15.207 (a) POWER LINE CONDUCTED LIMITS

Requirements:

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Test Procedure:

ANSI STANDARD C63.4-2003 using a 50µH LISN. Both lines were observed with the EUT transmitting. The bandwidth of the spectrum analyzer was 9KHz QP with an appropriate sweep speed. The ambient temperature of the EUT was 24?C with a humidity of 60%.

The spectrum was scanned from 0.15 to 30MHz.

Test Data:

Base Unit

The highest emission read for PHASE was **25.19 dBµV@ 0.15 MHz**.
The highest emission read for NEUTRAL was **22.94 dBµV@ 0.15 MHz**.

Refer to Appendix 1 and 2 for the plots.

Test Results:

Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

15.205(c)/15.209 SPURIOUS RADIATED EMISSIONS IN RESTRICTED BANDS

Procedure

The test procedure used was ANSI STANDARD C63.4-2003 using an appropriate spectrum analyzer, as listed in the Test Equipment List. The bandwidth (RBW) of the spectrum analyzer was 100KHz/120KHz up to 1GHz with an appropriate sweep speed. The RBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the EUT was 24?C with a humidity of 60%.

Requirements:

Emissions that fall in the restricted bands (15.205) must be less than 54dBµV/m.

Test Data:

Refer to Exhibits A(3)-3 to -4

15.205(c)/15.209 **FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**

BASE UNIT

Frequency Band MHz	Meter Reading (Peak) @3m dBµV/M	Meter Reading (Average) @3m dBµV/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dBµV/M	Average F. S dBµV/M	Average FCC Limit dBµV/M	Margin dB
Channel 1								
2406.24	**81.00**	**—**	**Horn V**	**33.08**	**114.08**	**—**	—	—
4812.48	16.00	0.00	Horn H	38.28	54.28	38.28	54	-15.72
Channel 6								
2445.12	**80.00**	**—**	**Horn V**	**33.20**	**113.20**	**—**	—	—
4890.24	16.00	0.00	Horn H	38.47	54.47	38.47	54	-15.53
Channel 10								
2475.36	**80.00**	**—**	**Horn V**	**33.23**	**113.23**	**—**	—	—
4950.72	16.00	0.00	Horn H	38.83	54.83	38.83	54	-15.17

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
3. The peak measurement cannot exceed the average limit +20dB.

15.205(c)/15.209 **FIELD STRENGTH OF RADIATED EMISSIONS INCLUDING RESTRICTED BANDS**

HANDSET UNIT

Frequency Band MHz	Meter Reading (Peak) @3m dBµV/M	Meter Reading (Average) @3m dBµV/M	Antenna and Polarization	Cable & Antenna Factor	Peak F. S. dBµV/M	Average F. S dBµV/M	FCC Limit dBµV/M	Margin dB
Channel 1								
2406.24	**82.00**	**—**	**Horn H**	**33.16**	**115.16**	**—**	—	—
4812.48	20.00	0.00	Horn H	38.28	58.28	38.28	54	-15.72
9624.96	15.00	—	Horn H	46.90	61.90	—	95.16 (dbc)	-33.26
Channel 6								
2445.12	**82.00**	**—**	**Horn H**	**33.24**	**115.24**	**—**	—	—
4890.24	20.00	0.00	Horn H	38.47	58.47	38.47	54	-15.53
9780.48	15.00	—	Horn H	47.06	62.06	—	95.24 (dbc)	-33.18
Channel 10								
2475.36	**83.00**	**—**	**Horn H**	**33.28**	**116.28**	**—**	—	—
4950.72	20.00	0.00	Horn H	38.83	58.83	38.83	54	-15.17
9901.44	15.00	—	Horn H	47.14	62.14	—	96.28 (dbc)	-34.14

1. If the peak meets the average limit, nothing further is required.
2. If the peak exceeds the average limit, then an average measurement is required (may be calculated) and must be below the average limit and also:
3. The peak measurement cannot exceed the average limit +20dB.

15.247(a)(2) DIGITAL MODULATION SYSTEM

CHANNEL BANDWIDTH

Requirements:

The minimum 6 dB bandwidth shall be at least 500 kHz.

Measurement Procedure

1. Position the EUT without connection to the Spectrum Analyzer (SA). Turn on the EUT and connect it to the SA. Then set it to any one convenient frequency within its operating range. Set a reference level on the SA equal to the highest peak value.

2. Measure the frequency difference of two frequencies that were attenuated 6dB from the reference level. Record the frequency difference as the emission bandwidth.

3. Repeat above procedures until all frequencies measured were complete.

Measurement Data - Refer Appendix 3 to 8 for plotted data

Base	Channel 1:	Channel Bandwidth is **920 kHz**.
	Channel 6:	Channel Bandwidth is **982 kHz**.
	Channel 10:	Channel Bandwidth is **980 kHz**.
Handset Unit	Channel 1:	Channel Bandwidth is **980 kHz**.
	Channel 6:	Channel Bandwidth is **992 kHz**.
	Channel 10:	Channel Bandwidth is **900 kHz**.

15.247(b) (3) MAXIMUM PEAK OUTPUT POWER [EIRP]

Requirements:

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: **1 Watt**.

Measurement Data:

Base

Channel 1:	Output Peak Power is **0.077 W**.	**[EIRP]**
Channel 6:	Output Peak Power is **0.063 W**.	**[EIRP]**
Channel 10:	Output Peak Power is **0.063 W**.	**[EIRP]**

Handset Unit

Channel 1:	Output Peak Power is **0.098 W**.	**[EIRP]**
Channel 6:	Output Peak Power is **0.100 W**.	**[EIRP]**
Channel 10:	Output Peak Power is **0.127 W**.	**[EIRP]**

15.247(d) BANDWIDTH OF BAND EDGE MEASUREMENT

Requirements:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Measurement Procedure

1. Position the EUT without connection to Spectrum Analyzer (SA). Turn on the EUT and connect its antenna terminal to SA via a low loss cable and set it to any one measured frequency within its operating range and ensure that the SA is operated in its linear range.

2. Set RBW to 120 kHz and suitable frequency span 500 KHz or 1000 kHz; VBW = none.

3. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

4. Repeat the above procedures until all frequencies measured were complete.

5. Note: Measurements made with hopping and modulation.

Measurement Data - Refer Appendix 9 to 12 for plotted data

Base
Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than **50.93 dB**.
Channel 10: All emissions in this 100 kHz bandwidth are attenuated more than **49.99 dB**.

Handset Unit
Channel 1: All emissions in this 100 kHz bandwidth are attenuated more than **51.55 dB**.
Channel 10: All emissions in this 100 kHz bandwidth are attenuated more than **51.24 dB**.

15.247(e) POWER SPECTRAL DENSITY

Requirements:

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3KHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Measurement Data - Refer Appendix 13 to 18 for plotted data

Base

Channel 1:	Power Spectral Density is **3.75 dBm**.
Channel 6:	Power Spectral Density is **3.43 dBm**.
Channel 10:	Power Spectral Density is **2.81 dBm**.

Handset Unit

Channel 1:	Power Spectral Density is **5.31 dBm**.
Channel 6:	Power Spectral Density is **5.31 dBm**.
Channel 10:	Power Spectral Density is **5.62 dBm**.