4 - RADIATED EMISSION DATA

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (Average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is $\pm$4.0 dB.

4.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4 - 1992. The specification used was the FCC 15 Subpart C limits.

The Base of EUT was connected to a 110 VAC / 60 Hz power source.

The spacing between the peripherals was 10 centimeters.

The external Input / Output cables were draped over edge of the test table and bundle when necessary.

4.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33 (a) (1), the system was tested to 25GHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	25GHz
Sweep Speed	Auto
IF Bandwidth	1 MHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

4.4 Test Procedure

For the radiated emissions test, both the EUT and all support equipment power cords were connected to the AC floor outlet since the power supply (U090050D) used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT complianceis with all installation combinations. All data was recorded in the Peak detection mode. Quasi-Peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "**Qp**" in the data table.

4.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - Class B Limit

4.6 Summary of Test Results

According to the data in section 4.7, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207, and 15.249 after tested to 10^{th} harmonics as required by FCC and had the worst margin of:

For Handset:

-9.9 dBμV at **4944.43 MHz** in the **Horizontal** polarization at Low Frequency, **30 to 25GHz, 3 meters**

-7.8 dBμV at 4953.88 **MHz** in the **Vertical** polarization at High Frequency, **30 to 25GHz, 3 meters**

Handset Unit, Intentional Emission, 30 MHz to 25GHz, 3 meters

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Low Frequency											
82.12	48.7	/	0	1.2	V	9.5	1.2	25.0	34.4	40.0	-5.6
930.02	37.3	/	270	2.0	H	23.6	4.1	25.0	40.0	46.0	-6.0
66.78	48.1	/	30	1.2	V	9.3	1.2	25.0	33.6	40.0	-6.4
550.00	42.3	/	120	2.0	H	19.3	2.8	25.0	39.4	46.0	-6.6
4944.43	36.7	AVE	180	1.8	H	32.5	4.9	30.0	44.1	54.0	-9.9
111.90	45.2	/	90	2.0	H	11.3	1.5	25.0	33.0	43.5	-10.5
2472.22	77.8	AVE	330	1.5	V	28.1	3.4	30.0	79.3	94.0	-14.7
4944.43	30.2	AVE	30	1.8	V	32.5	4.9	30.0	37.6	54.0	-16.4
2472.22	72.7	AVE	270	1.5	H	28.1	3.4	30.0	74.1	94.0	-19.9
4944.43	45.5	PEAK	180	1.8	H	32.5	4.9	30.0	52.9	74.0	-21.1
4944.43	42.5	PEAK	30	1.8	V	32.5	4.9	30.0	49.9	74.0	-24.1
2472.22	82.0	PEAK	330	1.5	V	28.1	3.4	30.0	83.5	114.0	-30.6
2472.22	79.3	PEAK	270	1.5	H	28.1	3.4	30.0	80.8	114.0	-33.2
High Frequency											
70.02	48.2	/	30	1.2	V	9.2	1.2	25.0	33.6	40.0	-6.4
4953.88	38.8	AVE	270	1.2	V	32.5	4.9	30.0	46.2	54.0	-7.8
959.02	34.2	PEAK	300	2.0	H	23.3	4.3	25.0	36.8	46.0	-9.2
420.90	40.8	PEAK	270	2.5	H	16.5	2.7	25.0	35.0	46.0	-11.0
4953.88	34.8	AVE	270	2.0	H	32.5	4.9	30.0	42.2	54.0	-11.8
150.00	40.9	/	90	2.0	V	12.7	1.7	25.0	30.3	43.5	-13.2
257.08	40.6	/	90	1.2	V	13.3	2.2	25.0	31.1	46.0	-14.9
4953.88	47.3	PEAK	270	2.0	H	32.5	4.9	30.0	54.7	74.0	-19.3
4953.88	46.1	PEAK	270	1.2	V	32.5	4.9	30.0	53.5	74.0	-20.5
2476.94	71.2	AVE	120	1.0	H	28.1	3.4	30.0	72.6	94.0	-21.4
2476.94	64.8	AVE	90	1.5	V	28.1	3.4	30.0	66.3	94.0	-27.8
2476.94	74.0	PEAK	120	1.0	H	28.1	3.4	30.0	75.5	114.0	-38.6
2476.94	71.9	PEAK	90	1.5	V	28.1	3.4	30.0	73.4	114.0	-40.7

FUND: Fundamental

Handset Radiated Emission Front View

Handset Radiated Emission Rear View