



Excellence in Compliance Testing

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## **Certification Exhibit**

**FCC ID: VEYCN3200W1**

**FCC Rule Part: 15.247**

**ACS Project: 14-2097**

Manufacturer: xG Technology, Inc.  
Model: CN3200W1

## **RF Exposure**

**General Information:**

Applicant: xG Technology, Inc.  
 ACS Project: 14-2097  
 Device Category: Mobile/Fixed  
 Environment: General Population/Uncontrolled Exposure

**Technical Information:**

Antenna Type: Panel Antenna  
 Antenna Gain: 15 dBi  
 Maximum Transmitter Conducted Power: 15.21 dBm, 33.19 mW  
 Maximum System EIRP: 30.21 dBm, 1049.542 mW  
 Exposure Conditions: Greater than 20 centimeters

**MPE Calculation**

The Power Density (mW/cm<sup>2</sup>) is calculated as follows:

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

Where:

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

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)

MPE Calculator for Mobile Equipment							
Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm <sup>2</sup> )	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )
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.

**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 WLAN CN3200W1 module (FCC ID: VEYCN3200W1) is integrated inside the xG Technology CN3200 (FCC ID: VEYCN3200R1) host device. The CN3200 includes a 900 MHz xMax radio which 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.

$$\text{Directional Gain} = G_{\text{ANT}} + \text{Array Gain}$$

$$\text{Array Gain} = 10 \cdot \log(N_{\text{ANT}}/N_{\text{SS}}) \text{ dB}$$

Where,

$G_{\text{ANT}}$  = Antenna Gain

$N_{\text{ANT}}$  = number of transmit antennas and

$N_{\text{SS}}$  = number of spatial streams. (Assume  $N_{\text{SS}} = 1$  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:

**Table 1: xMax 900 MHz MPE Calculations**

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

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.