

Manual For WDG720M

SAMSUNG ELECTRONICS CO., Ltd.

Wi-Fi module(2.4GHz, 5GHz, a/b/g/n)

- Model name : WDG720M
- Operation Temperature : -10°C ~ +70°C
- Power : +5V $\pm$ 5% (+4.75V ~ +5.25V)

1. Introduction

WDG720M is a USB embedded module compliant with IEEE802.11n standard. The core chipset is from MTK, part number is RT3572L.



2. Operational Description

WDG720M is the 802.11a/b/g/n RF Module, that acts as a communication hub for users of a wireless device to connect to a wired LAN.

MIMO type

Product type: WLAN (11b mode: 1TX, 1RX, 11g mode: 1TX, 1RX, 11n mode: 2TX, 2RX)

Time base of the transmission frequency

For IF and RF frequency, Crystal is a clock reference.

Synthesizer

Synthesizer inside Transceiver. Internal voltage controlled oscillator (VCO) provides the desired LO signal based on the phase-locked loop (PLL) with a relatively wide tuning range for this application.

Transmission

Base-band Processing (BBP) IC has DSSS (BPSK/QPSK/CCK) and OFDM (BPSK/QPSK/16QAM/64QAM) modulation function, it provides transmission data rates of 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 uses direct conversion (zero-IF) architecture converter to generate carrier frequency signal. Transceiver IC and internal PA magnify output power.

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.

Base band Processing

1. Channel selection is controlled by BBP IC to support data modulation:
 - DSSS (BPSK/QPSK/CCK)
 - OFDM (BPSK/QPSK/16QAM/64QAM)

Power Control Level

It uses closed-loop power control function to limit RF output power level.

Transmit/Receive Switch

EUT has Transmit/Receive Switch and Antenna switch. End user can't select any power setting.

Channel Selection Restriction

For product available in the USA/Canada/Taiwan market, only channel 1~11 can be operated. Selection of other channels is not possible. But product also could be available in the Europe/Japan market, channel 1~13 can be operated under the manufacturer change the different driver.

Data Rate Control

The operation data rate is changing during data transfer based on the optimization of driver.

Discontinue Transmitting with absence of Data or operational failure states

"The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met." Data transmission is always initiated by software, which is then passed down through the MAC, through the digital and analog baseband, and finally to the RF chip.

Several special packets (ACKs, CTS, PS-Poll, etc...) are initiated by the MAC. These are the only way the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet. Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted.

Product Details

- > Data Modulation OFDM (BPSK / QPSK / 16QAM / 64QAM)
- > Frequency : 2.4GHz and 5GHz
- > 802.11 a/b/g/n MIMO Type
- > Power : +5V $\pm$ 5% (+4.75V ~ +5.25V)

Approval Statement

CE Statement

Hereby, we declare that this device is in compliance with the essential requirements and other relevant provisions of directive 1999/5/EC.

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: A3LWDG720M

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.

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-WDG720M

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

Contient module émetteur IC :649E-WDG720M

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.*

This device is restricted to indoor use only within the 5.15 ~ 5.25GHz Band.

Cet appareil est restreint à l'utilisation à l'intérieur seulement dans la bande 5.15 ~ 5.25GHz.