FCC PART 15 CLASS B

EMI MEASUREMENT AND TEST REPORT

For

Shenzhen Highstar Electrical Co.,Ltd

Building 6, Highstar Industrial zone, Gangtou, Bantian Street,Longgang District,ShenZhen

FCC ID:2AAZRHSD7730BR

April 01, 2014

This Report Concerns: Original Report	Equipment Type: Remote weather station alarm
Test Engineer:	Lisa Chen
Report No.:	BSL14030426Y-1ER-3
Receive EUT Date/Test Date:	March. 21, 2014 / March. 21-31, 2014
Reviewed By:	Sky Zhang
Prepared By:	**BSL Testing Co.,LTD.** NO. 24, ZH Park, Nantou, Shenzhen, 518000 China Tel: 86- 755-26508703 Fax: 86- 755-26508703

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1. GENERAL INFORMATION

1.1. Report information

1.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that BSL approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that BSL in any way guarantees the later performance of the product/equipment.

1.1.2.The sample/s mentioned in this report is/are supplied by Applicant, BSL therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

1.1.3.Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through BSL, unless the applicant has authorized BSL in writing to do so.

Test Facility -
The test site used to collect the radiated data is located on the address of
BSL Testing Co.,LTD.
(FCC Registered Test Site Number: 191509) on
NO. 24, ZH Park, Nantou, Shenzhen, 518000 China
The Test Site is constructed and calibrated to meet the FCC requirements.

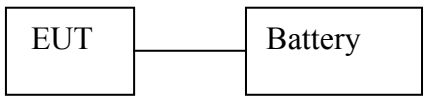
2. PRODUCT DESCRIPTION

2.1. EUT Description

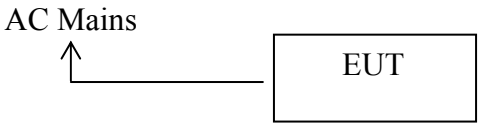
Applicant	:	Shenzhen Highstar Electrical Co.,Ltd
Address	:	Building 6, Highstar Industrial zone, Gangtou, Bantian Street, Longgang District, ShenZhen
Manufacturer	:	Shenzhen Highstar Electrical Co.,Ltd
Address	:	Building 6, Highstar Industrial zone, Gangtou, Bantian Street, Longgang District, ShenZhen
EUT Description	:	Remote weather station alarm
Trade Name	:	HIGHSTAR
Model Number	:	HSD7730B
Power Supply	:	DC 4.5V battery or DC 5V Powered by Adapter (The new battery is used during the measurement)
the RX frequency	:	433.878MHz
modulation type	:	ASK
the antenna type	:	Welding antenna

2.2. Block Diagram of EUT Configuration

Radiated emissions test



Conducted emissions Test



2.3. Figure 1 EUT Setup Support Equipment List

Name	Model No	S/N	Manufacturer	Used (Y/N)
Adapter	SW-050100A	--	--	*Y*

2.4. Test Conditions

Temperature: 23~27℃

Relative Humidity: 50~63 %

2.5. TEST Results SUmmary

Table 1 Test Results Summary

FCC Part 15B	
Test Items	Test Results
Conducted disturbance	Pass
Radiated disturbance	Pass

Remark: “N/A” means “Not applicable.”

3. TEST EQUIPMENT USED

EQUIPMENT/FACILITIES	MANUFACTURER	MODEL	SERIAL NO.	DATE OF CAL.	CAL. INTERVAL
3m Semi-Anechoic Chamber	Chengyu Electron	9 (L)*6 (W)* 6 (H)	BSL086	Aug. 23 2013	1 Year
EMI Test Receiver	Rohde & Schwarz	ESCI3	BSL001	Sep. 28 2013	1 Year
BiConiLog Antenna	Rohde & Schwarz	HL562	BSL009	Sep. 28 2013	1 Year
Double -ridged waveguide horn	Rohde & Schwarz	9120D	BSL008	Aug. 27 2013	1 Year
Horn Antenna	ETS-LINDGREN	3160	BSL072	Dec. 28 2012	1 Year
Cable	Rohde & Schwarz	N/A	BSL045	Aug. 27 2013	1 Year
Cable	Rohde & Schwarz	N/A	BSL046	Aug. 27 2013	1 Year
Cable	Rohde & Schwarz	N/A	BSL047	Aug. 27 2013	1 Year
Amplifier(100kHz-40GHz)	R&S	SMR40	BSL007	Sep. 28 2013	1 Year
Band filter	Amindeon	82346	BSL049	Aug. 27 2013	1 Year
Active Loop Antenna	EMTES	EM15	BSL011	Sep. 28 2013	1 Year
Power Meter	R&S	NRVS	BSL052	Aug. 3, 2013	1 Year
Power Sensor	R&S	NRV-Z33	BSL053	Aug. 3, 2013	1 Year
Shielding Room	Chengyu Electron	7.0(L)x3.0(W)x3.0(H)	BSL085	Aug. 25 2013	1 Year
EMI Test Receiver	R&S	ESPI13	BSL002	Sep. 28 2013	1 Year
10dB Pulse Limita	R&S	N/A	BSL003	Sep. 28 2013	1 Year
Coaxial Switch	YUANFANG	TA218B	BSL004	Aug. 27 2013	1 Year
LISN	Rohde & Schwarz	ESH3-Y5	BSL005	Sep. 28 2013	1 Year
Coaxial Cable	Rohde & Schwarz	N/A	BSL048	Aug. 27 2013	1 Year
Spectrum analyzer	Rohde & Schwarz	FSP40	BSL049	Sep. 28 2013	1 Year

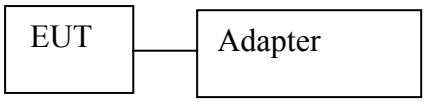
4. CONDUCTED EMISSION TEST

4.1. Measurement Uncertainty

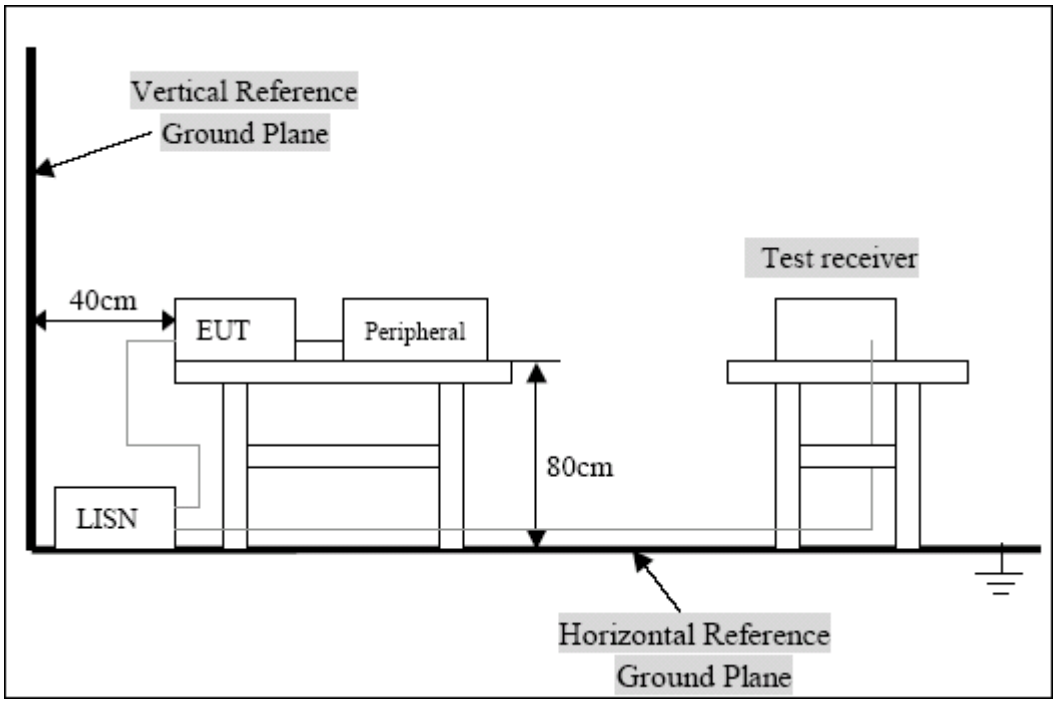
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is + 2.88 dB.

4.2. Block Diagram of Test Setup

4.2.1.Block Diagram of connection between the EUT and the simulators



4.2.2.Test Setup Diagram



4.3. Test Standard

FCC Part 15: 2013 CLASS B

ANSI C63.4 2003

4.4. Conducted Emission Limit(Class B)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.

4.5. EUT Configuration on Test

The following equipments are installed on conducted emission test to meet FCC Part 15 requirement and operating in a manner, which tends to maximize its emission characteristics in a normal application.

4.6. Operating Condition of EUT

4.6.1.Setup the EUT RX Mode. The new battery is used during the measurement.

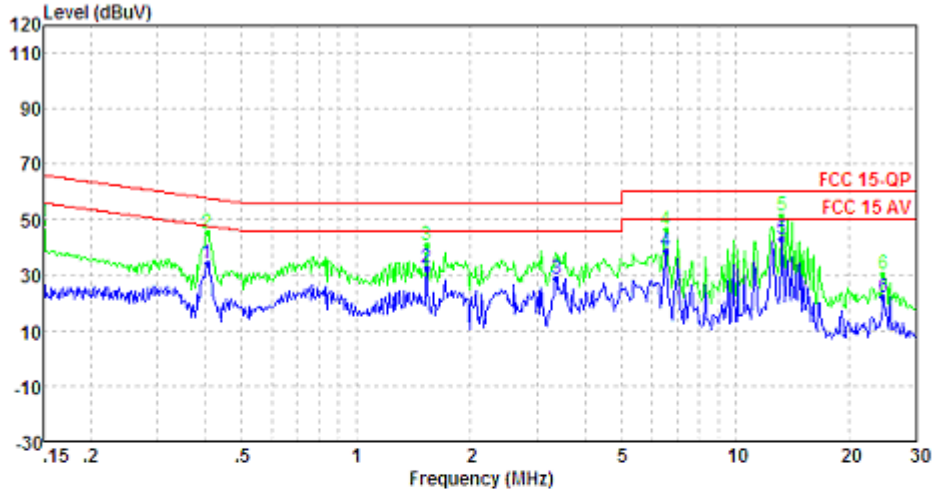
4.7. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver is used to test the emissions form both sides of AC line. The bandwidth of EMI test receiver is set at 9kHz.

4.8. Test Result

PASS

Link Mode

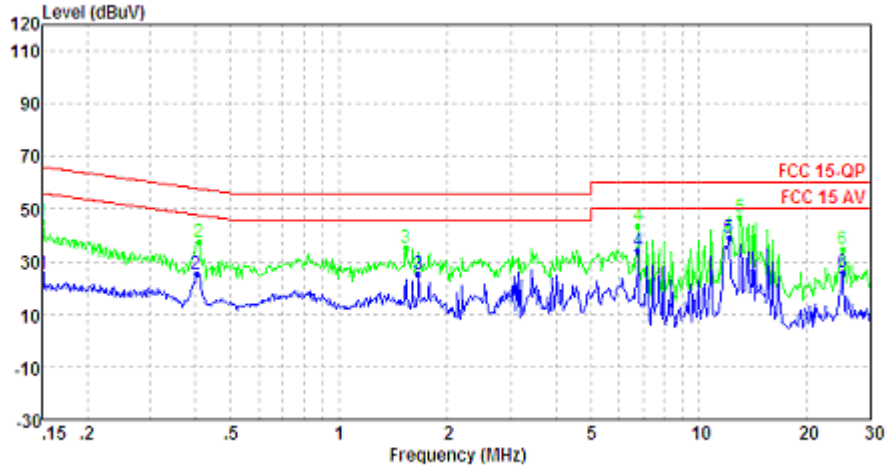


Condition:
: RBW:9.000KHz VBW:30.000KHz

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB		
1	0.41	33.98	47.73	-13.75	Average	LINE
2	1.54	32.32	46.00	-13.68	Average	LINE
3	3.36	28.90	46.00	-17.10	Average	LINE
4	6.56	38.61	50.00	-11.39	Average	LINE
5	13.27	43.00	50.00	-7.00	Average	LINE
6	24.53	22.07	50.00	-27.93	Average	LINE

Condition:
: RBW:9.000KHz VBW:30.000KHz

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB		
1	0.15	49.18	66.00	-16.82	QP	LINE
2	0.41	45.07	57.73	-12.66	QP	LINE
3	1.54	40.70	56.00	-15.30	QP	LINE
4	6.56	46.17	60.00	-13.83	QP	LINE
5	13.27	51.24	60.00	-8.76	QP	LINE
6	24.53	30.17	60.00	-29.83	QP	LINE



Condition:
: RBW:9.000KHz VBW:30.000KHz

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB		
1	0.15	25.49	56.00	-30.51	Average	NEUTRAL
2	0.40	25.33	47.81	-22.48	Average	NEUTRAL
3	1.66	25.23	46.00	-20.77	Average	NEUTRAL
4	6.77	34.45	50.00	-15.55	Average	NEUTRAL
5	12.12	39.38	50.00	-10.62	Average	NEUTRAL
6	25.05	26.08	50.00	-23.92	Average	NEUTRAL

Condition:
: RBW:9.000KHz VBW:30.000KHz

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB		
1	0.15	45.08	66.00	-20.92	QP	NEUTRAL
2	0.41	37.73	57.68	-19.95	QP	NEUTRAL
3	1.54	35.52	56.00	-20.48	QP	NEUTRAL
4	6.77	43.47	60.00	-16.53	QP	NEUTRAL
5	12.99	47.08	60.00	-12.92	QP	NEUTRAL
6	25.05	34.56	60.00	-25.44	QP	NEUTRAL

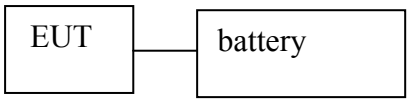
5. RADIATED EMISSION MEASUREMENT

5.1. Measurement Uncertainty

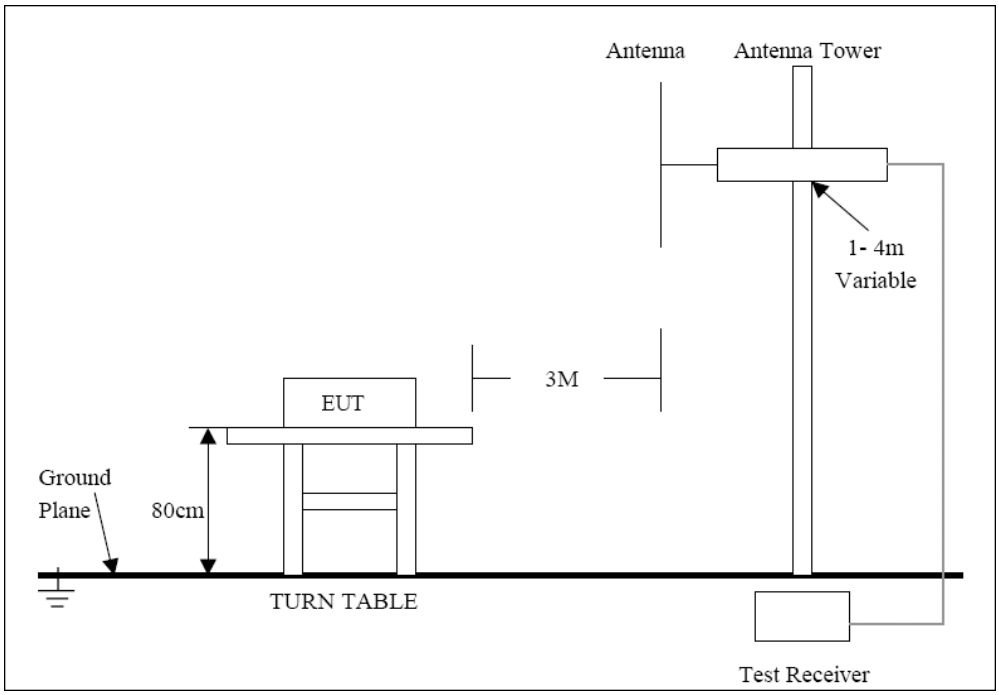
The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is + 5.10 dB.

5.2. Block Diagram of EUT Configuration

5.2.1.Block Diagram of connection between the EUT and the simulators



5.2.2.Semi-anechoic Chamber Test Setup Diagram



5.3. Test Standard

FCC Part 15: 2013 CLASS B
ANSI C63.4 2003

5.4. Radiated Emission Limit(Class B)

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dBμV/m)
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
Above 1000	3	54.0

Note**:**(1) The smaller limit shall apply at the edge between two frequency bands.
(2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT or system.

5.5. EUT Configuration on Test

The following equipment are installed on Radiated Emission Measurement to meet the Commission requirements and operating regulations in a manner which tends to maximize Its emission characteristics in normal application.

5.6. Operating Condition of EUT

5.6.1.Setup the EUT RX Mode. The new battery is used during the measurement.

5.7. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Calibrated Loop antenna is used as receiving antenna for frequencies below 30MHz, Calibrated Bilog antenna is used as receiving antenna for frequencies between 30 MHz and 1 GHz, Calibrated Horn antenna is used as receiving antenna for frequencies above 1000MHz. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to ANSI C63.4: 2003 on radiated emission measurement.
The bandwidth of test receiver is set at 9kHz in below 30MHz. and set at 120kHz in 30-1000MHz.
The final measurement in band 9-90kHz, 110-490kHz and above 1000MHz is performed with Peak detector and Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.

5.8. Test Result

PASS

Test mode:receiving

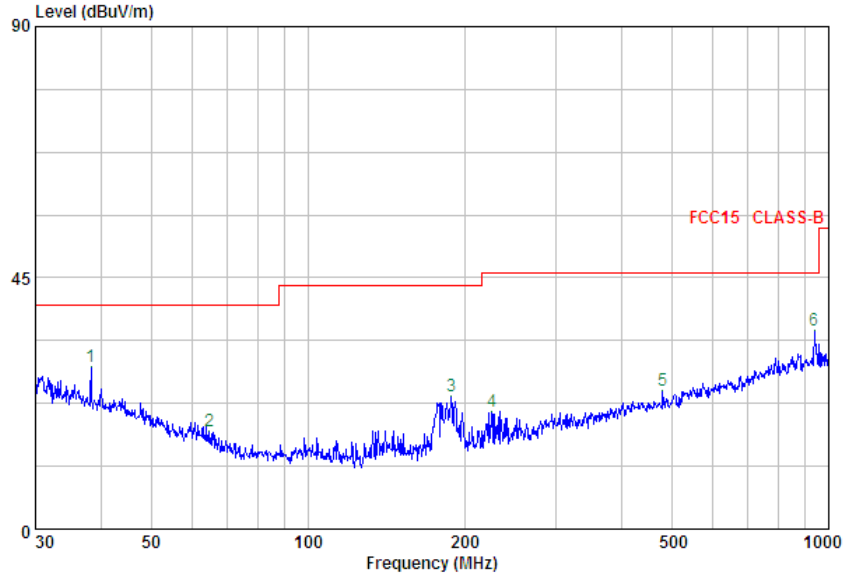
For below 9kHz-30MHz Spurious

Freq. (MHz)	Emission(dBuV/m) AV/PK	HORIZ/ VERT	Limits(dBuV/m) AV/PK	Margin (dB)
-	-	HORIZ	-	-
-	-	VERT	-	-

Note:

Emissions attenuated more than 20 dB below the permissible value are not reported.

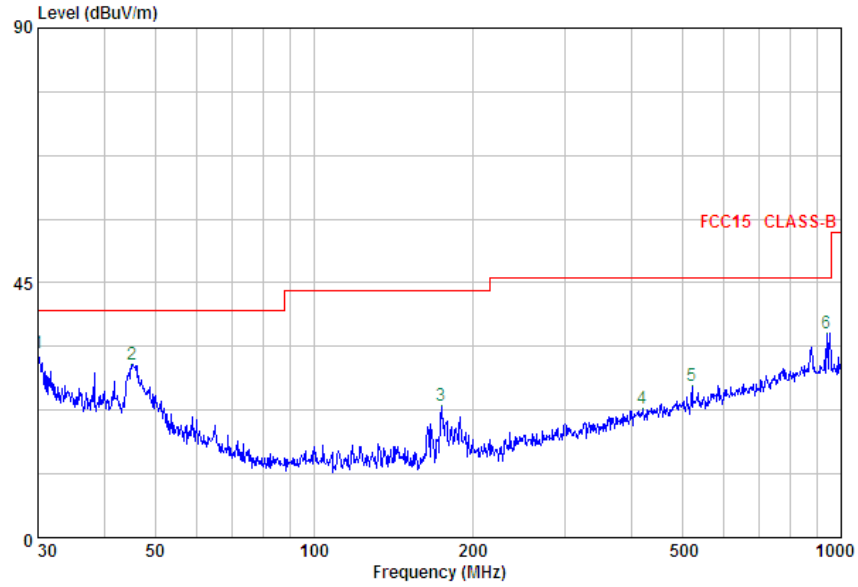
Horizontal



Site :
Condition : FCC15 CLASS-B 3m HORIZONTAL
: RBW:120.000KHz VBW:300.000KHz SWT:Auto

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1	38.35	29.16	40.00	-10.84	QP	HORIZONTAL
2	64.66	17.58	40.00	-22.42	QP	HORIZONTAL
3	188.41	23.75	43.50	-19.75	QP	HORIZONTAL
4	225.31	21.03	46.00	-24.97	QP	HORIZONTAL
5	480.53	24.91	46.00	-21.09	QP	HORIZONTAL
6 max	938.83	35.52	46.00	-10.48	QP	HORIZONTAL

Vertical



Site :
Condition : FCC15 CLASS-B 3m VERTICAL
: RBW:120.000KHz VBW:300.000KHz SWT:Auto

	Freq	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB		
1 max	30.00	32.55	40.00	-7.45	QP	VERTICAL
2	45.22	30.52	40.00	-9.48	QP	VERTICAL
3	174.42	23.24	43.50	-20.26	QP	VERTICAL
4	420.58	22.85	46.00	-23.15	QP	VERTICAL
5	520.89	26.79	46.00	-19.21	QP	VERTICAL
6	938.83	36.17	46.00	-9.83	QP	VERTICAL

Above 1GHz

Frequency (MHz)	Receiver		Turn table Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15.109	
	Reading (dBμV)	Detector (PK/QP/Ave.)		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1350	24.56	Ave.	166	2.47	V	9.19	33.75	54	20.25
2136	26.12	Ave.	100	2.32	V	1.88	28.00	54	26
2759	28.56	Ave.	23	3.14	V	3.8	32.36	54	21.64
3963	27.33	Ave.	27	3.38	V	10.46	37.79	54	16.21
4676	25.47	Ave.	123	3.45	V	15.87	41.34	54	12.66
5358	26.82	Ave.	13	3.57	V	17.24	44.06	54	9.94
1350	42.26	PK	166	2.47	V	9.19	51.45	74	22.55
2136	41.32	PK	23	2.32	V	1.88	43.20	74	30.8
2759	45.30	PK	100	3.4	V	3.8	49.10	74	24.9
3963	44.36	PK	27	3.38	V	10.46	54.82	74	19.18
4676	42.93	PK	123	3.45	V	15.87	58.80	74	15.2
5358	42.83	PK	13	3.57	V	17.24	60.07	74	13.93
1350	26.81	Ave.	166	2.49	H	9.21	36.02	54	17.98
2136	28.42	Ave.	100	2.76	H	2.49	30.91	54	23.09
2759	28.69	Ave.	23	3.24	H	6.25	34.94	54	19.06
3963	27.43	Ave.	27	3.69	H	11.58	39.01	54	14.99
4676	28.63	Ave.	123	3.82	H	17.01	45.64	54	8.36
5358	26.54	Ave.	13	3.3	H	18.45	44.99	54	9.01
1350	43.36	PK	166	2.4	H	9.21	52.57	74	21.43
2136	46.43	PK	23	2.7	H	2.49	48.92	74	25.08
2759	48.54	PK	100	3.4	H	6.25	54.79	74	19.21
3963	46.47	PK	27	3.9	H	11.58	58.05	74	15.95
4676	45.28	PK	123	3.2	H	17.01	62.29	74	11.71
5358	46.36	PK	13	34.3	H	18.45	64.81	74	9.19

******* END OF REPORT *******