

Full Modular Approval is being requested for this device.

The following paragraphs detail the requirements for modules and explain how the module meets those requirements. Where requirements are not met a justification for a limited modular approval is presented.

FCC §15.212 Requirements for Single Modular Transmitters (includes RSS GEN Section 3.2.2)

(a) Single modular transmitters consist of a completely self-contained radiofrequency transmitter device that is typically incorporated into another product, host or device. Split modular transmitters consist of two components: a radio front end with antenna (or radio devices) and a transmitter control element (or specific hardware on which the software that controls the radio operation resides). All single or split modular transmitters are approved with an antenna. All of the following requirements apply, except as provided in paragraph (b) of this section.

(1) Single modular transmitters must meet the following requirements to obtain a modular transmitter approval.

(i) The radio elements of the modular transmitter must have their own shielding. The physical crystal and tuning capacitors may be located external to the shielded radio elements.

All radio components including RF oscillator are shielded with a metal can attached to the PCB.

(ii) The modular transmitter must have buffered modulation/data inputs (if such inputs are provided) to ensure that the module will comply with part 15 requirements under conditions of excessive data rates or over-modulation.

All data inputs are buffered through a microprocessor, no direction external connections to the radio are provided.

(iii) The modular transmitter must have its own power supply regulation.

An internal voltage regulator is provided, this regulates the system voltage to the transmitter to 3.0 Volts DC fixed.

(iv) The modular transmitter must comply with the antenna and transmission system requirements of §§15.203, 15.204(b) and 15.204(c). The antenna must either be permanently attached or employ a “unique” antenna coupler (at all connections between the module and the antenna, including the cable). The “professional installation” provision of §15.203 is not applicable to modules but can apply to limited modular approvals under paragraph (b) of this section.

The external antenna connects to the module via a u.FL connector. This connector is a non-standard connector.

The antenna is a 2.4GHz omnidirectional "rubber-duck" antenna with a gain of 2.2 dBi (L-com P/N: HG2402RD-RSF)

(v) The modular transmitter must be tested in a stand-alone configuration, i.e., the module must not be inside another device during testing for compliance with part 15 requirements. Unless the transmitter module will be battery powered, it must comply with the AC line conducted requirements found in §15.207. AC or DC power lines and data input/output lines connected to the module must not contain ferrites, unless they will be marketed with the module (see §15.27(a)). The length of these lines shall be the length typical of actual use or, if that length is unknown, at least 10 centimeters to insure that there is no coupling between the case of the module and supporting equipment. Any accessories, peripherals, or support equipment connected to the module during testing shall be unmodified and commercially available (see §15.31(i)).

Test data contained in this application is for the device tested in a stand-alone configuration. Radiated spurious emissions data and AC conducted emissions data demonstrating compliance with the requirements of Part 15 of the FCC rules for intentional radiators and RSS GEN/RSS 210 has been provided.

(vi) The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number.

(A) If using a permanently affixed label, the modular transmitter must be labeled with its own FCC identification number, and, 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: XYZMODEL1" or "Contains FCC ID: XYZMODEL1." Any similar wording that expresses the same meaning may be used. The Grantee may either provide such a label, an example of which must be included in the application for equipment authorization, or, must provide adequate instructions along with the module which explain this requirement. In the latter case, a copy of these instructions must be included in the application for equipment authorization.

(B) If the modular transmitter uses an electronic display of the FCC identification number, the information must be readily accessible and visible on the modular transmitter or on the device in which it is installed. If the module is installed inside another device, then the outside of the device into which the module is installed must display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC certified transmitter module(s)." Any similar wording that expresses the same meaning may be used. The user manual must include instructions on how to access the electronic display. A copy of these instructions must be included in the application for equipment authorization.

The module is appropriately labeled. The label is included on the shield of the transmitter. In the event this is located inside another enclosure a label is provided on the outside of the enclosure.

(vii) The modular transmitter must comply with any specific rules or operating requirements that ordinarily apply to a complete transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements. A copy of these instructions must be included in the application for equipment authorization.

No specific rules are required to insure with compliance, other than specifying the antenna that is required. This antenna will be supplied with the product and this requirement is documented.

(viii) The modular transmitter must comply with any applicable RF exposure requirements in its final configuration.

This module meets all RF exposure requirements.

Questions and comments should be directed to:

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| RSS GEN Checklist | | |
|---|-----|------|
| Modular approval requirement | Yes | No * |
| (a) The radio elements must have the radio frequency circuitry must be shielded. Physical/discrete and tuning capacitors may be located external to the shield, but must be on the module assembly. | √ | |
| (b) The module shall have buffered modulation/data input(s) (if such inputs are provided) to ensure that the module will comply with the requirements set out in the applicable RSS standard under conditions of excessive data rates or over-modulation. | √ | |
| (c) The module shall have its own power supply regulation on the module. This is to ensure that the module will comply with the requirements set out in the applicable standard regardless of the design of the power supplying circuitry in the host device which houses the module. | √ | |
| (d) The module shall comply with the provisions for external power amplifiers and antennas detailed in this standard. The equipment certification submission shall contain a detailed description of the configuration of all antennas that will be used with the module. | √ | |
| (e) The module shall be tested for compliance with the applicable standard in a stand-alone configuration, i.e. the module must not be inside another device during testing. | √ | |
| (f) The module shall comply with the Category I equipment labeling requirements. | √ | |
| (g) The module shall comply with applicable RSS-102 exposure requirements, which are based on the intended use/configurations. | √ | |
| (h) Is the modular device for an Industry Canada licensed exempt service? | √ | |
| * Please refer to the previous sections for a detailed explanation if the answer is “No.” | | |