FCC 47 CFR PART 15 SUBPART C: 2012
ANSI C63.4: 2009

TEST REPORT

For

Water Leak Sensor

Model : WLS1300

Brand : Oplink

Issued to

Zhuhai FTZ Oplink Communications, Inc.
#29#30 Lianfeng Avenue, Free Trade Zone, Zhuhai City, Guangdong Province, China 591030

Issued by

Compliance Certification Services Inc.
Tainan Lab.
No.8,Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
TEL: (06) 580-2201
FAX: (06) 580-2202

Issued Date: April 21, 2014

REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	April 21, 2014	Initial Issue	ALL	Sunny Chang

TABLE OF CONTENTS

1. TEST RESULT CERTIFICATION 2

2. EUT DESCRIPTION 2

3. TEST METHODOLOGY 2

3.1 EUT CONFIGURATION 2
3.2 EUT EXERCISE 2
3.3 GENERAL TEST PROCEDURES 2
3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS 2
3.5 DESCRIPTION OF TEST MODES 2

4. INSTRUMENT CALIBRATION 2

4.1 MEASURING INSTRUMENT CALIBRATION 2
4.2 MEASUREMENT EQUIPMENT USED 2
4.3 MEASUREMENT UNCERTAINTY 2

5. FACILITIES AND ACCREDITATIONS 2

5.1 FACILITIES 2
5.2 EQUIPMENT 2
5.3 TABLE OF ACCREDITATIONS AND LISTINGS 2
5.4 TABLE OF ACCREDITATIONS AND LISTINGS 2

6. SETUP OF EQUIPMENT UNDER TEST 2

6.1 SETUP CONFIGURATION OF EUT 2
6.2 SUPPORT EQUIPMENT 2

7. FCC PART 15.231 REQUIREMENTS 2

7.1 20 DB BANDWIDTH 2
7.2 LIMIT OF TRANSMISSION TIME 2
7.3 DUTY CYCLE 2
7.4 CENTRAL FREQUNCY 2
7.5 RADIATED EMISSIONS 2
7.6 POWERLINE CONDUCTED EMISSIONS 2

8. APPENDIX 1 PHOTOGRAPHS OF TEST SETUP 2

1. TEST RESULT CERTIFICATION

Product:	Water Leak Sensor
Model:	WLS1300
Brand Name:	Oplink
Applicant:	**Zhuhai FTZ Oplink Communications, Inc.**
	#29#30 Lianfeng Avenue, Free Trade Zone, Zhuhai City, Guangdong Province, China 591030
Manufacturer:	**Vision Automobile Electronics Industrial Co., Ltd.**
	No. 78, Gongye 3rd Rd., Technology Industrial Park, Tainan 70955, Taiwan
Tested:	April 7, 2014 – April 16, 2014

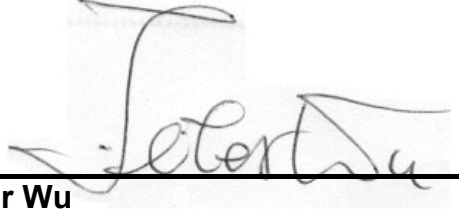
APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C: 2012 ANSI C63.4 : 2009	No non-compliance noted

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2009 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.207, 15.209 and Part 15.231(a).

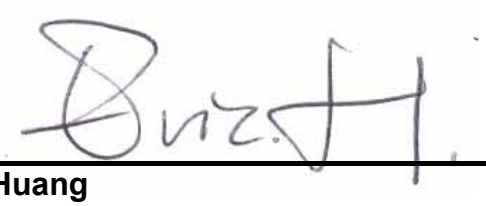
The test results of this report relate only to the tested sample identified in this report.

Approved by:



Jeter Wu
Assistant Manager

Reviewed by:



Eric Huang
Assistant Section Manager

2. EUT DESCRIPTION

Product	Water Leak Sensor
Model Number	WLS1300
Brand Name	Oplink
Received Date	April 03, 2014
Frequency Range	433.92 MHz ± 150 kHz
Number of Channels	1 Channel
Type of Modulation	ASK
Power Supply	Powered from battery, 3Vdc
Antenna Type	Helical antenna Gain: -10 dBi
Temperature Range	-20°C ~ +70°C

Remark:

1. Client consigns only one model sample to test (Model Number: **WLS1300**). Therefore, the testing Lab. just guarantees the unit, which has been tested.
2. This submittal(s) (test report) is intended for FCC ID: **OS3WLS01** filing to comply with Section 15.207, 15.209 and 15.231(a) of the FCC Part 15, Subpart C Rules.
3. There are two external colors-white and black for sale and the two external are all the same, except for different colors are just for marking purpose.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 (2009) and FCC CFR 47 15.207, 15.209 and 15.231(a)

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.

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. 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.

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: **WLS1300**) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

Note：

1) The field strength of spurious emission was measured in the following position: EUT have three test modes(X, Y, Z axis).

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	DEC. 18, 2014
BI-LOG Antenna	Sunol	JB1	A070506-2	SEP. 26, 2014
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2014
Pre-Amplifier	HP	8447F	NCR	NCR
EMI Receiver	R&S	ESVS10	833206/012	JUN 26, 2014
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2014
Horn Antenna	Com-Power	AH-118	071032	DEC. 05, 2014
3116 Double Ridge Antenna (40G)	ETS-LINDGREN	3116	00078900	DEC. 27, 2014
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
Power Meter	Anritsu	ML2487A	6K00003888	MAY 20, 2014
Power Sensor	Anritsu	MA2491A	33265	MAY 20.2014
Temp./Humidity Chamber	K.SON	THS-M1	242	AUG. 08, 2014
DC Power Source	LOKO	DSP-5050	L1507009282	N.C.R
Spectrum Analyzer	R&S	FSU	200789	JUL.01.2014
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP.28.2014

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

4.3 MEASUREMENT UNCERTAINTY

Parameter	Uncertainty
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.3456dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±2.6828dB
Radiated Emission, 1 to 8 GHz	± 2.6485dB
Radiated Emission, 8 to 18 GHz	± 2.6852dB
Radiated Emission, 18 to 26.5 GHz	± 2.6485dB
Radiated Emission, 26 to 40 GHz	± 3.0295dB
Power Line Conducted Emission	±1.91dB
Band Width	136.49kHz
Peak Output Power MU	±1.904dB
Band Edge MU	±0.302dBuV
Channel Separation MU	361.69Hz
Duty Cycle MU	0.064ms
Frequency Stability MU	0.223kHz

Uncertainty figures are valid to a confidence level of 95%, k=2

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 : 2009 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, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors 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 TABLE OF ACCREDITATIONS AND 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	N/A	---	---	---	---

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

[RF test]

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	N/A	-------	-------	-------	-------

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 15.231 REQUIREMENTS

7.1 20 DB BANDWIDTH

LIMIT

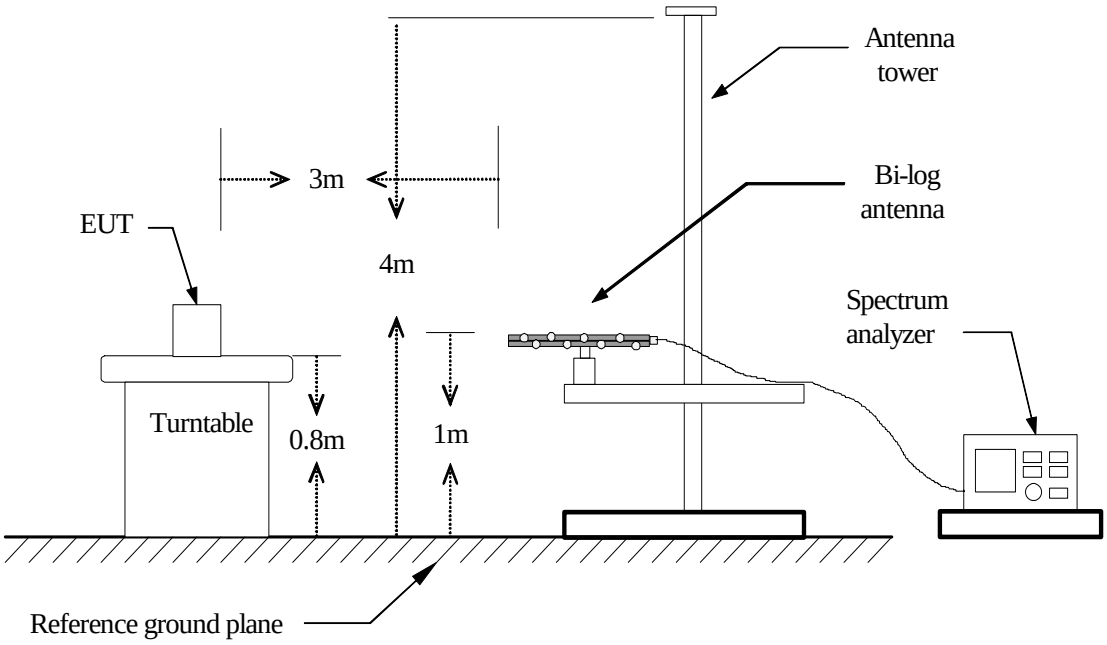
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	R&S	FSU	200789	JUL. 1, 2014

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

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 10 kHz and VBW is set 30kHz.

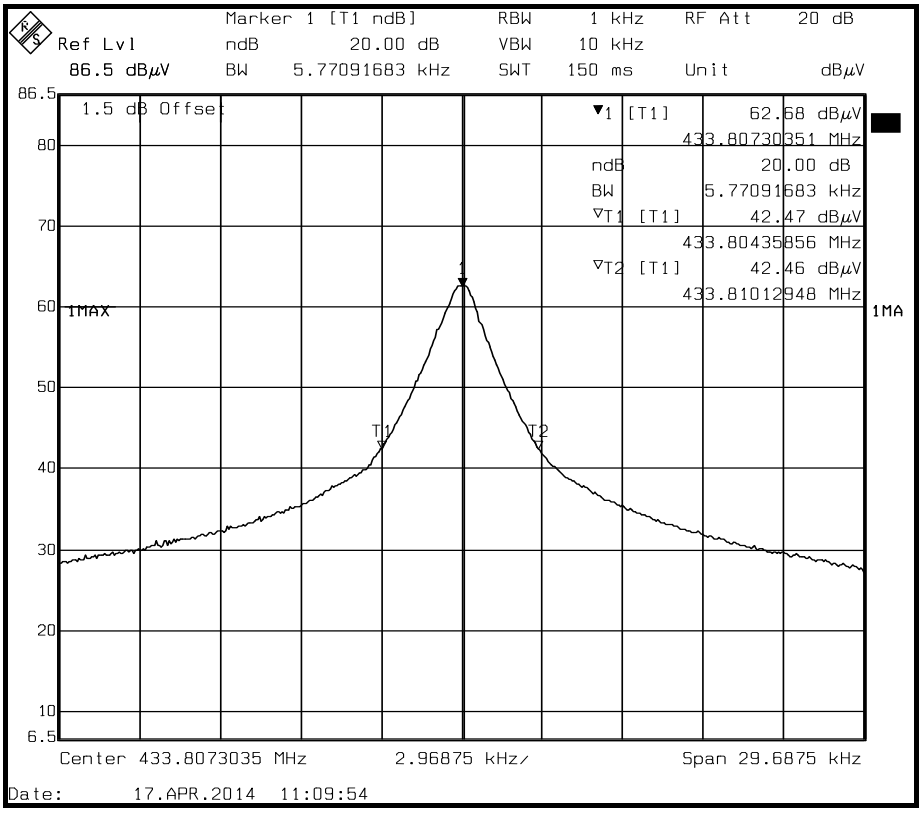
TEST RESULTS

No non-compliance noted.

TEST DATA

Frequency (MHz)	20dB Bandwidth (KHz)	Limit (KHz)	Result
433.807318	5.77091683	1084.5183	PASS

Test Plot



7.2 LIMIT OF TRANSMISSION TIME

LIMIT

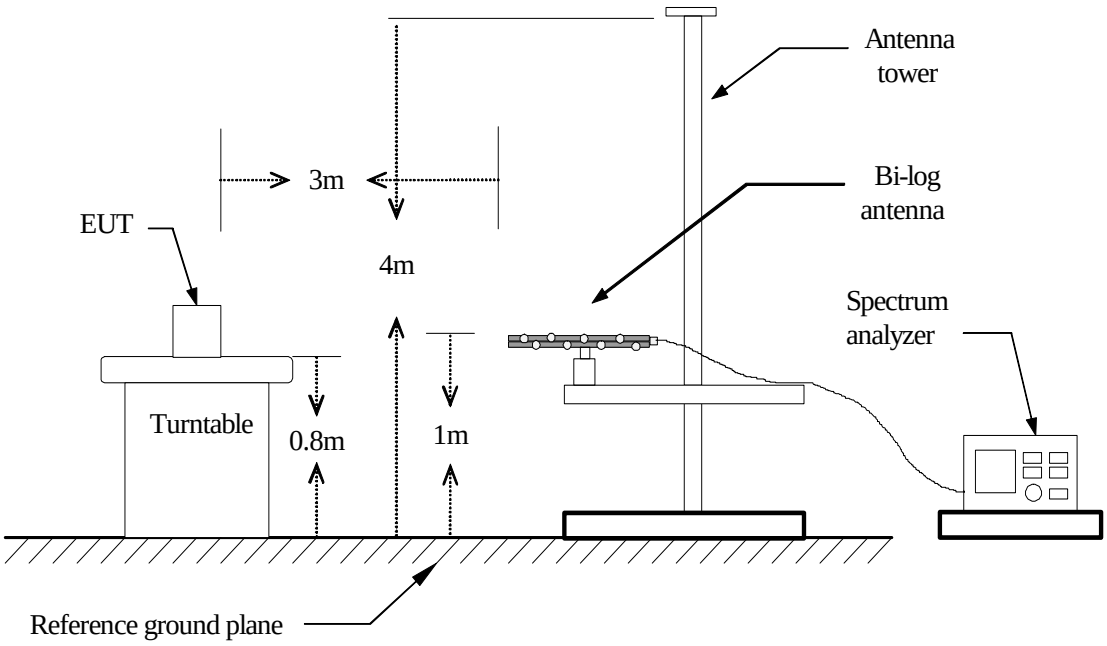
According to 15.231 (a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	R&S	FSU	200789	JUL. 1, 2014

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

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW＝100kHz and VBW＝300kHz.

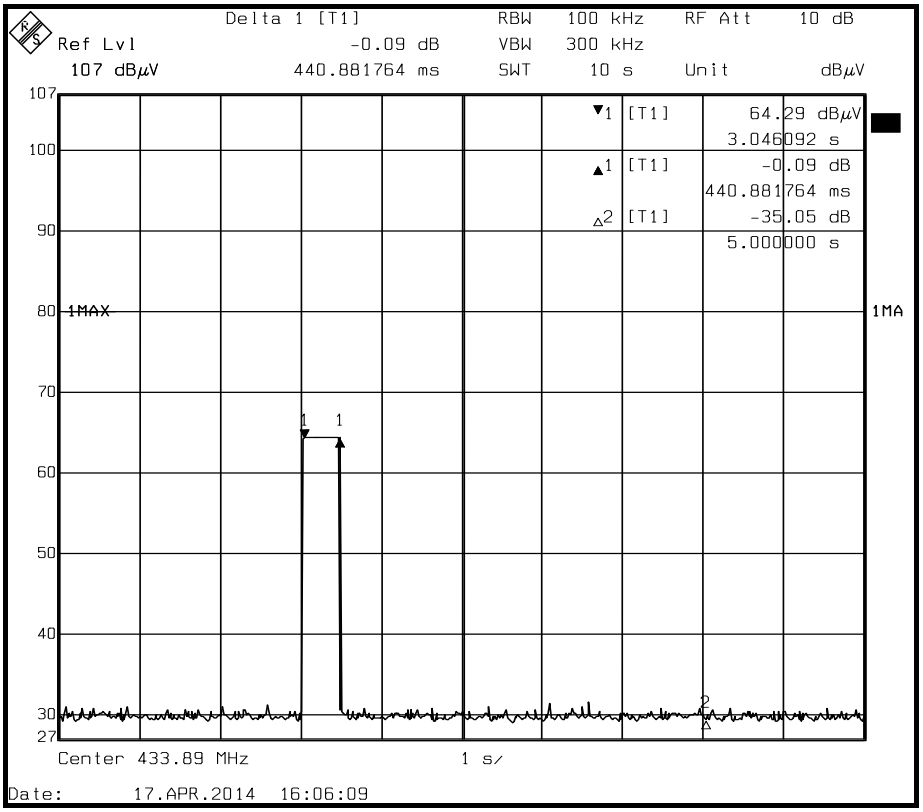
TEST RESULTS

No non-compliance noted.

TEST DATA

Frequency (MHz)	Transmission Time (s)	Limit (Second)	Result
433.807318	0.440881764	5	PASS

Test Plot



7.3 DUTY CYCLE

LIMIT

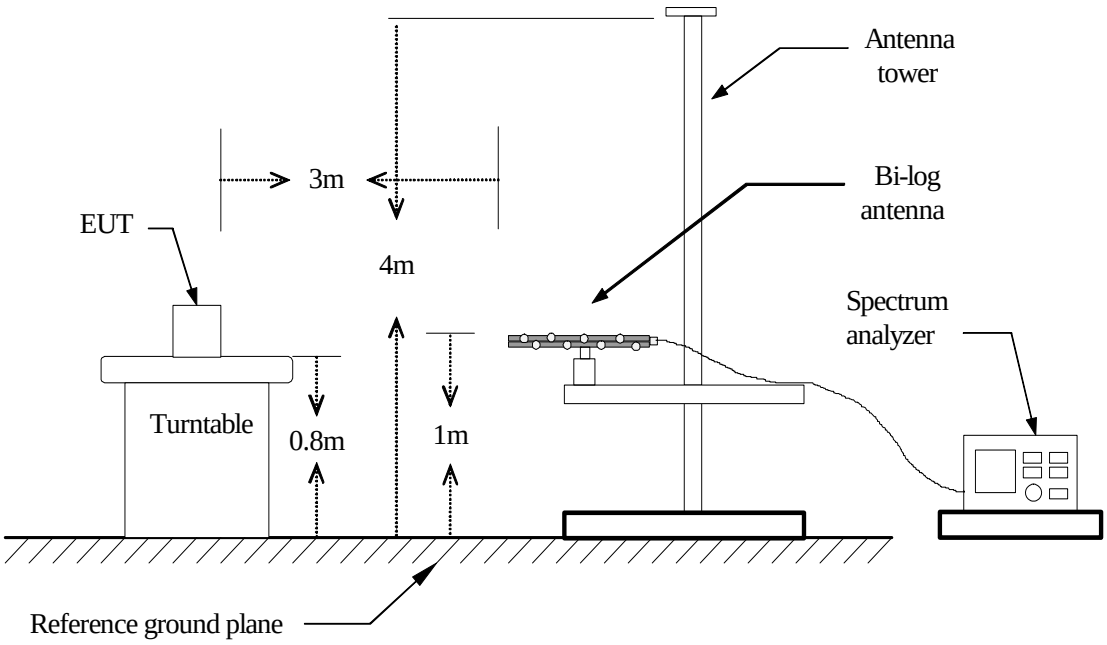
Nil (No dedicated limit specified in the Rules)

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	R&S	FSU	200789	JUL. 1, 2014

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

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW, VBW=100KHz, Span = 0Hz, a suitable Sweep Time.
4. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted.

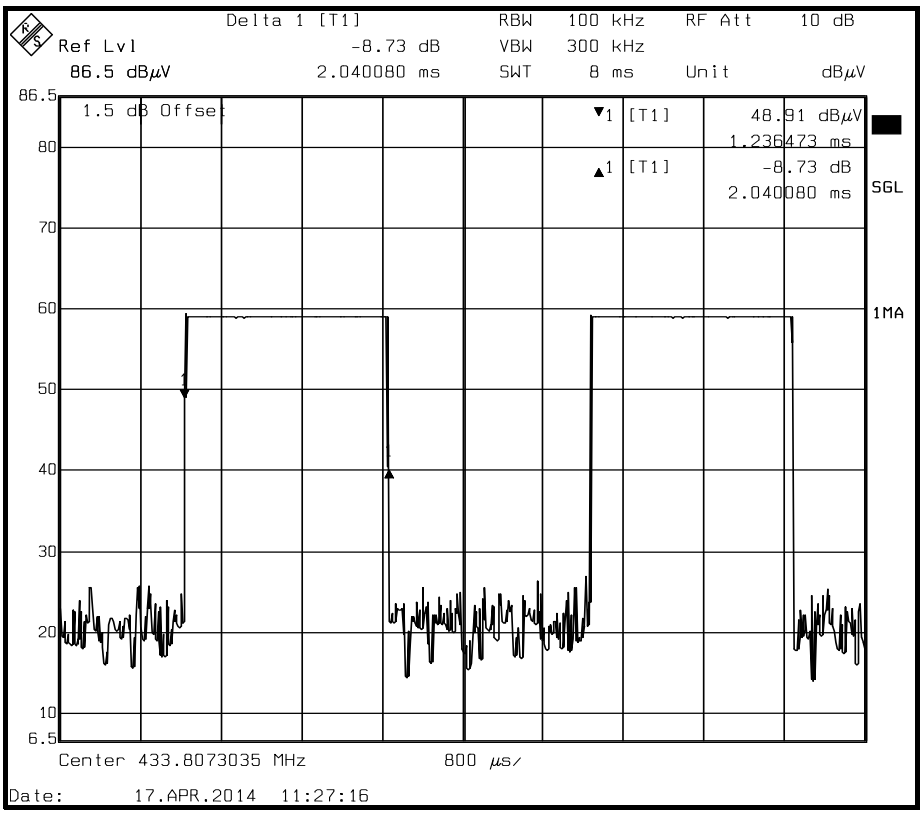
TEST DATA

	us	Times	Ton	Total Ton time(ms)
Ton1	2040.080	1	2040.080	2.040
Ton2			0.000	
Ton3		0	0.000	
Tp				4.044

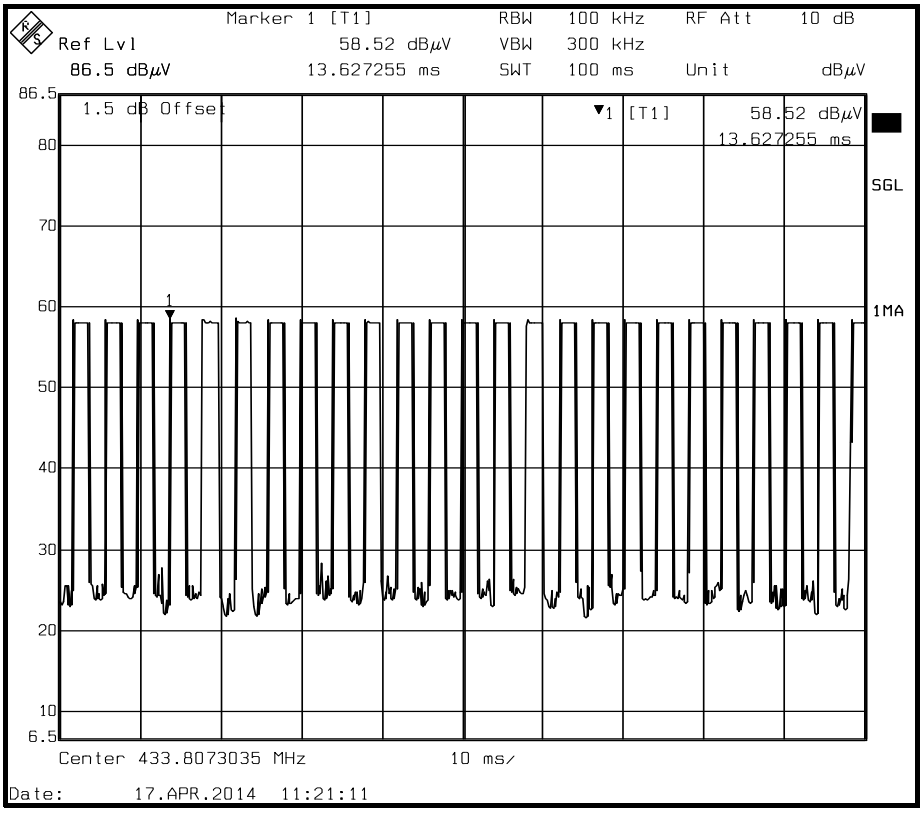
Ton	2.040
Tp(Ton+Toff)	4.044
Duty Cycle	0.504
Duty Factor	-5.943

Test Plot

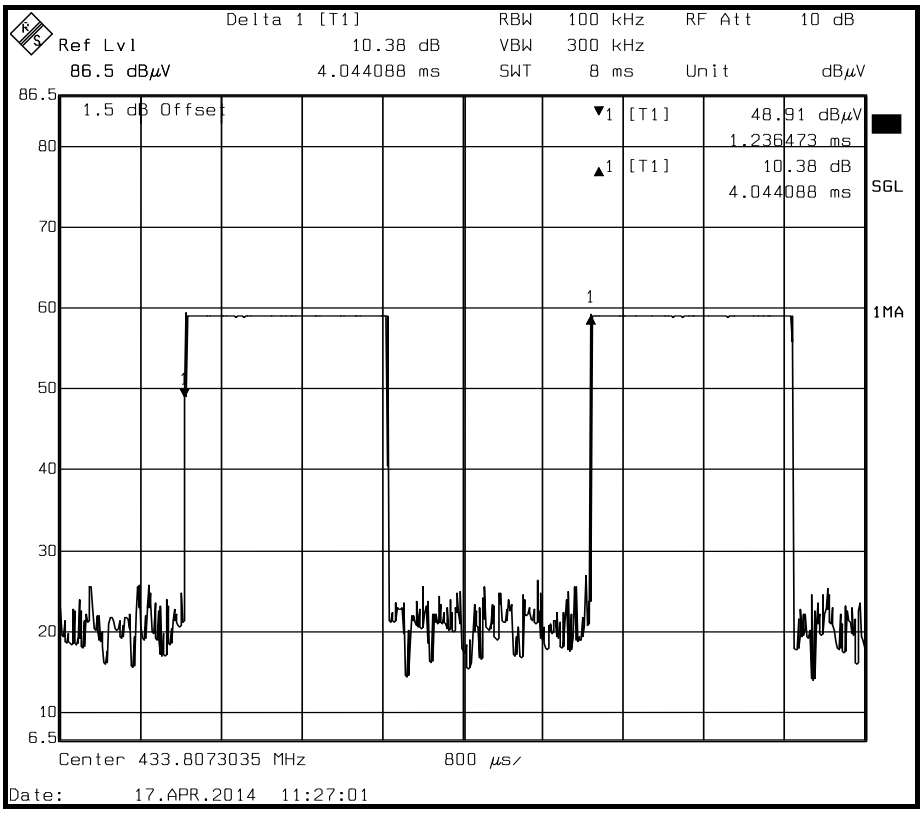
TON



TP1


Marker 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
58.52 dBµV
VBW 300 kHz
86.5 dBµV
13.627255 ms
SWT 100 ms
Unit dBµV
1.5 dB Offset
1 [T1]
58.52 dBµV
13.627255 ms
SGL
1MA
86.5
80
70
60
50
40
30
20
10
6.5
Center 433.8073035 MHz
10 ms/
Date: 17.APR.2014 11:21:11

TP2


Delta 1 [T1]
RBW 100 kHz
RF Att 10 dB
Ref Lvl
10.38 dB
VBW 300 kHz
86.5 dBµV
4.044088 ms
SWT 8 ms
Unit dBµV
1.5 dB Offset
1 [T1]
48.91 dBµV
1.236473 ms
1 [T1]
10.38 dB
4.044088 ms
SGL
1MA
86.5
80
70
60
50
40
30
20
10
6.5
Center 433.8073035 MHz
800 µs/
Date: 17.APR.2014 11:27:01

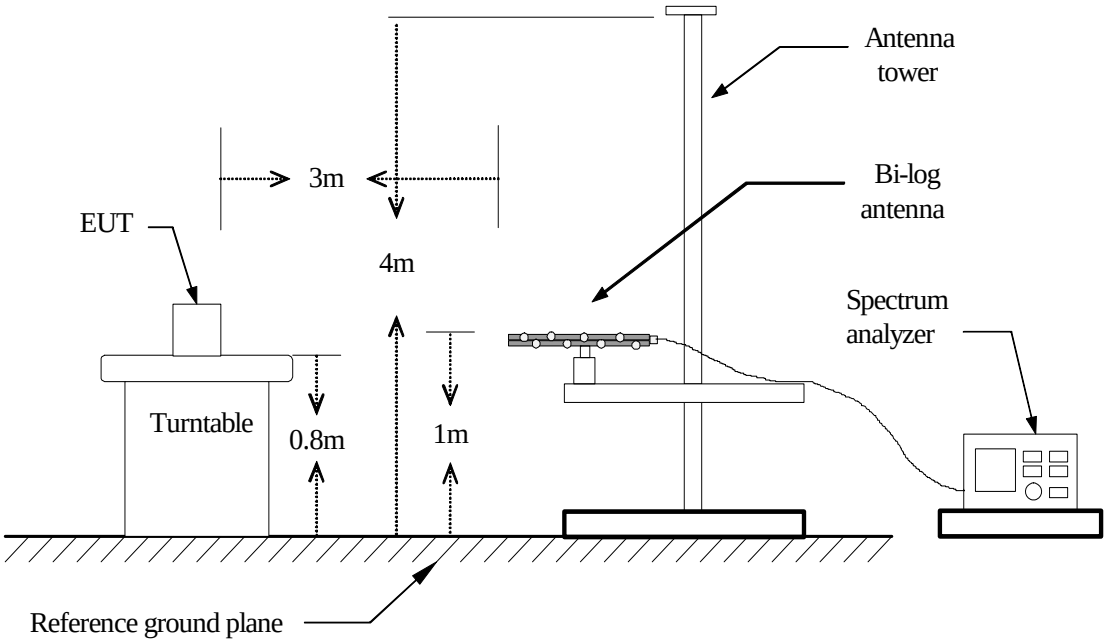
7.4 CENTRAL FREQUNCY

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
SPECTRUM ANALYZER	R&S	FSU	200789	JUL. 1, 2014

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

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW＝1kHz and VBW＝3kHz.

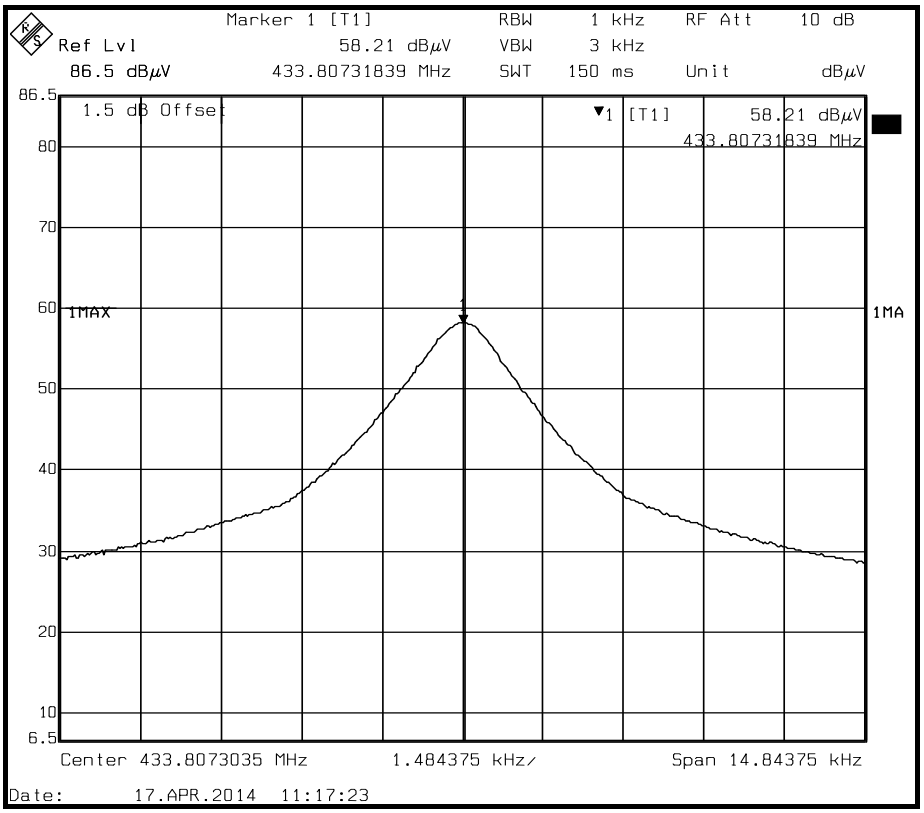
TEST RESULTS

No non-compliance noted.

TEST DATA

Frequency (MHz)	Central frequncy (MHz)	Frequncy Error (MHz)
433.92	433.8073184	0.11268161

Test Plot



7.5 RADIATED EMISSIONS

LIMIT

1. 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 (mV/m)	Field Strength (dBμV/m at 3-meter)	Measurement Distance (m)
30-88	100*	40	3
88-216	150*	43.5	3
216-960	200*	46	3
Above 960	500	54	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.

2. For intentional device, according to § 15.231(b), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following table.

Fundamental Frequency (MHz)	Field Strength of Fundamental (μV/M)	Field Strength of Spurious Emission
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750**	125 to 375**
174-260	3750	375
260-470	3750 to 12500**	375 to 1250**
Above 470	12500	1250

Note :

1. " ※※ " linear interpolations.
2. Where F is the frequency in MHz, the formulas for calculating the maximum permitted fundamental field strengths are as follows: for the band 130-174 MHz, uV/m at 3 meters = 56.81818(F) - 6136.3636; for the band 260-470 MHz, uV/m at 3 meters = 41.6667(F) - 7083.3333. The maximum permitted unwantedemission level is 20 dB below the maximum permitted fundamental level.

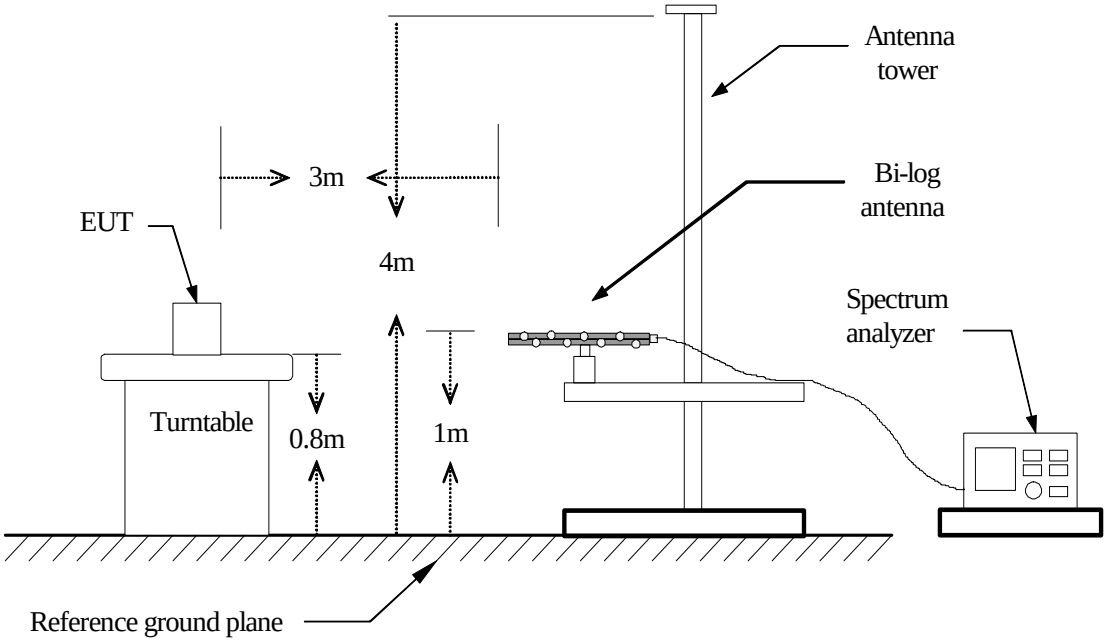
MEASUREMENT EQUIPMENT USED

Open Area Test Site # 6				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
TYPE N COAXIAL CABLE	SUHNER	CHA9513	6	DEC. 18, 2014
BI-LOG Antenna	Sunol	JB1	A070506-2	SEP. 26, 2014
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2014
Pre-Amplifier	HP	8447F	NCR	NCR
EMI Receiver	R&S	ESVS10	833206/012	JUN. 26, 2014
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2014
Horn Antenna	Com-Power	AH-118	071032	DEC. 05, 2014
3116 Double Ridge Antenna (40G)	ETS-LINDGREN	3116	00078900	DEC. 27, 2014
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
Power Meter	Anritsu	ML2487A	6K00003888	MAY 20, 2014
Power Sensor	Anritsu	MA2491A	33265	MAY 20.2014
Temp./Humidity Chamber	K.SON	THS-M1	242	AUG. 08, 2014
DC Power Source	LOKO	DSP-5050	L1507009282	N.C.R
Spectrum Analyzer	R&S	FSU	200789	JUL.01.2014
Spectrum Analyzer	R&S	FSEK 30	835253/002	SEP.28.2014

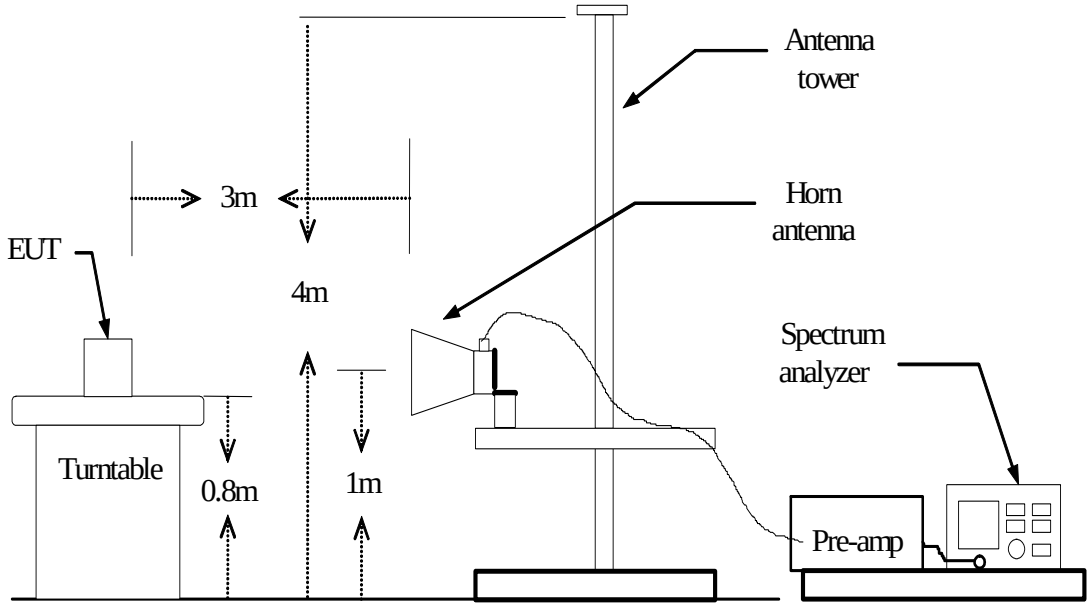
Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration

Below 1 GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above 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 emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:

   Below 1GHz:

   RBW=100kHz / VBW=300kHz / Sweep=AUTO

   Above 1GHz:

   (a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
   (b) AVERAGE: PEAK + DUTY FACTOR

7. Repeat above procedures until the measurements for all frequencies are complete.
8. No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

TEST RESULTS

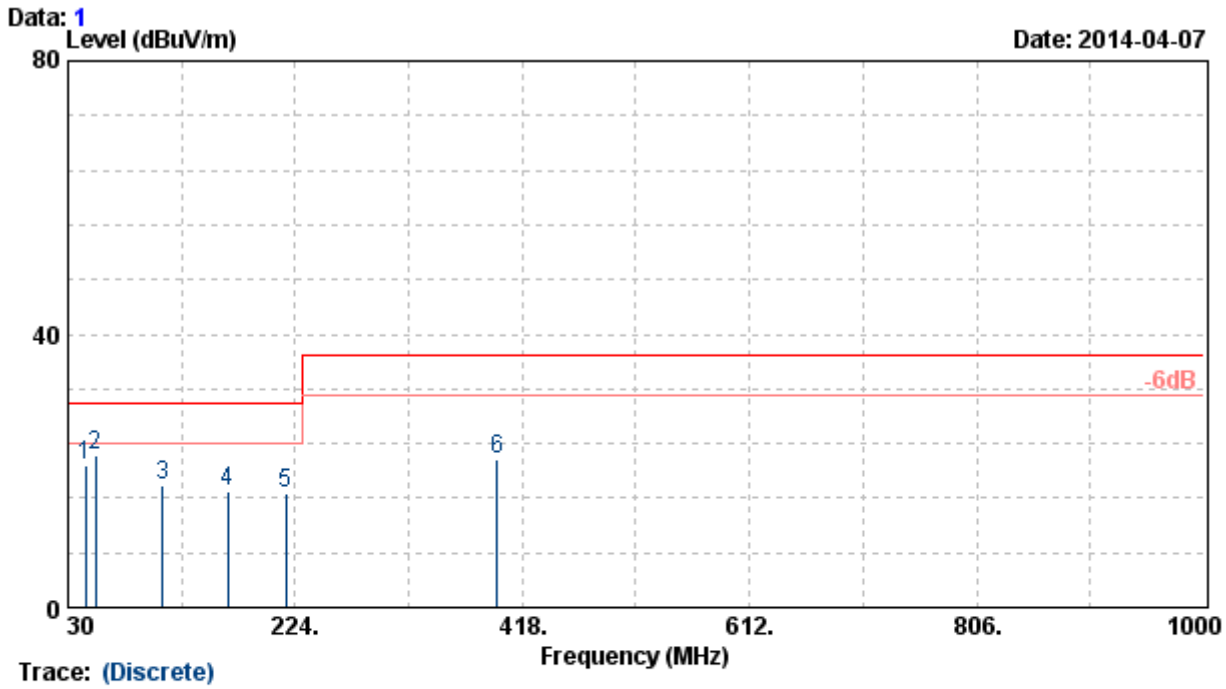
Below 1 GHz

Operation Mode: Normal Operation **Test Date:** 2014/4/8

Temperature: 26°C **Tested by:** Taiyu Cyu

Humidity: 58% RH **Polarity:** Ver. / Hor.

Vertical



Trace: (Discrete)

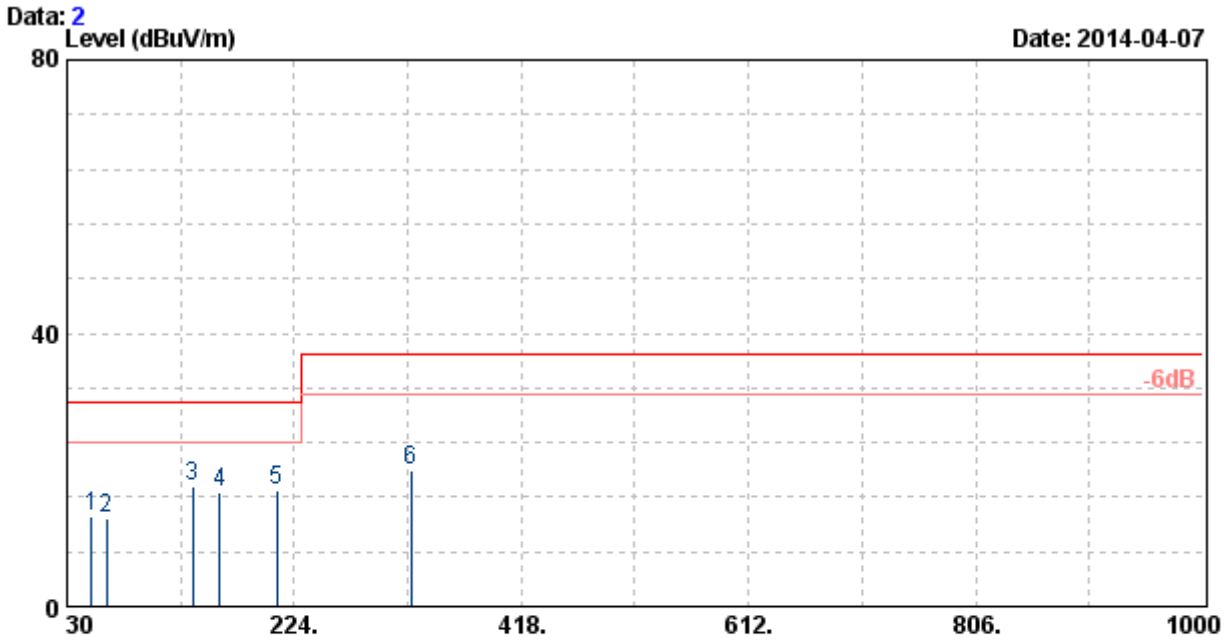
Freq.	Reading Level	Antenna Factor	Cable Loss	Measure Level	Limit	Over Limit	Detector
MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dBuV/m	
45.23	9.44	9.44	1.92	20.79	30.00	-9.21	QP
53.78	12.20	7.94	2.06	22.19	30.00	-7.81	QP
110.52	2.29	12.58	2.99	17.86	30.00	-12.14	QP
166.42	1.32	11.91	3.78	17.01	30.00	-12.99	QP
216.02	1.26	11.22	4.29	16.78	30.00	-13.22	QP
396.52	0.29	15.48	5.92	21.69	37.00	-15.31	QP

Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz 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).
6. That the limit for signals below 1GHz is a QP limit and peak readings are below the QP limit.
7. The fundamental signal is not shown in the test data because measurements at fundamental frequency are shown separately and were ignored during the 30 – 1000 MHz scan.

Operation Mode:	Normal Operation	**Test Date:**	2014/4/8
Temperature:	26°C	**Tested by:**	Taiyu Cyu
Humidity:	58% RH	**Polarity:**	Ver. / Hor.

Horizontal



Trace: (Discrete)

Freq. MHz	Reading Level dBuV	Antenna Factor dB/m	Cable Loss dB	Measure Level dBuV/m	Limit dBuV/m	Over Limit dBuV/m	Detector
51.20	3.21	7.96	2.01	13.19	30.00	-16.81	QP
63.52	2.55	8.02	2.20	12.76	30.00	-17.24	QP
137.50	1.12	13.09	3.41	17.62	30.00	-12.38	QP
160.04	0.81	12.17	3.73	16.71	30.00	-13.29	QP
209.28	0.89	11.86	4.22	16.97	30.00	-13.03	QP
324.18	0.75	13.94	5.32	20.01	37.00	-16.99	QP

Remark:

1. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz 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).
6. That the limit for signals below 1GHz is a QP limit and peak readings are below the QP limit.
7. The fundamental signal is not shown in the test data because measurements at fundamental frequency are shown separately and were ignored during the 30 – 1000 MHz scan.

The fundamental signal

Operation Mode:	TX / X Mode	**Test Date:**	April 16, 2014
Temperature:	26.4℃	**Tested by:**	Ted Huang
Humidity:	65 % RH	**Polarity:**	Ver. / Hor.

Horizontal

Measurement Distance at 3m Horizontal polarity									
Freq.	**Reading**	**AF**	**Closs**	**Pre-amp**	**Filter**	**Level**	**Limit**	**Margin**	**Mark**
(MHz)	**(dBμV)**	**(dBμV)**	**(dB)**	**(dB)**	**(dB)**	**(dBμV/m)**	**(dBμV/m)**	**(dB)**	**(P/Q/A)**
433.80	89.38	17.03	3.91	24.80	0.00	85.52	100.82	-15.30	P
433.80	83.44	17.03	3.91	24.80	0.00	79.58	80.82	-1.24	A
867.61	38.48	22.74	5.79	24.37	0.00	42.64	74.00	-31.36	P
867.61	32.54	22.74	5.79	24.37	0.00	36.70	59.58	-22.89	A

Vertical

Measurement Distance at 3m Vertical polarity									
Freq.	**Reading**	**AF**	**Closs**	**Pre-amp**	**Filter**	**Level**	**Limit**	**Margin**	**Mark**
(MHz)	**(dBμV)**	**(dBμV)**	**(dB)**	**(dB)**	**(dB)**	**(dBμV/m)**	**(dBμV/m)**	**(dB)**	**(P/Q/A)**
433.79	87.12	17.03	3.91	24.80	0.00	83.26	100.82	-17.56	P
433.79	81.18	17.03	3.91	24.80	0.00	77.32	80.82	-3.50	A
867.60	41.35	22.74	5.79	24.37	0.00	45.51	74.00	-28.49	P
867.60	35.41	22.74	5.79	24.37	0.00	39.57	57.32	-17.76	A

Remark:
Margin (dB) = Remark result (dBuV/m) – Quasi-peak limit (dBuV/m).

Above 1 GHz

Operation Mode:	TX / X Mode	**Test Date:**	April 16, 2014
Temperature:	26.4℃	**Tested by:**	Ted Huang
Humidity:	65 % RH	**Polarity:**	Ver. / Hor.

Horizontal

	Freq.	Reading	AF	Closs	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	1301.32	66.23	26.01	1.84	48.89	0.30	45.49	74.00	-28.51	P
*	1301.32	60.29	26.01	1.84	48.89	0.30	39.55	54.00	-14.45	A
	1735.30	58.35	28.54	2.16	48.45	0.30	40.91	80.82	-39.91	P
	1735.30	52.41	28.54	2.16	48.45	0.30	34.96	60.82	-25.86	A
	2169.04	64.29	30.40	2.44	47.87	0.30	49.56	80.82	-31.27	P
	2169.04	58.35	30.40	2.44	47.87	0.30	43.61	60.82	-17.21	A
	2602.82	58.11	30.28	2.70	47.38	0.30	44.01	80.82	-36.81	P
	2602.82	52.17	30.28	2.70	47.38	0.30	38.07	60.82	-22.75	A
	3036.67	67.74	30.61	2.93	47.11	0.30	54.47	80.82	-26.35	P
	3036.67	61.80	30.61	2.93	47.11	0.30	48.53	60.82	-12.29	A
	3470.47	57.71	30.79	3.16	47.49	0.30	44.47	80.82	-36.35	P
	3470.47	51.77	30.79	3.16	47.49	0.30	38.52	60.82	-22.30	A
*	3904.27	66.86	31.53	3.34	47.77	0.30	54.26	74.00	-19.74	P
*	3904.27	60.92	31.53	3.34	47.77	0.30	48.32	54.00	-5.68	A
*	4338.20	64.86	32.51	3.56	48.13	0.37	53.16	74.00	-20.84	P
*	4338.20	58.92	32.51	3.56	48.13	0.37	47.22	54.00	-6.78	A

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 1GHz to 4.5GHz was 1MHz.
5. Remark "*"means the Restricted band.
6. Average level=Peak level +Duty factor.

Operation Mode:	TX / X Mode	**Test Date:**	April 16, 2014
Temperature:	26.4℃	**Tested by:**	Ted Huang
Humidity:	65 % RH	**Polarity:**	Ver. / Hor.

Vertical

	Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Closs (dB)	Pre-amp (dB)	Filter (dB)	Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)
*	1301.67	66.71	26.01	1.84	48.89	0.30	45.97	74.00	-28.03	P
*	1301.67	60.77	26.01	1.84	48.89	0.30	40.03	54.00	-13.97	A
	1735.27	61.22	28.54	2.16	48.45	0.30	43.78	80.82	-37.05	P
	1735.27	55.28	28.54	2.16	48.45	0.30	37.83	60.82	-22.99	A
	2168.98	69.19	30.40	2.44	47.87	0.30	54.46	80.82	-26.37	P
	2168.98	63.25	30.40	2.44	47.87	0.30	48.51	60.82	-12.31	A
	2602.68	57.34	30.28	2.70	47.38	0.30	43.24	80.82	-37.58	P
	2602.68	51.40	30.28	2.70	47.38	0.30	37.30	60.82	-23.52	A
	3036.64	67.45	30.61	2.93	47.11	0.30	54.18	80.82	-26.64	P
	3036.64	61.51	30.61	2.93	47.11	0.30	48.24	60.82	-12.58	A
	3470.38	60.37	30.79	3.16	47.49	0.30	47.13	80.82	-33.69	P
	3470.38	54.43	30.79	3.16	47.49	0.30	41.18	60.82	-19.64	A
*	3904.27	69.19	31.53	3.34	47.77	0.30	56.59	74.00	-17.41	P
*	3904.27	63.25	31.53	3.34	47.77	0.30	50.65	54.00	-3.35	A
*	4338.07	64.46	32.51	3.56	48.13	0.37	52.76	74.00	-21.24	P
*	4338.07	58.52	32.51	3.56	48.13	0.37	46.82	54.00	-7.18	A

Notes:

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. The IF bandwidth of SPA between 1GHz to 4.5GHz was 1MHz.
5. Remark "*"means the Restricted band.
6. Average level=Peak level +Duty factor.

7.6 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Conducted Emission room #1				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8130	8130124	SEP. 30, 2014
	Rohde & Schwarz	ESH 3-Z5	840062/021	JUL. 31, 2014
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUL. 23, 2014
BNC COAXIAL CABLE	CCS	BNC50	11	OCT. 30, 2014
Test S/W	e-3 (5.04211c) R&S (2.27)			

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

TEST RESULTS

※ This EUT do not connect to AC Source directly. Not applicability for this test.