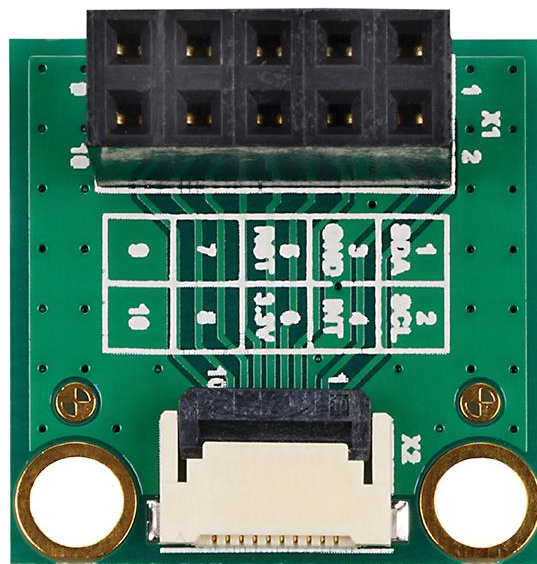


Capacitive Touch Adapter

Datasheet



Revision History

Date	Doc. Rev.	Board Version	Changes
20-July-17	Rev. 1.0	V1.0	Internal Sample
02-Nov-17	Rev. 1.1	V1.0	<ul style="list-style-type: none">- Updated product image on the cover page- Section 4.2.4, Connection with Aster Carrier Board: Removed detail related to Aster V1.0 board
27-March-19	Rev. 1.2	V1.0	<ul style="list-style-type: none">- Section 4.2.4, Typo correction
08-May-19	Rev. 1.3	V1.0	<ul style="list-style-type: none">- Section 4.2.4, Corrected SODIM numbers

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1. Introduction

The Capacitive Touch Adapter is an add-on board for the Toradex carrier boards. The adapter can be used to connect capacitive touch interface signals between the display and the Colibri / Apalis carrier board which doesn't feature capacitive touch connector on the carrier board.

1.1. Reference Documents

For detailed technical information on the suitable computer modules and other reference documents, please refer the following sections:

1.1.1 Apalis Computer Modules

An overview of the Apalis product family:

<https://www.toradex.com/computer-on-modules/apalis-arm-family>

1.1.2 Colibri Computer Modules

An overview of the Colibri product family:

<https://www.toradex.com/computer-on-modules/colibri-arm-family>

1.1.3 Toradex Developer Website

<http://developer.toradex.com/>

2. Features

2.1. Overview

The Capacitive Touch Adapter features:

- 10 way FFC connector compatible with Toradex Capacitive Touch Connector.

2.2. Hardware Architecture Block Diagram

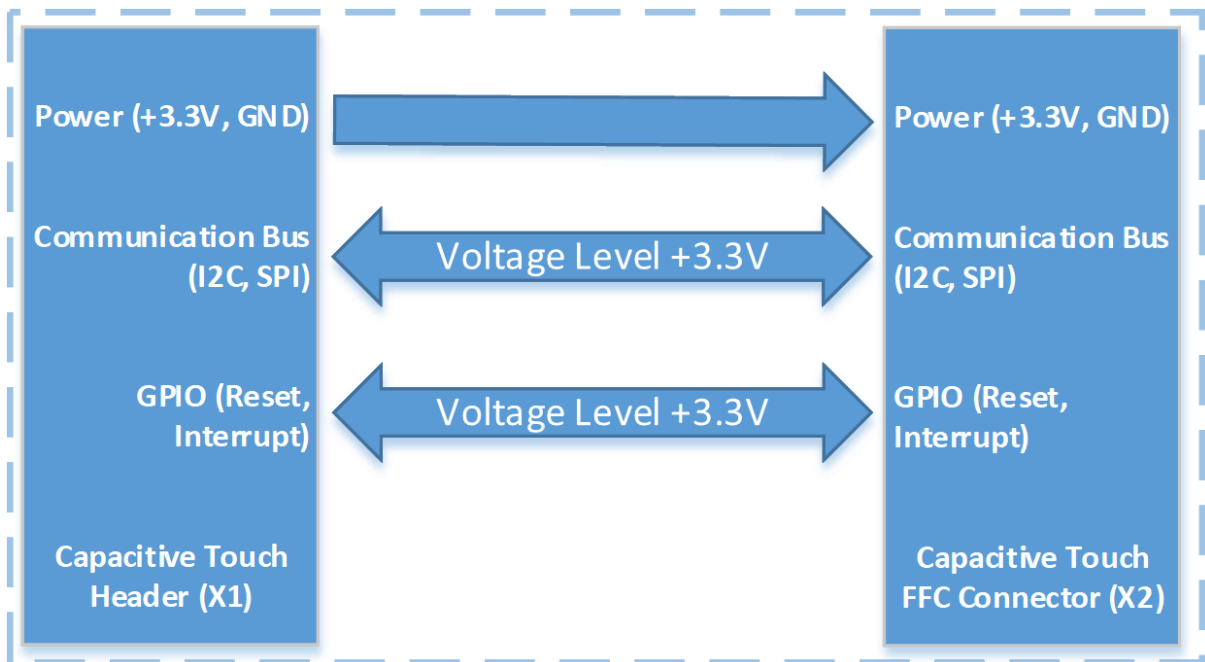


Fig.1 Capacitive Touch Adapter Hardware Architecture

2.3. Hardware Setup

The following block diagram represents the set-up required to use/test a Capacitive Touch Adapter:

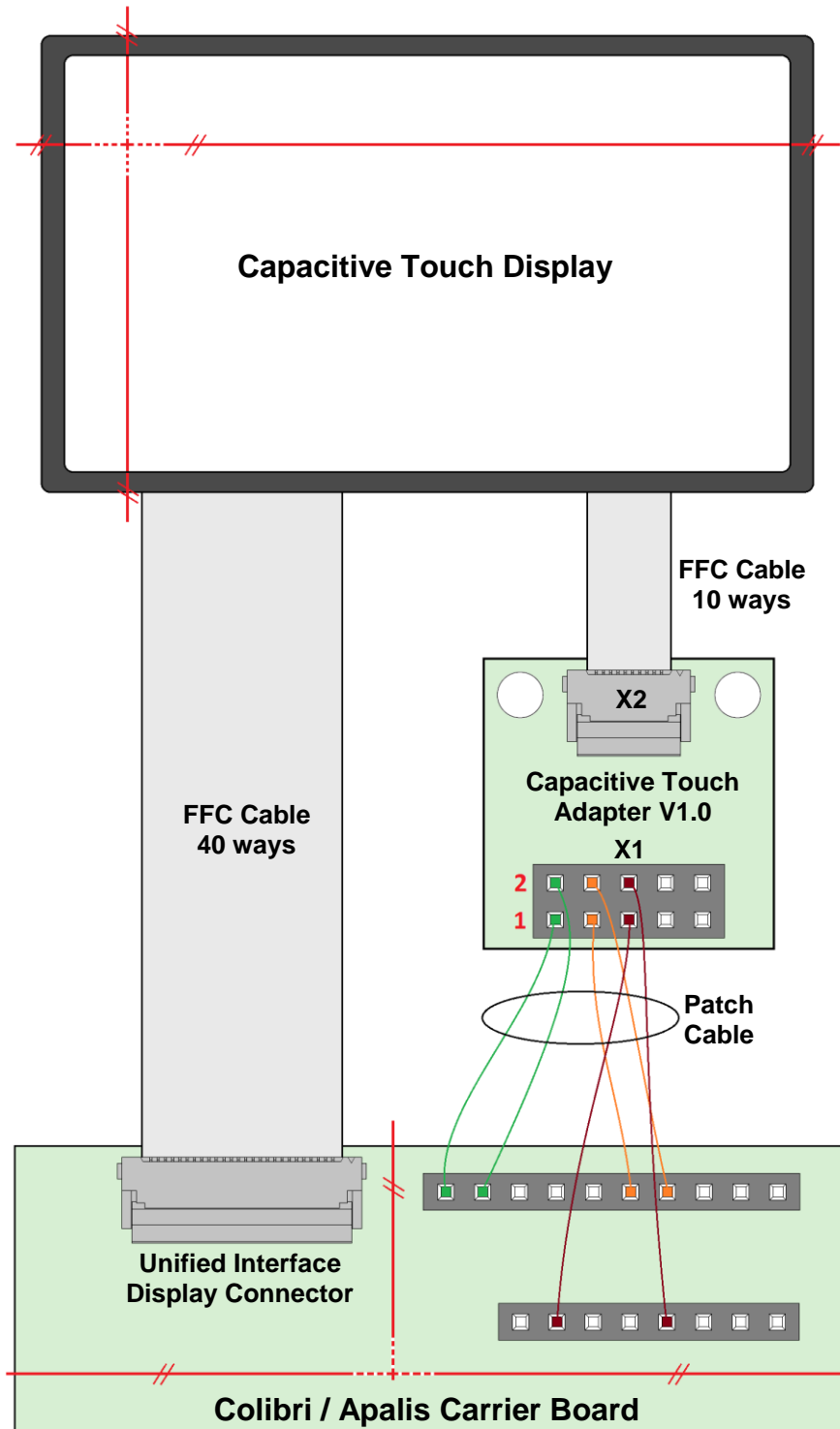


Fig.2 Hardware Set-up Block Diagram

2.4. Physical Drawings

2.4.1 Top Side Connectors

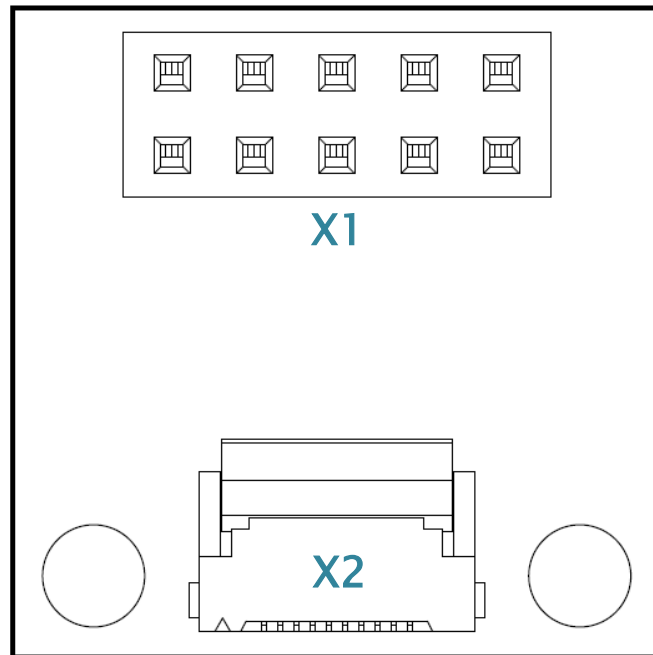


Fig.3 Capacitive Touch Adapter Connectors – Top Side

Ref	Description	Remarks
X1	Capacitive Touch Header	
X2	Capacitive Touch FFC Connector	

3. Interface Description

3.1. Capacitive Touch Header (X1)

Manufacturer: Würth - 61301021821

Type: 2x5 pin Header Female, pitch 2.54mm

Pin	Name	Description	I/O Type	Voltage	Pullup/Pulldown
1	I2C_SDA		I/O	+3.3V	
2	I2C_SCL		O	+3.3V	
3	GND		PWR		
4	TOUCH_INT#		I	+3.3V	
5	TOUCH_RESET#		O	+3.3V	
6	+3.3V		PWR	+3.3V	
7	TOUCH_SSP_CLK		O	+3.3V	
8	TOUCH_SSP_CS		O	+3.3V	
9	TOUCH_SSP_TX		O	+3.3V	
10	TOUCH_SSP_RX		I	+3.3V	

3.2. Capacitive Touch FFC Connector (X2)

Manufacturer: Omron - XF2M-1015-1A

Type: FFC Connector, 10 pins, top/bottom contact, pitch 0.5mm

Pin	Name	Description	I/O Type	Voltage	Pullup/Pulldown
1	I2C_SDA		I/O	+3.3V	
2	I2C_SCL		O	+3.3V	
3	GND		PWR		
4	TOUCH_INT#		I	+3.3V	
5	TOUCH_RESET#		O	+3.3V	
6	+3.3V		PWR	+3.3V	
7	TOUCH_SSP_CLK		O	+3.3V	
8	TOUCH_SSP_CS		O	+3.3V	
9	TOUCH_SSP_TX		O	+3.3V	
10	TOUCH_SSP_RX		I	+3.3V	

4. Pin Mapping

4.1. Apalis Carrier Boards

4.1.1 Connection with Apalis Evaluation Board

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Apalis Evaluation Board V1.0 / V1.1:

Capacitive Touch Adapter V1.0		Apalis Evaluation Board V1.0 / V1.1	Remarks
X1, Pin 1: I2C_SDA	↔	X8, Pin 40; X9, Pin A40: MXM3_209 (I2C1_SDA)	
X1, Pin 2: I2C_SCL	↔	X8, Pin 39; X9, Pin A39: MXM3_211 (I2C1_SCL)	
X1, Pin 3: GND	↔	X2/X3/X4, Pin 11: GND	
X1, Pin 4: TOUCH_INT#	↔	X2, Pin 6; X3, Pin A6: MXM3_11 (GPIO5)	
X1, Pin 5: TOUCH_RESET#	↔	X2, Pin 5; X3, Pin A5: MXM3_13 (GPIO6)	
X1, Pin 6: +3.3V	↔	X2/X3/X4, Pin 1: 3.3V_SW	Optional

4.1.2 Connection with Ixora Carrier Board

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Ixora Carrier Board V1.0:

Capacitive Touch Adapter V1.0		Ixora Carrier Board V1.0	Remarks
X1, Pin 1: I2C_SDA	↔	X27, Pin 5: I2C1_SDA	
X1, Pin 2: I2C_SCL	↔	X27, Pin 6: I2C1_SCL	
X1, Pin 3: GND	↔	X27, Pin 7: GND	
X1, Pin 4: TOUCH_INT#	↔	X27, Pin 17: GPIO5	
X1, Pin 5: TOUCH_RESET#	↔	X27, Pin 18: GPIO6	
X1, Pin 6: +3.3V	↔	X27, Pin 29: 3.3V_SW	Optional

Capacitive Touch Adapter is not required with the Ixora carrier board V1.1 as the Capacitive Touch Interface connector (X24) is available on the carrier board.

4.2. Colibri Carrier Boards

4.2.1 Connection with Colibri Evaluation Board

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Colibri Evaluation Board V3.1 / V3.2:

Capacitive Touch Adapter V1.0		Colibri Evaluation Board V3.1 / V3.2	Remarks
X1, Pin 1: I2C_SDA	↔	X9, Pin 47; X8, Pin A47: SODIMM_194 (I2C_SDA)	
X1, Pin 2: I2C_SCL	↔	X9, Pin 48; X8, Pin A48: SODIMM_196 (I2C_SCL)	
X1, Pin 3: GND	↔	X7/X8/X9, Pin 3: GND	
X1, Pin 4: TOUCH_INT#	↔	X10, Pin 27; X11, Pin B27: SODIMM_28 (PWM_B)	
X1, Pin 5: TOUCH_RESET#	↔	X10, Pin 28; X11, Pin B28: SODIMM_30 (PWM_C)	
X1, Pin 6: +3.3V	↔	X7/X8/X9, Pin 2: 3.3V	Optional

4.2.2 Connection with Iris Carrier Board

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Iris Carrier Board V1.1:

Capacitive Touch Adapter V1.0		Iris Carrier Board V1.1	Remarks
X1, Pin 1: I2C_SDA	↔	X16, Pin 5: I2C_SDA	
X1, Pin 2: I2C_SCL	↔	X16, Pin 6: I2C_SCL	
X1, Pin 3: GND	↔	X16, Pin 7: GND	
X1, Pin 4: TOUCH_INT#	↔	X16, Pin 38: SODIMM_28 (PWM_B)	
X1, Pin 5: TOUCH_RESET#	↔	X16, Pin 39: SODIMM_30 (PWM_C)	
X1, Pin 6: +3.3V	↔	X16, Pin 33: +3.3V	Optional

4.2.3 Connection with Viola Carrier Board

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Viola Carrier Board V1.0:

Capacitive Touch Adapter V1.0		Viola Carrier Board V1.0	Remarks
X1, Pin 1: I2C_SDA	↔	X9, Pin 6: I2C_SDA	
X1, Pin 2: I2C_SCL	↔	X9, Pin 5: I2C_SCL	
X1, Pin 3: GND	↔	X9, Pin 7: GND	
X1, Pin 4: TOUCH_INT#	↔	X9, Pin 44: SODIMM_28 (PWM_B)	
X1, Pin 5: TOUCH_RESET#	↔	X9, Pin 41: SODIMM_30 (PWM_C)	
X1, Pin 6: +3.3V	↔	X9, Pin 4: +3.3V	Optional

Following table describes the wiring between the Capacitive Touch Adapter connector (X1) and the Viola Carrier Board V1.1/V1.2 and Viola Plus Carrier Board V1.2:

Capacitive Touch Adapter V1.0		Viola Carrier Board V1.1 / V1.2 Viola Plus Carrier Board V1.2	Remarks
X1, Pin 1: I2C_SDA	↔	X9, Pin 6: I2C_SDA	
X1, Pin 2: I2C_SCL	↔	X9, Pin 5: I2C_SCL	
X1, Pin 3: GND	↔	X9, Pin 7: GND	
X1, Pin 4: TOUCH_INT#	↔	X9, Pin 42: SODIMM_28 (PWM_B)	
X1, Pin 5: TOUCH_RESET#	↔	X9, Pin 43: SODIMM_30 (PWM_C)	
X1, Pin 6: +3.3V	↔	X9, Pin 4: +3.3V	Optional

4.2.4 Connection with Aster Carrier Board

Capacitive Touch Adapter is not required with the Aster carrier board V1.1 as the Capacitive Touch Interface connector (X24) is available on the carrier board.

Please note that **TOUCH_INT#** and **TOUCH_RESET#** signal are connected to **SODIMM_106** and **SODIMM_107** pins respectively. For more details, please refer to Aster Carrier Board V1.1 schematics.

5. Electrical Characteristics

5.1. Electrical Specifications

Symbol	Description	Voltage	Min	Typ	Max	Unit
V_3.3V		+3.3		+3.3		V
I_3.3V				0.5		A

6. Temperature Range

6.1. Operating Temperature Range

- +30 to +85 °C

7. Mechanical Data

7.1. Capacitive Touch Adapter Dimensions - Top Side

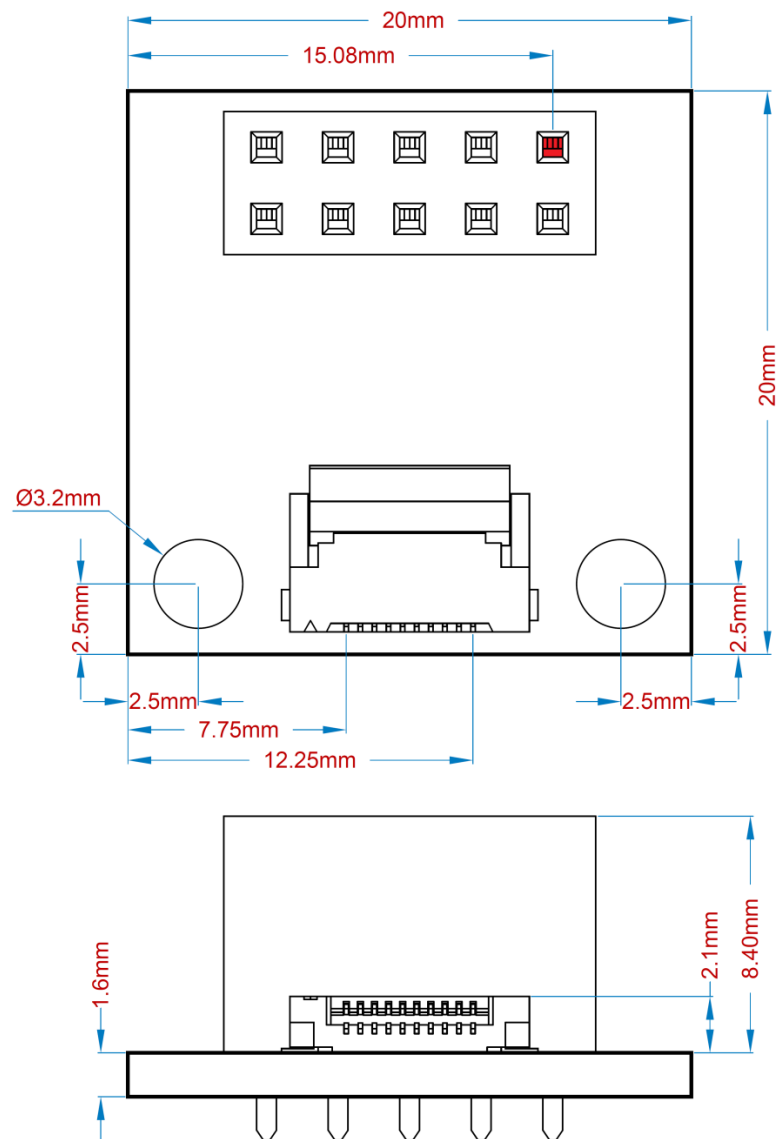


Fig.5 Capacitive Touch Adapter Dimensions – Top Side
All dimensions are in millimeters (mm)

8. Design Data

The design data for the Toradex carrier boards and adapter boards are freely available in the Altium Designer format. The design data includes schematics, layout, and component libraries.

To download the board design data, please use the web-link below:

<http://developer.toradex.com/carrier-board-design/reference-designs>

9. 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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