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VisionCB-iMX93-STD Datasheet and Pinout

Rev. 20250118220527

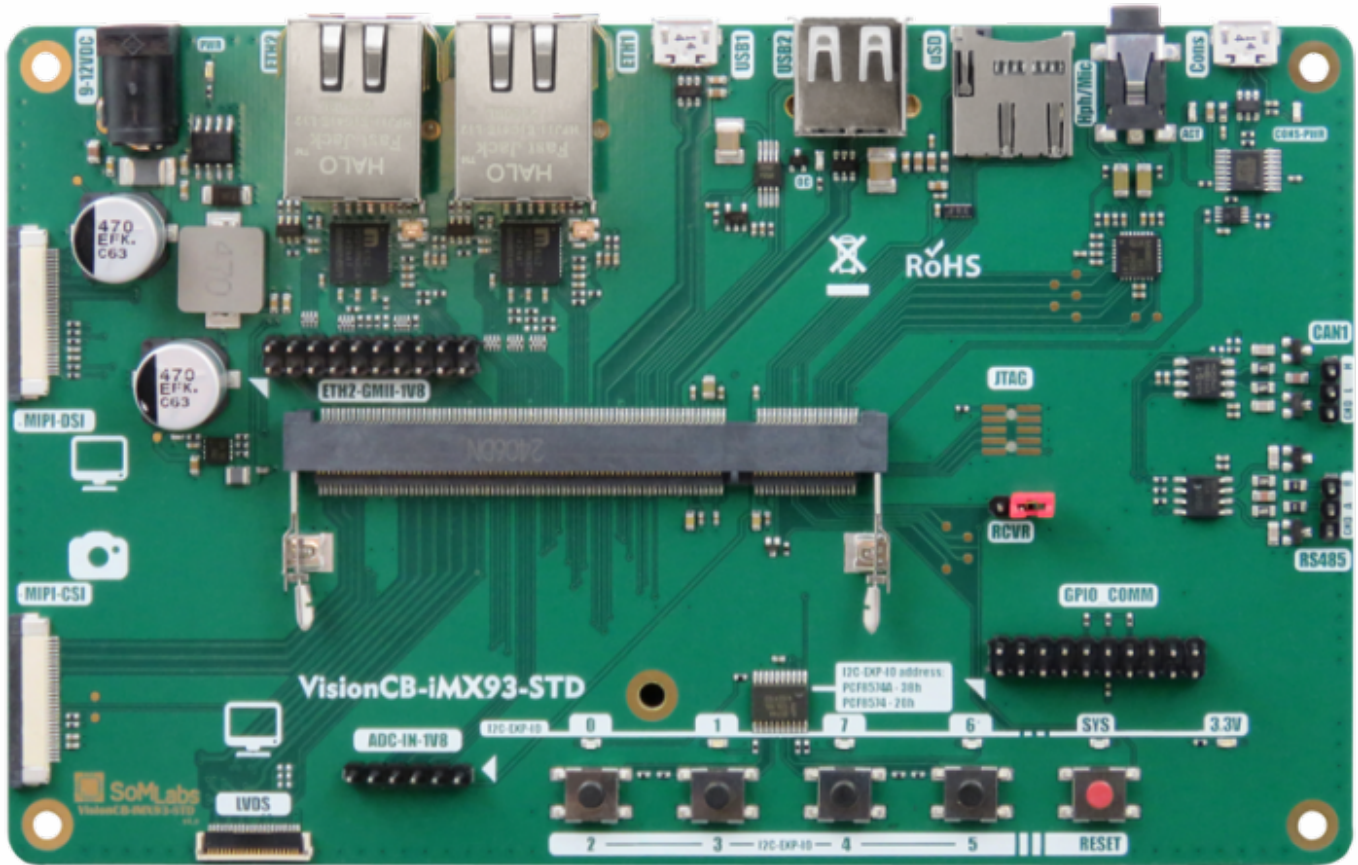
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VisionCB-iMX93-STD Datasheet and Pinout

General description



The VisionCB-iMX93-STD (with SOM equipped with heterogenous i.MX935x processor) is a carrier board for the VisionSOM-iMX93family of computer-on-modules which are powered by dual-core NXP MPUs (2 x ARM Cortex-A55 + Cortex-M33). The carrier board, together with a System on Module (SoM), makes a complete development platform similar to SBC. The carrier board houses the most common interfaces such as USB, Ethernet, CAN, RS485, audio codec, etc. A large variety of interfaces allows to use it as both a complete development platform or as a stand-alone end-product. The VisionCB-iMX93-STD is equipped with a simple user interface consisting of 4 buttons and 5 LEDs. VisionCB-iMX93-STD carrier board is also equipped with a large number of popular peripherals, including: RS485, CAN, 10/100/1G Ethernet, MIPI-DSI and camera connectors, serial console port on USB vCOM.

Applications

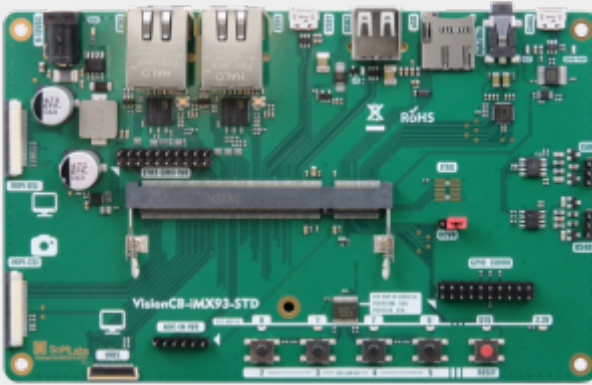
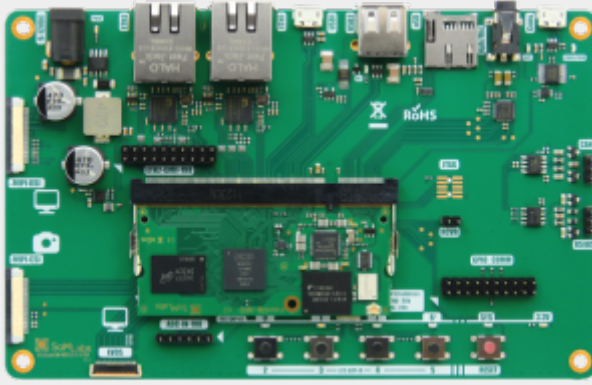
- Low-cost Gateway
- Domain Controller Compute Off-load Engine
- Human-machine Interfaces (HMI)
- Public Address Systems
- Home Appliances
- Home Automation - Smart Home
- IoT gateways
- Wireless or Networked Speakers

- Residential gateways
- Industrial embedded Linux computer
- Fitness/outdoor equipment

Features

- Carrier Board compatible with the VisionSOM-iMX93 families of modules based on dual core, heterogenous i.MX935x application processors
- SoM Connector: SODIMM200
- Expansion Connectors:
 - 3.3V GPIO connector 2x20 Pin Header (Male)
 - 1.8V GPIO connector 2x20 Pin Header (Male)
- Communication Connectors:
 - 2x Ethernet 10/100/1000Mbit/s (RJ45)
 - 1x CAN (1x3 Pin Header, Male)
 - 1x RS-485 (1x3 Pin Header, Male)
 - 1x USB Host Type A connectors
 - 1x USB OTG Micro AB connector
 - 1x Console MicroUSB B connector
- Audio Interface:
 - Mini-jack 3.5mm (headphones + microphone)
- Display Interface:
 - 30-pin FFC/FPC MIPI-DSI (up to 4 lanes)
 - 22-pin FFC/FPC LVDS (up to 4 lanes)
- Camera Interface:
 - 30-pin FFC/FPC MIPI-CSI2 (up to 2 lanes)
- User Interface:
 - 4+1 Pushbuttons
 - 5+1 LEDs
- External Power Supply 9-12V DC
- Temperature Range: 0 to +70°C
- Board Size: 160mm x 100mm x 20mm

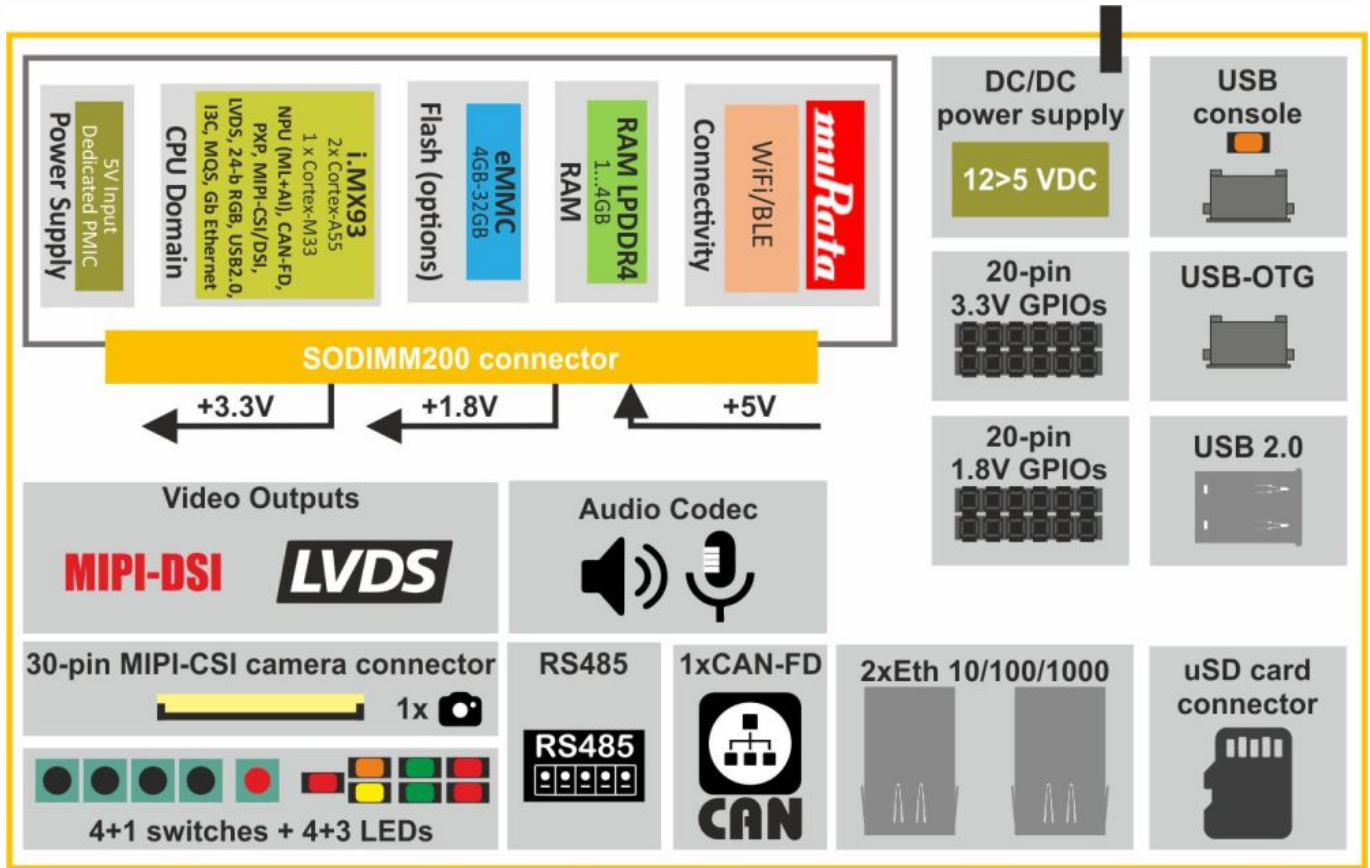
Pictures of VisionCB-iMX93-STD board

Version	Photo
VisionCB-iMX93-STD board only	
VisionCB-iMX93-STD with VisionSOM-iMX93	

Ordering info

VisionCB-iMX93-STD

Block Diagram

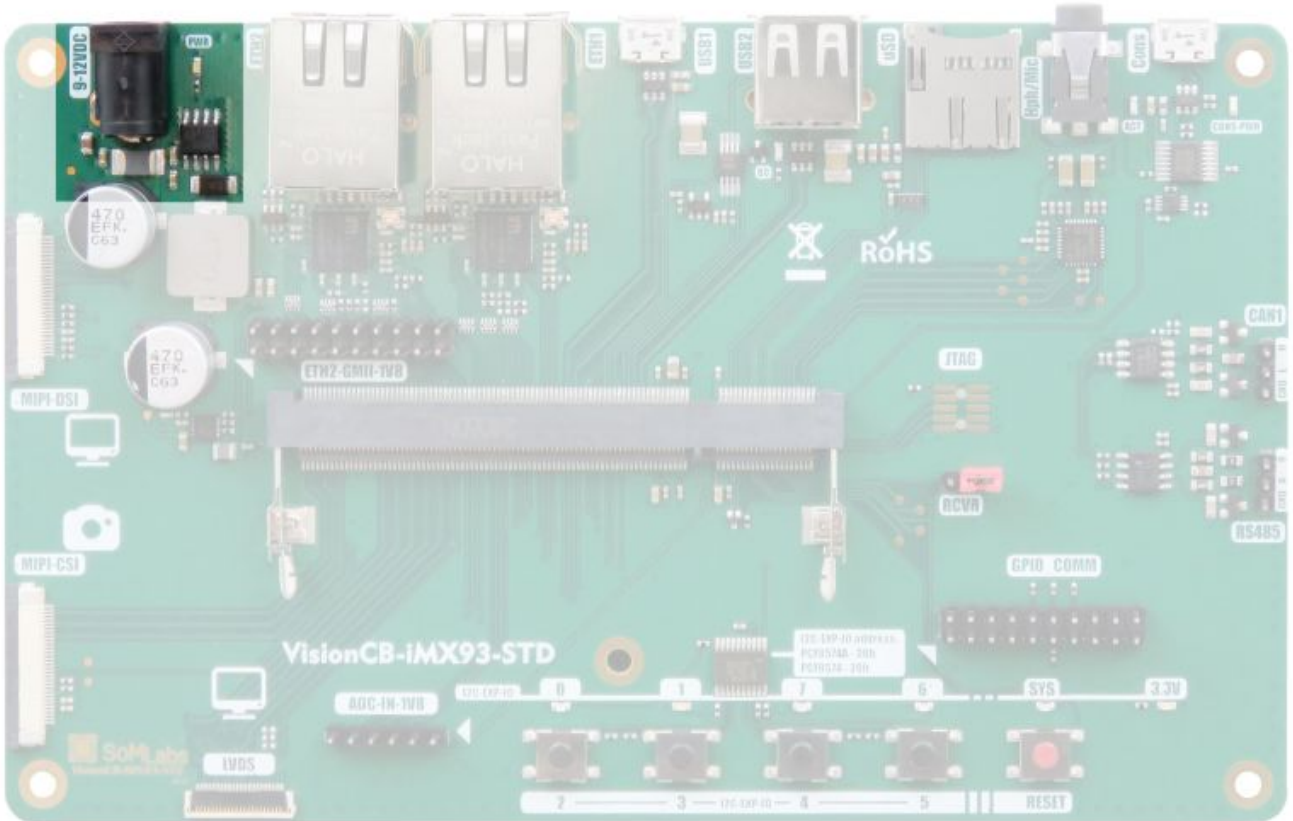


Electrical parameters

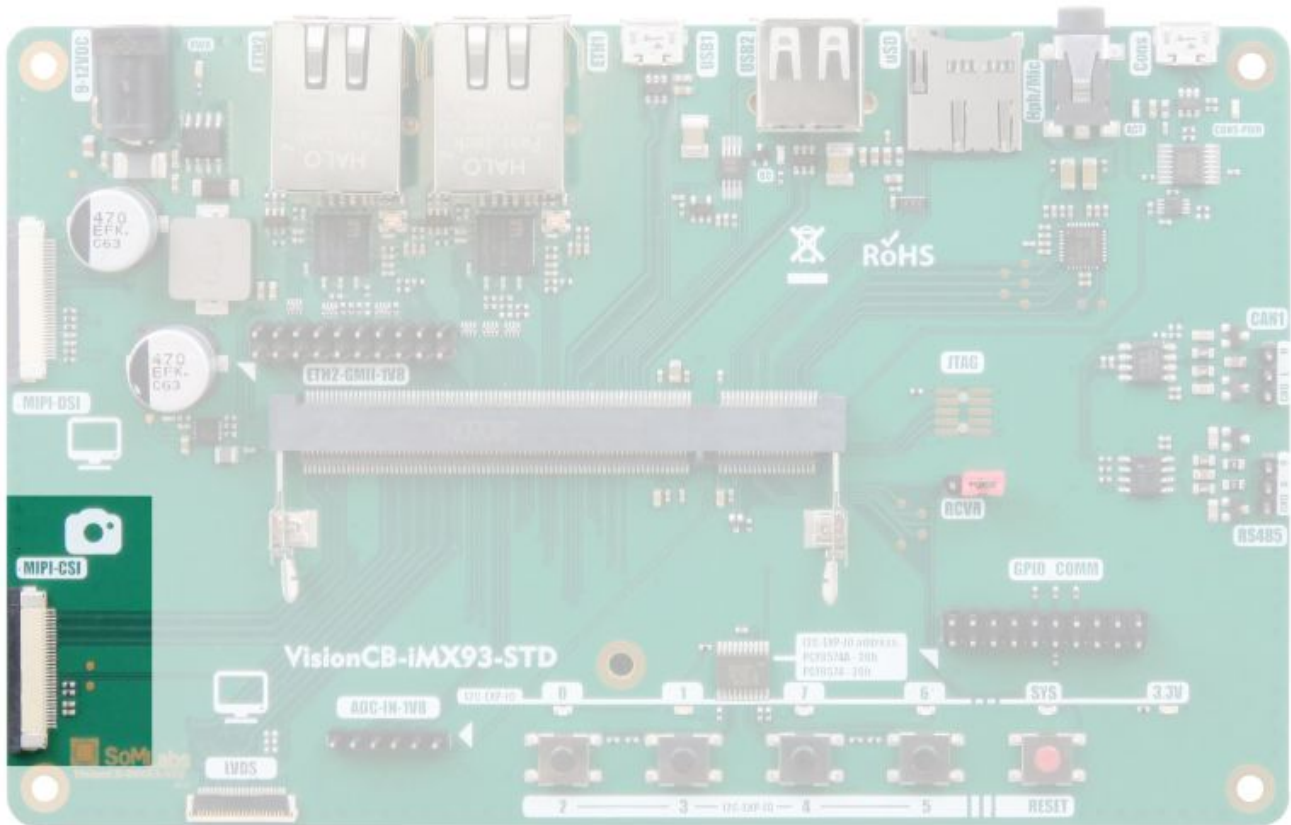
Parameter	Value			Units	Comment
	Min.	Typ.	Max.		
Power Supply	9.0	12.0	15.0	V	Positive pole on central connector of J200
Supply current	-	-	0.21	A	Excluding LCD, USB and antoher external loads
LCD/Camera Power Supply (logic)	3.25	3.3	3.35	V	-
LCD/Camera Power Supply (backlight and aux)	4.75	4.87	4.95	V	-
1.8V GPIO voltage	1.72	1.8	1.89	V	-
3.3V GPIO voltage	3.25	3.3	3.6	V	-
ADC in voltage	0	-	1.8	V	On dedicated ADC inputs

Power supply connector

The VisionCB-iMX93-STD is equipped with external power source connector with pin diameter 2.5mm and hole diameter 5mm. The voltage of the external power source should be within the range 9-12 VDC.



Camera MIPI-CSI interface (FPC/FFC30, 0.5mm)



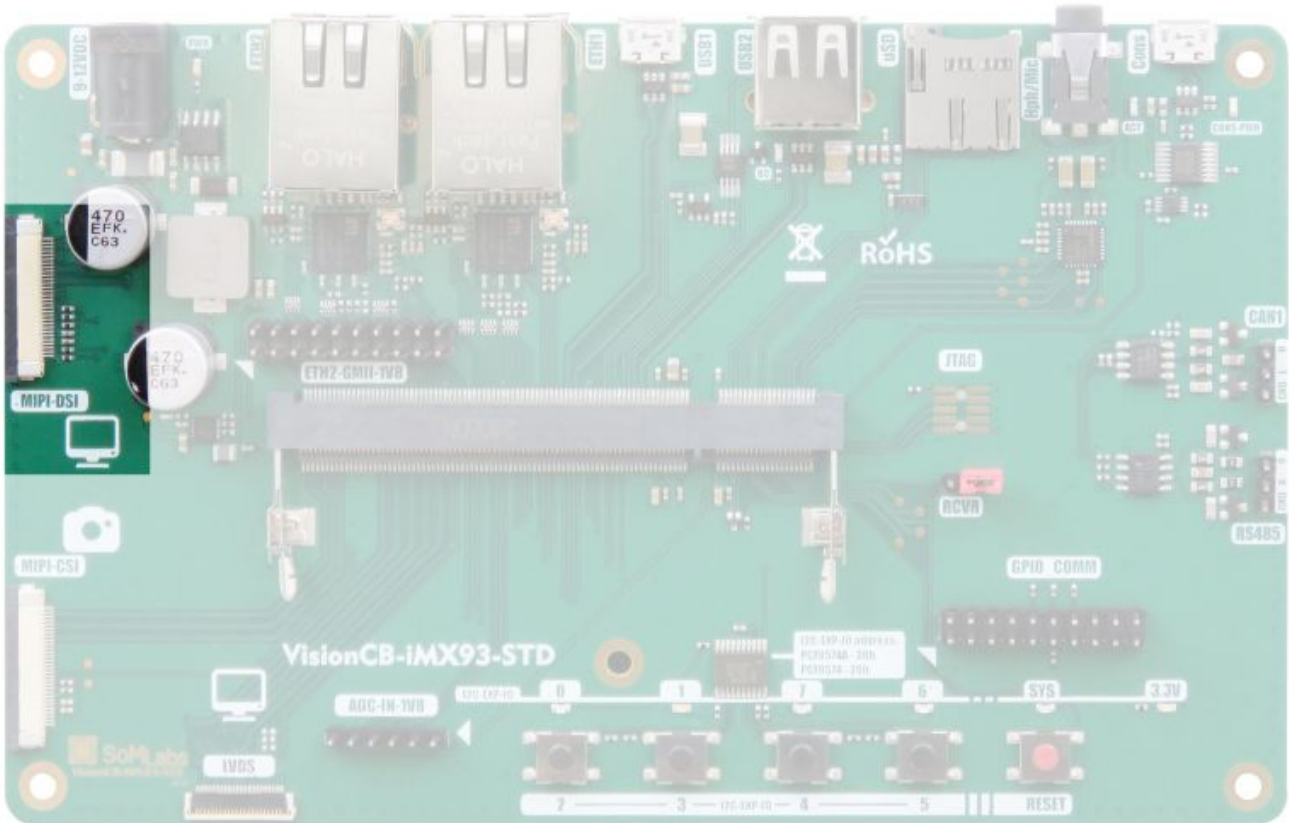
Pin	Signal	MPU pin name	Description
1	GND	-	-
2	CSI.CLK_P	MIPI_CSI1_CLK_P	-
3	CSI.CLK_N	MIPI_CSI1_CLK_N	-
4	GND	-	-
5	CSI.DATA0_P	MIPI_CSI1_D0_P	-
6	CSI.DATA0_N	MIPI_CSI1_D0_N	-
7	GND	-	-
8	CSI.DATA1_P	MIPI_CSI1_D1_P	-
9	CSI.DATA1_N	MIPI_CSI1_D1_N	-
10	GND	-	-
11	-	-	-
12	-	-	-
13	GND	-	-
14	-	-	-
15	-	-	-
16	GND	-	-
17	I2C1.SCL	I2C1_SCL	Camera configuration I2C interface (3.3V), shared on SOM with PCA9451AHN PMIC
18	I2C1.SDA	I2C1_SDA	Camera configuration I2C interface (3.3V), shared on SOM with PCA9451AHN PMIC
19	GND	-	-
20	CAM_RST	GPIO2_IO18	Auxiliary GPIO VisionSOM-iMX93 pin name SPI5.CS0

21	CAM_PWER_EN	GPIO2_IO19	Auxiliary GPIO VisionSOM-iMX93 pin name SPI5.MISO
22	-	-	-
23	GND	-	-
24	+3.3V	-	Power supply for camera module (on both pin: 24 and 25 max. 50 mA)
25	+3.3V	-	Power supply for camera module (on both pin: 24 and 25 max. 50 mA)
26	+5V	-	Power supply for camera module (on both pin: 26 and 27 max. 100 mA)
27	+5V	-	Power supply for camera module (on both pin: 26 and 27 max. 100 mA)
28	-	-	-
29	-	-	-
30	GND	-	-

Note:

1. The first pin of the MIPI-CSI connector is located in its upper part.
2. Recommended camera module is SL-MIPI-CSI-OV5640

Display MIPI-DSI interface (FPC/FFC30, 0.5mm)



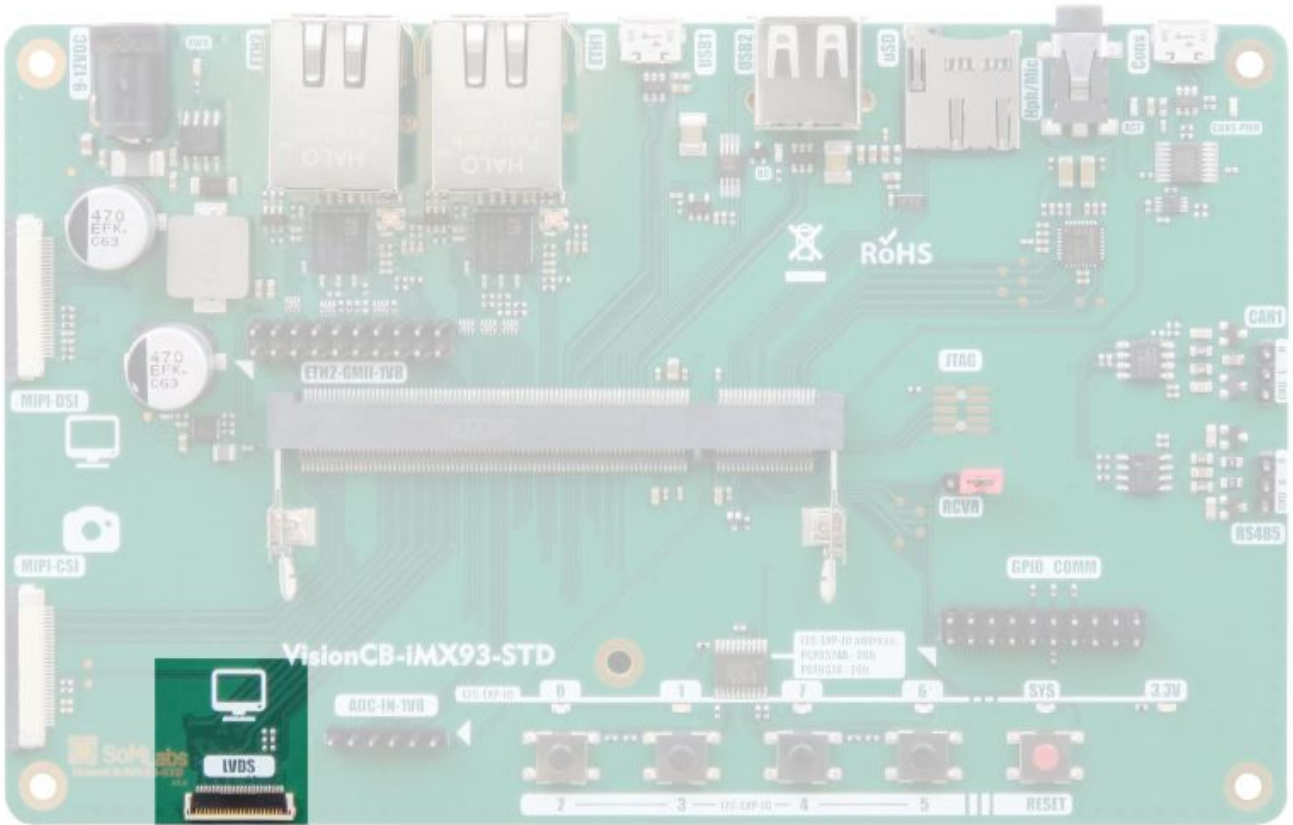
Pin	Signal	MPU pin name	Description
1	GND	-	
2	DSI.CLK_P	MIPI_DS1_CLK_P	-
3	DSI.CLK_N	MIPI_DS1_CLK_N	-
4	GND	-	-
5	DSI.DATA0_P	MIPI_DS1_D0_P	-
6	DSI.DATA0_N	MIPI_DS1_D0_N	-
7	GND	-	-
8	DSI.DATA1_P	MIPI_DS1_D1_P	-
9	DSI.DATA1_N	MIPI_DS1_D1_N	-
10	GND	-	-
11	DSI.DATA2_P	MIPI_DS1_D2_P	-
12	DSI.DATA2_N	MIPI_DS1_D2_N	-
13	GND	-	-
14	DSI.DATA3_P	MIPI_DS1_D3_P	-
15	DSI.DATA3_N	MIPI_DS1_D3_N	-
16	GND	-	-
17	I2C1.SCL	I2C1_SCL	Display configuration I2C interface (3.3V), shared on SOM with PCA9451AHN PMIC
18	I2C1.SDA	I2C1_SDA	Display configuration I2C interface (3.3V), shared on SOM with PCA9451AHN PMIC
19	GND	-	-
20	DISP-RST	GPIO2_11	Optional display reset signal VisionSOM-iMX93 pin name UART7.RTS

21	TP-INT	GPIO2_IO09	Optional touch-panel interrupt signal VisionSOM-iMX93 pin name UART7.RXD
22	TP-RST	GPIO2_IO08	Optional touch-panel reset signal VisionSOM-iMX93 pin name UART7.TXD
23	GND	-	-
24	+3.3V	-	Power supply for display module (on both pins: 21 and 22 max. 50 mA)
25	+3.3V	-	Power supply for display module (on both pins: 21 and 22 max. 50 mA)
26	+5V	-	Power supply for display module (on both pins: 21 and 22 max. 200 mA)
27	+5V	-	Power supply for display module (on both pins: 21 and 22 max. 200 mA)
28	DSI-BL-PWM	GPIO1_IO07	Optional PWM backlight signal
29	DSI-BL-EN	GPIO2_10	Optional ENABLE backlight signal VisionSOM-iMX93 pin name UART7.CTS
30	GND	-	-

Note:

1. The first pin of the MIPI-DSI connector is located in its upper part.
2. Recommended display module for evaluation purposes is SoMLabs SL-TFT7-TP-600-1024-MIPI or similar (connector pinout is fully compatible with this module)

Display LVDS interface (FPC/FFC22, 0.5mm)



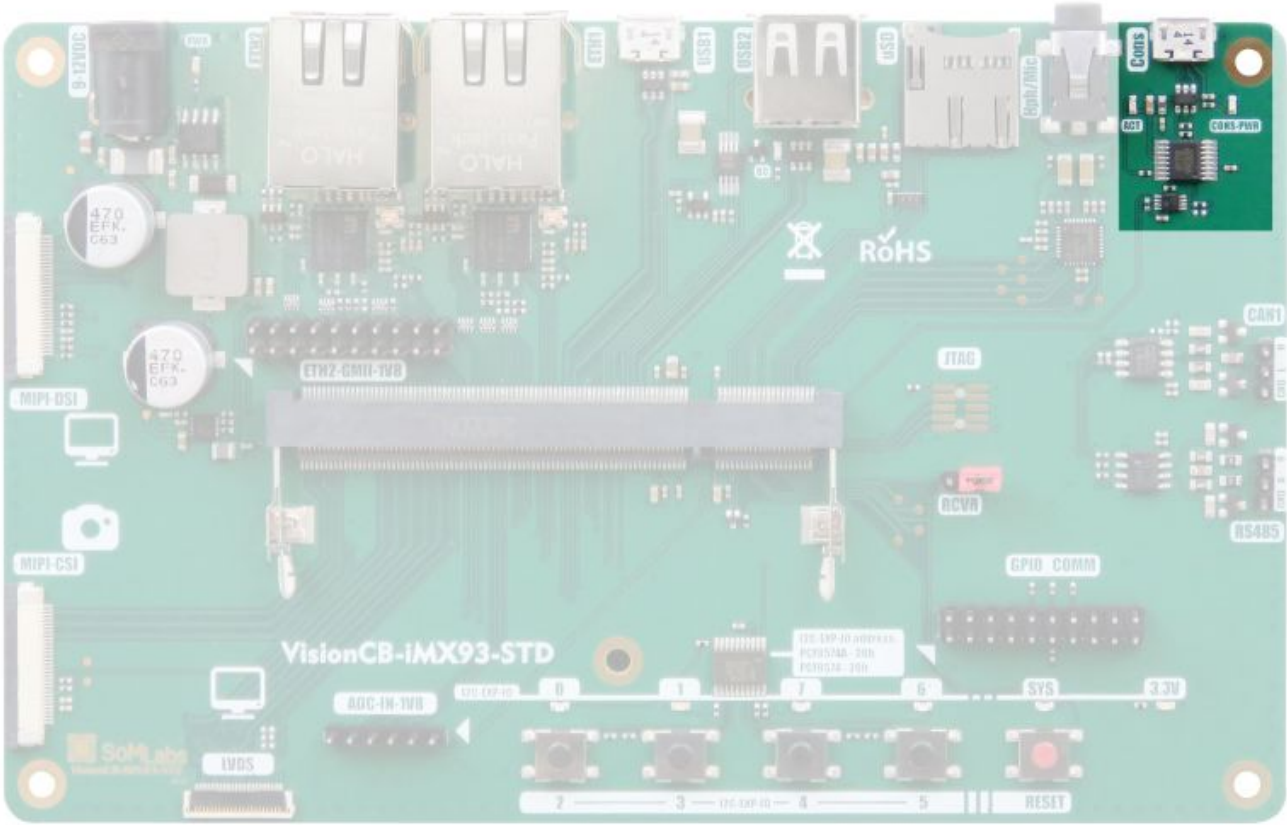
Pin	Signal	MPU pin name	Description
1	GND	-	
2	LVDS.DATA0_N	LVDS_D0_N	-
3	LVDS.DATA0_P	LVDS_D0_P	-
4	GND	-	-
5	LVDS.DATA1_N	LVDS_D1_N	-
6	LVDS.DATA1_P	LVDS_D1_P	-
7	GND	-	-
8	LVDS.DATA2_N	LVDS_D2_N	-
9	LVDS.DATA2_P	LVDS_D2_P	-
10	GND	-	-
11	LVDS.CLK_N	LVDS_CLK_N	-
12	LVDS.CLK_P	LVDS_CLK_P	-
13	GND	-	-
14	LVDS.DATA3_N	LVDS_D3_N	-
15	LVDS.DATA3_P	LVDS_D3_P	-
16	PWR_EN	-	Not connected by default, can be connected to SPI5.MOSI
17	PWM_IN	GPIO2_IO20	VisionSOM-iMX93 pin name SPI5.MOSI
18	I2C1.INT	GPIO2_IO21	Touch panel interrupt SOM pin name SPI5.SCK
19	I2C1.SCL	I2C1_SCL	Touch panel interface, shared with SOM PMIC (PCA9451AHN)
20	I2C1.SDA	I2C1_SDA	Touch panel interface, shared with SOM PMIC (PCA9451AHN)

21	VDD-5V0	-	Power supply for display module (on both pins: 21 and 22 max. 200 mA)
22	VDD-5V0	-	Power supply for display module (on both pins: 21 and 22 max. 200 mA)

Note:

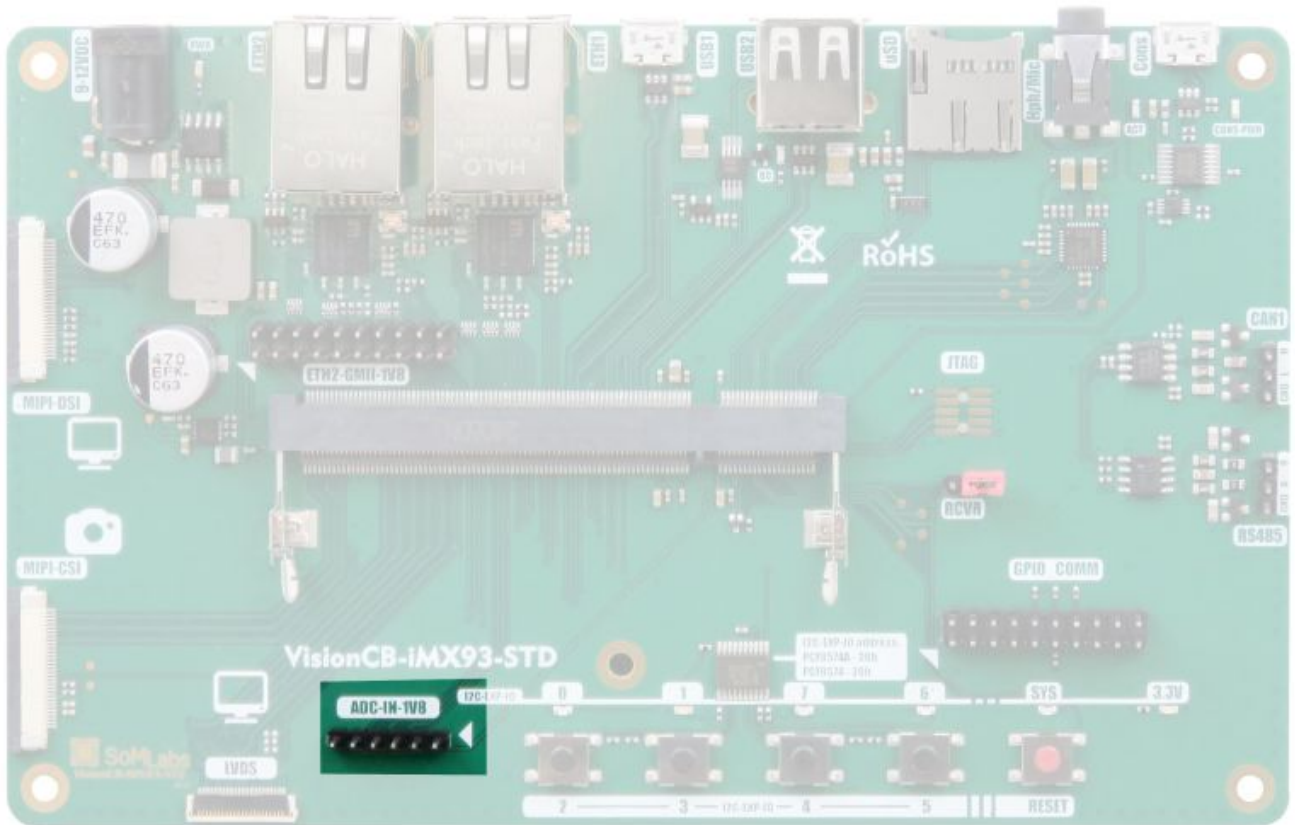
1. The first pin of the LVDS connector is located on its left side.
2. Recommended display module for evaluation purposes is SoMLabs SL-TFT7-TP-600-1024-LVDS or similar (connector pinout is fully compatible with this module)

USB Console Port



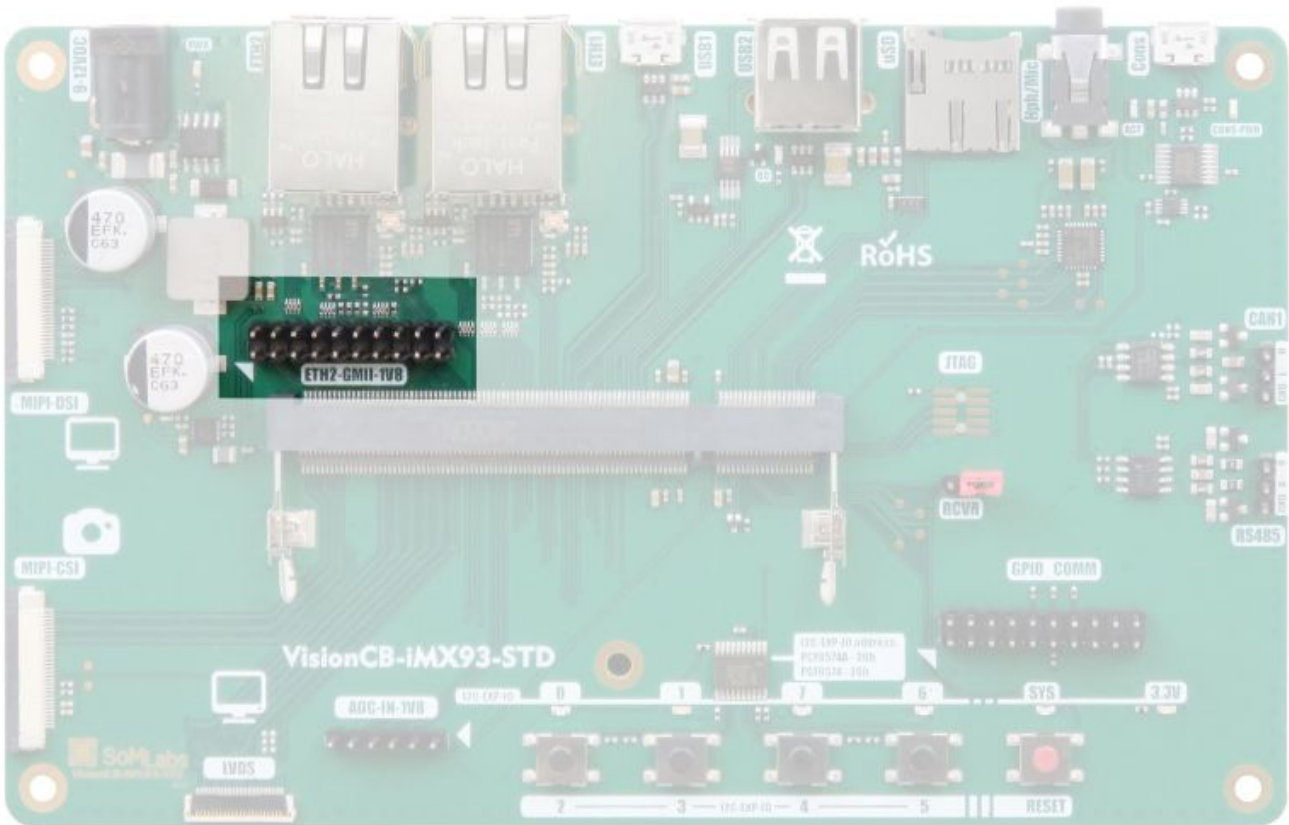
Console line	MPU signal	MPU pin name
CONSOLE-TXD	UART1.RXD	UART1_RXD
CONSOLE-RXD	UART1.TXD	UART1_TXD

ADC inputs connector



Pin	Signal	Description
1	GND	-
2	IN3	Dedicated 12-bit ADC input 1.8V compatible
3	IN2	Dedicated 12-bit ADC input 1.8V compatible
4	IN1	Dedicated 12-bit ADC input 1.8V compatible
5	IN0	Dedicated 12-bit ADC input 1.8V compatible
6	VDD-1V8	-

1.8V GPIO connector (ETH2-GMII-1V8)

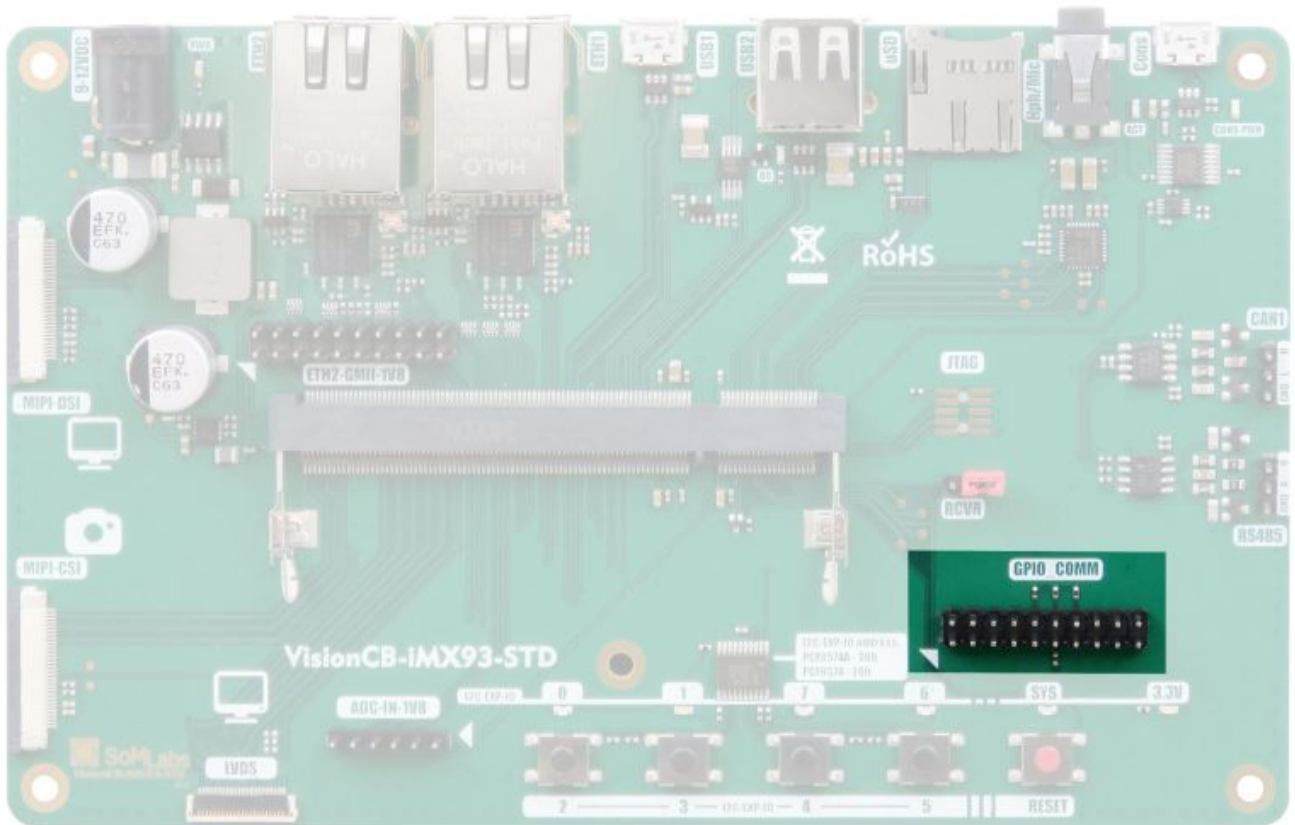


Pin	Signal	MPU pin name	Description
1	1.8V	-	Reference voltage for external logic
2	1.8V	-	Reference voltage for external logic
3	ENET2.TXD1	ENET2_TD1	GMII interface line with optional GPIO functions
4	ENET2.TXD0	ENET2_TD0	GMII interface line with optional GPIO functions
5	ENET2.TXD3	ENET2_TD3	GMII interface line with optional GPIO functions
6	ENET2.TXD2	ENET2_TD2	GMII interface line with optional GPIO functions
7	ENET2.TX-CTL	ENET2_TX_CTL	GMII interface line with optional GPIO functions
8	ENET2.TXC	ENET2_TXC	GMII interface line with optional GPIO functions
9	ENET2.RXD2	ENET2_RD2	GMII interface line with optional GPIO functions
10	ENET2.RXD3	ENET2_RD3	GMII interface line with optional GPIO functions
11	ENET2.RXD0	ENET2_RD0	GMII interface line with optional GPIO functions
12	ENET2.RXD1	ENET2_RD1	GMII interface line with optional GPIO functions
13	ENET2.RXC	ENET2_RXC	GMII interface line with optional GPIO functions
14	ENET2.RX-CTL	ENET2_RX_CTL	GMII interface line with optional GPIO functions
15	ENET2.MDIO	ENET2_MDIO	GMII interface line with optional GPIO functions
16	ENET2.MDC	ENET2_MDC	GMII interface line with optional GPIO functions
17	ENET2.RESET	CCM_CLKO1	-
18	ENET2.INT	CCM_CLKO2	-
19	GND	-	-
20	GND	-	-

Note:

1. The connector pins are numbered in the zig-zag style.
2. First connector pin is marked with an arrow.

3.3V GPIO connector (GPIO_COMM)

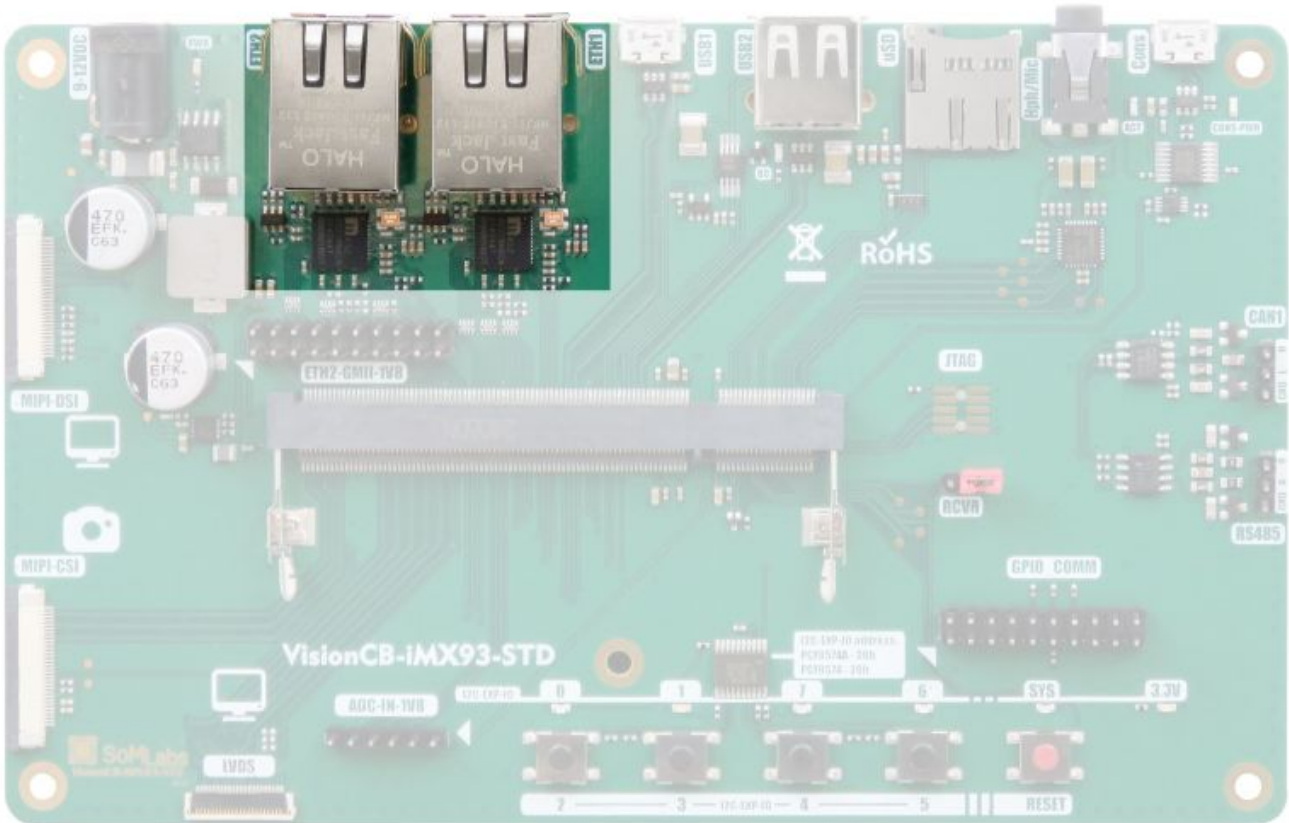


Pin	Signal	MPU pin name	Description
1	GND	-	-
2	SPI5.SCK	GPIO2_IO21	Line with optional GPIO functions
3	SPI7.SCK	GPIO2_IO07	Line with optional GPIO functions
4	SPI5.MOSI	GPIO2_IO20	Line with optional GPIO functions
5	SPI7.MOSI	GPIO2_IO06	Line with optional GPIO functions
6	SPI5.MISO	GPIO2_IO19	Line with optional GPIO functions
7	SPI7.MISO	GPIO2_IO05	Line with optional GPIO functions
8	SPI5.CS0	GPIO2_IO18	Line with optional GPIO functions
9	SPI7.CS0	GPIO2_IO04	Line with optional GPIO functions
10	I2C8.SDA	GPIO2_IO12	4.7 kOhm pull-up resistor connected to VDD-3V3
11	I2C8.SCL	GPIO2_IO13	4.7 kOhm pull-up resistor connected to VDD-3V3
12	I2C2.SDA	GPIO1_IO03	4.7 kOhm pull-up resistor connected to VDD-3V3
13	UART7.TXD	GPIO2_IO08	Line with optional GPIO functions
14	I2C2.SCL	GPIO1_IO02	4.7 kOhm pull-up resistor connected to VDD-3V3
15	UART7.RTS	GPIO2_11	Line with optional GPIO functions
16	I2C1.SDA	I2C1_SDA	Line pulled-up on the VisionSOM-iMX93
17	UART7.CTS	GPIO2_10	Line with optional GPIO functions
18	I2C1.SCL	I2C1_SCL	Line pulled-up on the VisionSOM-iMX93
19	UART7.RXD	GPIO2_IO09	Line with optional GPIO functions
20	VDD-3V3	-	-

Note:

1. The connector pins are numbered in the zig-zag style.
2. First connector pin is marked with an arrow.

1Gb Ethernet interfaces



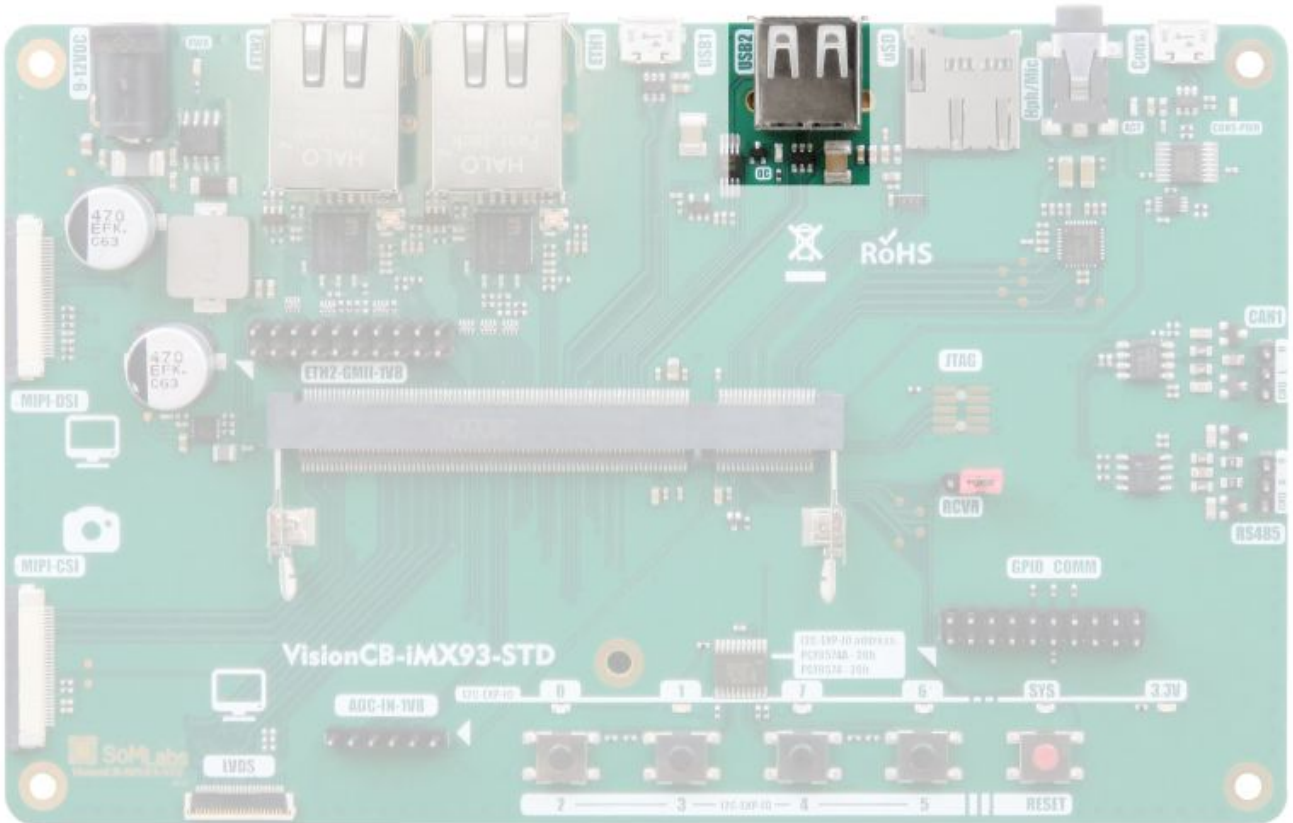
Ethernet channel 1

Signal	MPU pin name	Description
ENET1.RXD3	ENET1_RD3	1.8V Power Domain, alternative GPIO functions available
ENET1.RXD2	ENET1_RD2	1.8V Power Domain, alternative GPIO functions available
ENET1.RXD1	ENET1_RD1	1.8V Power Domain, alternative GPIO functions available
ENET1.RXD0	ENET1_RD0	1.8V Power Domain, alternative GPIO functions available
ENET1.RXC	ENET1_RXC	1.8V Power Domain, alternative GPIO functions available
ENET1.RX-CTL	ENET1_RXC_CTL	1.8V Power Domain, alternative GPIO functions available
ENET1.TXD3	ENET1_TD3	1.8V Power Domain, alternative GPIO functions available
ENET1.TXD2	ENET1_TD2	1.8V Power Domain, alternative GPIO functions available
ENET1.TXD1	ENET1_TD1	1.8V Power Domain, alternative GPIO functions available
ENET1.TXD0	ENET1_TD0	1.8V Power Domain, alternative GPIO functions available
ENET1.TXC	ENET1_TXC	1.8V Power Domain, alternative GPIO functions available
ENET1.TX-CTL	ENET1_TX_CTL	1.8V Power Domain, alternative GPIO functions available
ENET1.MDC	ENET1_MDC	1.8V Power Domain, alternative GPIO functions available
ENET1.MDIO	ENET1_MDIO	1.8V Power Domain, alternative GPIO functions available
ENET1.INT	CCM_CLKO4	1.8V Power Domain, alternative GPIO functions available
ENET1.RESET	CCM_CLKO3	1.8V Power Domain, alternative GPIO functions available

Ethernet channel 2

Signal	MPU pin name	Description
ENET2.RXD3	ENET2_RD3	1.8V Power Domain, alternative GPIO functions available
ENET2.RXD2	ENET2_RD2	1.8V Power Domain, alternative GPIO functions available
ENET2.RXD1	ENET2_RD1	1.8V Power Domain, alternative GPIO functions available
ENET2.RXD0	ENET2_RD0	1.8V Power Domain, alternative GPIO functions available
ENET2.RXC	ENET2_RXC	1.8V Power Domain, alternative GPIO functions available
ENET2.RX-CTL	ENET2_RXC_CTL	1.8V Power Domain, alternative GPIO functions available
ENET2.TXD3	ENET2_TD3	1.8V Power Domain, alternative GPIO functions available
ENET2.TXD2	ENET2_TD2	1.8V Power Domain, alternative GPIO functions available
ENET2.TXD1	ENET2_TD1	1.8V Power Domain, alternative GPIO functions available
ENET2.TXD0	ENET2_TD0	1.8V Power Domain, alternative GPIO functions available
ENET2.TXC	ENET2_TXC	1.8V Power Domain, alternative GPIO functions available
ENET2.TX-CTL	ENET2_TX_CTL	1.8V Power Domain, alternative GPIO functions available
ENET2.MDC	ENET2_MDC	1.8V Power Domain, alternative GPIO functions available
ENET2.MDIO	ENET2_MDIO	1.8V Power Domain, alternative GPIO functions available
ENET1.INT	CCM_CLKO2	1.8V Power Domain, alternative GPIO functions available
ENET2.RESET	CCM_CLKO1	1.8V Power Domain, alternative GPIO functions available

USB 2.0 (host)

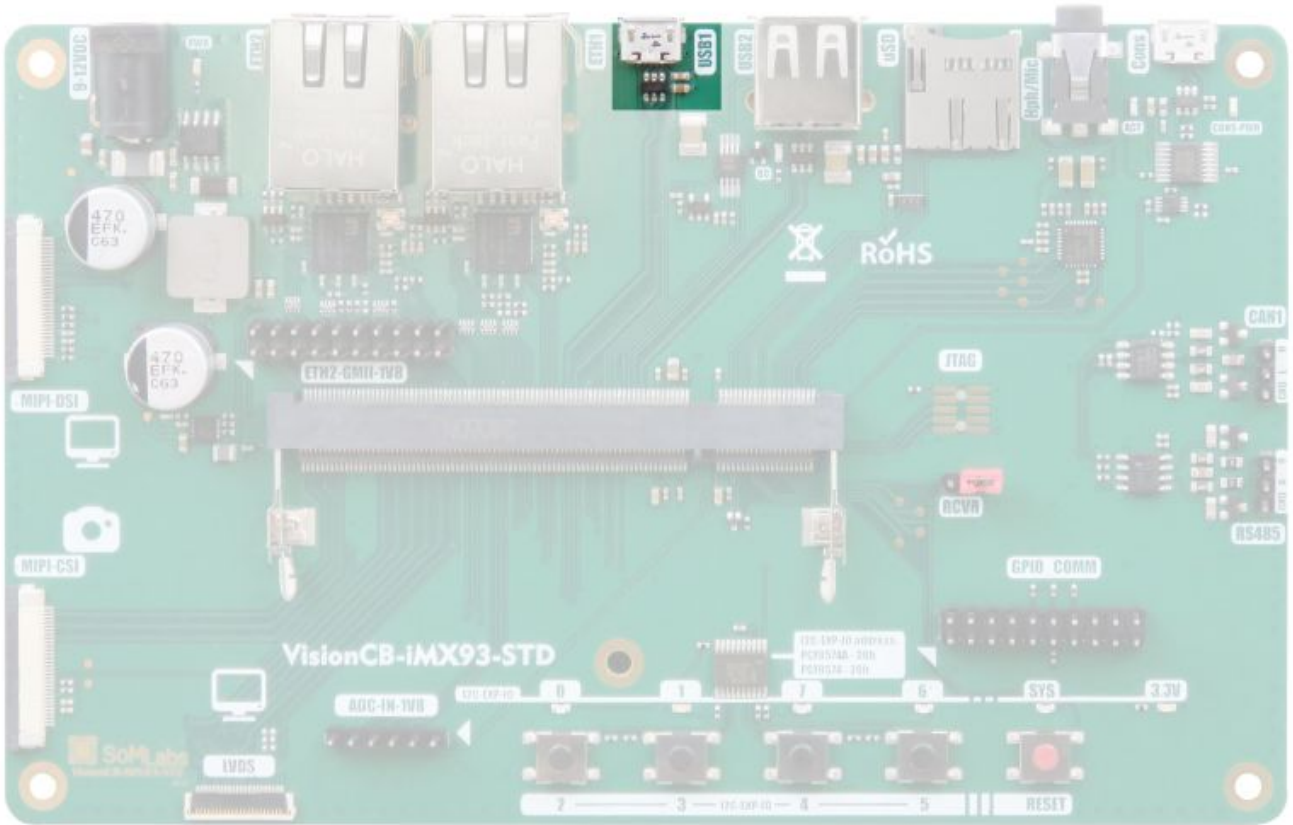


Signal	MPU pin name	Description
USB2.VBUS	USB2_VBUS	5V compatible
USB2.VBUS-EN	GPIO2_IO23	USB power switch enable line
USB2.VBUS-OC	SD2_RESET_B	Overcurrent signalling input with internal pull-up
USB2.D_N	USB2_D_N	Analog USB transceiver line
USB2.D_P	USB2_D_P	Analog USB transceiver line

Note:

1. USB2 is configured as the host interface on VisionCB-iMX93-STD board.

USB-OTG

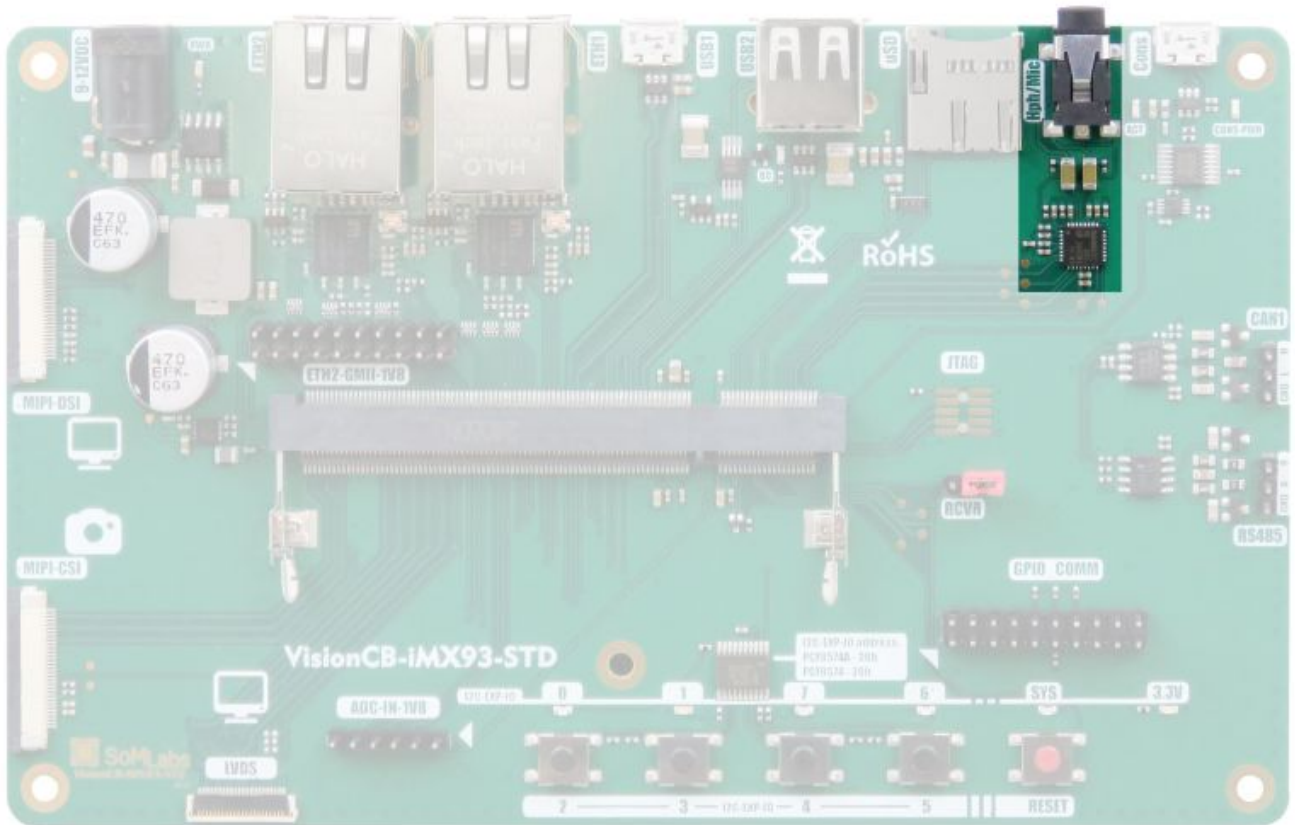


Signal	MPU pin name	Description
USB1.VBUS	USB1_VBUS	5V compatible
USB1.VBUS-EN	GPIO2_IO22	USB power switch enable line
USB1.VBUS-OC	SD_CD_B	Overcurrent signalling input with internal pull-up
USB1.ID	USB1_ID	OTG ID input with internal pull-up
USB1.D_N	USB1_D_N	Analog USB transceiver line
USB1.D_P	USB1_D_P	Analog USB transceiver line

Note:

1. USB1 is configured as the OTG interface on VisionCB-iMX93-STD board.

Audio codec

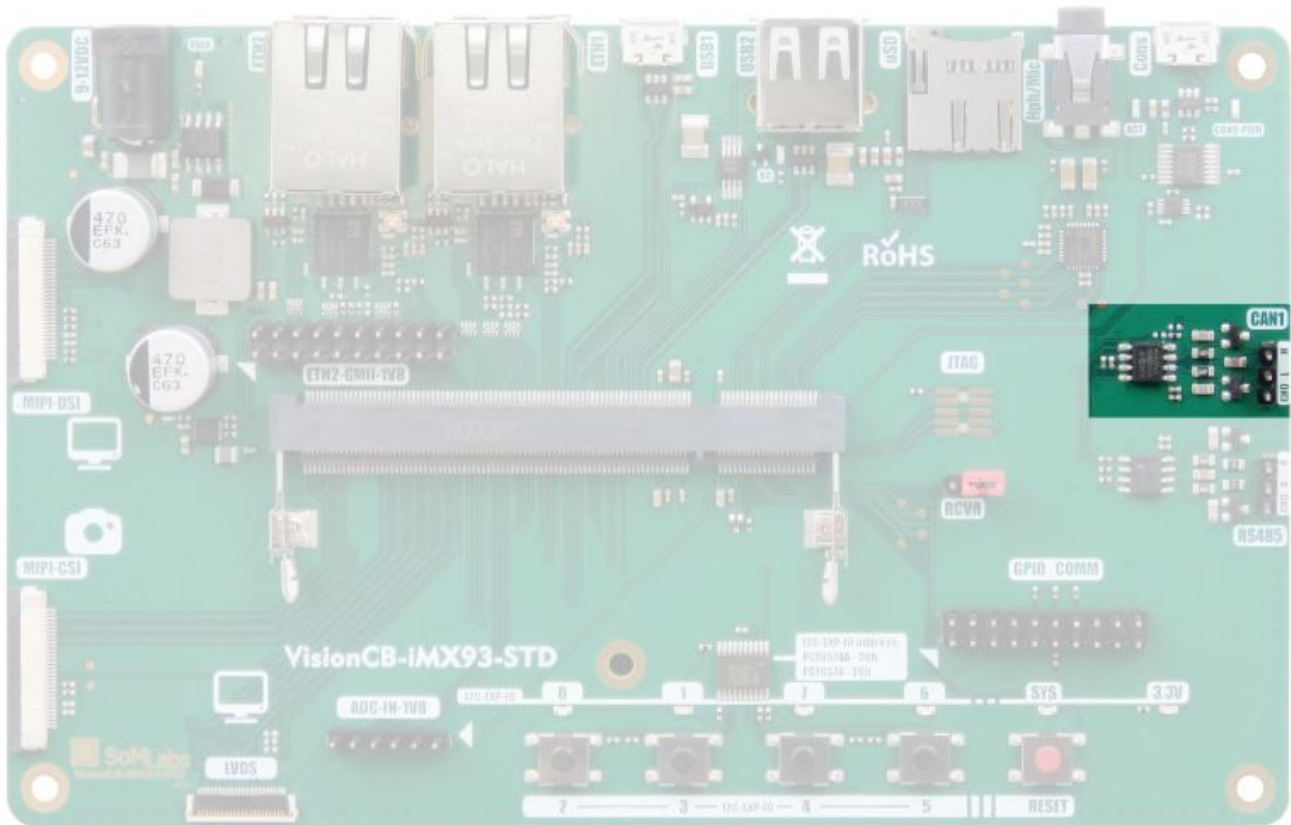


Signal	MPU pin name	Description
SAI1.MCLK	UART2_RXD	Master clock for audio codec
SAI1.BCLK	SAI1_TXC	Bit clock for audio codec
SAI1.SYNC	SAI1_TXFS	L and R bit frames selector
SAI1.TXD	SAI1_TXD0	Tx data line
SAI1.RXD	SAI1_RXD0	Rx data line
I2C8.SCL	GPIO2_IO13	Audio codec configuration I2C interface Pulled-up with 4.7 kOhm
I2C8.SDA	GPIO2_IO12	Audio codec configuration I2C interface Pulled-up with 4.7 kOhm

Note:

1. Audio codec is configured via I2C8 MPU interface.
2. Interface I2C8 is also used for on-board GPIO expander (PCF8574 or PCF8574A).

CAN interface

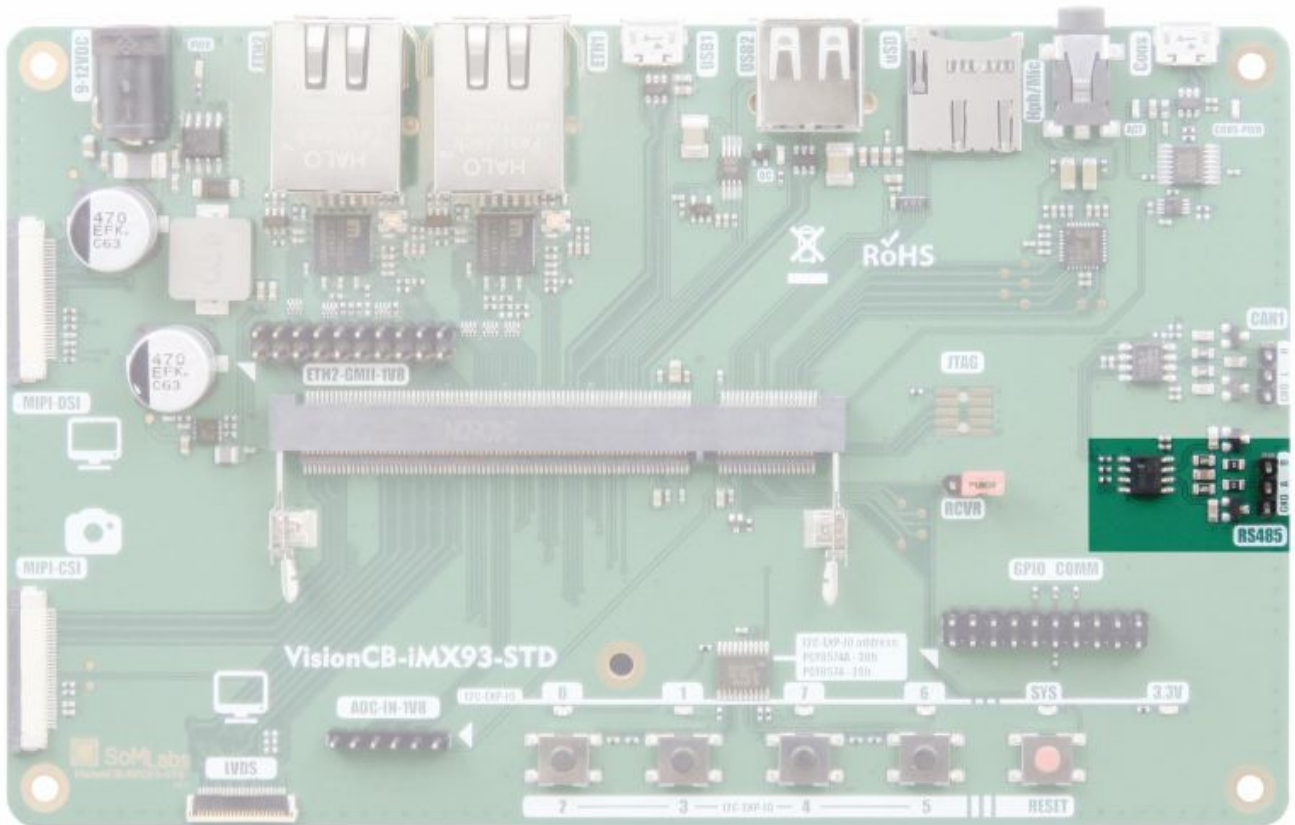


Signal	MPU pin name	Description
CAN1.TX	PDM_CLK	Tx line
CAN1.RX	PDM_BIT_STREAM0	Rx line
UART5.CTS	GPIO2_IO02	Optional STB line of MCP2542FD ¹

Note:

1. STB line of MCP2542FD is pulled-down with 10kOhm resistor by default.
2. The PHY of CAN interface is MCP2542FD by Microchip.

RS-485 interface

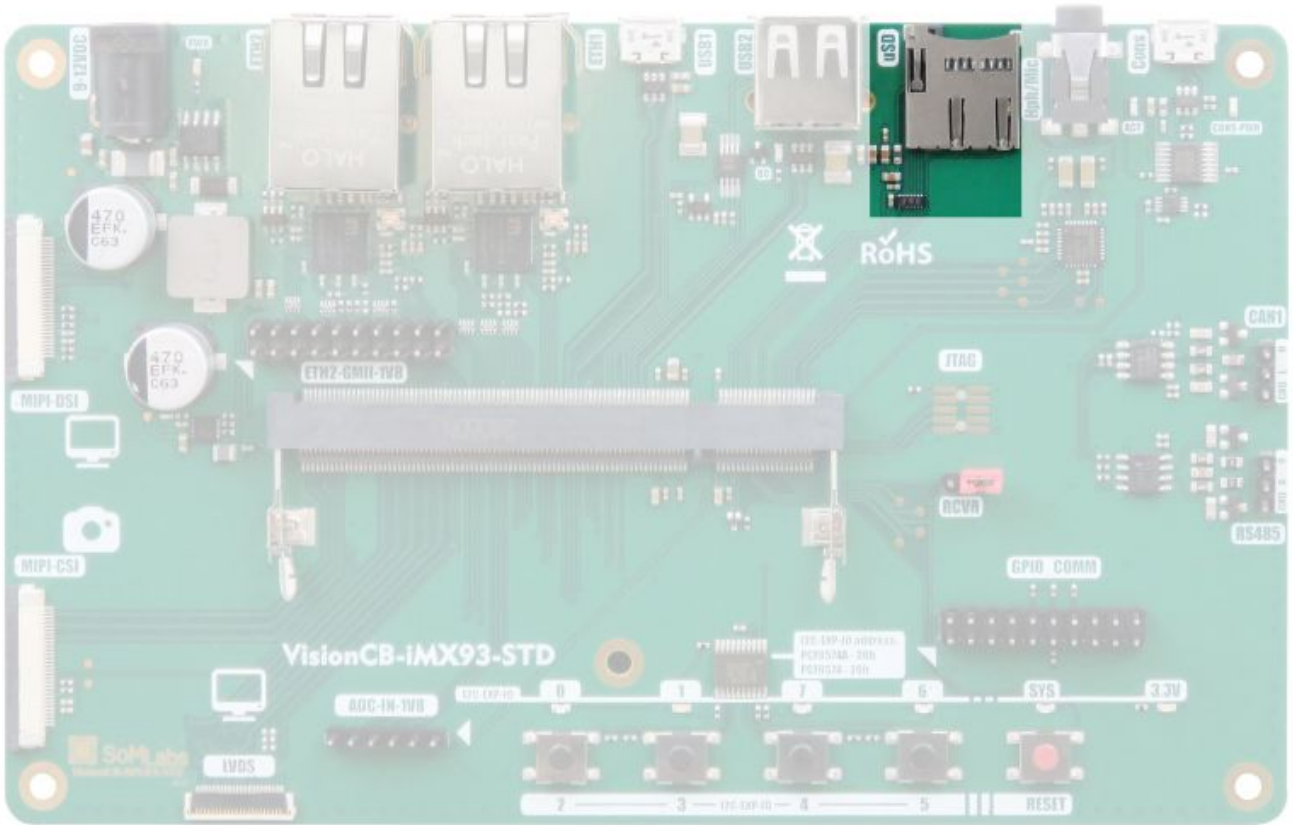


Signal	MPU pin name	Description
UART5.RXD	GPIO2_IO01	Tx line
UART5.TXD	GPIO2_IO00	Rx line
UART5.RTS	GPIO2_IO03	Data Enable line, connected to DE of MAX3485CSA

Note:

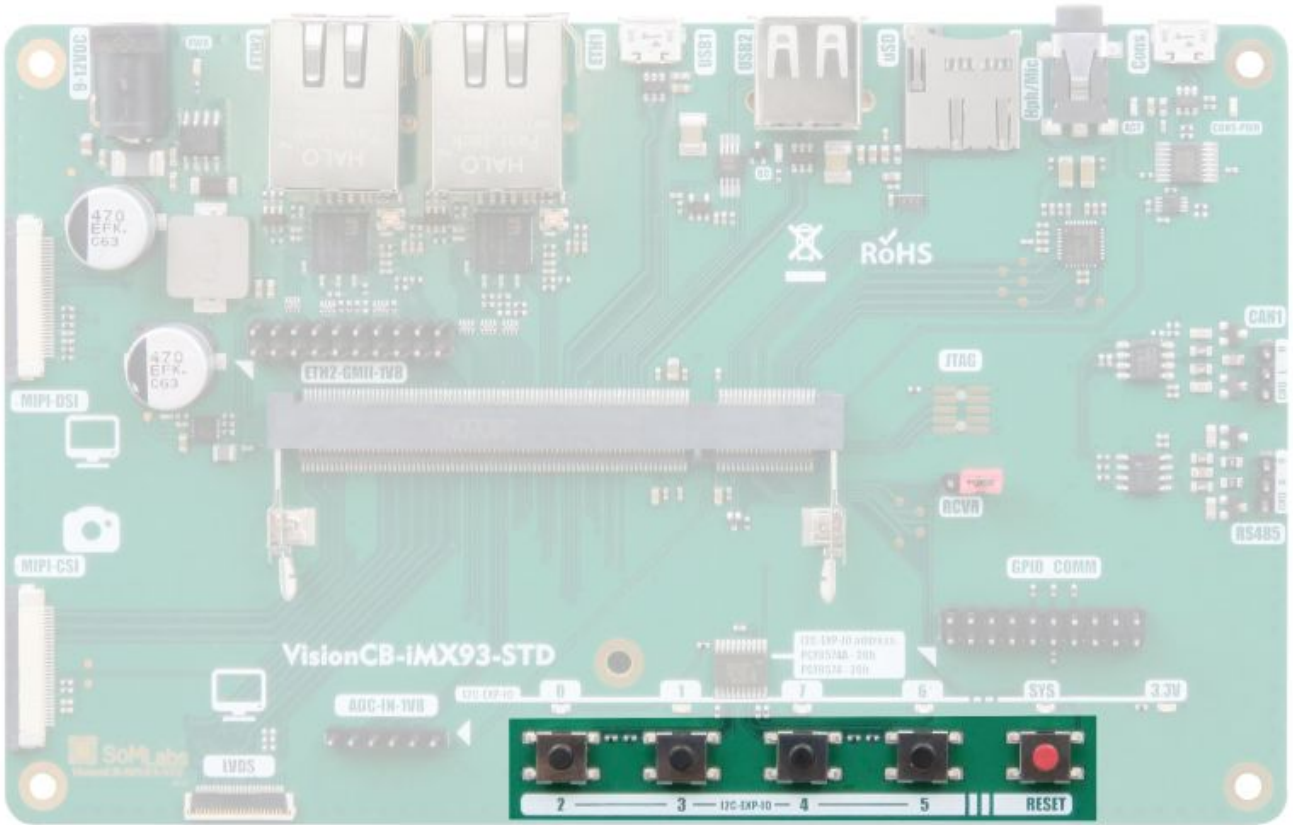
1. The PHY of RS-485 is MAX3485CSA or similar.

MicroSD socket



Signal	MPU pin name	Description
SD2.NVCC	GPIO2_IO01	1.8V/3.3V power supply for SD card
SD2.DATA3	SD2_DATA3	SD bi-dir data line
SD2.DATA2	SD2_DATA2	SD bi-dir data line
SD2.DATA1	SD2_DATA1	SD bi-dir data line
SD2.DATA0	SD2_DATA0	SD bi-dir data line
SD2.CLK	SD2_CLK	SD interface clock line
SD2.CMD	SD2_CMD	SD interface command line

User Interface (switches)

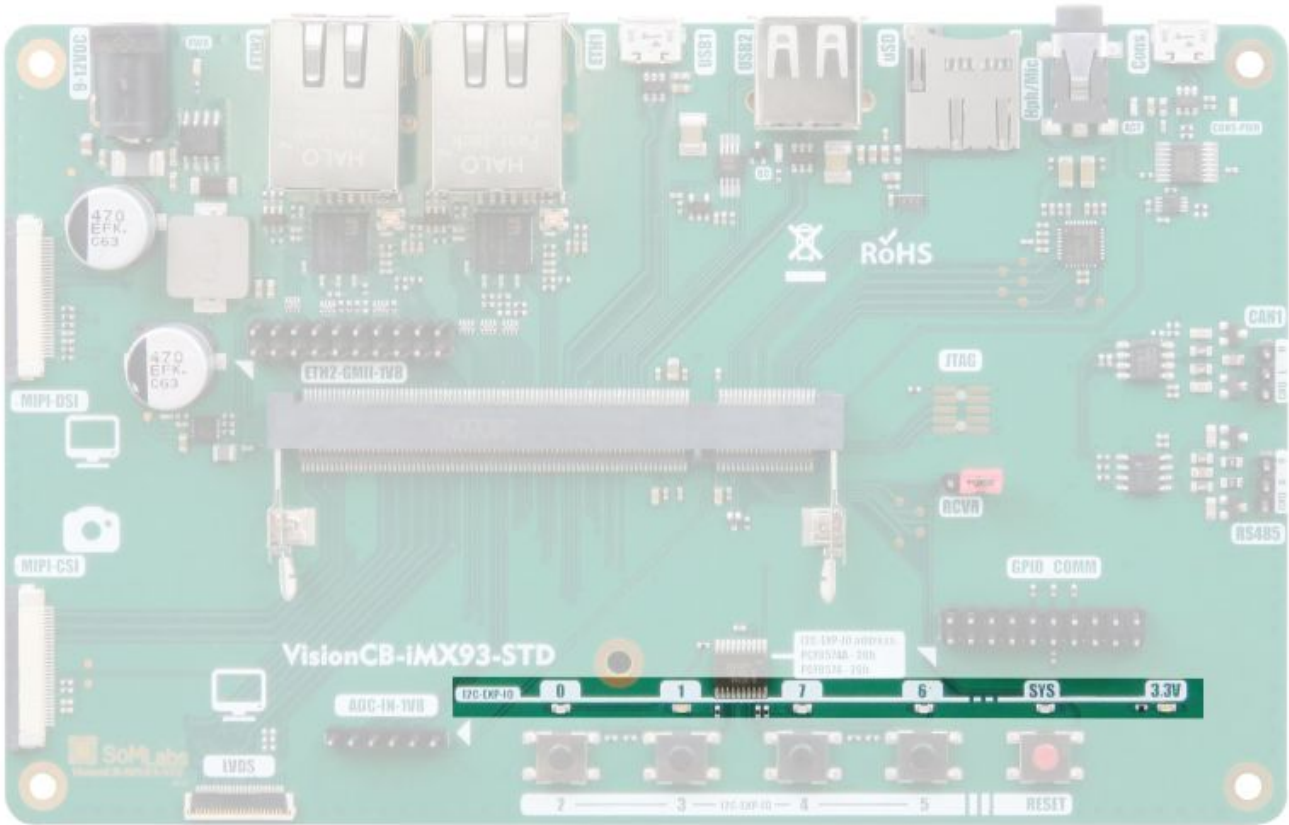


Switch/Function	GPIO expander pin name	Description
2/-	GPIO2	Pulled-up with 47kOhm
3/-	GPIO3	Pulled-up with 47kOhm
4/-	GPIO4	Pulled-up with 47kOhm
5/-	GPIO5	Pulled-up with 47kOhm
-/GPIO2-IO27	nINT	GPIO expander interrupt line

Note:

1. Switches are connected to MPU via PCF8574A GPIO expander.
2. The base I2C address of PCF8574A GPIO expander is 38h.
3. Optionally as GPIO expander can be used PCF8574 with base I2C address 20h.
4. GPIO expander is connected to MPU via I2C8 interface (the same like in audio codec, interface lines are pulled-up with 4.7 kOhm).
5. The GPIO expander interrupt output is connected to GPIO2_IO27 GPIO of MPU.

User Interface (LEDs)



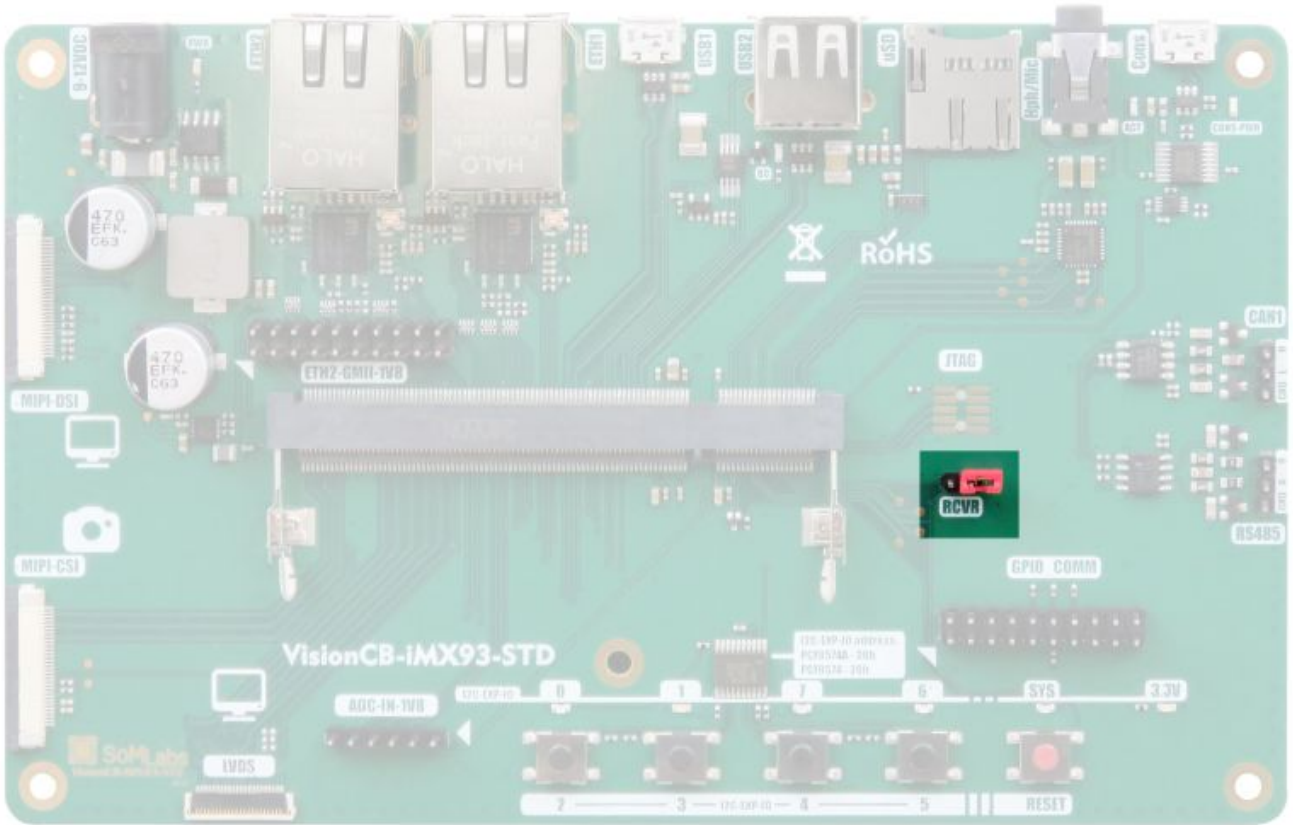
Switch/Function	GPIO expander pin name	Description
7/-	GPIO7	-
6/-	GPIO6	-
1/-	GPIO1	-
0/-	GPIO0	-
-/GPIO2_IO27	nINT	GPIO expander interrupt line

Note:

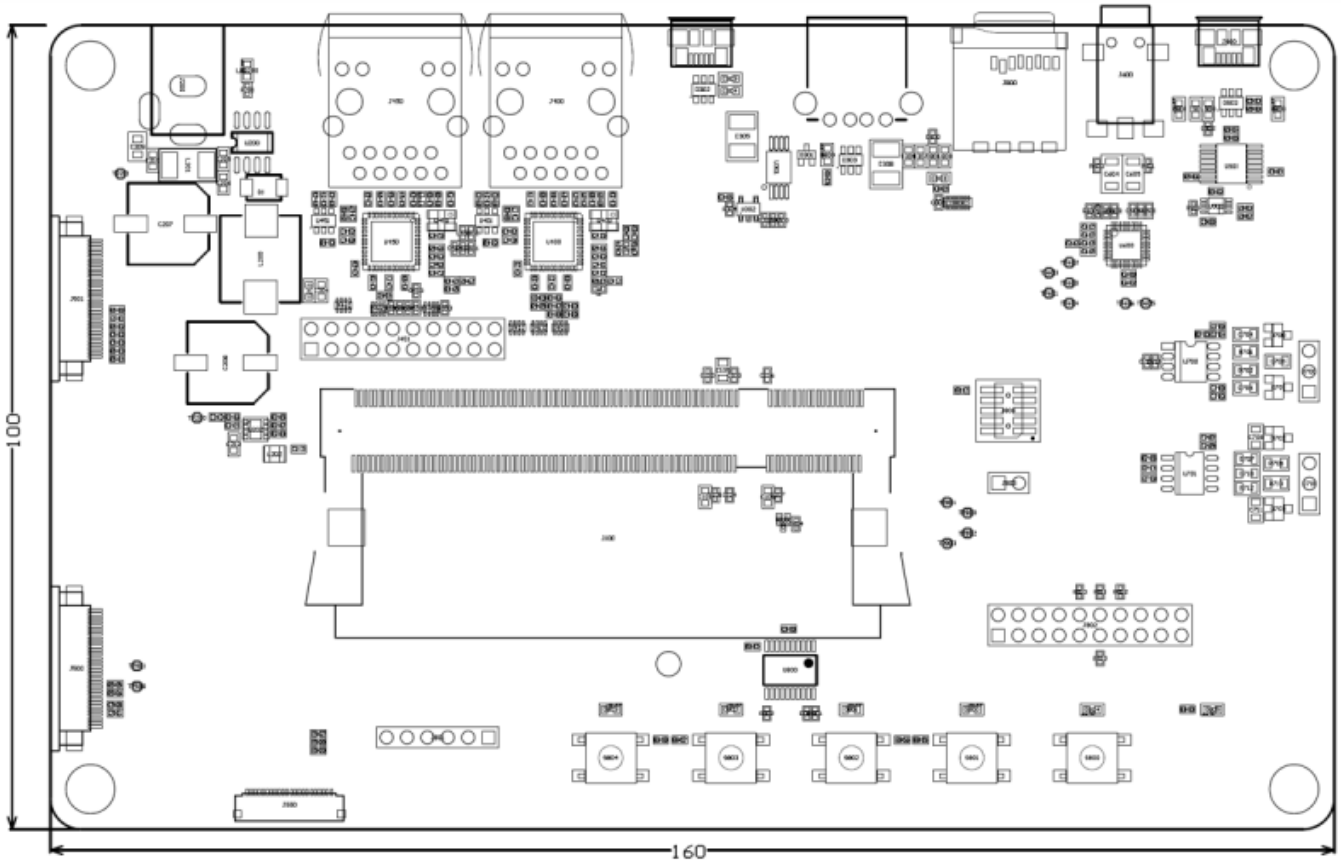
1. LEDs are connected to MPU via PCF8574A GPIO expander.
2. The base I2C address of PCF8574A GPIO expander is 38h.
3. Optionally as GPIO expander can be used PCF8574 with base I2C address 20h.
4. GPIO expander is connected to MPU via I2C8 interface (the same like in audio codec, interface lines are pulled-up with 4.7 kOhm).
5. The GPIO expander interrupt output is connected to GPIO2_IO27 GPIO of MPU.

Function	MPU pin name	Description
SYS-LED	PDM_BIT_STREAM1	System heart-beat Logic levels from MPU are inverted by LED driver

RECOVERY jumper



Dimensions





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