WLR089U0/WLR089UC
Regulatory Compliance Information

Revision 0.0
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This document covers the Regulatory Compliance information which will be part of the WLR089U0/WLR089UC datasheet and related documents shared with customers.

1.1 Antenna Considerations:

Table 1-1 provides the list of Approved antennas along with the manufacturer and part number details.

Part Number	Manufacturer	Antenna Gain @ 915 MHz Band	Antenna type	Cable Length/Remarks
RFA-S1-C55H1-150D034	ALEAD technology	2.0dBi	half-wave dipole	150mm
TH-89F-150mm-IPEX	BJTEK NAVIGATION,INC.	1.5dBi	half-wave dipole	150mm
GWF-152XMPXX-H015	Joymax Electronics Co., Ltd	2dBi	half-wave dipole	153mm
GWF-152XRSXX-H015	Joymax Electronics Co., Ltd	2dBi	half-wave dipole	Antenna has 156mm cable with RP-SMA plug and RP-SMA receptacle to u.FL cable of length 50mm used as adapter (Refer note 1 and 2)
6610D13081-100	Kinsun	2dBi	half-wave dipole	100mm
6610C03061	Kinsun	2dBi	half-wave dipole	RP-SMA receptacle to u.FL cable of length 203.20mm used as adapter (Refer note 1 and 2)
RFDPA131015IMBB301	PSA Walsin technology Corporation	0.90 dBi	half-wave dipole	150mm
RFA-ZW-C55-B-RP-D034	ALEAD technology	2.0dBi	half-wave dipole	RP-SMA receptacle to u.FL cable of length 203.20mm used as adapter (Refer note 1 and 2)

Note:

1) If the end-product using the Module is designed to have an antenna port that is accessible to the end-user then a unique antenna connector (as permissible by FCC) must be used (e.g. RP (Reverse Polarity)-SMA socket).

2) If an RF coaxial cable is used between the module RF output and the enclosure, then a unique antenna connector must be used in the enclosure wall for interface with antenna.

1.2 WLR089U0/WLR089UC Usage Instructions under Modular Approval

For USA/Canada, the module has been certified for the modulation modes listed below. The user must ensure that the module will only work on the 902-928 MHz frequency band and with one of the modulation modes listed below, when used in USA and Canada.

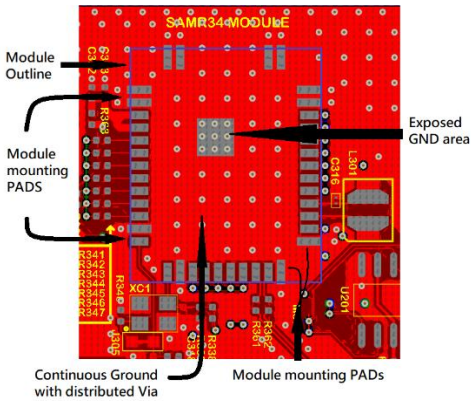
- Operating Channels:
  - 500kHz BW:
    - 903MHz ~ 927.5MHz
      - 8 Uplink Channels, Channel Spacing 1.6MHz
      - 8 Downlink Channels, Channel Spacing 0.6MHz
  - 125kHz BW:
      - 902.3MHz ~ 927.5MHz
        - 64 Channels, Channel Spacing 200kHz
      - 902.3MHz ~ 927.3 MHz
        - 26 Channels, Channel Spacing 1MHz
  - Modulation: LoRa®
  - Spreading Factor:
    - 500kHz BW: 7~12
    - 125kHz BW: 7~10

The host product manufacturer must ensure that the RF behavior adheres to the certification (e.g. FCC, ISED) requirements when the module is installed in the final host product.

The availability of some specific channels and/or operational frequency bands are country dependent and should be programmed at the Host product factory to match the intended destination. Regulatory bodies prohibit exposing the settings to the end user. This requirement needs to be taken care of via Host implementation.

The Host product manufacturer must ensure that the RF behavior adheres to the certification (e.g. FCC, ISED) requirements when the module is installed in the final Host product.

1.4 Host Board Top Layer Instructions:



The top layer (underneath the module) of the host PCB must be ground with as many GND vias as possible.

2 WLR089U0/WLR089UC Usage Instructions under Modular Approval

The WLR089U0 module has received regulatory approval for the following countries:

- United States/FCC ID: 2ADHKR34M
- Canada/ISED:
  - IC: 20266-R34M
  - HVIN: WLR089U0
  - PMN: WLR089U

The WLR089UC module has received regulatory approval for the following countries:

- United States/FCC ID: 2ADHKR34M
- Canada/ISED:
  - IC: 20266-R34M
  - HVIN: WLR089UC
  - PMN: WLR089U

2.1 United States

The WLR089U0/WLR089UC module has received Federal Communications Commission (FCC) CFR47 Telecommunications, Part 15 Subpart C "Intentional Radiators" single-modular approval in accordance with Part15.212 Modular Transmitter approval. Single-modular transmitter approval is defined as a complete RF transmission sub-assembly, designed to be incorporated into another device, that must demonstrate compliance with FCC rules and policies independent of any host. A transmitter with a modular grant can be installed in different end-use products (referred to as a host, host product, or host device) by the grantee or other equipment manufacturer, then the host product may not require additional testing or equipment authorization for the transmitter function provided by that specific module or limited module device.

The user must comply with all of the instructions provided by the Grantee, which indicate installation and/or operating conditions necessary for compliance.

The host product itself is required to comply with all other applicable FCC equipment authorizations regulations, requirements and equipment functions that are not associated with the transmitter module portion. For example, compliance must be demonstrated: to regulations for other transmitter components within a host product; to requirements for unintentional radiators(Part 15 Subpart B), such as digital devices, computer peripherals, radio receivers, etc.; and to additional authorization requirements for the non-transmitter functions on the transmitter module (i.e., Suppliers Declaration of Conformity (SDoC) or certification) as appropriate (for example, Bluetooth and Wi-Fi transmitter modules may also contain digital logic functions).

2.1.1 LABELING AND USER INFORMATION REQUIREMENTS

The WLR089U0/WLR089UC module has been labeled with its own FCC ID number, and if the FCC ID is not visible when the module is installed inside another device, then the outside of the finished product into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wordings follows:

For the WLR089U0/WLR089UC

Contains Transmitter Module
FCC ID: 2ADHKR34M
or

Contains FCC ID: 2ADHKR34M
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

A user's manual for the product must include the following 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

Additional information on labeling and user information requirements for Part 15 devices can be found in KDB Publication 784748, which is available at the FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB) https://apps.fcc.gov/oetcf/kdb/index.cfm

2.1.2 RF EXPOSURE

All transmitters regulated by FCC must comply with RF exposure requirements. KDB 447498 General RF Exposure Guidance provides guidance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to Radio Frequency (RF) fields adopted by the Federal Communications Commission (FCC).

From the FCC Grant: Output power is conducted. This grant is valid only when the module is sold to OEM integrators and must be installed by the OEM or OEM integrators. This transmitter is restricted for use with the specific antenna(s) tested in this application for Certification. The antenna(s) used with this transmitter must be installed to provide a separation distance of at least 20 mm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

2.1.3 APPROVED EXTERNAL ANTENNAS

To maintain modular approval in the United States, only the antenna types that have been tested shall be used. It is permissible to use different antenna, provided the same antenna type, antenna gain (equal to or less than), with similar in-band and out of band characteristics (refer to specification sheet for cutoff frequencies).

For WLR089U0/WLR089UC, Testing was performed with the antenna types listed in table mentioned in the Table 1-1.

2.1.4 MODULE INTEGRATION IN THE HOST PRODUCT

Host products are to ensure continued compliance as per KDB 996369 Module Integration Guide.

2.1.5 HELPFUL WEB SITES

Federal Communications Commission (FCC): https://www.fcc.gov/
FCC Office of Engineering and Technology (OET) Laboratory Division Knowledge Database (KDB): https://apps.fcc.gov/oetcf/kdb/index.cfm

2.2 Canada

The WLR089U0/WLR089UC module has been certified for use in Canada under Innovation, Science and Economic Development Canada (ISED, formerly Industry Canada) Radio Standards Procedure (RSP) RSP-100, Radio Standards Specification (RSS) RSS-Gen and RSS-247. Modular approval permits the installation of a module in a host device without the need to recertify the device.

2.2.1 LABELING AND USER INFORMATION REQUIREMENTS

Labeling Requirements (from RSP-100, Issue 12, Section 5): The host product shall be properly labeled to identify the module within the host device.
The Innovation, Science and Economic Development Canada certification label of a module shall be clearly visible at all times when installed in the host product, otherwise the host device must be labeled to display the Innovation, Science and Economic Development Canada certification number of the module, preceded by the word “Contains”, or similar word expressing the same meaning, as follows:

For the WLR089U0/WLR089UC:
Contains IC: 20266-R34M

User Manual Notice for License-Exempt Radio Apparatus (from Section 8.4 RSS-Gen, Issue 5, March 2019): User manuals for license-exempt radio apparatus shall contain the following or equivalent notice in a conspicuous location in the user manual or alternatively on the device or both:
This device contains license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s license-exempt RSS(s). Operation is subject to the following two conditions:
1. This device may not cause interference;
2. This device must accept any interference, including interference that may cause undesired operation of the device.
L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique 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’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

Transmitter Antenna (From Section 6.8 RSS-GEN, Issue 5, March 2019): User manuals, for transmitters shall display the following notice in a conspicuous location:

This radio transmitter [IC: 20266- R34M] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed above, 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.
Le présent émetteur radio [IC: 20266- R34M] a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés cidessous 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.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

2.2.2 RF EXPOSURE

All transmitters regulated by the Innovation, Science and Economic Development Canada (ISED) must comply with RF exposure requirements listed in RSS-102 - Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands).
This transmitter is restricted for use with a specific antenna tested in this application for certification, and must not be co-located or operating in conjunction with any other antenna or transmitters, except

in accordance with Innovation, Science and Economic Development Canada multi-transmitter guidelines.
The module antenna must be installed to meet the RF exposure compliance separation distance of “35 mm” and any additional testing and authorization process as required.
The host integrator installing this module into their product must ensure that the final composite product complies with the ISED requirements by a technical assessment.

L'antenne du module doit être installé pour répondre à la conformité en matière d'exposition RF distance de séparation de 35 "mm" et tout d'autres tests et processus d'autorisation au besoin.
L'hôte integrator l'installation de ce module dans leur produit final doit s'assurer que le produit est conforme à la composite Exigences ISED par une évaluation technique.

2.2.3 APPROVED EXTERNAL ANTENNAS

For WLR089U0/WLR089UC, the testing was performed with the antenna types listed in table mentioned in the Table 1-1.

2.2.4 HELPFUL WEBSITES

Innovation, Science and Economic Development Canada (ISED): http://www.ic.gc.ca/