FCC 47 CFR PART 15 SUBPART B

TEST REPORT

For

Applicant :	**GTSYS Limited**
Address :	**23/F, Heng Shan Centre, 145 Queen's Road East, Wan Chai, Hong Kong**
Product Name :	**SMALL Reader**
Model Name :	**IR-U-POE**
Brand Name :	**GTSYS "R.I.A."**
FCC ID :	**A2BIRUPOE-07-30DB**
Report No. :	**STS140522F1**
Date of Issue :	**June. 24, 2014**

Issued by :	**Shenzhen Super Test Service Technology Co., Ltd.**
Address :	**No.5, Langshan 2nd Rd., North Hi-Tech Industrial Park, Nanshan Shenzhen, China**
Tel :	**86-755-2795 8522**
Fax :	**86-755-2795 8022**

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1. VERIFICATION OF CONFORMITY

Equipment Under Test:	SMALL Reader
Brand Name:	GTSYS "R.I.A."
Model Number:	IR-U-POE
Series Model Name:	N/A
Difference description:	N/A
FCC ID:	A2BIRUPOE-07-30DB
Applicant:	GTSYS Limited 23/F, Heng Shan Centre, 145 Queen's Road East, Wan Chai, Hong Kong
Manufacturer:	CWLinux Limited Unit 138, 13/F Weswick Cermercial Bld. 147-151 Queen's Road East , Wan Chai, Hong Kong
Technical Standards:	FCC Part 15 B
File Number:	STS140522F1
Date of test:	June 09, 2014 ~ June 24, 2014
Deviation:	None
Condition of Test Sample:	Normal
Test Result:	PASS

The above equipment was tested by STS for compliance with the requirements set forth in FCC Part 15 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): Zhang Ling

Review by (+ signature): July Wen

Approved by (+ signature): Terry Yang

2. GENERAL INFORMATION

2.1 PRODUCT INFORMATION

EUT Description	
Description:	SMALL Reader
Brand Name:	GTSYS "R.I.A."
Model Name:	IR-U-POE
Series Number:	N/A
Model Difference description:	N/A
Power Supply:	This deceive is powered by Adapter
Frequency Range:	902.75MHz-927.25MHz(Low:902.75MHz,Middle:914.75MHz, High:927.25MHz)
Number of Channels:	50
Modulation Technique:	DSB-ASK
Antenna Type:	Internal
Antenna Gain:	7 dBi
Temperature Range:	-20°C ~ +55°C

NOTE:

1. Please refer to Appendix 2 for the photographs of the EUT. For a more detailed features description about the EUT, please refer to User's Manual.

2.2 OBJECTIVE

Perform FCC Part 15 Subpart B tests for FCC Marking.

2.3 TEST STANDARDS AND RESULTS

Test items and the results are as bellow:

EMISSION				
Standard	**Item**		**Result**	**Remarks**
FCC 47 CFR Part 15 Subpart B (10-1-05 Edition)	§15.107	Conducted Emission	PASS	Meet Class B limit
	§15.109	Radiated Emission	PASS	Meet Class B limit

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: 15-35ºC
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa

3. TEST FACILITY

Test Site: BZT Testing Technology Co.,Ltd.

Location: 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

Description: The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003.
FCC Registration No.: 701733

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 SUPPORT EQUIPMENT

Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
Notebook	lenovo	8890	N/A	L3-A19107/08	N/A	N/A

Remark:
All the equipment/cables were placed in the worst-case [-configuration to maximize the emission during the test.
Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.3 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 due date
1	Test Receiver	Rohde & Schwarz	ESCI	100492	2014/03/14	2015/03/14
2	L.I.S.N.	Rohde & Schwarz	ENV216	100093	2014/03/14	2015/03/14
3	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2014/03/14	2015/03/14
4	Terminator	Hubersuhner	50Ω	No.1	2014/03/14	2015/03/14
5	RF Cable	SchwarzBeck	N/A	No.1	2014/03/14	2015/03/14
6	Test Receiver	Rohde & Schwarz	ESPI	101202	2014/03/14	2015/03/14
7	Bilog Antenna	Sunol	JB3	A121206	2014/03/14	2015/03/14
8	Test Antenna - Horn	Schwarzbeck	BBHA 9120C	--	2014/03/14	2015/03/14
9	Test Antenna - Bi-Log	Schwarzbeck	VULB 9163	--	2014/03/14	2015/03/14
10	Cable	Resenberger	N/A	NO.1	2014/03/14	2015/03/14
11	Cable	SchwarzBeck	N/A	NO.2	2014/03/14	2015/03/14
12	Cable	SchwarzBeck	N/A	NO.3	2014/03/14	2015/03/14
13	DC Power Filter	DuoJi	DL2×30B	N/A	2014/03/14	2015/03/14
14	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	2014/03/14	2015/03/14
15	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	2014/03/14	2015/03/14
16	Test Receiver	Rohde & Schwarz	ESCI	100492	2014/03/14	2015/03/14
17	Absorbing Clamp	Luthi	MDS21	3635	2014/03/14	2015/03/14
18	Coaxial Switch	Anritsu Corp	MP59B	6200283933	2014/03/14	2015/03/14
19	AC Power Source	Kikusui	AC40MA	LM003232	2014/03/14	2015/03/14
20	Test Analyzer	Kikusui	KHA1000	LM003720	2014/03/14	2015/03/14
21	Line Impendence Network	Kikusui	LIN40MA-PCR-L	LM002352	2014/03/14	2015/03/14
22	ESD Tester	Kikusui	KES4021	LM003537	2014/03/14	2015/03/14
23	EMCPRO System	EM Test	UCS-500-M4	V0648102026	2014/03/14	2015/03/14
24	Signal Generator	IFR	2032	203002/100	2014/03/14	2015/03/14
25	Amplifier	A&R	150W1000	301584	2014/03/14	2015/03/14
26	CDN	FCC	FCC-801-M2-25	47	2014/03/14	2015/03/14
27	CDN	FCC	FCC-801-M3-25	107	2014/03/14	2015/03/14
28	EM Injection Clamp	FCC	F-203I-23mm	403	2014/03/14	2015/03/14
29	RF Cable	MIYAZAKI	N/A	No.1/No.2	2014/03/14	2015/03/14
30	Universal Radio Communication Tester	ROHDE&SCHWARZ	CMU200	0304789	2014/03/14	2015/03/14
31	Telecommunication Antenna	European Antennas	PSA 75301R/170	0304213	2014/03/14	2015/03/14

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

5. 47 CFR PART 15B REQUIREMENTS

5.1 GENERAL INFORMATION

EUT Function and Test Mode

Mode 1: Idle Mode

During the test, the EUT connected the Notebook via USB cable and was on idle mode.

The EUT configuration of the emission test was **EUT + Notebook.**

Mode 2 Transmitter Mode

During the test, the EUT was connected with the Notebook via USB cable and was on transmitter mode.

The EUT configuration of the emission test was **EUT + Notebook.**

NOTE:

All test modes are performed, only the worse cases are recorded in this report.

6. LINE CONDUCTED EMISSION TEST

6.1. LIMITS OF LINE CONDUCTED EMISSION TEST

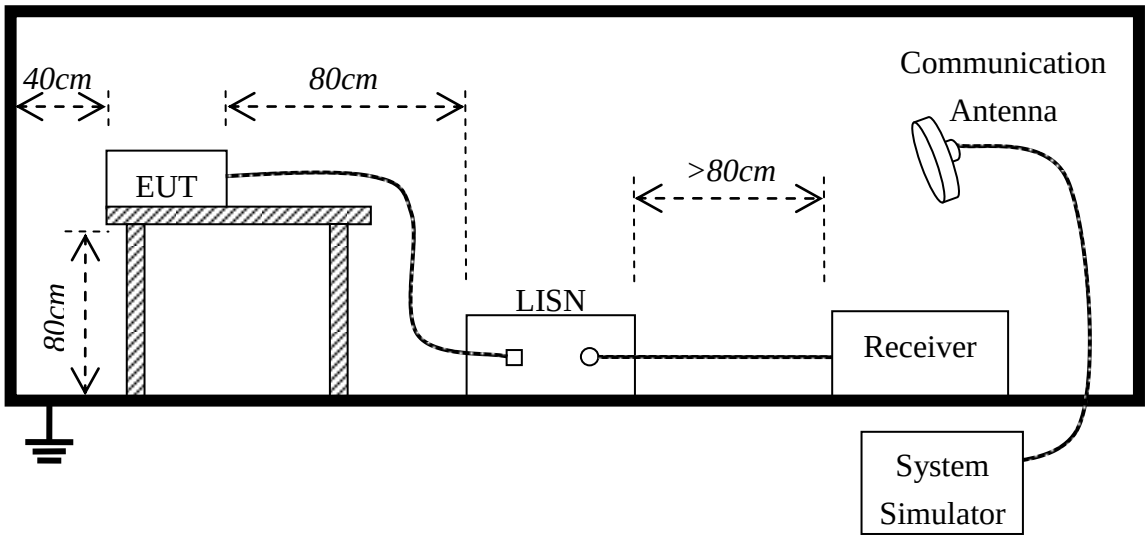
According to FCC §15.107, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

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

6.2. BLOCK DIAGRAM OF TEST SETUP



6.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per FCC Part 15 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2) Support equipment, if needed, was placed as per FCC Part 15.
3) All I/O cables were positioned to simulate typical actual usage as per FCC Part 15.
4) The EUT received DC 5V power by AC/DC adapter which through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5) All support equipments received power from a second LISN supplying power of AC 120V/60Hz, if any.
6) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7) Analyzer / Receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes.
8) During the above scans, the emissions were maximized by cable manipulation.
9) The following test mode(s) were scanned during the preliminary test:

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

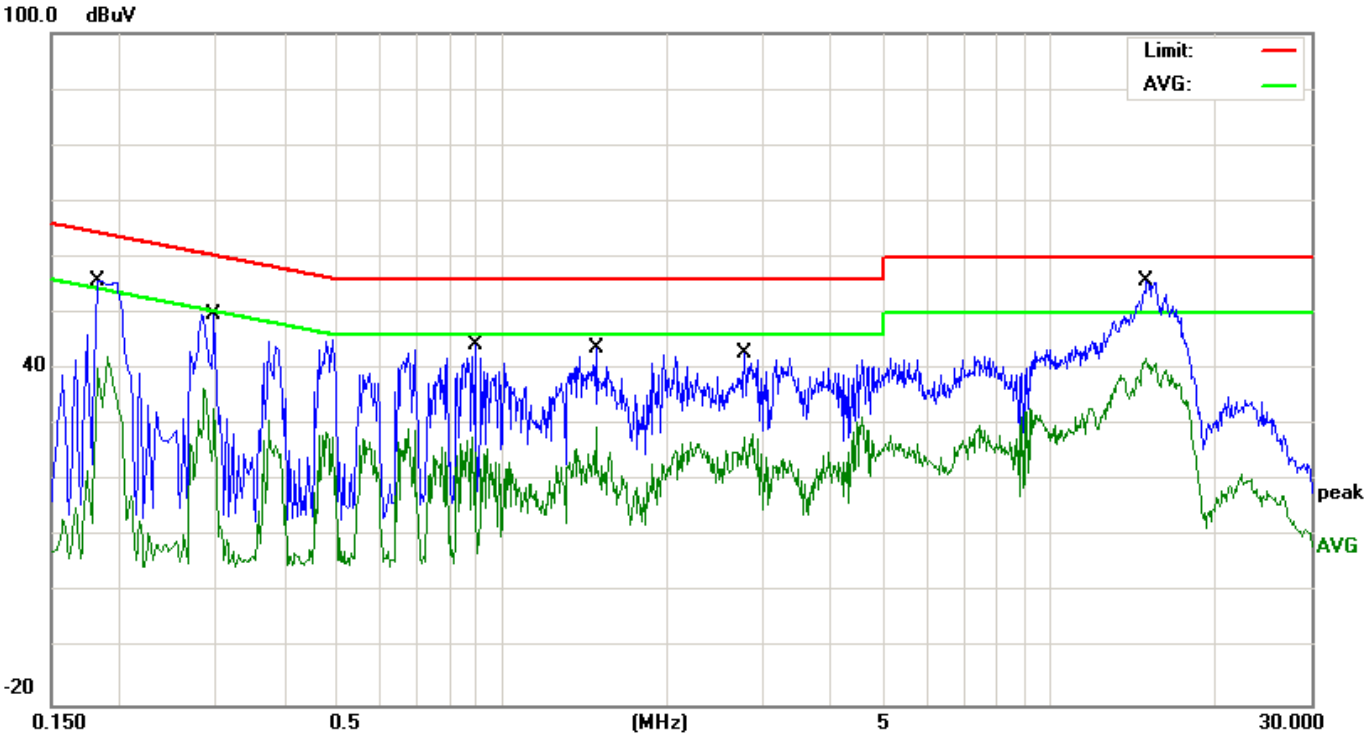
6.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

EUT and support equipment was set up on the test bench as per step 9 of the preliminary test.

A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.

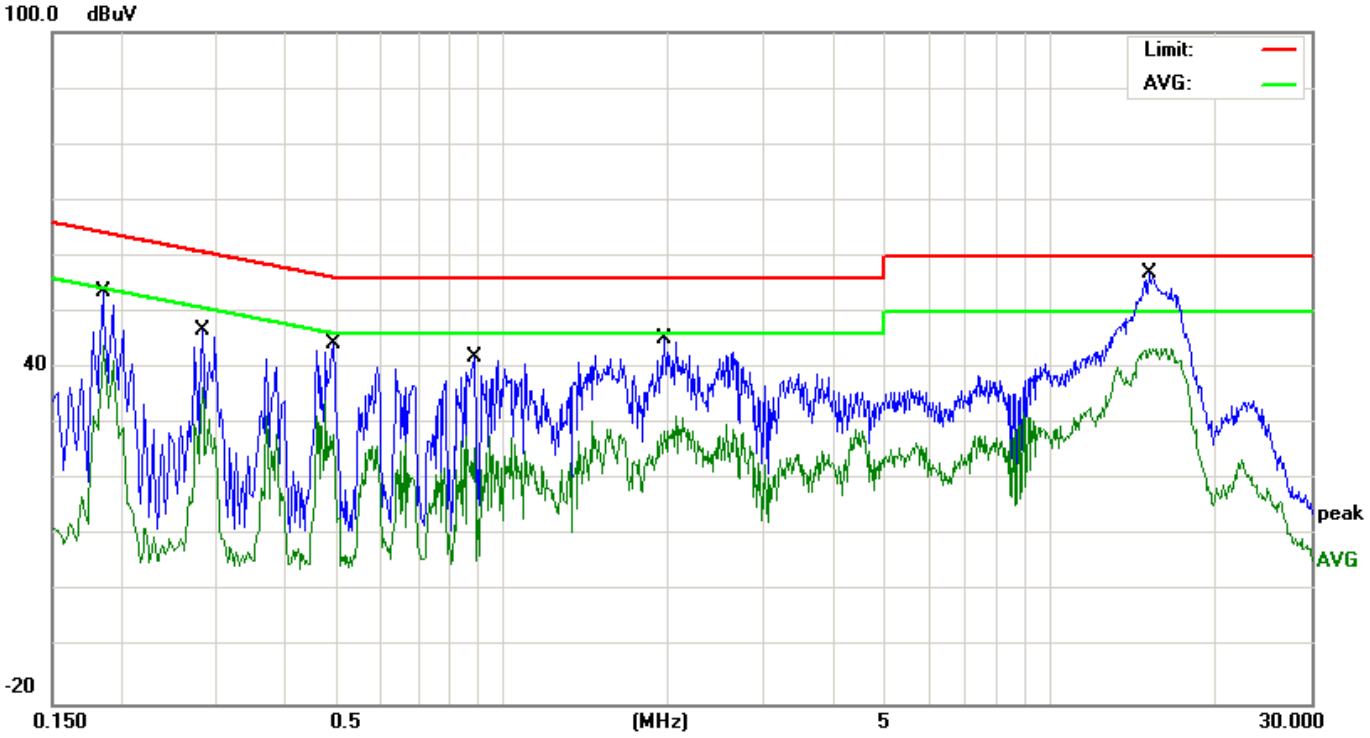
The test data of the worst case condition(s) was reported on the Summary Data page.

6.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST



L1

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1819	55.84	0.00	55.84	64.39	-8.55	QP
2		0.1819	42.14	0.00	42.14	54.39	-12.25	AVG
3		0.2980	49.87	0.00	49.87	60.30	-10.43	QP
4		0.2980	36.62	0.00	36.62	50.30	-13.68	AVG
5		0.8900	44.44	0.00	44.44	56.00	-11.56	QP
6		0.8900	27.80	0.00	27.80	46.00	-18.20	AVG
7		1.4819	43.69	0.00	43.69	56.00	-12.31	QP
8		1.4819	29.60	0.00	29.60	46.00	-16.40	AVG
9		2.7659	42.75	0.00	42.75	56.00	-13.25	QP
10		2.7659	28.50	0.00	28.50	46.00	-17.50	AVG
11	*	15.0179	55.62	0.00	55.62	60.00	-4.38	QP
12		15.0179	41.97	0.00	41.97	50.00	-8.03	AVG



N

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1860	53.73	0.00	53.73	64.21	-10.48	QP
2		0.1860	44.15	0.00	44.15	54.21	-10.06	AVG
3		0.2819	46.76	0.00	46.76	60.76	-14.00	QP
4		0.2819	36.53	0.00	36.53	50.76	-14.23	AVG
5		0.4900	44.36	0.00	44.36	56.17	-11.81	QP
6		0.4900	28.21	0.00	28.21	46.17	-17.96	AVG
7		0.8860	42.00	0.00	42.00	56.00	-14.00	QP
8		0.8860	27.80	0.00	27.80	46.00	-18.20	AVG
9		1.9700	45.14	0.00	45.14	56.00	-10.86	QP
10		1.9700	31.32	0.00	31.32	46.00	-14.68	AVG
11	*	15.1539	56.89	0.00	56.89	60.00	-3.11	QP
12		15.1539	43.58	0.00	43.58	50.00	-6.42	AVG

7. RADIATED EMISSION TEST

7.1. LIMITS OF RADIATED DISTURBANCES AT 3M DISTANCES FOR CLASS B

According to FCC §15.109, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

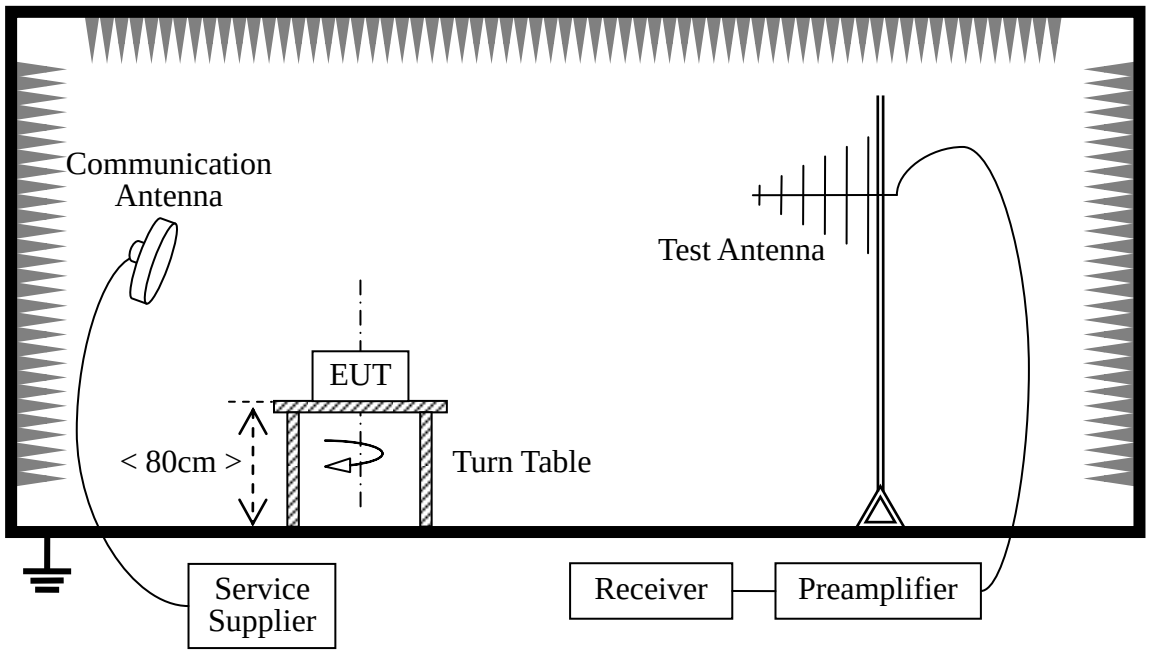
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1. Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].
2. In the emission tables above, the tighter limit applies at the band edges.

7.2 TEST DESCRIPTION

Test Setup:



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 EUT is activated and transmitting with the other Bluetooth device (Supply by the Applicant) during the test.

For the Test Antenna:

(a) In the frequency range of 9 kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.

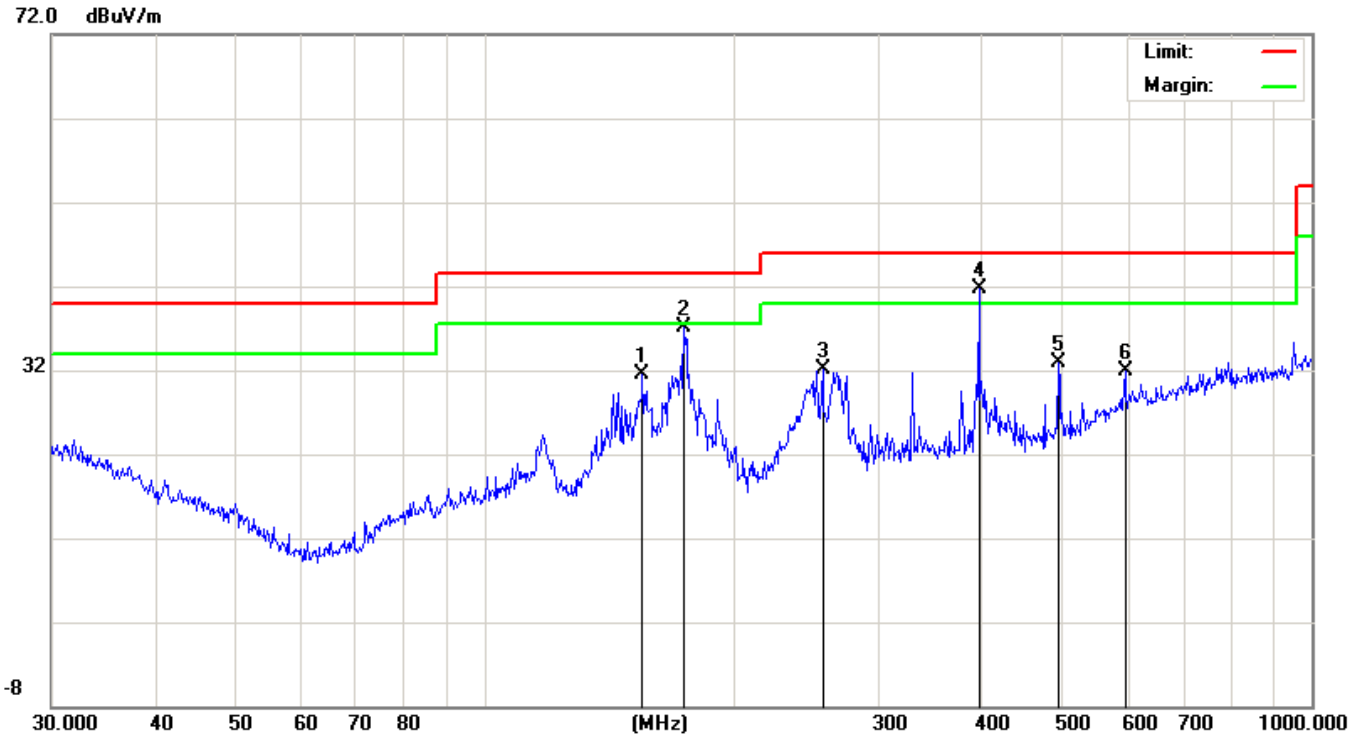
(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) is used. Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength. The emission levels at both horizontal and vertical polarizations should be tested.

7.3 TEST RESULT

Form 9KHz to 30MHz:

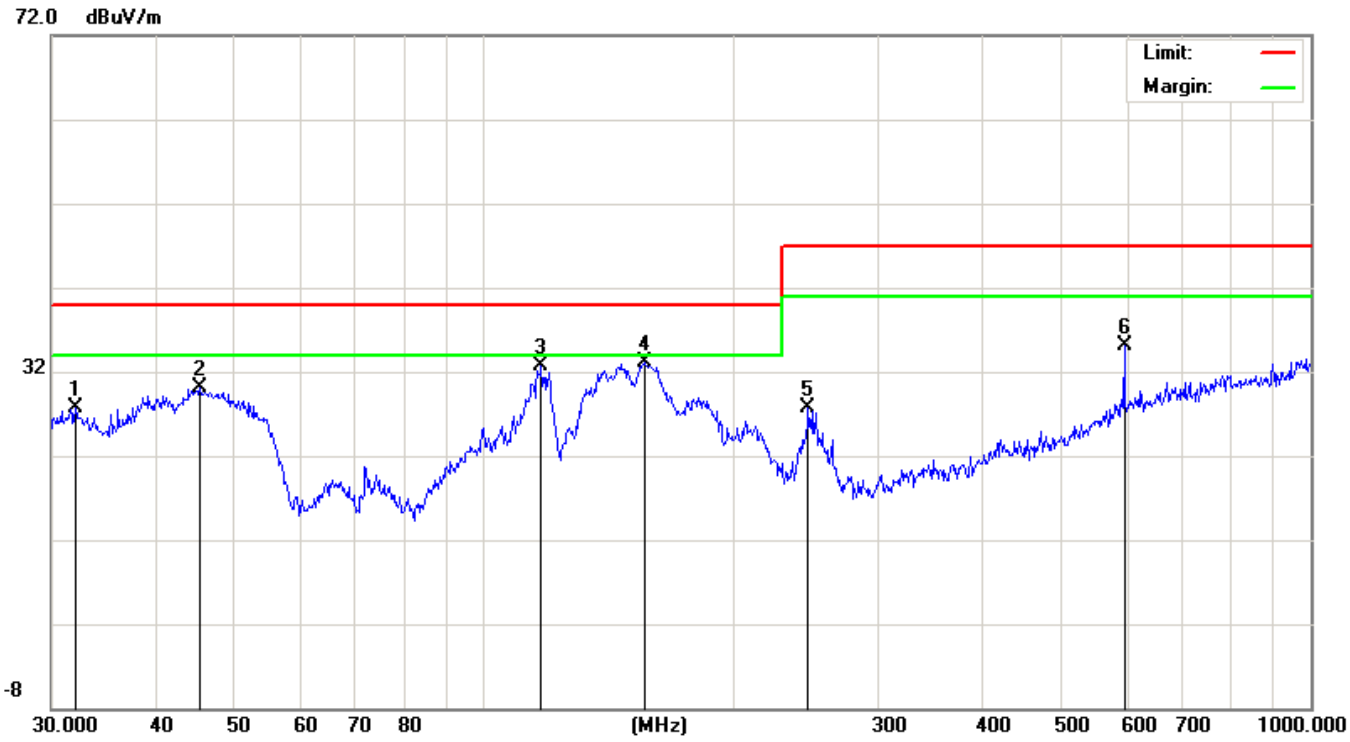
Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	AV Margin (dB)
					Peak (dBuV/m)	AV (dBuV/m)			
2402.00	H	92.05	66.29	9.08	101.13	75.37	114.00	94.00	-18.63
1612.50	H	54.66	30.74	5.84	60.50	36.58	74.00	54.00	-17.42
4815.00	H	55.96	26.86	16.63	72.59	43.49	74.00	54.00	-10.51
N/A									>20
2402.00	V	93.26	72.36	9.08	102.34	77.18	114.00	94.00	-16.82
1612.50	V	55.03	23.57	5.84	60.87	29.41	74.00	54.00	-24.59
4815.00	V	55.03	25.69	16.63	71.66	42.32	74.00	54.00	-11.68
N/A									>20

-No detected in below 30MHz.



Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		155.3642	20.72	10.76	31.48	43.50	-12.02	QP
2		174.4241	27.00	10.12	37.12	43.50	-6.38	QP
3		256.5210	19.82	12.33	32.15	46.00	-13.85	QP
4	*	396.2412	24.30	17.37	41.67	46.00	-4.33	QP
5		494.1983	16.70	16.28	32.98	46.00	-13.02	QP
6		595.1326	12.16	19.76	31.92	46.00	-14.08	QP



Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		32.0667	9.67	18.02	27.69	40.00	-12.31	QP
2		45.3755	18.83	11.23	30.06	40.00	-9.94	QP
3		117.3602	19.98	12.72	32.70	40.00	-7.30	QP
4	*	156.4577	22.33	10.81	33.14	40.00	-6.86	QP
5		246.8148	17.15	10.52	27.67	47.00	-19.33	QP
6		595.1327	15.29	19.76	35.05	47.00	-11.95	QP

Above 1 GHz:

Operation Mode:	Transmitter Mode	**Test Date:**	2014-06-15
Temperature:	24°C	**Tested by:**	Habby Guo
Humidity:	70 % RH	**Polarity:**	Ver. / Hor.

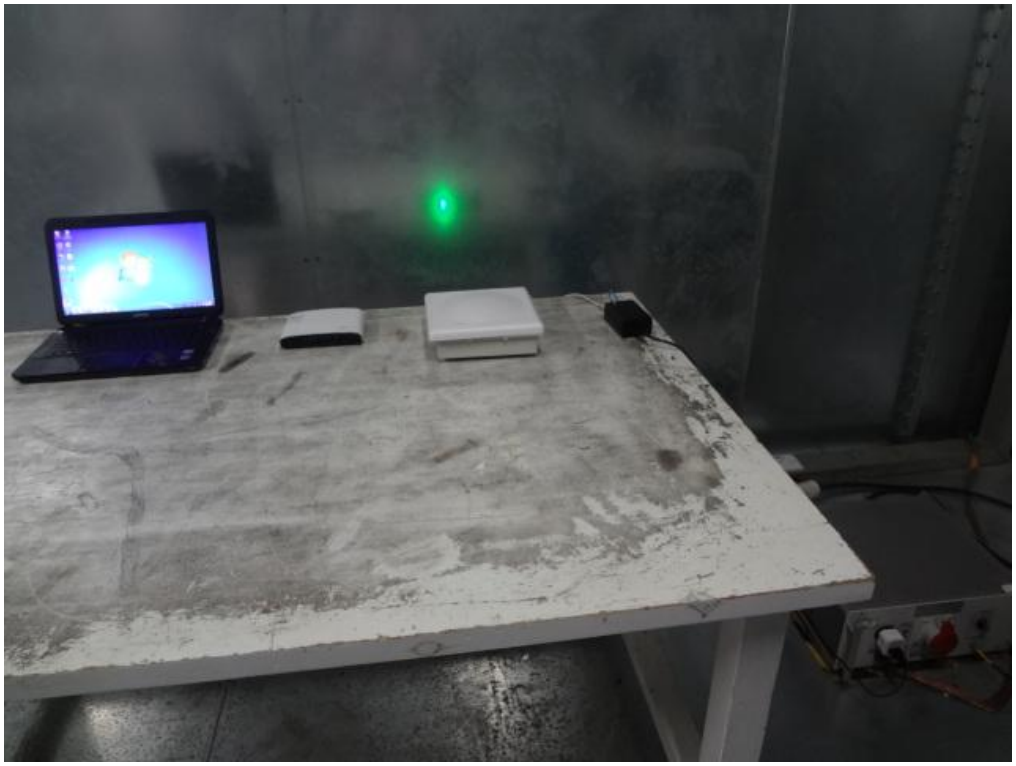
Freq.	Ant. Pol	Peak	AV	Ant. / CL	Actual Fs		Peak	AV	AV
(MHz)	H/V	Reading	Reading	CF			Limit	Limit	Margin
		(dBuV)	(dBuV)	(dB)	Peak	AV	(dBuV/m)	(dBuV/m)	(dB)
					(dBuV/m)	(dBuV/m)			
1828.50	H	51.42	32.29	15.54	66.96	47.83	74.00	54.00	-4.45
2742.75	H	49.17	25.24	20.32	69.49	45.56	74.00	54.00	-6.86
N/A	H								
1828.50	V	53.13	34.08	15.54	68.67	49.62	74.00	54.00	-4.38
2742.75	V	44.87	26.39	20.32	65.19	46.71	74.00	54.00	-7.29
N/A	V								

Notes:

1. *.Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *Radiated emissions measured in frequency above 1000MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.*
3. *The frequency that above 1GHz, the emission measurements of basic frequency and harmonic frequency is not suitable, and is mainly from the environment noise.*

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

CE TEST SETUP



RE TEST SETUP