

Cover Letter Request for Module Certification for
AP 2.4 GHz RF module
2ACQM- APG3-0240-A

Company: SES-imagotag GmbH
Date: 07.03.2022

Application for:

- ☐ Modular Approval ☒ Limited Modular Approval
☐ Split Modular Approval ☐ Limited Split Modular Approval

- Single-modular transmitter: A complete RF transmission sub-assembly, designed to be incorporated into another device, that must demonstrate compliance with FCC rules and policies independent of any host;
- Limited single-modular transmitter: A single-modular transmitter that complies with the § 15.212(a)(1) modular rules, only when constrained to specific operating host(s) and/or associated grants condition(s);
- Split-modular transmitter: An RF transmission system that complies with the requirements for a single-modular transmitter, that is separated into a radio front-end section and a control-element section, and can demonstrate compliance for a range of similar type hosts;
- Limited split-modular transmitter: A split-modular transmitter that complies with the definition and technical rules for split modules only when constrained to specific operating host(s), and/or associated grant condition(s).

*) Split modular transmitters require Pre-Approval Guidance (PAG)

Checklist for § 15.212(a)(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. Details: The designated user of the modules received dedicated integration knowhow to ensure compliance with FCC standard. The host system is evaluated, tested and approved in order to make sure that the module, especially the antenna, is compliant. Each change on the host system needs to be shared with the module grantee.	Requirement met? ☐ yes ☒ no
(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. Details: Compliant to FCC part 15.	Requirement met? ☒ yes ☐ no
(iii) The modular transmitter must have its own power supply regulation. Details: Module includes 1.8V step down regulator.	Requirement met? ☒ yes ☐ no
(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.	Requirement met? ☒ yes ☐ no

Details: When product is assembled, antenna can not be removed. Internal antenna.	
(v) The modular transmitter must be tested in a stand-alone configuration, <i>i.e.</i>, 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)). Details: Module was tested in a specific host and is not meant to be sold or used as stand alone product.	Requirement met? ☐ yes ☒ no
(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. Details: The module is not visible to the outside environment. Instead, the host system will show the FCC identification number.	Requirement met? ☐ yes ☒ no
(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. Details: Module manufacturer is the same as complete product manufacturer. There is no sales to third parties.	Requirement met? ☒ yes ☐ no
(viii) Radio frequency devices operating under the provisions of this part are subject to the radio frequency radiation exposure requirements specified in §§ 1.1307(b), 1.1310, 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of modular transmitters under this	Requirement met? ☒ yes ☐ no

section must contain a statement confirming compliance with these requirements. The modular transmitter must comply with any applicable RF exposure requirements in its final configuration. Technical information showing the basis for this statement must be submitted to the Commission upon request. Details: Module is certified as “Modular certification in a specific host”	
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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.

Checklist for KDB 996369 D03 OEM Manual v01

The grantee must provide clear and specific instructions describing the conditions, limitations, and procedures for third-parties to use and/or integrate the module into a host device

Is the module intended for sale to third parties?

*) If the modular transmitter is only approved for use by the grantee in its own products and not intended for sale to third parties, the integration instructions may not be detailed but this must be declared in the filing. In that case, it is permitted to place the instructions in the theory-of-operation exhibit folder using long-term confidentiality. The applicant must include a statement in the filing that the module is not for sale and the user manual integration instructions are internal confidential manufacturing documents. The grant of certification for such a modular transmitter must be limited.

Details: Module was tested in a specific host and is not meant to be sold or used as stand alone product. Module manufacturer is the same as complete product manufacturer. There is no sales to third parties.

Requirement met?

☐ yes ☒ no

Checklist for required items in the manual (KDB 996369 D03 OEM Manual v01)

Modular transmitter applicants should include information in their instructions for all these items indicating clearly when they are not applicable. For example, information on trace antenna2 designs could indicate "not applicable."

If the modular transmitter is only approved for use by the grantee in its own products and not intended for sale to third parties, the integration instructions may not be detailed but this must be declared in the filing. In that case, it is permitted to place the instructions in the theory-of-operation exhibit folder using long-term confidentiality. The applicant must include a statement in the filing that the module is not for sale and the user manual integration instructions are internal confidential manufacturing documents. The grant of certification for such a modular transmitter must be limited.

(i) List of applicable FCC rules (KDB 996469 D03, Section 2.2)

List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.

Included in manual?

☒ yes ☐ no

Details: Included in the manual.

(ii) Summarize the specific operational use conditions (KDB 996469 D03, Section 2.3)

Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.

Included in manual?

☒ yes ☐ no

Details: Our module APG3-0240-A was only tested with this specific antenna inside the host APG3-VGE1-A. Any changes to the antenna, or host need to be retested in a new version and might require a Class II Permissive Change.

(iii) Limited module procedures (KDB 996469 D03, Section 2.4)

Describe alternative means that the grantee uses to verify that the host meets the necessary limiting conditions
RF exposure evaluation is necessary, state how control will be maintained such that compliance is ensured, for example by requiring a Class II

Included in manual?

☒ yes ☐ no

Permissive Change for new hosts. For details see KDB 996469 D03, Section 2.4 Details: New host will be added through Class II Permissive Changes.	
(iv) Trace antenna designs (KDB 996469 D03, Section 2.5) If applicable, describe allowed trace layouts, parts lists, antenna, connectors, isolation requirements, specifications, test procedures for design validation, production test procedures For details see KDB 996469 D03, Section 2.5 Details: Not applicable.	Included in manual? ☐ yes ☒ no
(v) RF exposure considerations (KDB 996469 D03, Section 2.6) It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application). Details: It is not meant to be used in a proximity of a human body. Application conditions are defined in the manual. Module grantee and host integrator are the same company.	Included in manual? ☒ yes ☐ no
(vi) Antennas (KDB 996469 D03, Section 2.7) A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”)). For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors Details: Antenna is internal steel antenna attached on a PCB. Tests were performed with antenna in the host.	Included in manual? ☒ yes ☐ no
(vii) Label and compliance information (KDB 996469 D03, Section 2.8) Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748. Details: Compliance information is added to the manual.	Included in manual? ☒ yes ☐ no
(viii) Information on test modes and additional testing requirements (KDB 996469 D03, Section 2.9) Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host.	Included in manual? ☒ yes ☐ no

Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements. Details: Test modes and test procedures are the same as for our other products. The newest applicable operating procedures shall be used. Tests are performed with the host. If the new host includes additional transmitters, then tests should be performed in accordance with FCC multi-transmitter procedures. Simultaneous transmission of transmitters in a host shall be tested and shall be considered in the RF exposure evaluation. Module tests were performed with the host.	
(ix) Additional testing, Part 15 Subpart B disclaimer (KDB 996469 D03, Section 2.10) The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. Details: This limited modular transmitter is only FCC authorized for the Part 15 FCC transmitter rules listed in the grant. The host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the limited modular transmitter grant of certification. The host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.	Included in manual? ☒ yes ☐ no

Sincerely,

Philipp Jauck

Head of IP Management & Regulatory Compliance
SES-imagotag GmbH

