

Para wise action for American TCB Comments

- 1) This device is considered as equipment type DTS, not DSS. Please correct the 731 form.
See revised form.
- 2) FCC has recently stated the Confidentiality Letter signer must be listed on the 731 form. Please adjust the technical or non-technical section as appropriate to include the contact who signed the confidentiality letter. Additionally, please note that 2 confidentiality letters were provided (short term and standard), but are signed by 2 different people. Please correct.

See revised form and confidentiality letter.

- 3) Section 15.15(b) prohibits adjustments of any control by the user that will cause operation of a device in violation of the regulations. Accordingly, any proposal to allow the end user to choose extended channels on frequencies outside of an allowable frequency band in the USA is not acceptable. For example, a WLAN device operating according to Section 15.247 on channels 1-11 between 2.4 - 2.483.5 GHz must not have any user controls or software to allow the device to operate on channels 12 and 13 which are outside of the allowed USA band. For instance, the user should not be able to select alternative countries which would allow different channel plans outside of the allowed USA band. Please explain how this device is compliant to this requirement.
- 4) Repeaters under Part 15 are only allowed if the signals are fully demodulated and repeater only regenerates valid signals from specific devices designed to operate with it. Please comment on how the device is compliant to this requirement given the following:
 - a) Note that review of the block diagram does not clearly show the device demodulates and checks for valid data prior to retransmitting. Please comment.
 - b) Note the operational description appears to show only 2 modulations are internally generated, while it is capable of repeating 5 types of modulations. This would suggest that the device is not always demodulating before re-transmitting. Additionally, information suggests device is only capable of internally generating 2 of the many possible transfer rates associated with 802.11 b/g. This suggests that the device does not always demodulate and then retransmit only valid transmissions.
 - c) Operational description appears to suggest power is a function of distance from the AP to this device. This also suggests that signals are not demodulated and then re-transmitted. The operational description does mention possible frequency translation, but again it does not appear to be demodulating.
 - d) Please note that these types of device have only been allowed under Part 15 if the device properly demodulates prior to retransmission. If this is not clearly the case, then it may be the case this will not be allowed under Part 15. Additionally, if this is not straight forward in theory, then we must consult with the FCC prior to issuing any Certification on this device. Please note that TCB's can only follow clear cut rules, regulations, interpretations, and other information provided from the FCC and are not authorized to interpret the rules.
- 5) A cover letter with the application cites the device is a Multi Frequency Repeater, but it is unclear if it only repeats one channel at the same time. If device is capable of multi-frequency simultaneous transmission, then intermodulation testing using multi-carriers would also be necessary. Please comment as necessary.

See updated operational description. The unit can only repeat one channel at a time.

The unit is shipped with region specific software. It will not be possible for the user to force operation on any channel outside of 1-11. As an example, for units shipped in the USA the affiliation process will only check channels 1-11 for a valid AP signal. Also, the unit will not repeat until it can find a valid AP signal.

- 6) Please explain the purpose of the DoC labeling. This device does not appear to directly connect to a PC device meeting with the 15.3 definitions and therefore does not appear to require a DoC. At

first impression, this device would likely require a 15V verification. Please justify the use of the DoC or correct the labeling. Additionally, should a DoC be found to be necessary, the manual does not appear to have the information required by 2.1077 on a single page as desired by the FCC. Please review.

Label has been updated.

- 7) FYI.....DoC labeling no longer requires the use of "For Home or Office Use" or "Tested to Comply with FCC Standards".

Label has been updated.

- 8) External and Test Configuration Photos of the device show that the cover is metal (shielded), however the manual appears to show a translucent cover. Given the user is expected to see the board for various setup LED's, please explain how this will occur. Changing of this fact is expected to affect the devices emissions. Please review/explain as necessary.

The previous manual was more geared toward engineering evaluation. This one reflects the use by a consumer. The user's manual has been updated with the shielded cover. The setup LEDs are only for debugging/engineering purposes. The user isn't intended to see the LED's. Upon shipping the unit, with the new metal lid and the updated (and appropriate) user's manual, the end user will not even be aware that the LED's exist. They will only use the simple GUI to interact with the unit.

- 9) 15.247 devices are required to provide a separate RF exposure exhibit with the application. Additionally, please note that the calculated RF exposure information in the report appears to use W/m² limits, but the results appears to be in mW/cm². Please review/correct/provide as necessary. Additionally, please note that the FCC only considers 20 cm and greater for purposes of MPE calculations.

Please see the updated RF exposure exhibit

- 10) The users manual is required to contain RF exposure information. Typically this type of device would contain the following or similar:

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Please update the manual.

User's manual has been updated.

- 11) Please note that AC powerline emissions are required for the digital device (idle/RX modes of operation) under 15.107 and also under TX conditions under 15.207. The test report implies testing may have only been done for idle/RX modes of operation. Please review/correct/provide as necessary.

The EUT was tested in both idle/RX and TX modes. The unit was operated in a typical network operating environment. Packets were on the air for typical network loading. Between packets the EUT was in idle/RX mode. During a packet the signal was being processed and transmitted. The data is included in the FCC 15.247 Report.

- 12) Various aspects of the application cite ANSI C63.4 – 1992. This is no longer considered valid. The current version should be ANSI C63.4 – 2003. There are some differences between the two standards. Please review/correct as necessary.

The report has been updated.

- 13) Page 19 of the test report shows the bandedge testing. However field strength of the fundamental is only shown for one modulation. Were all modulations checked and only highest reported? Note that CCK field strength is typically higher than OFDM. Please review/clarify and correct if necessary.
- 14) Typically, a comparison of power and bandwidth is provided for repeaters comparing the input to the output across various modulations. Please provide.

The report has been updated. See operational description for comparison of power and bandwidth.

- 15) Information provided in the operational description suggests power is a function of distance from the AP to this device. This being the case, please justify the use of maximum input drive signals and how the device performs power leveling. How does the output signal vary as a function of the input signal?

The operational description has been updated

The received power at the input of the unit does depend on distance. The further away the AP or NIC is from the Xtender™ the lower the input or received power. The output power does not vary (with the exception of a small error term) as a function of input power. The “Theory of Operation” describes the automatic-gain control (AGC) scheme. A reference voltage is sent to an operational amplifier. This voltage is calibrated to correspond to an output power. The received signal is converted to a voltage via a logarithmic amplifier. The difference between the reference and measured voltages set the gain of the variable gain amplifier (VGA) on a packet by packet basis. This gain results in a constant output power of +10 dBm at the output of the transmit chain

- 16) FYI...Please note that additionally, DoC reports are not required to be submitted unless requested. Therefore please note that this test report was not reviewed.

Verification report not submitted.