



FCC Part 15C Test Report

FCC ID: TVVKS-12

Product Name:	Wireless Router
Trademark:	N/A
Model Name :	KS-12 PIAP-11N-M2V-LS, PIAP-11N-M2S-SW, PIAP-11AC-DS-US, PIAP-11AC-DM-US
Prepared For :	Pronto Networks, Inc
Address :	1966 Tice Valley Boulevard #411, Walnut Creek, CA 94595, United States
Prepared By :	Shenzhen BCTC Technology Co., Ltd.
Address :	No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	Jun. 12– Jun. 25, 2016
Date of Report :	Jun. 25, 2016
Report No.:	BCTC-160505327E



TEST RESULT CERTIFICATION

Applicant's name : Pronto Networks, Inc
Address : 1966 Tice Valley Boulevard #411, Walnut Creek, CA 94595,
United States

Manufacture's Name..... : SHENZHEN ZHIBOTONG ELECTRONICS CO.,LTD.
Address : 2F,Bldg A,Kangmai Science&Technology Industrial
Park,Renmin Rd, Guanlan,Longhua District, Shenzhen,
China

Product description

Product name : Wireless Router
Model and/or type reference : KS-12
PIAP-11N-M2V-LS, PIAP-11N-M2S-SW, PIAP-11AC-DS-US,
PIAP-11AC-DM-US

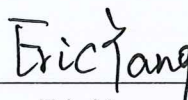
Standards : FCC Part15.247

Test procedure..... ANSI C63.10:2013

This device described above has been tested by BCTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Testing Engineer :


Eric Yang

Reviewer
(Supervisor) :



Approved &
Authorized
Signer(Manager) :


Carson Zhang

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report



1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.

Add. : No.101,Yousong Road,Longhua New District, Shenzhen,China

FCC Registered No.: 187086

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Router	
Trade Name	N/A	
Model Name	KS-12 PIAP-11N-M2V-LS, PIAP-11N-M2S-SW, PIAP-11AC-DS-US, PIAP-11AC-DM-US	
Model Difference	The product's different for model number and outlook color.	
Product Description	The EUT is a Wireless Router	
	Operation Frequency:	802.11b/g/n20MHz:2412~2462 MHz 802.11n40MHz:2422~2452 MHz
	Modulation Type:	WIFI: OFDM/DSSS
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps 802.11g:54/48/36/24/18/12/9/6Mbps 802.11n Up to 300Mbps
	Number Of Channel	802.11b/g/n20MHz:11 CH 802.11n40MHz: 7 CH
	Antenna Designation:	Please see Note 3.
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2.	
Adapter	Model:005D09 I/P:100~240V 47-63Hz 0.2A max O/P:DC 9V 0.6A	
Power	DC 9V from adapter	
hardware version	--	
Software version	--	
Serial number	--	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

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

Channel List for 802.11n(40)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
03	2422	05	2432	07	2442	09	2452
04	2427	06	2437	08	2447		

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	External Antenna		5.0	
2	N/A	N/A	External Antenna		5.0	
3	N/A	N/A	External Antenna		5.0	
4	N/A	N/A	External Antenna		5.0	

Note: The EUT incorporates a mimo funtion. Physically, the EUT provide two completed transmitter and two receivers.

This product used four external undetachable 2.4G antennas, two of them (chain0, chain1) are active, the other two (chain 2, chain 3) is passive, and each one antenna gain is 5dBi, which fulfill the requirement of this section, please refer to the EUT photos.

2.2 DESCRIPTION OF TEST MODES

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9
Mode 5	Link Mode

Conducted Emission	
Final Test Mode	Description
Mode 5	Link Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9

Note:

(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.



2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Wireless Router	N/A	KS-12	N/A	EUT
E-3	Adapter	N/A	005D09	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C1	NO	NO	0.8M	Unshielded

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.



2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Spectrum Analyzer	Agilent	E4407B	MY45109572	2015.08.25	2016.08.24
2	Test Receiver	R&S	ESPI	101396	2015.08.25	2016.08.24
3	Bilog Antenna	SCHWARZBECK	VULB9160	VULB9160-3369	2015.08.25	2016.08.24
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2015.08.24	2016.08.23
5	Spectrum Analyzer	Agilent	N9020A	MY5051041	2015.08.24	2016.08.23
6	Horn Antenna	SCHWARZBECK	9120D	9120D-1275	2015.08.25	2016.08.24
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.08.24	2016.08.23
8	Amplifier	SCHWARZBECK	BBV9718	9718-270	2015.08.25	2016.08.24
9	Amplifier	SCHWARZBECK	BBV9743	9743-119	2015.08.25	2016.08.24
10	Loop Antenna	ARA	PLKS-1230/B	1029	2015.08.25	2016.08.24
11	Power Meter	R&S	NRVS	100696	2015.08.25	2016.08.24
12	Power Sensor	R&S	URV5-Z4	0395.1619.05	2015.08.25	2016.08.24
13	RF cables	R&S	N/A	N/A	2015.08.25	2016.08.24

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
1	Test Receiver	R&S	ESCI	1166.5950K03-101165-ha	2015.08.24	2016.08.23
2	LISN	R&S	NSLK8126	8126466	2015.08.24	2016.08.23
3	LISN	R&S	NSLK8126	8126487	2015.08.24	2016.08.23
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2015.08.24	2016.08.23
5	RF cables	R&S	R204	R20X	2015.08.24	2016.08.23



3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

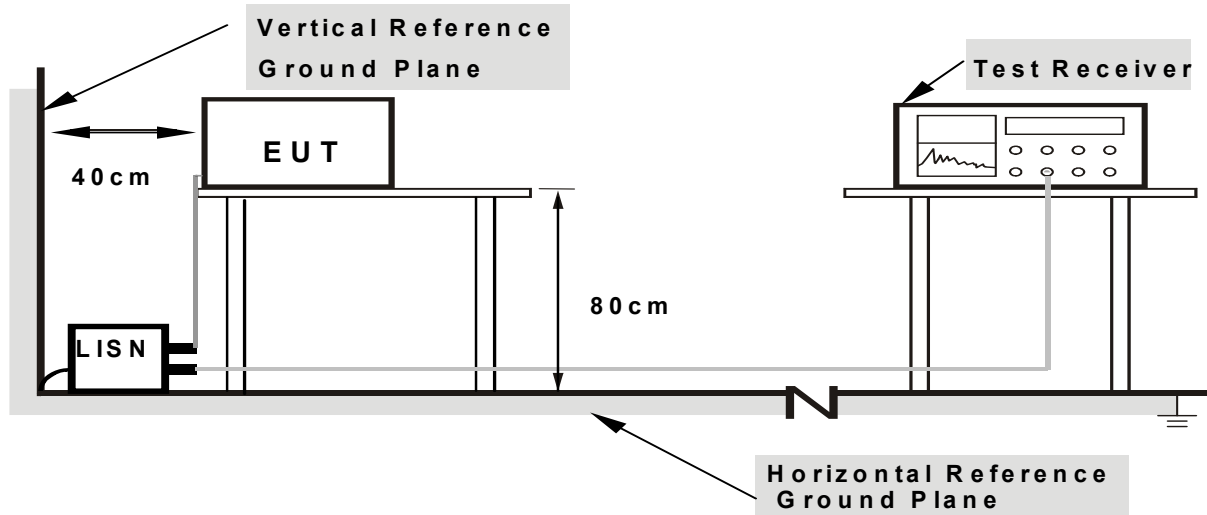
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

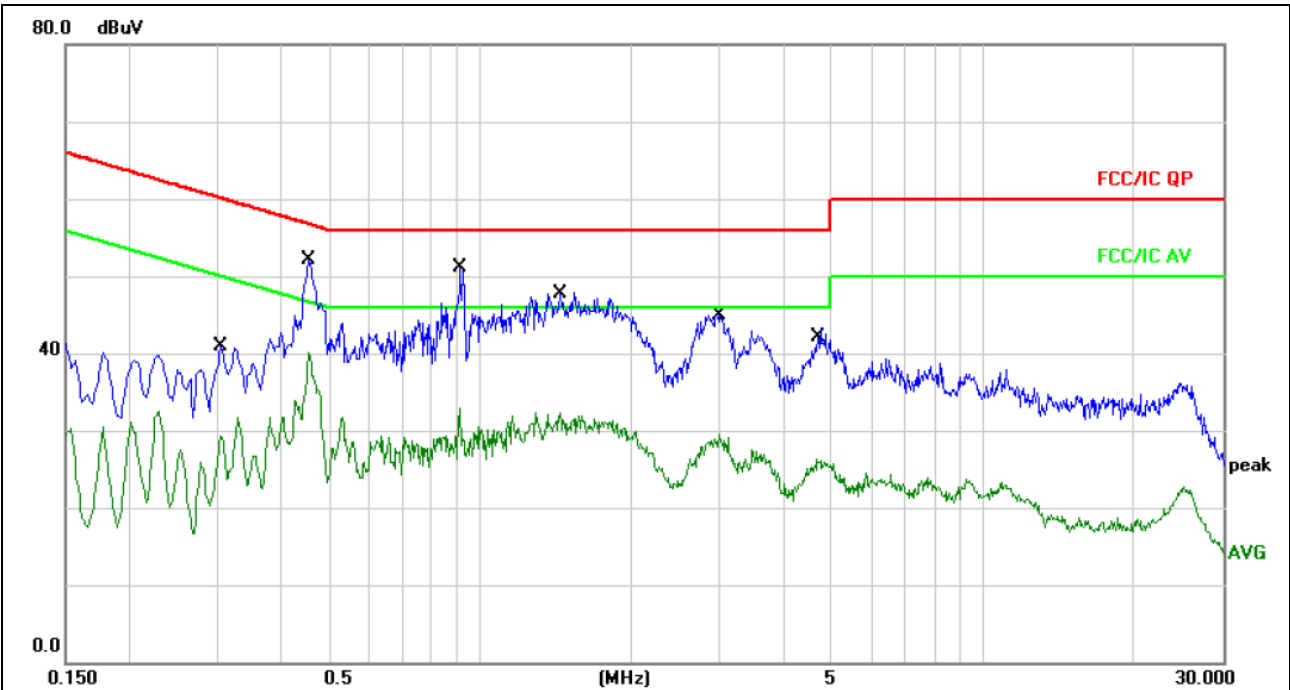
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.



3.1.6 TEST RESULTS

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 9V from adapter	Test Mode :	Mode 5

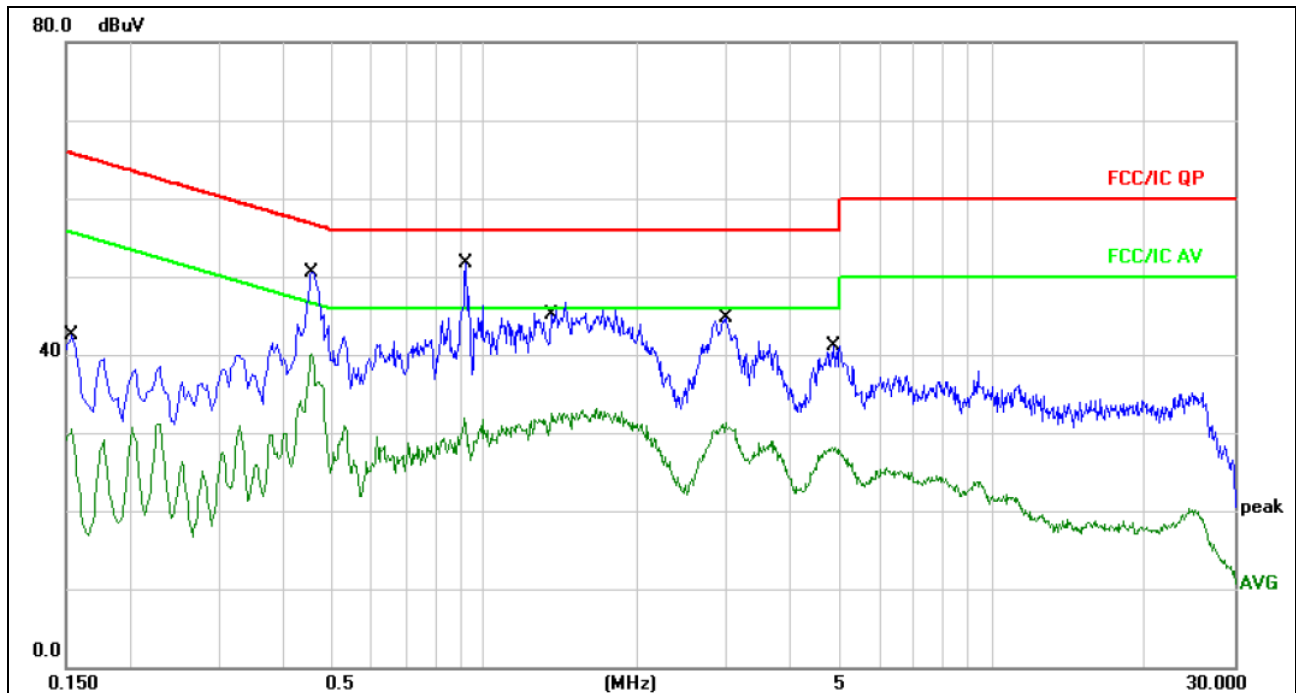
**Remark:**

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3060	30.75	10.09	40.84	60.08	-19.24	QP	
2		0.3060	21.61	10.09	31.70	50.08	-18.38	AVG	
3	*	0.4580	41.96	10.11	52.07	56.73	-4.66	QP	
4		0.4580	29.96	10.11	40.07	46.73	-6.66	AVG	
5		0.9140	40.85	10.16	51.01	56.00	-4.99	QP	
6		0.9140	22.70	10.16	32.86	46.00	-13.14	AVG	
7		1.4420	37.67	10.17	47.84	56.00	-8.16	QP	
8		1.4420	22.21	10.17	32.38	46.00	-13.62	AVG	
9		2.9860	34.79	10.19	44.98	56.00	-11.02	QP	
10		2.9860	19.38	10.19	29.57	46.00	-16.43	AVG	
11		4.6779	33.09	10.15	43.24	56.00	-12.76	QP	
12		4.6779	16.16	10.15	26.31	46.00	-19.69	AVG	



Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 9V from adapter	Test Mode :	Mode 5



Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1539	31.89	10.05	41.94	65.78	-23.84	QP	
2		0.1539	20.36	10.05	30.41	55.78	-25.37	AVG	
3		0.4580	40.48	10.11	50.59	56.73	-6.14	QP	
4		0.4580	29.97	10.11	40.08	46.73	-6.65	AVG	
5	*	0.9140	41.45	10.16	51.61	56.00	-4.39	QP	
6		0.9140	21.80	10.16	31.96	46.00	-14.04	AVG	
7		1.3580	36.47	10.17	46.64	56.00	-9.36	QP	
8		1.3580	22.43	10.17	32.60	46.00	-13.40	AVG	
9		2.9900	34.42	10.19	44.61	56.00	-11.39	QP	
10		2.9900	21.13	10.19	31.32	46.00	-14.68	AVG	
11		4.8380	30.96	10.15	41.11	56.00	-14.89	QP	
12		4.8380	17.92	10.15	28.07	46.00	-17.93	AVG	



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	25GHz
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

Below 1GHz test procedure as below:

- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

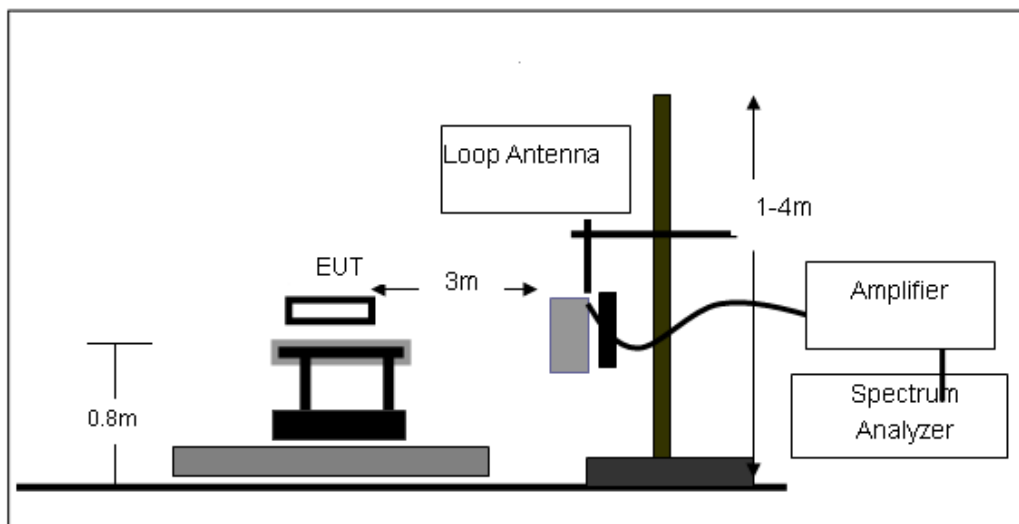
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in the report.

3.2.3 DEVIATION FROM TEST STANDARD

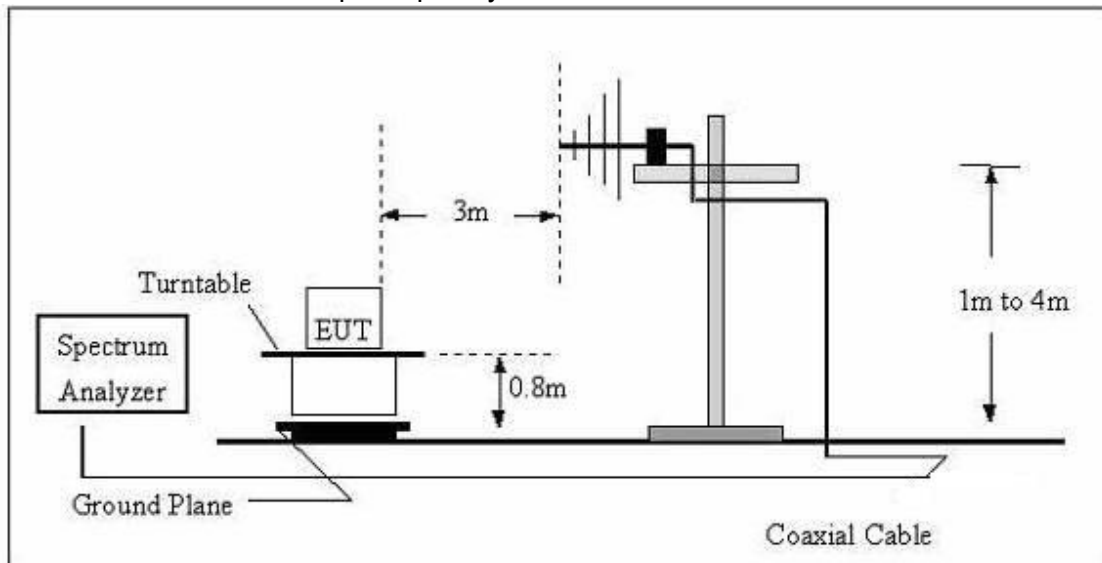
No deviation

3.2.4 TEST SETUP

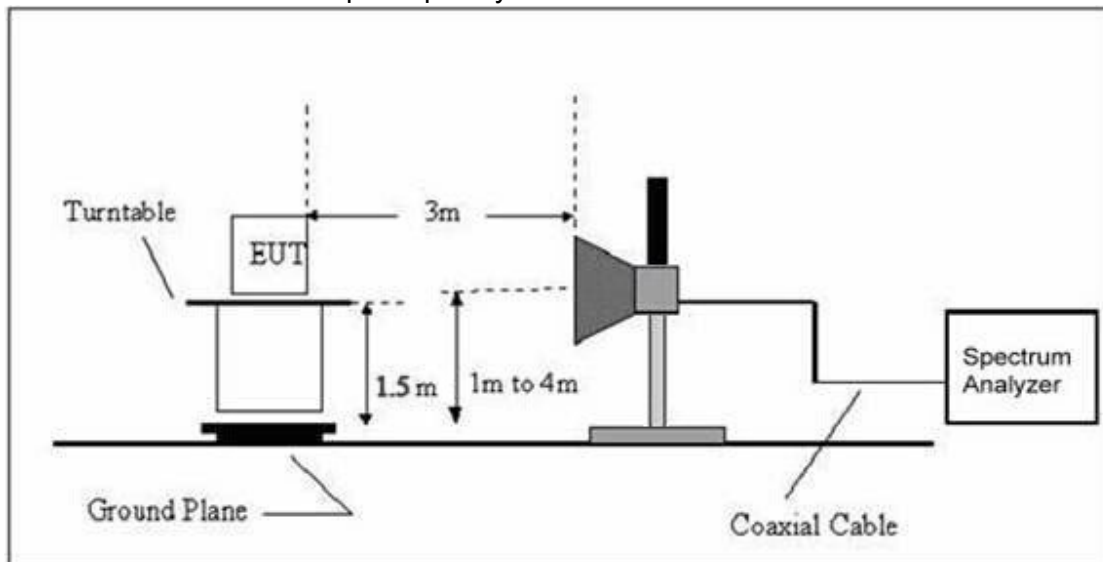
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

**3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ)**

Temperature:	20℃	Relative Humidity:	48%
Pressure:	1010 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	Mode 5	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

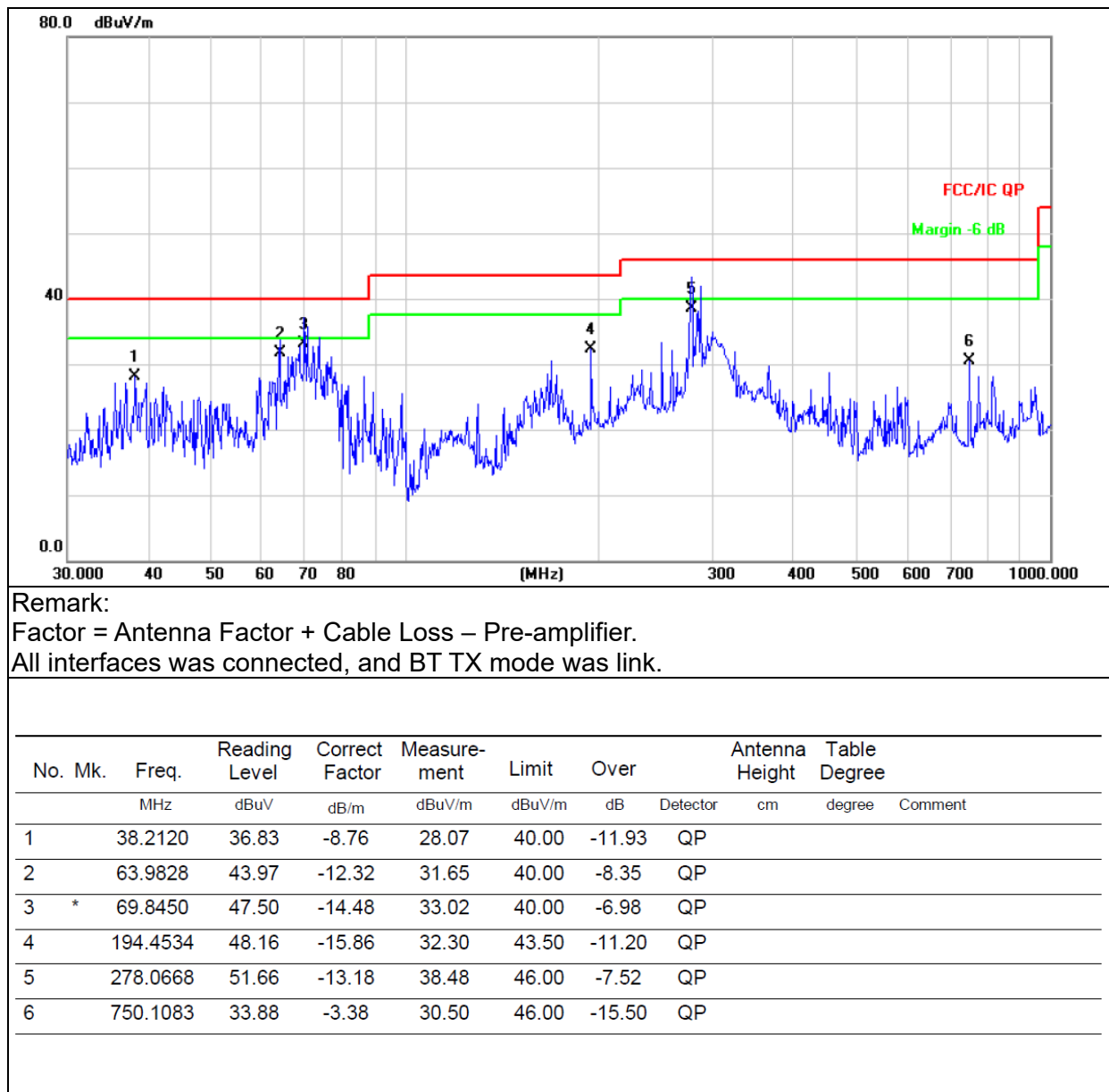
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor = $40 \log (\text{specific distance/test distance})$ (dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.

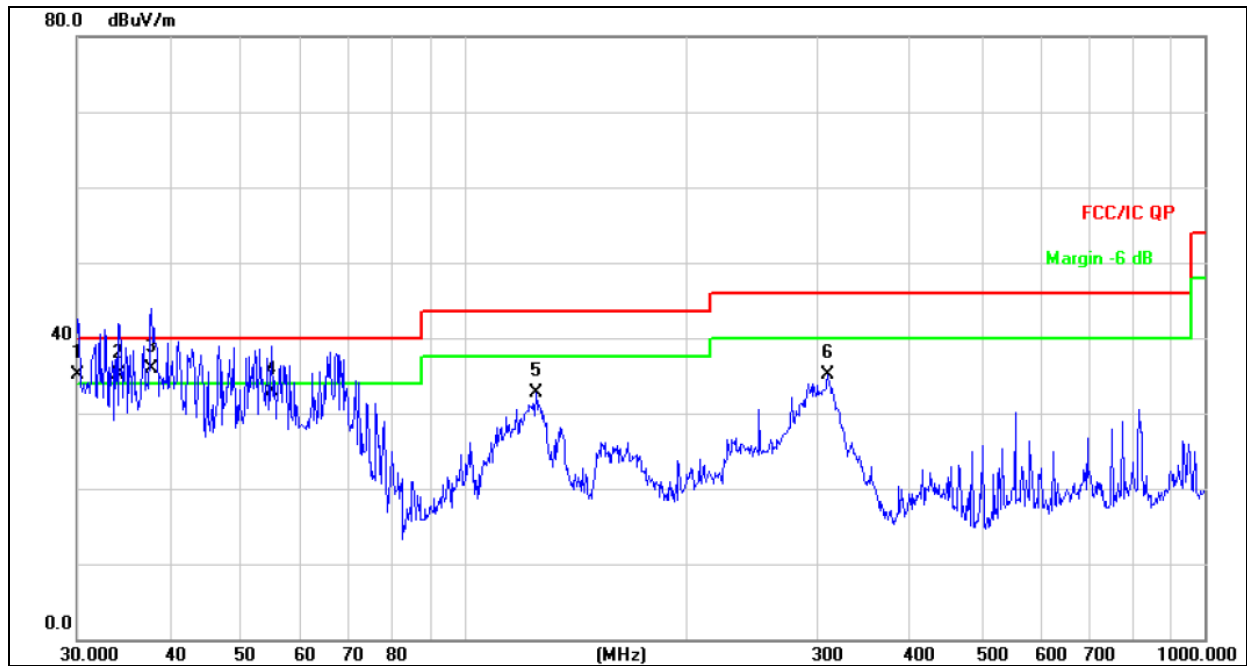
**3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)**

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 9V from adapter		
Test Mode :	Mode 5		





Temperature :	26°C	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 9V from adapter		
Test Mode :	Mode 5		



Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

All interfaces was connected, and BT TX mode was link.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree
1	!	30.1054	43.15	-8.03	35.12	40.00	-4.88	QP		
2	!	34.1561	43.62	-8.45	35.17	40.00	-4.83	QP		
3	*	37.8121	44.67	-8.74	35.93	40.00	-4.07	QP		
4		54.8348	44.01	-11.10	32.91	40.00	-7.09	QP		
5		125.0066	47.10	-14.41	32.69	43.50	-10.81	QP		
6		309.9977	47.38	-12.32	35.06	46.00	-10.94	QP		



3.2.8 TEST RESULTS (1GHZ~25GHZ)

802.11b

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	4824.00	42.12	19.36	61.48	74.00	-12.52	PK
V	4824.00	29.55	19.36	48.91	54.00	-5.09	AV
V	7236.00	38.35	17.17	55.52	74.00	-18.48	PK
V	7236.00	27.62	17.17	44.79	54.00	-9.21	AV
V	15450.00	31.92	20.59	52.51	74.00	-21.49	PK
H	4824.00	42.16	19.36	61.52	74.00	-12.48	PK
H	4824.00	29.36	19.36	48.72	54.00	-5.28	AV
H	7236.00	39.12	17.17	56.29	74.00	-17.71	PK
H	7236.00	29.88	17.17	47.05	54.00	-6.95	AV
H	15450.00	30.15	20.59	50.74	74.00	-23.26	PK
operation frequency:2437							
V	4874.00	42.32	19.42	61.74	74.00	-12.26	PK
V	4874.00	29.03	19.42	48.45	54.00	-5.55	AV
V	7311.00	40.35	17.19	57.54	74.00	-16.46	PK
V	7311.00	26.96	17.19	44.15	54.00	-9.85	AV
V	15450.00	31.92	20.59	52.51	74.00	-21.49	PK
H	4874.00	42.24	19.42	61.66	74.00	-12.34	PK
H	4874.00	26.80	19.42	46.22	54.00	-7.78	AV
H	7311.00	39.41	17.19	56.60	74.00	-17.40	PK
H	7311.00	26.26	17.19	43.45	54.00	-10.55	AV
H	15450.00	30.15	20.59	50.74	74.00	-23.26	PK
operation frequency:2462							
V	4924.00	41.68	19.47	61.15	74.00	-12.85	PK
V	4924.00	28.63	19.47	48.10	54.00	-5.90	AV
V	7386.00	38.16	17.22	55.38	74.00	-18.62	PK
V	7386.00	27.59	17.22	44.81	54.00	-9.19	AV
V	15450.00	31.72	20.59	52.31	74.00	-21.69	PK
H	4924.00	42.31	19.47	61.78	74.00	-12.22	PK
H	4924.00	28.35	19.47	47.82	54.00	-6.18	AV
H	7386.00	38.37	17.22	55.59	74.00	-18.41	PK
H	7386.00	28.99	17.22	46.21	54.00	-7.79	AV
H	15450.00	29.98	20.59	50.57	74.00	-23.43	PK

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11g

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	4824.00	40.08	19.36	59.44	74.00	-14.56	PK
V	4824.00	29.51	19.36	48.87	54.00	-5.13	AV
V	7236.00	40.29	17.17	57.46	74.00	-16.54	PK
V	7236.00	29.58	17.17	46.75	54.00	-7.25	AV
V	15450.00	31.88	20.59	52.47	74.00	-21.53	PK
H	4824.00	40.12	19.36	59.48	74.00	-14.52	PK
H	4824.00	29.32	19.36	48.68	54.00	-5.32	AV
H	7236.00	40.06	17.17	57.23	74.00	-16.77	PK
H	7236.00	29.84	17.17	47.01	54.00	-6.99	AV
H	15450.00	30.12	20.59	50.71	74.00	-23.29	PK
operation frequency:2437							
V	4874.00	42.26	19.42	61.68	74.00	-12.32	PK
V	4874.00	28.99	19.42	48.41	54.00	-5.59	AV
V	7311.00	40.30	17.19	57.49	74.00	-16.51	PK
V	7311.00	26.92	17.19	44.11	54.00	-9.89	AV
V	15450.00	31.88	20.59	52.47	74.00	-21.53	PK
H	4874.00	42.18	19.42	61.60	74.00	-12.40	PK
H	4874.00	26.77	19.42	46.19	54.00	-7.81	AV
H	7311.00	39.36	17.19	56.55	74.00	-17.45	PK
H	7311.00	26.23	17.19	43.42	54.00	-10.58	AV
H	15450.00	30.12	20.59	50.71	74.00	-23.29	PK
operation frequency:2462							
V	4924.00	41.63	19.47	61.10	74.00	-12.90	PK
V	4924.00	28.59	19.47	48.06	54.00	-5.94	AV
V	7386.00	38.11	17.22	55.33	74.00	-18.67	PK
V	7386.00	27.55	17.22	44.77	54.00	-9.23	AV
V	15450.00	31.68	20.59	52.27	74.00	-21.73	PK
H	4924.00	42.25	19.47	61.72	74.00	-12.28	PK
H	4924.00	28.31	19.47	47.78	54.00	-6.22	AV
H	7386.00	38.32	17.22	55.54	74.00	-18.46	PK
H	7386.00	28.95	17.22	46.17	54.00	-7.83	AV
H	15450.00	29.94	20.59	50.53	74.00	-23.47	PK
Remark:							
1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit							
2. If peak below the average limit, the average emission was no test.							
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.							



802.11n(20MHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	4824.00	40.21	19.36	59.57	74.00	-14.43	PK
V	4824.00	29.61	19.36	48.97	54.00	-5.03	AV
V	7236.00	40.42	17.17	57.59	74.00	-16.41	PK
V	7236.00	29.68	17.17	46.85	54.00	-7.15	AV
V	15450.00	31.98	20.59	52.57	74.00	-21.43	PK
H	4824.00	40.25	19.36	59.61	74.00	-14.39	PK
H	4824.00	29.42	19.36	48.78	54.00	-5.22	AV
H	7236.00	40.19	17.17	57.36	74.00	-16.64	PK
H	7236.00	29.94	17.17	47.11	54.00	-6.89	AV
H	15450.00	30.21	20.59	50.80	74.00	-23.20	PK
operation frequency:2437							
V	4874.00	42.40	19.42	61.82	74.00	-12.18	PK
V	4874.00	29.09	19.42	48.51	54.00	-5.49	AV
V	7311.00	40.43	17.19	57.62	74.00	-16.38	PK
V	7311.00	27.01	17.19	44.20	54.00	-9.80	AV
V	15450.00	31.98	20.59	52.57	74.00	-21.43	PK
H	4874.00	42.32	19.42	61.74	74.00	-12.26	PK
H	4874.00	26.85	19.42	46.27	54.00	-7.73	AV
H	7311.00	39.49	17.19	56.68	74.00	-17.32	PK
H	7311.00	26.31	17.19	43.50	54.00	-10.50	AV
H	15450.00	30.21	20.59	50.80	74.00	-23.20	PK
operation frequency:2462							
V	4924.00	41.76	19.47	61.23	74.00	-12.77	PK
V	4924.00	28.68	19.47	48.15	54.00	-5.85	AV
V	7386.00	38.23	17.22	55.45	74.00	-18.55	PK
V	7386.00	27.64	17.22	44.86	54.00	-9.14	AV
V	15450.00	31.78	20.59	52.37	74.00	-21.63	PK
H	4924.00	42.39	19.47	61.86	74.00	-12.14	PK
H	4924.00	28.40	19.47	47.87	54.00	-6.13	AV
H	7386.00	38.44	17.22	55.66	74.00	-18.34	PK
H	7386.00	29.05	17.22	46.27	54.00	-7.73	AV
H	15450.00	30.04	20.59	50.63	74.00	-23.37	PK
Remark:							
1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit							
2. If peak below the average limit, the average emission was no test.							
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.							

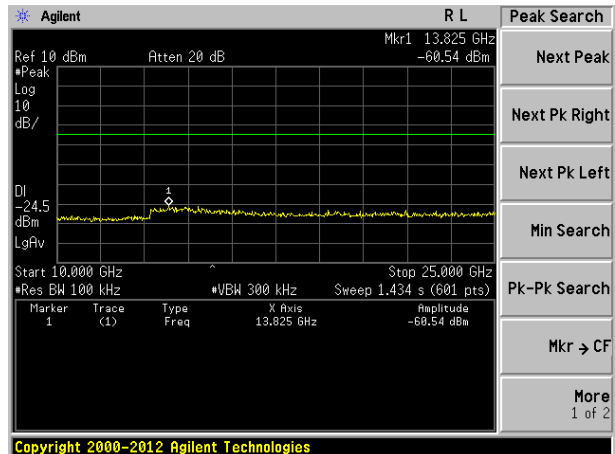
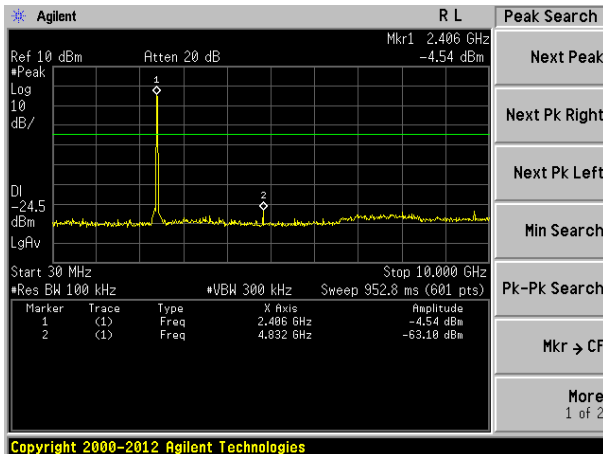


802.11n(40MHz)

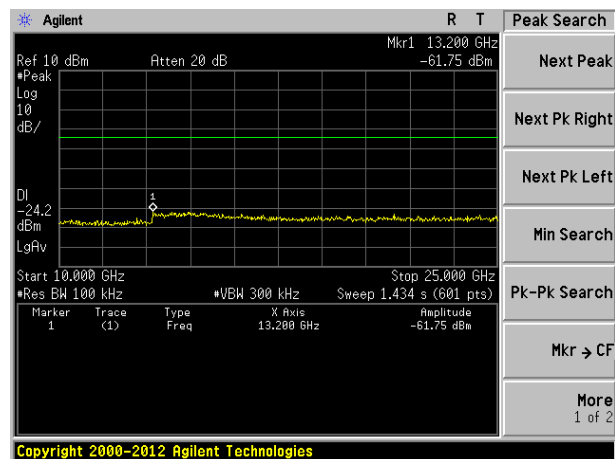
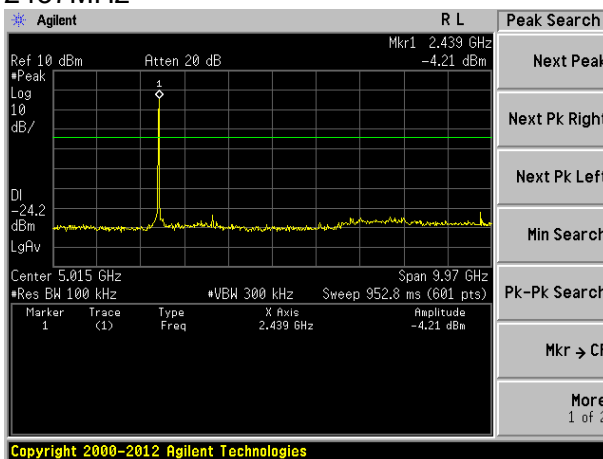
Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2422							
V	4844.000	39.89	19.37	59.26	74.00	-14.74	PK
V	4844.000	29.37	19.37	48.74	54.00	-5.26	AV
V	7266.000	40.09	17.18	57.27	74.00	-16.73	PK
V	7266.000	29.44	17.18	46.62	54.00	-7.38	AV
V	15450.00	31.72	20.59	52.31	74.00	-21.69	PK
H	4844.000	39.93	19.37	59.30	74.00	-14.70	PK
H	4844.000	29.18	19.37	48.55	54.00	-5.45	AV
H	7266.000	39.87	17.18	57.05	74.00	-16.95	PK
H	7266.000	29.70	17.18	46.88	54.00	-7.12	AV
H	15450.00	29.97	20.59	50.56	74.00	-23.44	PK
operation frequency:2437							
V	4874.00	41.98	19.42	61.40	74.00	-12.60	PK
V	4874.00	28.79	19.42	48.21	54.00	-5.79	AV
V	7311.00	40.02	17.19	57.21	74.00	-16.79	PK
V	7311.00	26.74	17.19	43.93	54.00	-10.07	AV
V	15450.00	31.66	20.59	52.25	74.00	-21.75	PK
H	4874.00	41.90	19.42	61.32	74.00	-12.68	PK
H	4874.00	26.58	19.42	46.00	54.00	-8.00	AV
H	7311.00	39.09	17.19	56.28	74.00	-17.72	PK
H	7311.00	26.05	17.19	43.24	54.00	-10.76	AV
H	15450.00	29.91	20.59	50.50	74.00	-23.50	PK
operation frequency:2452							
V	4904.00	41.42	19.44	60.86	74.00	-13.14	PK
V	4904.00	28.45	19.44	47.89	54.00	-6.11	AV
V	7356.00	37.92	17.21	55.13	74.00	-18.87	PK
V	7356.00	27.42	17.21	44.63	54.00	-9.37	AV
V	15450.00	31.52	20.59	52.11	74.00	-21.89	PK
H	4904.00	42.05	19.44	61.49	74.00	-12.51	PK
H	4904.00	28.17	19.44	47.61	54.00	-6.39	AV
H	7356.00	38.13	17.21	55.34	74.00	-18.66	PK
H	7356.00	28.81	17.21	46.02	54.00	-7.98	AV
H	15450.00	29.80	20.59	50.39	74.00	-23.61	PK
Remark:							
1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit							
2. If peak below the average limit, the average emission was no test.							
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.							



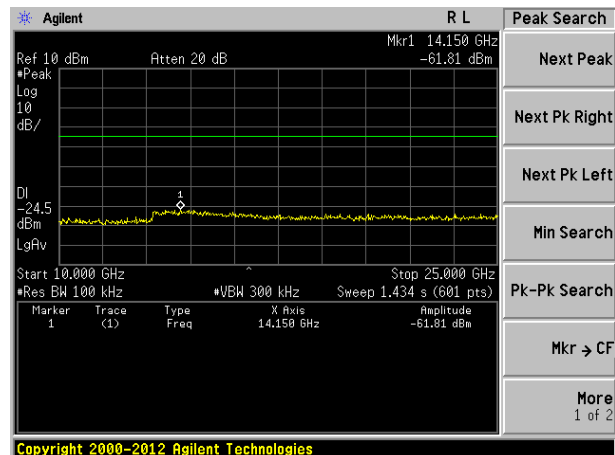
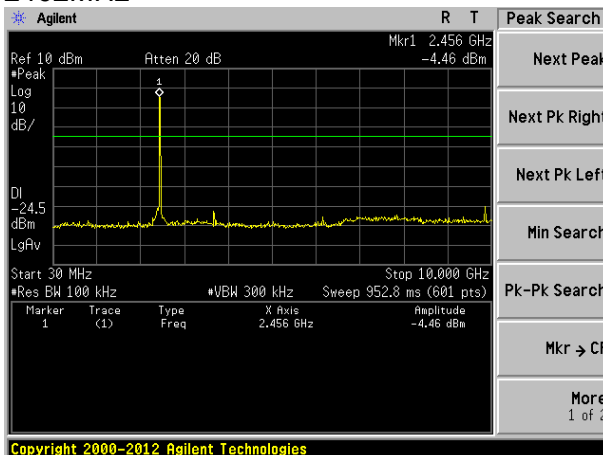
For Conducted
Antenna 1
802.11b
2412MHz

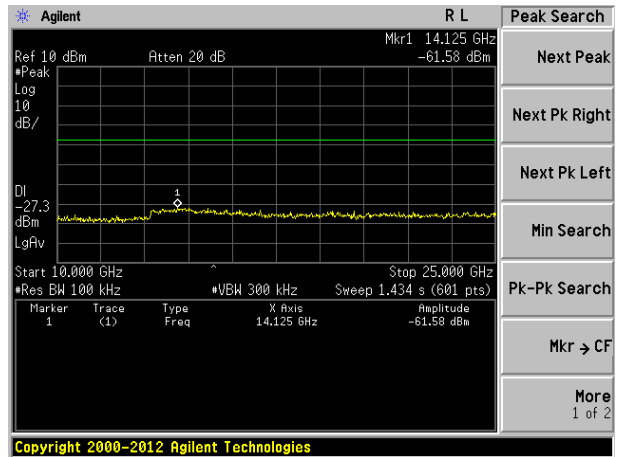
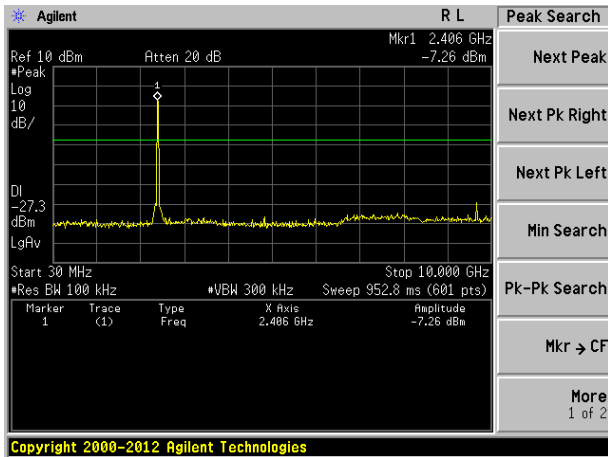


2437MHz

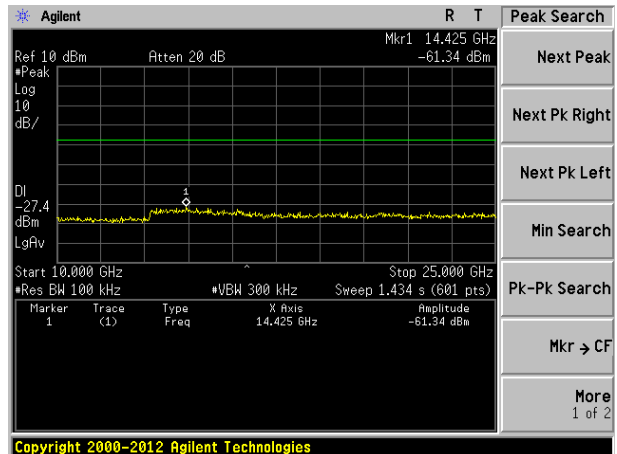
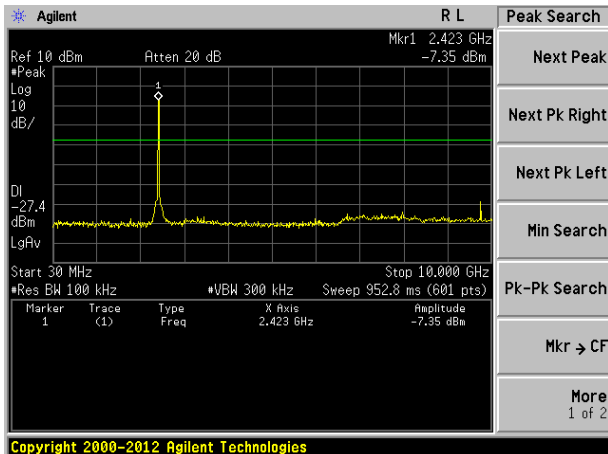


2462MHz

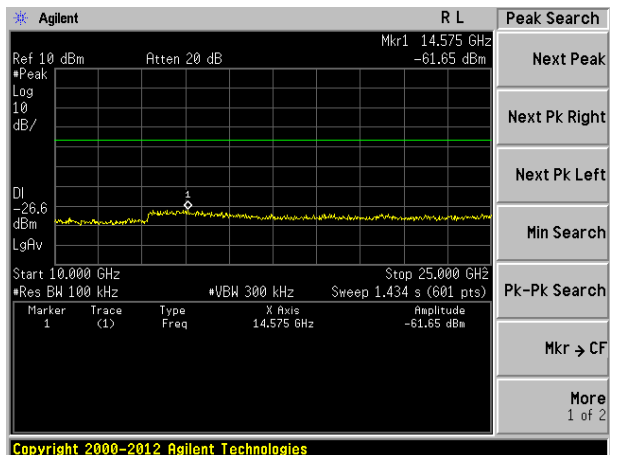
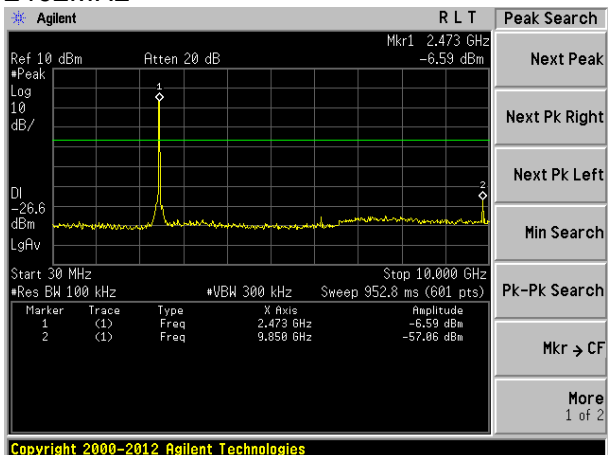


802.11g
2412MHz

2437MHz

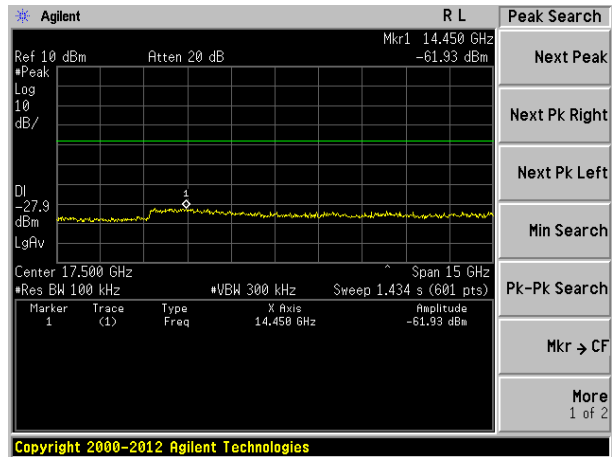
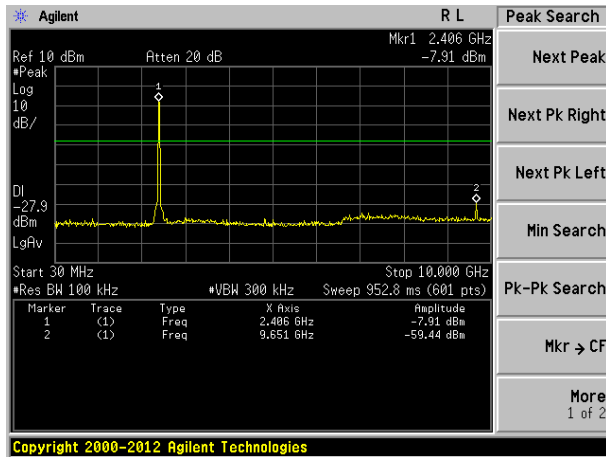


2462MHz

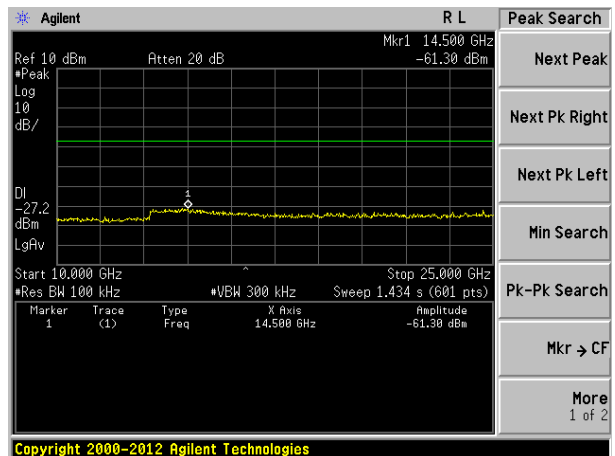
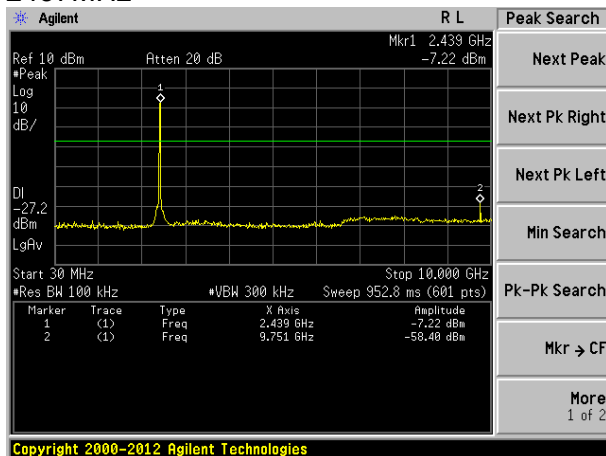




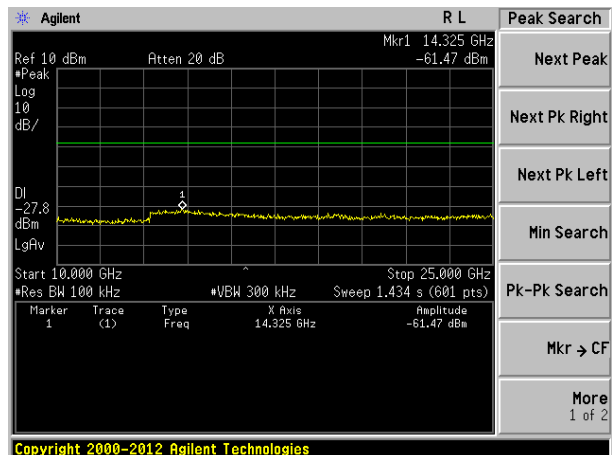
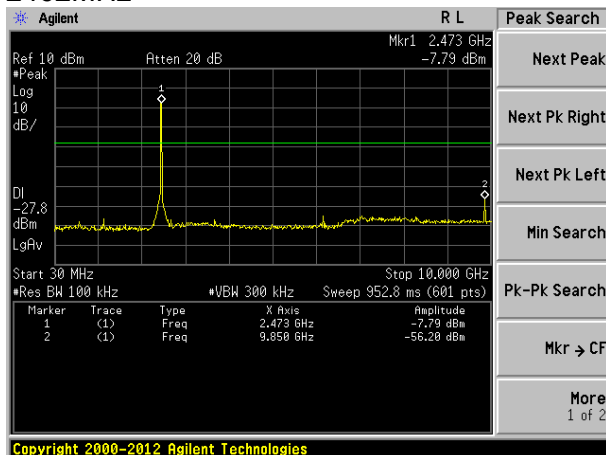
802.11n 20MHz
2412MHz



2437MHz

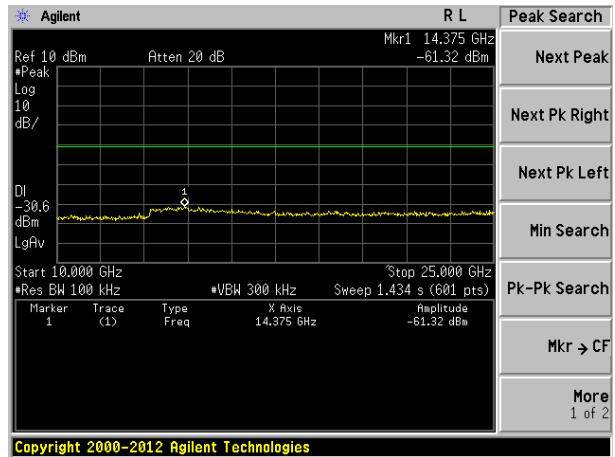
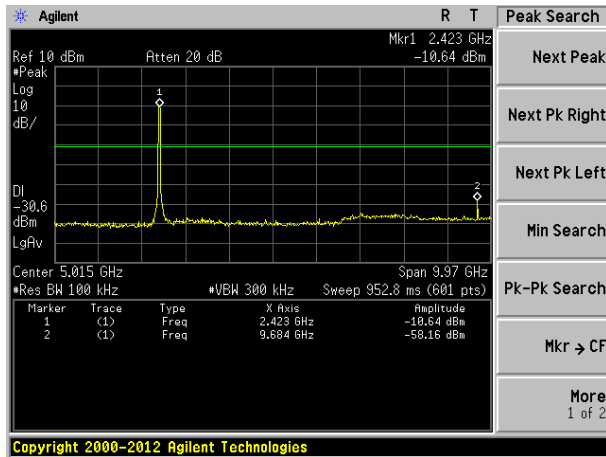


2462MHz

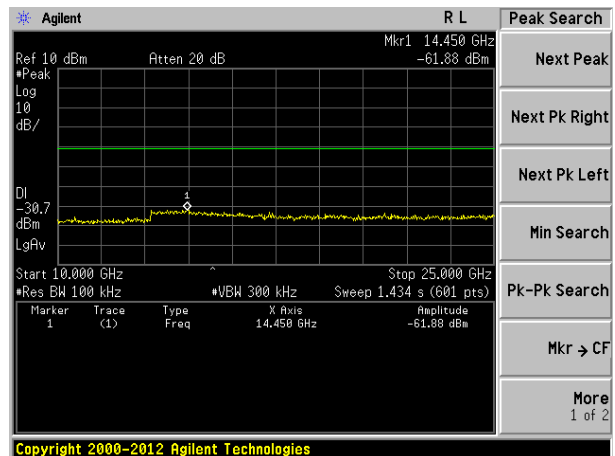
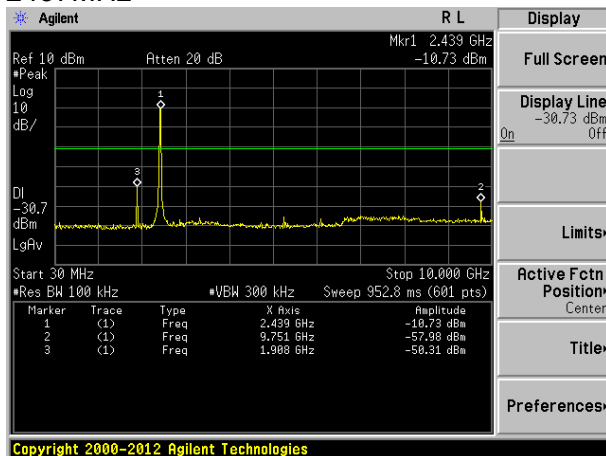




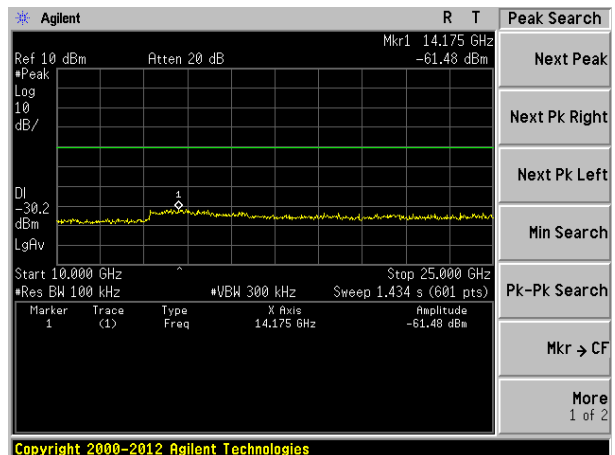
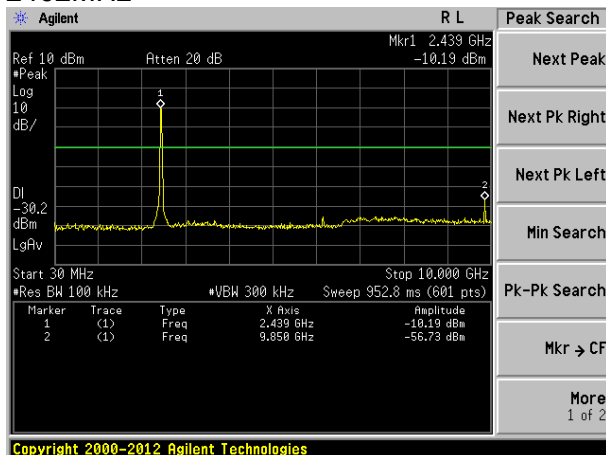
802.11n 40MHz
2412MHz



2437MHz

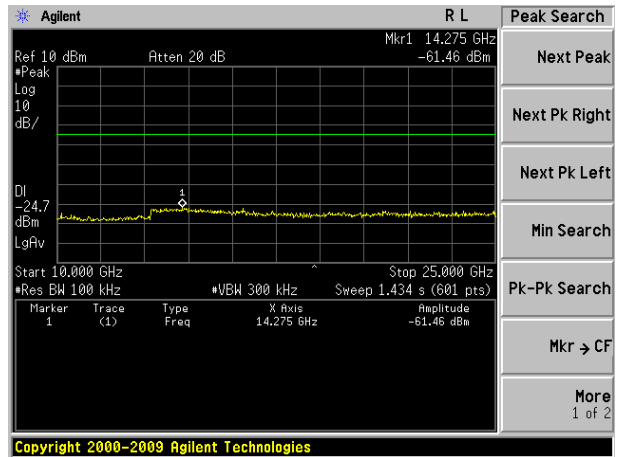
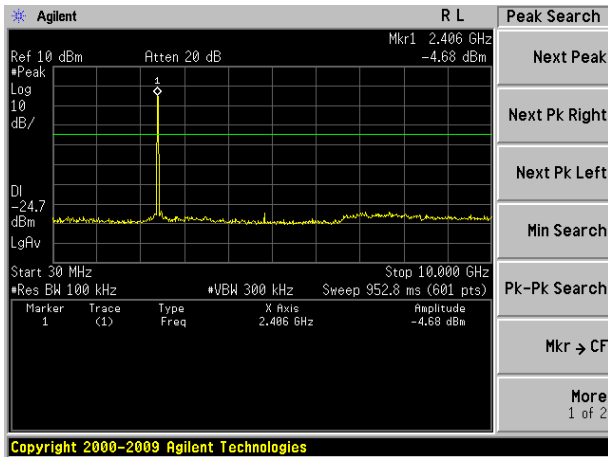


2462MHz

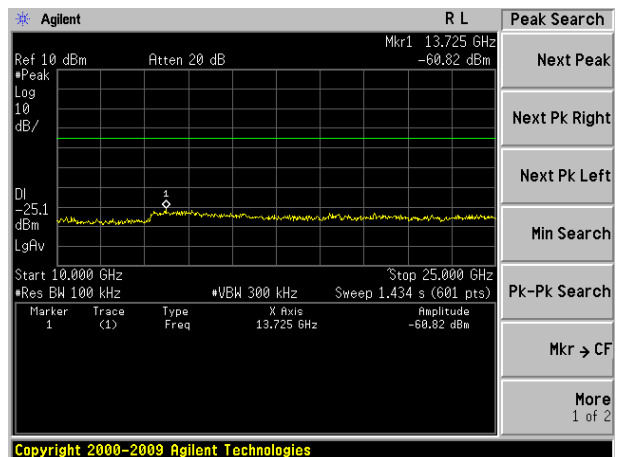
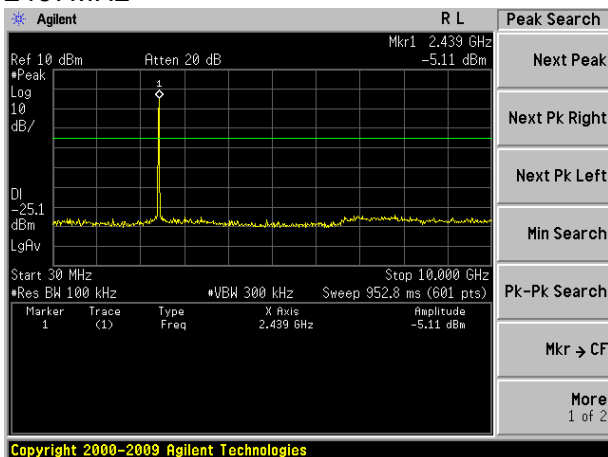




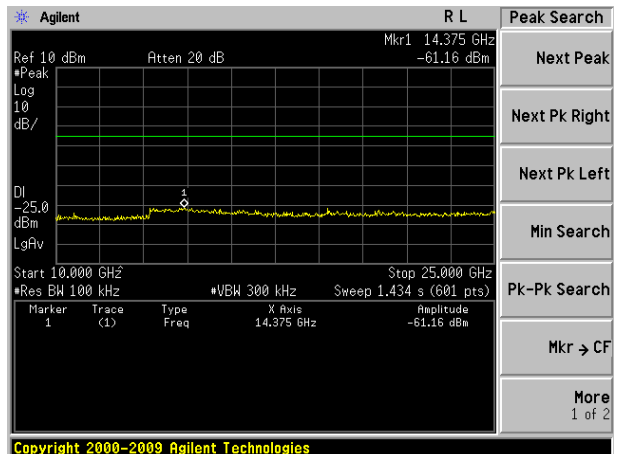
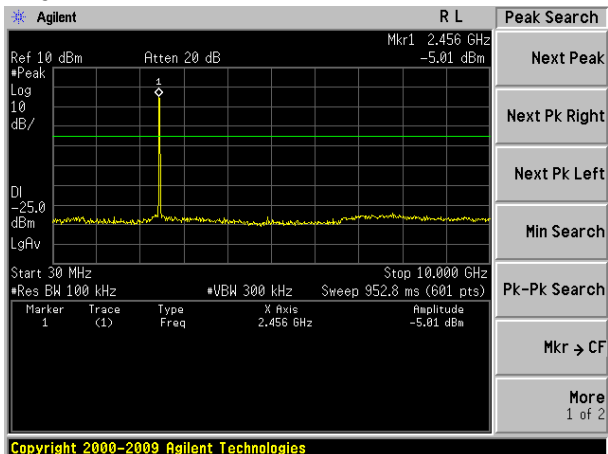
Antenna 2
802.11b
2412MHz

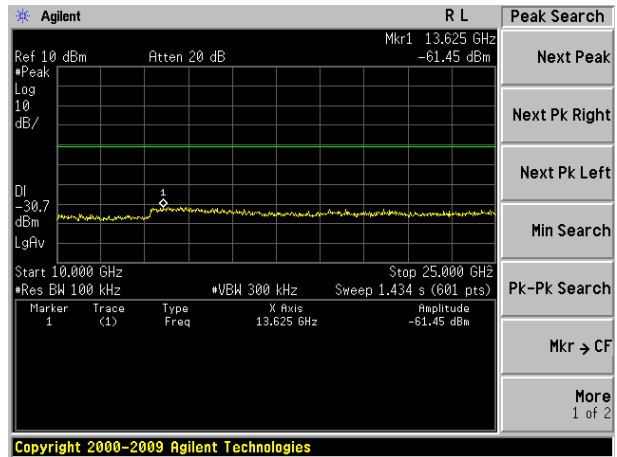
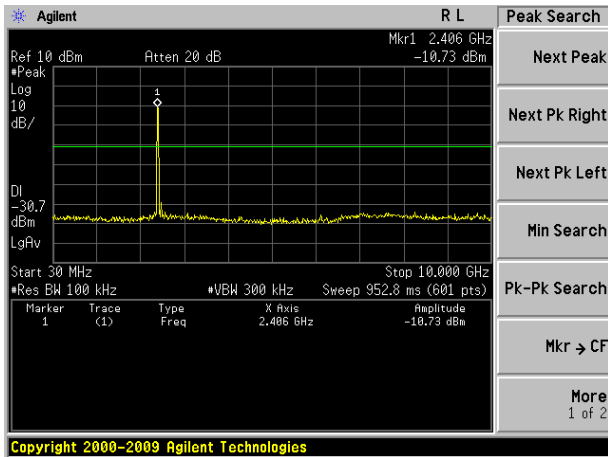


2437MHz

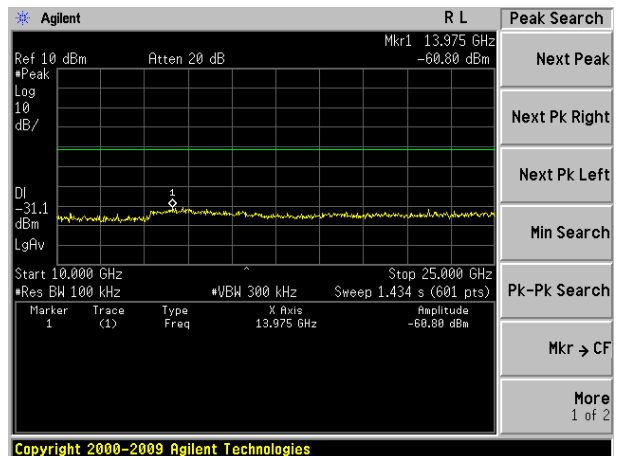
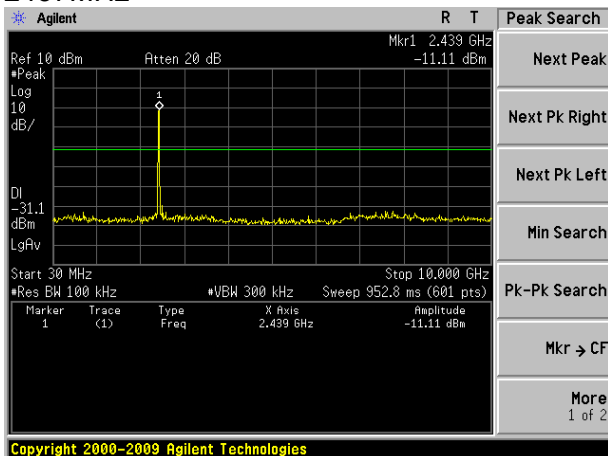


2462MHz

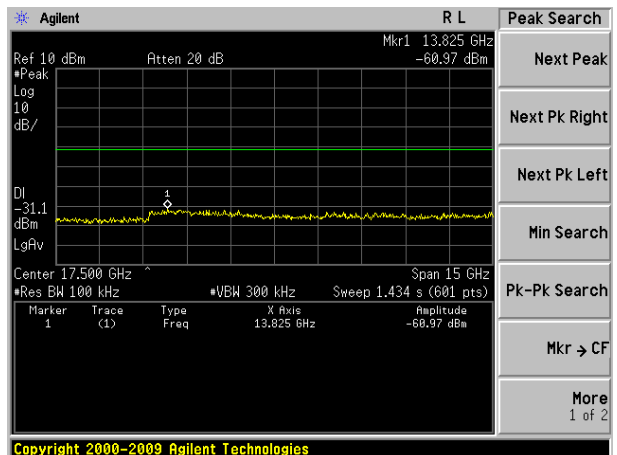
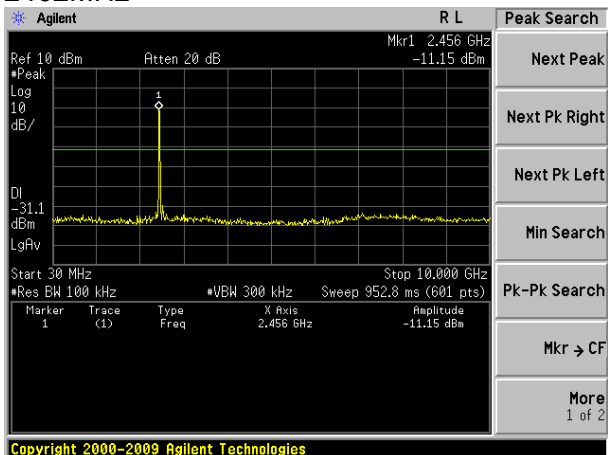


802.11g
2412MHz

2437MHz

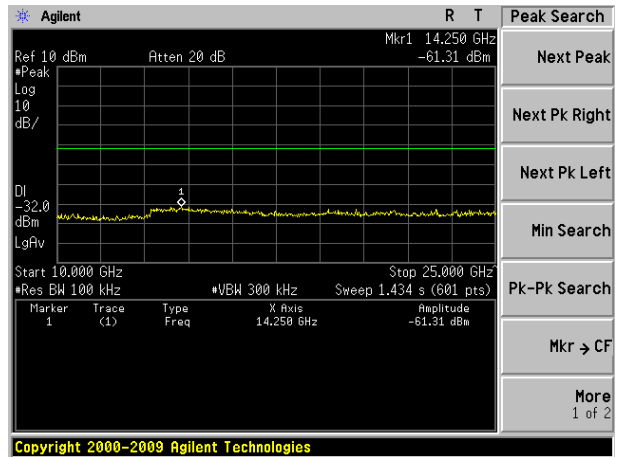
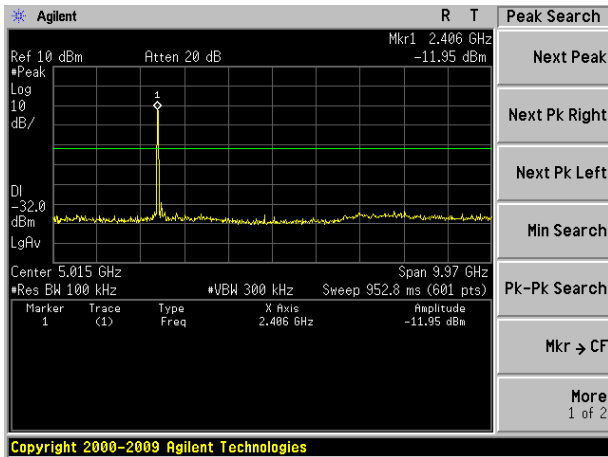


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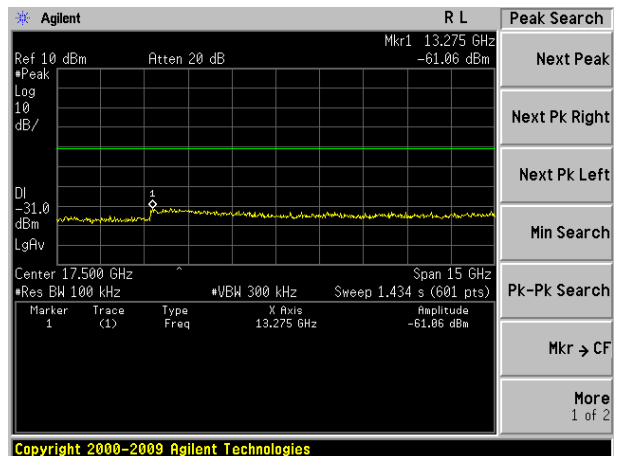
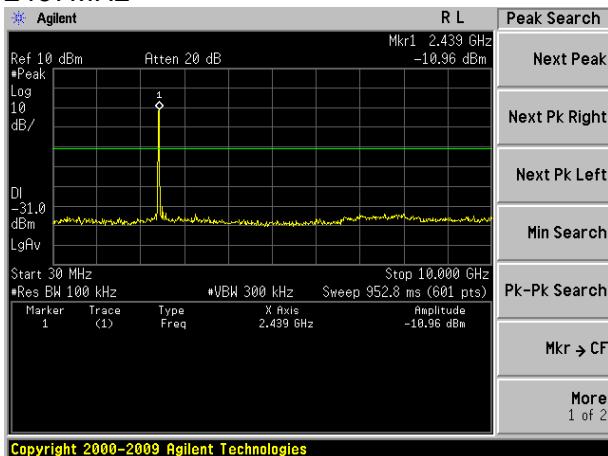




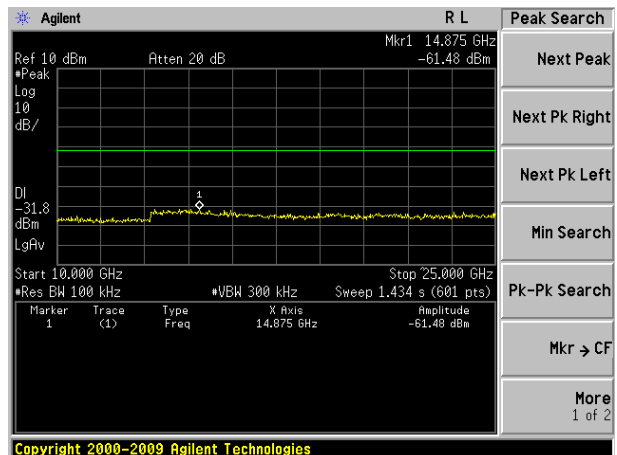
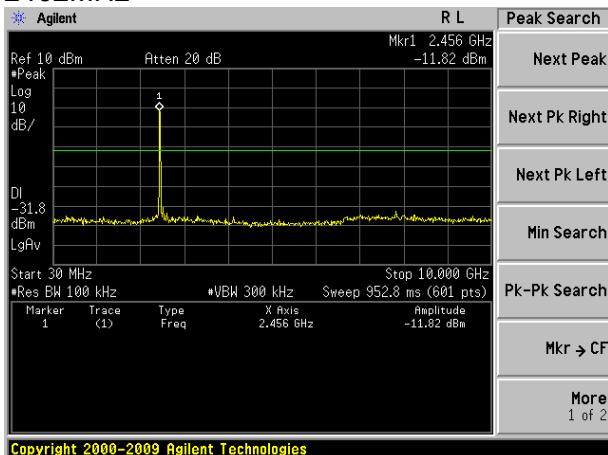
802.11n 20MHz
2412MHz



2437MHz

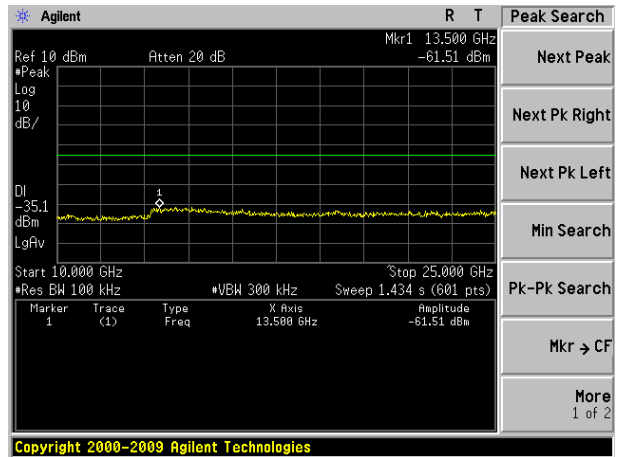
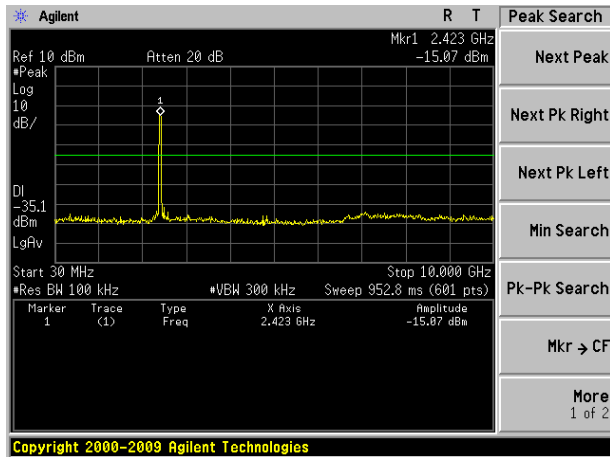


2462MHz

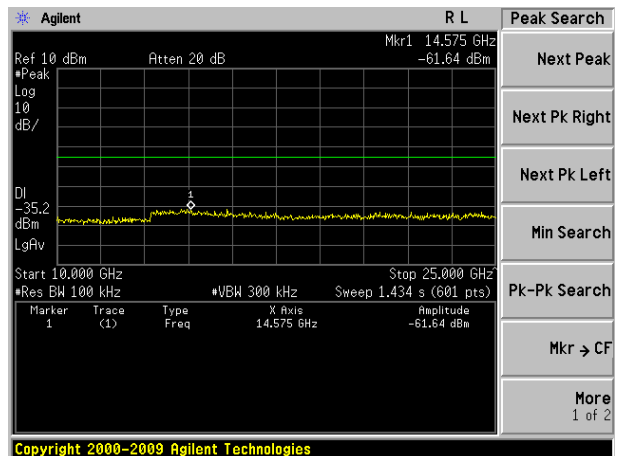
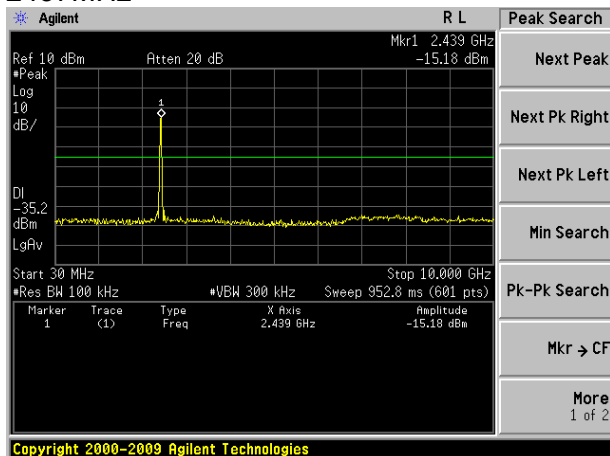




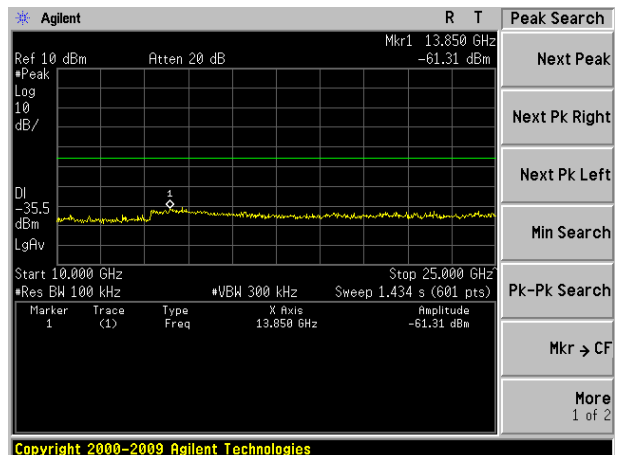
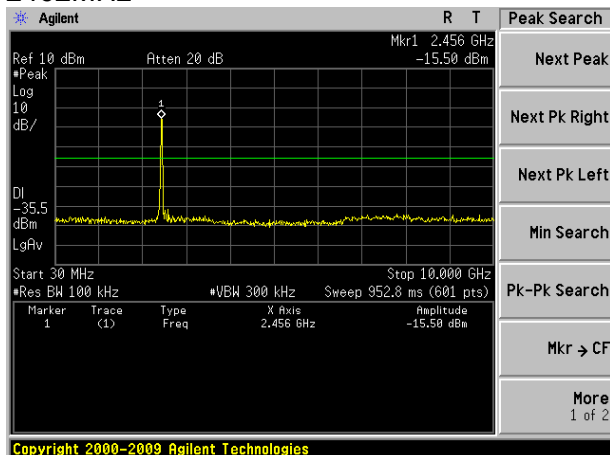
802.11n 40MHz
2412MHz



2437MHz



2462MHz





3.3 RADIATED BAND EMISSION MEASUREMENT

3.3.1 TEST REQUIREMENT:

FCC Part15 C Section 15.209 and 15.205

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

3.3.2 TEST PROCEDURE

Above 1GHz test procedure as below:

- a. 1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel,the Highest channel

Note:

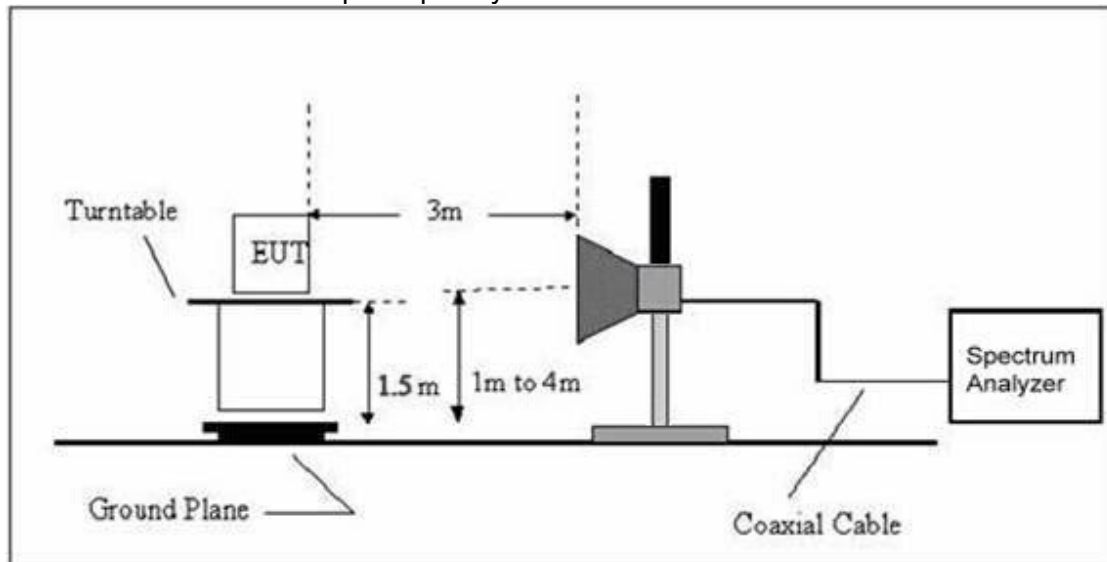
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP

Radiated Emission Test-Up Frequency Above 1GHz



3.3.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.3.6 TEST RESULT

802.11b

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2412							
V	2390.00	38.15	13.83	51.98	74.00	-22.02	PK
V	2390.00	26.50	13.83	40.33	54.00	-13.67	AV
V	2400.00	38.36	13.85	52.21	74.00	-21.79	PK
V	2400.00	26.06	13.85	39.91	54.00	-14.09	AV
H	2390.00	38.45	13.83	52.28	74.00	-21.72	PK
H	2390.00	26.53	13.83	40.36	54.00	-13.64	AV
H	2400.00	38.31	13.85	52.16	74.00	-21.84	PK
H	2400.00	26.47	13.85	40.32	54.00	-13.68	AV

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2462							
V	2483.50	38.36	14.02	52.38	74.00	-21.62	PK
V	2483.50	26.75	14.02	40.77	54.00	-13.23	AV
V	2500.00	38.30	14.06	52.36	74.00	-21.64	PK
V	2500.00	26.17	14.06	40.23	54.00	-13.77	AV
H	2483.50	38.49	14.02	52.51	74.00	-21.49	PK
H	2483.50	26.79	14.02	40.81	54.00	-13.19	AV
H	2500.00	38.10	14.06	52.16	74.00	-21.84	PK
H	2500.00	27.05	14.06	41.11	54.00	-12.89	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	37.84	13.83	51.67	74.00	-22.33	PK
V	2390.00	26.28	13.83	40.11	54.00	-13.89	AV
V	2400.00	38.05	13.85	51.90	74.00	-22.10	PK
V	2400.00	25.86	13.85	39.71	54.00	-14.29	AV
H	2390.00	38.14	13.83	51.97	74.00	-22.03	PK
H	2390.00	26.31	13.83	40.14	54.00	-13.86	AV
H	2400.00	38.00	13.85	51.85	74.00	-22.15	PK
H	2400.00	26.25	13.85	40.10	54.00	-13.90	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462							
V	2483.50	38.05	14.02	52.07	74.00	-21.93	PK
V	2483.50	26.53	14.02	40.55	54.00	-13.45	AV
V	2500.00	37.99	14.06	52.05	74.00	-21.95	PK
V	2500.00	25.96	14.06	40.02	54.00	-13.98	AV
H	2483.50	38.18	14.02	52.20	74.00	-21.80	PK
H	2483.50	26.57	14.02	40.59	54.00	-13.41	AV
H	2500.00	37.79	14.06	51.85	74.00	-22.15	PK
H	2500.00	26.83	14.06	40.89	54.00	-13.11	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n(20MHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	37.95	13.83	51.78	74.00	-22.22	PK
V	2390.00	26.36	13.83	40.19	54.00	-13.81	AV
V	2400.00	38.16	13.85	52.01	74.00	-21.99	PK
V	2400.00	25.93	13.85	39.78	54.00	-14.22	AV
H	2390.00	38.25	13.83	52.08	74.00	-21.92	PK
H	2390.00	26.39	13.83	40.22	54.00	-13.78	AV
H	2400.00	38.11	13.85	51.96	74.00	-22.04	PK
H	2400.00	26.33	13.85	40.18	54.00	-13.82	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2462							
V	2483.50	38.16	14.02	52.18	74.00	-21.82	PK
V	2483.50	26.61	14.02	40.63	54.00	-13.37	AV
V	2500.00	38.10	14.06	52.16	74.00	-21.84	PK
V	2500.00	26.03	14.06	40.09	54.00	-13.91	AV
H	2483.50	38.29	14.02	52.31	74.00	-21.69	PK
H	2483.50	26.65	14.02	40.67	54.00	-13.33	AV
H	2500.00	37.90	14.06	51.96	74.00	-22.04	PK
H	2500.00	26.90	14.06	40.96	54.00	-13.04	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



802.11n(40MHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2422							
V	2390.00	38.27	13.83	52.10	74.00	-21.90	PK
V	2390.00	26.58	13.83	40.41	54.00	-13.59	AV
V	2400.00	38.48	13.85	52.33	74.00	-21.67	PK
V	2400.00	26.14	13.85	39.99	54.00	-14.01	AV
H	2390.00	38.56	13.83	52.39	74.00	-21.61	PK
H	2390.00	26.61	13.83	40.44	54.00	-13.56	AV
H	2400.00	38.43	13.85	52.28	74.00	-21.72	PK
H	2400.00	26.55	13.85	40.40	54.00	-13.60	AV

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
operation frequency:2452							
V	2483.50	38.48	14.02	52.50	74.00	-21.50	PK
V	2483.50	26.83	14.02	40.85	54.00	-13.15	AV
V	2500.00	38.42	14.06	52.48	74.00	-21.52	PK
V	2500.00	26.25	14.06	40.31	54.00	-13.69	AV
H	2483.50	38.60	14.02	52.62	74.00	-21.38	PK
H	2483.50	26.87	14.02	40.89	54.00	-13.11	AV
H	2500.00	38.22	14.06	52.28	74.00	-21.72	PK
H	2500.00	27.13	14.06	41.19	54.00	-12.81	AV

Remark:

1. Emission Level = Meter Reading + Factor, Margin= Emission Level - Limit
2. If peak below the average limit, the average emission was no test.
3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

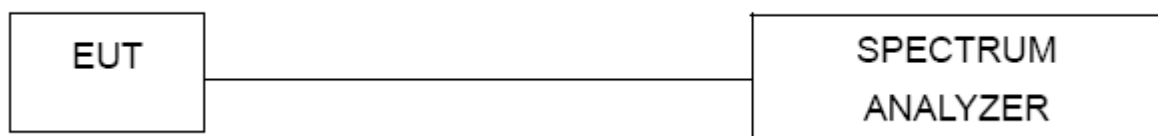
4.1.1 TEST PROCEDURE

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

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

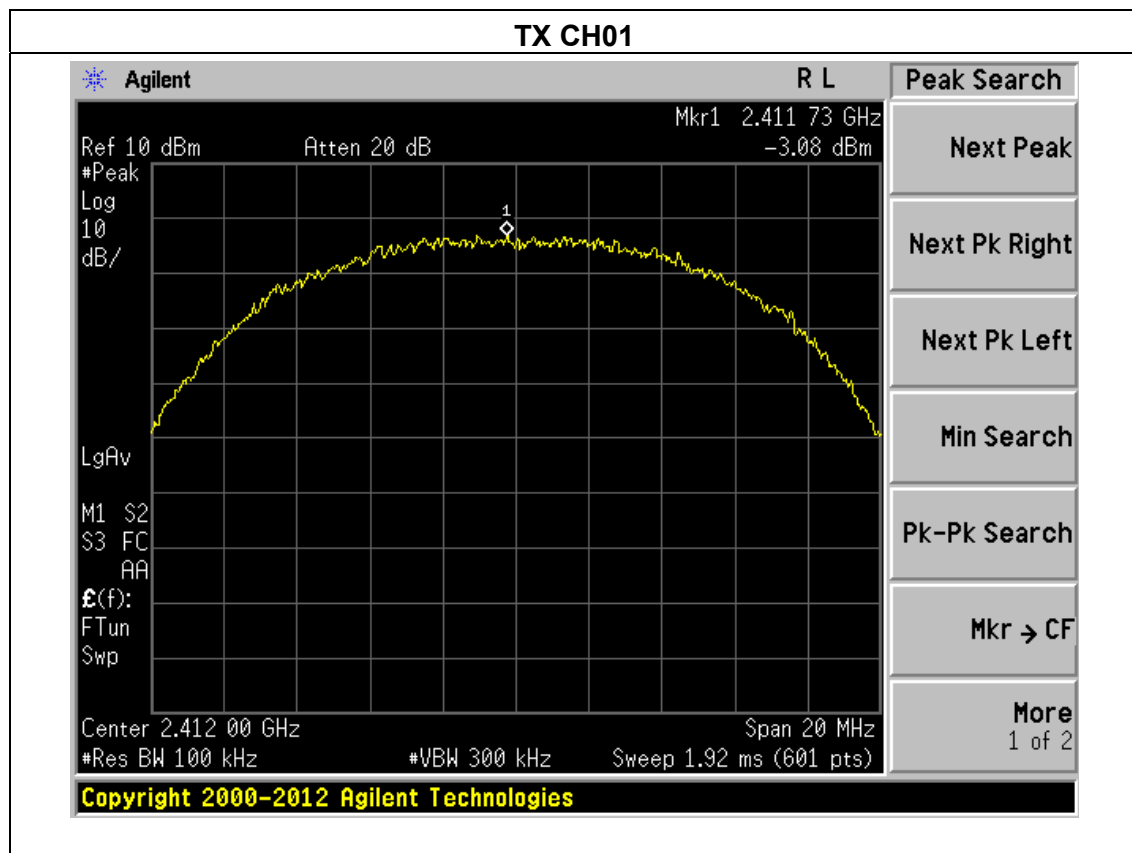


4.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX b Mode		

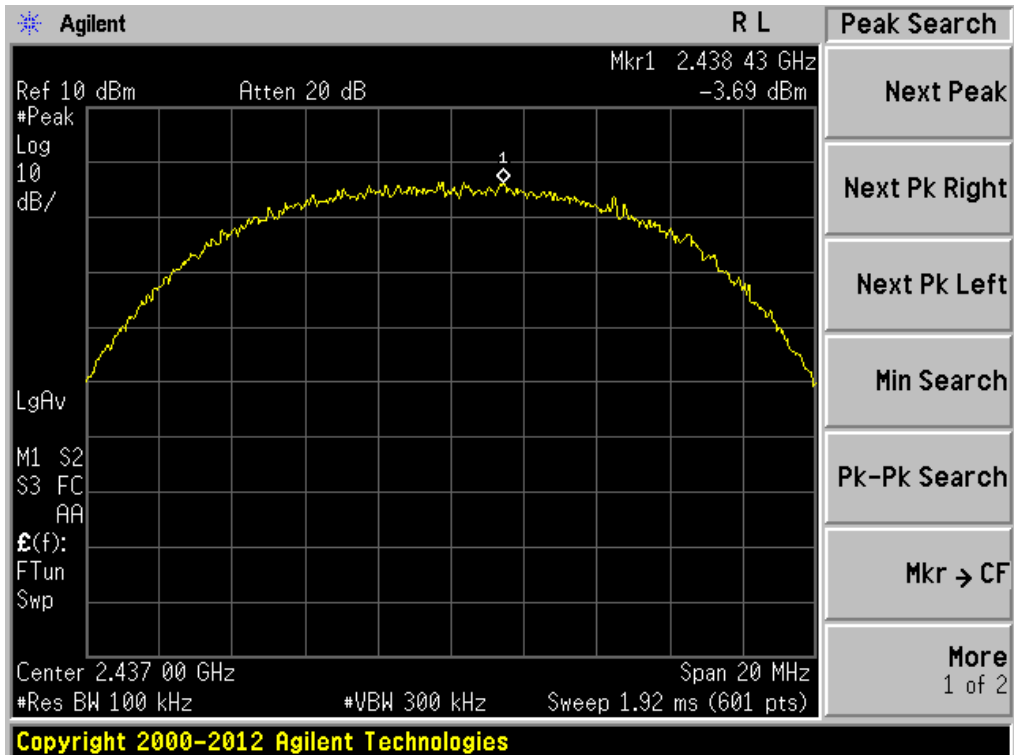
Frequency		Read Level (dBm)	Total Power Spectral Density(dBm)	Limit (dBm)	Result
Ant 1	2412 MHz	-3.08	-0.75	8	Pass
	2437 MHz	-3.69	-1.19	8	Pass
	2462 MHz	-3.29	-1.02	8	Pass
Ant 2	2412 MHz	-4.57	/	8	Pass
	2437 MHz	-4.88	/	8	Pass
	2462 MHz	-4.89	/	8	Pass

Ant. 1

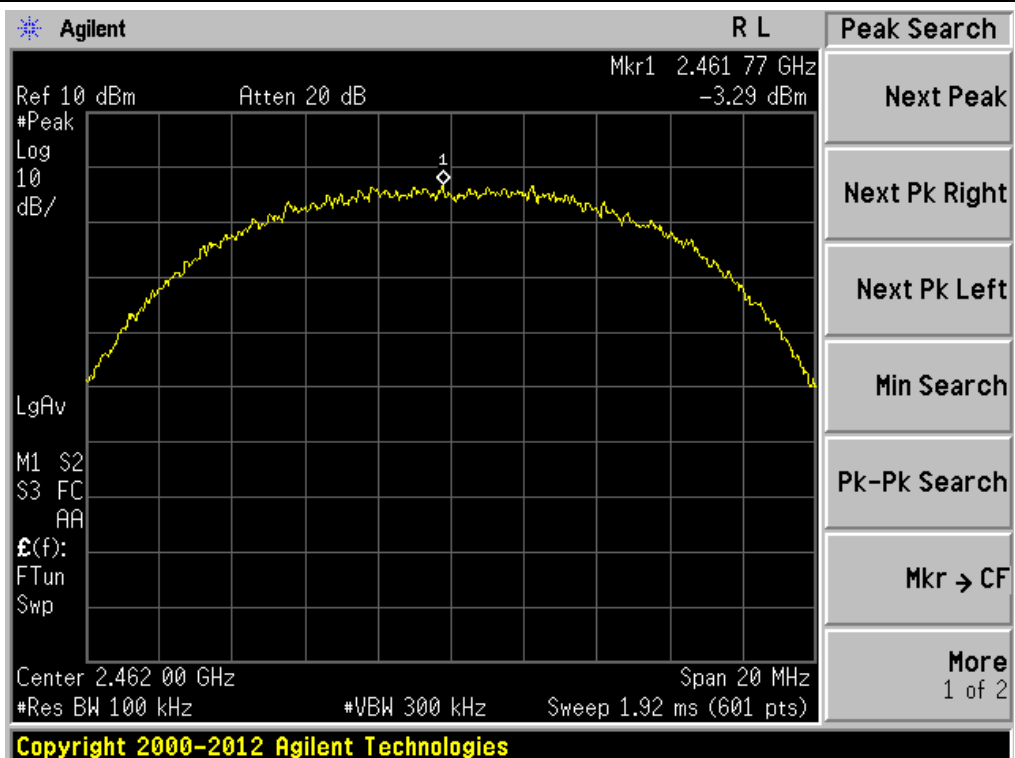




TX CH06

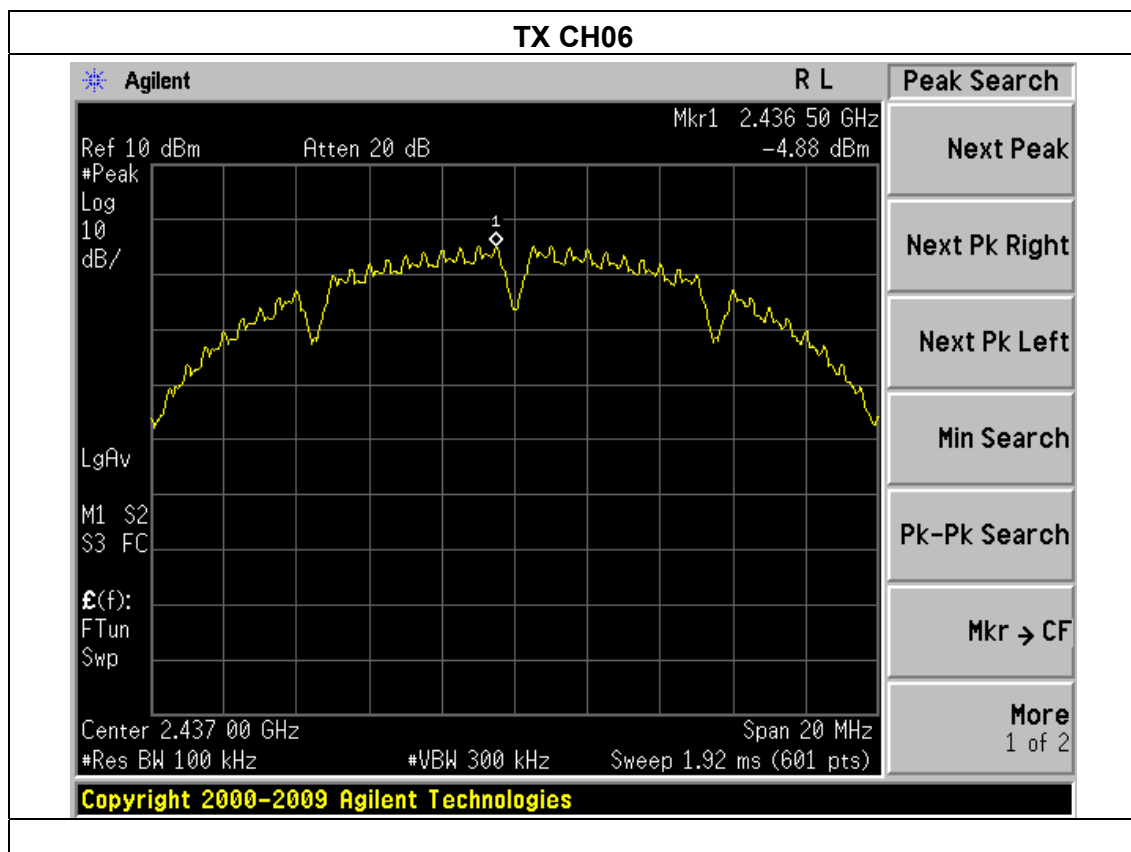
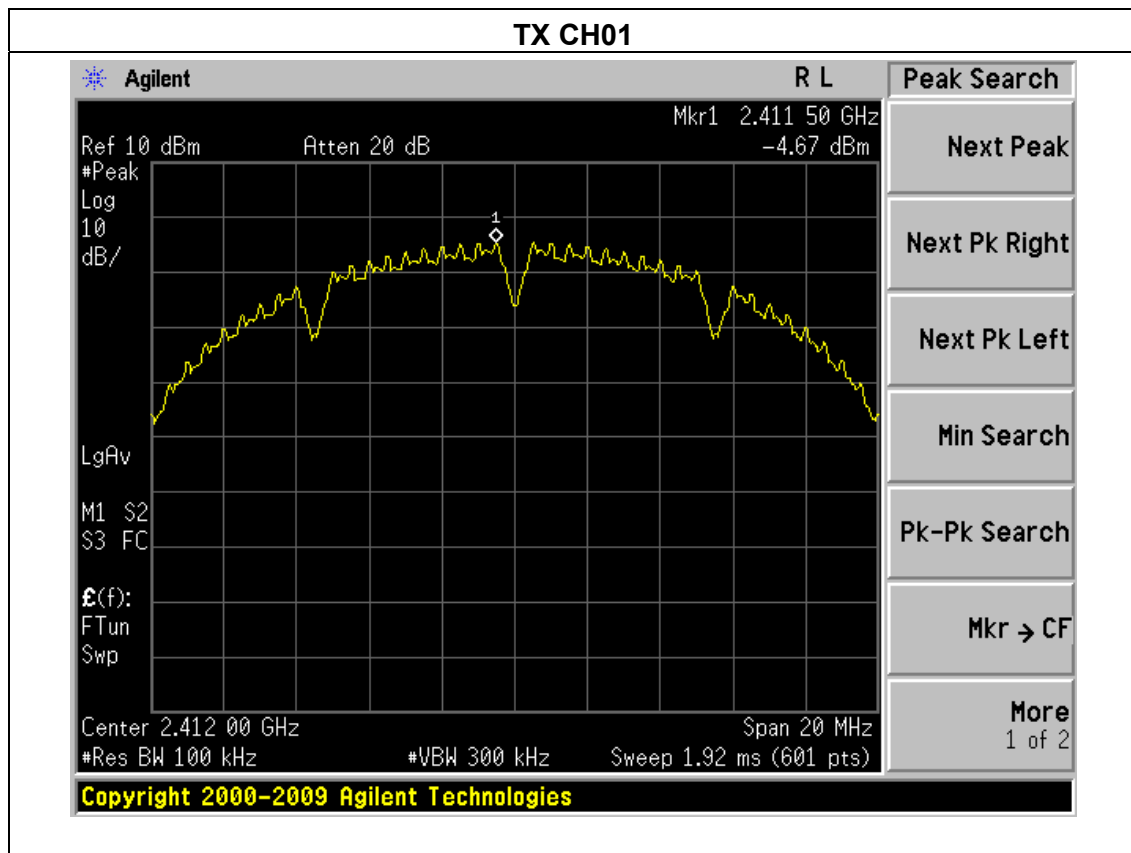


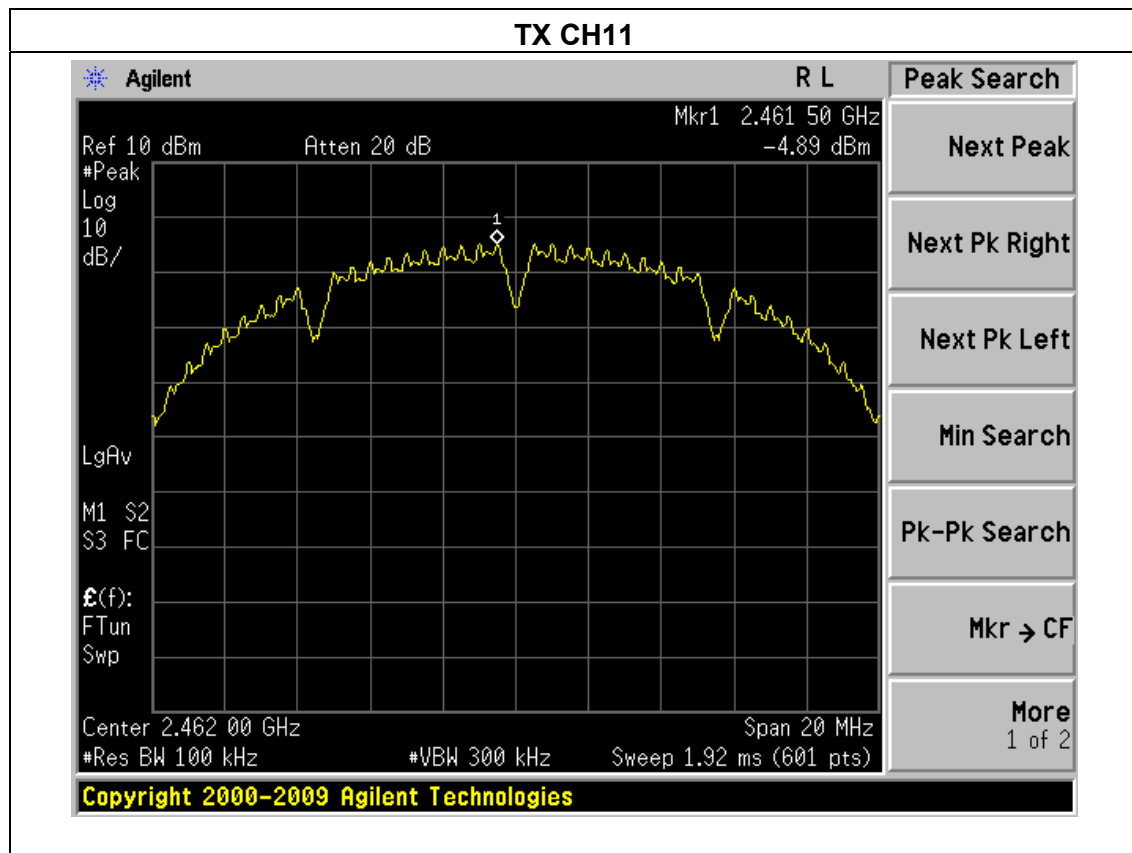
TX CH11





Ant. 2



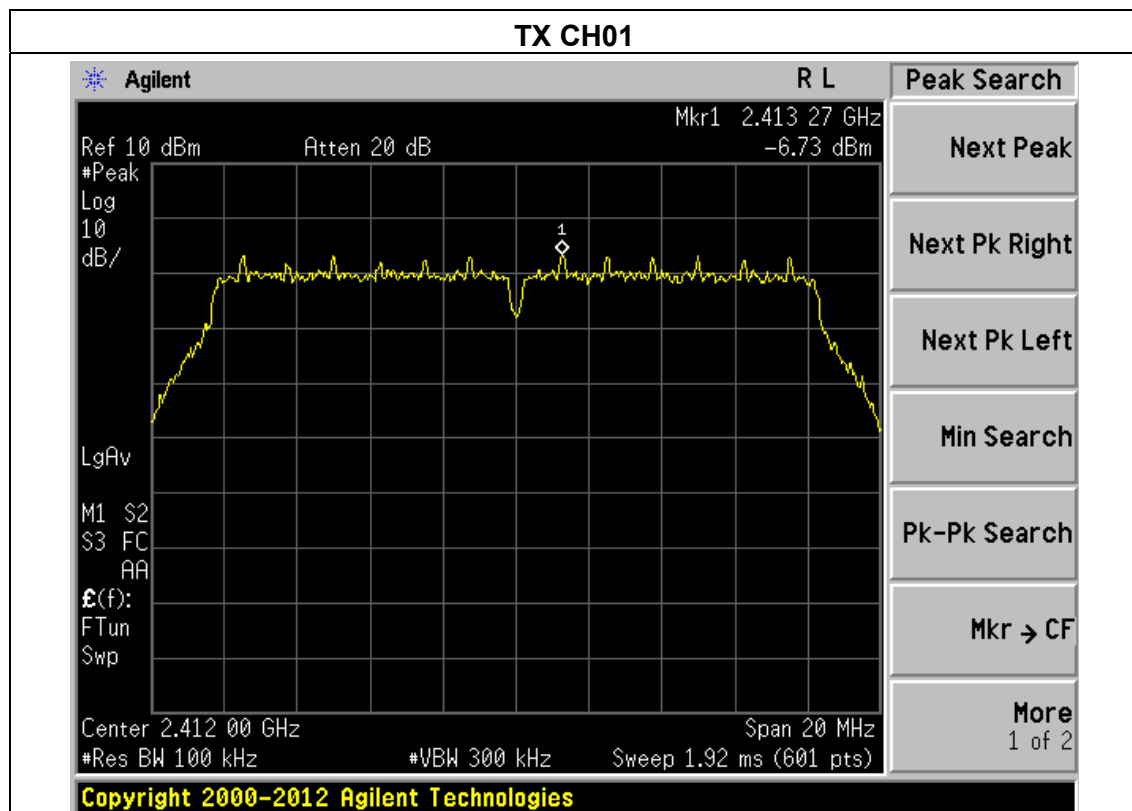


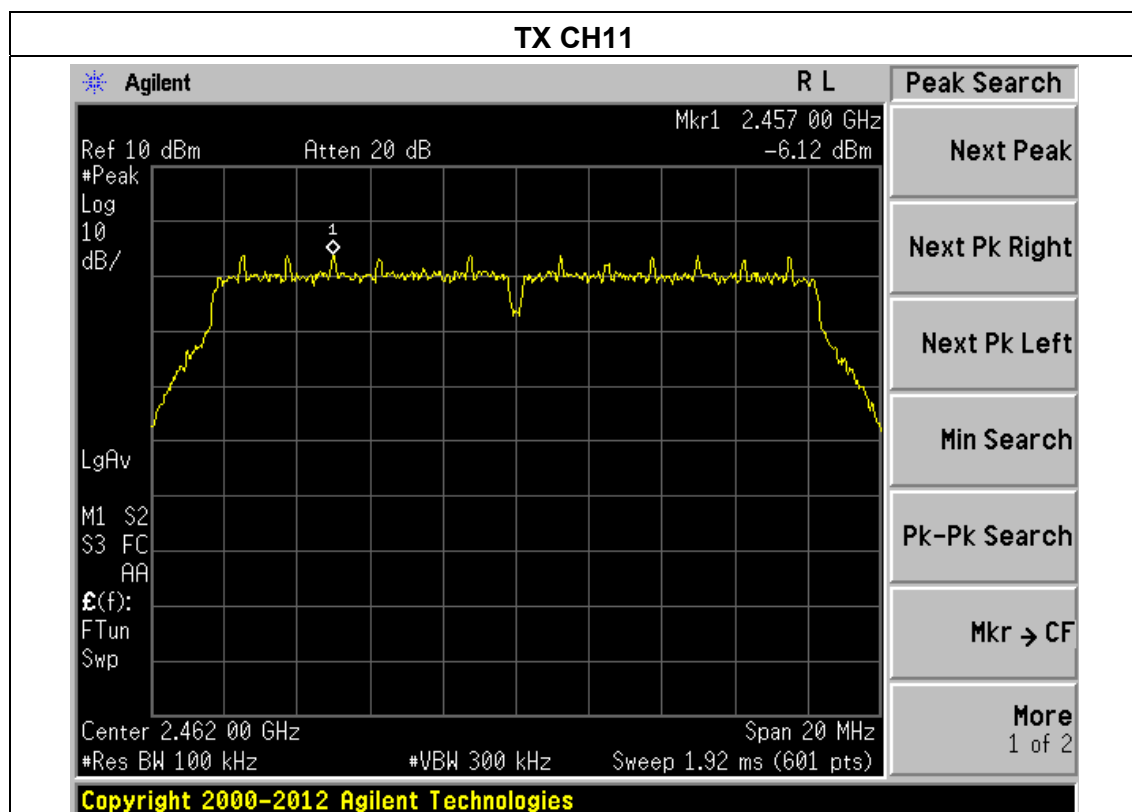
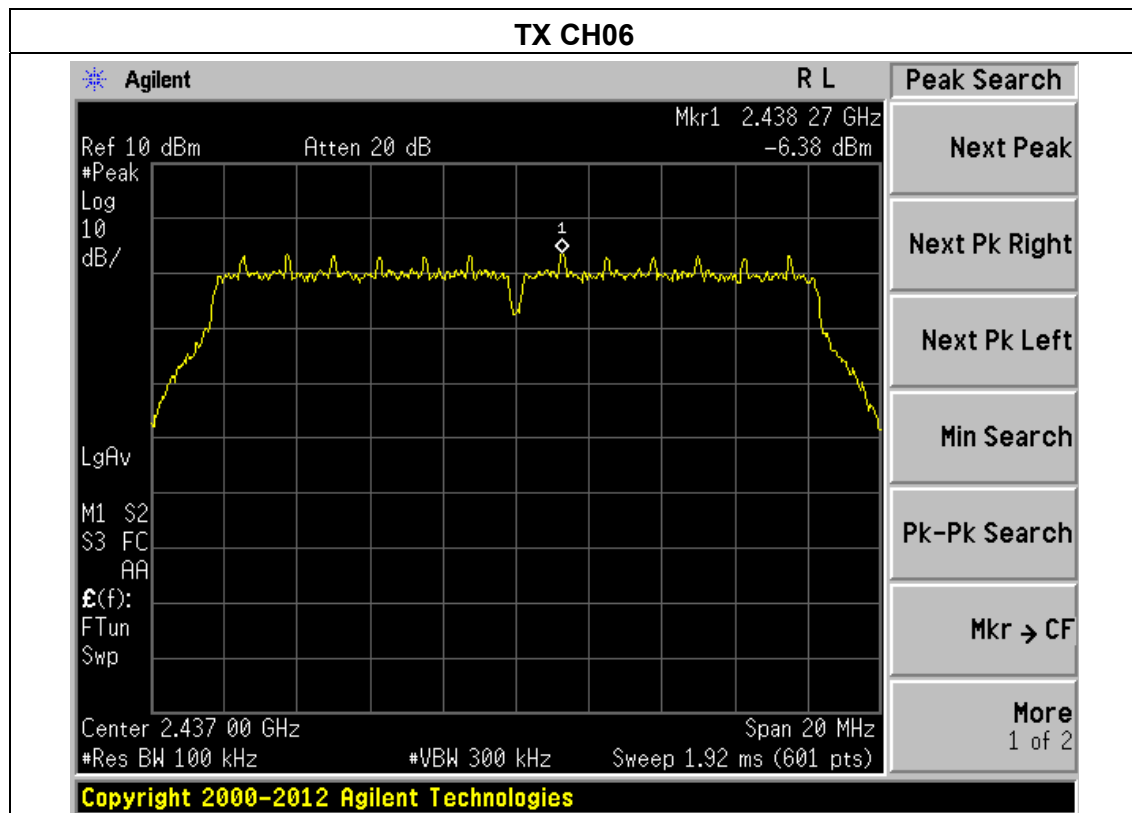


Temperature :	25°C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX g Mode		

Frequency		Read Level (dBm)	Total Power Spectral Density(dBm)	Limit (dBm)	Result
Ant 1	2412 MHz	-6.73	-5.23	8	Pass
	2437 MHz	-6.38	-5.09	8	Pass
	2462 MHz	-6.12	-4.69	8	Pass
Ant 2	2412 MHz	-10.60	/	8	Pass
	2437 MHz	-10.77	/	8	Pass
	2462 MHz	-10.10	/	8	Pass

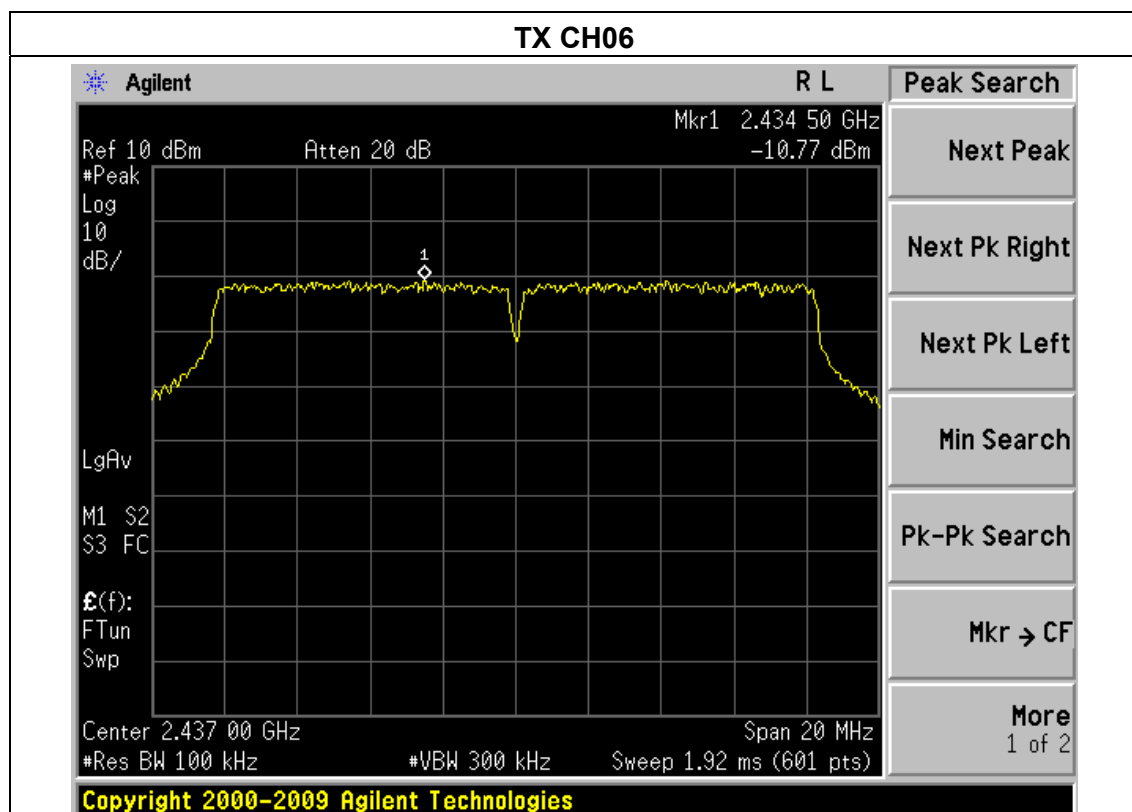
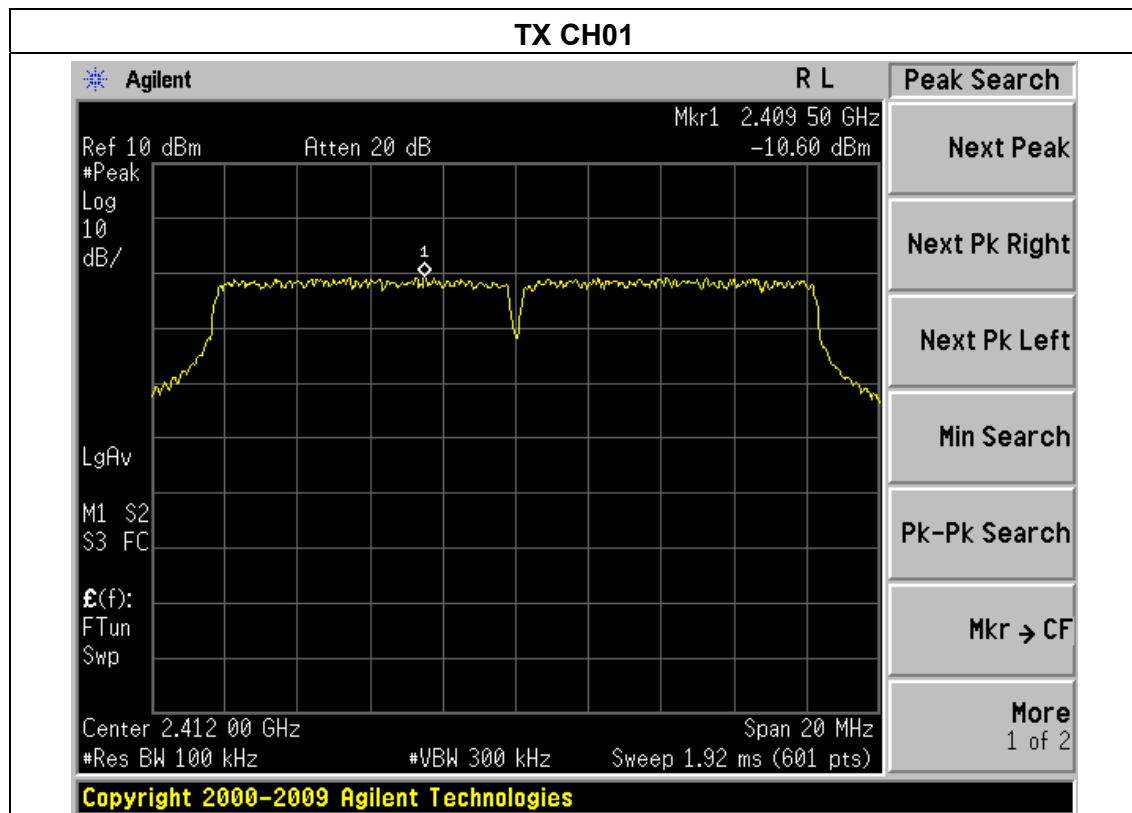
Ant.1

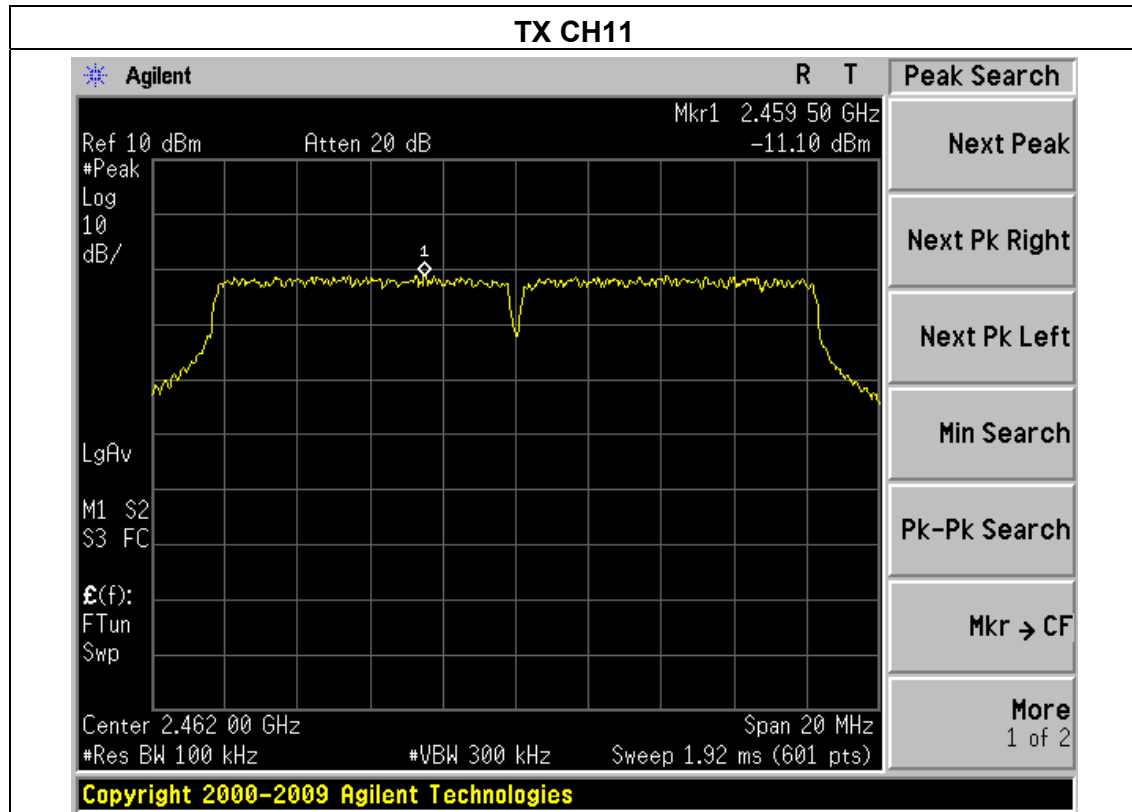






Ant.2



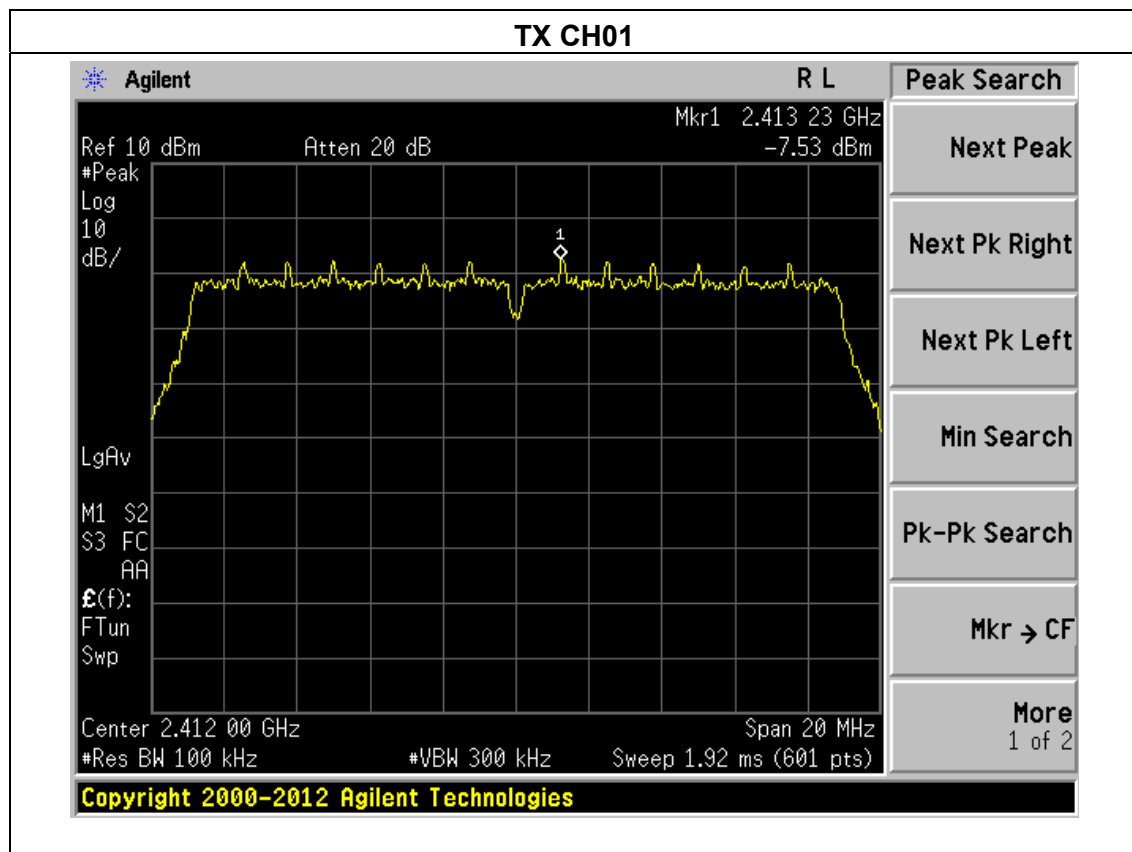




Temperature :	25°C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX n Mode(20M)		

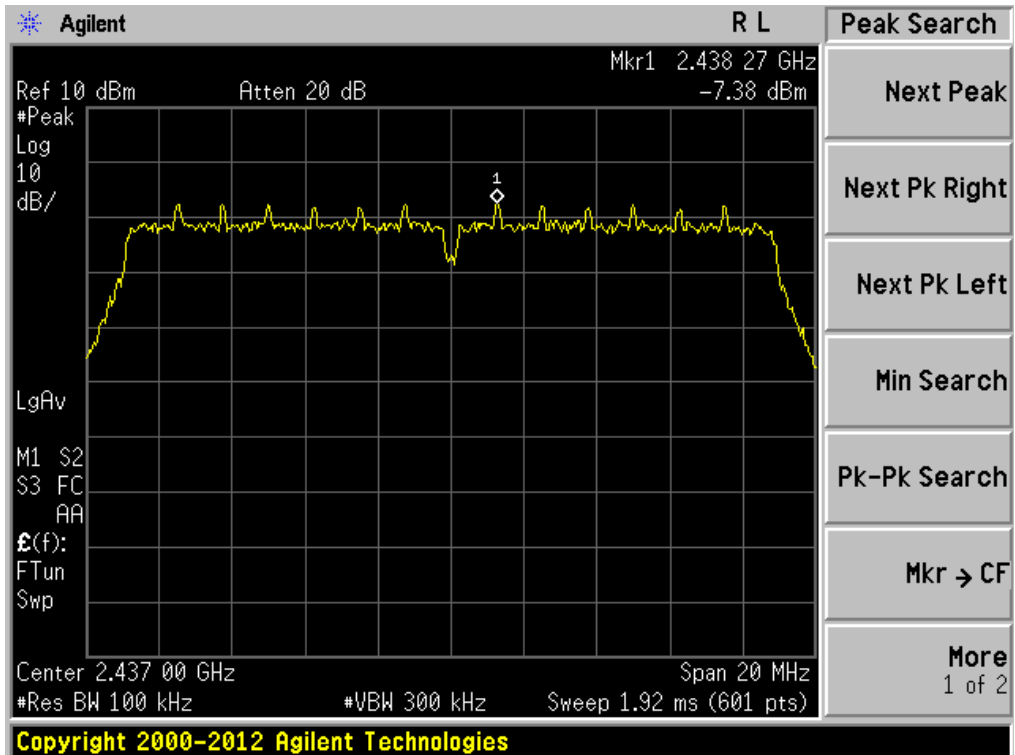
Frequency		Read Level (dBm)	Total Power Spectral Density(dBm)	Limit (dBm)	Result
Ant 1	2412 MHz	-7.53	-5.85	8	Pass
	2437 MHz	-7.38	-5.85	8	Pass
	2462 MHz	-6.78	-5.38	8	Pass
Ant 2	2412 MHz	-11.10	/	8	Pass
	2437 MHz	-10.73	/	8	Pass
	2462 MHz	-11.06	/	8	Pass

Ant.1

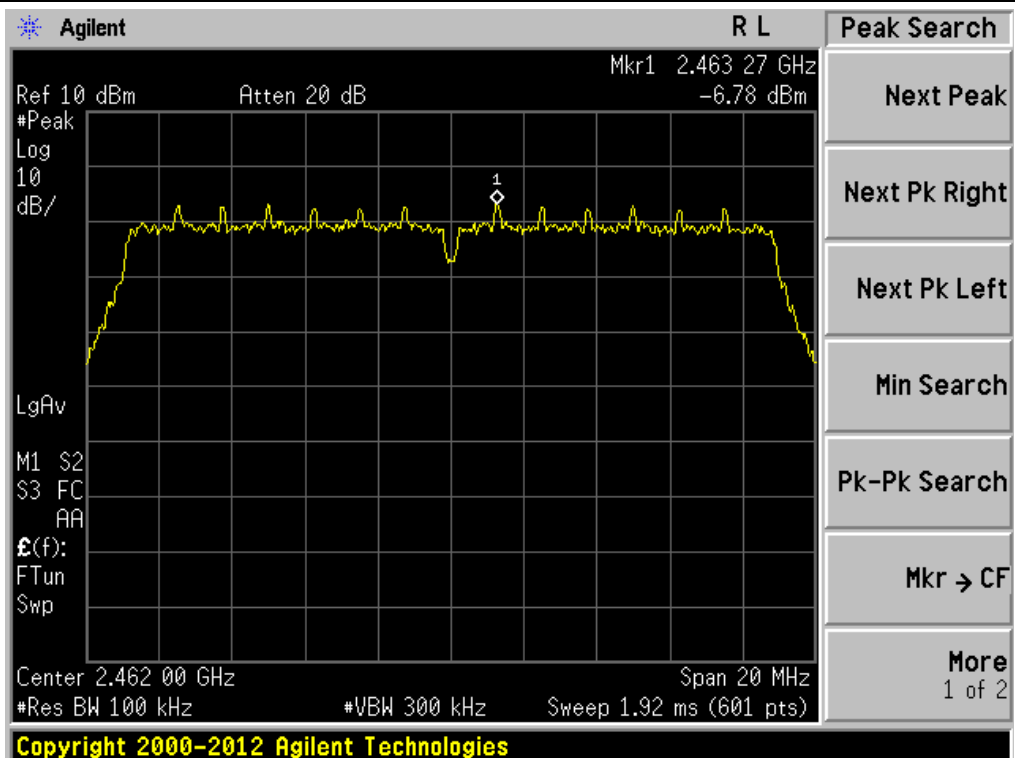




TX CH06

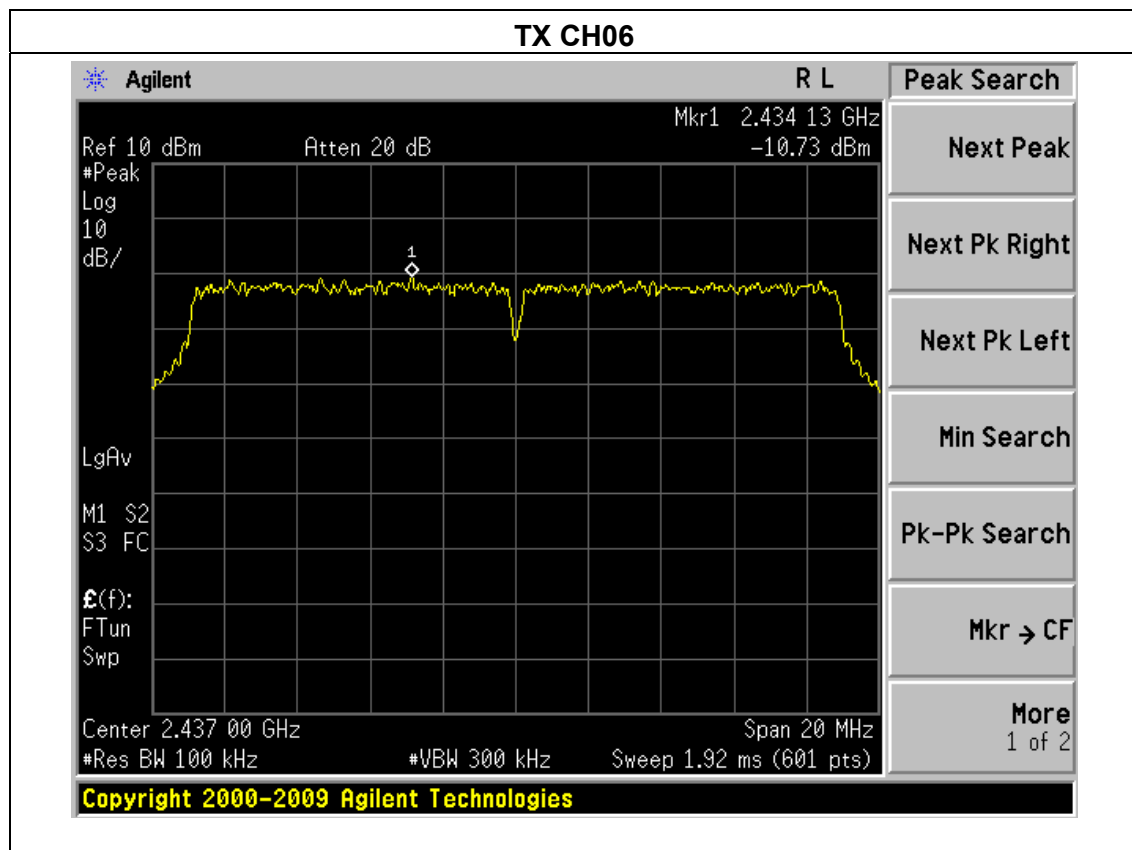
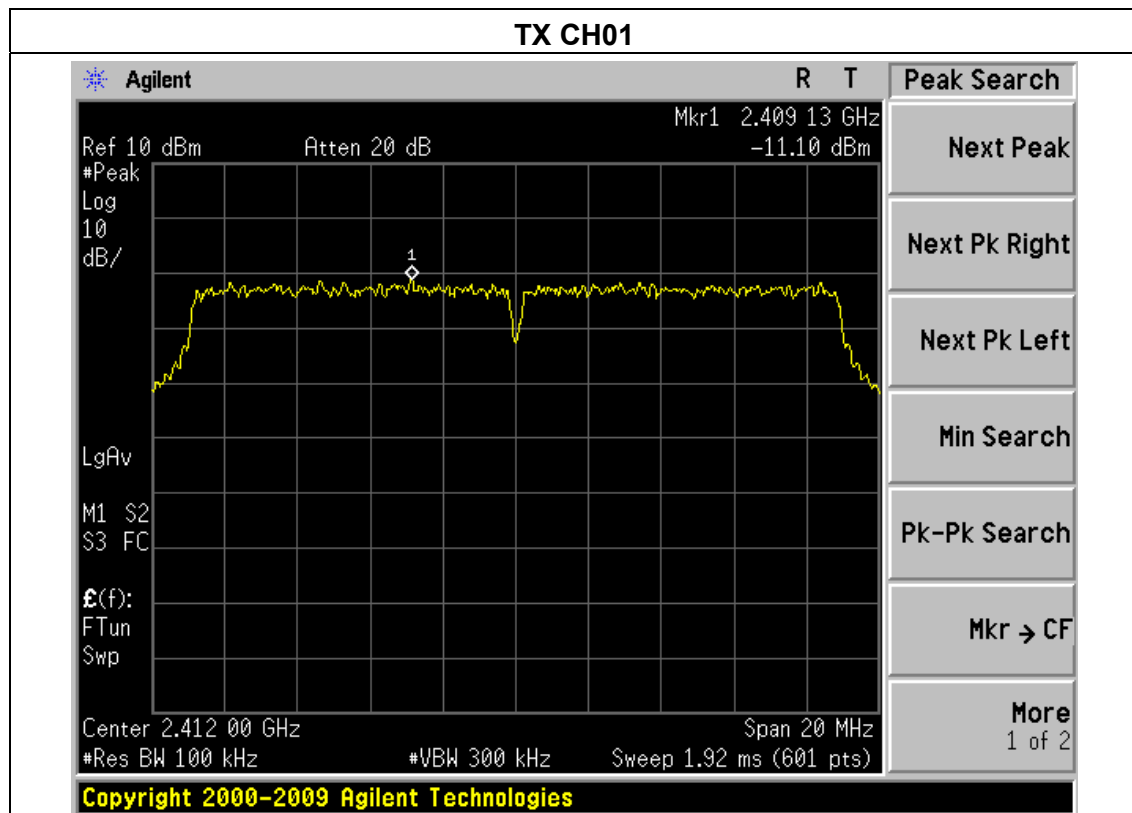


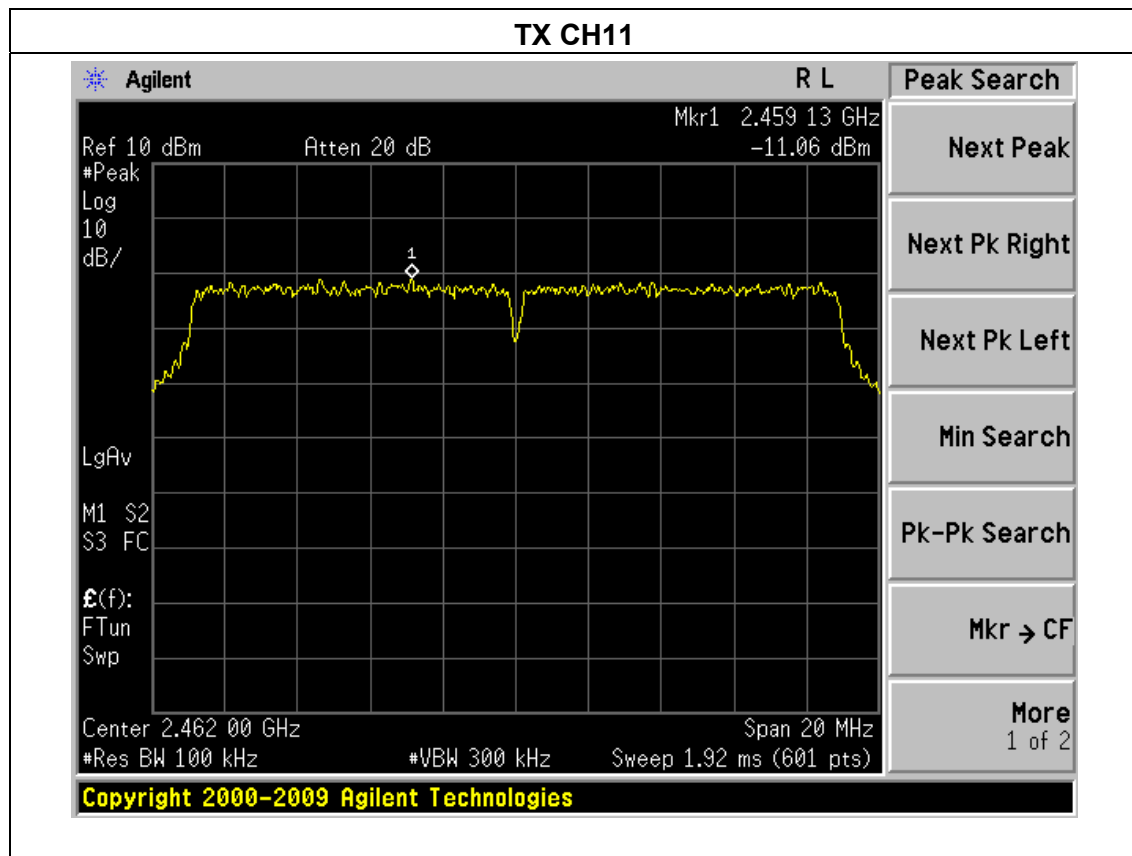
TX CH11





Ant.2



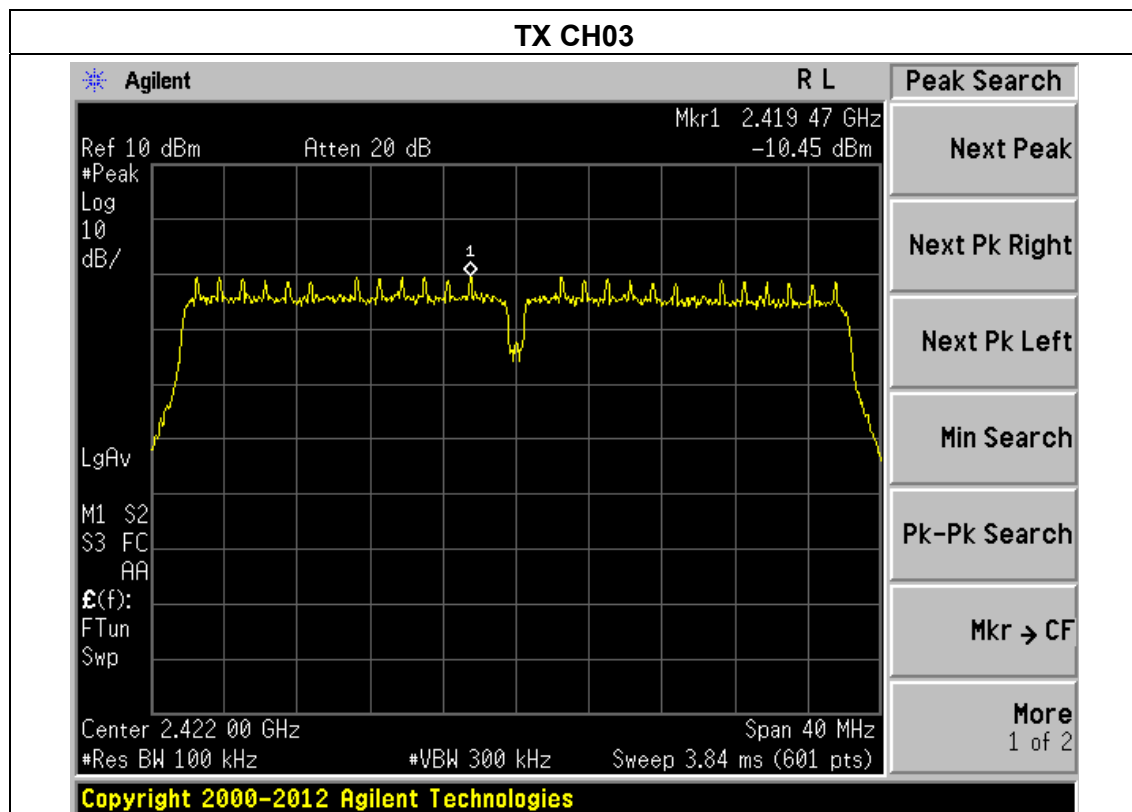




Temperature :	25°C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX n Mode(40M)		

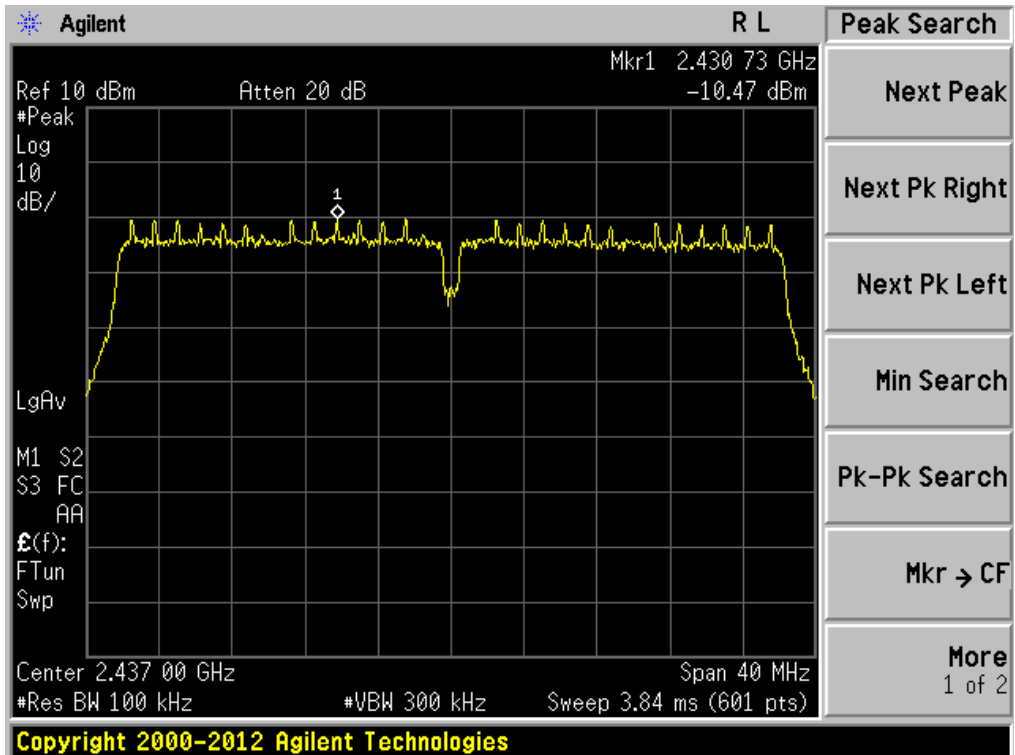
Frequency		Read Level (dBm)	Total Power Spectral Density(dBm)	Limit (dBm)	Result
Ant 1	2412 MHz	-10.45	-9.21	8	Pass
	2437 MHz	-10.47	-9.21	8	Pass
	2462 MHz	-9.88	-8.86	8	Pass
Ant 2	2412 MHz	-14.75	/	8	Pass
	2437 MHz	-14.77	/	8	Pass
	2462 MHz	-14.97	/	8	Pass

Ant.1

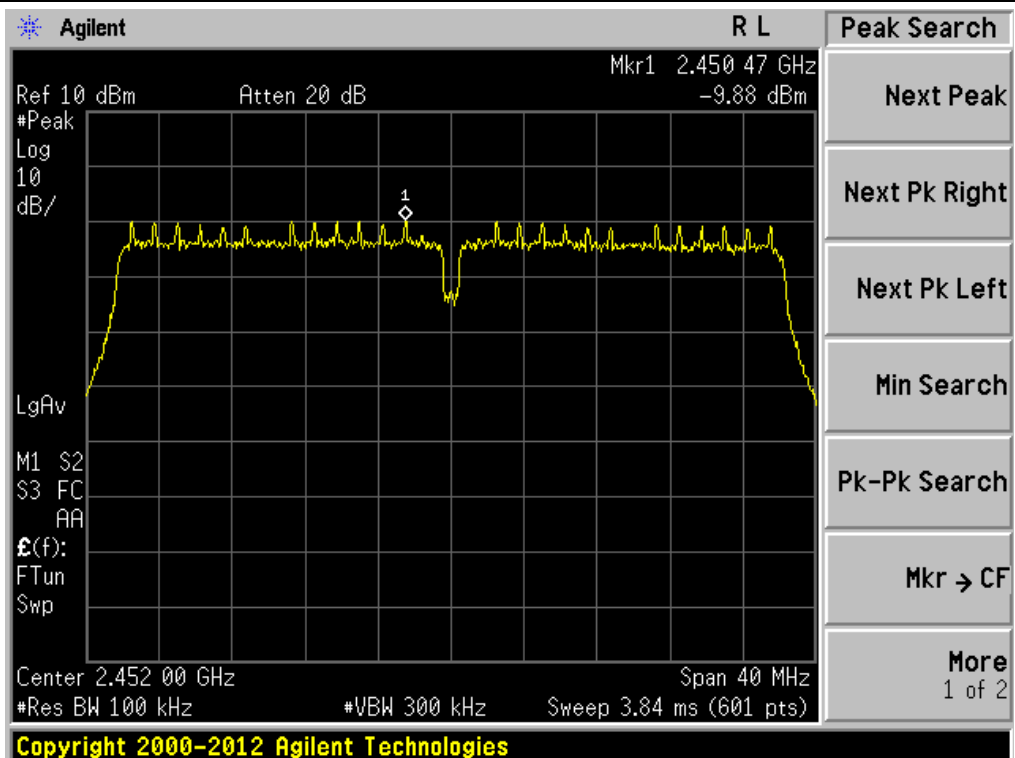




TX CH06

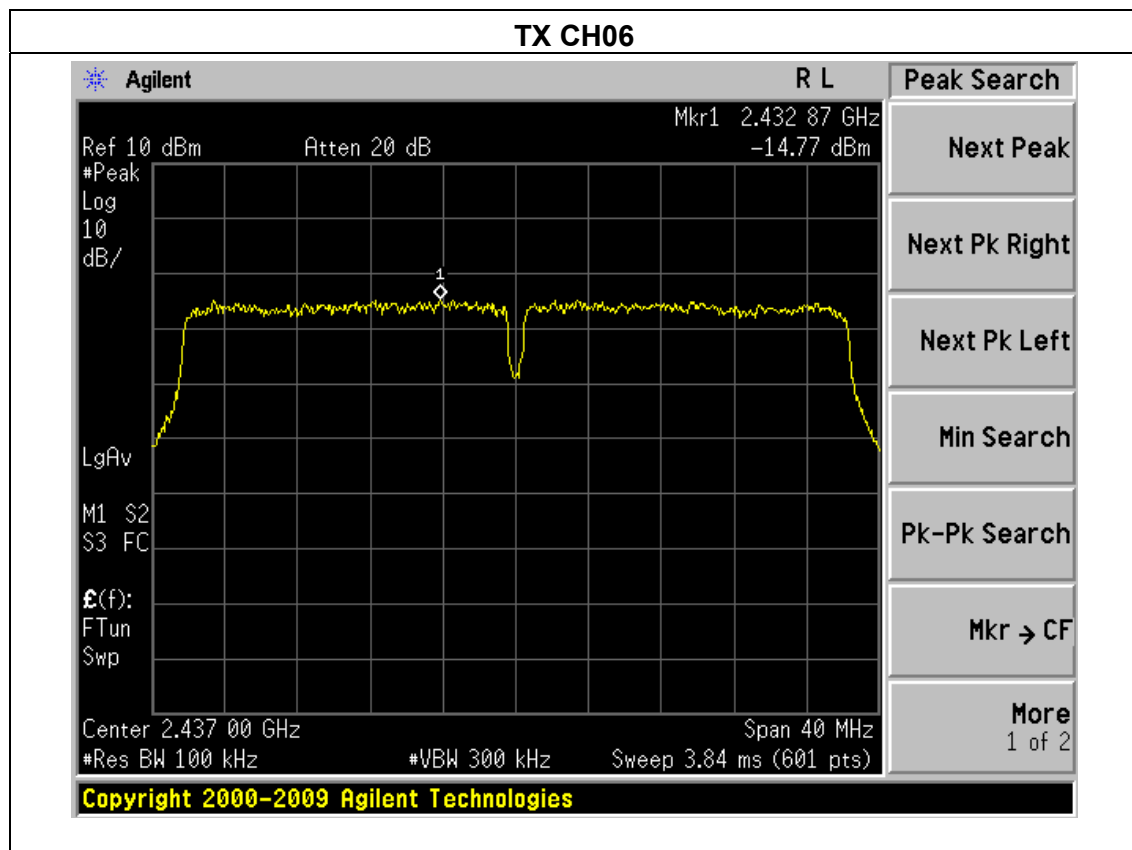
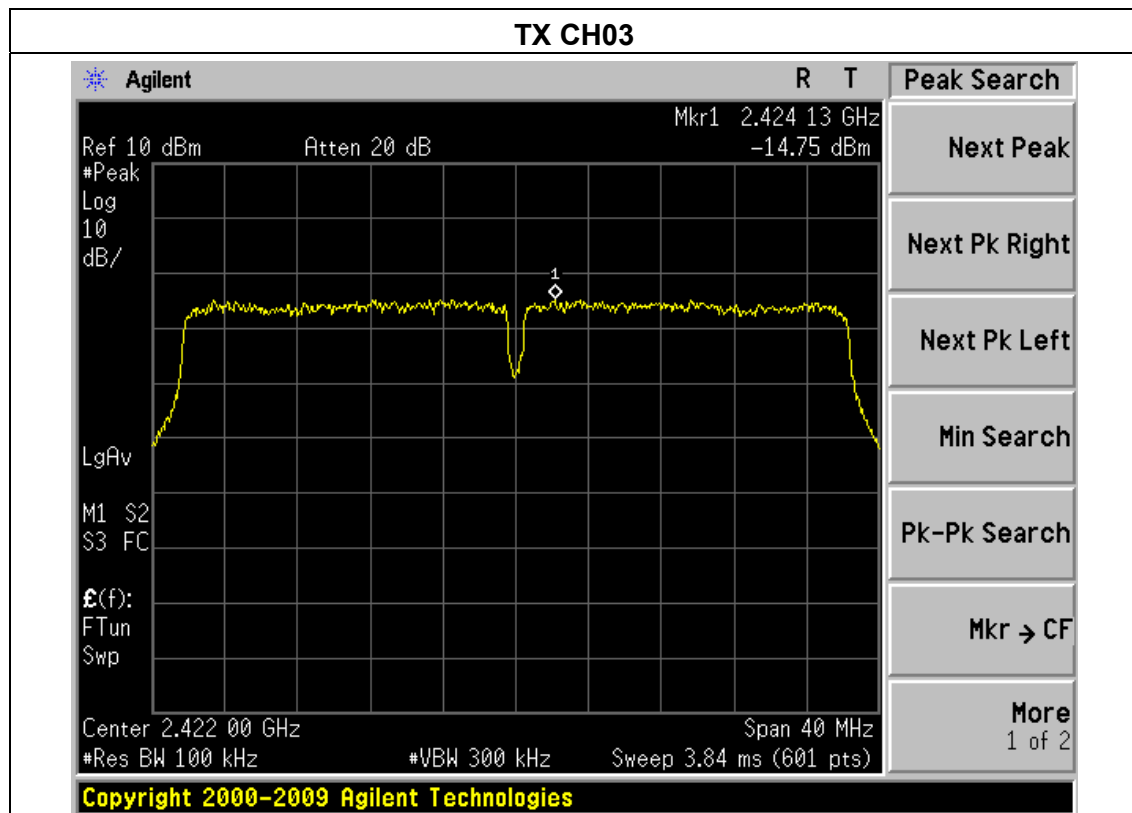


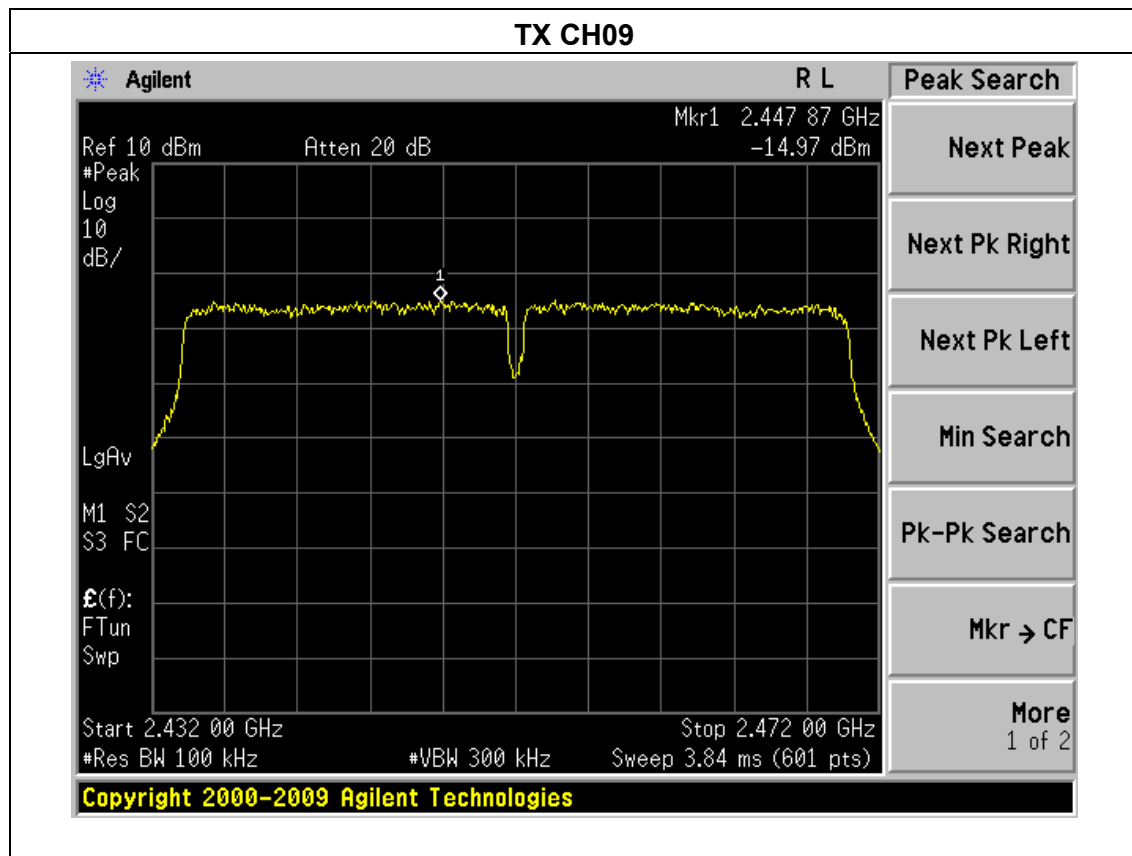
TX CH09





Ant.2







5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times \text{RBW}$.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

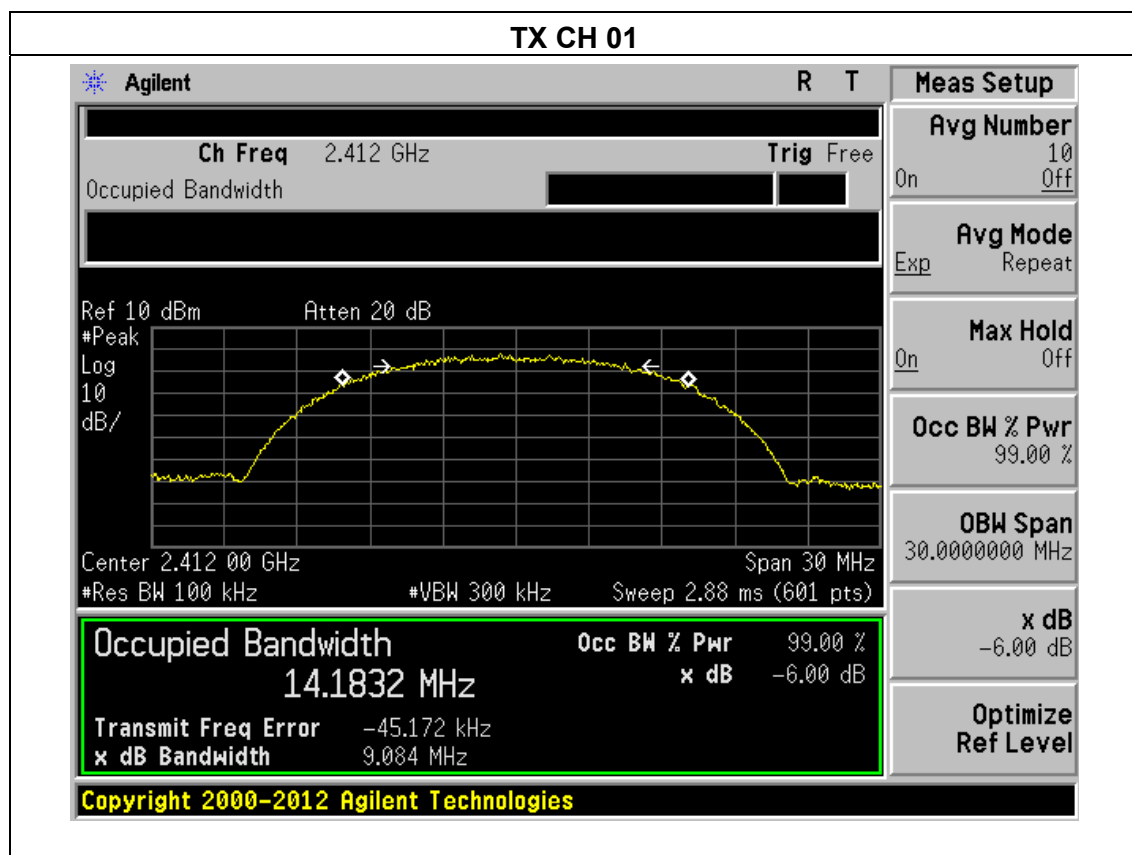


5.1.5 TEST RESULTS

Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX b Mode		

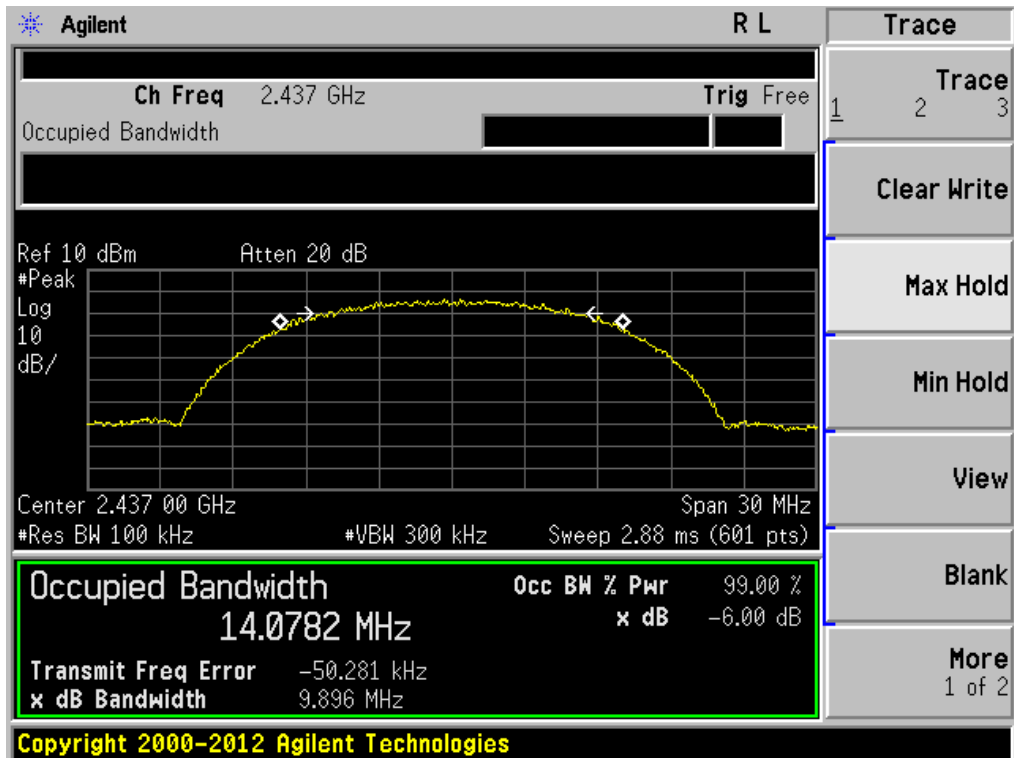
Frequency		6dB bandwidth (MHz)	Limit (kHz)	Result
Ant 1	2412 MHz	9.084	500	Pass
	2437 MHz	9.896	500	Pass
	2462 MHz	10.189	500	Pass
Ant 2	2412 MHz	10.113	500	Pass
	2437 MHz	10.113	500	Pass
	2462 MHz	10.116	500	Pass

Ant.1

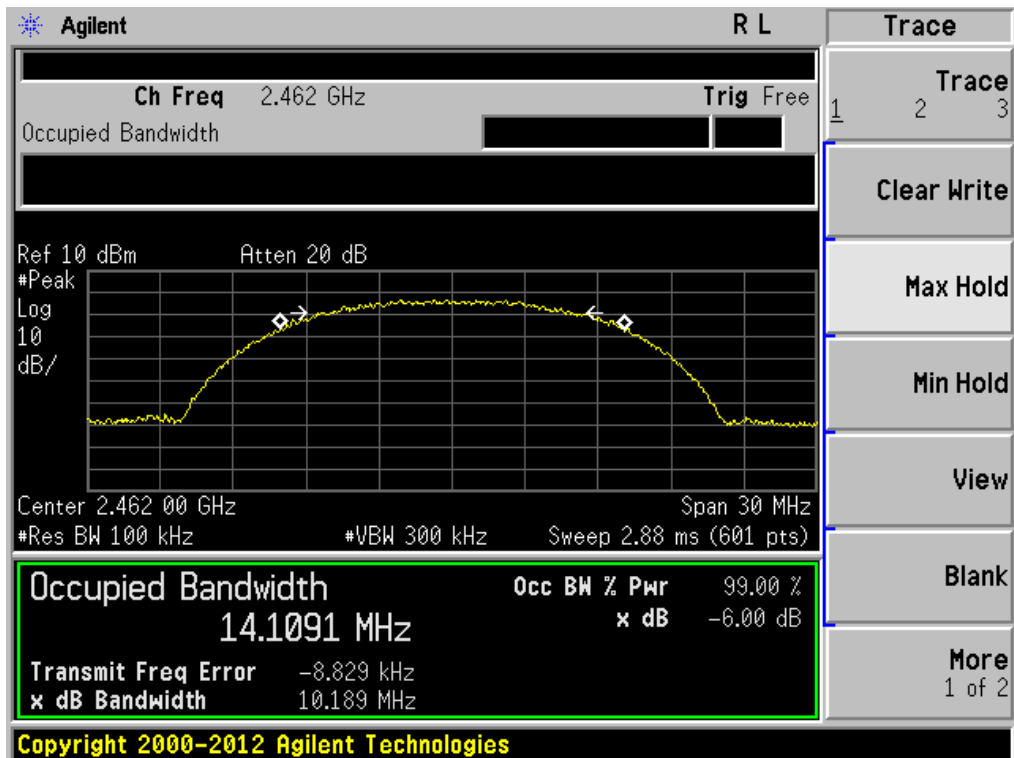




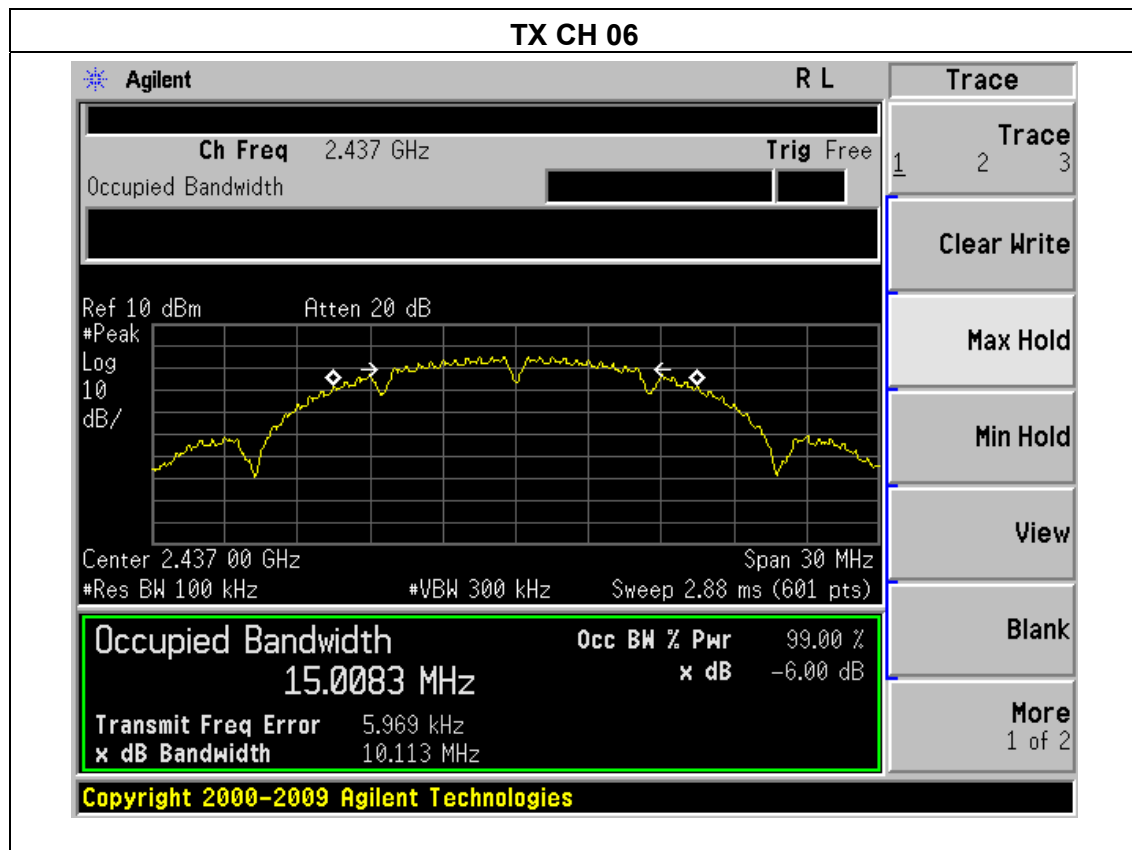
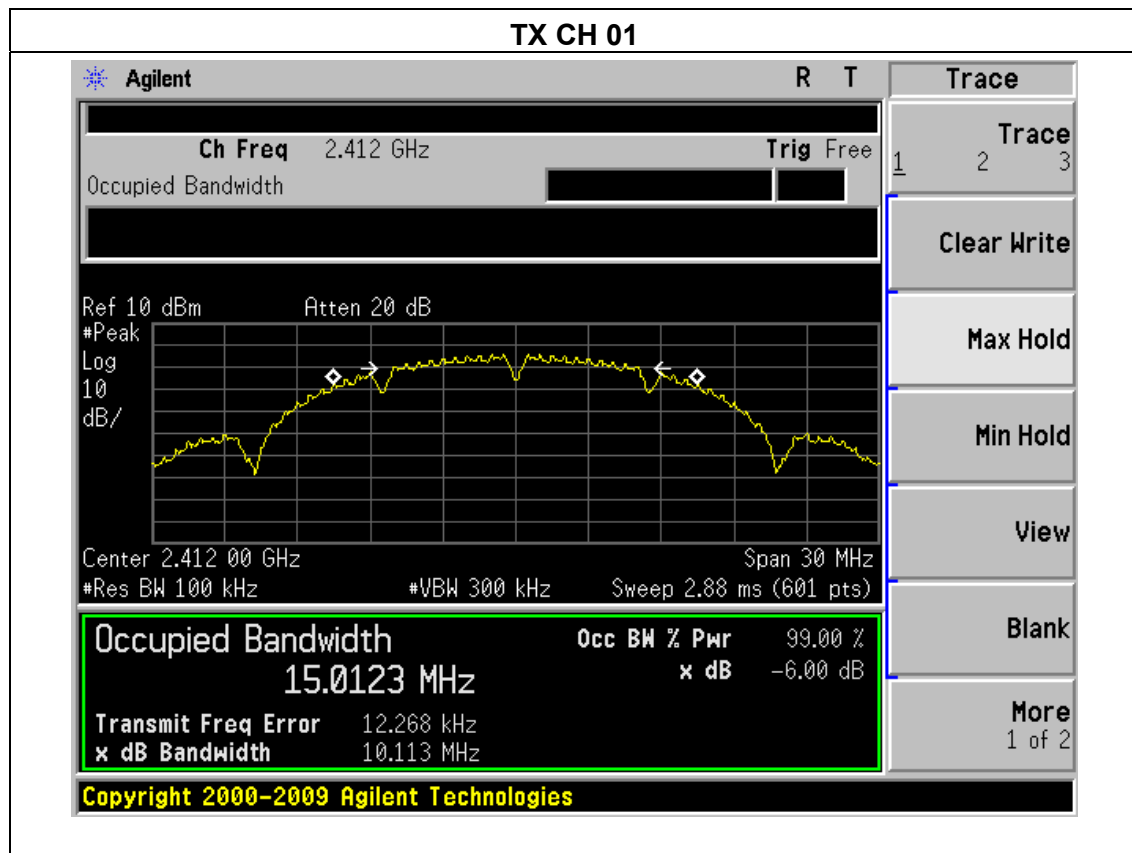
TX CH 06

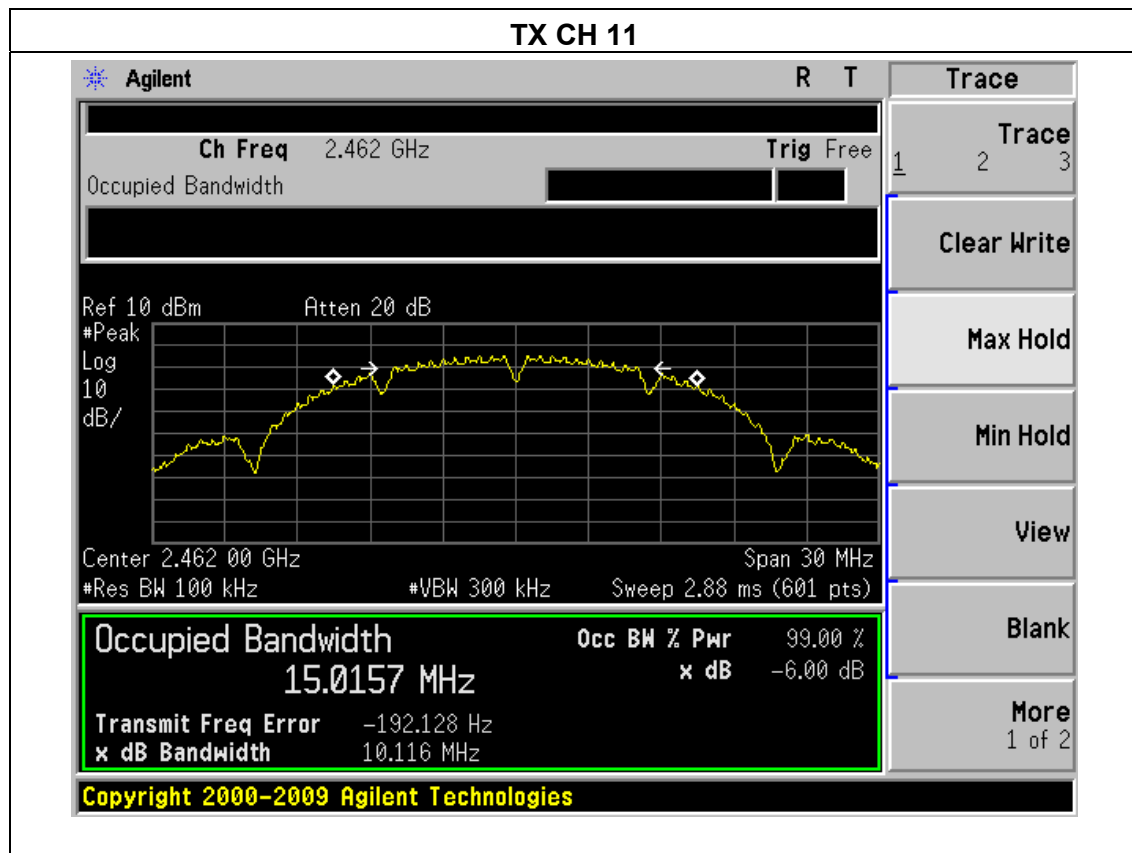


TX CH 11



Ant.2



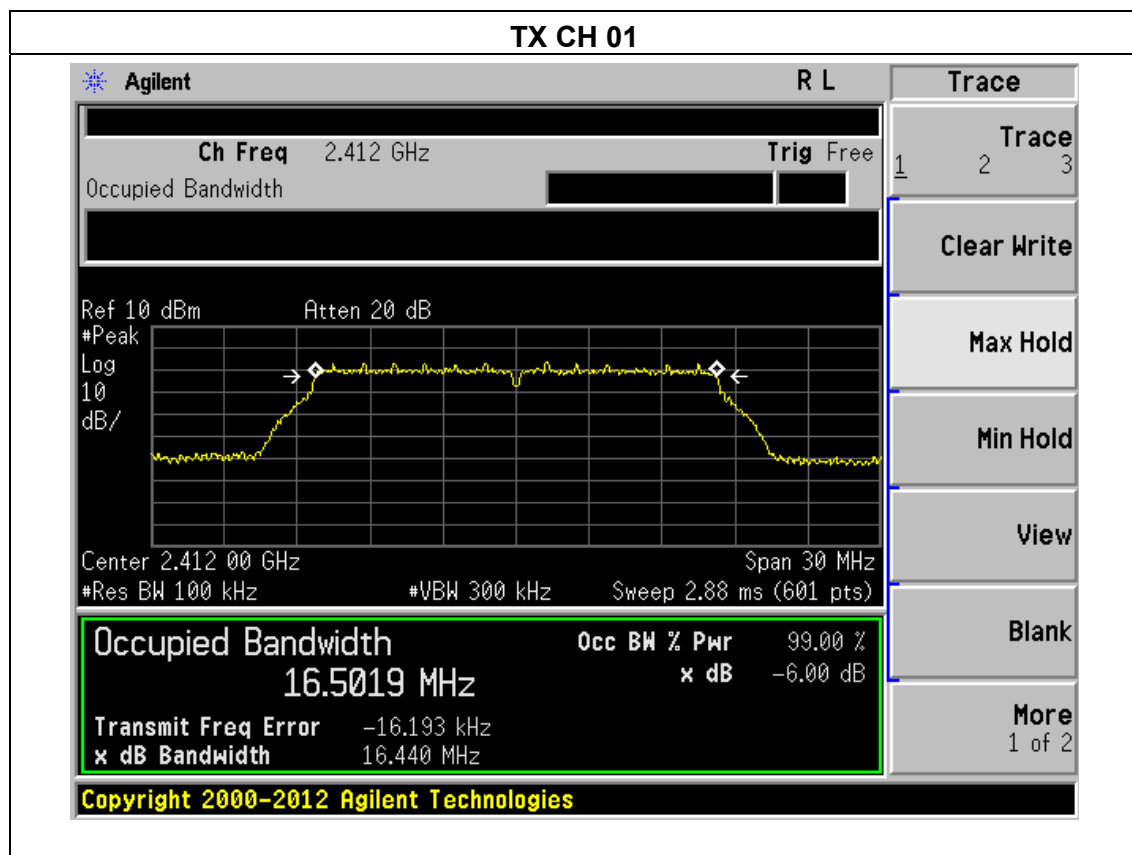




Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX g Mode		

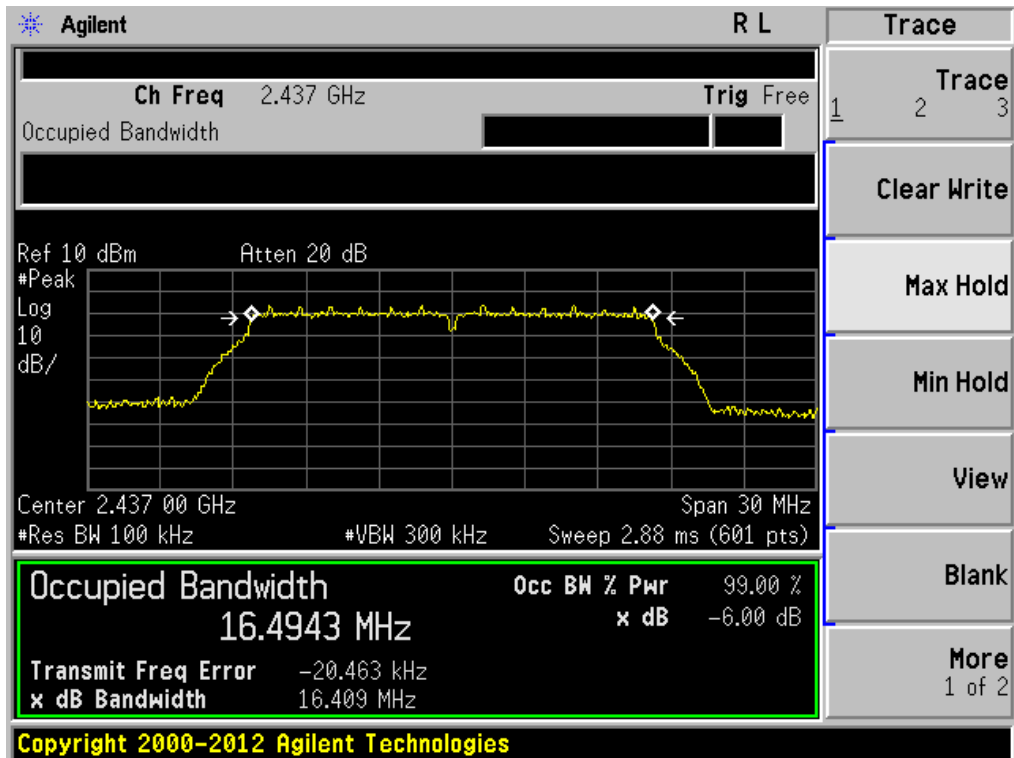
Frequency		6dB bandwidth (MHz)	Limit (kHz)	Result
Ant 1	2412 MHz	16.440	500	Pass
	2437 MHz	16.409	500	Pass
	2462 MHz	16.421	500	Pass
Ant 2	2412 MHz	16.617	500	Pass
	2437 MHz	16.627	500	Pass
	2462 MHz	16.627	500	Pass

Ant.1

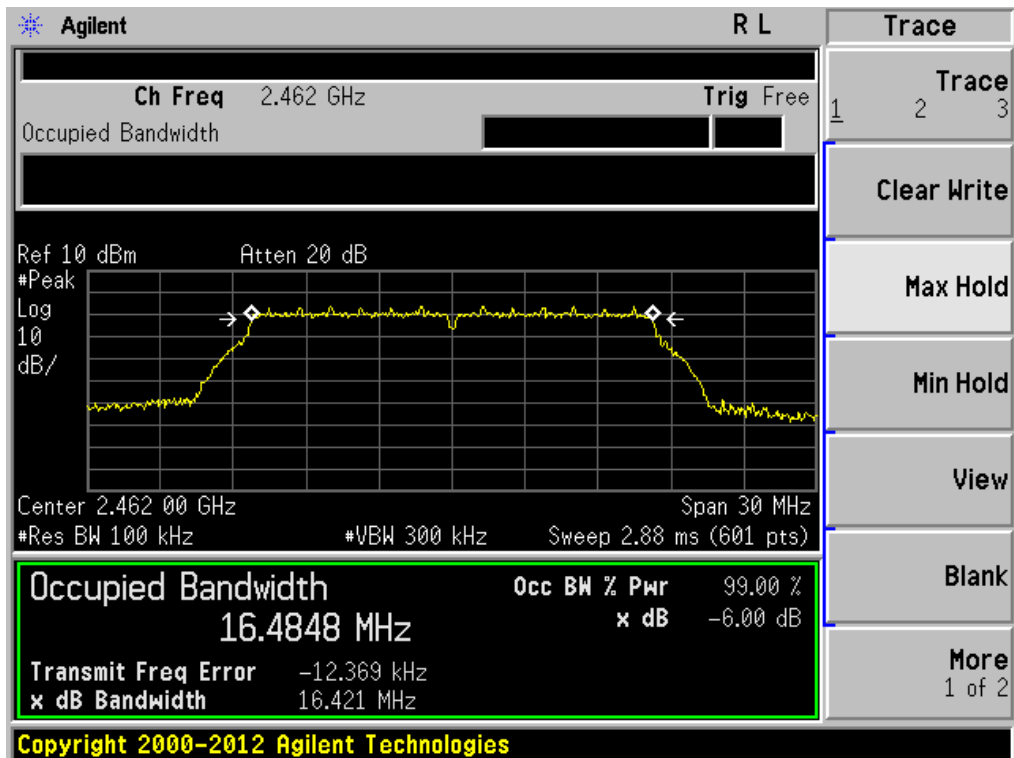




TX CH 06

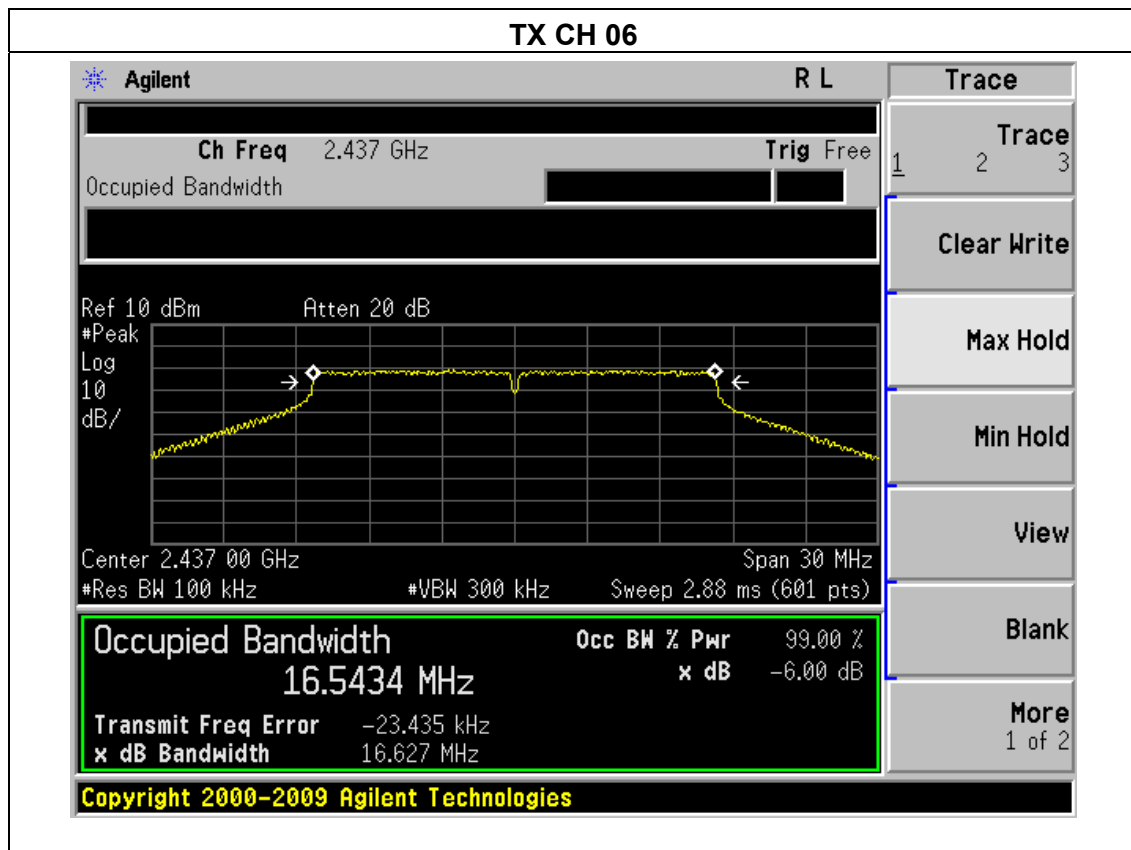
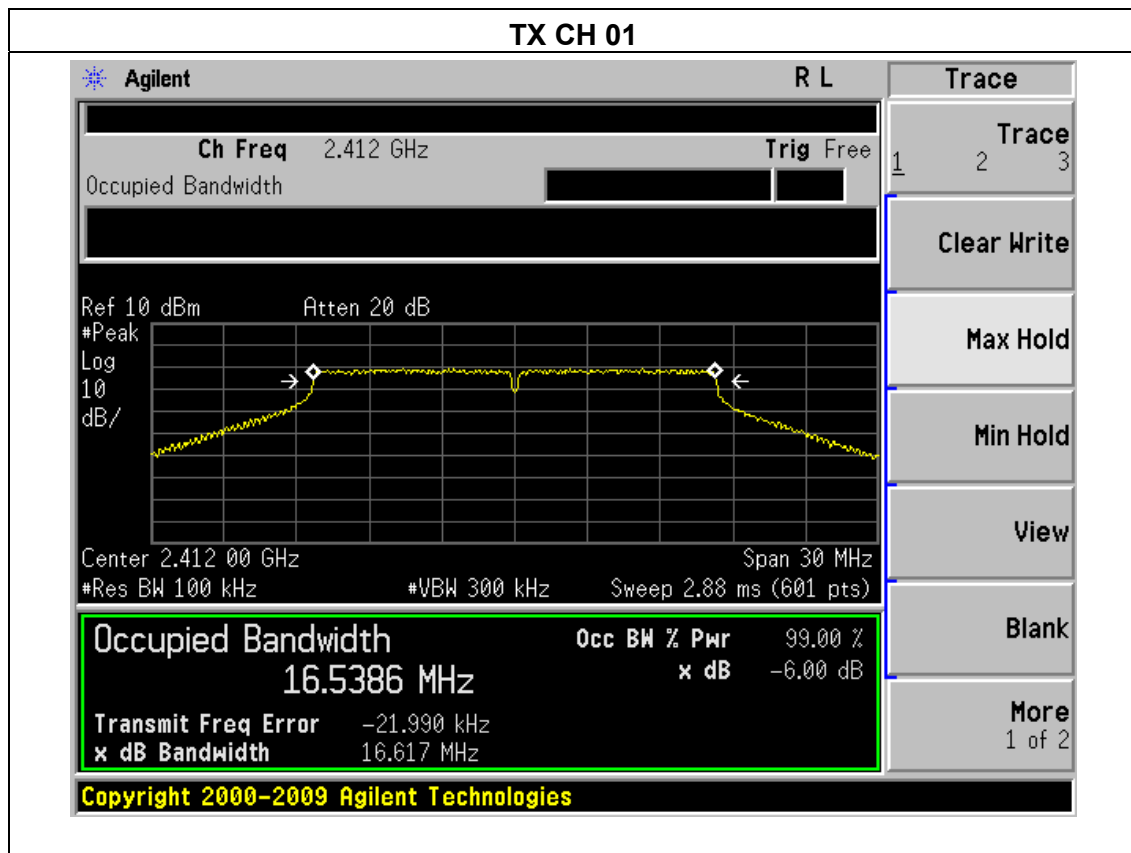


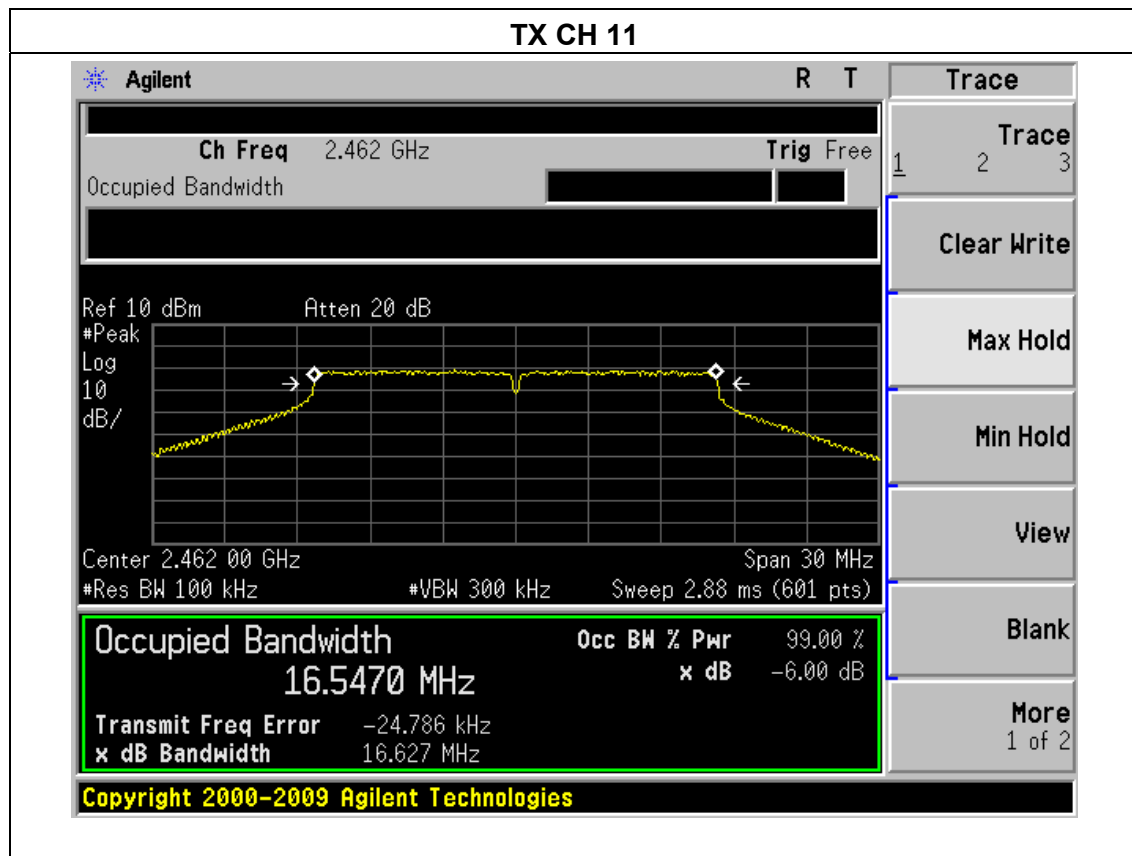
TX CH 11





Ant.2



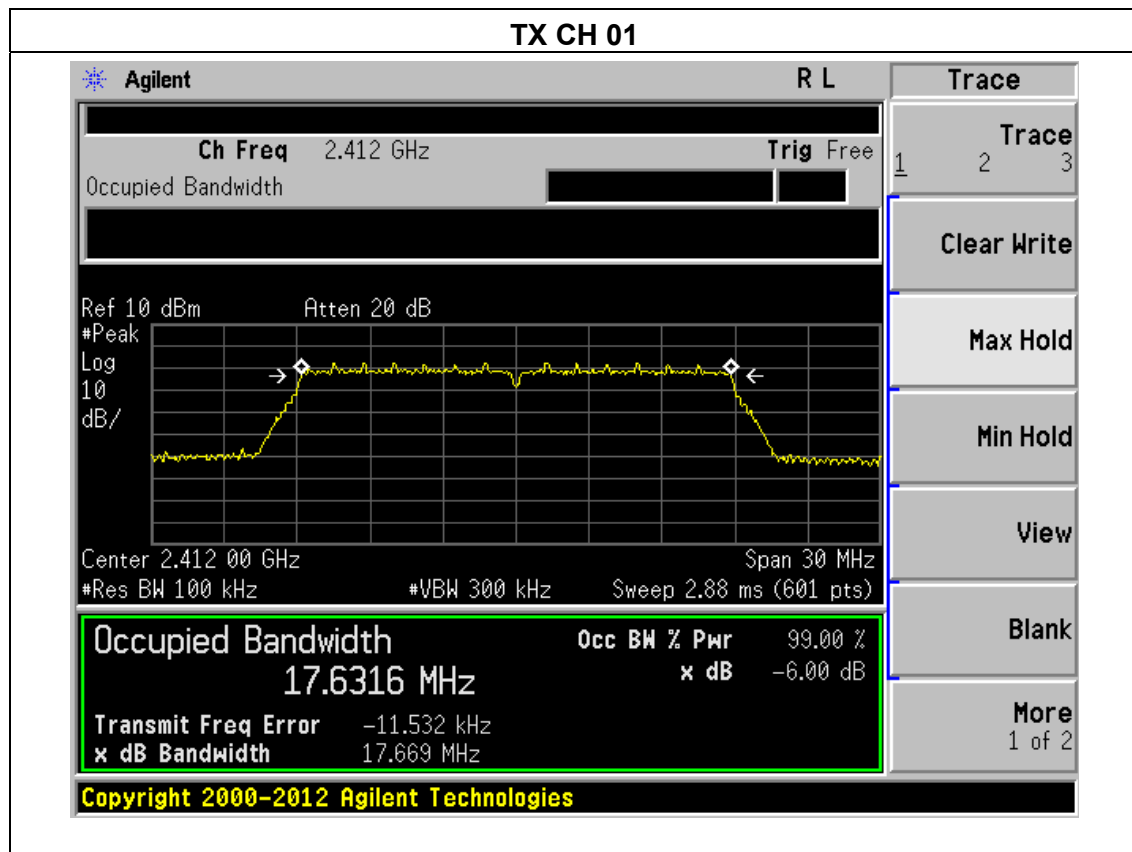


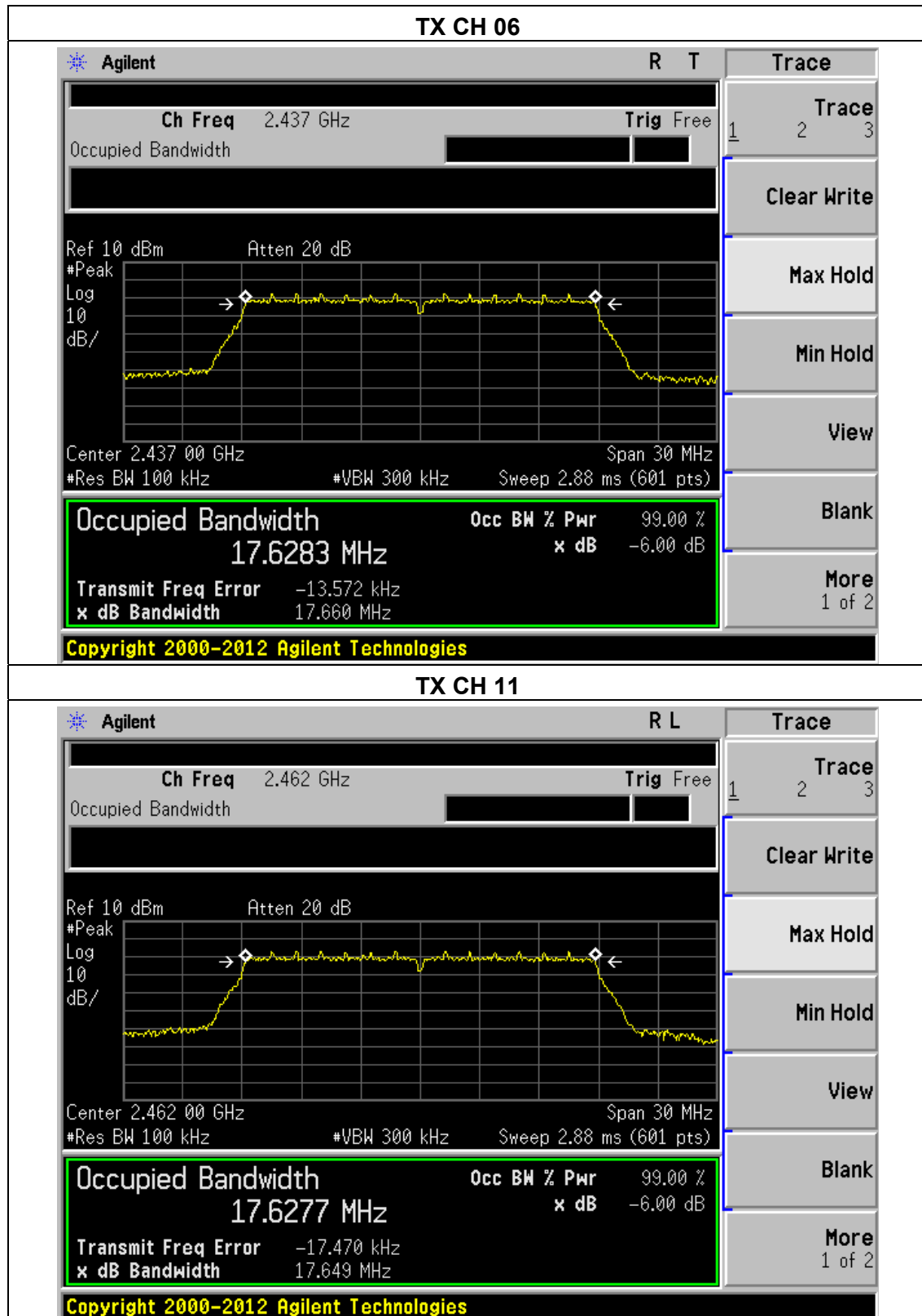


Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX n Mode(20M)		

Frequency		6dB bandwidth (MHz)	Limit (kHz)	Result
Ant 1	2412 MHz	17.669	500	Pass
	2437 MHz	17.660	500	Pass
	2462 MHz	17.649	500	Pass
Ant 2	2412 MHz	17.856	500	Pass
	2437 MHz	17.869	500	Pass
	2462 MHz	17.859	500	Pass

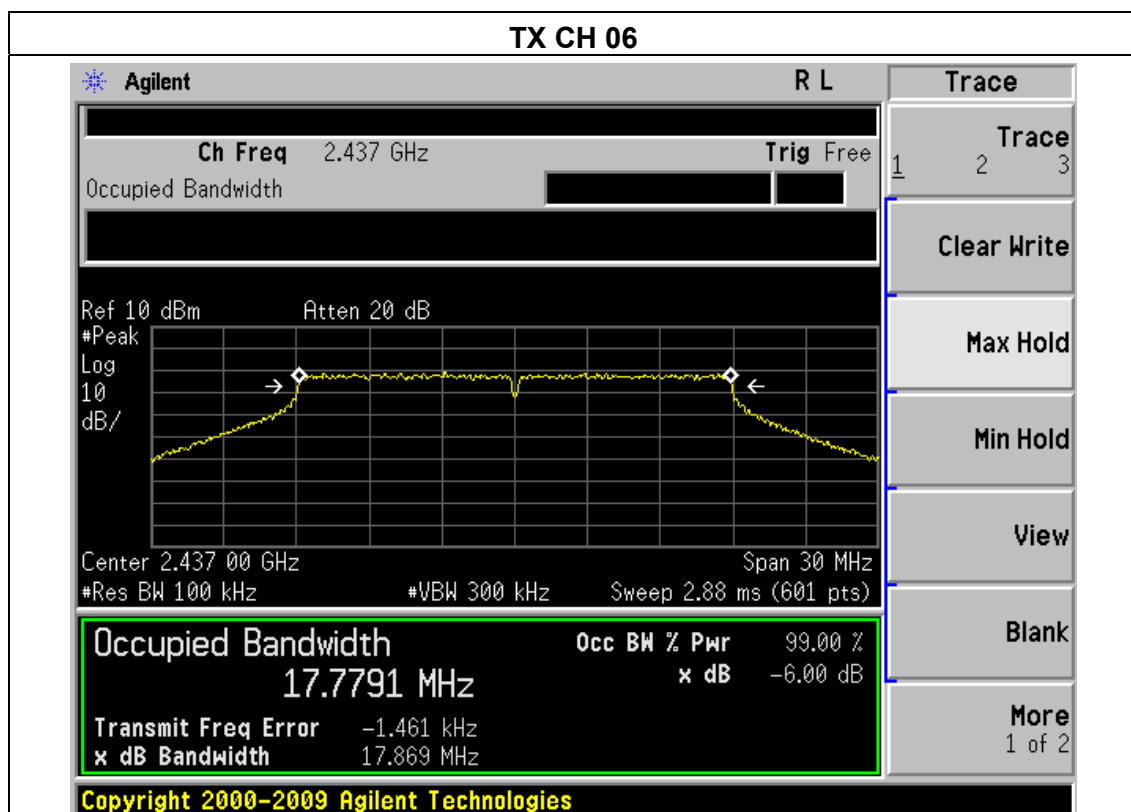
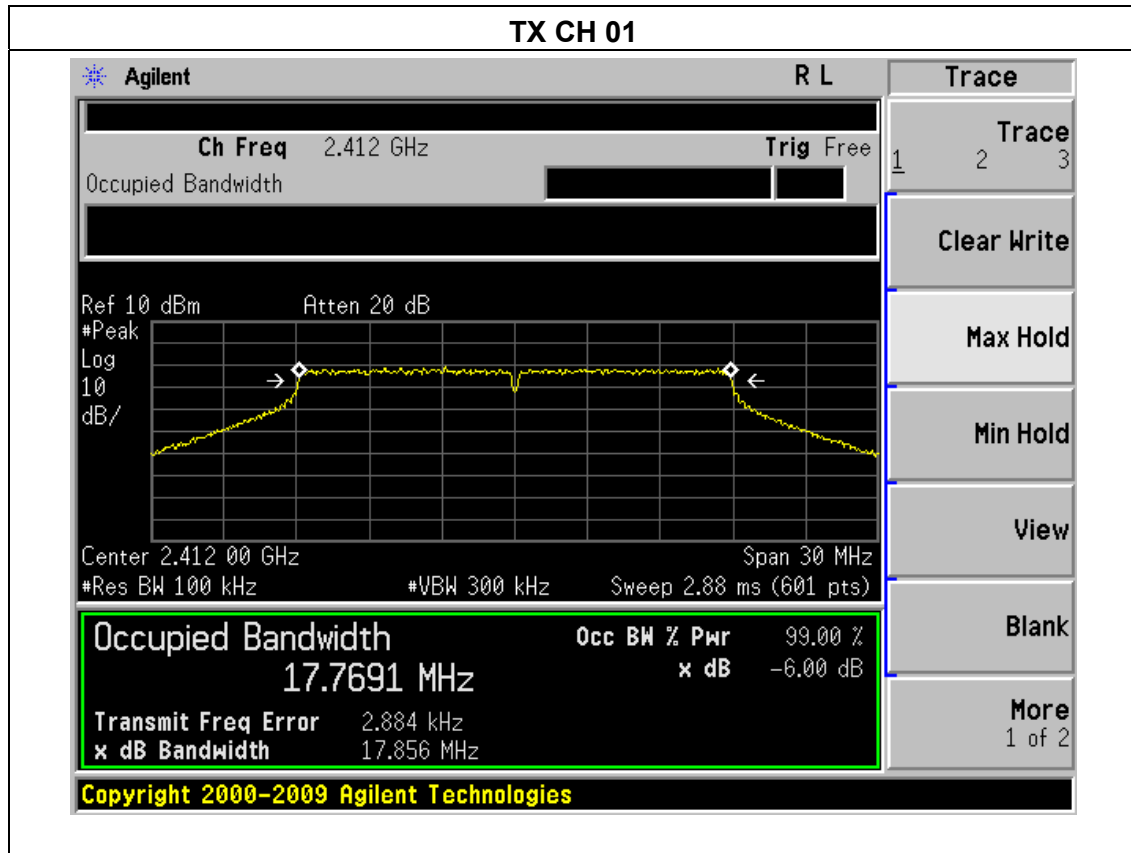
Ant.1

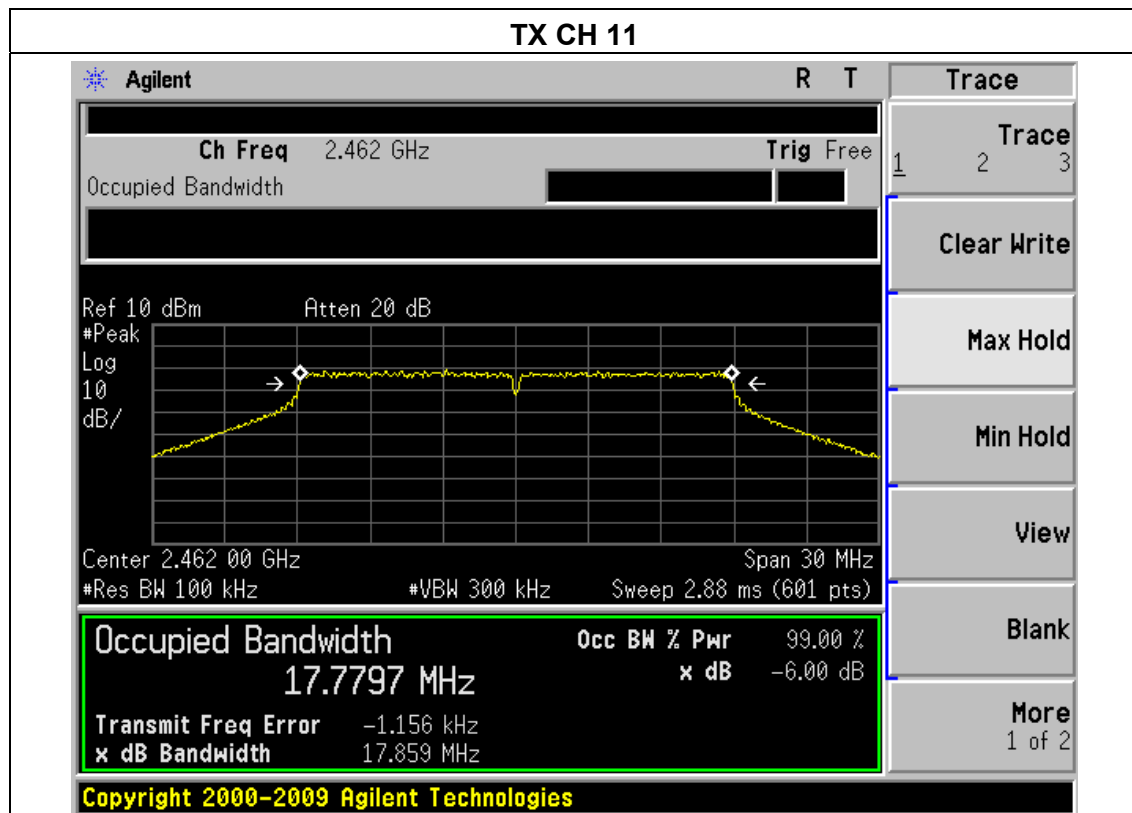






Ant.2



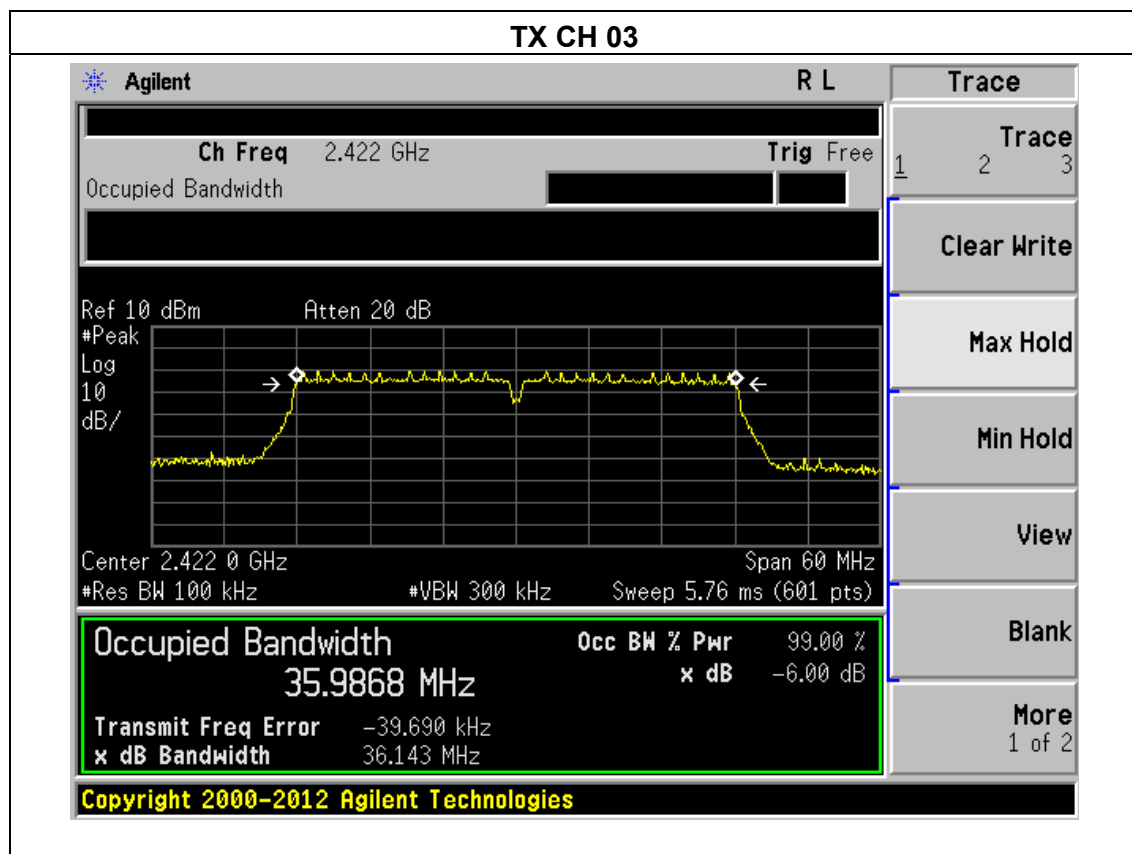


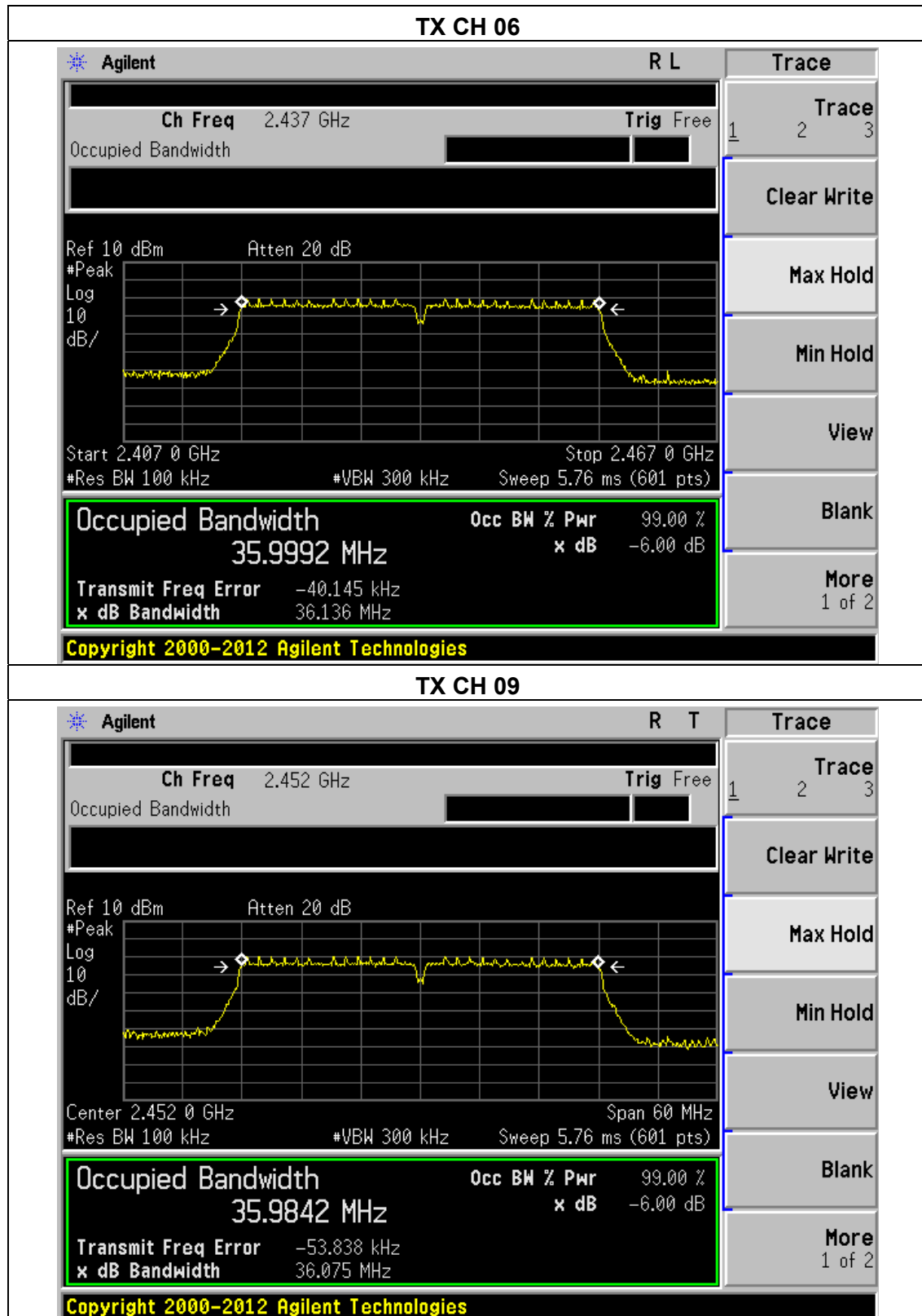


Temperature :	25°C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 9V from adapter
Test Mode :	TX n Mode(40M)		

Frequency		6dB bandwidth (MHz)	Limit (kHz)	Result
Ant 1	2412 MHz	36.143	500	Pass
	2437 MHz	36.136	500	Pass
	2462 MHz	36.075	500	Pass
Ant 2	2412 MHz	36.562	500	Pass
	2437 MHz	36.583	500	Pass
	2462 MHz	36.577	500	Pass

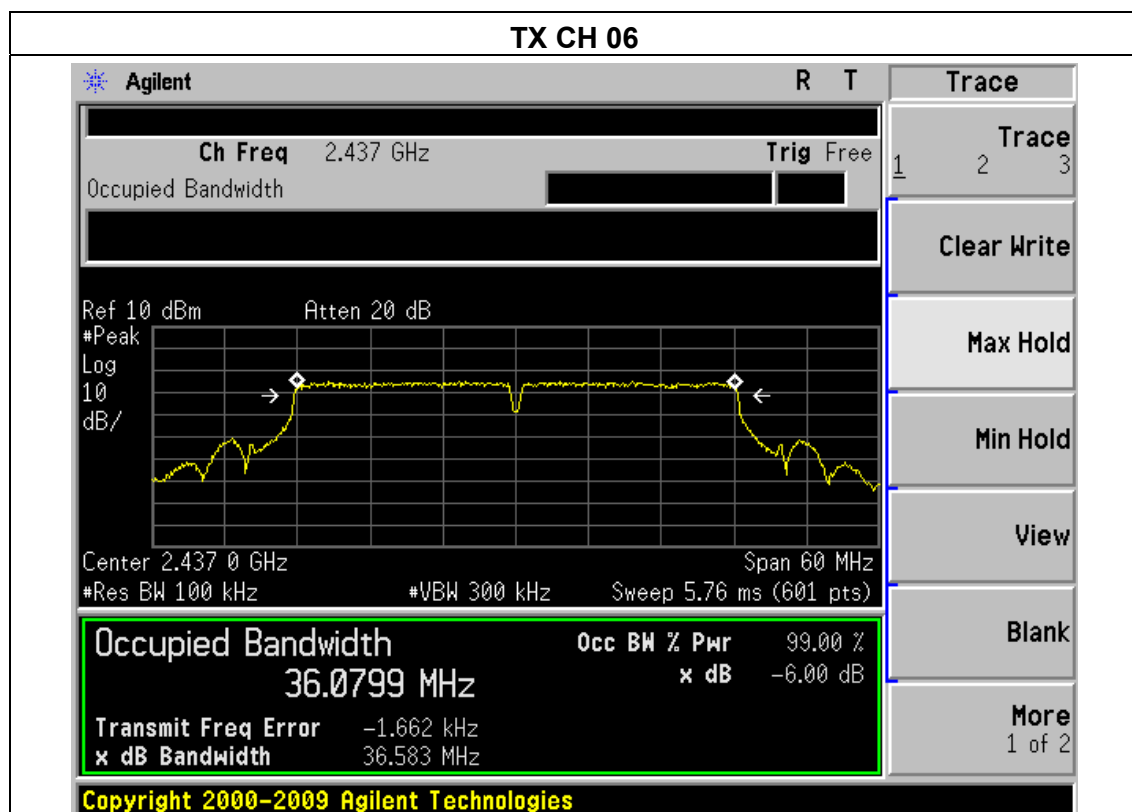
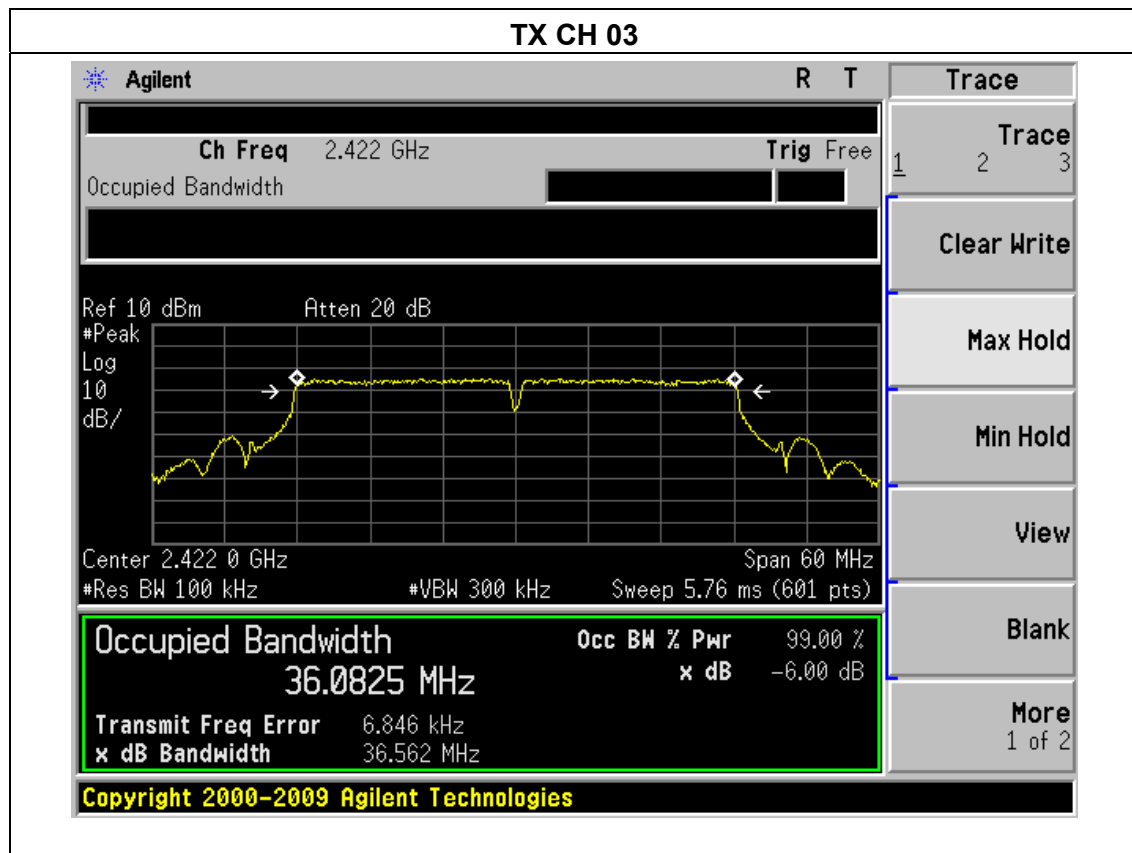
Ant.1

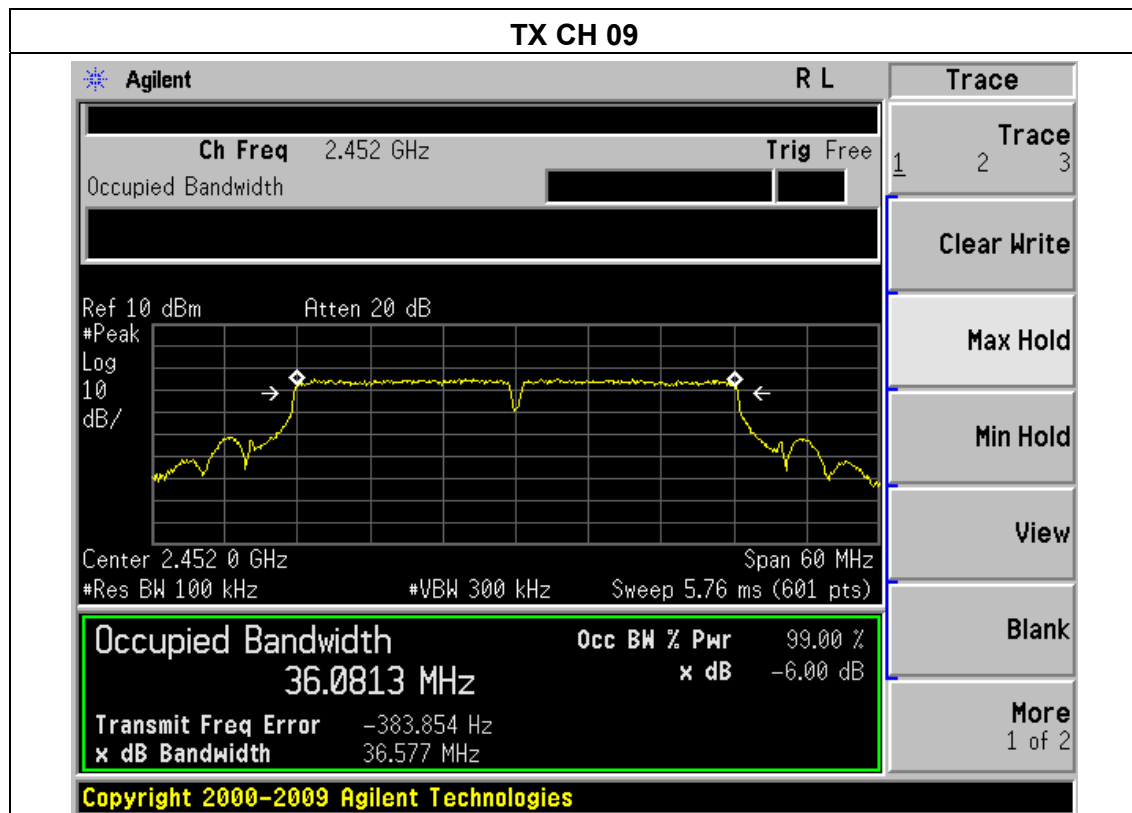






Ant.2







6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



6.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 9V from adapter

	Frequency	Antenna port	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(PK)	Total Conducted Output Power(PK)	Total Conducted Output Power(PK)	LIMIT
	(MHz)		(dBm)	(mW)	(mW)	(dBm)	dBm
802.11b	2412	Ant.1	14.89	30.83	61.31	17.90	30
		Ant.2	14.88	30.76			
	2437	Ant.1	14.84	30.48	60.54	17.82	30
		Ant.2	14.78	30.06			
	2462	Ant.1	14.85	30.55	61.38	17.88	30
		Ant.2	14.89	30.83			
802.11g	2412	Ant.1	12.71	18.66	37.41	15.73	30
		Ant.2	12.73	18.75			
	2437	Ant.1	12.75	18.84	37.76	15.77	30
		Ant.2	12.77	18.92			
	2462	Ant.1	12.74	18.79	37.54	15.74	30
		Ant.2	12.73	18.75			
802.11n20	2412	Ant.1	11.56	14.32	28.03	14.14	30
		Ant.2	11.37	13.71			
	2437	Ant.1	11.59	14.42	27.72	14.48	30
		Ant.2	11.28	13.43			
	2462	Ant.1	11.51	14.16	27.74	14.43	30
		Ant.2	11.33	13.58			
802.11n40	2422	Ant.1	9.88	9.73	18.20	12.60	30
		Ant.2	9.28	8.47			
	2437	Ant.1	9.80	9.55	18.02	12.56	30
		Ant.2	9.28	8.47			
	2452	Ant.1	9.80	9.55	18.16	12.59	30
		Ant.2	9.35	8.61			



7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

7.1 APPLICABLE STANDARD

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

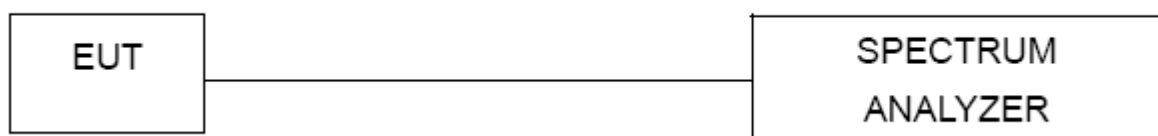
7.2 TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP





7.5 EUT OPERATION CONDITIONS

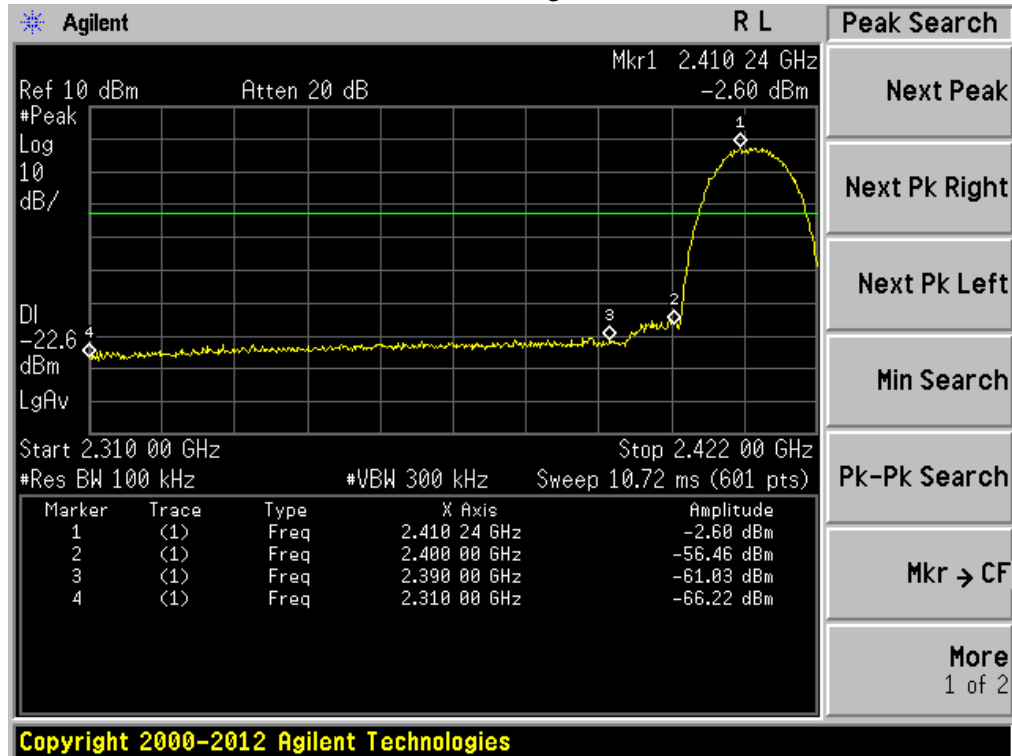
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.1 TEST RESULTS

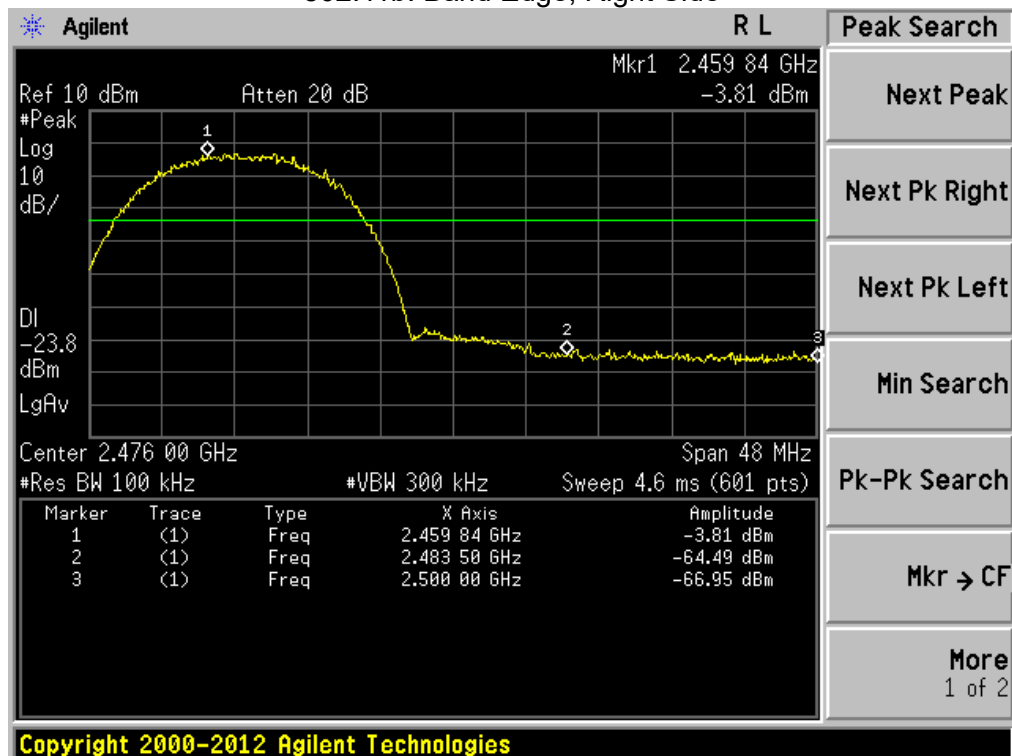


Ant.1

802.11b: Band Edge, Left Side

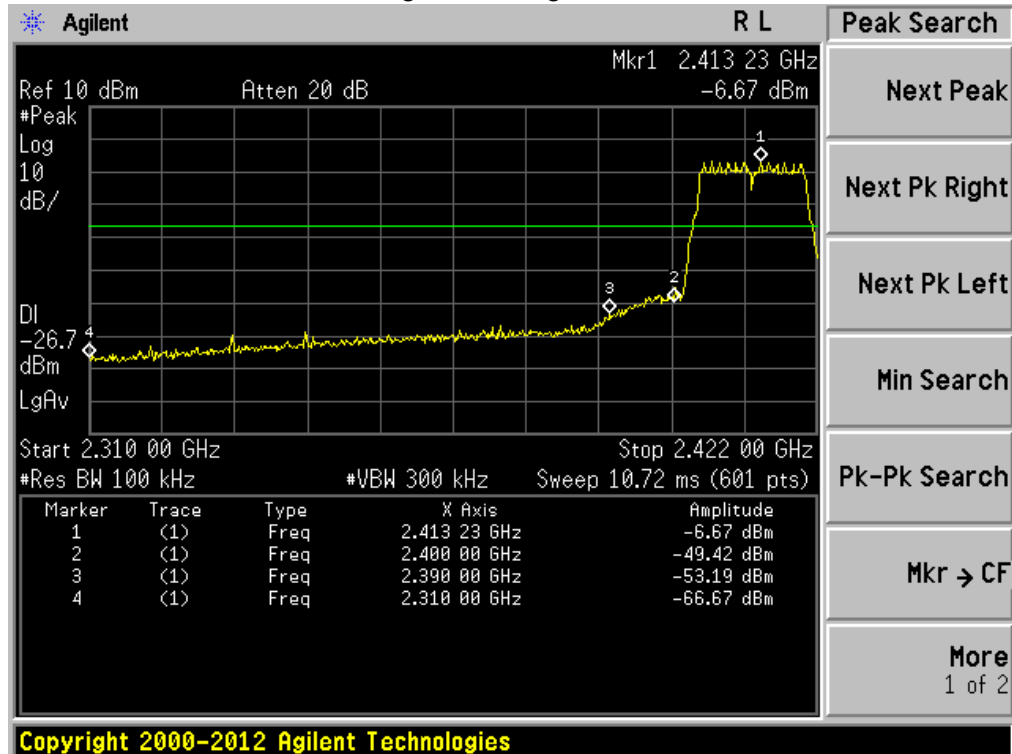


802.11b: Band Edge, Right Side

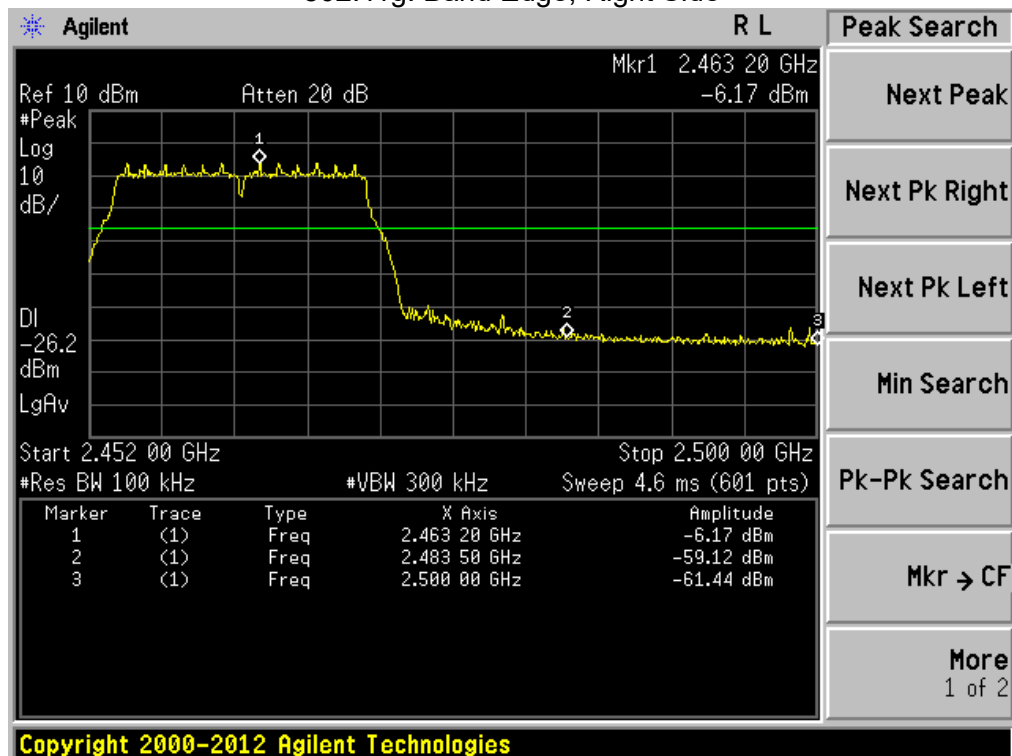




802.11g: Band Edge, Left Side

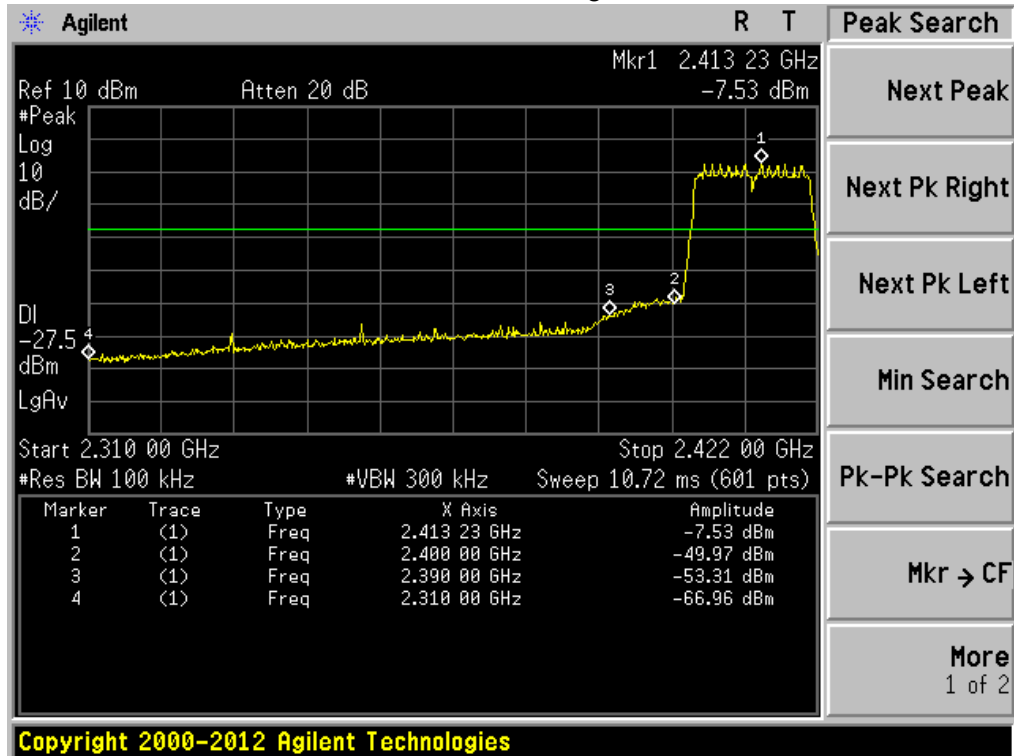


802.11g: Band Edge, Right Side

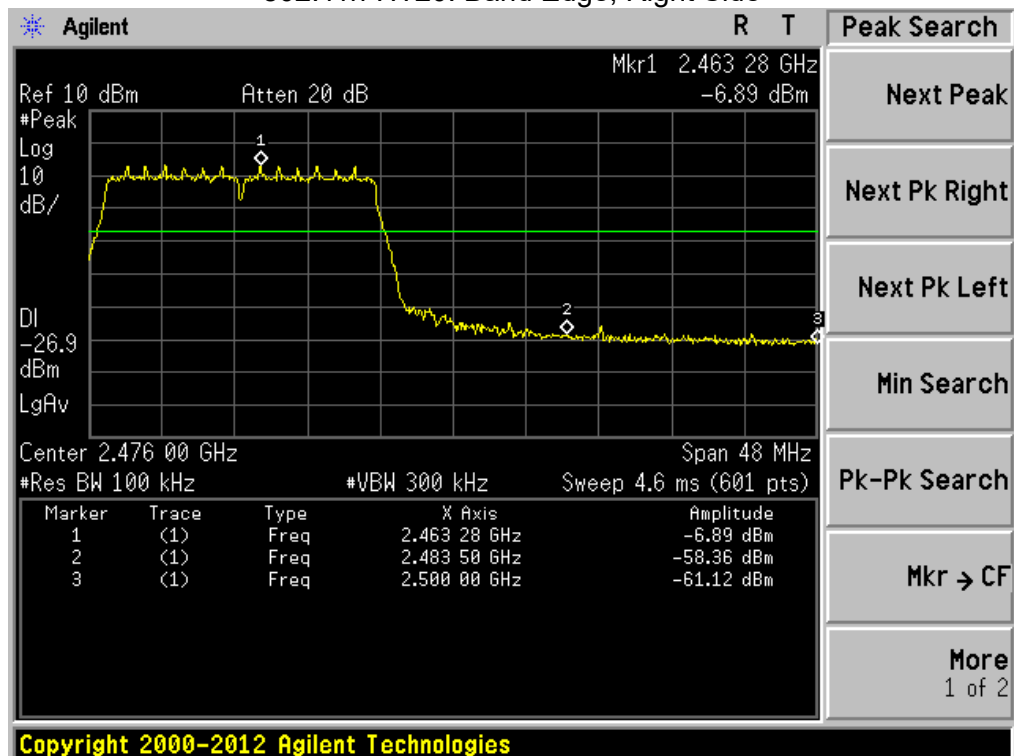




802.11n-HT20: Band Edge, Left Side

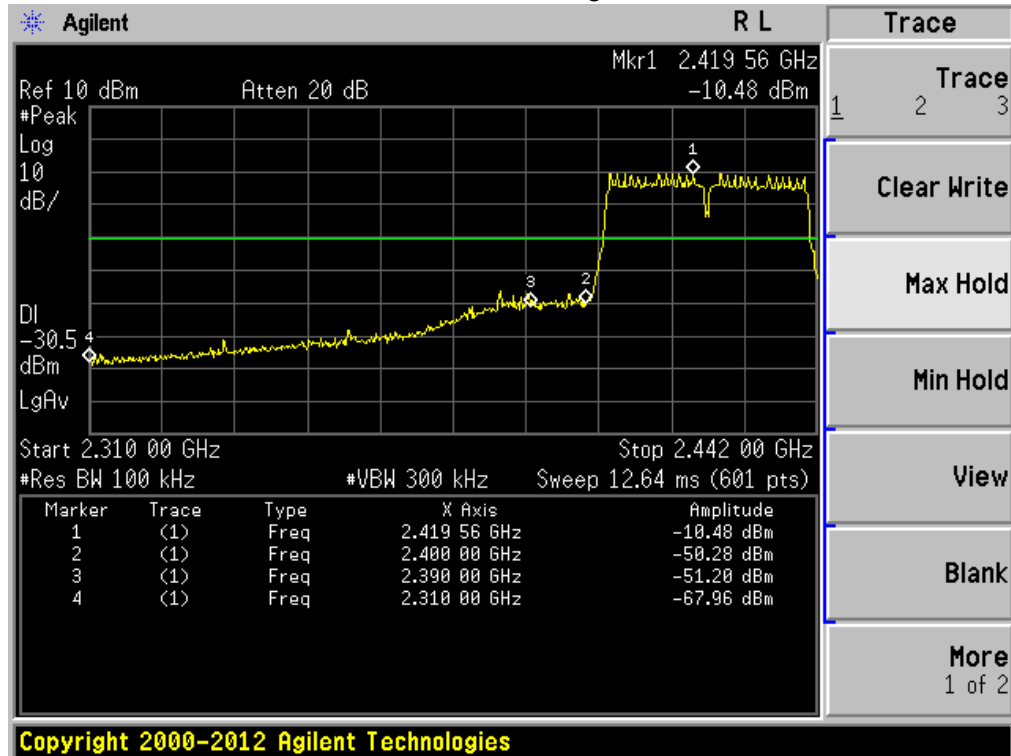


802.11n-HT20: Band Edge, Right Side

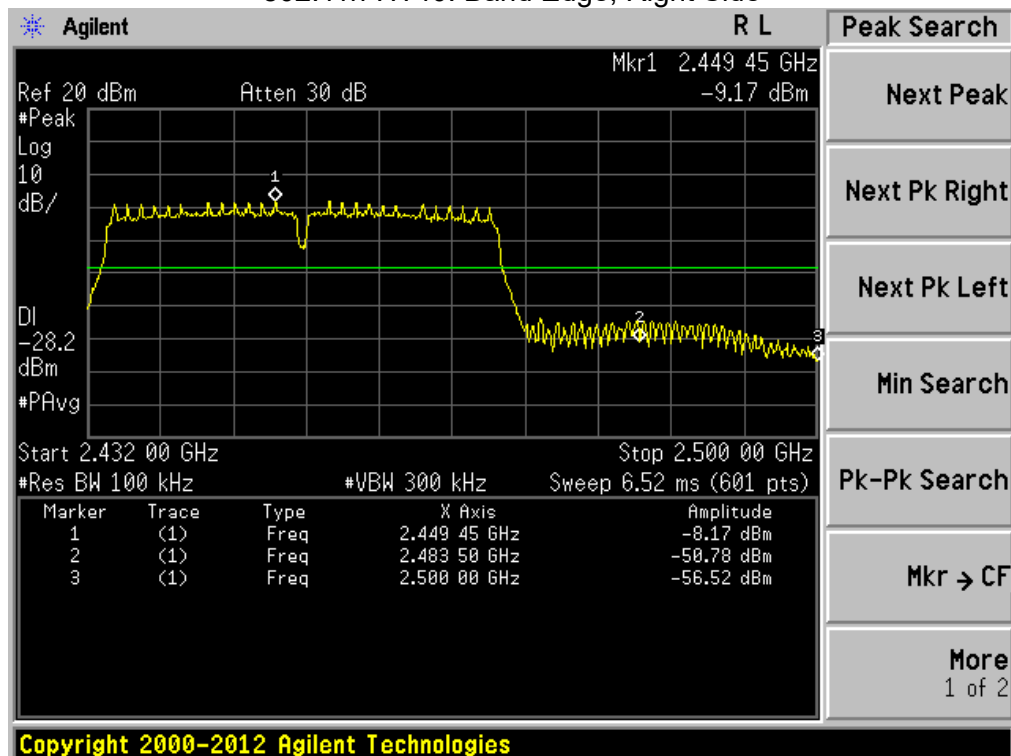




802.11n-HT40: Band Edge, Left Side



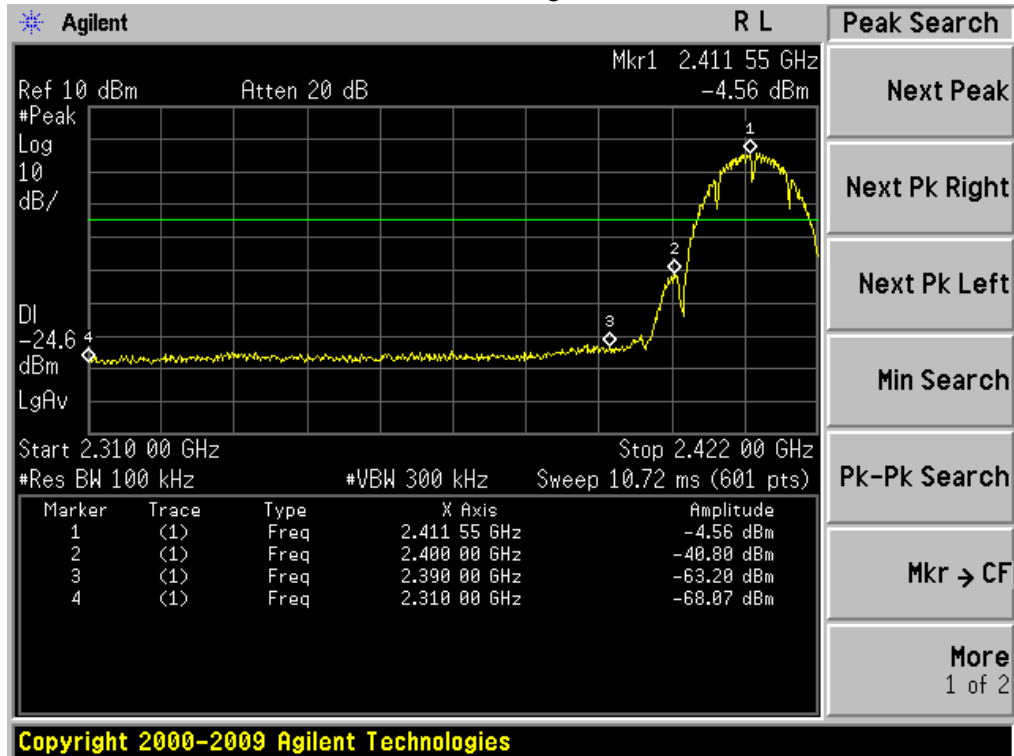
802.11n-HT40: Band Edge, Right Side



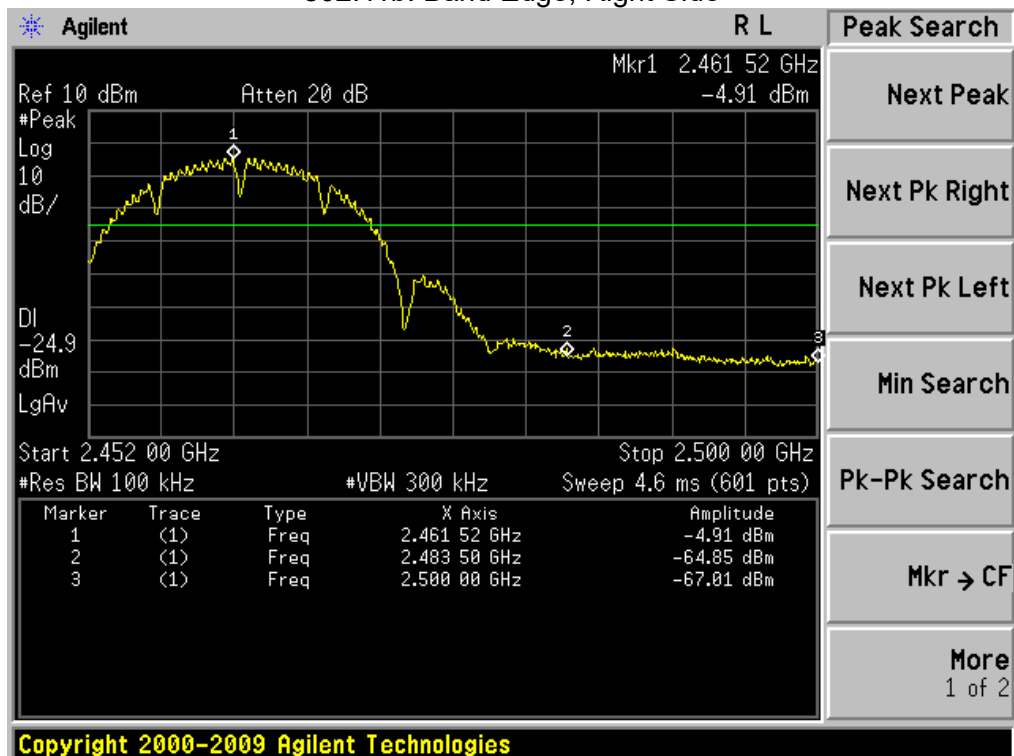


Ant.2

802.11b: Band Edge, Left Side

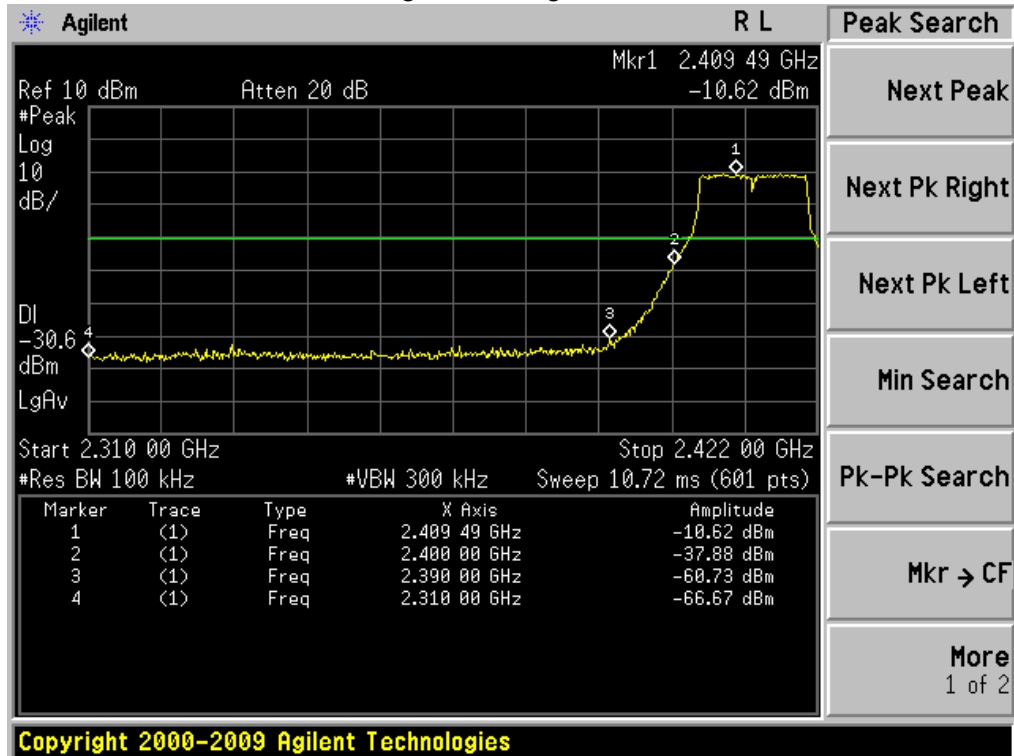


802.11b: Band Edge, Right Side

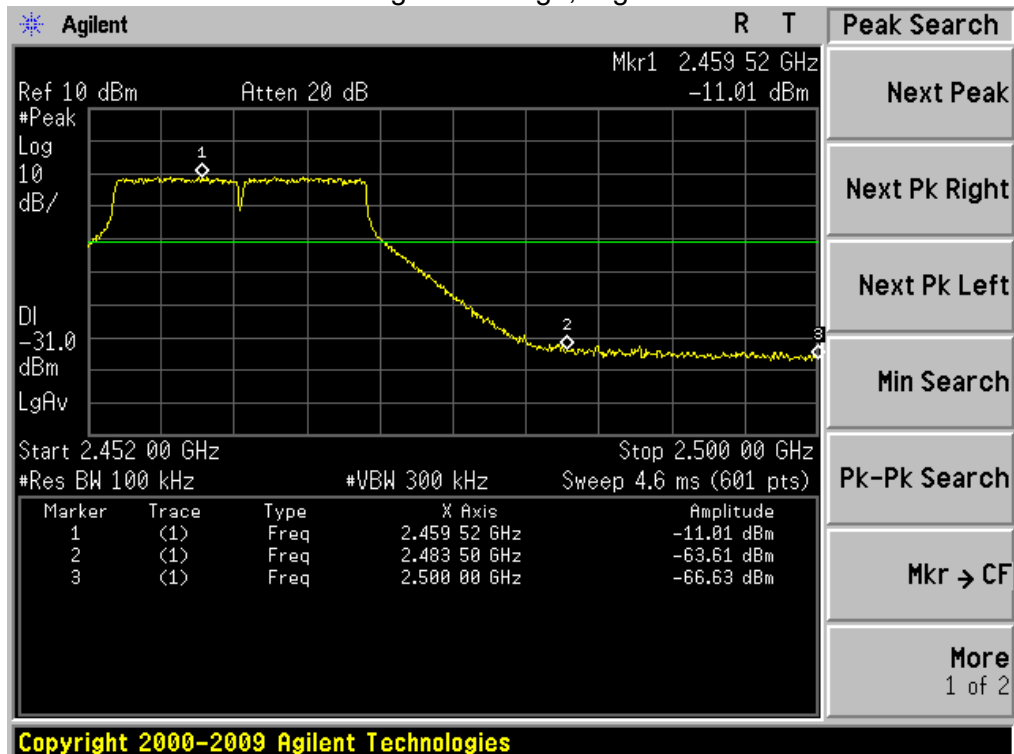




802.11g: Band Edge, Left Side

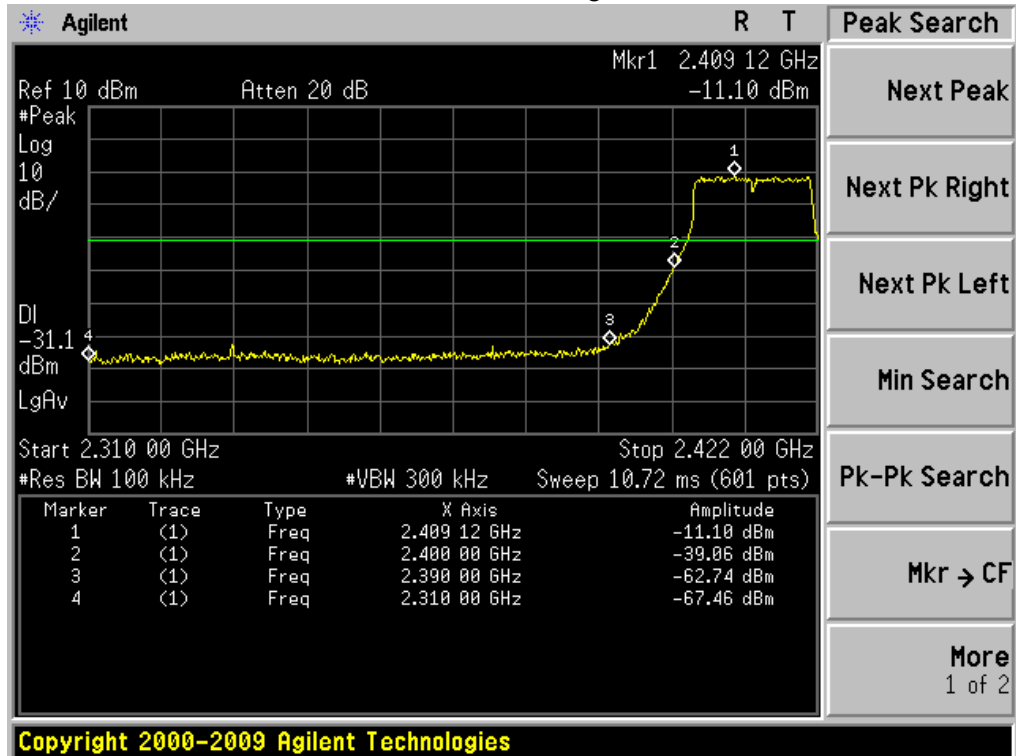


802.11g: Band Edge, Right Side

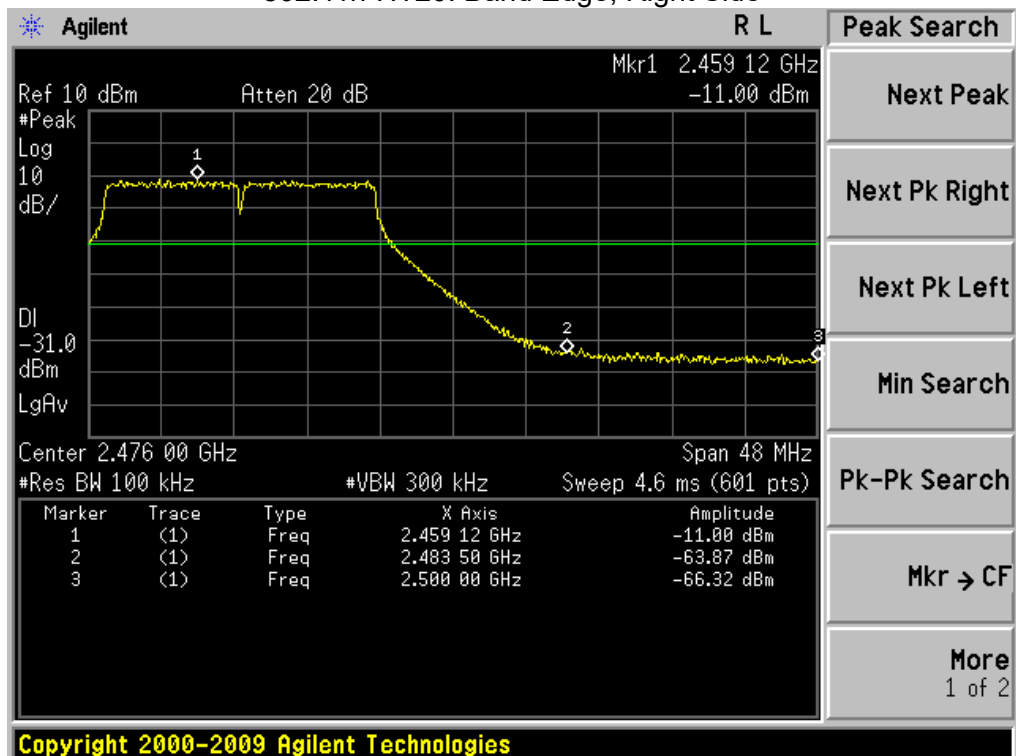




802.11n-HT20: Band Edge, Left Side

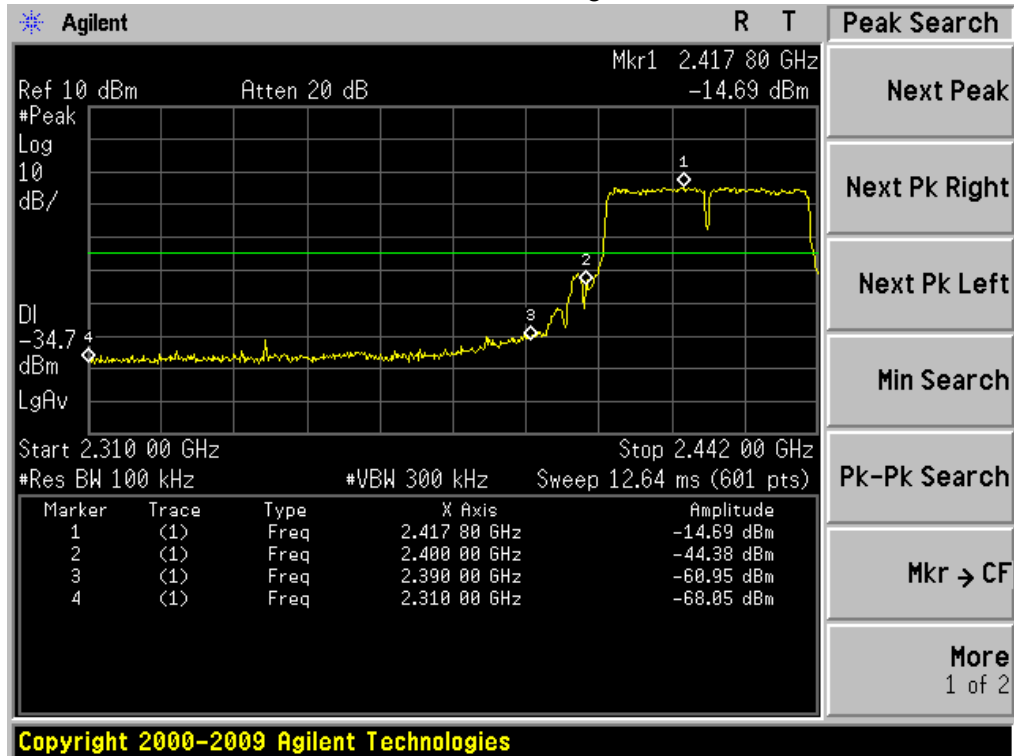


802.11n-HT20: Band Edge, Right Side





802.11n-HT40: Band Edge, Left Side



802.11n-HT40: Band Edge, Right Side





8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

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

8.2 EUT ANTENNA

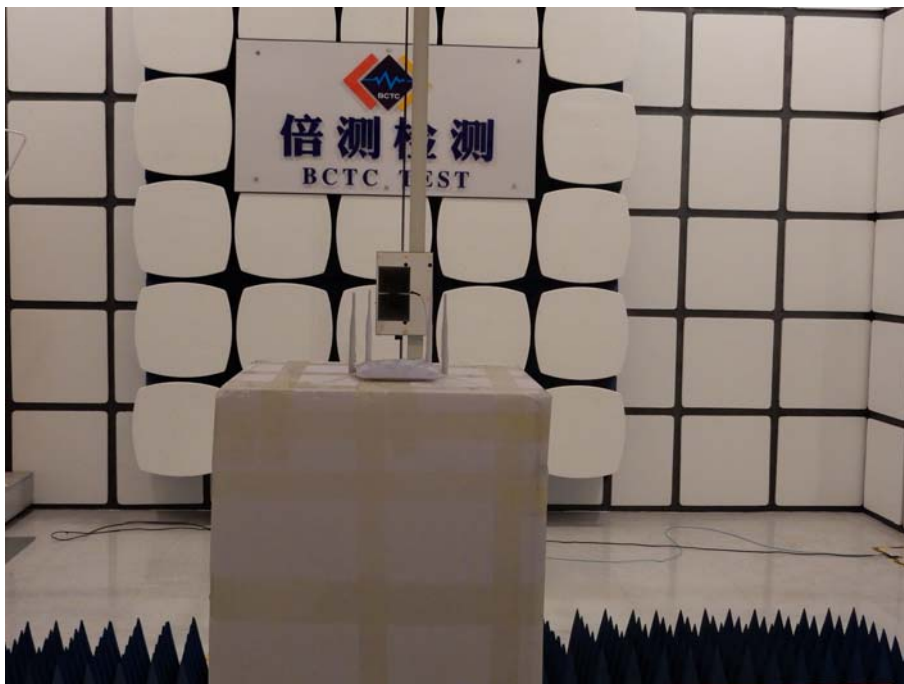
The EUT antenna is external antenna, use of permanent connection, It comply with the standard requirement.

9. EUT TEST PHOTO

Radiated Measurement Photos



Radiated Measurement Photos



Conducted Measurement Photos



10. EUT PHOTO







***** END OF REPORT *****