

User's Manual

CC3100MODR11MAMOB Module

Revision History

9-2-2022 Rev 5

10-18-22 Rev 6: Corrected Molex Antenna from 1461530100 to **1461530200**. Added missing Product Attributes for Taiyo Yuden AH316M245001-T, Laird CAF94505 and Taoglas FXP 840.07.0055B.

10-20-22 Rev 7: Modified section "2." to add antenna table listing host product family. Also added table to "RF Exposure" statement.

10-21-22 Rev 8: Edited "Host Conditions" in antenna table and RF exposure statement per request.

1. Introduction

The CC3100MODR11MAMOB module allows for Wi-Fi 802.11b/g/n communications from Knox products to connect with the KnoxConnect™ system using a Molex 1461530200, Laird CAF94505, Taoglas FXP840.07.0055B, Air802 ANRD2405-RPSMA, Larsen NM05E2400B, or Taiyo Yuden AH316M245001-T antenna. It is built from a standard networking component acquired from a large semiconductor supplier to ensure a long-lifetime secure supply in support of Knox products.

This CC3100MODR11MAMOB module is placed into the product on whose labels state "This Device Contains: FCC ID: 2AOVI-KNOX-RAS and IC: 23479-KNOXRAS".

2. Use

NOTE: The CC3100MODR11MAMOB is certified to be used with the following antennas and product families. The user is expected to operate it only in this fashion. Changes or modifications not expressly approved by Knox Company voids the user's authority to operate the equipment.

Antenna	Gain dBi	Host Conditions
Molex 1461530200	2.6	No host restriction
Laird CAF94505	2.0	Restricted to KeyDefender product family hosts.
Taoglas FXP840.07.0055B	3.3	Restricted to KeyDefender product family hosts.
Larsen NM05E2400B	5.0	No host restriction
Air802, ANRD2405-RPSMA	5.0	No host restriction
Taiyo Yuden AH316M245001-T	1.9	No host restriction

The antennas have the following specifications:

Molex 1461530200

Product Attributes

TYPE	DESCRIPTION
Category	RF/IF and RFID RF Antennas
Mfr	Molex
Series	146153
Package	Bulk 
Product Status	Active
RF Family/Standard	802.15.4, WiFi
Frequency Group	UHF (2GHz ~ 3GHz), SHF (f > 4GHz)
Frequency (Center/Band)	2.4GHz, 5GHz
Frequency Range	2.4GHz ~ 2.483GHz, 5.15GHz ~ 5.85GHz
Antenna Type	Flat Patch
Number of Bands	2
VSWR	-
Return Loss	-10dB
Gain	2.6dBi, 4dBi
Power - Max	2 W
Features	Cable - 200mm
Termination	U.FL (UMCC), IPEX MHF1
Ingress Protection	-
Mounting Type	Adhesive
Height (Max)	0.004" (0.10mm)
Applications	WLAN, Zigbee™
Base Product Number	146153

Laird CAF94505

Product Attributes

TYPE	DESCRIPTION
Category	RF/IF and RFID RF Antennas
Mfr	Laird Connectivity Inc.
Series	NanoBlade
Package	Bulk 
Part Status	Active
RF Family/Standard	Bluetooth, WiFi
Frequency Group	UHF (2GHz ~ 3GHz), SHF (f > 4GHz)
Frequency (Center/Band)	2.4GHz, 5.3GHz, 5.6GHz
Frequency Range	2.4GHz ~ 2.5GHz, 4.9GHz ~ 6GHz
Antenna Type	PCB Trace
Number of Bands	3
VSWR	2
Return Loss	-
Gain	2dBi, 3.9dBi, 4dBi
Features	Cable - 100mm
Termination	U.FL (UMCC), IPEX MHF1
Ingress Protection	-
Mounting Type	Surface Mount
Height (Max)	0.650" (16.50mm)
Applications	Bluetooth, Wi-Fi, WiMax™

Taoglas FXP840.07.0055B

Product Attributes

TYPE	DESCRIPTION
Category	RF/IF and RFID RF Antennas
Mr	Taoglas Limited
Series	Freedom
Package	Bulk 
Part Status	Active
RF Family/Standard	Bluetooth, WiFi
Frequency Group	UHF (2GHz ~ 3GHz), SHF (T = 4GHz)
Frequency (Center/Band)	2.4GHz, 5.4GHz
Frequency Range	2.41GHz ~ 2.49GHz, 4.9GHz ~ 5.8GHz
Antenna Type	Flat Patch
Number of Bands	2
VSWR	2, 2.5
Return Loss	-10dB, -7dB
Gain	2dBi, 2.5dBi
Power - Max	2 W
Features	-
Termination	U.FL (UMCC), IPEX MHF1
Ingress Protection	-
Mounting Type	Adhesive
Height (Max)	0.004" (9.10mm)
Applications	Bluetooth, WLAN
Base Product Number	FXP840

The Air802 ANRD2405-RPSMA antenna has the following Specifications:

Type External rubber ducky

Gain 5 dBi

Impedance 50 ohms

Termination Reverse polarity SMA (RP_SMA) plug male connector on antenna, to RP_SMA female bulkhead connector, to U.FL connector, to the Printed Circuit Board Assembly.

The Larson NM05E2400B Antenna has the following specifications

Type External Collinear

Gain 5 dBi

Impedance 50 ohms

Termination Reverse polarity SMA (RP_SMA) plug male connector on antenna, to RP_SMA female bulkhead connector, to U.FL connector, to the Printed Circuit Board Assembly.

Product Attributes

TYPE	DESCRIPTION
Category	RF/IF and RFID RF Antennas
Mfr	Taiyo Yuden
Series	-
Package	Tape & Reel (TR) ② Cut Tape (CT) ② Digi-Reel® ②
Product Status	Active
RF Family/Standard	802.15.4, Bluetooth, WiFi
Frequency Group	UHF (2GHz ~ 3GHz)
Frequency (Center/Band)	2.4GHz
Frequency Range	2.4GHz ~ 2.5GHz
Antenna Type	Chip
Number of Bands	1
VSWR	3
Return Loss	-
Gain	1.9dBi
Features	-
Termination	Solder
Ingress Protection	-
Mounting Type	Surface Mount
Height (Max)	0.020" (0.50mm)
Applications	Bluetooth, WLAN, Zigbee™

This module 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.

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numerique de la classe A est conforme a la norme NMB-003 du Canada.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type

indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissimal maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

RF Exposure statement

This product has been evaluated for RF exposure and determined to meet applicable requirements via low power exemption. This module may be installed into products where antenna to user distance is greater than 20cm. Only the following antennas are approved to be used with this module:

Antenna	Gain dBi	Host Conditions
Molex 1461530200	2.6	No host restriction
Laird CAF94505	2.0	Restricted to KeyDefender product family hosts.
Taoglas FXP840.07.0055B	3.3	Restricted to KeyDefender product family hosts.
Larsen NMO5E2400B	5.0	No host restriction
Air802, ANRD2405-RPSMA	5.0	No host restriction
Taiyo Yuden AH316M245001-T	1.9	No host restriction

General

The OEM should not provide information to the end user regarding installation or removal of this RF module or information on how to change RF related parameters in the user manual of the end product.

The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Finished Product Labelling

This Module is labelled with its own US and Canada Certification numbers. If the certification numbers cannot be seen while installed inside the finished product, then the finished product must display the label on it referring to the module. In that case, the finished product must be permanently labelled on the exterior of the product with wording such as the following*:

“Contains Transmitter Module FCC ID: 2AOVI-KNOX-RAS” OR “Contains FCC ID: 2AOVI-KNOX-RAS”. “Contains Transmitter Module IC: 23479-KNOXRAS” OR “Contains IC: 23479-KNOXRAS”.

* Or similar text which conveys the same meaning.

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.

** If the product is too small to include the above statement, it may be placed in the user's manual.

The following warnings must also be placed in the User Manual of the finished product using this module:

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.

This device complies with Industry Canada licence-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.

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, et (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

For a Class A digital device or peripheral, place the following warning:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

For a Class B digital device or peripheral, place the following warning:

Note: 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.

If the antenna used in the finished product is detachable or user serviceable then the following must be included:

This radio transmitter IC: 23479-KNOXRAS has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio IC: 23479-KNOXRAS a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

- *Antenna: Molex 1461530200
- *Antenna: Laird CAF94505
- *Antenna: Taoglas FXP840.07.0055B
- *Antenna: AIR802 model ANRD2405-RPSMA 5dBi Whip
- *Antenna: Larsen NM05E2400B 5 dBi Whip
- *Antenna: Taiyo Yuden AH316M245001-T

* Only include the specific antenna(s) used with the particular host integration.