

FCC 47 CFR PART 15 SUBPART C

Product Type : Wireless Motherboard
Applicant : ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address : No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Trade Name : ECS ELITEGROUP
Model Number : MCT02A
Test Specification : FCC 47 CFR PART 15 SUBPART C: Oct., 2013
ANSI C63.4:2009
Receive Date : Jul. 18, 2014
Test Period : Jul. 22~Jul. 26, 2014
Issue Date : Aug. 05, 2014

Issue by

A Test Lab Techno Corp.
No. 140-1, Changan Street, Bade City,
Taoyuan County 334, Taiwan R.O.C.
Tel : +886-3-2710188 / Fax : +886-3-2710190



Taiwan Accreditation Foundation accreditation number: 1330

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Revision History

Rev.	Issue Date	Revisions	Revised By
00	Aug. 01, 2014	Initial Issue	
01	Aug. 05, 2014	Revise Report Information	Janice Huang

Verification of Compliance

Issued Date: 08/05/2014

Product Type : Wireless Motherboard
Applicant : ELITEGROUP COMPUTER SYSTEMS CO., LTD
Address : No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Trade Name : ECS ELITEGROUP
Model Number : MCT02A
FCC ID : WL6-TC6BC30CA1
EUT Rated Voltage : DC 3.7V
Test Voltage : DC 3.7V
Applicable Standard : FCC 47 CFR PART 15 SUBPART C: Oct., 2013
ANSI C63.4:2009
Test Result : Complied
Performing Lab. : A Test Lab Techno Corp.

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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)

(Fly Lu)

Reviewed By



(Testing Engineer)

(Eric Ou Yang)

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1 General Information

1.1 Summary of Test Result

Standard	Item	Result	Remark
15.247			
15.207	AC Power Conducted Emission	N/A	This devices is powered by DC source
Standard	Item	Result	Remark
15.247			
15.247(d)	Transmitter Radiated Emissions	PASS	----
15.247(b)(3)	Max. Output Power	PASS	----
15.247(a)(2)	6dB RF Bandwidth	PASS	----
15.247(e)	Power Spectral Density	PASS	----
15.247(d)	Out of Band Conducted Spurious Emission	PASS	----
15.247(d)	Band Edge 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

Test Item	Frequency Range	Uncertainty (dB)	
Conducted Emission	9kHz ~ 30MHz	± 2.02	
Radiated Emission	30MHz ~ 1000MHz	Horizontal	± 3.98
		Vertical	± 3.62
	1000MHz ~ 18000MHz	Horizontal	± 3.11
		Vertical	± 3.07
	18000MHz ~ 40000MHz	Horizontal	± 3.66
		Vertical	± 3.54

2 EUT Description

Product Type	Wireless Motherboard
Trade Name	ECS ELITEGROUP
Model No.	MCT02A
Applicant	ELITEGROUP COMPUTER SYSTEMS CO., LTD No.239, Sec. 2, Ti Ding Blvd., Taipei, Taiwan
Manufacturer	Golden Elite Technology (SHENZHEN) Co., Ltd. No.1 , Nan-Huan Rd., ShaJing, BaoAn, Shen zhen, China
FCC ID	WL6-TC6BC30CA1
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2462 MHz
Modulation Type	IEEE 802.11b:DSSS IEEE 802.11g:DSSS + OFDM IEEE 802.11n 2.4GHz 20MHz: OFDM
Antenna Type	PIFA Type
Antenna Gain	2.85 dBi
RF Output Power	IEEE 802.11b: 0.139 W / 21.43 dBm IEEE 802.11g: 0.257 W / 24.10 dBm IEEE 802.11n 2.4GHz 20MHz: 0.237 W / 23.74 dBm
99 % Occupied Bandwidth	IEEE 802.11b: 12.54 MHz IEEE 802.11g: 16.33 MHz IEEE 802.11n 2.4GHz 20MHz: 17.47 MHz

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: Normal Operation Mode
Mode 2: IEEE 802.11b Link Mode
Mode 3: IEEE 802.11g Link Mode
Mode 4: IEEE 802.11n 2.4GHz 20MHz Link 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.

IEEE 802.11n 2.4GHz 20MHz mode:

Channel Low (2412MHz), Channel Mid (2437MHz) and Channel High (2462MHz) with MCS0 data rate were chosen for full testing.

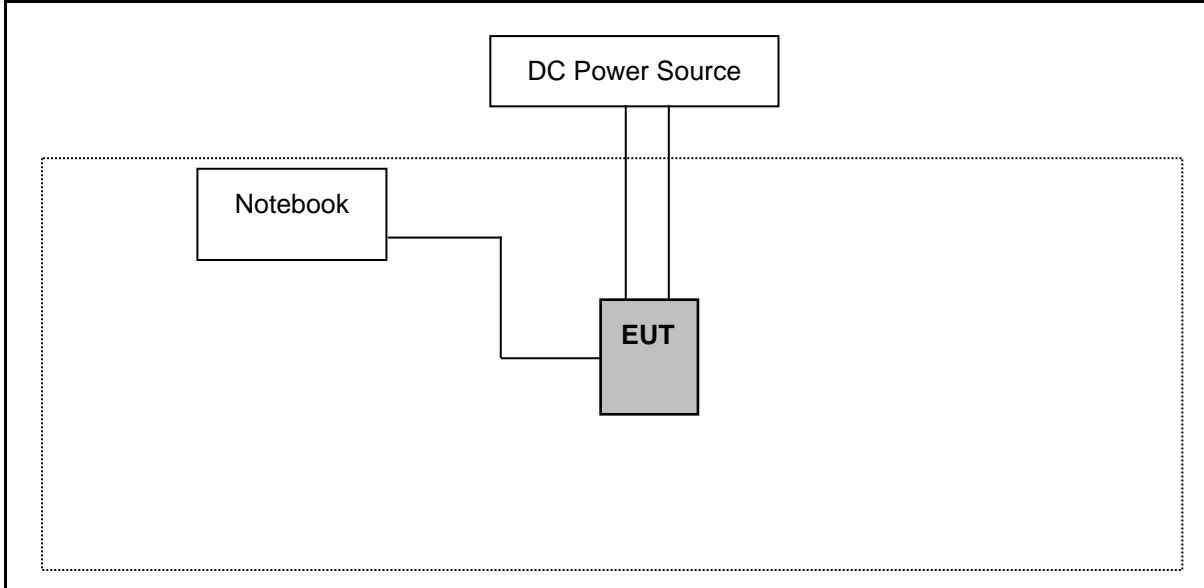
By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "X axis" position was the worst, then the final test was executed the worst condition and test data were recorded in this report.

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

Radiated Emissions



3.4. Test Site Environment

Items	Required (IEC 60068-1)	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

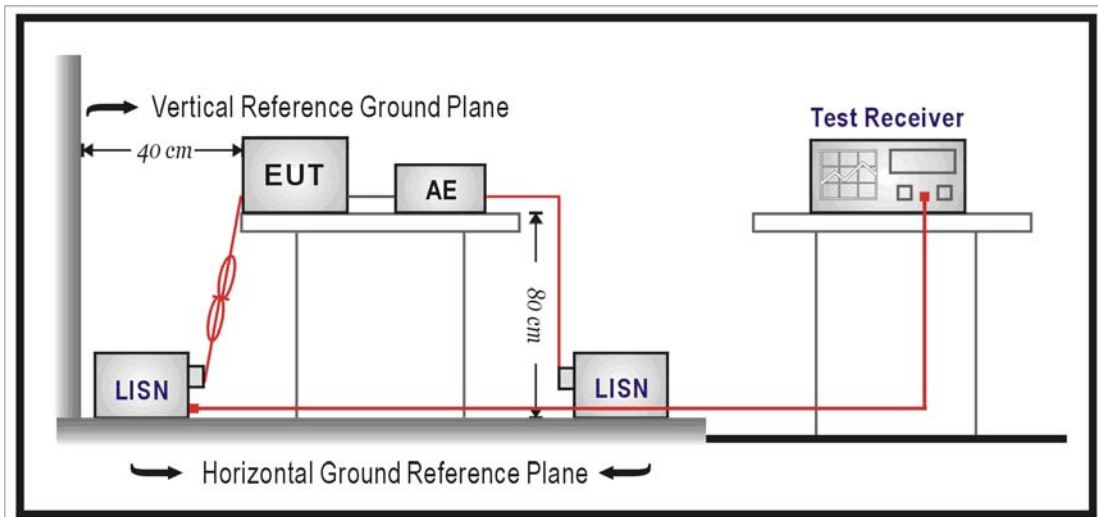
4.2. Test Instruments

Describe	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Test Receiver	R&S	ESCI	100367	06/06/2013	(1)
LISN	R&S	ENV216	101040	03/04/2013	(1)
LISN	R&S	ENV216	101041	03/04/2013	(1)
Test Site	ATL	TE02	TE02	N.C.R.	-----

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

Not applicable, this devices is powered by DC source.

5 Radiated Emission 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 ($\mu\text{V}/\text{m}$ 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

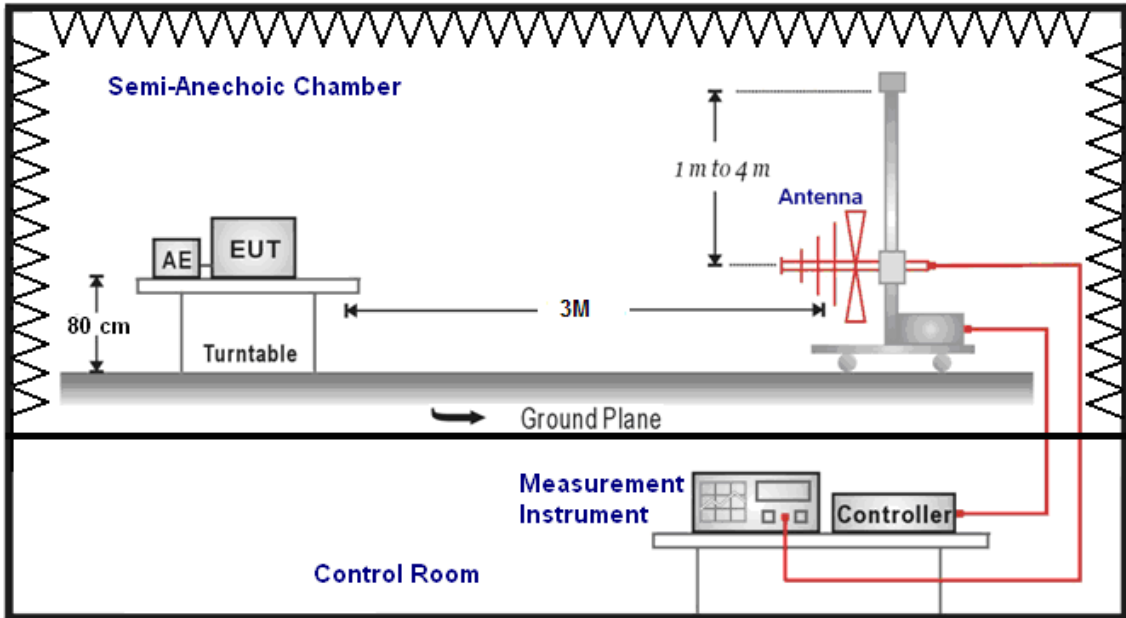
3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/10/2014	(1)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/10/2014	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Broadband Antenna (30MHz~1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	9163-270	07/22/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/11/2014	(1)
Horn Antenna (18~40GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9170	9170-320	06/13/2014	(1)
Loop Antenna	COM-POWER CORPORATION	AL-130	121014	01/28/2014	(3)
Test Site	ATL	TE01	888001	01/28/2014	(1)

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

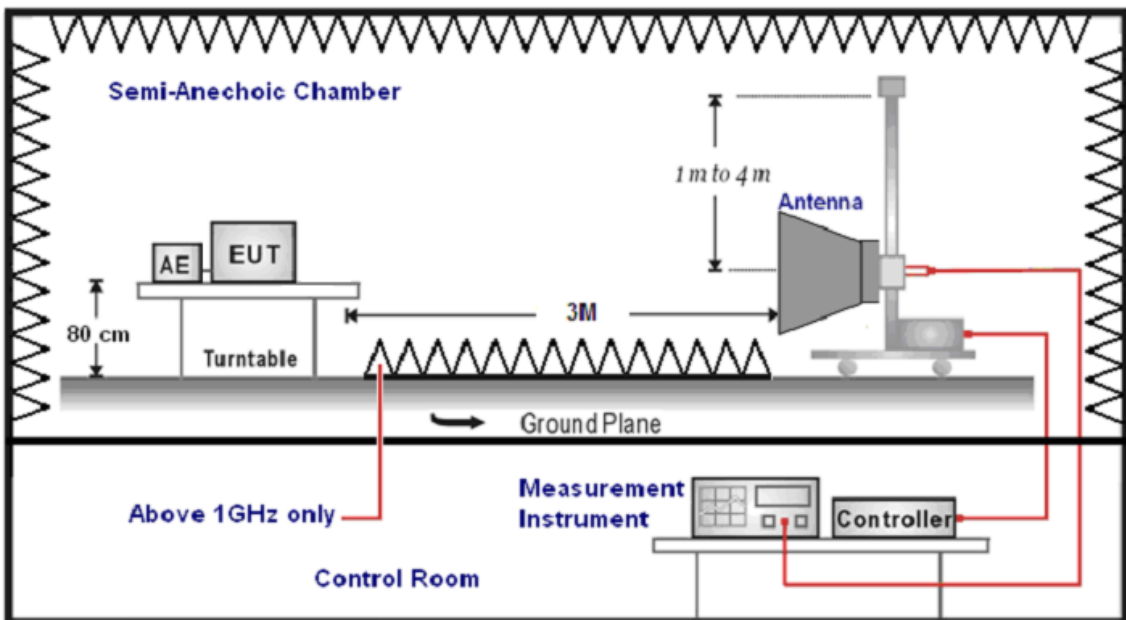
Note: N.C.R. = No Calibration Request.

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 (mode 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 pre 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:	DC 3.7V
Model Number:	MCT02A	Temp.(°C)/Hum.(%RH):	26(°C)/60%RH
Mode:	1	Date:	07/25/2014
		Test By:	Eric Ou Yang

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
150.5000	38.86	-11.65	27.21	43.50	-16.29	QP	H
210.0000	49.50	-14.07	35.43	43.50	-8.07	QP	H
259.0000	43.93	-11.81	32.12	46.00	-13.88	QP	H
375.5000	46.02	-8.76	37.26	46.00	-8.74	QP	H
462.5000	39.52	-6.85	32.67	46.00	-13.33	QP	H
773.5000	29.69	-0.76	28.93	46.00	-17.07	QP	H
166.0000	38.10	-11.98	26.12	43.50	-17.38	QP	V
207.0000	48.71	-14.17	34.54	43.50	-8.96	QP	V
381.0000	38.96	-8.63	30.33	46.00	-15.67	QP	V
452.5000	44.89	-6.97	37.92	46.00	-8.08	QP	V
635.5000	29.69	-3.47	26.22	46.00	-19.78	QP	V
911.0000	27.08	1.98	29.06	46.00	-16.94	QP	V

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:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/25/2014		
Frequency:	2412MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.17	-0.11	37.06	74.00	-36.94	peak	H
4824.000	44.60	5.03	49.63	74.00	-24.37	peak	H
6705.000	33.82	10.05	43.87	74.00	-30.13	peak	H
2995.000	37.53	-0.22	37.31	74.00	-36.69	peak	V
4824.000	42.74	5.03	47.77	74.00	-26.23	peak	V
6698.000	34.80	10.03	44.83	74.00	-29.17	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/25/2014		
Frequency:	2437MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.77	-0.11	37.66	74.00	-36.34	peak	H
4874.000	41.51	5.16	46.67	74.00	-27.33	peak	H
6670.000	36.24	9.95	46.19	74.00	-27.81	peak	H
3051.000	37.04	-0.06	36.98	74.00	-37.02	peak	V
4874.000	41.85	5.16	47.01	74.00	-26.99	peak	V
6691.000	33.79	10.01	43.80	74.00	-30.20	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/25/2014		
Frequency:	2462MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	35.96	-0.06	35.90	74.00	-38.10	peak	H
4924.000	42.43	5.29	47.72	74.00	-26.28	peak	H
6726.000	33.05	10.10	43.15	74.00	-30.85	peak	H
3009.000	36.26	-0.17	36.09	74.00	-37.91	peak	V
4924.000	43.94	5.29	49.23	74.00	-24.77	peak	V
6677.000	34.50	9.97	44.47	74.00	-29.53	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/25/2014		
Frequency:	2412MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3009.000	35.62	-0.17	35.45	74.00	-38.55	peak	H
4824.000	39.04	5.03	44.07	74.00	-29.93	peak	H
6649.000	33.82	9.90	43.72	74.00	-30.28	peak	H
3023.000	37.26	-0.14	37.12	74.00	-36.88	peak	V
4633.000	33.99	4.54	38.53	74.00	-35.47	peak	V
6733.000	34.00	10.13	44.13	74.00	-29.87	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/25/2014		
Frequency:	2437MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.16	-0.06	37.10	74.00	-36.90	peak	H
4874.000	38.09	5.16	43.25	74.00	-30.75	peak	H
6691.000	34.30	10.01	44.31	74.00	-29.69	peak	H
3023.000	37.32	-0.14	37.18	74.00	-36.82	peak	V
4570.000	34.07	4.38	38.45	74.00	-35.55	peak	V
6649.000	34.05	9.90	43.95	74.00	-30.05	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/25/2014		
Frequency:	2462MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	37.45	-0.11	37.34	74.00	-36.66	peak	H
4924.000	38.04	5.29	43.33	74.00	-30.67	peak	H
6719.000	33.80	10.09	43.89	74.00	-30.11	peak	H
3037.000	36.34	-0.10	36.24	74.00	-37.76	peak	V
4924.000	39.36	5.29	44.65	74.00	-29.35	peak	V
6663.000	33.75	9.94	43.69	74.00	-30.31	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/25/2014		
Frequency:	2412MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3058.000	36.66	-0.04	36.62	74.00	-37.38	peak	H
4824.000	37.71	5.03	42.74	74.00	-31.26	peak	H
6677.000	33.69	9.97	43.66	74.00	-30.34	peak	H
3037.000	36.38	-0.10	36.28	74.00	-37.72	peak	V
4591.000	33.60	4.43	38.03	74.00	-35.97	peak	V
6670.000	34.03	9.95	43.98	74.00	-30.02	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/25/2014		
Frequency:	2437MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3030.000	36.52	-0.11	36.41	74.00	-37.59	peak	H
4570.000	33.29	4.38	37.67	74.00	-36.33	peak	H
6677.000	34.19	9.97	44.16	74.00	-29.84	peak	H
3023.000	37.37	-0.14	37.23	74.00	-36.77	peak	V
4874.000	38.73	5.16	43.89	74.00	-30.11	peak	V
6733.000	34.39	10.13	44.52	74.00	-29.48	peak	V

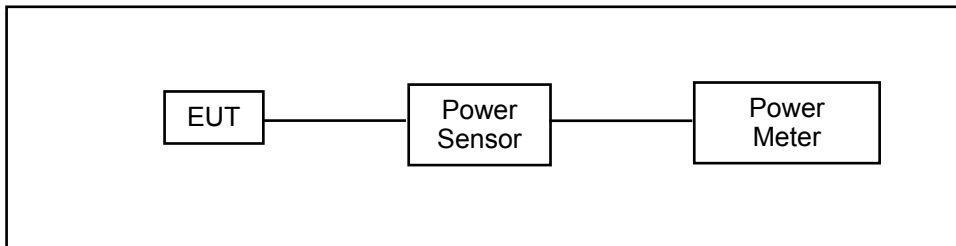
Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/25/2014		
Frequency:	2462MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
3051.000	37.03	-0.06	36.97	74.00	-37.03	peak	H
4619.000	32.51	4.51	37.02	74.00	-36.98	peak	H
6649.000	33.52	9.90	43.42	74.00	-30.58	peak	H
2981.000	36.23	-0.25	35.98	74.00	-38.02	peak	V
4924.000	39.10	5.29	44.39	74.00	-29.61	peak	V
6726.000	33.91	10.10	44.01	74.00	-29.99	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	12/21/2013	(1)
Wideband Power Meter	Agilent	N1921A	MY45241957	12/21/2013	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 $(\text{GAIN} - 6)/3$ 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	MCT02A					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 2: IEEE 802.11b Link Mode					
Date of Test	07/22/2014			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	1M	18.26	0.067	21.43	0.139	< 30
2437		18.22	0.066	21.08	0.128	< 30
2462		17.90	0.062	20.88	0.122	< 30
2437	2M	18.17	0.066	21.02	0.126	< 30
2437	5.5M	18.11	0.065	20.98	0.125	< 30
2437	11M	18.04	0.064	20.91	0.123	< 30

Model Number	MCT02A					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 3: IEEE 802.11g Link Mode					
Date of Test	07/22/2014			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	6M	16.64	0.046	24.10	0.257	< 30
2437		16.40	0.044	23.91	0.246	< 30
2462		16.25	0.042	23.74	0.237	< 30
2437	9M	16.35	0.043	23.81	0.240	< 30
2437	12M	16.31	0.043	23.74	0.237	< 30
2437	18M	16.23	0.042	23.68	0.233	< 30
2437	24M	16.15	0.041	23.54	0.226	< 30
2437	36M	16.11	0.041	23.48	0.223	< 30
2437	48M	16.04	0.040	23.42	0.220	< 30
2437	54M	15.98	0.040	23.34	0.216	< 30

Model Number	MCT02A					
Test Item	Maximum Conducted Output Power					
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode					
Date of Test	07/22/2014			Test Site	TE05	
Frequency (MHz)	Data Rate	Average Power		Peak Power		Limit (dBm)
		(dBm)	(W)	(dBm)	(W)	
2412	MCS0	15.39	0.035	23.74	0.237	< 30
2437		15.32	0.034	23.67	0.233	< 30
2462		15.13	0.033	23.52	0.225	< 30
2437	MCS1	15.26	0.034	23.61	0.230	< 30
2437	MCS2	15.21	0.033	23.54	0.226	< 30
2437	MCS3	15.16	0.033	23.49	0.223	< 30
2437	MCS4	15.09	0.032	23.41	0.219	< 30
2437	MCS5	15.01	0.032	23.34	0.216	< 30
2437	MCS6	14.96	0.031	23.29	0.213	< 30
2437	MCS7	14.89	0.031	23.21	0.209	< 30

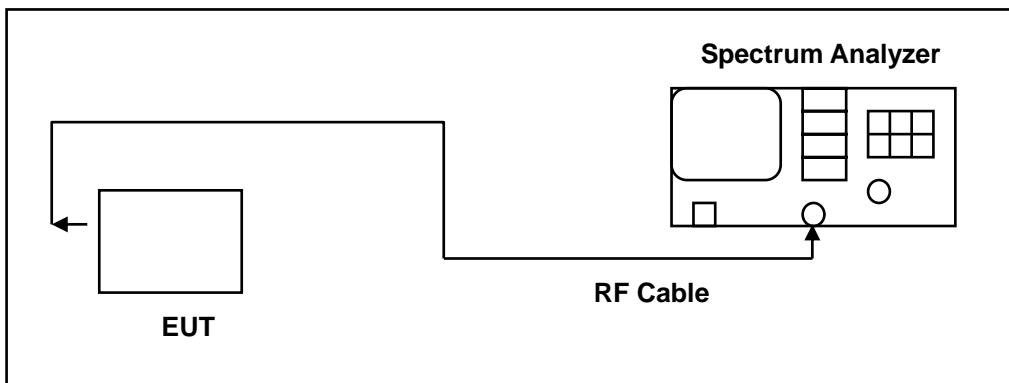
7 6dB RF Bandwidth and 99 % Occupied Bandwidth Measurement

7.1. Limit

6dB RF Bandwidth: 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.

99 % Occupied Bandwidth: N/A

7.2. Test Setup



7.3. Test Instruments

Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
Spectrum Analyzer	Agilent	E4445A	MY45300744	12/18/2013	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

dRemark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

6dB RF Bandwidth: 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 low, middle, high)

99 % Occupied Bandwidth: The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

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.

7.5. Test Result

Model Number	MCT02A		
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6dB RF Bandwidth Limit (MHz)
2412	7.141	12.5404	> 0.500
2437	5.644	12.3501	> 0.500
2462	7.103	12.2660	> 0.500

Model Number	MCT02A		
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6dB RF Bandwidth Limit (MHz)
2412	14.270	16.3271	> 0.500
2437	16.111	16.3261	> 0.500
2462	15.149	16.3051	> 0.500

Model Number	MCT02A		
Test Item	6dB RF Bandwidth and 99 % Occupied Bandwidth		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	6dB RF Bandwidth (MHz)	99 % Occupied Bandwidth (MHz)	6dB RF Bandwidth Limit (MHz)
2412	15.938	17.4745	> 0.500
2437	15.090	17.4655	> 0.500
2462	13.438	17.4554	> 0.500

7.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 12.5404 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 48.719 kHz</p> <p>x dB Bandwidth 7.141 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 12.3501 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 47.131 kHz</p> <p>x dB Bandwidth 5.644 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Occupied Bandwidth 12.2660 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 40.081 kHz</p> <p>x dB Bandwidth 7.103 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 3: IEEE 802.11g Link Mode

2412	 <p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.3271 MHz x dB -6.00 dB</p> <p>Transmit Freq Error 11.535 kHz</p> <p>x dB Bandwidth 14.270 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.437 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.3261 MHz x dB -6.00 dB</p> <p>Transmit Freq Error 12.767 kHz</p> <p>x dB Bandwidth 16.111 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>Center 2.462 00 GHz Span 30 MHz</p> <p>Res BW 100 kHz VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth Occ BW % Pwr 99.00 %</p> <p>16.3051 MHz x dB -6.00 dB</p> <p>Transmit Freq Error 7.749 kHz</p> <p>x dB Bandwidth 15.149 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

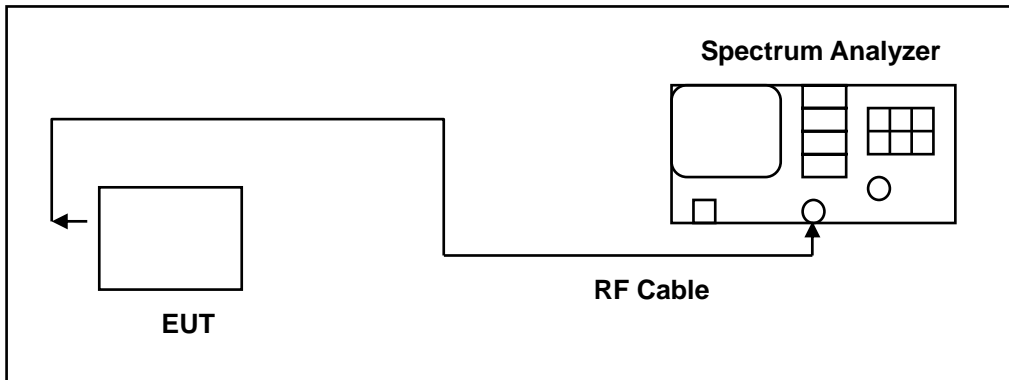
2412	 <p>Agilent T</p> <p>Ch Freq 2.412 GHz Trig Free</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39700000 GHz</p> <p>Stop Freq 2.42700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.412 00 GHz Span 30 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.4745 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 4.258 kHz x dB Bandwidth 15.938 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	 <p>Agilent T</p> <p>Ch Freq 2.437 GHz Trig Free</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42200000 GHz</p> <p>Stop Freq 2.45200000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.437 00 GHz Span 30 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.4655 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 6.636 kHz x dB Bandwidth 15.090 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	 <p>Agilent T</p> <p>Ch Freq 2.462 GHz Trig Free</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44700000 GHz</p> <p>Stop Freq 2.47700000 GHz</p> <p>CF Step 3.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Ref 20 dBm Atten 20 dB</p> <p>Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst 10.8</p> <p>dB</p> <p>Center 2.462 00 GHz Span 30 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.88 ms (601 pts)</p> <p>Occupied Bandwidth 17.4554 MHz Occ BW % Pwr 99.00 % x dB -6.00 dB</p> <p>Transmit Freq Error 6.653 kHz x dB Bandwidth 13.438 MHz</p> <p>Copyright 2000-2005 Agilent Technologies</p>

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	12/18/2013	(2)
Test Site	ATL	TE05	TE05	N.C.R.	-----

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 KDB558074D01 for compliance to FCC 47CFR 15.247 requirements.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
4. Set the VBW $\geq 3 \times \text{RBW}$.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

8.5. Test Result

Model Number	MCT02A		
Test Item	Maximum Power Density		
Test Mode	Mode 2: IEEE 802.11b Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-3.58		< 8
2437	-3.22		< 8
2462	-3.32		< 8

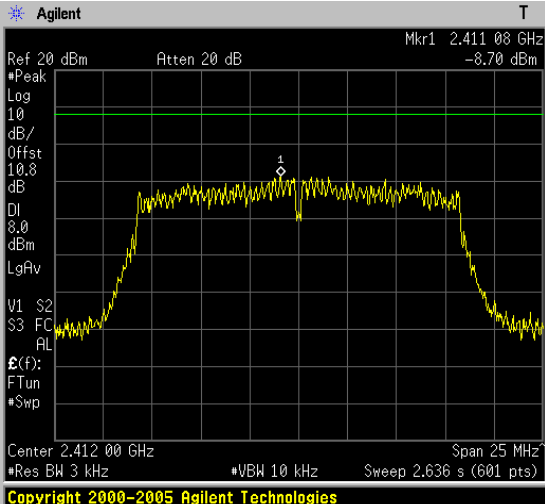
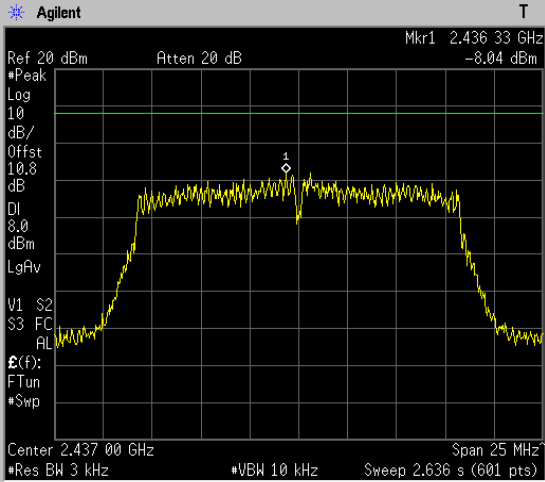
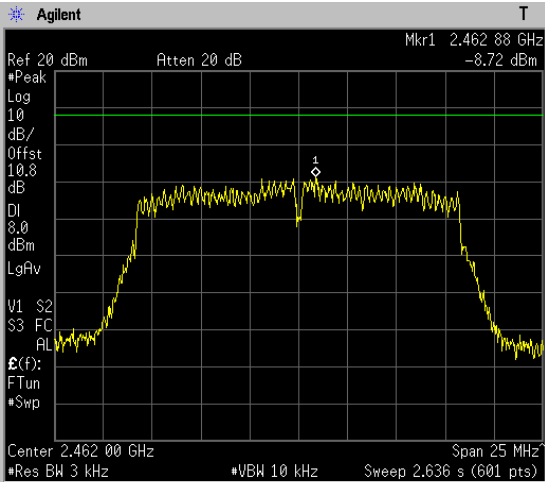
Model Number	MCT02A		
Test Item	Maximum Power Density		
Test Mode	Mode 3: IEEE 802.11g Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-8.70		< 8
2437	-8.04		< 8
2462	-8.72		< 8

Model Number	MCT02A		
Test Item	Maximum Power Density		
Test Mode	Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode		
Date of Test	07/25/2014	Test Site	TE05
Frequency (MHz)	Reading (dBm/3KHz)		Limit (dBm)
2412	-9.89		< 8
2437	-9.51		< 8
2462	-8.98		< 8

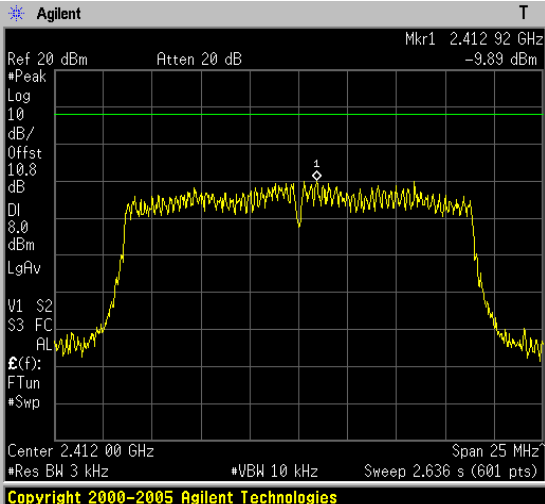
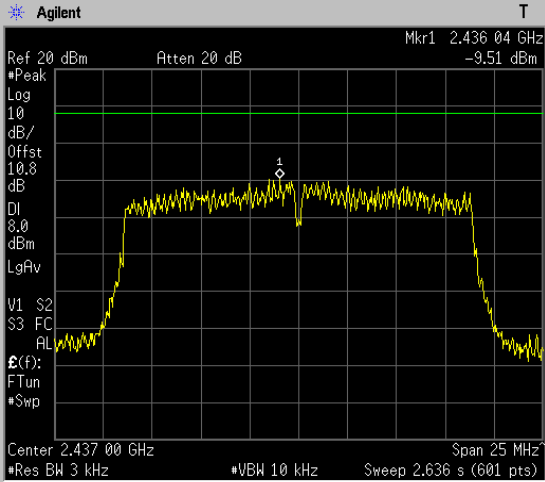
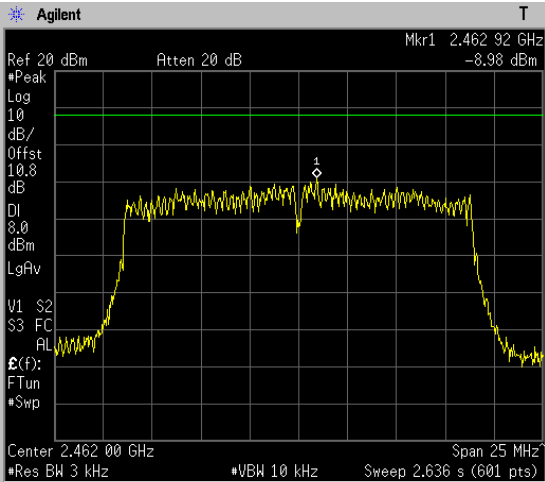
8.6. Test Graphs

Mode 2: IEEE 802.11b Link Mode																	
2412	<p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.412 57 GHz -3.58 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.412 00 GHz Span 11 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 1.16 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <tr><th colspan="2">Freq/Channel</th></tr> <tr><td>Center Freq</td><td>2.41200000 GHz</td></tr> <tr><td>Start Freq</td><td>2.40650000 GHz</td></tr> <tr><td>Stop Freq</td><td>2.41750000 GHz</td></tr> <tr><td>CF Step</td><td>1.10000000 MHz</td></tr> <tr><td></td><td>Auto Man</td></tr> <tr><td>Freq Offset</td><td>0.00000000 Hz</td></tr> <tr><td>Signal Track</td><td>On Off</td></tr> </table>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.40650000 GHz	Stop Freq	2.41750000 GHz	CF Step	1.10000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Freq Offset	0.00000000 Hz																
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2437	<p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.437 72 GHz -3.22 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.437 00 GHz Span 11 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 1.16 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <tr><th colspan="2">Freq/Channel</th></tr> <tr><td>Center Freq</td><td>2.43700000 GHz</td></tr> <tr><td>Start Freq</td><td>2.43150000 GHz</td></tr> <tr><td>Stop Freq</td><td>2.44250000 GHz</td></tr> <tr><td>CF Step</td><td>1.10000000 MHz</td></tr> <tr><td></td><td>Auto Man</td></tr> <tr><td>Freq Offset</td><td>0.00000000 Hz</td></tr> <tr><td>Signal Track</td><td>On Off</td></tr> </table>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.43150000 GHz	Stop Freq	2.44250000 GHz	CF Step	1.10000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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CF Step	1.10000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																
2462	<p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.462 81 GHz -3.32 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>Ⓔ(f):</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.462 00 GHz Span 11 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 1.16 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <tr><th colspan="2">Freq/Channel</th></tr> <tr><td>Center Freq</td><td>2.46200000 GHz</td></tr> <tr><td>Start Freq</td><td>2.45650000 GHz</td></tr> <tr><td>Stop Freq</td><td>2.46750000 GHz</td></tr> <tr><td>CF Step</td><td>1.10000000 MHz</td></tr> <tr><td></td><td>Auto Man</td></tr> <tr><td>Freq Offset</td><td>0.00000000 Hz</td></tr> <tr><td>Signal Track</td><td>On Off</td></tr> </table>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.45650000 GHz	Stop Freq	2.46750000 GHz	CF Step	1.10000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																	
Center Freq	2.46200000 GHz																
Start Freq	2.45650000 GHz																
Stop Freq	2.46750000 GHz																
CF Step	1.10000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	 <p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.411 08 GHz -8.70 dBm</p> <p>Center Freq 2.41200000 GHz</p> <p>Start Freq 2.39950000 GHz</p> <p>Stop Freq 2.42450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.412 00 GHz Span 25 MHz</p> <p>Res BW 3 kHz VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>2437</p>	 <p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.436 33 GHz -8.04 dBm</p> <p>Center Freq 2.43700000 GHz</p> <p>Start Freq 2.42450000 GHz</p> <p>Stop Freq 2.44950000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.437 00 GHz Span 25 MHz</p> <p>Res BW 3 kHz VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
<p>2462</p>	 <p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.462 88 GHz -8.72 dBm</p> <p>Center Freq 2.46200000 GHz</p> <p>Start Freq 2.44950000 GHz</p> <p>Stop Freq 2.47450000 GHz</p> <p>CF Step 2.50000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.462 00 GHz Span 25 MHz</p> <p>Res BW 3 kHz VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

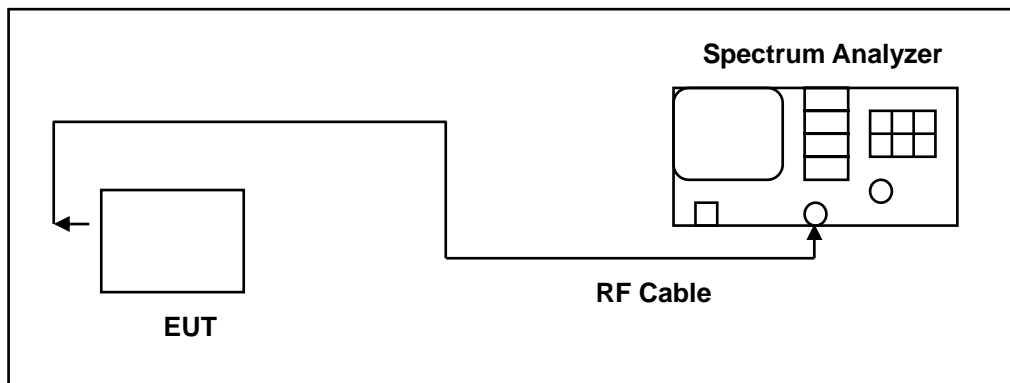
<p>2412</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.412 92 GHz -9.89 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>$\mathcal{E}(f)$:</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.412 00 GHz Span 25 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 389 1324 891"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.41200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.39950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.39950000 GHz	Stop Freq	2.42450000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel																	
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Start Freq	2.39950000 GHz																
Stop Freq	2.42450000 GHz																
CF Step	2.50000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																
<p>2437</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.436 04 GHz -9.51 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>$\mathcal{E}(f)$:</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.437 00 GHz Span 25 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 918 1324 1397"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.43700000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.42450000 GHz	Stop Freq	2.44950000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Signal Track	On Off																
<p>2462</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.462 92 GHz -8.98 dBm</p> <p>*Peak</p> <p>Log</p> <p>10</p> <p>dB/</p> <p>Offst</p> <p>10.8</p> <p>dB</p> <p>DI</p> <p>8.0</p> <p>dBm</p> <p>LgAv</p> <p>V1 S2</p> <p>S3 FC</p> <p>AL</p> <p>$\mathcal{E}(f)$:</p> <p>FTun</p> <p>*Swp</p> <p>Center 2.462 00 GHz Span 25 MHz</p> <p>*Res BW 3 kHz *VBW 10 kHz Sweep 2.636 s (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1" data-bbox="1197 1444 1324 1924"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.46200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.47450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz</td> </tr> <tr> <td></td> <td>Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.44950000 GHz	Stop Freq	2.47450000 GHz	CF Step	2.50000000 MHz		Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Stop Freq	2.47450000 GHz																
CF Step	2.50000000 MHz																
	Auto Man																
Freq Offset	0.00000000 Hz																
Signal Track	On Off																

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	12/19/2012	(2)
Spectrum Analyzer	Agilent	E4408B	MY45107753	07/24/2014	(1)
Test Site	ATL	TE05	TE05	N.C.R.	-----

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

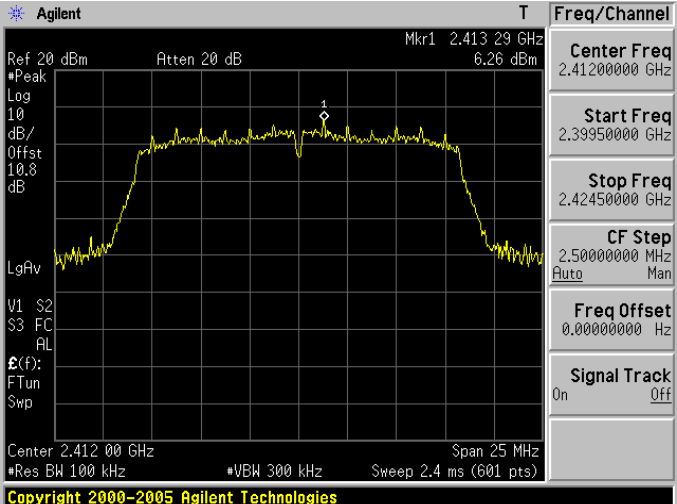
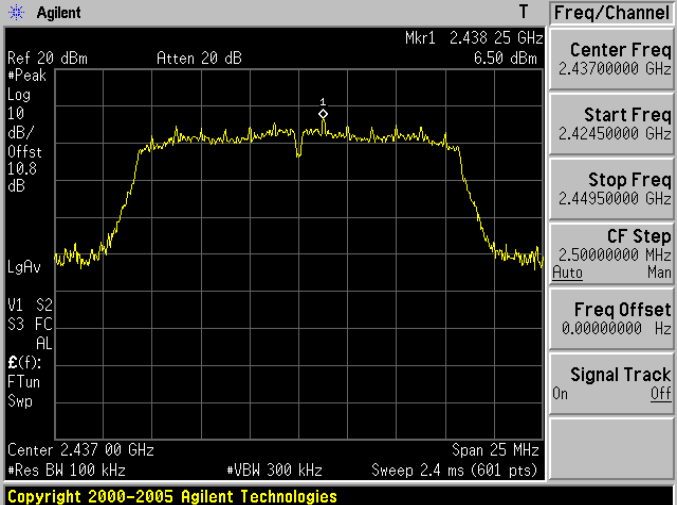
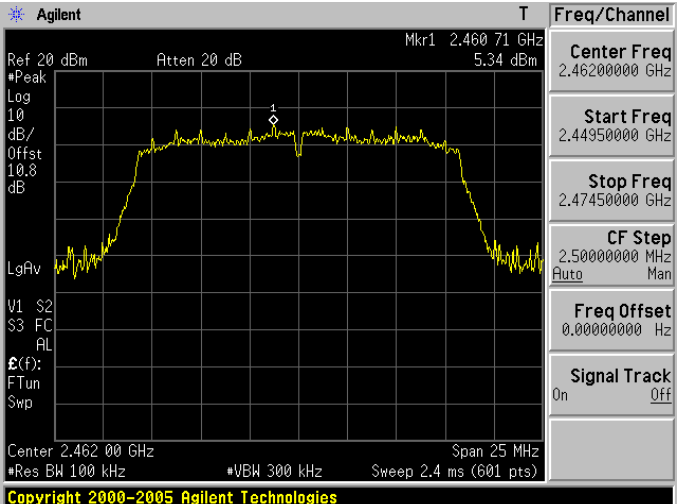
The test was performed at 3 channels.

9.5. Test Graphs

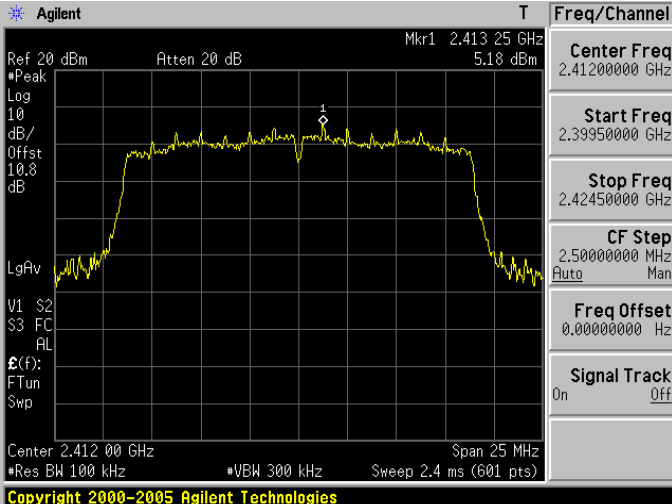
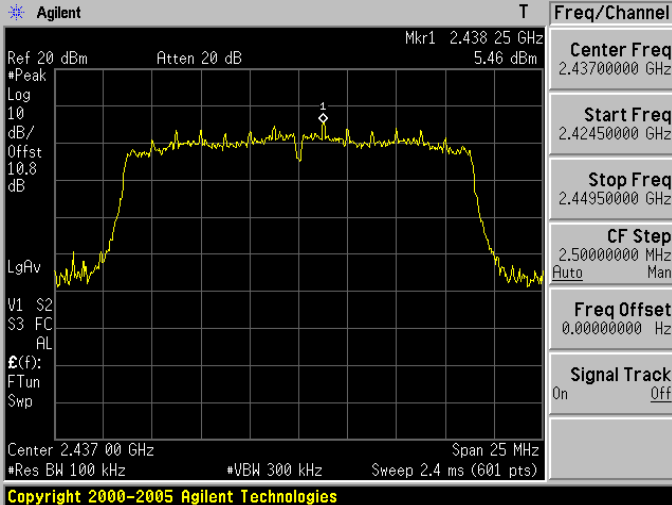
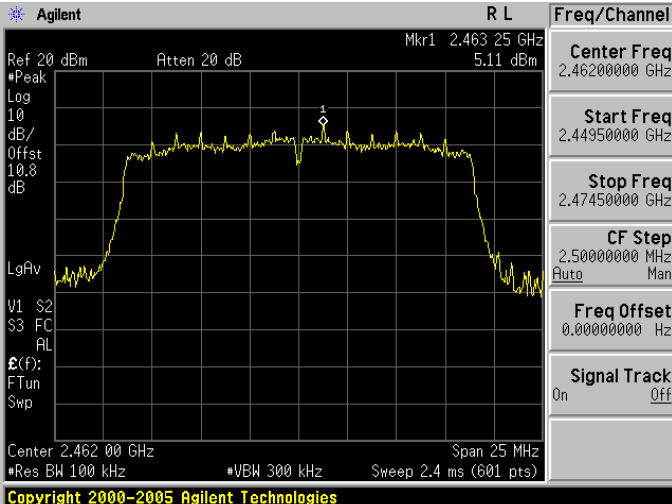
Reference level

Mode 2: IEEE 802.11b Link Mode	
2412	<p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.411 50 GHz *Peak 10.18 dBm Center Freq 2.41200000 GHz</p> <p>Log 10 dB/Offst 10.8 dB</p> <p>Start Freq 2.40650000 GHz</p> <p>Stop Freq 2.41750000 GHz</p> <p>CF Step 1.10000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.412 00 GHz Span 11 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 1.08 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2437	<p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.436 49 GHz *Peak 10.78 dBm Center Freq 2.43700000 GHz</p> <p>Log 10 dB/Offst 10.8 dB</p> <p>Start Freq 2.43150000 GHz</p> <p>Stop Freq 2.44250000 GHz</p> <p>CF Step 1.10000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.437 00 GHz Span 11 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 1.08 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>
2462	<p>Agilent T Freq/Channel</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.462 51 GHz *Peak 10.63 dBm Center Freq 2.46200000 GHz</p> <p>Log 10 dB/Offst 10.8 dB</p> <p>Start Freq 2.45650000 GHz</p> <p>Stop Freq 2.46750000 GHz</p> <p>CF Step 1.10000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p> <p>Center 2.462 00 GHz Span 11 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 1.08 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p>

Mode 3: IEEE 802.11g Link Mode

<p>2412</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.413 29 GHz *Peak 6.26 dBm</p> <p>Log 10 dB/ Offst 10.8 dB</p> <p>LgAv</p> <p>V1 S2 S3 FC AL</p> <p>Ⓔ(f): FTun Swp</p> <p>Center 2.412 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.41200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.39950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.39950000 GHz	Stop Freq	2.42450000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.41200000 GHz														
Start Freq	2.39950000 GHz														
Stop Freq	2.42450000 GHz														
CF Step	2.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2437</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.438 25 GHz *Peak 6.50 dBm</p> <p>Log 10 dB/ Offst 10.8 dB</p> <p>LgAv</p> <p>V1 S2 S3 FC AL</p> <p>Ⓔ(f): FTun Swp</p> <p>Center 2.437 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.43700000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.42450000 GHz	Stop Freq	2.44950000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2462</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.460 71 GHz *Peak 5.34 dBm</p> <p>Log 10 dB/ Offst 10.8 dB</p> <p>LgAv</p> <p>V1 S2 S3 FC AL</p> <p>Ⓔ(f): FTun Swp</p> <p>Center 2.462 00 GHz Span 25 MHz *Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.46200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.47450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.44950000 GHz	Stop Freq	2.47450000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Start Freq	2.44950000 GHz														
Stop Freq	2.47450000 GHz														
CF Step	2.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														

Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

<p>2412</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.413 25 GHz 5.18 dBm</p> <p>Center 2.412 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.41200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.39950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.41200000 GHz	Start Freq	2.39950000 GHz	Stop Freq	2.42450000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
Freq/Channel															
Center Freq	2.41200000 GHz														
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Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2437</p>	 <p>Agilent T</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.438 25 GHz 5.46 dBm</p> <p>Center 2.437 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.43700000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.42450000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.43700000 GHz	Start Freq	2.42450000 GHz	Stop Freq	2.44950000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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Stop Freq	2.44950000 GHz														
CF Step	2.50000000 MHz Auto Man														
Freq Offset	0.00000000 Hz														
Signal Track	On Off														
<p>2462</p>	 <p>Agilent R L</p> <p>Ref 20 dBm Atten 20 dB Mkr1 2.463 25 GHz 5.11 dBm</p> <p>Center 2.462 00 GHz Span 25 MHz</p> <p>*Res BW 100 kHz *VBW 300 kHz Sweep 2.4 ms (601 pts)</p> <p>Copyright 2000-2005 Agilent Technologies</p> <table border="1"> <thead> <tr> <th colspan="2">Freq/Channel</th> </tr> </thead> <tbody> <tr> <td>Center Freq</td> <td>2.46200000 GHz</td> </tr> <tr> <td>Start Freq</td> <td>2.44950000 GHz</td> </tr> <tr> <td>Stop Freq</td> <td>2.47450000 GHz</td> </tr> <tr> <td>CF Step</td> <td>2.50000000 MHz Auto Man</td> </tr> <tr> <td>Freq Offset</td> <td>0.00000000 Hz</td> </tr> <tr> <td>Signal Track</td> <td>On Off</td> </tr> </tbody> </table>	Freq/Channel		Center Freq	2.46200000 GHz	Start Freq	2.44950000 GHz	Stop Freq	2.47450000 GHz	CF Step	2.50000000 MHz Auto Man	Freq Offset	0.00000000 Hz	Signal Track	On Off
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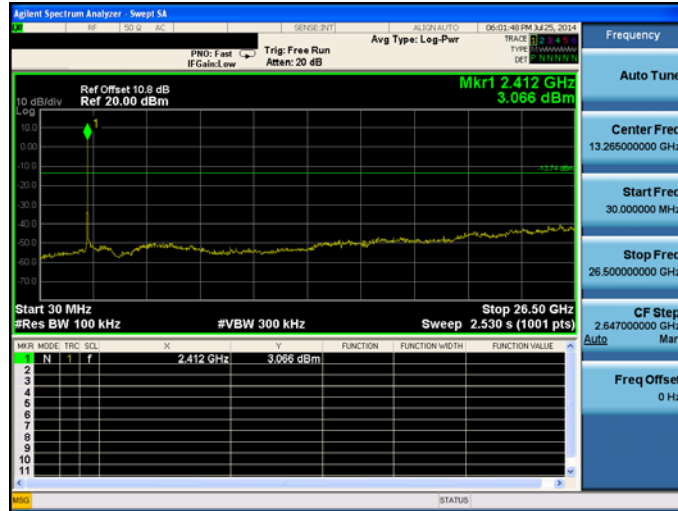
Out of Band Conducted Emissions

Mode 2: IEEE 802.11b Link Mode

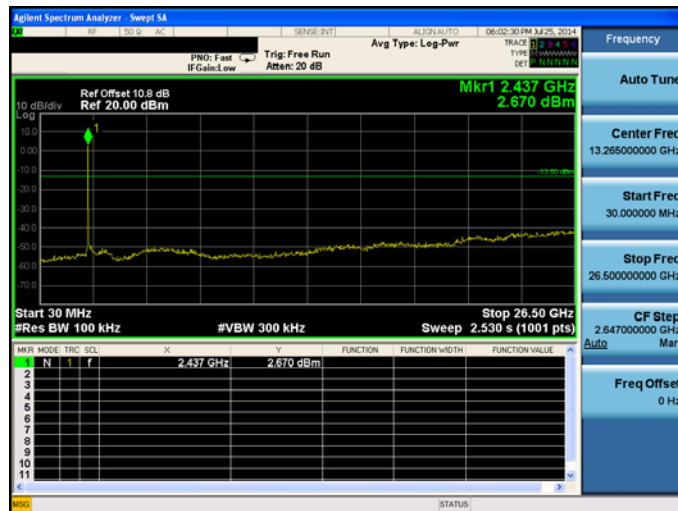
<p>2412</p>	
<p>2437</p>	
<p>2462</p>	

Mode 3: IEEE 802.11g Link Mode

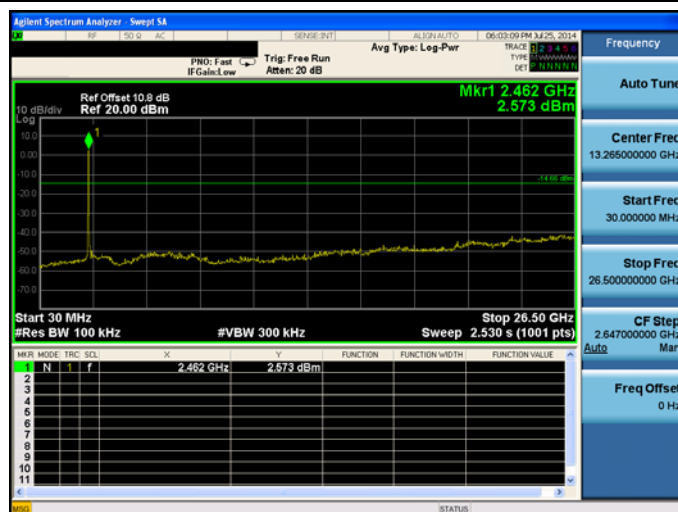
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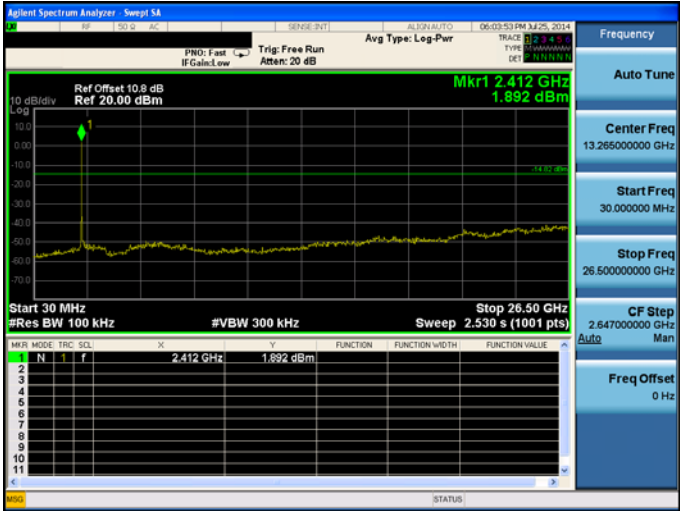
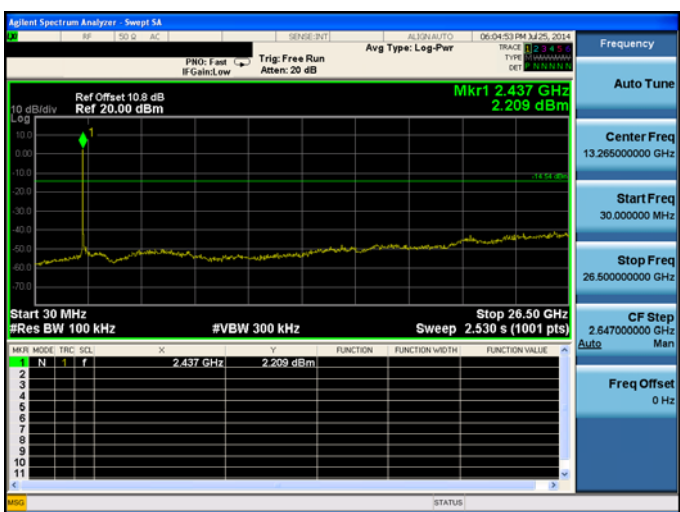
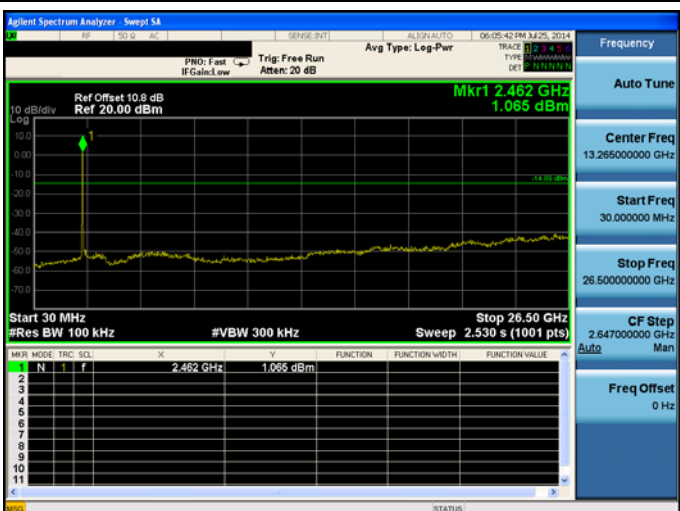
2437



2462

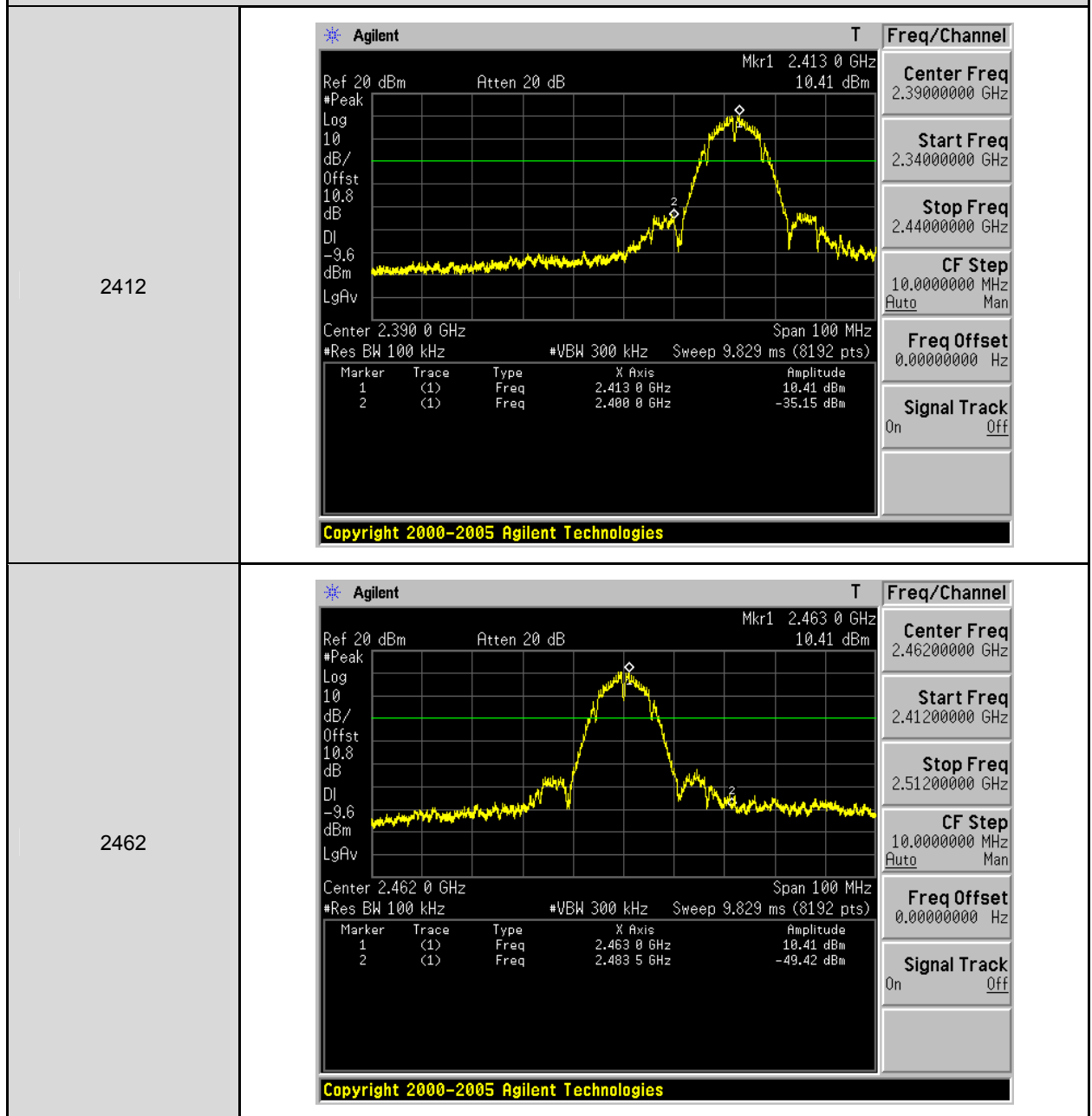


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

<p>2412</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset: 10.8 dB Ref: 20.00 dBm</p> <p>Mkr1 2.412 GHz 1.892 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.50 GHz Sweep 2.530 s (1001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>f</td> <td>2.412 GHz</td> <td>1.892 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Frequency: Auto Tune Center Freq: 13.265000000 GHz Start Freq: 30.000000 MHz Stop Freq: 26.500000000 GHz CF Step: 2.647000000 GHz Freq Offset: 0 Hz</p>	MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f	2.412 GHz	1.892 dBm			
MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE										
1	N	f	2.412 GHz	1.892 dBm													
<p>2437</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset: 10.8 dB Ref: 20.00 dBm</p> <p>Mkr1 2.437 GHz 2.209 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.50 GHz Sweep 2.530 s (1001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>f</td> <td>2.437 GHz</td> <td>2.209 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Frequency: Auto Tune Center Freq: 13.265000000 GHz Start Freq: 30.000000 MHz Stop Freq: 26.500000000 GHz CF Step: 2.647000000 GHz Freq Offset: 0 Hz</p>	MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f	2.437 GHz	2.209 dBm			
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<p>2462</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Ref Offset: 10.8 dB Ref: 20.00 dBm</p> <p>Mkr1 2.462 GHz 1.065 dBm</p> <p>Start 30 MHz #Res BW 100 kHz #VBW 300 kHz Stop 26.50 GHz Sweep 2.530 s (1001 pts)</p> <table border="1"> <thead> <tr> <th>MKR MODE</th> <th>TRC</th> <th>SCL</th> <th>X</th> <th>Y</th> <th>FUNCTION</th> <th>FUNCTION WIDTH</th> <th>FUNCTION VALUE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>N</td> <td>f</td> <td>2.462 GHz</td> <td>1.065 dBm</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Frequency: Auto Tune Center Freq: 13.265000000 GHz Start Freq: 30.000000 MHz Stop Freq: 26.500000000 GHz CF Step: 2.647000000 GHz Freq Offset: 0 Hz</p>	MKR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	1	N	f	2.462 GHz	1.065 dBm			
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1	N	f	2.462 GHz	1.065 dBm													

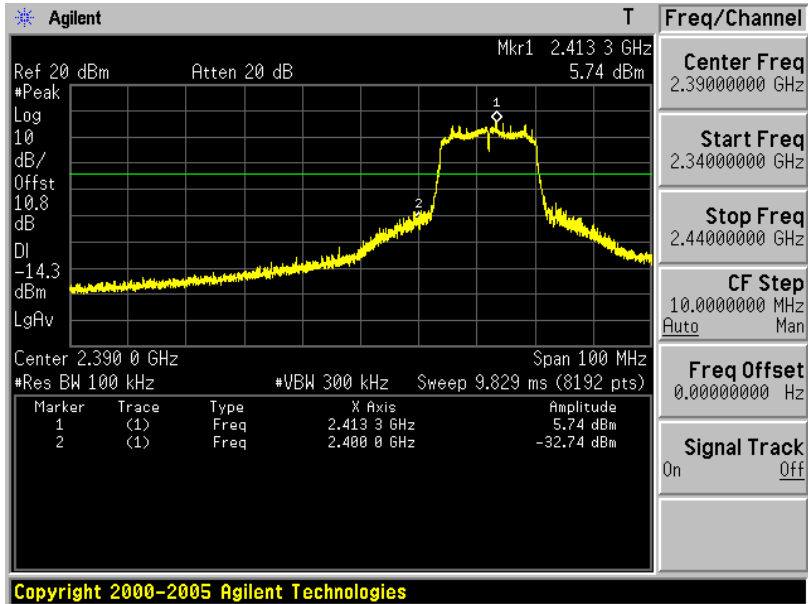
Conducted Band Edge

Mode 2: IEEE 802.11b Link Mode

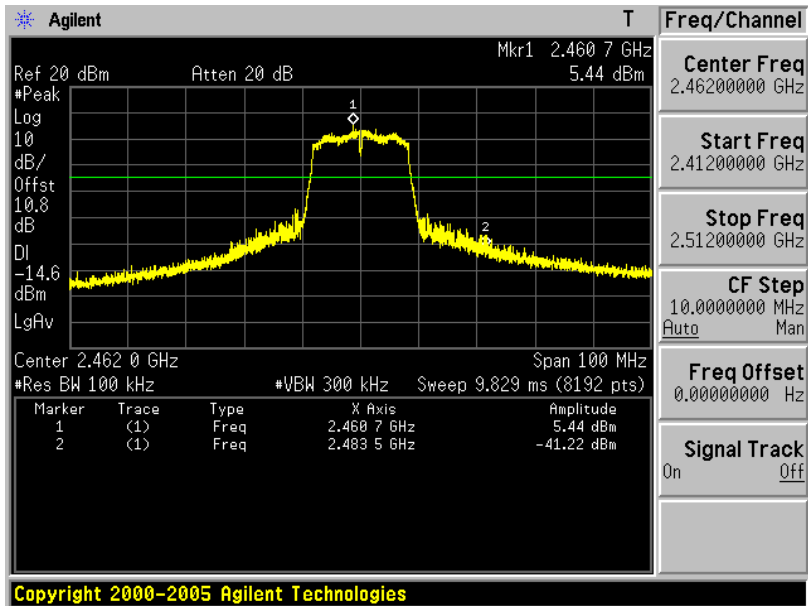


Mode 3: IEEE 802.11g Link Mode

2412

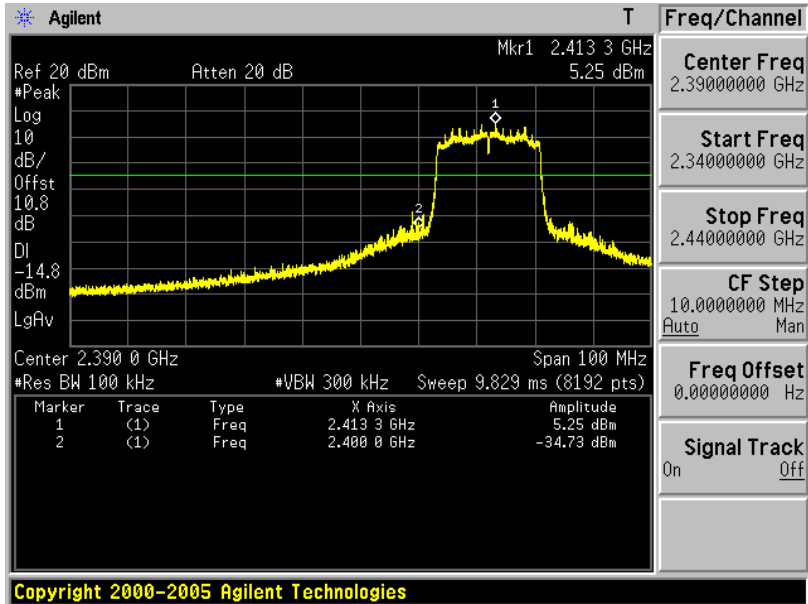


2462

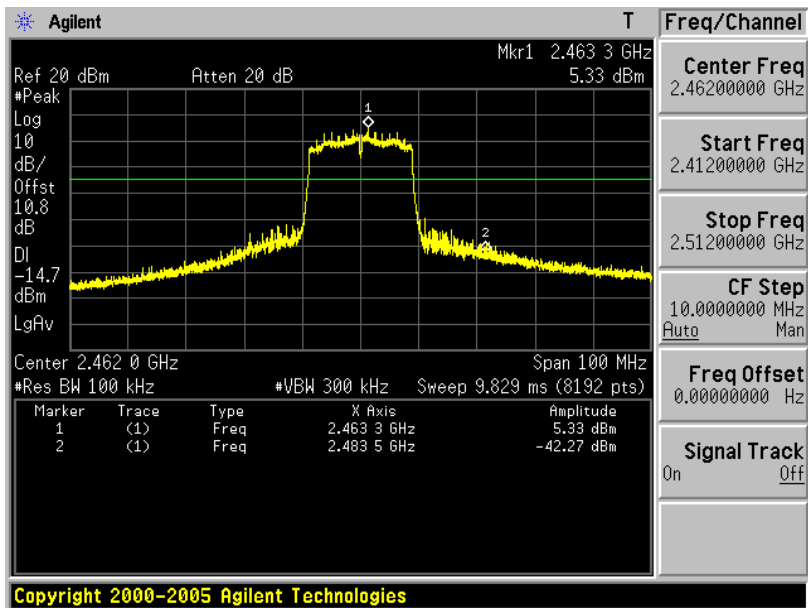


Mode 4: IEEE 802.11n 2.4GHz 20MHz Link Mode

2412



2462

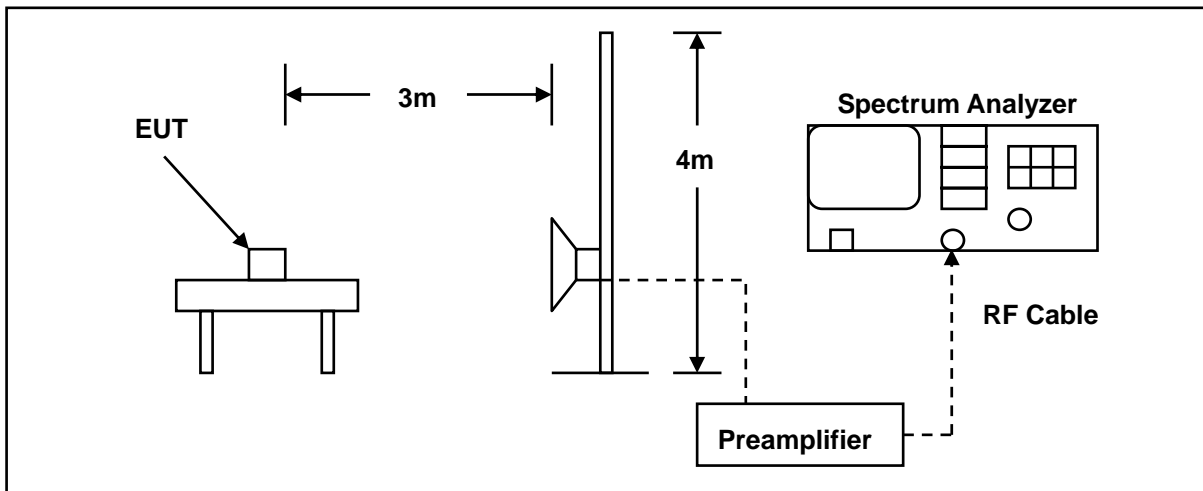


10 Band Edges Measurement

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

3 Meter Chamber					
Equipment	Manufacturer	Model Number	Serial Number	Cal. Date	Remark
RF Pre-selector	Agilent	N9039A	MY46520256	01/10/2014	(2)
Spectrum Analyzer	Agilent	E4446A	MY46180578	01/10/2014	(1)
Pre Amplifier	Agilent	8449B	3008A02237	02/21/2014	(1)
Pre Amplifier	Agilent	8447D	2944A10961	02/21/2014	(1)
Horn Antenna (1~18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA9120D	9120D-550	06/11/2014	(1)
Test Site	ATL	TE01	888001	08/28/2013	(1)

Remark: (1) Calibration period 1 year. (2) Calibration period 2 years. (3) Calibration period 3 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 KDB558074D01 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:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/25/2014		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2386.230	53.04	-1.97	51.07	74.00	-22.93	peak	H
2390.000	52.27	-1.94	50.33	74.00	-23.67	peak	H
2373.470	53.60	-2.01	51.59	74.00	-22.41	peak	V
2390.000	52.04	-1.94	50.10	74.00	-23.90	peak	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	2			Date:	07/25/2014		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	58.17	-1.52	56.65	74.00	-17.35	peak	H
2483.500	50.34	-1.52	48.82	54.00	-5.18	AVG	H
2487.840	60.58	-1.49	59.09	74.00	-14.91	peak	H
2487.840	53.01	-1.49	51.52	54.00	-2.48	AVG	H
2483.500	54.80	-1.52	53.28	74.00	-20.72	peak	V
2483.500	48.76	-1.52	47.24	54.00	-6.76	AVG	V
2484.960	57.39	-1.51	55.88	74.00	-18.12	peak	V
2484.960	47.83	-1.51	46.32	54.00	-7.68	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/25/2014		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2389.530	64.36	-1.95	62.41	74.00	-11.59	peak	H
2389.530	48.34	-1.95	46.39	54.00	-7.61	AVG	H
2390.000	66.08	-1.94	64.14	74.00	-9.86	peak	H
2390.000	48.56	-1.94	46.62	54.00	-7.38	AVG	H
2389.310	68.11	-1.96	66.15	74.00	-7.85	peak	V
2389.310	47.94	-1.96	45.98	54.00	-8.02	AVG	V
2390.000	68.13	-1.94	66.19	74.00	-7.81	peak	V
2390.000	48.69	-1.94	46.75	54.00	-7.25	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	3			Date:	07/25/2014		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	71.77	-1.52	70.25	74.00	-3.75	peak	H
2483.500	52.46	-1.52	50.94	54.00	-3.06	AVG	H
2483.800	73.04	-1.52	71.52	74.00	-2.48	peak	H
2483.800	52.41	-1.52	50.89	54.00	-3.11	AVG	H
2483.500	72.30	-1.52	70.78	74.00	-3.22	peak	V
2483.500	53.26	-1.52	51.74	54.00	-2.26	AVG	V
2484.000	69.91	-1.51	68.40	74.00	-5.60	peak	V
2484.000	52.70	-1.51	51.19	54.00	-2.81	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/25/2014		
Frequency:	2412 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2387.660	61.73	-1.96	59.77	74.00	-14.23	peak	H
2387.660	44.73	-1.96	42.77	54.00	-11.23	AVG	H
2390.000	60.51	-1.94	58.57	74.00	-15.43	peak	H
2390.000	45.89	-1.94	43.95	54.00	-10.05	AVG	H
2389.530	61.28	-1.95	59.33	74.00	-14.67	peak	V
2389.530	46.40	-1.95	44.45	54.00	-9.55	AVG	V
2390.000	64.07	-1.94	62.13	74.00	-11.87	peak	V
2390.000	46.65	-1.94	44.71	54.00	-9.29	AVG	V

Standard:	FCC Part 15C			Test Distance:	3m		
Test item:	Radiated Emission			Power:	DC 3.7V		
Model Number:	MCT02A			Temp.(°C)/Hum.(%RH):	26(°C)/60%RH		
Mode:	4			Date:	07/25/2014		
Frequency:	2462 MHz			Test By:	Eric Ou Yang		
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2483.500	63.13	-1.52	61.61	74.00	-12.39	peak	H
2483.500	52.10	-1.52	50.58	54.00	-3.42	AVG	H
2484.120	67.44	-1.51	65.93	74.00	-8.07	peak	H
2484.120	51.19	-1.51	49.68	54.00	-4.32	AVG	H
2483.500	62.65	-1.52	61.13	74.00	-12.87	peak	V
2483.500	47.48	-1.52	45.96	54.00	-8.04	AVG	V
2484.200	65.84	-1.51	64.33	74.00	-9.67	peak	V
2484.200	47.25	-1.51	45.74	54.00	-8.26	AVG	V

11 Antenna Measurement

11.1.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.

11.2.Antenna Connector Construction

The antenna used in this product is PIFA antenna. And the maximum Gain of this antenna is only 2.85 dBi.