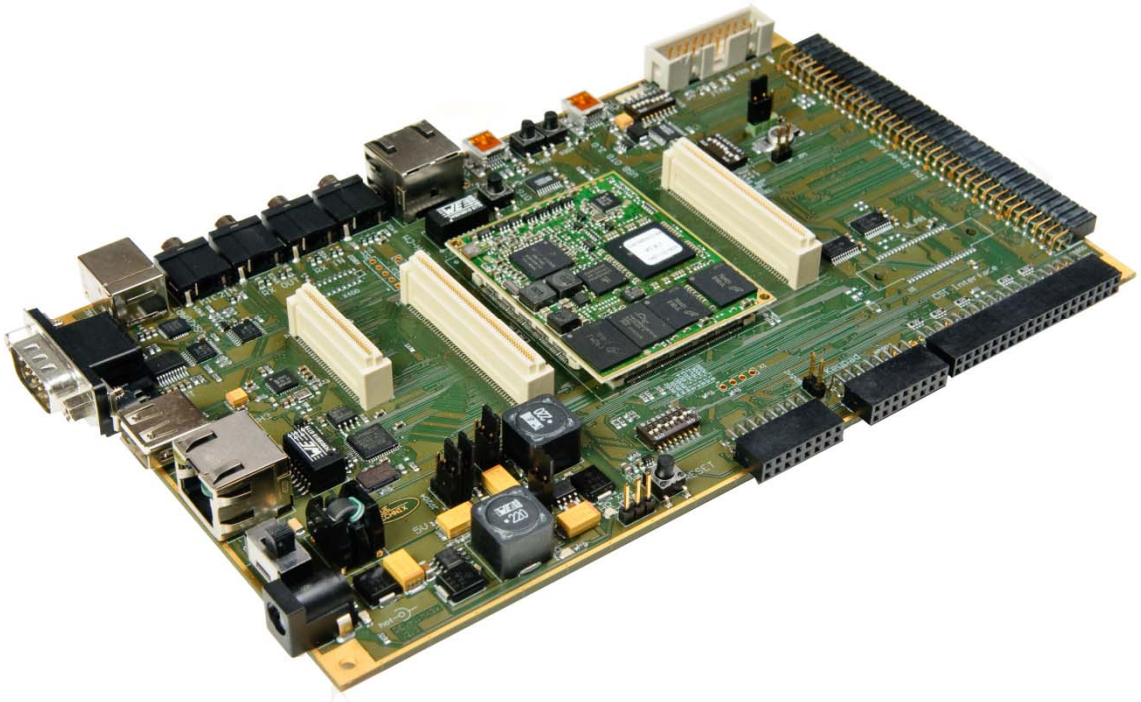
Hardware User Manual
DEV-i.MX31



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Information

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

Warning

Due to technical requirements components may contain dangerous substances.

The Core Modules and development systems contain ESD (electrostatic discharge) sensitive devices. Electro-static 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 Modules and Development Boards should be stored in the protective shipping

Contents

Freescale-based Products

Core Modules

CM-i.MX31B: Powered by the Freescale mobile processor i.MX31 at 520MHz incorporating an ARM11 core, this full featured processor module is the smallest in its class worldwide. The main features are: 128MB of mobile DDR RAM, up to 2GBit of NAND flash, up to 256MBit of NOR flash and 128MBit of SRAM, USB OTG transceiver, FPGA, full ALTAS chipset features supported, 400Balls BGA, only 45x55mm.

CM-i.MX31C: Same key parameters as CM-i.MX31B but instead of BGA, 0,5mm pitch connector version (400 pins) and additional Ethernet controller and an alternative Intel Strata NOR flash, 45x55mm

CM-i.MX27: Upcoming: Freescale's latest i.MX processor is mounted on the CM-i.MX27, with a powerful ARM9 processor and hardware MPEG4 encoder/decoder. Main features are: 128MB Mobile DDR RAM, Spansion Flash, Intel Strata Flash, NAND Flash, FPGA, USB OTG transceiver and low cost power management. The Core Module is available in a 280pin 0.5mm pitch connector version, ideal for low cost and maximum power applications; its tiny form-factor of 45x55mm is perfect for mobile applications.

Development Boards

DEV-i.MX31: The DEV-i.MX31 comes bundled with the CM-i.MX31C Core Module and can be used for development, as a reference design or the target application itself bringing all signal lines to an expansion connector that includes an Ethernet interface, USB host, audio and video interfaces, a TFT display and camera interfaces as well as 2 SD-Card interfaces.

Software Support:

Linux: For detailed BSP packages please consult the software user manual.

WinCE: WinCE is only supported on ARM platforms. Please contact Bluetechnix for support information.

Boot loader: Multiple boot loaders (u-boot, redboot, eboot) are available. Please consult the software user manuals for details on u-boot.

Note: For development tasks it is recommended that a Development Board is purchased.

Freescale Design Service

Bluetechnix offers development assistance as well as custom design services and software development.

1 Introduction

The DEV-i.MX31 is an application and development baseboard for the CM-i.MX31C Core Module (or the respective CM-i.MX31A or CM-i.MX31B Core Module for low profile and high volume and cost sensitive designs).

The DEV-i.MX31 Board is available in a package as a DEV-KIT CM-i.MX31 including a CM-i.MX31C-AA Core Module, three adapter boards (ADP) for keypad (ADP-KEY), display (ADP-IPU) and camera (ADP-CSI). The keypad adapter features multiple push buttons and a joystick. In addition it contains several LEDs. The display adapter contains an interface for the accompanying Hitachi display, a VGA connector and a composite video cinch connector. The camera adapter board features connections for either a composite signal or an on-board camera (OmniVision OV2640) (not included).

A support CD includes all schematics of the Development Board and provides a Board Support Package (BSP) with demo applications.

The Core Modules are general purpose high performance 32-bit embedded system devices incorporating Freescale's i.MX31 processor targeting mainly mobile applications and PDA designs. This Core Module allows very easy integration onto a two to four layer baseboard. The Development Board is a simple baseboard which includes the most important interfaces together with appropriate connectors and features, and all signal lines from the Core Module on expansion connectors.

1.1 Overview

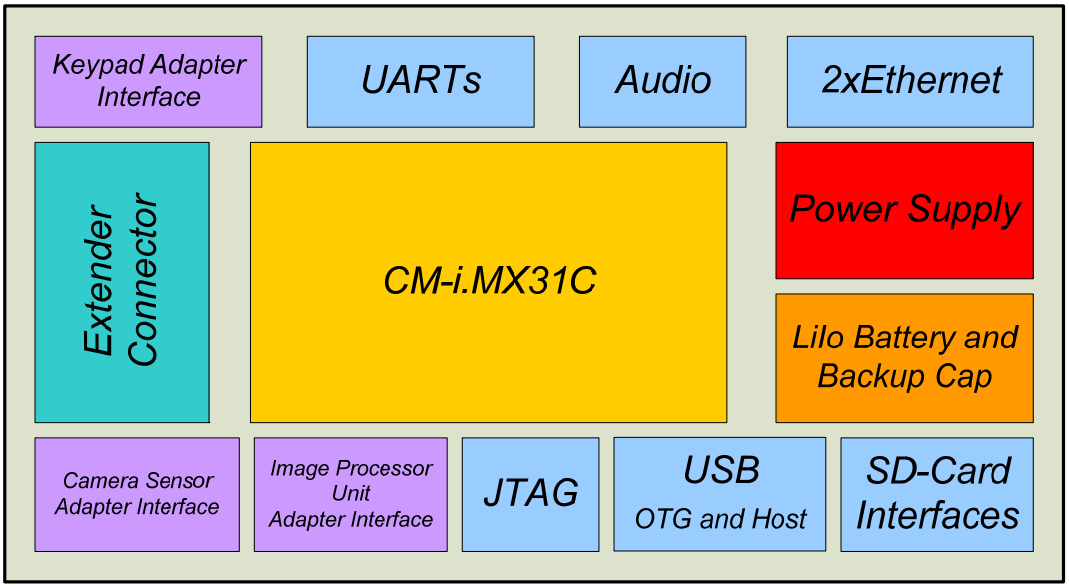

Figure 1 - Main components of the DEV-i.MX31 development board

- Power Supply
  - 3.3V Power Supply with 3A
  - 5V Power Supply with 3A
- LiIo Battery connector (3 pin terminal for LiIo batteries)
- Backup Battery (ultra cap)
- MMC/SD-Card Slots
  - Two SD-Card slots with card detection signal
  - Second SD-Card interface also available on the extender connector

- JTAG Connector (ARM20)
- USB features
    - USB OTG 2.0
        - USB OTG connector for the transceiver on the core module
        - VBUS switch on the dev-board (provides up to 500mA for host application)
    - 2nd USB Host
        - Additional USB host transceiver for 2nd USB host device
    - USB OTG ATLAS (1.1)
        - USB OTG transceiver from ATLAS on a USB OTG connector (currently not supported; please contact Bluetechnix for more information)
- Image Processing Unit adapter interface (ADP-IPU)
    - Generic 72pin 2.54mm connector
        - Contains all signal lines from the IPU interface
        - Backlight LED support
        - Multiple GPIOs available
        - I^2C interface
        - Touch screen interface
        - One analog input channel
    - Devices supported by Bluetechnix
        - Hitachi 3.5” TFT 240x320
        - Video OUT ADV7392 (Q4/2008)
        - Sharp 12.1” TFT 800x600 (upon request)
        - TPO 4.3” wide screen TFT 480x640 (upon request)
- Camera Sensor adapter interface (ADP-CSI)
    - Generic 38pin 2.54mm connector
        - All signal lines of the CSI interface
        - I^2C interface
        - Power-down logic
        - Reset line
    - Devices supported by Bluetechnix
        - Video-In TVP5150
        - Camera OV2640
- Keypad adapter interface (ADP-KEY)
    - Generic 16pin 2.54mm connector for keypad matrix (8x8)
    - Generic 16pin 2.54mm connector for TRI Color LED interface (MC13783)
- Extender Connectors
    - 2x 100pin extender connector AMP 0.8mm pitch
    - 1x 60pin extender connector AMP 0.8mm pitch
- UART
    - UART1 or UART2 on UART-to-USB Bridge (CP2102)
    - UART1 or UART2 on RS232-V.24 Level Shifter (Sub-D9)
- Audio interface
    - Stereo Line-In
    - Stereo Line-Out
    - Microphone Input
    - Headset connectors

- Ethernet
    - Ethernet device SMSC 92xx on Development Board
    - Second Ethernet connector for the Ethernet controller on the Core Module
    - *Note: First Ethernet connector (RJ45) only works with Core Module revisions 1.2 and above.*

1.2 Benefits

- The CM-i.MX31C is very compact and measures only 45x55 mm²
- Allows quick prototyping of products, bringing them very close to the final design
- Reduces development costs and risk, faster time to market
- Ideal for applications in mobile devices, industrial, automation and robotic applications

2 Specification

2.1 Functional specification

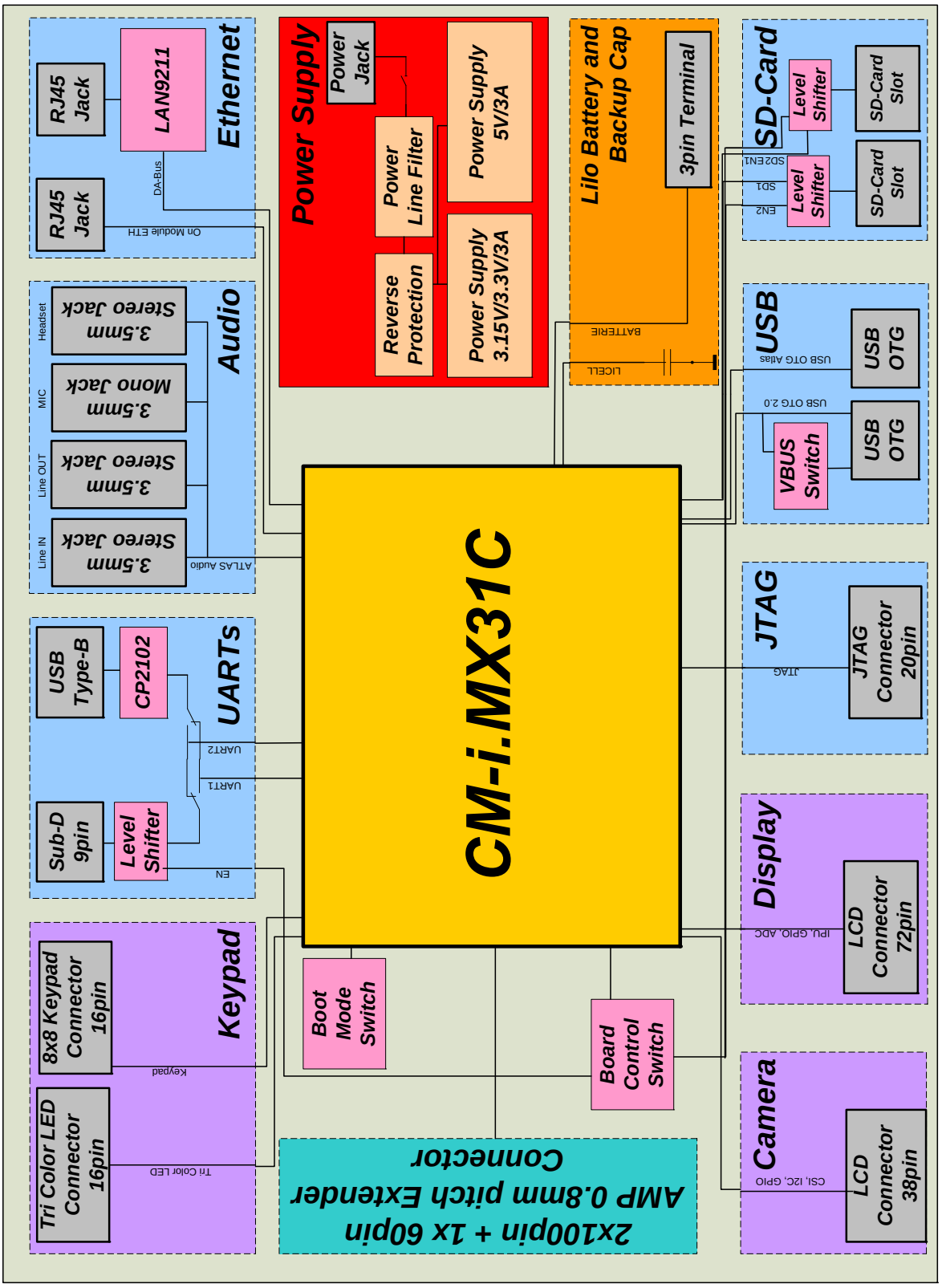

Figure 2 - Detailed block diagram

2.2 Mechanical outline and footprint

All dimensions in millimeters

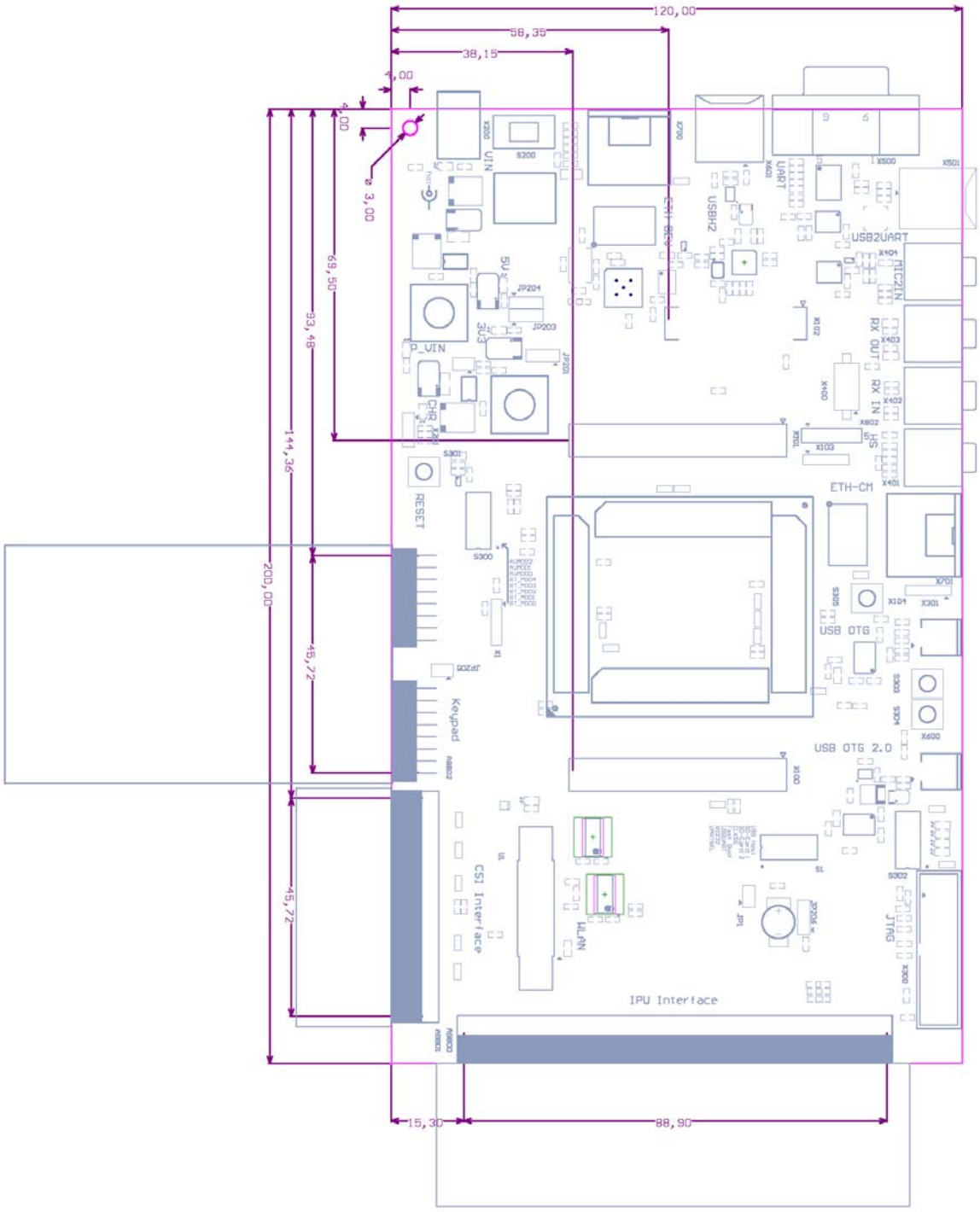

Figure 3 - Mechanical outline

2.3 Extension connector

For the extender board the following connectors have to be used.

Part Baseboard	Manufacturer	Manufacturer ID
X100, X101	AMP	5177984-4
X102	AMP	5179030-2 or 5179031-2

Table 1 - Baseboard connector types

The Connectors on the DEV-i.MX31 are of the following type.

Part	Manufacturer	Manufacturer Part Nr.
X100, X101	AMP	5-5179010-4
X102	AMP	179010-2

Table 2 - Module connector types

2.4 Connector pin assignments

2.4.1 Symbol A

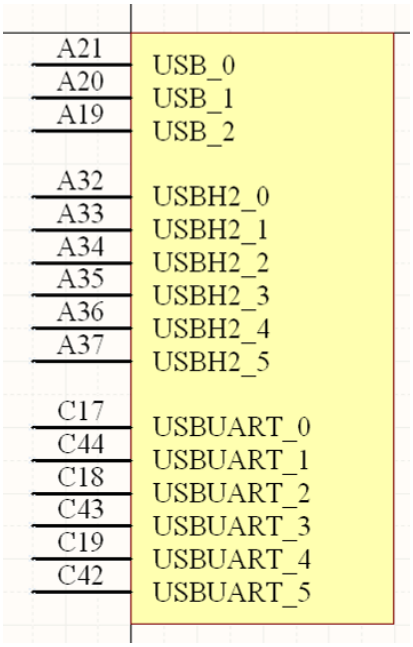

Figure 4 - Connector sub symbol A

Pin	Pin Name	Group	Description	Chip	PD
A21	USB_0	USB	USB_PWR/MAX1_HM_0/MCU1_29	MCIMX31	NVCC5
A20	USB_1	USB	USB_OC/MAX1_HM_1/MCU1_30	MCIMX31	NVCC5
A19	USB_2	USB	USB_BYP/MAX1_HM_2/MCU1_31	MCIMX31	NVCC5
A32	USBH2_0	USB	USBH2_CLK/ATA_INTRQ/UART5_RTS/TD_20	MCIMX31	NVCC10
A33	USBH2_1	USB	USBH2_STP/ATA_DMARQ/UART5_TXD/TD_22	MCIMX31	NVCC10
A34	USBH2_2	USB	USBH2_NXT/ATA_DA0/UART5_CTS/TD_23	MCIMX31	NVCC10
A35	USBH2_3	USB	USBH2_DIR/ATA_DIR/UART5_RXD/TD_21	MCIMX31	NVCC10
A36	USBH2_4	USB	USBH2_D1/ATA_DA2/TRCLK	MCIMX31	NVCC10
A37	USBH2_5	USB	USBH2_D0/ATA_DA1/TRCTL	MCIMX31	NVCC10
C17	USBUART_0	USB	UDATVP	MC13783	LV
C44	USBUART_1	USB	USEOVM	MC13783	LV
C18	USBUART_2	USB	UTXENB	MC13783	LV
C43	USBUART_3	USB	URCVD	MC13783	LV
C19	USBUART_4	USB	URXVM	MC13783	LV
C42	USBUART_5	USB	URXVP	MC13783	LV

Table 3 - Connector sub symbol A

2.4.2 Symbol B

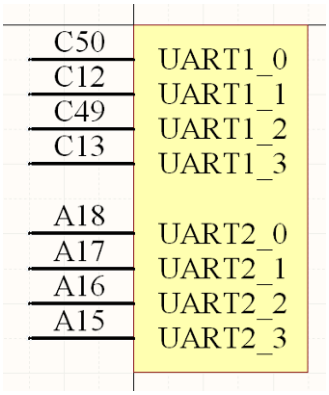

Figure 5 - Connector sub symbol B

Pin	Pin Name	Group	Description	Chip	PD
C50	UART1_0	UART	UART1_TXD/TKC/USBOTG_D1/PP4_CLK/RI_DCE1/MCU2_5	MCIMX31	NVCC8
C12	UART1_1	UART	UART1_RXD/TRSTB/USBOTG_D4/PP4_TXDAT/DSR_DCE1/MCU2_4	MCIMX31	NVCC8
C49	UART1_2	UART	UART1_RTS/PP4_FS/DCD_DCE1/MCU2_6	MCIMX31	NVCC8
C13	UART1_3	UART	UART1_CTS/DE_B/MCU2_7	MCIMX31	NVCC8
A18	UART2_0	UART	UART2_TXD/MCU1_28	MCIMX31	NVCC8
A17	UART2_1	UART	UART2_RXD/MCU1_27	MCIMX31	NVCC8
A16	UART2_2	UART	UART2_RTS	MCIMX31	NVCC8
A15	UART2_3	UART	UART2_CTS	MCIMX31	NVCC8

Table 4 - Connector sub symbol B

2.4.3 Symbol C

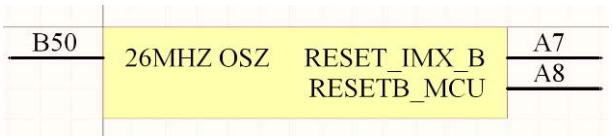

Figure 6 - Connector sub symbol C

Pin	Pin Name	Group	Description	Chip	PD
A7	RESET_IMX_B	JTAG	Reset output for application	MCIMX31	NVCC1
A8	RESETB_MCU	JTAG	Reset for MCU	MCIMX31	
B50	26MHZ OSZ	JTAG	26MHz output	MCIMX31	

Table 5 - Connector sub symbol C

2.4.4 Symbol D

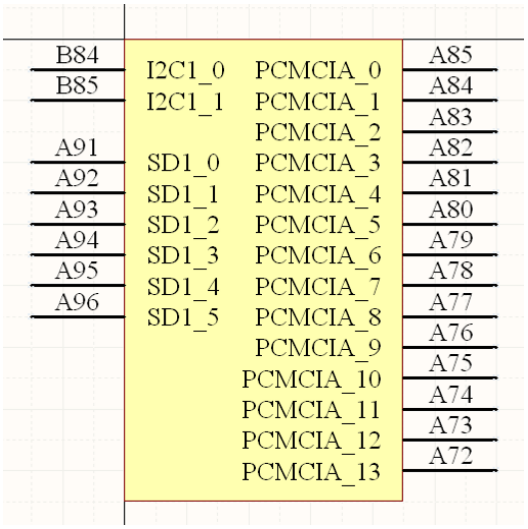

Figure 7 - Connector sub symbol D

Pin	Pin Name	Group	Description	Chip	PD
B84	I2C1_0	MMC	I2C1_CLK/ATA_D14	MCIMX31	NVCC4
B85	I2C1_1	MMC	I2C1_DAT/ATA_D15	MCIMX31	NVCC4
A85	PCMCIA0	MMC	PC_BVD1/USBH2_D3/UART5_RXD	MCIMX31	NVCC3
A84	PCMCIA1	MMC	PC_BVD2/USBH2_D4/UART5_TXD	MCIMX31	NVCC3
A83	PCMICIA2	MMC	PC_CD1_B/SD2_CLK/MSHC2_BS	MCIMX31	NVCC3
A82	PCMCIA3	MMC	PC_CD2_B/SD2_CLK/MSHC2_BS	MCIMX31	NVCC3
A81	PCMCIA4	MMC	PC_POE	MCIMX31	NVCC3
A80	PCMCIA5	MMC	PC_PWRON/SD_D2/MSHC2_D2	MCIMX31	NVCC3
A79	PCMCIA6	MMC	PC_READY/SD2_D1/MSHC2_D1	MCIMX31	NVCC3
A78	PCMCIA7	MMC	PC_RST/USBH2_D5/UART5_CTS	MCIMX31	NVCC3
A77	PCMCIA8	MMC	PC_RW_B/USBH2_D7	MCIMX31	NVCC3
A76	PCMCIA9	MMC	PC_VS1/SD2_D2/MSHC2_D3	MCIMX31	NVCC3
A75	PCMICIA10	MMC	PC_VS2/USBH2_D2/UART5_RTS	MCIMX31	NVCC3
A74	PCMCIA11	MMC	PC_WAIT_B/SD2_D0/MSHC2_SDIO_D0	MCIMX31	NVCC3
A73	PCMCIA12	MMC	IOIS16/USBH2_D6	MCIMX31	NVCC3
A72	PCMCIA13	MMC	PWMO/ATA_IORDY/PC_SPKOUT/MCU1_9	MCIMX31	NVCC3
A91	SD1_0	MMC	SDI_CLK/MSHC1_BS/TD_1/MCU2_27	MCIMX31	NVCC3
A92	SD1_1	MMC	SDI_CMD/MSHC1_SCLK/TD_0/MCU2_26	MCIMX31	NVCC3
A93	SD1_2	MMC	SD1_D3/MSHC1_D3/CTI_TIN_1_7/TD_5/MCU2_31	MCIMX31	NVCC3
A94	SD1_3	MMC	SD1_D2/MSHC1_D2/TD_4/MCU2_30	MCIMX31	NVCC3
A95	SD1_4	MMC	SD1_D1/MSHC1_D1/TD_3/MCU2_29	MCIMX31	NVCC3
A96	SD1_5	MMC	SD1_D0/MSHC1_SDIO-D0/TD_2/MCU2_28	MCIMX31	NVCC3

Table 6 - Connector sub symbol D

2.4.5 Symbol E

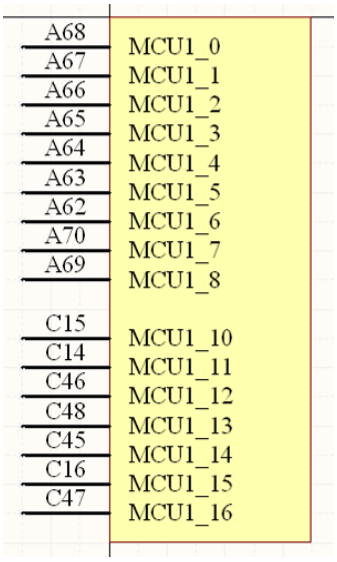

Figure 8 - Connector sub symbol E

Pin	Pin Name	Group	Description	Chip	PD
A68	MCU1_0	MCU1	GPIO1_0/EXTDMA_0/MCU1_0	MCIMX31	NVCC1
A67	MCU1_1	MCU1	GPIO1_1/EXTDMA_0/MCU1_1	MCIMX31	NVCC1
A66	MCU1_2	MCU1	GPIO1_2/EXTDMA_0/MCU1_2	MCIMX31	NVCC1
A65	MCU1_3	MCU1	GPIO1_3/MCU1_3	MCIMX31	NVCC1
A64	MCU1_4	MCU1	GPIO1_4/USBH1_SUSPEND/MCU1_4	MCIMX31	NVCC1
A63	MCU1_5	MCU1	GPIO1_5/MCU1_5	MCIMX31	NVCC1
A62	MCU1_6	MCU1	GPIO1_6/TMPR_DTCT/MCU1_6	MCIMX31	NVCC1
A70	MCU1_7	MCU1	CAPTURE/ATA_D14/CMP2/MCU1_7	MCIMX31	NVCC1
A69	MCU1_8	MCU1	COMPARE/ATA_D15/CAP2/CMP3/MCU1_8	MCIMX31	NVCC1
C15	MCU1_10	MCU1	NFWE_B/ATA_INTRQ/USBH2_D2/TD_0/MCU1_10	MCIMX31	NVCC10
C14	MCU1_11	MCU1	NFRE_B/ATA_D8/ATA_DIR/USBH2_D3/TD_1MCU1_11	MCIMX31	NVCC10
C46	MCU1_12	MCU1	NFALE/ATA_D9/ATA_DMARQ/USBH2_D4/TD_2/MCU1_12	MCIMX31	NVCC10
C48	MCU1_13	MCU1	NFCLE/ATA_D10/ATA_DA0/USBH2_D5/TD_3/MCU1_13	MCIMX31	NVCC10
C45	MCU1_14	MCU1	NFWP_B/ATA_D11/ATA_DA1/NFWP_B/USBH2_D6/TD_4/MCU1_14	MCIMX31	NVCC10
C16	MCU1_15	MCU1	NFCE/ATA_DATA12/ATA_DA2/TRACEDATA_6/MCU1_15	MCIMX31	
C47	MCU1_16	MCU1	NFRB/ATA_DATA13/TRACEDATA_6/MCU1_16	MCIMX31	

Table 7 - Connector sub symbol E

2.4.6 Symbol F

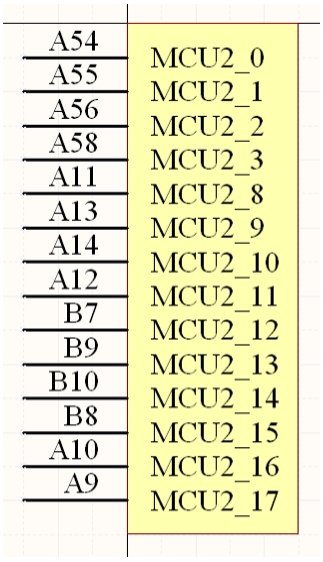

Figure 9 - Connector sub symbol F

Pin	Pin Name	Group	Description	Chip	PD
A54	MCU2_0	MCU2	SVEN0/CTI_TIN_1_6/MCU2_0	MCIMX31	NVCC9
A55	MCU2_1	MCU2	STX0/CTI_TIN_1_5/MCU2_1	MCIMX31	NVCC9
A56	MCU2_2	MCU2	SRX0/MCU2_2	MCIMX31	NVCC9
A58	MCU2_3	MCU2	SIMPD0/MCU2_3	MCIMX31	NVCC9
A11	MCU2_8	MCU2	DTR_DCE1/TMS/PP4_RXDAT/MCU2_8	MCIMX31	NVCC8
A13	MCU2_9	MCU2	DSR_DCE1/TD0/USBOTG_D4/CSPI1_SCLK/TXD 1/DSR_DCE2/MCU2_9	MCIMX31	NVCC8
A14	MCU2_10	MCU2	RI_DCE1/TDI/USBOTG_D3/CSPI1_RDY/RXD1/R I_DCE2/MCU2_10	MCIMX31	NVCC8
A12	MCU2_11	MCU2	DCD_DCE1//RESET_IN/USBOTG_D5/CSPI1_SS 3/RTS1/DCD_DCE2/USB_PWR/MCU2_11	MCIMX31	NVCC8
B7	MCU2_12	MCU2	DTR_DTE1/CSPI1_MOSI/DTR_DTE2/I2C_EVTN BUS_16/MCU2_12	MCIMX31	NVCC8
B9	MCU2_13	MCU2	DSR_DTE1/CSPI1_MISO/DSR_DTE2/MCU2_13	MCIMX31	NVCC8
B10	MCU2_14	MCU2	RI_DTE/CSPI1_SS0/RI_DTE2/I2C2_SCL/EVNTB US_18/MCU2_14	MCIMX31	NVCC8
B8	MCU2_15	MCU2	DCD_DTE1/CSPI1_SS1/DCD_DTE2/I2C2_SDA/ MCU2_15	MCIMX31	NVCC8
A10	MCU2_16	MCU2	DTR_DCE2/CSPI1_SS2/MCU2_16	MCIMX31	NVCC8
A9	MCU2_17	MCU2	BATT_LINE	MCIMX31	NVCC5

Table 8 - Connector sub symbol F

2.4.7 Symbol G

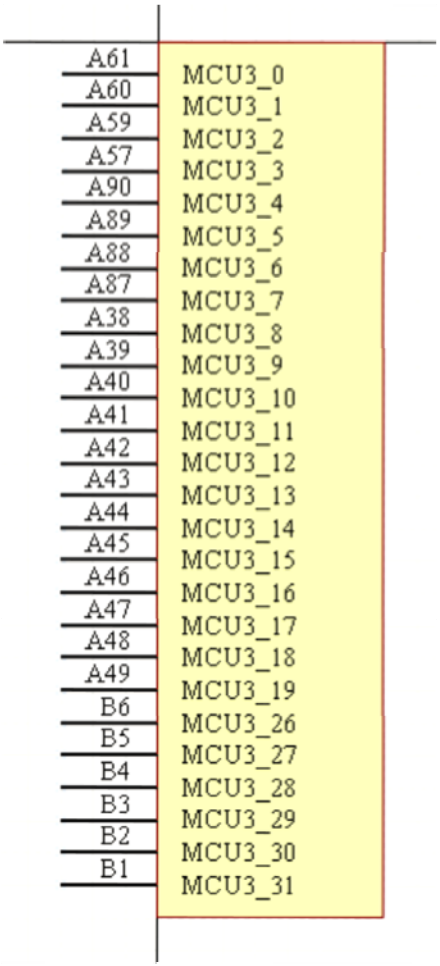

Figure 10 - Connector sub symbol G

Pin	Pin Name	Group	Description	Chip	PD
A61	MCU3_0	MCU3	GPIO3_1/UPLL_BYP_CLK/MCU3_0	MCIMX31	NVCC4
A60	MCU3_1	MCU3	GPIO3_0/SPLL_BYP_CLK/MCU3_1	MCIMX31	NVCC4
A59	MCU3_2	MCU3	SCLK0/CTI_TIN_1_4/DISPB_D2_CS/MCU3_2	MCIMX31	NVCC9
A57	MCU3_3	MCU3	SRST0/DISPB_D12_VSYNC/MCU3_3	MCIMX31	NVCC9
A90	MCU3_4	MCU3	CSI_D4/CTI_TOUT_1_2/MCU3_4	MCIMX31	NVCC4
A89	MCU3_5	MCU3	CSI_D5/CTI_TOUT_1_3/MCU3_5	MCIMX31	NVCC4
A88	MCU3_6	MCU3	CSI_D6/ATA_D0/CTI_TOUT_1_4/MCU3_6	MCIMX31	NVCC4
A87	MCU3_7	MCU3	CSI_D7/ATA_D1/CTI_TOUT_1_5/MCU3_7	MCIMX31	NVCC4
A38	MCU3_8	MCU3	CSI_D8/ATA_D2/MCU3_8	MCIMX31	NVCC4
A39	MCU3_9	MCU3	CSI_D9/ATA_D3/MCU3_9	MCIMX31	NVCC4
A40	MCU3_10	MCU3	CSI_D10/ATA_D4/MCU3_10	MCIMX31	NVCC4
A41	MCU3_11	MCU3	CSI_D11/ATA_D5/MCU3_11	MCIMX31	NVCC4
A42	MCU3_12	MCU3	CSI_D12/ATA_D6/MCU3_12	MCIMX31	NVCC4
A43	MCU3_13	MCU3	CSI_D13/ATA_D7/MCU3_13	MCIMX31	NVCC4
A44	MCU3_14	MCU3	CSI_D14/ATA_D8/MCU3_14	MCIMX31	NVCC4
A45	MCU3_15	MCU3	CSI_D15/ATA_D9/MCU3_15	MCIMX31	NVCC4
A46	MCU3_16	MCU3	CSI_VSYNC/ATA_D11/MCU3_17	MCIMX31	NVCC4
A47	MCU3_17	MCU3	CSI_MCLK/ATA_D10/MCU3_16	MCIMX31	NVCC4
A48	MCU3_18	MCU3	CSI_HSYNC/ATA_D12/MCU3_18	MCIMX31	NVCC4
A49	MCU3_19	MCU3	CSI_PIXCLK/ATA_D13/MCU3_19	MCIMX31	NVCC4

B6	MCU3_26	MCU3	ATA_CS0/UART4_RXD/CSI_D0/SD_D_CLK/TD_6/MCU3_26	MCIMX31	NVCC3
B5	MCU3_27	MCU3	ATA_CS1/UART4_RTS/CSI_D1/LCS1/TD_7/MCU3_27	MCIMX31	NVCC3
B4	MCU3_28	MCU3	ATA_DIOR/UART4_TXD/CSI_D2/SER_RS/TRCTL/MCU3_28	MCIMX31	NVCC3
B3	MCU3_29	MCU3	ATA_DIOW/UART4_CTS/CSI_D3/TRCLK/MCU3_29	MCIMX31	NVCC3
B2	MCU3_30	MCU3	ATA_DMACK/SD_D_O/MCU3_30	MCIMX31	NVCC3
B1	MCU3_31	MCU3	ATA_RESET_B/SD_D/MCU3_31	MCIMX31	NVCC3

Table 9 - Connector sub symbol G

2.4.8 Symbol H

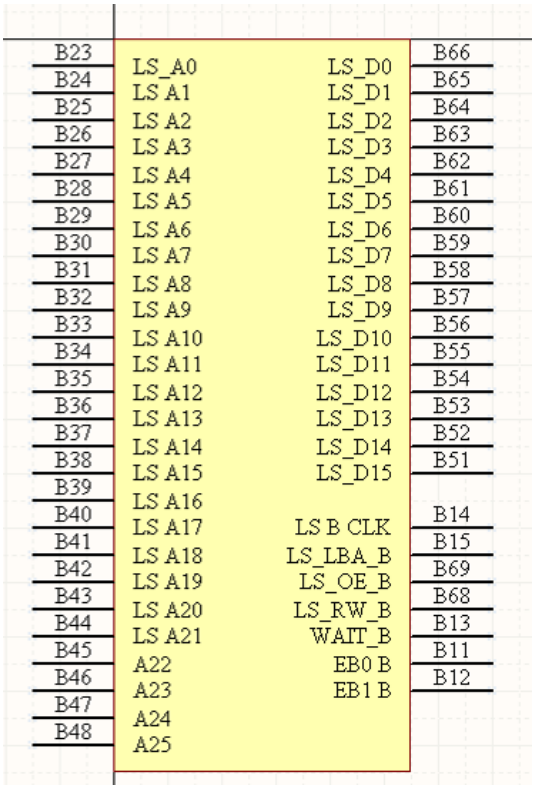

Figure 11 - Connector sub symbol H

Pin	Pin Name	Group	Description	Chip	PD
B23	LS_A0	EMI		MCIMX31	3V3
B24	LS_A1	EMI		MCIMX31	3V3
B25	LS_A2	EMI		MCIMX31	3V3
B26	LS_A3	EMI		MCIMX31	3V3
B27	LS_A4	EMI		MCIMX31	3V3
B28	LS_A5	EMI		MCIMX31	3V3
B29	LS_A6	EMI		MCIMX31	3V3
B30	LS_A7	EMI		MCIMX31	3V3
B31	LS_A8	EMI		MCIMX31	3V3
B32	LS_A9	EMI		MCIMX31	3V3
B33	LS_A10	EMI		MCIMX31	3V3
B34	LS_A11	EMI		MCIMX31	3V3
B35	LS_A12	EMI		MCIMX31	3V3

B36	LS_A13	EMI		MCIMX31	3V3
B37	LS_A14	EMI		MCIMX31	3V3
B38	LS_A15	EMI		MCIMX31	3V3
B39	LS_A16	EMI		MCIMX31	3V3
B40	LS_A17	EMI		MCIMX31	3V3
B41	LS_A18	EMI		MCIMX31	3V3
B42	LS_A19	EMI		MCIMX31	3V3
B43	LS_A20	EMI		MCIMX31	3V3
B44	LS_A21	EMI		MCIMX31	3V3
B45	A22	EMI		MCIMX31	P_SW2
B46	A23	EMI		MCIMX31	P_SW2
B47	A24	EMI		MCIMX31	P_SW2
B48	A25	EMI		MCIMX31	P_SW2
B14	LS_B_CLK	EMI		MCIMX31	3V3
B66	LS_D0	EMI		MCIMX31	3V3
B65	LS_D1	EMI		MCIMX31	3V3
B64	LS_D2	EMI		MCIMX31	3V3
B63	LS_D3	EMI		MCIMX31	3V3
B62	LS_D4	EMI		MCIMX31	3V3
B61	LS_D5	EMI		MCIMX31	3V3
B60	LS_D6	EMI		MCIMX31	3V3
B59	LS_D7	EMI		MCIMX31	3V3
B58	LS_D8	EMI		MCIMX31	3V3
B57	LS_D9	EMI		MCIMX31	3V3
B56	LS_D10	EMI		MCIMX31	3V3
B55	LS_D11	EMI		MCIMX31	3V3
B54	LS_D12	EMI		MCIMX31	3V3
B53	LS_D13	EMI		MCIMX31	3V3
B52	LS_D14	EMI		MCIMX31	3V3
B51	LS_D15	EMI		MCIMX31	3V3
B11	EB0_B	EMI		MCIMX31	P_SW2
B12	EB1_B	EMI		MCIMX31	P_SW2
B15	LS_LBA_B	EMI		MCIMX31	3V3
B69	LS_OE_B	EMI		MCIMX31	3V3
B13	WAIT B	EMI		MCIMX31	P_SW2
B68	LS_RW_B	EMI		MCIMX31	3V3

Table 10 - Connector sub symbol H

2.4.9 Symbol I

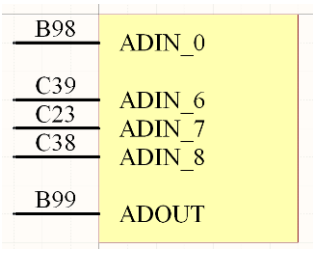

Figure 12 - Connector sub symbol I

Pin	Pin Name	Group	Description	Chip	PD
B98	ADIN0	ADC	ADTRIG	MC13783	-
C39	ADIN6	ADC	ADIN6	MC13783	-
C23	ADIN7	ADC	ADIN7	MC13783	-
C38	ADIN8	ADC	ADIN8	MC13783	-
B99	ADOUT	ADC	ADOUT	MC13783	-

Table 11 - Connector sub symbol I

2.4.10 Symbol J

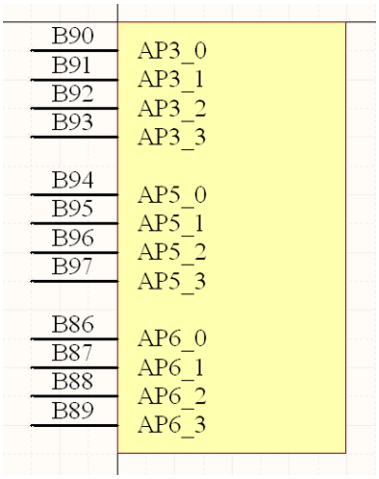

Figure 13 - Connector sub symbol J

Pin	Pin Name	Group	Description	Chip	PD
B90	AP3_0	AP	STXD3/ATA_D8/USBH2_D3/TD_8/EMI_DBG1/ MCU1_17	MCIMX31	NVCC10
B91	AP3_1	AP	STXD3/ATA_D7/USBH2_D2/TD_7/EMI_DBG0/ MCU1_18	MCIMX31	NVCC10
B92	AP3_2	AP	SFS3/ATA_D10/USBH2_D5/TD_10/EMI_DBG3	MCIMX31	NVCC10
B93	AP3_3	AP	SKC3/ATA_D9/USBH2_D4/TD_9/EMI_DBG2	MCIMX31	NVCC10
B94	AP5_0	AP	STXD5/ARM_CRASID3/MCU1_21	MCIMX31	NVCC5
B95	AP5_1	AP	SRXD5/ARM_CRASID4/MCU1_23	MCIMX31	NVCC5
B96	AP5_2	AP	SFS5/ARM_CRASID6	MCIMX31	NVCC5
B97	AP5_3	AP	SCK5/ARM_CRASID5	MCIMX31	NVCC5
B86	AP6_0	AP	STXD/ATA_D11/USBH2_D6/TD_11/ARM_CRA SID7MCU1_23	MCIMX31	NVCC10
B87	AP6_1	AP	SRXD6/ATA_D12/USBH2_D7/TD_12/M3IF_CH SN_MSTR_0/MCU1_24	MCIMX31	NVCC10
B88	AP6_2	AP	SFS6/USBH1_SUSPEND/TD_14/M3IFCHSN_MS TR_2/MCU1_26	MCIMX31	NVCC10
B89	AP6_3	AP	SCK6/ATA_D13/TD_13/M3IF_CHSN_MSTR_1/ MCU1_25	MCIMX31	NVCC10

Table 12 - Connector sub symbol J

2.4.11 Symbol K

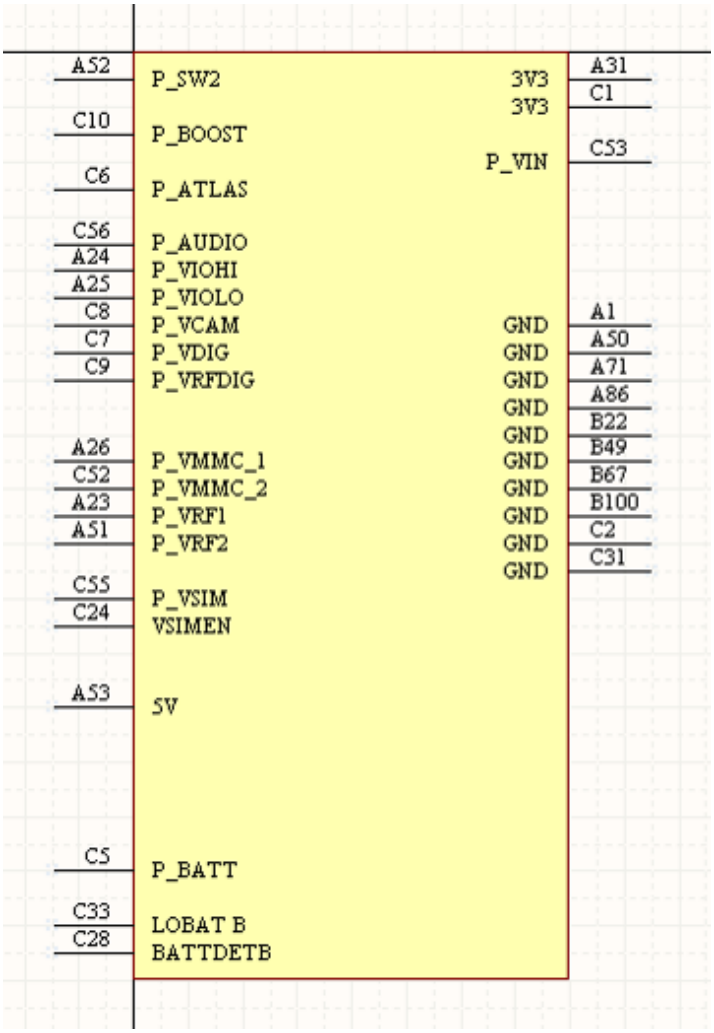

Figure 14 - Connector sub symbol K

Pin	Pin Name	Group	Description	Chip	PD
C28	BATTDETB	Power	BATTDETB	MC13783	-
C33	LOBAT B	Power	LOBATB	MC13783	-
A31	P_3V3	Power	3.3V +/- 10%	-	-
C1	P_3V3	Power	3.3V +/- 10%	-	-
C6	P_ATLAS	Power	2.775V	-	-
C56	P_AUDIO	Power	2.775V	-	-
C5	P_BATT	Power	Battery supply	-	-
C10	P_BOOST	Power	5.0V to 5.5V	-	-
A52	P_SW2	Power	0.9V to 2.2V	-	-
C8	P_VCAM	Power	1.5V to 3.0V	-	-
C7	P_VDIG	Power	1.2V to 1.8V	-	-
C53	P_VIN	Power	2.8 to 4.65V (Atlas)	-	-
A24	P_VIOHI	Power	2.775V	-	-
A25	P_VIOLO	Power	1.2V to 1.8V	-	-
A26	P_VMMC 1	Power	1.6V to 3.0V	-	-
C52	P_VMMC2	Power	1.6V to 3.0V	-	-
A23	P_VRF1	Power	1.5V to 2.775V	-	-

A53	P_VRF2	Power	1.5V to 2.775V	-	-
C55	P_VSIM	Power	1.8V or 2.9V	-	-
C24	VSIMEN	Power	-	-	-
A1	GND	Power	-	-	-
A50	GND	Power	-	-	-
A71	GND	Power	-	-	-
A86	GND	Power	-	-	-
B22	GND	Power	-	-	-
B49	GND	Power	-	-	-
B67	GND	Power	-	-	-
B100	GND	Power	-	-	-
C2	GND	Power	-	-	-
C31	GND	Power	-	-	-

Table 13 - Connector sub symbol K

2.4.12 Symbol L

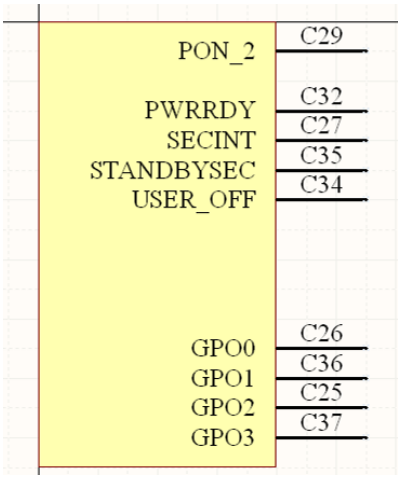

Figure 15 - Connector sub symbol L

Pin	Pin Name	Group	Description	Chip	PD
C26	GPO0	Control	GPO0	MC13783	LV
C36	GPO1	Control	GPO1	MC13783	LV
C25	GPO2	Control	GPO2	MC13783	LV
C37	GPO3	Control	GPO3	MC13783	LV
C29	PON_2	Control	ON2_B	MC13783	LV
C32	PWRRDY	Control	PWRDY	MC13783	LV
C27	SECINT	Control	SECINT	MC13783	LV
C35	STANDBYSEC	Control	STANDBYSEC	MC13783	LV
C34	USER_OFF	Control	USER_OFF	MC13783	LV

Table 14 - Connector sub symbol L

2.4.13 Symbol M

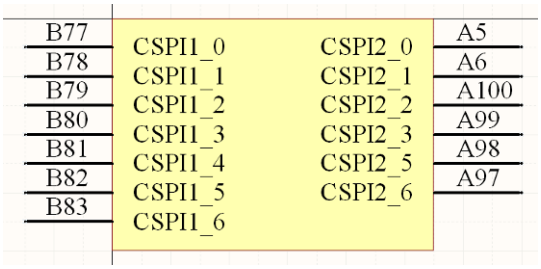

Figure 16 - Connector sub symbol M

Pin	Pin Name	Group	Description	Chip	PD
B77	CSPI1_0	CSPI	CSPI1_MOSI/ATA_D0/ATA_INTRQ/USBH1_RXDM/UART_RXD/TD_15	MCIMX31	NVCC10
B78	CSPI1_1	CSPI	CSPI1_MISO/ATA_D1/ATA_BUFFER_EN/USBH1_RXDP/UART_TXD/TD_16	MCIMX31	NVCC10
B79	CSPI1_2	CSPI	CSPI1_SS2/ATA_D4/ATA_DA1/USBH1_RCV/CSPI3_SS3/TD_19	MCIMX31	NVCC10
B80	CSPI1_3	CSPI	CSPI1_SS1/ATA_D3/ATA_DA0/USBH1_TXDP/CSPI2_SS3/TD_18	MCIMX31	NVCC10
B81	CSPI1_4	CSPI	CSPI1_SS0/ATA_D2/ATA_DMARQ/USBH1_TXDM/CSPI13_SS2/TD_17	MCIMX31	NVCC10
B82	CSPI1_5	CSPI	CSPI1_SCLK/ATA_D5/ATA_DA2/USBH1_OEB/UART3_RTS	MCIMX31	NVCC10
B83	CSPI1_6	CSPI	CSPI1_SPI_RDY/ATA_D6/USBH1_FS/UART3_CTS	MCIMX31	NVCC10
A5	CSPI2_0	CSPI	CSPI2_MOSI/I2C2_SCL	MCIMX31	NVCC10
A6	CSPI2_1	CSPI	CSPI2_MISO/I2C2_SDA	MCIMX31	NVCC10
A100	CSPI2_2	CSPI	CSPI2_SS2/I2C3_SDA/IPU_FLS_STRB	MCIMX31	NVCC10
A99	CSPI2_3	CSPI	CSPI2_SS1/CSPI3_SS1/CSPI1_SS3	MCIMX31	NVCC10
A98	CSPI2_5	CSPI	CSPI2_SCLK/I2C3_SCL	MCIMX31	NVCC10
A97	CSPI2_6	CSPI	CSPI2_SPI_RDY	MCIMX31	NVCC10

Table 15 - Connector sub symbol M

2.4.14 Symbol N

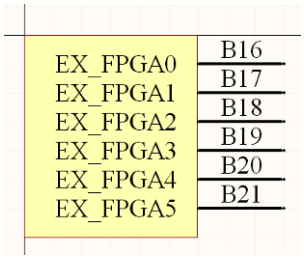

Figure 17 - Connector sub symbol N

Pin	Pin Name	Group	Description	Chip	PD
B16	EX_FPGA0	FPGA	Used for Ethernet on Dev-Board	MACHXO	3V3
B17	EX_FPGA2	FPGA	Used for Ethernet on Dev-Board	MACHXO	3V3
B18	EX_FPGA1	FPGA	FPGA GPIO 2	MACHXO	3V3
B19	EX_FPGA3	FPGA	FPGA GPIO 3	MACHXO	3V3
B20	EX_FPGA4	FPGA	FPGA GPIO 4	MACHXO	3V3
B21	EX_FPGA5	FPGA	FPGA GPIO 5	MACHXO	3V3

Table 16 - Connector sub symbol N

2.4.15 Symbol O

These pins are not used and reserved for special use, do not connect these pins. For net name to processor name reference or net name to MC13783 reference check the CM-i.MX31 Hardware User Manual and the Freescale datasheet and reference manuals.

2.4.16 Keypad interface adapter

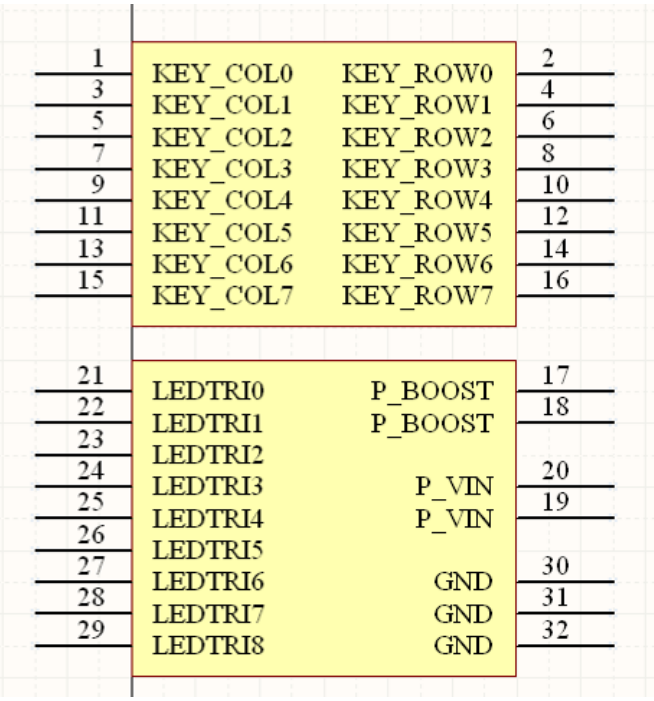

Figure 18 - Keypad interface adapter

Pin	Pin Name	Group	Description	Chip	PD
1	KEY_COL0	KEY_COL	KEY_COL0	MCIMX31	NVCC6
2	KEY_ROW0	KEY_ROW	KEY_ROW0	MCIMX31	NVCC6
3	KEY_COL1	KEY_COL	KEY_COL1	MCIMX31	NVCC6

4	KEY_ROW1	KEY_ROW	KEY_ROW1	MCIMX31	NVCC6
5	KEY_COL2	KEY_COL	KEY_COL2	MCIMX31	NVCC6
6	KEY_ROW2	KEY_ROW	KEY_ROW2	MCIMX31	NVCC6
7	KEY_COL3	KEY_COL	KEY_COL3/TD3	MCIMX31	NVCC6
8	KEY_ROW3	KEY_ROW	KEY_ROW3/TRCTL	MCIMX31	NVCC6
9	KEY_COL4	KEY_COL	KEY_COL4/ATA_DMARQ/TD_4/MCU2_22	MCIMX31	NVCC6
10	KEY_ROW4	KEY_ROW	KEY_ROW4/TRCLK/MCU2_18	MCIMX31	NVCC6
11	KEY_COL5	KEY_COL	KEY_COL5/ATA_DA0/TD_5/MCU2_23	MCIMX31	NVCC6
12	KEY_ROW5	KEY_ROW	KEY_ROW5/TD_0/MCU2_19	MCIMX31	NVCC6
13	KEY_COL6	KEY_COL	KEY_COL6/ATA_DA1/TD_6/MCU2_24	MCIMX31	NVCC6
14	KEY_ROW6	KEY_ROW	KEY_ROW6/ATA_INTRQ/TD_1/MCU2_20	MCIMX31	NVCC6
15	KEY_COL7	KEY_COL	KEY_COL7/ATA_DA2/TD_7/MCU2_25	MCIMX31	NVCC6
16	KEY_ROW7	KEY_ROW	KEY_ROW7/ATA_BUF_EN/TD_2/MCU2_21	MCIMX31	NVCC6
17	P_BOOST	POWER	Step up converter (4.5-5.5V)	-	-
18	P_BOOST	POWER	Step up converter (4.5-5.5V)	-	-
19	P_VIN	POWER	BP from ATLAS	-	-
20	P_VIN	POWER	BP from ATLAS	-	-
21	LEDTRI0	LED_TRI	LEDG1	MC13783	-
22	LEDTRI1	LED_TRI	LEDR1	MC13783	-
23	LEDTRI2	LED_TRI	LEDB1	MC13783	-
24	LEDTRI3	LED_TRI	LEDG2	MC13783	-
25	LEDTRI4	LED_TRI	LEDR2	MC13783	-
26	LEDTRI5	LED_TRI	LEDB2	MC13783	-
27	LEDTRI6	LED_TRI	LEDG3	MC13783	-
28	LEDTRI7	LED_TRI	LEDR3	MC13783	-
29	LEDTRI8	LED_TRI	LEDB3	MC13783	-
30	GND	POWER	GND	-	-
31	GND	POWER	GND	-	-

Table 17 - Keypad interface adapter

2.4.17 Camera sensor interface adapter

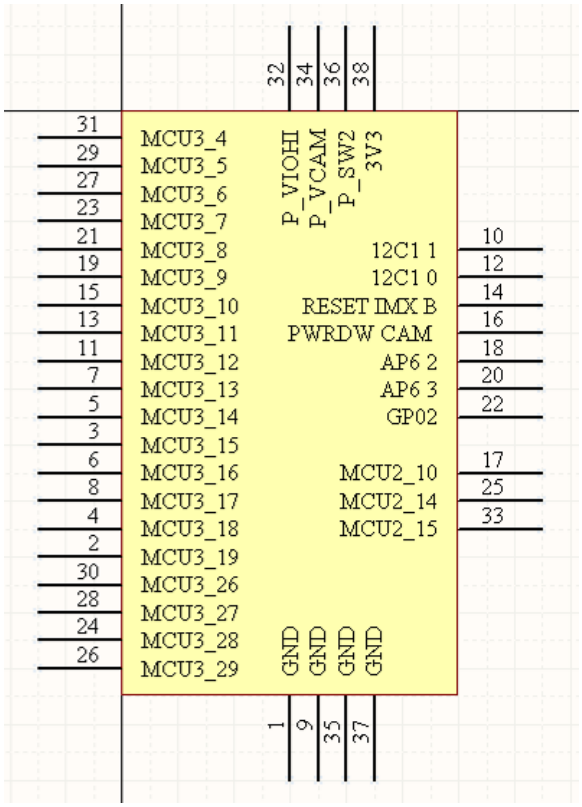

Figure 19 - Camera sensor interface adapter

Pin	Pin Name	Group	Description	Chip	PD
1	GND	POWER	GND	-	-
2	MCU3_19	MCU3	CSI_PIXCLK/ATA_D13/MCU3_19	MCIMX31	NVCC4
3	MCU3_15	MCU3	CSI_D15/ATA_D9/MCU3_15	MCIMX31	NVCC4
4	MCU3_18	MCU3	CSI_HSYNC/ATA_D12/MCU3_18	MCIMX31	NVCC4
5	MCU3_14	MCU3	CSI_D14/ATA_D8/MCU3_14	MCIMX31	NVCC4
6	MCU3_16	MCU3	CSI_VSYNC/ATA_D11/MCU3_17	MCIMX31	NVCC4
7	MCU3_13	MCU3	CSI_D13/ATA_D7/MCU3_13	MCIMX31	NVCC4
8	MCU3_17	MCU3	CSI_MCLK/ATA_D10/MCU3_16	MCIMX31	NVCC4
9	GND	POWER	GND	-	-
10	I2C1_0	MMC	I2C1_CLK/ATA_D14	MCIMX31	NVCC4
11	MCU3_12	MCU3	CSI_D12/ATA_D6/MCU3_12	MCIMX31	NVCC4
12	I2C1_1	MMC	I2C1_DAT/ATA_D15	MCIMX31	NVCC4
13	MCU3_11	MCU3	CSI_D11/ATA_D5/MCU3_11	MCIMX31	NVCC4
14	RESET_IMX_B	JTAG	Reset output for application	MCIMX31	NVCC1
15	MCU3_10	MCU3	CSI_D10/ATA_D4/MCU3_10	MCIMX31	NVCC4
16	PWRDW_CAM	-	Power Down mode enable/disable	-	-
17	MCU2_10	MCU2	RI_DCE1/TDI/USBOTG_D3/CSPI1_RDY/RXD1/RI_DCE2/MCU2_10	MCIMX31	NVCC8
18	AP6_2	AP	SFS6/USBH1_SUSPEND/TD_14/M3IFCHSN_MSTR_2/MCU1_26	MCIMX31	NVCC10
19	MCU3_9	MCU3	CSI_D9/ATA_D3/MCU3_9	MCIMX31	NVCC4
20	AP6_3	AP	SCK6/ATA_D13/TD_13/M3IF_CHSN_MSTR_1/MCU1_25	MCIMX31	NVCC10
21	MCU3_8	MCU3	CSI_D8/ATA_D2/MCU3_8	MCIMX31	NVCC4

22	GPO2	Control	GPO2	MC13783	LV
23	MCU3_7	MCU3	CSI_D7/ATA_D1/CTI_TOUT_1_5/MCU3_7	MCIMX31	NVCC4
24	MCU3_28	MCU3	ATA_DIOR/UART4_TXD/CSI_D2/SER_RS/TRCTL/MCU3_28	MCIMX31	NVCC3
25	MCU2_14	MCU2	RI_DTE/CSPI1_SS0/RI_DTE2/I2C2_SCL/EVNTBUS_18/MCU2_14	MCIMX31	NVCC8
26	MCU3_29	MCU3	ATA_DIOW/UART4_CTS/CSI_D3/TRCLK/MCU3_29	MCIMX31	NVCC3
27	MCU3_6	MCU3	CSI_D6/ATA_D0/CTI_TOUT_1_4/MCU3_6	MCIMX31	NVCC4
28	MCU3_27	MCU3	ATA_CS1/UART4_RTS/CSI_D1/LCS1/TD_7/MCU3_27	MCIMX31	NVCC3
29	MCU3_5	MCU3	CSI_D5/CTI_TOUT_1_3/MCU3_5	MCIMX31	NVCC4
30	MCU3_26	MCU3	ATA_CS0/UART4_RXD/CSI_D0/SD_D_CLK/TD_6/MCU3_26	MCIMX31	NVCC3
31	MCU3_4	MCU3	CSI_D4/CTI_TOUT_1_2/MCU3_4	MCIMX31	NVCC4
32	P_VIOHI	POWER	P_VIOHI	MC13783	-
33	MCU2_15	MCU2	DCD_DTE1/CSPI1_SS1/DCD_DTE2/I2C2_SDA/MCU2_15	MCIMX31	NVCC8
34	P_VCAM	POWER	P_VCAM	MC13783	-
35	GND	POWER	GND	-	-
36	P_SW2	POWER	P_SW2	MC13783	-
38	3V3	POWER	P_3V3	MC13783	-
37	GND	POWER	GND	-	-

Table 18 - Camera sensor interface adapter

2.4.18 Image processing unit interface adapter

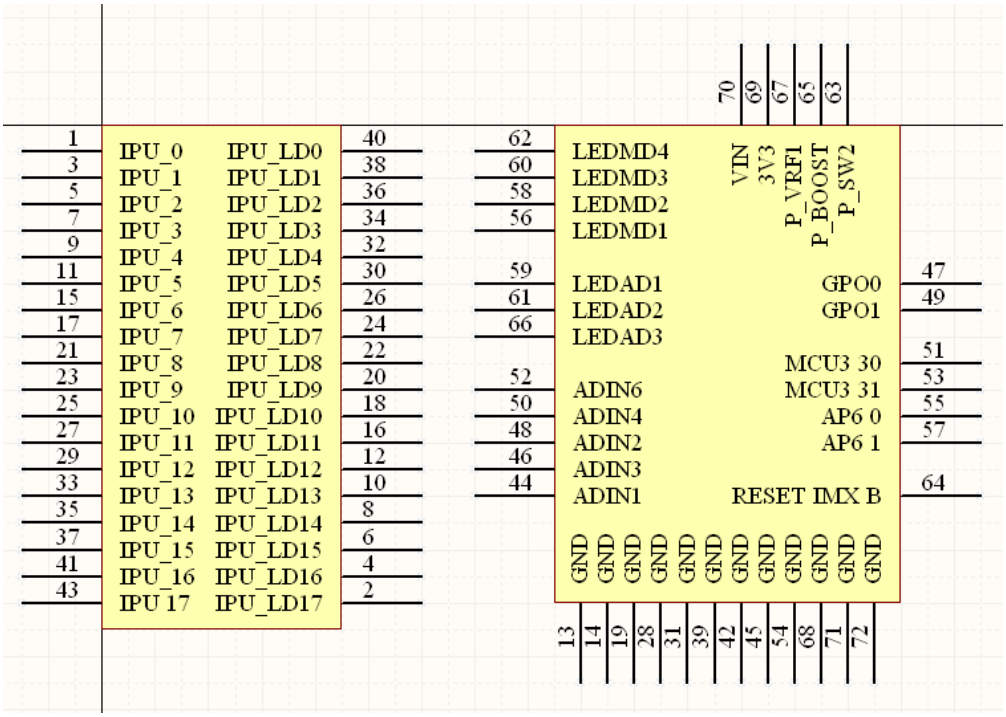

Figure 20 - Image processing unit interface adapter

Pin	Pin Name	Group	Description	Chip	PD
1	IPU_0	IPU	SD_D_IO/DB-CS-3/MCU3-21	MCIMX31	NVCC7
2	IPU_LD17	IPU_LD	LD17/SDB_EC_3	MCIMX31	NVCC7
3	IPU_1	IPU	SD_D_I/SD_D_I/SDB_CS_2/MCU3_20	MCIMX31	NVCC7
4	IPU_LD16	IPU_LD	LD16/SDB_EC_2	MCIMX31	NVCC7
5	IPU_2	IPU	SD_D_CLK/MCU3_22	MCIMX31	NVCC7
6	IPU_LD15	IPU_LD	LD15/SDB_EC_1	MCIMX31	NVCC7
7	IPU_3	IPU	SER_RS/MCU3_22	MCIMX31	NVCC7
8	IPU_LD14	IPU_LD	LD14/SDB_EC_0	MCIMX31	NVCC7
9	IPU_4	IPU	PAR_RS	MCIMX31	NVCC7
10	IPU_LD13	IPU_LD	LD13/SDB_PC_13	MCIMX31	NVCC7
11	IPU_5	IPU	VSYNC0/SDB_EC_4	MCIMX31	NVCC7
12	IPU_LD12	IPU_LD	LD12/SDB_PC_12	MCIMX31	NVCC7
13	GND	POWER	GND	-	-
14	GND	POWER	GND	-	-
15	IPU_6	IPU	VSYNC3	MCIMX31	NVCC7
16	IPU_LD11	IPU_LD	LD11/SDB_PC_11	MCIMX31	NVCC7
17	IPU_7	IPU	READ	MCIMX31	NVCC7
18	IPU_LD10	IPU_LD	LD10/SDB_PC_10	MCIMX31	NVCC7
19	GND	POWER	GND	-	-
20	IPU_LD9	IPU_LD	LD9/SDB_PC_9	MCIMX31	NVCC7
21	IPU_8	IPU	WRITE	MCIMX31	NVCC7
22	IPU_LD8	IPU_LD	LD8/SDB_PC_8	MCIMX31	NVCC7
23	IPU_9	IPU	CONTRAST	MCIMX31	NVCC7
24	IPU_LD7	IPU_LD	LD7/SDB_PC_7	MCIMX31	NVCC7
25	IPU_10	IPU	D3_CLS	MCIMX31	NVCC7
26	IPU_LD6	IPU_LD	LD6/SDB_PC_6	MCIMX31	NVCC7
27	IPU_11	IPU	D3_REV	MCIMX31	NVCC7

28	GND	POWER	GND	-	-
29	IPU_12	IPU	D3_SPL	MCIMX31	NVCC7
30	IPU_LD5	IPU_LD	LD5/SDB_PC_5	MCIMX31	NVCC7
31	GND	POWER	GND	-	-
32	IPU_LD4	IPU_LD	LD4/SDB_PC_4	MCIMX31	NVCC7
33	IPU_13	IPU	DRDY0/SDB_CS_1	MCIMX31	NVCC7
34	IPU_LD3	IPU_LD	LD3/SDB_PC_3	MCIMX31	NVCC7
35	IPU_14	IPU	FPSHIFT/DISPB_BCLK/SDB_CS_0	MCIMX31	NVCC7
36	IPU_LD2	IPU_LD	LD2/SDB_PC_2	MCIMX31	NVCC7
37	IPU_15	IPU	HSYNC/SDB_EC_5	MCIMX31	NVCC7
38	IPU_LD1	IPU_LD	LD1/SDB_PC_1	MCIMX31	NVCC7
39	GND	POWER	GND	-	-
40	IPU_LD0	IPU_LD	LD0/SDB_PC_0	MCIMX31	NVCC7
41	IPU_16	IPU	LCS0/DISPB_BCLK/MCU3_23	MCIMX31	NVCC7
42	GND	POWER	GND	-	-
43	IPU_17	IPU	LSC1/MCU3_24	MCIMX31	NVCC7
45	GND	POWER	GND	-	-
47	GPO0	Control	GPO0	MC13783	LV
49	GPO1	Control	GPO1	MC13783	LV
51	MCU3_30	MCU3	ATA_DMACK/SD_D_O/MCU3_30	MCIMX31	NVCC3
53	MCU3_31	MCU3	ATA_RESET_B/SD_D/MCU3_31	MCIMX31	NVCC3
54	GND	POWER	GND	-	-
55	AP6_0	AP	STXD/ATA_D11/USBH2_D6/TD_11/ARM_CRASID7MCU1_23	MCIMX31	NVCC10
56	LEDMD1	LED_MD	LEDMD1	MC13783	-
57	AP6_1	AP	SRXD6/ATA_D12/USBH2_D7/TD_12/M3IF_CHSN_MSTR_0/MCU1_24	MCIMX31	NVCC10
58	LEDMD2	LED_MD	LEDMD2	MC13783	-
59	LEDAD1	LED_AD	LEDAD1	MC13783	-
60	LEDMD3	LED_MD	LEDMD3	MC13783	-
61	LEDAD2	LED_AD	LEDAD2	MC13783	-
62	LEDMD4	LED_MD	LEDMD4	MC13783	-
63	P_SW2	POWER	P_SW2	MC13783	-
64	RESET_IMX_B	JTAG	Reset output for application	MCIMX31	NVCC1
65	P_BOOST	POWER	P_BOOST	MC13783	-
66	LEDAD3	LED_AD	LEDKP	MC13783	-
67	P_VRF1	POWER	P_VRF1	MC13783	-
68	GND	POWER	GND	-	-
69	3V3	POWER	3.3V	-	-
70	VIN	POWER	P_VIN	MC13783	-
71	GND	POWER	GND	-	-
72	GND	POWER	GND	-	-

Table 19 - Image processing unit interface adapter

2.4.19 Unpopulated connectors

A few connectors are unpopulated because they are rarely used. It is possible to solder some wire to them or solder a connector to the footprint. Upon request we can solder this connector for you.

Pin	Pin Name	Group	Description	Chip	PD
1	CKIH	JTAG	CKIH	MCIMX31	NVCC1
2	CLKO	JTAG	CLKO	MCIMX31	NVCC1
3	CLIB	JTAG	CLIB	MCIMX31	LV
4	CLIA	JTAG	CLIA	MCIMX31	LV

Table 20 - X1 clock lines

Pin	Pin Name	Group	Description	Chip	PD
1	ASSPI0	AP	SECCS	MC13783	LV
2	ASSPI1	AP	SECCLK	MC13783	LV
3	ASSPI2	AP	SECMOSI	MC13783	LV
4	ASSPI3	AP	SECMISO	MC13783	LV

Table 21 - X103 second ATLAS SPI interface

Pin	Pin Name	Group	Description	Chip	PD
1	AA2_0	AP	TX2	MC13783	LV
2	AA2_1	AP	FS2	MC13783	LV
3	AA2_2	AP	BCL2	MC13783	LV
4	AA2_3	AP	RX2	MC13783	LV

Table 22 - X104 second ATLAS SSI interface

Pin	Pin Name	Group	Description	Chip	PD
1	GND	ATLAS	GND	MC13783	LV
2	NTC	ATLAS	10k NTC Connector	MC13783	LV
3	P_BATT	ATLAS	P_BATT line	MC13783	LV

Table 23 - X201 battery connector

Pin	Pin Name	Group	Description	Chip	PD
1	LSPL	audio	LSPL	MC13783	-
2	LSPM	audio	LSPM	MC13783	-
3	LSPP	audio	LSPP	MC13783	-
4	SPM	audio	SPM	MC13783	-
5	SPP	audio	SPP	MC13783	-
6	P_AUDIO	POWER	2.775V	-	-
7	P_3V3	POWER	3.3V	-	-
8	AUDIOGND	POWER	AUDIO GND	-	-
9	GND	POWER	GND	-	-
10	CDCOUT	audio	CDCOUT	MC13783	-
11	TXOUT	audio	TXOUT	MC13783	-
12	TXIN	audio	TXIN	MC13783	-
13	MC1RIN	audio	MC1RIN	MC13783	-
14	MC1RB	audio	MC1RB	MC13783	-
15	MC1LIN	audio	MC1LIN	MC13783	-
16	GND	POWER	GND	-	-

Table 24 – X400 analog audio interfaces

2.5 Onboard peripheries

2.5.1 SMSC LAN921x Ethernet controller (Development Board)

The chips physical address starts at 0xb4000000.

2.5.2 SMSC LAN 921x Ethernet controller (Core Module)

The chips physical address starts at 0xb4200000. It is connected directly to the RJ45 jack on the Development Board.

2.5.3 USB host transceiver

The USB transceiver ISP1504 is connected to the 2nd USB Host on the i.MX31. The VBUS power can be chosen from either the ISP1504 internal power or an external MOSFET which switches the 5V on the VBUS line directly. (*Note: that there is no current limiter and no fuse with this option*).

2.5.4 USB OTG

The USB OTG interface is connected directly to the USB OTG connector. The VBUS power can be chosen from either the ISP1504 internal power or an external MOSFET which switches the 5V on the VBUS line directly. (*Note: that there is no current limiter and no fuse in this option*).

2.5.5 USB-to-UART converter

A USB-to-UART bridge is used for UART1 or UART2 communication ports. The used UART can be selected using a DIP switch on the Development-Board. It is also possible to disable this interface.

Note: If you select UART1 on the USB-to-UART interface this will automatically select UART2 on the RS232 interface and vice versa.

2.5.6 RS232 V.24 interface on SUB-D9

An RS232 UART level shifter is used for the RS232 on the SUB-D9 connector. You can select UART1 or UART2 on this interface or disable this UART device.

Note: If you select UART1 on the USB-to-UART interface this will automatically select UART2 on the RS232 interface and vice versa.

2.5.7 SD-Cards

Two SD-Card slots are available on the Development Board. Both can be enabled or disabled by enabling or disabling the level shifter. Because the SD-Cards operate at a higher voltage level than the i.MX31 supports, the ADG3308 bidirectional level shifter was used. The SD-Card 1 interface is also available on the extender connector.

Note: If you use the SD-Card 1 interface on the extender connector you must disable the SD-Card slot 1 on the Development Board. Failure to do so could result in destruction of the development board.

2.5.8 Audio jacks

The Development Board has two audio input jacks and two audio output jacks which are connected directly to the MC13783.

2.6 Onboard configuration switches

2.6.1 S1 – Interface control switch

Various functions from the development board can be switched on or off by setting this switch. This is especially useful if you want to use external hardware connected to a shared signal line.

#	Name	Function	ON	OFF
1	UARTSEL	UART selector	RS232 = UART1 USB = UART2	RS232 = UART2 USB = UART1
2	RS232	RS232 level shifter	enabled	Disabled
3	USBUART	USB-to-UART bridge	enabled	Disabled
4	Fast Boot	Enabled by a resistor on UART1_0	10k pull up on UART1_0	10k is floating
5	CLKSS	Clock Source Select	CLKLO (32kHz) selected	CLKHI(26MHz) selected
6	SD-Card2	SD-Card slot 2	disabled	enabled
7	SD-Card1	SD-Card slot 1	disabled	Enabled
8	USB Host	2nd USB Host	enabled	Disabled

Table 25 - Interface control switch settings

2.6.2 S200 – Power on/off switch

S200 is the main power switch. It switches the complete target board on or off.

Note: This switch doesn't deactivate any of the batteries (LiIo Main Battery or LiIo Backup Battery).

2.6.3 S300 – Boot mode switch

This switch performs two different functions. While the BT_MOD switches change the boot mode, the AUMOD pins perform some functions on the ATLAS (MC13783).

#	Function
1	BT_MOD0
2	BT_MOD1
3	BT_MOD2
4	BT_MOD3
5	BT_MOD4
6	AUMOD0
7	AUMOD1
8	AUMOD2

Table 26 - S300 switch description

For reference concerning the AUMOD pins, please check the MC13783 datasheet chapter 10.1.3 on page 153. The following lookup table will support you in this.

Development Board	Datasheet
AUMOD0	UMOD0
AUMOD1	UMOD1
AUMOD2	USBen

Table 27 - AUMOD lookup table

The following table lists the possible boot modes which can be set by changing the BTMOD switches.
Note: The settings here describe the position of the DIP switches. This does not necessarily need to correspond to the physical voltage level.

BTMOD4	BTMOD3	BTMOD2	BTMOD1	BTMOD0	Function
ON	ON	ON	ON	ON	UART/USB boot loader int
ON	ON	ON	ON	OFF	8-bit NAND Flash (2 Kbytes per page)
ON	ON	ON	OFF	ON	8-bit NAND Flash (512 bytes per page)
ON	ON	ON	OFF	OFF	16-bit NAND Flash (2 Kbytes per page)
ON	ON	OFF	ON	ON	16-bit NAND Flash (512 bytes per page)
ON	ON	OFF	ON	OFF	16-bit CS0 at D[15:0]
ON	ON	OFF	OFF	ON	reserved
ON	ON	OFF	OFF	OFF	reserved
ON	OFF	ON	ON	ON	M-Systems Disk On Chip
ON	OFF	ON	ON	OFF	reserved
ON	OFF	ON	OFF	ON	reserved
ON	OFF	ON	OFF	OFF	reserved
ON	OFF	OFF	ON	ON	reserved
ON	OFF	OFF	ON	OFF	reserved
ON	OFF	OFF	OFF	ON	reserved
ON	OFF	OFF	OFF	OFF	reserved
OFF	ON	ON	ON	ON	8-bit NAND Flash (2 Kbytes per page)
OFF	ON	ON	ON	OFF	8-bit NAND Flash (512 bytes per page)
OFF	ON	ON	OFF	ON	16-bit NAND Flash (2 Kbytes per page)
OFF	ON	ON	OFF	OFF	16-bit NAND (512 bytes per page)
OFF	ON	OFF	ON	ON	16-bit CS0 at D[15:0]
OFF	ON	OFF	ON	OFF	reserved
OFF	ON	OFF	OFF	ON	reserved
OFF	ON	OFF	OFF	OFF	reserved
OFF	OFF	ON	ON	ON	reserved
OFF	OFF	ON	ON	OFF	reserved
OFF	OFF	ON	OFF	ON	reserved
OFF	OFF	ON	OFF	OFF	reserved
OFF	OFF	OFF	ON	ON	reserved
OFF	OFF	OFF	ON	OFF	reserved
OFF	OFF	OFF	OFF	ON	reserved
OFF	OFF	OFF	OFF	OFF	reserved

Table 28 - BTMOD switch settings

2.6.4 S302 – Debug switch

S302 can be used to activate debug functions like LEDs, DIP switches and push buttons on some GPIO pins.

#	Function
1	Activate MC13786 GPIO LEDAD3 on LED
2	Activate i.MX UART2_3 GPIO on LED
3	Activate i.MX MCU3_30 GPIO on LED
4	Activate i.MX MCU3_31 GPIO on LED
5	Activate i.MX MCU3_31 GPIO on pull down resistor
6	Activate i.MX MCU3_30 GPIO on pull down resistor
7	Activate i.MX UART 2_2 GPIO on push button
8	Activate i.MX PCMCIA13 GPIO on push button

Table 29 - S302 Debug switch

2.7 Jumper settings

2.7.1 JP201

JP201 selects the 3.3V power source from either the TPS5430 or from the LT3530 which is needed if you want to power the Core Module from battery only.

2.7.2 JP202

If you close JP202, 3.3V will be available on the 3V3 power domain. If JP202 is open, 3.15V will be available on the 3V3 power domain. This can be used for low power applications.

2.7.3 JP203

JP203 chooses the P_CHARGER power domain source.

- 1-2 – P_VIN is the P_CHARGER source
- 2-3 – 5V from the TPS is the charger source

2.7.4 JP204

With JP204 you can select the source for the 5V power domain.

- 1-2 – select the TPS as 5V power domain source
- 2-3 – select P_VIN as 5V power domain source

Note: JP205 needs to be open when JP204 is closed.

2.7.5 JP205

If JP205 is closed, make sure that JP204 is open. If JP205 is closed, you will need to connect the P_BOOST converter domain from the MC13783 to the 5V power domain.

2.7.6 JP206

With JP206 you can select the backup device for the LICELL domain.

Note: This jumper is only available on V2.1 or lower.

2.8 Push Buttons

2.8.1 S301 Reset

S301 can be used to reset the i.MX31 and the periphery devices.

2.8.2 S303 PCMCIA13

S303 can be used for debugging functions. It connects PCMCIA13 with a 220R resistor to GND.

Note: If PCMCIA13 is used for any other function, it is recommended not to use the push button. The push button can be disabled by setting S302.8 to off.

2.8.3 S304 UART2_2

S304 can be used for debugging functions. It connects UART2_2 with a 220R resistor to GND.

Note: If UART2_2 is used for any other function, it is recommended not to use the push button. The push button can be disabled by setting S302.7 to off.

2.8.4 S305 Power on (Atlas)

S305 is used for the power on switch functionality of the MC13783. The power on push button is connected to POWER_ON1 line of the MC13783.

3 Interface adapter modules

3.1 Keypad interface adapter module (ADP-KEY)

The Keypad interface adapter module includes 21 push buttons which are designed for mobile phones and multimedia devices. A small joystick is mounted for more comfort. Nine color LEDs simulate the ATLAS chip's TRI color functionality.

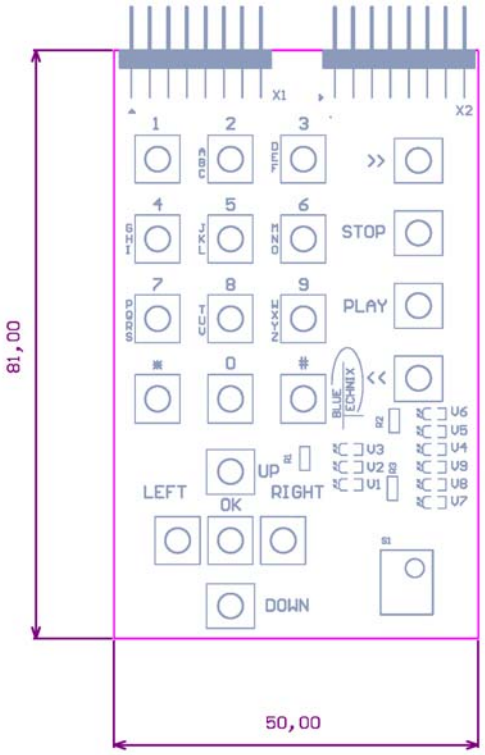

Figure 21 - Keypad adapter

3.2 Camera sensor interface adapter module (ADP-CSI)

The camera sensor interface adapter module supports two Video-In sources.

- An analog PAL or NTSC video source which is then converted to digital signals by the TVP5150AM1 from Texas Instruments
- A digital camera (OmniVision OV2640)

Jumper JP1 enables the level shifter between the i.MX31 CSI interface and the TVP5150 chip. If the Jumper is closed the TVP5150 lines will be activated for the i.MX31.

Note: No camera should be connected if the TVP is enabled. This would result in two driving sources and could possibly lead to destruction of either component.

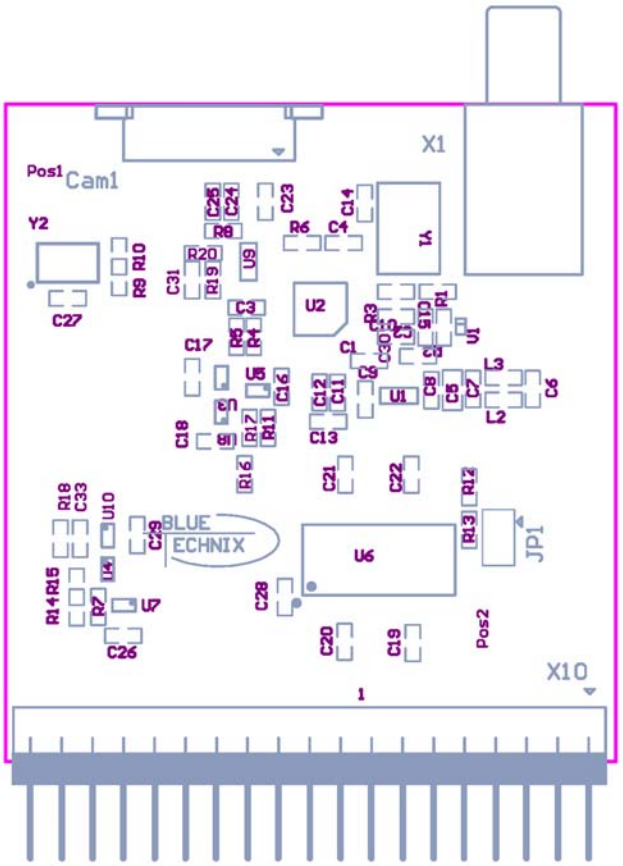

Figure 22 - Camera sensor interface adapter

3.3 Image processing unit adapter module (ADP-IPU)

The image processing unit adapter module supports two types of Video-Out devices: A digital display interface and an analog interface. The Hitachi 3.5” QVGA display can be connected to the digital display interface by using the ZIF connector. An analog video output can be generated by the digital to analog codec ADV7393 which is manufactured by Analog Devices. On this converter there are two connecters available, a composite video output and a VGA output on a 15pin Sub-D video connector.

Jumper JP100 selects the main clock source for the Video AD converter from either the 27MHz Oscillator or the CLIH source pin. If the jumper is set to the position next to the oscillator, the oscillator is chosen as source.

Note: The default setting is that no jumper is set at all. This will suffice for operation of the Hitachi 3,5’’ display.

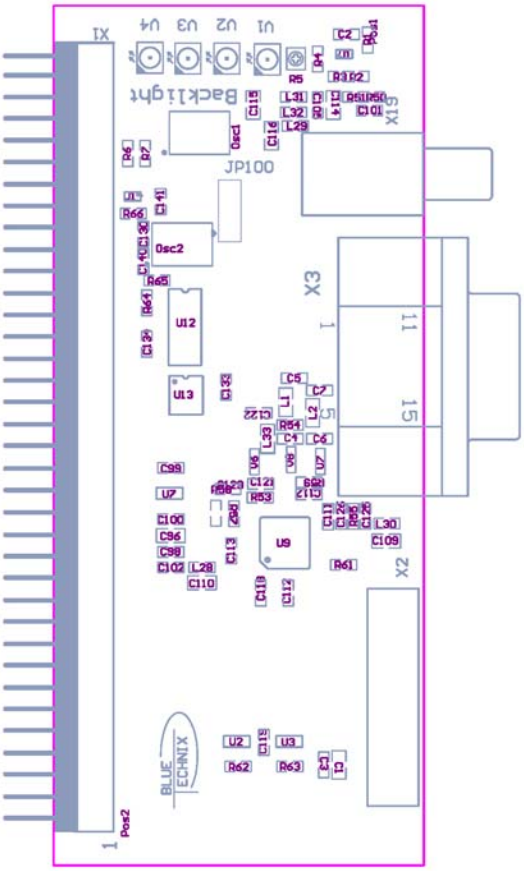

Figure 23 - Image processing unit adapter

4 Component Placement

For the placement of the components, please refer to the accompanying PDF file named DEV-i.MX31 - Component Placement.pdf.

5 Anomalies

On some development boards of this version there will be no sound on the headset connector at the first play of a sound or song, it will work on the second song/sound. This anomaly will occur every time the development board is switched off and on again.

Please consult the product homepage for up-to-date information regarding this product.
http://www.bluetechnix.com/goto/dev-i.mx31

6 Product changes

Please consult the product homepage for the latest information regarding this product.
http://www.bluetechnix.com/goto/dev-i.mx31

Version	Changes
V2.3	Added SMSC Ethernet Controller
V2.2	Fixed bug on 2nd USB Host
V2.1	Fixed some bugs on SD-Card
V2.0	Support only Connector Version, compliant with CM-i.MX31C-R10
V1.1	Support BGA Version of the Module
V1.0	Initial release

Table 30 - Product changes

7 Document revision history

Please consult the product homepage for the latest information regarding this product.
http://www.bluetechnix.com/goto/dev-i.mx31

Version	Date	Document Revision
6	2008-09-10	Major changes, Word 2007 format
5	2008-08-11	Checked English grammar, spelling and phrases.
4	2008-08-04	Fixup pictures, updated tables, …
3	2008-03-03	Major changes
2	2008-02-05	Update section 2,3,4 with major changes (R11 to R21!)
1		Initial release

Table 31 - Document revision history

8 List of figures

9 List of tables