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## FCC PART 15 SUBPART C TEST REPORT

### Part 15.247

**Report Reference No.** : CTL1412042914-WF

Compiled by

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Date of issue : Jan. 13, 2015

**Test Laboratory Name** : Shenzhen CTL Testing Technology Co., Ltd.

Address : Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road,  
Nanshan District, Shenzhen, China 518055

**Applicant's name** : DCOM Technology Co., LTD

Address : Room 8004, B/51, 2<sup>nd</sup> Dist, Shangtang Songzi Park, Minzhi,  
Longhua, Shenzhen, China

#### Test specification:

Standard : FCC Part 15.247: Operation within the bands 902–928 MHz, 2400–  
2483.5 MHz, and 5725–5850 MHz.

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

Master TRF : Dated 2011-01

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**Test item description** : 802.11b/g/n wireless ADSL Router

**FCC ID** : 2AD2HDWAN150USERIES

Trade Mark : N/A

Model/Type reference : DWA-N150USERIES, DWA-N300USERIES

Modulation : 802.11b DSSS, 802.11g/n: OFDM

Work Frequency Range : 802.11b/g/n(20MHz): 2412~2462MHz

Antenna Type : Undetectable

Antenna Gain : 5dBi

Result : Positive

## TEST REPORT

Test Report No. :	CTL1412042914-WF	Jan. 13, 2015 Date of issue
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Equipment under Test : 802.11b/g/n wireless ADSL Router

Model /Type : DWA-N150USeries

Listed Modes : DWA-N300USeries

Difference Description : Only the color and model's name is different

Applicant : DCOM Technology Co., LTD

Address : Room 8004, B/51, 2<sup>nd</sup> Dist, Shangtang Songzi Park, Minzhi, Longhua, Shenzhen, China

Manufacturer : DCOM Technology Co., LTD

Address : Room 8004, B/51, 2<sup>nd</sup> Dist, Shangtang Songzi Park, Minzhi, Longhua, Shenzhen, China

**Test Result** according to the standards on page 4:

**Positive**

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 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.

**ANSI C63.4-2009**

**KDB Publication No. 558074 D01 v03r02 Guidance on Measurements for Digital Transmission Systems**



## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	Dec. 10, 2014
	:	
Testing commenced on	:	Dec. 10, 2014
	:	
Testing concluded on	:	Jan. 13, 2015

### 2.2. Equipment Under Test

#### Power supply system utilised

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

#### Description of the test mode

IEEE 802.11b/g/n(HT20): Thirteen channels are provided to the EUT, but only eleventh channels used for USA and Canada.

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		

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

802.11b/g/n wireless ADSL Router, support 802.11b/g/n.

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

Serial number: Prototype

## 2.4. EUT operation mode

Test Mode:

1. The EUT has been tested under normal operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel low (2412MHz), mid (2437MHz) and high (2462MHz) for 802.11b/g/n(HT20) with highest data rate are chosen for full testing.
3. Test Mode:

Test Mode(TM)	Description	Remark
1	Transmitting	802.11 b 2412MHz, 2437MHz, 2462MHz
2	Transmitting	802.11 g 2412MHz, 2437MHz, 2462MHz
3	Transmitting	802.11 n HT20 2412MHz, 2437MHz, 2462MHz

## 2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- supplied by the manufacturer
- supplied by the lab

- AC Adapter

Manufacturer: DCOM Technology Co., LTD  
Model No.: JOD-120100

## 2.6. NOTE

1. The EUT is an **802.11b/g/n wireless ADSL Router**, The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11b/g, 802.11n	FCC Part 15 Subpart C (Section15.247)	CTL1412042914-WF
	FCC Per 47 CFR 2.1091(b)	CTL1412042914-WM

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 MIMO function, Physically, the EUT provides two completed transmitter and two completed receivers.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	2TX

## 2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCCID: 2AD2HDWAN150USERIES filing to comply with of the FCC part15.247 Rules.

## 2.8. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.  
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

The sites are constructed in conformance with the requirements of ANSI C6230, ANSI C63.4 (2009) and CISPR Publication 22.

#### 3.2. Test Facility

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

##### IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

##### FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., 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 970318, December 19, 2013.

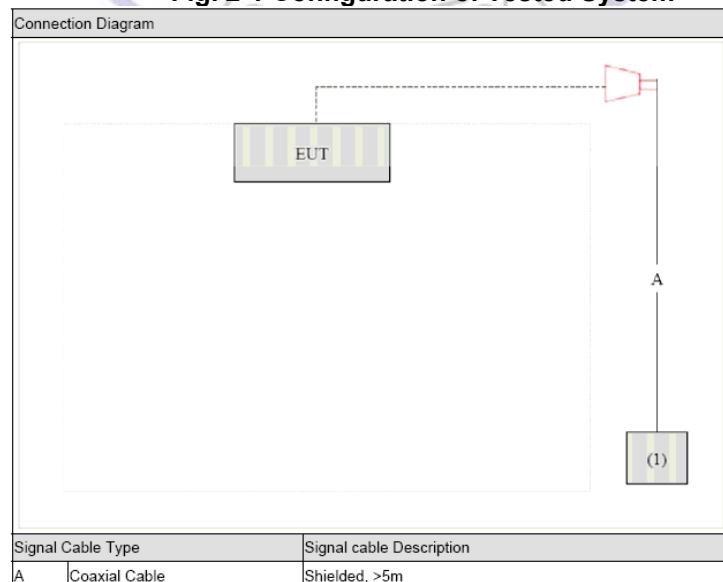
#### 3.3. Environmental conditions

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

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

#### 3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



### 3.5. Duty Cycle

Operated Mode for Worst Duty Cycle		
<input type="checkbox"/> Operated normally mode for worst duty cycle <input checked="" type="checkbox"/> Operated test mode for worst duty cycle		
Mode	Duty Cycle (%)	Duty Factor (dB)
11b	100	0
11g	100	0
11n HT20	100	0

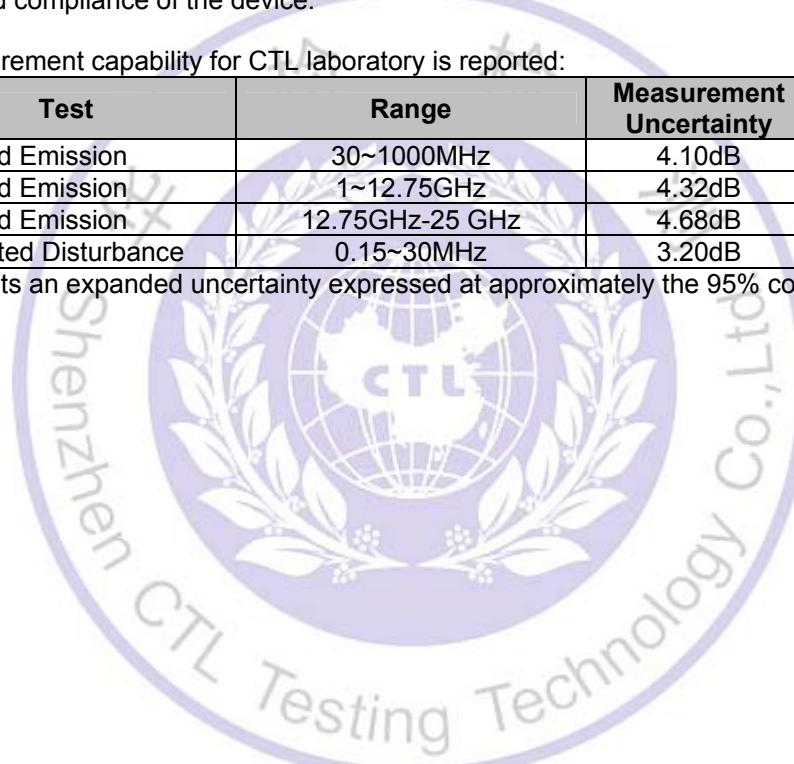
### 3.6. Statement of the measurement uncertainty

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 Shenzhen CTL Testing Technology Co., 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 CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Radiated Emission	12.75GHz-25 GHz	4.68dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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



### 3.7. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2014/07/12	2015/07/11
EMI Test Receiver	R&S	ESCI	103710	2014/07/10	2015/07/09
Spectrum Analyzer	Agilent	E4407B	MY45108355	2014/07/06	2015/07/05
Controller	EM Electronics	Controller EM 1000	N/A	2014/07/06	2015/07/05
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2014/07/12	2015/07/11
Horn Antenna	SCHWARZBECK	BBHA9170	1562	2014/07/12	2015/07/11
Active Loop Antenna	SCHWARZBECK	FMZB1519	1519-037	2014/07/12	2015/07/11
LISN	R&S	ENV216	101316	2014/07/10	2015/07/09
LISN	SCHWARZBECK	NSLK8127	8127687	2014/07/10	2015/07/09
Microwave Preamplifier	HP	8349B	3155A00882	2014/07/10	2015/07/09
Amplifier	HP	8447D	3113A07663	2014/07/10	2015/07/09
Transient Limiter	Com-Power	LIT-153	532226	2014/07/10	2015/07/09
Radio Communication Tester	R&S	CMU200	3655A03522	2014/07/06	2015/07/05
Temperature/Humidity Meter	zhicheng	ZC1-2	22522	2014/07/10	2015/07/09
SIGNAL GENERATOR	HP	8647A	3200A00852	2014/07/10	2015/07/09
Wideband Peak Power Meter	Anritsu	ML2495A	220.23.35	2014/07/06	2015/07/05
Power Sensor	Anritsu	MA2411B	0738552	2014/07/06	2015/07/05
Climate Chamber	ESPEC	EL-10KA	A20120523	2014/07/06	2015/07/05
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	/	2014/07/06	2015/07/05
High-Pass Filter	K&L	41H10-1375/U12750-O/O	/	2014/07/06	2015/07/05
RF Cable	HUBER+SUHNER	RG214	/	2014/07/09	2015/07/08

### 3.8. Summary of Test Result

FCC PART 15		
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 Compliance of RF Emission	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	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
AC Power Conducted Emission	Normal Link	11 Mbps	1
Maximum Peak Conducted Output Power	11b/DSSS	11 Mbps	1/6/11
Power Spectral Density	11g/OFDM	54 Mbps	1/6/11
6dB Bandwidth	11n(20MHz)/OFDM	65Mbps	1/6/11
Spurious RF conducted emission	11b/DSSS	11 Mbps	1/6/11
Radiated Emission 30MHz~1GHz	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
Radiated Emission 1GHz~10th Harmonic	11b/DSSS	11 Mbps	1/6/11
	11g/OFDM	54 Mbps	1/6/11
	11n(20MHz)/OFDM	65Mbps	1/6/11
Band Edge Compliance of RF Emission	11b/DSSS	11 Mbps	1/11
	11g/OFDM	54 Mbps	1/11
	11n(20MHz)/OFDM	65Mbps	1/11

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

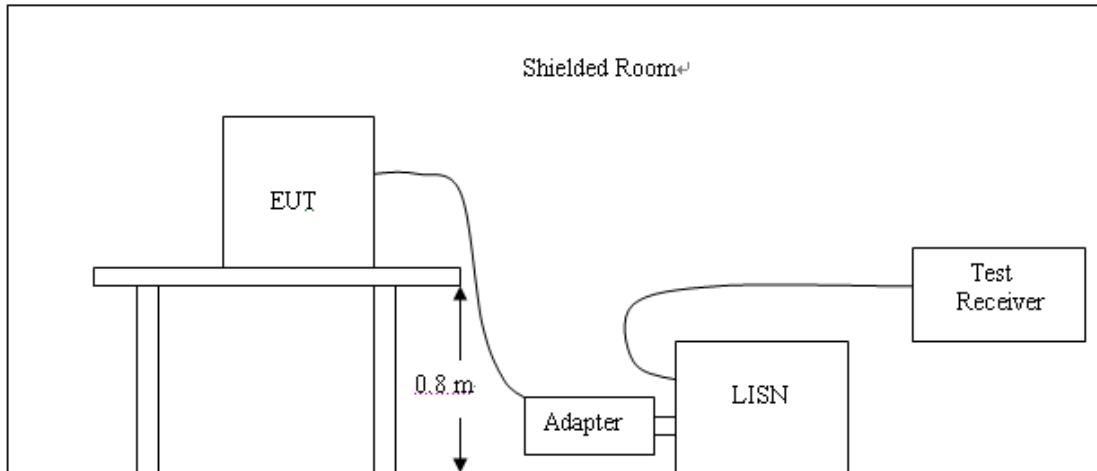
Note2: This device use MIMO 2X2 antennas, for 802.11n mode, SISO for 802.11 b/g mode, for SISO mode, Antenna 1 and Antenna 2 all tested on keeping transmit, the test results are not visible difference, antenna 1 is worst case, only report worst case in the report.

Based exploratory test, when transmit with Antenna 1 have worse emissions, so the final radiated spurious emissions were tested with Antenna 1. For 802.11n mode, all the radiated spurious emissions and band edge test were performed with two antennas transmit synchronous.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. Conducted Emissions Test

#### TEST CONFIGURATION



#### TEST PROCEDURE

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

Frequency (MHz)	Maximum RF Line Voltage (dB $\mu$ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	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

\* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

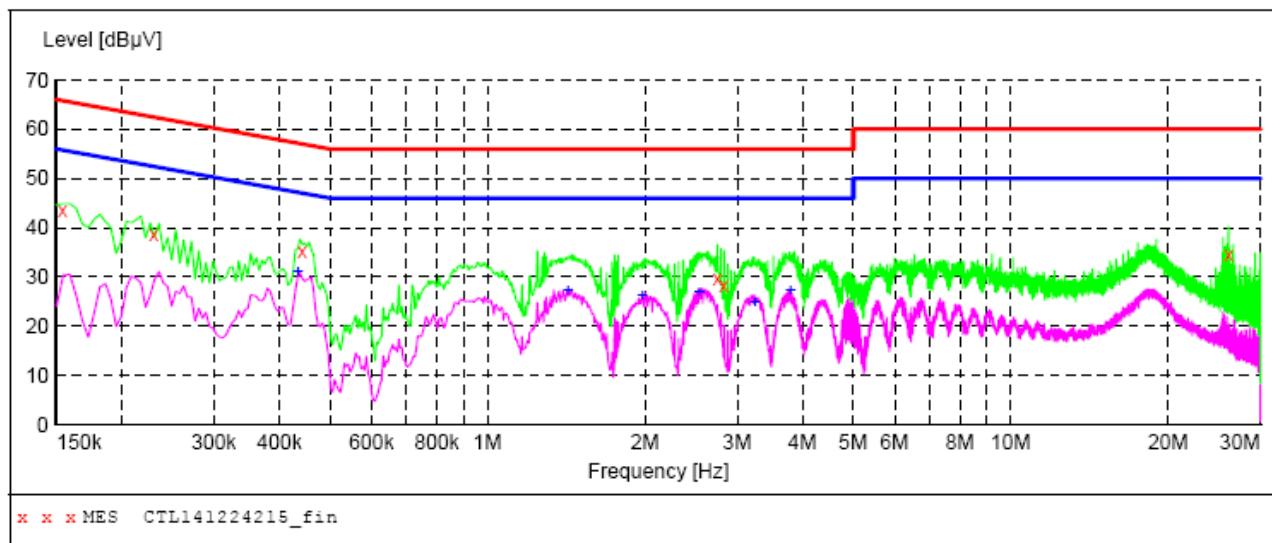
1. Please follow the guidelines in ANSI C63.4-2009.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

The RBW/VBW for 150KHz to 30MHz: 9KHz

## TEST RESULTS

All the modes tested and report the worst case MIMO transmitting.

**SCAN TABLE: "Voltage (9K-30M) FIN"**  
Short Description: 150K-30M Voltage



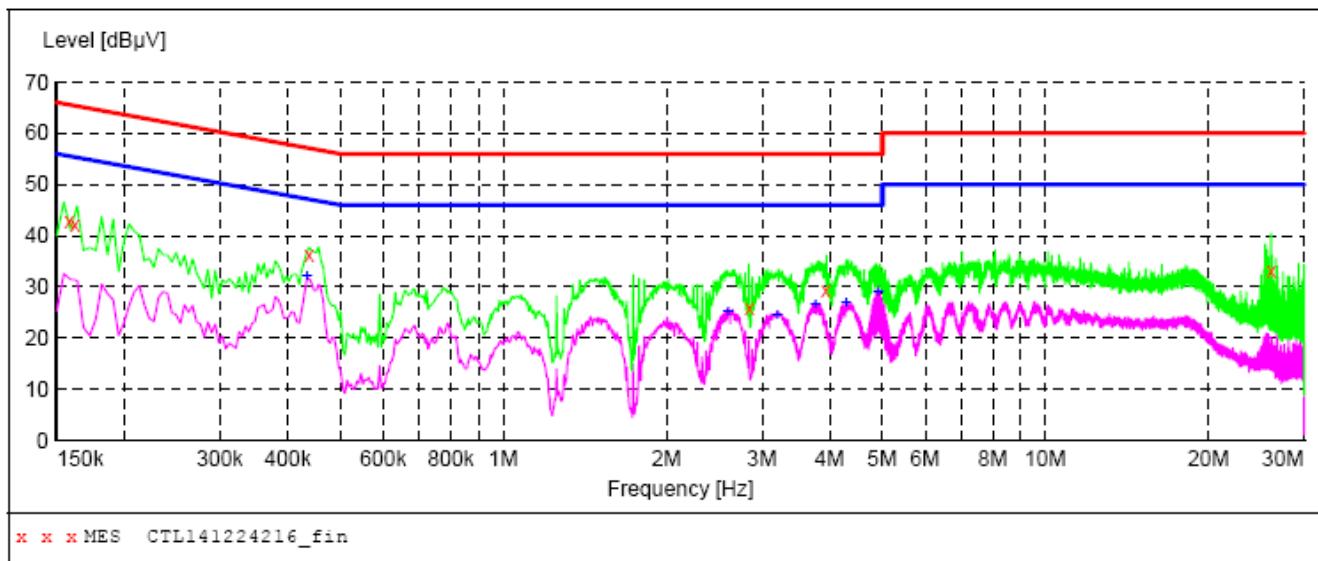
### **MEASUREMENT RESULT: "CTL141224215\_fin"**

12/24/2014 9:59AM	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dB $\mu$ V	dB	dB $\mu$ V	dB			
	0.154000	43.50	10.2	66	22.3	QP	N	GND
	0.230000	38.80	10.2	62	23.6	QP	N	GND
	0.442000	35.30	10.2	57	21.7	QP	N	GND
	2.744000	29.60	10.4	56	26.4	QP	N	GND
	2.822000	28.30	10.4	56	27.7	QP	N	GND
	26.054000	34.40	11.2	60	25.6	QP	N	GND

### **MEASUREMENT RESULT: "CTL141224215\_fin2"**

12/24/2014 9:59AM	Frequency	Level	Transd	Limit	Margin	Detector	Line	PE
	MHz	dB $\mu$ V	dB	dB $\mu$ V	dB			
	0.434000	31.00	10.2	47	16.2	AV	N	GND
	1.424000	27.40	10.3	46	18.6	AV	N	GND
	1.976000	26.20	10.3	46	19.8	AV	N	GND
	2.540000	27.00	10.4	46	19.0	AV	N	GND
	3.248000	24.90	10.4	46	21.1	AV	N	GND
	3.794000	27.10	10.4	46	18.9	AV	N	GND

**SCAN TABLE: "Voltage (9K-30M) FIN"**  
 Short Description: 150K-30M Voltage



**MEASUREMENT RESULT: "CTL141224216\_fin"**

12/24/2014 10:05AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.158000	42.80	10.2	66	22.8	QP	L1	GND
0.162000	42.20	10.2	65	23.2	QP	L1	GND
0.438000	36.40	10.2	57	20.7	QP	L1	GND
2.840000	25.90	10.4	56	30.1	QP	L1	GND
3.932000	29.40	10.4	56	26.6	QP	L1	GND
26.054000	33.30	11.2	60	26.7	QP	L1	GND

**MEASUREMENT RESULT: "CTL141224216\_fin2"**

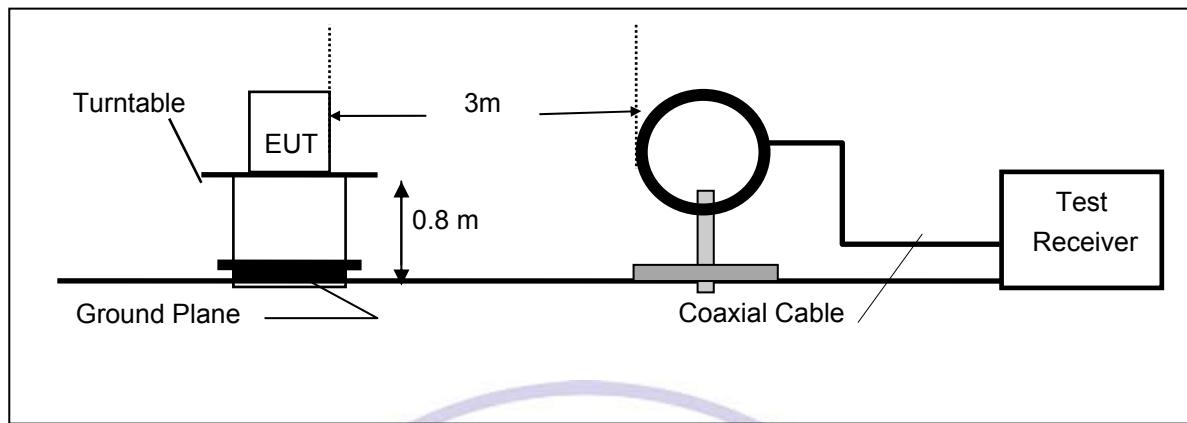
12/24/2014 10:05AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.434000	32.10	10.2	47	15.1	AV	L1	GND
2.600000	25.10	10.4	46	20.9	AV	L1	GND
3.206000	24.30	10.4	46	21.7	AV	L1	GND
3.770000	26.50	10.4	46	19.5	AV	L1	GND
4.286000	26.90	10.4	46	19.1	AV	L1	GND
4.922000	29.10	10.4	46	16.9	AV	L1	GND

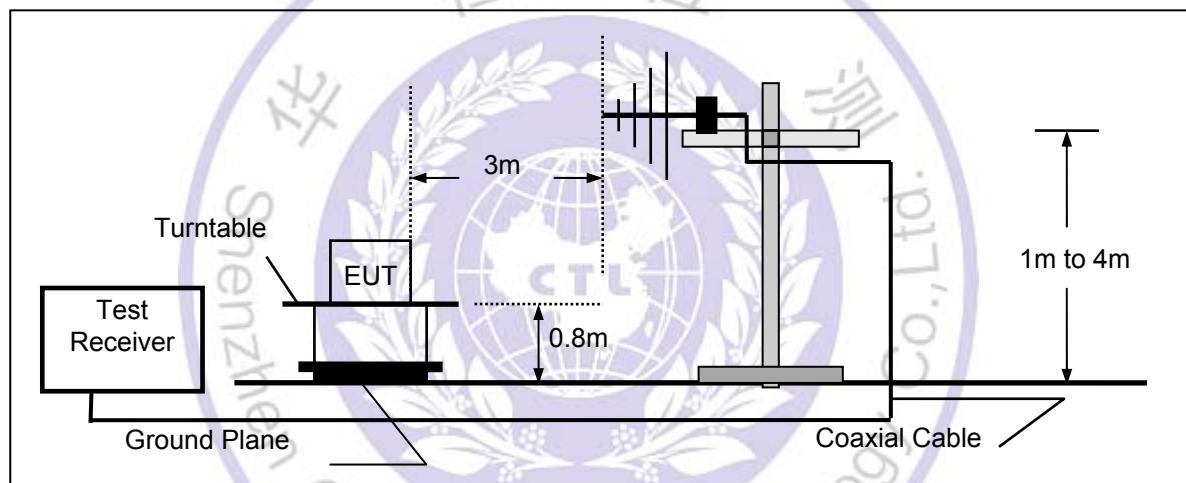
## 4.2. Radiated Emission Test

### TEST CONFIGURATION

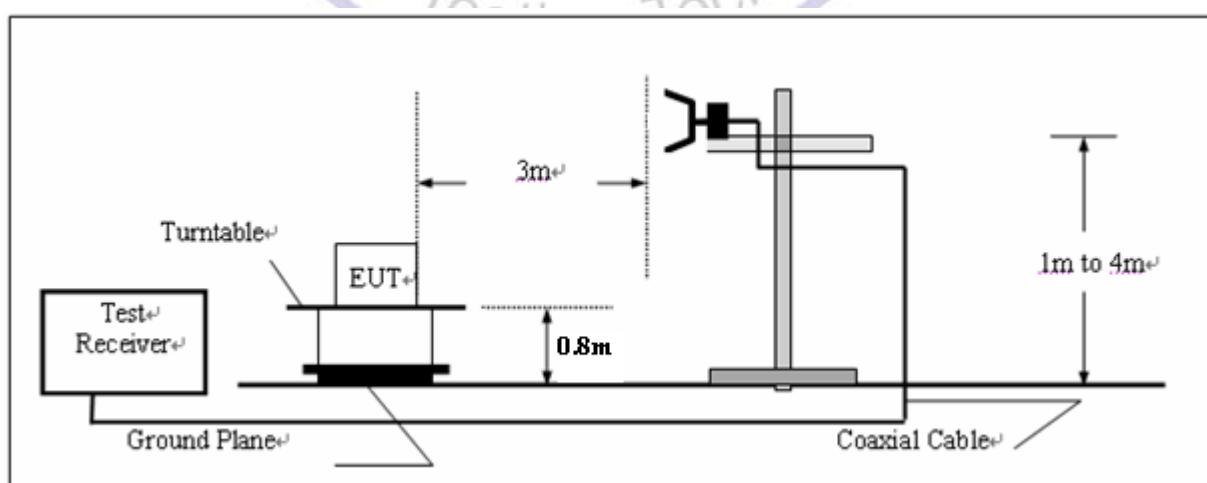
#### (A) Radiated Emission Test Set-Up, Frequency Below 30MHz



#### (B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



#### (C) Radiated Emission Test Set-Up, Frequency above 1000MHz



## 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	

## TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 D01 v03r02 (Measurement Guidelines of DTS).
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. 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
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for f > 1 GHz, 100 kHz for f < 1 GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold.
6. Repeat above procedures until all frequency measurements have been completed.

Note:

When doing emission measurement above 1GHz, the horn antenna will be bended down a little (as horn antenna has the narrow beamwidth) in order to keeping the antenna in the “cone of radiation” of EUT. The 3dB beamwidth is 60 degrees for H-plane and 90 degrees for E-plane.

Remark : For above 1GHz, RBW 1MHz, VBW 3MHz, Peak detector for PK value, RMS detector for AV value.

## LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT 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 desired power.

**TEST RESULTS****9KHz-30MHz:**

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

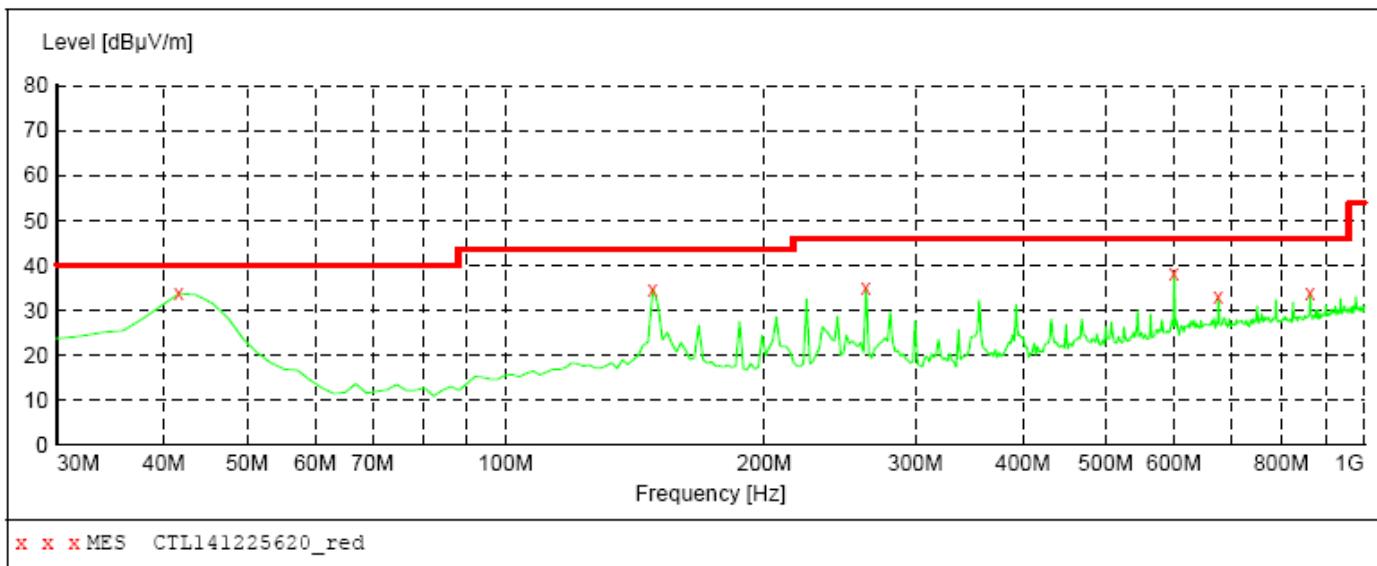
Distance extrapolation factor=  $40 \log (\text{specific distance} / \text{test distance})$  (dB);  
 Limit line= specific limits (dBuV) + distance extrapolation factor.

**Below 1GHz:**

The radiated measurement are performed the each test mode (802.11b/g SISO mode Ant 1, Ant2 Keeping TX mode, 802.11n keeping MIMO Tx MODE) and channel (low/mid/high), the datum recorded below (802.11b ANT 1 keeping TX mode) is the worst case for all the test mode and channel.

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

Short Description:		Field Strength			
Start Frequency	Stop Frequency	Detector	Meas.	IF	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

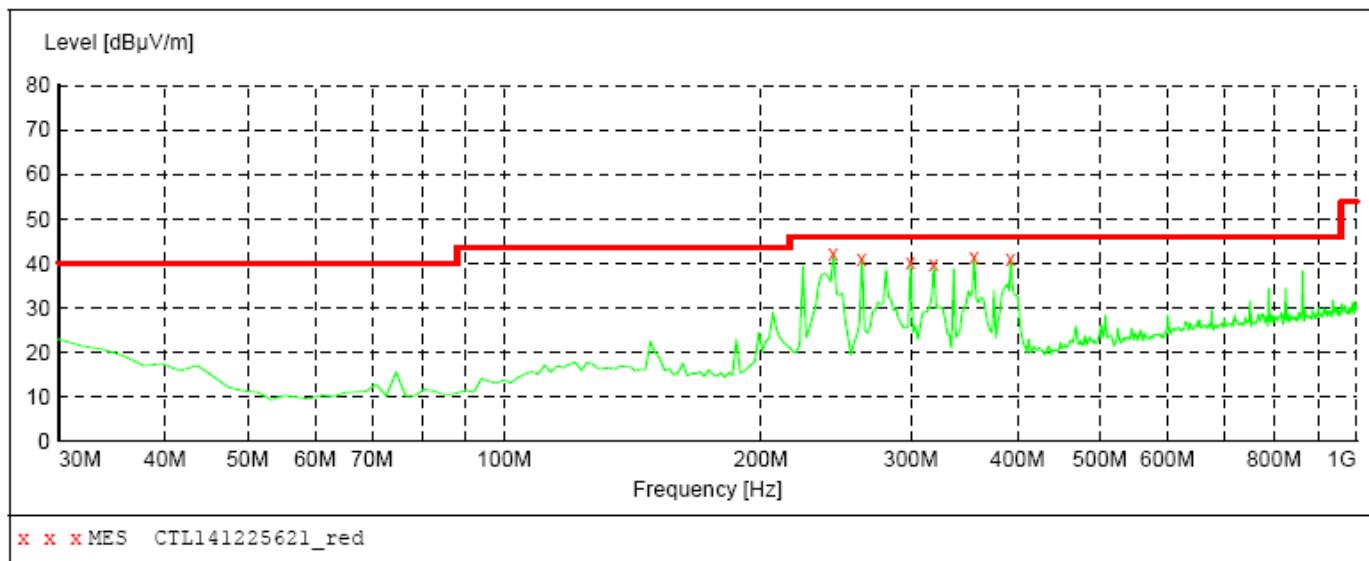
**MEASUREMENT RESULT: "CTL141225620\_red"**

12/25/2014 9:45AM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
41.640000	33.70	12.5	40.0	6.3	---	0.0	0.00	VERTICAL
148.340000	34.80	14.2	43.5	8.7	---	0.0	0.00	VERTICAL
262.800000	34.90	15.1	46.0	11.1	---	0.0	0.00	VERTICAL
600.360000	38.20	21.8	46.0	7.8	---	0.0	0.00	VERTICAL
676.020000	33.00	23.0	46.0	13.0	---	0.0	0.00	VERTICAL
864.200000	33.80	25.5	46.0	12.2	---	0.0	0.00	VERTICAL

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

Short Description:		Field Strength		
Start Frequency	Stop Frequency	Detector	Meas.	IF
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz
				JB1

***MEASUREMENT RESULT: "CTL141225621\_red"***

12/25/2014 9:47AM

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det. ---	Height cm	Azimuth deg	Polarization
243.400000	42.30	14.1	46.0	3.7	---	0.0	0.00	HORIZONTAL
262.800000	41.20	15.1	46.0	4.8	---	0.0	0.00	HORIZONTAL
299.660000	40.20	15.4	46.0	5.8	---	0.0	0.00	HORIZONTAL
319.060000	39.90	15.9	46.0	6.1	---	0.0	0.00	HORIZONTAL
355.920000	41.60	17.2	46.0	4.4	---	0.0	0.00	HORIZONTAL
392.780000	40.90	18.0	46.0	5.1	---	0.0	0.00	HORIZONTAL

CTL Testing Technology

**Above 1GHz:**

802.11b

SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2411.9	72.9	30.8	103.7	Fundamental	/	PK
	H	123.1	14.9	14.8	29.7	46	16.3	PK
	H	625.9	14.5	19.7	34.2	46	11.8	PK
	V	3200	49.2	-0.6	48.6	54(note3)	5.4	PK
	V	4824	49.7	2.6	52.3	54(note3)	1.7	PK
	V	7236	60.8	8.1	68.9	74	5.1	PK
	V	7239	41.7	8.9	50.6	54	3.4	AV
	H	24000	61.0	-8.9	52.1	54	1.9	PK
6	V	2437	71.6	31.2	102.8	Fundamental	/	PK
	H	229.4	16.1	15.2	31.3	46	14.7	PK
	H	728.5	8.9	21.2	30.1	46	15.9	PK
	V	3200	50.4	-0.6	49.8	54(note3)	4.2	PK
	V	4876	44.9	2.8	47.7	54(note3)	6.3	PK
	V	7298.5	60.1	8.8	68.9	74	5.1	PK
	V	7298.5	44.0	8.1	52.1	54	1.9	AV
	H	24000	62.0	-8.9	53.1	54	0.9	PK
11	V	2462.3	71.5	30.9	102.4	Fundamental	/	PK
	H	114.3	13.2	14.9	28.1	46	17.9	PK
	H	552.4	10.5	21.2	31.7	46	14.3	PK
	V	3200	48.2	-0.6	47.6	54(note3)	6.4	PK
	V	4927	46.4	3.0	49.4	54(note3)	4.6	PK
	V	7386	60.2	8.9	69.1	74	4.9	PK
	V	7386	43.0	8.9	51.9	54	2.1	AV
	H	24000	61.7	-8.9	52.8	54	1.2	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

4. RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value.

802.11g

SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2411.9	70.7	31.9	102.6	Fundamental	/	PK
	H	267.1	13.4	15.7	29.1	46	16.9	PK
	H	824.4	16.6	21.3	37.9	46	8.1	PK
	V	3200	48.2	-0.6	47.6	54(note3)	6.4	PK
	V	4824	48.6	2.6	51.2	54(note3)	2.8	PK
	V	7236	61.0	8.9	69.9	74	4.1	PK
	V	7236	39.5	8.9	48.4	54	5.6	AV
	H	24000	61.1	-8.9	52.2	54	1.8	PK
6	V	2437	72.4	31.2	103.6	Fundamental	/	PK
	H	302.3	13.1	14.8	27.9	46	18.1	PK
	H	775.1	14.9	21.2	36.1	46	9.9	PK
	V	3200	49.5	-0.6	48.9	54(note3)	5.1	PK
	V	4876	44.6	2.8	47.4	54(note3)	6.6	PK
	V	7298.5	59.5	8.8	68.3	74	5.7	PK
	V	7298.5	42.5	8.8	51.3	54	2.7	AV
	H	24000	60.5	-8.9	51.6	54	2.4	PK
11	V	2462.3	71.8	30.9	102.7	Fundamental	/	PK
	H	109.6	12.4	21.2	33.6	46	12.4	PK
	H	447.5	17.0	14.7	31.7	46	14.3	PK
	V	3200	49.5	-0.6	48.9	54(note3)	5.1	PK
	V	4927	44.1	3.0	47.1	54(note3)	6.9	PK
	V	7386	60.3	8.9	69.2	74	4.8	PK
	V	7386	42.5	8.9	51.4	54	2.6	AV
	H	24000	61.0	-8.9	52.1	54	1.9	PK

Note: 1. Measure Level = Reading Level + Factor.

2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

4. RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value

## 802.11n(20MHz), KEEPING MIMO TX MODE

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	2411.9	73.0	30.7	103.7	Fundamental	/	PK
	H	196.5	10.4	21.2	31.6	46	14.4	PK
	H	537.4	15.0	15.1	30.1	46	15.9	PK
	V	3200	48.8	-0.6	48.2	54(note3)	5.8	PK
	V	4824	49.0	2.6	51.6	54(note3)	2.4	PK
	V	7236	60.3	8.9	69.2	74	4.8	PK
	V	7236	42.7	8.9	51.6	54	2.4	AV
	H	24000	61.8	-8.9	52.9	54	1.1	PK
6	V	2437	71.7	31.2	102.9	Fundamental	/	PK
	H	276.1	8.4	21.2	29.6	46	16.4	PK
	H	735.9	10.9	16.0	26.9	46	19.1	PK
	V	3200	50.9	-0.6	50.3	54(note3)	3.7	PK
	V	4876	44.9	2.8	47.7	54(note3)	6.3	PK
	V	7298.5	60.8	8.8	69.6	74	4.4	PK
	V	7298.5	41.3	8.8	50.1	54	3.9	AV
	H	24000	61.3	-8.9	52.4	54	1.6	PK
11	V	2462.3	72.2	30.9	103.1	Fundamental	/	PK
	H	201.4	13.9	14.7	28.6	46	17.4	PK
	H	643.5	5.7	21.2	26.9	46	19.1	PK
	V	3200	49.8	-0.6	49.2	54(note3)	4.8	PK
	V	4927	46.7	3.0	49.7	54(note3)	4.3	PK
	V	7386	60.8	9.0	69.8	74	4.2	PK
	V	7386	41.7	9.0	50.7	54	3.3	AV
	H	24000	60.7	-8.9	51.8	54	2.2	PK

Note: 1. Measure Level = Reading Level + Factor.

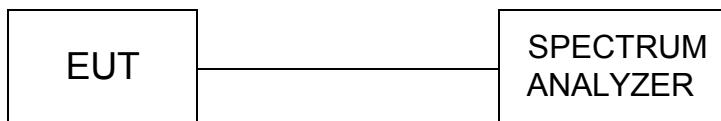
2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

4. RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value

### 4.3. 6dB Bandwidth Measurement

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 D01 v03r02 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

#### LIMIT

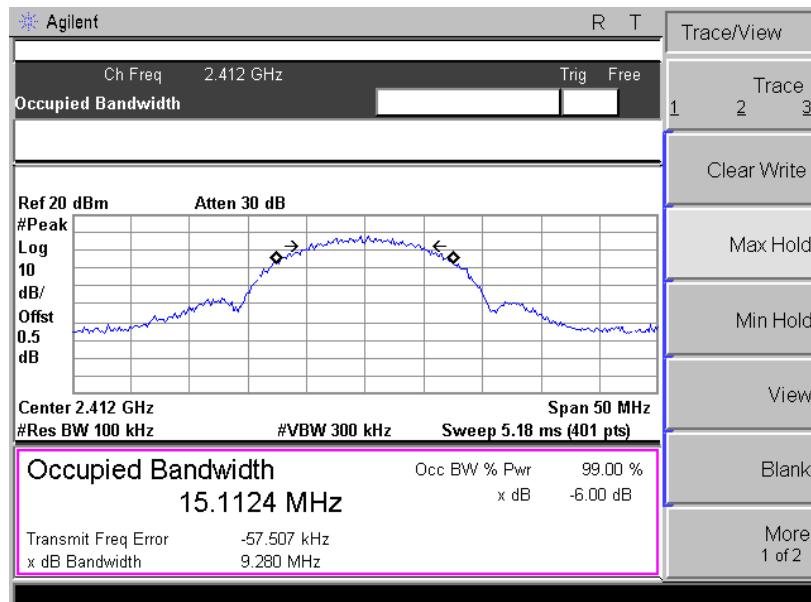
For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### TEST RESULTS

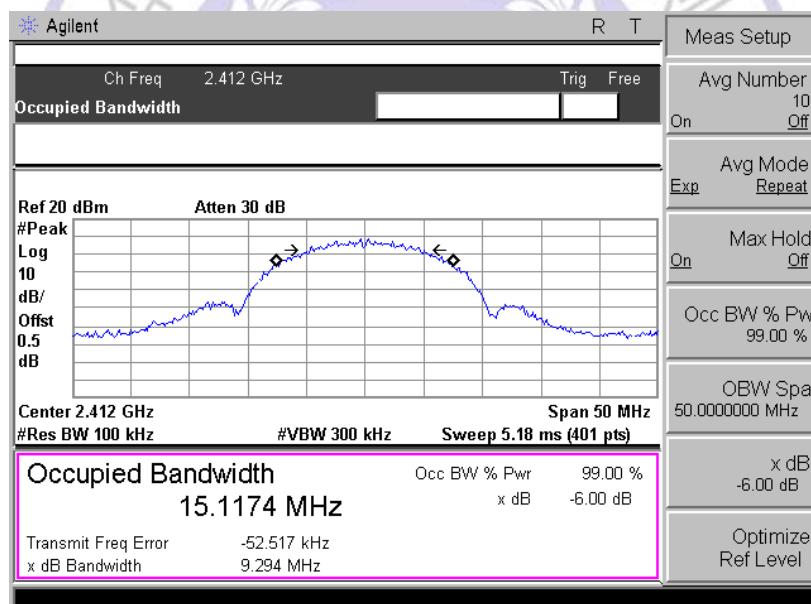
Mode	CHANNEL	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS/FAIL
		Ant 1 6dB	Ant 2 6dB		
802.11b	1	9.280	9.294	0.5	PASS
	6	9.435	9.425	0.5	PASS
	11	9.284	9.768	0.5	PASS
802.11g	1	16.538	16.575	0.5	PASS
	6	16.612	16.501	0.5	PASS
	11	16.585	16.610	0.5	PASS
802.11n HT20	1	17.632	17.580	0.5	PASS
	6	17.682	17.640	0.5	PASS
	11	17.674	16.658	0.5	PASS

For 802.11b:

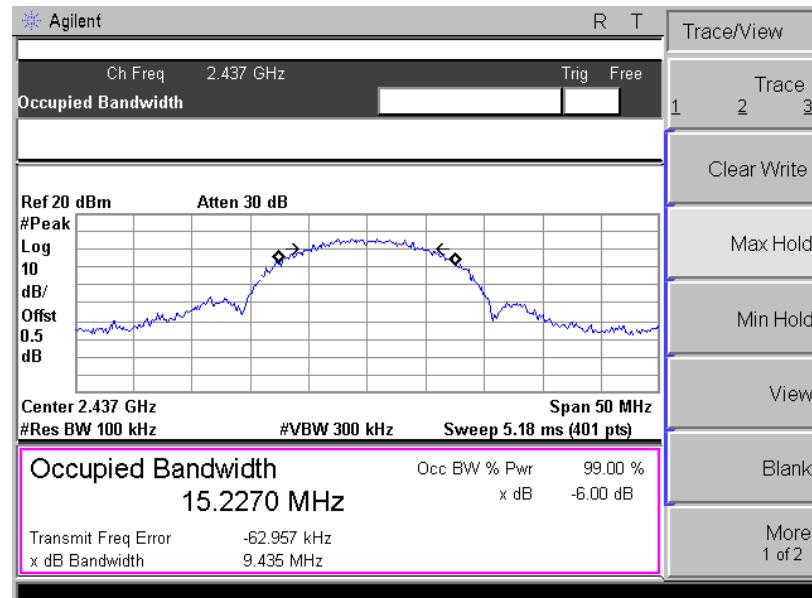
CH1 @ANT 1



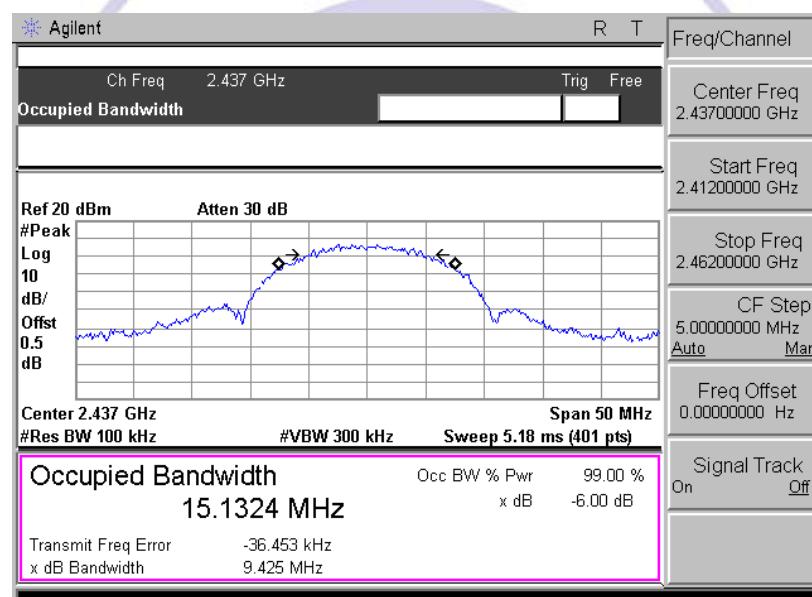
CH1 @ANT 2



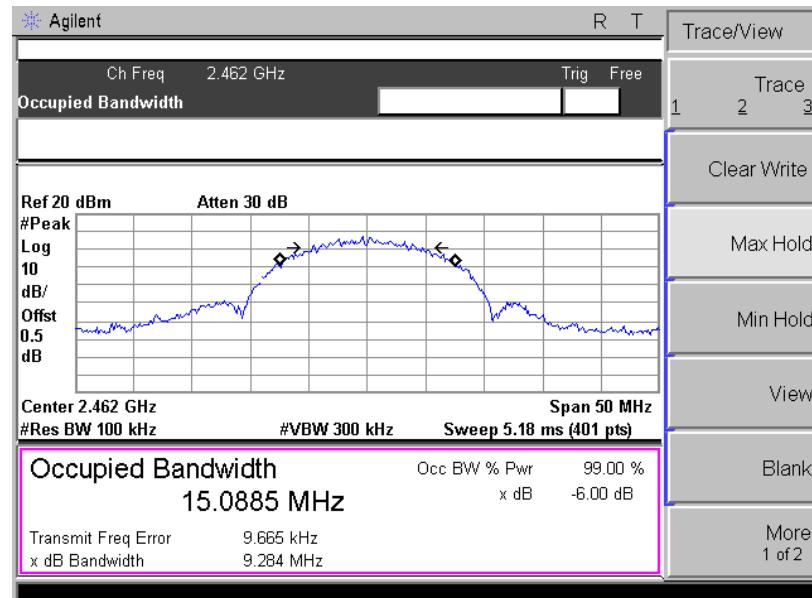
CH6 @ANT 1



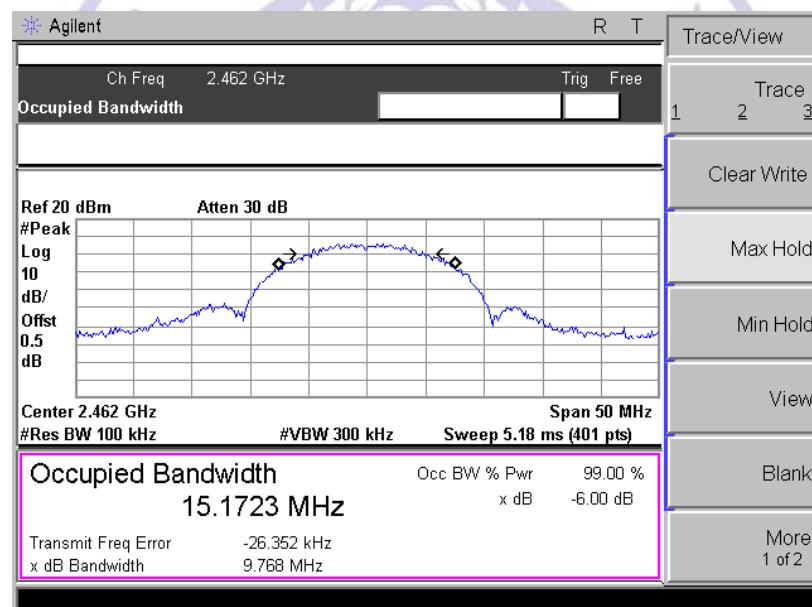
CH6 @ANT 2



## CH11 @ANT 1

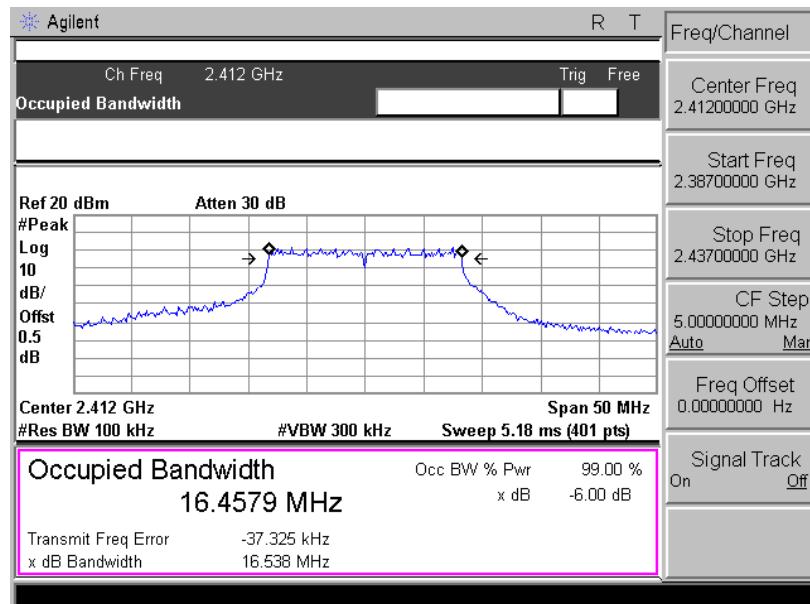


## CH11 @ANT 2

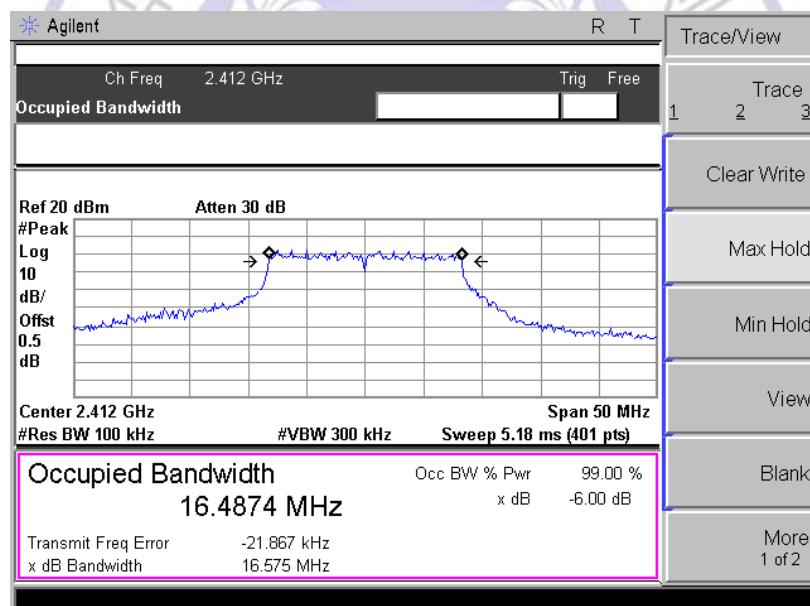


For 802.11g:

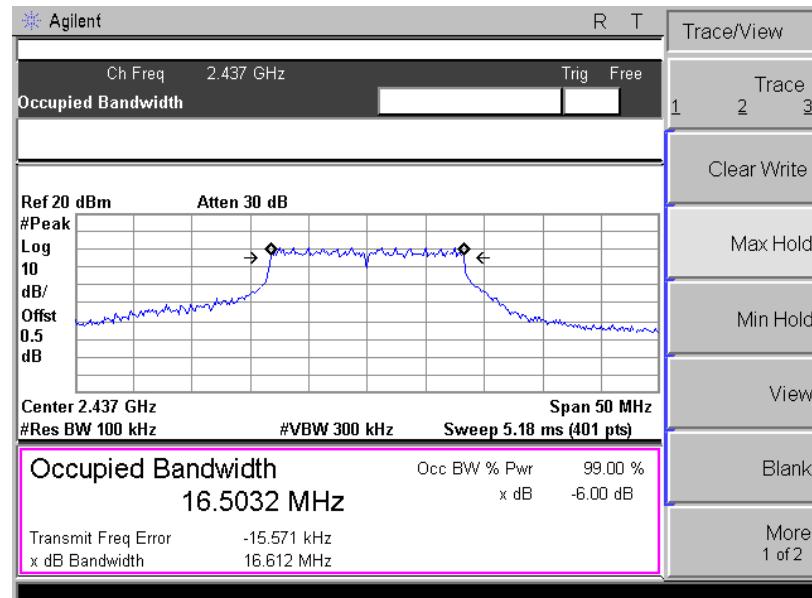
CH1 @ANT 1



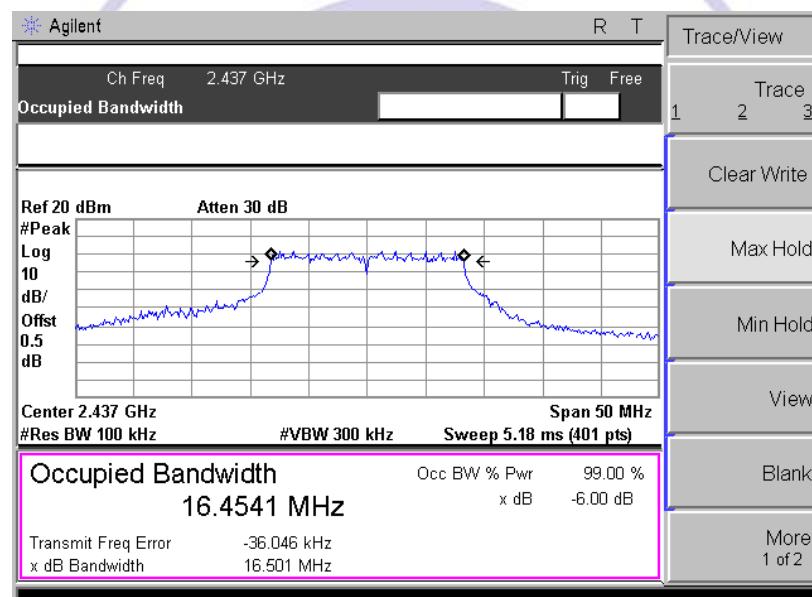
CH1 @ANT 2



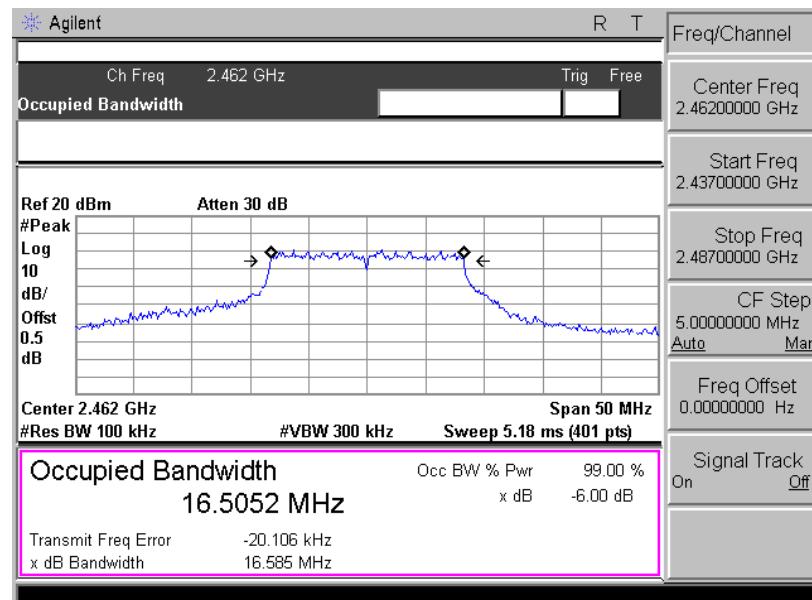
CH6 @ ANT 1



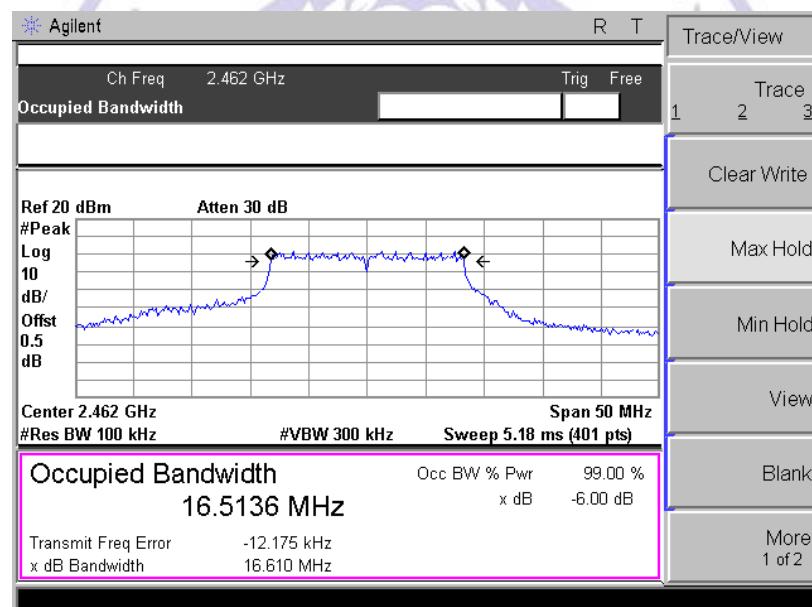
CH6 @ANT 2



## CH11 @ANT 1

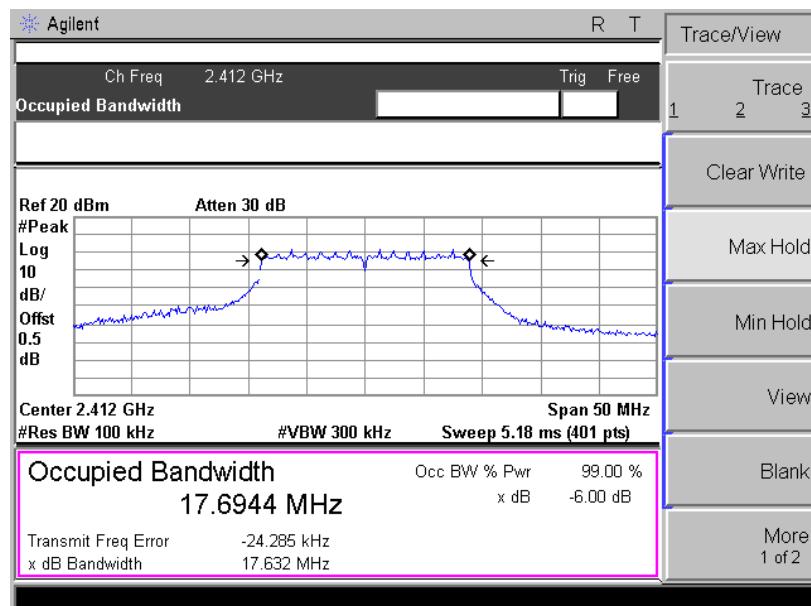


## CH11 @ANT 2

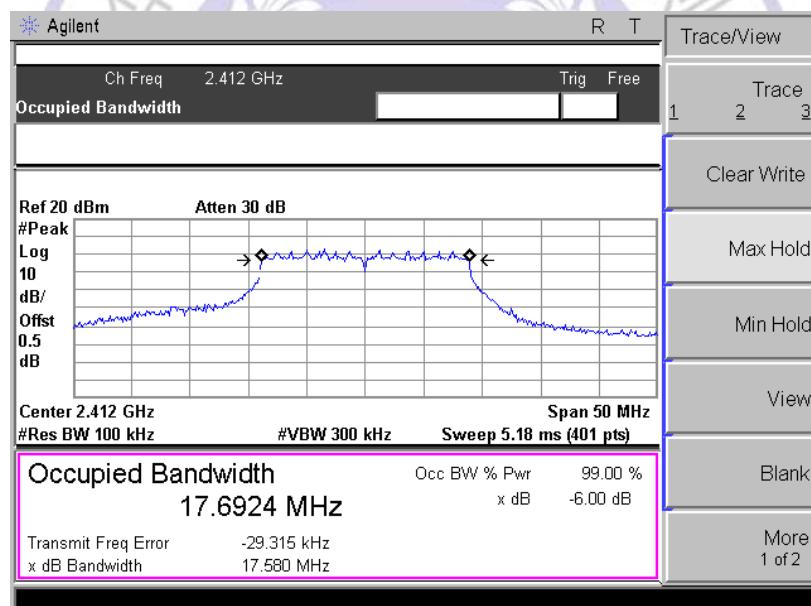


For 802.11n (20MHz) Mode:

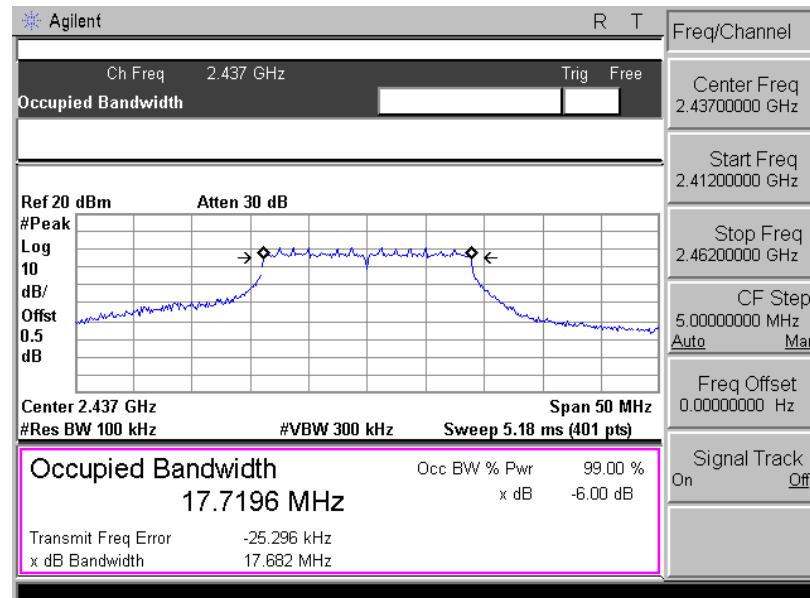
CH1 @ANT 1



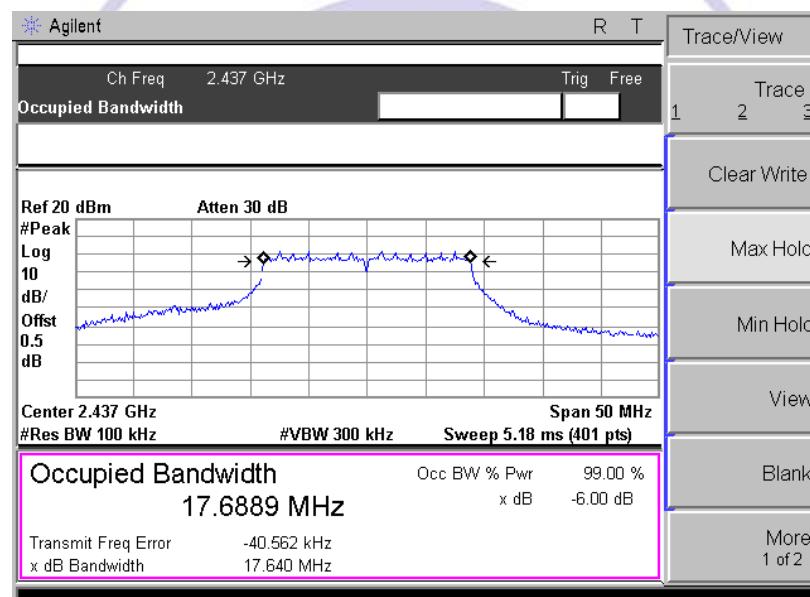
CH1 @ANT 2



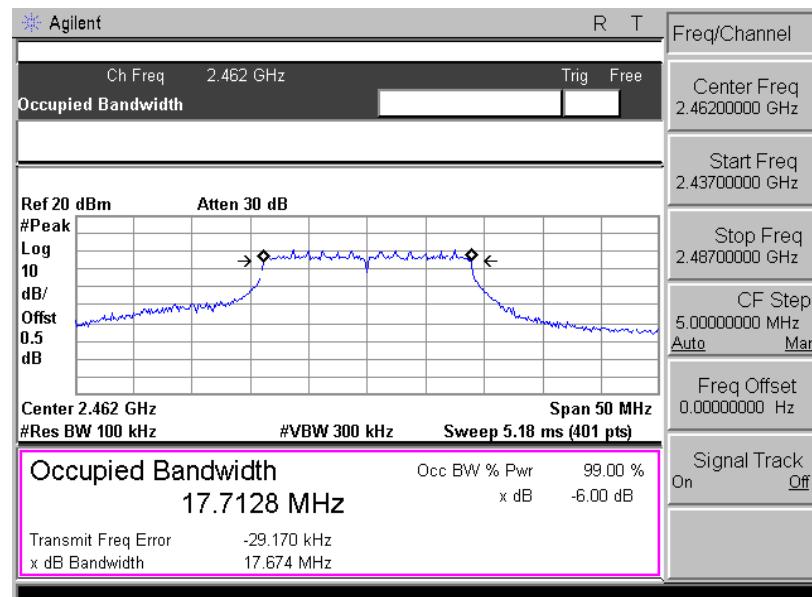
CH6 @ANT 1



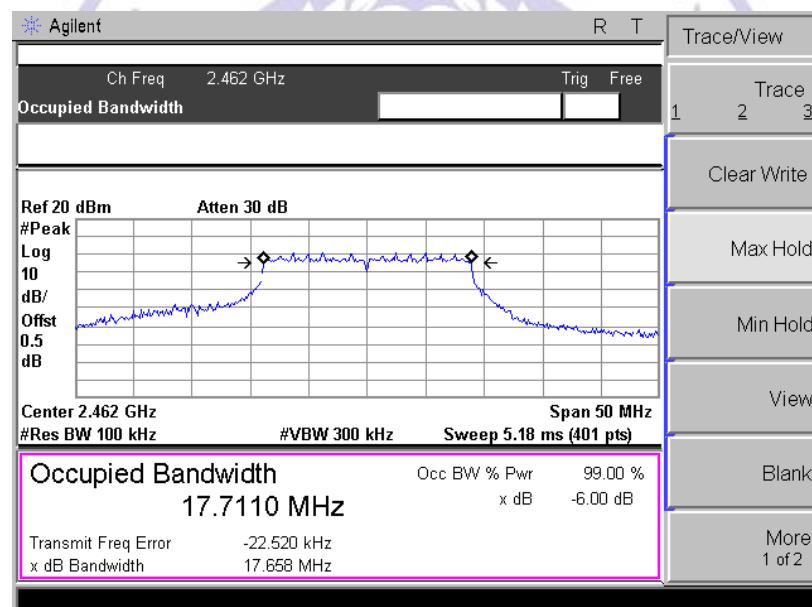
CH6 @ANT 2



## CH11 @ANT 1



## CH11 @ANT 2



## 4.4. Maximum Peak Output Power

### TEST CONFIGURATION



### TEST PROCEDURE

According to C63.10 -2009 and KDB558074 D01 v03r02, The EUT was directly connected to the power meter / spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Use the wideband power meter to test peak power and record the result.

### LIMIT

The Peak Output Power Measurement limits are 30dBm.

### TEST RESULTS

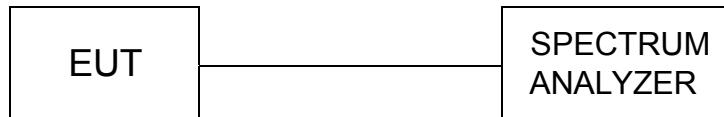
Mode	Channel	Peak Power Output (dBm)			Peak Power Limit (dBm)	PASS / FAIL
		Ant1	Ant 2	Total		
802.11b	1	9.36	9.07	N/A	30	PASS
	6	9.43	9.29	N/A	30	PASS
	11	9.31	9.26	N/A	30	PASS
802.11g	1	9.14	9.26	N/A	30	PASS
	6	9.23	9.09	N/A	30	PASS
	11	9.11	9.21	N/A	30	PASS
802.11n HT20	1	6.42	6.49	9.47	27.49	PASS
	6	6.39	6.41	9.41	27.49	PASS
	11	6.50	6.38	9.45	27.49	PASS

Note: The test results including the cable loss.

Remark:  $30 - (8.51 - 6) = 27.49$  dBm

## 4.5. Band Edge Measurement

### TEST CONFIGURATION



### TEST PROCEDURE

According to FCC KDB Publication No. 558074 D01 v03r02 (Measurement Guidelines of DTS)

Set RBW 1MHz VBW 3MHz PEAK detector for PK value, RMS detector for AV value.

### LIMIT

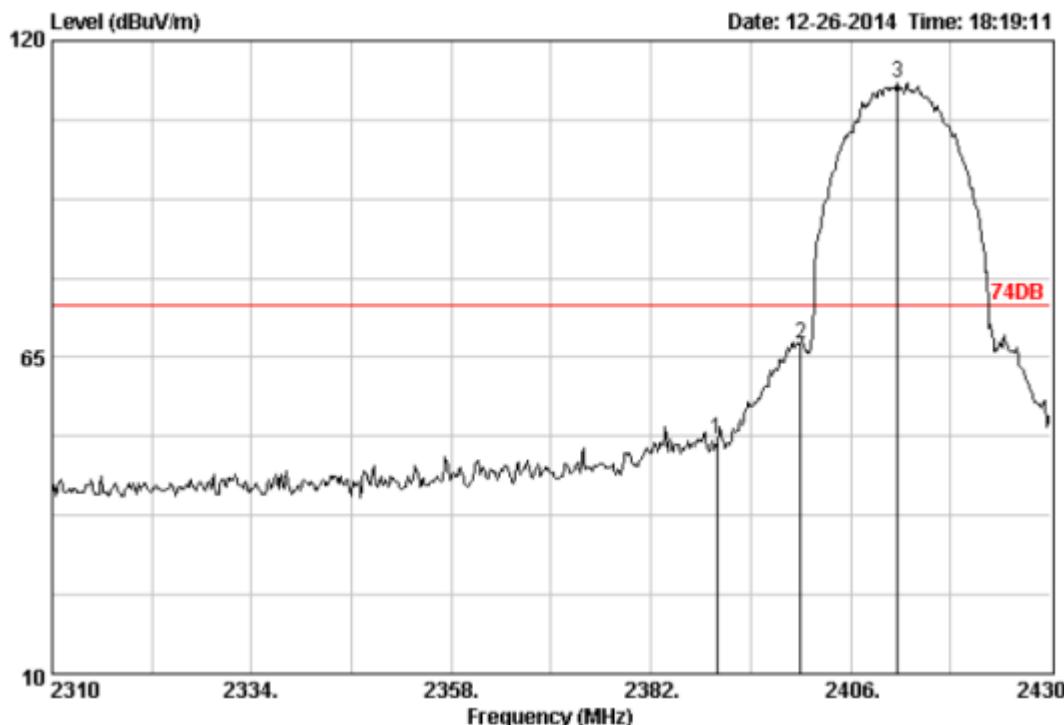
1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209(see Section 15.205(c)).

Frequency (MHz)	Limit Average (dB <sub>AV</sub> /m)	Limit Peak (dB <sub>AV</sub> /m)
Below 2390 or Above 2483.5	54	74



**TEST RESULTS**

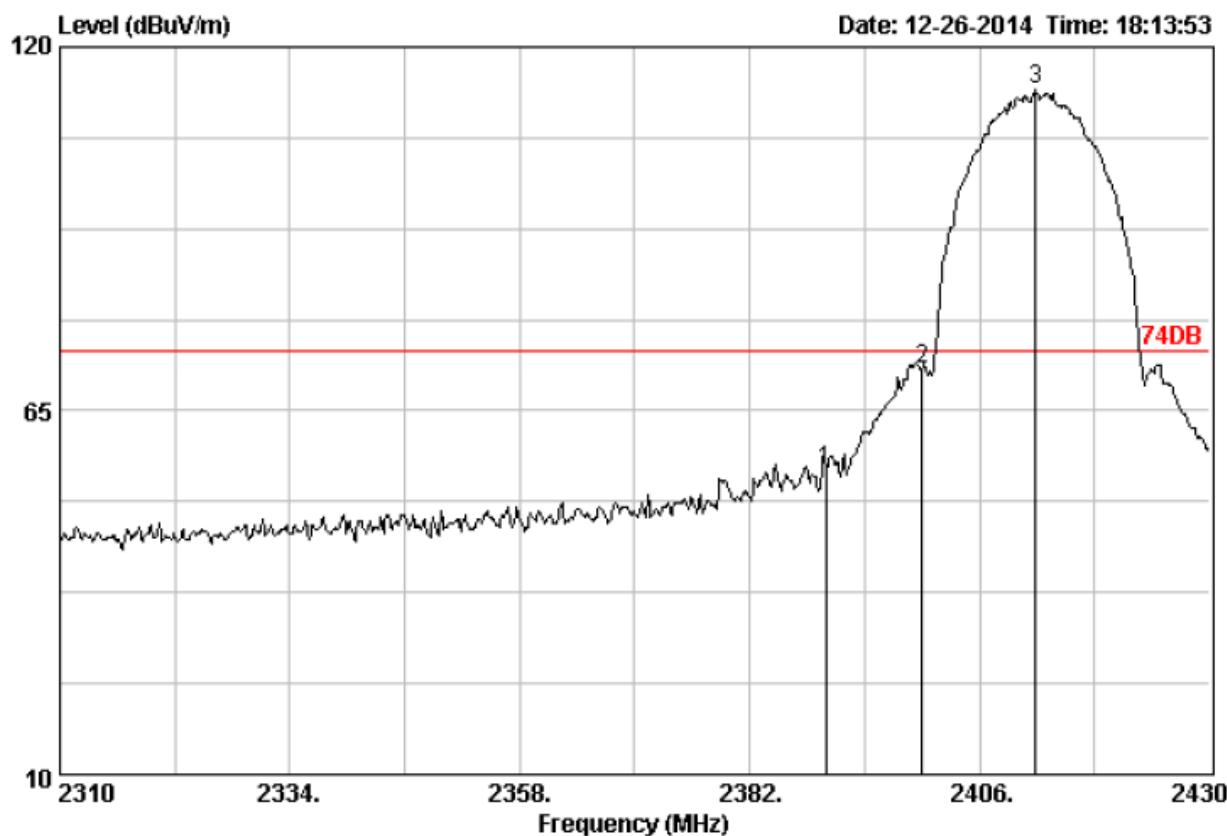
Transmitting mode: 802.11b



Site no. : 3m Chamber Data no. : 1396  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

		Ant.	Cable	Emission			
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark
(MHz)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.00	28.78	4.61	52.86	50.89	74.00	23.11 Peak
2	2400.00	28.78	4.61	69.33	67.36	74.00	6.64 Peak
3	2411.64	28.81	4.63	114.57	112.65	74.00	-38.65 Peak

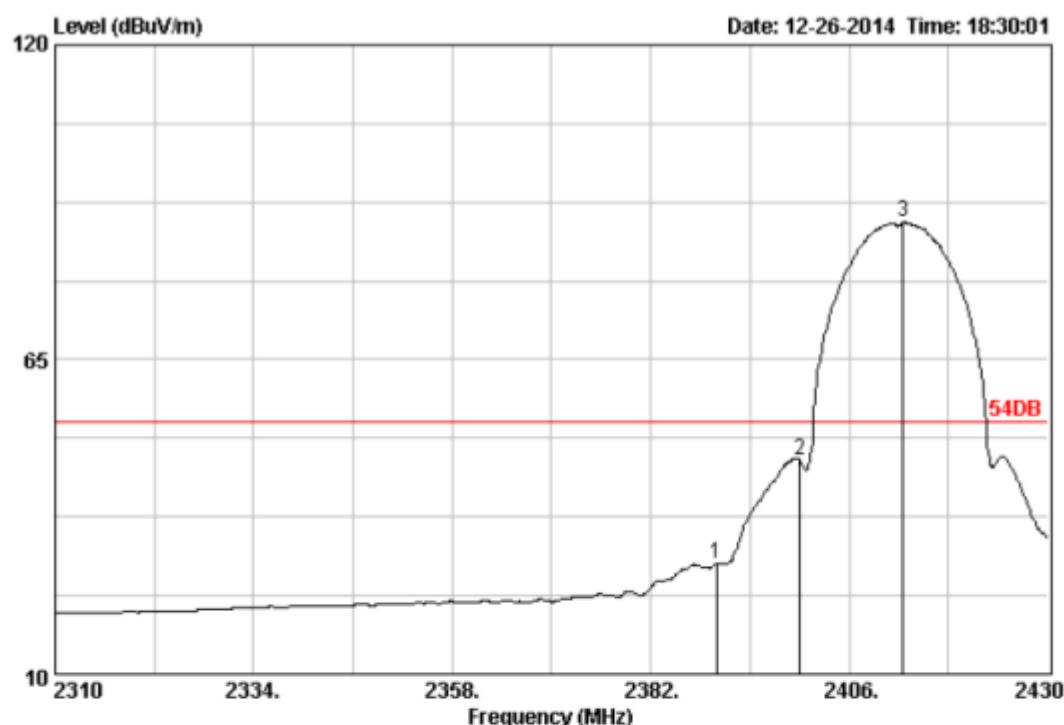
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1395  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor	Cable Loss (dB)	Reading (dBuV)	Emission			
				Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2390.00	28.78	4.61	58.02	56.05	74.00	17.95	Peak
2 2400.00	28.78	4.61	73.31	71.34	74.00	2.66	Peak
3 2411.88	28.81	4.63	115.38	113.46	74.00	-39.46	Peak

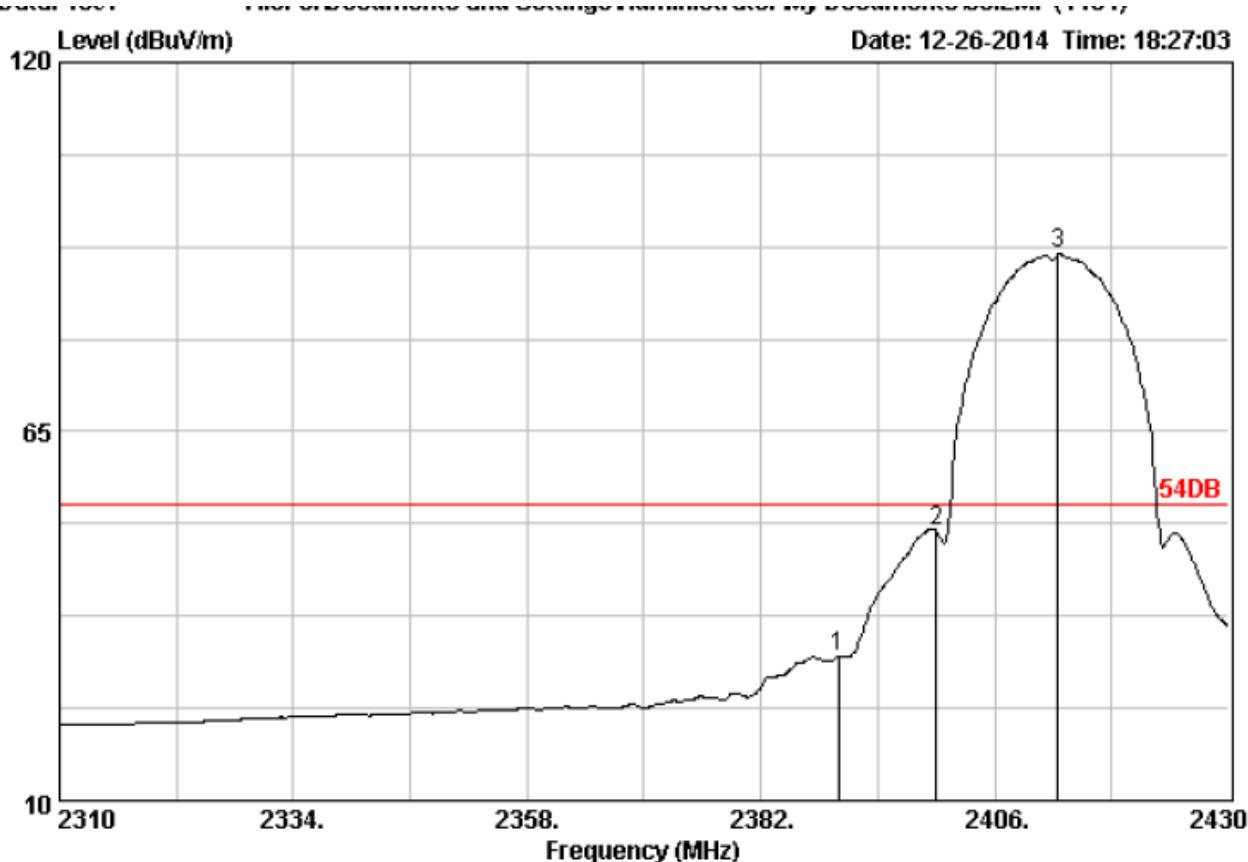
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1398  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2390.00	28.78	4.61	31.33	29.36	54.00	24.64	Average
2 2400.00	28.78	4.61	49.32	47.35	54.00	6.65	Average
3 2412.48	28.81	4.63	90.94	89.02	54.00	-35.02	Average

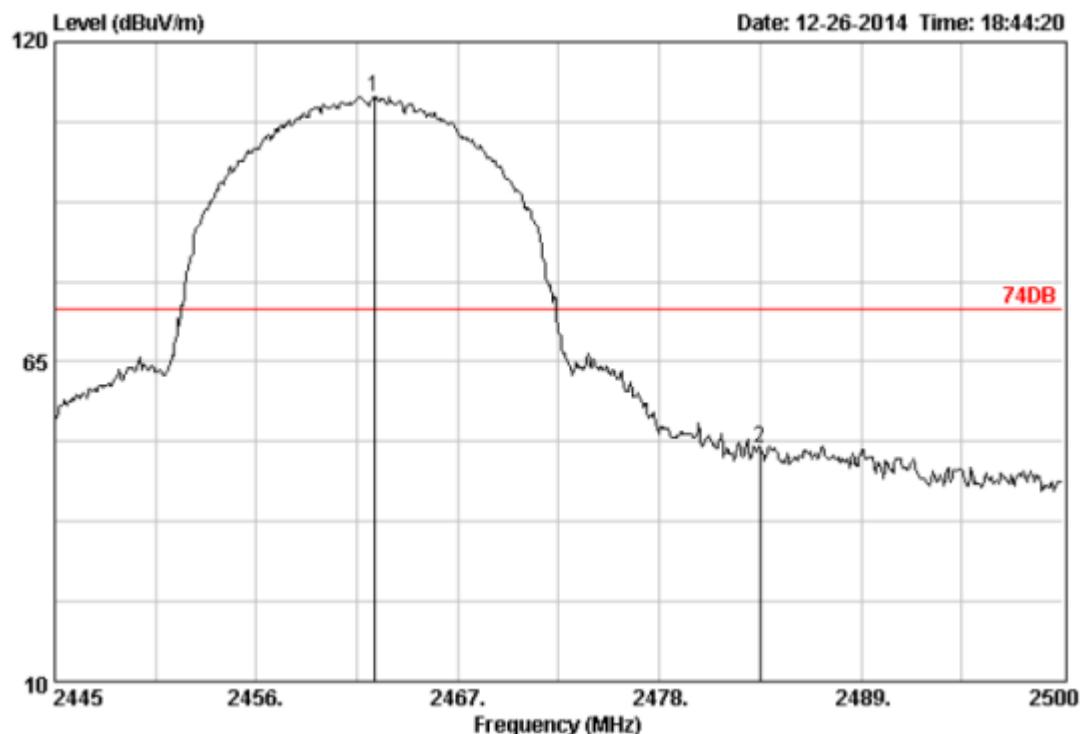
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1397  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2390.00	28.78	4.61	33.52	31.55	54.00	22.45	Average	
2 2400.00	28.78	4.61	52.07	50.10	54.00	3.90	Average	
3 2412.48	28.81	4.63	93.36	91.44	54.00	-37.44	Average	

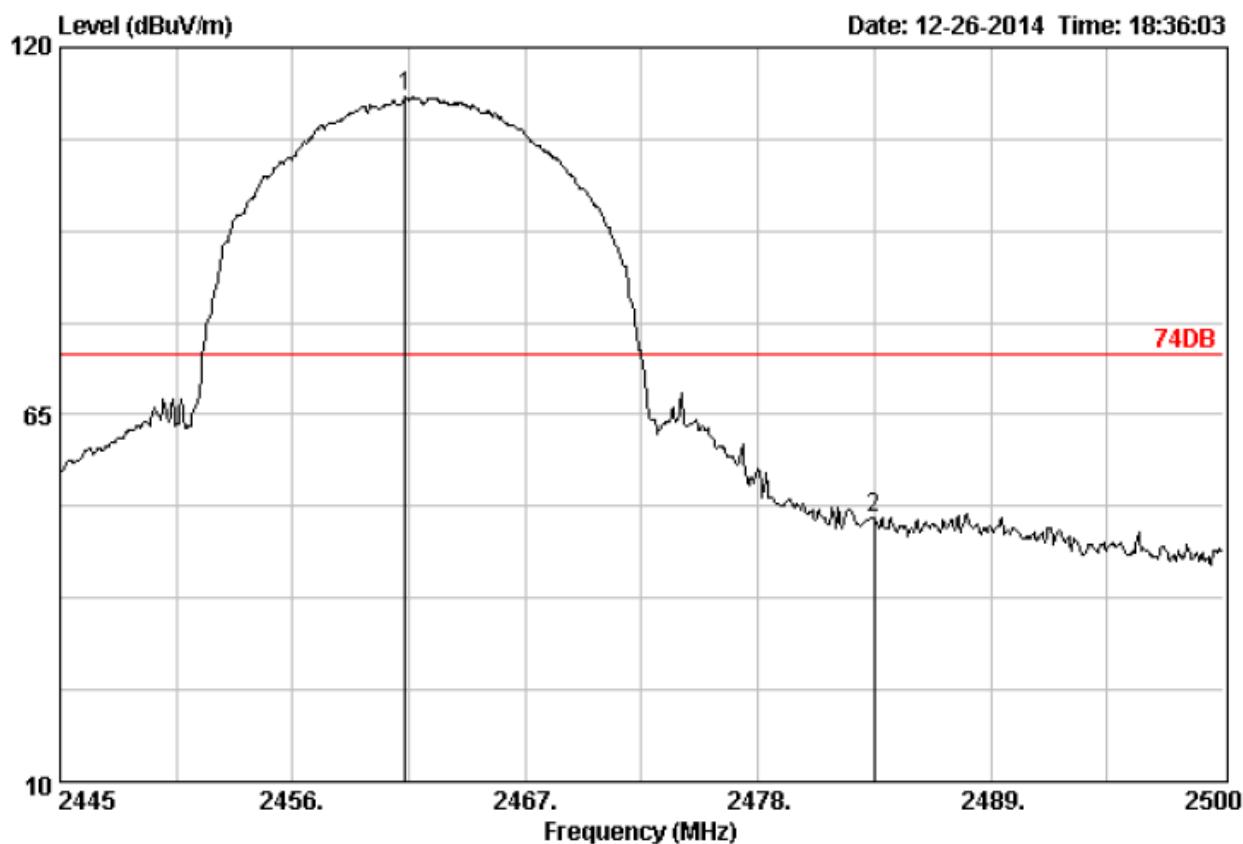
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1402  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2462.44	28.90	4.68	112.34	110.55	74.00	-36.55	Peak
2 2483.50	28.93	4.70	51.92	50.17	74.00	23.83	Peak

Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

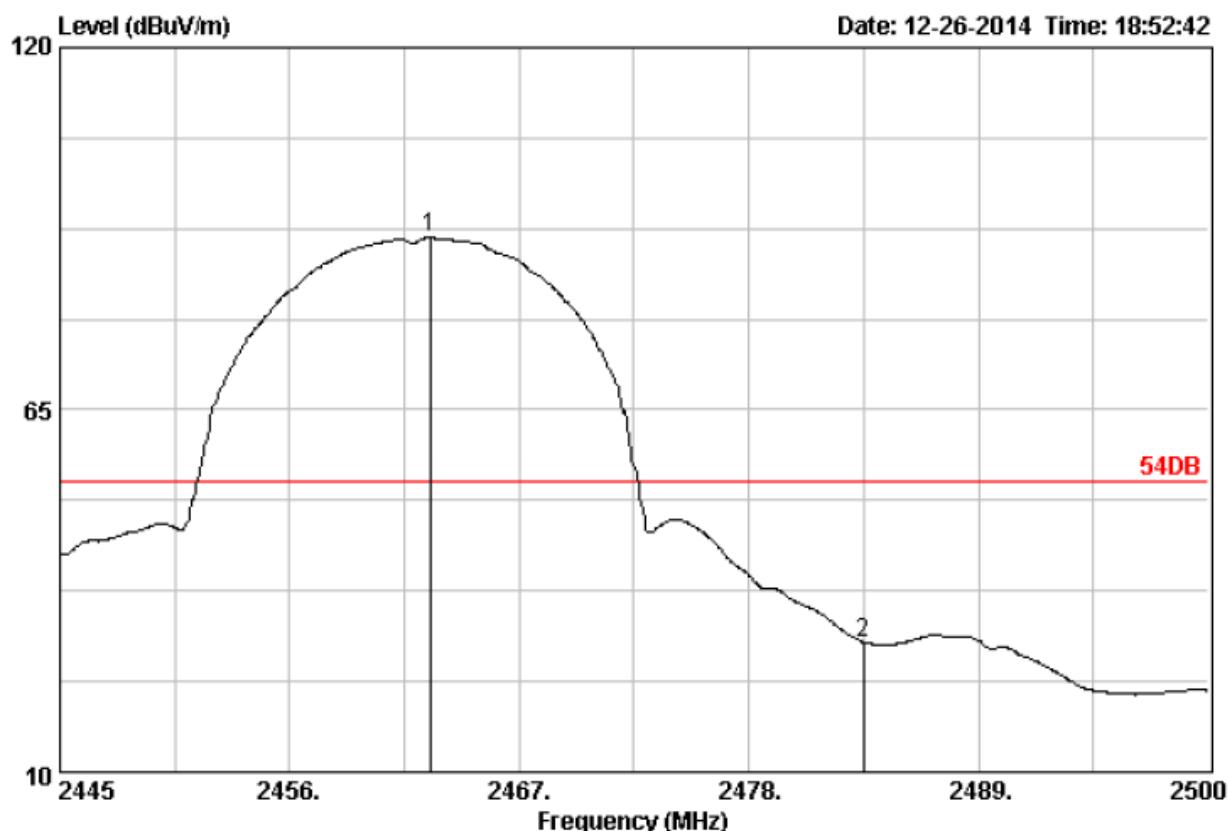


Site no. : 3m Chamber  
 Dis. / Ant. : 3m DRH-118  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Data no. : 1400  
 Ant. pol. : VERTICAL

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2461.34	28.90	4.68	114.34	112.55	74.00	-38.55	Peak	
2 2483.50	28.93	4.70	51.19	49.44	74.00	24.56	Peak	

Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

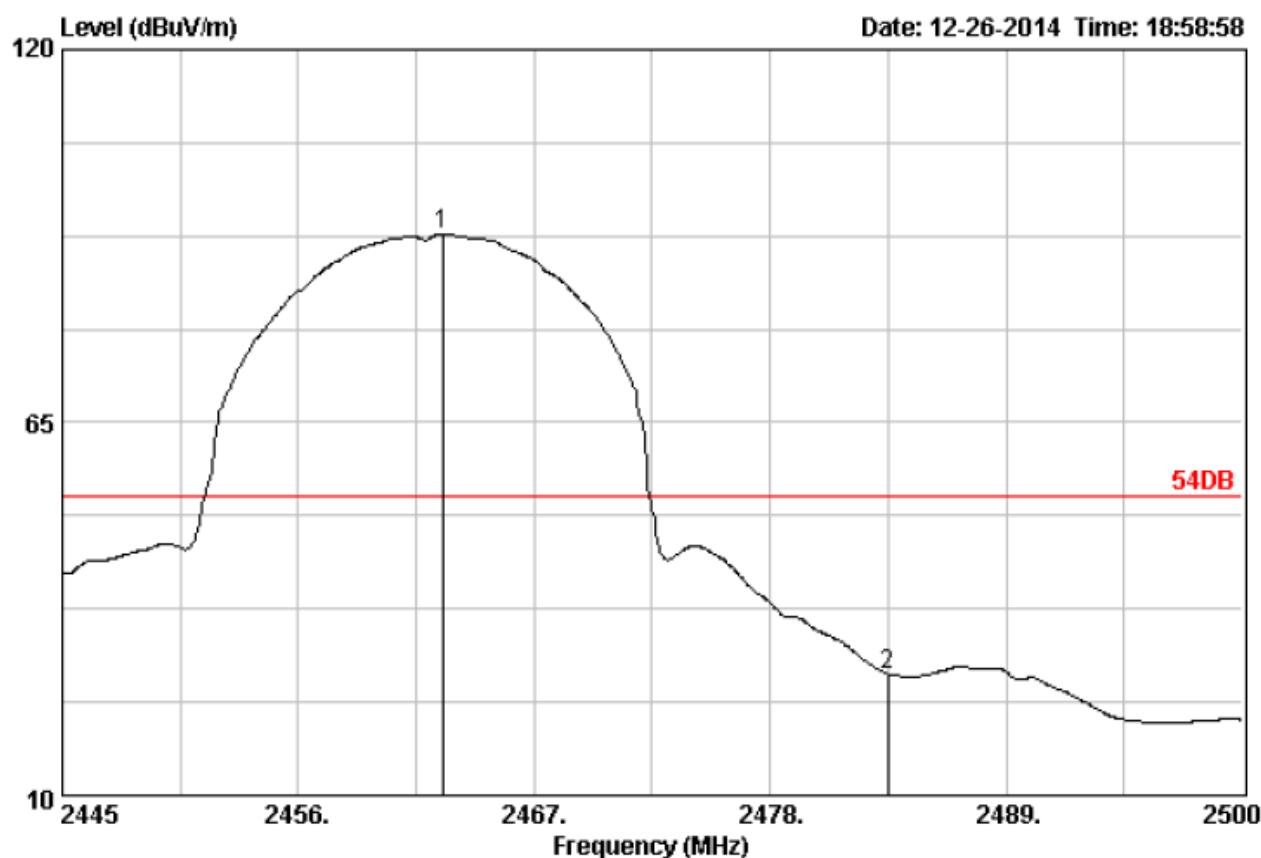


Site no. : 3m Chamber  
 Dis. / Ant. : 3m DRH-118  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Data no. : 1403  
 Ant. pol. : HORIZONTAL

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission			
				Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<hr/>							
1 2462.71	28.90	4.68	93.08	91.29	54.00	-37.29	Average
2 2483.50	28.93	4.70	31.47	29.72	54.00	24.28	Average

Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

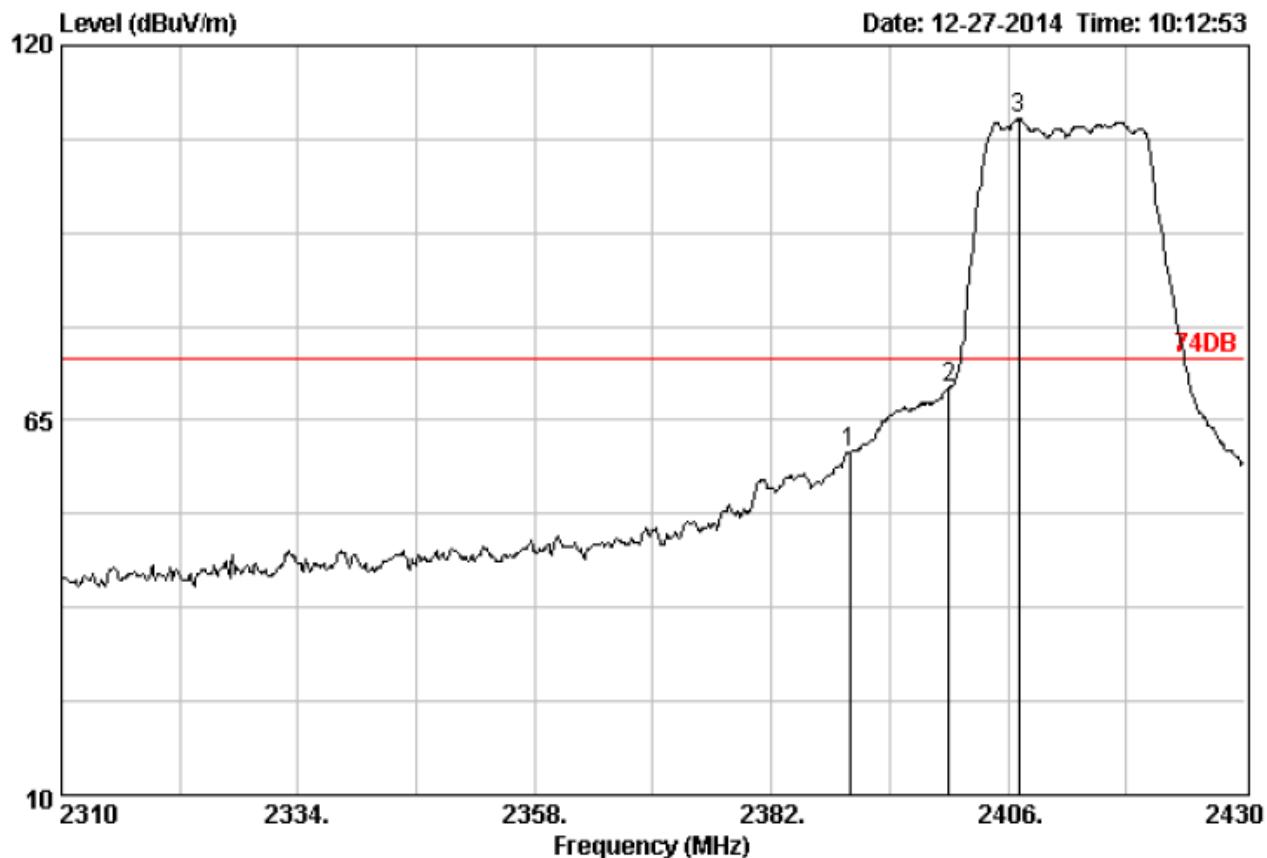


Site no. : 3m Chamber Data no. : 1404  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2462.71	28.90	4.68	94.66	92.87	54.00	-38.87	Average	
2 2483.50	28.93	4.70	29.67	27.92	54.00	26.08	Average	

Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

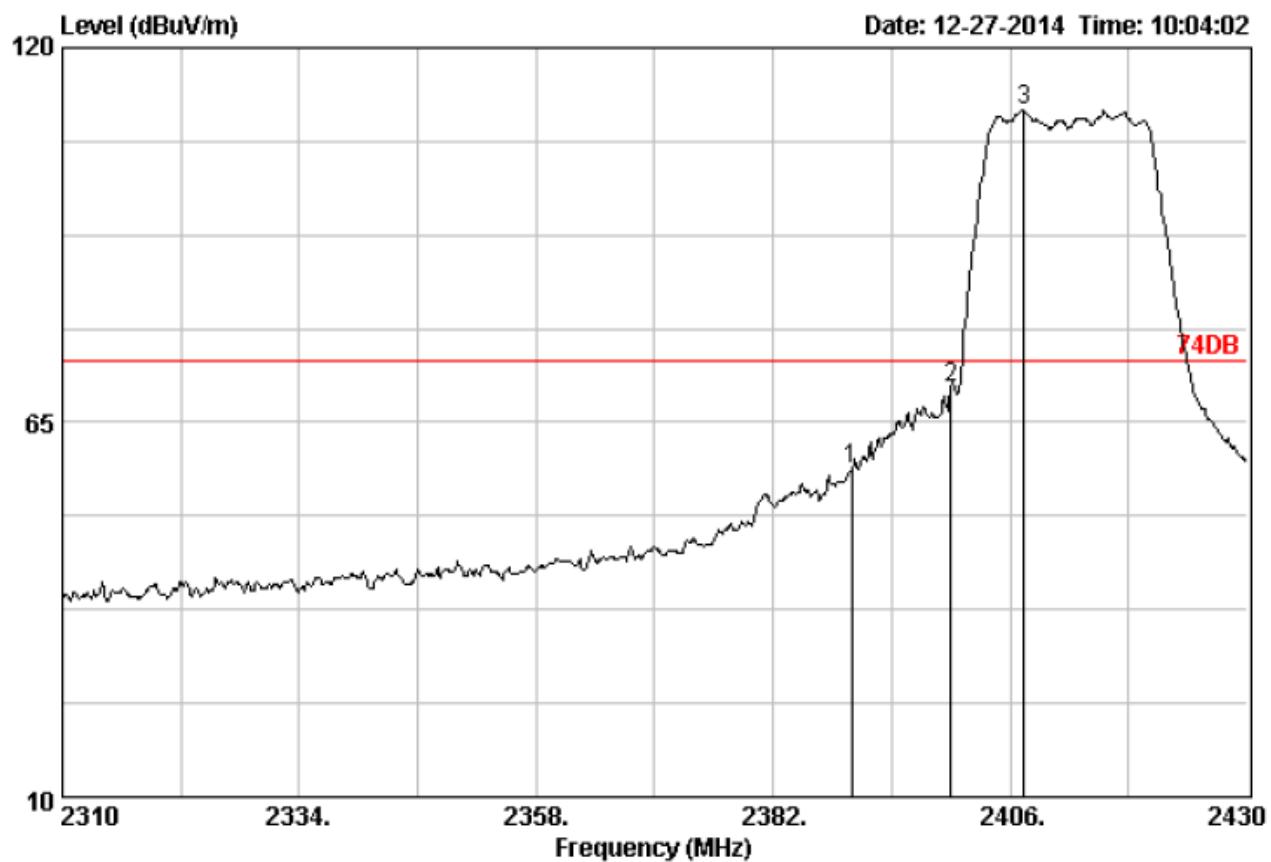
Note : For 802.11g Mode:



Site no. : 3m Chamber Data no. : 1407  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2390.00	28.78	4.61	62.27	60.30	74.00	13.70	Peak
2 2400.00	28.78	4.61	71.71	69.74	74.00	4.26	Peak
3 2407.08	28.81	4.63	111.24	109.32	74.00	-35.32	Peak

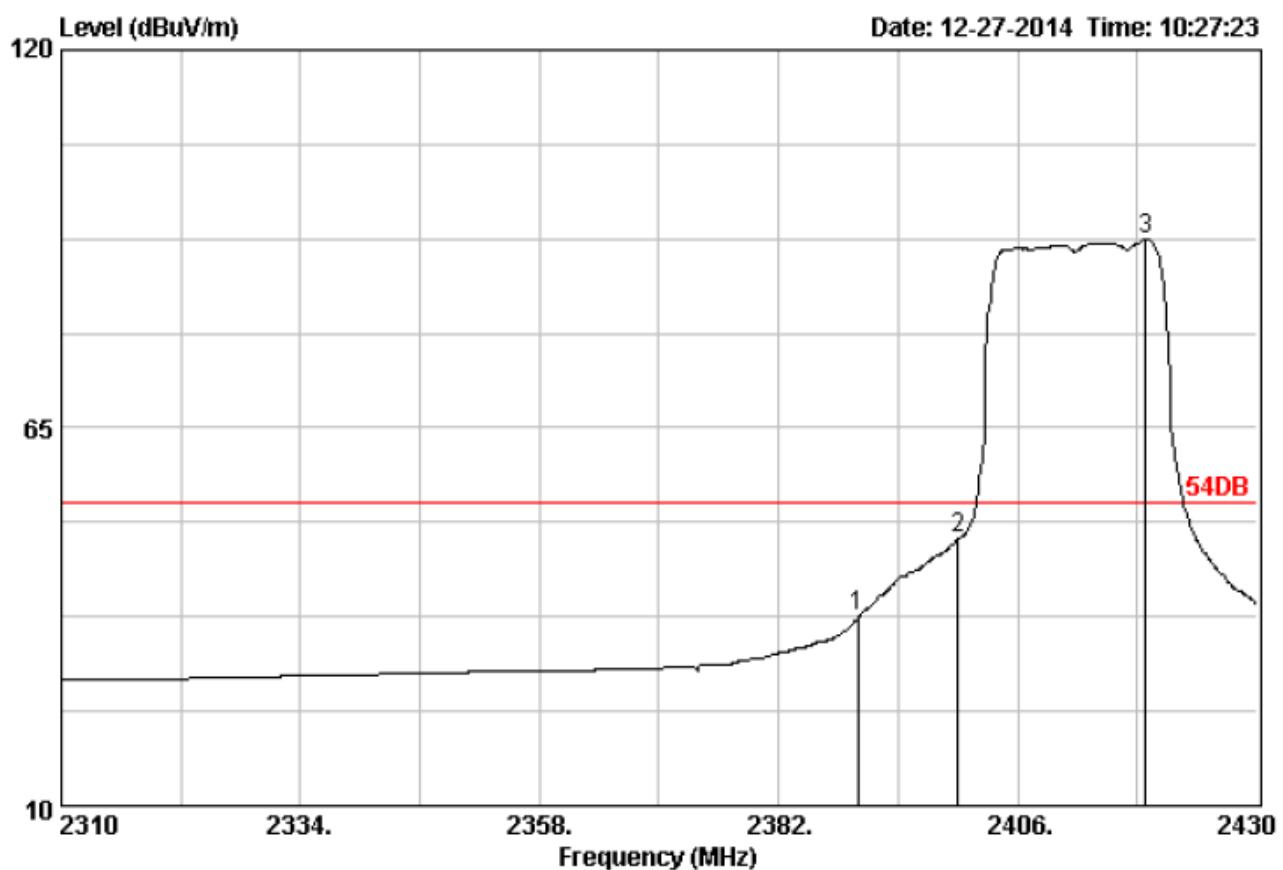
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1406  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 74DB  
 Env. / Ins. : 23\*C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2390.00	28.78	4.61	60.16	58.19	74.00	15.81	Peak	
2 2400.00	28.78	4.61	72.02	70.05	74.00	3.95	Peak	
3 2407.44	28.81	4.63	112.76	110.84	74.00	-36.84	Peak	

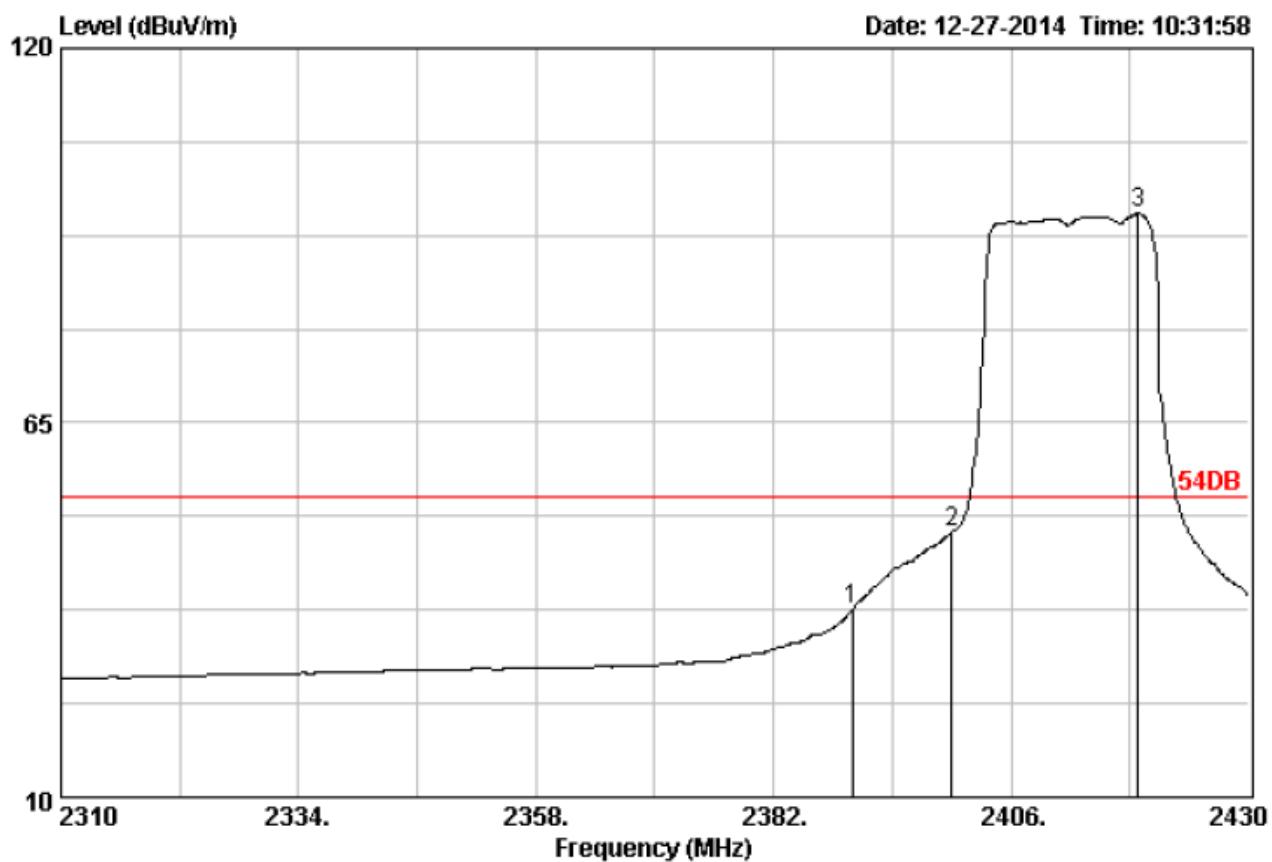
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1408  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission				Remark
				Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2390.00	28.78	4.61	39.40	37.43	54.00	16.57	Average	
2 2400.00	28.78	4.61	50.76	48.79	54.00	5.21	Average	
3 2418.84	28.81	4.63	94.46	92.54	54.00	-38.54	Average	

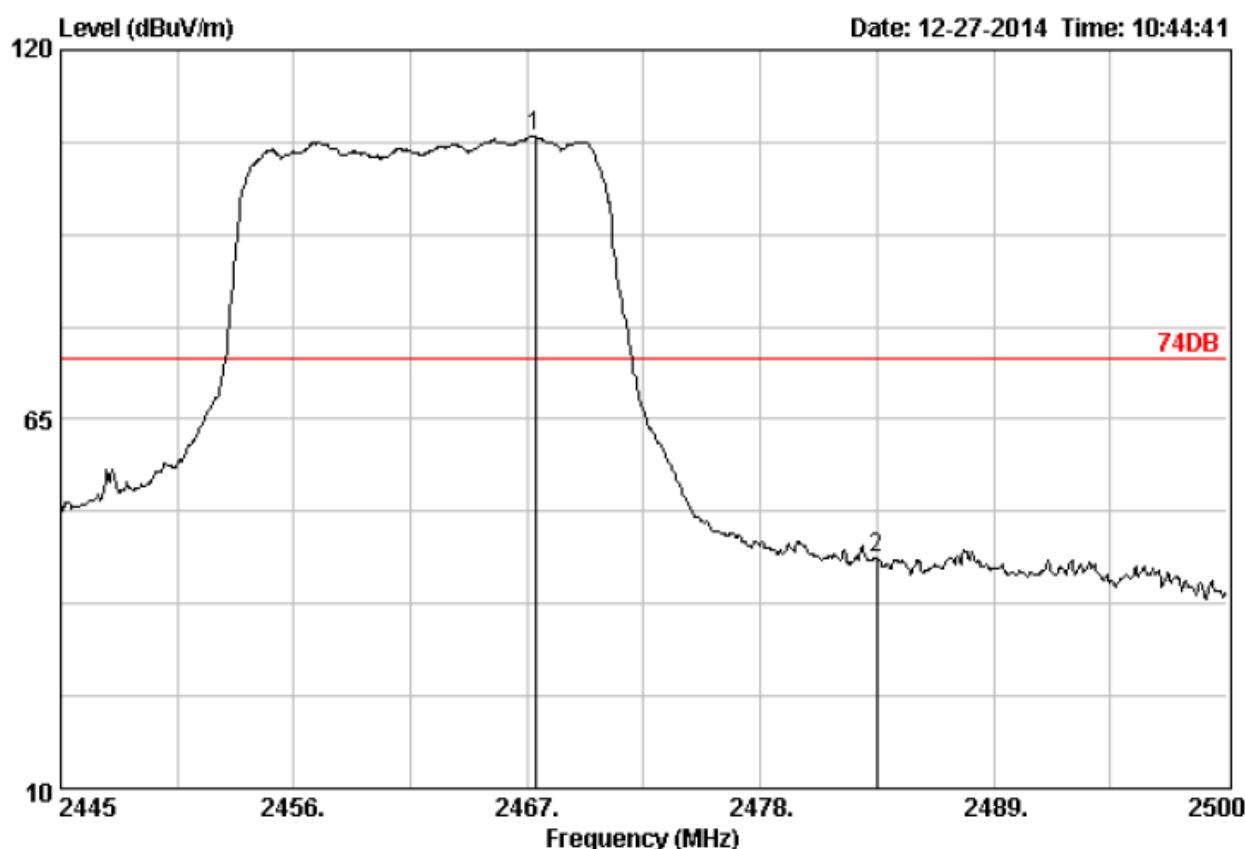
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1409  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2390.00	28.78	4.61	39.66	37.69	54.00	16.31	Average
2 2400.00	28.78	4.61	50.95	48.98	54.00	5.02	Average
3 2418.84	28.81	4.63	97.79	95.87	54.00	-41.87	Average

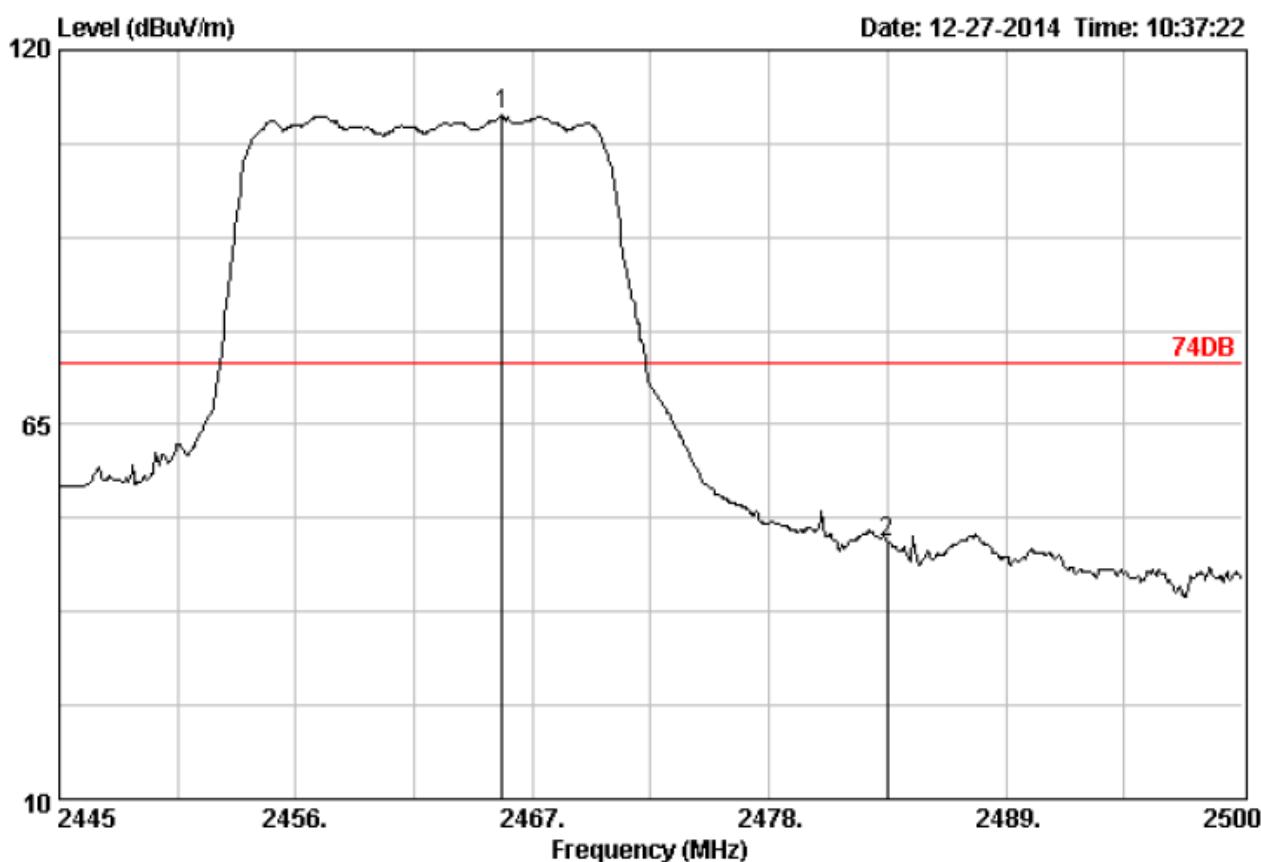
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1411  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

	Ant.	Cable	Emission				
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark
(MHz)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	2467.39	28.90	4.68	109.02	107.23	74.00	-33.23 Peak
2	2483.50	28.93	4.70	45.97	44.22	74.00	29.78 Peak

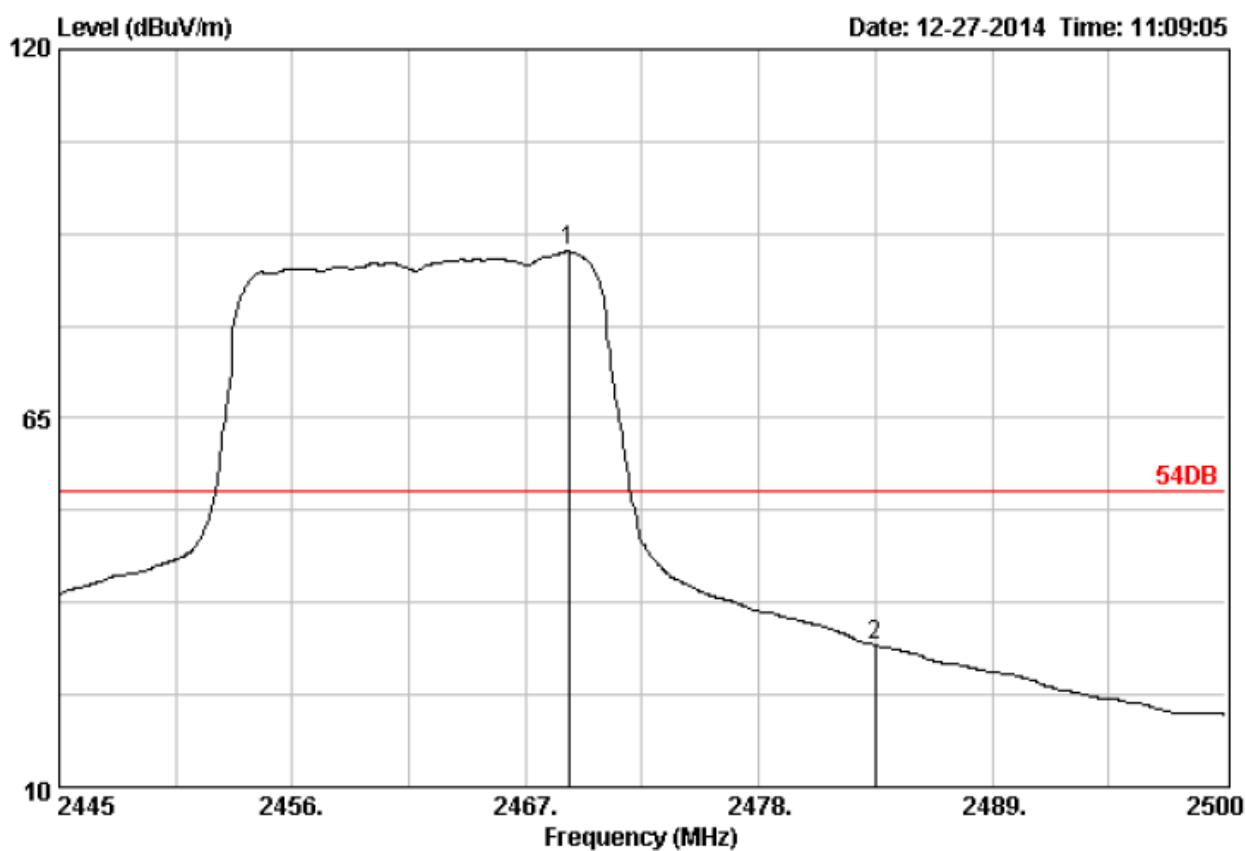
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1410  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 74DB  
 Env. / Ins. : 23\*C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2465.57	28.90	4.68	112.20	110.41	74.00	-36.41	Peak	
2 2483.50	28.93	4.70	49.49	47.74	74.00	26.26	Peak	

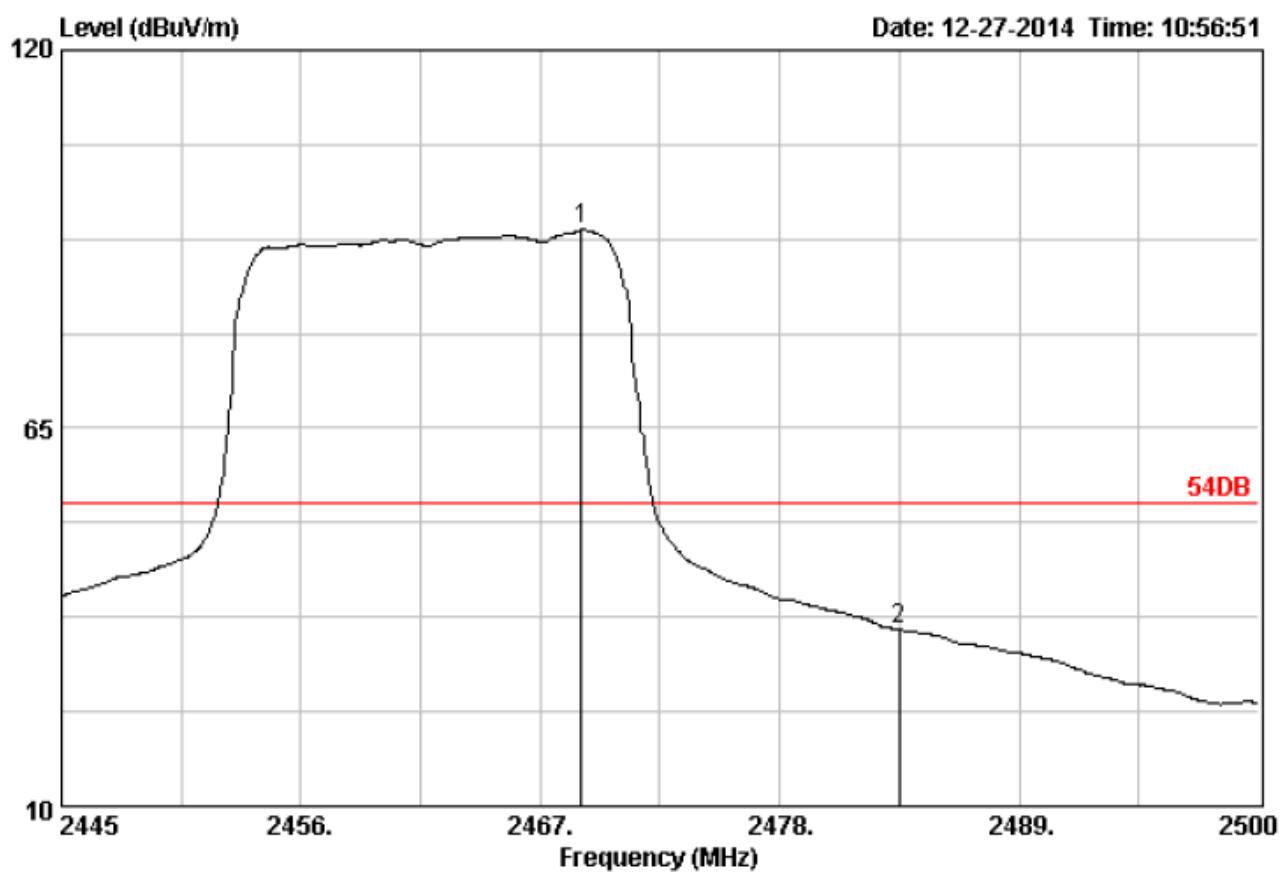
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



Site no. : 3m Chamber Data no. : 1414  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<hr/>							
1 2469.04	28.90	4.68	91.65	89.86	54.00	-35.86	Average
2 2483.50	28.93	4.70	32.87	31.12	54.00	22.88	Average

Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.



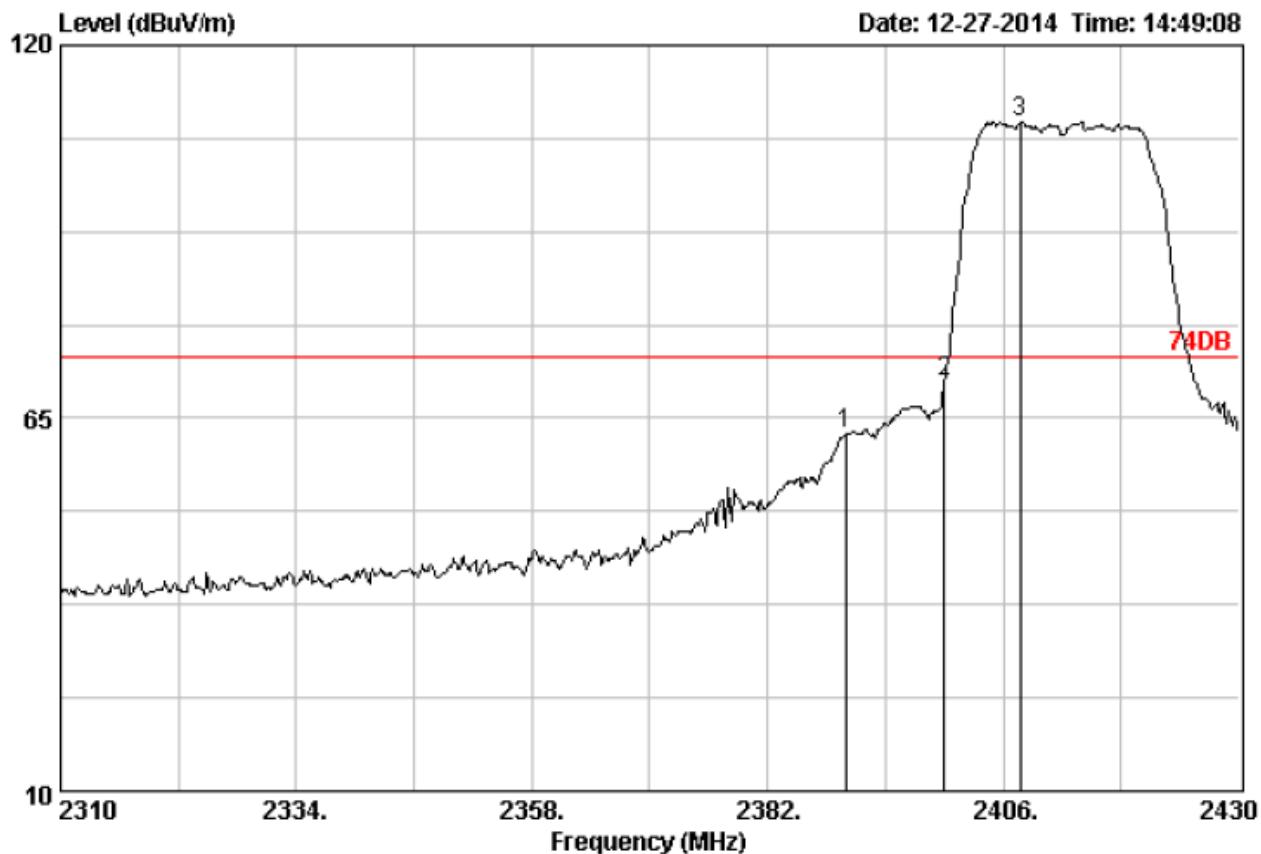
Site no. : 3m Chamber  
 Dis. / Ant. : 3m DRH-118  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Data no. : 1412  
 Ant. pol. : VERTICAL

		Ant.	Cable	Emission				
Freq.	Factor	Loss	Reading	Level		Limits	Margin	Remark
(MHz)	(dB)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	2468.87	28.90	4.68	95.66	93.87	54.00	-39.87	Average
2	2483.50	28.93	4.70	37.42	35.67	54.00	18.33	Average

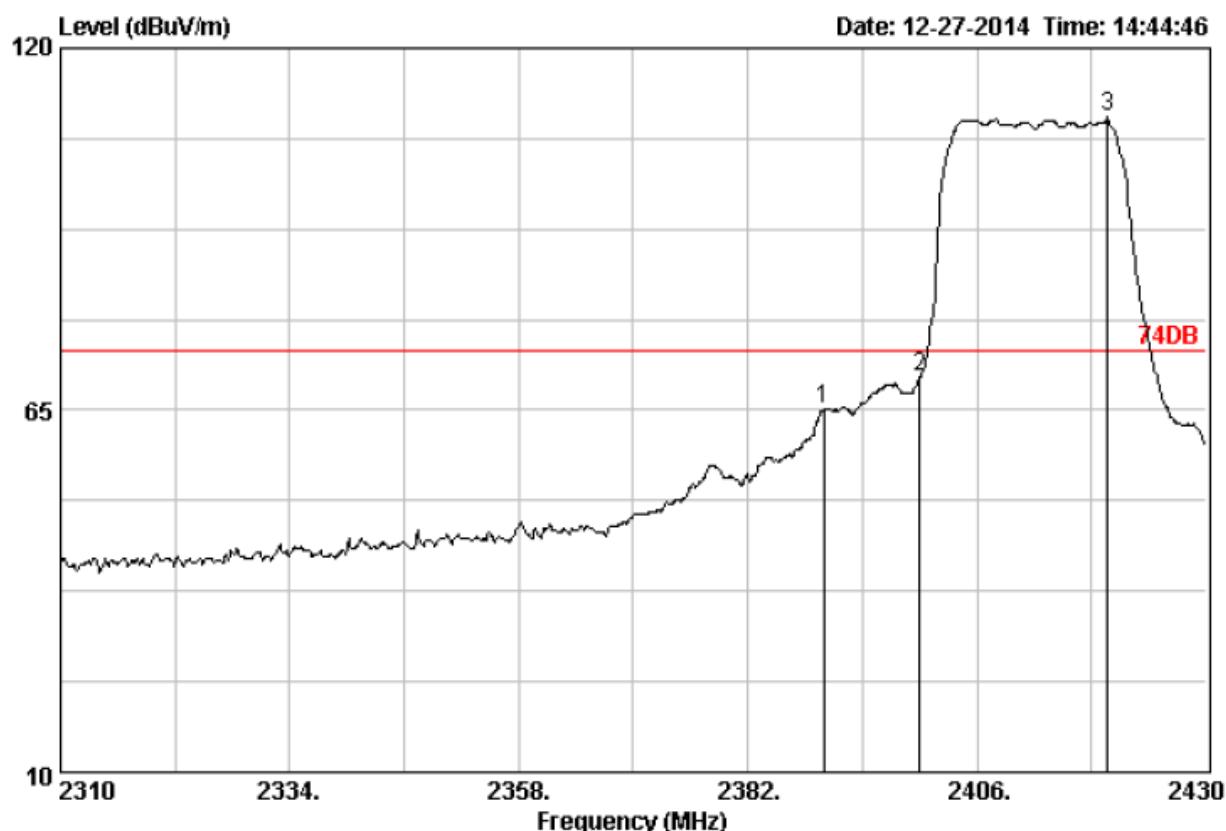
Remark : SISO mode ANT 1, ANT2 keeping TX mode all have been tested, only report worse case ANT1 mode.

Note : For 802.11n (20MHz, KEEPING MIMO TX MODE) Mode:



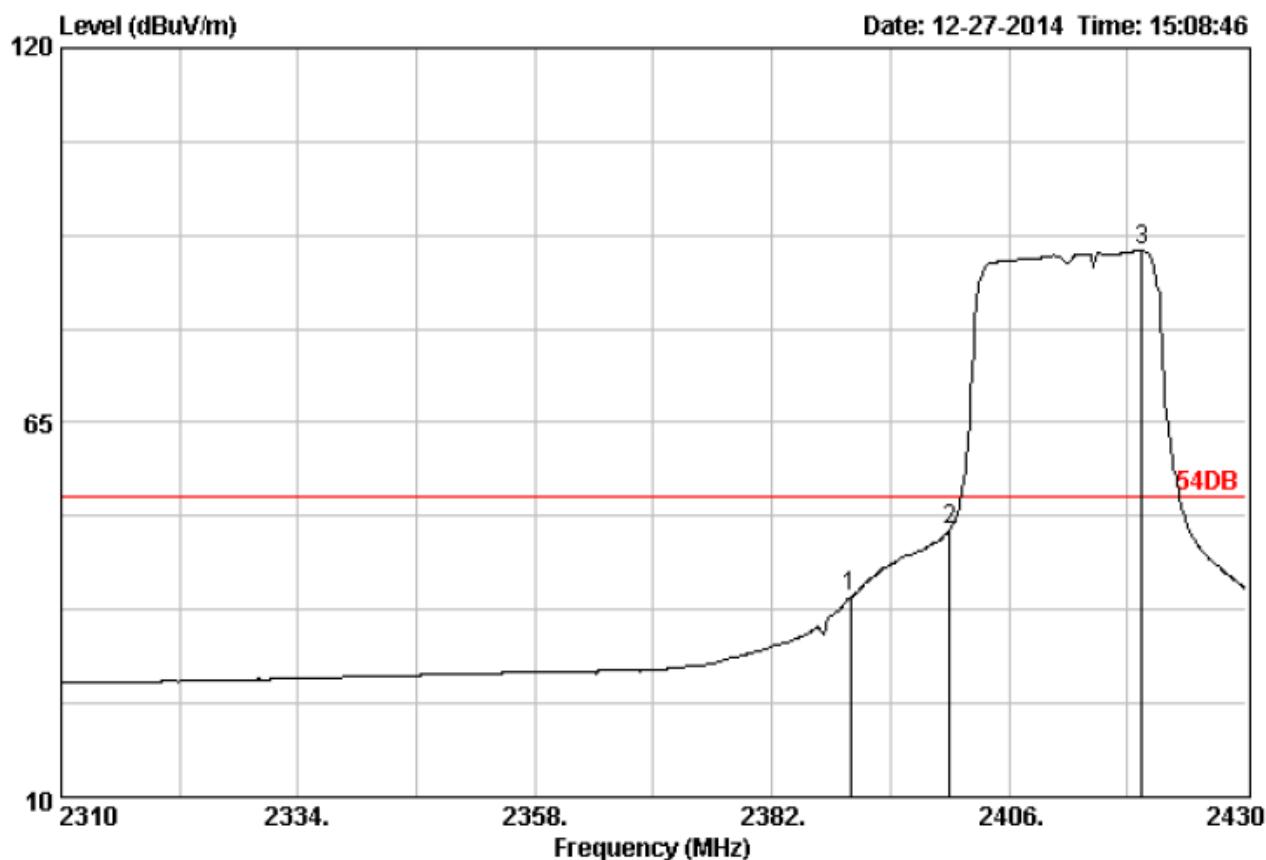
Site no. : 3m Chamber Data no. : 1417  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2390.00	28.78	4.61	64.60	62.63	74.00	11.37	Peak	
2 2400.00	28.78	4.61	72.26	70.29	74.00	3.71	Peak	
3 2407.68	28.81	4.63	110.61	108.69	74.00	-34.69	Peak	



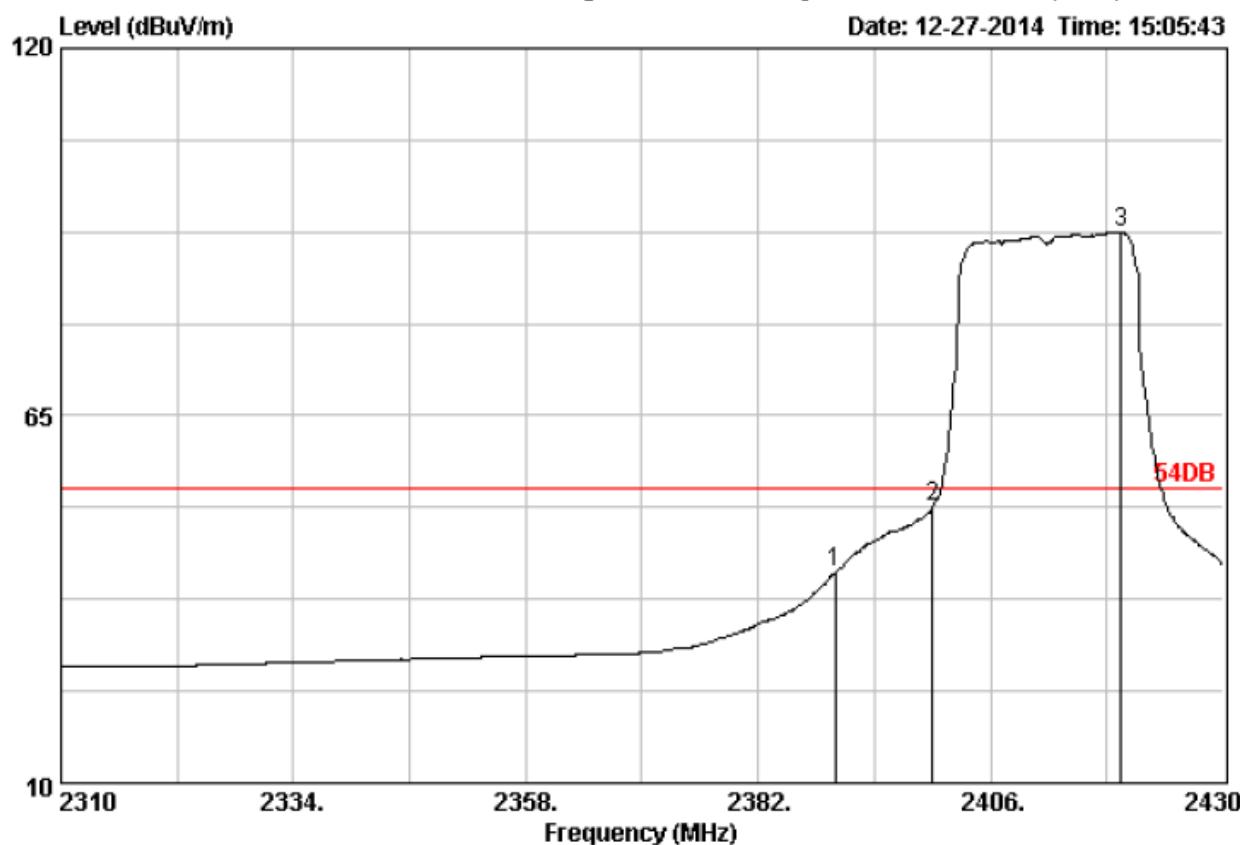
Site no. : 3m Chamber Data no. : 1416  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2390.00	28.78	4.61	67.05	65.08	74.00	8.92	Peak
2 2400.00	28.78	4.61	72.02	70.05	74.00	3.95	Peak
3 2419.68	28.84	4.64	111.48	109.60	74.00	-35.60	Peak



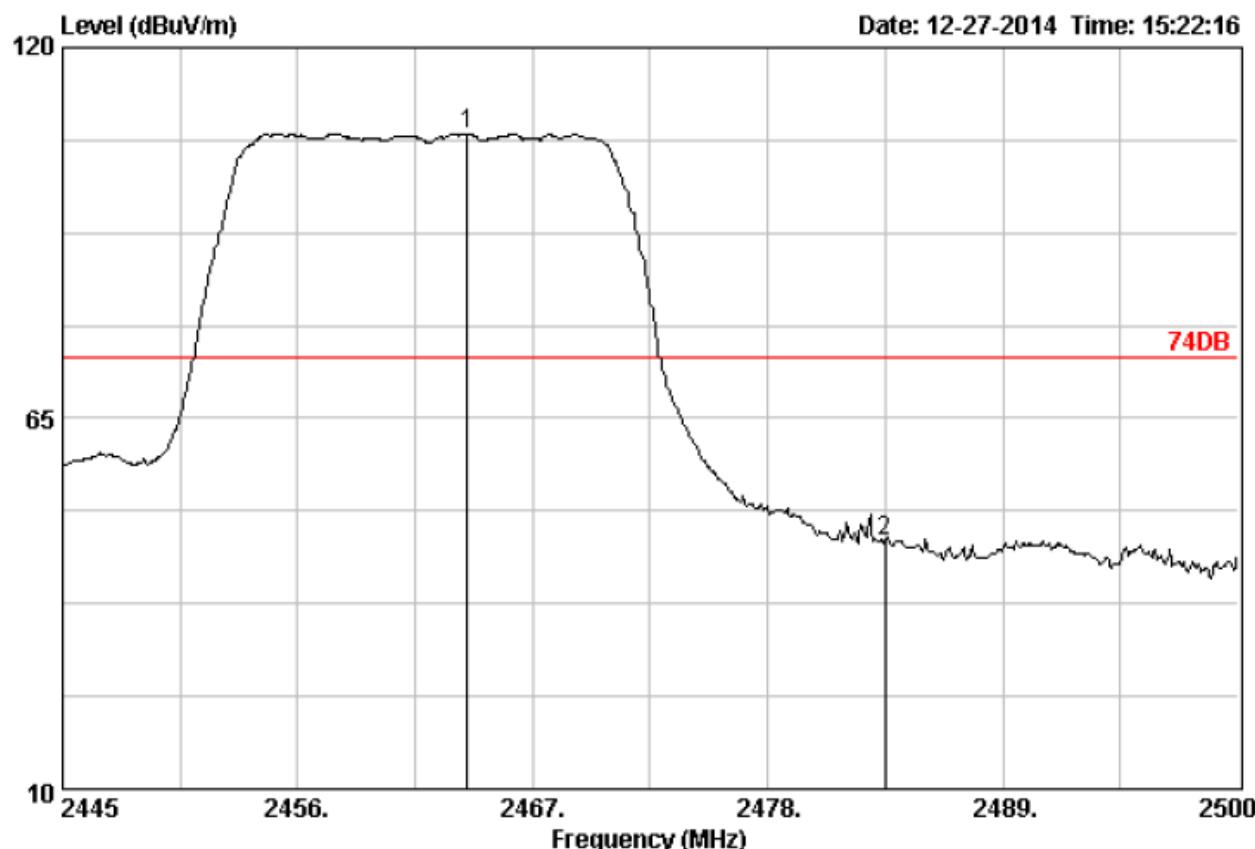
Site no. : 3m Chamber Data no. : 1420  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<hr/>							
1 2390.00	28.78	4.61	41.30	39.33	54.00	14.67	Average
2 2400.00	28.78	4.61	51.30	49.33	54.00	4.67	Average
3 2419.44	28.81	4.63	92.21	90.29	54.00	-36.29	Average



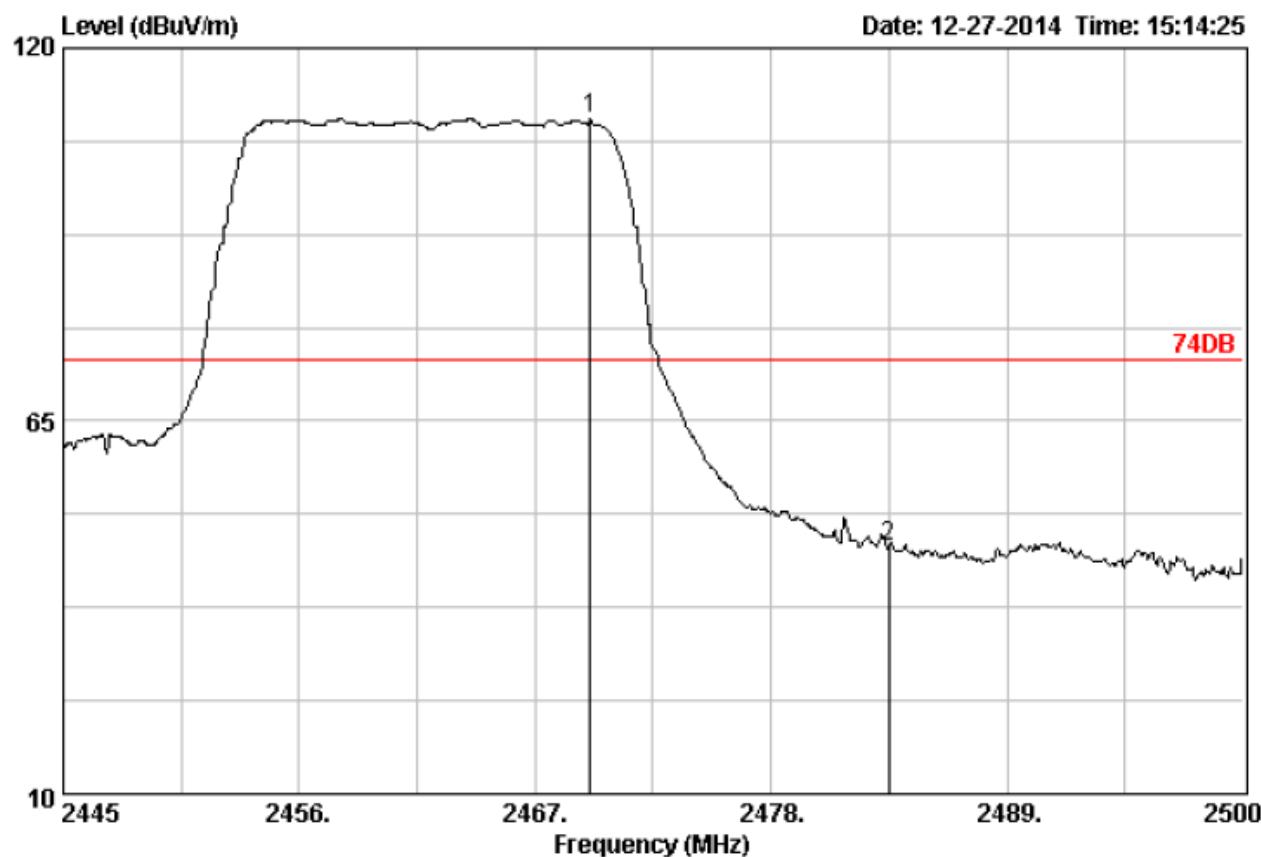
Site no. : 3m Chamber Data no. : 1419  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<hr/>							
1 2390.00	28.78	4.61	43.63	41.66	54.00	12.34	Average
2 2400.00	28.78	4.61	53.27	51.30	54.00	2.70	Average
3 2419.44	28.81	4.63	94.43	92.51	54.00	-38.51	Average



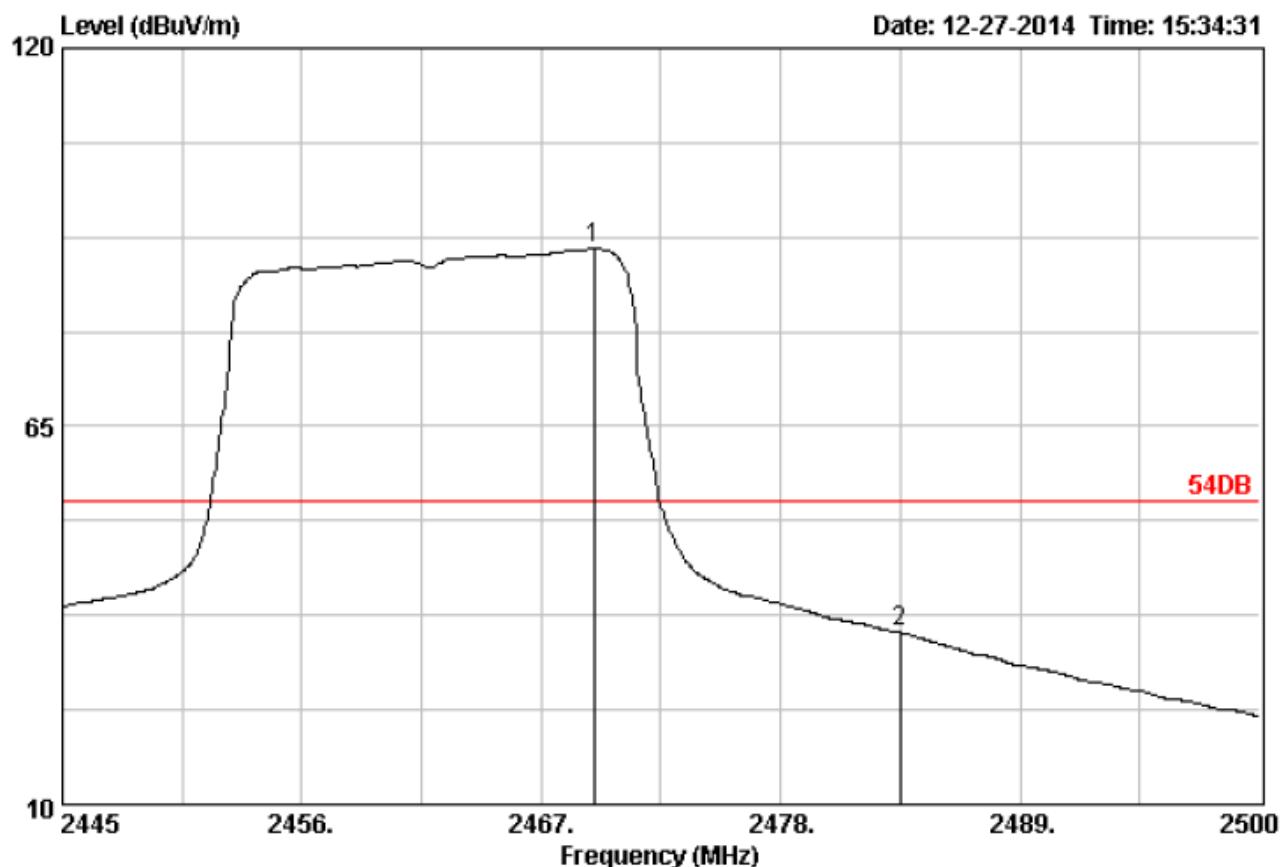
Site no. : 3m Chamber Data no. : 1422  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Factor (dB)	Cable Loss (dB)	Emission		Margin (dB)	Remark
			Reading (dBuV)	Level (dBuV/m)		
1 2463.92	28.90	4.68	109.04	107.25	74.00	-33.25 Peak
2 2483.50	28.93	4.70	48.54	46.79	74.00	27.21 Peak



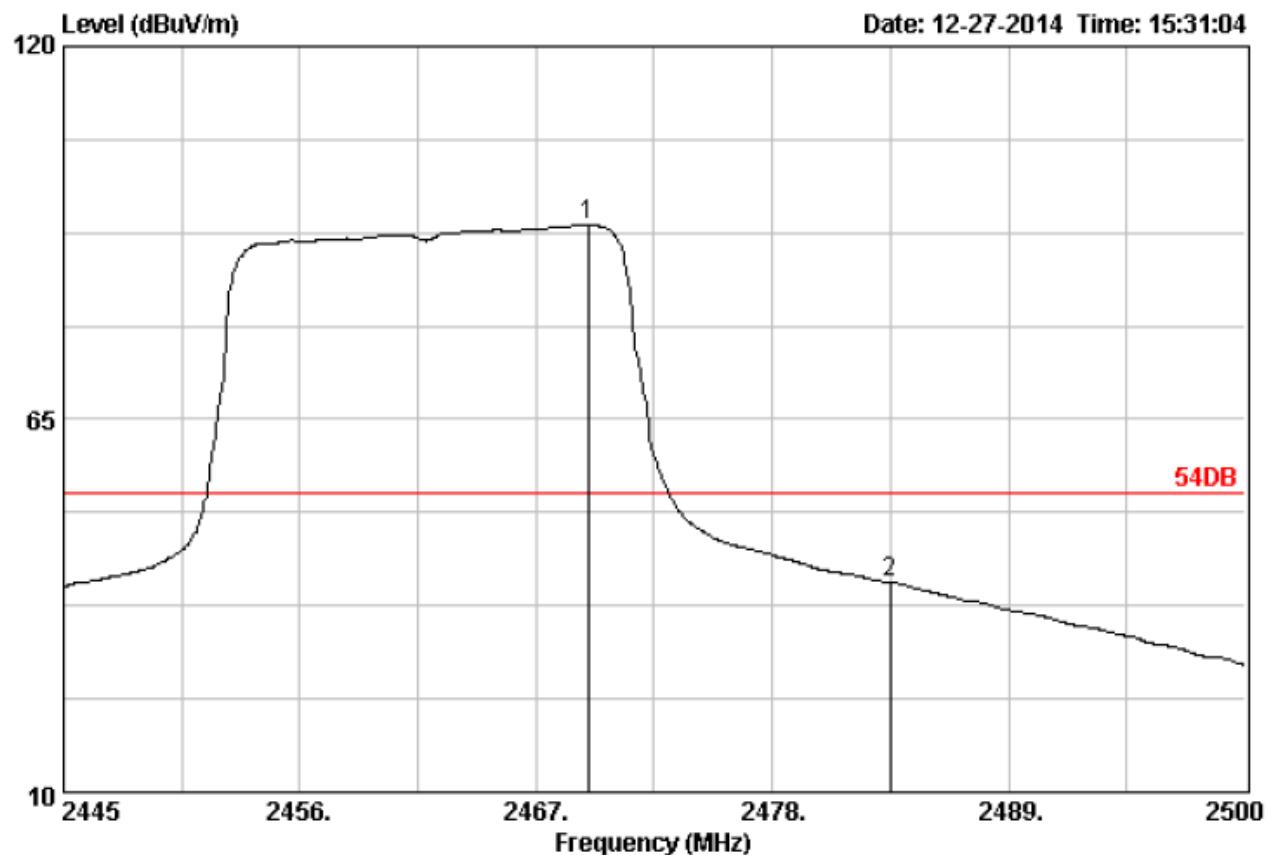
Site no. : 3m Chamber Data no. : 1421  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 74DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
<hr/>							
1 2469.59	28.90	4.68	111.46	109.67	74.00	-35.67	Peak
2 2483.50	28.93	4.70	48.08	46.33	74.00	27.67	Peak



Site no. : 3m Chamber Data no. : 1424  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : HORIZONTAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission				
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1 2469.42	28.90	4.68	92.65	90.86	54.00	-36.86	Average
2 2483.50	28.93	4.70	36.74	34.99	54.00	19.01	Average

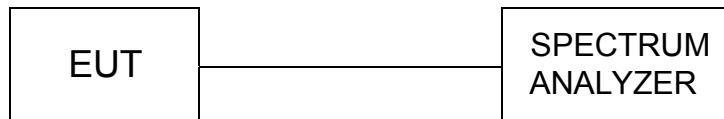


Site no. : 3m Chamber Data no. : 1423  
 Dis. / Ant. : 3m DRH-118 Ant. pol. : VERTICAL  
 Limit : 54DB  
 Env. / Ins. : 23°C/54%  
 Engineer :  
 EUT :  
 Power :  
 M/N :  
 Test Mode :

Freq. (MHz)	Ant. Factor (dB)	Cable Loss (dB)	Emission					Remark
			Reading (dBuV)	Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)		
1 2469.42	28.90	4.68	95.52	93.73	54.00	-39.73	Average	
2 2483.50	28.93	4.70	42.69	40.94	54.00	13.06	Average	

## 4.6. Power Spectral Density Measurement

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was tested according to KDB558074 D01 v03r02 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, VBW $\geq$ 10KHz, SPAN to 1.5 times greater than the EBW,.

### LIMIT

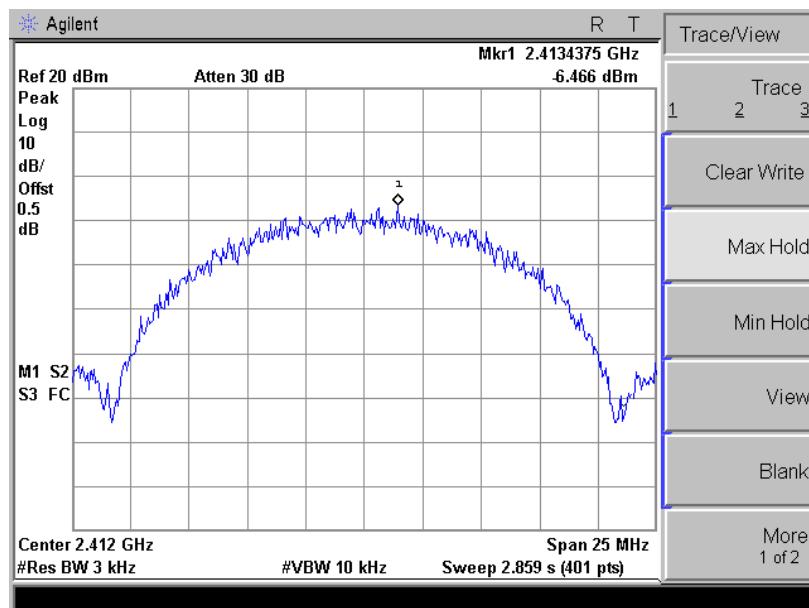
For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### TEST RESULTS

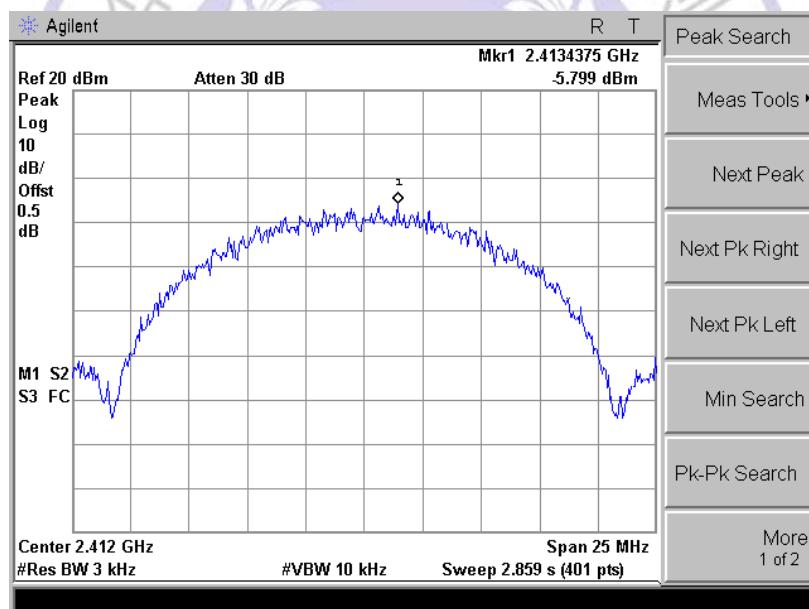
Channel	Channel Frequency (MHz)	PSD (dBm/3KHz)			Maximum limit (dBm/3KHz)	PASS / FAIL
		Ant1	Ant 2	Total		
1	2412	-6.466	-5.799	N/A	8	PASS
6	2437	-7.131	-6.029	N/A	8	PASS
11	2462	-7.380	-7.125	N/A	8	PASS
1	2412	-12.51	-12.49	N/A	8	PASS
6	2437	-12.95	-13.04	N/A	8	PASS
11	2462	-13.46	-12.83	N/A	8	PASS
1	2412	-14.24	-12.23	-10.11	8	PASS
6	2437	-14.77	-13.99	-11.35	8	PASS
11	2462	-16.57	-13.56	-11.80	8	PASS

For 802.11b Mode:

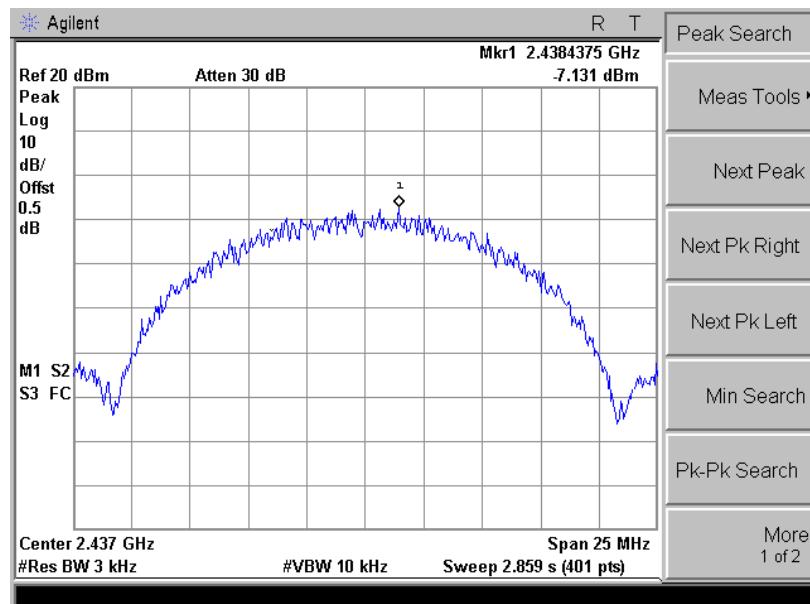
CH1 @ANT 1



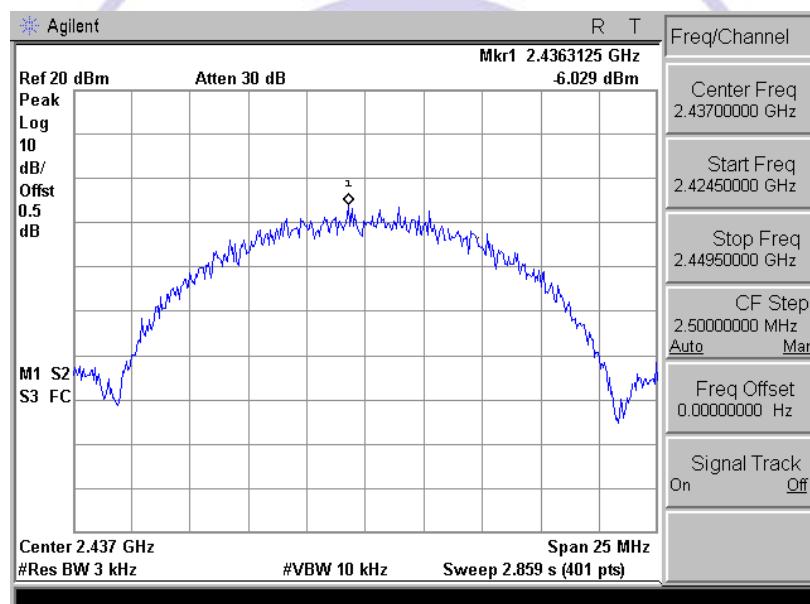
CH1 @ANT 2



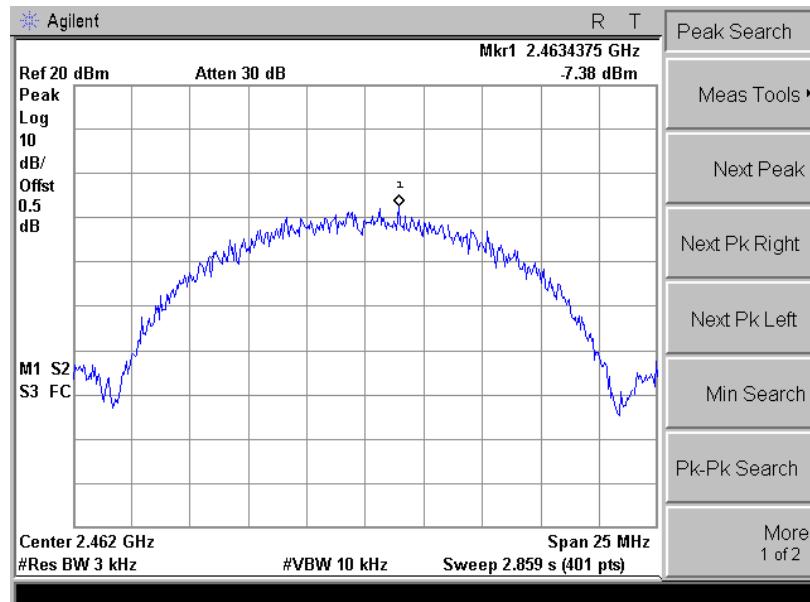
## CH6 @ANT 1



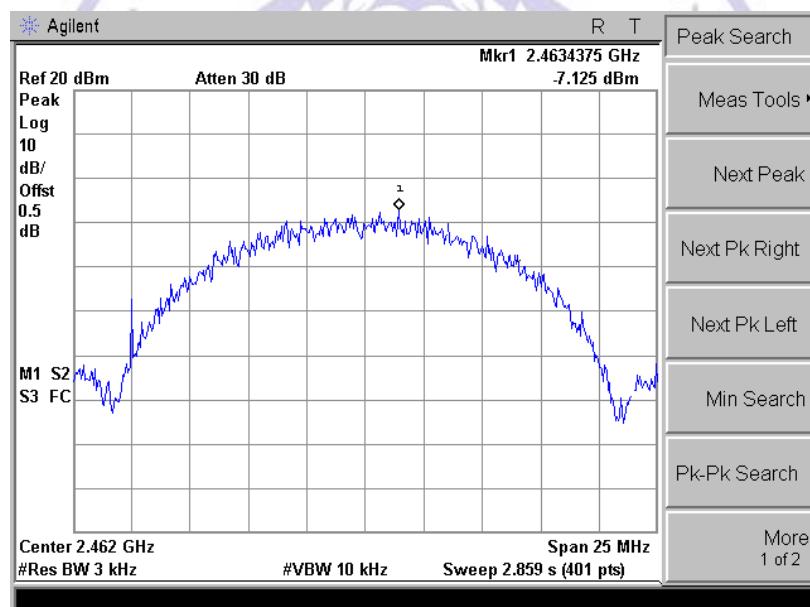
## CH6 @ANT 2



## CH11 @ANT 1

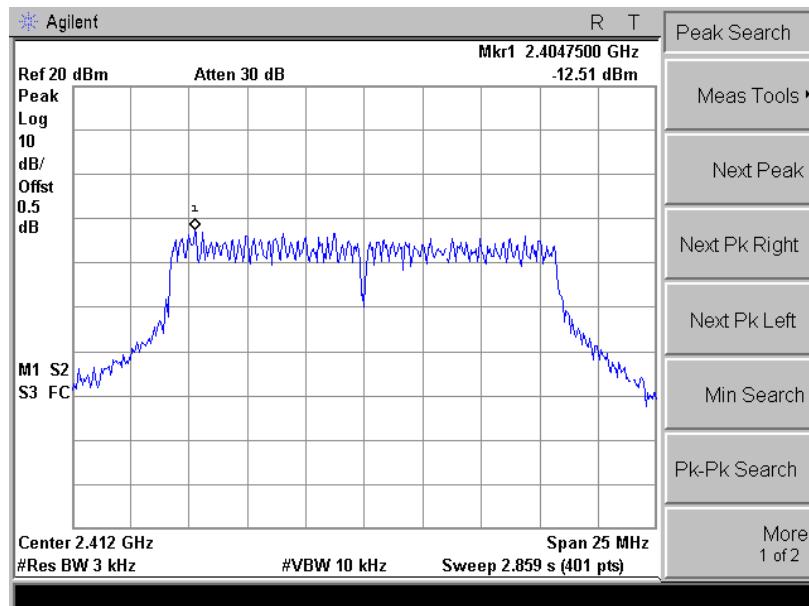


## CH11 @ANT 2

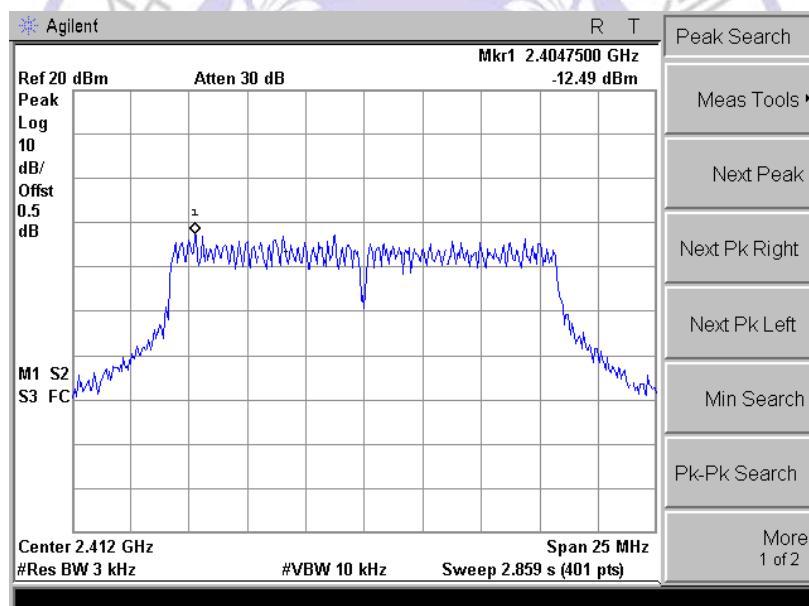


For 802.11g Mode:

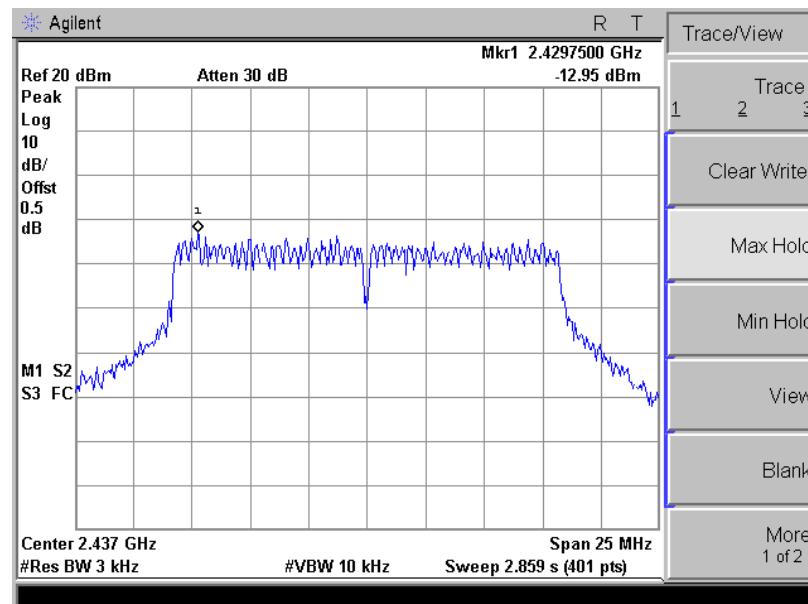
**CH1 @ANT 1**



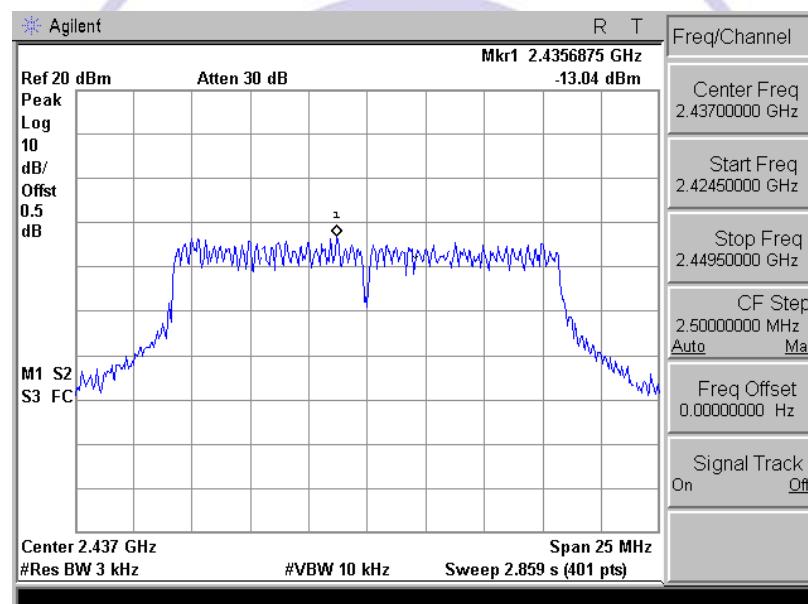
**CH1 @ANT 2**



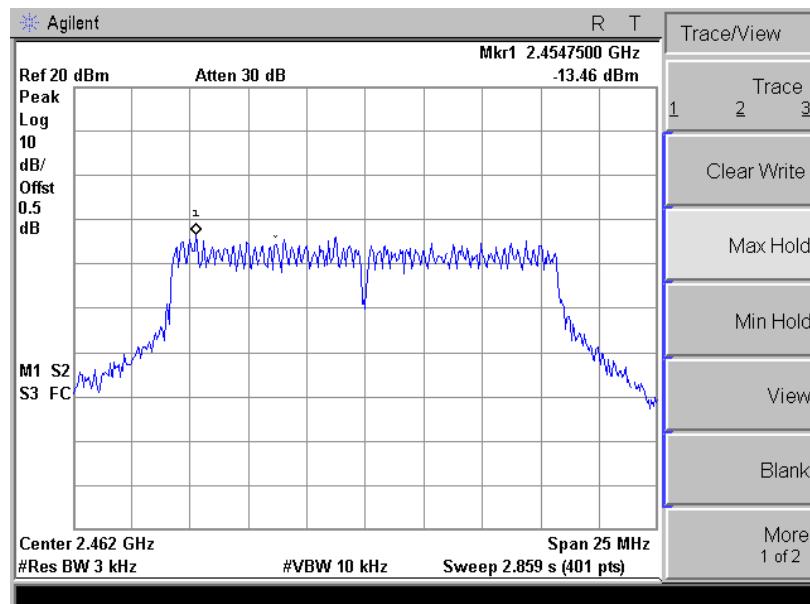
## CH6 @ANT 1



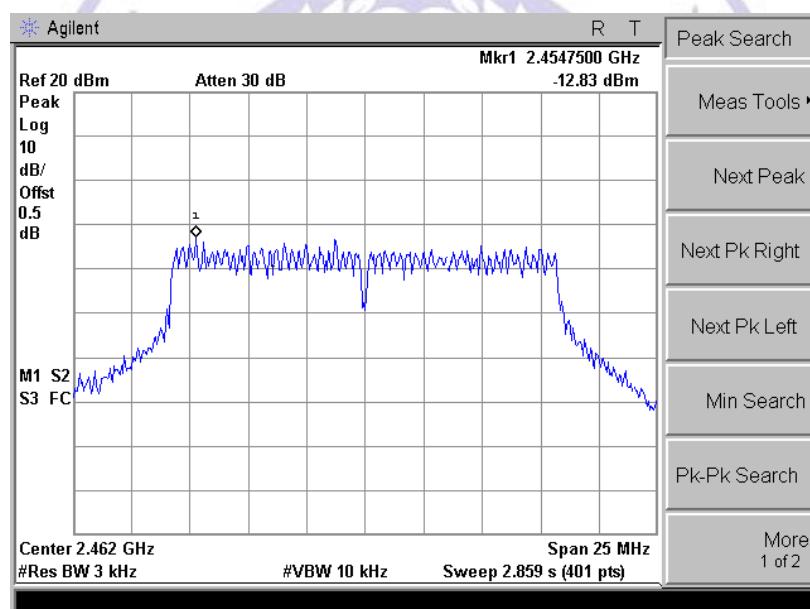
## CH6 @ANT 2



## CH11 @ANT 1

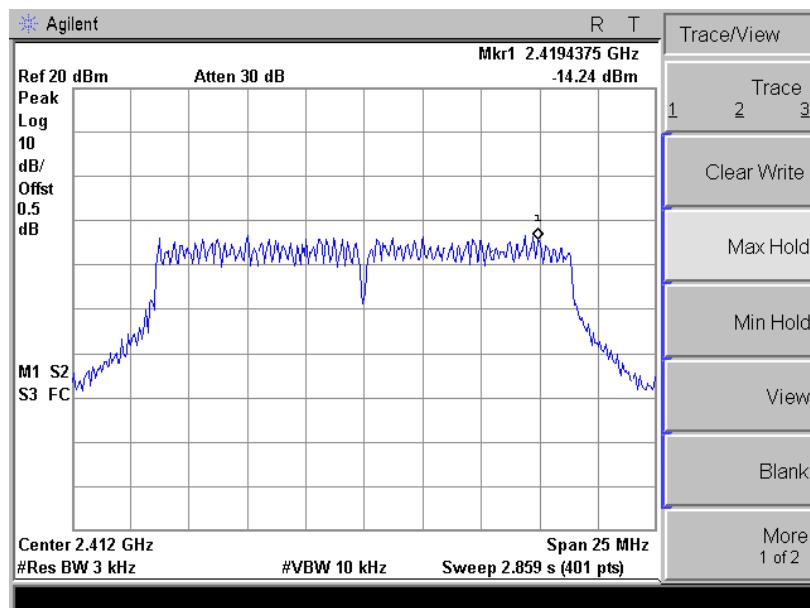


## CH11 @ANT 2

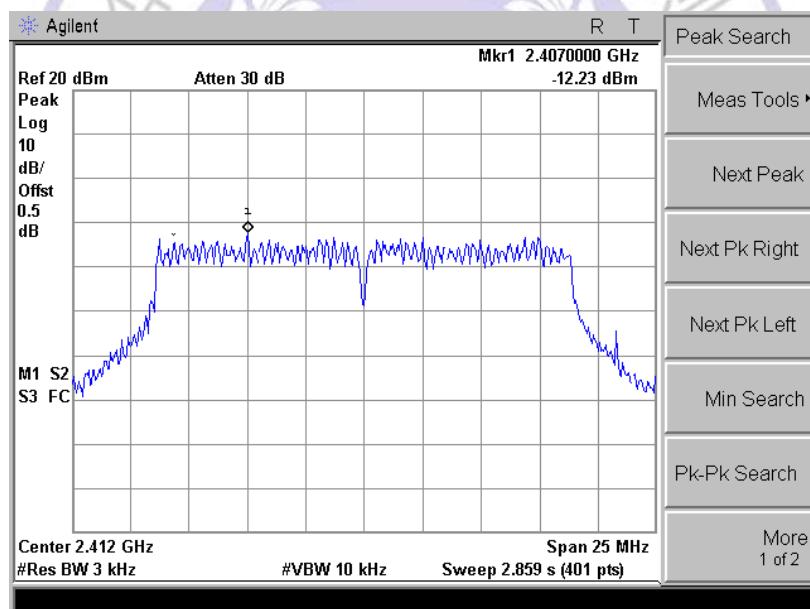


For 802.11n (20MHz) Mode:

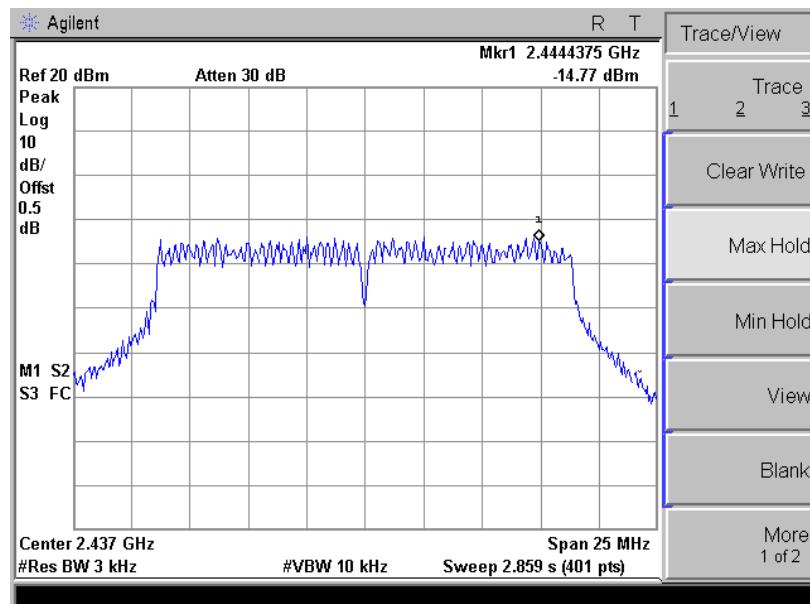
CH1 @ANT 1



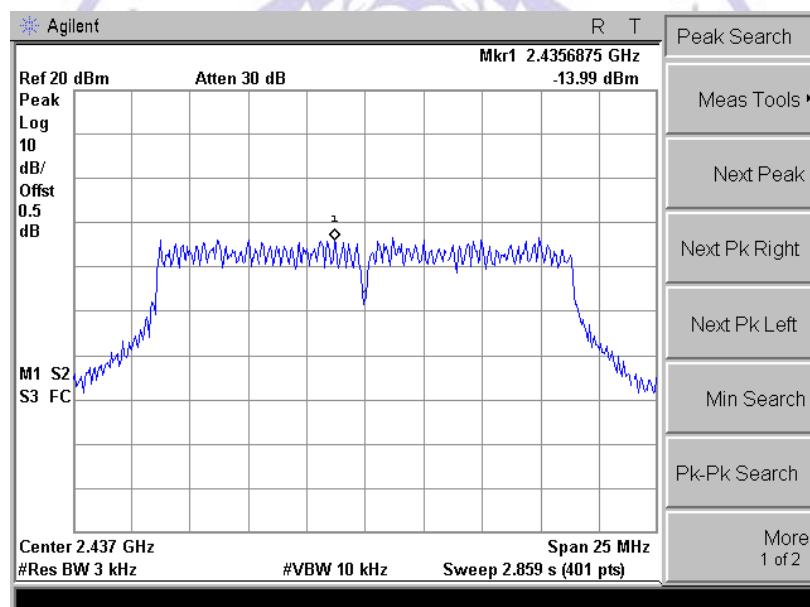
CH1 @ANT 2



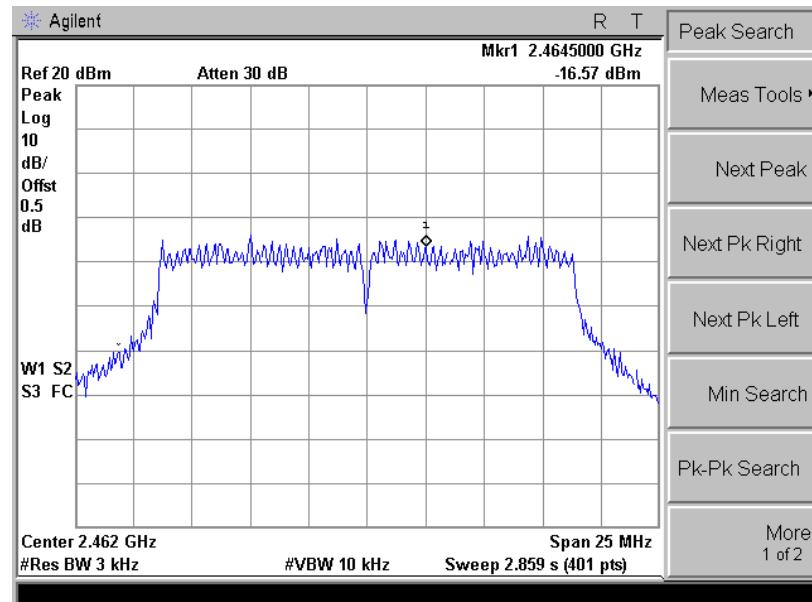
## CH6 @ANT 1



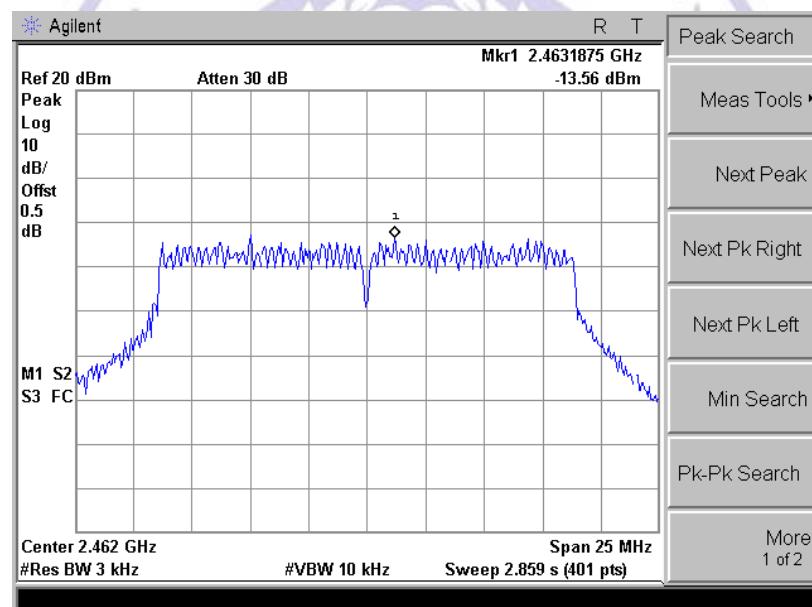
## CH6 @ANT 2



## CH11 @ANT 1

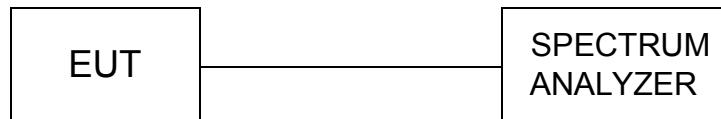


## CH11 @ANT 2



## 4.7. Spurious RF Conducted Emission

### TEST CONFIGURATION



### TEST PROCEDURE

The EUT was tested according to KDB558074 D01 v03r02 for compliance to FCC 47CFR 15.247 requirements.

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 frequeny range from 30MHz to 26.5GHz.

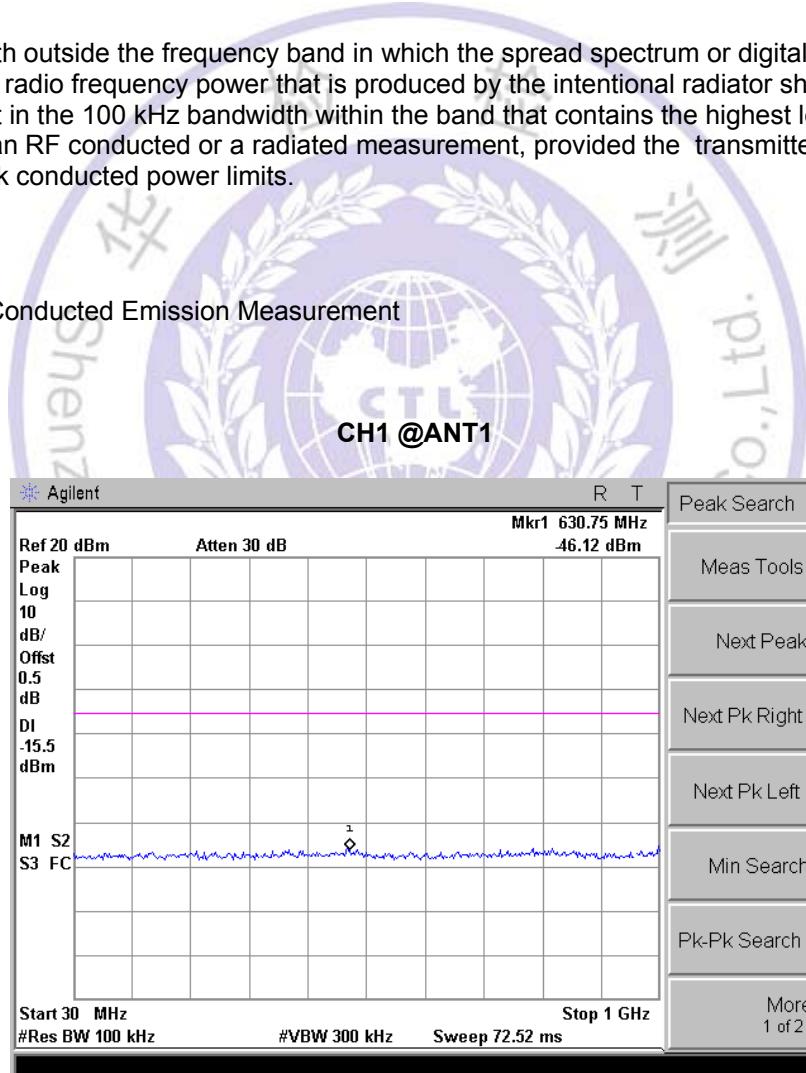
### LIMIT

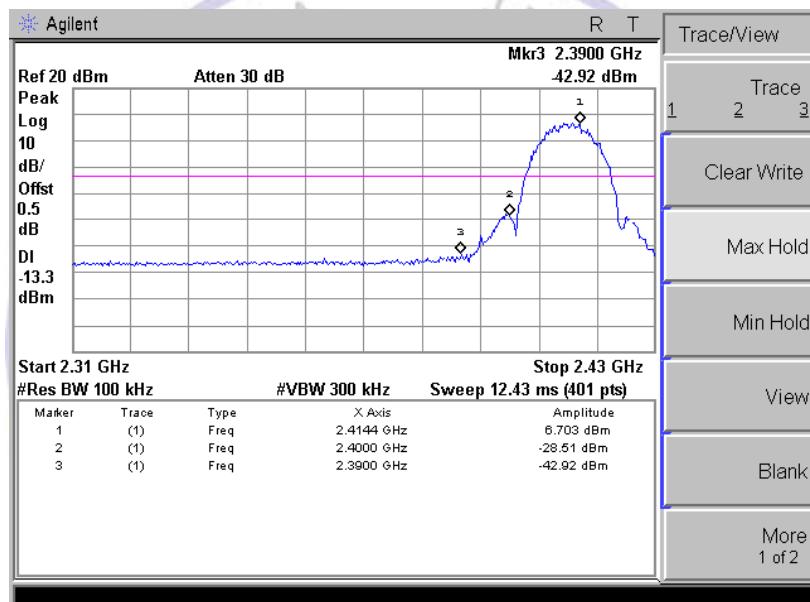
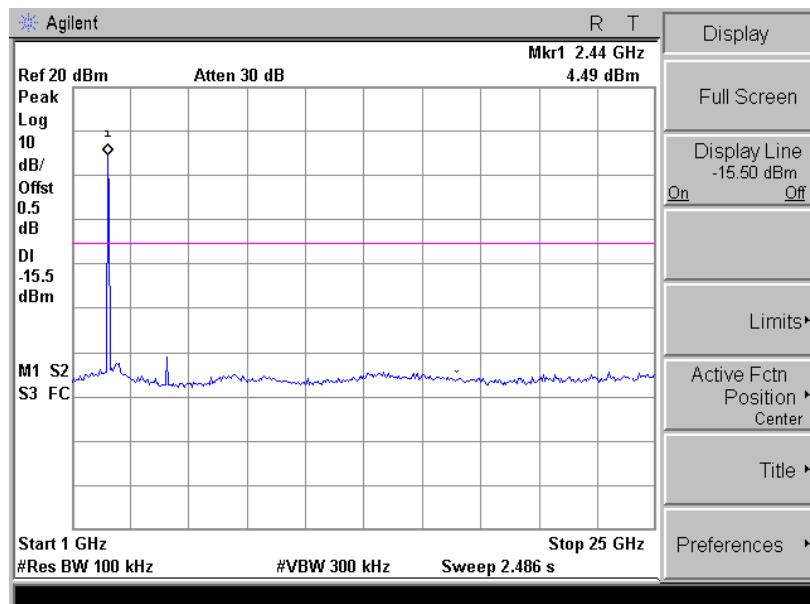
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

### TEST RESULTS

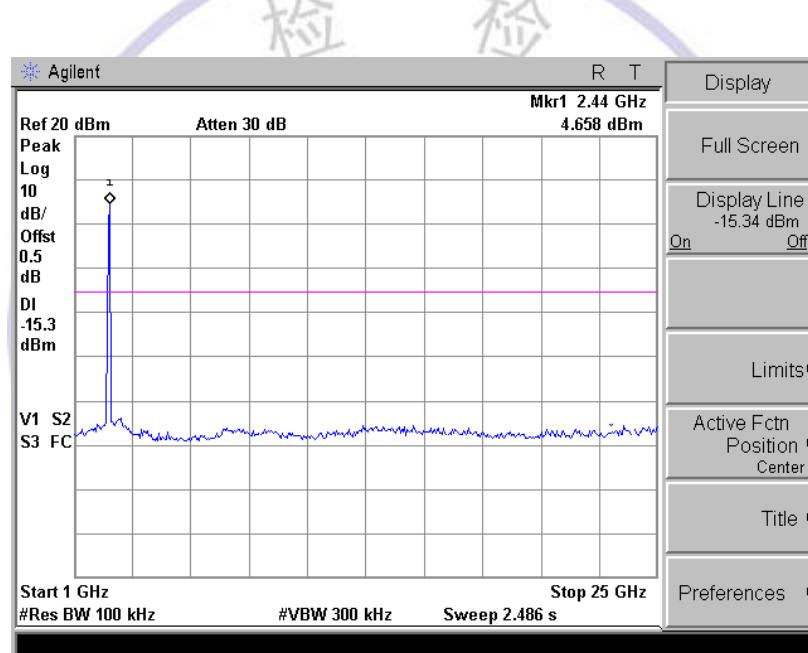
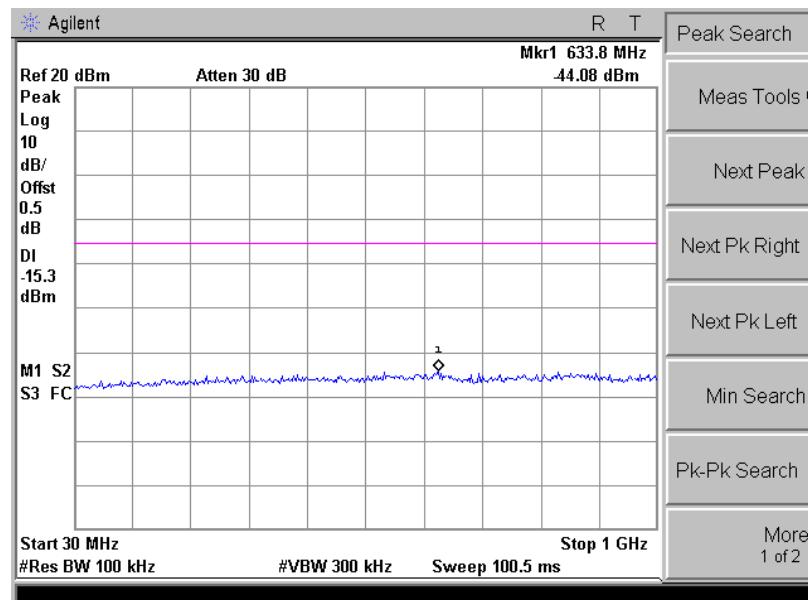
Photos of Spurious RF Conducted Emission Measurement

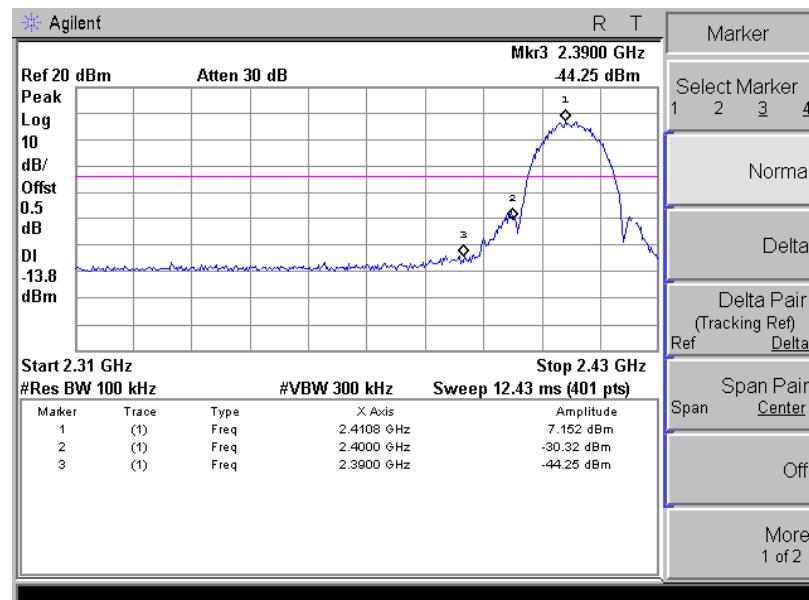
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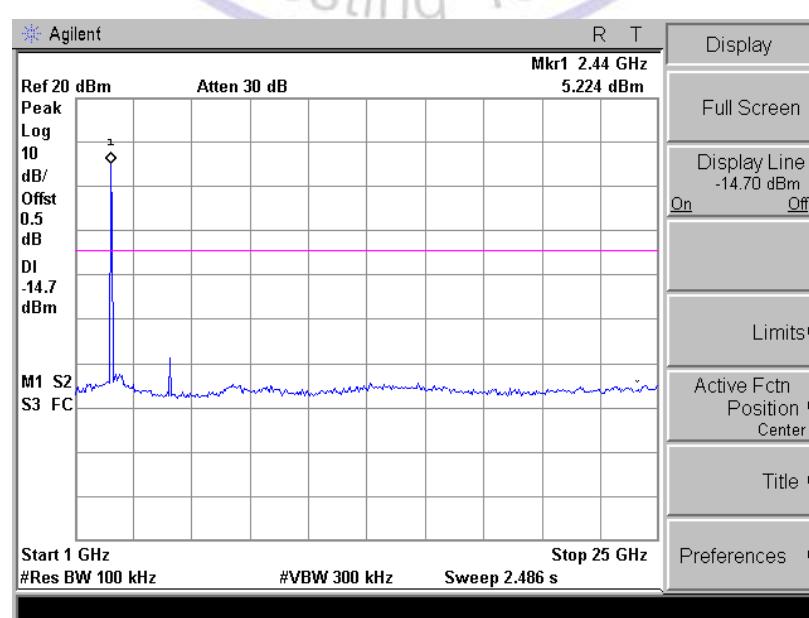
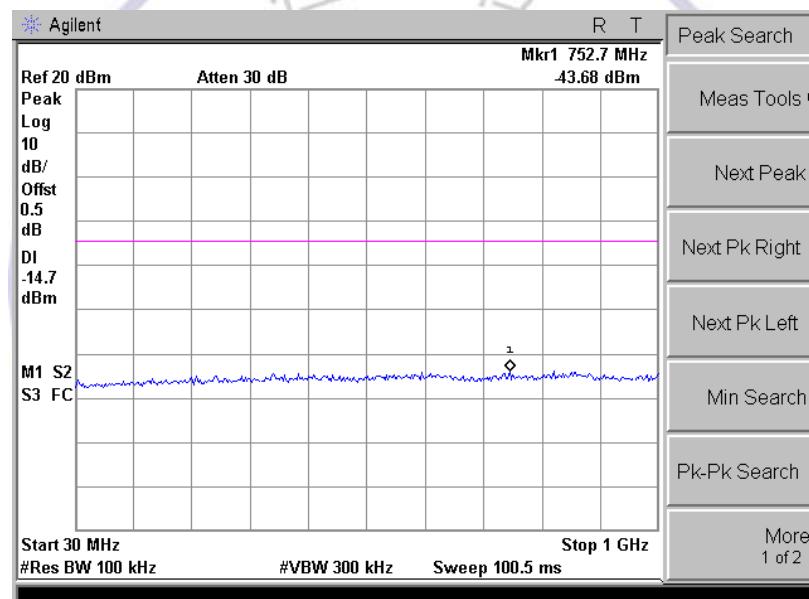


## CH1 @ANT 2

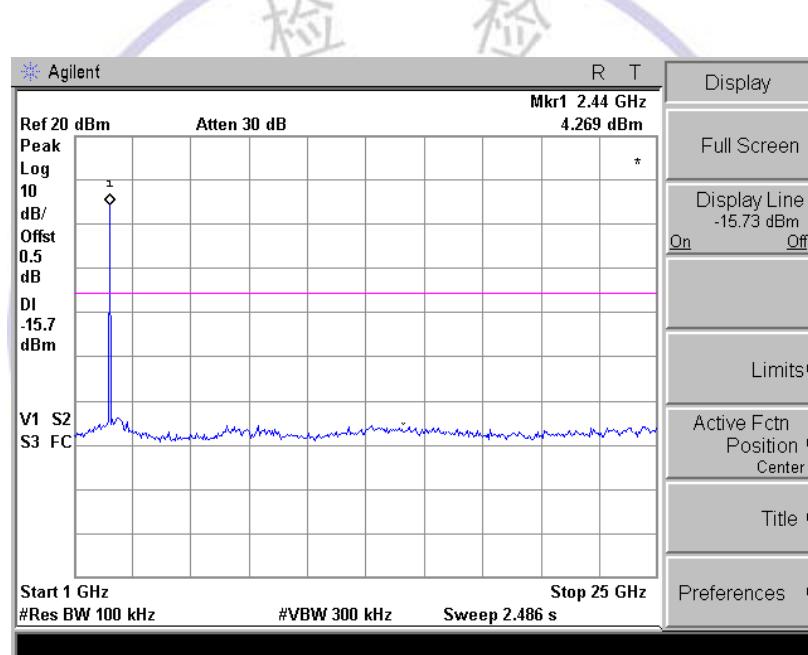
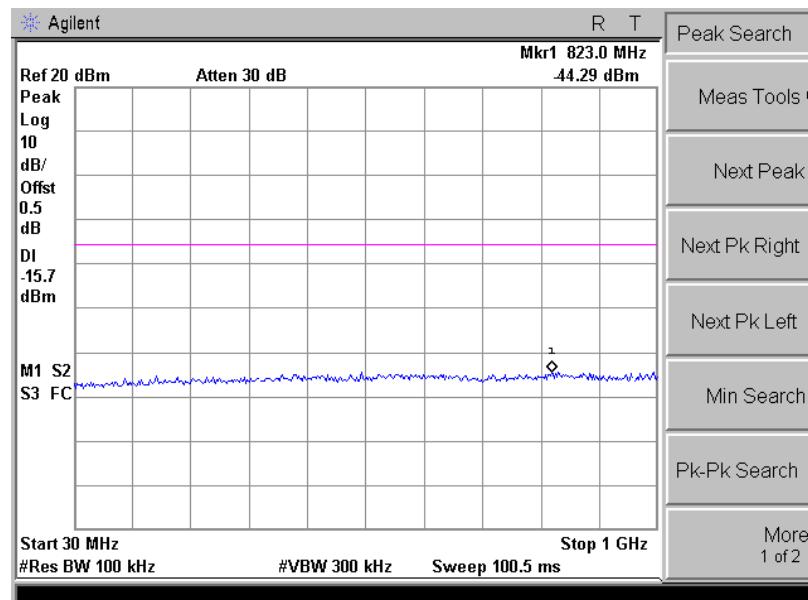




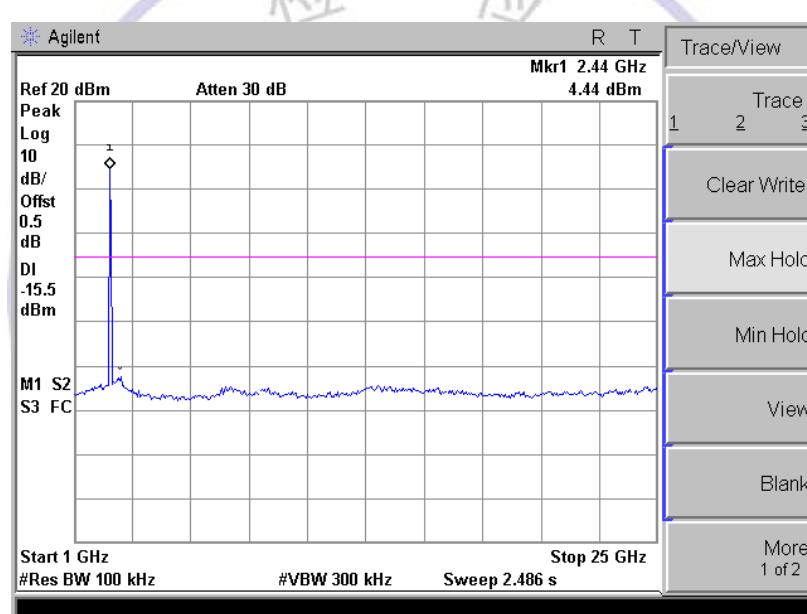
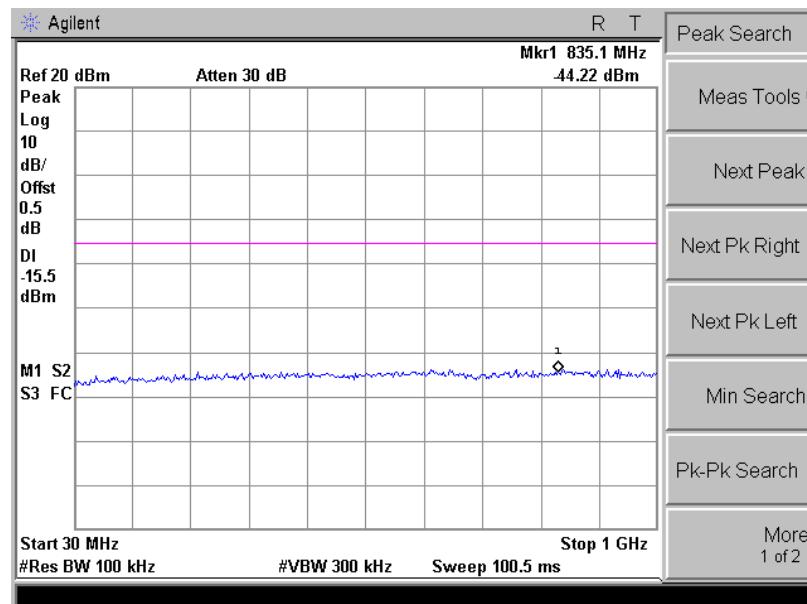
CH6 @ANT 1

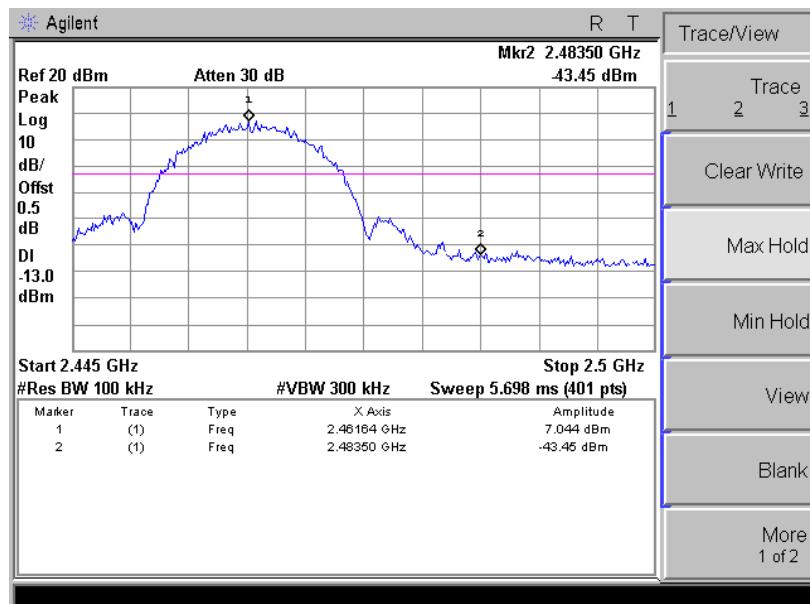


## CH6 @ANT 2

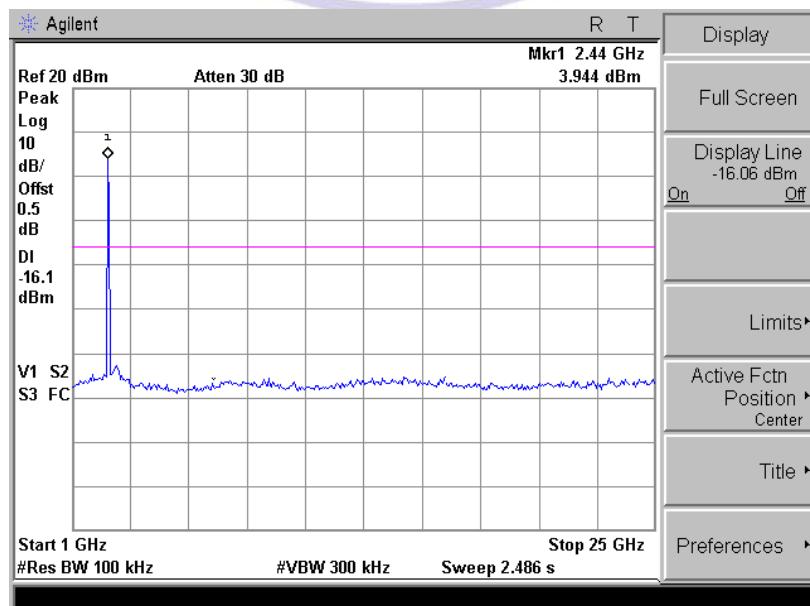
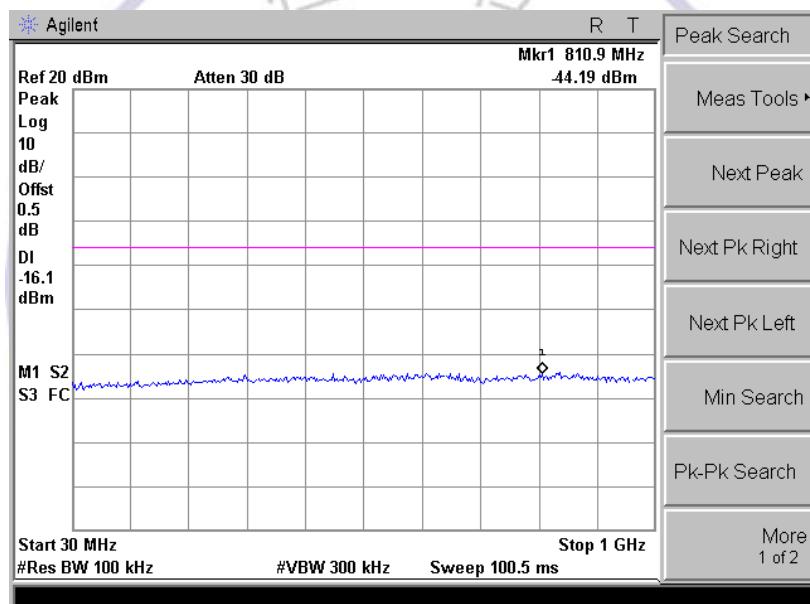


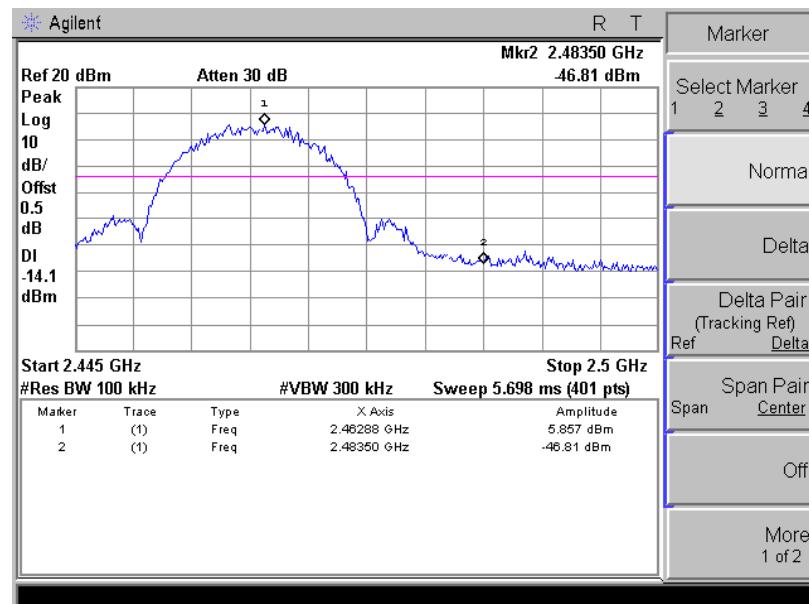
## CH11 @ANT 1



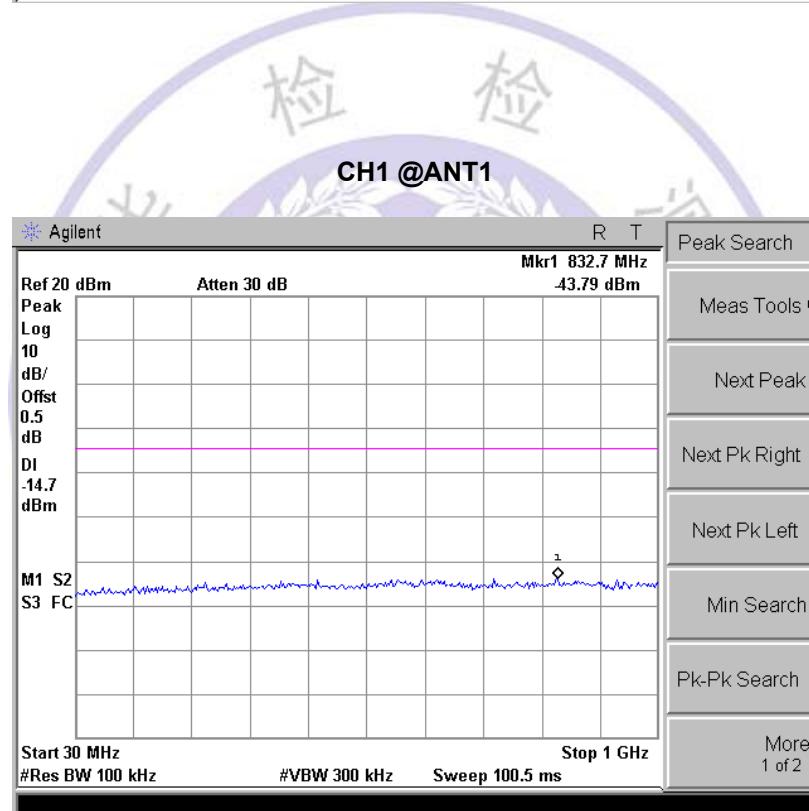


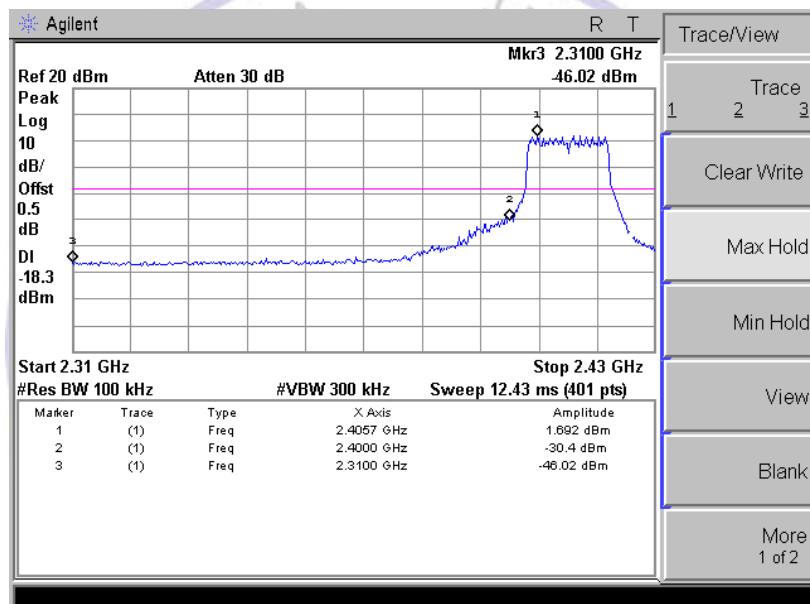
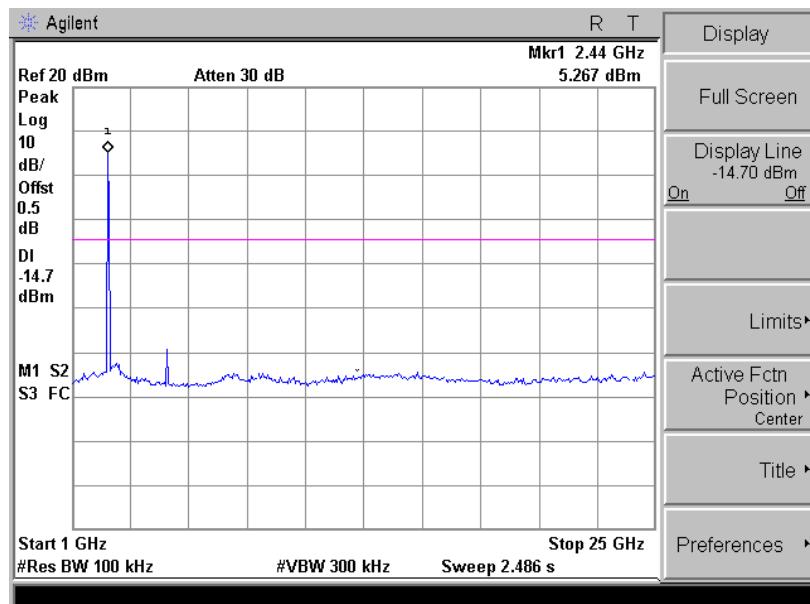
CH11 @ANT 2



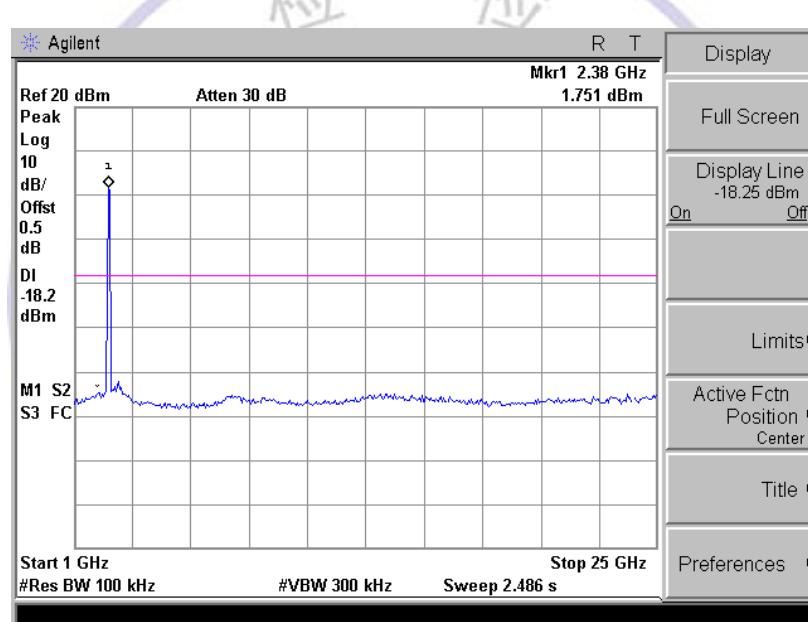
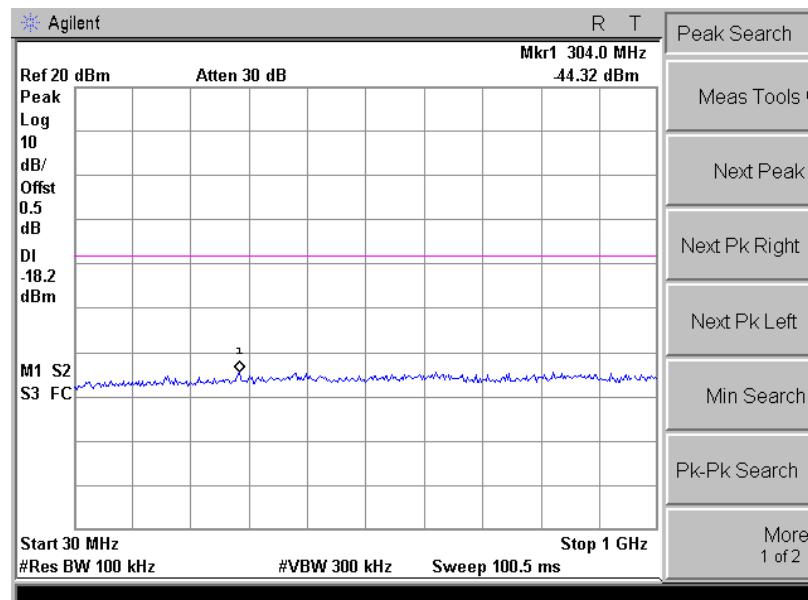


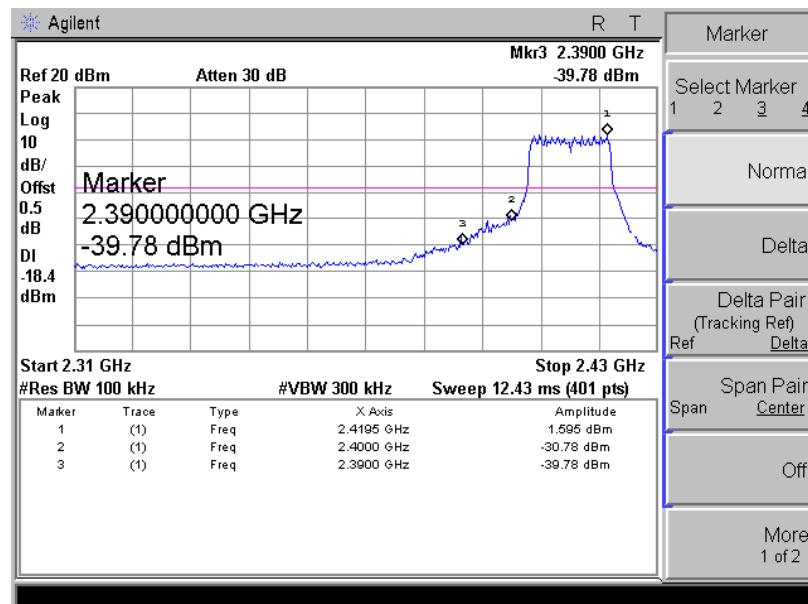
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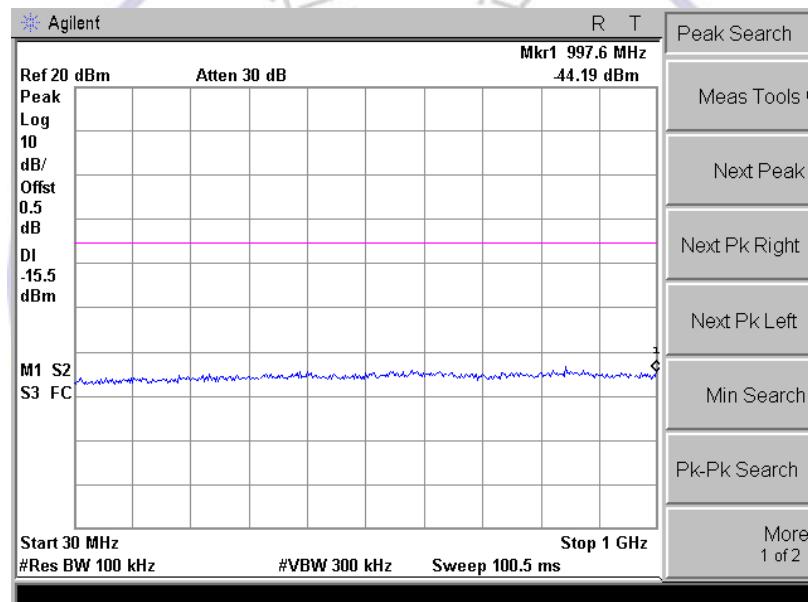


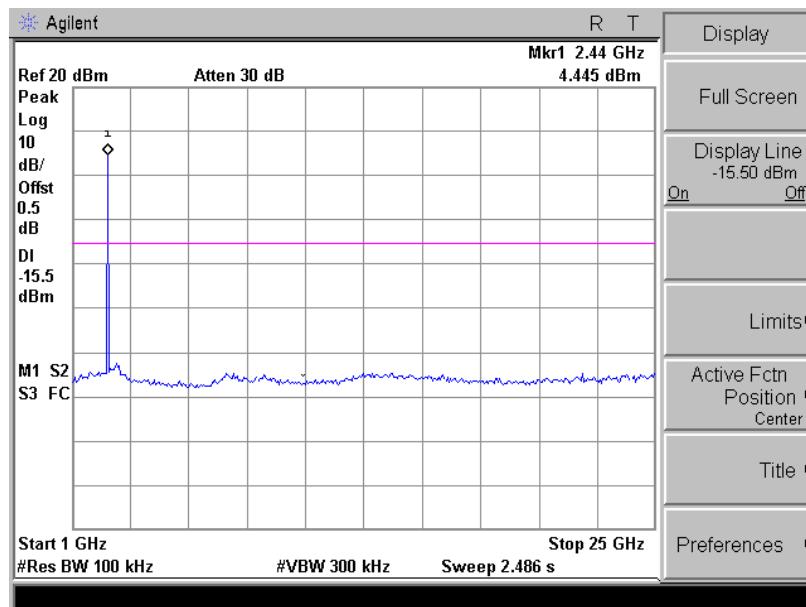
## CH1 @ANT 2



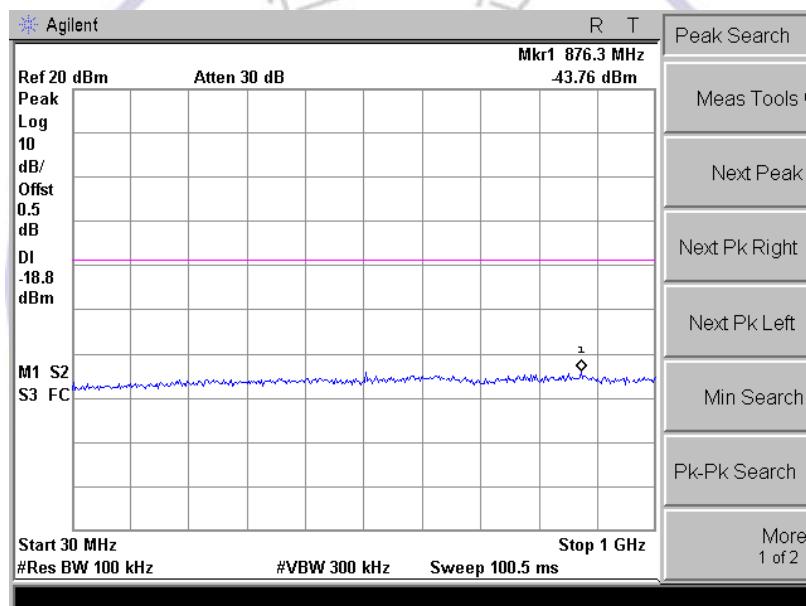


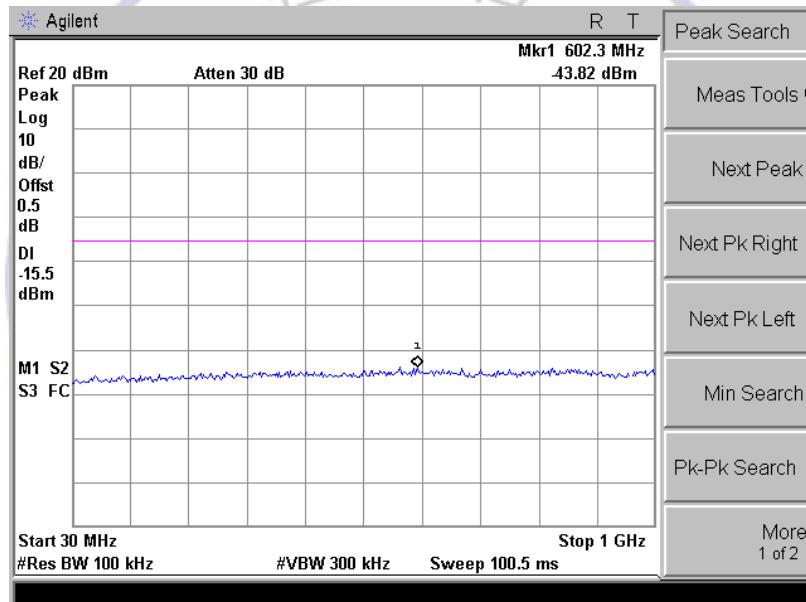
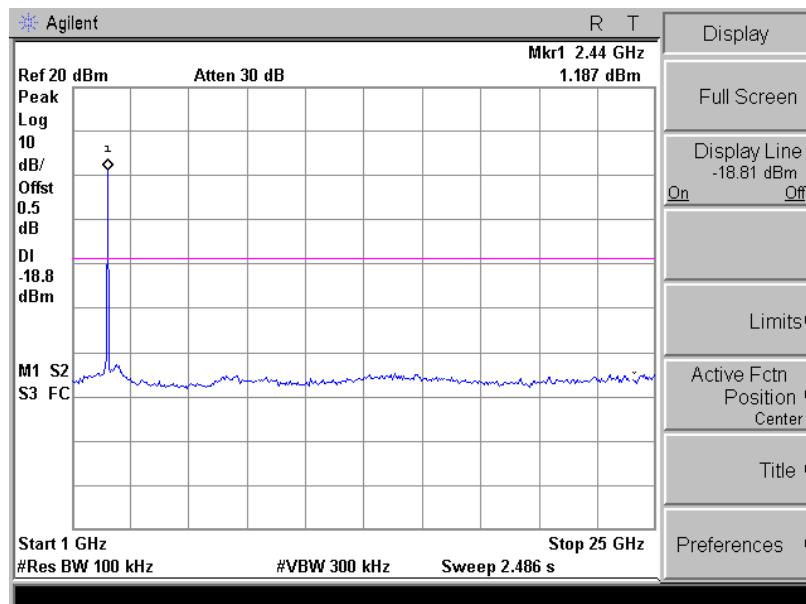
CH6 @ANT 1

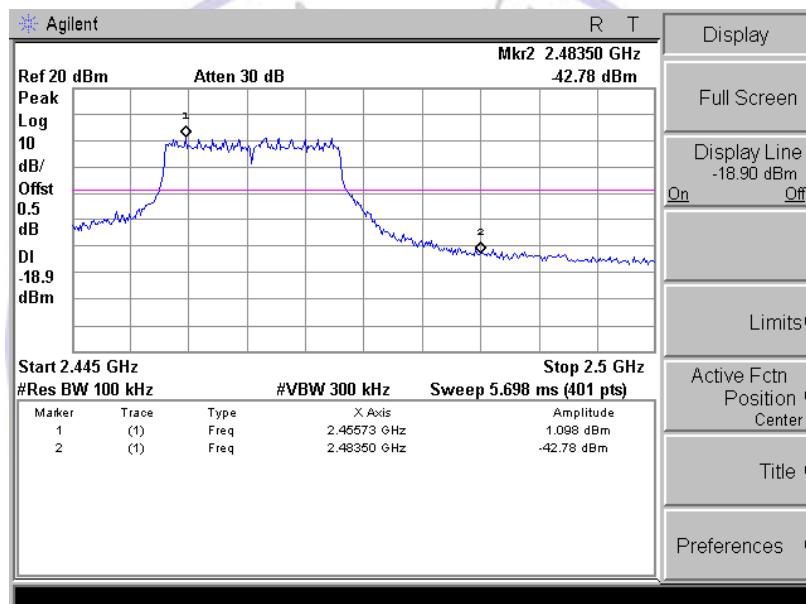
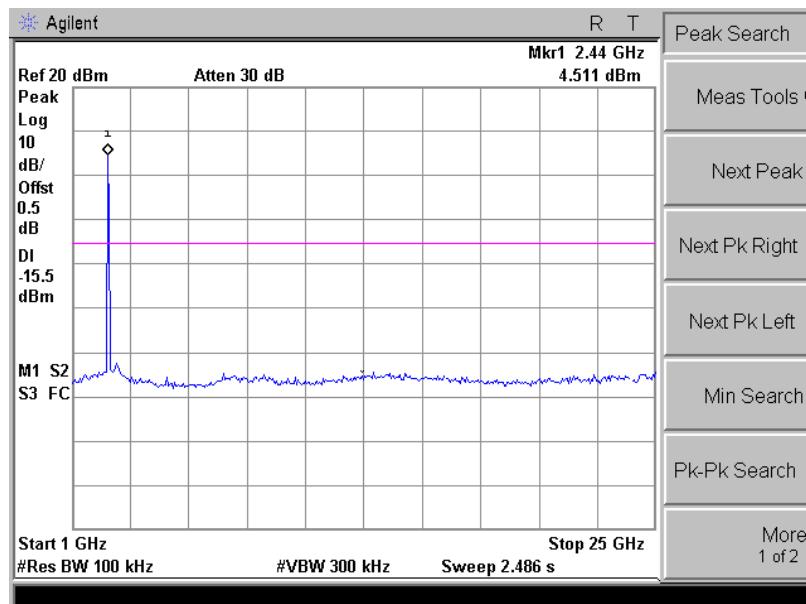




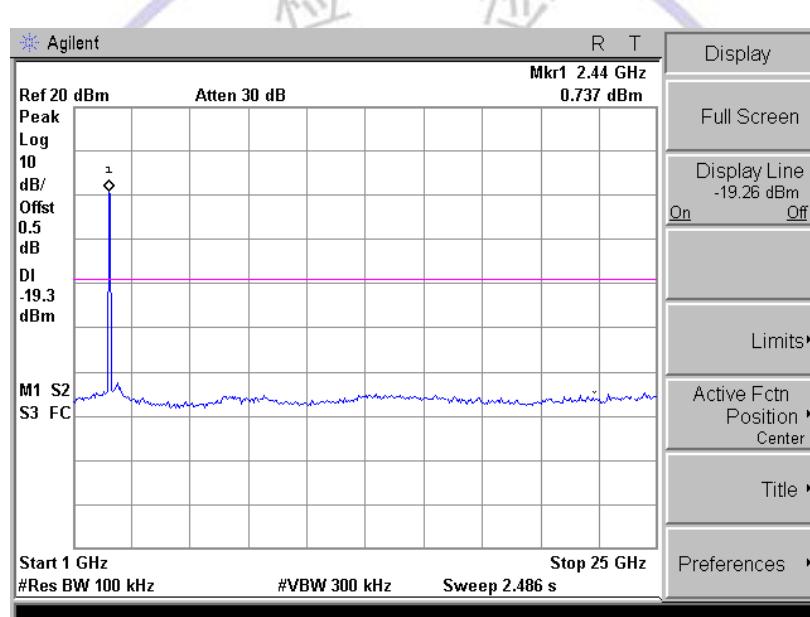
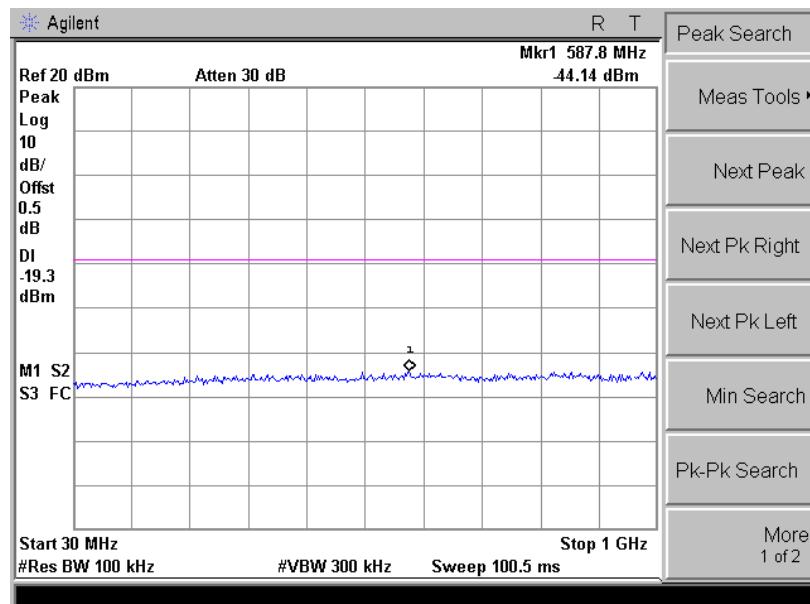
CH6 @ANT 2

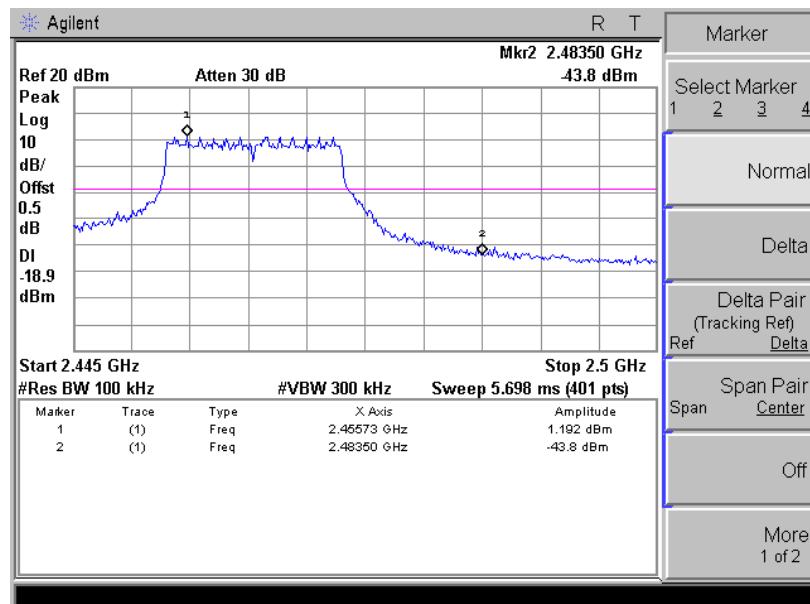




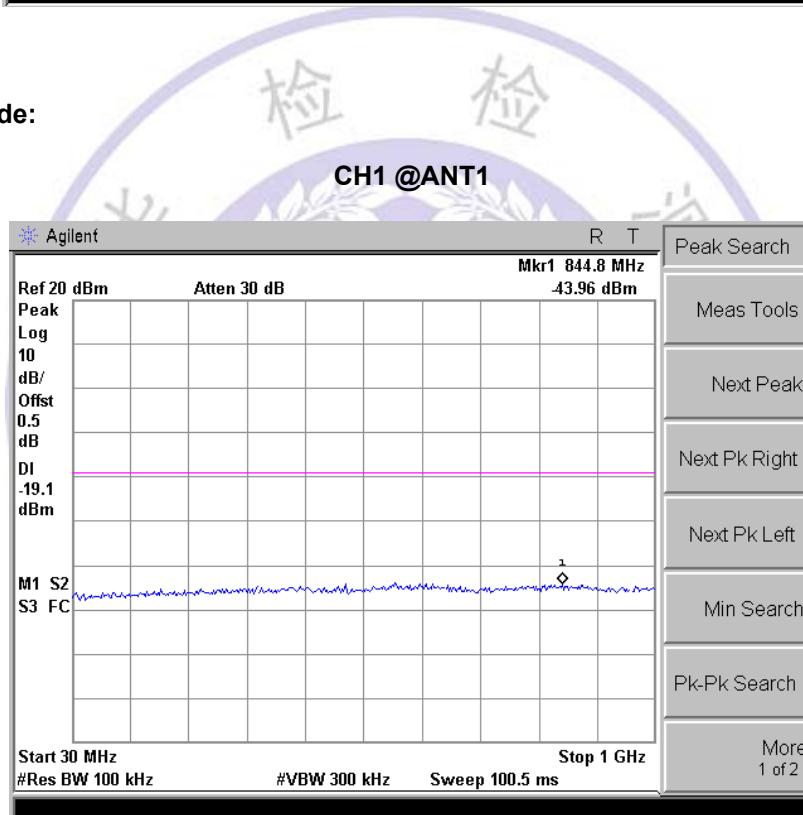


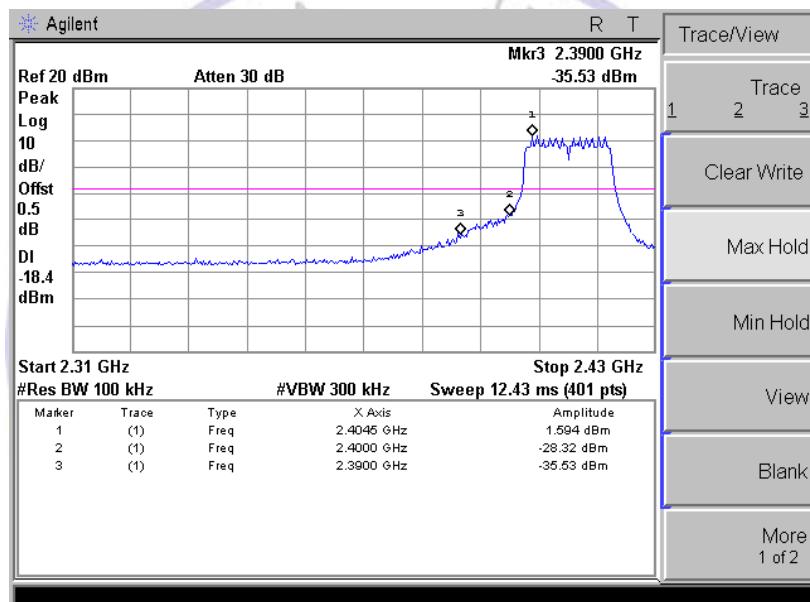
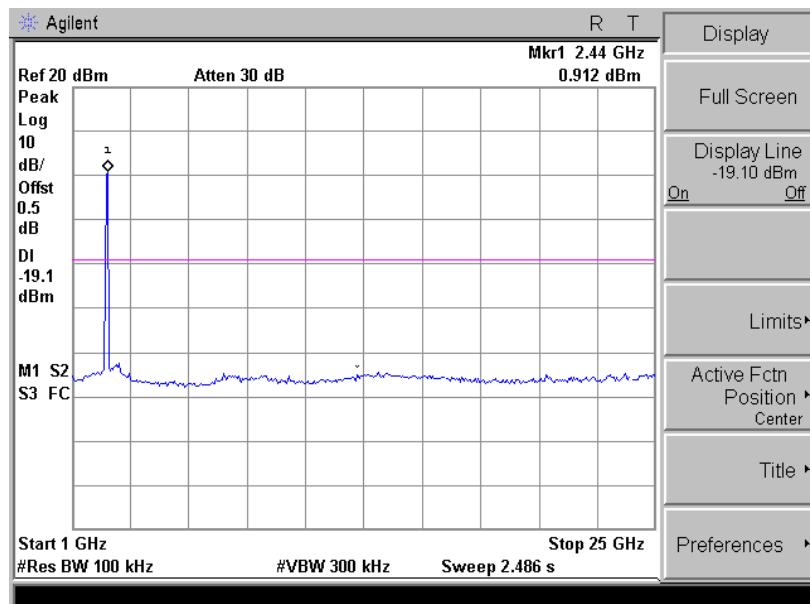
CH11 @ANT 2



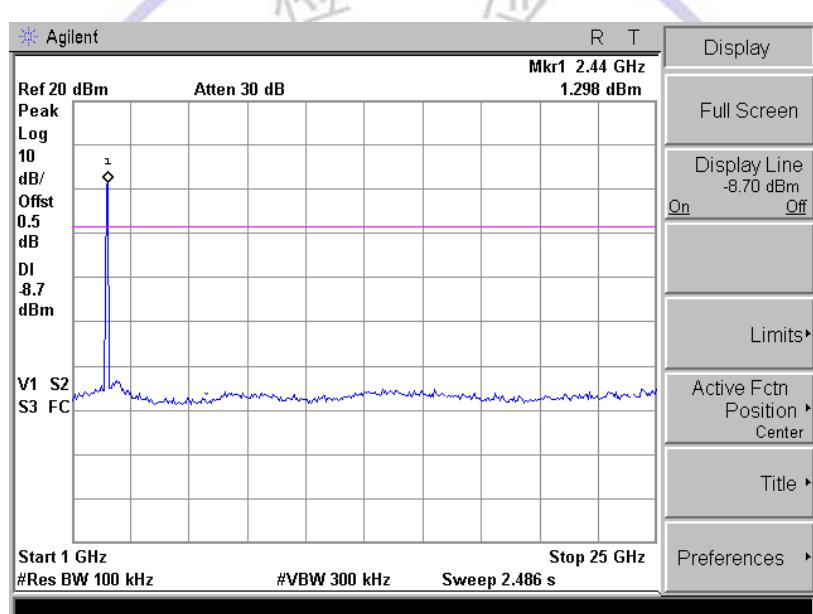
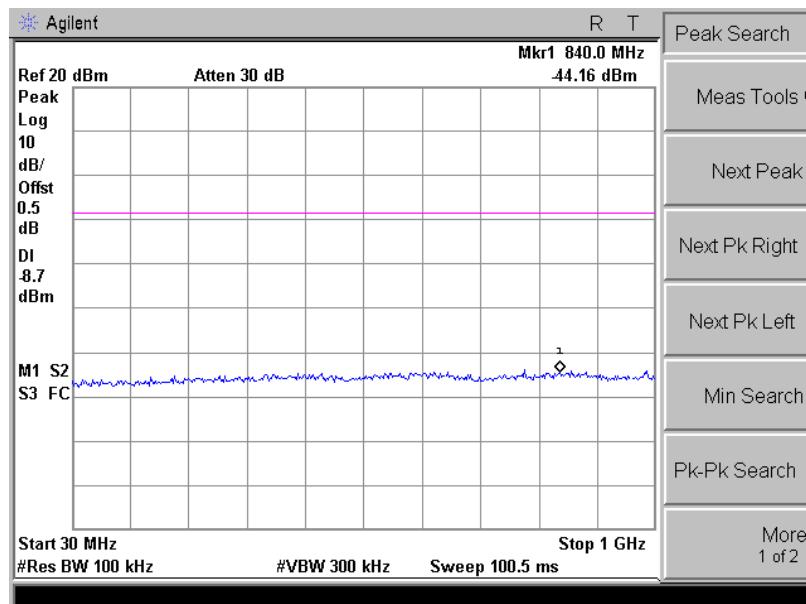


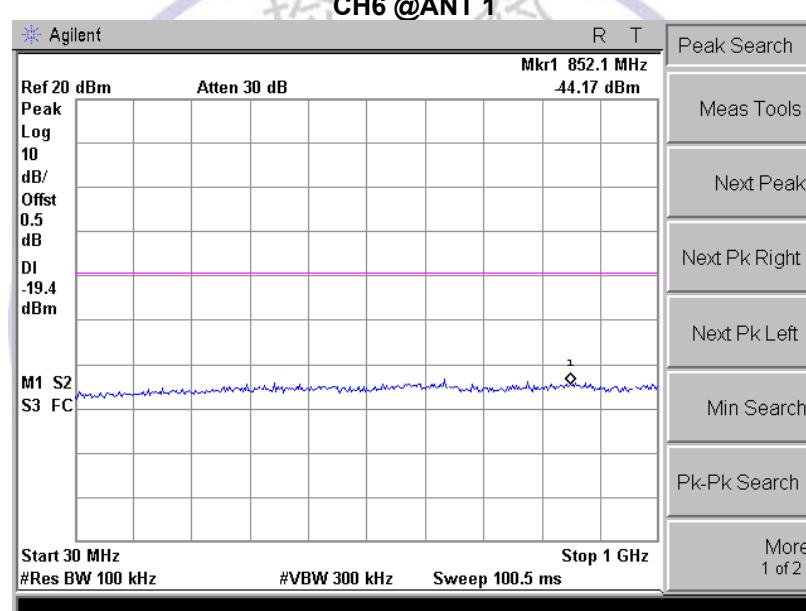
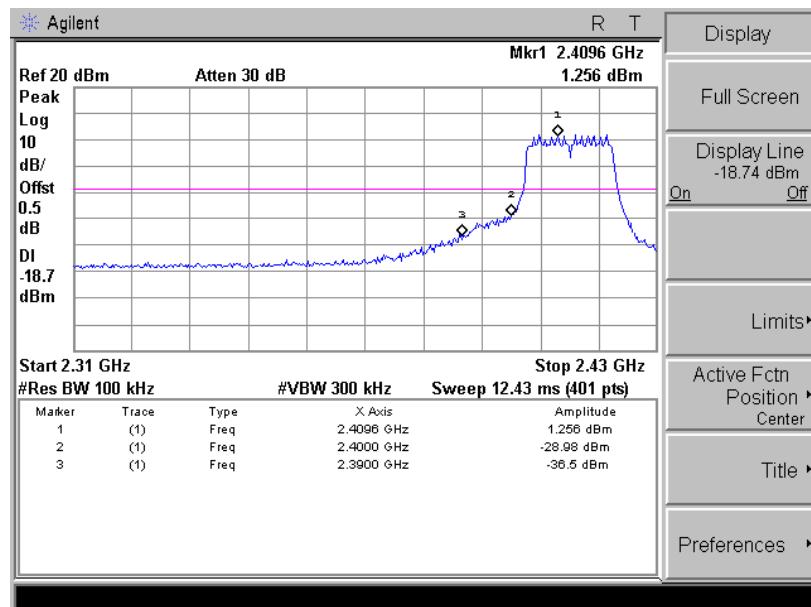
For 802.11n (20MHz) Mode:

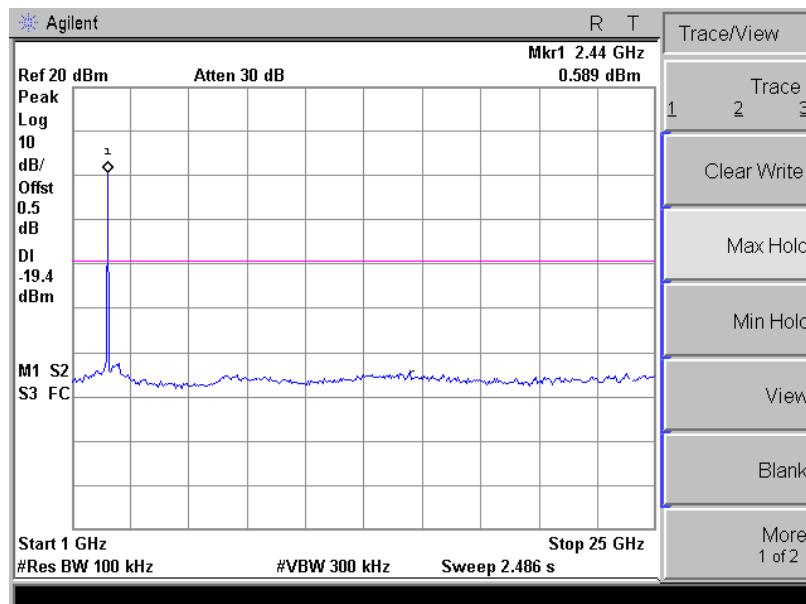




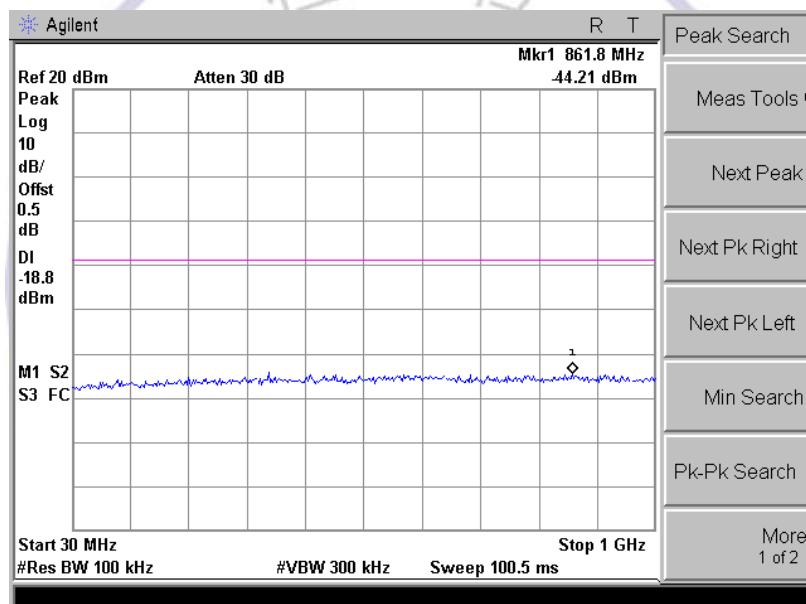
## CH1 @ANT 2

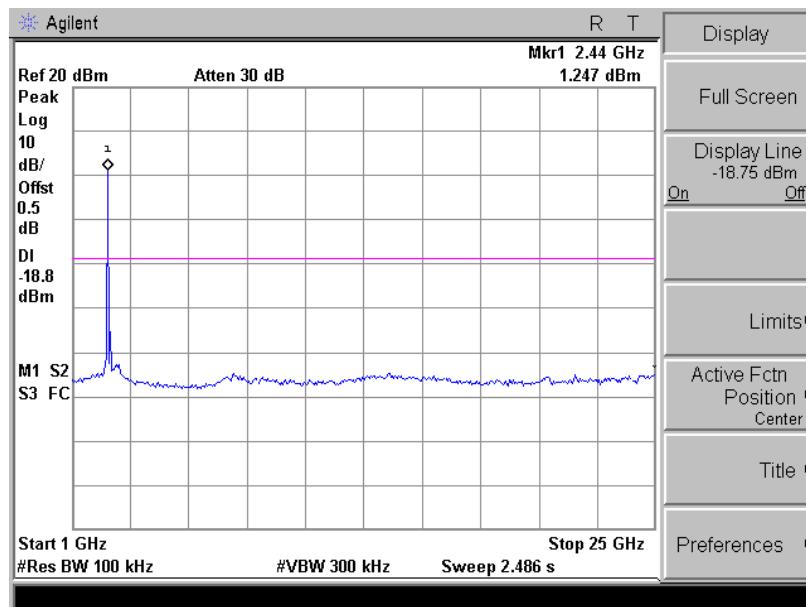




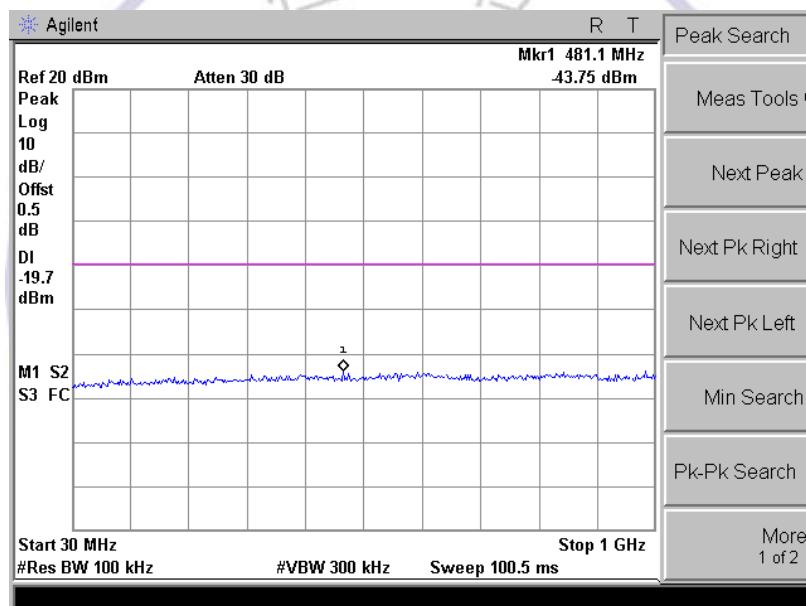


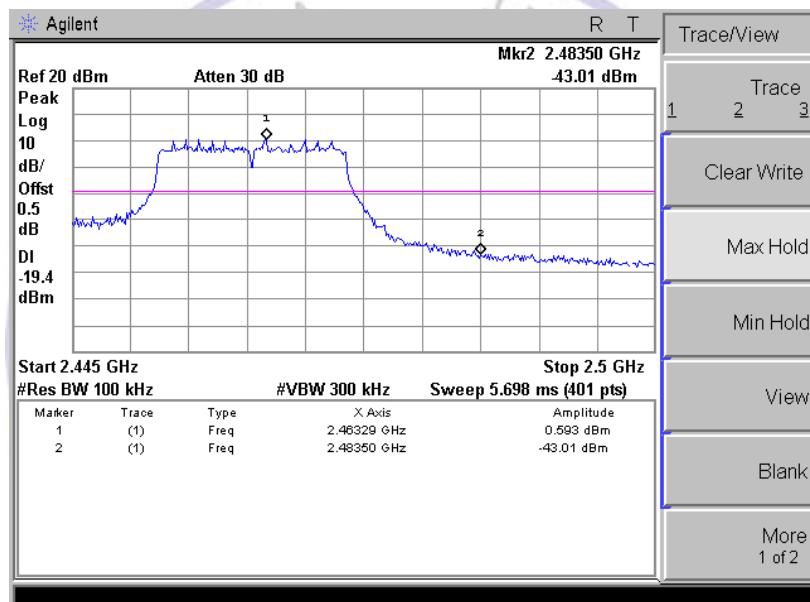
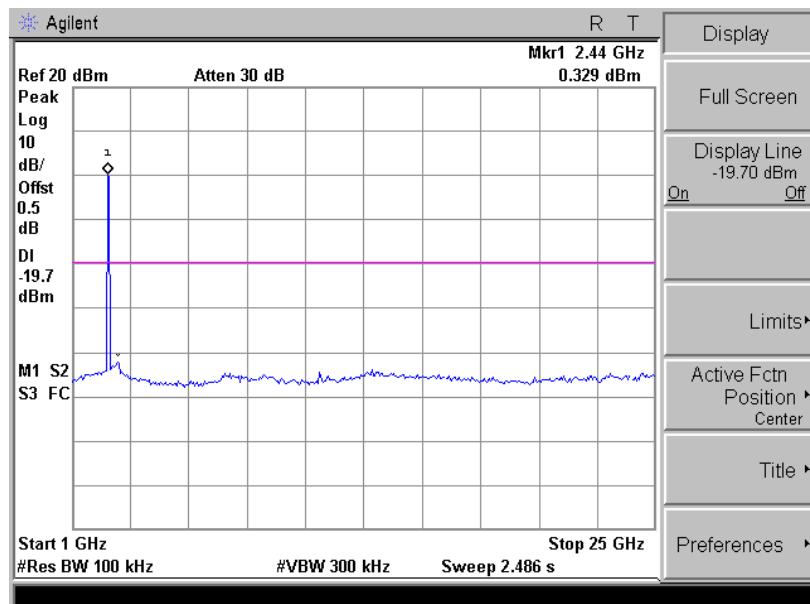
CH6 @ANT 2



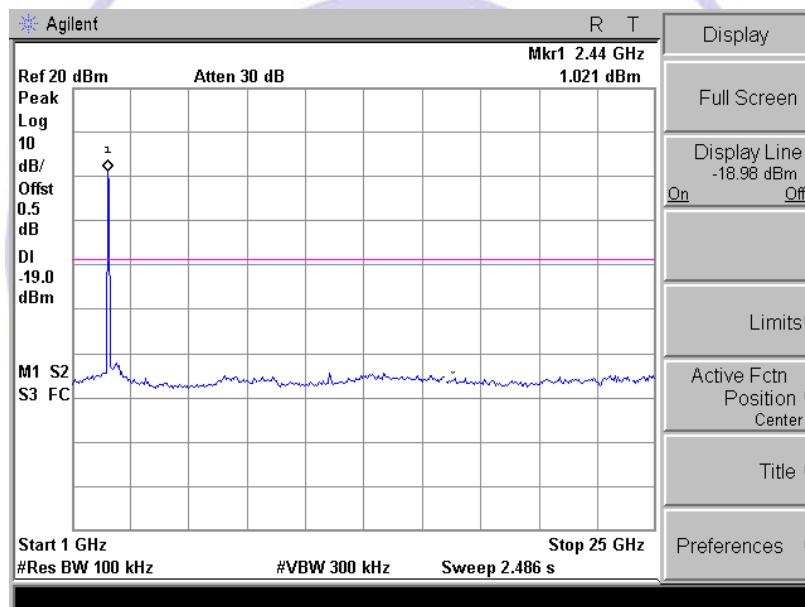
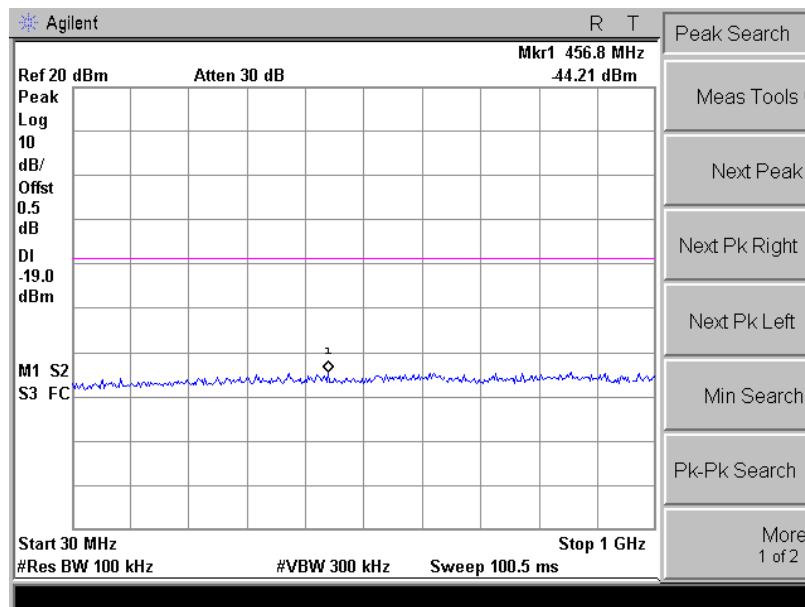


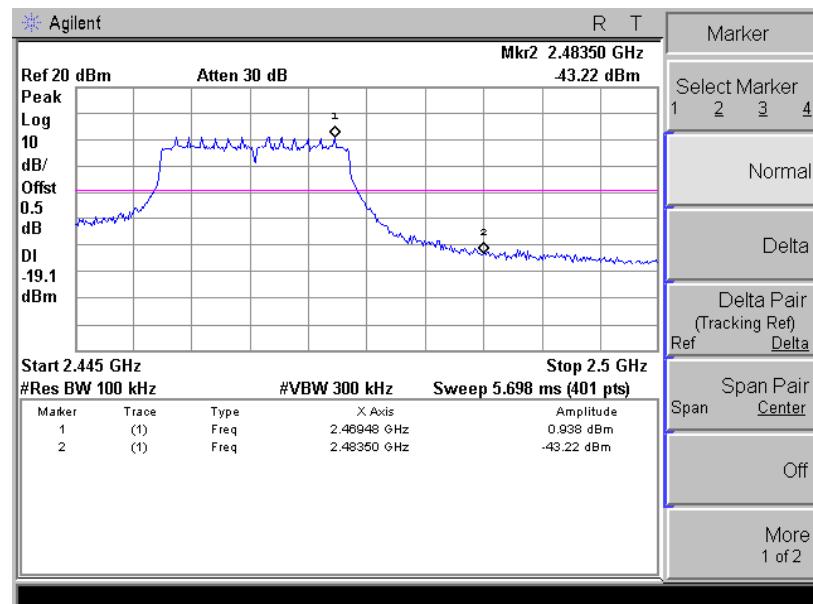
CH11 @ANT1





## CH11 @ANT 2





## 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.

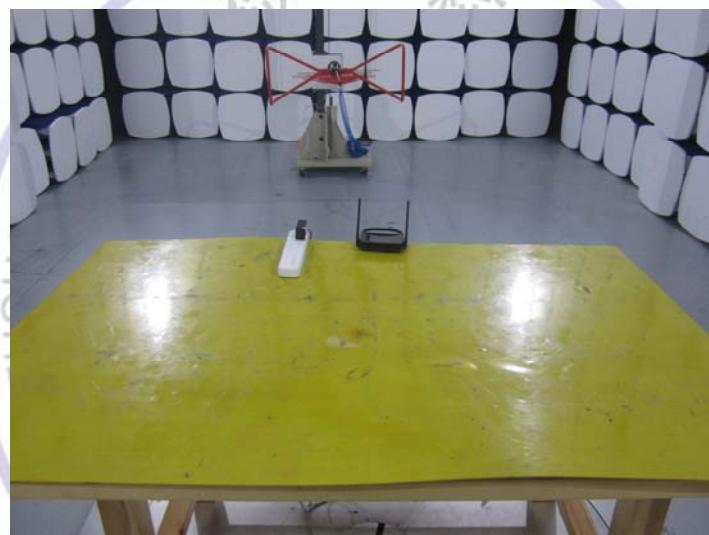
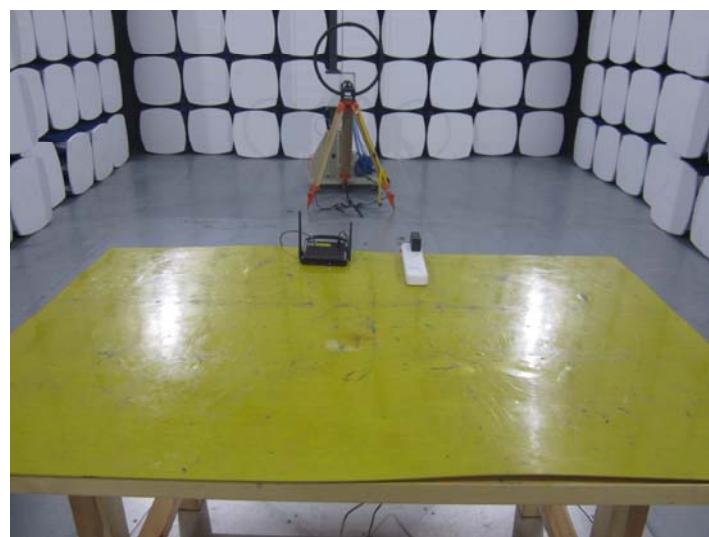
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

### ANTENNA CONNECTED CONSTRUCTION

The directional gains of antenna used for transmitting is 5dBi, for MIMO mode, Antenna Directional gain is  $5+10\log_2=8.01\text{dBi}$  and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.



## 5. Test Setup Photos of the EUT





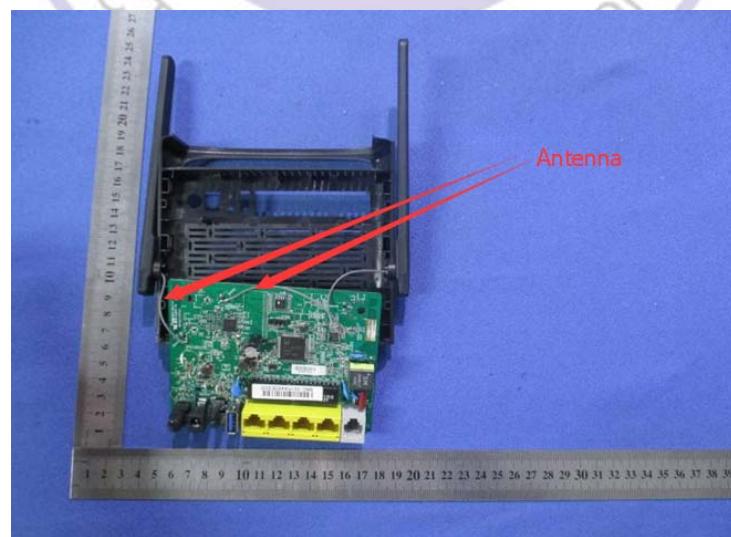
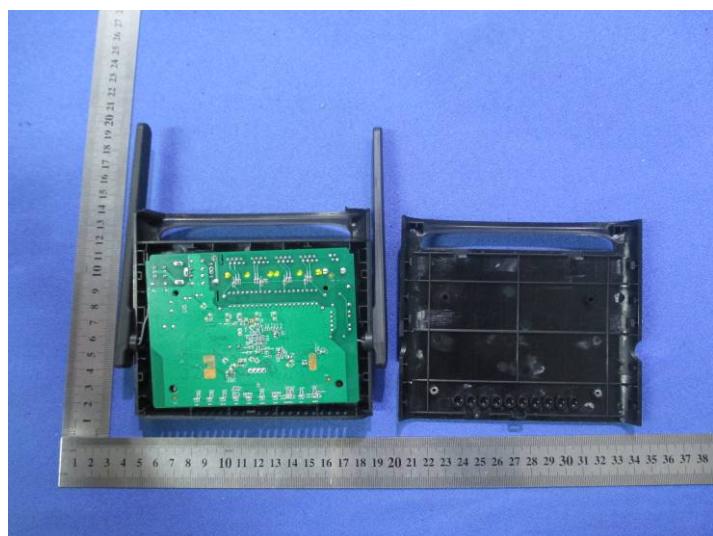
## 6. External and Internal Photos of the EUT

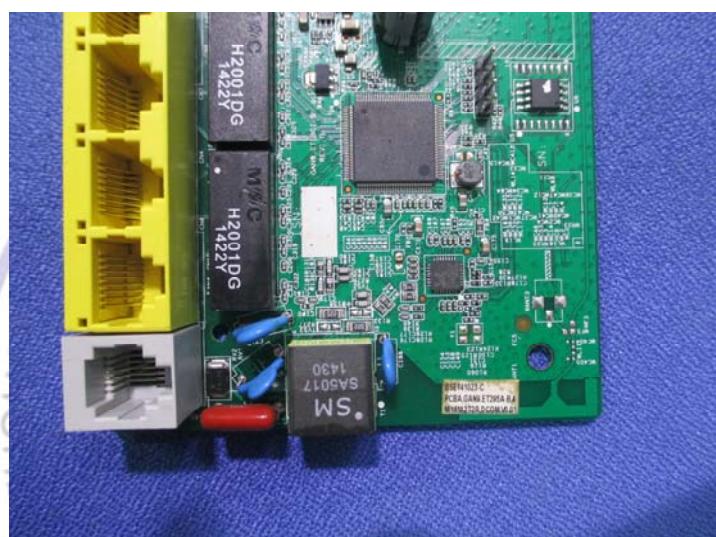
### External Photos of EUT

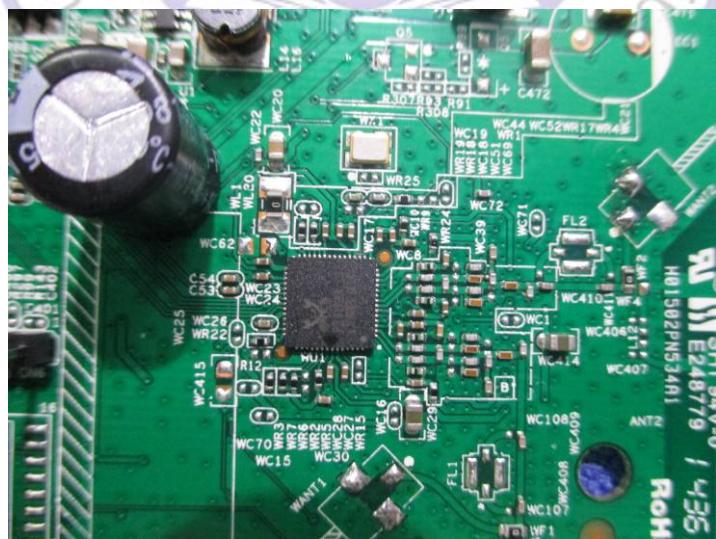
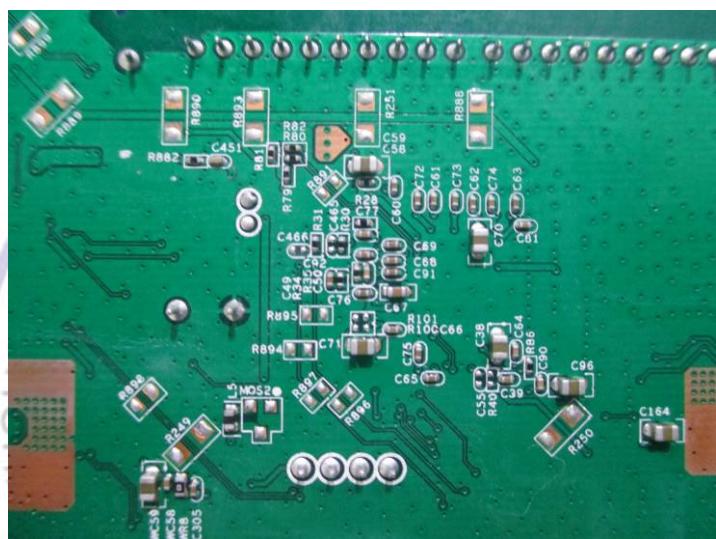
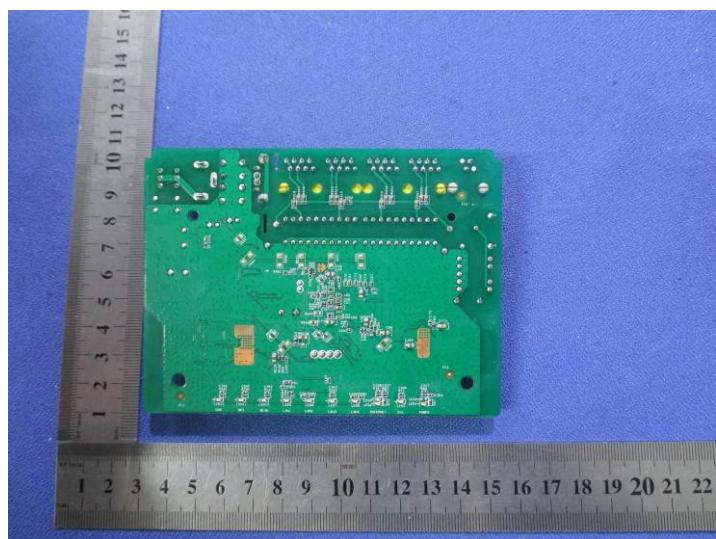


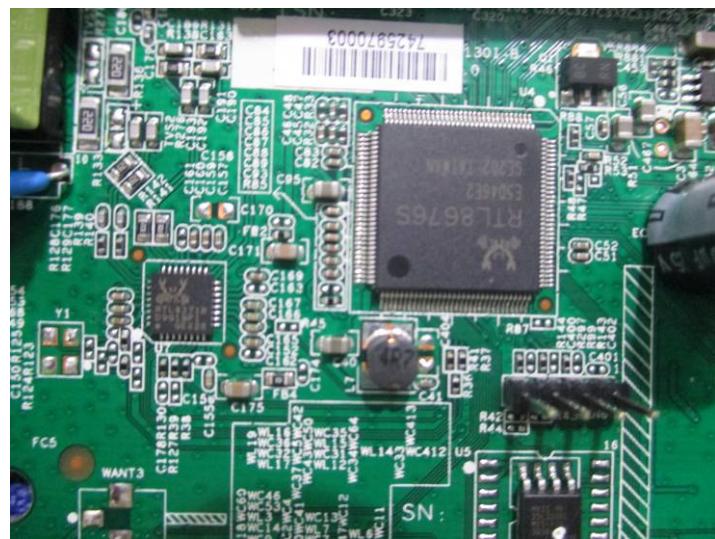




Internal Photos of EUT







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

