

**Zigbee SoC**  
**Model number: JASMG21A**

## 1. Product Description

The MG21 Module is a small form factor, certified module, enabling rapid development of wireless mesh networking solutions. Based on the Silicon Labs EFR32MG21 Mighty Gecko SoC, the MGM13P combines an energy-efficient, multi-protocol wireless SoC with a proven RF/antenna design and industry leading wireless software stacks.

## 2. Product Feature

- 32-bit ARM® Cortex M33 core with 80MHz maximum operating frequency
- Peripheral Reflex System enabling autonomous interaction of MCU peripherals
- 2.4 GHz IEEE 802.15.4
- Excellent Receive Sensitivity: -104.5 dBm @250 kbps O-QPSK DSSS
- 1.71 to 3.8 V single power supply
- -40 to 125 °C ambient
- 8.8 mA RX current at 2.4 GHz (1 Mbps GFSK)
- 9.4 mA RX current at 2.4 GHz (250 kbps O-QPSK DSSS)
- 9.3 mA TX current @ 0 dBm output power at 2.4 GHz
- MCU Features overview
  - 12-bit 1 Msps SAR Analog to Digital Converter (ADC)
  - 2 × Analog Comparator (ACMP)
  - 8 Channel DMA Controller
  - 2 × 16-bit Timer/Counter
  - 3 Compare/Capture/PWM channels
  - 1 × 32-bit Timer/Counter
  - 2 × I2C interface with SMBus support
- Supported Protocols
  - Zigbee
  - Thread
  - Bluetooth Low Energy (Bluetooth 5)

### 3. Product Specification

Model	JASMG21A
Product Name	Zigbee SoC
Standard	IEEE 802.15.4 DSSS-OQPSK
Data Transfer Rate	250kbps
Modulation Method	DSSS (O-QPSK)
Frequency Band	2.405~2.480GHz
Channel	CH11-CH26
Operating Voltage	1.71V~3.8V DC
Current Consumption	9.4mA
Antenna Type	Chip Antenna
Operating Temperature	-40°C ~ +85°C
Storage Temperature	+5 to +40°C
Humidity	30 to 70% relative humidity

### 4. Applications

- IoT Multi-Protocol Devices
- Connected Home
- Lighting
- Health and Wellness
- Metering
- Building Automation and Security

#### NOTICE:

- ◆ please keep this product and accessories attached to the places which children can't touch;
- ◆ do not splash water or other liquid onto this product, otherwise it may cause damage;
- ◆ do not put this product near the heat source or direct sunlight, otherwise it may cause deformation or malfunction;
- ◆ please keep this product away from flammable or naked flame;
- ◆ please do not repair this product by yourself. Only qualified personnel can be repaired.

## **FCC Statement**

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.

This equipment 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.

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

Please notice that 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: U2ZJASMG21A", or "Contains FCC ID: U2ZJASMG21A" any similar wording that expresses the same meaning may be used.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The module is limited to OEM installation ONLY.

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application.  
A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.

There is requirement that the grantee provide guidance to the host manufacturer for compliance with Part 15B requirements.  
The module complies with FCC Part 15.247 and apply for Single module approval.

Trace antenna designs: Not applicable.

This radio transmitter FCC ID: U2ZJASMG21A has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated.

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 Designation: chip antenna

Antenna Gain: 2dBi

The concrete contents to check are the following three points.

1. Must use the same antenna type and gain equal to or lower than 2dBi;
2. Should be installed so that the end user cannot modify the antenna;
3. Feed line should be designed in 50ohm

Fine tuning of return loss etc. can be performed using a matching network.

## Canada Statement

This device complies with Industry Canada's licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie 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'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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 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.

Please notice that if the ISED certification 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 IC: 6924A-JASMG21A", or "Contains IC: 6924A-JASMG21A" any similar wording that expresses the same meaning may be used.

Notez que si le numéro d'identification IC n'est pas visible lorsque le module est installé dans un autre appareil, une étiquette indiquant le module attaché

doit également être affichée à l'extérieur de l'appareil où le module est installé. L'étiquette extérieure peut être libellée comme suit: « Contient le Module émetteur IC: 6924A-JASMG21A» ou « contient IC: 6924A-JASMG21A» toute expression similaire qui exprime le même sens.

This radio transmitter [IC: 6924A-JASMG21A] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. 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.

The concrete contents to check are the following three points.

1. Must use antenna such as Chip antenna with gain not exceeding 2 dBi;
2. Should be installed so that the end user cannot modify the antenna;
3. Feed line should be designed in 50ohm

Fine tuning of return loss etc. can be performed using a matching network.

Le présent émetteur radio [IC: 6924A-JASMG21A] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur. Le contenu concret à vérifier sont les trois points suivants.

1. doit utiliser une antenne comme Antenne à puce avec pifa gain n'excédant pas 2 dBi
2. doivent être installés de façon que l'utilisateur final ne peut pas modifier l'antenne
3. La ligne d'alimentation doit être conçue en 50ohm

Le réseau correspondant peut être utilisé pour affiner la perte de retour, etc.

### **Notice to OEM integrator**

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 20cm from persons. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as show in this manual (FCC/Canada statement). 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, ICES 003. Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.

Must have on the host device a label showing

“Contains Transmitter Module FCC ID: U2ZJASMG21A” or

“Contains FCC ID: U2ZJASMG21A”,

“Contains Transmitter Module IC: 6924A-JASMG21A” or

“Contains IC: 6924A-JASMG21A”.

The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer’s instruction manual.

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. Any company of the host device which install this modular should perform the test of radiated & conducted emission and spurious emission etc. according to FCC Part 15C: 15.247 and 15.209 &15.207, 15B class B requirement, only if the test result comply with FCC part 15C: 15.247 and15.209 & 15.207, 15B class B requirement. Then the host can be sold legally.

This modular transmitter is only FCC authorized for the specific rule parts (47CFR Part 15.247) listed on the grant, and that 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. Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.

Must have on the host device a label showing

“Contains Transmitter Module FCC ID: U2ZJASMG21A” or



“Contains FCC ID: U2ZJASMG21A”,  
“Contains Transmitter Module IC: 6924A-JASMG21A” or  
“Contains IC: 6924A-JASMG21A”.

l'hôte doit utiliser l'instrument uniquement dans des dispositifs qui répondent à la fcc / (catégorie d'exposition rf mobile, ce qui signifie le dispositif est installé et utilisé à une distance d'au moins 20 cm de personnes. Le manuel de l'utilisateur final doit inclure la partie 15 / (fac rss gen déclarations de conformité relatives à l'émetteur que de montrer dans ce manuel. le fabricant est responsable de la conformité de l'hôte, le système d'accueil avec le module installé avec toutes les autres exigences applicables du système comme la partie 15 b, ices-003. accueillir le fabricant est fortement recommandé de confirmer la conformité avec les exigences de la fcc / (émetteur lorsque le module est installé dans l'hôte. le dispositif d'accueil doivent avoir une étiquette indiquant contient FCC ID: U2ZJASMG21A, IC: 6924A-JASMG21A.