Re: FCC ID F9C26-0288
Applicant: Schlumberger Sema Inc
Correspondence Reference Number: 23044
731 Confirmation Number: EA727109

RF safety issues

1. OET65: In some cases, the time averaging aspects of the exposure limits may be used by placing appropriate restrictions on occupancy in high field areas. However, such restrictions are often not possible where continuous exposure of the public may occur. In general, time averaging of exposures is usually more practical in controlled situations where occupational exposure is the only issue.
If a maximum operating duty factor is clearly defined and specified for the operation of a device, and specific instructions have been given to users allowing them to comply with the exposure limits, this maximum duty factor may be included in the time averaging for demonstrating compliance with respect to MPE or SAR limits for controlled exposure environment.
The maximum operating duty factor should ensure that it is unlikely for users to exceed RF exposure limits for normal operation of the device. Users should be instructed and/or warned to avoid operating conditions that may have the potential of exceeding MPE or SAR limits.

The maximum operating duty factor does not apply to compliance with respect to MPE or SAR limits for General Population/Uncontrolled exposures where nearby persons typically do not have knowledge or control of their RF exposure conditions. Except for source based time averaging, devices operating in uncontrolled exposure environment should be evaluated for continuous exposure for mobile and portable transmitters.
Time averaging does not apply in MPE estimation.

Response: Duty cycle removed from formula. MPE now reflects worst-case RF exposure levels.

2. MPE exhibit 2nd column refers to average power. Part 15 uses peak power. Please revise.

Response: MPE revised to reflect Peak Power.

EMC issues

1) Per the Public Notice on modules, Professional installation cannot be used to satisfy 15.203 for modules. Either use unique connectors (state the type), on all connections or make each permanent with industrial strength epoxy or permanent loctite.

Response: Please refer to the uploaded document label "Unique Antenna Statement". This will explain the mounting mechanism.

2) The device was tested at 5 pulses/second. What is the pulse width? Verify the pulse repetition factor.

Response: This sentence is not accurate. It should read "The device was tested at 5 packets/second. Pulse Width= 22.5 mS with OOK modulation, 11 mS with CCSK modulation.

PRF = 0.2 (22.5 ms on time + 177.5 ms off time = 200 ms) OOK at 5 packets/second

PRF = 0.2 (11 ms on time + 189 ms off time = 200 ms) CCSK at 5 packets/second

3) Processing gain must be shown for each modulation type. For each modulation, provide the data and show the calculations. The BER or Bit error rate of 2.7 X 10^3 seems to high for a data system.

Response: this should be a minus 3 (-3), not a ^3, please see below)

Please provide a confirmation from the manufacturer that this is the true design specification.

Response: The following is taken from our BLT 3 functional specification document:

2.1.3 Sensitivity
Receive a CCSK signal level of -114 dBm measured at the antenna port with a symbol error rate of 2.7x10E-3.
Receive an OOK signal level of -108 dBm measured at the antenna port with a bit error rate of 10E-3.

4) For each modulation type, provide the theoretical processing gain. Indicate the spread rate/data rate. Indicate the chip/bit rate.

Response : The theoretical calculation for the processing gain is as follows:

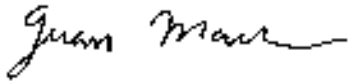**data symbol rate = 19.266 kbaud**

Spreading code clock rate = 1.22 MHz

Processing gain = 10 * log(1.22E6 / 19.266E3) = 18.01dB

This calculation is absolutely the same for both OOK and CCSK.

Hopefully this answers all of your questions. Please contact me via doc@elliottlabs.com if you require more information.

Regards,

Juan Martinez
Sr. EMC Engineer