FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4: 2003

TEST REPORT

For

Wireless Dongle

Model : RX017

Brand Name : SUNREX

Test Report Number:

T111006404-RP1

Issued for

Sunrex Technology Corp.

No.188-1,Chung Cheng Road.,Ta Ya Dist,Taichung City.Taiwan,R.O.C

Issued by
Compliance Certification Services Inc.
Tainan Lab.
No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
TEL: 886-6-580-2201
FAX: 886-6-580-2202
Issued Date: November 10, 2011

REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	October 25, 2011	Initial Issue	ALL	Sunny Chang
01	October 31, 2011	Update data	Page 1; 2; 4; 5; 7; 13; 24; 25	Sunny Chang
02	November 10, 2011	Update Data	Page 1-5; 13-15; 17-18; 26-27	Sunny Chang
03	November 10, 2011	Update Data	Page 2; 5; 26-28	Sunny Chang

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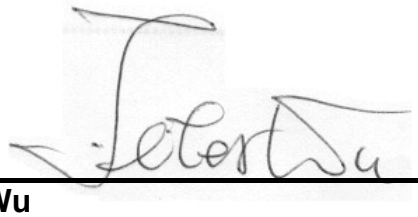
1. TEST RESULT CERTIFICATION

Product:	Wireless Dongle
Model:	RX017
Brand Name:	SUNREX
Applicant:	Sunrex Technology Corp.
	No.188-1,Chung Cheng Road.,Ta Ya Dist,Taichung City.Taiwan,R.O.C
Manufacturer:	Sunrex Technology (Jiangsu) Co., Ltd.
	Fenhu Economic Development Zone, Wujiang, China
Tested:	October 18, 2011 ~ November 08, 2011

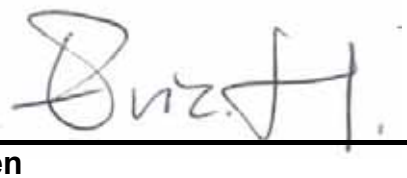
APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C AND ANSI C63.4 : 2003	No non-compliance noted

Approved by:



Jeter Wu
Assistant Manager

Reviewed by:



John Chen
Assistant Section Manager

2. EUT DESCRIPTION

Product	Wireless Dongle
Model Number	RX017
Brand Name	SUNREX
Serial Number	T111006404
Received Date	October 06, 2011
Power Supply	DC 5V (Powered from PC)
Frequency Range	2406 ~ 2468MHz
Transmit Peak Power	94.77dBuV/m
Transmit Data Rate	1Mbps
Modulation Technique	GFSK
Number of Channels	63 Channels
Antenna Specification	Gain : -0.98 dBi
Antenna Designation	Print Antenna
Temperature Range	0 ~ +55°C

Remark:

1. The sample selected for test was production product and was provided by manufacturer.

2. This submittal(s) (test report) is intended for FCC ID: **J75RX017** filing to comply with Section 15.107, 15.109, 15.207, 15.209, 15.249 (FCC Part 15, Subpart C Rules.)

3. According to customer declaration Wireless Trackball Keyboard [FCC ID : J75RX018] and 2.4 G Dongle [FCC ID : J75RX017] for sale.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2003 and FCC CFR 47 Part 15.207, 15.209 and 15.249.

3.1 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.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209,15.249 under the FCC Rules Part 15 Subpart C.

3.3 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 13.1.4.1 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 and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, 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.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	([2])
13.36 - 13.41	322 - 335.4		

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT (model: RX017) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode only, and powerline conducted emission below 30MHz, which worst case was in normal link mode .

All tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz, which worst case was in normal link mode .

Channel Low (2406MHz), Channel Mid (2437MHz) and Channel High (2468MHz) were chosen for the RF final testing.

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4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Open Area Test Site # 6				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
TYPE N COAXIAL CABLE	SUHNER	CHA9513	6	NOV. 17, 2011
BI-LOG Antenna	Sunol	JB1	A070506-2	OCT. 04, 2012
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2012
Pre-Amplifier	HP	8447F	2944A03817	NOV. 23, 2011
EMI Receiver	R&S	ESVS10	833206/012	MAY 10, 2012
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2011
Horn Antenna	Com-Power	AH-118	071032	DEC. 27, 2011
Spectrum Analyzer	R&S	FSEK 30	835253/002	JUL. 14, 2012
Pre-Amplifier	MITEQ	AFS44-00108650-42-10P-44	1205908	NOV. 23, 2011
3116 Double Ridge Antenna (40G)	ETS-LINDGREN	EMCO-003	00078	NOV. 14, 2011
Turn Table	Yo Chen	001	----------	N.C.R.
Antenna Tower	AR	TP1000A	309874	N.C.R.
Controller	CT	SC101	----------	N.C.R.
RF Swicth	E-INSTRUMENT TELH LTD	ERS-180A	EC1204141	N.C.R
Test S/W	e-3 (5.04303e)			

Remark: *Each piece of equipment is scheduled for calibration once a year.*

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☒ No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)

The sites are constructed in conformance with the requirements of ANSI C63.7:1992, ANSI C63.4 : 2003 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW-1037).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http://www.ccsrf.com

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

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

6.2 SUPPORT EQUIPMENT

[EMC test]

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	PC	Acer	M3630	R33142	Power cable, unshd, 1.6m
2	LCD Monitor	BenQ	FP731	R43002	VGA cable, shd, 1.8m
3	Note Book	Acer	AS3830TG	DoC	Power cable, unshd, 1.6m

No.	Signal cable description	
A	N/A	--------

[RF test]

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Note Book	IBM	T43	DoC	Power cable, unshd, 1.6m

No.	Signal cable description	
A	N/A	--------

Remark:

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

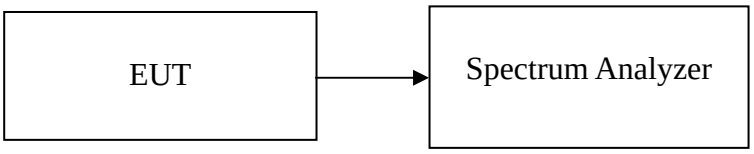
7. FCC PART 15.249 REQUIREMENTS

7.1 20 DB BANDWIDTH

LIMIT

None; for reporting purposes only.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=30kHz, VBW = 100kHz, Span = 3MHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

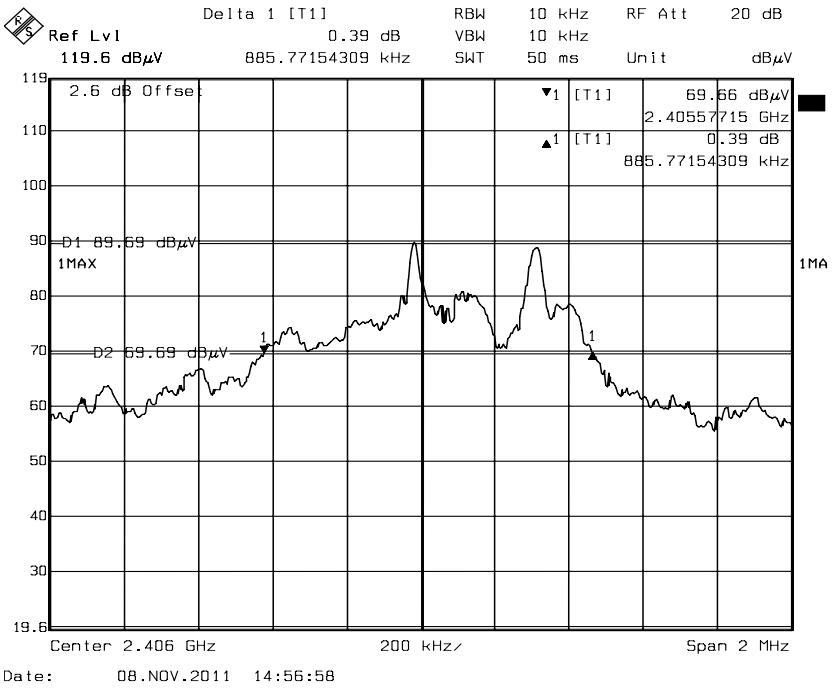
No non-compliance noted

Test Data

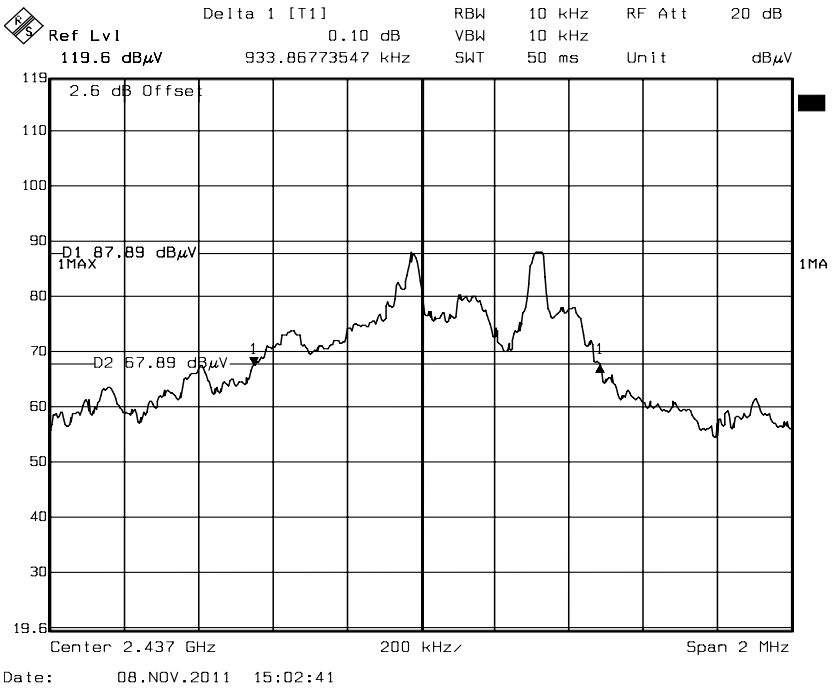
Channel	Frequency (MHz)	20 dB Bandwidth Chain0 (MHz)
CH1	2406	885.77
CH32	2437	933.87
CH63	2468	925.85

Test Plot

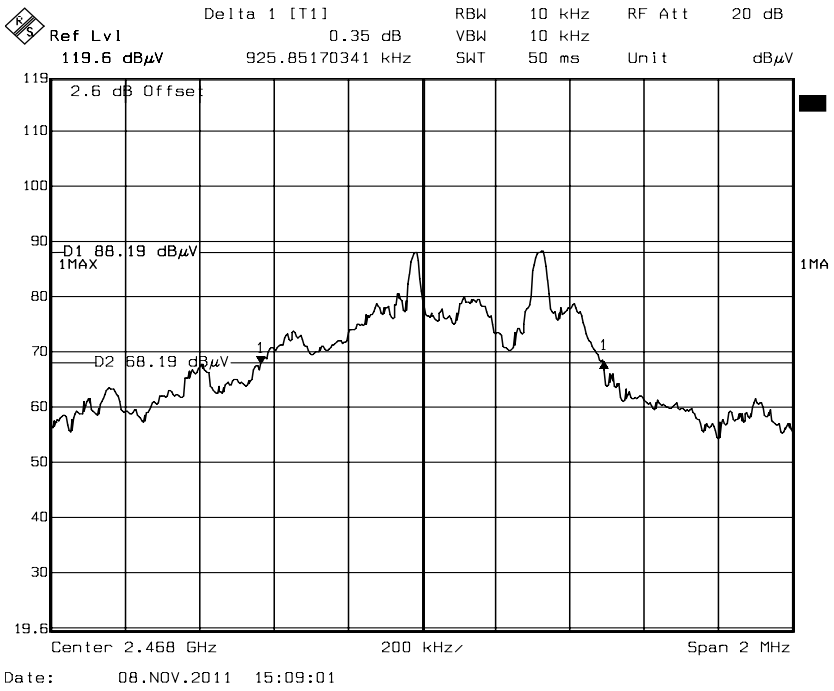
CH Low



CH Mid



CH High


Delta 1 [T1]
RBW 10 kHz
RF Att 20 dB
Ref Lvl
0.35 dB
VBW 10 kHz
119.6 dBµV
925.85170341 kHz
SWT 50 ms
Unit dBµV
2.6 dB Offset
D1 88.19 dBµV
1MAX
D2 68.19 dBµV
1MA
Center 2.468 GHz
200 kHz/
Span 2 MHz
Date: 08.NOV.2011 15:09:01

7.2 BAND EDGES MEASUREMENT

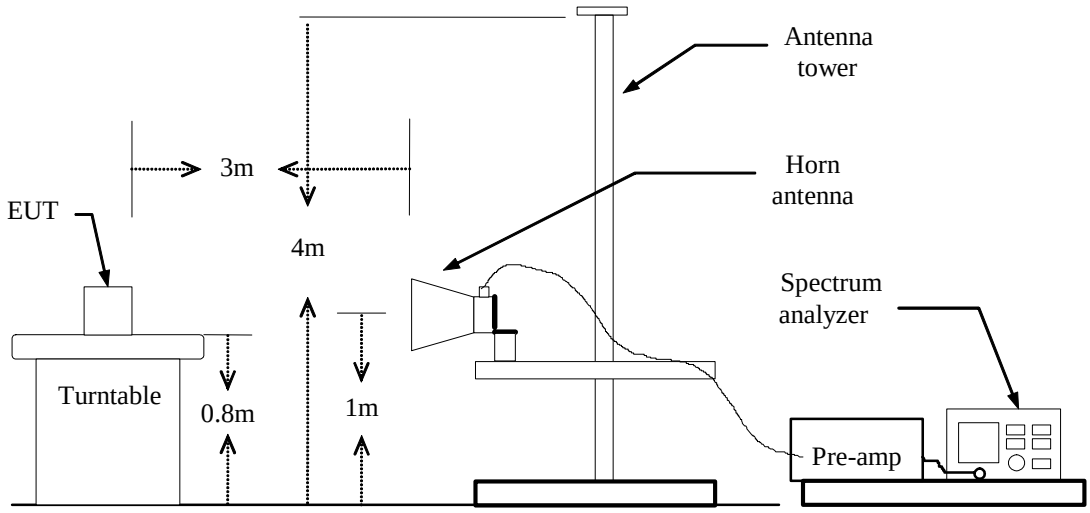
LIMIT

1. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Test Configuration



TEST PROCEDURE

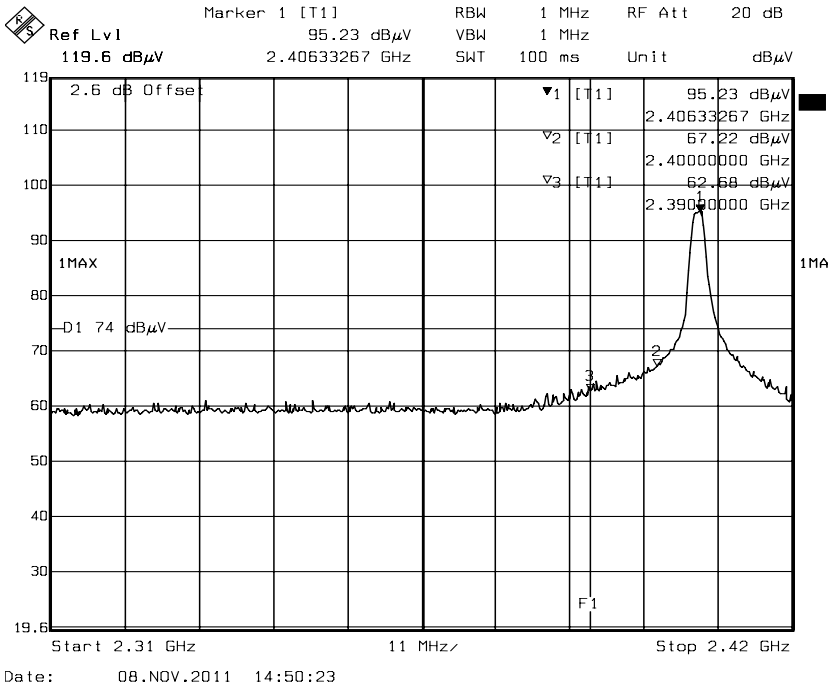
1. The EUT is placed on a turntable, which is 0.8m above the ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
4. Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
5. Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

TEST RESULTS

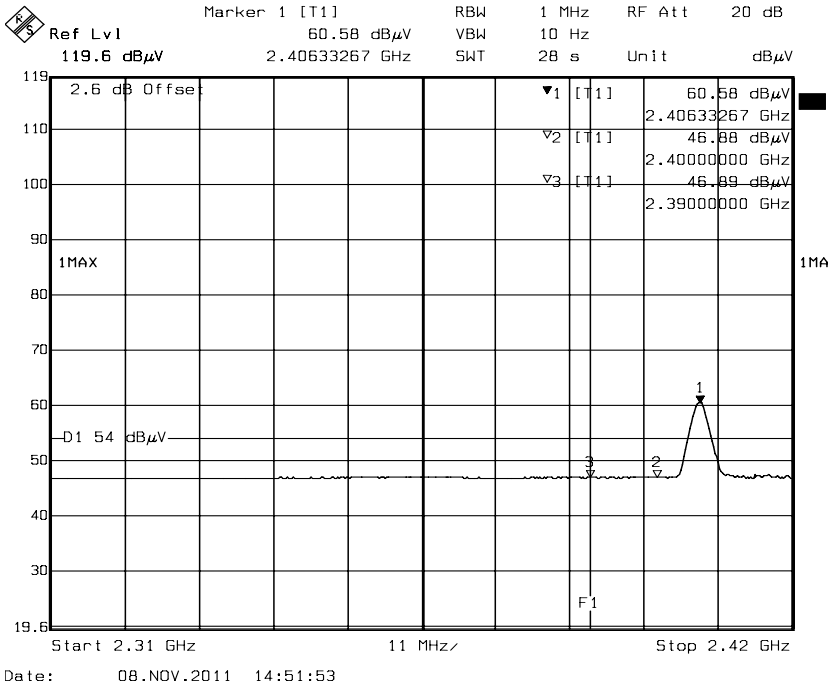
Refer to attach spectrum analyzer data chart.

Band Edges (CH Low)

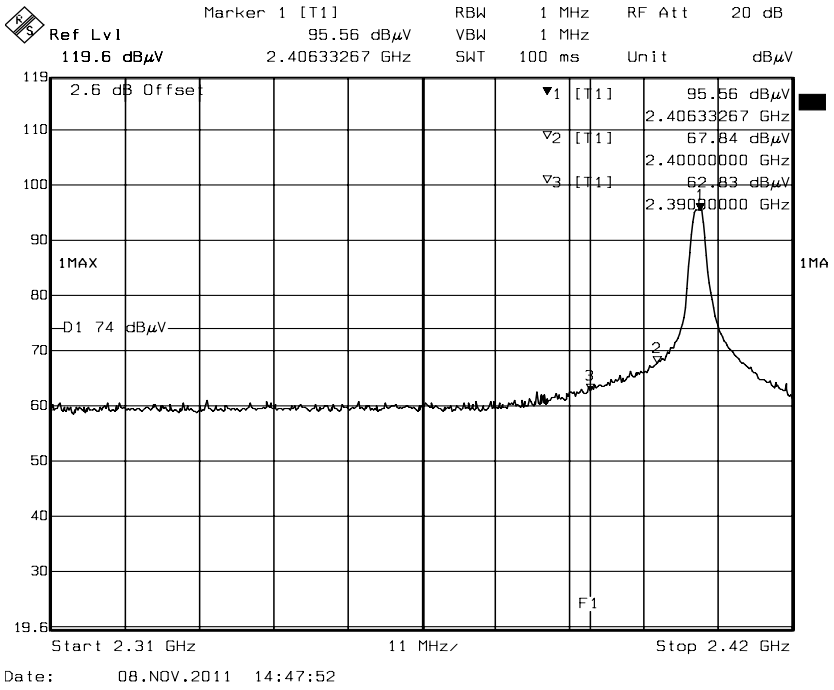
Detector mode: Peak Polarity: Vertical



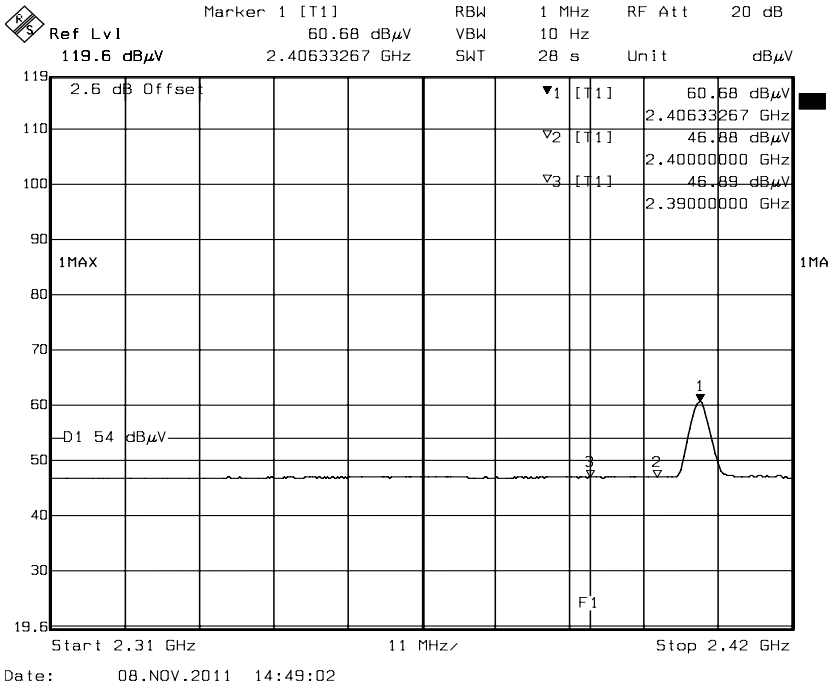
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**

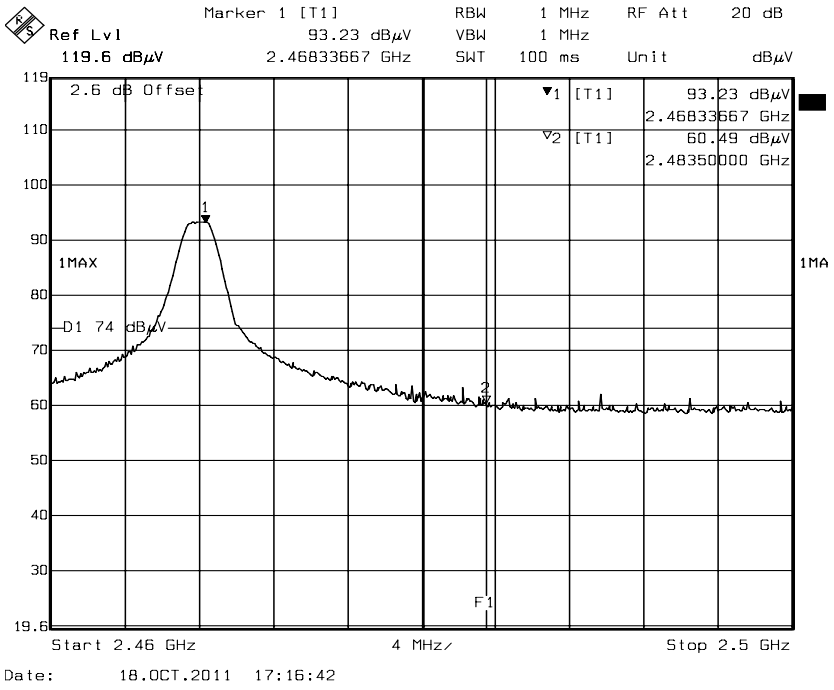


Detector mode: Average **Polarity: Horizontal**

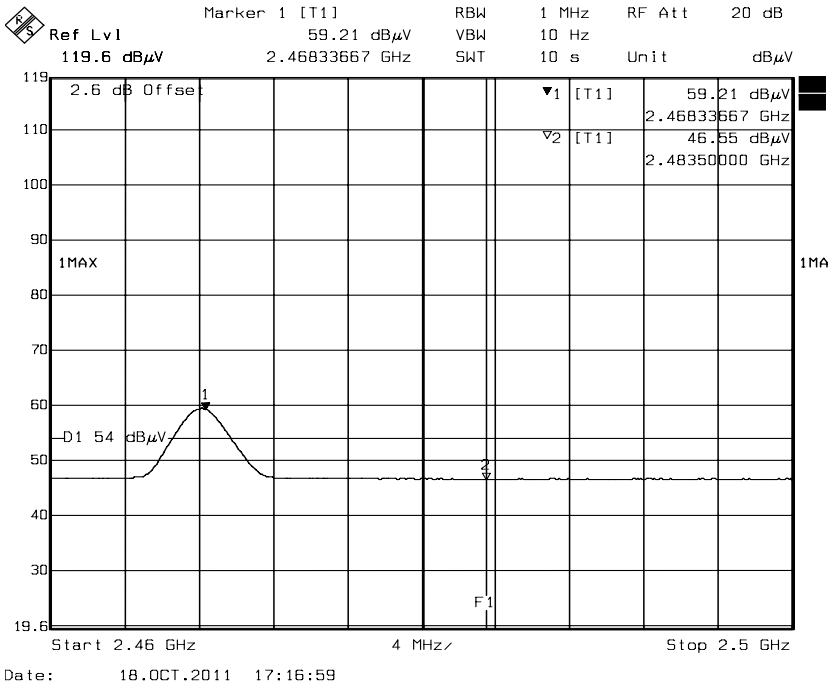


Band Edges (CH High)

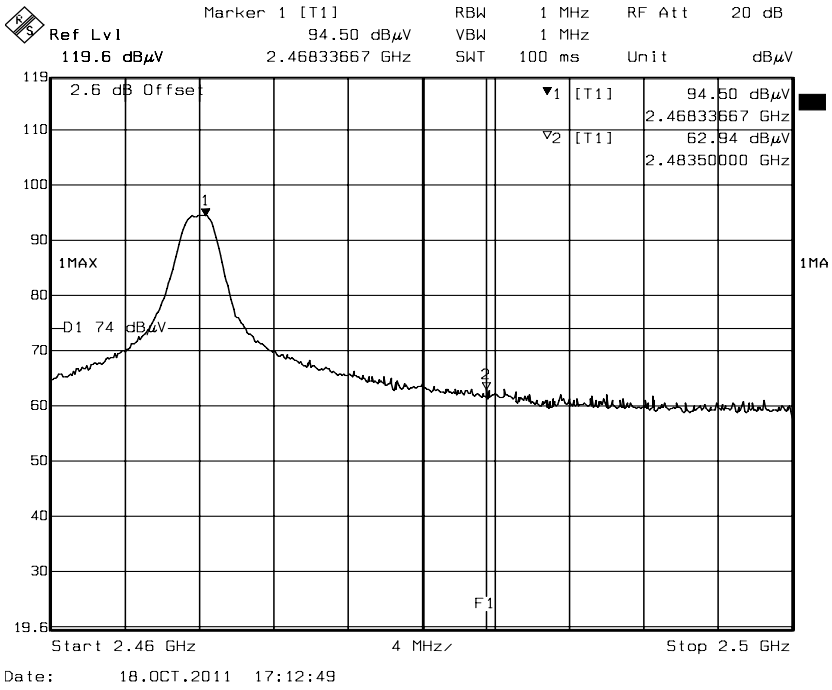
Detector mode: Peak Polarity: Vertical



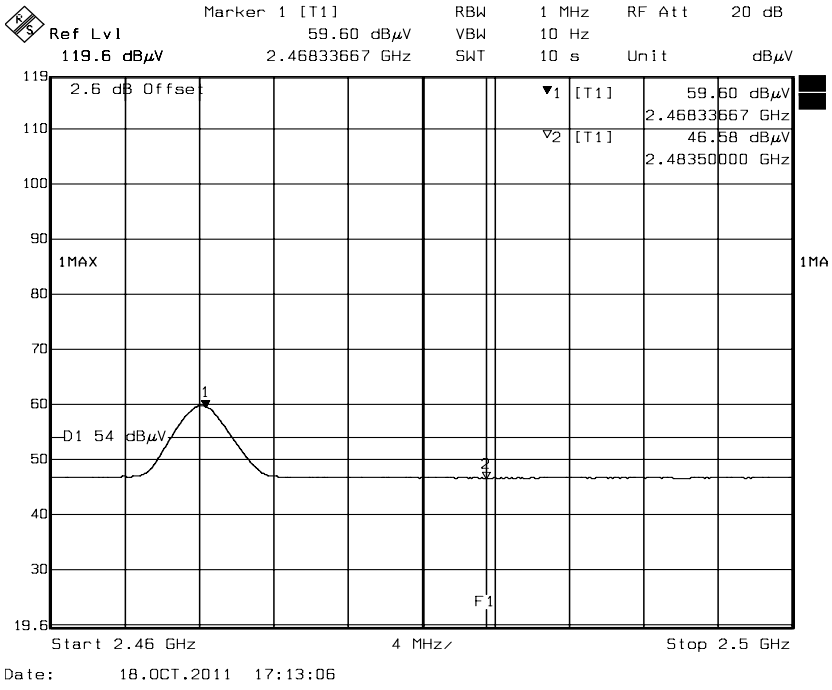
Detector mode: Average Polarity: Vertical



Detector mode: Peak **Polarity: Horizontal**



Detector mode: Average **Polarity: Horizontal**



7.3 SPURIOUS EMISSION

LIMIT

1. In the section 15.249(a):
   Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

2. 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 (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

   Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

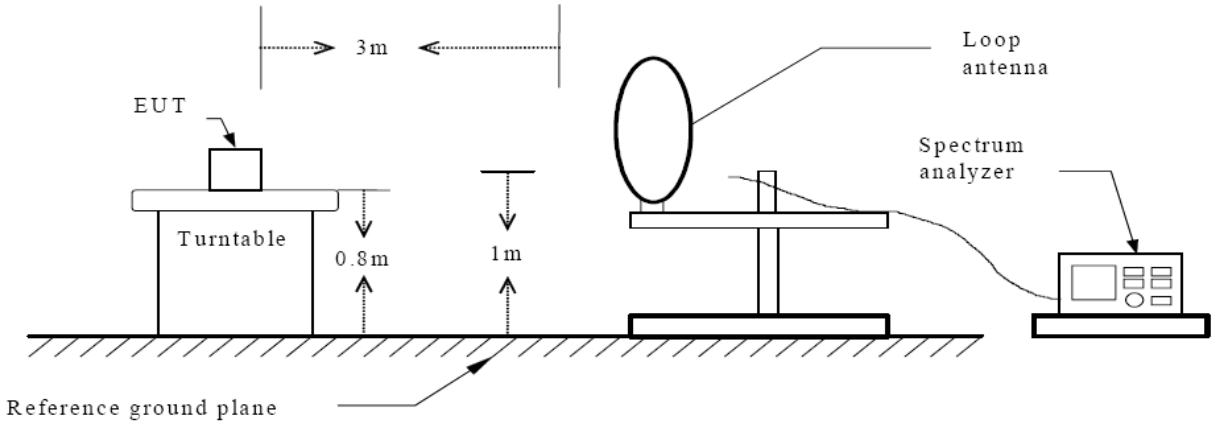
3. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

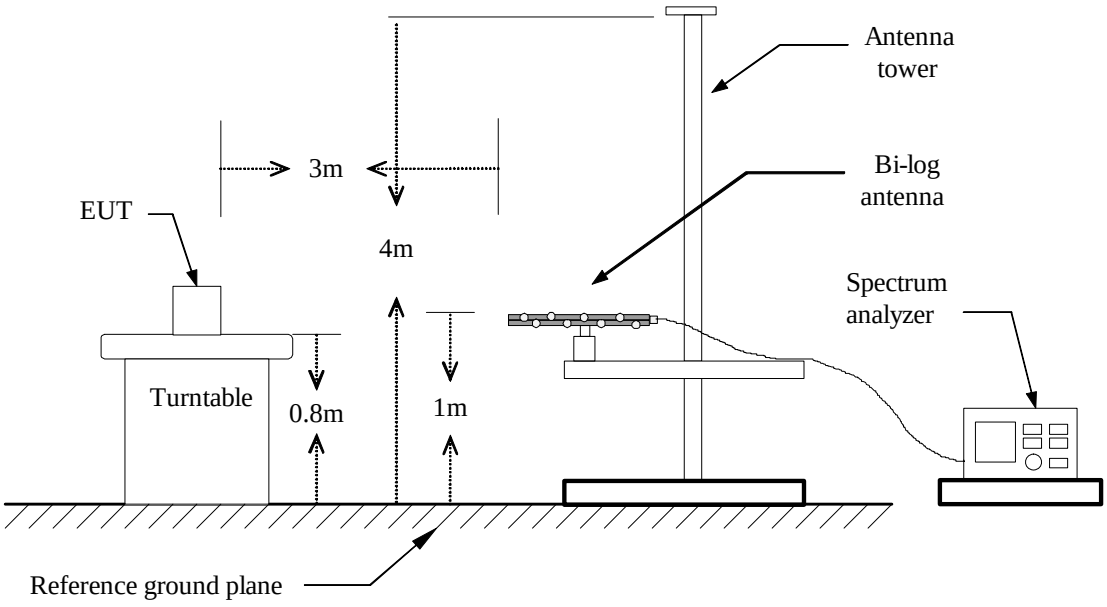
Test Configuration

The diagram below shows the test setup that is utilized to make the measurements for emission from below 1GHz.

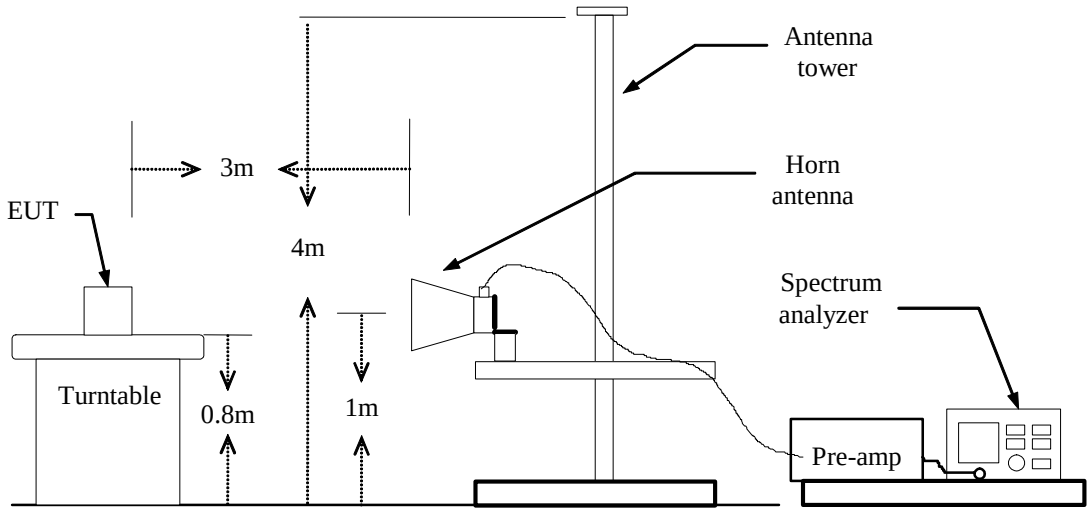
9kHz ~ 30MHz



30MHz ~ 1GHz



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. White measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna

c. 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 polarization of the antenna are set to make the measurement.

d. 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 table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

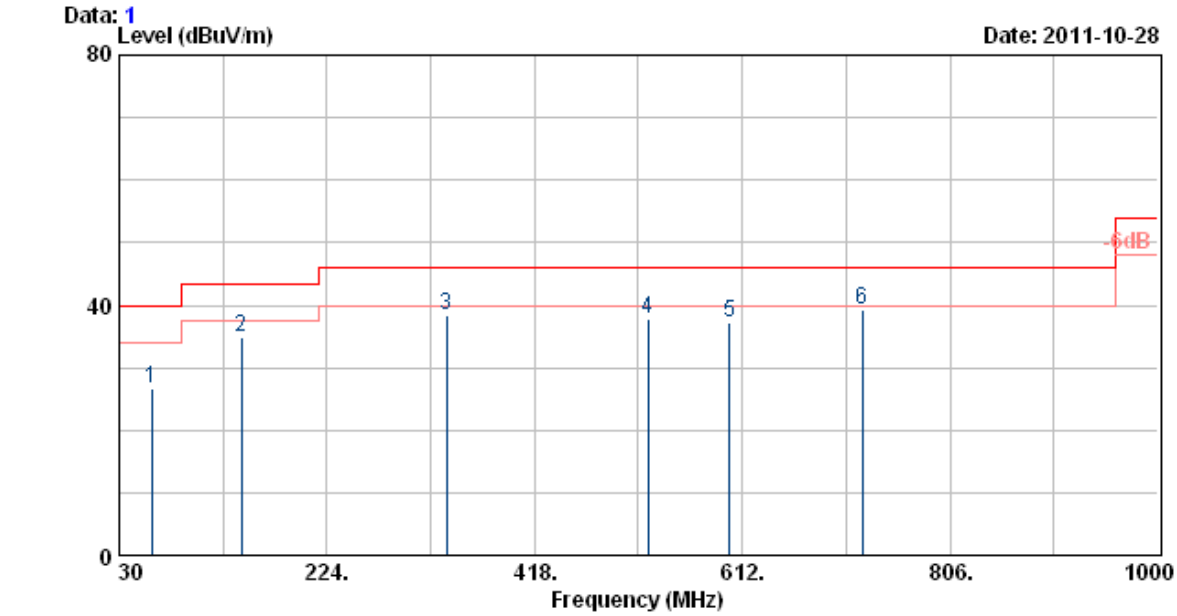
f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified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

Note：

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

Below 1 GHz

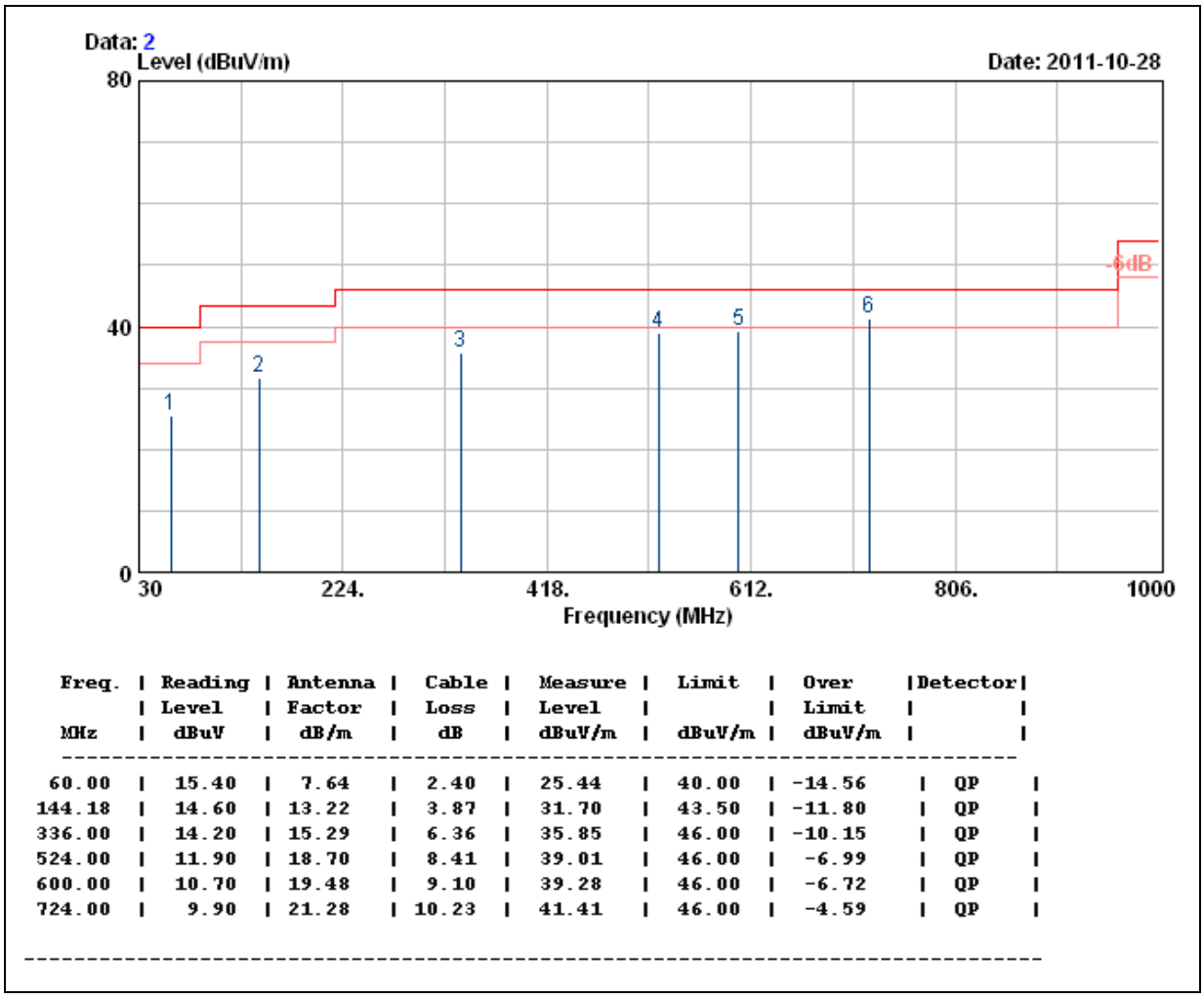
Operation Mode:	Normal Operation	**Test Date:**	October 28, 2011
Temperature:	27 °C	**Tested by:**	Taiyu Cyu
Humidity:	66 % RH	**Polarity:**	Vertical



Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
60.00	16.70	7.64	2.40	26.74	40.00	-13.26	QP
144.18	17.90	13.22	3.87	35.00	43.50	-8.50	QP
336.00	16.70	15.29	6.36	38.35	46.00	-7.65	QP
524.00	10.80	18.70	8.41	37.91	46.00	-8.09	QP
600.00	8.70	19.48	9.10	37.28	46.00	-8.72	QP
724.00	7.80	21.28	10.23	39.31	46.00	-6.69	QP

Remark:
1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Operation Mode:	Normal Operation	**Test Date:**	October 28, 2011
Temperature:	27 °C	**Tested by:**	Taiyu Cyu
Humidity:	66 % RH	**Polarity:**	Horizontal



Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
60.00	15.40	7.64	2.40	25.44	40.00	-14.56	QP
144.18	14.60	13.22	3.87	31.70	43.50	-11.80	QP
336.00	14.20	15.29	6.36	35.85	46.00	-10.15	QP
524.00	11.90	18.70	8.41	39.01	46.00	-6.99	QP
600.00	10.70	19.48	9.10	39.28	46.00	-6.72	QP
724.00	9.90	21.28	10.23	41.41	46.00	-4.59	QP

Remark:
1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured were made with an instrument using peak/quasi-peak detector mode.
3. Quasi-peak test would be performed if the peak result were greater than the quasi-peak limit or as required by the applicant.
4. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.
5. Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Above 1 GHz

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH Low)	Temp& Humidity	26.1℃, 54%

Horizontal

	TX mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2406.00	103.42	29.83	2.62	41.10	0.00	94.77	114.00	-19.23	P
	2406.00	67.58	29.83	2.62	41.10	0.00	58.93	94.00	-35.07	A
*	3609.01	57.23	30.37	3.26	41.34	0.83	50.35	74.00	-23.65	P
*	3609.01	40.08	30.37	3.26	41.34	0.83	33.20	54.00	-20.80	A
*	4812.00	62.47	33.14	3.73	42.37	0.69	57.65	74.00	-16.35	P
*	4812.00	43.69	33.14	3.73	42.37	0.69	38.87	54.00	-15.13	A

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH Low)	Temp& Humidity	26.1℃, 54%

Vertical

	TX mode / CH Low				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2406.00	101.95	29.83	2.62	41.10	0.00	93.30	114.00	-20.70	P
	2406.00	67.20	29.83	2.62	41.10	0.00	58.55	94.00	-35.45	A
*	3608.99	54.39	30.37	3.26	41.34	0.83	47.51	74.00	-26.49	P
*	3608.99	40.01	30.37	3.26	41.34	0.83	33.13	54.00	-20.87	A
*	4811.98	61.54	33.14	3.73	42.37	0.69	56.72	74.00	-17.28	P
*	4811.98	43.72	33.14	3.73	42.37	0.69	38.90	54.00	-15.10	A

Remark:
1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH Mid)	Temp& Humidity	26.1℃, 54%

Horizontal

	TX mode / CH Mid				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2437.00	102.31	29.79	2.63	41.10	0.00	93.63	114.00	-20.37	P
	2437.00	67.24	29.79	2.63	41.10	0.00	58.56	94.00	-35.44	A
*	3655.50	55.94	30.45	3.28	41.36	0.80	49.11	74.00	-24.89	P
*	3655.50	39.98	30.45	3.28	41.36	0.80	33.15	54.00	-20.85	A
*	4873.99	57.26	33.32	3.74	42.43	0.71	52.60	74.00	-21.40	P
*	4873.99	44.30	33.32	3.74	42.43	0.71	39.64	54.00	-14.36	A

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH Mid)	Temp& Humidity	26.1℃, 54%

Vertical

	TX mode / CH Mid				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2437.00	101.68	29.79	2.63	41.10	0.00	93.00	114.00	-21.00	P
	2437.00	67.13	29.79	2.63	41.10	0.00	58.45	94.00	-35.55	A
*	3655.49	56.24	30.45	3.28	41.36	0.80	49.41	74.00	-24.59	P
*	3655.49	40.23	30.45	3.28	41.36	0.80	33.40	54.00	-20.60	A
*	4874.00	66.08	33.32	3.74	42.43	0.71	61.42	74.00	-12.58	P
*	4874.00	44.91	33.32	3.74	42.43	0.71	40.25	54.00	-13.75	A

Remark:
1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH High)	Temp& Humidity	26.1℃, 54%

Horizontal

	TX mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2468.00	102.23	29.74	2.65	41.11	0.00	93.51	114.00	-20.49	P
	2468.00	67.00	29.74	2.65	41.11	0.00	58.28	94.00	-35.72	A
*	3701.99	56.82	30.52	3.30	41.39	0.78	50.03	74.00	-23.97	P
*	3701.99	40.12	30.52	3.30	41.39	0.78	33.33	54.00	-20.67	A
*	4935.97	56.60	33.51	3.76	42.50	0.74	52.11	74.00	-21.89	P
*	4935.97	44.19	33.51	3.76	42.50	0.74	39.70	54.00	-14.30	A

Product Name	Wireless Dongle	Test Date	November 08, 2011
Model	RX017	Test By	John Chen
Test Mode	TX (CH High)	Temp& Humidity	26.1℃, 54%

Vertical

	TX mode / CH High				Measurement Distance at 3m				Horizontal polarity	
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
	2467.98	100.07	29.74	2.65	41.11	0.00	91.35	114.00	-22.65	P
	2467.98	66.52	29.74	2.65	41.11	0.00	57.80	94.00	-36.20	A
*	3701.99	55.98	30.52	3.30	41.39	0.78	49.19	74.00	-24.81	P
*	3701.99	40.09	30.52	3.30	41.39	0.78	33.30	54.00	-20.70	A
*	4935.99	63.07	33.51	3.76	42.50	0.74	58.58	74.00	-15.42	P
*	4935.99	44.71	33.51	3.76	42.50	0.74	40.22	54.00	-13.78	A

Remark:
1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter, Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

7.4 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, 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 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). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dBµV)	
	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

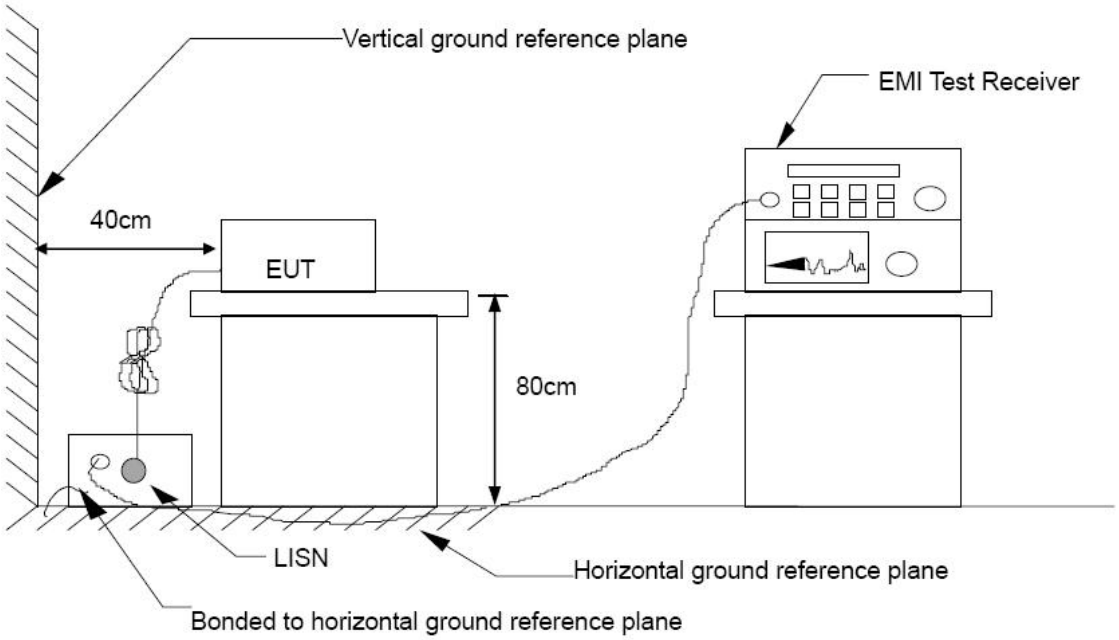
***** *Decreases with the logarithm of the frequency.*

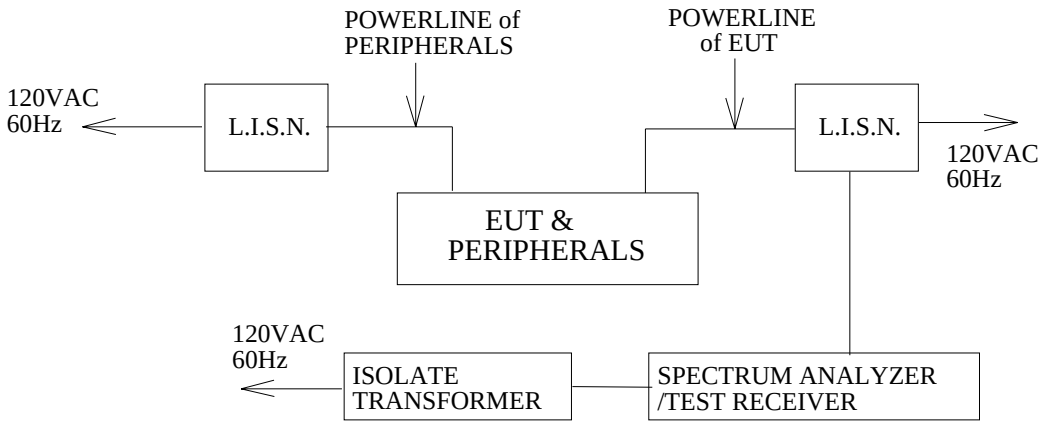
TEST EQUIPMENTS

Conducted Emission room				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8121	8121-308	Sep. 06, 2012
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUL. 03, 2012
BNC COAXIAL CABLE	CCS	BNC50	11	OCT. 04, 2012
Test S/W	e-3 (5.04211c) R&S (2.27)			

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST SETUP





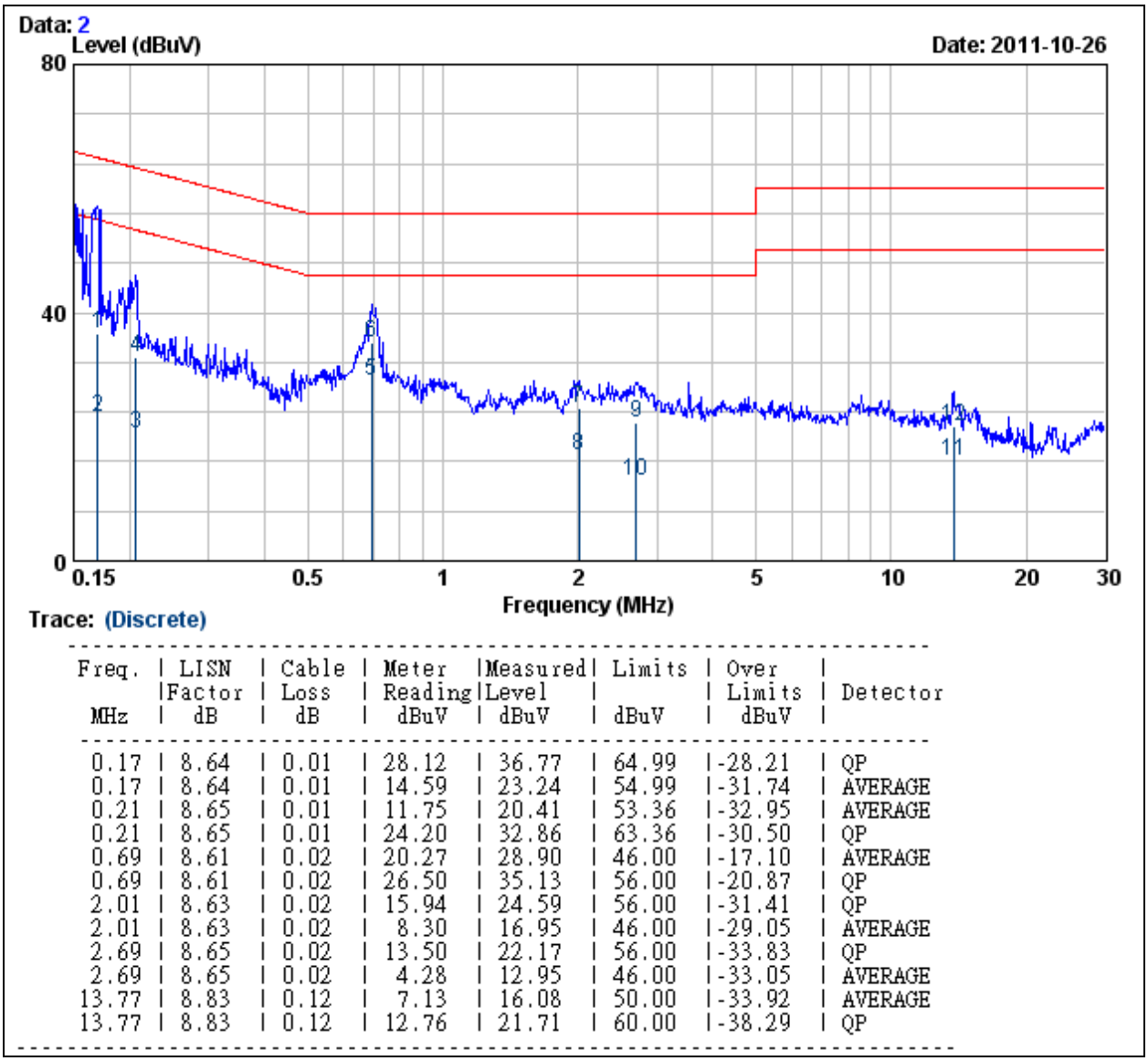
TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

Product Name	Wireless Dongle	Test Date	October 26, 2011
Model Name	RX017	Test By	Ted Huang
Test Mode	Full Load	Temp & Humidity	25.5°C, 65%

LINE



Trace: (Discrete)

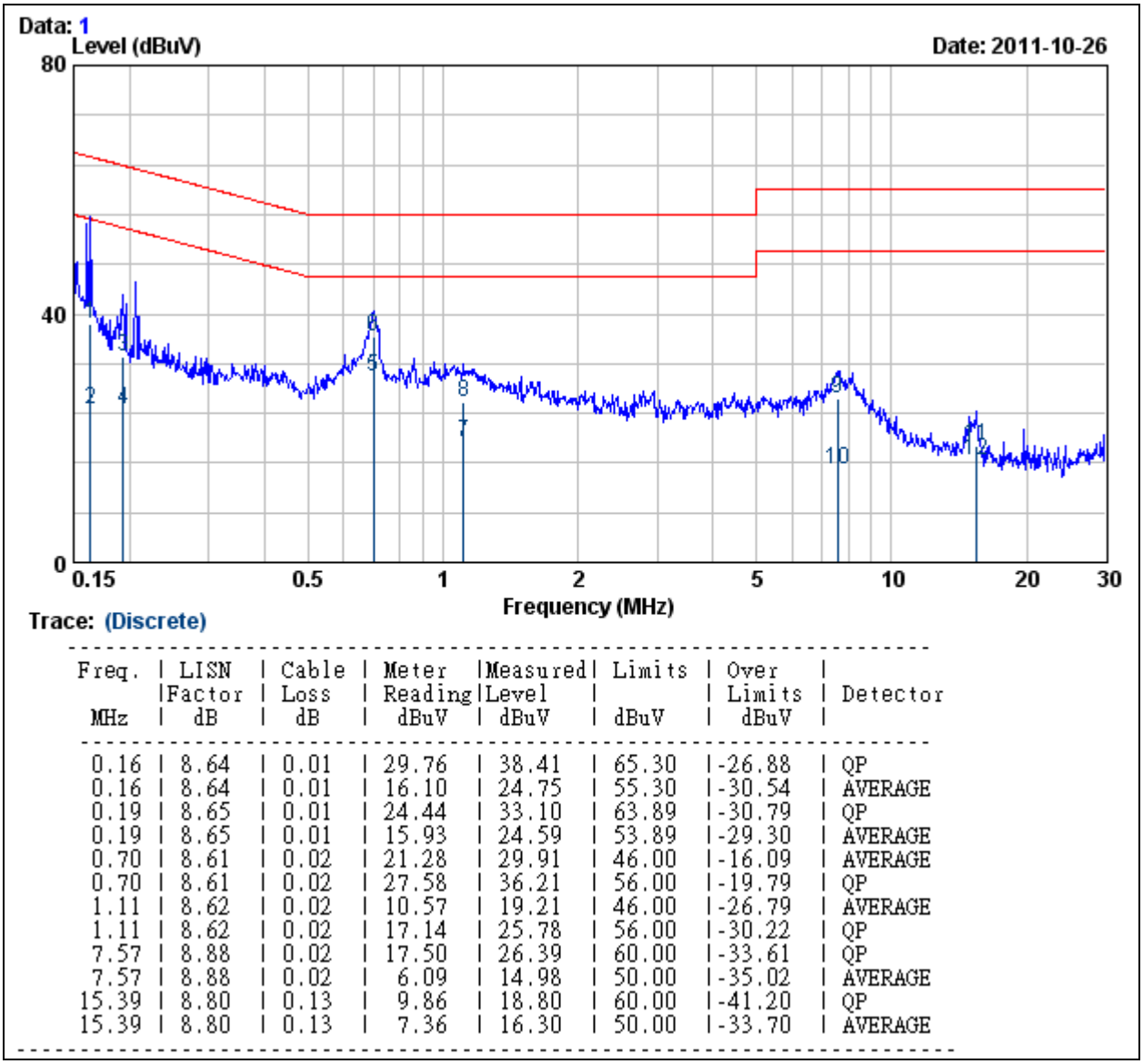
Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.17	8.64	0.01	28.12	36.77	64.99	-28.21	QP
0.17	8.64	0.01	14.59	23.24	54.99	-31.74	AVERAGE
0.21	8.65	0.01	11.75	20.41	53.36	-32.95	AVERAGE
0.21	8.65	0.01	24.20	32.86	63.36	-30.50	QP
0.69	8.61	0.02	20.27	28.90	46.00	-17.10	AVERAGE
0.69	8.61	0.02	26.50	35.13	56.00	-20.87	QP
2.01	8.63	0.02	15.94	24.59	56.00	-31.41	QP
2.01	8.63	0.02	8.30	16.95	46.00	-29.05	AVERAGE
2.69	8.65	0.02	13.50	22.17	56.00	-33.83	QP
2.69	8.65	0.02	4.28	12.95	46.00	-33.05	AVERAGE
13.77	8.83	0.12	7.13	16.08	50.00	-33.92	AVERAGE
13.77	8.83	0.12	12.76	21.71	60.00	-38.29	QP

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Product Name	Wireless Dongle	Test Date	October 26, 2011
Model Name	RX017	Test By	Ted Huang
Test Mode	Full Load	Temp & Humidity	25.5°C, 65%

NEUTRAL



Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.16	8.64	0.01	29.76	38.41	65.30	-26.88	QP
0.16	8.64	0.01	16.10	24.75	55.30	-30.54	AVERAGE
0.19	8.65	0.01	24.44	33.10	63.89	-30.79	QP
0.19	8.65	0.01	15.93	24.59	53.89	-29.30	AVERAGE
0.70	8.61	0.02	21.28	29.91	46.00	-16.09	AVERAGE
0.70	8.61	0.02	27.58	36.21	56.00	-19.79	QP
1.11	8.62	0.02	10.57	19.21	46.00	-26.79	AVERAGE
1.11	8.62	0.02	17.14	25.78	56.00	-30.22	QP
7.57	8.88	0.02	17.50	26.39	60.00	-33.61	QP
7.57	8.88	0.02	6.09	14.98	50.00	-35.02	AVERAGE
15.39	8.80	0.13	9.86	18.80	60.00	-41.20	QP
15.39	8.80	0.13	7.36	16.30	50.00	-33.70	AVERAGE

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value