



## American Telecommunications Certification Body Inc.

6731 Whittier Ave, McLean, VA 22101

May 26, 2003

RE: Zebra Technologies

FCC ID: I28MD-BTC2TY

I have a few comments on the above referenced Application.

- 1) The top view of the Bluetooth board without the shield shown in the internal photographs is too dark. Please provide a better photograph. Additionally, please provide clear top and bottom views of the Bluetooth module itself (with and without shield as applicable).
- 2) The theory of operation mentions that the Bluetooth module is a class 2 Bluetooth device with a 0 dBm output. Note that a typical Class 2 Bluetooth are typically considered to have a +4 dBm output. Please explain.
- 3) RF exposure takes into consideration both conducted and EIRP power. Therefore, please update the RF exposure information to include the worse case power (EIRP) by including the highest antenna gain as well.
- 4) Please provide a close up photograph of a typical tested configuration showing the standalone portion as tested. Note that from the photos provided, it can not be determined if the device and antenna were both tested as a stand alone, if one portion such as the antenna was contained within an actual device, or if the end use device was fully configured or only the "shell" of a device was present to hold the antenna, etc. Information regarding the internal construction of the end use device and any justification vs. stand-alone testing should also be provided.

Note that loading conditions due to close proximity of components, shields, etc. from device to device can vary therefore affecting the spurious emissions results. In order to characterize a device and its antennas for a modular approval for use in a variety of devices, it is desirable to see its characteristics in a stand-alone condition. Normally both the device and its antennas should be tested as a standalone configuration. Given that this approval is specific to Zebra devices, we can accept an explanation regarding the positioning of the antennas for a Limited Modular Approval specific to Zebra devices if adequate information regarding the configuration tested and how it is relevant to all future configurations can be provided.

- 5) Information regarding conducted emissions was not provided. Can any device this is intended to be installed within work while powered from 120 VAC, or are these adapters only used to charge the device, etc? Additionally, will all such future devices only be battery powered as well and how can this be assured? Note that if conducted emissions results are not provided the grant notes will include the following or similar: "This device may only be used in battery powered devices which do not have any provision for operation while connected to the AC power lines".
- 6) The limits on page 42 do not appear to match the limits specified on that page. Please correct.
- 7) Spurious emissions are required to be tested for a typical low, middle, and high channel, but the results of harmonics appear to only be provided for the middle channel. Please explain.
- 8) FYI. 6 dB bandwidth tests are not necessary for this type of device.
- 9) FYI. Note that power spectral density tests are normally required for Bluetooth submissions. However, given that the maximum power of this device is less than the limit for spectral density, further information is not necessary for this particular application.

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The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information may result in application termination. Correspondence should be considered part of the permanent submission and may be viewed from the Internet after a Grant of Equipment Authorization is issued.

Please do not respond to this correspondence using the email reply button. In order for your response to be processed expeditiously, you must submit your documents through the AmericanTCB.com website. Also, please note that partial responses increase processing time and should not be submitted.

Any questions about the content of this correspondence should be directed to the sender.