FCC Part 15.247
TEST REPORT

for

Odin

Model Name: MG758/MG75X/MG75875075X/MG752/E750
Trade Name: UniStrong
Brand Name: UniStrong
Report No: SH11110007B02
FCC ID: YYEMG75875075X

prepared for

Beijing UniStrong Science & Technology Co., Ltd
6f East, A2 Building, #9 Jiuxianqiao East Road, Chaoyang District,
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prepared by

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LAB CODE 20081223-00

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1. Test Report Certification

Equipment under Test:	Odin
Trade Name:	UniStrong
Brand Name:	UniStrong
Model Name:	MG758/MG75X/MG75875075X/MG752/E750
FCC ID:	YYEMG75875075X
Applicant:	Beijing UniStrong Science & Technology Co., Ltd 6F East, A2 Building,#9 Jiuxianqiao East Road, Chaoyang District, Beijing 100015,China
Manufacturer:	Beijing UniStrong Science & Technology Co., Ltd 6F East, A2 Building,#9 Jiuxianqiao East Road, Chaoyang District, Beijing 100015,China
Test Standards:	47 CFR Part 15,Subpart C
Test Date(s):	Nov.14, 2011 –Nov.16, 2011
Test Result:	PASS

*** We Hereby Certify That:**

The equipment under test was tested by Shenzhen Electronic Product Quality Testing Center Morlab Laboratory. The test data, data evaluation, test procedures and equipment configurations shown in this report were made in accordance with the requirement of related FCC rules.

The test results of this report only apply for the tested sample equipment identified above. The test report shall be invalid without all the signatures of the test engineer, the reviewer and the approver.

Tested by: Shi Feng Dated: 2011.11.24

Shi Feng

Reviewed by: Zhang Jun Dated: 2011.11.24

Zhang Jun

Approved by: Wei Bei Dated: 2011.11.24

Wei Bei

2. General Information

2.1. Description of EUT

Product Feature & Specification	
Equipment	Odin
Brand Name	UniStrong
Model Number	MG758/MG75X/MG75875075X/MG752/E750
Frequency Range	2400MHz~2483.5MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1MHz;n=0~78
Channel Spacing	1MHz
Max Transmit Power To antenna	Bluetooth (1Mbps) : 0.57 dBm (0.00114 W) Bluetooth EDR (2Mbps) : 0.35 dBm (0.00108 W) Bluetooth EDR (3Mbps) : 0.51 dBm (0.00112 W)
Modulation Technique	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
Antenna Information	Chip Antenna with gain 5 dBi
Hardware Version	v2.6
Software Version	E750_V2.6_CHS_V1.00
EUT Stage	Production Unit

NOTE:

1. The EUT is a Mobile Phone, it contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies allocated for the Bluetooth Module is F(MHz)=2402+1*n (0<=n<=78). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 39 (2441MHz) and 78 (2480MHz).

2. The above EUT's information was declared by manufacturer.. For a more detailed features description about the EUT, please refer to User's Manual.

2.2. Test Standards and Results

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC Public Notice DA 00-705
- ANSI C63.4-2003

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

Test items and the results are as bellow:

№	FCC Rules	Test Type	Limits	Result
1	15.247(b)(1)	Peak Output Power	≤ 1W	PASS
2	15.247(d)	Band Edge	≤ 20dBc	PASS
3	15.207	Conducted Emission	15.207(a)	PASS
4	15.247(d)	Radiated Emission	15.209(a) & 15.247(d)	PASS

2.3. Test Facility

Shenzhen Electronic Product Quality Testing Center Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L1659.

All measurement facilities used to collect the measurement data are located at Electronic Testing Building, Shahe Road, Xili, Nanshan District, Shenzhen 518055 CHINA. The test site is constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22; the FCC registration number is 741109.

2.4. Environmental conditions

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

Temperature (℃):	20 - 25
Relative Humidity (%):	40 - 60
Atmospheric Pressure (kPa):	96

2.5. Operation mode of test

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).
Pre-scanned tests were conducted to determine the final configuration from all possible combinations. The following tables are showing the test modes as the worst cases and recorded in this report.

TEST MODE			
BT Data Rate / Modulation	**Conducted Mode**	**Radiated Mode**	**AC Conducted Emission**
Bluetooth 1Mbps GFSK	Channel 00_2402 MHz	Channel 00_2402 MHz	GSM 850 Idle + BT link + Adapter
	Channel 39_2441 MHz	Channel 39_2441 MHz	
	Channel 78_2480 MHz	Channel 78_2480 MHz	
Bluetooth EDR 2Mbps π /4-DQPSK	Channel 00_2402 MHz	N/A	
	Channel 39_2441 MHz		
	Channel 78_2480 MHz		
Bluetooth EDR 3Mbps 8-DPSK	Channel 00_2402 MHz	N/A	
	Channel 39_2441 MHz		
	Channel 78_2480 MHz		

2.6. Ancillary Equipents List

Equipment	Model	Trade	FCC ID	Data cable	Power cord
Bluetooth base station	MT8852B	Anritsu	/	N/A	Unshieding,1.8m
Notebook PC	SL410	IBM	/	N/A	Unshieding,1.8m
BT earphone	BH-105	NOKIA	/	N/A	/

3. Peak Output Power

3.1. Requirement

According to FCC section 15.247(b)(1), for frequency hopping systems that operates in the 2400MHz to 2483.5MHz band employing at least 75 hopping channels, the maximum peak output power of the intentional radiator shall not exceed 1Watt. For all other frequency hopping systems in the 2400MHz to 2483.5MHz band, it is 0.125Watts.

3.2. Test Description

See section 3.2 of this report.

3.3. Test Result

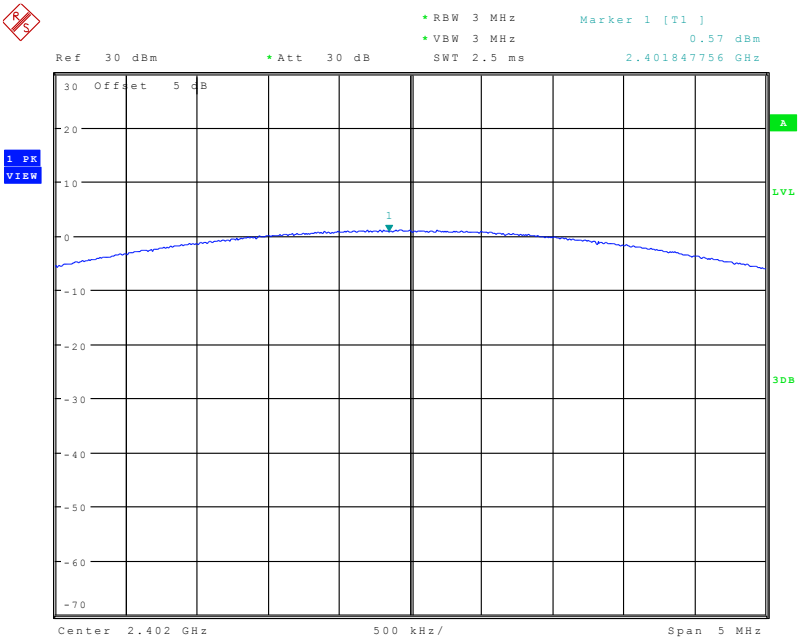
The Bluetooth Module operates at hopping-off test mode. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

Channel	Frequency (MHz)	Measured Output Peak Power(dBm)			Limit	Verdict
		Data Rate/Modulation				
		GFSK	π /4-DQPSK	8-DPSK	dBm	
		1Mbps	2Mbps	3Mbps		
0	2402	0.57	0.35	0.51	30	PASS
39	2441	-0.17	-0.28	-0.20		PASS
78	2480	-0.95	-1.21	-1.11		PASS

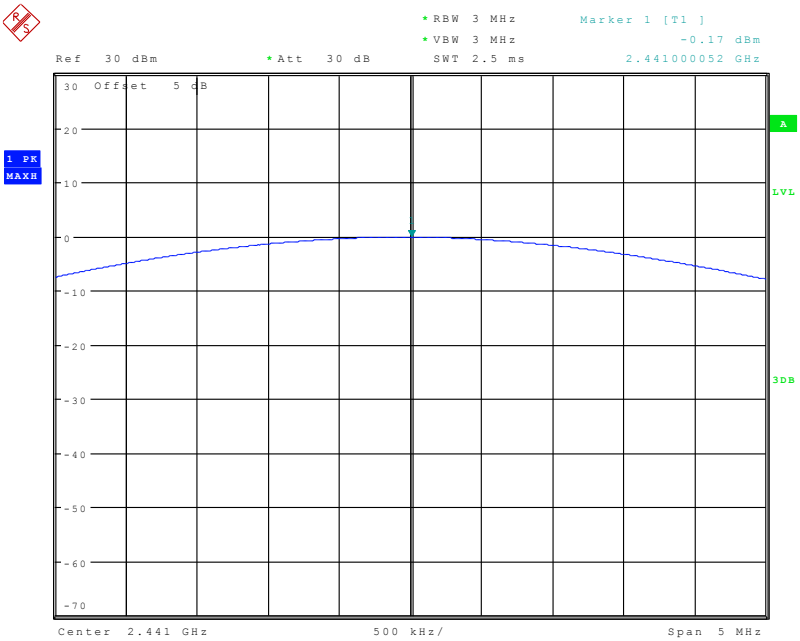
GFSK (1Mbps)

Channel	Frequency (MHz)	Measured Output Peak Power			Limit		Verdict
		dBm	W	Refer to Plot	dBm	W	
0	2402	0.57	0.00114	Plot A	30	1	PASS
39	2441	-0.17	0.00096	Plot B			PASS
78	2480	-0.95	0.00080	Plot C			PASS

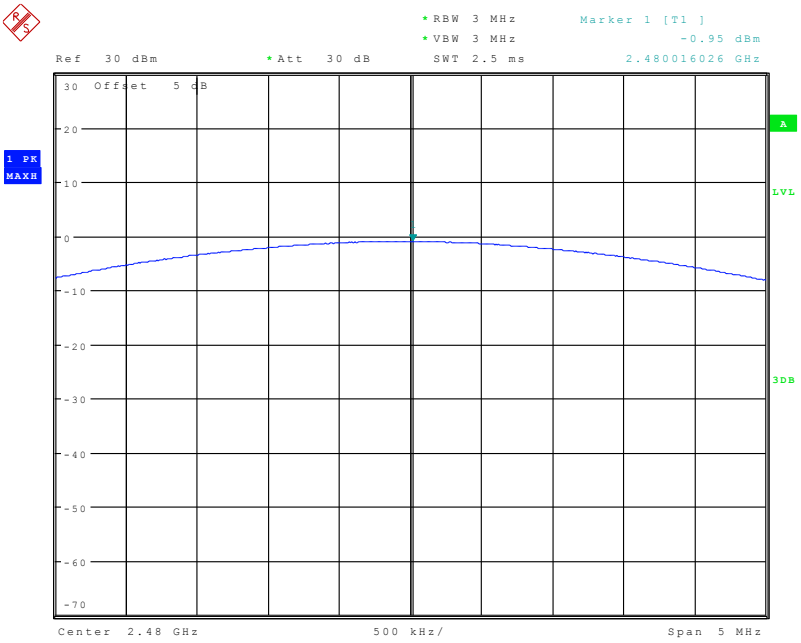
3.3.1. Test Plots:



(Plot A: Channel = 2402)



(Plot B: Channel = 2441)



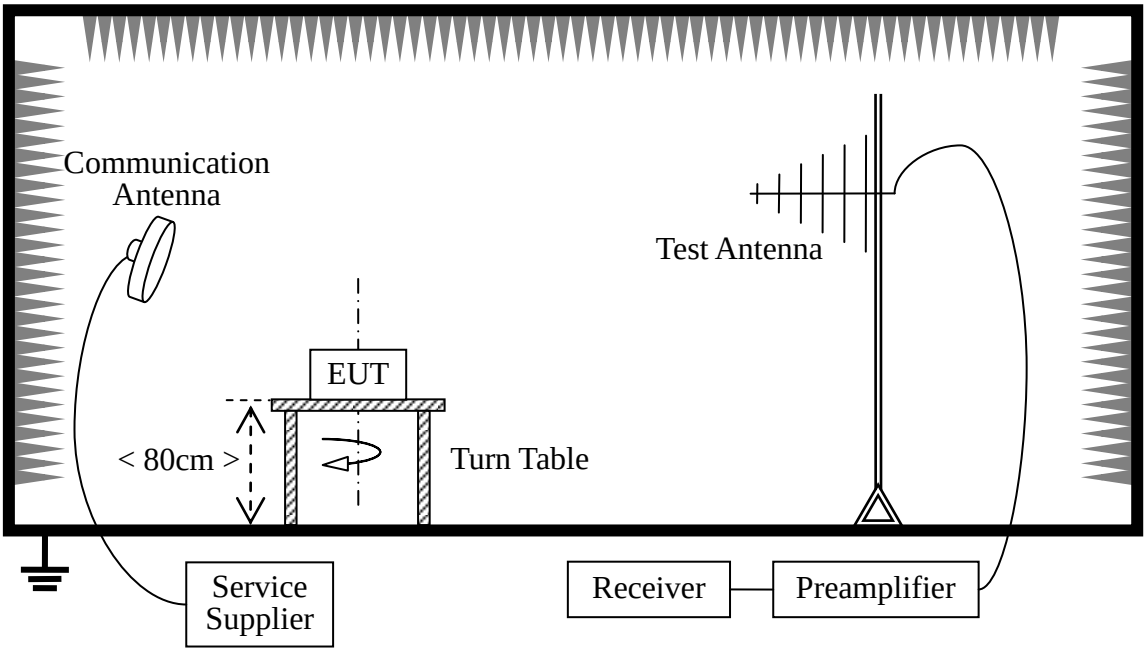
(Plot C: Channel = 2480)

4. Radiated Band Edge

4.1. Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

4.2. Test Description



4.3. Test Result

The Bluetooth Module operates at hopping-off test mode. The lowest and highest channels are tested to verify the band edge emissions.

4.3.1. Radiated Band Edge：

Frequency (MHz)	Measure Level (dBuV/m)	Correct Factor (dB)	Reading Level (dBuV)	Limit (dBuV/m)	Detector Type	Antenna Polarity
2400	48.51	0.35	48.16	74	Peak	H
2400	32.57	0.35	32.22	54	Average	
2400	48.24	0.35	47.89	74	Peak	V
2400	31.78	0.35	31.43	54	Average	
2483.5	52.64	0.64	52.00	74	Peak	H
2483.5	41.61	0.64	40.97	54	Average	
2483.5	51.65	0.64	51.01	74	Peak	V
2483.5	41.18	0.64	40.54	54	Average	

NOTE：

Measurement Level = Reading Level + Correct Factor

5. Conducted Emission

5.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

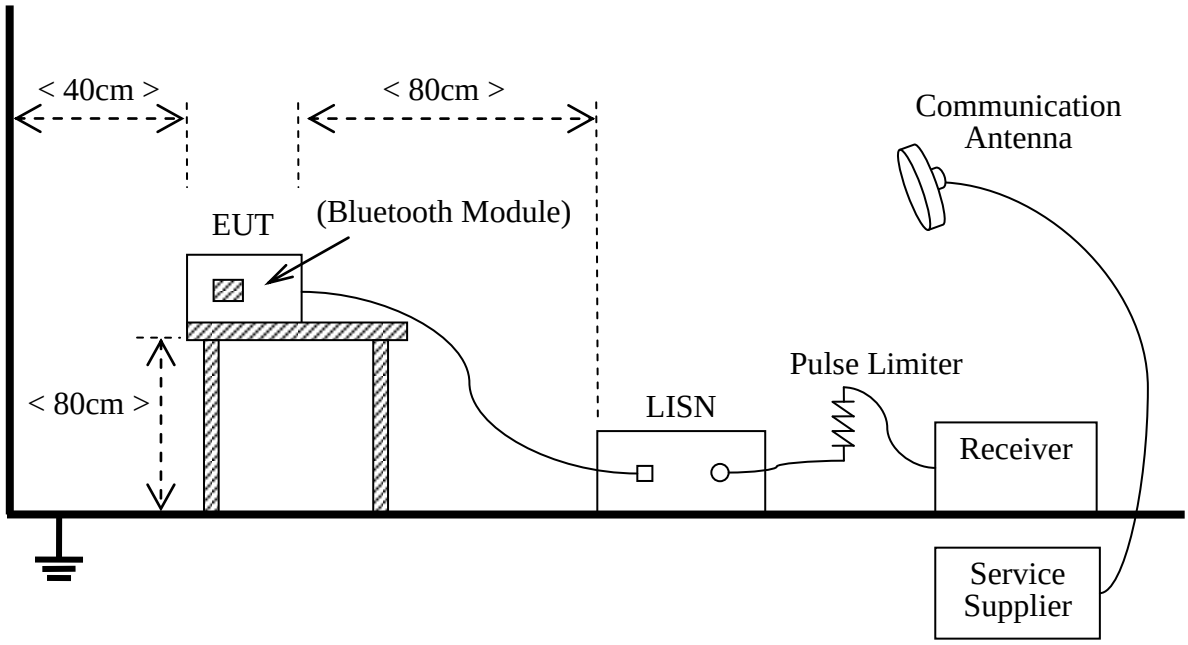
Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

NOTE:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

5.2. Test Description



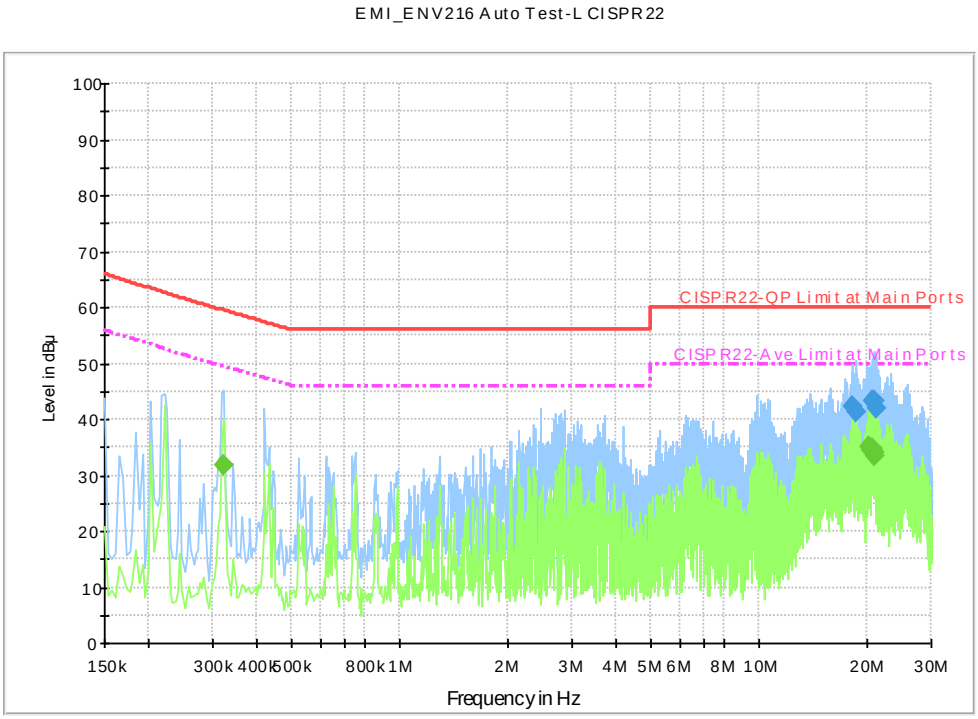
The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.4:2003

The Bluetooth Module of the EUT is powered by the Battery charged with the AC Adapter which is

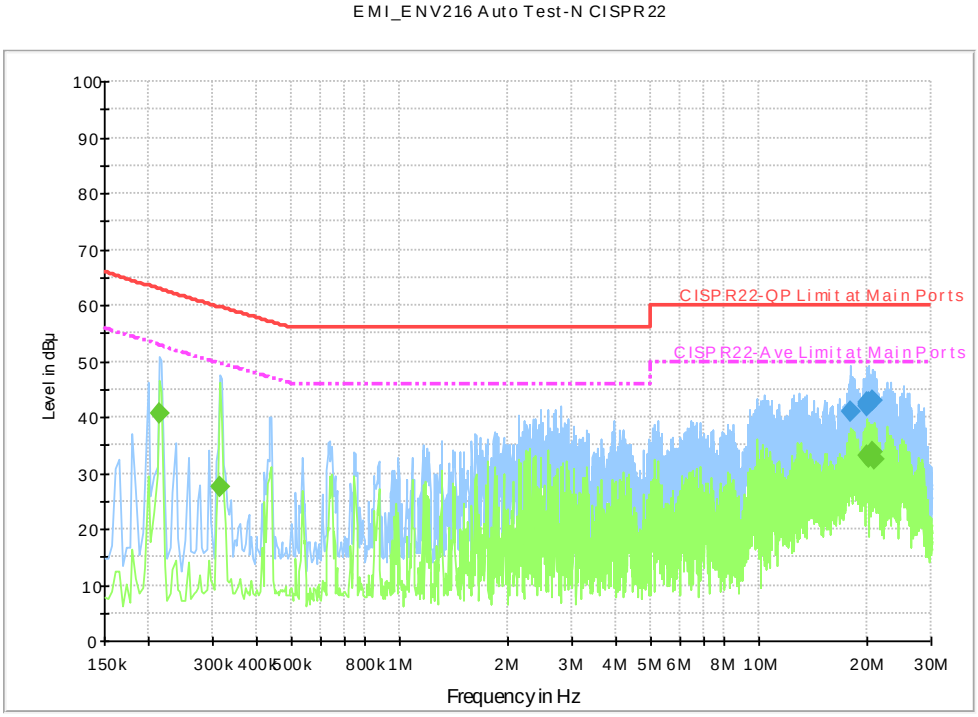
powered by 120V, 60Hz AC mains supply. The factors of the site are calibrated to correct the reading. During the measurement, the Bluetooth Module is activated and controlled by the Bluetooth Service Supplier (SS) via a Common Antenna, and is set to operate under hopping-on test mode transmitting 339 bytes DH5 packages at maximum power.

5.3. Test Result

The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.



(Plot A: L Phase)



(Plot B: N Phase)

6. Radiated Emission

6.1. Requirement

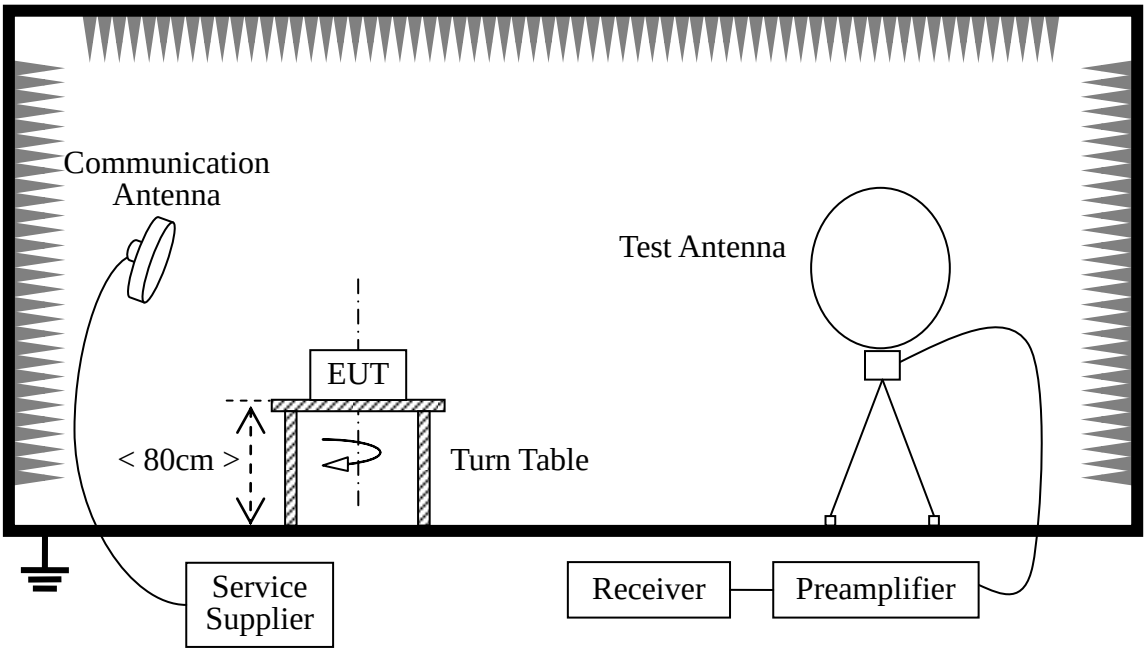
According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

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:

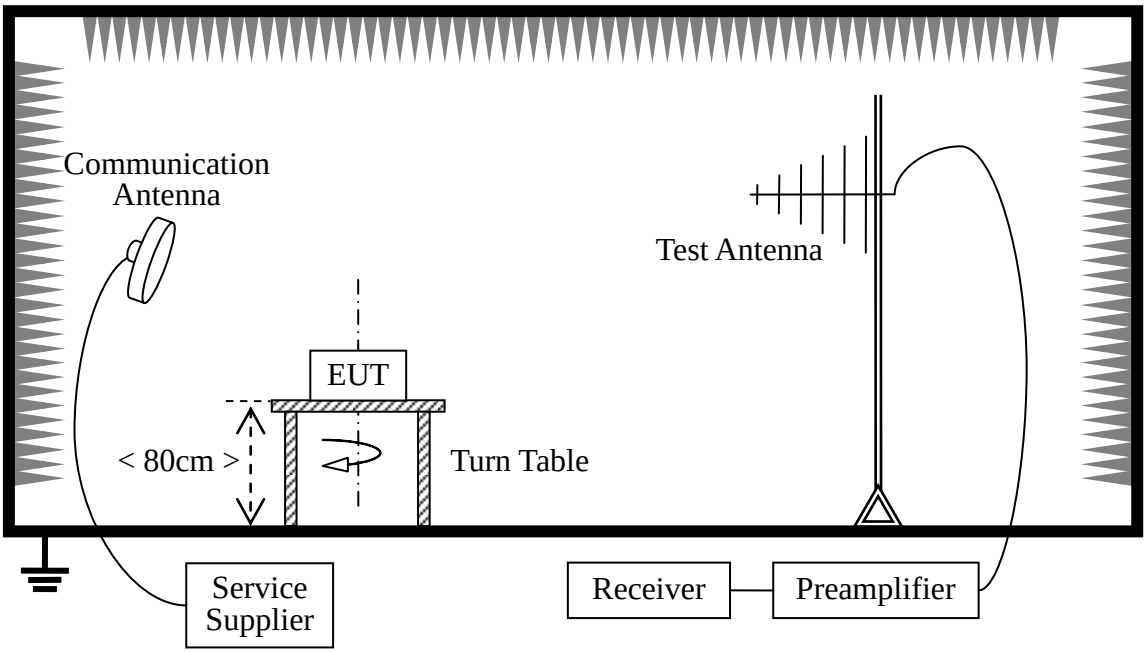
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
960 - 1000	500	3
Above 1000	500	3

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

6.2. Test Description



radiated emissions below 30MHz



radiated emissions above 30MHz

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 (2003). The EUT was set-up on insulator 80cm above the Ground Plane. The set-up and test methods were according to ANSI C63.4.

The Bluetooth Module of the EUT is powered by the Battery charged with the AC Adapter which is powered by 120V, 60Hz AC mains supply. The Module is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading. During the measurement, the Bluetooth Module is activated and controlled by the Bluetooth Service Supplier (SS) via a Common Antenna, and is set to operate under hopping-on test mode transmitting 339 bytes DH5 packages at maximum power.

For the Test Antenna: In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength, the azimuth range of turntable was 0^o to 360^o, the receive antenna has two polarizations horizontal and vertical. When doing measurements above 1GHz, the EUT was placed within the 3dB beam width range of the horn antenna, and the EUT was tested in 3 orthogonal positions as recommended in ANSI C63.4 for Radiated Emissions and the worst-case data was presented.

6.3. Test Result

6.3.1. Test Result for 9 kHz ~ 30 MHz:

Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
--	--	10	--	See Note

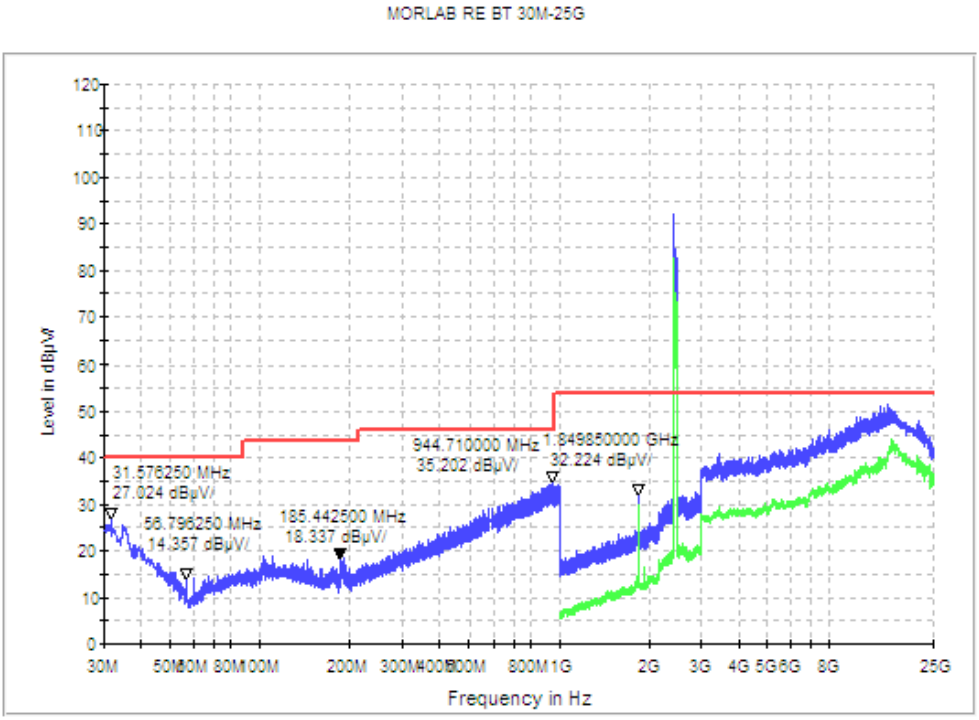
Note:

a) The amplitude of spurious emissions that are attenuated by more than 10dB below the permissible value has no need to be reported.

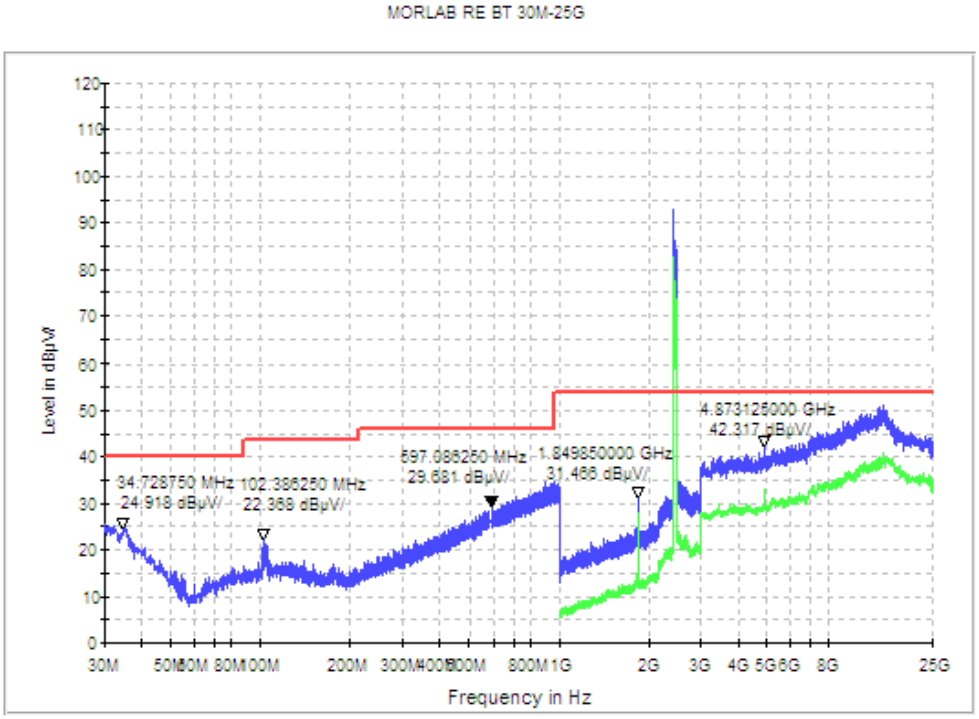
b) Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

c) Limit line = specific limits (dBuV) + distance extrapolation factor.

6.3.2. Test Result for 30 MHz ~ 10th Harmonic:



(Plot A.1: Antenna Horizonta)



(Plot A.2: Antenna Vertical)

7. List of Equipments Used

Description	Manufacturer	Model No.	Cal. Date	Due Date	Serial No.
Test Receiver	Rohde & Schwarz	ESCI3	2011.9	2012.9	100666
Spectrum Analyzer	Rohde & Schwarz	FSP30	2011.9	2012.9	101020
Spectrum Analyzer	Rohde & Schwarz	FSU26	2011.9	2012.9	200880
System Simulator	Agilent	E5515C	2011.9	2012.9	GB46040102
System Simulator	Rohde&Schwarz	CMU200	2011.9	2012.9	105571
LISN	Rohde & Schwarz	ENV216	2011.9	2012.9	812744
Loop Antenna	Rohde & Schwarz	HFH2-Z2	2010.9	2012.9	A0304220
Ultra Broadband Ant.	Rohde & Schwarz	HL562	2010.9	2012.9	A0304224
Horn Ant.	Rohde & Schwarz	HF906	2010.9	2012.9	100150
DC power supply	HP	66309D	2010.9	2012.9	US39070653
Shield Room	ETS	Site 1	/	/	A0304188
Anechoic Chamber	ETS	EMC9×6×6 (m)	/	/	/

**** END OF REPORT ****