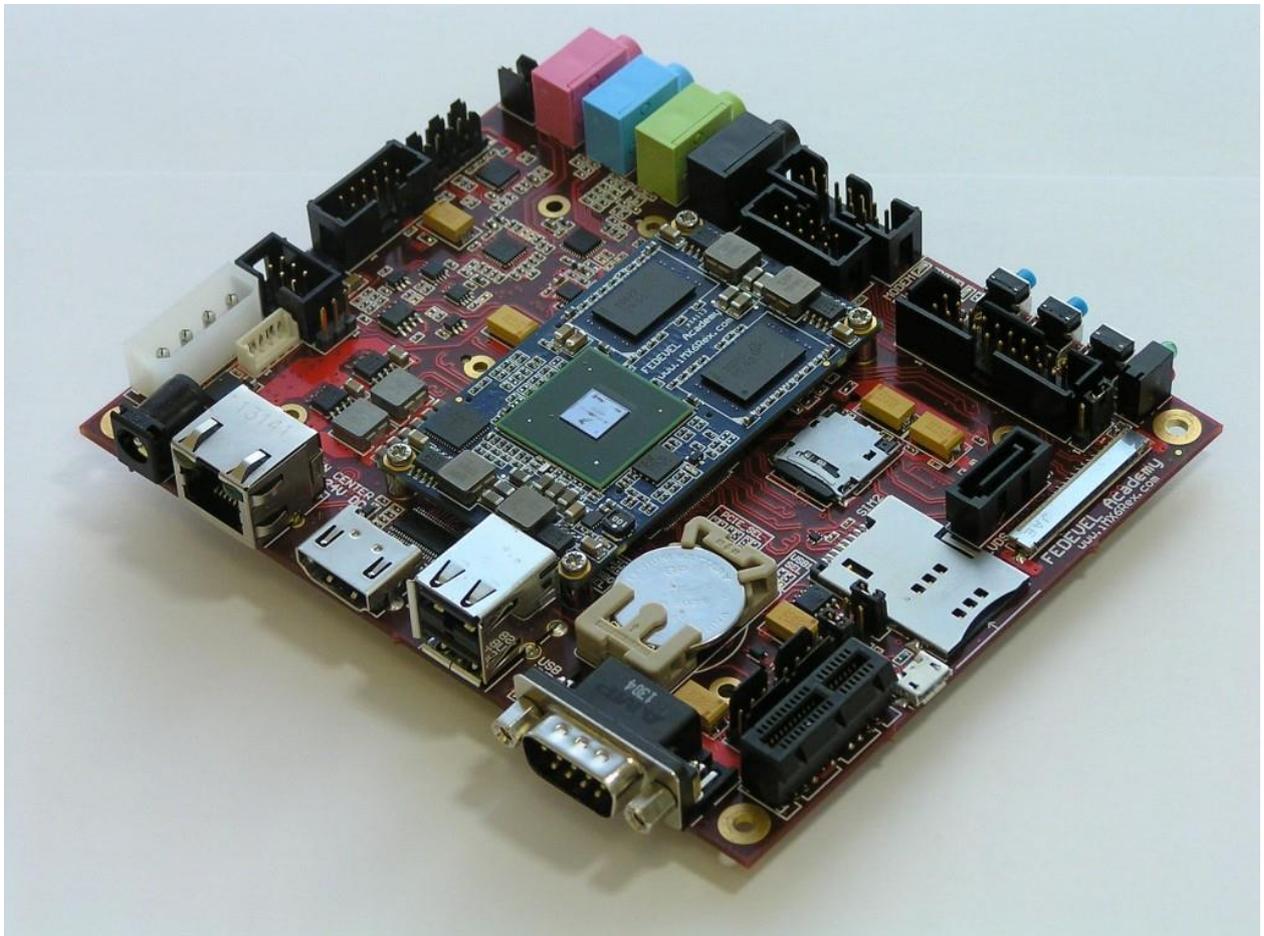


# iMX6 Rex Development Baseboard

## Manual

(version 0.2)



[www.iMX6Rex.com](http://www.iMX6Rex.com)

Contact: [info@iMX6Rex.com](mailto:info@iMX6Rex.com)

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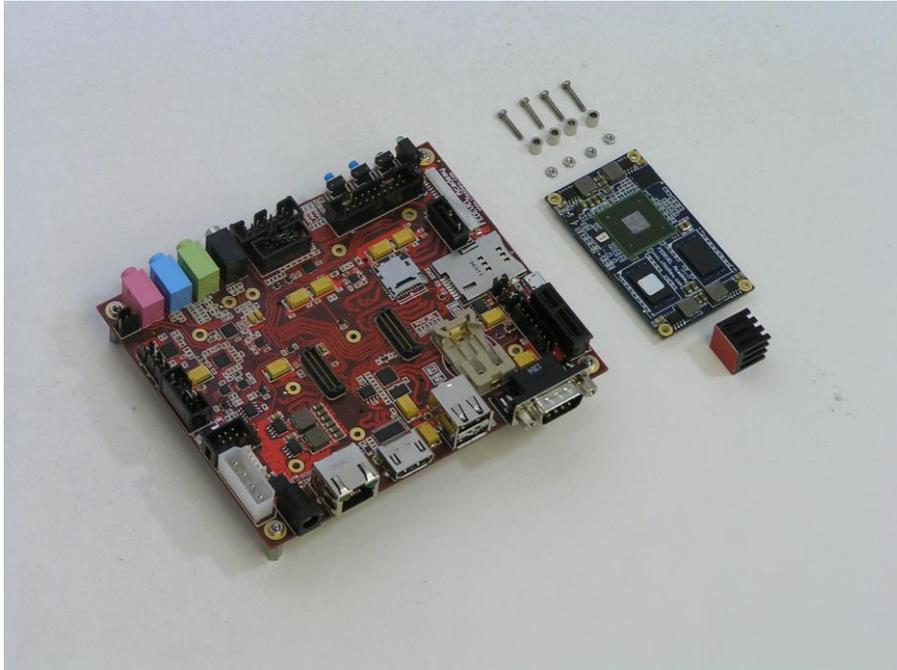
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## Getting started

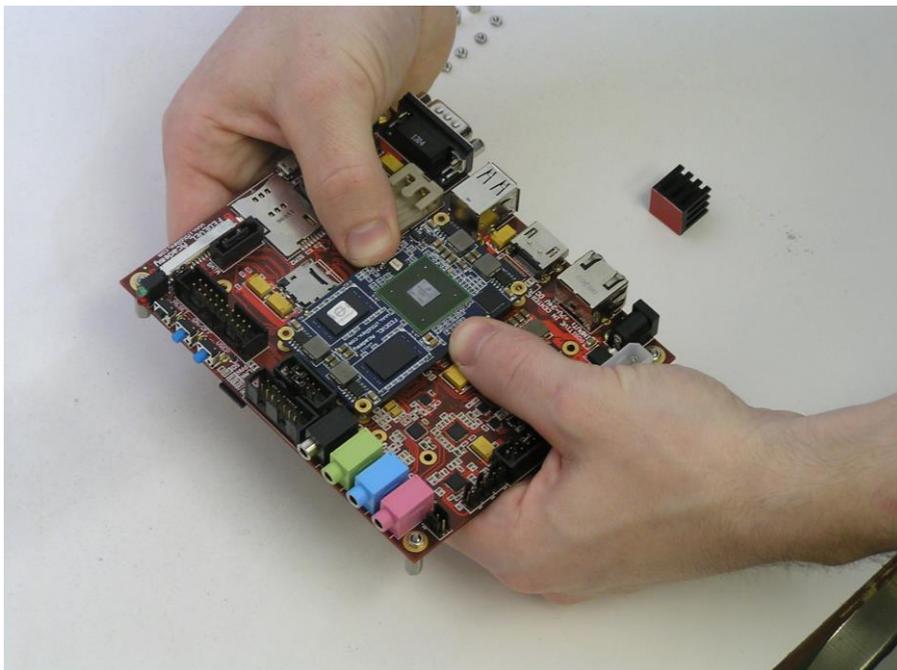
These steps will help you to power up your iMX6 Rex development kit for the very first time.

### 1. Plug the module into the baseboard

These are the important parts to build the kit:

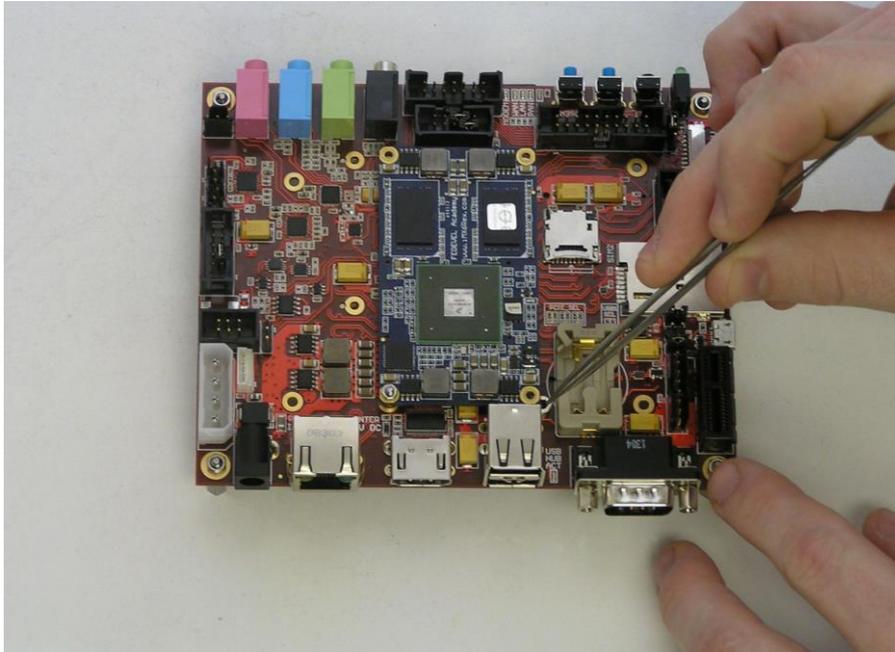


Notice the position of the thumbs:

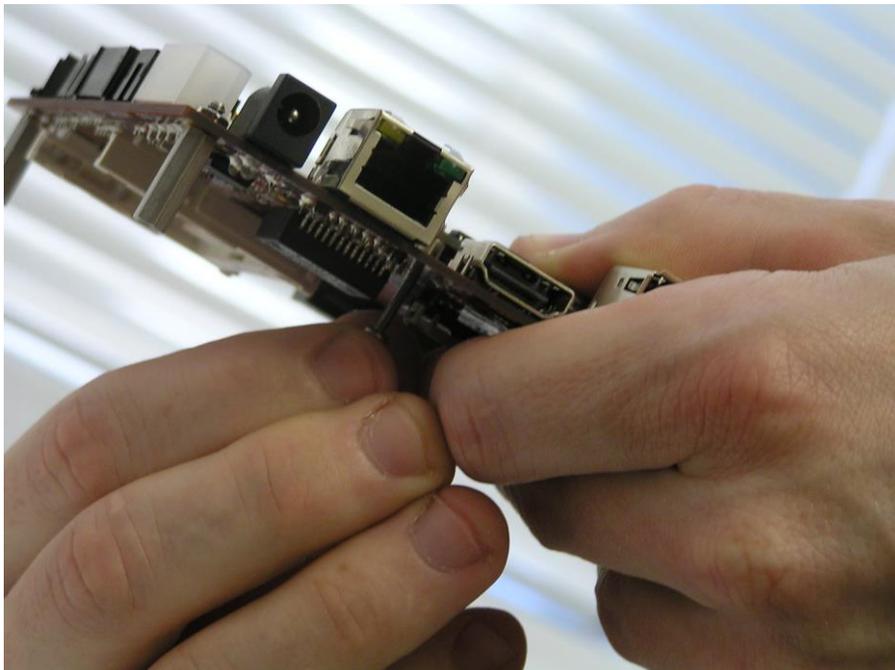


## 2. Add spacers and tight up all the four screws

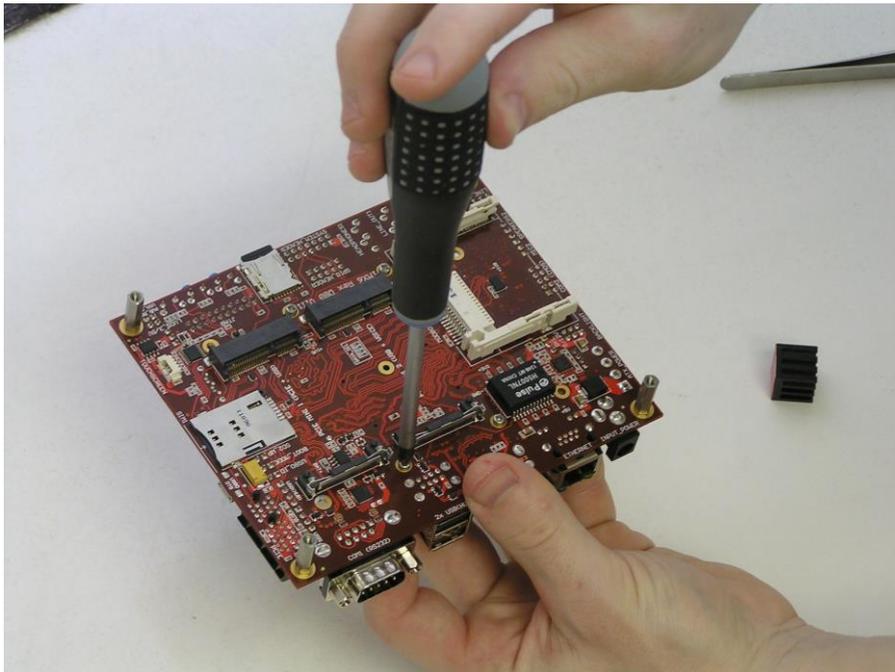
Notice how the spacer is moved between the module and baseboard:



Plug a screw into the mounting hole and secure it with a nut:

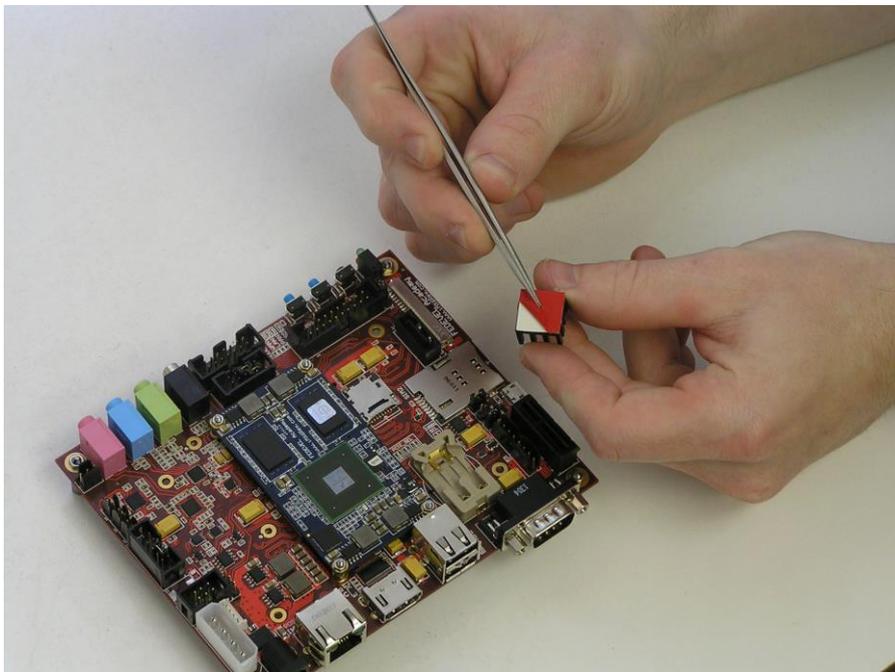


Use a screwdriver to tight it up:

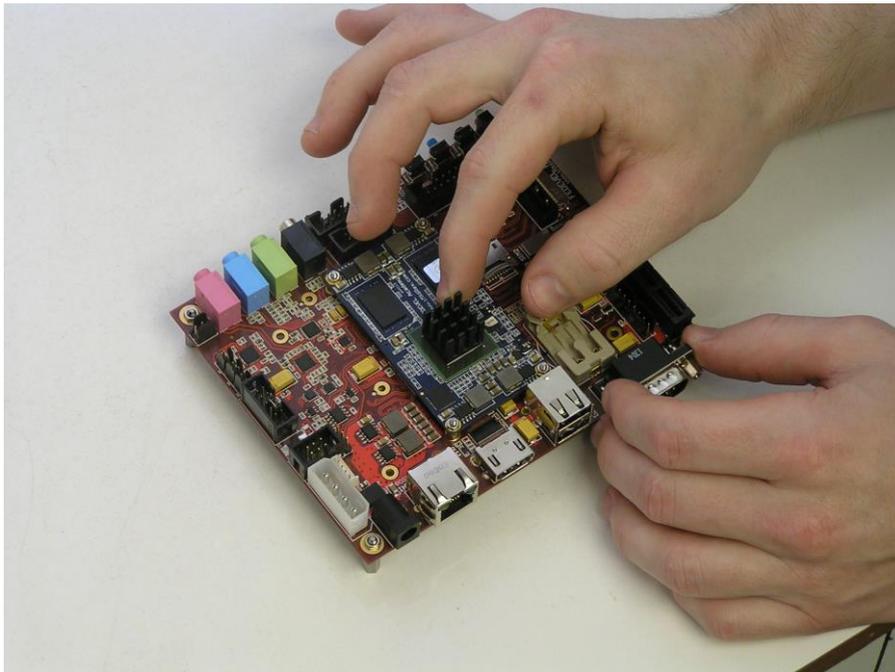


### 3. Place the heatsink

Remove the red protection foil from the heatsink:



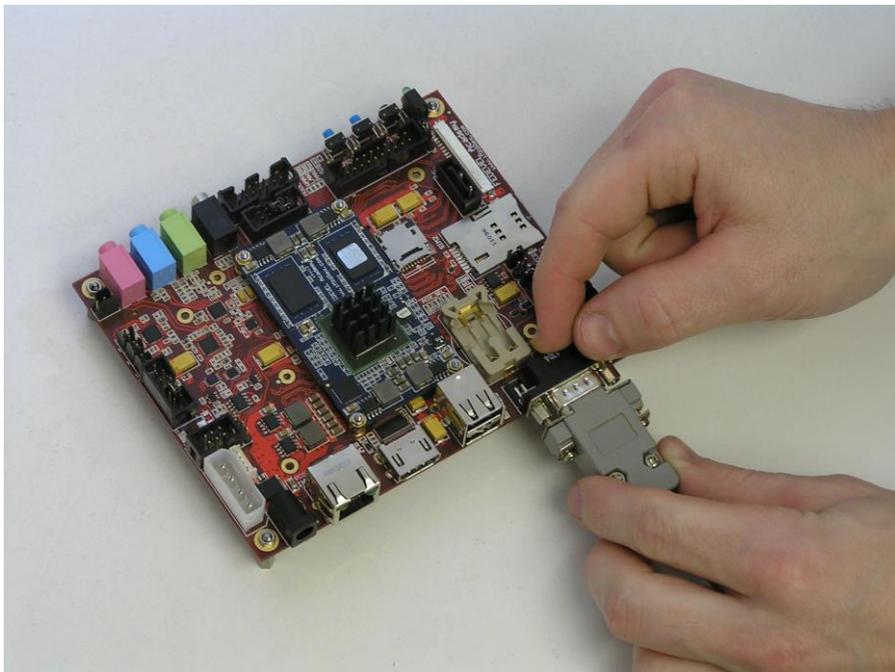
Place the heatsink on the top of the processor:



#### 4. Connect serial cable

Connect the iMX6 Rex RS232 serial port to your computer. Use the cable from development kit (it has to be a null modem cable with crossed wires). Run Hyperterminal (or download and use [Tera Term](#)).

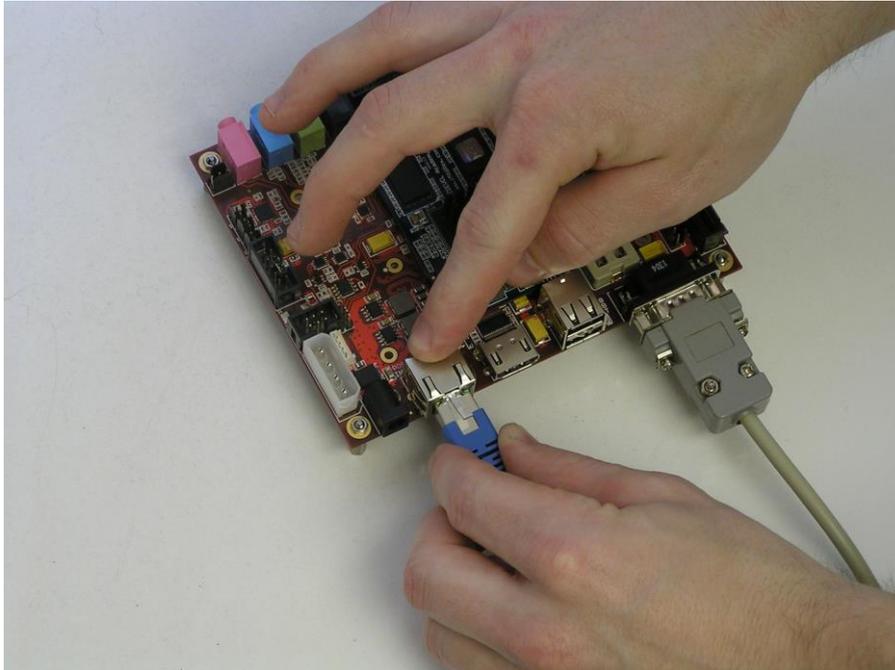
Set the following serial port parameters – **Baud rate: 115200 / Data: 8 / Parity: none / Stop bit: 1 / Flow control: none.**



## 5. Connect network cable

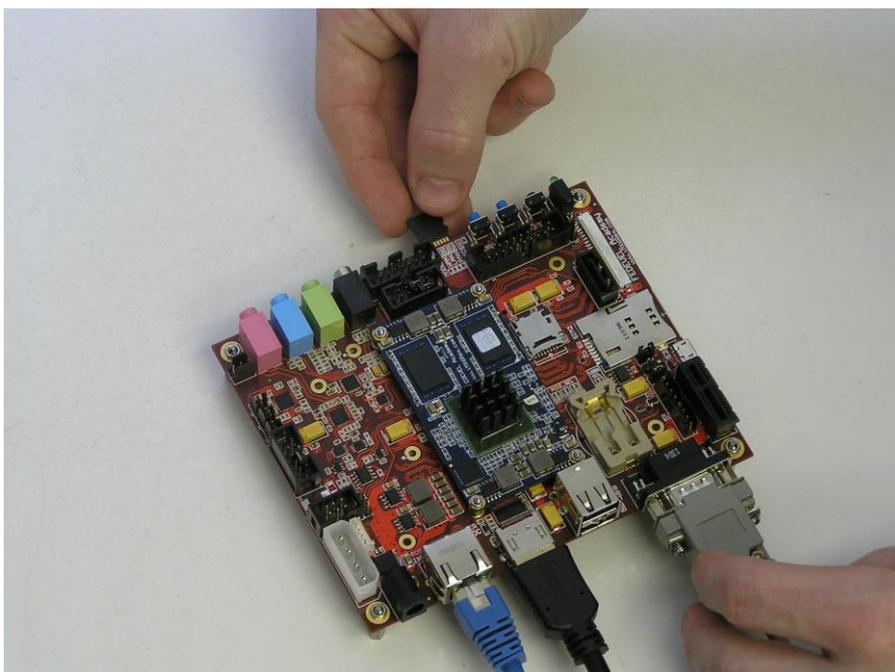
Use the network cable delivered with your development kit (this cable is rated for 1Gb Ethernet). Connect the cable between your iMX6 Rex development kit and a network switch (possibly a computer).

Connecting the baseboard to a network is not required, but missing network may slow down booting process as Linux will be waiting for a DHCP answer.



## 6. Insert SD card

Insert the SD card delivered with your development kit into the slot placed on the edge of the board. Be sure the other SD card slot is empty.

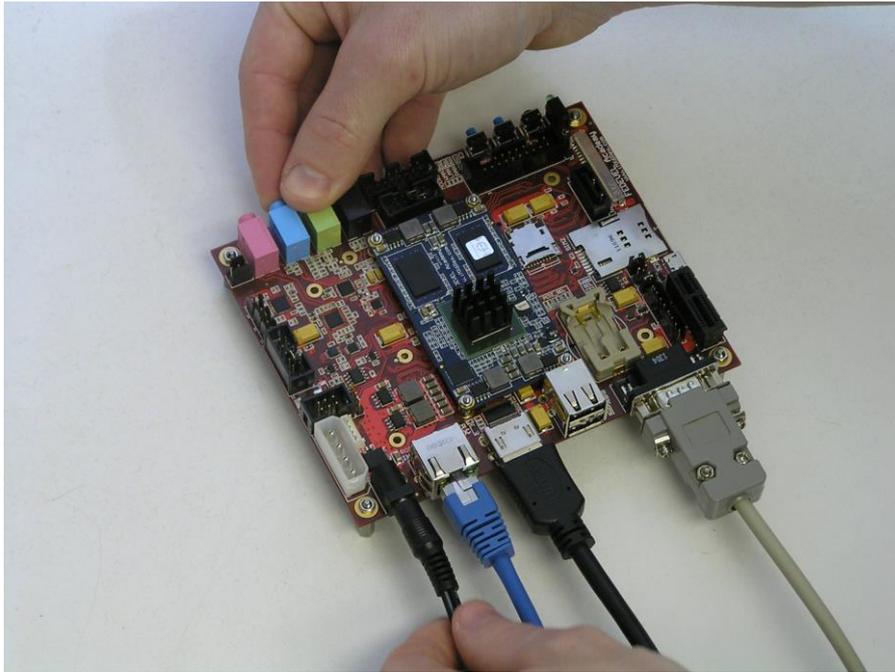


## 7. Connect the power

You have two options, how the board may be powered. **Be sure, your power supply can deliver enough power!**

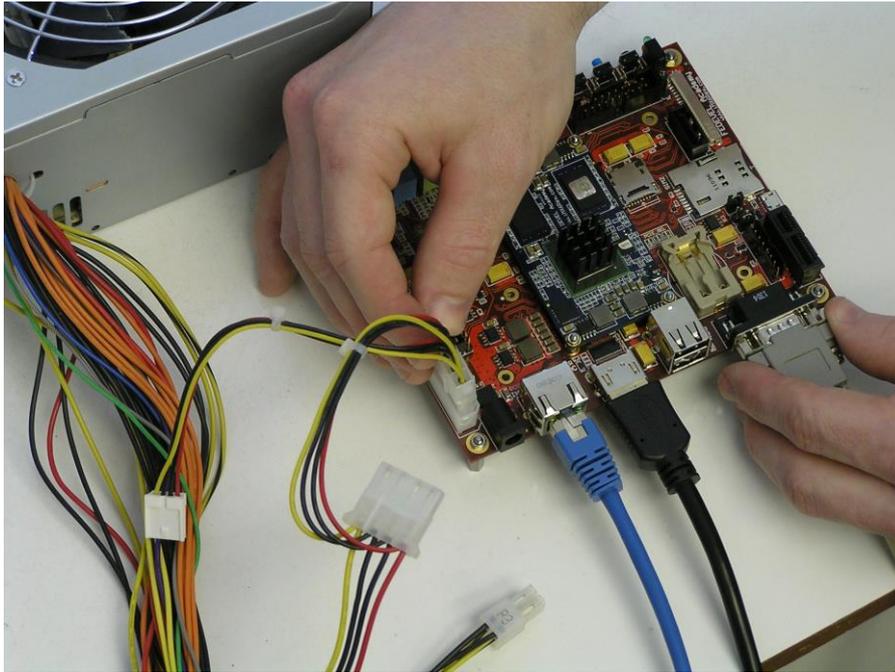
### Option 1:

Use a 7V to 24V DC adapter (usually 12V/3A is fine – here is one from Farnell [VEP36US12](#)) with a power jack. The plug diameters are 2mm x 5.5mm with the positive voltage in the middle (use e.g. [Switchcraft S-760](#)).



### Option 2:

Use an ATX power supply



## 8. Update network configuration

After you connect the power, the board will start. Watch the console messages in your PC terminal. Once you see how the u-Boot autostart is counting down, press any key (e.g. ENTER) to interrupt it. Update the u-boot parameters based on your company network setting. Here is an example:

```
> setenv gateway '192.168.1.1'  
> setenv netmask '255.255.255.0'  
> setenv ipaddr '192.168.1.78'
```

Select a valid IP address from your network to use an initial ping and insert this command:

```
> setenv bootcmd 'ping 192.168.1.1; run bootcmd_mmc'
```

In the case your server does not support DHCP, set a fixed IP address and network mask which will be assigned to the Rex board after it boots up into the Linux:

```
> setenv bootargs_mmc 'setenv bootargs ${bootargs}  
ip=192.168.1.78:::255.255.255.0 root=/dev/mmcb1k0p1 rootwait'
```

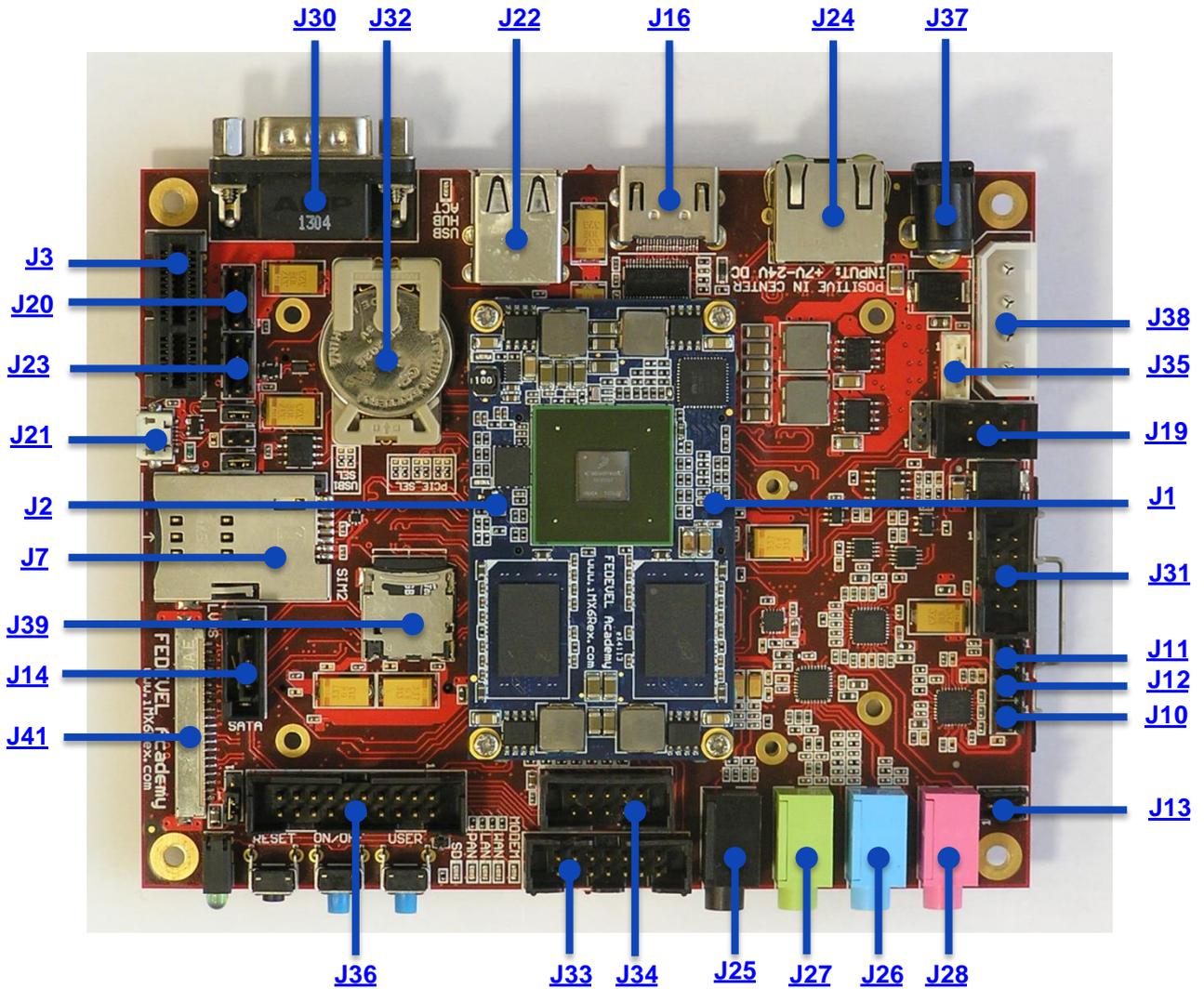
Save the u-boot parameters and restart the board:

```
> saveenv; reset
```

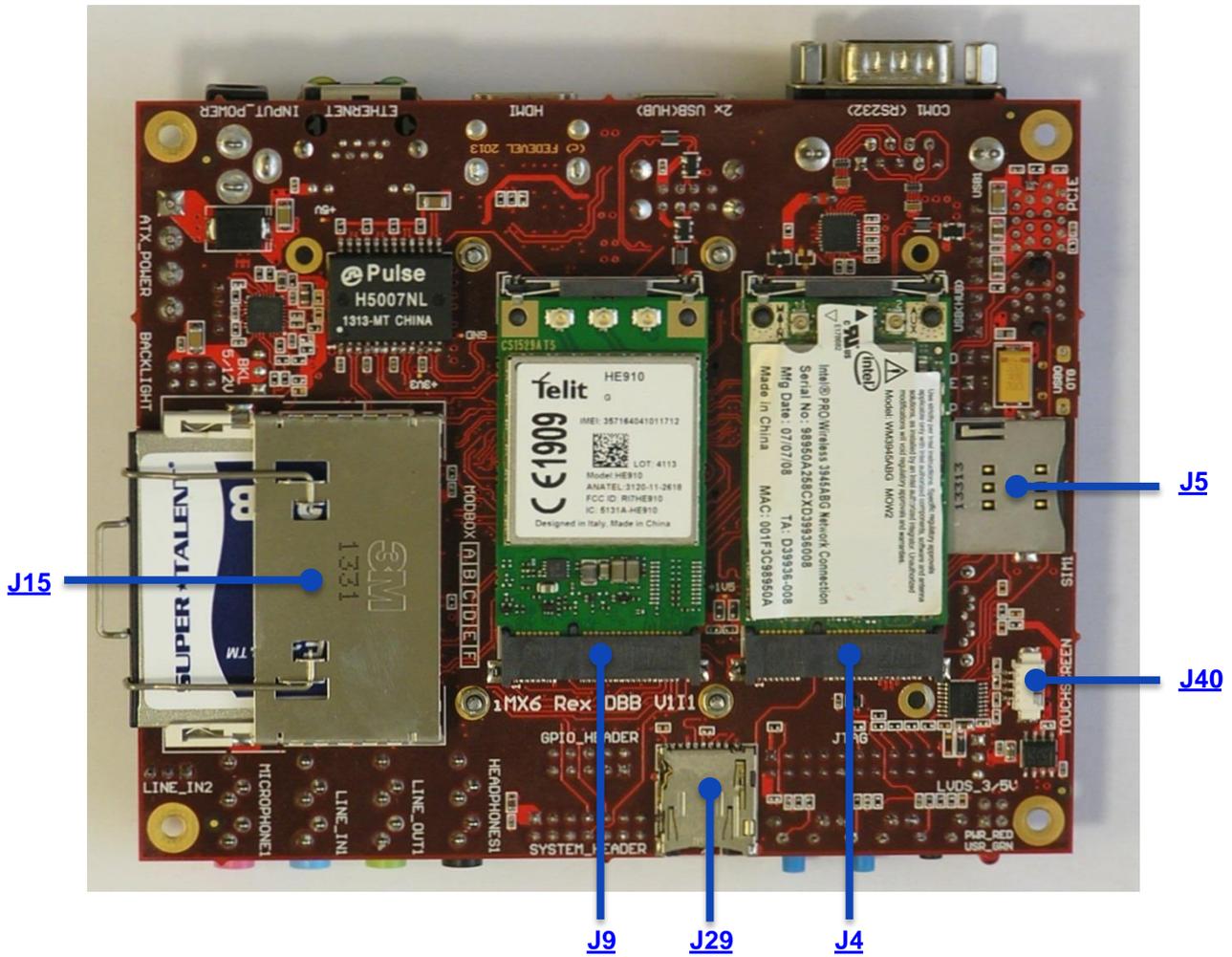
## 9. Tada!

Now, your board should boot up into Linux. In case you have any problems to setup your Development kit, check out our [FORUM & Questions](#) or [contact us](#). Enjoy!

### Connectors - Top



## Connectors - Bottom



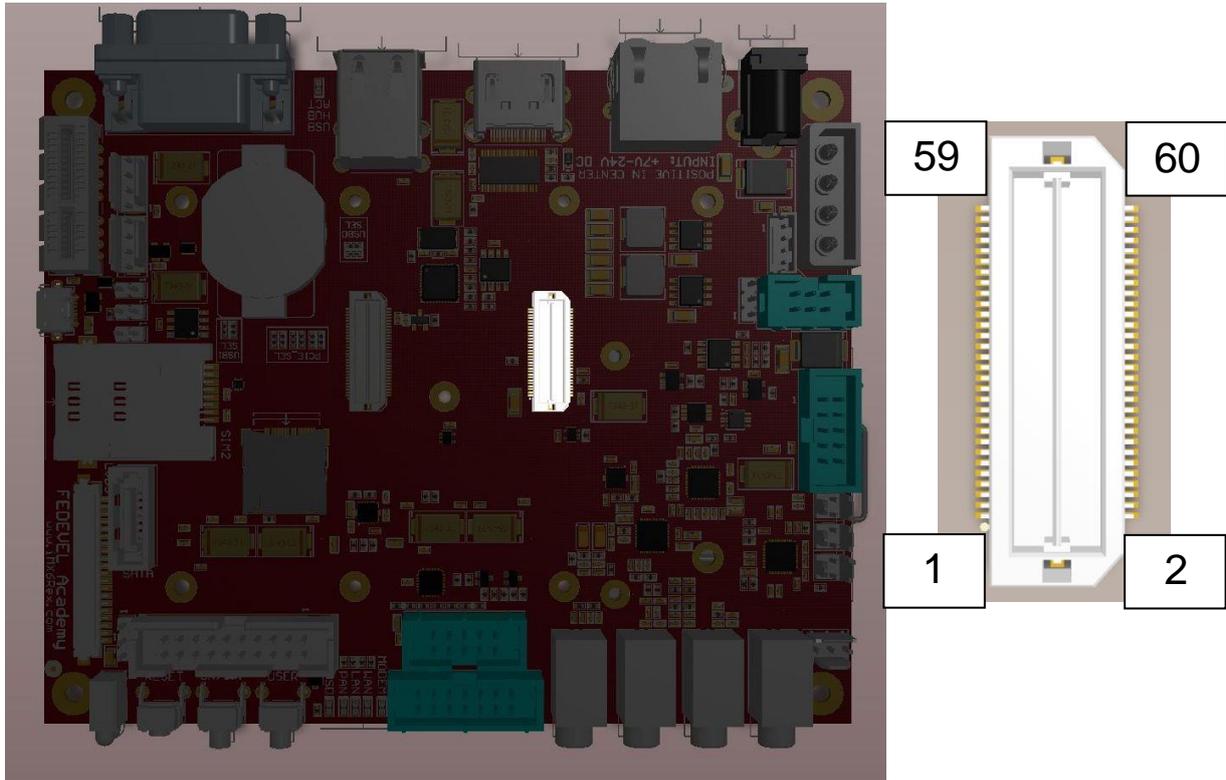
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## J1 – Module Board to Board Connector

**Description:** J1 connects the baseboard with the module. The connector contains all the important signals needed to run the board.

**Connector:** Samtec QTH-030-01-L-D-A

**Mating:** Samtec QSH-030-01-L-D-A



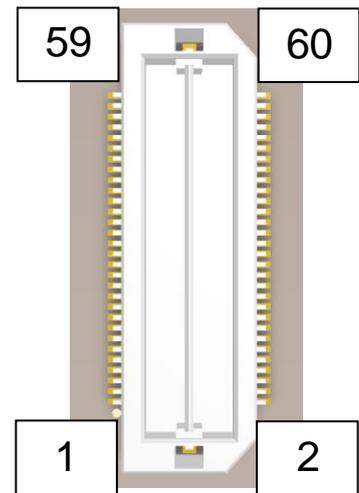
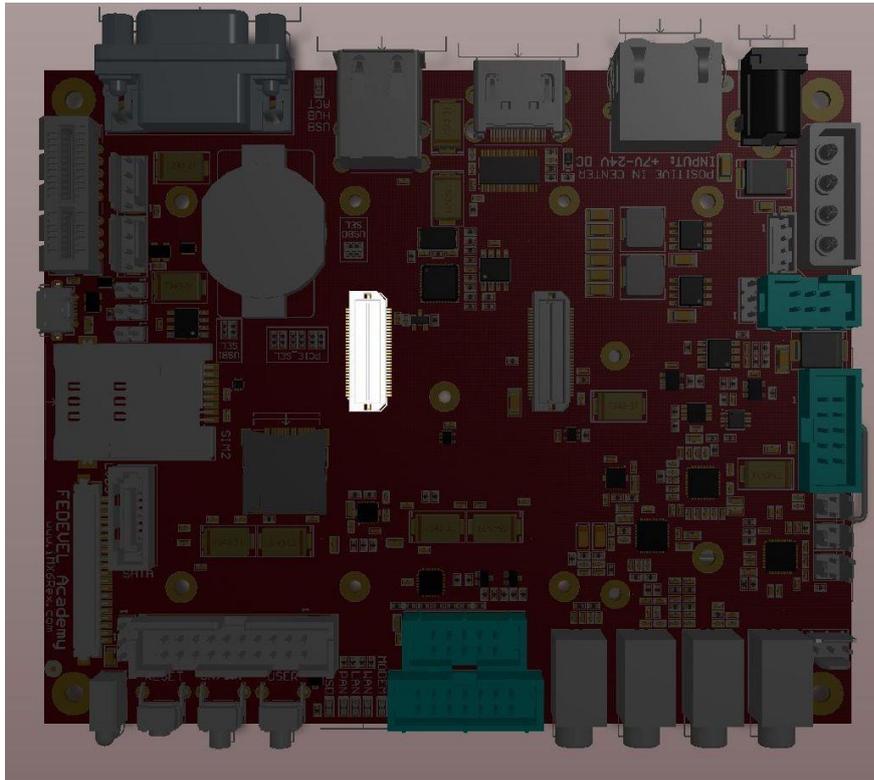
Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
Power for the Module	PO	+Vin	1	2	+Vin	PO	Power for the Module
Power for the Module	PO	+Vin	3	4	+Vin	PO	Power for the Module
Power for the Module	PO	+Vin	5	6	ON_OFF	OD	On / Off signal
Peripheral reset	I	SYS_RSTn	7	8	SYS_POKn	O	Reset for the Module
	O	UART1_DSR	9	10	UART1_RI	O	
	O	UART1_CTS	11	12	UART1_TXD	I	
	I	UART1_RTS	13	14	UART1_RXD	O	
	I	UART1_DTR	15	16	UART1_DCD	O	
	I	CSPI2_CLK	17	18	+5V_USB_VBUS	PO	
I	CSPI2_CS0	19	20	USB0_ID	O	USB0 host/slave mode selection	
O	CSPI2_MISO	21	22	USB0_N	I/O		
I	CSPI2_MOSI	23	24	USB0_P	I/O		
O	SD3_WP	25	26	N.C.			
I	SD3_CLK	27	28	USB_OC	OD		
I/O	SD3_DATA0	29	30	SD3_DATA1	I/O		
I/O	SD3_DATA2	31	32	SD3_DATA3	I/O		
I/O	SD3_CMD	33	34	SD3_CD	O		
INT from touchscreen	O	TSC_INT	35	36	I2C2_SCL	I	I2C for peripherals
INT from peripherals	OD	CPU_INT	37	38	I2C2_SDA	I/O	I2C for peripherals
I	HDMI_D0_N	39	40	HDMI_D2_N	I		
I	HDMI_D0_P	41	42	HDMI_D2_P	I		
O	HDMI_HPD	43	44	HDMI_CEC_IN	I/O		
I	HDMI_CLK_N	45	46	HDMI_D1_N	I		
I	HDMI_CLK_P	47	48	HDMI_D1_P	I		
		N.C.	49	50	BOOT_MODE	O	Open: Normal / Fitted: Boots to USB
I/O	TRD1_N	51	52	TRD3_N	I/O		
I/O	TRD1_P	53	54	TRD3_P	I/O		
I	ENET_LED_RX	55	56	ENET_LED_LINK	I		
I/O	TRD0_N	57	58	TRD2_N	I/O		
I/O	TRD0_P	59	60	TRD2_P	I/O		

## J2 –Module Board to Board Connector (Optional)

**Description:** J2 connects the baseboard with the module. The connector contains signals, which are not required to boot the module up.

**Connector:** Samtec QTH-030-01-L-D-A

**Mating:** Samtec QSH-030-01-L-D-A

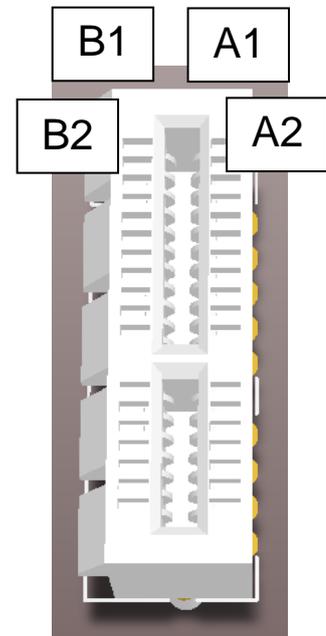
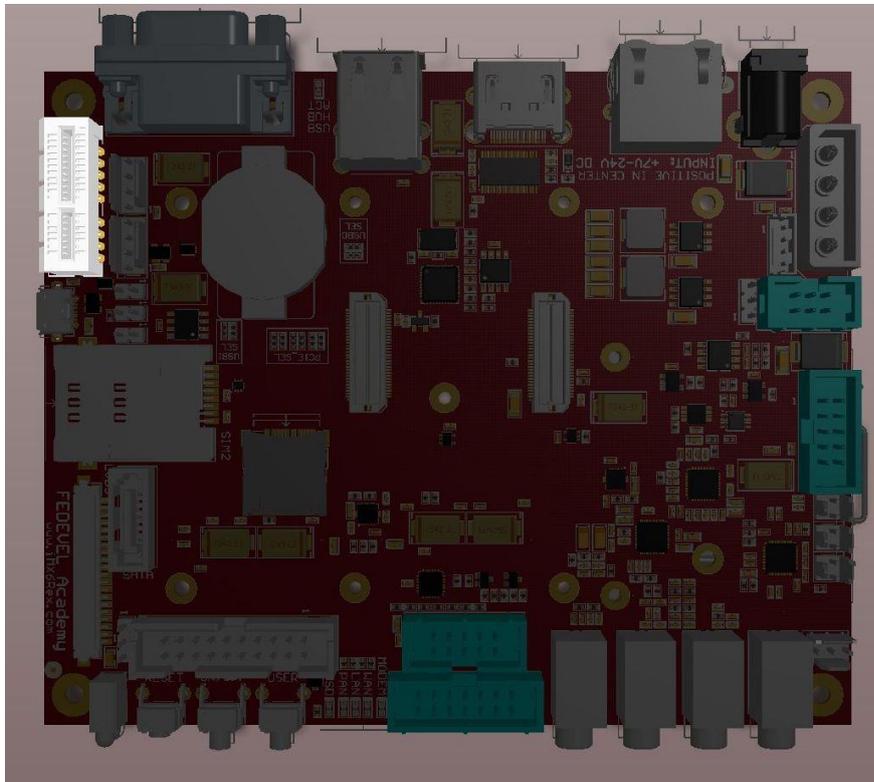


Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
	I	LVDS0_TX2_N	1	2	LVDS0_TX0_N	I	
	I	LVDS0_TX2_P	3	4	LVDS0_TX0_P	I	
	I	LVDS0_PWM	5	6	LVDS0_CABC	I	
	I	LVDS0_TX3_N	7	8	LVDS0_TX1_N	I	
	I	LVDS0_TX3_P	9	10	LVDS0_TX1_P	I	
SD2 Activity LED	I	SD2_ACT	11	12	I2C1_SDA	I/O	I2C for Audio
	I	LVDS0_CLK_N	13	14	I2C1_SCL	I	I2C for Audio
	I	LVDS0_CLK_P	15	16	AUD3_TXC	I	
I2C on GPIO Header	I/O	I2C3_SDA	17	18	AUD3_TXD	I	
I2C on GPIO Header	I	I2C3_SCL	19	20	AUD3_CLK	I	
	I/O	SD2_CMD	21	22	AUD3_RXD	O	
	I/O	SD2_DATA1	23	24	AUD3_TXFS	I	
	I/O	SD2_DATA3	25	26	SD2_DATA0	I/O	
	I/O	SD2_DATA5	27	28	SD2_DATA2	I/O	
	I/O	SD2_DATA7	29	30	SD2_DATA4	I/O	
	O	UART2_CTS	31	32	SD2_DATA6	I/O	
	I	UART2_RTS	33	34	SD2_WP	O	
	O	UART2_RXD	35	36	SD2_CLK	I	
	I	UART2_TXD	37	38	SD2_CD	O	
	OD	PCIE_WAKE	39	40	USB1_N	I/O	
	O	JTAG_nTRST	41	42	USB1_P	I/O	
	O	JTAG_TCK	43	44	USB1_PWR_EN	I	
	I	JTAG_TDO	45	46	CLK1_N	I	Clock for PCIe
	O	JTAG_TDI	47	48	CLK1_P	I	Clock for PCIe
	O	JTAG_TMS	49	50	+3V3_MODULE	PI	+3V3 from the Module
	I	PCIE_TX_N	51	52	PCIE_RX_N	O	
	I	PCIE_TX_P	53	54	PCIE_RX_P	O	
	G	GND	55	56	GND	G	
	I	SATA_TX_N	57	58	SATA_RX_N	O	
	I	SATA_TX_P	59	60	SATA_RX_P	O	

### J3 – PCI Express x1 Slot (Optional)

**Description:** PCI Express can be optionally redirected to the J3 PCIE slot (requires resistor swapping, see the schematic). To supply +12V, the ATX connector must be used ([J38](#))

**Connector:** FCI 10018783-10010TLF



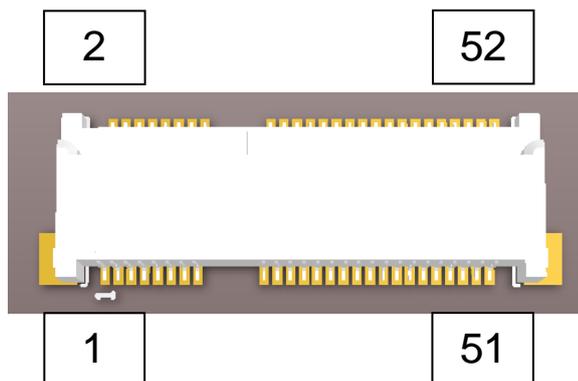
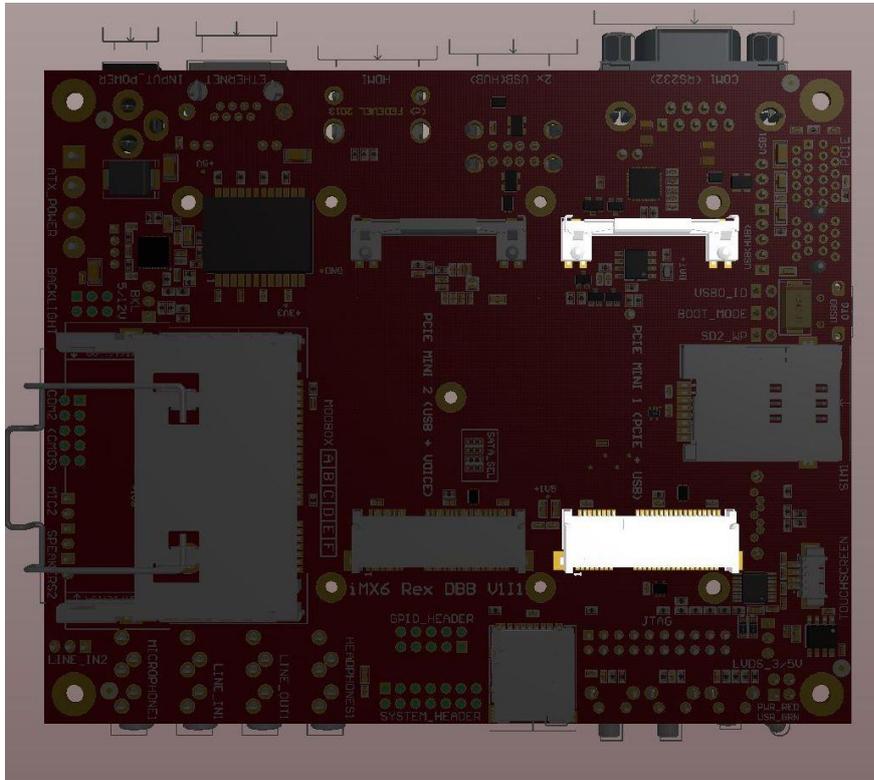
Description	Type	Pin Name	Pin	Pin	Pin Name	Type	Description
Hot-Plug presence detect	O	PRSNT1#	A1	B1	+12V_1	PO	
	PO	+12V_4	A2	B2	+12V_2	PO	
	PO	+12V_5	A3	B3	+12V_3	PO	
	G	GND_6	A4	B4	GND_1	G	
Not connected		JTAG2	A5	B5	SMCLK	O	Connected to I2C2
Not connected		JTAG3	A6	B6	SMDAT	I/O	Connected to I2C2
Not connected		JTAG4	A7	B7	GND_2	G	
Not connected		JTAG5	A8	B8	+3.3V_1	PO	
	PO	+3.3V_2	A9	B9	JTAG1		Not connected
	PO	+3.3V_3	A10	B10	3.3VAUX	PO	Connected to +3V3
Fundamental reset	O	PERST#	A11	B11	WAKE#	OD	PCIe Wake up
Mechanical Key							
	G	GND_7	A12	B12	RSVD		
PCIe Clock Positive	O	REFCLK+	A13	B13	GND_3	G	
PCIe Clock Negative	O	REFCLK-	A14	B14	PET_P0	O	PCIe Transmit Positive
	G	GND_8	A15	B15	PET_N0	O	PCIe Transmit Negative
PCIe Receive Positive	I	PER_P0	A16	B16	GND_4	G	
PCIe Receive Negative	I	PER_N0	A17	B17	PRSNT2#	I	Hot-Plug presence detect
	G	GND_9	A18	B18	GND_5	G	

## J4 – PCI Express Mini Card 1 socket

**Description:** J4 is connected to the PCI Express and USB1 interface. SIM Card ([J5](#)) functionality is also supported.

**Connector:** JAE MM60-52B1-E1-R650

**Card Latch:** JAE MM60-EZH059-B5-R650

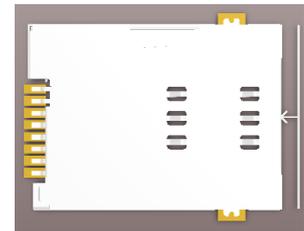
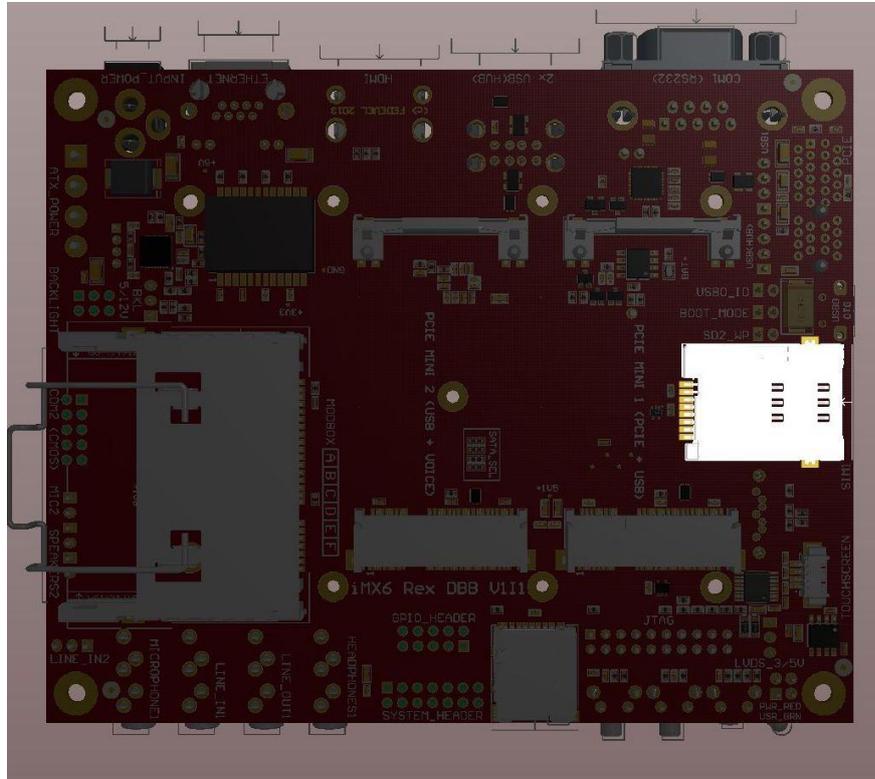


Description	Type	Pin Name	Pin	Pin	Pin Name	Type	Description
PCIe Wake up	OD	WAKE#	1	2	3.3V_1	PO	
		Reserved_1	3	4	GND_7	G	
		Reserved_2	5	6	1.5V_1	PO	
Not connected	G	CLKREQ#	7	8	UIM_PWR	PI	SIM Card Power
		GND_1	9	10	UIM_DATA	I/O	SIM Card Data
PCIe Clock Negative	O	REFCLK-	11	12	UIM_CLK	I	SIM Card Clock
PCIe Clock Positive	O	REFCLK+	13	14	UIM_RESET	I	SIM Card Reset
		GND_2	15	16	UIM_VPP	PI	SIM Card VPP
Not connected		Reserved/ UIM_C8	17	18	GND_8	G	
Not connected	G	Reserved/ UIM_C4	19	20	W_DISABLE#	O	Wireless disable
		GND_3	21	22	PERST#	O	Reset
PCIe Receive Negative	I	PERn0	23	24	+3.3Vaux	PO	Connected to +3V3
PCIe Receive Positive	I	PERp0	25	26	GND_9	G	
		GND_4	27	28	1.5V_2	PO	
		GND_5	29	30	SMB_CLK	O	Connected to I2C2
PCIe Transmit Negative	O	PETn0	31	32	SMB_DATA	I/O	Connected to I2C2
PCIe Transmit Positive	O	PETp0	33	34	GND_10	G	
		GND_6	35	36	USB_D-	I/O	Connected to USB1
Connected to Ground	G	Reserved_3	37	38	USB_D+	I/O	Connected to USB1
Connected to +3.3V	PO	Reserved_4	39	40	GND_11	G	
Connected to +3.3V	PO	Reserved_5	41	42	LED_WWAN#	I	Status indicator D1
Connected to Ground	G	Reserved_6	43	44	LED_WLAN#	I	Status indicator D2
Not connected		Reserved_7	45	46	LED_WPAN#	I	Status indicator D3
Not connected		Reserved_8	47	48	1.5V_3	PO	
Not connected		Reserved_9	49	50	GND_12	G	
Not connected		Reserved_10	51	52	3.3V_2	PO	

## J5 – SIM Card Holder 1

**Description:** J5 is a SIM Card socket connected to the PCI Express Mini Card 1 (J4).

**Socket:** Molex 0475531001

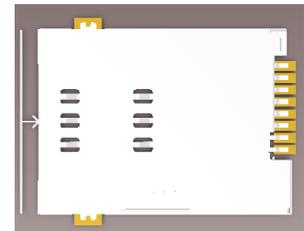
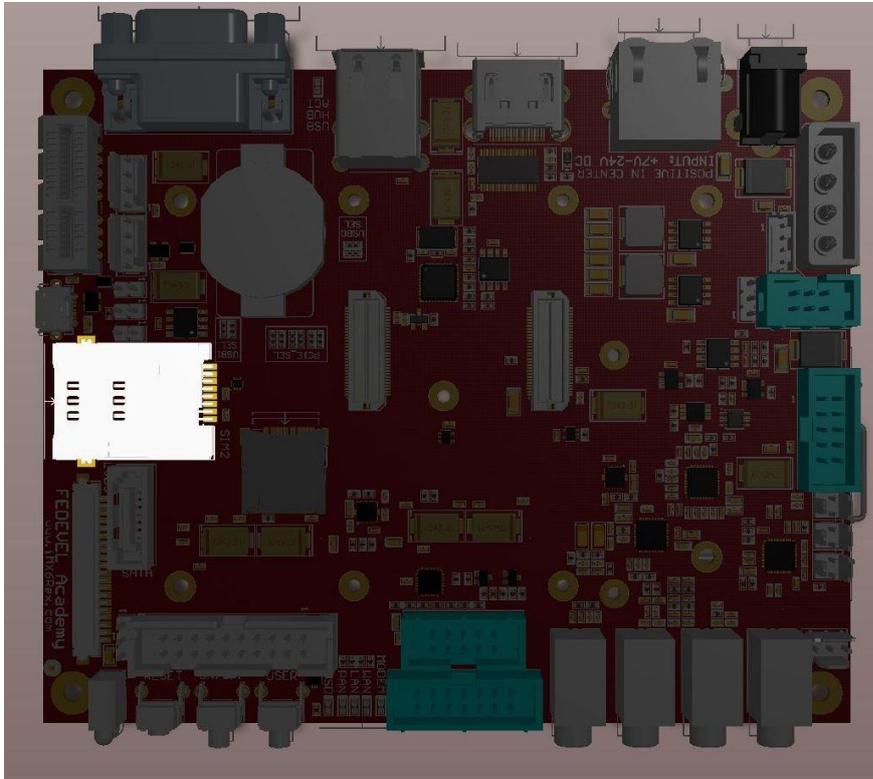


Pin	Pin Name	Type	Description
C1	VCC	PO	SIM Card Power
C2	RESET	O	SIM Card Reset
C3	CLK	O	SIM Card Clock
C5	GND	G	
C6	VPP	PO	SIM Card VPP
C7	I/O	I/O	SIM Card Data
S1	S1		Not connected
S2	S2		Not connected

## J7 – SIM Card Holder 2

**Description:** J7 is a SIM Card socket connected to the PCI Express Mini Card 2 ([J9](#)).

**Socket:** Molex 0475531001



Pin	Pin Name	Type	Description
<b>C1</b>	VCC	PO	SIM Card Power
<b>C2</b>	RESET	O	SIM Card Reset
<b>C3</b>	CLK	O	SIM Card Clock
<b>C5</b>	GND	G	
<b>C6</b>	VPP	PO	SIM Card VPP
<b>C7</b>	I/O	I/O	SIM Card Data
<b>S1</b>	S1		Not connected
<b>S2</b>	S2		Not connected



Description	Type	Pin Name	Pin	Pin	Pin Name	Type	Description
Connected to CPU_INT	OD	WAKE#	1	2	3.3V_1	PO	
		Reserved_1	3	4	GND_7	G	
		Reserved_2	5	6	1.5V_1	PO	
Not connected		CLKREQ#	7	8	UIM_PWR	PI	SIM Card Power
	G	GND_1	9	10	UIM_DATA	I/O	SIM Card Data
Not connected		REFCLK-	11	12	UIM_CLK	I	SIM Card Clock
Not connected		REFCLK+	13	14	UIM_RESET	I	SIM Card Reset
	G	GND_2	15	16	UIM_VPP	PI	SIM Card VPP
Not connected		Reserved/ UIM_C8	17	18	GND_8	G	
Not connected		Reserved/ UIM_C4	19	20	W_DISABLE#	O	Wireless disable
	G	GND_3	21	22	PERST#	O	Reset
Not connected		PERn0	23	24	+3.3Vaux	PO	Connected to +3V3
Not connected		PERp0	25	26	GND_9	G	
	G	GND_4	27	28	1.5V_2	PO	
	G	GND_5	29	30	SMB_CLK	O	Connected to I2C2
Not connected		PETn0	31	32	SMB_DATA	I/O	Connected to I2C2
Not connected		PETp0	33	34	GND_10	G	
	G	GND_6	35	36	USB_D-	I/O	Connected to USB0 Downstream 4
Connected to Ground	G	Reserved_3	37	38	USB_D+	I/O	Connected to USB0 Downstream 4
Connected to +3.3V	PO	Reserved_4	39	40	GND_11	G	
Connected to +3.3V	PO	Reserved_5	41	42	LED_WWAN#	I	
Connected to Ground	G	Reserved_6	43	44	LED_WLAN#		Not connected
Audio2 Clock	I/O	Reserved_7	45	46	LED_WPAN#		Not connected
Audio2 RX	O	Reserved_8	47	48	1.5V_3	PO	
Audio2 TX	I	Reserved_9	49	50	GND_12	G	
Audio2 Sync	I/O	Reserved_10	51	52	3.3V_2	PO	

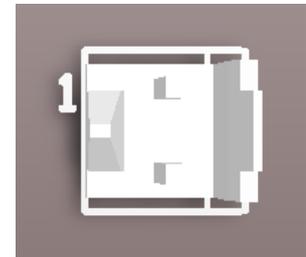
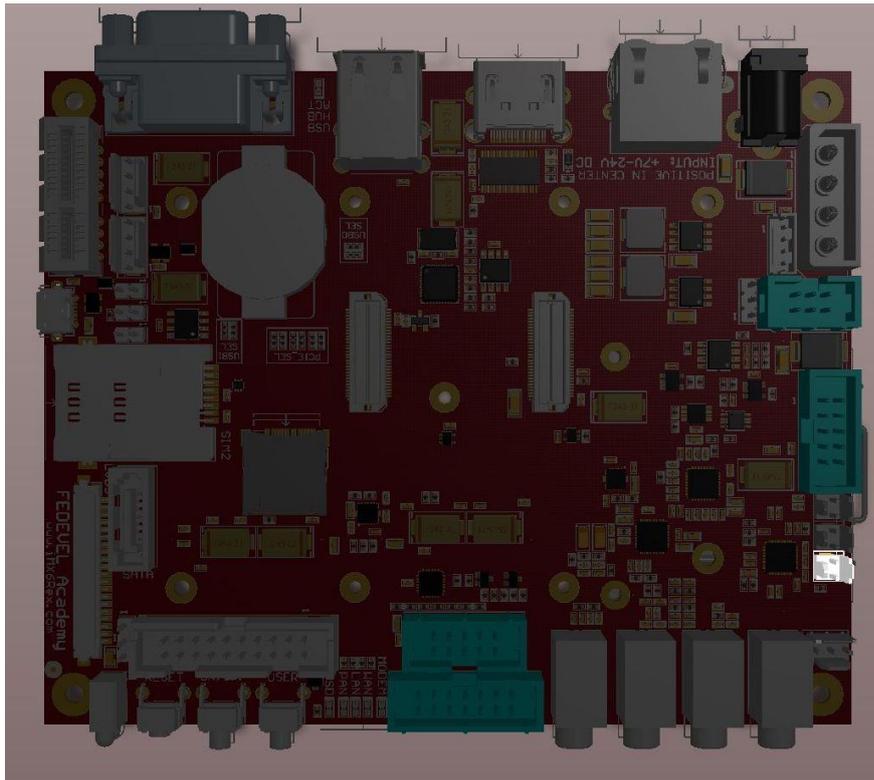
## J10 – Speaker 2 Left Header

**Description:** J10 is connected to the Left Channel Speakers Output of the Modem Audio Interface (Audio2). The speaker output mode can be selected between: differential (default build option) or single-ended. When differential mode is used, this speaker output signal is amplified.

**Connector:** FCI 76384-302LF

**Mating housing:** FCI 65240-002LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent



### Differential mode:

Pin	Signal Name	Type	Description
1	MODEM_LOUT+	O	Speakers 2 Left Channel Positive
2	MODEM_LOUT-	O	Speakers 2 Left Channel Negative

### Single-ended mode:

Pin	Signal Name	Type	Description
1	MODEM_LOUT+	O	Speakers 2 Left Channel
2	MODEM_LOUT-	G	Signal ground

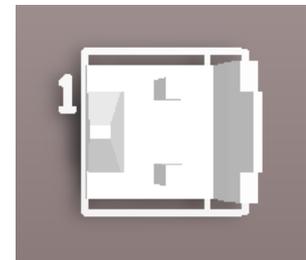
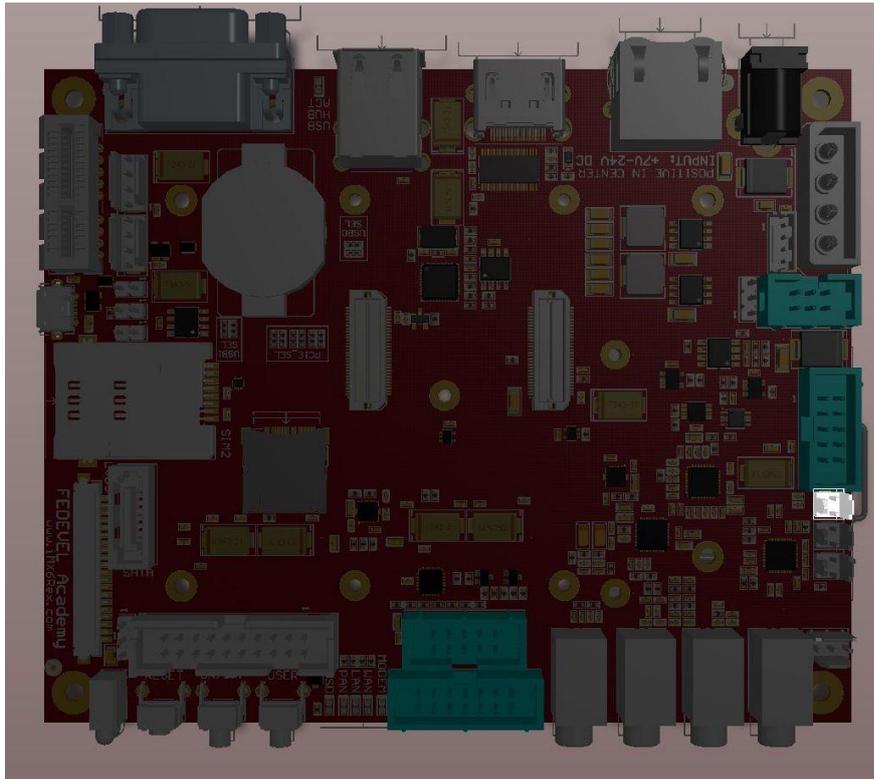
## J11 – Microphone 2 Header

**Description:** An external microphone can be connected to the modem Audio 2 via J11. The microphone input supplies bias voltage.

**Connector:** FCI 76384-302LF

**Mating housing:** FCI 65240-002LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent



Pin	Signal Name	Type	Description
1	AUD2_FIL_MIC_IN	I	Microphone 2 Input
2	GND	G	Signal ground

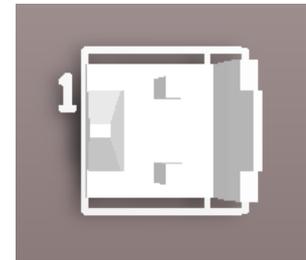
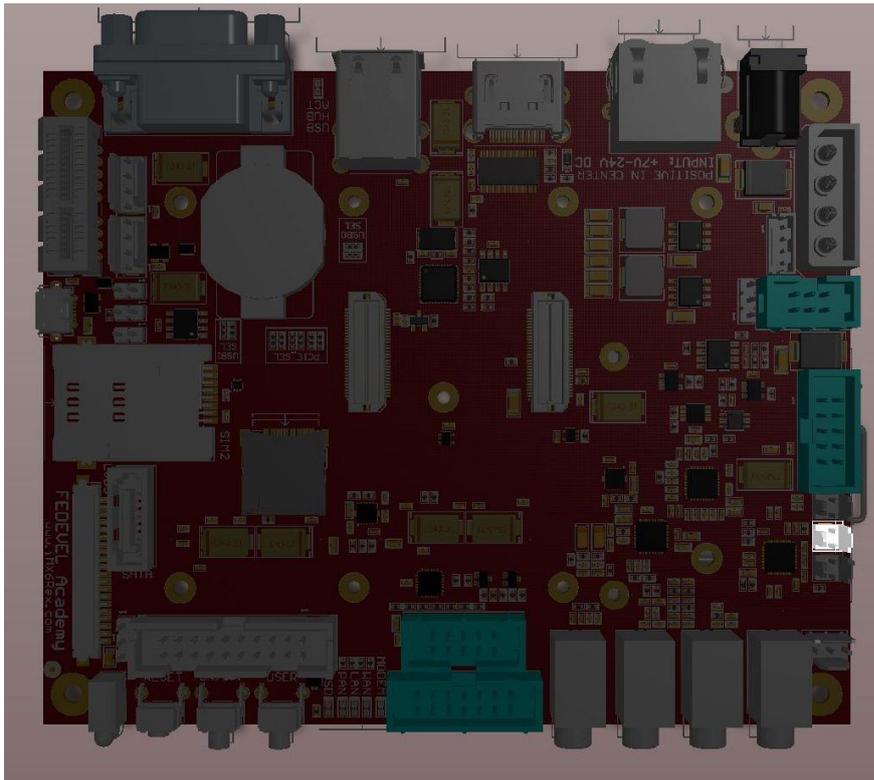
## J12 – Speaker 2 Right Header

**Description:** J12 is connected to the Right Channel Speakers Output of the Modem Audio Interface (Audio2). The speaker output mode can be selected between: differential (default build option) or single-ended. When differential mode is used, this speaker output signal is amplified.

**Connector:** FCI 76384-302LF

**Mating housing:** FCI 65240-002LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent



### Differential mode:

Pin	Signal Name	Type	Description
1	MODEM_ROUT+	O	Speakers 2 Right Channel Positive
2	MODEM_ROUT-	O	Speakers 2 Right Channel Negative

### Single-ended mode:

Pin	Signal Name	Type	Description
1	MODEM_ROUT+	O	Speakers 2 Right Channel
2	MODEM_ROUT-	G	Signal ground

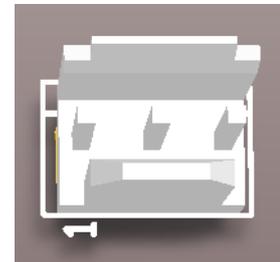
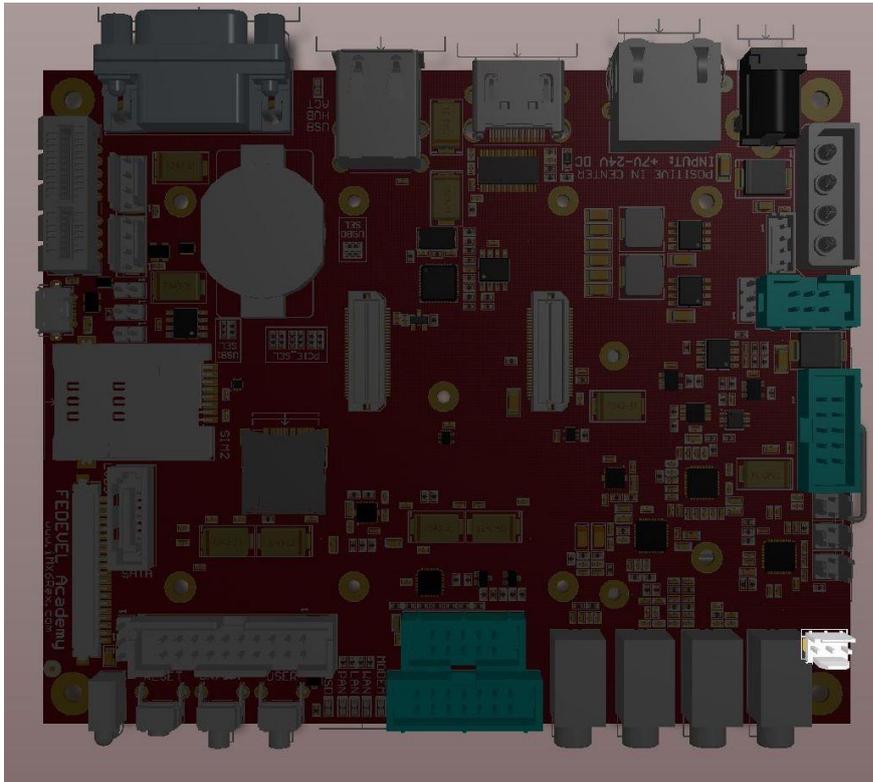
## J13 – Line Input 2 Header

**Description:** J13 is connected to the Modem Audio Interface (Audio2) Line Input.

**Connector:** FCI 76384-303LF

**Mating housing:** FCI 65240-003LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent

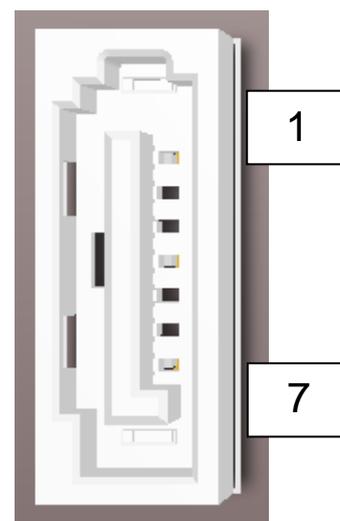
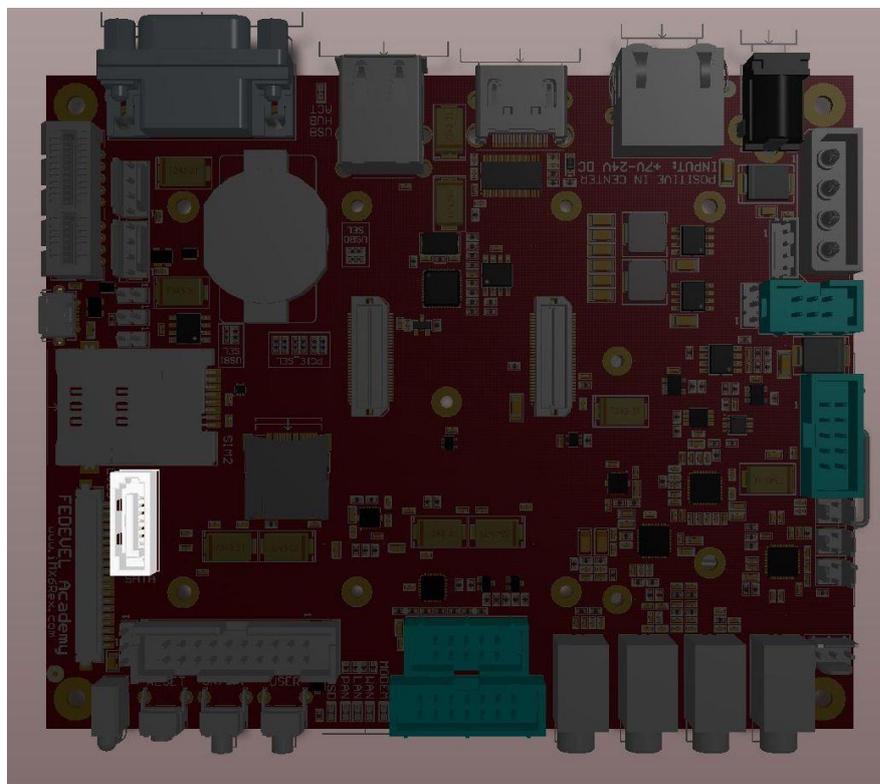


Pin	Signal Name	Type	Description
1	LINE_IN_C_R	I	Right Line Input 2
2	GND	G	Signal ground
3	LINE_IN_C_L	I	Left Line Input 2

## J14 – SATA Connector (Optional)

**Description:** J14 can be optionally connected to the SATA Interface (see schematic, resistor swap is required).

**Connector:** Molex 0471554001



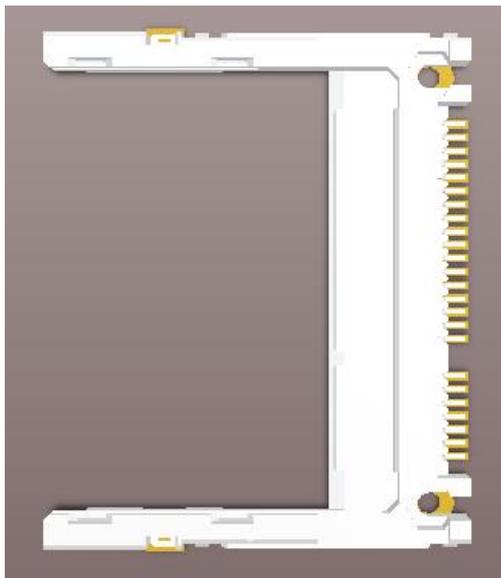
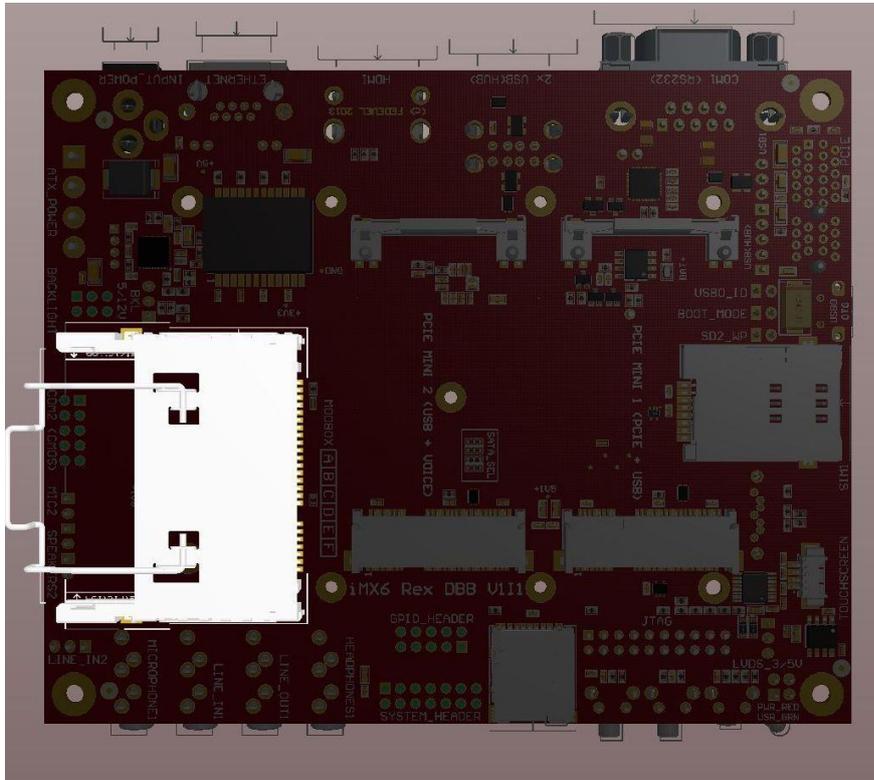
Pin	Pin Name	Type	Description
1	GND1	G	
2	TX+	O	SATA Transmit Positive Signal
3	TX-	O	SATA Transmit Negative Signal
4	GND2	G	
5	RX-	I	SATA Receive Negative Signal
6	RX+	I	SATA Receive Positive Signal
7	GND3	G	

## J15 – CFAST Socket

**Description:** J15 provides support for the removable SATA SSD devices. For rugged environment there is an option to use a locking mechanism.

**Connector:** 3M N7G24-A0B2RB-10-0HT

**Locking mechanism:** 3M 7E50-C016-00 (Optional)

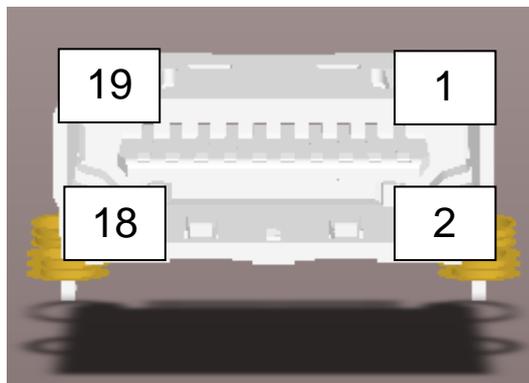
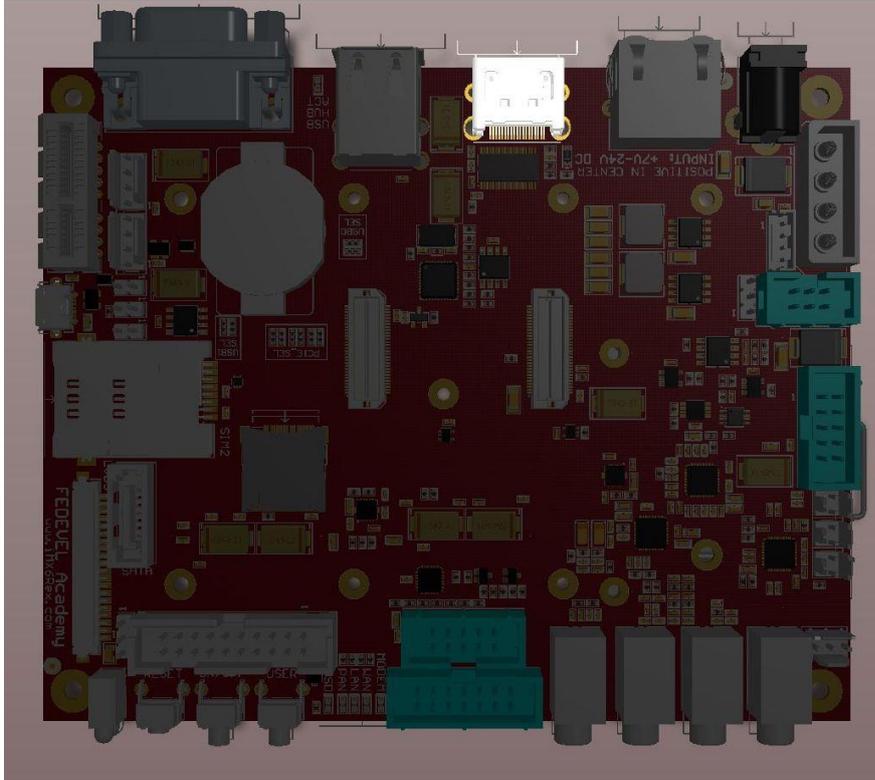


Pin	Pin Name	Type	Description
<b>S1</b>	SGND	G	
<b>S2</b>	A+ (Host TX+)	O	SATA Transmit Positive Signal
<b>S3</b>	A- (Host TX-)	O	SATA Transmit Negative Signal
<b>S4</b>	SGND	G	
<b>S5</b>	B- (Host RX-)	I	SATA Receive Negative Signal
<b>S6</b>	B+ (Host RX+)	I	SATA Receive Positive Signal
<b>S7</b>	SGND	G	
<b>PC1</b>	CDI	I/O	Card detection / Sleep mode control
<b>PC2</b>	GND	G	
<b>PC3</b>	TBD		Not connected
<b>PC4</b>	TBD		Not connected
<b>PC5</b>	TBD		Not connected
<b>PC6</b>	TBD		Not connected
<b>PC7</b>	GND	G	
<b>PC8</b>	LED1		Not connected
<b>PC9</b>	LED2		Not connected
<b>PC10</b>	IO1		Not connected
<b>PC11</b>	IO2		Not connected
<b>PC12</b>	IO3		Not connected
<b>PC13</b>	3.3V	PO	+3.3V supply for the device
<b>PC14</b>	3.3V	PO	+3.3V supply for the device
<b>PC15</b>	PGND	G	
<b>PC16</b>	PGND	G	
<b>PC17</b>	CDO	O	Card detection

## J16 – HDMI Connector

**Description:** J16 is connected to the HDMI interface.

**Connector:** Molex 47151-0001



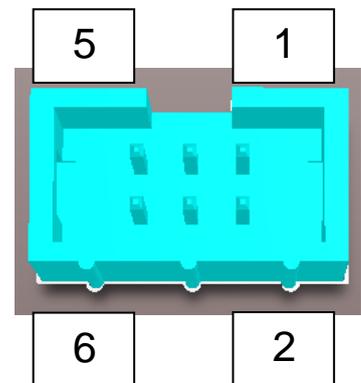
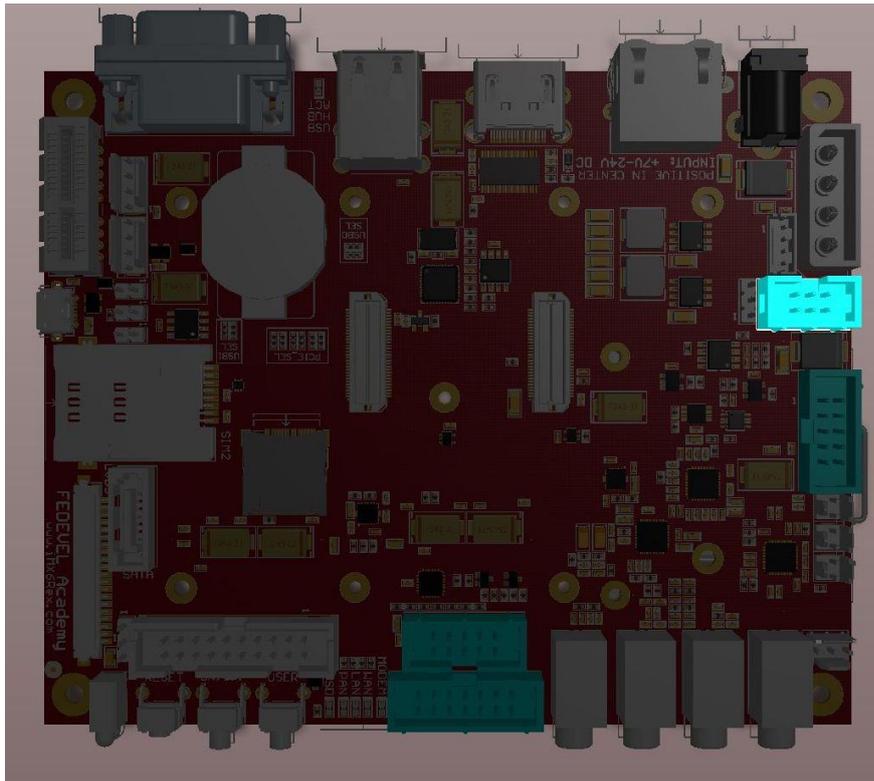
Pin	Pin Name	Type	Description
1	D2+	O	TMDS Data2+
2	D2 SHIELD	G	TMDS Data2 Shield
3	D2-	O	TMDS Data2-
4	D1+	O	TMDS Data1+
5	D1 SHIELD	G	TMDS Data1 Shield
6	D1-	O	TMDS Data1-
7	D0+	O	TMDS Data0+
8	D0 SHIELD	G	TMDS Data0 Shield
9	D0-	O	TMDS Data0-
10	CK+	O	TMDS Clock+
11	CK SHIELD	G	TMDS Clock Shield
12	CK-	O	TMDS Clock-
13	CE REMOTE	I/O	Consumer Electronics Control
14	NC.14		Not connected
15	DDC CLK	O	Connected to I2C2
16	DDC DATA	I/O	Connected to I2C2
17	GND	G	
18	+5V	PO	+3.3V Supply for the device
19	HP DET	I	Hot Plug detect

## J19 – Backlight Header

**Description:** J19 provides a backlight support for the LVDS display ([J41](#)). This connector contains also a brightness regulation and the Content-Adaptive Backlight Control (CABC). Supply voltage for a backlight can be selected by jumper J18 (between +5V or +12V, for +12V the ATX connector must be used).

**Connector:** 3M 30306-6002HB

**Mating housing:** FCI 71600-006LF or equivalent



Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
Supply for the backlight +5V / +12V	PO	+BKLT_VCC	1	2	GND	G	
Backlight enable	O	P_ENABKL_5V	3	4	BKLT_ADJ	O	Brightness regulation
LVDS CABC control	O	BUF_LVDS0_CABC	5	6	N.C.		

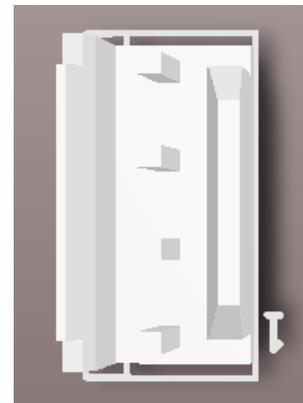
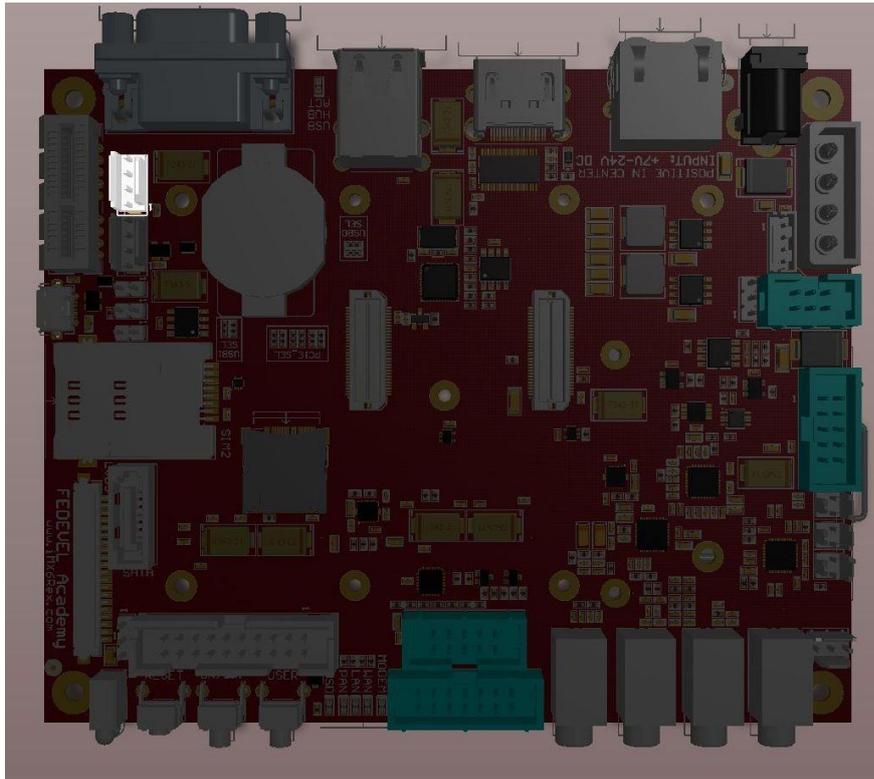
## J20 – CPU-USB1 Header (Optional)

**Description:** J20 is a header for the CPU-USB1 Interface. To use this header, resistor swap is required. See the schematic.

**Connector:** FCI 76384-304LF

**Mating housing:** FCI 65240-004LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent

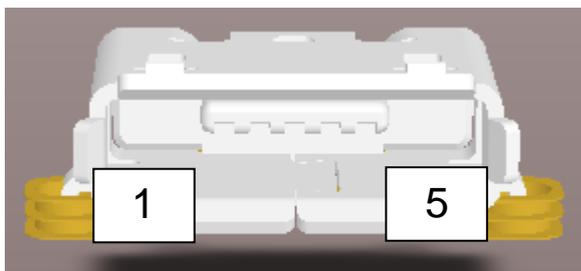
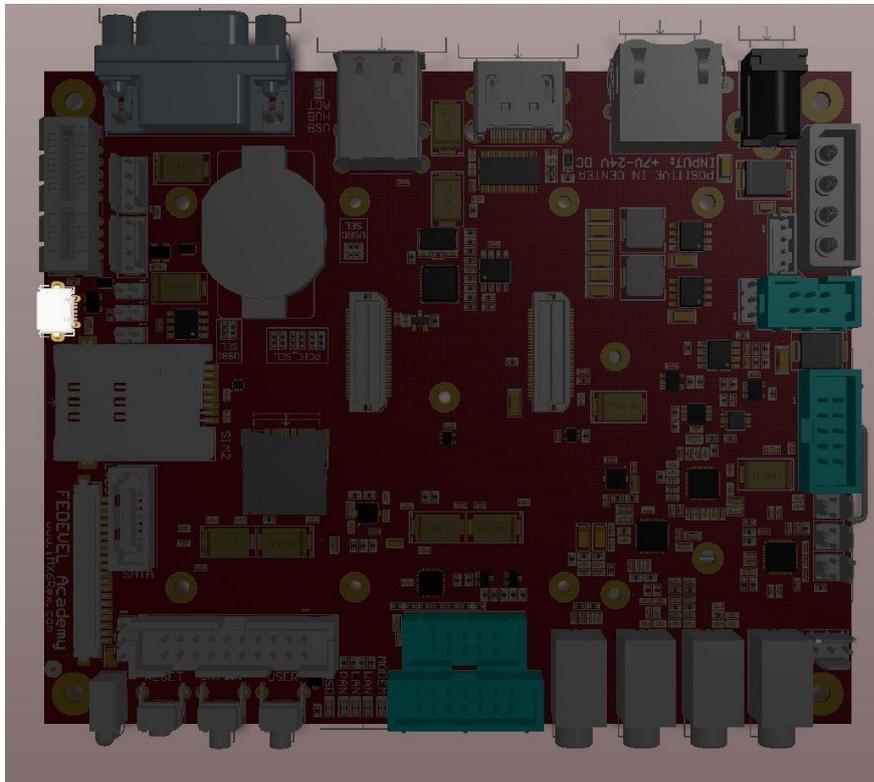


Pin	Signal Name	Type	Description
1	+5V_USB1_VBUS	PO	+5V supply for the device
2	USB1_CON_N	I/O	CPU-USB1 Negative signal
3	USB1_CON_P	I/O	CPU-USB1 Positive signal
4	GND	G	

## J21 – CPU-USB0 Micro AB (Optional)

**Description:** J21 is connected to the CPU-USB0 Interface. ID selection (defines USB0 as a host or as a slave) can be chosen by the jumper JP1. Connector is intended to use as a slave for the debugging purposes. To use this connector, resistor swap is required. See the schematic.

**Connector:** Molex 0475890001

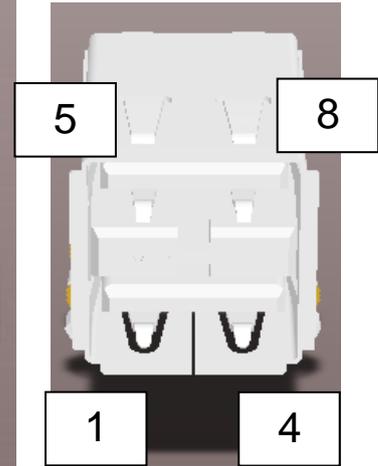
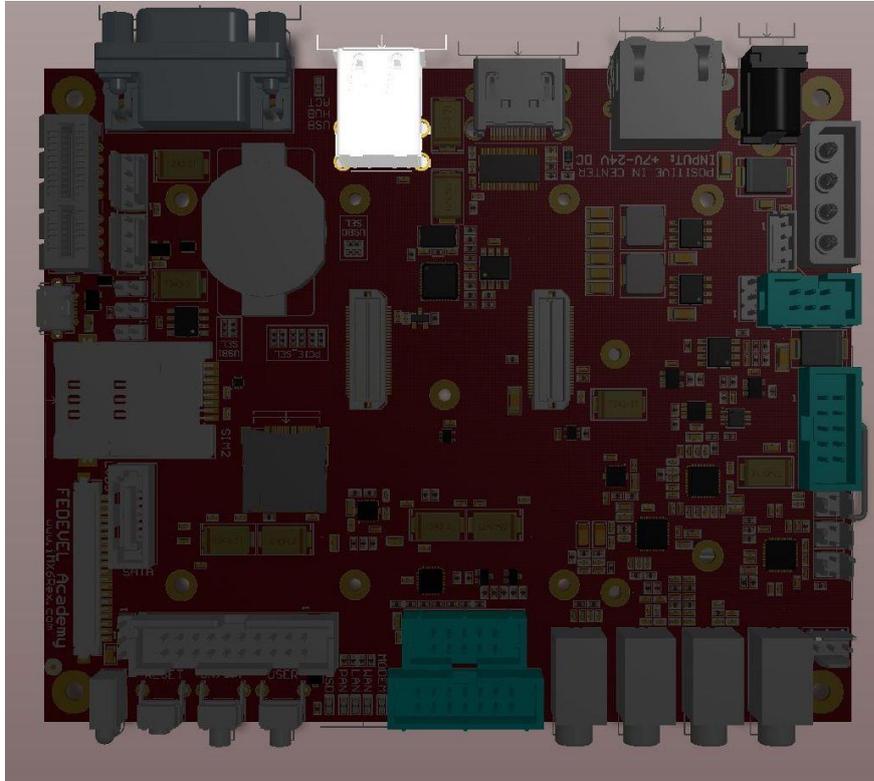


Pin	Signal Name	Type	Description
1	+5V_USB_OTG	PO	Not connected
2	USB1_CON_N	I/O	USB0 Negative signal
3	USB1_CON_P	I/O	USB0 Positive signal
4	USB0_ID	I/O	USB0 Host Selection
5	GND	G	

## J22 – USB Stacked A Connector

**Description:** J22 is connected to the USB Hub located on the baseboard. This on board USB hub connects to the CPU-USB0.

**Connector:** TE 5787617-1



Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
+5V supply for the device	PO	+5V_USBDN1_VBUS	1	5	+5V_USBDN2_VBUS	PO	+5V supply for the device
USB0 Downstream 1 Negative signal	I/O	USBDN1_CON_N	2	6	USBDN2_CON_N	I/O	USB0 Downstream 2 Negative signal
USB0 Downstream 1 Positive signal	I/O	USBDN1_CON_P	3	7	USBDN2_CON_P	I/O	USB0 Downstream 2 Positive signal
	G	GND	4	8	GND	G	

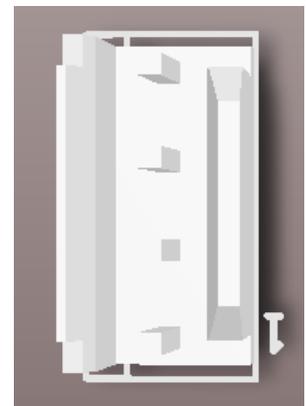
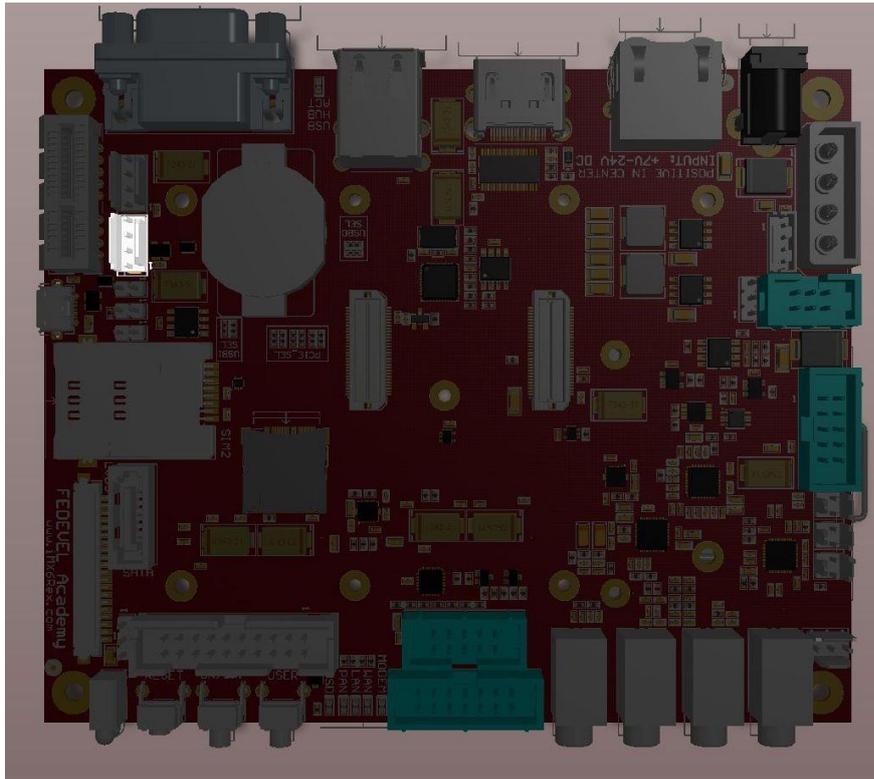
## J23 – USB0 Header

**Description:** J23 is connected to the USB Hub located on the baseboard. This on board USB hub connects to the CPU-USB0.

**Connector:** FCI 76384-304LF

**Mating housing:** FCI 65240-004LF or equivalent

**Mating crimps:** FCI 76347-401LF or equivalent

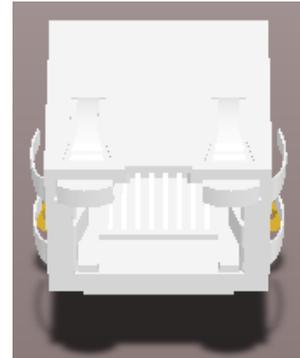
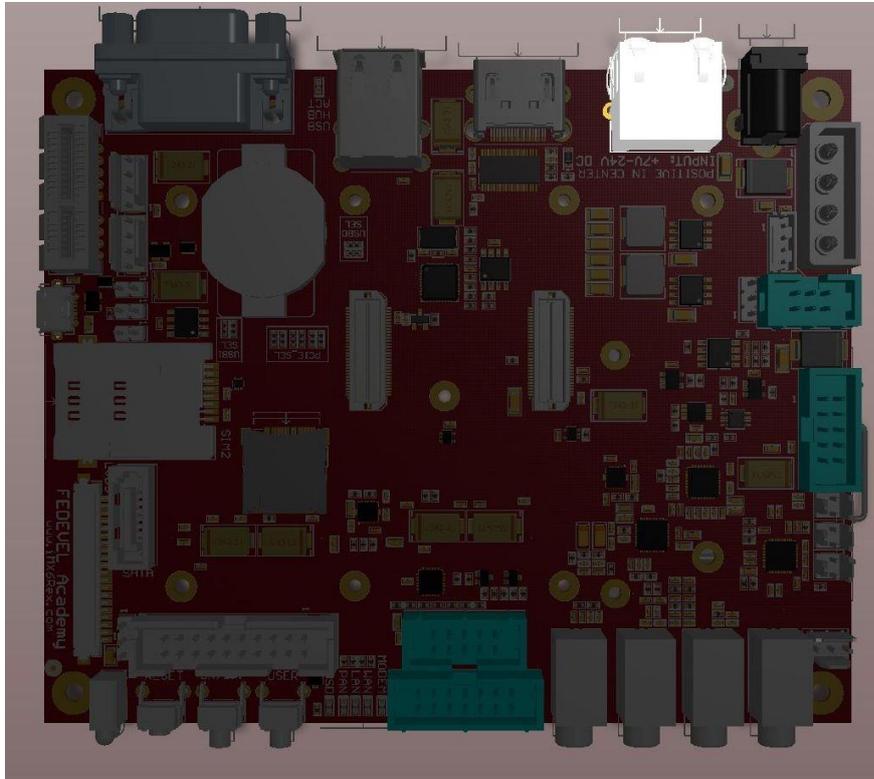


Pin	Signal Name	Type	Description
1	+5V_USBDN3_VBUS	PO	+5V supply for the device
2	USBDN3_CON_N	I/O	USB0 Hub Downstream 3 Negative signal
3	USBDN3_CON_P	I/O	USB0 Hub Downstream 3 Positive signal
4	GND	G	

## J24 – Ethernet Connector

**Description:** J24 is 1Gb Ethernet interface.

**Connector:** Tyco 2-406549-1



Pin	Pin Name	Type	Description
1	BI_DA+	I/O	TRD0 Positive signal
2	BI_DA-	I/O	TRD0 Negative signal
3	BI_DB+	I/O	TRD1 Positive signal
4	BI_DC+	I/O	TRD2 Positive signal
5	BI_DC-	I/O	TRD2 Negative signal
6	BI_DB-	I/O	TRD1 Negative signal
7	BI_DD+	I/O	TRD3 Positive signal
8	BI_DD-	I/O	TRD3 Negative signal

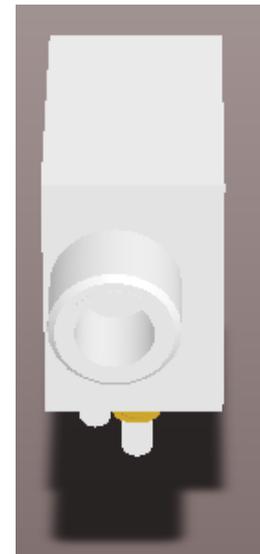
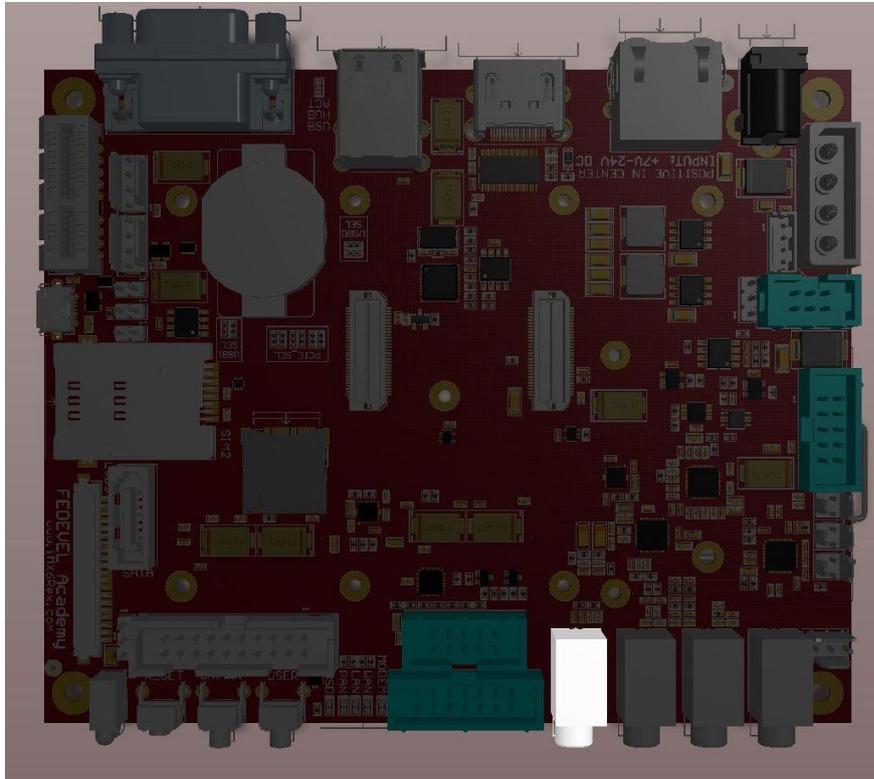
**LED Function:**

<b>Link / Activity</b>	<b>State of yellow LED</b>	<b>State of green LED</b>
Link off	OFF	OFF
1000 Link / No activity	ON	OFF
1000 Link / Activity	Blinking	OFF
100 Link / No Activity	OFF	ON
100 Link / Activity	OFF	Blinking
10 Link / No Activity	ON	ON
10 Link / Activity	Blinking	Blinking

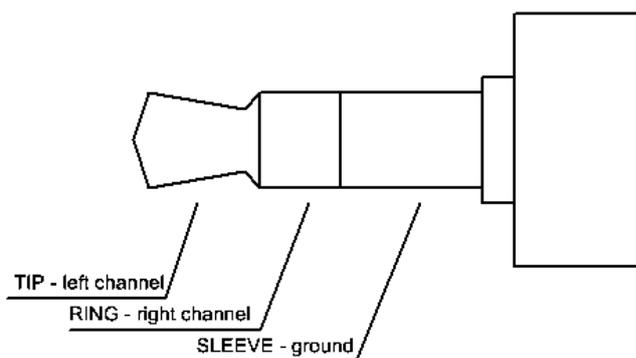
## J25 – Headphones 1 Jack

**Description:** J25 is connected to the Audio 1 Codec Headphones. Signal can be amplified if required.

**Connector:** CUI SJ1-3535NG



**3.5mm jack reference:**

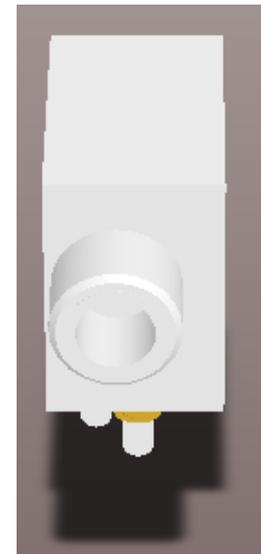
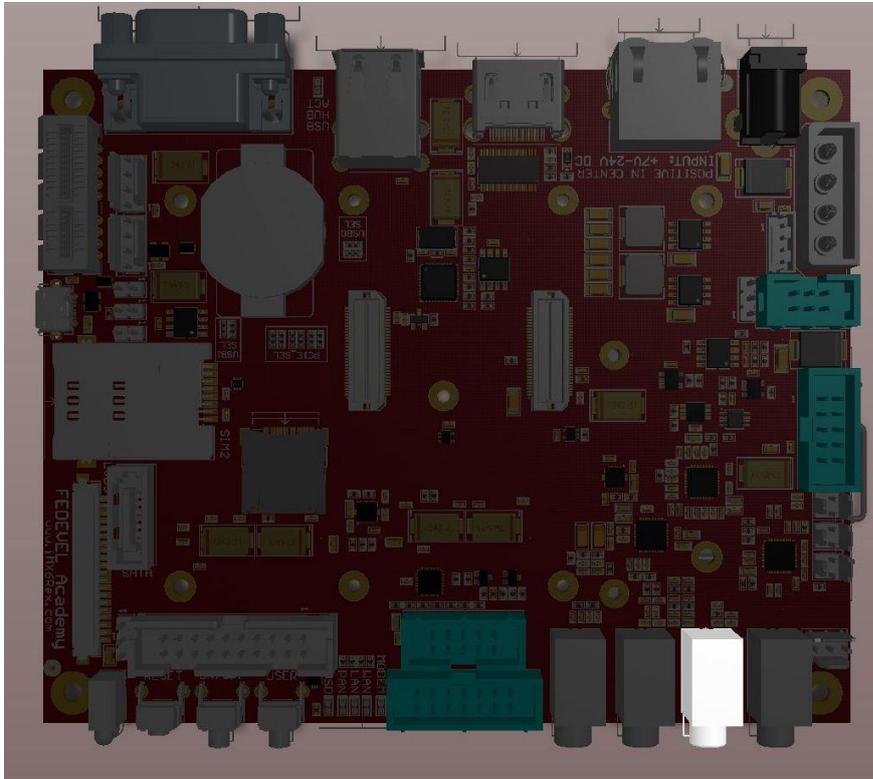


Pin	Pin Name	Signal Name	Type	Description
1	sleeve	GND	G	
2	tip	FIL_HP_OUTL	O	Headphones 1 Left Channel
3	ring	FIL_HP_OUTR	O	Headphones 1 Right Channel

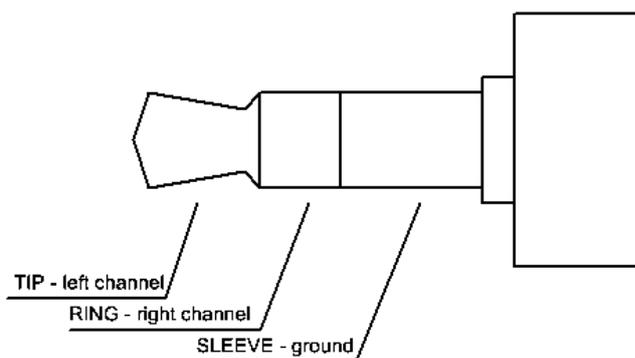
## J26 – Line In 1 Jack

**Description:** J26 is connected to the Audio 1 Codec Line Input.

**Connector:** CUI SJ1-3535NG-BE



**3.5mm jack reference:**

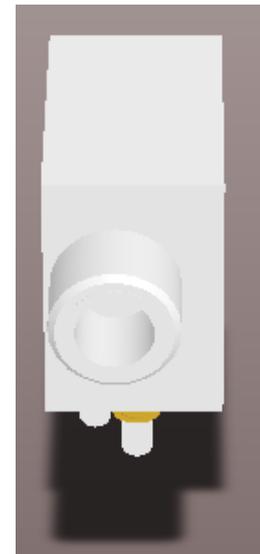
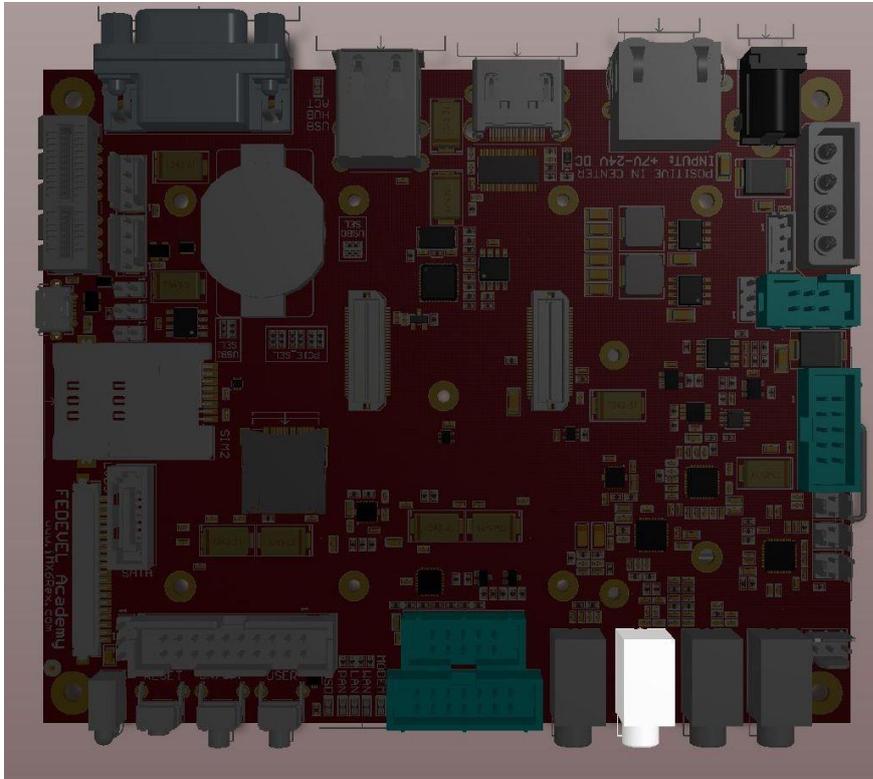


Pin	Pin Name	Signal Name	Type	Description
1	sleeve	GND	G	
2	tip	FIL_LINEIN_L	I	Line Input 1 Left Channel
3	ring	FIL_LINEIN_R	I	Line Input 1 Right Channel

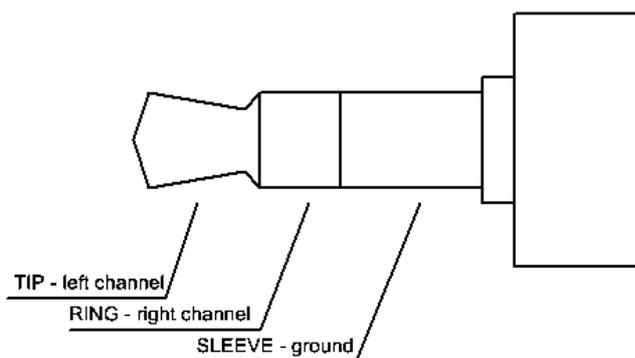
## J27 – Line Out 1 Jack

**Description:** J27 is connected to the Audio 1 Codec Line Output.

**Connector:** CUI SJ1-3535NG-GR



**3.5mm jack reference:**

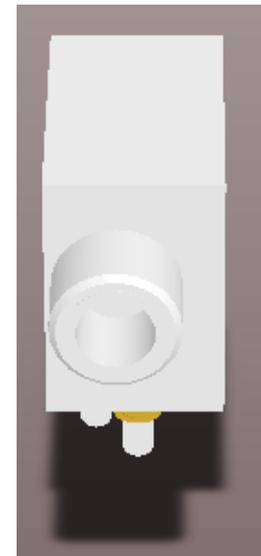
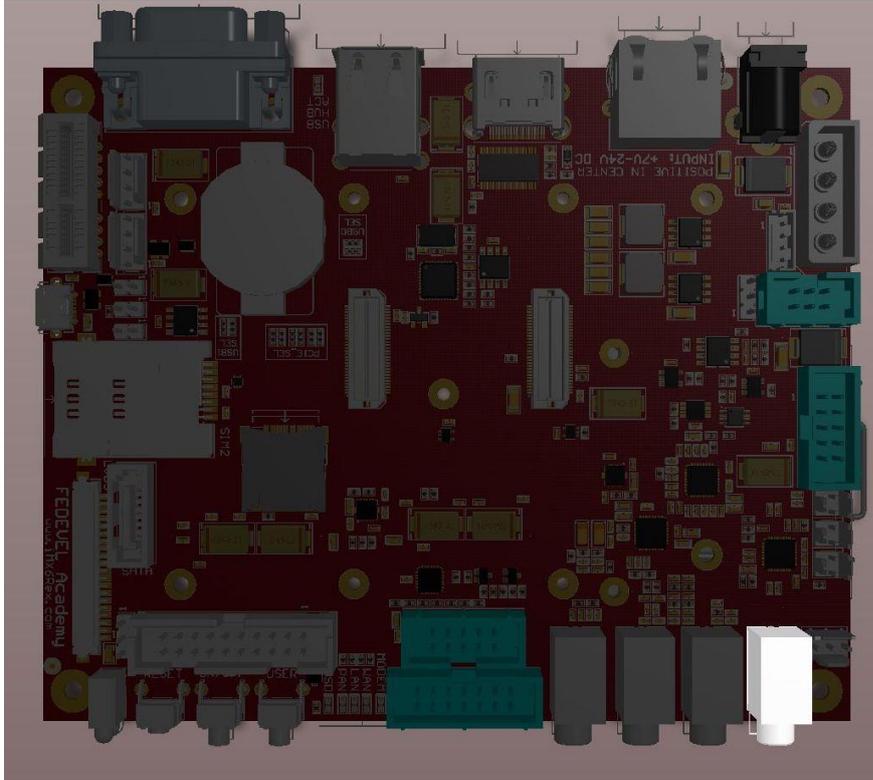


Pin	Pin Name	Signal Name	Type	Description
1	sleeve	GND	G	
2	tip	FIL_AUD_OUT_L	O	Line Output 1 Left Channel
3	ring	FIL_AUD_OUT_R	O	Line Output 1 Right Channel

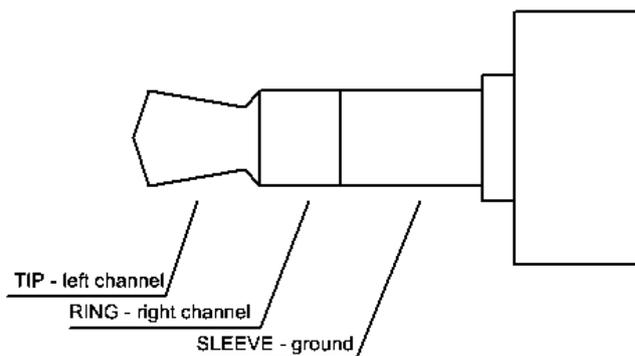
## J28 – Microphone 1 Jack

**Description:** J28 is connected to the Audio 1 Microphone input.

**Connector:** CUI SJ1-3535NG-PI



**3.5mm jack reference:**

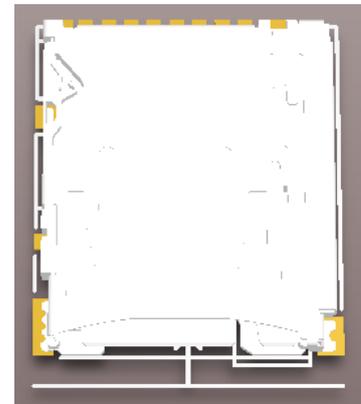
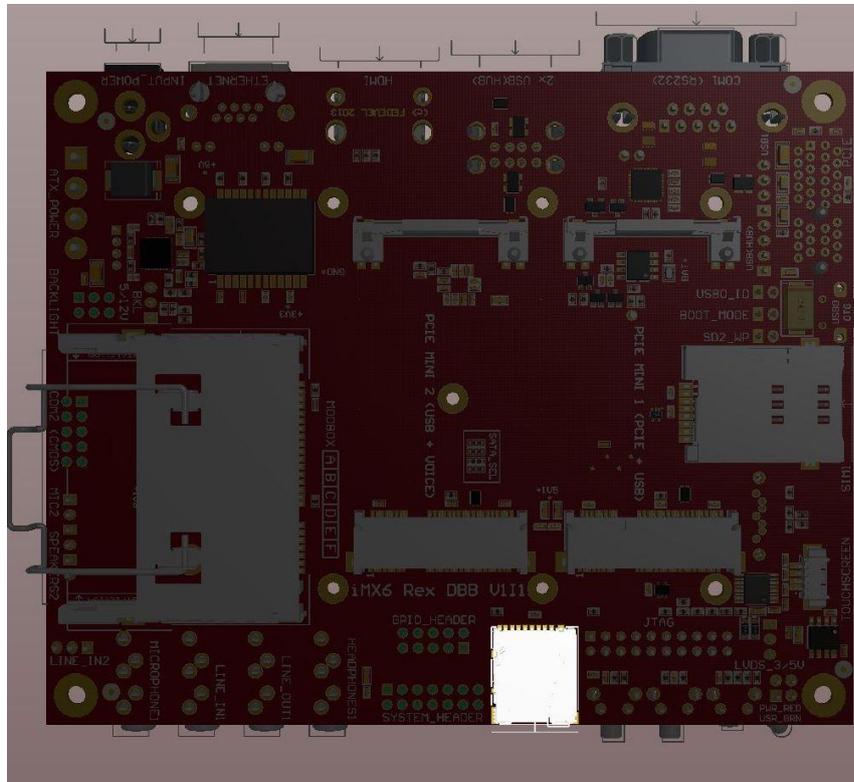


Pin	Pin Name	Signal Name	Type	Description
1	sleeve	GND	G	
2	tip	FIL_MIC_IN	I	Microphone 1 Input
3	ring	FIL_MIC_IN	I	Microphone 1 Input

## J29 – Micro SD Slot 1

**Description:** J29 is connected to the CPU-SD3 interface. Card detection is supported. When resistor R105 is not fitted, write protection is enabled.

**Connector:** Hirose DM3AT-SF-PEJM5

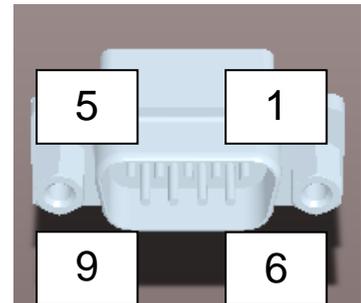
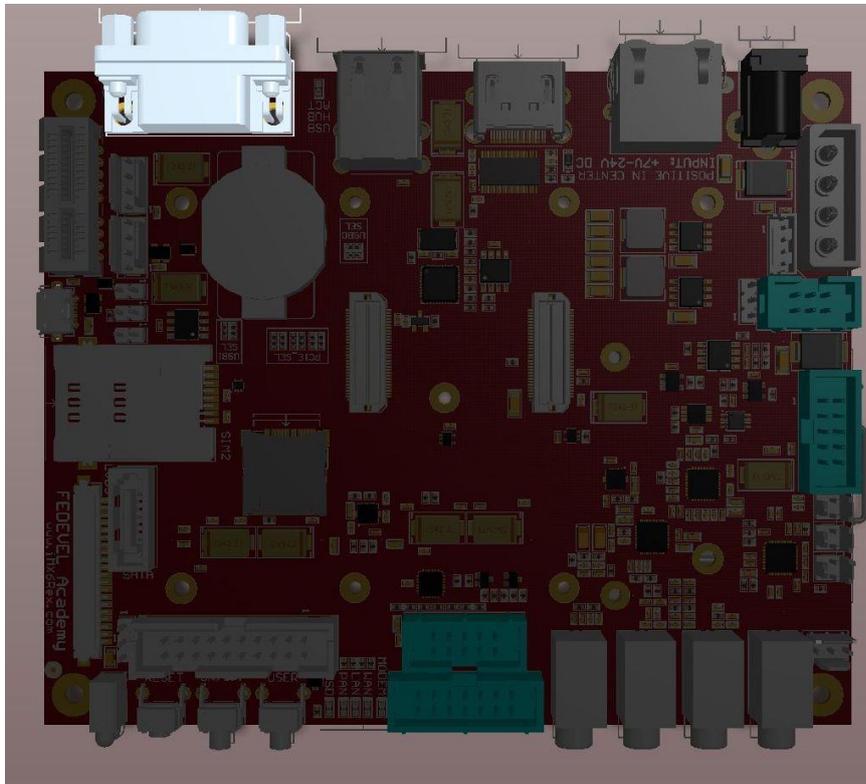


Pin	Pin Name	Type	Description
1	DAT2	I/O	
2	CD/DAT3	I/O	
3	CMD	I/O	
4	VDD	PO	
5	CLK	O	
6	VSS	G	
7	DAT0	I/O	
8	DAT1	I/O	
9	SW1	I	Card detection pin 1
11	SW2	I	Card detection pin 2

## J30 – RS232 DB9 Connector

**Description:** J30 is connected to the full COM1 serial port via a RS232 transceiver.

**Connector:** TE 1734351-1



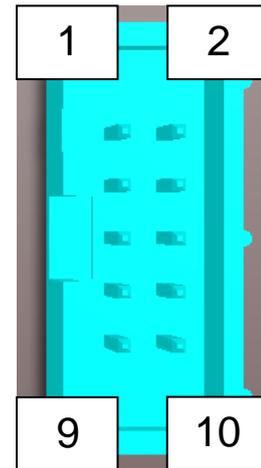
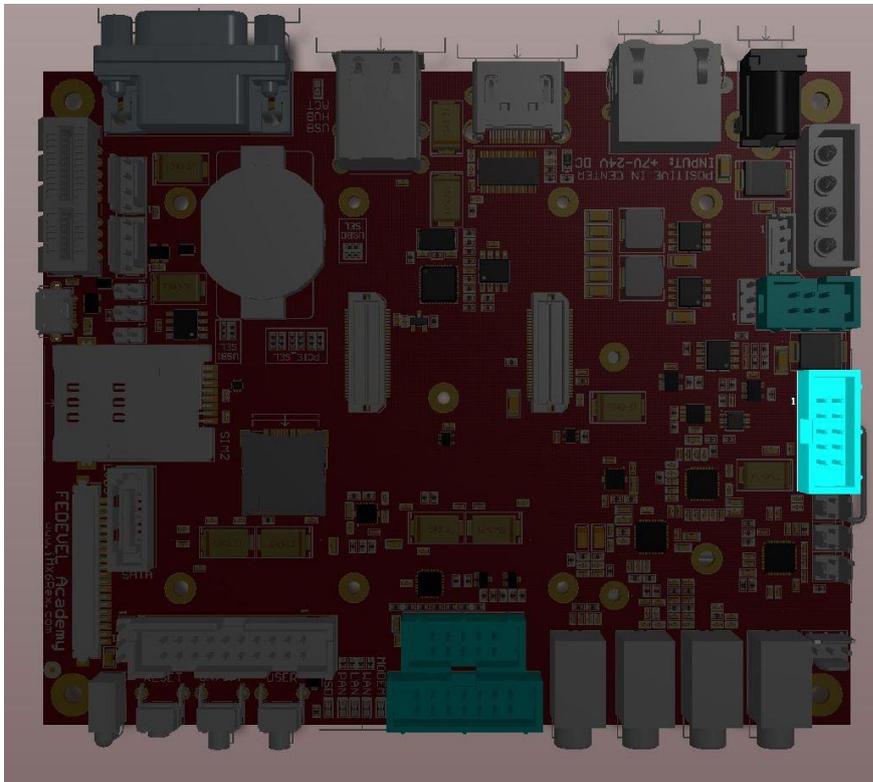
Pin	Signal Name	Type	Description
1	RS232_DCD_CON	I	
2	RS232_RXD_CON	I	
3	RS232_TXD_CON	O	
4	RS232_DTR_CON	O	
5	GND	G	
6	RS232_DSR_CON	I	
7	RS232_RTS_CON	O	
8	RS232_CTS_CON	I	
9	RS232_RI_CON	I	

## J31 – COM 2 Header

**Description:** J31 is connected to the UART2 serial port (CMOS levels).

**Connector:** 3M D2510-6002-AR

**Mating housing:** TE 1658622-1 or equivalent



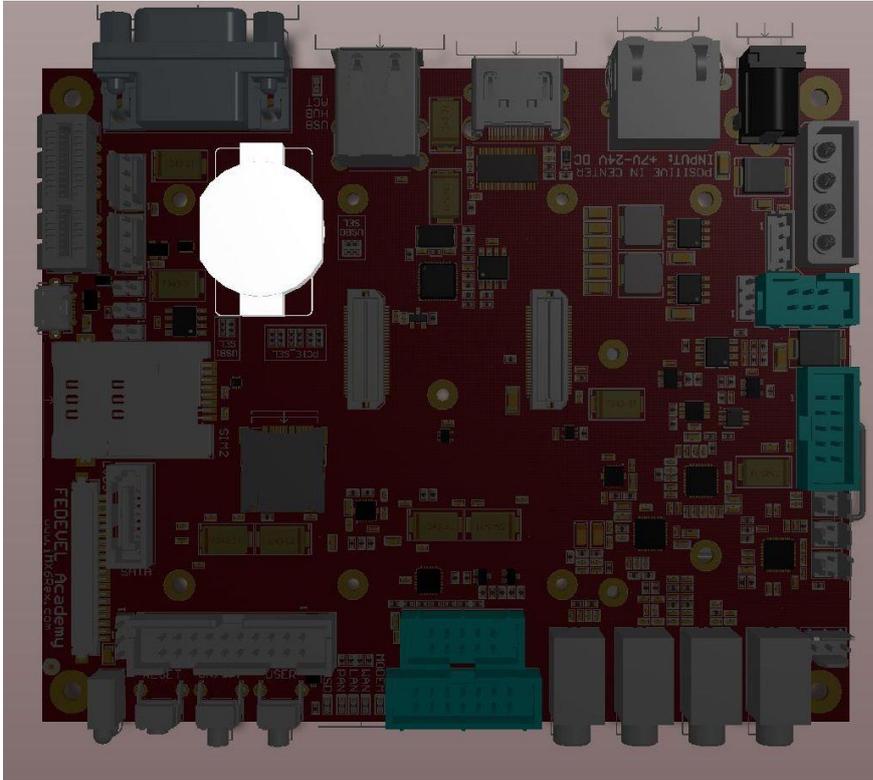
Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
		N.C.	1	2	N.C.		
	I	UART2_RXD	3	4	UART2_RTS	O	
	O	UART2_TXD	5	6	UART2_CTS	I	
		N.C.	7	8	N.C.		
	G	GND	9	10	+3V3	PO	

## J32 – Battery Holder

**Description:** J32 is used as a holder for a battery. If the board is powered off, the battery supplies an RTC clock chip and a touchscreen controller (optional).

**Connector:** MPD BA2032

**Battery:** GP CR2025 or equivalent

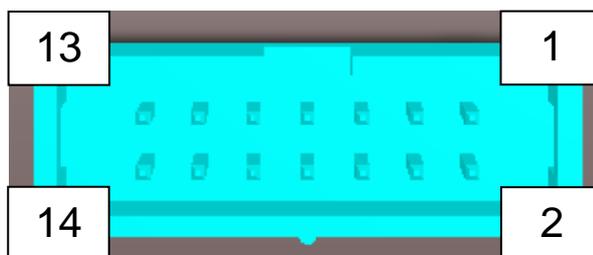
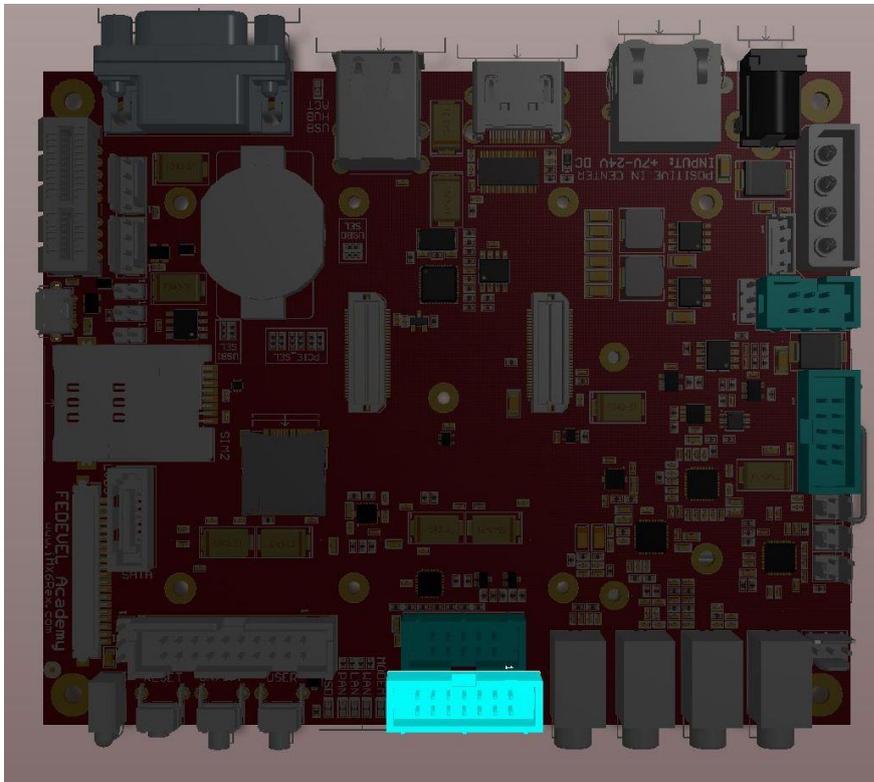


## J33 – System Header

**Description:** J33 connector brings out CPU-SPI2 interface and other various system signals.

**Connector:** 3M D2514-6002-AR

**Mating housing:** TE 1658622-2 or equivalent



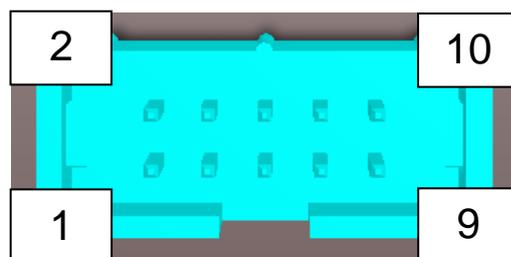
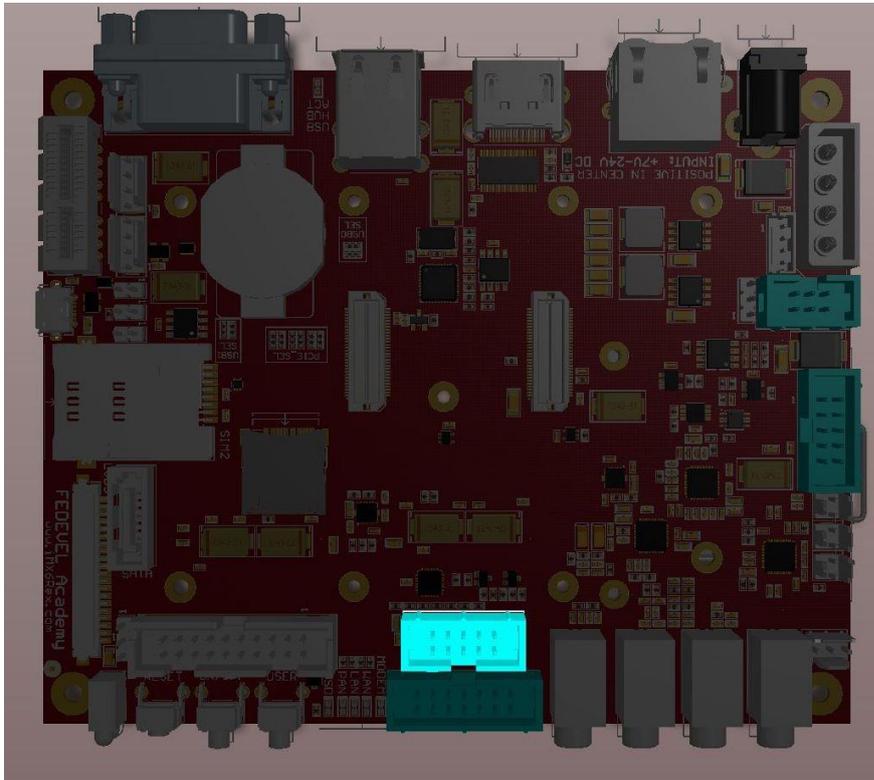
Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
	PO	+3V3	1	2	PWR_LED_HDR	O	Power good LED output . No series resistor is required.
ON/OFF button	I	PWR_BTN_HDR	3	4	USER_LED_HDR	O	User LED output. No series resistor is required.
Reset button	I	RST_BTN_HDR	5	6	BUF_SYS_RSTn	O	Reset OUT for external peripherals
I2C Expander GPIO pin. This pin has 200kΩ pull up to +3V3.	I/O	GPIO6	7	8	CPU_INT	I	General purpose CPU interrupt
I2C Expander GPIO pin. This pin has 200kΩ pull down.	I/O	GPIO7	9	10	+ CSPI2_CS0	O	
	I	CSPI2_MISO	11	12	CSPI2_MOSI	O	
	G	GND	13	14	CSPI2_CLK	O	

## J34 – GPIO Header

**Description:** J34 is connected to six signals of the I2C GPIO Expander. Each GPIO signal has 200kΩ pull up / down resistor. Connector also brings out the I2C3 bus for a general purpose use.

**Connector:** 3M D2510-6002-AR

**Mating housing:** TE 1658622-1 or equivalent



Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
	PO	+3V3	1	2	GPIO0	I/O	pull up to +3V3
pull up to +3V3	I/O	GPIO1	3	4	GPIO2	I/O	pull up to +3V3
pull down	I/O	GPIO3	5	6	GPIO4	I/O	pull down
pull down	I/O	GPIO5	7	8	I2C3_SDA	I/O	
	G	GND	9	10	I2C3_SCL	O	

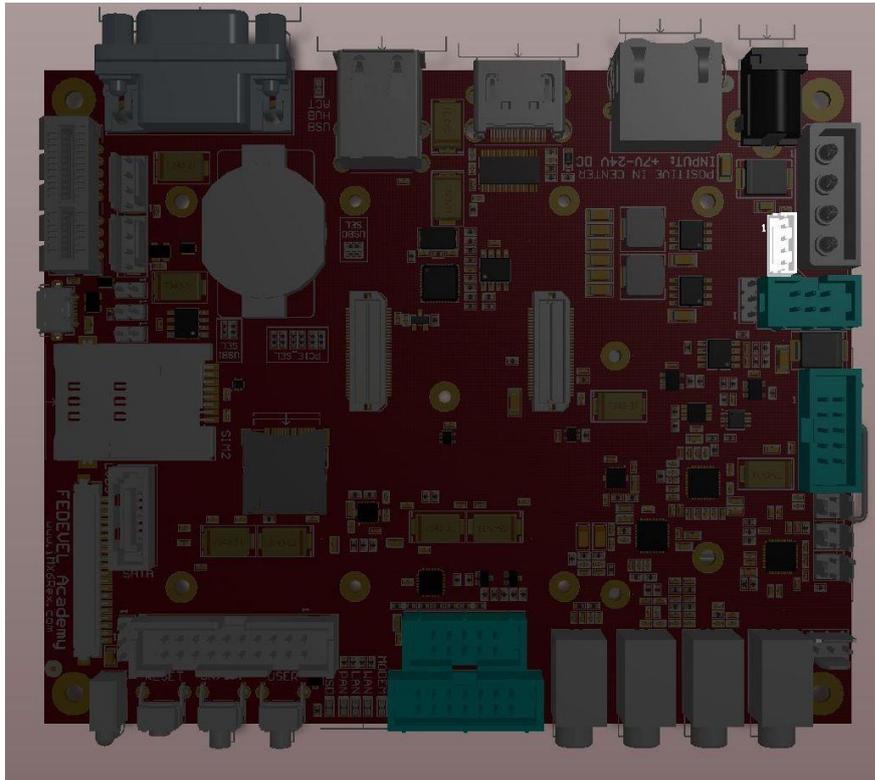
## J35 – Power +5V Out Connector

**Description:** J35 is a +5V power output for a general use (e.g. as a 2.5" HDD power supply).

**Connector:** Molex 0532530470

**Mating housing:** Molex 0510650400 or equivalent

**Mating crimps:** Molex 0502128000 or equivalent

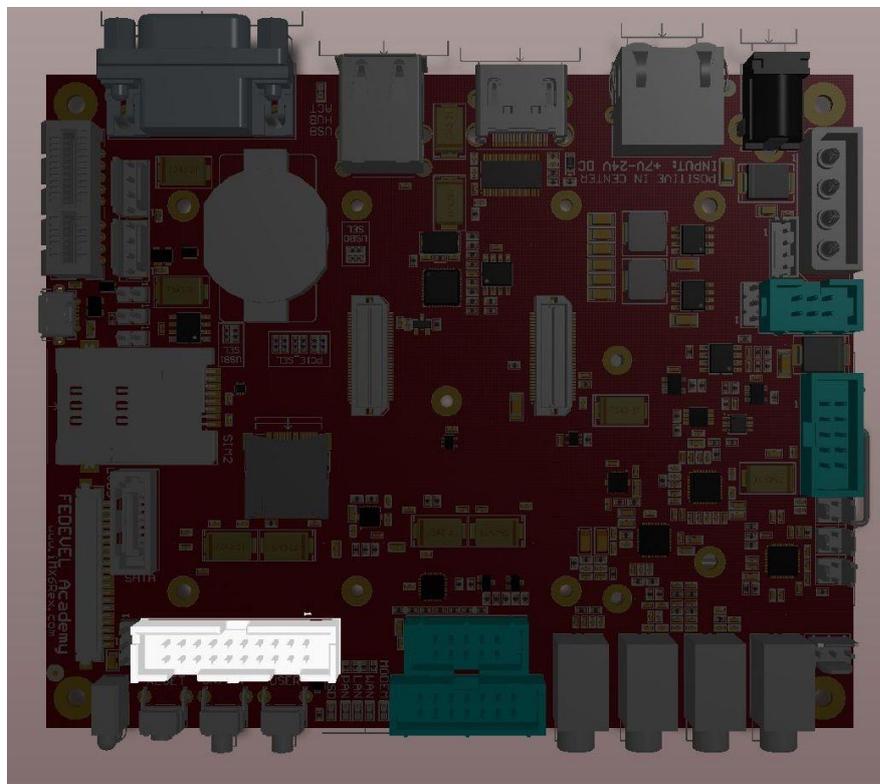


Pin	Signal Name	Type	Description
1	+5V	PO	+5V supply for a device
2	GND	G	Power ground
3	GND	G	Power ground
4	+5V	PO	+5V supply for a device

## J36 – JTAG Header

**Description:** J36 is a JTAG header to debug the CPU.

**Connector:** TE 5103308-5



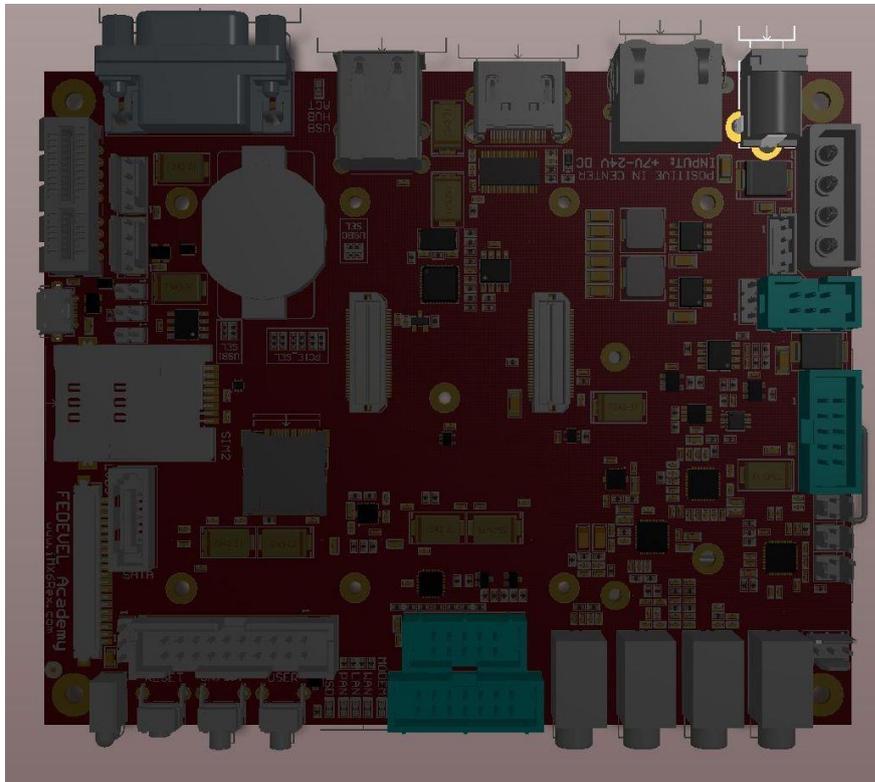
Description	Type	Signal Name	Pin	Pin	Signal Name	Type	Description
	O	JTAG_VREF	1	2	+3V3	PO	
	I	JTAG_nTRST	3	4	GND	G	
	I	JTAG_TDI	5	6	GND	G	
	I	JTAG_TMS	7	8	GND	G	
	I	JTAG_TCK	9	10	GND	G	
	O	JTAG_RTCK	11	12	GND	G	
	O	JTAG_TDO	13	14	GND	G	
	I/O	JTAG_nSRST	15	16	GND	G	
	O	JTAG_DACK	17	18	GND	G	
	G	GND	19	20	GND	G	

## J37 – Power Input Connector

**Description:** J37 is a main input power jack (input voltage range: +7V to +24V DC).

**Connector:** CUI PJ-002AH

**Mating plug:** Switchcraft S-760 or equivalent

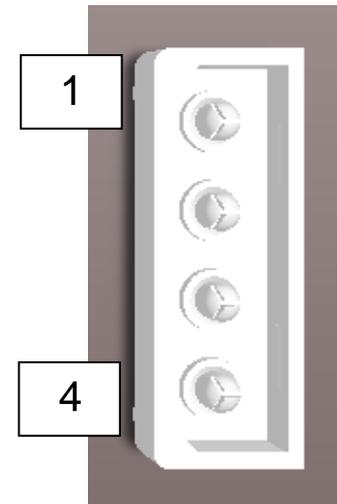
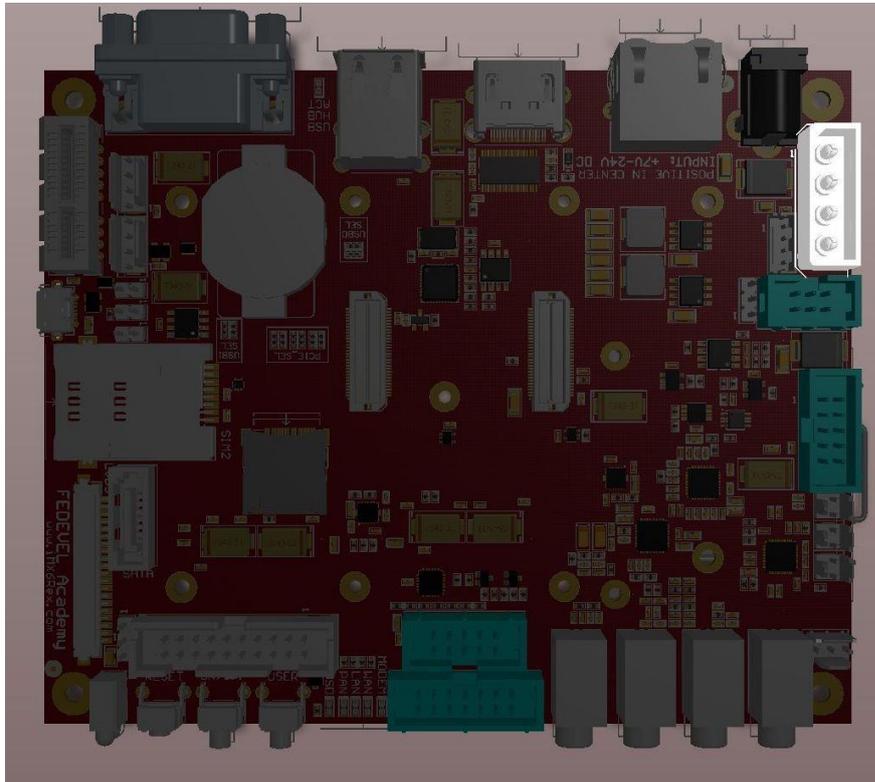


Pin	Signal Name	Type	Description
Center	+V_INPUT	PI	Input power for the board
Outer barrel	GND	G	Power ground

## J38 – ATX Power Connector

**Description:** J38 is an optional power connector. It can be used as a main power input for the board (+12V) or as an output connector (+5V) (e.g. for HDD supply). If +12V is required for the PCI Express Card ([J3](#)) or for the LVDS Backlight inverter ([J19](#)), this connector should be powered from an external source.

**Connector:** Molex 0015244449

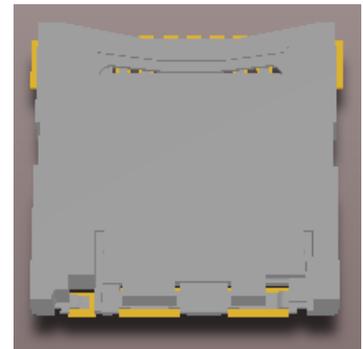
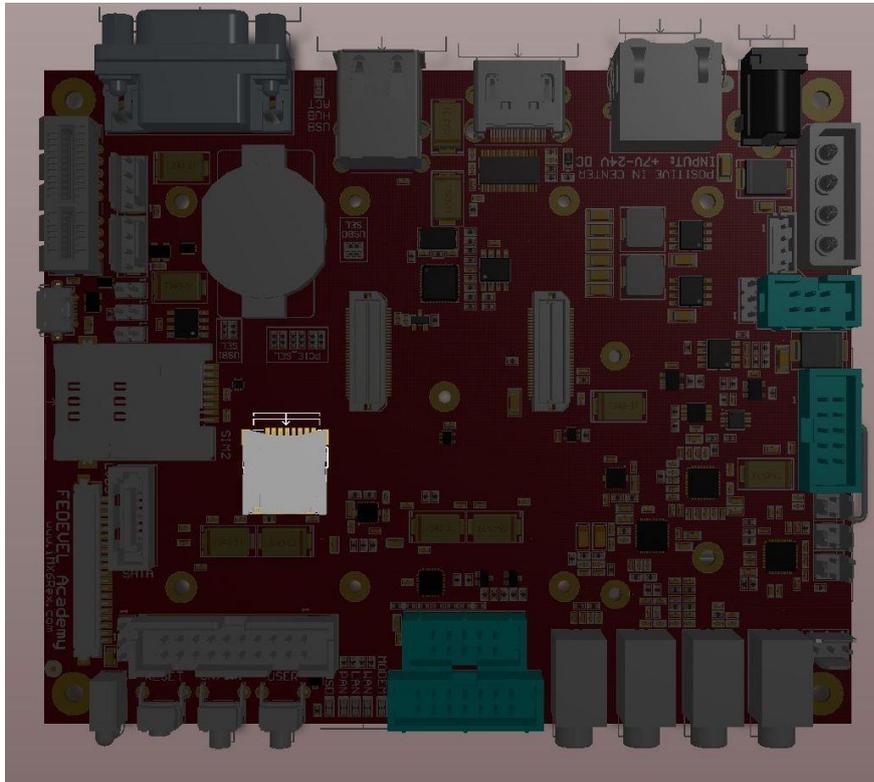


Pin	Signal Name	Type	Description
1	+12V_ATX	PI	+12V supply for the board
2	GND	G	Power ground
3	GND	G	Power ground
4	+5V_ATX	PO	+5V supply for the device (optional, see schematic)

## J39 – Micro SD Slot 2

**Description:** J39 is connected to the CPU-SD2 interface. This slot is intended to be used as the main storage for the operating system. The card detection is supported. Write protection is controlled by JP3 jumper.

**Connector:** Hirose DM3C-SF



Pin	Pin Name	Type	Description
1	DAT2	I/O	
2	CD/DAT3	I/O	
3	CMD	I/O	
4	VDD	PO	
5	CLK	O	
6	VSS	G	
7	DAT0	I/O	
8	DAT1	I/O	
9	SW	I	Card detection pin

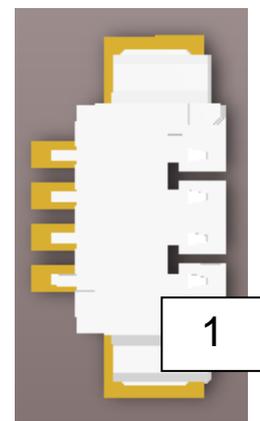
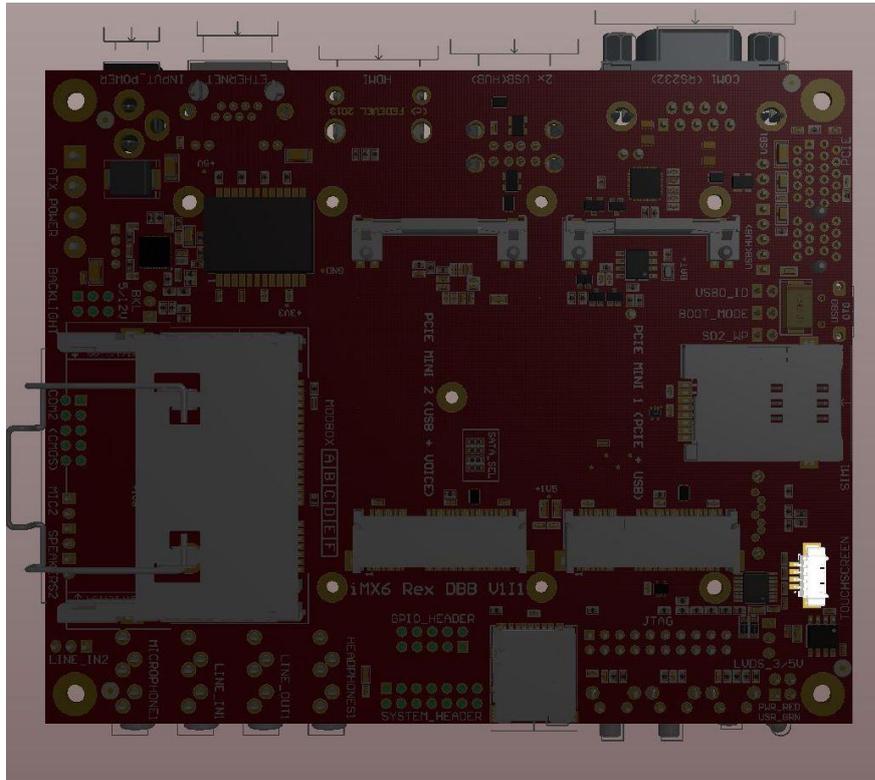
## J40 – Touchscreen input header

**Description:** J40 is connected to the on board analog resistive touchscreen controller.

**Connector:** Molex 0532610471

**Mating housing:** Molex 0510210400 or equivalent

**Mating crimps:** Molex 0500588000 or equivalent



Pin	Signal Name	Type	Description
1	TS_Y+	I	Y+ channel input
2	TS_X+	I	X+ channel input
3	TS_Y-	I	Y- channel input
4	TS_X-	I	X- channel input

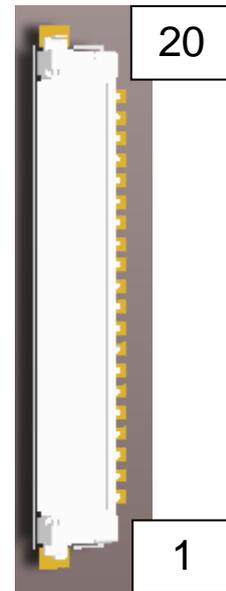
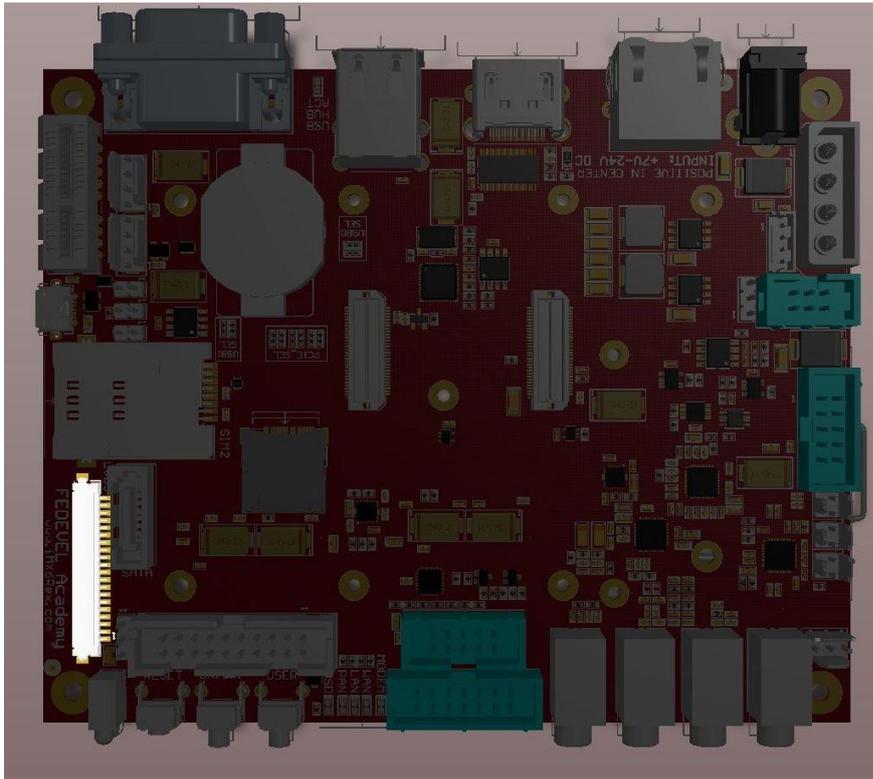
## J41 – LVDS Connector

**Description:** J41 is connected to the LVDS interface. Connector [J19](#) provides a backlight support for this interface. The display power can be selected between +5V and +3V3 by jumper J17.

**Connector:** JAE FI-SE20P-HFE

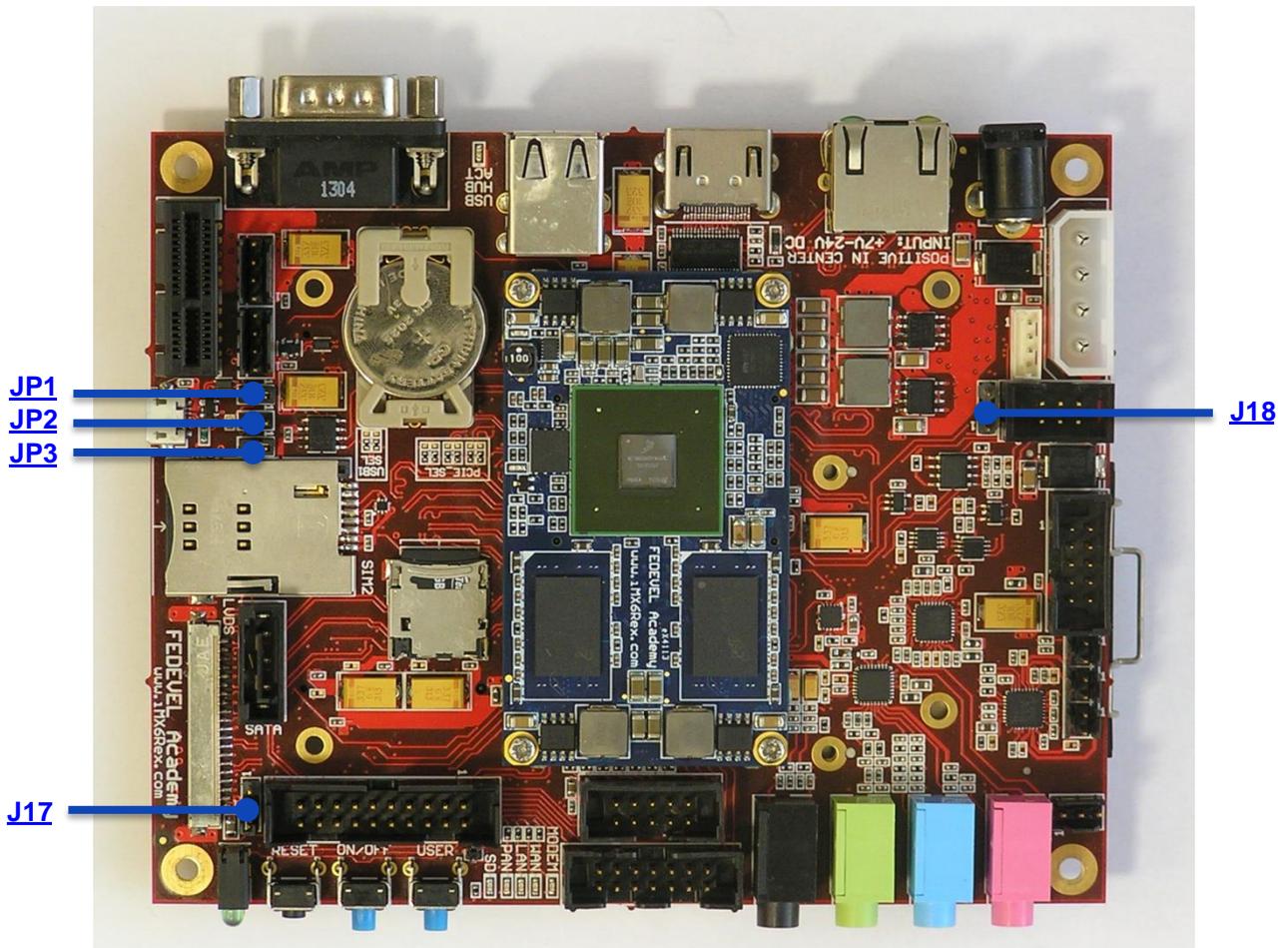
**Mating housing:** JAE FI-S20S or equivalent

**Mating crimps:** JAE FI-C3-A1-15000 or equivalent



Pin	Signal Name	Type	Description
1	VCC_1	PO	+3V3 / +5V Supply for the display
2	VCC_2	PO	+3V3 / +5V Supply for the display
3	GND_1	G	
4	GND_2	G	
5	D0-	O	LVDS D0 Negative signal
6	D0+	O	LVDS D0 Positive signal
7	GND_3	G	
8	D1-	O	LVDS D1 Negative signal
9	D1+	O	LVDS D1 Positive signal
10	GND_4	G	
11	D2-	O	LVDS D2 Negative signal
12	D2+	O	LVDS D2 Positive signal
13	GND_5	G	
14	CK-	O	LVDS Clock Negative signal
15	CK+	O	LVDS Clock Positive signal
16	GND_6	G	
17	FRC	O	Pulled up (10k $\Omega$ ) to LVDS supply
18	DPS	O	Pulled down (10k $\Omega$ )
19	D3-/GND_7	O	LVDS D3 Negative signal
20	D3+/GND_8	O	LVDS D3 Positive signal

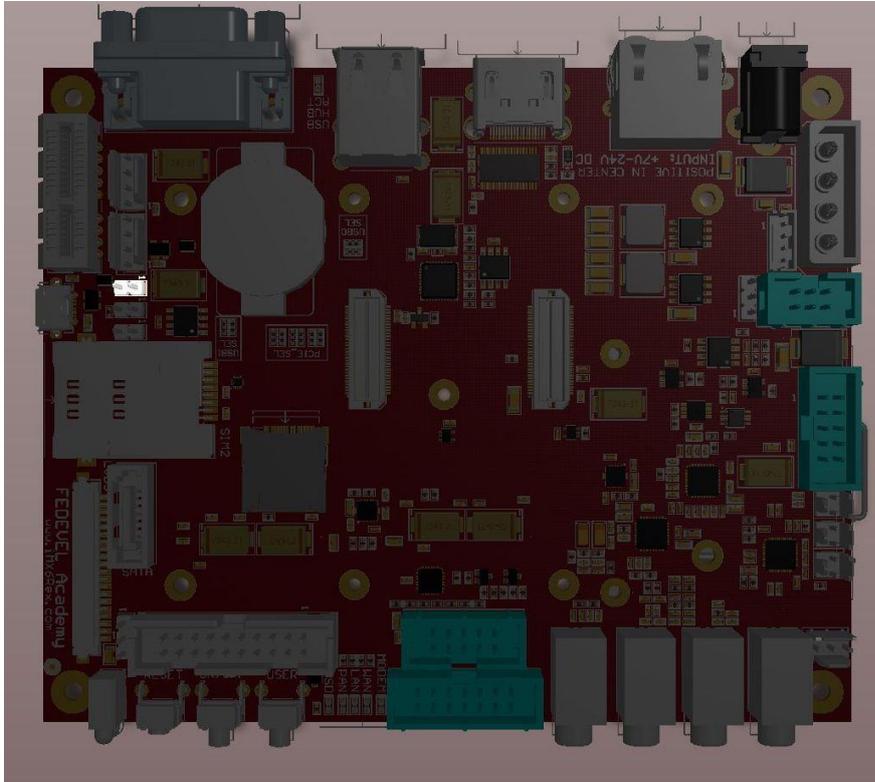
## Jumpers - Top



<b>Ref. Number</b>	<b>Function</b>	<b>Default position</b>	<b>Page</b>
<u>JP1</u>	USB0 ID selection	Pins closed	62
<u>JP2</u>	Boot mode selection	Pins left open	63
<u>JP3</u>	SD2 write protection	Pins closed	64
<u>J17</u>	LVDS Display supply voltage selection	Pin 2-3 closed	65
<u>J18</u>	Backlight voltage selection	Pin 2-3 closed	66

## JP1 – USB0 ID selection

**Description:** The JP1 header selects the level of the USB0\_ID signal. This signal controls the operation of the USB0 interface as a host or as a device.

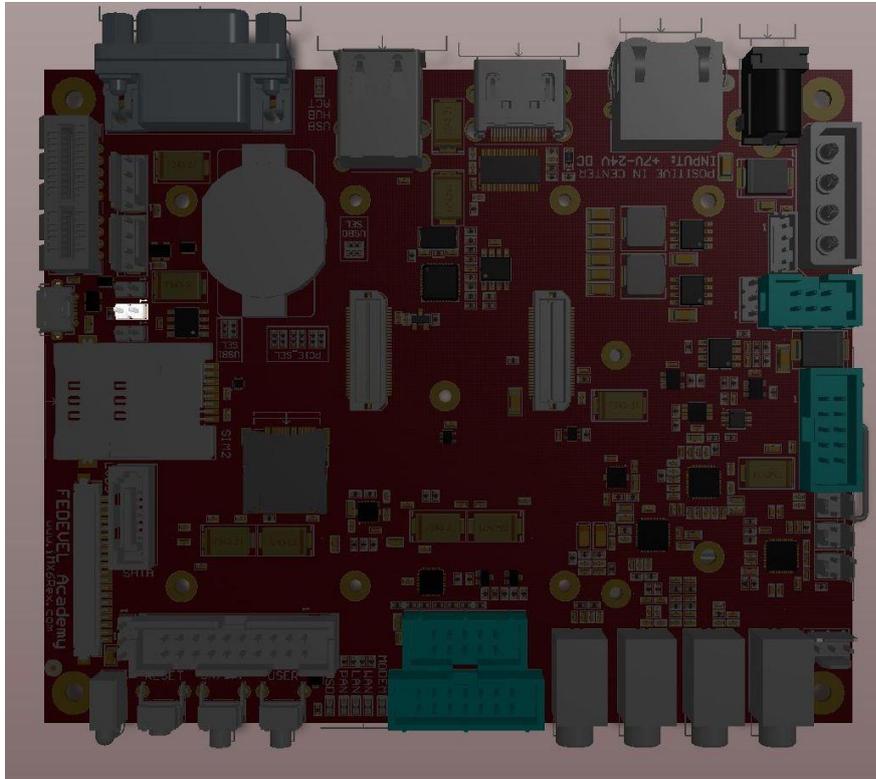


Pins	Level of USB0_ID	Description
Closed	GND	iMX6 REX acts as a host (default)
Open	High	iMX6 REX acts as a device

**Usage:** The main purpose of this pin is capability of USB0 to act as a device (e.g. in the case when you would like to connect iMX6 Rex to your PC and see it as a disk storage). A proper driver may be required.

## JP2 – Boot mode selection

**Description:** The JP2 header controls the level of the Boot mode signal. This signal selects between booting from the on module SPI memory chip (default) or running in USB bootloader mode (used by MFGTools during manufacturing or debugging).



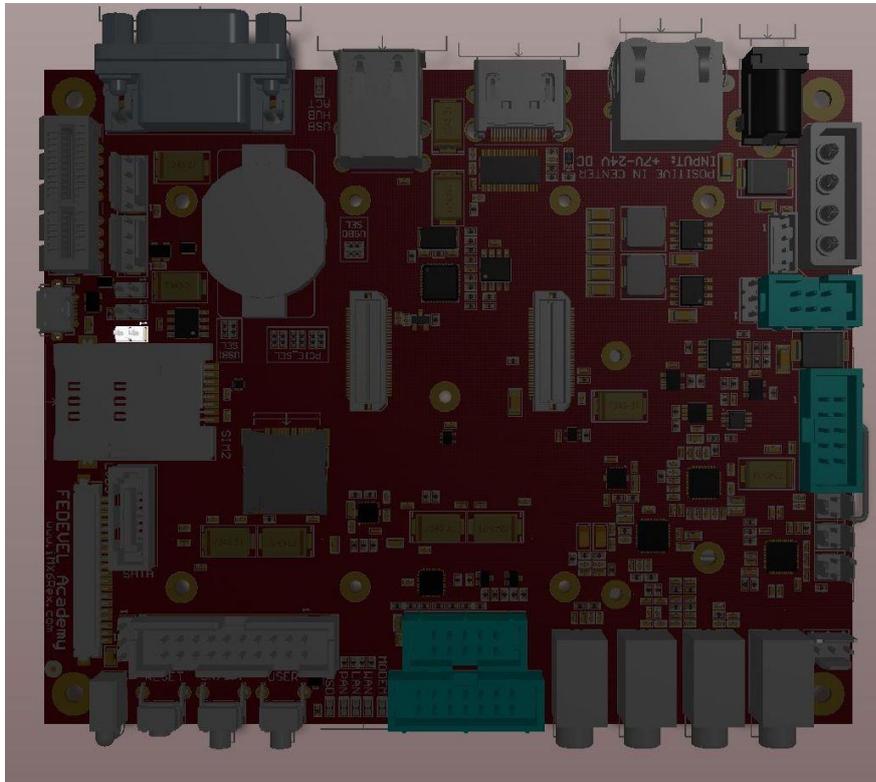
Pins	Level of BOOT_MODE	Description
Closed	GND	iMX6 Rex running in USB bootloader mode
Open	+3V0_ALWAYS	Boots from the on module SPI chip (default)

**Usage:** As a default the board boots up from the e-fuses. For special purpose the link on JP2 can be fitted. The board then boots from the serial downloader located in the USB0 host device.

**Note:** When running an iMX6 Rex module for the very first time (before eFUSES are programmed), this pin has to be left open to run the module in USB bootloader mode.

## JP3 – SD2 write protection

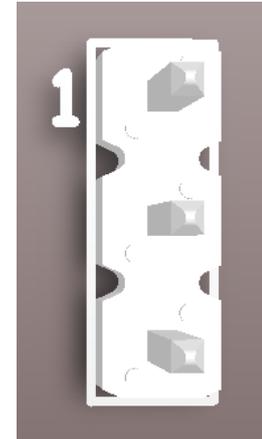
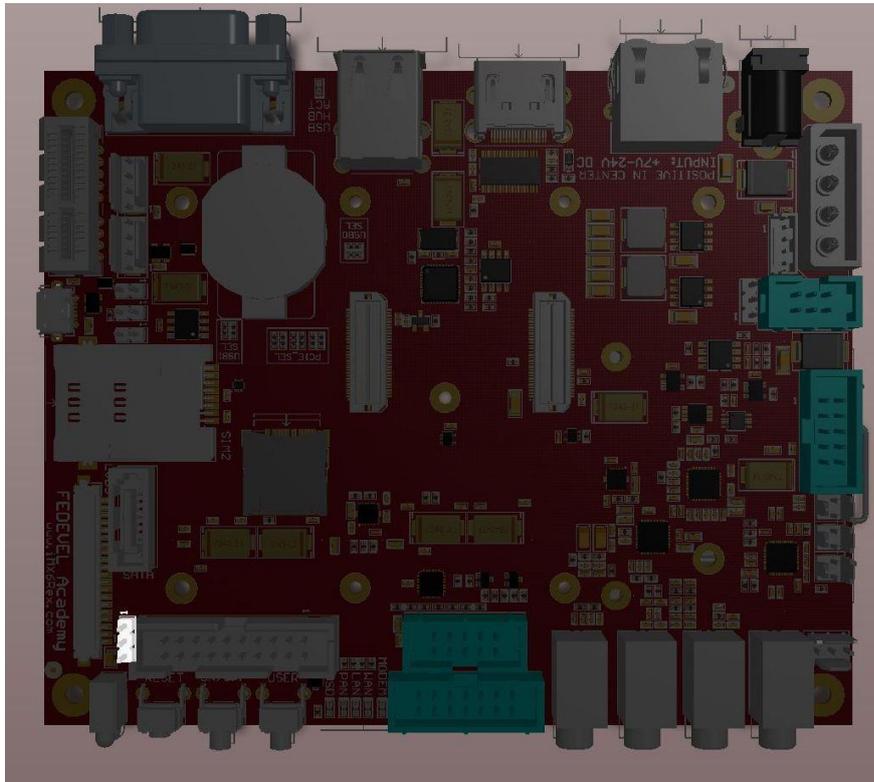
**Description:** JP3 header controls the write protection of the SD card inserted into SD2 card holder ([J39](#)).



Pins	Level of SD2_WP	Description
Closed	GND	SD card write enabled (default)
Open	+3V3	The SD card is write protected

## J17 – LVDS Power Supply selection

**Description:** The header J17 selects display supply voltage on the [J41](#) connector.



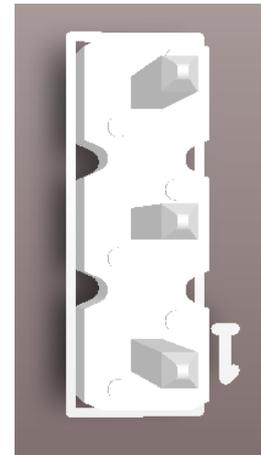
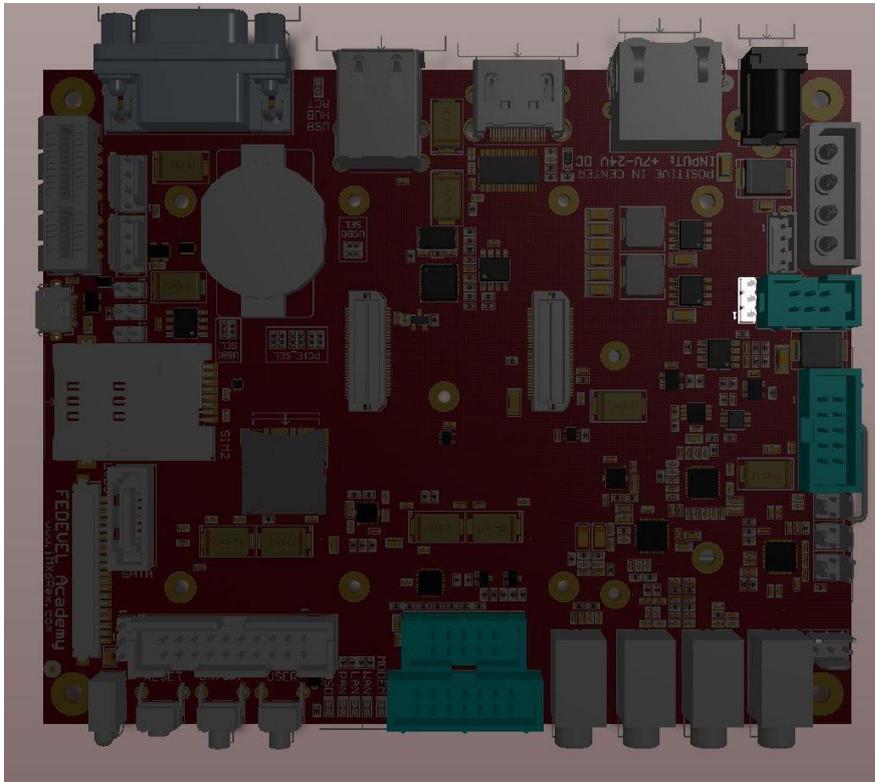
Pins	Level of +VDD_LVDS	Description
Closed 1-2	+5V	<a href="#">J41</a> delivers +5V
Closed 2-3	+3V3	<a href="#">J41</a> delivers +3V3 (default)
Open	float	Not connected

**Usage:** According to your display supply requirements connect the link. Many of the LVDS displays are supplied with +3V3 voltage. The +5V voltage is intended to be used in cases when an adapter is connected (e.g. LVDS to HDMI adapter, LVDS to DVI adapter, ....).

**Warning:** Before you connect your display, be sure you had selected the right voltage level, otherwise your display may be damaged!

## J18 – Backlight voltage selection

**Description:** The header J18 selects the voltage which will be present on the backlight connector [J19](#) and will supply the backlight of the LVDS display ([J41](#)).



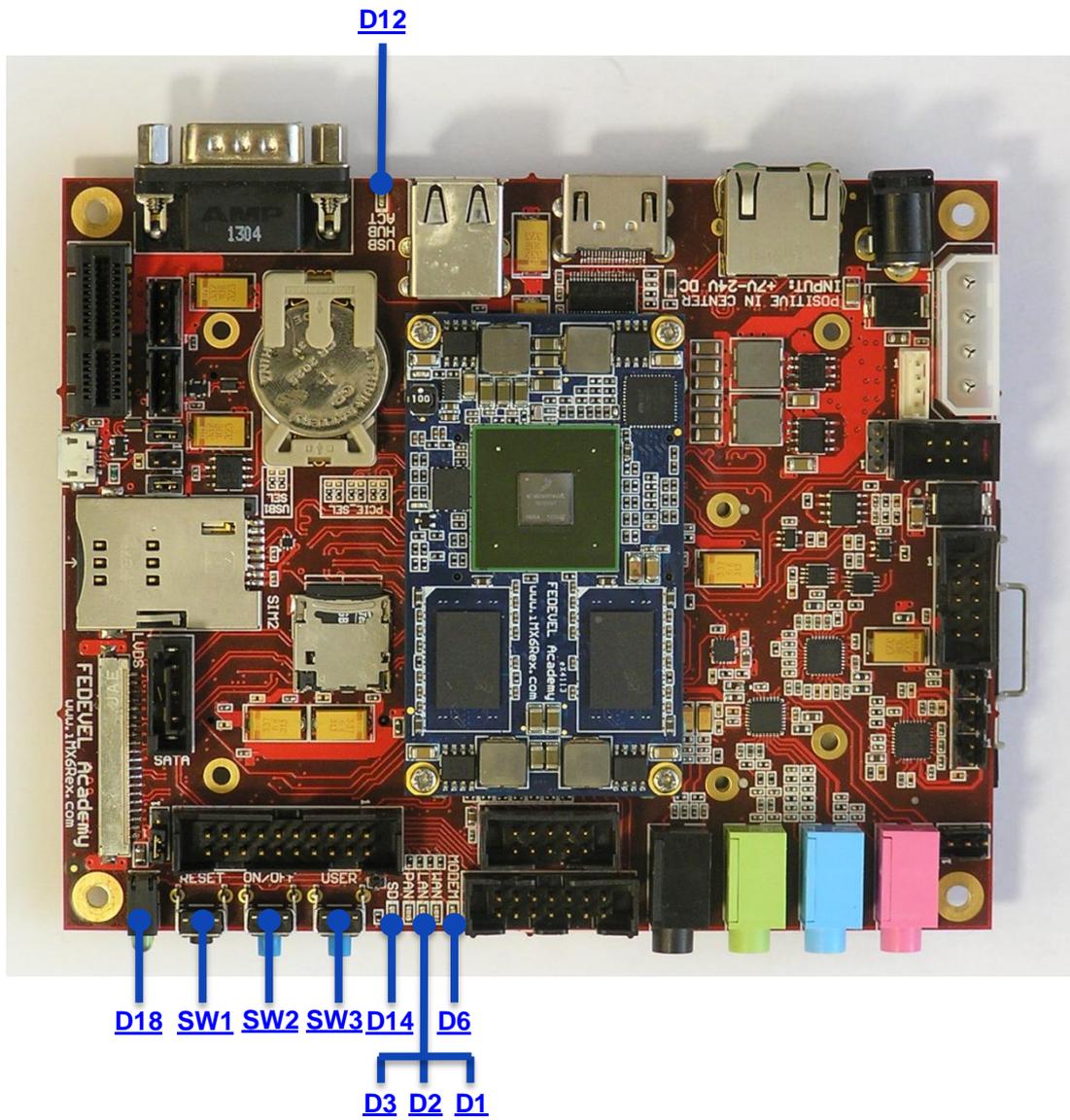
Pins	Level of +BKLT_VCC	Description
Closed 1-2	+12_ATX	For +12V backlights
Closed 2-3	+5V	For +5V backlights (default)
Open	float	Not connected

**Usage:** Select the proper backlight voltage based on your backlight inverter requirements.

**Warning:** If you connect the wrong voltage to the backlight, the backlight inverter may be damaged!

**Important:** If you decide to supply the backlight with +12V, the board must be powered from an ATX Power Connector ([J38](#)).

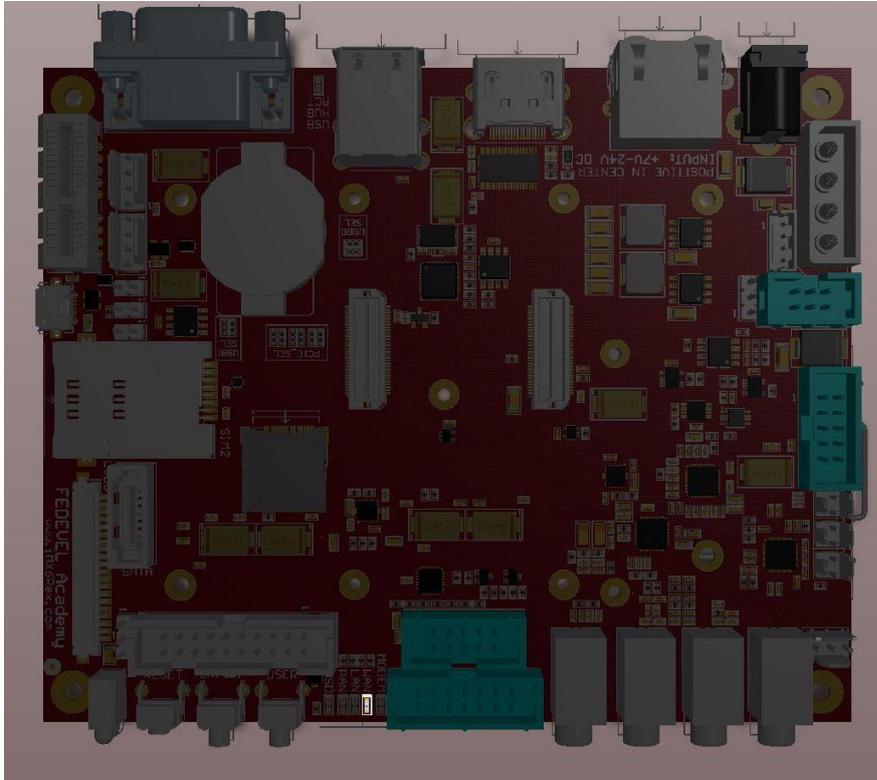
## LEDs & Buttons - Top



<b>Ref. Number</b>	<b>Function</b>	<b>Page</b>
<u>D1</u>	PCIe Mini Card 1 WWAN	69
<u>D2</u>	PCIe Mini Card 1 WLAN	70
<u>D3</u>	PCIe Mini Card 1 WPAN	71
<u>D6</u>	PCIe Mini Card 2 WWAN	72
<u>D12</u>	USB0 Hub State indicator	73
<u>D14</u>	SD2 Activity indicator	74
<u>D18</u>	Power / User LED indicators	75
<u>SW1</u>	Reset button	76
<u>SW2</u>	Power button	77
<u>SW3</u>	User button	78

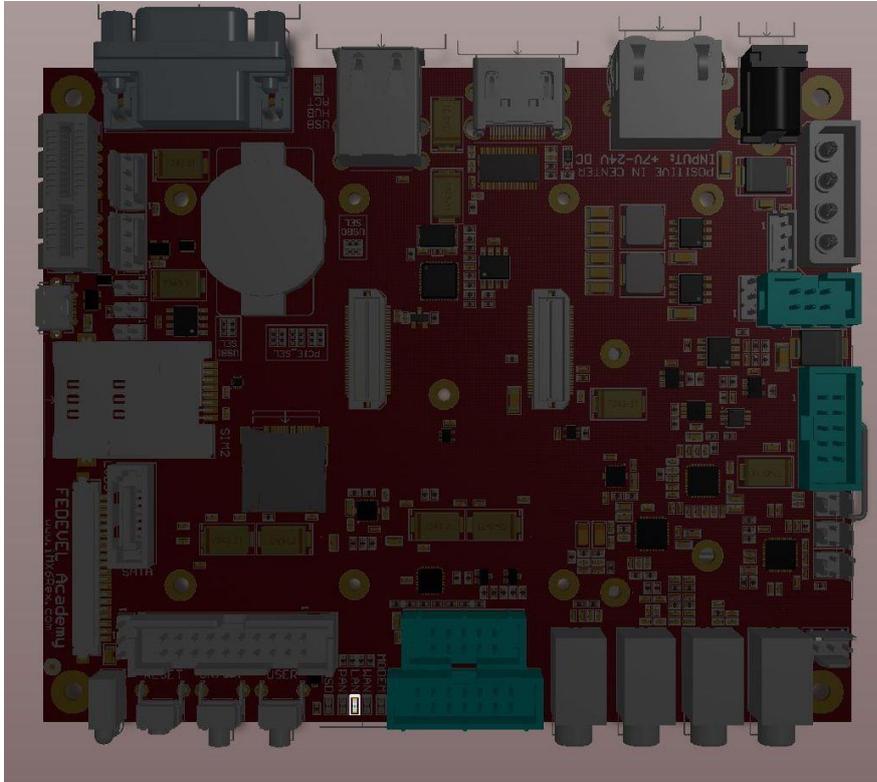
## D1 – PCIe Mini Card 1 WWAN

**Description:** D1 indicates the PCIe Mini Card 1 WWAN activity. This signal depends on the card settings.



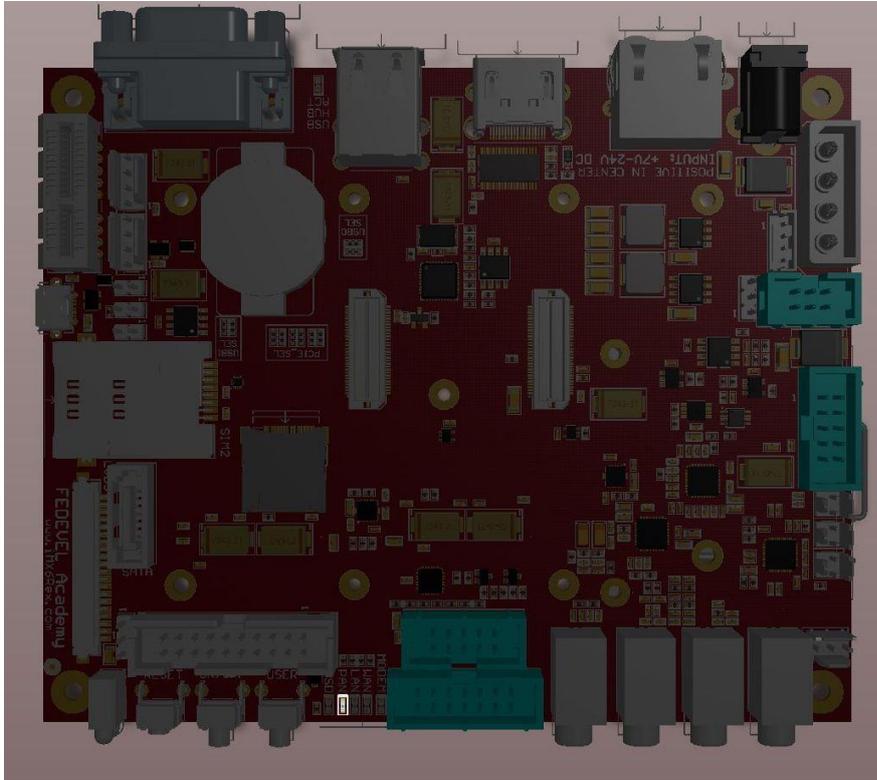
## D2 – PCIe Mini Card 1 WLAN

**Description:** D2 indicates the PCIe Mini Card 1 WLAN activity. This signal depends on the card settings.



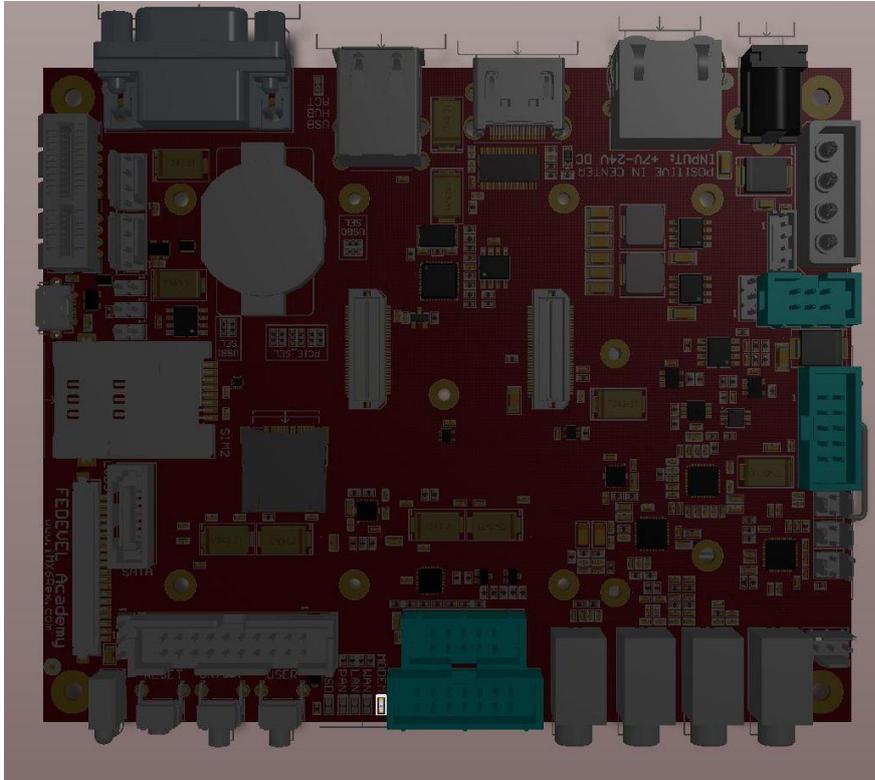
## D3 – PCIe Mini Card 1 WPAN

**Description:** D3 indicates the PCIe Mini Card 1 WPAN activity. This signal depends on the card settings.



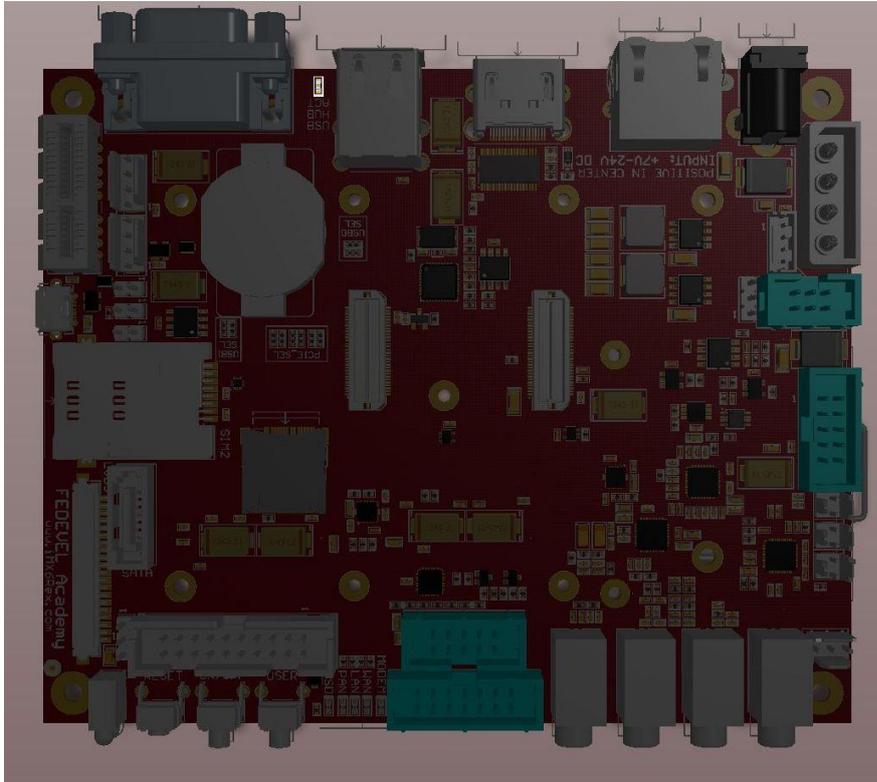
## D6 – PCIe Mini Card 2 WWAN

**Description:** D6 indicates the PCIe Mini Card 2 WWAN activity. This signal depends on the card settings.



## D12 – USB0 Hub State indicator

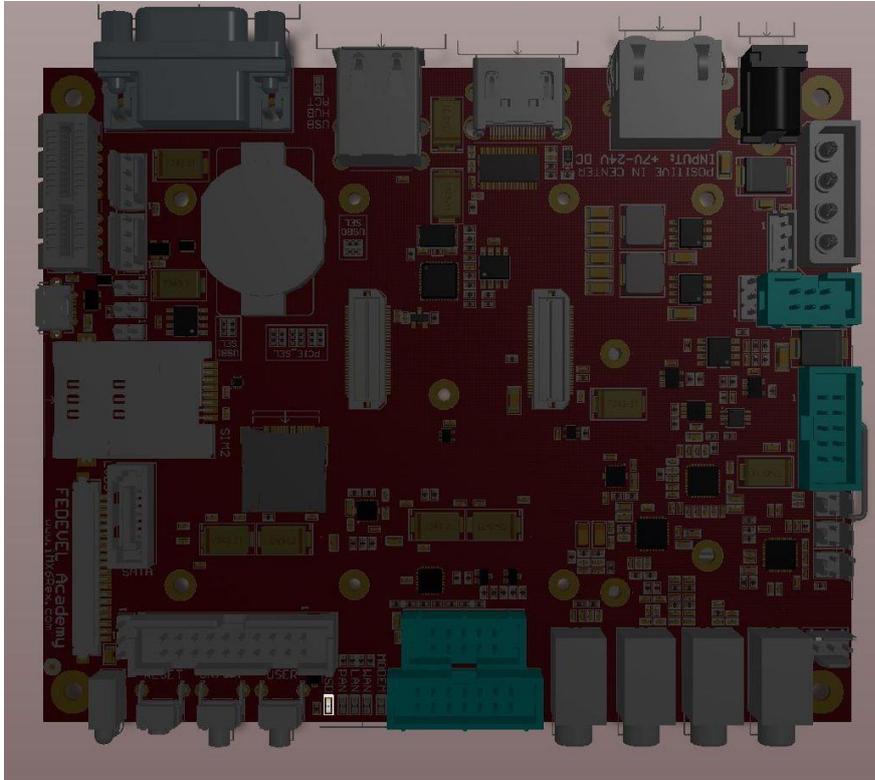
**Description:** D12 indicates the state of the USB0 Hub.



LED state	Description
Off	No USB device plugged in
On	An USB device is plugged in

## D14 – SD2 Activity indicator

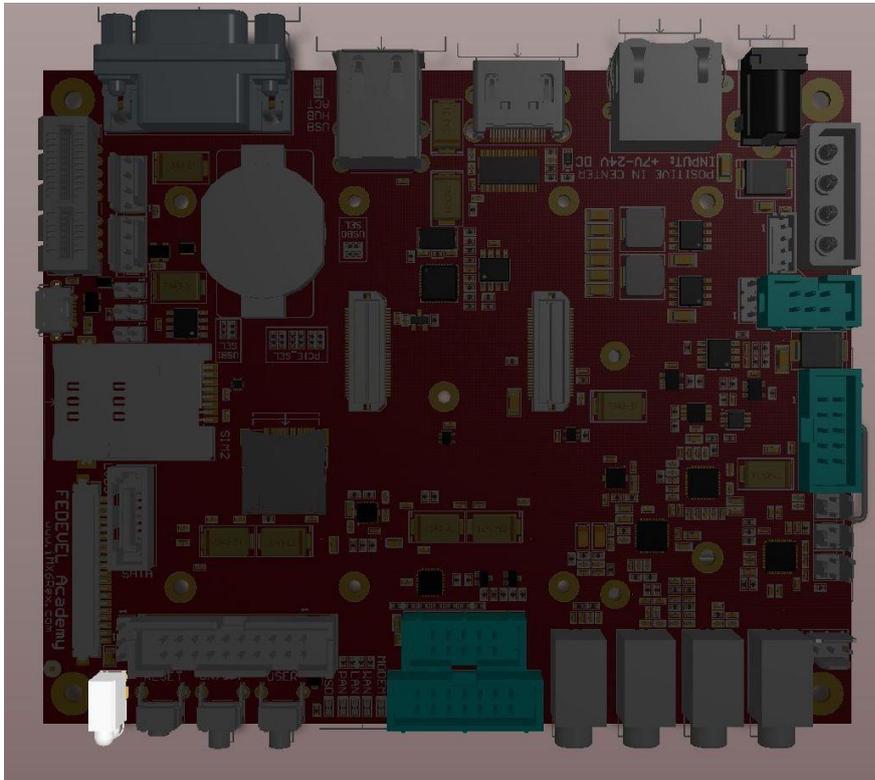
**Description:** D14 indicates that the SD2 interface is in the busy state (the card inserted into the [J39](#) holder). *\*Note: This feature has to be supported in software.*



## D18 – Power / User LED indicators

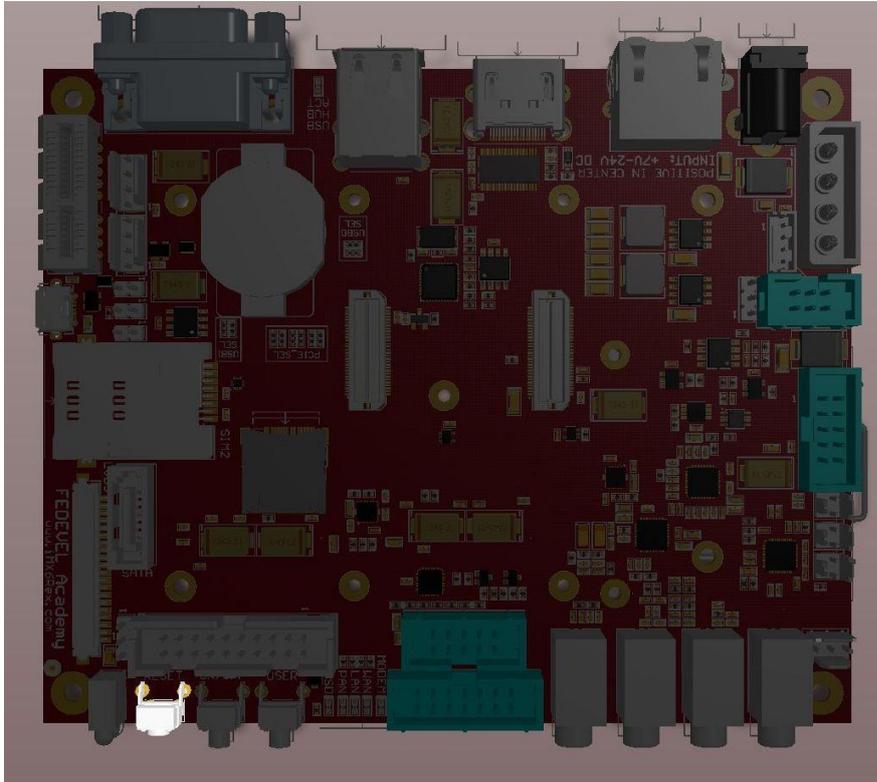
**Description:** D18 is a stacked LED indicator. The upper green diode is used for power good indication – the green diode is ON if all the powers are working correctly. The bottom red diode is a general purpose indicator and can be used by your application.

These two signals are also connected to the System header ([J33](#)) and can be take out from the board.



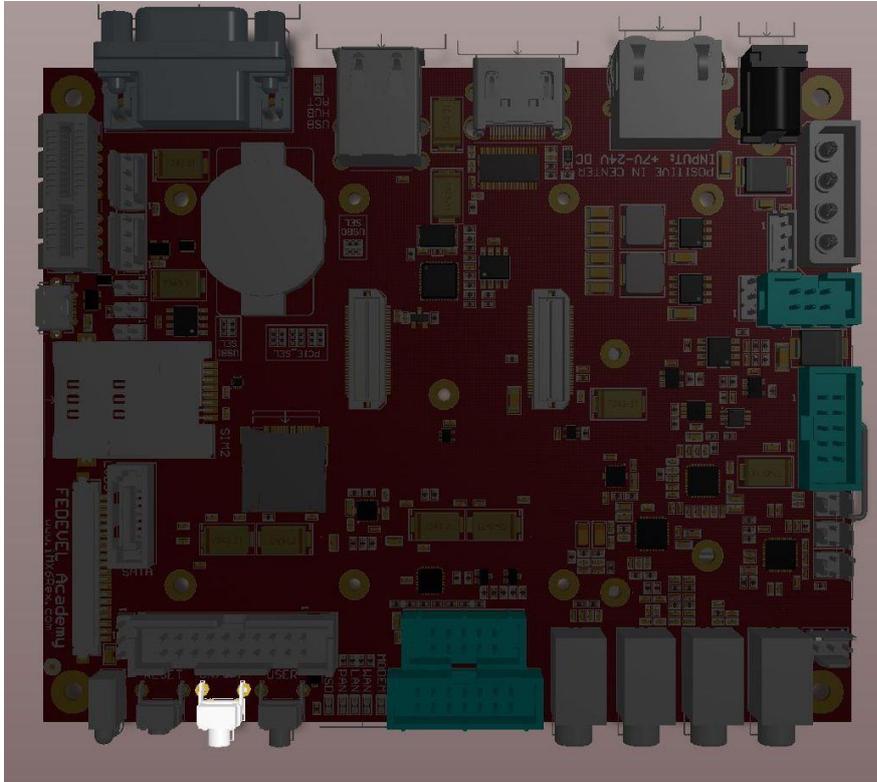
## SW1 – Reset button

**Description:** The SW1 button is used to reset the board. It is a hardware reset.



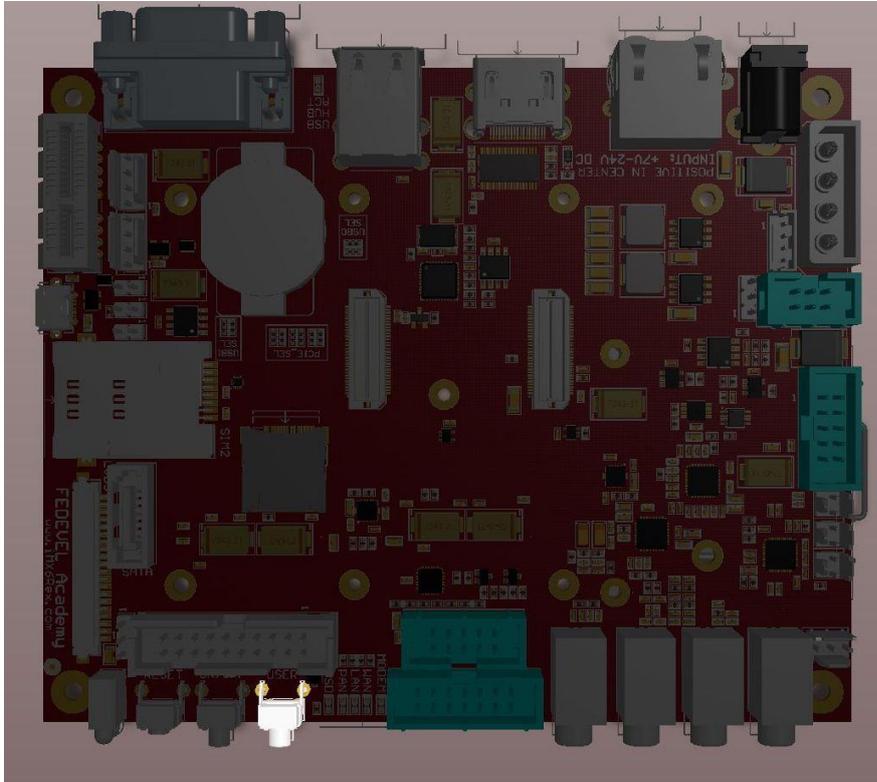
## SW2 – Power button

**Description:** The SW2 button is used to power on and off the board. This signal is also available through the System header ([J33](#)). *\*Note: This feature needs to be supported by software.*



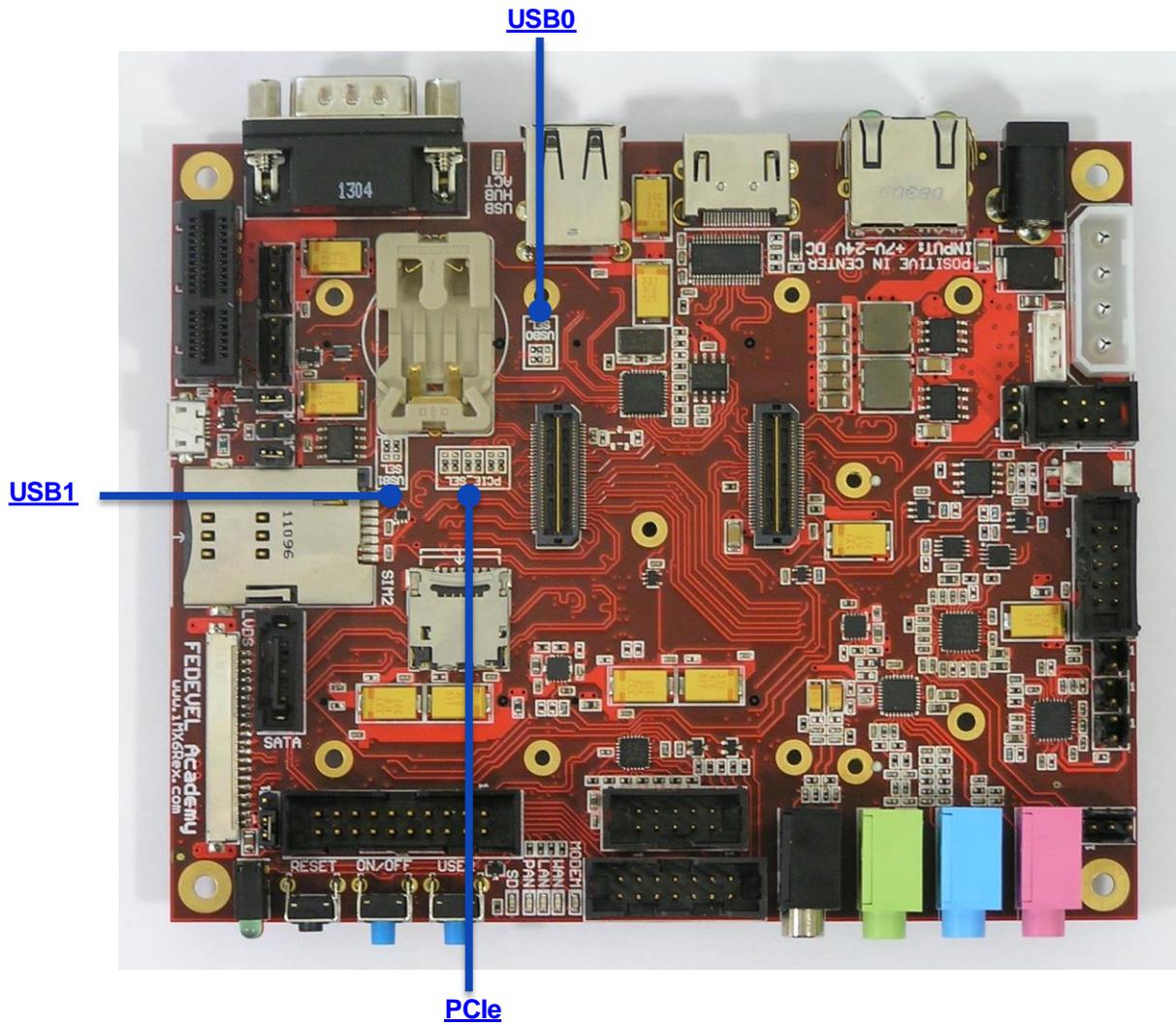
## SW3 – User button

**Description:** The SW3 button is a general purpose button and can be used by your application. This signal is also available on the System header ([J33](#)).

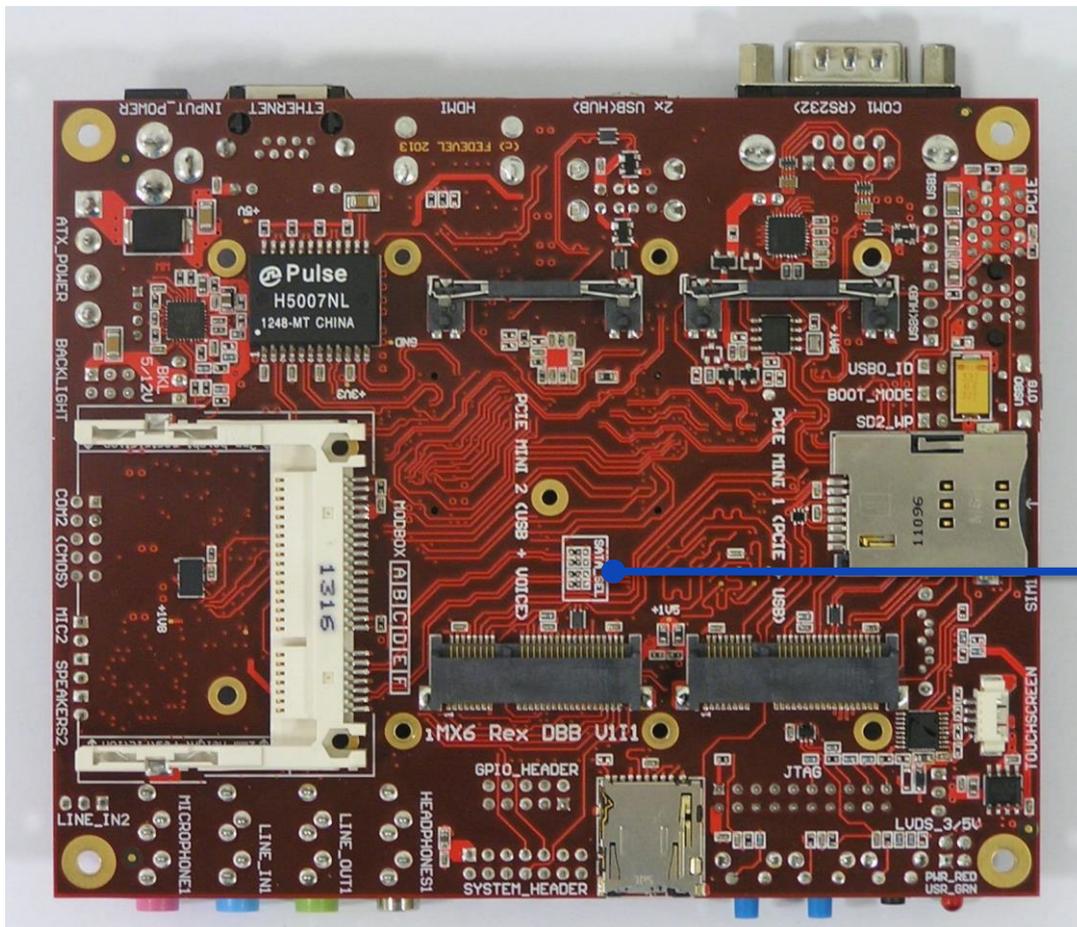


## Peripheral selection resistors - Top

The iMX6 Rex board includes several optional resistors, which can route selected peripherals to different type of connector (e.g. SATA can be routed to a standard SATA connector or CFAST slot)



## Peripheral selection resistors - Bottom



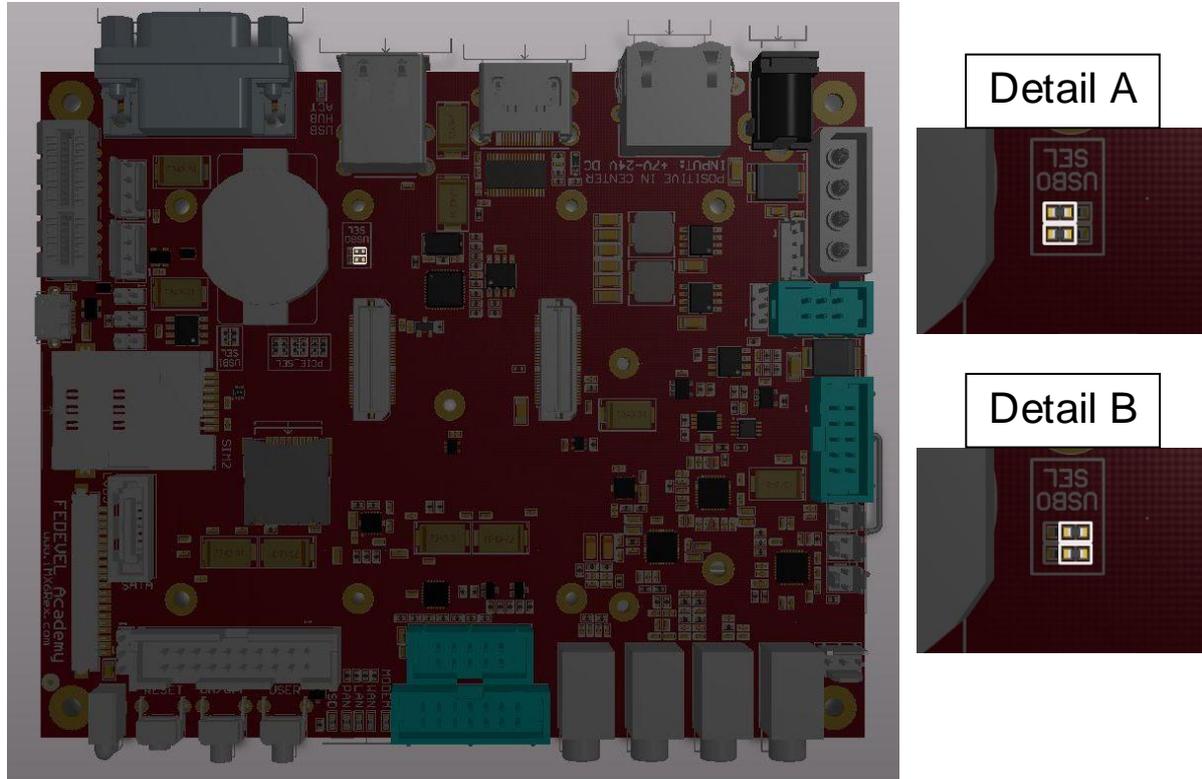
SATA

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<b>Ref. Number</b>	<b>Function</b>	<b>Page</b>
<u>USB0</u>	USB0 Resistors Selection	82
<u>USB1</u>	USB1 Resistors Selection	83
<u>PCIe</u>	PCIe Resistors Selection	84
<u>SATA</u>	SATA Resistors Selection	85

## USB0 Resistors Selection

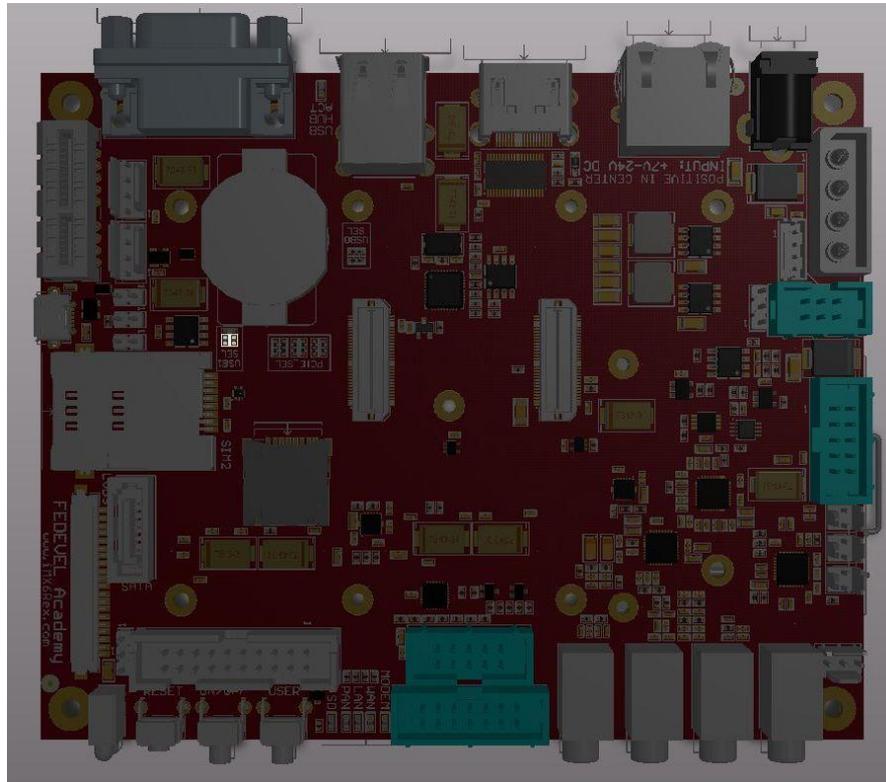
**Description:** The USB0 interface can be routed either to the USB AB Micro connector ([J21](#)). When the USB Hub is selected, the USB stacked connector ([J22](#)), the USB Header ([J23](#)) and the PCIe Mini Card 2 ([J9](#)) can be used.



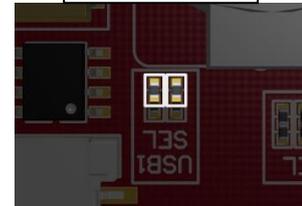
Detail	Resistors fitted	USB0 connected to
A	R62, R65	USB AB Micro connector ( <a href="#">J21</a> )
B	R63, R67	USB Hub (default)

## USB1 Resistors Selection

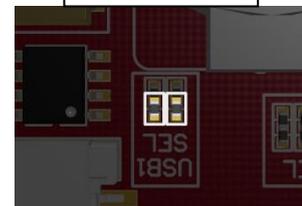
**Description:** The USB1 interface can be routed either to the PCIe Mini Card 1 ([J4](#)) or to the USB Header ([J20](#)).



Detail A



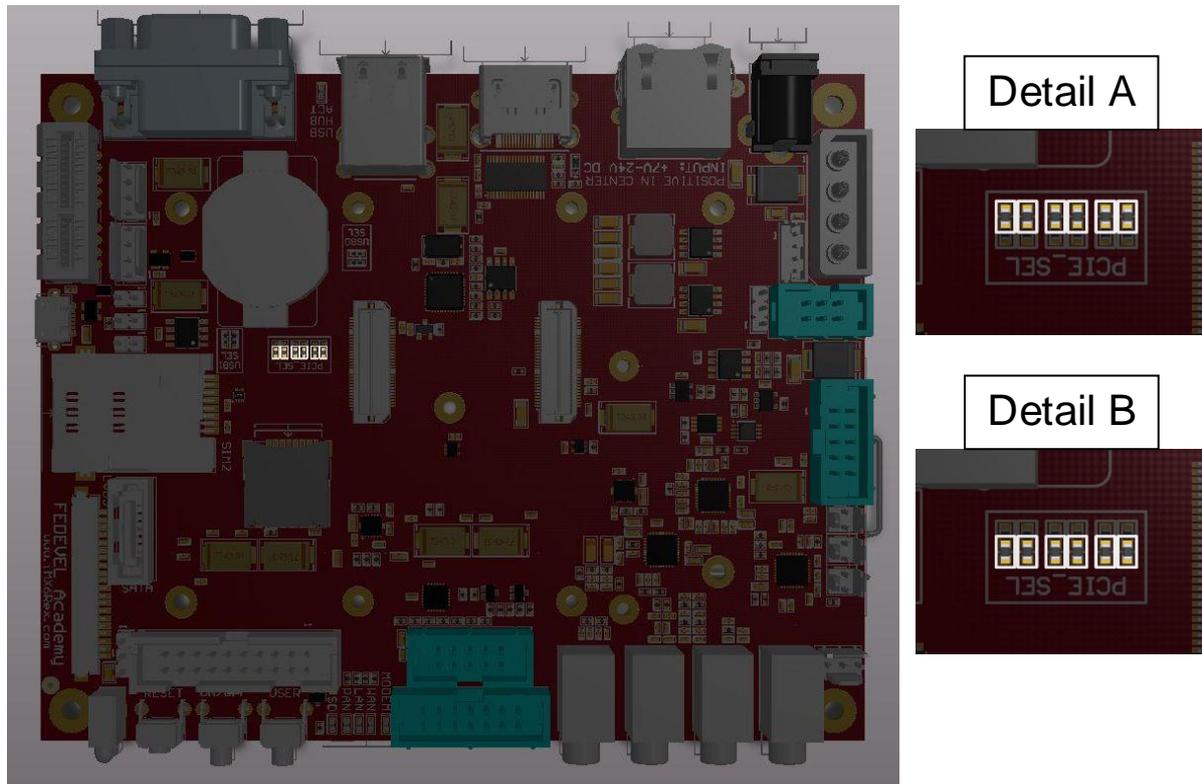
Detail B



Detail	Resistors fitted	USB1 connected to
A	R64, R68	USB Header ( <a href="#">J20</a> )
B	R66, R69	PCIe Mini Card 1 ( <a href="#">J4</a> ) (default)

## PCIe Resistors Selection

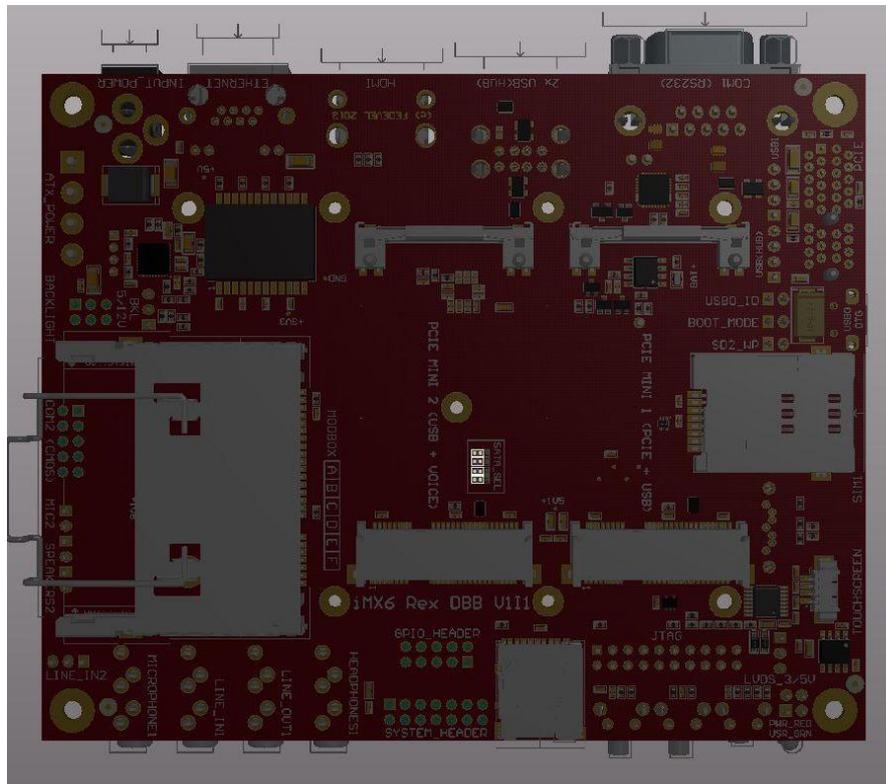
**Description:** The PCIe interface can be routed either to the PCIe x1 Slot ([J3](#)) or to the PCIe Mini Card 1 ([J4](#)).



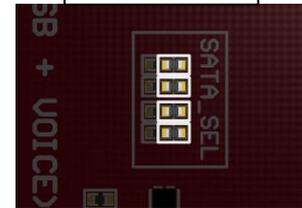
Detail	Resistors fitted	PCIe connected to
A	R1, R3 R5, R8 R10, R14	PCIe x1 Slot ( <a href="#">J3</a> )
B	R2, R4 R7, R9 R12, R16	PCIe Mini Card 1 ( <a href="#">J4</a> ) (default)

## SATA Resistors Selection

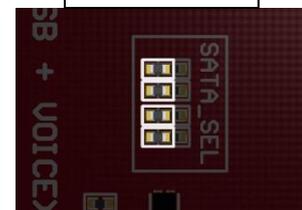
**Description:** The SATA interface can be routed either to the SATA Connector ([J14](#)) or to the CFAST Socket ([J15](#)).



Detail A



Detail B



Detail	Resistors fitted	SATA connected to
A	R36, R38 R40, R42	SATA Connector ( <a href="#">J14</a> )
B	R37, R39 R41, R43	CFAST Socket ( <a href="#">J15</a> ) (default)