Cast BTRM-001 Radio Module

Certification Integrator Guide

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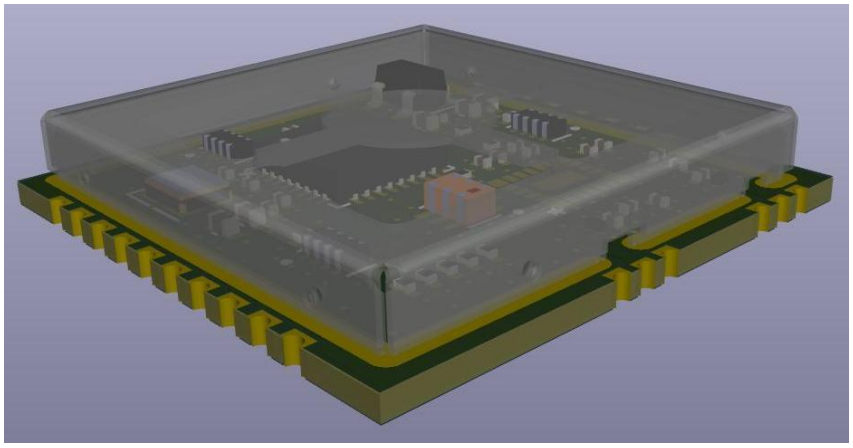

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INTRODUCTION

The BTRM-001 is a pre-certified 2.4GHz radio module based on an 802.15.4 system on chip meant for integration into end-user products with a separate host processor to control the BTRM-001.

PURPOSE

This document describes the steps that the integrator must follow when designing and manufacturing a system utilizing the BTRM-001 radio module. Failing to follow the instructions in this document may invalidate the FCC and ISED (Canada) certifications and authorizations of the module for use in the U.S. and Canada. The Module certifications described in this document apply only to radio conformance for the module. The integrator is responsible for all system-level EMI/EMC and product safety testing and certifications that apply to the host system in the U.S., Canada and other countries where the system will be marketed or sold.

APPLICABLE CERTIFICATIONS

Part number	USA/FCC	Canada/ISED
BTRM-001	RKT-BTRM001	10858A-BTRM001

ADDITIONAL CONFORMANCE TESTING AND/OR SUBMISSIONS REQUIRED BY INTEGRATOR

The modular certifications apply to the radio conformance for the BTRM-001 Module only. The integrator is responsible for additional system-level EMI/EMC and Product Safety testing and certification that applies to the host system containing the Module. This includes but is not limited to Federal Communications Commission ("FCC") Part 15 Class B Digital Emissions. These system-level EMC tests are to be done with the Module installed and included in the scope of the submission.

Some countries for which modular certifications are provided may require additional submissions, authorizations or import permission by the system-vendor or importer. The integrator is responsible for these additional actions.

Modular radio certification is not possible in some countries. Integrators are responsible for determining what certification actions are required for other countries and must ensure radio certification for the end system is obtained, before placing the product on the market.

ALLOWABLE TRANSMIT POWER SETTINGS

The certification testing of the BTRM-001 was done at the maximum transmit power setting (11 dBm) and the integrator is free to choose any of the available transmit power settings through the host processor interface. See table below for available transmit power settings.

Any attempts to increase transmit power settings beyond the standard settings listed below will invalidate all radio certifications for this module.

Tx Power Setting	Typical Antenna Port Power (+/- 1dB)
11 dBm	10 dBm
10 dBm	9 dBm
9 dBm	8 dBm
8 dBm	7 dBm
6 dBm	6 dBm
4 dBm	4 dBm
0 dBm	0 dBm

ALLOWABLE ANTENNAS FOR USE WITH THE BTRM-001

The BTRM-001 is certified for use with only specific antenna types and gains as described in this section. The BTRM-001 modular certification testing was done with the following antenna:

- **Pulse Electronics W3334B0100** Flexible Printed Circuit dipole antenna with peak gain of 4.0dBi

ALLOWED ANTENNA SPECIFICATIONS

- Antenna type: dipole
- Frequency band: 2.4 – 2.5 GHz
- Maximum gain: 4.0dBi, including cable loss
- Impedance: 50 ohms

Use of other antenna types or the same type of antenna with higher gain than listed above is not allowed without additional testing and appropriate regulatory approvals.

ANTENNA PLACEMENT AND RF SAFETY

The FCC and other countries' regulatory bodies impose strict conditions and limitations on the RF exposure levels of end products. Acceptable RF exposure levels for this Module depend on transmitting power, the location of the transmitting antenna(s) inside the host system and the expected separation of the transmitting antennas to the end user. Integrators must take care to ensure each host system complies with the applicable RF exposure requirements.

The antenna-to-user (or bystander) separation distance must be at least 0.5 cm. Failure to adhere to these separation/spacing rules will invalidate the FCC and ISED certifications for the Module.

- This separation is measured between the closest point of each transmitting antenna inside the host device to the point of contact by the user or nearby person outside the host device.
- The transmitter module may not be co-located with any other transmitter or antenna.

Where one or more of the conditions above cannot be met for a particular host system, additional testing is required to secure the necessary certifications for the system.

SIMULTANEOUS TRANSMISSION WITH OTHER CO-LOCATED RADIO TRANSMITTERS

The FCC and ISED impose conditions and limitations when additional radio(s) are co-located in the same host system as the Module with capability to transmit simultaneously. Co-locating other radios such as an integrated or plug-in Wireless WAN/cellular radio with the Module requires additional evaluation and possibly submission for authorization from the FCC and ISED.

Since the rules are highly dependent on the characteristics of the particular radios that are co-located and simultaneously transmitting, the integrator should seek guidance from a knowledgeable test lab or consultant to determine if additional testing and certification is required. In this case, failure to evaluate and follow the required FCC and ISED procedures will invalidate the FCC and ISED certifications of the Module and end system.

MODULE MAY NOT BE INSTALLED BY END USERS

FCC and ISED rules require this Module to be installed into host systems at the factory by the integrator. Thus, end users of the system may not install the Module. Therefore, the host product user instructions must not advise the end user on how to access or remove the Module. Additional FCC authorization/filing is needed to allow end user installation of the radio modules.

If modules are provided to the end users for installation in the host, a two-way authentication protocol is required to limit the module to operate only with the authorized host system.

REQUIRED LABELING ON THE OUTSIDE OF THE HOST PRODUCT

FCC LABELING REQUIREMENTS

The FCC requires a label on the outside of the host product visible to the end user.

Example wording is (covering both FCC and ISED):

Contains: FCC ID: RKT-BTRM001 ISED: 10858A-BTRM001

The FCC requires a logo signifying emission compliance on the outside of the host system. The OEM integrator is responsible for performing FCC Part 15 Class B digital emissions testing on the end system with the radio Module installed. The FCC logo below should not be affixed unless the OEM integrator has obtained the necessary Part 15 approval, e.g., self-declaration of conformity. If the host system is approved to FCC Class B digital emissions limits under a grant of certification issued by a TCB, the FCC ID number shown on the grant should be used on the label instead of the FCC logo shown below.

Also see: https://www.fcc.gov/logos.

A host product with a certified module has the option to use a permanently affixed label, or an electronic label (Refer to FCC KDB 784748 D02 for e-labeling guidance). All products without an integrated display must be labeled with a module's FCC ID - Section 2.926.

ISED CANADA LABELING REQUIREMENTS

For Canada, ISED also requires a label on the outside of the host product visible to the end user.

The final end product must be labeled in a visible area with the following:

Contains ISED: 10858A-BTRM001

Plaque signalétique du produit final Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante:

Contient des ISED: 10858A-BTRM001

REQUIRED LABELING ON THE MODULE

The OEM integrator must ensure that the FCC ID and ISED number are affixed on the Module or in a User/Installation Manual along with other country certification numbers and logos as described herein.

Note: the original Module manufacturer may affix regulatory labeling at time of Module manufacturing. However, the integrator must ensure that the Module labeling is complete, correct, and applicable for all the countries to which the host system is to be imported, marketed, or sold.

REQUIRED REGULATORY WORDING FOR END USER MANUAL

The integrator must provide instructions in the end user manual on how to retrieve the module FCC ID for host devices using electronic labeling (for example an integrated display) in lieu of a physical label or nameplate to meet the labeling requirements (Refer to FCC KDB 784748 D02 e-labeling document for guidance).

The OEM integrator must include text in the end user manual meeting the regulators' requirements. When the module is installed inside another device, the user manual of that device must contain the statements and warnings below for both FCC and ISED Canada compliance.

FCC STATEMENT REQUIREMENTS FOR END USER PRODUCT MANUAL

FEDERAL COMMUNICATIONS INTERFERENCE STATEMENT

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.

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 of the following measures:

- Re-orient 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.

Radiation Exposure Statement: This equipment complies with FCC radiation exposure limits for portable devices. This equipment should be installed and operated with minimum distance 0.5 cm between the radiator and a human body.

Contains FCC ID: RKT-BTRM001

ISED CANADA STATEMENT REQUIREMENTS FOR END USER PRODUCT MANUAL

For Canada, ISED requires the following text to be included in the end user product manual which includes both English and French language notices.

ISED CANADA STATEMENTS

This device complies with ISED's license-exempt RSS standards. 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.

Le présent appareil est conforme aux RSSs' ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement: This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with at least 0.5 cm distance between the antenna and the human body.

Déclaration d'exposition aux radiations: Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 2 cm entre le radiateur et votre corps.

Contains: ISED 10858A-BTRM001
Contient des ISED: 10858A-BTRM001

INTEGRATION CHECKLIST

The Integrator shall integrate the Module into the host systems in accordance with the instruction specified in this document and other documents provided.

- ☐ The Integrator will ensure the Module is integrated in a host system using only antennas that are of the same type and having equal or less antenna gain as described in this document.
- ☐ The Integrator will ensure the antenna placement inside the host system will maintain the required spacing to the end user for RF Exposure compliance, as specified in this document.
- ☐ If other radios are integrated inside the host with the Module, the Integrator will contact a test lab or TCB to determine if additional FCC compliance evaluation is required to meet FCC co-location rules.
- ☐ The Integrator will ensure end user documentation will contain the specified regulatory wording and ensure that the host system and the Module are labeled as specified in this document.
- ☐ The Integrator will ensure that nothing is done that will change the transmit power level of the module.
- ☐ The Integrator will ensure that the end user documentation will contain clear instructions on how to access the FCC ID and ISED Number of the module should an electronic display (e-labeling) be used to meet the FCC and IC labeling requirements (Refer to FCC KDB 784748 D02 e labeling document and IC Notice 2014-DRS1003 for guidance).