

EDM1-FAIRY

CARRIER BOARD

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2. Revision

Revision	Date	Description	Created by
0.90	7/30/2013	Preliminary Release	TechNexion
0.91	9/24/2013	Update photo, schematic	TechNexion

3. Care and maintenance

3.1. General

Your device is a product of superior design and craftsmanship and should be treated with care. The following suggestions will help you.

- Keep the device dry. Precipitation, humidity, and all types of liquids or moisture can contain minerals that will corrode electronic circuits. If your device does get wet, allow it to dry completely.
- Do not use or store the device in dusty, dirty areas. Its moving parts and electronic components can be damaged.
- Do not store the device in hot areas. High temperatures can shorten the life of electronic devices, damage batteries, and warp or melt certain plastics.
- Do not store the device in cold areas. When the device returns to its normal temperature, moisture can form inside the device and damage electronic circuit boards.
- Do not attempt to open the device.
- Do not drop, knock, or shake the device. Rough handling can break internal circuit boards and fine mechanics.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Do not paint the device. Paint can clog the moving parts and prevent proper operation.
- Unauthorized modifications or attachments could damage the device and may violate regulations governing radio devices.

These suggestions apply equally to your device, battery, charger, or any enhancement. If any device is not working properly, take it to the nearest authorized service facility for service.

3.2. Regulatory information

Disposal of Waste Equipment by Users in Private Household in the European Union



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.



We hereby declare that the product is in compliance with the essential requirements and other relevant provisions of European Directive 1999/5/EC (radio equipment and telecommunications terminal equipment Directive).

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The Compliance of RoHS /REACH

We warrant that all the materials, products and components which provided by TechNexion to customer comply according directive EU RoHS (2002/95/EC), RoHS II amendment, REACH (1907/2006/ED) SVHC and Annex 17, JIG-101, as follows:

Cadmium (Cd)	: Under 100ppm
Lead (Pb)	: Under 1000ppm
Mercury (Hg)	: Under 1000ppm
Hexavalent Chromium (Cr6)	: Under 1000ppm
PBB	: Under 1000ppm
PBDE (include DecaBDE)	: Under 1000ppm

RoHS Compliance Statement

We are aware of above directive and our product can meet the specification requirements above.



Company Stamp

**Federal Communications Commission (FCC) Unintentional emitter per FCC Part 15**

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment to an outlet on a different circuit from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.



WARNING! To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

4. Introduction

The EDM1-FAIRY is a Carrier Board based on the EDM Type 1 standard..

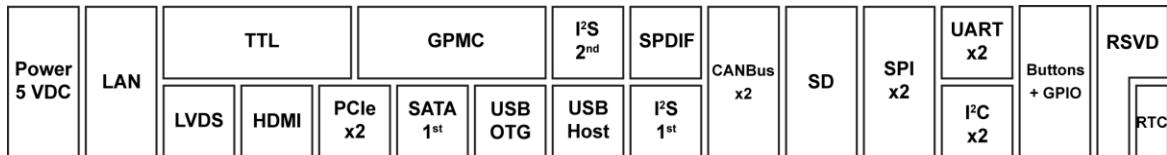


Figure 1: supported interfaces on the EDM1-FAIRY Carrier Board

Support of certain interfaces depend on the System on Module that is used in combination with the EDM1-FAIRY Carrier Board.

The EDM modules are typically being used as building blocks for portable and stationary embedded systems. The core CPU and support circuits, including DRAM, boot flash, power sequencing, CPU power supplies, Gigabit Ethernet and display interfaces are concentrated on the module. The modules are used with application specific carrier boards that implement other features such as audio CODECs, touch controllers, sensors and etcetera.

The modular approach offered by the EDM standard gives your project scalability, fast time to market and upgradability while reducing engineering risk and maintain a competitive total cost of ownership.

The SOM and its carrier board come in different versions, the user's guide is meant as a general guide for all these versions. Pictures and details of the device can differ from the actual purchased product. All specifications are subject to change without notice.

Visit our website (www.technexion.com) for more details, to download this user guide or to see other information.

5. Getting started

5.1. Contents of the EDM1FAIRYSTART



1	EDM1-FAIRY Carrier Board	9	4 standoffs
2	12V DC Power adapter	10	4 bolts for the standoffs
3	Converter for the power adapter	11	DE9 cable for CAN BUS and COM1 (3x)
4	BS 1363 (Type G) power cord (UK)	12	SATA Data cable
5	CEE 7/4 (Type F) Power cord (EU)	13	SATA power cable
6	NEMA 5-15 (Type B) power cord (US)	14	EDM-MNF-BOOT PCB
7	USB 3.0 A to micro-USB B cable	15	RTC-battery
8	4 screws to mount the System on Module		

Table 1: contents of the EDM1FAIRYSTART

5.2. Additional products and accessories

System on Module

A EDM Type 1 System on Module is required to create fully functional development kit. The EDM1-FAIRY carrier board is fully compatible with EDM Type1 System on modules.

Display

A HDMI monitor with a good HDMI cable can be used as a Display. Other Displays are also available, for example TDHJ070NA4RESKIT, which is a 7"LVDS Display with 4 wire resistive touch screen.

5.3. EDM-MNF-BOOT PCB

By default the board will boot first from iNAND / NAND Flash.

To force the board to boot from SD-card, the EDM-MNF-BOOT PCB should be inserted in the MNF Connector as shown in Figure 2 (white dot at orange arrow; jumpers facing inward). The boot order will change and it will first boot from SD-card.

The Jumper settings on the EDM-MNF-BOOT PCB depend on the System on Module, and can be found in the respective System on Module User guide.

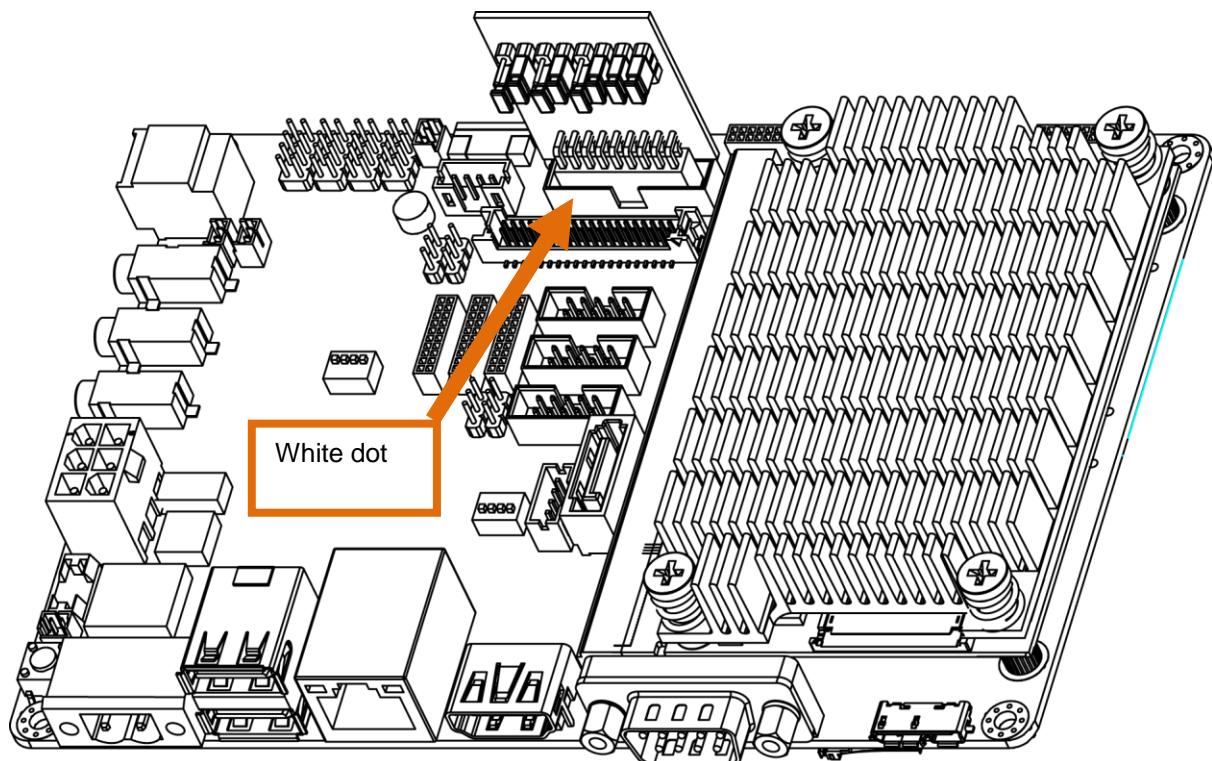


Figure 2: the EDM-MNF-BOOT PCB inserted in the MNF connector

5.4. Battery for RTC

The power for the RTC is supplied by a CR2032 battery which can be connected to the J8 connector on the carrier board.

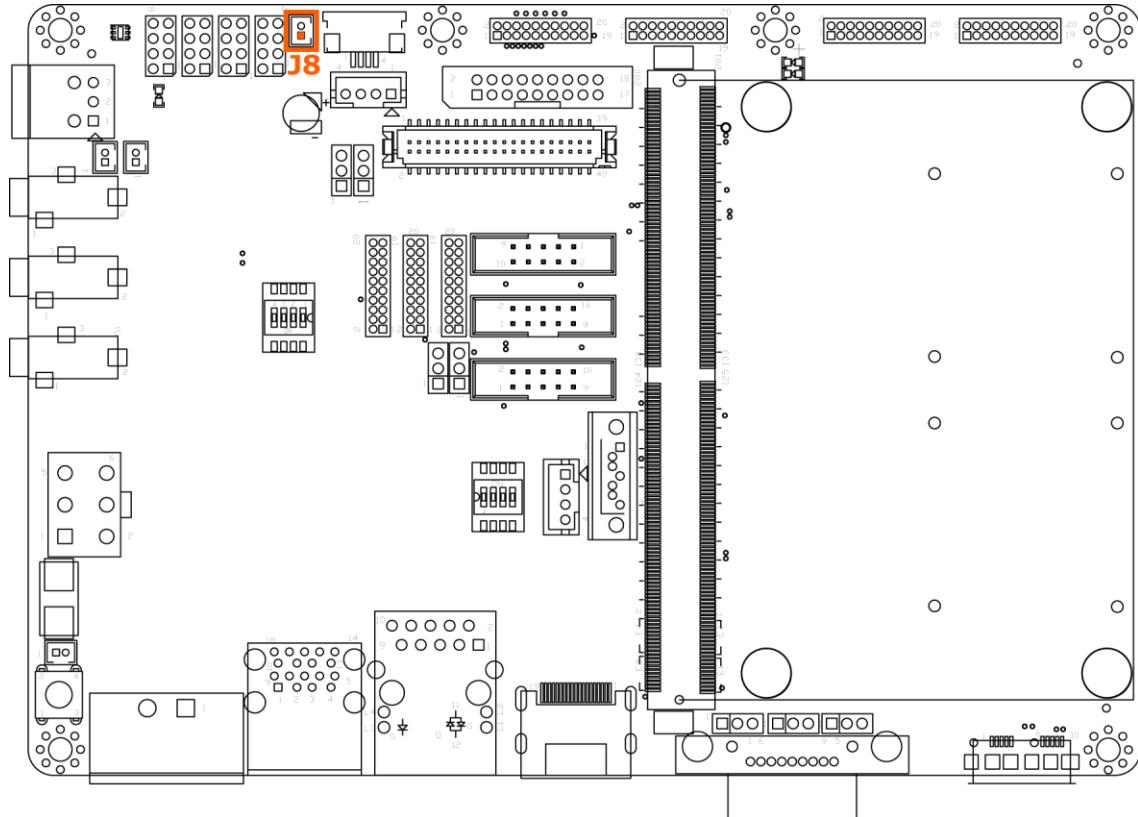


Figure 3: Location of the RTC battery connector



Figure 4: CR2032 Battery for RTC

5.5. Mounting an EDM Type 1 System on Module

EDM System on modules are sold separately in Evaluation Start Kits. Ensure that your module is an EDM Type 1 System on Module. Modules that require a heat sink will have them included inside the Evaluation Start Kit. In case the evaluation start kit does not include a heat sink, steps 1 till 4 can be skipped.

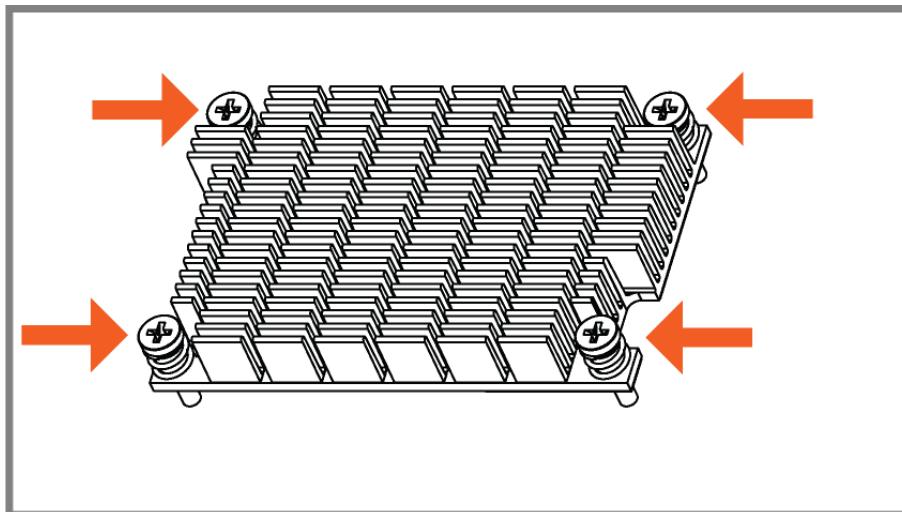


Figure 5: Step 1 - Insert the screws

Insert the screws (with springs), in the four corner holes of the heat sink.

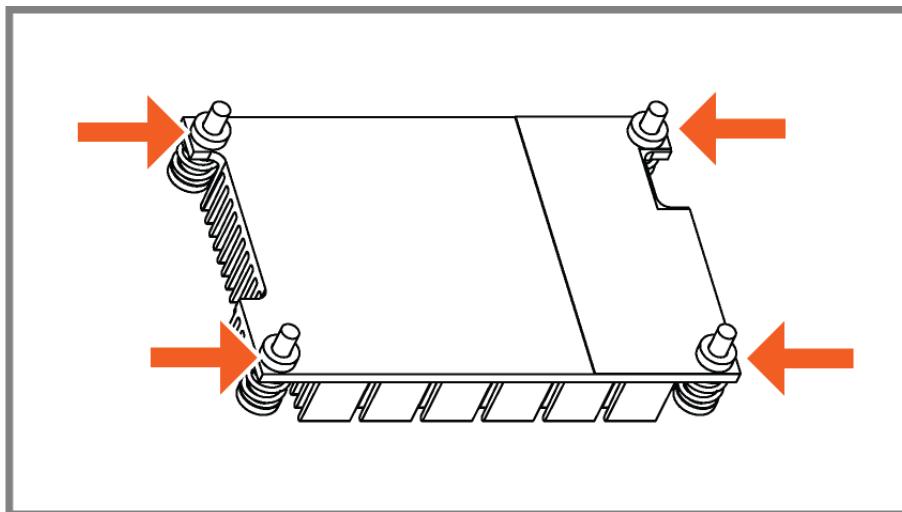


Figure 6: Step 2 - Mount the washers

Turn the assembly upside down. Mount the four washers on the screws.

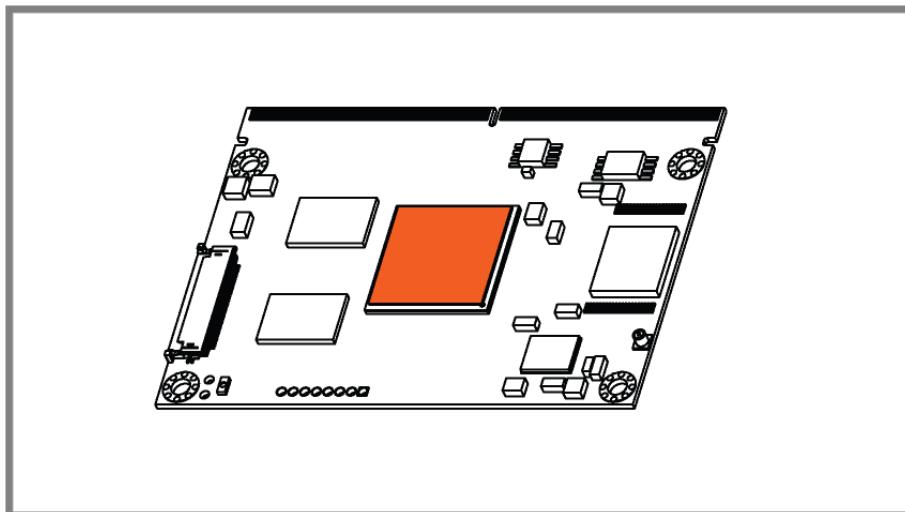


Figure 7: Step3 - Place the thermopad (on the processor)

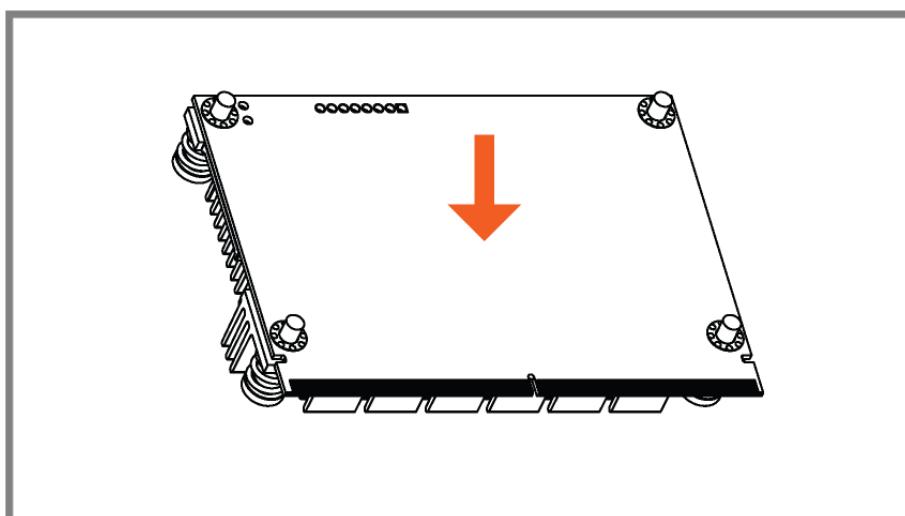


Figure 8: Step4 - Place the module on the heat sink, and turn the assembly around.

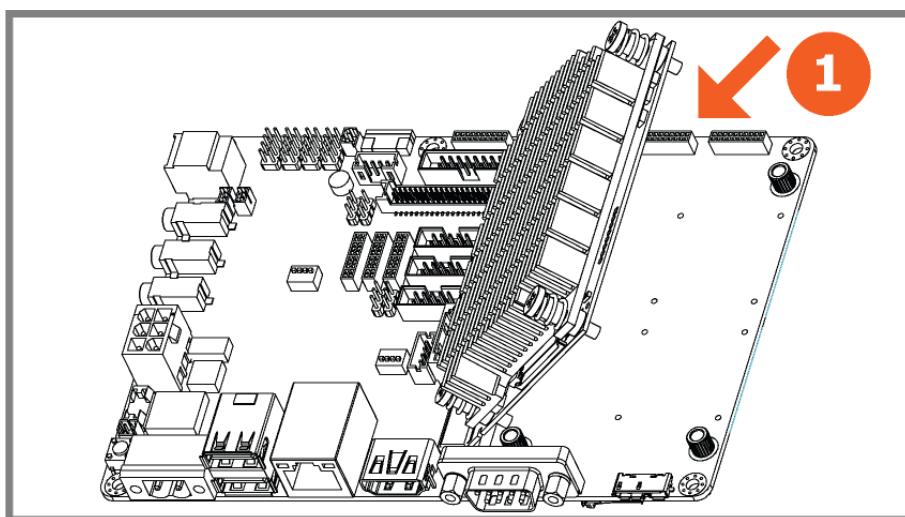


Figure 9: Step5 - Insert the module in the carrier board

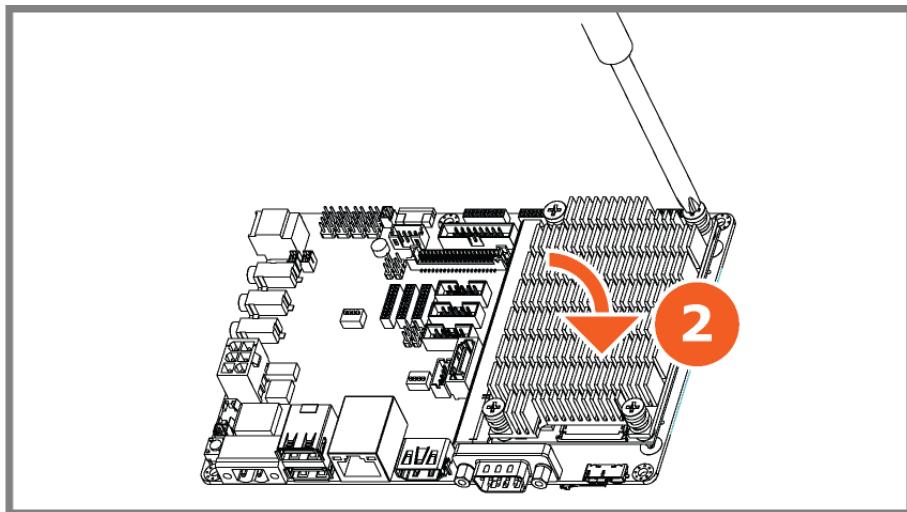


Figure 10: Step6 - Press the module down and fasten the screws

5.6. Mounting the standoffs

The standoffs should be mounted in the corners of the carrier board to place the board stable on a flat surface. This will also allow airflow under the carrier board.

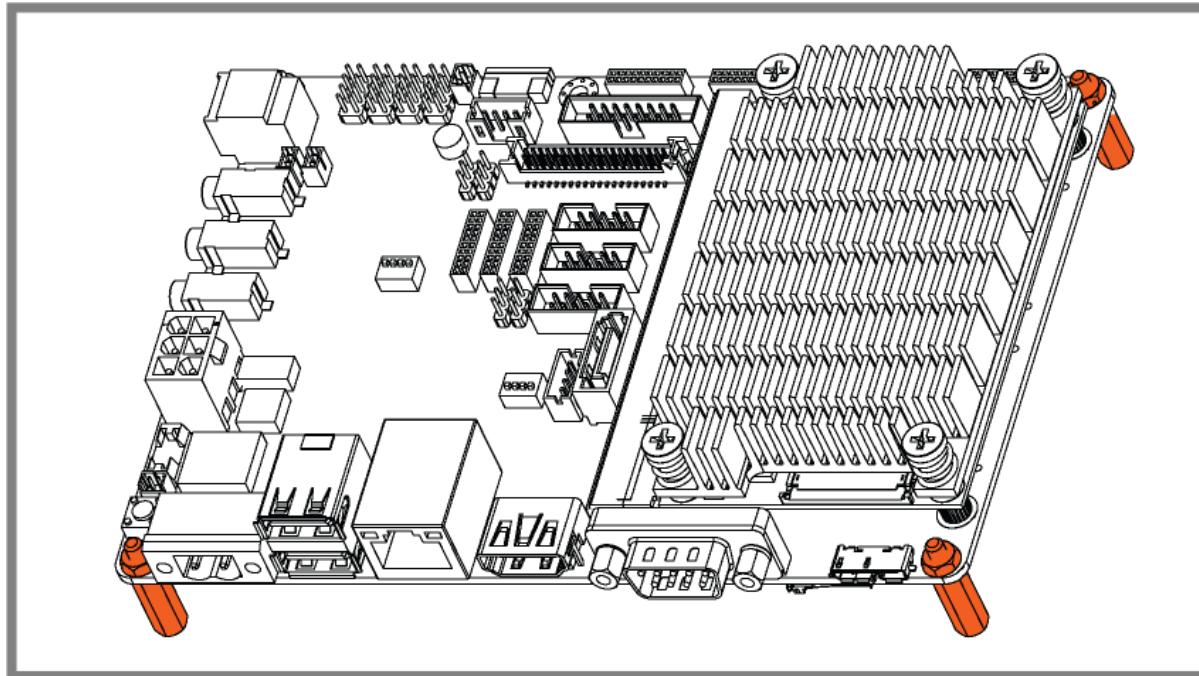


Figure 11: standoffs and bolts mounted in the four corners of the carrier board

5.7. Connecting a null modem cable to COM1

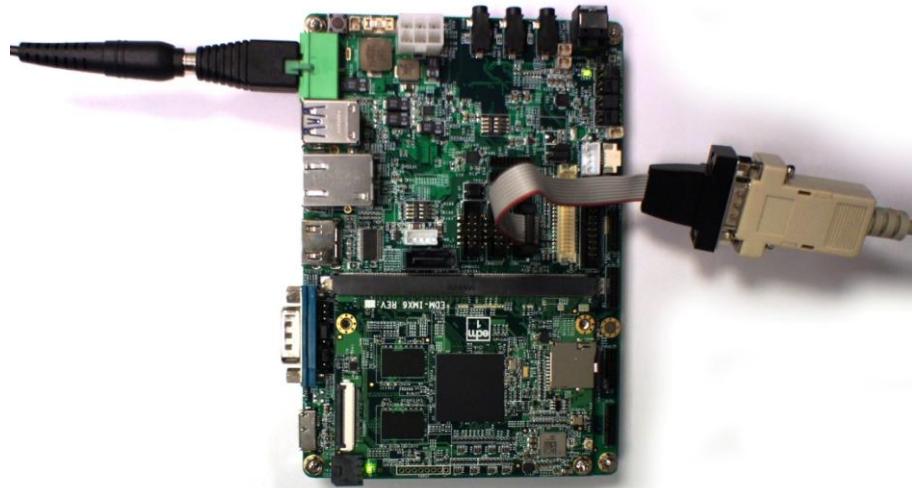


Figure 12: The terminal cable connected with the DE9 cable to the COM1 (UART1) connector.

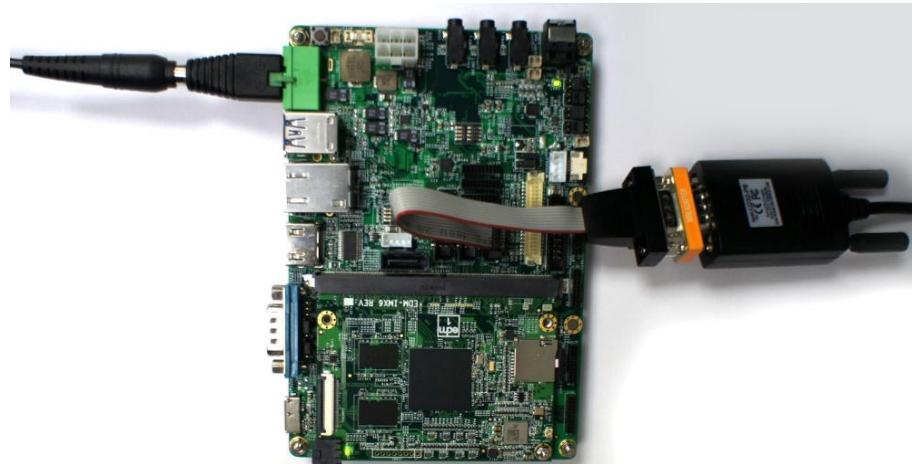


Figure 13: The cable (RS-232 to USB) with null-modem-block connected with the DB9 cable to the COM1 (UART1) connector.

Start PuTTY (a free telnet/ ssh client) on your computer and make sure the “Options controlling local serial lines” are as in Figure 14:

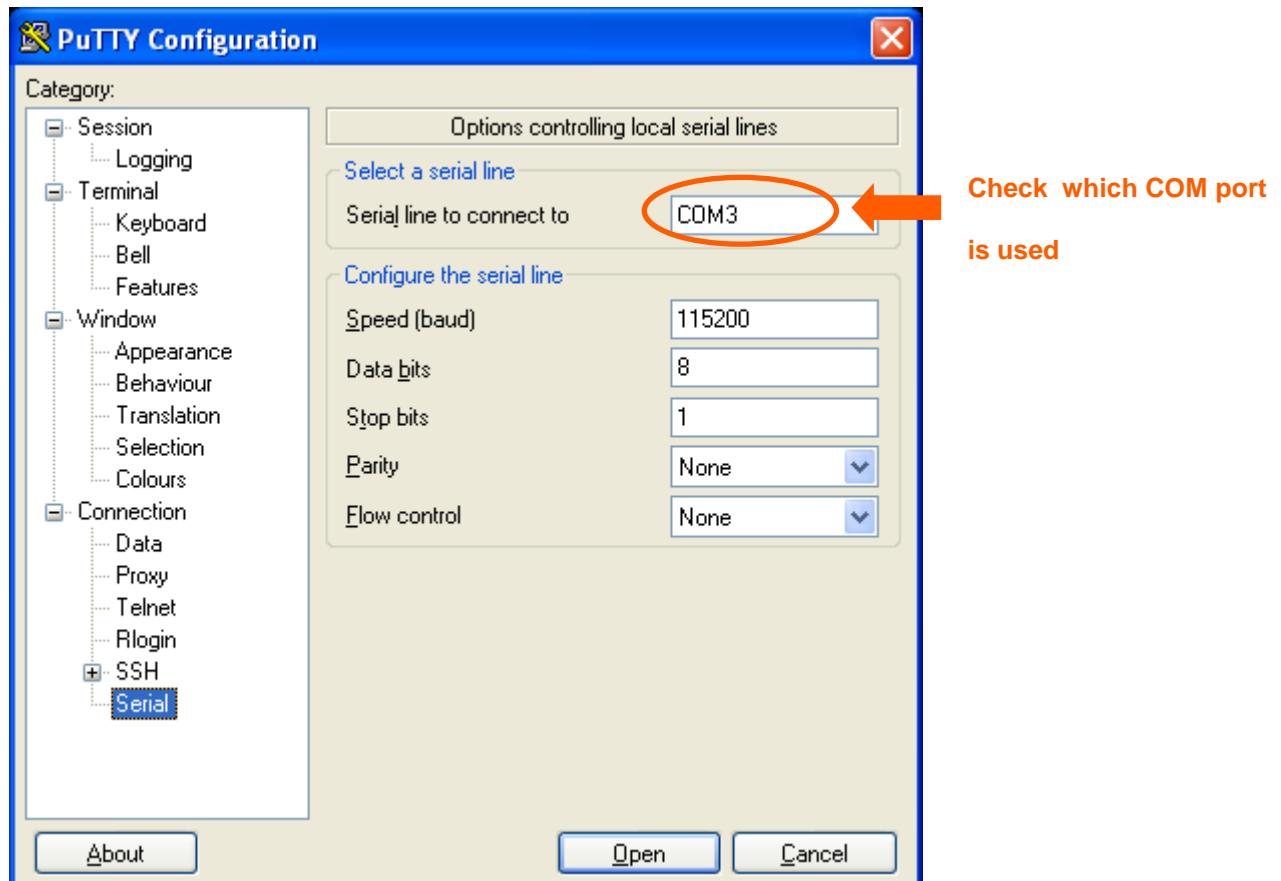


Figure 14: Settings

For computers running a Windows Operating System, more steps (see Figure 15 to Figure 18) might be required in order to check which serial line is used (see orange circle in Figure 14):



Figure 15: Right click on “My Computer” and select Properties

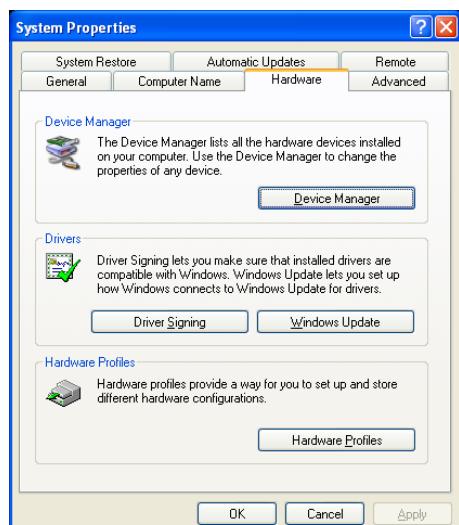


Figure 16: Go to the hardware tab and select “Device manager”

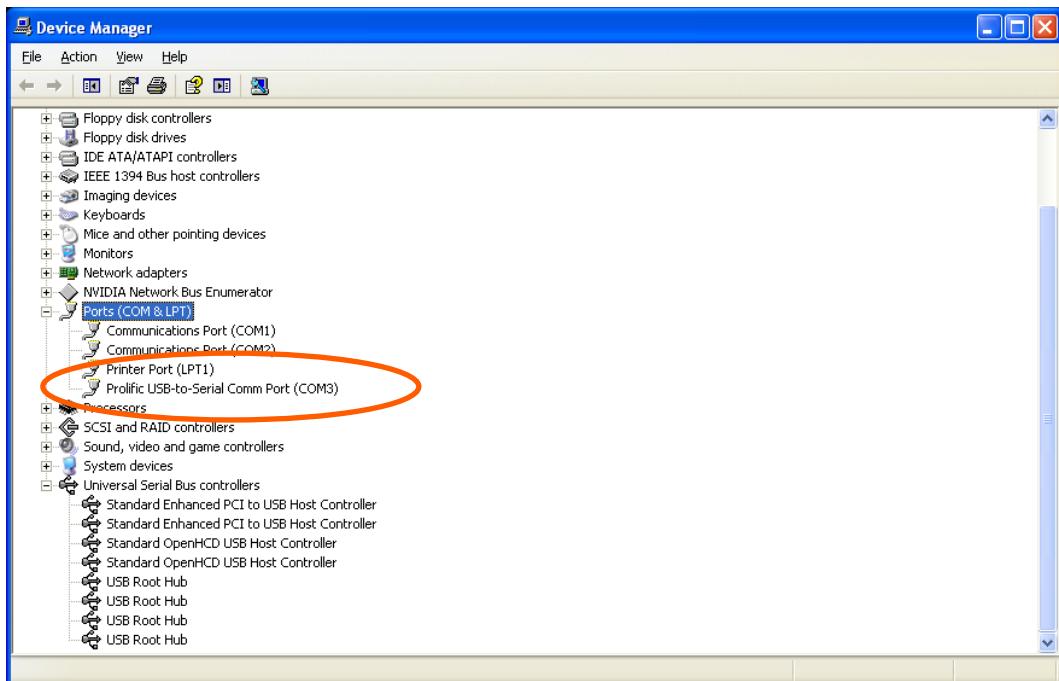


Figure 17: Under Ports (COM & LPT) you will see the board connected with the null modem cable (in this picture COM3), this means in Putty the serial line should be changed into COM3.

- Go to Session and check if “specify the destination you want to connect to “ is on Serial (See Figure 18)
- Press open and a window will pop up (see Figure 19)

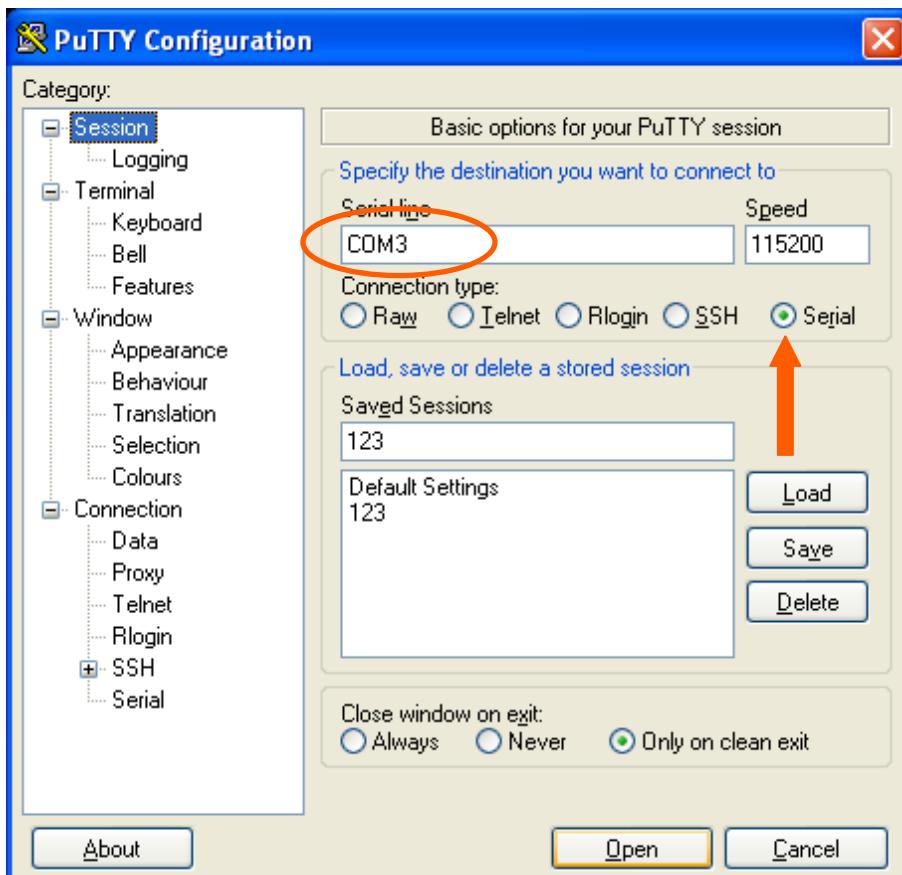


Figure 18: check if serial is selected and then select open



Figure 19: PuTTY terminal window

- You will now be able to see what is going on during the installation.
- If nothing happens then please check the settings and check if the cable is correctly connected to the UART1/COM1 pin header.

5.8. Block diagram

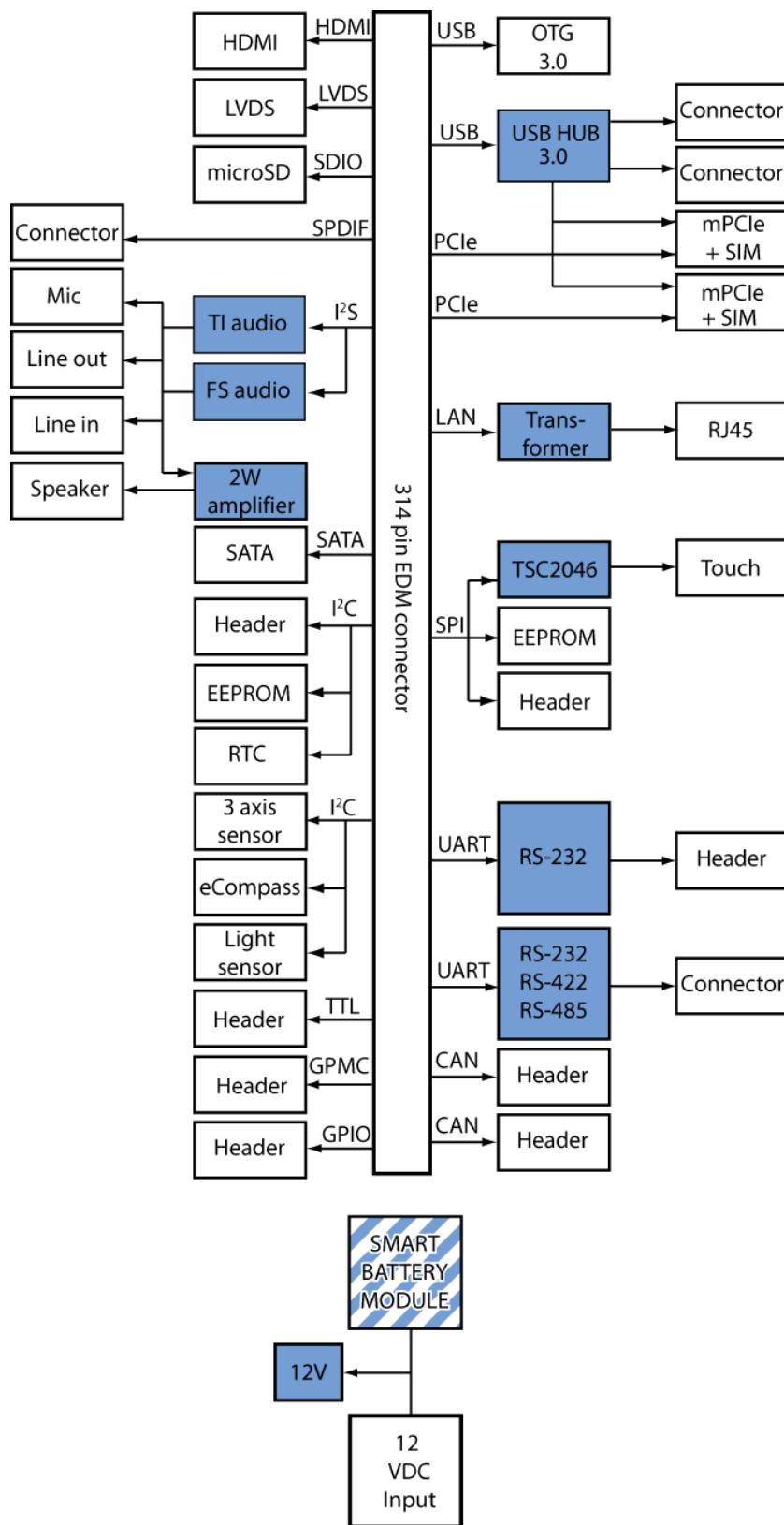


Figure 20: Block diagram of the EDM1-FAIRY Carrier Board

5.9. EDM1-FAIRY Carrier Board Overview

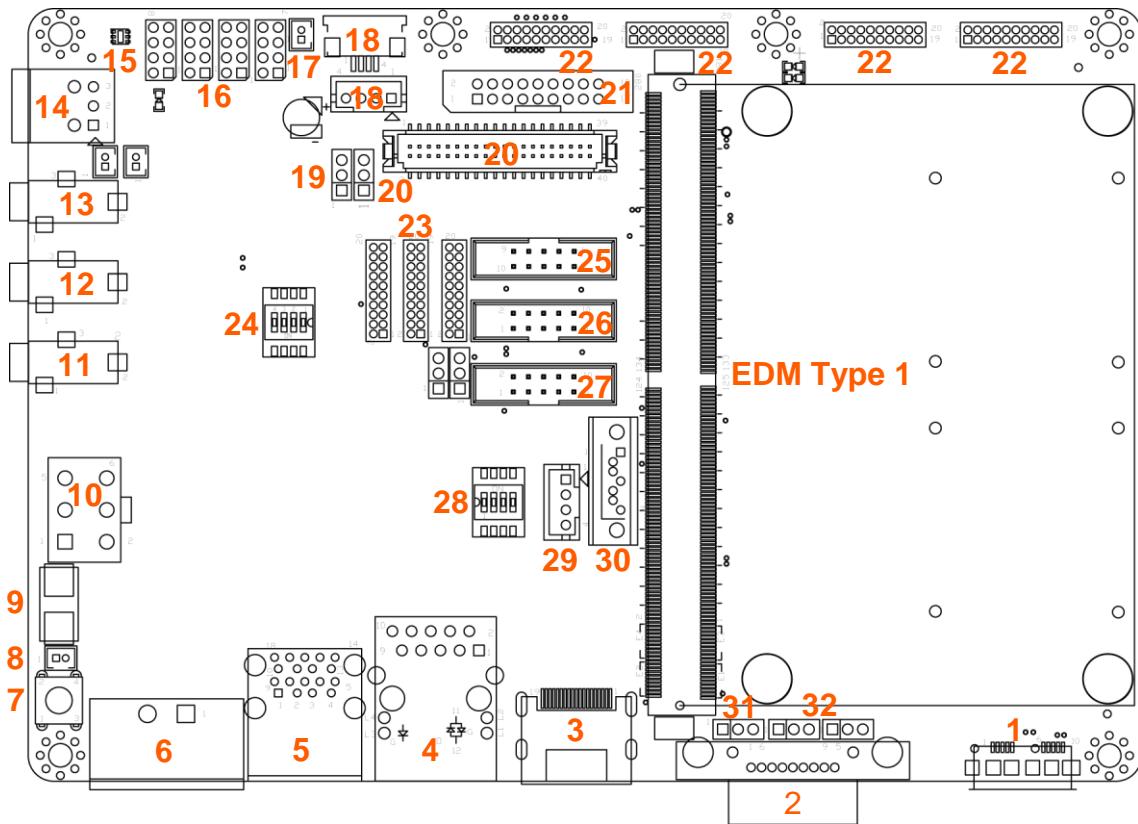


Figure 21: EDM1-FAIRY top view

Top view

#	function	#	function
1	USB-OTG 3.0	17	RTC battery connector
2	COM 2: (RS232/422/485)	18	4 wire touch connectors
3	HDMI connector	19	4 wire touch ON/OFF jumper
4	RJ45 Gigabit LAN connector	20	LVDS connector and 6/8 bit selection jumper
5	USB Host (2x)	21	MIF connector
6	Power connector 12V DC (Phoenix Combicon MSTB 2.5)	22	Expansion connectors
7	Reset switch	23	GPMC connectors
8	power switch connector	24	audio select switch SW2
9	Fuse	25	COM1 connector
10	Smart battery connector	26	CAN BUS2 connector
11	Microphone	27	CAN BUS1 connector
12	Line in	28	COM2/ audio selection switch
13	Line out	29	SATA power connector
14	S/P Dif	30	SATA data connector
15	light sensor	31	USB-OTG jumper to select client/host
16	I2C selection jumper	32	WAN ON/ OFF Jumpers for mPCIe slots

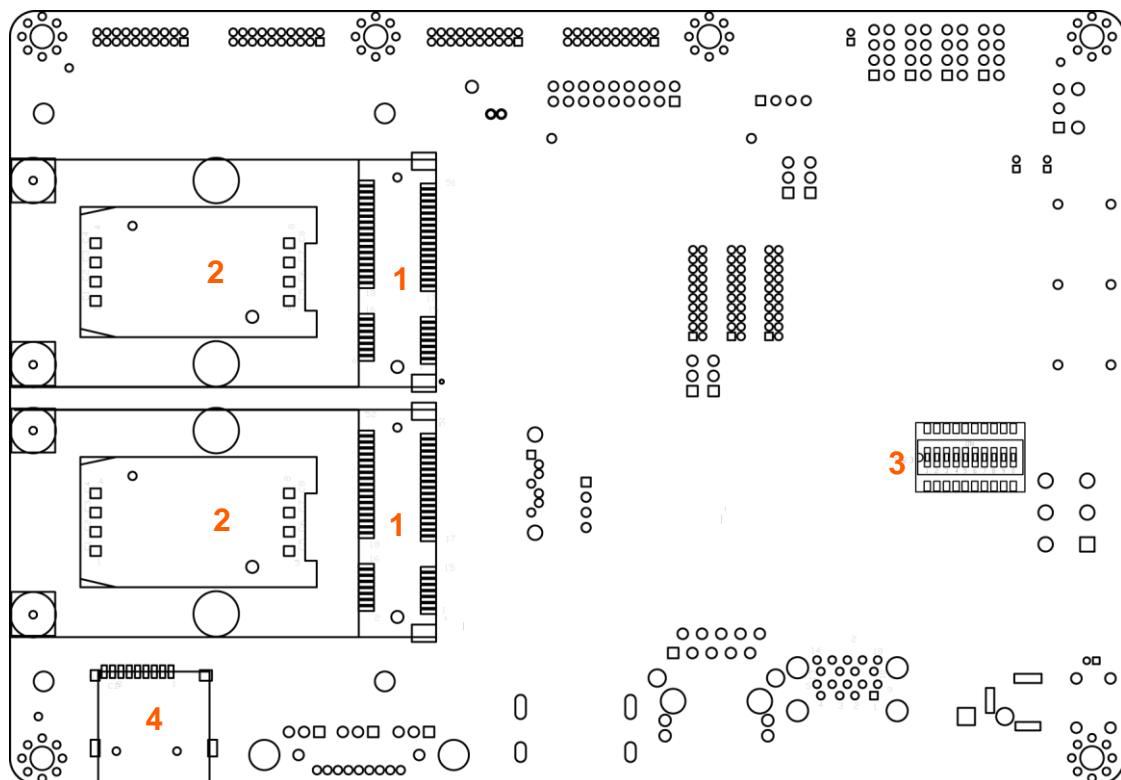


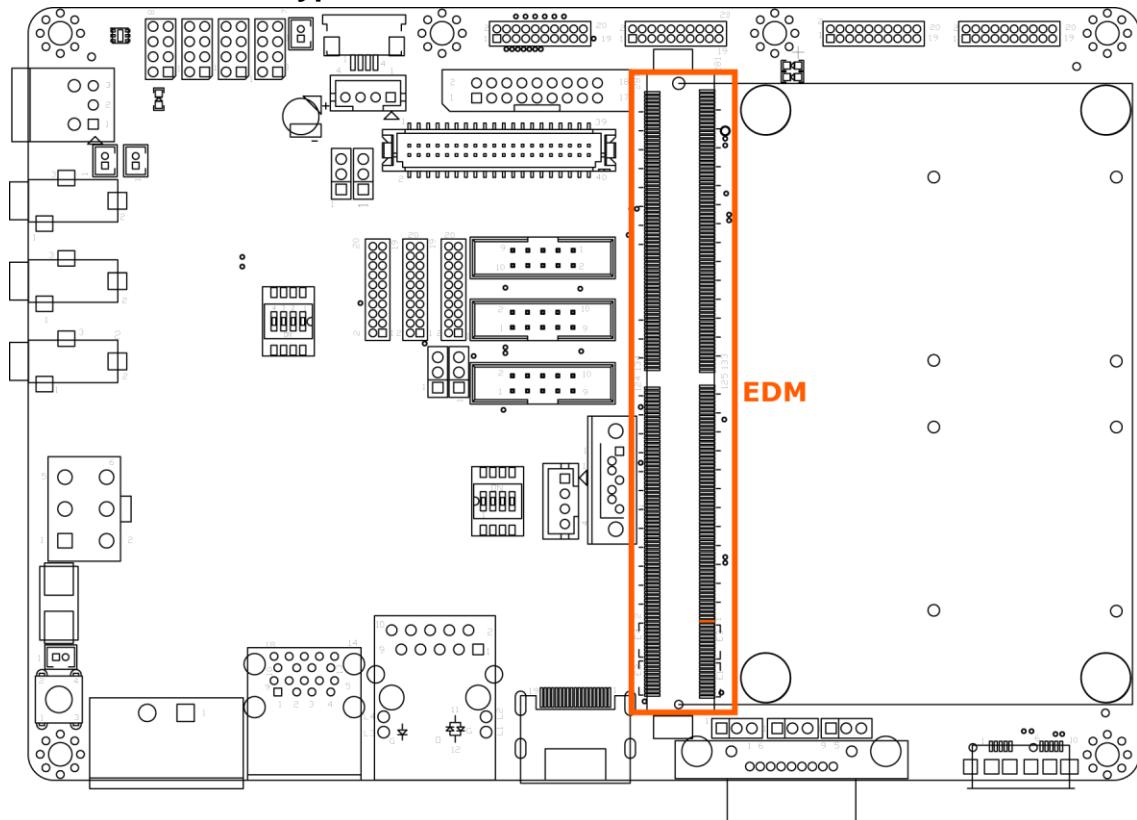
Figure 22: EDM1-FAIRY bottom view

Bottom view

#	function	#	function
1	Mini PCIe connector	3	Audio select switch
2	SIM card slot	4	micro SD-card slot

6. Connector - Pin outs

6.1. EDM Type 1 Connector



The EDM connector 314 pin assignment for type 1 are listed in the table below.

Pin #	EDM	Signal	V	I/O	Description
E1_1	NC	5VSB	5VSB	P	Standby Power Supply 5VDC ± 5%
E2_1	NC	5VSB	5VSB	P	Standby Power Supply 5VDC ± 5%
E1_2		VCC	5V	P	Power Supply 5VDC ± 5%
E2_2		VCC	5V	P	Power Supply 5VDC ± 5%
E1_3		VCC	5V	P	Power Supply 5VDC ± 5%
E2_3		VCC	5V	P	Power Supply 5VDC ± 5%
E1_4		VCC	5V	P	Power Supply 5VDC ± 5%
E2_4		VCC	5V	P	Power Supply 5VDC ± 5%
E1_5		VCC	5V	P	Power Supply 5VDC ± 5%
E2_5		VCC	5V	P	Power Supply 5VDC ± 5%
E1_6		VCC	5V	P	Power Supply 5VDC ± 5%
E2_6		VCC	5V	P	Power Supply 5VDC ± 5%
E1_7		VCC	5V	P	Power Supply 5VDC ± 5%
E2_7		VCC	5V	P	Power Supply 5VDC ± 5%
E1_8		VCC	5V	P	Power Supply 5VDC ± 5%
E2_8		VCC	5V	P	Power Supply 5VDC ± 5%
E1_9		VCC	5V	P	Power Supply 5VDC ± 5%
E2_9		VCC	5V	P	Power Supply 5VDC ± 5%
E1_10		VCC	5V	P	Power Supply 5VDC ± 5%
E2_10		VCC	5V	P	Power Supply 5VDC ± 5%
E3_1		GND	GND	P	Ground
E4_1		GND	GND	P	Ground
E3_2		GBE_MDI2+	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 2 positive signal

Pin #	EDM	Signal	V	I/O	Description
E4_2		GBE_MDI0+	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 0 positive signal
E3_3		GBE_MDI2-	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 2 negative signal
E4_3		GBE_MDI0-	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 0 negative signal
E3_4		GND	GND	P	Ground
E4_4		GND	GND	P	Ground
E3_5		GBE_MDI3+	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 3 positive signal
E4_5		GBE_MDI1+	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 1 positive signal
E3_6		GBE_MDI3-	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 3 negative signal
E4_6		GBE_MDI1-	LAN	I/O	Gigabit Ethernet Media Dependent Interface (MDI) differential pair 1 negative signal
E3_7		LED1_ACT	CMOS 3.3V	O	Gigabit Ethernet LED Activity indicator
E4_7		GND	GND	P	Ground
E3_8		GND	GND	P	Ground
E4_8		LED1_nLink100	CMOS 3.3V	O	Gigabit Ethernet 100Mbit/sec LED link indicator
E3_9		LVDS_A0-	LVDS	O	LVDS primary channel differential pair 0 negative signal
E4_9		LED1_nLink1000	CMOS 3.3V	O	Gigabit Ethernet 1000Mbit/sec LED link indicator
E3_10		LVDS_A0+	LVDS	O	LVDS primary channel differential pair 0 positive signal
E4_10		GND	GND	P	Ground
1		GND	GND	P	Ground
2		LCD_D0	TTL	O	LCD Pixel Data bit 0
3		LVDS_A1-	LVDS	O	LVDS primary channel differential pair 1 negative signal
4		LCD_D1	TTL	O	LCD Pixel Data bit 1
5		LVDS_A1+	LVDS	O	LVDS primary channel differential pair 1 positive signal
6		GND	GND	P	Ground
7		GND	GND	P	Ground
8		LCD_D2	TTL	O	LCD Pixel Data bit 2
9		LVDS_A2-	LVDS	O	LVDS primary channel differential pair 2 negative signal
10		LCD_D3	TTL	O	LCD Pixel Data bit 3
11		LVDS_A2+	LVDS	O	LVDS primary channel differential pair 2 positive signal
12		GND	GND	P	Ground
13		GND	GND	P	Ground
14		LCD_D4	TTL	O	LCD Pixel Data bit 4
15		LVDS_A3-	LVDS	O	LVDS primary channel differential pair 3 negative signal
16		LCD_D5	TTL	O	LCD Pixel Data bit 5

Pin #	EDM	Signal	V	I/O	Description
17		LVDS_A3+	LVDS	O	LVDS primary channel differential pair 3 positive signal
18		GND	GND	P	Ground
19		GND	GND	P	Ground
20		LCD_D6	TTL	O	LCD Pixel Data bit 6
21		LVDS_ACLK-	LVDS	O	LVDS primary channel clock negative signal
22		LCD_D7	TTL	O	LCD Pixel Data bit 7
23		LVDS_ACLK+	LVDS	O	LVDS primary channel clock positive signal
24		GND	GND	P	Ground
25		GND	GND	P	Ground
26		LCD_D8	TTL	O	LCD Pixel Data bit 8
27		LVDS_ABL_CTRL	CMOS 3.3V	O	LVDS primary channel panel backlight control
28		LCD_D9	TTL	O	LCD Pixel Data bit 9
29		LVDS_AEN	CMOS 3.3V	O	LVDS primary channel panel backlight enable
30		GND	GND	P	Ground
31		LVDS_AVDD_EN	CMOS 3.3V	O	LVDS primary channel panel power enable
32		LCD_D10	TTL	O	LCD Pixel Data bit 10
33	NC	eDP0_SELFTEST	CMOS 3.3V	I	Embedded Display Port Detection pin
34		LCD_D11	TTL	O	LCD Pixel Data bit 11
35	NC	eDP0_HPD	CMOS 3.3V	I	Embedded Display Port Hot Plug Detection pin
36		LCD_D12	TTL	O	LCD Pixel Data bit 12
37		I2C_SDA	CMOS 3.3V	I/O	Display ID DDC data line used for LVDS flat panel detection. If not used this can be assigned to General Purpose I ² C bus data line
38		LCD_D13	TTL	O	LCD Pixel Data bit 13
39		I2C_SCL	CMOS 3.3V	I/O	Display ID DDC clock line used for LVDS flat panel detection. If not used this can be assigned to General Purpose I ² C bus clock line
40		LCD_D14	TTL	O	LCD Pixel Data bit 14
41		GND	GND	P	Ground
42		GND	GND	P	Ground
43		HDMI1_CLK+	HDMI	O	HDMI differential pair clock positive signal
44		LCD_D15	TTL	O	LCD Pixel Data bit 15
45		HDMI1_CLK-	HDMI	O	HDMI differential pair clock negative signal
46		LCD_D16	TTL	O	LCD Pixel Data bit 16
47		GND	GND	P	Ground
48		GND	GND	P	Ground
49		HDMI1_D0+	HDMI	O	HDMI differential pair 0 positive signal
50		LCD_D17	TTL	O	LCD Pixel Data bit 17
51		HDMI1_D0-	HDMI	O	HDMI differential pair 0 negative signal
52		LCD_D18	TTL	O	LCD Pixel Data bit 18
53		GND	GND	P	Ground
54		GND	GND	P	Ground
55		HDMI1_D1+	HDMI	O	HDMI differential pair 1 positive signal
56		LCD_D19	TTL	O	LCD Pixel Data bit 19
57		HDMI1_D1-	HDMI	O	HDMI differential pair 1 negative signal

Pin #	EDM	Signal	V	I/O	Description
58		LCD_D20	TTL	O	LCD Pixel Data bit 20
59		GND	GND	P	Ground
60		GND	GND	P	Ground
61		HDMI1_D2+	HDMI	O	HDMI differential pair 2 positive signal
62		LCD_D21	TTL	O	LCD Pixel Data bit 21
63		HDMI1_D2-	HDMI	O	HDMI differential pair 2 negative signal
64		LCD_D22	TTL	O	LCD Pixel Data bit 22
65		GND	GND	P	Ground
66		GND	GND	P	Ground
67		HDMI1_HPD DP1_HPD	CMOS 3.3V	I	HDMI/DP Hot plug detection signal that serves as an interrupt request
68		LCD_D23	TTL	O	LCD Pixel Data bit 23
69	NC	HDMI1_CAD	HDMI	I/O	Cable Adaptor Detect
70		LCD_CLK	TTL	O	LCD Pixel Clock
71		HDMI1_CEC	HDMI	I/O	HDMI Consumer Electronics Control
72		LCD_HSYNC	TTL	O	LCD Horizontal Synchronization
73		I2C_SCL	CMOS 5V	I/O	Display ID DDC data line used for HDMI detection. If not used this can be assigned to General Purpose I ² C bus clock line
74		LCD_VSYNC	TTL	O	LCD Vertical Synchronization
75		I2C_SDA	CMOS 5V	I/O	Display ID DDC data line used for HDMI detection. If not used this can be assigned to General Purpose I ² C bus data line
76		LCD_BKLEN	TTL	O	LCD backlight control
77		GND	GND	P	Ground
78		LCD_DRD_Y	TTL	O	LCD dot enable pin signal
79		PCIEB_CLK+	PCIE	O	PCI Express channel B clock differential pair positive signal
80		LCD_VDDEN	TTL	O	LCD Voltage On
81		PCIEB_CLK-	PCIE	O	PCI Express channel B clock differential pair negative signal
82		LCD_CNTRST	TTL	O	LCD Backlight Control
83		GND	GND	P	Ground
84		RSVD			Reserved
85		PCIEA_CLK+	PCIE	O	PCI Express channel A clock differential pair positive signal
86		GPMC_nCSA	CMOS 3.3V	O	GPMC Chip Select bit A
87		PCIEA_CLK-	PCIE	O	PCI Express channel A clock differential pair negative signal
88		GND	GND	P	Ground
89		GND	GND	P	Ground
90		GPMC_nCSB	CMOS 3.3V	O	GPMC Chip Select bit B
91		PCIEA_TX+	PCIE	O	PCI Express channel A Transmit output differential pair positive signal
92		GPMC_nCSC	CMOS 3.3V	O	GPMC Chip Select bit C
93		PCIEA_TX-	PCIE	O	PCI Express channel A Transmit output differential pair negative signal
94	NC	GND	GND	P	Ground
95		GND	GND	P	Ground
96		GPMC_nCSD	CMOS 3.3V	O	GPMC Chip Select bit D

Pin #	EDM	Signal	V	I/O	Description
97		PCIEA_RX+	PCIE	I	PCI Express channel A Receive input differential pair positive signal
98		GPMC_nCSE	CMOS 3.3V	O	GPMC Chip Select bit E
99		PCIEA_RX-	PCIE	I	PCI Express channel A Receive input differential pair negative signal
100		GND	GND	P	Ground
101		GND	GND	P	Ground
102		GPMC_WAIT	CMOS 3.3V	I	External indication of wait
103		PCIEB_TX+	PCIE	O	PCI Express channel B Transmit output differential pair positive signal
104		GPMC_WP	CMOS 3.3V	O	GPMC Write Protect / Enable
105		PCIEB_TX-	PCIE	O	PCI Express channel B Transmit output differential pair negative signal
106		GPMC_CLE	CMOS 3.3V	O	GPMC Lower Byte Enable. Also used for Command Latch Enable
107	NC	PCIE_PRST#	PCIE	I	PCI Express interface presence detection pin
108		GPMC_ALE	CMOS 3.3V	O	GPMC Address Valid or Address Latch Enable
109		PCIEB_RX+	PCIE	I	PCI Express channel B Receive input differential pair positive signal
110		GPMC_WE	CMOS 3.3V	I	GPMC Write Enable
111		PCIEB_RX-	PCIE	I	PCI Express channel B Receive input differential pair negative signal
112		GPMC_RE	CMOS 3.3V	O	GPMC Read Enable
113		PCIECLK_OEA	PCIE	O	PCI Express channel A hot plug detection signal
114	NC	RSVD			Reserved
115		PCIECLK_OEB	PCIE	O	PCI Express channel B hot plug detection signal
116		GPMC_A10	CMOS 3.3V	O	GPMC output address bit 10
117		PCIE_WAKE#	CMOS 3.3V	I	PCI Express Wake Event: Sideband wake signal asserted by components requesting wake up
118		GPMC_A9	CMOS 3.3V	O	GPMC output address bit 9
119		PCIE_RST#	CMOS 3.3V	O	PCI Express Reset signal for external devices
120		GPMC_A8	CMOS 3.3V	O	GPMC output address bit 8
121		GND	GND	P	Ground
122		GPMC_A7	CMOS 3.3V	O	GPMC output address bit 7
123		SATA1_RXP	SATA	I	Serial ATA channel 1 Receive differential pair positive signal
124		GND	GND	P	Ground
125		SATA1_RXN	SATA	I	Serial ATA channel 1 Receive differential pair negative signal
126		KEY			
127		KEY			
128		KEY			
129		KEY			

Pin #	EDM	Signal	V	I/O	Description
130		KEY			
131		KEY			
132		KEY			
133	NC	SATA1_nACT	SATA	I/O	Serial ATA LED. Open collector output pin driven during SATA command activity
134		GPMC_A6	CMOS 3.3V	O	GPMC output address bit 6
135		SATA1_TXP	SATA	O	Serial ATA channel 1 Transmit differential pair positive signal
136		GPMC_A5	CMOS 3.3V	O	GPMC output address bit 5
137		SATA1_TXN	SATA	O	Serial ATA channel 1 Transmit differential pair negative signal
138		GPMC_A4	CMOS 3.3V	O	GPMC output address bit 4
139		USB1_HUB_RST	USB	O	Universal Serial Bus carrier board hub reset pin
140		GPMC_A3	CMOS 3.3V	O	GPMC output address bit 3
141		USB2_OC	CMOS 3.3V	I	Over current detect input pin to monitor USB power over current
142		GPMC_A2	CMOS 3.3V	O	GPMC output address bit 2
143		StdB2_SSRX+	USB	I	Universal Serial Bus Superspeed receiver differential pair positive signal
144		GPMC_A1	CMOS 3.3V	O	GPMC output address bit 1
145		StdB2_SSRX-	USB	I	Universal Serial Bus Superspeed receiver differential pair negative signal
146		GPMC_D15	CMOS 3.3V	I/O	GPMC data bit 15
147		GND2_DRAIN	USB	P	Universal Serial Bus ground for signal return
148		GND	GND	P	Ground
149		StdB2_SSTX+	USB	O	Universal Serial Bus Superspeed transmitter differential pair positive signal
150		GPMC_D14	CMOS 3.3V	I/O	GPMC data bit 14
151		StdB2_SSTX-	USB	O	Universal Serial Bus Superspeed transmitter differential pair negative signal
152		GPMC_D13	CMOS 3.3V	I/O	GPMC data bit 13
153		GND	GND	P	Ground
154		GND	GND	P	Ground
155		USB2_OTG_ID	USB	I	Universal Serial Bus On-The-Go detection signal
156		GPMC_D12	CMOS 3.3V	I/O	GPMC data bit 12
157		USB2_D+	USB	I/O	Universal Serial Bus port 2 differential pair positive signal
158		GPMC_D11	CMOS 3.3V	I/O	GPMC data bit 11
159		USB2_D-	USB	I/O	Universal Serial Bus port 2 differential pair negative signal

Pin #	EDM	Signal	V	I/O	Description
160		GPMC_D10	CMOS 3.3V	I/O	GPMC data bit 10
161		USB2_VBUS	5V	I/O	Universal Serial Bus port 2 power
162		GPMC_D9	CMOS 3.3V	I/O	GPMC data bit 9
163		USB2_PWR_EN	USB	O	Universal Serial Bus power enable
164		GPMC_D8	CMOS 3.3V	I/O	GPMC data bit 8
165		USB1_OC	CMOS 3.3V	I	Over current detect input pin to monitor USB power over current
166		GND	GND	P	Ground
167		StdB1_SSRX+	USB	I	Universal Serial Bus Superspeed receiver differential pair positive signal
168		GPMC_D7	CMOS 3.3V	I/O	GPMC data bit 7
169		StdB1_SSRX-	USB	I	Universal Serial Bus Superspeed receiver differential pair negative signal
170		GPMC_D6	CMOS 3.3V	I/O	GPMC data bit 6
171		GND1_DRAIN	USB	P	Universal Serial Bus ground for signal return
172		GPMC_D5	CMOS 3.3V	I/O	GPMC data bit 5
173		StdB1_SSTX+	USB	O	Universal Serial Bus Superspeed transmitter differential pair positive signal
174		GPMC_D4	CMOS 3.3V	I/O	GPMC data bit 4
175		StdB1_SSTX-	USB	O	Universal Serial Bus Superspeed transmitter differential pair negative signal
176		GPMC_D3	CMOS 3.3V	I/O	GPMC data bit 3
177		GND	GND	P	Ground
178		GPMC_D2	CMOS 3.3V	I/O	GPMC data bit 2
179		USB1_D-	USB	I/O	Universal Serial Bus port 1 differential pair negative signal
180		GPMC_D1	CMOS 3.3V	I/O	GPMC data bit 1
181		USB1_D+	USB	I/O	Universal Serial Bus port 1 differential pair positive signal
182		GPMC_D0	CMOS 3.3V	I/O	GPMC data bit 0
183		USB1_VBUS	5V	I/O	Universal Serial Bus port 1 power
184		GND	GND	P	Ground
185		GND	GND	P	Ground
186		I2S2_RXD	CMOS 3.3V	I	Secondary Integrated Interchip Sound (I ² S) channel receive data line
187		I2S1_RXD	CMOS 3.3V	I	Primary Integrated Interchip Sound (I ² S) channel receive data line
188		I2S2_TXFS	CMOS 3.3V	O	Secondary Integrated Interchip Sound (I ² S) channel frame synchronization signal
189		I2S1_TXFS	CMOS 3.3V	O	Primary Integrated Interchip Sound (I ² S) channel frame synchronization signal

Pin #	EDM	Signal	V	I/O	Description
190		I2S2_TXD	CMOS 3.3V	O	Secondary Integrated Interchip Sound (I ² S) channel transmit data line
191		I2S1_TXD	CMOS 3.3V	O	Primary Integrated Interchip Sound (I ² S) channel transmit data line
192		I2S2_TXC	CMOS 3.3V	O	Secondary Integrated Interchip Sound (I ² S) channel word clock signal
193		I2S1_TXC	CMOS 3.3V	O	Primary Integrated Interchip Sound (I ² S) channel word clock signal
194		I2S2_CLK	CMOS 3.3V	O	Secondary Integrated Interchip Sound (I ² S) channel master clock signal
195		I2S1_CLK	CMOS 3.3V	O	Primary Integrated Interchip Sound (I ² S) channel master clock signal
196		SPDIF_OUT	SPDIF	O	Sony / Philips Digital Interconnect Format Audio output
197		CAN2+	CAN	I/O	Secondary CAN (controller Area Network) differential pair positive signal
198		GND	GND	P	Ground
199		CAN2-	CAN	I/O	Secondary CAN (controller Area Network) differential pair negative signal
200		CAN1+	CAN	I/O	Primary CAN (controller Area Network) differential pair positive signal
201		GND	GND	P	Ground
202		CAN1-	CAN	I/O	Primary CAN (controller Area Network) differential pair negative signal
203		SDIO_CD	CMOS 3.3V	I/O	MMC/SDIO Card Detect
204		GND	GND	P	Ground
205		SDIO_CMD	CMOS 3.3V	I/O	MMC/SDIO Command
206		SDIO_CLK	CMOS 3.3V	O	MMC/SDIO Clock
207		SDIO_WP	CMOS 3.3V	I/O	MMC/SDIO Write Protect
208	NC	SDIO_LED	CMOS 3.3V	O	MMC/SDIO LED
209		SDIO_DAT1	CMOS 3.3V	I/O	MMC/SDIO Data bit 1
210		SDIO_PWR	CMOS 3.3V	O	MMC/SDIO Power Enable
211		SDIO_DAT3	CMOS 3.3V	I/O	MMC/SDIO Data bit 3
212		SDIO_DAT0	CMOS 3.3V	I/O	MMC/SDIO Data bit 0
213	NC	SDIO_DAT5	CMOS 3.3V	I/O	MMC/SDIO Data bit 5
214		SDIO_DAT2	CMOS 3.3V	I/O	MMC/SDIO Data bit 2
215	NC	SDIO_DAT7	CMOS 3.3V	I/O	MMC/SDIO Data bit 7
216	NC	SDIO_DAT4	CMOS 3.3V	I/O	MMC/SDIO Data bit 4
217		GND	GND	P	Ground
218	NC	SDIO_DAT6	CMOS 3.3V	I/O	MMC/SDIO Data bit 6

Pin #	EDM	Signal	V	I/O	Description
219		SPI2_MOSI	CMOS 3.3V	O	Serial Peripheral Interface primary channel master output slave input signal
220		GND	GND	P	Ground
221		SPI2_MISO	CMOS 3.3V	I	Serial Peripheral Interface primary channel master input slave output signal
222		SPI1_MOSI	CMOS 3.3V	O	Serial Peripheral Interface secondary channel master output slave input signal
223		SPI2_CLK	CMOS 3.3V	O	Serial Peripheral Interface primary channel clock signal
224		SPI1_MISO	CMOS 3.3V	I	Serial Peripheral Interface secondary channel master input slave output signal
225		SPI2_CS0	CMOS 3.3V	O	Serial Peripheral Interface primary channel Chip Select 0 signal
226		SPI1_CLK	CMOS 3.3V	O	Serial Peripheral Interface secondary channel clock signal
227	NC	SPI2_CS1	CMOS 3.3V	O	Serial Peripheral Interface primary channel Chip Select 1 signal. Do not use if only 1 SPI device is used
228		SPI1_CS0	CMOS 3.3V	O	Serial Peripheral Interface secondary channel Chip Select 0 signal
229		GND	GND	P	Ground
230		SPI1_CS1	CMOS 3.3V	O	Serial Peripheral Interface secondary channel Chip Select 1 signal. Do not use if only 1 SPI device is used
231		I2C2_SCL	CMOS 3.3V	I/O	I ² C bus clock line
232		GND	GND	P	Ground
233		I2C2_SDA	CMOS 3.3V	I/O	I ² C bus data line
234		UART2_CTS	UART	O	Universal Asynchronous Receive Transmit secondary channel clear to send signal
235		I2C3_SCL	CMOS 3.3V	I/O	I ² C bus clock line
236		UART2_TXD	UART	O	Universal Asynchronous Receive Transmit secondary channel transmit data signal
237		I2C3_SDA	CMOS 3.3V	I/O	I ² C bus data line
238		UART2_RXD	UART	I	Universal Asynchronous Receive Transmit secondary channel receive data signal
239		GND	GND	P	Ground
240		UART2_RTS	UART	O	Universal Asynchronous Receive Transmit secondary channel request to send signal
241		UART1_CTS	UART	O	Universal Asynchronous Receive Transmit secondary channel clear to send signal
242		UART2_DCD	UART	I	Universal Asynchronous Receive Transmit secondary channel carrier detect signal

Pin #	EDM	Signal	V	I/O	Description
243		UART1_TXD	UART	O	Universal Asynchronous Receive Transmit secondary channel transmit data signal
244		UART2_DSR	UART	I	Universal Asynchronous Receive Transmit secondary channel data set ready signal
245		UART1_RXD	UART	I	Universal Asynchronous Receive Transmit secondary channel receive data signal
246		UART2_DTR	UART	O	Universal Asynchronous Receive Transmit secondary channel data terminal ready signal
247		UART1_RTS	UART	O	Universal Asynchronous Receive Transmit secondary channel request to send signal
248		UART2_RI	UART	I	Universal Asynchronous Receive Transmit secondary channel ring indication signal
249		GND	GND	P	Ground
250		GND	GND	P	Ground
251	NC	S3	CMOS 3.3V	O	S3 signal shuts off power to all runtime system components that are not maintained during S3 state (suspend to RAM)
252		ON/OFF	CMOS 3.3V	I	Power ON button input signal
253	NC	S5	CMOS 3.3V	O	S5 signal shuts off power to the system. Restart is only possible with power button or by a system wake up event
254		RESET	CMOS 3.3V	I	Reset button input signal
255		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
256		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
257		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
258		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
259		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
260		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
261		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
262		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
263		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
264		GPIO	CMOS 3.3V	I/O	General Purpose Input Output
265		GND	GND	P	Ground
266		GND	GND	P	Ground
267		RSVD			Reserved
268		RSVD			Reserved
269		RSVD			Reserved
270		RSVD			Reserved

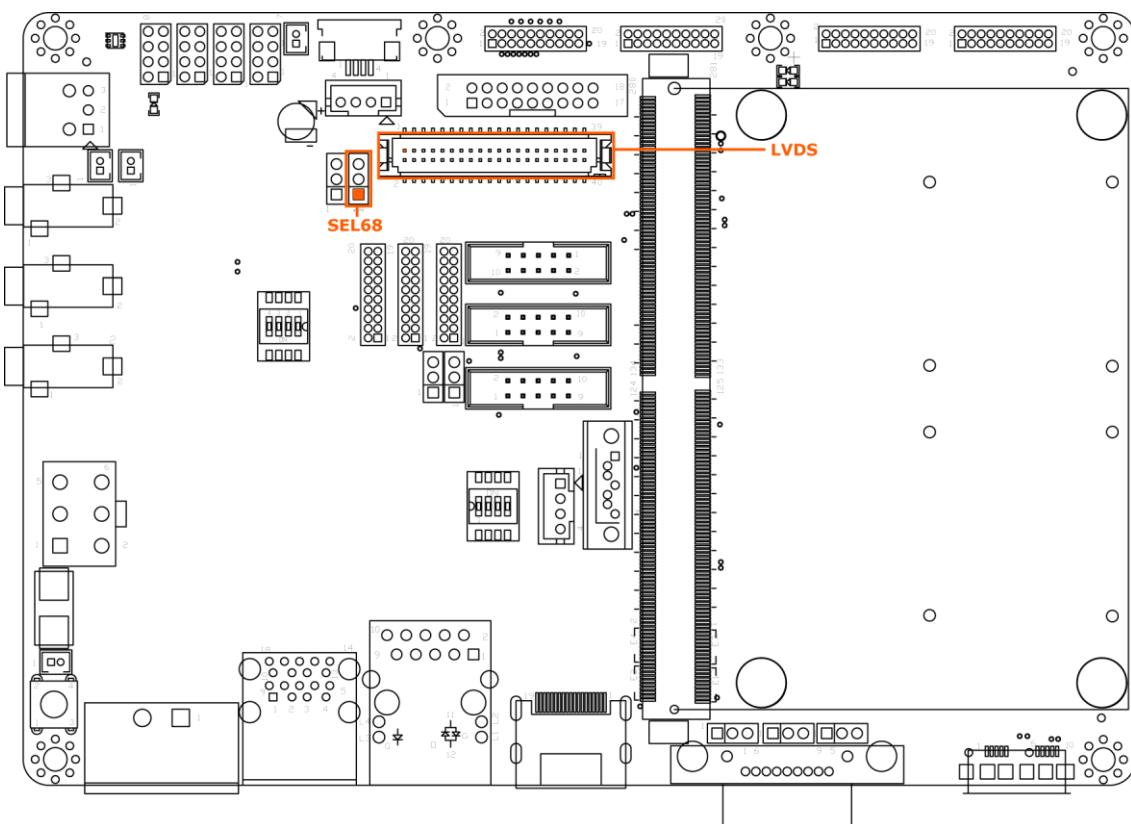
Pin #	EDM	Signal	V	I/O	Description
271		RSVD			Reserved
272		RSVD			Reserved
273		RSVD			Reserved
274		RSVD			Reserved
275		RSVD			Reserved
276		RSVD			Reserved
277		RSVD			Reserved
278		RSVD			Reserved
279		Watchdog	CMOS 3.3V	O	Watchdog event indication signal
280		RSVD			Reserved
281		VCC_RTC	3.3V	I	Input power for RTC clock

6.2. LVDS Connector

EDM type 1 modules in the carrier board provide up to one single-channel LVDS which is defined as LVDS_A. Systems normally use a single-channel LVDS for most displays.

Each EDM LVDS channel consists of four differential data pairs and a differential clock pair for a total of five differential pairs per channel. Certain EDM module processors or chipsets may not use all pairs.

There are five single-ended signals included to support the LVDS interface: two lines are used for an I²C interface that may be used to support EDID or other panel information and identification schemes. Additionally, there are an LVDS power enable (LVDS_xVDD_EN) and backlight control and enable lines (LVDS_xBL_CTRL and LVDS_xEN).



	SEL68
High	1-2
Low	2-3

Table 2: 6 or 8 bit panels can also be set with the jumper (SEL68)

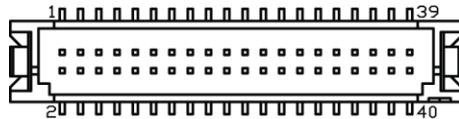


Figure 23 - LVDS Connector (for example: Hirose DF13-40DP-1.25)

Pin #	Signal	Description	Pin #	Signal	Description
1	12V	12V power to data driver circuit	2	5V	5V power to data driver circuit
3	12V		4	5V	
5	LCD_ENB	LCD on/off @ 5V	6	PWM_5V	Backlight PWM @ 5V
7	LCD_ENBK	LCD on/off @ 3.3V	8	PWM_3.3V	Backlight PWM @ 3.3V
9	GND	Ground	10	GND	Ground
11	SEL68	LVDS 18/24 bit selection pin	12	3.3V	3.3V power to data driver circuit
13	LVDS_D0-	LVDS primary channel differential pair 0 signal	14	3.3V	
15	LVDS_D0+		16	LVDS REV	LVDS Reverse Scan signal
17	GND	Ground	18	LVDS R/L	Horizontal Reverse Scan Control
19	LVDS_D1-	LVDS primary channel differential pair 1 signal	20	LVDS U/D	Vertical Reverse Scan Control
21	LVDS_D1+		22	SCL	Display ID DDC clock line used for LVDS flat panel detection
23	GND	Ground	24	SDA	Display ID DDC data line used for LVDS flat panel detection.
25	LVDS_D2-	LVDS primary channel differential pair 2 signal	26	LED enable	Backlight on/off
27	LVDS_D2+		28	LED+	Backlight LED signals (5V)
29	GND	Ground	30	LED+	
31	LVDS_CLK-	LVDS primary channel differential pair clock signal	32	LED+	
33	LVDS_CLK+		34	LVDS enable	LCD signal (driver IC) on/off
35	GND	Ground	36	LED-	Ground return signals for LED backlight signals
37	LVDS_D3-	LVDS primary channel differential pair 3 signal	38	LED-	
39	LVDS_D3+		40	LED-	

Table 3 - LVDS Connector Pin-out

6.3. HDMI

HDMI provides a digital audio/video interface that connects to a compatible television or monitor.

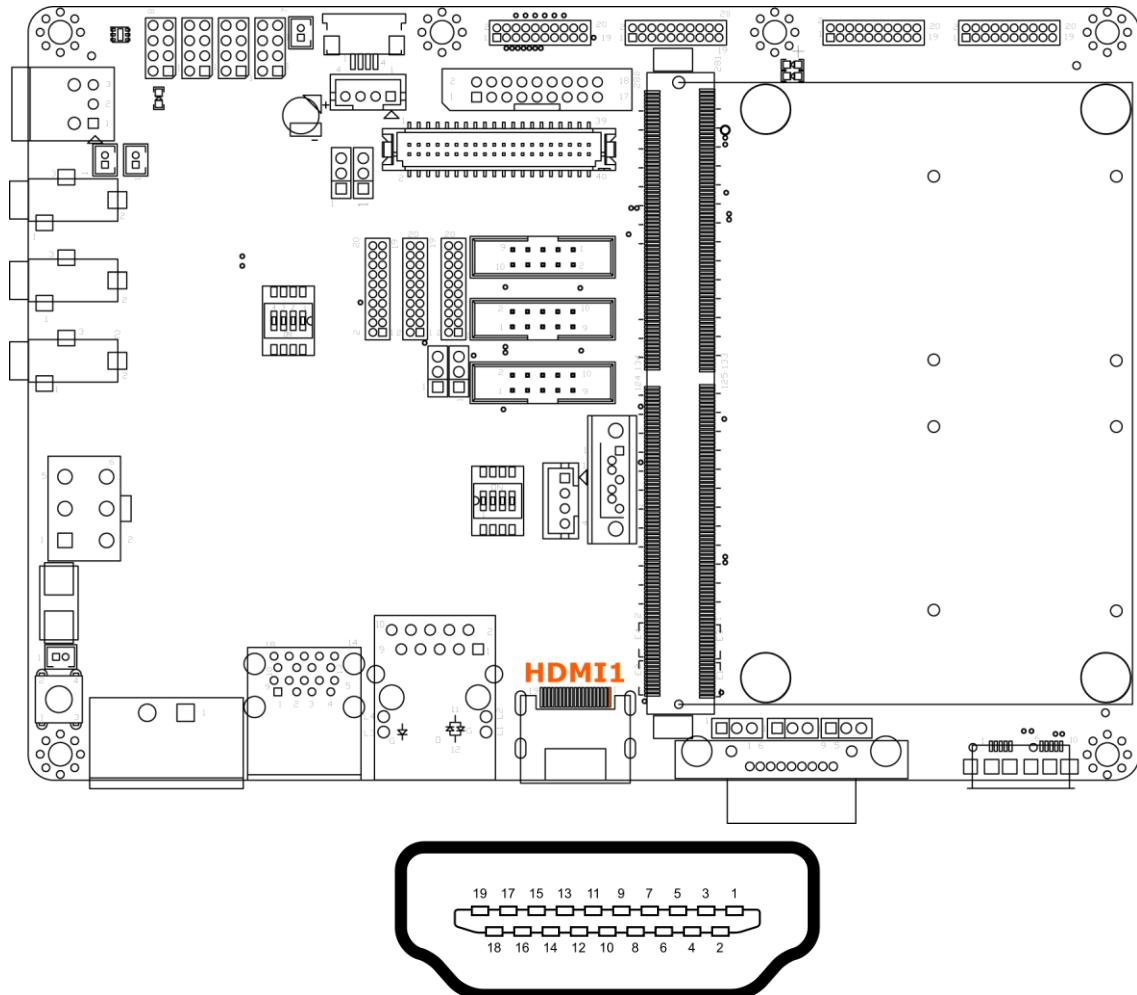


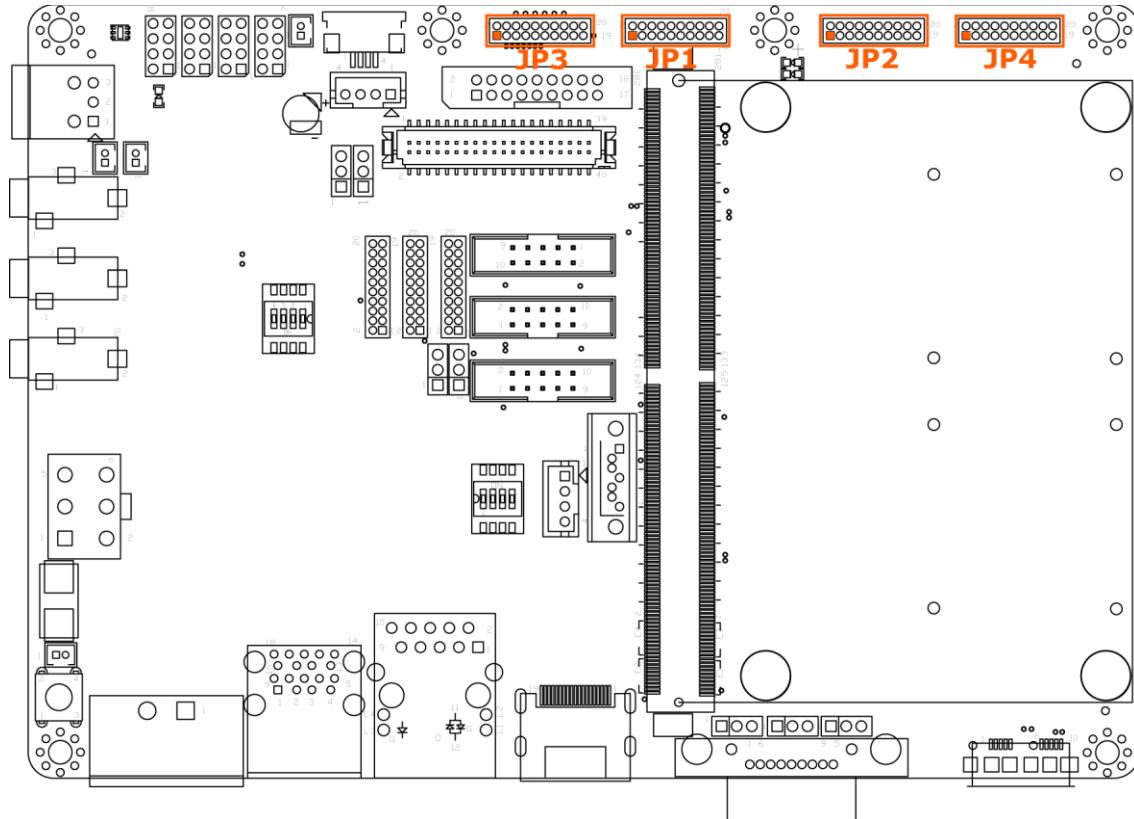
Figure 24 - HDMI Connector Pin-out

Pin #	Signal	Description	Pin #	Signal	Description
1	HDMI_D2+	HDMI differential pair 2 signal	2	Shield_D2	Shield of data pair 2
3	HDMI_D2-		4	HDMI_D1+	HDMI differential pair 1 signal
5	Shield_D1	Shield of data pair 1	6	HDMI_D1-	
7	HDMI_D0+	HDMI differential pair 2 signal	8	Shield_D0	Shield of data pair 0
9	HDMI_D0-		10	HDMI_CLK+	HDMI differential clock signal
11	Shield_CLK	Shield of Clock pair	12	HDMI_CLK-	
13	CEC	Consumer Electronics Control Interface	14	RSVD	Reserved
15	DDC Clock	DDC based control clock signal	16	DDC Data	DDC based control data signal
17	GND	Ground	18	+5V	5V Power
19	HPD	Hot plug detect			

Table 4 - HDMI Connector Pin-out

6.4. Expansion headers

The expansion headers are a standardized interface that contains TTL, I²C, SPI, GPIO and power.



JP3 pin #	Function	JP3 pin #	Function
1	+3.3V	2	+3.3V
3	X	4	+3.3V
5	X	6	X
7	X	8	X
9	X	10	X
11	X	12	X
13	X	14	X
15	X	16	LVDS_AVDD_EN
17	X	18	GND
19	GND	20	GND

JP1 pin #	Function	JP3 pin #	Function
1	R_DSS_DATA0	2	R_DSS_DATA10
3	R_DSS_DATA1	4	R_DSS_DATA11
5	R_DSS_DATA2	6	R_DSS_DATA12
7	R_DSS_DATA3	8	R_DSS_DATA13
9	R_DSS_DATA4	10	R_DSS_DATA14
11	R_DSS_DATA5	12	R_DSS_DATA15
13	R_DSS_DATA6	14	R_DSS_DATA16
15	R_DSS_DATA7	16	R_DSS_DATA17
17	R_DSS_DATA8	18	R_DSS_DATA18
19	R_DSS_DATA9	20	R_DSS_DATA19

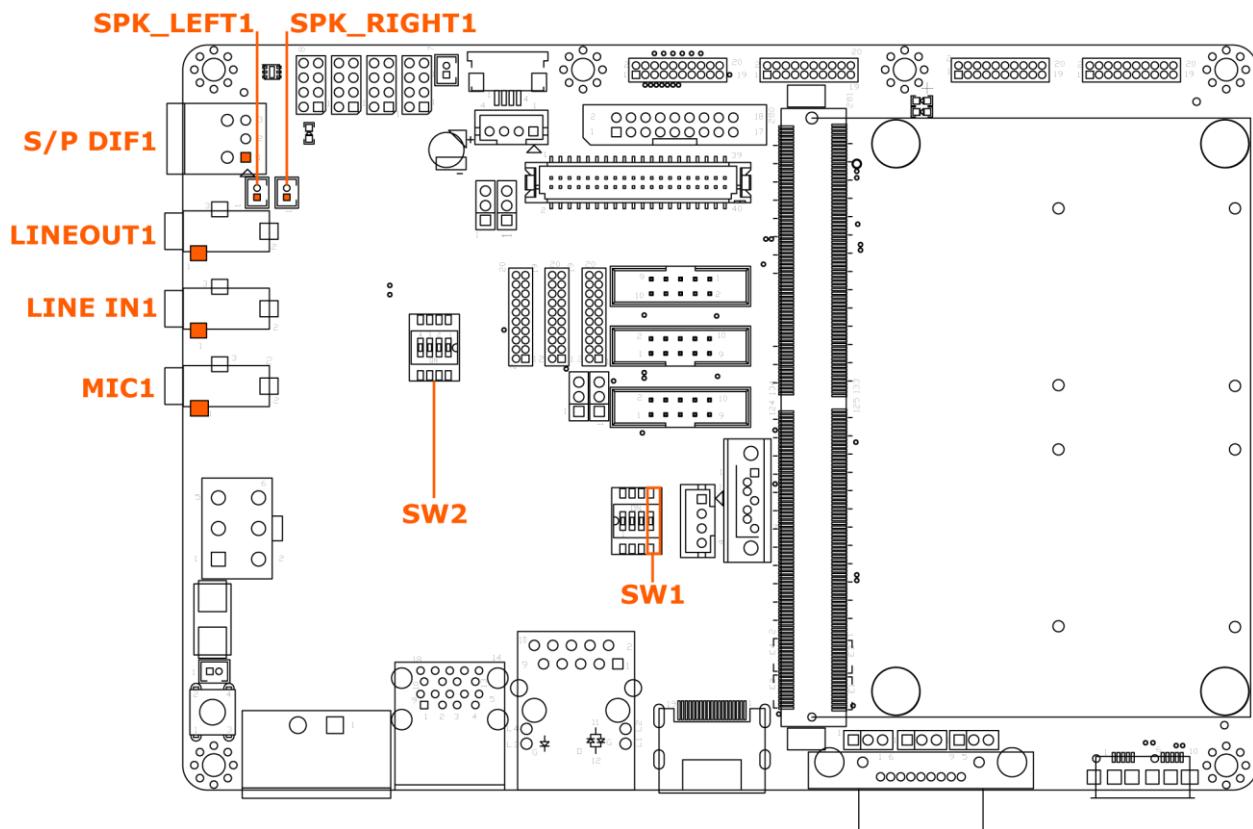
JP2 pin #	Function	JP3 pin #	Function
1	+3.3V	2	+3.3V
3	R_DISP0_CNTRST	4	R_DSS_DATA20
5	R_DISP0_VDDEN	6	R_DSS_DATA21
7	I ² C1_SDA	8	R_DSS_DATA22
9	I ² C1_SCL	10	R_DSS_DATA23
11	I ² C2_SDA	12	R_DSS_PCLK
13	I ² C2_SCL	14	R_DSS_VSYNC
15	I ² C3_SDA	16	R_DSS_HSYNC
17	I ² C3_SCL	18	R_DISP0_DRDY
19	GND	20	GND

JP4 pin #	Function	JP3 pin #	Function
1	+5V	2	+5V
3	+5V	4	GPIO_P256
5	+5V	6	GPIO_P258
7	SPI1_MOSI	8	GPIO_P260
9	SPI1_MISO	10	GPIO_P262
11	SPI1_CLK	12	GPIO_P264
13	SPI1_CS0	14	GPIO_P259
15	SPI1_CS1	16	GPIO_P261
17	GND	18	GPIO_P263
19	GND	20	GND

Table 5 - Expansion header Connector Pin-out (female header 10x2 pitch 1.27 mm)

6.5. Audio

The EDM1-FAIRY carrier board contains several Audio interfaces, ranging from line in/out , S/P DIF to amplified speakers. The Carrier Board has two audio codec's, each of them can be selected with dipswitch SW1. Next to that the user can also select which I²C and I²Sis used.



SPK_Left1	
1	S_OUTL+
2	S_OUTL-

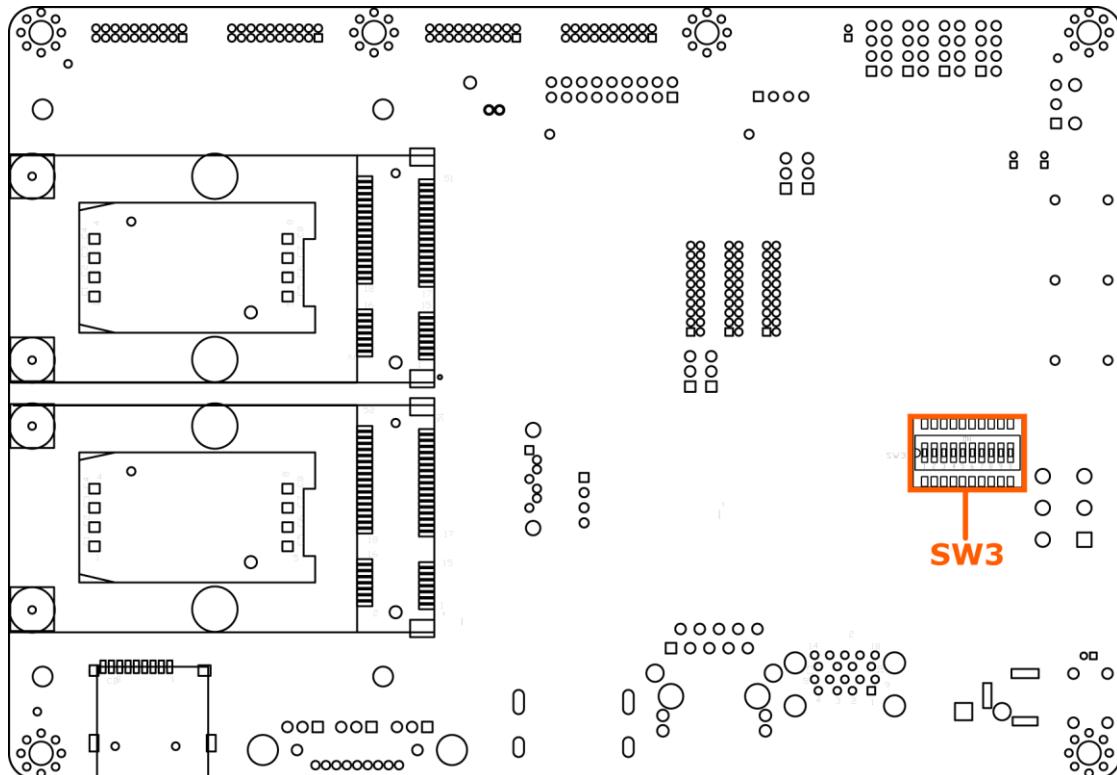
SPK_RIGHT1	
1	S_OUTR+
2	S_OUTR-

Table 6 - Speaker connectors Pin-out (wafer 2pin pitch 1.25 mm)

SW1 (RS-232/485/422 Select on COM2)	RS-422	RS-485	RS-232
1	ON	OFF	OFF
2	OFF	ON	OFF
3	OFF	OFF	ON
SW1 (Audio output select)	SGTL5000	TLV320	
4	OFF	ON	

Table 7: Selection of audio codec with dipswitch SW1 (4)

SW2 (Audio I²C select)	I²C2	I²C3	OFF
1	ON	OFF	OFF
2	ON	OFF	OFF
3	OFF	ON	OFF
4	OFF	ON	OFF

Table 8: Selection of I²C with dipswitch SW2 (1-4)

SW3 (Audio I²S select)	SGTL5000	TLV320	OFF
1	ON	OFF	OFF
2	ON	OFF	OFF
3	ON	OFF	OFF
4	ON	OFF	OFF
5	ON	OFF	OFF
6	OFF	ON	OFF
7	OFF	ON	OFF
8	OFF	ON	OFF
9	OFF	ON	OFF
0	OFF	ON	OFF

Table 9: Connect I²S to the selected audio codec with dipswitch SW3 (1-0)

6.6. Gigabit Ethernet

Utilizes the IEEE 802.3 PHY / MDI interface circuit resources between the module and carrier board, with the Ethernet PHY located on the EDM module and the coupling magnetics located on the carrier board.

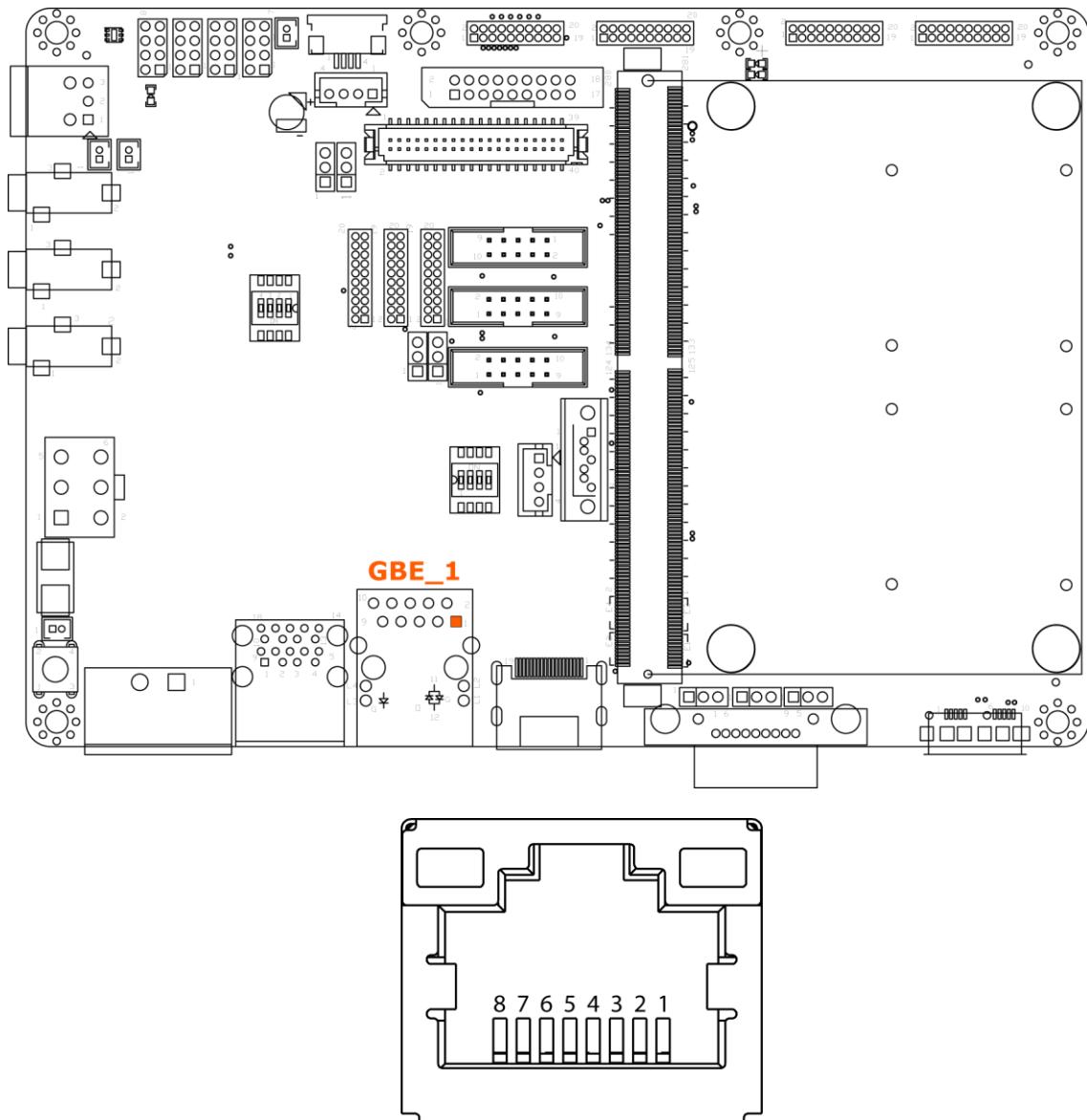


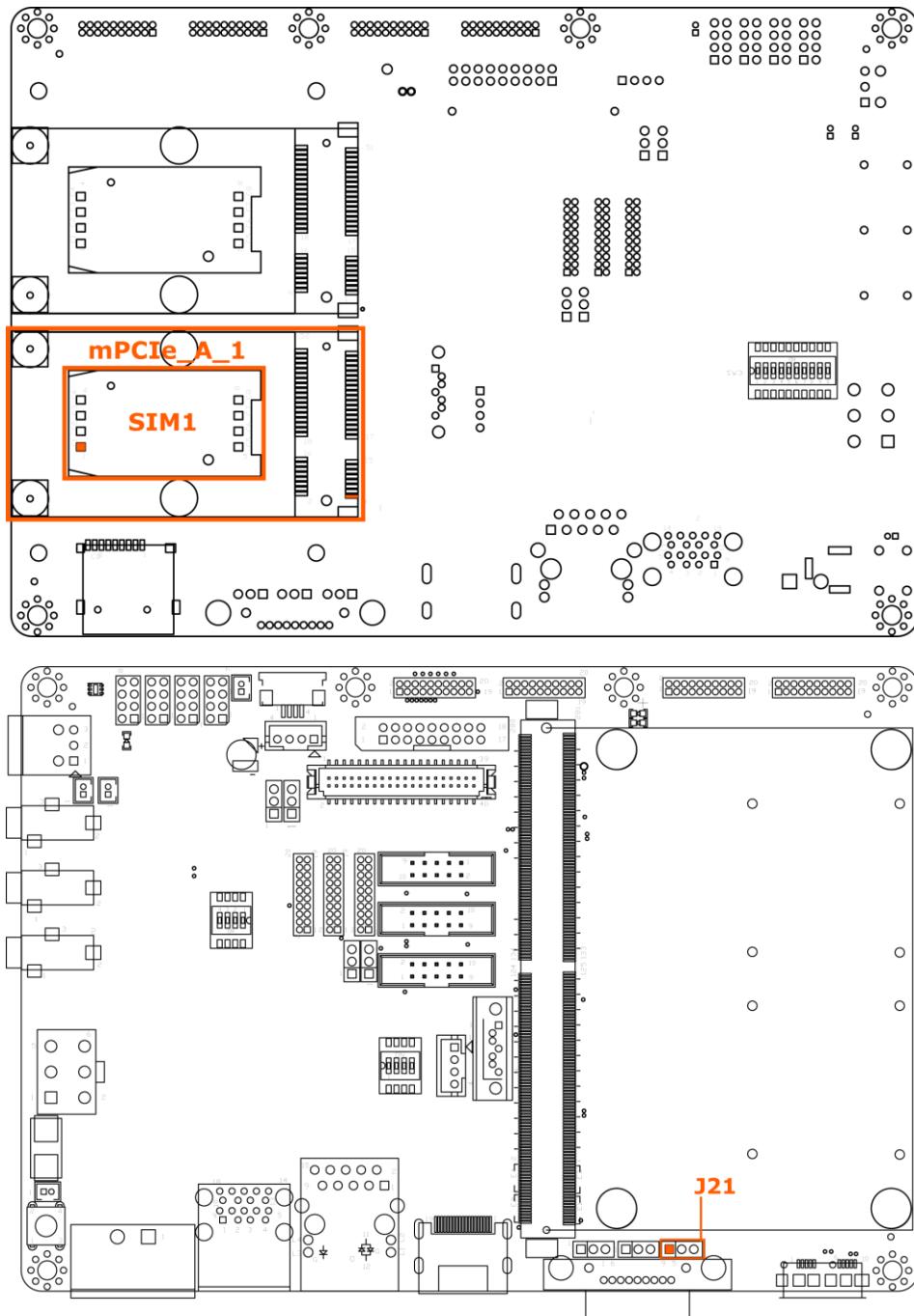
Figure 25 - Gigabit Ethernet RJ-45 Connector

Pin #	1000 Mbps	100 Mbps	10 Mbps
1	MDI0+	Transmit Data+	Transmit Data+
2	MDI0-	Transmit Data-	Transmit Data-
3	MDI1+	Receive Data+	Receive Data+
4	MDI2+		
5	MDI2-		
6	MDI1-	Receive Data-	Receive Data-
7	MDI3+		
8	MDI3-		

Table 10 - Gigabit Ethernet RJ-45 Connector Pin-out

6.7. mPCIe A Connector

The PCI Express Mini Card is a small form factor add-in card optimized for mobile computing and embedded platforms. It is not hot-swappable. PCI Express Mini Cards are popular for implementing features such as wireless LAN and communication modules. A small footprint connector on the carrier board provides the ability to insert different removable PCI Express Mini Cards.

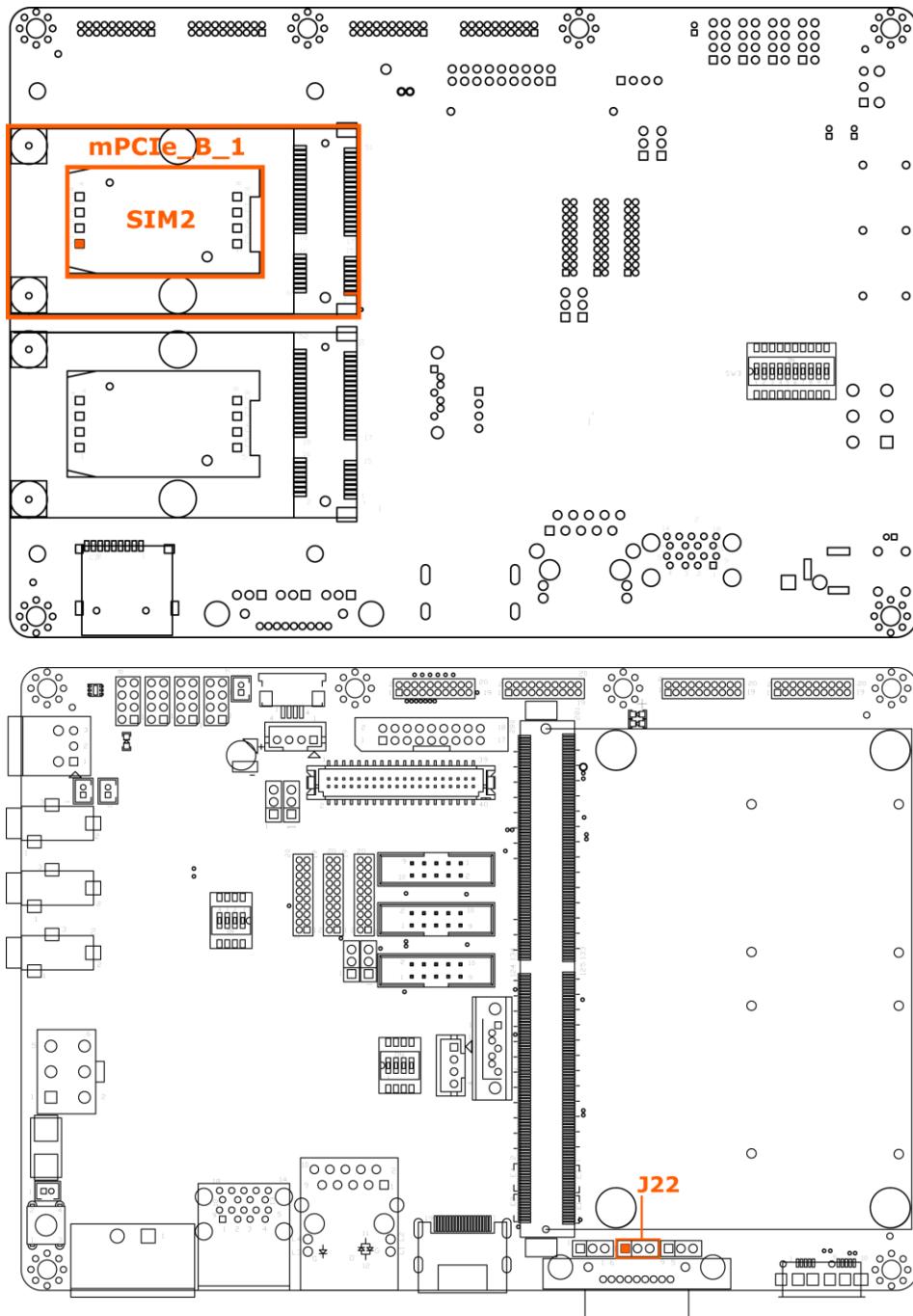


J21 (mPCIe WAN ON/OFF)	ON (default)	OFF
1-2	ON	OFF
2-3	OFF	ON

Table 11: jumper settings to switch WAN ON/OFF

6.8. mPCIe B Connector

The PCI Express Mini Card is a small form factor add-in card optimized for mobile computing and embedded platforms. It is not hot-swappable. PCI Express Mini Cards are popular for implementing features such as wireless LAN and communication modules. A small footprint connector on the carrier board provides the ability to insert different removable PCI Express Mini Cards.



J22 (mPCIe WAN ON/OFF)	ON (default)	OFF
1-2	ON	OFF
2-3	OFF	ON

Table 12: jumper settings to switch WAN ON/OFF

6.9. SATA Connector

Serial ATA (SATA) is a serial interface for connecting storage devices (mainly hard disks) and was defined to replace the old parallel ATA interface. Serial ATA uses a point-to-point serial connection between the system and the storage device. The first generation of standard Serial ATA provides a maximum effective data transfer rate of 150MB/s per port. With the second generation SATA II, an effective transfer rate of up to 300MB/s per port is possible. With the third generation SATA III, an effective transfer rate of up to 600MB/s per port is possible.

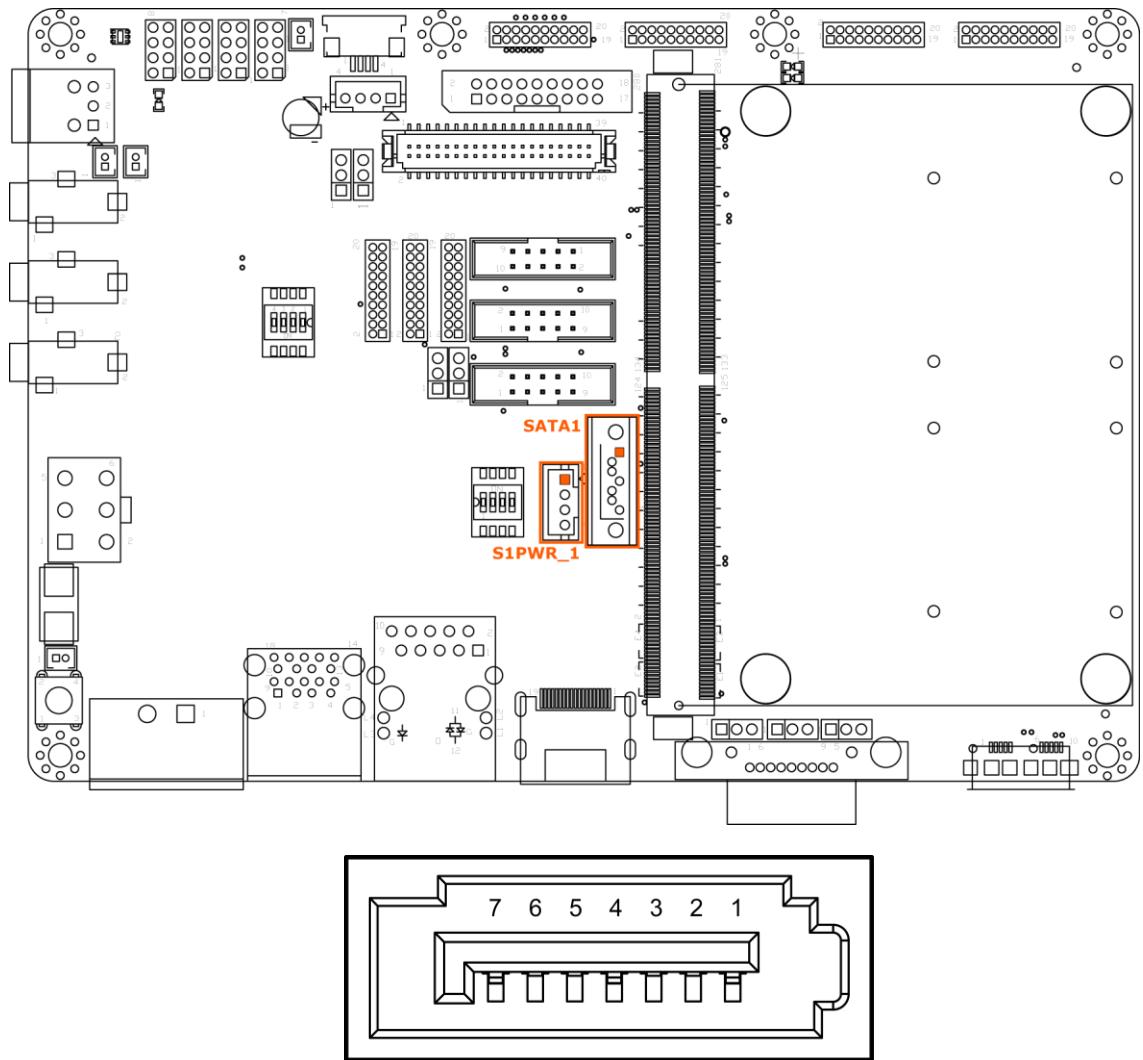


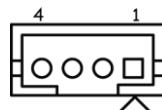
Figure 26 - Serial ATA Connector

Pin #	Signal	Description
1	GND	Ground
2	TX+	Transmitter differential pair signal
3	TX-	
4	GND	Ground
5	RX-	
6	RX+	Receiver differential pair signal
7	GND	

Table 13 - Serial ATA Connector Pin-out



Figure 27: SATA DATA Cable for the SATA1 connector



S1PWR_1 (connector)	
1	VCC12V
2	GND
3	GND
4	+5V

Table 14 - Serial ATA Power Connector Pin-out((wafer 4 pin, 2.0 mm pitch)



Figure 28: SATA Power Cable for the S1PWR_1 connector

Pin #	Signal	Description
1,2,3	+3.3V	3.3V Power supply
4,5,6	GND	Ground
7,8,9	+5V	5V Power supply
10,11,12	GND	Ground
13,14,15	+12V	12V Power supply

Table 15 - Serial ATA Power Connector Pin-out

6.10. USB

The EDM1-FAIRY Carrier Board contains 2 USB3.0 USB Hosts connectors which are connected to a USB hub controller.

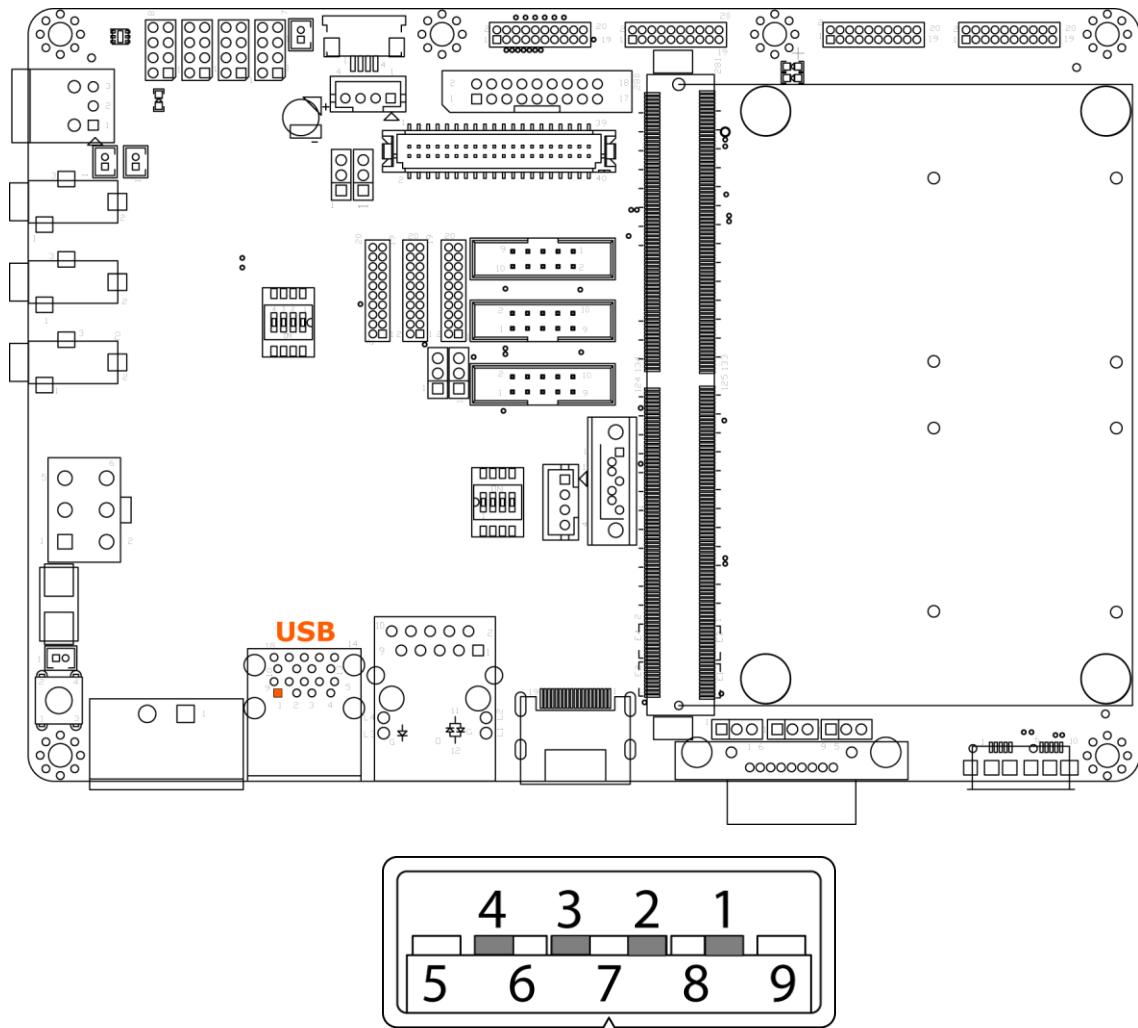


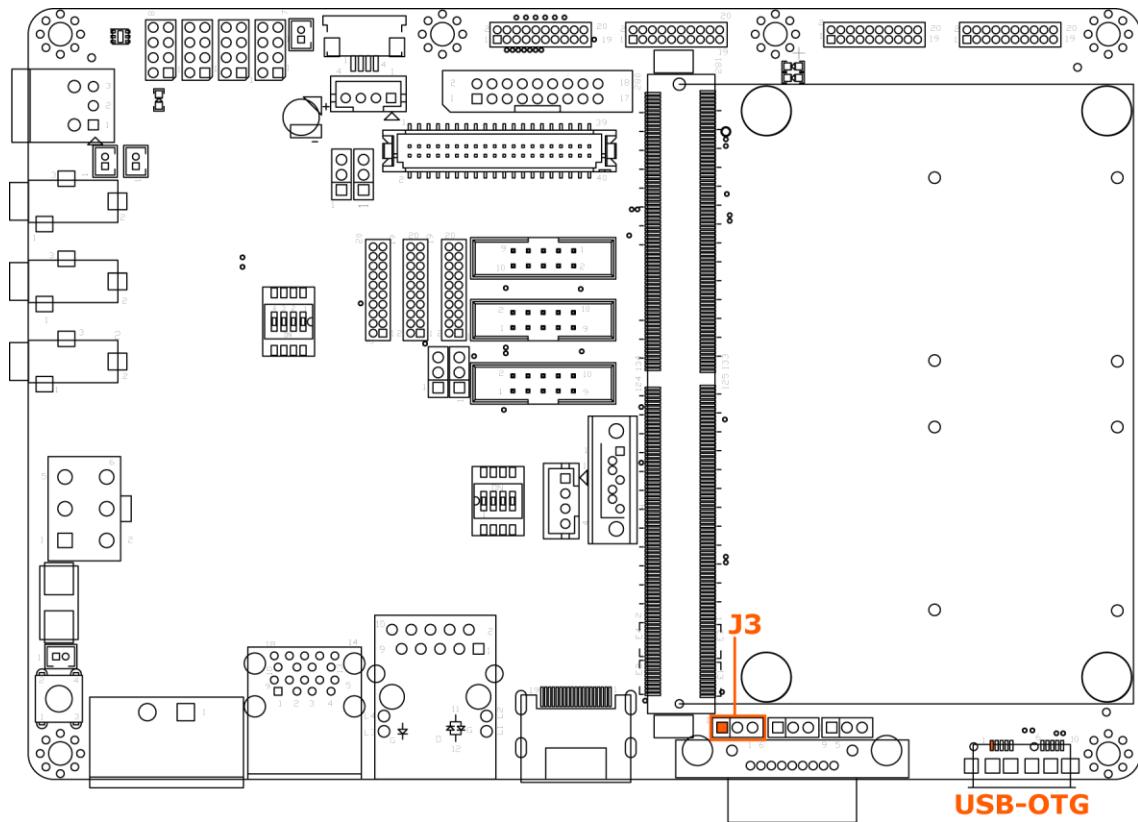
Figure 29 - USB Host Connector

Pin #	Signal	Description
1	VBUS	5V Universal Serial Bus Power
2	USB_D-	Universal Serial Bus port 2 differential pair signal
3	USB_D+	
4	GND	Ground
5	StdA_SSRX-	Universal Serial Bus Superspeed receiver differential pair signal
6	StdA_SSRX+	
7	GND	Ground
8	StdA_SSTX-	Universal Serial Bus Superspeed transmitter differential pair signal
9	StdA_SSTX+	

Table 16 - USB connector Pin-out

6.11. USB-OTG

The USB-OTG is a connector that can be switched from Client to Host by setting the jumper on pin header J3.



USB OTG Type	J3
Client/ OTG (Default)	1-2
Host	2-3

Table 17: Host / Client setting with jumper J3

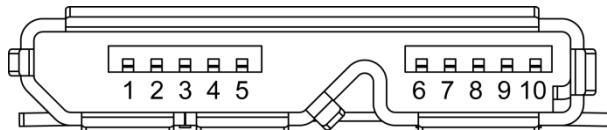


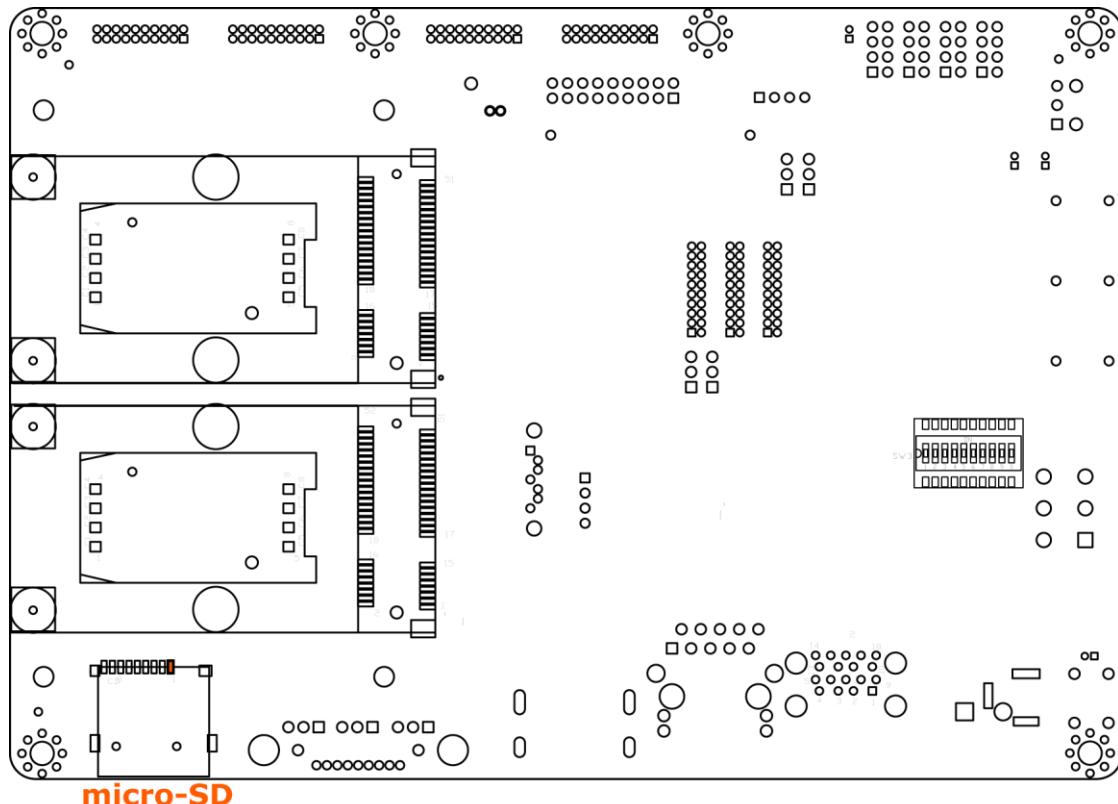
Figure 30: USB-OTG connector pin out

Pin #	Signal	Description
1	VBUS	Ground
2	USB_D-	Universal Serial Bus port 2 differential pair signal
3	USB_D+	Universal Serial Bus On-The-Go detection signal
4	GND	Ground
5	StdA_SSTX-	Universal Serial Bus Superspeed transmitter differential pair signal
6	StdA_SSTX+	Universal Serial Bus Superspeed receiver differential pair signal
7	GND	Ground
8	StdA_SSRX-	Universal Serial Bus Superspeed transmitter differential pair signal
9	StdA_SSRX+	Universal Serial Bus Superspeed receiver differential pair signal

Table 18: USB-OTG 3.0 Connector pin out

6.12. micro SD-card slot

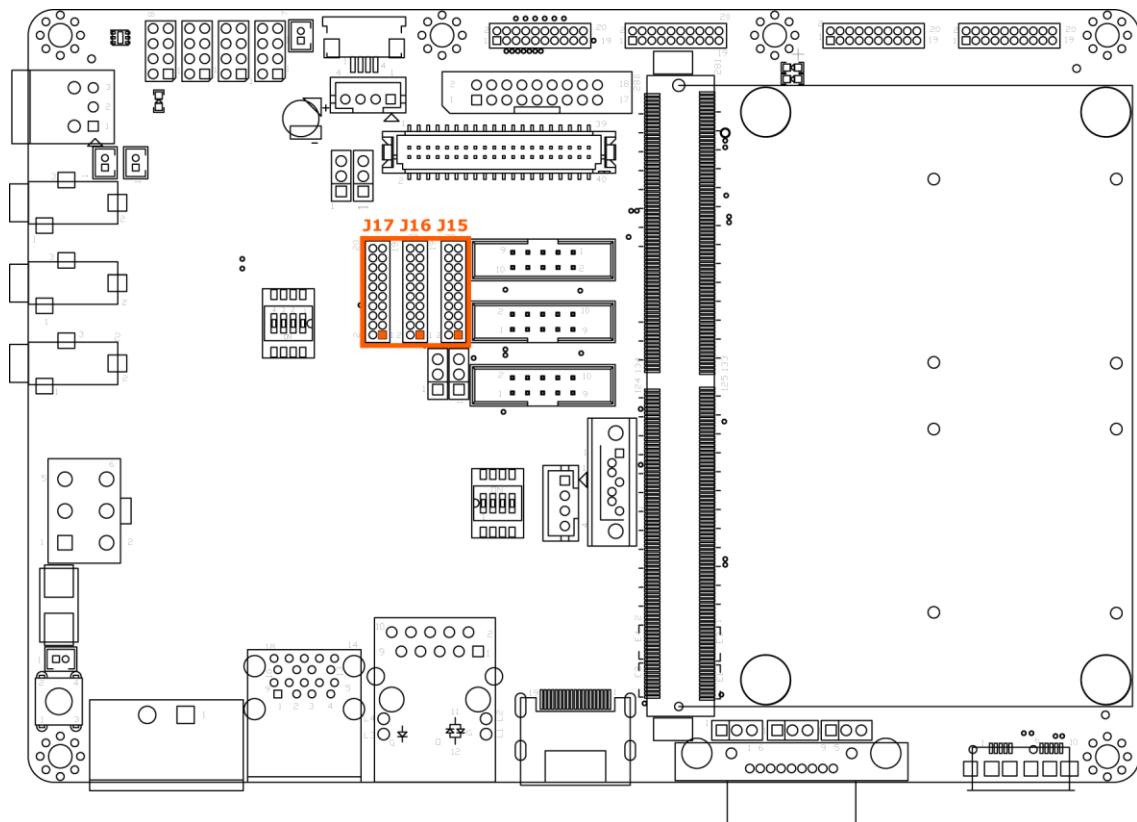
SDIO (Secure Digital I/O) provides an easy to implement solution for high-speed data I/O combined with low power consumption. SDIO cards are fully compatible with SD memory cards. This includes mechanical, electrical, power, signaling and software compatibility. SDIO hosts are able to drive SD cards and MMC (MultiMediaCards) as well as SDIO cards that provide functions such as Ethernet or WLAN, GPS receivers, Bluetooth, modems etc.



6.13. GPMC Connectors

Local bus is a common interface in ARM based systems that connect directly, or almost directly, from the CPU to one or more slots on the expansion bus. The significance of direct connection to the CPU is avoiding the bottleneck created by the expansion bus, thus providing fast throughput. There are several local buses built into various types of computers to increase the speed of data transfer. Local buses for expanded memory and video boards are the most common.

The General Purpose Memory Controller (GPMC) can be used to connect to external memory devices such as NOR Flash, NAND Flash, Pseudo SRAM, SRAM or Field programmable Gate Array (FPGA)



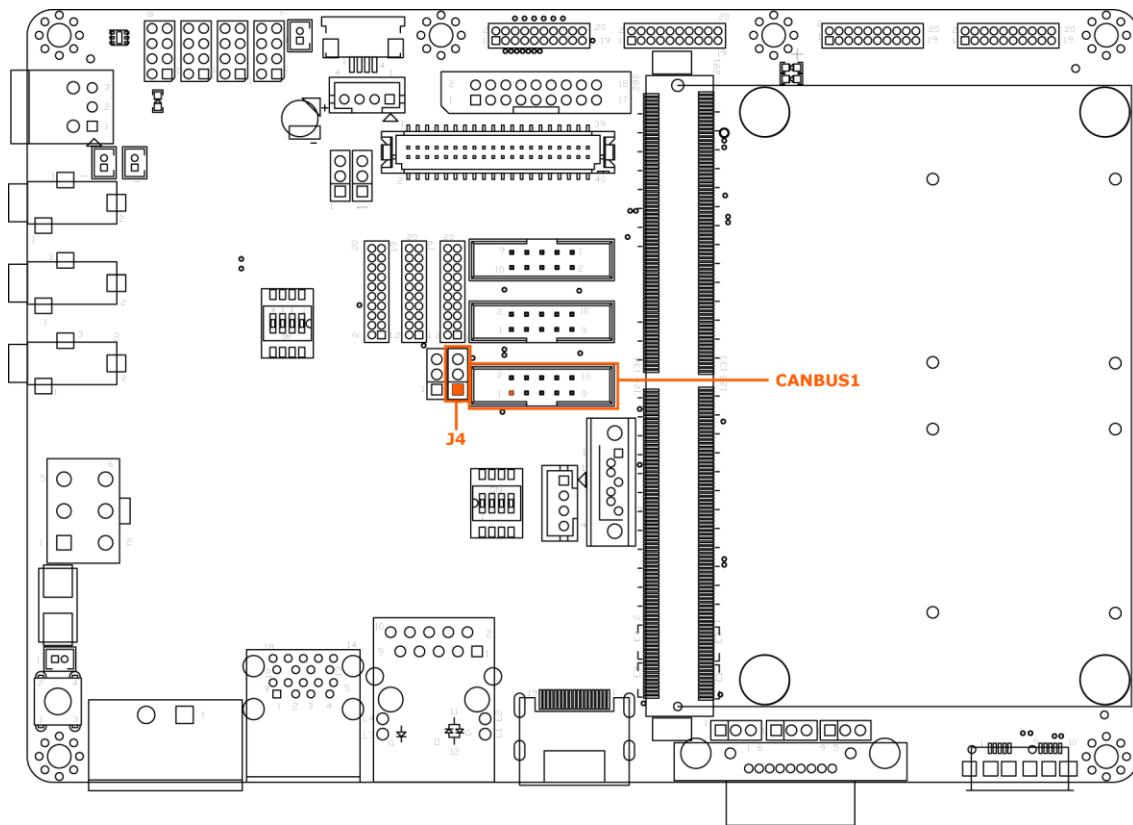
J15 pin #	Function	J15 pin #	Function
1	+3.3V	2	GND
3	GPMC_D0	4	GPMC_D1
5	GPMC_D2	6	GPMC_D3
7	GPMC_D4	8	GPMC_D5
9	GPMC_D6	10	GPMC_D7
11	GPMC_D8	12	GPMC_D9
13	GPMC_D10	14	GPMC_D11
15	GPMC_D12	16	GPMC_D13
17	GPMC_D14	18	GPMC_D15
19	GPMC_A1	20	GPMC_A2

J16 pin #	Function	J16 pin #	Function
1	+3.3V	2	GND
3	GPMC_A3	4	GPMC_A4
5	GPMC_A5	6	GPMC_A6
7	GPMC_A7	8	GPMC_A8
9	GPMC_A9	10	GPMC_A10
11	GPMC_WE	12	GPMC_RE
13	GPMC_CLE	14	GPMC_ALE
15	GPMC_WAIT	16	GPMC_WP
17	GPMC_nCSA	18	GPMC_nCSB
19	GPMC_nCSC	20	GPMC_nCSD

J17 pin #	Function	J17 pin #	Function
1	+3.3V	2	+5V
3	+3.3V	4	+5V
5	+3.3V	6	+5V
7	GPMC_nCSE	8	X
9	I ² S1_RXD	10	I ² S2_RXD
11	I ² S1_TXFS	12	I ² S2_TXFS
13	I ² S1_TXD	14	I ² S2_TXD
15	I ² S1_TXC	16	I ² S2_TXC
17	I ² S1_CLK	18	I ² S2_CLK
19	GND	20	GND

Table 19 - GPMC Connector Pin-out (female header 10x2 pitch 1.27 mm)

6.14. CAN BUS1



CAN BUS1 pin #	Function	CAN BUS1 pin #	Function
1	Reserved	2	CAN1-
3	GND	4	Reserved
5	CAN_Shield	6	GND
7	CAN1+	8	Reserved
9	+5V	10	X

Table 20: pin out on the CAN BUS1 connector (box header 2x5, 2 mm pitch)

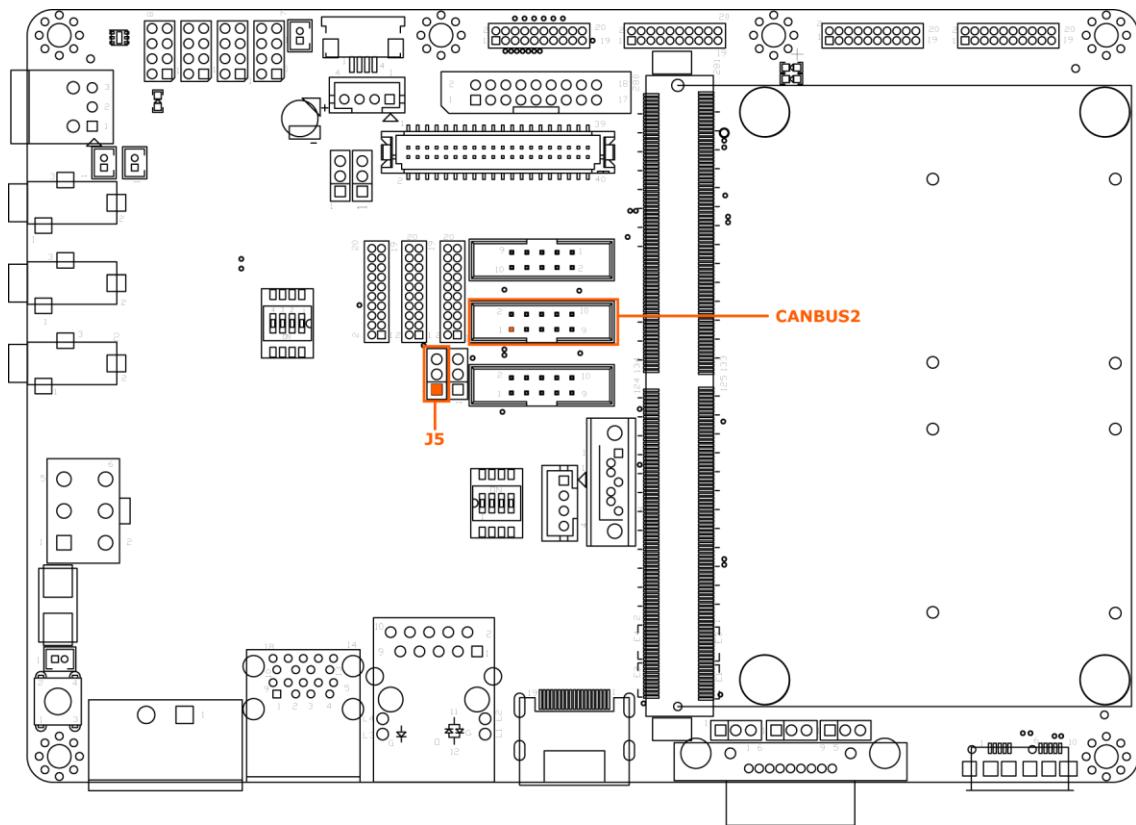
CAN BUS1	J4
Termination	1-2
Not used	2-3

Table 21: termination jumper setting for CAN BUS



Figure 31: DE9 cable for the CAN BUS1 connector

6.15. CAN BUS2



CAN BUS2 pin #	Function	CAN BUS2 pin #	Function
1	Reserved	2	CAN2-
3	GND	4	Reserved
5	CAN_Shield	6	GND
7	CAN2+	8	Reserved
9	+5V	10	X

Table 22: pin out on the CAN BUS2 connector (box header 2x5, 2 mm pitch)

CAN BUS2	J5
Termination	1-2
Not used	2-3

Table 23: termination jumper setting for CAN BUS

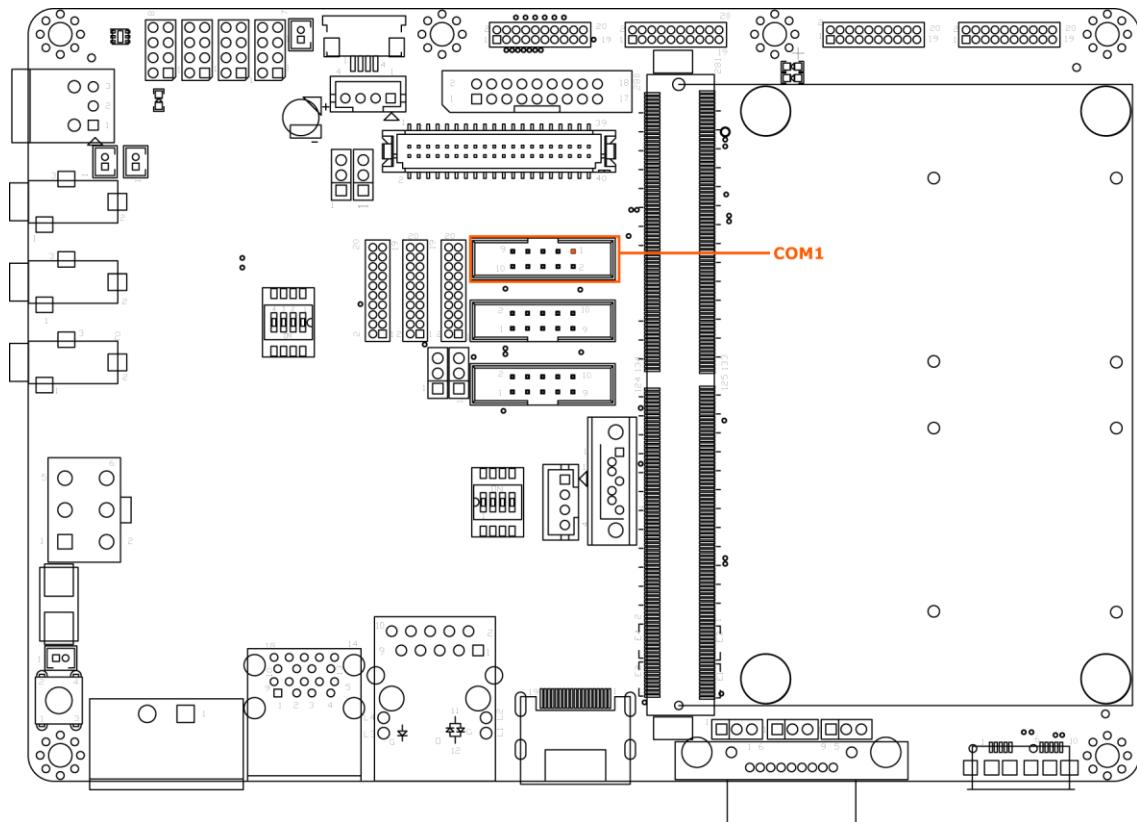


Figure 32: DE9 cable for the CAN BUS2 connector

6.16. COM1

A universal asynchronous receiver/transmitter (UART) is a type of "asynchronous receiver/transmitter", a piece of computer hardware that translates data between parallel and serial forms.

The COM1/UART1port can be used to connect a terminal (null modem).



COM1 pin #	Function	COM1 pin #	Function
1	X	2	RS232_RX1
3	RS232_TX1	4	X
5	GND	6	X
7	RS232_RTS1	8	RS232_CTS1
9	X	10	X

Table 24: pin out on the COM1 connector (box header 2x5, 2 mm pitch)



Figure 33: DE9 cable for the COM1 connector

6.17. COM2

A universal asynchronous receiver/transmitter (UART) is a type of "asynchronous receiver/transmitter", a piece of computer hardware that translates data between parallel and serial forms. UARTs are commonly used in conjunction with communication standards such as EIA RS-232, RS-422 or RS-485.

The COM2 is a DE9 serial port connector. The Serial port can be switched in RS-232, RS-422 or RS-485 modes by setting Dipswitch SW1.

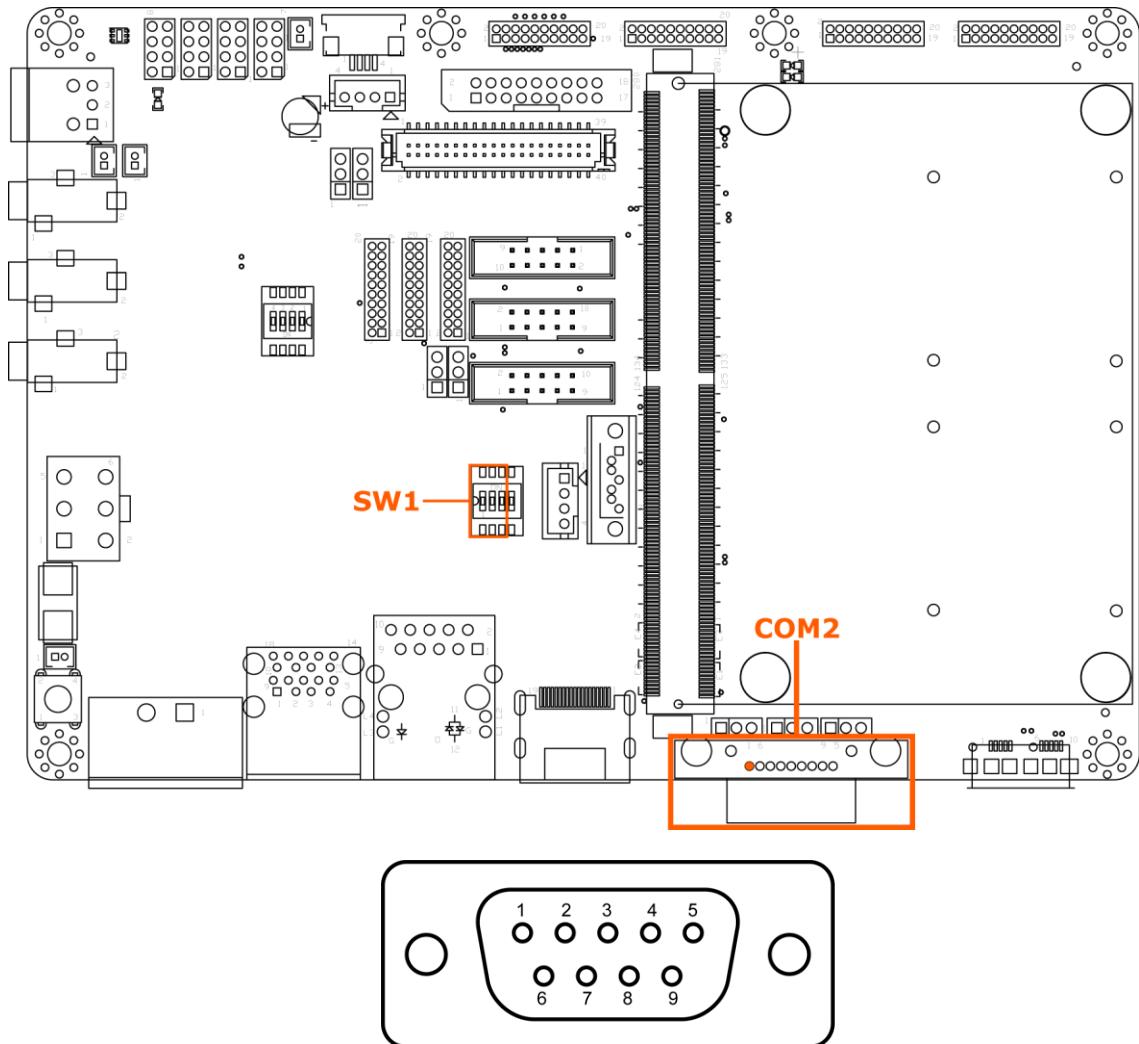
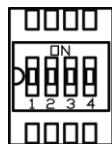


Figure 34 - DE-9 Serial Port Connector

Pin #	RS-232	RS-422	RS-485
1	Carrier Detect	TxD- (A)	Data- (A)
2	Receive Data	TxD+ (B)	Data+ (B)
3	Transmit Data	RXD+ (B)	
4	Data Terminal Ready	RxD- (A)	
5	GND	GND	GND
6	Data Set Ready		
7	Request to Send		
8	Clear to Send		
9	Ring Indicator		

Table 25 - Serial Port Connector Pin-out

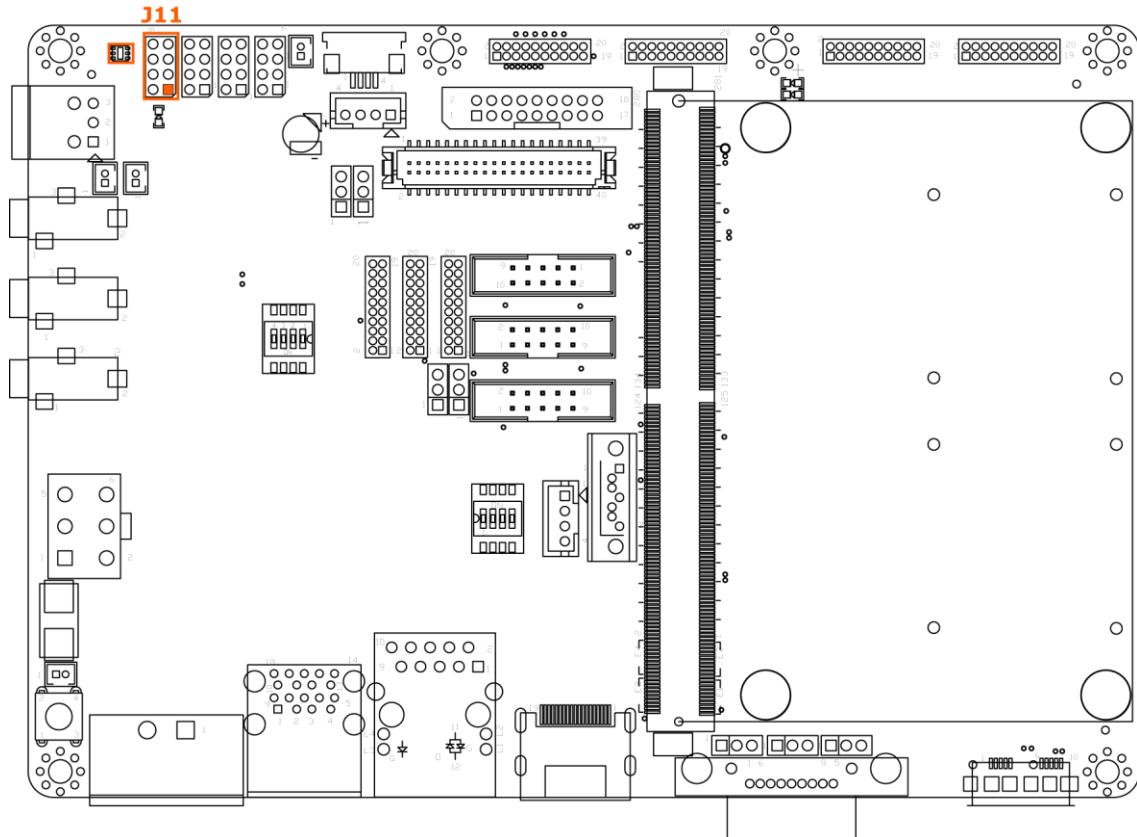


SW1 (RS-232/485/422 Select on COM2)	RS-422	RS-485	RS-232
1	ON	OFF	OFF
2	OFF	ON	OFF
3	OFF	OFF	ON
SW1 (Audio output select)	SGTL5000	TLV320	
4	OFF	ON	

Table 26: RS-422 / 485 / 232 selection

6.18. Light Sensor

The Intersil ISL29023 is an integrated ambient and infrared light to digital converter with I²C Interface.

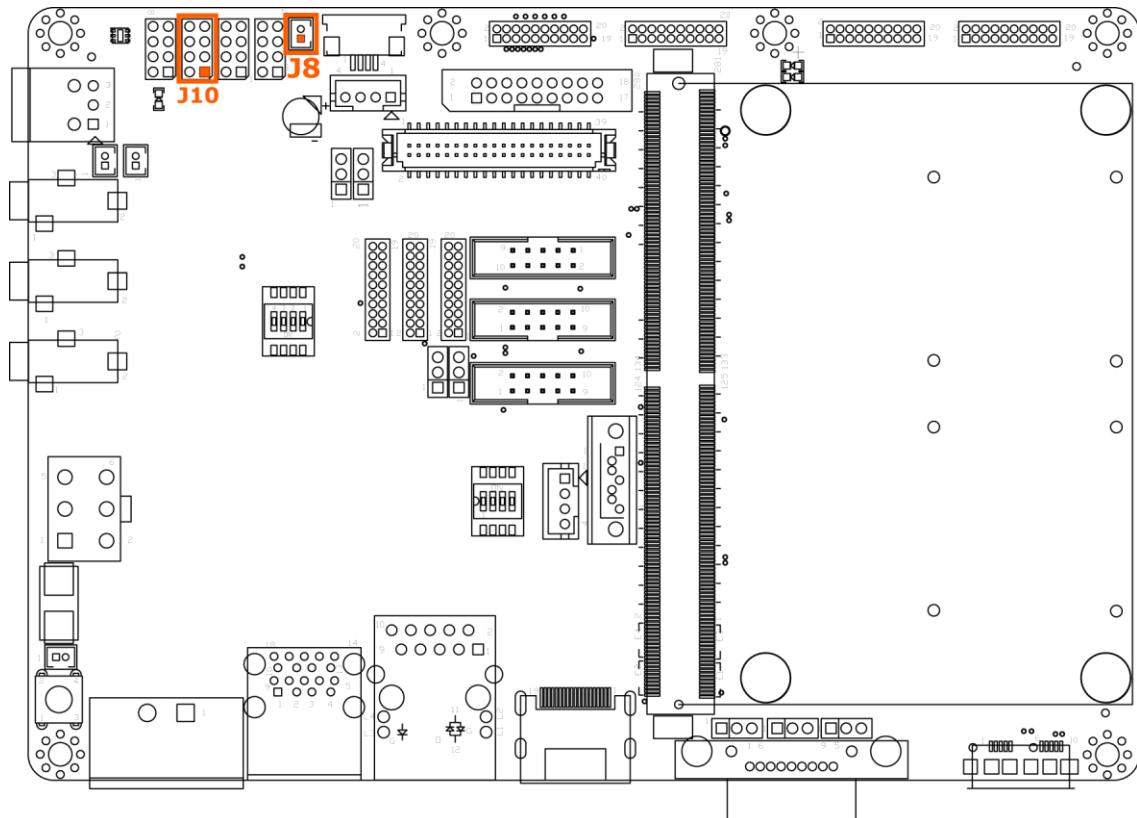


J11 (I ² C Select for Light sensor)	I ² C2	I ² C3 (default)
1-2	ON	OFF
3-4	OFF	ON
5-6	OFF	ON
7-8	ON	OFF

Table 27: jumper settings for the light sensor I²C selection

6.19. RTC

The power for the RTC is supplied by a CR2032 battery which can be connected to the J8 connector on the carrier board.



J10 (I ² C Select for RTC)	I ² C2	I ² C3 (default)
1-2	ON	OFF
3-4	OFF	ON
5-6	OFF	ON
7-8	ON	OFF

Table 28: jumper settings for the RTC I²C selection

J8 (RTC)	
1	Ground
2	+

Table 29 - RTC battery connector Pin-out (wafer 2pin pitch 1.25 mm)

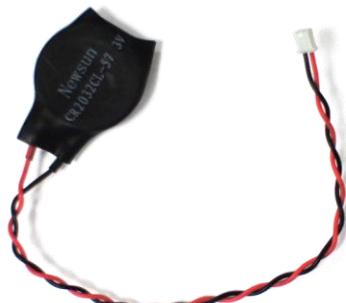
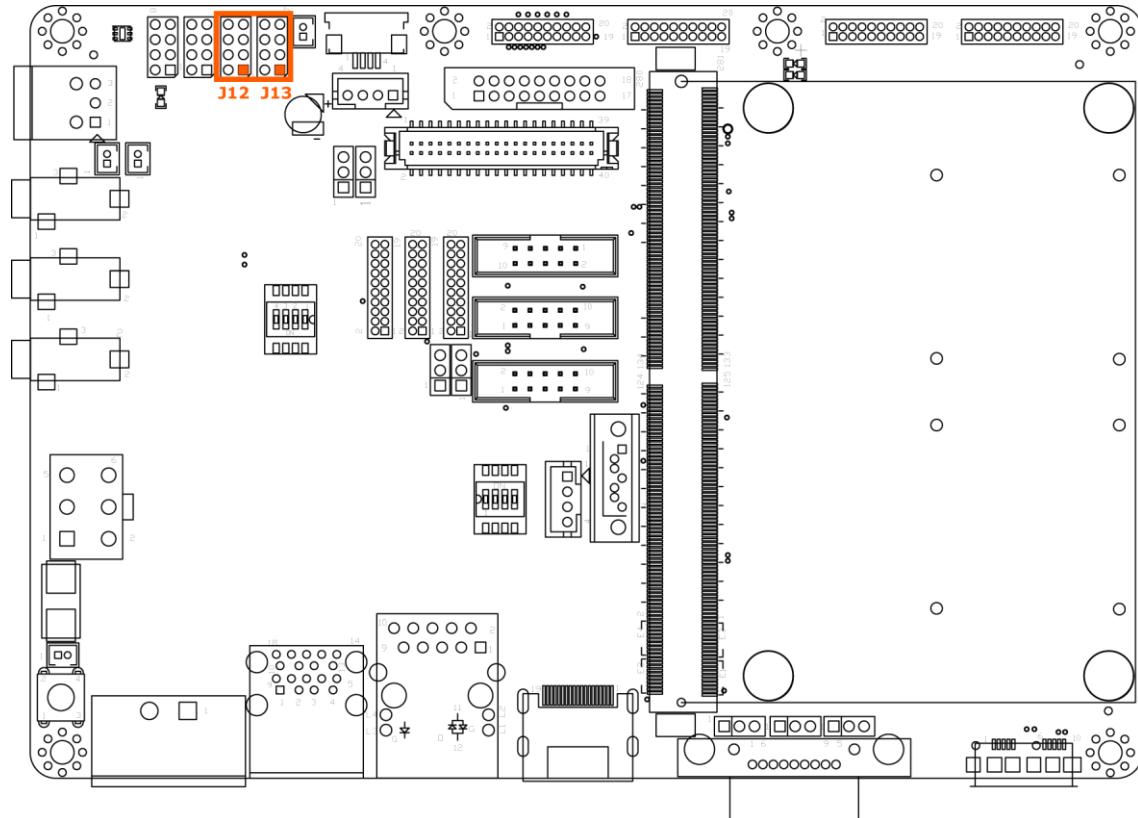


Figure 35: CR2032 Battery for RTC

6.20. eCOMPASS and 3 axis Sensors

The Freescale MAG3110 is a small, low-power, digital 3-axis magnetometer. The device can be used in conjunction with a 3-axis accelerometer to realize an orientation independent electronic compass that can provide accurate heading information. It features a standard I²C serial interface output and smart embedded functions. The ST Microelectronics LIS331DLH is the 3 axis linear accelerometer.



J12 (I ² C Select for eCOMPASS)	I ² C2	I ² C3 (default)
1-2	ON	OFF
3-4	OFF	ON
5-6	OFF	ON
7-8	ON	OFF

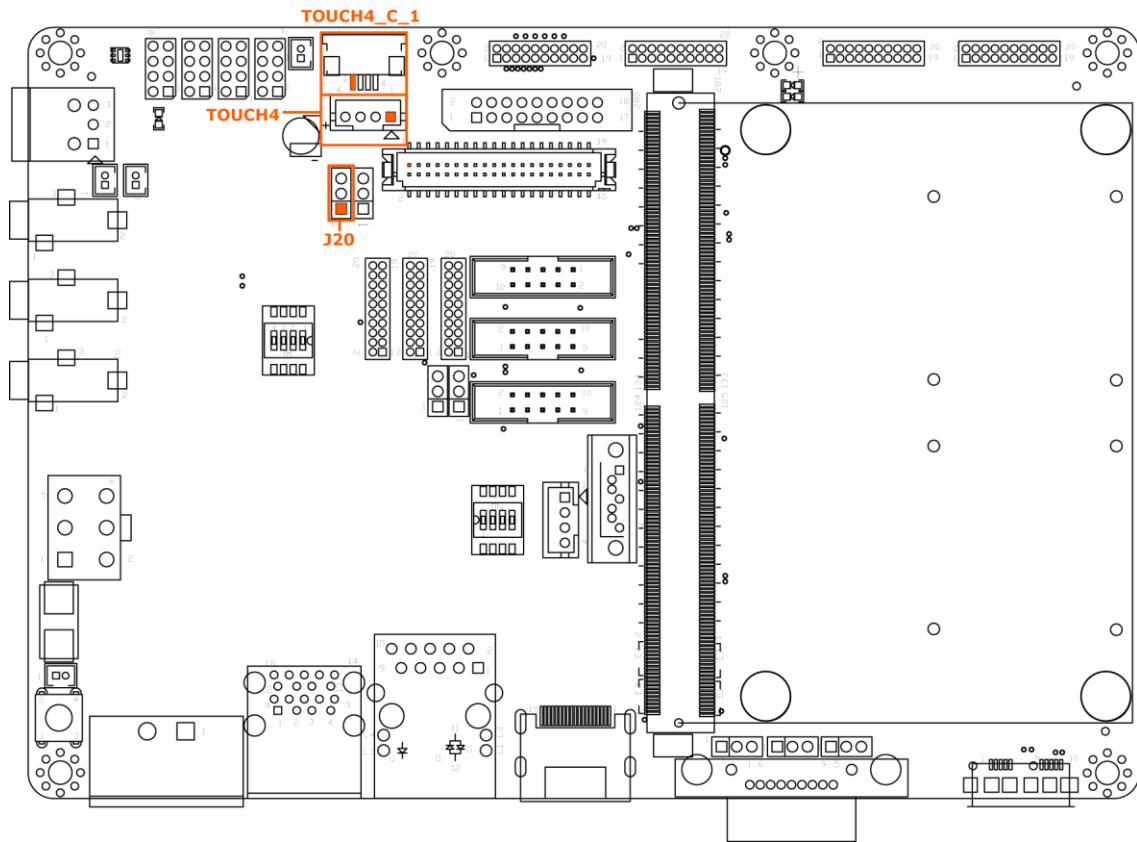
Table 30: jumper settings for the eCOMPASS sensor I²C selection

J13 (I ² C Select for 3 axis sensor)	I ² C2	I ² C3 (default)
1-2	ON	OFF
3-4	OFF	ON
5-6	OFF	ON
7-8	ON	OFF

Table 31: jumper settings for the 3-axis sensor I²C selection

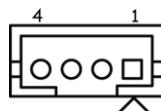
6.21. 4-wire touch connectors

The TSC2046 is a 4-wire touch screen controller that is connected to an FPC connector and a wafer connector. The wafer connector can be used to for example connect the optional EDM display kit (TDHJ070NA4RESKIT).



TOUCH4_C_1 (for FPC)	
1	XL_ch1
2	YD_ch1
3	XR_ch1
4	YU_ch1

Table 32: FPC connector pin out (4 pins, 1 mm pitch, right angle, upper contact, h=2.5 mm)



wafer 4 pin 2.0 mm

TOUCH4 (connector)	
1	YU_ch1
2	XR_ch1
3	YD_ch1
4	XL_ch1

Table 33: wafer connector pin out (4pins, 2 mm pitch)

J20 (4 wire Touch ON/OFF)	ON (default)	OFF
1-2	ON	OFF
2-3	OFF	ON

Table 34: Switch ON/OFF touch IC

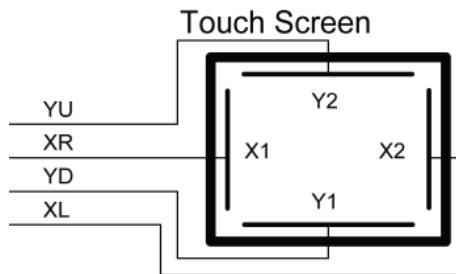


Figure 36: explanation of touch panel naming



Figure 37: optional EDM Display kit (TDHJ070NA4RESKIT))

6.22. 12V DC Power

Connect the 12V DC power adapter with the converter to the Phoenix Combicon MSTB 2.5 connector on the carrier board.

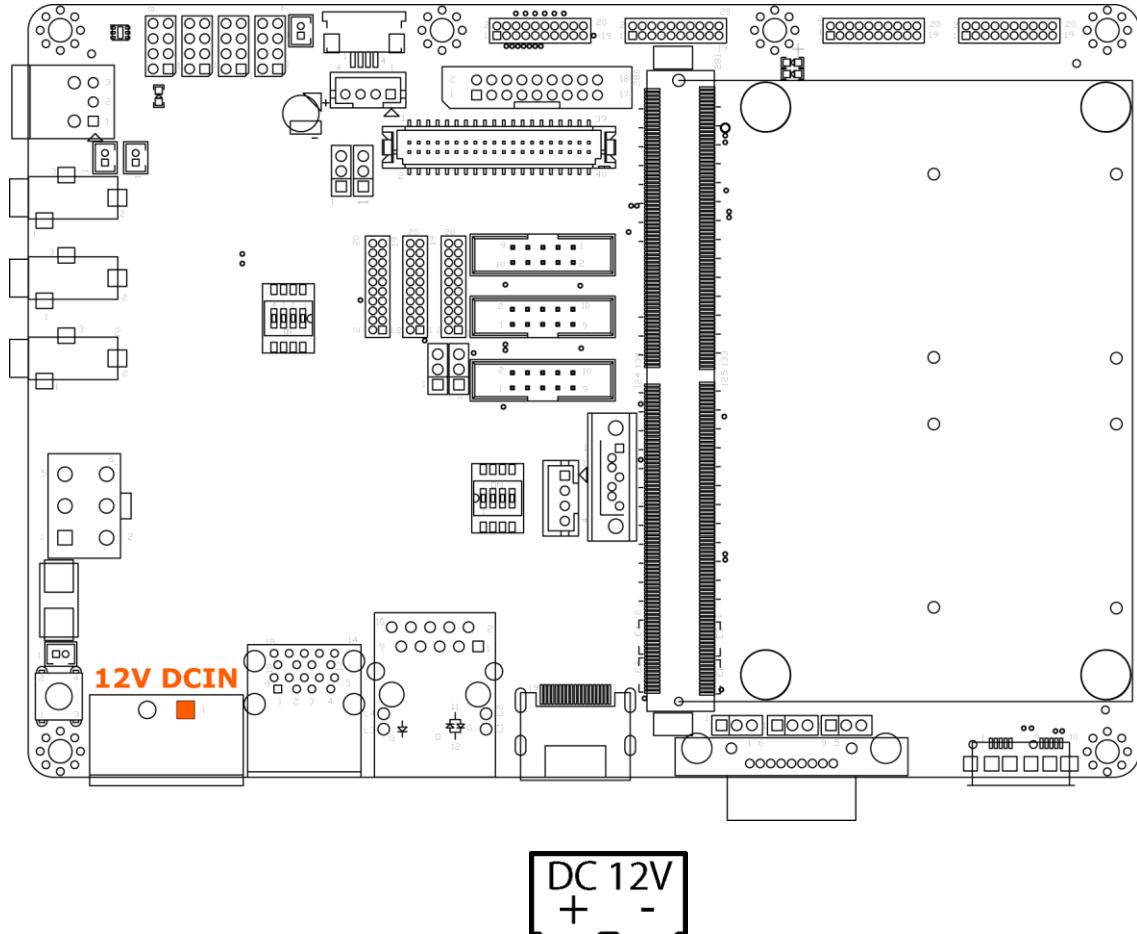


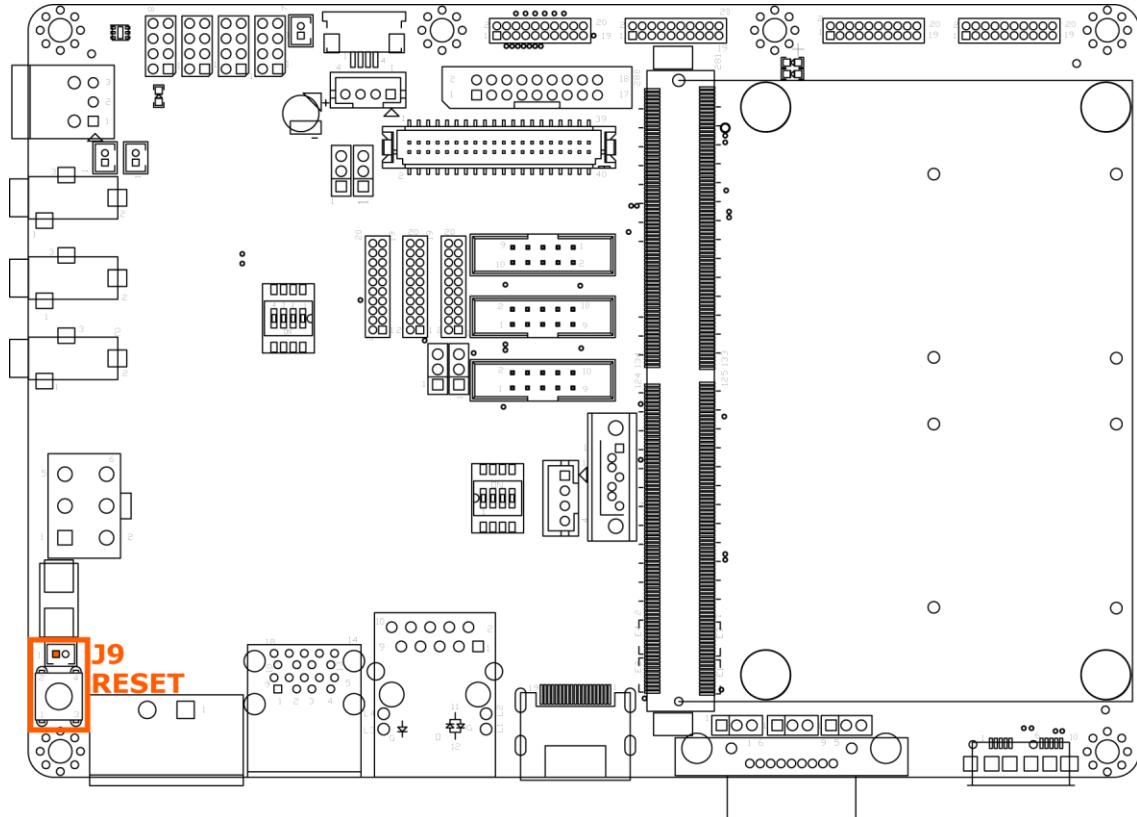
Figure 38: pin out of the Phoenix Combicon MSTB 2.5 connector



Figure 39: converter from power adapter to Phoenix Combicon MSTB 2.5 connector

6.23. Reset button

The hardware reset button is placed next to a small connector. In case the board is mounted in an enclosure, this small connector can be used to connect an external switch.

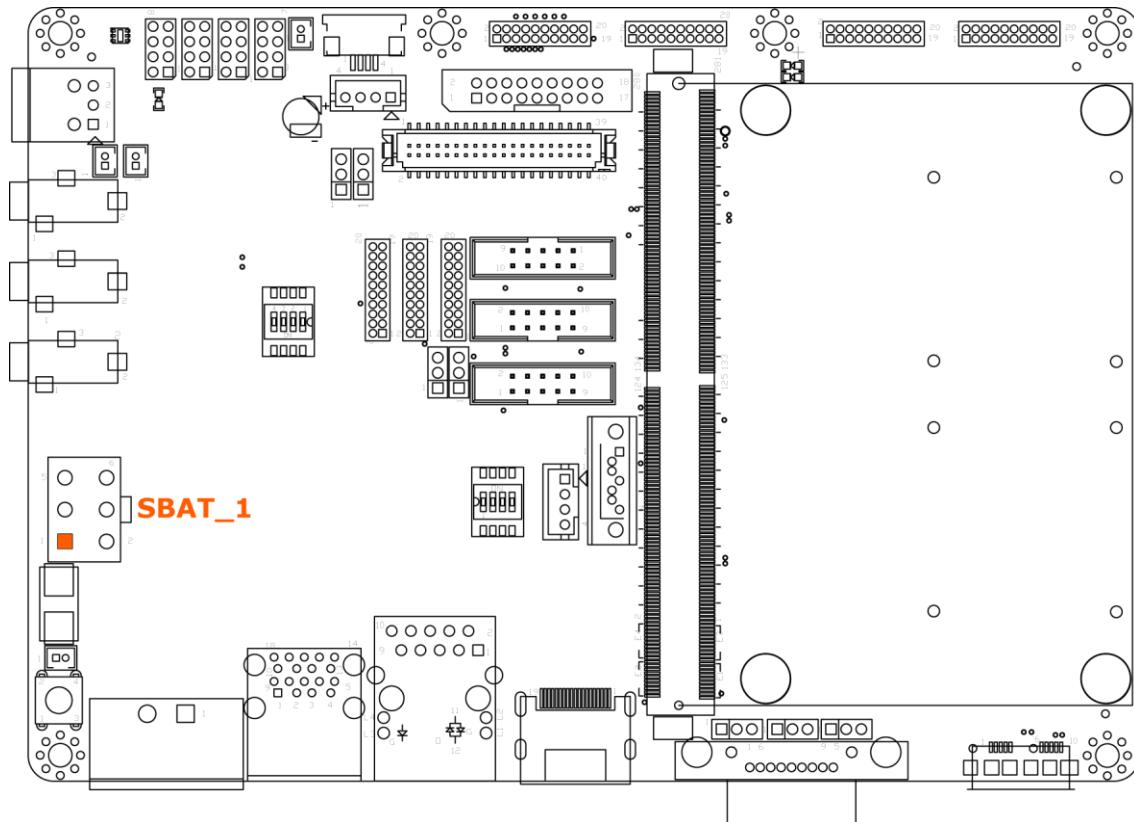


J9 (reset, ON/OFF)	
1	Reset
2	Ground

Table 35 - Connector to connect a reset switch externally (wafer 2 pin pitch 1.25 mm)

6.24. Smart Battery

A Smart Battery System (SBS) is used for determining e.g. accurate smart battery capacity readings. It allows operating systems to perform power management operations via a smart battery charger based on remaining estimated run times. Through this communication, the system also controls the amount the battery is charged.

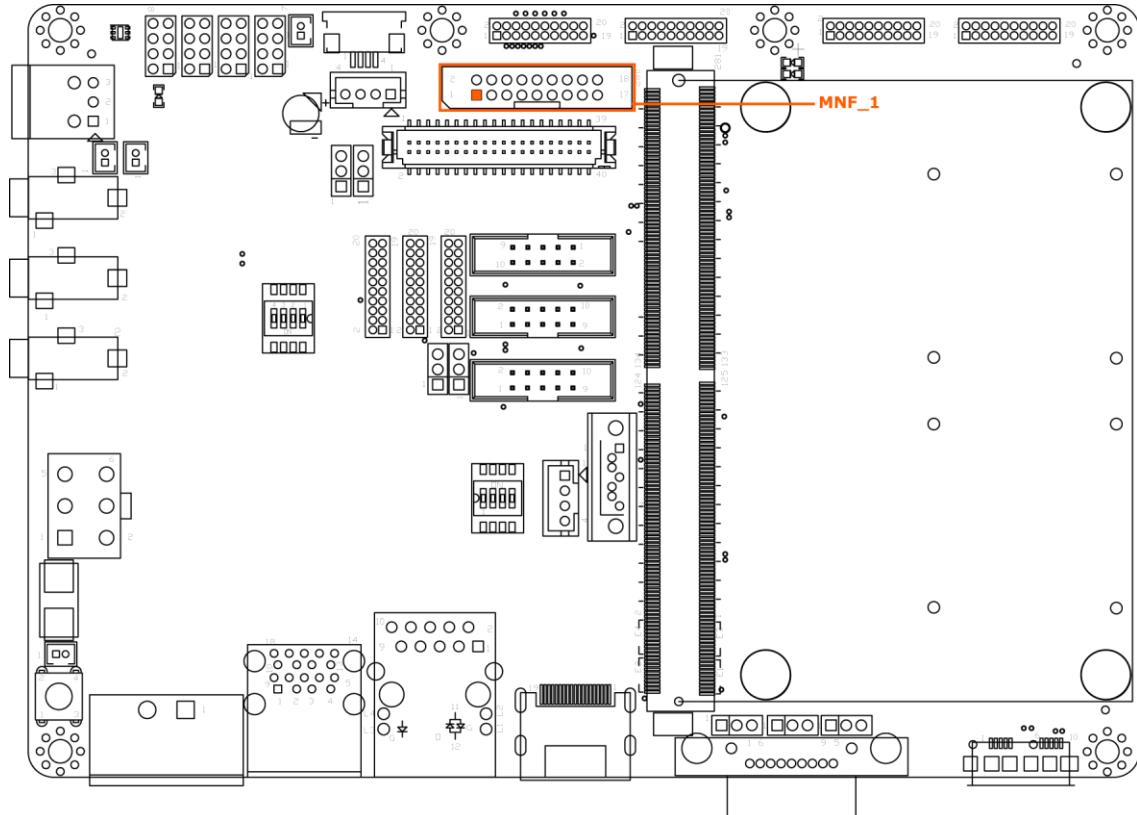


SBAT_1 Pin #	Function	SBAT_1 Pin #	Function
1	GND	2	GND
3	VCC 12V	4	VCC 12V
5	EXT_SCL	6	EXT_SDA

Table 36 - Smart battery Connector Pin-out (power connector 2x3 pitch 4.2 mm)

6.25. MNF Connector

The MNF connector can for example connect the EDM-MNF-BOOT PCB, which is used to change the boot order to the SD-card.



MNF pin #	Function	MNF pin #	Function
1	RSVD_P267	2	RSVD_P268
3	RSVD_P269	4	RSVD_P270
5	RSVD_P271	6	RSVD_P272
7	RSVD_P273	8	RSVD_P274
9	RSVD_P275	10	RSVD_P276
11	RSVD_P277	12	RSVD_P278
13	Watchdog	14	RSVD_P280
15	GND	16	+3.3V
17	GND	18	+3.3V

Table 37 - MNF Connector Pin-out (Box header 9x2 pitch2.0 mm)

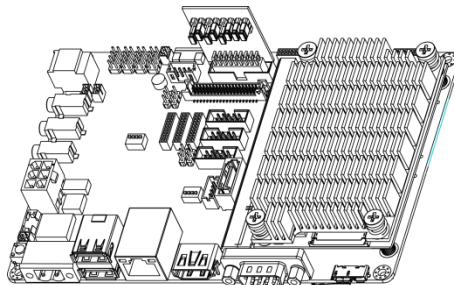


Figure 40: example of the use of the MNF connector: changing the boot order with the EDM-MNF-BOOT PCB

7. EDM1-FAIRY Carrier Board dimensions

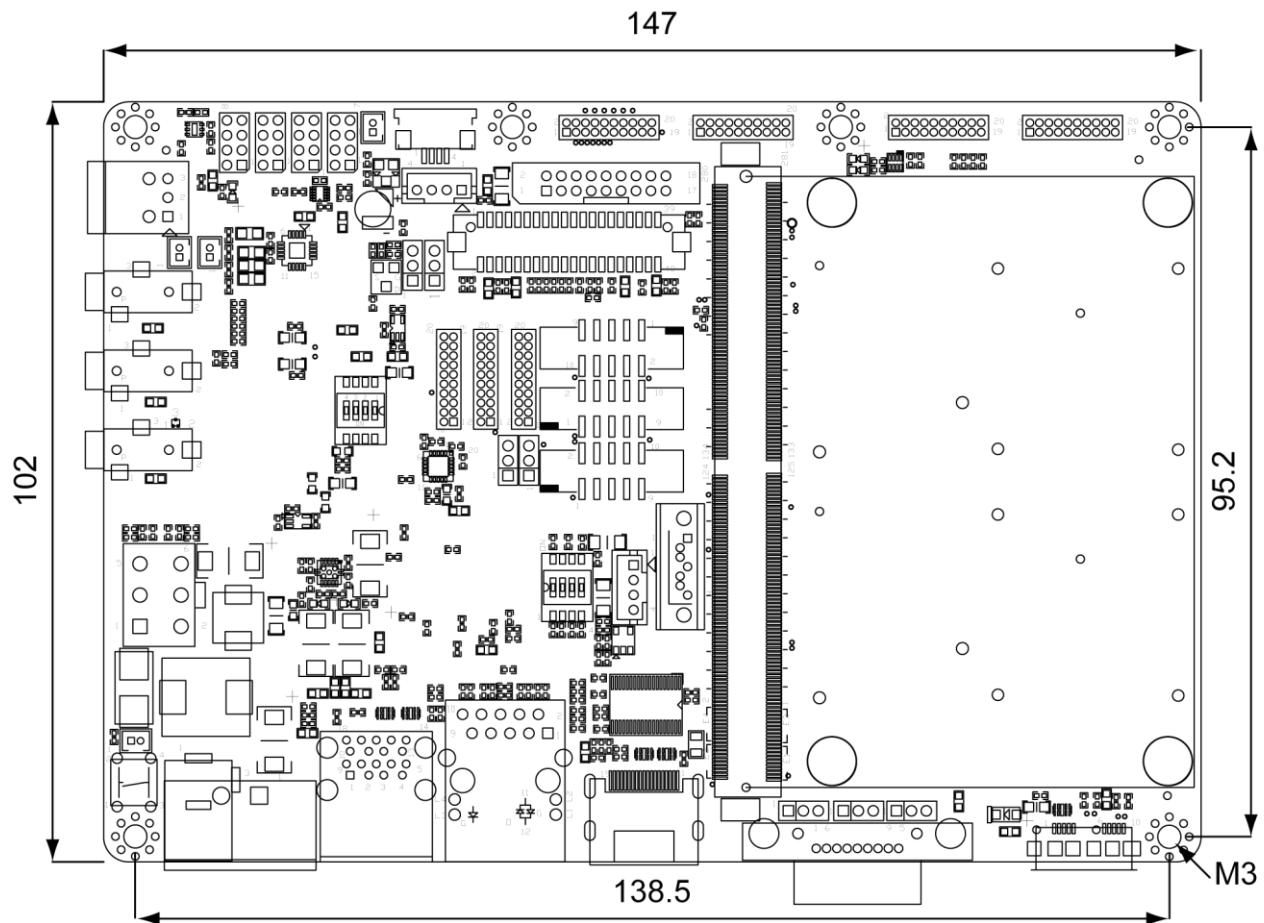


Figure 41: EDM1-FAIRY Carrier Board dimensions (Dimensions in mm)

Note: 2D DXF-files and 3D STEP-files are available for download at the TechNexion website.

Important notice

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8. APPENDIX A - Schematics

EDM1-FAIRY REV:A1

L=6, 147 x 102 mm(5.8" x 4")

PAGE TITLE

P01 Index

P02 Expansion CONN.

P03 DC-DC& M-SD & BatterySocket

P04 USB Host

P05 USB Ports & CAN bus

P06 HDMI & Others

P07 RS232/422/485

P08 Others

P09 Audio_1/Audio_2

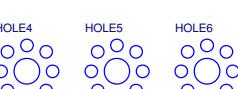
P10 RJ45 & EEPROM/ SPDIF

P11 LVDS & CONNs

P12 Touch & 3G & MNF



FM1 FM40S-X FM2 FM40S-X FM3 FM40S-X FM4 FM40S-X FM5 FM40S-X FM6 FM40S-X FM7 FM40S-X FM8 FM40S-X



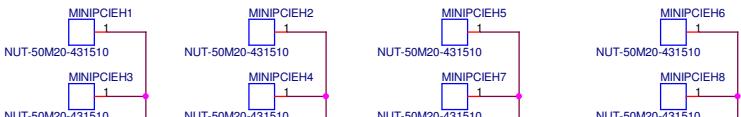
PCB
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DESIGN AND DISCLAIMER

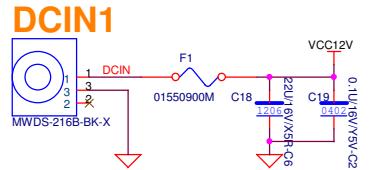
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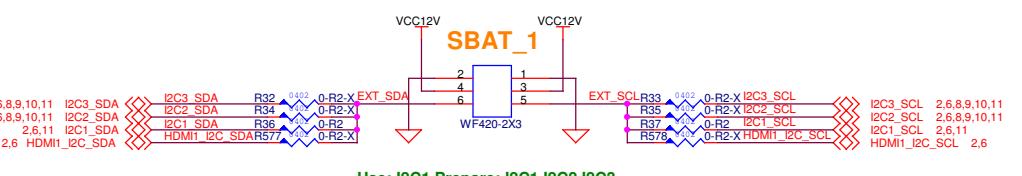
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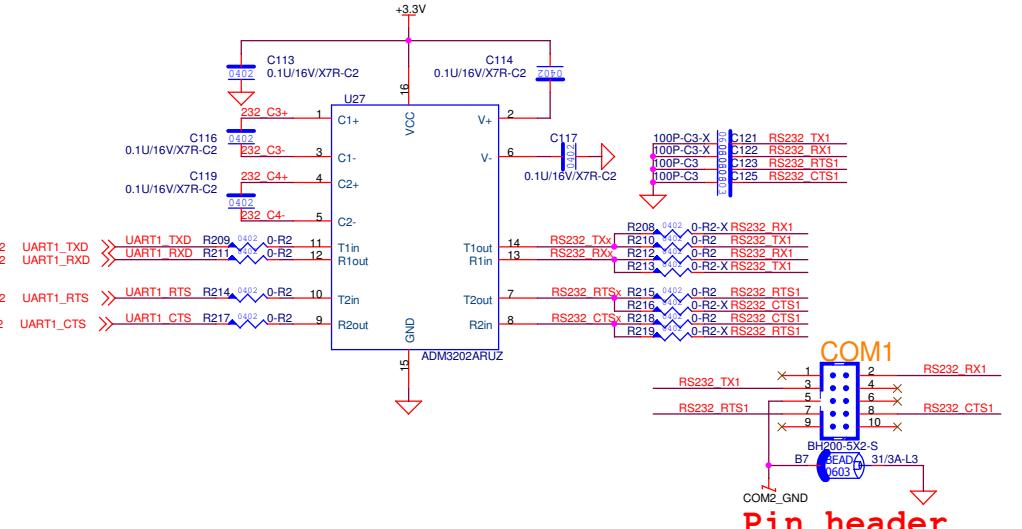


Battery Module Socket

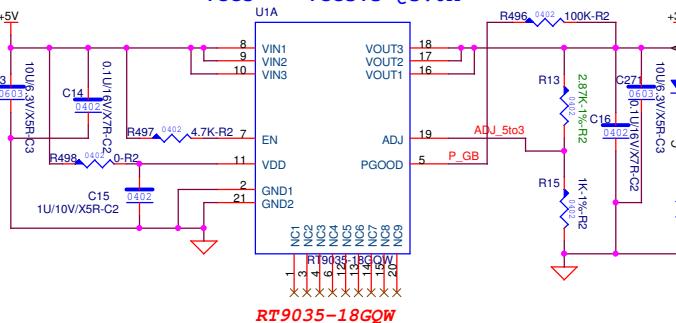


COM1

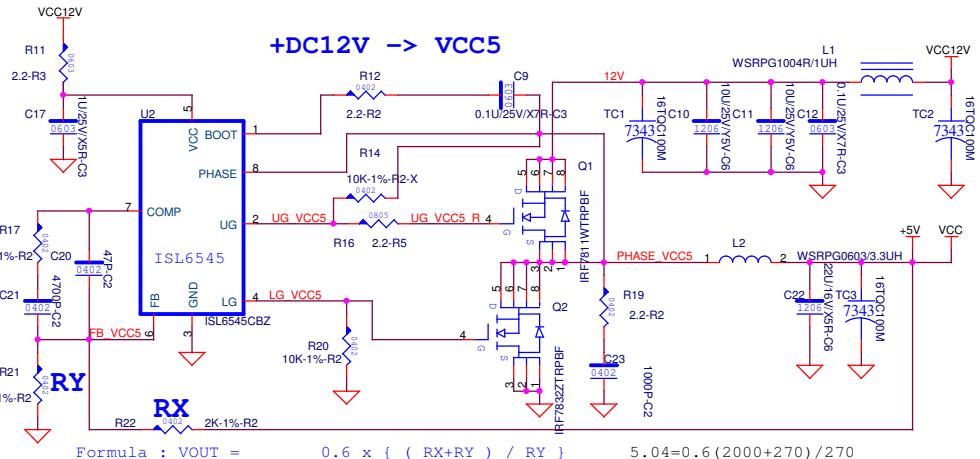
UART1 for Console



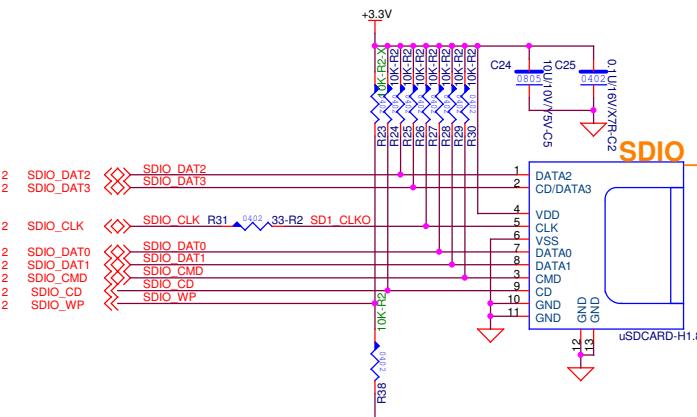
DC-DC



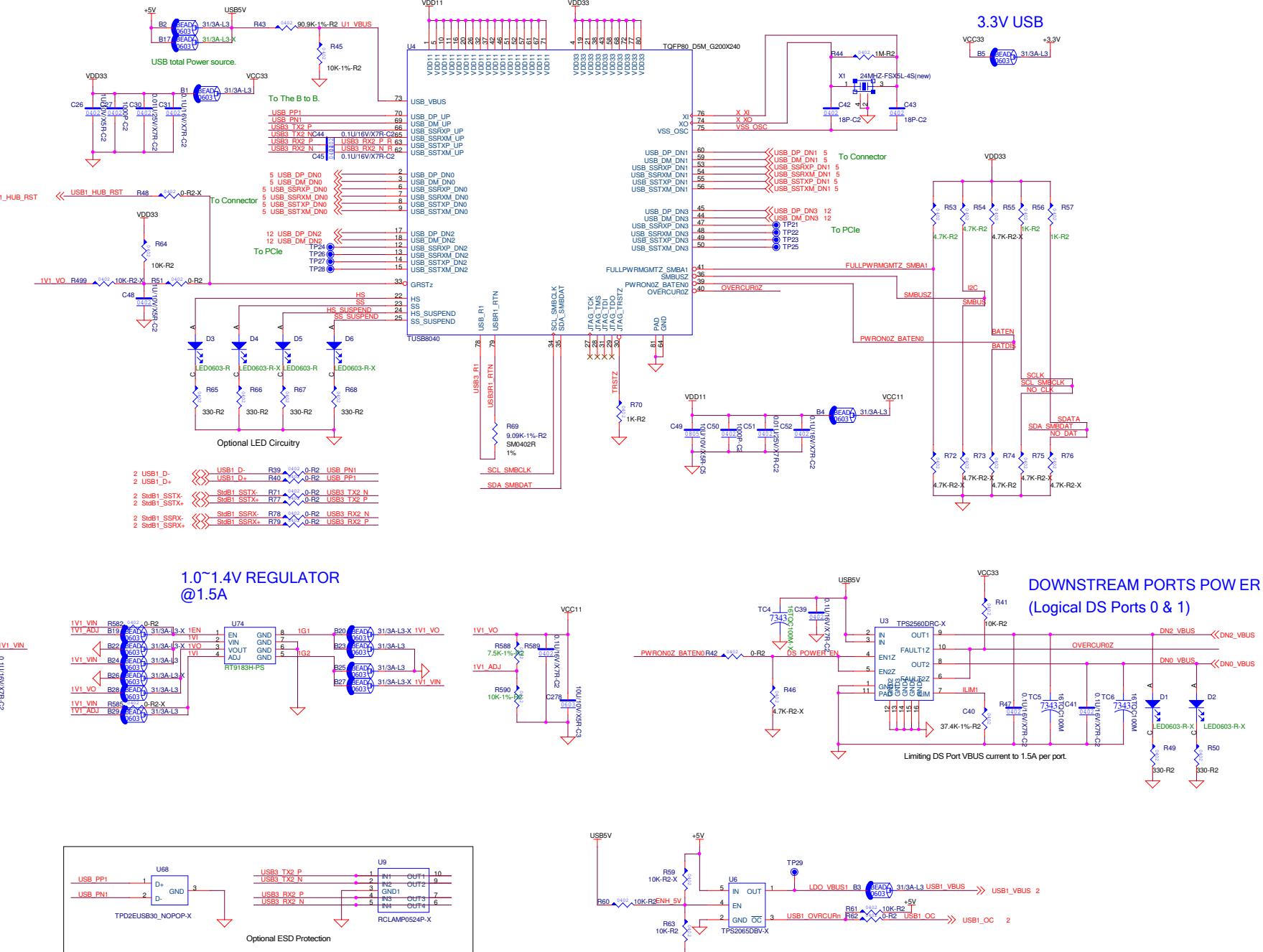
+DC12V → VCC5

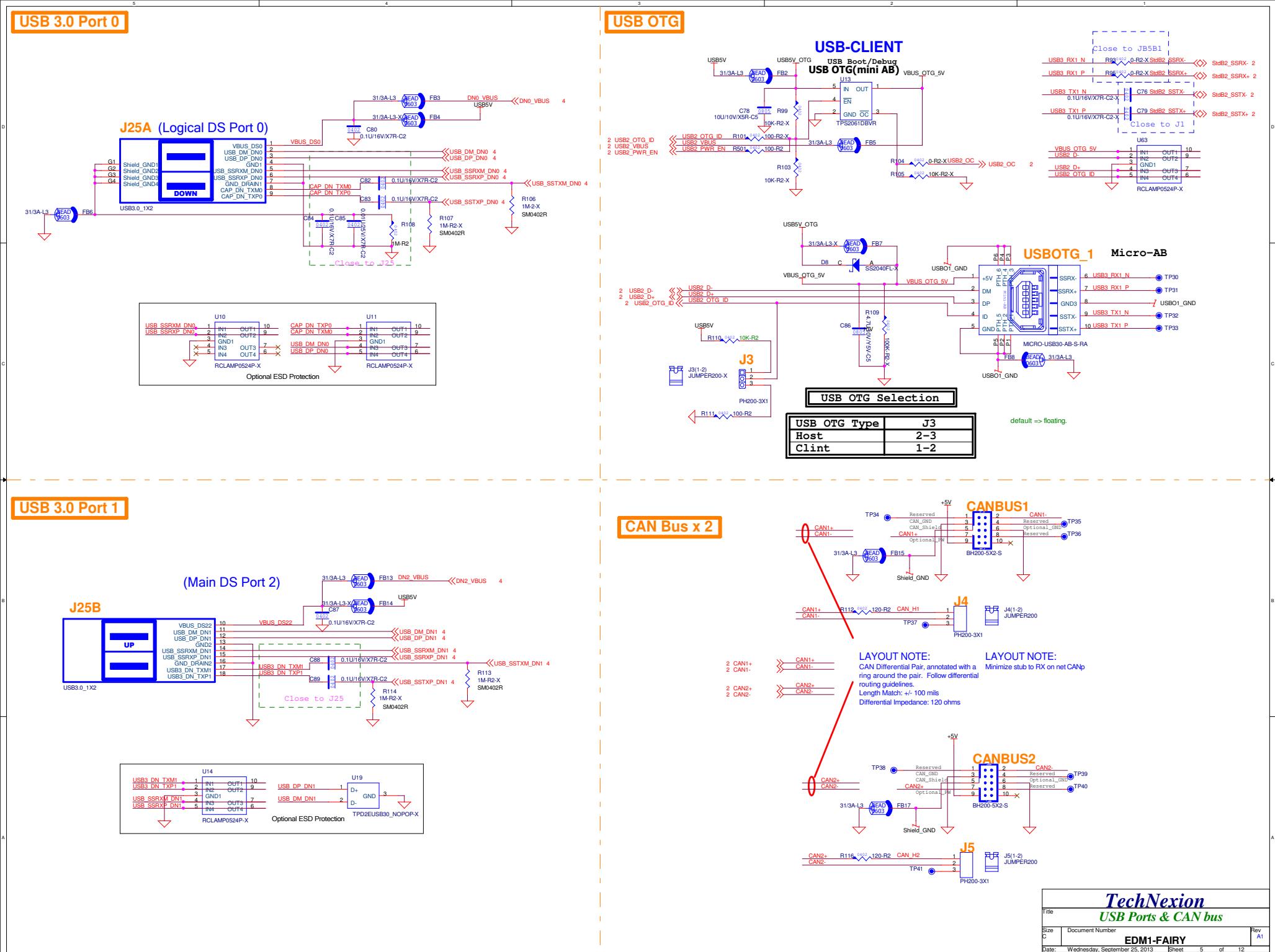


Micro-SD

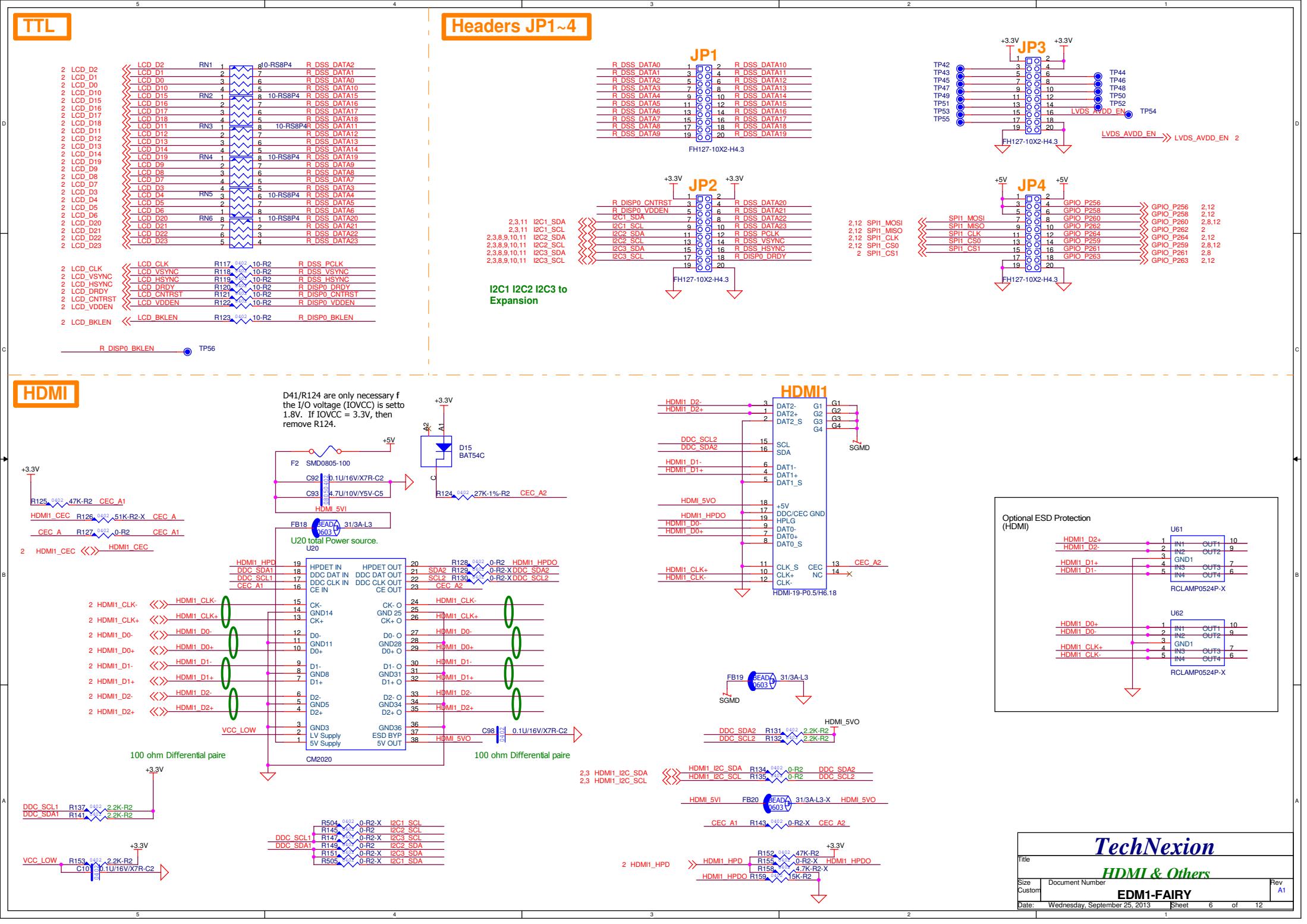


USB Host



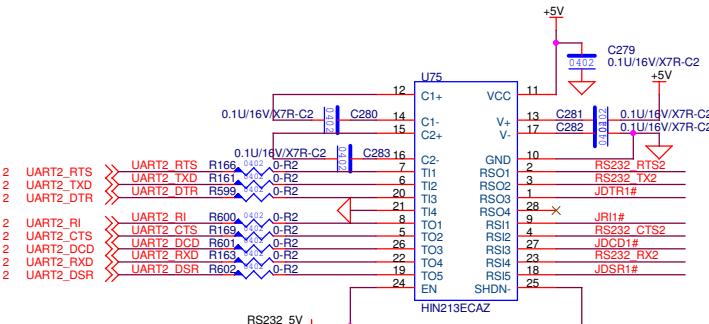
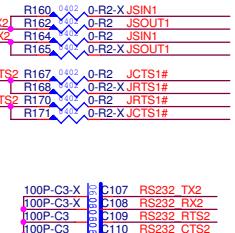
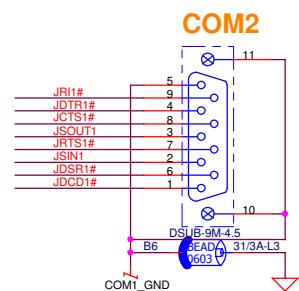


Headers JP1~4

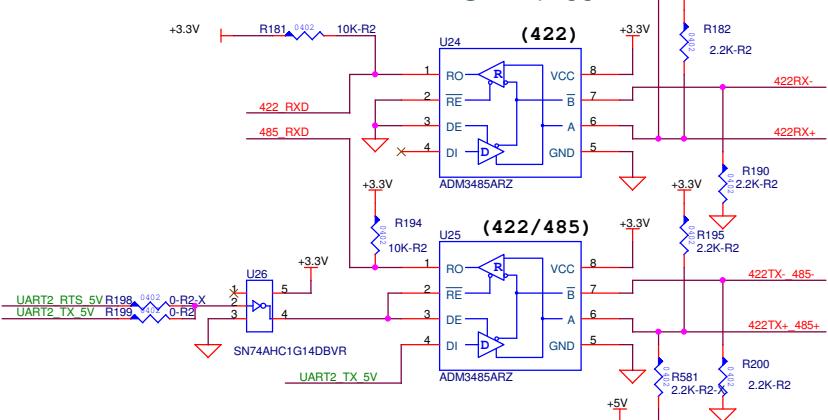


RS232

Uart2

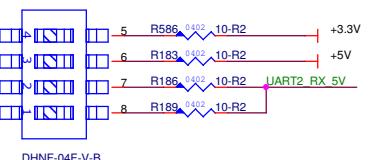
**RS232/422/485 @ DB-9****COM2****RS422/485**

Uart2

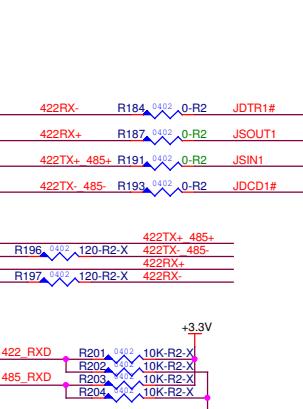
**RS-422/485****Audio Output SELECT**

SW1 SGTL5000 TLV320

4-5 OFF ON

SW1**RS-232/485/422 SELECT (Com2)**

SW1 RS-422 RS-485 RS-232

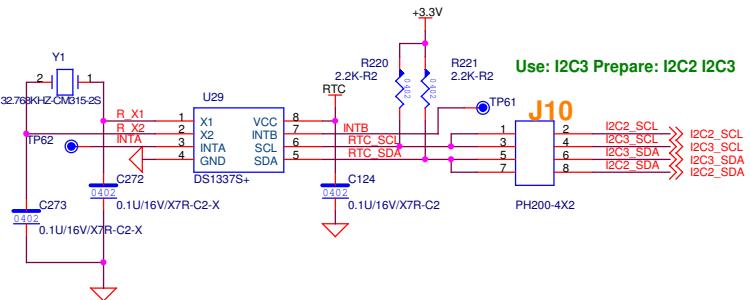
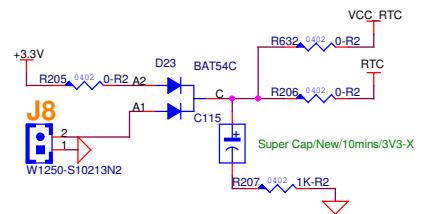
1-8 ON OFF OFF
2-7 OFF ON OFF
3-6 OFF OFF ON**TechNexion**

RS232/422/485

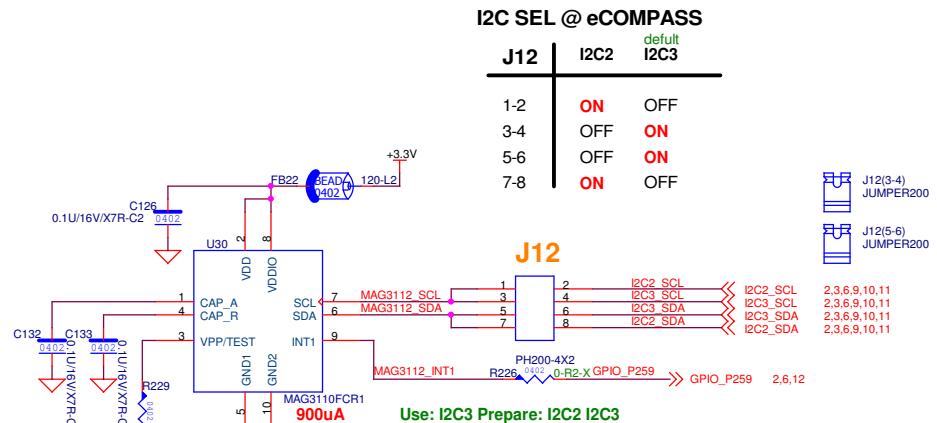
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RTC

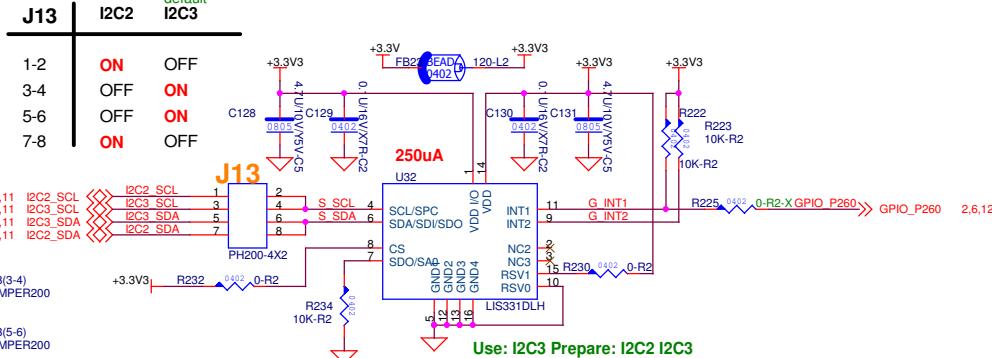


eCOMPASS



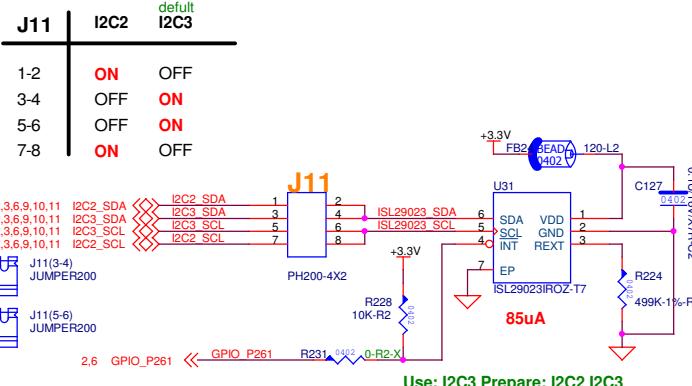
3 axis sensor

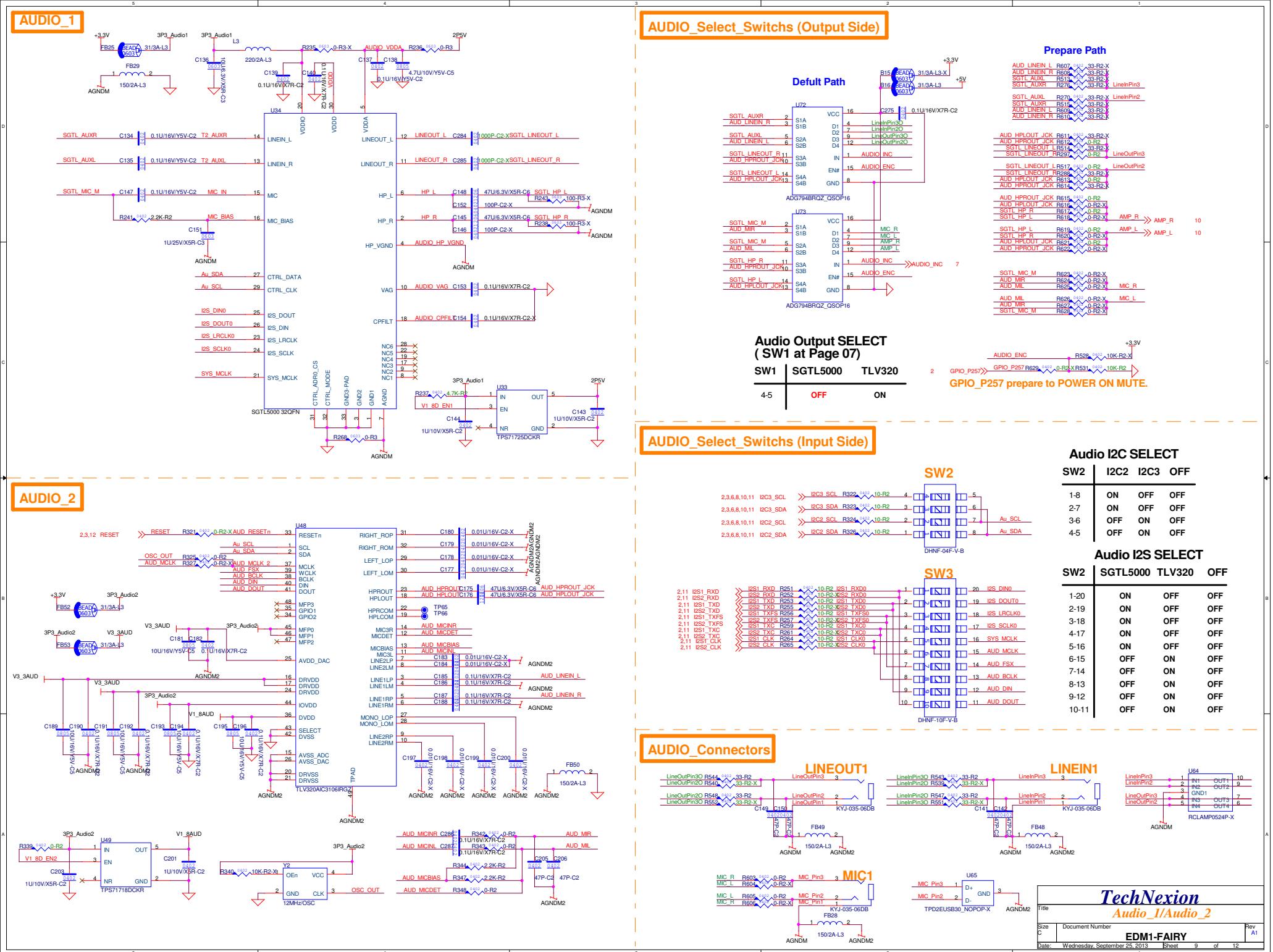
I2C SEL @ 3 axis sensor

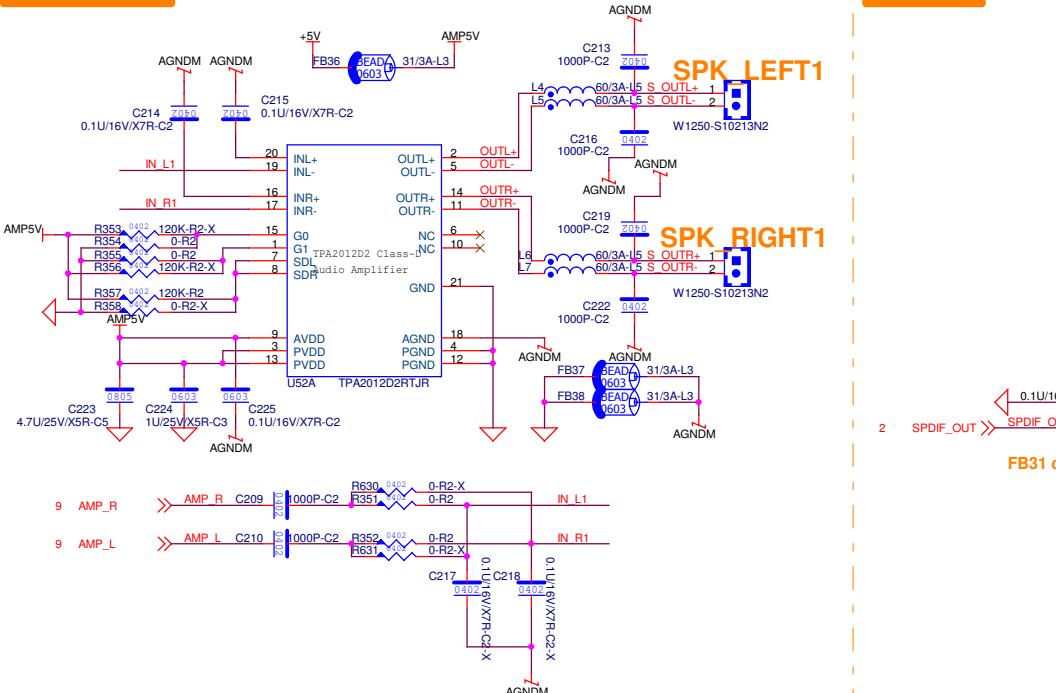
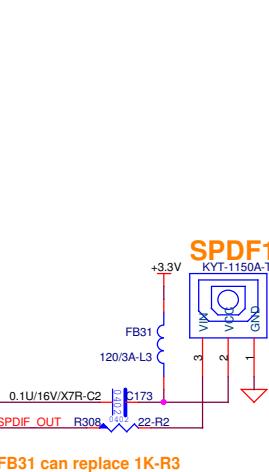
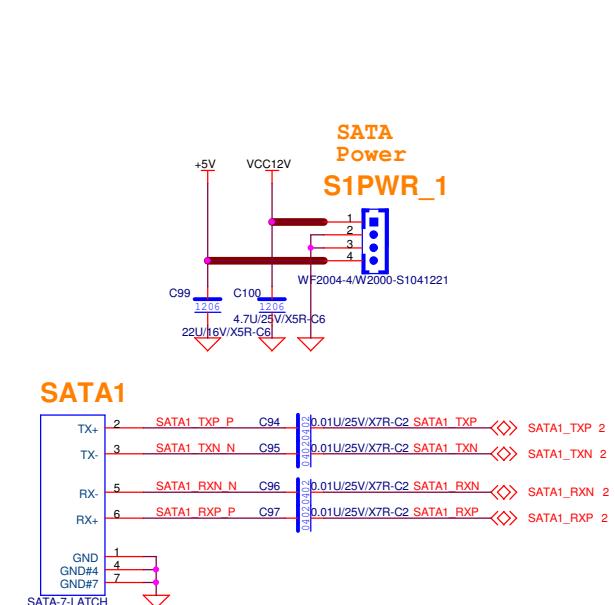
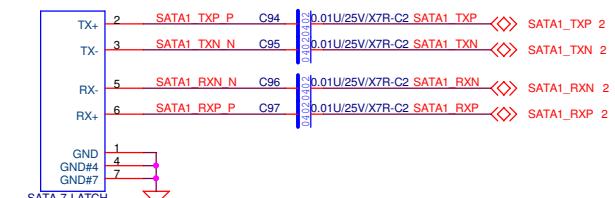
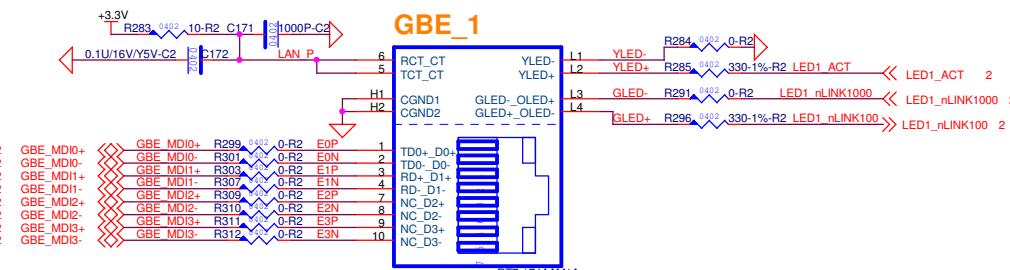


LIGHT-SENSOR

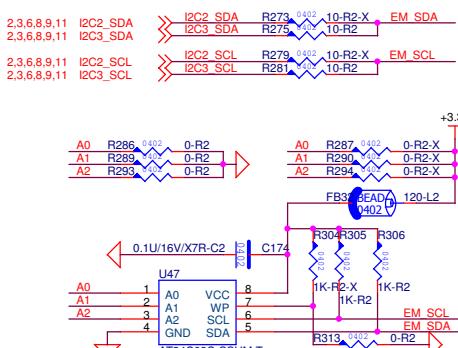
I2C SEL @ Light-Sensor





AUDIO AMP**SPDIF****SATA****SATA1****RJ45****EEPROM**

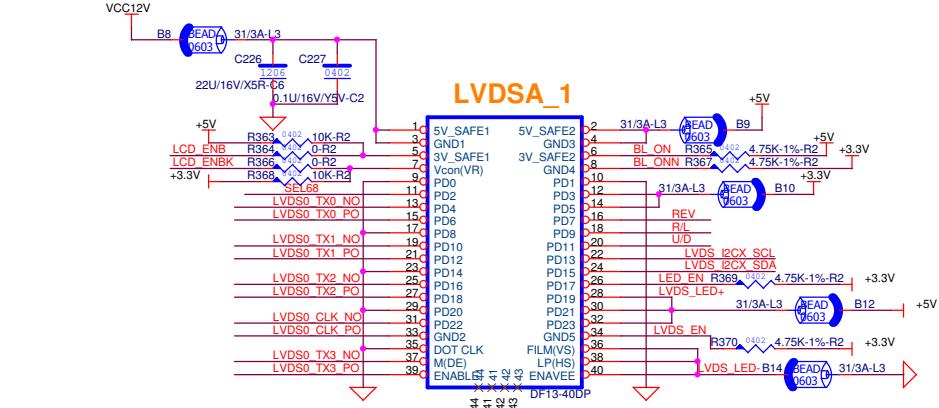
Use: I2C3 Prepare: I2C2 I2C3

**TechNexion**

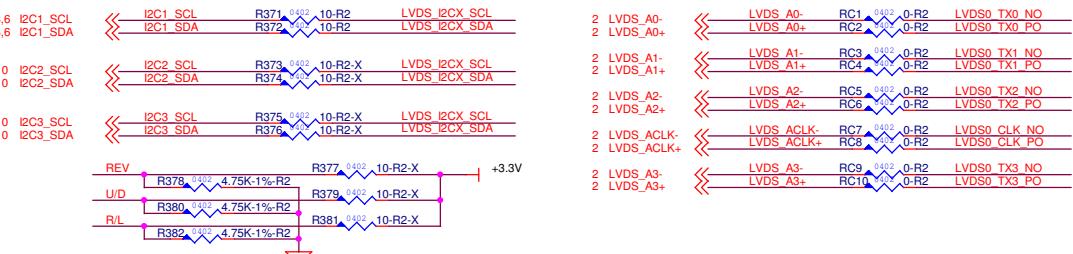
RJ45 & EEPROM/SPDIF

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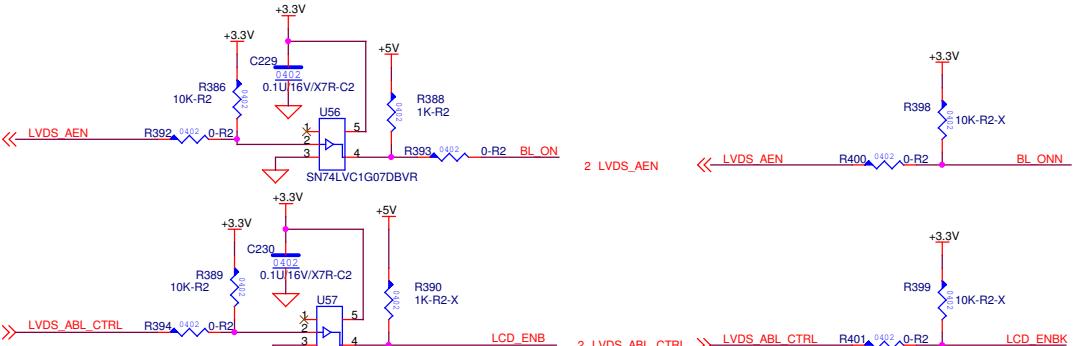
LVDS



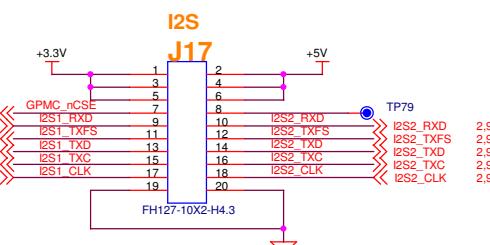
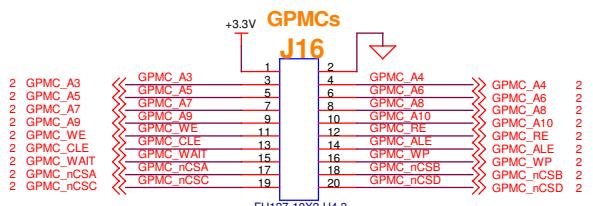
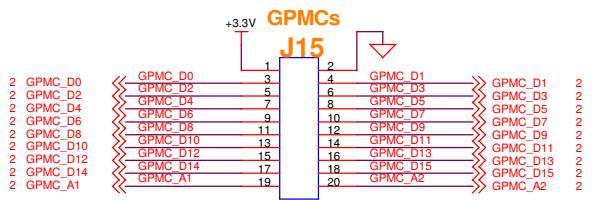
Use: I2C3 Prepare: I2C1 I2C2 I2C3

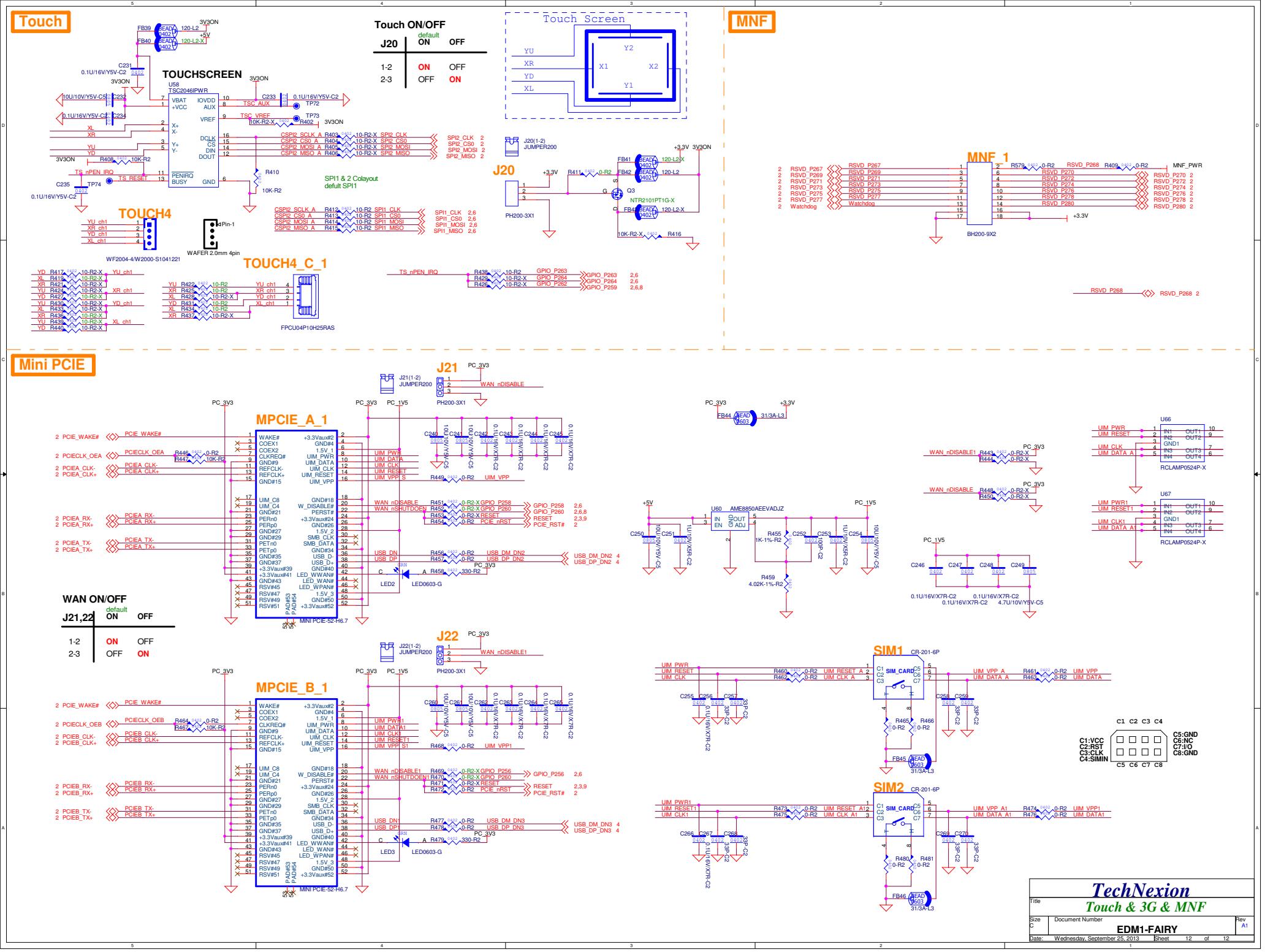


Pull H/L	SEL68
High	1-2
Low	2-3



CONNs





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