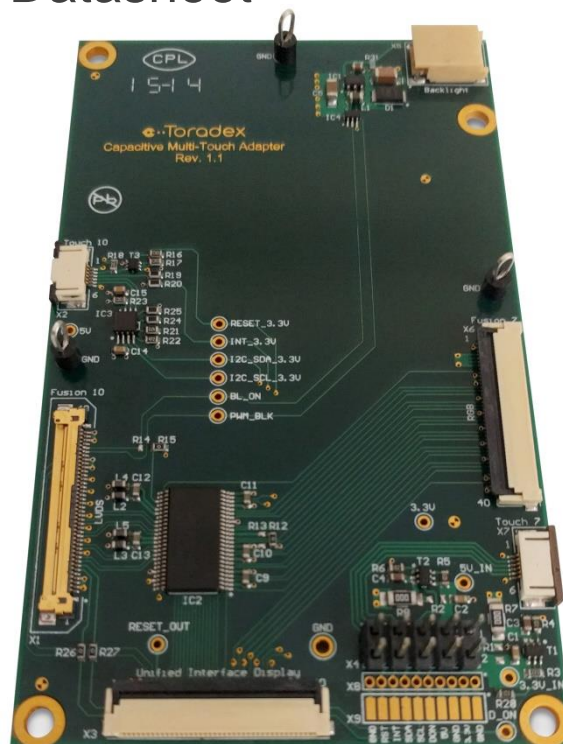


## Capacitive Multi-Touch Adapter Datasheet



## Revision History

Date	Doc. Rev.	Board Version	Changes
22-Aug-13	Rev. 1.0	V1.0	Initial Release: Preliminary Version
30-Apr-14	Rev. 1.1	V1.1	Section 5.1 and 5.2: fig. 4 and fig. 5 updated. Section 5.1 table: Connector X4A and X4B are renamed to X9 and X8, respectively. Changed titles, header, pictures etc. to Capacitive Multi-Touch Adapter
12-March-15	Rev. 1.2	V1.1	Section 5.4: Corrected pin details for the connector X4. For Connectors X8 and X9, new table have been added for the pin details.
26-Nov-15	Rev. 1.3	V1.1	Section 1.1, Reference Documents: Updated Fusion display datasheet download links. Section 6.0, Product Compliance: Changed heading from RoHS Compliance to Product Compliance. Updated Compliance details.
08-June-16	Rev. 1.4	V1.1	Section 1.1.1, Touch Display Fusion 7 and Section 1.1.2, Touch Display Fusion 10: Updated display manufacturer name.

## Contents

<b>1. Introduction</b> .....	<b>4</b>
1.1. <i>Reference Documents</i> .....	4
1.1.1 Touch Display Fusion 7.....	4
1.1.2 Touch Display Fusion 10 .....	4
1.1.3 Schema “Capacitive Multi-Touch Adapter Board” .....	4
1.1.4 Setup a System with Capacitive Multi-Touch Display .....	4
<b>2. Use of the Capacitive Multi-Touch Adapter</b> .....	<b>4</b>
2.1. <i>Kit Capacitive Multi-Touch Display 7”</i> .....	5
2.2. <i>Kit Capacitive Multi-Touch Display 10”</i> .....	6
<b>3. Capacitive Multi-Touch Adapter Board</b> .....	<b>7</b>
3.1. <i>Features</i> .....	7
3.1.1 Block Diagram .....	7
3.1.2 Connection to Toradex Carrier Boards .....	8
3.1.3 Connection to Fusion 7 .....	8
3.1.4 Connection to Fusion 10 .....	8
<b>4. Capacitive Multi-Touch Adapter Board Physical Drawings</b> .....	<b>8</b>
4.1. <i>Connector Locations</i> .....	8
4.2. <i>Mechanical Drawing</i> .....	9
<b>5. Capacitive Multi-Touch Adapter Board Connectors</b> .....	<b>9</b>
5.1. <i>Fusion 10, LCD Interface [X1]</i> .....	9
5.2. <i>Fusion 10, Communication Interface [X2]</i> .....	10
5.3. <i>Carrier Board, Unified Display Connector [X3]</i> .....	11
5.4. <i>Carrier Board, Communication Interface</i> .....	12
5.4.1 Communication Interface [X4].....	12
5.4.2 Communication Interface [X8], [X9] .....	12
5.5. <i>Fusion 7, Backlight [X5]</i> .....	12
5.6. <i>Fusion 7, LCD Interface [X6]</i> .....	13
5.7. <i>Fusion 7, Communication Interface [X7]</i> .....	14
<b>6. Product Compliance</b> .....	<b>14</b>

## 1. Introduction

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This document describes the Capacitive Multi-Touch Adapter.

### 1.1. Reference Documents

For detailed technical information about suitable computer modules, please refer to the documents listed below.

#### 1.1.1 Touch Display Fusion 7

Detailed information can be found at the manufacturer “TPK America LLC”  
“Product Specification, Touch Revolution, Fusion 7, P/N: F07A-102”  
<http://docs.toradex.com/102948-fusion-7-inch-capacitive-display.pdf>

#### 1.1.2 Touch Display Fusion 10

Detailed information can be found at the manufacturer “TPK America LLC”  
“Product Specification, Touch Revolution, Fusion 10, P/N: F10A-102”  
<http://docs.toradex.com/102949-fusion-10-inch-capacitive-display.pdf>

#### 1.1.3 Schema “Capacitive Multi-Touch Adapter Board”

The schematic can be found on our website.  
<http://developer.toradex.com/product-selector/capacitive-multi-touch-display>

#### 1.1.4 Setup a System with Capacitive Multi-Touch Display

We have a getting started guide on our website.  
<http://developer.toradex.com/product-selector/capacitive-multi-touch-display>

## 2. Use of the Capacitive Multi-Touch Adapter

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The two sets ‘Capacitive Multi-Touch Display 7” ‘ and ‘Capacitive Multi-Touch Display 10” ‘ are display kits consisting of a Fusion 7 Display Touch and Fusion 10 Display Touch respectively on, a Capacitive Multi-Touch Adapter Board. Cables are included with the set so as to enable easy connection to different Toradex boards. On the software side, these sets are supported with drivers for Windows CE and Linux along with detailed descriptions on the Toradex Developer Center.

Please see:

<http://developer.toradex.com/product-selector/capacitive-multi-touch-display>.

## 2.1. Kit Capacitive Multi-Touch Display 7"

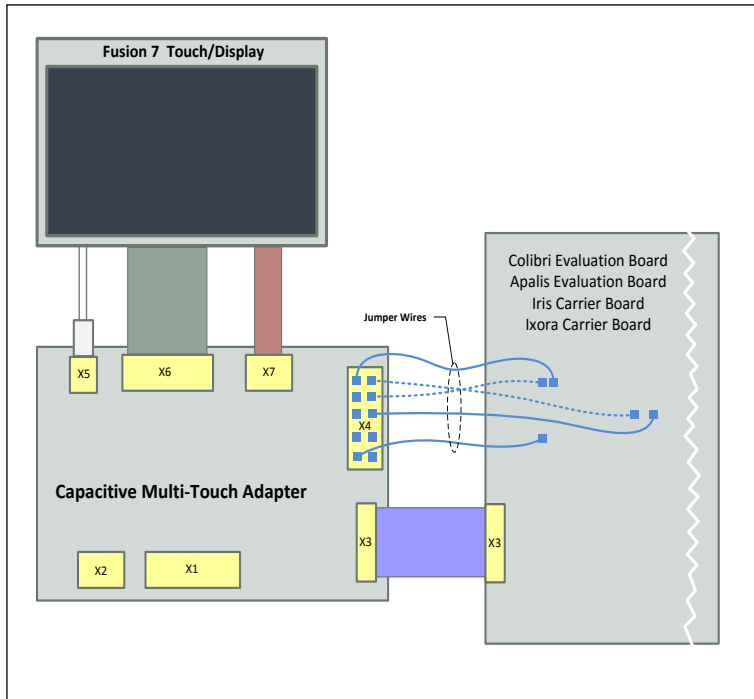


Figure 1 Kit Capacitive Multi-Touch Display 7"

The Kit Capacitive Multi-Touch Display 7" includes:

- **1 psc Fusion 7 Touch Display P/N: F10A-0102**
  - Screen Size 7"
  - LCD Resolution 800 x 480
    - LCD Interface TTL
  - Touch Resolution (points) 1500 x 900
    - Multi Touch 2 points with 15mm separation
    - Touch Interface I2C (3.3V)
  - For more information see chapter 1.1.1
- **1 psc Capacitive Multi-Touch Adapter Board**
  - For more information see chapter 3.
- **1 psc LCD Signal Cable**
  - FCC cable 0.5mm pitch, 40ways, 120mm length
- **1 psc Unified Display Interface Cable**
  - FCC cable 0.5mm pitch, 40ways, 200mm length
- **20 pcs Jumper Wires**
  - 10 pcs female to female, 200mm length
  - 10 pcs female to male, 200mm length

See chapter 1.1.4 to setup a system with a Kit Capacitive Multi-Touch Display 7".

## 2.2. Kit Capacitive Multi-Touch Display 10"

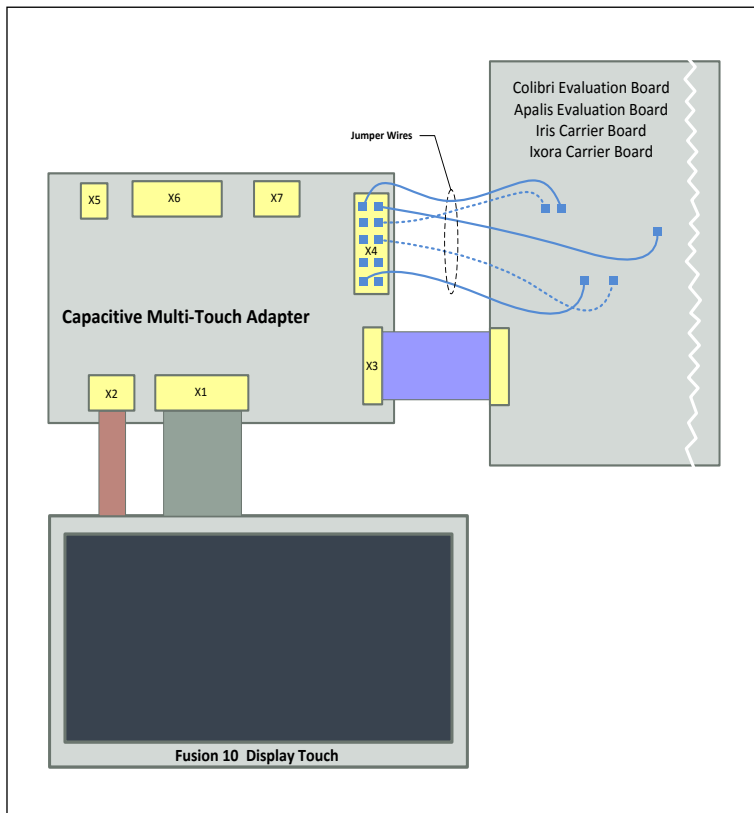


Figure 2 Capacitive Multi-Touch Display 10"

The Kit Capacitive Multi-Touch Display 10" includes:

- **1 psc Fusion 10 Touch Display P/N: F07A-0102**
  - Screen Size 10.1"
    - LCD Resolution 1024 x 600
    - LCD Interface 1-channel LVDS
  - Touch Resolution (points) 2300 x 1350
    - Multi Touch 2 points with 15mm separation
    - Touch Interface I2C (5.0V)
  - For more information see 1.1.2
- **1 psc Capacitive Multi-Touch Adapter Board**
  - For more information see chapter 3.
- **1 psc LCD Signal Cable**
  - LVDS cable, 40ways, 100mm length
- **1 psc Unified Display Interface Cable**
  - FCC cable 0.5mm pitch, 40ways, 200mm length
- **1 psc pcs Jumper Wires**
  - 10 pcs female to female, 200mm length
  - 10 pcs female to male, 200mm length

See chapter 1.1.4 to setup a system with a Kit Capacitive Multi-Touch Display 10".

## 3. Capacitive Multi-Touch Adapter Board

### 3.1. Features

The Capacitive Multi-Touch Adapter Board allows you to connect the Fusion 10 or Fusion 7 Display Touch to different Toradex Carrier Boards, so that the setup of a system with capacitive multi-touch and display can be made very easily (see chapter 1.1.4).

**Please note: It is not possible to connect a Fusion 7 and Fusion 10 Display at the same time.**

#### 3.1.1 Block Diagram

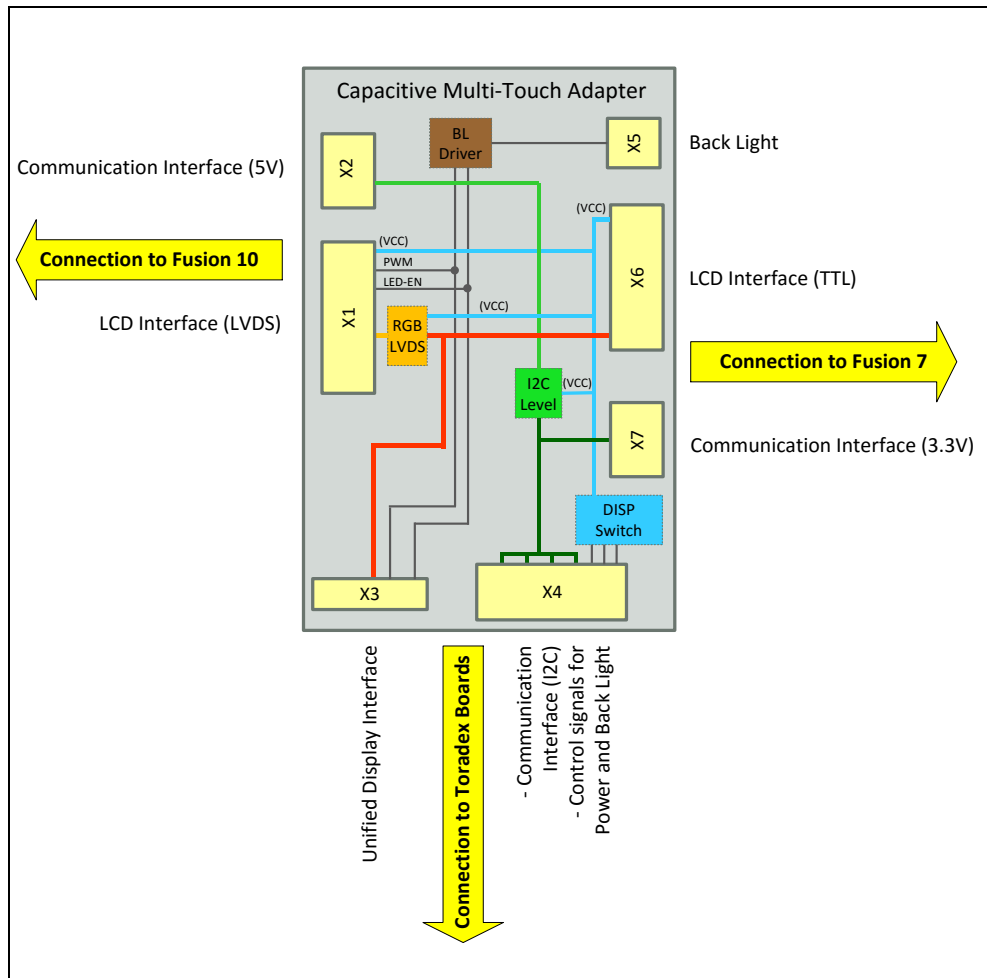


Figure 3: Function Overview of the Adapter

The Adapter has a size of 100 x 60 mm and possesses the following functionalities:

- LVDS converter for the Fusion 10 LCD interface (RGB/LVDS)
- Level Shifter for the Fusion 10 communication interface (I2C Level)
- Driver for the Fusion 7 back light (BL Driver)
- Power switches for the display's power and back lights (DISP Switches)

For more detail information see chapter 1.1.3

### 3.1.2 Connection to Toradex Carrier Boards

The Fusion Capacitive Touch Adapter contains a Unified Display Interface [X3] for the display output.

Plug X4 contains the communication interface (I2C) for the touch controller of the displays and the signal to switch the power on and off (depending on the assembly option).

The 5V power supply is plugged to [X4]. The 3.3V power supply can be plugged to [X3] and/or [X4].

See chapters 1.1.1 and 1.1.2 respectively for details about power consumption.

### 3.1.3 Connection to Fusion 7

The Fusion 7 Display Touch can be plugged in [X5] (backlight) and [X7] (touch controller). The connection of the display signals on [X6] needs a flat cable (FFC).

### 3.1.4 Connection to Fusion 10

The Fusion 10 Display Touch can be plugged in [X2] (touch controller). The connection of the display signals on [X1] needs a flat cable (LVDS).

## 4. Capacitive Multi-Touch Adapter Board Physical Drawings

### 4.1. Connector Locations

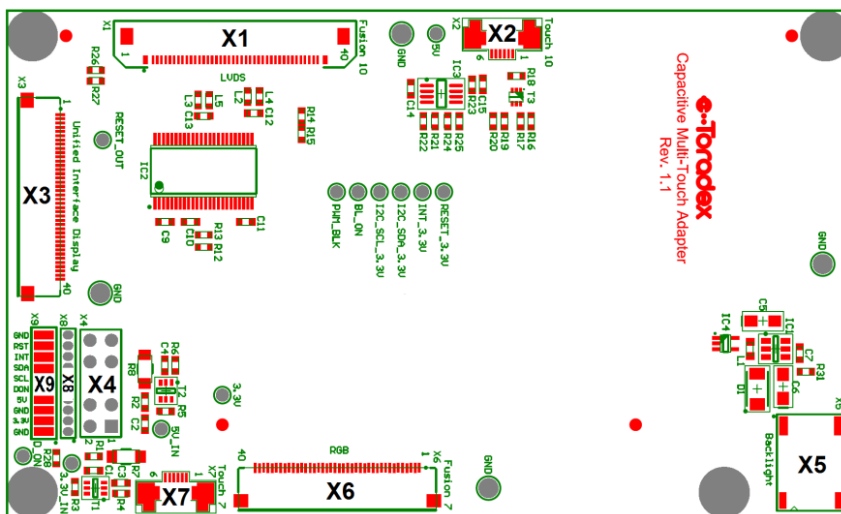


Figure 4 Capacitive Multi-Touch Adapter Board Connectors - Top Side

Ref	Description	Remarks
X1	Fusion 10, LCD Interface	LVDS
X2	Fusion 10, Communication Interface	5V
X3	Carrier Board, Unified Display Interface	
X4	Carrier Board, Communication Interface, power supply, control signal	Header 2.45mm
X8	Carrier Board, Communication Interface, power supply, control signal	Not assembled
X9	Carrier Board, Communication Interface, power supply, control signal	Not assembled
X5	Fusion 7, Backlight	
X6	Fusion 7, LCD Interface	TTL



Ref	Description	Remarks
X7	Fusion 7, Communication Interface	3.3V

## 4.2. Mechanical Drawing

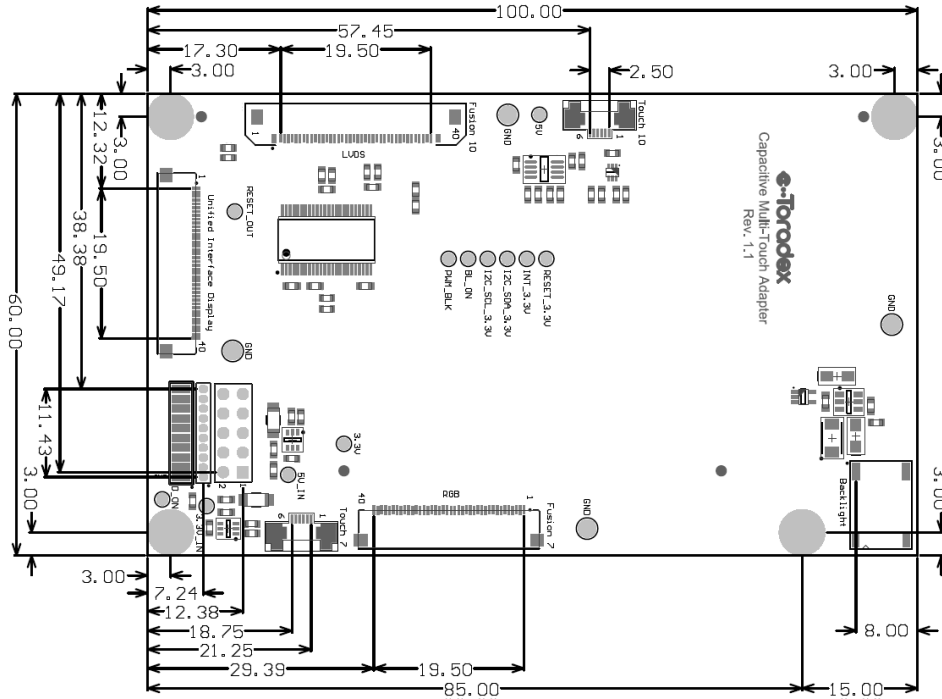


Figure 5 Mechanical Dimensions, All dimensions in millimetre (mm).

## 5. Capacitive Multi-Touch Adapter Board Connectors

In the following tables, the pin names from the Fusion 7 and Fusion 10 data sheets are used whenever possible. In this case, the pin number gives the link to the schematic of the Capacitive Multi-Touch Adapter Board.

### 5.1. Fusion 10, LCD Interface [X1]

Connector type: TE STE-20455-040E-12

Pin	Signal Name	Description
1	NC	No Connection
2	VCC	3.3V Power Supply
3	VCC	3.3V Power Supply
4	V-EDID	EDID 3.3V Power Supply
5	NC	No Connection
6	CLK-EDID	EDID Clock
7	DATA-EDID	EDID Data
8	RXIN0-	LVDS Signal-channel0-
9	RXIN0+	LVDS Signal+channel0+
10	GND	Ground
11	RXIN1-	LVDS Signal-channel1-

Pin	Signal Name	Description
12	RXIN1+	LVDS Signal+channel1+
13	GND	Ground
14	RXIN2-	LVDS Signal-channel2-
15	RXIN2+	LVDS Signal+channel2+
16	GND	Ground
17	RXCLKIN-	Data Input CLK-
18	RXCLKIN+	Data Input CLK+
19	GND	Ground
20	NC	No Connection
21	NC	No Connection
22	GND	Ground
23	NC	No Connection
24	NC	No Connection
25	GND	Ground
26	NC	No Connection
27	NC	No Connection
28	GND	Ground
29	NC	No Connection
30	NC	No Connection
31	VLED - GND	LED Ground
32	VLED - GND	LED Ground
33	VLED - GND	LED Ground
34	NC	No Connection
35	PWM_A	Backlight intensity signal
36	BL_ON	Backlight enable signal
37	NC	No Connection
38	VLED	LED Power Supply, 5-21V
39	VLED	LED Power Supply, 5-21V
40	VLED	LED Power Supply, 5-21V

## 5.2. Fusion 10, Communication Interface [X2]

Connector type: AVX 04-6277-006001883

Pin	Signal Name	Description
1	VCC	Power supply
2	RST	Reset
3	INT	Interrupt
4	SDA	I2C data line
5	SCL	I2C clock line
6	GND	Ground

### 5.3. Carrier Board, Unified Display Connector [X3]

Connector type: Omron Electronics XF2M-4015-1A

Pin	Signal Name	I/O Type	Voltage
1	GND	PWR	
2	GND	PWR	
3	3.3V_IN	PWR	+3.3V
4	3.3V_IN	PWR	+3.3V
5	BKL_ON	O	+3.3V
6	PWM_A	O	+3.3V
7	RESET_OUT #	O	+3.3V
8	LCD_D_5	O	+3.3V
9	LCD_D_4	O	+3.3V
10	LCD_D_3	O	+3.3V
11	LCD_D_2	O	+3.3V
12	LCD_D_1	O	+3.3V
13	LCD_D_0	O	+3.3V
14	GND	PWR	
15	LCD_D_11	O	+3.3V
16	LCD_D_10	O	+3.3V
17	LCD_D_9	O	+3.3V
18	LCD_D_8	O	+3.3V
19	LCD_D_7	O	+3.3V
20	LCD_D_6	O	+3.3V
21	GND	PWR	
22	LCD_D_17	O	+3.3V
23	LCD_D_16	O	+3.3V
24	LCD_D_15	O	+3.3V
25	LCD_D_14	O	+3.3V
26	LCD_D_13	O	+3.3V
27	LCD_D_12	O	+3.3V
28	LCD_PCLK_WR	O	+3.3V
29	GND	PWR	
30	LCD_LCLK_A0	O	+3.3V
31	LCD_LCLK_RD	O	+3.3V
32	LCD_BIAS	O	+3.3V
33	NC	O	-
34	NC	O	-
35	GND	PWR	
36	3.3V_IN	PWR	+3.3V
37	NC	O	-
38	NC	O	-
39	NC	O	-
40	NC	O	-

## 5.4. Carrier Board, Communication Interface

### 5.4.1 Communication Interface [X4]

Connector type: Molex 87914-1026, Male Type, 2.54mm Pitch

Pin	Signal Name	Description
1	GND	Power supply GND
2	3V3_IN	Power supply 3.3V
3	5V_IN	Power supply 5V
4	GND	Power supply GND
5	DISP_ON	Power supply 3.3V and 5V enable
6	TOUCH_I2C_SCL_3.3V	Touch controller, I2C Clock
7	TOUCH_I2C_SDA_3.3V	Touch controller, I2C Data
8	TOUCH_INT3.3V	Touch controller, Interrupt
9	TOUCH_RESET_3.3V	Touch controller, Reset
10	GND	Power supply GND

### 5.4.2 Communication Interface [X8], [X9]

Connector type: Sullins GRPB101VWVN-RC, Male Type, 1.27mm Pitch

Pin	Signal Name	Description
1	GND	Power supply GND
2	3V3_IN	Power supply 3.3V
3	GND	Power supply GND
4	5V_IN	Power supply 5V
5	DISP_ON	Power supply 3.3V and 5V enable
6	TOUCH_I2C_SCL_3.3V	Touch controller, I2C Clock
7	TOUCH_I2C_SDA_3.3V	Touch controller, I2C Data
8	TOUCH_INT3.3V	Touch controller, Interrupt
9	TOUCH_RESET_3.3V	Touch controller, Reset
10	GND	Power supply GND

## 5.5. Fusion 7, Backlight [X5]

Connector type: AVX 04-6298-006000883

Pin	Signal Name	Description
1	VLED+	LED Anode
2	VLED-	LED Cathode

## 5.6. Fusion 7, LCD Interface [X6]

Connector type Omron Electronics XF2M-4015-1A

Pin	Signal Name	Description
1	GND	Power Ground
2	GND	Power Ground
3	NC	No Connect
4	3.3V	Digital Power Supply
5	3.3V	Digital Power Supply
6	3.3V	Digital Power Supply
7	3.3V	Digital Power Supply
8	NC	No Connect
9	DE	Data Enable
10	GND	Power Ground
11	GND	Power Ground
12	GND	Power Ground
13	B5	Blue Data 5 (MSB)
14	B4	Blue Data 4
15	B3	Blue Data 3
16	GND	Power Ground
17	B2	Blue Data 2
18	B1	Blue Data 1
19	B0	Blue Data 0 (LSB)
20	GND	Power Ground
21	G5	Green Data 5 (MSB)
22	G4	Green Data 4
23	G3	Green Data 3
24	GND	Power Ground
25	G2	Green Data 2
26	G1	Green Data 1
27	G0	Green Data 0 (LSB)
28	GND	Power Ground
29	R5	Red Data 5 (MSB)
30	R4	Red Data 4
31	R3	Red Data 3
32	GND	Power Ground
33	R2	Red Data 2
34	R1	Red Data 1
35	R0	Red Data 0 (LSB)
36	GND	Power Ground
37	GND	Power Ground
38	DCLK	Clock Signal- Note1
39	GND	Power Ground
40	GND	Power Ground

## 5.7. Fusion 7, Communication Interface [X7]

Connector type: JST Sales America Inc SM02B-BHSS-1-TB

Pin	Signal Name	Description
1	VCC	Power supply
2	RST	Reset
3	INT	Interrupt
4	SDA	I2C data line
5	SCL	I2C clock line
6	GND	Ground

## 6. 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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