

# Colibri XScale<sup>®</sup> PXA300 (XT) & PXA310 Datasheet



## Revision history

Date	Doc. Rev.	Colibri PXA300(XT)/310 Version	Changes
22-Oct-07	Rev. 1.0	V1.1	Initial Release
24-Dec-07	Rev. 1.1	V1.1	Changed some pin names (MD to DATA, MA to ADDRESS)
23-Apr-08	Rev. 1.2	V1.1	Operation currents added
31-Dec-08	Rev. 1.3	V1.1 / V1.2 and higher	Added note 11 for SODIMM pins 88, 90, 92  Moved CPLD description to separate document (Colibri PXA CPLD Description)  Do not connect SODIMM pin 184  Colibri PXA310 description added
26-Feb-09	Rev. 1.4	V1.1 / V1.2 and higher	Added PXA310 Temperature Range
03-Jun-09	Rev. 1.5	V1.1 / V1.2 and higher	Added Tolerance value for PCB outline. Added slew rate and some current consumption values Added new Marvell datasheet link (without NDA)
07-Jul-09	Rev. 1.6	V1.1 / V1.2 and higher	Adjusted temperature range for PXA300 (0-70°C)
24-Sep-09	Rev. 1.7	V1.1 / V1.2 and higher	Added temperature range description. Added note 17 and 18 for SODIMM pin assignment (SODIMM Pin 88,90,92)
22-Jan-10	Rev. 1.8	V1.1 / V1.2 and higher	GPIO97 and GPIO98 have pull-up and pull-down description (Note 19 SODIMM list)
10-Jun-10	Rev. 1.9	V1.1 / V1.2 and higher	Added description for AVDD_AUDIO and AVSS_AUDIO Added chap. 4.8
23-Nov-11	Rev. 2.0	V1.1 / V1.2 and higher	Changed Disclaimer Clarified nBATT_FAULT description
12-Jun-12	Rev. 2.1	V1.1 / V1.2 and higher	Added restriction about PXA310 SODIMM pin 47 (GPIO7). Do not use this pin with alternate function GPIO.
14-Jan-13	Rev. 2.2	V1.1/V1.2 and higher	Clarified 4/5-wire Touchscreen capabilities
17-Apr-13	Rev. 2.3	V1.1/V1.2 and higher	Added information for Colibri PXA300 XT module
01-May-13	Rev. 2.4	V1.1/V1.2 and higher	Updated Block Diagram in chapter 2.1
02-Jul-13	Rev. 2.5	V1.1/V1.2 and higher	Added power consumption for Colibri PXA300 XT
29-May-14	Rev. 2.6	V1.1/V1.2 and higher	Section 1.3, Features: changed maximum number of GPIOs supported to 92.
02-Dec-14	Rev. 2.7	V1.1/V1.2 and higher	Section 6.4 renamed and updated
30-Nov-16	Rev. 2.8	V1.1/V1.2 and higher	Section 1.3 Features: added new NAND size for 1.3C version of the product
17-Feb-17	Rev. 2.9	V1.1/V1.2 and higher	Section 1.4, Reference Documents: Updated details and web-links. Section 6.3.1, Sockets for the Colibri Module Family: Updated web-links.

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## 1. Introduction

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This datasheet describes all three, the Colibri PXA300, Colibri PXA300 XT, and the Colibri PXA310 module. All general descriptions are all these modules unless there is a special note.

### 1.1 Hardware

Colibri XScale® PXA300(XT)/310 is a SODIMM sized computer module based on the new Marvell XScale® PXA300 or PXA310 processor. Colibri PXA300 (XT) runs at up to 208 MHz and Colibri PXA310 runs up to 624MHz. The module delivers state of the art technology, targeting low power systems that still require high CPU performance.

It also offers all the interfaces needed in a modern embedded device: beside the internal Flash memory, SDCard is also available. The module provides glueless connectivity to passive and active LCDs with resolutions of up to 1024x768. Colibri PXA300(XT)/310 can directly connect to a CMOS/CCD camera sensor.

In addition Colibri PXA300(XT)/310 offers a 100 MBit Ethernet as well as USB host and USB device functionality.

The 16 bit wide demultiplexed system bus (DFI) is available for custom extensions, such as special interfaces for high bandwidth applications.

The Colibri PXA300 XT and the Colibri PXA310 module also provide audio, analog input, and 4/5-wire touch-screen functionality. These functionalities aren't available on the Colibri PXA300 module.

The Colibri PXA300(XT)/310 features an 8 bit interface to on board NAND FLASH and a 16 bit interface to the Ethernet controller.

Wireless Intel (Marvell) Speedstep® Technology, which adjusts the CPU core voltage dynamically according to the CPU load, and four low-power modes both enable excellent MIPS/mW performance for the Colibri PXA300(XT)/310 module.

### 1.2 Software

The module is shipped with a preinstalled WinCE image with WinCE Core license. Other OS like Embedded Linux and QNX are available from third-party.

#### 1.2.1 Windows CE

Colibri PXA300(XT)/310 modules are shipped with a valid Windows CE 6.0 core license. This license is backward-compatible for Windows CE 5.0.

Toradex provides a WinCE5.0 image and a WinCE6.0.

All WinCE images contain drivers for the most common interfaces and are easily customizable by registry settings to adapt to specific hardware.

## 1.3 Features

### CPU:

- ✓ Marvell PXA300 208 MHz
- ✓ Marvell PXA310 624 MHz

### Memory:

#### Colibri PXA300(XT):

- ✓ 64 MByte of DDR SDRAM (16 Bit)
- ✓ 128 MByte of NAND FLASH (8 Bit)

#### Colibri PXA310:

- ✓ 128 MByte of DDR SDRAM (16 Bit)
- ✓ 512 MByte of NAND FLASH (8 Bit) (up to V1.3B)
- ✓ 1 GByte of NAND FLASH (8 Bit) (V1.3C and higher)

### Interfaces:

- ✓ 16 Bit demultiplexed DFI bus
- ✓ LCD (up to 1024x768)
- ✓ CMOS/CCD image sensor interface
- ✓ I2C
- ✓ SPI
- ✓ 2x SDCard (SDIO, MMC)
- ✓ Up to 92 GPIOs
- ✓ 100 MBit Ethernet
- ✓ One-Wire
- ✓ Keypad
- ✓ Consumer Infrared
- ✓ USIM
- ✓ USB host / device

#### **Colibri PXA300 (XT) only:**

- USB 2.0 device (requires external UTMI chip)

#### **Colibri PXA300 XT and Colibri PXA310 only:**

- Audio in-/output; Mic-in
- 4 Analog input
- <V2.1 = 4-wire resistive touch-screen interface
- V2.1+ = 4/5-Wire resistive touch-screen interface

#### **Colibri PXA310 only:**

- Built-In USB 2.0 device transceiver

### Operating systems supported by Toradex:

WinCE 5.0

WinCE 6.0

## 1.4 Reference Documents

For detailed technical information about the Colibri PXA300(XT)/310 components, please refer to the documents listed below.

Marvell PXA3xx Processor Based on Intel XScale Technology

The datasheets and other technical documents about the PXA3xx processor are available on the Marvell web page.

<http://www.marvell.com>

AX88796B Ethernet Controller

<http://www.asix.com.tw>

Xilinx XC2C64A CPLD

<http://www.xilinx.com/>

Power Management IC

Colibri PXA300 up to V1.1: Maxim MAX866x

<http://www.maxim-ic.com/>

Colibri PXA300(XT)/310 V1.2 and higher: TI LP3972

<http://www.ti.com/product/LP3972>

### 1.4.1 Colibri PXA300 XT and Colibri PXA310 only:

Cirrus Logic / Wolfson WM9715L Audio-Codec

<http://www.wolfsonmicro.com/>

### 1.4.2 Colibri PXA310 only:

Microchip ULPI Transceiver USB3329

<http://www.microchip.com/wwwproducts/en/usb3329>

Fairchild USB Transceiver USB1T1105

<http://www.fairchildsemi.com/>

## 2. Architecture Overview

### 2.1 Block Diagram

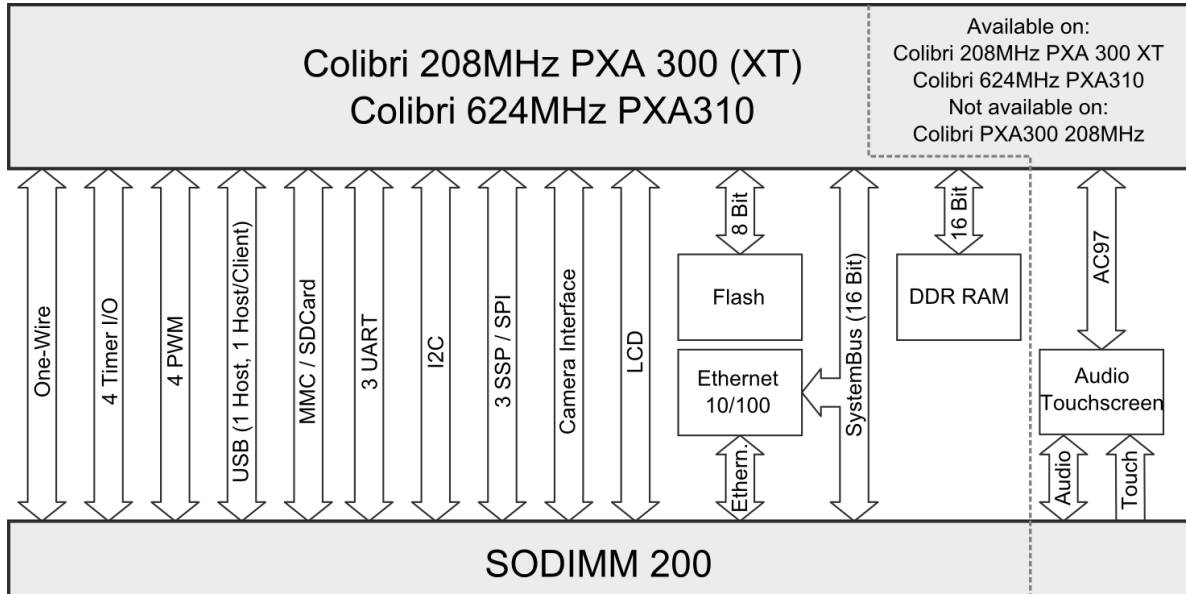


Figure 1: Colibri PXA300(XT)/310 block diagram

Figure 1 shows the Colibri PXA300(XT)/310 interfaces. However, some PXA300(XT)/310 pins are mapped to multiple interfaces. Therefore not all functions can be used simultaneously.

## 3. Colibri PXA300(XT)/310 Connectors

### 3.1 Physical Locations

Along with the main 200 Pin SODIMM connector the Colibri PXA300(XT)/310 is equipped with two additional FCC connectors. The position of the connectors is shown in the figure below.

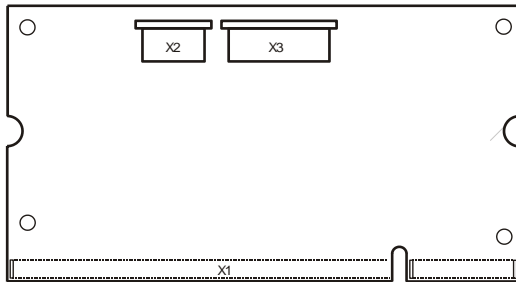


Figure 2: Location of Colibri PXA300(XT)/310 Connectors

### 3.2 Assignment

Some of the following pins are multiplexed, that means there is more than one PXA300(XT)/310 pin connected to one SODIMM or FFC pin. For example GPIO101 and GPIO115 are both assigned to SODIMM pin 25. Take care to tristate (set to input) the unused GPIO of the two multiplexed GPIO's when you are writing your software.

If there is no special note, the signals on the SODIMM connector are power supply pins or directly connected to the PXA3xx processor. Refer to the PXA3xx datasheets for more details about electrical specifications of these pins.

**Caution: Pay attention to the notes of the individual signals!**

#### 3.2.1 SODIMM 200 (X1) Top Side (Toradex Logo)

Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
1	SYS_EN <sup>2</sup>		MIC_IN <sup>1</sup>	MIC_IN <sup>1</sup>
3		Not connected	VSS_AUDIO	VSS_AUDIO
5		Not connected	LINEIN_L <sup>1</sup>	LINEIN_L <sup>1</sup>
7		Not connected	LINEIN_R <sup>1</sup>	LINEIN_R <sup>1</sup>
9		Not connected	VSS_AUDIO	VSS_AUDIO
11		Not connected	VSS_AUDIO	VSS_AUDIO
13		Not connected	HEADPHONE_GND <sup>1</sup>	HEADPHONE_GND <sup>1</sup>
15		Not connected	HEADPHONE_L <sup>1</sup>	HEADPHONE_L <sup>1</sup>
17		Not connected	HEADPHONE_R <sup>1</sup>	HEADPHONE_R <sup>1</sup>
19	GPIO110 <sup>3</sup>			
21	GPIO8			
23	GPIO103			
25	GPIO101 / GPIO115 <sup>3</sup>			
27	GPIO90 / GPIO106			
29	GPIO105			
31	GPIO102			
33	GPIO99			
35	GPIO100			
37	GPIO104 / GPIO119			



Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
39	GND			
41	GND			
43	GPIO13 / EXT_WAKEUP0 <sup>6</sup>			
45	GPIO127			
47		GPIO7	GPIO7	GPIO7 <sup>20</sup>
49	GPIO4			
51	GPIO5			
53	GPIO6			
55		GPIO80	GPIO80	GPIO10_2 <sup>5</sup>
57	GPIO70			
59	GPIO20 / CIF_DD7 (GPIO46) <sup>4</sup>			
61	GPIO71			
63		GPIO31 <sup>3</sup>	GPIO31 <sup>3</sup>	GPIO9_2 <sup>5</sup>
65	GPIO48 / GPIO124			
67	GPIO45			
69		GPIO77	GPIO77	GPIO8_2 <sup>5</sup>
71	GPIO39			
73		GPIO78	GPIO78	PWR_GPIO2 <sup>7</sup>
75	CIF_MCLK (GPIO49) <sup>4</sup>	GPIO79	GPIO79	
77		GPIO81	GPIO81	Not Connected
79	GPIO43			
81	CIF_VSYNC (GPIO52) <sup>4</sup> / GPIO83			
83	GND			
85	GPIO47 / GPIO125			
87	nRESET_OUT			
89	DF_ALE_nWE			
91	DF_CLE_nOE			
93	GPIO12 (RDnWR) <sup>8,9</sup>			
95	GPIO0			
97	GPIO44			
99	DF_ALE_nWE (GPIO95) <sup>10</sup>			
101	GPIO41			
103	GPIO42			
105	GPIO16 / EXT_nCS0 <sup>3,9</sup>			
107	GPIO15 / EXT_nCS1 <sup>9</sup>			
109	GND			
111	ADDRESS[00] <sup>14</sup>			
113	ADDRESS[01] <sup>14</sup>			
115	ADDRESS[02] <sup>14</sup>			
117	ADDRESS[03] <sup>14</sup>			
119	ADDRESS[04] <sup>14</sup>			
121	ADDRESS[05] <sup>14</sup>			
123	ADDRESS[06] <sup>14</sup>			

Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
125	ADDRESS[07] <sup>14</sup>			
127	GPIO11 <sup>8</sup>			
129	GPIO_2 <sup>5</sup>			
131	GPIO1_2 <sup>5</sup>			
133	GPIO96			
135	GPIO97 <sup>19</sup>			
137	GPIO98 <sup>19</sup>			
139	USBH1_P <sup>11</sup>			
141	USBH1_N <sup>11</sup>			
143	USBC_H_P <sup>12</sup>			
145	USBC_H_N <sup>12</sup>			
147	GND			
149	DATA[00]			
151	DATA[01]			
153	DATA[02]			
155	DATA[03]			
157	DATA[04]			
159	DATA[05]			
161	DATA[06]			
163	DATA[07]			
165	DATA[08]			
167	DATA[09]			
169	DATA[10]			
171	DATA[11]			
173	DATA[12]			
175	DATA[13]			
177	DATA[14]			
179	DATA[15]			
181	GND			
183	ETH_LINK_ACT <sup>13</sup>			
185	nETH_SPEED100 <sup>13</sup>			
187	ETH_TXO- <sup>13</sup>			
189	ETH_TXO+ <sup>13</sup>			
191	GND			
193	ETH_RXI- <sup>13</sup>			
195	ETH_RXI+ <sup>13</sup>			
197	GND			
199	GND			

### 3.2.2 SODIMM 200 (X1) Bottom Side

Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
2		GPIO23	AD3 <sup>1</sup>	AD3 <sup>1</sup>
4		GPIO24	AD2 <sup>1</sup>	AD2 <sup>1</sup>
6		GPIO25	AD1 <sup>1</sup>	AD1 <sup>1</sup>
8		Not connected	AD0 <sup>1</sup>	AD0 <sup>1</sup>
10		Not connected	AVDD_AUDIO	AVDD_AUDIO
12		Not connected	AVDD_AUDIO	AVDD_AUDIO
14		GPIO27	TSPX <sup>1</sup>	TSPX <sup>1</sup>
16		GPIO28	TSMX <sup>1</sup>	TSMX <sup>1</sup>
18		GPIO29	TSPY <sup>1</sup>	TSPY <sup>1</sup>
20		GPIO107	TSMY <sup>1</sup>	TSMY <sup>1</sup>
22	nGPIO_RESET			
24	nBATT_FAULT (BATT_SENSE) <sup>15</sup>			
26	nRESET_EXT			
28	GPIO19			
30	GPIO17			
32	GPIO111			
34	GPIO114			
36	GPIO112			
38	GPIO113			
40	VCC_BATT <sup>16</sup>			
42	+3V3			
44	GPIO75			
46	GPIO61			
48	GPIO63			
50	GPIO65			
52	GPIO66			
54	GPIO67			
56	GPIO74			
58	GPIO57			
60	GPIO56			
62	GPIO62			
64	GPIO69			
66	GPIO68			
68	GPIO73			
70	GPIO55			
72	GPIO59			
74	GPIO64			
76	GPIO54			
78	GPIO58			
80	GPIO60			
82	GPIO72			

Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
84	+3V3			
86	GPIO86 <sup>3</sup>			
88	GPIO85 <sup>17,18</sup>			
90	GPIO87 <sup>17</sup>			
92	GPIO88 <sup>17,18</sup>			
94	CIF_HSYNC (GPIO51) <sup>4</sup>			
96	CIF_PCLK (GPIO50) <sup>4</sup>			
98	GPIO40			
100	GPIO122			
102	GPIO12 (RDnWR) <sup>8,9</sup>			
104	GPIO11 <sup>8</sup>			
106	GPIO89 / EXT_nCS2 <sup>9</sup>			
108	+3V3			
110	ADDRESS[08] <sup>14</sup>			
112	ADDRESS[09] <sup>14</sup>			
114	ADDRESS[10] <sup>14</sup>			
116	ADDRESS[11] <sup>14</sup>			
118	GPIO116 <sup>3</sup>			
120	GPIO117 <sup>3</sup>			
122	GPIO118 <sup>3</sup>			
124	GPIO120 <sup>3</sup>			
126	nBE0			
128	nBE1			
130	nDF_RE_OE			
132	nDF_WE			
134		GPIO38	GPIO38	Not connected
136	GPIO2_2 <sup>3,5</sup>			
138	GPIO3_2 <sup>3,5</sup>			
140	GPIO121 <sup>3</sup>			
142	GPIO123 <sup>3</sup>			
144	GPIO4_2 <sup>3,5</sup>			
146	GPIO5_2 <sup>3,5</sup>			
148	+3V3			
150		GPIO82	GPIO82	Not connected
152	GPIO18 / GPIO126			
154	GPIO53 / GPIO91			
156	GPIO92			
158	GPIO93			
160	GPIO94			
162		GPIO32	GPIO32	Not connected
164		GPIO33	GPIO33	Not connected
166		GPIO34	GPIO34	Not connected
168		GPIO35	GPIO35	Not connected

Pin#	Compatible functions	Colibri PXA300 only	Colibri PXA300 XT only	Colibri PXA310 only
170		GPIO36	GPIO36	Not connected
172		GPIO37	GPIO37	Not connected
174	GPIO10			
176	GPIO9			
178	GPIO6_2 <sup>3,5</sup>			
180		GPIO30	GPIO30	Not connected
182	+3V3			
184	<b>Do not connect</b>			
186	nLUA			
188	nLLA			
190	GPIO14			
192	GPIO3			
194	GPIO22			
196	GPIO21			
198	+3V3			
200	+3V3			

### 3.2.3 Additional GPIOs (X3)

Connector: FCC 18 pins, 0.5mm pitch, bottom contact

Pin Nr.	Compatible Function	Colibri PXA300 (XT) only	Colibri PXA310 only
1	GPIO86 <sup>3</sup>		
2	GPIO3_2 <sup>3,5</sup>		
3	GPIO110 <sup>3</sup>		
4	GPIO6_2 <sup>3,5</sup>		
5	GPIO109		
6	GPIO2_2 <sup>3,5</sup>		
7		GPIO31 <sup>3</sup>	<b>Do not Connect</b>
8	GPIO108		
9	GPIO5_2 <sup>3,5</sup>		
10	GPIO118 <sup>3</sup>		
11	GPIO120 <sup>3</sup>		
12	GPIO116 <sup>3</sup>		
13	GPIO117 <sup>3</sup>		
14	GPIO121 <sup>3</sup>		
15	GPIO123 <sup>3</sup>		
16	GPIO4_2 <sup>3,5</sup>		
17	GPIO101 / GPIO115 <sup>3</sup>		
18	GPIO16 / EXT_nCS0 <sup>3,9</sup>		

### 3.2.4 JTAG (X2)

Connector: FCC 8 pins, 0.5mm pitch, bottom contact

Pin Nr.	Signal name
1	+3V3
2	GND
3	TMS
4	nTRST
5	TCK
6	TDO
7	TDI
8	nReset_OUT

Notes: (see next page)

Notes:

1. For electrical specifications please refer to the Wolfson WM9715L datasheet. See also chap. 4.8 for more details about analog inputs AD[3:0].
2. The SYS\_EN signal is directly connected to the PXA on the Colibri PXA300 module. On the Colibri PXA300 XT and Colibri PXA310 board this signal is multiplexed with the MIC\_IN signal. Have a look at our developers website for details. <http://developer.toradex.com>
3. These pins are connected to an SODIMM pin and to an extension connector pin. Be careful by using these pins when using the extension connector.
4. These pins don't have GPIO as alternate function 0. See chapter 4.5 *GPIO* for more details.
5. These pins are second instance GPIOs. See chapter 4.5 *GPIO* for more details.
6. See chapter 4.4 *EXT\_WAKEUP0* for more details.
7. PWR\_GPIO2 on the Colibri PXA310 is the GPIO2 of the National PMIC LP3972. It's not recommended to use this pin on Colibri PXA310 or designs that have to be compatible with the Colibri PXA310. For more details please refer to the National LP3972 datasheet.
8. These GPIOs are connected to two SODIMM pins each. Be careful by using these pins.
9. See *Colibri PXA CPLD Description* for details about how to enable EXT\_nCSx and RDnWR.
10. This pin is always new (DF\_ALE\_nWE). It's not possible to use this pin as GPIO.
11. For electrical specifications please refer to the Fairchild USB1T1105 datasheet.
12. For electrical specifications please refer to the SMSC USB3329 datasheet.
13. For electrical specifications please refer to the Asix AX88796B datasheet.
14. For electrical specifications please refer to the Xilinx XC2C64A datasheet.
15. See chapter 4.1 nBATT\_FAULT for more details.
16. See chapter 4.6 VCC\_BATT for more details.
17. These pins are used when updating the CPLD on the PXA (SODIMM pin 88, 90, 92). Do not drive these pins until the CPLD update is done. The CPLD update has to be started manually (Toradex Bootloader V3.3 and higher). You can use these pins when not performing a CPLD update.
18. These pins have an internal pull-up of about 10kOhm.
19. GPIO97 has an internal pull-down of about 75kOhm.  
GPIO98 has an internal pull-up of about 1MOhm.
20. Do not use GPIO7 on Colibri PXA310 (SODIMM pin 47) with alternate function GPIO. Reason: GPIO7\_2 is already used as GPIO on the module. Using GPIO7 as GPIO would lead to wrong behavior of the GPIO7\_2 on the module. SODIMM pin 47 can be used with any alternate function other than GPIO.

## 4. Signal description

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The following signals are Colibri PXA300(XT)/310 specific signals. For descriptions about the other signals see the corresponding datasheets mentioned in chapter 0 *Reference Documents*.

### 4.1 nBATT\_FAULT (formerly BATT\_SENSE)

The nBATT\_FAULT signal can be used control the nBATT\_FAULT signal of the PXA3xx.

#### 4.1.1 For Colibri PXA300 up to V 1.1

nBATT\_FAULT is connected to the LBF and LBR input of the Maxim 866x PMIC and to a 1M $\Omega$  pull-up resistor to VCC on the Colibri module.

The nBatt\_Fault signal of the PXA3xx gets asserted if the voltage applied to the nBATT\_FAULT input pin drops below 1.2V. It's deasserted if the voltage exceeds 1.25V.

#### 4.1.2 For Colibri PXA300(XT)/PXA310 V1.2 and higher

The nBATT\_FAULT signal is connected to the PXA3xx's nBATT\_FAULT pin through a diode. You can always pull down this signal externally to assert the nBATT\_FAULT signal of the PXA.

This signal is also connected to the power management IC LP3972 on the Colibri and is asserted when VCC\_BATT is present and the +3.3V supply is below 2.8V. It de-asserts when the +3.3V supply is above 3.0V (Default PMIC values).

### 4.2 External Chip Selects

See Colibri PXA CPLD Description document for more details.

### 4.3 MEM Ctrl Signals

See Colibri PXA CPLD Description document for more details.

### 4.4 EXT\_WAKEUP0

The EXT\_WAKEUP0 signal on SODIMM pin 43 is the main wakeup source of the PXA300(XT)/310. For more information about this pin see the PXA3xx developer's manual.

### 4.5 GPIO

Some of the SODIMM pins have more than one GPIO assigned. If you would like to use one of them, then tristate the other one (set to GPIO input). For example if you would like to use an alternate function of the GPIO101 you have to set the GPIO115 to GPIO input.

The GPIO46 and GPIO49-52 don't have GPIO as alternate function 0.

The alternate function GPIO is as mentioned below:

GPIO46 (AltFn 1); GPIO49 (AltFn 3); GPIO50 (AltFn 2); GPIO51 (AltFn 3); GPIO52 (AltFn 3)

On the Colibri PXA300(XT) the GPIO0 to GPIO6 have a second instance (GPIO0\_2 to GPIO6\_2).

On the Colibri PXA310 the GPIO0 to GPIO10 have a second instance (GPIO0\_2 to GPIO10\_2).

They are assigned to different balls on the PXA. You can use one of them as GPIO and the other one should have a different alternate function than GPIO. The GPIO registers are the same for both (e.g. GPIO0 and GPIO\_2 share the same bit in the GPIO level register GPLR0[0]). Be careful when using both as GPIO: When choosing GPIO input, then the value in the GPIO level register is GPIOx OR GPIOx\_2. When choosing output, both GPIO pins will provide the level from the level register.

Do not use GPIO7 on Colibri PXA310 (SODIMM pin 47) with alternate function GPIO. Reason: GPIO7\_2 is already used as GPIO on the module. Using GPIO7 as GPIO would lead to wrong behavior of the GPIO7\_2 on the module. SODIMM pin 47 can be used with any alternate function other than GPIO.



#### 4.6 VCC\_BATT

This power domain can be used to power the VCC\_BATT power domain of the PXA processor. For general designs it is recommended to connect this pin to normal +3.3V power supply. This pin must be powered in order to boot the Colibri successfully.

#### 4.7 AVDD\_AUDIO, AVSS\_AUDIO

These pins are available on Colibri PXA300 XT and Colibri PXA310 modules only. These pins must be connected to 3.3V and GND even if audio and touch-screen functionality aren't used. You can connect this to normal 3.3V and GND or to filtered 3.3V and GND.

#### 4.8 Analog Inputs AD[3:0]

Analog input maximum voltage on Colibri PXA300 XT and Colibri PXA310 (Colibri PXA300 doesn't have analog inputs):

- AD[3, 1, 0]: 0V to 3.3V
- AD[2]: 0V to 5V

**We recommend using 3.3V as maximum voltage on all AD inputs to ensure the compatibility to future Colibri modules.**

## 5. Compatibility to Colibri PXAxxx and Trizeps III/IV

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Colibri PXA300(XT)/310 modules can be used as a replacement for the entire Colibri module family or Keith & Koep's Trizeps III / IV family of modules. This chapter points out the differences for a smooth transition.

There is a Migration Guide available on [www.toradex.com](http://www.toradex.com) which shows the compatible signals of all Colibri modules.

### 5.1 Alternate Function Mapping

Colibri PXA300(XT)/310 and PXAxxx/Trizeps share a compatible pin mapping regarding all pins as GPIOs. However, the mapping GPIOxx to SODIMM pin yy is not identical.

This fact leads to the following consequences:

- As long as Colibri PXA300(XT)/310 pins are used only as general purpose IOs (GPIOs), Colibri PXAxxx and Trizeps III/IV are hardware compatible. Slight Software adaptations are necessary in most projects to transition between Colibri PXAxxx and Trizeps III / IV to remap the GPIO pins.
- Many of the Colibri PXA300(XT)/310 pins are multiplexed so they can be configured for use as a general purpose I/O signal (GPIOxx) or as one of several alternate functions (for example as SDIO interface signals). Not all of these alternate functions are available on the same Colibri PXAxxx and Trizeps III / IV pins.

### 5.2 USB Channels

The Colibri PXA300(XT)/310 module provides one USB host and one shared USB (selectable host/client) channel as differential pair.

The Colibri PXA300(XT)/310 module can be configured to map the USB shared channel to SODIMM pins 28 and 30. Contact Toradex for further information.

## 6. Technical Specifications

### 6.1 Electrical Characteristics

Symbol	Description	Min	Typ	Max	Unit
VCC	Power supply operating voltage	3.0	3.3	3.6	V
IDD_208A <sup>1</sup>	Operating at 208 MHz, Ethernet off, Display off, Idle		106		mA
IDD_208B <sup>1</sup>	Operating at 208 MHz, Ethernet off, Display on, Idle		127		mA
IDD_208C <sup>1</sup>	Operating at 208 MHz, Ethernet off, Display on, 100% CPU		153		mA
IDD_208A <sup>2</sup>	Operating at 208 MHz, Ethernet off, Display off, Idle		121		mA
IDD_208B <sup>2</sup>	Operating at 208 MHz, Ethernet off, Display on, Idle		143		mA
IDD_208C <sup>2</sup>	Operating at 208 MHz, Ethernet off, Display on, 100% CPU		168		mA
IDD_624A <sup>3</sup>	Operating at 624 MHz, Ethernet off, Display off, Idle		209		mA
IDD_624B <sup>3</sup>	Operating at 624 MHz, Ethernet off, Display on, Idle		233		mA
IDD_624C <sup>3</sup>	Operating at 624 MHz, Ethernet off, Display on, 100% CPU		357		mA
IDD_ETHL	Ethernet on		+106		mA
IDD_ETHNL	Ethernet on, no link (probing with default timings)		+81		mA
IDD_SUSP	In Suspend-Mode		1.5		mA
VIH	Digital input high voltage	VCC*0.8		VCC+0.3	V
VIL	Digital input low voltage	-0.3		VCC*0.2	V
VCC_SR	VCC Slew Rate	2		12	kV/s

Notes:

1. PXA300 @ 208MHz
2. PXA300 XT @ 208MHz
3. PXA310 @ 624MHz

### 6.2 Temperature Range

Module	Description	Min	Typ	Max	Unit
Colibri PXA 300	Operating temperature range	0		70 <sup>1</sup>	°C
Colibri PXA 300 XT	Operating temperature range	-25		85 <sup>1</sup>	°C
Colibri PXA 310	Operating temperature range	-25		85 <sup>1</sup>	°C

Notes:

1. The maximum temperature is limited by the case temperature of the PXA processor which must not exceed 85°C. For passive thermal solutions this may result in an ambient temperature lower than the stated value. For further details please refer to Marvell's EMTS datasheet.

### 6.3 Mechanical Characteristics

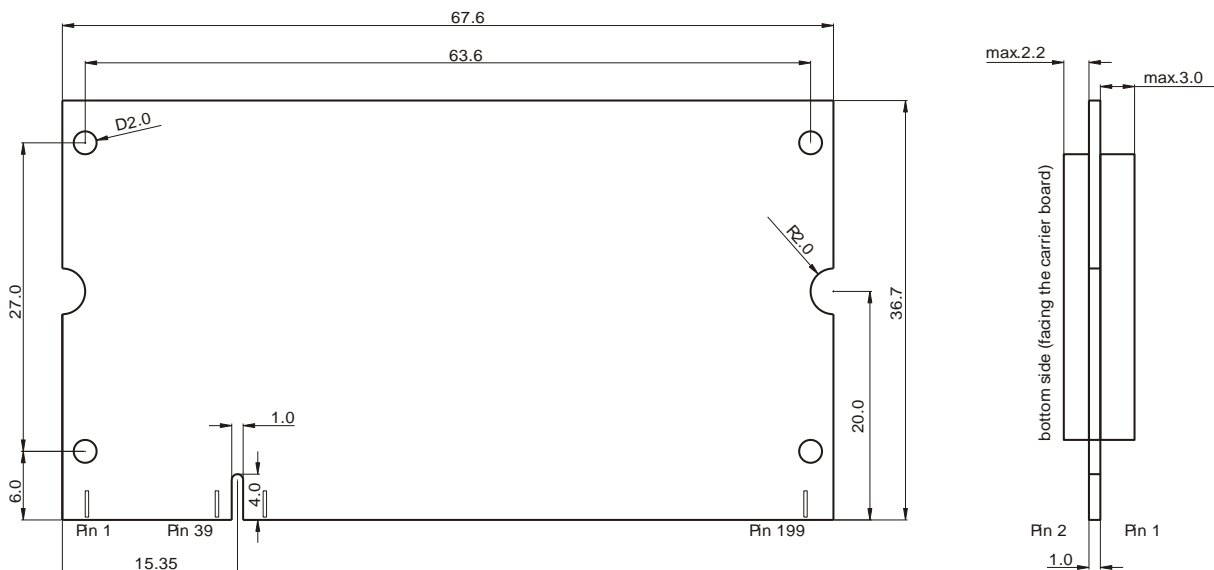


Figure 3: Mechanical dimensions of the entire Colibri module family.  
Tolerance for all measures: +/- 0.1mm

#### 6.3.1 Sockets for the Colibri Module Family

The entire Colibri module family fits into a regular 2.5V (DDR1) SODIMM200 memory socket. A choice of SODIMM200 socket manufacturers is given below:

FCI:	<a href="http://www.fciconnect.com">http://www.fciconnect.com</a>
Foxconn:	<a href="http://www.foxconn.com">http://www.foxconn.com</a>
JAE:	<a href="http://www.jae.com">http://www.jae.com</a>
Tyco Electronics (AMP):	<a href="http://www.te.com/usa-en/home.html">http://www.te.com/usa-en/home.html</a>

### 6.4 Product Compliance

Up-to-date information about product compliance such as RoHS, CE, UL-94, Conflict Mineral, REACH etc. can be found on our website at: <http://www.toradex.com/support/product-compliance>

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