

FCC TEST REPORT

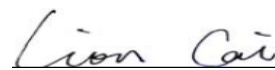
47 CFR FCC Part 15 Subpart C 12.247

FCC ID.....: 2AAMTLW-S101

Report Reference No.....: SKW1306010E-RF

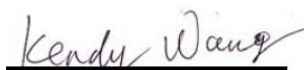
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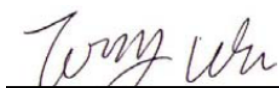
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Approved by

(position+printed name+signature)..: Manager Tony Wu



Date of issue.....: June 30, 2013

Representative Laboratory Name ..: Shenzhen Sinco Testing Technology Co., Ltd.

Address: 4F, Block B, Famous Industry Products Center Baoyuan Rd.,
Xixiang, Baoan, Shenzhen, China

Testing Laboratory Name ..: Bontek Compliance Testing Laboratory Ltd

Address: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East
Road, Nanshan, Shenzhen, China

Applicant's name.....: LongWin technology Co.,Ltd.

Address: Ram802,8/F Xinzhou 11 Road,139#Intersection of Binhe Avenue
and Shazui Road,Futian District,Shenzhen,China

Test specification:

Standard: **FCC Part 15.247: Operation within the bands 902-928 MHz,
2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System**

TRF Originator.....: Shenzhen Sinco Testing Technology Co., Ltd.

Master TRF.....: Dated 2012-06

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Test item description: ipcamera

Trade Mark: /

Manufacturer: **LongWin technology Co.,Ltd.**

Model/Type reference.....: LW-S101

Listed Models: /

Rating: DC 5.0 V Adapter from AC 120V/60Hz

Modulation Type.....: CCK,OFDM

Operation Frequency: From 2412MHz to 2462MHz

Result.....: **Positive**

TEST REPORT

Test Report No. : SKW1306010E-RF	June 30, 2013
	Date of issue

Equipment under Test : ipcamera

Model /Type : LW-S101

Listed Models : /

Applicant : LongWin technology Co.,Ltd.

Address : Ram802,8/F Xinzhou 11 Road,139#Intersection of Binhe Avenue and Shazui Road,Futian District,Shenzhen,China

Manufacturer LongWin technology Co.,Ltd.

Address : Ram802,8/F Xinzhou 11 Road,139#Intersection of Binhe Avenue and Shazui Road,Futian District,Shenzhen,China

Test Result according to the standards on page 4:	Positive
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10:2009](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB558074](#): DTS Meas Guidance D01 v03 of Measurement Procedure

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	June 15,2013
Testing commenced on	:	June 15,2013
Testing concluded on	:	June 30, 2013

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 5.0V Adapter from AC 120V/60Hz

2.3. Short description of the Equipment under Test (EUT)

2.4GHz (ipcamera)

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

IEEE 802.11b/g/n: Eleven channels are provided to the EUT.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

2.5. Related Submittal(s) / Grant (s)

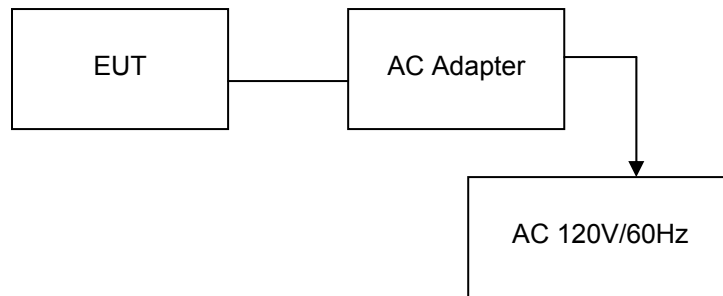
This submittal(s) (test report) is intended for **FCC ID: 2AAMTLW-S101** filing to comply with the FCC Part 15, Subpart C 15.247 Rules.

2.6. Modifications

No modifications were implemented to meet testing criteria.

2.7. Configuration of Tested System

Configuration of Tested System



Model: M050200W311
 Input: 100-240V ~ 50/60Hz 0.3A
 Output: DC 5V 2000mA
 Power Cable: 150cm
 ◇ Shielded ◆ Unshielded

2.8. NOTE

1. The EUT is a ip camera with WLAN function, The functions of the EUT listed as below:

	Test Standards	Reference Report
Radio	FCC Part 15 Subpart C (Section 15.247)	SKW1306010-E-RF
MPE	OET 65 C KDB447498	SKW1306010-E-MPE

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	✓	—	—	—

3. The EUT incorporates a SISO function, Physically, the EUT provides one completed transmitter and one completed receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Bontek Compliance Testing Laboratory Ltd
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 7631A

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

FCC-Registration No.: 338263

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

CNAS-Lab Code: L3923

Bontek Compliance Testing Laboratory Ltd has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories, Date of Registration: Mar 22, 2012. Valid time is until Mar 21, 2015.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

3.4. Test Description

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS
FCC Part 2 2.1091(d)	RF Exposure	PASS

Remark: The measurement uncertainty is not included in the test result.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power	11b/DSSS	1 Mbps	1/6/11
Power Spectral Density	11g/OFDM	6 Mbps	1/6/11
6dB Bandwidth	11n(20MHz)/OFDM	6.5Mbps	1/6/11
Spurious RF conducted emission	11n(40MHz)/OFDM	13.5 Mbps	3/6/9
Radiated Emission 9kHz~1GHz&			
Radiated Emission 1GHz~10th Harmonic			
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	13.5 Mbps	3/9

Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Bontek Compliance Testing Laboratory Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Bontek Compliance Testing Laboratory Ltd is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emissio 1~18GHz	5.16 dB	(1)
Radiated Emissio 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	-----	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.6. Equipments Used during the Test

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	Rohde&Schwarz	HL562	100015	2012/4/23
2	EMI TEST SOFTWARE	Audix	Z3	N/A	----
3	HORN ANTENNA	Rohde&Schwarz	HF906	100039	2012/4/23
4	Amplifer	Sonoma	310N	E009-13	2012/4/23
5	JS amplifer	Rohde&Schwarz	JS4-00101800-28-5A	F201504	2012/4/23
6	High pass filter	Compliance Direction systems	BSU-6	34202	2012/4/23
7	Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	470	2012/4/23
8	Ultra-Broadband Antenna	ShwarzBeck	VULB9163	539	2012/4/23
9	HORN ANTENNA	ShwarzBeck	9120D	1011	2012/4/23
10	TURNTABLE	MATURO	TT2.0	----	2012/4/23
11	ANTENNA MAST	MATURO	TAM-4.0-P	----	2012/4/23

12	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100025	2012/4/23
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Maximum Peak Output Power / Frequency Separation / 20dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission/ Number of hopping frequency/ Time of Occupancy

No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Spectrum Analyzer	AGILENT	E4407B	MY44210779	2012/4/23
2	Spectrum Analyzer	Rohde&Schwarz	FSP	1164.4425.40	2012/4/23

Conducted Disturbance

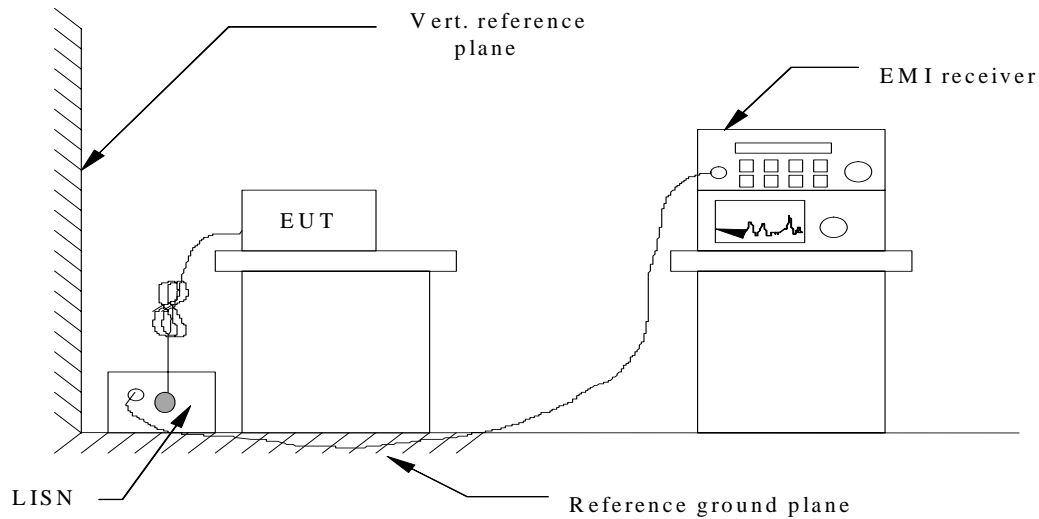
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	Rohde&Schwarz	ESCI	100106	2012/4/23
2	Artificial Mains	Rohde&Schwarz	ESH2-Z5	100028	2012/4/23
3	Pulse Limiter	Rohde&Schwarz	ESHSZ2	100044	2012/4/23
4	EMI Test Software	Rohde&Schwarz	ESK1	N/A	2012/4/23

The calibration interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

- 1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2009.
- 2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
- 3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
- 4 The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5 All support equipments received AC power from a second LISN, if any.
- 6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
- 8 During the above scans, the emissions were maximized by cable manipulation.

CONDUCTED POWER LINE EMISSION LIMIT

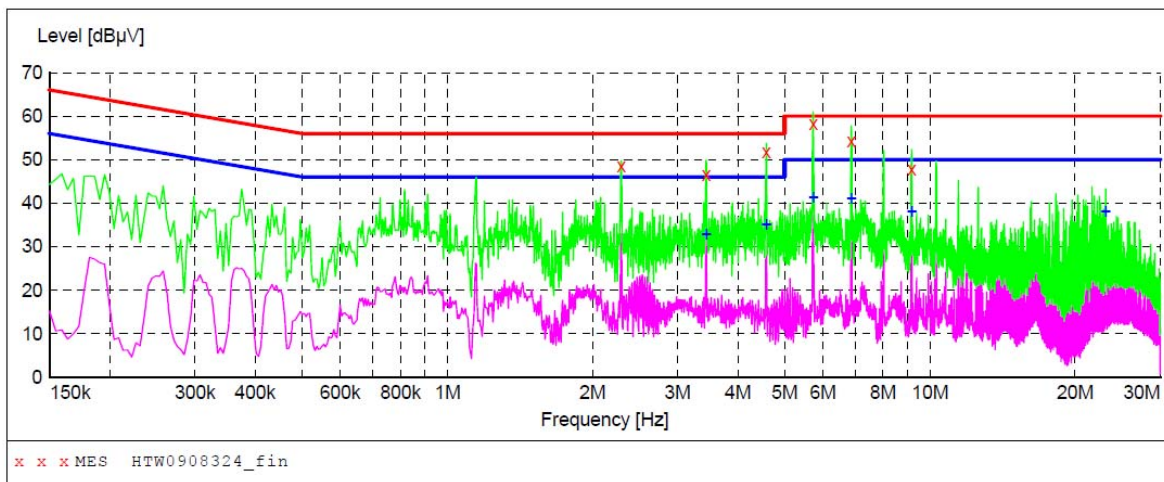
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	CLASS A		CLASS B	
	QP	Ave	QP	Ave
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

TEST RESULTS

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "SINCO0628324_fin"**

6/28/2013 2:31PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
2.292000	48.60	10.6	56	7.4	QP	N	GND
3.439500	46.60	10.6	56	9.4	QP	N	GND
4.582500	51.80	10.6	56	4.2	QP	N	GND
5.730000	58.40	10.6	60	1.6	QP	N	GND
6.877500	54.40	10.6	60	5.6	QP	N	GND
9.168000	47.70	10.8	60	12.3	QP	N	GND

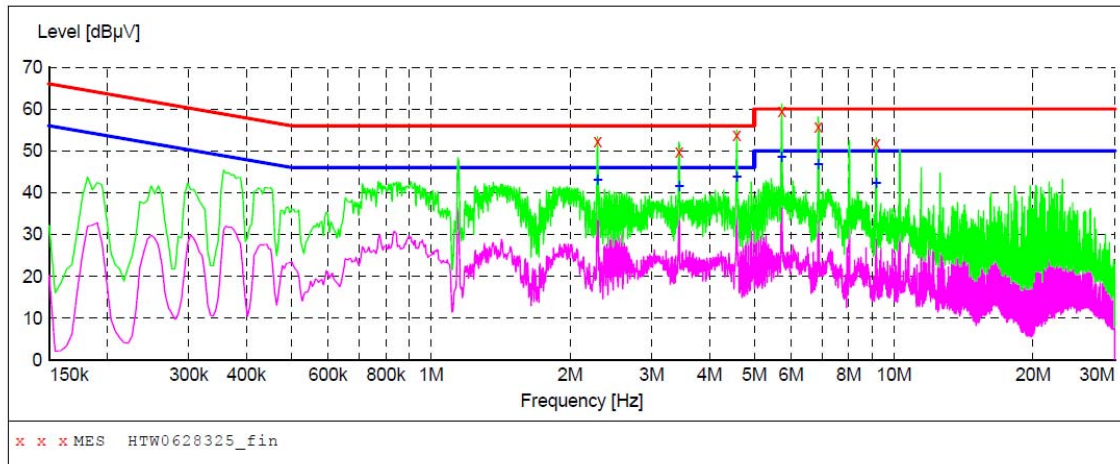
MEASUREMENT RESULT: "SINCO0628324_fin2"

6/28/2013 2:31PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
3.439500	32.90	10.6	46	13.1	AV	N	GND
4.582500	35.20	10.6	46	10.8	AV	N	GND
5.734500	41.40	10.6	50	8.6	AV	N	GND
6.877500	41.10	10.6	50	8.9	AV	N	GND
9.163500	38.10	10.8	50	11.9	AV	N	GND
23.127000	38.00	11.0	50	12.0	AV	N	GND

SCAN TABLE: "Voltage (9K-30M) FIN"

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT: "SINCO0628325_fin"**

6/28/2013 2:36PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
2.292000	52.30	10.6	56	3.7	QP	L1	GND
3.439500	49.80	10.6	56	6.2	QP	L1	GND
4.582500	53.80	10.6	56	2.2	QP	L1	GND
5.730000	59.40	10.6	60	0.6	QP	L1	GND
6.873000	55.90	10.6	60	4.1	QP	L1	GND
9.163500	51.70	10.8	60	8.3	QP	L1	GND

MEASUREMENT RESULT: "SINCO0628325_fin2"

6/28/2013 2:36PM

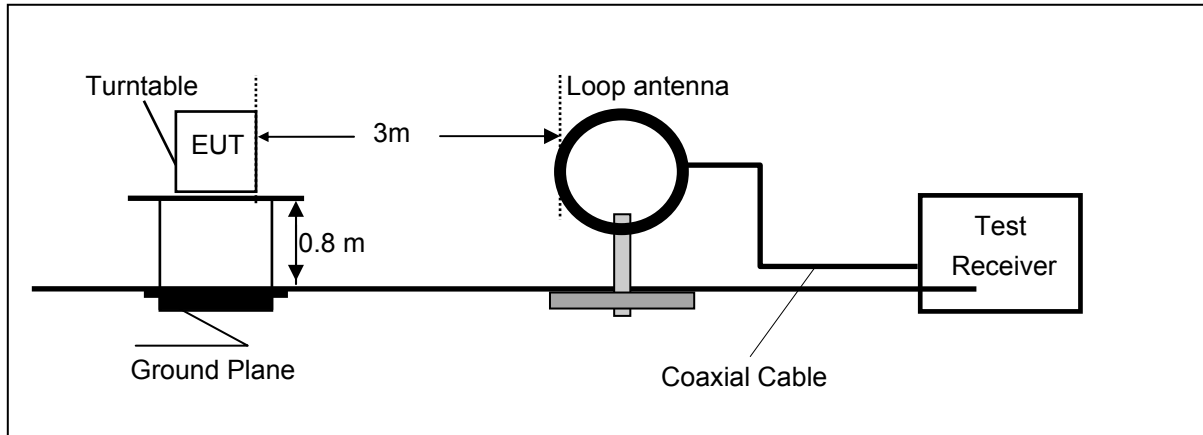
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
2.292000	43.10	10.6	46	2.9	AV	L1	GND
3.439500	41.60	10.6	46	4.4	AV	L1	GND
4.578000	43.70	10.6	46	2.3	AV	L1	GND
5.725500	48.50	10.6	50	1.5	AV	L1	GND
6.877500	46.90	10.6	50	3.1	AV	L1	GND
9.163500	42.40	10.8	50	7.6	AV	L1	GND

4.2. Radiated Emission Test

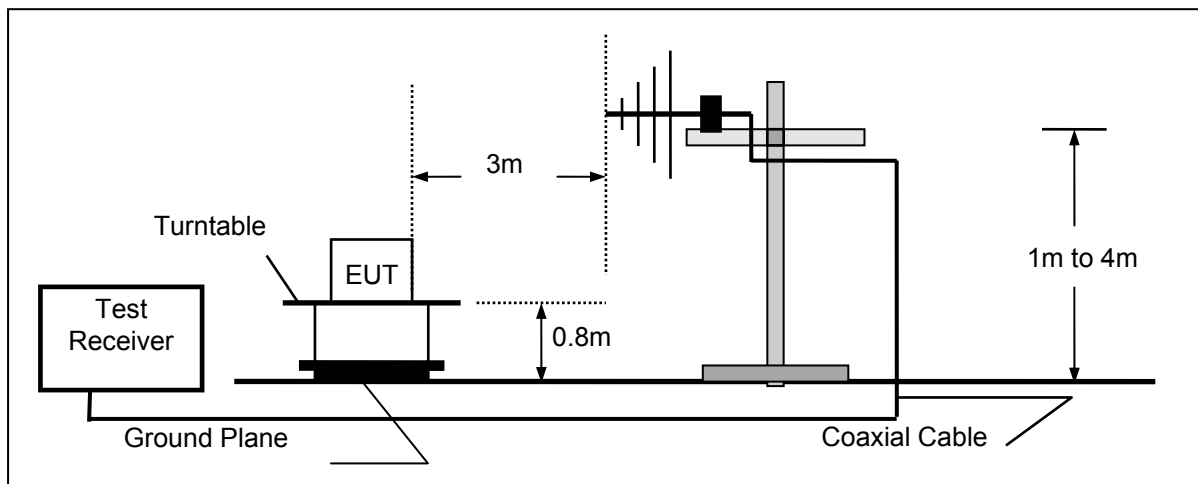
TEST CONFIGURATION

Radiated Emission Test Set-Up

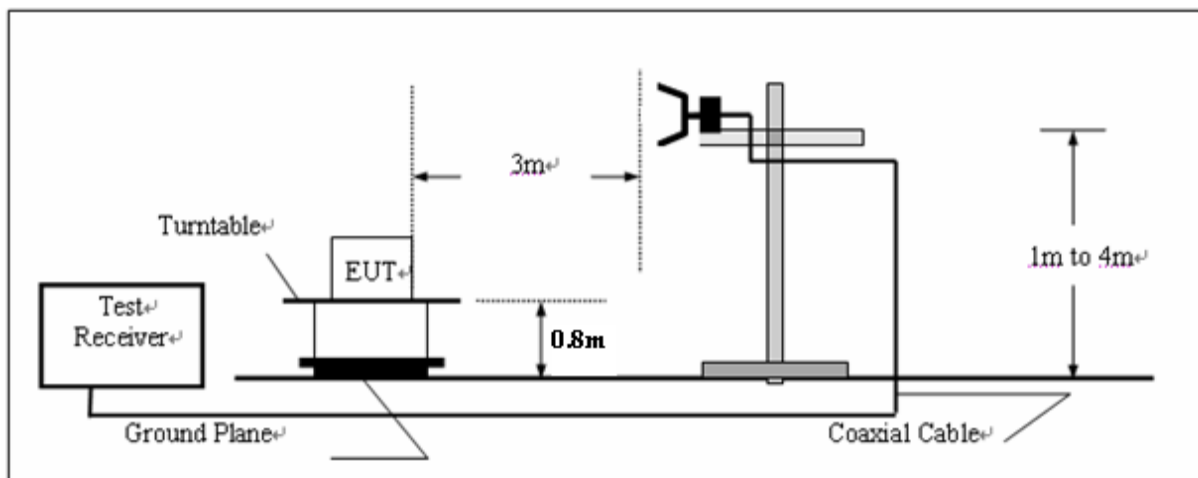
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

- 1 The EUT was placed on a turn table which is 0.8m above ground plane.
- 2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- 3 And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 4 Repeat above procedures until all frequency measurements have been completed.
- 5 The minimum clock frequency was less than 30MHz, so the radiation emissions frequency range was tested from 9 KHz to 25GHz.

FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

$$\text{Transd} = \text{AF} + \text{CL} - \text{AG}$$

RADIATION LIMIT

According to FCC section 15.247(c), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 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 (μV/m)	Field Strength (dBμV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	20log(2400/F(KHz))+80	300
0.490 - 1.705	24000/F(kHz)	20log(24000/F(KHz))+40	30
1.705 - 30.0	30	20log(30)+40	30
30 - 88	100	40.0	3
88 - 216	150	43.5	3
216 - 960	200	46.0	3
Above 960	500	54.0	3

Note:

1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)
3. The radiated measurement are performed the each test mode (b/g/n) and channel (low/mid/high), the datum recorded below (802.11b mode, the middle channel) is the worst case for all the test mode and channel.
4. Loop Antenna for the radiation emission test below 30MHz.

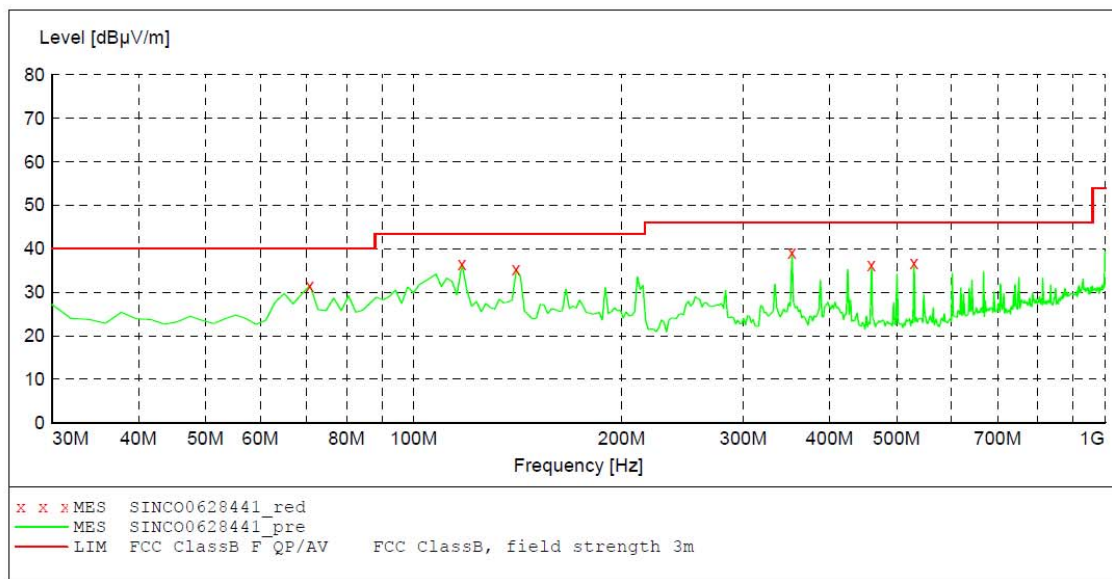
In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

Radiated emission in frequency band below 30MHz

Frequency (MHz)	Corrected Reading (dB μ V/m)@3m	FCC Limit (dB μ V/m) @3m	Margin (dB)	Detector	Verdict
0.63	50.00	71.21	21.21	QP	PASS
1.62	43.62	63.05	19.43	QP	PASS
24	31.56	49.54	17.98	QP	PASS

For 30MHz to 1000MHz**SWEEP TABLE: "test (30M-1G)"**

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163

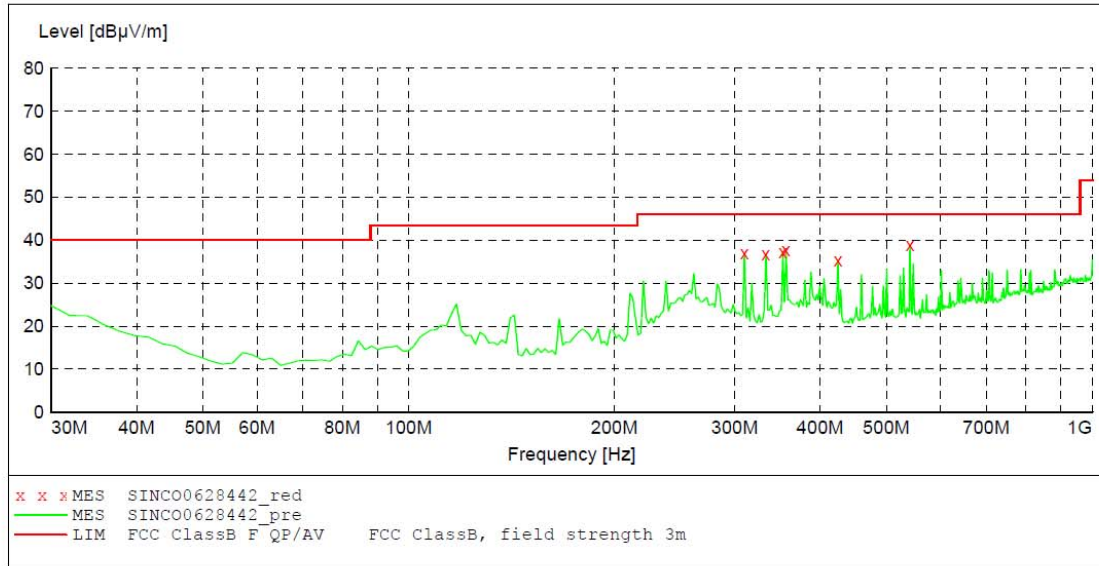
**MEASUREMENT RESULT: "SINCO0628441_red"**

6/28/2013 1:24AM

Frequency MHz	Level dB μ V/m	Transd dB	Limit dB μ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
70.821643	31.60	-17.1	40.0	8.4	QP	100.0	213.00	VERTICAL
117.474950	36.40	-12.8	43.5	7.1	QP	100.0	55.00	VERTICAL
140.801603	35.20	-15.3	43.5	8.3	QP	100.0	226.00	VERTICAL
352.685371	39.20	-9.7	46.0	6.8	QP	100.0	138.00	VERTICAL
459.599198	36.20	-7.8	46.0	9.8	QP	100.0	317.00	VERTICAL
529.579158	36.80	-5.8	46.0	9.2	QP	100.0	324.00	VERTICAL

SWEEP TABLE: "test (30M-1G)"

Short Description:		Field Strength			
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163

***MEASUREMENT RESULT: "SINCO0628442_red"***

6/28/2013 1:27AM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
309.919840	36.90	-10.9	46.0	9.1	QP	100.0	167.00	HORIZONTAL
333.246493	36.80	-10.6	46.0	9.2	QP	100.0	53.00	HORIZONTAL
352.685371	37.20	-9.7	46.0	8.8	QP	100.0	33.00	HORIZONTAL
356.573146	37.70	-9.6	46.0	8.3	QP	100.0	335.00	HORIZONTAL
424.609218	35.30	-8.6	46.0	10.7	QP	300.0	43.00	HORIZONTAL
541.242485	38.90	-5.8	46.0	7.1	QP	100.0	296.00	HORIZONTAL

Above 1G

The frequency spectrum above 1 GHz for Transmitter was investigated. All emission not reported are much lower than the prescribed limits. Set the RBW=1MHz, VBW=3MHz for Peak Detector while the RBW=1MHz, VBW=10Hz for Average Detector, Readings are both peak and average values. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11b--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	50.11	PK	74.00	23.89	1.00 H	359	46.91	32.7	7.00	-36.5
1	4824.00	40.96	AV	54.00	13.04	1.00 H	359	37.76	32.7	7.00	-36.5
2	7236.00	52.94	PK	74.00	21.06	1.00 H	152	43.54	35.8	8.90	-35.3
2	7236.00	44.99	AV	54.00	9.01	1.00 H	152	35.59	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11b--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	53.82	PK	74.00	20.18	1.00 V	339	50.62	32.7	7.00	-36.5
1	4824.00	44.07	AV	54.00	9.93	1.00 V	339	40.87	32.7	7.00	-36.5
2	7236.00	53.96	PK	74.00	20.04	1.00 V	340	44.56	35.8	8.90	-35.3
2	7236.00	42.89	AV	54.00	11.11	1.00 V	340	33.49	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11b--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	47.43	PK	74.00	26.57	1.00 H	202	44.03	32.3	7.60	-36.5
1	4874.00	36.17	AV	54.00	17.83	1.00 H	202	32.77	32.3	7.60	-36.5
2	7311.00	52.68	PK	74.00	21.32	1.00 H	355	43.28	36.1	8.60	-35.3
2	7311.00	40.49	AV	54.00	13.51	1.00 H	355	31.09	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11b--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	48.54	PK	74.00	25.46	1.00 V	97	45.14	32.3	7.60	-36.5
1	4874.00	36.24	AV	54.00	17.76	1.00 V	97	32.84	32.3	7.60	-36.5
2	7311.00	60.84	PK	74.00	13.16	1.00 V	288	51.44	36.1	8.60	-35.3
2	7311.00	40.79	AV	54.00	13.21	1.00 V	288	31.39	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11b--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	51.00	PK	74.00	23.00	1.00 H	100	47.20	33.0	7.00	-36.2
1	4924.00	35.20	AV	54.00	18.80	1.00 H	100	31.40	33.0	7.00	-36.2
2	7386.00	58.38	PK	74.00	15.62	1.00 H	190	48.98	36.2	8.50	-35.3
2	7386.00	44.67	AV	54.00	9.33	1.00 H	190	35.27	36.2	8.50	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11b--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	56.69	PK	74.00	17.31	1.00 V	90	52.89	33.0	7.00	-36.2
1	4924.00	49.12	AV	54.00	4.88	1.00 V	90	45.32	33.0	7.00	-36.2
2	7386.00	66.19	PK	74.00	7.81	1.00 V	29	56.79	36.2	8.50	-35.3
2	7386.00	44.62	AV	54.00	9.38	1.00 V	29	35.22	36.2	8.50	-35.3

REMARKS: 1. Emission level (dBuV/m)=Raw Value(dBuV) +Antenna Factor (dB/m) + Cable Factor (dB) +Pre-amplifier Factor
 2. The other emission levels were very low against the limit.
 3. Margin value = Limit value- Emission level.
 4. The limit value is defined as per 15.247
 5. For Wireless 802.11b mode at 1Mbps.

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11g--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	50.42	PK	74.00	23.58	1.00 H	216	46.62	32.7	7.30	-36.2
1	4824.00	42.43	AV	54.00	11.57	1.00 H	216	38.63	32.7	7.30	-36.2
2	7236.00	57.25	PK	74.00	16.75	1.00 H	176	47.85	35.8	8.90	-35.3
2	7236.00	42.72	AV	54.00	11.28	1.00 H	176	33.32	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11g--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	57.85	PK	74.00	16.15	1.00 V	95	54.05	32.7	7.30	-36.2
1	4824.00	45.87	AV	54.00	8.13	1.00 V	95	42.07	32.7	7.30	-36.2
2	7236.00	63.88	PK	74.00	10.12	1.00 V	0	54.48	35.8	8.90	-35.3
2	7236.00	49.52	AV	54.00	4.48	1.00 V	0	40.12	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11g--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	65.80	PK	74.00	8.20	1.00 H	214	62.40	32.8	7.10	-36.5
1	4874.00	48.16	AV	54.00	5.84	1.00 H	214	44.76	32.8	7.10	-36.5
2	7311.00	60.55	PK	74.00	13.45	1.00 H	0	51.15	36.1	8.60	-35.3
2	7311.00	47.60	AV	54.00	6.40	1.00 H	0	38.20	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11g--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	60.66	PK	74.00	13.34	1.00 V	100	57.26	32.8	7.10	-36.5
1	4874.00	43.74	AV	54.00	10.26	1.00 V	100	40.34	32.8	7.10	-36.5
2	7311.00	55.35	PK	74.00	18.65	1.00 V	356	45.95	36.1	8.60	-35.3
2	7311.00	44.69	AV	54.00	9.31	1.00 V	356	35.29	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11g--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	48.47	PK	74.00	25.53	1.00 V	96	44.67	33.0	7.00	-36.2
1	4924.00	36.87	AV	54.00	17.13	1.00 V	96	33.07	33.0	7.00	-36.2
2	7386.00	56.94	PK	74.00	17.06	1.00 V	35	47.54	36.2	8.50	-35.3
2	7386.00	44.92	AV	54.00	9.08	1.00 V	35	35.52	36.2	8.50	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11g--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	52.74	PK	74.00	21.26	1.00 H	198	48.94	33.0	7.00	-36.2
1	4924.00	39.76	AV	54.00	14.24	1.00 H	198	35.96	33.0	7.00	-36.2
2	7386.00	57.72	PK	74.00	16.28	1.00 H	90	48.32	36.2	8.50	-35.3
2	7386.00	44.62	AV	54.00	9.38	1.00 H	90	35.22	36.2	8.50	-35.3

REMARKS:

1. Emission level (dBuV/m) = Raw Value (dBuV) + Antenna Factor (dB/m) + Cable Factor (dB) + Pre-amplifier Factor
2. The other emission levels were very low against the limit.
3. Margin value = Limit value- Emission level.
4. The limit value is defined as per 15.247
5. For Wireless 802.11g mode at 6Mbps.

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-20--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	57.69	PK	74.00	16.31	1.00 H	204	53.89	32.7	7.30	-36.2
1	4824.00	43.7	AV	54.00	10.30	1.00 H	204	39.90	32.7	7.30	-36.2
2	7236.00	59.29	PK	74.00	14.71	1.00 H	114	49.89	35.8	8.90	-35.3
2	7236.00	43.5	AV	54.00	10.50	1.00 H	114	34.10	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n-20--2412MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4824.00	59.55	PK	74.00	14.45	1.00 V	100	55.75	32.7	7.30	-36.2
1	4824.00	45.38	AV	54.00	8.62	1.00 V	100	41.58	32.7	7.30	-36.2
2	7236.00	61.91	PK	74.00	12.09	1.00 V	236	52.51	35.8	8.90	-35.3
2	7236.00	47.24	AV	54.00	6.76	1.00 V	236	37.84	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-20--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	51.93	PK	74.00	22.07	1.00 H	194	48.53	32.3	7.60	-36.5
1	4874.00	41.73	AV	54.00	12.27	1.00 H	194	38.33	32.3	7.60	-36.5
2	7311.00	54.44	PK	74.00	19.56	1.00 H	248	45.04	36.1	8.60	-35.3
2	7311.00	45.7	AV	54.00	8.30	1.00 H	248	36.30	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n-20--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	53.95	PK	74.00	20.05	1.00 V	181	50.55	32.3	7.60	-36.5
1	4874.00	42.63	AV	54.00	11.37	1.00 V	181	39.23	32.3	7.60	-36.5
2	7311.00	60.88	PK	74.00	13.12	1.00 V	346	51.48	36.1	8.60	-35.3
2	7311.00	43.57	AV	54.00	10.43	1.00 V	346	34.17	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-20--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	52.02	PK	74.00	21.98	1.00 H	217	48.22	33.0	7.00	-36.2
1	4924.00	39.33	AV	54.00	14.67	1.00 H	217	35.53	33.0	7.00	-36.2
2	7386.00	56.99	PK	74.00	17.01	1.00 H	0	47.59	36.2	8.50	-35.3
2	7386.00	45.58	AV	54.00	8.42	1.00 H	0	36.18	36.2	8.50	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11b--2462MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4924.00	47.64	PK	74.00	26.36	1.00 V	100	43.84	33.0	7.00	-36.2
1	4924.00	35.37	AV	54.00	18.63	1.00 V	100	31.57	33.0	7.00	-36.2
2	7386.00	56.12	PK	74.00	17.88	1.00 V	0	46.72	36.2	8.50	-35.3
2	7386.00	43.93	AV	54.00	10.07	1.00 V	0	34.53	36.2	8.50	-35.3

REMARKS: 1. Emission level (dBuV/m)=Raw Value(dBuV) +Antenna Factor (dB/m) + Cable Factor (dB) +Pre-amplifier Factor
 2. The other emission levels were very low against the limit.
 3. Margin value = Limit value- Emission level.
 4. The limit value is defined as per 15.247
 5. For Wireless 802.11n (20MHz) mode at 6.5Mbps.

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-40--2422MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4844.00	53.77	PK	74.00	20.23	1.00 H	91	49.97	32.7	7.30	-36.2
1	4844.00	38.66	AV	54.00	15.34	1.00 H	91	34.86	32.7	7.30	-36.2
2	7266.00	47.72	PK	74.00	26.28	1.00 H	266	38.32	35.8	8.90	-35.3
2	7266.00	39.06	AV	54.00	14.94	1.00 H	266	29.66	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n-40--2422MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4844.00	52.62	PK	74.00	21.38	1.00 V	211	48.82	32.7	7.30	-36.2
1	4844.00	40.00	AV	54.00	14.00	1.00 V	211	36.20	32.7	7.30	-36.2
2	7266.00	62.29	PK	74.00	11.71	1.00 V	57	52.89	35.8	8.90	-35.3
2	7266.00	47.26	AV	54.00	6.74	1.00 V	57	37.86	35.8	8.90	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-40--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	53.92	PK	74.00	20.08	1.00 H	198	50.52	32.3	7.60	-36.5
1	4874.00	41.63	AV	54.00	12.37	1.00 H	198	38.23	32.3	7.60	-36.5
2	7311.00	57.54	PK	74.00	16.46	1.00 H	203	48.14	36.1	8.60	-35.3
2	7311.00	42.57	AV	54.00	11.43	1.00 H	203	33.17	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n-40--2437MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4874.00	51.93	PK	74.00	22.07	1.00 V	96	48.53	32.3	7.60	-36.5
1	4874.00	44.77	AV	54.00	9.23	1.00 V	96	41.37	32.3	7.60	-36.5
2	7311.00	56.9	PK	74.00	17.10	1.00 V	26	47.50	36.1	8.60	-35.3
2	7311.00	43.26	AV	54.00	10.74	1.00 V	26	33.86	36.1	8.60	-35.3

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (802.11n-40--2452MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4904.00	51.71	PK	74.00	22.29	1.00 H	204	47.91	33.0	7.00	-36.2
1	4904.00	38.96	AV	54.00	15.04	1.00 H	204	35.16	33.0	7.00	-36.2
2	7356.00	58.51	PK	74.00	15.49	1.00 H	301	49.11	36.2	8.50	-35.3
2	7356.00	44.62	AV	54.00	9.38	1.00 H	301	35.22	36.2	8.50	-35.3

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (802.11n-40--2452MHz)											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	4904.00	56.27	PK	74.00	17.73	1.00 V	177	52.47	33.0	7.00	-36.2
1	4904.00	41.28	AV	54.00	12.72	1.00 V	177	37.48	33.0	7.00	-36.2
2	7356.00	61.86	PK	74.00	12.14	1.00 V	0	52.46	36.2	8.50	-35.3
2	7356.00	45.68	AV	54.00	8.32	1.00 V	0	36.28	36.2	8.50	-35.3

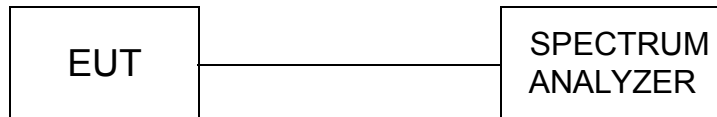
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Antenna Factor (dB/m) + Cable Factor (dB) + Pre-amplifier Factor
 2. The other emission levels were very low against the limit.
 3. Margin value = Limit value - Emission level.
 4. " * " : Fundamental frequency
 5. For Wireless 802.11n (40MHz) mode at 13.5Mbps.

4.3. Peak Output Power

REQUIREMENT

According to FCC section 15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

TEST CONFIGURATION



TEST PROCEDURE

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum.

LIMIT

The Maximum Peak Output Power Measurement is 30dBm.

TEST RESULTS

Remark: 1. The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.
2. Each mode test difference speeds and recorded worst cases at each mode.

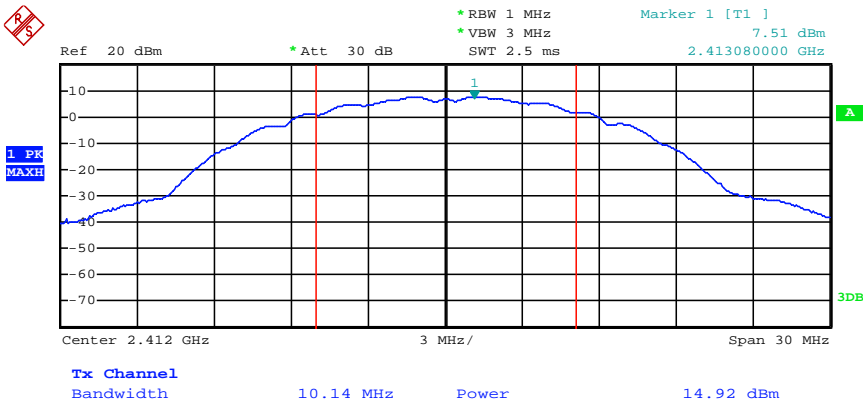
4.3.1 802.11b Test mode

A Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Refer to Plot	Limits (dBm)	Verdict
1	2412	14.92	Plot 4.3.1 A	30	PASS
6	2437	15.54	Plot 4.3.1 B	30	PASS
11	2462	16.09	Plot 4.3.1 C	30	PASS

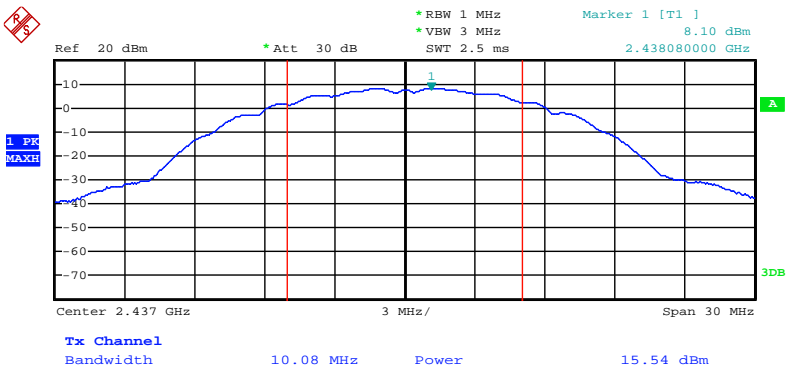
Note: 1. For 802.11b mode at final test to get the worst-case emission at 1Mbps.
2. The test results including the cable loss.

B Test Plots:



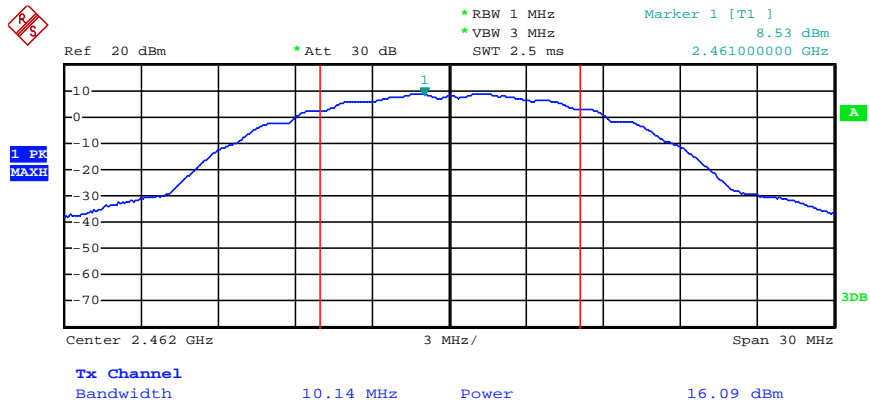
Date: 29.JUN.2013 21:29:05

(Plot 4.3.1 A: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:27:41

(Plot 4.3.1 B: Channel 6: 2437MHz @ 802.11b)



Date: 29.JUN.2013 21:26:35

(Plot 4.3.1 C: Channel 11: 2462MHz @ 802.11b)

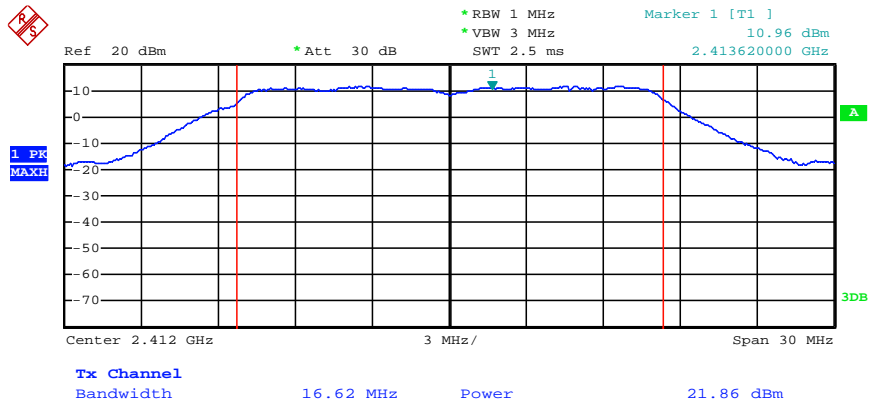
4.3.2 802.11g Test mode

A Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Refer to Plot	Limits (dBm)	Verdict
1	2412	21.86	Plot 4.3.2 A	30	PASS
6	2437	22.47	Plot 4.3.2 B	30	PASS
11	2462	22.52	Plot 4.3.2 C	30	PASS

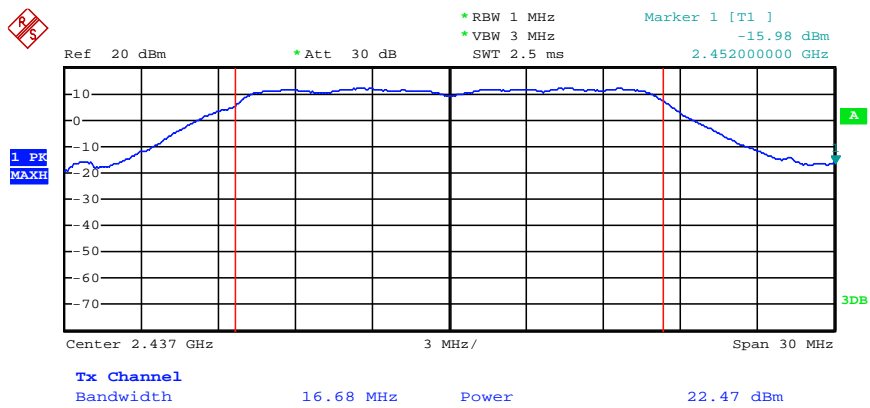
Note: 1. For 802.11g mode at final test to get the worst-case emission at 6Mbps.
2. The test results including the cable loss.

B Test Plots:



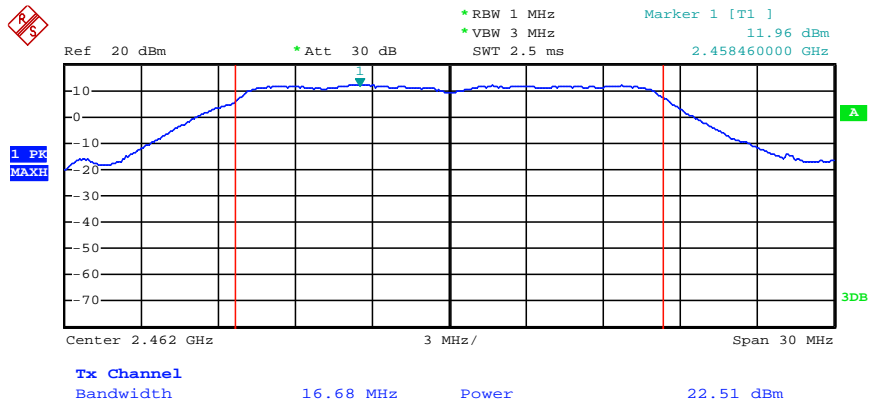
Date: 29.JUN.2013 22:02:33

(Plot 4.3.2 A: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 22:01:03

(Plot 4.3.2 B: Channel 6: 2437MHz @ 802.11g)



Date: 29.JUN.2013 21:59:16

(Plot 4.3.2 C: Channel 11: 2462MHz @ 802.11g)

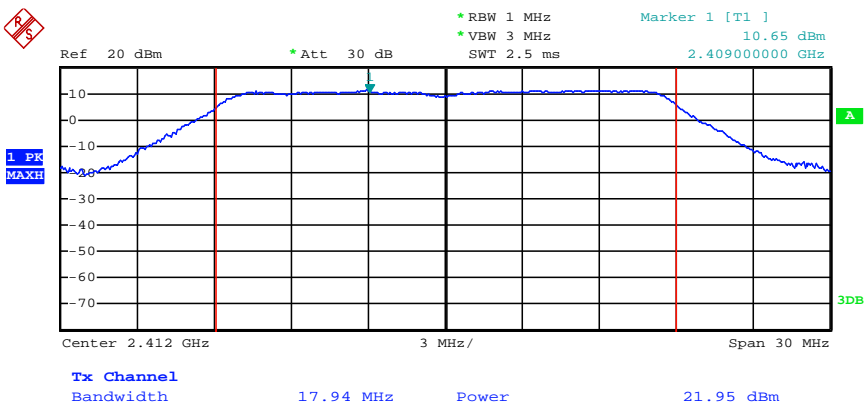
4.3.3 802.11n(20MHz) Test mode

A Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Refer to Plot	Limits (dBm)	Verdict
1	2412	21.95	Plot 4.3.3 A	30	PASS
6	2437	22.67	Plot 4.3.3 B	30	PASS
11	2462	22.87	Plot 4.3.3 C	30	PASS

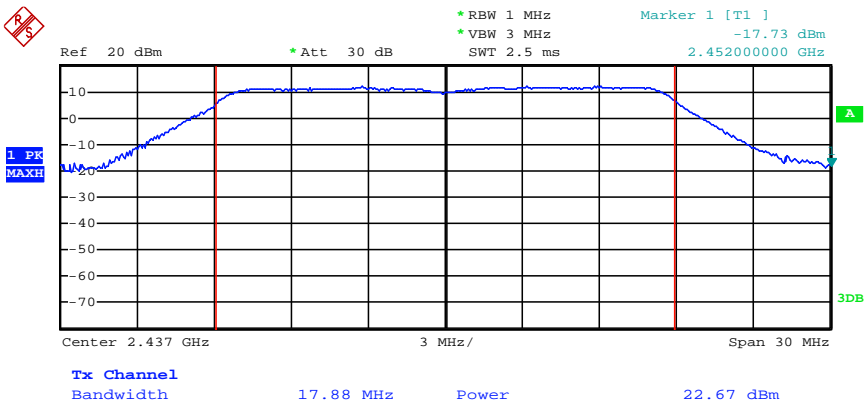
Note: 1. For 802.11n(20MHz) mode at final test to get the worst-case emission at 6.5Mbps.
2. The test results including the cable loss.

B Test Plots:



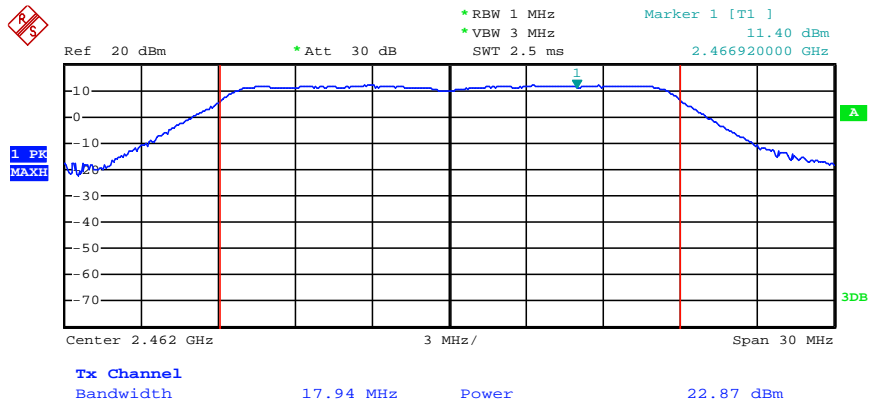
Date: 29.JUN.2013 22:16:40

(Plot 4.3.3 A: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:15:56

(Plot 4.3.3 B: Channel 6: 2437MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:15:29

(Plot 4.3.3 C: Channel 11: 2462MHz @ 802.11n(20MHz))

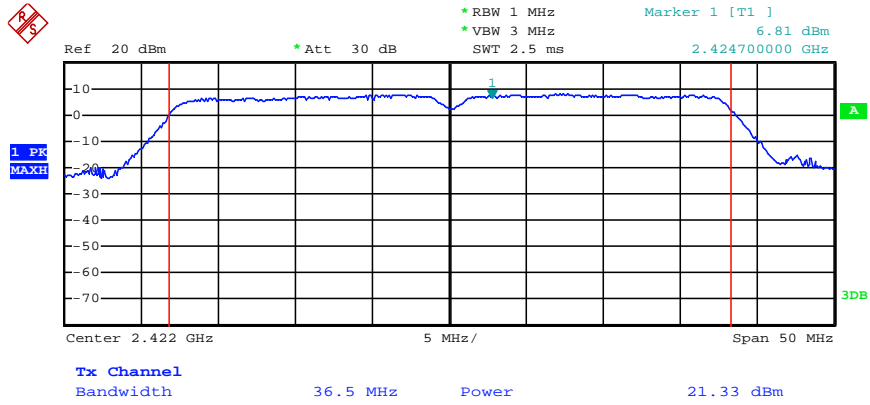
4.3.4 802.11n(40MHz) Test mode

A Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power (dBm)	Refer to Plot	Limits (dBm)	Verdict
3	2422	21.33	Plot 4.3.4 A	30	PASS
6	2437	22.05	Plot 4.3.4 B	30	PASS
9	2452	17.08	Plot 4.3.4 C	30	PASS

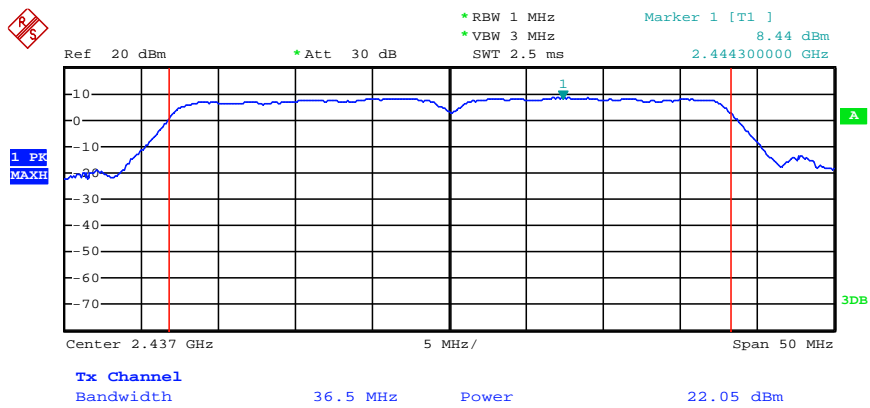
Note: 1. For 802.11n(40MHz) mode at final test to get the worst-case emission at 13.5Mbps.
2. The test results including the cable loss.

B Test Plots:



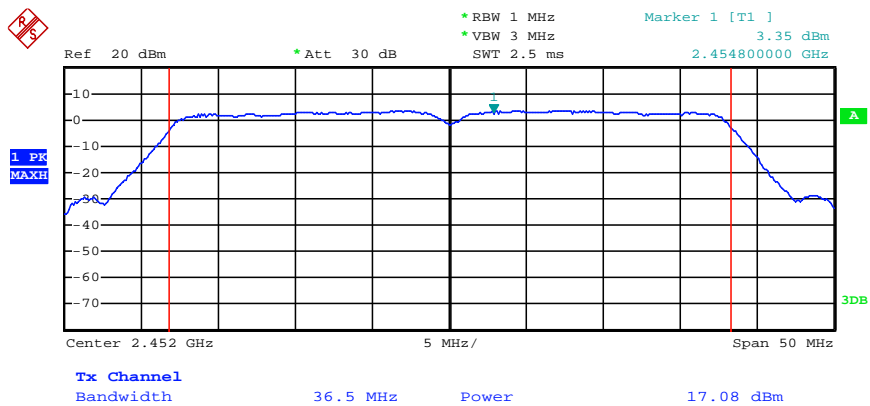
Date: 29.JUN.2013 22:28:04

(Plot 4.3.4 A: Channel 3: 2422MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:27:45

(Plot 4.3.4 B: Channel 6: 2437MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:27:12

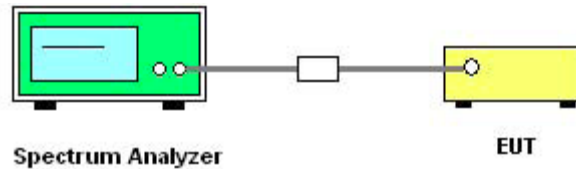
(Plot 4.3.4 C: Channel 9: 2452MHz @ 802.11n(40MHz))

4.4. Power Spectral Density

REQUIREMENT

According to FCC section 15.247(d), the same method of determining the conducted output power shall be used to determine the power spectral density. If a peak output power is measured, then a peak power spectral density measurement is required. If an average output power is measured, then an average power spectral density measurement should be used.

TEST CONFIGURATION



The EUT which is powered by the Battery, is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss and Atten as the factor is calibrated to correct the reading.

TEST PROCEDURE

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 $\geq 3\text{RBW}$.
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.
11. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $\text{BWCF} = 10\log(3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$ if set $\text{RBW}=100\text{kHz}$ for test.
12. The resulting peak PSD level must be 8 dBm.
13. Follow KDB 558074 D01 DTS Meas Guidance v03 of measurement procedure PKPSD

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.

TEST RESULTS

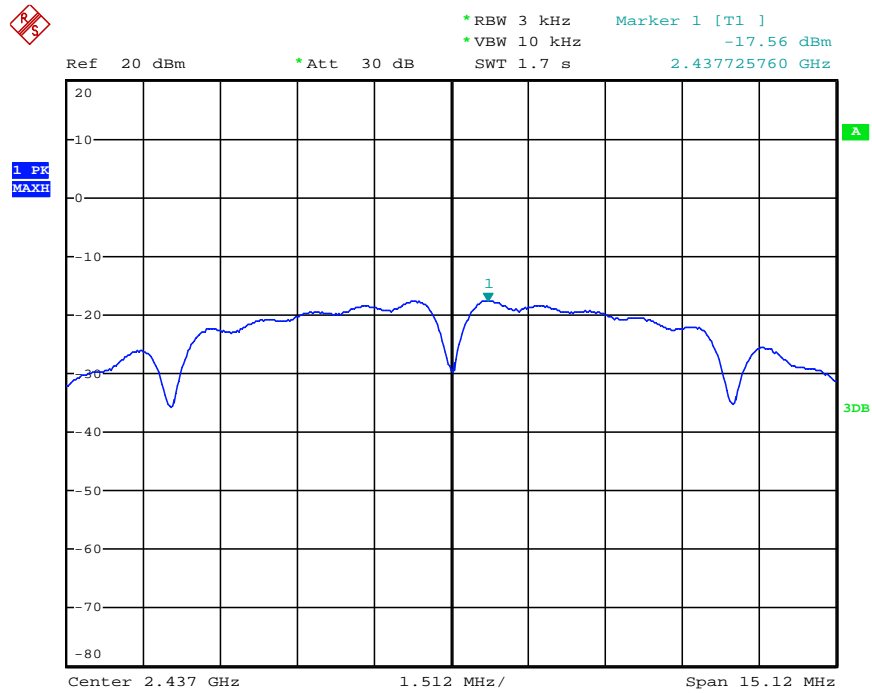
The lowest, middle and highest channels are tested to verify the band edge emissions.

4.4.1 802.11b Test mode

A. Test Verdict:

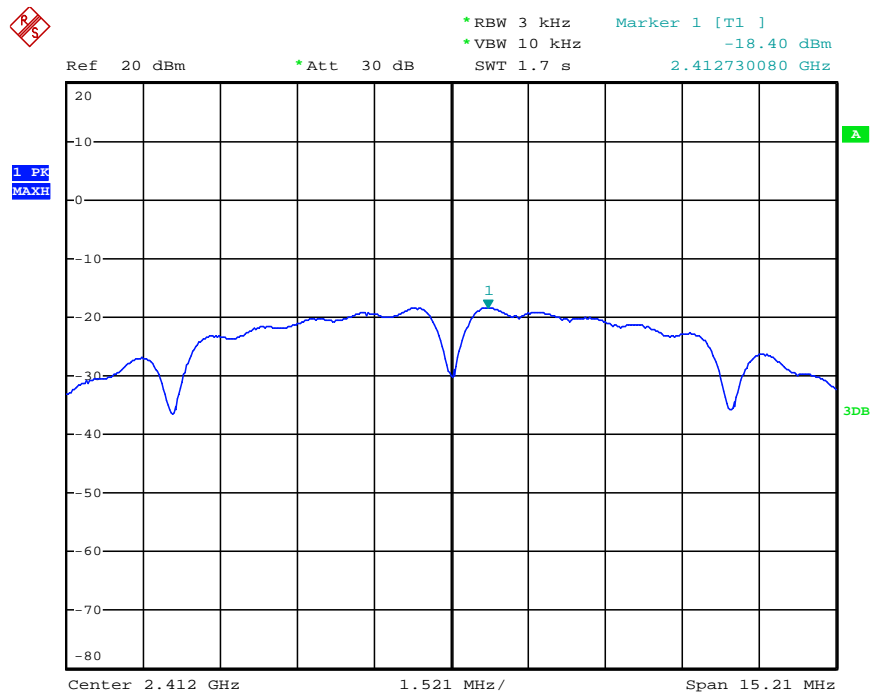
Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
1	2412	-17.56	Plot 4.4.1 A	8	PASS
6	2437	-18.40	Plot 4.4.1 B	8	PASS
11	2462	-16.84	Plot 4.4.1 C	8	PASS

Note: 1. For 802.11b mode at final test to get the worst-case emission at 1Mbps.
2. The test results including the cable loss.

B. Test Plots:

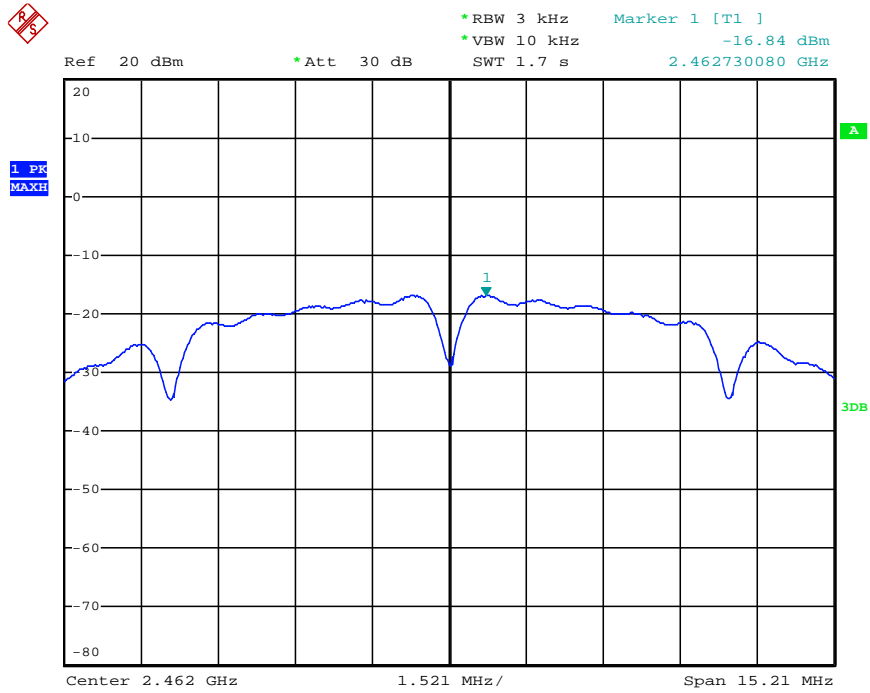
Date: 29.JUN.2013 21:32:06

(Plot 4.4.1 A: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:31:16

(Plot 4.4.1 B: Channel 6: 2437MHz @ 802.11b)



Date: 29.JUN.2013 21:32:55

(Plot 4.4.1 C: Channel 11: 2462MHz @ 802.11b)

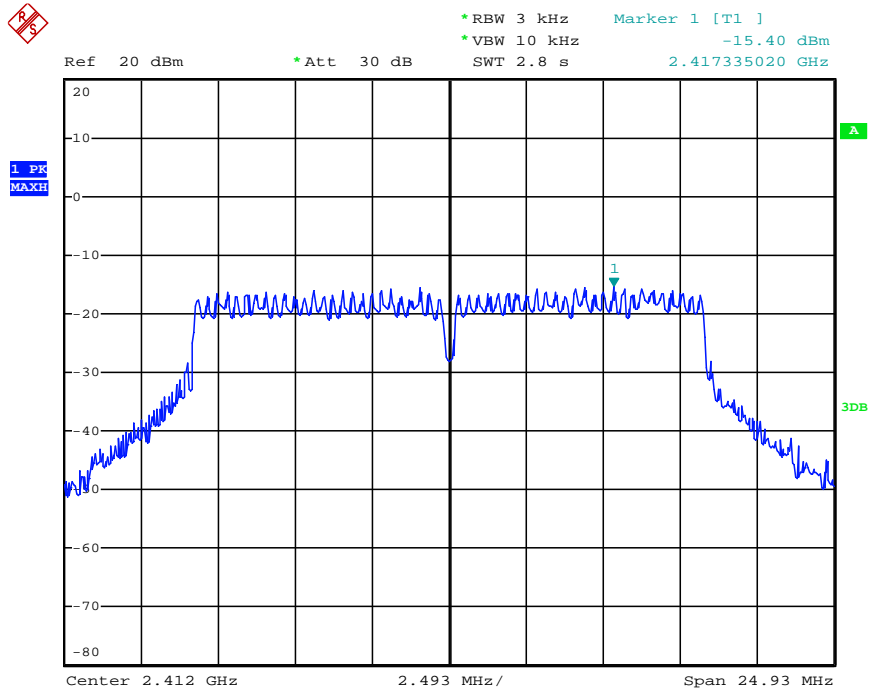
4.4.2 802.11g Test mode

A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
1	2412	-15.40	Plot 4.4.2 A	8	PASS
6	2437	-20.03	Plot 4.4.2 B	8	PASS
11	2462	-19.38	Plot 4.4.2 C	8	PASS

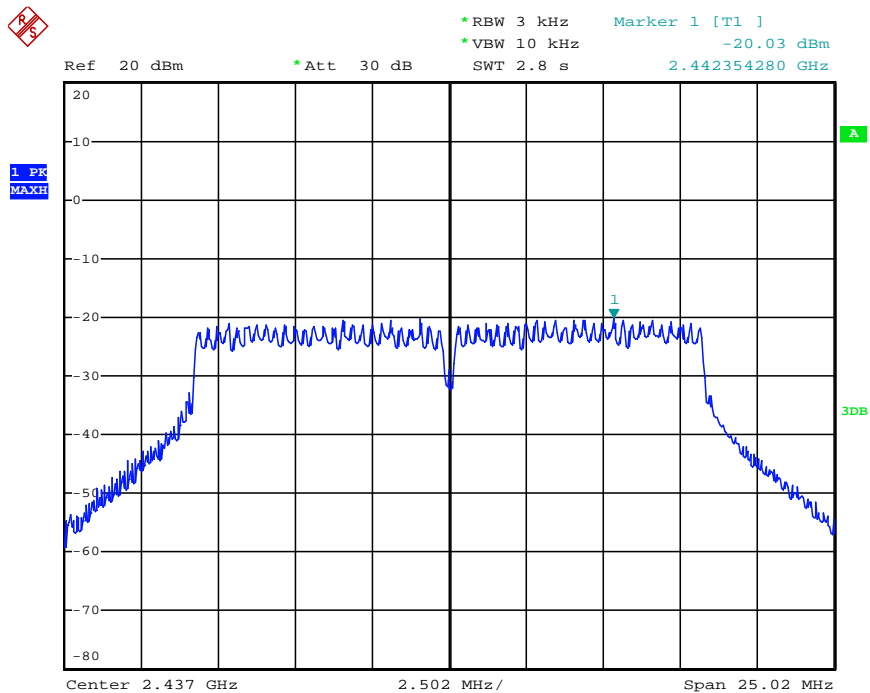
Note: 1. For 802.11g mode at final test to get the worst-case emission at 6Mbps.
 2. The test results including the cable loss.

B. Test Plots:



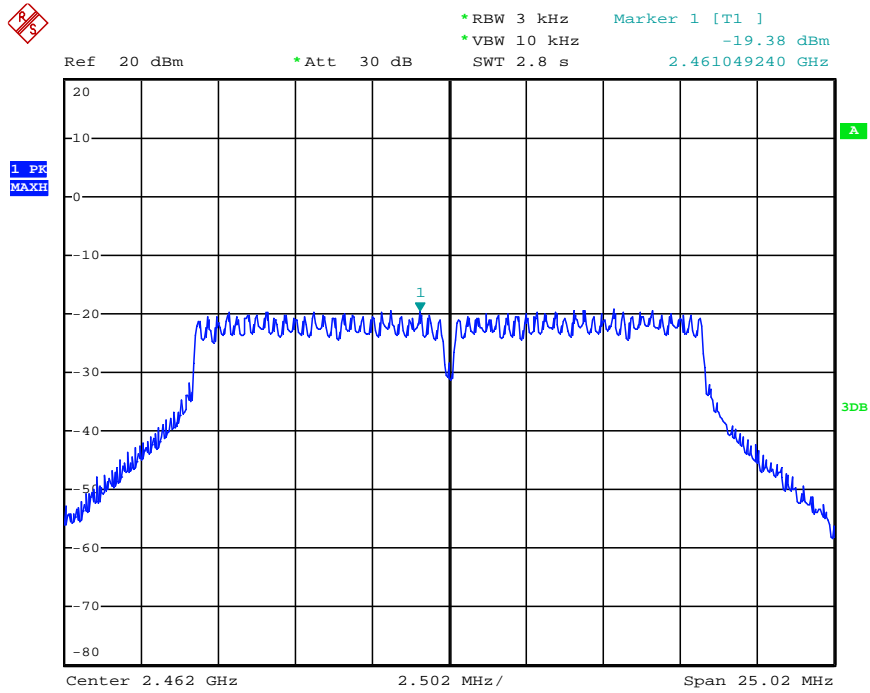
Date: 29.JUN.2013 22:03:55

(Plot 4.4.2 A: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 22:04:39

(Plot 4.4.2 B: Channel 6: 2437MHz @ 802.11g)



Date: 29.JUN.2013 22:05:25

(Plot 4.4.2 C: Channel 11: 2462MHz @ 802.11g)

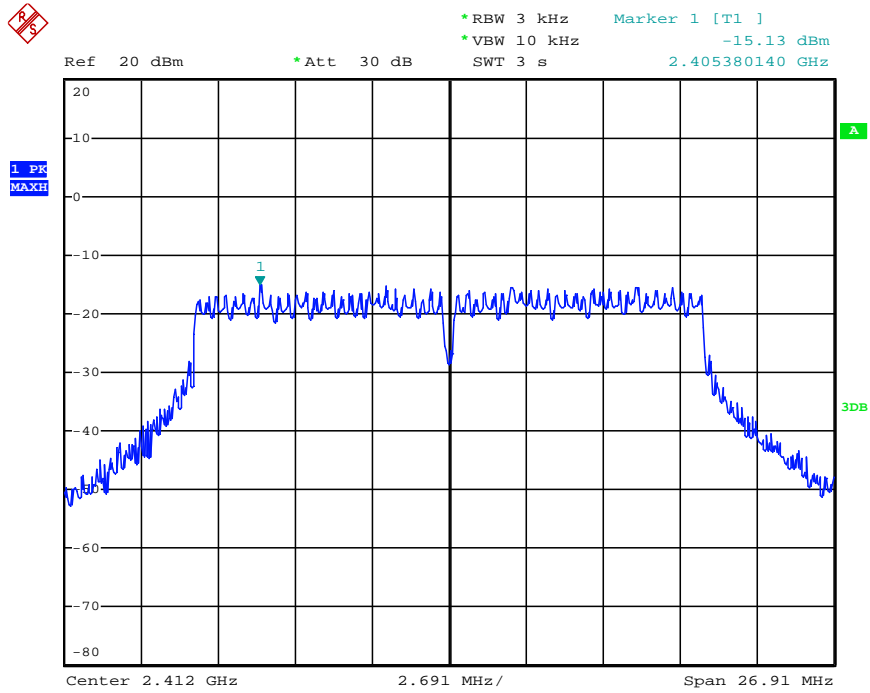
4.4.3 802.11n(20MHz) Test mode

A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
1	2412	-15.13	Plot 4.4.3 A	8	PASS
6	2437	-13.37	Plot 4.4.3 B	8	PASS
11	2462	-13.59	Plot 4.4.3 C	8	PASS

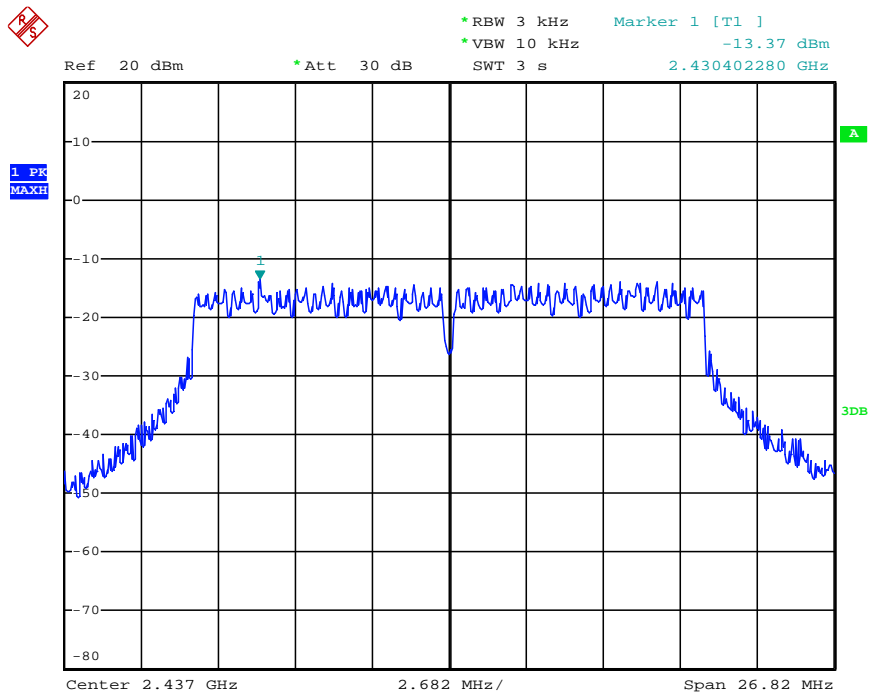
Note: 1. For 802.11n(20MHz) mode at final test to get the worst-case emission at 6.5Mbps.
2. The test results including the cable lose.

B. Test Plots:



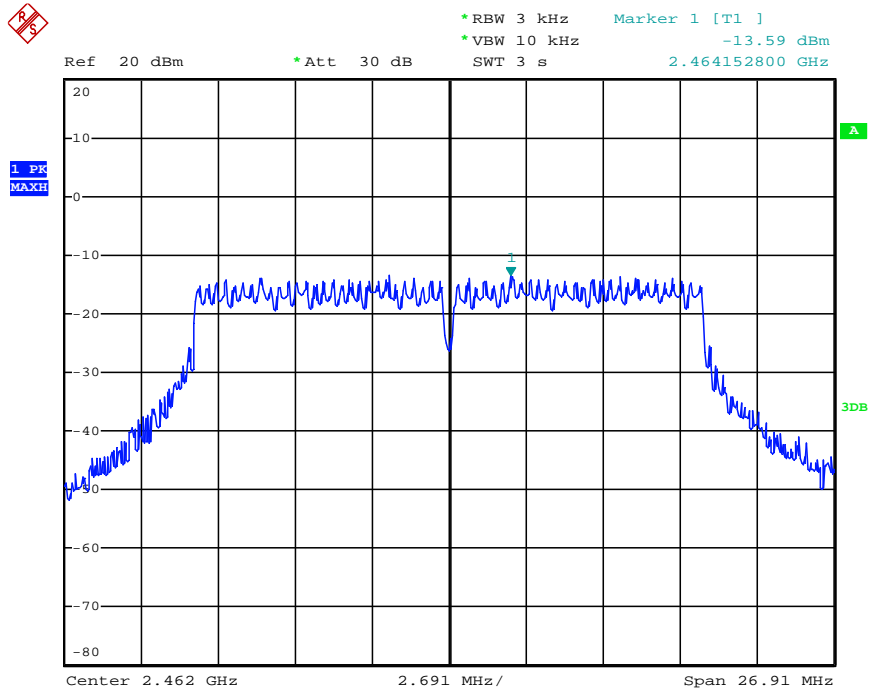
Date: 29.JUN.2013 22:17:26

(Plot 4.4.3 A: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:17:59

(Plot 4.4.3 B: Channel 6: 2437MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:18:22

(Plot 4.4.3 C: Channel 11: 2462MHz @ 802.11n(20MHz))

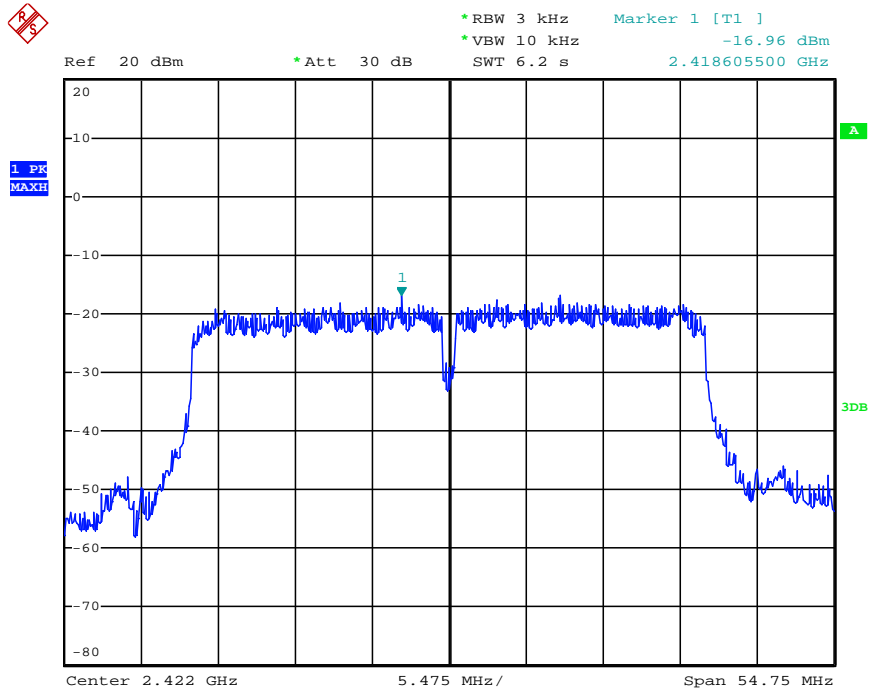
4.4.4 802.11n(40MHz) Test mode

A. Test Verdict:

Spectral power density (dBm/3kHz)					
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Refer to Plot	Limit (dBm/3kHz)	Verdict
3	2422	-16.96	Plot 4.4.4 A	8	PASS
6	2437	-14.42	Plot 4.4.4 B	8	PASS
9	2452	-18.61	Plot 4.4.4 C	8	PASS

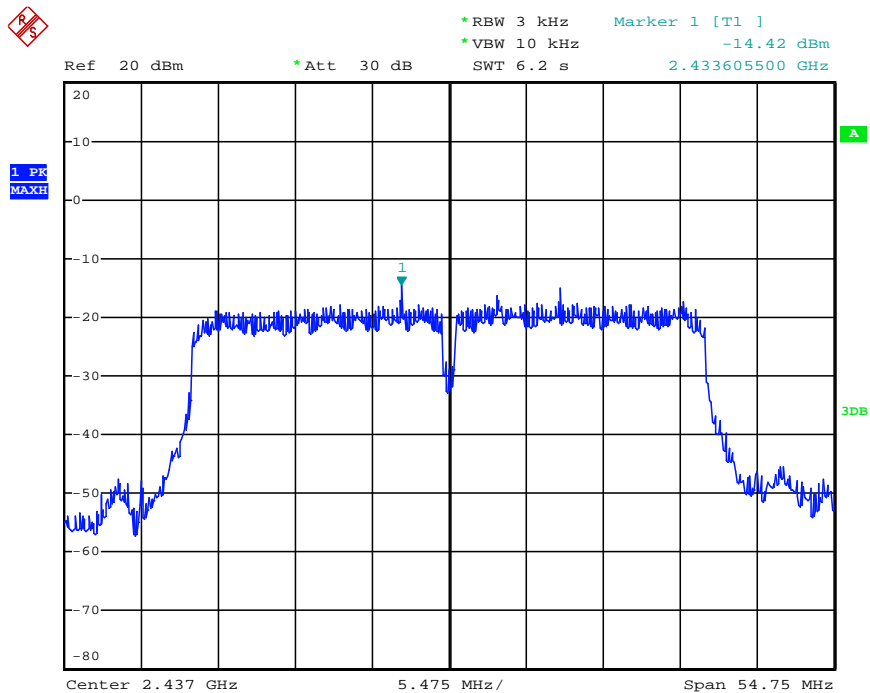
Note: 1. For 802.11n(40MHz) mode at final test to get the worst-case emission at 13.5Mbps.
 2. The test results including the cable loss.

B. Test Plots:



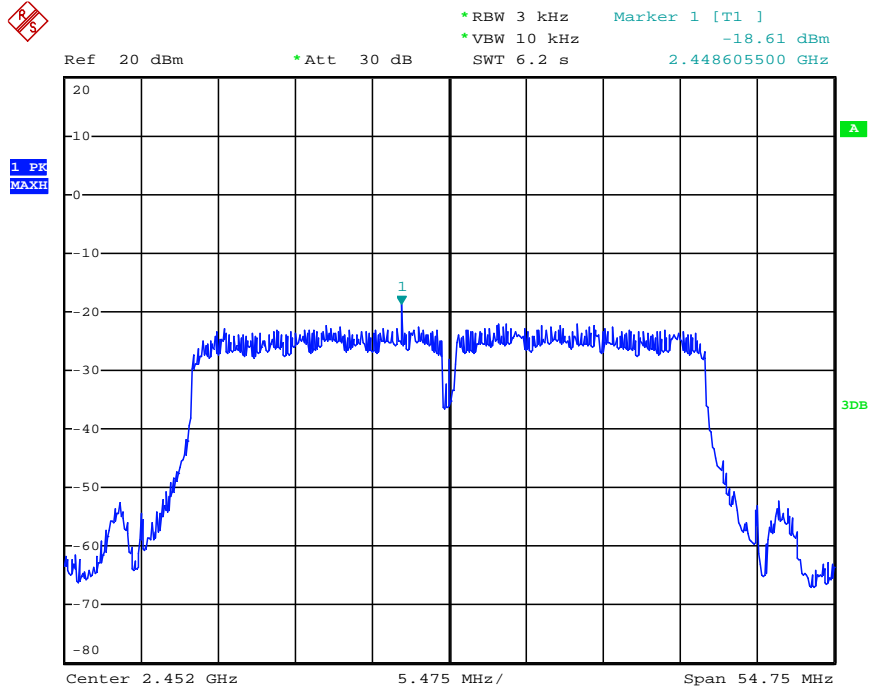
Date: 29.JUN.2013 22:29:36

(Plot 4.4.4 A: Channel 3: 2422MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:30:29

(Plot 4.4.4 B: Channel 6: 2437MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:30:58

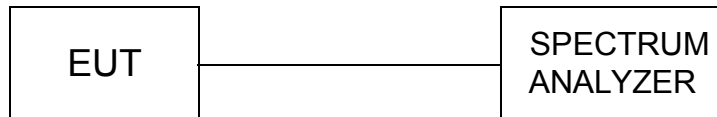
(Plot 4.4.4 C: Channel 9: 2452MHz @ 802.11n(40MHz))

4.5. 6dB Bandwidth

REQUIREMENT

According to FCC section 15.247(a) (2), Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

LIMIT

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST RESULTS

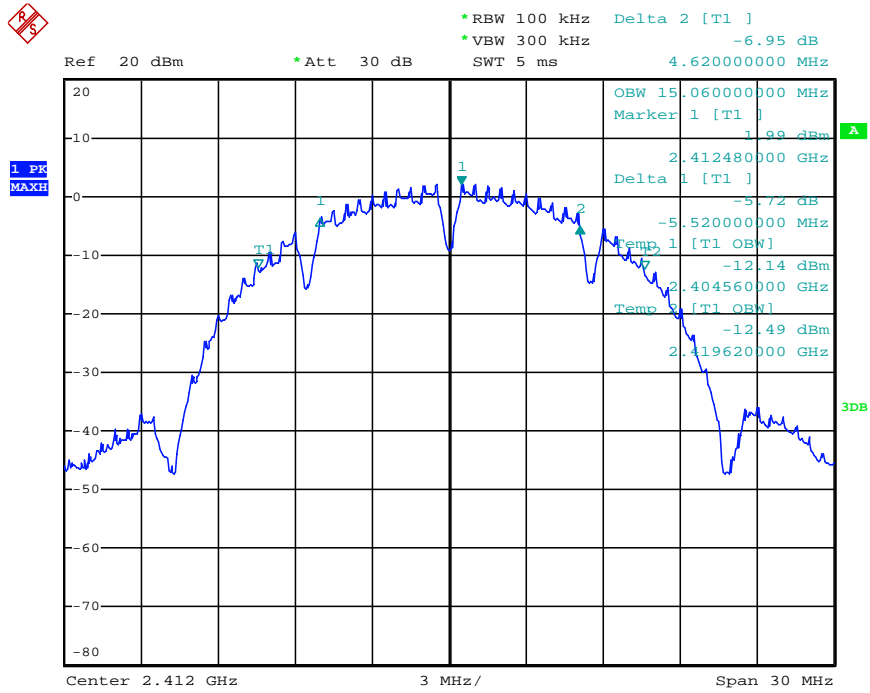
4.5.1 802.11b Test mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Verdict
1	2412	10.14	Plot 4.5.1 A	≥500	PASS
6	2437	10.08	Plot 4.5.1 B	≥500	PASS
11	2462	10.14	Plot 4.5.1 C	≥500	PASS

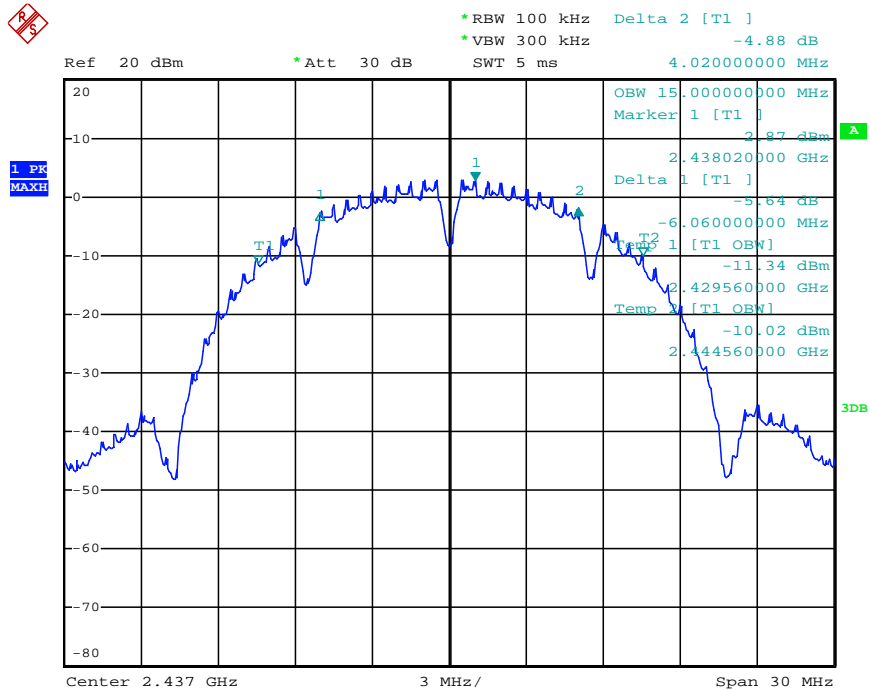
Note: 1. For 802.11 b mode at final test to get the worst-case emission at 1Mbps.
2. The test results including the cable loss.

B. Test Plots:



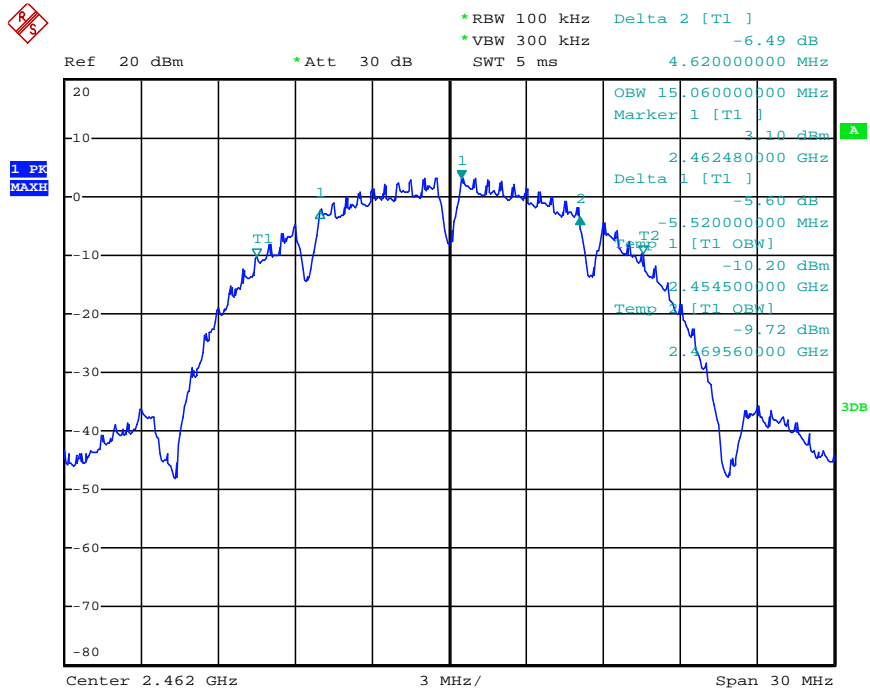
Date: 29.JUN.2013 21:12:25

(Plot 4.5.1 A: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:14:01

(Plot 4.5.1 B: Channel 6: 2437MHz @ 802.11b)



Date: 29.JUN.2013 21:14:45

(Plot 4.5.1 C: Channel 11: 2462MHz @ 802.11 b)

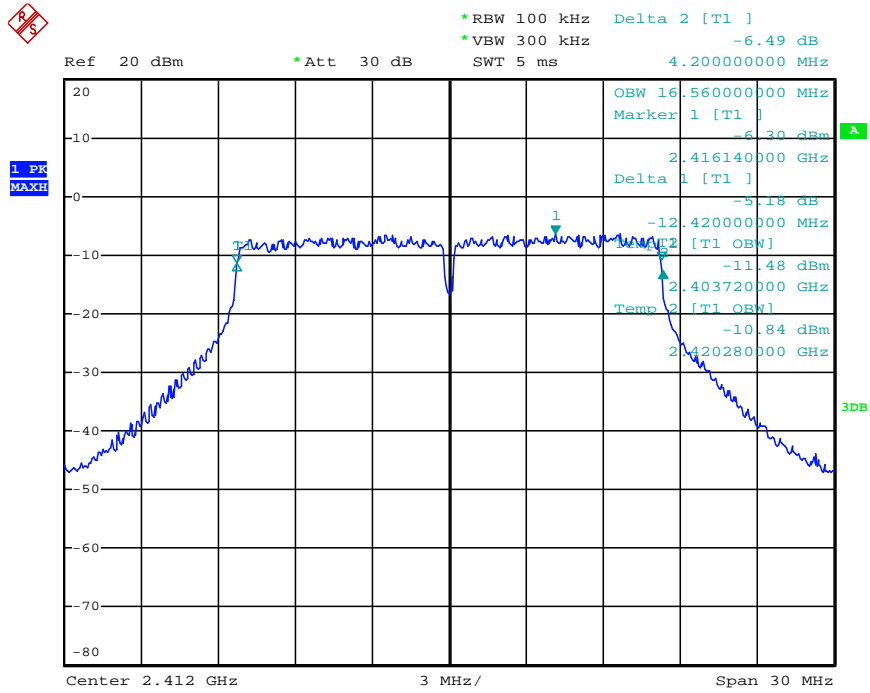
4.5.2 802.11g Test mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Verdict
1	2412	16.62	Plot 4.5.2 A	≥500	PASS
6	2437	16.68	Plot 4.5.2 B	≥500	PASS
11	2462	16.68	Plot 4.5.2 C	≥500	PASS

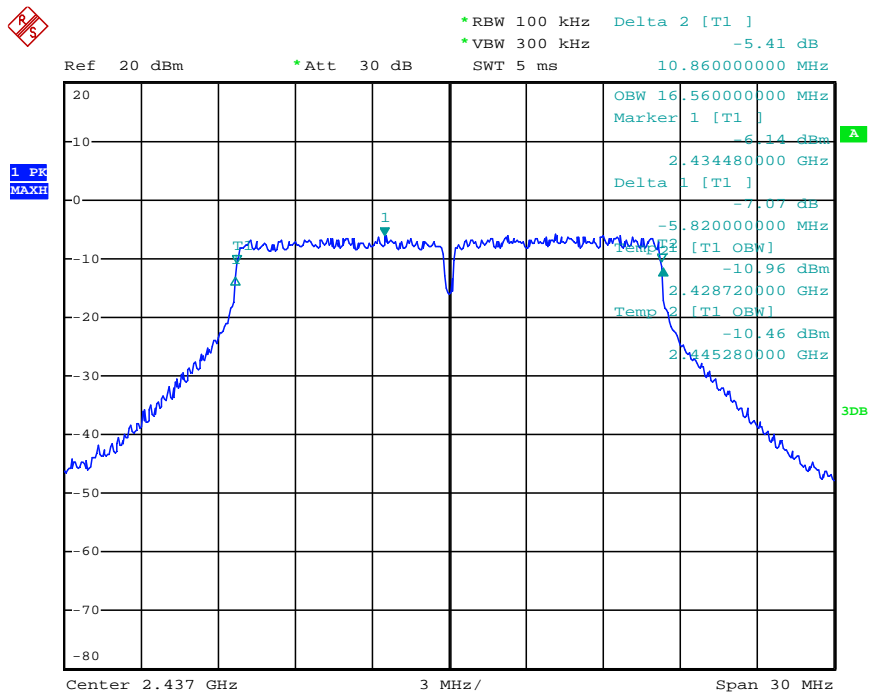
Note: 1. For 802.11 g mode at final test to get the worst-case emission at 6Mbps.
2. The test results including the cable loss.

B. Test Plots:



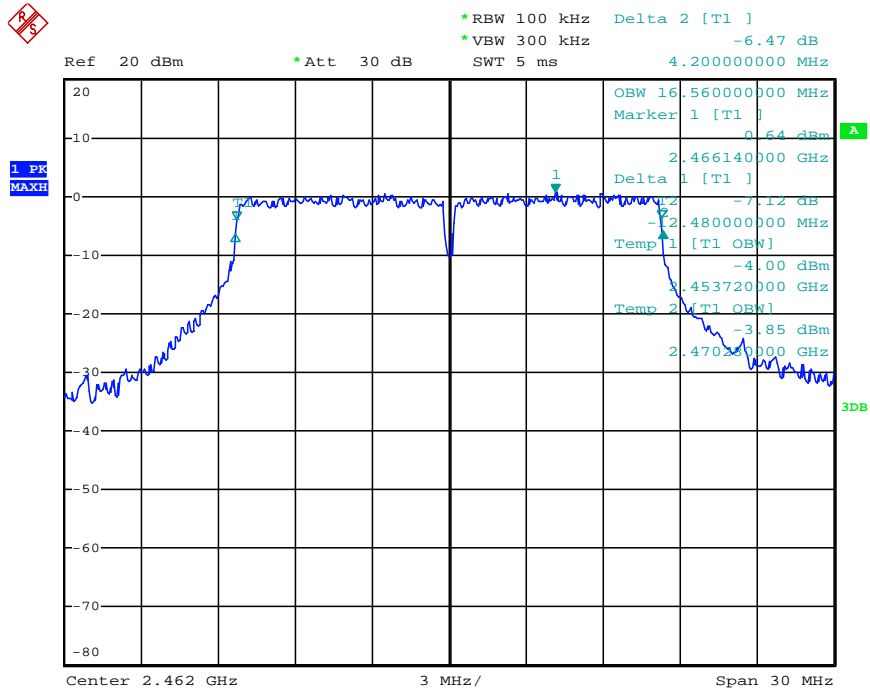
Date: 29.JUN.2013 21:56:12

(Plot 4.5.2 A: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 21:57:29

(Plot 4.5.2 B: Channel 6: 2437MHz @ 802.11g)



Date: 29.JUN.2013 21:58:16

(Plot 4.5.2 C: Channel 11: 2462MHz @ 802.11 g)

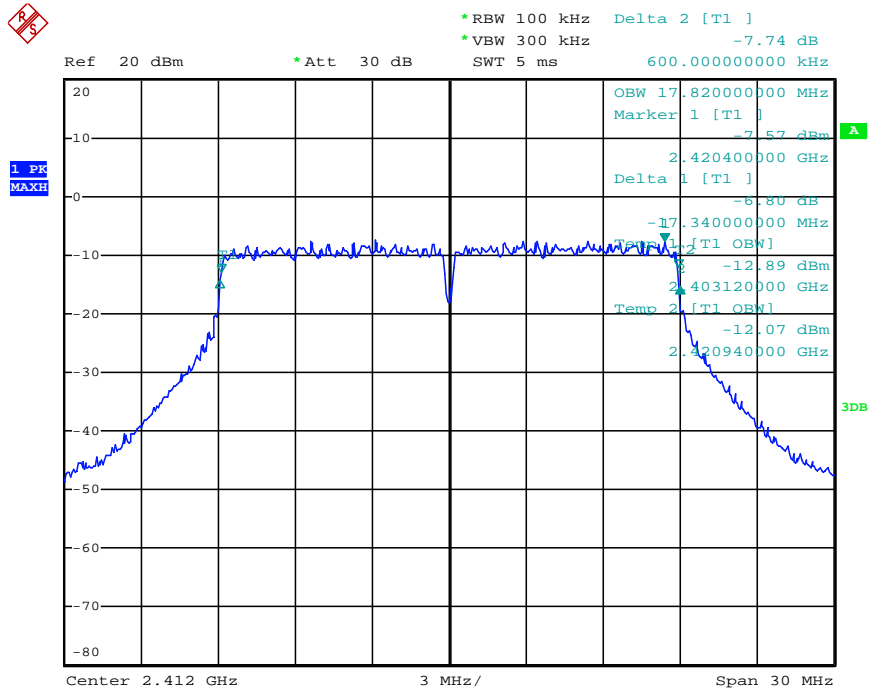
4.5.3 802.11n(20MHz) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Verdict
1	2412	17.94	Plot 4.5.3 A	≥500	PASS
6	2437	17.88	Plot 4.5.3 B	≥500	PASS
11	2462	17.94	Plot 4.5.3 C	≥500	PASS

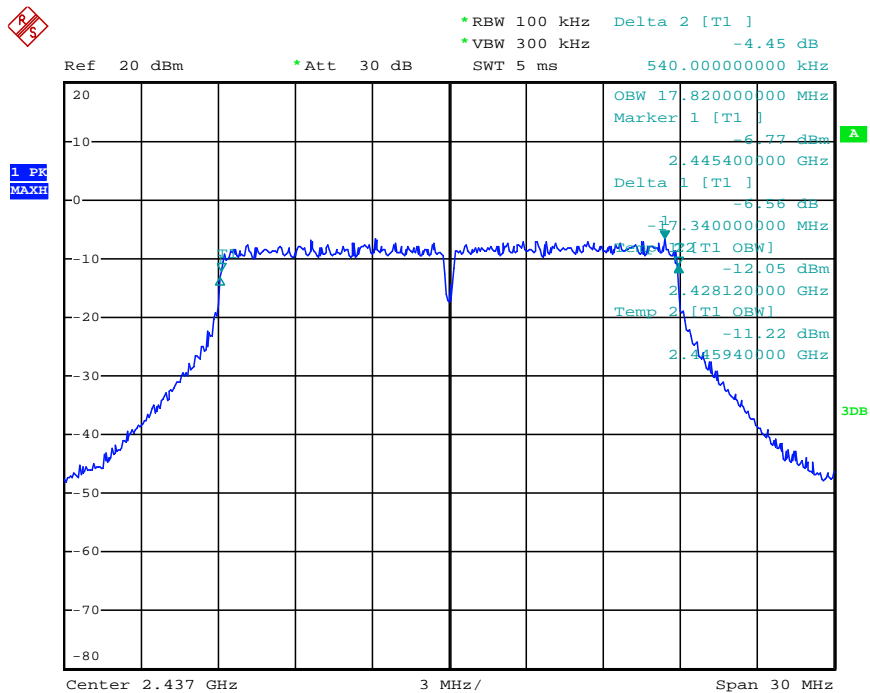
Note: 1. For 802.11 n(20MHz) mode at final test to get the worst-case emission at 6.5Mbps.
2. The test results including the cable loss.

B. Test Plots:



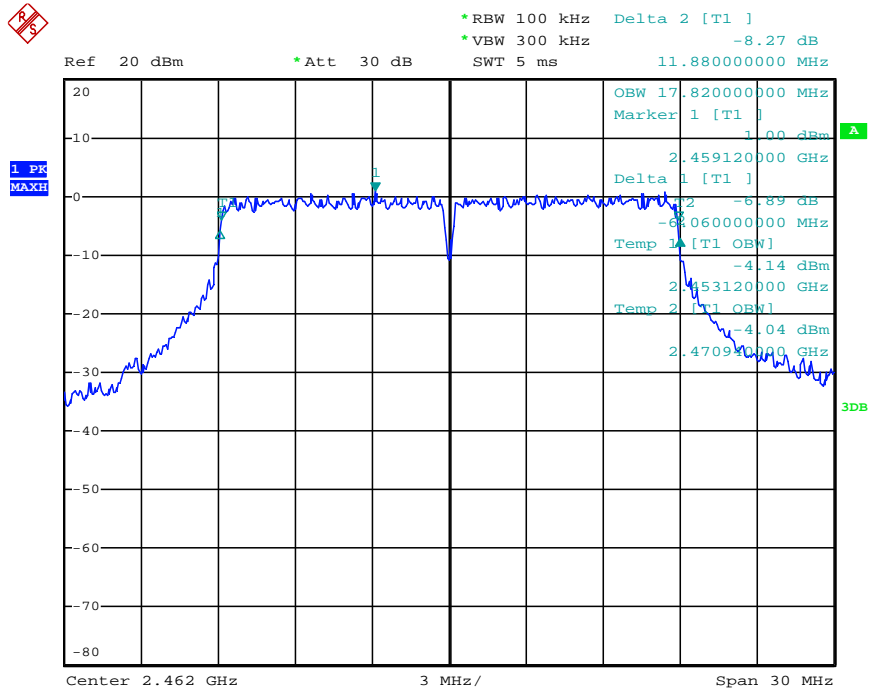
Date: 29.JUN.2013 22:13:20

(Plot 4.5.3 A: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:14:12

(Plot 4.5.3 B: Channel 6: 2437MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:14:53

(Plot 4.5.3 C: Channel 11: 2462MHz @ 802.11 n(20MHz))

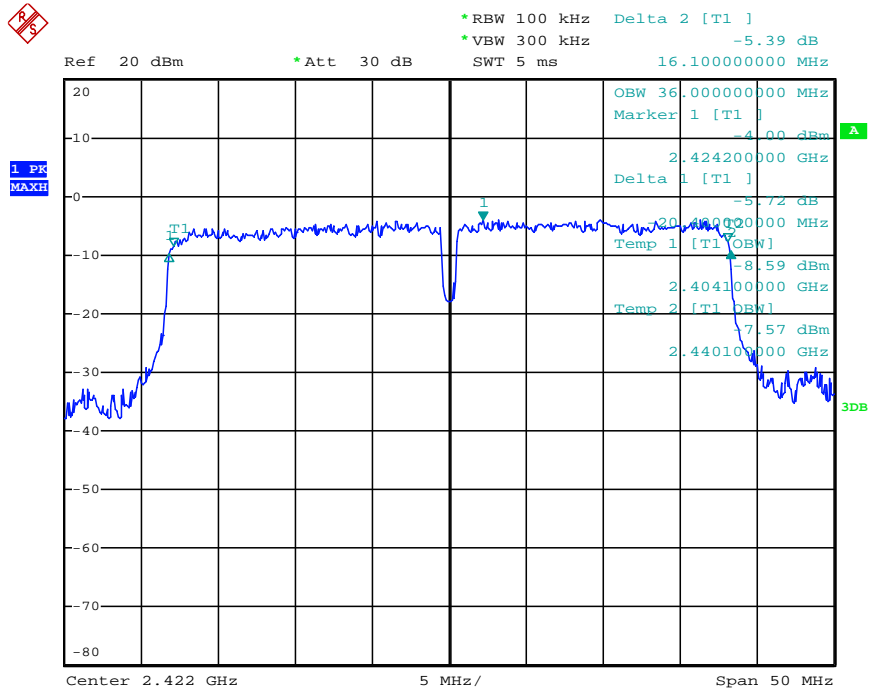
4.5.4 802.11n(40MHz) Test mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Refer to Plot	Limits(kHz)	Verdict
3	2422	36.50	Plot 4.5.4.A	≥500	PASS
6	2437	36.50	Plot 4.5.4 B	≥500	PASS
9	2452	36.50	Plot 4.5.4 C	≥500	PASS

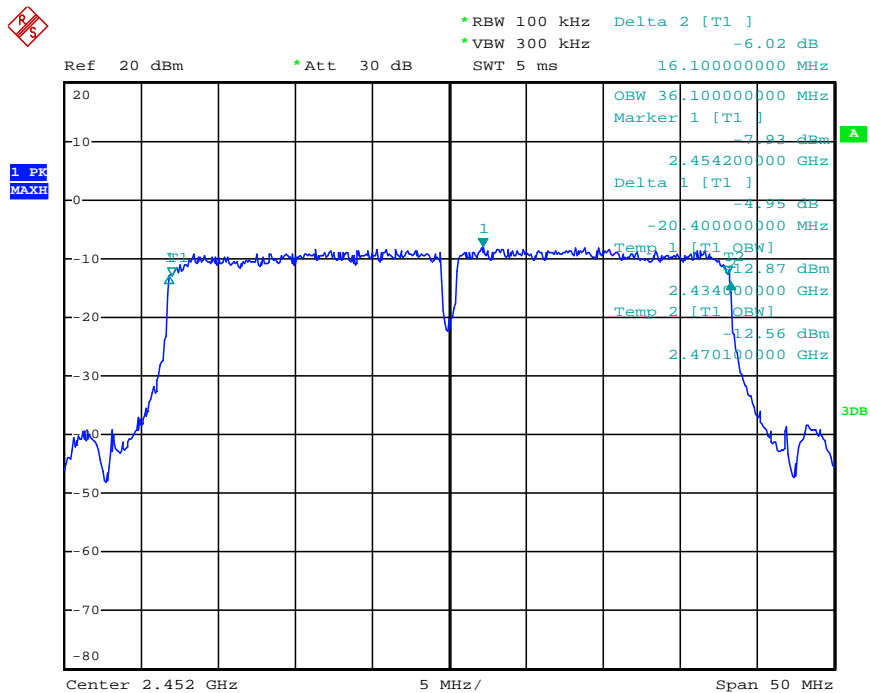
Note: 1. For 802.11 n(40MHz) mode at final test to get the worst-case emission at 13.5Mbps.
2. The test results including the cable loss.

B. Test Plots:



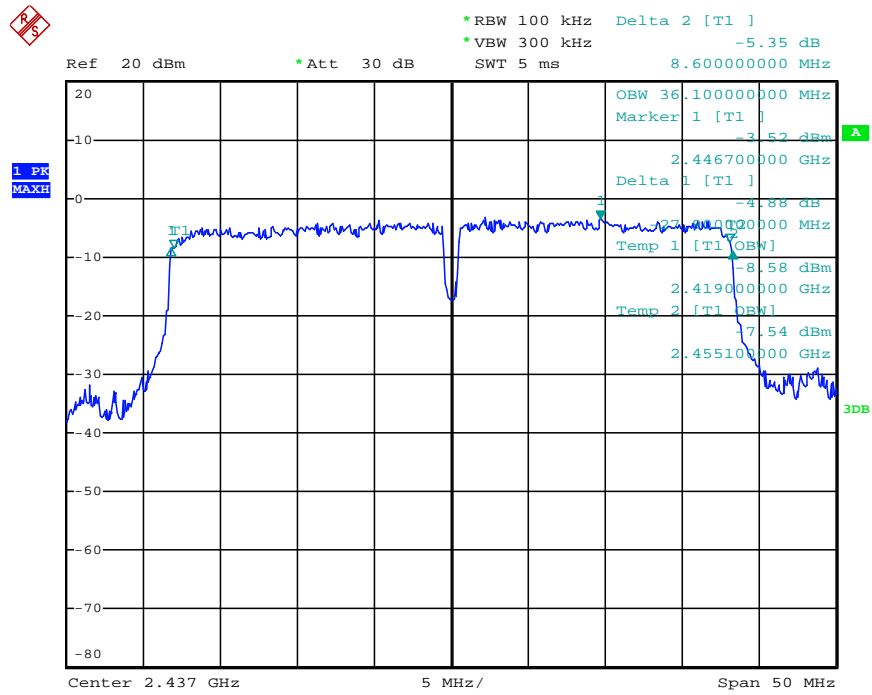
Date: 29.JUN.2013 22:25:05

(Plot 4.5.4 A: Channel 3: 2422MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:26:40

(Plot 4.5.4 B: Channel 6: 2437MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:25:43

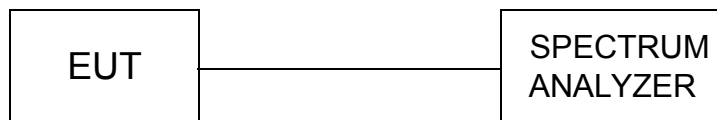
(Plot 4.5.4 C: Channel 9: 2452MHz @ 802.11 n(40MHz))

4.6. Spurious RF Conducted Emission

REQUIREMENT

According to FCC section 15.247(c), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

TEST CONFIGURATION



TEST PROCEDURE

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2009 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength, and measure frequency range from 30MHz to 26.5GHz.

LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

TEST RESULTS

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

4.6.1 802.11b Test mode

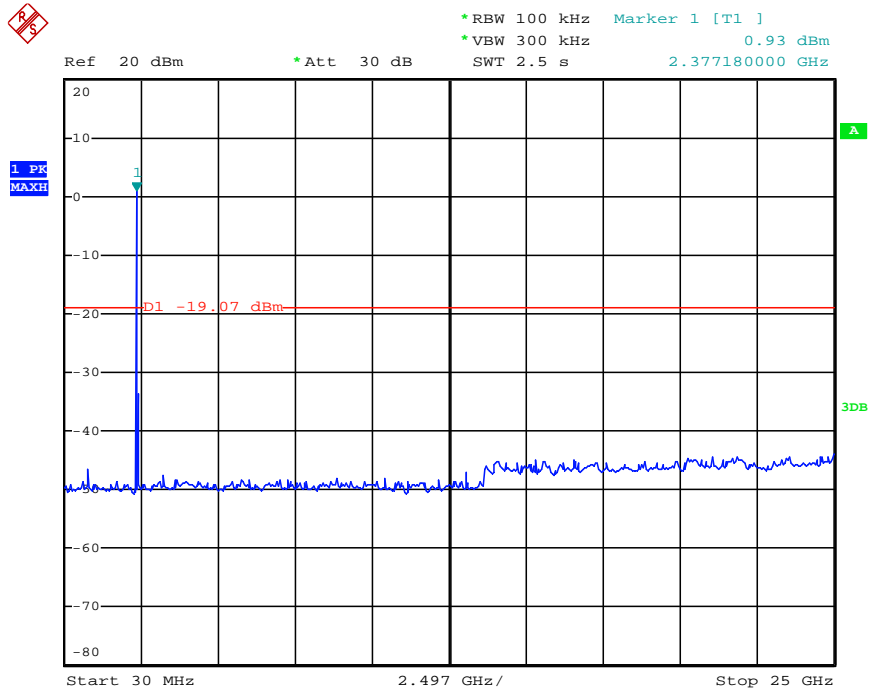
A. Test Verdict:

Channel	Frequency (MHz)	Refer to Plot	Limit (dBc)	Verdict
1	2412	Plot 4.6.1 A	-20	PASS
6	2437	Plot 4.6.1 B	-20	PASS
11	2462	Plot 4.6.1 C	-20	PASS

Note: 1. For 802.11 b mode at final test to get the worst-case emission at 1Mbps.
2. The test results including the cable loss.

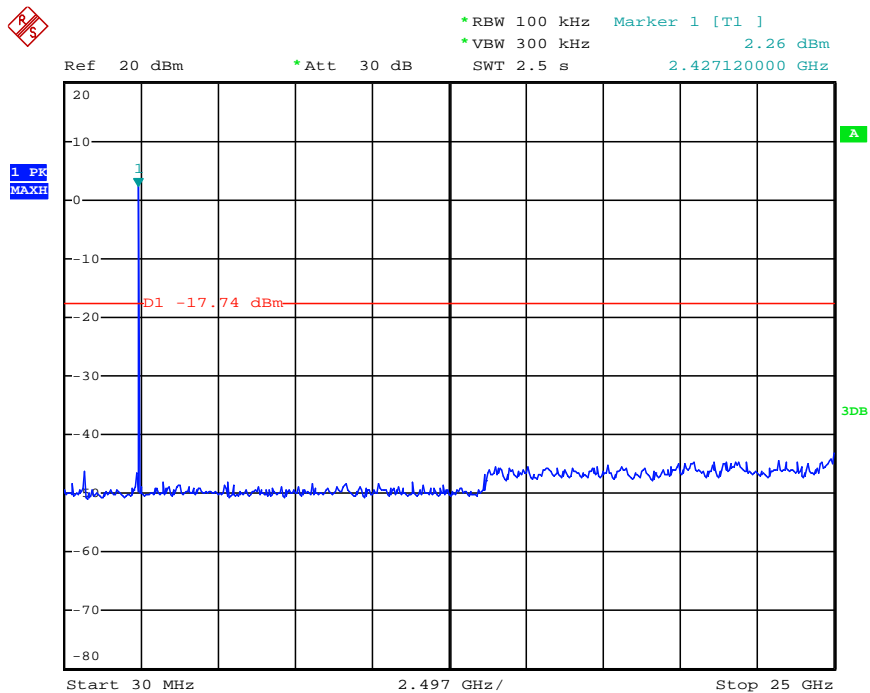
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



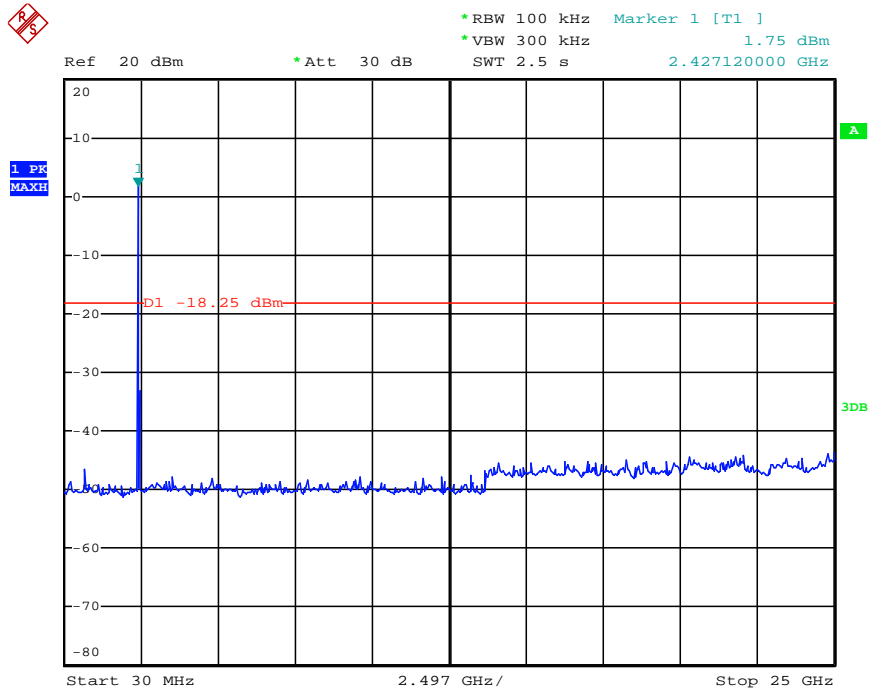
Date: 29.JUN.2013 21:36:44

(Plot 4.6.1 A: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:35:00

(Plot 4.6.1 B: Channel 6: 2437MHz @ 802.11 b)



Date: 29.JUN.2013 21:34:06

(Plot 4.6.1 C: Channel 11: 2462MHz @ 802.11 b)

4.6.2 802.11g Test mode

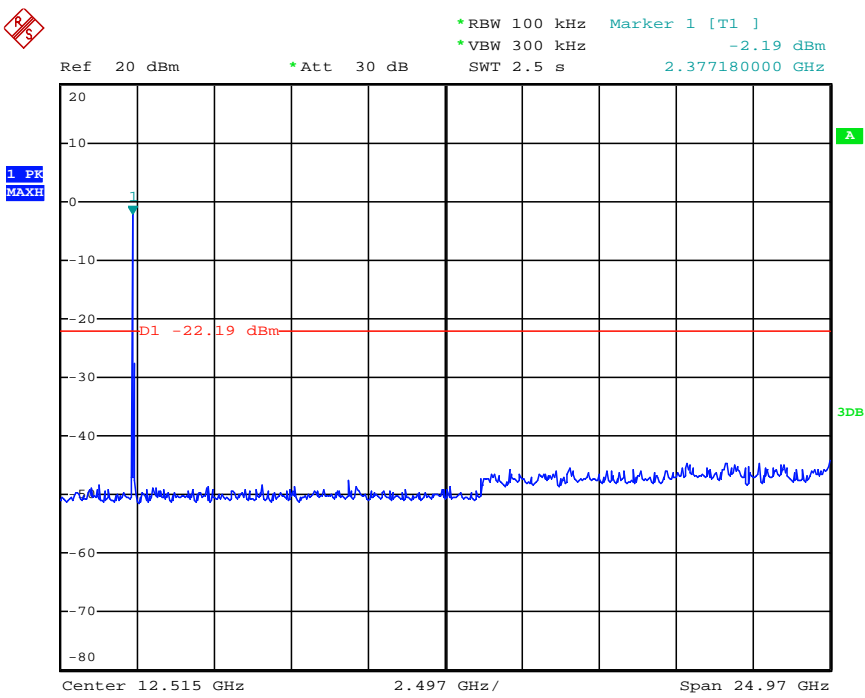
A. Test Verdict:

Channel	Frequency (MHz)	Refer to Plot	Limit (dBc)	Verdict
1	2412	Plot 4.6.1 A	-20	PASS
6	2437	Plot 4.6.1 B	-20	PASS
11	2462	Plot 4.6.1 C	-20	PASS

Note: 1. For 802.11 g mode at final test to get the worst-case emission at 6Mbps.
2. The test results including the cable loss.

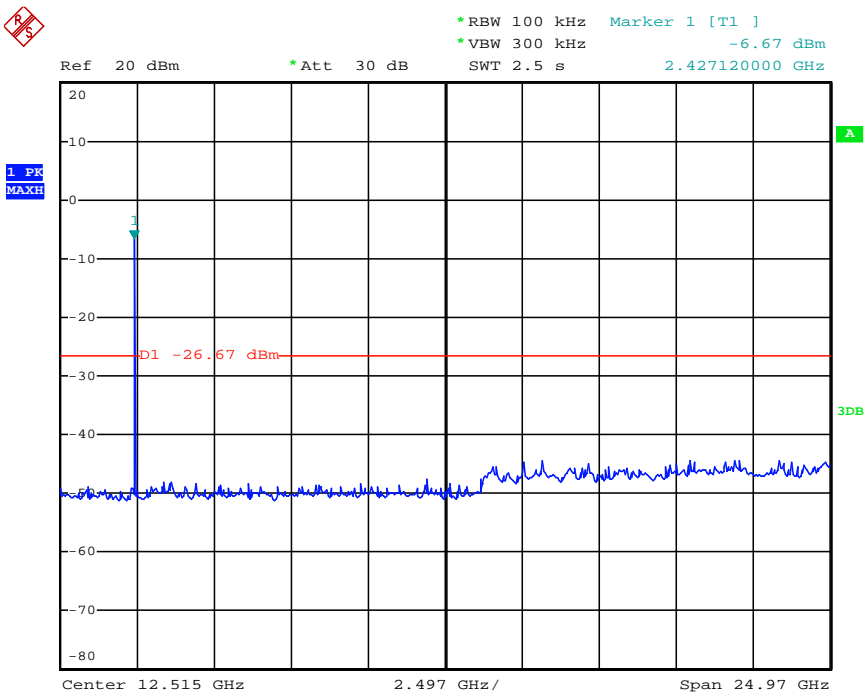
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



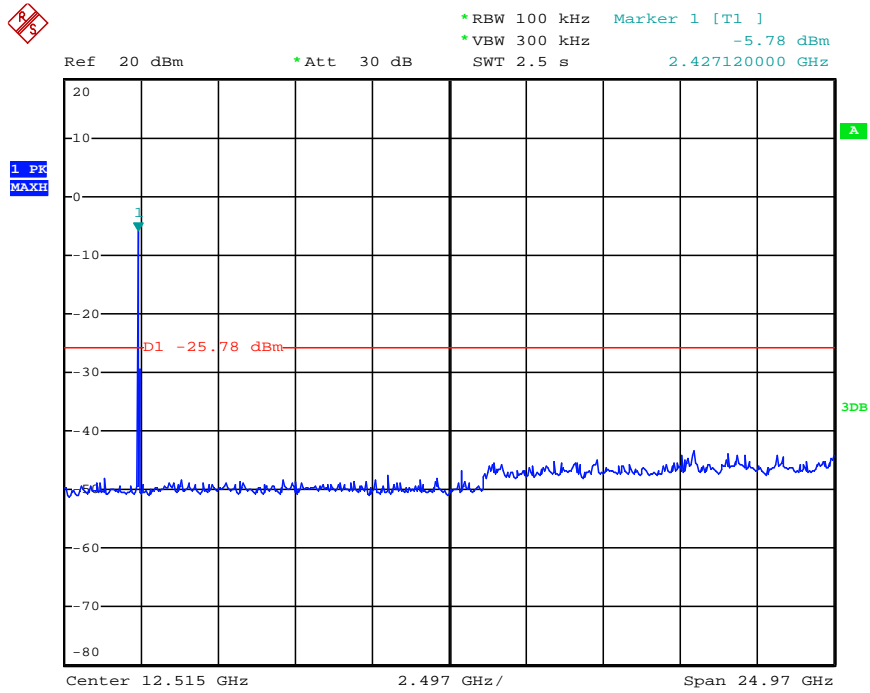
Date: 29.JUN.2013 22:07:41

(Plot 4.6.2 A: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 22:07:03

(Plot 4.6.2 B: Channel 6: 2437MHz @ 802.11g)



Date: 29.JUN.2013 22:06:27

(Plot 4.6.2 C: Channel 11: 2462MHz @ 802.11 g)

4.6.3 802.11n(20MHz) Test mode

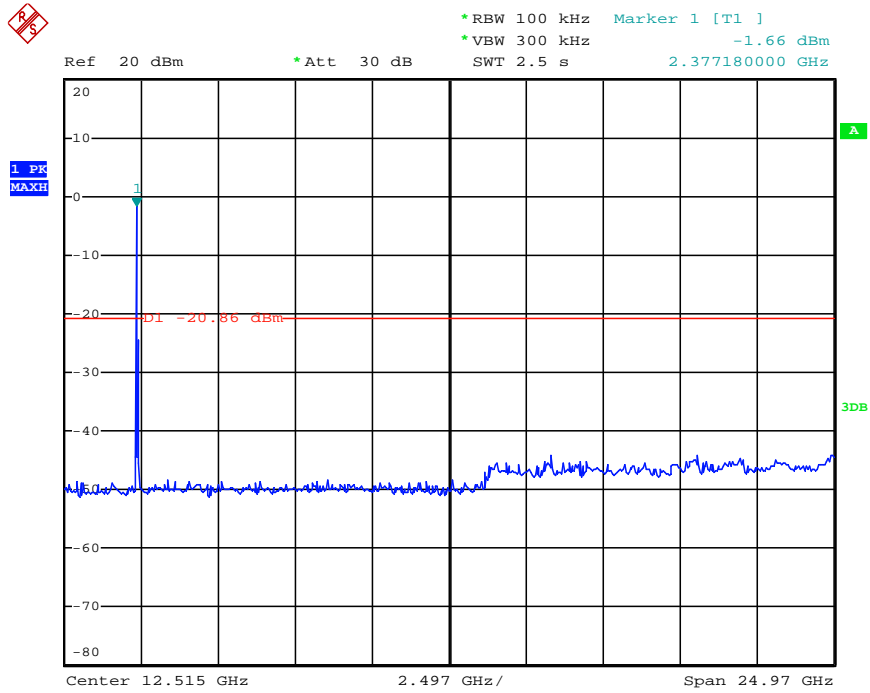
A. Test Verdict:

Channel	Frequency (MHz)	Refer to Plot	Limit (dBc)	Verdict
1	2412	Plot 4.6.1 A	-20	PASS
6	2437	Plot 4.6.1 B	-20	PASS
11	2462	Plot 4.6.1 C	-20	PASS

Note: 1. For 802.11 n(20MHz) mode at final test to get the worst-case emission at 6.5Mbps.
 2. The test results including the cable loss.

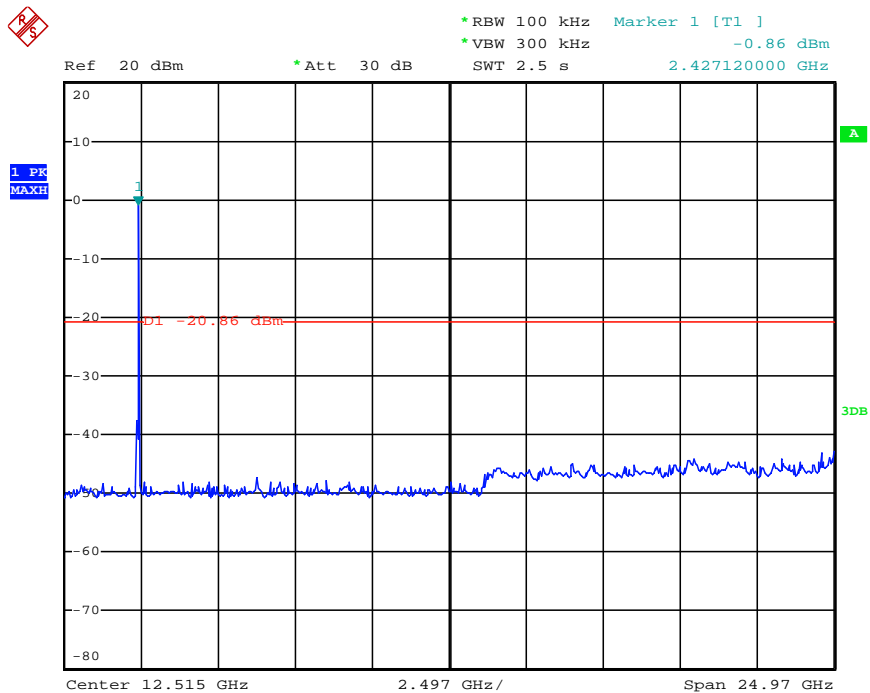
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



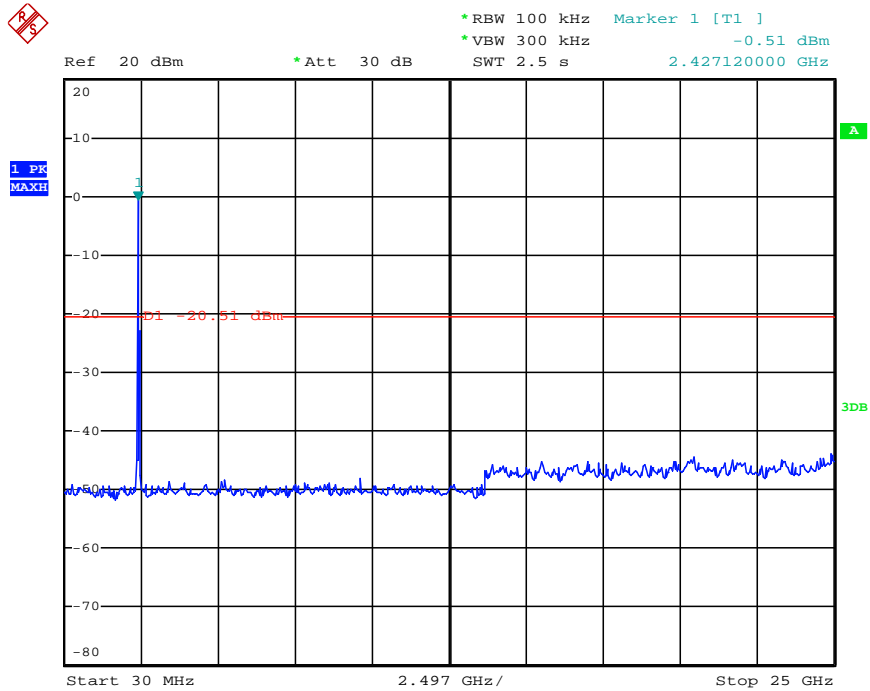
Date: 29.JUN.2013 22:21:21

(Plot 4.6.3 A: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:20:11

(Plot 4.6.3 B: Channel 6: 2437MHz @ 802.11 n(20MHz))



Date: 29.JUN.2013 22:18:58

(Plot 4.6.3 C: Channel 11: 2462MHz @ 802.11 n(20MHz))

4.6.4 802.11n(40MHz) Test mode

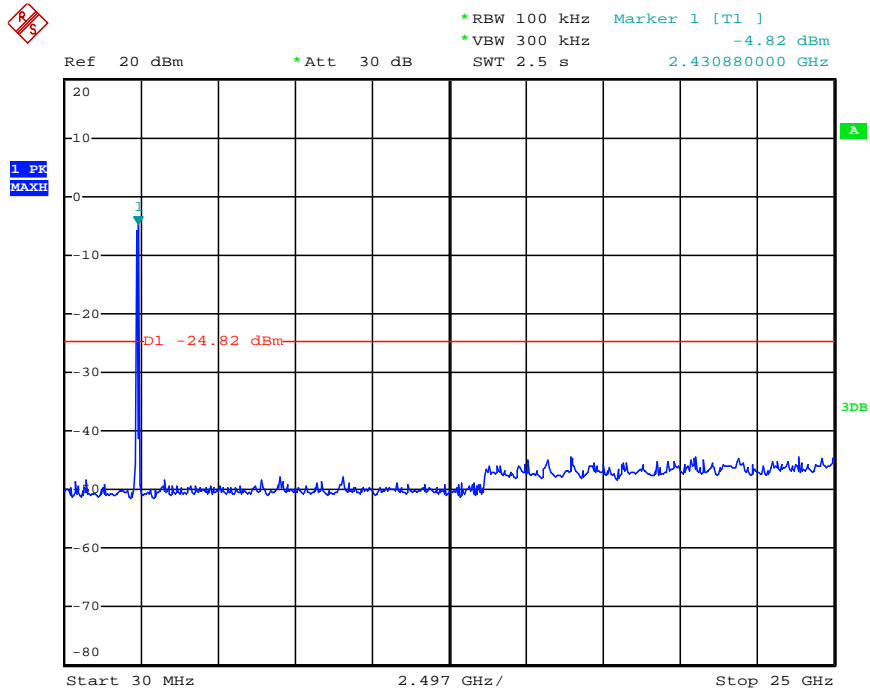
A. Test Verdict:

Channel	Frequency (MHz)	Refer to Plot	Limit (dBc)	Verdict
3	2422	Plot 4.6.1 A	-20	PASS
6	2437	Plot 4.6.1 B	-20	PASS
9	2452	Plot 4.6.1 C	-20	PASS

Note: 1. For 802.11 n(40MHz) mode at final test to get the worst-case emission at 13.5Mbps.
 2. The test results including the cable loss.

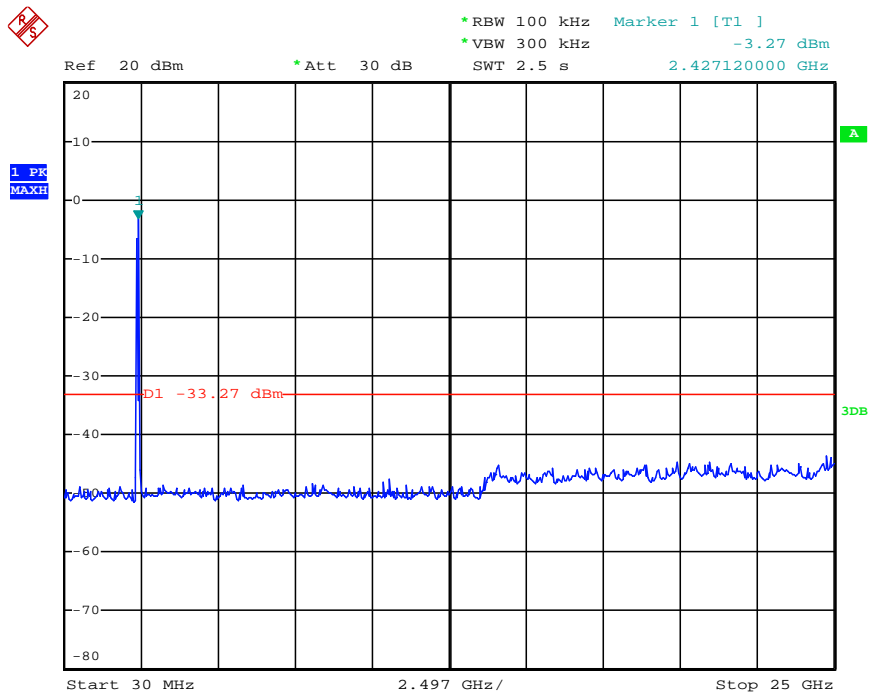
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



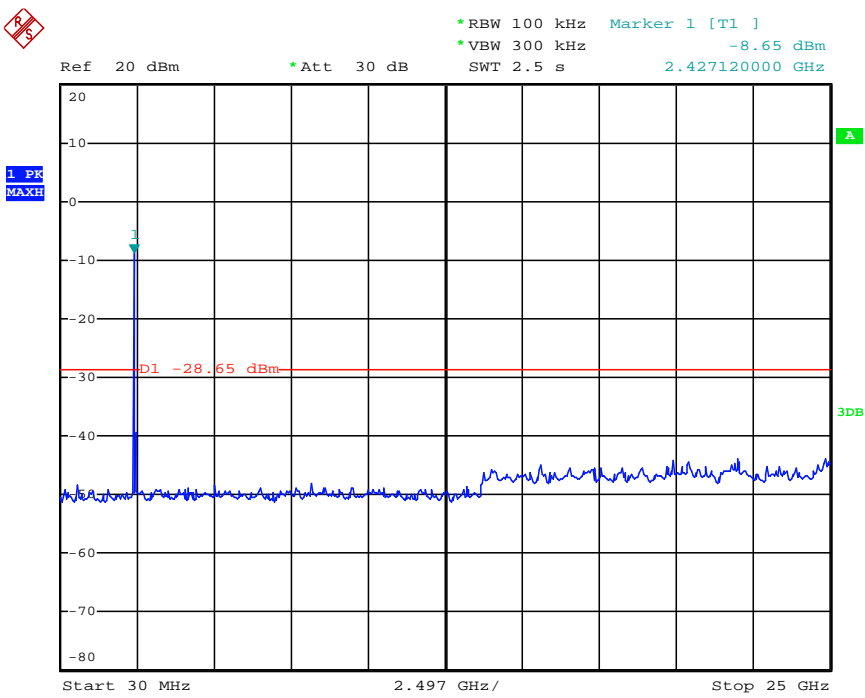
Date: 29.JUN.2013 22:32:32

(Plot 4.6.4 A: Channel 3: 2422MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:32:56

(Plot 4.6.4 B: Channel 6: 2437MHz @ 802.11 n(40MHz))



Date: 29.JUN.2013 22:33:28

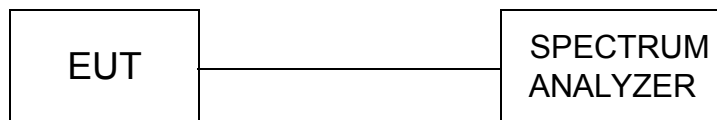
(Plot 4.6.4 C: Channel 9: 2452MHz @ 802.11 n(40MHz))

4.7. Band Edge Compliance of RF Emission

REQUIREMENT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

TEST CONFIGURATION



TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, for Radiated emissions restricted band RBW=1MHz, VBW=3MHz for peak detector and RBW=1MHz, VBW=10Hz for average detector.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.
6. Antenna-port conducted measurements are acceptable as an alternative to radiated measurements for demonstrating compliance to the limits in the restricted frequency bands. If conducted measurements are performed, then proper impedance matching must be ensured and an additional radiated test (with antenna port(s) terminated) for cabinet/case emissions will also be required.
7. Measure the conducted output power (in dBm) using the detector specified by the appropriate regulatory agency (see 12.2.2, 12.2.3, and 12.2.4 for guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).
8. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level (see 12.2.5 for guidance on determining the applicable antenna gain)
9. Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).
10. For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW).
11. § 15.209(a) specifies radiated emissions limits for unwanted emissions in the restricted bands in terms of the maximum permissible electric field strength at a specified measurement distance. A correspondent EIRP level can be determined from the following relationship:
$$E = \text{EIRP} - 20\log(d) + 104.8$$

where:
EIRP = the equivalent isotropic radiated power in dBm,
E = electric field strength in dB μ V/m,
d = measurement distance in meters.
12. Compare the resultant electric field strength level to the applicable regulatory limit.

LIMIT

Below -20dB of the highest emission level in operating band.

Radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a)

TEST RESULTS

Both radiated and conducted band edge were measurement for 802.11b,802.11g,802.11n(20MHz) and 802.11n(40MHz) mode at each difference data transmission speeds,recording worst case in test report.

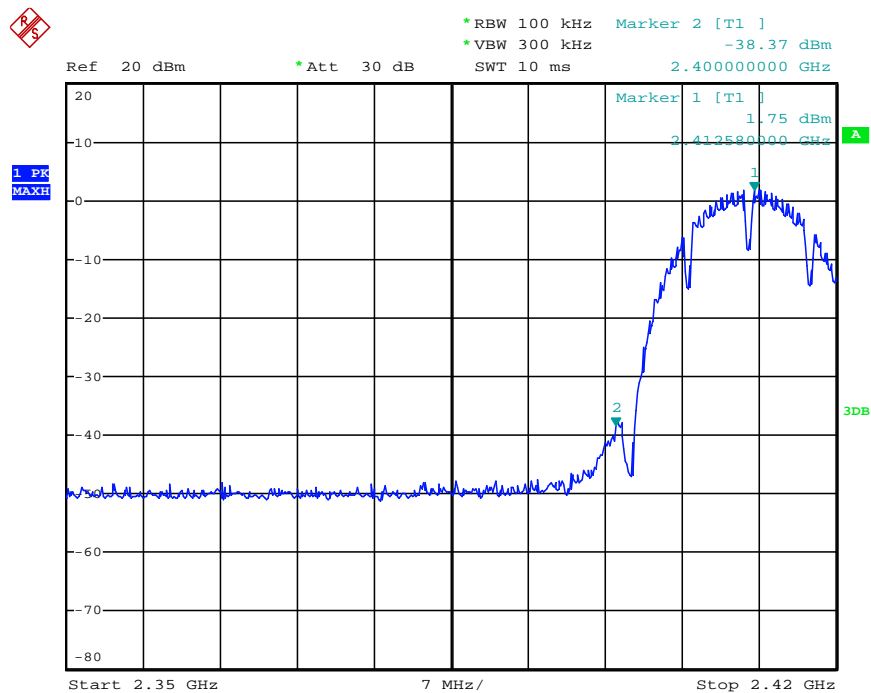
Photos of Conducted Band Edge Measurement**4.7.1 802.11b****A. Test Verdict:**

Frequency (MHz)	Delta Peak to Band emission (dBc)	Detector	Limit (dBc)	Refer to Plot	Verdict
Out of left side band					
2400.00	-40.12	PK	-20.00	Plot 4.7.1 A	PASS
Out of right side band					
2483.50	-53.07	PK	-20.00	Plot 4.7.1 B	PASS

Note: 1. For 802.11 b mode at final test to get the worst-case emission at 1Mbps.
 2. The test results including the cable loss.

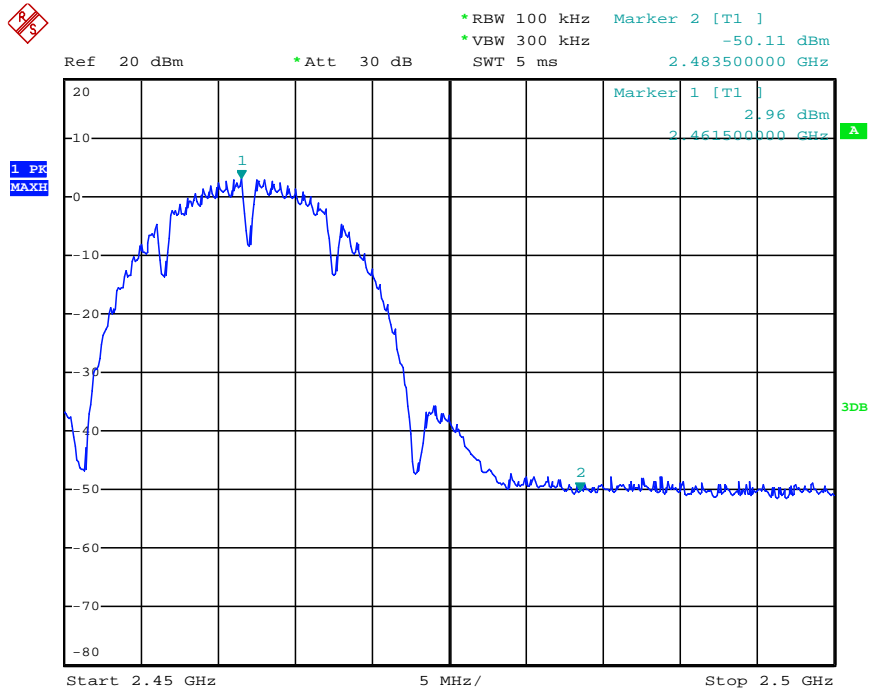
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



Date: 29.JUN.2013 21:41:36

(Plot 4.7.1 A: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:53:17

(Plot 4.7.1 B: Channel 11: 2462MHz @ 802.11 b)

4.7.2 802.11g

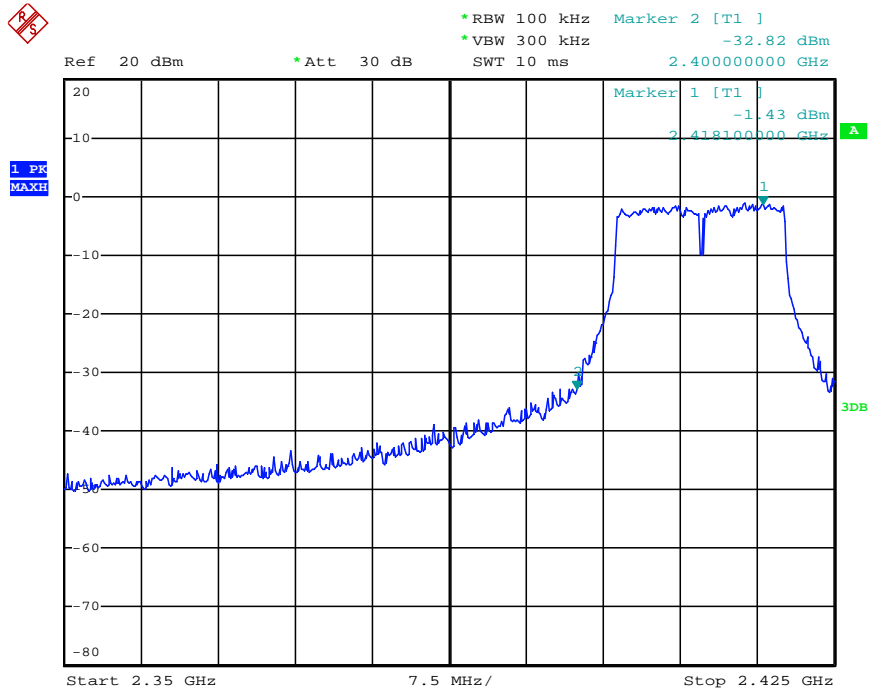
A. Test Verdict:

Frequency (MHz)	Delta Peak to Band emission (dBc)	Detector	Limit (dBc)	Refer to Plot	Verdict
Out of left side band					
2400.00	-31.39	PK	-20.00	Plot 4.7.2 A	PASS
Out of right side band					
2483.50	-45.50	PK	-20.00	Plot 4.7.2 B	PASS

Note: 1. For 802.11 g mode at final test to get the worst-case emission at 6Mbps.
 2. The test results including the cable loss.

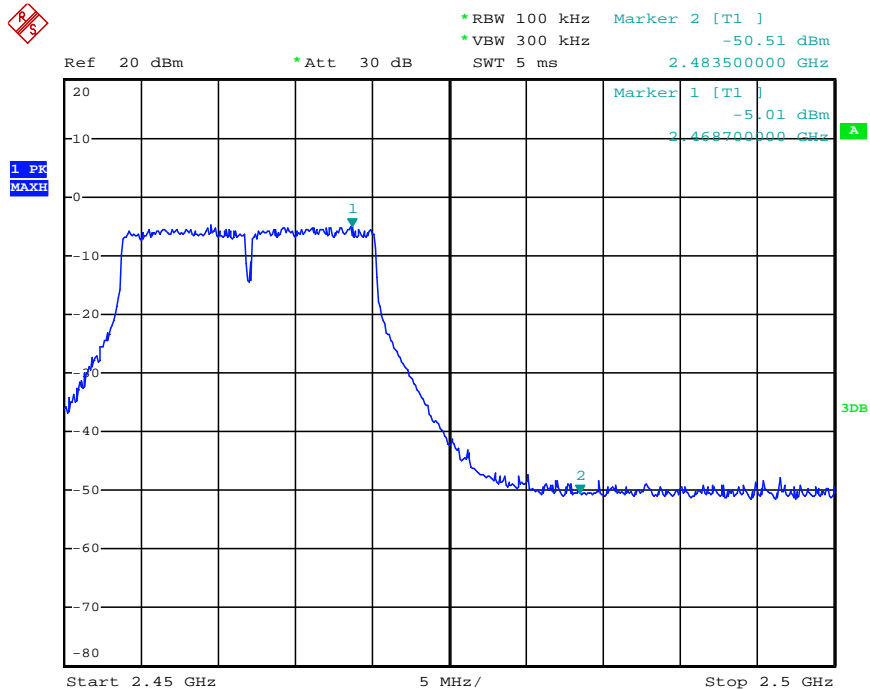
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



Date: 29.JUN.2013 22:08:48

(Plot 4.7.2 A: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 22:10:51

(Plot 4.7.2 B: Channel 11: 2462MHz @ 802.11 g)

4.7.3 802.11n(20MHz)

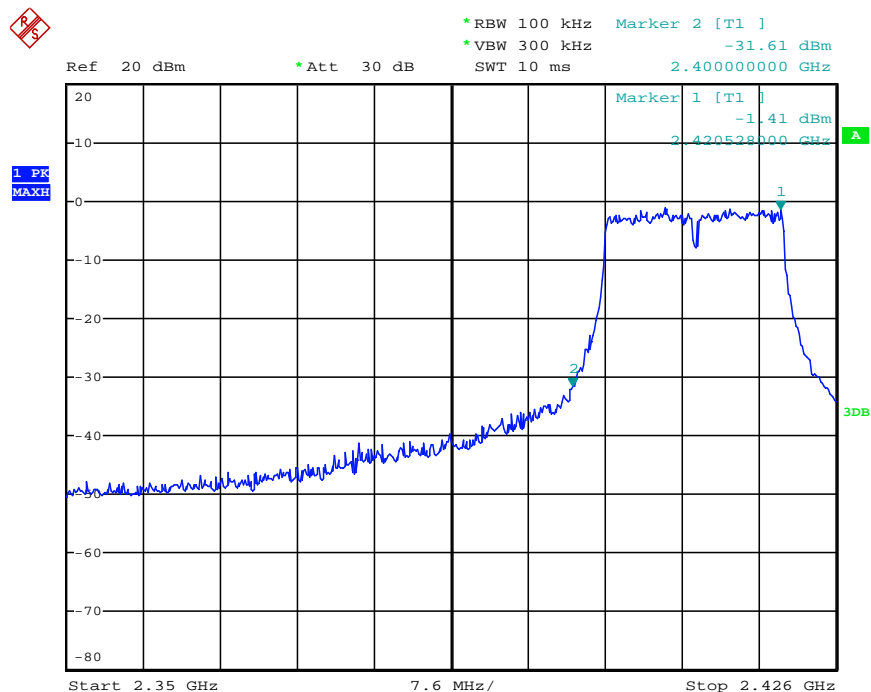
A. Test Verdict:

Frequency (MHz)	Delta Peak to Band emission (dBc)	Detector	Limit (dBc)	Refer to Plot	Verdict
Out of left side band					
2400.00	-30.20	PK	-20.00	Plot 4.7.3 A	PASS
Out of right side band					
2483.50	-36.18	PK	-20.00	Plot 4.7.3 B	PASS

Note: 1. For 802.11 n(20MHz) mode at final test to get the worst-case emission at 6.5Mbps.
 2. The test results including the cable lose.

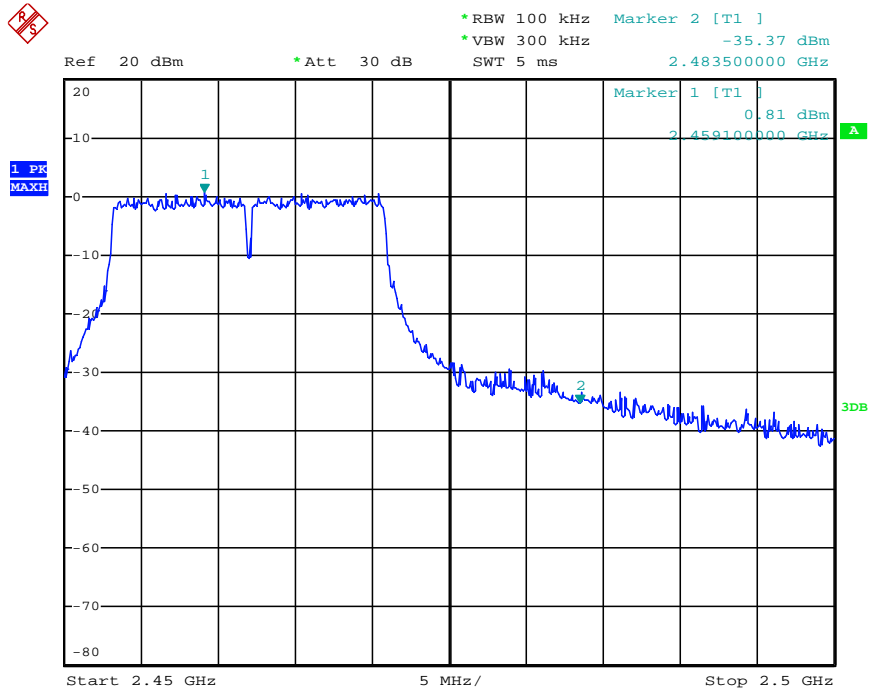
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



Date: 29.JUN.2013 22:22:27

(Plot 4.7.3 A: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:23:27

(Plot 4.7.3 B: Channel 11: 2462MHz @ 802.11 n(20MHz))

4.7.4 802.11n(40MHz)

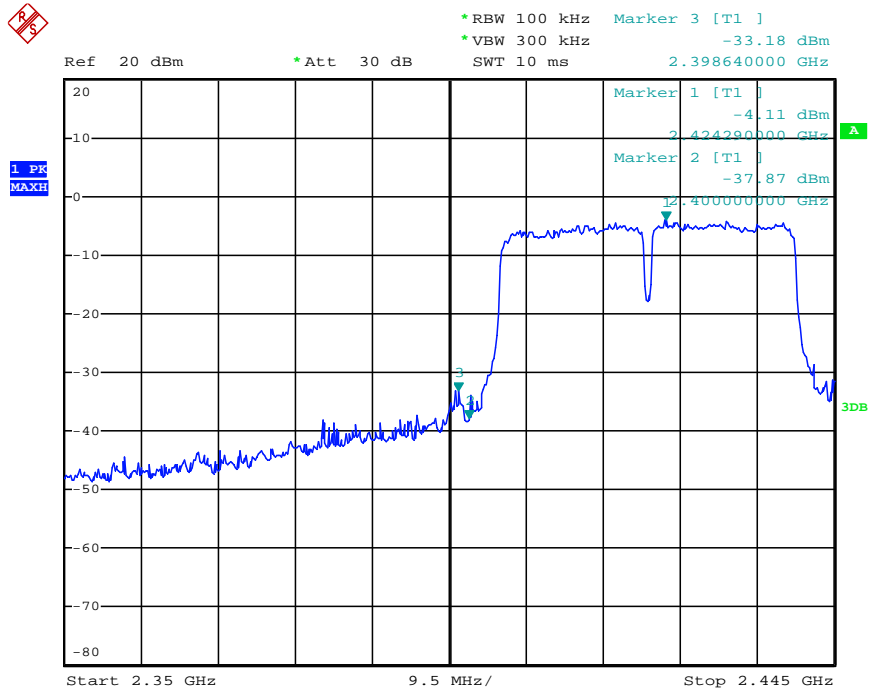
A. Test Verdict:

Frequency (MHz)	Delta Peak to Band emission (dBc)	Detector	Limit (dBc)	Refer to Plot	Verdict
Out of left side band					
2400.00	-33.76	PK	-20.00	Plot 4.7.4 A	PASS
Out of right side band					
2483.50	-42.03	PK	-20.00	Plot 4.7.4 B	PASS

Note: 1. For 802.11 n(40MHz) mode at final test to get the worst-case emission at 13.5Mbps.
 2. The test results including the cable loss.

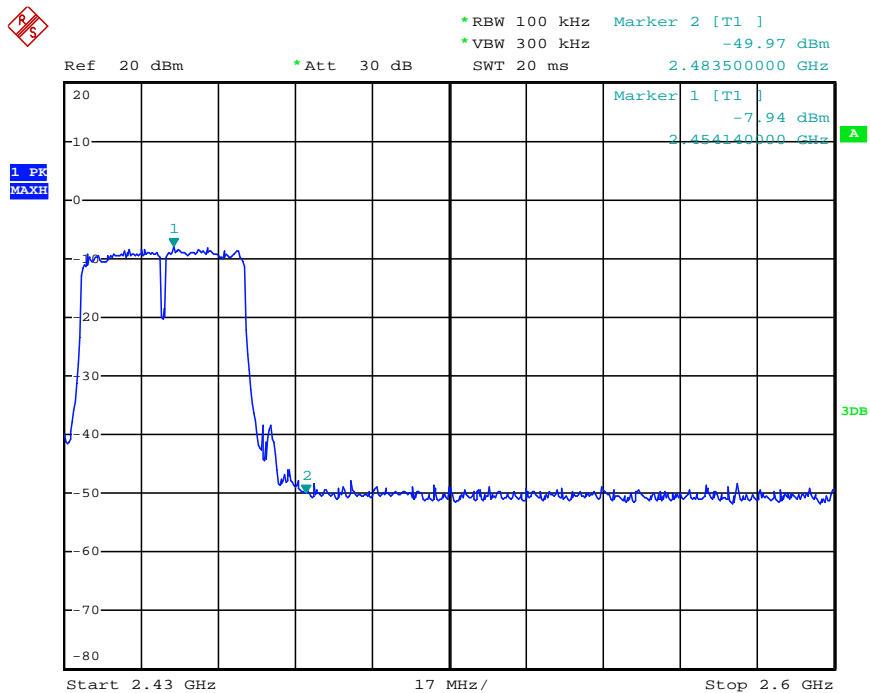
B. Test Plots:

Note: the power of the Module transmitting frequency should be ignored.



Date: 29.JUN.2013 22:36:22

(Plot 4.7.4 A: Channel 3: 2422MHz @ 802.11n(40MHz))

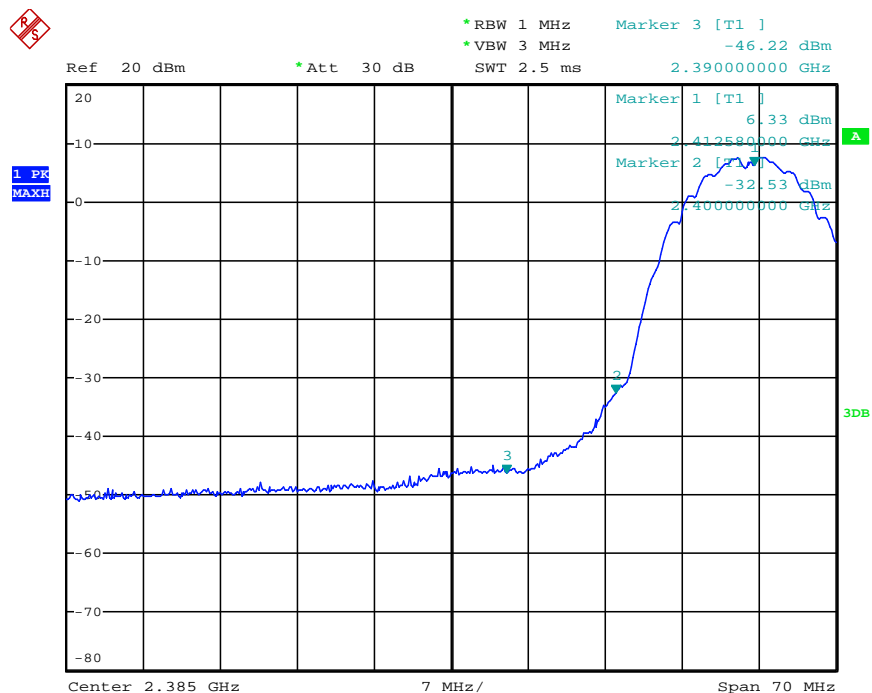


Date: 29.JUN.2013 22:37:56

(Plot 4.7.4 B: Channel 9: 2452MHz @ 802.11 n(40MHz))

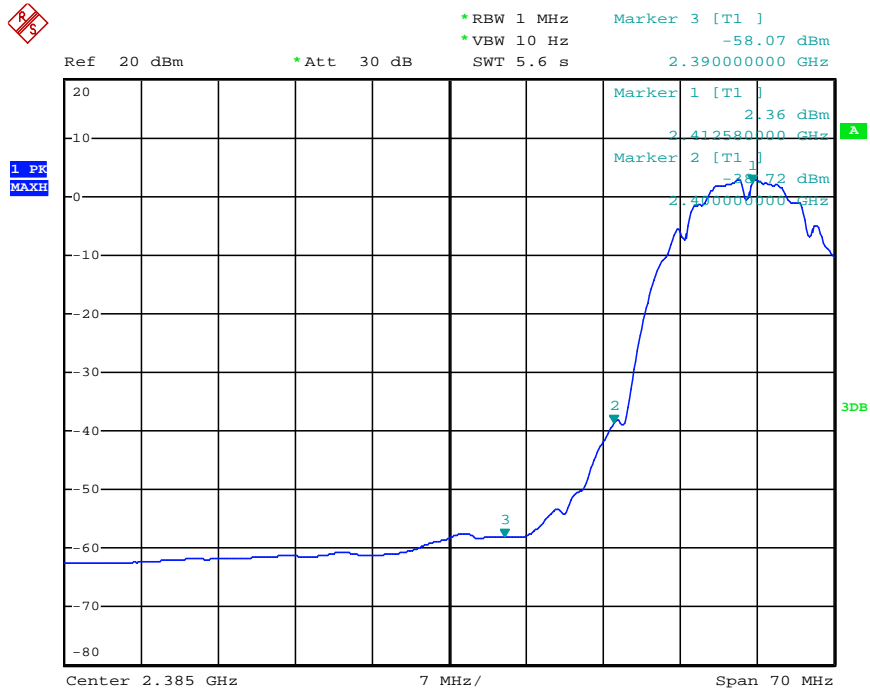
Photos of Radiated Band Edge Measurement**4.7.5 802.11b****A. Test Verdict:**

Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Covert Radiated E Level At 3m (dBuV/m) (dB)	Detector	Ground reflection factor	Limit (dBuV/m)	Refer to Plot
Out of left side band							
2390.00	-46.22	3.00	52.04	PK	0.00	74.00	Plot 4.7.5.A
2390.00	-58.07	3.00	40.19	AV	0.00	54.00	Plot 4.7.5.B
2412.00	6.33	3.00	104.59	PK	0.00	---	Plot 4.7.5.A
2412.00	2.36	3.00	100.62	AV	0.00	---	Plot 4.7.5.B
Out of right side band							
2462.00	8.88	3.00	107.14	PK	0.00	---	Plot 4.7.5.C
2462.00	3.68	3.00	101.94	AV	0.00	---	Plot 4.7.5.D
2483.50	-43.51	3.00	54.75	PK	0.00	74.00	Plot 4.7.5.C
2483.50	-56.04	3.00	42.22	AV	0.00	54.00	Plot 4.7.5.D

B. Test Plots:

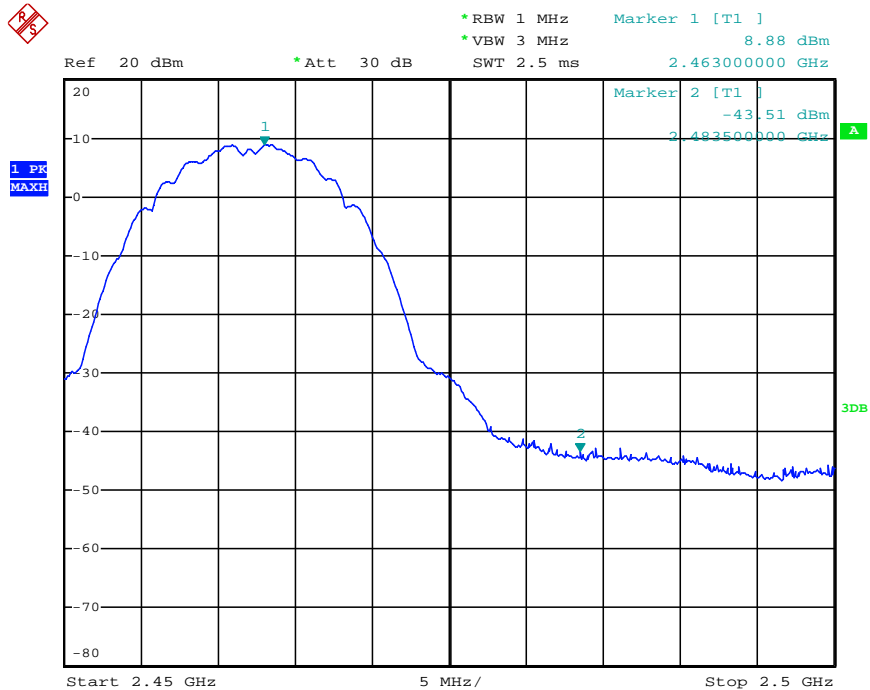
Date: 29.JUN.2013 21:48:13

(Plot 4.7.5 A: Channel 1: 2412MHz @ 802.11b)



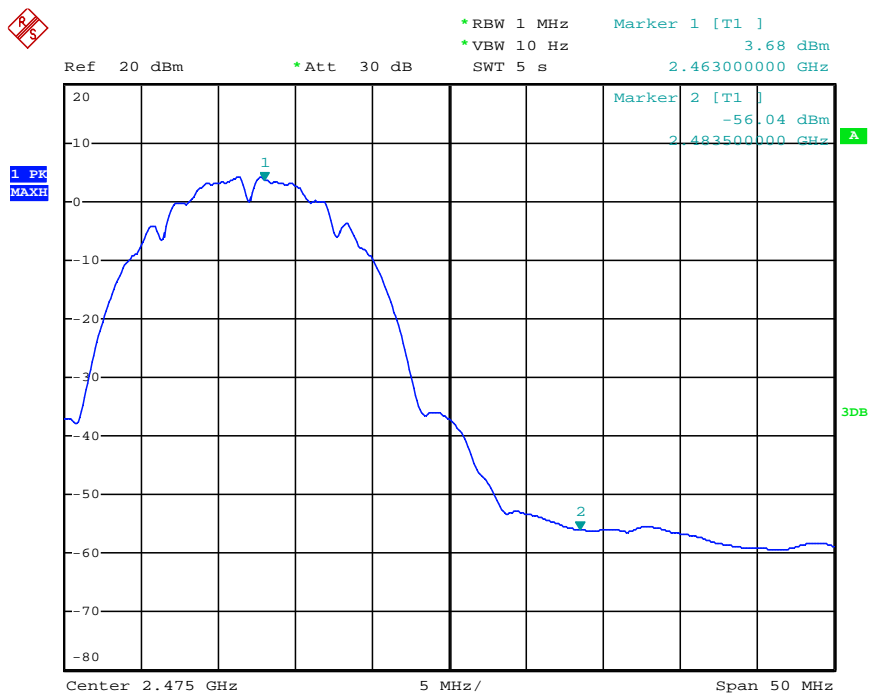
Date: 29.JUN.2013 21:49:04

(Plot 4.7.5 B: Channel 1: 2412MHz @ 802.11b)



Date: 29.JUN.2013 21:53:51

(Plot 4.7.5 C: Channel 11: 2462MHz @ 802.11b)



Date: 29.JUN.2013 21:54:14

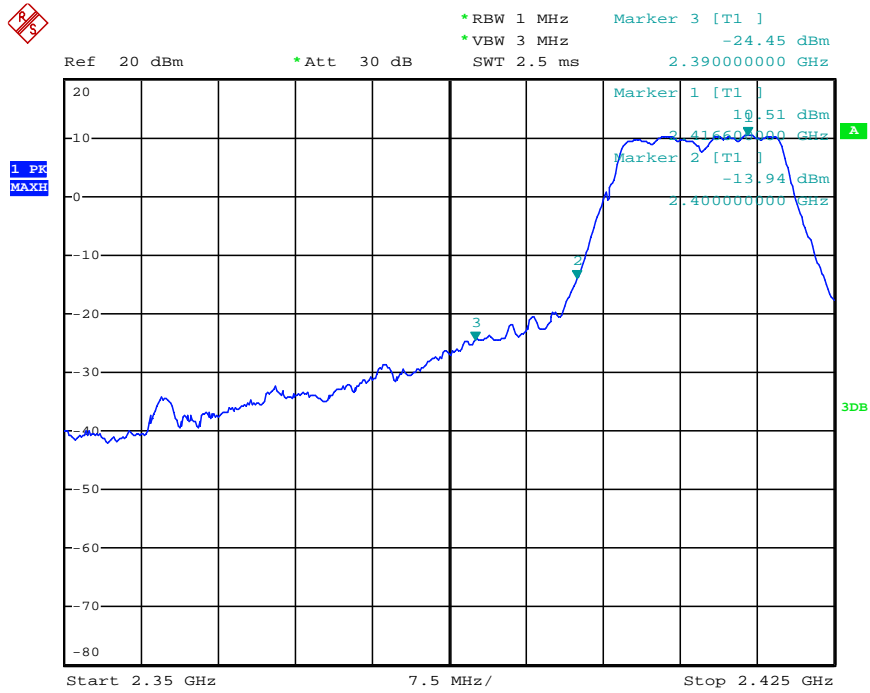
(Plot 4.7.5 D: Channel 11: 2462MHz @ 802.11b)

4.7.6 802.11g

A. Test Verdict:

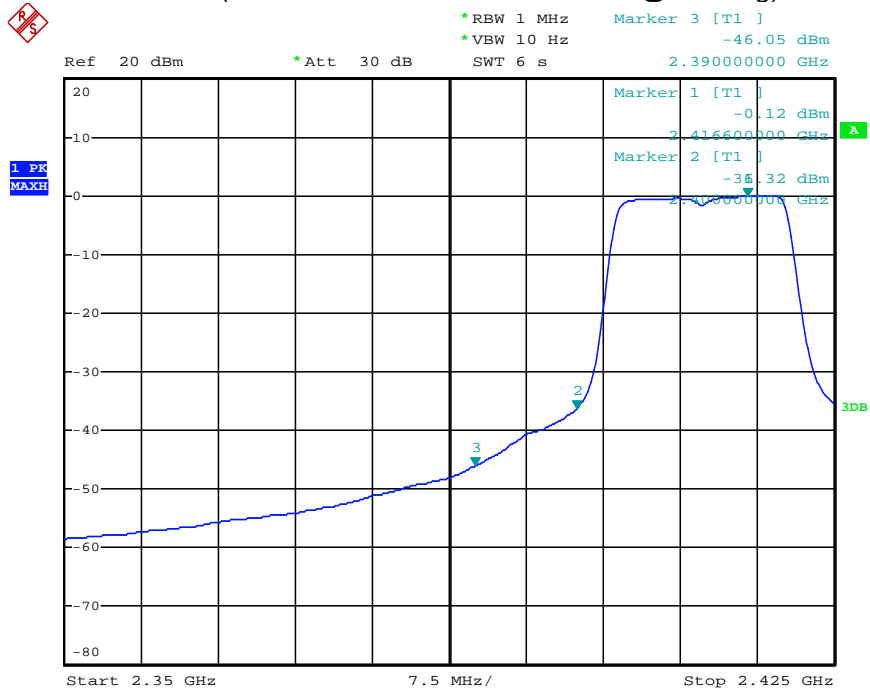
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Covert Radiated E Level At 3m (dBuV/m) (dB)	Detector	Ground reflection factor	Limit (dBuV/m)	Refer to Plot
Out of left side band							
2390.00	-24.45	3.00	73.81	PK	0.00	74.00	Plot 4.7.6.A
2390.00	-46.05	3.00	52.21	AV	0.00	54.00	Plot 4.7.6.B
2412.00	10.51	3.00	108.77	PK	0.00	---	Plot 4.7.6.A
2412.00	-0.12	3.00	98.14	AV	0.00	---	Plot 4.7.6.B
Out of right side band							
2462.00	6.44	3.00	104.70	PK	0.00	---	Plot 4.7.6.C
2462.00	-4.32	3.00	93.94	AV	0.00	---	Plot 4.7.6.D
2483.50	-39.33	3.00	58.93	PK	0.00	74.00	Plot 4.7.6.C
2483.50	-56.73	3.00	41.53	AV	0.00	54.00	Plot 4.7.6.D

B. Test Plots:



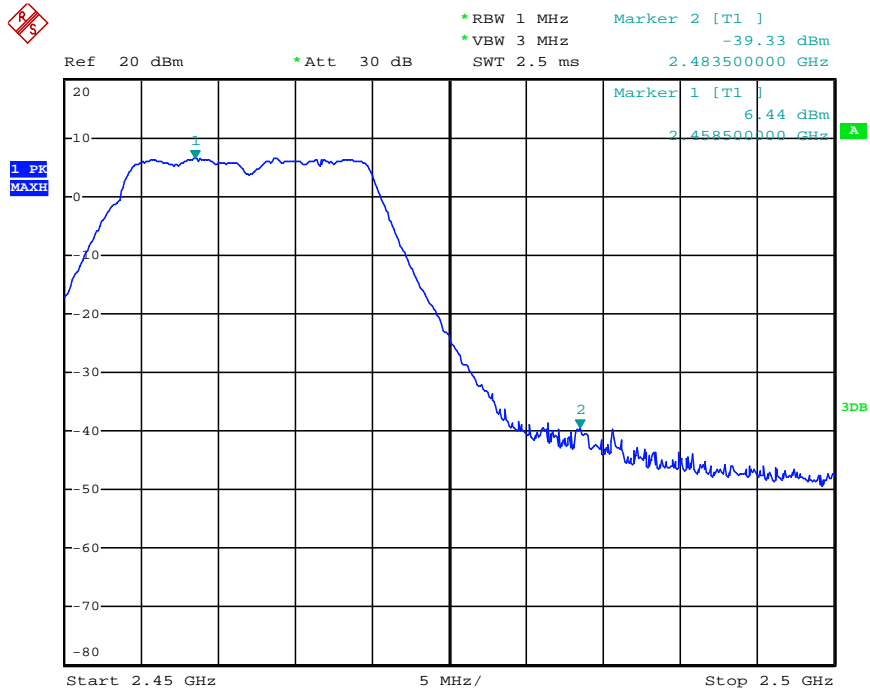
Date: 29.JUN.2013 22:09:23

(Plot 4.7.6 A: Channel 1: 2412MHz @ 802.11g)



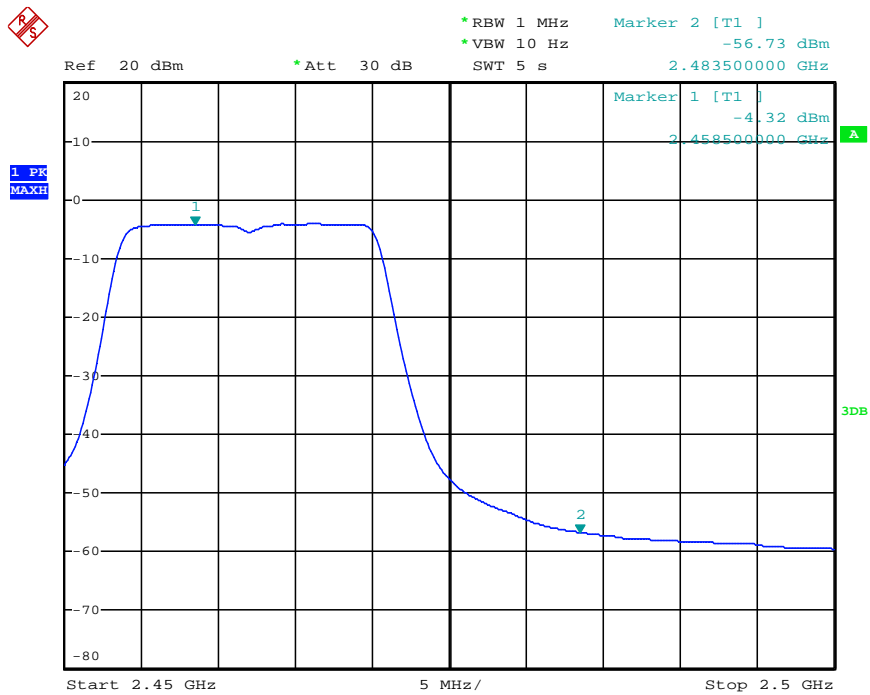
Date: 29.JUN.2013 22:09:49

(Plot 4.7.6 B: Channel 1: 2412MHz @ 802.11g)



Date: 29.JUN.2013 22:11:07

(Plot 4.7.6 C: Channel 11: 2462MHz @ 802.11g)



Date: 29.JUN.2013 22:11:32

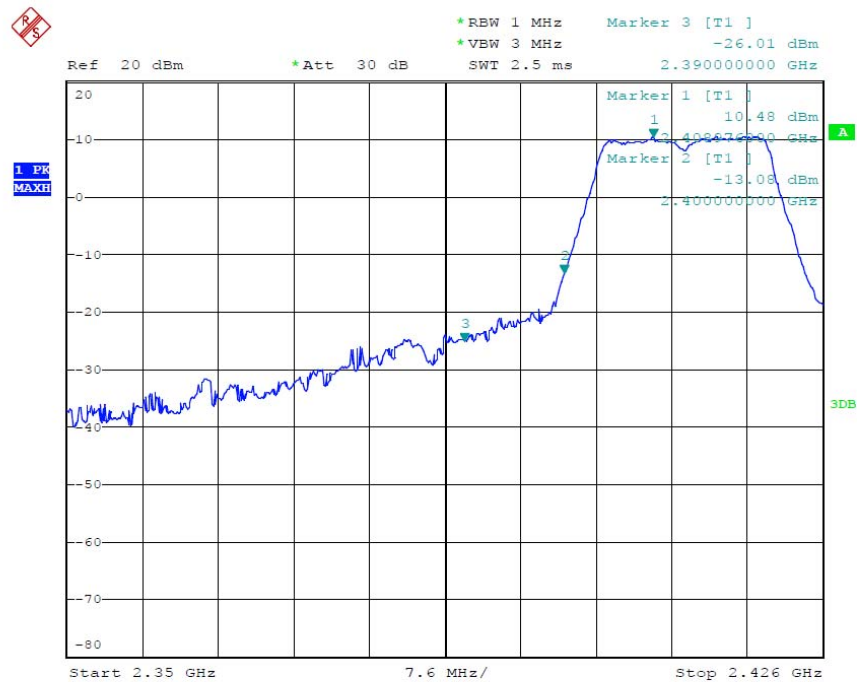
(Plot 4.7.6 D: Channel 11: 2462MHz @ 802.11g)

4.7.7 802.11n(20MHz)

A. Test Verdict:

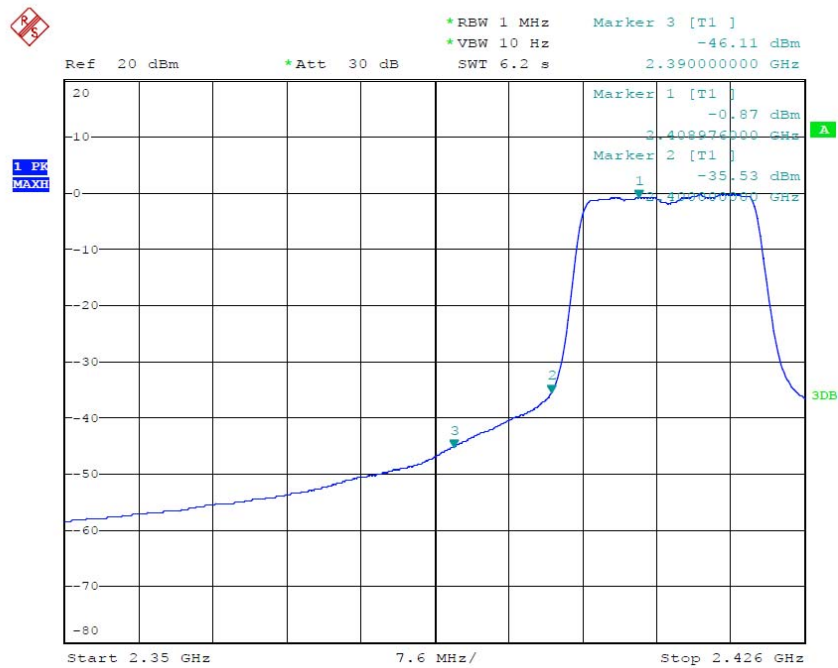
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Covert Radiated E Level At 3m (dBuV/m) (dB)	Detector	Ground reflection factor	Limit (dBuV/m)	Refer to Plot
Out of left side band							
2390.00	-26.01	3.00	72.25	PK	0.00	74.00	Plot 4.7.7.A
2390.00	-46.11	3.00	52.15	AV	0.00	54.00	Plot 4.7.7.B
2412.00	10.48	3.00	108.74	PK	0.00	---	Plot 4.7.7.A
2412.00	-0.87	3.00	97.39	AV	0.00	---	Plot 4.7.7.B
Out of right side band							
2462.00	11.81	3.00	110.07	PK	0.00	---	Plot 4.7.7.C
2462.00	0.64	3.00	98.90	AV	0.00	---	Plot 4.7.7.D
2483.50	-25.78	3.00	72.48	PK	0.00	74.00	Plot 4.7.7.C
2483.50	-45.30	3.00	52.96	AV	0.00	54.00	Plot 4.7.7.D

B. Test Plots:



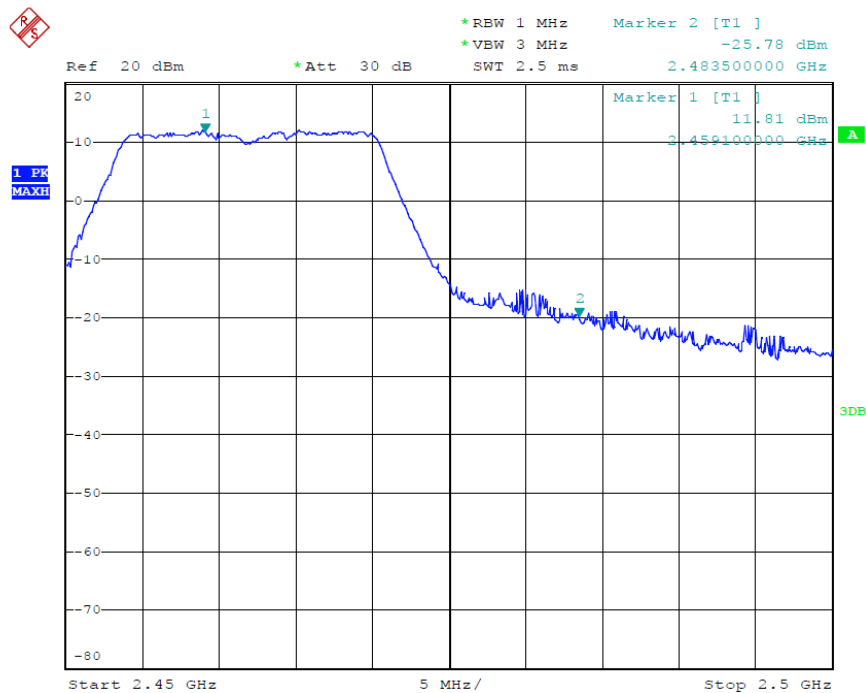
Date: 29.JUN.2013 22:22:47

(Plot 4.7.7 A: Channel 1: 2412MHz @ 802.11n(20MHz))



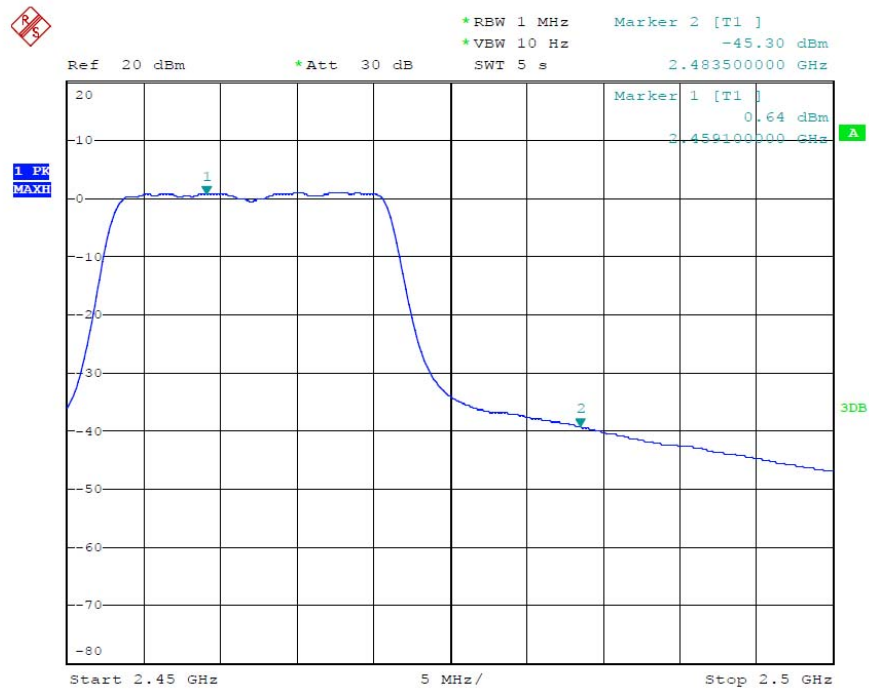
Date: 29.JUN.2013 22:23:01

(Plot 4.7.7 B: Channel 1: 2412MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:23:38

(Plot 4.7.7 C: Channel 11: 2462MHz @ 802.11n(20MHz))



Date: 29.JUN.2013 22:23:51

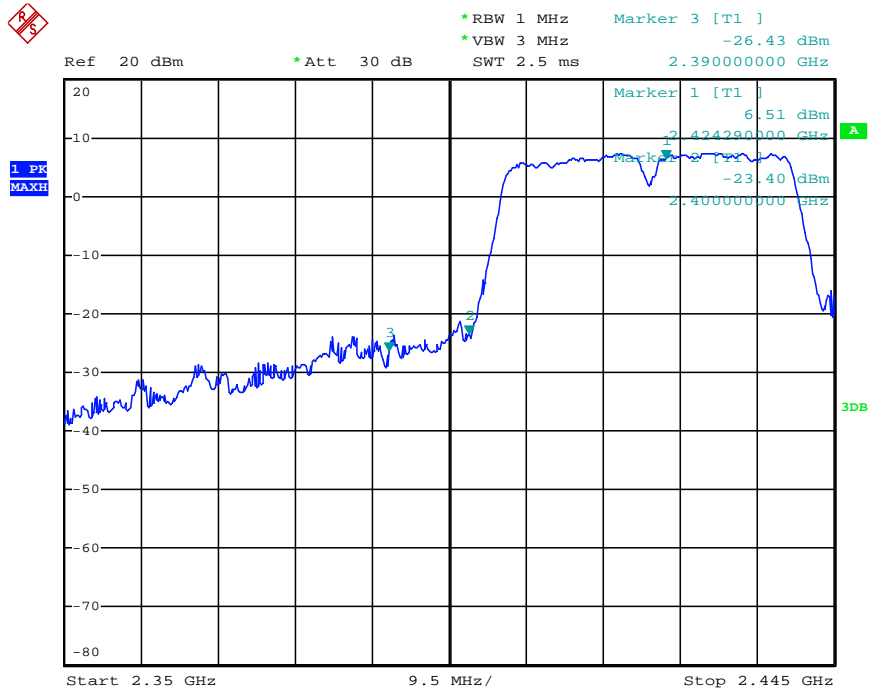
(Plot 4.7.7 D: Channel 11: 2462MHz @ 802.11n(20MHz))

4.7.8 802.11n(40MHz)

A. Test Verdict:

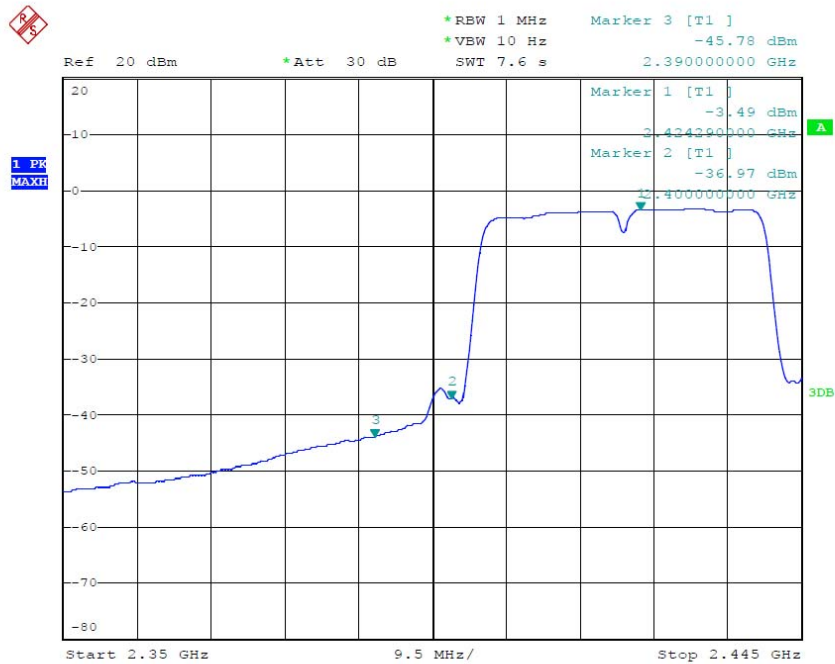
Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Covert Radiated E Level At 3m (dBuV/m) (dB)	Detector	Ground reflection factor	Limit (dBuV/m)	Refer to Plot
Out of left side band							
2390.00	-26.43	3.00	71.83	PK	0.00	74.00	Plot 4.7.8.A
2390.00	-45.78	3.00	52.48	AV	0.00	54.00	Plot 4.7.8.B
2422.00	6.51	3.00	104.77	PK	0.00	---	Plot 4.7.8.A
2422.00	-3.49	3.00	94.77	AV	0.00	---	Plot 4.7.8.B
Out of right side band							
2452.00	3.44	3.00	101.70	PK	0.00	---	Plot 4.7.8.C
2452.00	-7.25	3.00	91.01	AV	0.00	---	Plot 4.7.8.D
2483.50	-39.94	3.00	58.32	PK	0.00	74.00	Plot 4.7.8.C
2483.50	-56.44	3.00	41.82	AV	0.00	54.00	Plot 4.7.8.D

B. Test Plots:



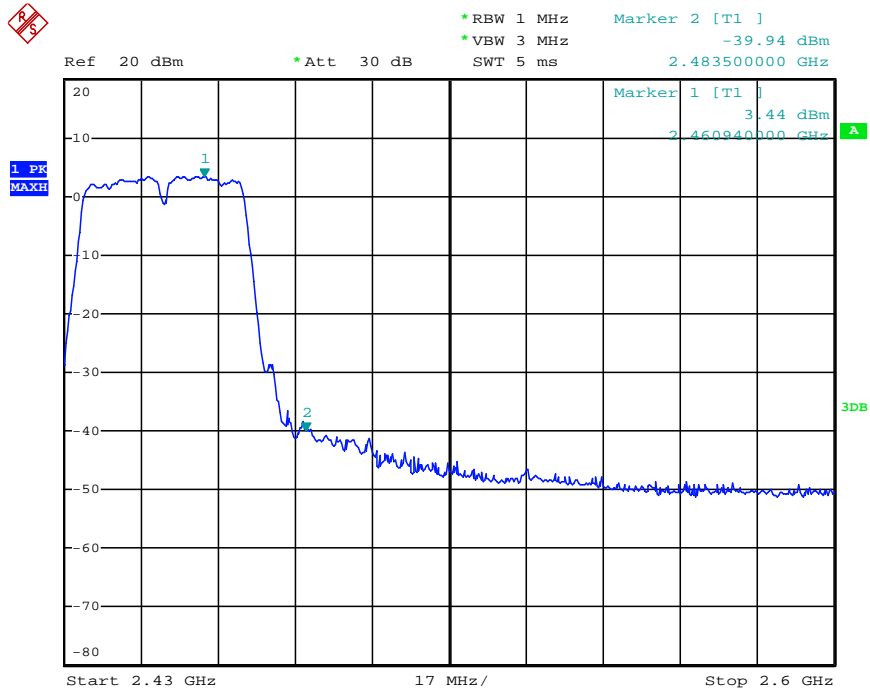
Date: 29.JUN.2013 22:36:46

(Plot 4.7.8 A: Channel 3 2422MHz @ 802.11n(40MHz))



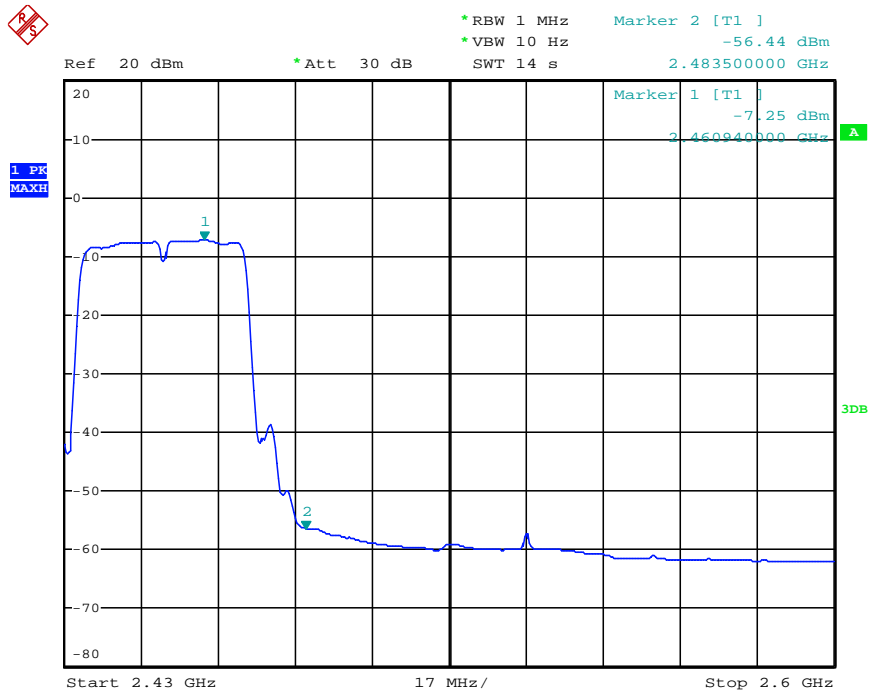
Date: 29.JUN.2013 22:37:01

(Plot 4.7.8 B: Channel 3: 2422MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:38:25

(Plot 4.7.8 C: Channel 9: 2452MHz @ 802.11n(40MHz))



Date: 29.JUN.2013 22:38:48

(Plot 4.7.8 D: Channel 9: 2452MHz @ 802.11n(40MHz))

4.8. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 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.

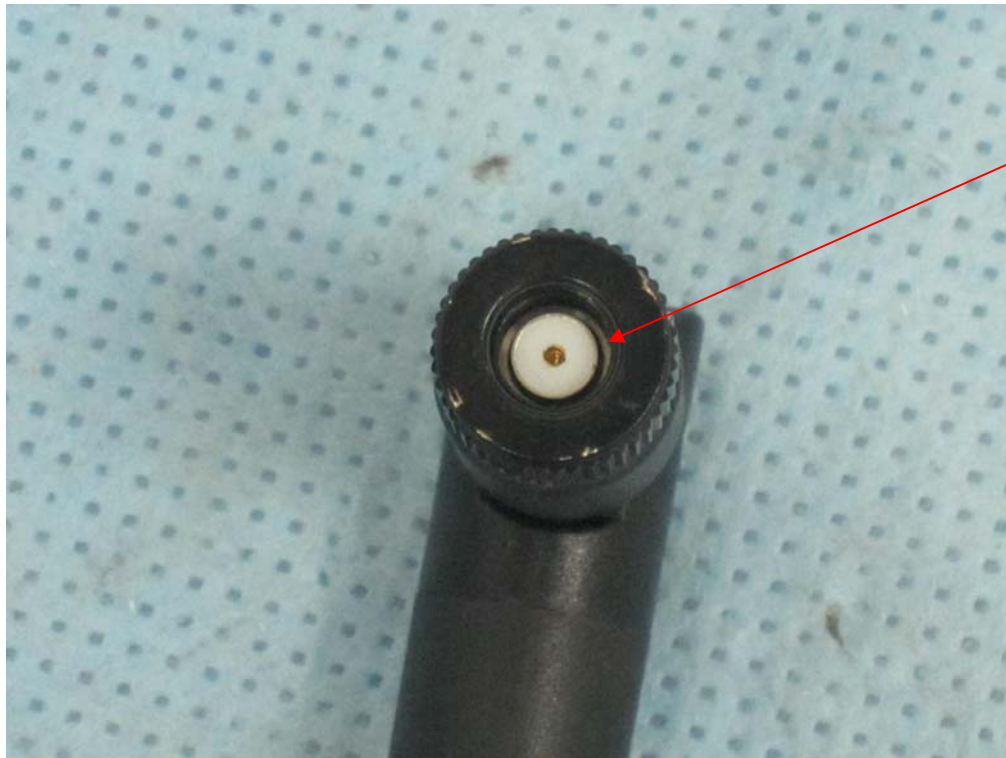
And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is a SMA Antenna .The maximum Gain of the antenna only 3.0dBi. Detail please see the photos as following:



Antenna

5. Test Setup Photos of the EUT

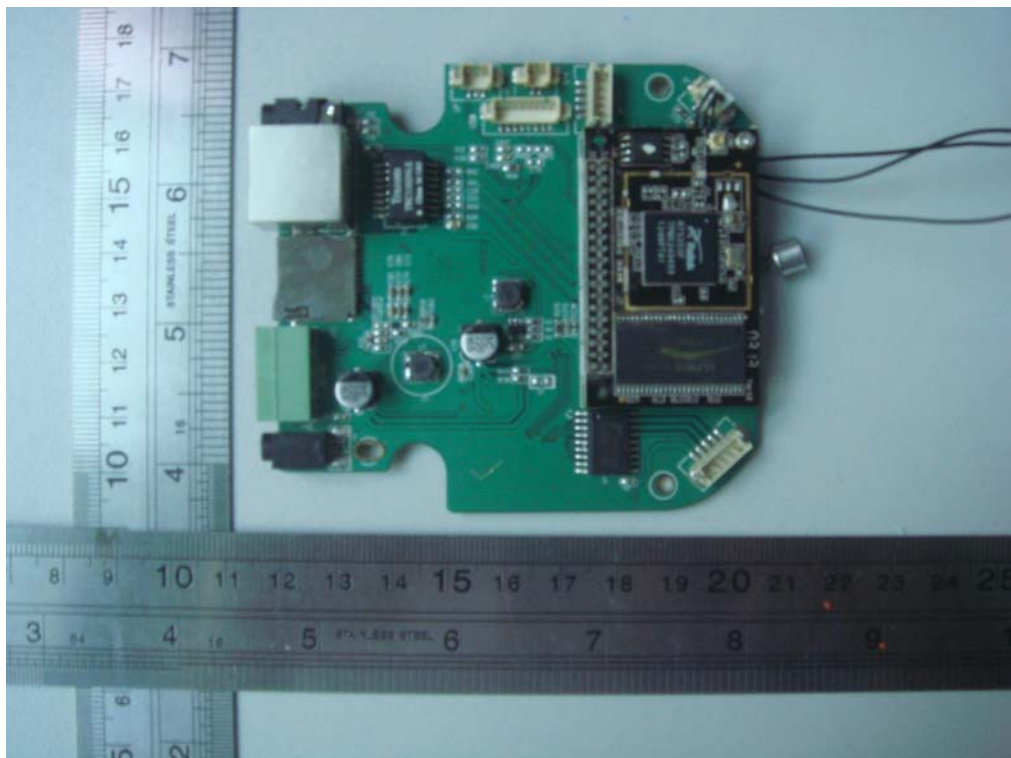


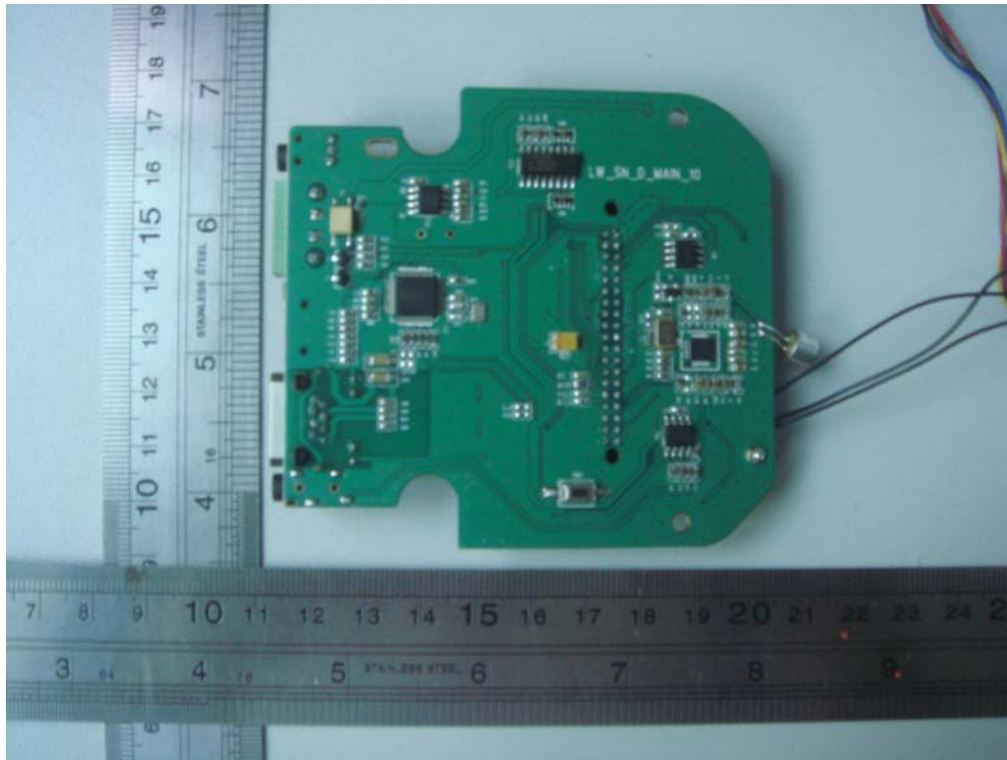
6. External and Internal Photos of the EUT

External Photos





Internal Photos



.....End of Report.....