
FCC Test Report

Report No.: AGC08I110501F2

FCC ID : ZNOHD988
PRODUCT DESIGNATION : MID
BRAND NAME : N/A
TEST MODEL : HD988
CLIENT : DONGGUAN CHANGMING ELECTRONIC CO., LTD
DATE OF ISSUE : June 15, 2011
STANDARD(S) : FCC Part 15 Rules

Attestation of Global Compliance Co., Ltd.

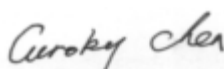
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VERIFICATION OF COMPLIANCE

Applicant	DONGGUAN CHANGMING ELECTRONIC CO., LTD
	Shigang Rd,Guxia Industrial Zone,Shipai Town
Manufacturer	DONGGUAN CHANGMING ELECTRONIC CO., LTD
	Shigang Rd,Guxia Industrial Zone,Shipai Town
Product Designation	MID
Brand Name	N/A
Model Name	HD988
FCC ID	ZNOHD988
Report Number	AGC08I110501F2
Date of Test	June 13 to June 15, 2011

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 C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with radiated emission limits of FCC Rules Part 15.247.

Checked By: 
Curoky Chen June 15, 2011


Authorized By 
Forrest Lei June 15, 2011

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1. GENERAL INFORMATION

1.1 PRODUCT DESCRIPTION

The EUT is a MID designed as an “Wifi Device”. It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.412 GHz to 2.462GHz
Max. Output Power	11b/g/n(20):12.11dBm ,11n(40):11.85dBm
Modulation	DBPSK,DQPSK,CCK,16-QAM,64-QAM
Data Rate	DSSS(1/2/5.5/11),OFDM(6/9/12/18/24/36/48/54) See section 1.3 for 802.11n
Number of channels	11
Antenna Designation	PCB Antenna
Antenna Gain	Antenna (max): 0.9dBi
Power Supply	DC 7V by battery (or charged by adapter)

1.2 TABLE OF CARRIER FREQUENCIES

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	1	2412MHZ
	2	2417MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11
For 40MHZ bandwidth system use Channel 3 to Channel 9

1.3 IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps)	
									800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	486	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	guard interval

1.4 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: ZNOHD988** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

1.5 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.

1.6 TEST FACILITY

All measurement facilities used to collect the measurement data are located at
Attestation of Global Compliance Co., Ltd.
1F., 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

1.7 SPECIAL ACCESSORIES

Refer to section 2.2.

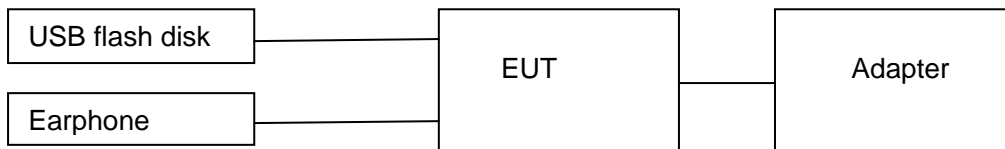
1.8 EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

2. SYSTEM TEST CONFIGURATION

2.1 CONFIGURATION OF EUT SYSTEM

Configure:



2.2 EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Mfr/Brand	Model/Type No.	Remark
1	MID	N/A	HD988	EUT
2	Adapter	N/A	AHZ090150-A03	accessory
3	battery	--	--	accessory
4	Earphone	--	--	A.E
5	USB Flash disk	--	--	A.E

Note: the following "EUT" in setup diagram means EUT system.

3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	6dB Bandwidth	Compliant
§15.247	Power Spectral Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Conduction Emission	Compliant

4. DESCRIPTION OF TEST MODES

TEST MODES
Transmit by 802.11b with Data rate(1/2/5.5/11)
Transmit by 802.11g with Data rate (6/9/12/18/24/36/48/54)
Transmit by 802.11n (20MHz) with Data rate(6.5/13/19.5/26/39/52/58.5/65)
Transmit by 802.11n (40MHz) with Data rate (13.5/27/40.5/54/81/108/121.5/135)

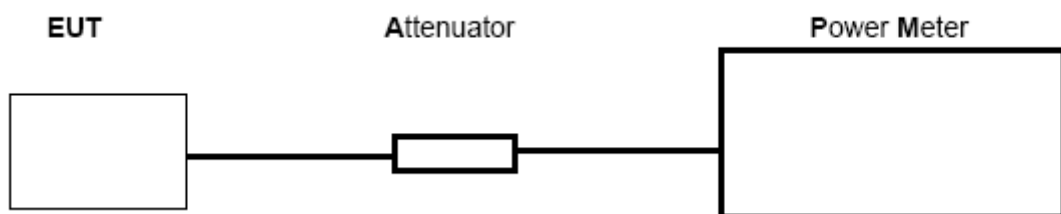
- Note: 1 The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually.
- 2 All modes under which configure applicable have been tested and the worst mode test data recording in the test report.

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 power meter through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set the RBW greater than 6DB bandwidth of emission.
5. Record the maximum power from the power meter.

5.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



5.3 MEASUREMENT EQUIPMENT USED

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Power meter	Agilent	N1911A	N/A	06/29/2010	06/28/2011
Power sensor	Agilent	N192XA	N/A	06/29/2010	06/28/2011
RF attenuator	N/A	RFA20db	N/A	N/A	N/A

5.4 LIMITS AND MEASUREMENT RESULT

TEST ITEM	PEAK POWER
TEST MODE	802.11b with data rate 11

LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	12.10	30	Pass
2.437	12.03	30	Pass
2.462	11.98	30	Pass

TEST ITEM	PEAK POWER
TEST MODE	802.11n 40 with data rate 135

LIMITS AND MEASUREMENT RESULT			
Frequency (GHz)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.422	11.68	30	Pass
2.437	11.82	30	Pass
2.452	11.85	30	Pass

6 6 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.
3. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW= 100 KHz.
4. Set SPA Trace 1 Max hold, then View.

6.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The Same as described in Section 7.2

6.3 MEASUREMENT EQUIPMENT USED

The same as described in Section 7.3

6.4 LIMITS AND MEASUREMENT RESULTS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11b with data rate 11

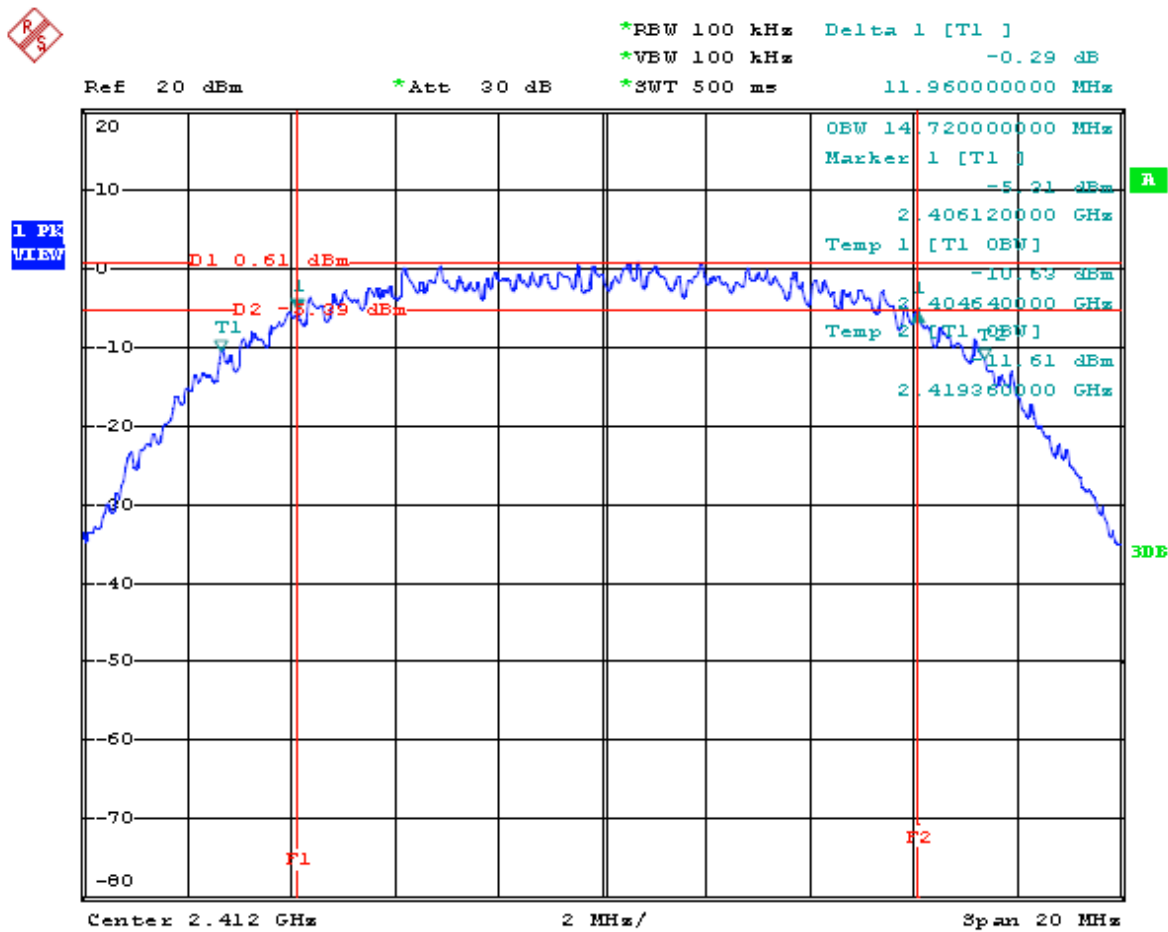
LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
>500KHZ	Low Channel	11.96	PASS
	Middle Channel	10.76	PASS
	High Channel	10.57	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 40 with data rate 135

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (MHz)		Criteria
>500KHZ	Low Channel	35.78	PASS
	Middle Channel	36.32	PASS
	High Channel	36.01	PASS

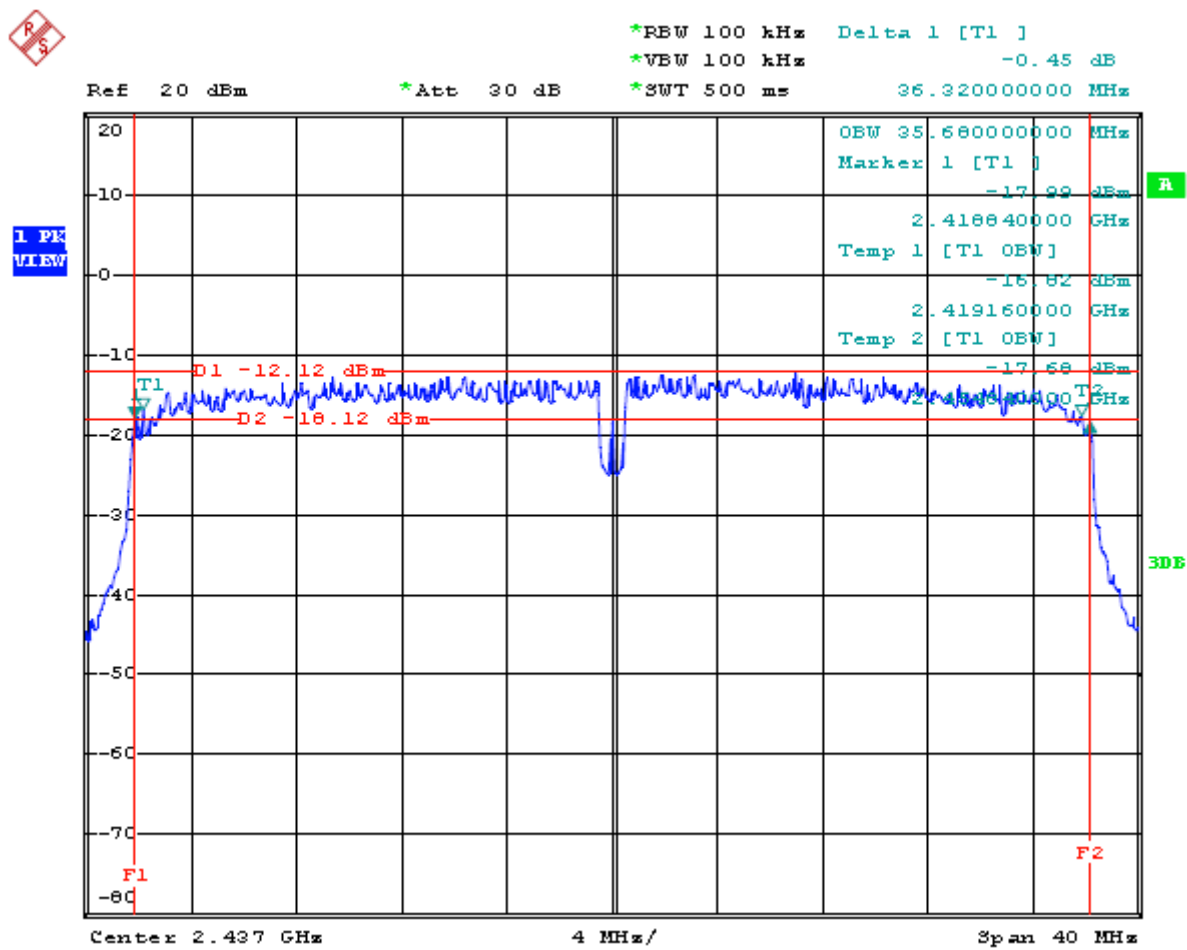
802.11b TEST RESULT

TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



802.11n 40 TEST RESULT

TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

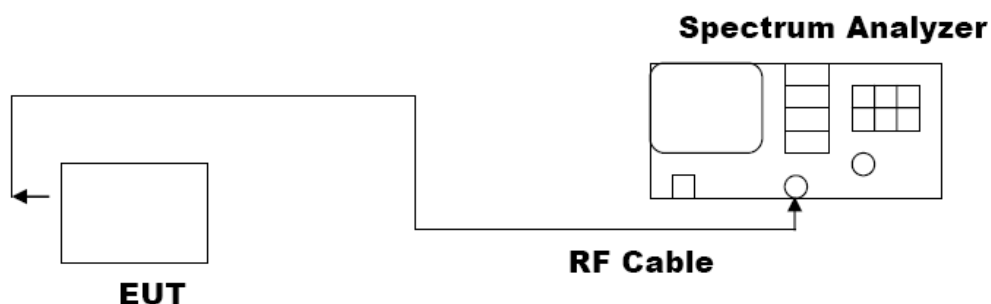


7. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

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 SPA Centre Frequency = Operation Frequency, RBW= 3 KHz, VBW= 3 KHz., Sweep time= 100s
- (5). Set SPA Trace 1 Max hold, then View.

7.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



7.3 MEASUREMENT EQUIPMENT USED

SHIELDING ROOM					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2010	06/28/2011
TEST RECEIVER	R&S	ESCI	N/A	06/29/2010	06/28/2011

7.4 LIMITS AND MEASUREMENT RESULT

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11b with data rate 11

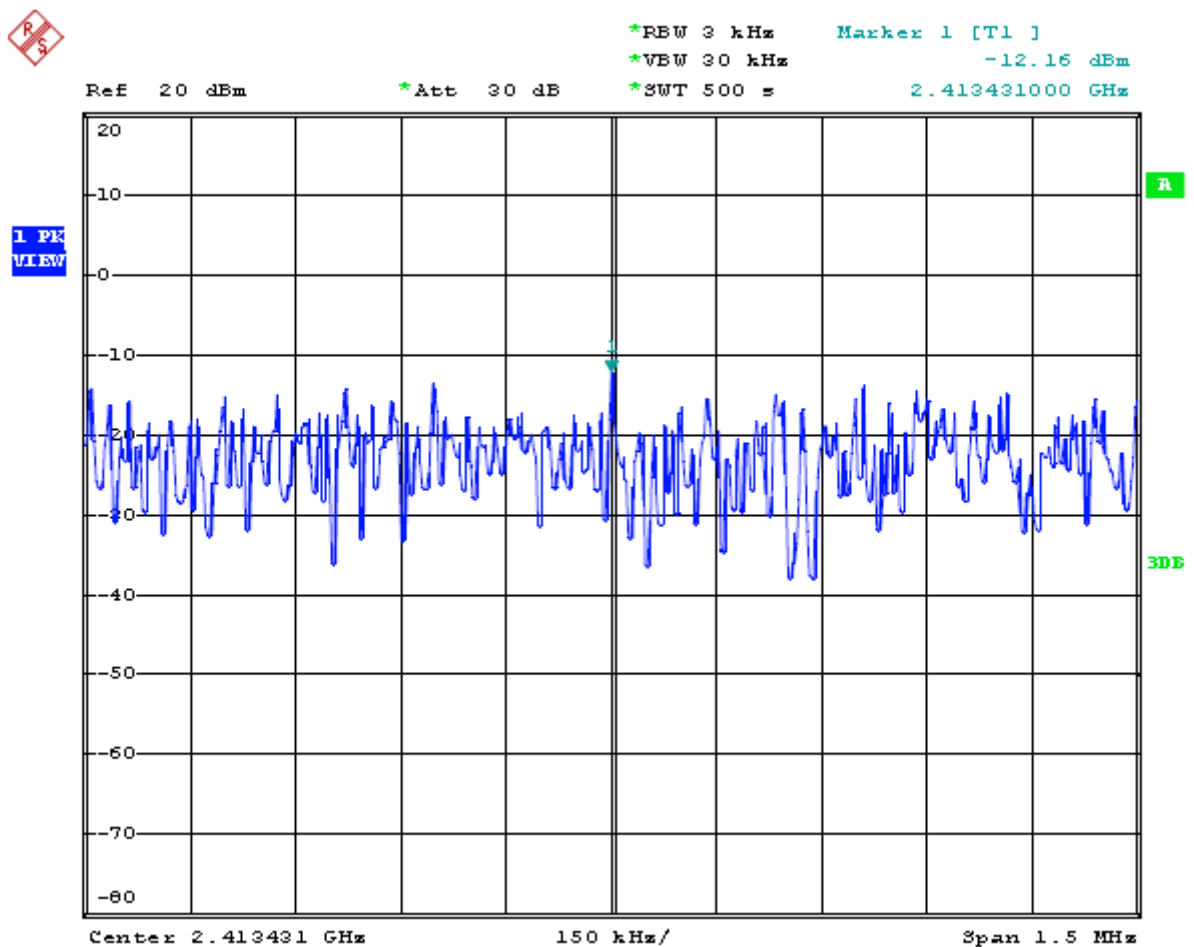
LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (dBm/3KHz)		Criteria
8 dBm / 3KHz	Low Channel	-12.16	Pass
	Middle Channel	-14.78	Pass
	High Channel	-13.77	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 40 with data rate 135

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	Measurement Result		
	Test Data (dBm/3KHz)		Criteria
8 dBm / 3KHz	Low channel	-23.16	Pass
	Middle Channel	-22.39	Pass
	High channel	-24.01	Pass

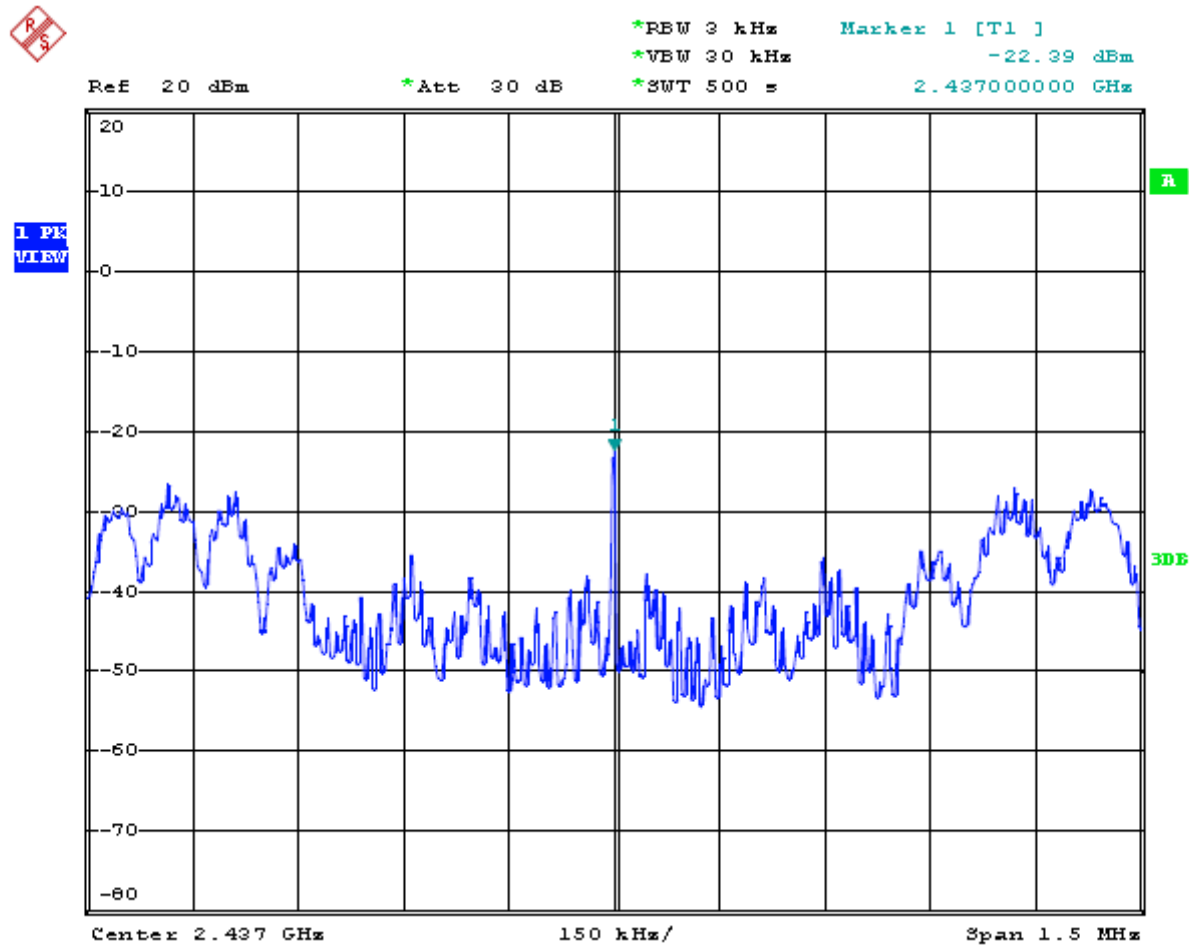
802.11b TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



802.11n 40 TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



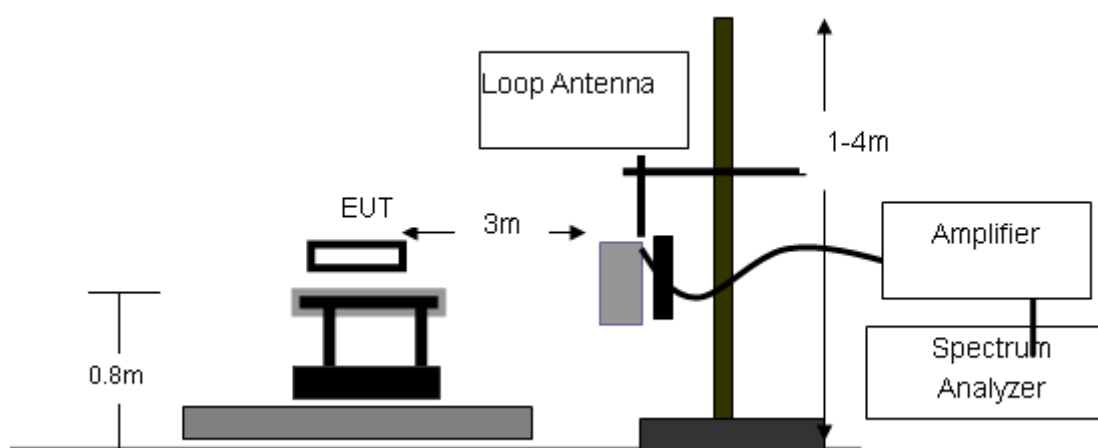
8. RADIATED EMISSION MEASUREMENT

8.1 MEASUREMENT PROCEDURE

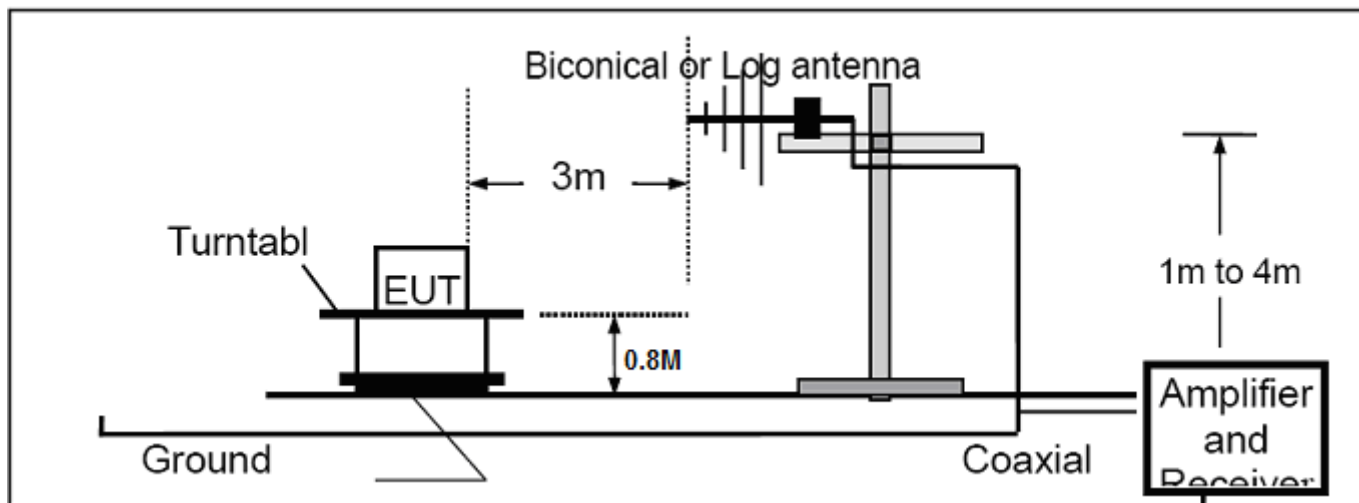
- 1 Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 Meter above ground. The phase center of the receiving antenna mounted on the top of a height-Variable antenna tower was placed 3 meters far away from the turntable.
- 2 Power on the EUT and all the supporting 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 1M to 4M)and then the turntable was Rotated(from 0 degree to 360degrees) 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 emission 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 seconds 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 3dB 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.

8.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

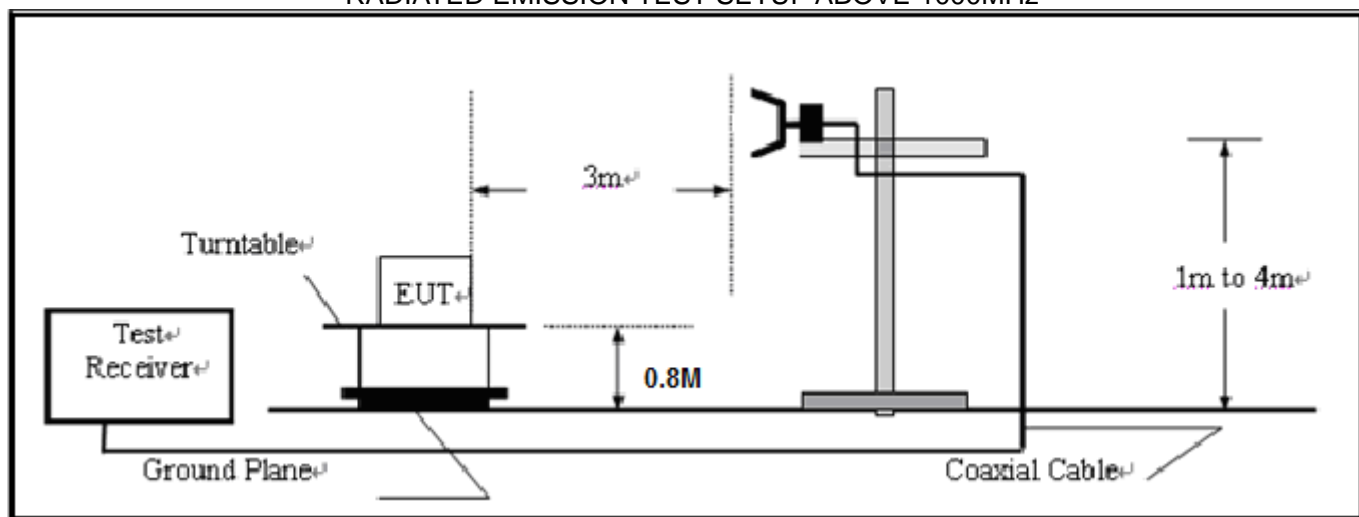
RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



8.3 MEASUREMENT EQUIPMENT USED

Description	Manufacturer	Model	SERIAL NUMBER	Cal. Date	Cal. Due
Spectrum Analyzer	Agilent	E4440A	N/A	06/29/2010	06/28/2011
Amplifier	EM	EM30180	0607030	06/29/2010	06/28/2011
Horn Antenna	EM	EM-AH-10180	N/A	06/29/2010	06/28/2011
Horn Antenna	A.H. Systems Inc.	SAS-574	--	06/29/2010	06/28/2011
EMI Test Receiver	Rohde & Schwarz	ESCI	N/A	06/29/2010	06/28/2011
Amplifier	EM	EM30180	N/A	06/29/2010	06/28/2011
Biological Antenna	A.H. Systems Inc.	SAS-521-4	N/A	06/29/2010	06/28/2011
Loop Antenna	Daze	ZN30900N	SEL0097	06/29/2010	06/28/2011
Isolation Transformer	LETEAC	LTBK	--	06/29/2010	06/28/2011

8.4 LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/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: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

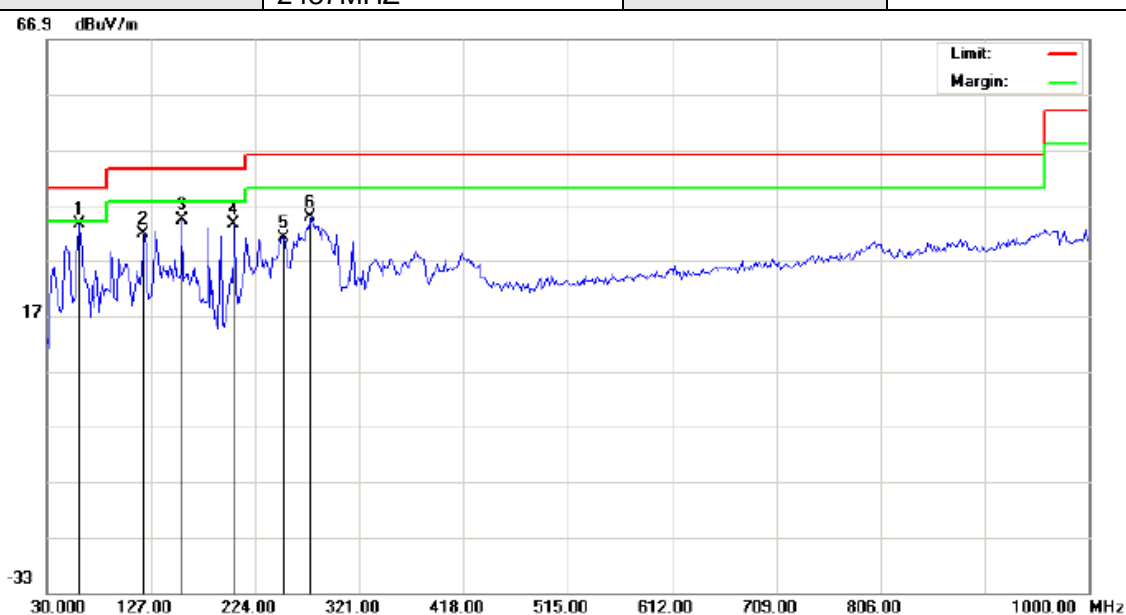
All modes were tested For restricted band radiated emission, the test records reported below are the worst result compared to other modes.

RADIATED EMISSION BELOW 30MHZ

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

RADIATED EMISSION BELOW 1GHZ

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With date rate 11 2437MHZ	Antenna	Vertical



Site: site #1	Polarization: Vertical	Temperature: 26
Limit: FCC Class B 3M Radiation	Power:	Humidity: 60 %
EUT: MID	Distance: 3m	
M/N: HD988		
Mode:		
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	*	60.7167	15.74	17.71	33.45	40.00	-6.55	peak			
2		120.5331	17.44	14.22	31.66	43.50	-11.84	peak			
3		156.0997	20.83	13.49	34.32	43.50	-9.18	peak			
4		204.5997	18.50	14.96	33.46	43.50	-10.04	peak			
5		249.8667	13.92	17.23	31.15	46.00	-14.85	peak			
6		275.7332	17.48	17.20	34.68	46.00	-11.32	peak			

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With date rate 11 2437MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: MID
M/N: HD988
Mode:
Note:

Polarization: **Horizontal**
Power:
Distance: 3m

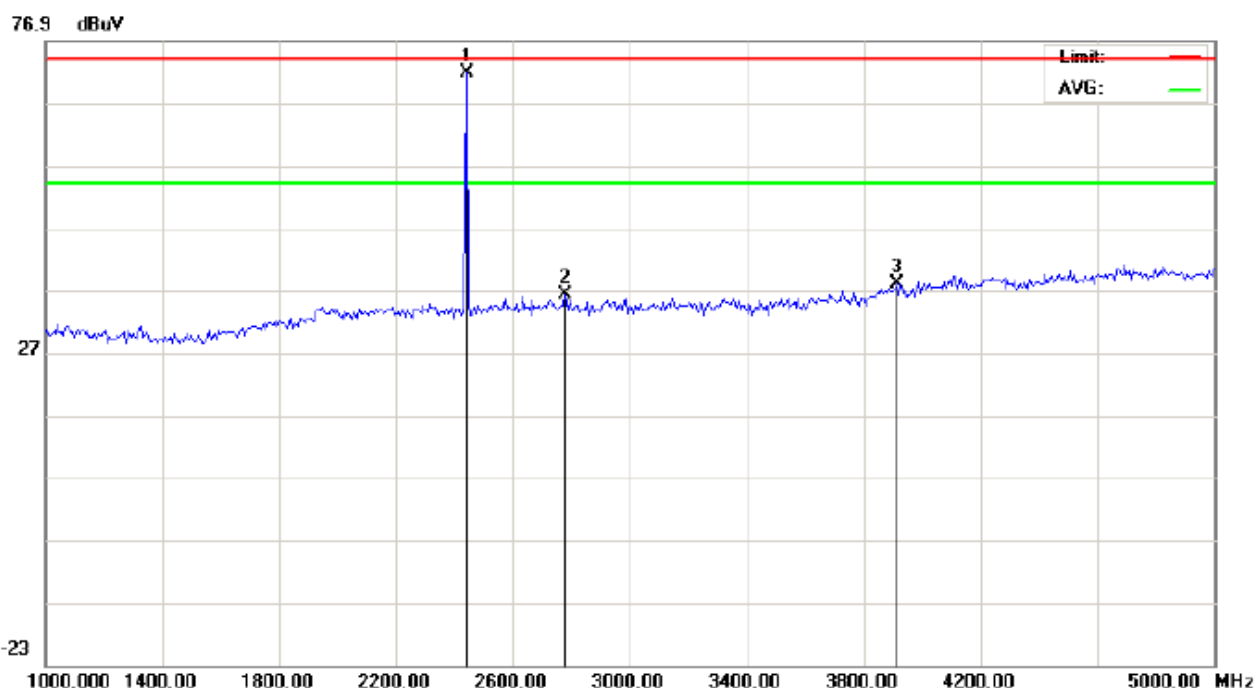
Temperature: 26
Humidity: 60 %

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	*	60.7167	16.12	18.95	35.07	40.00	-4.93	peak			
2		101.1333	18.15	15.77	33.92	43.50	-9.58	peak			
3		131.8497	21.91	14.04	35.95	43.50	-7.55	peak			
4		180.3497	18.14	18.05	36.19	43.50	-7.31	peak			
5		215.9165	22.93	12.93	35.86	43.50	-7.64	peak			
6		275.7332	19.03	17.20	36.23	46.00	-9.77	peak			

Note: the other modes radiation emission at least have 20dB margin.

RADIATED EMISSION ABOVE 1GHZ

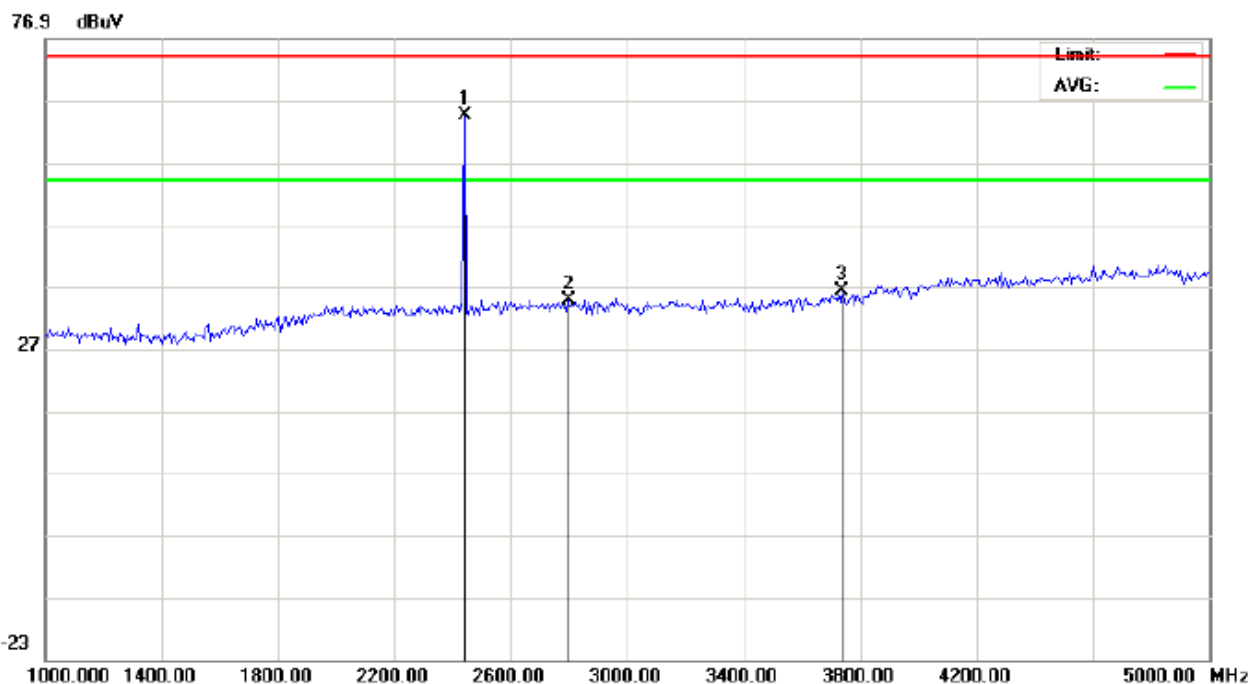
EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With data rate 11 2437MHZ	Antenna	Vertical



Site: site #1 Polarization: **Vertical** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHZ(PK) Power: Humidity: 60 %
EUT: MID Distance: 3m
M/N: HD988
Mode:
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		cm	degree	
1	*	2437.000	81.31	-9.64	71.67	74.00	-2.33	peak			
2		2780.000	45.14	-8.89	36.25	74.00	-37.75	peak			
3		3913.333	43.39	-5.34	38.05	74.00	-35.95	peak			

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With date rate 11 2437MHZ	Antenna	Horizontal



Site: site #1 Polarization: **Horizontal** Temperature: 26
Limit: FCC Class B 3M Radiation above 1GHz(PK) Power: Humidity: 60 %
EUT: MID Distance: 3m
M/N: HD988
Mode:
Note:

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		cm	degree	
1	*	2437.000	74.08	-9.64	64.44	74.00	-9.56	peak			
2		2800.000	43.72	-8.84	34.88	74.00	-39.12	peak			
3		3740.000	42.58	-6.41	36.17	74.00	-37.83	peak			

Note: the other modes radiation emission at least have 20dB margin.
All modes radiation emission from 5GHz to 24GHz at least have 20dB margin.

9 BAND EDGE EMISSION

9.1 MEASUREMENT PROCEDURE

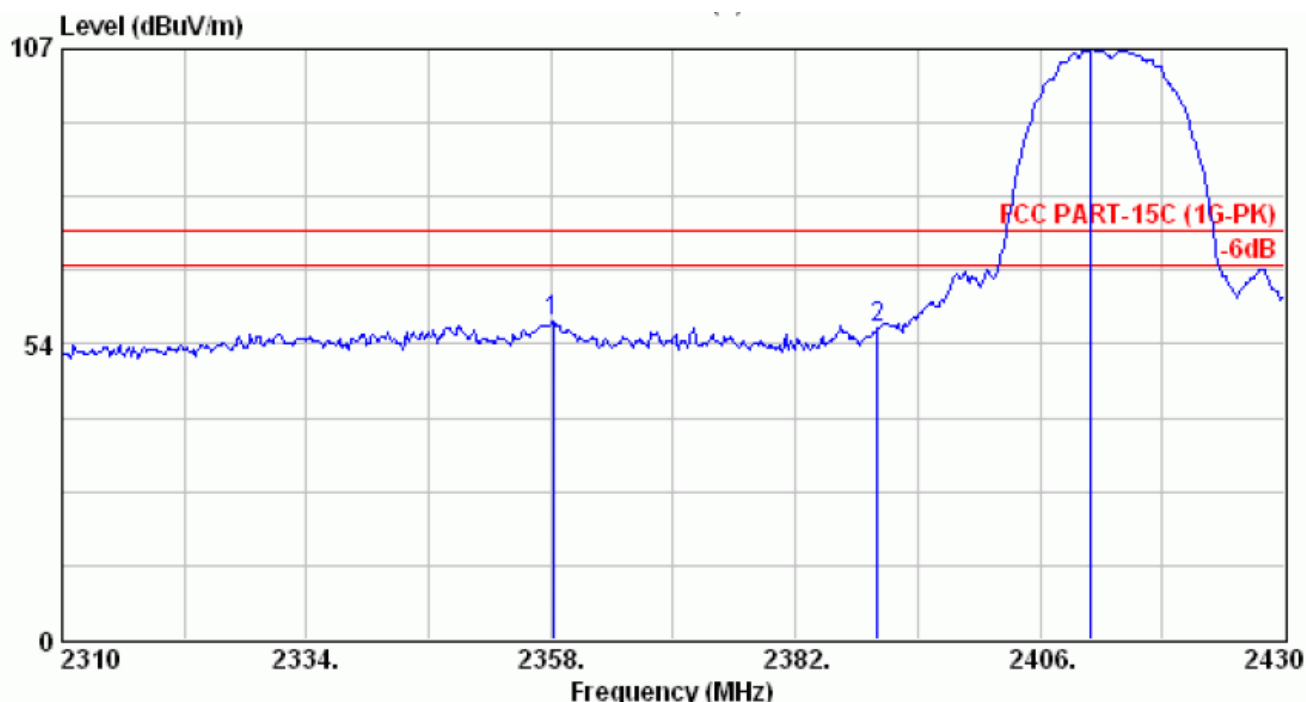
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW= 1MHz, VBW= 1MHz.
3. The band edges was measured and recorded.

9.2 TEST SET-UP

The Same as described in section 8.2

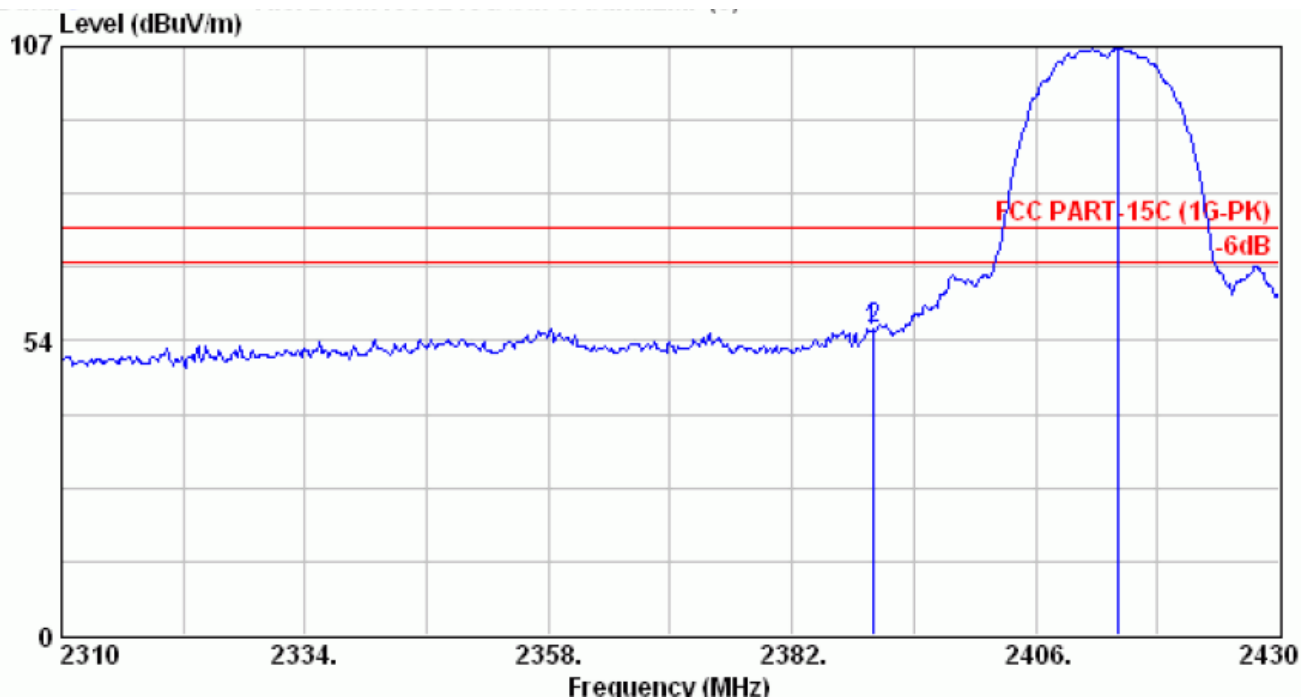
9.3 TEST RESULT

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With data rate 11 2412MHZ	Antenna	Vertical



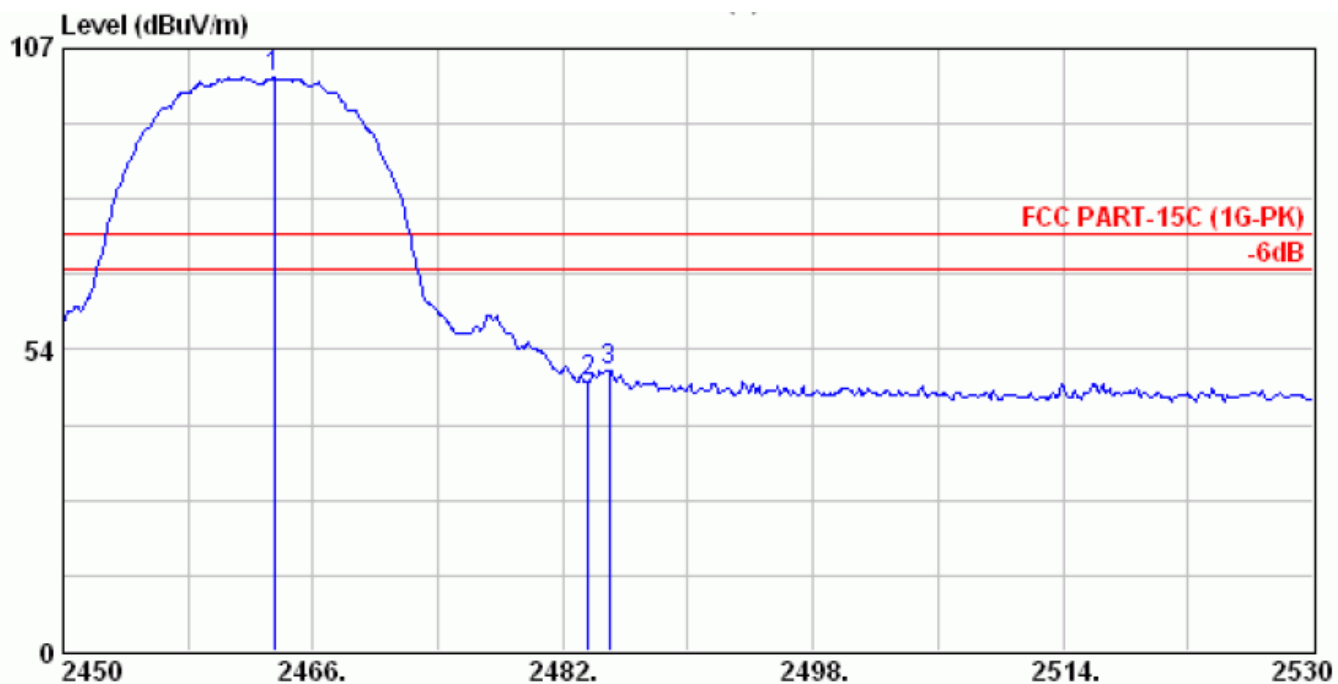
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2358.240	28.40	6.29	23.09	57.78	74.00	16.22	Peak
2	2390.040	28.47	6.34	21.53	56.35	74.00	17.65	Peak
3	2411.040	28.51	6.36	72.05	106.92	74.00	-32.92	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With data rate 11 2412MHZ	Antenna	Horizontal



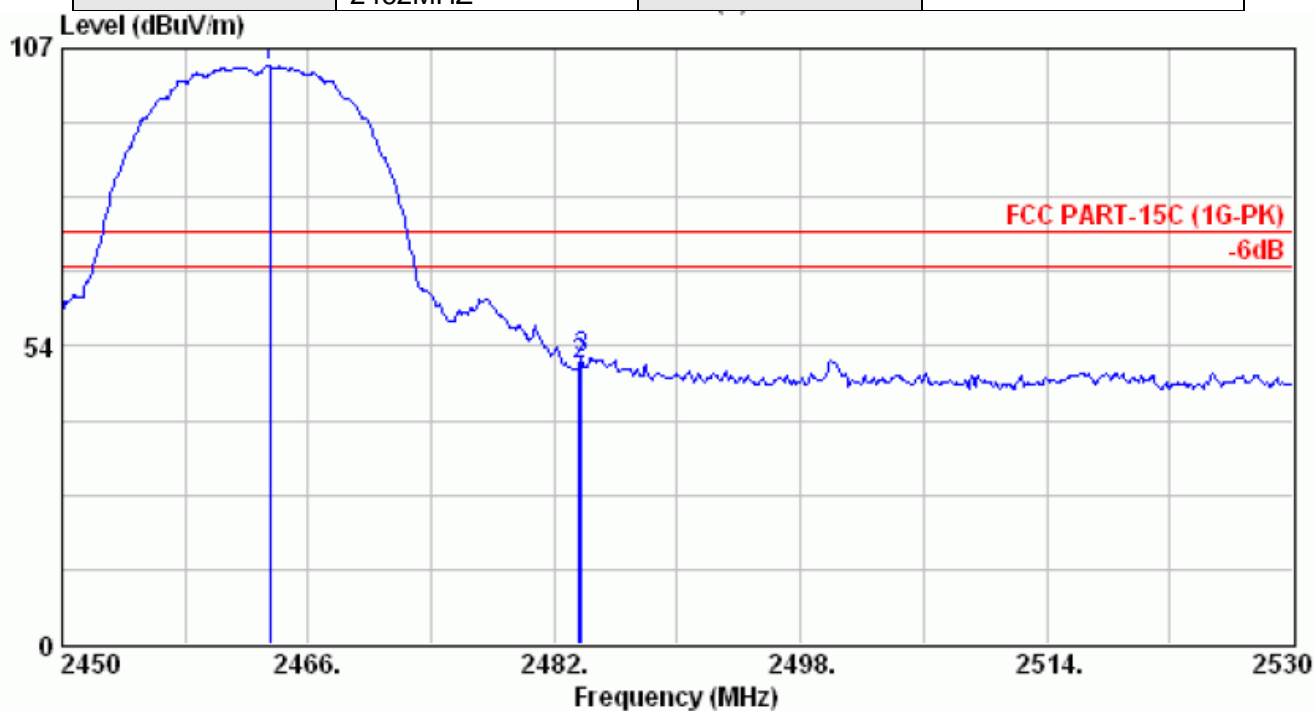
		Ant. Cable		Emission		Limits	Margin	Remark
Freq.	(MHz)	Factor	Loss	Reading	Level			
		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2389.920	28.47	6.34	20.59	55.41	74.00	18.59	Peak
2	2390.040	28.47	6.34	20.72	55.54	74.00	18.46	Peak
3	2414.040	28.51	6.36	71.78	106.65	74.00	-32.65	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With data rate 11 2462MHZ	Antenna	Vertical



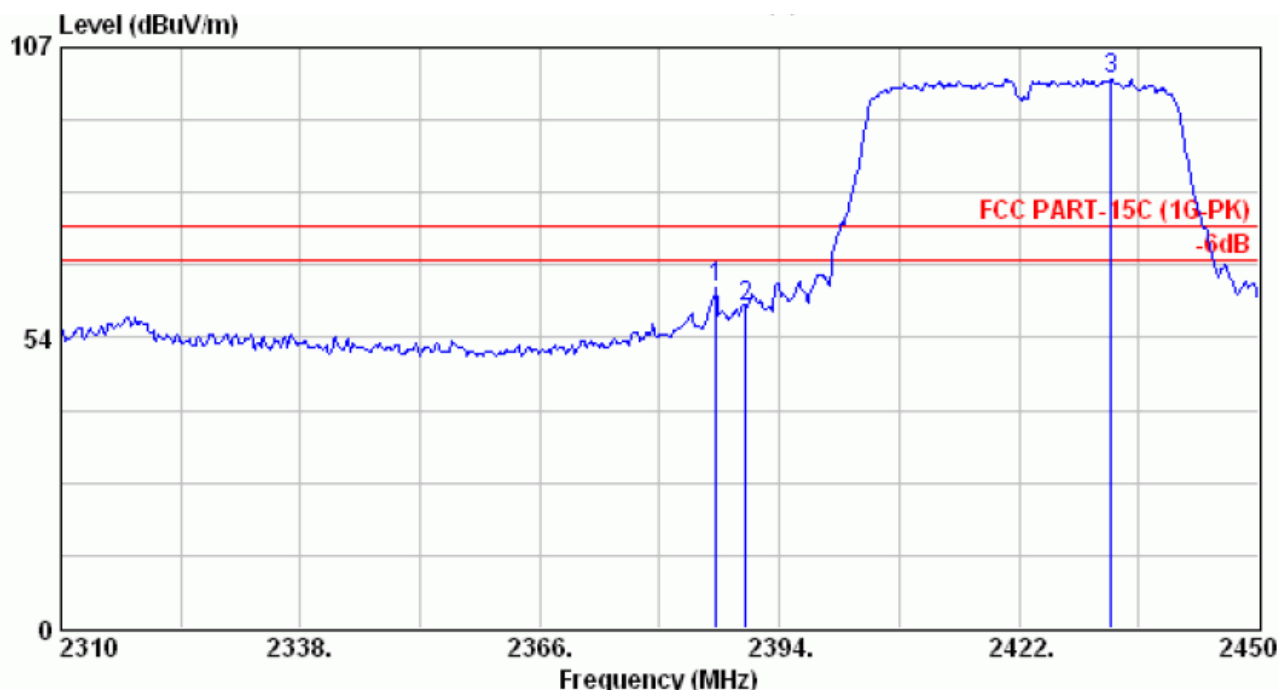
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2463.520	28.62	6.42	66.86	101.91	74.00	-27.91	Peak
2	2483.600	28.66	6.45	12.78	47.89	74.00	26.11	Peak
3	2484.960	28.66	6.45	14.74	49.85	74.00	24.15	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11b With data rate 11 2462MHZ	Antenna	Horizontal



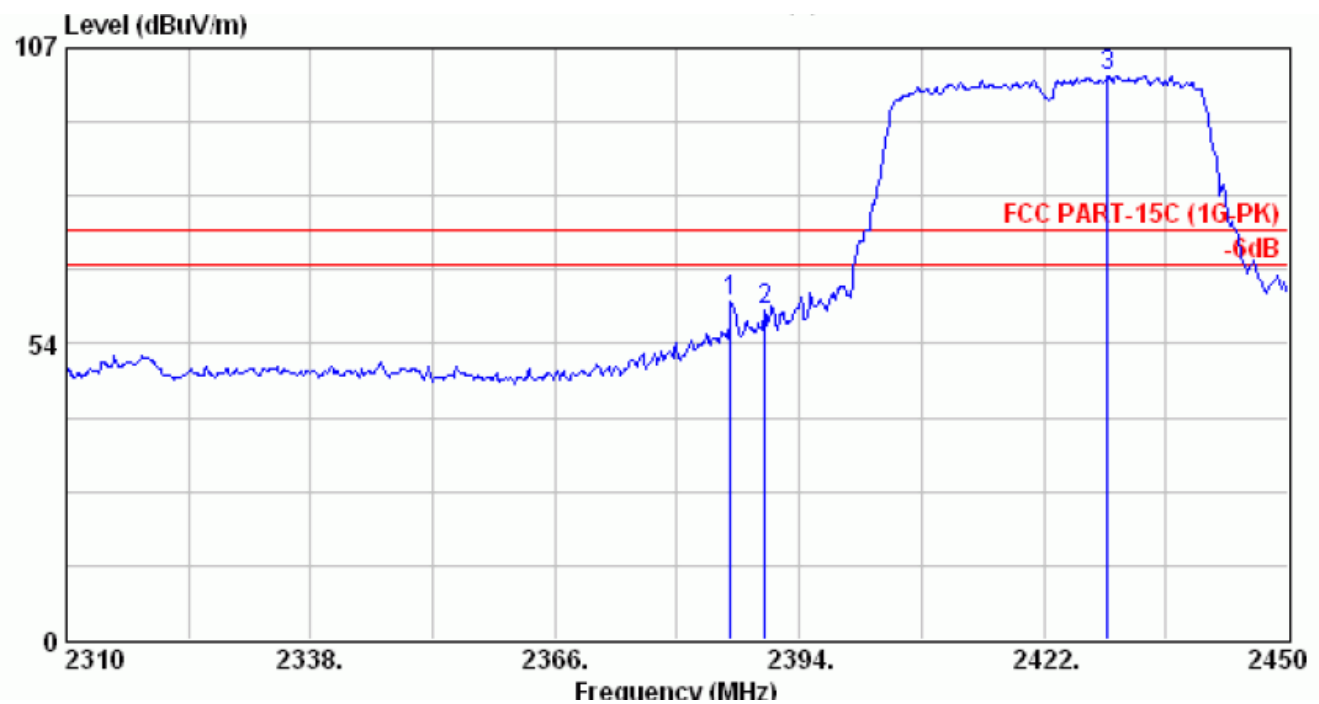
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2463.520	28.62	6.42	68.84	103.89	74.00	-29.89	Peak
2	2483.600	28.66	6.45	15.14	50.25	74.00	23.75	Peak
3	2483.760	28.66	6.45	16.28	51.40	74.00	22.60	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11n 40 With data rate 135 2422MHZ	Antenna	Vertical



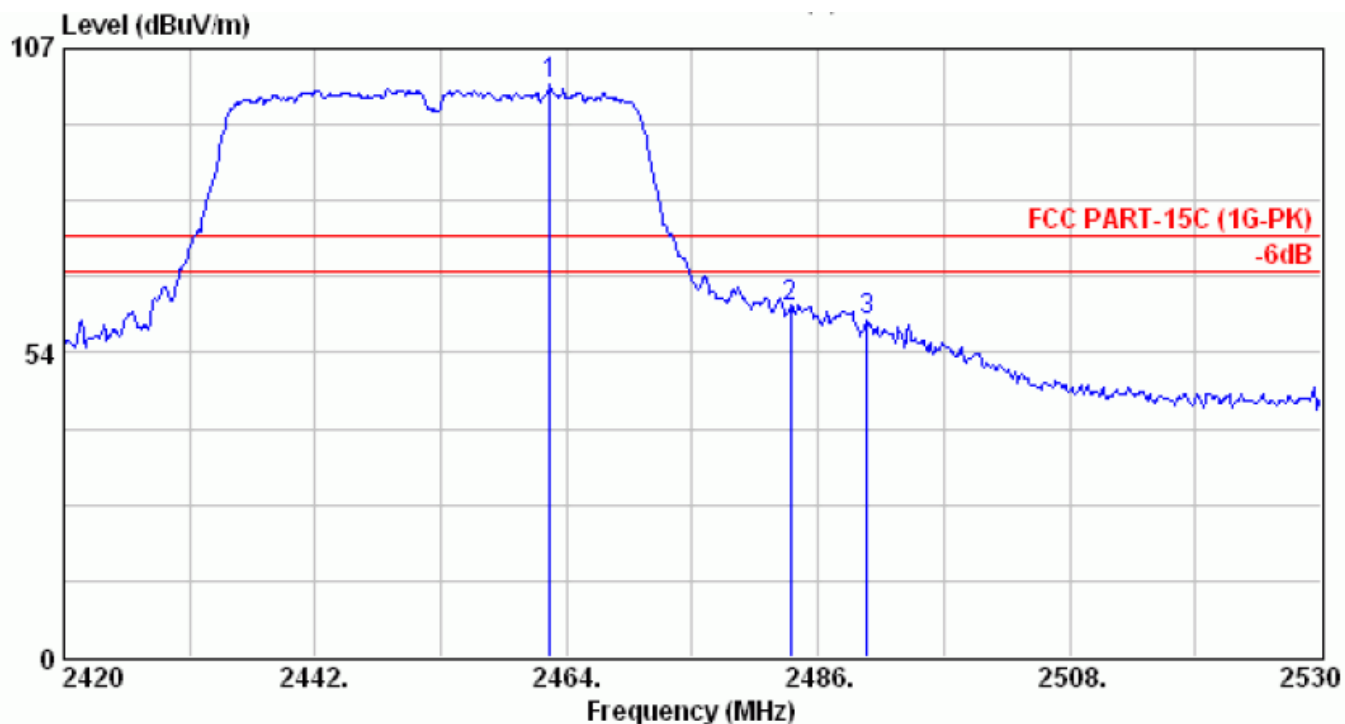
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2386.580	28.10	6.33	28.45	62.88	74.00	11.12	Peak
2	2390.080	28.10	6.34	24.86	59.30	74.00	14.70	Peak
3	2432.780	28.13	6.39	66.75	101.27	74.00	-27.27	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11n 40 With data rate 135 2422MHZ	Antenna	Horizontal



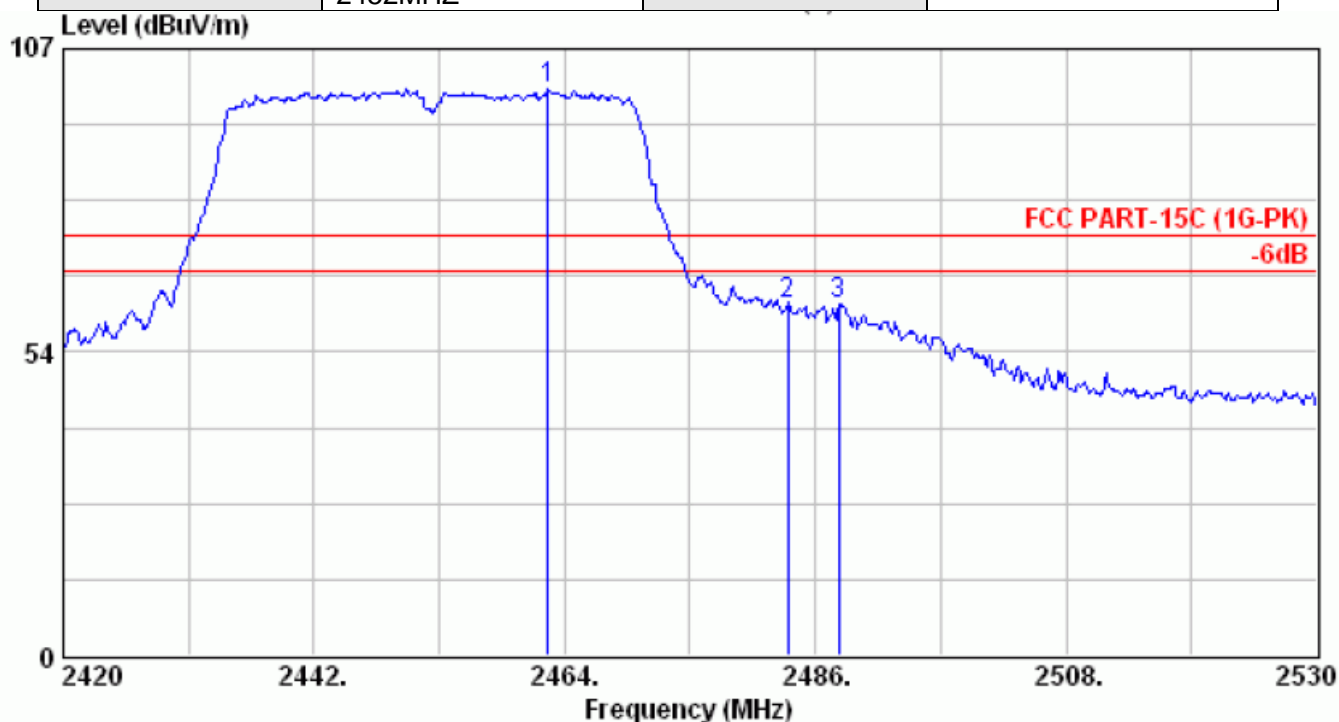
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2386.160	28.10	6.33	26.87	61.30	74.00	12.70	Peak
2	2390.080	28.10	6.34	24.98	59.42	74.00	14.58	Peak
3	2429.280	28.13	6.38	67.45	101.96	74.00	-27.96	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11n 40 With data rate 135 2452MHZ	Antenna	Vertical



	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.570	28.17	6.42	66.03	100.62	74.00	-26.62	Peak
2	2483.580	28.18	6.45	26.72	61.36	74.00	12.64	Peak
3	2490.290	28.20	6.46	24.70	59.36	74.00	14.64	Peak

EUT	MID	Model Name	HD988
Temperature	25° C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7V
Test Mode	802.11n 40 With data rate 135 2452MHZ	Antenna	Horizontal



	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2462.570	28.17	6.42	65.33	99.92	74.00	-25.92	Peak
2	2483.580	28.18	6.45	27.17	61.80	74.00	12.20	Peak
3	2488.090	28.20	6.45	27.09	61.74	74.00	12.26	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

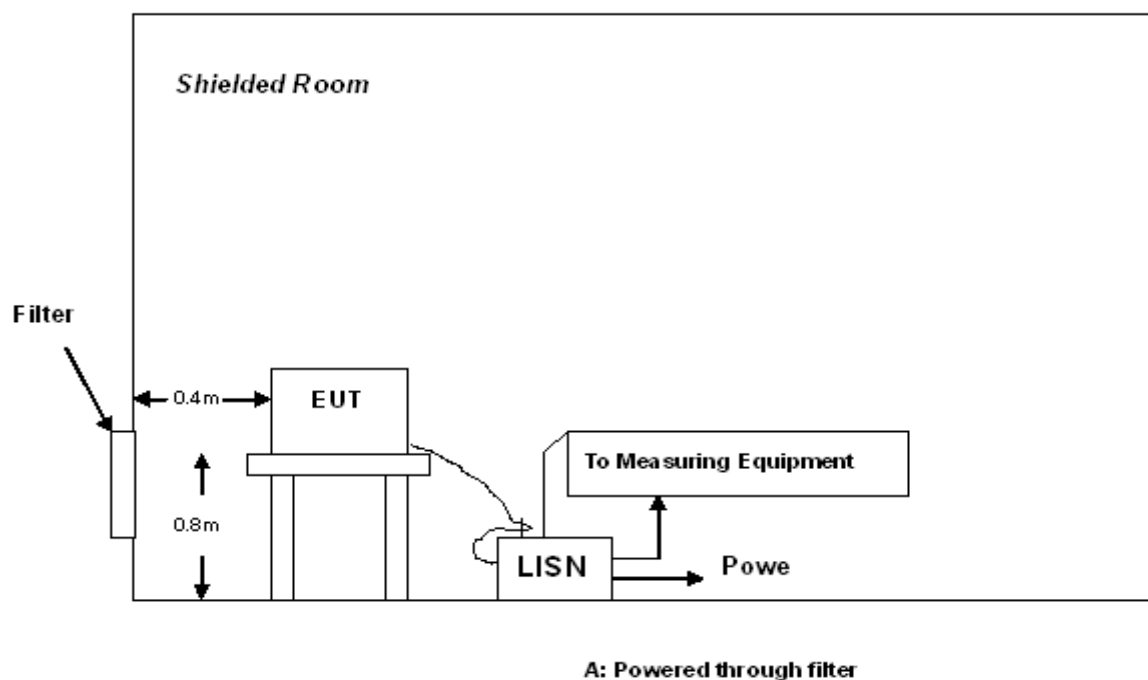
10 FCC LINE CONDUCTED EMISSION TEST

10.1 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

10.2 BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



10.3 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.
- 4) All support equipments received AC120V power from a LISN, if any.
- 5) The EUT received power from support adapter.
- 6) 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.
- 7) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8) During the above scans, the emissions were maximized by cable manipulation.
- 9) The following test mode(s) were scanned during the preliminary test:

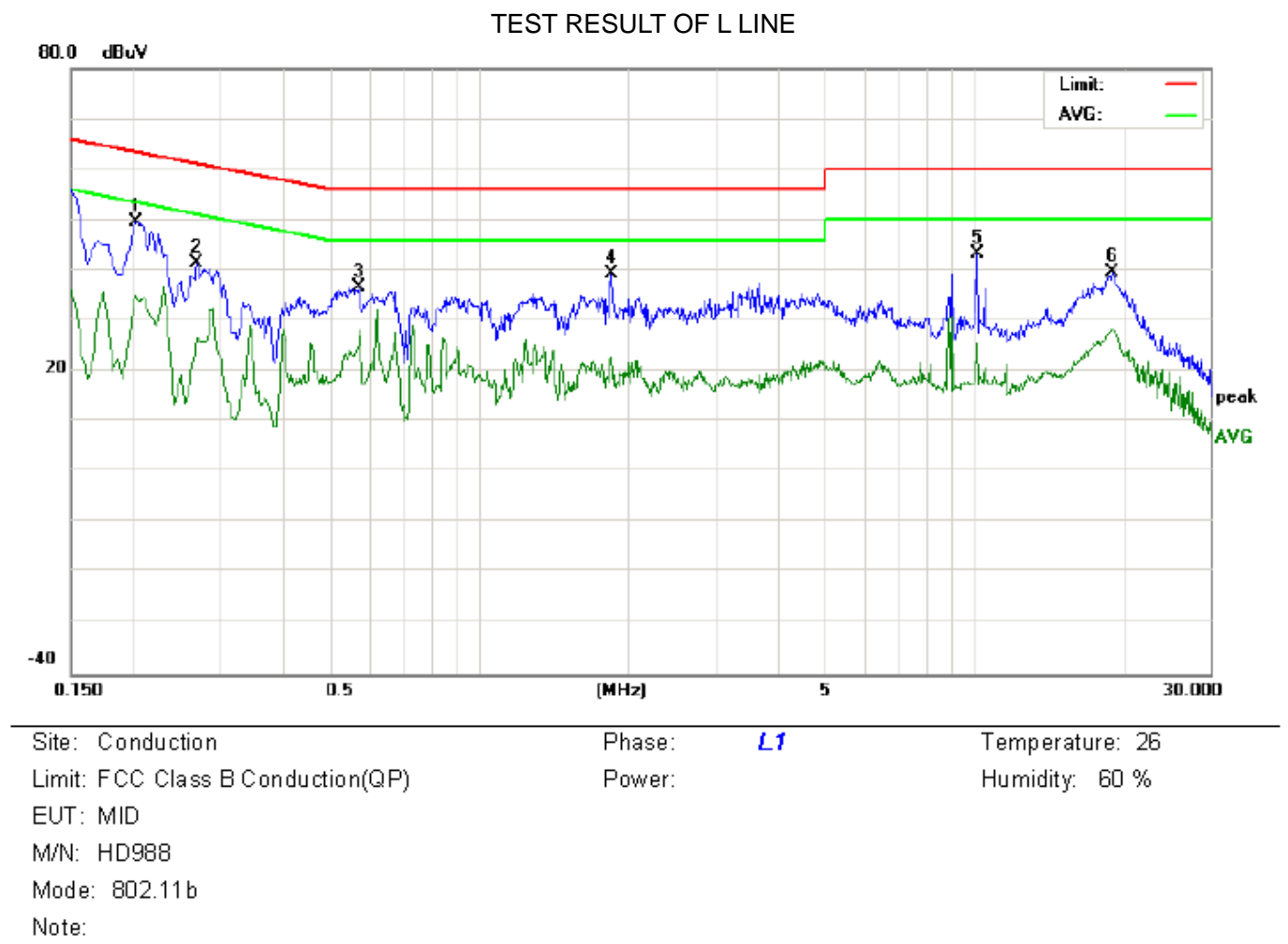
Preliminary Line Conducted Emission Test				
Frequency Range Investigated		150 KHz TO 30 MHz		
Mode of operation	Date	Report No.	Data#	Worst Mode
802.11b	06/14/2011	AGC08I110501	HD988-0	<input checked="" type="checkbox"/>
802.11g	06/14/2011	AGC08I110501	HD988-1	<input type="checkbox"/>
802.11n	06/14/2011	AGC08I110501	HD988-2	<input type="checkbox"/>

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

10.4 FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

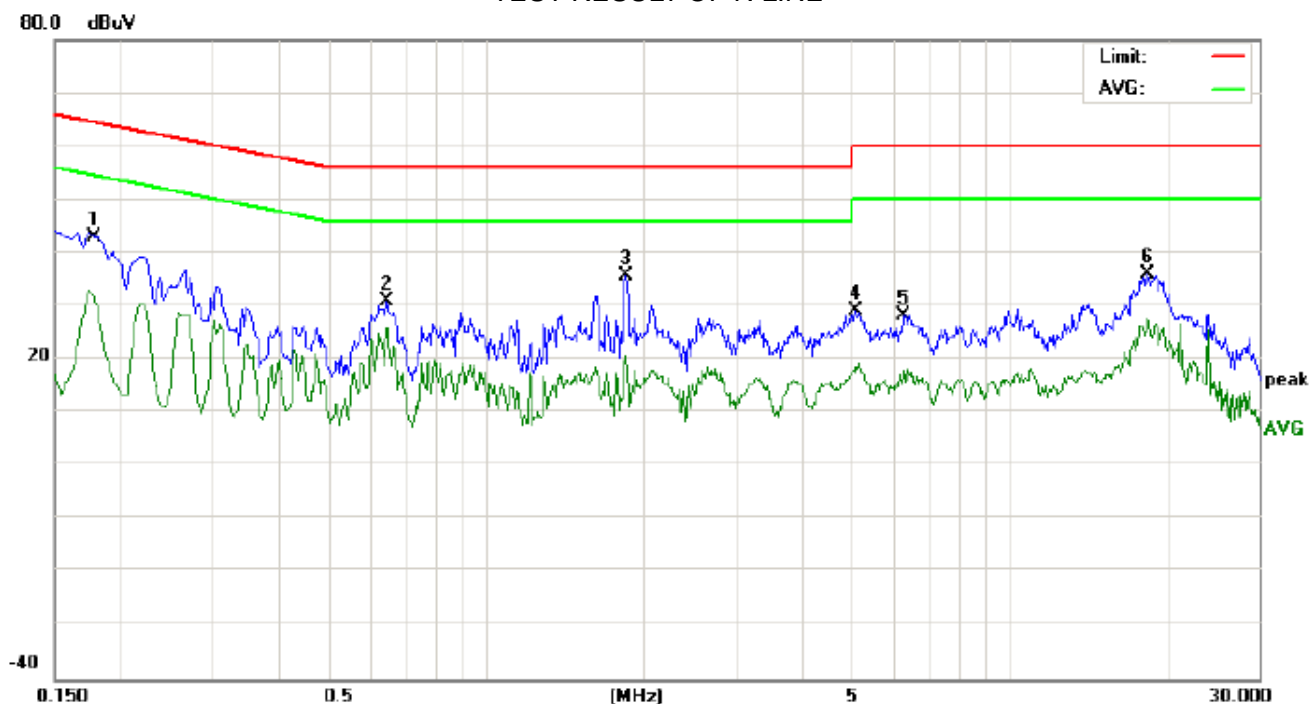
- 1) EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were 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.

10.5 TEST RESULT OF LINE CONDUCTED EMISSION TEST



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	0.2020	39.48		25.04	10.22	49.70		35.26	63.52	53.52	-13.82	-18.26	P	
2	0.2700	31.06		16.38	10.28	41.34		26.66	61.12	51.12	-19.78	-24.46	P	
3	0.5740	26.35		17.78	10.33	36.68		28.11	56.00	46.00	-19.32	-17.89	P	
4	1.8540	29.14		12.47	10.27	39.41		22.74	56.00	46.00	-16.59	-23.26	P	
5	10.1459	33.07		15.32	10.09	43.16		25.41	60.00	50.00	-16.84	-24.59	P	
6	19.0220	29.44		18.03	10.12	39.56		28.15	60.00	50.00	-20.44	-21.85	P	

TEST RESULT OF N LINE



Site: Conduction

Phase: **N**

Temperature: 26

Limit: FCC Class B Conduction(QP)

Power:

Humidity: 60 %

EUT: MID

M/N: HD988

Mode: 802.11b

Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1806	34.09		7.08	10.19	44.28		17.27	64.45	54.45	-20.17	-37.18	P	
2	0.6460	20.57		15.62	10.33	30.90		25.95	56.00	46.00	-25.10	-20.05	P	
3	1.8540	25.57		10.36	10.27	35.84		20.63	56.00	46.00	-20.16	-25.37	P	
4	5.1060	18.94		8.34	10.24	29.18		18.58	60.00	50.00	-30.82	-31.42	P	
5	6.3100	18.10		7.63	10.29	28.39		17.92	60.00	50.00	-31.61	-32.08	P	
6	18.4140	25.96		17.56	10.12	36.08		27.68	60.00	50.00	-23.92	-22.32	P	

APPENDIX I PHOTOGRAPHS OF THE EUT

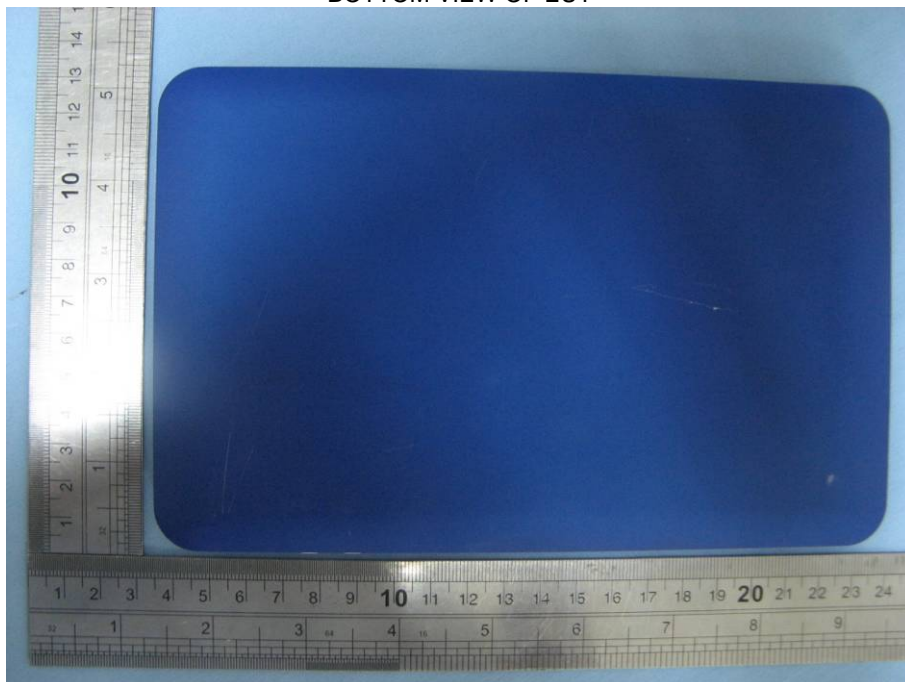
TOTAL VIEW OF EUT



TOP VIEW OF EUT



BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



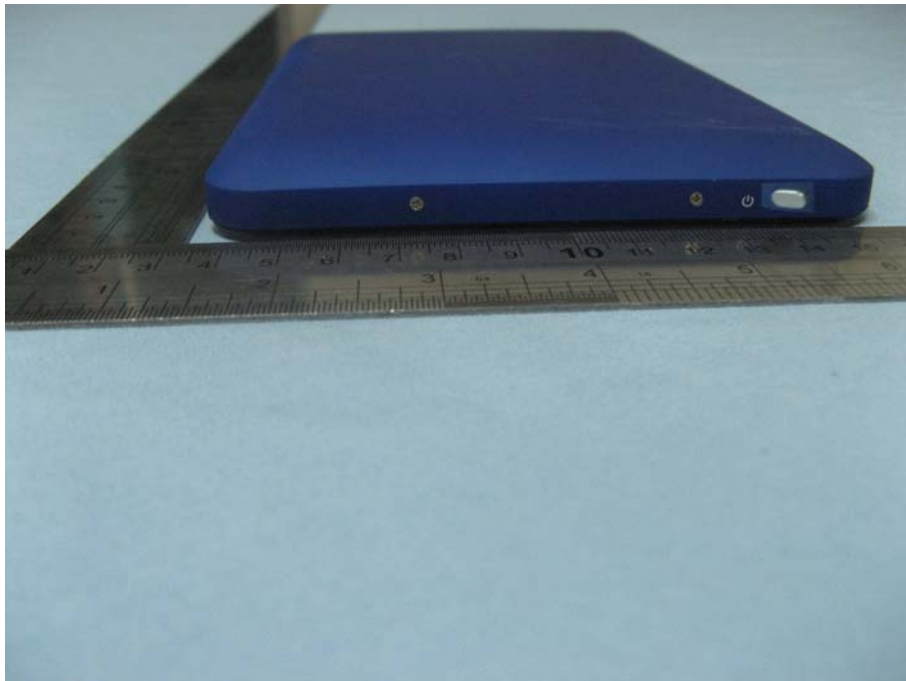
BACK VIEW OF EUT



LEFT VIEW OF EUT



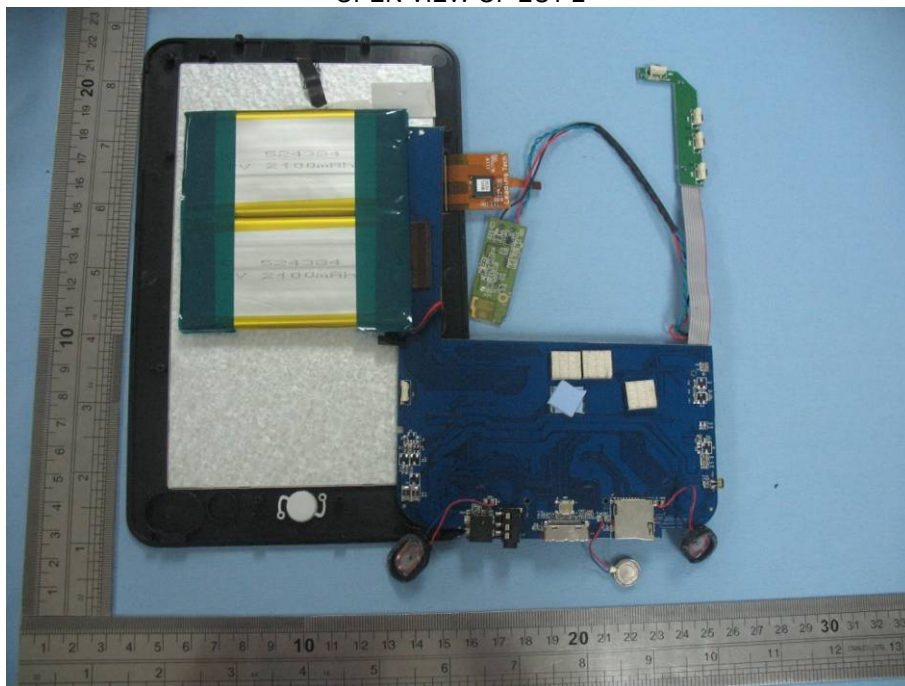
RIGHT VIEW OF EUT



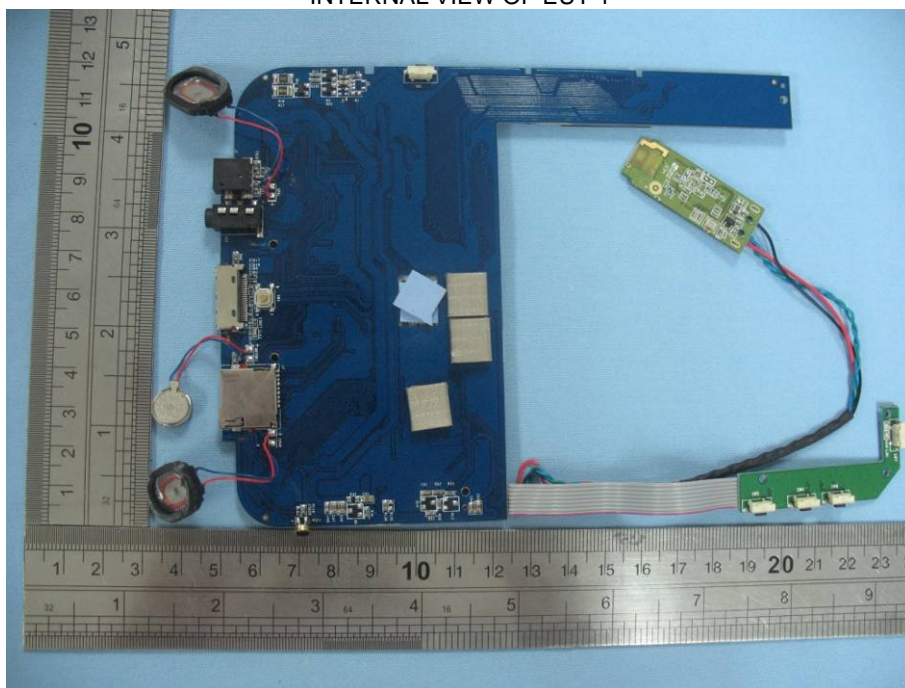
OPEN VIEW OF EUT-1



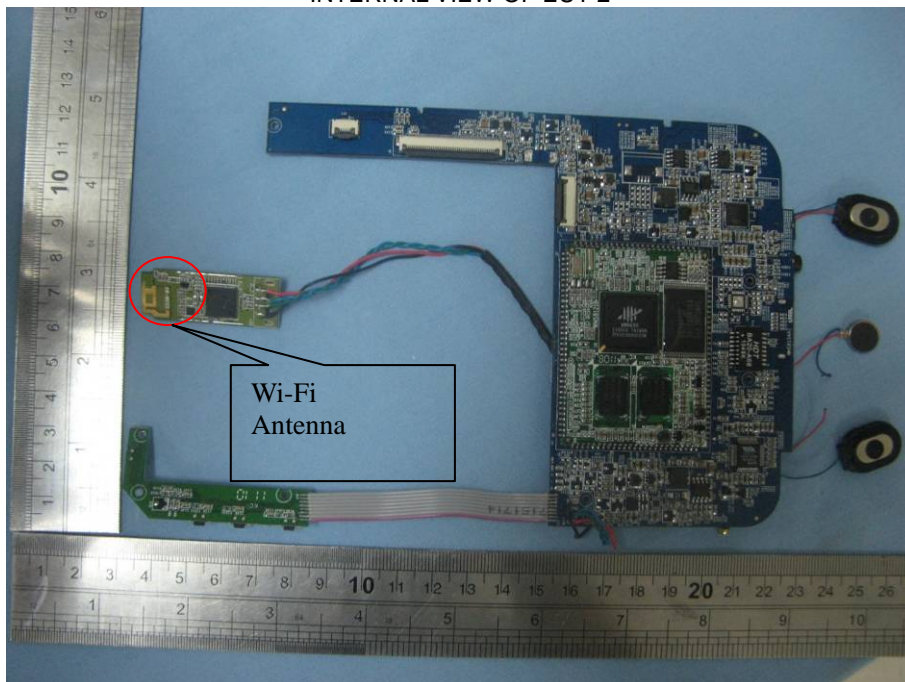
OPEN VIEW OF EUT-2



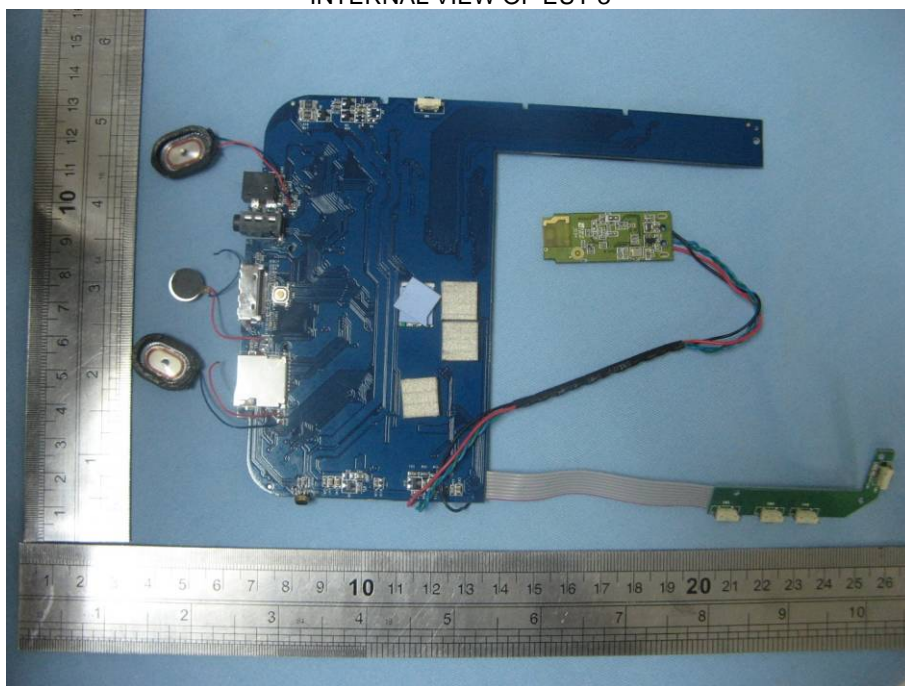
INTERNAL VIEW OF EUT-1



INTERNAL VIEW OF EUT-2



INTERNAL VIEW OF EUT-3



PPENDIX II PHOTOGRAPHS OF THE TEST SETUP

RADIATED EMISSION TEST SETUP



CONDUCTED EMISSION TEST SETUP



----END OF REPORT----