

TEST REPORT

Applicant:	Janam Technologies LLC
Address of Applicant:	100 CROSSWAYS PARK WEST, SUITE 105, WOODBURY, New York, United States 11797
Manufacturer:	Janam Technologies LLC
Address of Manufacturer:	100 CROSSWAYS PARK WEST, SUITE 105, WOODBURY, New York, United States 11797
Product name:	XM20 MOBILE BARCODE TERMINAL
Model:	XM20
Rating(s):	Lithium battery : DC 5.5V 1200mA
Trademark:	XM
FCC register number:	935596
FCC ID:	UTWXM20
Standards:	FCC Part15 subpart B: 2010
Data of Receipt:	2013-07-24
Date of Test:	2013-07-25~2013-08-03
Date of Issue:	2013-08-05
Test Result	Pass*

* In the configuration tested, the test item complied with the standards specified above.

Authorized for issue by:**Test by:**

Aug.05.2013

Jumy Qiu

Jumy Qiu

Project Engineer

Reviewed by:

Aug.05.2013

Pauler Li

Pauler Li

Project Manager

Date

Name/Position

Signature

Date

Name/Position

Signature

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Testing Laboratory information:

Testing Laboratory Name : I-Test Laboratory
Address : 1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City,
Guangzhou, Guangdong Province, P.R. China
Testing location : Same as above
Tel..... : 0086-20-32209330
Fax : 0086-20-62824387
E-mail : itl@i-testlab.com

Possible test case verdicts:

- test case does not apply to the test object... : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement . : F (Fail)

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

This report would be invalid test report without all the signatures of testing technician and approver.

This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

General product information:

/

Test Summary:

The following standards have been applied to ensure the product conforms with the protection requirements of the council directive FCC part 15B

Electromagnetic Emissions				
Test Item	Test Standard	Test Method	Class/Severity	Result
Conducted Emission(0.15-30MHz)	FCC part 15.107	ANSI C63.4:2009	Class B	PASS
Radiated Emission(30-1000MHz)	FCC part 15.109	ANSI C63.4:2009	Class B	PASS
Radiated Emission(1000-6000MHz)	FCC part 15.109	ANSI C63.4:2009	Class B	PASS

Test Location

ALL the tests were performed in GuangZhou ITL Co., Ltd. Which is located at 1-2 floor, South Block, Building A2 , No 3 Keyan Lu, Science City, Guangzhou, Guangdong Province, P.R. China

Tel: 0086-20-32209330, Fax: 0086-20-62824387

No test is subcontracted

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Section 1 General Information and Equipment Used

1.1 Client Information

Applicant: Janam Technologies LLC
 Address of Applicant: 100 CROSSWAYS PARK WEST, SUITE 105, WOODBURY, New York, United States 11797

1.2 EUT General and Technical Descriptions

EUT Name: XM20 MOBILE BARCODE TERMINAL
 EUT Model: XM20
 EUT Trademark: XM
 Input Voltage: DC 5.5V
 Frequency: /
 Input Power/Current: /
 Output rated: /
 Power Cable Description: /
 Other Cables Description: /
 I/O Ports: /
 Function(s) Description: /
 Accessories information: /

1.3 Support Equipment(s) and Test Configuration

1.3.1 Details of Support Equipment(s)

Description	Manufacturer	Model No.	Connection	Working state
/	/	/	/	/

1.3.2 Working State of EUT

Power Supply of EUT: DC 5.5V
 EUT Status: Normal Working

1.3.3 Block Diagram of Test Configuration

/

1.4 Equipment Used during Test

Conducted Emission					
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
EMI Test receiver	R&S	ESCI	ITL-102	2013/06/19	2014/06/19
Two-line v-network	R&S	ENV216	ITL-103	2013/06/19	2014/06/19
Shielded Room	ETS•Lindgren	8*4*3	ITL-101	2012/03/23	2015/03/22

Radiated Emission					
Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due
Semi-Anechoic chamber	ETS•Lindgren	FACT3 2.0	ITL-100	2013/06/17	2014/06/17
Shielding room	ETS•Lindgren	8*4*3	ITL-101	2012/03/23	2015/03/22
EMI Test Receiver	R&S	ESVS10	ITL-111	2013/02/01	2014/02/01
EXA Spectrum Analyzer	Agilent Technologies	N9010A	ITL-114	2013/02/01	2014/02/01
Biconilog Antenna	ETS•Lindgren	3142D	ITL-105	2013/02/10	2014/02/10
Broadband horn antenna	A-INFOMW	JXTXLB-101 80-NF	ITL-110	2011/12/28	2014/12/27

Section 2 Emission Test Results

2.1 Conducted Emission at Mains Terminals, 150 kHz to 30MHz

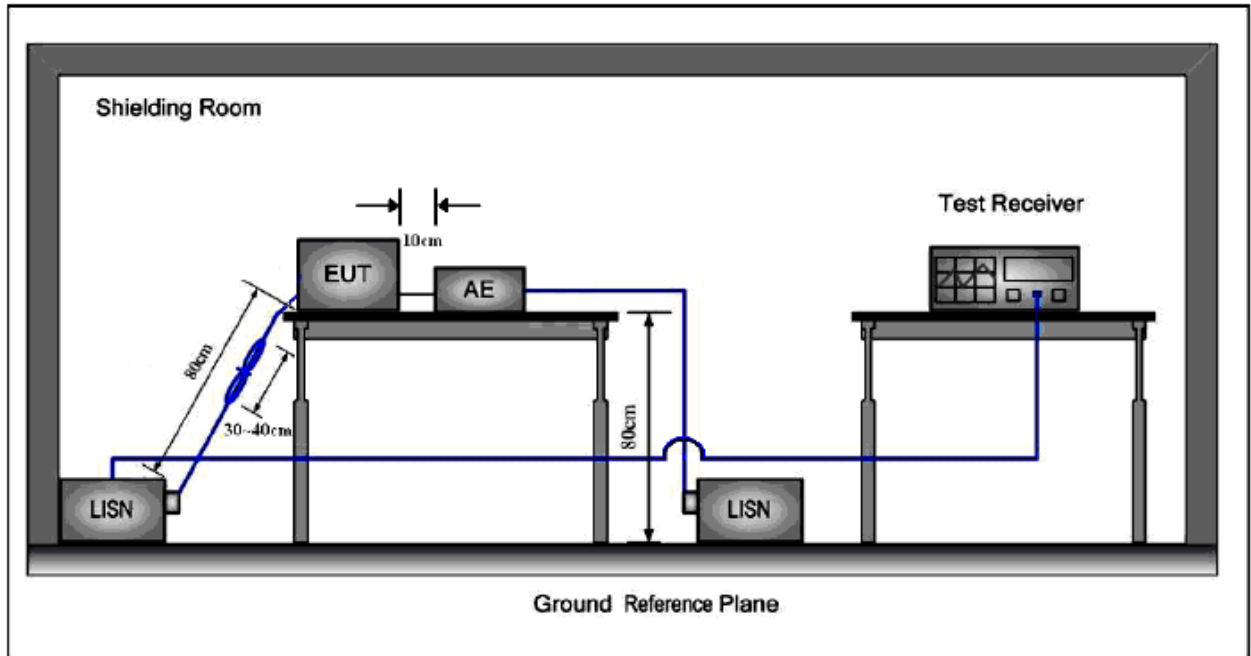
Test Requirement:	FCC part 15.107
Test Method:	ANSI C63.4:2009
Test Voltage:	5.5Vdc
Test Date:	2013-08-01
Frequency Range:	150 kHz to 30MHz
Detector:	Peak for pre-scan Quasi-Peak and Average at frequency with maximum peak (9 kHz resolution bandwidth)
Uncertainty:	2Uc (V) = 2.3dB
Class / Limit:	Class B

Frequency range MHz	Class B Limits dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
NOTE 1 :The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		
NOTE 2: The lower limit is applicable at the transition frequency.		

2.1.1 E.U.T. Operation

Operating Environment:			
Temperature:	22.0 °C	Humidity:	48 % RH
		Atmospheric Pressure:	101 k Pa
EUT Operation:	Normal Working		

2.1.2 Test Setup and Procedure



1. The mains terminal disturbance voltage test was conducted in a shielded room.
2. The EUT was connected to nominal power supply through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H}+5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

2.1.3 Measurement Data

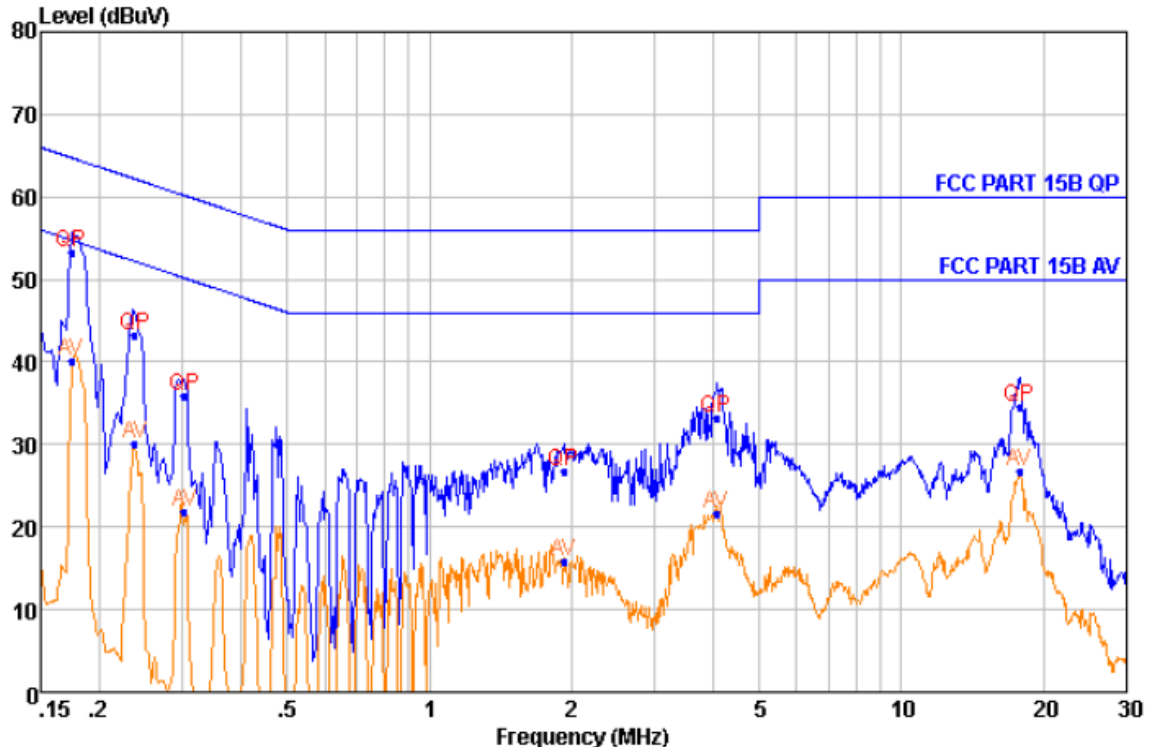
Pre-scan was performed with peak detected on both live and neutral cable. Quasi-peak & average measurements were performed at the frequencies which maximum peak emission level was detected. Please see the attached Quasi-peak and Average test results.

Model: XM20

Live Line:

Peak Scan:

Level (dBμV)



Quasi-peak and Average measurement

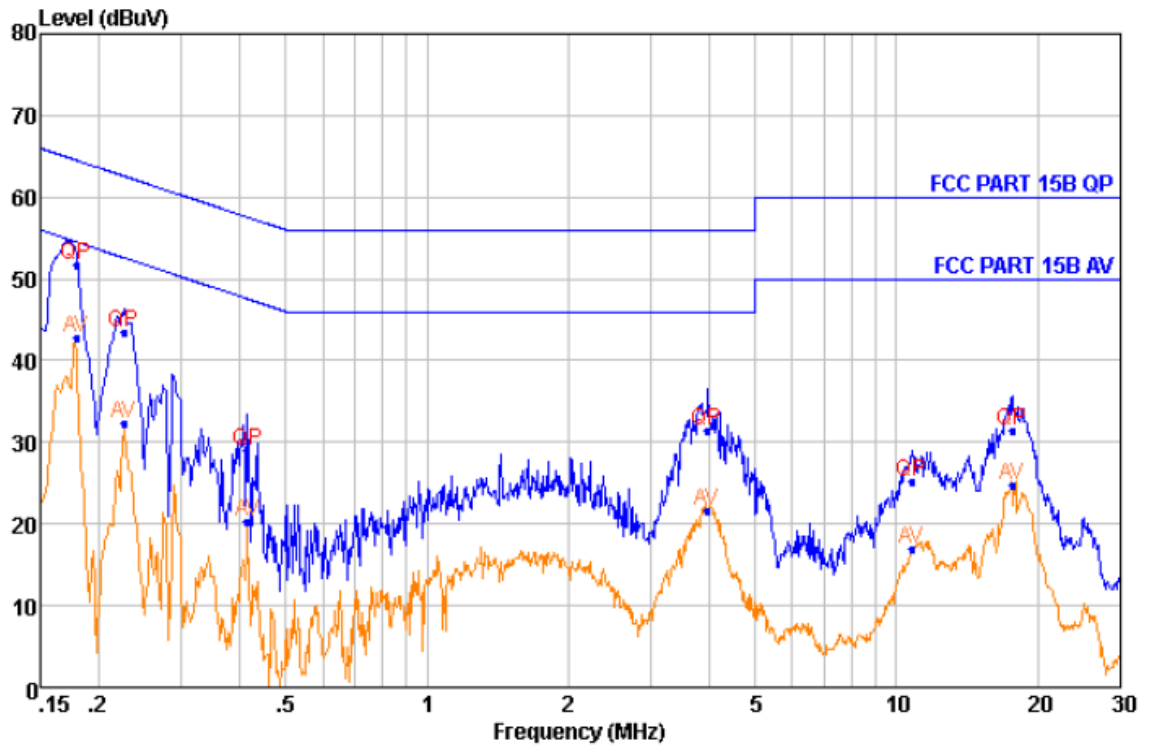
NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.174	53.15	QP	9.69	0.21	64.77	-11.62
2	0.174	40.14	Average	9.69	0.21	54.77	-14.63
3	0.238	43.19	QP	9.67	0.23	62.17	-18.98
4	0.238	30.19	Average	9.67	0.23	52.17	-21.98
5	0.302	35.81	QP	9.67	0.24	60.19	-24.38
6	0.302	21.81	Average	9.67	0.24	50.19	-28.38
7	1.924	26.81	QP	9.65	0.34	56.00	-29.19
8	1.924	15.91	Average	9.65	0.34	46.00	-30.09
9	4.061	33.16	QP	9.61	0.39	56.00	-22.84
10	4.061	21.64	Average	9.61	0.39	46.00	-24.36
11	17.813	34.43	QP	9.69	0.47	60.00	-25.57
12	17.813	26.77	Average	9.69	0.47	50.00	-23.23

Note: 1. Margin = Limit Line - Level
2. Level = Read level + LISN Factor + Cable Loss

Neutral Line:

Peak Scan:

Level (dB μ V)



Quasi-peak and Average measurement

NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.179	51.79	QP	9.66	0.21	64.55	-12.76
2	0.179	42.79	Average	9.66	0.21	54.55	-11.76
3	0.226	43.40	QP	9.64	0.22	62.61	-19.21
4	0.226	32.40	Average	9.64	0.22	52.61	-20.21
5	0.414	28.86	QP	9.66	0.26	57.57	-28.71
6	0.414	20.33	Average	9.66	0.26	47.57	-27.24
7	3.955	31.36	QP	9.62	0.39	56.00	-24.64
8	3.955	21.62	Average	9.62	0.39	46.00	-24.38
9	10.765	25.10	QP	9.62	0.44	60.00	-34.90
10	10.765	16.85	Average	9.62	0.44	50.00	-33.15
11	17.617	31.35	QP	9.62	0.47	60.00	-28.65
12	17.617	24.77	Average	9.62	0.47	50.00	-25.23

Note: 1. Margin = Limit Line - Level
2. Level = Read level + LISN Factor + Cable Loss

2.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement:	FCC part 15.109
Test Method:	ANSI C63.4:2009
Test Voltage:	5.5Vdc
Test Date:	2013-08-02
Frequency Range:	30MHz to 1GHz
Measurement Distance	3m
Detector:	Peak for pre-scan Quasi-Peak if maximised peak within 6dB of limit (120 kHz resolution bandwidth)
Uncertainty:	$2U_c (V) = 3.35\text{dB}$
Class / Limit:	Class B

Frequency range MHz	Quasi-peak limits dB ($\mu\text{V/m}$)
30 to 88	40
88 to 216	43.5
216 to 960	46
960 to 1000	54
At transitional frequencies the lower limit applies	

2.2.1 E.U.T. Operation

Operating Environment:

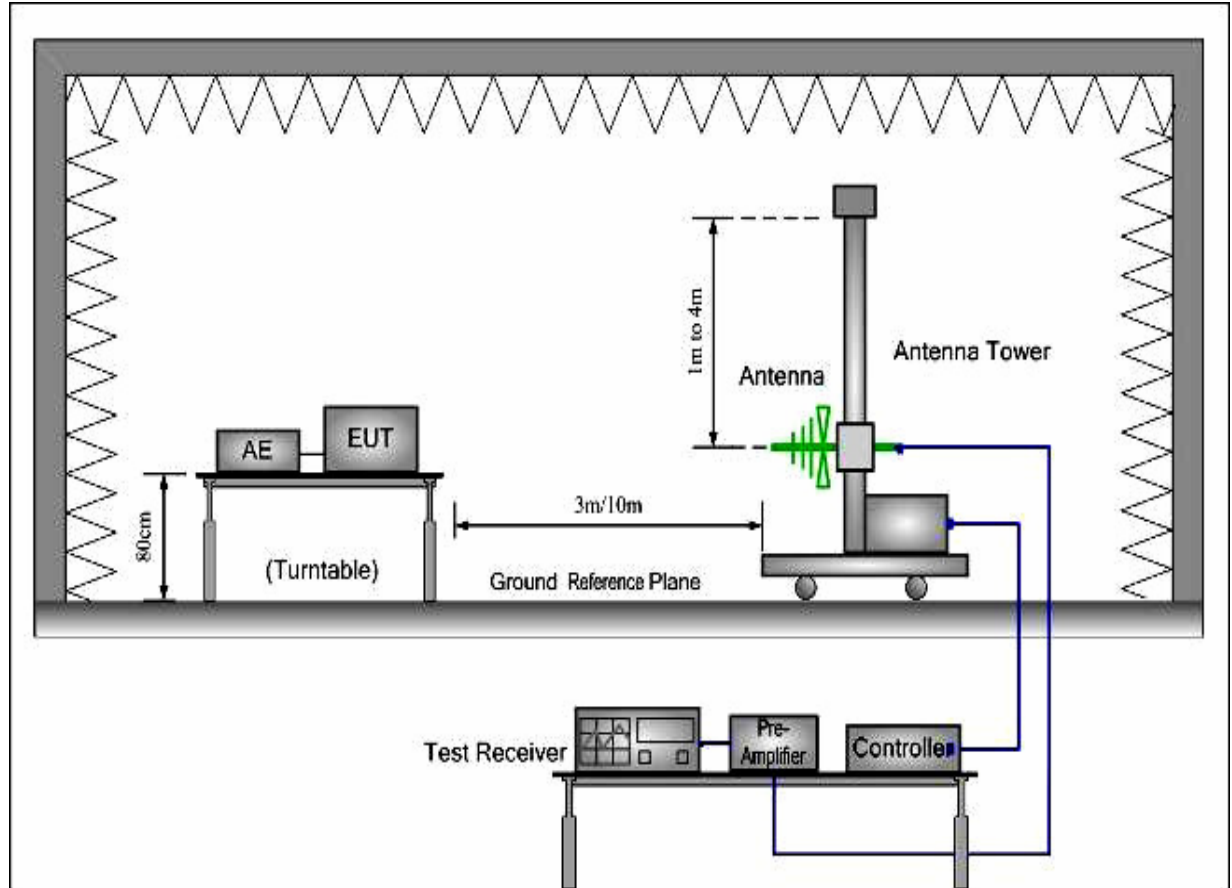
Temperature: 22.0 °C

Humidity: 51 % RH

Atmospheric Pressure: 101 k Pa

EUT Operation: Normal Working.

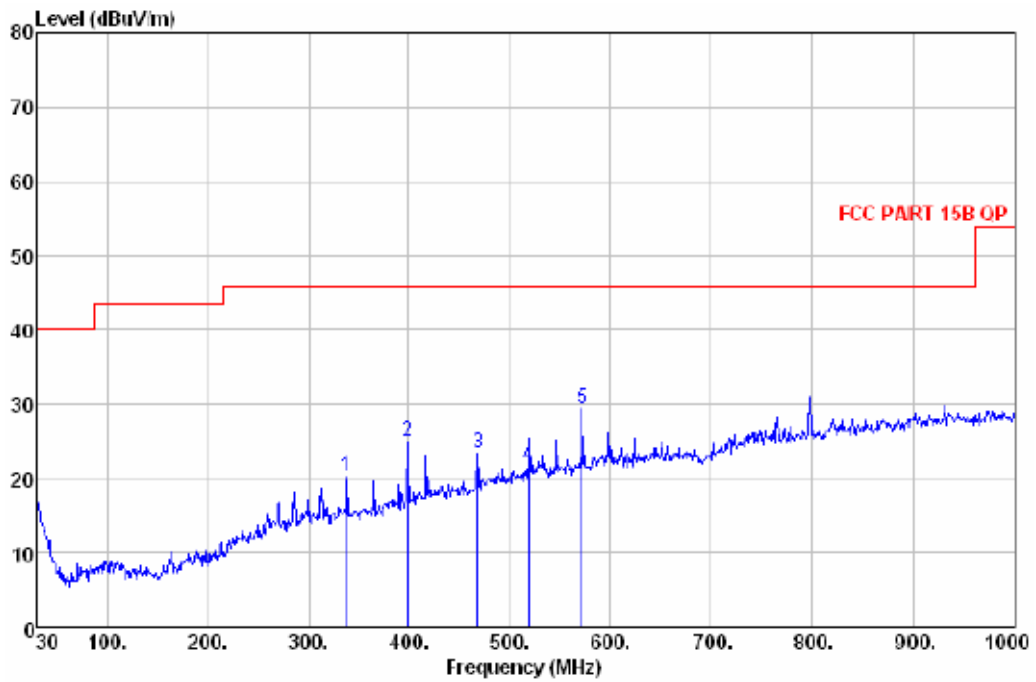
2.2.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. Biconical and log periodic antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360° , and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

2.2.3 Measurement Data

Model: XM20
Horizontal:
 Peak scan
 Level (dBuV/m)

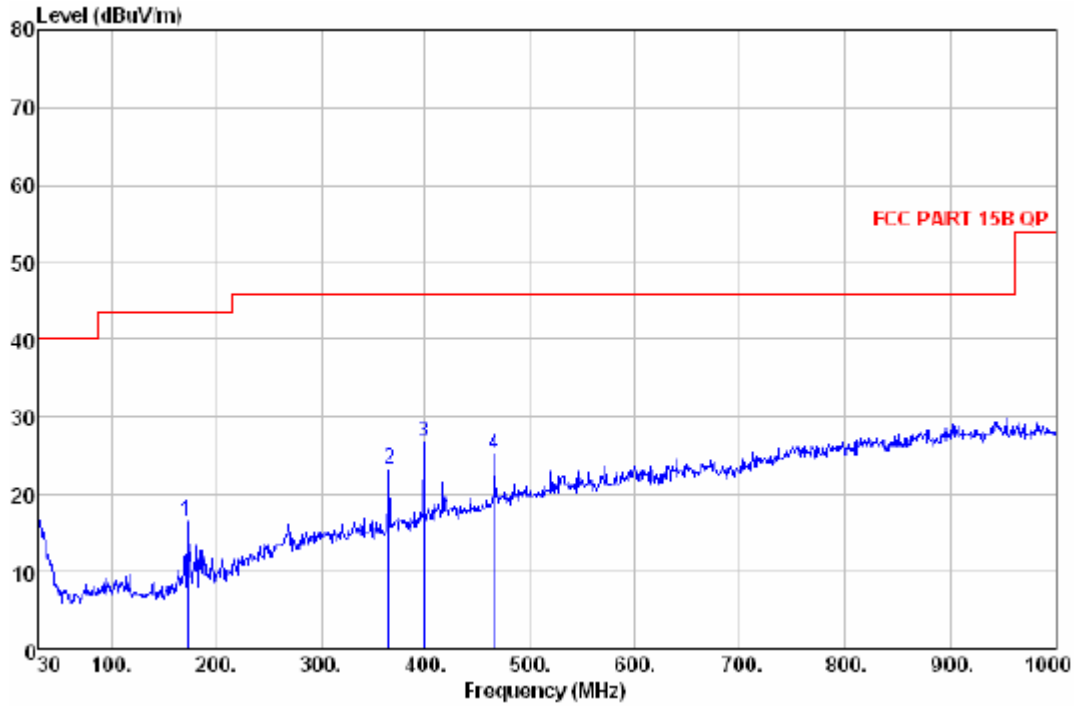


Quasi-peak measurement

No.	Freq MHz	Level dBuV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBuV/m	Margin dB	A/pos cm	T/pos deg
1	338.460	20.36	QP	13.75	2.25	46.00	-25.64	100	6
2	398.600	25.05	QP	15.94	2.44	46.00	-20.95	100	15
3	468.440	23.33	QP	17.89	2.68	46.00	-22.67	100	48
4	518.880	21.62	QP	18.76	2.83	46.00	-24.38	200	159
5	572.230	29.44	QP	19.64	2.98	46.00	-16.56	200	127

Level=Read Level + Antenna Factor + Cable Loss

Vertical:
 Peak scan
 Level (dBµV/m)



Quasi-peak measurement

No.	Freq MHz	Level dBµV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBµV/m	Margin dB	A/pos cm	T/pos deg
1	172.590	16.57	QP	8.30	1.57	43.50	-26.93	100	4
2	365.620	23.18	QP	14.68	2.33	46.00	-22.82	100	99
3	398.600	26.82	QP	15.94	2.44	46.00	-19.18	200	12
4	465.530	25.28	QP	17.69	2.67	46.00	-20.72	200	78

Level=Read Level + Antenna Factor + Cable Loss

2.3 Radiated Emissions above 1 GHz

Test Requirement:	FCC part 15B
Test Method	ANSI C63.4
Test Voltage:	5.5Vdc
Frequency Range:	1GHz to 6GHz
Measurement Distance	3m
Class / Limit:	Class B
Test Date:	2013-08-02
Detector:	Peak for pre-scan Quasi-Peak if maximised peak within 6dB of limit (120 kHz resolution bandwidth)
Uncertainty:	2Uc (V) = 3.69dB

Frequency range MHz	Class B Limits	
	Peak	Average
Above 1000	74	54

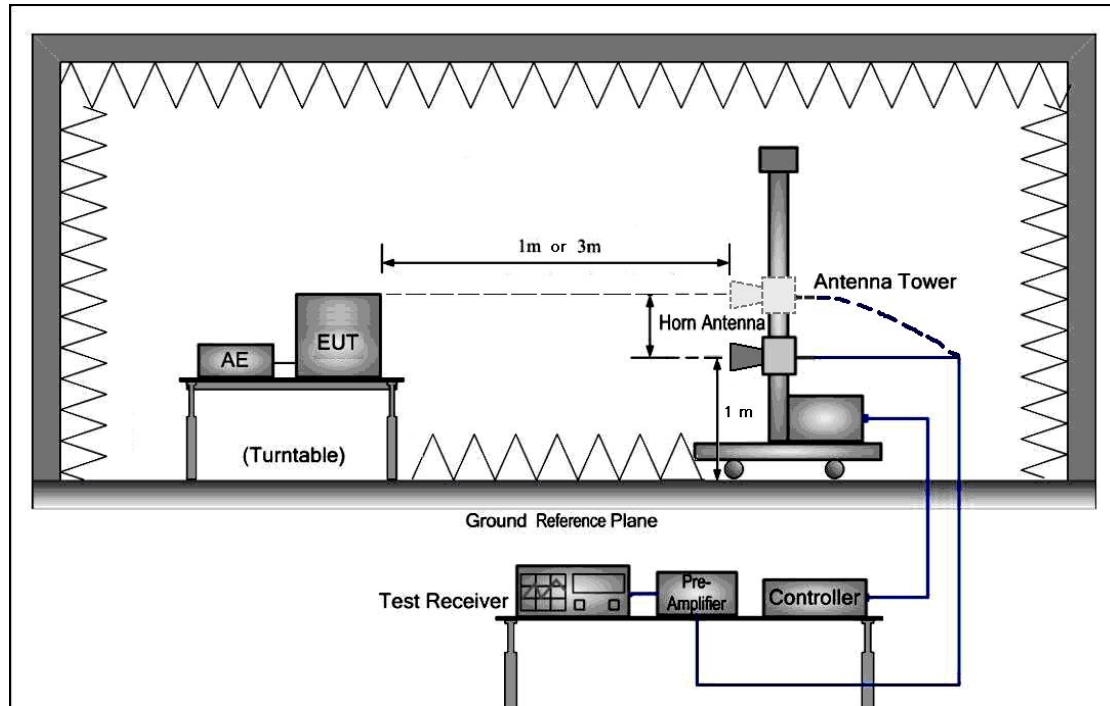
2.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22.0 °C Humidity: 51 % RH Atmospheric Pressure: 101 k Pa

EUT Operation: Normal Working.

2.3.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. Horn antenna was used for the frequency above 1GHz
3. The EUT was connected to nominal power supply through a mains power outlet which was bonded to the ground reference plane; The mains cables were draped to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.
5. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

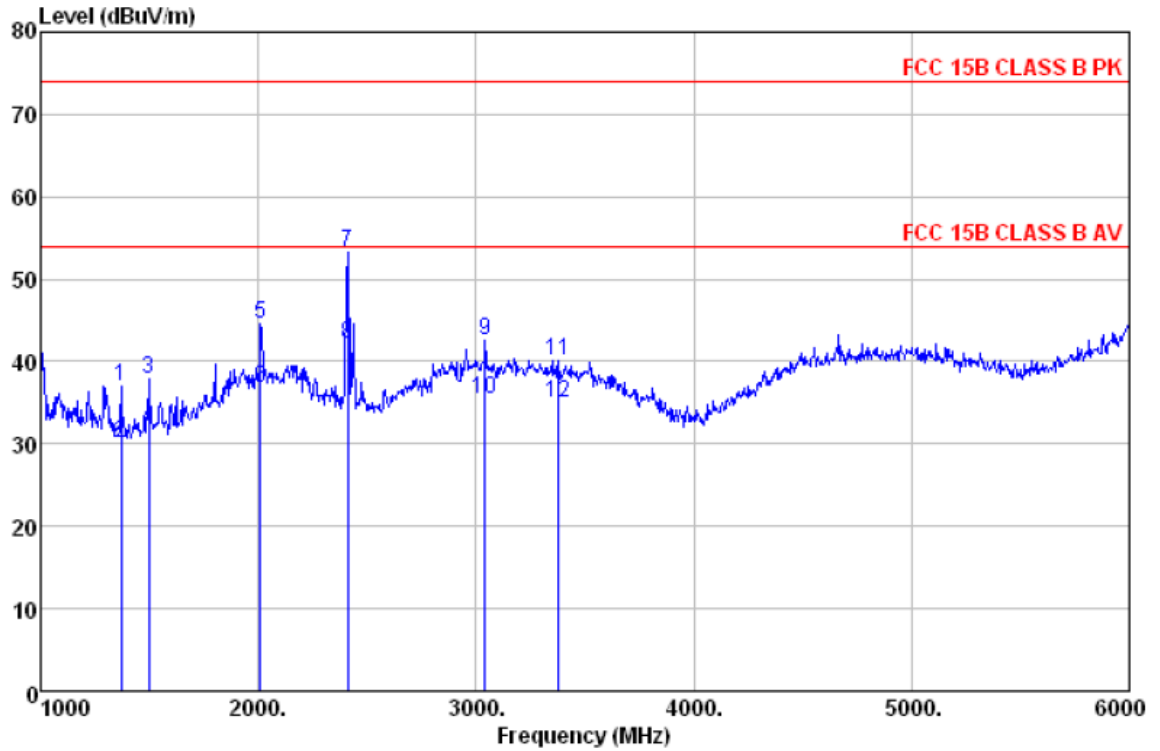
2.3.3 Measurement Data

Model: XM20

Horizontal:

Peak scan

Level (dBµV/m)



Peak measurement

No.	Freq MHz	Level dBµV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBµV/m	Margin dB	A/pos cm	T/pos deg
1	1370.000	37.07	Peak	24.05	4.74	74.00	-36.93	200	112
2	1370.000	30.07	Average	24.05	4.74	54.00	-23.93	200	112
3	1495.000	37.83	Peak	23.52	4.99	74.00	-36.17	200	78
4	1495.000	31.83	Average	23.52	4.99	54.00	-22.17	200	78
5	2010.000	44.66	Peak	29.91	5.86	74.00	-29.34	200	11
6	2010.000	36.66	Average	29.91	5.86	54.00	-17.34	200	11
7	2410.000	53.17	Peak	26.47	6.48	74.00	-20.83	200	165
8	2410.000	42.17	Average	26.47	6.48	54.00	-11.83	200	165
9	3040.000	42.51	Peak	31.18	7.38	74.00	-31.49	100	56
10	3040.000	35.51	Average	31.18	7.38	54.00	-18.49	100	56
11	3375.000	40.07	Peak	31.85	7.82	74.00	-33.93	100	91
12	3375.000	35.07	Average	31.85	7.82	54.00	-18.93	100	91

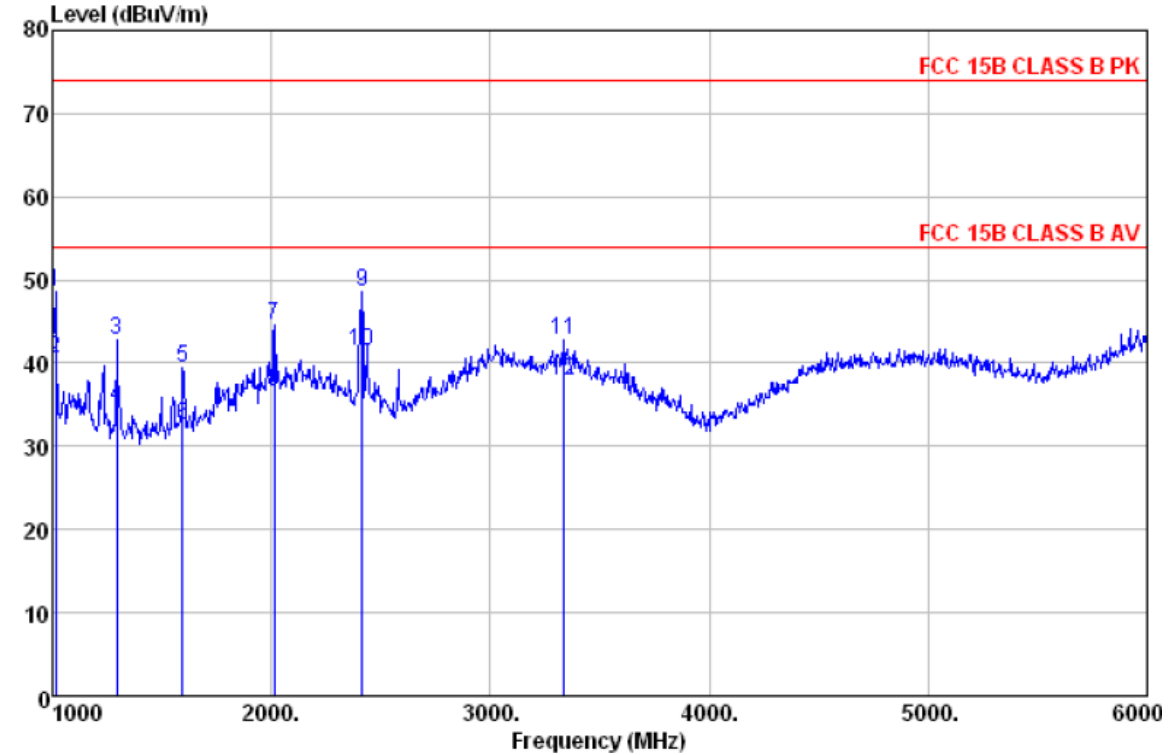
Level=Read Level + Antenna Factor + Cable Loss

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Vertical:

Peak scan

Level (dBµV/m)



Peak measurement

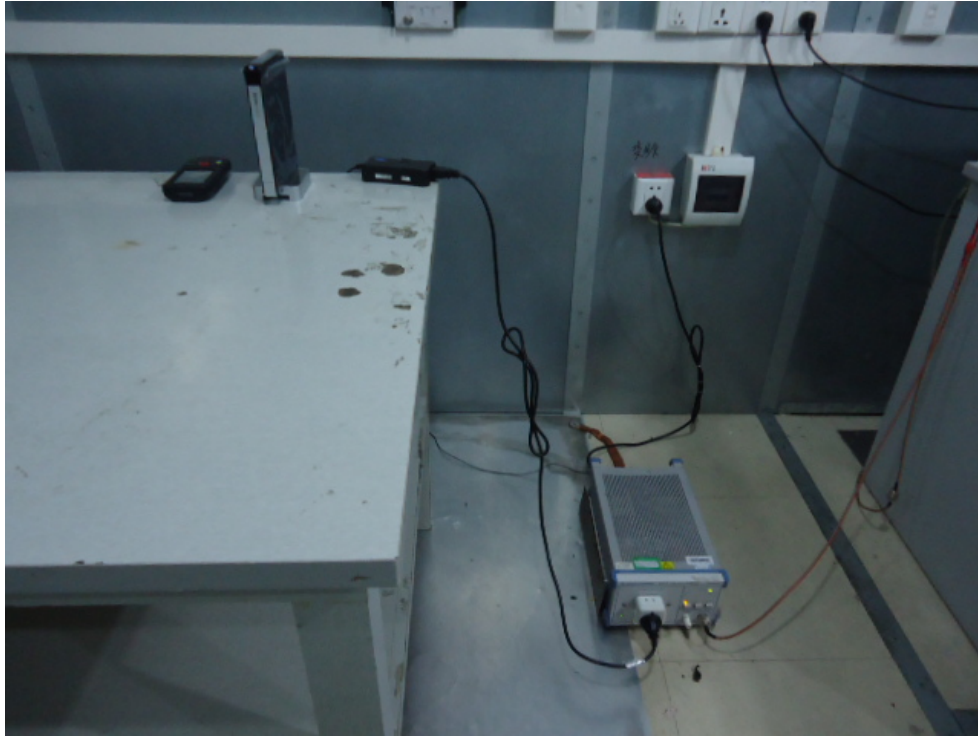
No.	Freq MHz	Level dBµV/m	Remark	Antenna Factor dB/m	Cable Loss dB	Limit Line dBµV/m	Margin dB	A/pos cm	T/pos deg
1	1015.000	48.57	Peak	25.54	4.03	74.00	-25.43	100	7
2	1015.000	40.57	Average	25.54	4.03	54.00	-13.43	100	7
3	1295.000	42.81	Peak	24.36	4.59	74.00	-31.19	102	86
4	1295.000	34.81	Average	24.36	4.59	54.00	-19.19	102	86
5	1595.000	39.53	Peak	24.74	5.16	74.00	-34.47	100	65
6	1595.000	32.53	Average	24.74	5.16	54.00	-21.47	100	65
7	2015.000	44.63	Peak	29.87	5.86	74.00	-29.37	100	96
8	2015.000	36.63	Average	29.87	5.86	54.00	-17.37	100	96
9	2415.000	48.53	Peak	26.43	6.49	74.00	-25.47	120	78
10	2415.000	41.53	Average	26.43	6.49	54.00	-12.47	120	78
11	3335.000	42.80	Peak	31.77	7.77	74.00	-31.20	200	32
12	3335.000	37.80	Average	31.77	7.77	54.00	-16.20	200	32

Level=Read Level + Antenna Factor + Cable Loss

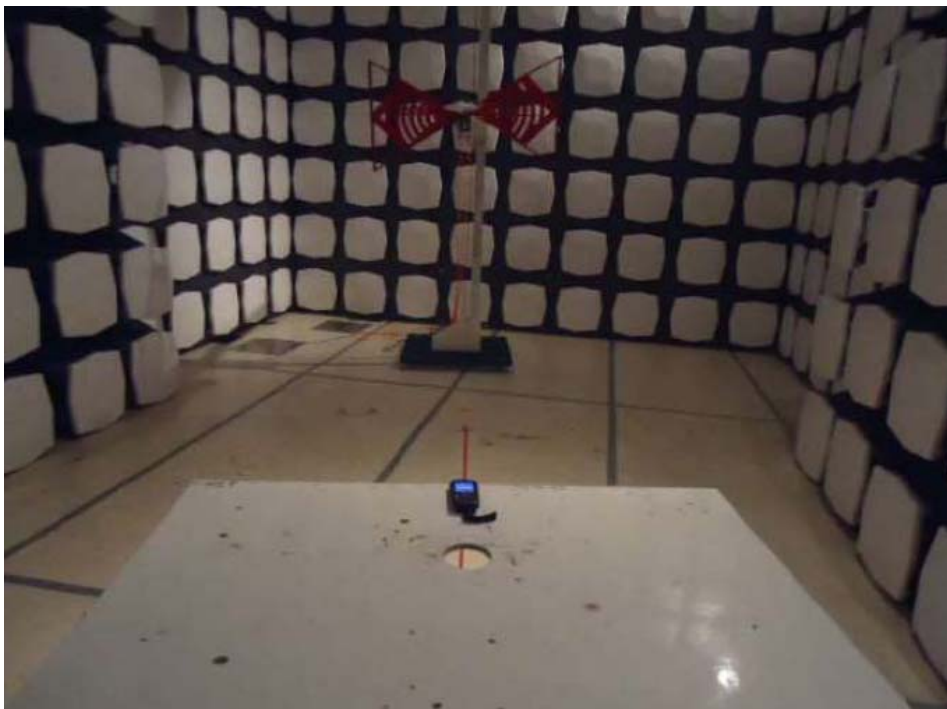
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Section 3 Photographs

3.1 Conducted Emissions Mains Terminals Test Setup

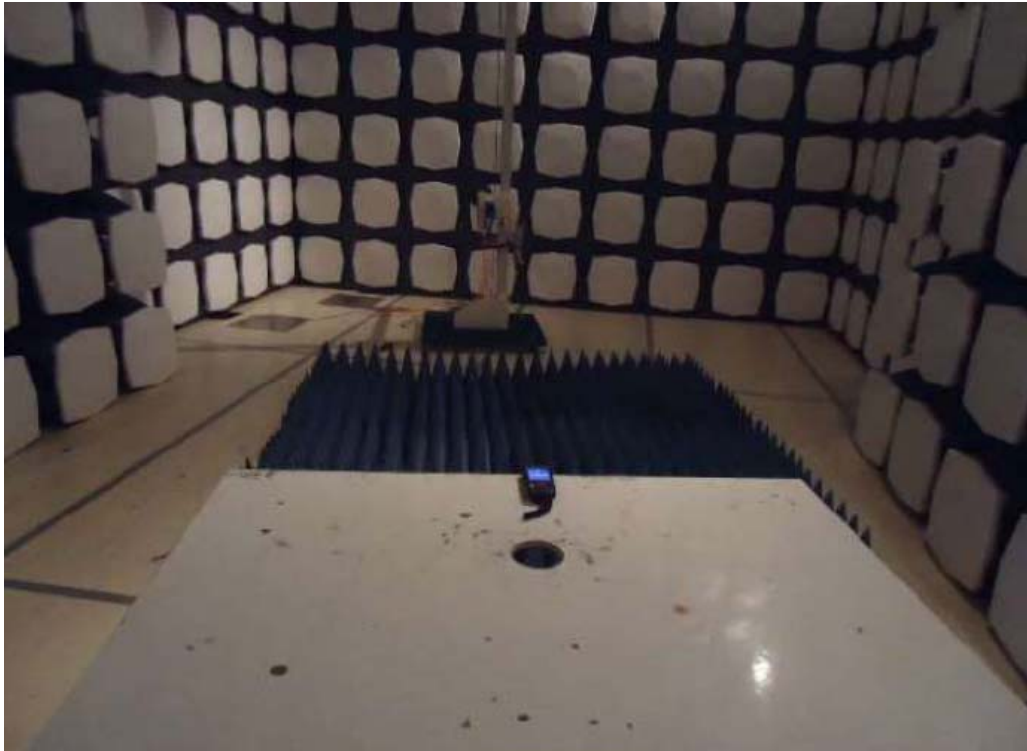


3.2 Radiated Emissions, 30MHz to 1GHz Test Setup



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3.3 Radiated Emissions above 1 GHz Test Setup



END OF THE TEST REPORT