Elliott Laboratories Inc. 684 West Maude Avenue 408-245-7800 Phone
www.elliottlabs.com Sunnyvale, CA 94086-3518 408-245-3499 Fax

In response to our comments raised on December 13, 2001 for the Savi Technology FCC ID: KL7-612R-V1, please see our replies below:

After a review of the submitted information, I have a few comments on the above referenced Application.
1) The block diagram should show the frequency of all oscillators in the device (CFR2.1033(a)(5)).

A revised block diagram with a table indicating the frequency of oscillators contained in each block has been uploaded.

2) Photographs may not be held confidential based only upon on the basis of trade secrets. Please remove the request for photographs from the letter of confidentiality or provide a better justification.

The request for confidentiality has been revised to remove photographs from its scope. The updated request has been uploaded.

3) The theory of operation provided information with respect to meeting the requirements of 15.231(a) & 15.231(e). In specific please address the following concerns:
a) The information is somewhat ambiguous (i.e. what is the timing between elements, of the collection mode, etc.) Please provide a timing diagram showing worse case timing elements and possible variants that occur between reader and tag as mentioned in the Theory of Operation.

The Reader is based on Savi's existing Reader (KL7-410R-V1. (The only difference between the 600 series reader and the existing 410 series is that the 410 series had an additional digital interface board(providing a LONWorks interface). All other characteristics (RF circuit board, antennas, power supply, digital control board and enclosure) are the same. I have uploaded the Theory of Operations submitted to the FCC for the KL7-410R-V1 that was submitted to the FCC.

b) The Theory of Operation categorizes all of the collection mode signals under 15.231(a), and only the data under 15.231(e). However the test report separates only the "wake up" signal. Please provide a better explanation of which signals are categorized under 15.231(a) and which ones under 15.231(e). Also explain why each type of signal is categorized as which.

All transmissions in the collection cycle are control signals since they control the tags (Wake-up, hello, sleep and find), causing the tags to either power-up, transmit their code or go back to sleep mode.

Data signals may be used to send data to certain tags, as detailed in the Theory of Operations.

The "Hello", "Sleep" and "Find" control signals and the data signals are identical in the sense that they use the same output power and do not exceed a duty cycle of 30mS in a 100mS period. This duty cycle allows for a duty cycle correction factor of 10dB to be applied to the peak output level to calculate the average output level.

The Wake-Up signal, because it is a continuous signal for 5 seconds (and, therefore, has no duty cycle correction factor), uses a lower peak output power.

By measuring the data/control signals against the radiated emissions limits of 15.231(e) it is demonstrated that the control signals meet the field strength limits of 15.231(a) and the data signals the limits of 15.231(e). The Wake-Up signal, with its lower peak output power, was measured and compared to the 15.231(a) limit

c) The duty cycle in the report was listed as 33% for all types of signals, while the theory of operation states 30% and 12%. Please explain.

At the time of testing, the worst-case anticipated duty cycle for the acknowledge signal was 33%. Once the firmware was reviewed it was realized that a maximum of 30% would be required for this signal. The hello, sleep and find signals all have a duty cycle of 10% and the data signals have a duty cycle of 12%.

d) Please explain what is meant by the Data transmission mode where "the duty cycle of data pulses is limited by firmware control to maximum 12 ms every 100 ms.

Data transmissions, as explained in the Theory of Operations, are used to send data to the Tags. These transmissions are very rare. When data signals are sent, they last no more than 1 second. Within that one-second period they have a duty cycle of 12% (when measured over any 100mS interval).

4) Please explain the purpose of 2 identical transmitters in the unit. The theory of operation does not bring up this issue. Are they ever expected to transmit at the same time? If so, how does this affect the measurements made?

Each transmitter powers an orthogonal antennal to provide 360-degree coverage. Only one transmitter is operated at any time. The 5-second wake-up signal is actually two transmissions – 2.5 seconds from one transmitter immediately followed by a 2.5 second transmission from the other. For all other types of transmissions, the signal is transmitted from one transmitter and then repeated, 100mS later, from the second transmitter to give an omni-directional coverage.

5) FYI, Page 8 of 16 states that the EUT was received on October 4, 2001 and tested on September 6, 2001.

The EUT was received on September 4, 2001, this is a typographical error.

6) It appears that the data/control signals measured were higher than the wakeup signal. Was this expected since the reports states that the wakeup signals was to meet 15.231(a), while the data/control was to meet 15.231(e)?

As detailed under 2(b) the peak value of the Wake-UP signal is lower than the control/data signals because there is no average correction factor that can be applied, while the average correction factor for the control/data signals is 10dB.

7) FYI, the information requested in item 3) & 4) will need to be provided before a final the review of the test report can be completed.

Noted

If you have further questions, please do not hesitate to contact me via doc@elliottlabs.com.

Regards

Mark Briggs