IECQ COMPONENT SPECIFICATION

IEC Quality Assessment System for Electronic Components (IECQ System)

Smart Air Conditioner 2.4GHz Wi-Fi + Bluetooth Dual Modules MHCWB6G-B – K182-CO-0001
IECQ COMPONENT SPECIFICATION

IEC Quality Assessment System for Electronic Components (IECQ System)

Smart Air Conditioner 2.4GHz Wi-Fi + Bluetooth Dual Modules MHCWB6G-B – K182-CO-0001
CONTENTS

FOREWORD .............................................................................................................. 3
IECQ Specification Cover Page ............................................................................. 4

Section one – General information........................................................................ 5
  1.1 Approved Scope ................................................................................................. 5
     1.1.1 Appearance, Modules and Dimensions ..................................................... 5
  1.2 Normative references ....................................................................................... 6
  1.3 Terms and definitions ...................................................................................... 6
     1.3.1 Smart Air Conditioner ............................................................................... 6
     1.3.2 Application (APP) .................................................................................... 7
     1.3.3 Maximum permissible power consumption ............................................ 7
     1.3.4 Packet loss ............................................................................................... 7
     1.3.5 Throughput .............................................................................................. 7
  1.4 Abbreviation ..................................................................................................... 7
  1.5 Function usability ............................................................................................. 7
  1.6 Appearance ...................................................................................................... 8
  1.7 MAC address .................................................................................................. 8
  1.8 Version of Wi-Fi Model and Associated Device Requirement ....................... 8
  1.9 Remote Upgradeability ................................................................................... 8
  1.10 Power supply parameter : ............................................................................ 8
     1.11 RF parameter ............................................................................................... 8
     1.12 Wire connection ......................................................................................... 9
     1.13 DC Electrical Characteristics for Digital I/Os ............................................. 10
  1.14 Associated Applications ................................................................................ 11
  1.15 ESD requirements ......................................................................................... 11
  1.16 MHCWB6G-B module parameter .................................................................. 11

Section Two – Quality Conformance Test Schedule ................................................ 13
  2.1 Procedure ...................................................................................................... 13
     2.1.1 Component Product Approval (Qualification) ........................................... 13
     2.1.2 Quality Conformance Inspection ............................................................. 13
  2.2 Composition of inspection lot ......................................................................... 13
  2.3 Sampling Plan .................................................................................................. 13
  2.4 Quality conformance inspection procedure .................................................... 15
     2.4.2 Production inspection items (Lot-by-Lot inspection and periodic
           inspection) .................................................................................................. 15
  2.5 Treatment of sample unit ............................................................................... 15

Section Three – Test methods ................................................................................ 16
  3.1 Test condition .................................................................................................. 16
  3.2 Power supply parameter ................................................................................ 16
  3.3 DC Electrical Characteristics for Digital I/O ................................................... 16
  3.4 Wireless connection usability ......................................................................... 16
  3.5 Module stability test ....................................................................................... 16
  3.6 Uplink/Downlink data transmission ............................................................... 16
  3.7 AOI inspection ................................................................................................ 16
  3.8 Broadcasting scan .......................................................................................... 16
FOREWORD

The IEC Quality Assessment System for Electronic Components (IECQ) is composed of those member countries of the International Electrotechnical Commission (IEC) who wish to take part in a harmonized system for electronic components of assessment quality. IECQ is also formally known in some European member countries as IECQ-CECC.

The object of the System is to facilitate international trade via business-to-business supply chain management tools and the harmonization of the specifications and quality assessment procedures for electronic components, assemblies and related materials and processes, and by the grant of an international recognized Certification of Conformity and the optional use of an IECQ Mark of Conformity. The components produced or services provided under the System are therefore accepted in all member countries without further testing.

This Component Specification is based upon the requirements of IECQ 03 Series of Rules of Procedure by:

Beijing Xiaomi Electronics Co., Ltd
Room 802, 8 Floor, Building 5, No.15, Kechuang Ten Street, Beijing Economic and Technological Development Zone, Beijing

and published under the authority of:

DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch
Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China

AMENDMENT RECORD

No previous editions.

REQUIREMENTS

The following data sheet satisfies the requirements of IECQ Component Specifications as detailed in IECQ 03 Series of Rules of Procedure.

It should be note that IECQ is not responsible for manufactures declaration made in data sheets that fall outside the limits of Certificates of Conformity.
## IECQ Specification Cover Page

### Component Specification available from:

- **Publicly available Specifications**
  - IECQ Certification Body under whose authority the Component Specification (CS) is published
  - IEC Webstore
  - IECQ Website
    
  [Image](#)

- **Proprietary Specifications**
  - IECQ Certification Body under whose authority the Component Specification (CS) is published
  - Other: ...

### Component Specification number:

**IECQ-CS 033000-CN0005**

for use within the IECQ Approved Component Scheme for *IoT smart home device*

**Edition 1, 2023-05**

### Product description:

Smart Air Conditioner 2.4GHz Wi-Fi + Bluetooth Dual Modules MHCWB6G-B

### Electronic Components of Assessed Quality Component Specification in according with:

- DEKRA K182
- GB/T 37879-2019
- IEC TS 63134
- ITU-T Recommendation G.1010 Series G TR-398
- IEC 61000-4-2
- Bluetooth Core Specification Version 5.0.

### Applicant:

**Beijing Xiaomi Electronics Co.,Ltd**

Room 802, 8 Floor, Building 5, No.15, Kechuang Ten Street, Beijing

Economic and Technological Development Zone, Beijing

### Outline drawing and install information:

The 2.4 GHz Wi-Fi+Bluetooth Dual modules MHCWB6G-B is used in Mi smart air conditioner with size 18 * 20 * 2.5 mm (length * width * height) and 15 GPIO ports. For MHCWB6G-B, there is an onboard antenna on the wireless module.

![Diagram](https://via.placeholder.com/150)

### IECQ Certification Body:

**DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch**

Block 5, No.3, Qiyun Road, Huangpu District, Guangzhou, Guangdong, China

Tel: +86 206661 2000

Fax: +86 206661 2001
Component Specification for Smart Air Conditioner 2.4GHz Wi-Fi + Bluetooth dual-mode module MHCWB6G-B – K182-MI-0001

Section one – General information

1.1 Approved Scope
This specification is applicable to smart air conditioner Wi-Fi + Bluetooth Modules MHCWB6G-B.

This specification defines the functional performance requirements for initial qualification and any component product change and establishes continuous quality consistency inspection procedures / control measures to check and issue IECQ Approved Components - Smart Air Conditioner Wi-Fi + Bluetooth Modules MHCWB6G-B-K182-MI-0001.

MHCWB6G-B is a high-performance Wi-Fi + Bluetooth dual mode wireless module based on Espressif’s ESP32-C3 chip. It uses RISC-V 32-bit single core processor with 4 pipeline architectures, and main frequency up to 160 MHz. The module Wi-Fi supports IEEE 802.11b/g/n standard and supports 20M and 40M working bandwidth; The Bluetooth section supports Bluetooth 5.0.

The peripheral of the module supports rich data interfaces, supporting a total of 15 GPIO ports. The data communication module includes SPI, UART, I2C, I2S, remote control peripheral, LED PWM controller, universal DMA controller, TWAI ® Controller (compatible with ISO11898-1), USB serial port/JTAG controller, temperature sensor, SAR A/D converter.

MHCWB6G-B is an integrated PCB on-board antenna.

MHCWB6G-B is suitable for many application scenarios such as smart home, industrial automation, healthcare, and consumer electronics.

Figure 1 – overview of the architecture for the smart home system

1.1.1 Appearance, Modules and Dimensions
The 2.4GHz WIFI+Bluetooth dual-mode module dimensions 18±0.1mm * 20±0.1mm * 2.5±0.1mm (length * width * height).
Table 1 - Module and Dimensions of Smart Air Conditioner Wi-Fi+Bluetooth Module

<table>
<thead>
<tr>
<th>Module ID</th>
<th>Dimension</th>
<th>CMIIT ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHCWB6G-B</td>
<td>18<em>20</em>2.5(mm)</td>
<td>2021DP16919</td>
</tr>
</tbody>
</table>

1.2 Normative references
The following referenced documents are for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DEKRA K182, *IoT smart home device*

GB/T 37879-2019, *Intelligentization technology for intelligent household appliances — Particular requirements for room air conditioners*

IEC TS 63134, *Active assisted living (AAL) use cases*

ITU-T Recommendation G.1010 Series G, *Transmission system and media, digital systems and networks; Quality of service and performance; End-user multimedia QoS categories*

TR-398, *Wi-Fi In-Premises Performance Testing*

*IEC 61000-4-2, Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test*

Bluetooth Core Specification Version 5.0.

1.3 Terms and definitions
The following terms and definitions apply to this specification, other terms and definitions apply to related normative references.

1.3.1 Smart Air Conditioner
A smart air conditioner with networking function, which can be remotely controlled through the app on the mobile terminal. Xiaomi Internet Air Conditioner is connected to the whole house interconnected ecosystem and supports voice control by Xiaoai speaker. Xiaomi Internet Air Conditioning also supports temperature and humidity sensors and intelligent IoT, monitoring indoor temperature and humidity conditions, and linking the air conditioning to activate refrigeration, heating, or dehumidification functions, achieving automatic operation of the air conditioning, and activating an intelligent lifestyle.
1.3.2 **Application (APP)**
Software specific to the application installed in Android or IOS system, that is implemented by the designer of the electrical control system, generally containing logic sequences, limits and expressions that control the appropriate input, output, calculations, and decisions necessary to meet the electrical control system functional requirements.

1.3.3 **Maximum permissible power consumption**
It refers to maximum permissible input power consumption under the temperature of 25°C.

1.3.4 **Packet loss**
The loss of data packets during transmission over a network.  
[SOURCE: IEC 62676-1-2:2013]

1.3.5 **Throughput**
Throughput is the maximum continuous traffic rate that a device can handle without dropping a single packet.  
[SOURCE: IEC 62351-1:2008]

1.4 **Abbreviation**
- **MUT**: Module under test
- **KPI**: Key Performance Indicator
- **QoS**: Quality of Service

1.5 **Function usability**
The Wi-Fi+Bluetooth Module in Smart Air Conditioner shall have the function as bellow:

**Table 2 – Function usability - Wi-Fi+Bluetooth Module in Smart Air Conditioner**

<table>
<thead>
<tr>
<th>Function</th>
<th>Description of Smart Control Function</th>
<th>Declaration to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network connection</td>
<td>Wi-Fi+Bluetooth Module in Smart Air Conditioner shall be able to access network via Wi-Fi 2.4 GHz with IEEE 802.11 b/g/n.</td>
<td>DEKRA K182, 9 KPI Level: Satisfactory</td>
</tr>
<tr>
<td>Device Binding</td>
<td>Wi-Fi+Bluetooth Module in Smart Air Conditioner shall be able to binding to the App in the mobile with authorization</td>
<td>DEKRA K182, 6.1, 7.1.6.1, 7.1.6.2, 7.1.6.3 KPI Level: Satisfactory</td>
</tr>
<tr>
<td>Working mode selection by remote control</td>
<td>The Wi-Fi+Bluetooth Module in Smart Air Conditioner is working with App to receive and transfer the control mode selection command to the operation protocol executed by smart home appliance.</td>
<td>DEKRA K182, 7.1.6.3 KPI Level: Satisfactory</td>
</tr>
<tr>
<td>Working status and alarm report</td>
<td>The Wi-Fi+Bluetooth Module in Smart Air Conditioner shall be able to assist to send the local status and alarm message and transfer them to the protocol recognized by the terminal.</td>
<td>DEKRA K182, 7.1.6.5, 7.2 KPI Level: Satisfactory</td>
</tr>
<tr>
<td>Firmware update</td>
<td>Wi-Fi+Bluetooth Module in Smart Air Conditioner shall be able to assist transfer the firmware package to complete DUT update function.</td>
<td>DEKRA K182, 8 KPI Level: Satisfactory</td>
</tr>
<tr>
<td>Broadcasting</td>
<td>BLE function in the Module shall be able to broadcast device information to be searched by App</td>
<td>Bluetooth Core Specification Version 5.0, LE Set Host Channel Classification command</td>
</tr>
</tbody>
</table>