

---

# Radio Test Report

---

Report No.: AGC20M120302-2F2

**FCC ID** : T54AD701-K  
**PRODUCT DESIGNATION** : AD701-KRECEIVER  
**BRAND NAME** : N/A  
**MODEL NAME** : AD701-K  
**CLIENT** : AnJieLun Electronic Technology Limited  
**DATE OF ISSUE** : May 08, 2012  
**STANDARD(S)** : FCC Part 15 Rules  
**REPORT VERSION** : V1.0

**Attestation of Global Compliance Co., Ltd.**

CAUTION: This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.

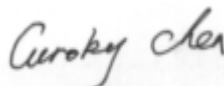
## VERIFICATION OF COMPLIANCE

Applicant	AnJieLun Electronic Technology Limited
	2F, 12st, LONGBI INDUSTRIAL PARK, BANTIAN VILLAGE, BUJI TOWN, SHENZHEN, GUANG DONG PROVIDENCE, CHINA
Manufacturer	AnJieLun Electronic Technology Limited
	2F, 12st, LONGBI INDUSTRIAL PARK, BANTIAN VILLAGE, BUJI TOWN, SHENZHEN, GUANG DONG PROVIDENCE, CHINA
Product Designation	AD701-KRECEIVER
Brand Name	N/A
Test Model	AD701-K
Report Number	AGC20M120302-2F2
Date of Test	May 04, 2012 to May 07, 2012

### WE HEREBY CERTIFY THAT:

The above equipment was tested by Attestation of Global Compliance Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C 63.4:2003. The sample tested as described in this report is in compliance with the FCC Rules Part 15 requirements.

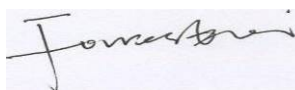
Tested By:



Curoky Chen

May 08, 2012

Reviewed By:



Forrest Lei

May 08, 2012

Approved By:



Solger Zhang

May 08, 2012

## TABLE OF CONTENTS

<b>1 GENERAL INFORMATION .....</b>	<b>4</b>
1.1 PRODUCT DESCRIPTION .....	4
1.2 RELATED SUBMITTAL(S) / GRANT (S) .....	5
1.3 TEST METHODOLOGY .....	5
1.4 TEST FACILITY .....	5
1.5 SPECIAL ACCESSORIES .....	5
1.6 EQUIPMENT MODIFICATIONS .....	5
<b>2 SYSTEM TEST CONFIGURATION .....</b>	<b>6</b>
2.1 CONFIGURATION OF EUT SYSTEM .....	6
2.2 EQUIPMENT USED IN EUT SYSTEM .....	6
<b>3 SUMMARY OF TEST RESULTS.....</b>	<b>7</b>
<b>4. DESCRIPTION OF TEST MODES .....</b>	<b>8</b>
<b>5 PEAK OUTPUT POWER.....</b>	<b>9</b>
5.1 MEASUREMENT PROCEDURE .....	9
5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	9
5.3 MEASUREMENT EQUIPMENT USED.....	10
5.4 LIMITS AND MEASUREMENT RESULT .....	10
<b>6 20 DB BANDWIDTH .....</b>	<b>11</b>
6.1 MEASUREMENT PROCEDURE .....	11
6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	11
6.3 MEASUREMENT EQUIPMENT USED.....	11
6.4 LIMITS AND MEASUREMENT RESULTS.....	11
<b>7. CONDUCTED SPURIOUS EMISSION .....</b>	<b>13</b>
7.1 MEASUREMENT PROCEDURE .....	13
7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION) .....	13
7.3 MEASUREMENT EQUIPMENT USED.....	13
7.4 LIMITS AND MEASUREMENT RESULT .....	13
<b>8. RADIATED EMISSION .....</b>	<b>15</b>
8.1 MEASUREMENT PROCEDURE .....	15
1. CONFIGURE THE EUT ACCORDING TO ANSI C63.4: 2003. THE EUT WAS PLACED ON THE TOP OF THE .....	15
TURNABLE 0.8 METER ABOVE GROUND. THE PHASE CENTER OF THE RECEIVING ANTENNA MOUNTED ON THE .....	15
TOP OF A HEIGHT-VARIABLE ANTENNA TOWER WAS PLACED 3 METERS FAR AWAY FROM THE TURNTABLE. ....	15
8.2 TEST SETUP .....	16
8.3 TEST EQUIPMENT LIST .....	17
8.4 TEST RESULT .....	18
<b>9 BAND EDGES EMISSION .....</b>	<b>22</b>
9.1 MEASUREMENT PROCEDURE .....	22
9.2 TEST SET-UP .....	22
9.3 TEST RESULT .....	22
<b>10. NUMBER OF HOPPING FREQUENCY .....</b>	<b>26</b>
10.1 MEASUREMENT PROCEDURE .....	26
10.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION) .....	26
10.3 MEASUREMENT EQUIPMENT USED .....	26
10.4 AND MEASUREMENT RESULT .....	26

<b>11. TIME OF OCCUPANCY (DWELL TIME)</b>	<b>28</b>
11.1 MEASUREMENT PROCEDURE	28
11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	28
11.3 MEASUREMENT EQUIPMENT USED	28
11.4 LIMITS AND MEASUREMENT RESULT	28
<b>12. FREQUENCY SEPARATION</b>	<b>30</b>
12.1 MEASUREMENT PROCEDURE	30
12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)	30
12.3 MEASUREMENT EQUIPMENT USED	30
12.4 LIMITS AND MEASUREMENT RESULT	30
<b>13 FCC LINE CONDUCTED EMISSION TEST</b>	<b>31</b>
13.1 LIMITS OF LINE CONDUCTED EMISSION TEST	31
13.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	31
13.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	32
13.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	32
13.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST	33
<b>APPENDIX I</b>	<b>35</b>
<b>PHOTOGRAPHS OF THE EUT</b>	<b>35</b>
<b>INTERNAL VIEW OF SAMPLE – 3</b>	<b>39</b>
<b>APPENDIX II</b>	<b>42</b>
<b>PHOTOGRAPHS OF THE TEST SETUP</b>	<b>42</b>

## 1 GENERAL INFORMATION

### 1.1 PRODUCT DESCRIPTION

The EUT is a **AD701-KRECEIVER** designed as an “Communication Device”. It is designed by way of utilizing the FHSS technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2408.95 MHz to 2474.23 MHz
Rated Output Power	15.43dBm(max)
Hardware Version	V1.0
Software Version	V1.0
Modulation	GFSK
Number of channels	24
Antenna Designation	Fixed
Antenna Gain	1.8dBi
Power Supply	DC 5V by adapter

## **1.2 RELATED SUBMITTAL(S) / GRANT (S)**

This submittal(s) (test report) is intended for **FCC ID: T54AD701-K**, filing to comply with the FCC Part 15 requirements.

## **1.3 TEST METHODOLOGY**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

## **1.4 TEST FACILITY**

The test site used to collect the radiated data is located on the address of Attestation of Global Compliance Co., Ltd. 2F., No.2 Building, Huafeng No.1 Technical Industrial Park, Sanwei, Xixiang, Baoan District, Shenzhen. The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003 .  
FCC register No.: 259865

## **1.5 SPECIAL ACCESSORIES**

Refer to section 2.2.

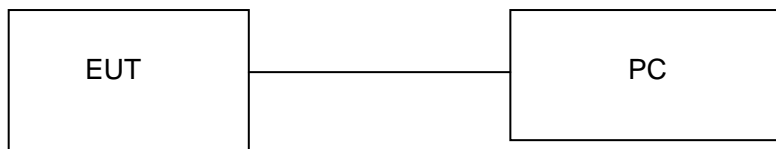
## **1.6 EQUIPMENT MODIFICATIONS**

Not available for this EUT intended for grant.

## 2 SYSTEM TEST CONFIGURATION

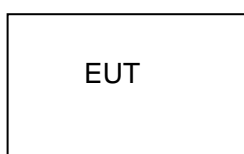
### 2.1 CONFIGURATION OF EUT SYSTEM

Configure 1:



*Note: the EUT controlled by PC to work in continuous TX mode.*

Configure 2:



*Note: EUT worked in Normal hopping mode.*

### 2.2 EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	AD701-KRECEIVER	N/A	AD701-K	EUT
2	Power supply	Nalin	NLA10050W1A	Accessory
3	PC	Dell	Inspiron N5110	A.E
4	Earphone	Sennheiser	CX 300-II Precision Black	A.E

*Note: All the accessories have been used during the test.  
the EUT in test setup diagram means "EUT system".*

### 3 SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	20 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.247	Number of Hopping Frequency	Compliant
§15.247	Time of Occupancy	Compliant
§15.247	Frequency Separation	Compliant
§15.207	Line Conduction Emission	Compliant



#### 4. DESCRIPTION OF TEST MODES

The EUT has been operated in three modulations: GFSK independently.  
The following operating modes were applied for the related test items.

No.	TEST MODES
1	Low Channel(TX)
2	Middle Channel(TX)
3	High Channel(TX)
4	Normal Hopping

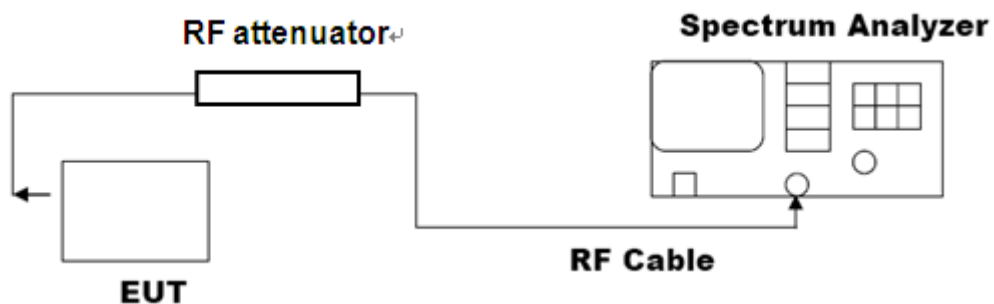
**Note:** All test modes were performed during the testing with configure in section 2.1, only the result of the worst case was recorded in the report.

## 5 PEAK OUTPUT POWER

### 5.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel  
RBW > the 20 dB bandwidth of the emission being measured  
VBW  $\geq$  RBW; Sweep = auto; Detector function = peak
5. Set SPA Trace 1 Max hold, then View.

### 5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



### 5.3 MEASUREMENT EQUIPMENT USED

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/27/2011	06/26/2012
RF attenuator	N/A	RFA20db	N/A	N/A	N/A

### 5.4 LIMITS AND MEASUREMENT RESULT

PEAK OUTPUT POWER MEASUREMENT RESULT FOR GFSK MODULATION			
Channel	Result (dBm)	Applicable Limits (dBm)	Pass or Fail
Channel 0	14.71	30	Pass
Channel 12	14.93	30	Pass
Channel 23	15.43	30	Pass

## 6 20 DB BANDWIDTH

### 6.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel  
RBW  $\geq$  1% of the 20 dB bandwidth, VBW  $\geq$  RBW; Sweep = auto; Detector function = peak
5. Set SPA Trace 1 Max hold, then View.

### 6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

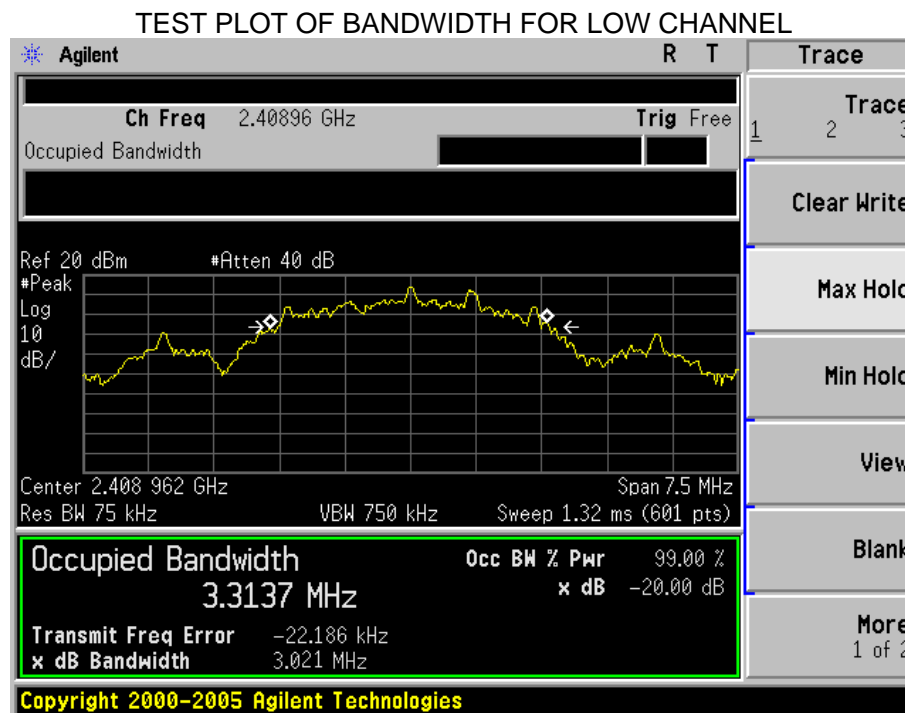
The same as described in Section 5.2

### 6.3 MEASUREMENT EQUIPMENT USED

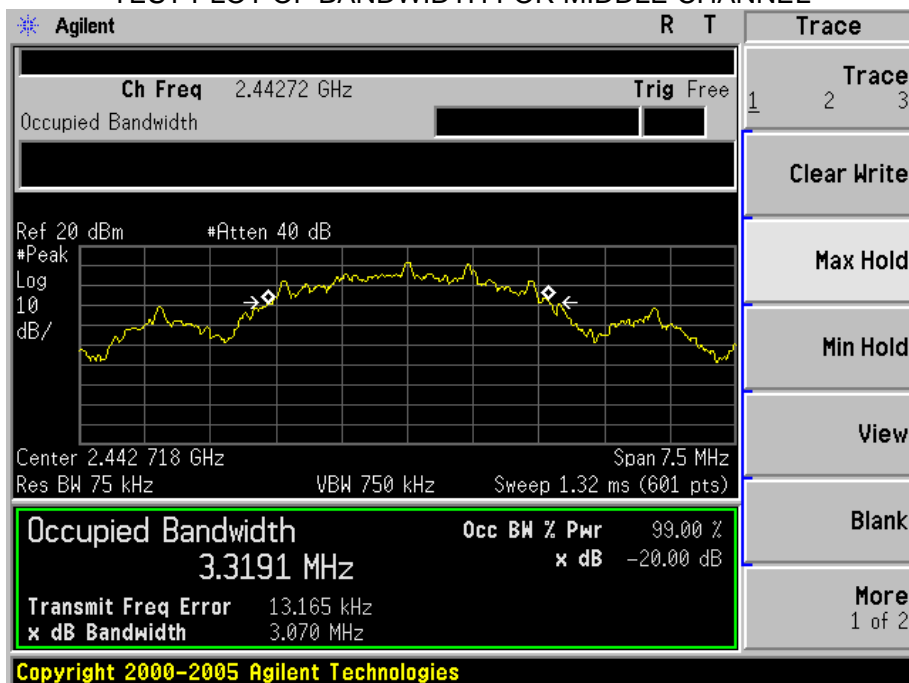
The same as described in Section 5.3

### 6.4 LIMITS AND MEASUREMENT RESULTS

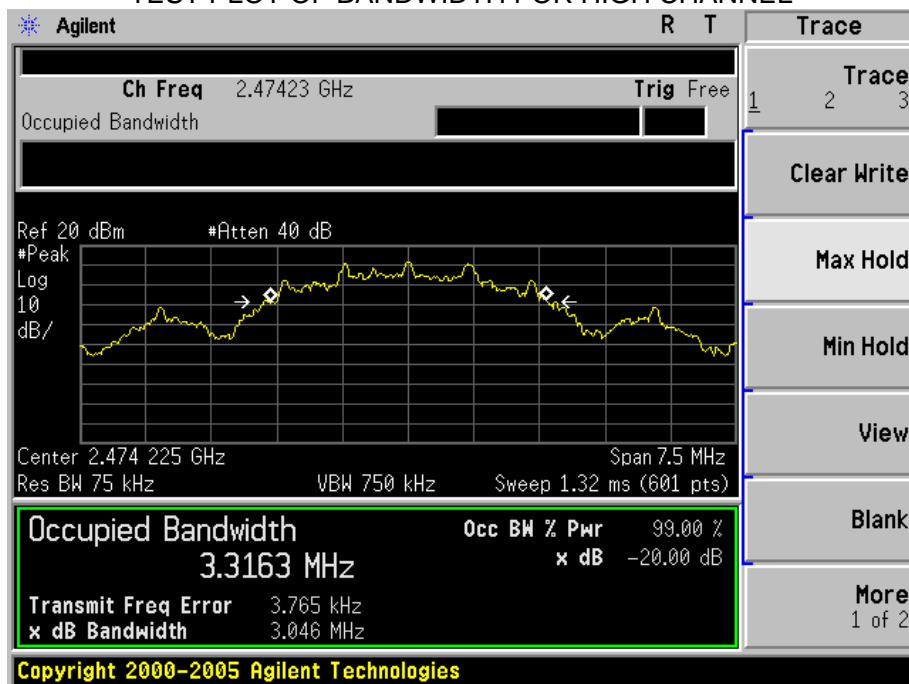
TEST RESULT			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
--	Low Channel	3.021	PASS
	Middle Channel	3.070	PASS
	High Channel	3.046	PASS



### TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



### TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



## 7. CONDUCTED SPURIOUS EMISSION

### 7.1 MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.  
RBW = 100 kHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak.
5. Set SPA Trace 1 Max hold, then View.

### 7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in section 5.2

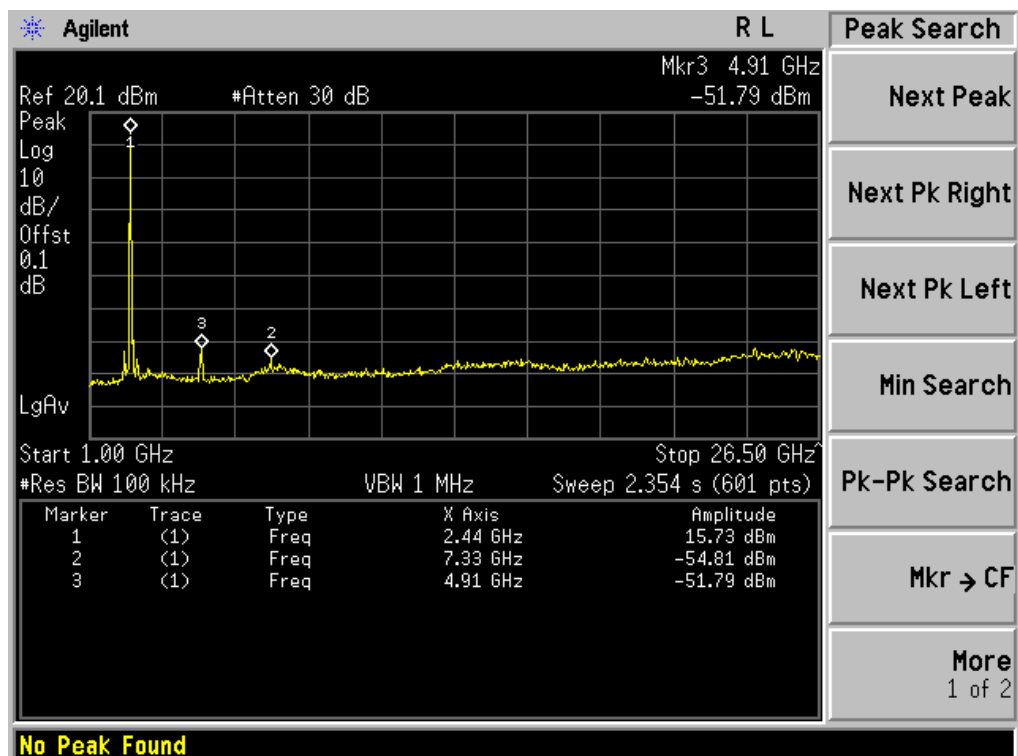
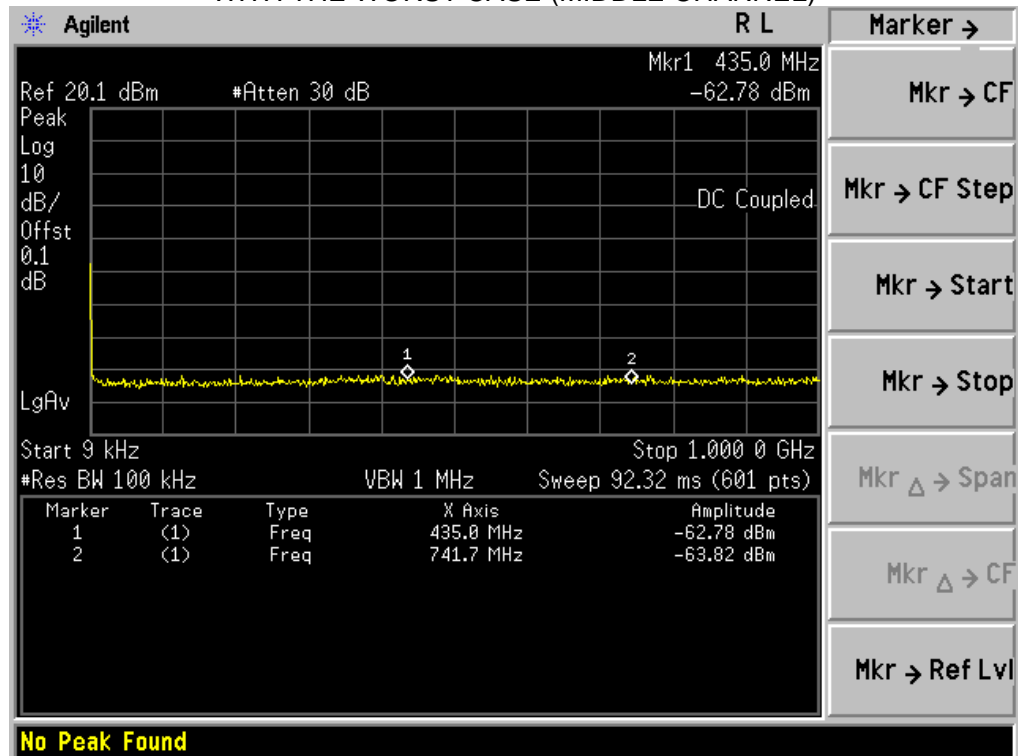
### 7.3 MEASUREMENT EQUIPMENT USED

The Same as described in section 5.3

### 7.4 LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test Data	Criteria
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power.	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
In addition, radiation emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in§15.209(a))	At least -20dBc than the limit Specified on the TOP Channel	PASS

# TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE (MIDDLE CHANNEL)



## **8. RADIATED EMISSION**

### **8.1 MEASUREMENT PROCEDURE**

1. Configure the EUT according to ANSI C63.4: 2003. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.



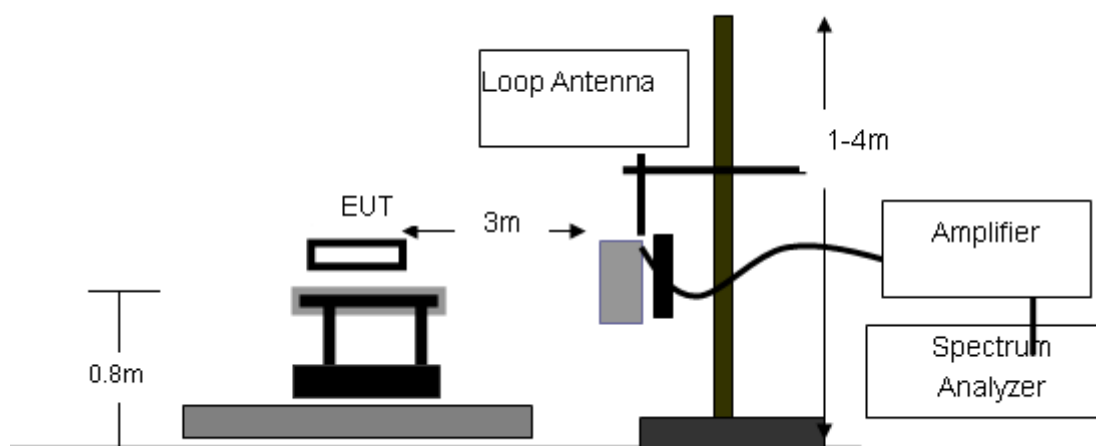
The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start Frequency	1GHz
Stop Frequency	26.5GHz
RB/VB(Emission in restricted band)	1MHz/1MHz for Peak, 1MHz/10Hz for Average
RB/VB(Emission in non-restricted band)	1MHz/1MHz for Peak

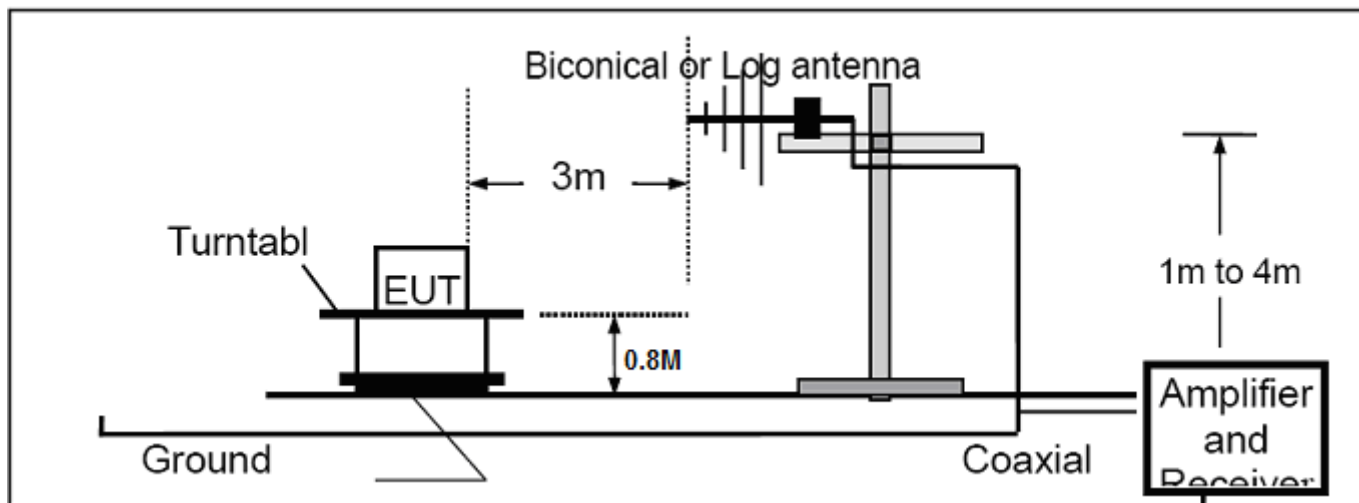
Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

## 8.2 TEST SETUP

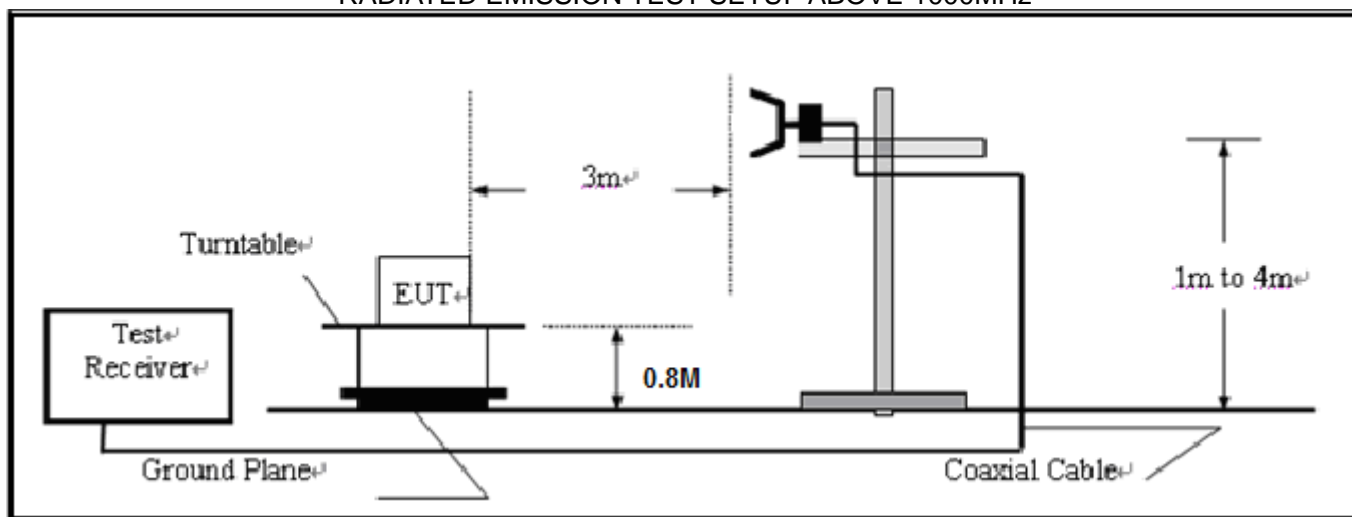
### RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



### 8.3 TEST EQUIPMENT LIST

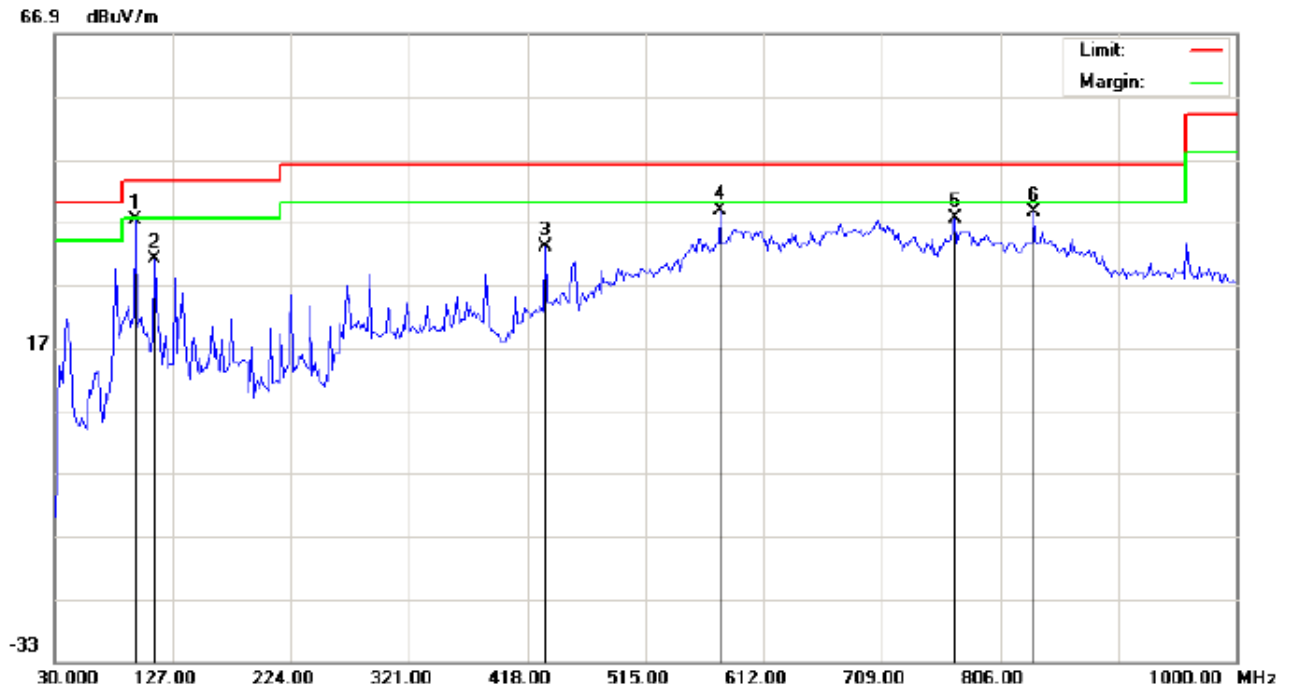
Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/27/2011	06/26/2012
Amplifier	EM	EM30180	0607030	06/27/2011	06/26/2012
Horn Antenna	EM	EM-AH-10180	N/A	06/27/2011	06/26/2012
EMI Test Receiver	Rohde & Schwarz	ESCI	N/A	06/27/2011	06/26/2012
Amplifier	EM	EM30180	N/A	06/27/2011	06/26/2012
Biological Antenna	A.H. Systems Inc.	SAS-521-4	N/A	06/27/2011	06/26/2012
Loop Antenna	Daze	ZN30900N	SEL0097	06/27/2011	06/26/2012
Isolation Transformer	LETEAC	LTBK	--	06/27/2011	06/26/2012

## 8.4 TEST RESULT

### RADIATED EMISSION BELOW 30MHZ

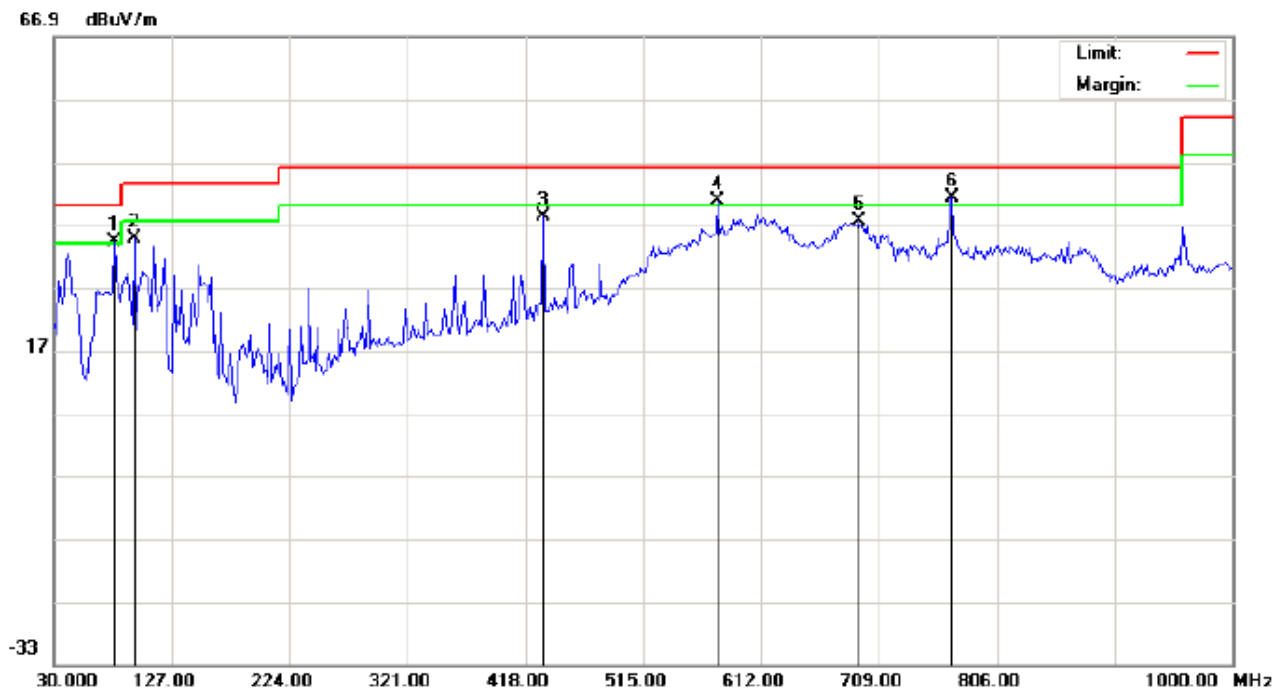
No emission found between lowest internal used/generated frequencies to 30MHz.

### RADIATED EMISSION BELOW 1GHZ



Site: site #1	Polarization: <i>Horizontal</i>	Temperature: 26
Limit: FCC Class B 3M Radiation	Power: AC 120V/60Hz	Humidity: 60 %
EUT: AD701-KRECEIVER	Distance: 3m	
M/N: AD701-K		
Mode: Channel 12 TX		
Note:		

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	96.2833	23.14	14.16	37.30	43.50	-6.20	peak			
2		112.4500	18.49	12.63	31.12	43.50	-12.38	peak			
3		432.5500	11.92	21.09	33.01	46.00	-12.99	peak			
4		576.4333	14.32	24.54	38.86	46.00	-7.14	peak			
5		768.8167	9.64	27.81	37.45	46.00	-8.55	peak			
6		833.4833	8.26	30.28	38.54	46.00	-7.46	peak			



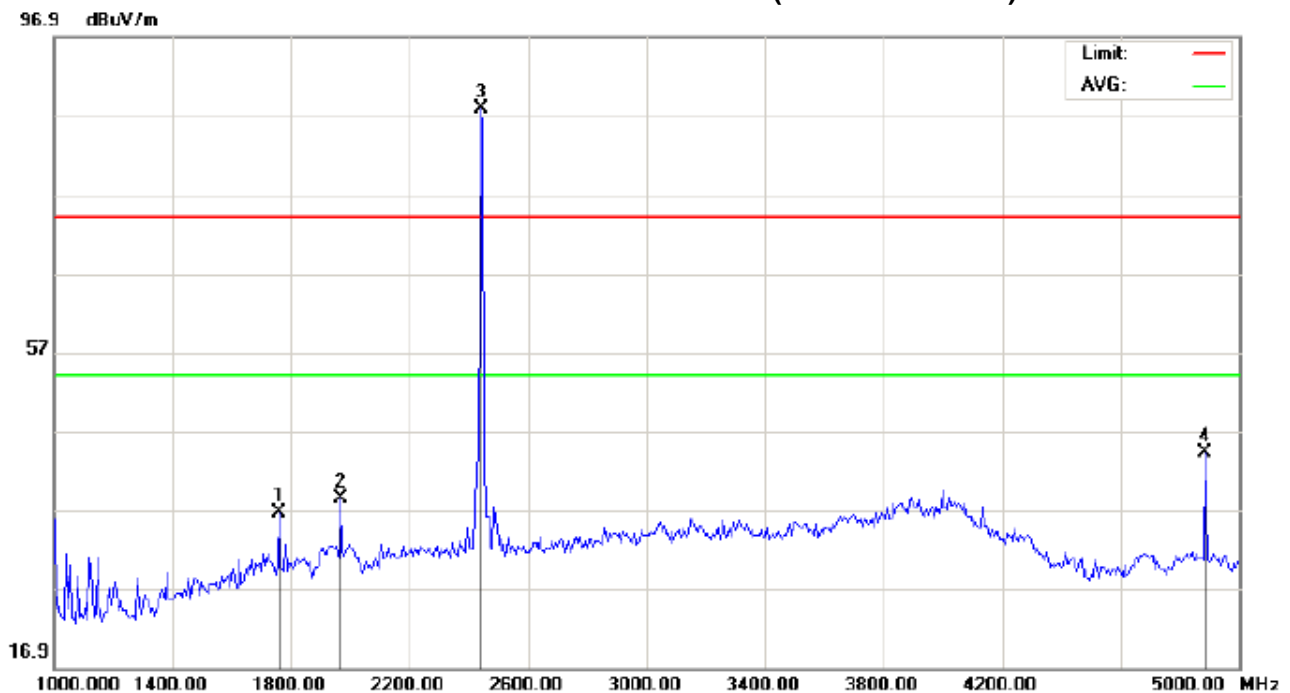
Site: site #1  
Limit: FCC Class B 3M Radiation  
EUT: AD701-KRECEIVER  
M/N: AD701-K  
Mode: Channel 12 TX  
Note:

Polarization: *Vertical*  
Power: AC 120V/60Hz  
Distance: 3m

Temperature: 26  
Humidity: 60 %

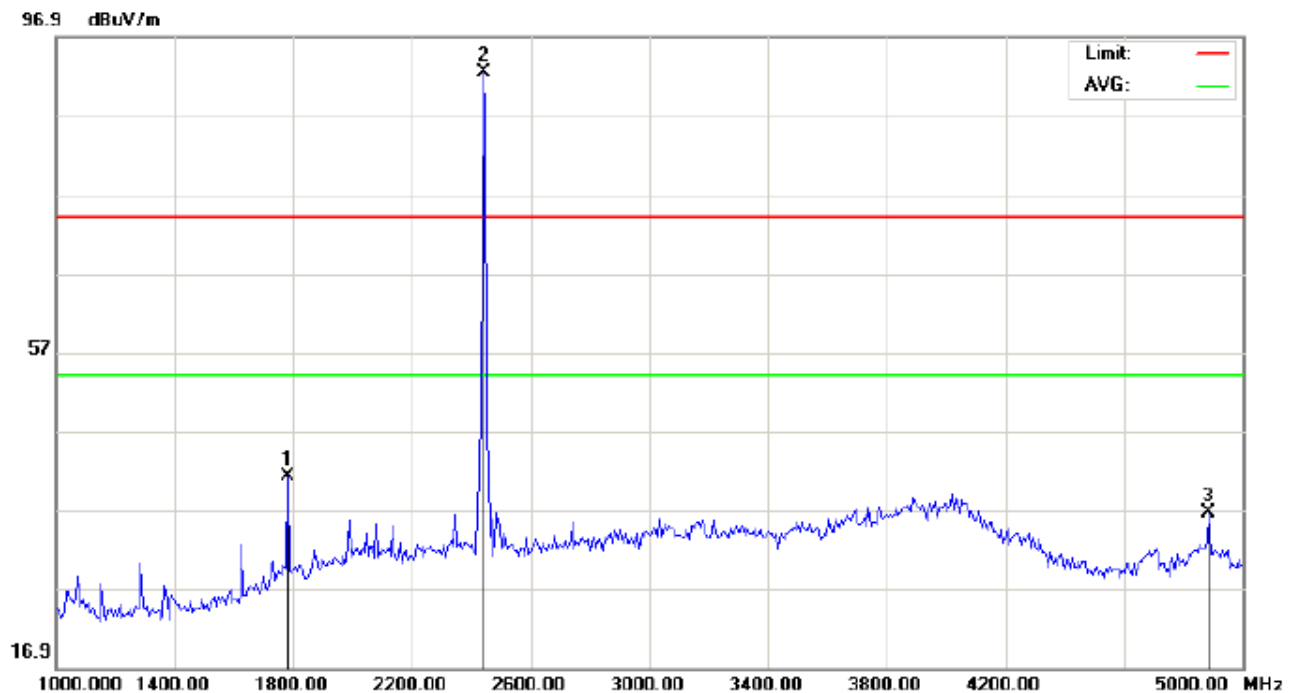
No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	!	80.1167	28.81	5.39	34.20	40.00	-5.80	peak			
2		96.2833	28.84	5.92	34.76	43.50	-8.74	peak			
3		432.5500	16.70	21.47	38.17	46.00	-7.83	peak			
4	!	576.4333	16.17	24.54	40.71	46.00	-5.29	peak			
5		692.8333	11.08	26.34	37.42	46.00	-8.58	peak			
6	*	768.8167	13.93	27.36	41.29	46.00	-4.71	peak			

### RADIATED EMISSION ABOVE 1GHZ (1-10<sup>th</sup> Harmonics)



Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEICER Distance: 3m  
M/N: AD701-K  
Mode: channel 12 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1760.000	29.26	7.36	36.62	74.00	-37.38	peak			
2		1966.667	28.80	9.53	38.33	74.00	-35.67	peak			
3	*	2440.000	77.50	10.36	87.86	74.00	13.86	peak			
4		4886.667	36.28	7.90	44.18	74.00	-29.82	peak			



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHz(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEICER Distance: 3m  
M/N: AD701-K  
Mode: channel 12 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1780.000	33.59	7.57	41.16	74.00	-32.84	peak			
2	*	2440.000	82.05	10.36	92.41	74.00	18.41	peak			
3		4886.667	28.73	7.90	36.63	74.00	-37.37	peak			

**Note:** 5~25GHz at least have 20dB margin. no recording in the test report.  
Factor=Antenna Factor+ Cable loss-Amplifier gain, Margin=Measurement-Limit.

## 9 BAND EDGES EMISSION

### 9.1 MEASUREMENT PROCEDURE

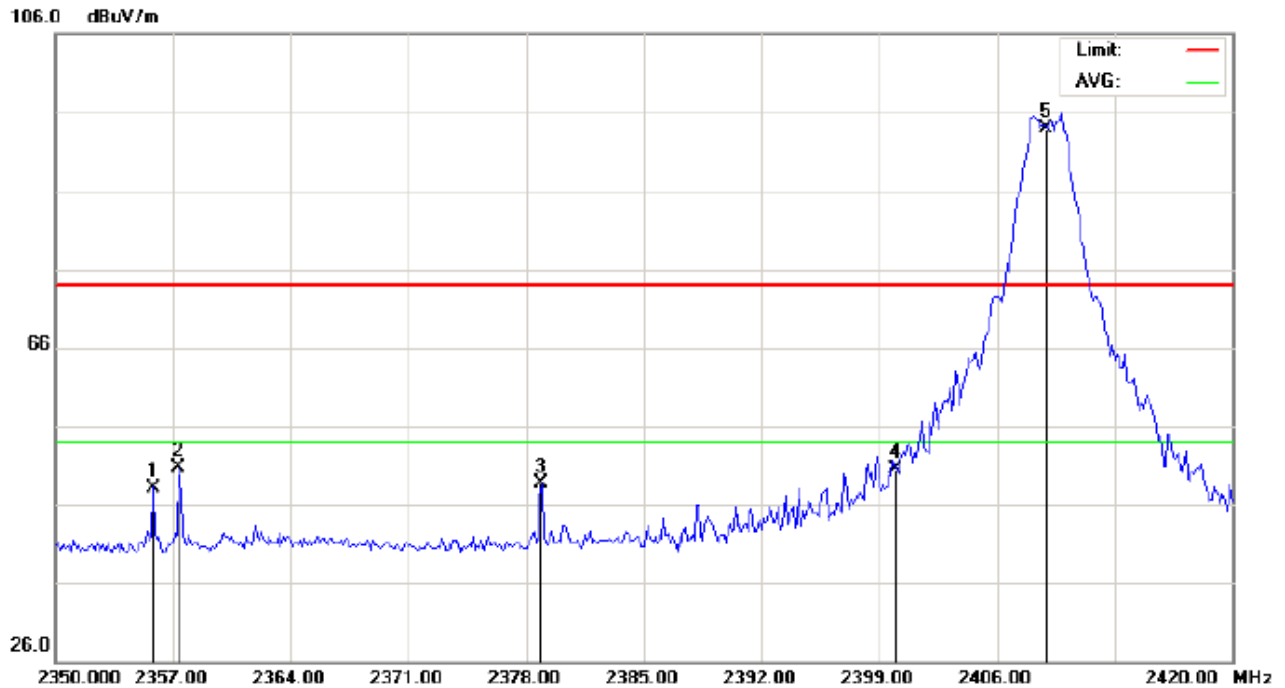
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW $\geq$ 1%span, VBW $\geq$ RBW
3. The band edges was measured and recorded.

### 9.2 TEST SET-UP

The Same as described in section 8.2

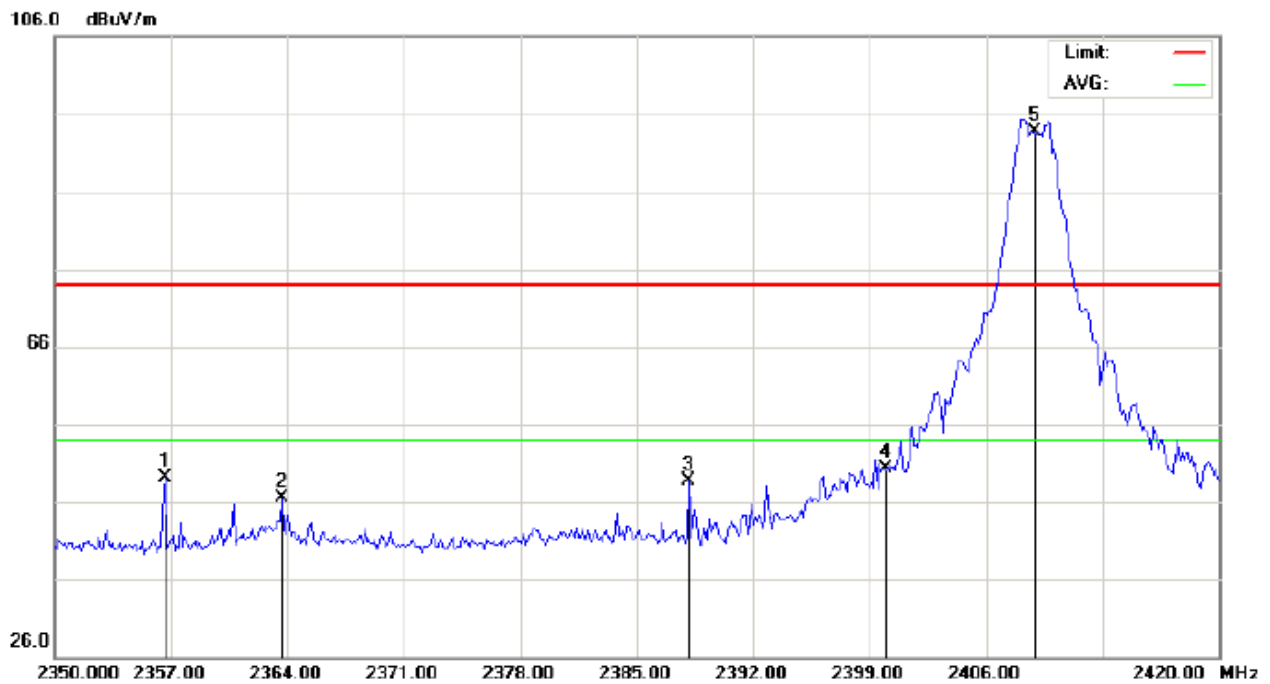
### 9.3 TEST RESULT

TEST PLOT OF BAND EDGE FOR LOW CHANNEL



Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEIVER Distance: 3m  
M/N: AD701-K  
Mode: channel 0 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2355.833	37.93	10.27	48.20	74.00	-25.80	peak			
2		2357.350	40.48	10.27	50.75	74.00	-23.25	peak			
3		2378.933	38.33	10.30	48.63	74.00	-25.37	peak			
4		2400.000	40.21	10.32	50.53	74.00	-23.47	peak			
5	*	2408.950	83.59	10.33	93.92	74.00	19.92	peak			

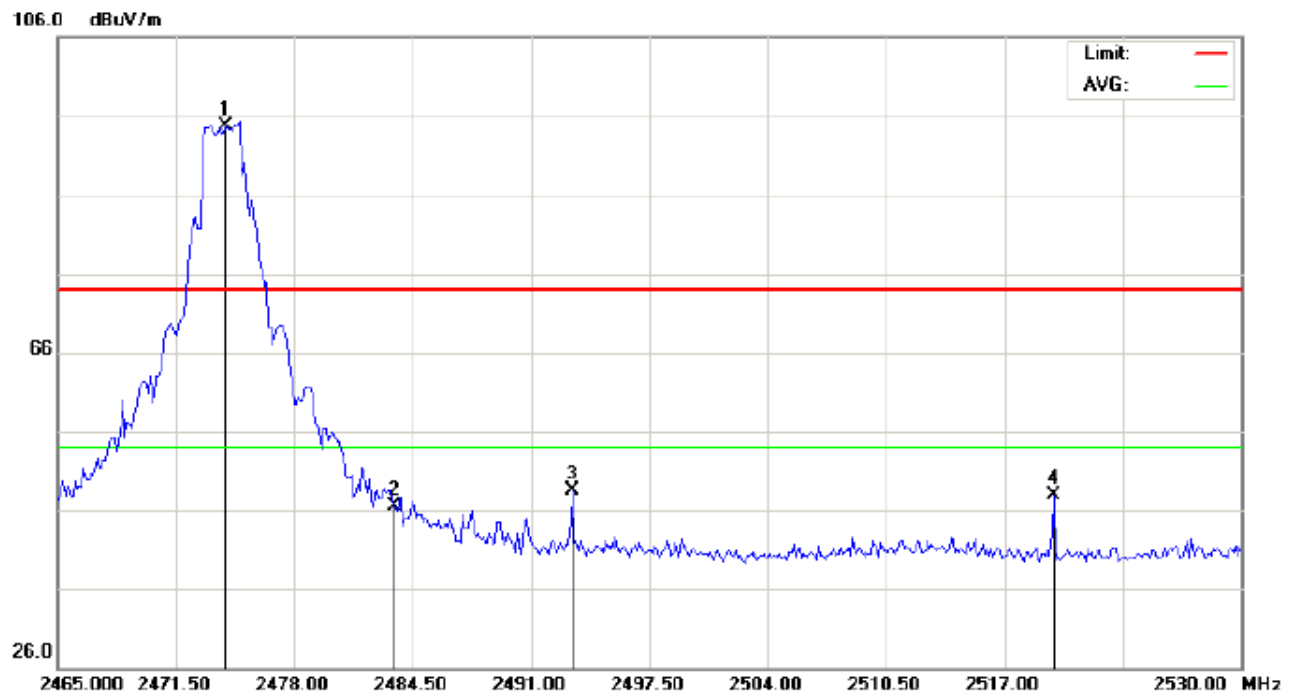


Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEIVER Distance: 3m  
M/N: AD701-K  
Mode: channel 0 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2356.650	38.78	10.27	49.05	74.00	-24.95	peak			
2		2363.650	36.28	10.28	46.56	74.00	-27.44	peak			
3		2388.150	38.40	10.31	48.71	74.00	-25.29	peak			
4		2400.000	39.95	10.32	50.27	74.00	-23.73	peak			
5	*	2408.950	83.37	10.33	93.70	74.00	19.70	peak			

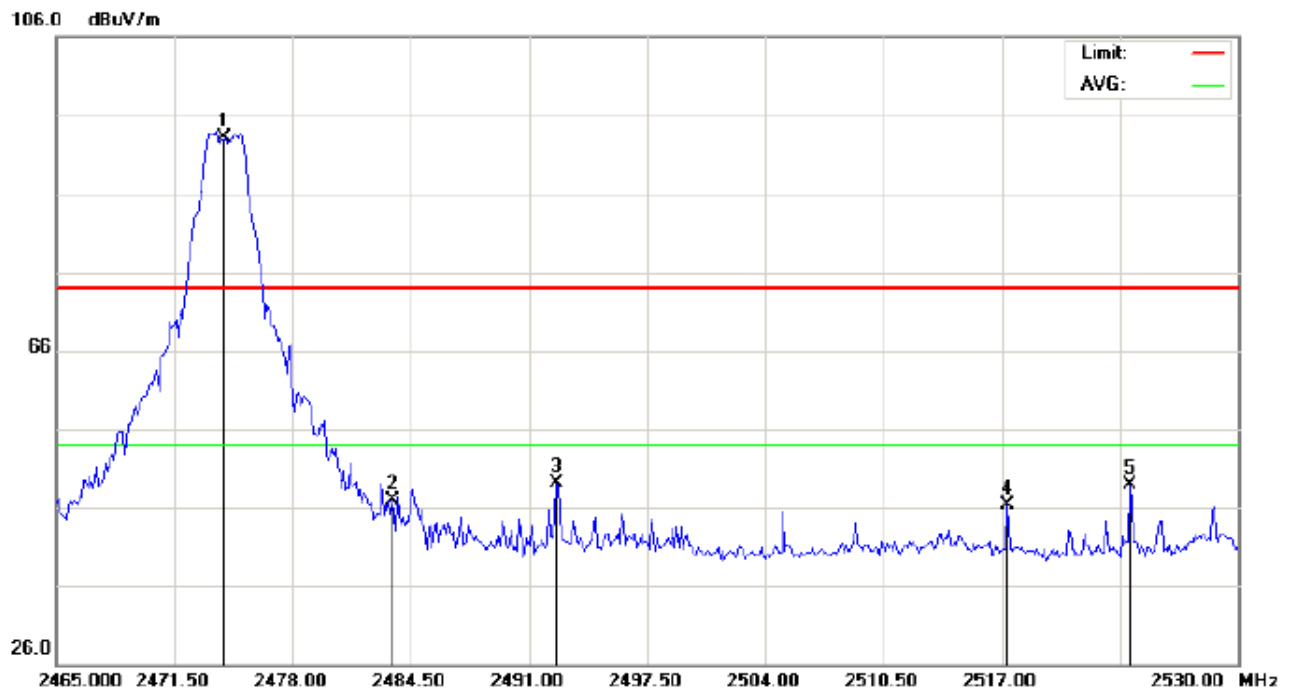


# TEST PLOT OF BAND EDGE FOR HIGH CHANNEL



Site: site #1 Polarization: *Horizontal* Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEIVER Distance: 3m  
M/N: AD701-K  
Mode: channel 23 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2474.225	84.28	10.40	94.68	74.00	20.68	peak			
2		2483.500	36.05	10.41	46.46	74.00	-27.54	peak			
3		2493.275	38.10	10.42	48.52	74.00	-25.48	peak			
4		2519.708	37.41	10.48	47.89	74.00	-26.11	peak			



Site: site #1 Polarization: **Vertical** Temperature: 26  
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %  
EUT: AD701-KRECEIVER Distance: 3m  
M/N: AD701-K  
Mode: channel 23 TX  
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2474.225	82.66	10.40	93.06	74.00	19.06	peak			
2		2483.500	36.44	10.41	46.85	74.00	-27.15	peak			
3		2492.517	38.76	10.42	49.18	74.00	-24.82	peak			
4		2517.325	35.86	10.47	46.33	74.00	-27.67	peak			
5		2524.042	38.39	10.49	48.88	74.00	-25.12	peak			

## 10. NUMBER OF HOPPING FREQUENCY

### 10.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer Start = 2.4GHz Stop = 2.4835GHz.
4. Set the Spectrum Analyzer as RBW $\geq$ 1%span, VBW $\geq$ RBW.

### 10.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2  
Conducted Method.

### 10.3 MEASUREMENT EQUIPMENT USED

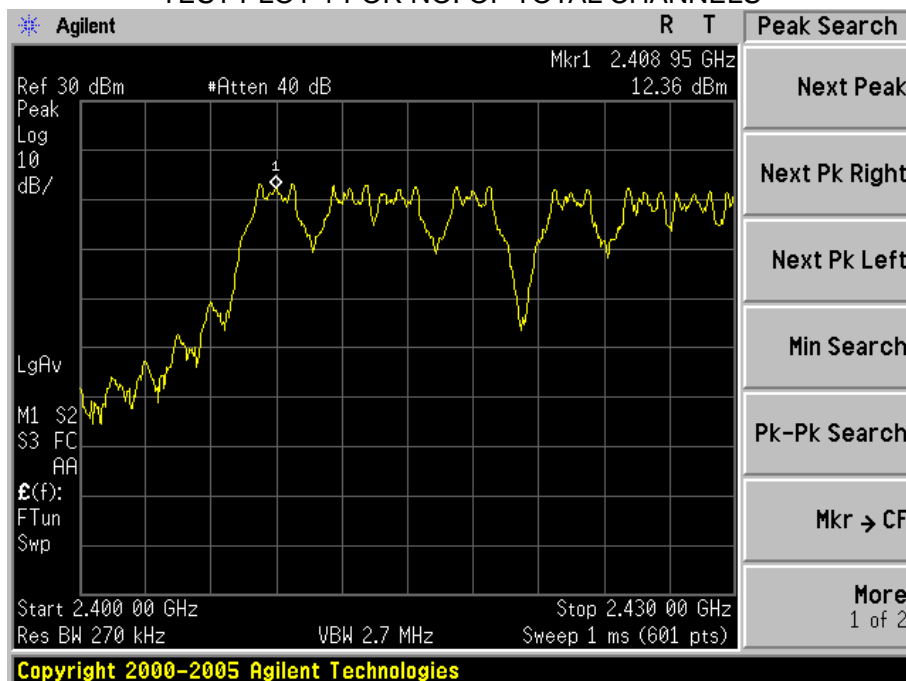
The Same as described in section 5.3

### 10.4 AND MEASUREMENT RESULT

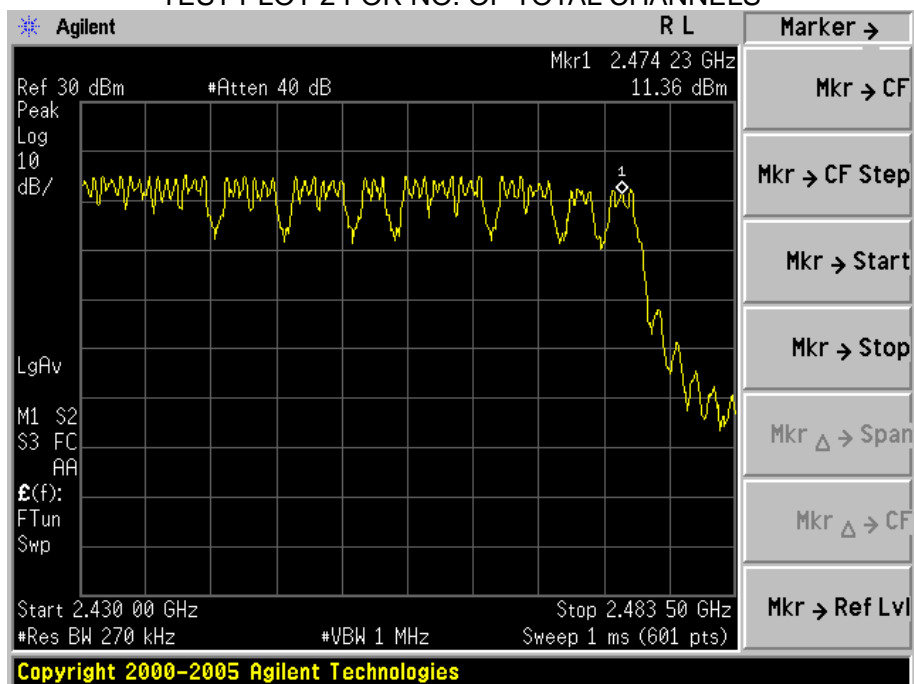
TOTAL NO. OF HOPPING CHANNEL	LIMIT (NO. OF CH)	MEASUREMENT (NO. OF CH)	RESULT
	$\geq 15$	24	PASS

Channel	Frequency (GHz)	Channel	Frequency (GHz)
00	2.40895	14	2.44834
01	2.41234	15	2.45060
02	2.41459	16	2.45397
03	2.41797	17	2.45735
04	2.42247	18	2.45960
05	2.42584	19	2.46185
06	2.42809	20	2.46522
07	2.43034	21	2.46747
08	2.43259	22	2.47085
09	2.43484	23	2.47423
10	2.43709		
11	2.43934		
12	2.44272		
13	2.44497		

TEST PLOT-1 FOR NO. OF TOTAL CHANNELS



TEST PLOT-2 FOR NO. OF TOTAL CHANNELS



## 11. TIME OF OCCUPANCY (DWELL TIME)

### 11.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer
3. Set Span = zero span, centered on a hopping channel
4. Set the spectrum analyzer as RBW=1MHz, VBW>=RBW, Span = 0 Hz,.

### 11.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2  
Conducted Method

### 11.3 MEASUREMENT EQUIPMENT USED

The same as described in section 5.3

### 11.4 LIMITS AND MEASUREMENT RESULT

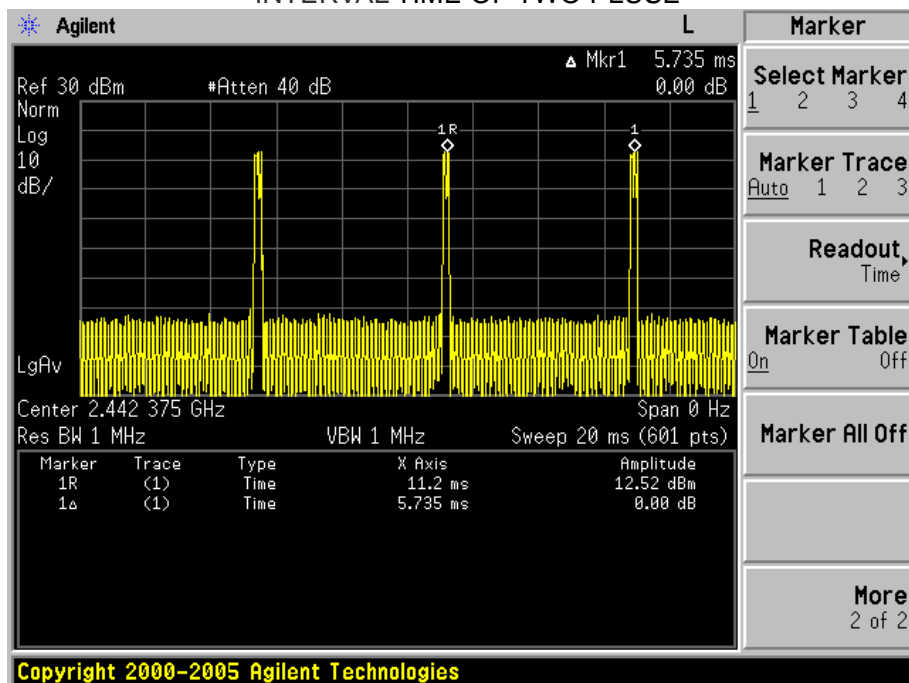
Test Result(worst case)			
Time of Pulse (ms)	Interval Time Of Two Pluses (ms)	Dwell Time (ms)	Limit (ms)
0.2184	5.735	365.59	400

Interval Time of Two Pluse= 5.735ms

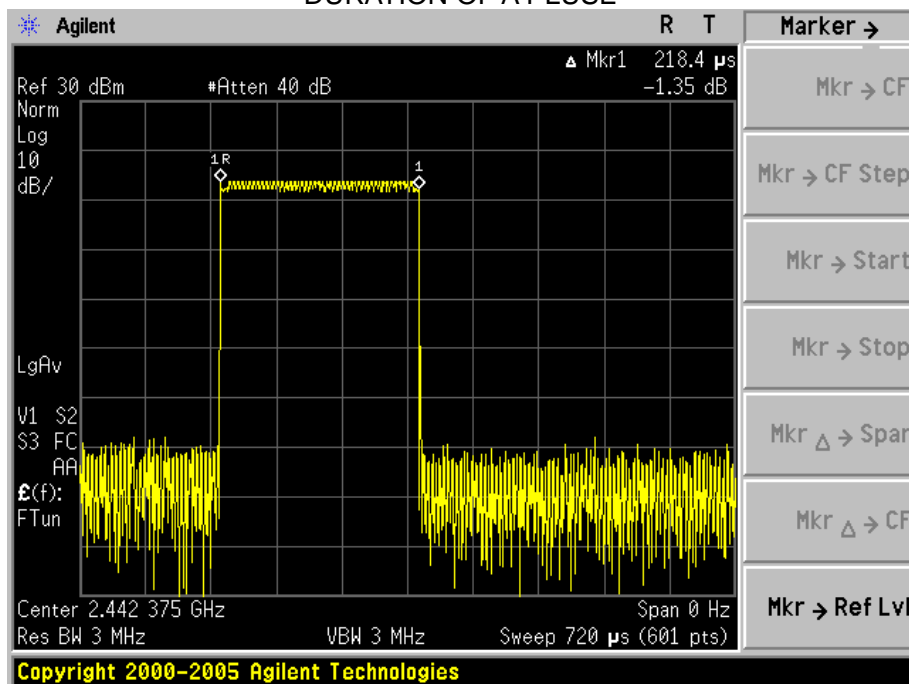
Duration of A Pluse = 0.2184ms

Dwell time =  $24 \times 0.4(s) \times 0.2184ms / 5.735ms = 0.36559s = 365.59ms$

### INTERVAL TIME OF TWO PULSE



### DURATION OF A PULSE



## 12. FREQUENCY SEPARATION

### 12.1 MEASUREMENT PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer.
3. Set Span = wide enough to capture the peaks of two adjacent channels Resolution (or IF) Bandwidth (RBW)  $\geq 1\%$  of the span Video (or Average) Bandwidth (VBW)  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.

### 12.2 TEST SETUP (BLOCK DIAGRAM OF CONFIGURATION)

Same as described in section 5.2

### 12.3 MEASUREMENT EQUIPMENT USED

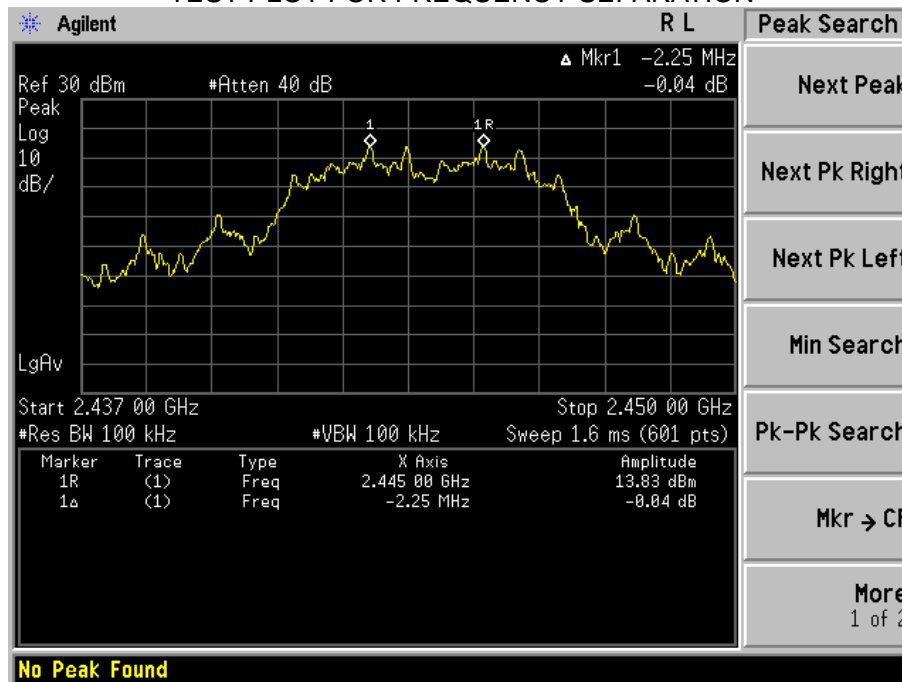
The same as described in section 5.3

### 12.4 LIMITS AND MEASUREMENT RESULT

TEST RESULT (WORST CASE)

CHANNEL	CHANNEL SEPARATION	LIMIT	RESULT
	MHz	KHz	
CH13-CH14	2.25	$\geq 25$ KHz or 2/3 20 dB BW	Pass

TEST PLOT FOR FREQUENCY SEPARATION



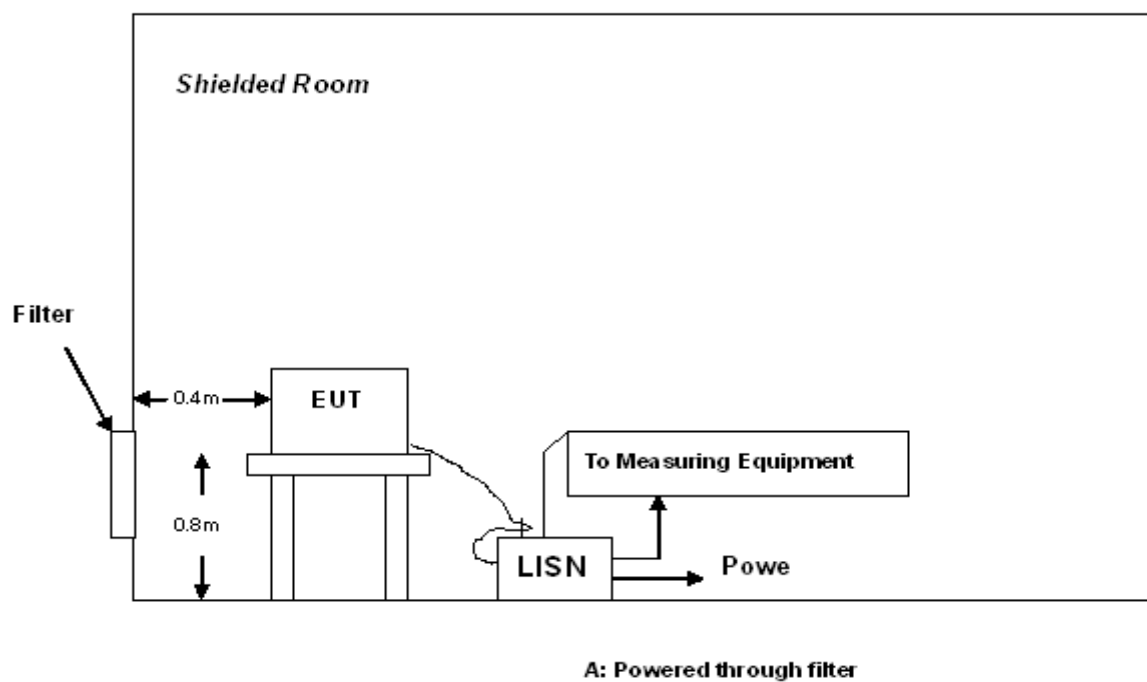
### 13 FCC LINE CONDUCTED EMISSION TEST

#### 13.1 LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.( dBuV)	Average( dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

\*\*Note: 1. The lower limit shall apply at the transition frequency.  
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz

#### 13.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST





### **13.3 PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST**

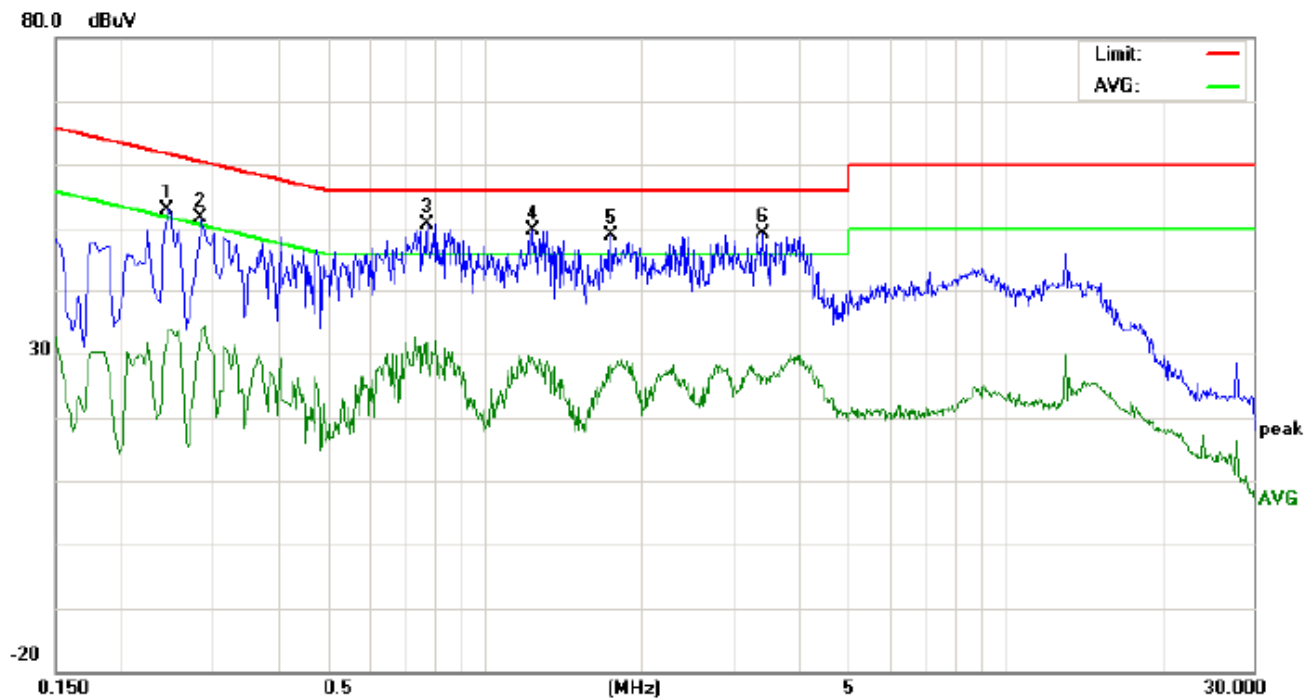
- 1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2) Support equipment, if needed, was placed as per ANSI C63.4.
- 3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- All support equipments received AC120V/60Hz power from a LISN, if any.
- 4) The EUT received DC 5V by adapter which received 120V/50Hz power from a LISN..
- 5) The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 7) During the above scans, the emissions were maximized by cable manipulation.
- 8) The test mode(s) were scanned during the preliminary test.  
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

### **13.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST**

- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3) The test data of the worst case condition(s) was reported on the Summary Data page.

### 13.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST

Line Conducted Emission Test Line 1-L



Site: Conduction

Phase: **L1**

Temperature: 26

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 60 %

EUT: AD701-KRECEIVER

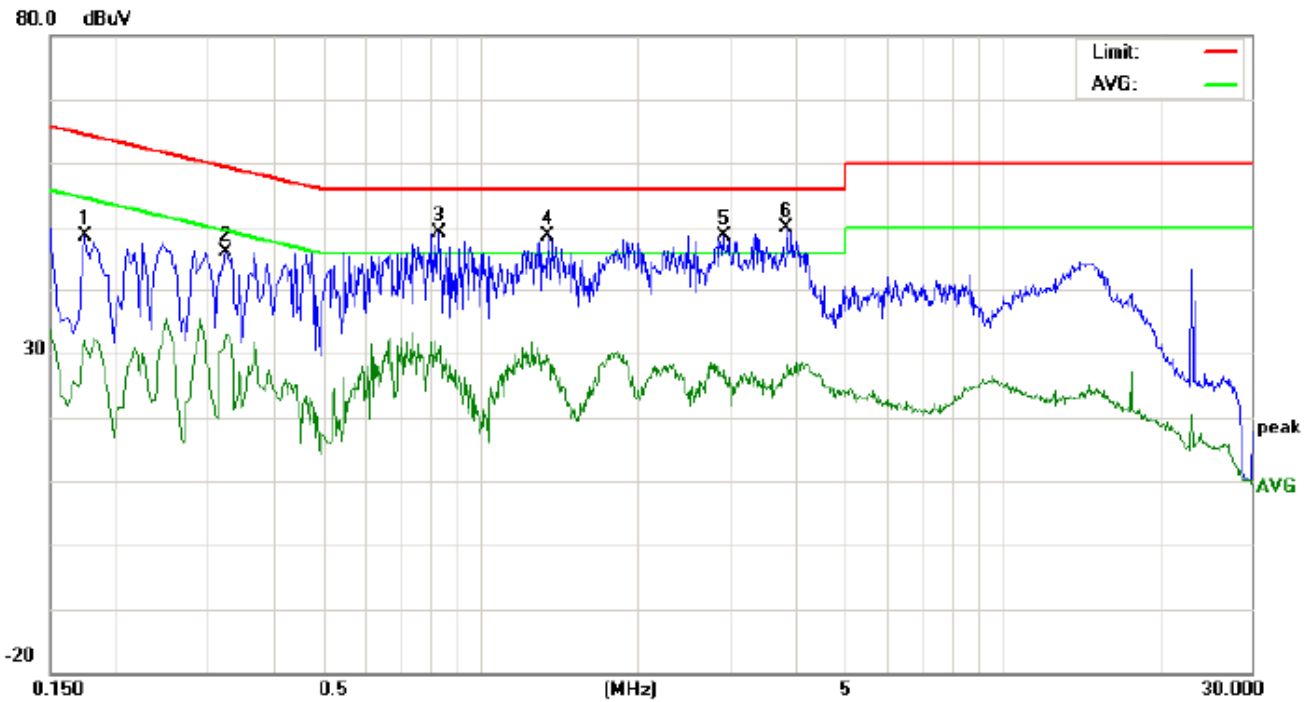
M/N: AD701-K

Mode: Normal Hopping

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2460	42.67		23.34	10.27	52.94		33.61	61.89	51.89	-8.95	-18.28	P	
2	0.2860	41.27		23.56	10.28	51.55		33.84	60.64	50.64	-9.09	-16.80	P	
3	0.7780	40.37		21.41	10.30	50.67		31.71	56.00	46.00	-5.33	-14.29	P	
4	1.2420	39.30		19.04	10.37	49.67		29.41	56.00	46.00	-6.33	-16.59	P	
5	1.7460	38.68		18.07	10.30	48.98		28.37	56.00	46.00	-7.02	-17.63	P	
6	3.4260	38.58		15.26	10.52	49.10		25.78	56.00	46.00	-6.90	-20.22	P	

Line Conducted Emission Test Line 2-N



Site: Conduction Phase: **N** Temperature: 26  
Limit: FCC Class B Conduction(QP) Power: Humidity: 60 %  
EUT: AD701-KRECEIVER  
M/N: AD701-K  
Mode: Normal Hopping  
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1740	38.38		21.91	10.19	48.57		32.10	64.76	54.76	-16.19	-22.66	P	
2	0.3260	39.50		23.32	10.30	49.80		33.62	59.55	49.55	-9.75	-15.93	P	
3	0.8340	38.68		20.19	10.32	49.00		30.51	56.00	46.00	-7.00	-15.49	P	
4	1.3460	38.29		18.70	10.38	48.67		29.08	56.00	46.00	-7.33	-16.92	P	
5	2.9219	37.99		15.69	10.53	48.52		26.22	56.00	46.00	-7.48	-19.78	P	
6	3.8780	39.34		17.44	10.45	49.79		27.89	56.00	46.00	-6.21	-18.11	P	

**APPENDIX I**  
**PHOTOGRAPHS OF THE EUT**  
TOP VIEW OF SAMPLE



**BOTTOM VIEW OF SAMPLE**



LEFT VIEW OF SAMPLE



RIGHT VIEW OF SAMPLE



FRONT VIEW OF SAMPLE



BACK VIEW OF SAMPLE

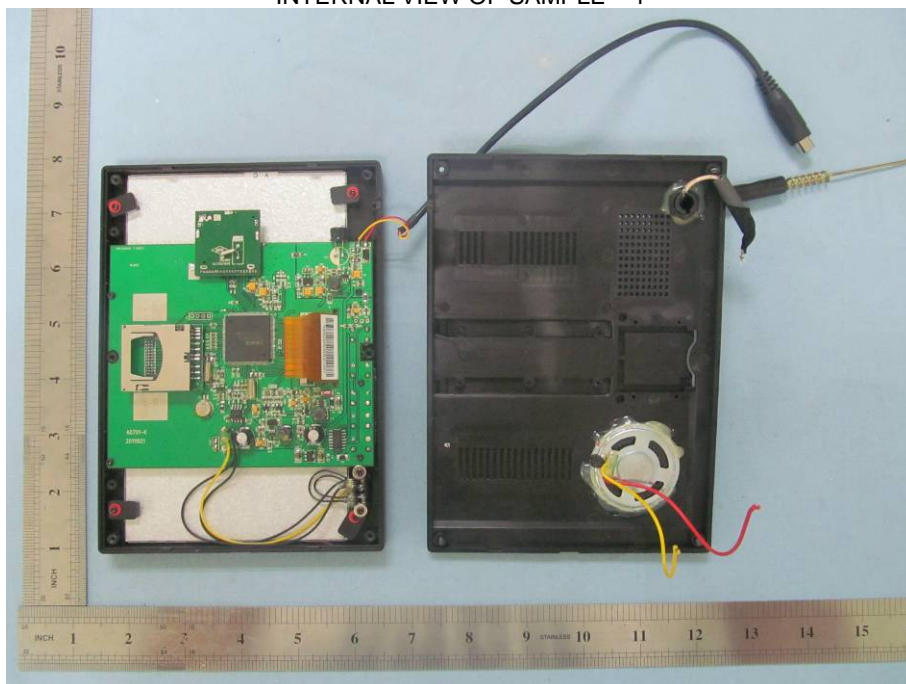




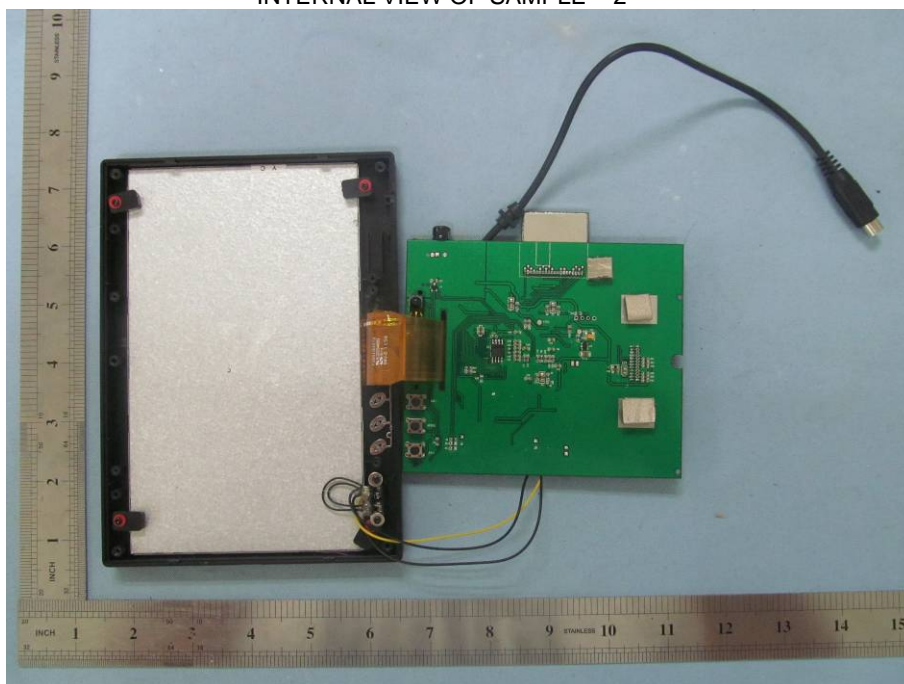
ALL VIEW OF SAMPLE



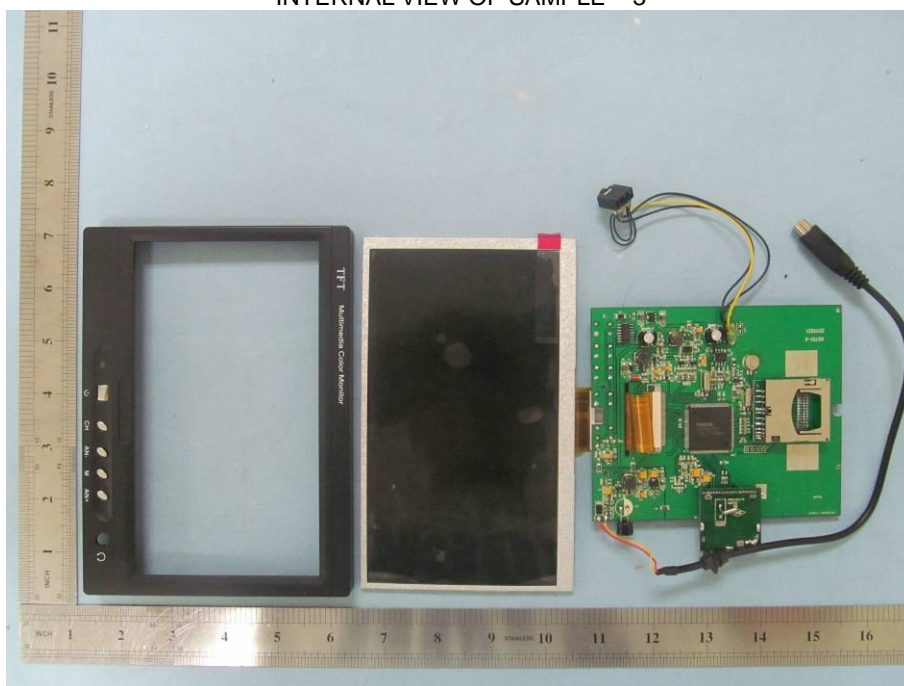
INTERNAL VIEW OF SAMPLE – 1



INTERNAL VIEW OF SAMPLE – 2

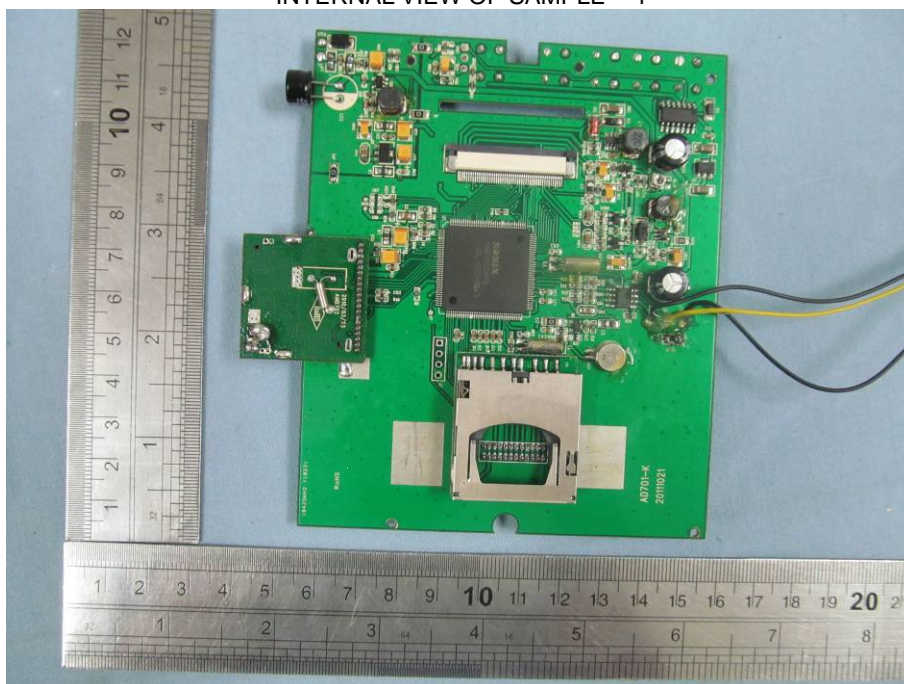


INTERNAL VIEW OF SAMPLE – 3

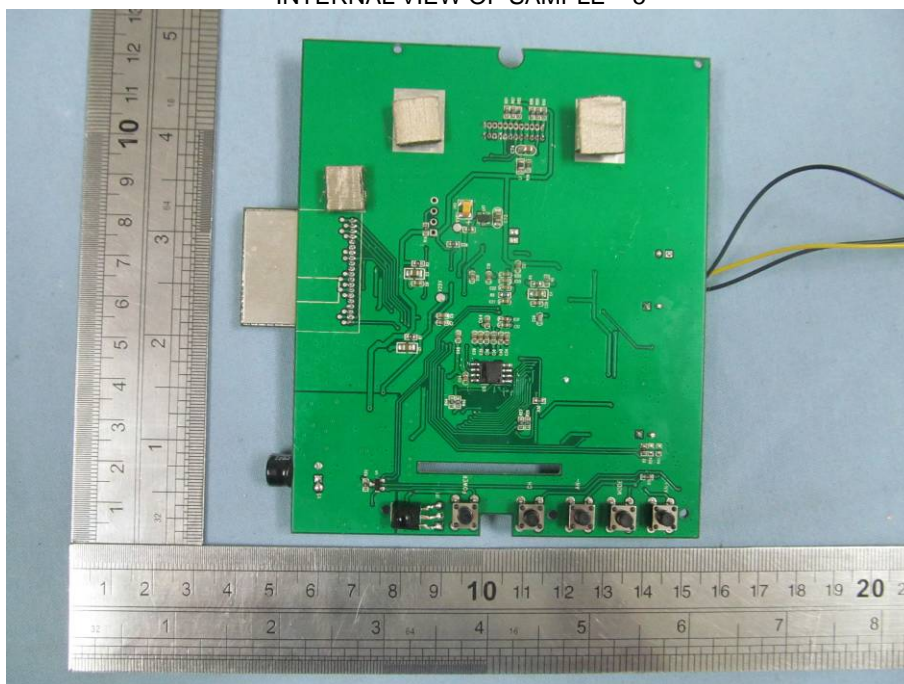




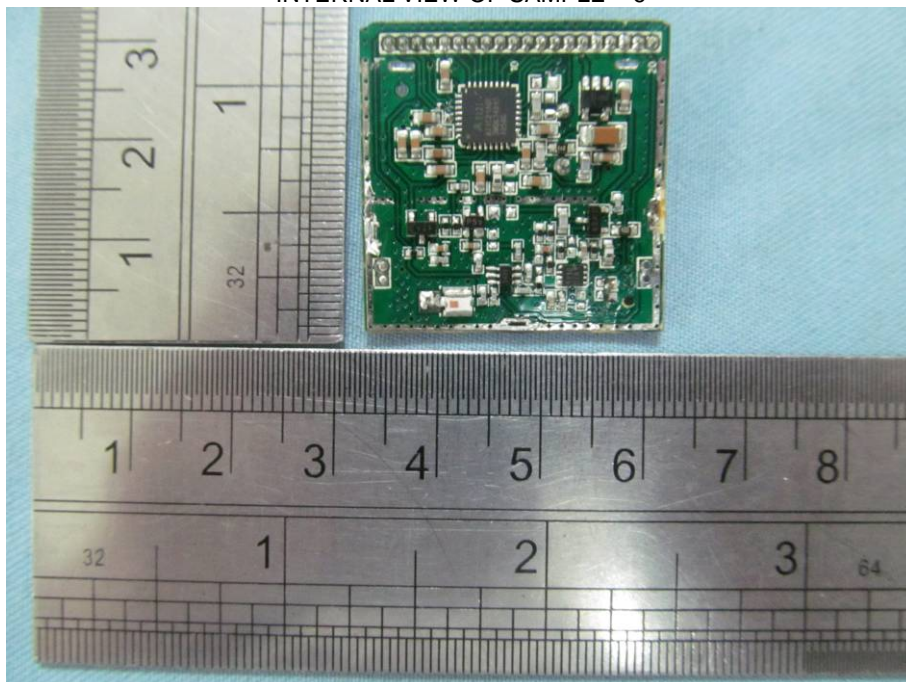
INTERNAL VIEW OF SAMPLE – 4



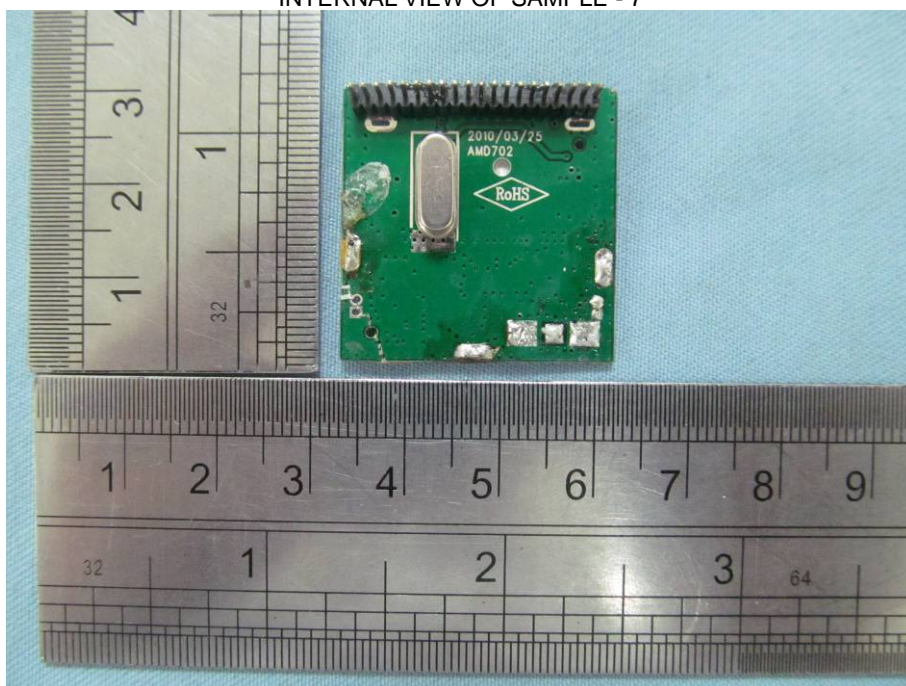
INTERNAL VIEW OF SAMPLE – 5



INTERNAL VIEW OF SAMPLE – 6



INTERNAL VIEW OF SAMPLE - 7

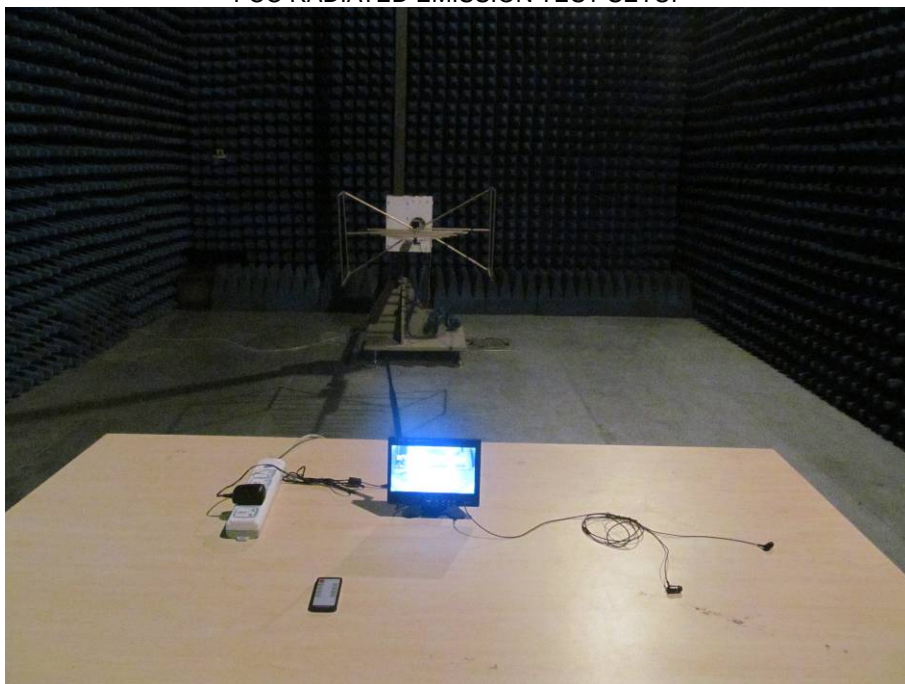




**APPENDIX II**  
**PHOTOGRAPHS OF THE TEST SETUP**  
**FCC LINE CONDUCTED EMISSION TEST SETUP**



**FCC RADIATED EMISSION TEST SETUP**



**----END OF REPORT----**