

SPECTRUM REPORT

Applicant: FLYSKY RC MODEL TECHNOLOGY CO., LTD
Address of Applicant: West building3, Huangjianyuan Ind Park QIAOLI North Gate
Changping Town Dongguan CN.
Equipment Under Test (EUT)
Product Name: 3CH Gun Radio
Model No.: FS-GT2B
Trade Mark: 
Applicable standards: ETSI EN 300 328 V1.7.1 (2006-10)
Date of sample receipt: May 07, 2012
Date of Test: May 07-14, 2012
Date of report issue: May 15, 2012
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.



Robinson Lo
Laboratory Manager



The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. 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. Any mention of GTS International Electrical Approvals or testing done by GTS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by GTS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only."

2 Version

Version No.	Date	Description
00	May 15, 2012	Original

Prepared By:

Oscar. Li

Date:

May 15, 2012

Project Engineer

Check By:

Hans. Hu

Date:

May 15, 2012

Reviewer

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 OPERATING MODES.....	5
5.4 DESCRIPTION OF SUPPORT UNITS.....	6
5.5 DEVIATION FROM STANDARDS.....	6
5.6 ABNORMALITIES FROM STANDARD CONDITIONS.....	6
5.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	6
5.8 TEST FACILITY.....	6
5.9 TEST LOCATION.....	6
5.10 TEST INSTRUMENTS LIST.....	7
6 RADIO TECHNICAL SPECIFICATION IN ETSI EN 300 328.....	8
6.1 TRANSMITTER REQUIREMENT.....	8
6.1.1 Equivalent isotropic radiated power.....	8
6.1.2 Frequency Range.....	10
6.1.3 Dwell time.....	12
6.1.4 Hopping channel:.....	13
6.1.5 Hopping sequence:.....	14
6.1.6 Medium access protocol.....	15
6.1.7 Spurious emissions.....	16
6.2 RECEIVER REQUIREMENT.....	20
6.2.1 Spurious emissions.....	20
7 TEST SETUP PHOTO.....	23
8 EUT CONSTRUCTIONAL DETAILS.....	24

4 Test Summary

Radio Spectrum Matter (RSM) Part of Tx				
Test	Test Requirement	Test method	Limit/Severity	Result
Equivalent isotropic radiated power	clause 4.3.1	clause 5.7.2	10dBm	Pass
Frequency range	clause 4.3.3	clause 5.7.4	2.4GHz to 2.4835GHz	Pass
Dwell time	clause 4.3.4.1	clause 4.3.4.1	<0.4S	Pass
Hopping channel	clause 4.3.4.2	clause 4.3.4.2	clause 4.3.4.2.2	Pass
Hopping sequence	clause 4.3.4.3	clause 4.3.4.3	clause 4.3.4.3.2	Pass
Medium access protocol	clause 4.3.5			Pass
Transmitter spurious emissions	clause 4.3.6	clause 5.7.5	Table 2 or table 3	Pass
Radio Spectrum Matter (RSM) Part of Rx				
Test	Test Requirement	Test method	Limit/Severity	Result
Receiver spurious emissions	clause 4.3.7	clause 5.7.6	Table 4 or table 5	Pass

Remark:

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

5 General Information

5.1 Client Information

Applicant:	FLYSKY RC MODEL TECHNOLOGY CO., LTD
Address of Applicant:	West building3, Huangjiyuan Ind Park QIAOLI North Gate Changping Town Dongguan CN.
Manufacturer:	FLYSKY RC MODEL TECHNOLOGY CO., LTD
Address of Manufacturer:	West building3, Huangjiyuan Ind Park QIAOLI North Gate Changping Town Dongguan CN.
Factory:	FLYSKY RC MODEL TECHNOLOGY CO., LTD
Address of factory :	West building3, Huangjiyuan Ind Park QIAOLI North Gate Changping Town Dongguan CN.

5.2 General Description of E.U.T.

Product Name:	3CH Gun Radio
Model No.:	FS-GT2B
Operation Frequency:	2405.5MHz~2475.0MHz
Channel numbers:	16
Modulation technology:	GFSK
Antenna Type:	Integral
Antenna gain:	2dBi
Power supply:	DC 3.7V Li-ion Battery

5.3 Operating Modes

Operating mode	Detail description
Transmitting mode	Keep the EUT in transmitting continuously mode.

5.4 Description of Support Units

The EUT has been tested as an independent unit.

5.5 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.6 Abnormalities from Standard Conditions

None

5.7 Other Information Requested by the Customer

None

5.8 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- FCC —Registration No.: 600491
Global United Technology Services Co., Ltd., Shenzhen 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 files. Registration 600491, July 20, 2010.
- Industry Canada (IC)
The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-1.

5.9 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

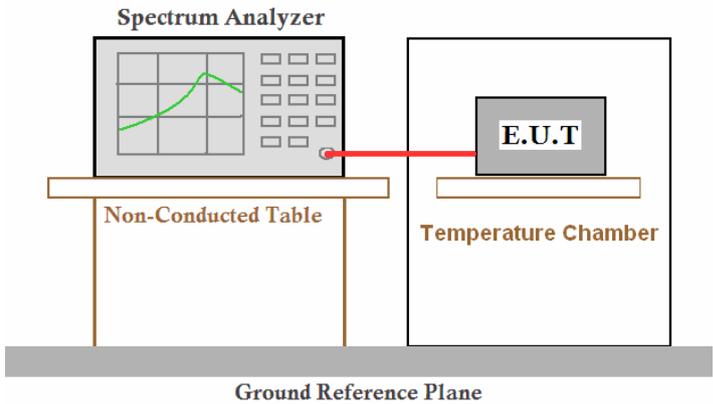
5.10 Test Instruments list

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	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 04 2011	Jul. 03 2012
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 25 2012	Feb. 24 2013
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 30 2011	June 29 2012
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 30 2011	Mar. 29 2013
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	Mar. 31 2012	Mar. 30 2013
9	Coaxial Cable	GTS	N/A	GTS211	Mar. 31 2012	Mar. 30 2013
10	Coaxial cable	GTS	N/A	GTS210	Mar. 31 2012	Mar. 30 2013
11	Coaxial Cable	GTS	N/A	GTS212	Mar. 31 2012	Mar. 30 2013
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 04 2011	Jul. 03 2012
13	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 04 2011	Jul. 03 2012
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 30 2011	June 29 2012
15	Band filter	Amindeon	82346	GTS219	Mar. 31 2012	Mar. 30 2013
16	Constant temperature and humidity box	Oregon Scientific	BA-888	GTS248	May 10 2012	May 09 2013
17	D.C. Power Supply	Instek	PS-3030	GTS232	May 10 2012	May 09 2013

6 Radio Technical Specification in ETSI EN 300 328

6.1 Transmitter Requirement

6.1.1 Equivalent isotropic radiated power

Test Requirement:	ETSI EN300 328 clause 4.3.1
Test Method:	ETSI EN300 328 clause 5.7.2.2
Limit:	20dBm
Test setup:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) inside a Temperature Chamber. Both are placed on a Non-Conducted Table, which sits on a Ground Reference Plane.</p>
Test procedure:	<ol style="list-style-type: none"> 1. The output of the transmitter shall be connected to the spectrum analyzer. 2. Set the Spectrum Analyzer as below: RBW=VBW=1MHz, Span=0Hz, Detector=Peak; read out the duty cycle(X) of the transmitter. 3. Adjust the test Frequency in spectrum analyzer, use the channel power function of Spectrum Analyzer, and the the spectrum analyzer was setted as below: RBW=VBW=1MHz, Detector=average, read out the average output power A. 4. The E.I.R.P. shall be calculated from the above measured power output A, the observed duty cycle x, cable loss, and the applicable antenna assembly gain "G" in dBi, according to the formula: $P = A + G + \text{Cable loss} + 10 \log (1/x);$ 5. Repeated the test in extreme test conditions.
Measurement Record:	Uncertainty: $\pm 1.5\text{dB}$
Test Instruments:	See section 5.10
Test mode:	See section 5.3
Test result:	Pass

Measurement Data

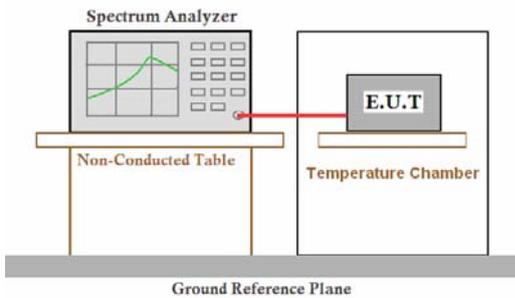
Test conditions		Channel	Read Level (dBm)	Antenna Gain(dBi)	EIRP (dBm)	Limit (dBm)	Result
Volt	Temp						
12.00V	25°C	CH 1	15.84	2.00	17.84	20.00	Pass
		CH 8	15.36	2.00	17.36		
		CH 16	15.34	2.00	17.34		
10.20V	55°C	CH 1	15.63	2.00	17.63		
		CH 8	15.15	2.00	17.15		
		CH 16	15.13	2.00	17.13		
10.20V	-20°C	CH 1	16.07	2.00	18.07		
		CH 8	15.59	2.00	17.59		
		CH 16	15.57	2.00	17.57		
13.80V	55°C	CH 1	15.43	2.00	17.43		
		CH 8	14.95	2.00	16.95		
		CH 16	14.93	2.00	16.93		
13.80V	-20°C	CH 1	16.20	2.00	18.20		
		CH 8	15.72	2.00	17.72		
		CH 16	15.70	2.00	17.70		

Remark:

1>. Volt= Voltage, Temp= Temperature

2>. Duty cycle=100%, Antenna Gain=2.0dBi

6.1.2 Frequency Range

Test Requirement:	ETSI EN300 328 clause 4.3.3
Test Method:	ETSI EN300 328 clause 5.7.4.1
Limit:	Within the band 2.4GHz to 2.4835GHz
Test setup:	
Test procedure:	<ol style="list-style-type: none"> 1. The output of the transmitter shall be connected to the spectrum analyzer 2. Offset the factor which it include antenna gain, cable loss and duty cycle in the spectrum analyzer; Remark: the factor=Antenna Gain + Cable Loss + Duty cycle 3. Set the spectrum analyzer as below: RBW=VBW=100 kHz, Detector: Average, Sweep time= 60Seconds, Span: Wide enough to capture the complete power envelope, including all sidebands 4. Using the marker of the spectrum analyser, find the lowest frequency below the operating frequency at which the spectral power density drops below the level - 30dBm. this frequency shall be recorded as fL. 5. Select the highest operating frequency of the equipment under test, repeated the step 3 to step 4, and recorded the frequency as fH. 6. The difference between the frequencies measured (fH - fL) is the frequency range which shall be recorded. 7. Repeated the test in extreme test conditions.
Measurement Record:	Uncertainty: $\pm 3\text{dB}$
Test Instruments:	See section 5.10
Test mode:	See section 5.3
Test result:	Pass

Measurement Data

Test conditions		fL (MHz)	fH (MHz)	Limit	Result
Volt(DC)	Temp				
12.00V	25°C	2404.420	2476.070	fL \geq 2.4GHz and fH \leq 2.4835GHz	Pass
10.20V	55°C	2404.424	2476.082		
10.20V	-20°C	2404.436	2476.089		
13.80V	55°C	2404.447	2476.096		
13.80V	-20°C	2404.455	2476.093		

Remark:

1>. Volt= Voltage, Temp= Temperature

2>. Duty cycle=100%, Antenna Gain=2.0dBi

6.1.3 Dwell time

Test Requirement:	ETSI EN 300 328 clause 4.3.4.1
Limit:	0.4 Second
Test procedure:	<ol style="list-style-type: none"> 1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. 2. Equipment mode: spectrum analyzer, detector function: Peak RBW=1MHz, VBW=1MHz, Span=zero. Adjust the center frequency of spectrum analyzer on any frequency be measured. 3. Measure the Dwell Time by spectrum analyzer Marker function. 4. Test the EUT in the lowest channel (2405MHz),the middle channel (2440MHz),the Highest channel (2475MHz) 5. Repeat above procedures until all frequencies measured were complete.
Test Instruments:	See section 5.10
Test mode:	See section 5.3
Test result:	Pass

Measurement Data:

Channel	Dwell time(ms)	Limit(ms)	Result
CH1	135.93	400.00	Pass
CH8	136.28	400.00	Pass
CH16	135.96	400.00	Pass

6.1.4 Hopping channel:

Test Requirement:	ETSI EN 300 328 clause 4.3.4.2
Limit:	Non-adaptive Frequency Hopping systems shall make use of non-overlapping hopping channels separated by the channel bandwidth as measured at 20 dB below peak power. The hopping channels defined within a hopping sequence shall be at least 1 MHz apart (channel separation).
Test procedure:	<ol style="list-style-type: none"> 1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. Detector function: Peak; RBW=1MHz, VBW=1MHz, Span=zero. Adjust the center frequency of spectrum analyzer on any frequency be measured. 2. Measure the Dwell Time by spectrum analyzer Marker function. 3. Test the EUT in the lowest channel (2402MHz), the middle channel(2441MHz), the Highest channel (2480MHz) 4. Repeat above procedures until all frequencies measured were complete.
Test Instruments:	See section 5.10
Test mode:	See section 5.3
Test result:	Pass

Measurement Data:

Lowest channel: (2405.5MHz)	Middle channel: (2442.5MHz)	Highest channel: (2475MHz)
5.001MHz	5.001MHz	5.001MHz

6.1.5 Hopping sequence:

Test Requirement:	ETSI EN 300 328 clause 4.3.4.3
Limit:	<p>Non-adaptive Frequency Hopping systems shall make use of a hopping sequence(s) that contains at least 15 hopping channels.</p> <p>Adaptive Frequency Hopping systems shall make use of a hopping sequence(s) that is capable of operating over a minimum of 90% of the band specified in table 1, from which at any give time a minimum of 20 hopping channels shall be used.</p> <p>Each hopping channel of the hopping sequence shall be occupied at least once during a period not exceeding four times the product of the dwell time per hop and the number of channels.</p>
Test mode:	Hopping tansmit mode
Test Instruments:	See section 5.10
For Hopping Channel Number:	
Test Precedure:	<ol style="list-style-type: none"> 1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. Detector function: Peak, RBW=100KHz, VBW=100KHz, sweep time=auto Span: the frequency band of operation 2. By using the Max-Hold function and Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.
For Hopping Sequence:	
Test Precedure:	<ol style="list-style-type: none"> 1. Connect EUT antenna terminal to the spectrum analyzer with a low loss cable. Detector function: Peak, RBW=1MHz, VBW=1MHz, Sweet Time = 4 x dwell time per hop x the number of channels Span=zero span, centered on a hopping channel Sweep mode = Single 2. By using the Max-Hold function and Allow the trace to stabilize. It may prove necessary to bread the span up to sections, in order to clearly show all of the hopping frequencies.

Measurement Data:

Hopping Channel Number		
Channel number	Limit	Result
16	15	Pass
Hopping Sequence		
Occupancy Number	Limit	result
≥1	≥1	Pass

6.1.6 Medium access protocol

Test Requirement:	ETSI EN300 328 clause 4.3.5
Test method:	NA
Declare by Manufacturer:	A medium access protocol shall be implemented by the equipment

6.1.7 Spurious emissions

Test Requirement:	ETSI EN300 328 clause 4.3.6		
Test Method:	ETSI EN300 328 clause 5.7.5		
Test Frequency range:	25MHz to 12.75GHz		
Receiver setup:	RBW=100KHz, VBW=30KHz, Detector= peak		
Limit:	Narrowband spurious emissions		
	Frequency range	Limit(operating)	Limit(standby)
	30 MHz to 1 GHz	-36 dBm	-57 dBm
	1 GHz to 12,75 GHz	-30 dBm	-47 dBm
	1.8 GHz to 1.9 GHz 5.15 GHz to 5.3 GHz	-47 dBm	-47 dBm
	Or		
Test setup:	Wideband spurious emissions		
	Frequency range	Limit(operating)	Limit(standby)
	30 MHz to 1 GHz	-86 dBm/MHz	-107 dBm/MHz
	1 GHz to 12,75 GHz	-80 dBm/MHz	-97 dBm/MHz
	1.8 GHz to 1.9 GHz 5.15 GHz to 5.3 GHz	-97 dBm/MHz	-97 dBm/MHz
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>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: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$where: Pg is the generator output power into the substitution antenna. <p>Above 1GHz test procedure:</p> <p>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>
------------------------	---

	<p><i>Remark:</i></p> <p><i>For measuring emissions that exceed the level of 6 dB below the applicable limit, the resolution bandwidth shall be switched to 30 kHz and the span shall be adjusted accordingly. If the level does not change by more than 2 dB, it is a narrowband emission; the observed value shall be recorded. If the level changes by more than 2 dB, the emission is a wideband emission</i></p>
Measurement Record:	Uncertainty: $\pm 6\text{dB}$
Test Instruments:	See section 5.10
Test mode:	See section 5.3
Test result:	Pass

Measurement Data

The lowest channel					
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result	
	polarization	Level(dBm)			
79.44	Vertical	-62.08	-36.00	Pass	
108.66	V	-61.32	-36.00		
4810.00	V	-49.69	-30.00		
7215.00	V	-43.83	-30.00		
9620.00	V	-40.87	-30.00		
12025.00	V	-39.58	-30.00		
77.48	Horizontal	-63.25	-36.00		
92.46	H	-62.81	-36.00		
4810.00	H	-51.56	-30.00		
7215.00	H	-45.05	-30.00		
9620.00	H	-41.85	-30.00		
12025.00	H	-40.11	-30.00		
The highest channel					
Frequency (MHz)	Spurious Emission		Limit (dBm)		Test Result
	polarization	Level(dBm)			
124.07	Vertical	-61.31	-36.00	Pass	
173.46	V	-60.48	-36.00		
4950.00	V	-49.34	-30.00		
7425.00	V	-42.51	-30.00		
9900.00	V	-38.52	-30.00		
12375.00	V	-37.35	-30.00		
128.92	Horizontal	-62.83	-36.00		
183.74	H	-61.79	-36.00		
4950.00	H	-50.16	-30.00		
7425.00	H	-43.69	-30.00		
9900.00	H	-39.07	-30.00		
12375.00	H	-38.41	-30.00		
Tx in standby Mode					
N/A: Not applicable, since the spurious emission of the EUT is too weak to be detected.(≤-70dBm)					

Remark:

-70dBm was the minimum level which could be detected by measuring facility when below 1GHz, -60dBm at over 1GHz.

6.2 Receiver requirement

6.2.1 Spurious emissions

Test Requirement:	ETSI EN300 328 clause 4.3.7		
Test Method:	ETSI EN300 328 clause 5.7.6		
Test Frequency range:	25MHz to 4GHz		
Receiver setup:	RBW=100KHz, VBW=30KHz, Detector= peak		
Limit:	Frequency	Limit(narrowband)	Limit(wideband)
	30MHz to 1000 MHz	2nW(-57dBm)	-107dBm/Hz
	1GHz to 12.75GHz	20nW(-47dBm)	-97dBm/Hz
Test setup:	Below 1GHz		
Test setup:	Above 1GHz		
Test procedure:	<p>Substitution method was performed to determine the actual ERP emission levels of the EUT.</p> <p>The following test procedure as below:</p> <p>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 		

	<p>test.</p> <ol style="list-style-type: none"> 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: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ where: Pg is the generator output power into the substitution antenna. <p>Above 1GHz test procedure:</p> <p>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> <p><i>Remark:</i> <i>For measuring emissions that exceed the level of 6 dB below the applicable limit, the resolution bandwidth shall be switched to 30 kHz and the span shall be adjusted accordingly. If the level does not change by more than 2 dB, it is a narrowband emission; the observed value shall be recorded. If the level changes by more than 2 dB, the emission is a wideband emission</i></p>
Measurement Record:	Uncertainty: ± 6dB
Test Instruments:	See section 5.10
Test mode:	Kept Rx in receive mode.
Test result:	Pass

Measurement Data

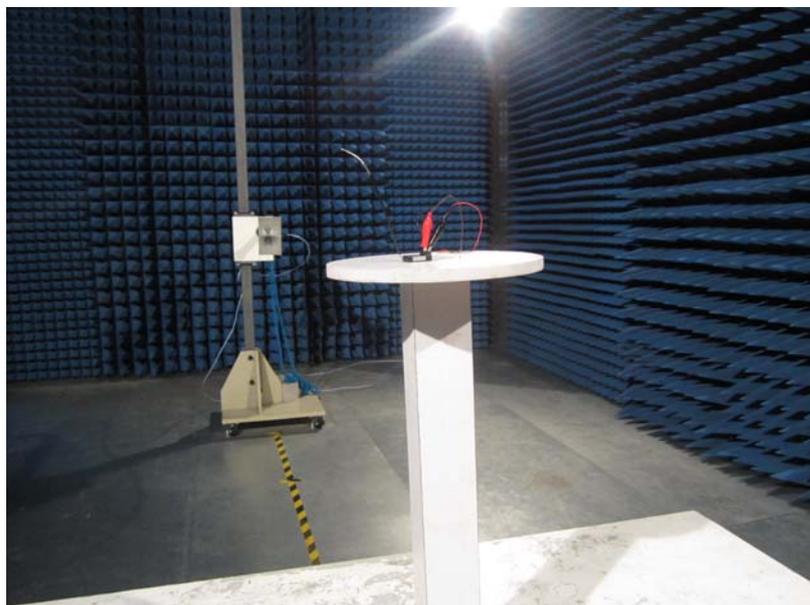
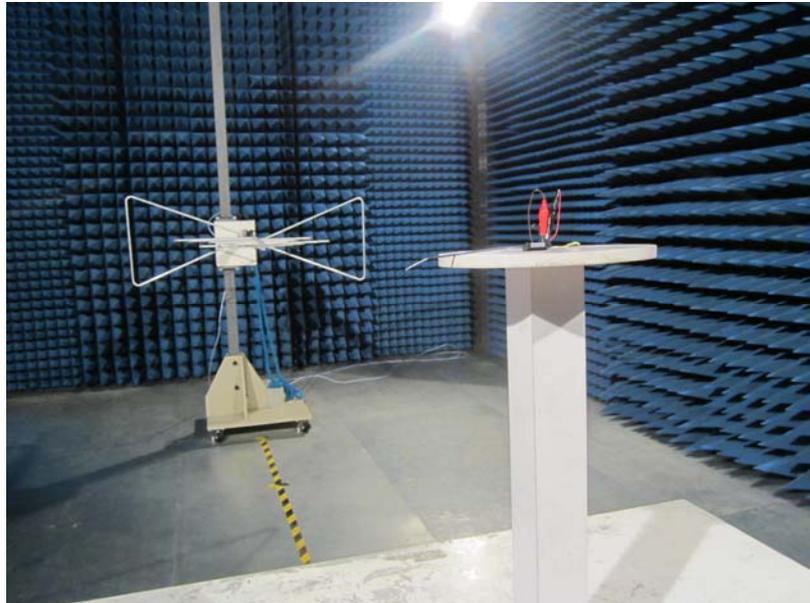
The lowest channel						
Frequency (MHz)	Spurious Emission		Limit (dBm)	Test Result		
	polarization	Level(dBm)				
2405.00	Vertical	-59.36	2nW/ -57dBm below 1GHz, 20nW/ -47dBm above 1GHz.	Pass		
4810.00	V	-54.82				
7215.00	V	-54.37				
9620.00	V	-55.28				
12025.00	V	-57.65				
14430.00	V	-58.36				
2405.00	Horizontal	-65.44				
4810.00	H	-55.12				
7215.00	H	-59.98				
9620.00	H	-60.85				
12025.00	H	-64.36				
14430.00	H	-65.33				
The highest channel						
Frequency (MHz)	Spurious Emission				Limit (dBm)	Test Result
	polarization	Level(dBm)				
2475.00	Vertical	-60.30	2nW/ -57dBm below 1GHz, 20nW/ -47dBm above 1GHz.	Pass		
4950.00	V	-53.67				
7425.00	V	-55.65				
9900.00	V	-54.35				
12375.00	V	-54.51				
14850.00	V	-55.61				
2475.00	Horizontal	-64.03				
4950.00	H	-60.44				
7425.00	H	-60.31				
9900.00	H	-60.53				
12375.00	H	-60.89				
14850.00	H	-62.41				

7 Test setup photo

Tx



Rx



8 EUT Constructional Details

Reference to the test report No. : GTSE12050040301

-----end-----