

Limited Modular Approval is being requested for this device and the device will be installed only in host systems manufactured by Intuitive Surgical, Inc.

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.

The module contains a shield consisting of the carriage frame.

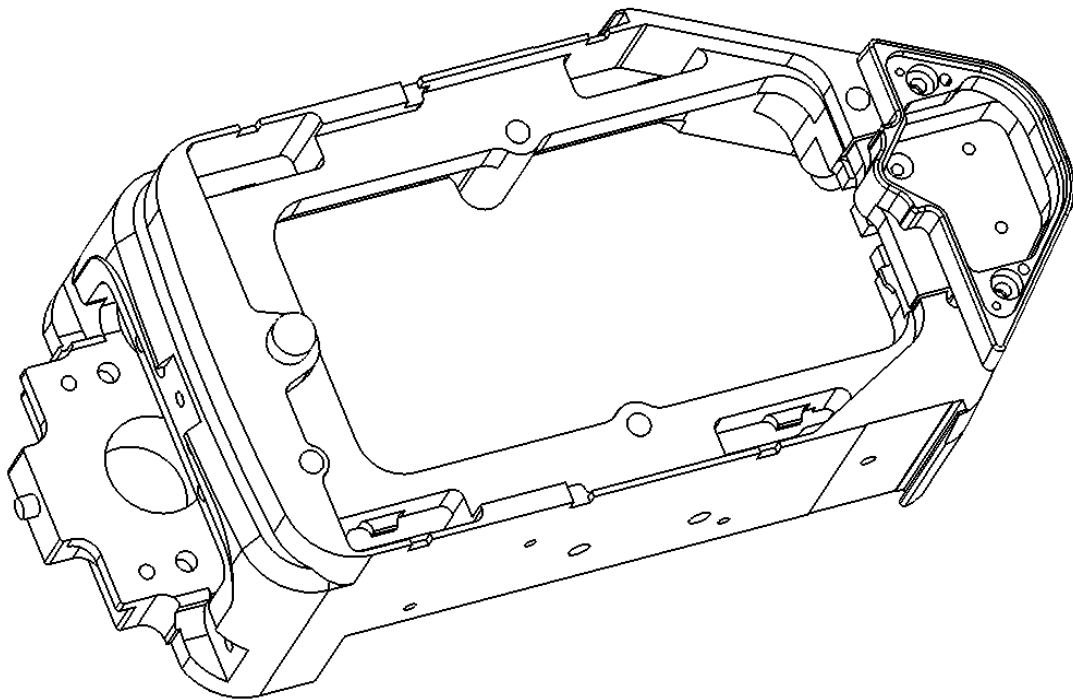


Figure 1. Drawing of carriage frame

(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.

The module uses the ST-Microelectronics IC and CR95HF for RF communication. This IC provides a serial interface, UART to communicate with RFID tags over ISO14443B. The CR95HF provides generation of the center frequency, 13.56 MHz, modulation, and demodulation. Data sheet is attached.

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

The module is supplied 3.3V +/- 3% from the host device (SSPM 171929). The RF reference oscillator is contained within the module and is as described below:

27.120 MHz; Frequency Tolerance of +/- 15PPM; Frequency Stability of +/- 30 PPM.

(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 module uses a fixed antenna that is permanently embedded within the module’s PCB layers. The antenna is a PCB trace antenna that is approximately 387nH +/- 3%, with a series resistance of 1 ohms, +/- 15%. It has approximately 4 turns and is approximately 547 mils by 419 mils. (1.9mil thick copper after plating). The peak current is not more than 100mA according to the datasheet, with a typical value listed as 70mA Installation instructions for the module are in the MPI DOCs 1008843, and explain that only this antenna may be used with the device and that the end user shall not be able to access the antenna port or change antennas.

(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.

- *Labels are attached in a manner such that they will remain fastened to the device during the expected life of the product.*
- *The “minimum size” is that the text must be legible.*
- *Module and module label will not be visible when installed, however the approval ID information will be visible near the rear vent panel label.*
- *Label with approval ID information is readily visible to the user of the device without the use of tools.*

Instructions to the end user regarding the labeling requirements for host devices are included in this application.

(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.

The module complies with the specific rules and operating requirements for which certification is sought. Instructions to the OEM installer or end user regarding such requirements for use in host devices are included in this application. Operating requirements are in our functional specifications .

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

The rule part that we are operating under doesn't not have an RF exposure assessment.