Excellence in Compliance Testing

Certification Exhibit

FCC ID: VEYCN3200R1

FCC Rule Part: 15.247

ACS Project: 14-2096

Manufacturer: xG Technology, Inc.
Model: CN3200

RF Exposure

General Information:

Applicant: xG Technology, Inc.
ACS Project: 14-2096
Device Category: Fixed
Environment: General Population/Uncontrolled Exposure

Technical Information:

Antenna Type: Panel Antenna (4 RX x 2 TX)
Antenna Gain: 11.3 dBi
Maximum Transmitter Conducted Power: 24.23 dBm, 264.85 mW
Maximum System EIRP: 35.53 dBm, 3572.728 mW
Exposure Conditions: Greater than 25 centimeters

MPE Calculation

The Power Density (mW/cm^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = power density (in appropriate units, e.g. mW/cm2)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

The CN3200 uses a MIMO (4 RX x 2 TX) 11.3 dBi Panel Antenna. The directional gain of the array is calculated per FCC KDB Publication No. 662911 D01 Multiple Transmitter Output v02r01.

Directional Gain = G_{ANT} + Array Gain
*Array Gain = 10*log(N_{ANT}/N_{SS}) dB*

Where,
G_{ANT} = Antenna Gain
N_{ANT} = number of transmit antennas and
N_{SS} = number of spatial streams. (Assume N_{SS} = *1* unless you have specific information to the contrary.)

For the panel antenna configuration, the TX antennas are cross-polarized. Therefore, the directional gain is the individual gain of the antenna:

Directional Gain = 11.3 dBi

The MPE calculations for the CN3200 operating single-handedly using the directional gain are provided below:

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	**Radio Power (dBm)**	**Power Density Limit (mW/Cm2)**	**Radio Power (mW)**	**Antenna Gain (dBi)**	**Antenna Gain (mW eg.)**	**Distance (cm)**	**Power Density (mW/cm^2)**
900	24.23	0.60	264.85	11.3	13.490	25	0.455

Installation Guidelines

The installation manual should contain text similar to the following advising how to install the equipment to maintain compliance with the FCC RF exposure requirements:

Summation of Power Densities

The xG Technology CN3200 (FCC ID: VEYCN3200R1) host device also includes a WLAN CN3200W1 module (FCC ID: VEYCN3200W1). The WLAN uses a 15 dBi panel antenna and can transmit simultaneously with the 900 MHz radio within the CN3200. The MPE calculations for the WLAN radio are provided below.

Table 1: Wi-Fi model CN3200W1 MPE Calculations

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	**Radio Power (dBm)**	**Power Density Limit (mW/Cm2)**	**Radio Power (mW)**	**Antenna Gain (dBi)**	**Antenna Gain (mW eq.)**	**Distance (cm)**	**Power Density (mW/cm^2)**
2437	15.21	1.00	33.19	15	31.623	20	0.209
2437	15.21	1.00	33.19	15	31.623	25	0.134

Note:

The CN3200W1 stand-alone meets the RF exposure requirements at a distance of 20 cm with the 15 dBi antenna. When the CN3200W1 is installed inside of the CN3200 host device, a minimum separation distance of 25 cm is needed for the CN3200 system to meet the RF Exposure requirements.

The 900 MHz and 2.4 GHz radios can operate simultaneously. Therefore, the maximum RF exposure is determined by the summation of the MPE ratios. The limits is such that the total MPE ratio is less or equal to 1.0

The maximum MPE ratio is calculated as such, using the power densities values at 25 cm:

900 MHz xMax and 2.4 GHz WLAN Operating Simultaneously:
900 MHz xMax MPE Ratio + 2.4 GHz WLAN MPE Ratio
(0.455/0.6) + (0.134/1) =
(0.758 + 0.134) =
0.892 < 1

RF Exposure

In accordance with FCC requirements of human exposure to radio frequency fields, the radiating element shall be installed such that a minimum separation distance of 25 centimeters will be maintained.

Conclusion

This device complies with the MPE requirements by providing adequate separation between the device, any radiating structure and the general population.