

Test Report

FCC Part15 Subpart C

Product Name : IP-STB
Model No. : Bagel
FCC ID : MCL-BAGELXX1

Applicant : HON HAI Precision Ind. Co., Ltd.
Address : 5F-1, 5, Hsin-An Road, Hsinchu Science-Based
Industrial Park, Hsinchu, Taiwan

Date of Receipt : Jan. 17, 2014
Test Date : Jan. 17, 2014~Feb. 16, 2014
Issued Date : Mar. 07, 2014
Report No. : 1410379R-RF-US-P05V01
Report Version : V2.0



The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Test Report Certification

Issued Date : Mar. 07, 2014
Report No. : 1410379R-RF-US-P05V01



Product Name : IP-STB
Applicant : HON HAI Precision Ind. Co., Ltd.
Address : 5F-1, 5, Hsin-An Road, Hsinchu Science-Based Industrial Park,
Hsinchu, Taiwan
Manufacturer : Ambit Mircosystems (Shanghai) LTD.
Address : 1925, Nanle Road, Songjiang Export Processing Zone,
Shanghai, China 201613
Model No. : Bagel
FCC ID : MCL-BAGELXX1
EUT Voltage : 5V/2A
Brand Name : GITV
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2012
ANSI C63.4: 2009
KDB 558074 D01 DTS Meas Guidance v03r01
Test Result : Complied
Performed Location : Suzhou EMC Laboratory
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TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392

Documented By : Alice Ni
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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
Germany	:	TUV Rheinland
Norway	:	Nemko, DNV
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site :<http://www.quietek.com/tw/ctg/cts/accreditations.htm>

The address and introduction of Quietek Corporation's laboratories can be founded in our Web site :
<http://www.quietek.com/>

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1. General Information

1.1. EUT Description

Product Name	IP-STB
Brand Name	GITV
Model No.	Bagel
EUT Voltage	5V/2A
Frequency Range	802.11b/g/n(20MHz): 2412~2462MHz
Channel Number	802.11b/g/n(20MHz): 11
Type of Modulation	802.11b: DSSS
	802.11g/n: OFDM
Data Rate	802.11b: 1/2/5.5/11 Mbps
	802.11g: 6/9/12/18/24/36/48/54 Mbps
	802.11n: up to 135 Mbps
Channel Control	Auto
Antenna Delivery	1*Tx + 1*Rx
Antenna Type	PCB Antenna
Peak Antenna Gain	3.21dBi
Component	
Adapter	MFR: DVE Model: DSA-10PFG-05 FUS 050200 Input: 100-240V~ 50/60Hz 0.4A Output: +5V, 2A

For 2.4GHz Band

802.11b/g/n(20MHz) Working Frequency of Each Channel:							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
01	2412 MHz	02	2417 MHz	03	2422 MHz	04	2427 MHz
05	2432 MHz	06	2437 MHz	07	2442 MHz	08	2447 MHz
09	2452 MHz	10	2457 MHz	11	2462 MHz	N/A	N/A

Duty Cycle

Test Mode	Duty Cycle
802.11b	98.9%
802.11g	94.5%
802.11n(20MHz)	91.4%

Power Parameter Value of the test software

Test Mode	Test Channel	The Setting Level
802.11b	2412	64
	2437	64
	2462	64
802.11g	2412	60
	2437	60
	2462	60
802.11n(20MHz)	2412	56
	2437	56
	2462	56

1.2. Mode of Operation

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

Test Mode
Mode 1: Transmit by 802.11b
Mode 2: Transmit by 802.11g
Mode 3: Transmit by 802.11n(20MHz)

Note:

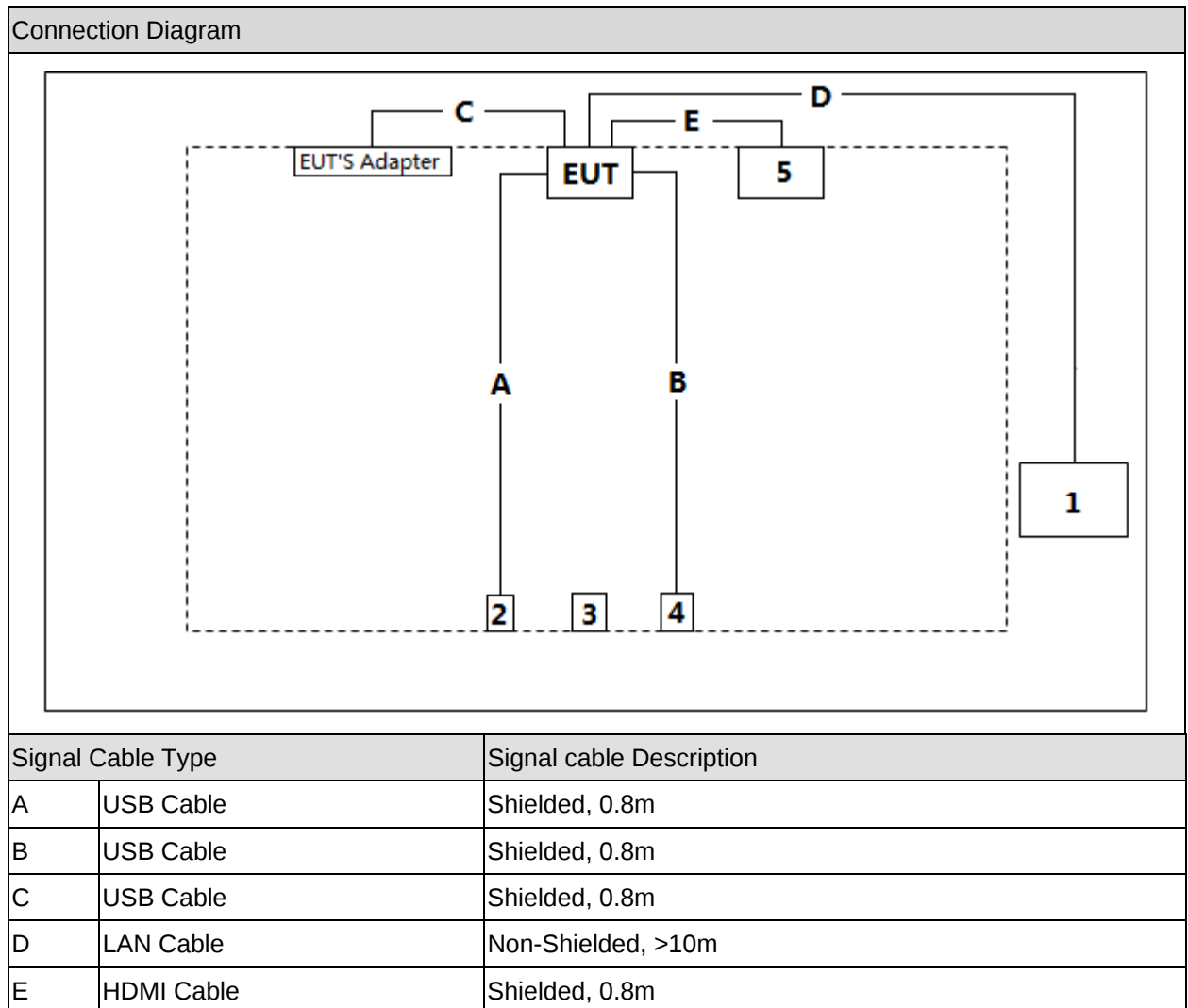
1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. This device is a composite device in accordance with Part 15 Subpart B regulations. The function for the receiver was measured and made a test report that the report number is 1410379R-RF-US-P01V02.

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	PC	DELL	OPTIPLEX 390	N/A	Non-Shielded, 1.8m
2	Mouse	DELL	MOC5UO	10D00JJL	N/A
3	Controller	Ambit Mircosystems (Shanghai) LTD.	N/A	N/A	Power by Battery
4	iPod	Apple	A1199	7J71085BVQ5	Power by PC
5	LCD Monitor	DELL	ST2420LB	CN-OXOK27-74261-189 -OA4U	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Execute some commands on the PC provided by applicant.
4	Setup the test channel and the test mode press ok to start the continue transmit or receive.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.207	Yes	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.209	Yes	No
RF Antenna Conducted Spurious	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(d)	Yes	No
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2012 15.247(d)	Yes	No
Operation Frequency Range of 20dB Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2012 15.215(c)	Yes	No
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(a)(2)	Yes	No
Power Output	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(b)(3)	Yes	No
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2012 Section 15.247(e)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

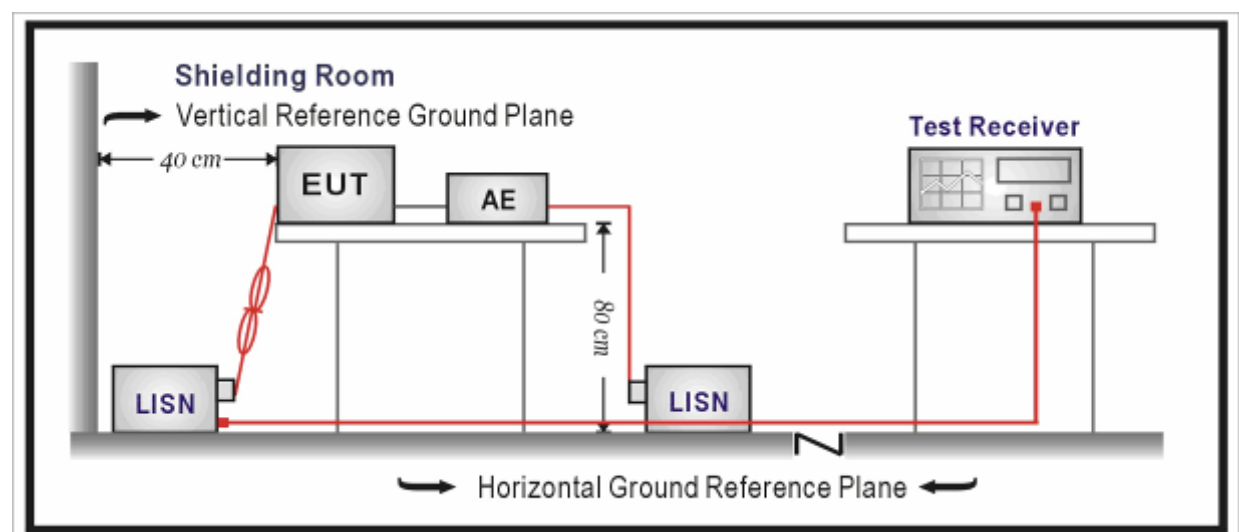
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100726	2014.03.30
Two-Line V-Network	R&S	ENV216	100043	2014.03.30
Two-Line V-Network	R&S	ENV216	100044	2014.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2014.03.01
50ohm Termination	SHX	TF2	07081401	2014.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2015.01.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to ANSI C63.10: 2009 for compliance to FCC 47CFR 15.247 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

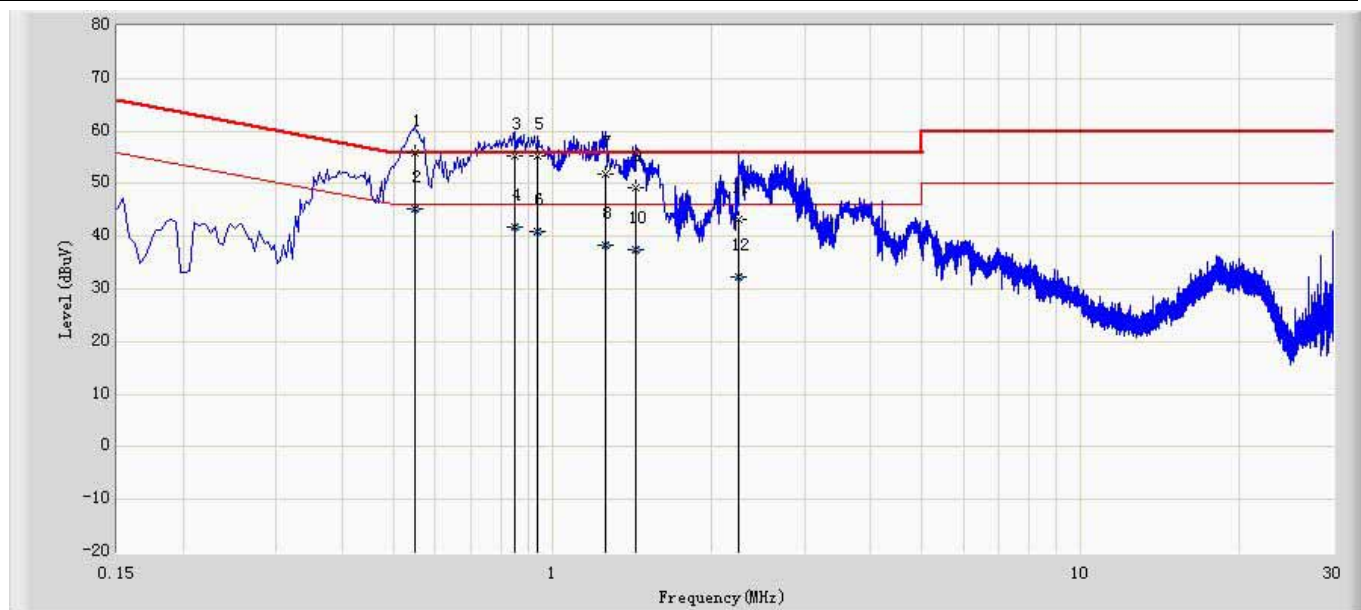
The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

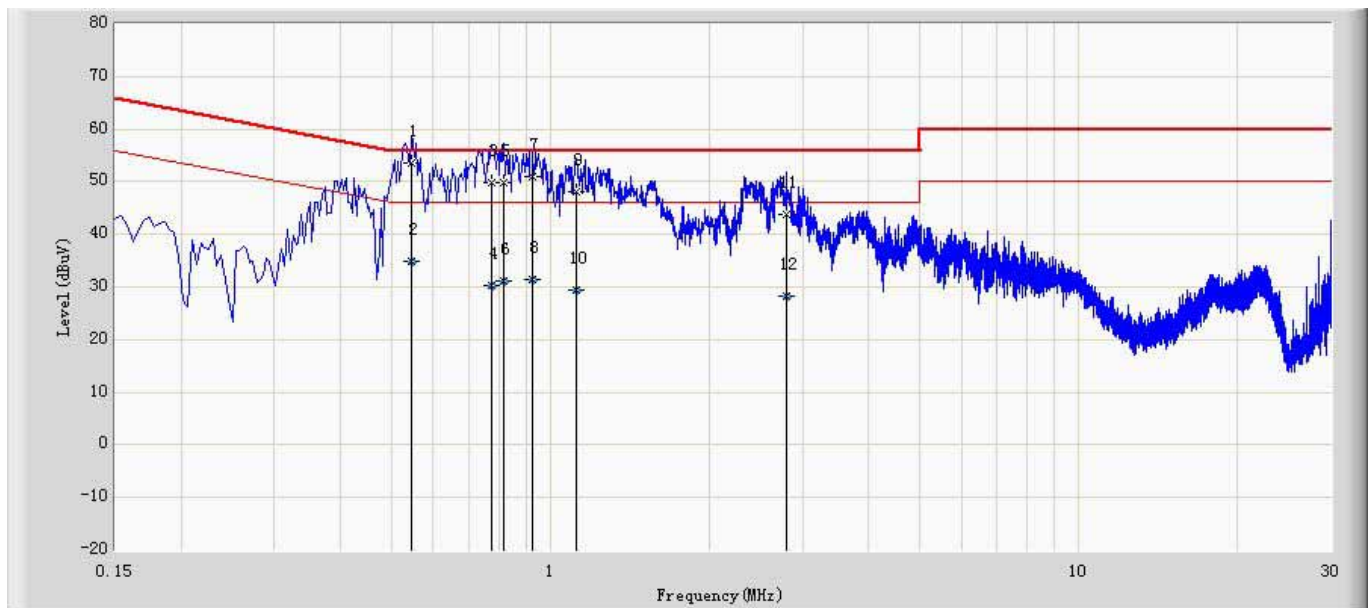
3.6. Test Result

Engineer: Toms	
Site: TR1	Time: 2014/02/11 - 17:24
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Line
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.550	55.765	45.872	-0.235	56.000	9.893	QP
2		0.550	45.303	35.410	-0.697	46.000	9.893	AV
3		0.850	55.364	45.544	-0.636	56.000	9.820	QP
4		0.850	41.712	31.893	-4.288	46.000	9.820	AV
5		0.938	55.257	45.439	-0.743	56.000	9.818	QP
6		0.938	40.889	31.071	-5.111	46.000	9.818	AV
7		1.262	51.792	41.993	-4.208	56.000	9.799	QP
8		1.262	38.465	28.666	-7.535	46.000	9.799	AV
9		1.442	49.367	39.565	-6.633	56.000	9.802	QP
10		1.442	37.448	27.646	-8.552	46.000	9.802	AV
11		2.254	43.141	33.350	-12.859	56.000	9.791	QP
12		2.254	32.295	22.504	-13.705	46.000	9.791	AV

Engineer: Toms	
Site: TR1	Time: 2014/02/11 - 17:37
Limit: FCC_Part15.207_CE_AC Power	Margin: 0
Probe: ENV216_101044(0.009-30MHz)	Polarity: Neutral
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1	



No	Mark	Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor (dB)	Type
1	*	0.546	53.703	43.685	-2.297	56.000	10.019	QP
2		0.546	34.978	24.960	-11.022	46.000	10.019	AV
3		0.774	49.877	39.960	-6.123	56.000	9.917	QP
4		0.774	30.329	20.412	-15.671	46.000	9.917	AV
5		0.814	49.782	39.845	-6.218	56.000	9.937	QP
6		0.814	31.056	21.120	-14.944	46.000	9.937	AV
7		0.926	50.900	40.898	-5.100	56.000	10.003	QP
8		0.926	31.559	21.556	-14.441	46.000	10.003	AV
9		1.122	47.960	37.933	-8.040	56.000	10.027	QP
10		1.122	29.541	19.515	-16.459	46.000	10.027	AV
11		2.798	43.866	33.875	-12.134	56.000	9.991	QP
12		2.798	28.300	18.309	-17.700	46.000	9.991	AV

4. Radiated Emission

4.1. Test Equipment

Radiated Emission / AC-2

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100573	2014.03.30
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.25
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2014.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2015.03.01
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2015.01.08

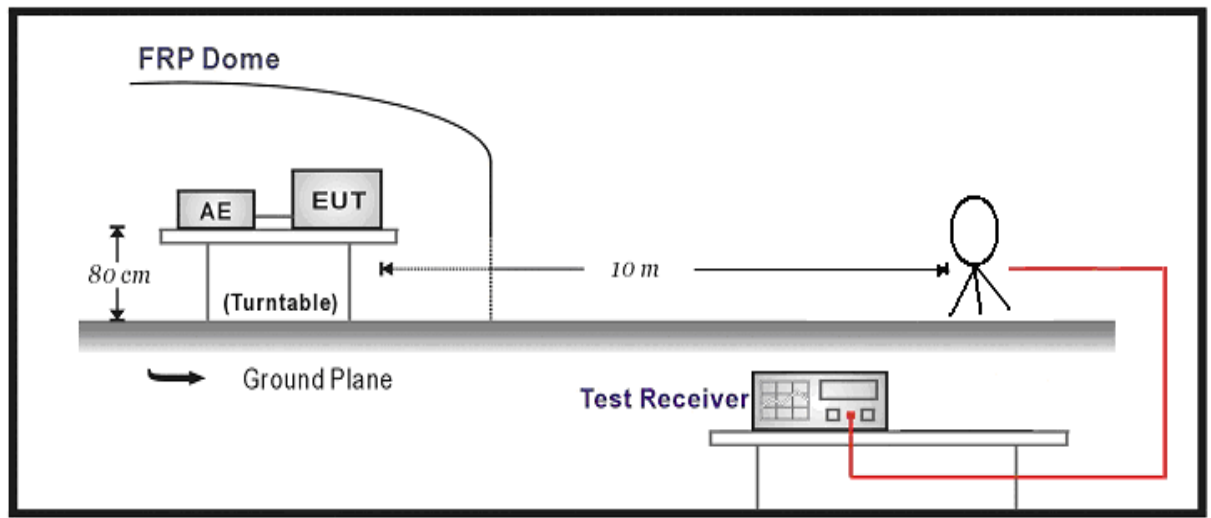
Radiated Emission / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2014.03.30
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Preamplifier	Miteq	NSP1800-25	1364185	2014.05.04
Preamplifier	QuieTek	AP-040G	CHM-0906001	2014.05.04
DRG Horn	ETS-Lindgren	3117	00123988	2015.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2014.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2015.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2015.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2015.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2014.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2015.01.08

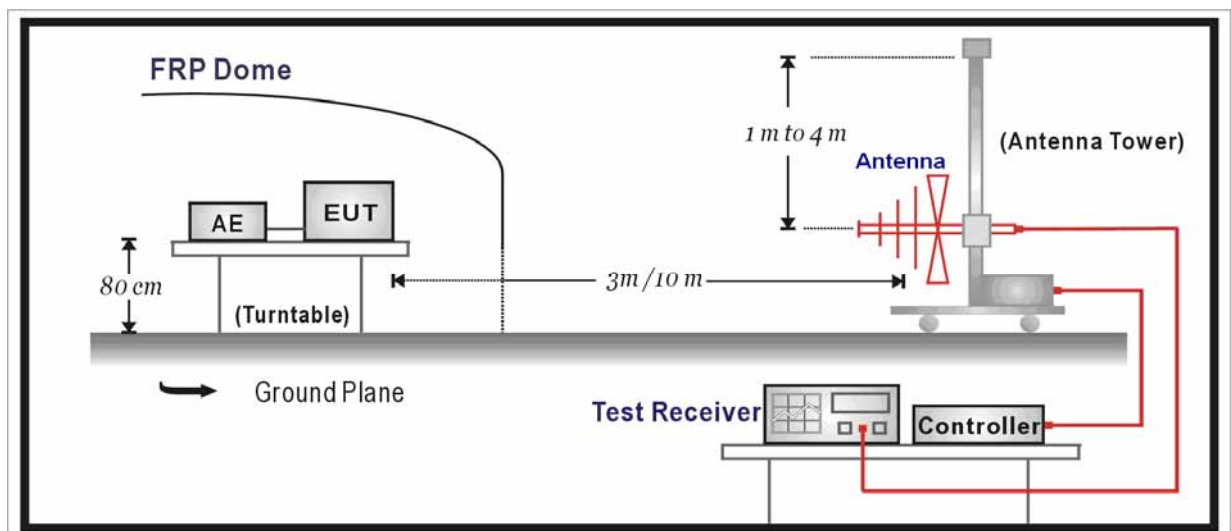
Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

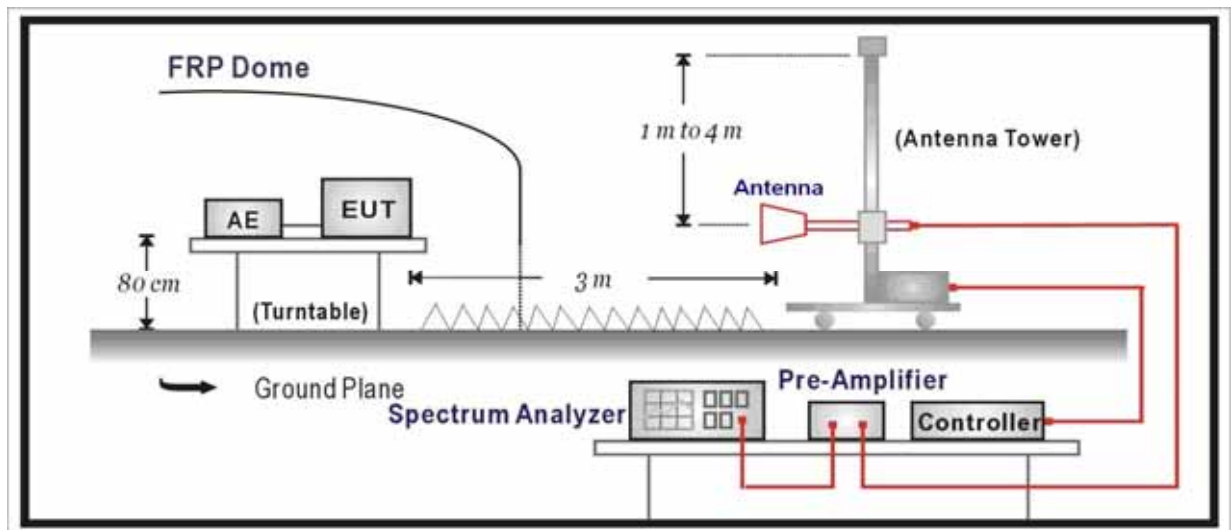
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (dBuV/m)
30 - 88	3	40
88 - 216	3	43.5
216 - 960	3	46
Above 960	3	54

Note 1: The lower limit shall apply at the transition frequency.

Note 2: Distance refers to the distance in meters between the measuring instrument Antenna and the closed point of any part of the device or system.

Note 3: E field strength (dBuV/m) = 20 log E field strength (uV/m)

4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from Antenna to the EUT was 3 meters.

The Antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This

is repeated for both horizontal and vertical polarization of the Antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2009 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

The frequency range from 30MHz to 10th harmonic is checked.

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 10~60 degrees for H-plane and 10~90 degrees for E-plane.

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
below 1G is defined as ± 3.8 dB

4.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Measure Level = Reading Level + Cable Loss + Antenna Factor - Preamplifier Gain

Mode1: Transmit at 802.11b

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	4825.0	39.4	7.1	46.5	54(Note3)	-7.5	PK
	V	4825.0	43.6	7.1	50.7	54(Note3)	-3.3	PK
	H	7236.0	31.5	10.7	42.2	54(Note3)	-11.8	PK
	V	7236.0	31.1	10.7	41.8	54(Note3)	-12.2	PK
	H	9648.0	30.8	12.4	43.2	54(Note3)	-10.8	PK
	V	9648.0	31.1	12.5	43.6	54(Note3)	-10.4	PK
6	H	4876.0	37.7	7.2	44.9	54(Note3)	-9.1	PK
	V	4876.0	43.8	7.2	51.0	54(Note3)	-3.0	PK
	H	7311.0	30.3	10.8	41.1	54(Note3)	-12.9	PK
	V	7311.0	30.4	10.8	41.2	54(Note3)	-12.8	PK
	H	9748.0	30.1	12.6	42.7	54(Note3)	-11.3	PK
	V	9748.0	29.9	12.7	42.6	54(Note3)	-11.4	PK
11	H	4927.0	38.8	7.3	46.1	54(Note3)	-7.9	PK
	V	4927.0	41.3	7.4	48.7	54(Note3)	-5.3	PK
	H	7386.0	31.0	10.9	41.9	54(Note3)	-12.1	PK
	V	7386.0	31.0	10.9	41.9	54(Note3)	-12.1	PK
	H	9848.0	31.6	12.8	44.4	54(Note3)	-9.6	PK
	V	9848.0	29.8	12.9	42.7	54(Note3)	-11.3	PK

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

2. The test trace is same as the ambient noise (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.

Mode2: Transmit at 802.11g

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	4816.5	37.1	7.1	44.2	54(Note3)	-9.8	PK
	V	4825.0	40.2	7.1	47.3	54(Note3)	-6.7	PK
	H	7236.0	29.9	10.7	40.6	54(Note3)	-13.4	PK
	V	7236.0	30.4	10.7	41.1	54(Note3)	-12.9	PK
	H	9648.0	31.4	12.4	43.8	54(Note3)	-10.2	PK
	V	9648.0	30.6	12.5	43.1	54(Note3)	-10.9	PK
6	H	4884.5	35.6	7.2	42.8	54(Note3)	-11.2	PK
	V	4876.0	40.3	7.2	47.5	54(Note3)	-6.5	PK
	H	7311.0	30.3	10.8	41.1	54(Note3)	-12.9	PK
	V	7311.0	30.8	10.8	41.6	54(Note3)	-12.4	PK
	H	9748.0	30.2	12.6	42.8	54(Note3)	-11.2	PK
	V	9748.0	29.7	12.7	42.4	54(Note3)	-11.6	PK
11	H	4927.0	36.3	7.3	43.6	54(Note3)	-10.4	PK
	V	4927.0	39.5	7.4	46.9	54(Note3)	-7.1	PK
	H	7386.0	31.3	10.9	42.2	54(Note3)	-11.8	PK
	V	7386.0	31.1	10.9	42.0	54(Note3)	-12.0	PK
	H	9848.0	30.3	12.8	43.1	54(Note3)	-10.9	PK
	V	9848.0	30.8	12.9	43.7	54(Note3)	-10.3	PK

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

2. The test trace is same as the ambient noise (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.

Mode3: Transmit at 802.11n(20MHz)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	4825.0	34.0	7.1	41.1	54(Note3)	-12.9	PK
	V	4825.0	38.5	7.1	45.6	54(Note3)	-8.4	PK
	H	7236.0	30.4	10.7	41.1	54(Note3)	-12.9	PK
	V	7236.0	30.4	10.7	41.1	54(Note3)	-12.9	PK
	H	9648.0	30.5	12.4	42.9	54(Note3)	-11.1	PK
	V	9648.0	30.7	12.5	43.2	54(Note3)	-10.8	PK
6	H	4876.0	33.5	7.2	40.7	54(Note3)	-13.3	PK
	V	4876.0	38.6	7.2	45.8	54(Note3)	-8.2	PK
	H	7311.0	30.3	10.8	41.1	54(Note3)	-12.9	PK
	V	7311.0	30.2	10.8	41.0	54(Note3)	-13.0	PK
	H	9748.0	29.7	12.6	42.3	54(Note3)	-11.7	PK
	V	9748.0	30.5	12.7	43.2	54(Note3)	-10.8	PK
11	H	4918.5	34.2	7.3	41.5	54(Note3)	-12.5	PK
	V	4927.0	38.1	7.4	45.5	54(Note3)	-8.5	PK
	H	7386.0	30.5	10.9	41.4	54(Note3)	-12.6	PK
	V	7386.0	30.1	10.9	41.0	54(Note3)	-13.0	PK
	H	9848.0	30.2	12.8	43.0	54(Note3)	-11.0	PK
	V	9848.0	30.5	12.9	43.4	54(Note3)	-10.6	PK

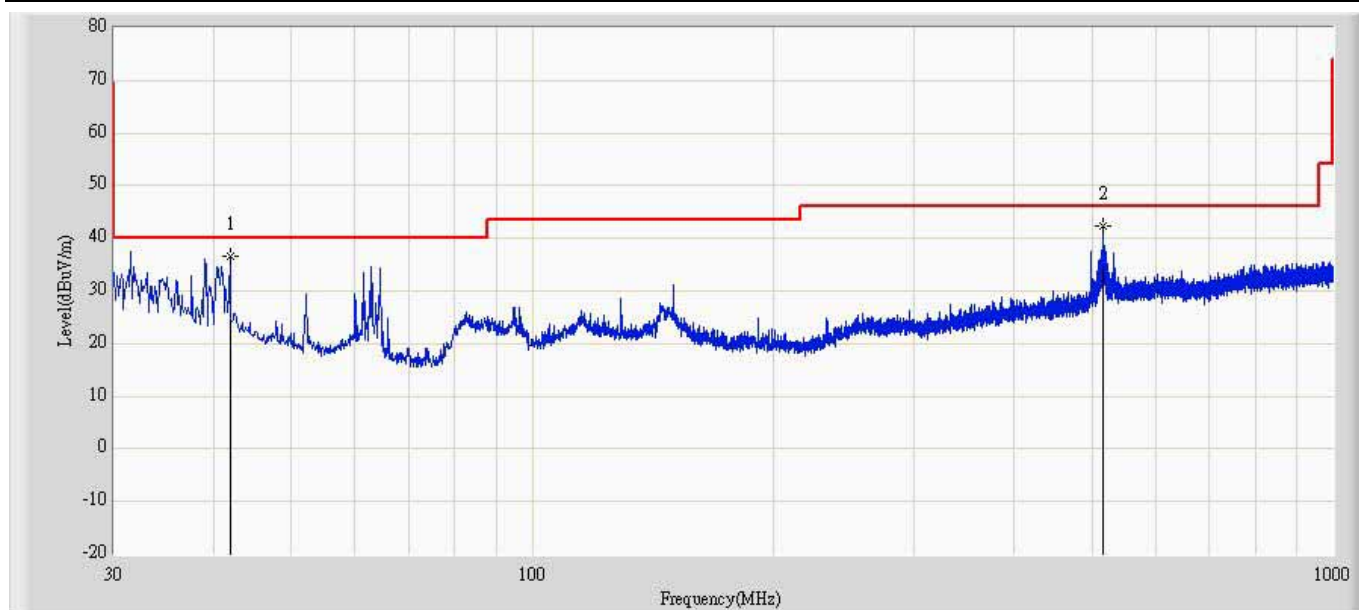
Note: 1. Measure Level = Reading Level + Factor.

2. The test trace is same as the ambient noise (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.

The worst case of Radiated Emission below 1GHz:

Engineer: Toms	
Site: AC3	Time: 2014/02/11 - 17:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: CBL6112D_27613(30-1000MHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	41.882	36.697	18.013	-3.303	40.000	18.683	QP
2		516.819	42.444	16.328	-3.556	46.000	26.116	QP

Engineer: Toms

Site: AC3

Time: 2014/02/11 - 17:54

Limit: FCC_Part15.209_RE(3m)

Margin: 0

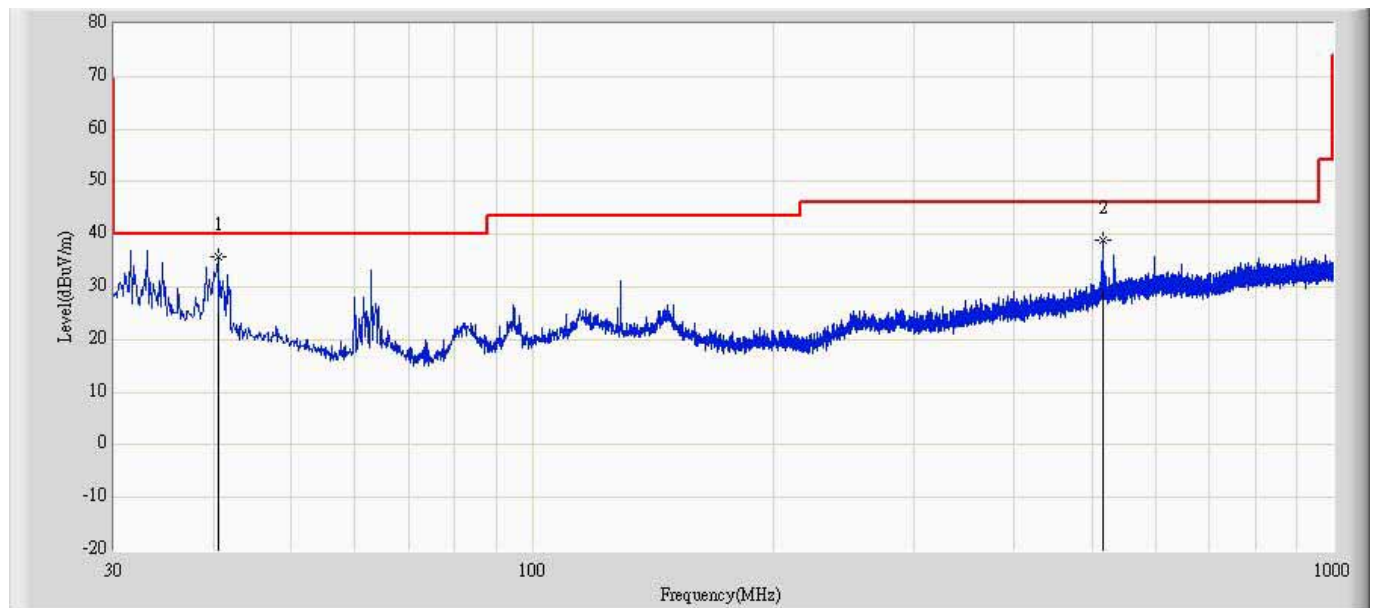
Probe: CBL6112D_27613(30-1000MHz)

Polarity: Vertical

EUT: IP-STB

Power: AC 120V/60Hz

Note: Mode1: Transmit at channel 2412MHz by 802.11b



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	40.428	35.883	16.404	-4.117	40.000	19.479	QP
2		515.970	38.853	12.774	-7.147	46.000	26.079	QP

5. RF Antenna Conducted Spurious

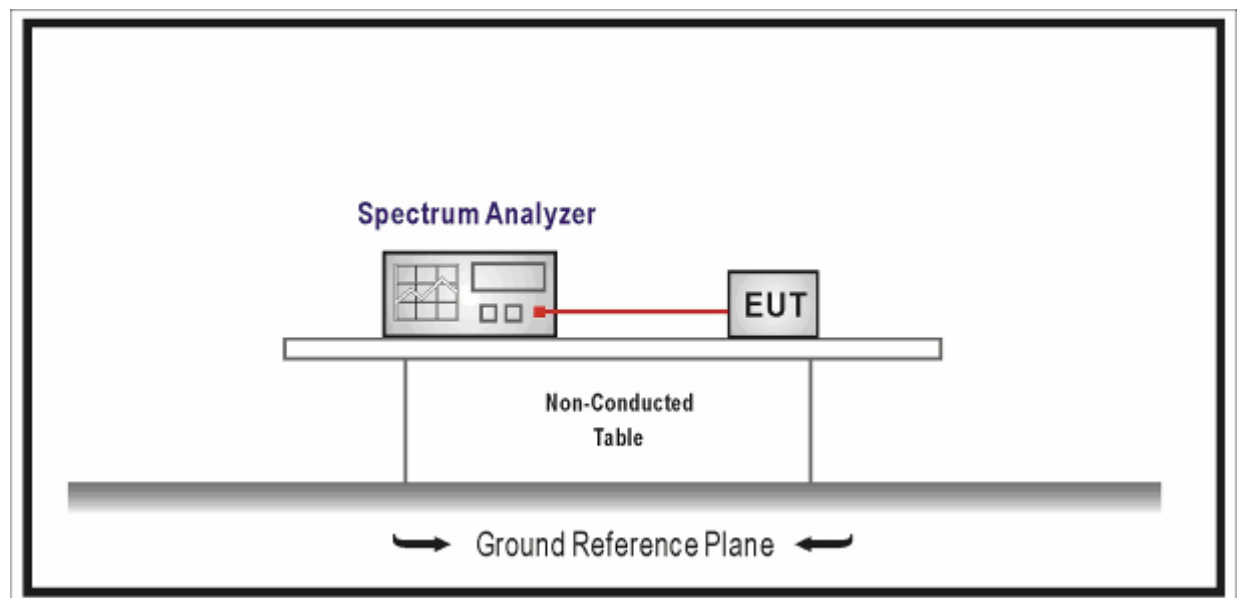
5.1. Test Equipment

RF Antenna Conducted Spurious / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2014.03.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

5.4. Test Procedure

The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW $\geq$ 3* RBW, scan up through 10th harmonic.

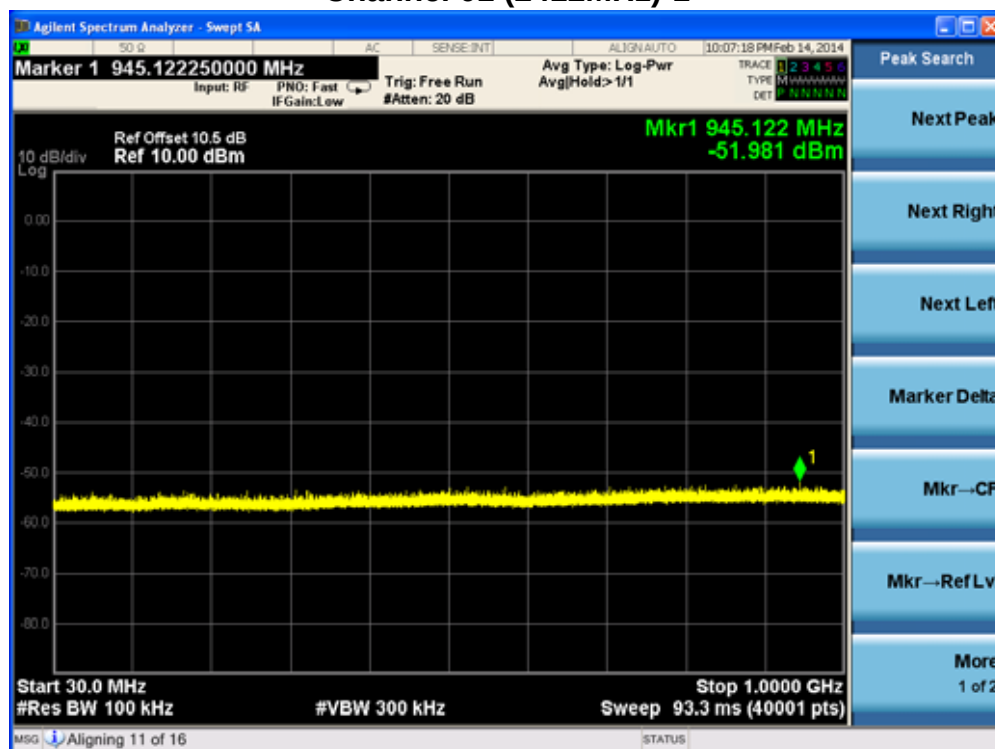
5.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

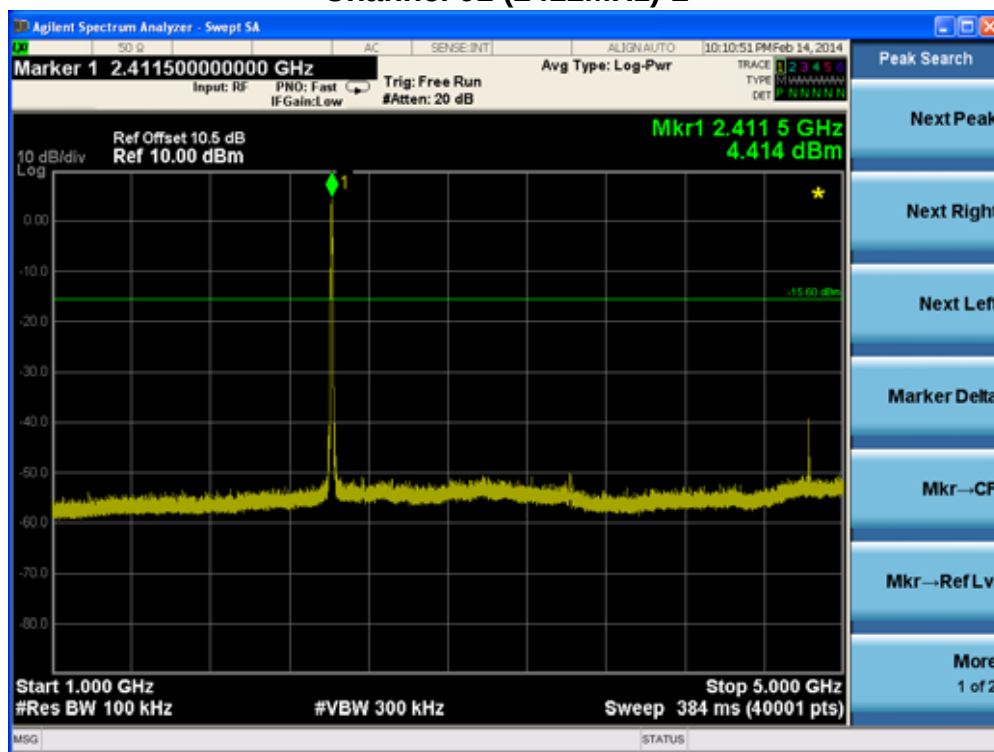
5.6. Test Result

Product	:	IP-STB
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

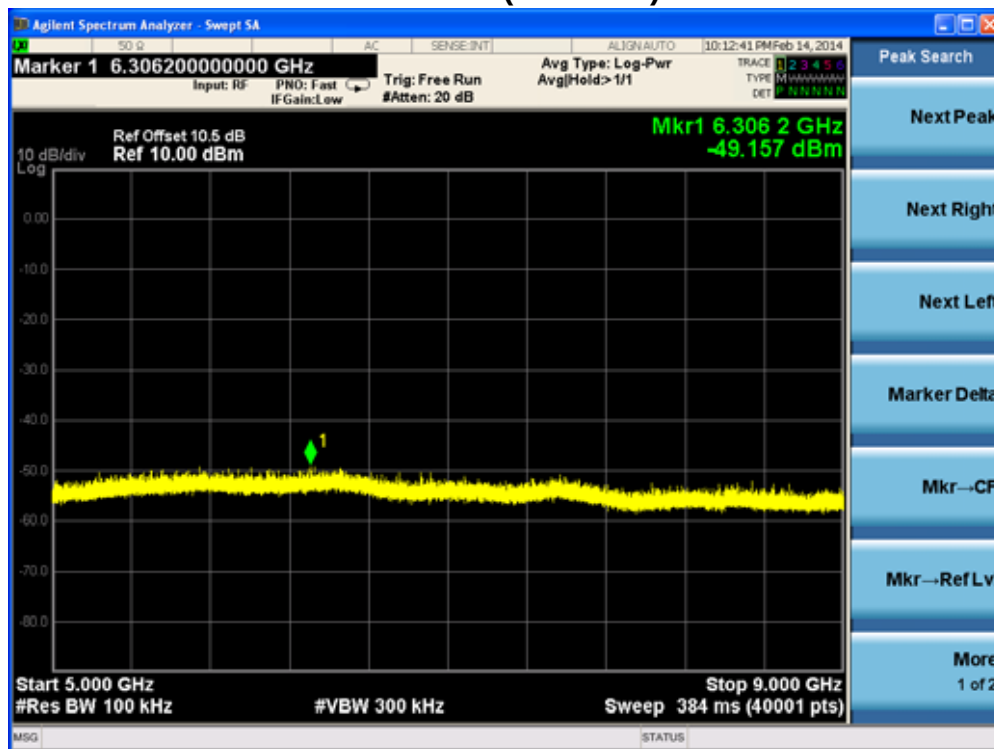
Channel 01 (2412MHz)-1



Channel 01 (2412MHz)-2



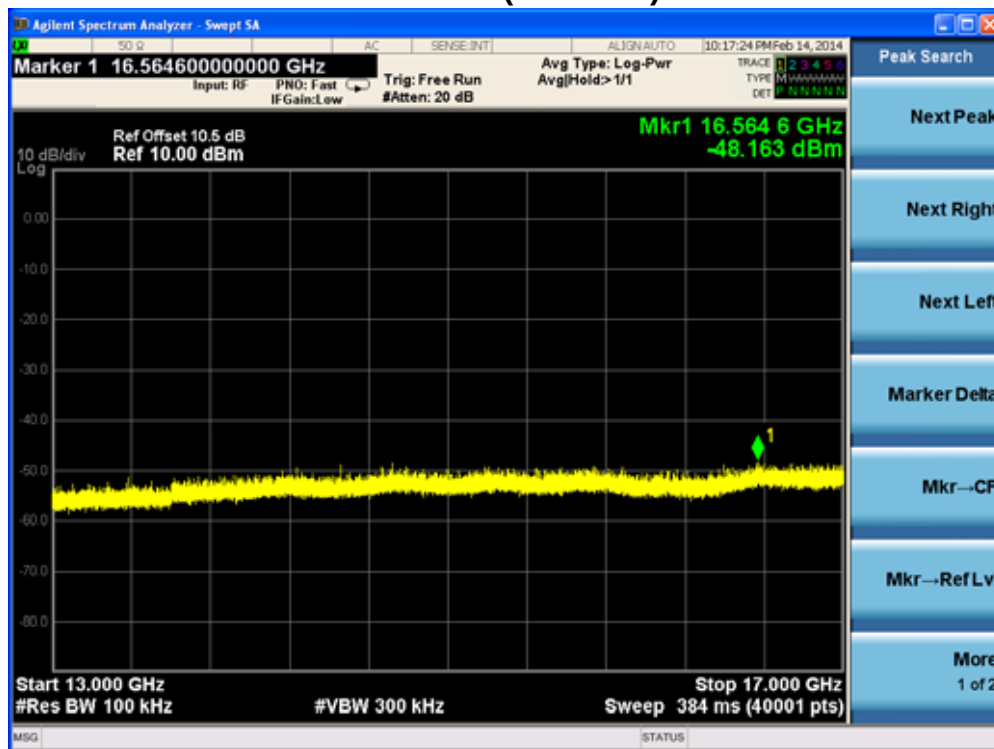
Channel 01 (2412MHz)-3



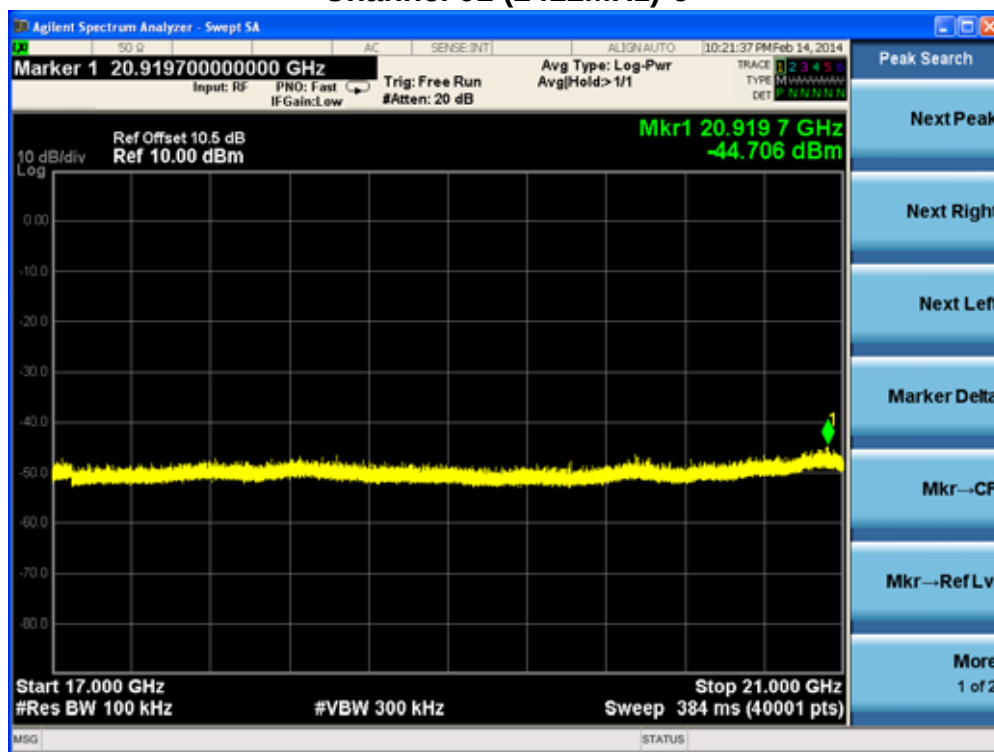
Channel 01 (2412MHz)-4



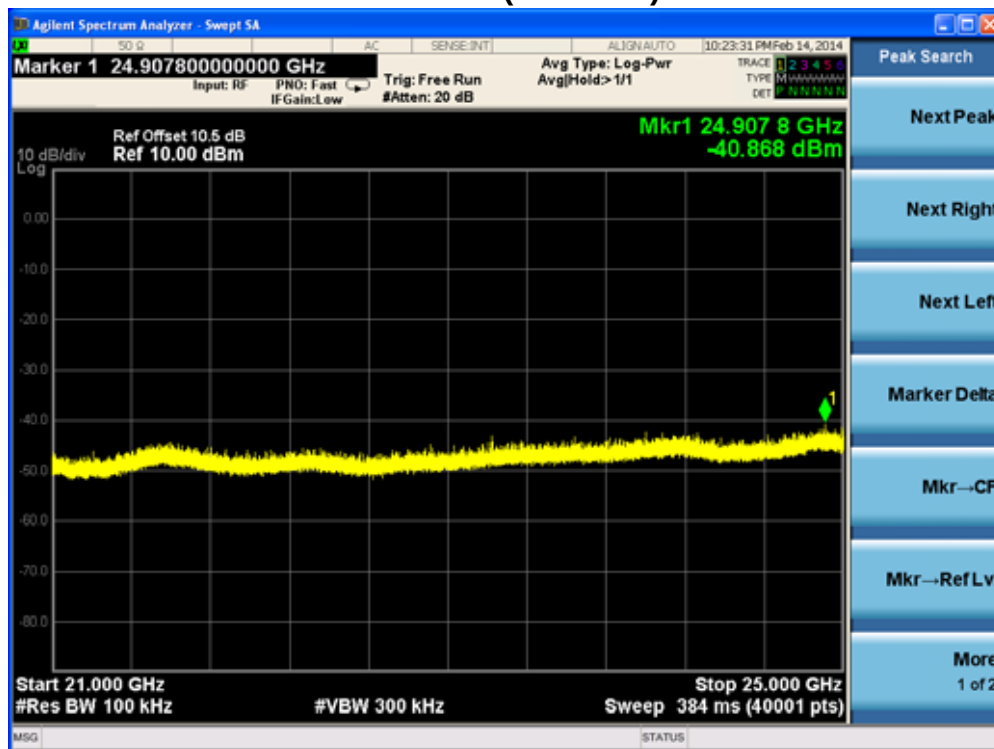
Channel 01 (2412MHz)-5



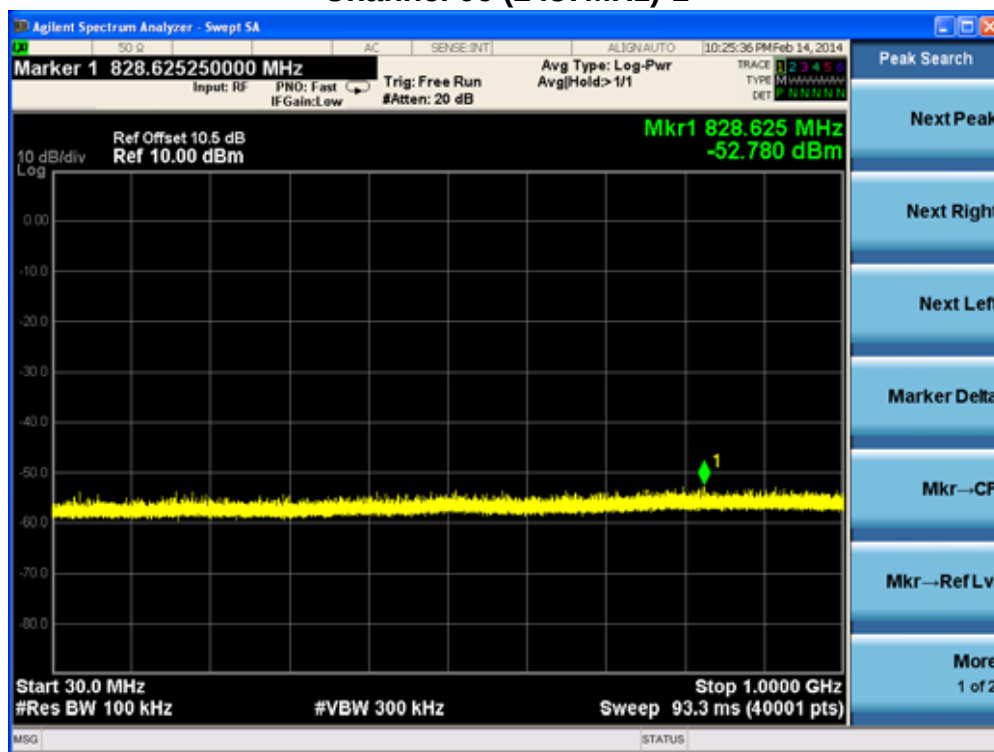
Channel 01 (2412MHz)-6



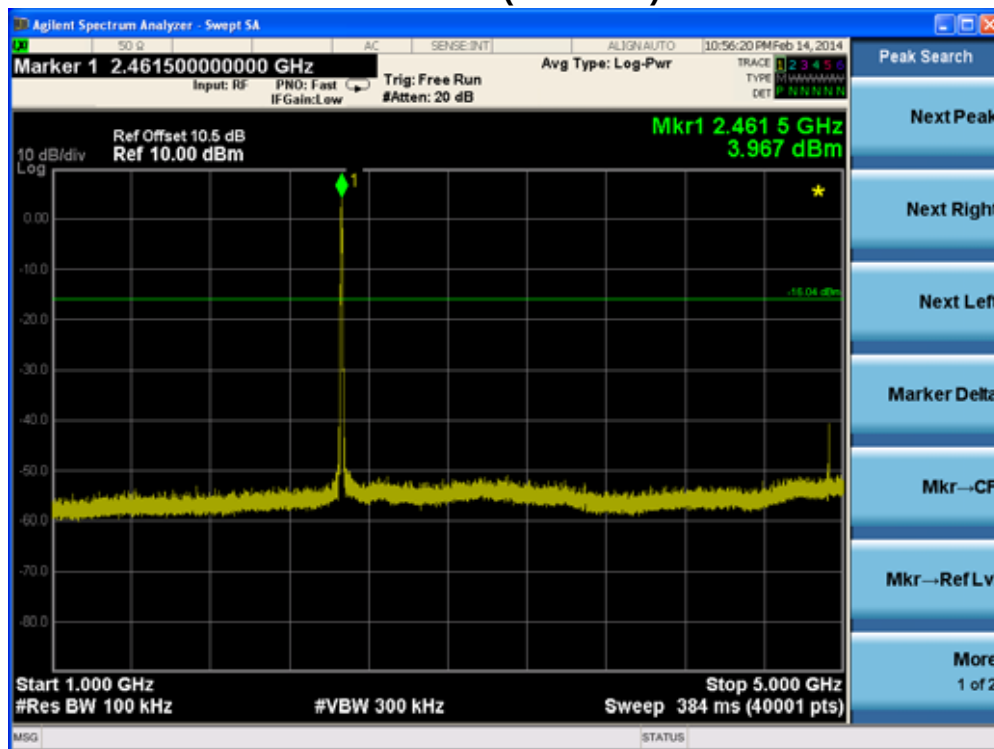
Channel 01 (2412MHz)-7



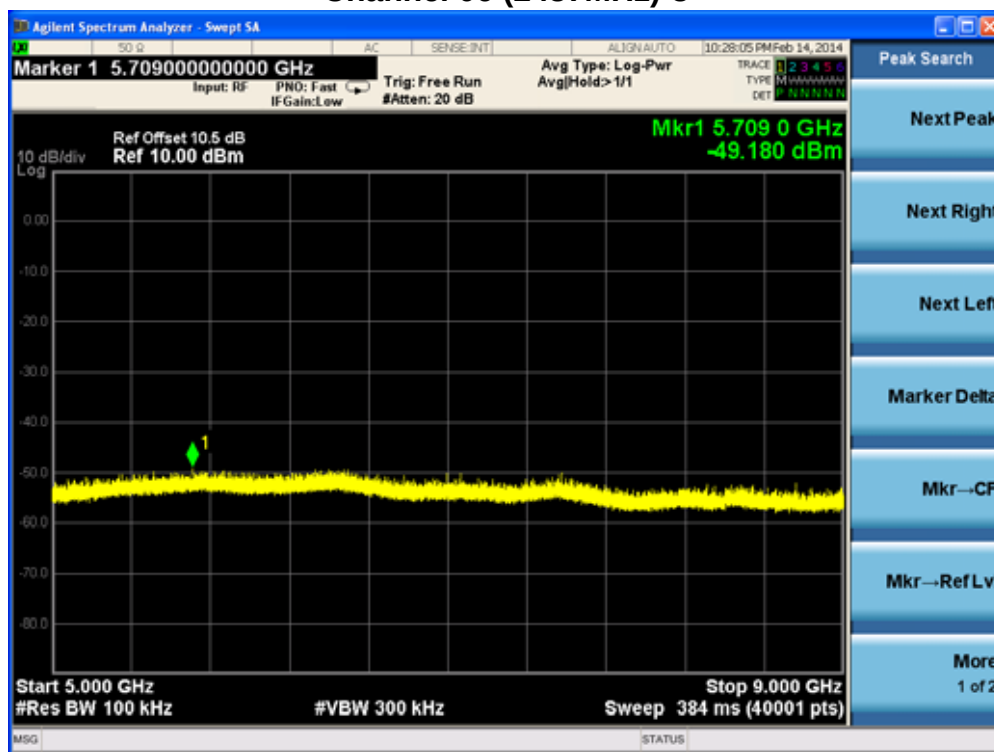
Channel 06 (2437MHz)-1



Channel 06 (2437MHz)-2



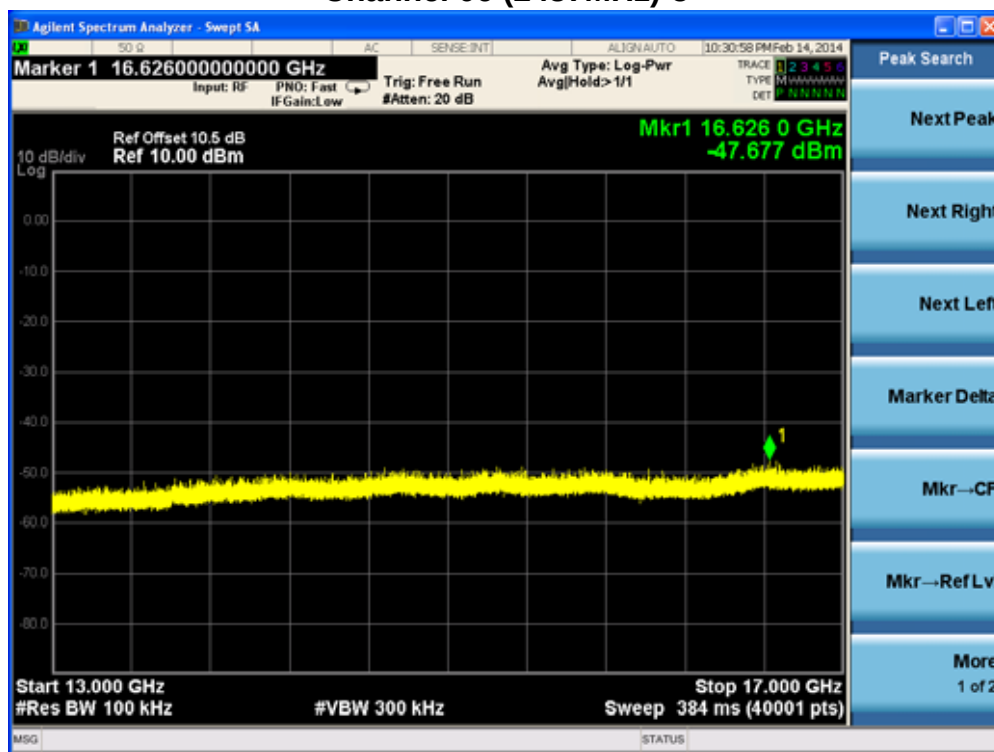
Channel 06 (2437MHz)-3



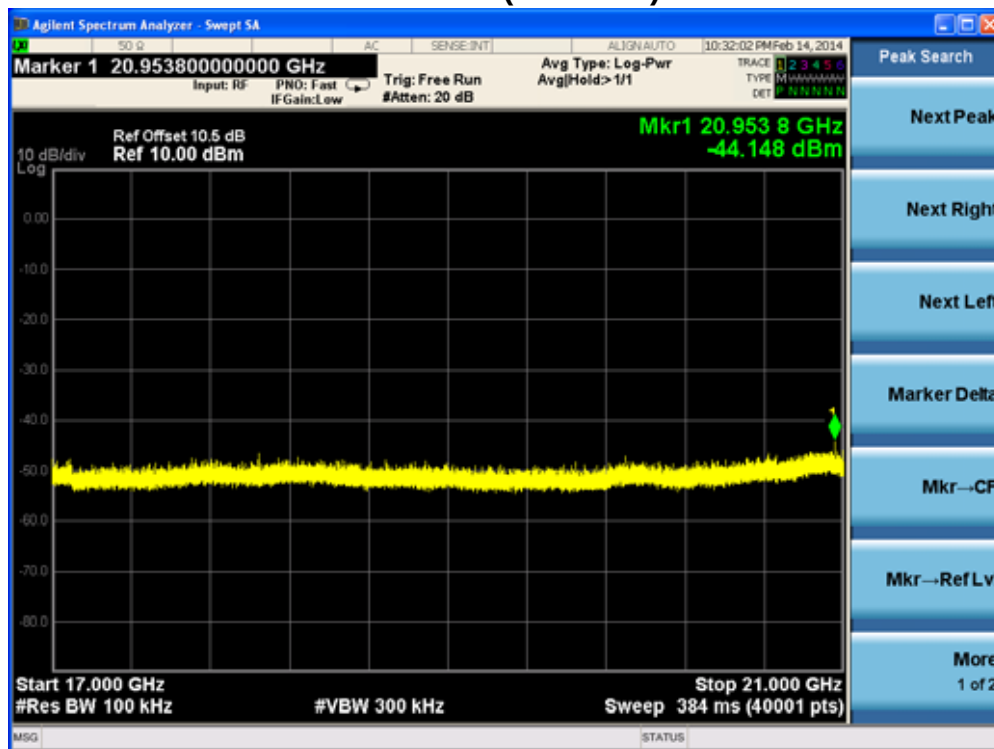
Channel 06 (2437MHz)-4



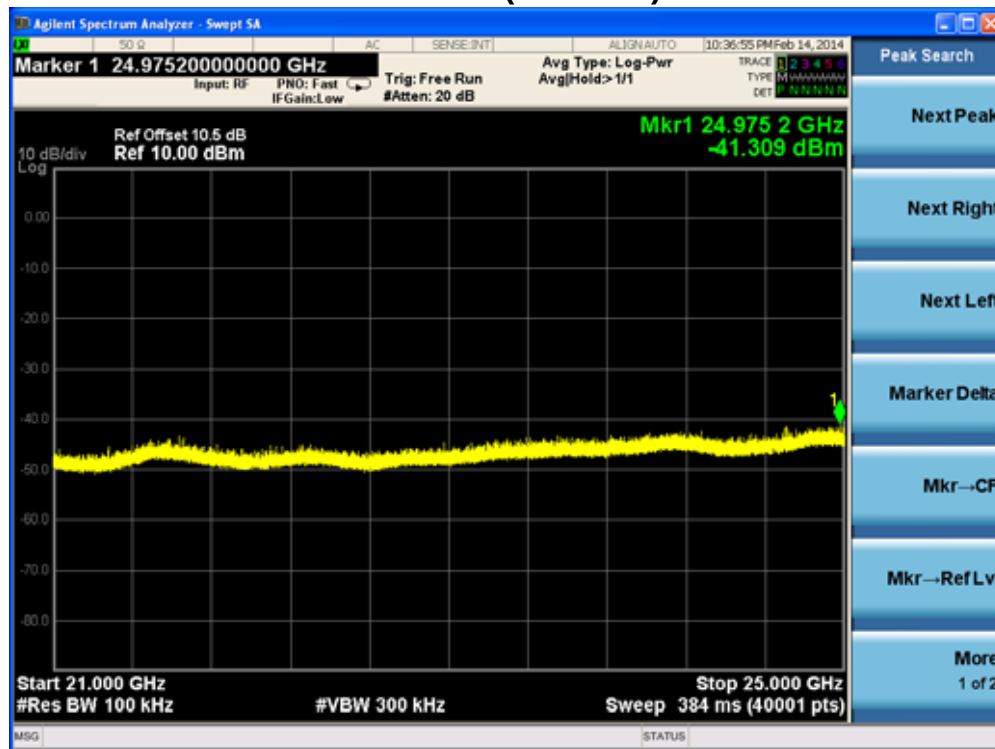
Channel 06 (2437MHz)-5



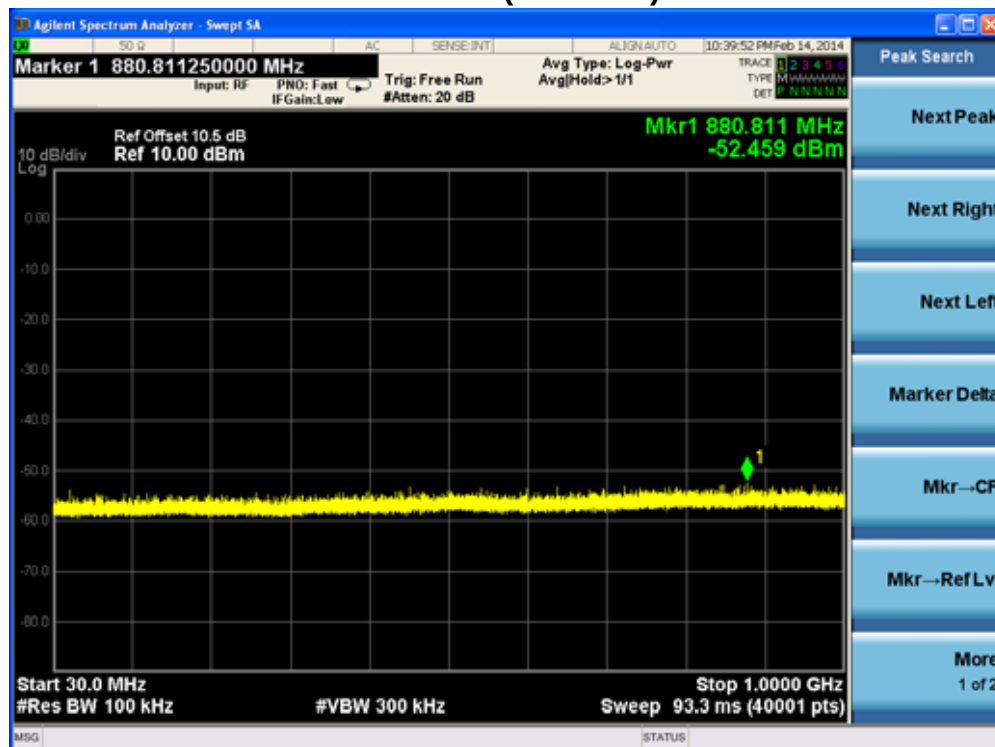
Channel 06 (2437MHz)-6



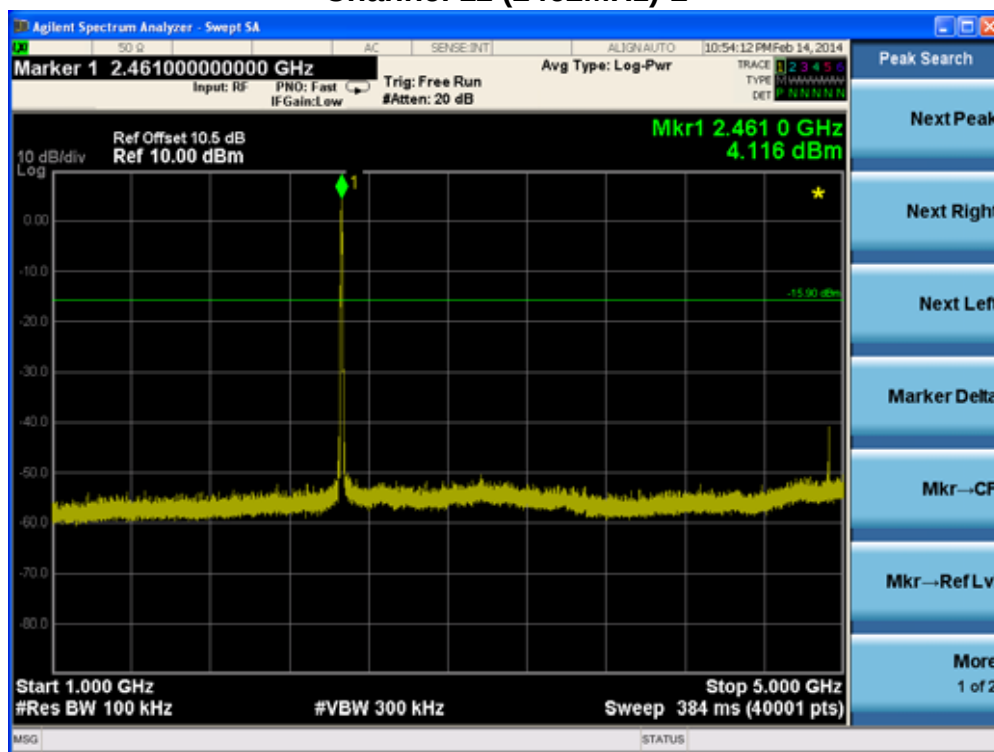
Channel 06 (2437MHz)-7



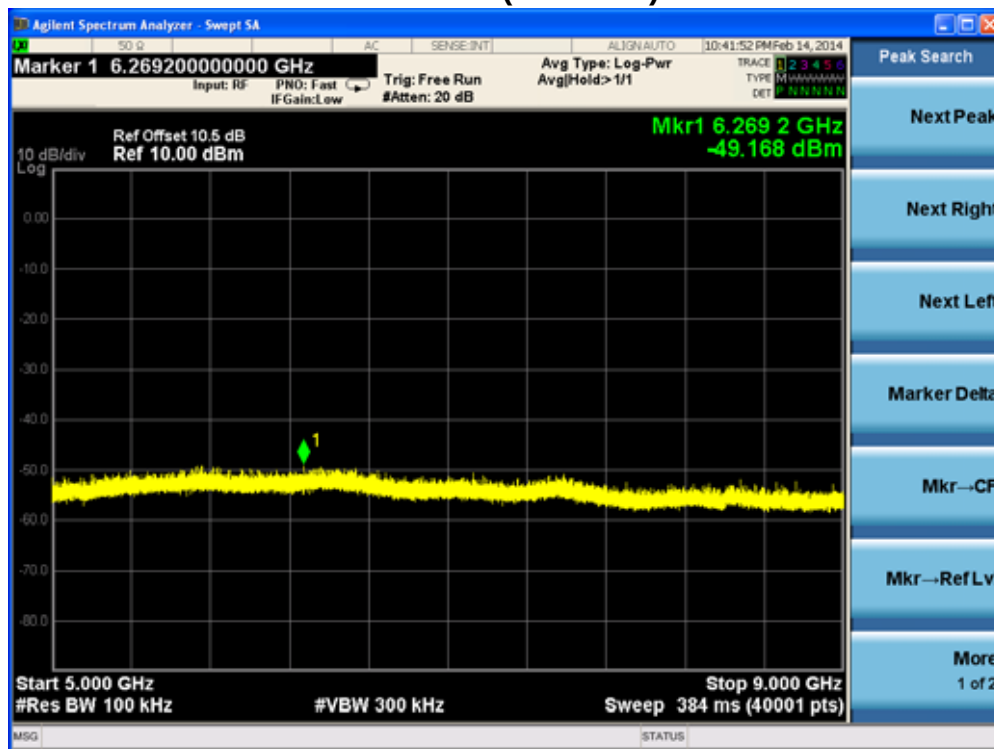
Channel 11 (2462MHz)-1



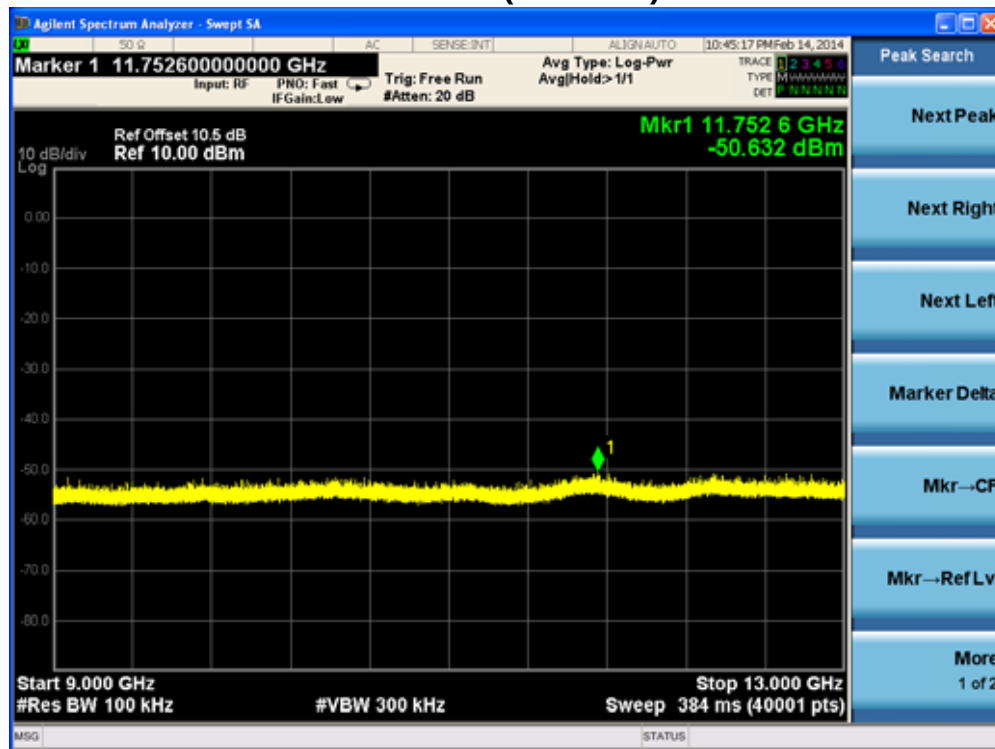
Channel 11 (2462MHz)-2



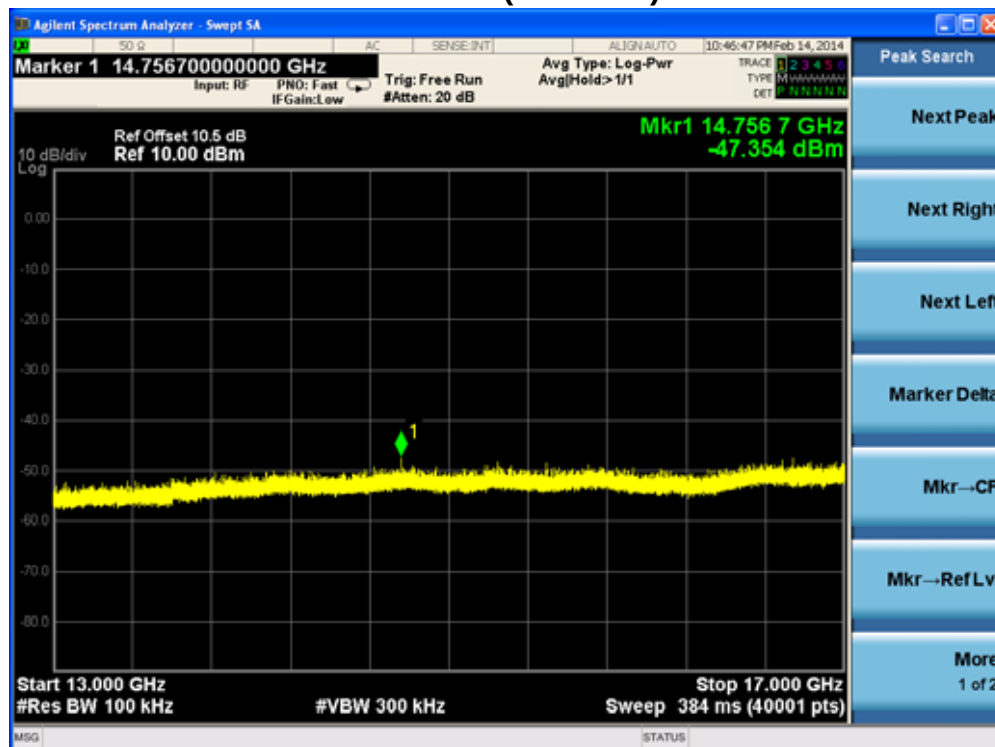
Channel 11 (2462MHz)-3



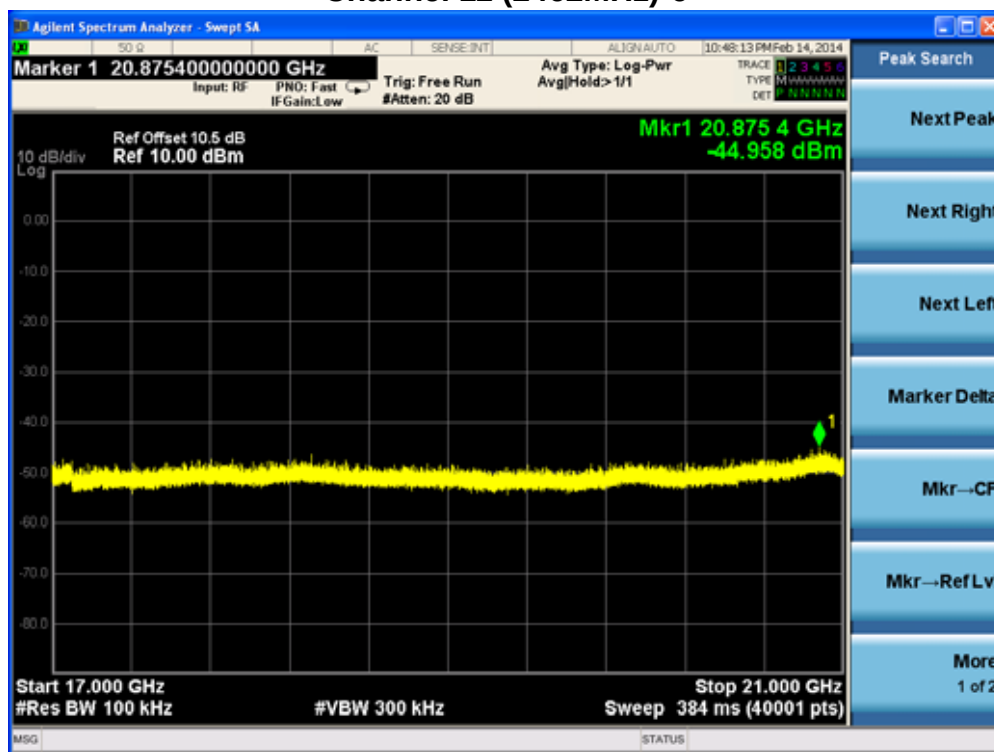
Channel 11 (2462MHz)-4



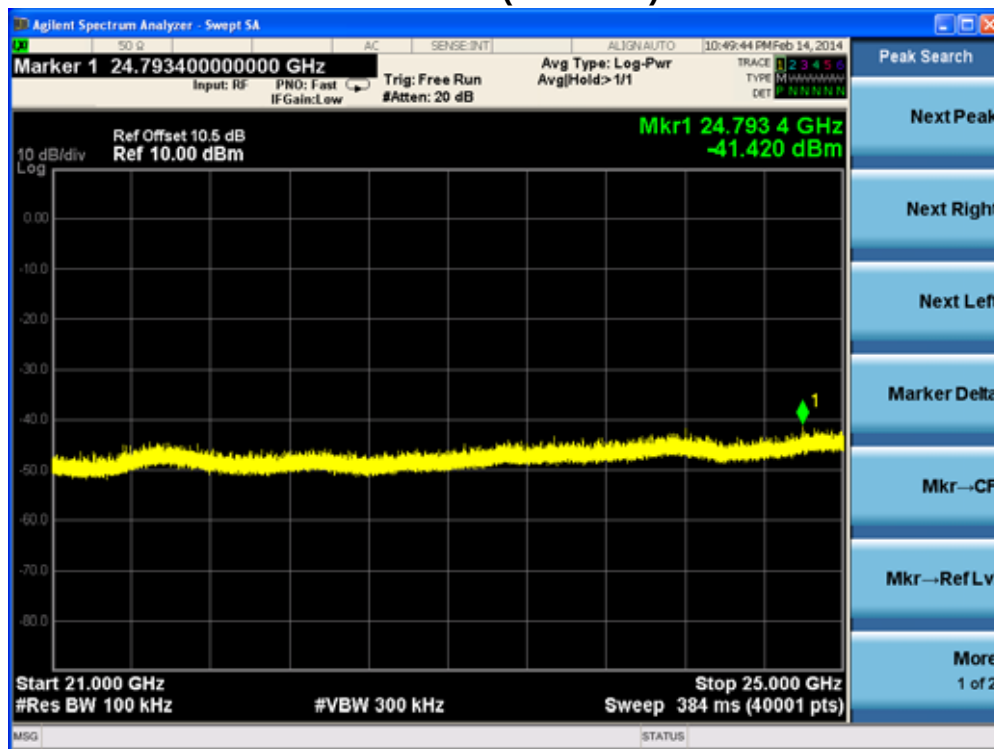
Channel 11 (2462MHz)-5



Channel 11 (2462MHz)-6

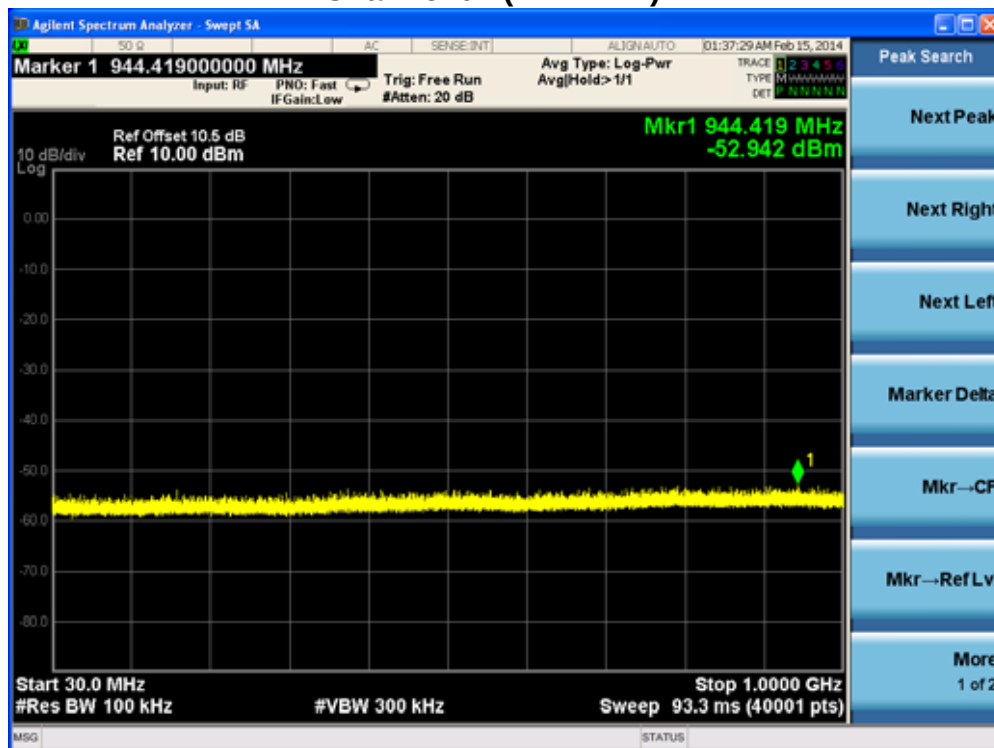


Channel 11 (2462MHz)-7

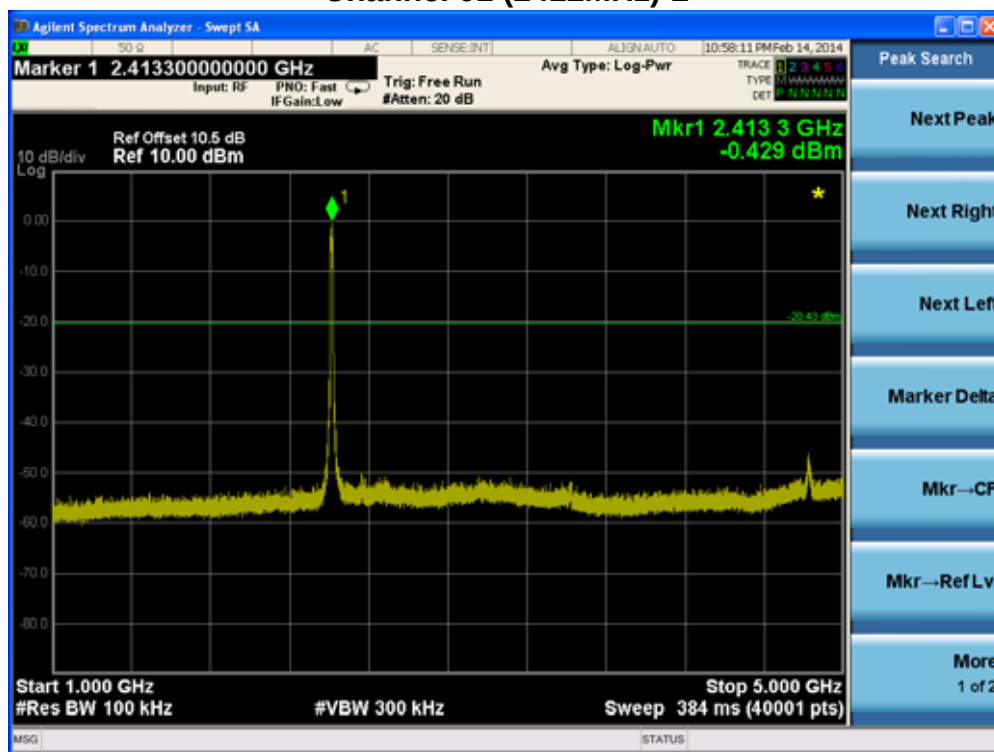


Product	:	IP-STB
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel 01 (2412MHz)-1



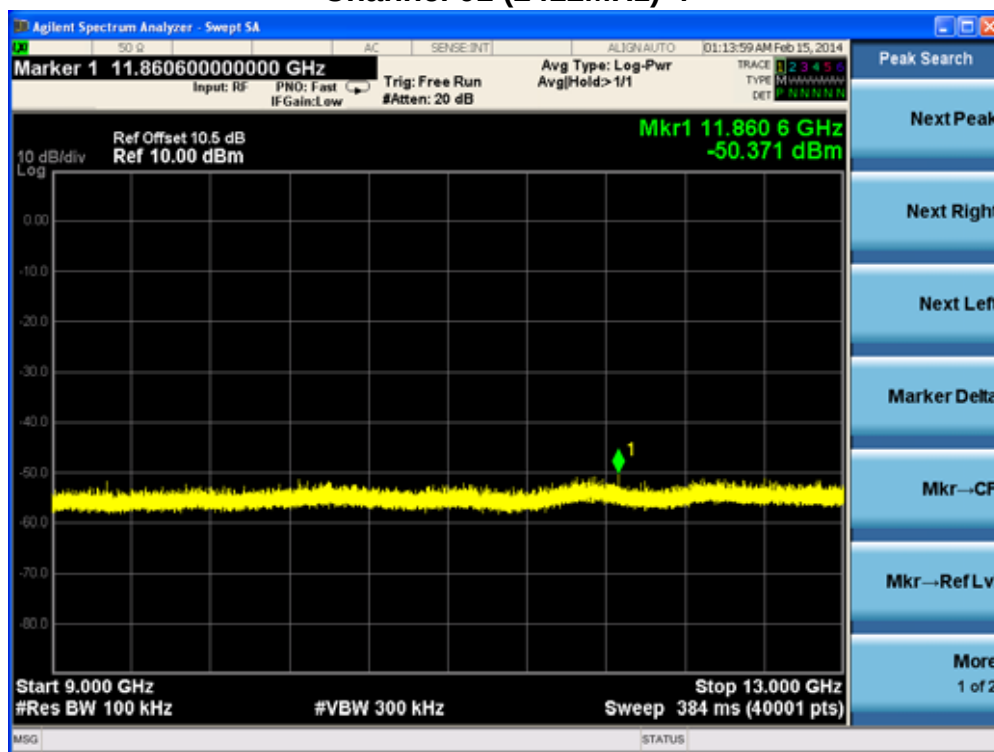
Channel 01 (2412MHz)-2



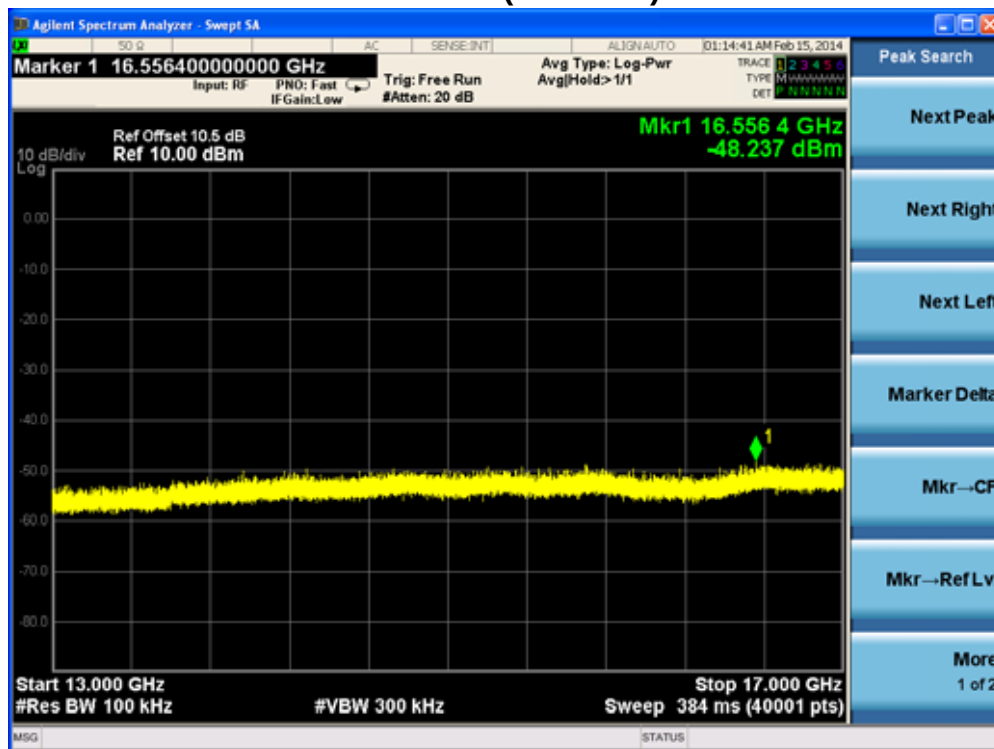
Channel 01 (2412MHz)-3



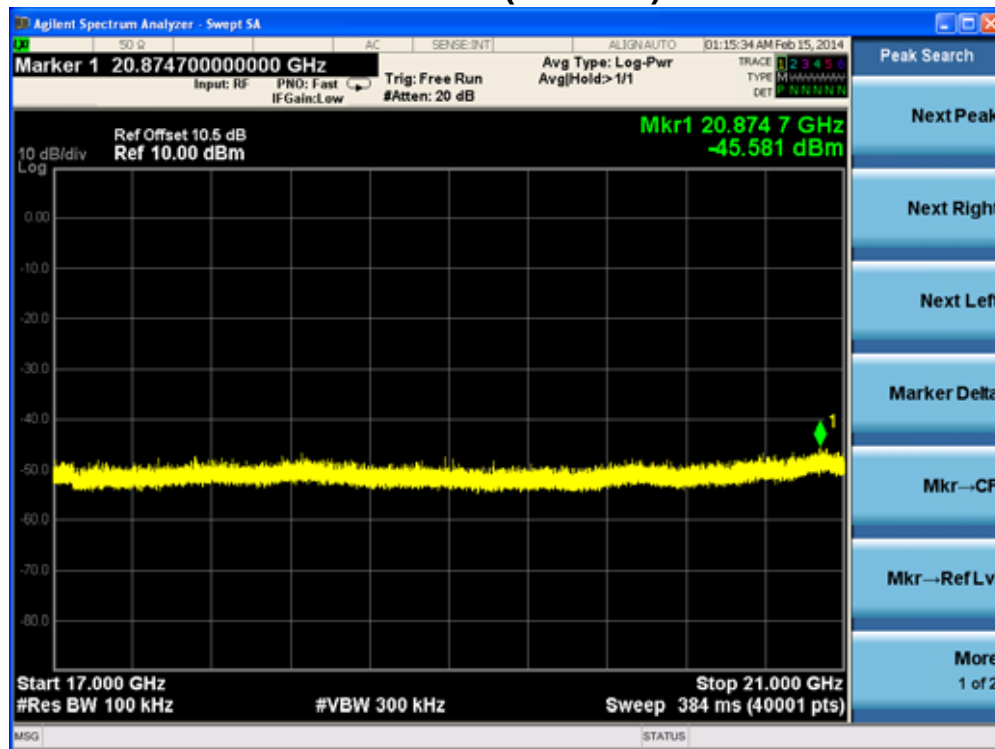
Channel 01 (2412MHz)-4



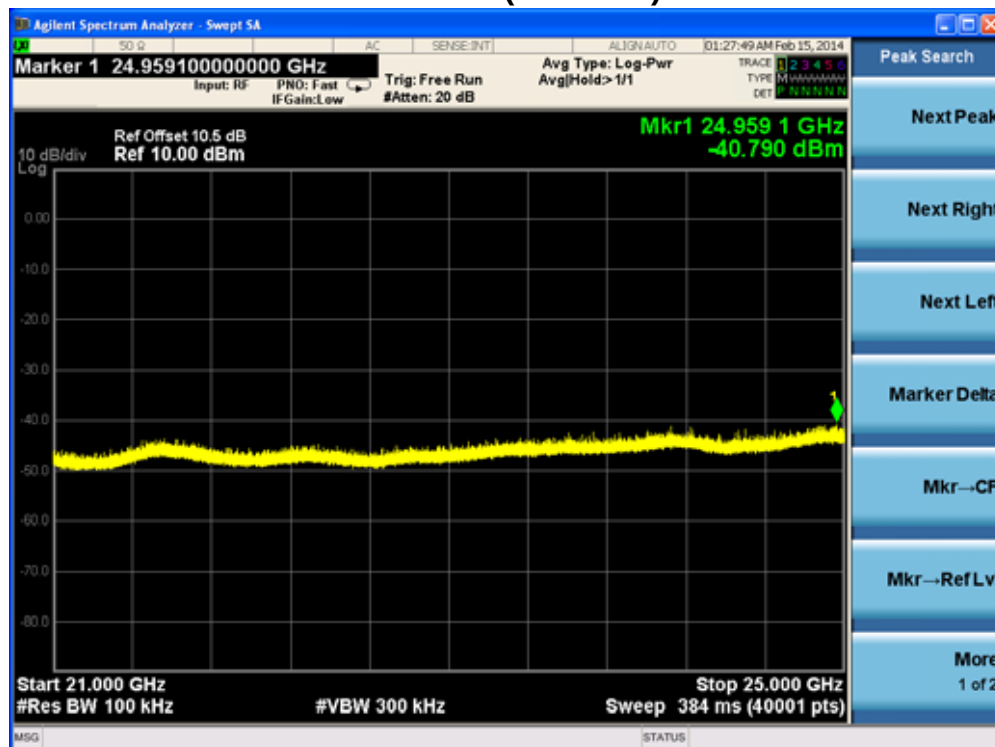
Channel 01 (2412MHz)-5



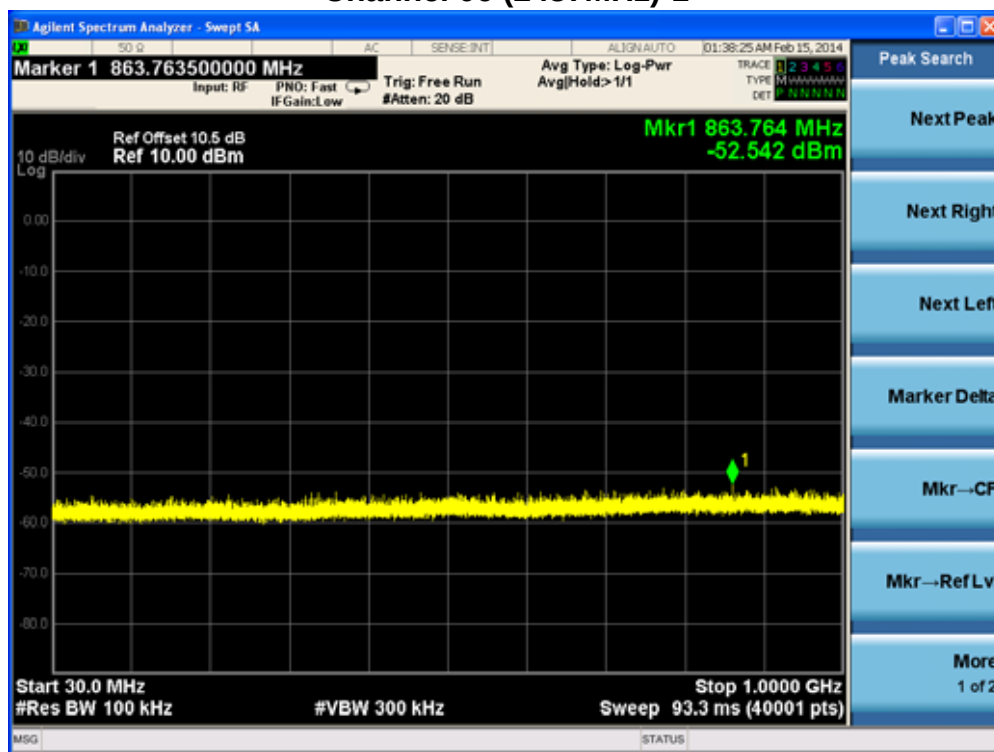
Channel 01 (2412MHz)-6



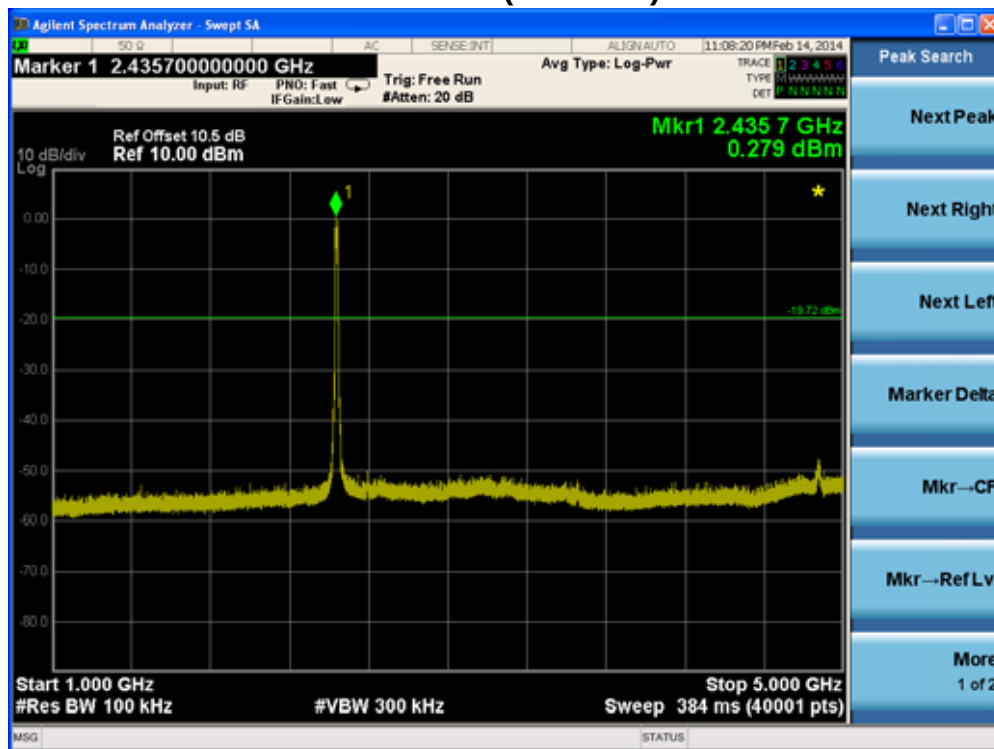
Channel 01 (2412MHz)-7



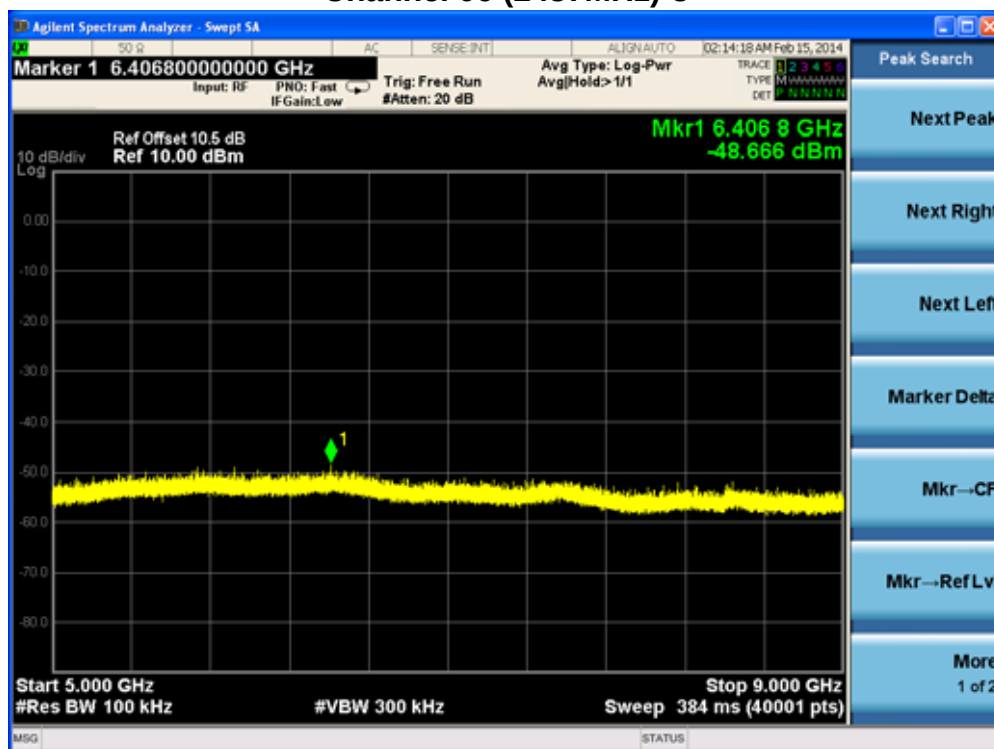
Channel 06 (2437MHz)-1



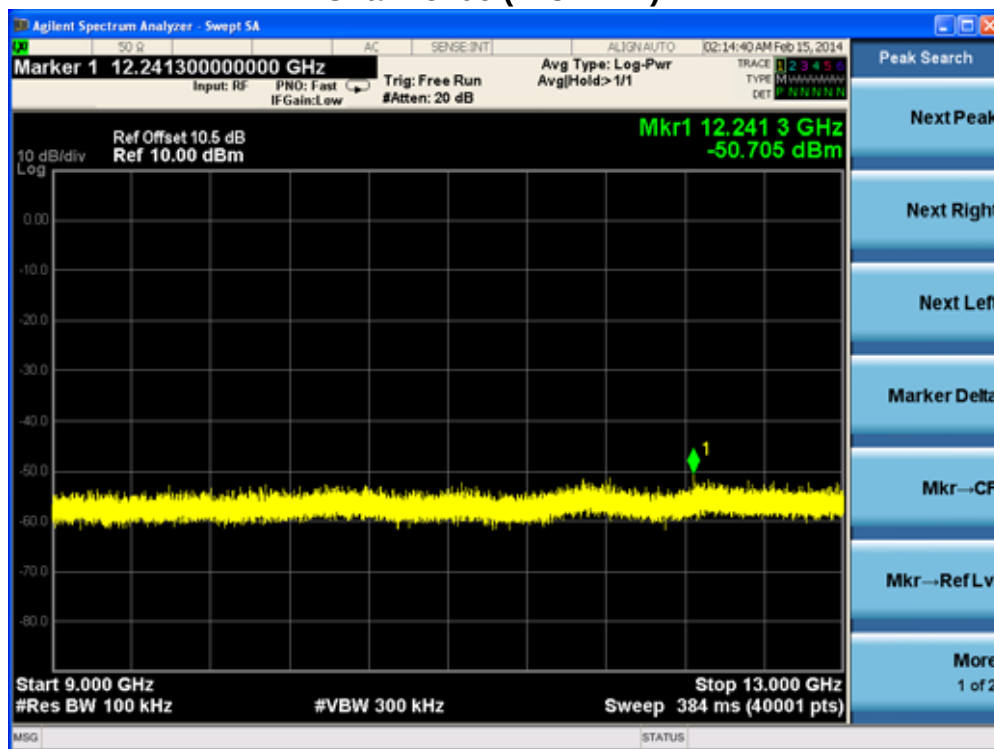
Channel 06 (2437MHz)-2



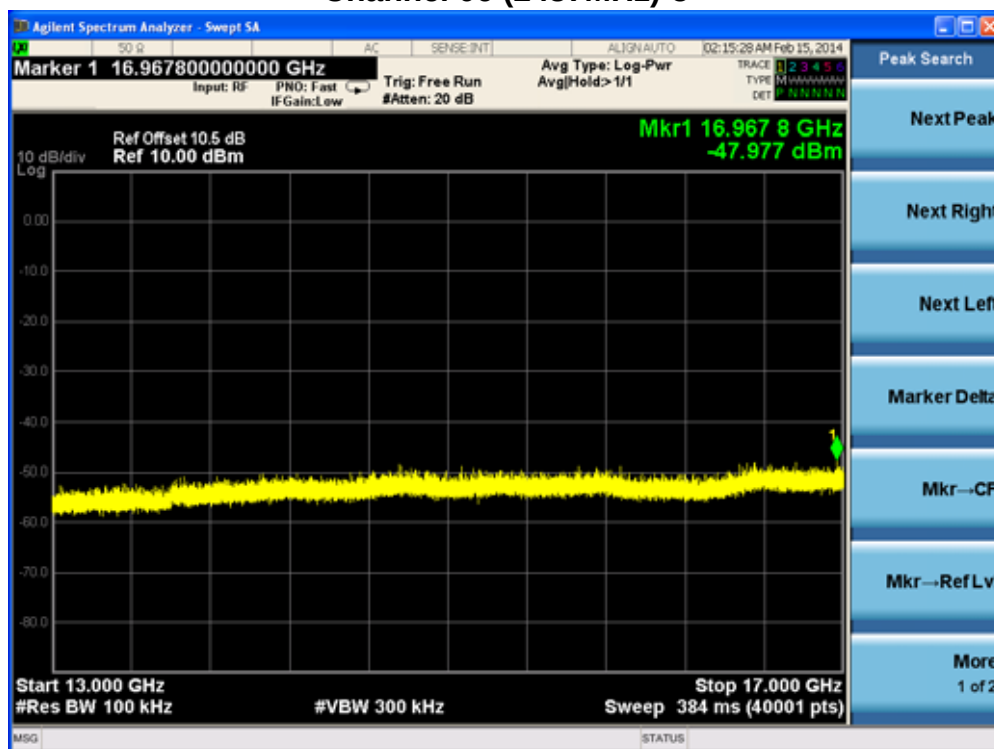
Channel 06 (2437MHz)-3



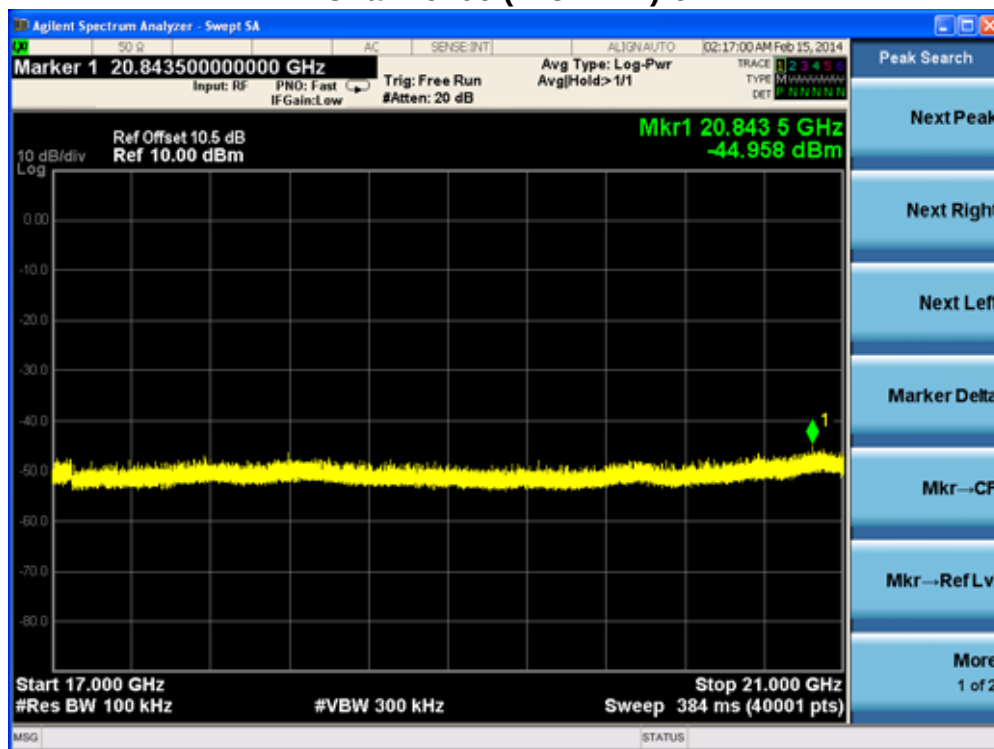
Channel 06 (2437MHz)-4



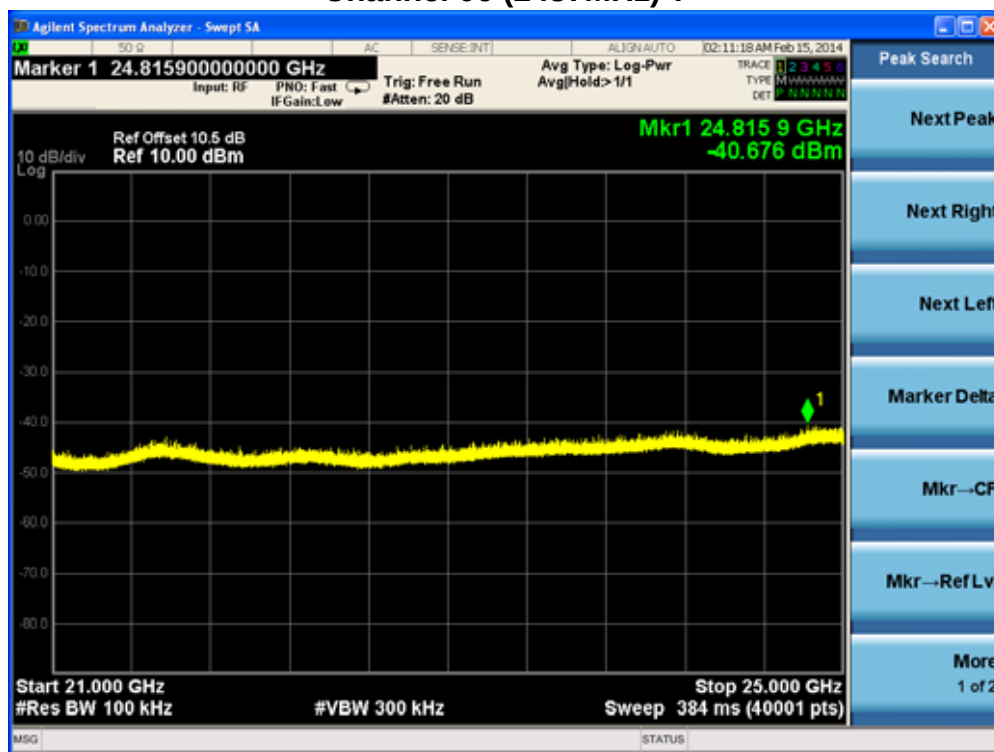
Channel 06 (2437MHz)-5



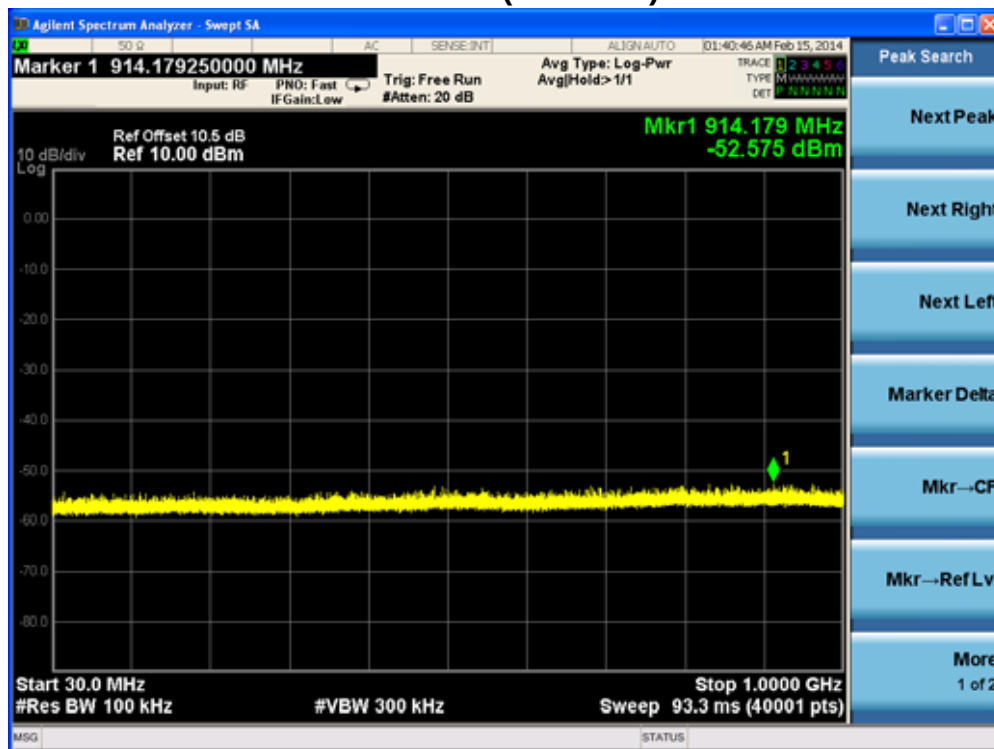
Channel 06 (2437MHz)-6



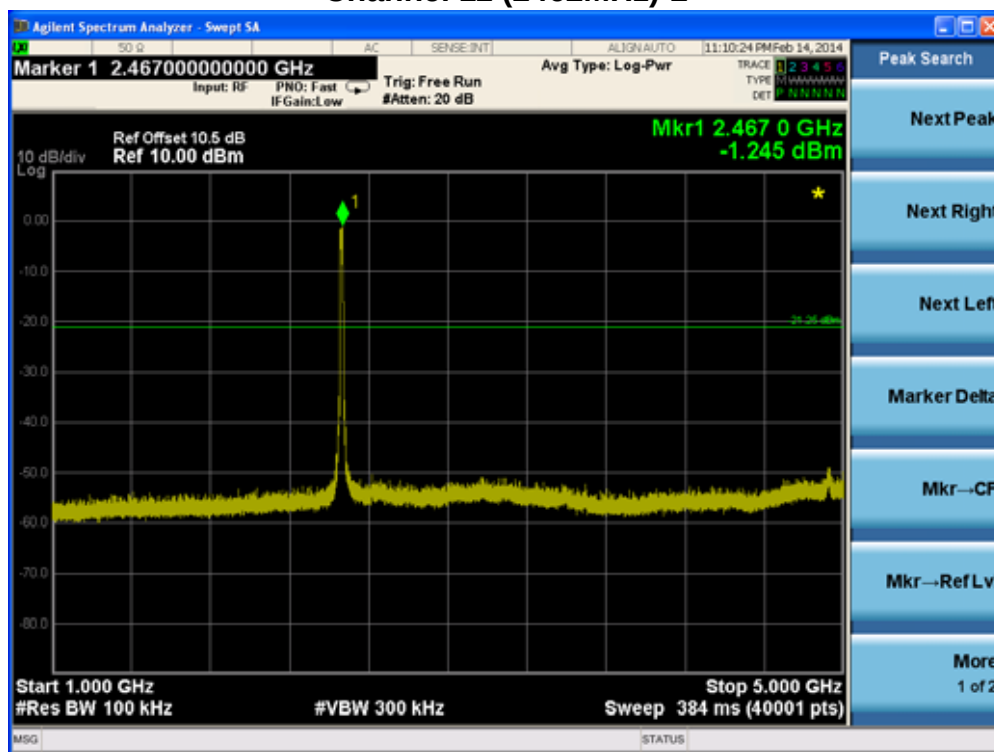
Channel 06 (2437MHz)-7



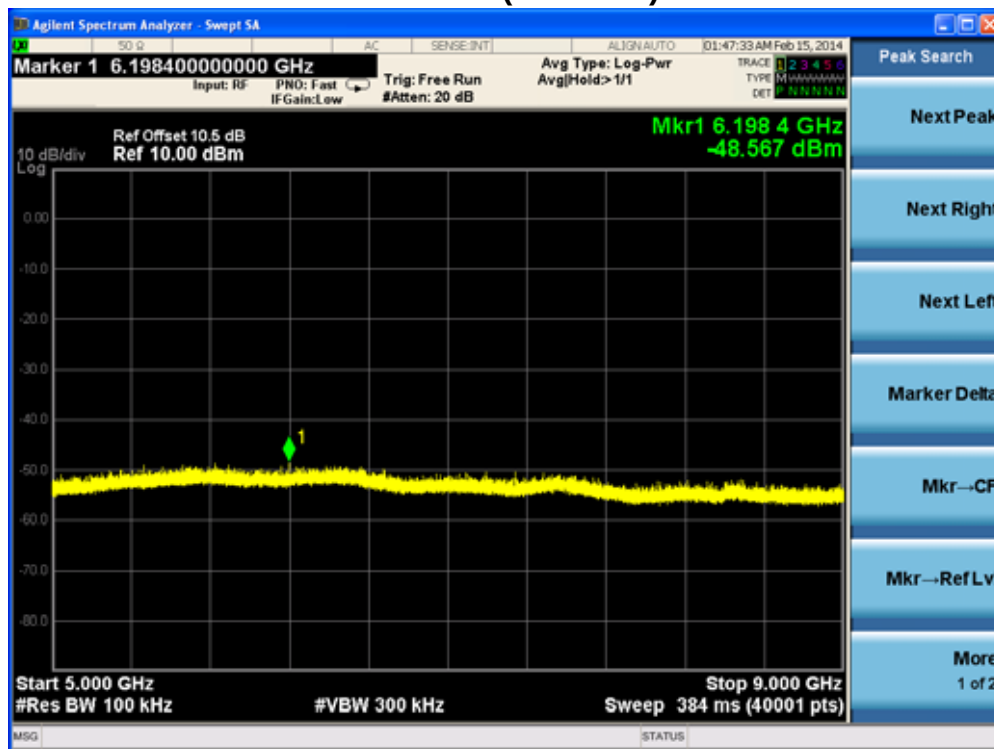
Channel 11 (2462MHz)-1



Channel 11 (2462MHz)-2



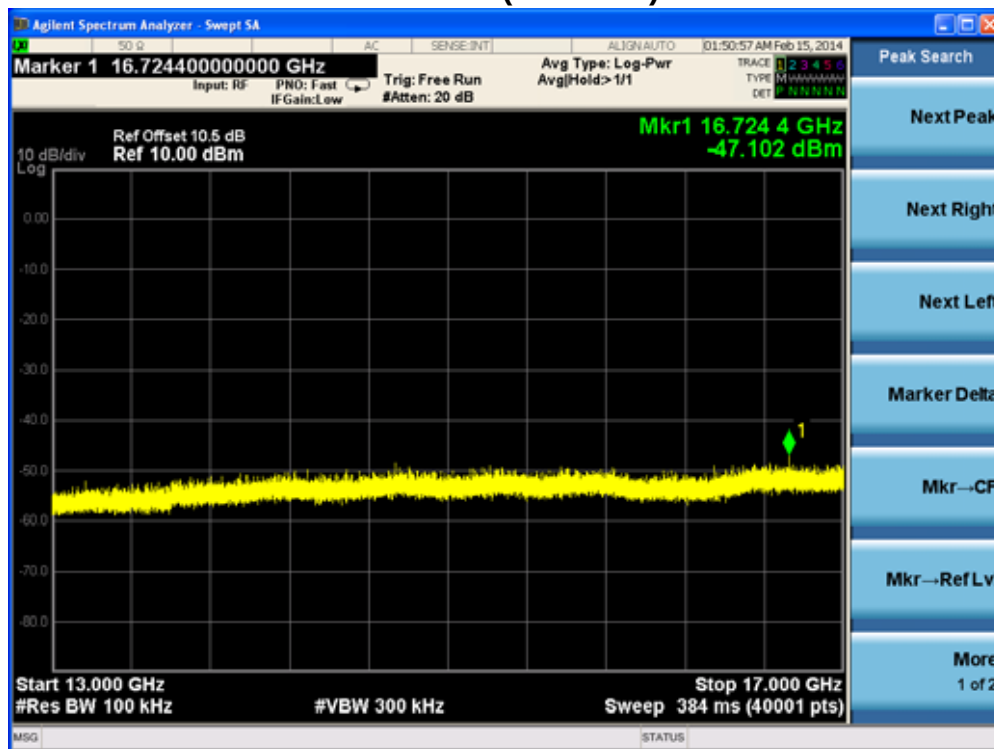
Channel 11 (2462MHz)-3



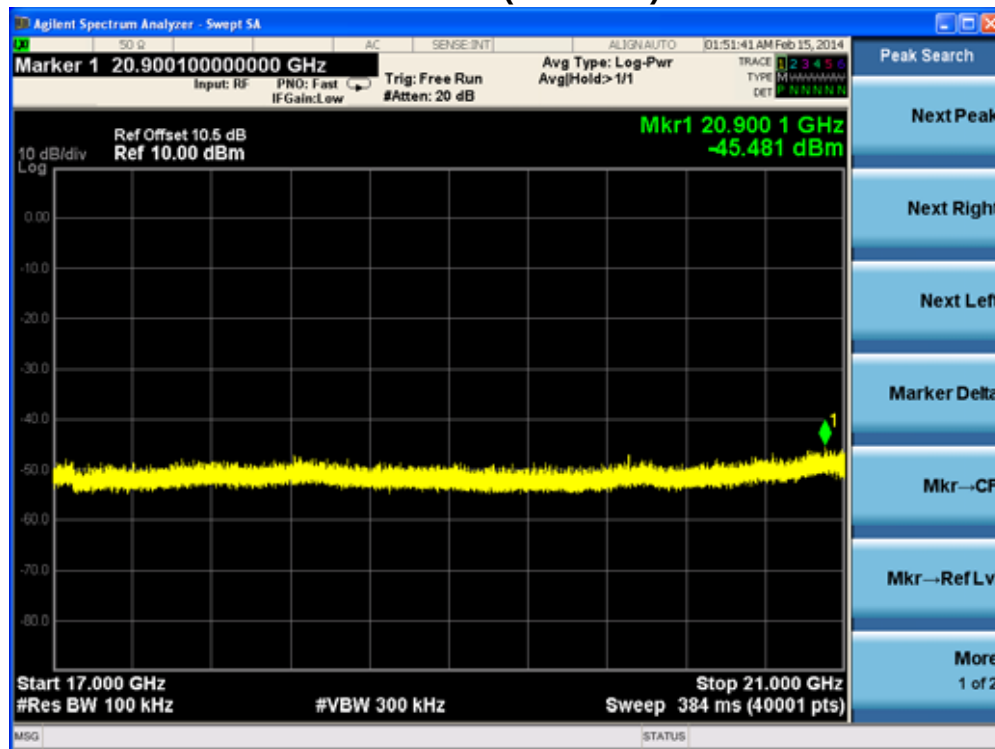
Channel 11 (2462MHz)-4



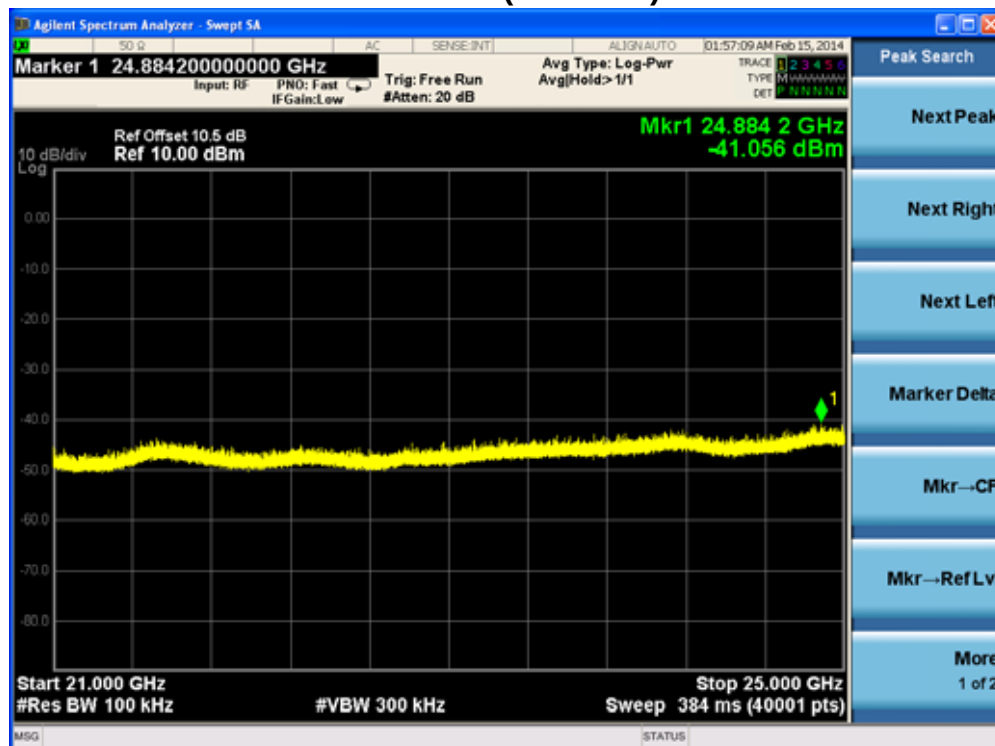
Channel 11 (2462MHz)-5



Channel 11 (2462MHz)-6

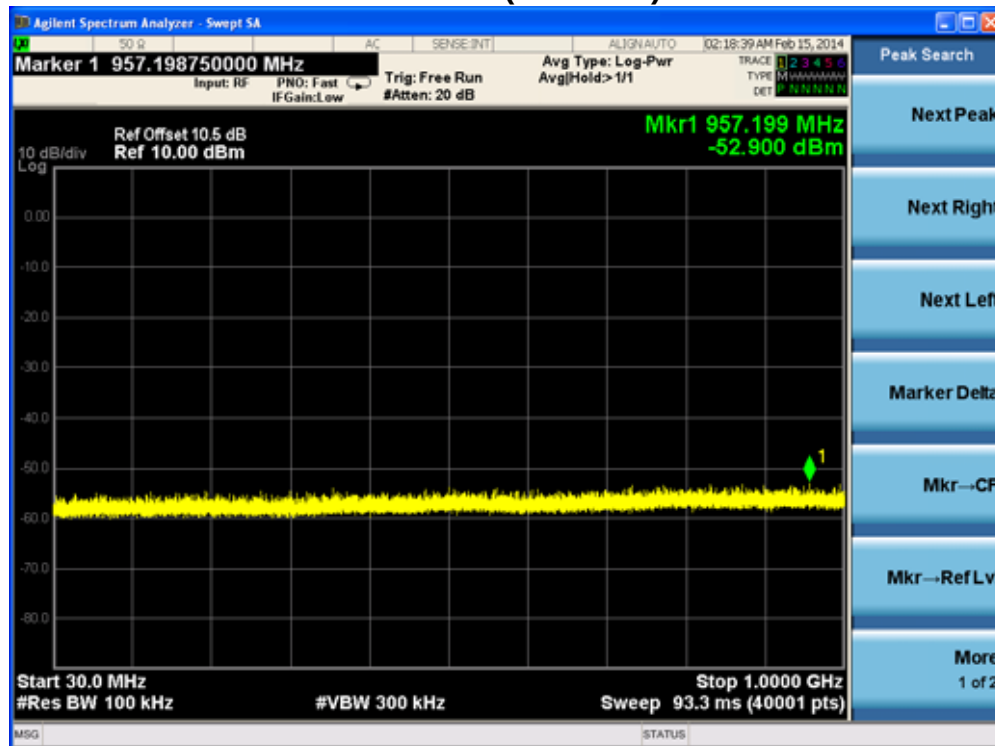


Channel 11 (2462MHz)-7

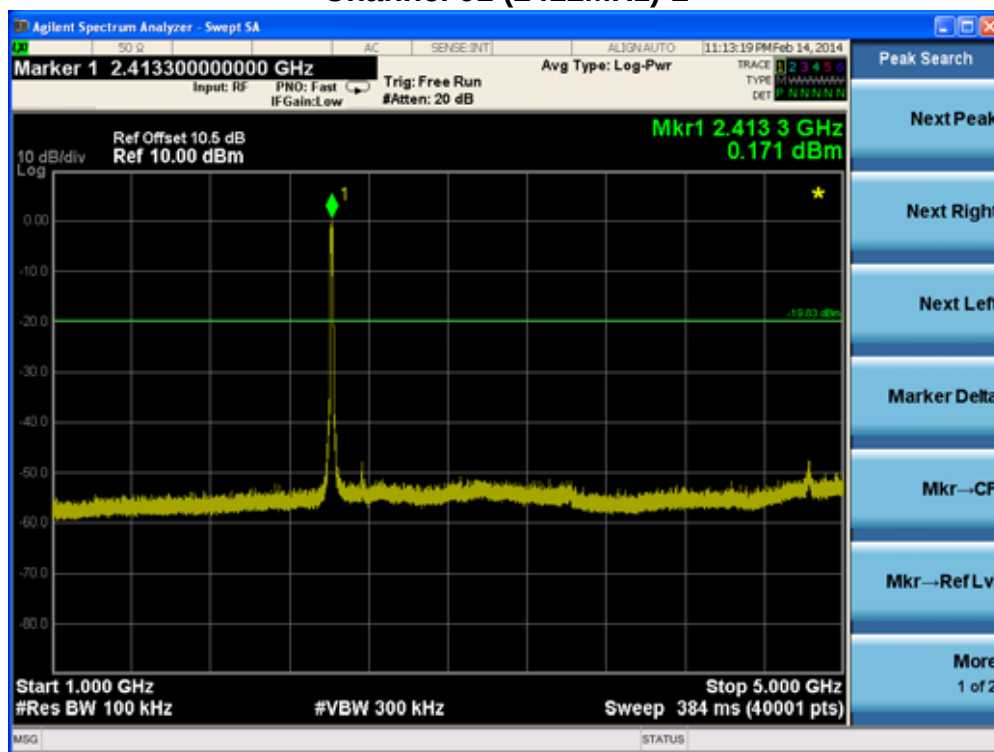


Product	:	IP-STB
Test Item	:	RF Antenna Conducted Spurious
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

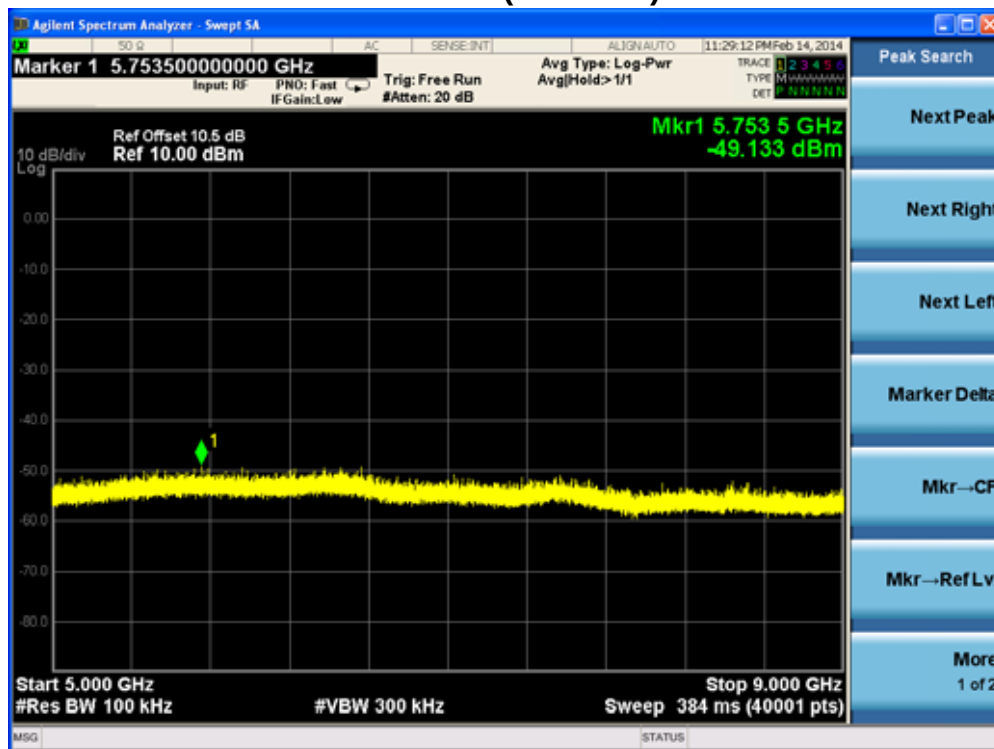
Channel 01 (2412MHz)-1



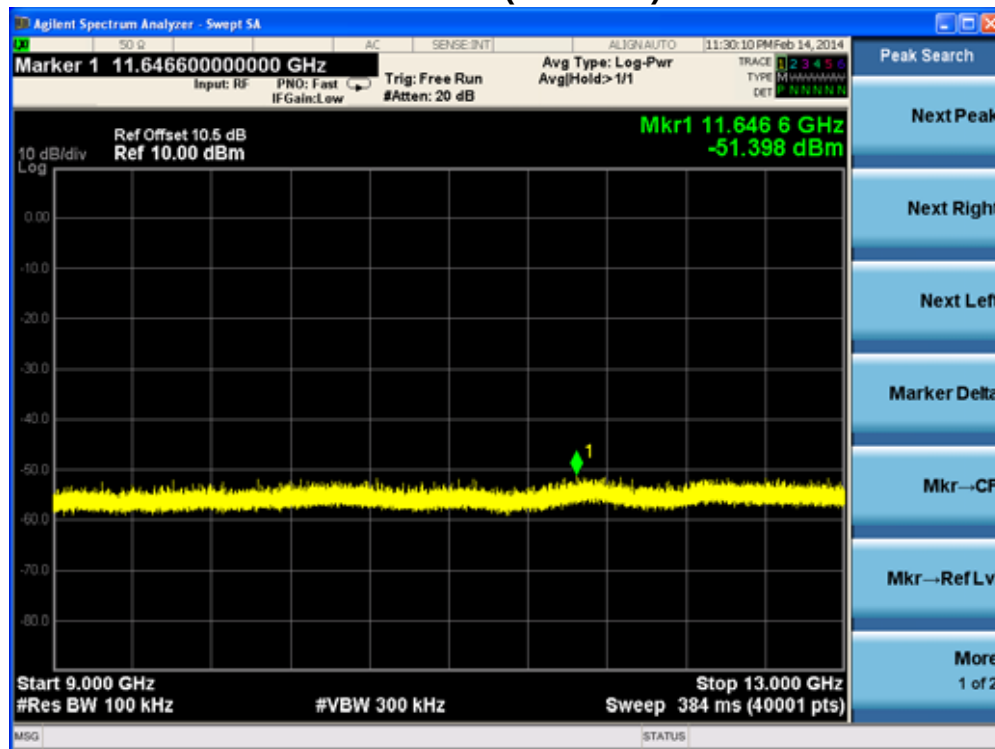
Channel 01 (2412MHz)-2



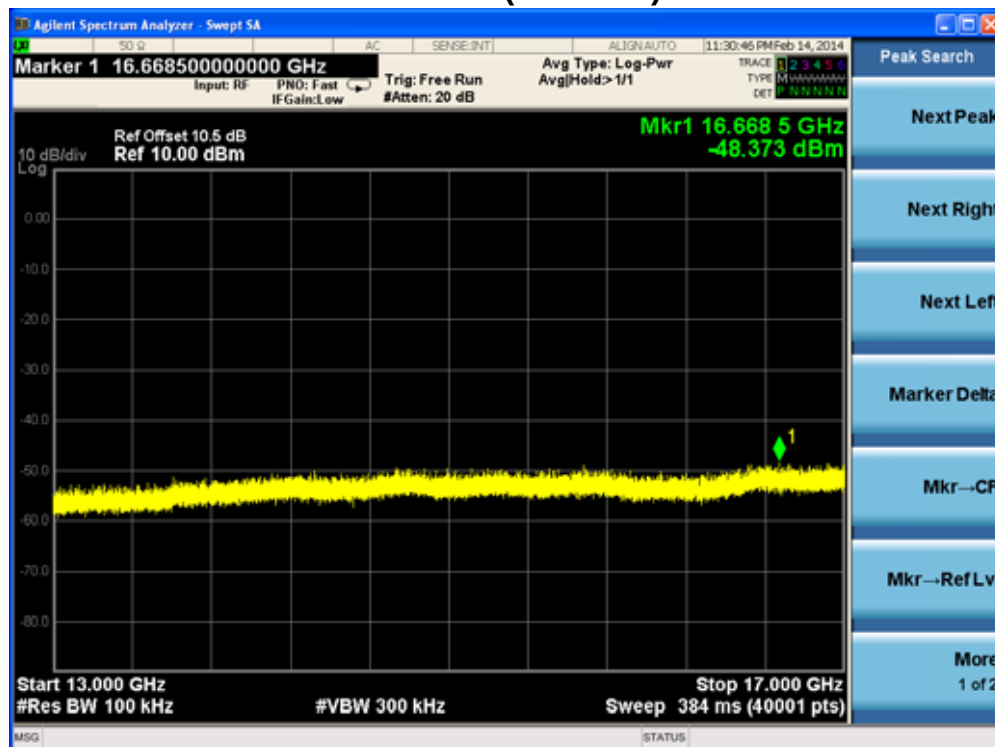
Channel 01 (2412MHz)-3



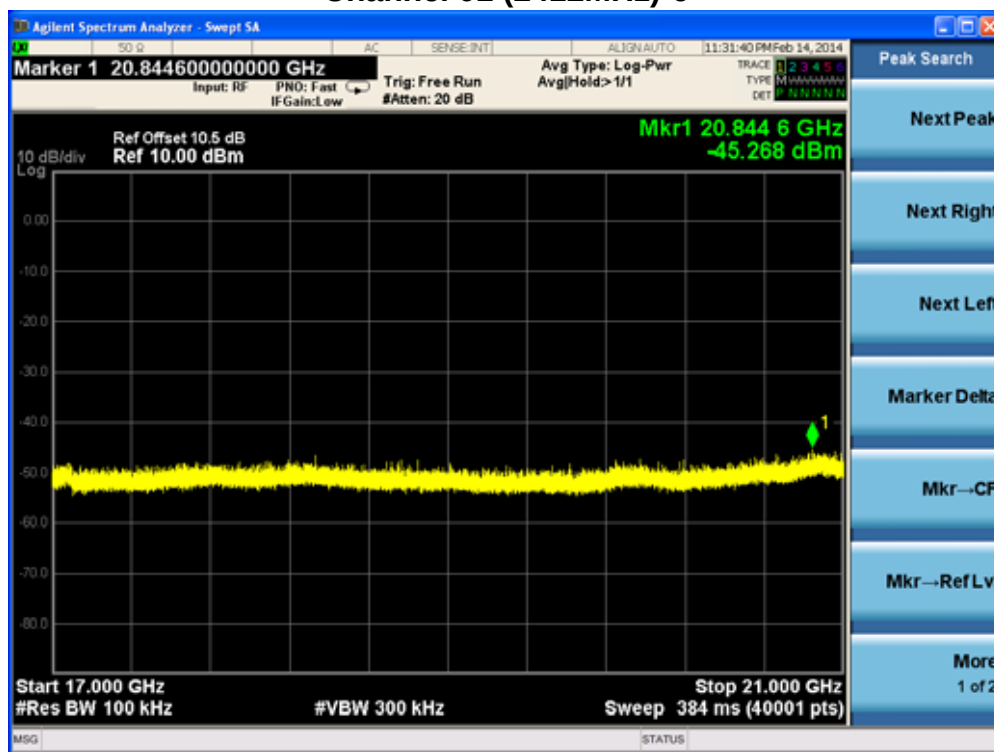
Channel 01 (2412MHz)-4



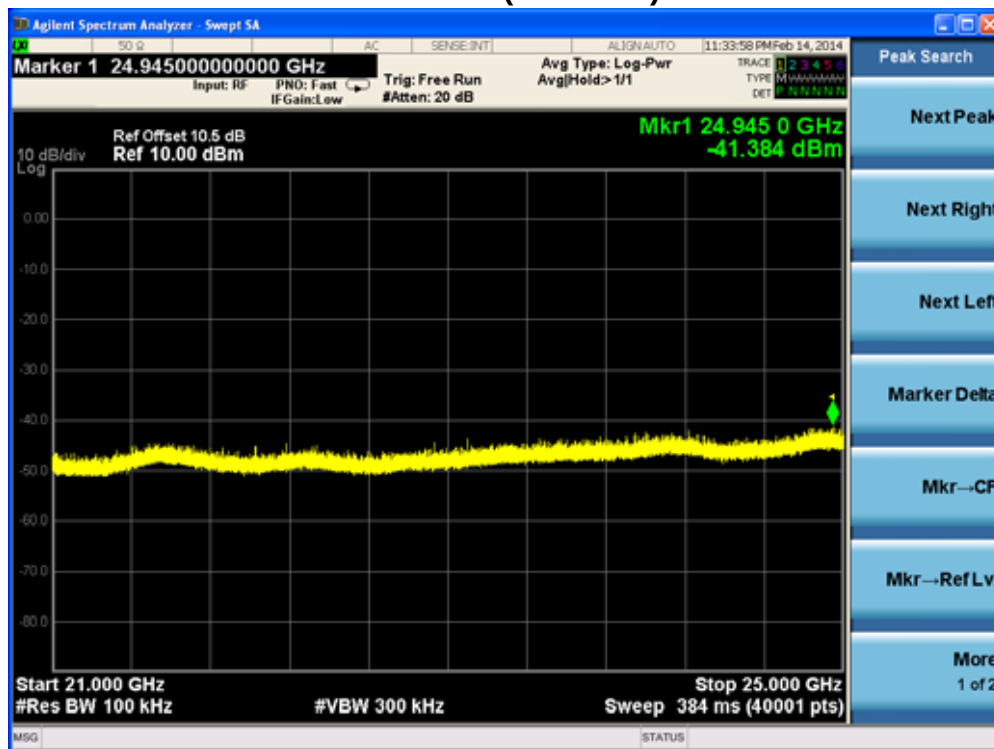
Channel 01 (2412MHz)-5



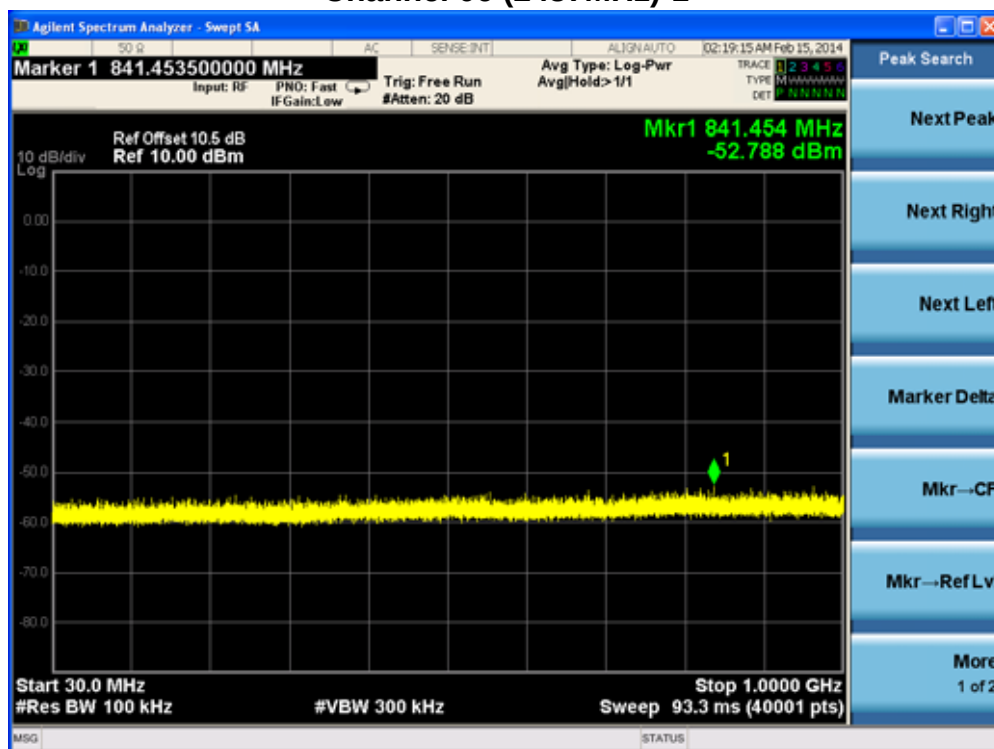
Channel 01 (2412MHz)-6



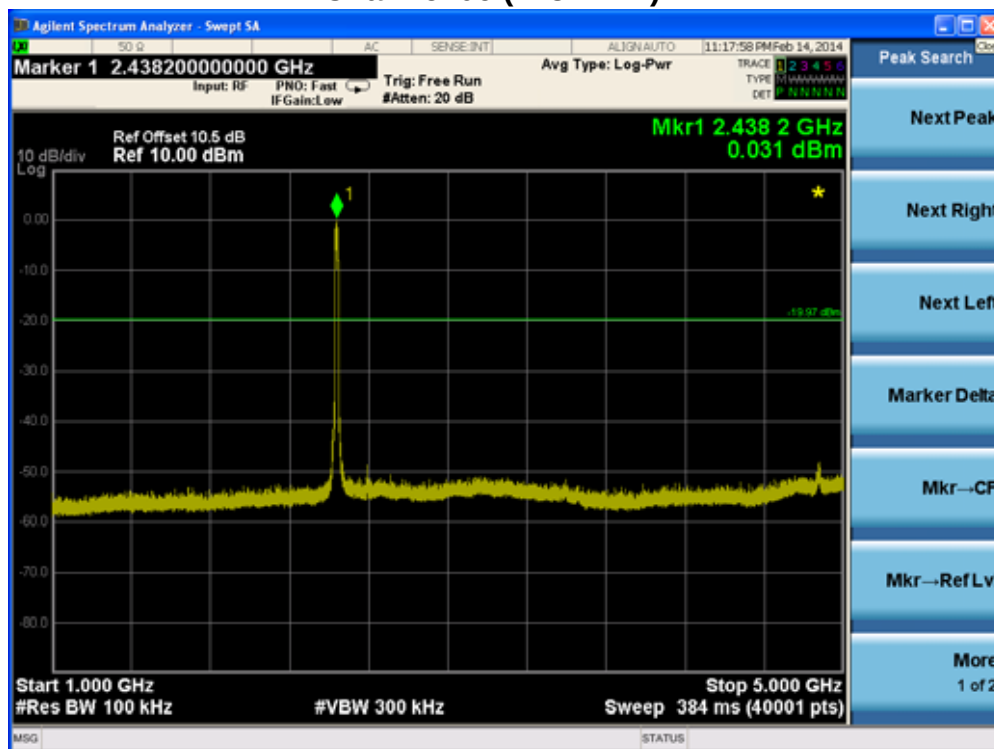
Channel 01 (2412MHz)-7



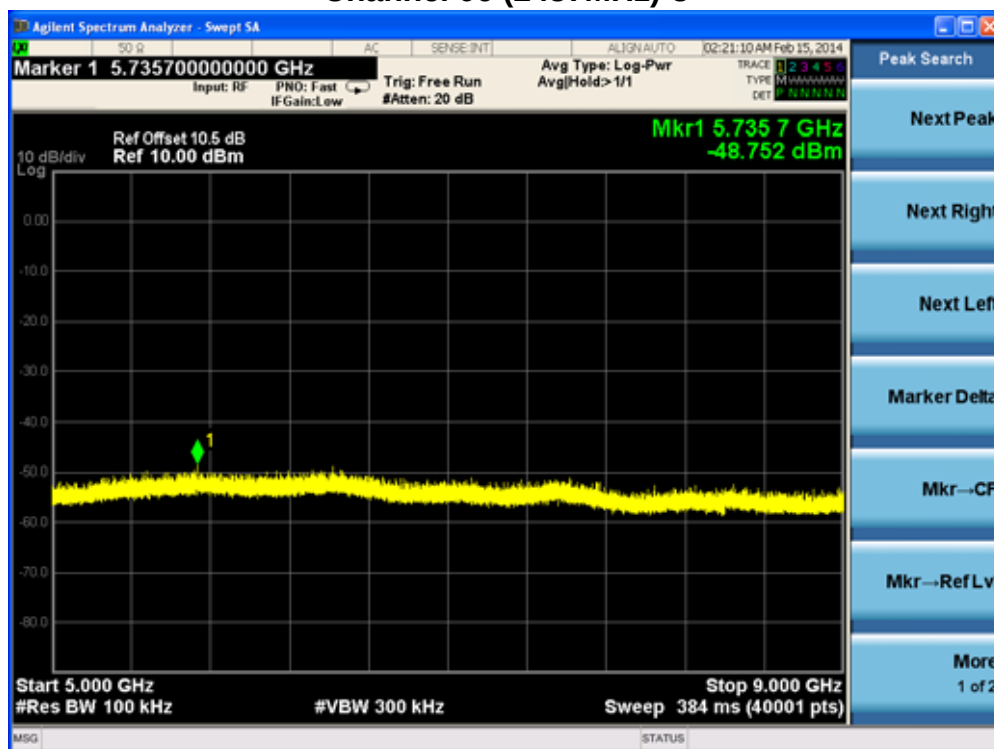
Channel 06 (2437MHz)-1



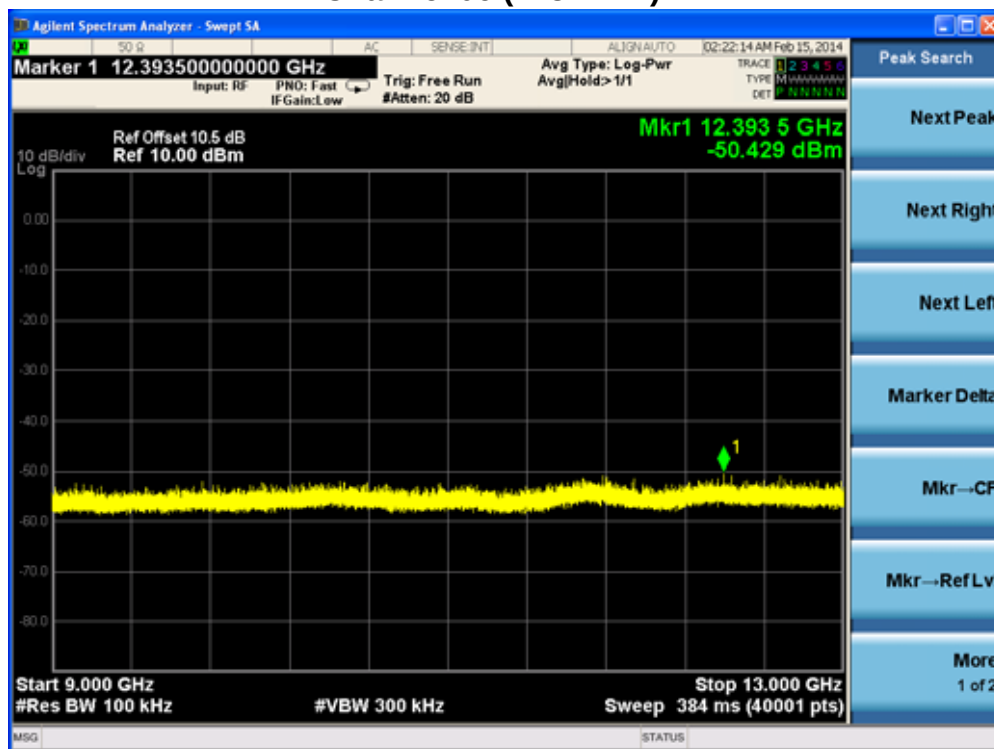
Channel 06 (2437MHz)-2



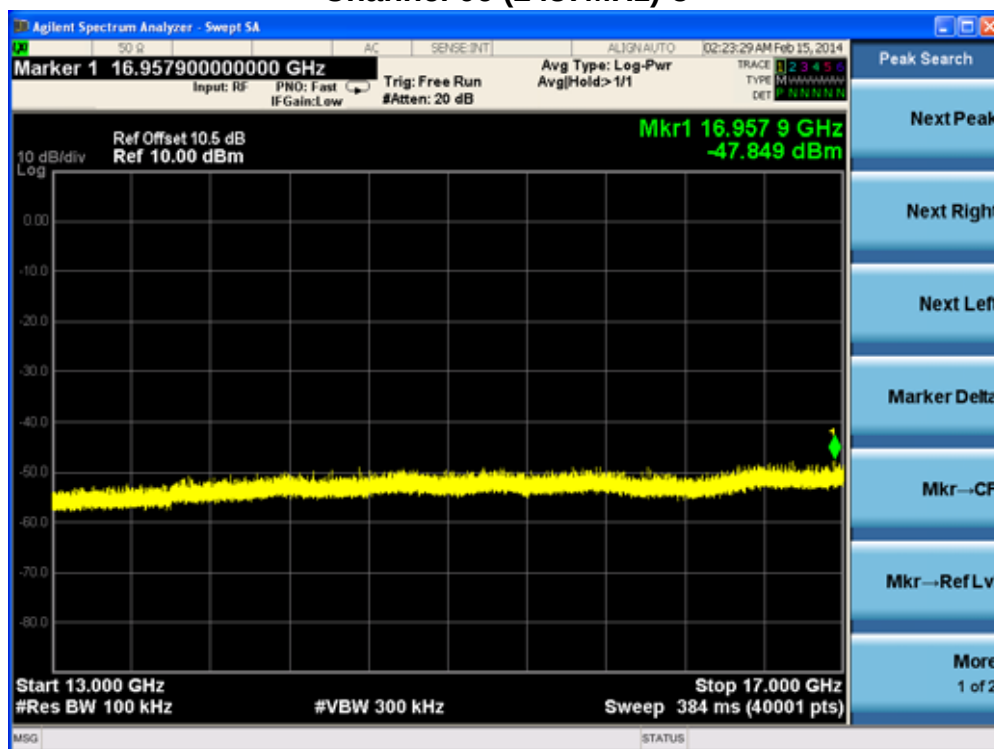
Channel 06 (2437MHz)-3



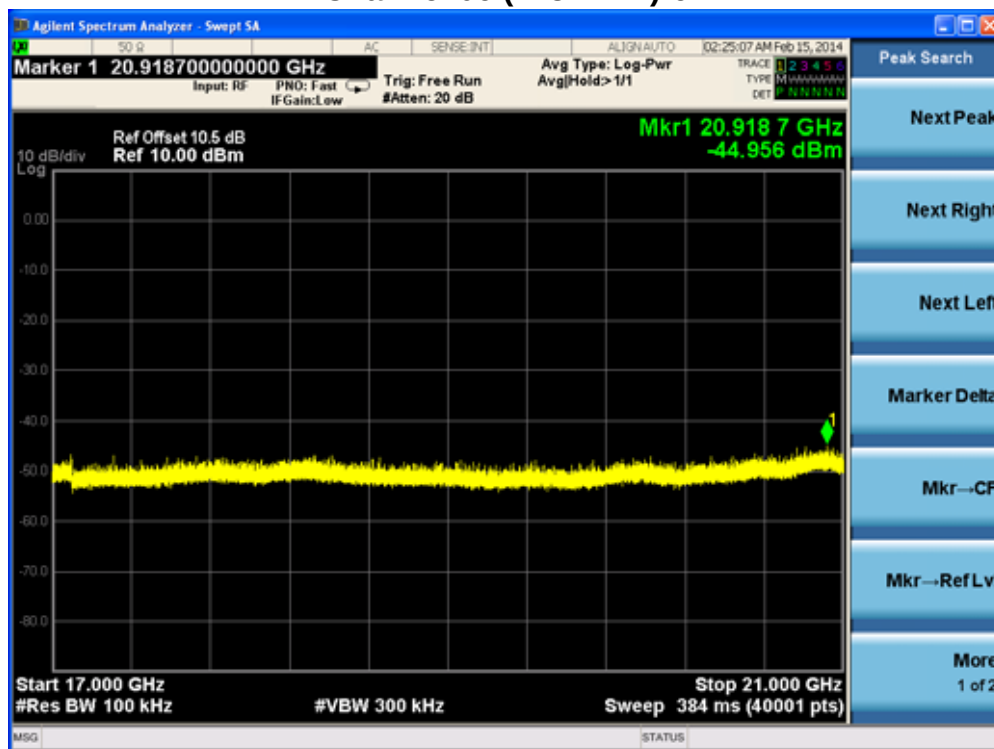
Channel 06 (2437MHz)-4



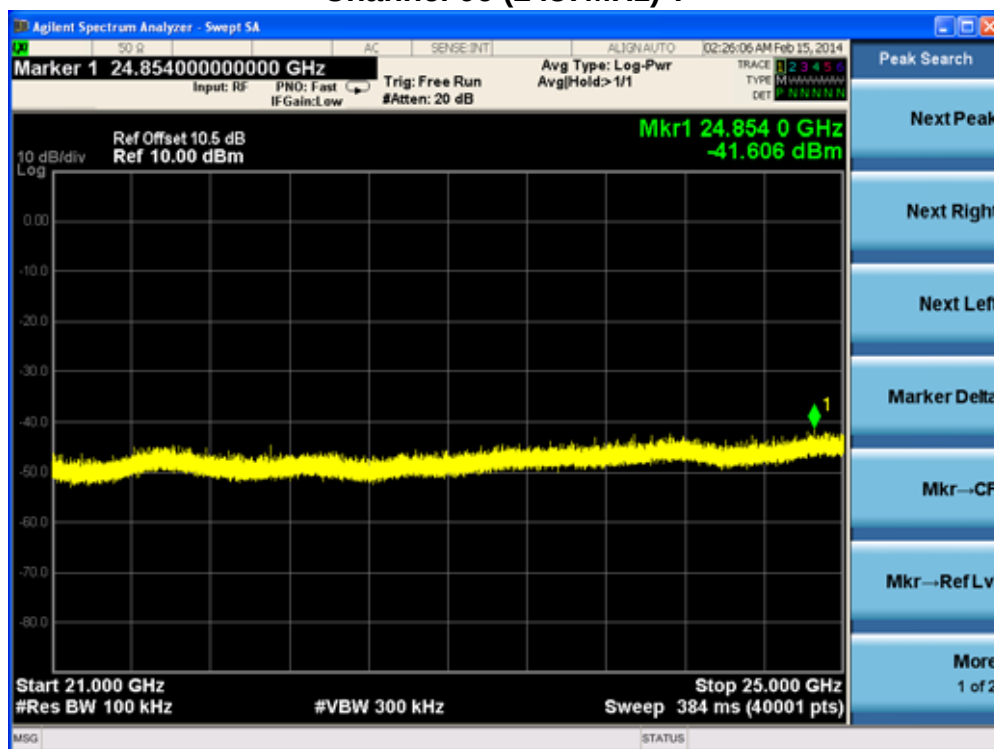
Channel 06 (2437MHz)-5



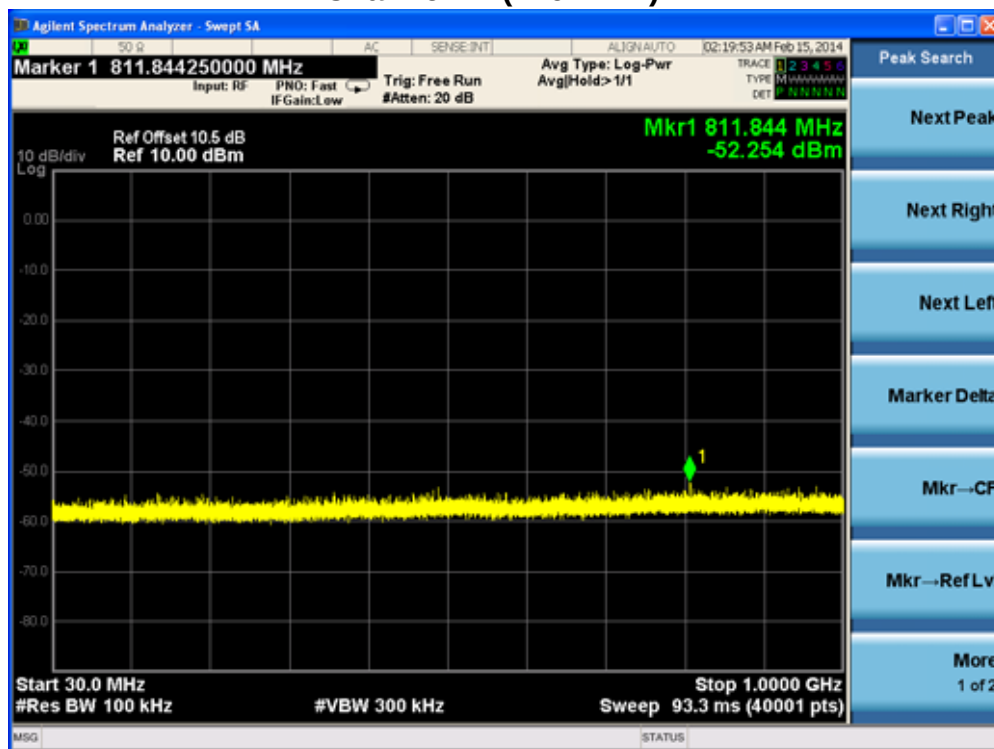
Channel 06 (2437MHz)-6



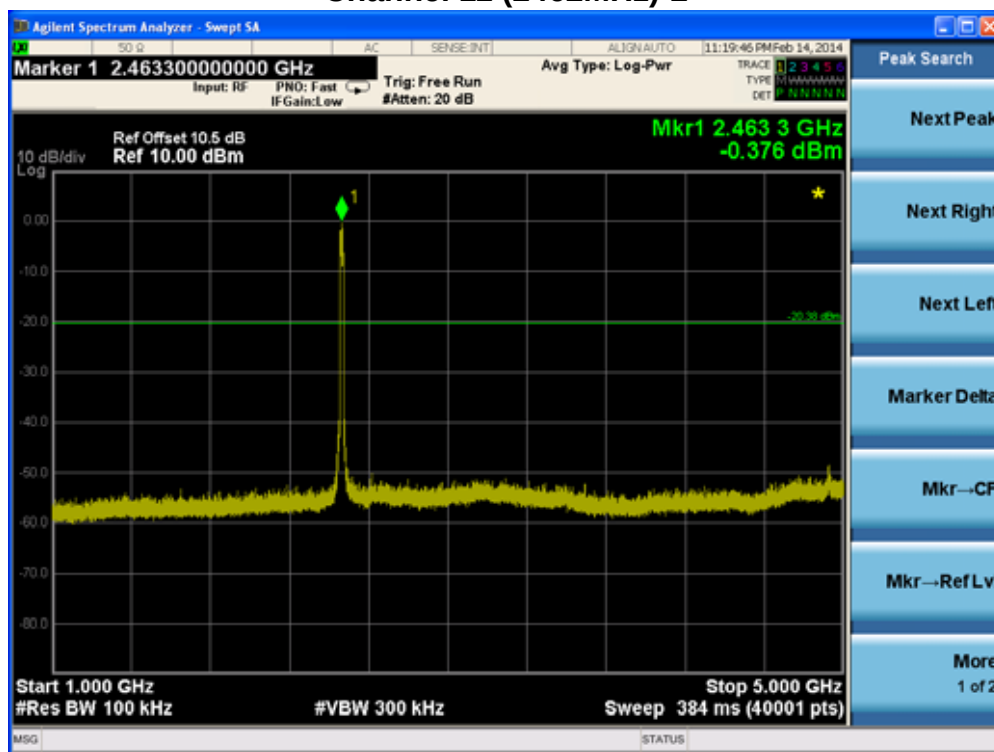
Channel 06 (2437MHz)-7



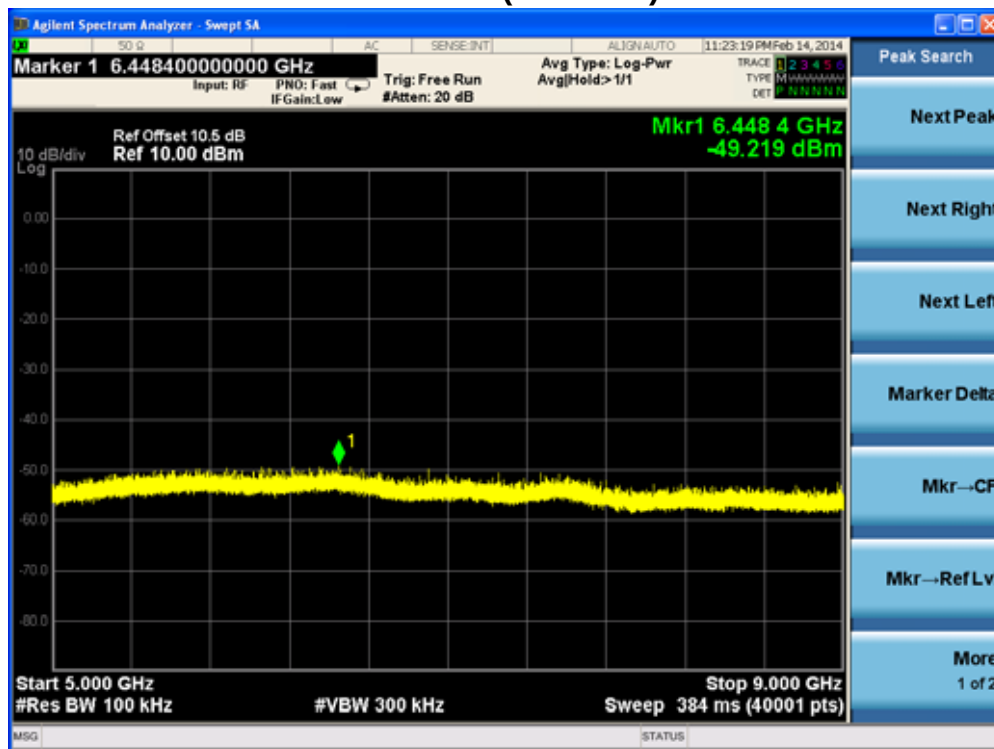
Channel 11 (2462MHz)-1



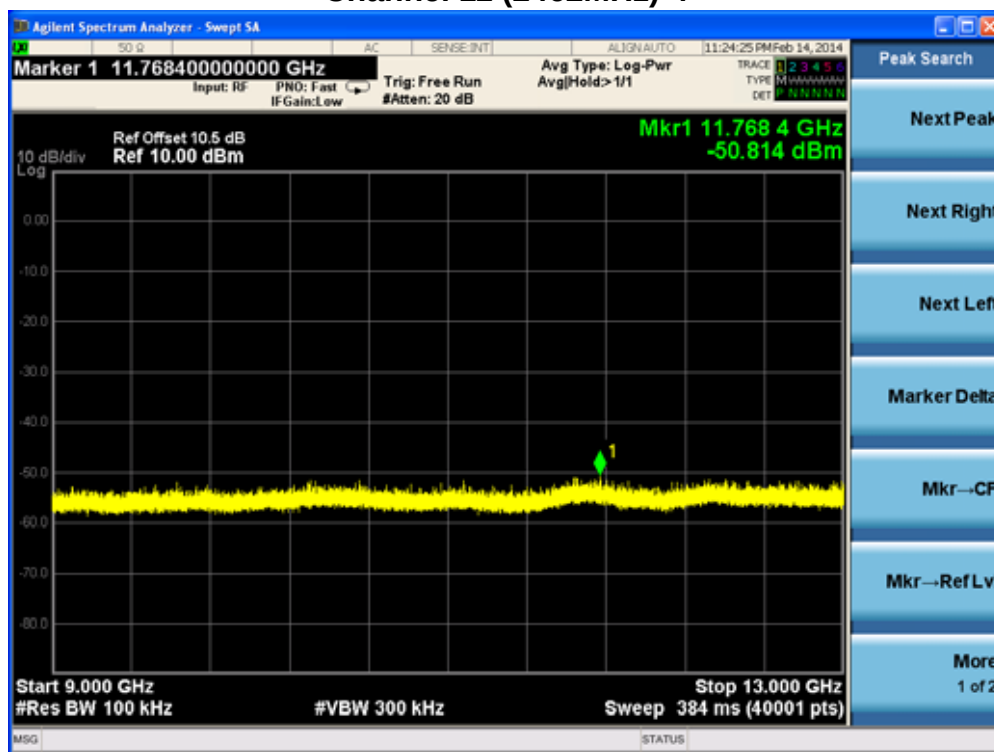
Channel 11 (2462MHz)-2



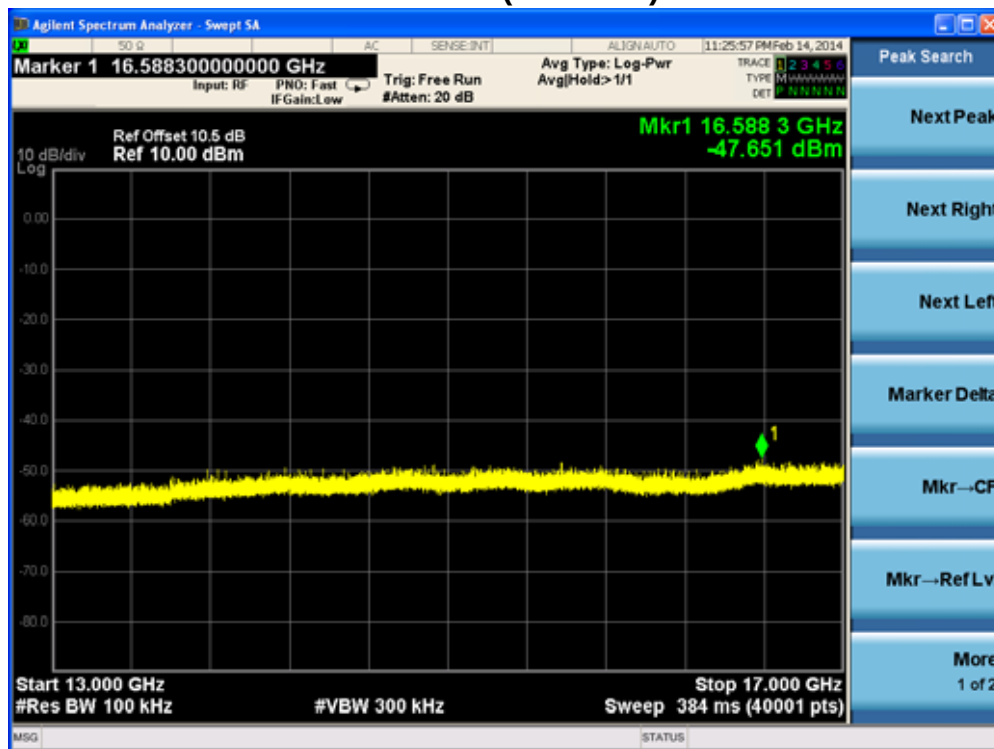
Channel 11 (2462MHz)-3



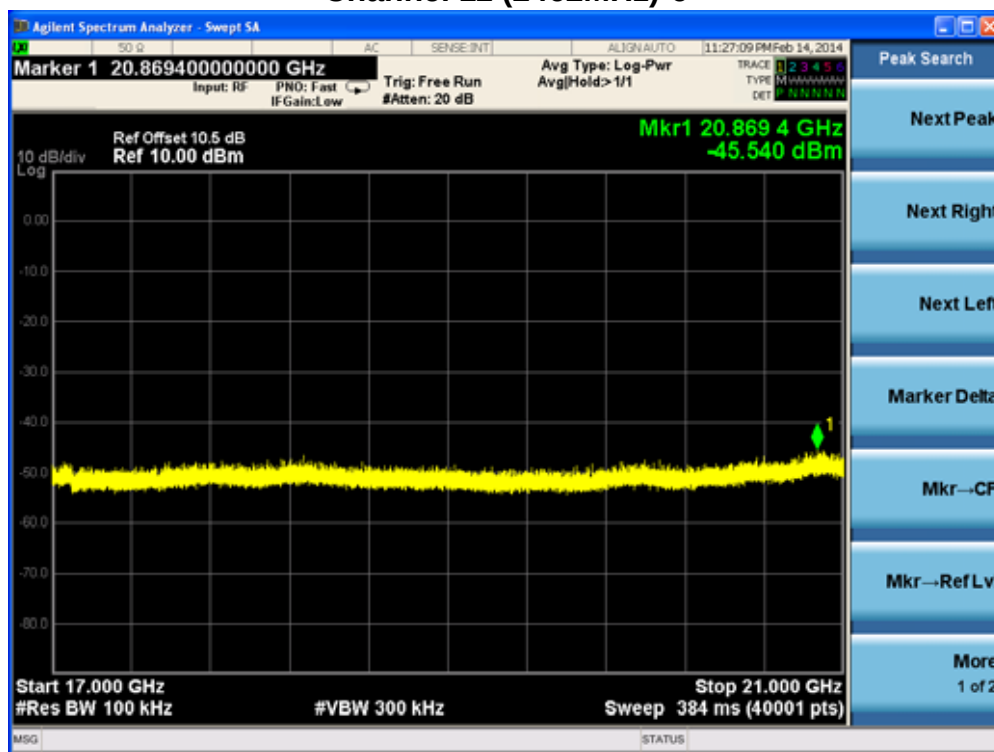
Channel 11 (2462MHz)-4



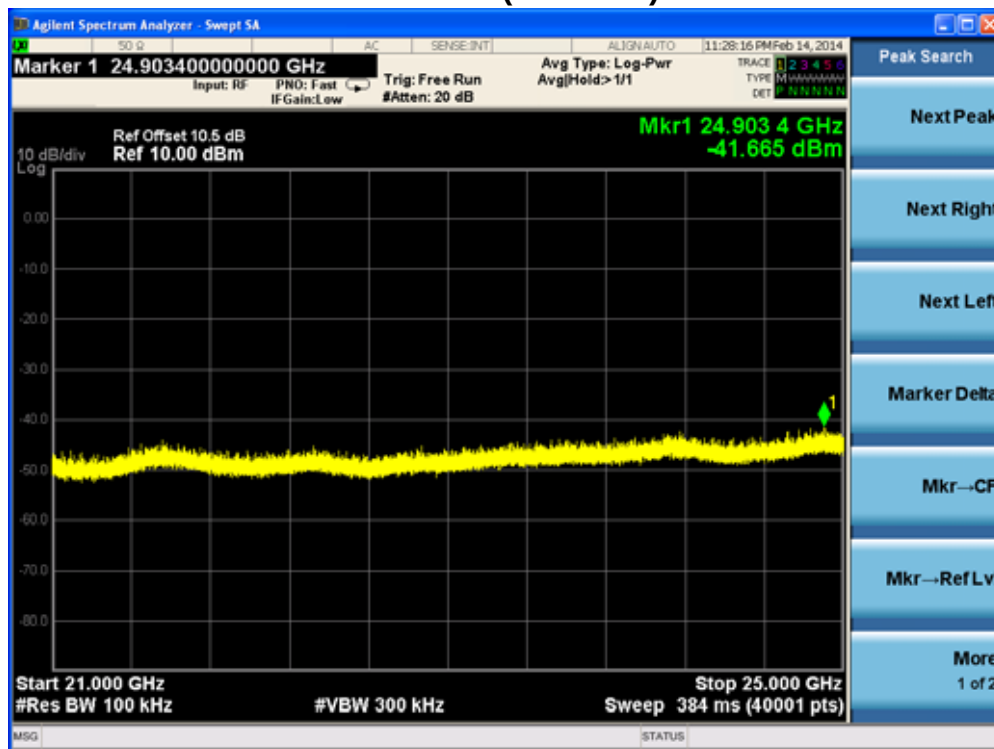
Channel 11 (2462MHz)-5



Channel 11 (2462MHz)-6



Channel 11 (2462MHz)-7



6. Radiated Emission Band Edge

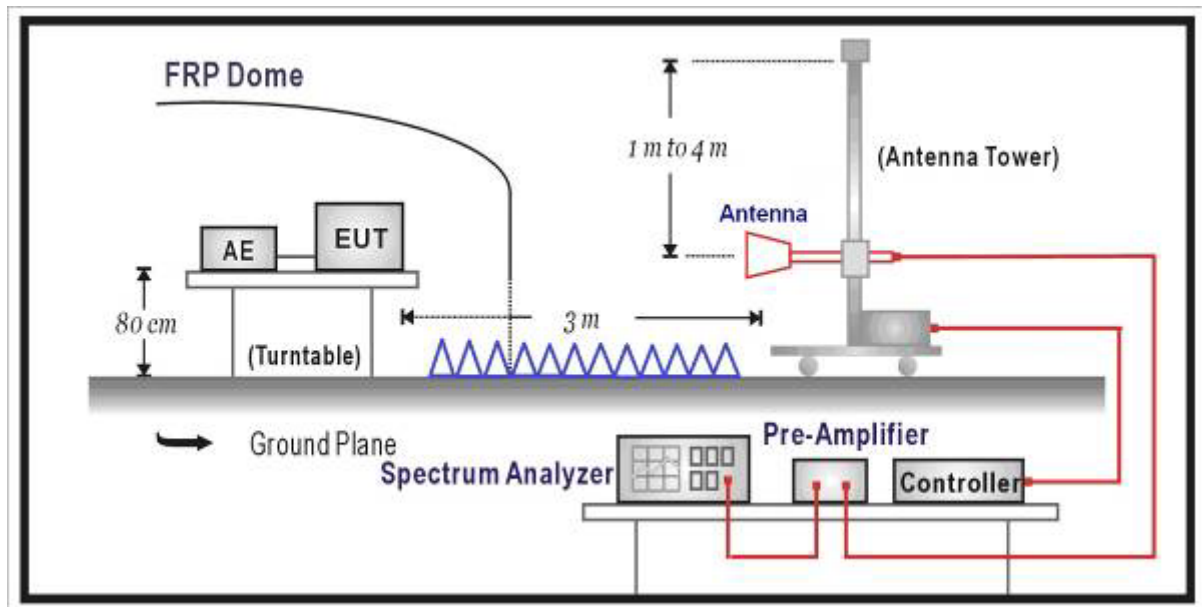
6.1. Test Equipment

☒ Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2014.03.30
Preamplifier	Miteq	NSP1800-25	1364185	2014.05.04
Preamplifier	Quietek	AP-040G	CHM-0906001	2014.05.04
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2014.10.15
DRG Horn	ETS-Lindgren	3117	00123988	2015.01.21
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2015.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2015.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2015.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2014.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2015.01.08

Note 1: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

6.2. Test Setup



6.3. Limit

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4: 2009 on radiated measurement.

6.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

6.6. Test Result

All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

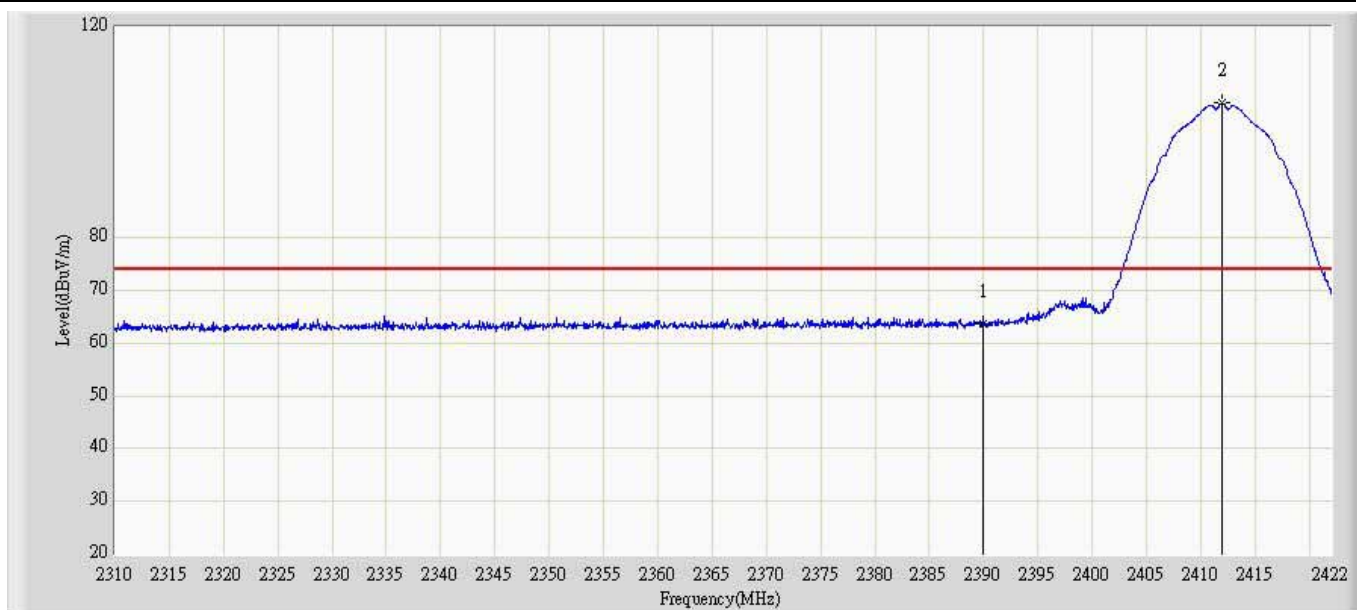
Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

Average detector: RBW = 1MHz, VBW = 10Hz, sweep time = auto.

Measure Level = Reading Level + Cable Loss + Antenna Factor - Preamplifier Gain

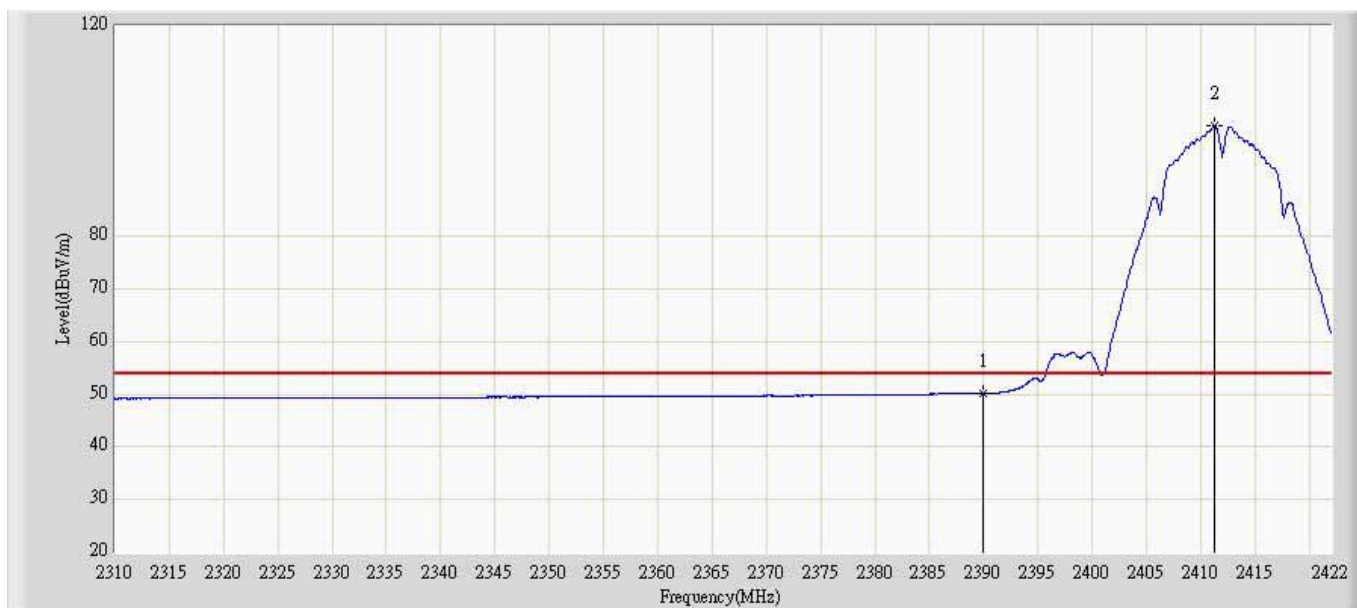
In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice will be followed.

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 10:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



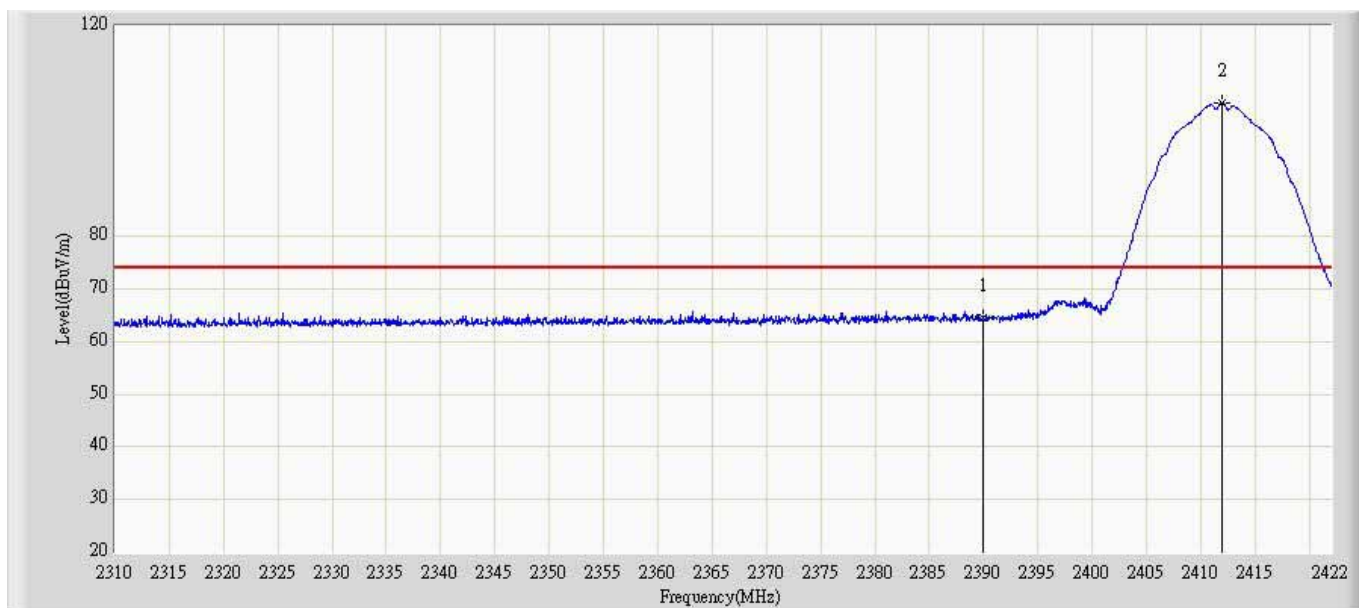
No	Flag	Marker	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	63.819	26.832	-10.181	74.000	36.988	PK
2		*	2412.032	105.506	68.409	N/A	N/A	37.097	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:40
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



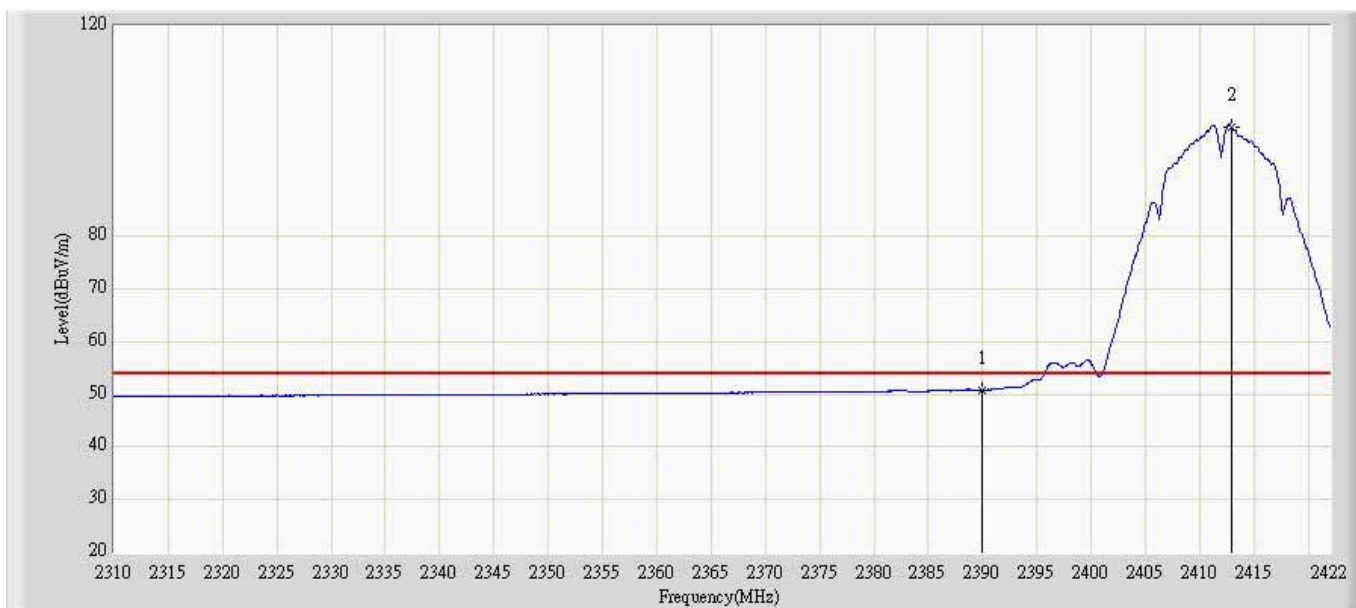
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.057	13.070	-3.943	54.000	36.988	AV
2		*	2411.304	101.017	63.924	N/A	N/A	37.093	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:41
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



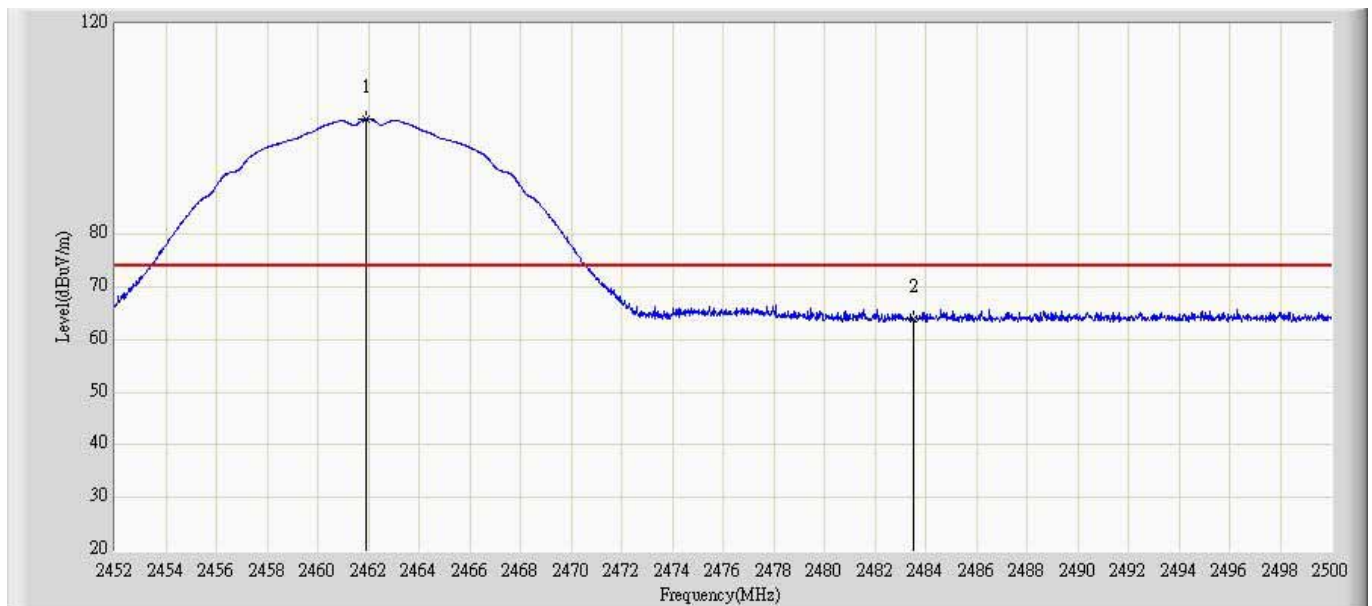
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.400	26.753	-9.600	74.000	37.648	PK
2		*	2412.032	105.288	67.443	N/A	N/A	37.845	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:48
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2412MHz by 802.11b	



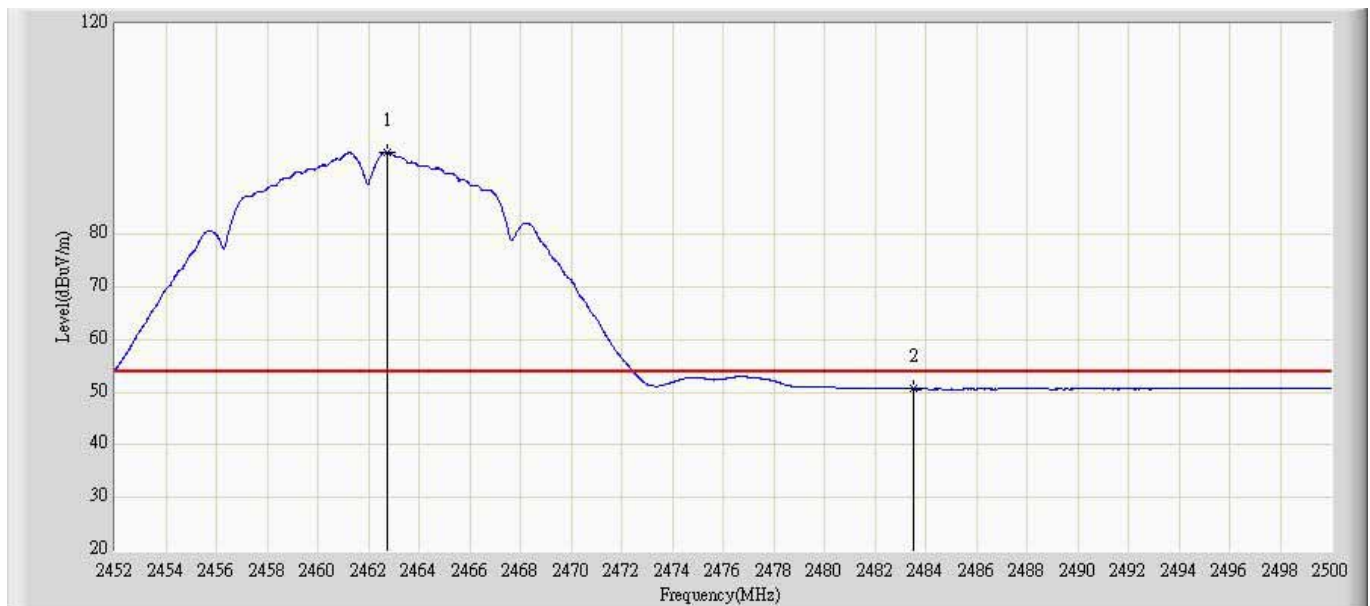
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.728	13.081	-3.272	54.000	37.648	AV
2		*	2412.942	100.700	62.847	N/A	N/A	37.853	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:50
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



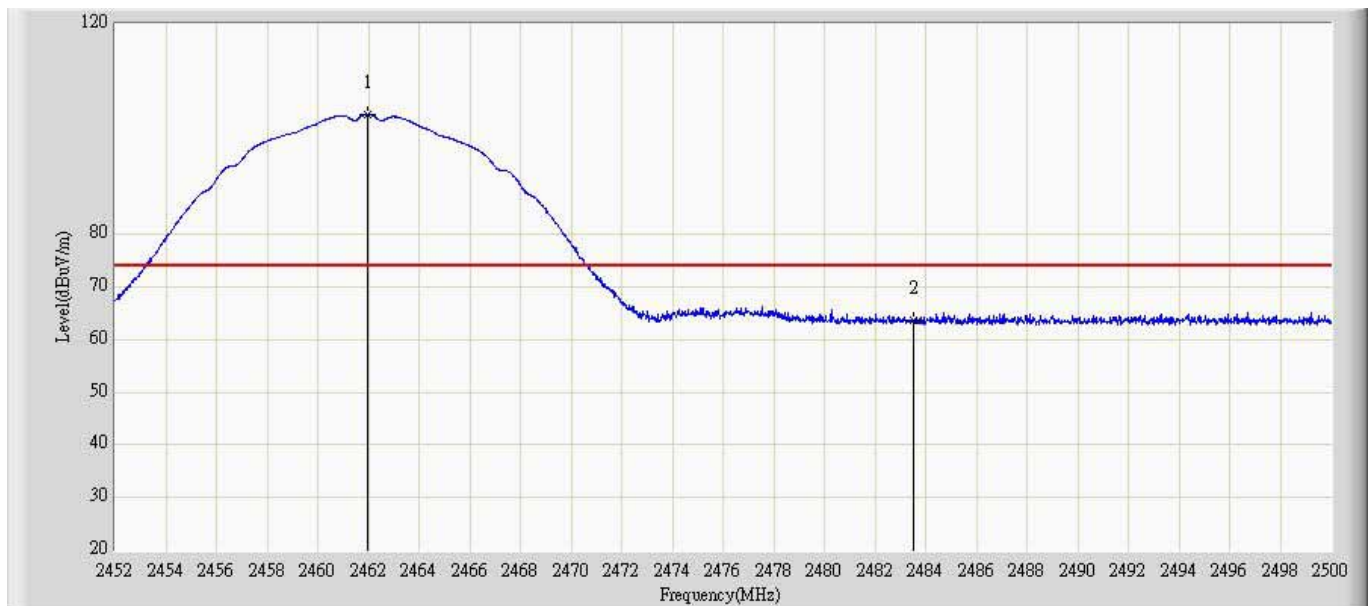
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.912	101.920	64.583	N/A	N/A	37.337	PK
2			2483.500	63.851	26.410	-10.149	74.000	37.441	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



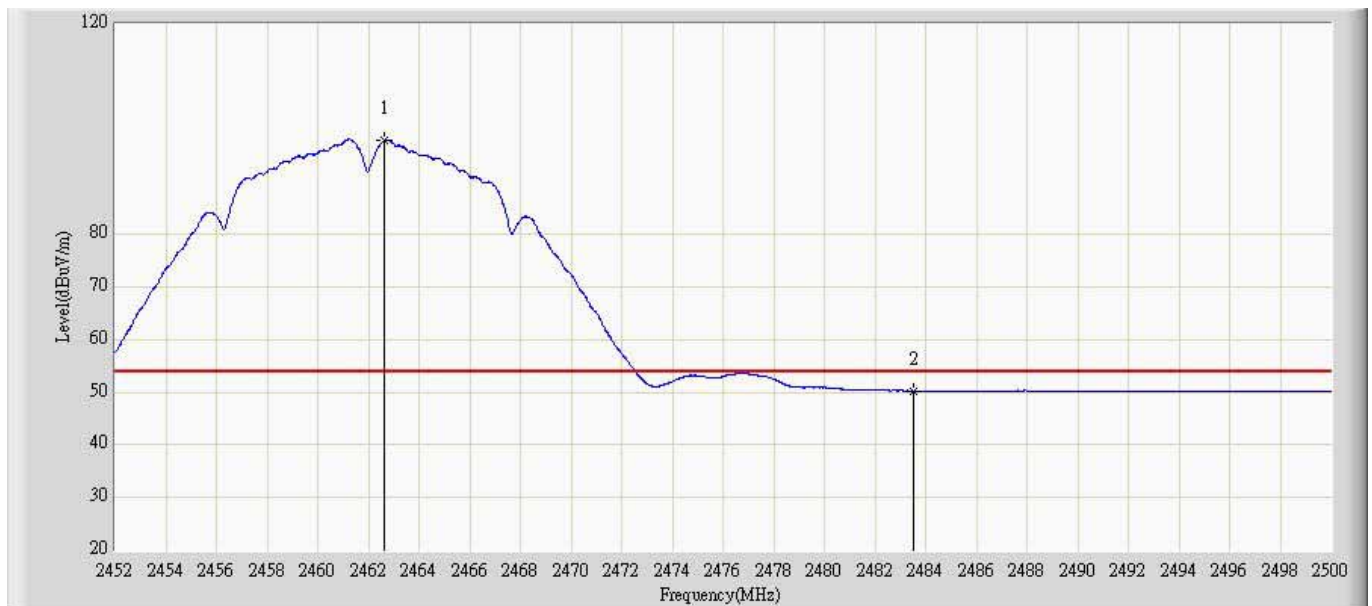
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.728	95.666	58.325	N/A	N/A	37.341	AV
2			2483.500	50.620	13.179	-3.380	54.000	37.441	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 13:56
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



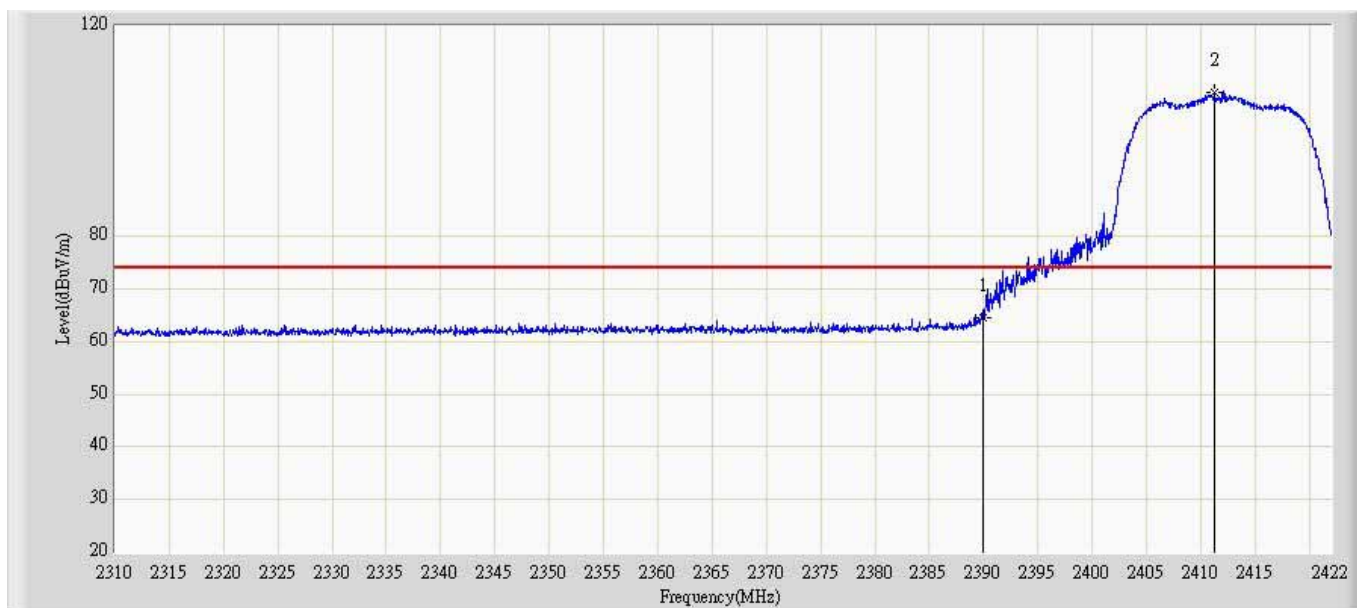
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.984	102.817	64.532	N/A	N/A	38.285	PK
2			2483.500	63.548	25.073	-10.452	74.000	38.475	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode1: Transmit at channel 2462MHz by 802.11b	



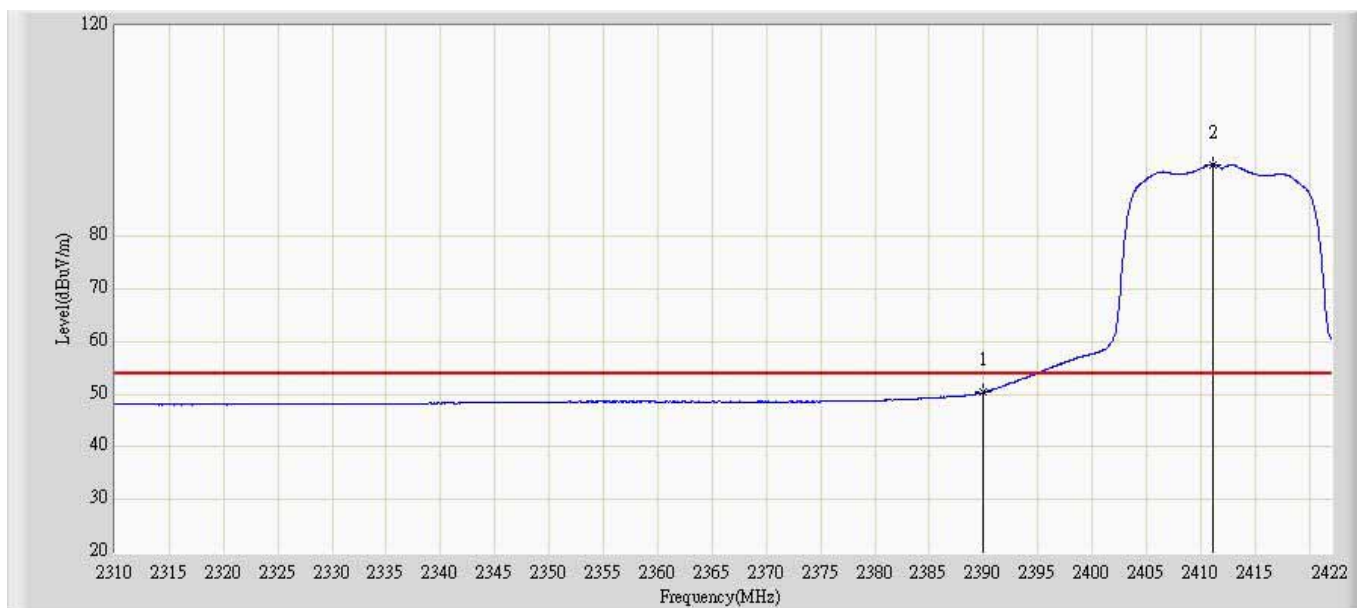
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.656	97.893	59.602	N/A	N/A	38.291	AV
2			2483.500	50.251	11.776	-3.749	54.000	38.475	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



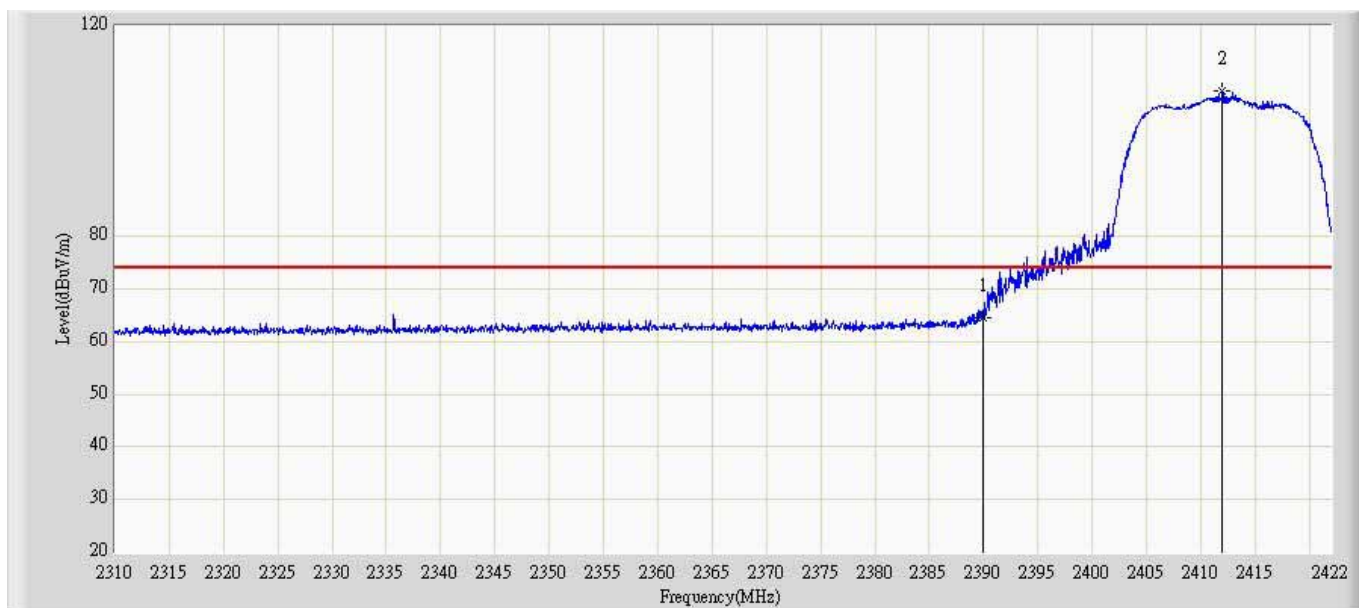
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.562	27.575	-9.438	74.000	36.988	PK
2		*	2411.248	107.437	70.344	N/A	N/A	37.093	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:06
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



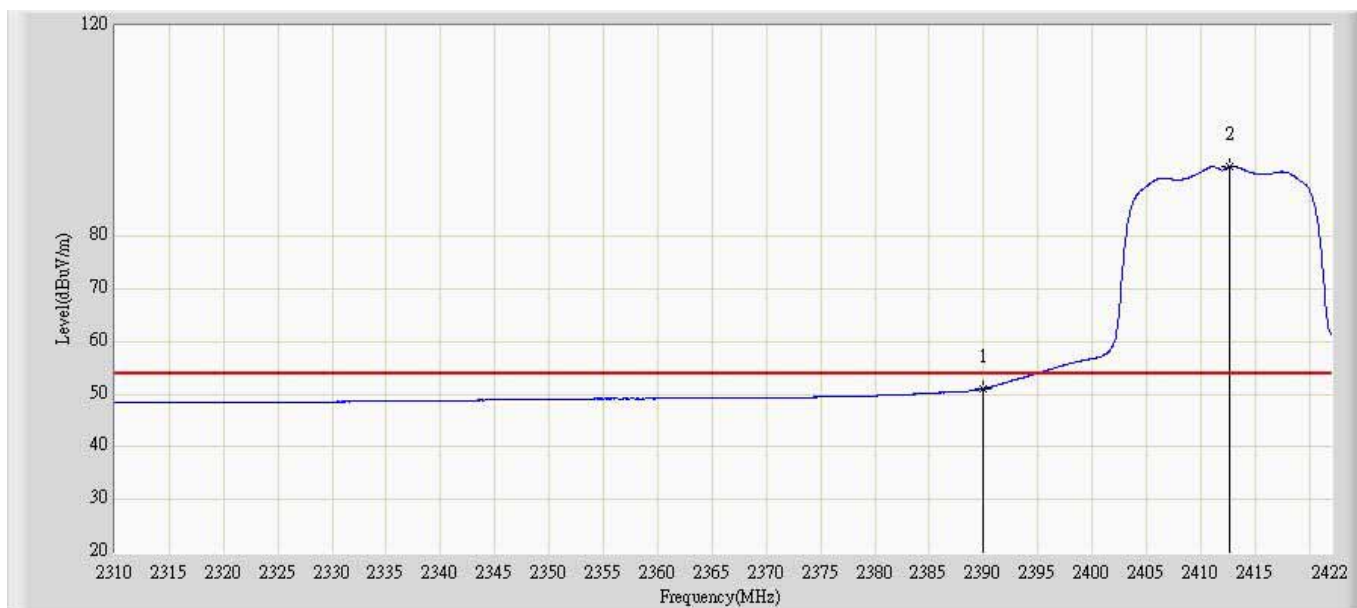
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.387	13.400	-3.613	54.000	36.988	AV
2		*	2411.136	93.701	56.608	N/A	N/A	37.092	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:07
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



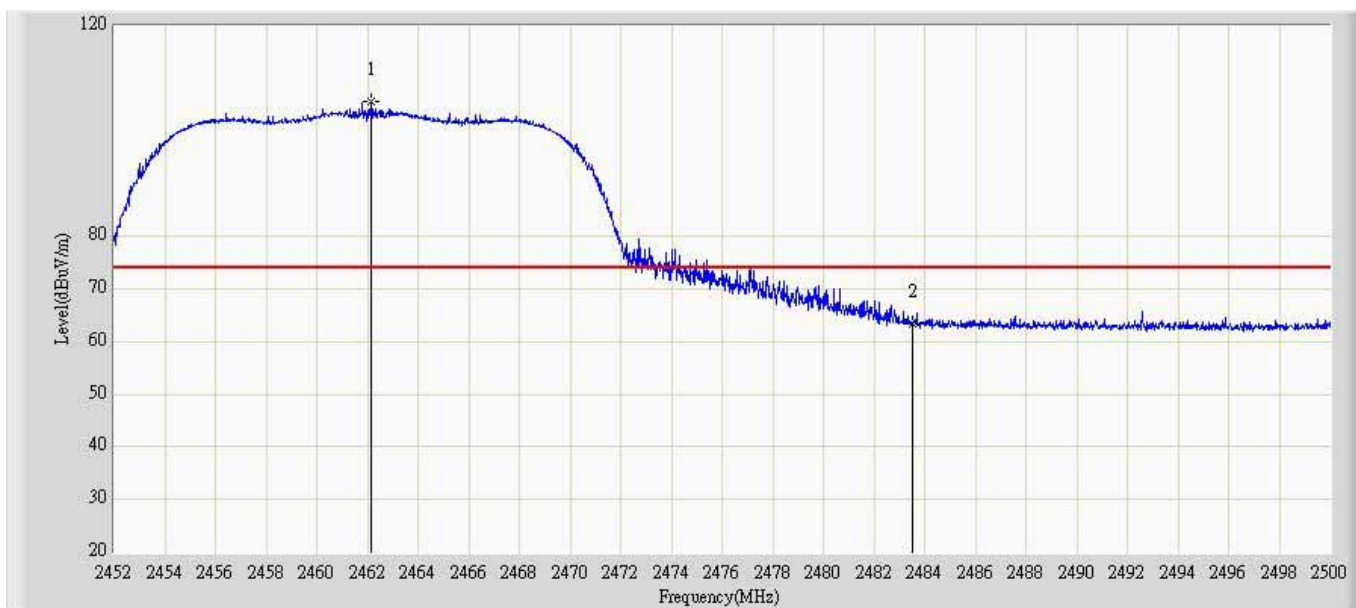
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.538	26.891	-9.462	74.000	37.648	PK
2		*	2411.976	107.603	69.758	N/A	N/A	37.844	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2412MHz by 802.11g	



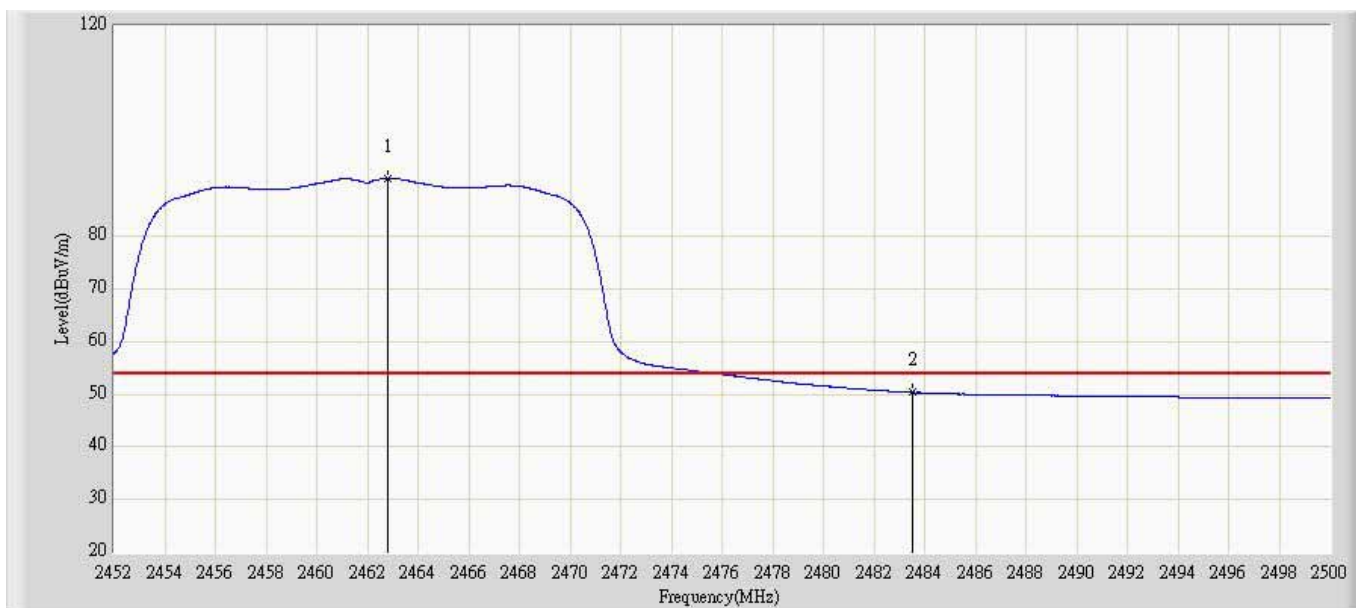
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	51.053	13.406	-2.947	54.000	37.648	AV
2		*	2412.704	93.326	55.475	N/A	N/A	37.851	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:14
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



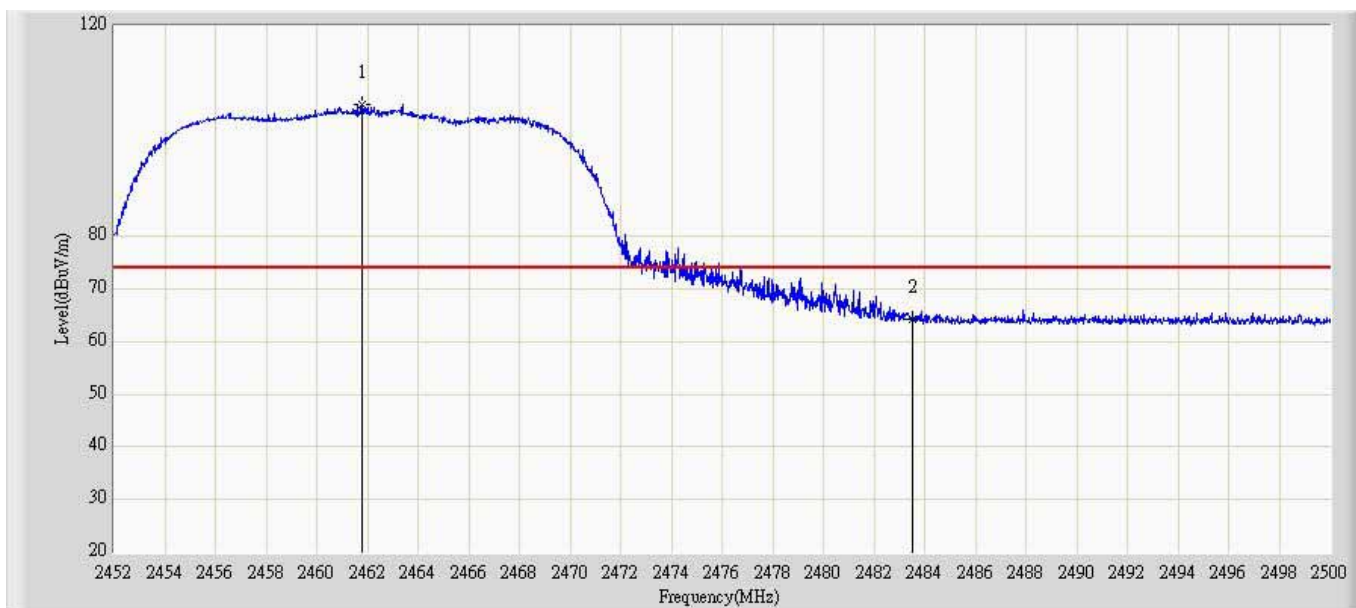
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.128	105.626	68.288	N/A	N/A	37.337	PK
2			2483.500	63.428	25.987	-10.572	74.000	37.441	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:20
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



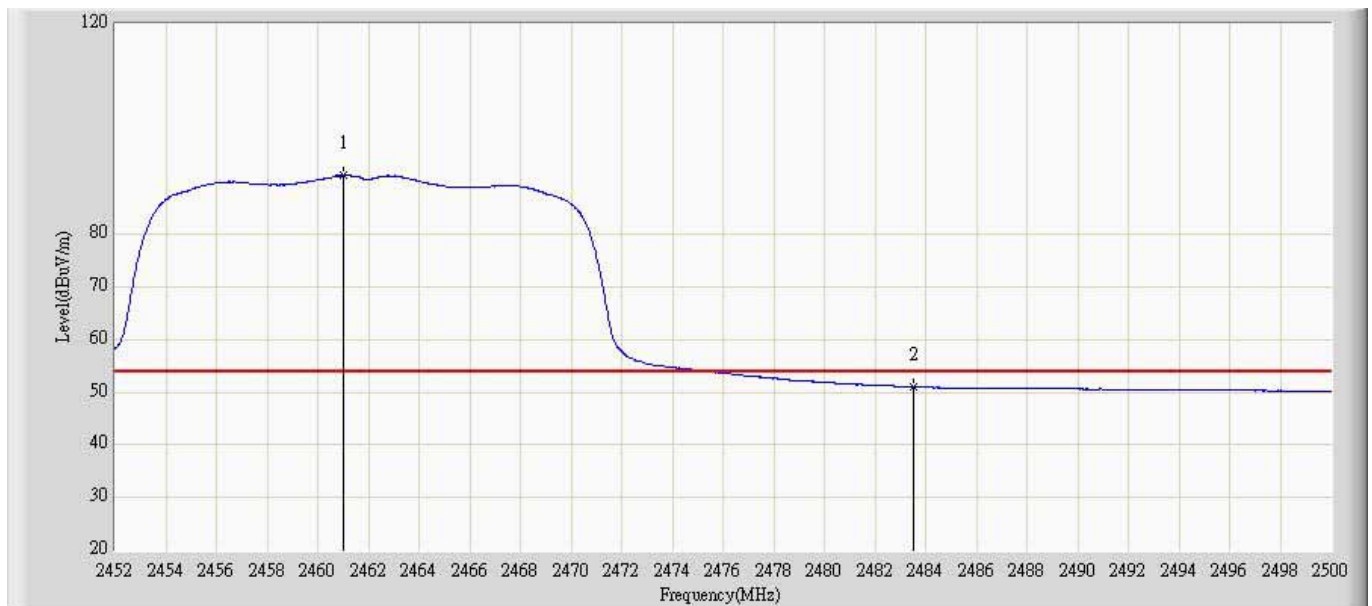
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.800	91.042	53.701	N/A	N/A	37.341	AV
2			2483.500	50.347	12.906	-3.653	54.000	37.441	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:29
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



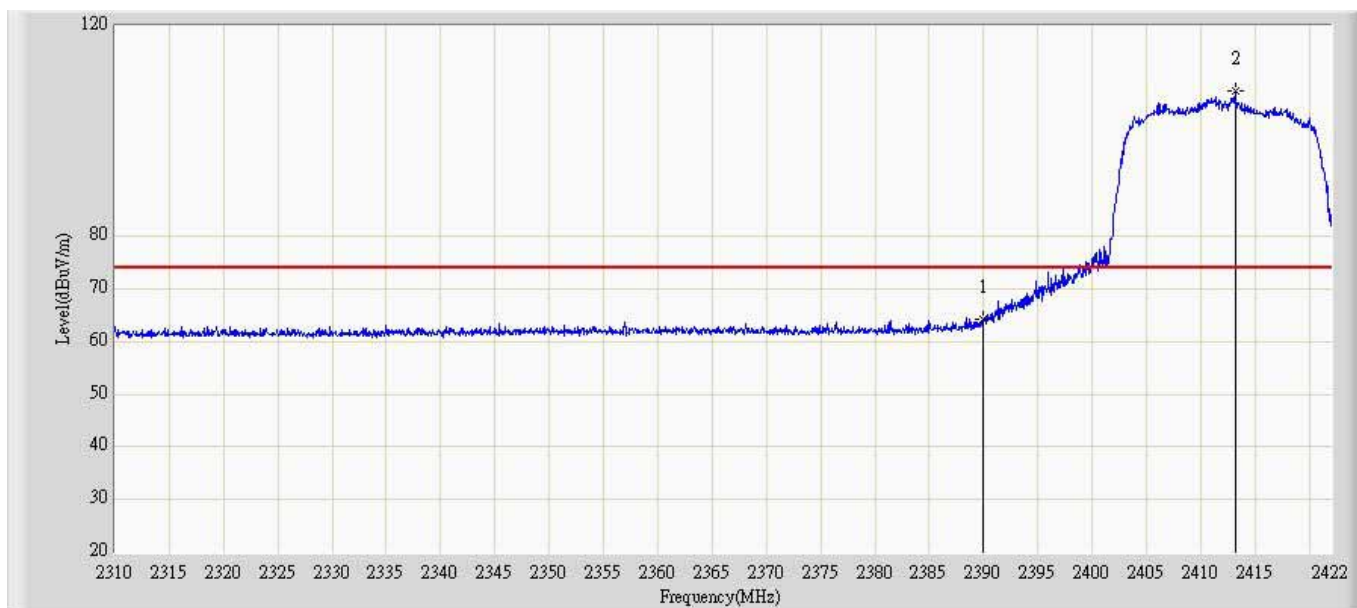
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.816	105.151	66.868	N/A	N/A	38.284	PK
2			2483.500	64.382	25.907	-9.618	74.000	38.475	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:42
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode2: Transmit at channel 2462MHz by 802.11g	



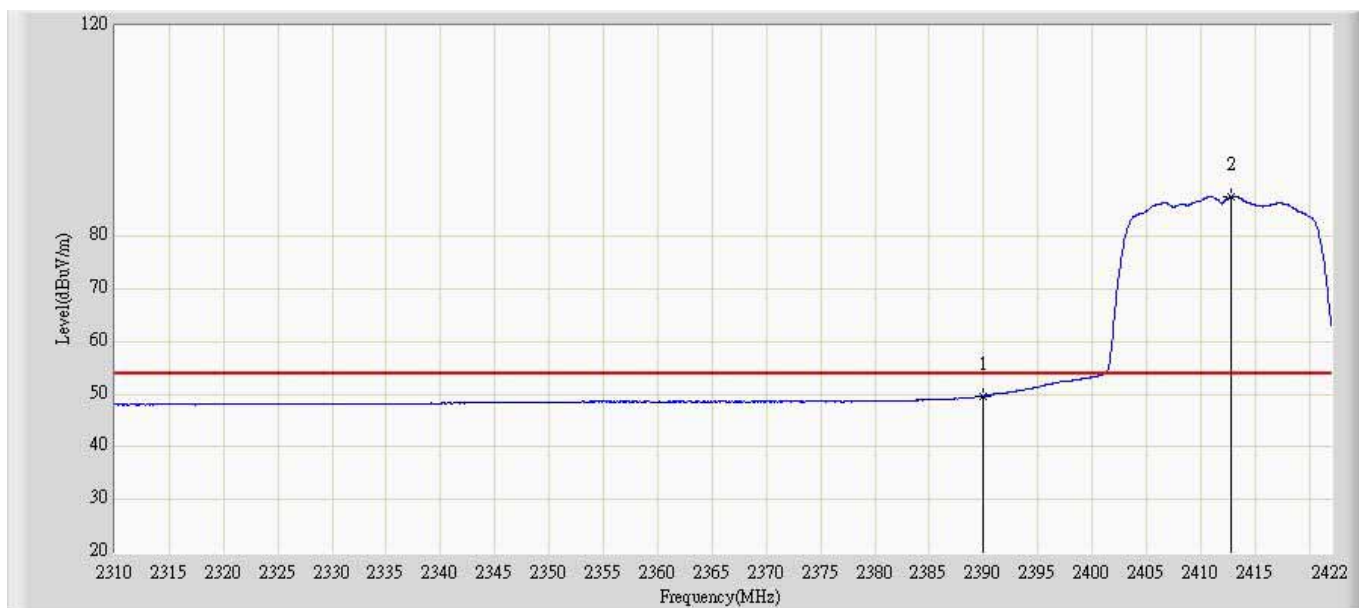
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2461.000	91.202	52.926	N/A	N/A	38.276	AV
2			2483.500	51.006	12.531	-2.994	54.000	38.475	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:44
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2412MHz by 802.11n20(MHz)	



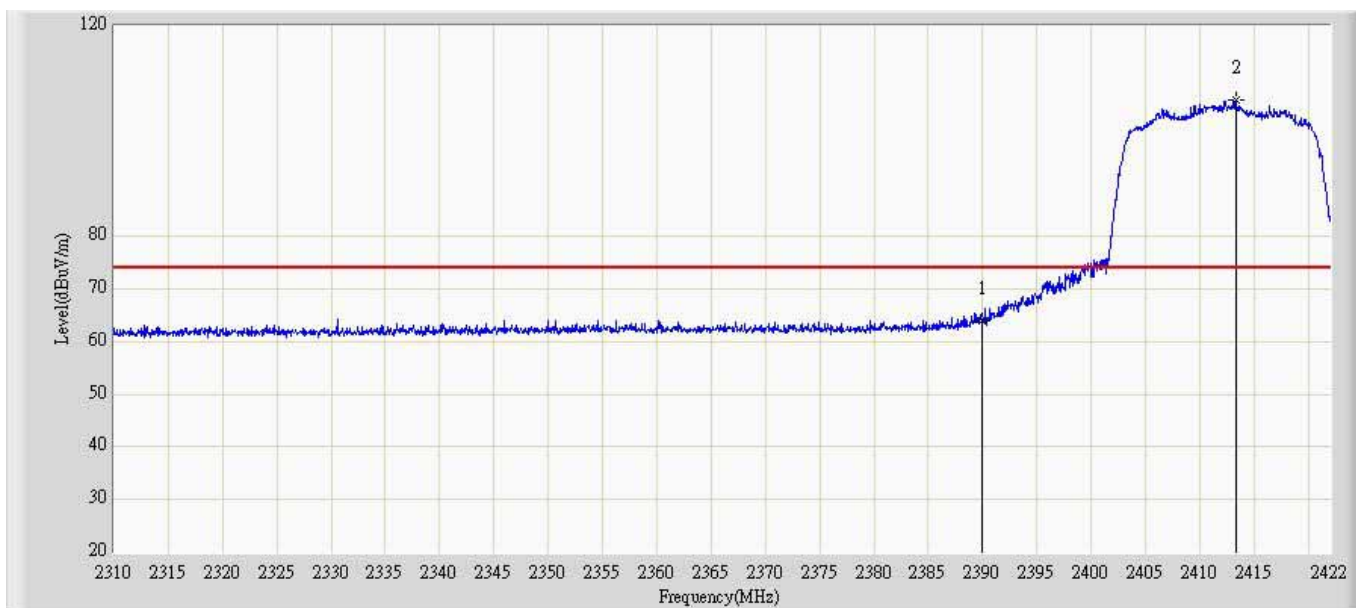
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	64.168	27.181	-9.832	74.000	36.988	PK
2		*	2413.208	107.611	70.508	N/A	N/A	37.103	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:51
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2412MHz by 802.11n20(MHz)	



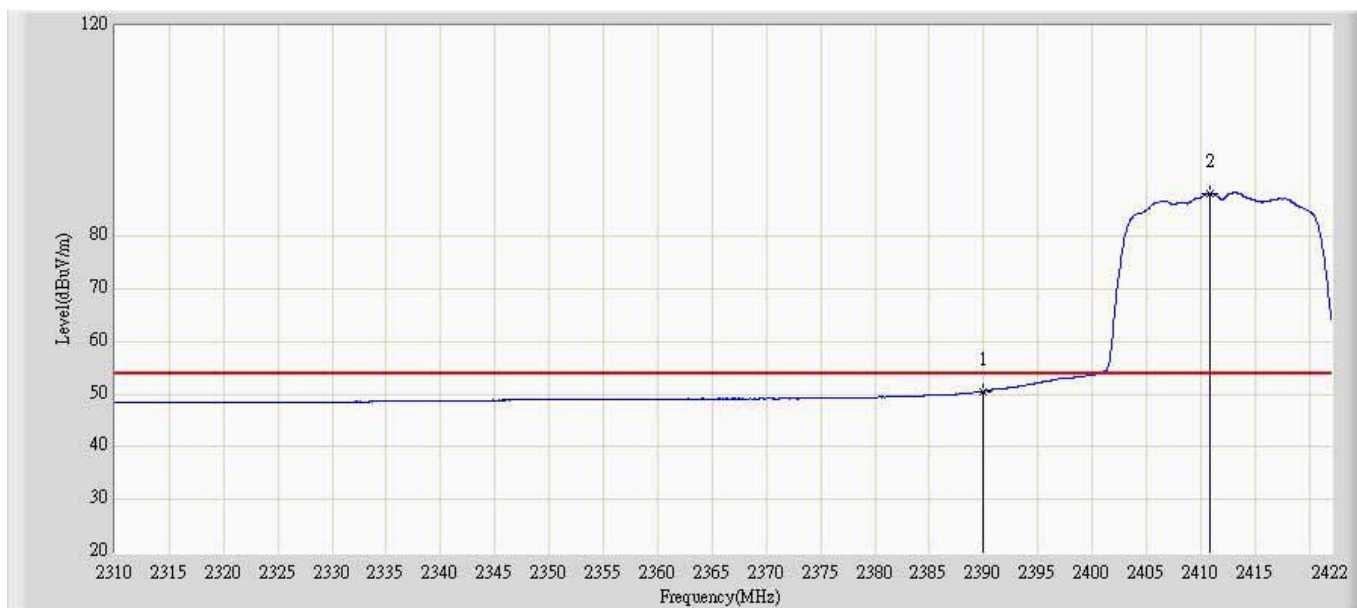
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	49.661	12.674	-4.339	54.000	36.988	AV
2		*	2412.872	87.573	50.472	N/A	N/A	37.101	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:52
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2412MHz by 802.11n20(MHz)	



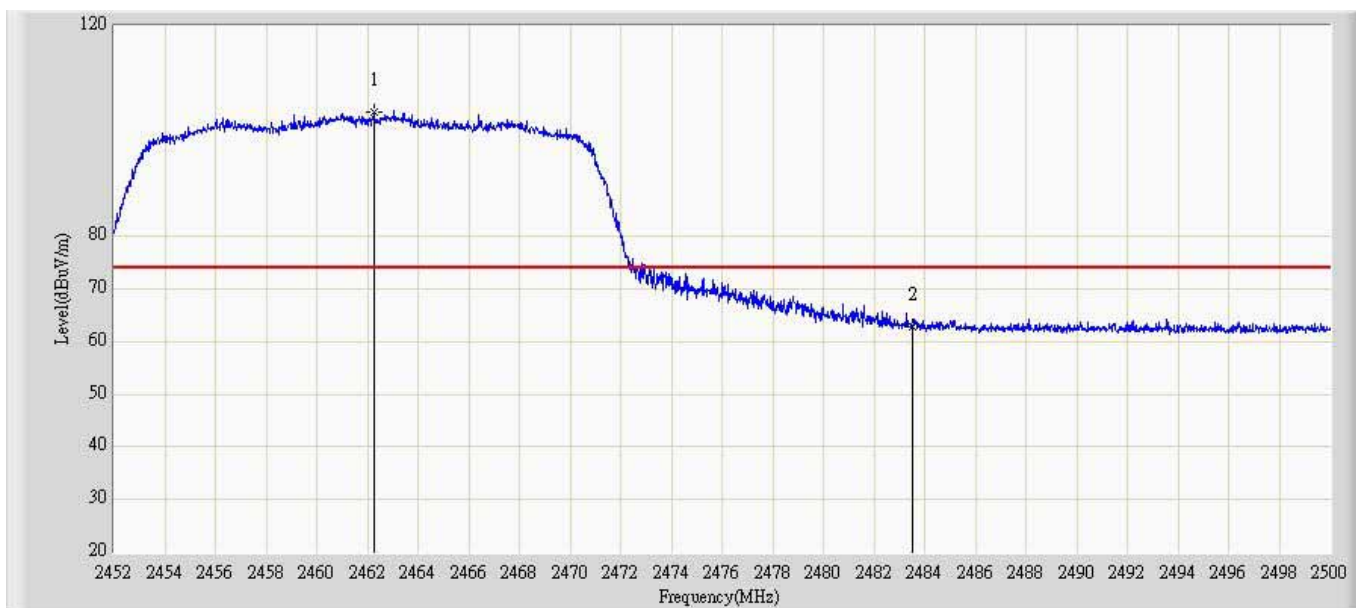
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	63.838	26.191	-10.162	74.000	37.648	PK
2		*	2413.320	106.058	68.202	N/A	N/A	37.857	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:54
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2412MHz by 802.11n20(MHz)	



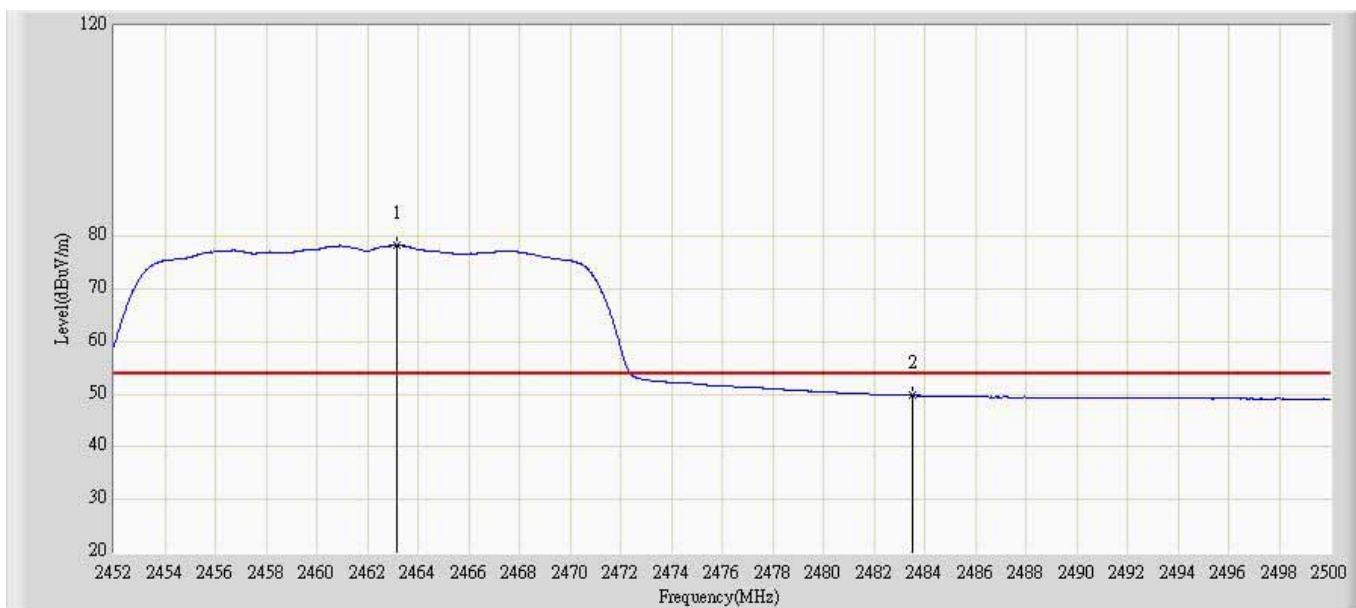
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			2390.000	50.537	12.890	-3.463	54.000	37.648	AV
2		*	2410.800	88.142	50.308	N/A	N/A	37.834	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:55
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2462MHz by 802.11n20(MHz)	



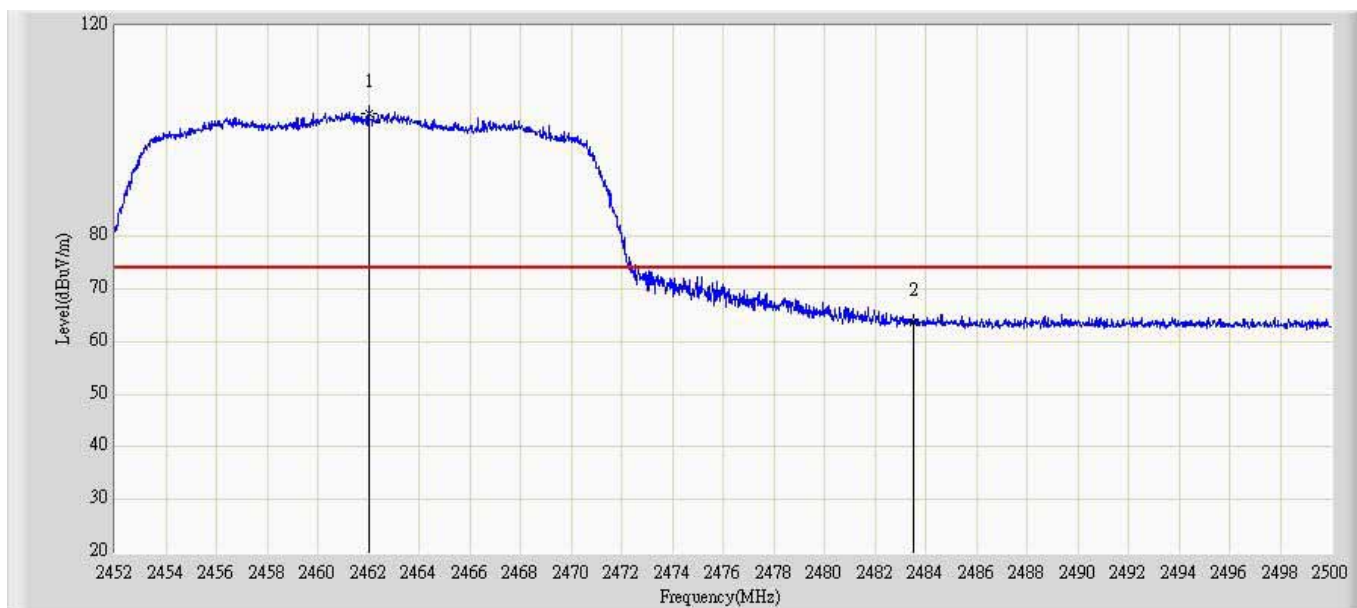
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.248	103.699	66.361	N/A	N/A	37.338	PK
2			2483.500	62.915	25.474	-11.085	74.000	37.441	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:57
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Vertical
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2462MHz by 802.11n20(MHz)	



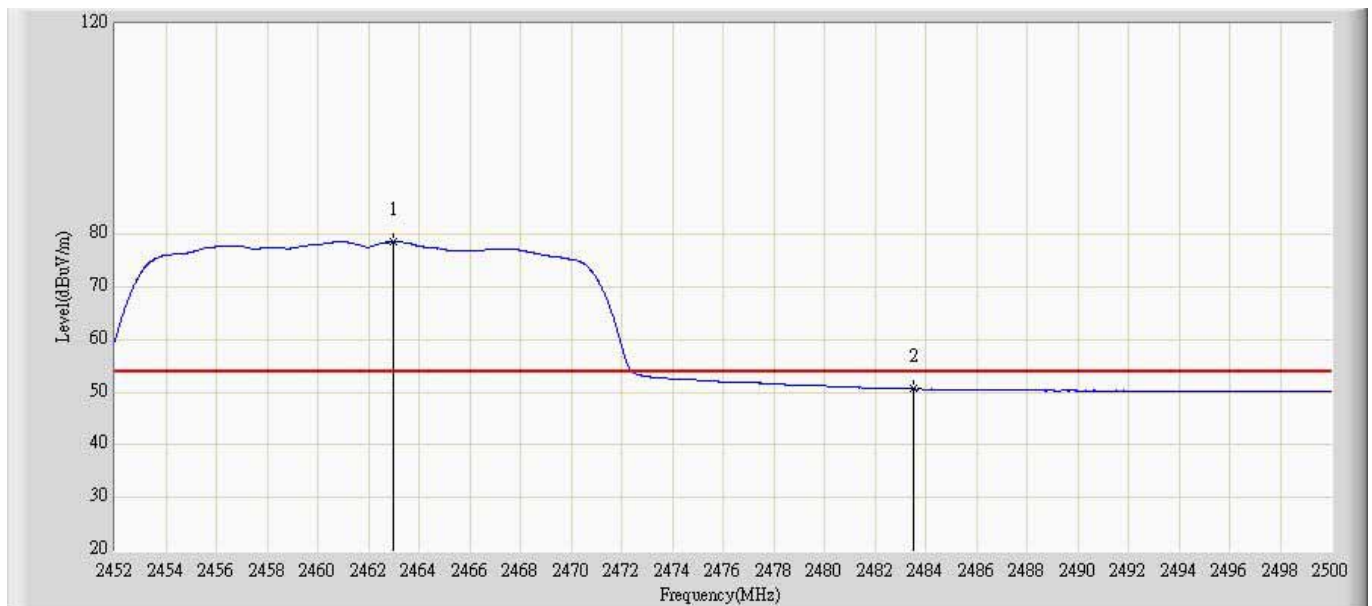
No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2463.184	78.263	40.920	N/A	N/A	37.342	AV
2			2483.500	49.763	12.322	-4.237	54.000	37.441	AV

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 14:58
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2462MHz by 802.11n20(MHz)	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.003	103.348	65.063	N/A	N/A	38.285	PK
2			2483.500	63.753	25.278	-10.247	74.000	38.475	PK

Engineer: Toms	
Site: AC5	Time: 2014/02/10 - 15:00
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_988(1-18GHz)	Polarity: Horizontal
EUT: IP-STB	Power: AC 120V/60Hz
Note: Mode3: Transmit at channel 2462MHz by 802.11n20(MHz)	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1		*	2462.992	78.555	40.261	N/A	N/A	38.294	AV
2			2483.500	50.655	12.180	-3.345	54.000	38.475	AV

7. Operation Frequency Range of 20dB Bandwidth

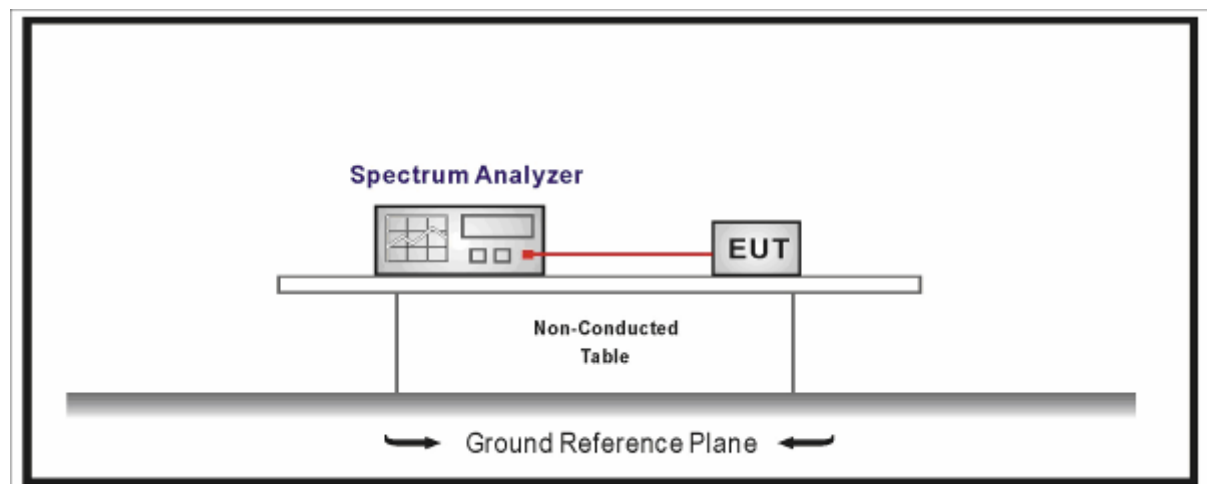
7.1. Test Equipment

Operation Frequency Range of 20dB Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

7.2. Test Setup



7.3. Limit

20 dB bandwidth of the emission is contained within the operation frequency band.

7.4. Test Procedure

The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

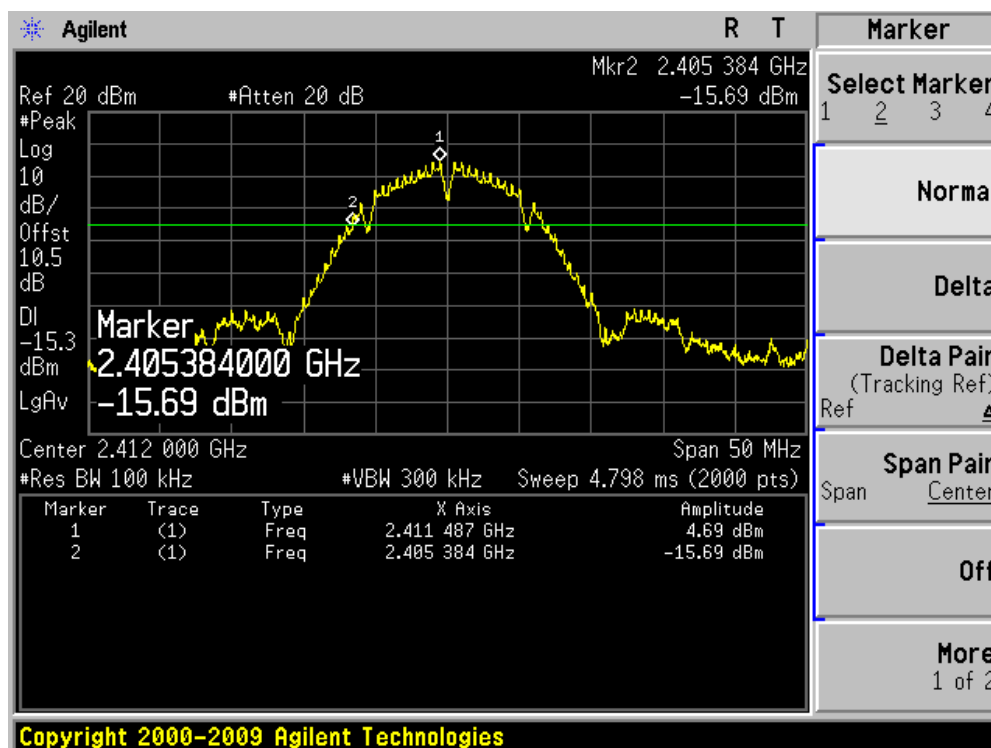
7.5. Uncertainty

The measurement uncertainty is defined as ± 1 kHz

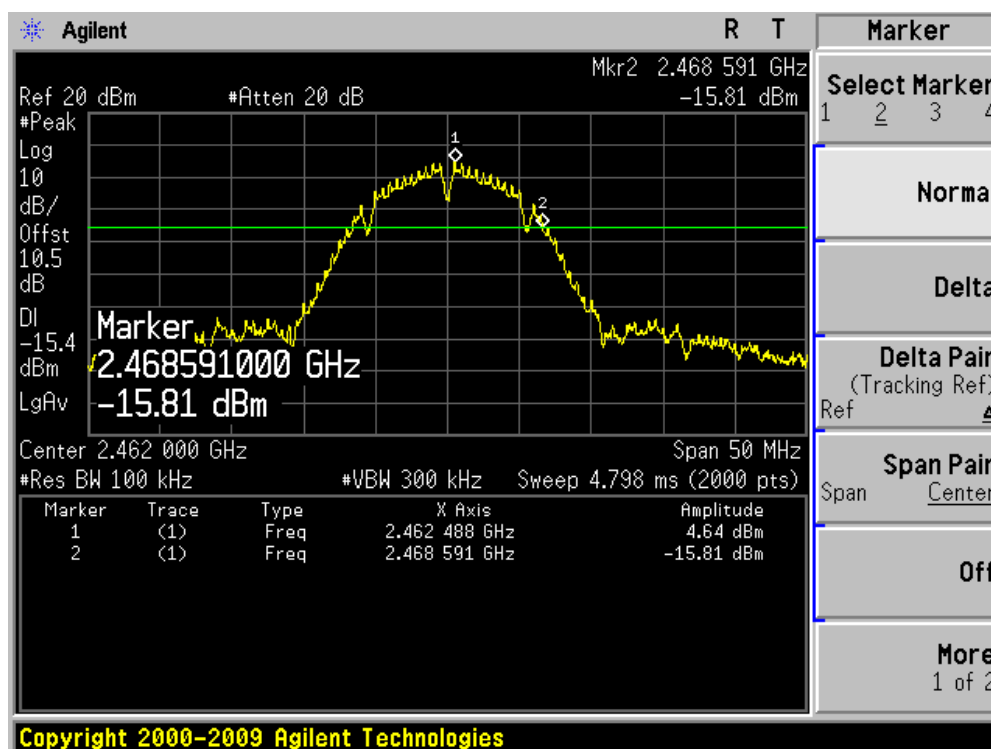
7.6. Test Result

Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel 01 (2412MHz)

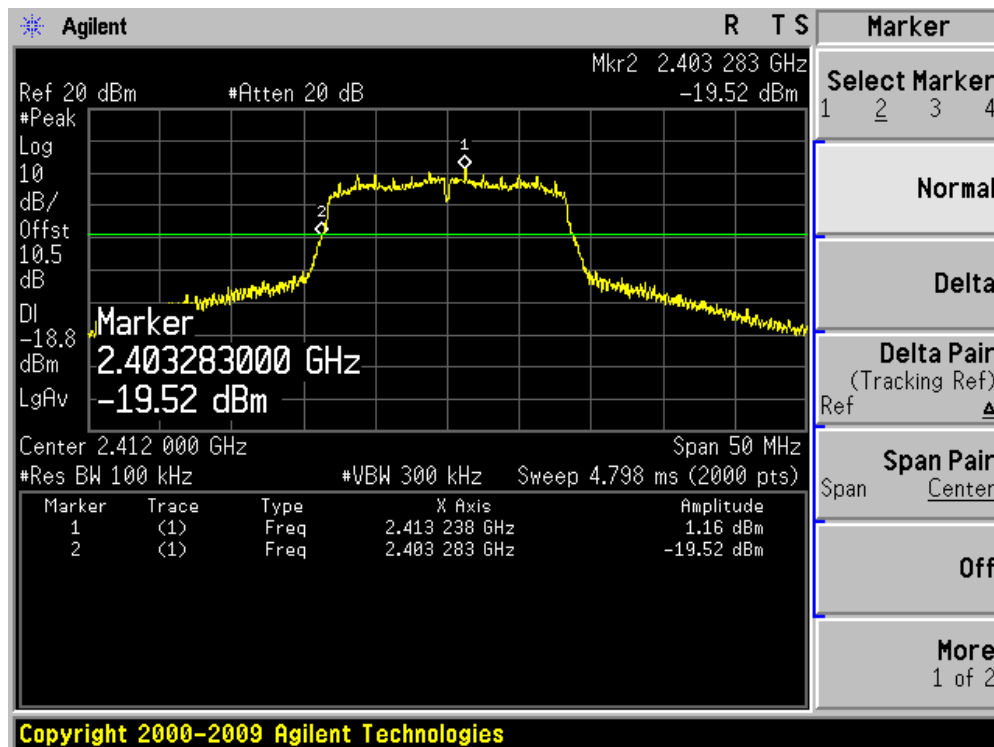


Channel 11 (2462MHz)

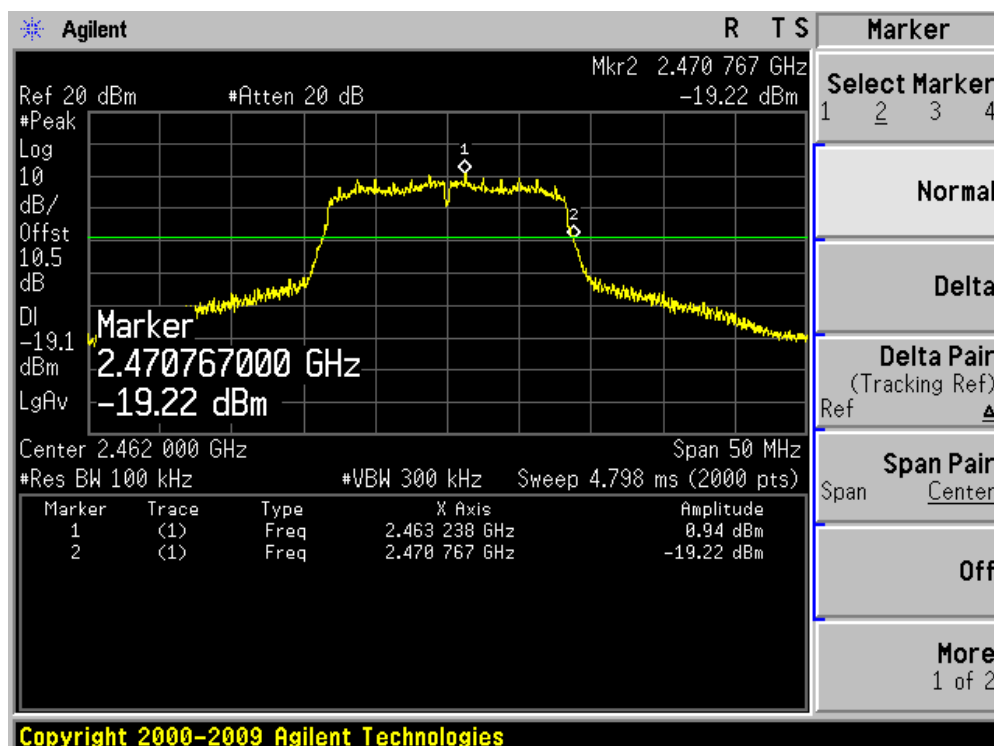


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel 01 (2412MHz)

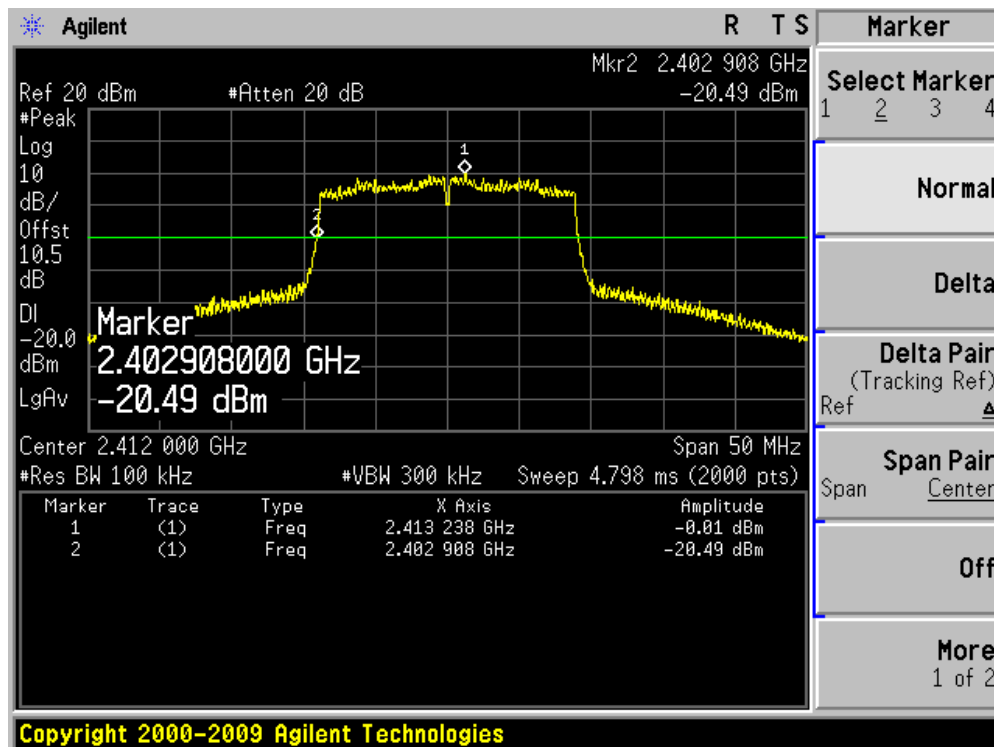


Channel 11 (2462MHz)

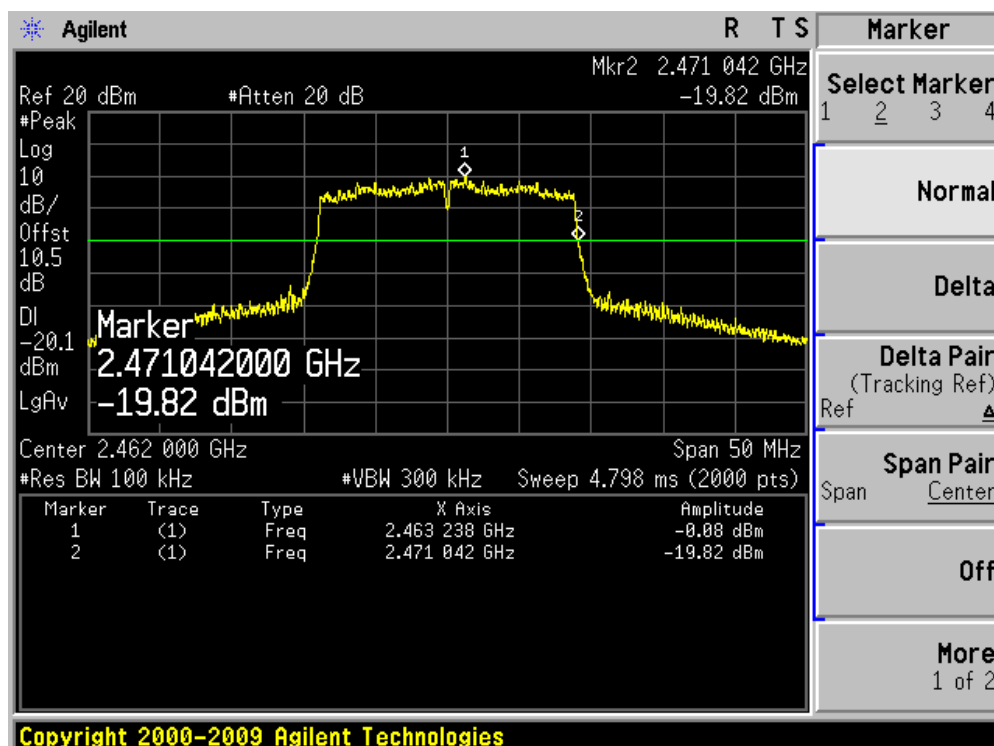


Product	:	IP-STB
Test Item	:	Operation Frequency Range of 20dB Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel 01 (2412MHz)



Channel 11 (2462MHz)



8. Occupied Bandwidth

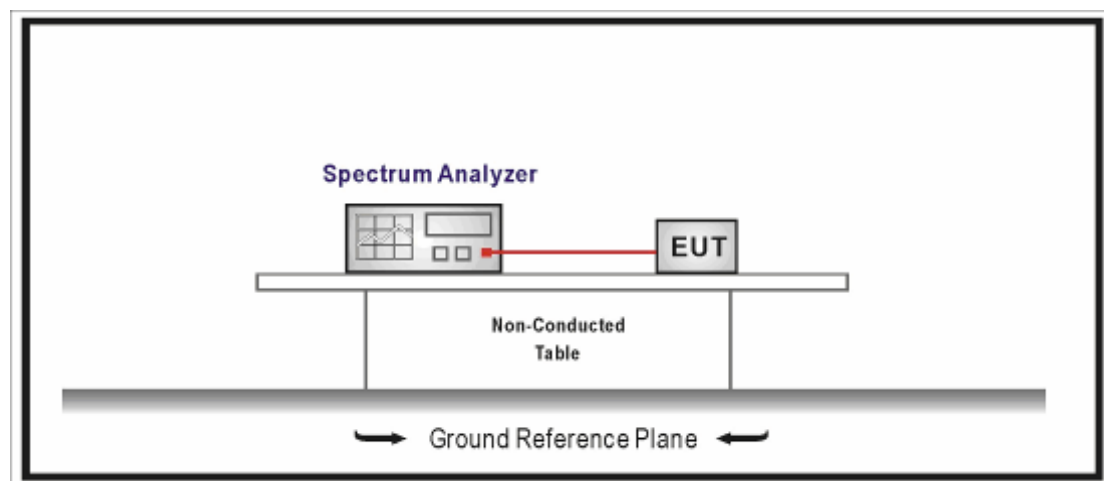
8.1. Test Equipment

Occupied Bandwidth / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2015.01.07
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

8.2. Test Setup



8.3. Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

8.4. Test Procedure

The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW $\geq$ 3*RBW, peak detector with maximum hold) is implemented by the instrument function.

8.5. Uncertainty

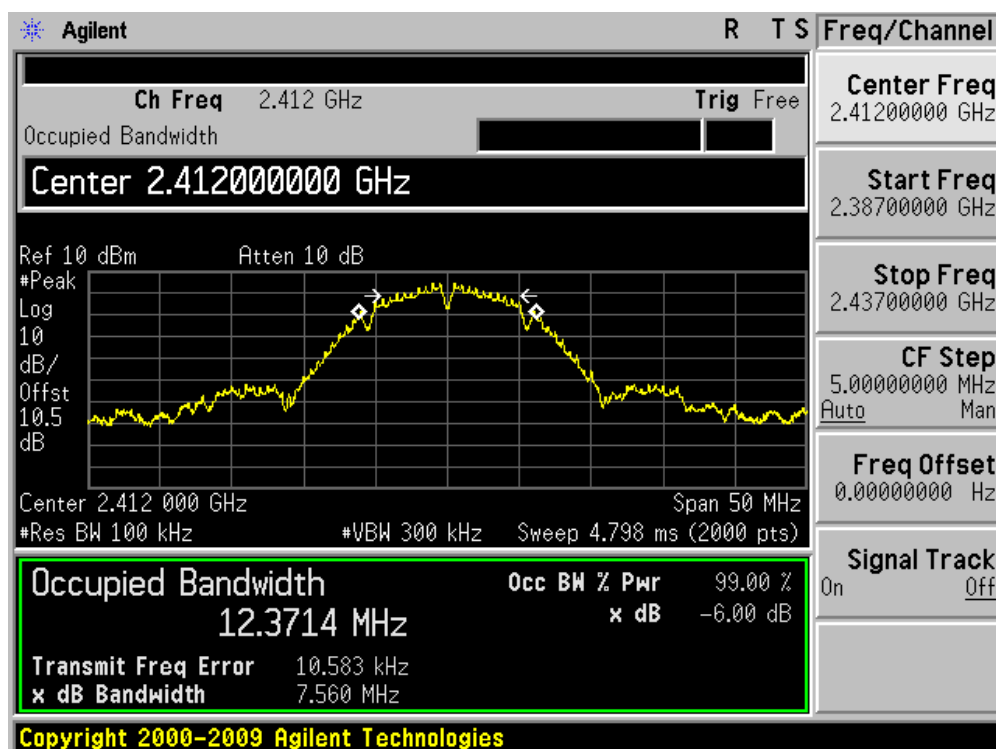
The measurement uncertainty is defined as ± 1 kHz

8.6. Test Result

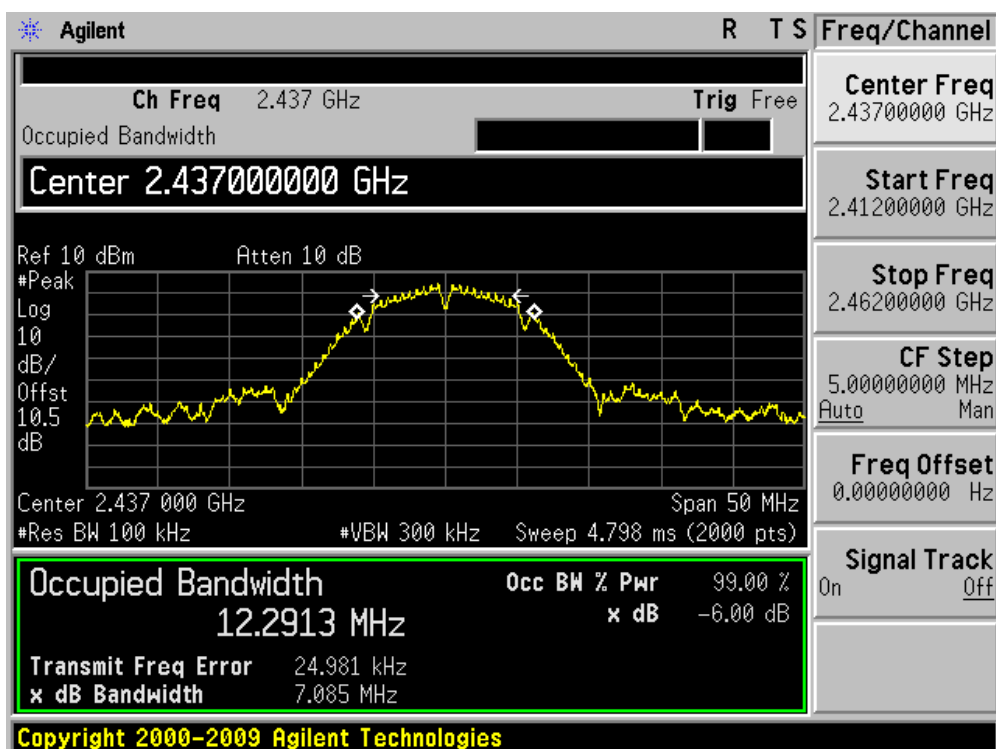
Product	:	IP-STB
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result	99% Bandwidth (kHz)
01	2412	7560.0	500	Pass	12371.4
06	2437	7085.0	500	Pass	12291.3
11	2462	7083.0	500	Pass	12245.9

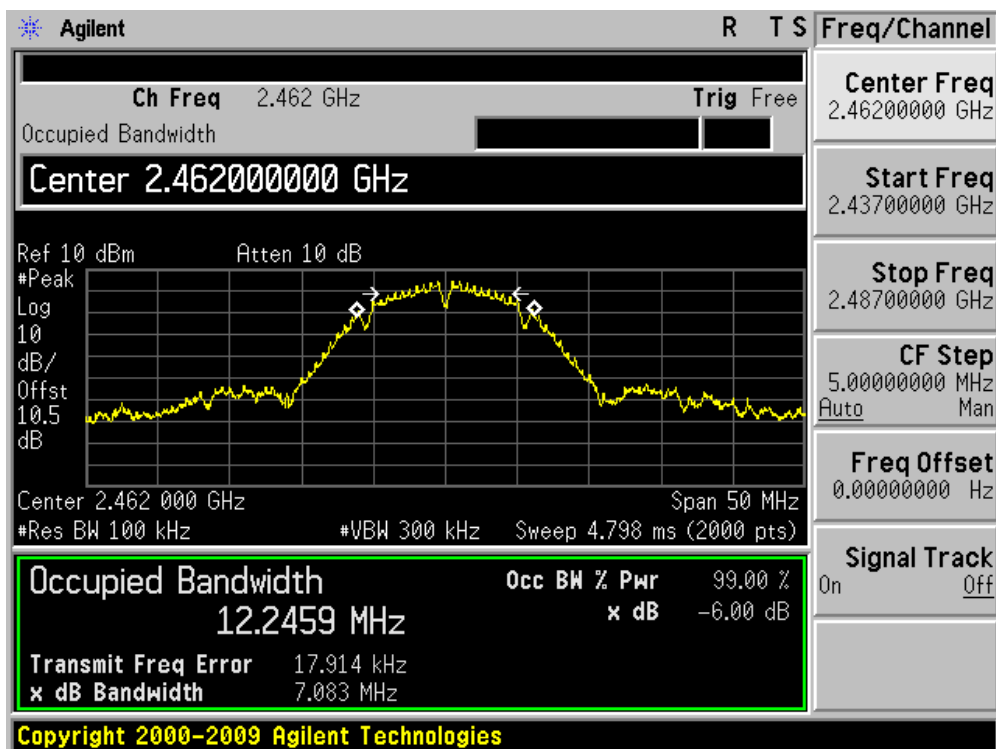
Channel 01 (2412MHz)



Channel 06 (2437MHz)



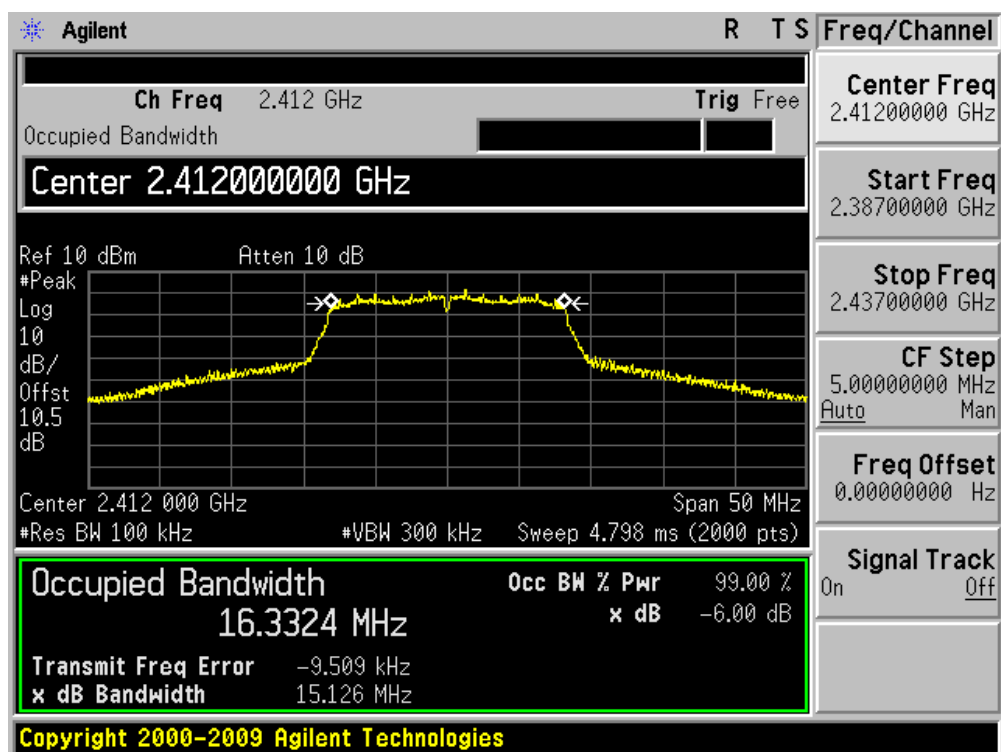
Channel 11 (2462MHz)



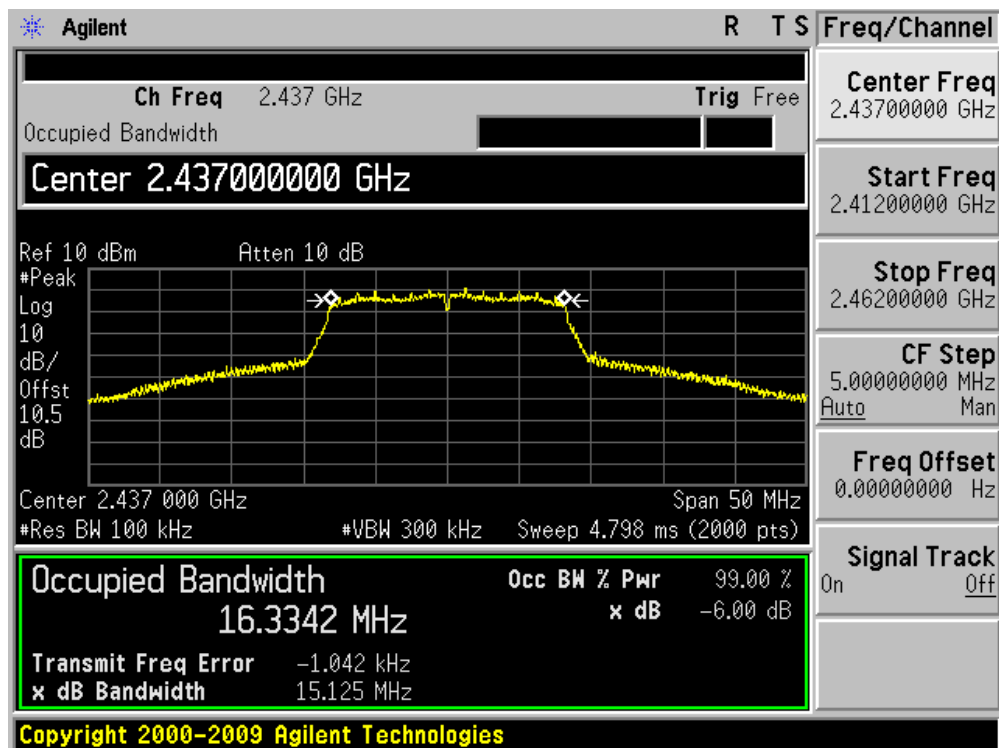
Product	:	IP-STB
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result	99% Bandwidth (kHz)
01	2412	15126.0	500	Pass	16332.4
06	2437	15125.0	500	Pass	16334.2
11	2462	15124.0	500	Pass	16343.2

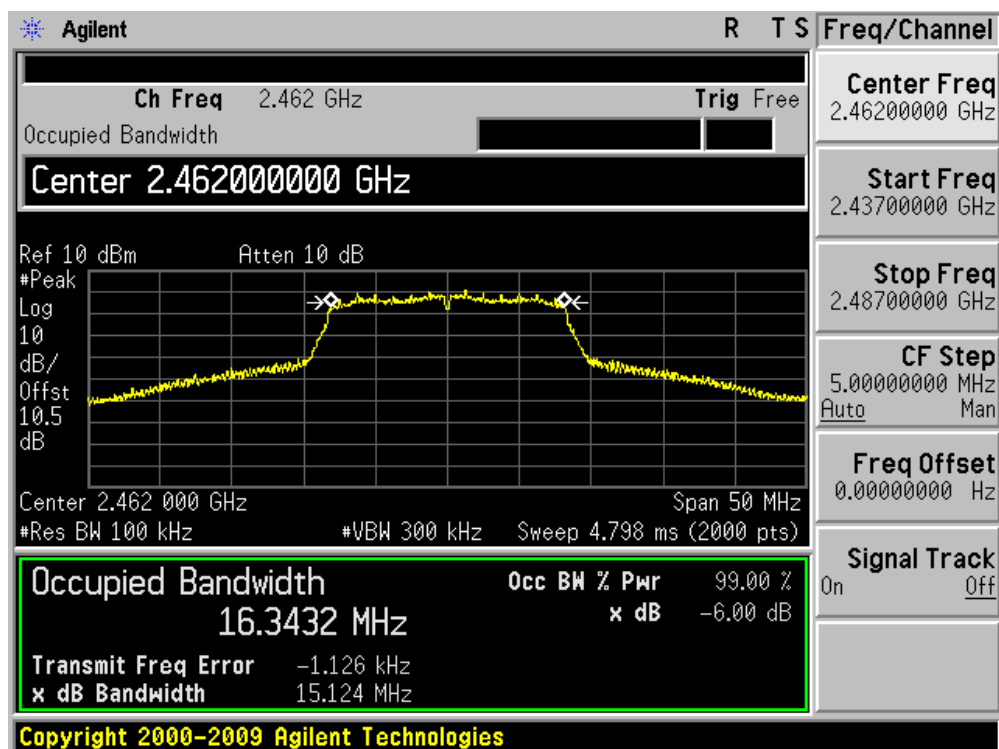
Channel 01 (2412MHz)



Channel 06 (2437MHz)



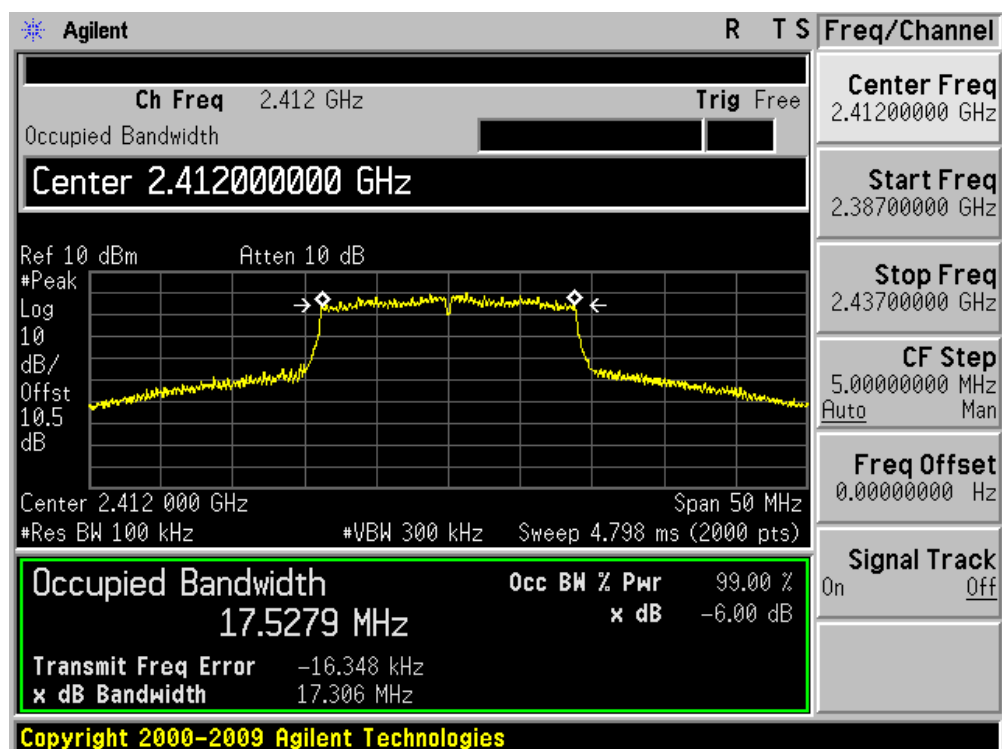
Channel 11 (2462MHz)



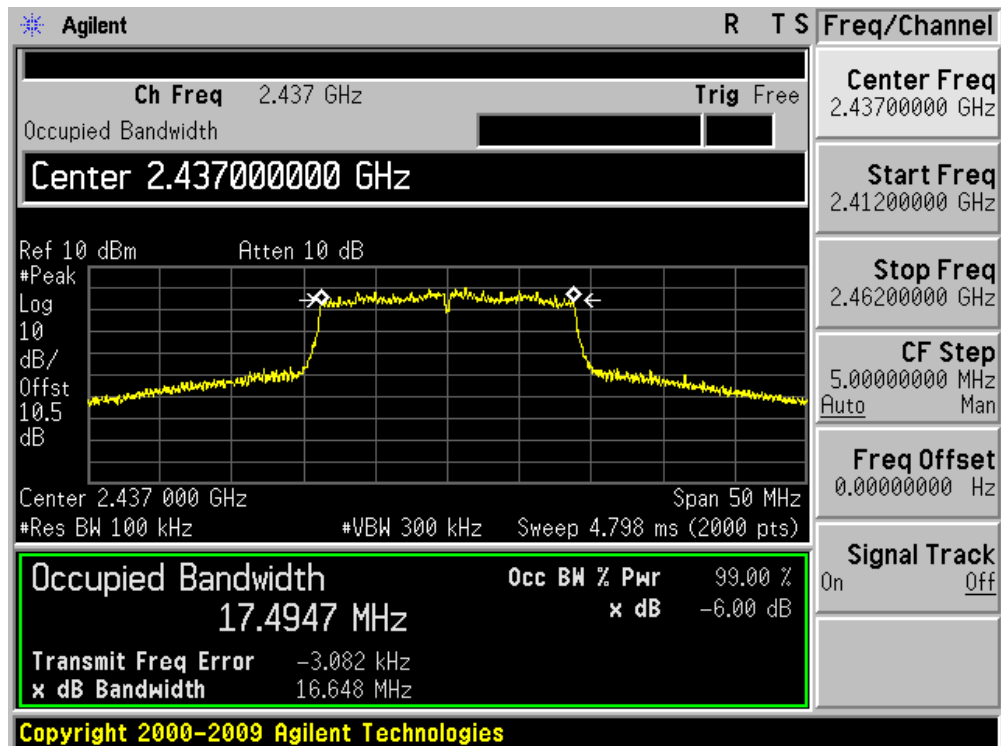
Product	:	IP-STB
Test Item	:	6dB Occupied Bandwidth
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result	99% Bandwidth (kHz)
01	2412	17306.0	500	Pass	17527.9
06	2437	16648.0	500	Pass	17494.7
11	2462	16650.0	500	Pass	17487.2

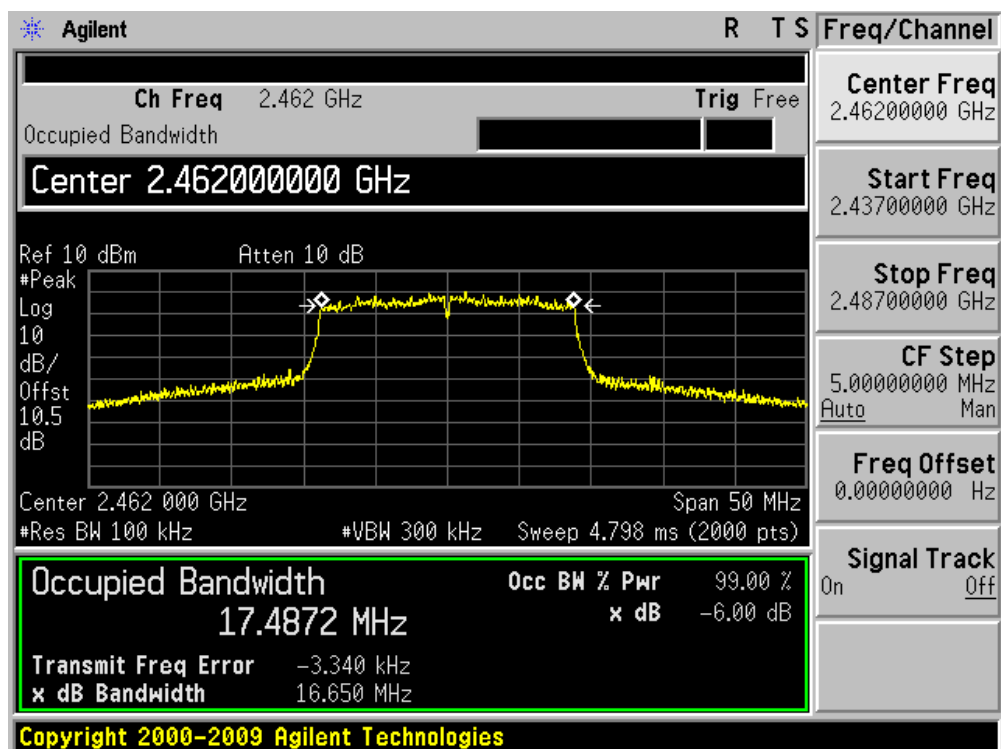
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



9. Power Output

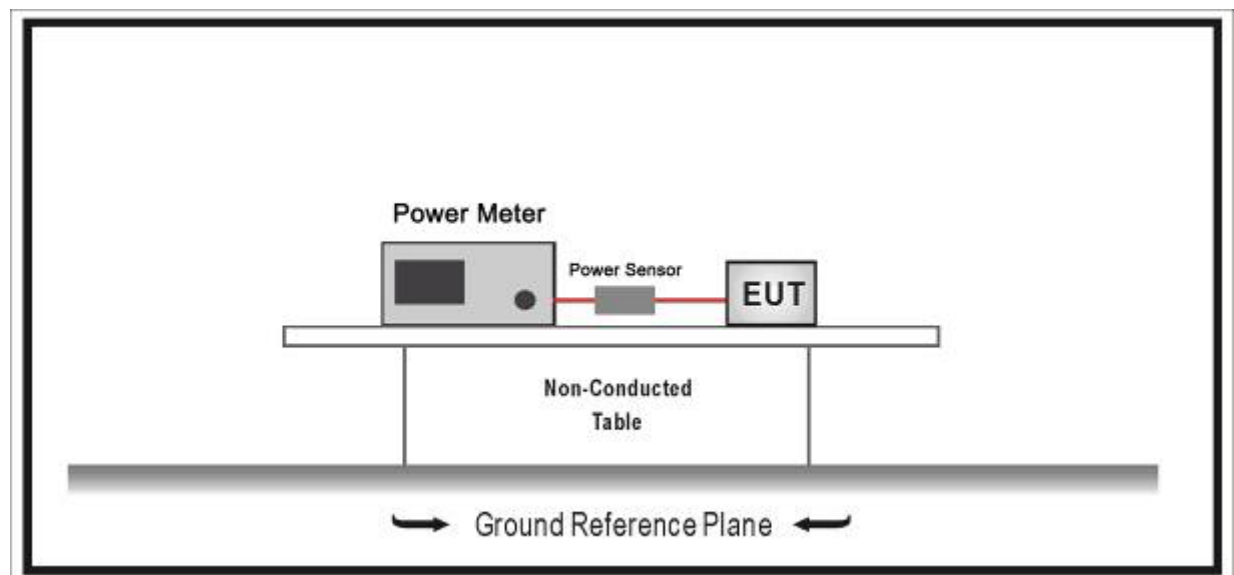
9.1. Test Equipment

Power Output / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2014.11.01
Power Sensor	Anritsu	MA2411B	0846014	2014.11.01
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

9.2. Test Setup



9.3. Limit

The maximum peak power shall be less 1 Watt (30dBm).

Note: the conducted output power limit specified above is based on the use the antennas with directional gains that do not exceed 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values above, as appropriate, by the amount in dB that the directional gain of antenna exceeds 6 dBi.

9.4. Test Procedure

The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Use the broadband peak RF power meter to test peak power and record the result.

9.5. Uncertainty

The measurement uncertainty is defined as ± 1.27 dB

9.6. Test Result

Power output test was verified over all data rates of each mode, and then choose the maximum power output (blue marker) for final test of each channel.

MCS Index for 802.11n	Spatial Streams	Data Rate (Mbps)			
		802.11b	802.11g	20MHz Bandwidth	
				800ns GI	400ns GI
0	1	1	6	6.5	7.2
1	1	2	9	13.0	14.4
2	1	5.5	12	19.5	21.7
3	1	11	18	26.0	28.9
4	1	---	24	39.0	43.3
5	1	---	36	52.0	57.8
6	1	---	48	58.5	65.0
7	1	---	54	65.0	72.2

Power output at various data rates:

Test Mode	Bandwidth	Frequency (MHz)	Channel	Data Rate	Average Power (dBm)	Peak Power (dBm)
802.11b	20	2437	6	1M	12.76	15.93
				5.5M	12.18	15.81
				11M	11.92	15.27
802.11g	20	2437	6	6M	10.93	19.87
				24M	10.42	19.34
				54M	9.63	19.44
802.11n(20MHz)	20	2437	6	MCS0	9.87	19.19
				MCS3	9.25	19.08
				MCS7	8.44	18.75

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Average Power Output Value (dBm)	Peak Power Output Value (dBm)	Limit (dBm)	Result
		Data Rate(1M)	Data Rate(1M)		
1	2412	12.16	15.18	30	Pass
6	2437	12.76	15.93	30	Pass
11	2462	12.04	15.10	30	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Average Power Output Value (dBm)	Peak Power Output Value (dBm)	Limit (dBm)	Result
		Data Rate(6M)	Data Rate(6M)		
1	2412	11.12	20.01	30	Pass
6	2437	10.93	19.87	30	Pass
11	2462	10.97	19.57	30	Pass

Product	:	IP-STB
Test Item	:	Power Output
Test Site	:	TR8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Average Power Output Value (dBm)	Peak Power Output Value (dBm)	Limit (dBm)	Result
		Data Rate(MCS0)	Data Rate(MCS0)		
1	2412	10.08	19.13	30	Pass
6	2437	9.87	19.19	30	Pass
11	2462	10.01	19.21	30	Pass

10. Power Spectral Density

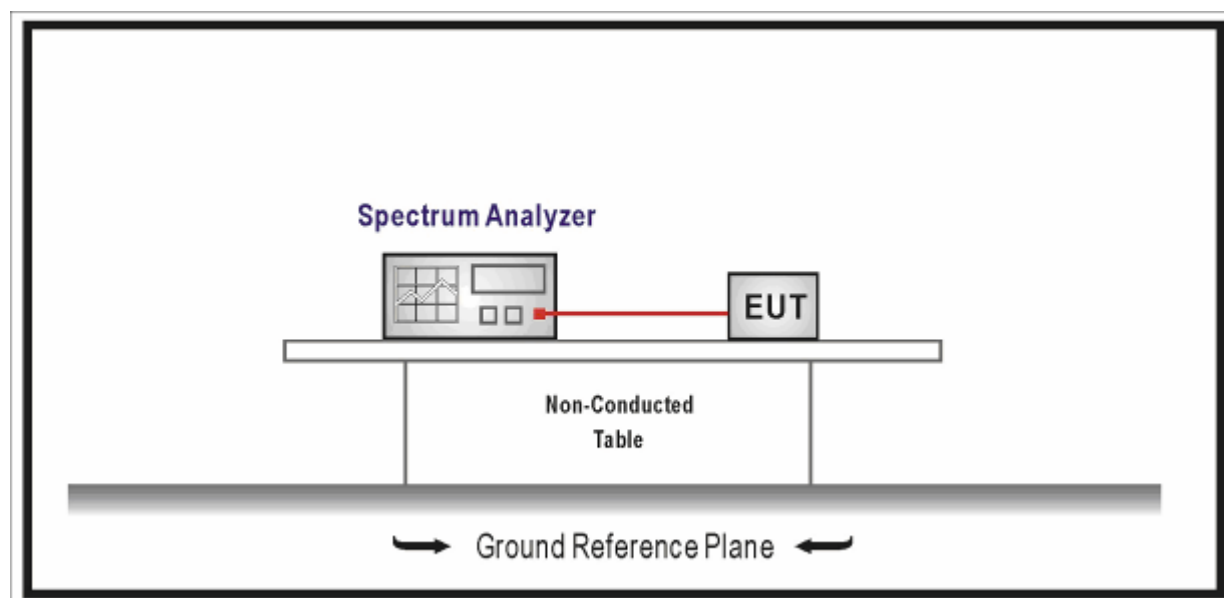
10.1. Test Equipment

Power Spectral Density / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cali. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2014.03.30
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2014.05.08

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

10.2. Test Setup



10.3. Limit

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

10.4. Test Procedure

The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

Set analyzer center frequency to DTS channel center frequency, the span to 1.5 times the DTS channel bandwidth, Set $100 \text{ kHz} \geq \text{RBW} \geq 3 \text{ kHz}$, Set $\text{VBW} \geq 3 * \text{RBW}$, Sweep time = auto couple, Detector = peak, Trace mode = max hold, Allow trace to fully stabilize, use the peak marker function to determine the maximum amplitude level. If measured value exceed limit reduce RBW (no less than 3kHz) and repeat.

10.5. Uncertainty

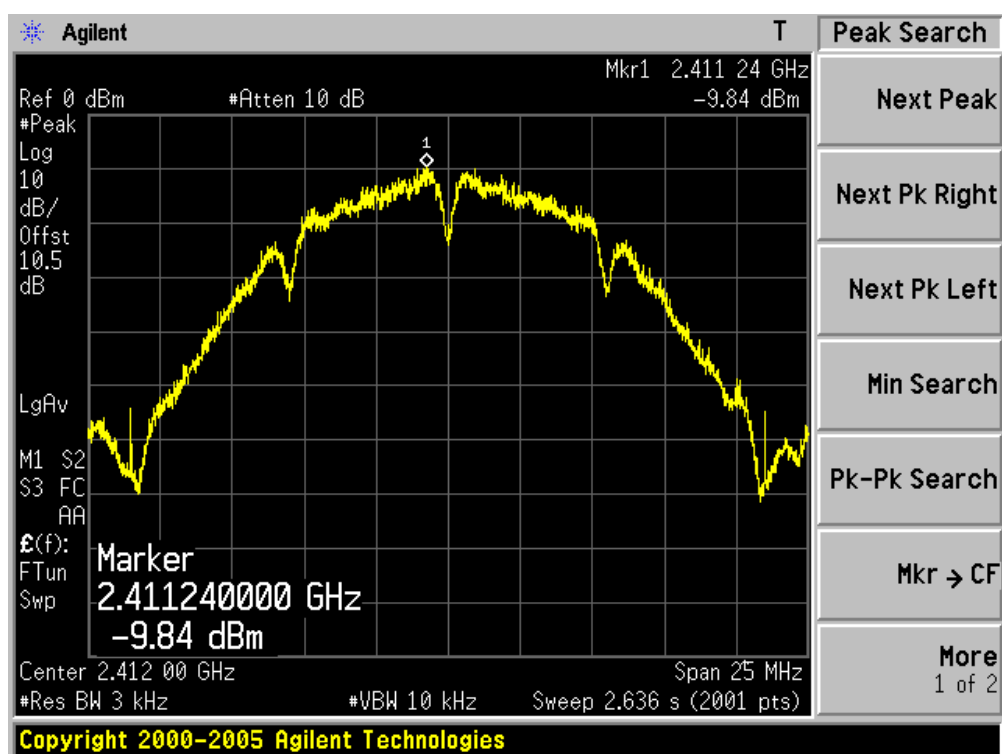
The measurement uncertainty is defined as $\pm 1.27 \text{ dB}$

10.6. Test Result

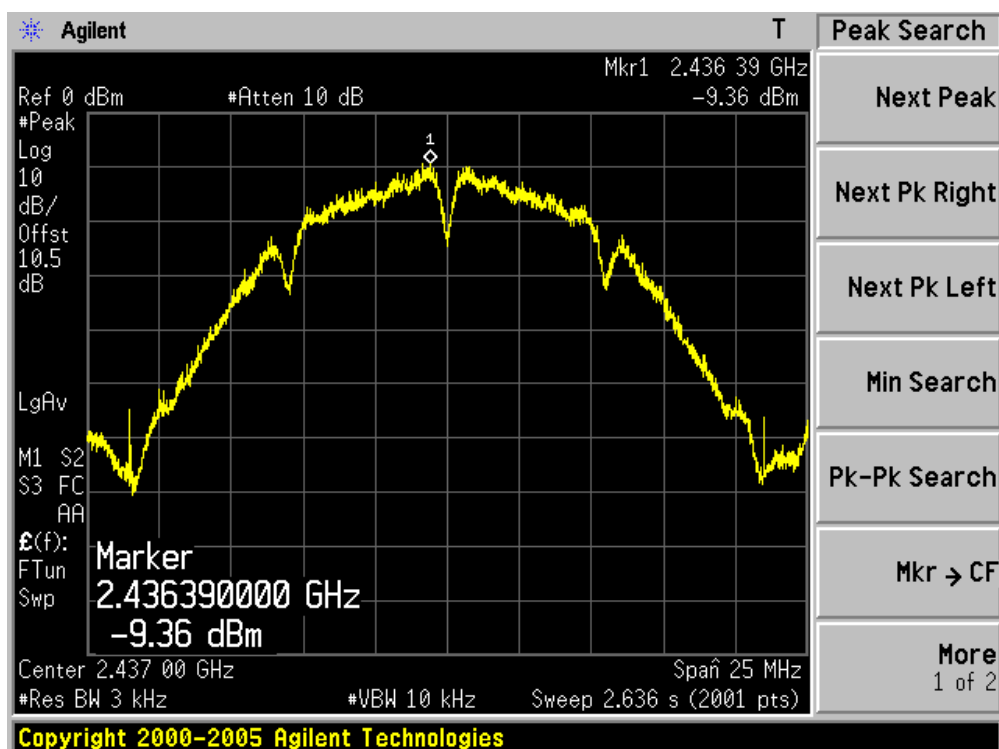
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 1: Transmit by 802.11b

Channel No.	Frequency (MHz)	Measurement PPSP (dBm)	Total PPSP (dBm)	Limit (dBm)	Result
01	2412	-9.84	-9.84	8	Pass
06	2437	-9.36	-9.36	8	Pass
11	2462	-9.31	-9.31	8	Pass

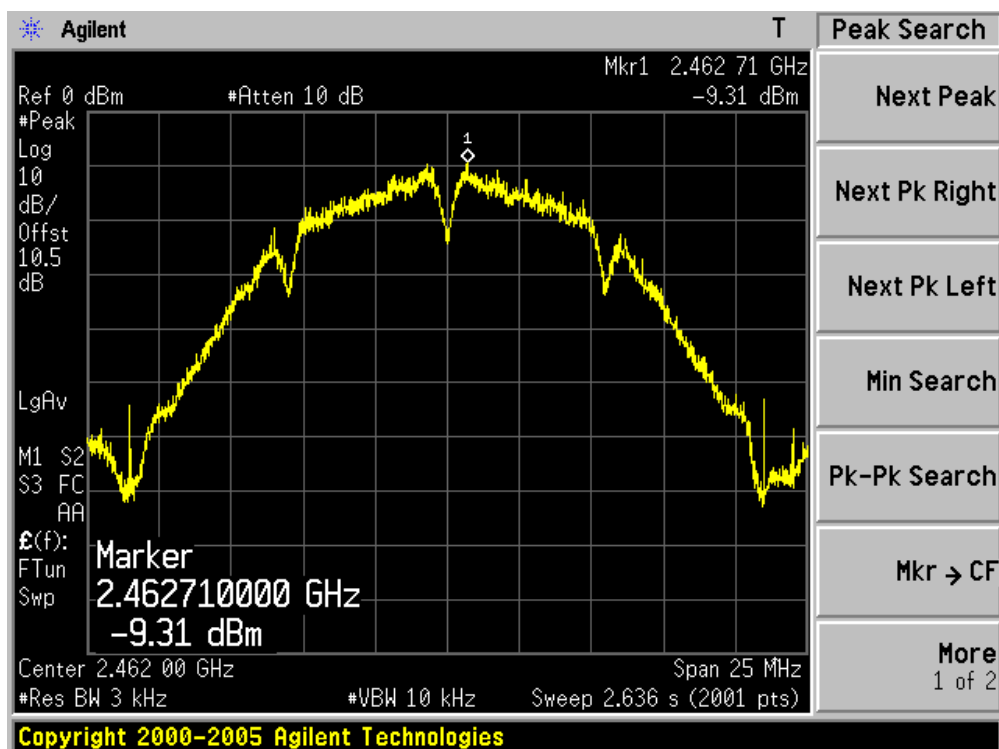
Channel 01 (2412MHz)



Channel 06 (2437MHz)



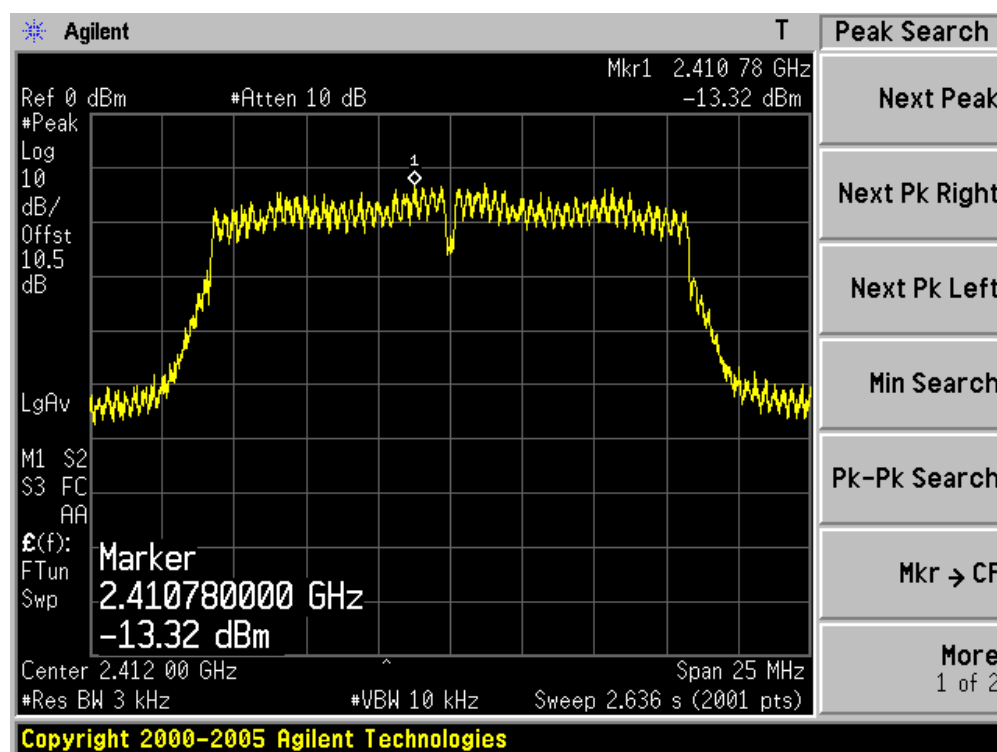
Channel 11 (2462MHz)



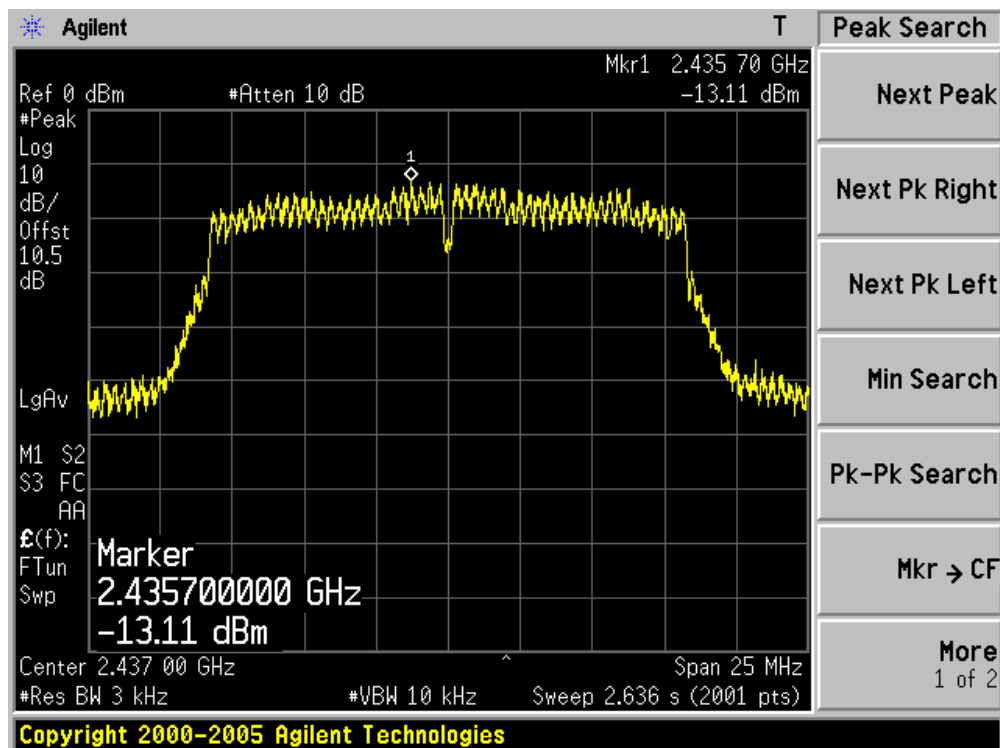
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 2: Transmit by 802.11g

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)	Result
01	2412	-13.32	-13.32	8	Pass
06	2437	-13.11	-13.11	8	Pass
11	2462	-12.87	-12.87	8	Pass

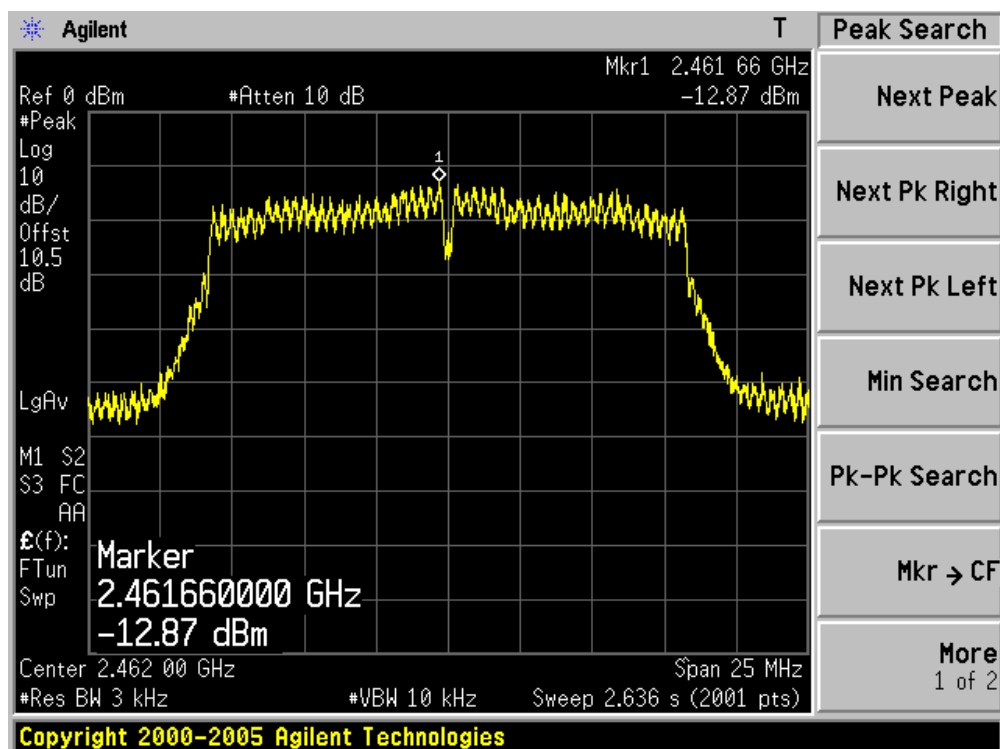
Channel 01 (2412MHz)



Channel 06 (2437MHz)



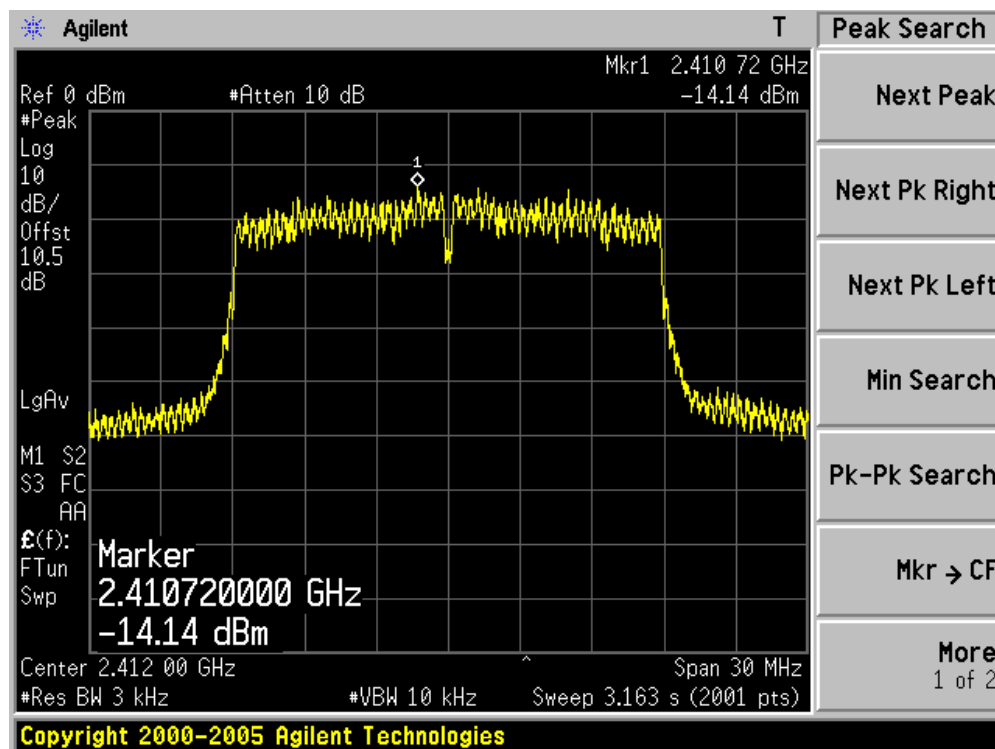
Channel 11 (2462MHz)



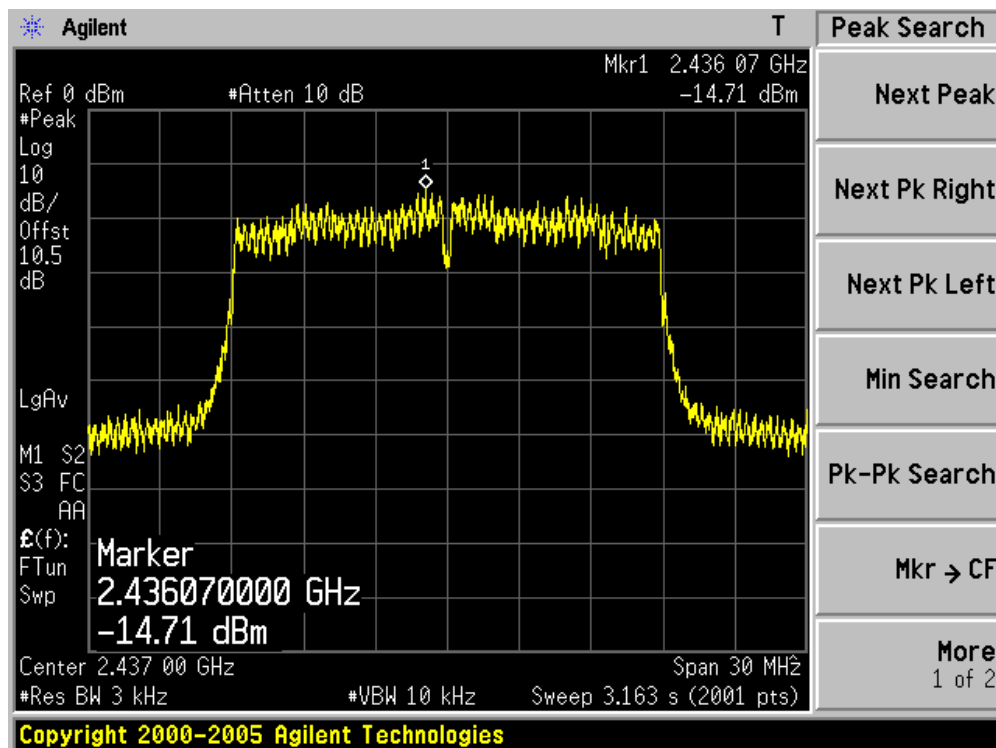
Product	:	IP-STB
Test Item	:	Power Spectral Density
Test Site	:	TR-8
Test Mode	:	Mode 3: Transmit by 802.11n(20MHz)

Channel No.	Frequency (MHz)	Measurement PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)	Result
01	2412	-14.14	-14.14	8	Pass
06	2437	-14.71	-14.71	8	Pass
11	2462	-15.24	-15.24	8	Pass

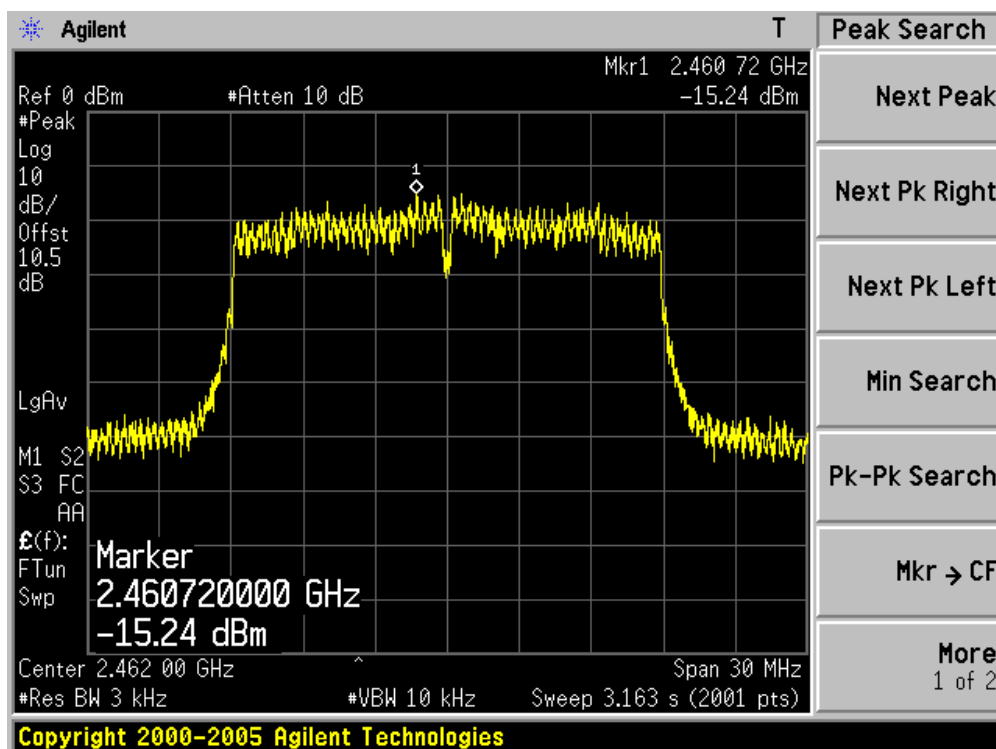
Channel 01 (2412MHz)



Channel 06 (2437MHz)



Channel 11 (2462MHz)



The End