

Desktop Metal Cartridge RFID Modular Exhibit 20180126

Section	Requirement	Comment
15.212	Modular transmitters.	
15.212(a)	Single modular transmitters consist of a completely self-contained radiofrequency transmitter device that is typically incorporated into another product, host or device.	Desktop Metal requests certification for the device as a limited single-modular transmitter. The device complies with requirements of 15.212(a)(1) as detailed below, with an exception for shielding in 15.212(a)(1)(i). Desktop Metal, Inc. controls the manufacture, marketing, operation and servicing of the module. The module will only be incorporated in host systems developed & manufactured by Desktop Metal, Inc. The module will not be end-user accessible or replaceable.
	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).	Not a split modular device
	All single or split modular transmitters are approved with an antenna.	Antenna is included
	All of the following requirements apply, except as provided in paragraph (b) of this section.	See below
15.212(a)(1)	Single modular transmitters must meet the following requirements to obtain a modular transmitter approval.	See below
15.212(a)(1)(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.	Radio elements of the module are not shielded. Limited single-modular approval.
15.212(a)(1)(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 microcontroller on the host side PCB handles buffered modulation/data input needs.
15.212(a)(1)(iii)	The modular transmitter must have its own power supply regulation.	The host side PCB provides (DC) power regulation for the RF circuitry.
15.212(a)(1)(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.	Refer to test report. The antennas and their means of connection are custom & proprietary designs and Desktop Metal, Inc. controls the manufacture, marketing, operation and servicing of the module.
15.212(a)(1)(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)).	Refer to test report.
15.212(a)(1)(vi)	The modular transmitter must be equipped with either a permanently affixed label or must be capable of electronically displaying its FCC identification number.	See below
15.212(a)(1)(vi)(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.	The device is intended for incorporation in host systems developed by Desktop Metal, Inc., and labeling will be provided on the host system. The labeling requirement will be included in the integration instructions for the device.
15.212(a)(1)(vi)(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 device is intended for incorporation in host systems developed by Desktop Metal, Inc., and labeling will be provided on the host system. The labeling requirement will be included in the integration instructions for the device.
15.212(a)(1)(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.	Refer to test report & device integration instructions.
15.212(a)(1)(viii)	The modular transmitter must comply with any applicable RF exposure requirements in its final configuration.	Refer to test report & device integration instructions.
15.212(a)(2)	Split modular transmitters must meet the requirements in paragraph (a)(1) of this section, excluding paragraphs (a)(1)(i) and (a)(1)(v), and the following additional requirements to obtain a modular transmitter approval.	Not a split modular device

Section	Requirement	Comment
15.212(a)(2)(i)	Only the radio front end must be shielded. The physical crystal and tuning capacitors may be located external to the shielded radio elements. The interface between the split sections of the modular system must be digital with a minimum signaling amplitude of 150 mV peak-to-peak.	Not a split modular device
15.212(a)(2)(ii)	Control information and other data may be exchanged between the transmitter control elements and radio front end.	Not a split modular device
15.212(a)(2)(iii)	The sections of a split modular transmitter must be tested installed in a host device(s) similar to that which is representative of the platform(s) intended for use.	Not a split modular device
15.212(a)(2)(iv)	Manufacturers must ensure that only transmitter control elements and radio front end components that have been approved together are capable of operating together. The transmitter module must not operate unless it has verified that the installed transmitter control elements and radio front end have been authorized together. Manufacturers may use means including, but not limited to, coding in hardware and electronic signatures in software to meet these requirements, and must describe the methods in their application for equipment authorization.	Not a split modular device
15.212(b)	A limited modular approval may be granted for single or split modular transmitters that do not comply with all of the above requirements, e.g., shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation, if the manufacturer can demonstrate by alternative means in the application for equipment authorization that the modular transmitter meets all the applicable part 15 requirements under the operating conditions in which the transmitter will be used. Limited modular approval also may be granted in those instances where compliance with RF exposure rules is demonstrated only for particular product configurations. The applicant for certification must state how control of the end product into which the module will be installed will be maintained such that full compliance of the end product is always ensured.	Not a split modular device