

Daisy V1.1 COM Express Baseboard

Datasheet





Revision History

Date	Doc. Rev.	Daisy Version	Changes
08-Okt-09	Rev. 0.9	V1.0	Preliminary Release
23-Okt-09	Rev. 0.91	V1.0	USB header X76, chapter 3.2.6
03-Dec-09	Rev 1.0	V1.1	Transition to Daisy V1.1
22-Jan-10	Rev 1.1	V1.1	Chapter 3.3: "JILI30" to "JILI (40 pin)" chapter 4.2 + weight information chapter 3.4.2 LVDS Connector (X82)
01-Feb-11	Rev 1.2	V1.1	Chapter 3.2.7: SMB Clock / Data corrected TV DAC connector GND signal clarification Disclaimer Update
01-Apr-11	Rev 1.21	V1.1	Added pitch information of connectors.



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1. Introduction

Daisy is a COM Express compliant carrier board. It allows a convenient integration of the Robin COM Express computer module into a system. The connector pinout of Daisy is compliant to COM Express Type 1. The form factor of Daisy adheres to Pico ITX making it ideally suited for mobile computing applications.

1.1. Reference Documents

For detailed technical information about suitable computer modules and the COM Express™ standard, please refer to the documents listed below.

1.1.1 COM Express™ Design Guide

Guidelines for designing a COM Express™ carrier board
http://www.picmg.org/pdf/PICMG_COMDG_100.pdf

1.1.2 Robin Computer Module

http://www.toradex.com/En/Products/Robin_Z530_Z510

1.1.3 Pico-ITX form Factor

http://www.via.com.tw/en/downloads/whitepapers/initiatives/spearhead/pico-itx_form_factor.pdf

2. Features

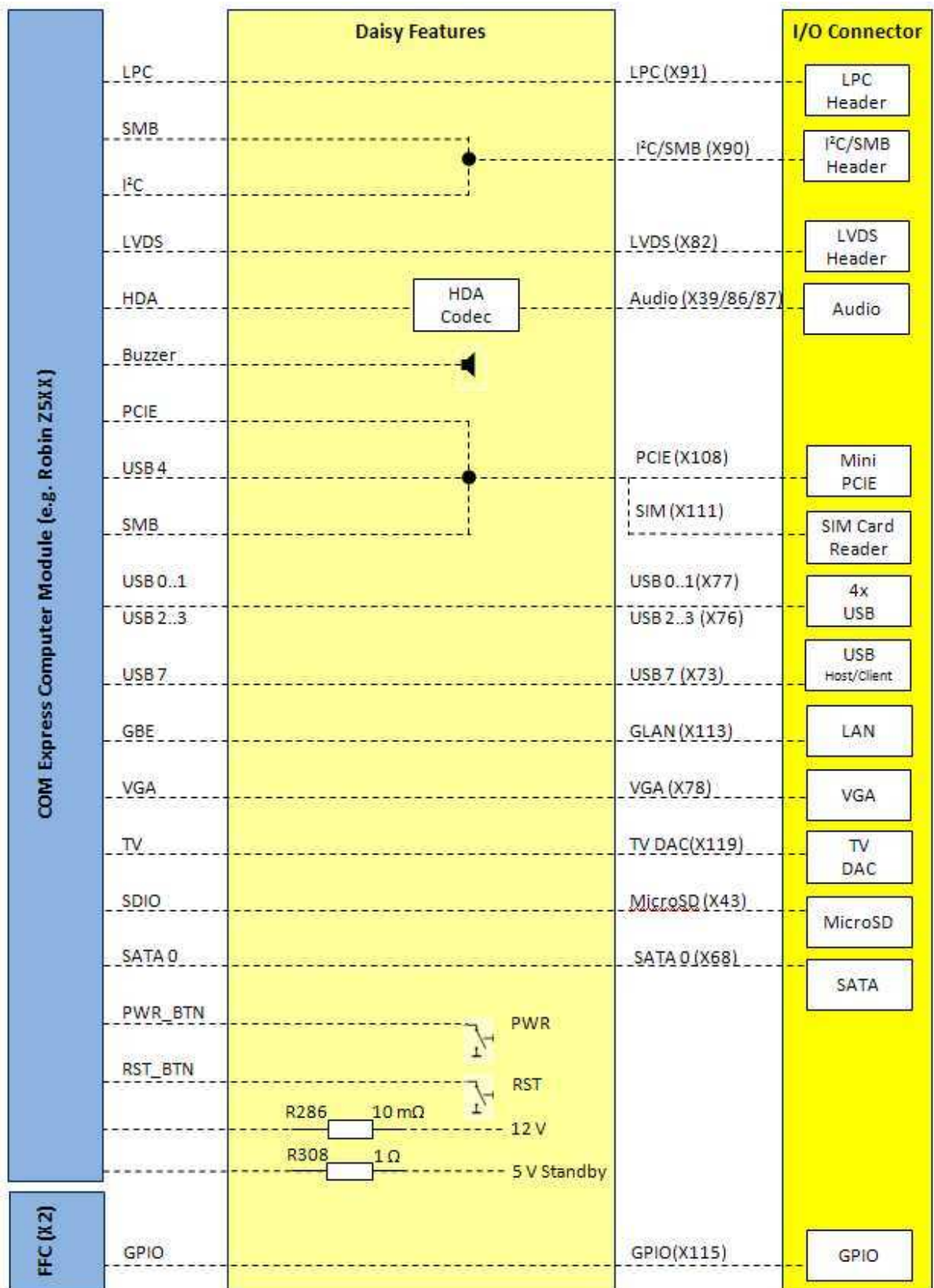
2.1. Overview

The carrier board Daisy implements the major part of the interfaces available on COM Express Type 1 compliant modules such as Toradex Robin:

- Connectivity such as USB and GLAN
- SATA and Micro SD to enhance on-Board storage of Robin
- Mini PCIe including SIM holder for wireless modems
- Video port on a VGA connector
- LVDS FFC connector
- TV-out signals on headers
- HD-Audio functionality with output, input jack and FFC connector
- Power management signals, LPC, I2C and SMB on headers
- GPIO header
- Battery Holder (RTC)
- USB client
- 3-Pin Fan connector
- Power connector for powering external devices like a Harddisk



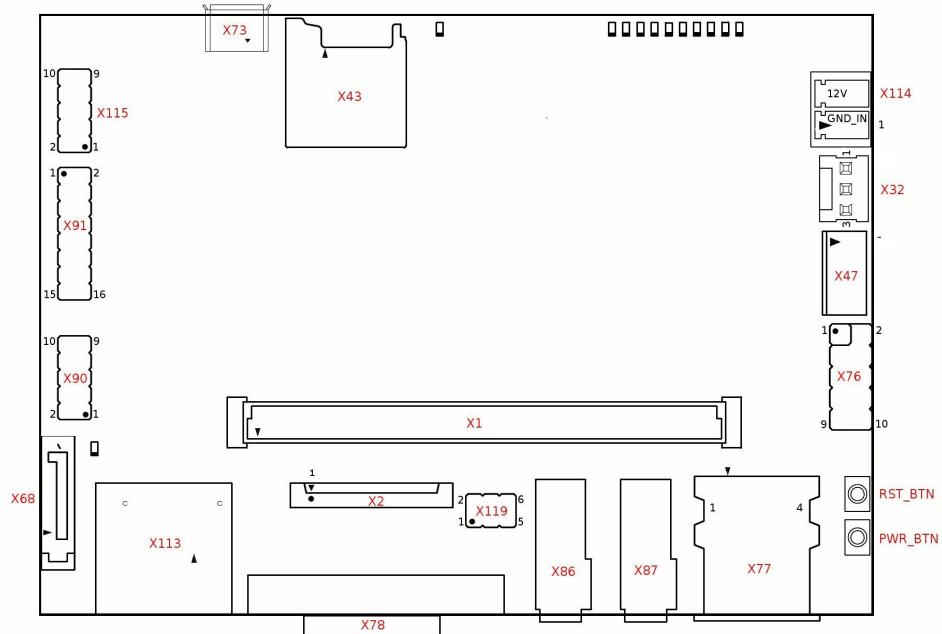
2.2. Block Diagram





3. Interfaces

3.1. Top Side Connectors: Physical Drawing



Ref	Description	Remarks
X1	COM Express connector	8mm stack height
X2	FFC Connector	Connects the GPIOs from Robin to the carrier board
X32	Switched Fan 12V Power	+ 12V is unregulated derived from main input
X43	MicroSD	
X47	Hard Disk Power Out	+12V unregulated and +5V regulated
X68	SATA	
X73	USB Micro A/B (Host/Device)	
X76	USB Header of Ports 2 and 3	
X77	USB Ports 0 and 1	
X78	VGA	
X86	Mic 2 Jack	
X87	Line 2 Jack	
X90	I ² C / SMB Header	
X91	LPC Header	
X113	Ethernet Jack	
X114	DC IN 8-14V	Use 12V if hard disc fan output is used
X115	GPIO	
X119	TV DAC	



3.2. Top Side Connectors: Pin Assignments

3.2.1 FFC Connector for USB and GPIO (X2)

Pitch: 0.5mm

Pin	Description	Voltage range
1	NC	
2	GND	
3	NC	
4	NC	
5	NC	
6	NC	
7	NC	
8	NC	
9	NC	
10	NC	
11	GND	
12	NC	
13	NC	
14	NC	
15	NC	
16	GND	
17	NC	
18	NC	
19	NC	
20	USB CLIENT DET	0 - +3.3V
21	SD0 LED	0 - +3.3V
22	GPIO 0	0 - +3.3V
23	GPIO 1	0 - +3.3V
24	GND	
25	GPIO 2	0 - +3.3V
26	GPIO 3	0 - +3.3V
27	GPIO 4	0 - +3.3V
28	GPIO 5	0 - +3.3V
29	GPIO 6	0 - +3.3V
30	GPIO 7	0 - +3.3V

3.2.2 Switched Fan 12V Power (X32)

Pitch: 2.54mm

Pin	Description	Voltage	Active	Remarks
1	GND	GND		
2	SWITCHED POWER (FAN POWER)	+12V	S0	Unregulated!
3	NC			



3.2.3 Hard Disk Power Out (X47)

Pitch: 2.50mm

Pin	Description	Voltage	Active	Remarks
1	12V Output Unregulated	+12V	S0	Unregulated!
2	GND			
3	GND			
4	5V Output	+5V	S0	Regulated

3.2.4 SATA Connector (X68)

Pin	Description	Voltage	Active	Remarks
1	GND			
2	SATA 0 RX P			
3	SATA 0 RX N			
4	GND			
5	SATA 0 TX P			
6	SATA 0 TX N			
7	GND			

3.2.5 USB Micro A/B (X73)

Pin	Description	Voltage	Active	Remarks
1	V BUS USB FILT	+5V	S0	Only active if client device plugged (ID-Pin connected to GND)
2	USB N			
3	USB P			
4	USB ID CON			
5	GND			

Remarks:

- This USB connector can be used for Host and Client
- If used as Client, client must be enabled in the BIOS on Robin
- If used as Host, host must be enabled in the BIOS on Robin
- Client to Host or Host to Client switching is not hot pluggable (doesn't fit the OTG requirements)



3.2.6 USB Header of Ports 2 and 3 (X76)

Pitch: 2.54mm

Pin	Description	Voltage	Active	Remarks
1	V BUS USB 2 FILT			
2	V BUS USB 3 FILT			
3	USB 2 N			
4	USB 3 N			
5	USB 2 P			
6	USB 3 P			
7	GND			
8	GND			
9	Local Earth			
10	Local Earth			

3.2.7 I²C / SMB Header (X90)

Pitch: 2.00mm

Pin	Description	Voltage	Active	Remarks
1	+3V3 EXP	+3.3V	S0	
2	CTRL PWR OK			
3	CTRL WAKE 1			
4	GND			
5	I ² C Clock			
6	I ² C Data			
7	SMB Clock			
8	SMB Data			
9	SMB Alert			
10	CTRL BATTLOW			



3.2.8 LPC Header (X91)

Pitch: 2.00mm

Pin	Description	Voltage	Active	Remarks
1	CTRL System Reset			
2	CTRL Power Button			
3	CTRL SUS Status			
4	CTRL BIOS DISABLE			
5	LPC SERIRQ			
6	LPC FRAME			
7	LPC AD 0			
8	GND			
9	LPC AD 1			
10	LPC AD 2			
11	LPC AD 3			
12	GND			
13	LPC DRQ 0			
14	LPC DRQ 1			
15	LPC Clock			
16	GND			

3.2.9 DC IN 8-14V (X114)

Pin	Description	Voltage	Active	Remarks
1	GND	GND IN		CAUTION ¹
2	+12V IN	8-14V DC		CAUTION ¹

3.2.10 GPIO (X115)

Pitch: 2.00mm

Pin	Description	Voltage / range	Active	Remarks
1	+3V3 EXP	+3.3V	S0	
2	GPIO4	0 – +3.3V	S5-S0	
3	GPIO0	0 – +3.3V	S5-S0	
4	GPIO5	0 – +3.3V	S5-S0	
5	GPIO1	0 – +3.3V	S5-S0	
6	GPIO6	0 – +3.3V	S5-S0	
7	GPIO2	0 – +3.3V	S5-S0	
8	GPIO7	0 – +3.3V	S5-S0	

¹ CAUTION!! The supply voltage is forwarded **UNREGULATED** to all nominally 12V driven ports => Modules can operate over the range as specified; however user must take care to power peripherals (such as hard disk drives or PCI cards) within their specified voltage range.



Pin	Description	Voltage / range	Active	Remarks
9	GPIO3	0 – +3.3V	S5-S0	
10	GND			

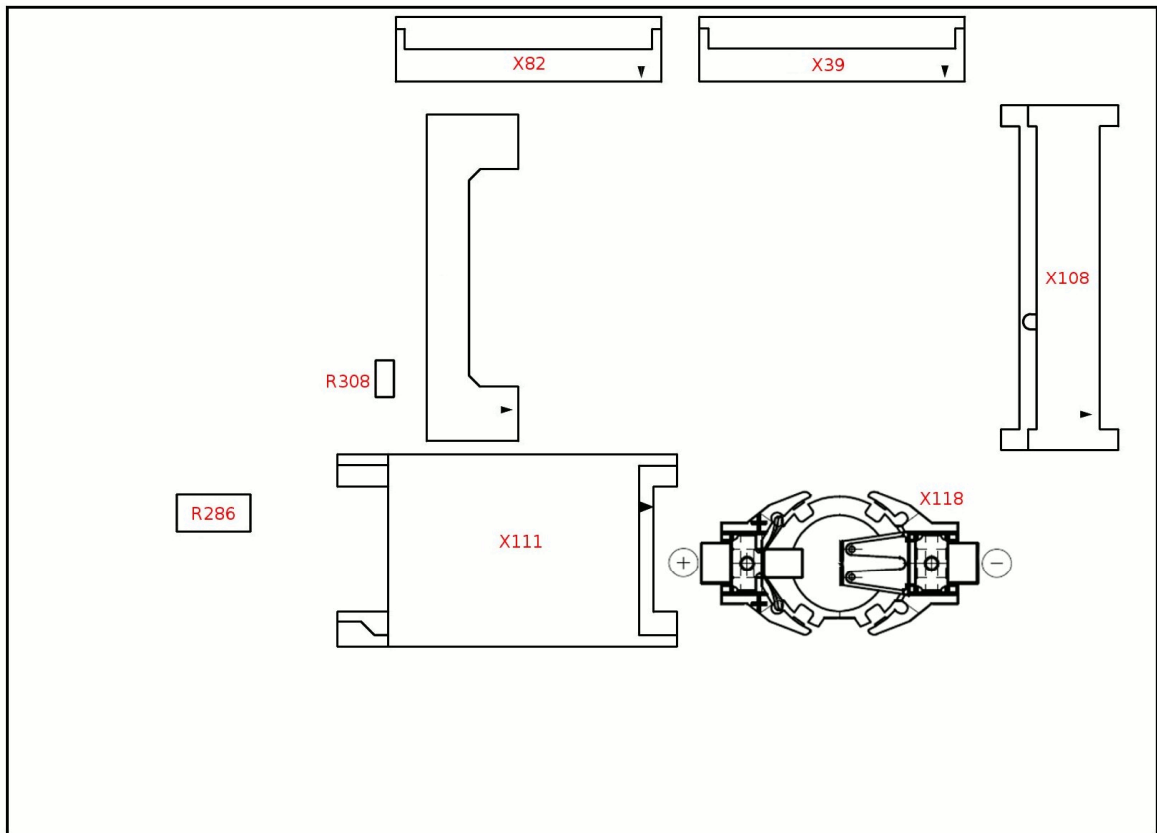
3.2.11 TV DAC (X119)

Pitch: 2.00mm

Pin	Description	Remarks
1	TV_DAC_A	
2	TV_GND	TV_GND is connected by a ferrite bead to GND. Use for TV signal GND.
3	TV_DAC_B	
4	TV_GND	TV_GND is connected by a ferrite bead to GND. Use for TV signal GND.
5	TV_DAC_C	
6	EARTH	Earth is connected to mounting holes, connector housings, etc on Daisy. Use for cable shield.



3.3. Bottom Side Connectors: Physical Drawing



	Description	Remarks
X39	Audio connector	
X82	LVDS connector	JILI (40 pin) LVDS Connector (compatible to Kontron)
X108	PCI Express MiniCard connector	
X111	SIM Card Reader	
X118	Coin Cell Holder	RENATA-SMTU1225-LF (for CR 1225 batteries)

3.4. Bottom Side Connectors: Pin Assignment

3.4.1 Audio FFC (X39)

Pitch: 0.5mm

Pin	Description	Voltage	Active	Remarks
1	GND			
2	SUR L			
3	VREF			
4	SUR R			
5	GND			
6	MIC 1 L			
7	MIC 1 VREF L			



Pin	Description	Voltage	Active	Remarks
8	MIC 1 R			
9	MIC 1 VREF R			
10	GND			
11	FRONT L			
12	FRONT R			
13	GND			
14	MIC 2 L			Only if no Plug in X2
15	MIC 2 VREF			
16	MIC 2 R			Only if no Plug in X2
17	GND			
18	CENTER			
19	LOW FREQ			
20	GND			
21	SIDE L			
22	SIDE R			
23	GND			
24	LINE 1 L			
25	LINE 1 VREF			
26	LINE 1 R			
27	GND			
28	LINE 2 L			Only if no Plug in X3
29	LINE 2 VREF			
30	LINE 2 R			Only if no Plug in X2
31	GND			
32	GND			
33	S/PDIF IN			
34	S/PDIF OUT			
35	GND			
36	SENSE B			
37	SENSE A			
38	GND			
39	GND			
40	+5V OUT	+5V	S0	



3.4.2 LVDS Connector (X82)

Connector: bottom contacts, connector type: FH12S-40S-0.5SH(55), Pitch: 0.5mm

Pin	Description	Voltage	Active	Remarks
1	LVDS_BKLT_CTRL_BUF			Buffered ²
2	LVDS_A0_N			
3	LVDS_A0_P			
4	LVDS_VDD_EN			
5	LVDS_A1_N			
6	LVDS_A1_P			
7	NC			Assembly Option ³
8	LVDS_A2_N			
9	LVDS_A2_P			
10	GND			
11	LVDS_AC_N			
12	LVDS_AC_P			
13	GND			
14	LVDS_A3_N			
15	LVDS_A3_P			
16	LVDS_DDC_DAT			
17	LVDS_B0_N			
18	LVDS_B0_P			
19	LVDS_DDC_CLK			
20	LVDS_B1N			
21	LVDS_B1_P			
22	GND			
23	LVDS_B2_N			
24	LVDS_B2_P			
25	GND			
26	LVDS_BC_N			
27	LVDS_BC_P			
28	GND			
29	LVDS_B3_N			
30	LVDS_B3_P			
31	5V_Output	+5V		
32	5V_Output	+5V		
33	5V_Output	+5V		
34	5V_Output	+5V		
35	LVDS_BKLT_EN_#			Inverted ⁴
36	GND			
37	GND			
38	12V_Output	+12V		Unregulated!
39	12V_Output	+12V		Unregulated!
40	12V_Output	+12V		Unregulated!

² LVDS_BKLT_CTRL_BUF is a buffered variant of the ComExpress LVDS_BKLT_CTRL Pin B83, polarity can be changed by an assembly option

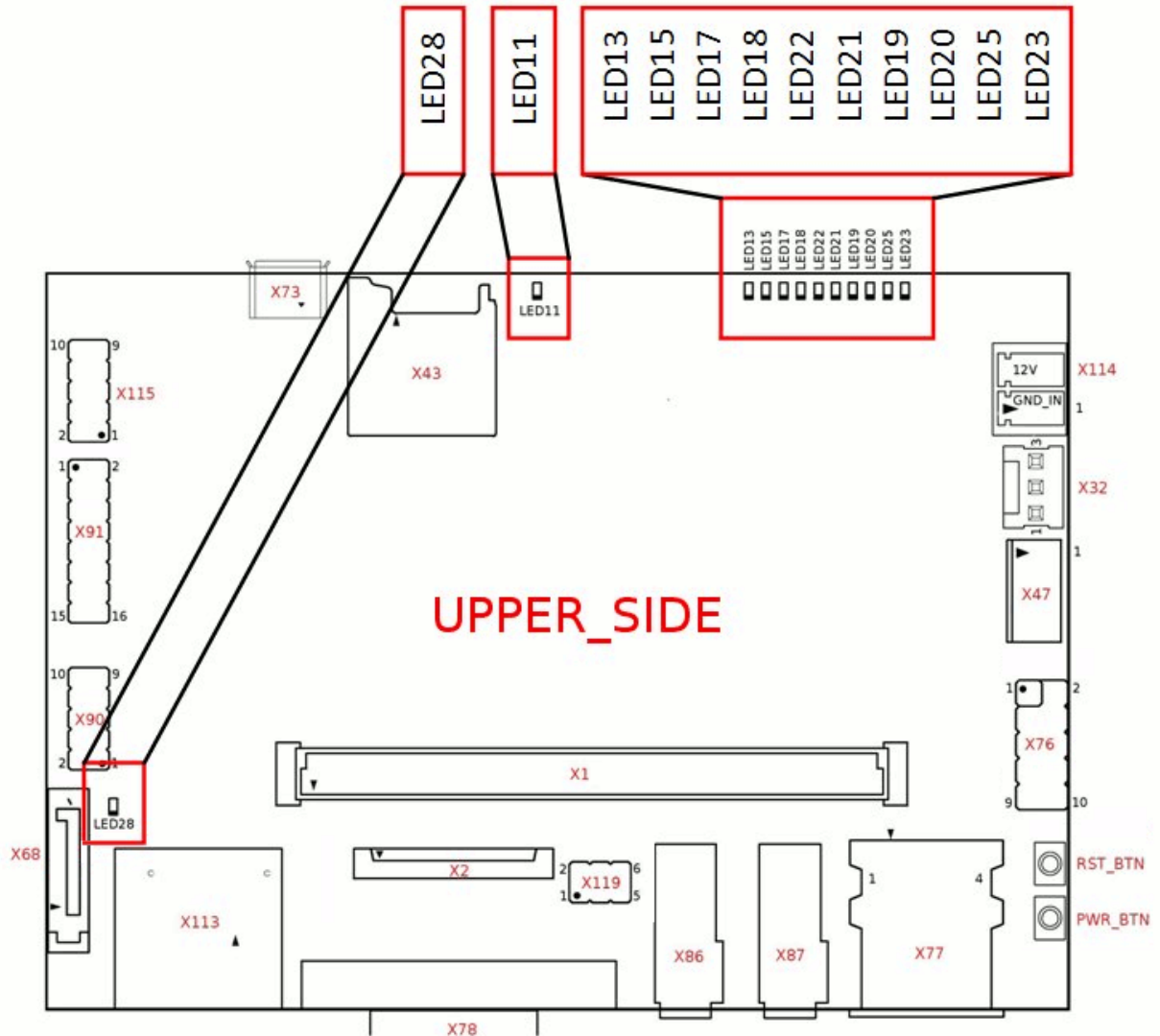
³ Can be connected to LVDS_BKLT_CTRL_BUF by an assembly option

⁴ LVDS_BKLT_EN_# is an inverted variant of the ComExpress LVDS_BKLT_EN Pin B79, polarity can be changed by an assembly option



3.5. LEDs

Please note that LED's are not assembled in series production lots due to power savings.

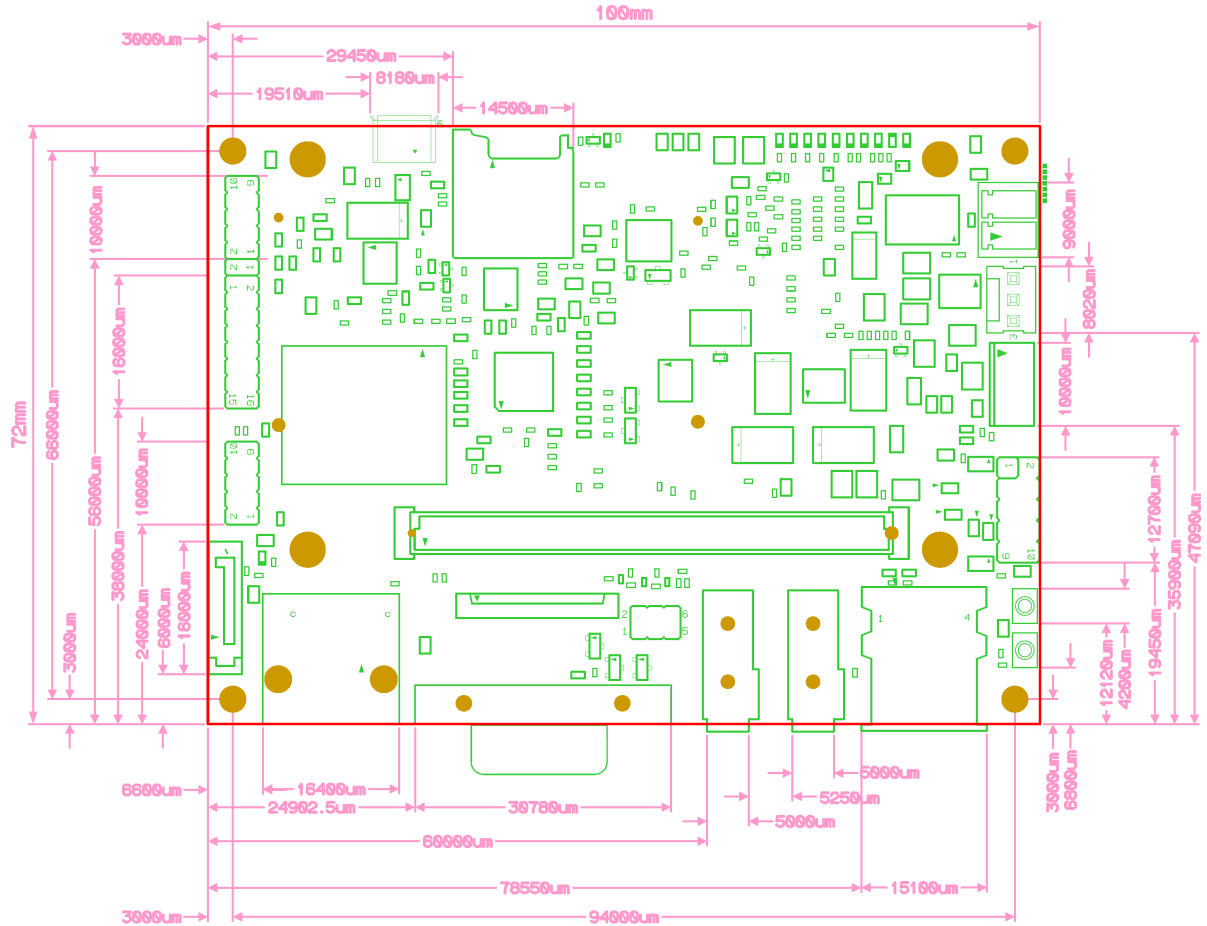


	Name	Remarks
LED11	SD 0 LED	green
LED13	+5V S5	green
LED15	+3V3 S5	green
LED17	+3V3 S0	green
LED18	+5V S0	green
LED19	CTRL THERMTRIP	red
LED20	CTRL CB RESET	red
LED22	CTRL SUS STAT	yellow
LED23	CTRL SUS 4	yellow
LED25	CTRL SUS 3	yellow
LED28	SATA active	green



4. Mechanical Data

4.1. Dimensions



4.2. Mass

The mass of Daisy is without Robin.

- Daisy V1.0: 71g
- Daisy V1.1a: 71g



5. Electrical Characteristics

Symbol	Description	Min	Typ	Max	Unit
VDD_main	Main power supply voltage ¹⁾	7 ²⁾	12	14	V
I_main	Main power supply current	0	0.5 ⁴⁾	10	A
VDD_RTC	Optional RTC battery voltage	2.3	3	3.6	V
I_(+5V0_S0)	total current for external devices at +5V0_S0 rail ³⁾ : X47 Pin 4 X82 Pins 31-34 X39 Pin 40 USB connectors / USB header			3	A
I_(+3V3_S0)	total current for external devices at +3V3_S0 rail ³⁾ : X115 Pin 1 X90 Pin 1			1.5	A
I_Pin(X39)	Current for a single power pin of connector X39			0.5	A
I_Pin(X82)	Current for a single power pin of connector X82			0.5	A
I_Pin(X47)	Current for a single power pin of connector X47			1.5	A
I_Pin(X76)	Current for a single power pin of connector X76			0.5	A
I_Pin(X90)	Current for a single power pin of connector X90			1	A
I_Pin(X91)	Current for a single power pin of connector X91			1	A
I_Pin(X115)	Current for a single power pin of connector X115			1	A

- 1) Limits for components on Daisy, check specification of module and periphery
- 2) Externally applied load of 3A at +5V0_S0 power rail.
- 3) Total current, sum of all listed interfaces
- 4) Measured with Robin Z530 V1.0, WinXP, VGA, USB Hub, Keyboard, Mouse, Fan @ VDD=12V



6. PCB Versions

At the moment, there have been produced the following Daisy versions:

- Daisy V1.0
- Daisy V1.1

From V1.0 to V1.1 the following changes have been made:

- Headers and connectors have been shifted slightly
- The power and reset button have been shifted
- LED signals are buffered by transistors (This is useful for future assembly options, since in the standard assembly most LEDs are not placed in order to reduce power consumption)
- An assembly variant for connecting GPIO header signals directly to the COMExpress GPIO is available. (Robin Z5xx V2.0) will support shared SDIO and GPIOs on COM Express. This will make costumers able to get rid of the FFC for using GPIOs.

The following bugs have been fixed (on V1.0 the bugs have been solved by patches):

- The sense-signals of the audio codec is now routed correctly to the audio jacks
- A power management signal was pulled up, and caused Daisy not to switch off

6.1. Assembly Variants

There are various assembly variants possible:

- Powering Daisy V1.1 with 5V instead of 12V
- Using GPIOs on COM Express connector instead of SDIO:
 - Micro SD of Daisy will be useless in this case
 - COM Express module must provide GPIOs on COM Express connector instead of SDIO
- LED for power management, MicroSD and SATA
- Power management (always on, different dependencies)
- Power over Ethernet (PoE) support (not tested or validated by Toradex, external hardware needed)
- FAN-power to be controlled by a GPIO, (may be useful for thermal management solutions)

While some variants can be enabled by adding and removing OR resistors, others may need another assembly variant by Toradex.

If you need more information about an assembly variant, please contact Toradex using: robin@toradex.com.

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