

SPECTRUM REPORT (GPS)

Applicant: Shenzhen Concox Information Technology Co., Ltd

Address of Applicant: Floor 4th, Building B, Gaoxingqi Industrial Park, Liuxian 1st Road, District 67, Bao'an, Shenzhen, Guangdong

Equipment Under Test (EUT)

Product Name: GPS Vehicle tracker

Model No.: TR02, TR02N, TR02A, GT02A, GT02B, GT02D

Applicable standards: ETSI EN 300 440-1 V1.6.1 (2010-08)
ETSI EN 300 440-2 V1.4.1 (2010-08)

Date of sample receipt: 18 Jul., 2013

Date of Test: 19 Jul., to 22 Jul., 2013

Date of report issued: 23 Jul., 2013

Test Result : PASS *

*In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 1999/5/EC are considered.



Bruce Zhang
Laboratory Manager



This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	23 Jul., 2013	Original

Prepared By:



Date:

23 Jul., 2013

Report Clerk

Check By:



Date:

23 Jul., 2013

Project Engineer

3 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
5 GENERAL INFORMATION	5
5.1 CLIENT INFORMATION	5
5.2 GENERAL DESCRIPTION OF E.U.T.	5
5.3 DESCRIPTION OF SUPPORT UNITS	5
5.4 LABORATORY FACILITY	5
5.5 LABORATORY LOCATION	6
5.6 TEST INSTRUMENTS LIST	6
6 RADIO TECHNICAL REQUIREMENTS SPECIFICATION IN ETSI EN 300 440-2	7
6.1 TEST ENVIRONMENT	7
6.2 TEST MODE	7
6.3 RECEIVER REQUIREMENTS	8
6.3.1 Spurious emissions	9
6.3.2 Additional Requirements	15
6.3.3 Adjacent Channel Selectivity	15
6.3.4 Blocking or Desensitization	15
6.4 TEST SETUP PHOTO	16
6.5 EUT CONSTRUCTIONAL DETAILS	17

4 Test Summary

Radio Spectrum Matter (RSM) Part of Transmitter					
Test	Test Requirement	Test method	Limit/Severity	Uncertainty	Result
Equivalent isotropically radiated power	EN 300 440-2	EN 300 440-1	Table 4 10mW/ 10dBm	± 3dB	N/A
Permitted Range of Operating Frequencies	EN 300 440-2	EN 300 440-1	Table 4	± 10 ⁻⁵	N/A
Duty cycle	EN 300 440-2	EN 300 440-1	Table 6	N/A	N/A
Transmitter spurious emissions	EN 300 440-2	EN 300 440-1	Table 5	± 4.88 dB	N/A
Radio Spectrum Matter (RSM) Part of Receiver					
Receiver spurious emissions	EN 300 440-2	EN 300 440-1	<2nW <1GHz, <20nW >1GHz	±4.88dB	PASS

Remark:

- 1>. Pass: The EUT complies with the essential requirements in the standard.
- 2>. N/A: Indicates that the test was not applicable
- 3>. Temperature (Uncertainty): ±1 °C Humidity(Uncertainty): ±5%

5 General Information

5.1 Client Information

Applicant:	Shenzhen Concox Information Technology Co., Ltd
Address of Applicant:	Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road, District 67, Bao'an, Shenzhen,Guangdong
Manufacturer:	Shenzhen Concox Information Technology Co., Ltd
Address of Manufacturer:	Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road, District 67, Bao'an, Shenzhen,Guangdong

5.2 General Description of E.U.T.

Product Name:	GPS Vehicle tracke
Model No.:	TR02,TR02N,TR02A,GT02A,GT02B,GT02D
Remark:	The Model: TR02,TR02N,TR02A,GT02A,GT02B,GT02D were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being different model number.
Operation Frequency:	1.57542GHz
Power supply:	DC 12V

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
TELONG	Battery	T112120	N/A

5.4 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC - Registration No.: 817957 Shenzhen Zhongjian Nanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012. ● IC - Registration No.: 10106A-1 The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. ● CNAS - Registration No.: CNAS L6048 Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.
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5.5 Laboratory Location

<p>Shenzhen Zhongjian Nanfang Testing Co., Ltd. Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Tel: 0755-23118282 Fax: 0755-23116366</p>
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5.6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	SAEMC	9(L)*6(W)* 6(H)	CCIS0001	June 09 2013	June 08 2014
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	CCIS0002	N/A	N/A
3	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	CCIS0005	June 04 2013	June 03 2014
4	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	CCIS0006	May 30 2013	May 29 2014
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Coaxial Cable	CCIS	N/A	CCIS0016	Apr. 01 2013	Mar. 31 2014
7	Coaxial Cable	CCIS	N/A	CCIS0017	Apr. 01 2013	Mar. 31 2014
8	Coaxial cable	CCIS	N/A	CCIS0018	Apr. 01 2013	Mar. 31 2014
9	Coaxial Cable	CCIS	N/A	CCIS0019	Apr. 01 2013	Mar. 31 2014
10	Coaxial Cable	CCIS	N/A	CCIS0087	Apr. 01 2013	Mar. 31 2014
11	Amplifier(10kHz-1.3GHz)	HP	8447D	CCIS0003	Apr. 01 2013	Mar. 31 2014
12	Amplifier(1GHz-18GHz)	Compliance Direction Systems Inc.	PAP-1G18	CCIS0011	June 09 2013	June 08 2014
13	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Apr. 01 2013	Mar. 31 2014
14	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2013	Mar. 29 2014
15	Printer	HP	HP LaserJet P1007	N/A	N/A	N/A
16	Positioning Controller	UC	UC3000	CCIS0015	N/A	N/A
17	Spectrum analyzer 9k-30GHz	Rohde & Schwarz	FSP	CCIS0023	May. 29 2013	May. 28 2014
18	EMI Test Receiver	Rohde & Schwarz	ESPI	CCIS0022	Apr 01 2013	Mar. 31 2014
19	Loop antenna	Laplace instrument	RF300	EMC0701	Aug. 12 2012	Aug. 11 2013

6 Radio Technical Requirements Specification in ETSI EN 300 440-2

6.1 Test environment

Test Condition	Temperature	Relative Humidity	Voltage		
			AC mains	Lead-acid battery on vehicles	Other power sources
Normal	+15°C to +35°C	20% to 75%	nominal	1,1 times the nominal voltage	nominal
Extreme	-20°C to +55°C (General use) -20°C to +55°C (Portable use) 5°C to +35°C (Indoor use)	20% to 75%	▼ 0,9 times ▲ 1,1 times	▼ 0,9 times ▲ 1,3 times	▼0,85 times (Leclanché or lithium) 0,9 times (mercury or nickel-cadmium) ▲ 1,15 times

6.2 Test mode

Receiving mode:	Keep the EUT in receive mode by GPS.
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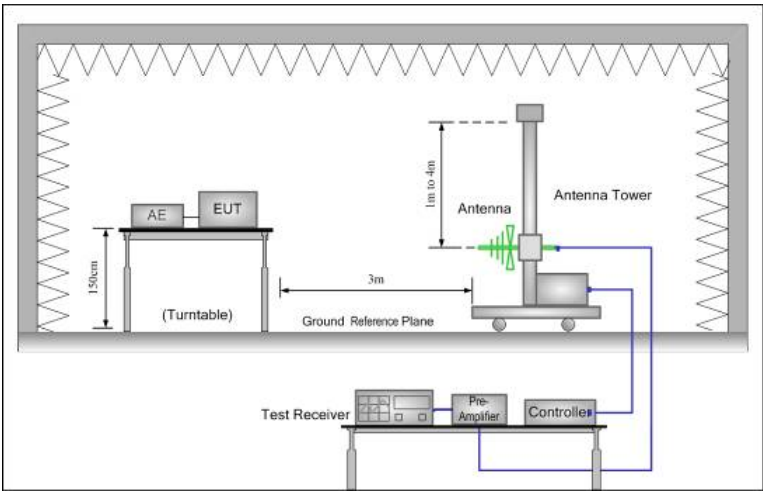
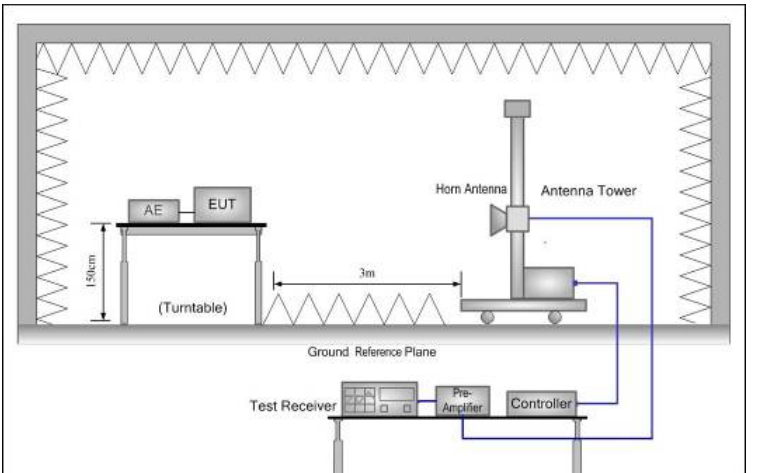
6.3 Receiver Requirements

Receiver Classification, Table 2 of EN 300 440-1.

Rx Class	Relevant Rx Clauses	Risk assessment of Rx performance
1	8.1, 8.2 and 8.3	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).
2	8.2 and 8.3	Medium reliable SRD communication media e.g. causing Inconvenience to persons, which cannot simply be overcome by other means.
3	8.3	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).

The EUT (Rx part) belong to Class 3.

6.3.1 Spurious emissions

Test Requirement:	EN 300 440-2 clause 4.2.1.3	
Test Method:	EN 300 440-1 clause 7.3.4	
Receiver setup:	Frequency<1000MHz; RBW=100KHz, VBW=300KHz, Detector= peak Frequency>=1000MHz; RBW=1MHz, VBW=3MHz, Detector=peak.	
Limit:	Frequency	Limit
	30MHz to 1000 MHz	2nW(-57dBm)
	Above 1GHz	20nW(-47dBm)
Test Frequency range:	25MHz to 25GHz	
Test setup:	Below 1GHz	
		
Test setup:	Above 1GHz	
		

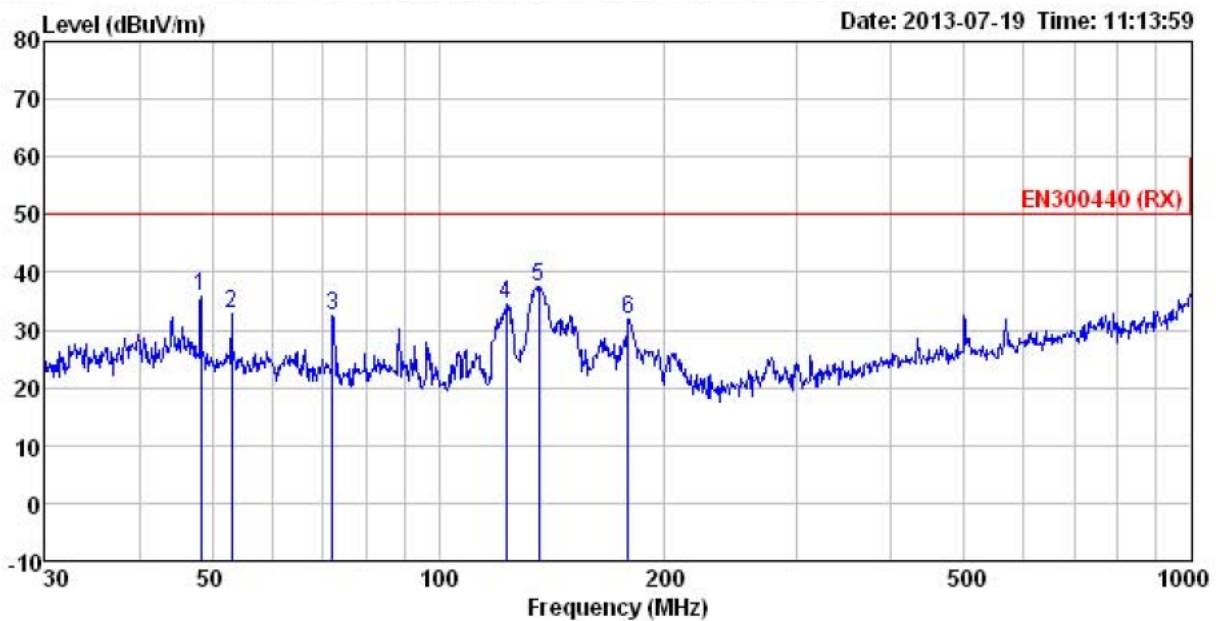
<p>Test procedure:</p>	<p>Substitution method was performed to determine the actual ERP emission levels of the EUT. The following test procedure as below:</p> <p style="text-align: center;">Below 1GHz test procedure:</p> <ol style="list-style-type: none"> 1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground. 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dB)}$ <p style="margin-left: 20px;">where: Pg is the generator output power into the substitution antenna.</p>
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	<p>Above 1GHz test procedure: Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.</p>
Test Instruments:	See the section 5.6
Test mode:	Kept Rx in receive mode.
Measurement Record:	Uncertainty: 4.88dB

Measurement Data

Below 1GHz

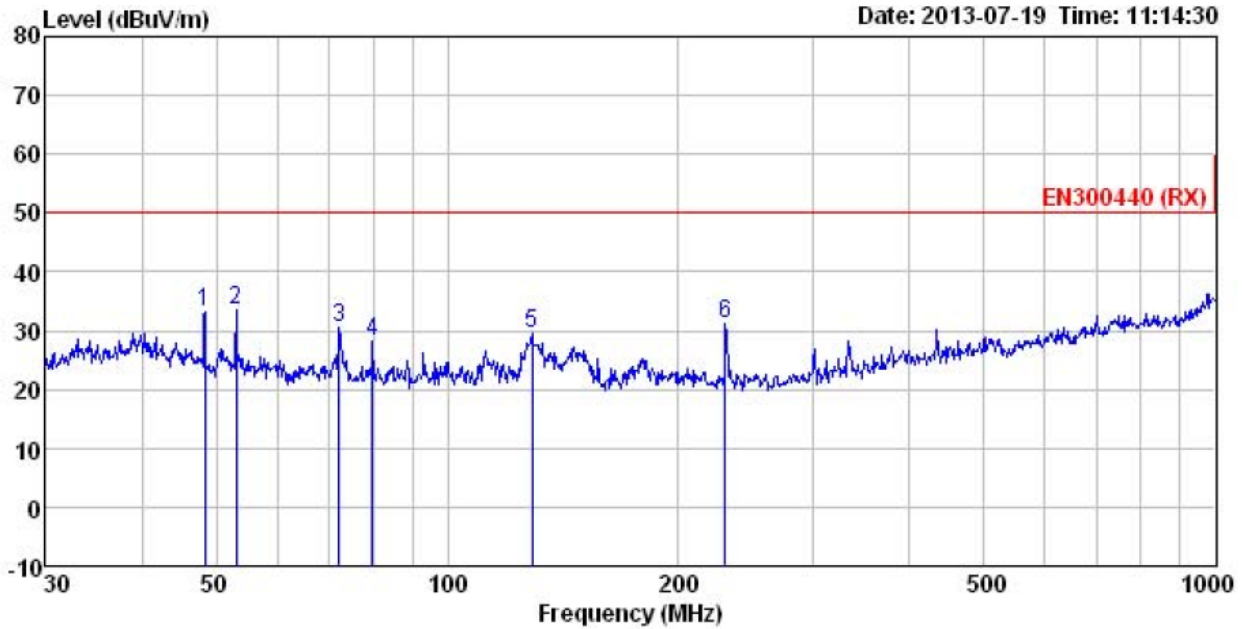
Vertical:



Site : 3m chamber
 Condition : EN300440 (RX) 3m R&TTE(30M18G) VERTICAL
 Job NO, : 225RF
 Test mode : GPS mode
 Power Rating : DC 13.2V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Joe

	ReadAntenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	
1	48.332	37.14	25.68	1.27	28.14	35.95	50.00 -14.05
2	53.131	34.94	25.19	1.32	28.60	32.85	50.00 -17.15
3	72.338	37.04	24.14	1.56	30.14	32.60	50.00 -17.40
4	122.834	39.07	22.87	2.20	29.65	34.49	50.00 -15.51
5	135.982	41.81	22.68	2.35	29.44	37.40	50.00 -12.60
6	178.758	34.01	22.04	2.72	26.81	31.96	50.00 -18.04

Horizontal:

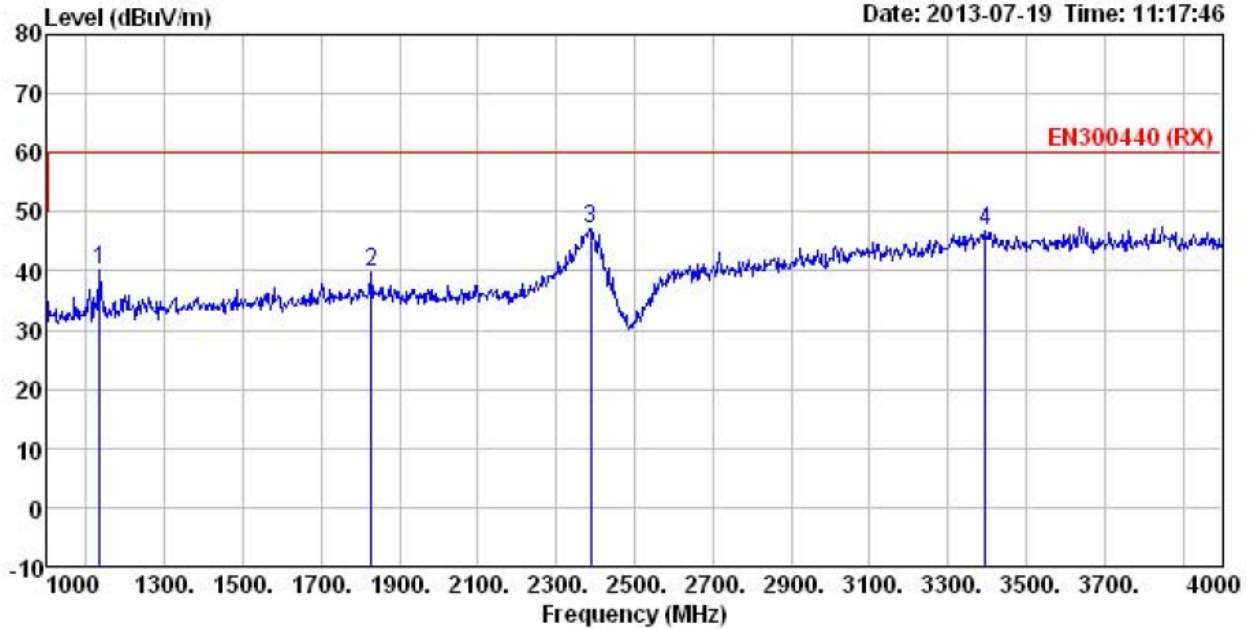


Site : 3m chamber
 Condition : EN300440 (RX) 3m R&TTE(30M18G) HORIZONTAL
 Job NO. : 225RF
 Test mode : GPS mode
 Power Rating : DC 13.2V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Joe

	Read	Antenna	Cable	Preamp	Limit	Over		
Freq	Level	Factor	Loss	Factor	Line	Limit	Remark	
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	48.332	34.43	25.68	1.27	28.14	33.24	50.00	-16.76
2	53.131	35.56	25.19	1.32	28.60	33.47	50.00	-16.53
3	72.338	35.09	24.14	1.56	30.14	30.65	50.00	-19.35
4	79.800	32.85	23.88	1.65	30.13	28.25	50.00	-21.75
5	129.015	34.02	22.78	2.27	29.54	29.53	50.00	-20.47
6	230.099	35.76	22.11	2.83	29.68	31.02	50.00	-18.98

Above 1GHz

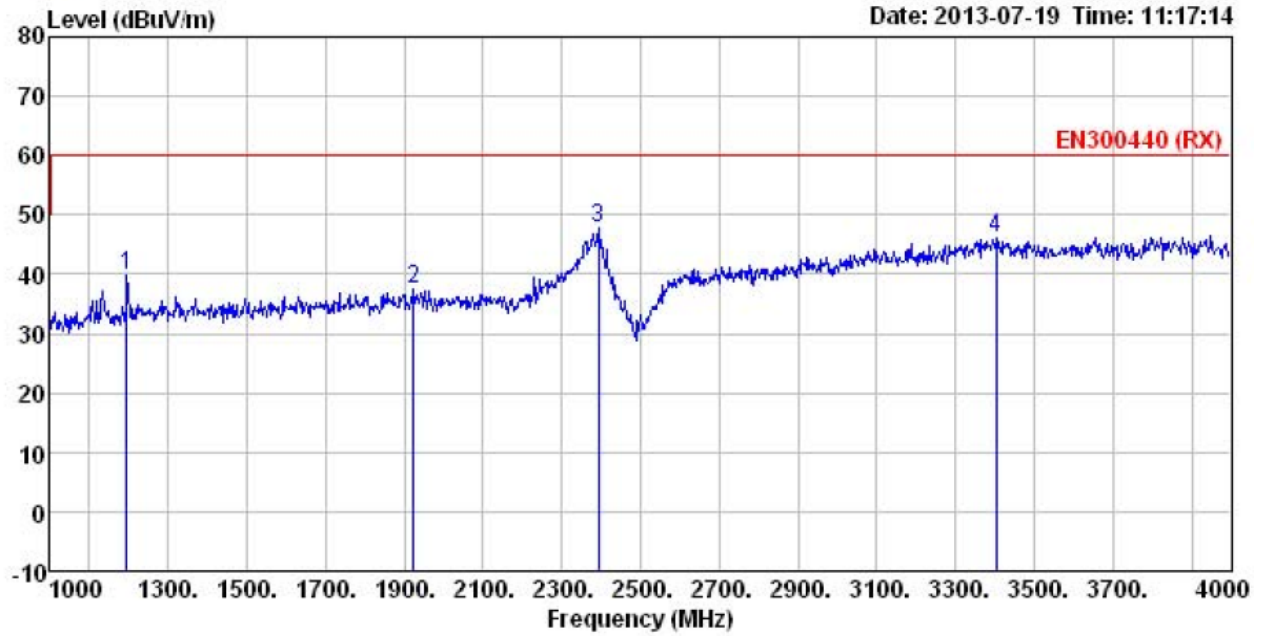
Vertical:



Site : 3m chamber
 Condition : EN300440 (RX) 3m R&TTE(30M18G) VERTICAL
 Job NO, : 225RF
 Test mode : GPS mode
 Power Rating : DC 13.2V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Joe

	Freq	ReadAntenna	Cable	Preamp	Limit	Over	
	MHz	Level	Factor	Loss	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dBuV/m	dB
1	1135.000	41.85	35.97	3.39	40.92	40.29	60.00 -19.71
2	1828.000	38.51	37.43	4.70	40.96	39.68	60.00 -20.32
3	2389.000	34.19	38.71	5.67	31.35	47.22	60.00 -12.78
4	3397.000	36.75	42.33	6.44	38.84	46.68	60.00 -13.32

Horizontal:



Site : 3m chamber
 Condition : EN300440 (RX) 3m R&TTE(30M18G) HORIZONTAL
 Job NO. : 225RF
 Test mode : GPS mode
 Power Rating : DC 13.2V
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: Joe

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit	Over	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1195.000	40.96	36.26	3.47	40.90	39.79	60.00	-20.21	
2	1924.000	36.14	37.42	4.76	40.90	37.42	60.00	-22.58	
3	2392.000	34.85	38.71	5.67	31.35	47.88	60.00	-12.12	
4	3403.000	36.09	42.33	6.44	38.84	46.02	60.00	-13.98	

6.3.2 Additional Requirements

Not applicable, since not FHSS

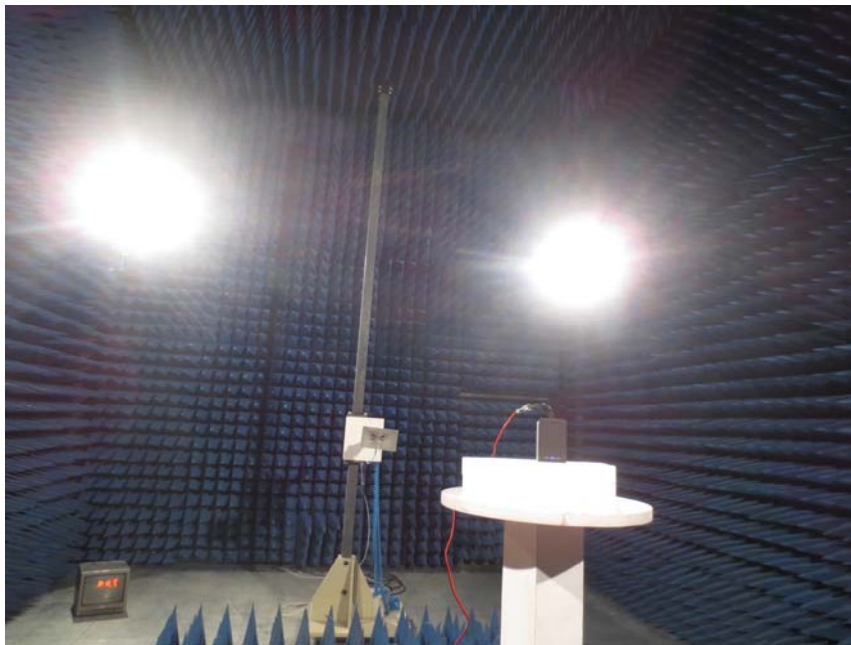
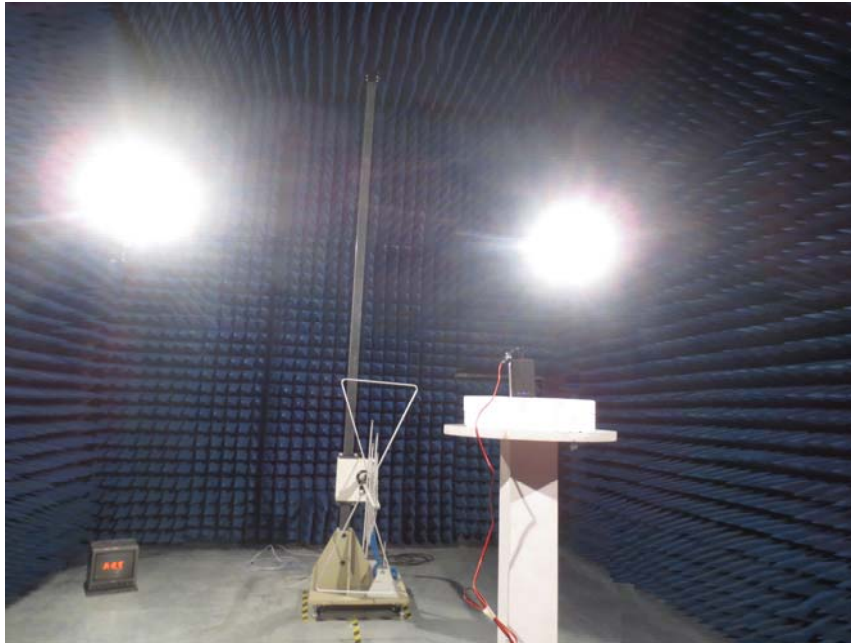
6.3.3 Adjacent Channel Selectivity

Not applicable, since the test applied to class 1 receivers only. Please refer to clause 4.2.2.1 of EN 300 440-2 and clause 8.1 of EN 300 440-1.

6.3.4 Blocking or Desensitization

Not applicable, since the test applied to class 1 and class 2 receivers only. Please refer to clause 4.2.2.2 of EN 300 440-2 and clause 8.2 of EN 300 440-1.

6.4 Test Setup Photo



6.5 EUT Constructional Details

Reference to the test report No. CCIS13070022501

----- End of report -----