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American TCB

November 1, 2005

RE: FCC ID: BRWDSMTX10

Attention: Tim Johnson

Please find our responses to your comments on this Application below:

1) Please justify use of the DoC authorization. This does not appear to directly apply to this device.

> There is no justification for a DoC procedure for this device. The suggested use of the FCC logo has been removed from the user instructions and the logo has been removed from the drawing of the proposed label.

2) The labeling shows an FCC DoC logo, but the device appears to be tested in a portable device and therefore not directly connected or considered a PC peripheral under 15.3. Please review/explain.

> Refer to (1) above.

3) If this device is subject to a DoC, then the manual is missing the appropriate information on a single page that is given in 2.1077.

> Refer to (1) above.

4) The device appears to be tested within a portable device. This type of device is commonly held against the stomach during use and 20 cm as a mobile device does not appear to always be possible. Note this type of transmitter commonly have a neck strap as well. Please review/explain in more detail the intended types of installations.

> The device provided was used for convenience to provide power/signaling to the EUT. The actual antenna used during testing was connected to the host (refer to additional test configuration photograph uploaded showing connection from module to antenna) but the host system will not be used with this device.
>
> The host systems that will use this device will be designed to ensure that the antenna and its feed point will be positioned on the device to provide a 20cm separation from persons. Further the host device will be designed to ensure that the normal location of hands on the controller and the location of the controls will also be more than 20cm from the antenna.
>
> To relieve some of these issues please change the application to one for limited modular approval. The limitations should restrict the module's use to Horizon Hobby's end products.

5) Please explain the intent of this module as these are typically not allowed to be installed by the end user and also not clear what types of devices this is intended for. Additionally see items 3 and 4 above. It is uncertain if these devices can meet appropriate RF exposure requirements if their intent is for a portable controller.

The modules will be used in purpose-built controllers that are designed to operate in the 2.4 GHz band (current units use alternative frequency bands for model control). There is no intent to provide the end user with the module, in fact the end user would not have access to the module as it would be installed inside the controller.

See also item (4) above for rf exposure concerns.

6) The operational description mentions 100 mW, while testing shows about 3 dB lower. Additionally some testing even appears to mention a 21.6 dBm output. Note that the FCC expects tests all testing to be performed at maximum output power. Please explain/comment as necessary.

The original intent was to operate at a nominal power of 100mW, and the actual measured power at this nominal setting was 21.6dBm. At this power level the device failed spurious emissions limits.

The final power to be used in the US devices will be the 17dBm power setting referenced in the application.

The operating/installation guide defines conducted output power as being 18dBm max and the radiated power as being 20dBm (conducted power plus 2dBi gain of the antenna). These has been modified to reflect a maximum output power of 17dBm, eirp of 19dBm, in-line with the measured values.

7) Photographs regarding what antenna was tested (i.e. to be approved) was not provided. Please provide.

A spec sheet for the antenna has been uploaded.

8) AC power line emissions are generally required for modular approvals since there is no guarantee that an integrator will use a battery powered device and the grantee can not maintain control of the installation for another integrator. Simply instructing the integrator to only use in battery installations is not sufficient. See attached. Please provided further justification or AC powerline emissions testing as necessary. If the device can be powered from AC mains while using (i.e. some airplane controllers make use of AC adapters and an PC adapter for use in training programs), then AC line emissions become necessary as well Some controllers that can utilize a PC interface can be operated at the same time as powered.

Although the module is currently intended for use in Horizon Hobby controllers that would not have a provision for being powered from an external AC-DC adapter, your suggestions have been noted and a test for AC conducted emissions has been performed. During that test we did spot check the emissions at the fundamental frequency and the harmonics and saw no increase in these emissions from the module.

9) FYI….Generally the FCC strongly prefers for the FCC ID to be visible to the user upon purchase and after installation (when possible). Modular approvals are somewhat unique in the respect that they do get integrated and it is hard to meet this requirement per se. However generally we see that these types of devices would place the labels on the shield of the device. By placing on the bottom side of the board, anyone opening the device (for any reason, including compliance issues) may not have access to the label, especially if the board is soldered in by the integrator instead of placed on a removable mount. We highly suggest that labeling be done on the shield on the other side of the board instead of underneath.

Your comment is noted. This device will only be installed by Horizon Hobby (see [4] above) into their own controllers and the outside of the host enclosure will contain the FCC ID for the module.

10) The user manual tends to suggest issues that need to be in the manual for the integrator. However it is not clear that this information also applies for the device as is (i.e. no modifications, etc.). It is recommended that the manual be clarified to show this.

The installation guide has been modified to add a specific statement to the integrator regarding modifications.

11) Instructions to the integrator appear to suggest use of the FCC Logo (DoC Authorization). However it is uncertain how this can be instructed to the integrator since it is uncertain how the device will be used (applicant doesn't control use by integrator, and integrator should only label DoC when applicable).

These have been removed

12) Please re-verify the equipment list in the report. It appears a few instruments may have not been listed.

The spectrum analyzer system (HP84125C) includes antennas and amplifiers and filters to test to 40GHz. The test equipment list has been updated to include the individual parts of the test system. The equipment used for the re-test for PSD and AC conducted emissions have also been added.

13) Page 36 of the report - please review the types of detectors and readings obtains for spurious emissions. AVG readings appear higher than Peak limits. Also AVG readings use Peak limits and Peak readings use AVG limits. Please review. Additionally note that some AVG readings appear over the true AVG limits.

The data has been revised and the detectors and limits corrected. All signals are compliant.

14) Page 37 of the report. Please review the limits and margins. It appears incorrect limits are cited and that most actually do fall in restricted bands.

The data has been revised and the detectors and limits corrected. All signals are compliant.

15) Please comment on the high spur seen at 30 MHz on page 40.

The spur is, in fact, the artifact of "0Hz", this occurs on some plots but not on all. As this was 20dB below the fundamental the engineer did not re-take the measurement.

16) PSD do not appear to be taken using a > 3 kHz as specified by the published procedures. Additionally results are very close to the limits. Please review.

The PSD has been re-measured use the correct analyzer settings.

17) FYI….Depending on the responses regarding RF exposure, further detail review may still be necessary once a response is received.

Understood.

18) For IC the 99% bandwidth does not appear to be reported. Generally this requires a > 1% RBW, VBW at >3*RBW, and no video averaging.

This has been measured in accordance with RSS-GEN and the results included in the revised test data. A sample plot has also been provided.

19) The IC label is missing the dash ("-") between the CN and UPN codes. Please correct.

Corrected.

20) IC labeling also requires manufacturer and model as approved according to RSS-GEN 5.2 and as listed on the IC form. This information does not appear on the label.

Although RSS-GEN 5.2 permits this information to be in the manual where the device is small, with the removal of the FCC logo from the label there is space and it has been added.

21) RX emissions do not appear in test report. Please review.

Apologies for the omission. The data has been included in the revised report.

The following documents have been uploaded to support this response:

- Antenna specifciation RF-DAMA0.pdf
- R61491 Revised.pdf
- X1TXM Label drawing no logo.pdf
- X1TXM User Guide rev 2.doc

Regards

Mark Briggs