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V1.0	

BM1880AA

Edge Development Board

Hardware User Manual

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Revision History

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BM1880AA Edge Development Board User Manual

Key words: EDB、BM1880、USB3.0、LPDDR4、eMMC

Abstract: The document is about EDB, The EDB is a 96Boards compliant community based on BITMAIN SOC of BM1880AA。

Abbreviation list:

Abbreviation	Description	Remark
USB3.0	Universal Serial Bus 3.0	
LPDDR4	Low Power Double Data Rate 4	
eMMC	embedded MultiMedia Card	
EDB	Edge Development Board	

1 Overview

1.1 Background

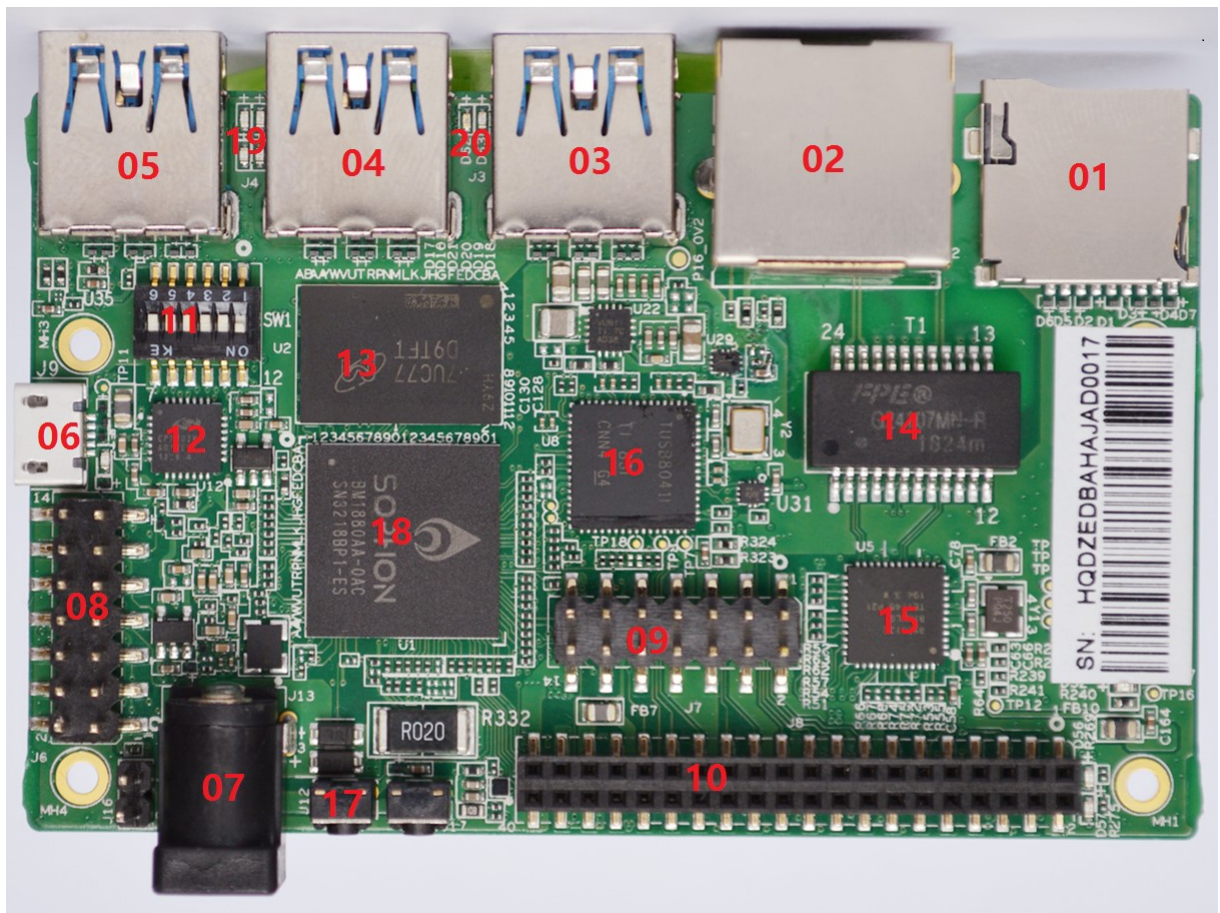
- 1) Board name and version

Board name: Edge development board (EDB)

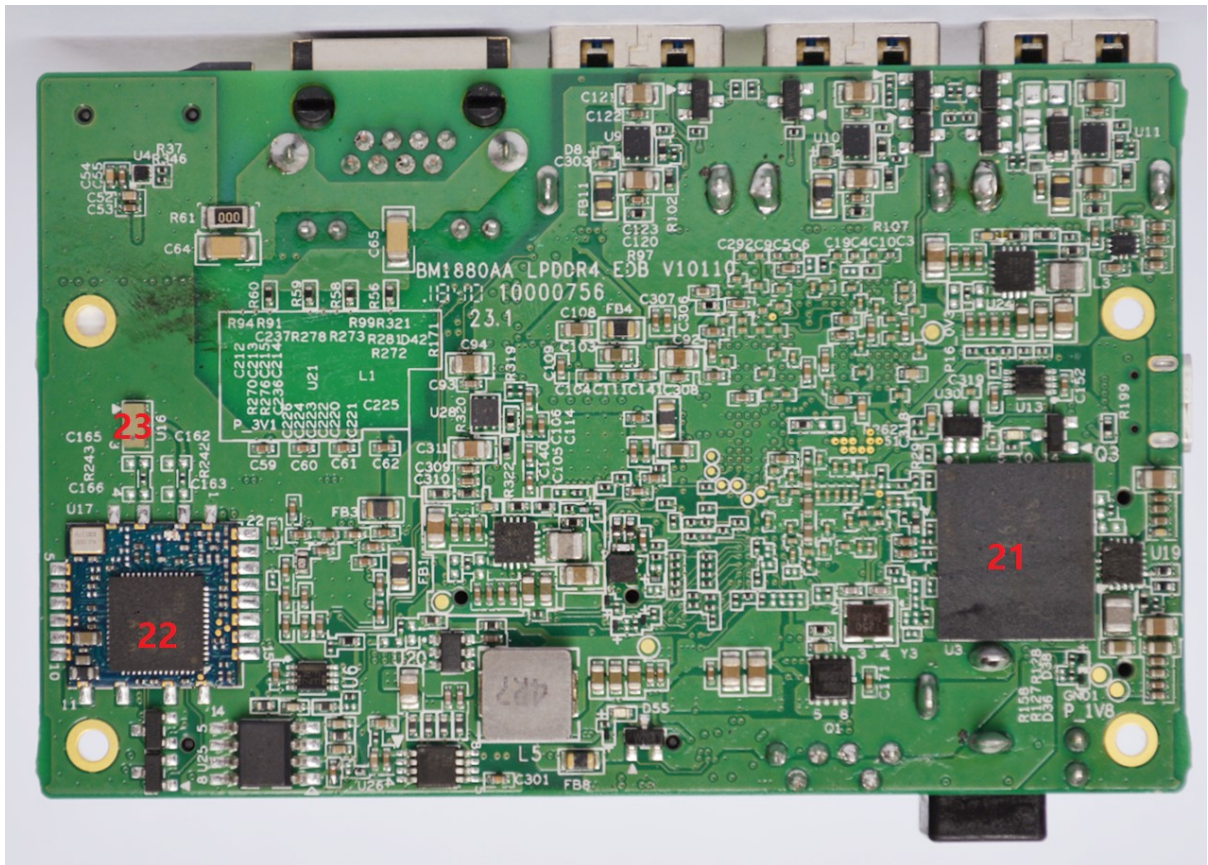
Version: V100

- 2) Board overview

Top view:



Bottom view:



Number	Description
01	(J1) Micro SD Card Socket
02	(J2) Ethernet connector (10/100/1000M) RJ45
03	(J3) USB3.0 Type A connector
04	(J4) USB3.0 Type A connector
05	(J5) USB3.0 Type A connector
06	(J9) Micro USB2.0 connector, UART debug port
07	(J13) DC IN JACK
08	(J6) 2.54mm 2*7 header, JTAG0 port, A53 debug
09	(J7) 2.54mm 2*7 header, JTAG1 port, not installed, RSIC-V debug
10	(J8) Low Speed Expansion Connector
11	(SW1) SWITCH, BOOT switches
12	(U12) CP2102, USB TO UART
13	(U2) LPDDR4
14	(T1) Gigabit Ethernet(10/100/1000M) transform
15	(U5) Gigabit PHY
16	(U8) USB HUB
17	(SW2, SW3) RESET_BTN, PUSH BUTTON
18	(U1) BM1880AA
19	(D58,D59,D60,D61) USER LEDs
20	(D62,D63) WIFI/BT LED
21	(U3) EMMC flash
22	(U17) WIFI module
23	(U16) Antenna

1.2 Specification

Work conditions:

- ◆ Temperature: 0°C~40°C;
- ◆ Humidity: 5%~90%
- ◆ Storage temperature: -40~90 °C
- ◆ Temperature changing rate: ±15°C/hours
- ◆ Power supply 4V-16V(DC JACK)/5V (USB)

Operation voltage: 3.3V/1.8V/1.1V/0.9V

Dimension: 85mm*54mm

Weight:36g

Location hole diameter:2mm

1.3 Key parameters

This EDB key parameters is following:

Name	Description	Remark
Processor	BM1880	CPU: dual core A53@1.5Ghz; TPU: 1TOPS INT8 support Winograd
System Memory	LPDDR4	1GB 3200Mhz
Storage	eMMC	8GB; micro SD card slot
video	N/A	
Camera support	USB	USB host for USB camera
Connectivity	Ethernet	Gigabit Ethernet RJ-45
	WLAN	WiFi/BT
	External module	USB or SPI
Audio	MIC	4-mic I2S*2(codec and connector)
	Speaker	4-mic I2S*2(codec and connector)
USB	USB3.0/USB2.0/OTG	USB3.0*4(USB HUB on board, one reserved for WIFI/BT module)
Expansion	40-PIN header(female)	40-PIN 96Boards low-speed expansion header
Power supply	DC IN JACK / USB	12V@2A or 5V@1A
Debug	JTAG/UART	JTAG for CPU, Micro USB for UART, another optional JTAG for RSIC-V
OS	Linux	
Dimensions	85mm X 54mm	

2 Getting started

2.1 Prerequisites

Before you power up your EDB boards for the first time you need the following:

- ◆ Edge Development Board(EDB)
- ◆ A 96Boards compliant power supply

2.2 Starting the board for the first time

To start the board, follow these steps:

- ◆ Step1. Make sure that the boot switches SW1 is configured as “110”(boot from USB)
- ◆ Step2. Connector USB cable to UART port (Micro USB)
- ◆ Step3. Connector power adaptor to DC JACK

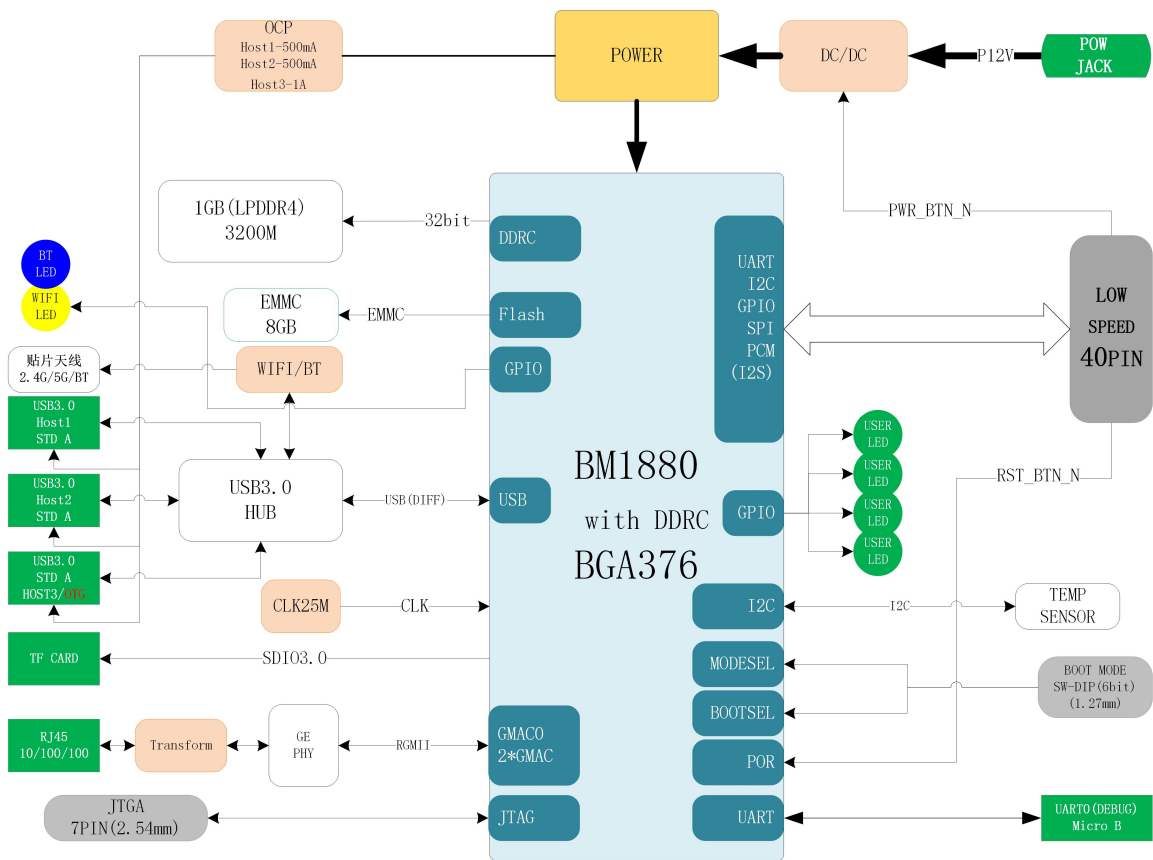
Once the board power up, the boot information will be printed on the UART terminal.

Please note that the first boot will take few minutes due to initialization.

3 Functional description

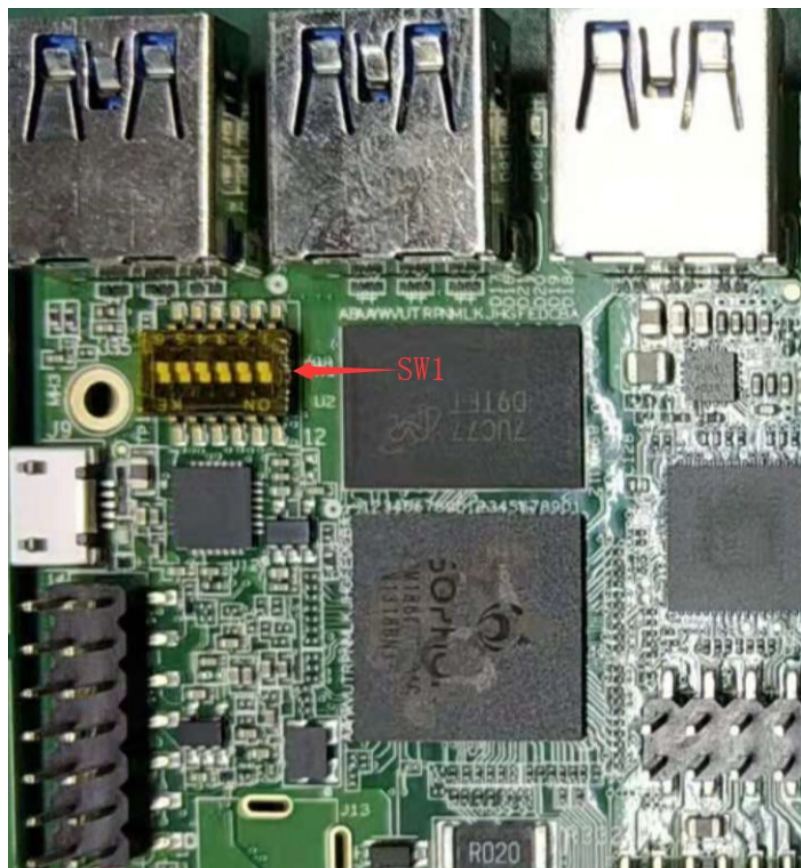
3.1 Block diagram

BM1880 EDB (Edge Development Board) BD



3.2 Boot mode

The EDB board has several boot options by switch of SW1 on the board.



bit	function	default	description
1	boot_sel2	on	boot_sel[2:0]=3'b110: boot from usb
2	boot_sel1	on	
3	boot_sel0	off	
4	boot_sel5	off	1'b1: A53 boot as main AP
5	OTG_ID	on	1'b0: host mode
6	port_sel	off	1'b1: the three host USB3.0 ports enabled

Bit4: BOOT_SEL[5]

OFF: A53 boot as main AP.

ON: RISC-V boot as main AP.

Bit1-bit3:BOOT_SEL[2:0]

000: loading linux kernel from I2C.

001: loading linux kernel from UART.

010: loading linux kernel from ONFI NAND.

011: loading linux kernel from SPI NOR Flash.

100: loading linux kernel from eMMC.

101: loading linux kernel from SD card.

110: loading linux kernel from USB.

111: this is not used.

Bit5: OTG_ID

ON: BM1880 USB as host or OTG enabled

OFF: BM1880 USB as device

Bit6: PORT_SEL

ON: USB port3 is directly connected to BM1880 USB2.0 port

OFF: all three USB ports as host ports

3.3 POWER on button /reset button

The power button SW2 can be used to power ciycle the board.

The reset button SW3 can be used to reset the system

3.4 DC in jack

DC power is provided via the DC JACK of J13. This is a connector with a center pin diameter of 1.65mm configured with positive plolarity. An 12V power supply at a minimum of 2A rateing can be used to provide sufficient board power for on system requirements as well as external devices. Additional current rating may be required for mezzanine boards or modules. DC power can also be supplied via the SYS_DCIN pins on the low speed expansion of J8.

3.5 Low speed expansion connector

The EDB features one expansion connector. This connector is a low-profile 40 pin femal 2mm receptacle(20*2) of a specified height of 4.5mm height. The low speed expansion brings out 1.8V level SOC signals such as UART and I2C and I2S, and GPIO, power supply of 1.8V and Ground. The complete list of signals is shown as below:

GND	Pin 1	Pin 2	GND
UART0_CTS	Pin 3	Pin 4	PWR_BTN_N
UART0_TxD	Pin 5	Pin 6	RST_BTN_N
UART0_RxD	Pin 7	Pin 8	SPI1_SCLK
UART0_RTS	Pin 9	Pin 10	SPI1_SDI
UART1_TxD	Pin 11	Pin 12	SPI1_CS
UART1_RxD	Pin 13	Pin 14	SPI1_SDO
I2C0_SCL	Pin 15	Pin 16	I2S0_FS
I2C0_SDA	Pin 17	Pin 18	I2S0_SCLK
I2C1_SCL	Pin 19	Pin 20	I2S0_SDO
I2C1_SDA	Pin 21	Pin 22	I2S0_SDI
GPIO0	Pin 23	Pin 24	GPIO62
GPIO1	Pin 25	Pin 26	GPIO64/I2S1_FS
GPIO3	Pin 27	Pin 28	GPIO63/I2S1_SCLK
GPIO7	Pin 29	Pin 30	GPIO66/I2S1_SDO
GPIO50	Pin 31	Pin 32	GPIO65/I2S1_SDI
GPIO51	Pin 33	Pin 34	GPIO67
+1V8	Pin 35	Pin 36	+12V
+5V	Pin 37	Pin 38	+12V
GND	Pin 39	Pin 40	GND

3.6 Antenna

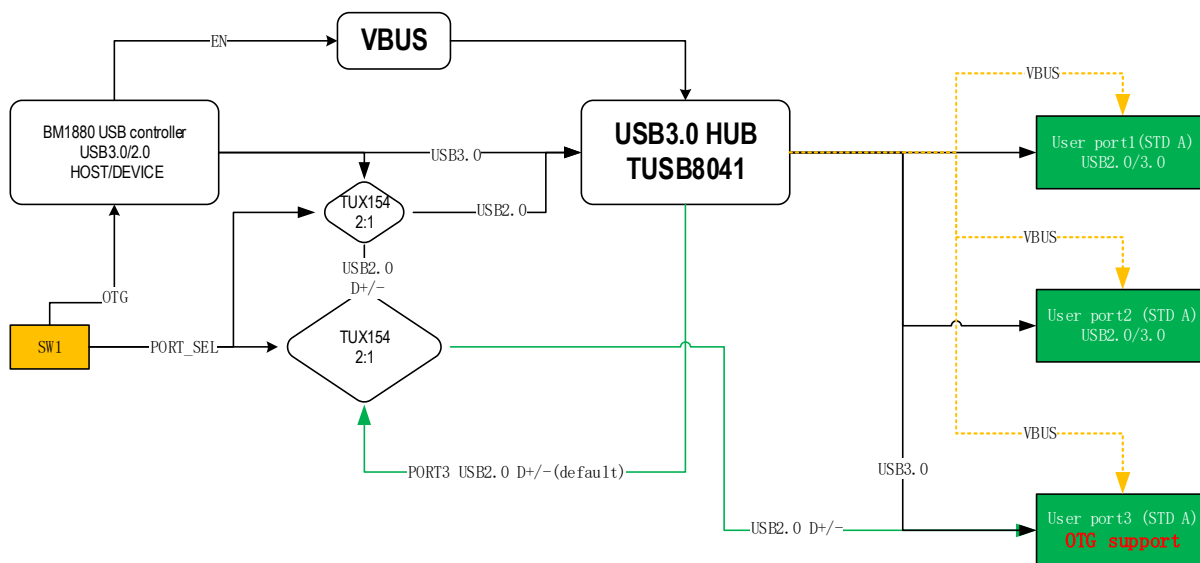
The EDB is equipped with a realtek RT8821 WLAN basedband processor and RF transceiver which supports IEEE802.11a, 802.11b, 802.11g, 802.11n and 802.11ac WIFI and bluetooth.

A PCB chip antenna is available on board by default.

3.7 USB interfaces

There are total 4 USB ports on the EDB board. Three type A USB3.0 host ports at J3 and J4 and J5, one micro USB slave port at J9 as UART debug port.

Port3 of J5 can be used as OTG port, which is directly connected to BM1880 USB2.0 port.



The EDB board utilizes a single SoC USB interface, which support USB2.0 and USB3.0 protocol.

3.8 System and user LEDs

There are one status LED and four User LEDs on the EDB. The user LEDs can be programmed by the SoC directly.

- ◆ D56- 3.3V power LED: 3.3V power good indicator,
This is a green type surface mount 0402 LED
- ◆ D58-D61 USER LEDs
The four user LEDs are surface mount green type 0402 LED
- ◆ D62 WIFI LED
The WiFi activity LED is a yellow type surface mount 0402 LED
- ◆ D63 BT LED
The BT activity LED is a blue type surface mount 0402 LED

3.9 JTAG header

The EDB includes soldering a 14-pin header of J6 that brings out the SoC signals for A53 JTAG debugging. Another optional 14-pin header of J7 is for RSIC-V JTAG debugging.