



**Federal Communications Commission
Office of Engineering and Technology
Laboratory Division**

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Draft Laboratory Division Publications Report

Title: Module Equip Auth Guide

Short Title: Module Equip Auth Guide

Reason: 996369 D01 Module Certification Guide v02 to be updated to v03. Clarifications were added, and a PAG approval procedure for limited modules. Appendix A lists equipment classes to identify when modules are permitted or not. Added references to draft publication 447498 D01 General RF Exposure Guidance for Equipment Authorization DR05-44791 447498 and its future attachment D01 General RF Exposure Guidance v07 when published.

Publication: 96369 D01 Module Certification Guide v03

Keyword/Subject: Modules, Module Certification, 15.212

Question: What is the FCC guidance for equipment authorization of transmitter module devices, and equipment that incorporates transmitter modules?

Answer: See the guidance for transmitter module devices in the following attachments:

996369 D01 Module Certification Guide v03 provides a guide for equipment authorization applications under Section 15.212 modular transmitters;

996369 D02 Module Q and A v01 provides additional guidance in a question and answer format;

996369 D03 OEM Manual v01r01 provides guidance to grantees (applicants) seeking to certify a modular transmitter (module) and the key elements to be reviewed by a Telecommunication Certification Body (TCB) during the certification process;

996369 D04 Module Integration Guide v02 provides guidance to host product manufacturers.

Attachment List:

[996369 D01 Module Certification Guide v03](#) *

996369 D02 Module Q&A v01

996369 D03 OEM Manual v01

996369 D04 Module Integration Guide V02

* This Attachment being posted for draft review and seeks comments and alternatives prior to being published as guidance.

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TRANSMITTER MODULE EQUIPMENT AUTHORIZATION GUIDE

1. Introduction

This guidance¹ supplements the module rule² §15.212³. A transmitter with a modular or limited modular grant⁴ can be installed in different end-use products (also referred to as the host, host product, or host device). The host product may⁵not be subject to further Certification. However, the host product must still obtain other applicable equipment authorizations not covered by the module certification. The product must comply with all the applicable rules, including those that apply to the module⁶. Host manufacturers (or host integrators) can save time and costs for equipment authorization compared to certifying the same transmitter multiple times when used in different products. A module can be certified in one of the following four configurations:

- **A single-modular transmitter:** a complete RF transmission assembly⁷ designed to be incorporated into the host. The Grantee of the module must demonstrate compliance to all requirements of §§15.212(a)(1) (i) through (viii) independently of any host in a standalone configuration.

¹ This KDB publication is written for an audience familiar with FCC equipment authorization rules under the Code of Federal Regulations Title 47 Telecommunication, and the FCC's Office of Engineer's Knowledge Data Base (KDB) procedures.

² When referencing a rule, section (§) refers to rules in the Code of Federal Regulations Title 47 Telecommunication CFR 47.

³ <https://www.ecfr.gov/current/title-47/chapter-I/subchapter-A/part-15#15.212>

⁴ FCC Public Notice DA 00-1407 established policies that allowed for Part 15 unlicensed transmitter equipment authorization certification for a modular device; DA 00-1407 is now replaced by rules in Part 15. The Second Report and Order FCC 07-56 (Docket No. 03-201) established regulations under Part 15 (§15.212 Modular Transmitters), provided clarification for modular grants, and set a new class for modular devices called split modular transmitters. FCC Public Notice DA 08-314 is a guide to help small businesses, small organizations (non-profits), small governmental jurisdictions, etc., comply with the §15.212 rules.

⁵The Module is not subject to further Certification when used under the conditions it was granted. The integration instructions (see attachment D03) shall define what conditions do not require additional FCC filing for the host integrator; such as mobile or portable use, without any simultaneous transmission.

⁶ Although no additional filing is required when the module is used according to its grant condition, the statement “Including the rules that apply to the module” means that a host manufacture has responsibility to comply to all rules with the module installed. For this reason, it is recommended that host manufacturers use 996369 D04 Module Integration Guide to verify that the host and the module remain compliant with all the applicable rules when operating in a host. Host manufacturers should also note that the general rules §§15.5 and 15.29 state that no device can cause harmful interference. If this were to happen, it could cause significant issues for the host manufacturer.

⁷ A module consists of a completely self-contained transmitter that is missing only an input signal and power source to make it functional. (FCC DA 08-314).

- **A limited single-modular transmitter:** a single-modular transmitter that complies with some, but not all, of the §§15.212(a)(1) (i) through (vii) requirements.
- **A split-modular transmitter:** an RF transmission assembly separated into a radio front-end(s) and a control-element section that can demonstrate compliance for a range of "similar type" hosts, as defined in the 996369 D05 Split Module attachment.
- **A limited split-modular transmitter:** a split-modular transmitter that cannot comply with some but not all of the requirements §§15.212(a)(2) (i) through (vi), and must be certified in "similar type" host(s), as defined in 996369 D05 Split Module attachment.

2. MODULE OVERVIEW

Under §15.212 rules, a certified module is only allowed for part 15 transmitters. For equipment authorization, by Policy, the provisions in this Knowledge Data Base Publication also apply to transmitters operating under licensed rules. Therefore this publication covers both module transmitters certified under part 15 unlicensed and licensed rules.

Module certifications do not apply to Part 15B⁸ unintentional radiators or Part 18 devices, and transmitter modules are not permitted for specific equipment classes, as listed in Appendix A.

Any host product using a module must also obtain the applicable part 15B equipment authorization for any unintentional radiator part and any additional transmitters not certified as a module with the module installed, even if the module is advertised as authorized under part 15B.

A hosted product may only use a module operating simultaneously with other transmitters after further evaluating the simultaneous transmitters involved. Guidance⁹for simultaneous transmitters is in for RF exposure requiring evaluation according to 447498 and Question 12 for EMC (see Sections 6 and 7).

3. LIMITED MODULE APPROVAL (LMA)

3.1 General

LMA is permitted under §15.212(b) when some, but not all, of the conditions can't comply with §15.212(a)(1) for non-split modules or §15.212(a)(2) for split modules. Sections 3.2 and 3.3 define the conditions that qualify and which do not.

⁸ Certified modules under §15.212 Modular transmitters are single modular transmitters consisting of a completely self-contained radiofrequency transmitter device and, by rule, do not apply to 15 Subpart B.

⁹ Guidance references publication 447498 and to draft publication 447498 D01 General RF Exposure Guidance for Equipment Authorization DR05-44791 447498 and its future attachment D01 General RF Exposure Guidance v07 when published.

When a module is limited, the Grantee must file with the certification application a proposed test or spot test plan or FCC procedure as a limited module which currently requires a PAG identified in KDB Publication 388624 PAG as item MODLIM. MODLIM can establish a PAG reuse seed for the same Grantee when the same spot check or test method is used for different modules¹⁰.

In addition, limited modules are not permitted for any application where end users can insert a module into any open host platform unless the module is certified and tested by the Grantee with specific hosts that are authorized together to include an authentication (bias lock) protocol to confirm that modules are inserted in the host that has been authorized together. See Question 5 of 996369 D02 Module Q and A.

LMA¹¹ MODLIM is for modules that cannot comply with RF shielding (§§15.212(a)(1 & 2)(i)); buffered modulation/data inputs (§§15.212 (a)(1& 2)(ii)); voltage regulation (§§15.212(a)(1&2)(iii)); when professional¹² host antenna installation is permitted (§§15.212(a)(1 & 2)(iv); and when a module cannot be tested in a stand-alone configuration (§§15.212(a)(1 & 2)(v)).

Modules must comply with: module antenna requirements (§§15.212(a)(1&2)(iv)); labelling (§§15.212(a)(1&2)(vi)- small size can qualify under §2.925(f); comply to all specific rules §15.212(a)(1&2)(vii); RF exposure (§15.212(a)(1)(viii)).

The word "limited"¹³ on the grant, if used for a specific host for RF exposure (i.e., mobile granted module use when used in a portable host) or some other established KDB critical policies, is not a MODLIM PAG. Technically, when a C2PC is used to add RF exposure testing, the module is compliant with §15.212(a)(1)(viii) for that specific host. It is not a question of not complying with RF exposure but how it complies. For guidance on using a module for compliance with RF exposure¹⁴, see publication 447498.

The module 731 application (s) for a limited module shall include:

- The cover letter requires a statement that the module is limited and provide a justification for that choice,
- the Grantee's test validation or required FCC procedure in the integration instructions,
- the MODLIM PAG inquiry tracking number,
- and grant comments (see Section 5 below).

¹⁰ This MODLIM PAG is for the Grantee's module and not for the host that uses the limited module..

¹¹ LMA for MODLIM

¹² Professional installation for MODLIM is only applicable under §15.203 Antenna requirement to allow professional installation of antennas for the host.

¹³ The word "limited" on the grant has been used as KDB policy for identifying other critical concerns as a case-by-case inquiry. A MODLIM PAG is for limited modules under §15.212(b).

¹⁴ Modules must identify the conditions for the type of host that can be used with the module without further RF exposure evaluation, testing, or FCC filing. Typically and for practical reasons, a Grantee certifies a module for the least restrictive conditions based on frequency, antenna distance from persons, and the number of RF sources. For example, a module's least-restrictive-conditions are typically beyond a distance, such as 20 cm, for mobile use and only as a single RF source. Any other use not meeting that condition will require using publication 447498 to determine the actions and procedures necessary.

This verification (spot-checking) test requires no specific format or template. A Grantee knows their LMA's design shortcomings and is responsible for developing a verification test procedure using sound engineering for the host manufacturer¹⁵.

Although the verification test procedure may be based on an FCC rule, policy, and good engineering practices, the verification test procedure cannot just reference a rule or policy as a requirement¹⁶. It must be a detailed test procedure that the Grantee established to ensure continual compliance when integrated into a host. For example, simply stating that the host must comply with §§15.31(e) or use KDB 996369 D04 Module Integration Guide is insufficient.

The following represent some basic concepts for the Grantee's limited module verification test exhibit:

RF shielding. The PAG may be approved requiring a C2PC¹⁷ for that module for that specific host¹⁸.

Buffered modulation/data inputs. Modules are expected to comply with §§15.212 (a)(1&2)(ii) in most cases, except for exceptional circumstances, such as failures on the host circuitry or for other abnormal reasons. In these cases, the host could cause the module to operate outside of its grant condition; the Grantee must provide a verification test in the integration instructions to ensure that the module will not have emissions that are out of compliance or outside of its grant conditions.

Voltage regulation. Noncompliance to §15.212(a)(1&2)(iii) requires providing a test procedure for operating voltage over an operating range. It represents the range of voltage regulation that the module emissions must remain compliant with its grant conditions. The Grantee can base their test on a similar test measurement to §15.31(e) or require the host to include voltage regulation in their design as part of the host manufacture's product development practices and procedures.

Antenna LMA for Professional Host Installation. §15.212(a)(1&2)(iv) as LMA allows a module to be used in a host when professional installation is needed for the host when permitted by §15.203, when a unique connector¹⁹ on the host is not required: This is limited for carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, §15.221, or §15.236, and as perimeter protection systems and some field disturbance sensors, or for other intentional radiators which, by §§15.31(d), must be measured at the installation site²⁰. The integration instructions shall provide

¹⁵ The LMA requires an alternative means (verification test procedure) to ensure compliance to be filled with the application by §15.212(b) by the Grantee. §15.212(b) states: "If the Grantee 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."

¹⁶ Verification test procedure (the alternative means required by §15.212(b)) is the Grantee's responsibility so that the limited modular transmitter meets all the applicable part 15 requirements under the operating conditions when installed in a host.

¹⁷ Inquiry Guidance and TCB workshop presentations have guided that a C2PC is required for testing in a specific host.

¹⁸ This draft seeks alternative comments for allowing the host integrator's instructions to permit, other than a C2PC, to do verification testing. For example, the results for the particular host testing shall be reviewed by the Grantee for joint responsibility or permit the host integrator to perform a Grantee's test procedure. It is noted, Intrinsic to testing a host for compliance to 15B under SDoC or Certification provides the opportunity to confirm when the module transmitter is operating to ensure that no out-of-complaint emissions as a composite result from any stray host signals being reradiated out of compliance.

¹⁹ See section 8, Antennas.

²⁰ This does not apply to the module itself.

detailed instructions in integration instructions to the host manufacturers of their obligation to document in their user manual the professional installer's instructions for the proper antenna arrangement.

Module Can Not Be Tested in a Stand-Alone Configuration. Suppose a module cannot comply (§15.212(a)(1)(v)) in a stand-alone configuration or §15.212(a)(2)(iii) for other than RF exposure conditions. In that case, the module may qualify for limited module certification by testing in various hosts but limited to these types of hosts. This LMA is not to be confused with the policy to allow a module initially granted for RF exposure conditions as a mobile device and then through a C2PC to demonstrate RF exposure compliance in a specific host as a portable device²¹[1]. This LMA can be used when the Grantee is the host manufacturer for a series of similar host models to allow the host and the module to share compliance responsibilities. (e.g., shielding, buffered modulation/data inputs, power supply regulation).

In some cases, when receiver detection is required (i.e., DFS, CBP), the certified antenna(s) must be unrestricted by the host and, when used in a host and based on current policy, requires the module to be reviewed on a case-by-case²² bases by submitting an equipment compliance review inquiry to confirm that the integration instructions will include strict guidance for antenna location for receiver detection.

3.2 PAG requirements for LMA

- a) The MODLIM PAG is for a limited module under §15.212(b) when shielding, buffered modulation/data inputs, and power supply regulation cannot comply.
- b) Shielding of radio elements is required under §15.212(a)(1)(i), and if the module cannot comply, the module can qualify as a limited module, and a PAG MODLIM is required.
- c) The module must have buffered modulation/data inputs §15.212 (a)(1)(ii), and if the module cannot comply, the module can qualify as a limited module, and a PAG MODLIM is required.
- d) If voltage regulation is required under §15.212(a)(1)(iii), and if the module cannot comply, the module can qualify as a limited module, and a PAG MODLIM is required.
- e) Antenna and transmission system requirements of §15.212(a)(1)(iv) for §15.203, §15.204(b) and §15.204(c). Professional installation procedures can be extended to host professional installers. For modules that are used in host professional installation can qualify as an LMA when the details are defined in the filing and integration instructions 996369 D03 OEM Manual v01 as a PAG item MODLIM.
- f) Tested in a stand-alone configuration under §15.212(a)(1)(v). If the module cannot comply with a stand-alone configuration, the module can qualify for limited module certification by testing in the Host under LMA under PAG item MODLIM.
- g) The modular transmitter must be equipped with either a permanently affixed label §15.212(a)(1)(vi) or if the small size meets §2.925(f) and capable of electronically displaying its FCC identification. All modules must comply with this condition and cannot be used as a condition for obtaining LMA.
- h) The modular transmitter must comply with all the specific rules or operating requirements §15.212(a)(1)(vii), and this requirement cannot be used as a condition for obtaining limited module certification.

²¹ Using a module for different RF exposure conditions than initially granted, guidance is in 447498 and not in this publication.

²² UNII devices with DFS see 996369 D02 Module Q and A Question 2 and October 2009 workshop Modular Transmitter Basics. For modules that require Contention based Protocol, CBP will be considered for future policy on as either a MODLIM or possible case-by-case.

- i) §15.212(a)(1)(viii) subject to the radio frequency radiation exposure requirements. All modules must comply with this condition and cannot be used as a condition for obtaining LMA.

3.3 Limited Split Module (996369 D05 Split Module)

- a) Only the radio front end must be shielded. §15.212(2)(2)(i). If the split module cannot comply, the split module can qualify as a limited split module, and a PAG MODLIM is required, the same as 3.2a).
- b) The module must have buffered modulation/data inputs. §15.212 (a)(1)(ii). If the split module cannot comply, the module can qualify as a limited split module, and a PAG MODLIM is required, the same as 3.2b).
- c) Voltage regulation is required under §15.212(a)(1)(iii). If the split module cannot comply, the module can qualify as a limited split module, and a PAG MODLIM is required, the same as 3.2c).
- d) Antenna and transmission system requirements §15.212(a)(1)(iv) can qualify for the Limited Split module the same as 3.2d).
- e) The sections of a split modular transmitter must be tested and installed in hosts that can be considered representative of the ones intended for use. §15.212(a)(2)(iii). See 996369 D05 Split Module for guidance on the definition of similar hosts. If the module cannot comply with a representative host configuration, the module may qualify for limited split module certification for a specific host.
- f) The modular transmitter must be equipped with either a permanently affixed label, etc. Same as 3.2g) §15.212(a)(1)(vi).
- g) The modular transmitter must comply with all the specific rules or operating requirements, same as 3.2h) §15.212(a)(1)(vii).
- h) Radiofrequency radiation exposure requirements. §15.212(a)(1)(viii) the same as 3.2i).
- i) Additional Split module requirements:
 - 1) Control information and other data may be exchanged between the transmitter control elements and the radio front end. §15.212(a)(2)(ii). Control information is not a requirement but permitted, i.e., for authentication to comply with §15.212(a)(2)(iv) ensure that only transmitter control elements and radio front-end components that have been approved together.
 - 2) Manufacturers must ensure that only transmitter control elements and radio front-end components that have been approved together can operate together. §15.212(a)(2)(iv). All modules must comply with this condition²³.

4. INTEGRATION INSTRUCTIONS

Section §15.212(a)(1)(vii) requires the module Grantee to provide clear integration instructions for host manufacturers to use the module in the host legally. Attachment 996369 D03 OEM Manual v01 guides what must be included in the application for equipment authorization. The integration instructions must clearly define in a professional style²⁴ the conditions for a host manufacturer to use the module without requiring additional testing, filling, or permissive changes. The host manufacturer shall refrain from using the module and contact the Grantee for clarification when the conditions are unclear.

²³ A description in the filling is required explaining that the control element and radio front end(s) that have been approved together can operate together when used as a certified module.

²⁴ Professional technical writing quality includes necessary diagrams, reference supporting documents, and rules to correctly communicate complex and technical information. Integration instructions for modules only used in the Grantee's host products are required in a format considered conventional internal manufacturing procedures.

The instructions shall describe all the applicable rule restrictions plus the RF exposure requirements for portable, mobile, and fixed-mount operation. The integration instructions must prohibit a host from utilizing a module in violating any operating conditions if restricted by a rule for which the module is certified and any labeling or notifications required by the host integrator for the host product. (e.g., indoor use, not used on aircraft, etc.).

5. FILING REQUIREMENTS

In addition to requirements in §2.1033, modules require:

a) All Modules

- i) Selecting on Form 731 the appropriate modular approval type.
- ii) A cover letter requesting modular approval that includes an itemized list documenting compliance to the appropriate section §15.212(a)(1) for non-split modules or §15.212(a)(2) for split modules.
- iii) An integration manual with detailed instructions describing host manufacturers' conditions, limitations, and procedures (see 96369 D03 OEM Manual for guidance).
- iv) For split modular transmitters, details are provided in D05 Split Module guidance.
- v) All modules shall have the appropriate RF exposure exhibit as required by §2.1033(f). Guidance for the appropriate RF exposure exhibit is in Publication 4447498.

b) Additional requirements or LMA under PAG MODLIM:

- i) In the cover letter (5a)ii), state why the module is limited and the conditions that cannot comply (see Section 3 above).
- ii) The limited module test procedure in the integration instructions.
- iii) MODLIM PAG, inquiry tracking number.
- iv) Grant comments.
 - 1. "This Module is limited, requiring the host integrator to perform additional verification testing as provided by the manufacture's integration instructions for: <provided reason>, ex: RF shielding, buffered modulation/data inputs, Voltage regulation, and professional host installation, or not tested in a stand-alone configuration". Or;
 - 2. "This Module is limited, requiring the host integrator to file a Class II permissive change for each specific host.

6. RF EXPOSURE

The assessment for RF exposure under KDB Guidance of 447498²⁵ is mandatory for all modules.

- a) An initial grant for certification may fall under the following general conditions:
 - i) A single RF source for use in a mobile §2.1091(b) or a fixed host device maintains a separation distance of at least 20 centimeters between the RF source's radiating structure(s) and the body of a person. This category is the most common for initially certifying a module.
 - ii) A single RF source for use in a §2.1093(c)-portable configuration of the host device, where the distance from the body of nearby persons may be less than 20 centimeters. Any minimum separation distance requirement must be stated in the integration instructions. This category is generally used for low-power and low-duty cycle devices.
 - iii) Multiple RF sources for §2.1091(b)-mobile or §2.1093(c)-portable use, depending on the RF source power and distance within or beyond 20 centimeters of the user's body. This condition is the most restrictive and least used since it is generally limited to specific modules (by FCC ID) and hosts.
 - iv) Typically, modules are certified as single RF sources for a mobile host (6a)i) or low-power modules in a portable host (6a)ii), and a few, if any, for multiple RF sources (6a)iii).
- b) When a host integrator needs to use the module differently than the way it was initially certified, an RF exposure evaluation is mandatory. Updates in the filing are done via Class 2 Permissive Change (C2PC). For example: Certified for a mobile host and to be used still in a mobile host but with a restriction for a larger minimum than the minimum distance the module was certified for. A mobile configuration requires, by default, MPE compliance for a minimum separation distance of 20 cm, but certification may be provided for more considerable distances. So if a module was certified for installation in hosts that require a minimum distance of 30 cm and then is installed in a host that requires a minimum distance of 31 cm, a new RF exposure evaluation is necessary. A C2PC is needed because the MPE limits on file (show distance at 30 cm) do not demonstrate the RF exposer at the greater distance of 31 cm for this host.

²⁵ Either the Draft version 447498 01General RF Exposure Guidance for Equipment Authorization DR05-44791.pdf or the published version, "447498 D01 General RF Exposure Guidance v06," may also be used during this transition period (01/17/2023: UPDATES TO THE TRANSITION PERIOD UNTIL FURTHER NOTICE) as long as the 731 Form and the related granted application are submitted to the FCC on or before the end of transition period. "447498 D01 General RF Exposure Guidance v06" must be used entirely (i.e., no mixing of old and new procedures for certification application filing(s)).

- c) Grantee²⁶ can only evaluate RF exposure to determine if new conditions other than those initially certified still qualify for an RF exposure test exemption per KDB 447498²⁷. If no exemptions are permitted, RF exposure testing is required as a C2PC; only the Grantee can add the RF exposure test reports to the filing via C2PC²⁸. For example:
- i) The module was certified for a mobile host with MPE limits to be used in a portable host. A C2PC is required unless the Grantee's evaluation conditions qualify²⁹ for an RF exposure test exemption.
 - ii) Certified as a single RF source for use within 20 cm at a defined separation distance, a C2PC is required unless the Grantee's evaluation conditions still qualify³⁰ for an RF exposure test exemption under the conditions.
 - iii) Or simultaneously with other transmitters not initially certified. A C2PC is required unless the Grantee's evaluation conditions qualify³¹ for an RF exposure test exemption.

7. EMC CONSIDERATIONS

When the module is used as a signal source without any other transmitters operating simultaneously and used in a host for the conditions that it was initially granted, then it is recommended for the host manufacturer to use attachment D04 Module Integration Guide recommended³² to conform compliance when installed in the host.

However, for simultaneous transmissions³³ with any other transmitters not initially certified with the module, an EMC evaluation test by the host integrator or the Grantee is required as permitted in D02 Module Q&A Question 12 is considered sufficient to confirm compliance.

²⁶ This draft seeks alternative comments, such as allowing the host integrator to perform an RF exposure test exemption evaluation without requiring any permissive change policy. ; Host integrators must contact the Grantee to be responsible for any RF exposure evaluation under C1PC or Grantee to be accountable for any RF exposure evaluation only under C2PC.

²⁷ If the evaluation determines the conditions still qualify for an RF exposure, the Grantee shall use the procedure defined in the appropriate 447498 01General RF Exposure Guidance for Equipment Authorization DR05-44791.pdf or the published version, "447498 D01 General RF Exposure Guidance v06," see note 25 above.

²⁸ Alternatively, the host integrator can request permission from the Grantee to allow a change ID (see KDB 249634).

²⁹ Same comment as note 26 above.

³⁰ Same comment as note 26 above.

³¹ Same comment as note 26 above.

³² D04 Module Integration Guide recommends a "best practice" for determining if situations such as non-linear interactions or unwanted radiation of signals may occur when the module is in the host. Since D04 Module Integration Guide is not a specific rule, is why it is recommended. However, if these unwanted emissions result in harmful interference under §§15.5 and 15.29, the users must stop using the device until the interference has been resolved. If this happens, it could cause a significant issue for most manufacturers.

³³ Since the module was not certified with any other transmitters for simultaneous transmission, a C2PC or new FCC ID would typically be required by the Grantee. However, the current KDB policy permits, by D02 Q&A Q12, that the host manufacturer only needs to do an evaluation (i.e., no C2PC required when no emission exceeds the limit of any individual device (including unintentional radiators) as a composite (i.e., §2.947). The host manufacturer must fix any failure. This KDB policy may be subject to change in the future.

The evaluation test shall be performed with all devices operating, including unintentional (15B) radiators, for both the standalone and simultaneous cases. If the evaluation testing confirms that no emissions exceed the limit of any individual transmitter or unintentional radiator (i.e., §2.947), no additional C2PC is required. If any emission exceeds an applicable limit, the host manufacturer must take corrective actions to bring the device into compliance.

8. ANTENNAS

For Part 15 and licensed client³⁴ modules³⁵, the antennas shall comply with §15.212(a)(1)(iv) and §§ 15.203, 15.204(b), and 15.204(c), and the application(s) shall provide specifications for each type: bandwidth, impedance, form factor, frequency, bandwidth, impedance, directivity and gain, and polarization, in the test report.

When the module is not to be installed by end users and a physical antenna is not supplied³⁶ with the module, the antenna shall also be specified, mechanically and electrically, including type, form factor, frequency, bandwidth, impedance, directivity and gain, and polarization and shall be in the integration instructions (see 996369 D03 OEM Manual).

Modules certified as trace antennas or trace to an antenna design shall follow the requirements of Question 11 of 996369 D02 Module Q&A.

When a module is positioned to be installed by end users³⁷, it must include the antenna.

A module with a permanently attached antenna on the module or requires the host manufacturer to use a permanently attached antenna is considered §15.212(a)(1)(iv) complaint. It is complaint because, in this case, no antenna other than the antenna on the module or the antenna identified in the integration instructions by the Grantee can be used. On the other hand, (except for licensed base station or licensed fixed-non-client modules) if the Grantee permits the host manufacturer to allow the host to use replaceable antennas, then that host must use a unique coupling connector. The Grantee is responsible for stating this in the integration instructions. For connector(s) on the module itself: when the module is manufactured or assembled in the host's facility (factory), and end users cannot replace or attach the antenna, this is considered as unique coupling. For licensed base stations or fixed-non-client modules, the licensee is responsible for using the appropriate antenna under the terms of their license.

Licensed (non-client station) modules for a base station, non-client, or non-client fixed station can be certified using conducted power and antenna data. The licensee is responsible for the applicable limits under their license operation.

³⁴ A client operates in a master/client network under control to initiate a transmission by a base or master station or device. A non-client device, non-client fixed, or base station can transmit without an enabling signal and activate a transmission.

³⁵ Licensed client devices require §2.1093 Radiofrequency radiation exposure evaluation, as mobile or portable devices, and § 2.1091 Radiofrequency radiation exposure evaluation is required. This includes the device antenna. In addition, modules cannot currently be used for licensed CMRS handsets, as stated in 447498.

³⁶ This is not a limited module when an antenna is not provided with the module. However, precise specifications are required in the integration instructions.

³⁷ Not providing an antenna to modules inserted by end users is prohibited and is considered like any other part 15 device.

A module certified in a host that allows professional installation³⁸ for Part 15 modules, if permitted under §15.203, must be certified as a limited modular (see Section 3 above). The integration instructions 996369 D03 OEM Manual must fully explain the obligation to document the professional installer's instructions for the proper antenna arrangement in the host user manual.

When receiver detection is required (i.e., DFS, CBP), the certified antenna(s) must be unrestricted by the host and, when used in a host and based on policy, requires the module to be limited. Under current policy, these are handled case-by-case by submitting an Equipment Compliance Review inquiry to confirm that the integration instructions will include strict guidance for antenna location. (See Section 3 above).

9. PERMISSIVE CHANGES

Only Grantees are permitted to make permissive changes. See KDB 178919 Permissive changes.

A host manufacturer that wants to make permissive changes must have the Grantee make the changes or request permission from the original Grantee to file a Change-in-ID (see KDB 249634). After the change in ID is approved by a TCB, the host manufacturer is authorized to make permissive changes.

Changes from a non-modular to modular certification and from a full-modular to a limited-modular certificate are permitted if the changes meet the requirements in §2.1043 (also see KDB Publication 178919) and the modular approval requirements discussed above.

10. REFERENCES

- KDB Publication 178919 Permissive Change Policy
- KDB Publication 388624 Pre-Approval Guidance procedures and list
- KDB Publication 442812 SDR Apps (Application) Guide
- KDB Publication 447498 RF exposure in equipment authorizations
- KDB Publication 594280 Software Configuration control
- KDB Publication 616217 RF exposure for laptop and tablet computers
- KDB Publication 784748 Labeling requirements

³⁸ For licensed (non-client station) modules for a base station, non-client or non-client fixed station modules are treated similarly to professional installations but do not require it to be an LMA.

APPENDIX A

MODULES PERMITTED (Y) OR NOT PERMITTED (N) BY EQUIPMENT CLASS CODE

The following list is subject to change, for questions, submit an inquiry at <http://www.fcc.gov/labhelp>.

- Devices that are not transmitters and can not qualify as modules.
- ** Future Equipment Class under draft applications not accepted
- A transmitter indicated as N, is either [prohibited by rule, or in some cases may require an Equipment Compliance Review Inquiry. For any questions submit an inquiry.

Code	Description	Module Permitted
5GM	Part 30 Mobile Transmitter	Y
5GB	Part 30 Fixed Transmitter	Y
5GT	Part 30 Transportable Transmitter	Y
6CD	15E 6 GHz Low Power Dual Client	Y
6ID	15E 6 GHz Low Power Indoor Access Point	Y
6PP	15E 6 GHz Subordinate Indoor Device	N
6XD	15E 6 GHz Low Power Indoor Client	Y
6SD	Standard Power Access Point	**
6FX	Standard Client	**
6FC	Fixed Client	**
8CC	Part 18 Consumer Device	N*
AIS	Automatic Identification Systems	N
AMP	Amplifier	N*
B2I	Part 20 Industrial Booster (CMRS)	N
B2P	Part 20 Provider-Specific Consumer Booster (CMRS)	N
B2W	Part 20 Wideband Consumer Booster (CMRS)	N
B9A	Part 90 Class A Industrial Booster (non-SMR)	N
B9B	Part 90 Class B Industrial Booster (non-SMR)	N
BOS	All other signal boosters other than 20.21/90.219	N
BPL	Access Broadband Over Powerline System	N*
CBD	Citizens Band Category A and B Devices	Y
CBE	Citizens Band End User Devices	Y
CRD	Part 15 Radar Detector	N*
CRR	Super-regenerative Receiver	N*
CSR	Scanning Receiver	N*
CXX	Communications Rcvr for use w/ licensed Tx and CBs	N*
CYY	Communications Receiver used w/Pt 15 Transmitter	N*
DCD	Part 15 Low Power Transmitter Below 1705 kHz	Y
DSC	Part 15 Security/Remote Control Transmitter	Y

Code	Description	Module Permitted
DSR	Part 15 Remote Control/Security Device Transceiver	Y
DSS	Part 15 Spread Spectrum Transmitter	Y
DTS	Digital Transmission System	Y
DWM	Part 15 Wireless Microphone	N
DXX	Part 15 Low Power Communication Device Transmitter	Y
EAD	Part 11 Emergency Alert Devices	N*
EAV	Part 15 Automatic Vehicle Identification System	Y
ETB	Part 15 Cordless Telephone Base Transceiver	Y
ETR	Part 15 Cordless Telephone Remote Transceiver	Y
ETS	Part 15 Cordless Telephone System	N*
FAP	Part 15 Anti-Pilferage Device	N*
FDS	Part 15 Field Disturbance Sensor	N
FRB	Part 95 Family Radio Base Transmitter	N
FRE	Part 95 Family Radio Ear Held Transmitter	N
FRF	Part 95 Family Radio Face-Held Transmitter	N
FRT	Part 95 Family Radio Body Worn Transmitter	N
GAT	Part 15 Auditory Assistance Device (Transmitter)	Y
GEP	406 MHz EPIRB	N
GHF	Part 80 HF Transmitter (GMDSS)	N
GHH	Part 80 VHF Hand Held Transmitter (GMDSS)	N
GMF	Part 80 MF Transmitter (GMDSS)	N
GVH	Part 80 VHF Transmitter (GMDSS)	N
HID	Part 15 TV Interface Device	N*
JAB	Part 15 Class B Digital Device	N*
JAD	Part 15 Class A Digital Device	N*
JAV	Other Non-Digital SDoC Devices	N*
JBC	Part 15 Class B Computing Device/Personal Computer	N*
JBP	Part 15 Class B Computing Device Peripheral	N*
LMS	Part 90 Location & Monitoring Transmitter	N
LPR	Level Probing Radar	Y
MRD	Marine Radar	N
MWR	Part 80 Marine Watch Receiver	N
NII	Unlicensed National Information Infrastructure TX	Y
PCB	PCS Licensed Transmitter	Y
PCE	PCS Licensed Transmitter held to ear	N
PCF	PCS Licensed Transmitter held to face	N
PCT	PCS Licensed Transmitter worn on body	Y

Code	Description	Module Permitted
PLB	Personal Locator Beacons	N
PUB	Part 15 Unlicensed PCS Base Station	Y
PUE	Part 15 Unlicensed PCS portable Tx held to the ear	N
PUF	Part 15 Unlicensed PCS portable Tx held to face	N
PUT	Part 15 Unlicensed PCS portable Tx worn on body	N
RNV	Part 80 NAVTEX Receiver	N*
SRT	Radar Transponder	N
SSA	Ship Security Alert Systems (SSAS)	N
TBC	Licensed Broadcast Station Transmitter	N
TBF	Licensed Broadcast Transmitter Held to Face	N
TBT	Licensed Broadcast Transmitter Worn on Body	N
TDC	Part 80 DSC Controller	N
TLD	Licensed LPAS Device	N
TNB	Licensed Non-Broadcast Station Transmitter	Y
TNE	Licensed Non-Broadcast Transmitter Held to Ear	N
TNF	Licensed Non-Broadcast Transmitter Held to Face	N
TNT	Licensed Non-Broadcast Transmitter Worn on Body	N
UWB	Ultra-Wideband Transmitter	Y
VRD	Part 95 Vehicular Radar Systems	Y
WBT	Wideband Transmitter	Y
WG1	White Space Device with Geo-location- Mode 1	Y
WG2	White Space Device with Geo-location- Mode 2	Y
WGF	White Space Device with Geo-location- Fixed	Y

Change notices:

10/23/2015: 996369 D01 Module Equip Auth Guide v01r04 has been changed to 996369 D01 Module Equip Auth Guide v02.

1. The module Q&A section of 996369 D01 Module Equip Auth Guide v01r04 has been moved to a separate attachment 996369 D02 Module Q&A.
2. Questions 12 and 13 are added to 996369 D02 Module Q&A about misc—multi-transmitter operations.
3. Question 14 added USB dongles as an example integrated within end products.
4. Clause I modified by moving the first bulleted list to the end of the clause.
5. Footnote 1 amended to remind that DA-00-1407 is obsolete because it is superseded by §15.212.
6. Change notation from PBA to PAG.
7. Misc. basic editorial cleanups.
8. Clause numbering was adjusted after adding a number for the integration instructions clause.
9. Clause IX added about host product considerations.

04/24/2023, TBD: 996369 D01 Module Equip Auth Guide v02 has been changed to 996369 D01 Module Equip Auth Guide v03. v03.chamnges allow Split modules allowed for licensed devices, added PAG approval procedure for limited modules, List of Equipment Classes as Appendix A for modules not permitted, additional clarification on RF exposure referencing for publication 447498 D01 General RF Exposure Guidance for Equipment Authorization DR05-44791 or when the draft is published as 447498 D01 General RF Exposure Guidance v07.