

FCC 47 CFR PART 15 SUBPART C

Product Type : PDA phone

Applicant : Atelier Haute Communication

Address : 11 bis rue Roquépine, 75008 Paris - France

Trade Name : TAG Heuer

Model Number : TH03M

Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2010
Canada RSS-210 ISSUE 8: Dec., 2010
Canada RSS-Gen ISSUE 3: Dec., 2010
ANSI C63.4-2009

Application Purpose : Original

Receive Date : Mar. 14, 2012

Issue Date : Apr. 06, 2012

Issue by

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Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Apr. 06, 2012	Initial Issue	

Verification of Compliance

Issued Date: 04/06/2012

Product Type : PDA phone

Applicant : Atelier Haute Communication

Address : 11 bis rue Roquépine, 75008 Paris - France

Trade Name : TAG Heuer

Model Number : TH03M

FCC ID : GUOTH03M

EUT Rated Voltage : DC 5 V, 1A

Test Voltage : 120 Vac / 60 Hz

Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2010
Canada RSS-210 ISSUE 8: Dec., 2010
Canada RSS-Gen ISSUE 3: Dec., 2010
ANSI C63.4-2009

Test Result : Complied

Application Purpose : Original

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<http://www.atl-lab.com.tw/e-index.htm>

The above equipment was tested by A Test Lab Techno Corp. 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: 2009 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 .
The test results of this report relate only to the tested sample identified in this report.

Approved By :



(Manager)

Reviewed By :



(Testing Engineer)

(Fly Lu)

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1 General Information

1.1 Summary of Test Result

Standard		Item	Result	Remark
15.247	RSS-GEN			
15.207	7.2.2	AC Power Conducted Emission	PASS	-----
-----	6	Receiver Radiated Emissions	PASS	-----
Standard		Item	Result	Remark
15.247	RSS-210			
15.247(d)	A8.5	Transmitter Radiated Emissions	PASS	-----
15.247(b)(3)	A8.4	Max. Output Power	PASS	-----
15.247(a)(2)	A8.2 (a)	6dB RF Bandwidth	PASS	-----
15.247(e)	A8.2 (b)	Power Spectral Density	PASS	-----
15.247(c)	A8.5	Out of Band Conducted Spurious Emission	PASS	-----
15.247(d)	A8.5	Band Edge Measurement	PASS	-----
15.247(c)	A8.5	Occupied Bandwidth Measurement	PASS	-----
15.203	-	Antenna Requirement	PASS	-----

The test results of this report relate only to the tested sample(s) identified in this report. Manufacturer or whom it may concern should recognize the pass or fail of the test result.

1.2 Measurement Uncertainty

Conducted Emission

The measurement uncertainty is evaluated as ± 2.24 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 3.072 dB.

2 EUT Description

Product	:	PDA phone
Trade Name	:	TAG Heuer
Model No.	:	TH03M
Applicant	:	Atelier Haute Communication 11 bis rue Roquépine, 75008 Paris - France
Manufacturer	:	Atelier Haute Communication 11 bis rue Roquépine, 75008 Paris - France
FCC ID	:	GUOTH03M
IMEI Number	:	359352040045383
Frequency Range	:	2412 ~ 2462 MHz
Modulation Type	:	IEEE 802.11b: DSSS IEEE 802.11g: DSSS+ OFDM draft 802.11n Standard-20MHz: OFDM
Antenna Type	:	Internal antenna
Antenna Gain	:	-4.3 dBi
RF Output Power	:	IEEE 802.11b: 0.021 W / 13.26 dBm IEEE 802.11g: 0.219 W / 23.41 dBm draft 802.11n Standard-20MHz: 0.173 W / 22.37 dBm
Hardware Version	:	5001MB-R006
Software Version	:	2.3.7
Component		
Battery	:	TAG Heuer, TIGER-BAT1 3.7Vdc, 1400mAh
Power Adapter	:	LG, STA-U15WS Input:100-240Vac, 50/60Hz, 0.3A Output: 5Vdc, 1A Cable out: Shielded, 1.1 m

3 Test Methodology

3.1. Mode of Operation

Decision of Test ATL has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: IDLE Mode
Mode 2: Normal Operation Mode
Mode 3: IEEE 802.11b Link Mode
Mode 4: IEEE 802.11g Link Mode
Mode 5: draft 802.11n Standard-20MHz Link Mode
Mode 6: Receiver Mode

Software used to control the EUT for staying in continuous transmitting mode was programmed.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

IEEE 802.11b mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 1Mbps data rate were chosen for full testing.

IEEE 802.11g mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6Mbps data rate were chosen for full testing.

draft 802.11n Standard-20 MHz Channel mode:

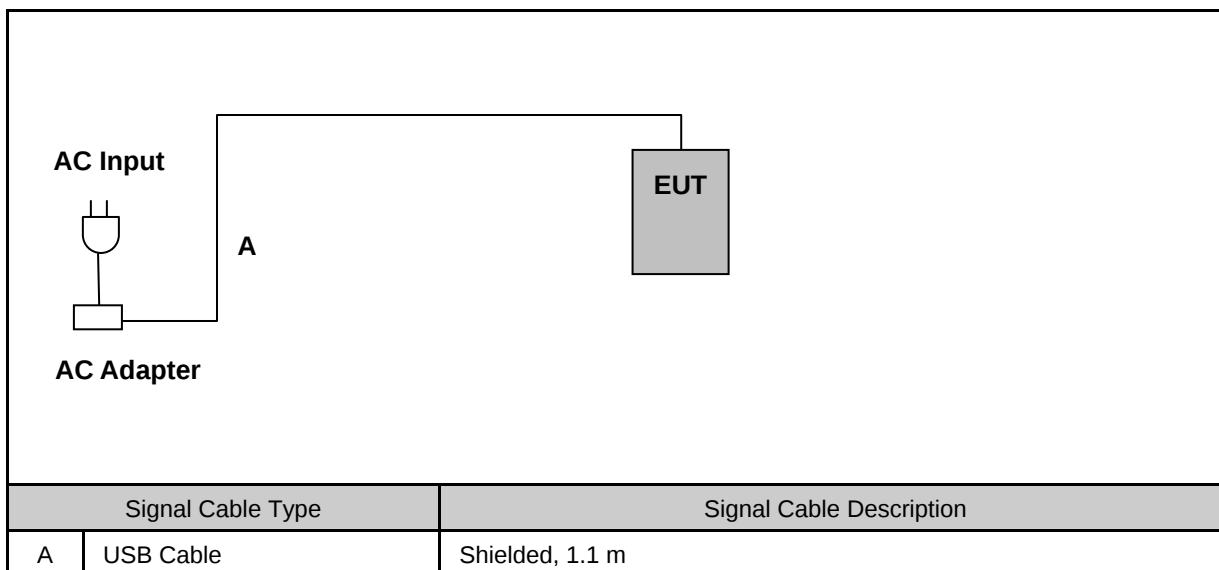
Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with 6.5Mbps data rate were chosen for full testing.

By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

3.2. EUT Exercise Software

1.	Setup the EUT shown on 3.3.
2.	Turn on the power of all equipment.
3.	Turn on Wi-Fi function link to AP.
4.	EUT run test program.

3.3. Configuration of Test System Details



Devices Description					
	Product	Manufacturer	Model Number	Serial Number	Power Cord
1.	-----	-----	-----	-----	-----

3.4. Test Site Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	26
Humidity (%RH)	25-75	60
Barometric pressure (mbar)	860-1060	950

4 Conducted Emission Measurement

4.1. Limit

Frequency (MHz)	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

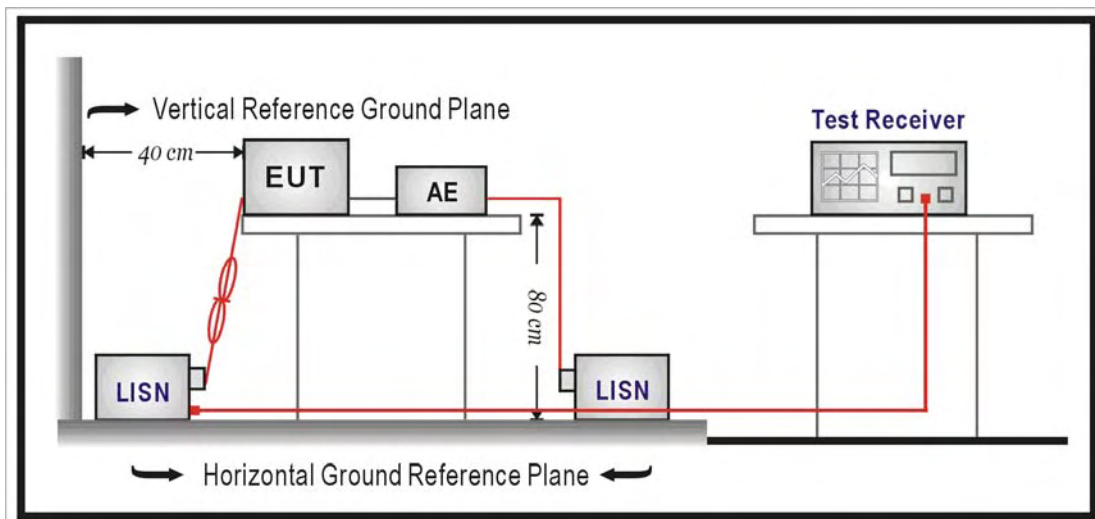
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/30/2011	(1)
LISN	R&S	ENV216	101040	03/07/2012	(1)
LISN	R&S	ENV216	101041	03/07/2012	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

4.3. Test Setup



4.4. Test Procedure

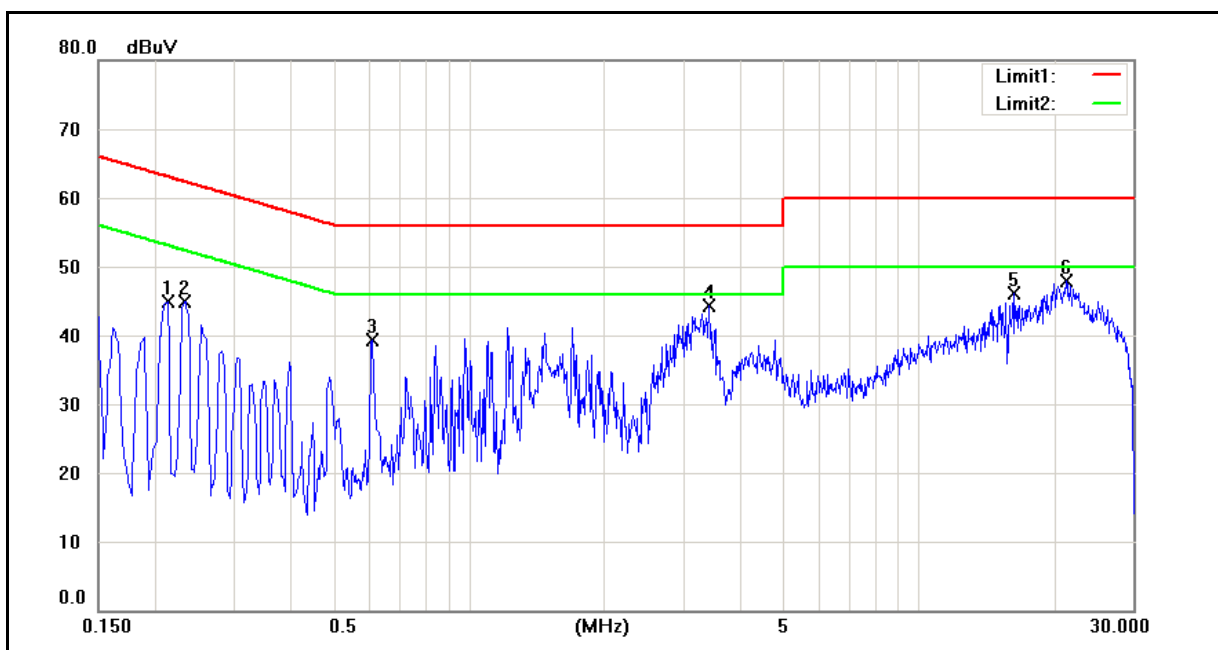
The power line conducted emission measurements were performed in a shielded enclosure. The EUT was assembled on a wooden table which is 80 centimeters high, was placed 40 centimeters from the back wall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and EMCO Model 3162/2 SH Line Impedance Stabilization Networks (LISN). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150 KHz to 30 MHz. The physical arrangement of the test system and associated cabling was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.1.

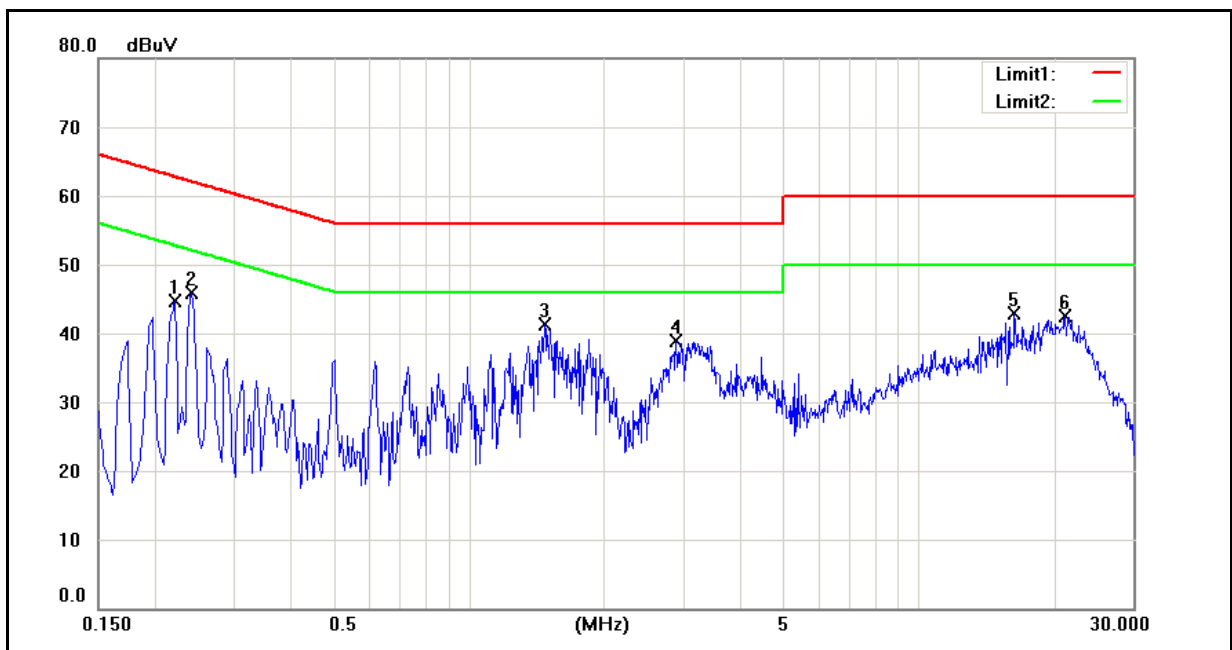
4.5. Test Result

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	22(°C)/54%RH
Mode:	Mode 1	Date:	03/16/2012
		Test By:	Fly Lu
Description:			



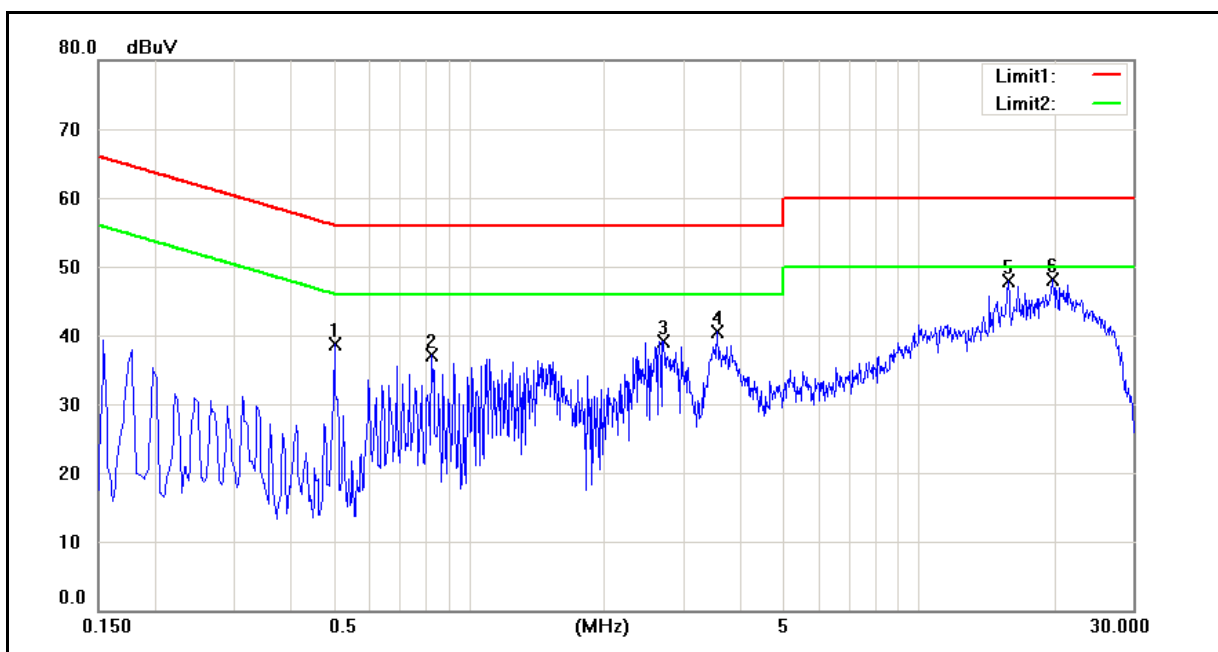
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2140	30.45	15.21	9.65	40.10	24.86	63.05	53.05	-22.95	-28.19	Pass
2	0.2340	30.66	17.03	9.65	40.31	26.68	62.31	52.31	-22.00	-25.63	Pass
3	0.6100	26.30	17.00	9.66	35.96	26.66	56.00	46.00	-20.04	-19.34	Pass
4	3.4300	27.51	18.57	9.75	37.26	28.32	56.00	46.00	-18.74	-17.68	Pass
5	16.3100	30.88	22.12	9.88	40.76	32.00	60.00	50.00	-19.24	-18.00	Pass
6	21.2700	30.03	19.51	9.77	39.80	29.28	60.00	50.00	-20.20	-20.72	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	22(°C)/54%RH
Mode:	Mode 1	Date:	03/16/2012
		Test By:	Fly Lu
Description:			



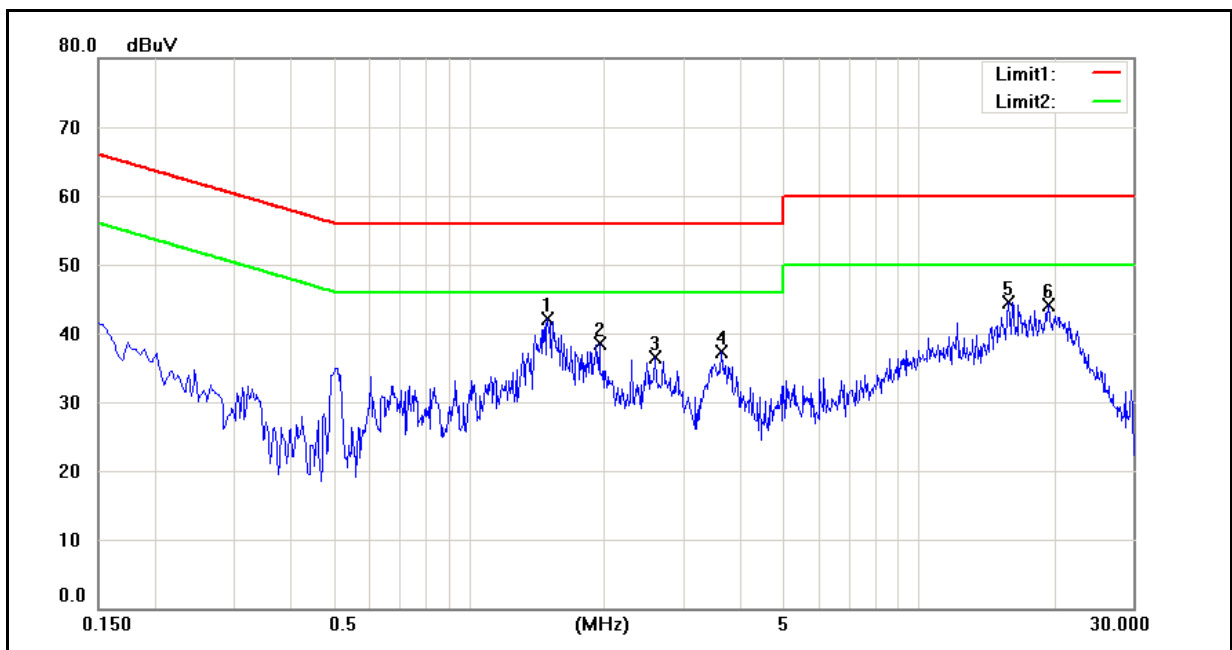
No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.2220	30.04	15.15	9.65	39.69	24.80	62.74	52.74	-23.05	-27.94	Pass
2	0.2420	31.33	16.23	9.65	40.98	25.88	62.03	52.03	-21.05	-26.15	Pass
3	1.4740	27.45	19.88	9.70	37.15	29.58	56.00	46.00	-18.85	-16.42	Pass
4	2.8860	21.98	14.93	9.75	31.73	24.68	56.00	46.00	-24.27	-21.32	Pass
5	16.3180	28.12	22.01	9.93	38.05	31.94	60.00	50.00	-21.95	-18.06	Pass
6	21.1900	24.90	17.68	9.86	34.76	27.54	60.00	50.00	-25.24	-22.46	Pass

Standard:	FCC Part 15C	Line:	L1
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	22(°C)/54%RH
Mode:	Mode 2	Date:	03/16/2012
		Test By:	Fly Lu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	0.5020	25.65	14.40	9.65	35.30	24.05	56.00	46.00	-20.70	-21.95	Pass
2	0.8300	21.55	12.40	9.68	31.23	22.08	56.00	46.00	-24.77	-23.92	Pass
3	2.7140	23.48	14.19	9.74	33.22	23.93	56.00	46.00	-22.78	-22.07	Pass
4	3.5740	24.34	16.67	9.75	34.09	26.42	56.00	46.00	-21.91	-19.58	Pass
5	15.8180	32.54	24.05	9.89	42.43	33.94	60.00	50.00	-17.57	-16.06	Pass
6	19.8740	30.18	20.36	9.75	39.93	30.11	60.00	50.00	-20.07	-19.89	Pass

Standard:	FCC Part 15C	Line:	N
Test item:	Conducted Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	22(°C)/54%RH
Mode:	Mode 2	Date:	03/16/2012
		Test By:	Fly Lu
Description:			



No.	Frequency (MHz)	QP reading (dBuV)	AVG reading (dBuV)	Correction factor (dB)	QP result (dBuV)	AVG result (dBuV)	QP limit (dBuV)	AVG limit (dBuV)	QP margin (dB)	AVG margin (dB)	Remark
1	1.4980	28.20	18.88	9.70	37.90	28.58	56.00	46.00	-18.10	-17.42	Pass
2	1.9580	26.38	15.16	9.73	36.11	24.89	56.00	46.00	-19.89	-21.11	Pass
3	2.6060	18.94	12.35	9.74	28.68	22.09	56.00	46.00	-27.32	-23.91	Pass
4	3.6580	20.80	14.67	9.74	30.54	24.41	56.00	46.00	-25.46	-21.59	Pass
5	15.8220	29.83	26.79	9.94	39.77	36.73	60.00	50.00	-20.23	-13.27	Pass
6	19.5140	25.77	18.22	9.82	35.59	28.04	60.00	50.00	-24.41	-21.96	Pass

5 Radiated Interference Measurement

5.1. Limit

According to §15.209(a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V/m}$ at 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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

5.2. Test Instruments

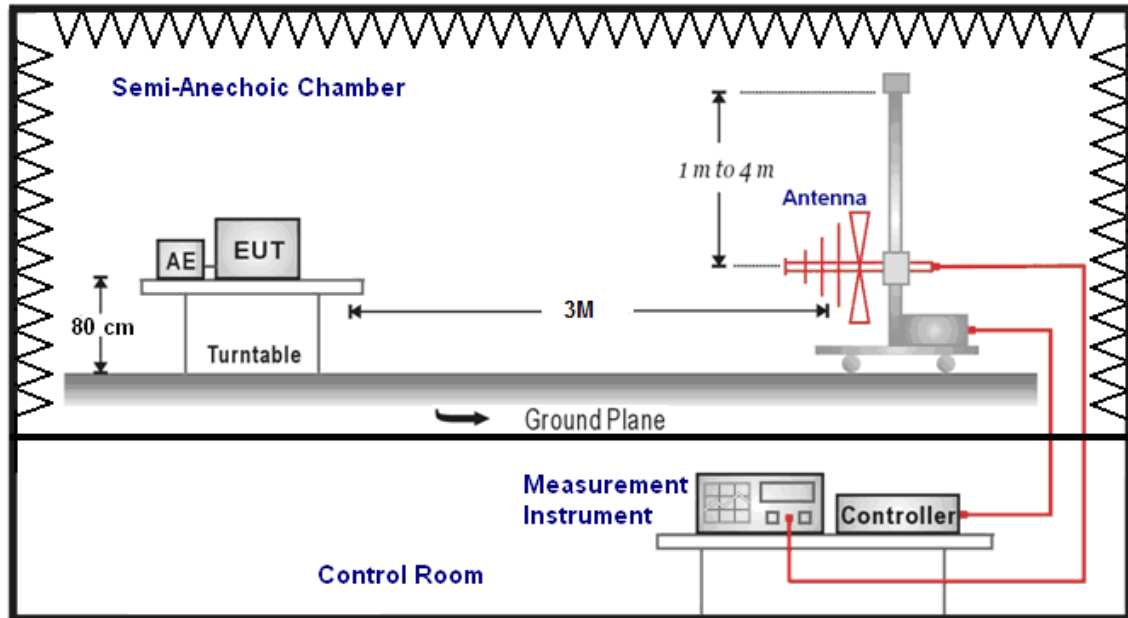
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/16/2012	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/16/2012	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/22/2012	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/29/2011	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/29/2011	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/28/2011	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	08/14/2009	(3)
Test Site	ATL	TE01	888001	12/20/2011	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 years.

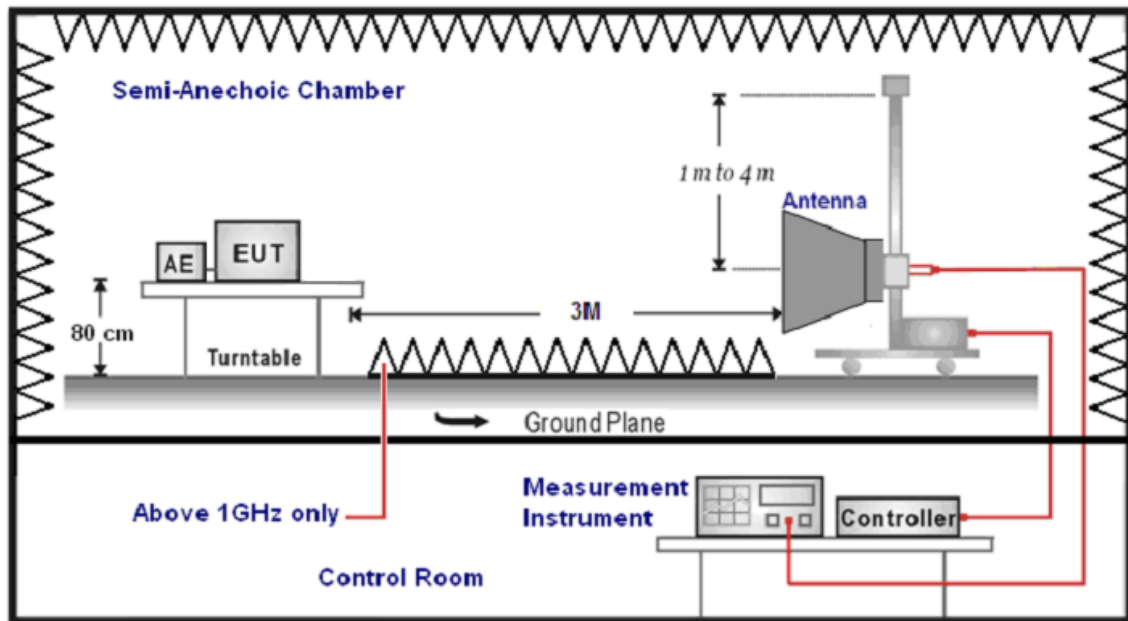
NOTE: N.C.R. = No Calibration Request.

5.3. Setup

Below 1GHz



Above 1GHz



5.4. Test Procedure

Final radiation measurements were made on a three-meter, Semi Anechoic Chamber. The EUT system was placed on a nonconductive turntable which is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 250 MHz to 2.5 GHz in order to cover the whole spectrum below 10th harmonic which could generate from the EUT. During the test, EUT was set to transmit continuously & Measurements spectrum range from 9 kHz to 26.5 GHz is investigated.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

SCHWARZBECK MESS-ELEKTRONIK Biconilog Antenna (model VULB9163) at 3 Meter and the SCHWARZBECK Double Ridged Guide Antenna (model BBHA9120D&9170) was used in frequencies 1 – 26.5 GHz at a distance of 1 meter. All test results were extrapolated to equivalent signal at 3 meters utilizing an inverse linear distance extrapolation Factor (20dB/decade).

For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission 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.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post – detector video filters were used in the test.

The spectrum analyzer's 6 dB bandwidth was set to 1 MHz, and the analyzer was operated in the peak detection mode, for frequencies both below and up 1 GHz. The average levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 microvolt (dBuV) into field intensity in micro volts per meter (uV/m).

The actual field intensity in decibels referenced to 1 microvolt in to field intensity in micro volts per meter (dBuV/m).

The actual field intensity in referenced to 1 microvolt per meter (dBuV/m) is determined by algebraically adding the measured reading in dBuV, the antenna factor (dB), and cable loss (dB) and Subtracting the gain of preamplifier (dB) is auto calculate in spectrum analyzer.

(1) $\text{Amplitude (dBuV/m)} = \text{FI (dBuV)} + \text{AF (dBuV)} + \text{CL (dBuV)} - \text{Gain (dB)}$

FI= Reading of the field intensity.

AF= Antenna factor.

CL= Cable loss.

P.S Amplitude is auto calculate in spectrum analyzer.

(2) $\text{Actual Amplitude (dBuV/m)} = \text{Amplitude (dBuV)} - \text{Dis(dB)}$

The FCC specified emission limits were calculated according the EUT operating frequency and by following linear interpolation equations:

(a) For fundamental frequency : Transmitter Output < +30dBm

(b) For spurious frequency : Spurious emission limits = fundamental emission limit /10

Data of measurement within this frequency range without mark in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5.5. Test Result

Below 1GHz

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 2		Date:		03/19/2012	
Ant.Polar.:		Horizontal		Test By:		Fly Lu	
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	92.5000	44.25	-15.36	28.89	43.50	-14.61	QP
2	202.5000	43.18	-14.02	29.16	43.50	-14.34	QP
3	390.0000	37.88	-8.70	29.18	46.00	-16.82	QP
4	546.0000	30.66	-6.45	24.21	46.00	-21.79	QP
5	780.0000	31.14	-1.87	29.27	46.00	-16.73	QP
6	924.0000	26.03	0.60	26.63	46.00	-19.37	QP

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 2		Date:		03/19/2012	
Ant.Polar.:		Vertical		Test By:		Fly Lu	
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	92.5000	43.36	-15.36	28.00	43.50	-15.50	QP
2	216.0000	41.02	-13.70	27.32	43.50	-16.18	QP
3	351.0000	36.86	-8.79	28.07	46.00	-17.93	QP
4	520.0000	34.78	-6.67	28.11	46.00	-17.89	QP
5	702.0000	28.61	-3.35	25.26	46.00	-20.74	QP
6	939.5000	25.91	0.80	26.71	46.00	-19.29	QP

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Above 1GHz

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 3		Date:		03/19/2012	
Frequency:		2412MHz		Test By:		Fly Lu	
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2785.000	40.26	1.44	41.70	74.00	-32.30	peak	H
4824.000	39.99	7.95	47.94	74.00	-26.06	peak	H
6278.000	35.22	12.10	47.32	74.00	-26.68	peak	H
3142.000	38.60	2.52	41.12	74.00	-32.88	peak	V
4824.000	45.37	7.95	53.32	74.00	-20.68	peak	V
4824.000	40.60	7.95	48.55	54.00	-5.45	AVG	V
6481.000	35.20	13.00	48.20	74.00	-25.80	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 3		Date:		03/19/2012	
Frequency:		2437MHz		Test By:		Fly Lu	
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2799.000	39.94	1.49	41.43	74.00	-32.57	peak	H
4874.000	40.73	8.11	48.84	74.00	-25.16	peak	H
6383.000	34.64	12.57	47.21	74.00	-26.79	peak	H
2757.000	39.70	1.34	41.04	74.00	-32.96	peak	V
4874.000	44.47	8.11	52.58	74.00	-21.42	peak	V
4874.000	42.53	8.11	50.64	54.00	-3.36	AVG	V
6320.000	34.93	12.29	47.22	74.00	-26.78	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	TH03M			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 3			Date:	03/19/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2806.000	40.52	1.52	42.04	74.00	-31.96	peak	H
4924.000	41.57	8.26	49.83	74.00	-24.17	peak	H
6425.000	34.97	12.76	47.73	74.00	-26.27	peak	H
2799.000	39.81	1.49	41.30	74.00	-32.70	peak	V
4924.000	41.66	8.26	49.92	74.00	-24.08	peak	V
6474.000	35.36	12.98	48.34	74.00	-25.66	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	TH03M			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	03/19/2012		
Frequency:	2412MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2820.000	40.27	1.56	41.83	74.00	-32.17	peak	H
4829.000	39.37	7.97	47.34	74.00	-26.66	peak	H
6180.000	35.10	11.66	46.76	74.00	-27.24	peak	H
2778.000	40.03	1.42	41.45	74.00	-32.55	peak	V
4479.000	37.36	6.88	44.24	74.00	-29.76	peak	V
5760.000	36.09	10.45	46.54	74.00	-27.46	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	TH03M			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	03/19/2012		
Frequency:	2437MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2785.000	40.44	1.44	41.88	74.00	-32.12	peak	H
4874.000	40.77	8.11	48.88	74.00	-25.12	peak	H
6446.000	35.18	12.85	48.03	74.00	-25.97	peak	H
2771.000	40.54	1.39	41.93	74.00	-32.07	peak	V
4874.000	43.76	8.11	51.87	74.00	-22.13	peak	V
6138.000	35.06	11.47	46.53	74.00	-27.47	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	TH03M			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 4			Date:	03/19/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2456.000	41.43	0.23	41.66	74.00	-32.34	peak	H
4924.000	40.97	8.26	49.23	74.00	-24.77	peak	H
6320.000	35.50	12.29	47.79	74.00	-26.21	peak	H
2435.000	41.11	0.15	41.26	74.00	-32.74	peak	V
4920.000	40.62	8.26	48.88	74.00	-25.12	peak	V
7384.000	38.25	15.87	54.12	74.00	-19.88	peak	V
7386.000	28.24	15.88	44.12	54.00	-9.88	AVG	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 5		Date:		03/19/2012	
Frequency:		2412MHz		Test By:		Fly Lu	
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2799.000	40.64	1.49	42.13	74.00	-31.87	peak	H
4824.000	38.50	7.95	46.45	74.00	-27.55	peak	H
6425.000	34.92	12.76	47.68	74.00	-26.32	peak	H
2470.000	40.89	0.30	41.19	74.00	-32.81	peak	V
4824.000	40.09	7.95	48.04	74.00	-25.96	peak	V
6551.000	35.23	13.26	48.49	74.00	-25.51	peak	V

Standard:		FCC Part 15C		Test Distance:		3m	
Test item:		Radiated Emission		Power:		AC 120V/60Hz	
Model Number:		TH03M		Temp.(°C)/Hum.(%RH):		26(°C)/60%RH	
Mode:		Mode 5		Date:		03/19/2012	
Frequency:		2437MHz		Test By:		Fly Lu	
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2442.000	41.14	0.18	41.32	74.00	-32.68	peak	H
4874.000	40.09	8.11	48.20	74.00	-25.80	peak	H
6306.000	35.13	12.23	47.36	74.00	-26.64	peak	H
2456.000	41.04	0.23	41.27	74.00	-32.73	peak	V
4874.000	42.11	8.11	50.22	74.00	-23.78	peak	V
6530.000	35.22	13.19	48.41	74.00	-25.59	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	AC 120V/60Hz		
Model Number:	TH03M			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 5			Date:	03/19/2012		
Frequency:	2462MHz			Test By:	Fly Lu		
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2757.000	40.08	1.34	41.42	74.00	-32.58	peak	H
4924.000	39.77	8.26	48.03	74.00	-25.97	peak	H
6523.000	35.58	13.16	48.74	74.00	-25.26	peak	H
2463.000	40.75	0.27	41.02	74.00	-32.98	peak	V
4924.000	41.35	8.26	49.61	74.00	-24.39	peak	V
7386.000	46.35	15.88	62.23	74.00	-11.77	peak	V
7386.000	33.78	15.88	49.66	54.00	-4.34	AVG	V

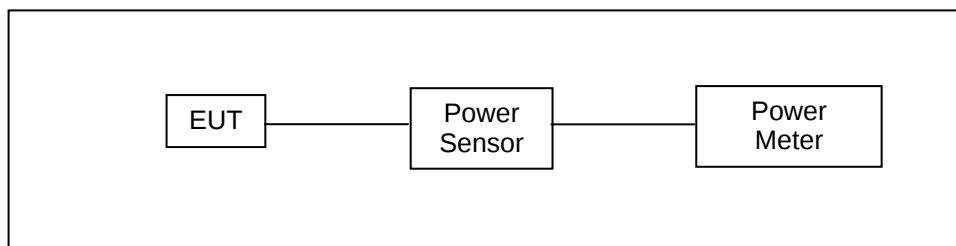
Standard:	FCC Part 15C				Test Distance:	3m		
Test item:	Radiated Emission				Power:	AC 120V/60Hz		
Model Number:	TH03M				Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	Mode 6				Date:	03/19/2012		
Modulation:	IEEE 802.11b				Test By:	Fly Lu		
Frequency:	2437MHz							
Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Peak Limit (dBuV/m)	AVG. Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2470.000	40.98	0.30	41.28	74.00	54.00	-32.72	peak	H
4430.000	37.03	6.72	43.75	74.00	54.00	-30.25	peak	H
5781.000	36.54	10.48	47.02	74.00	54.00	-26.98	peak	H
2799.000	39.50	1.49	40.99	74.00	54.00	-33.01	peak	V
4577.000	37.01	7.19	44.20	74.00	54.00	-29.80	peak	V
6054.000	35.60	11.10	46.70	74.00	54.00	-27.30	peak	V

6 Maximum Conducted Output Power Measurement

6.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm.

6.2. Test Setup



6.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Single Channel PK Power Sensor	Agilent	N1911A	MY45101619	07/19/2010	(2)
Wideband Power Meter	Agilent	N1921A	MY45241957	07/19/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

6.4. Test Procedure

The tests below are run with the EUT's transmitter set at high power in TX mode. The EUT is needed to force selection of output power level and channel number. While testing, EUT was set to transmit continuously. Remove the Subjective device's antenna and connect the RF output port to power sensor. The maximum peak output power shall not exceed 1 watt.

Use a direct connection between the antenna port of transmitter and the power sensor, for prevent the power sensor input attenuation 40-50 dB. Set the RBW Bandwidth of the emission or use a channel power meter mode.

For antennas with gains of 6 dBi or less, maximum allowed transmitter output is 1 watt (+30 dBm). For antennas with gains greater than 6 dBi, transmitter output level must be decreased by an amount equal to (GAIN - 6)/3 dBm.

The antenna port of the EUT was connected to the input of a power sensor. Power was read directly and cable loss correction was added to the reading to obtain power at the EUT antenna terminals.

6.5. Test Result

Model Number	TH03M					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11b Link Mode					
Date of Test	03/19/2012			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1	10.88	0.012	13.26	0.021	< 30
2437		10.08	0.010	12.51	0.018	< 30
2462		9.72	0.009	12.10	0.016	< 30
2412	11	10.71	0.012	13.14	0.021	< 30
2437		9.95	0.010	12.29	0.017	< 30
2462		9.52	0.009	11.88	0.015	< 30

Model Number	TH03M					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11g Link Mode					
Date of Test	03/19/2012			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6	14.68	0.029	23.41	0.219	< 30
2437		13.93	0.025	22.28	0.169	< 30
2462		13.41	0.022	19.89	0.097	< 30
2412	54	10.32	0.011	22.03	0.160	< 30
2437		9.51	0.009	20.66	0.116	< 30
2462		9.16	0.008	19.57	0.091	< 30

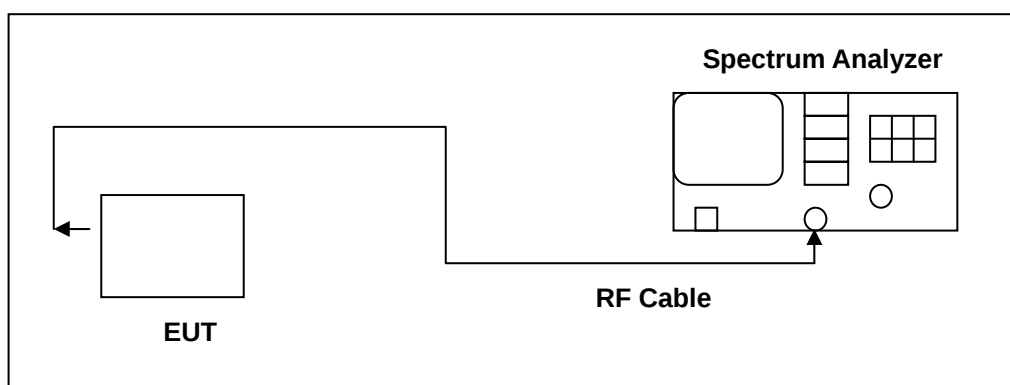
Model Number	TH03M					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode					
Date of Test	03/19/2012			Test Site	TE02	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	MCS0	10.55	0.011	22.37	0.173	< 30
2437		9.78	0.010	20.43	0.110	< 30
2462		9.39	0.009	19.34	0.086	< 30
2412	MCS7	9.35	0.009	21.25	0.133	< 30
2437		8.50	0.007	20.19	0.104	< 30
2462		8.21	0.007	19.19	0.083	< 30

7 6dB RF Bandwidth Measurement

7.1. Limit

Systems using digital modulation techniques may operate in the 2400–2483.5 MHz bands. The minimum 6 dB band-width shall be at least 500 kHz.

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

7.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A peak output reading was taken, a DISPLAY line was drawn 6 dB lower than peak level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

The test was performed at 3 channels (Channel 1, 6, 11)

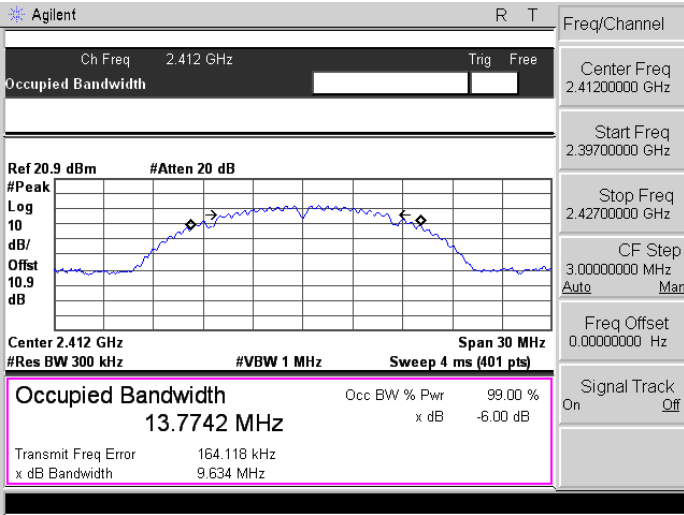
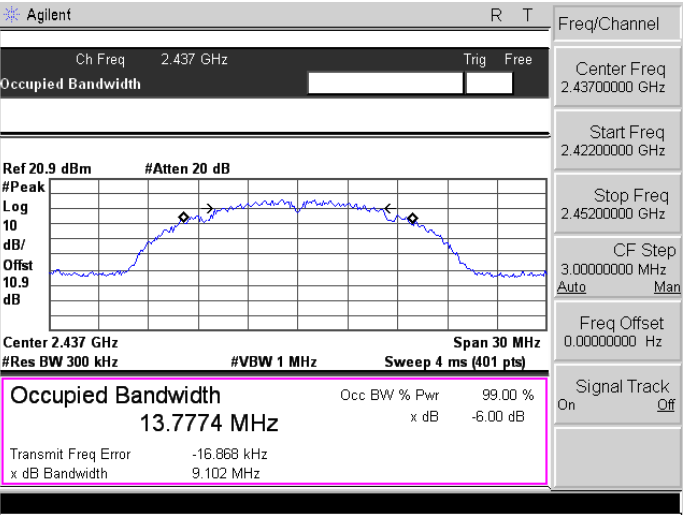
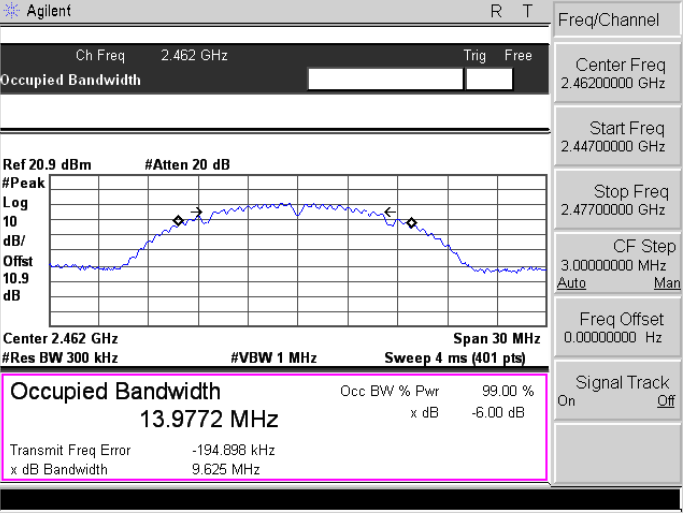
7.5. Test Result

Model Number	TH03M		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	9634	> 500	
2437	9102	> 500	
2462	9625	> 500	

Model Number	TH03M		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	03/20/2012	Test Site	TE06
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	16235	> 500	
2437	16123	> 500	
2462	15928	> 500	

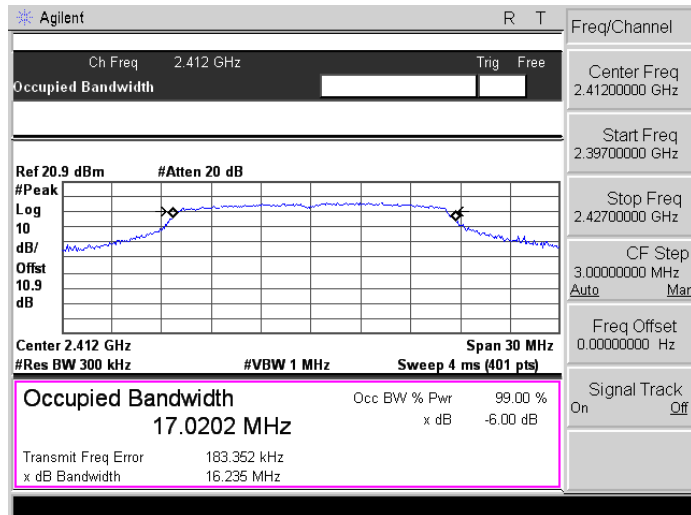
Model Number	TH03M		
Test Item	6dB RF Bandwidth		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	17247	> 500	
2437	17096	> 500	
2462	17263	> 500	

7.6. Test Graphs

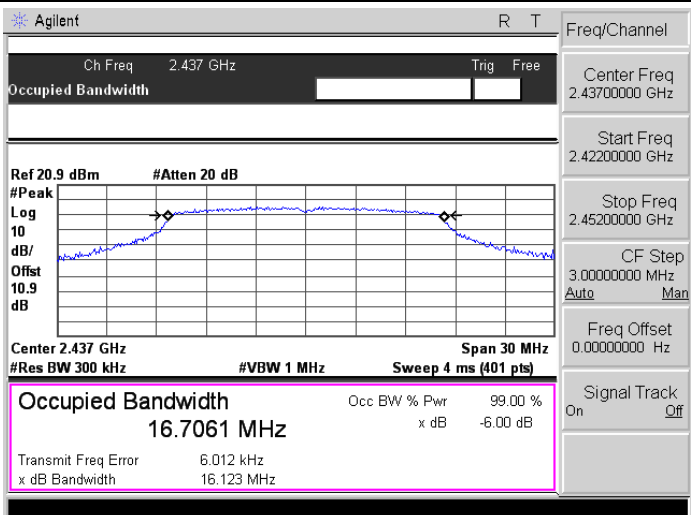
Mode 3: IEEE 802.11b Link Mode	
2412	 Agilent R T Ch Freq 2.412 GHz Trig Free Occupied Bandwidth Ref 20.9 dBm #Atten 20 dB #Peak Log 10 dB/Offset 10.9 dB Center 2.412 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.7742 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error 164.118 kHz x dB Bandwidth 9.634 MHz Freq/Channel Center Freq 2.41200000 GHz Start Freq 2.39700000 GHz Stop Freq 2.42700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
2437	 Agilent R T Ch Freq 2.437 GHz Trig Free Occupied Bandwidth Ref 20.9 dBm #Atten 20 dB #Peak Log 10 dB/Offset 10.9 dB Center 2.437 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.7774 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -16.868 kHz x dB Bandwidth 9.102 MHz Freq/Channel Center Freq 2.43700000 GHz Start Freq 2.42200000 GHz Stop Freq 2.45200000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off
2462	 Agilent R T Ch Freq 2.462 GHz Trig Free Occupied Bandwidth Ref 20.9 dBm #Atten 20 dB #Peak Log 10 dB/Offset 10.9 dB Center 2.462 GHz Span 30 MHz #Res BW 300 kHz #VBW 1 MHz Sweep 4 ms (401 pts) Occupied Bandwidth 13.9772 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB Transmit Freq Error -194.898 kHz x dB Bandwidth 9.625 MHz Freq/Channel Center Freq 2.46200000 GHz Start Freq 2.44700000 GHz Stop Freq 2.47700000 GHz CF Step 3.00000000 MHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off

Mode 4: IEEE 802.11g Link Mode

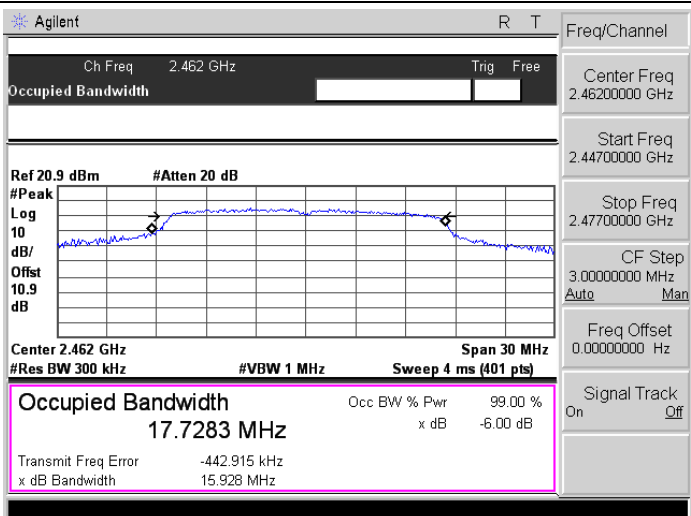
2412



2437

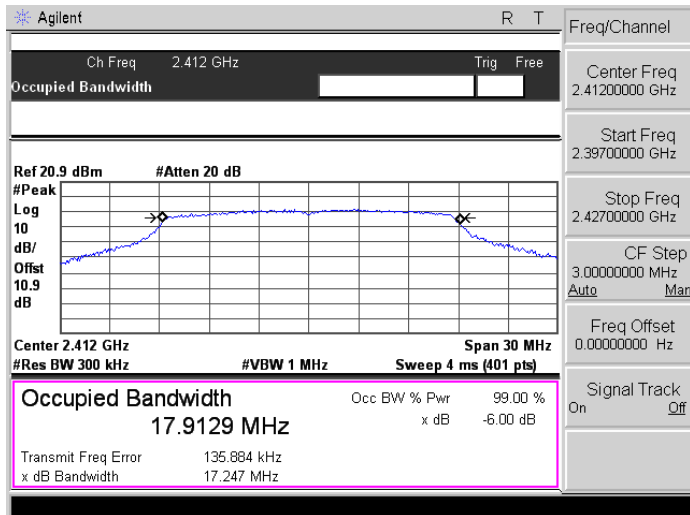


2462

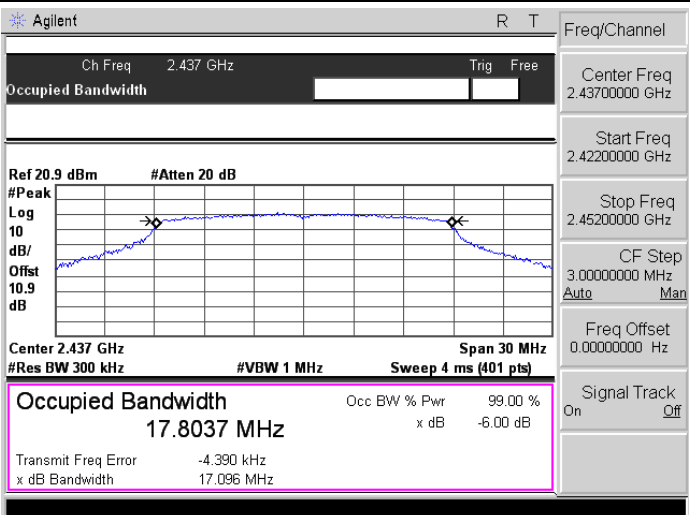


Mode 5: draft 802.11n Standard-20MHz Link Mode

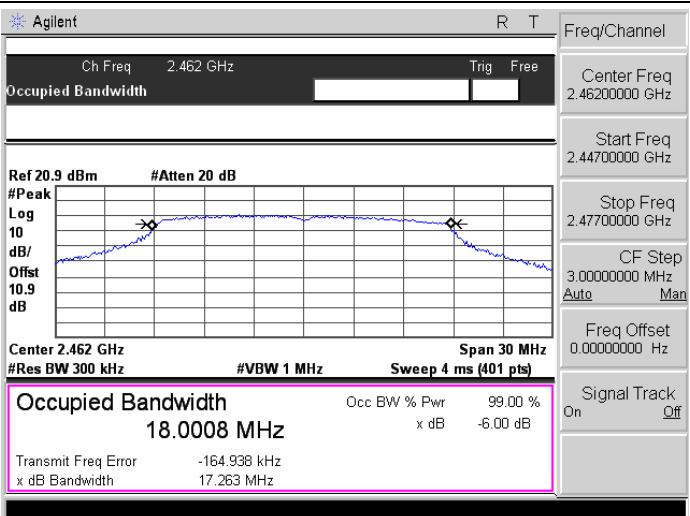
2412



2437



2462

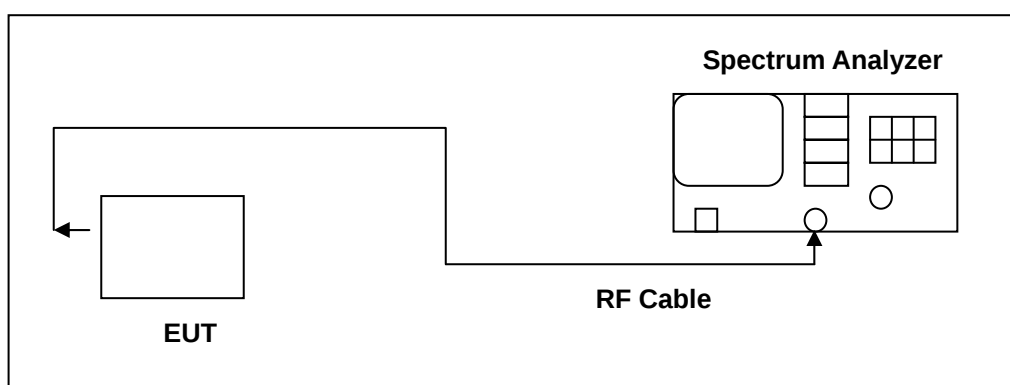


8 Maximum Power Density Measurement

8.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.2. Test Setup



8.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

8.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The spectrum analyzer RES BW was set to 3 kHz. The START and STOP frequencies were set to the band edges of the maximum output pass band. If there is no clear maximum amplitude in any given portion of the band, it may be necessary to make measurements at a number of bands defined by several START and STOP frequency pairs. The specification calls for a 1 second interval at each 3 kHz bandwidth; total SWEEP TIME is calculated as follows:

$$\text{SWEEP TIME (SEC)} = (\text{Fstop, kHz} - \text{Fstart, kHz}) / 3 \text{ kHz}$$

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

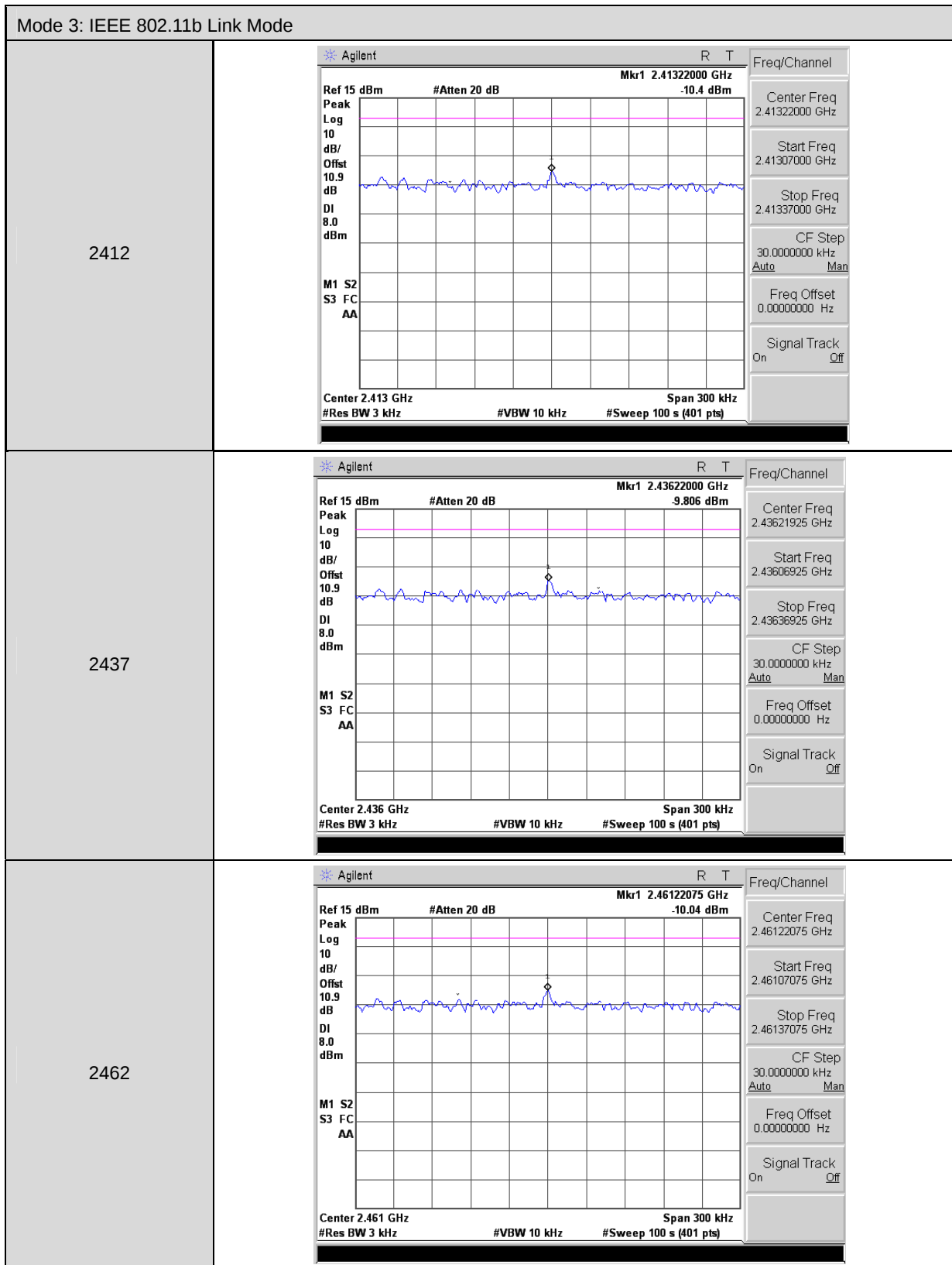
8.5. Test Result

Model Number	TH03M		
Test Item	Maximum Power Density		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (dBm)	Limit (dBm)	
2412	-10.400	< 8	
2437	-9.806	< 8	
2462	-10.040	< 8	

Model Number	TH03M		
Test Item	Maximum Power Density		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (dBm)	Limit (dBm)	
2412	-8.916	< 8	
2437	-9.569	< 8	
2462	-10.840	< 8	

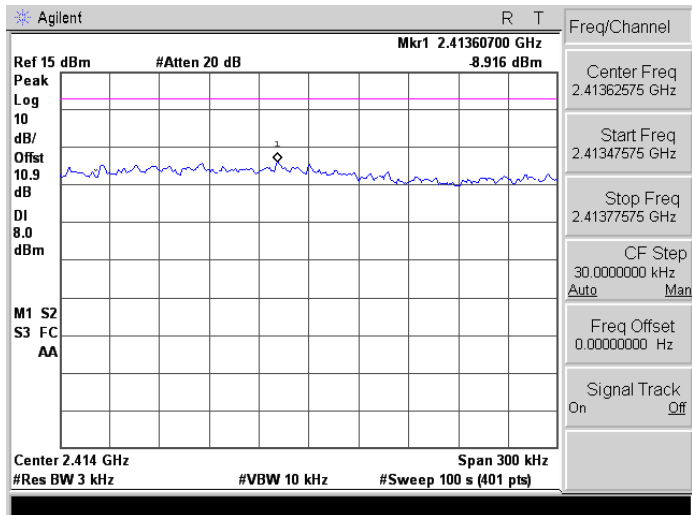
Model Number	TH03M		
Test Item	Maximum Power Density		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (dBm)	Limit (dBm)	
2412	-12.310	< 8	
2437	-13.930	< 8	
2462	-14.000	< 8	

8.6. Test Graphs

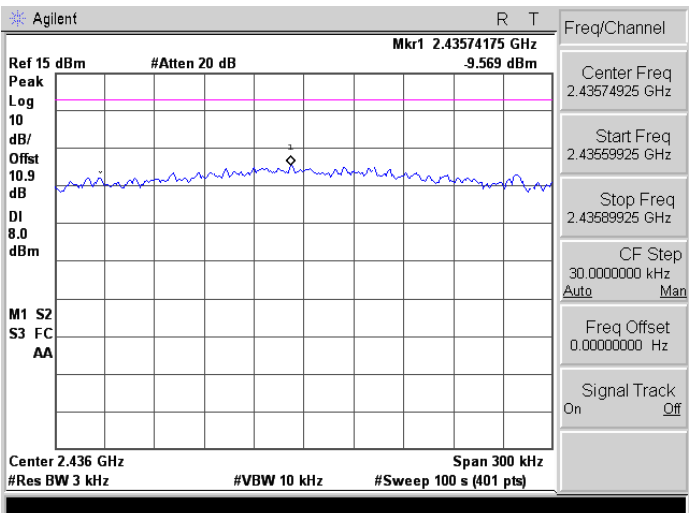


Mode 4: IEEE 802.11g Link Mode

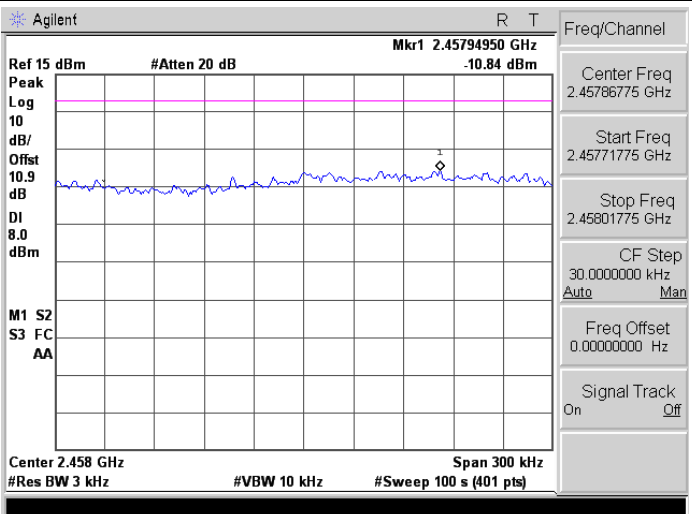
2412



2437

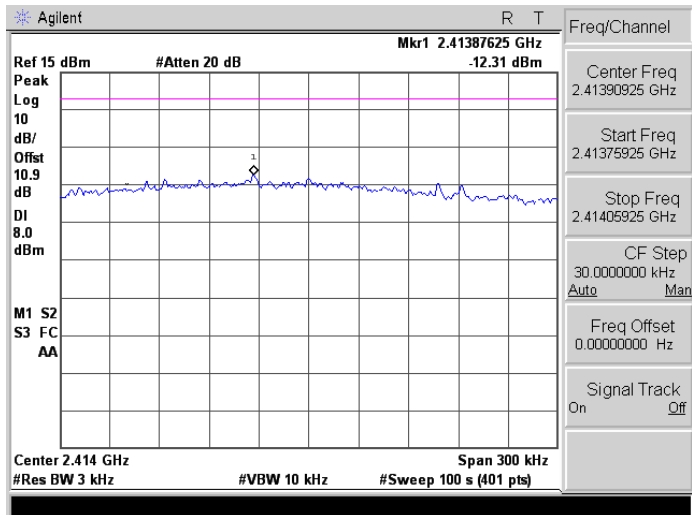


2462

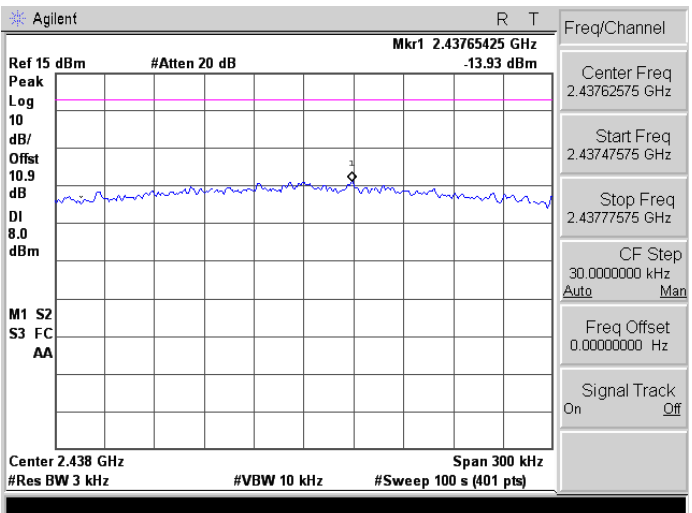


Mode 5: draft 802.11n Standard-20MHz Link Mode

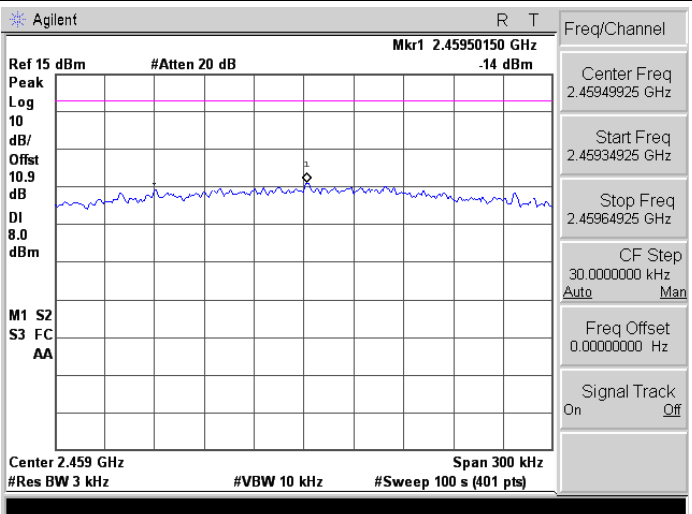
2412



2437



2462

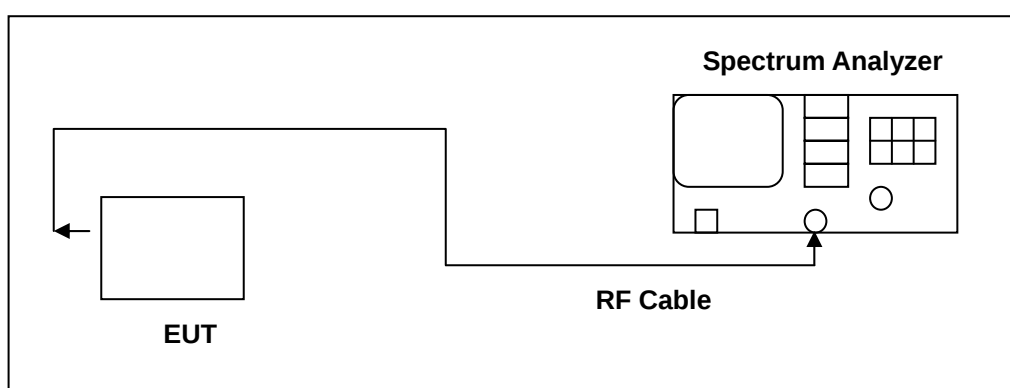


9 Out of Band Conducted Emissions Measurement

9.1. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power.

9.2. Test Setup



9.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/07/2011	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

9.4. Test Procedure

In any 100 kHz bandwidth outside the EUT pass band, the RF power produced by the modulation products of the spreading sequence, the information sequence, and the carrier frequency shall be at least 20 dB below that of the maximum in-band 100 kHz emission, antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

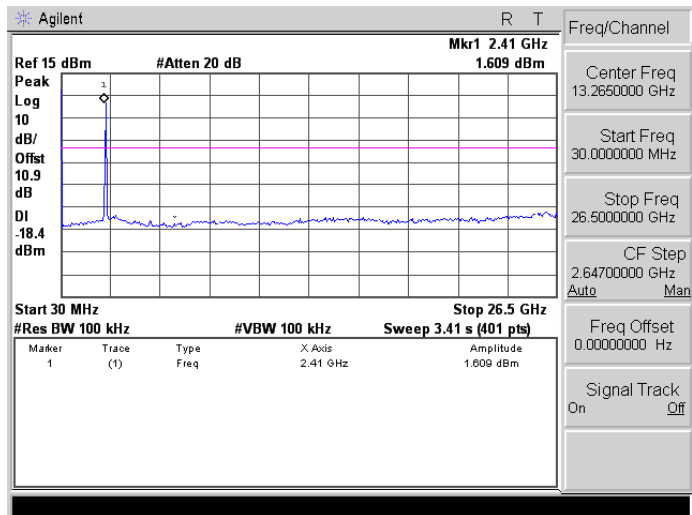
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the pass band. The test was performed at 3 channels (Channel 1, 6, 11)

9.5. Test Graphs

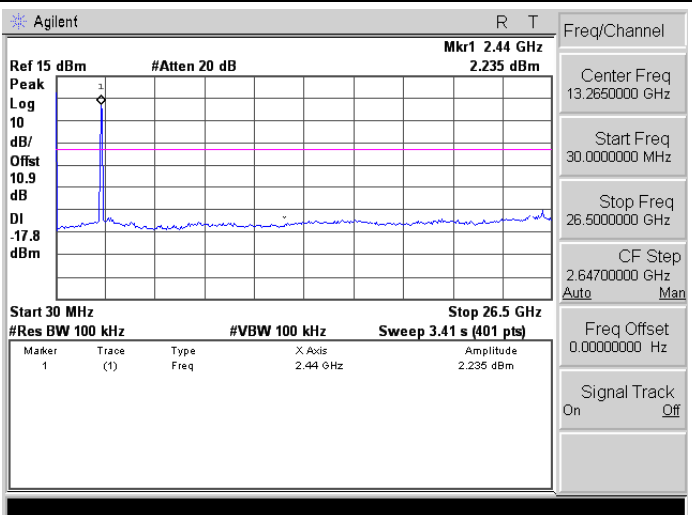
Mode 3: IEEE 802.11b Link Mode																
2412	Agilent R T Ref 15 dBm #Atten 20 dB Mkr2 4.79 GHz 47.09 dBm Peak Log 10 dB/Offst 10.9 dB DI -20.4 dBm Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts) <table><tr><td>Marker</td><td>Trace</td><td>Type</td><td>X Axis</td><td>Amplitude</td></tr><tr><td>1</td><td>(1)</td><td>Freq</td><td>2.41 GHz</td><td>-0.439 dBm</td></tr><tr><td>2</td><td>(1)</td><td>Freq</td><td>4.79 GHz</td><td>-47.09 dBm</td></tr></table> Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.41 GHz	-0.439 dBm	2	(1)	Freq	4.79 GHz	-47.09 dBm
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.41 GHz	-0.439 dBm												
2	(1)	Freq	4.79 GHz	-47.09 dBm												
2437	Agilent R T Ref 15 dBm #Atten 20 dB Mkr1 2.44 GHz 1.543 dBm Peak Log 10 dB/Offst 10.9 dB DI -18.5 dBm Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts) <table><tr><td>Marker</td><td>Trace</td><td>Type</td><td>X Axis</td><td>Amplitude</td></tr><tr><td>1</td><td>(1)</td><td>Freq</td><td>2.44 GHz</td><td>1.543 dBm</td></tr></table> Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.44 GHz	1.543 dBm					
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.44 GHz	1.543 dBm												
2462	Agilent R T Ref 15 dBm #Atten 20 dB Mkr1 2.46 GHz 0.269 dBm Peak Log 10 dB/Offst 10.9 dB DI -19.7 dBm Start 30 MHz Stop 26.5 GHz #Res BW 100 kHz #VBW 100 kHz Sweep 3.41 s (401 pts) <table><tr><td>Marker</td><td>Trace</td><td>Type</td><td>X Axis</td><td>Amplitude</td></tr><tr><td>1</td><td>(1)</td><td>Freq</td><td>2.46 GHz</td><td>0.269 dBm</td></tr></table> Freq/Channel Center Freq 13.2650000 GHz Start Freq 30.0000000 MHz Stop Freq 26.5000000 GHz CF Step 2.64700000 GHz Auto Man Freq Offset 0.00000000 Hz Signal Track On Off	Marker	Trace	Type	X Axis	Amplitude	1	(1)	Freq	2.46 GHz	0.269 dBm					
Marker	Trace	Type	X Axis	Amplitude												
1	(1)	Freq	2.46 GHz	0.269 dBm												

Mode 4: IEEE 802.11g Link Mode

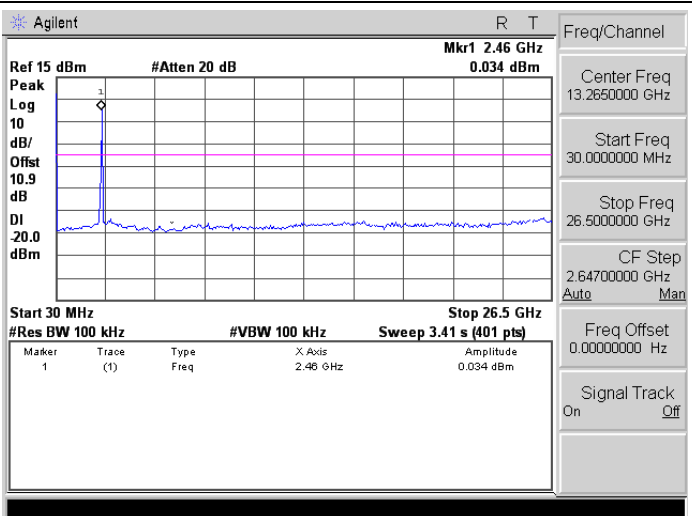
2412



2437

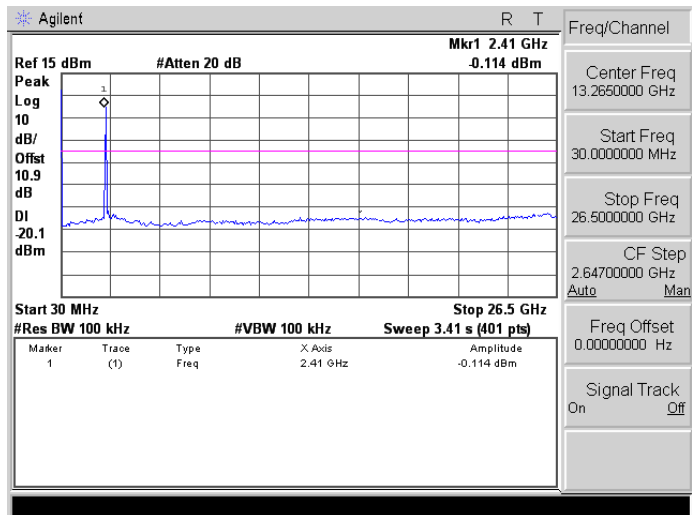


2462

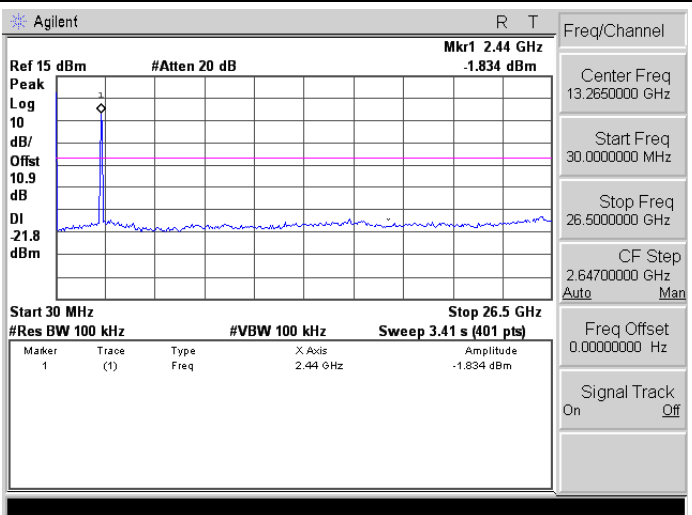


Mode 5: draft 802.11n Standard-20MHz Link Mode

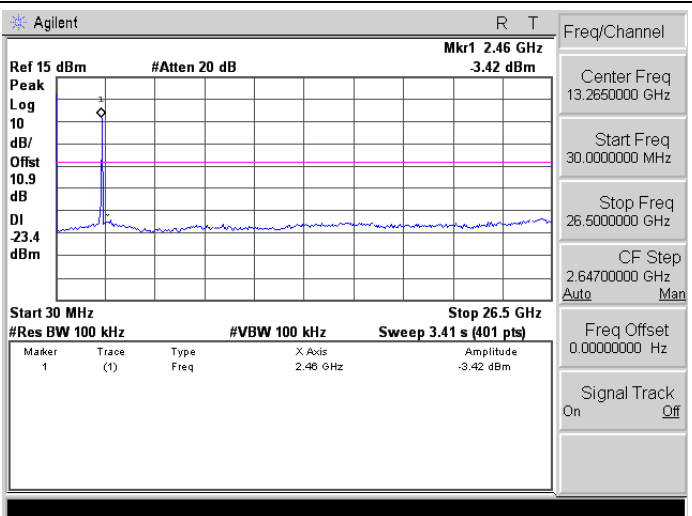
2412



2437



2462

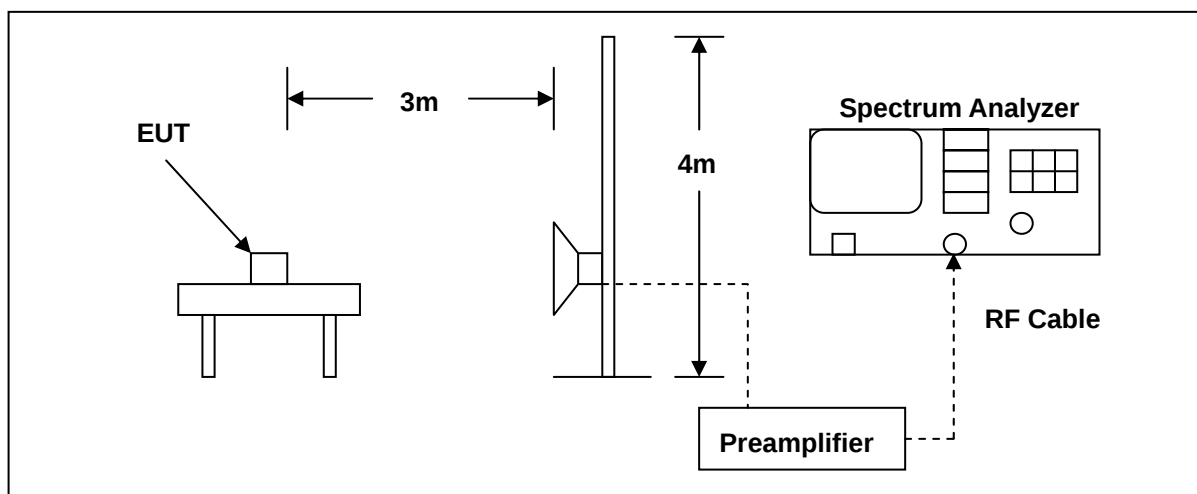


10 Band Edges Measurement

10.1.Limit

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

10.2.Test Setup



10.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/07/2011	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/22/2012	(1)
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	9120D	9120D-550	06/29/2011	(1)
Test Site	ATL	TE01	888001	12/20/2011	-----

Remark: ⁽¹⁾ Calibration period 1 year. ⁽²⁾ Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

10.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to DTS test procedure of Oct 2002 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

The emissions on the harmonics frequencies, the limits, and the margin of compliance are presented. These tests were made when the transmitter was in full radiated power. The additional test was performed to show compliance with the requirement at the band-edge frequency 2483.5 MHz and up to 2500 MHz and at 2390.0 MHz.

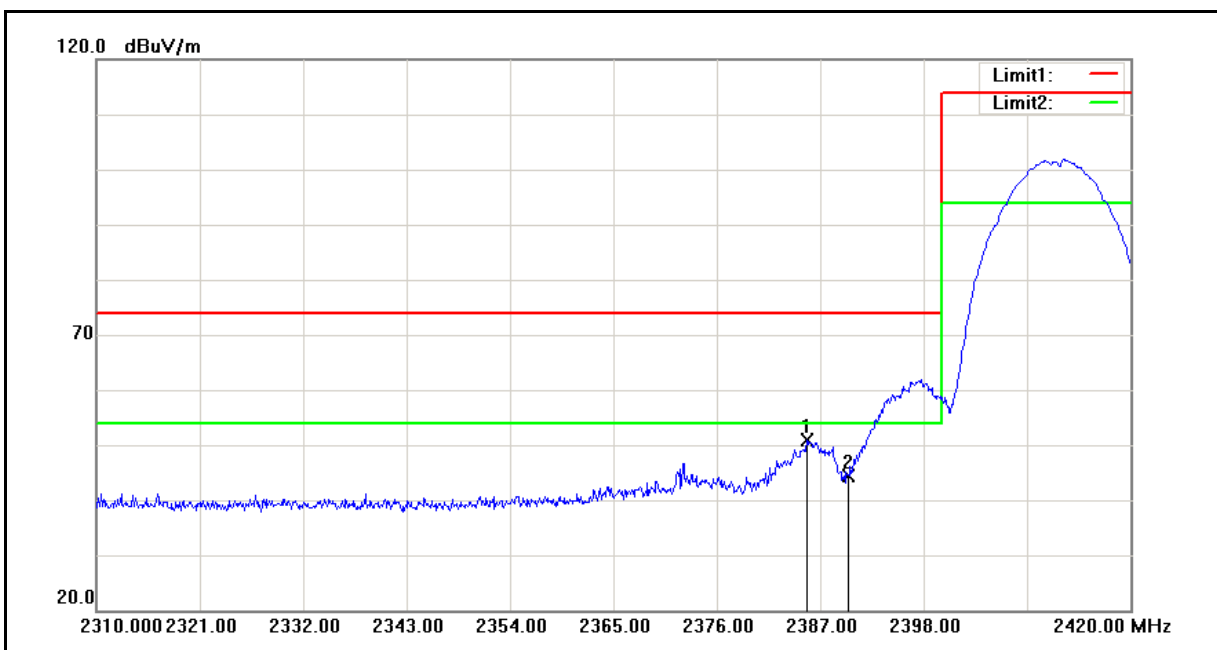
The transmitter was configured with the worst case antenna and setup to transmit at the highest channel. Then the field strength was measured at 2483.5 MHz.

The transmitter was then configured with the worst case antenna and setup to transmit at the lowest channel. Then the field strength was measured at 2390.0 MHz. These tests were performed at 4 different bit rates.

For measurements the resolution bandwidth is set to 1 MHz, and then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

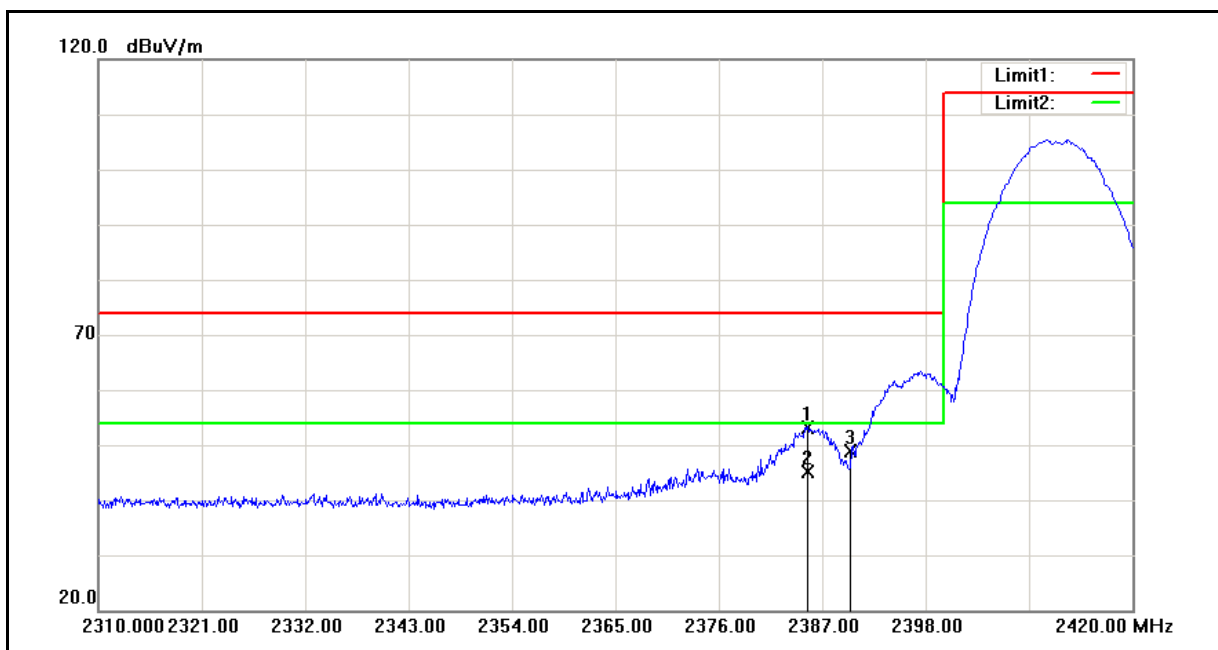
10.5.Test Result

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



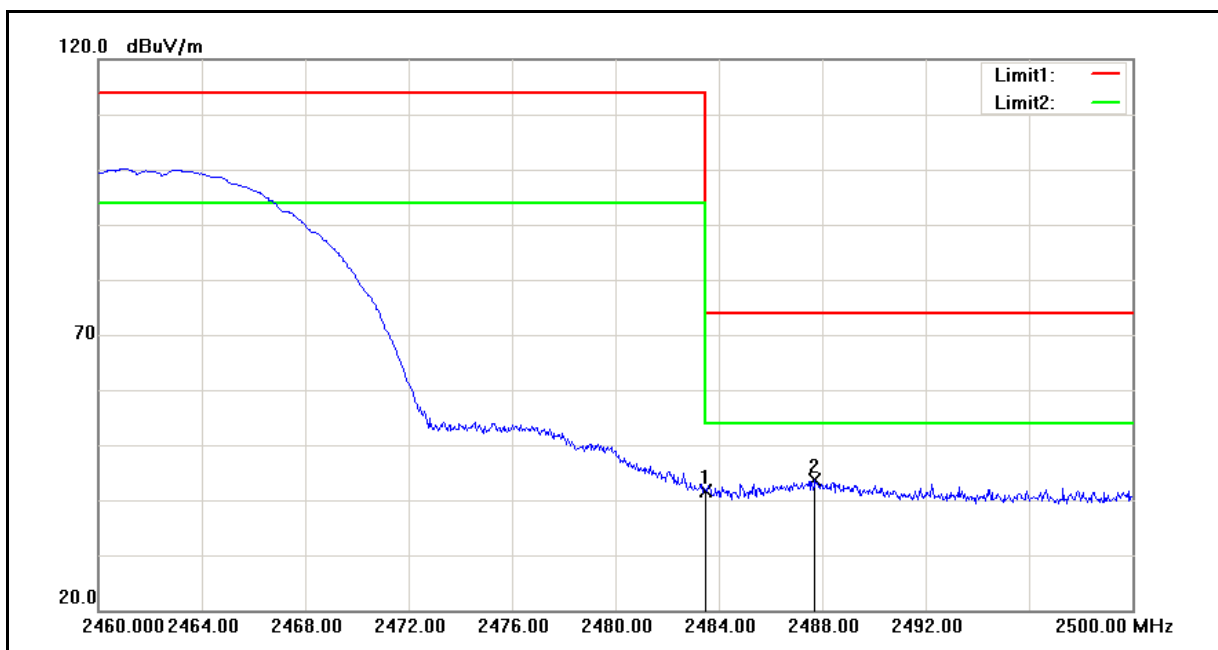
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.570	51.07	-0.08	50.99	74.00	-23.01	peak
2	2390.000	44.36	-0.06	44.30	74.00	-29.70	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



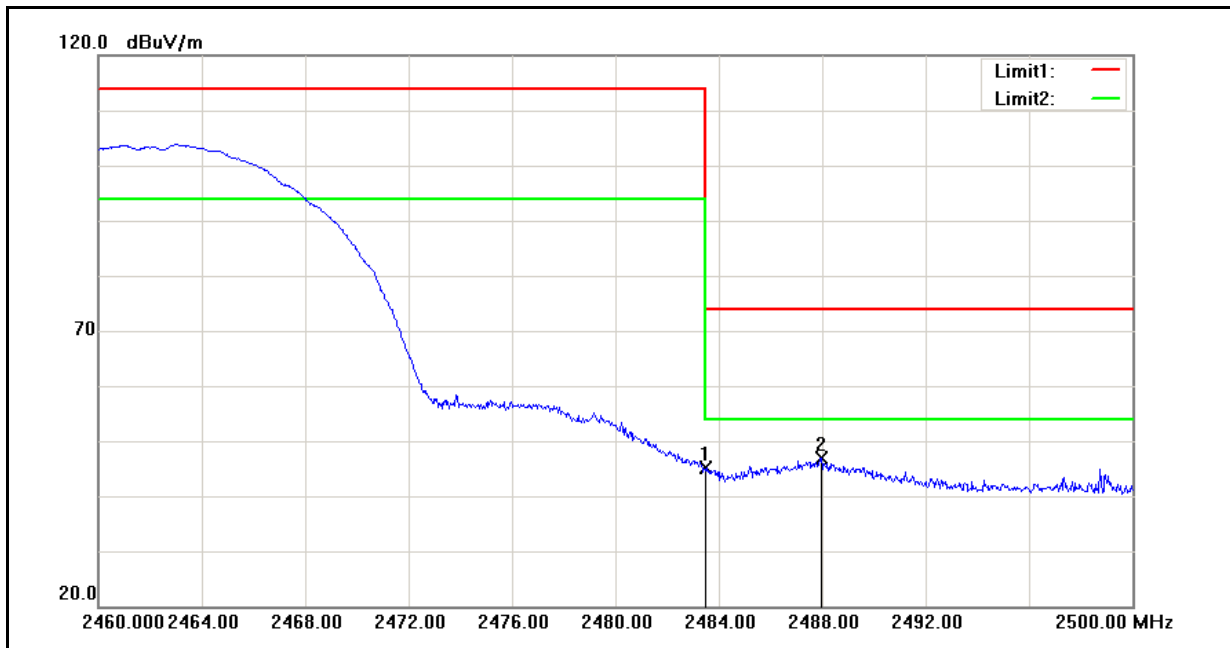
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2385.460	53.33	-0.08	53.25	74.00	-20.75	peak
2	2385.460	45.23	-0.08	45.15	54.00	-8.85	AVG
3	2390.000	48.91	-0.06	48.85	74.00	-25.15	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



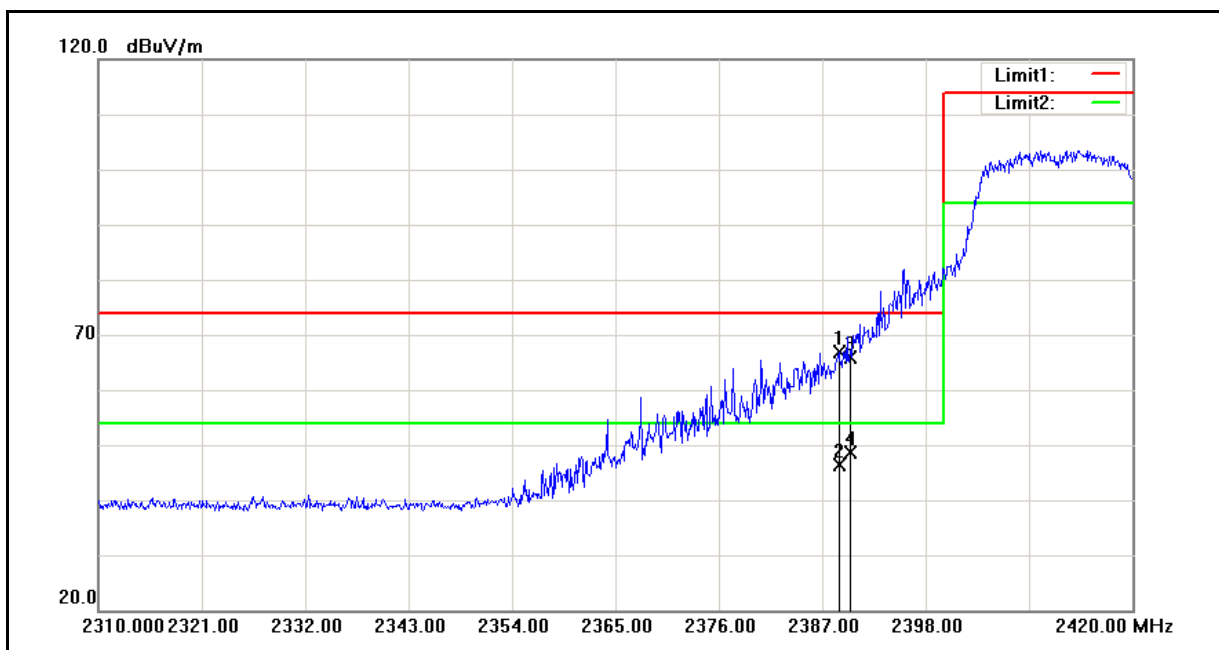
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	41.35	0.35	41.70	74.00	-32.30	peak
2	2487.720	43.15	0.37	43.52	74.00	-30.48	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 3	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



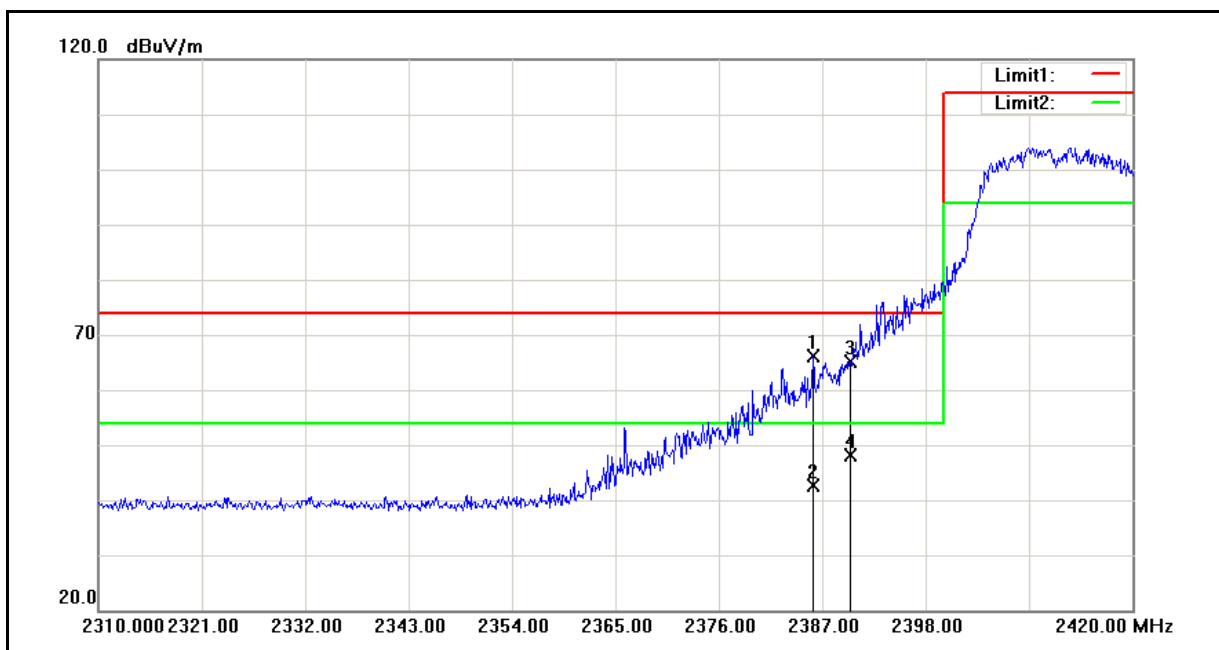
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	44.78	0.35	45.13	74.00	-28.87	peak
2	2487.960	46.61	0.37	46.98	74.00	-27.02	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



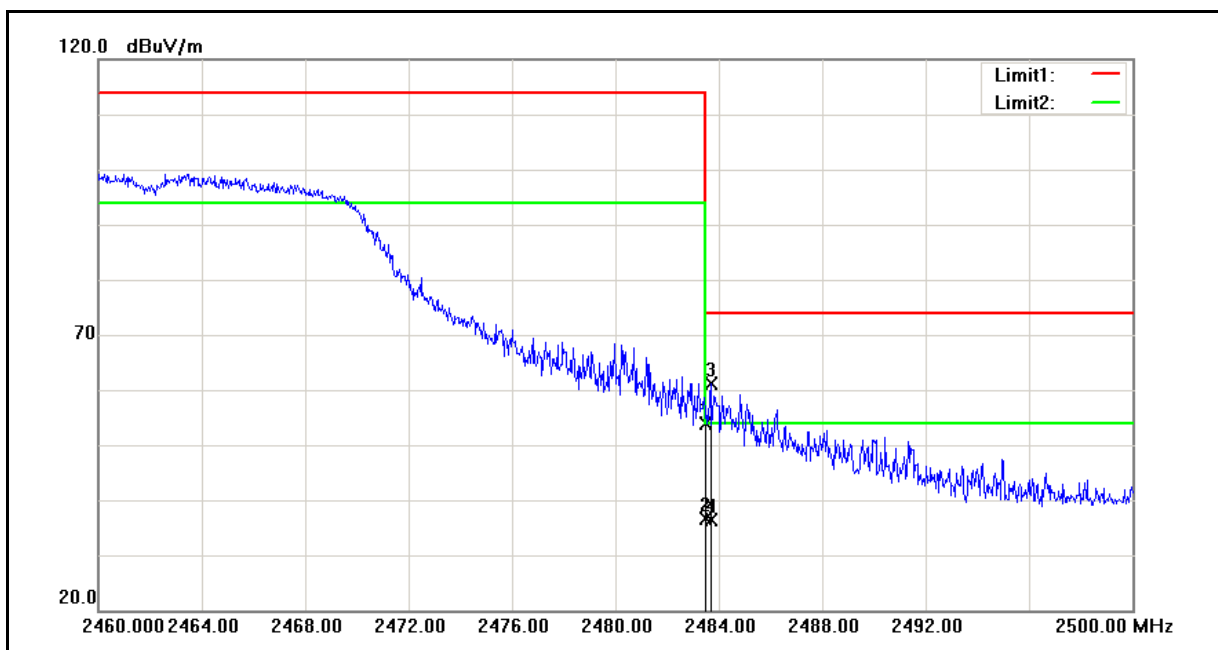
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.760	67.06	-0.06	67.00	74.00	-7.00	peak
2	2388.760	46.51	-0.06	46.45	54.00	-7.55	AVG
3	2390.000	65.84	-0.06	65.78	74.00	-8.22	peak
4	2390.000	48.67	-0.06	48.61	54.00	-5.39	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



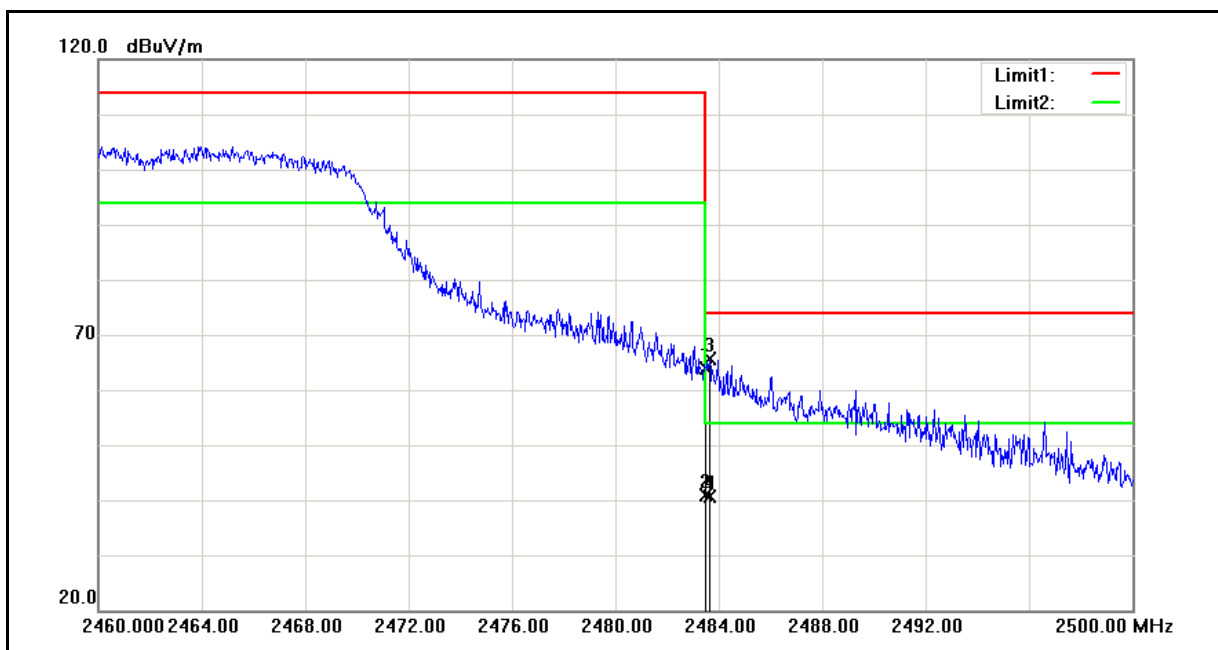
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.010	66.10	-0.08	66.02	74.00	-7.98	peak
2	2386.010	42.70	-0.08	42.62	54.00	-11.38	AVG
3	2390.000	65.28	-0.06	65.22	74.00	-8.78	peak
4	2390.000	48.28	-0.06	48.22	54.00	-5.78	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



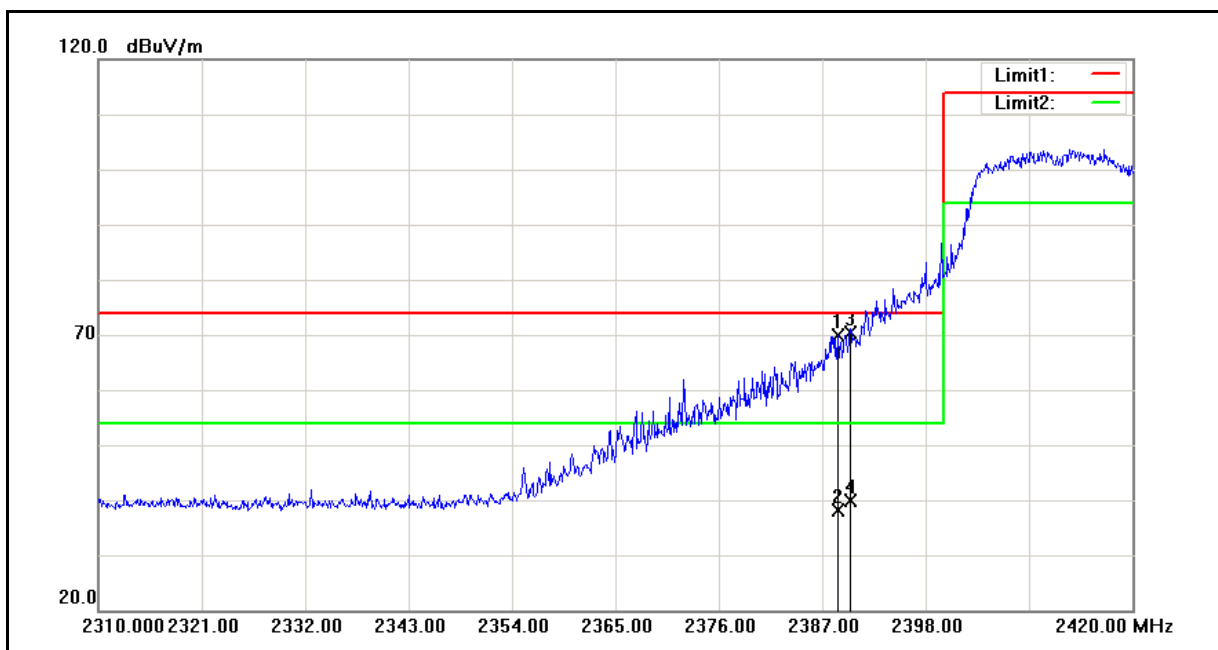
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	53.41	0.35	53.76	74.00	-20.24	peak
2	2483.500	36.27	0.35	36.62	54.00	-17.38	AVG
3	2483.680	60.81	0.35	61.16	74.00	-12.84	peak
4	2483.680	35.95	0.35	36.30	54.00	-17.70	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 4	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



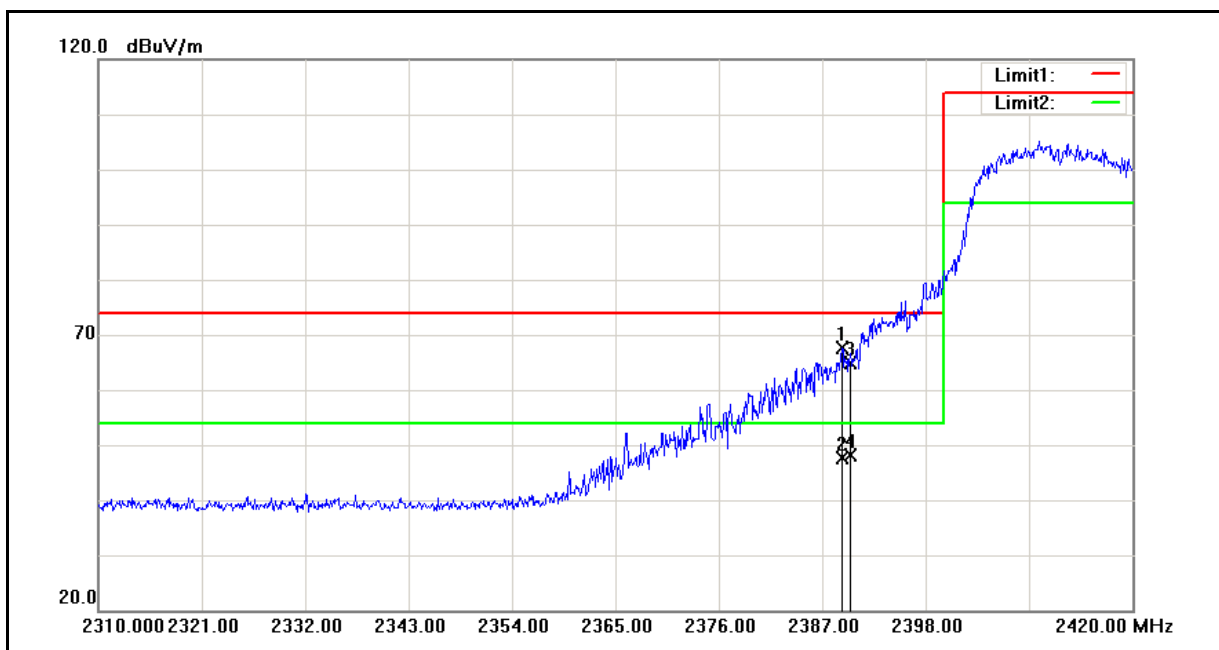
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	63.55	0.35	63.90	74.00	-10.10	peak
2	2483.500	40.54	0.35	40.89	54.00	-13.11	AVG
3	2483.640	65.26	0.35	65.61	74.00	-8.39	peak
4	2483.640	40.25	0.35	40.60	54.00	-13.40	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



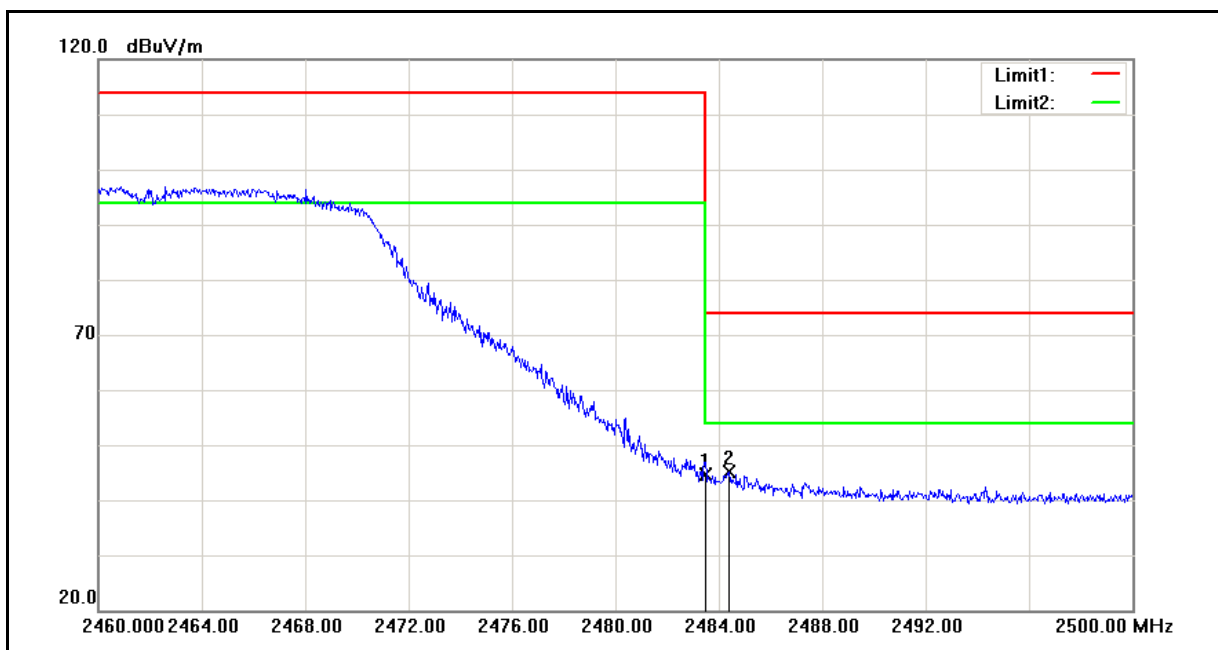
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2388.650	69.91	-0.06	69.85	74.00	-4.15	peak
2	2388.650	38.27	-0.06	38.21	54.00	-15.79	AVG
3	2390.000	70.37	-0.06	70.31	74.00	-3.69	peak
4	2390.000	39.85	-0.06	39.79	54.00	-14.21	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	03/19/2012
Frequency:	2412 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



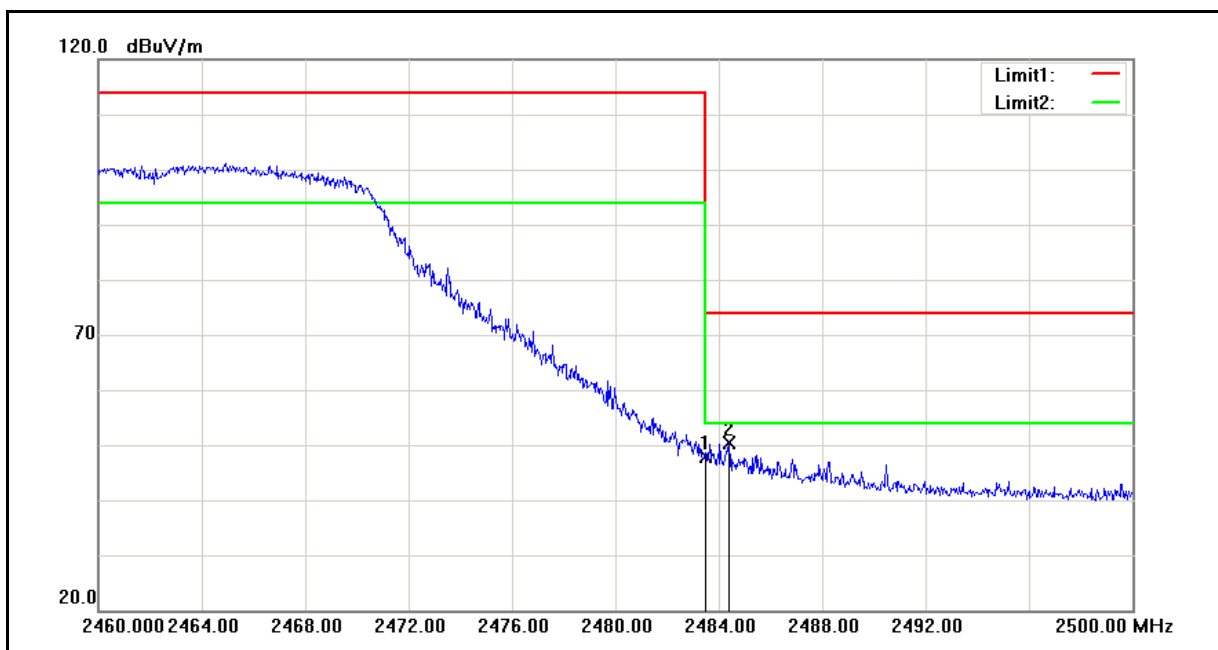
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.090	67.58	-0.06	67.52	74.00	-6.48	peak
2	2389.090	47.75	-0.06	47.69	54.00	-6.31	AVG
3	2390.000	65.03	-0.06	64.97	74.00	-9.03	peak
4	2390.000	48.14	-0.06	48.08	54.00	-5.92	AVG

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Horizontal		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	44.22	0.35	44.57	74.00	-29.43	peak
2	2484.400	44.68	0.35	45.03	74.00	-28.97	peak

Standard:	FCC Part 15C	Test Distance:	3m
Test item:	Radiated Emission	Power:	AC 120V/60Hz
Model Number:	TH03M	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	Mode 5	Date:	03/19/2012
Frequency:	2462 MHz	Test By:	Fly Lu
Ant.Polar.:	Vertical		



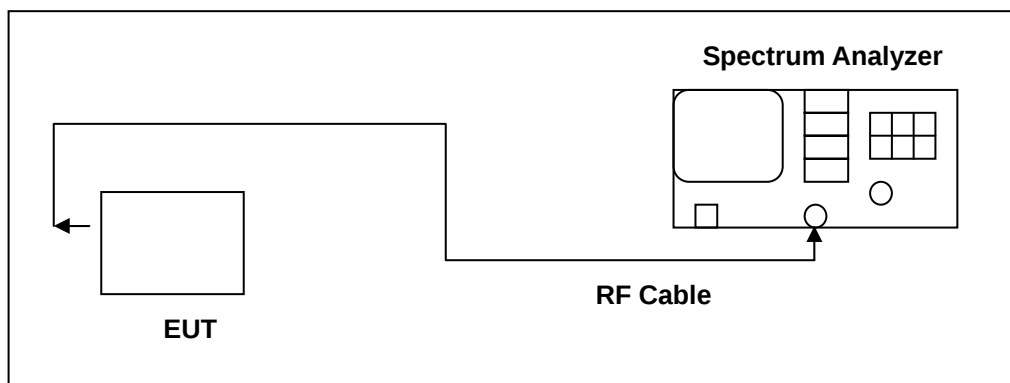
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	47.56	0.35	47.91	74.00	-26.09	peak
2	2484.400	49.91	0.35	50.26	74.00	-23.74	peak

11 99 % Occupied Bandwidth Measurement

11.1.Limit

N/A

11.2.Test Setup



11.3.Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/28/2010	(2)
Test Site	ATL	TE02	TE02	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years.

NOTE: N.C.R. = No Calibration Request.

11.4.Test Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.

The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.

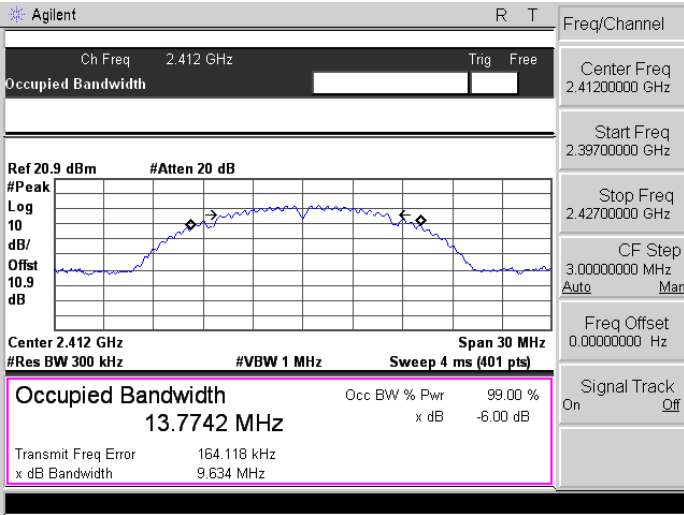
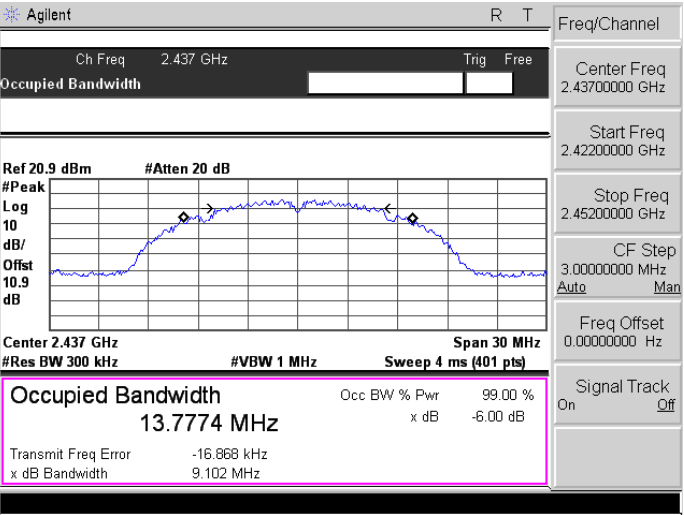
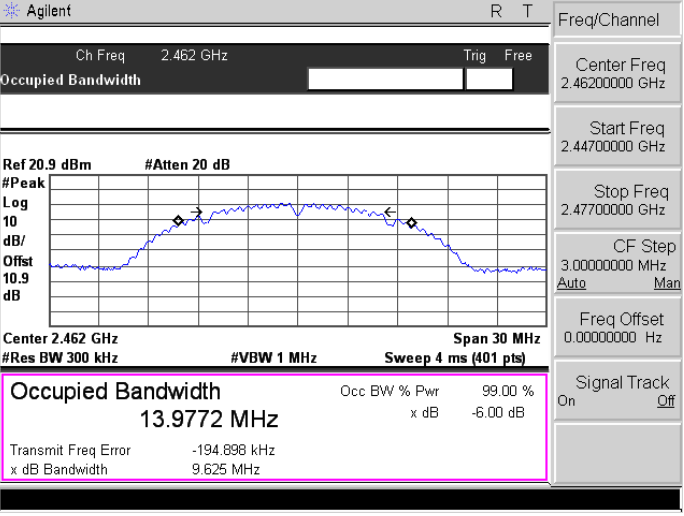
11.5. Test Result

Model Number	TH03M		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11b Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	13774.2	-----	
2437	13777.4	-----	
2462	13977.2	-----	

Model Number	TH03M		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11g Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	17020.2	-----	
2437	16706.1	-----	
2462	17728.3	-----	

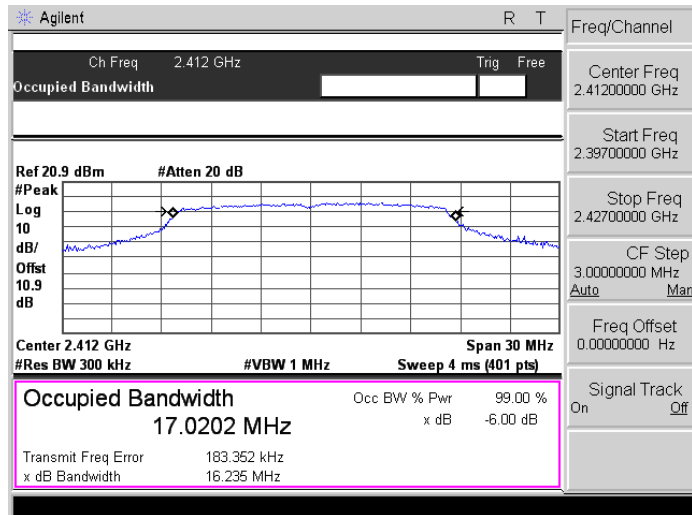
Model Number	TH03M		
Test Item	99 % Occupied Bandwidth		
Test Mode	Mode 5: draft 802.11n Standard-20MHz Link Mode		
Date of Test	03/20/2012	Test Site	TE02
Frequency (MHz)	Measurement (kHz)	Limit (kHz)	
2412	17912.9	-----	
2437	17803.7	-----	
2462	18000.8	-----	

11.6. Test Graphs

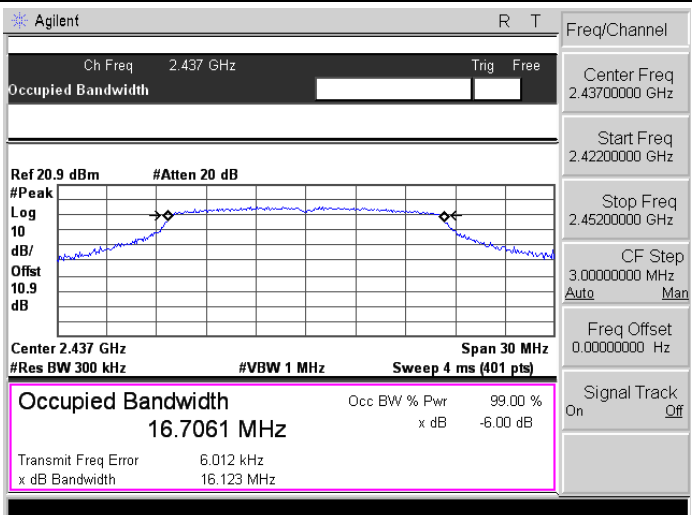
Mode 3: IEEE 802.11b Link Mode	
2412	
2437	
2462	

Mode 4: IEEE 802.11g Link Mode

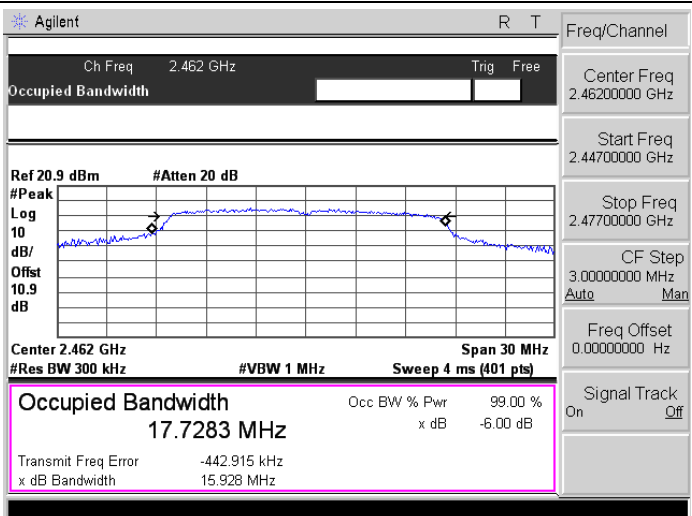
2412



2437

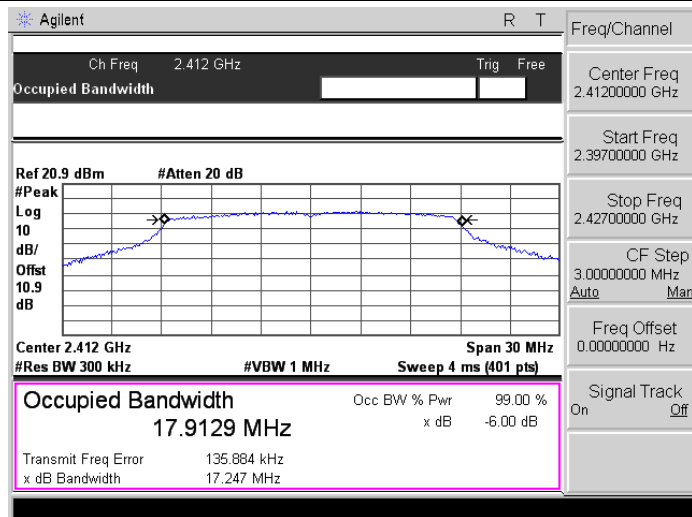


2462

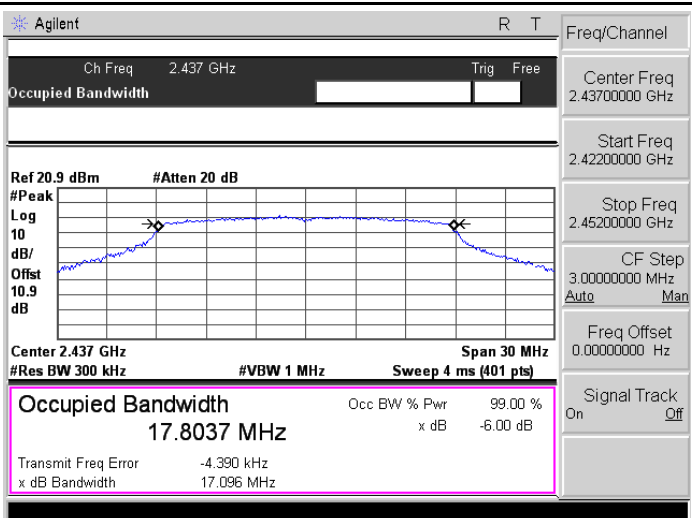


Mode 5: draft 802.11n Standard-20MHz Link Mode

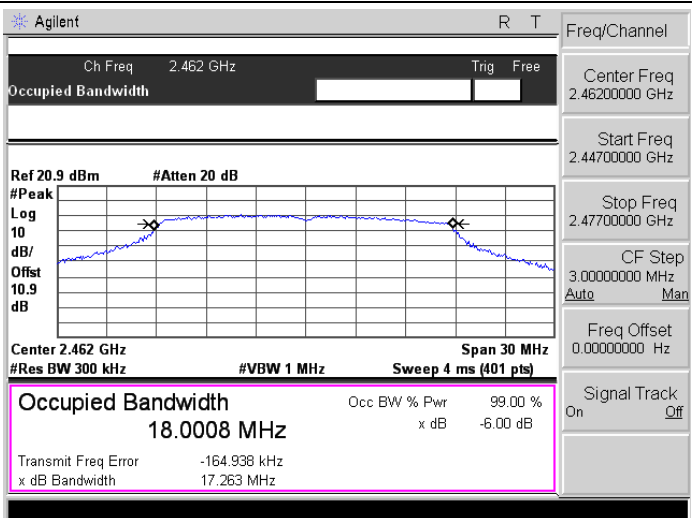
2412



2437



2462



12 Antenna Measurement

12.1.Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

12.2.Antenna Connector Construction

The antenna used in this product is **Internal antenna**. And the maximum Gain of this antenna is only **-4.3 dBi**.