封面

100mm

140mm

MB41

AIoT Edge Controller

User Manual

1. Brief Introduction

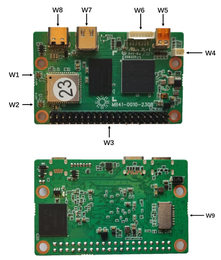
MB41 is an AIoT Edge Controller based on S905X4 processor, it has multiple interfaces include HDMI, TF card, 10/100M Ethernet, Wi-Fi (BT integrated), I2C, UART, SPI, GPIO, USB3.0, USB2.0 (OTG), RTC, etc.

2. Specification

Feature	MB41 - AIoT Edge Controller
PCB Size / Overall Size	65mm x 40mm
Display	1x HDMI (Type D)
Ethernet	1x Ethernet (10/100)
Wi-Fi	2T2R, IEEE 802.11b/g/n/a/ac
BT	2.1/3.0/4.2/5.0
USB	1x USB 3.0 Type C 1x USB 2.0 Type C(Can be used as power input port)
Serial	2x UART (TTL 3V3 Power level)
I2S	1x I2S (3.3V Level)
I2C	2x (3.3V Level)
GPIO	11x GPIO (3.3V Level)
ADC	1x (range 0 ~1.8V)
RTC	With super capacitor for RTC power supply (over 2 hours)
LED	1x LED (Green): power indication 1x LED (Blue): status indication (controlled by software)
Power Requirements	+5VDC Input
Operating Temperature	0°C to +55°
Weight	50g
Accessories	N/A

3. Interfaces

3.1 Hardware interface



Label	Name	Description
W1	Wi-Fi with BT ANT	IPEX-1
W2	Wi-Fi only ANT	IPEX-1
W3	40PIN	GPIO, I2C, I2S, UART, ADC
W4	RTC battery Connector	For external RTC battery input
W5	HDMI connector	Type D
W6	Ethernet	10/100M (need extra transformer)
W7	USB 3.0: 5V/0.9A	Type C
W8	USB 2.0: 5V/0.5A	OTG, power input
W9	TF card	Half size

3.2 Description

3.2.1 ANT (W1)

IPEX- 1 (Dual Band Wi - Fi and Bluetooth Combo)
Manufacturer: Beijing Huatong Jiaye Technology Co., Ltd
Type/Model: Dual band fan-shaped rubber rod omnidirectional antenna
Bluetooth (BR/EDR/LE):maximum PK gain: 3.09 dBi
2.4G WIFI:Maximum PK gain: 3.09 dBi
5G WIFI: Maximum PK gain: 4.56 dBi

3.2.2 ANT (W2)

IPEX- 1(Dual Band Wi - Fi Only)
Manufacturer: Quectel Wireless Solutions Co., Ltd.
Type/Model: WIFI FPC Antenna
2.4G WIFI:Maximum PK gain: 2.0 dBi
5G WIFI: Maximum PK gain: 5.3 dBi

3.2.3 40PIN (W3)

Pin	Pin Description	Pin	Pin Description
1	3V3	2	5V
3	GPIOZ_14	4	5V
5	GPIOZ_15	6	GND
7	GPIOZ_13	8	GPIOD_0
9	GND	10	GPIOD_1
11	GPIOZ_8	12	GPIOZ_7
13	GPIOZ_9	14	GND
15	GPIOZ_3	16	GPIOZ_2
17	3V3	18	GPIOC_7
19	GPIOH_4	20	GND
21	GPIOH_5	22	GPIOZ_12
23	GPIOH_7	24	GPIOH_6
25	GND	26	SARADC_CH0
27	GPIOA_14	28	GPIOA_15
29	GPIOD_9	30	GND
31	GPIOZ_11	32	GPIOD_10
33	GPIOD_6	34	GND
35	GPIOZ_6	36	GPIOD_8
37	GPIOZ_10	38	GPIOZ_4
39	GND	40	GPIOZ_5

I2C:
PIN3(SDA), PIN5(SCL)
PIN27(SDA), PIN28(SCL)
UART:
PIN8(TXD), PIN10(RXD)
PIN36(TXD), PIN29(RXD)
ADC:
PIN26
SPI:
PIN19(MOSI), PIN21(MISO), PIN23(SCLK), PIN24(CS)
I2S:
PIN12(BCLK), PIN35(LRCK), PIN38(DIN), PIN40(DOUT)
GPIO:
40PIN number (7,11,13,15,16,18,22,31,32,33,37)
PIN18 is Open Drain

3.2.4 RTC Backup Battery (W4)

Pin	Pin Description	Pin	Pin Description
1	VCC (3.3V Maximum)	2	GND

3.2.5 HDMI (W5)

Pin	Pin Description	Pin	Pin Description
1	HPD	2	NC
3	TMD+	4	GND
5	TMD-	6	TMT+
7	GND	8	TMT-
9	TMB+	10	GND
11	TMB-	12	TMC+
13	GND	14	TMC
15	CEC	16	GND
17	SCL	18	SDA
19	+5V		

3.2.6 ETHERNET (W6)

Pin	Pin Description	Pin	Pin Description
1	L_MX	2	MDI_CP
3	MDI_TN	4	GND
5	MDI_RP	6	MDI_RN
7	GND		

3.2.7 USB 3.0 (W7)

Pin	Pin Description	Pin	Pin Description
A1	GND	B12	GND
A2	TX1+	B11	RX1+
A3	TX1-	B10	RX1-
A4	VBUS	B9	VBUS
A5	CC1	B8	NC
A6	USB2_0 P	B7	CC2
A7	USB2_0 N	B6	USB2_0 P
A8	NC	B5	USB2_0 N
A9	VBUS	B4	VBUS
A10	RX2-	B3	TX2-
A11	RX2+	B2	TX2+
A12	GND	B1	GND

3.2.8 USB 2.0 (W8)

Pin	Pin Description	Pin	Pin Description
A1	GND	B12	GND
A4	VBUS	B9	VBUS
A5	CC1	B8	ID input
A6	USB2_0 P	B7	CC2
A7	USB2_0 N	B6	USB2_0 P
A8	ID input	B5	USB2_0 N
A9	VBUS	B4	VBUS
A12	GND	B1	GND

3.2.9 TF card (W9)

Pin	Pin Description	Pin	Pin Description
1	SDIO_DATA2	2	SDIO_DATA3
3	SDIO_CMD	4	SDIO_VCC （3.3V）
5	SD_DET	6	SDIO_CLK
7	GND	8	SDIO_DATA0
9	SDIO_DATA1		

Declaration of Conformity

Hereby, Shenzhen SDMC Technology Co., LTD declares that the radio equipment type MB41 is in compliance with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available upon request.

The WLAN function for this device is restricted to indoor use only when operating in the 5150 to 5350 MHz frequency range.

AT	BE	BG	CH	CY	CZ	DK	DE	EE	EL	ES	FI		
FR	HR	HU	IE	IS	IT	LI	LT	LU	LV	MT	NL		
NO	PL	PT	RO	SE	SI	SK	TR	UKNI					

UK	

FCC Statements

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 any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement
The modular can be installed or integrated in mobile or fix devices only.
This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.
This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: 2BECT-MB41 Or Contains FCC ID: 2BECT-MB41"

When the module is installed inside another device, the user manual of this device must contain below warning statements:
1. 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 any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.
The end user manual shall include all required regulatory information/warning as shown in this manual, include:
This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

Requirement per KDB996369 D03

2.2 List of applicable FCC rules
CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter.

2.3 Summarize the specific operational use conditions
This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting
condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have
to consult with module manufacturer for the installation method in end system.

2.4 Limited module procedures
The module is a single module, not applicable.

2.5 Trace antenna designs
The module has no tracking antenna be used, not applicable.

2.6 RF exposure considerations
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

2.7 Antennas
This radio transmitter has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. FCC ID: 2BECT-MB41
Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Antenna No.	Type of ANT A:	Type of ANT B:	Gain of the antenna(Max.)	Frequency range
Bluetooth	RP-SMA antenna	/	4.96dBi for RP-SMA antenna; 5dBi for FPC antenna	2400-2500MHz
2.4GWiFi	RP-SMA	FPC antenna		2400-2500MHz
5GWiFi	RP-SMA	FPC antenna		5000-5900MHz

2.8 Label and compliance information
The final end product must be labeled in a visible area with the following" Contains FCC ID: 2BECT-MB41".

2.9 Information on test modes and additional testing requirements
Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.

2.10 Additional testing, Part 15 Subpart B disclaimer
Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B.

Frequency band:
Bluetooth: 2402MHz – 2480MHz
2.4G WIFI: 2412MHz – 2472MHz
5G WIFI: 5150MHz – 5250MHz, 5250MHz – 5350MHz, 5470MHz – 5725MHz, 5725MHz – 5850MHz,
RF Effective Isotropic Radiated Power,EIRP:
2.4GWIFI: EIRP<20dBm
Bluetooth: EIRP<20dBm
5GWIFI : 5150-5250MHz: EIRP<23dBm
5250–5350MHz: EIRP<20dBm
5470-5725MHz: EIRP<20dBm
5725–5850MHz: EIRP<14dBm

This product bears the selective sorting symbol for Waste electrical and electronic equipment (WEEE). This means that this product must be handled pursuant to European directive 2012/19/EU in order to be recycled or dismantled to minimize its impact on the environment. User has the choice to give his product to a competent recycling organization or to the retailer when he buys a new electrical or electronic equipment.

IC Statement:
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;
2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Radiation Exposure Statement:
The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.
Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

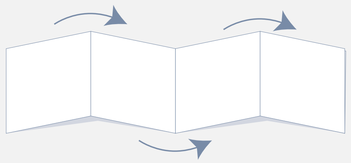
This device complies with RSS 247 of Industry Canada. This Class B device meets all the requirements of the Canadian interference-causing equipment regulations.
Cet appareil numérique de la Classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
For devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate.

le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5250-5350 MHz et 5470-5725 MHz doit se conformer à la limite de p.i.r.e.; le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5725-5850 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

The final end product must be labeled in a visible area with the following" Contains IC: 31883-MB41".

折页示意图



技术要求：

1）尺寸公差±2mm

2）环保要求RoHS、Reach

增加认证信息	2024-03-04
蔡晨 首发	2024-01-22
DESCRIPTION 备注说明	DATE 日期

历史修订版本记录

华曦达科技股份有限公司

资料名称：DM8914-UserManual	单位:mm
物料编号：460900475	**工艺描述汇总：** 说明书,100x140mm,80g书写纸彩色,风琴折
设计：	
校对：	
审核：	
会签：	
批准：	

Size	Scale	Rev
A1	1:1	