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Andrew Leimer  
FCC Equipment Authorization Branch

RE:   Applicant: Wisair  
      FCC I D: RN2DV9100A  
      731 Confirmation: EA658120

Subject: Antenna gain factor

For measurements of the radiated emissions at 1-meter as shown in the test report, we used the following procedure with respect to the limit line and antenna factor.

All limit lines were converted from the 3-meter distance to the 1-meter distance using FCC 47 CFR section 15.31 guidelines:

**UWB Specific Radiated emissions limits greater than 960 MHz.** The general emissions limits applicable to UWB communications systems are derived from subpart F, sections §15.517 for Indoor UWB Communications Systems. Refer to the Table below for emissions limits above 960 MHz.

Frequency (MHz)	Emissions Limit (dBm/MHz)	
	Indoor @ 3m	Indoor @ 1m
960-1610	-75.3	-65.7
1610-1990	-53.3	-43.7
1990-3100	-51.3	-41.7
3100- 10,600	-41.3	-31.7
> 10,600	-51.3	-41.7

Table: Emissions Limits Greater than 960 MHz Applicable to UWB Comm. Systems

An example of this can be seen in our figures on page 27, "UWB Radiated Emissions 960 MHz to 12 GHz Requirements". The labels beneath each graph show the details of the measurements.

All of the high frequency measurement antennas used to make these measurements are calibrated at 1-meter, 3-meter and 10-meter distances. For measurements taken at 1-meter the antenna factors calibrated at 1-meter were used.

In section 4.61 and 4.62 (pages 15 & 16) of the test report, sample calculations of field strength and EIRP are carried out. Here is a more detailed explanation of these calculations:

$$\text{EMI (dB}\mu\text{V/m)} = \text{SA (Spectrum Analyzer reading in dB}\mu\text{V)} + \text{CL (Cable Loss in dB)} + \text{AF (1m Antenna Factor in dB/m)} - \text{PG (Preamplifier Gain in dB)}$$

$$\text{EIRP(dBm/MHz)} = \text{EMI (dB}\mu\text{V/m)} - 95.2 \text{ (Electric Field to EIRP conversion in dB)}$$

In all measurements no distance conversion is needed on the measured data since the limit lines were translated to the 1-meter distance to match the measurement conditions.

Pat Carson  
pcarson@tdktca.com