TEST REPORT

of

FCC Part 15 Subpart C §15.249

FCC ID : RVBXP350T

Equipment Under Test	:	2.4 GHz Wireless Presenter
Model Name	:	XP350T
Serial No.	:	N/A
Applicant	:	Chois Technology Co., Ltd.
Manufacturer	:	Chois Technology Co., Ltd.
Date of Test(s)	:	2011.07.04 ~ 2011.07.06
Date of Issue	:	2011.07.19

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

Tested By: **Date** **2011.07.19**

Duke Ko

Approved By: **Date** **2011.07.19**

Charles Kim

Table of contents

1. General information

1.1 Testing laboratory

SGS Korea Co., Ltd. (Gunpo Laboratory)
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www.kr.sgs.com/ee
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371

1.2 Details of applicant

Applicant : Chois Technology Co., Ltd.
Address : 1102, Incheon, IT Tower, 592-5, Dowha-1dong, Namgu, Incheon, Korea
Contact Person : Nam, Sang-Hwan
Phone No. : +82 +2 6445 8216
Fax No. : +82 +2 6455 3406

1.3. Description of EUT

Kind of Product	2.4 GHz Wireless Presenter
Model Name	XP350T
Serial Number	N/A
Power Supply	DC 3 V (Battery type)
Frequency Range	2 405 ㎒ ~ 2 480 ㎒
Modulation Technique	GFSK
Number of Channels	79
Antenna Type	PCB Antenna
Antenna Gain	-0.90 dBi

1.4 Details of modification

-N/A

1.5. Test equipment list

Equipment	Manufacturer	Model	Serial Number	Cal Due.
Signal Generator	Agilent	E4438C	MY42082477	Mar 31, 2012
Spectrum Analyzer	R & S	FSV30	100955	Apr. 01, 2012
Power Meter	Agilent	E4416A	GB4129123	Mar. 31, 2012
Power Sensor	Agilent	E9327A	US40441371	Mar. 30, 2012
Attenuator	Agilent	8495B	MY42141937	Apr. 01, 2012
High Pass Filter	Wainwright	WHK3.0/18G-10SS	344	Sep. 29, 2011
DC power Supply	Agilent	U8002A	MY48490027	Jan. 01, 2012
Preamplifier	H.P.	8447F	2944A03909	Jul. 04, 2012
Preamplifier	Agilent	8449B	3008A01932	Mar. 31, 2012
Test Receiver	R & S	ESU26	100109	Feb. 21, 2012
Bilog Antenna	SCHWARZBECK MESSELEKTRONIK	VULB9163	390	Apr. 27, 2013
Horn Antenna	Rohde & Schwarz	HF 906	100326	Oct. 08, 2011
Antenna Master	EMCO	1050	1228	N.C.R.
Turn Table	Daeil EMC	DI-1500	N/A	N.C.R.
Anechoic Chamber	SY Corporation	L × W × H (9.6 m × 6.4 m × 6.6 m)	N/A	N.C.R.

1.6. Summary of test results

The EUT has been tested according to the following specifications:

APPLIED STANDARD:FCC Part15, RSS-210,RSS-Gen		
Section in FCC 15	**Test Item**	**Result**
15.209(a) 15.249(a) 15.249(d) 15.205	Fundamental, Spurious emission and edge band radiated emission	Complied
1.1307(b)(1)	Maximum Permissible Exposure (Exposure of Humans to RF Fields)	Complied

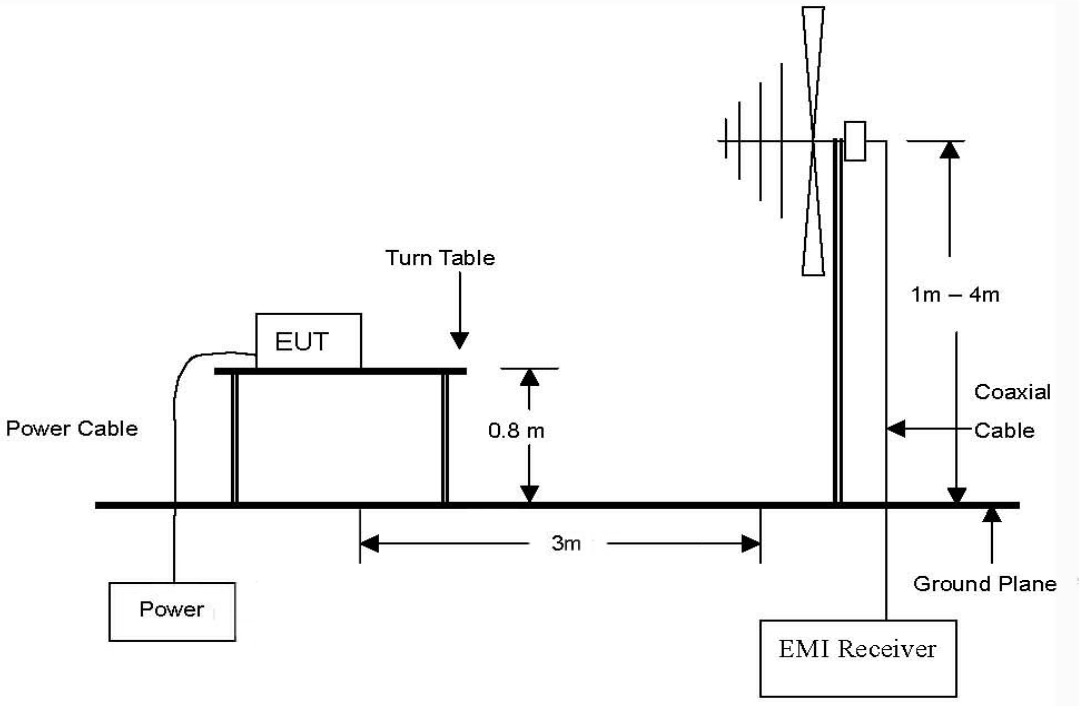
1.7. Test report revision

Revision	Report number	Description
0	F690501/RF-RTL004819	Initial
1	F690501/RF-RTL004819-1	Changed model name

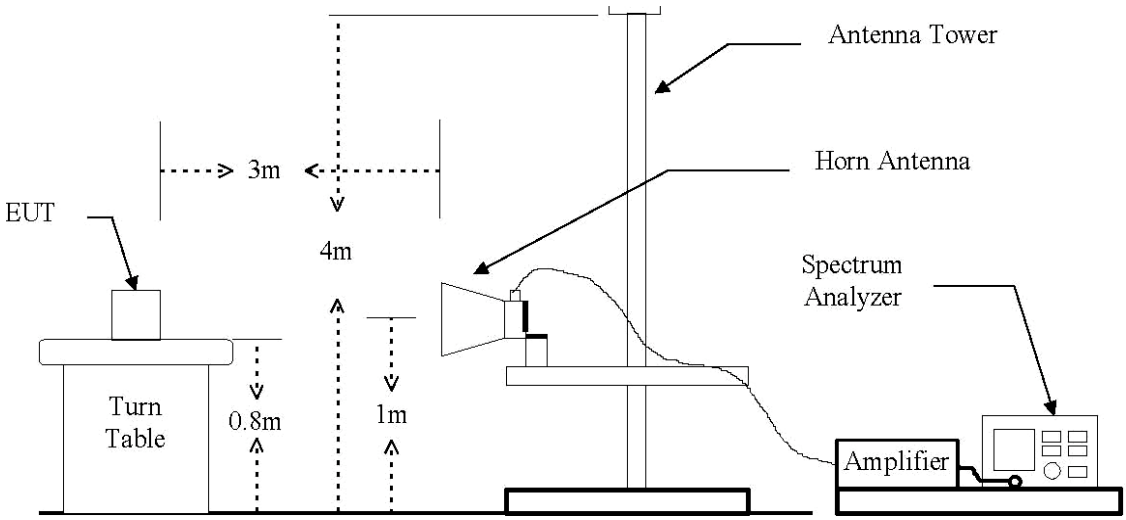
2. Fundamental, Spurious emission and edge band radiated emission

2.1. Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ Emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to 24 ㎓ Emissions.



2.2. Test procedures

Radiated emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic Chamber The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission above 1 ㎓, the EUT was set 3 meter away from the interference-receiving antenna.
3. 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.
4. 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.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10 ㏈ 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 1 ㎒ for Peak detection and frequency above 1 ㎓.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 ㎒ and the video bandwidth is 10 ㎐ for Average detection (AV) at frequency above 1 ㎓.

2.3. Limit

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	Field strength of fundamental (㎷/m)	Field strength of harmonics (㎶/m)
902 ~ 928 ㎒	50	500
2 400 ~ 2 483.5 ㎒	50	500
5 725 ~ 5 875 ㎒	50	500
24.0 ~ 24.25 ㎓	250	2 500

In the section 15.209(a) :
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:

Fundamental frequency (㎒)	Field strength (㎶/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 ㎒, 76-88 ㎒, 174-216 MHz or 470-806 ㎒. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(b) In the above emission table, the tighter limit applies at the band edges.

Fundamental frequency (㎒)	Field strength (㎶/m at 3 meter)	Field strength (dB㎶/m at 3 meter)
30 ~ 88	100	40
88 ~ 216	150	43.5
216 ~960	200	46
Above 960	500	54

(e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

2.4. Test result

Ambient temperature : (23 ± 2) ℃
Relative humidity : 47 % R.H.

2.4.1. Below 1 ㎓

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP + CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
Below 1 000.000	Not Detected	-	-	-	-	-	-	-

Remark
1. To get a maximum emission level from the EUT, the EUT was moved throughout the X, Y and Z planes.(Worst case is y-plane)
2. All spurious emission at channels are almost the same below 1 ㎓, so that the channel was chosen at representative in final test.

2.4.2. Above 1 ㎓

A. Low Channel (2 405 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 404.58	56.46	Peak	H	28.06	6.26	90.78	114.00	23.22
2 390.00	21.92	Peak	H	28.09	6.23	56.24	74.00	17.76
2 390.00	11.43	Average	H	28.09	6.23	45.75	54.00	8.25

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
4 809.39	58.72	Peak	H	32.61	-25.07	66.26	74.00	7.74
4 809.39	30.79	Average	H	32.61	-25.07	38.33	54.00	15.67
Above 4 900.000	Not Detected	-	-	-	-	-	-	-

B. Middle Channel (2 440 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 439.49	58.23	Peak	H	28.00	6.28	92.51	114.00	21.49

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
4 879.94	63.18	Peak	H	32.89	-25.26	70.81	74.00	3.19
4 879.94	31.22	Average	H	32.89	-25.26	38.85	54.00	15.15
Above 4 900.000	Not Detected	-	-	-	-	-	-	-

C. High Channel (2 480 ㎒)

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
2 479.49	57.04	Peak	H	28.07	6.35	91.46	114.00	22.54
2 483.50	29.79	Peak	H	28.09	6.36	64.24	74.00	9.76
2 483.50	11.75	Average	H	28.09	6.36	46.20	54.00	7.80

Radiated Emissions			Ant	Correction Factors		Total	FCC Limit	
Frequency (㎒)	Reading (dB㎶)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB㎶/m)	Limit (dB㎶/m)	Margin (dB)
4 959.36	60.10	Peak	H	33.22	-24.63	68.69	74.00	5.31
4 959.36	31.99	Average	H	33.22	-24.63	40.58	54.00	13.42
Above 5 000.000	Not Detected	-	-	-	-	-	-	-

Remarks ;

1. "*" means the restricted band.
2. To get a maximum emission level from the EUT, the EUT was moved throughout the X, Y and Z planes.(Worst case is y-plane)
3. Measuring frequencies from 1 ㎓ to the 10th harmonic of highest fundamental Frequency.
4. Radiated emissions measured in frequency above 1 000 ㎒ were made with an instrument using peak/average detector mode.
5. Average test would be performed if the peak result were greater than the average limit.
6. Actual = Reading + AF - Amp Gain + CL

5. RF Exposure Evaluation

5.1. Environmental evaluation and exposure limit according to FCC CFR 47 part 1, 1.1307(b), 1.1310

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (㎒)	Electric Field Strength(V/m)	Magnetic Field Strength (A/m)	Power Density (㎽/㎠)	Average Time
(A) Limits for Occupational /Control Exposures				
300 – 1 500	--	--	F/300	6
1 500 – 100 000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300 – 1 500	--	--	F/1500	6
1 500 – 100 000	**--**	**--**	**1**	**30**

5.1.1. Friis transmission formula: Pd = (Pout*G)/(4*pi*R^2)

Where Pd = power density in ㎽/㎠

Pout = output power to antenna in ㎽

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in ㎝

Pd the limit of MPE, 1 ㎽/㎠. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

5.1.2. Test Result of RF Exposure Evaluation

Test Item : RF Exposure Evaluation Data
Test Mode : Normal Operation

5.1.3. Output Power into Antenna & RF Exposure Evaluation Distance

Channel	Channel Frequency (㎒)	Output Average Power to Antenna (dB m)	Antenna Gain (dB i)	Power Density at 20 ㎝ (㎽/㎠)	LIMITS (㎽/㎠)
Low	2 405	-9.91	-0.90	0.000 02	1
Middle	2 440	-10.14	-0.90	0.000 02	1
High	2 480	-10.54	-0.90	0.000 01	1

Note :
1. The power density Pd (5th column) at a distance of 20 ㎝ calculated from the friis transmission formula is far below the limit of 1 ㎽/㎠ .