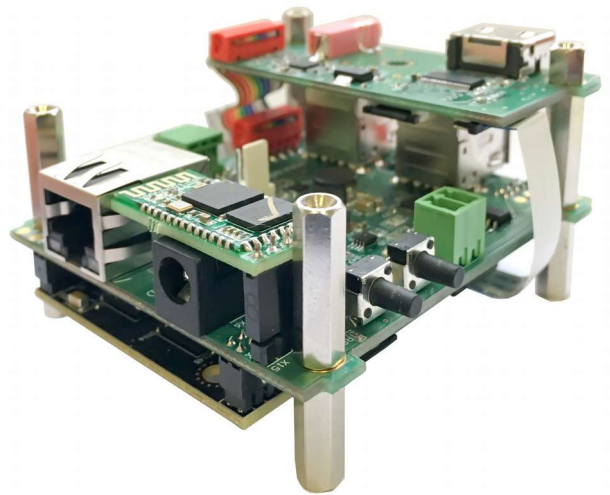


ADK-MX6 Hardware User Manual

Revision History

Date	Revision	Description
24.05.17	3	Fist



1 Contents

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2 Overview

ADK-MX6 consists from top-class AMX6 SBC(Single board computer) based on NXP i.MX6 application processor and kit of additional boards. ADK-MX6 is final solution and can be used as compact solution that permits to reach scalable performances in various devices or as development kit thanks to customers have the chance to save time and resources.

The i.MX6x CPU belongs to the group of CPUs included in the [NXP Product Longevity Program](#), that guarantees a minimum availability period of 15 years for the automotive and medical segments, and 10 years for all other market segments.

ADK-MX6 application:

- iMX6 CPU development kit;
- AMX6 SBC development kit;
- Mediaplayer;
- VoIP and video conference terminal (Skype, TrueConf, Vsee e.t.c.);
- HDMI Android dongle;
- Intelligent Vision Systems using OpenCV;
- IP video server;
- SmartHome solution.

ADK-MX6 includes PCB case which has high-temperature-resistant and protects the electronics from dust and moisture.

ADK-MX6 has 2 modification: low ADK-MX6v1C, base ADK-MX6v1B and extended ADK-MX6v1A.

The extended modification is fully corresponded below hardware specifications.

The base modification does not have a camera, wifi/bt module and case, unlike the extended.

Low modification only consists from AMX6 SBC and motherboard, does not include case, Bluetooth console, WiFi/Bt module, HDMI, analog audio, camera and power DC adapter 5V.

ADK-MX6 is compatible with SDK Sabrelite powered by BoundaryDevice, support Linux kernel 3.x & 4.x, Android 4.2/4.4/5.0, Ubuntu, Yocto, BuildRoot.

The Bluetooth console module helps to easy start debugging process.

ADK-MX6 is available with complete Altium Designer project documentation including schematics and PCB layout source files, as well as manufacturing documentation.

The hardware specifications following:

- AMX6x module
- Mother board,
- two mini boards (ADK-MX6v1A/B only)
- case (ADK-MX6v1A only), for ADK-MX6v1B/C on request
- 4xUSB 2.0 host, hi speed
- Display port HDMI 1.4a (ADK-MX6v1A/B only)
- USB Device, Android ADB support
- Audio jack 3.5mm for mic. and stereo out (ADK-MX6v1A/B only)
- Ethernet 1G
- Connector for uSD
- Protected UART for external peripheral
- BlueTooth console for debug (ADK-MX6v1A/B only)
- 3 android button (power on/home, vol up, vol down),
- Advanced placed in board for debug: UART, SPI, I2C, CAN, GPIO, PWM, Reset button, 5V conn. (internal for debug)
- 5V power DC adapter (ADK-MX6v1A/B only)
- Can be installed on a tripod (ADK-MX6v1A only)
- Advanced Power management, power on/off
- 5 Mpix camera module (ADK-MX6v1A only)
- WiFi/BT modem with android 4.4 support (source code available on request) (ADK-MX6v1A only)
- 0-70C Operating Temperature (Avt. Temperature -40-+125C Vers. Available)
- High vibration resistance

3 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
Main Input Voltage	5V	5.1V	5.4V	V
Power Consumption*	0.01	7	15	W
Internal input/output Hi level	3.2	3.3	3.4	V
Internal input/output Lo level	0	0.3	0.7	V
Protected UART RX, Hi level	3	3.3	3.8	V
Protected UART RX, Lo level	0	0.7	2	V
Protected UART TX, Hi level	3	3.1	3.25	V
Protected UART TX, Lo level	0	0.4	0.5	V

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

4 ADK-MX6 kit, assembly details



4.1 Standard Connectors

The list of standard connectors with known pin outs is the following:

Number	Function
1	microSD Slot 1
2	USB A, USB host 1
3	USB A,USB host 2
4	USB A,USB host 3
5	USB A,USB host 4
6	Mini USB, USB Device
7	HDMI
8	audio jack 3.5 for external headset (connector for standard headset)
9	RJ45, Ethernet 1G
10	DC 5.5/2.1, Power 5V

4.2 Custom Connectors

Protected UART (UART3), number 11

Pin#	Function
1	RXD
2	TXD
3	GND

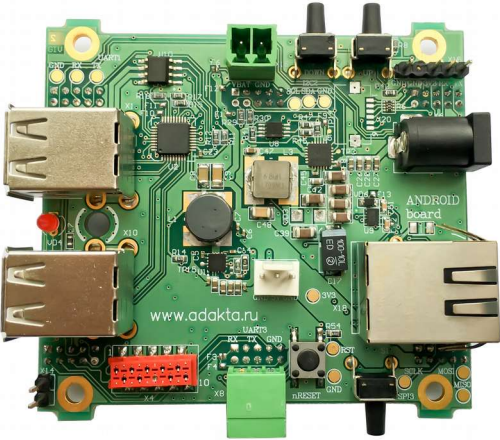
4.3 Buttons

Button	Function
12	Vol Up
13	Vol Down
14	Power on/off

4.4 Dimensions

The overall dimensions 80x80x44mm.

5 ADK-MX6 mother board, assembly details



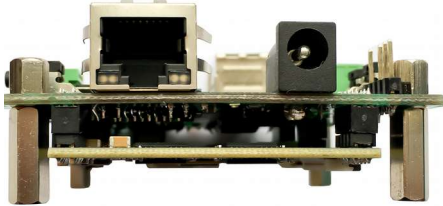
TOP



Back



Bottom



Front

5.1 Internal board connectors and mechanics

The list of connectors/pads is the following:

RefDes	Function
X9	Power 5V
X16	Rechargeable battery connector
X20	Multi purpose connector
X14	Boot mode connector
X4	Audio connector
X15	Debug console
X17	Ethernet 1G
SCLK, MOSI, MISO (TP6,TP7,TP8)	SPI3 debug pads
GND, RX, TX (TP11, TP2, TP5)	UART1 debug pads
SCL,SDA,GND (TP9, TP10, TP12)	I2C2 debug pads
VD1	Led, indicate supply
NRESET (S3)	Reset button for debug
RST (TP4)	Reset debug pad

Power 5V connector, X9

Pin#	Function
1	GND
2	5V
3	GND

Multi purpose connector, X20

Pin#	Function
1	CAN1_STBY/GPIO2
2	CAN1_RXD/GPIO8
3	CAN1_TXD/GPIO7
4	PWM1/GPIO9
5	I2C3_SDA
6	I2C3_SCL

Boot mode connector, X14

Pin#	Function
1	BOOT_MODE0
2	3.3V

For change boot mode from spi nor flash to USB device, insert jumper.

X17: Ethernet

Pin#	Function
1	TX_A_P
2	TX_A_N
3	GND
4	TX_B_P
5	TX_B_N
6	GND
7	TX_C_P
8	TX_C_N
9	GND
10	TX_D_P
11	TX_D_N
12	GND
13	LED1_ACT
14	LED2_LINK

Audio connector, X4

Pin#	Function
1	5V
2	AUD4_TXC
3	GND
4	AUD4_TXD
5	I2C1_SDA
6	AUD4_TXFS
7	I2C1_SCL
8	AUD4_RXD
9	GND
10	MCLK

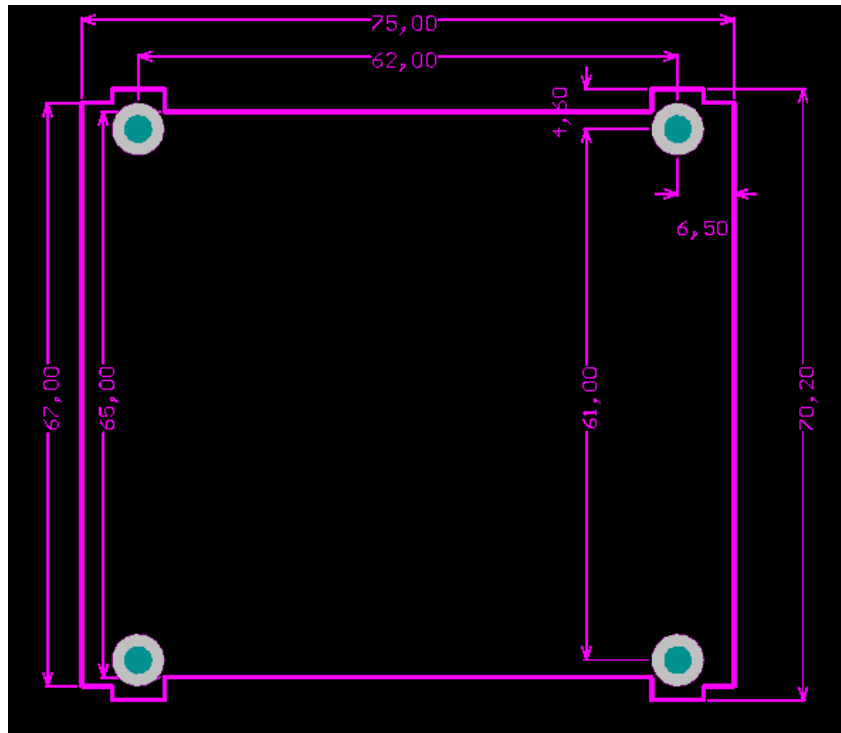
For using I2S on corresponded board you should setup capacitors and resistors. The information is below.

Debug console, X15

Pin#	Function
1	UART2_TXD
2	UART2_RXD
3	3.3V
4	GND
5	GND

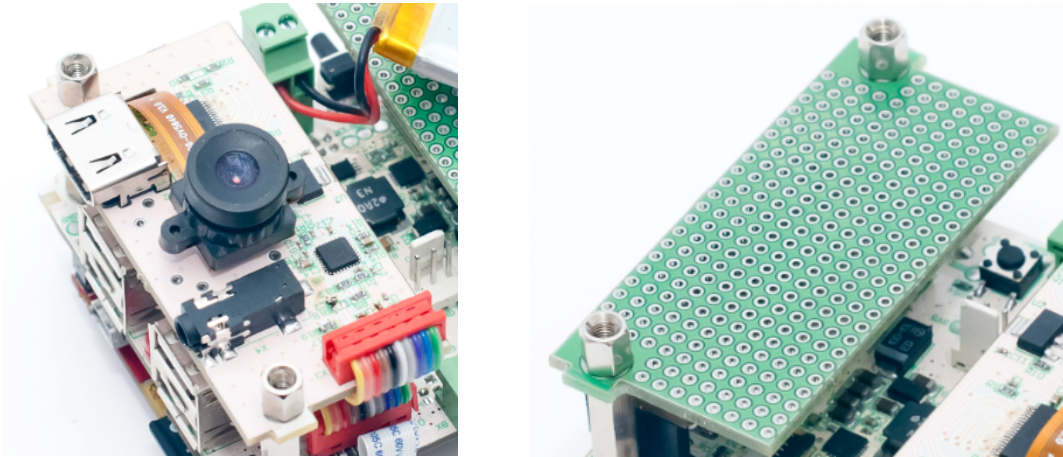
5.2 Dimensions

The overall dimensions of the mother board are 75mm x 70.2mm

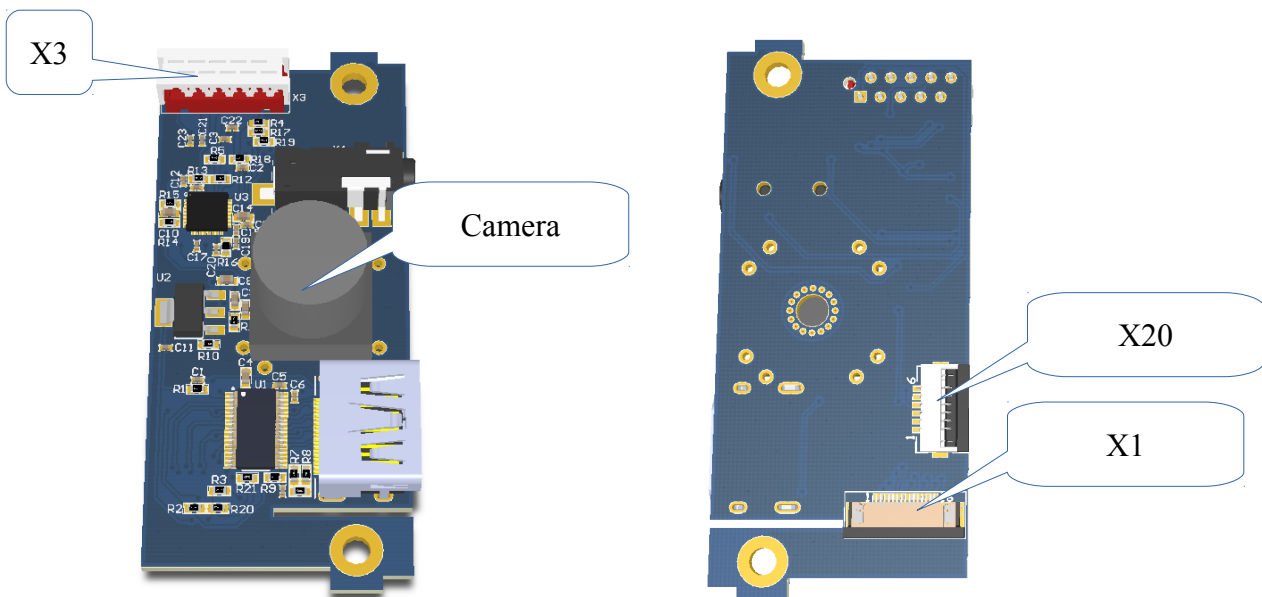


6 ADK-MX6 mini boards, assembly details

ADK-MX6 has 2 additional boards. One of them has audiocodec and HDMI interface. The second board should be referenced board for your own application.

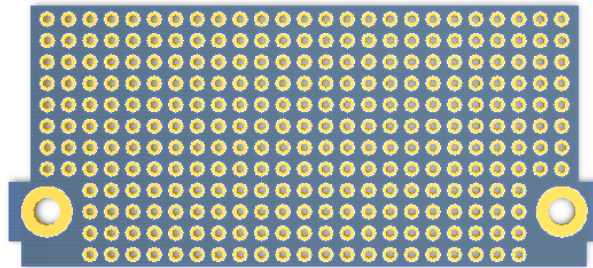


6.1 Internal connectors and mechanics, for mini board 1



Mini board 1 (Audio, HDMI extender)

Mini board 2 (model board)



The list of connector is the following:

RefDes	Function
X1	Hdmi conn
X3	Audio conn
X20	Multi purpose connector

X3: Audio connector

Pin#	Function
1	5V
2	AUD4_TXC
3	GND
4	AUD4_TXD
5	I2C1_SDA
6	AUD4_TXFS
7	I2C1_SCL
8	AUD4_RXD
9	GND
10	MCLK

X20: Multi purpose connector

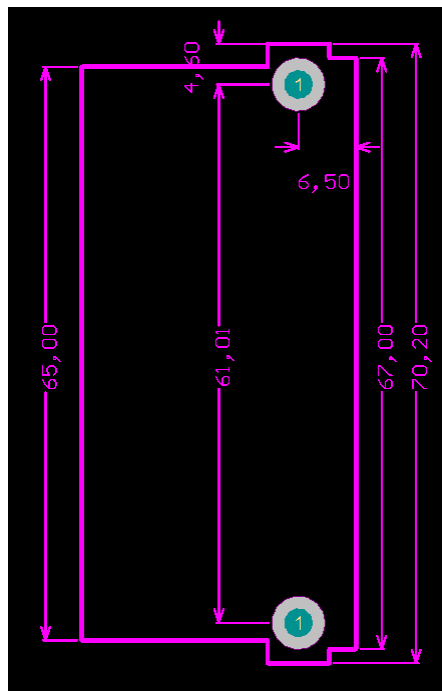
Pin#	Function
1	
2	CAN1/GPIO8
3	
4	PWM1/GPIO9
5	
6	

X1: HDMI

Pin#	Function
1	HDMI_HPD
2	I2C2_SDA
3	I2C2_SCL
4	HDMI_DDC
5	GND
6	HDMI_CLK_N
7	HDMI_CLK_P
8	GND
9	HDMI_D0_N
10	HDMI_D0_P
11	GND
12	HDMI_D1_N
13	HDMI_D1_P
14	GND
15	HDMI_D2_N
16	HDMI_D2_P

6.2 Dimensions

The overall dimensions of the mini board are 31mm x 70.2mm



7 Software

ADK-MX6 is fully compatible with Sabre Light SDK BD-SL-I.MX6. Software is available for downloading from our site. Now module supports all original distribution ubuntu, yocto, buldroot and android 4.2/4.3/4.4/5/6. The description and examples can be found on Boundary devices web page.

A lot of actual and useful information can be found on NXP web page which suitable for quick start of developing.

ADK-MX6 has built-in Bluetooth for Linux console. The bluetooth device name is HC-05, password 1234.

The OS is located on SD card.

