P 801.798.4660
F. 801.798.2814

940 South 2000 West #140
Springville, UT 84663

www.TAGSMYTH.com

Grant Notes for Compliance as a Final Product in Model Range COMPANION

Federal Communications Commission
Authorization and Evaluation Division
1435 Oakland Mills Road
Columbia, MD 21046

FCC Application for FCC ID: 2ADS3-TS1RCOM101

The model RangeCOMPANION, carrying FCC ID: 2ADS3-TS1RCOM101 contains the following FCC certified Bluetooth module. This attestation is to attest that the FCC Grant Note is satisfied in the final product.

FCC ID: 2ADHKSAMB11
Manufacturer: Atmel Corporation
Model: SAMB11 MODULE
Grant Note: Must not be co-located or operation in conjunction with any other antenna or transmitter.

With the attached document, RangeCOMPANION Module Grant Note Considerations, TAGSMYTH confirms and attests that the RangeCOMPANION with Bluetooth module is compliant with all FCC regulations, and no additional filing is required for the RangeCOMPANION or the Bluetooth module.

Joshua Hintze 16 November 2016
Vice President

RangeCOMPANION
Module Grant Note Considerations

Summary

The RangeCOMPANION includes a 915 MHz long-range transmitter located about 5cm away from a bluetooth module (Modular ID: 2ADHKSAMB11), whose grant note states

> "The antenna(s) used with this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter."

The purpose of this document is to show that even with the two transmitters simultaneously transmitting, the RangeCOMPANION is in compliance with all FCC regulations regarding RF exposure and EMC, thus not requiring additional testing or FCC application filings to be completed.

Introduction

To understand what considerations we must make for FCC compliance, we will first look at KDB 996369 D01 Clause VII (Multiple Transmitter Modules Used in a Host) which explains:

> Combining multiple modular approved transmitters within a host is permitted for modules which have been evaluated and granted authorization to cover such configurations; and all required and submitted test data must include compliance information for any simultaneous transmission configurations. Each module must have a unique FCC ID. A transmitter module capable of transmitting simultaneously with another transmitter can be granted as an original grant, or a Class II permissive change, by following the applicable simultaneous transmission test procedures.[9] Additional tests for RF exposure and EMC are necessary for modules which have not been evaluated for such operation to demonstrate compliance with all the rules. This will require modification of simultaneous transmission restrictions through permissive changes for the modules in the host, unless it is determined that such evaluations are exempted. Applicability of such a policy must be explained within a filing when a justification for no testing is submitted. The OEM integrator or the host manufacturer is responsible for the overall compliance of the host products, and as discussed below, may work with the module grantees to ensure that proper test data for multiple transmitter operations are included in the application filings for the modules.

Footnote 9 give a little clarification:

For examples and discussions, see Questions 12 and 13 in KDB Publication 996369 D02. Also, KDB Publications 447498 and 662911 provide guidance for evaluation of multiple transmitters. EMC see requirements under § 15.31(k) for simultaneous transmission.

Based on this, we must show two things:

1. RF exposure with both the long-range transmitter and the bluetooth transmitting complies with FCC regulations.
2. EMC compliance is met with the bluetooth module installed and operational in the RangeCOMPANION.

EMC Considerations

Since the bluetooth module is not removable, all EMC testing done on the RangeCOMPANION was with the bluetooth module installed and active. Therefore EMC compliance is shown through the results of the RangeCOMPANION testing reports.

RF Exposure Considerations

With some further discussion, we will determine that further testing and filings for RF exposure compliance will not be necessary.

Question 12 in KDB 996369 D02 reads as follows:

> Question 12: Aside from RF exposure evaluation considerations (which are covered in, e.g., Question 13), is there guidance for multiple certified modules when integrated in a host and transmitting simultaneously in the same or different bands?
>
> Answer 12: Over the years, the numbers and types of modules used in end products has evolved, in particular products with MIMO capabilities and a large number of multi-transmitter products. KDB Publication 662911 specifies additional procedures for host products with combinations of certified modular transmitters and/or built-in transmitters.
>
> For EMC/radio-parameter compliance purposes, when an evaluation is done by the grantee or host provider (see Clause IX in KDB Publication 996369 D01) and there are no additional emissions generated due to simultaneous-transmission operations compared to single transmitter operations testing (i.e., not transmitting simultaneously), it is not necessary to file the additional simultaneous transmission test data. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for

the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

We will look at Clause IX in KDB 996369 D01 and determine if the RangeCOMPANION is exempt from further testing.

Question 13 in KDB 996369 D02 does not apply, as each of the three question parts discuss modules that were certified as mobile devices, or for use in mobile devices only. This is not the case with the bluetooth module, as is shown by the SAR test exclusion document of the bluetooth module, which uses a test separation distance of 5mm.

KDB 996369 D01 Clause IX (Guidance for host manufacturers using modules) states:

> A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end-use operational conditions, including simultaneous transmission operations. When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application (as discussed in Clause VIII above).
>
> When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers.
>
> Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters[11] not previously granted together.

The RangeCOMPANION falls under option (C) simultaneous transmission for independent collocated transmitters not previously granted together. Based on this, additional testing and/or FCC application filings may be required for the RangeCOMPANION. Footnote 11 states:

> Independent of whether the grant notes explicitly state collocation restrictions or not, compliance for simultaneously-transmitting transmitters contained in an end product not previously tested together must be addressed, as described in this document.

This footnote explains that even though the bluetooth module grant note states collocation restrictions, compliance for the simultaneously-transmitting transmitters in the RangeCOMPANION must be addressed.

Clause IX section C of KDB 996369 D01 explains:

> To date, very few modules have been tested together and granted for operation in simultaneously-transmitting (collocated) end product configurations. Evaluating compliance for a host using certified modules and/or a standalone end product requires addressing EMI requirements under § 15.31(k) for simultaneous transmission and for RF exposure (§ 2.1091 mobile devices and § 2.1093 portable devices). In either case, the filing requires demonstrating that all transmitters designed to operate simultaneously have been evaluated under simultaneous transmission conditions.
>
> When a host product supports simultaneous-transmission operations, and the associated transmitters have not been evaluated for the specific combination, the host manufacturer can first determine if there are additional RF exposure filing requirements due to the simultaneous transmissions (see Clause VI above, and KDB Publication 447498). If additional filling is required, either have the grantee file a Class II permissive change, or the host manufacturer may file a Change in ID application or new FCC ID (see Question 1 in KDB Publication 996369 D02).

We must determine if there are additional RF exposure filing requirements due to the simultaneous transmissions, so we will look at Clause VI in KDB 996369 D01, which states:

> KDB Publication 447498 provides detailed guidance to determine RF exposure evaluation requirements for modular transmitters for use in mobile and portable devices.

KDB Publication 447498 D01 (RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices) Sections 4.3.1 and 4.3.2 contain General SAR test exclusion considerations, and Simultaneous transmission SAR test exclusion considerations, respectively. In the RangeCOMPANION MPE Analysis document, the RangeCOMPANION is shown to be under the the SAR test exclusion thresholds for both standalone, and simultaneous transmission configurations. To summarize:

SAR test exclusion for simultaneous transmission is defined in KDB 447498 Chapter 4.3.2. To wit,

> "Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration."

With both bluetooth and the long-range radio enabled, worst-case Total SAR is 2.1, which is under the test exclusion threshold. This shows that the SAR test exclusion applies to the simultaneous transmission configuration in the RangeCOMPANION, and therefore the RangeCOMPANION complies with FCC RF exposure regulations.

Conclusion

With the RangeCOMPANION excluded from SAR testing, and EMC tested compliant, no additional test information is required to be submitted for the simultaneously-transmitting transmitters in the RangeCOMPANION. As such, a permissive change is also not required for the bluetooth module per Answer 12 in KDB 996369 D02. It is the responsibility of the host provider to ensure compliance with the applicable FCC rules, which has been done.