FCC Part 15C

Measurement And Test Report

For

SIORI Technology Co.,Ltd

#510,Bldg B,Yingdali Science & Digital Building,Tariff-free Zone,
Futian District,Shenzhen,China.

FCC ID: COUSR9X0X

April 16, 2012

This Report Concerns:	**Equipment Type:**
☒ Original Report	UHF Reader

Report Number:	MTI110402001RF
Test Engineer:	Bill Chen
Reviewed By:	Jason Zheng
Approved & Authorized By:	Hebe Lee
Test Date:	April 1-16,2012
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of MTI Technology Laboratory Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Applicant:	SIORI Technology Co., Ltd
Address of applicant:	#510,Bldg B, Yingdali Science & Digital Building, Tariff-free Zone, Futian District, Shenzhen, China.
Manufacturer:	SIORI Technology Co., Ltd
Address of manufacturer:	#510,Bldg B, Yingdali Science & Digital Building, Tariff-free Zone, Futian District, Shenzhen, China.
Equipment Under Test:	UHF Reader
Tested Model No.:	SR9101
Trade Name:	/
Supplementary Models No:	SR9102,SR9106,SR9201,SR9202,SR9204 Remark: supplementary models are only different in exterior with tested Model and with the same circuit construction
Type of Modulation:	ASK
Antenna Type:	Integral Antenna, max Gain: 12dBi.
Frequency Band:	902.5-927.5 MHz
Channel Spacing:	0.5 MHz
Rated Power:	<10mW
Power Supply:	DC 5V from adapter

Remark: * *The test data gathered are from the production sample provided by the manufacturer.*

1.2 Related Submittal(s) / Grant (s)

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.207, 15.209, and 15.249 rules.

1.3 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 - 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4 Test Facility

All measurement required was performed at laboratory of MTI Technology Laboratory Ltd. at 10F,Yinxing Business Building, Xixiang Road, Bao'an District, Shenzhen, P.R.China.

The test facility is recognized, certified, or accredited by the following organizations:

FCC – Registration No.: 167003

MTI Technology Laboratory Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 167003, May 04, 2009.

2. SYSTEM TEST CONFIGURATION

The tests documented in this report were performed in accordance with ANSI C63.4-2003 and FCC CFR 47 Part 15 Subpart C.

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

2.3 General Test Procedures

Conducted Emissions The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4-2003.

2.4 List of Measuring Equipments Used

Items	Equipment	Manufacturer	Model No.	Serial No.	Last Cal	Calibration Period
1	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100079	2011/11/18	1 year
2	Horn Antenna	R/S	CH14-H052	1091698	2011/11/18	1 year
3	3m Semi- Anechoic Chamber	ETS	N/A	N/A	2011/11/18	1 year
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2011/11/18	1 year
2	EMI Test Receiver	ROHDE & SCHWARZ	ESI 26	100009	2011/11/18	1 year
3	Receiver/ Spectrum Analyzer	ROHDE & SCHWARZ	ESCI	100106	2011/11/18	1 year
4	Spectrum Analyzer	Agilent	E7405A	US41160415	2011/11/18	1 year
5	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2011/11/18	1 year
6	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2011/11/18	1 year
7	LISN	COM Power	LI-200	12212	2011/11/18	1 year
8	LISN	COM Power	LI-200	12019	2011/11/18	1 year
9	3m/5m Semi-Anechoic Chamber	ETS	N/A	N/A	2011/11/18	1 year
10	Ultra-Broadband Antenna	R/S	HL562	100015	2011/11/18	1 year
11	Horn Antenna	R/S	HF906	100039	2011/11/18	1 year
12	RF Test Panel	R/S	TS / RSP	335015/ 0017	N/A	N/A
13	Turntable	ETS	2088	2149	N/A	N/A
14	Antenna Mast	ETS	2075	2346	N/A	N/A

3. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
15.203	Antenna Requirement	Pass
15.205	Restricted Band of Operation	Pass
15.207	Conducted Emission	Pass
15.209	Radiated Emission	Pass
15.249(a)	Field Strength	Pass
15.249(d)	Out of Band Emission	Pass

4. ANTENNA REQUIREMENT

4.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

4.2 Antenna Connected Construction

This product has a permanent antenna, fulfill the requirement of this section.

5. CONDUCTED DISTURBANCES

5.1. Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is +2.4 dB.

5.2. Limit of Conducted Disturbances (Class B)

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150～0.500	66～56	56～46
0.500～5.000	56	46
5.000～30.00	60	50

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

5.3. EUT Setup

The setup of EUT is according with ANSI Standard C63.4-2003 measurement procedure.

The EUT was placed center and the back edge of the test table.

The cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10 cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

5.4. Instrument Setup

The test receiver was set with the following configurations:
Test Receiver Setting:
Frequency Range……150 KHz to 30 MHz
Detector……..Peak & Quasi-Peak & Average
Sweep Speed……Auto
IF Band Width……..9 KHz

5.5. Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.
Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.
All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dBμV of specification limits). Quasi-peak readings are distinguished with a **"QP"**. Average readings are distinguished with a **"AV".**

5.6. Summary of Test Results

According to the data in section 3.6, the worst margin reading of:

EUT Configuration on Test

UHF Reader

Model Number	:	SR9101
Serial Number	:	N/A
Applicant	:	SIORI Technology Co.,Ltd

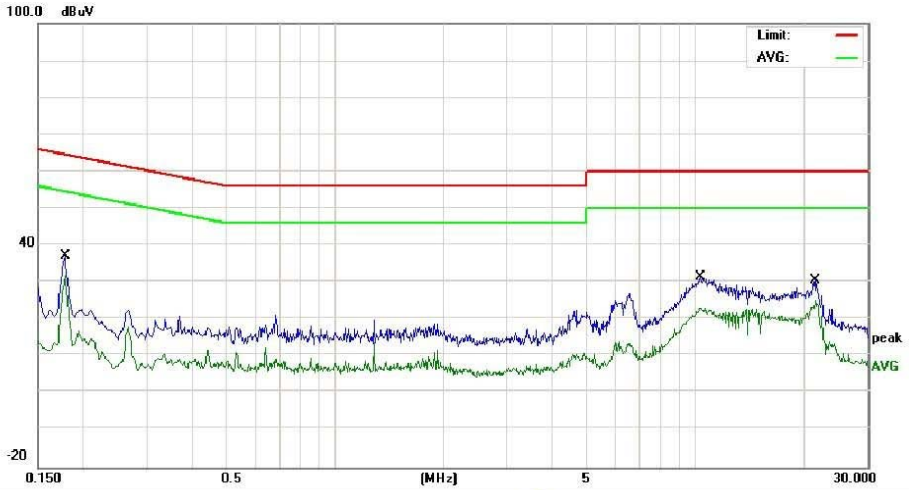
5.7. Test Result

Detailed information, Please refer to the following pages.

According to the data in section 3.8, the EUT complied with the FCC 15B Conducted margin for a Class B device, with the worst margin reading of:

-20.01 dBμV at 12.00 MHz in the **NEUTRAL** mode**, QP** detector, **0.15-30MHz**

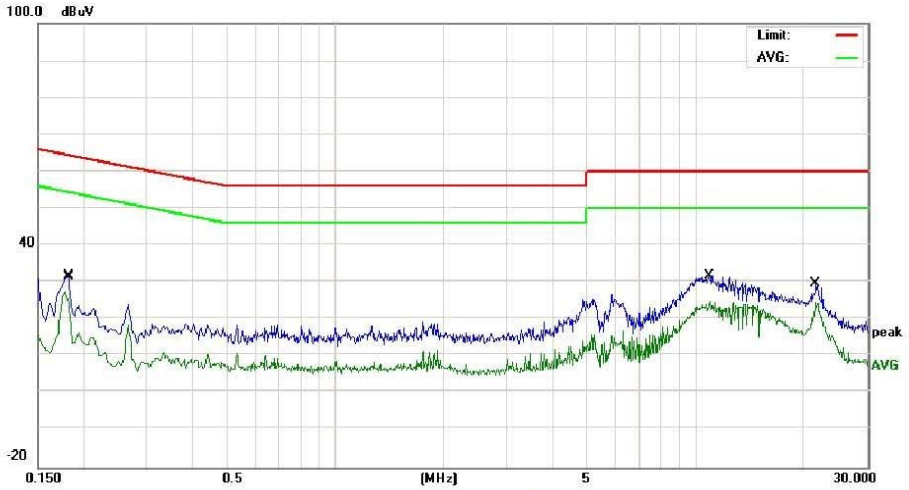
Plot of Conducted Emissions Test Data
Conducted Disturbance
EUT: UHF Reader
M/N: SR9101
Operating Condition: Charging
Test Specification: L
Comment: AC 120V/60Hz connect to Adapter



Site CONDUCTION #1 Phase: *L1* Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1780	26.82	10.44	37.26	64.57	-27.31	QP	
2	*	0.1780	21.29	10.44	31.73	54.57	-22.84	AVG	
3		10.3139	20.82	10.63	31.45	60.00	-28.55	QP	
4		10.3860	12.46	10.63	23.09	50.00	-26.91	AVG	
5		21.5300	19.90	10.73	30.63	60.00	-29.37	QP	
6		21.5300	14.48	10.73	25.21	50.00	-24.79	AVG	

Plot of Conducted Emissions Test Data
Conducted Disturbance
EUT: UHF Reader
M/N: SR9101
Operating Condition: Charging
Test Specification: N
Comment: AC 120V/60Hz connect to Adapter



Site CONDUCTION #1 Phase: N Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1780	17.24	10.37	27.61	54.57	-26.96	AVG	
2		0.1819	21.25	10.38	31.63	64.39	-32.76	QP	
3		10.9019	21.16	10.69	31.85	60.00	-28.15	QP	
4	*	10.9938	14.24	10.70	24.94	50.00	-25.06	AVG	
5		21.5060	18.98	10.76	29.74	60.00	-30.26	QP	
6		21.5060	13.78	10.76	24.54	50.00	-25.46	AVG	

6. §15.205, §15.209, §15.249 (a)- RADIATED EMISSION

6.1 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

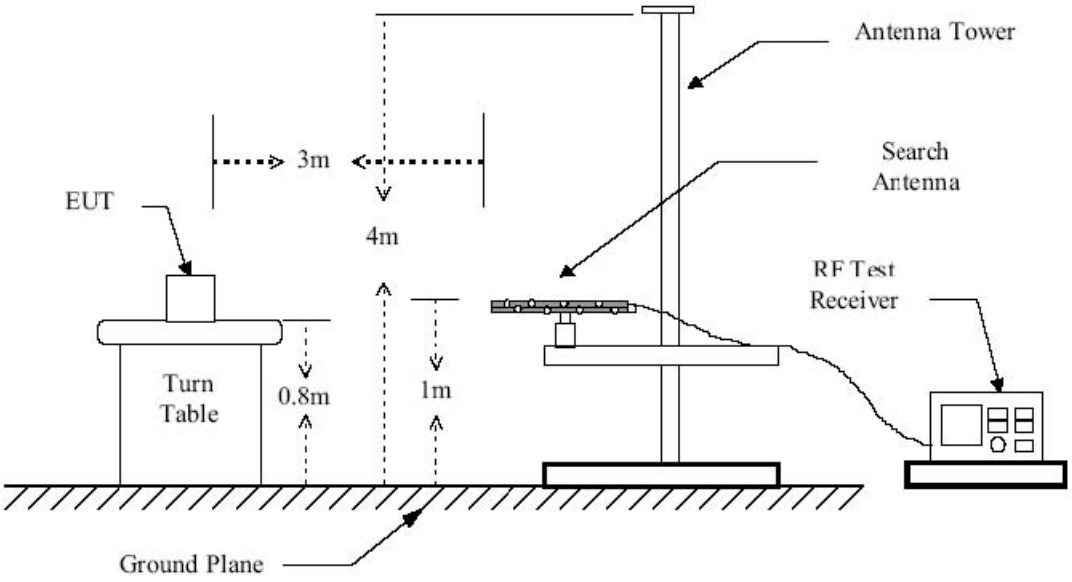
Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of fundamental (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209,WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

6.2 EUT Setup



6.3 Test Equipment List and Details

See section 2.4.

6.4 Test Procedure

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

3. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

6. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

6.5 Corrected Amplitude & Margin Calculation

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

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – FCC Part 15 Limit

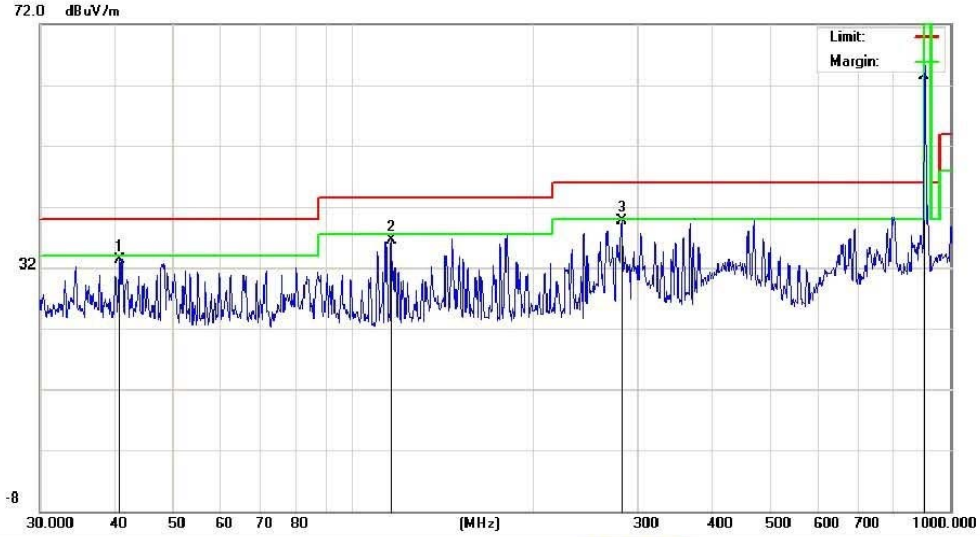
6.6 Test Result

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

-6.30 dBμV at **281.9945 MHz** in the **Horizontal** polarization, **9 kHz to 10 GHz, 3Meters**

Note: *this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

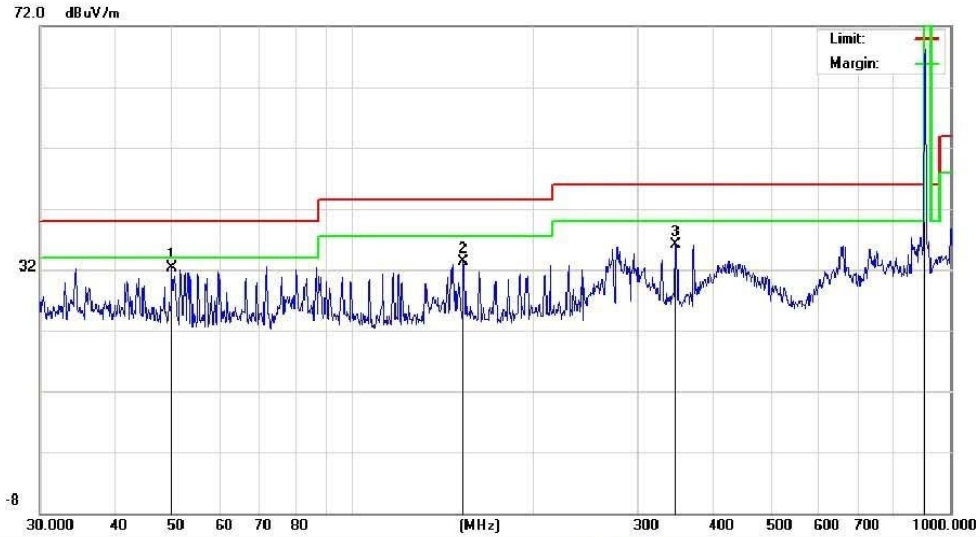
Plot of Radiation Emissions Test
Transmitting below 1GHz- Low CH
Horizontal



Site Chamber #1 Polarization: ***Horizontal*** Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		40.7014	20.45	12.95	33.40	40.00	-6.60	peak			
2		116.1320	24.79	11.71	36.50	43.50	-7.00	peak			
3	*	281.9945	26.25	13.45	39.70	46.00	-6.30	peak			

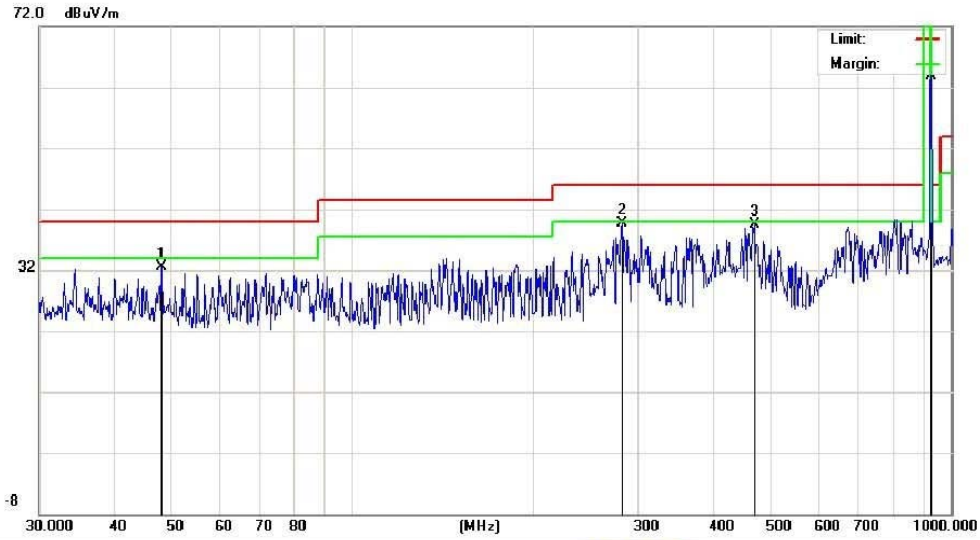
Vertical



Site Chamber #1 Polarization: *Vertical* Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	49.8813	24.17	8.23	32.40	40.00	-7.60	peak			
2		153.2004	21.92	11.48	33.40	43.50	-10.10	peak			
3		346.8091	20.82	15.28	36.10	46.00	-9.90	peak			

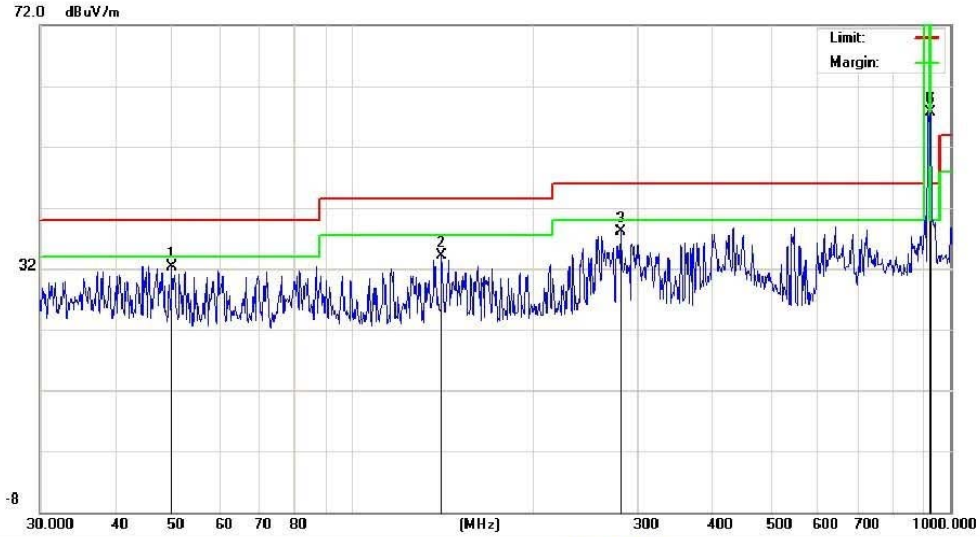
Transmitting below 1GHz- Middle CH
Horizontal



Site Chamber #1 Polarization: ***Horizontal*** Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		47.9938	23.37	9.13	32.50	40.00	-7.50	peak			
2	*	281.9945	26.25	13.45	39.70	46.00	-6.30	peak			
3		468.8761	21.08	18.52	39.60	46.00	-6.40	peak			

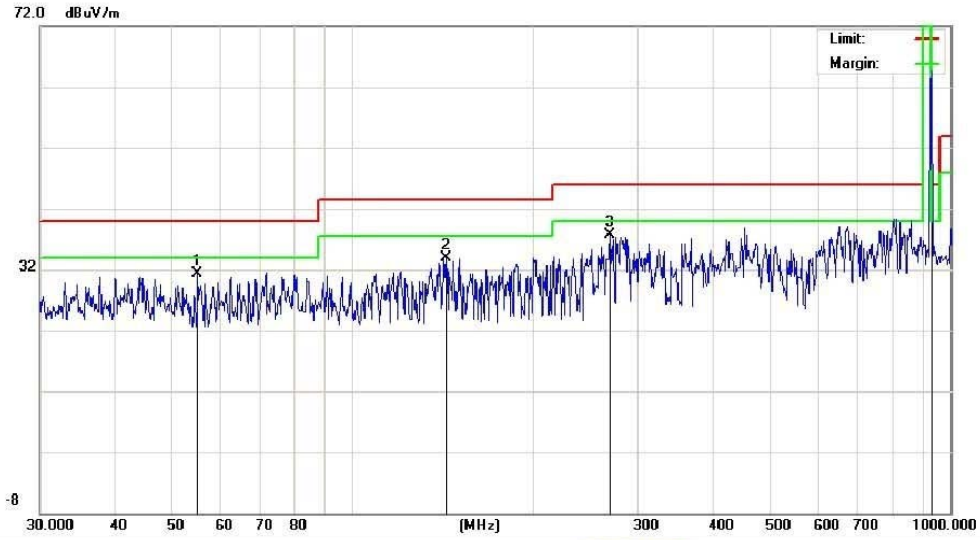
Vertical



Site Chamber #1 Polarization: ***Vertical*** Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	49.8813	24.17	8.23	32.40	40.00	-7.60	peak			
2		140.8351	22.27	11.93	34.20	43.50	-9.30	peak			
3		281.0074	24.80	13.40	38.20	46.00	-7.80	peak			

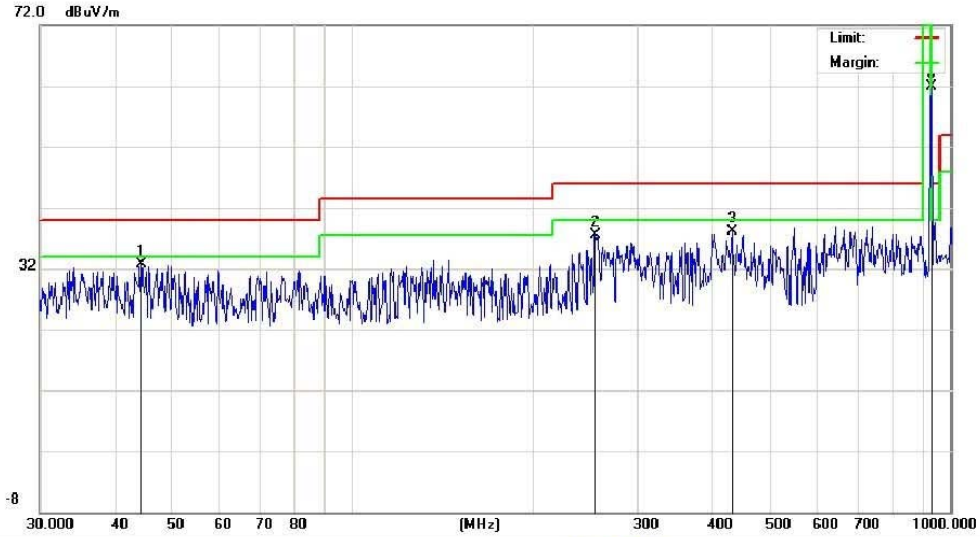
Transmitting below 1GHz- High CH
Horizontal



Site Chamber #1 Polarization: *Horizontal* Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		55.0274	25.33	6.07	31.40	40.00	-8.60	peak			
2		143.3257	21.97	11.93	33.90	43.50	-9.60	peak			
3	*	269.4284	24.31	13.49	37.80	46.00	-8.20	peak			

Vertical



Site Chamber #1 Polarization: ***Vertical*** Temperature: 26

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	44.2751	21.78	11.02	32.80	40.00	-7.20	peak			
2		254.7281	23.90	13.70	37.60	46.00	-8.40	peak			
3		431.0316	20.38	17.72	38.10	46.00	-7.90	peak			

Spurious Emission Above 1GHz

Frequency MHz	Detector	Meter Reading dBuV	Direction Degree	Polar H / V	Antenna Loss dB	Cable loss dB	Amplifier dB	Correction Amplitude dBuV/m	Limit dBuV/m	Margin dB
Low CH										
902.5	AV	80.42	179	H	21.87	3.83	29.63	76.49	94	-17.51
902.5	AV	81.10	168	V	21.87	3.83	29.63	77.17	94	-16.83
902.5	PK	97.47	76	H	21.87	3.83	29.63	93.54	114	-20.46
902.5	PK	96.09	213	V	21.87	3.83	29.63	92.16	114	-21.84
1805.0	AV	38.07	154	H	29.10	4.47	33.00	38.64	54	-15.36
1805.0	AV	36.64	86	V	29.10	4.47	33.00	37.21	54	-16.79
1805.0	PK	56.11	188	H	29.10	4.47	33.00	56.68	74	-17.32
1805.0	PK	54.89	272	V	29.10	4.47	33.00	55.46	74	-18.54
2707.5	AV	31.53	169	H	37.45	5.28	34.00	40.26	54	-13.74
2707.5	AV	29.98	147	V	37.45	5.28	34.00	38.71	54	-15.29
2707.5	PK	49.96	108	H	37.45	5.28	34.00	58.69	74	-15.31
2707.5	PK	47.99	253	V	37.45	5.28	34.00	56.72	74	-17.28
Middle CH										
922.0	AV	80.96	169	H	21.94	3.84	29.63	77.11	94	-16.89
922.0	AV	80.53	138	V	21.94	3.84	29.63	76.68	94	-17.32
922.0	PK	95.01	267	H	21.94	3.84	29.63	91.16	114	-22.84
922.0	PK	94.32	84	V	21.94	3.84	29.63	90.47	114	-23.53
1844.0	AV	42.57	305	H	29.10	4.65	33.00	43.32	54	-10.68
1844.0	AV	41.94	124	V	29.10	4.65	33.00	42.69	54	-11.31
1844.0	PK	60.71	159	H	29.10	4.65	33.00	61.46	74	-12.54
1844.0	PK	59.38	163	V	29.10	4.65	33.00	60.13	74	-13.87
2766.0	AV	32.92	286	H	37.45	5.40	34.00	41.77	54	-12.23
2766.0	AV	31.98	98	V	37.45	5.40	34.00	40.83	54	-13.17
2766.0	PK	50.63	155	H	37.45	5.40	34.00	59.48	74	-14.52
2766.0	PK	49.37	174	V	37.45	5.40	34.00	58.22	74	-15.78
High CH										
927.5	AV	83.48	156	H	22.00	3.86	29.63	79.71	94	-14.29
927.5	AV	81.43	183	V	22.00	3.86	29.63	77.66	94	-16.34
927.5	PK	98.06	254	H	22.00	3.86	29.63	94.29	114	-19.71
927.5	PK	96.94	352	V	22.00	3.86	29.63	93.17	114	-20.83
1855.0	AV	41.59	312	H	29.10	4.77	33.00	42.46	54	-11.54
1855.0	AV	40.30	183	V	29.10	4.77	33.00	41.17	54	-12.83
1855.0	PK	58.82	217	H	29.10	4.77	33.00	59.69	74	-14.31
1855.0	PK	57.27	98	V	29.10	4.77	33.00	58.14	74	-15.86
2782.5	AV	33.13	126	H	37.45	5.48	34.00	42.06	54	-11.94
2782.5	AV	31.36	174	V	37.45	5.48	34.00	40.29	54	-13.71
2782.5	PK	50.79	58	H	37.45	5.48	34.00	59.72	74	-14.28
2782.5	PK	49.18	131	V	37.45	5.48	34.00	58.11	74	-15.89

Note: Testing is carried out with frequency rang 9 kHz to the tenth harmonics, which above 4th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4. Emissions 20dB lower than the limit are not reported.

7. §15.249(b) OUT OF BAND EMISSIONS

7.1 Limits of bandedge Measurement

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

7.2 Test Equipment List and Details

See section 2.4.

7.3 Test Procedure

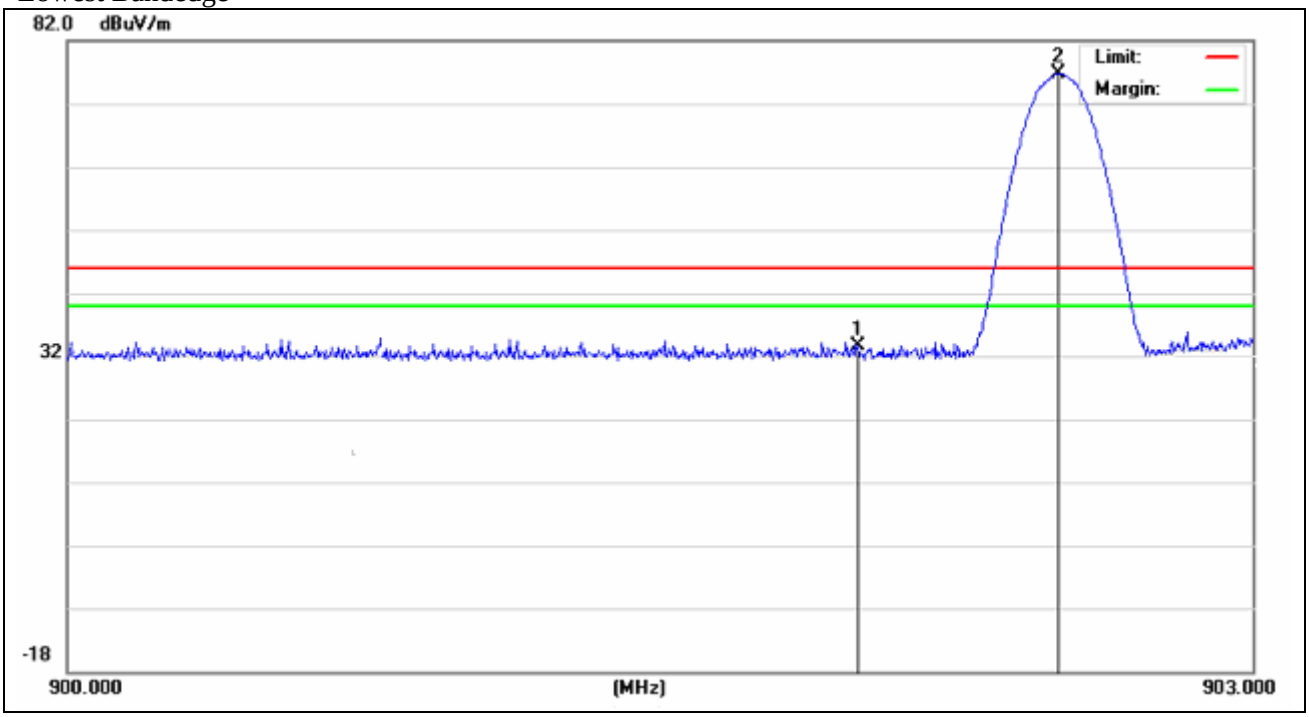
As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 902MHz to 928MHz, than mark the higher-level emission for comparing with the FCC rules.

7.4 Test Result /Plots

Frequency MHz	Limit dBuv	Result
Low Edge	<46	Pass
High Edge	<46	Pass

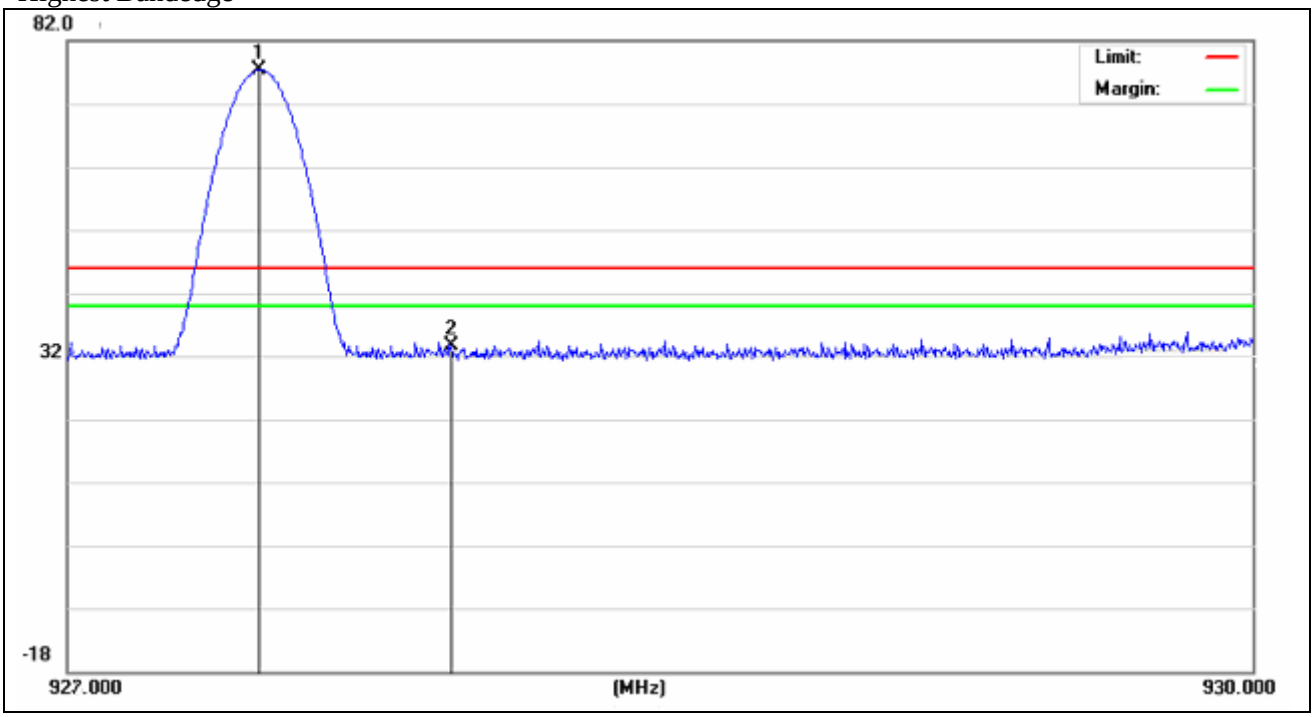
The edge emissions are below the FCC 15.209 Limits. Please refer to the test plots below.

Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	902.0000	6.09	25.75	31.84	46.00	-14.16	peak

Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
2	928.0000	8.16	26.57	34.73	46.00	-11.27	peak