

Hardware User Manual

EXT-BF5xx-CAM V2.x

www.tinyboards.com

Maximum Power at Minimum Size

Contact

Bluetechnix Mechatronische Systeme GmbH

Waidhausenstr. 3/19
A-1140 Vienna
AUSTRIA/EUROPE
office@bluetechnix.at
<http://www.bluetechnix.com>

Document No.: 100-2253-2.0

Version 2

2010-07-13

Table of Contents

1	Introduction	1
1.1	Overview.....	1
1.2	Possible mount configurations.....	2
1.3	Blackfin Products.....	3
2	Specification	6
2.1	Schematic	6
2.2	Connectors, PCB Placement and PIN Assignment.....	6
2.2.1	EX1 – Expansion Connector 1	9
2.2.2	EX2 – Expansion Connector 2	7
2.2.3	Cam1 – Camera Connector 1	9
2.2.4	Cam2 – Camera Connector 2	12
2.2.5	P1 – TFT Display Connector	13
2.2.6	Expansion Connector Types.....	14
2.2.7	JP1 - Power Supply Jumper	14
2.3	Mechanical Outline.....	15
2.4	Configuration	15
2.4.1	JP1 - Power Supply Jumper	15
2.4.2	S1 – DIP Switch	15
2.4.3	S2 – Camera Core Voltage Select.....	16
2.4.4	S3 – PWM Timer Select Switch	16
2.4.5	Timer used to drive TFT-Display signals	16
3	Known Bugs	18
4	Abbreviations	19
5	Revision History	20
A	List of Figures and Tables.....	21

Edition 2005-08

© Bluetechnix Mechatronische Systeme GmbH 2005

All Rights Reserved.

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.

Terms of delivery and rights of technical change reserved.

We hereby disclaim any warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

Bluetechnix makes and you receive no warranties or conditions, express, implied, statutory or in any communication with you. Bluetechnix specifically disclaims any implied warranty of merchantability or fitness for a particular purpose.

Bluetechnix takes no liability for any damages and errors causing of the usage of this board. The user of this board is responsible by himself for the functionality of his application. He is allowed to use the board only if he has the qualification. More information is found in the General Terms and Conditions (AGB).

Information

For further information on technology, delivery terms and conditions and prices please contact Bluetechnix (<http://www.bluetechnix.com>).

Warnings

Due to technical requirements components may contain dangerous substances.

The Core Boards and Development systems contain ESD (electrostatic discharge) sensitive devices. Electrostatic charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Unused core boards and development boards should be stored in the protective shipping package.



1 Introduction

The EXT-BF5xx-Camera Board is an extender plug-on board for the DEV-BF5xx or the EVAL-BF5xx Board. The board supports the Omnivision OV7660 camera modules and/or the TX09D50VM1CCA from Hitachi or compatible devices.

1.1 Overview

The EXT-BF5xx-Camera Board includes the following components:

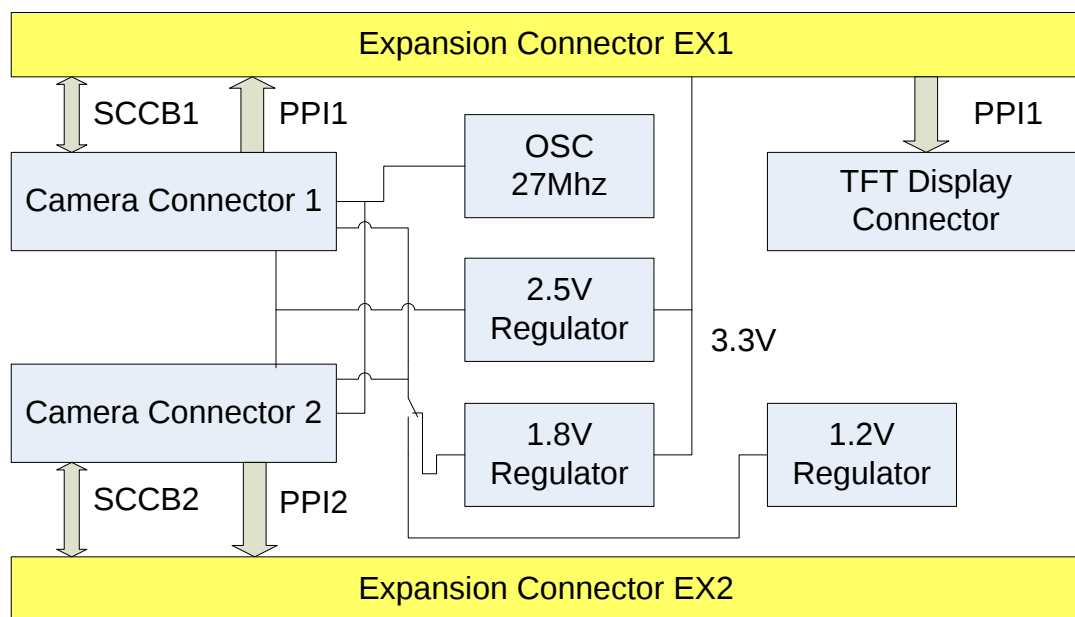


Figure 1-1: Overview of the EXT-BF5xx-Camera Board

▪ 2 Camera Connectors

1. Supported cameras: OV7660, OV2630
2. Resolution: 640x480 @ max 30fps or 320x240@ max 60fps up to 2Mpixel (depends on the camera model connected)

▪ TFT Display Connector

3. Supports Hitachi TX09D50VM1CCA (Note 1) or compatible devices.

▪ Stacked Connectors

4. For connecting the basis board or other extender boards.

The TFT Display TX09D50VM1CCA can be ordered from Bluetechnix.

1.2 Possible mount configurations

The possible mounting configurations are depending on the used Core Module:

- **CM-BF561**

1. 2 cameras inserted in Cam1 and Cam2 *¹⁾

- **CM-BF533**

1. Only 1 camera in Cam1 is possible*²⁾

- **CM-BF537E/U**

1. Only one camera on Cam1 *²⁾
2. Only the display, don't connect Cam1 if you use the display

*¹⁾ Do not connect the display, if you insert two cameras. The camera Cam1 and the Display share the same PPI interface!

*³⁾ Leave camera Cam2 and display P1 open!

1.3 Blackfin Products

BLACKFIN Products

CM-BF533:	Blackfin Processor Module powered by Analog Devices single core ADSP-BF533 processor; up to 600MHz, 32MB RAM, 2MB Flash, 120 pin expansion connector and a size of 36.5x31.5mm
CM-BF537U:	Blackfin Processor Module powered by Analog Devices single core ADSP-BF537 processor; up to 600MHz, 32MB RAM, 4MB Flash, integrated USB 2.0 Device, 120 pin expansion connector and a size of 36.5x31.5mm
CM-BF537E:	Blackfin Processor Module powered by Analog Devices single core ADSP-BF537 processor; up to 600MHz, 32MB RAM, 4MB Flash, integrated TP10/100 Ethernet physical transceiver, 120 pin expansion connector and a size of 36.5x31.5mm
CM-BF561:	Blackfin Processor Module powered by Analog Devices dual core ADSP-BF561 processor; up to 2x 600MHz, 32MB RAM, 4MB Flash, 120 pin expansion connector and a size of 36.5x31.5mm
TCM-BF537:	Blackfin Processor Module powered by Analog Devices single core ADSP-BF537 processor; up to 500MHz, 32MB RAM, 8MB Flash, 28x28mm, 120 pin expansion connector, Ball Grid Array or Border Pads for reflow soldering, industrial temperature range -40°C to +85°C.
EVAL-BF5xx:	Low cost Blackfin processor Evaluation Board with one socket for any Bluetechnix Blackfin Core Module. Additional periphery is available, such as a SD-Card.
EVAL-BF5xxDA:	An EVAL-BF5xx including a Debug Agent. Low cost starter development system for Bluetechnix core Modules including VDSP++ Evaluation Software License.
DEV-BF5xx:	Blackfin Development Board with two sockets for any combination of Core Modules. Additional periphery is available, such as CF-Card, SD-Card, DP-RAM, Ethernet, USB host and device, multi-port JTAG, connector for a LCD-TFT Display and connector for a digital camera system.
EXT-Boards:	The following Extender Boards are available: EXT-BF5xx-Audio, EXT-BF5xx-Video, EXT-BF5xx-Camera, EXT-BF5xx-Experimental, EXT-BF5xx-LVDS, EXP-BF5xx-ETH-USB, EXP-BF5xx-AD/DA. Additional boards based on customer request
BLACKSheep:	The BLACKSheep VDK is a multithreaded framework for the Analog Devices Blackfin processor family that includes driver support for a variety of hardware extensions. It is based on the real-time VDK kernel included within the VDSP++ development environment.

LabVIEW: LabVIEW embedded support for the CM-BF537E, CM-BF537U and TCM-BF537 Core Modules based on the BLACKSheep VDK driver Framework.

Notes: For product development it is highly recommended that the developer purchase the *DEV-BF5xx* or *EVAL-BF5xx (DA)* Blackfin development board and the BLACKSheep VDK low level driver software for the on board peripherals.

BLACKFIN Design Service

Based on over three years Blackfin experience Bluetechnix offers development assistance as well as custom design services and software development.

2 Specification

2.1 Schematic

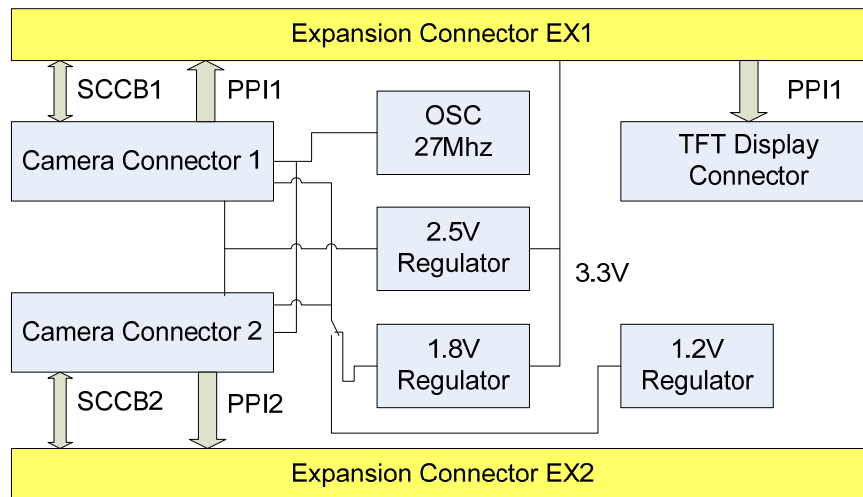


Figure 2-1: Detailed Block Diagram

2.2 Connectors, PCB Placement and PIN Assignment

The following sections describe the signal and pin assignment depending on which core module is inserted on the basis board.

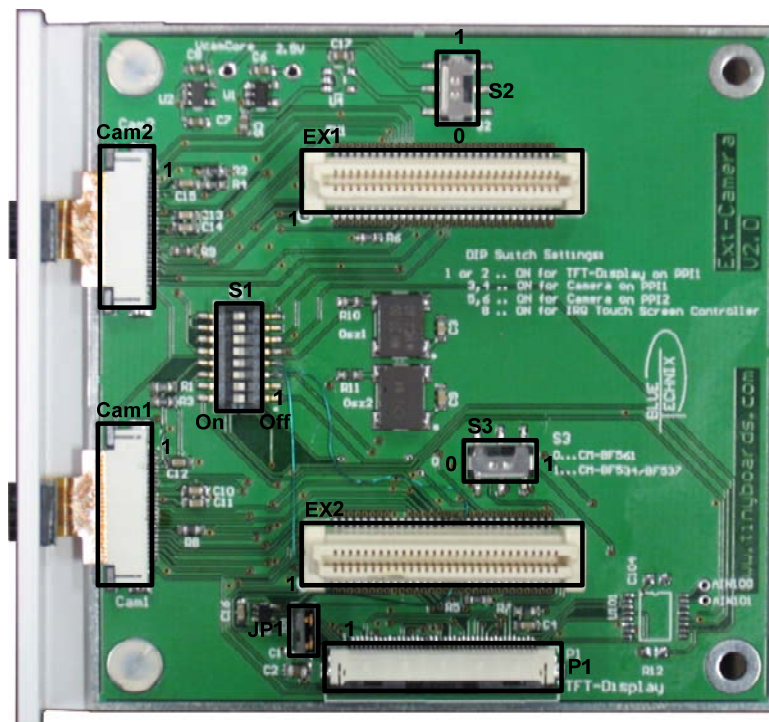


Figure 2-2: Connector PCB Placement

2.2.1 EX1 – Expansion Connector 1

The pin assignment of the expansion connector EX1 depends on the core module inserted on the basis board.

CM-BF533 inserted on basis board:

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	A1	O	2	A3	O
3	A5	O	4	A7	O
5	A9	O	6	A11	O
7	A13	O	8	A15	O
9	A17	O	10	A19	O
11	ABE1	O	12	n.c.	-
13	n.c.	-	14	n.c.	-
15	1V8	O	16	ADRY	I
17	n/BG	O	18	CLK_Out 25MHz	O
19	GND	PWR	20	nAMS3	O
21	nAWE	O	22	NMI	I
23	D0	I/O	24	D2	I/O
25	D4	I/O	26	D6	I/O
27	D8	I/O	28	D10	I/O
29	D12	I/O	30	D14	I/O
31	D15	I/O	32	D13	I/O
33	D11	I/O	34	D9	I/O
35	D7	I/O	36	D5	I/O
37	D3	I/O	38	D1	I/O
39	nRESET	I	40	nAOE	O
41	nARE	O	42	nAMS2	O
43	VDD-RTC	PWR	44	nBGH (at Slot B via R205)	O
45	nBR	I	46	n.c.	-
47	n.c.	-	48	n.c.	-
49	n.c.	-	50	n.c.	-
51	ABE0	O	52	A18	O
53	A16	O	54	A14	O
55	A12	O	56	A10	O
57	A8	O	58	A6	O
59	A4	O	60	A2	O

Table 2-1: Connector EX1 pin assignment for CM-BF533

CM-BF537E/U

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	A1	O	2	A3	O
3	A5	O	4	A7	O
5	A9	O	6	A11	O

7	A13	O	8	A15	O
9	A17	O	10	A19	O
11	nABE1	O	12	PH1/LED_ACT (Note 2)	O
13	GND	-	14	PH5/RX+ (Note 2)	I
15	PH7/RX- (Note 2)	I	16	ADRY	I
17	nBG/USBD+ (Note 1)	O	18	CLK_out	O
19	GND	PWR	20	nAMS3	O
21	nAWE	O	22	NMI	I
23	D0	I/O	24	D2	I/O
25	D4	I/O	26	D6	I/O
27	D8	I/O	28	D10	I/O
29	D12	I/O	30	D14	I/O
31	D15	I/O	32	D13	I/O
33	D11	I/O	34	D9	I/O
35	D7	I/O	36	D5	I/O
37	D3	I/O	38	D1	I/O
39	nReset	I	40	nAOE	O
41	nARE	O	42	nAMS2	O
43	VDD-RTC	PWR	44	nBGH/USBD- (Note 1)	O
45	nBR	I	46	PH8/VA25 (Note 2)	PWR
47	PH6/TX- (Note 2)	O	48	TX+ (Note 2)	O
49	PH2/LED_FD (Note 2)	O	50	PH0/LED_SPEED (Note 2)	O
51	nABE0	O	52	A18	O
53	A16	O	54	A14	O
55	A12	O	56	A10	O
57	A8	O	58	A6	O
59	A4	O	60	A2	O

Table 2-2: Connector EX1 pin assignment for CM-BF537E/U

Note 1: The USB signals are only available with CM-BF537U inserted otherwise alternate signal function is available.

Note 2: The Ethernet signals are only available with CM-BF537E inserted otherwise alternate signal function is available.

CM-BF561 inserted on basis board:

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	nABE3	O	2	A3	O
3	A5	O	4	A7	O
5	A9	O	6	A11	O
7	A13	O	8	A15	O
9	PPI2SYNC1	I/O	10	PPI2SYNC2	I/O
11	PPI2D1	I/O	12	PPI2D3	I/O
13	PPI2D5	I/O	14	PPI2D7	I/O
15	PPI2D9 / PF33	I/O	16	PPI2D11 / PF35	I/O

17	PPI2D13 / PF37	I/O	18	PPI2D15 / PF39	I/O
19	GND	PWR	20	nAMST	O
21	nAWE	O	22	NMI0	I
23	D0	I/O	24	D2	I/O
25	D4	I/O	26	D6	I/O
27	D8	I/O	28	D10	I/O
29	D12	I/O	30	D14	I/O
31	D15	I/O	32	D13	I/O
33	D11	I/O	34	D9	I/O
35	D7	I/O	36	D5	I/O
37	D3	I/O	38	D1	I/O
39	nRESET	I	40	nAOE	O
41	nARE	O	42	nAMS2	O
43	n.c.	-	44	PPI2D14 / PF38 (at Slot B via R205)	I/O
45	PPI2D12 / PF36	I/O	46	PPI2D10 / PF34	I/O
47	PPI2D8 / PF32	I/O	48	PPI2D6	I/O
49	PPI2D4	I/O	50	PPI2D2	I/O
51	PPI2D0	I/O	52	PPI2SYNC3	I/O
53	PPI2CLK	I	54	A14	O
55	A12	O	56	A10	O
57	A8	O	58	A6	O
59	A4	O	60	A2	O

Table 2-3: Connector EX1 pin assignment for CM-BF561

2.2.2 EX2 – Expansion Connector 2

The pin assignment of the expansion connector EX2 depends on the core module inserted on the basis board.

CM-BF533 inserted on basis board:

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	RSCLK0	I/O	2	DR0PRI	I
3	TSCLK0	I/O	4	DT0PRI	O
5	RSCLK1	I/O	6	DR1PRI	I
7	TSCLK1	I/O	8	DT1PRI	O
9	3V3	PWR	10	3V3	PWR
11	PPI0	I/O	12	PPI2	I/O
13	PF15 / PPI4	I/O	14	PF13 / PPI6	I/O
15	PF11 / PPI8	I/O	16	PF9 / PPI10	I/O
17	PF7/SPISEL7/PPI12	I/O	18	PF5/SPISEL5/PPI14	I/O
19	PF3/SPISEL3/PPI_FS3	I/O	20	TMR1 / PPI_FS1	I/O
21	TMR0	I/O	22	PF1 / SPISEL1	I/O
23	RX	I	24	MOSI	I/O
25	SCK	I	26	BMODE0	I
27	GND	PWR	28	n.c.	-

29	n.c.	-	30	n.c.	-
31	n.c.	-	32	n.c.	-
33	n.c.	-	34	n.c.	-
35	n.c.	-	36	BMODE1	I
37	MISO	I/O	38	TX	O
39	PF0 / nSPISS	I/O	40	PF2 / SPISEL2	I/O
41	PPI_CLK	I/O	42	TMR2 / PPI_FS2	I/O
43	PF4/SPISEL4/PPI15	I/O	44	PF6/SPISEL6/PPI13	I/O
45	PF8 / PPI11	I/O	46	PF10 / PPI9	I/O
47	PF12 / PPI7	I/O	48	PF14 / PPI5	I/O
49	PPI3	I/O	50	PPI1	I/O
51	GND	PWR	52	GND	PWR
53	DT1SEC	O	54	TFS1	I/O
55	DR1SEC	I	56	RFS1	I/O
57	DT0SEC	O	58	TFS0	I/O
59	DR0SEC	I	60	RFS0	I/O

Table 2-4: Connector EX2 pin assignment for CM-BF533

CM-BF537E/U inserted on basis board:

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	RSCLK0/TACLK2	I/O	2	DR0PRI/ TACLK4	I
3	TSCLK0/TACLK1	I/O	4	DT0PRI/SPI_CS2	O
5	CLK_out	O	6	SDA	I/O
7	PF4/TMR5/SPI_CS6	I/O	8	PF5/TMR4/SPI_CS5	I/O
9	3V3	PWR	10	3V3	PWR
11	PG0/PPI1D0	I/O	12	PG2/PPI1D2	I/O
13	PG4/PPI1D4	I/O	14	PG6/PPI1D6	I/O
15	PG8/PPI1D8/DR1SEC	I/O	16	PG10/PPI1D10/RSCLK1	I/O
17	PG12/PPI1D12/RE1PRI	I/O	18	PG14/PPI1D14/TFS1	I/O
19	PPI1SY3/PF7/TMR2	I/O	20	PPI1SY1/PF8/TMR0	I/O
21	PPI1SY1/PF8/TMR0	I/O	22	PF3/Tx1/TMR6/TACI6	I/O
23	PF1/DMAR1/TACI1/Rx0	I/O	24	PF11/MOSI	I/O
25	PF13/SCK	I/O	26	BMODE0	I
27	GND	PWR	28	n.c.	-
29	n.c.	-	30	n.c.	-
31	n.c.	-	32	n.c.	-
33	n.c.	-	34	BMODE2	I
35	n.c.	-	36	BMODE1	I
37	PF12/MISO	I/O	38	PF0/DMAR0/Tx0	O
39	PF14/SPI_SS	I/O	40	PF2/Rx1/TMR7	I/O
41	PPI1Clk/PF15/TMRCLK	I/O	42	PPI1Sy2/PF8/TMR1	I/O
43	PG15/PPI1D15/DT1PRI	I/O	44	PG13/PPI1D13/TSCLK1	I/O
45	PG11/PPI1D11/RFS1	I/O	46	PG9/PPI1D9/TD1SEC	I/O
47	PG7/PPI1D7	I/O	48	PG5/PPI1D5	I/O
49	PG3/PPI1D3	I/O	50	PG1/PPI1D1	I/O

51	GND	PWR	52	GND	PWR
53	PF5/TMR4/SPI_CS5	O	54	PF6/TMR3/SPI_CS4	I/O
55	PF10/SPI_SC1	I	56	SCL	I/O
57	DT0SEC/CANTX/SPICS7	O	58	TFS0	I/O
59	DR0SEC/TACIO/CANRX	I	60	RFS0/TACLK3	I/O

Table 2-5: Connector EX2 pin assignment for CM-BF537E/U

CM-BF561 inserted on basis board:

Pin No	Signal	Signal type	Pin No	Signal	Signal type
1	RSCLK0 / PF28	I/O	2	DR0PRI	I
3	TSCLK0 / PF29	I/O	4	DT0PRI / PF18	I/O
5	PF11(Clk_out optional)	I/O	6	PF9	I/O
7	PF7/SPISEL7/TMR7	I/O	8	PF5/SPISEL5/TMR5	I/O
9	3V3	PWR	10	3V3	PWR
11	PPI1D0	I/O	12	PPI1D2	I/O
13	PPI1D4	I/O	14	PPI1D6	I/O
15	PPI1D8 / PF40	I/O	16	PPI1D10 / PF42	I/O
17	PPI1D12 / PF44	I/O	18	PPI1D14 / PF46	I/O
19	PPI1SYNC3	I/O	20	PPI1SYNC1 / TMR8	I/O
21	PF3 / SPICS2	I/O	22	PF1/SPISEL1/TMR1	I/O
23	RX / PF27	I/O	24	MOSI	I/O
25	SCK	I/O	26	nABE2	O
27	ARDY	I	28	n.c.	-
29	n.c.	-	30	n.c.	-
31	n.c.	-	32	n.c.	-
33	n.c.	-	34	nAMS3	O
35	nABE1	O	36	nABE0	O
37	MISO	I/O	38	TX / PF26	I/O
39	PF0/SPISS/TMR0	I/O	40	PF2/SPISEL2/TMR2	I/O
41	PPI1CLK	I	42	PPI1SYNC2 / TMR9	I/O
43	PPI1D15 / PF47	I/O	44	PPI1D13 / PF45	I/O
45	PPI1D11 / PF43	I/O	46	PPI1D9 / PF41	I/O
47	PPI1D7	I/O	48	PPI1D5	I/O
49	PPI1D3	I/O	50	PPI1D1	I/O
51	GND	PWR	52	GND	PWR
53	PF4/SPISEL4/TMR4	I/O	54	PF6/SPISEL6/TMR6	I/O
55	PF8	I/O	56	PF10	I/O
57	DT0SEC / PF17	O	58	TFS0 / PF16	I/O
59	DR0SEC / PF20	I	60	RFS0 / PF19	I/O

Table 2-6: Connector EX2 pin assignment for CM-BF561

2.2.3 Cam1 – Camera Connector 1

Pin	Description	Pin on CM-BF533	Pin on CM-BF537E/U	Pin on CM-BF561
1	n.c.	n.c.	n.c.	n.c.
2	AGND	n.c.	n.c.	n.c.
3	SIO_D	PPI1D12	PPI1D12	PPI1D12
4	AVDD	n.c.	n.c.	n.c.
5	SIO_C	PPI1D15	PPI1D15	PPI1D15
6	RESET	n.c.	n.c.	n.c.
7	VSYNC	PPI1Sy2	PPI1Sy2	PPI1Sy2
8	PWDN	n.c.	n.c.	n.c.
9	HREF	PPI1Sy1	PPI1Sy1	PPI1Sy1
10	DVDD	n.c.	n.c.	n.c.
11	DOVDD	n.c.	n.c.	n.c.
12	D7	PPI1D7	PPI1D7	PPI1D7
13	CamClk	n.c.	n.c.	n.c.
14	D6	PPI1D6	PPI1D6	PPI1D6
15	DGND	n.c.	n.c.	n.c.
16	D5	PPI1D5	PPI1D5	PPI1D5
17	PCLK	PPI1Clk	PPI1Clk	PPI1Clk
18	D4	PPI1D4	PPI1D4	PPI1D4
19	D0	PPI1D0	PPI1D0	PPI1D0
20	D3	PPI1D3	PPI1D3	PPI1D3
21	D1	PPI1D1	PPI1D1	PPI1D1
22	D2	PPI1D2	PPI1D2	PPI1D2
23	D8	PPI1D8	PPI1D8	PPI1D8
24	D9	PPI1D9	PPI1D9	PPI1D9

Table 2-7: Connector Cam1 pin assignment

2.2.4 Cam2 – Camera Connector 2

A camera connected on Cam2 is only supported with a CM-BF561 inserted on basis board. It does not work with the other Core Modules because they don't have a second PPI interface.

ATTENTION: Leave connector Cam2 unconnected with CM-BF53x inserted!

Pin	Description	Pin on CM-BF561
1	n.c.	n.c.
2	AGND	n.c.
3	SIO_D	PPI2D11
4	AVDD	n.c.
5	SIO_C	PPI2D10
6	RESET	n.c.
7	VSYNC	PPI2Sy2
8	PWDN	n.c.
9	HREF	PPI2Sy1
10	DVDD	n.c.
11	DOVDD	n.c.

12	D7	PPI2D7
13	CamClk	n.c.
14	D6	PPI2D6
15	DGND	n.c.
16	D5	PPI2D5
17	PCLK	PPI2Clk
18	D4	PPI2D4
19	D0	PPI2D0
20	D3	PPI2D3
21	D1	PPI2D1
22	D2	PPI2D2
23	D8	PPI2D8
24	n.c.	PPI2D9

Table 2-8: Connector Cam2 pin assignment

2.2.5 P1 – TFT Display Connector

The TFT-Display is only supported with CM-BF537E/U.

ATTENTION: Leave connector P1 unconnected if CM-BF533 inserted.

Pin	Description	Pin on CM-BF537E/U	Pin on CM-BF561 ¹⁾
1	VDD	n.c.	n.c.
2	VDD	n.c.	n.c.
3	VDD	n.c.	n.c.
4	DCLK	PPI1Clk/TMR5	PPI1Clk/TMR7
5	VSS	n.c.	n.c.
6	HSYNC	PPI1Sy1	PPI1Sy1
7	VSS	n.c.	n.c.
8	DTMG	PPI1Sy2	PPI1Sy2
9	VSS	n.c.	n.c.
10	n.c.	n.c.	n.c.
11	VSS	n.c.	n.c.
12	R5	PPI1D0	PPI1D0
13	R4	PPI1D1	PPI1D1
14	R3	PPI1D2	PPI1D2
15	VSS	n.c.	n.c.
16	R2	PPI1D3	PPI1D3
17	R1	PPI1D4	PPI1D4
18	R0	PPI1D0	PPI1D0
19	VSS	n.c.	n.c.
20	G5	PPI1D5	PPI1D5
21	G4	PPI1D6	PPI1D6
22	G3	PPI1D7	PPI1D7
23	VSS	n.c.	n.c.
24	G2	PPI1D8	PPI1D8
25	G1	PPI1D9	PPI1D9
26	G0	PPI1D10	PPI1D10

27	VSS	n.c.	n.c.
28	B5	PPI1D11	PPI1D11
29	B4	PPI1D12	PPI1D12
30	B3	PPI1D13	PPI1D13
31	VSS	n.c.	n.c.
32	B2	PPI1D14	PPI1D14
33	B1	PPI1D15	PPI1D15
34	B0	PPI1D11	PPI1D11
35	PCI	PF14	PF0
36	PWM	TMR6	TMR5
37	XR	n.c.	n.c.
38	YL	n.c.	n.c.
39	XL	n.c.	n.c.
40	YU	n.c.	n.c.

Table 2-9: Connector P1 (TFT-Display) pin assignment

¹⁾ Currently there is no software support for a TFT-Display on the CM-BF561. If you need a Display on the CM-BF561 please contact support@bluetechnix.at

2.2.6 Expansion Connector Types

The Expansion Connectors on the EXT-BF5xx-Camera for a Stacked Height of 16mm are of the following type:

Part	Manufacturer	Manufacturer Part Nr.
EX1, EX2	AMP (Stacked Height = 16mm)	5-5179010-2
Matching connector	AMP	5179031-2

Table 2-10: EXT-BF5xx-Camera board connector types

These connectors can be ordered from Bluetechnix.

2.2.7 JP1 - Power Supply Jumper

This jumper can be removed in order to insert an AMPERE METER for current measurement of the entire EXT-BF5xx-Camera or to disable the entire board.

2.3 Mechanical Outline

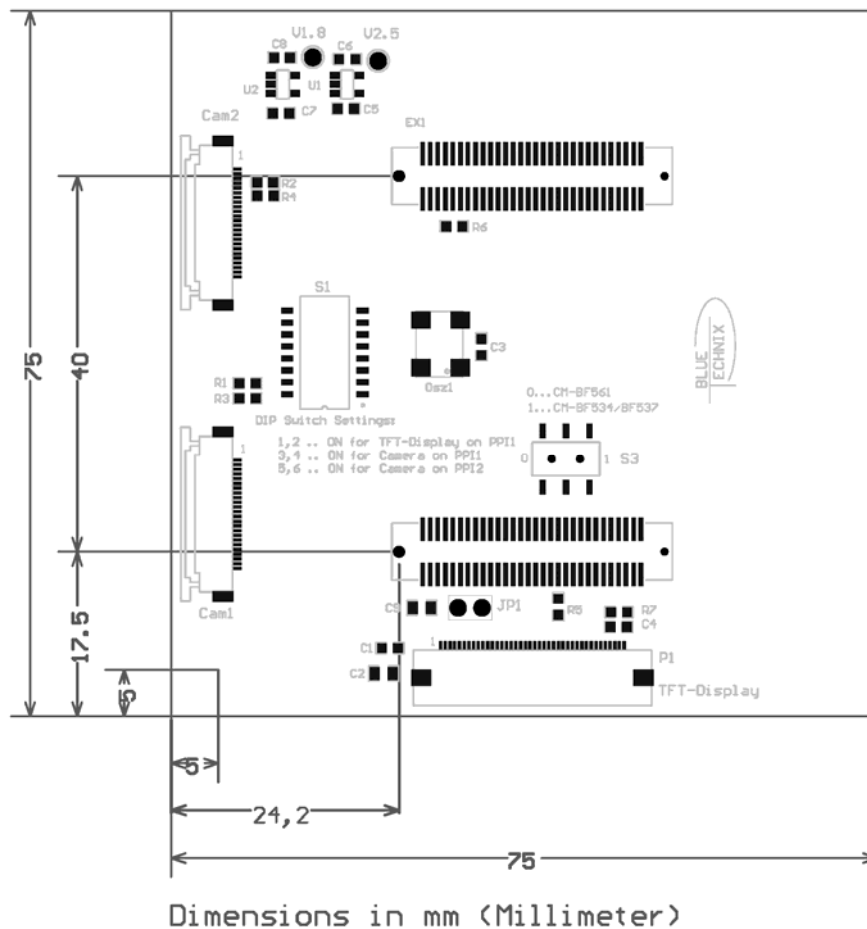


Figure 2-3: Mechanical Outline

2.4 Configuration

This section describes the settings of all switches depending on the inserted core module on the basis board.

2.4.1 JP1 - Power Supply Jumper

Always on, otherwise the entire board is deselected (powered off).

2.4.2 S1 – DIP Switch

The DIP-Switch controls the timer pins for the PWM signals of the display and the SCCB signals of Cam1, depending on the configuration and the core module inserted on the basis board.

Core Module	Switch Positions
CM-BF533	<u>Only Cam1 connected:</u> 3,4 ON / 1,2,5,6,7,8 OFF * ¹⁾
CM-BF537E/U	<u>Only Cam1 connected:</u> 3,4 ON / 1,2,5,6,7,8 OFF * ¹⁾ <u>Only TFT-Display connected:</u> 1 ON / 2,3,4,5,6,7,8 OFF * ²⁾
CM-BF561	<u>Cam1 and Cam2 connected:</u> 3,4,5,6 ON / 1,2,7,8 OFF * ³⁾

Table 2-11: S1 DIP-Switch configuration

*¹⁾ Leave Cam2 and P1 open

*²⁾ Leave Cam1 and Cam2 open

*³⁾ Leave P1 open

If you are using 2 Cameras please set on the EVAL-BF5xx (S1) or at the DEV-BF5xx (S204) the Switch for the Ethernet plug to 'OFF'

If you are using the Ethernet functionality please remove the Cam 2.

2.4.3 S2 – Camera Core Voltage Select

This switch selects the core voltage depending on the camera module(s) inserted.

Camera module(s) inserted	Switch position	Core Voltage
OV7660	1	1.8 V
OV2630	0	1.2 V

2.4.4 S3 – PWM Timer Select Switch

This switch selects the timer used to generate the background PWM signal.

Core module on basis board	Switch position
CM-BF533	X (Note 1)
CM-BF537E/U	1
CM-BF534	1
CM-BF561	0

Table 2-12: Timer Select Switch Settings

Note 1: TFT Display not supported for CM-BF533

2.4.5 Timer used to drive TFT-Display signals

This section describes which Blackfin timer pin is used to drive the TFT-Display, depending on the inserted core module on the basis board.

Core module	DCLK	DTMG	HSYNC	DTMG phase shift	PWM
-------------	------	------	-------	------------------	-----

CM-BF533	n.s.	n.s.	n.s.	n.s.	n.s.
CM-BF537E/U	TMR7	TMR1	TMR0	TMR3	TMR6

Table 2-13: Timer assignment

ATTENTION: Leave P1 (TFT-Display) unconnected, with CM-BF533 inserted.

3 Known Bugs

19-01-2006	No known bugs
------------	---------------

4 Abbreviations

n.c.	Not connected
n.s.	Not supported

5 Revision History

2006 12 20	Beta Version of the Document
2005 01 19	Initial release of the Document

A List of Figures and Tables

Figure 1-1: Overview of the EXT-BF5xx-Camera Board	1
Figure 2-1: Detailed Block Diagram.....	6
Figure 2-2: Connector PCB Placement	6
Figure 2-3: Mechanical Outline	15
Table 2-1: Connector EX1 pin assignment for CM-BF533	10
Table 2-2: Connector EX1 pin assignment for CM-BF537E/U.....	11
Table 2-3: Connector EX1 pin assignment for CM-BF561	11
Table 2-4: Connector EX2 pin assignment for CM-BF533	7
Table 2-5: Connector EX2 pin assignment for CM-BF537E/U.....	8
Table 2-6: Connector EX2 pin assignment for CM-BF561	9
Table 2-7: Connector Cam1 pin assignment.....	12
Table 2-8: Connector Cam2 pin assignment.....	13
Table 2-9: Connector P1 (TFT-Display) pin assignment.....	14
Table 2-10: EXT-BF5xx-Camera board connector types	14
Table 2-11: S1 DIP-Switch configuration.....	16
Table 2-12: Timer Select Switch Settings.....	16
Table 2-13: Timer assignment.....	17