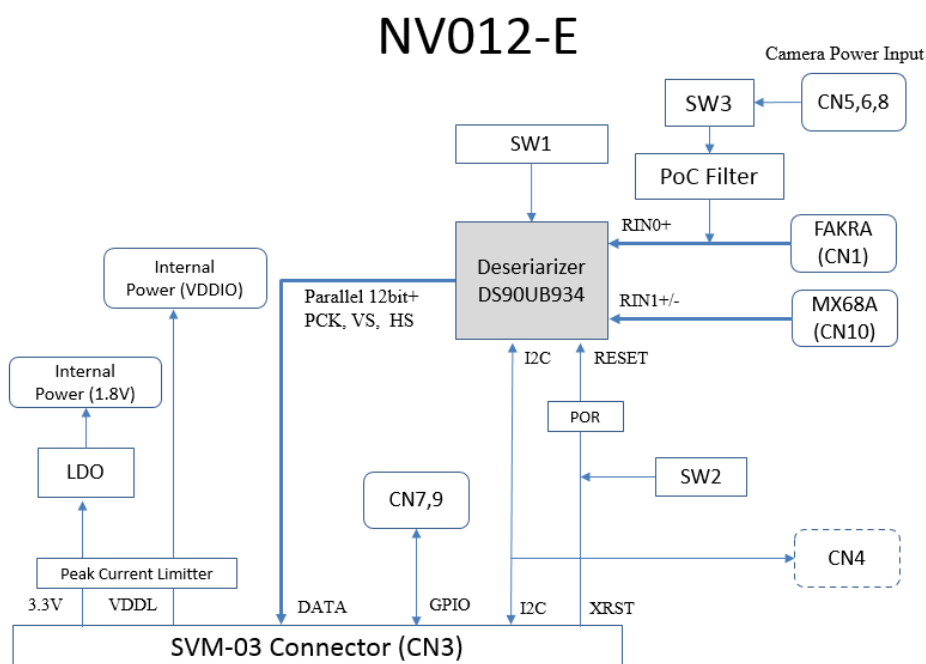
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## 1. Overview

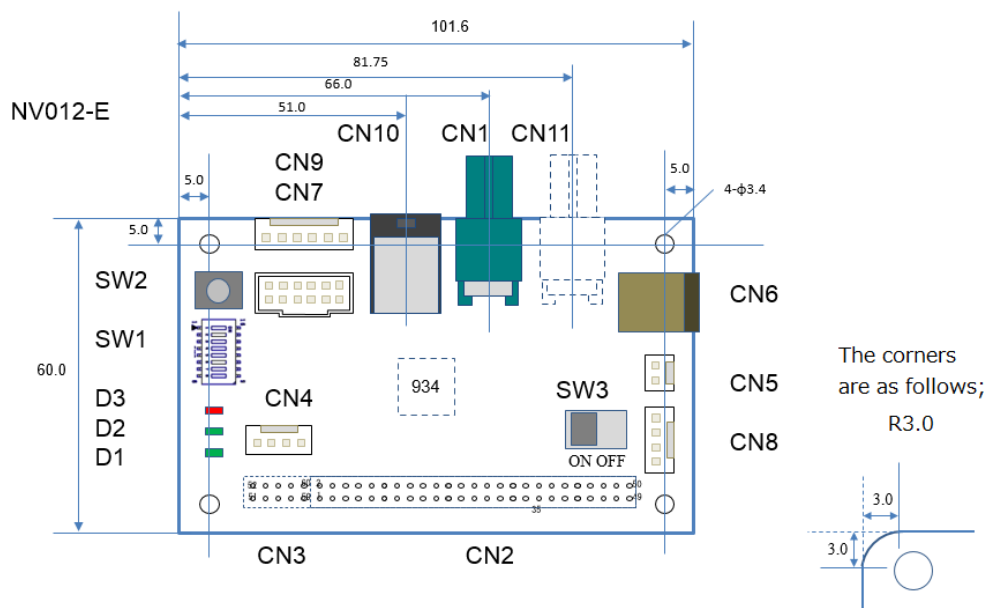
This document is a hardware specification of NV012-E / FPI-934-F (FPD-Link III deserializer board). NV012-E converts the video of the serial signal transmitted in the TI company FPD-Link III Standard to a parallel signal, and this board is used in connection with our SV series board (SVM-03 / SVI-09 etc.). Although the ordering model number is “FPI-934-F”, this board is written “NV012-E” that is manufacturing model number in this document.

Block Diagram



The above figure is the block diagram of NV012-E. This board is equipped with TI company deserializer IC DS90UB934. This board have functions of serial-parallel converting of FPD-Link III video signal up to 100MHz pixel clock, and I2C communication used the FPD-Link III signal line. The output connector of the parallel signal has a common interface with our SV series board, so it can be connected directly to our SV board. You can use either FAKRA connector (coaxial) or MX68A connector as serial signal input. A PoC filter circuit is mounted on the coaxial input to supply power to the camera.

Connector Arrangement Diagram

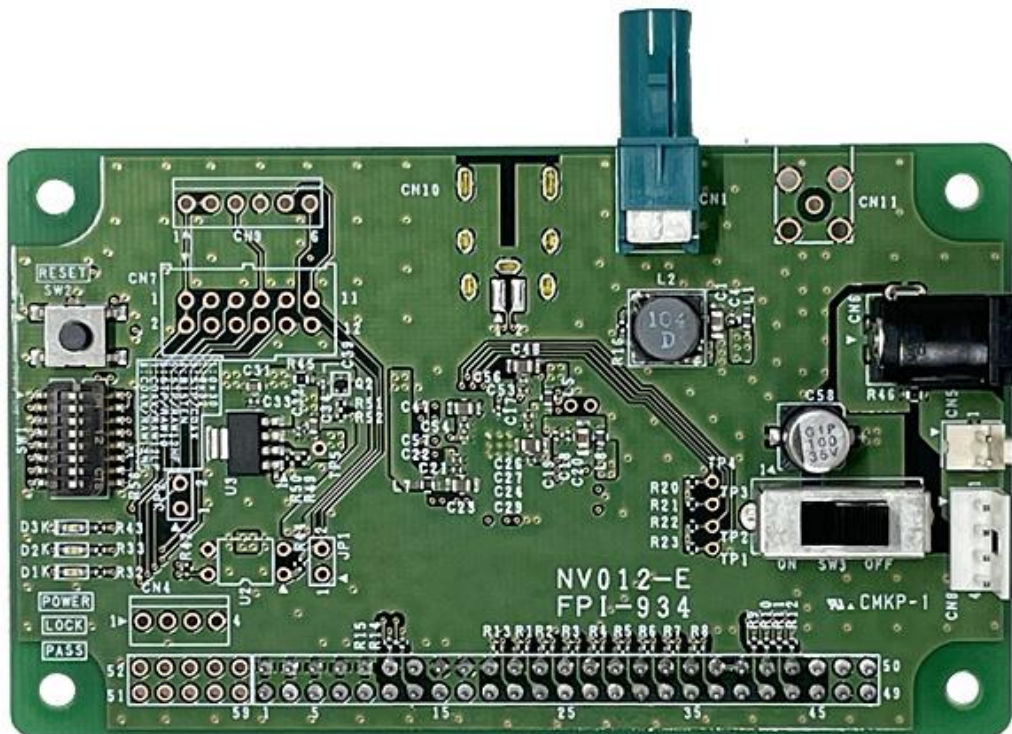


\* Specify whether CN1 or CN10 when ordering.

\* CN3, CN4, CN7, CN9 and CN11 are not mounted.

The connector arrangement diagram of NV012-E is shown above. Please specify the mounting status of the input connector when ordering. The ordering model number also differs depending on the input connector.

## 1.1. Board Photo (-F version)



## 2. Details

### 2.1. Board Power Supply

The power to the IC on NV012-E supply from our SV series board such as SVM-03 via CN2. In this case, VDDH and VDDL on the SV board correspond to the core voltage and IO voltage of NV012-E, respectively. Normally, both VDDH and VDDL are set to 3.3V. This board has a 1.8V regulator (LDO), which supplies power to the core voltage of the deserializer IC.

In addition, the power supply for the camera can be superimposed on the FPD-Link III input on the coaxial side (CN1). This power is supplied from CN5, CN6, or CN8. The power supply for the camera and the IC are separated in a direct current way through a capacitor, so the power supply for the IC and for the camera can be turned on in any order. the STP connector (CN10) is a 2-pin specification, and the camera power supply cannot be output to the STP connector.

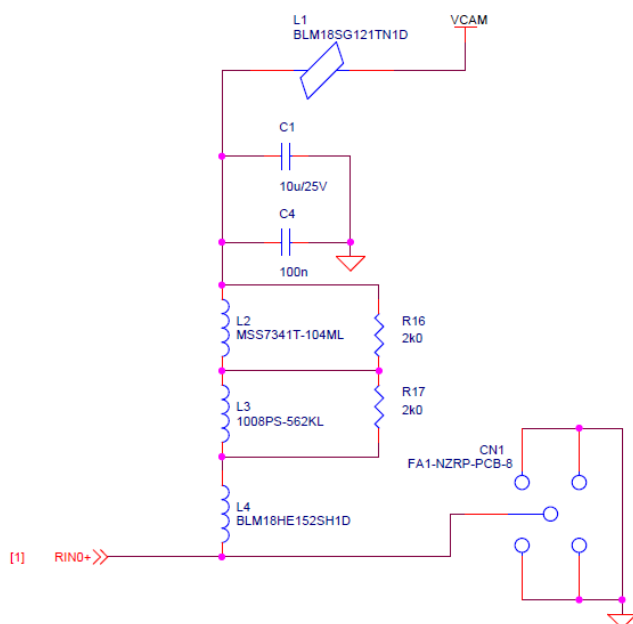
## 2.2. I2C function

The deserializer IC (DS90UB934) has an I2C bus, which has functions IC register setting or I2C communication between the serializer and the target device through an FPD-Link III cable. The I2C bus of DS90UB934 is pulled up to the IO voltage with 4.7kΩ, and directly connected with the connector for the SV series board, so I2C communication is possible from SV board. At the same time, the I2C bus is directly connected to the I2C input/Output connector (CN4) on NV012-E, allowing to connect with external devices or be operated from external masters.

The DS90UB934 I2C address can be changed by DIP switch (SW1). Refer to the DIP Switch Settings section for details.

## 2.3. PoC Filter Circuit

Camera power can be output to the FAKRA coaxial connector (CN1) that transfers video signals. The PoC filter circuit of NV012-E is shown below. The camera power output can be switched ON/OFF with switch SW3.



## 2.4. Connector List

CN#	Mounted State	Description	Model number
CN1		FPD-Link Input (FAKRA Coax)	FA1-NCRP-PCB-8
CN2		Parallel Output	C-00086
CN3	Un-mounted	N/A	N/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 1	90130-1212
CN8		Camera Power Input 3	171825-4
CN9	Un-mounted	Expansion Connector 2	171825-6
CN10	Un-mounted	FPD-Link Input (MX68A STP)	MX68A**HQ1
CN11	Unimplemented	N/A	FA1-NZRP-PCB-8

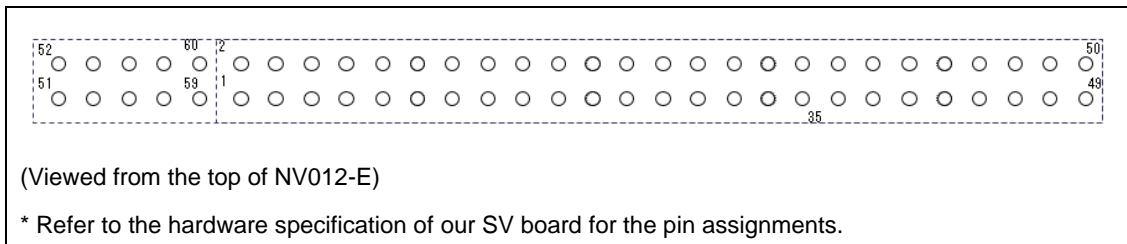
\* Mounted states apply to FPI-934-F.

## 2.5. Connector Details

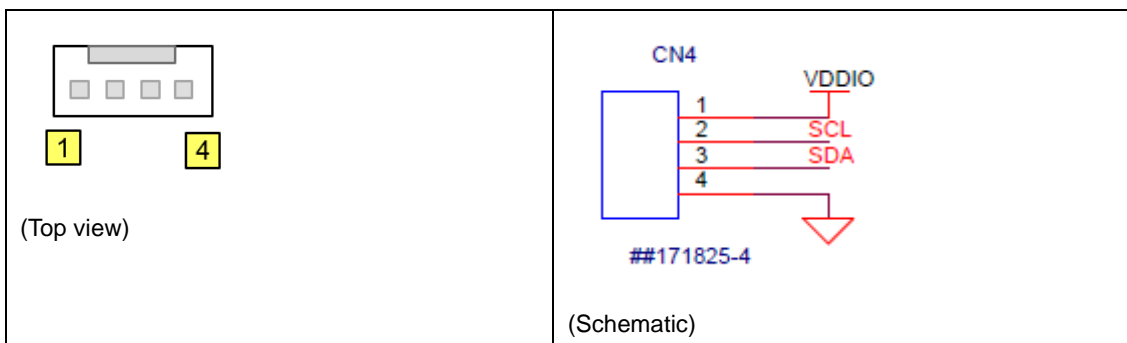
The top views (outline) and pin assignments (excerpt from the schematic) of the connectors are shown below. Refer to the schematic for details.

Name	Description
VDDIO	IO Power
VCAM	Camera Power
VDDH	SV Board VDDH (CN2 direct connection)
VCAM_DO	Output of a DC-DC converter (un-mounted)
SCL / SDA	I2C Signal Lines
P0 - P5	General-purpose IO Port for SV board (CN2 direct connection)
PC_A/PC_K	Reserve  (Photocoupler primary side LED, Not used on NV012-E)

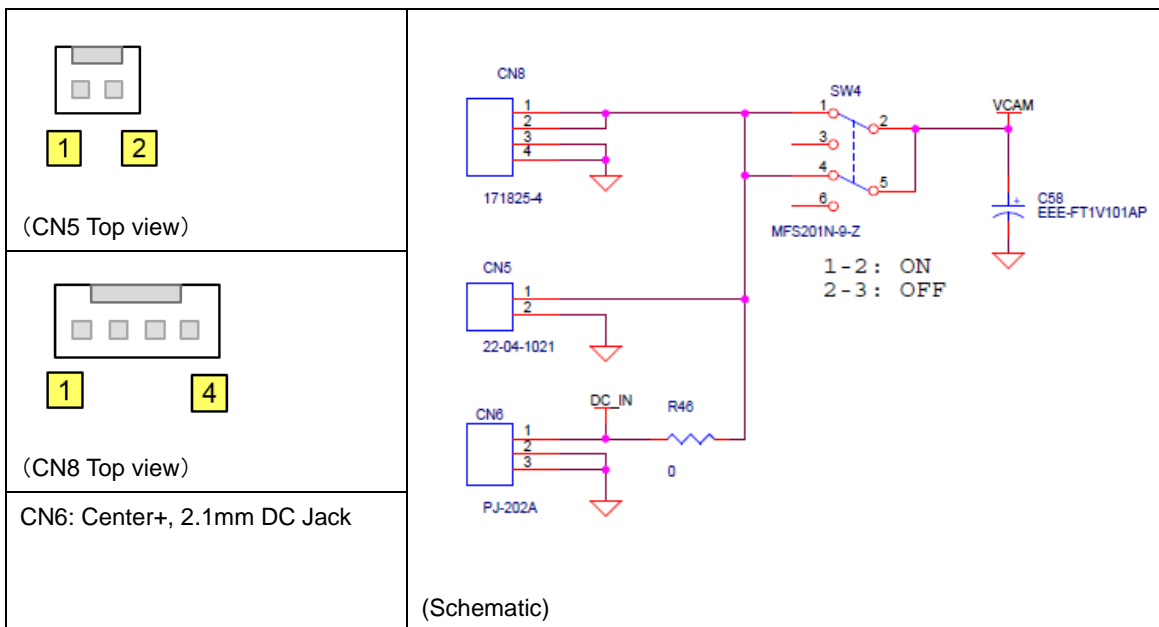
•CN2(C-00086 = Right side) , CN3(Left side)



•CN4 (171825-4 / TE Connectivity)

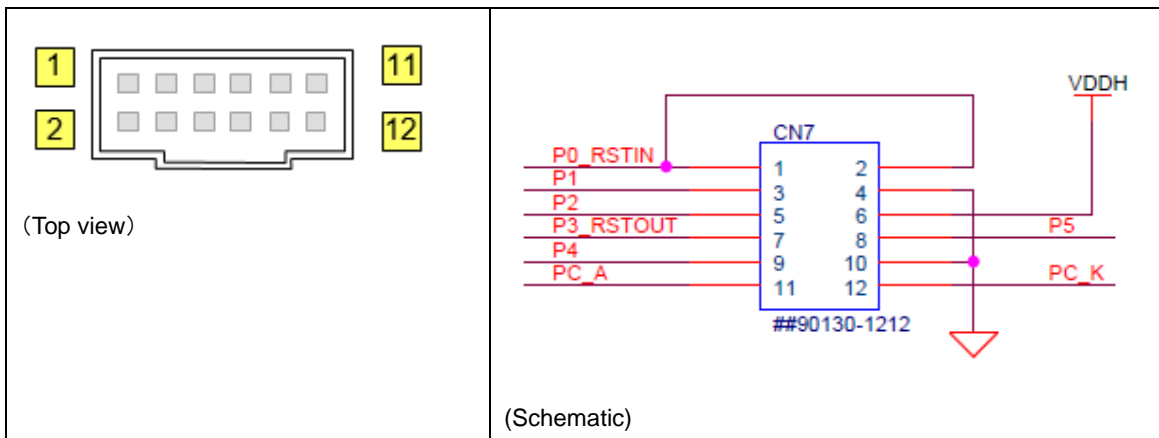


•CN5 (22-04-1021 / Molex), CN6(PJ-202A), CN8(171825-4 / TE Connectivity)

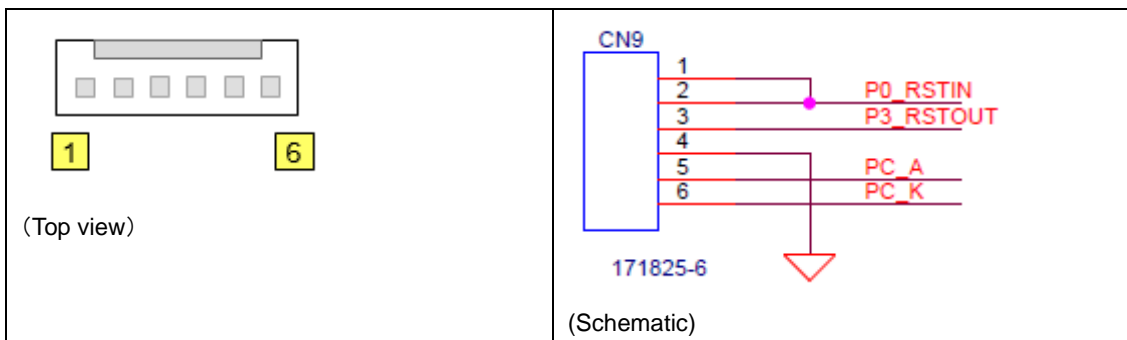




•CN7 (90130-1212 / Molex)

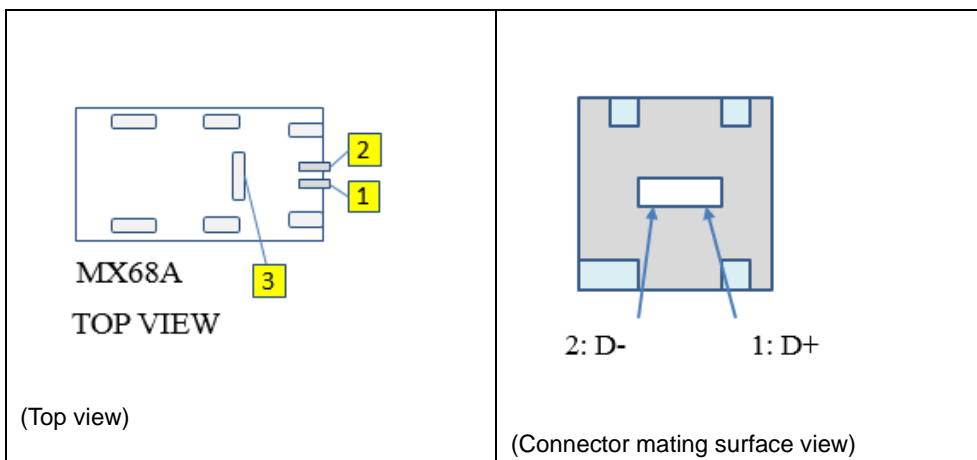


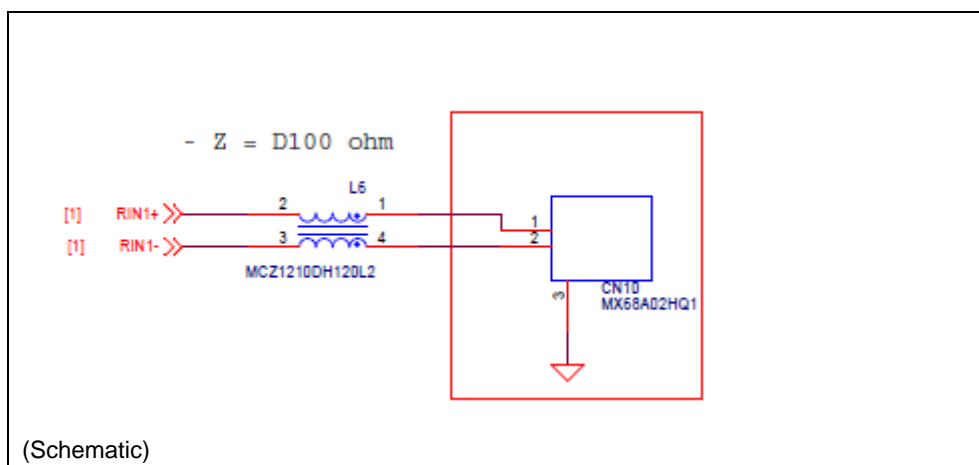
•CN9 (171825-6 / TE Connectivity)



•CN10 (MX68A\*\*HQ1 / JAE)

- When only the FAKRA connector is mounted, CN10 is not mounted.





## 2.6. DIP Switch Settings

NV012-E has an 8-bit DIP switch (SW1) that can be used to set the deserializer function and I2C address.

SW#	Name	Description
1	IDX0	Specify the I2C address of DS90UB934.
2	IDX1	(IDX0 = OFF, IDX1 = OFF: I2C Address = 0x3D) IDX0 = ON, IDX1 = OFF: I2C Address = 0x30 IDX0 = OFF, IDX1 = ON: I2C Address = 0x32
3	SEL	Specify the input connector. ON: RIN0 Select (CN1: FAKRA coaxial connector input)
4	BISTEN	Set BIST (Built In Self Test) Mode. ON: BIST Mode Disabled OFF: BIST Mode Enable
5	MODE0	Select device mode.
6	MODE1	Refer to the data sheet of DS90UB934 for each mode details
7	MODE2	MODE0   MODE1   MODE 2   MODE3
8	MODE3	OFF   OFF   OFF   OFF   COAX/RAW10 OFF   OFF   OFF   <b>ON</b>   COAX/RAW12HF OFF   OFF   <b>ON</b>   OFF   COAX/RAW12LF OFF   ON   OFF   OFF   STP/RAW10 ON   OFF   OFF   OFF   STP/RAW12HF ON   ON   ON   OFF   STP/RAW12LF

- As for the default, only IDX0 (1), SEL(3), BISTEN(4) are ON.

- Some settings are different from NV012-D board, which is another revision of FIP-934-F.

## 2.7. Reset Switch

When the switch SW2 is pushed, the PDB pin of DS90UB934 is driven low to reset the device. the PDB pin is driven low when this board is powered on, when SW2 is pushed, or when the XRST signal line of CN2 is low to reset the device.

## 2.8. LED Indicator

Three LEDs are mounted on this board. The functions are shown in the table below.

LED#	Name	Description
D1	PASS	Lights up when there are no transfer errors.
D2	LOCK	Lights up when the PLL is locked.
D3	POWER	Lights up when the power (VDDH) is supplied.

## 3. Specifications (-F version)

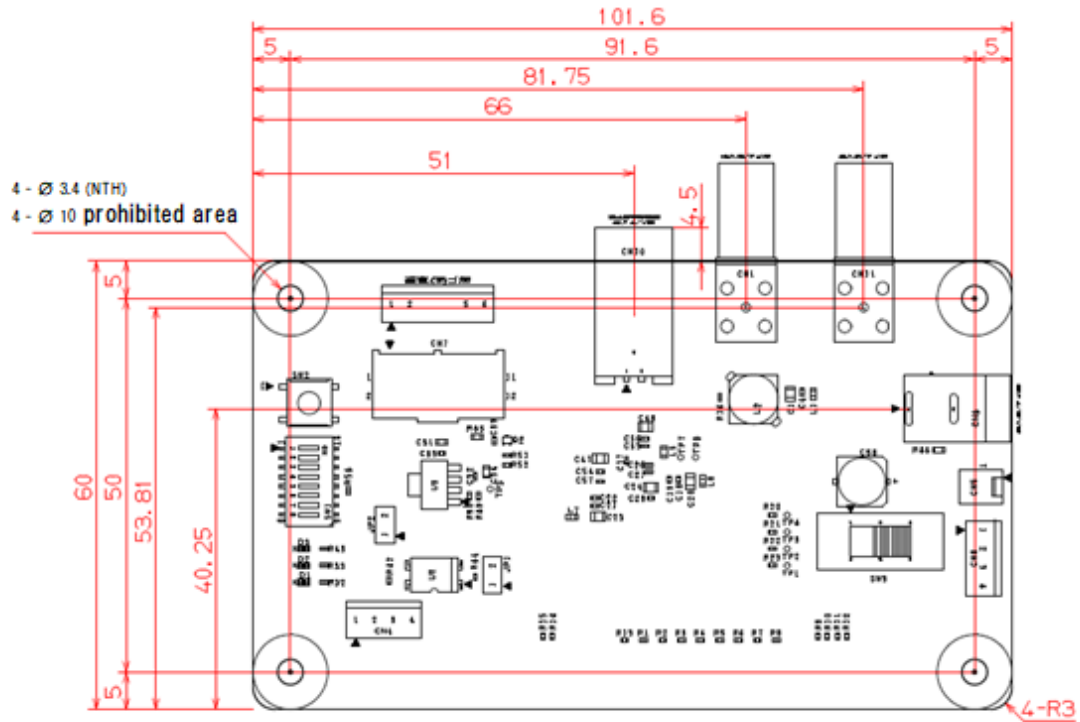
Item	Value	Description
Board Dimensions	60.0 x 101.6 mm	Value without connector
Power for Deserializer	DC +3.3V	Via CN2, supplied from VDDH of our SV boards such as SVM-03.
IO Power	DC +3.3V / 2.8V / 1.8V	Via CN2, supplied from VDDL of our SV boards such as SVM-03.
Camera Power	DC +12V or lower	Supplied from CN5, CN6 or CN8 connector. AC adapter is also supported with CN6(DC jack). Supply voltage follows camera.
Video Input	FPD-Link III	Single-ended coax (CN1: FAKRA)
Video Output	Parallel Signal Max. 100MHz / 12bit	The interface is the standard specification of our SV boards such as SVM-03

\* The above specifications apply only to NV012-E.

#### 4. Appendix

##### 4.1. Figure of board dimensions

(Top side / Part view)



(Bottom side / Part view)

