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# User manual of CCBQ730M

## 1. Introduction

CCBQ730M is a Wi-Fi module compliant with IEEE802.11 a.b.g.n.ac MAC/baseband/radio, Bluetooth 5.0 applications. The core chipset is from Mediatek, part number MT7668.

## 2. Hardware Architecture:

### 2.1 Main Chipset Information

Item	Vendor	Part Number
IEEE802.11 a.b.g.n.ac mac/baseband/radio Bluetooth 5.0(LE 4.2)	Mediatek	MT7668

### 3. Operational Description

CCBQ730M is the 802.11a/b/g/n/ac WIFI Module that acts as a communication controller for users of a wireless device to connect to SMART DEVICE

#### - Features

- > IEEE 802.11 a/b/g/n/ac
- > Dual-band 2T2R Mode(2.4GHz/5GHz)
- > 2X2 MIMO, 600MHz
- > Support 20MHz, 40MHz, 80MHz bandwidth in 2.4GHz band 5GHz band<sup>1</sup>
- > Security support for WPA WPA/WPA2 personal, WPS2.0, WAPIP
- > QoS support of WFA WMM, WMM PST
- > Integrated LNA, PA, and T/R switch
- > Optional external LNA and PA support.
- > Bluetooth 4.2 Low Energy(LE)
- > Channel assessment and WB RSSI for AFH

#### - Time base of the RF frequency

For IF and RF frequency, a crystal(40MHz) is a clock reference.

#### - Synthesizer

Synthesizer inside Transceiver. Internal voltage controlled oscillator (VCO) provides the desired LO signal base on the phase-locked loop (PLL) with a relatively wide tuning range for this application. Internal fractional nPLL allows support for a wide range of reference clock frequencies

#### - WIFI Transmission

Baseband data is modulated and upconverted to the 2.4GHz ISM band, respectively.

Base-band Processing (BBP) IC has DSSS and OFDM modulation function, it provides transmission data rate are 1, 2, 5.5, 11Mbps on DSSS and 6, 12, 18, 24, 36, 48, 54 Mbps on OFDM. Digital data signal will be converted to analog (TX IQ) signals through DAC in BBP IC, TX IQ pass through to low pass filter. TX I/Q signal

use direct conversion (zero-IF) architecture converter to generate carrier frequency signal. Transceiver IC and internal PA magnify output power.

#### - WIFI Receiver

Reverse direction isolation of LNA inside Transceiver IC suppresses unwanted radiation. Then RF signal will be directly down to IF signal (RX IQ) and high frequency spurious emissions are suppressed by LPF. At last RX IQ signal will be demodulated digital data.

#### - Bluetooth 4.2

- > LE Privacy 1.2
- > Data length extension
- > LE security connection



**- Product Details**

> Data Modulation

DSSS: CCK, BPSK, QPSK for 802.11b

OFDM: BPSK, QPSK, 16QAM, 64QAM, 256QAM for 802.11a, g, n, ac

GPSK,  $\pi/4$ -DQPSK, 8DPSK for Bluetooth

> Frequency

- 2400-2483.5 MHz

- 5150-5350MHz, 5470-5725MHz, 5725-5850MHz

This module ensures frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation



## 4. Notice

### FCC Statement

## Approval Statement

### ***FCC approval***

This device complies with Part 15 of the FCC's 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 undesirable operation.
- To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product.

### **Contains Transmitter module FCC ID: **A3LCCBQ730M****

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/ TV technician for help.
- The OEM integrator is responsible for ensuring the end-user has no manual instruction to remove or install module.
- The module is limited to installation in mobile or fixed applications.

### ***IC approval***

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

*Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). L'opération est soumise aux deux conditions suivantes:*

- (1) cet appareil ne peut causer d'interférences, et*
- (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.*

The host device must be labeled to display the Industry Canada certification number of the module.

### **Contains transmitter module IC: **649E-CCBQ730M****

*Le dispositif d'accueil doivent être étiquetés pour afficher le numéro de certification d'Industrie Canada du module.*

### **Contient module émetteur IC : **649E-CCBQ730M****

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 5 150-5 250 MHz sont réservés uniquement pour une utilisation à l'intérieur a n de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux*



## **IMPORTANT NOTE**

This device complies with FCC & IC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

- 1) This module may not be co-located with any other transmitters or antennas.
- 2) The antenna must be installed such that 20cm is maintained between the antenna and users.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements with this module installed. In the event that these conditions cannot be met, then the FCC & IC authorizations are no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product including this module and obtaining separate FCC & IC authorizations.

*Cet appareil est conforme aux limites de la FCC et IC exposition aux radiations dans un environnement non contrôlé. Cet appareil doit être installé et ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou un autre émetteur.*

*Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes :*

- 1 ) L'antenne doit être installée de telle sorte que 20 cm est maintenue entre l'antenne et les utilisateurs .*
- 2 ) Ce module ne peut pas être co-localisé avec d'autres émetteurs ou des antennes .*

*Aussi longtemps que deux conditions précitées sont remplies, le test du transmetteur supplémentaires ne seront pas tenus. Toutefois, l'intégrateur OEM est toujours responsable de tester leurs produits finis pour toutes les exigences de conformité supplémentaires avec ce module installé.*

*Dans le cas où ces conditions ne peuvent pas être remplies, alors la FCC et IC autorisations ne sont plus considérés comme valides et l'ID de la FCC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera responsable de réévaluer le produit final, y compris l'obtention de ce module et séparée de la FCC et IC Autorisations*

## **User Information**

**Caution:** Any changed or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

**Attention:** *Toute changé ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'utilisateur `autorité de faire fonctionner cet équipement.*