



TEST REPORT

For

Applicant : Outform Ltd

Room A103 and A105, Nanshan Medical Instrument

**Address : Industry Park, No.1019 Nanhai Avenue, Nanshan District,
Shenzhen, Guangdong Province 518000 China.**

Product Name : Smart cushion

**Model Name : UM100335, UM10xxxx, UF10xxxx, UC10xxxx,
(XXXX representatives product serial number)**

Remark : Only difference in the model name.

Brand Name : N/A

FCC Number : FCC ID: 2AC8G-UM335

Report No. : MTE/CEC/B17020143

Date of Issue : Feb.13,2017

Issued by : Most Technology Service Co., Limited

**Address : No.5, Langshan 2nd Road, North District, Hi-tech Industrial Park,
Nanshan, Shenzhen, Guangdong, China**

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The report consists 16 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by MOST. The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of testing engineers, reviewer and approver.

TABLE OF CONTENTS

1. PRODUCT INFORMATION..... 3

2. GENERAL INFORMATION 4

2.1 Product Information..... 4

2.2 Objective 4

2.3 Test Standards and Results..... 5

2.4 Environmental Conditions..... 5

3. TEST METHODOLOGY..... 6

3.1TEST FACILITY 6

4. SETUP OF EQUIPMENT UNDER TEST 7

4.1 SETUP CONFIGURATION OF EUT..... 7

4.2 TEST EQUIPMENT LIST 7

5. 47 CFR Part 15 C Requirements 8

5.1.1 Applicable Standard..... 8

5.1.2 Evaluation Criteria..... 8

5.1.3 Result: Compliance. 8

5.2 CONDUCTED EMISSION TEST 9

5.2.1Requirement 9

5.2.2 Block Diagram of Test Setup 9

5.2.3 Test procedure 9

5.2.4 Test Result 9

5.3 Radiated Emission 12

5.3.1Requirement 12

5.4.2 Test Configuration 12

5.4.3 Test Procedure: 13

5.4.4 Test Result 14

1. PRODUCT INFORMATION

Equipment Under Test: Smart cushion

Brand Name: N/A

Model Number: UM100335

FCC Number: FCC ID: 2AC8G-UM335

Applicant: Outform Ltd

Room A103 and A105, Nanshan Medical Instrument Industry Park,
No.1019 Nanhai Avenue, Nanshan District, Shenzhen, Guangdong
Province 518000 China.

Manufacturer: Outform Ltd

Room A103 and A105, Nanshan Medical Instrument Industry Park,
No.1019 Nanhai Avenue, Nanshan District, Shenzhen, Guangdong
Province 518000 China.

Technical Standards: 47 CFR Part 15 Subpart C

File Number: MTE/CEC/B17020143

Date of test: Feb.06-08,2017

Deviation: None

Condition of Test Normal

Sample:

Test Result: PASS

The above equipment was tested by Most Technology Service Co., Ltd. for compliance with the requirements set forth in FCC rules and the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements.

The test results of this report relate only to the tested sample identified in this report.

Tested by (+ signature):

chloe

Chloe Cai (Engineer)

Feb.06-13,2017

Review by (+ signature):

John

John Lin (Engineer)



Feb.13,2017

Approved by (+ signature):

Yvette Zhou

Yvette Zhou(Manager)

Feb.13,2017

2. GENERAL INFORMATION

2.1 Product Information

Product	Smart cushion
Brand Name	N/A
Model Number	UM100335
Series Model Name:	UM10xxxx, UF10xxxx, UC10xxxx,(XXXX representatives product serial number)
Series Model Difference description:	Only difference in the model name.
Power Supply	DC5V by adapter
Frequency Range	125KHz
Modulation Type:	FSK
Channel Number	1
Antenna Type	Internal antenna , Antenna Gain: 4.0dBi
Temperature Range	0°C ~ +40°C

NOTE:

1. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 Objective

The objective of the report is to perform tests according to FCC Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices

2.3 Test Standards and Results

No.	Section	Test Items	Result	Date of Test
1	FCC 15.203	Antenna Requirement	PASS	2017.02.06
2	FCC 15.207 (a)	AC Power Line Conducted Emission	N/A	---
3	FCC 15.209,	Radiated Emission	PASS	2017.02.06
Remark: N/A means not applicable				

Note: 1. The test result judgment is decided by the limit of measurement standard
 2. The information of measurement uncertainty is available upon the customer's request.

2.4 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST METHODOLOGY

3.1 TEST FACILITY

Test Site:	Most Technology Service Co., Limited
Location:	No.5, Langshan 2nd Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong, China
Description:	<p>There is one 3m semi-anechoic an area test sites and two line conducted labs for final test. The Open Area Test Sites and the Line Conducted labs are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013 and CISPR 16 requirements.</p> <p>The FCC Registration Number is 490827. The IC Registration Number is 7103A-1.</p>
Site Filing:	<p>The site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046.</p>
Instrument	All measuring equipment is in accord with ANSI C63.10: 2013 and CISPR 16
Tolerance:	requirements that meet industry regulatory agency and accreditation agency requirement.
Ground Plane:	<p>Two conductive reference ground planes were used during the Line Conducted Emission, one in vertical and the other in horizontal. The dimensions of these ground planes are as below. The vertical ground plane was placed distancing 40 cm to the rear of the wooden test table on where the EUT and the support equipment were placed during test. The horizontal ground plane projected 50 cm beyond the footprint of the EUT system and distanced 80 cm to the wooden test table. For Radiated Emission Test, one horizontal conductive ground plane extended at least 1m beyond the periphery of the EUT and the largest measuring antenna, and covered the entire area between the EUT and the antenna.</p>

4. SETUP OF EQUIPMENT UNDER TEST

4.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

4.2 TEST EQUIPMENT LIST

Instrumentation: The following list contains equipment used at Most for testing. The equipment conforms to the CISPR 16-1 / ANSI C63.2 Specifications for Electromagnetic Interference and Field Strength Instrumentation from 10 kHz to 1.0 GHz or above.

No.	Equipment	Manufacturer	Model No.	S/N	Calibration date	Calibration Interval
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2016/03/10	1 Year
2	Spectrum Analyzer	Agilent	E7405A	US44210471	2016/03/14	1 Year
3	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2016/03/10	1 Year
4	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2016/03/07	1 Year
5	Terminator	Hubersuhner	50Ω	No.1	2016/03/07	1 Year
6	RF Cable	SchwarzBeck	N/A	No.1	2016/03/07	1 Year
7	Test Receiver	Rohde & Schwarz	ESPI	101202	2016/03/10	1 Year
8	Bilog Antenna	Sunol	JB3	A121206	2016/03/14	1 Year
9	Horn Antenna	SCHWARZBECK	BBHA9120D	756	2016/03/14	1 Year
10	Horn Antenna	Penn Engineering	9034	8376	2016/03/14	1 Year
11	Cable	Resenberger	N/A	NO.1	2016/03/07	1 Year
12	Cable	SchwarzBeck	N/A	NO.2	2016/03/07	1 Year
13	Cable	SchwarzBeck	N/A	NO.3	2016/03/07	1 Year
14	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2016/03/07	1 Year
15	Test Receiver	Rohde & Schwarz	ESCI	100492	2016/03/10	1 Year
16	Loop antenna	ARA	PLA-1030/B	1039	2016/03/14	1 Year
17	Climate Chamber	ESPEC	EL-10KA	A20120523	2016/07/05	1 Year

NOTE: Equipments listed above have been calibrated and are in the period of validation.

5. 47 CFR Part 15 C Requirements

5.1 ANTENNA REQUIREMENT

5.1.1 Applicable Standard

According to FCC § 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.1.2 Evaluation Criteria

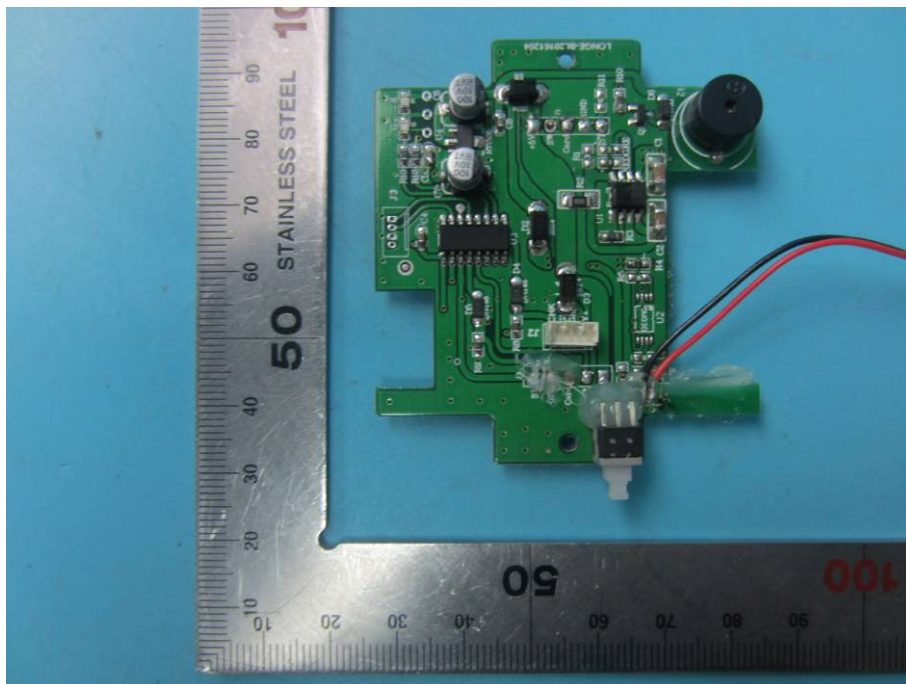
(a) Antenna must be permanently attached to the unit.

(b) Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, Installer shall be responsible for verifying that the correct antenna is employed with the unit.

5.1.3 Result: Compliance.

The antenna connector is designed with unique type RF connector and no consideration of replacement. Please see the following EUT antenna photo for details:



5.2 CONDUCTED EMISSION TEST

5.2.1 Requirement

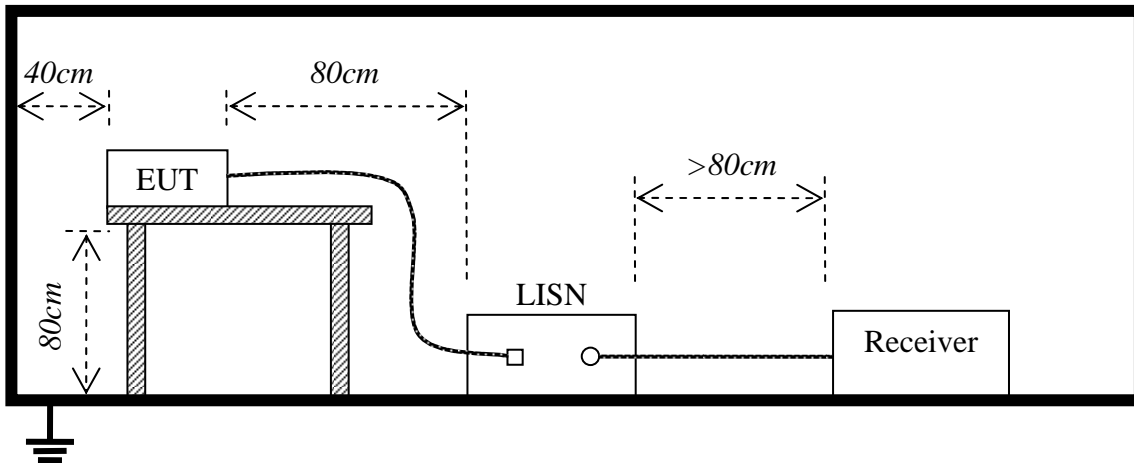
A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the and 150 kHz-30 MHz, shall not exceed the limits in the following table:

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

****Note:** 1. the lower limit shall apply at the band edges.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

5.2.2 Block Diagram of Test Setup



5.2.3 Test procedure

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. Exploratory measurements were made to identify the frequency of the emission that has the highest amplitude relative to the limit;
3. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
4. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.
5. The bandwidth of test receiver (ESCI) set at 9 KHz.
6. All data was recorded in the Quasi-peak and average detection mode.

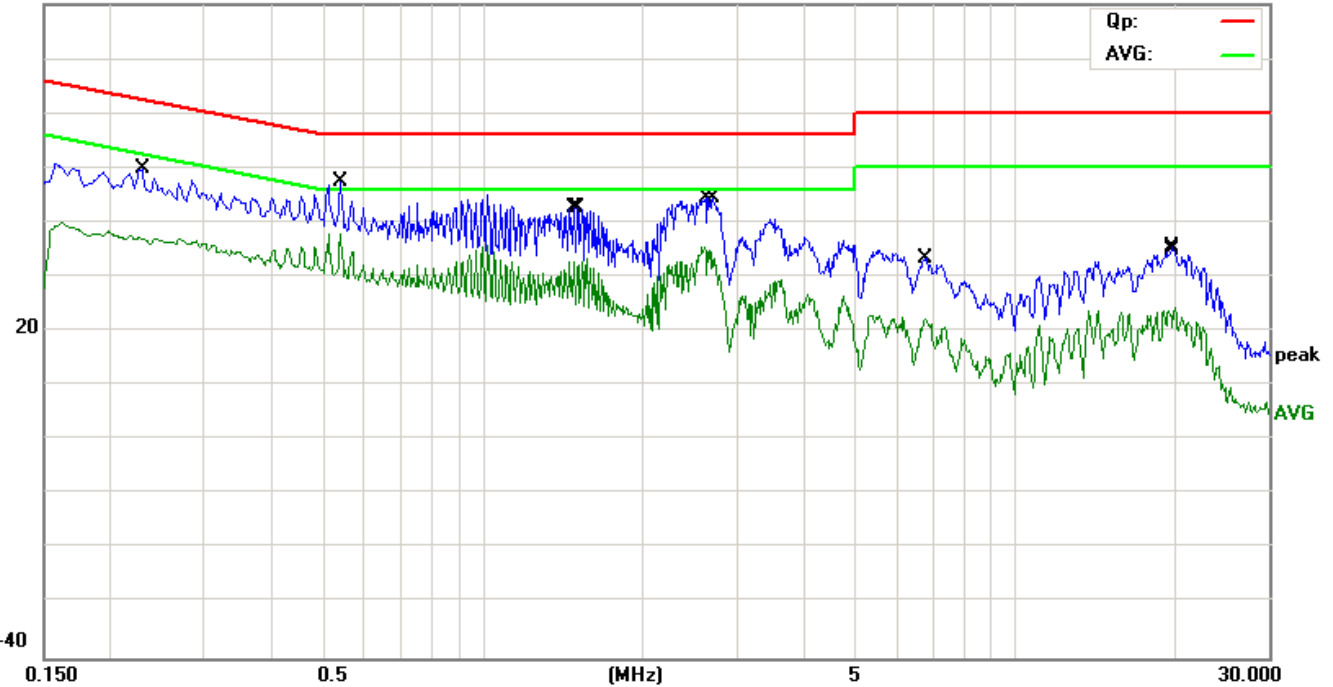
5.2.4 Test Result

Pass

Note: All test modes are performed, only the worst case is recorded in this report.
Please refer the following pages.

EUT:	Smart cushion	M/N:	UM100335
Mode:	FSK mode	Phase:	L1
Tested by:	Sunny(Engineer)	Power:	DC 5 V by adapter
Temperature: / Humidity	25.0°C / 53.0%	Test date:	2017-02-07

80.0 dBuV

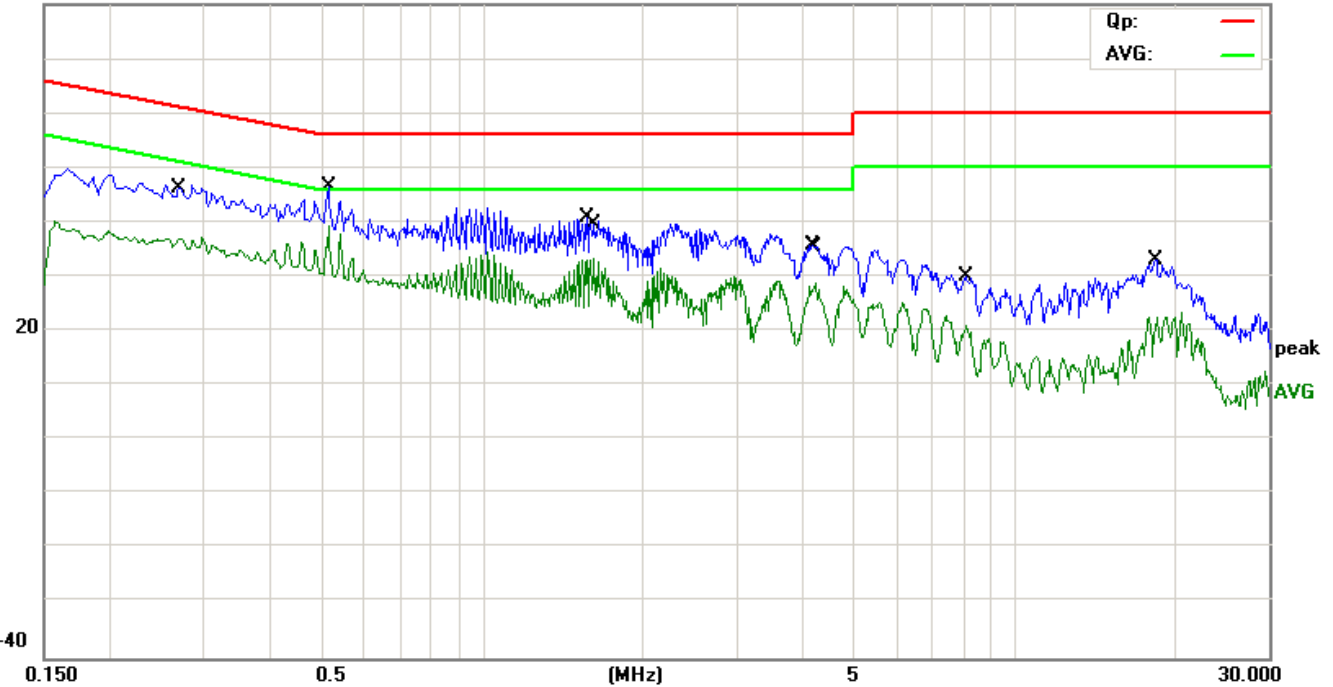


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2260	27.62	9.60	37.22	52.60	-15.38	AVG	
2		0.2300	40.16	9.60	49.76	62.45	-12.69	QP	
3		0.5420	37.99	9.59	47.58	56.00	-8.42	QP	
4	*	0.5420	28.38	9.59	37.97	46.00	-8.03	AVG	
5		1.4580	23.18	9.60	32.78	46.00	-13.22	AVG	
6		1.4860	33.06	9.60	42.66	56.00	-13.34	QP	
7		2.5940	25.86	9.61	35.47	46.00	-10.53	AVG	
8		2.7100	34.94	9.61	44.55	56.00	-11.45	QP	
9		6.7900	23.83	9.65	33.48	60.00	-26.52	QP	
10		6.7900	12.71	9.65	22.36	50.00	-27.64	AVG	
11		19.7620	25.72	9.73	35.45	60.00	-24.55	QP	
12		19.9980	14.76	9.73	24.49	50.00	-25.51	AVG	

*:Maximum data x:Over limit !:over margin

EUT:	Smart cushion	M/N:	UM100335
Mode:	FSK mode	Phase:	N
Tested by:	Sunny(Engineer)	Power:	DC 5 V by adapter
Temperature: / Humidity	25.0°C / 53.0%	Test date:	2017-02-07

80.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2700	36.76	9.60	46.36	61.12	-14.76	QP	
2		0.2700	27.33	9.60	36.93	51.12	-14.19	AVG	
3		0.5140	36.89	9.59	46.48	56.00	-9.52	QP	
4	*	0.5140	29.90	9.59	39.49	46.00	-6.51	AVG	
5		1.5700	31.10	9.60	40.70	56.00	-15.30	QP	
6		1.6220	23.66	9.60	33.26	46.00	-12.74	AVG	
7		4.1620	26.12	9.62	35.74	56.00	-20.26	QP	
8		4.2420	19.19	9.62	28.81	46.00	-17.19	AVG	
9		8.0780	20.33	9.66	29.99	60.00	-30.01	QP	
10		8.1060	11.41	9.66	21.07	50.00	-28.93	AVG	
11		18.3740	23.28	9.72	33.00	60.00	-27.00	QP	
12		18.4780	12.97	9.72	22.69	50.00	-27.31	AVG	

*:Maximum data x:Over limit !:over margin

5.3 Radiated Emission

5.3.1 Requirement

According to FCC section 15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Test Distance (m)	Field Strength ($\text{dB}\mu\text{V/m}$ at 3-meter)
0.009 - 0.490	$2400/F(\text{kHz})$	300	128.5-93.8
0.490 - 1.705	$24000/F(\text{kHz})$	30	73.8-63.0
1.705-30	30	30	69.5
30-88	100	3	40
88-216	150	3	43.5
216-960	200	3	46
Above 960	500	3	54

Note:

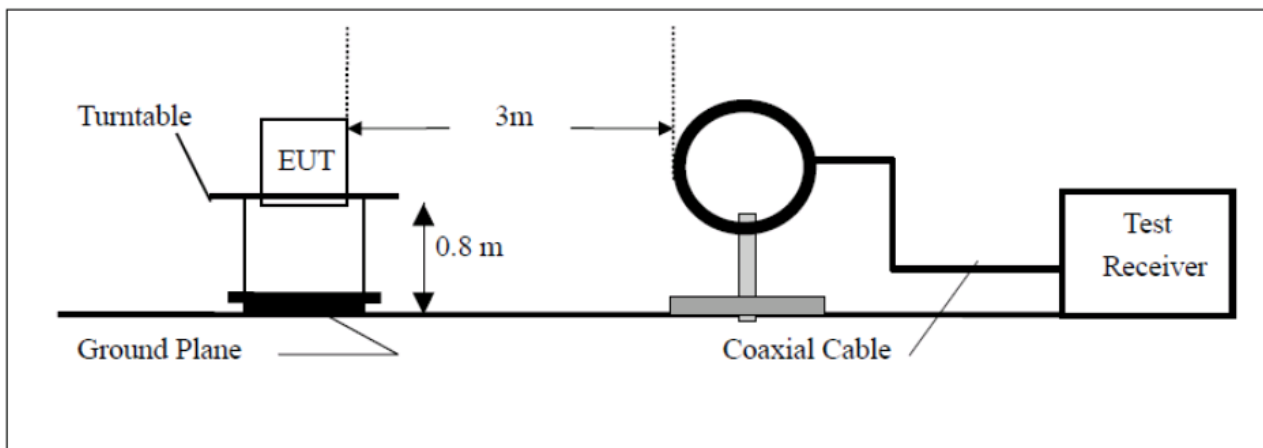
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

2. For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

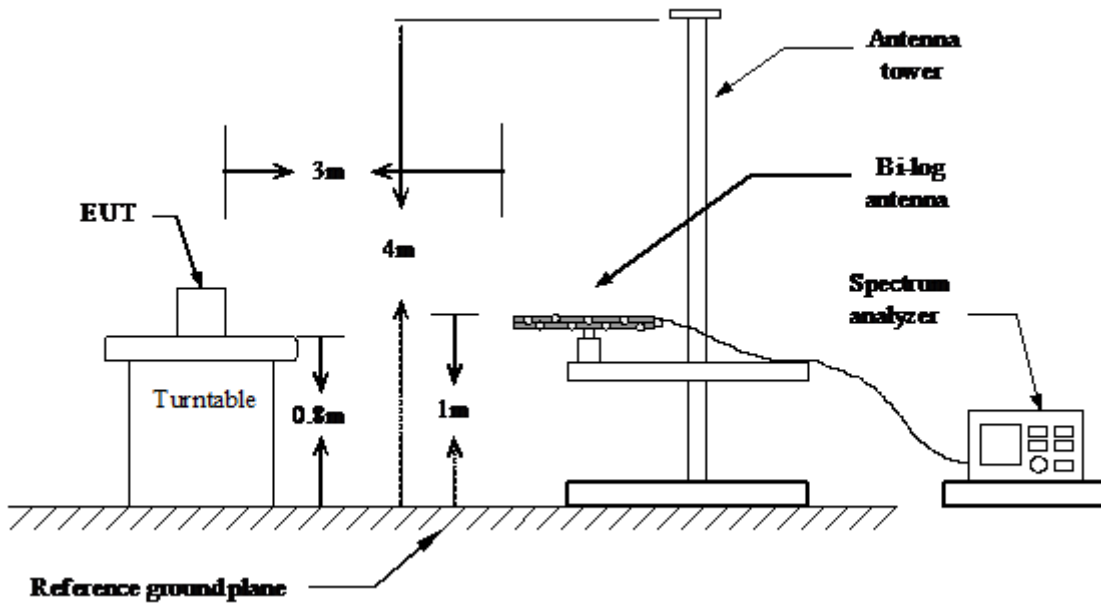
5.4.2 Test Configuration

Test Setup:

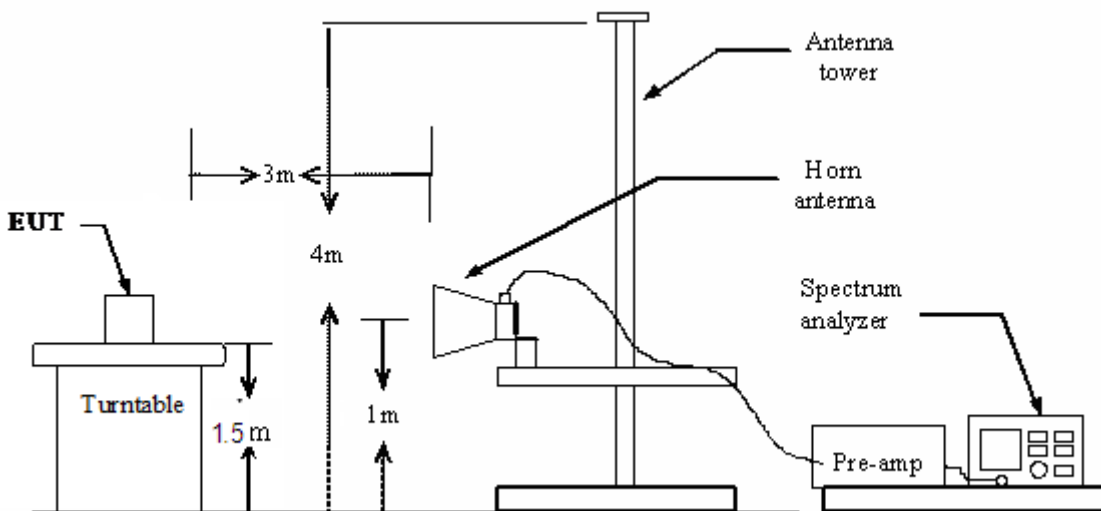
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



5.4.3 Test Procedure:

1. The EUT was placed on the top of a wooden table 0.8 meters (for measurement at frequency below 1GHz) and a wooden table 1.5 meters (for measurement at frequency above 1GHz) 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 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter, for the test frequency of above 1GHz, horn antenna opening in the test would have been facing the EUT when rise or fall) and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. Set the spectrum analyzer in the following setting as:

Below 1GHz: PEAK: RBW=100 kHz / VBW=300 kHz / Sweep=AUTO QP: RBW=120 kHz / Sweep=AUTO
Above 1GHz: (a)PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b)AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

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 10dB 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 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

5.4.4 Test Result

Pass

Please refer the following pages.

Fundamental & harmonic frequency measurement:

Test Frequency (MHz)	Peak (dB μ V/m)		Limits (dB μ V/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
0.125	77.10	76.33	125.67	-48.57	-49.34
0.250	---	---	---	---	---
0.375	---	---	---	---	---
0.500	---	---	---	---	---
0.625	---	---	---	---	---
0.750	---	---	---	---	---

Note:

1: Limit calculation and transfer to 3m test distance:

According to FCC 15.209 (a)(d), FCC 15.31 (f)(2) and FCC 15.35,

If the frequency between 9 to 490kHz,

$$\text{Limit (AV)} = 20\log(2400/f(\text{kHz})) + 40\log(300/3)$$

$$\text{Limit (Peak)} = \text{Limit (AV)} + 20\text{dB}$$

If the frequency between 490kHz to 1.705MHz,

$$\text{Limit (QP)} = 20\log(24000/f(\text{kHz})) + 40\log(30/3)$$

- 2: Data of measurement within this frequency range shown “--- ” in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.

Spurious measurement (other than Fundamental & harmonic frequency):**Below 30MHz:**

Spurious Emission					
Test Frequency (MHz)	Quasi-Peak (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
1.923	25.5	26.5	69.5	43.0	43.0
3.548	25.4	26.1	69.5	44.1	43.4
9.687	25.3	26.2	69.5	44.2	43.3
11.853	25.5	26.5	69.5	44.0	43.0
20.496	25.4	26.6	69.5	44.0	42.9
25.348	25.5	26.4	69.5	44.0	43.1

30MHz-1GHz:

Spurious Emission					
Test Frequency (MHz)	Quasi-Peak (dBμV/m)		Limits (dBμV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
39.025	32.08	26.23	40.00	7.92	13.77
45.535	31.70	35.47	40.00	8.30	4.53
66.266	36.47	35.70	40.00	3.53	4.30
76.244	30.77	31.98	40.00	9.32	8.02
88.342	29.54	34.39	43.50	13.96	9.11
130.379	29.53	28.11	43.50	13.97	15.39

End of Report