

American TCB

October 28, 2005

RE: FCC ID: SK6XS35004 _ATCB002850

Attention: Tim Johnson

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

1. *The 731 forms provide were incomplete. The information regarding equipment type (DTS, NII), FCC rule parts, and equipment specifications was not completed. Please complete.*

The 731 forms have been completed and new forms uploaded

2. *The block diagram should show the frequencies of all oscillators in the TX portion of the device (CFR 2.1033(a)(5)), unless this portion of the device is an OEM part from a different manufacturer. Please provide either the block diagram for the TX portion, or alternatively provide a parts list that shows that this part is provided by another manufacturer. Please update the list of confidential exhibits if necessary.*

An additional block diagram showing the radio board alone has been uploaded. Note that the radio circuitry is provided via an Agere chipset with a 40 MHz external source. All other clocks are internally generated.

3. *Please provide information to show placement of labeling on the device.*

A label location document has been uploaded.

4. *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. Please explain how this device is compliant to this requirement for both DTS and UNII bands of operation.*

Products shipped in the US are designed to only use channels 1 – 11 in the 2400 MHz band and the UNII channels are limited to channels 36 – 64 and channels 149 – 165. A manufacturer attestation to this will be uploaded.

5. *The device used automatic channel selection. How does this ensure compliance to 15.15.*

All UNII devices use automatic channel selection of some description to optimize channel selection. Manual over-ride of channels is permitted. In all cases the firmware limits the output power and frequencies. Refer also back to #4.

6. *Page 91 (and several others) of the manual suggests changing to any channel. How is compliance with aggregate power requirements ensured. For instance this device incorporates power level adjustments for when multiple channels occur in the 5150-5250 MHz band. Please explain how this occurs. If this requires manual adjustment of power levels, then compliance with 15.15 is not maintained.*

The device firmware will limit the device to operate on non-overlapping channels. Further, the end user cannot adjust power above the maximum that is limited by the firmware. As there are only 3 non-overlapping channels the MPE calculation has been corrected to account for the true worst-case: 3 TRx in the 2.4 GHz band and 1 TRx at 5320 MHz.

7. *The manual (page 49) mentions 4 internal antennas + 1 omni directional internal antenna. Where is the internal omni located and was this tested as well.*

The 1 omni antenna is located on one of the four boards and is a receive-only antenna, therefore no tests performed on this antenna.

8. *Page 9 of the test report suggest that the band-edge at 2462 MHz for 802.11b mode was not tested with maximum output power. Please review.*

The power setting at 2462 MHz in b mode for the band edge measurement was setting 15 (peak power = 17.7dBm). This is the maximum power on that channel. Page 9 of the report has been corrected to remove the incorrect reference to a maximum power setting of 17 for this channel.

9. *Page 9 also suggests that the device may not be at full power for testing of the 2412 802.11g mode. Please review.*

The power setting at 2412 MHz in g mode for the band edge measurement was setting 16 (average power = 17.1dBm). This is the maximum power on that channel.

10. *Where the various ports (serial, Ethernet, Gigabit) investigated to ensure worst case was used for testing.*

There is only one interface port that is intended for use during normal operation, and that is the Gigabit Ethernet interface port. The serial (console) port is only needed to be used for configuration purposes and would not typically be permanently connected. The gigE port was connected during testing.

11. *Power spectral density does not appear to utilize a VBW > RBW as specified by FCC procedures for 802.11b and the 5745-5825 MHz DTS band. Please review.*

In 802.11b mode, the highest PSD per 3kHz is a narrowband spike. The tests have been repeated with the correct settings to obtain the correct result.

In 802.11a mode (5725 – 5850MHz), the highest PSD per 3kHz is well below the 8dBm/3kHz limit. Increasing the VBW from 3 kHz to 10kHz would not significantly affect the measured value. It is requested that the measurement data be accepted as is.

12. *Please explain why 25 cm is cited in the manual while the device complies at 20 cm.*

The manual covers three different units, two of which have already been approved and the 25cm warning within the manual was included in the application packages for those two devices.

13. *Indoor usage requirements in the manual suggest the incorrect frequency band. Please review.*

Page 4 of 273, this should be 5150 – 5250 MHz under indoor use.

14. *Please explain compliance to 15.407(c) & (g). Note that for frequency stability, IC requires +/- 10 ppm or testing per RSS-GEN 7.2.4.*

The operational description details better than 5ppm, based on the reference crystal used for the radio.

15. *The -27 dBm limit on pages 88 – 89 was not adjusted for worse case antenna. Note this limit is EIRP.*

The gain of the antennas used outside of the allocated bands is not known, so the limit of -27dBm is left at -27dBm and assumes 0dBi antenna gain. All signals are significantly below this limit or were measured during the radiated emissions tests to demonstrate compliance with the -27dBm limit. A note has been added to the test data to explain this.

16. *The sections starting on page 90 (test report) and also on page 94 both say internal antennas. Was one of these for the external antenna?*

Page 94 is actually for EXTERNAL Antennas. It has been corrected in the test log.

17. *Page 95 (test report), what is Note 2 referenced in the bottom table.*

Refer to Page 96 for the rest of the table and the notes

18. *Because of the power reduction for the external antenna at 5320 MHz, has consideration been given to the proper power level necessary for 5300 since the second harmonic will fall in a restricted band and 5320 was already marginal. It is likely that 5300 will also need to have a lower power level. Please evaluate.*

The device has been re-tested for the signal level of the second harmonic at a power setting of 19 on channel 5320 MHz (channel 64). In the re-test the sample passed at this frequency. Between the original tests for the spurious emissions from the internal and external antennas the device was opened to gain access to the internal antenna connections. We believe that the high level of the 2nd harmonic of #64 was due to the incorrect seating of the internal shields and that the 2nd harmonic was radiating from the enclosure and not the external antenna.

The re-test demonstrated compliance at 2nd and 3rd harmonics of 5320 MHz at the power level of 17dBm. However, the output power at 5320 MHz is limited to 14.8dBm to meet restricted band emissions limits at 5350 MHz. The test data has been updated to reflect these new measurements.

19. *Evaluation on page 107 for external antenna appears to incorrectly use dBi instead of dBd.*

The correct gains have been entered into the test data sheets.

20. *The IC form provide was incomplete. The information on the second page should be filled out Please complete.*

The IC form has been completed and uploaded

21. *Please note that the device is compliant to RSS-210 Issue 6 for DTS and Issue 5 for LAN devices.*

Noted - the IC form has been completed to reflect this.

22. *Antenna information in the manual appears limited to certain bands. However RSS-GEN 7.1.4 and 7.1.5 require informing the user for any detachable antenna. Please review and correct.*

Page 4 of 273 of the user manual has been updated and should read as follows:

Currently, the maximum antenna gain for external antennas is limited to 5.2dBi for operation in the 2400 – 2483.5 MHz, 5250MHz to 5350MHz and 5725MHz to 5825MHz bands. The antenna gains must not exceed maximum EIRP limits set by the FCC / Industry Canada.

23. *Please show sample calculations for the RSS PSD limit given on page 75 and 79. Additionally, my understanding of the avg PSD requirement is that you compare the measured peak PSD to the calculated average PSD (from power and bandwidth measured) and ensure < 3 dB delta exists. If peak is > 3 dB over average, then reduction is necessary. Please review.*

The limit is calculated as follows: The maximum psd is compared to the calculated average limit. The average limit is calculated from the maximum permitted power in the band (50mW for the 5150 – 5250 MHz band and 250mW for the 5250 – 5350 MHz band) divided by the measured 99% bandwidth (17MHz).

The test data had an error in the formula and this has been corrected.

The following documents have been uploaded to support this response:

- xirrus_array_userguide1.pdf
- ATCB Form 731-15247 revised.doc
- ATCB Form 731-UNII revised.doc
- ATCB-Appendix I and II revised.doc
- Attestation regarding channel and power.pdf
- Block Diagram of the individual radio boards.doc
- Label location.doc
- MPE Calculation revised.pdf
- R60963 revision 1.pdf

Regards,



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