Aura iMX6UL/ iMX6ULL/ iMX6ULZ Module
Rev 1.0

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Revision History..

Rev.	Document Code	Released	Written	Verified	Approved
1.0	Aura iMX6UL	16/10/2019	S.Mascetti	16/10/2019	S.Mascetti

Introduction

The AURA CPU is IMX6UL, IMX6ULL and IMX6ULZgeneral purpose system on module designed to work in Industrial, Automotive and consumer environment.
The AURA CPU is Sodimm module with a small foot print ready be applied on the Application Board (Carrier Board).

Reference Documentation

1) IPC-A-610E Acceptability of Electronics Assemblies Training and Certification Program
2) IPC-A-600 Acceptability of Printed Boards Training and Certification Program
3) IPC-A-6011: Generic Performance Specification for Printed Boards
4) IPC-A-6012D: Qualification and Performance Specification for Rigid Printed Boards
5) RoHS II Directive 2011/65/EU and 2015/863/EU (2002/95/EC and successive amendments)
6) REACH - Regulation (EC) No. 1907/2006
7) NXP - iMX6UL Datasheet and Application Notes
8) NXP - PF3000 DataSheet and Application Notes

Specification

Mechanical
AURA CPU   PCB Board Dimensions   : 67,6X36,58 mm

Electrical
AURA CPU Processor Board : (+5Vdc +/- 5%) or +4Vdc (LiIon Cell)

Temperature
The working temperature is -40°C to +85°C.
The storage temperature is -40°C to +85°C.

Certifications

European CE Mark
The AURA CPU product is CE compliant

The CE mark indicate that the product is compliant to all the European Community Directive. MAS Elettronica is not liable about the use of their products associated to other devices not CE Compliant and not compliant with the technical requirements of this document.

RoHS and REACH Directive
This product (include all the components, materials for packaging, etc.) must be compliant with the RoHS European directive 2002/95/CE (known as RoHS, Restriction on the use of certain Hazardous Substances) for the use of particular dangerous material on electrical equipment (AEE)

RoHS Directive 2011/65/EU
    EN 50581:2012
    EN 62321:2009
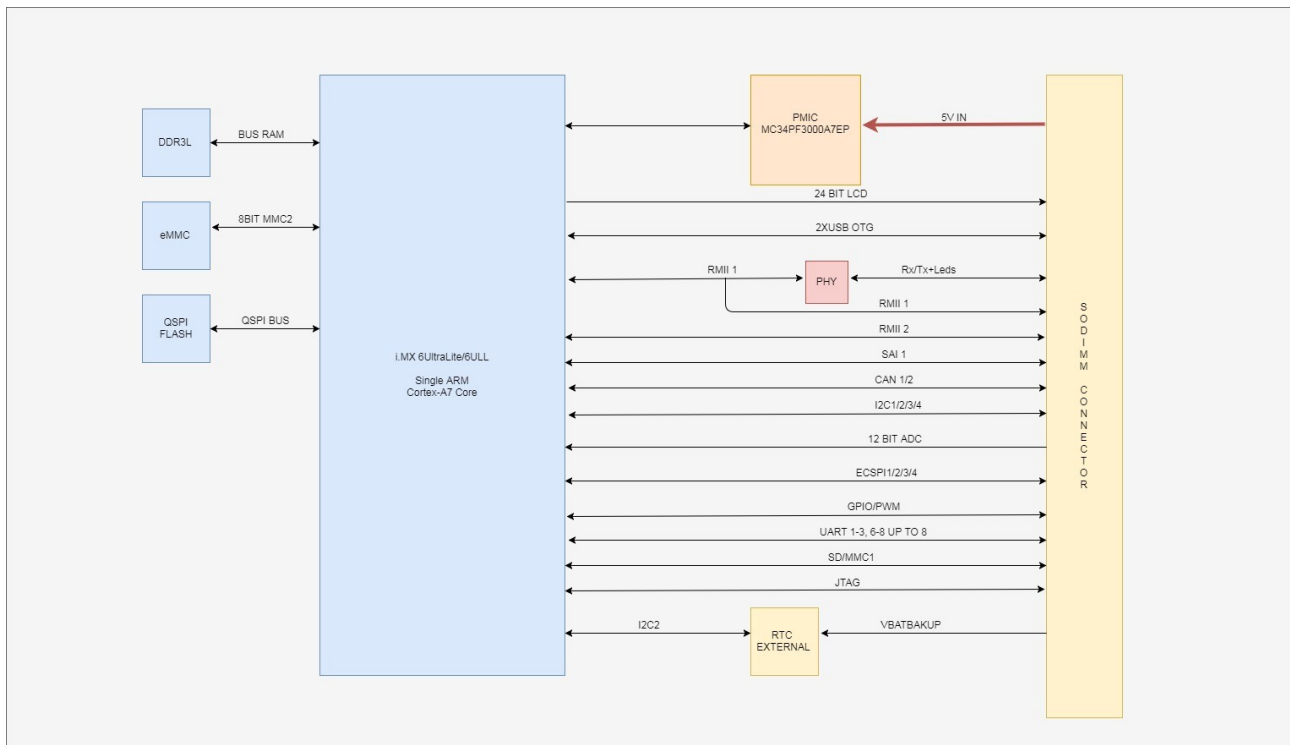*REACH Regulation (EC) No 1907/2006*

AURA CPU

The AURA CPU is the system on module based on NXP iMX6UL family that integrate the following peripherals / functions:

- NXP i.MX6UL, i.MX6ULL, i.MX6ULZ Application Processor
- 256MiB,512MiB or 1GiB of DDR3L Memory
- 4/8/16GB of eMMC Flash
- Real Time Clock
- LCD Interface (24Bit) (Optionally con be configured as General Purpose TTL 3V3 I/O)
- 3 Analog Input
- General Purpose I/O
- 6 UART Serial Port TTL 3V3 (RX - TX)
- 2 CAN Port TTL 3V3 with Driver Enable I/O
- 2 I2C Bus TTL 3V3
- 2 SPI Bus TTL 3V3
- SDIO Bus TTL 3V3
- I2S Bus
- 1 USB OTG Port
- 1 USB 2.0 Port
- 1 10/100 Ethernet Port with physical on board
- 1 10/100 Ethernet MAC Port
- 5V Dc +/- 5%

AURA CPU Operating System

LINUX Kernel Version 4.1.15 or later build with YOCTO
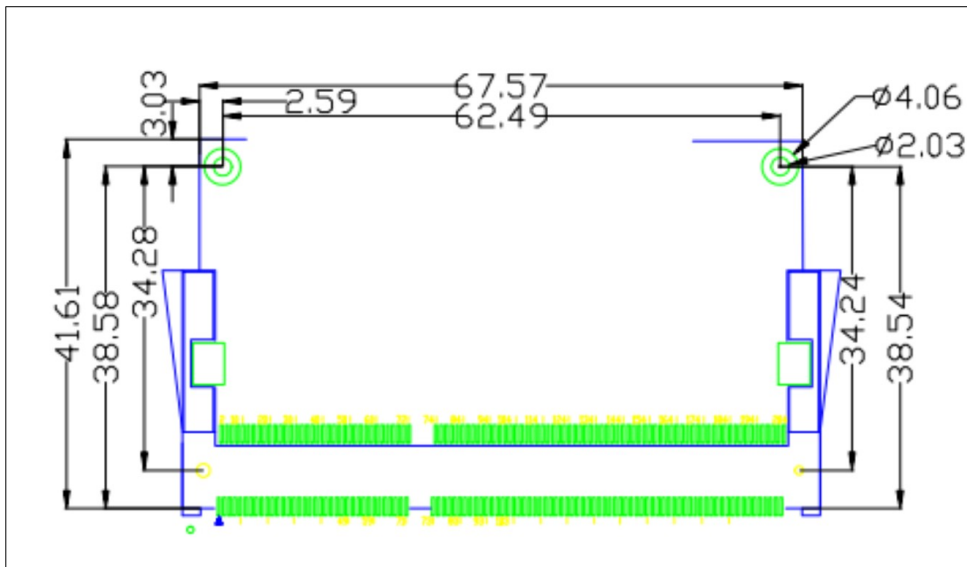
Block Diagram

AURA CPU block diagram

Functionalities

| Function	Type	Description
MEMORY	DDR3L Memory	The module is designed in order to support the following memory size/configuration: 256 MiB 1*256MB DDR3L 512MiB 1*512MB DDR3L 1GiB 1*1GiB DDR3L
	eMMC Flash	The main FLASH memory of the module is an eMMC. The minimum size is 4/8/16GB. *On the eMMC are installed the Linux OS and uBoot.*
COMs	UART1 (Console)	This UART is used to communicate with the Linux Console TTL 3V3
	UART2--3-4-6	This UARTs are available as RX and TX TTL 3v3 UART. The RS232 driver should be added on the Application Board. These UARTs could be used as RS485 or RS422 adding the transceiver into the Application Board and using the GPIO to drive the data direction
	UART5	This UART is available RX, TX, CTS and RTS TTL 3V3. The UART5 could be used to connect devices that are using RTS and CTS (example BT Modules).
	Ethernet	The iMX6UL processor integrate 2 Ethernet Controller ETH0 and ETH1. The Physical Driver for ETH0 are present on the AURA CPU, and on the Castellated Connectors there are available the Signals to connect the Magnetic and RJ45. Link and activity LED signals are present in the Castellated Connector The MAC signal of ETH1 are available on the Castellated Connector. The Physical Driver have to be added on the Application Board in case the second ETH is required. *The MDx pins of ETH1 pins can be configured as GPIO.* *The MC Bus to configure the Physicals is shared between ETH0 and ETH1 MAC Controllers*
	CAN Port	2 CAN Port are provided by the iMX6UL processor. The CAN RX / TX are TTL 3V3 and the CAN Driver is not present on the board.
Expansin BUS	SDIO	The SDIO Bus function is provided by the iMX6UL Processor. This Bus can be used to connect a Flash Memory Card or other devices that are using this kind of communication Bus (example combo WIFI and BT Module). *The SDIO Bus could be 3V3 or TTL 1.8V Voltage level selectable on PMU PF3000.*
	I2S	The I2S bus function is provided by the iMX6UL Processor. *The signals are TTL 3V3 level and can be software configured as GPIO*
	SPI	2 SPI bus, SPI0 and SPI1,are available on the Castellated Connector. The Bus are TTL 3V3
	I2C	1 I2C bus is available on the Castellated Connector The Bus are TTL 3V3 The internal PMU PF3000 is connected on this I2C2 Bus.
Digital & AnalogI I/O	LCD/GPIO	An 24Bit LCD controller is present on the iMX6UL5 Processor. *If the LCD Function is not used the pins can be software configured as GPIO. The voltage level is configurable from 1.8V and 3.3V on PMU PF3000*
	ANALOG	3 Analog Input are present on the iMX6UL Processor. The voltage Input level is 3.3VMax *These pins can be software configured as GPIO*
USB	USB1	This port is an USB2.0 OTG Device/Host Mode.
	USB0	This port is an USB2.0 Host Only Mode and does not have a 5V power over current protection
	RTC	The Real Time Clock function is integrated on the iMX6UL Processor. Battery Back-up have to be provided on the Application Board
	PMU	The Power Management is performed by the PF3000.

Aura Module Dimentions

Dimentions of Aura Module

Carrier Board Sara for Aura i.MX6ULL
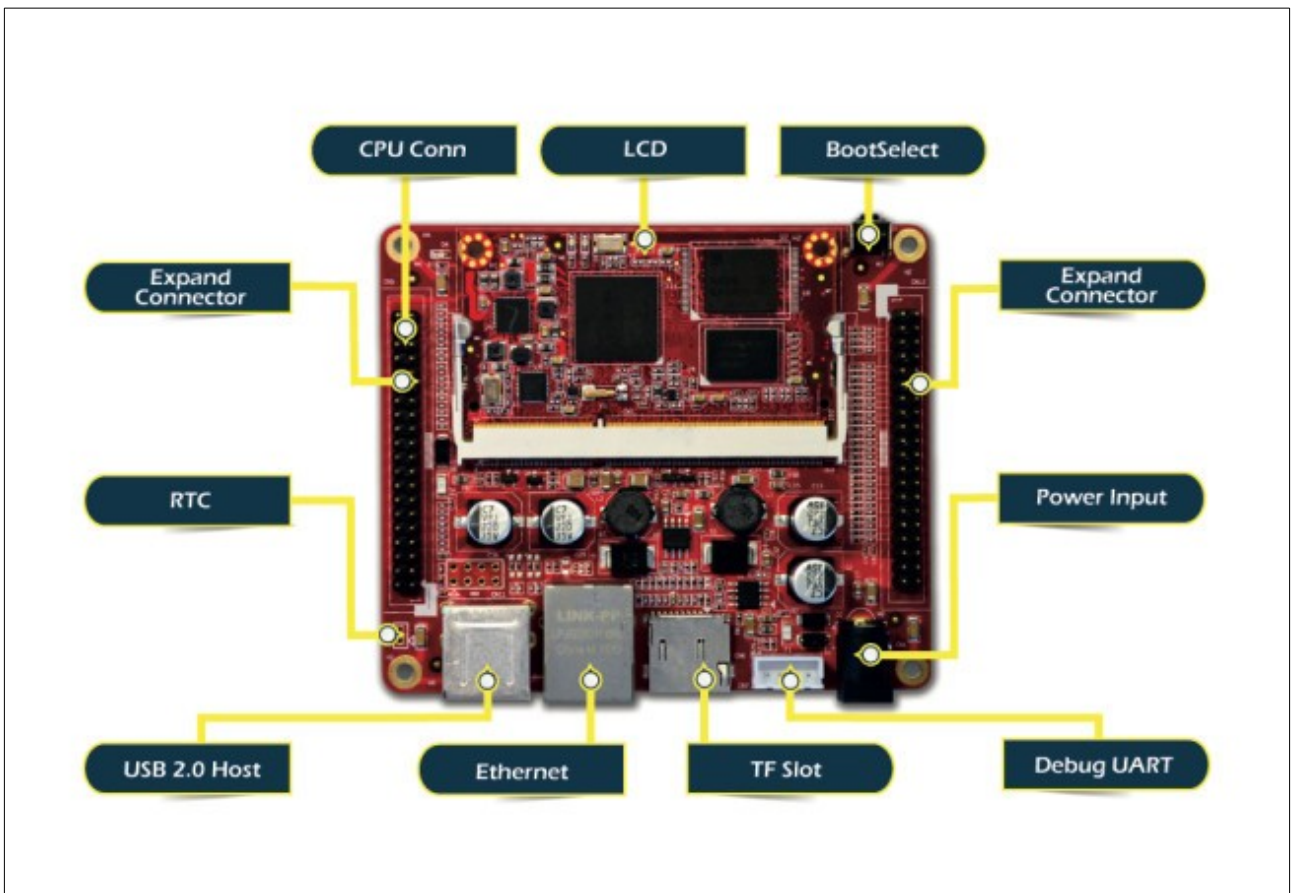
Aura has a dedicated carrier board SARA.

With the following characteristics:

• SD/ MMC x1
• 2 USB Host, 1x USB OTG
• UART x2
• I2C x2
• SPI x2
• RTC x1
• Ethernet x1
• GPIOs x30
• Display LCD TTL
• Touch screen interface resistive of capacitive
• Power supply 12VDC
• Dimetions 130 x 103.5 mm
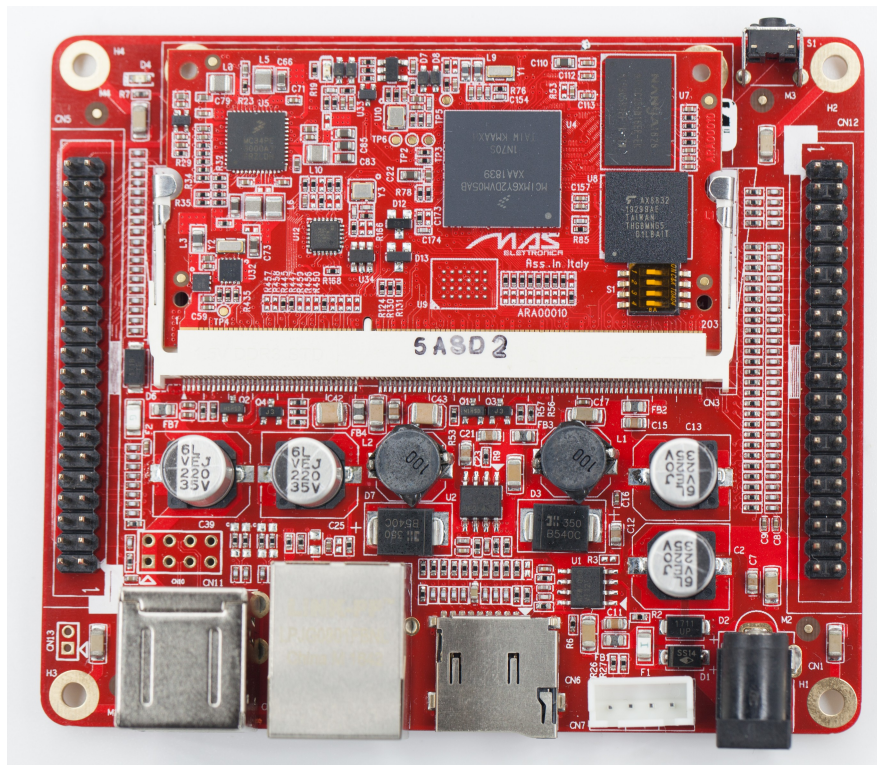
SARA with Aura CPU

Carrier Board Sara Block diagram

Sara Block Diagram and Connectors

AURA iMX6ULL Module Rev 1.0

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