



SoM ADAKTA-mx6ull

Hardware User Guide

Revision History

| Date | Revision | Description |
|----------|----------|-------------------------|
| 19.03.18 | 1.0 | First draft |
| 05.04.18 | 1.1 | Edit connectors chapter |

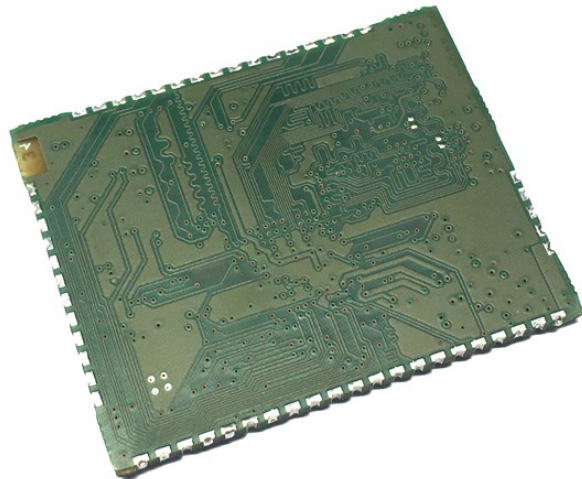
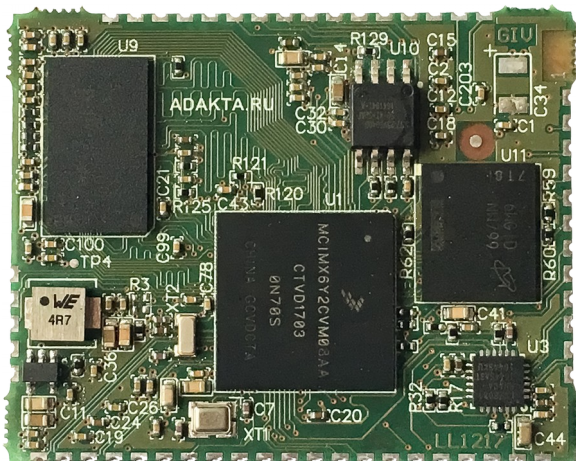


Table of contents

| | |
|--|---|
| 1. Overview..... | 3 |
| 1.1 Information for order..... | 3 |
| 1.2 Scope of application:..... | 3 |
| 2. Electrical Characteristics..... | 4 |
| 3. Connector Details..... | 5 |
| 4. Mounting..... | 7 |
| 5. Requirements for the motherboard..... | 8 |
| 6. Software..... | 8 |

1. Overview

System on Module (SoM) **ADAKTA-mx6ull** is a low-cost development platform featuring based on the powerful NXP i.MX6ULL processor. The hardware specifications for the **ADAKTA-mx6ull** module are the following:

- CPU: NXP iMX6ull, Single ARM Cortex-A7 MPCore (with TrustZone);
- DDR3: 256Mb;
- NAND:512Mb (**m52i only**);
- SPI NOR: 1Mb (for bootloader);
- 1x external SD/eMMC;
- 1x 10/100 Ethernet;
- 2x High speed USB OTG;
- 1xCAN port;
- 1xI2S port for audio codec;
- 2xADC;
- 1xPWM;
- 1xFull UART with RTS/CTS;
- 1xSPI;
- 2xI2C or 2xUART;
- 20xGPIO (max);
- Temperature range: 0 +85 C (**m02c**) \ -40 +85 C (**m52i**);
- High vibration resistance, high reliability;
- Vibration and water resistance;
- Do not require a radiator.

1.1 Information for order

There available 2 partnumber for orders:

- ADAKTA-mx6ull-**m02c**
- ADAKTA-mx6ull-**m52i**

1.2 Scope of application:

- Gateway for Smart home;
- IP phone;
- IoT gateway;
- Audio player;
- Human-to-machine interface (via WEB);
- Portable medical devices;
- Universal devices for vehicles;
- Network devices (WEB / FTP server, print server, router, etc.);
- Telemetry devices.

2. Electrical Characteristics

| Parameter | Min | Typical | Max | Unit |
|--------------------|------|---------|------|------|
| Main Input Voltage | 3.2V | 3.3V | 3.4V | V |
| Power Consumption* | 0,01 | 1 | 1,5 | W |
| CPU Clock | 300 | 500 | 900 | MHz |

*The Power Consumption refers to a single board with no other peripherals plugged in.

3. Connector Details

The **ADAKTA-mx6ull** board has a wide variety of peripheral interfaces available via custom connectors.

X2: LEFT

| Pin# | Function | SOC Pin name | SOC Pad |
|------|--------------|-----------------|----------|
| 1 | GPIO5_IO1 | SNVS_TAMPER1 | R9 |
| 2 | GPIO5_IO2 | SNVS_TAMPER2 | P11 |
| 3 | USB_OTG_VBUS | USB_OTG1/2_VBUS | T12, U12 |
| 4 | GND | GND | |
| 5 | 3V3 | 3V3 | |

X4: UP

| Pin# | Function | SOC Pin name | SOC Pad |
|------|------------|---------------|---------|
| 1 | I2C1_SDA | UART4_RX_DATA | G16 |
| 2 | I2C1_SCL | UART4_TX_DATA | G17 |
| 3 | UART1_RXD | UART1_RX_DATA | K16 |
| 4 | UART1_TXD | UART1_TX_DATA | K14 |
| 5 | SD1_CD | UART1_RTS | J14 |
| 6 | SD1_CLK | SD1_CLK | C1 |
| 7 | SD1_CMD | SD1_CMD | C2 |
| 8 | SD1_DATA0 | SD1_DATA0 | B3 |
| 9 | SD1_DATA1 | SD1_DATA1 | B2 |
| 10 | SD1_DATA2 | SD1_DATA2 | B1 |
| 11 | SD1_DATA3 | SD1_DATA3 | A2 |
| 12 | ESPI2_CLK | CSI_DATA00 | E4 |
| 13 | ESPI2_SS | CSI_DATA01 | E3 |
| 14 | ESPI2_MISO | CSI_DATA03 | E1 |
| 15 | ESPI2_MOSI | CSI_DATA02 | E2 |
| 16 | GND | GND | |

X1: RIGHT

| Pin# | Function | SOC Pin name | SOC Pad |
|------|----------|------------------------|-----------------|
| 1 | ETH1_RXM | PHY out (KSZ8081RNDCA) | 3 (ethernet ic) |
| 2 | ETH1_RXP | PHY out (KSZ8081RNDCA) | 4 (ethernet ic) |
| 3 | ETH1_TXM | PHY out (KSZ8081RNDCA) | 5 (ethernet ic) |
| 4 | ETH1_TXP | PHY out (KSZ8081RNDCA) | 6 (ethernet ic) |

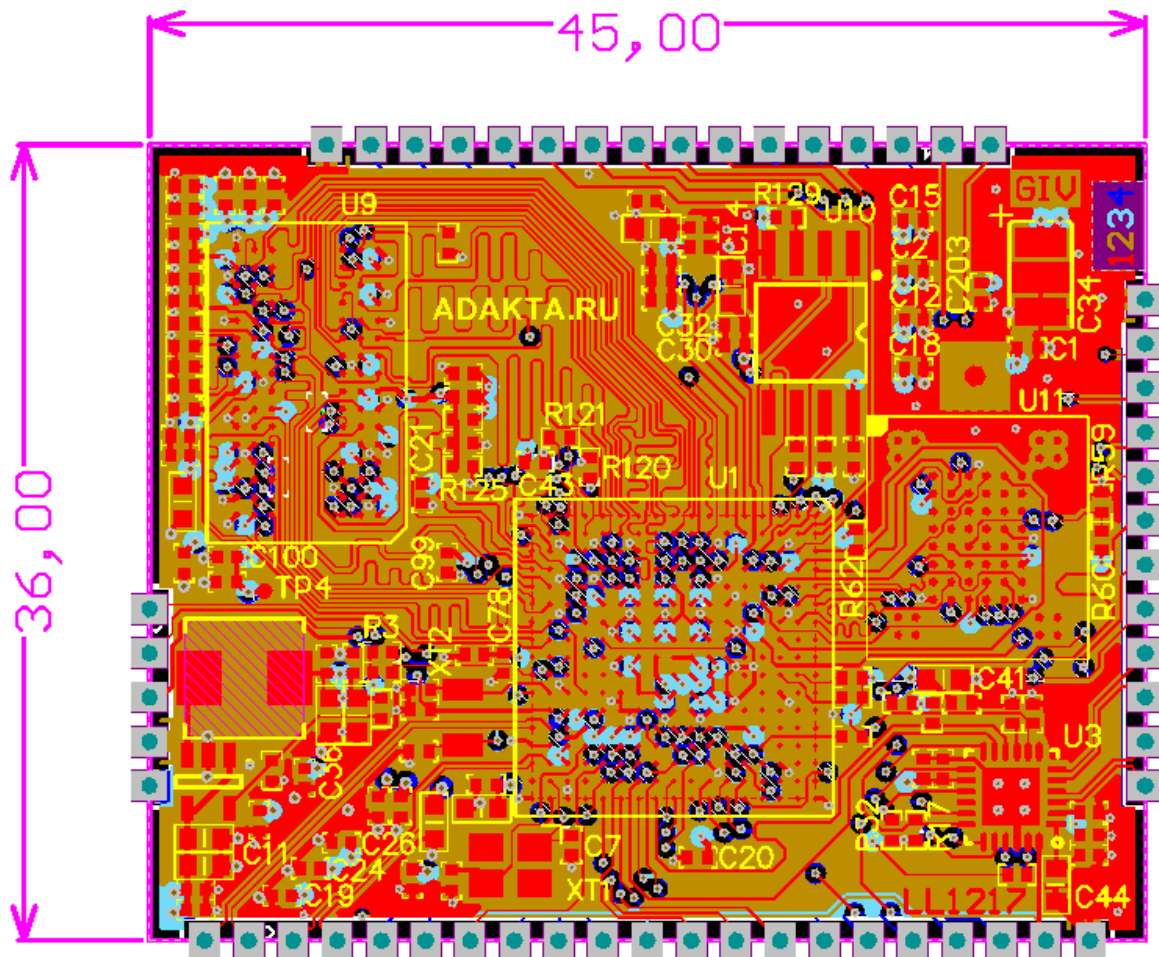
| | | | |
|----|-----------|------------------------|------------------|
| 5 | ETH1_LED0 | LED0/AS (KSZ8081RNDCA) | 23 (ethernet ic) |
| 6 | I2C2_SDA | UART5_RX_DATA | G13 |
| 7 | I2C2_SCL | UART5_TX_DATA | F17 |
| 8 | UART2_TXD | UART2_TX_DATA | J17 |
| 9 | UART2_RXD | UART2_RX_DATA | J16 |
| 10 | UART2_RTS | UART2_RTS | H14 |
| 11 | UART2_CTS | UART2_CTS | J15 |
| 12 | GND | GND | |

X3: DOWN

| Pin# | Function | SOC Pin name | SOC Pad |
|------|--------------|--------------|---------|
| 1 | USB_OTG2_DN | USB_OTG2_DN | T13 |
| 2 | USB_OTG2_DP | USB_OTG2_DP | U13 |
| 3 | USB_OTG1_DN | USB_OTG1_DN | T15 |
| 4 | USB_OTG1_DP | USB_OTG1_DP | U15 |
| 5 | SAI2_TXD | JTAG_TRST | N14 |
| 6 | SAI2_RXD | JTAG_TCK | M14 |
| 7 | SAI2_SYNC | JTAG_TDO | N15 |
| 8 | SAI2_MCLK | JTAG_TMS | P14 |
| 9 | SAI2_BCLK | JTAG_TDI | N16 |
| 10 | USB_OTG2_PWR | GPIO1_IO02 | L14 |
| 11 | USB_OTG2_OC | GPIO1_IO03 | L17 |
| 12 | USB_OTG1_PWR | GPIO1_IO04 | M16 |
| 13 | USB_OTG1_OC | GPIO1_IO01 | L15 |
| 14 | USB_OTG1_ID | GPIO1_IO00 | K13 |
| 15 | ADC1_IN9 | GPIO1_IO09 | M15 |
| 16 | ADC1_IN8 | GPIO1_IO08 | N17 |
| 17 | CAN_TX | UART3_CTS | J15 |
| 18 | CAN_RX | UART3_RTS | H14 |
| 19 | PWM4 | GPIO1_IO05 | M17 |
| 20 | RESET | POR | P8 |
| 21 | GND | GND | |

4. Mounting

The overall dimensions of the **ADAKTA-mx6ull** board are 45mm x 36mm



5. Requirements for the motherboard

Requirements for operating:

- RESET pin (X3 connector) should be in High level.
- On 3V3 (X2 connector) should be supplied 3.3V for module, the power should not be less 2W.

Console default setting:

- UART1_TXD/UART1_RXD (X4 connector).
- Flow control is disabled.

6. Software

Yocto software is available on https://github.com/trotill/adk_yocto/, addition software available by request. **ADAKTA-mx6ull** supports: ubuntu, debian, yocto. The description and examples can be found on site <https://help.adakta.ru>.

If you have any difficulties, try to find the answer at <https://help.adakta.ru> or write us a mail to support@adakta.ru.