ConnectCore 6®

ConnectCore for i.MX6

Preliminary Hardware Reference Manual

90001394

Revision Record

Revision	Date (MM/DD/YY)	Description
1P		Preliminary draft release

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Using this Guide

This guide provides information about the Digi ConnectCore for i.MX6 embedded core module family.

Conventions used in this guide

This table describes the typographic conventions used in this guide:

This convention	Is used for
italic type	Emphasis, new terms, variables, and document titles.
monospaced type	Filenames, pathnames, and code examples.

Digi Information

Document Updates

Please always check the product specific section on the Digi support website at *www.digiembedded.com/support* for the most current revision of this document.

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Additional Resources

Refer to the most recent Freescale i.MX6 processor reference manual and related documentation (available on the Freescale web site at: http://www.freescale.com/imx6) for additional information.

About the ConnectCore 6

The ConnectCore 6 is an ultra-compact and highly integrated system-on-module solution based on the Freescale i.MX6 Cortex-A9 processor family.

With processor speeds up to 1.2 GHz and fully interchangeable single-/dual-/quad-core variants, the ConnectCore 6 offers a truly future-proof platform solution with scalable performance and pre-certified wireless 802.11a/b/g/n and Bluetooth 4.0, including Bluetooth Low Energy connectivity.

Its innovative and scalable design maximizes integration flexibility and significantly reduces design risk in a highly cost-effective, reliable, low-profile surface mount form factor with optimal thermal management even in the most demanding quad-core system configurations.

Seamless Cloud Connector integration as part of the Digi Linux and Android software platform support offers secure remote management and web services capabilities through the scalable Device Cloud™ by Etherios™.

In addition, Digi offers complete professional Etherios custom hardware and wireless design services as well as end-to-end solutions services for cloud integration and app development.

ConnectCore 6 Features and Functionality

The ConnectCore for i.MX6 module is based on the i.MX6 processor from Freescale. This processor offers a high number of interfaces. Most of these interfaces are multiplexed and are not available simultaneously. The module has the following features:

- i.MX6 single/dual/quad ARM Cortex-A9 cores operating at speeds up to 1.2GHz.
  - 32Kbytes L1 Instruction cache
  - 32Kbytes L1 Data cache
  - Up to 1MB unified Instruction/Data L2 cache
  - NEON MPE (Media Processing Engine) co-processor
- Graphical Hardware accelerators:
  - IPU (Image Processing Unit)
  - Optional VPU (Video Processing Unit)
  - Optional 2D/3D GPU (Graphics Processing Unit)
- 64-bit DDR3-1066 memory interface with a density up to 2GBytes.
- 8-bit eMMC support up to revision 4.4/4.41
- Dialog DA9063 Power Management IC (PMIC)
  - 6x DC/DC buck converters
  - 11x LDO regulators
  - RTC with rechargeable coin cell battery support
  - 10-bit ADC channels
  - GPIO pins
- Optional IEEE802.11a/b/g/n WLAN interface with spatial diversity support.
  - SoftAP (Software Access Point) support
- Optional Bluetooth 4.0 dual mode
- Optional Cortex-M0+/Cortex-M4 MCA (Microcontroller Assist) subsystem
- Debug interfaces:
  - Standard JTAG controller IEEE 1149.1

    - ETM/ETB support
- Support of i.MX6 typical interfaces:
    - 16/32-bit data/address bus
    - SATA II, 3.0Gbps (24-bit parallel bus, LVDS, HDMI, MIPI/DSI)
    - Cameras (20-bit parallel bus, MIPI/CSI)
    - MMC/SD/SDIO
    - 1x USB OTG with integrated PHY
    - 3x USB Host
- 1x Host with integrated PHY
- 2x Host with integrated HS-IC USB PHY
    - PCI Express Gen 2.0 lane
    - Gigabit Ethernet MAC
    - 10/100M Ethernet MAC
    - UART, SPI, I2C, PWM, CAN, I2S and GPIO
- Ultra-miniature SMT module (50x50mmx5mm) based on 400-LGA pads

IEEE 802.11 a/b/g/n and Bluetooth Features and Functionality

The RF interface of the ConnectCore for i.MX6 is handled by a Qualcomm-Atheros module capable of 2.4 GHz and 5 GHz connections using 802.11 a/b/g/n and Bluetooth 4.0 (Dual mode with Blueooth Low Energy support).

The module is built with coexistence in mind and handles the BT coexistence internally. Cellular coexistence filtering is onboard to aid in designing systems susceptible to cellular interference.

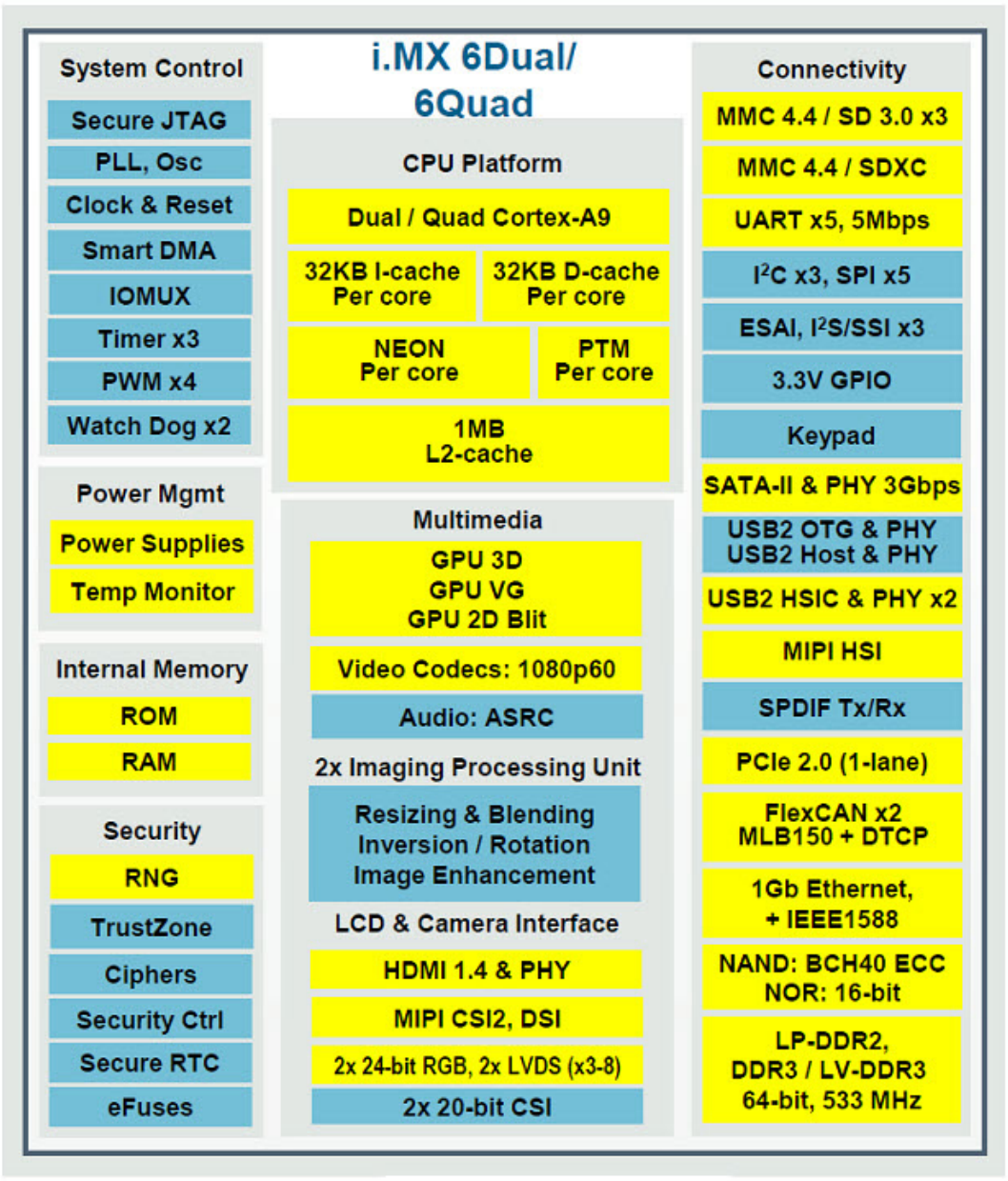
Module Variants

The ConnectCore for i.MX6 module supports population options such as network interface (Wi-Fi), memory (flash, RAM), MCU-assist, processor (single, dual and quad-cores), and others.

Block Diagram of the Freescale i.MX6

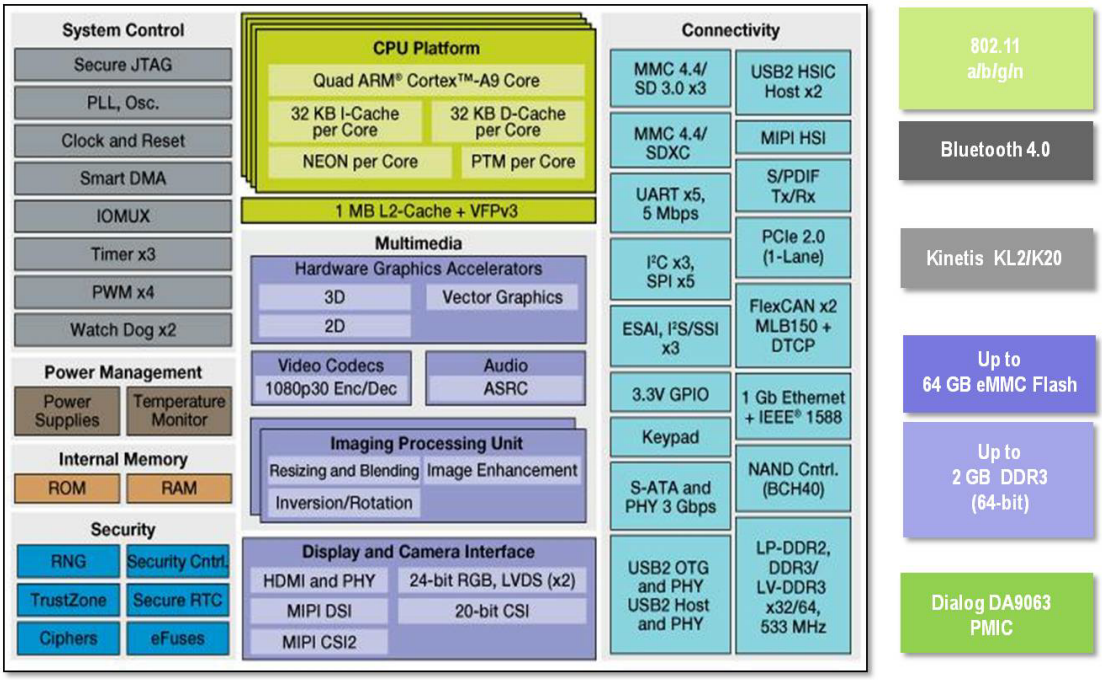
The figure below shows the block diagram of the Freescale i.MX6 application processor. Not all functions are available on all processor variants.

Block diagram of the ConnectCore 6 CPU



The following figure below provides a high-level block diagram of the ConnectCore for i.MX6 module.

Block diagram of ConnectCore 6



Power Supply Architecture of the ConnectCore 6

The ConnectCore for i.MX6 provides a primary 5V power supply input. This supply is the main power domain to the on-module Dialog DA9063 power management IC (PMIC), which generates all required supply voltages for the module components as well as the carrier board.

The module provides support for a backup battery (coin-cell or super cap) powering the real-time clock (RTC) on the module. In addition, rechargeable backup batteries (ML414, others) are also supported.

The PMIC generates the following power domains that are available on the module pads:

- 3.3V (GEN_3V3)

Power domain	Regulator type	Output accuracy	Maximum current	Dropout voltage (MAX)	Turn on time (MAX)	Turn off time (MAX)	Quiescent current in OFF mode (TYP)
3.3V	DC/DC	+/-3%	1500mA	-	1µA	1.2ms	-

Note: The maximum current consumption mentioned above is a combination of the current consumed by the module and by the carrier board.

Moreover, 5x PMIC LDO outputs are also available on the module pads:

- VLDO3
- VLDO4
- VLDO6
- VLDO7
- VLDO8

The table below provides the characteristics of the optional LDO outputs:

LDO	Output voltage	Output accuracy	Default voltage	Maximum current	Dropout voltage (MAX)	Turn on time (MAX)	Turn off time (MAX)	Quiescent current in OFF mode (TYP)
VLDO3	0.9-3.44V	+/-3%	3.3V	200mA	150mV	1µA	300µs	1ms
VLDO4	0.9-3.44V	+/-3%	3.3V	200mA	150mV	1µA	300µs	1ms
VLDO6	0.9-3.6V	+/-3%	3.3V	200mA	150mV	1µA	200µs	1ms
VLDO7	0.9-3.6V	+/-3%	1.8V	200mA	150mV	1µA	300µs	1ms
VLDO8	0.9-3.6V	+/-3%	3.3V	200mA	150mV	1µA	300µs	1ms

Note:

- For information about using the LDOs options, please contact Digi.
- VLDO3 is used for supplying MCA processor on the module.

The power management IC located on the module is responsible for generating all required i.MX6 processor supply voltages. The following i.MX6x supplies are available on the module pads:

- NVCC_ENET
- NVCC_EIM
- NVCC_LCD
- NVCC_CSI
- NVCC_RGMII

Some of the I/O supplies are set on the module. See the table following table:

Power domain	Connection
NVCC_GPIO	GEN_3V3
NVCC_JTAG	GEN_3V3
NVCC_NANDF	GEN_3V3
NVCC_SD1	GEN_3V3
NVCC_SD2	GEN_3V3
NVCC_SD3	GEN_3V3

The remaining I/O voltages must be set externally and are left open on the ConnectCore for i.MX6 module. See the following table for operating ranges of the remaining I/O supplies.

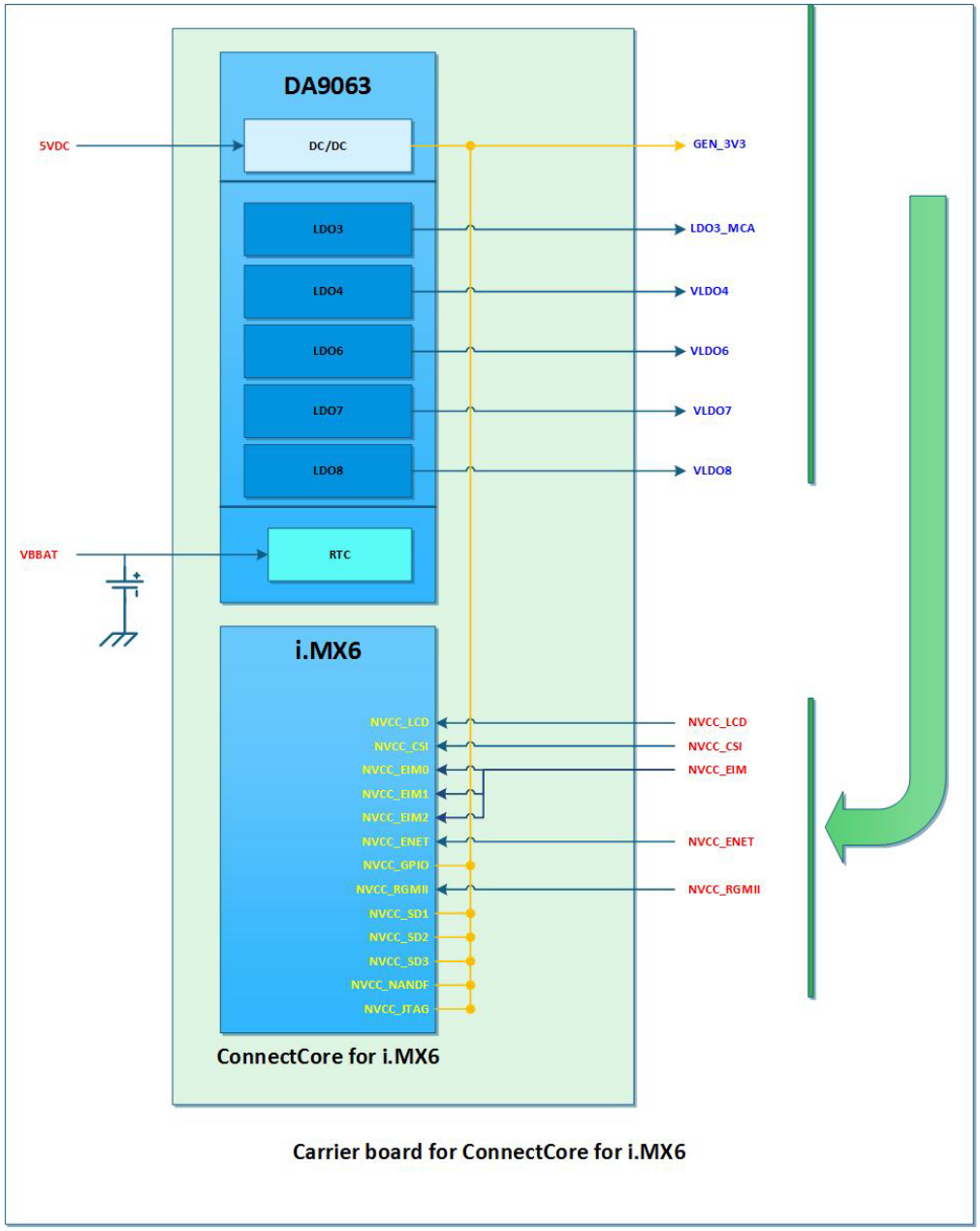
Power domain	Min	Type	Max
NVCC_ENET	1.65V	1.8V	3.6V
NVCC_EIM		2.8V	
NVCC_LCD		3.3V	
NVCC_CSI		-	
NVCC_RGMII in HSIC 1.2V mode	1.15V	-	1.30V
NVCC_RGMII in RGMII 1.5V mode	1.43V	-	1.58V
NVCC_ 1.8V mode	1.70V	-	1.90V
NVCC_RGMII in RGMII 2.5V mode	2.25V	-	2.625V

As shown in the table above, the supplies have a wide operating range. In order to provide the most cost-effective and flexible solution for a given use-case, the supplies listed in the table need to be provided by the carrier board integrating the ConnectCore for i.MX6 module. However, PMIC power domains 3.3V - and LDO3/4/6/7/8 options - are dedicated power sources for supplying i.MX6 power domains.

The MCU - assist specific power domain (LDO3_MCA) available on the ConnectCore for i.MX6 LGA pads is a power supply output powering the on-module Kinetis processor.

The following diagram outlines the power supply approach of the ConnectCore for i.MX6. Inputs are marked red, blue marks outputs.

ConnectCore 6 power supply diagram



Bootstrap

The ConnectCore 6 is configured by default to boot in "Internal boot" mode. See the following table:

BOOT_MODE [1:0]	Boot type
00	Boot from fuses
01	Serial Downloader
10	Internal Boot (default)
11	Reserved

Note:

- 10K pull-up populated on BOOT_MODE1
- 10K pull-down populated on BOOT_MODE0

By default, the boot media configured on the ConnectCore for i.MX6 module is the on-module eMMC. This is achieved by having the following resistors populated on the module:

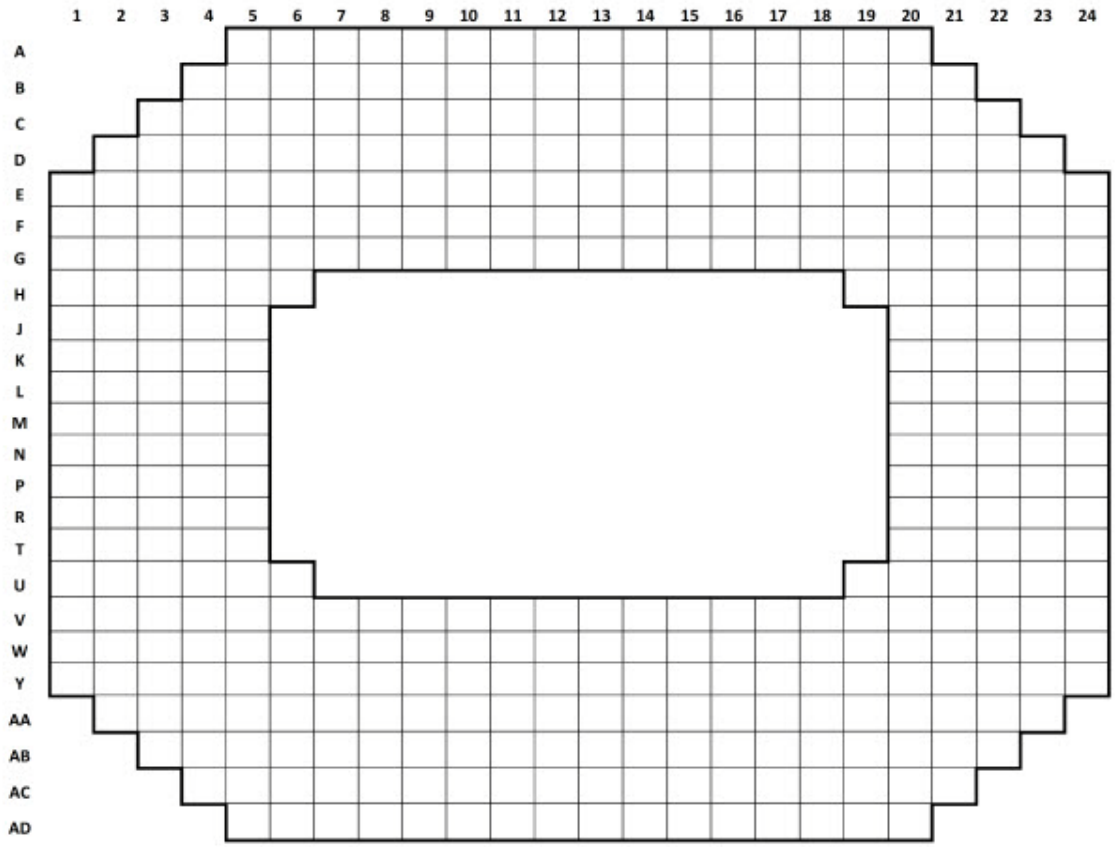
- 10K pull-down on EIM_DA4 (BOOT_CFG1[4])
- 10K pull-up on EIM_DA5 (BOOT_CFG1[5])
- 10K pull-up on EIM_DA5 (BOOT_CFG1[6])
- 10K pull-up on EIM_DA7 (BOOT_CFG1[7]
- 10K pull-down on EIM_DA11 (BOOT_CFG2[3])
- 10K pull-up on EIM_DA12 (BOOT_CFG2[4])

When selecting "Internal Boot", bootstrap pins shall be protected to insure a proper boot process. "Internal Boot" has the benefit that multiple boot media can be supported. For mass production, Digi recommends to use "Boot from fuses" for more security.

Module Pinout of the ConnectCore 6

The module has a LGA pad structure based on 400 pads. See the following diagram for the general layout.

ConnectCore top view module pinout



ConnectCore 6 Pinout Information

The following table provides pinout information of the ConnectCore for i.MX6 module.

Please also refer to the Freescale i.MX6 technical documentation for additional information related to the signals listed in the table.

LGA pad	Pad name	Multiplexing	IO type	Comments
A5	CSI0_MCLK	ALT0: IPU1_CSI0_HSYNC ALT1: ALT2: ALT3: CCM_CLKO1 ALT4: ALT5: GPIO5_IO19 ALT6: ALT: ARM_TRACE_CTL	NVCC_CSI	
A6	CSI0_DAT11	ALT0: IPU1_CSI0_DATA11 ALT1: AUD3_RXFS ALT2: ECSPI2_SS0 ALT3: UART1_RX_DATA ALT4: ALT5: GPIO5_IO29 ALT6: ALT7: ARM_TRACE08	NVCC_CSI	Connected on module to MCA processor
A7	CSI0_DAT17	ALT0: IPU1_CSI0_DATA17 ALT1: EIM_DATA13 ALT2: ALT3: UART4_CTS_B ALT4: ALT5: GPIO6_IO03 ALT6: ALT7: ARM_TRACE14	NVCC_CSI	
A8	GND		-	
A9	HDMI_D0_N		HDMI_VPH	
A10	GND		-	
A11	CSI_CLK0_P		NVCC_MIPI	
A12	GND		-	
A13	CSI_D1_N		NVCC_MIPI	
A14	PCIE_RX_N		PCIE_VPH	
A15	PCIE_TX_N		PCIE_VPH	
A16	CLK2_P		VDD_HIGH_CAP	
A17	GND		-	
A18	CLK1_P		VDD_HIGH_CAP	
A19	MLB_DP		VDD_HIGH_CAP	
A20	MLB_DN		VDD_HIGH_CAP	
B4	LVDS0_TX2_P		NVCC_LVDS_2P5	
B5	GND		-	

B6	CSI0_DAT14	ALT0: IPU1_CSI0_DATA14 ALT1: EIM_DATA10 ALT2: ALT3: UART5_TX_DATA ALT4: ALT5: GPIO6_IO00 ALT6: ALT7: ARM_TRACE11	NVCC_CSI	
B7	CSI0_DAT4	ALT0: IPU1_CSI0_DATA04 ALT1: EIM_DATA02 ALT2: ECSPI1_SCLK ALT3: KEY_COL5 ALT4: AUD3_TXC ALT5: GPIO5_IO22 ALT6: ALT7: ARM_TRACE01	NVCC_CSI	
B8	HDMI_D1_N		HDMI_VPH	
B9	HDMI_D0_P		HDMI_VPH	
B10	DSI_D0_P		NVCC_MIPI	
B11	CSI_CLK0_N		NVCC_MIPI	
B12	CSI_D2_N		NVCC_MIPI	
B13	CSI_D1_P		NVCC_MIPI	
B14	PCIE_RX_P		PCIE_VPH	
B15	PCIE_TX_P		PCIE_VPH	
B16	CLK2_N		VDD_HIGH_CAP	
B17	GND		-	
B18	CLK1_N		VDD_HIGH_CAP	
B19	GND		-	
B20	GND		-	
B21	SD3_CLK/ BT_UART_RTS	ALT0: SD3_CLK ALT1: UART2_RTS_B ALT2: FLEXCAN1_RX ALT3: ALT4: ALT5: GPIO7_IO03 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	Connected to Bluetooth module
C3	KEY_COL3	ALT0: ECSPI1_SS3 ALT1: ENET_CRS ALT2: HDMI_TX_DDC_SCL ALT3: KEY_COL3 ALT4: I2C2_SCL ALT5: GPIO4_IO12 ALT6: SPDIF_IN ALT7:	NVCC_GPIO (GEN_3V3)	Connected to MCA processor and PMIC. Not recommended as main I2C port. 4,7K pull-up on module.
C4	LVDS0_TX2_N		NVCC_LVDS_2P5	

C5	CSI0_DAT6	ALT0: IPU1_CSI0_DATA06 ALT1: EIM_DATA04 ALT2: ECSPI1_MISO ALT3: KEY_COL6 ALT4: AUD3_TXFS ALT5: GPIO5_IO24 ALT6: ALT7: ARM_TRACE03	NVCC_CSI	
C6	CSI0_DAT13	ALT0: IPU1_CSI0_DATA13 ALT1: EIM_DATA09 ALT2: ALT3: UART4_RX_DATA ALT4: ALT5: GPIO5_IO31 ALT6: ALT7: ARM_TRACE10	NVCC_CSI	
C7	CSI0_DAT5	ALT0: IPU1_CSI0_DATA05 ALT1: EIM_DATA03 ALT2: ECSPI1_MOSI ALT3: KEY_ROW5 ALT4: AUD3_TXD ALT5: GPIO5_IO23 ALT6: ALT7: ARM_TRACE02	NVCC_CSI	
C8	HDMI_D1_P		HDMI_VPH	
C9	GND		-	
C10	DSI_D0_N		NVCC_MIPI	
C11	GND		-	
C12	CSI_D2_P		NVCC_MIPI	
C13	GND		-	
C14	GND		-	
C15	GND		-	
C16	USB_H1_DN		VDD_USB_CAP	
C17	TAMPER		VDD_SNVS_IN	
C18	Reserved		-	
C19	MLB_SP		VDD_HIGH_CAP	
C20	MLB_SN		VDD_HIGH_CAP	
C21	SD3_DAT7	ALT0: SD3_DATA7 ALT1: UART1_TX_DATA ALT2: ALT3: ALT4: ALT5: GPIO6_IO17 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	

C22	SD3_DAT4/ BT_UART_RXD	ALT0: SD3_DATA4 ALT1: UART2_RX_DATA ALT2: ALT3: ALT4: ALT5: GPIO7_IO01 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	Connected to Bluetooth module
D2	KEY_ROW4	ALT0: FLEXCAN2_RX ALT1: IPU1_SISG5 ALT2: USB_OTG_PWR ALT3: KEY_ROW4 ALT4: UART5_CTS_B ALT5: GPIO4_IO15 ALT6: ALT7:	NVCC_GPIO (GEN_3V3)	
D3	KEY_ROW1	ALT0: ECSPI1_SS0 ALT1: ENET_COL ALT2: AUD5_RXD ALT3: KEY_ROW1 ALT4: UART5_RX_DATA ALT5: GPIO4_IO09 ALT6: SD2_VSELECT ALT7:	NVCC_GPIO (GEN_3V3)	
D4	GND		-	
D5	CSI0_DAT9	ALT0: IPU1_CSI0_DATA09 ALT1: EIM_DATA07 ALT2: ECSPI2_MOSI ALT3: KEY_ROW7 ALT4: I2C1_SCL ALT5: GPIO5_IO27 ALT6: ALT7: ARM_TRACE06	NVCC_CSI	Connected on module to MCA processor
D6	CSI0_DAT8	ALT0: IPU1_CSI0_DATA08 ALT1: EIM_DATA06 ALT2: ECSPI2_SCLK ALT3: KEY_COL7 ALT4: I2C1_SDA ALT5: GPIO5_IO26 ALT6: ALT7: ARM_TRACE05	NVCC_CSI	Connected on module to MCA processor
D7	HDMI_DDCCEC		HDMI_VPH	
D8	GND		-	
D9	DSI_D1_P		NVCC_MIPI	
D10	GND		-	
D11	CSI_D3_P		NVCC_MIPI	
D12	Reserved		-	
D13	#BT_DISABLE		WLAN/BT_3V3	
D14	JTAG_TDI		NVCC_JTAG (GEN_3V3)	

D15	#JTAG_TRST		NVCC_JTAG (GEN_3V3)	
D16	USB_H1_DP		VDD_USB_CAP	
D17	TEST_MODE		VDD_SNVS_IN	
D18	ON/OFF		VDD_SNVS_IN	Must be connected to a power button
D19	SATA_TX_N		SATA_VPH	
D20	GND		-	
D21	SD3_DAT1	ALT0: SD3_DATA1 ALT1: UART1_RTS_B ALT2: FLEXCAN2_RX ALT3: ALT4: ALT5: GPIO7_IO05 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
D22	SD3_RST	ALT0: SD3_RESET ALT1: UART3_RTS_B ALT2: ALT3: ALT4: ALT5: GPIO7_IO08 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
D23	SD3_DAT5/ BT_UART_TXD	ALT0: SD3_DATA5 ALT1: UART2_TX_DATA ALT2: ALT3: ALT4: ALT5: GPIO7_IO00 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	Connected to Bluetooth module
E1	LVDS1_CLK_N		NVCC_LVDS_2P5	
E2	KEY_ROW0	ALT0: ECSPI1_MOSI ALT1: ENET_TX_DATA3 ALT2: AUD5_TXD ALT3: KEY_ROW0 ALT4: UART4_RX_DATA ALT5: GPIO4_IO07 ALT6: DCIC2_OUT ALT7:	NVCC_GPIO (GEN_3V3)	
E3	KEY_COL1	ALT0: ECSPI1_MISO ALT1: ENET_MDIO ALT2: AUD5_TXFS ALT3: KEY_COL1 ALT4: UART5_TX_DATA ALT5: GPIO4_IO08 ALT6: SD1_VSELECT ALT7:	NVCC_GPIO (GEN_3V3)	
E4	LVDS0_TX1_P		NVCC_LVDS_2P5	

E5	CSI0_DATA_EN	ALT0: IPU1_CSI0_DATA_EN ALT1: EIM_DATA00 ALT2: ALT3: ALT4: ALT5: GPIO5_IO20 ALT6: ALT7: ARM_TRACE_CLK	NVCC_CSI	
E6	CSI0_DAT15	ALT0: IPU1_CSI0_DATA15 ALT1: EIM_DATA11 ALT2: ALT3: UART5_RX_DATA ALT4: ALT5: GPIO6_IO01 ALT6: ALT7: ARM_TRACE12	NVCC_CSI	
E7	GND		-	
E8	HDMI_CLK_N		HDMI_VPH	
E9	DSI_D1_N		NVCC_MIPI	
E10	DSI_CLK0_N		NVCC_MIPI	
E11	CSI_D3_N		NVCC_MIPI	
E12	Reserved		-	
E13	Reserved		-	
E14	JTAG_TDO		NVCC_JTAG (GEN_3V3)	
E15	Reserved		-	
E16	GND		-	
E17	BOOT_MODE0		VDD_SNVS_IN	
E18	#POR		VDD_SNVS_IN	
E19	SATA_TX_P		SATA_VPH	
E20	GEN_3V3		NVCC_SD3 (GEN_3V3	
E21	SD3_DAT6	ALT0: SD3_DATA6 ALT1: UART1_RX_DATA ALT2: ALT3: ALT4: ALT5: GPIO6_IO18 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
E22	NANDF_CLE/ BT_WAKE	ALT0: NAND_CLE ALT1: IPU2_SISG4 ALT2: ALT3: ALT4: ALT5: GPIO6_IO07 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	

E23	SD3_CMD/ BT_UART_CTS	ALT0: SD3_CMD ALT1: UART2_CTS_B ALT2: FLEXCAN1_TX ALT3: ALT4: ALT5: GPIO7_IO02 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
E24	SD3_DAT2	ALT0: SD3_DATA2 ALT1: ALT2: ALT3: ALT4: ALT5: GPIO7_IO06 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
F1	LVDS1_CLK_P		NVCC_LVDS_2P5	
F2	KEY_ROW3	ALT0: ALT1: ASRC_EXT_CLK ALT2: HDMI_TX_DDC_SDA ALT3: KEY_ROW3 ALT4: I2C2_SDA ALT5: GPIO4_IO13 ALT6: SD1_VSELECT ALT7:	NVCC_GPIO (GEN_3V3)	Connected to MCA processor and PMIC. Not recommended as main I2C port. 4,7K pull-up on module.
F3	GPIO_8	ALT0: ESAI_TX5_RX0 ALT1: XTALOSC_REF_CLK_32K ALT2: EPIT2_OUT ALT3: FLEXCAN1_RX ALT4: UART2_RX_DATA ALT5: GPIO1_IO08 ALT6: SPDIF_SR_CLK ALT7: USB_OTG_PWR_CTL_WAKE	NVCC_GPIO (GEN_3V3)	
F4	LVDS0_TX1_N		NVCC_LVDS_2P5	
F5	GND		-	
F6	CSI0_DAT18	ALT0: IPU1_CSI0_DATA18 ALT1: EIM_DATA14 ALT2: ALT3: UART5_RTS_B ALT4: ALT5: GPIO6_IO04 ALT6: ALT7: ARM_TRACE15	NVCC_CSI	
F7	HDMI_D2_N		HDMI_VPH	
F8	HDMI_CLK_P		HDMI_VPH	
F9	GND		-	
F10	DSI_CLK0_P		NVCC_MIPI	
F11	GND		-	
F12	GND		-	
F13	JTAG_TCK		NVCC_JTAG (GEN_3V3)	

F14	JTAG_TMS		NVCC_JTAG (GEN_3V3)	
F15	BOOT_MODE1		VDD_SNVS_IN	
F16	USB_H1_VBUS		-	
F17	MLB_CP		-	
F18	MLB_CN		-	
F19	GND		-	
F20	SD3_DAT0	ALT0: SD3_DATA0 ALT1: UART1_CTS_B ALT2: FLEXCAN2_TX ALT3: ALT4: ALT5: GPIO7_IO04 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
F21	NANDF_CS0	ALT0: NAND_CE0_B ALT1: ALT2: ALT3: ALT4: ALT5: GPIO6_IO11 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
F22	#NANDF_WP	ALT0: NAND_WP_B ALT1: IPU2_SISG5 ALT2: ALT3: ALT4: ALT5: GPIO6_IO09 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
F23	NANDF_CS3	ALT0: NAND_CE3_B ALT1: IPU1_SISG1 ALT2: ESAI_TX1 ALT3: EIM_ADDR26 ALT4: ALT5: GPIO6_IO16 ALT6: IPU2_SISG1 ALT7:	NVCC_NANDF (GEN_3V3)	
F24	SD3_DAT3	ALT0: SD3_DATA3 ALT1: UART3_CTS_B ALT2: ALT3: ALT4: ALT5: GPIO7_IO07 ALT6: ALT7:	NVCC_SD3 (GEN_3V3)	
G1	GND		-	

G2	GPIO_0	ALT0: CCM_CLKO1 ALT1: ALT2: KEY_COL5 ALT3: ASRC_EXT_CLK ALT4: EPIT1_OUT ALT5: GPIO1_IO00 ALT6: USB_H1_PWR ALT7: SNVS_VIO_5	NVCC_GPIO (GEN_3V3)	
G3	GPIO_2	ALT0: ESAI_TX_FS ALT1: ALT2: KEY_ROW6 ALT3: ALT4: ALT5: GPIO1_IO02 ALT6: SD2_WP ALT7: MLB_DATA	NVCC_GPIO (GEN_3V3)	
G4	GND		-	
G5	CSI0_PIXCLK	ALT0: IPU1_CSI0_PIXCLK ALT1: ALT2: ALT3: ALT4: ALT5: GPIO5_IO18 ALT6: ALT7: ARM_EVENTO	NVCC_CSI	
G6	CSI0_DAT19	ALT0: IPU1_CSI0_DATA19 ALT1: EIM_DATA15 ALT2: ALT3: UART5_CTS_B ALT4: ALT5: GPIO6_IO05 ALT6: ALT7:	NVCC_CSI	
G7	HDMI_D2_P		HDMI_VPH	
G8	GND		-	
G9	HDMI_HPD		HDMI_VPH	
G10	GND		-	
G11	CSI_D0_P		NVCC_MIPI	
G12	CSI_D0_M		NVCC_MIPI	
G13	JTAG_MOD		NVCC_JTAG (GEN_3V3)	
G14	USB_OTG_VBUS		USB_OTG_VBUS	
G15	#USB_OTG_CHD		VDD_USB_CAP	
G16	USB_OTG_DN		VDD_USB_CAP	
G17	USB_OTG_DP		VDD_USB_CAP	
G18	GND		-	
G19	SATA_RX_N		SATA_VPH	
G20	GEN_3V3		NVCC_NANDF	

G21	NANDF_D2	ALT0: NAND_DATA02 ALT1: SD1_DATA6 ALT2: ALT3: ALT4: ALT5: GPIO2_IO02 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
G22	NANDF_D6	ALT0: NAND_DATA06 ALT1: SD2_DATA6 ALT2: ALT3: ALT4: ALT5: GPIO2_IO06 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
G23	NANDF_D3	ALT0: NAND_DATA03 ALT1: SD1_DATA7 ALT2: ALT3: ALT4: ALT5: GPIO2_IO03 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
G24	NANDF_ALE	ALT0: NAND_ALE ALT1: SD4_RESET ALT2: ALT3: ALT4: ALT5: GPIO6_IO08 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
H1	LVDS1_TX0_N		NVCC_LVDS_2P5	
H2	KEY_ROW2	ALT0: ECSPI1_SS2 ALT1: ENET_TX_DATA2 ALT2: FLEXCAN1_RX ALT3: KEY_ROW2 ALT4: SD2_VSELECT ALT5: GPIO4_IO11 ALT6: HDMI_TX_CEC_LINE ALT7:	NVCC_GPIO (GEN_3V3)	
H3	GPIO_9	ALT0: ESAI_RX_FS ALT1: WDOG1_B ALT2: KEY_COL6 ALT3: CCM_REF_EN_B ALT4: PWM1_OUT ALT5: GPIO1_IO09 ALT6: SD1_WP ALT7:	NVCC_GPIO (GEN_3V3)	
H4	LVDS0_TX0_P		NVCC_LVDS_2P5	
H5	GND		-	

H6	CSI0_DAT16	ALT0: IPU1_CSI0_DATA16 ALT1: EIM_DATA12 ALT2: ALT3: UART4_RTS_B ALT4: ALT5: GPIO6_IO02 ALT6: ALT7: ARM_TRACE13	NVCC_CSI	
H19	SATA_RX_P		SATA_VPH	
H20	GND		-	
H21	NANDF_CS1/ #MCA_INT	ALT0: NAND_CE1_B ALT1: SD4_VSELECT ALT2: SD3_VSELECT ALT3: ALT4: ALT5: GPIO6_IO14 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	Connected to MCA processor
H22	NANDF_D1	ALT0: NAND_DATA01 ALT1: SD1_DATA5 ALT2: ALT3: ALT4: ALT5: GPIO2_IO01 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
H23	NANDF_D7	ALT0: NAND_DATA07 ALT1: SD2_DATA7 ALT2: ALT3: ALT4: ALT5: GPIO2_IO07 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
H24	NANDF_CS2	ALT0: NAND_CE2_B ALT1: IPU1_SISG0 ALT2: ESAI_TX0 ALT3: EIM_CRE ALT4: CCM_CLKO2 ALT5: GPIO6_IO15 ALT6: IPU2_SISG0 ALT7:	NVCC_NANDF (GEN_3V3)	
J1	LVDS1_TX0_P		NVCC_LVDS_2P5	
J2	KEY_COL0	ALT0: ECSPI1_SCLK ALT1: ENET_RX_DATA3 ALT2: AUD5_TXC ALT3: KEY_COL0 ALT4: UART4_TX_DATA ALT5: GPIO4_IO06 ALT6: DCIC1_OUT ALT7:	NVCC_GPIO (GEN_3V3)	

J3	GPIO_6	ALT0: ESAI_TX_CLK ALT1: ALT2: I2C3_SDA ALT3: ALT4: ALT5: GPIO1_IO06 ALT6: SD2_LCTL ALT7: MLB_SIG	NVCC_GPIO (GEN_3V3)	
J4	LVDS0_TX0_N		NVCC_LVDS_2P5	
J5	CSI0_VSYNC	ALT0: IPU1_CSI0_VSYNC ALT1: EIM_DATA01 ALT2: ALT3: ALT4: ALT5: GPIO5_IO21 ALT6: ALT7: ARM_TRACE00	NVCC_CSI	
J20	GEN_3V3		NVCC_SD1	
J21	SD1_DAT2	ALT0: SD1_DATA2 ALT1: ECSPI5_SS1 ALT2: GPT_COMPARE2 ALT3: PWM2_OUT ALT4: WDOG1_B ALT5: GPIO1_IO19 ALT6: WDOG1_RESET_B_DEB ALT7:	NVCC_SD1 (GEN_3V3)	
J22	SD1_DAT1	ALT0: SD1_DATA1 ALT1: ECSPI5_SS0 ALT2: PWM3_OUT ALT3: GPT_CAPTURE2 ALT4: ALT5: GPIO1_IO17 ALT6: ALT7:	NVCC_SD1 (GEN_3V3)	
J23	SD1_CMD	ALT0: SD1_CMD ALT1: ECSPI5_MOSI ALT2: PWM4_OUT ALT3: GPT_COMPARE1 ALT4: ALT5: GPIO1_IO18 ALT6: ALT7:	NVCC_SD1 (GEN_3V3)	
J24	NANDF_D0	ALT0: NAND_DATA00 ALT1: SD1_DATA4 ALT2: ALT3: ALT4: ALT5: GPIO2_IO00 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
K1	GND		-	

K2	KEY_COL2	ALT0: ECSPI1_SS1 ALT1: ENET_RX_DATA2 ALT2: FLEXCAN1_TX ALT3: KEY_COL2 ALT4: ENET_MDC ALT5: GPIO4_IO10 ALT6: USB_H1_PWR_CTL_WAKE ALT7:	NVCC_GPIO (GEN_3V3)	
K3	GPIO_1	ALT0: ESAI_RX_CLK ALT1: WDOG2_B ALT2: KEY_ROW5 ALT3: USB_OTG_ID ALT4: PWM2_OUT ALT5: GPIO1_IO01 ALT6: SD1_CD_B ALT7:	NVCC_GPIO (GEN_3V3)	
K4	GND		-	
K5	CSI0_DAT10	ALT0: IPU1_CSI0_DATA10 ALT1: AUD3_RXC ALT2: ECSPI2_MISO ALT3: UART1_TX_DATA ALT4: ALT5: GPIO5_IO28 ALT6: ALT7: ARM_TRACE07	NVCC_CSI	
K20	GEN_3V3		NVCC_SD2	
K21	SD2_DAT1	ALT0: SD2_DATA1 ALT1: ECSPI5_SS0 ALT2: EIM_CS2 ALT3: AUD4_TXFS ALT4: KEY_COL7 ALT5: GPIO1_IO14 ALT6: ALT7:	NVCC_SD2 (GEN_3V3)	
K22	SD2_CLK	ALT0: SD2_CLK ALT1: ECSPI5_SCLK ALT2: KEY_COL5 ALT3: AUD4_RXFS ALT4: ALT5: GPIO1_IO10 ALT6: ALT7:	NVCC_SD2 (GEN_3V3)	
K23	SD2_DAT3	ALT0: SD2_DATA3 ALT1: ECSPI5_SS3 ALT2: KEY_COL6 ALT3: AUD4_TXC ALT4: ALT5: GPIO1_IO12 ALT6: ALT7:	NVCC_SD2 (GEN_3V3)	

K24	NANDF_D4	ALT0: NAND_DATA04 ALT1: SD2_DATA4 ALT2: ALT3: ALT4: ALT5: GPIO2_IO04 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
L1	LVDS1_TX1_P		NVCC_LVDS_2P5	
L2	KEY_COL4	ALT0: FLEXCAN2_TX ALT1: IPU1_SISG4 ALT2: USB_OTG_OC ALT3: KEY_COL4 ALT4: UART5_RTS_B ALT5: GPIO4_IO14 ALT6: ALT7:	NVCC_GPIO (GEN_3V3)	
L3	GPIO_4	ALT0: ESAI_TX_HF_CLK ALT1: ALT2: KEY_COL7 ALT3: ALT4: ALT5: GPIO1_IO04 ALT6: SD2_CD_B ALT7:	NVCC_GPIO (GEN_3V3)	
L4	LVDS0_CLK_P		NVCC_LVDS_2P5	
L5	CSI0_DAT12	ALT0: IPU1_CSI0_DATA12 ALT1: EIM_DATA08 ALT2: ALT3: UART4_TX_DATA ALT4: ALT5: GPIO5_IO30 ALT6: ALT7: ARM_TRACE09	NVCC_CSI	
L20	SD1_DAT3	ALT0: SD1_DATA3 ALT1: ECSPI5_SS2 ALT2: GPT_COMPARE3 ALT3: PWM1_OUT ALT4: WDOG2_B ALT5: GPIO1_IO21 ALT6: WDOG2_RESET_B_DEB ALT7:	NVCC_SD1 (GEN_3V3)	
L21	SD1_CLK	ALT0: SD1_CLK ALT1: ECSPI5_SCLK ALT2: ALT3: GPT_CLKIN ALT4: ALT5: GPIO1_IO20 ALT6: ALT7:	NVCC_SD1 (GEN_3V3)	
L22	GND		-	

L23	MCA_SWD_CLK	ALT0: ADC0_SE12/CMP0_IN2 ALT1: PTA0/IRQ_0/LLWU_P7 ALT2: TPM1_CH0 ALT3: SWD_CLK	LDO3_MCA	
L24	NANDF_D5	ALT0: NAND_DATA05 ALT1: SD2_DATA5 ALT2: ALT3: ALT4: ALT5: GPIO2_IO05 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
M1	LVDS1_TX1_N		NVCC_LVDS_2P5	
M2	GPIO_19	ALT0: KEY_COL5 ALT1: ENET_1588_EVENT0_OUT ALT2: SPDIF_OUT ALT3: CCM_CLKO1 ALT4: ECSPI1_RDY ALT5: GPIO4_IO05 ALT6: ENET_TX_ER ALT7:	NVCC_GPIO (GEN_3V3)	
M3	GPIO_16	ALT0: ESAI_TX3_RX2 ALT1: ENET_1588_EVENT2_IN ALT2: ENET_REF_CLK ALT3: SD1_LCTL ALT4: SPDIF_IN ALT5: GPIO7_IO11 ALT6: I2C3_SDA ALT7: JTAG_DE_B	NVCC_GPIO (GEN_3V3)	
M4	LVDS0_CLK_N		NVCC_LVDS_2P5	
M5	CSI0_DAT7	ALT0: IPU1_CSI0_DATA07 ALT1: EIM_DATA05 ALT2: ECSPI1_SS0 ALT3: KEY_ROW6 ALT4: AUD3_RXD ALT5: GPIO5_IO25 ALT6: ALT7: ARM_TRACE04	NVCC_CSI	
M20	SD2_CMD	ALT0: SD2_CMD ALT1: ECSPI5_MOSI ALT2: KEY_ROW5 ALT3: AUD4_RXC ALT4: ALT5: GPIO1_IO11 ALT6: ALT7:	NVCC_SD2 (GEN_3V3)	
M21	MCA_IO12	ALT0: ALT1: PTB3/IRQ_14 ALT2: I2C0_SCL ALT3: UART0_TX	LDO3_MCA	
M22	LDO3_MCA		LDO3_MCA	

M23	MCA_SWD_DIO	ALT0: ALT1: PTA2 ALT2: CMP0_OUT ALT3: SWD_DIO	LDO3_MCA	
M24	NANDF_RB0	ALT0: NAND_READY ALT1: IPU2_DI0_PIN01 ALT2: ALT3: ALT4: ALT5: GPIO6_IO10 ALT6: ALT7:	NVCC_NANDF (GEN_3V3)	
N1	GND		-	
N2	GPIO_18	ALT0: ESAI_TX1 ALT1: ENET_RX_CLK ALT2: SD3_VSELECT ALT3: SDMA_EXT_EVENT1 ALT4: ASRC_EXT_CLK ALT5: GPIO7_IO13 ALT6: SNVS_VIO_5_CTL ALT7:	NVCC_GPIO (GEN_3V3)	
N3	VCC_LICELL		VCC_LICELL	
N4	GND		-	
N5	GEN_3V3		NVCC_GPIO	
N20	MCA_IO/USB0_P	ALT0: ADC0_SE11 ALT1: PTB8 ALT2: TPM0_CH3 *ALT3:*	LDO3_MCA	
N21	MCA_IO13	ALT0: ALT1: PTB4/IRQ_15/LLWU_P6 ALT2: I2C0_SDA ALT3: UART0_RX	LDO3_MCA	
N22	MCA_IO7	ALT0: ADC0_SE0/CMP0_IN0 ALT1: PTA12/IRQ_17/ LPTMR0_ALT2 ALT2: TPM1_CH0 ALT3: TPM_CLKIN0	LDO3_MCA	
N23	#MCA_RESET	ALT0: ALT1: PTA1/IRQ_1/LPTMR0_ALT1 ALT2: TPM_CLKIN0 ALT3: RESET_b	LDO3_MCA	
N24	SD1_DAT0	ALT0: SD1_DATA0 ALT1: ECSPI5_MISO ALT2: ALT3: GPT_CAPTURE1 ALT4: ALT5: GPIO1_IO16 ALT6: ALT7:	NVCC_SD1 (GEN_3V3)	
P1	LVDS1_TX2_N		NVCC_LVDS_2P5	

P2	ENET_CRS_DV	ALT0: ENET_RX_EN ALT1: ESAI_TX_CLK ALT2: SPDIF_EXT_CLK ALT3: ALT4: ALT5: GPIO1_IO25 ALT6: ALT7:	NVCC_ENET	
P3	GPIO_7	ALT0: ESAI_TX4_RX1 ALT1: ECSPI5_RDY ALT2: EPIT1_OUT ALT3: FLEXCAN1_TX ALT4: UART2_TX_DATA ALT5: GPIO1_IO07 ALT6: SPDIF_LOCK ALT7: USB_OTG_HOST_MODE	NVCC_GPIO (GEN_3V3)	
P4	LVDS0_TX3_P		NVCC_LVDS_2P5	
P5	NVCC_CSI		NVCC_CSI	
P20	MCA_IO/USB0_N	ALT0: ADC0_SE10 ALT1: PTB9 ALT2: TPM0_CH2 *ALT3:*	LDO3_MCA	
P21	MCA_IO14	ALT0: ADC0_SE1/CMP0_IN1 ALT1: PTB5/IRQ_16 ALT2: TPM1_CH1 ALT3: NMI_b	LDO3_MCA	
P22	MCA_IO8	ALT0: TSI0_IN9 ALT1: PTA13 ALT2: *ALT3:*	LDO3_MCA	
P23	MCA_IO1	ALT0: ALT1: PTA6/LLWU_P2 ALT2: TPM0_CH4 *ALT3: SPI0_MISO*	LDO3_MCA	
P24	SD2_DAT0	ALT0: SD2_DATA0 ALT1: ECSPI5_MISO ALT2: ALT3: AUD4_RXD ALT4: KEY_ROW7 ALT5: GPIO1_IO15 ALT6: DCIC2_OUT ALT7:	NVCC_SD2 (GEN_3V3)	
R1	LVDS1_TX2_P		NVCC_LVDS_2P5	
R2	ENET_RX_ER	ALT0: USB_OTG_ID ALT1: ENET_RX_ER ALT2: ESAI_RX_HF_CLK ALT3: SPDIF_IN ALT4: ENET_1588_EVENT2_OUT ALT5: GPIO1_IO24 ALT6: ALT7:	NVCC_ENET	

R3	GPIO_5	ALT0: ESAI_TX2_RX3 ALT1: ALT2: KEY_ROW7 ALT3: CCM_CLKO1 ALT4: ALT5: GPIO1_IO05 ALT6: I2C3_SCL ALT7: ARM_EVENTI	NVCC_GPIO (GEN_3V3)	
R4	LVDS0_TX3_N		NVCC_LVDS_2P5	
R5	NVCC_RGMII		NVCC_RGMII	
R20	MCA_IO19	ALT0: ADC0_SE9/TSI0_IN7 ALT1: PTB10 ALT2: TPM0_CH1 ALT3:	LDO3_MCA	
R21	MCA_IO16	ALT0: ALT1: PTB7/IRQ_3 ALT2: TPM0_CH2 *ALT3:*	LDO3_MCA	
R22	MCA_IO9	ALT0: ADC0_SE6/TSI0_IN4 ALT1: PTB0/IRQ_8/LLWU_P4 ALT2: EXTRG_IN ALT3: SPI0_SCK	LDO3_MCA	
R23	MCA_IO2	ALT0: ADC0_SE7/TSI0_IN5 ALT1: PTA7/IRQ_7/LLWU_P3 ALT2: SPI0_MISO ALT3: SPI0_MOSI	LDO3_MCA	
R24	SD2_DAT2	ALT0: SD2_DATA2 ALT1: ECSPI5_SS1 ALT2: EIM_CS3 ALT3: AUD4_TXD ALT4: KEY_ROW6 ALT5: GPIO1_IO13 ALT6: ALT7:	NVCC_SD2 (GEN_3V3)	
T1	GND		-	
T2	GND		-	
T3	GPIO_3	ALT0: ESAI_RX_HF_CLK ALT1: ALT2: I2C3_SCL ALT3: XTALOSC_REF_CLK_24M ALT4: CCM_CLKO2 ALT5: GPIO1_IO03 ALT6: USB_H1_OC ALT7: MLB_CLK	NVCC_GPIO (GEN_3V3)	
T4	GND		-	
T5	GND		-	
T20	MCA_IO24	ALT0: ADC0_SE8/TSI0_IN6 ALT1: PTB11 ALT2: TPM0_CH0 ALT3:	LDO3_MCA	

T21	MCA_IO22	ALT0: ADC0_SE13 ALT1: PTB13 ALT2: TPM1_CH1 ALT3: RTC_CLKOUT	LDO3_MCA	
T22	MCA_IO10	ALT0: ADC0_SE5/TSI0_IN3/ DAC0_OUT/CMP0_IN3 ALT1: PTB1/IRQ_9 ALT2: UART0_TX ALT3: UART0_RX	LDO3_MCA	
T23	MCA_IO0	ALT0: ALT1: PTA5/LLWU_P1/RTC_CLK_IN ALT2: TPM0_CH5 ALT3: SPI0_SS_b	LDO3_MCA	
T24	MCA_IO3	ALT0: ADC0_SE3/TSI0_IN1 ALT1: PTA8 ALT2: *ALT3:*	LDO3_MCA	
U1	LVDS1_TX3_N		NVCC_LVDS_2P5	
U2	ENET_TXD0	ALT0: ALT1: ENET_TX_DATA0 ALT2: ESAI_TX4_RX1 ALT3: ALT4: ALT5: GPIO1_IO30 ALT6: ALT7:	NVCC_ENET	
U3	GND		-	
U4	RGMII_TXC	ALT0: USB_H2_DATA ALT1: RGMII_TXC ALT2: SPDIF_EXT_CLK ALT3: ALT4: ALT5: GPIO6_IO19 ALT6: ALT7: XTALOSC_REF_CLK_24M	NVCC_RGMII	
U5	RGMII_TD0	ALT0: HSI_TX_READY ALT1: RGMII_TD0 ALT2: ALT3: ALT4: ALT5: GPIO6_IO20 ALT6: ALT7:	NVCC_RGMII	
U6	DISP0_DAT21	ALT0: IPU1_DISP0_DATA21 ALT1: IPU2_DISP0_DATA21 ALT2: ECSPI1_MOSI ALT3: AUD4_TXD ALT4: ALT5: GPIO5_IO15 ALT6: ALT7:	NVCC_LCD	

U19	EIM_DA3	ALT0: EIM_DA03 ALT1: IPU1_DISP1_DATA06 ALT2: IPU2_CSI1_DATA06 ALT3: ALT4: ALT5: GPIO3_IO03 ALT6: ALT7: SRC_BOOT_CFG03	NVCC_EIM	
U20	EIM_DA0	ALT0: EIM_AD00 ALT1: IPU1_DISP1_DATA09 ALT2: IPU2_CSI1_DATA09 ALT3: ALT4: ALT5: GPIO3_IO00 ALT6: ALT7: SRC_BOOT_CFG00	NVCC_EIM	
U21	EIM_LBA	ALT0: EIM_LBA ALT1: IPU1_DI1_PIN17 ALT2: ECSPI2_SS1 ALT3: ALT4: ALT5: GPIO2_IO27 ALT6: ALT7: SRC_BOOT_CFG26	NVCC_EIM	
U22	MCA_IO11	ALT0: ADC0_SE4/TSI0_IN2 ALT1: PTB2/IRQ_10/LLWU_P5 ALT2: UART0_RX ALT3: UART0_TX	LDO3_MCA	
U23	EIM_DA6	ALT0: EIM_AD06 ALT1: IPU1_DISP1_DATA03 ALT2: IPU2_CSI1_DATA03 ALT3: ALT4: ALT5: GPIO3_IO06 ALT6: ALT7: SRC_BOOT_CFG06	NVCC_EIM	
U24	MCA_IO4	ALT0: ADC0_SE2/TSI0_IN0 ALT1: PTA9 ALT2: *ALT3:*	LDO3_MCA	
V1	LVDS1_TX3_P		NVCC_LVDS_2P5	
V2	ENET_TXD1	ALT0: MLB_CLK ALT1: ENET_TX_DATA1 ALT2: ESAI_TX2_RX3 ALT3: ALT4: ENET_1588_EVENT0_IN ALT5: GPIO1_IO29 ALT6: ALT7:	NVCC_ENET	
V3	NVCC_ENET		NVCC_ENET	

V4	RGMII_RX_CTL	ALT0: USB_H3_DATA ALT1: RGMII_RX_CTL ALT2: ALT3: ALT4: ALT5: GPIO6_IO24 ALT6: ALT7:	NVCC_RGMII	
V5	RGMII_TD1	ALT0: HSI_RX_FLAG ALT1: RGMII_TD1 ALT2: ALT3: ALT4: ALT5: GPIO6_IO21 ALT6: ALT7:	NVCC_RGMII	
V6	DISP0_DAT16	ALT0: IPU1_DISP0_DATA16 ALT1: IPU2_DISP0_DATA16 ALT2: ECSPI2_MOSI ALT3: AUD5_TXC ALT4: SDMA_EXT_EVENT0 ALT5: GPIO5_IO10 ALT6: ALT7:	NVCC_LCD	
V7	DISP0_DAT22	ALT0: IPU1_DISP0_DATA22 ALT1: IPU2_DISP0_DATA22 ALT2: ECSPI1_MISO ALT3: AUD4_TXFS ALT4: ALT5: GPIO5_IO16 ALT6: ALT7:	NVCC_LCD	
V8	DI0_PIN3	ALT0: IPU1_DI0_PIN03 ALT1: IPU2_DI0_PIN03 ALT2: AUD6_TXFS ALT3: ALT4: ALT5: GPIO4_IO19 ALT6: ALT7:	NVCC_LCD	
V9	DI0_DISP_CLK	ALT0: IPU1_DI0_DISP_CLK ALT1: IPU2_DI0_DISP_CLK ALT2: ALT3: ALT4: ALT5: GPIO4_IO16 ALT6: ALT7:	NVCC_LCD	

V10	DI0_PIN15	ALT0: IPU1_DI0_PIN15 ALT1: IPU2_DI0_PIN15 ALT2: AUD6_TXC ALT3: ALT4: ALT5: GPIO4_IO17 ALT6: ALT7:	NVCC_LCD	
V11	VSYS		VSYS	
V12	PMIC_GPIO11		-	PMIC
V13	PMIC_GPIO15		-	PMIC
V14	CHG_WAKE		-	PMIC
V15	EIM_OE	ALT0: EIM_OE ALT1: IPU1_DI1_PIN07 ALT2: ECSPI2_MISO ALT3: ALT4: ALT5: GPIO2_IO25 ALT6: ALT7:	NVCC_EIM	
V16	EIM_EB1	ALT0: EIM_EB1 ALT1: IPU1_DISP1_DATA10 ALT2: IPU2_CSI1_DATA10 ALT3: ALT4: ALT5: GPIO2_IO29 ALT6: ALT7: SRC_BOOT_CFG28	NVCC_EIM	
V17	EIM_D17	ALT0: EIM_DATA17 ALT1: ECSPI1_MISO ALT2: IPU1_DI0_PIN06 ALT3: IPU2_CSI1_PIXCLK ALT4: DCIC1_OUT ALT5: GPIO3_IO17 ALT6: I2C3_SCL ALT7:	NVCC_EIM	
V18	EIM_DA11	ALT0: EIM_DA11 ALT1: IPU1_DI1_PIN02 ALT2: IPU2_CSI1_HSYNC ALT3: ALT4: ALT5: GPIO3_IO11 ALT6: ALT7: SRC_BOOT_CFG11	NVCC_EIM	
V19	EIM_DA9	ALT0: EIM_DA9 ALT1: IPU1_DISP1_DATA00 ALT2: IPU2_CSI1_DATA00 ALT3: ALT4: ALT5: GPIO3_IO09 ALT6: ALT7: SRC_BOOT_CFG09	NVCC_EIM	

V20	EIM_DA13	ALT0: EIM_DA13 ALT1: IPU1_DI1_D0_CS ALT2: ALT3: ALT4: ALT5: GPIO3_IO13 ALT6: ALT7: SRC_BOOT_CFG13	NVCC_EIM	
V21	EIM_DA10	ALT0: EIM_DA10 ALT1: IPU1_DI1_PIN15 ALT2: IPU2_CSI1_DATA_EN ALT3: ALT4: ALT5: GPIO3_IO10 ALT6: ALT7: SRC_BOOT_CFG10	NVCC_EIM	
V22	EIM_DA12	ALT0: EIM_DA12 ALT1: IPU1_DI1_PIN03 ALT2: IPU2_CSI1_VSYNC ALT3: ALT4: ALT5: GPIO3_IO12 ALT6: ALT7: SRC_BOOT_CFG12	NVCC_EIM	
V23	GND		-	
V24	EIM_DA2	ALT0: EIM_DA02 ALT1: IPU1_DISP1_DATA07 ALT2: IPU2_CSI1_DATA07 ALT3: ALT4: ALT5: GPIO3_IO02 ALT6: ALT7: SRC_BOOT_CFG02	NVCC_EIM	
W1	GND		-	
W2	GND		-	
W3	ENET_MDC	ALT0: MLB_DATA ALT1: ENET_MDC ALT2: ESAI_TX5_RX0 ALT3: ALT4: ENET_1588_EVENT1_IN ALT5: GPIO1_IO31 ALT6: ALT7:	NVCC_ENET	
W4	RGMII_TX_CTL	ALT0: USB_H2_STROBE ALT1: RGMII_TX_CTL ALT2: ALT3: ALT4: ALT5: GPIO6_IO26 ALT6: ALT7: ENET_REF_CLK	NVCC_RGMII	
W5	GND		-	

W6	DISP0_DAT20	ALT0: IPU1_DISP0_DATA20 ALT1: IPU2_DISP0_DATA20 ALT2: ECSPI1_SCLK ALT3: AUD4_TXC ALT4: ALT5: GPIO5_IO14 ALT6: ALT7:	NVCC_LCD	
W7	DISP0_DAT15	ALT0: IPU1_DISP0_DATA15 ALT1: IPU2_DISP0_DATA15 ALT2: ECSPI1_SS1 ALT3: ECSPI2_SS1 ALT4: ALT5: GPIO5_IO09 ALT6: ALT7:	NVCC_LCD	
W8	DISP0_DAT13	ALT0: IPU1_DISP0_DATA13 ALT1: IPU2_DISP0_DATA13 ALT2: ALT3: AUD5_RXFS ALT4: ALT5: GPIO5_IO07 ALT6: ALT7:	NVCC_LCD	
W9	GND		-	
W10	DI0_PIN2	ALT0: IPU1_DI0_PIN02 ALT1: IPU2_DI0_PIN02 ALT2: AUD6_TXD ALT3: ALT4: ALT5: GPIO4_IO18 ALT6: ALT7:	NVCC_LCD	
W11	VSYS		VSYS	
W12	VSYS		VSYS	
W13	PMIC_PWR_EN		-	PMIC
W14	GND		-	
W15	EIM_RW	ALT0: EIM_RW ALT1: IPU1_DI1_PIN08 ALT2: ECSPI2_SS0 ALT3: ALT4: ALT5: GPIO2_IO26 ALT6: ALT7: SRC_BOOT_CFG29	NVCC_EIM	

W16	EIM_D29	ALT0: EIM_DATA29 ALT1: IPU1_DI1_PIN15 ALT2: ECSPI4_SS0 ALT3: ALT4: UART2_RTS_B ALT5: GPIO3_IO29 ALT6: IPU2_CSI1_VSYNC ALT7: IPU1_DI0_PIN14	NVCC_EIM	
W17	GND		-	
W18	EIM_A25	ALT0: EIM_ADDR25 ALT1: ECSPI4_SS1 ALT2: ECSPI2_RDY ALT3: IPU1_DI1_PIN12 ALT4: IPU1_DI0_D1_CS ALT5: GPIO5_IO02 ALT6: HDMI_TX_CEC_LINE ALT7:	NVCC_EIM	
W19	EIM_D20	ALT0: EIM_DATA20 ALT1: ECSPI4_SS0 ALT2: IPU1_DI0_PIN16 ALT3: IPU2_CSI1_DATA15 ALT4: UART1_RTS_B ALT5: GPIO3_IO20 ALT6: EPIT2_OUT ALT7:	NVCC_EIM	
W20	EIM_D24	ALT0: EIM_DATA24 ALT1: ECSPI4_SS2 ALT2: UART3_TX_DATA ALT3: ECSPI1_SS2 ALT4: ECSPI2_SS2 ALT5: GPIO3_IO24 ALT6: AUD5_RXFS ALT7: UART1_DTR_B	NVCC_EIM	
W21	EIM_DA14	ALT0: EIM_DA14 ALT1: IPU1_DI1_D1_CS ALT2: ALT3: ALT4: ALT5: GPIO3_IO14 ALT6: ALT7: SRC_BOOT_CFG14	NVCC_EIM	
W22	EIM_DA8	ALT0: EIM_DA8 ALT1: IPU1_DISP1_DATA01 ALT2: IPU2_CSI1_DATA01 ALT3: ALT4: ALT5: GPIO3_IO08 ALT6: ALT7: SRC_BOOT_CFG08	NVCC_EIM	

W23	EIM_DA1	ALT0: EIM_DA1 ALT1: IPU1_DISP1_DATA08 ALT2: IPU2_CSI1_DATA08 ALT3: ALT4: ALT5: GPIO3_IO01 ALT6: ALT7: SRC_BOOT_CFG01	NVCC_EIM	
W24	EIM_DA4	ALT0: EIM_DA4 ALT1: IPU1_DISP1_DATA05 ALT2: IPU2_CSI1_DATA05 ALT3: ALT4: ALT5: GPIO3_IO04 ALT6: ALT7: SRC_BOOT_CFG04	NVCC_EIM	
Y1	ENET_REF_CLK	ALT0: ALT1: ENET_TX_CLK ALT2: ESAI_RX_FS ALT3: ALT4: ALT5: GPIO1_IO23 ALT6: SPDIF_SR_CLK ALT7:	NVCC_ENET	
Y2	ENET_RXD0	ALT0: ALT1: ENET_RX_DATA0 ALT2: ESAI_TX_HF_CLK ALT3: SPDIF_OUT ALT4: ALT5: GPIO1_IO27 ALT6: ALT7:	NVCC_ENET	
Y3	ENET_MDIO	ALT0: ALT1: ENET_MDIO ALT2: ESAI_RX_CLK ALT3: ALT4: ENET_1588_EVENT1_OUT ALT5: GPIO1_IO22 ALT6: SPDIF_LOCK ALT7:	NVCC_ENET	
Y4	GND		-	
Y5	RGMII_TD2	ALT0: HSI_RX_DATA ALT1: RGMII_TD2 ALT2: ALT3: ALT4: ALT5: GPIO6_IO22 ALT6: ALT7:	NVCC_RGMII	

Y6	DISP0_DAT19	ALT0: IPU1_DISP0_DATA19 ALT1: IPU2_DISP0_DATA19 ALT2: ECSPI2_SCLK ALT3: AUD5_RXD ALT4: AUD4_RXC ALT5: GPIO5_IO13 ALT6: ALT7: EIM_CS3	NVCC_LCD	
Y7	DISP0_DAT11	ALT0: IPU1_DISP0_DATA11 ALT1: IPU2_DISP0_DATA11 ALT2: ALT3: ALT4: ALT5: GPIO5_IO05 ALT6: ALT7:	NVCC_LCD	
Y8	DISP0_DAT10	ALT0: IPU1_DISP0_DATA10 ALT1: IPU2_DISP0_DATA10 ALT2: ALT3: ALT4: ALT5: GPIO4_IO31 ALT6: ALT7:	NVCC_LCD	
Y9	NVCC_LCD		NVCC_LCD	
Y10	PMIC_GPIO14		-	
Y11	GND		-	
Y12	GND		-	
Y13	NVCC_EIM		NVCC_EIM	
Y14	EIM_EB0	ALT0: EIM_EB0 ALT1: IPU1_DISP1_DATA11 ALT2: IPU2_CSI1_DATA11 ALT3: ALT4: CCM_PMIC_READY ALT5: GPIO2_IO28 ALT6: ALT7: SRC_BOOT_CFG27	NVCC_EIM	
Y15	EIM_D30	ALT0: EIM_DATA30 ALT1: IPU1_DISP1_DATA21 ALT2: IPU1_DI0_PIN11 ALT3: IPU1_CSI0_DATA03 ALT4: UART3_CTS_B ALT5: GPIO3_IO30 ALT6: USB_H1_OC ALT7:	NVCC_EIM	

Y16	EIM_D21	ALT0: EIM_DATA21 ALT1: ECSPI4_SCLK ALT2: IPU1_DI0_PIN17 ALT3: IPU2_CSI1_DATA11 ALT4: USB_OTG_OC ALT5: GPIO3_IO21 ALT6: I2C1_SCL ALT7: SPDIF_IN	NVCC_EIM	
Y17	EIM_D19	ALT0: EIM_DATA19 ALT1: ECSPI1_SS1 ALT2: IPU1_DI0_PIN08 ALT3: IPU2_CSI1_DATA16 ALT4: UART1_CTS_B ALT5: GPIO3_IO19 ALT6: EPIT1_OUT ALT7:	NVCC_EIM	
Y18	EIM_D22	ALT0: EIM_DATA22 ALT1: ECSPI4_MISO ALT2: IPU1_DI0_PIN01 ALT3: IPU2_CSI1_DATA10 ALT4: USB_OTG_PWR ALT5: GPIO3_IO22 ALT6: SPDIF_OUT ALT7:	NVCC_EIM	
Y19	GND		-	
Y20	EIM_DA15	ALT0: EIM_DA15 ALT1: IPU1_DI1_PIN01 ALT2: IPU1_DI1_PIN04 ALT3: ALT4: ALT5: GPIO3_IO15 ALT6: ALT7: SRC_BOOT_CFG15	NVCC_EIM	
Y21	EIM_DA7	ALT0: EIM_DA7 ALT1: IPU1_DISP1_DATA02 ALT2: IPU2_CSI1_DATA02 ALT3: ALT4: ALT5: GPIO3_IO07 ALT6: ALT7: SRC_BOOT_CFG07	NVCC_EIM	
Y22	MCA_IO27		LDO3_MCA	
Y23	MCA_IO23		LDO3_MCA	
Y24	EIM_EB2	ALT0: EIM_EB2 ALT1: ECSPI1_SS0 ALT2: ALT3: IPU2_CSI1_DATA19 ALT4: HDMI_TX_DDC_SCL ALT5: GPIO2_IO30 ALT6: I2C2_SCL ALT7: SRC_BOOT_CFG30	NVCC_EIM	

AA2	ENET_RXD1	ALT0: MLB_SIG ALT1: ENET_RX_DATA1 ALT2: ESAI_TX_FS ALT3: ALT4: ENET_1588_EVENT3_OUT ALT5: GPIO1_IO26 ALT6: ALT7:	NVCC_ENET	
AA3	ENET_TX_EN	ALT0: ALT1: ENET_TX_EN ALT2: ESAI_TX3_RX2 ALT3: ALT4: ALT5: GPIO1_IO28 ALT6: ALT7:	NVCC_ENET	
AA4	RGMII_RD0	ALT0: HSI_RX_READY ALT1: RGMII_RD0 ALT2: ALT3: ALT4: ALT5: GPIO6_IO25 ALT6: ALT7:	NVCC_RGMII	
AA5	RGMII_TD3	ALT0: HSI_RX_WAKE ALT1: RGMII_TD3 ALT2: ALT3: ALT4: ALT5: GPIO6_IO23 ALT6: ALT7:	NVCC_RGMII	
AA6	DISP0_DAT23	ALT0: IPU1_DISP0_DATA23 ALT1: IPU2_DISP0_DATA23 ALT2: ECSPI1_SS0 ALT3: AUD4_RXD ALT4: ALT5: GPIO5_IO17 ALT6: ALT7:	NVCC_LCD	
AA7	DISP0_DAT12	ALT0: IPU1_DISP0_DATA12 ALT1: IPU2_DISP0_DATA12 ALT2: ALT3: ALT4: ALT5: GPIO5_IO06 ALT6: ALT7:	NVCC_LCD	

AA8	DISP0_DAT8	ALT0: IPU1_DISP0_DATA08 ALT1: IPU2_DISP0_DATA08 ALT2: PWM1_OUT ALT3: WDOG1_B ALT4: ALT5: GPIO4_IO29 ALT6: ALT7:	NVCC_LCD	
AA9	DISP0_DAT4	ALT0: IPU1_DISP0_DATA04 ALT1: IPU2_DISP0_DATA04 ALT2: ECSPI3_SS1 ALT3: ALT4: ALT5: GPIO4_IO25 ALT6: ALT7:	NVCC_LCD	
AA10	VLDO6		VLDO6	
AA11	VLDO7		VLDO7	
AA12	GEN_3V3		GEN_3V3	
AA13	EIM_WAIT	ALT0: EIM_WAIT ALT1: EIM_DTACK_B ALT2: ALT3: ALT4: ALT5: GPIO5_IO00 ALT6: ALT7: SRC_BOOT_CFG25	NVCC_EIM	
AA14	EIM_A23	ALT0: EIM_ADDR23 ALT1: IPU1_DISP1_DATA18 ALT2: IPU2_CSI1_DATA18 ALT3: IPU2_SISG3 ALT4: IPU1_SISG3 ALT5: GPIO6_IO06 ALT6: ALT7: SRC_BOOT_CFG23	NVCC_EIM	
AA15	EIM_D31	ALT0: EIM_DATA31 ALT1: IPU1_DISP1_DATA20 ALT2: IPU1_DI0_PIN12 ALT3: IPU1_CSI0_DATA02 ALT4: UART3_RTS_B ALT5: GPIO3_IO31 ALT6: USB_H1_PWR ALT7:	NVCC_EIM	
AA16	GND		-	
AA17	EIM_D25	ALT0: EIM_DATA25 ALT1: ECSPI4_SS3 ALT2: UART3_RX_DATA ALT3: ECSPI1_SS3 ALT4: ECSPI2_SS3 ALT5: GPIO3_IO25 ALT6: AUD5_RXC ALT7: UART1_DSR_B	NVCC_EIM	

AA18	EIM_EB3	ALT0: EIM_EB3 ALT1: ECSPI4_RDY ALT2: UART3_RTS_B ALT3: UART1_RI_B ALT4: IPU2_CSI1_HSYNC ALT5: GPIO2_IO31 ALT6: IPU1_DI1_PIN03 ALT7: SRC_BOOT_CFG31	NVCC_EIM	
AA19	EIM_DA5	ALT0: EIM_DA5 ALT1: IPU1_DISP1_DATA04 ALT2: IPU2_CSI1_DATA04 ALT3: ALT4: ALT5: GPIO3_IO05 ALT6: ALT7: SRC_BOOT_CFG05	NVCC_EIM	
AA20	MCA_IO21		LDO3_MCA	
AA21	MCA_IO26		LDO3_MCA	
AA22	MCA_IO25		LDO3_MCA	
AA23	MCA_IO6/ PMIC_GP_FB2		LDO3_MCA	
AB3	RGMII_RD1	ALT0: HSI_TX_FLAG ALT1: RGMII_RD1 ALT2: ALT3: ALT4: ALT5: GPIO6_IO27 ALT6: ALT7:	NVCC_RGMII	
AB4	GND		-	
AB5	DISP0_DAT17	ALT0: IPU1_DISP0_DATA17 ALT1: IPU2_DISP0_DATA17 ALT2: ECSPI2_MISO ALT3: AUD5_TXD ALT4: SDMA_EXT_EVENT1 ALT5: GPIO5_IO11 ALT6: ALT7:	NVCC_LCD	
AB6	DISP0_DAT9	ALT0: IPU1_DISP0_DATA09 ALT1: IPU2_DISP0_DATA09 ALT2: PWM2_OUT ALT3: WDOG2_B ALT4: ALT5: GPIO4_IO30 ALT6: ALT7:	NVCC_LCD	

AB7	DISP0_DAT6	ALT0: IPU1_DISP0_DATA06 ALT1: IPU2_DISP0_DATA06 ALT2: ECSPI3_SS3 ALT3: AUD6_RXC ALT4: ALT5: GPIO4_IO27 ALT6: ALT7:	NVCC_LCD	
AB8	DISP0_DAT3	ALT0: IPU1_DISP0_DATA03 ALT1: IPU2_DISP0_DATA03 ALT2: ECSPI3_SS0 ALT3: ALT4: ALT5: GPIO4_IO24 ALT6: ALT7:	NVCC_LCD	
AB9	PMIC_GPIO7		-	PMIC
AB10	GND		-	
AB11	Reserved		-	
AB12	EIM_BCLK	ALT0: EIM_BCLK ALT1: IPU1_DI1_PIN16 ALT2: ALT3: ALT4: ALT5: GPIO6_IO31 ALT6: ALT7:	NVCC_EIM	
AB13	EIM_CS0	ALT0: EIM_CS0 ALT1: IPU1_DI1_PIN05 ALT2: ECSPI2_SCLK ALT3: ALT4: ALT5: GPIO2_IO23 ALT6: ALT7:	NVCC_EIM	
AB14	PMIC_ADCIN1/ GPIO0		-	PMIC
AB15	EIM_A18	ALT0: EIM_ADDR18 ALT1: IPU1_DISP1_DATA13 ALT2: IPU2_CSI1_DATA13 ALT3: ALT4: ALT5: GPIO2_IO20 ALT6: ALT7: SRC_BOOT_CFG18	NVCC_EIM	
AB16	EIM_A20	ALT0: EIM_ADDR20 ALT1: IPU1_DISP1_DATA15 ALT2: IPU2_CSI1_DATA15 ALT3: ALT4: ALT5: GPIO2_IO18 ALT6: ALT7: SRC_BOOT_CFG20	NVCC_EIM	

AB17	EIM_D28	ALT0: EIM_DATA28 ALT1: I2C1_SDA ALT2: ECSPI4_MOSI ALT3: IPU2_CSI1_DATA12 ALT4: UART2_CTS_B ALT5: GPIO3_IO28 ALT6: IPU1_EXT_TRIG ALT7: IPU1_DI0_PIN13	NVCC_EIM	
AB18	EIM_D18	ALT0: EIM_DATA18 ALT1: ECSPI1_MOSI ALT2: IPU1_DI0_PIN07 ALT3: IPU2_CSI1_DATA17 ALT4: IPU1_DI1_D0_CS ALT5: GPIO3_IO18 ALT6: I2C3_SDA ALT7:	NVCC_EIM	
AB19	PMIC_PWR1_EN			
AB20	#PMIC_VDD_FAULT			
AB21	GND		-	
AB22	#PMIC_OFF			
AC4	RGMII_RD2	ALT0: HSI_TX_DATA ALT1: RGMII_RD2 ALT2: ALT3: ALT4: ALT5: GPIO6_IO28 ALT6: ALT7:	NVCC_RGMII	
AC5	RGMII_RD3	ALT0: HSI_TX_WAKE ALT1: RGMII_RD3 ALT2: ALT3: ALT4: ALT5: GPIO6_IO29 ALT6: ALT7:	NVCC_RGMII	
AC6	DISP0_DAT14	ALT0: IPU1_DISP0_DATA14 ALT1: IPU2_DISP0_DATA14 ALT2: ALT3: AUD5_RXC ALT4: ALT5: GPIO5_IO08 ALT6: ALT7:	NVCC_LCD	
AC7	DISP0_DAT7	ALT0: IPU1_DISP0_DATA07 ALT1: IPU2_DISP0_DATA07 ALT2: ECSPI3_RDY ALT3: ALT4: ALT5: GPIO4_IO28 ALT6: ALT7:	NVCC_LCD	

AC8	DISP0_DAT0	ALT0: IPU1_DISP0_DATA00 ALT1: IPU2_DISP0_DATA00 ALT2: ECSPI3_SCLK ALT3: ALT4: ALT5: GPIO4_IO21 ALT6: ALT7:	NVCC_LCD	
AC9	DISP0_DAT1	ALT0: IPU1_DISP0_DATA01 ALT1: IPU2_DISP0_DATA01 ALT2: ECSPI3_MOSI ALT3: ALT4: ALT5: GPIO4_IO22 ALT6: ALT7:	NVCC_LCD	
AC10	MCA_VREFH		-	
AC11	Reserved		-	
AC12	GND		-	
AC13	GND		-	
AC14	PMIC_ADCIN2/ GPIO1		-	PMIC
AC15	EIM_CS1	ALT0: EIM_CS1 ALT1: IPU1_DI1_PIN06 ALT2: ECSPI2_MOSI ALT3: ALT4: ALT5: GPIO2_IO24 ALT6: ALT7:	NVCC_EIM	
AC16	EIM_A21	ALT0: EIM_ADDR21 ALT1: IPU1_DISP1_DATA16 ALT2: IPU2_CSI1_DATA16 ALT3: ALT4: ALT5: GPIO2_IO17 ALT6: ALT7: SRC_BOOT_CFG21	NVCC_EIM	
AC17	EIM_A17	ALT0: EIM_ADDR17 ALT1: IPU1_DISP1_DATA12 ALT2: IPU2_CSI1_DATA12 ALT3: ALT4: ALT5: GPIO2_IO21 ALT6: ALT7: SRC_BOOT_CFG17	NVCC_EIM	
AC18	GND		-	

AC19	EIM_A22	ALT0: EIM_ADDR22 ALT1: IPU1_DISP1_DATA17 ALT2: IPU2_CSI1_DATA17 ALT3: ALT4: ALT5: GPIO2_IO16 ALT6: ALT7: SRC_BOOT_CFG22	NVCC_EIM	
AC20	EIM_D23	ALT0: EIM_DATA23 ALT1: IPU1_DI0_D0_CS ALT2: UART3_CTS_B ALT3: UART1_DCD_B ALT4: IPU2_CSI1_DATA_EN ALT5: GPIO3_IO23 ALT6: IPU1_DI1_PIN02 ALT7: IPU1_DI1_PIN14	NVCC_EIM	
AC21	MCA_IO28		LDO3_MCA	
AD5	RGMII_RXC	ALT0: USB_H3_STROBE ALT1: RGMII_RXC ALT2: ALT3: ALT4: ALT5: GPIO6_IO30 ALT6: ALT7:	NVCC_RGMII	
AD6	DISP0_DAT18	ALT0: IPU1_DISP0_DATA18 ALT1: IPU2_DISP0_DATA18 ALT2: ECSPI2_SS0 ALT3: AUD5_TXFS ALT4: AUD4_RXFS ALT5: GPIO5_IO12 ALT6: ALT7: EIM_CS2	NVCC_LCD	
AD7	DISP0_DAT5	ALT0: IPU1_DISP0_DATA05 ALT1: IPU2_DISP0_DATA05 ALT2: ECSPI3_SS2 ALT3: AUD6_RXFS ALT4: ALT5: GPIO4_IO26 ALT6: ALT7:	NVCC_LCD	
AD8	DI0_PIN4	ALT0: IPU1_DI0_PIN04 ALT1: IPU2_DI0_PIN04 ALT2: AUD6_RXD ALT3: SD1_WP ALT4: ALT5: GPIO4_IO20 ALT6: ALT7:	NVCC_LCD	

AD9	DISP0_DAT2	ALT0: IPU1_DISP0_DATA02 ALT1: IPU2_DISP0_DATA02 ALT2: ECSPI3_MISO ALT3: ALT4: ALT5: GPIO4_IO23 ALT6: ALT7:	NVCC_LCD	
AD10	VLDO4		-	
AD11	VLDO8		-	
AD12	PMIC_GP_FB3		-	PMIC
AD13	PMIC_GP_FB1/ GPIO13		-	PMIC
AD14	PMIC_ADCIN3/ GPIO2		-	PMIC
AD15	EIM_A16	ALT0: EIM_ADDR16 ALT1: IPU1_DI1_DISP_CLK ALT2: IPU2_CSI1_PIXCLK ALT3: ALT4: ALT5: GPIO2_IO22 ALT6: ALT7: SRC_BOOT_CFG16	NVCC_EIM	
AD16	EIM_A19	ALT0: EIM_ADDR19 ALT1: IPU1_DISP1_DATA14 ALT2: IPU2_CSI1_DATA14 ALT3: ALT4: ALT5: GPIO2_IO19 ALT6: ALT7: SRC_BOOT_CFG19	NVCC_EIM	
AD17	EIM_A24	ALT0: EIM_ADDR24 ALT1: IPU1_DISP1_DATA19 ALT2: IPU2_CSI1_DATA19 ALT3: IPU2_SISG2 ALT4: IPU1_SISG2 ALT5: GPIO5_IO04 ALT6: ALT7: SRC_BOOT_CFG24	NVCC_EIM	
AD18	EIM_D27	ALT0: EIM_DATA27 ALT1: IPU1_DI1_PIN13 ALT2: IPU1_CSI0_DATA00 ALT3: IPU2_CSI1_DATA13 ALT4: UART2_RX_DATA ALT5: GPIO3_IO27 ALT6: IPU1_SISG3 ALT7: IPU1_DISP1_DATA23	NVCC_EIM	

AD19	EIM_D26	ALT0: EIM_DATA26 ALT1: IPU1_DI1_PIN11 ALT2: IPU1_CSI0_DATA01 ALT3: IPU2_CSI1_DATA14 ALT4: UART2_TX_DATA ALT5: GPIO3_IO26 ALT6: IPU1_SISG2 ALT7: IPU1_DISP1_DATA22	NVCC_EIM	
AD20	EIM_D16	ALT0: EIM_DATA16 ALT1: ECSPI1_SCLK ALT2: IPU1_DI0_PIN05 ALT3: IPU2_CSI1_DATA18 ALT4: HDMI_TX_DDC_SDA ALT5: GPIO3_IO16 ALT6: I2C2_SDA ALT7:	NVCC_EIM	

Signal Usage Limitations

The following signals available on ConnectCore for i.MX6 pads have a limited usage:

- SD1_CLK (pad L21), SD1_CMD (pad J23), SD1_DAT[3:0] (pads L20, J21, J22 and N24) are only available externally on modules which don't have Wi-Fi populated.
- SD3_DAT4/BT_UART_RXD (pad C22), SD3_DAT5/BT_UART_TXD (pad D23), SD3_CLK/BT_UART_RTS (pad B21), SD3_CMD/BT_UART_CTS (pad E23) are only available externally on modules which don't have Bluetooth populated.
- NANDF_CLE/BT_WAKE (pad E22) is only available externally on modules which don't have Bluetooth populated.
- I2C2_SCL/KEY_COL3 (pad C3) and I2C2_SDA/KEY_ROW3 (pad F2) are used on the module as I2C signals connected to the PMIC and MCA processor. Using these signals externally should be done with caution, since it could prevent the module from working properly. It is recommended that you use another I2C port for connecting external devices to the ConnectCore i.MX6 module in order to avoid excessive bus load.
- NANDF_CS1/#MCA_INT (pad H21), CSI0_DAT11/ECSPI2_SS0 (pad A6), CSI0_DAT8/ECSPI2_SCLK (pad D6), CSI0_DAT10/ECSPI2_MISO (pad K5) and CSI0_DAT9/ECSPI2_MOSI (pad D5) are connected to MCA processor. #MCA_INT is a signal reserved as interrupt between MCA processor and i.MX6 processor. The other signals are a SPI bus shared between i.MX6 and MCA processor. The usage and availability of these signals is depending on the firmware running in the MCA processor.
- ON/OFF (pad D18) signal is connected to PMIC and MCA.
- #POR (pad E18) is connected to PMIC and i.MX6 processor.

About the ConnectCore 6 Adapter Board

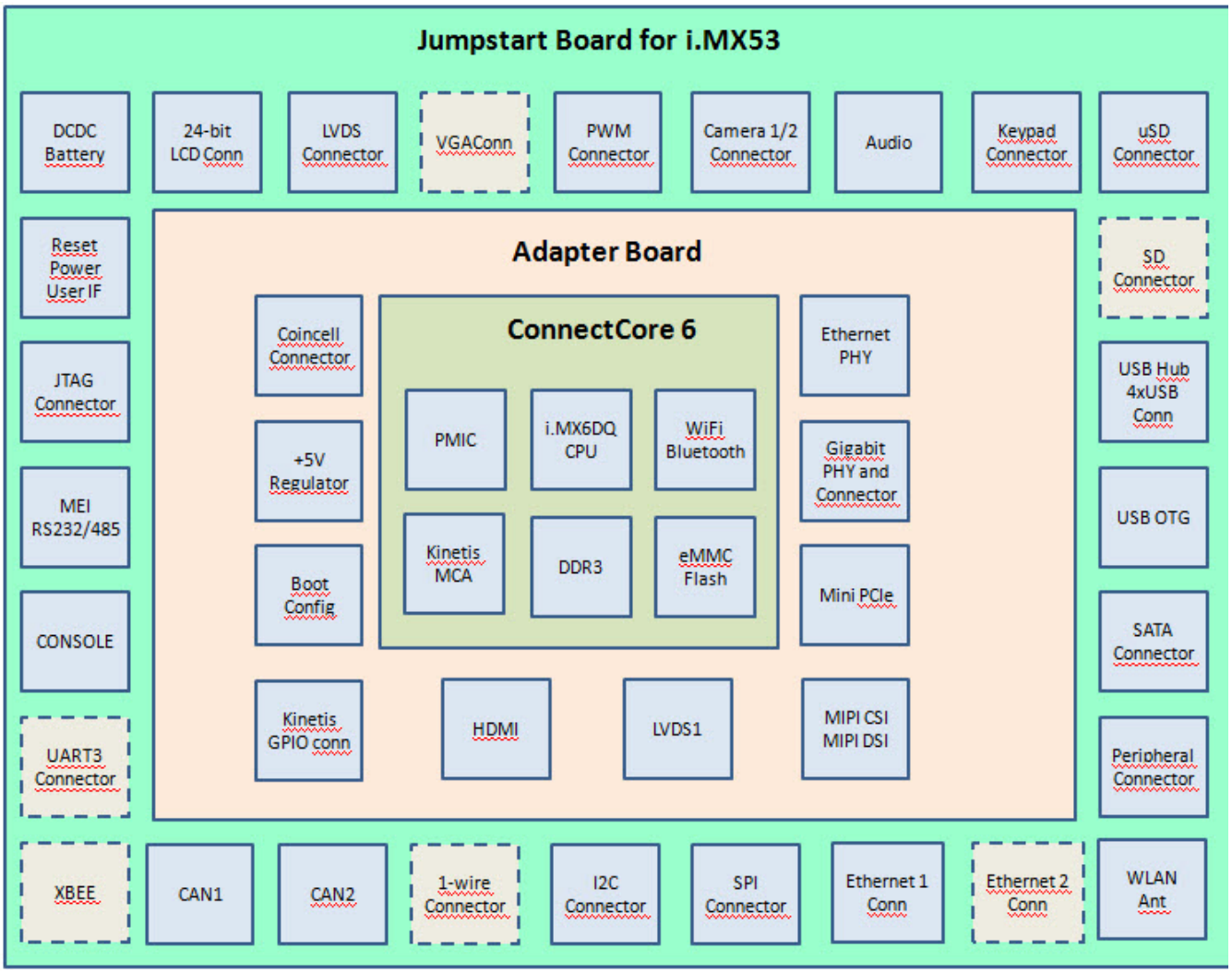
The ConnectCore 6 adapter board allows connecting the ConnectCore 6 module to the Jumpstart board for the i.MX53 (JSCCWMX53), providing connections and hardware to use most of the interfaces of the module for initial development and prototyping.

The ConnectCore 6 module is soldered on the adapter board. The adapter has two 2x90 pin connectors for connecting the board to the JSCCWMX53.

The following picture shows the block diagram of hardware formed by the ConnectCore 6, the adapter board and the JSCCWMX53. Dash boxes represent interfaces of the JSCCWMX53 that are not connected to the adapter board.

Refer to the Single Board Computer (SBC) development board design information posted on the Digi technical support website for a reference design based on a discrete implementation without using an adapter board.

Hardware block diagram of the ConnectCore 6

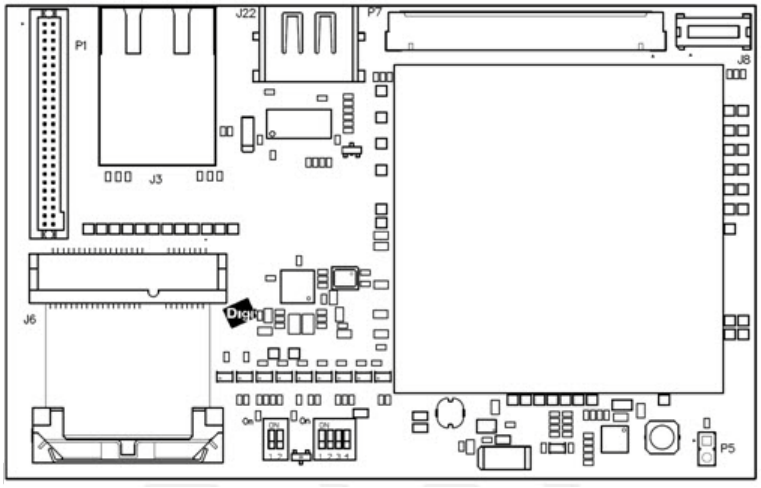


Features of the ConnectCore 6 Adapter Board

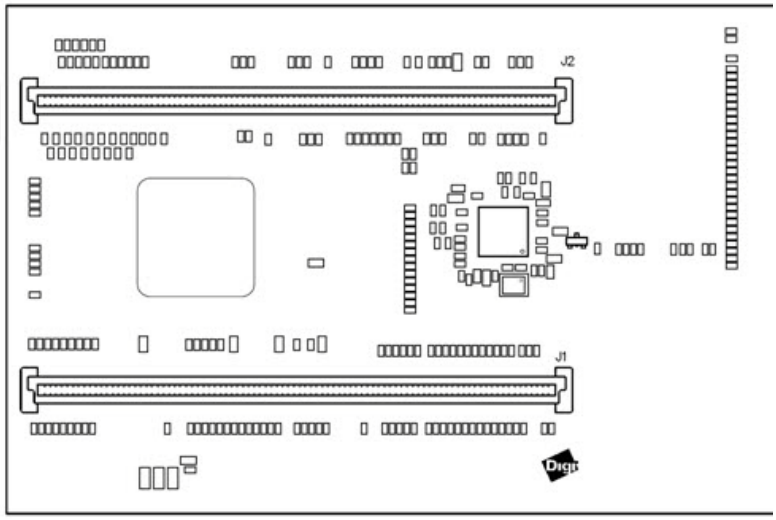
- ConnectCore 6 module
- Boot mode and boot source configuration switches
- +5V regulator
- Coin cell connector to supply the on module RTC
- Gigabit Ethernet PHY
- Gigabit Ethernet connector with link and speed LEDs
- HDMI connector
- LVDS1 connector
- MIPI Camera & MIPI Display connector
- PCI express mini card connector
- Connector for the Kinetis GPIO signals and SWD (single wire debug) interface.
- Two 2x90 pin connectors for connecting the board to the JSCCWMX53

ConnectCore 6 Adapter Board

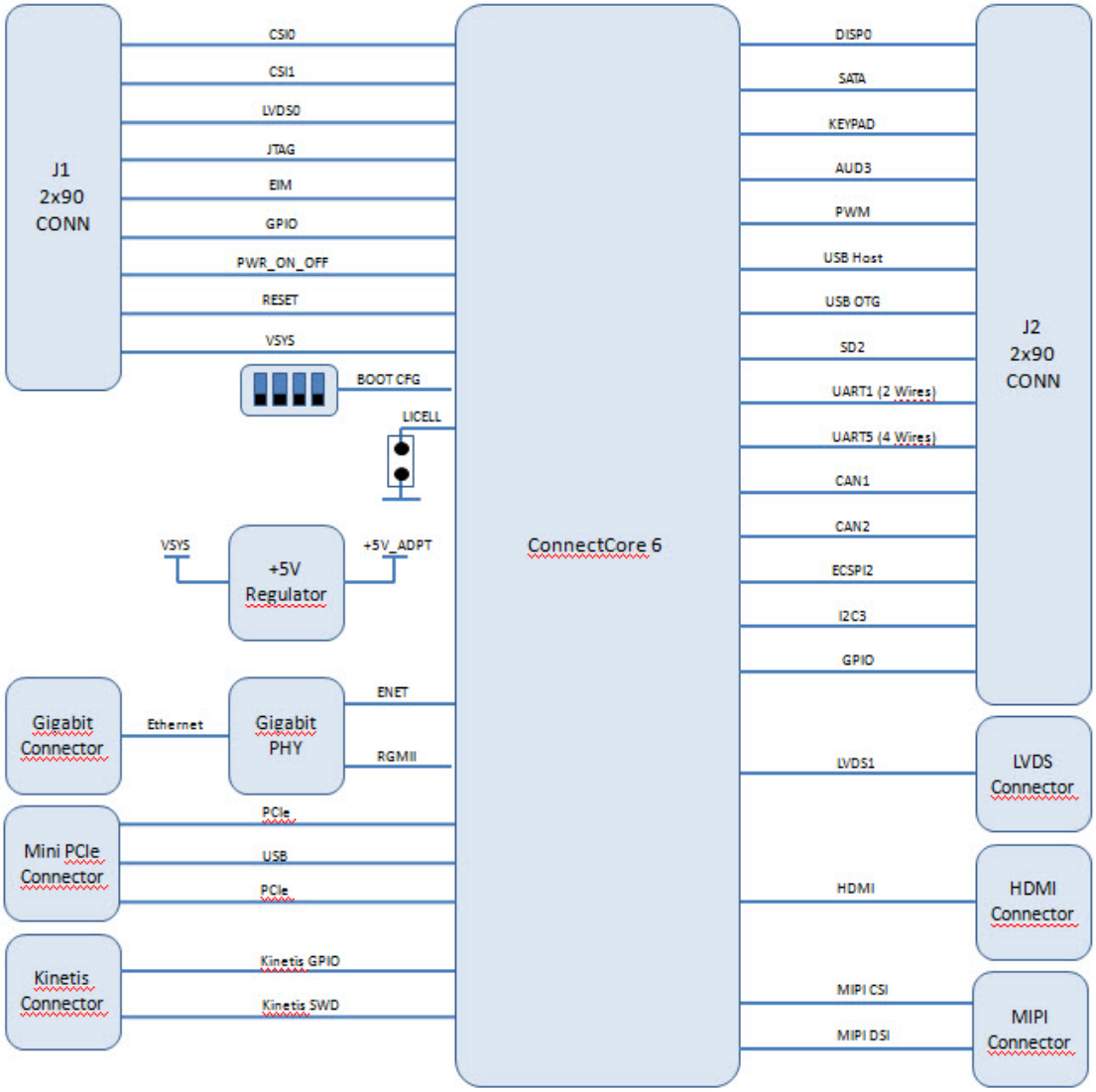
Top side



Bottom side



Block Diagram



ConnectCore 6 GPIO Assignments

The table below show the default GPIO assignments done on the ConnectCore 6 module on the adapter board.

Signal name	GPIO	Use on the adapter board
NAND_D0	GPIO2_0	Audio Headphone detection
NAND_D1	GPIO2_1	JSCCWMX53 Touch IRQ
NAND_D2	GPIO2_2	User LED1
NAND_D3	GPIO2_3	User LED2
NAND_D4	GPIO2_4	User Key 1
NAND_D5	GPIO2_5	User Key 2

NAND_D6	GPIO2_6	EIM IRQ
NAND_D7	GPIO2_7	JSCCWMX53 DIGIO0
EIM_CSI	GPIO2_24	JSCCWMX53 DIGIO1
EIM_EB0	GPIO2_28	JSCCWMX53 DIGIO2
EIM_EB1	GPIO2_29	JSCCWMX53 DIGIO3
EIM_DA10	GPIO3_10	USB Hub reset
EIM_DA15	GPIO3_15	CSI1 Reset / Key Col 7
EIM_WAIT	GPIO5_0	CSI0 Reset / Key Row 7
EIM_BCLK	GPIO6_31	MIPI Backlight control
SD3_DAT2	GPIO7_6	MIPI GPIO
SD3_DAT3	GPIO7_7	PCIe Mini Card Wake up
SD3_RST	GPIO7_8	PCIe Mini Card Reset
GPIO_16	GPIO7_11	LVDS1 Touch IRQ

I2C Address Table

The ConnectCore 6 module has three I2C busses available on the module pinout. The default configuration of the adapter board uses I2C2 and I2C3 busses. The following tables show the configuration and use of these two I2C busses on the adapter board.

I2C2

This I2C bus is used internally on the ConnectCore 6 module. The bus is connected to the PMIC and to the Kinetis MCA, and it's used to configure and monitor the PMIC.

This I2C bus is available on the module PADs, but should not be used unless absolutely necessary. A problem on this bus can cause the module to not boot correctly.

Two 4K7 pull-up resistors to 3.3V are connected to the I2C2 lines on the ConnectCore 6 module.

The following table shows the interfaces connected to the I2C2 bus.

Interface	**Speed (Kbps)**	**Address**
Kinetis MCA	400	SW configurable
PMIC	400	Write: 0xB0 Read: 0xB1
Module PADs	400	

I2C3

The I2C bus is not used internally on the ConnectCore 6 module. Two 2K2 pull-up resistors to 3.3V are connected to the I2C3 lines on the adapter board.

The following table shows the interfaces connected to the I2C3 bus.

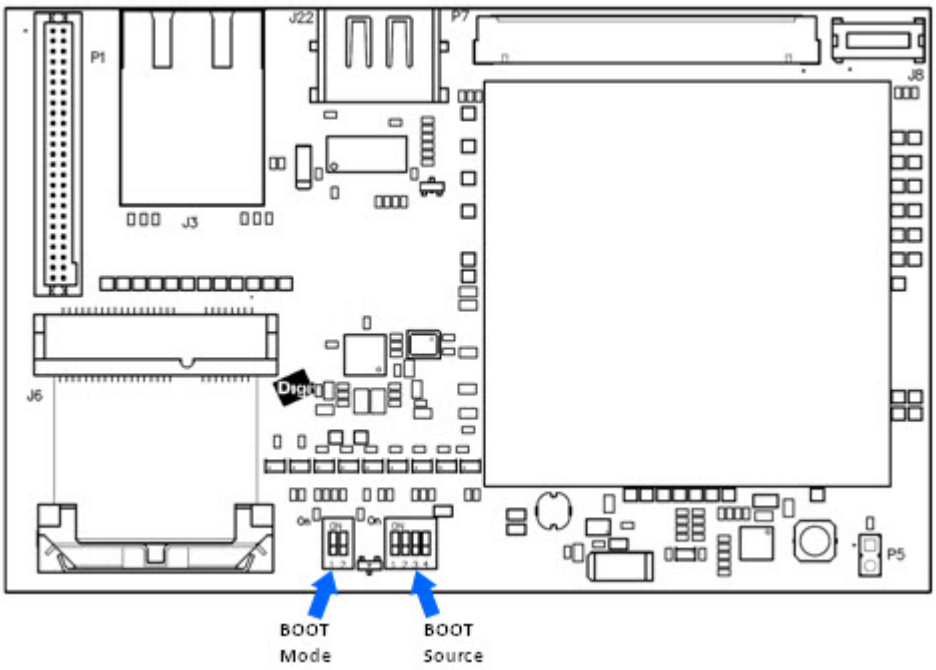
Interface	Speed (Kbps)	Address	Comment
HDMI EDID	100	0x50	Read only accesses
HDMI Transmitter	400	0x38, 0x39, 0x3F	Not used (1)
MIPI Camera	-	-	Depend on display used
PCIe mini card	-	-	Depend on PCIe card used
Parallel LCD (touch)	-	-	Depend on the LCD used
Audio CODEC	400	0x0A	Address of SGTL5000
Peripheral Connector	-	-	Depends on the device connected
RTC (2)	400	0x56	Address of EM3027 RTC
I2C connector	-	-	Depends on the device connected

(1) The JSCCWMX53 has an HDMI transmitter. This device is not used because an HDMI transmitter is already integrated on the ConnectCore 6 module.

(2) The JSCCWMX53 has an EM3027 RTC device. This device is not used because an RTC controller is already integrated on the ConnectCore 6 module.

Boot Switches for the ConnectCore 6

Boot Switches



Boot Mode Switch, SW6

Use SW6 to configure the module boot mode:

SW6 Pin 1	SW6 Pin 2	Comments
OFF	OFF	Boot from Fuses
ON	OFF	Serial downloader
OFF	ON	Boot from board settings
ON	ON	Reserved

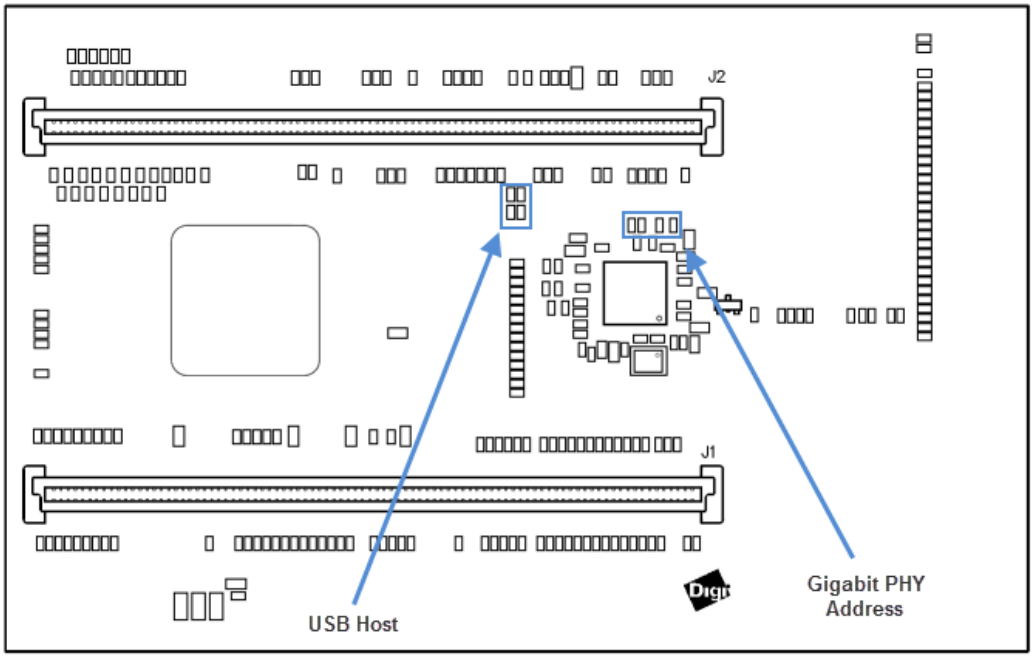
Boot Source Switch, SW5

Use SW5 to configure the source of the boot code when SW6 is configured in boot from the board settings mode.

SW5 Pin 1	SW5 Pin 2	SW5 Pin 3	SW5 Pin 3	Comments
ON	ON	OFF	OFF	Boot from eMMC, 1-bit data bus
OFF	ON	OFF	OFF	Boot from eMMC, 4-bit data bus
ON	OFF	OFF	OFF	Boot from eMMC, 8-bit data bus
ON	-	ON	OFF	Boot from microSD, 4-bit data bus
-	-	OFF	ON	Boot from SATA

Configuration Resistors for the ConnectCore 6

Configuration resistors



Gigabit Ethernet PHY Address

The adapter board has a Gigabit PHY for the Gigabit interface. The address of the Gigabit PHY can be configured with four configuration resistors.

The Gigabit PHY address configured by default is 0x0.

R32	R24	R30	R31	PHY Address
NOT Populated	Populated	NOT Populated	Populated	0x0
Populated	NOT Populated	NOT Populated	Populated	0x1
NOT Populated	Populated	Populated	NO Populated	0x2
Populated	NOT Populated	Populated	NOT Populated	0x3

USB Host

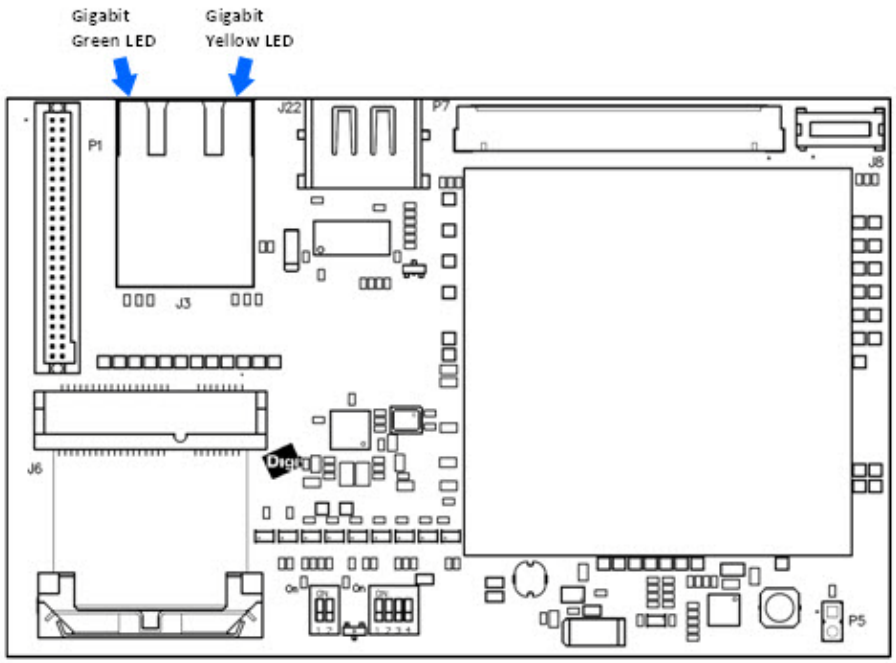
The ConnectCore 6 module provides one USB Host port. This USB port can be connected on the adapter board to the PCIe mini card connector and to the JSCCWMX53. Four configuration resistors are used to select the interface where the USB Host is connected.

By default the USB Host port is connected to the JSCCWMX53.

R678	R679	R658	R659	USB host connection
NOT Populated	NOT Populated	Populated	Populated	To JSCCWMX53
Populated	Populated	NOT Populated	NOT Populated	To PCIe

ConnectCore 6 Gigabit LEDs

Gigabit LEDs

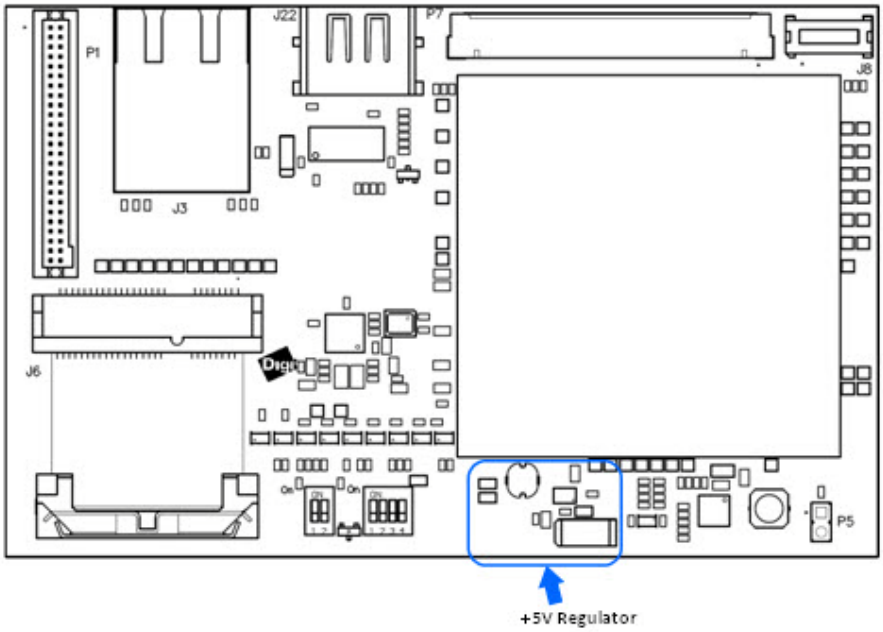


Gigabit Ethernet LEDs

The Gigabit Ethernet PHY has two outputs to indicate the link and activity status of the port. These outputs are connected to a green LED and to a yellow LED, integrated on the Ethernet connector. The following table shows the link/activity status indicated by the two LEDs.

Yellow LED	Green LED	Link/Activity Status
OFF	OFF	Link off
ON	OFF	1000 Link/ No activity
Blinking	OFF	1000 Link/ activity (Rx, Tx)
OFF	ON	100 Link/ No activity
OFF	Blinking	100 Link/Activity (Rx, Tx)
ON	ON	10 Link/ No activity
Blinking	Blinking	10 Link/ activity (Rx, Tx)

5V Regulator



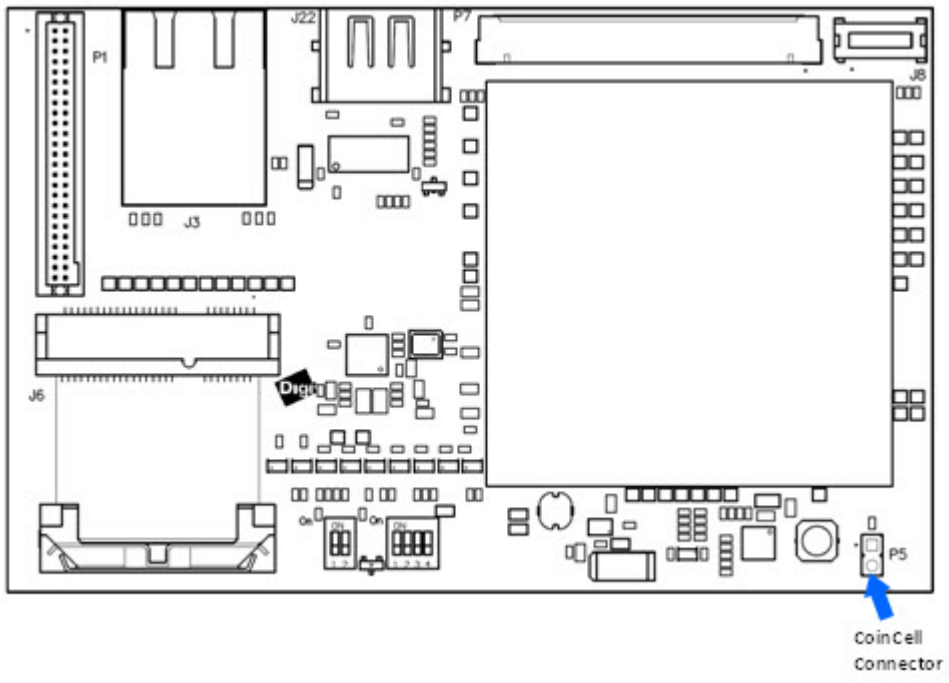
The adapter board has several interfaces that need a regulated 5V supply. To generate this supply one LTC3125 step-up DC/DC converter is used. This DC/DC converted can generate a regulated 5V from a 1.8V to 5.5V input supply. The LTC3125 will maintain voltage regulation even when the input voltage is above the desired output voltage.

The 5V regulator will be enabled by the ConnectCore 6 signal PWR_EN. On low power mode this regulator will be disabled. The following table shows the interfaces of the adapter board where the +5V supply is connected.

Interface	Comments
USBH1_VBUS	Power supply for the USB Host controller of the i.MX6 CPU
LVDS1	Supply for the LVDS backlight

HDMI	Supply for HDMI display
MIPI	Supply for MIPI camera and display

Coin Cell Connector



Coin Cell Connector, P5

The adapter board provides a 2-pin, 2.54mm pitch straight pin header for connecting an external coin cell or super capacitor to power the RTC interface when the main supply is off. If higher voltage is present on the main supply, it will be used as a power source for the RTC.

The following table shows the pinout of the coin cell connector.

Pin	Signal	Comments
1	VCC_LICELL	Power supply for RTC
2	GND	Ground

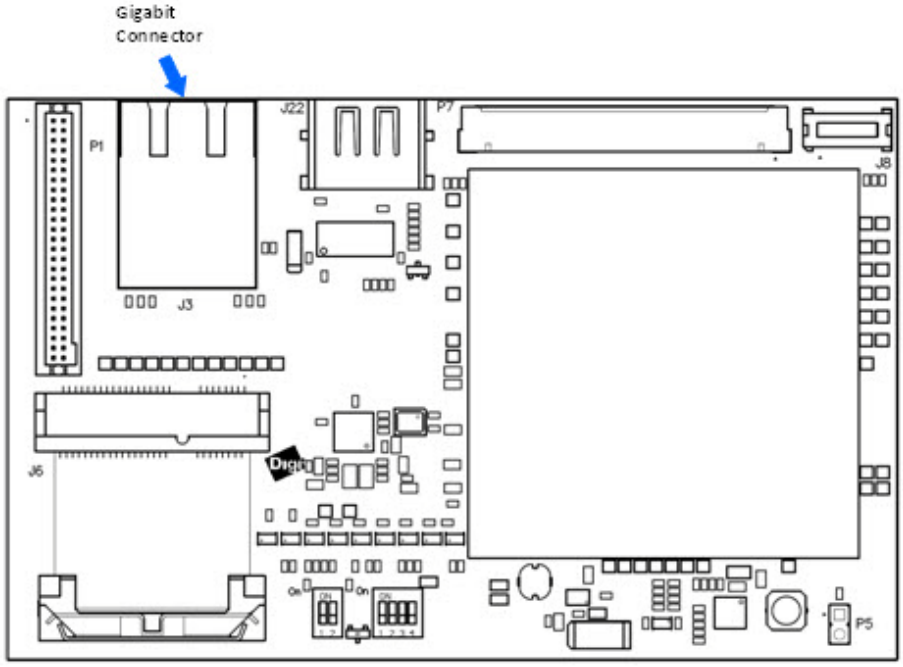
There are three types of components that can be connected to this connector: Lithium coin cells (Primary cell: non-rechargeable), Lithium coin cells (Secondary cell: rechargeable), and Supercaps. When a Primary Lithium coin cell is connected, the PMIC backup battery charger must be turned off and this pin is used strictly as an input. It is hazardous to attempt to charge Primary Lithium cells as they may vent or explode. Secondary Lithium coin cells are only made available directly to manufacturers of equipment that could use them, in that case they are normally required to design their product to prevent the user gaining access to this part since there is a danger to the user if by replacing it, they fit a primary type (the only sort that they are likely to be able to source) into the charging circuit. When a Secondary Lithium coin cell is used, both the charging current and the termination voltage are programmable. When a Supercap is used, both the charge current and termination voltage should be set to the maximum values.

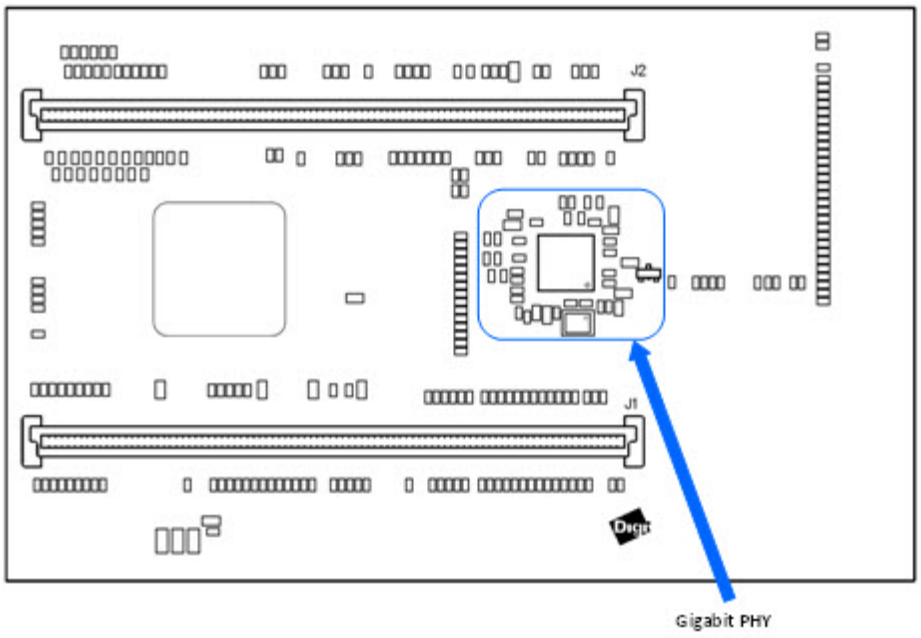
The advantage of using a Primary Lithium coin cell is that the energy density usually allows years of service since the self discharge rate is low. The advantage of using a Secondary Lithium coin cell is that the self discharge rate is usually sufficient to allow a few months of support for the RTC before it will need recharging. The advantage of the Supercap is that it is intrinsically safe and can out-last the Primary Lithium coin cell option, however the self discharge rate is high meaning that a 1F capacitor at 25° C is likely to support the RTC for approximately 5 to 10 days.

A programmable constant charge current charger with a programmable top-off charging voltage is provided for charging of Secondary Lithium-Manganese coin cell batteries and super capacitors. Charging current is programmable from 100uA to 6mA. Termination voltage is programmable from +1.1 to +3.1V.

The minimum voltage of the coin cell supply is +2V. The maximum voltage of the coin cell supply is +3.6V.

Gigabit Ethernet





Gigabit PHY

The adapter board has a triple-speed (10Base-T/100Base-Tx/1000Base-T) Ethernet PHY connected to the RGMII interface of the ConnectCore 6 module. Two GPIO signals of the i.MX6 CPU are used to reset the Ethernet PHY (GPIO1_25) and as interrupt input from the PHY (GPIO1_28).

Gigabit Connector, J3

The adapter board provides a Gigabit RJ-45 connector with integrated 1:1 transformer and link/activity LEDs. The functionality of the two LEDs is detailed on chapter Gigabit Ethernet LEDs.

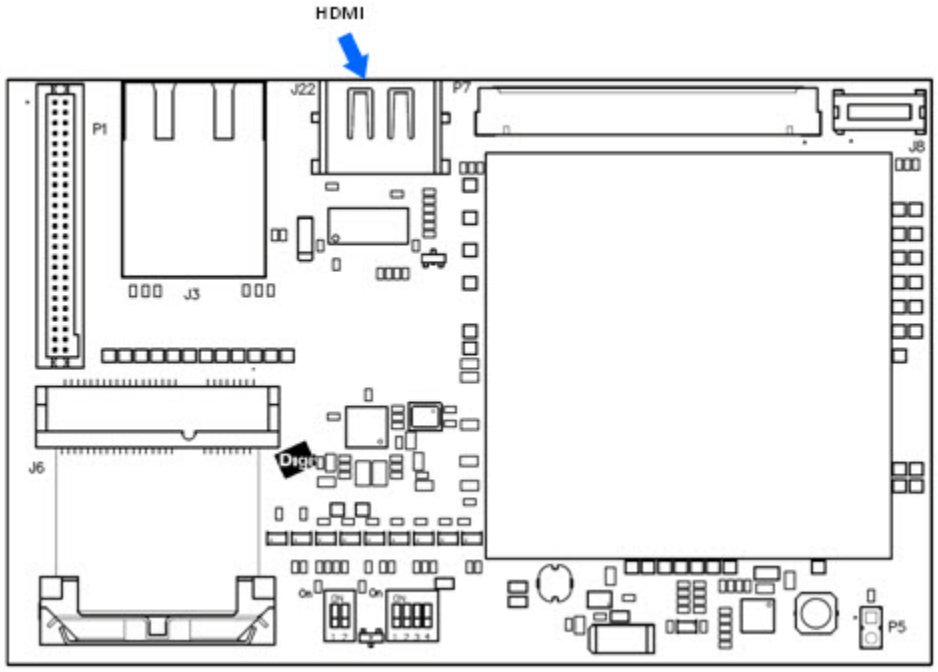
The following table shows the pinout of the Gigabit connector.

Pin	Signal	Comments
1	TRP1+	Transmit and receive pair 1 data +
2	TRP1-	Transmit and receive pair 1 data -
3	TRP2+	Transmit and receive pair 2 data +
4	TRP2-	Transmit and receive pair 2 data -
5	TRP3+	Transmit and receive pair 3 data +
6	TRP3-	Transmit and receive pair 3 data -
7	TRP4+	Transmit and receive pair 4 data +
8	TRP4-	Transmit and receive pair 4 data -

HDMI

The ConnectCore 6 module provides an HDMI 1.4a compatible interface. The interface includes the HDMI controller and PHY. Video resolutions up to 1080p@120Hz HDTV are supported. All audio formats as specified by the HDMI Specification 1.4a are supported. Hot plug/unplug detection is also supported.

The adapter board provides an HDMI port protection device with all ESD, overcurrent output protection and backdrive protection for an HDMI port.



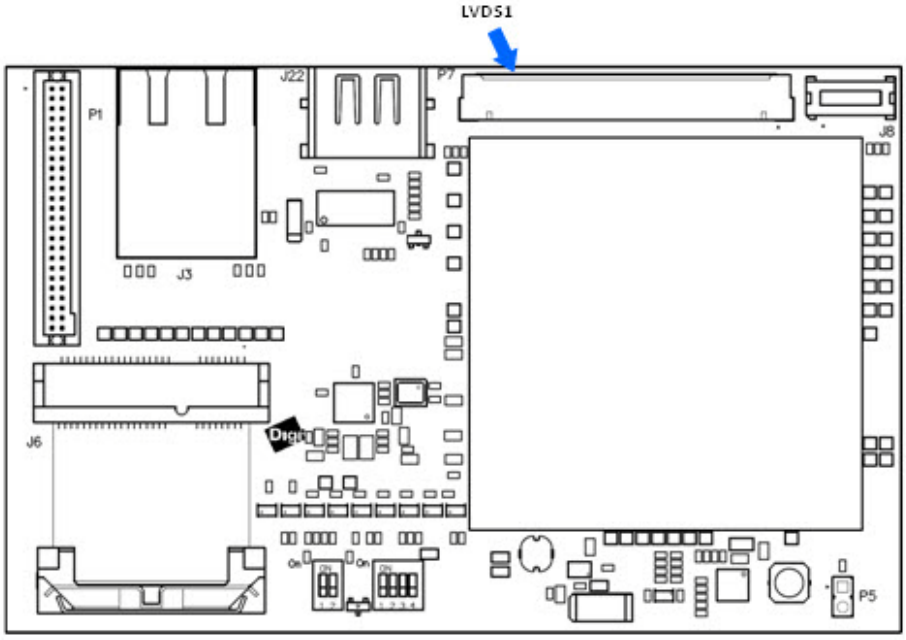
HDMI Connector, J22

The adapter board provides an HDMI connector, J22. The table below shows the pinout of the HDMI connector.

Pin	Signal	Comments
1	HDMI_TX2+	Transmit and receive pair 2 data +
2	GND	Data2 shield
3	HDMI_TX2-	Transmission pair2 data-
4	HDMI_TX1+	Transmission pair1 data+
5	GND	Data 1 shield
6	HDMI_TX1-	Transmission pair 1 data-
7	HDMI_TX0+	Transmission pair 0 data+
8	GND	Data0 shield
9	HDMI_TX0-	Transmission pair 0 data-
10	HDMI_TXC+	Transmission pair clock+
11	GND	Clock shield

12	HDMI_TXC-	Transmission pair clock-
13	NC	Consumer electronic control
14	NC	Reserved
15	HDMI_SCL	I2C SCL
16	HDMI_SDA	I2C SDA
17	GND	DDC/CEC Ground
18	+5V	5V supply (50mA max)
19	HOTPLUG_DET	Hot plug detection

LVDS1



LVDS Interface

The adapter board provides a 30 pin, 1.25mm pitch connector (Hirose DF14-30P-1.25H) for accessing the ConnectCore 6 LVDS1 interface.

The LVDS connector provides access to the following LVDS capabilities:

- 4 LVDS differential data pairs
- 1 LVDS differential clock pair
- SPI bus for an external touch screen controller
- Interrupt input for touch screen
- PWM output to control the backlight brightness
- +3.3VDC and +5VDC supplies

LVDS Connector, P7

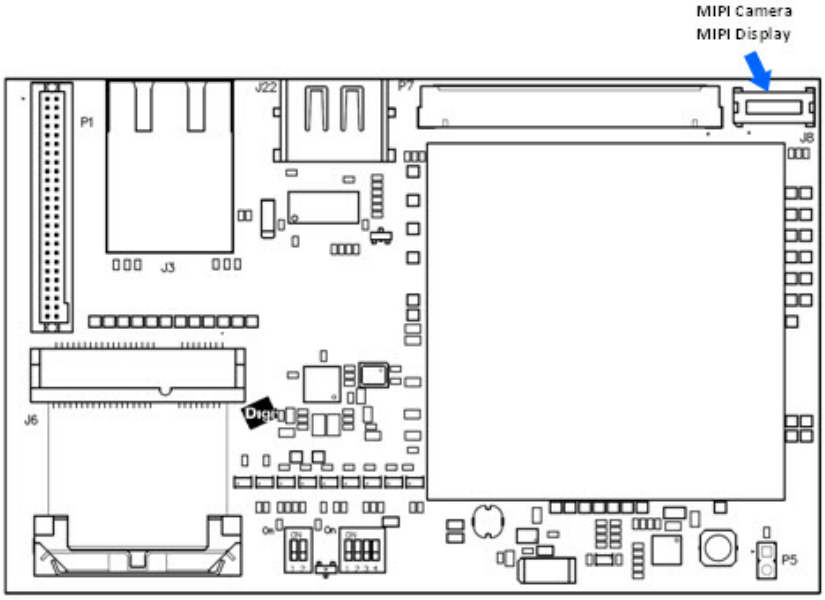
The table below shows the pinout of the LVDS1 connector, P7:

Pin	Signal	Comments
1	+3.3V	Generated on PMIC buckperi
2	+3.3V	Generated on PMIC buckperi
3	GND	
4	LVDS1_TX0_N	Transmission pair 0 data -
5	LVDS1_TX0_P	Transmission pair 0 data +
6	GND	
7	LVDS1_TX1_N	Transmission pair 1 data-
8	LVDS1_TX1_P	Transmission pair 1 data +
9	GND	
10	LVDS1_TX2_N	Transmission pair 2 data-
11	LVDS1_TX2_P	Transmission pair 2 data+
12	GND	
13	LVDS1_CLK_N	Transmission pair clock-
14	LVDS1_CLK_P	Transmission pair clock+
15	GND	
16	LVDS1_TX3_N	Transmission pair 3 data-
17	LVDS1_TX3_P	Transmission pair 3 data+
18	GND	
19	nc	
20	nc	
21	nc	
22	nc	
23	LVDS1_PENIRQ#	Connected to i.MX6 GPIO_16 pad
24	ECSPI2_MOSI	
25	ECSPI2_MISO	
26	ECSPI2_CLK	
27	ECSPI2_SS1	Connected to i.MX6 EIM_LBA pad
28	PWM1	Shared with MIPI display
29	+5V	Generated on adapter board
30	+5V	Generated on adapter board

MIPI Camera and MIPI Display

The ConnectCore 6 board provides a MIPI camera serial interface (MIPI_CSI) compliant with the MIPI CSI-2 specification. A MIPI D-PHY is also included on the module, allowing direct connections between the module and a MIPI CSI-2 compliant camera sensor. This interface supports up to 4 differential data pairs.

The ConnectCore for iMX6 board provides a MIPI display serial interface (MIPI_DSI) compliant with the MIPI DSI specification. A MIPI D-PHY is also included on the module, allowing direct connections between the module and a MIPI DSI compliant display. This interface supports up to 2 differential data pairs.



MIPI Connector

The adapter board provides a 2x15 pin, 0.5mm pitch connector (Molex 54167-0308) for the MIPI interfaces. The following table shows the pinout of the MIPI connector.

Pin	Signal	Comments
1	+5V	Supply for camera and display
2	CSI_D0_N	MIPI Camera pair 0 data-
3	+5V	Supply for camera and display
4	CSI_D0_P	MIPI Camera pair 0 data+
5	MIPI_I2C_SDA	I2C2 bus
6	GND	
7	MIPI_I2C_SCL	I2C2 bus
8	CSI_D1_N	MIPI Camera pair 1 data-
9	PWM1	Shared with LVDS1 interface
10	CSI_D1_P	MIPI Camera pair 1 data+
11	MIPI_BACKLGT_ON	MIPI Display Backlight control
12	GND	
13	MIPI_GPIO	Can be used to reset or disable a MIPI Camera or display
14	CSI_D2_N	MIPI Camera pair 2 data-
15	DSI_D0_P	MIPI Display pair 0 data+
16	CSI_D2_P	MIPI Camera pair 2 data+
17	DSI_D0_N	MIPI Display pair 0 data-

18	GND	
19	GND	
20	CSI_D3_N	MIPI Camera pair 3 data-
21	DSI_CLK0_P	MIPI Display clock+
22	CSI_D3_P	MIPI Camera pair 3 data
23	DSI_CLK0_N	MIPI Display clock-
24	GND	
25	GND	
26	CSI_CLK0_N	MIPI Camera clock-
27	DSI_D1_P	MIPI Display pair 1 data+
28	CSI_CLK0_P	MIPI Camera clock+
29	DSI_D1_N	MIPI Display pair 1 data-
30	GND	

PCI Express Mini Card Interface

The ConnectCore 6 module provides a PCI express controller and a PCI express PHY. The adapter board has a half size mini PCIe card connector (J6) to support this interface.

The following interfaces are connected to the PCIe card connector:

- PCIe: Three differential pairs for transmit data, receive data and clock
- I2C3
- USB Host 2.0. This interface is shared with the USB connected to the JSCCWMX53. Please refer to chapter Configuration Resistors to connect this interface for the PCIe connector
- PCIE_WAKE_N: output, open drain, low level signal to wake up the module
- PCIE_RESET_N: low level signal to reset the mini PCIe card.

PCI Express Mini Card Connector

The following table shows the pinout of the PCI express mini card connector.

Pin	Signal	Comments
1	PCIE_WAKE_N	
2	3.3V	
3	-	
4	GND	
5	-	
6	1.5V	
7	-	
8	-	
9	GND	
10	-	
11	PCIE_CLK_N	
12	-	
13	PCIE_CLK_P	
14	-	
15	GND	
16	-	
17	-	
18	GND	
19	-	
20	-	
21	GND	
22	PCIE_RESET_N	
23	PCIE_RX_N	
24	+3.3V	
25	PCIE_RX_P	
26	GND	
27	GND	
28	+1.5V	
29	GND	
30	I2C3_SCL	
31	PCIE_TX_N	
32	I2C3_SDA	
33	PCIE_TX_P	
34	GND	
35	GND	
36	USB_DN	
37	GND	

38	USB_DP
39	+3.3V
40	GND
41	+3.3V
42	-
43	GND
44	-
45	-
46	-
47	-
48	+1.5V
49	-
50	GND
51	-
52	+3.3V

Kinetis Microcontroller Assistant, MCA

The ConnectCore 6 module has a Kinetic microcontroller for wake up, power management control, and analogue and digital GPIO expander.

The MCA can be programmed through the Serial Wire Debug (SWD) interface. These signals are available on the module pinout and are connected on the adapter board to the MCA connector.

All the MCA signals that are not used internally on the ConnectCore 6 module are connected to the module pinout. These signals can be used as GPIO, low leakage wake up sources, PWM outputs, etc. On the adapter these signals are connected to the MCA connector.

Kinetis MCA Connector, P1

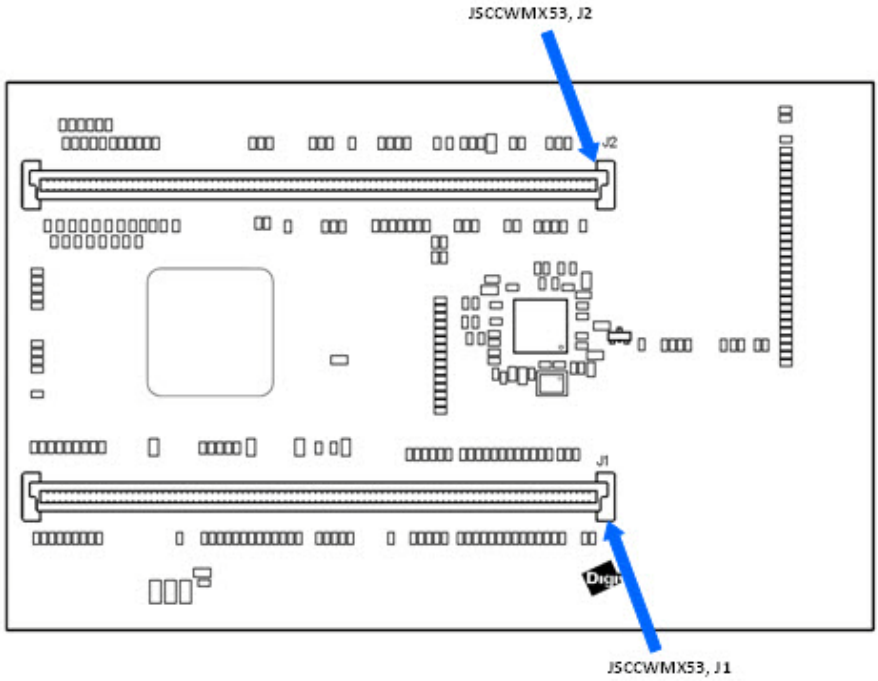
The adapter provides a 2x25 pin, 1.27mm pitch, pin header (SAMTEC TFM-125-32-L-D-A) for the Kinetis MCA signals. Four of these signals are connected to the ConnectCore 6 module and also to the touch screen inputs of the JSCCWMX53. The following table shows the pinout of this connector.

Pin	Signal	Comments
1	VLDO3_MCA	+3.3V supply
2	MCA_SWD_DIO	Single wire debug (SWD) data
3	GND	
4	MCA_SWD_CLK	Single wire debug (SWD) clock
5	GND	
6	-	
7	-	
8	-	

9	-	
10	MCA_RESET_N	Input signal to reset the MCA
11	GND	
12	GND	
13	MCA_PTA1	
14	MCA_PTA4	
15	MCA_PTA19	
16	-	
17	GND	
18	GND	
19	MCA_PTB0	Also connected to Touch input from the JSCCWMX53
20	MCA_PTB1	
21	MCA_PTB16	
22	MCA_PTB17	
23	GND	
24	GND	
25	MCA_PTC0	Also connected to Touch input from the JSCCWMX53
26	MCA_PTC2	Also connected to Touch input from the JSCCWMX53
27	MCA_PTC3	
28	MCA_PTC4	
29	MCA_PTC5	
30	MCA_PTC6	
31	MCA_PTC7	
32	-	
33	GND	
34	GND	
35	MCA_PTD4	
36	MCA_PTD5	
37	MCA_PTD6	
38	MCA_PTD7	
39	GND	
40	GND	
41	MCA_IO/USB0_P	
42	MCA_IO/USB0_N	
43	MCA_PTE18	
44	MCA_PTE19	
45	MCA_PTE20	Also connected to Touch input from the JSCCWMX53
46	MCA_PTE21	
47	MCA_PTE25	
48	MCA_PTE29	
49	GND	

50	GND

Connectors for JSCCWMX53



The adapter board has two 2x90 pin connectors, J1 and J2, for connecting the board to the Jumpstart Kit for CCW-i.MX53 board.

Most of the interfaces of the ConnectCore 6 are directly connected to the JSCCWMX53. Please refer to chapter Block Diagram to see the interfaces that are directly connected between the ConnectCore 6 and the JSCCWMX53 board.

The following paragraphs detail the connections between the ConnectCore 6 module and the JSCCWMX53. For a detailed description of the JSCCWMX53 board please refer to the Hardware Reference Manual of the JSCCWMX53.

Parallel Camera 0, CSI0

The following table shows the signals mapping between the parallel camera 0 of the adapter board and the parallel camera 0 of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
CSI0_D12	J1-5	CSI0_D12	L5
CSI0_D13	J1-6	CSI0_D13	C6
CSI0_D14	J1-7	CSI0_D14	B6
CSI0_D15	J1-8	CSI0_D15	E6
CSI0_D16	J1-9	CSI0_D16	H6

CSI0_D17	J1-10	CSI0_D17	A7
CSI0_D18	J1-11	CSI0_D18	F6
CSI0_D19	J1-12	CSI0_D19	G6
CSI0_VSYNC	J1-13	CSI0_VSYNC	J5
CSI0_HSYNC	J1-14	CSI0_MCLK	A5
CSI0_PIXCLK	J1-15	CSI0_PIXCLK	G5
CSI_MCLK	J1-16	GPIO_0	G2
CSI0_RESET_N	J1-2	MX6_EIM_WAIT	AA13

Parallel Camera 1, CSI1

The following table shows the signals mapping between the parallel camera 1 of the adapter board and the parallel camera 1 of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
CSI1_D12	J1-160	EIM_A17	AC17
CSI1_D13	J1-163	EIM_A18	AB15
CSI1_D14	J1-162	EIM_A19	AD16
CSI1_D15	J1-165	EIM_A20	AB16
CSI1_D16	J1-164	EIM_A21	AC16
CSI1_D17	J1-167	EIM_A22	AC19
CSI1_D18	J1-166	EIM_A23	AA14
CSI1_D19	J1-169	EIM_A24	AD17
CSI1_VSYNC	J1-137	EIM_DA12	V22
CSI1_HSYNC	J1-134	EIM_DA11	V18
CSI1_PIXCLK	J1-161	EIM_A16	AD15
CSI_MCLK	J1-16	GPIO_0	G2
CSI1_RESET_N	J1-1	EIM_DA15	Y20

LVDS0

The following table shows the signals mapping between the LVDS0 interface of the adapter board and the LVDS0 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
LVDS0_CLK_N	J1-63	LVDS0_CLK_N	M4
LVDS0_CLK_P	J1-65	LVDS0_CLK_P	L4
LVDS0_TXD0_N	J1-67	LVDS0_TXD0_N	J4
LVDS0_TXD0_P	J1-69	LVDS0_TXD0_P	H4
LVDS0_TXD1_N	J1-71	LVDS0_TXD1_N	F4

LVDS0_TXD1_P	J1-73	LVDS0_TXD1_P	E4
LVDS0_TXD2_N	J1-75	LVDS0_TXD2_N	C4
LVDS0_TXD2_P	J1-77	LVDS0_TXD2_P	B4
LVDS0_TXD3_N	J1-79	LVDS0_TXD3_N	R4
LVDS0_TXD3_P	J1-81	LVDS0_TXD3_P	P4

JTAG

The following table shows the signals mapping between the JTAG interface of the adapter board and the JTAG interface of the JSCCWMX53.

JSCCWMX53		**Adapter board**	
Signal name	**Pin**	**Signal name**	**Pin**
JTAG_TCK	J1-91	JTAG_TCK	F13
JTAG_TRST_N	J1-92	JTAG_TRST_N	D15
JTAG_TMS	J1-93	JTAG_TMS	F14
JTAG_MOD	J1-94	JTAG_MOD	G13
JTAG_TDI	J1-95	JTAG_TDI	D15
JTAG_TDO	J1-97	JTAG_TDO	E14

EIM

The ConnectCore 6 module provides an external interface module (EIM) to connect memory mapped devices. This module is highly configurable to different modes, data length, address length, etc. Most of the pins of the EIM are multiplexed with other functionalities. The following table shows the signal mapping of the EIM signals between the JSCCWMX53 and the adapter board module.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
EIM_DA0	J1-121	EIM_DA0	U20
EIM_DA1	J1-122	EIM_DA1	W23
EIM_DA2	J1-123	EIM_DA2	V24
EIM_DA3	J1-124	EIM_DA3	U19
EIM_DA4	J1-127	EIM_DA4	W24
EIM_DA5	J1-126	EIM_DA5	AA19
EIM_DA6	J1-129	EIM_DA6	U23
EIM_DA7	J1-128	EIM_DA7	Y21
EIM_DA8	J1-131	EIM_DA8	W22
EIM_DA9	J1-132	EIM_DA9	V19
EIM_D16	J1-141	EIM_D16	AD20
EIM_D17	J1-142	EIM_D17	V17
EIM_D18	J1-143	EIM_D18	AB18
EIM_D19	J1-144	EIM_D19	Y17
EIM_D20	J1-147	EIM_D20	W19
EIM_D21	J1-146	EIM_D21	Y16
EIM_D22	J1-149	EIM_D22	Y18
EIM_D23	J1-148	EIM_D23	AC20
EIM_D24	J1-151	EIM_D24	W20
EIM_D25	J1-152	EIM_D25	AA17
EIM_D26	J1-153	EIM_D26	AD19
EIM_D27	J1-154	EIM_D27	AD18
EIM_D28	J1-157	EIM_D28	AB17
EIM_D29	J1-156	EIM_D29	W16
EIM_D30	J1-159	EIM_D30	Y115
EIM_D31	J1-158	EIM_D31	AA15
EIM_OE	J1-172	EIM_OE	V15
EIM_RW	J1-174	EIM_RW	W15
EIM_CS0	J1-113	EIM_CS0	AB13
EIM_EB2	J1-177	EIM_EB2	Y24
EIM_EB3	J1-179	EIM_EB3	AA18
EIM_IRQ	J1-178	NANDF_D6	G22

Display 0

The following table shows the signals mapping between the display 0 interface of the adapter board and the Display 0 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
DISP0_DAT0	J2-1	DISP0_DAT0	AC8
DISP0_DAT1	J2-2	DISP0_DAT1	AC9
DISP0_DAT2	J2-3	DISP0_DAT2	AD9
DISP0_DAT3	J2-4	DISP0_DAT3	AB8
DISP0_DAT4	J2-5	DISP0_DAT4	AA9
DISP0_DAT5	J2-6	DISP0_DAT5	AD7
DISP0_DAT6	J2-7	DISP0_DAT6	AB7
DISP0_DAT7	J2-8	DISP0_DAT7	AC7
DISP0_DAT8	J2-9	DISP0_DAT8	AA8
DISP0_DAT9	J2-10	DISP0_DAT9	AB6
DISP0_DAT10	J2-11	DISP0_DAT10	Y8
DISP0_DAT11	J2-12	DISP0_DAT11	Y7
DISP0_DAT12	J2-13	DISP0_DAT12	AA7
DISP0_DAT13	J2-14	DISP0_DAT13	W8
DISP0_DAT14	J2-15	DISP0_DAT14	AC6
DISP0_DAT15	J2-16	DISP0_DAT15	W7
DISP0_DAT16	J2-17	DISP0_DAT16	V6
DISP0_DAT17	J2-18	DISP0_DAT17	AB5
DISP0_DAT18	J2-19	DISP0_DAT18	AD6
DISP0_DAT19	J2-20	DISP0_DAT19	Y6
DISP0_DAT20	J2-21	DISP0_DAT20	W6
DISP0_DAT21	J2-22	DISP0_DAT21	U6
DISP0_DAT22	J2-23	DISP0_DAT22	V7
DISP0_DAT23	J2-24	DISP0_DAT23	AA6
DISP0_HSYNC	J2-25	DI0_PIN2	W10
DISP0_VSYNC	J2-30	DI0_PIN3	V8
DISP0_CLK	J2-28	DI0_DISP_CLK	V9
DISP0_BIAS	J2-31	DI0_PIN15	V10
PWM1	J2-27	DI0_PIN4	AD8

SATA

The following table shows the signals mapping between the SATA interface of the adapter board and the SATA interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
SATA_TX_N	J2-33	SATA_TX_N	D19
SATA_TX_P	J2-35	SATA_TX_P	E19
SATA_RX_N	J2-34	SATA_RX_N	G19
SATA_RX_P	J2-36	SATA_RX_P	H19

Touch

The JSCCWMX53 has four analog signals for a resistive touch screen connection. These four analog inputs are connected to four analog input of the ConnectCore 6 module. These signals are also connected to the Kinetis MCA connector on the adapter board.

The following table shows the signals mapping between the touch interface of the adapter board and the touch interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
TOUCH_X1	J2-39	MCA_IO0	T23
TOUCH_X2	J2-41	MCA_IO2	R23
TOUCH_Y1	J2-43	MCA_IO4	U24
TOUCH_Y2	J2-45	MCA_IO9	R22

Keypad

The following table shows the signals mapping between the keypad interface of the adapter board and the keypad interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
KEY_ROW2	J2-93	KEY_ROW0	E2
KEY_ROW3	J2-95	KEY_ROW2	H2
KEY_ROW5	J2-97	GPIO_2	G3
KEY_ROW7	J1-2	GPIO_5	R3
KEY_COL2	J2-90	KEY_COL0	J2
KEY_COL3	J2-92	KEY_COL2	K2
KEY_COL6	J2-94	GPIO_9	H3
KEY_COL7	J1-1	GPIO_4	L3

Audio

The following table shows the signals mapping between the audio interface of the adapter board and the audio interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
AUD5_TXD	J2-137	CSI0_DAT5	C7
AUD5_RXD	J2-139	CSI0_DAT7	M5
AUD5_TXC	J2-141	CSI0_DAT4	B7
AUD5_TXFS	J2-144	CSI0_DAT6	C5
AUD_HP_DET	J2-79	NANDF_D0	J24

PWM

The ConnectCore 6 module has three PWM signals generated by the PMIC. Two of these PWM signals are connected to the PWM signals of the JSCCWMX53. The other PWM signal is connected to the LVDS1 connector and to the MIPI connector of the adapter board, to control the intensity of these displays.

The following table shows the connection between the PWM signals of the adapter board and the PWM signals of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
PMIC_GPIO14/PWM1	J2-27	PMIC_GPIO14/PWM2	Y10
PMIC_GPIO15/PWM2	J2-32	PMIC_GPIO15/PWM3	V13

The following table shows the connection between the PWM signal of the adapter board and the LVDS1 connector of the adapter board.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
PMIC_GPIO11/PWM1	P4-28	PMIC_GPIO11/PWM1	V11

The following table shows the connection between the PWM of the adapter board and the MIPI connector of the adapter board.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
PMIC_GPIO11/PWM1	J6-9	PMIC_GPIO11/PWM1	V11

USB Host

The JSCCWMX53 has a USB Hub connected to the USB Host interface. The following table shows the signals mapping between the USB Host interface of the adapter board and the USB Host interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
USB_H1_DN	J2-131	USB_H1_DN	C16
USB_H1_DP	J2-129	USB_H1_DP	D16
USB_HUB_RESET_N	J1-4	EIM_DA10	V21

USB OTG

The JSCCWMX53 has a USB OTG interface with a reduced number of signals. The over current (USB_OTG_OC) and power enable (USB_OTG_PWR) signals are not used.

The following table shows the signals used in the JSCCWMX53 for the USB OTG interface and the mapping of these signals on the module.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
USB_OTG_DN	J2-73	USB_OTG_DN	G16
USB_OTG_DP	J2-71	USB_OTG_DP	G17
USB_OTG_ID	J2-70	GPIO_1	K3
USB_OTG_VBUS	J2-72	USB_OTG_VBUS	G14

SD2

The following table shows the signal mapping between the SD2 interface of the adapter board and the SD3 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
SD3_CLK	J2-170	SD2_CLK	K22
SD3_CMD	J2-169	SD2_CMD	M20
SD3_DATA0	J2-153	SD2_DATA0	P24
SD3_DATA1	J2-156	SD2_DATA1	K21
SD3_DATA2	J2-155	SD2_DATA2	R24
SD3_DATA3	J2-158	SD2_DATA3	K23

Note: The microSD interface on the JSCCWMX53 does not have card detect and write protect signals.

UART1

The following table shows the signal mapping between the UART1 interface of the adapter board and the UART1 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
UART1_TX	J2-123	SD3_DAT7	C21
UART1_RX	J2-121	SD3_DAT6	E21

UART2

The following table shows the signal mapping between the UART1 interface of the adapter board and the UART1 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
UART2_RXD	J2-117	KEY_ROW1	D3
UART2_RTS	J2-118	KEY_COL4	L2
UART2_TXD	J2-119	KEY_COL1	E3
UART2_CTS	J2-120	KEY_ROW4	D2

CAN1

The following table shows the signal mapping between the CAN1 interface of the adapter board and the CAN1 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
CAN1_TXD	J2-130	GPIO_7	P3
CAN1_RXD	J2-134	GPIO_8	F3

CAN2

The following table shows the signal mapping between the CAN2 interface of the adapter board and the CAN2 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
CAN1_TXD	J2-130	GPIO_7	P3
CAN1_RXD	J2-134	GPIO_8	F3

ECSPI

The ECSPI2 interface of the ConnectCore 6 module is connected on the adapter board to the LVDS1 connector and to the JSCCWMX53 connector. This interface is also connected on the module to the Kinetis MCA controller. Two chip select signals are used to control all these connections.

The following table shows the signal mapping between the ECSPI2 interface of the adapter board and the ECSPI1 interface of the JSCCWMX53.

JSCCWMX53		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
ECSPI1_MOSI	J2-111	CSI0_DAT9	D5
ECSPI1_MISO	J2-113	CSI0_DAT10	K5
ECSPI1_MCLK	J2-115	CSI0_DAT8	D6
ECSPI1_SS0	J2-112	EIM_LBA (ECSPI2_SS1)	U21
ECSPI1_SS1	J2-114	CSI0_DAT11(ECSPI2_SS0)	A6

The following table shows the signal mapping between the ECSPI2 interface of the adapter board and the LVDS1 connector.

LVDS1 on Adapter		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
ECSPI1_MOSI	P7-24	CSI0_DAT9	D20
ECSPI1_MISO	P7-25	CSI0_DAT10	K20
ECSPI1_MCLK	P7-26	CSI0_DAT8	D19
ECSPI1_SS0	P7-27	EIM_LBA (ECSPI2_SS1)	U4

The following table shows the signal connections between the ECSPI2 chip select signals and the different interfaces. These signals are shared between more than one interface. Only one of the shared interfaces can be used at the same time.

Signal	Adapter board	Adapter	JSCCWMX53
CSI0_DAT11(ECSPI2_SS0)	Kinetis MCA		SPI Connector
EIM_LBA (ECSPI2_SS1)	-	LVDS1	LVDS0

I2C3

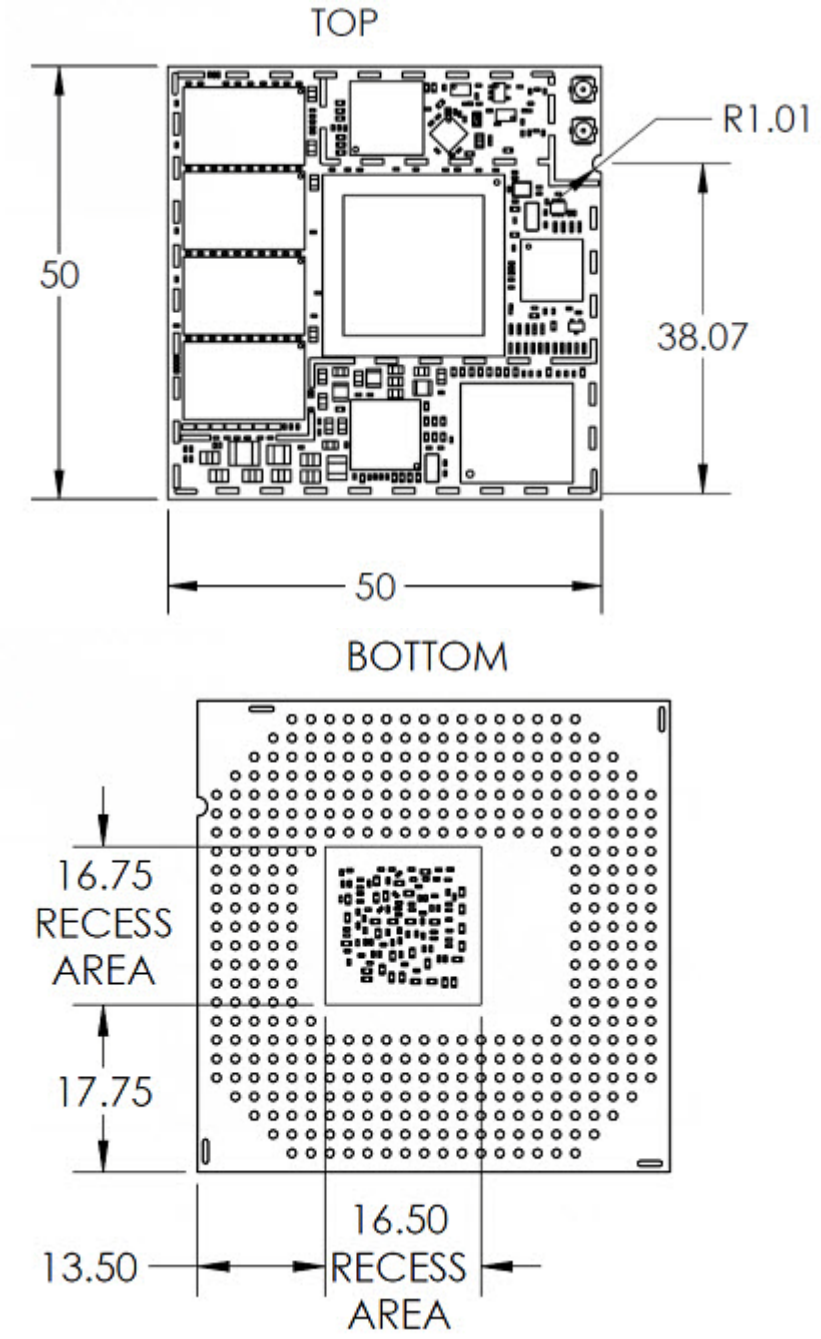
The following table shows the signal mapping between the I2C3 interface of the adapter board and the I2C3 interface of the JSCCWMX53.

LVDS1 on Adapter		Adapter board	
Signal name	**Pin**	**Signal name**	**Pin**
I2C3_SDA	J2-78	GPIO_6	J3
I2C3_SCL	J2-76	GPIO_3	T3

The chapter I2C Address table details the interfaces where the I2C3 is connected and the different addresses of these I2C3 interfaces.

Module Specifications

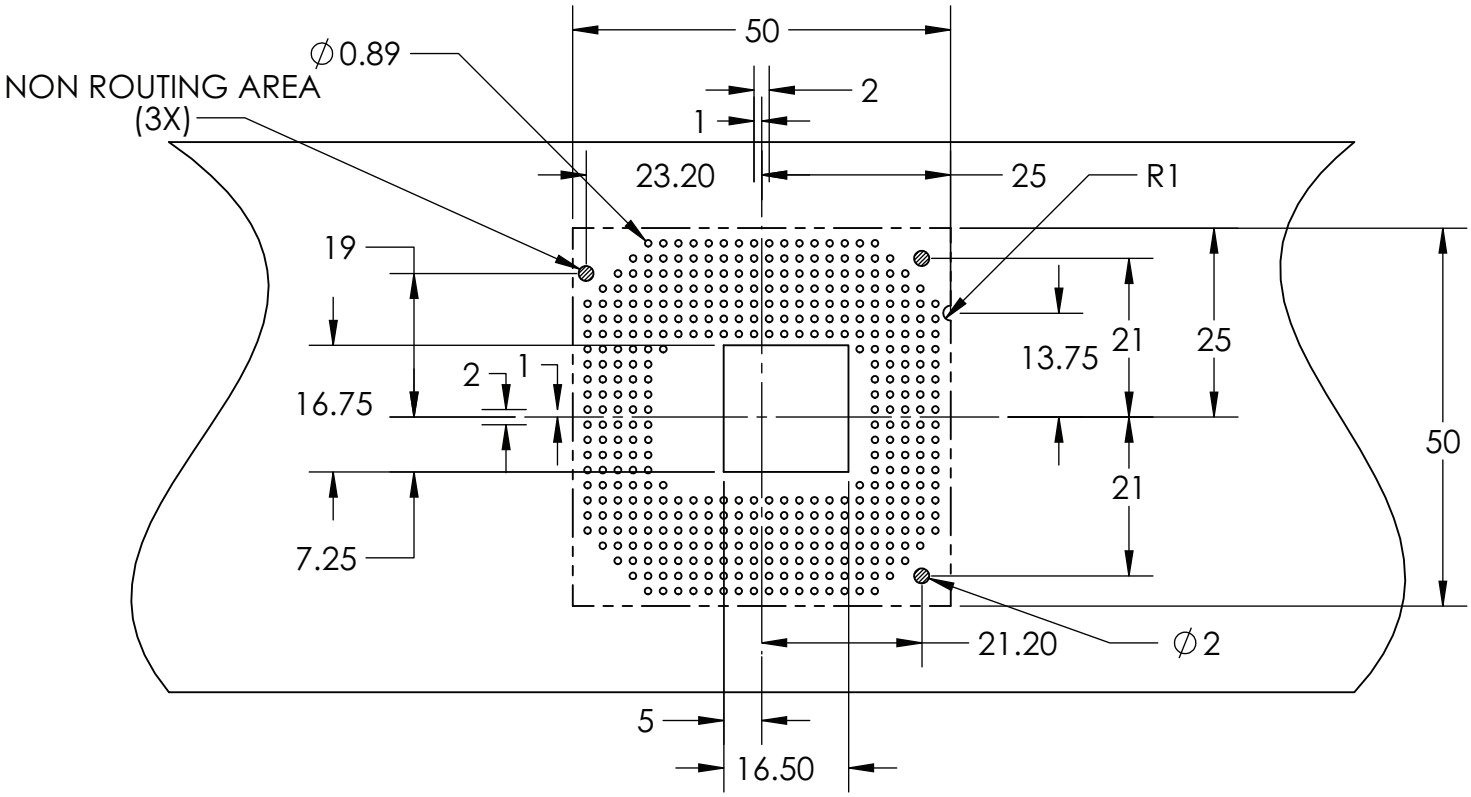
Mechanical specifications



There must be a recess in the host PCB to accommodate the components on the bottom side of the SOM. All dimensions are in millimeters.

Refer to Digi Application Note #31-31-14-x posted on the Digi technical support website for additional information.

Host PCB Footprint



Note: Minimum thickness of the host board shall be 2mm.

Specifications for the ConnectCore 6

Environmental Specifications

Operating temperatures stated below are Tj (i.MX6 junction temperatures) and are depending on the actual processor population on the ConnectCore 6 module.

Industrial Variant: -40° C to +105° C

Extended Commercial Variant: -20° C to +105° C

Commercial Variant: 0° C to +95° C

The customer design must assure that the specified i.MX6 junction temperatures are not exceeded during operation.

Storage temperature: -40°C to +85°C

Moisture Sensitivity and Shelf Life

a The ConnectCore for i.MX6 module is classified as a Level 3 Moisture Sensitive Device in accordance with IPC/JEDEC J-STD-020.
b Calculated shelf life in sealed packaging: 12 months at <40°C and <90% relative humidity (RH).
c Environmental condition during production: 30°C /60% RH according to IPC/JEDEC J-STD -033A, paragraph 5.
d Maximum time between opening of the sealed packaging and reflow process must not exceed 168 hours, based on condition b), IPC/JEDEC J-STD -033A, paragraph 5.2.
e Baking is required, if conditions b) or c) do not apply. See above.
f Baking is required, if the packaging humidity indicator indicates 10% RH or higher.
g If baking is required, bake modules in trays 4-6 hours at 125°C; maximum stacking height is 10 trays.

Mounting

The ConnectCore 6 module has been designed with easy integration into existing SMT processes in mind. Guidance for mounting the module on your carrier board is given in this section of the document.

The ConnectCore 6 module is specified for one (1) soldering cycle only. Modules are also not sealed and therefore they should not be subjected to a wash cycle or similar treatment where condensation could occur. Contact Digi International for additional guidance to discuss conformal coating approaches and options, if needed.Solder Paste

The following solder paste type has been approved for mounting the module on a carrier board:

- SAC305 (Lead-free: Alpha OM-340 Type 4 or equivalent)

Solder Paste Print

The following solder paste printing parameters are recommended:

- Stencil Thickness: 0.15 mm/5 mil
- Stencil Diameter: One to one of Pad diameter (to +20% of pad)
- Paste alignment: 20% off the pad max (offset <20% pad diameter)

Stencil

The recommendation is to use a laser cut and/or electro-formed stencil for placing the ConnectCore 6 module. Based on the actual coplanarity characteristics of your carrier board, adjustments may be required to determine the optimal solder paste volume.

It is also recommended to perform an X-ray analysis of the initial production run of your assembly with the ConnectCore 6. Please contact Digi for additional support.

Coplanarity

The coplanarity measured on the ConnectCore for 6 is <0.001" bow and twist (98% confidence interval). It is important that the carrier board is also coplanar. If the carrier board is thinner than the ConnectCore 6 it is recommended that the assembly be supported during the reflow process, i.e. reflow fixture should be used to minimize the potential bow of the carrier card.

SMT Pick and Place

- Placement Nozzle: Large is available on the machine
- Nozzle Pick Surface: Center of Shield on i.MX6 SOM
- Placement Speed: Slowest speed for the machine
- Placement alignment: 10% of pad diameter (compensating for module weight and supporting alignment). The module should be placed last as part of the assembly/mounting process to eliminate unexpected shifting.

SMT Process Parameter Reference

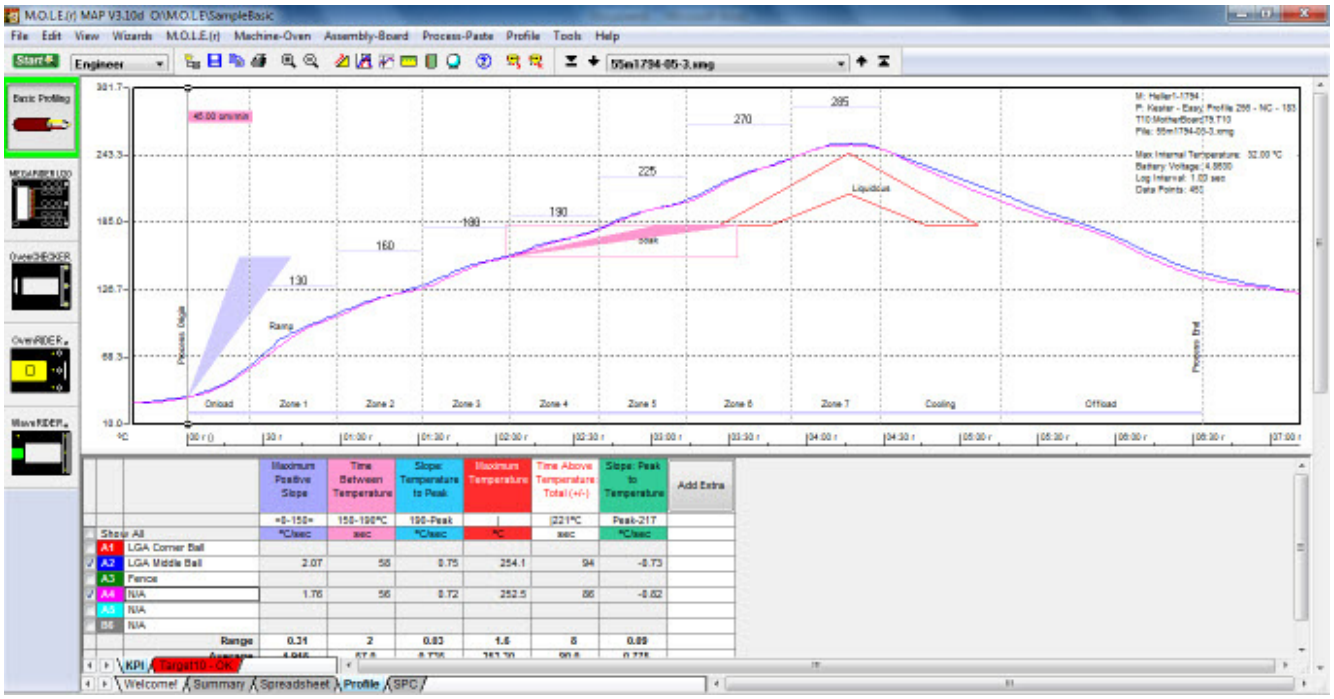
Process	**SMT process**	**Specification recommendations**
Screen print	Solder paste	Leaded: Indium NC-SMQ92J / Lead-free: Alpha OM-340
	Stencil thickness	0.15mm / 5 mil
	Stencil diameter	1.47mm / 58mil
	Paster alignment	25% off the pad (offset <0.25* diameter

PnP	Placement nozzle	0>15mm vacuum
	Nozzle Pick Surface	PnP cap center
	Speed	Slowest speed for the machine
	Placement Sequence	Place the SoM last
	Placement Alignment	50% off the pad (offset <.5* diameter)
Reflow	Belt speed	0.6-1.1 m/sec
	Refer to SMT profile recommendation in the next page	

Reflow Profile Using Seven Zone Oven, SAC 305Lead-Free Solder Paste (Alpha OM-340)

Time Above Liquidous (TAL) is recommended to be between 56 to 63 seconds. Use of 40AWG K-type thermal couple and M.O.L.E or equivalent thermal profiler is recommended. The first recommended thermal probe location is on the outer row of pads, to be on the out most row of pins preferably a ground pad. The second thermal probe location is on the inner row of pads preferably a signal pad.

The following image shows the reflow profile based on a seven zone convection oven.



The reflow profile shown above is valid for the combination solder paste/reflow machine and Digi reference carrier board. Optimization of a reflow profile will depend on the selected solder paste/ reflow machine (reflow or vapor phase) and carrier board design.

Network Interface

WLAN Standard:

- IEEE 802.11a/b/g/n standards
- HT20, and HT40 IEEE 802.11n

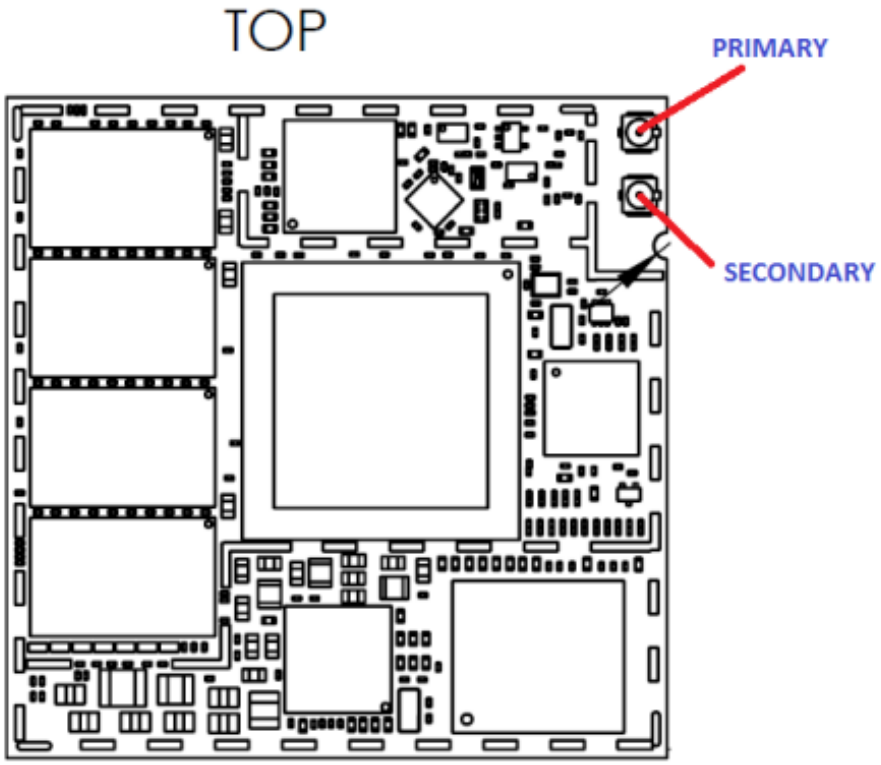
Frequency Band:

- 2.40-2.50 GHz (low band)
- 5.18-5.825 GHz (High band)

Data Rates:

- 802.11b: 1, 2, 5.5, 11 Mbps
- 802.11a/g: 6, 9, 12, 18, 24, 35, 48, 54 Mbps
- 802.11n HT20 FGI: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps
- 802.11n HT20 HGI: 7.2, 14.4, 21.7, 29.9, 43.3, 57.8, 65, 72.2 Mbps
- 802.11n HT40 FGI (5GHz only): 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps
- 802.11n HT40 HGI (5GHz only): 15, 30, 45, 60, 90, 120, 135, 150 Mbps

Antenna ports:



Note: Modules with Bluetooth capabilities will not support spatial diversity.

Modulation

Mode	Data rate	Modulation	Mode	Data rate	Modulation	Mode	Data rate	Modulation
802.11b	1	DBPSK	802.11g	6	BPSK	802.11a	6	BPSK
	2	DQPSK		9	BPSK		9	BPSK
	5.5	CCK		12	QPSK		12	QPSK
	11	CCK		18	QPSK		18	QSPK
				24	16-QAM		24	16-QAM
				35	16-QAM		35	16-QAM
				48	64-QAM		48	64-QAM
				54	64-QAM		54	64-QAM

Mode	MCS	Modulation			Data rate	
802.11n			HT20 (2.4 GHz and 5GHz)		HT40 (5GHz only)	
			FGI	HGI	FGI	HGI
	MCS0	BPSK	6.5	7.2	13.5	15
	MCS1	QPSK	13	14.4	27	30
	MCS2	QPSK	19.5	21.7	40.5	45
	MCS3	16-QAM	26	29.9	54	60
	MCS4	16-QAM	39	43.3	81	90
	MCS5	64-QAM	52	57.8	108	120
	MCS6	64-QAM	58.5	65	121.5	135
	MCS7	64-QAM	65	72.2	135	150

Security/Interoperability

- WPA-PSK
- WPA-Enterprise
- WPA2-Personal
- WPA2-Enterprise
- Wi-Fi Direct
- Soft AP
- WAPI (optional, China)
- Cisco CCXv4 ASD certification ready (optional)
- Wi-Fi Alliance Logo certification ready

The listed capabilities are dependent on software platform in use. Refer to the corresponding software platform documentation for additional information.

Please contact Digi if your end product requires a Wi-Fi Alliance Logo and/or Cisco CCX certification.

Frequency Bands

US, Canada

- 2.412 to 2.462 GHz; 11 channels
- 5.180 to 5.320 GHz; 8 channels
- 5.500 to 5.700 GHz, 8 channels (excludes 5.600 to 5.650 GHz)
- 5.745 to 5.825 GHz; 5 channels

Europe

- 2.412 to 2.472 GHz; 13 channels
- 5.180 to 5.320 GHz; 8 channels
- 5.500 to 5.700 GHz, 8 channels (excludes 5.600 to 5.640 GHz)

Australia, New Zealand

- 2.412 to 2.462 GHz; 11 channels
- 5.180 to 5.320 GHz; 8 channels
- 5.745 to 5.825 GHz; 5 channels

Japan

- 2.412 to 2.472 GHz; 13 channels
- 5.180 to 5.320 GHz; 8 channels
- 5.500 to 5.700 GHz; 11 channels

Ad-Hoc Mode Channels

- 2.4GHz Band - Channels 10 and 11
- 5GHz Band US, Australia, New Zealand - Channels 36, 40, 44, 45, 149, 157, 161, and 165 Channels 36, 40, 44, and 45 are for indoor use only
- 5GHz Band Europe and Japan - per 802.11d

5GHz HT20 and HT40 channel available:

Channel number	Frequency (MHz)	Mode	Secondary channel allowed
36	5180	HT40	PLUS
38	5190	HT20	
40	5200	HT40	MINUS
44	5220	HT40	PLUS
46	5230	HT20	

48	5240	HT40	MINUS
52	5260	HT40	PLUS
54	5270	HT20	
56	5280	HT40	MINUS
60	5300	HT40	PLUS
62	5310	HT20	
64	5320	HT40	MINUS
100	5500	HT40	PLUS
102	5510	HT20	
104	5520	HT40	MINUS
108	5540	HT40	PLUS
110	5550	HT20	
112	5560	HT40	MINUS
116	5580	HT40	PLUS
118	5590	HT20	
120	5600	HT40	MINUS
124	5620	HT40	PLUS
126	5630	HT20	
128	5640	HT40	MINUS
132	5660	HT40	PLUS
134	5670	HT20	
136	5680	HT40	MINUS
140	5700	HT20	
159	5745	HT40	PLUS
151	5755	HT20	
153	5765	HT40	MINUS
157	5785	HT40	PLUS
159	5795	HT20	
161	5805	HT40	MINUS
165	5825	HT20	

Receive Sensitivity

Network type	Sensitivity
802.11b	-88 dBm
802.11g	-88 dBm
802.11n (2.4GHz)	-89 dBm
802.11a	-90 dBm
802.11n (5GHz, HT20)	-90 dBm
802.11n (5GHz, HT40)	-86 dBm

Transmit Power

Network type	Transmit power
802.11b	10.5 dBm
802.11g/n	11 dBm
802.11a/n	13 dBm

Bluetooth

- Bluetooth 3.0 + HS (BT3.0 + HS)
- Bluetooth 4.0 (BT4.0)
- Class 1.5 Bluetooth with integrated TX/RX switch

Electrical Characteristics

Voltage supplies

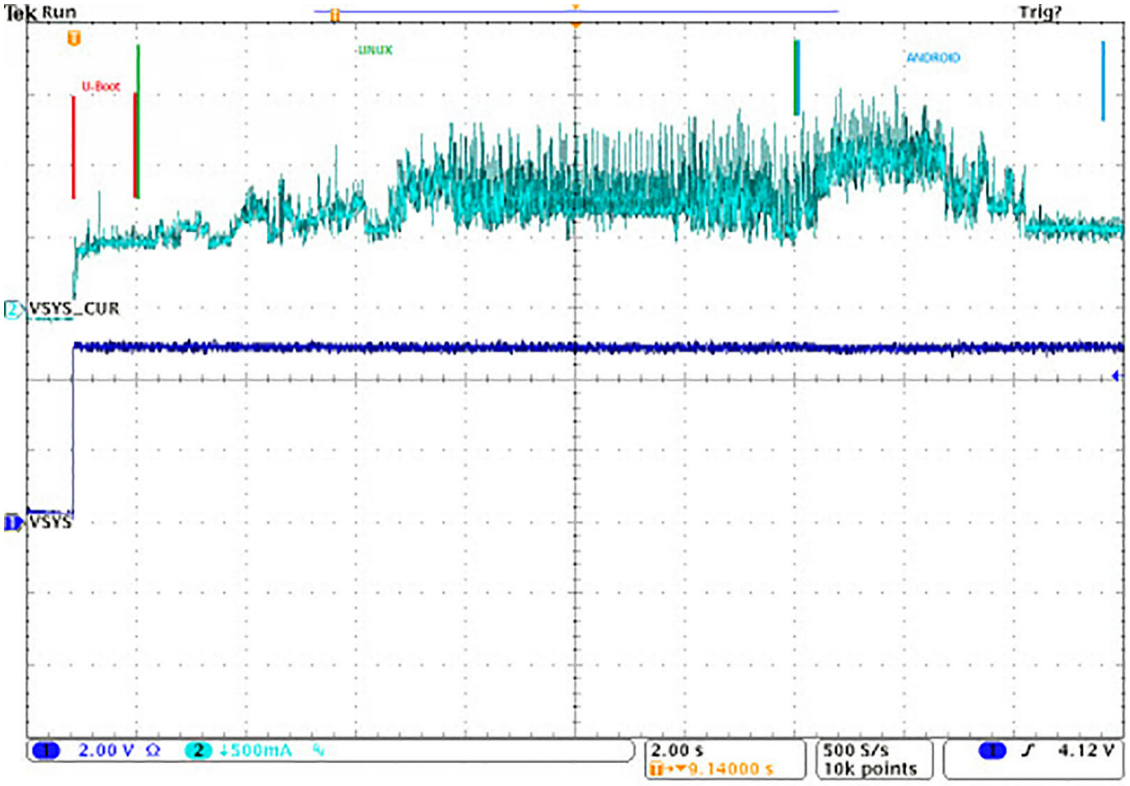
Parameter	Min	Typ	Max	Unit
5V supply	4.2	5	5.5	V
VCC_LICELL	2.0	3.0	TBD	V
LDO3_MCA	1.71	3.3	3.6	V

Note: No specific ESD protection components have been implemented on the ConnectCore for i.MX6 module. ESD protection level on the module's I/Os is the same as what is specified in the freescale datasheet. Any required ESD protection must be implemented on the carrier board.

Power Consumption

The following image displays the current consumption of the ConnectCore for i.MX6 module when booting respectively through U-Boot, Linux kernel and Android user space.

Power consumption of the ConnectCore 6



Agency Approval

Specification	ConnectCore for i.MX6
United States (FCC Part 15.247)	Pending
Industry Canada (IC)	Pending
Europe (DC)	Pending
Japan	Pending
Australia	Pending

Certifications

Agency Certifications

United States FCC

The ConnectCore™ for i.MX6 Module complies with Part 15 of the FCC rules and regulations. Compliance with the labeling requirements, FCC notices and antenna usage guidelines is required. To fulfill FCC Certification, the OEM must comply with the following regulations:

- The system integrator must ensure that the text on top side of the module is placed on the outside of the final product.
- ConnectCore™ for i.MX6 Module may only be used with antennas approved [refer to the antenna tables in this section].

WARNING: The Original Equipment Manufacturer (OEM) must ensure that FCC labeling requirements are met. This includes a clearly visible label on the outside of the final product enclosure that displays the contents shown in the figure below. Required FCC Label for OEM products containing the ConnectCore™ for i.MX6 Module.

For WiFi/Bluetooth variant:

> **Contains FCC ID: MCQ-CCIMX6B**
>
> This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept ant interference received, including interference that may cause undesired operation.

For WiFi only variant:

> **Contains FCC ID: MCQ-CCIMX6**
>
> This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept ant interference received, including interference that may cause undesired operation.

FCC Notices

IMPORTANT: The ConnectCore™ for i.MX6 module has been certified by the FCC for use with other products without any further certification (as per FCC section 2.1091). Modifications not expressly approved by Digi could void the user's authority to operate the equipment.

IMPORTANT: OEMs must test final product to comply with unintentional radiators (FCC section 15.107 & 15.109) before declaring compliance of their final product to Part 15 of the FCC Rules.

IMPORTANT: The ConnectCore™ for i.MX6 module has been certified for remote and base radio applications. If the module will be used for portable applications, the device must undergo SAR testing. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Re-orient or relocate the receiving antenna, Increase the separation between the equipment and receiver, Connect equipment and receiver to outlets on different circuits, or Consult the dealer or an experienced radio/TV technician for help.

FCC-Approved Antennas

The ConnectCore™ for i.MX6 can be installed utilizing antennas and cables constructed with non-standard connectors (RPSMA, RPTNC, and so on).

The modules are FCC approved for fixed base station and mobile applications for the channels indicated in the tables below. If the antenna is mounted at least 20cm (8 in.) from nearby persons, the application is considered a mobile application. Antennas not listed in the table must be tested to comply with FCC Section 15.203 (Unique Antenna Connectors) and Section 15.247 (Emissions).

The antennas in the tables below have been approved for use with this module. Digi does not carry all of these antenna variants. Contact Digi Sales for available antennas.

Antennas Approved for Use with the ConnectCore™ for i.MX6 Wi-Fi Modules

Omni- directional antennas			
Part number	**Type (description)**	**Peak Gain 2.4 GHz**	**Peak Gain 5 GHz**
Digi International A24-HASM-450	Dipole (articulated RPSMA, 2.4GHz antenna)	1.8dBi	
Linx Technologies Inc ANT-DB1-RAF-RPS	Dipole (articulated RPSMA, 2.4GHz and 5GHz antenna)	2.5dBi	4.6dBi
Yageo ANTX100P001B24003	2.4GHz PCB antenna	4dBi (@2.4GHz) 4.4dBi (@2.45GHz) 4.1dBi (@2.5GHz)	
Ethertronics 1001932	2.4 - 5GHz PCB antenna	1.5-2.5dBi	3-5dBi

Note: If using the RF module in a portable application (for example - if the module is used in a hand-held device and the antenna is less than 20cm from the human body when the device is in operation): The integrator is responsible for passing additional SAR (Specific Absorption Rate) testing based on FCC rules 2.1091 and FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, OET Bulletin and Supplement C. The testing results will be submitted to the FCC for approval prior to selling the integrated unit. The required SAR testing measures emissions from the module and how they affect the person.

RF Exposure

WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance are not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter. The preceding statement must be included as a CAUTION statement in OEM product manuals in order to alert users of FCC RF Exposure compliance.

Europe (ETSI)

The ConnectCore™ for i.MX6 Module has been certified for use in several European countries. For a complete list, refer to www.digi.com.

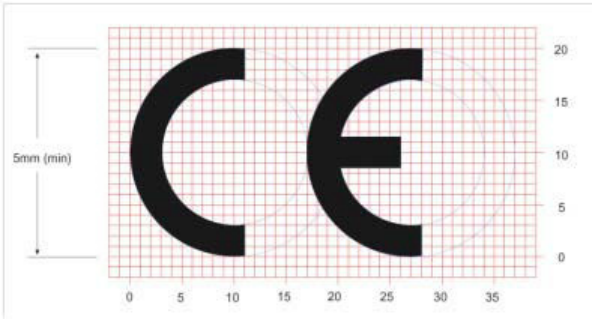
If the ConnectCore™ for i.MX6 module is incorporated into a product, the manufacturer must ensure compliance of the final product to the European harmonized EMC and low-voltage/safety standards. A Declaration of Conformity must be issued for each of these standards and kept on file as described in Annex II of the R&TTE Directive.

Furthermore, the manufacturer must maintain a copy of the ConnectCore™ for i.MX6 Hardware Reference manual documentation and ensure the final product does not exceed the specified power ratings, antenna specifications, and/or installation requirements as specified in the user manual. If any of these specifications are exceeded in the final product, a submission must be made to a notified body for compliance testing to all required standards.

OEM Labeling Requirements

The **CE** marking must be affixed to a visible location on the OEM product.

CE Labeling Requirements



The CE mark shall consist of the initials **CE** taking the following form:

- If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.
- The CE marking must have a height of at least 5mm except where this is not possible on account of the nature of the apparatus.
- The CE marking must be affixed visibly, legibly, and indelibly.

Declarations of Conformity

Digi has issued Declarations of Conformity for the ConnectCore™ for i.MX6 module concerning emissions, EMC and safety. Files can be obtained by contacting Digi Support.

Note: Digi does not list the entire set of standards that must be met for each country. Digi customers assume full responsibility for learning and meeting the required guidelines for each country in their distribution market.

Approved Antennas

The same antennas have been approved for Europe as stated in the FCC table for use with the ConnectCore™ for i.MX6 module.

Canada (IC)

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Labeling Requirements

Labeling requirements for Industry Canada are similar to those of the FCC. A clearly visible label on the outside of the final product enclosure must display the following text:

For WiFi/Bluetooth variant:

Contains Model ConnectCore™ for i.MX6 Radio, IC: 1846A-CCIMX6B

For WiFi only variant:

Contains Model ConnectCore™ for i.MX6 Radio, IC: 1846A-CCIMX6

The integrator is responsible for its product to comply with IC ICES-003 & FCC Part 15, Sub. B - Unintentional Radiators. ICES-003 is the same as FCC Part 15 Sub. B and Industry Canada accepts FCC test report or CISPR 22 test report for compliance with ICES-003.

Transmitters with Detachable Antennas

This radio transmitter (IC: 1846A-CCIMX6 / IC: 1846A-CCIMX6B) has been approved by Industry Canada to operate with the antenna types listed in the table above with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC: 1846A-CCIMX6 / IC: 1846A-CCIMX6B) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Japan

この製品は、周波数帯域 5.15 ~ 5.35 GHz で動作しているときは、屋内においてのみ使用可能です。

This device has been granted a designation number by Ministry of Internal Affairs and Communications according to:

Ordinance concerning Technical Regulations Conformity Certification etc. of Specified Radio Equipment (特定無線設備の技術基準適合証明等に関する規則).

- Article 2 clause 1 item 19 Approval n°: TBD
- Article 2 clause 1 item 19 (2) Approval n°: TBD
- Article 2 clause 1 item 19 (3) Approval n°: TBD
- Article 2 clause 1 item 19 (3) (2) Approval n°: TBD

This device should not be modified (otherwise the granted designation number will be invalid).