

FCC CERTIFICATION RADIO MEASUREMENT TECHNICAL REPORT

On Model Name: Remote Control Transmitter

Model Numbers : AT401 / AT402 / AT501 / AT601

Brand Name : N/A

FCC ID : XNS-BTT-RC

Prepared for Taizhou Best Team Technology Limited

According to FCC Part 15 Subpart C 15.249

Test Report #: SHA-0908-8306-FCC

Prepared by: Chris Huang

Reviewed by: Harry Zhao

QC Manager: Paul Chen

Test Report Released by: Paul J. Chen

Paul Chen

2009, September 10

Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location: ECMG Worldwide Certification Solution, Inc. (China)
Building 2, 1298 Lian Xi Road, Pu Dong New Area, Shanghai, P.R. China 201204

Tel: 86-21-51909300
Fax: 86-21-51909333

FCC Registration Number: 172634

Table of Contents

GOVERNMENT DISCLAIMER NOTICE	1
REPRODUCTION CLAUSE	1
ADMINISTRATIVE DATA	2
EUT DESCRIPTION	3
TYPE OF DERIVER	3
TEST SUMMARY	4
TEST MODE JUSTIFICATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATION	5
TEST SYSTEM DETAILS	6
CONFIGURATION OF TESTED SYSTEM	7
ATTACHMENT 1 - RADIATED EMISSION TEST RESULTS	8
ATTACHMENT 2 - FUNDAMENTAL AND HARMONIC FIELD STRENGTH TEST RESULTS	27
ATTACHMENT 3 - BAND EDGE TEST	35-38

Government Disclaimer Notice

When government drawing, specification, or other data are used for any purpose other than in connection with a definitely related government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawing, specifications, or other data, is not to be regarded by implication or otherwise in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell patented invention that may in any way be related thereto. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

Reproduction Clause

Any reproduction of this document must be done in full. No single part of this document may be reproduced without permission from ECMG Worldwide Certification Solution, Inc., 684 West Maude Avenue Sunnyvale, CA 94085.

Administrative Data

Test Sample : *Remote Control Transmitter*

Model Numbers : *AT401 / AT402 / AT501 / AT601*

Model Tested : *AT401*

Brand Name : *N/A*

Date Tested : *2009, August 20th*

Applicant : *Taizhou Best Team Technology Limited
Shenlong Industrial Park, Jiangyan City,
Jiangsu, China*

Telephone : *86-523-88863059*

Fax : *86-523-88863077*

Manufacturer : *Taizhou Best Team Technology Limited
Shenlong Industrial Park, Jiangyan City,
Jiangsu, China*

EUT Description

Taizhou Best Team Technology Limited Model number AT401 (referred to as the EUT in this report) is a Remote Control Transmitter.

The EUT has 50 channels from 2433MHz to 2473MHz, and the channel spacing is 0.8MHz.

Type of Device

Models AT401 / AT402 / AT501 / AT601 are same product except for the appearance and model name differences which are for marketing purpose only.

Test Summary

The Electromagnetic Compatibility requirements on model AT401 for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment Under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

EMC Test Items			
Reference FCC Part 15 (2008), Subpart C			
<i>Specification</i>	<i>Description</i>	<i>Test Results</i>	<i>Remark</i>
FCC Part 15.203	Antenna Requirement	Compliance	Integral Antenna
FCC Part 15.205	Restricted Band of Operation	Compliance	Attachment 1
FCC Part 15.209	Radiated Emission Limits	Compliance	Attachment 1
FCC Part 15.249 (a)	Fundamental and Harmonics	Compliance	Attachment 2
FCC Part 15.249 (d)	Band Edge	Compliance	Attachment 3

Test Mode Justification

The EUT is handheld product, so the test modes (Lie, Side, Stand) were done for testing.

*Note: Lie mode means let EUT put flat;
 Side mode means let EUT put side;
 Stand mode means let EUT stand up.*

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

EUT Exercise Software

The EUT doesn't use software during test.

Equipment Modification

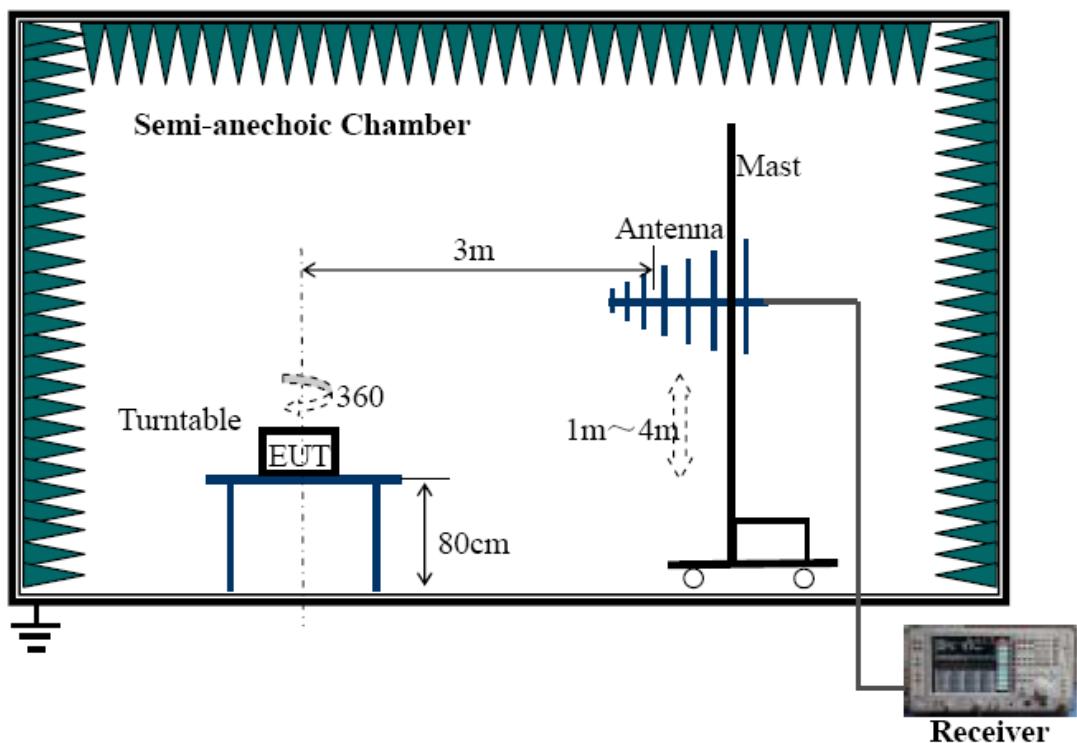
Any modifications installed previous to testing by Taizhou Best Team Technology Limited will be incorporated in each production model sold or leased in United States.

There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.

Test System Details

EUT	
Model Numbers:	AT401 / AT402 / AT501 / AT601
Model Tested:	AT401
Brand Name:	Height
Serial Number:	Engineering Sample
Input Voltage:	6V DC
Description:	Remote Control Transmitter
EUT Power Supply	
AA battery *4	
Support Equipment	
None	
Cable Description	
None	

Configuration of Tested System



ATTACHMENT 1 - RADIATED EMISSION TEST RESULTS

CLIENT:	Taizhou Best Team Technology Limited	TEST STANDARD:	FCC Part 15.209 FCC Part 15.205
MODEL TESTED:	AT401	PRODUCT:	Remote Control Transmitter
SERIAL NO.:	Engineering Sample	EUT DESIGNATION:	RF Equipment
TEMPERATURE:	21°C	HUMIDITY:	53%RH
ATM PRESSURE:	101.6 kPa	GROUNDING:	No Grounding
TESTED BY:	Cloud Feng	DATE OF TEST:	2009, August 20
SETUP METHOD:	ANSI C63.4 : 2003		
TEST PROCEDURE:	<p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.</p> <p>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.</p> <p>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz</p> <p>Explanation of the Correction Factor are given as follows:</p> <p>FS= RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p>		
TESTED RANGE:	9kHz to 24.730GHz for the Remote Control		
TEST VOLTAGE:	6V DC		

CONTINUE ON THE NEXT PAGE...

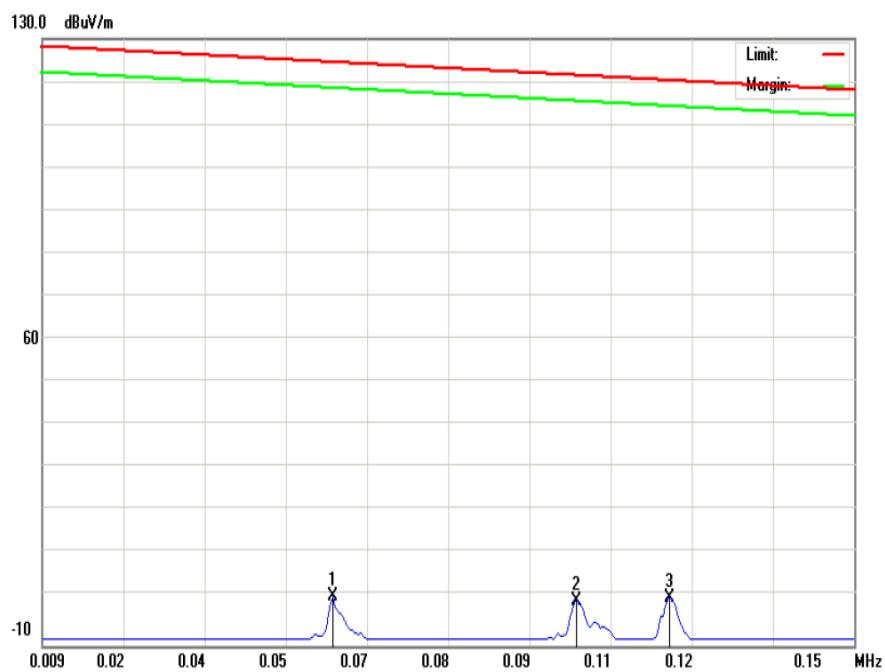
TEST STATUS:	Keep Tx in normal continuous transmission mode, modulated
RESULTS:	<p>The EUT meets the requirements of field strength test.</p> <p>The test results relate only to the equipment under test provided by client.</p>
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc. (China) test personnel.
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp ± 2.6 dB

15.209 Limit:

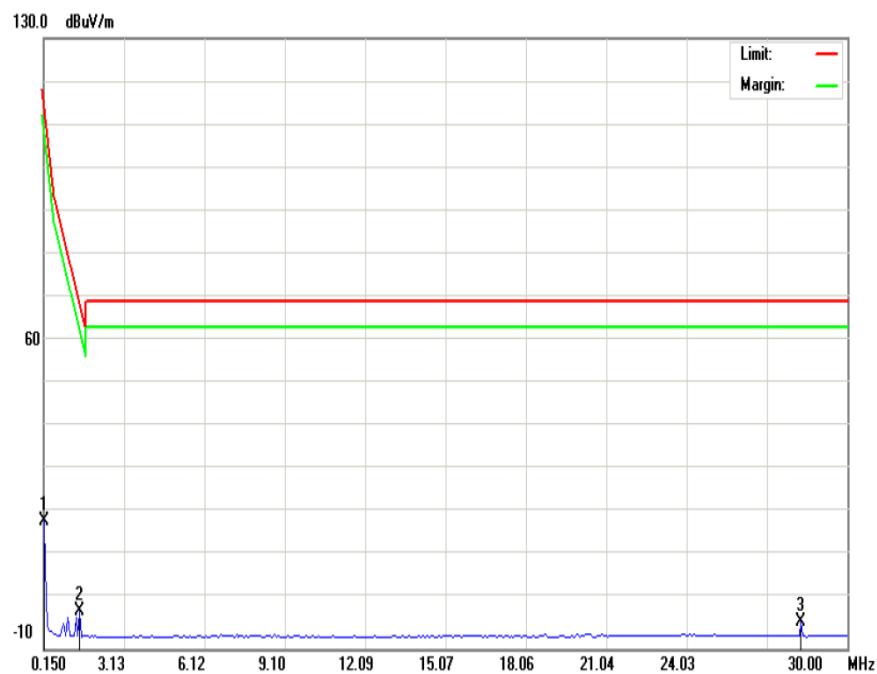
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

Note: Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

**Model: AT401
Low Channel (2433MHz)
(9kHz-30MHz)**



Field strength Emission Plot (Peak, Max Hold Mode 9kHz-0.15MHz)

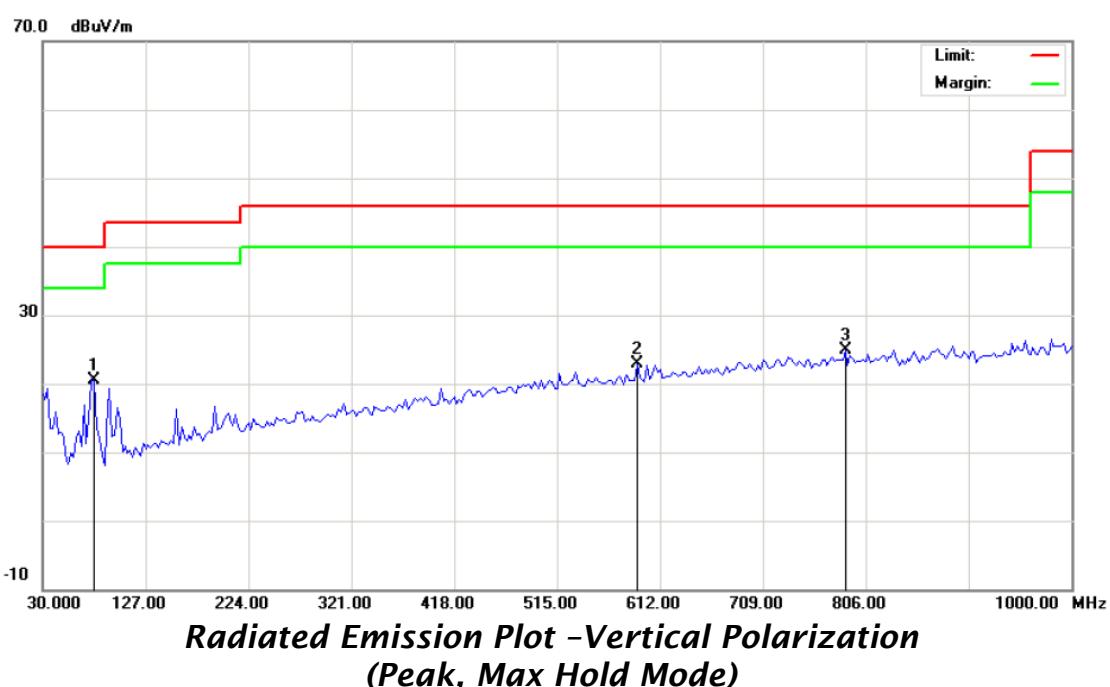
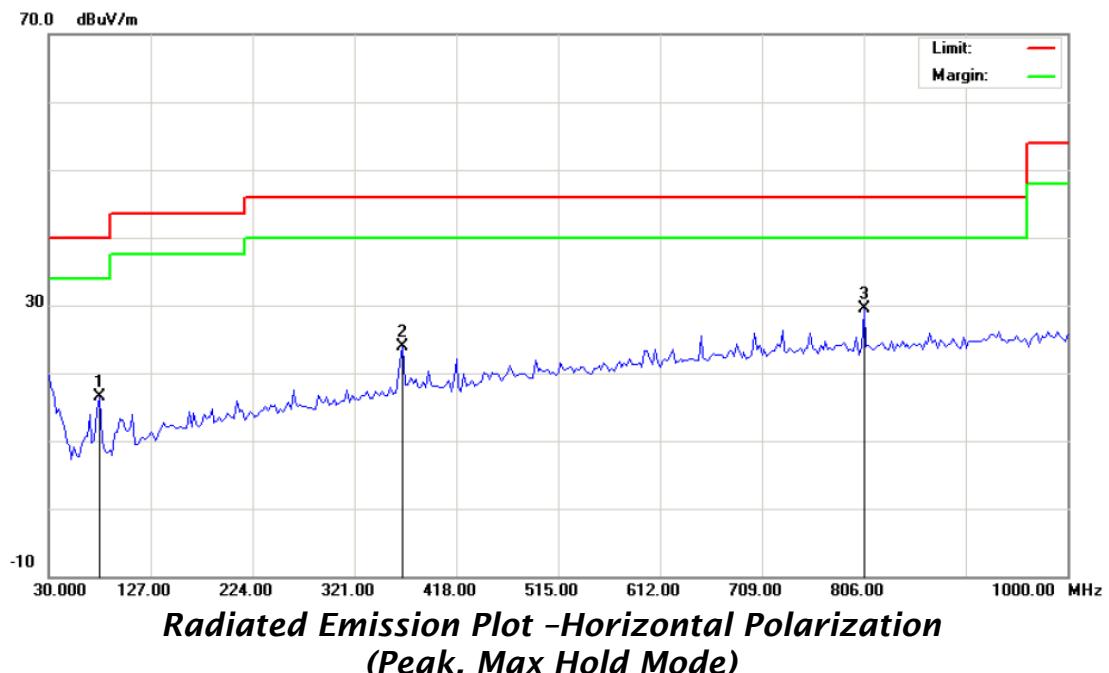


Field strength Emission Plot (Peak, Max Hold Mode 0.15MHz-30MHz)

Test Results (9kHz~30MHz)

9kHz – 0.15MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.0594	8.83	1.28	124.87	-123.59	90	132
2	0.1017	8.64	0.22	121.82	-121.60	0	119
3	0.1179	8.65	1.12	120.65	-119.53	90	104
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 200Hz, with a 600ms sweep time. A video filter was not used.							
0.15MHz – 30MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.1500	9.02	19.29	118.33	-99.04	43	106
2	1.4932	9.98	2.34	68.34	-66.00	0	138
3	28.2836	7.78	1.07	69.50	-68.43	45	112
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 9kHz, with a 600ms sweep time. A video filter was not used.							

Model: AT401
Low Channel (2433MHz)
(30MHz-1000MHz)



Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	78.500	7.48	8.97	16.45	40.00	-23.55	218	103
2	367.075	6.84	16.98	23.82	46.00	-22.18	249	119
3	806.000	5.28	24.16	29.44	46.00	-16.56	73	102
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	78.500	11.57	8.97	20.54	40.00	-19.46	173	104
2	590.175	2.12	20.73	22.85	46.00	-23.15	120	115
3	786.600	0.98	23.92	24.90	46.00	-21.10	328	104

Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 600 ms sweep time. A video filter was not used.

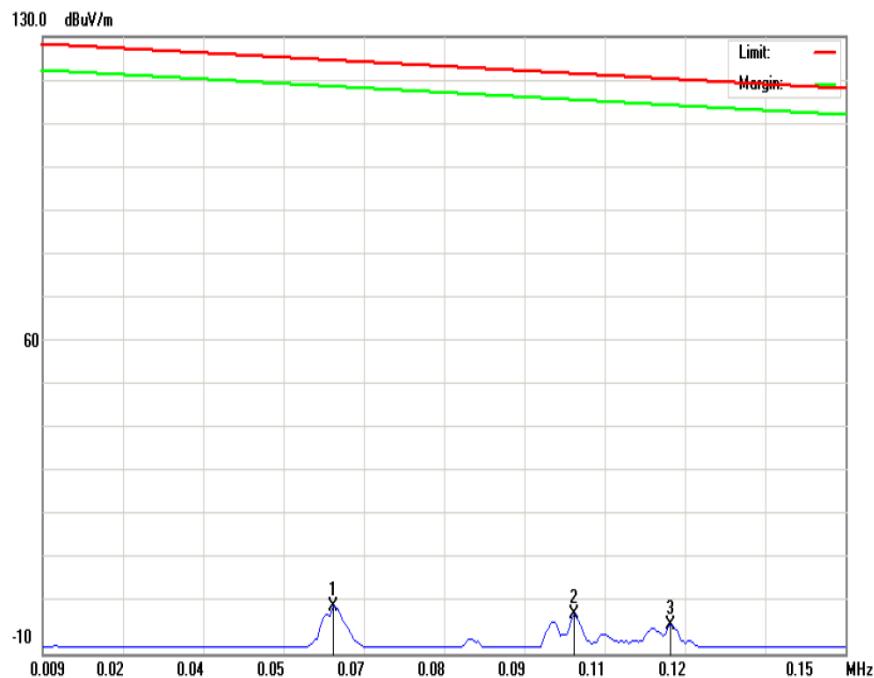
Model: AT401
Low Channel (2433MHz)
(1GHz-24.33GHz)

Test Results (1GHz~24.33GHz)

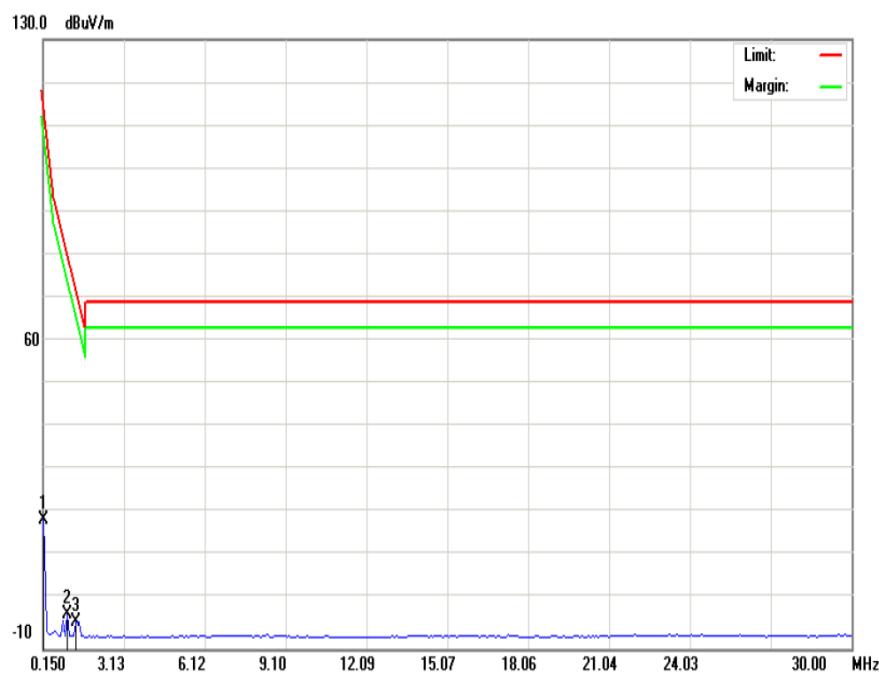
<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1250	24.57	32.35	54.00	-21.65	38.19	74.00	-35.81
2	2280	30.78	34.46	54.00	-19.54	43.17	74.00	-30.83
3	3580	36.63	35.80	54.00	-18.20	46.88	74.00	-27.12
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1710	27.47	33.24	54.00	-20.76	45.82	74.00	-28.18
2	2980	34.49	38.54	54.00	-15.46	49.01	74.00	-24.99
3	4180	38.28	41.43	54.00	-12.85	48.66	74.00	-25.34

Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 600 ms sweep time. A video filter was not used.

Model: AT401
Middle Channel (2453MHz)
(9kHz-30MHz)



Field strength Emission Plot (Peak, Max Hold Mode 9kHz-0.15MHz)

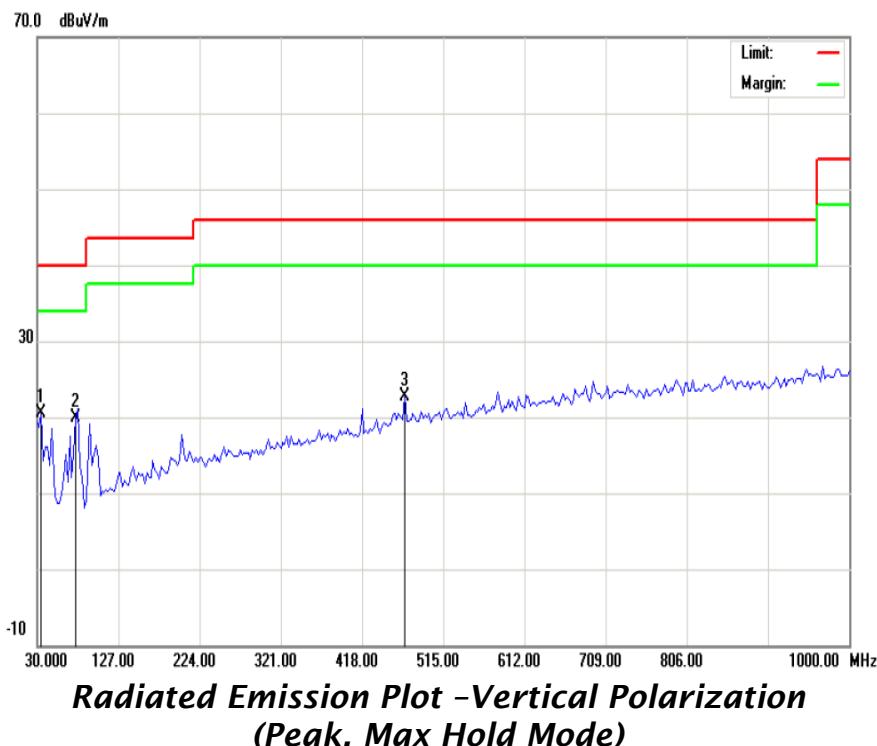
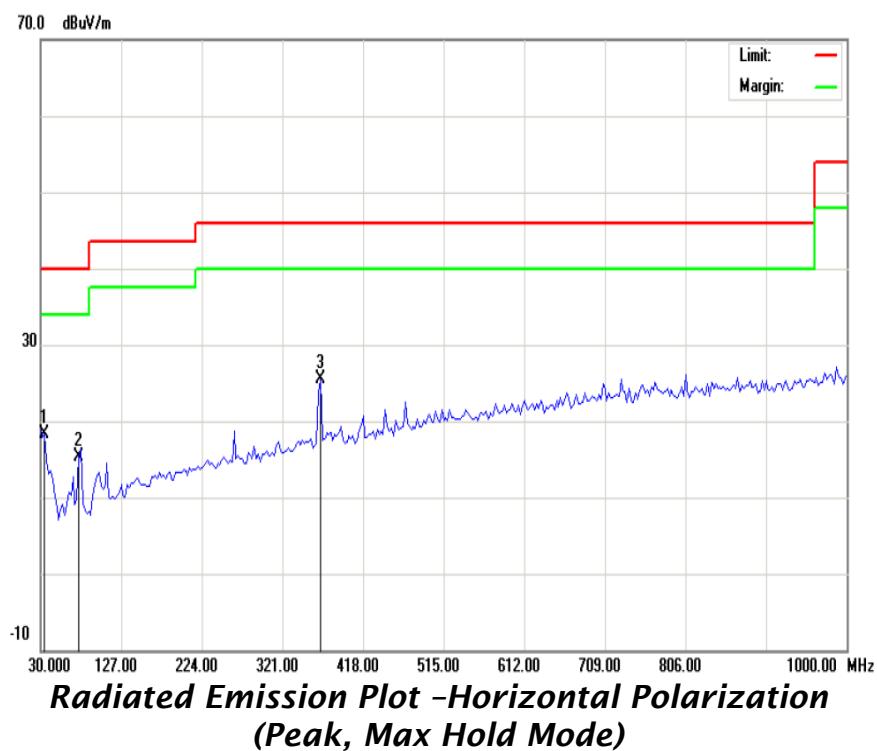


Field strength Emission Plot (Peak, Max Hold Mode 0.15MHz-30MHz)

Test Results (9kHz~30MHz)

9kHz – 0.15MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.0601	8.84	0.83	124.82	-123.99	180	101
2	0.1024	8.64	-1.06	121.77	-122.83	0	112
3	0.1193	8.65	-3.48	120.55	-124.03	90	105
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 200Hz, with a 600 ms sweep time. A video filter was not used.							
0.15MHz – 30MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.1500	9.02	19.44	118.33	-98.89	0	134
2	1.0455	9.92	-2.29	79.70	-81.99	0	129
3	1.3440	9.98	-4.00	72.13	-76.13	45	117
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 9kHz, with a 600 ms sweep time. A video filter was not used.							

Model: AT401
Middle Channel (2453MHz)
(30MHz-1000MHz)



Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	34.850	1.40	16.89	18.29	40.00	-21.71	194	104
2	76.075	6.11	9.10	15.21	40.00	-24.79	128	185
3	367.075	8.47	16.98	25.45	46.00	-20.55	204	124
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	34.850	3.52	16.89	20.41	40.00	-19.59	284	129
2	76.085	10.87	9.15	20.02	40.00	-19.98	135	103
3	468.925	3.26	19.36	22.62	46.00	-23.38	31	100

Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 600 ms sweep time. A video filter was not used.

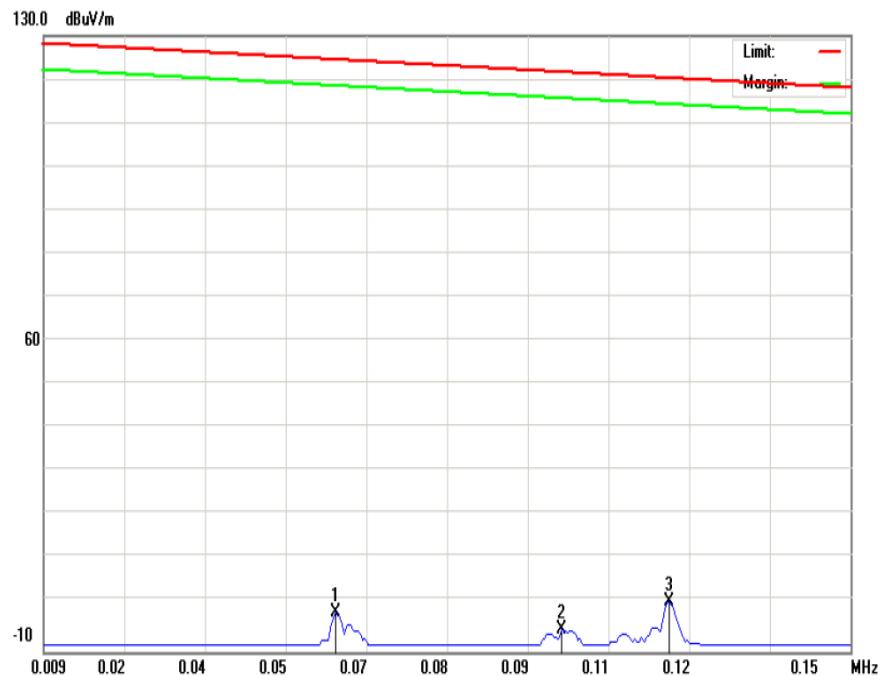
Model: AT401
Middle Channel (2453MHz)
(1GHz-24.53GHz)

Test Results (1GHz~24.53GHz)

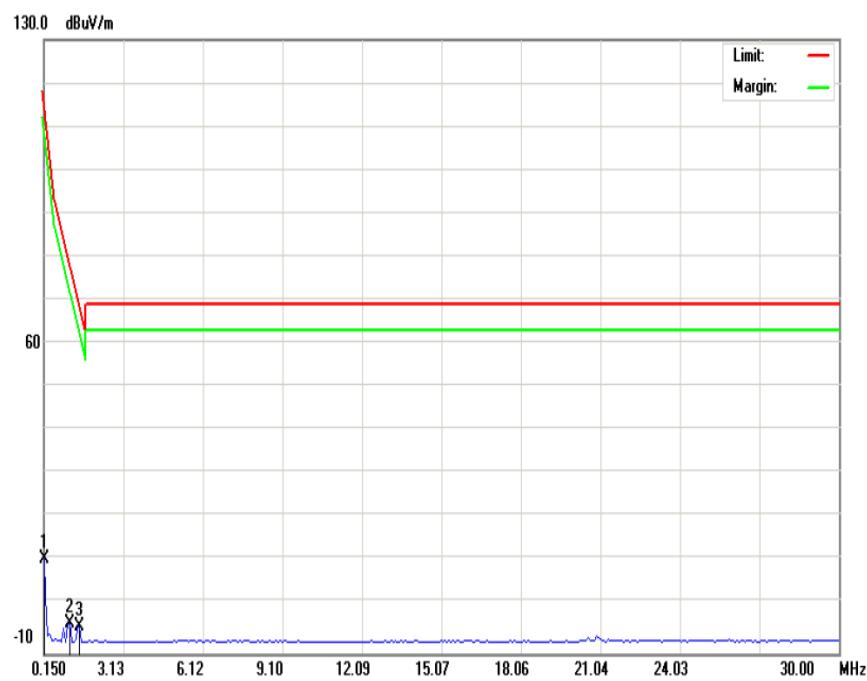
<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1690	27.35	37.36	54.00	-16.64	45.87	74.00	-28.13
2	3100	34.95	40.72	54.00	-13.28	48.72	74.00	-25.28
3	3740	37.19	41.34	54.00	-12.66	50.37	74.00	-23.63
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1190	24.20	34.36	54.00	-19.64	45.56	74.00	-28.44
2	2280	30.78	40.33	54.00	-13.67	49.02	74.00	-24.98
3	3890	37.72	41.95	54.00	-12.05	50.88	74.00	-23.12

Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 600 ms sweep time. A video filter was not used.

Model: AT401
High Channel (2473MHz)
(9kHz-30MHz)



Field strength Emission Plot (Peak, Max Hold Mode 9kHz-0.15MHz)

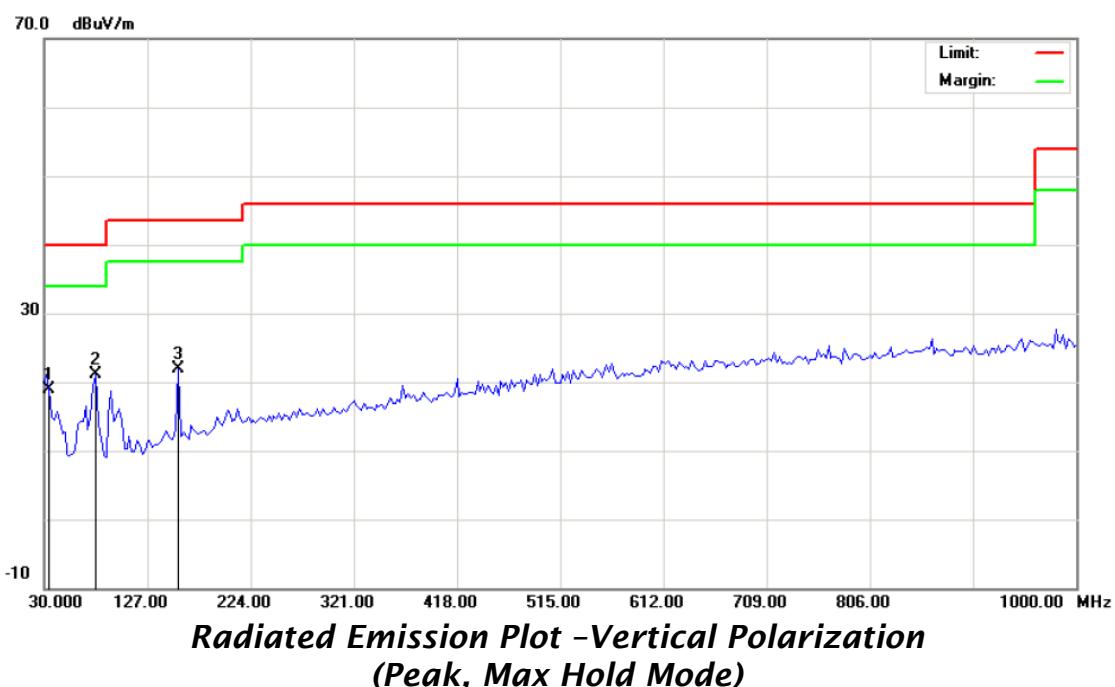
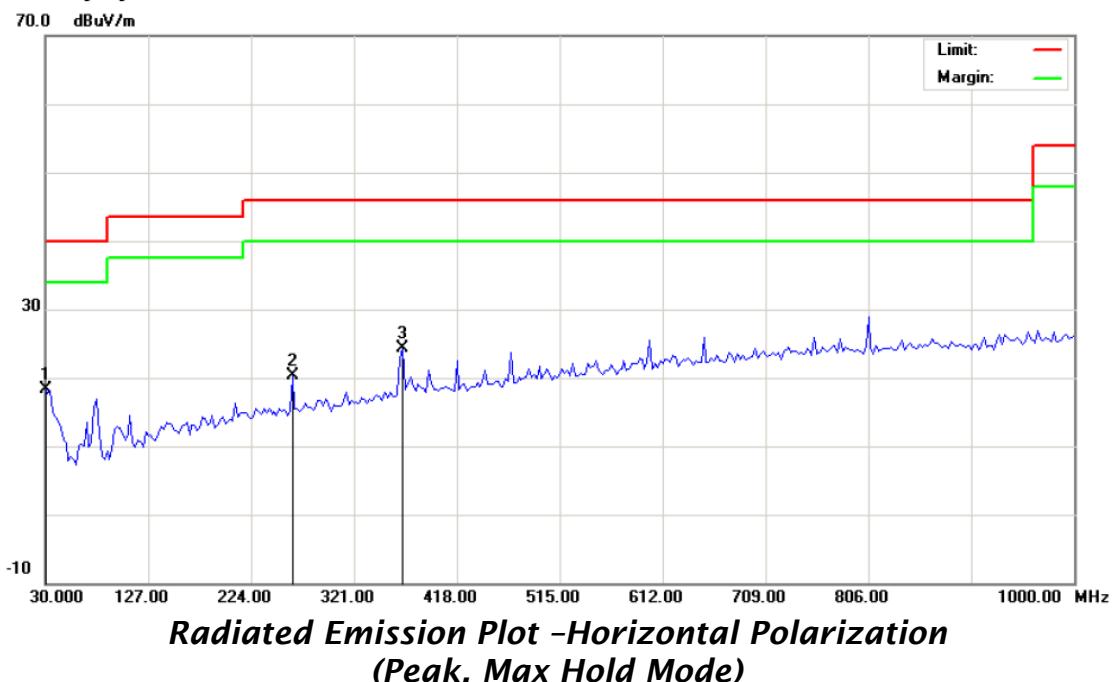


Field strength Emission Plot (Peak, Max Hold Mode 0.15MHz-30MHz)

Test Results (9kHz~30MHz)

9kHz – 0.15MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.0601	8.84	-1.06	124.84	-125.88	180	165
2	0.0996	8.70	-5.03	121.97	-127.00	90	183
3	0.1183	8.73	1.40	120.62	-119.22	90	150
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 200Hz, with a 600 ms sweep time. A video filter was not used.							
0.15MHz – 30MHz							
Signal	Frequency (MHz)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	0.1500	9.02	11.54	118.33	-106.79	0	101
2	1.1201	9.97	-3.20	77.81	-81.01	0	127
3	1.4932	10.05	-4.02	68.34	-72.36	45	143
Set-up/Configuration: ANSI C63.4-2003							
Comments: None							
Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 9kHz, with a 600 ms sweep time. A video filter was not used.							

Model: AT401
High Channel (2473MHz)
(30MHz-1000MHz)



Test Results (30MHz~1GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	30.000	-1.52	19.90	18.38	40.00	-21.62	173	103
2	262.800	5.52	14.83	20.35	46.00	-25.65	305	157
3	367.075	7.41	16.98	24.39	46.00	-21.61	118	165
<i>Vertical</i>								
Signal	Frequency (MHz)	Reading Level (dBuV)	Factor (dB)	Corrected QP Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Angle of Turner (degree)	Height of Tower (cm)
1	34.850	1.94	16.89	18.83	40.00	-21.17	67	110
2	78.500	12.22	8.97	21.19	40.00	-18.81	182	103
3	156.099	9.84	12.13	21.97	43.50	-21.53	239	167

Note: All readings are quasi-peak unless stated otherwise, using a QP bandwidth of 120kHz, with a 600 ms sweep time. A video filter was not used.

Model: AT401
High Channel (2473MHz)
(1GHz-24.73GHz)

Test Results (1GHz~24.73GHz)

<i>Horizontal</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1540	26.40	35.49	54.00	-18.51	41.23	74.00	-32.77
2	2640	32.69	38.56	54.00	-15.44	45.93	74.00	-28.07
3	4190	38.29	42.81	54.00	-11.19	49.10	74.00	-24.90
<i>Vertical</i>								
Signal	Frequency (MHz)	Factor (dB)	Corrected AV Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)	Corrected PK Level dB(uV/m)	3 Meter Limits dB(uV/m)	Margin (dB)
1	1660	24.20	34.36	54.00	-19.64	42.34	74.00	-31.66
2	2560	32.27	37.18	54.00	-16.82	48.48	74.00	-25.52
3	3310	35.69	40.96	54.00	-13.04	49.17	74.00	-24.83

Note: All readings are average and peak unless stated otherwise, using a bandwidth of 1000kHz, with a 600 ms sweep time. A video filter was not used.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/08	11/28/09
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/08	11/28/09
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/08	11/28/09
Loop Antenna	EMCO	6502	2053	11/29/08	11/28/09
Broadband Antenna	Sunol	JB5	A110503	11/29/08	11/28/09
Horn Antenna	R&S	HF906	4044.4507.02	05/13/09	05/12/10
Double-Ridged Horn Antenna	A-infor	JXTXLB-SJ-180400-15	WK293382	05/17/09	05/16/10
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY: _____

Cloud Feng

ENGINEER

REVIEWED BY: _____

Hang Zhou

SENIOR ENGINEER

**ATTACHMENT 2 – FUNDAMENTAL AND HARMONIC FIELD STRENGTH
TEST RESULTS**

CLIENT:	Taizhou Best Team Technology Limited	TEST STANDARD:	FCC Part 15.249 (a)
MODEL TESTED:	AT401	PRODUCT:	Remote Control Transmitter
SERIAL NO.:	Engineering Sample	EUT DESIGNATION:	RF Equipment
TEMPERATURE:	21°C	HUMIDITY:	53%RH
ATM PRESSURE:	101.6 kPa	GROUNDING:	No Grounding
TESTED BY:	Cloud Feng	DATE OF TEST:	2009, August 20
SETUP METHOD:	ANSI C63.4 : 2003		
TEST PROCEDURE:	<p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. The antenna was varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna were set to make measurement.</p> <p>d. For each suspected emission the EUT was arranged to its worst case and then change the antenna tower height (from 1m to 4m) and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>e. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>f. Broadband antenna (Calibrated antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz.</p> <p>g. The bandwidth is 120 kHz below 1000 MHz, and 1 MHz above 1000 MHz</p> <p>Explanation of the Correction Factor are given as follows:</p> <p>FS = RA + AF + CF - AG</p> <p>Where: FS = Field Strength</p> <p>RA = Receiver Amplitude</p> <p>AF = Antenna Factor</p> <p>CF = Cable Attenuation Factor</p> <p>AG = Amplifier Gain</p> <p>FCC 15.249 limit</p> <p>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:</p>		
	Fundamental Frequency	Field Strength of Fundamental	Field Strength of Harmonics

EMC Test Report #: SHA-0908-8306-FCC

Prepared for Taizhou Best Team Technology Limited

Prepared by ECMG Worldwide Certification Solution, Inc.

Page 27 of 38

		(milivolts/meter)	(microvolts/meter)
	902-928MHz	50	500
	2400-2483.5MHz	50	500
	5725-5875MHz	50	500
	24.0-24.25GHz	250	2500
TESTED RANGE:	2.4GHz to 24.73GHz for the Remote Control		
TEST VOLTAGE:	6V DC		
TEST STATUS:	Set Remote Control to generate signal at low, middle and high channels continually		
RESULTS:	The EUT meets the requirements of the fundamental and harmonic field strength. The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc.(China) test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7} \times$ Center Freq., Amp ± 2.6 dB		

Duty Cycle Correction Factor is calculated by averaging the sum of the pulse train. Correction factor is measured as follows:

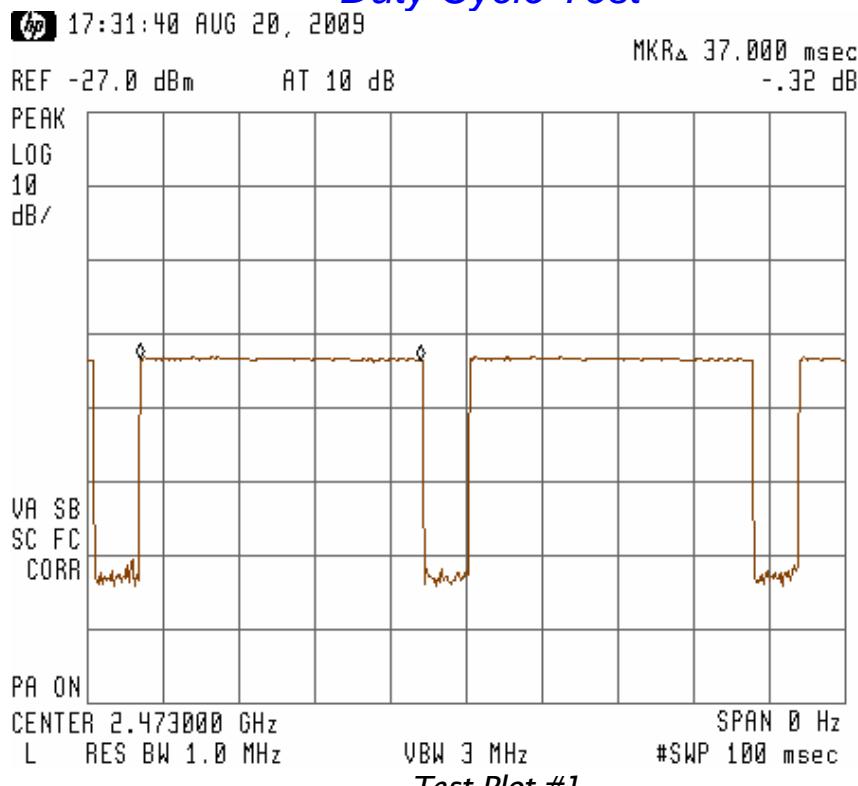
Keep the EUT in continuous transmission mode (modulated), and set the spectrum to the fundamental frequency and set the span width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse train and determine the number and width of the pulses, as well as the period of the train.

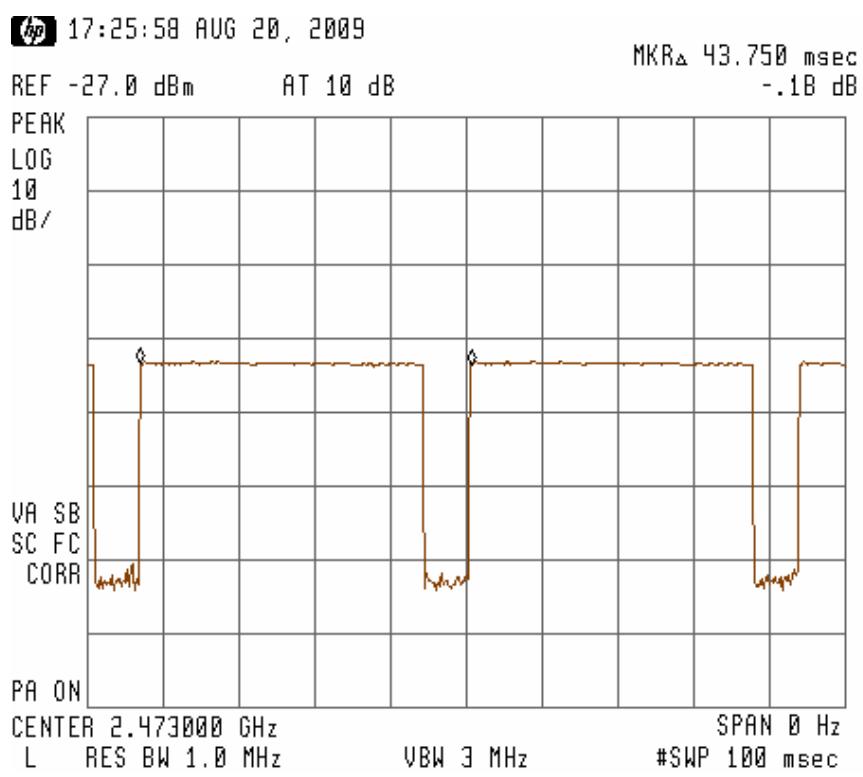
$$\text{Duty cycle} = 37.00\text{ms}/43.75\text{mS} = 84.57\%$$

$$\text{So the Duty Cycle Correction Factor} = 20 \log 84.57\% = 1.46\text{dB}$$

(See the plot below)

Duty Cycle Test





For Channel 1 (2433MHz) Lie mode
Test Results (2.4GHz~24.33GHz)

<i>Horizontal</i>										
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2433	28.46	1.46	80.43	114.00	-33.57	78.97	94.00	-15.03	
2	4866	30.14	1.46	49.56	74.00	-24.44	48.10	54.00	-5.90	
3	7299	37.24	1.46	47.19	74.00	-26.81	45.73	54.00	-8.27	
4	9732	38.84	1.46	46.43	74.00	-27.57	44.97	54.00	-9.03	
5	12165	41.37	1.46	41.83	74.00	-32.17	40.37	54.00	-13.63	
HIGHER HARMONICS		--	---	<40	74.00	-34.00	<40	54.00	-14.00	
<i>Vertical</i>										
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2433	28.46	1.46	78.08	114.00	-35.92	76.62	94.00	-17.38	
2	4866	30.14	1.46	49.08	74.00	-24.92	47.62	54.00	-6.38	
3	7299	37.24	1.46	48.30	74.00	-25.70	46.84	54.00	-7.16	
4	9732	38.84	1.46	46.67	74.00	-27.33	45.21	54.00	-8.79	
5	12165	41.37	1.46	40.61	74.00	-33.39	39.15	54.00	-14.85	
HIGHER HARMONICS		--	---	<40	74.00	-34.00	<40	54.00	-14.00	

Note#1: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 100 ms sweep time. A video filter was not used.

Note#2: Factor = Antenna Factor + Cable Loss - Preamp Factor;
 Corrected Peak Level= Reading level + Factor; Corrected AV Level = Corrected Peak Level - -Duty Cycle Factor.
 Margin = Corrected Level – Limits;

**For Channel 26 (2453MHz) Side mode
Test Results (2.4GHz~24.53GHz)**

<i>Horizontal</i>										
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2453	28.49	1.46	80.71	114.00	-33.29	79.25	94.00	-14.75	
2	4906	30.78	1.46	49.19	74.00	-24.81	47.73	54.00	-6.27	
3	7359	37.35	1.46	47.12	74.00	-26.88	45.66	54.00	-8.34	
4	9812	38.78	1.46	46.73	74.00	-27.27	45.27	54.00	-8.73	
5	12265	42.26	1.46	43.49	74.00	-30.51	42.03	54.00	-11.97	
HIGHER HARMONICS		--	---	<40	74.00	-34.00	<40	54.00	-14.00	
<i>Vertical</i>										
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2453	28.49	1.46	77.47	114.00	-36.53	76.01	94.00	-17.99	
2	4906	30.78	1.46	50.43	74.00	-23.57	48.97	54.00	-5.03	
3	7359	37.35	1.46	49.00	74.00	-25.00	47.54	54.00	-6.46	
4	9812	38.78	1.46	48.65	74.00	-25.35	47.19	54.00	-6.81	
5	12265	42.26	1.46	47.19	74.00	-26.81	45.73	54.00	-8.27	
HIGHER HARMONICS		--	---	<40	74.00	-34.00	<40	54.00	-14.00	

Note#1: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 100 ms sweep time. A video filter was not used.

Note#2: Factor = Antenna Factor + Cable Loss - Preamp Factor;
Corrected Peak Level= Reading level + Factor; Corrected AV Level = Corrected Peak Level - -Duty Cycle Factor.
Margin = Corrected Level – Limits;

**For Channel 50 (2473MHz) Standing mode
Test Results (2.4GHz~24.73GHz)**

<i>Horizontal</i>									
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2473	28.58	1.46	78.19	114.00	-35.81	76.73	94.00	-17.27
2	4936	31.52	1.46	49.04	74.00	-24.96	47.58	54.00	-6.42
3	7419	37.54	1.46	47.47	74.00	-26.53	46.01	54.00	-7.99
4	9892	38.69	1.46	47.65	74.00	-26.35	46.19	54.00	-7.81
5	12365	42.40	1.46	44.39	74.00	-29.61	42.93	54.00	-11.07
HIGHER HARMONICS		--	---	<60	74.00	-14.00	<40	54.00	-14.00
<i>Vertical</i>									
Signal	Frequency (MHz)	Factor (dB)	Duty Cycle Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)
1	2473	28.58	1.46	80.42	114.00	-33.58	78.96	94.00	-15.04
2	4936	31.52	1.46	51.55	74.00	-22.45	50.09	54.00	-3.91
3	7419	37.54	1.46	48.82	74.00	-25.18	47.36	54.00	-6.64
4	9892	38.69	1.46	50.50	74.00	-23.50	49.04	54.00	-4.96
5	12365	42.40	1.46	47.33	74.00	-26.67	45.87	54.00	-8.13
HIGHER HARMONICS		--	---	<60	74.00	-14.00	<40	54.00	-14.00
<p>Note#1: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 100 ms sweep time. A video filter was not used.</p> <p>Note#2: Factor = Antenna Factor + Cable Loss - Preamp Factor; Corrected Peak Level= Reading level + Factor; Corrected AV Level = Corrected Peak Level - -Duty Cycle Factor. Margin = Corrected Level – Limits;</p>									

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/08	11/28/09
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/08	11/28/09
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/08	11/28/09
Broadband Antenna	Sunol	JB5	A110503	11/29/08	11/28/09
Horn Antenna	R&S	HF906	4044.4507.02	05/13/09	05/12/10
Double-Ridged Horn Antenna	A-infor	JXTXLB-SJ-180400-15	WK293382	05/17/09	05/16/10
Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.					

SIGNED BY:

Cloud Feng

ENGINEER

REVIEWED BY:

Hang Zhou

SENIOR ENGINEER

ATTACHMENT 3 – Band Edge Test

CLIENT:	Taizhou Best Team Technology Limited	TEST STANDARD:	FCC Part 15.249 (d)
MODEL TESTED:	AT401	PRODUCT:	Remote Control Transmitter
SERIAL NO.:	Engineering Sample	EUT DESIGNATION:	RF Equipment
TEMPERATURE:	21°C	HUMIDITY:	53%RH
ATM PRESSURE:	101.6 kPa	GROUNDING:	No Grounding
TESTED BY:	Cloud Feng	DATE OF TEST:	2008, August 18
SETUP METHOD:	ANSI C63.4 - 2003		
BANDEdge REQUIREMENT:	FCC 15.249 (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to general radiated emission limits in Section 15.209, which is the lesser attenuation.		
TEST PROCEDURE:	Set the spectrum as follow: Span=wide enough to capture the peak level of the emission operating on the channel closest to the band-edge, as well as any modulation products which fall outside of the authorized band of operation. RBW=1000kHz; VBW \geq RBW; Sweep=Auto; Detector=Peak; Trace=Maxhold; Allow the trace to stabilize and use the search peak function to set the marker to the peak of the useful emission, then use delta-mark function to mark the maximum emission outside of the band, record the delta level to see if it's more than 50dB. Or see if the emissions outside the operating frequencies can satisfy the limit 15.209.		
TEST VOLTAGE:	6V DC		
TEST STATUS:	Channel 1 for low and Channel 50 for high		
RESULTS:	The EUT meets band edge requirement. The test results relate only to the equipment under test provided by client.		
CHANGES OR MODIFICATIONS:	There were no modifications installed by ECMG Worldwide Certification Solution, Inc.(China) test personnel.		
M. UNCERTAINTY:	Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB		

Model AT401

14:46:45 AUG 18, 2009

MKR 2.39995 GHz

REF 80.0 dB μ V AT 10 dB

17.61 dB μ V

**PEAK
LOG
10
dB/**

**VA SB
SC FC
CORR**

PA ON

START 2.38000 GHz

#RES BW 1.0 MHz

VBW 3 MHz

STOP 2.45000 GHz

#SWP 300 msec

Channel 1 (2433MHz)

14:07:59 AUG 18, 2009

MKR 2.48388 GHz

REF 70.0 dB μ V #AT 0 dB

13.47 dB μ V

**PEAK
LOG
10
dB/**

**VA SB
SC FC
CORR**

PA ON

START 2.45000 GHz

L #RES BW 1.0 MHz

#VBW 3 MHz

STOP 2.50000 GHz

#SWP 300 msec

Channel 50 (2473MHz)

Band Edge Test Plot with antenna horizontal

Band Edge Test Table

Antenna Horizontal									
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2400	28.21	45.82	74.00	-28.18	42.65	54.00	-11.35	
2	2483.5	28.70	42.17	74.00	-31.83	39.87	54.00	-14.13	
Antenna Vertical									
Signal	Frequency (MHz)	Factor (dB)	Corrected PK Level (dBuV/m)	3 Meter PK Limits (dB uV/m)	Margin (dB)	Corrected AV Level (dBuV/m)	3 Meter AV Limits (dBuV/m)	Margin (dB)	
1	2400	28.21	48.78	74.00	-25.22	42.91	54.00	-11.09	
2	2483.5	28.70	44.85	74.00	-29.15	40.19	54.00	-13.81	

Note #1: The peak and average readings are using a resolution bandwidth of 1MHz and video bandwidth of 3MHz.

Note #2: Corrected level = Reading level + Factor; Factor = Antenna Factor + Cable Factor – Preamp Gain.

Test Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal. Due Date
EMI Receiver	HP	85462A	3650A00363	11/29/08	11/28/09
EMI Test Receiver RF Unit	R&S	ESMI-RF	DE23873	11/29/08	11/28/09
EMI Test Receiver Display Unit	R&S	ESAI-D	825035/005	11/29/08	11/28/09
Broadband Antenna	Sunol	JB5	A110503	11/29/08	11/28/09
Horn Antenna	R&S	HF906	4044.4507.02	05/13/09	05/12/10

Note: All testing were performed using internationally recognized standards. All test instruments were calibrated.

SIGNED BY:

Cloud Feng

ENGINEER

REVIEWED BY:

Hang Zhou

SENIOR ENGINEER