FCC Part 15C Test Report

FCC ID: YWTWF5572N4B

Product Name:	300Mbps Wifi Adapter
Trademark:	N/A
Model Name :	GWF-4B06
Prepared For : Address :	Shenzhen Ogemray Technology Co., Ltd. 3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Prepared By : Address :	Shenzhen BCTC Technology Co., Ltd. No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	Jul. 06– Jul. 13, 2016
Date of Report :	Jul. 13, 2016
Report No.:	BCTC-160608467E

TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen Ogemray Technology Co., Ltd.
Address	:	3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Manufacture's Name	:	Shenzhen Ogemray Technology Co., Ltd.
Address	:	3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Product description		
Product name	:	300Mbps Wifi Adapter
Model and/or type reference	:	GWF-4B06
Standards	:	FCC Part15.247 ANSI C63.10:2013 KDB 558074 D01 DTS Meas Guidance v03r03

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.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Testing Engineer	:	Eric Yang
Reviewer (Supervisor)	:	Jade Yang
Approved & Authorized Signer(Manager)	:	Carson Zhang

Table of Contents

Page

1 . SUMMARY OF TEST RESULTS 5

1.1 TEST FACILITY 6

1.2 MEASUREMENT UNCERTAINTY 6

2 . GENERAL INFORMATION 7

2.1 GENERAL DESCRIPTION OF EUT 7

2.2 DESCRIPTION OF TEST MODES 8

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 9

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) 9

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 10

3 . EMC EMISSION TEST 11

3.1 CONDUCTED EMISSION MEASUREMENT 11

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS 11

3.1.2 TEST PROCEDURE 11

3.1.3 DEVIATION FROM TEST STANDARD 11

3.1.4 TEST SETUP 12

3.1.5 EUT OPERATING CONDITIONS 12

3.1.6 TEST RESULTS 13

3.2 RADIATED EMISSION MEASUREMENT 15

3.2.1 RADIATED EMISSION LIMITS 15

3.2.2 TEST PROCEDURE 16

3.2.3 DEVIATION FROM TEST STANDARD 16

3.2.4 TEST SETUP 16

3.2.5 EUT OPERATING CONDITIONS 17

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ) 18

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ) 19

3.2.8 TEST RESULTS (1GHZ~25GHZ) 21

3.3 RADIATED BAND EMISSION MEASUREMENT 25

3.3.1 TEST REQUIREMENT: 25

3.3.2 TEST PROCEDURE 25

3.3.3 DEVIATION FROM TEST STANDARD 26

3.3.4 TEST SETUP 26

3.3.5 EUT OPERATING CONDITIONS 26

4 . POWER SPECTRAL DENSITY TEST 31

Table of Contents

Page

4.1 APPLIED PROCEDURES / LIMIT 31
4.1.1 TEST PROCEDURE 31
4.1.2 DEVIATION FROM STANDARD 31
4.1.3 TEST SETUP 31
4.1.4 EUT OPERATION CONDITIONS 31
4.1.5 TEST RESULTS 32

5 . BANDWIDTH TEST 48
5.1 APPLIED PROCEDURES / LIMIT 48
5.1.1 TEST PROCEDURE 48
5.1.2 DEVIATION FROM STANDARD 48
5.1.3 TEST SETUP 48
5.1.4 EUT OPERATION CONDITIONS 48
5.1.5 TEST RESULTS 49

6 . PEAK OUTPUT POWER TEST 65
6.1 APPLIED PROCEDURES / LIMIT 65
6.1.1 TEST PROCEDURE 65
6.1.2 DEVIATION FROM STANDARD 65
6.1.3 TEST SETUP 65
6.1.4 EUT OPERATION CONDITIONS 65
6.1.5 TEST RESULTS 66

7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE 67
7.1 APPLICABLE STANDARD 67
7.2 TEST PROCEDURE 67
7.3 DEVIATION FROM STANDARD 67
7.4 TEST SETUP 67
7.5 EUT OPERATION CONDITIONS 68
7.1 TEST RESULTS 68

8 . ANTENNA REQUIREMENT 77
8.1 STANDARD REQUIREMENT 77
8.2 EUT ANTENNA 77

9 . EUT TEST PHOTO 78

10 . EUT PHOTO 80

APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

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 ± 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	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	300Mbps Wifi Adapter
Trade Name	N/A
Model Name	GWF-4B06
Model Difference	N/A
Product Description	The EUT is a 300Mbps Wifi Adapter 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.
Power	DC 5V
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	PCB Antenna	N/A	2.0	
2	N/A	N/A	PCB Antenna	N/A	2.0	

Note1: Directional Gain=2dBi+10log(2)=5.01dBi

Note2: The EUT incorporates a mimo funtion. Physically, the EUT provide two completed transmitter and two receivers.

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

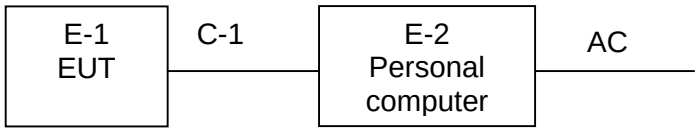
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9

Note:

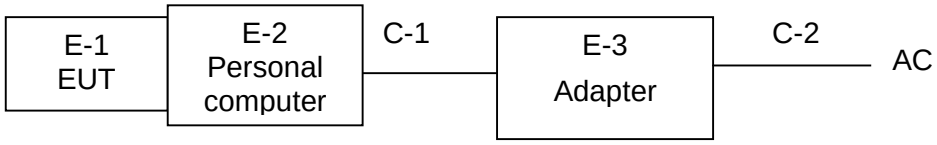
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

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	300Mbps Wifi Adapter	N/A	GWF-4B06	N/A	EUT
E-2	Personal computer	N/A	X550C	N/A	N/A
E-3	Adapter	N/A	AD887520	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.5M	DC cable unshielded
C-2	NO	NO	0.2M	AC cable 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	2016.07.06	2017.07.05
5	Spectrum Analyzer	Agilent	N9020A	MY5051041	2016.07.06	2017.07.05
6	Horn Antenna	SCHWARZBECK	9120D	9120D-1275	2015.08.25	2016.08.24
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05
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	PLGWF-4B 0630/B	1029	2016.07.06	2017.07.05
11	Power Meter	R&S	NRVS	100696	2016.07.06	2017.07.05
12	Power Sensor	R&S	NRV-Z55	161905	2016.07.06	2017.07.05
13	RF cables	R&S	N/A	N/A	2016.07.06	2017.07.05

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	2016.06.06	2017.06.05
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	2016.06.07	2017.06.06
5	RF cables	R&S	R204	R20X	2016.07.06	2017.07.05

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.

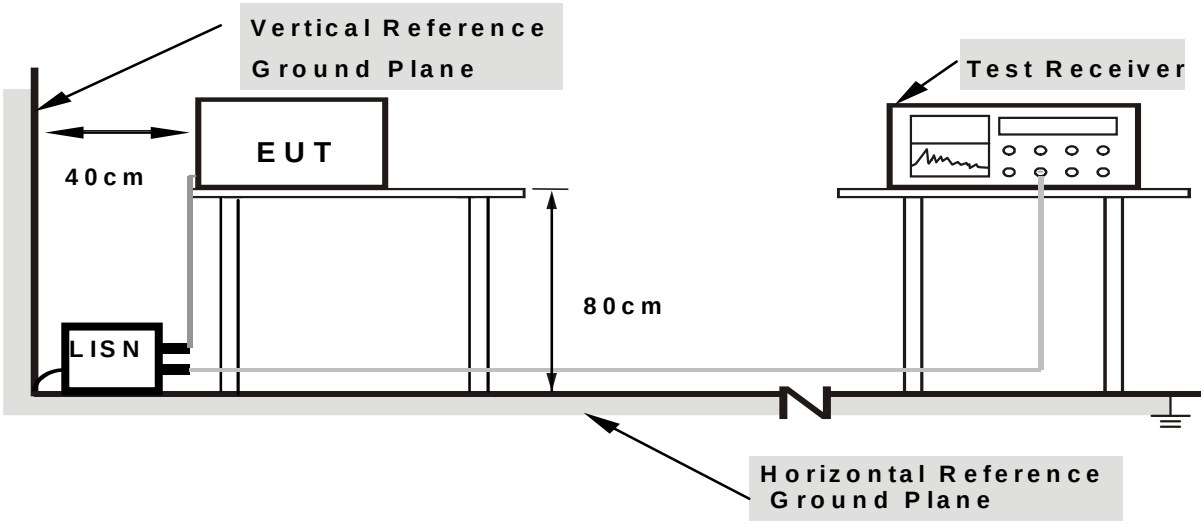
d. LISN at least 80 cm from nearest part of EUT chassis.

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 from other units and other metal planes

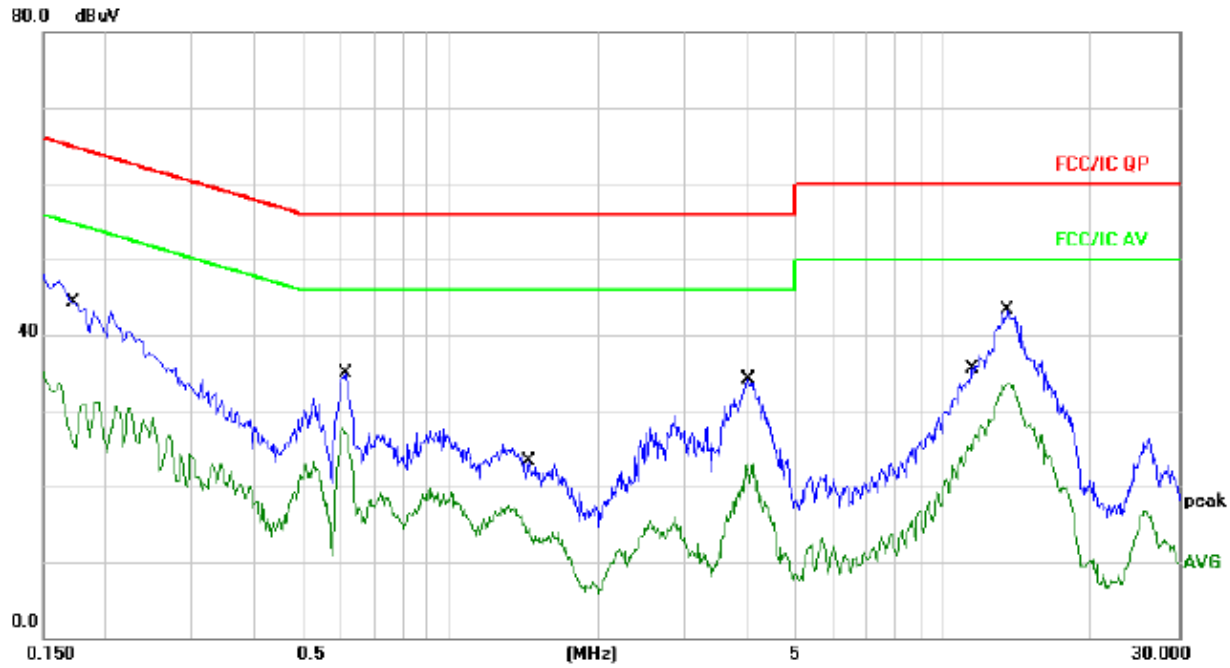
3.1.5 EUT OPERATING CONDITIONS

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

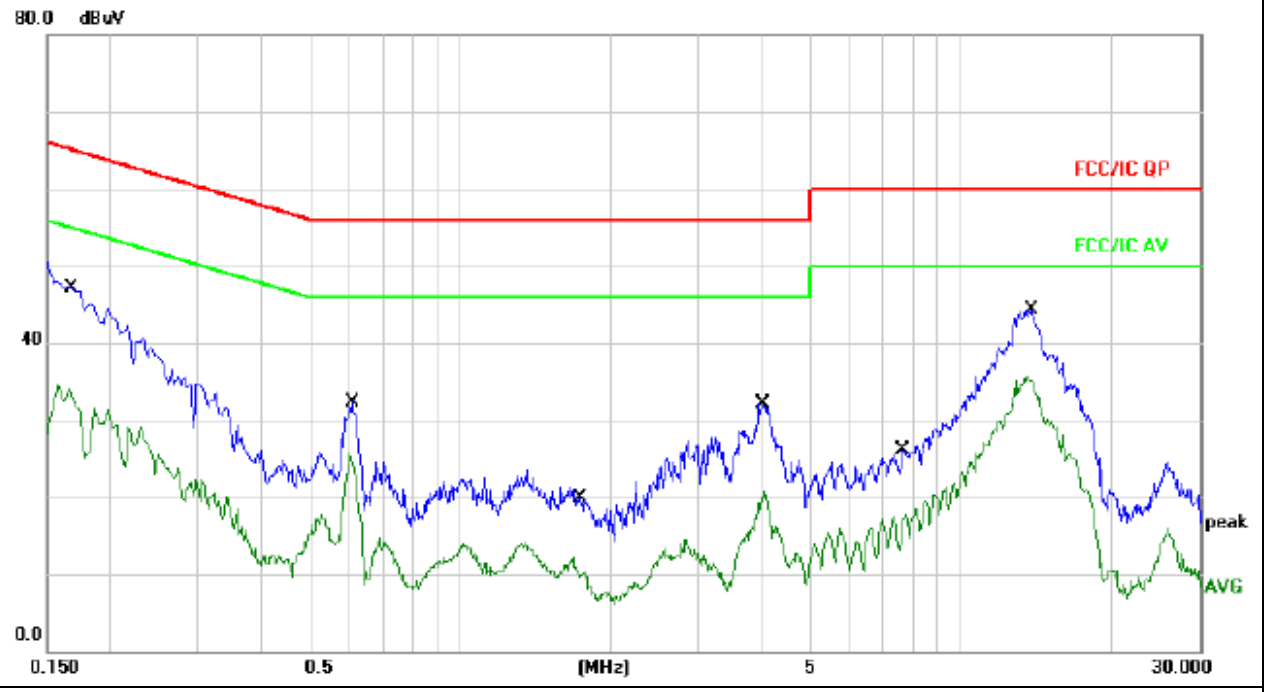
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from PC	Test Mode：	Mode 5



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		0.1749	33.87	10.06	43.93	64.72	-20.79	QP	
2		0.1749	21.00	10.06	31.06	54.72	-23.66	AVG	
3		0.6140	24.82	10.13	34.95	56.00	-21.05	QP	
4		0.6140	8.98	10.13	19.11	46.00	-26.89	AVG	
5		1.4460	13.18	10.17	23.35	56.00	-32.65	QP	
6		1.4460	3.77	10.17	13.94	46.00	-32.06	AVG	
7		4.0380	24.00	10.16	34.16	56.00	-21.84	QP	
8		4.0380	7.99	10.16	18.15	46.00	-27.85	AVG	
9		11.4980	25.47	10.13	35.60	60.00	-24.40	QP	
10		11.4980	16.04	10.13	26.17	50.00	-23.83	AVG	
11	*	13.5140	33.17	10.14	43.31	60.00	-16.69	QP	
12		13.5140	21.77	10.14	31.91	50.00	-18.09	AVG	

Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from PC	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		0.1700	36.75	10.06	46.81	64.96	-18.15	QP	
2		0.1700	22.30	10.06	32.36	54.96	-22.60	AVG	
3		0.6100	22.20	10.13	32.33	56.00	-23.67	QP	
4		0.6100	13.89	10.13	24.02	46.00	-21.98	AVG	
5		1.7420	9.72	10.18	19.90	56.00	-36.10	QP	
6		1.7420	-0.25	10.18	9.93	46.00	-36.07	AVG	
7		4.0220	21.95	10.16	32.11	56.00	-23.89	QP	
8		4.0220	4.31	10.16	14.47	46.00	-31.53	AVG	
9		7.6700	16.10	10.10	26.20	60.00	-33.80	QP	
10		7.6700	8.50	10.10	18.60	50.00	-31.40	AVG	
11	*	13.8460	34.19	10.14	44.33	60.00	-15.67	QP	
12		13.8460	20.86	10.14	31.00	50.00	-19.00	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:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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 (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.
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.

Above 1GHz test procedure as below:

g. 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).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

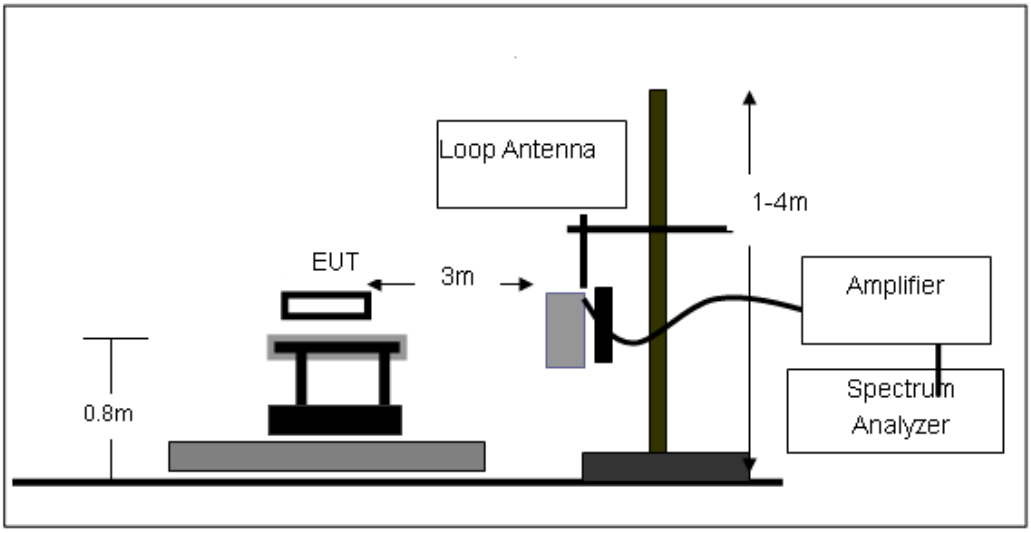
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in t he report.

3.2.3 DEVIATION FROM TEST STANDARD

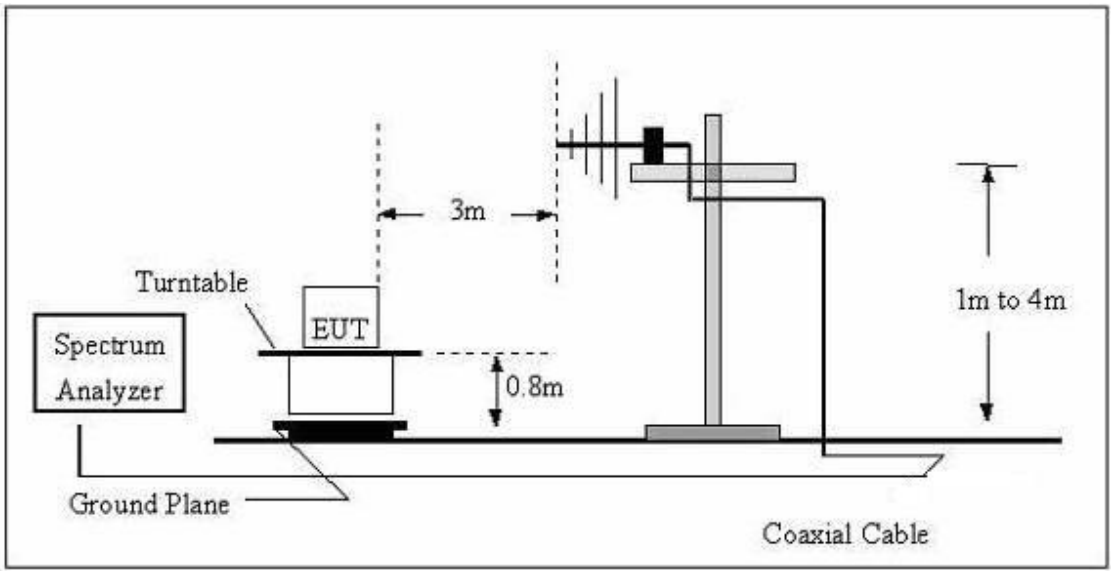
No deviation

3.2.4 TEST SETUP

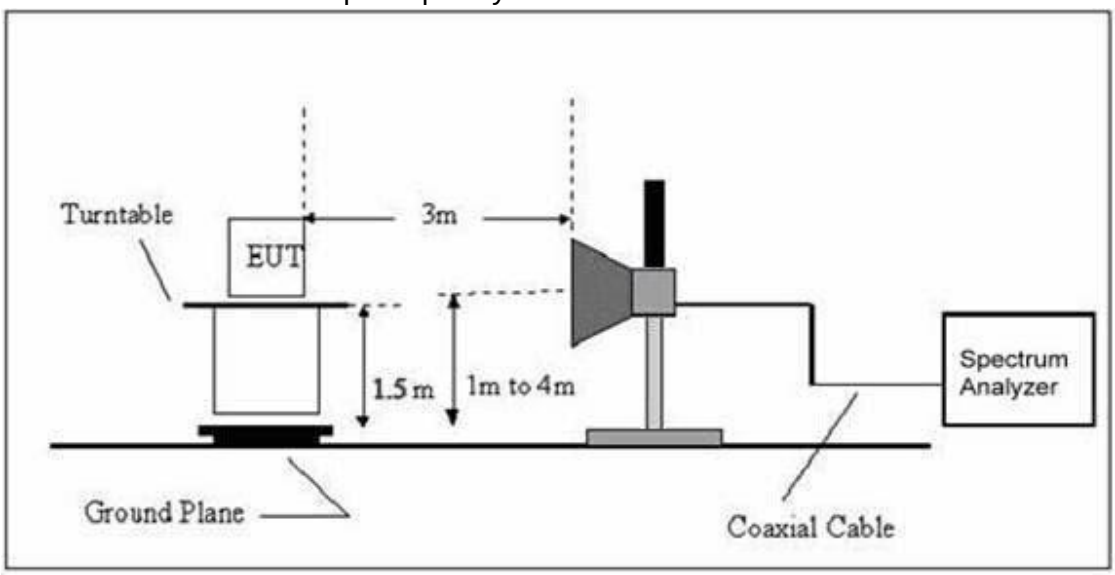
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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 Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V from PC
Test Mode ：	Mode 5	Polarization :	--

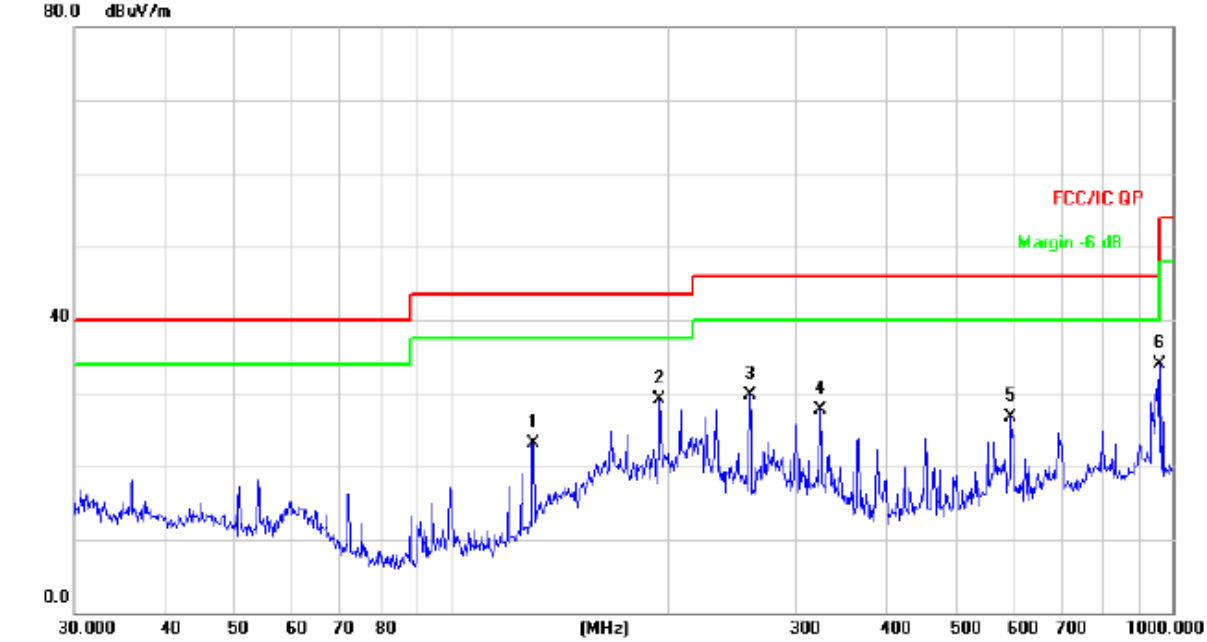
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

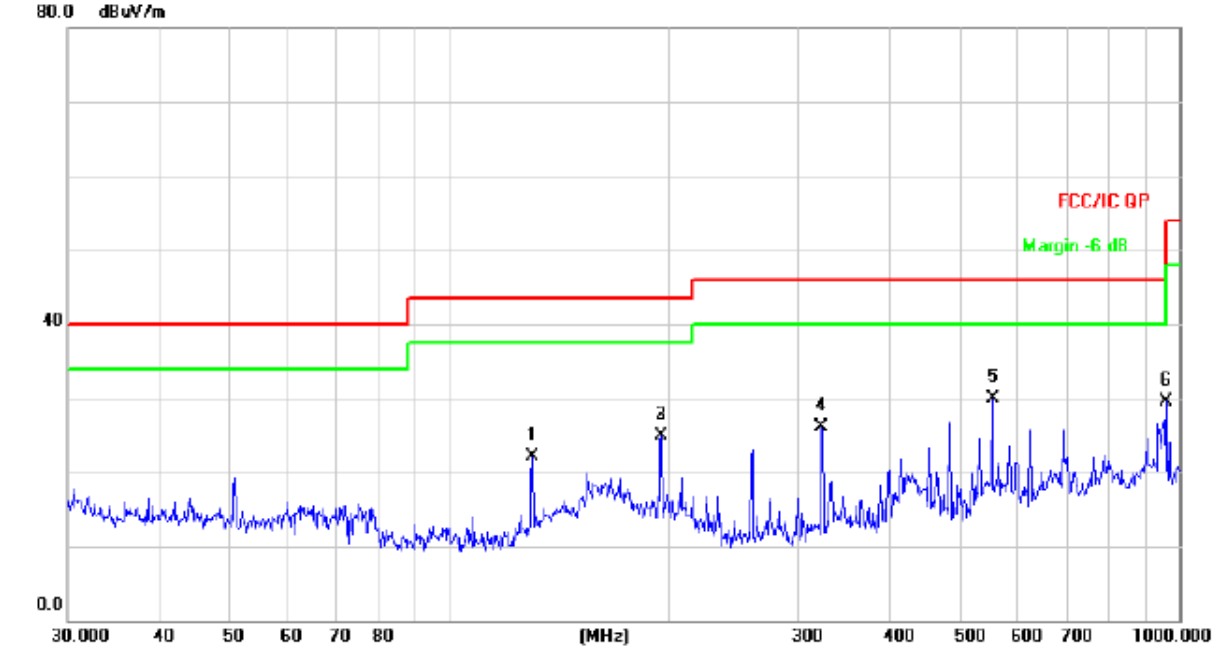
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 5V from PC		
Test Mode :	Mode 5		



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	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.9226	37.25	-14.11	23.14	43.50	-20.36	QP			
2	*	194.4534	44.88	-15.86	29.02	43.50	-14.48	QP			
3		259.2338	43.67	-13.94	29.73	46.00	-16.27	QP			
4		324.4561	39.74	-11.95	27.79	46.00	-18.21	QP			
5		597.2234	32.44	-5.77	26.67	46.00	-19.33	QP			
6		962.1623	34.39	-0.42	33.97	54.00	-20.03	QP			

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 5V from PC		
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	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.9226	36.13	-14.11	22.02	43.50	-21.48	QP			
2		195.1365	40.82	-15.90	24.92	43.50	-18.58	QP			
3		195.1365	40.82	-15.90	24.92	43.50	-18.58	QP			
4		323.3204	38.04	-11.98	26.06	46.00	-19.94	QP			
5	*	554.8254	36.78	-6.96	29.82	46.00	-16.18	QP			
6		962.1623	29.86	-0.42	29.44	54.00	-24.56	QP			

3.2.8 TEST RESULTS (1GHZ~25GHZ)

802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2412							
V	4824.00	66.01	39.55	7.85	25.66	59.97	74	-14.03	PK
V	4824.00	49.47	39.55	7.85	25.66	43.43	54	-10.57	AV
V	7236.00	66.25	38.33	7.52	24.55	59.99	74	-14.01	PK
V	7236.00	47.55	38.33	7.52	24.55	41.29	54	-12.71	AV
V	15450.00	50.83	35.23	6.75	26.59	48.94	74	-25.06	PK
H	4824.00	63.05	39.55	7.85	25.66	57.01	74	-16.99	PK
H	4824.00	49.28	39.55	7.85	25.66	43.24	54	-10.76	AV
H	7236.00	69.01	38.33	7.52	23.55	61.75	74	-12.25	PK
H	7236.00	50.81	38.33	7.52	23.22	43.22	54	-10.78	AV
H	15450.00	45.69	35.45	6.75	27.88	44.87	74	-29.13	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	65.56	38.89	7.57	25.45	59.69	74	-14.31	PK
V	4874.00	48.65	38.89	7.57	25.45	42.78	54	-11.22	AV
V	7311.00	66.68	38.78	7.35	24.78	60.03	74	-13.97	PK
V	7311.00	48.25	38.78	7.35	24.78	41.60	54	-12.40	AV
V	15450.00	52.36	35.89	6.42	26.47	49.36	74	-24.64	PK
H	4874.00	64.89	38.89	7.57	25.45	59.02	74	-14.98	PK
H	4874.00	49.55	38.89	7.57	25.45	43.68	54	-10.32	AV
H	7311.00	70.35	38.78	7.35	24.78	63.70	74	-10.30	PK
H	7311.00	48.81	38.78	7.35	24.78	42.16	54	-11.84	AV
H	15450.00	48.69	36.68	6.45	26.65	45.11	74	-28.89	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2462							
V	4924.00	67.56	38.75	7.46	25.45	61.72	74	-12.28	PK
V	4924.00	48.65	38.75	7.46	25.45	42.81	54	-11.19	AV
V	7386.00	68.68	38.65	7.22	24.78	62.03	74	-11.97	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.36	35.58	6.35	26.47	50.60	74	-23.40	PK
H	4924.00	66.89	38.75	7.46	25.45	61.05	74	-12.95	PK
H	4924.00	50.59	38.75	7.46	25.45	44.75	54	-9.25	AV
H	7386.00	69.35	38.65	7.22	24.78	62.70	74	-11.30	PK
H	7386.00	48.56	38.65	7.22	24.78	41.91	54	-12.09	AV
H	15450.00	49.69	36.42	6.32	26.65	46.24	74	-27.76	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   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 (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2412							
V	4824.00	66.23	39.55	7.85	25.66	60.19	74	-13.81	PK
V	4824.00	49.58	39.55	7.85	25.66	43.54	54	-10.46	AV
V	7236.00	66.39	38.33	7.52	24.55	60.13	74	-13.87	PK
V	7236.00	47.67	38.33	7.52	24.55	41.41	54	-12.59	AV
V	15450.00	50.95	35.23	6.75	26.59	49.06	74	-24.94	PK
H	4824.00	63.25	39.55	7.85	25.66	57.21	74	-16.79	PK
H	4824.00	49.49	39.55	7.85	25.66	43.45	54	-10.55	AV
H	7236.00	69.35	38.33	7.52	23.55	62.09	74	-11.91	PK
H	7236.00	50.47	38.33	7.52	23.22	42.88	54	-11.12	AV
H	15450.00	45.78	35.45	6.75	27.88	44.96	74	-29.04	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
V	4874.00	48.96	38.89	7.57	25.45	43.09	54	-10.91	AV
V	7311.00	66.45	38.78	7.35	24.78	59.80	74	-14.20	PK
V	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
V	15450.00	52.59	35.89	6.42	26.47	49.59	74	-24.41	PK
H	4874.00	64.23	38.89	7.57	25.45	58.36	74	-15.64	PK
H	4874.00	49.75	38.89	7.57	25.45	43.88	54	-10.12	AV
H	7311.00	70.89	38.78	7.35	24.78	64.24	74	-9.76	PK
H	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
H	15450.00	48.75	36.68	6.45	26.65	45.17	74	-28.83	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2462							
V	4924.00	67.89	38.75	7.46	25.45	62.05	74	-11.95	PK
V	4924.00	48.45	38.75	7.46	25.45	42.61	54	-11.39	AV
V	7386.00	68.57	38.65	7.22	24.78	61.92	74	-12.08	PK
V	7386.00	49.78	38.65	7.22	24.78	43.13	54	-10.87	AV
V	15450.00	53.66	35.58	6.35	26.47	50.90	74	-23.10	PK
H	4924.00	66.55	38.75	7.46	25.45	60.71	74	-13.29	PK
H	4924.00	50.44	38.75	7.46	25.45	44.60	54	-9.40	AV
H	7386.00	69.37	38.65	7.22	24.78	62.72	74	-11.28	PK
H	7386.00	48.88	38.65	7.22	24.78	42.23	54	-11.77	AV
H	15450.00	49.74	36.42	6.32	26.65	46.29	74	-27.71	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   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	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2412							
V	4824.00	67.22	39.55	7.85	25.66	61.18	74	-12.82	PK
V	4824.00	48.88	39.55	7.85	25.66	42.84	54	-11.16	AV
V	7236.00	66.95	38.33	7.52	24.55	60.69	74	-13.31	PK
V	7236.00	48.56	38.33	7.52	24.55	42.30	54	-11.70	AV
V	15450.00	51.45	35.23	6.75	26.59	49.56	74	-24.44	PK
H	4824.00	68.25	39.55	7.85	25.66	62.21	74	-11.79	PK
H	4824.00	49.44	39.55	7.85	25.66	43.40	54	-10.60	AV
H	7236.00	69.31	38.33	7.52	23.55	62.05	74	-11.95	PK
H	7236.00	52.41	38.33	7.52	23.22	44.82	54	-9.18	AV
H	15450.00	47.32	35.45	6.75	27.88	46.50	74	-27.50	PK

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2437							
V	4874.00	66.94	38.89	7.57	25.45	61.07	74	-12.93	PK
V	4874.00	49.56	38.89	7.57	25.45	43.69	54	-10.31	AV
V	7311.00	67.25	38.78	7.35	24.78	60.60	74	-13.40	PK
V	7311.00	47.55	38.78	7.35	24.78	40.90	54	-13.10	AV
V	15450.00	52.11	35.89	6.42	26.47	49.11	74	-24.89	PK
H	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
H	4874.00	49.71	38.89	7.57	25.45	43.84	54	-10.16	AV
H	7311.00	69.56	38.78	7.35	24.78	62.91	74	-11.09	PK
H	7311.00	48.77	38.78	7.35	24.78	42.12	54	-11.88	AV
H	15450.00	49.25	36.68	6.45	26.65	45.67	74	-28.33	PK

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2462							
V	4924.00	68.25	38.75	7.46	25.45	62.41	74	-11.59	PK
V	4924.00	50.78	38.75	7.46	25.45	44.94	54	-9.06	AV
V	7386.00	67.56	38.65	7.22	24.78	60.91	74	-13.09	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.22	35.58	6.35	26.47	50.46	74	-23.54	PK
H	4924.00	66.11	38.75	7.46	25.45	60.27	74	-13.73	PK
H	4924.00	50.35	38.75	7.46	25.45	44.51	54	-9.49	AV
H	7386.00	69.78	38.65	7.22	24.78	63.13	74	-10.87	PK
H	7386.00	48.96	38.65	7.22	24.78	42.31	54	-11.69	AV
H	15450.00	50.47	36.42	6.32	26.65	47.02	74	-26.98	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
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 (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2422							
V	4844.000	68.11	39.55	7.77	25.66	61.99	74	-12.01	PK
V	4844.000	48.44	39.55	7.77	25.66	42.32	54	-11.68	AV
V	7266.000	67.25	38.33	7.30	24.55	60.77	74	-13.23	PK
V	7266.000	48.86	38.33	7.30	24.55	42.38	54	-11.62	AV
V	15450.00	51.75	35.23	6.60	26.59	49.71	74	-24.29	PK
H	4844.000	68.78	39.55	7.77	25.66	62.66	74	-11.34	PK
H	4844.000	49.98	39.55	7.77	25.66	43.86	54	-10.14	AV
H	7266.000	69.74	38.33	7.30	23.55	62.26	74	-11.74	PK
H	7266.000	52.62	38.33	7.30	23.22	44.81	54	-9.19	AV
H	15450.00	48.58	35.45	6.60	27.88	47.61	74	-26.39	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	66.74	38.89	7.57	25.45	60.87	74	-13.13	PK
V	4874.00	49.35	38.89	7.57	25.45	43.48	54	-10.52	AV
V	7311.00	67.35	38.78	7.35	24.78	60.70	74	-13.30	PK
V	7311.00	47.57	38.78	7.35	24.78	40.92	54	-13.08	AV
V	15450.00	52.48	35.89	6.42	26.47	49.48	74	-24.52	PK
H	4874.00	65.68	38.89	7.57	25.45	59.81	74	-14.19	PK
H	4874.00	49.25	38.89	7.57	25.45	43.38	54	-10.62	AV
H	7311.00	69.23	38.78	7.35	24.78	62.58	74	-11.42	PK
H	7311.00	48.71	38.78	7.35	24.78	42.06	54	-11.94	AV
H	15450.00	49.63	36.68	6.42	26.65	46.02	74	-27.98	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2452							
V	4904.00	68.66	38.75	7.38	25.45	62.74	74	-11.26	PK
V	4904.00	50.85	38.75	7.38	25.45	44.93	54	-9.07	AV
V	7356.00	67.32	38.65	7.15	24.78	60.60	74	-13.40	PK
V	7356.00	49.47	38.65	7.15	24.78	42.75	54	-11.25	AV
V	15450.00	53.69	35.58	6.25	26.47	50.83	74	-23.17	PK
H	4904.00	66.36	38.75	7.38	25.45	60.44	74	-13.56	PK
H	4904.00	50.47	38.75	7.38	25.45	44.55	54	-9.45	AV
H	7356.00	69.69	38.65	7.15	24.78	62.97	74	-11.03	PK
H	7356.00	48.75	38.65	7.15	24.78	42.03	54	-11.97	AV
H	15450.00	50.25	36.42	6.25	26.65	46.73	74	-27.27	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
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.

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:

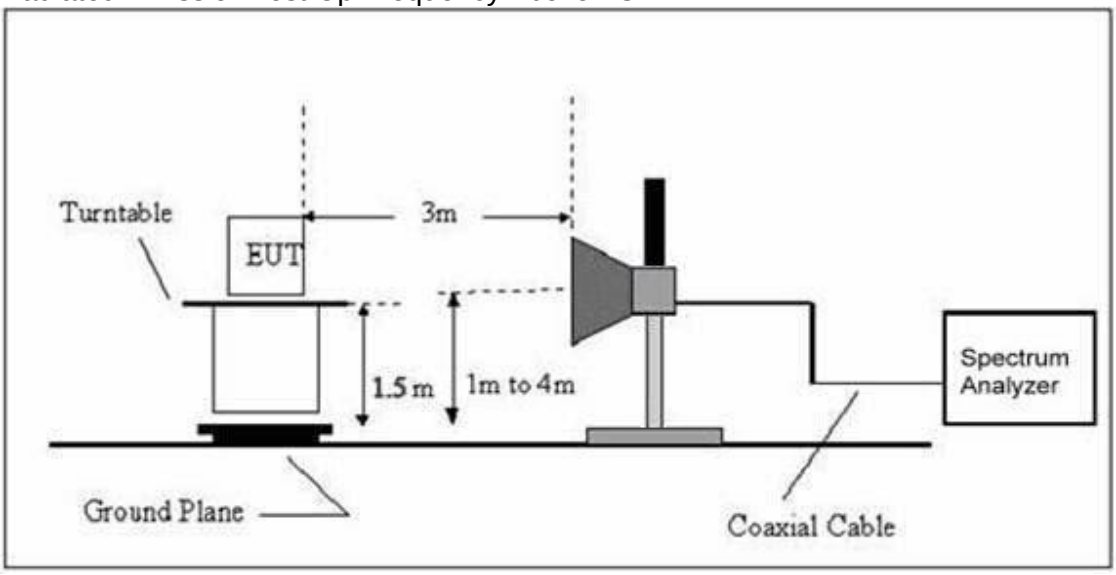
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

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 (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	38.05	13.83	51.88	74.00	-22.12	PK
V	2390.00	26.43	13.83	40.26	54.00	-13.74	AV
V	2400.00	38.26	13.85	52.11	74.00	-21.89	PK
V	2400.00	25.99	13.85	39.84	54.00	-14.16	AV
H	2390.00	38.35	13.83	52.18	74.00	-21.82	PK
H	2390.00	26.46	13.83	40.29	54.00	-13.71	AV
V	2400.00	38.21	13.85	52.06	74.00	-21.94	PK
V	2400.00	26.40	13.85	40.25	54.00	-13.75	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	38.26	14.02	52.28	74.00	-21.72	PK
V	2483.50	26.68	14.02	40.70	54.00	-13.30	AV
V	2500.00	38.20	14.06	52.26	74.00	-21.74	PK
V	2500.00	26.10	14.06	40.16	54.00	-13.84	AV
H	2483.50	38.39	14.02	52.41	74.00	-21.59	PK
H	2483.50	26.72	14.02	40.74	54.00	-13.26	AV
H	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
H	2500.00	26.98	14.06	41.04	54.00	-12.96	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	37.74	13.83	51.57	74.00	-22.43	PK
V	2390.00	26.21	13.83	40.04	54.00	-13.96	AV
V	2400.00	37.95	13.85	51.80	74.00	-22.20	PK
V	2400.00	25.79	13.85	39.64	54.00	-14.36	AV
H	2390.00	38.04	13.83	51.87	74.00	-22.13	PK
H	2390.00	26.24	13.83	40.07	54.00	-13.93	AV
V	2400.00	37.90	13.85	51.75	74.00	-22.25	PK
V	2400.00	26.18	13.85	40.03	54.00	-13.97	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	37.95	14.02	51.97	74.00	-22.03	PK
V	2483.50	26.46	14.02	40.48	54.00	-13.52	AV
V	2500.00	37.89	14.06	51.95	74.00	-22.05	PK
V	2500.00	25.89	14.06	39.95	54.00	-14.05	AV
H	2483.50	38.08	14.02	52.10	74.00	-21.90	PK
H	2483.50	26.50	14.02	40.52	54.00	-13.48	AV
H	2500.00	37.69	14.06	51.75	74.00	-22.25	PK
H	2500.00	26.76	14.06	40.82	54.00	-13.18	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	37.85	13.83	51.68	74.00	-22.32	PK
V	2390.00	26.29	13.83	40.12	54.00	-13.88	AV
V	2400.00	38.06	13.85	51.91	74.00	-22.09	PK
V	2400.00	25.86	13.85	39.71	54.00	-14.29	AV
H	2390.00	38.15	13.83	51.98	74.00	-22.02	PK
H	2390.00	26.32	13.83	40.15	54.00	-13.85	AV
V	2400.00	38.01	13.85	51.86	74.00	-22.14	PK
V	2400.00	26.26	13.85	40.11	54.00	-13.89	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	38.06	14.02	52.08	74.00	-21.92	PK
V	2483.50	26.54	14.02	40.56	54.00	-13.44	AV
V	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
V	2500.00	25.96	14.06	40.02	54.00	-13.98	AV
H	2483.50	38.19	14.02	52.21	74.00	-21.79	PK
H	2483.50	26.58	14.02	40.60	54.00	-13.40	AV
H	2500.00	37.80	14.06	51.86	74.00	-22.14	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(40MHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2422							
V	2390.00	38.17	13.83	52.00	74.00	-22.00	PK
V	2390.00	26.51	13.83	40.34	54.00	-13.66	AV
V	2400.00	38.38	13.85	52.23	74.00	-21.77	PK
V	2400.00	26.07	13.85	39.92	54.00	-14.08	AV
H	2390.00	38.46	13.83	52.29	74.00	-21.71	PK
H	2390.00	26.54	13.83	40.37	54.00	-13.63	AV
V	2400.00	38.33	13.85	52.18	74.00	-21.82	PK
V	2400.00	26.48	13.85	40.33	54.00	-13.67	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2452							
V	2483.50	38.38	14.02	52.40	74.00	-21.60	PK
V	2483.50	26.76	14.02	40.78	54.00	-13.22	AV
V	2500.00	38.32	14.06	52.38	74.00	-21.62	PK
V	2500.00	26.18	14.06	40.24	54.00	-13.76	AV
H	2483.50	38.50	14.02	52.52	74.00	-21.48	PK
H	2483.50	26.80	14.02	40.82	54.00	-13.18	AV
H	2500.00	38.12	14.06	52.18	74.00	-21.82	PK
H	2500.00	27.06	14.06	41.12	54.00	-12.88	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

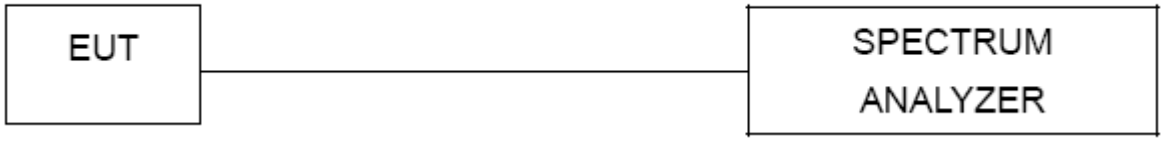
4.1.1 TEST PROCEDURE

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 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x 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.

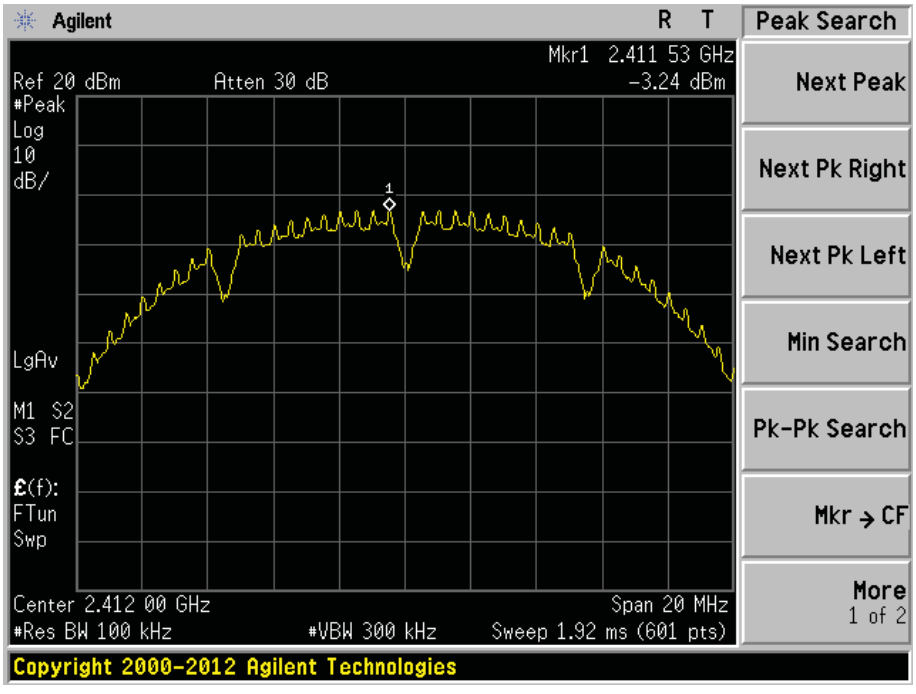
4.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX b Mode		

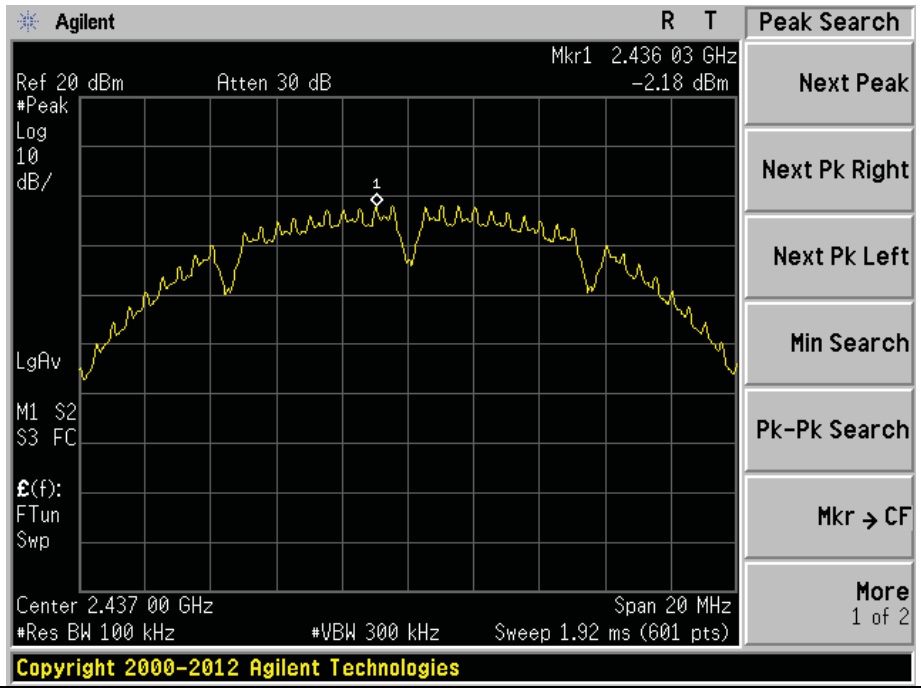
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-3.24	-0.61	8	PASS
	Ant.2	-3.93			
2437 MHz	Ant.1	-2.18	0.04	8	PASS
	Ant.2	-3.96			
2462 MHz	Ant.1	-1.83	0.79	8	PASS
	Ant.2	-2.70			

Ant. 1

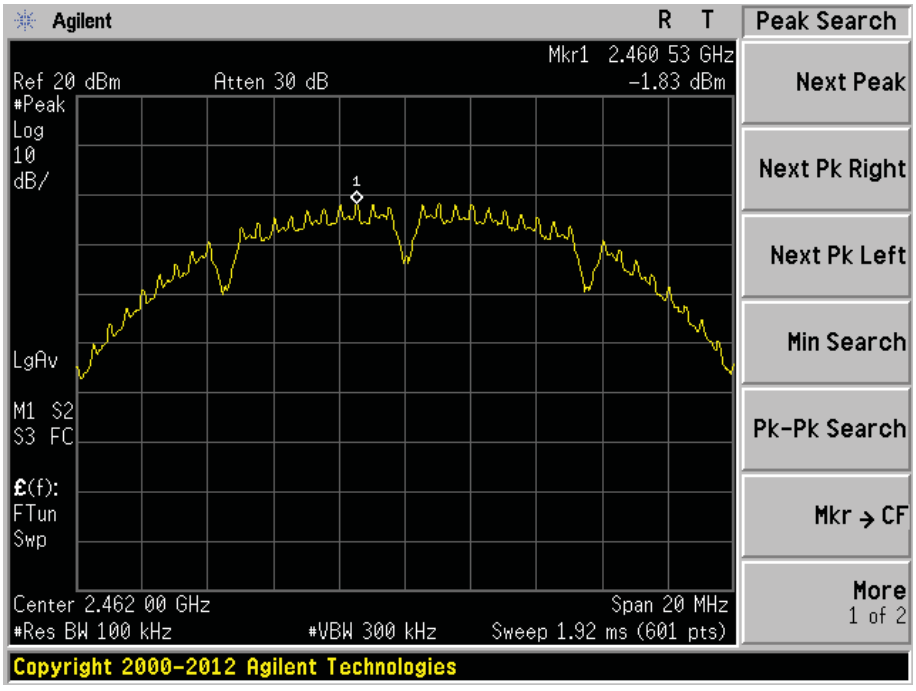
TX CH01



TX CH06

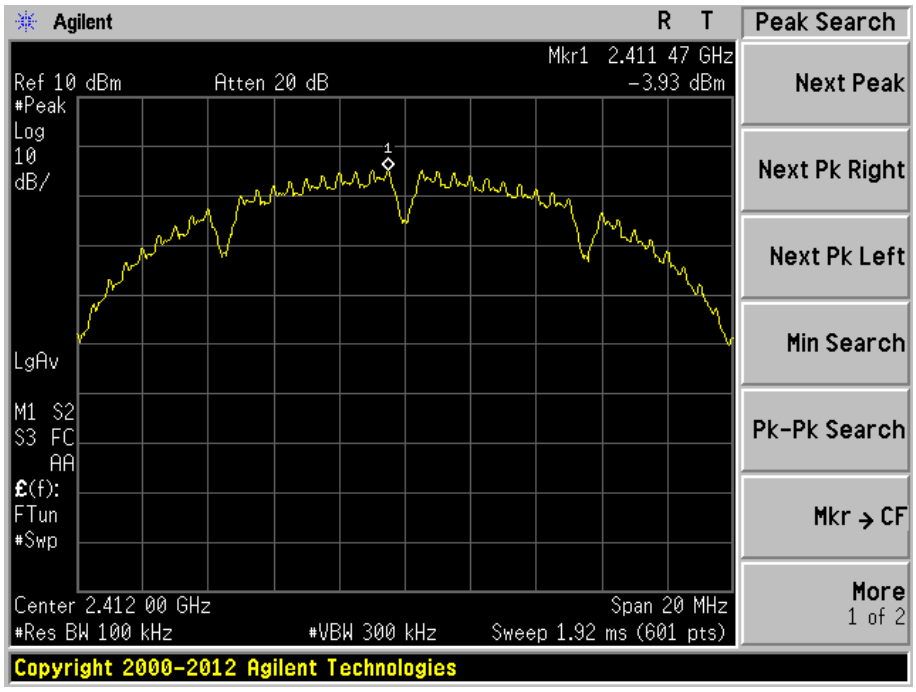


TX CH11

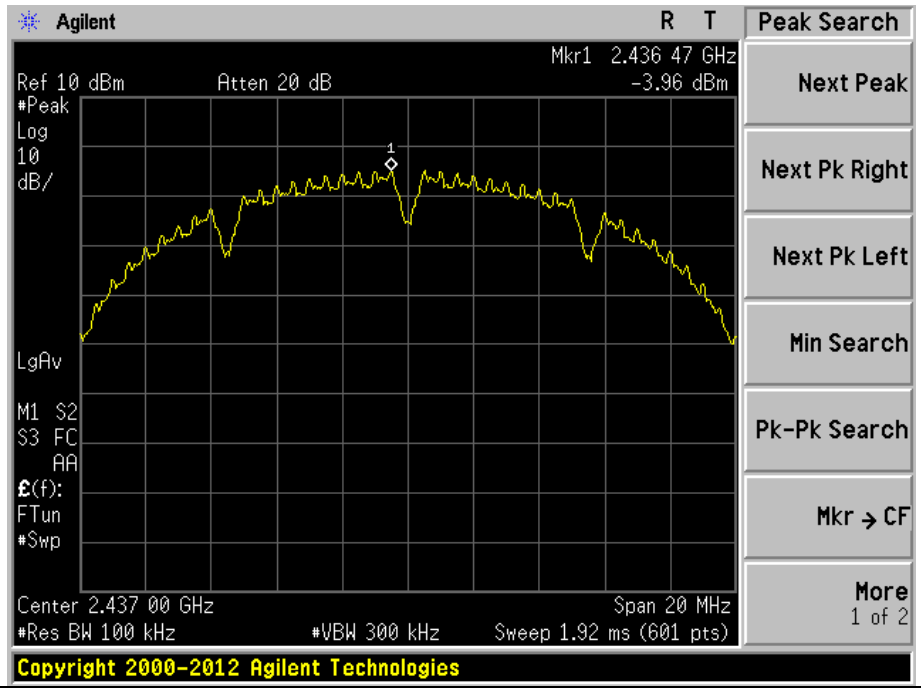


Ant. 2

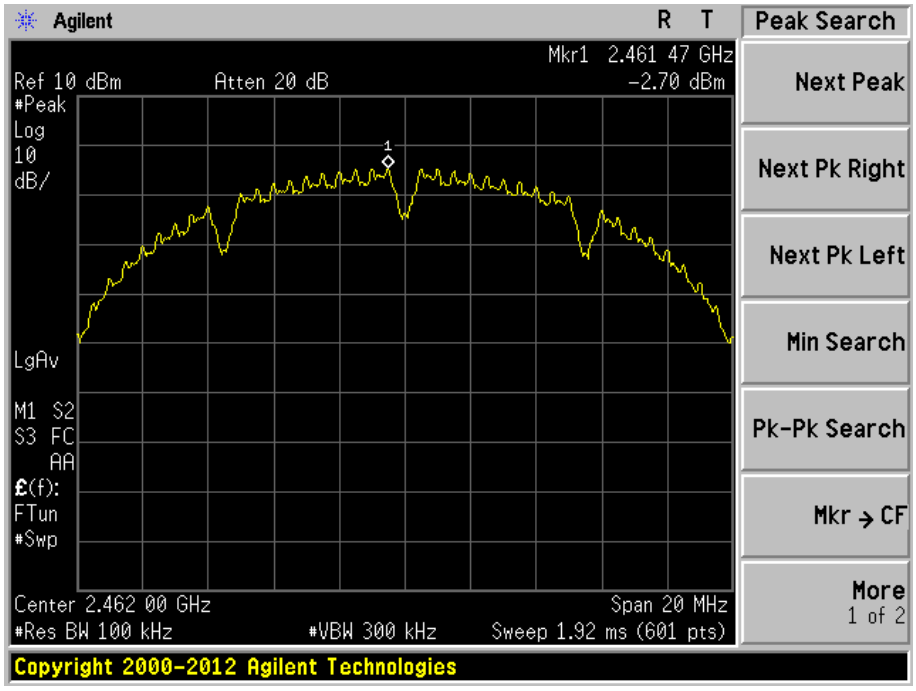
TX CH01



TX CH06



TX CH11

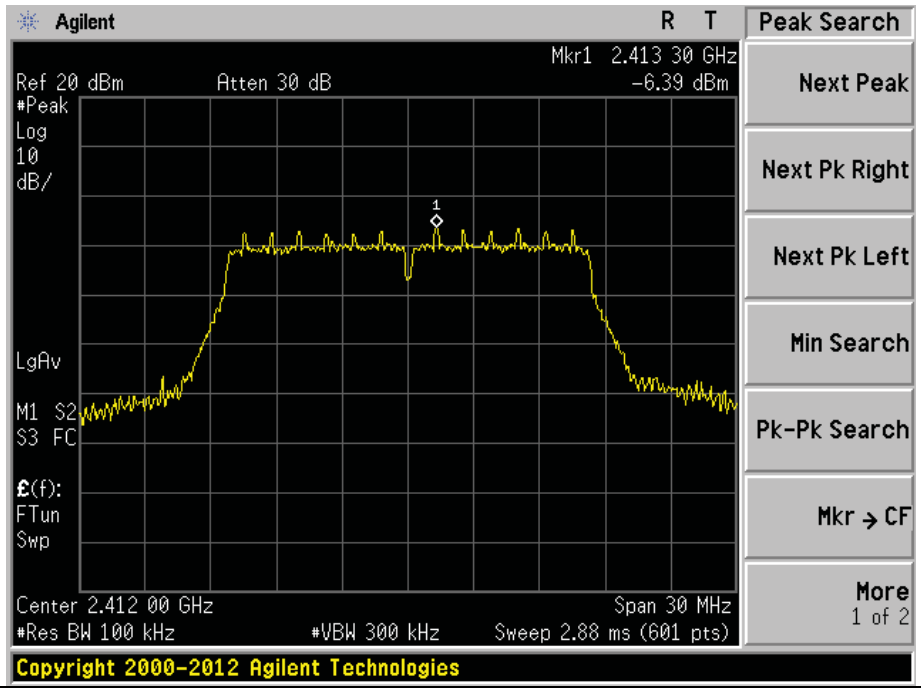

Agilent
R T
Peak Search
Mkr1 2.461 47 GHz
Ref 10 dBm
Atten 20 dB
-2.70 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 20 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.92 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX g Mode		

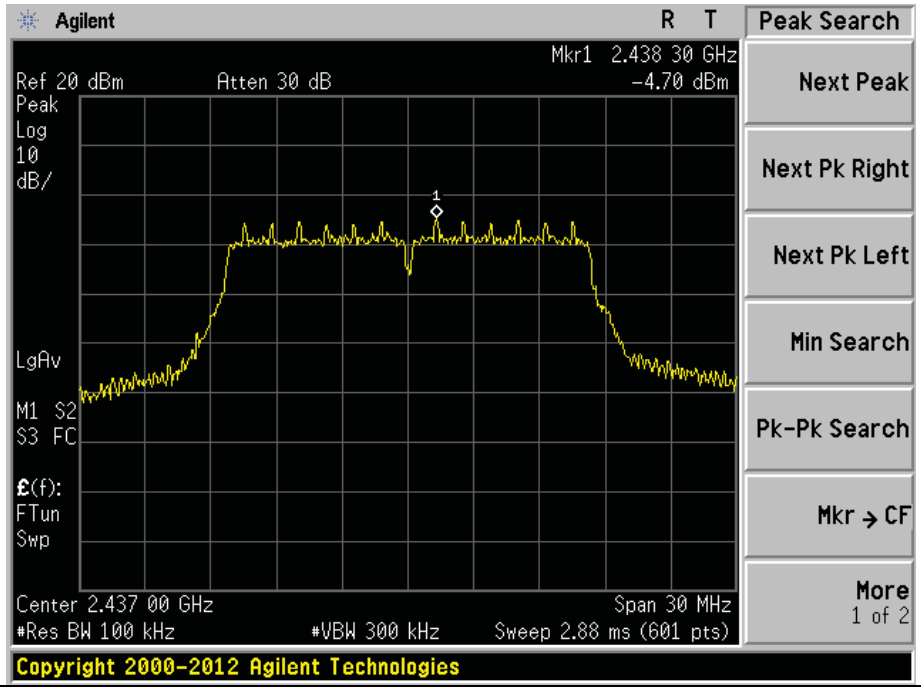
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-6.39	-3.10	8	PASS
	Ant.2	-5.85			
2437 MHz	Ant.1	-4.70	-1.37	8	PASS
	Ant.2	-4.11			
2462 MHz	Ant.1	-4.70	-1.87	8	PASS
	Ant.2	-5.14			

Ant.1

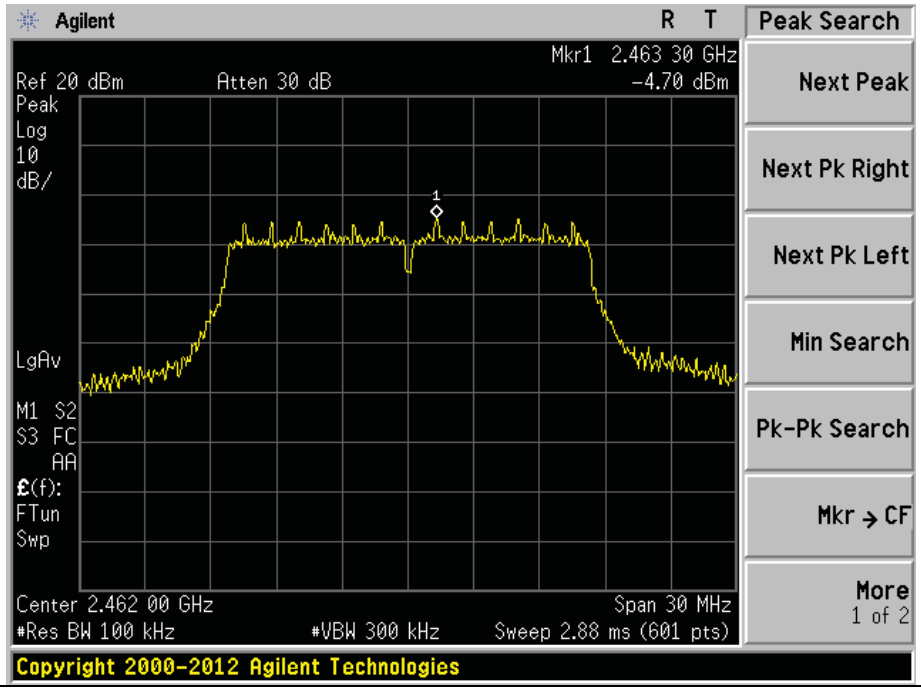
TX CH01



TX CH06

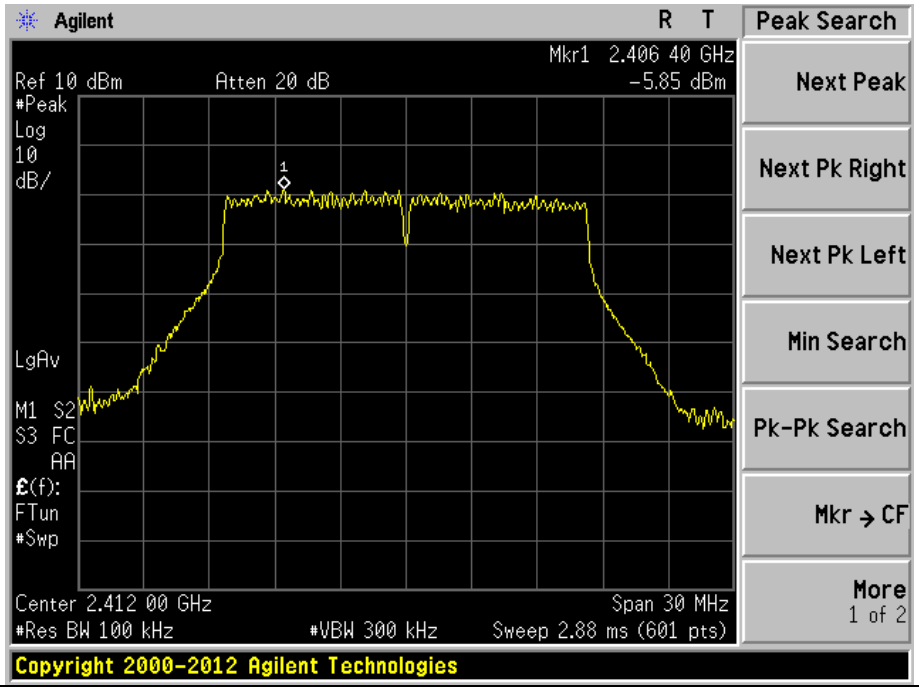


TX CH11

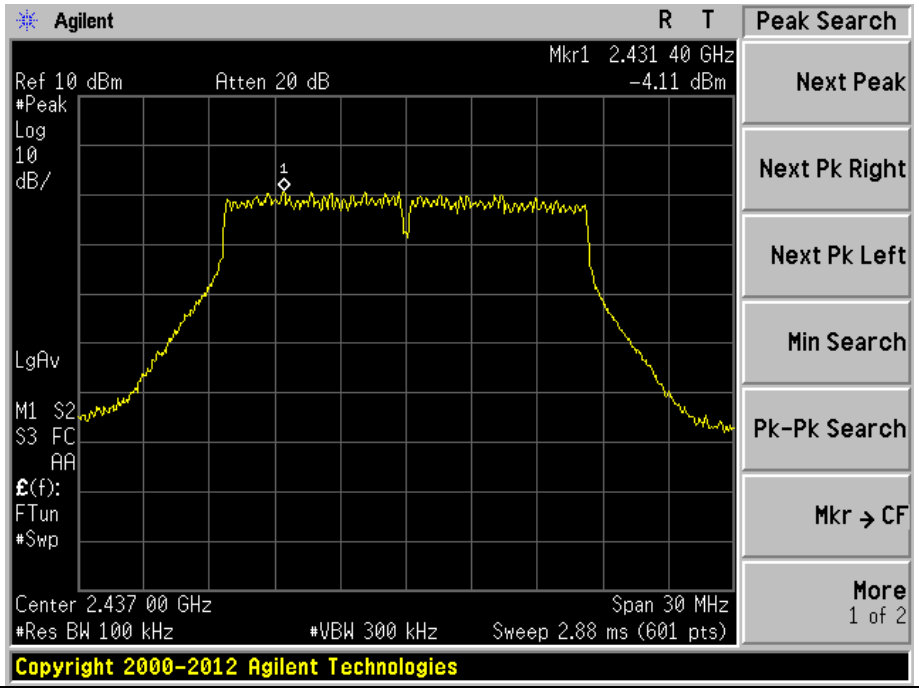


Ant.2

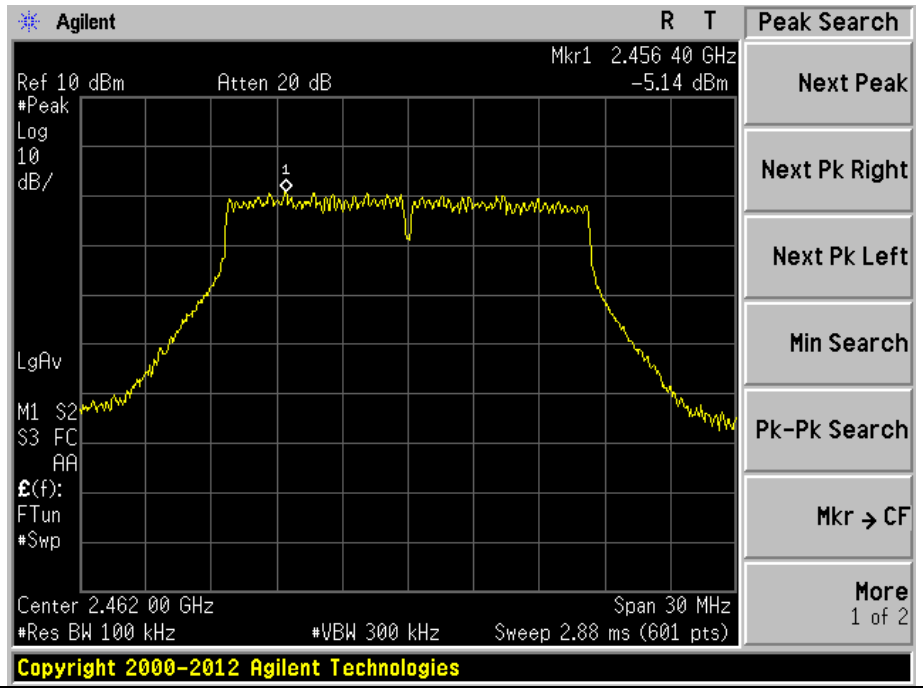
TX CH01



TX CH06



TX CH11

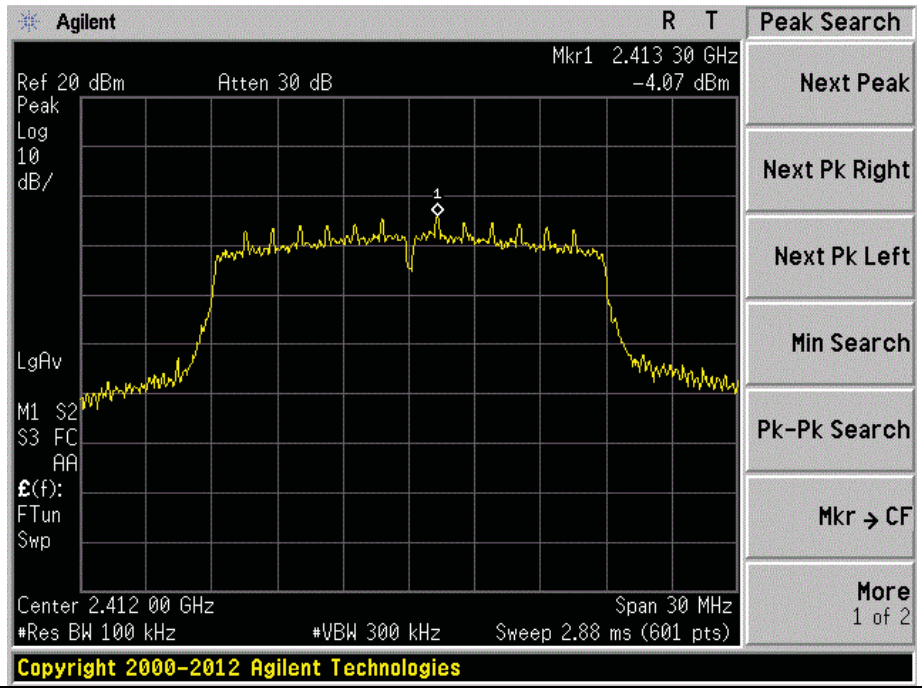

Agilent
R T
Peak Search
Mkr1 2.456 40 GHz
Ref 10 dBm
Atten 20 dB
-5.14 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(20M)		

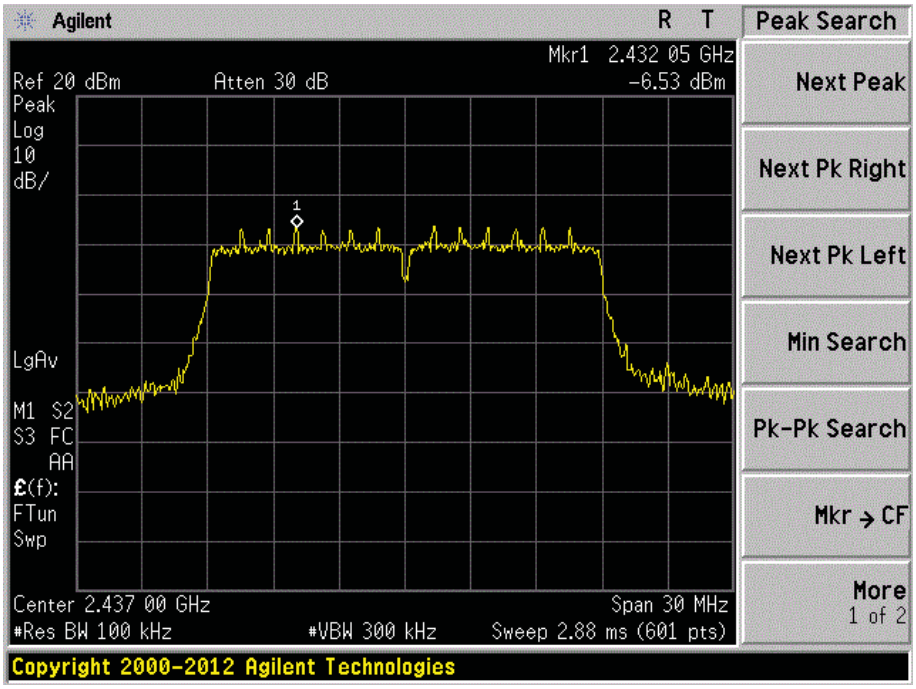
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-4.07	-3.28	8	PASS
	Ant.2	-10.76			
2437 MHz	Ant.1	-6.53	-4.77	8	PASS
	Ant.2	-11.19			
2462 MHz	Ant.1	-4.87	-3.87	8	PASS
	Ant.2	-11.15			

Ant.1

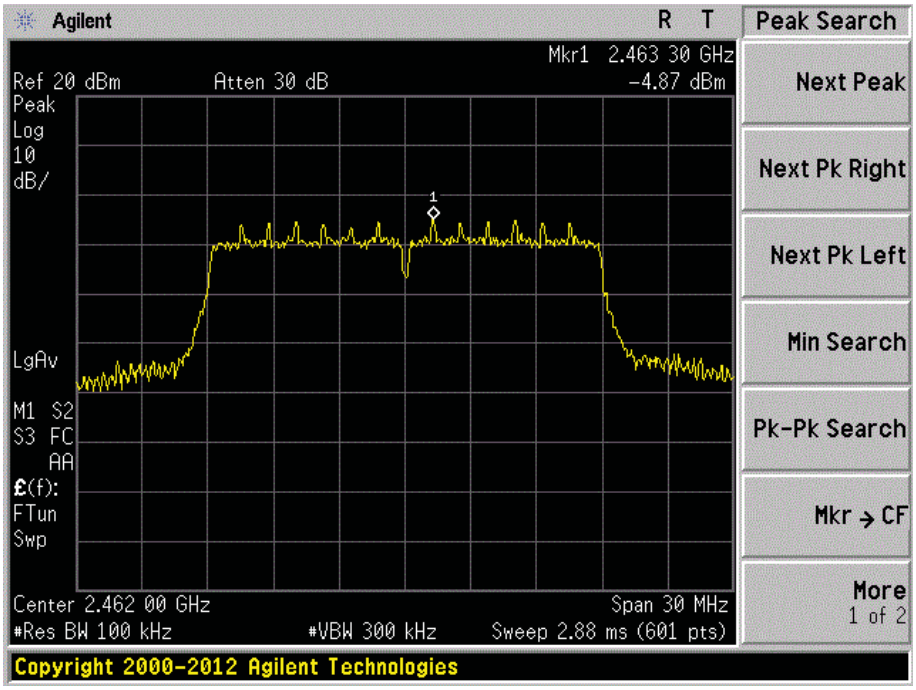
TX CH01



TX CH06

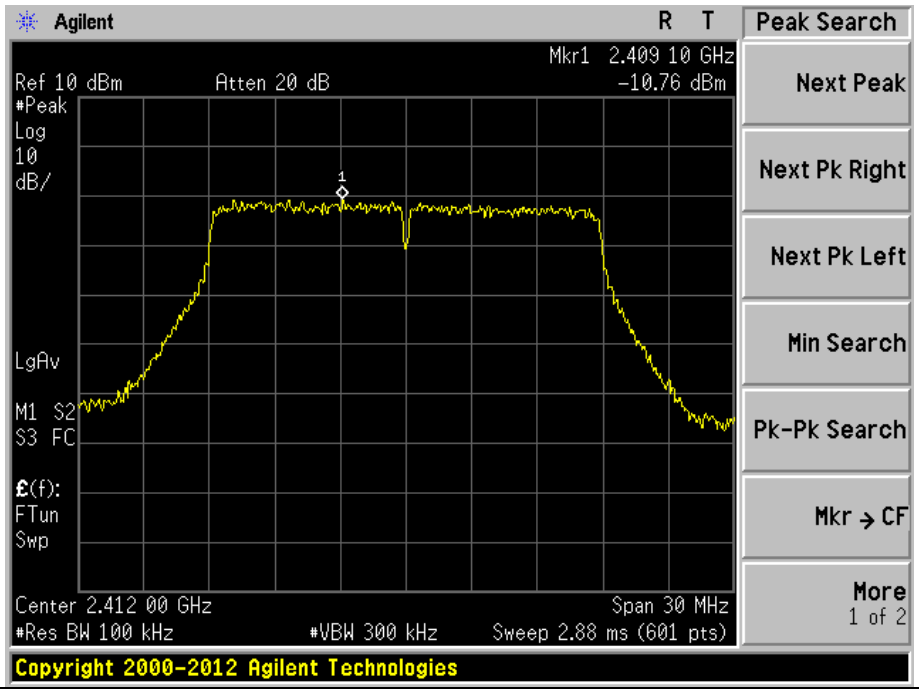


TX CH11

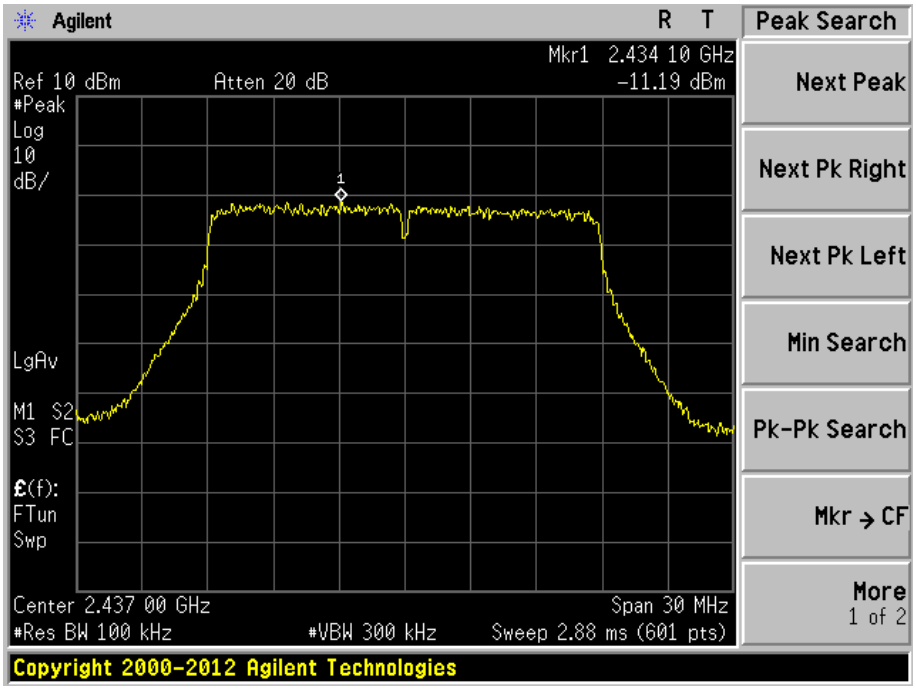


Ant.2

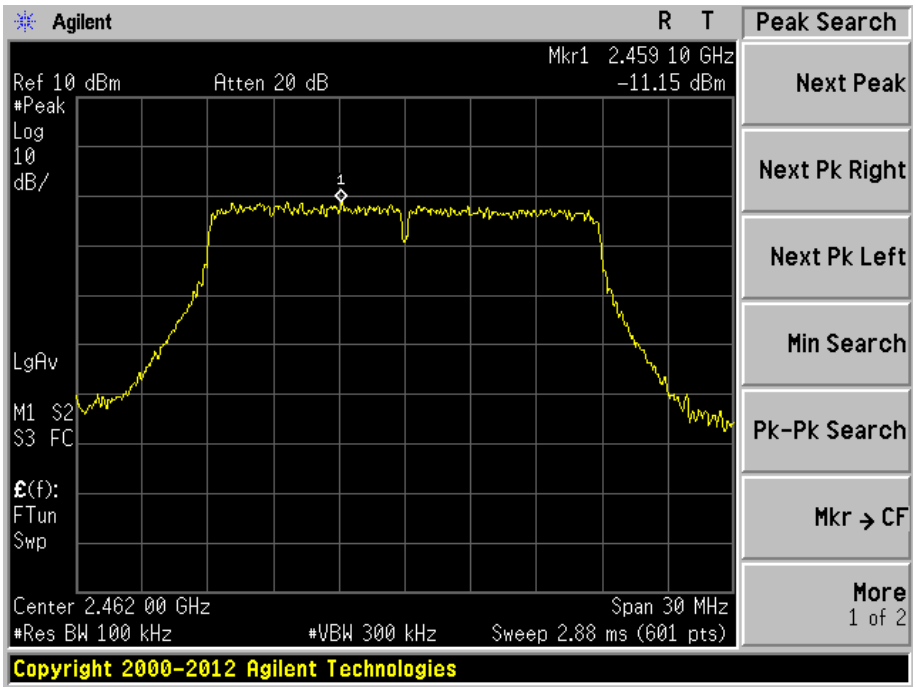
TX CH01



TX CH06



TX CH11

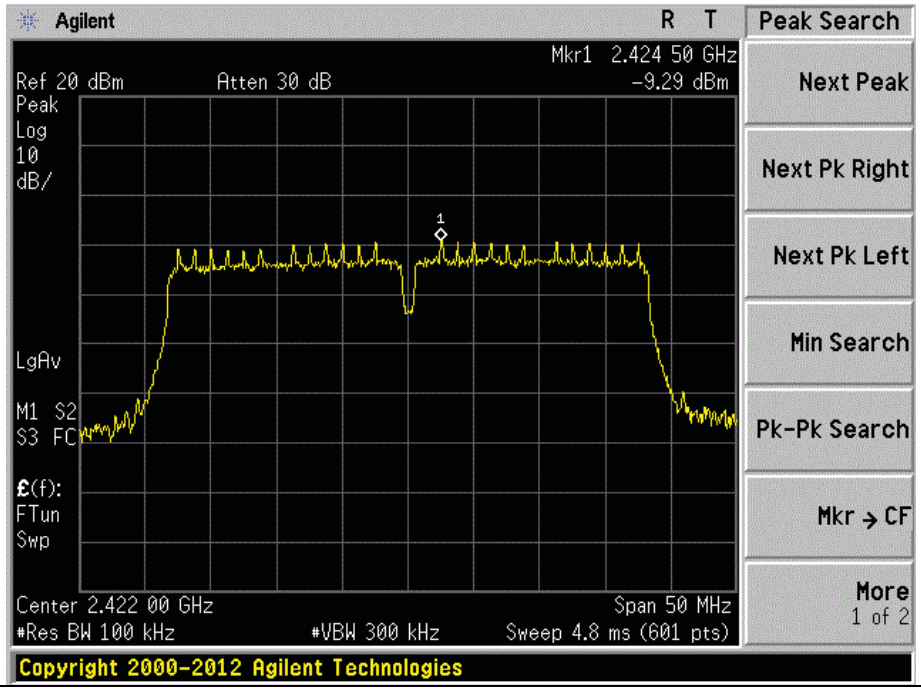

Agilent
R T
Peak Search
Mkr1 2.459 10 GHz
Ref 10 dBm
Atten 20 dB
-11.15 dBm
#Peak
Log
10
dB/
Next Peak
Next Pk Right
Next Pk Left
Min Search
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(40M)		

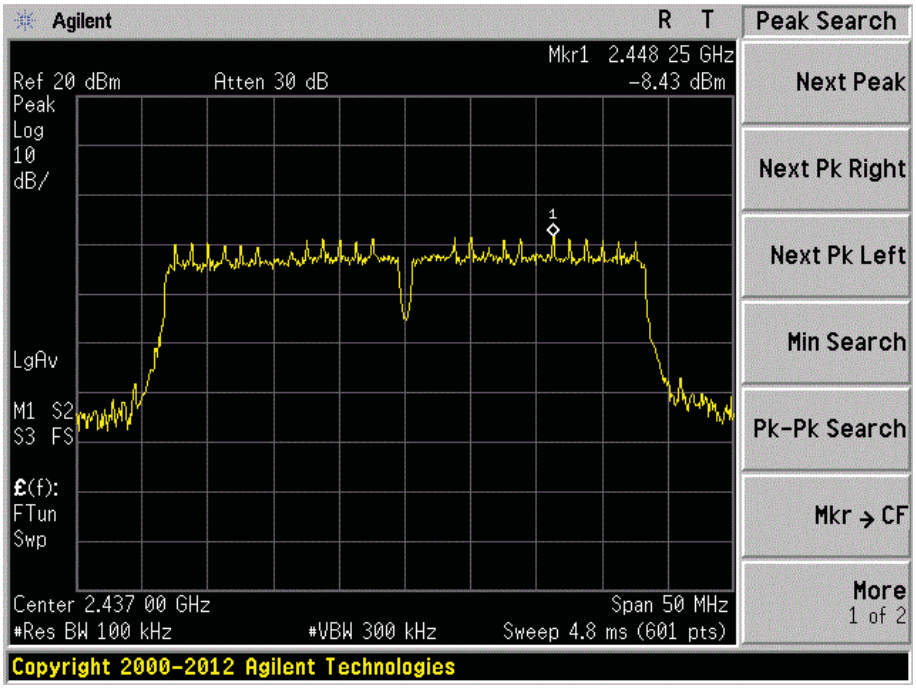
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2422 MHz	Ant.1	-9.29	-7.21	8	PASS
	Ant.2	-11.39			
2437 MHz	Ant.1	-8.43	-6.78	8	PASS
	Ant.2	-11.56			
2452 MHz	Ant.1	-7.83	-6.38	8	PASS
	Ant.2	-11.71			

Ant.1

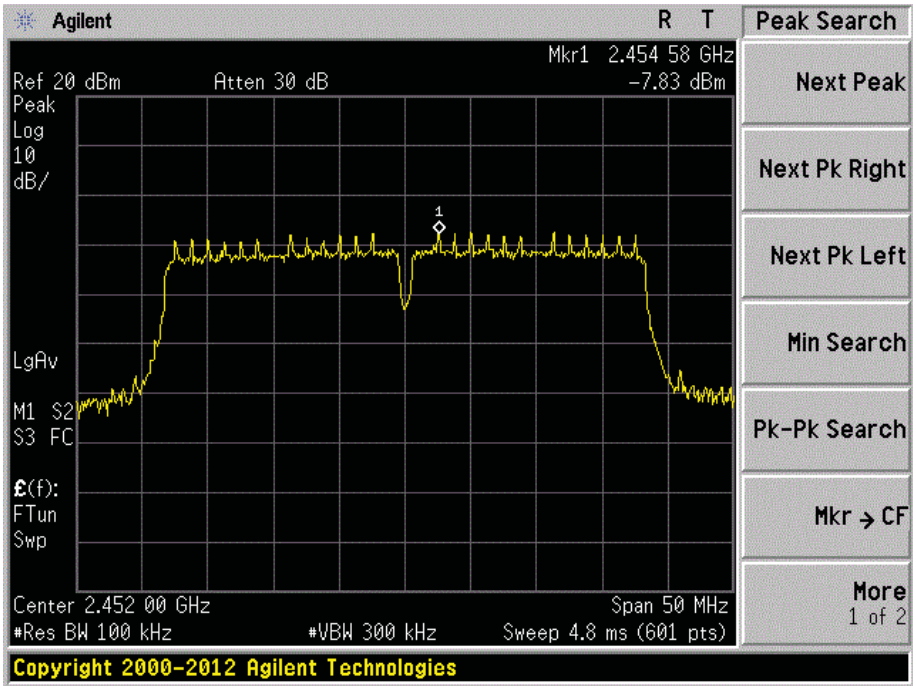
TX CH03



TX CH06

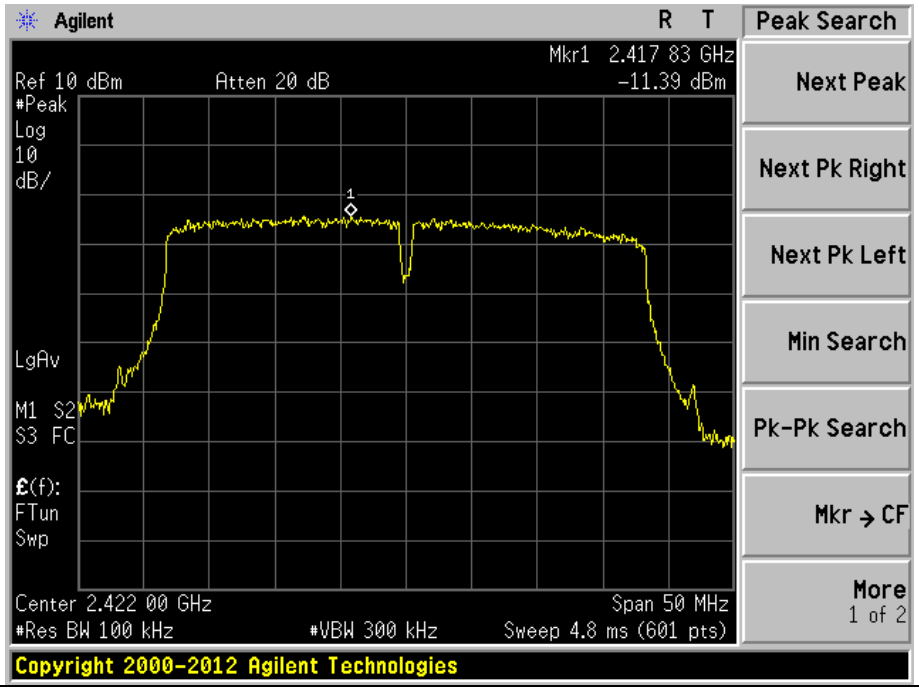


TX CH09

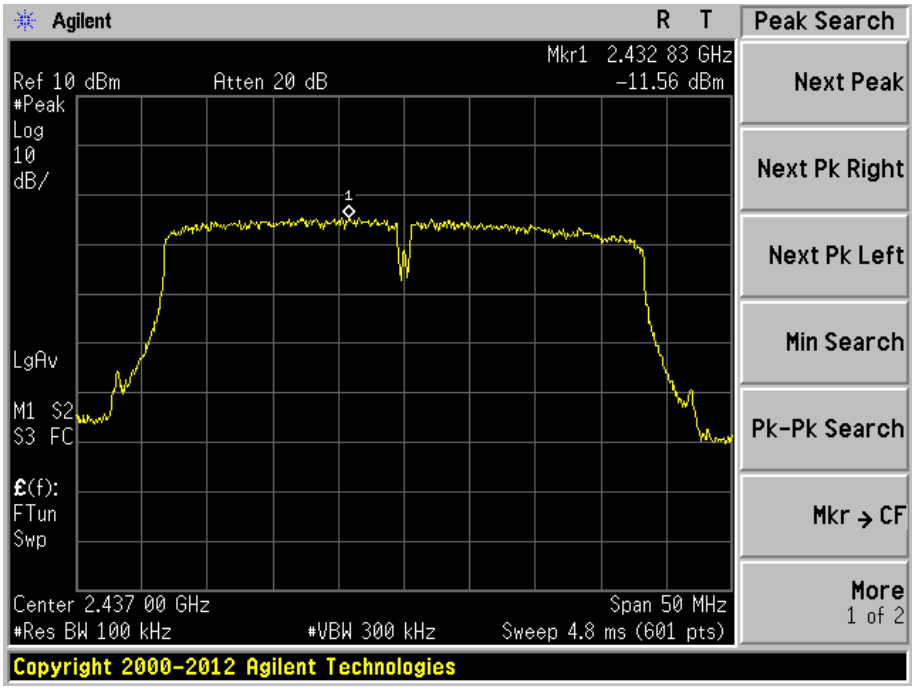


Ant.2

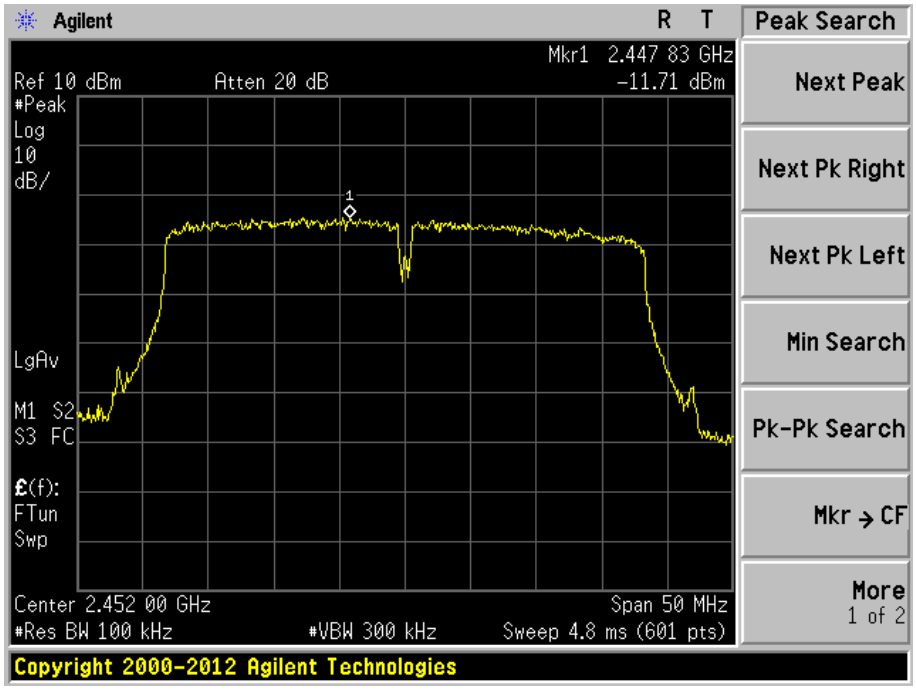
TX CH03



TX CH06



TX CH09


Agilent
R T
Peak Search
Mkr1 2.447 83 GHz
Ref 10 dBm
Atten 20 dB
-11.71 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.452 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

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	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

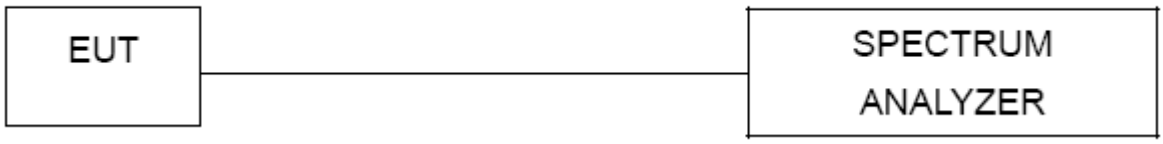
5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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.

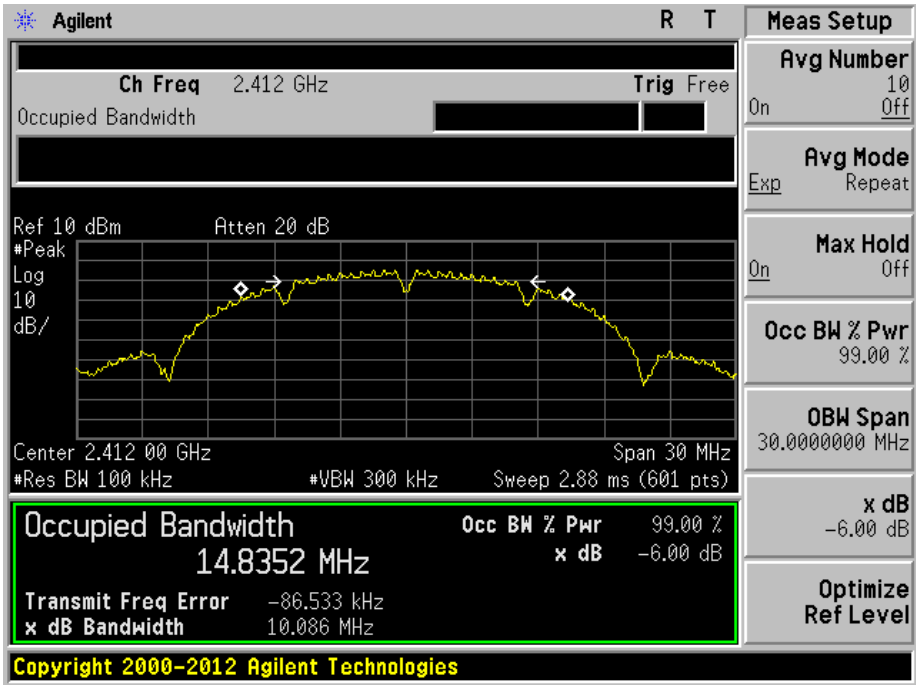
5.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX b Mode		

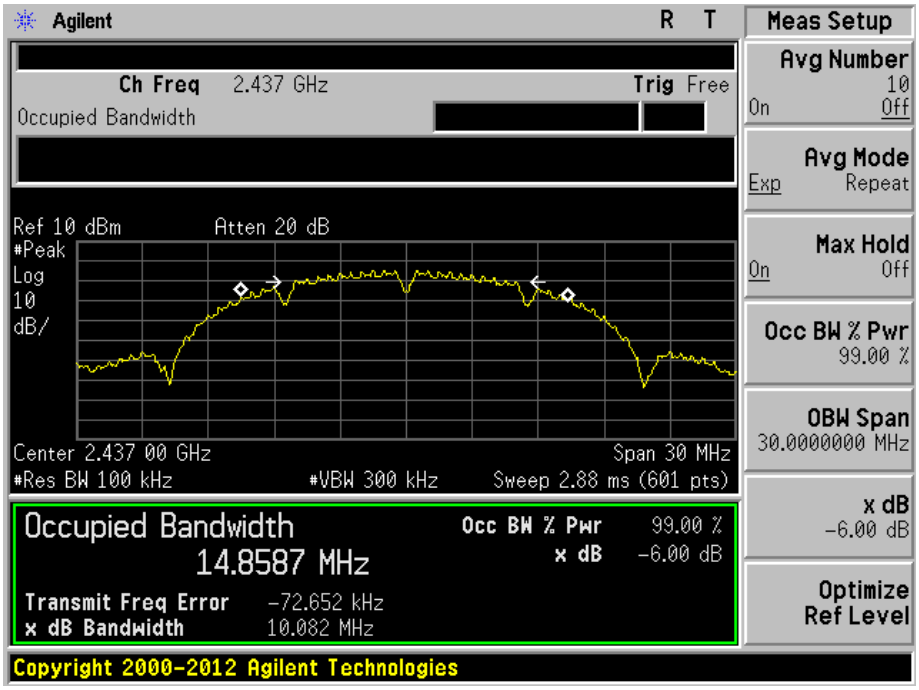
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	10.086	500	Pass
		Ant.2	10.112	500	Pass
Middle	2437	Ant.1	10.082	500	Pass
		Ant.2	10.134	500	Pass
High	2462	Ant.1	10.086	500	Pass
		Ant.2	10.146	500	Pass

Ant.1

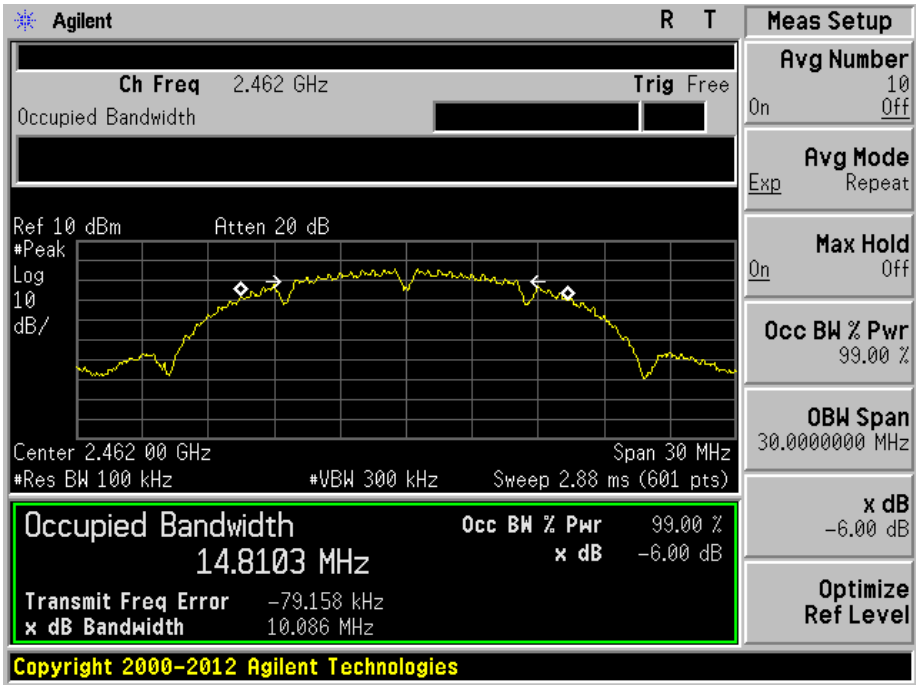
TX CH 01



TX CH 06

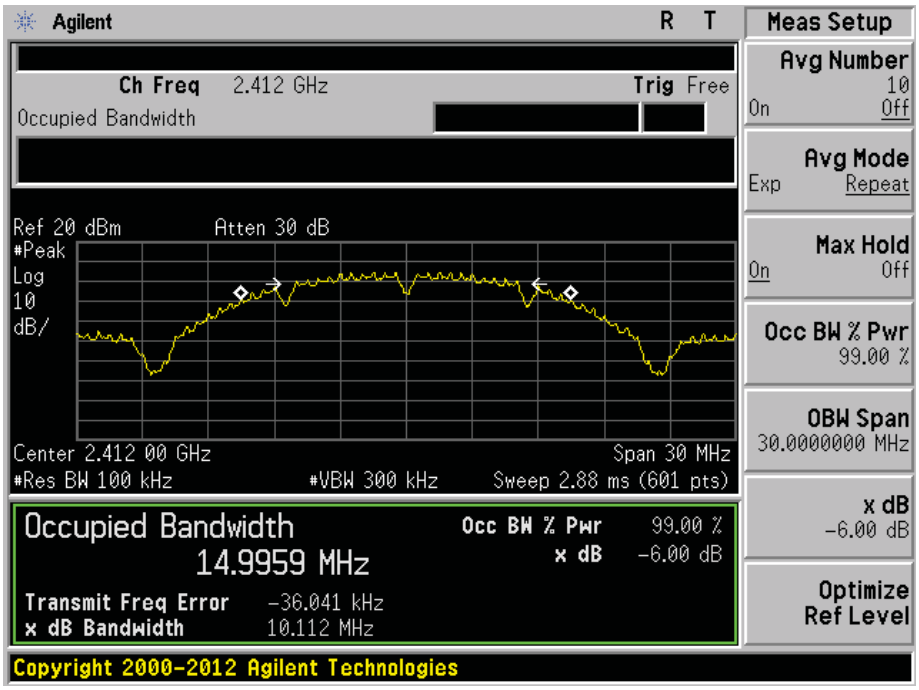


TX CH 11

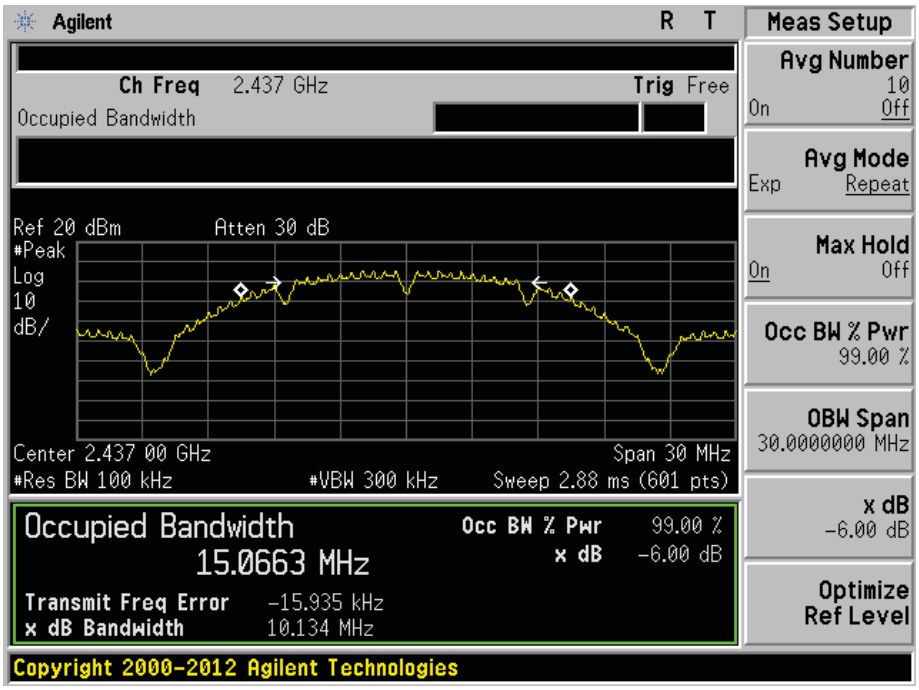


Ant.2

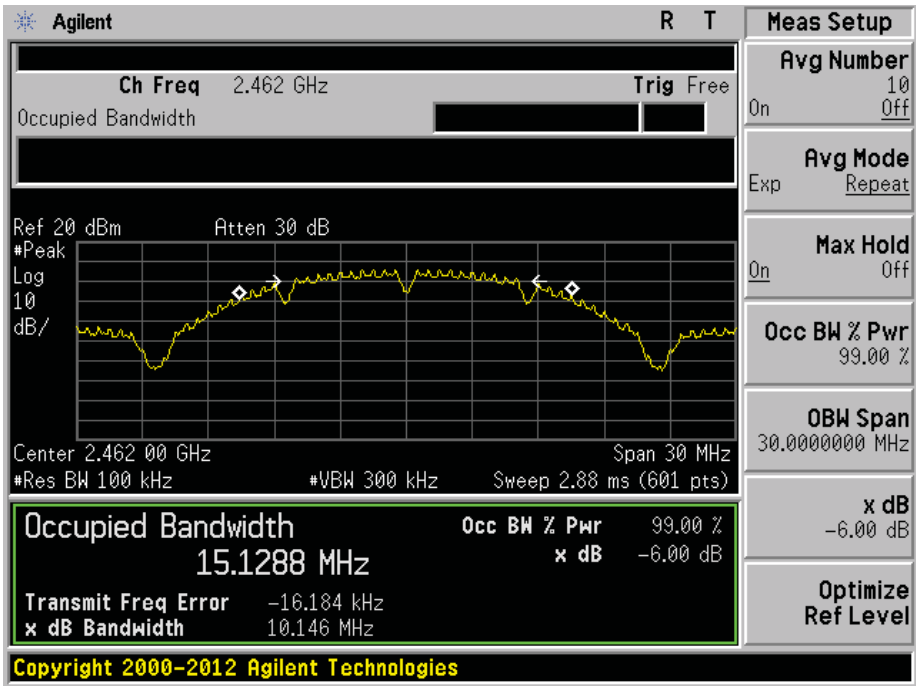
TX CH 01



TX CH 06



TX CH 11

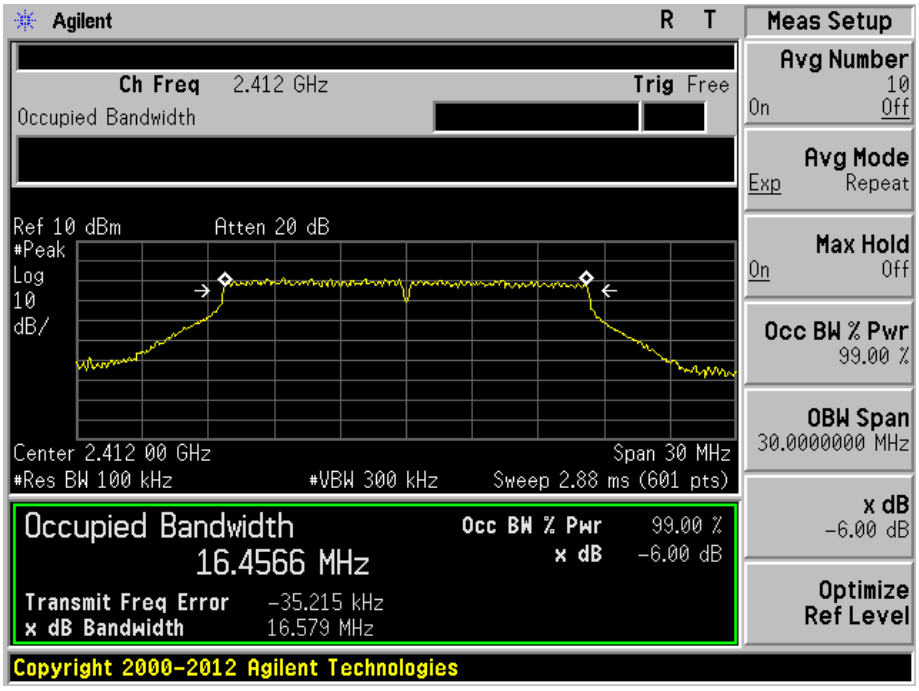

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
x dB
-6.00 dB
Occupied Bandwidth
15.1288 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -16.184 kHz
x dB Bandwidth 10.146 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX g Mode		

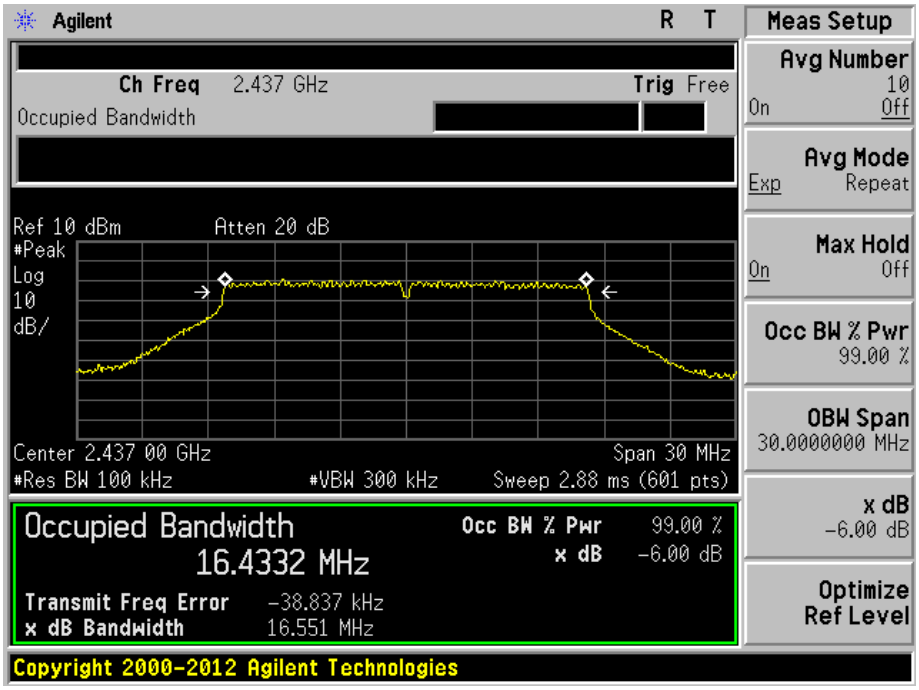
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	16.579	500	Pass
		Ant.2	16.438	500	Pass
Middle	2437	Ant.1	16.551	500	Pass
		Ant.2	15.142	500	Pass
High	2462	Ant.1	16.574	500	Pass
		Ant.2	15.155	500	Pass

Ant.1

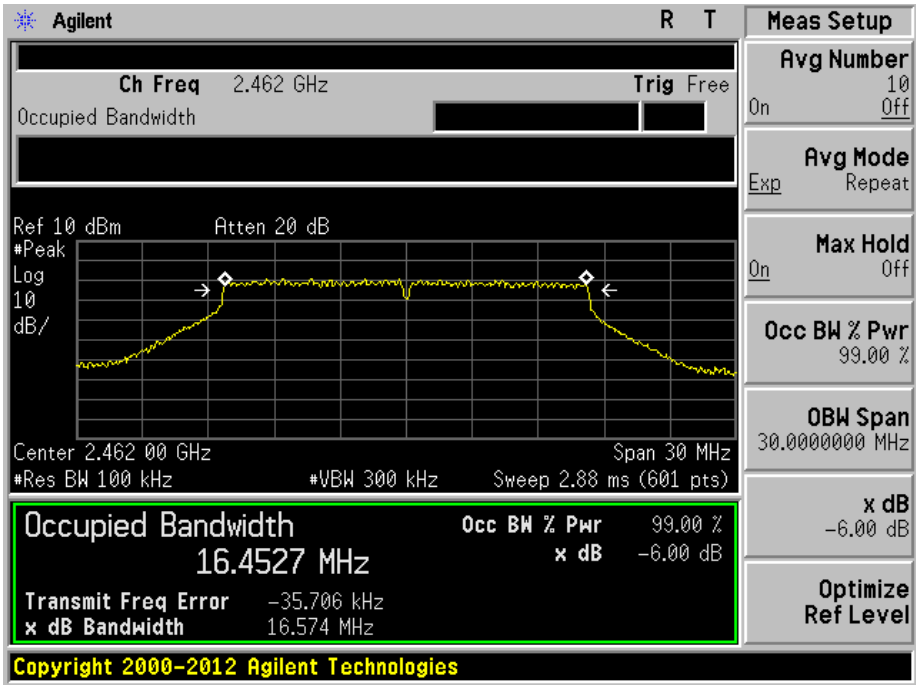
TX CH 01



TX CH 06

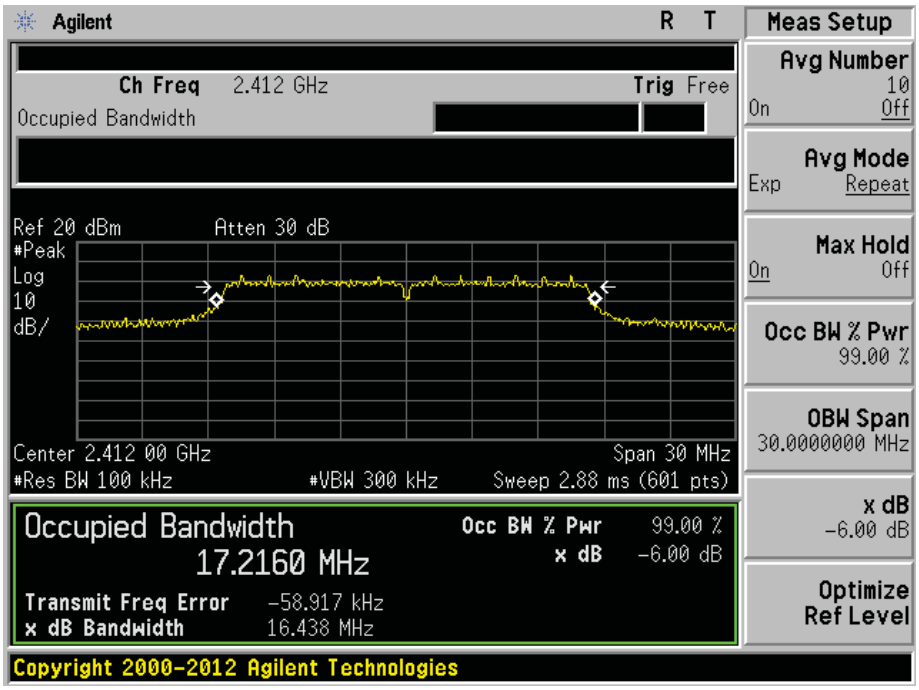


TX CH 11

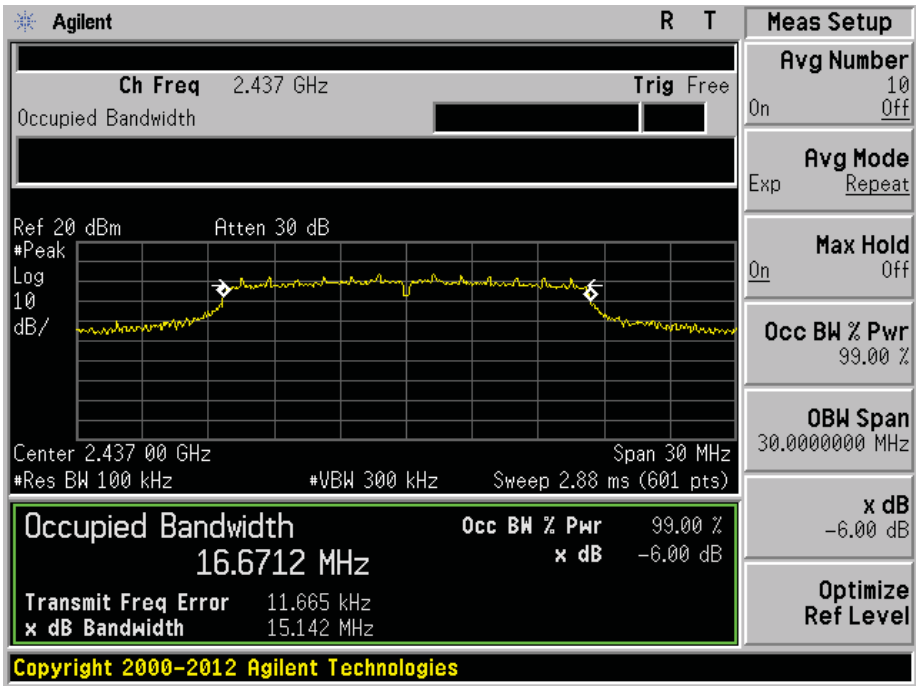


Ant.2

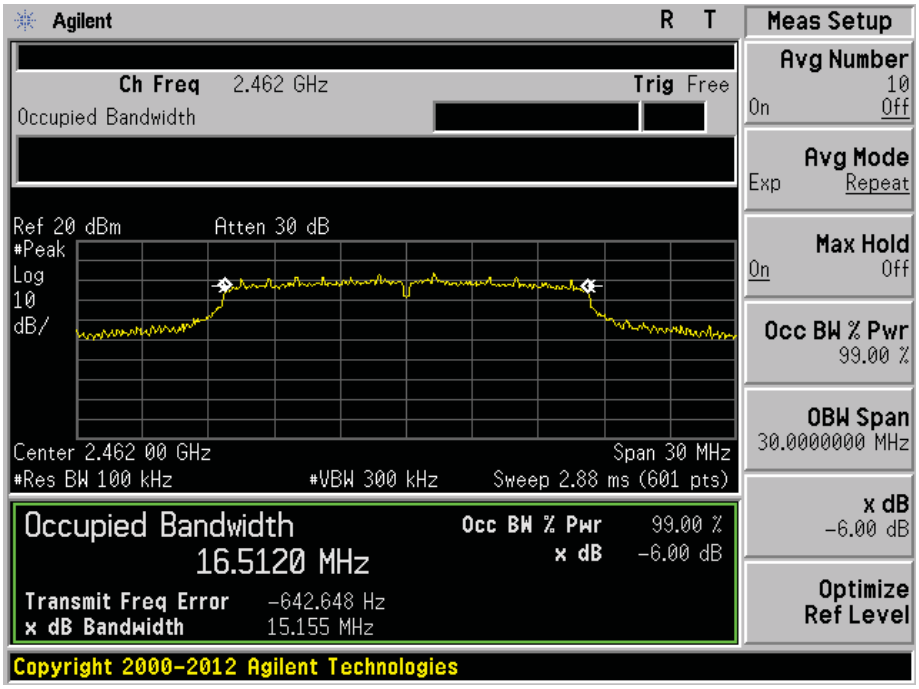
TX CH 01



TX CH 06



TX CH 11

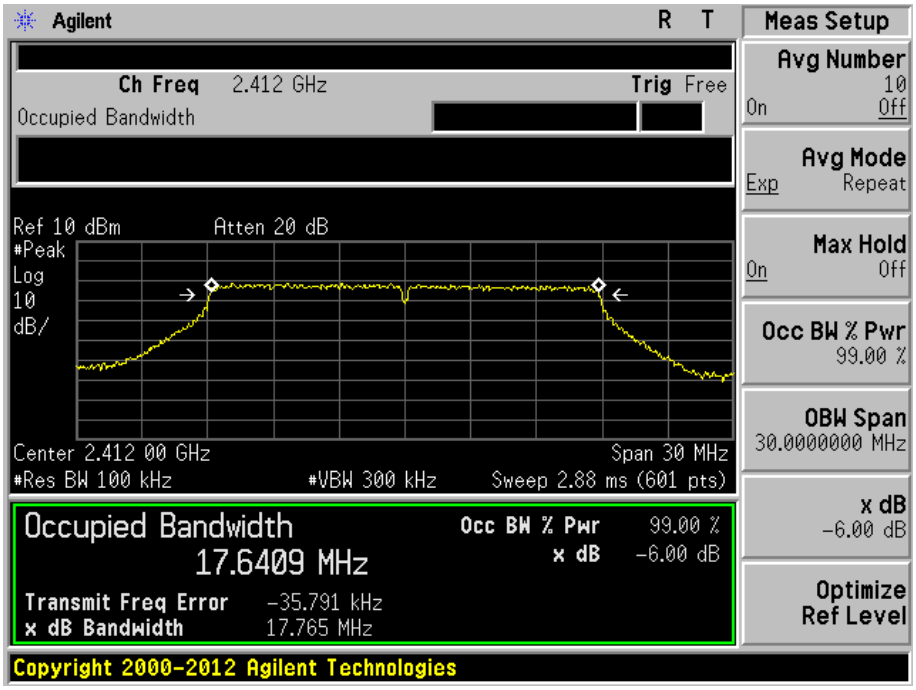

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Occupied Bandwidth
16.5120 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error -642.648 Hz
x dB Bandwidth 15.155 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(20M)		

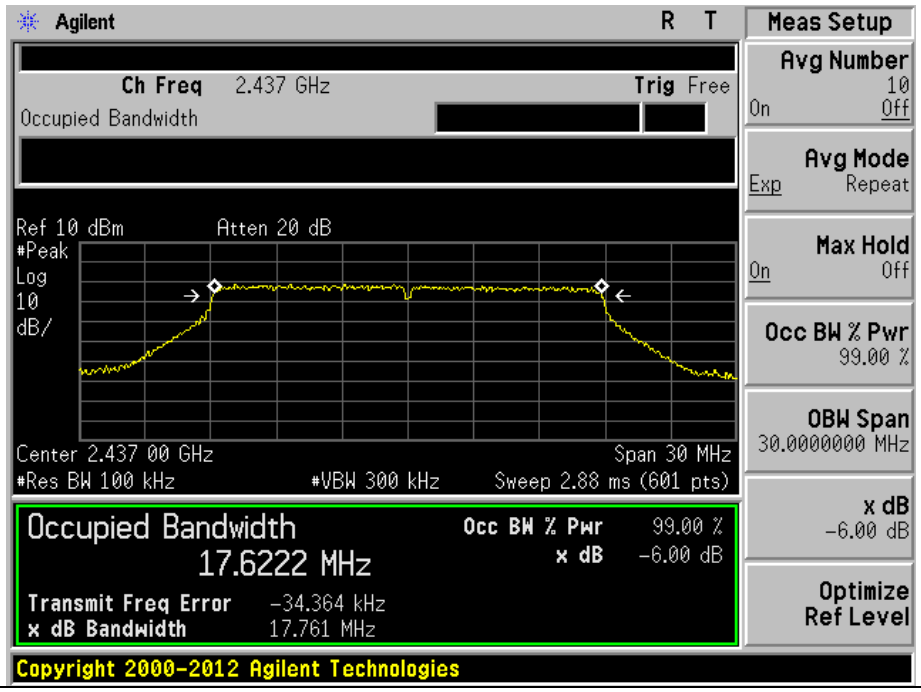
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	17.765	500	Pass
		Ant.2	16.101	500	Pass
Middle	2437	Ant.1	17.761	500	Pass
		Ant.2	15.188	500	Pass
High	2462	Ant.1	17.760	500	Pass
		Ant.2	15.119	500	Pass

Ant.1

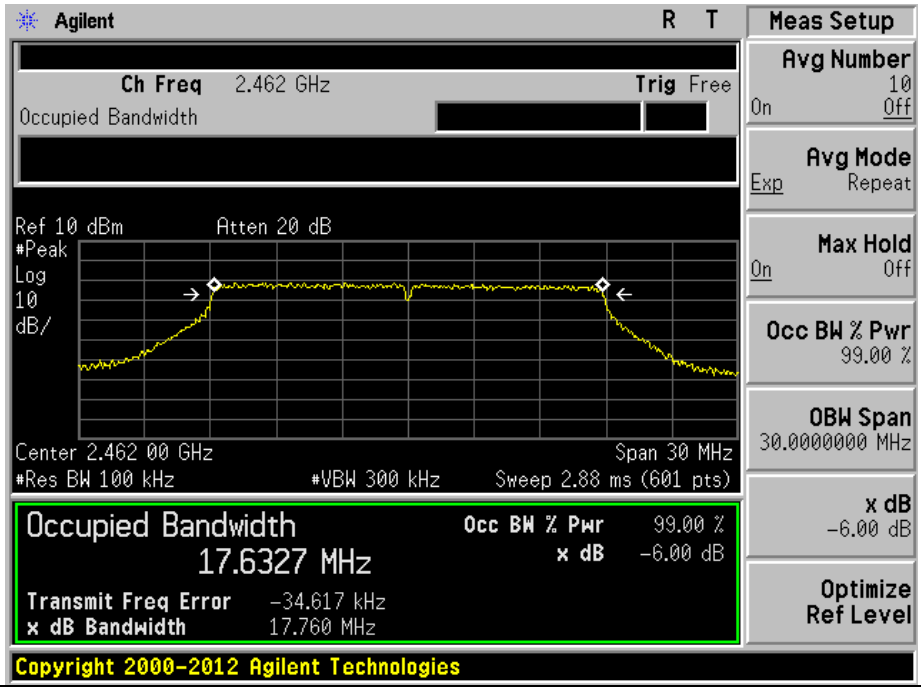
TX CH 01



TX CH 06

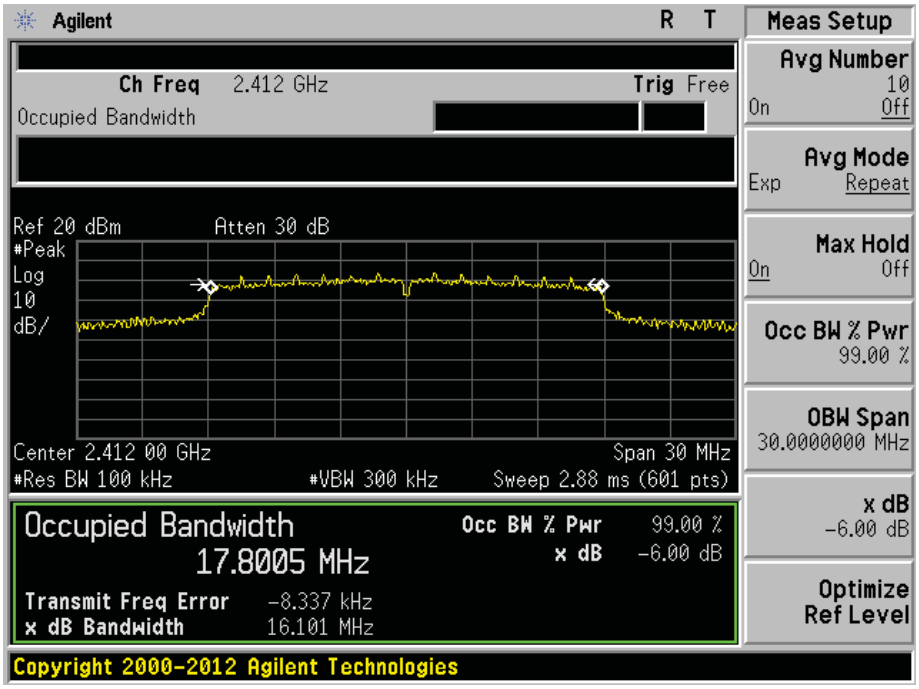


TX CH 11

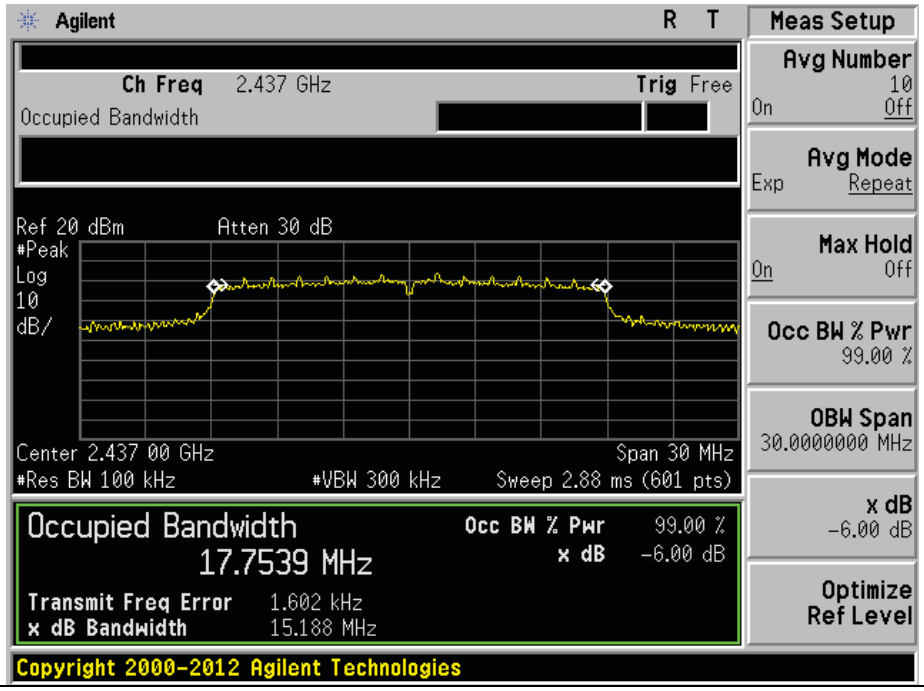


Ant.2

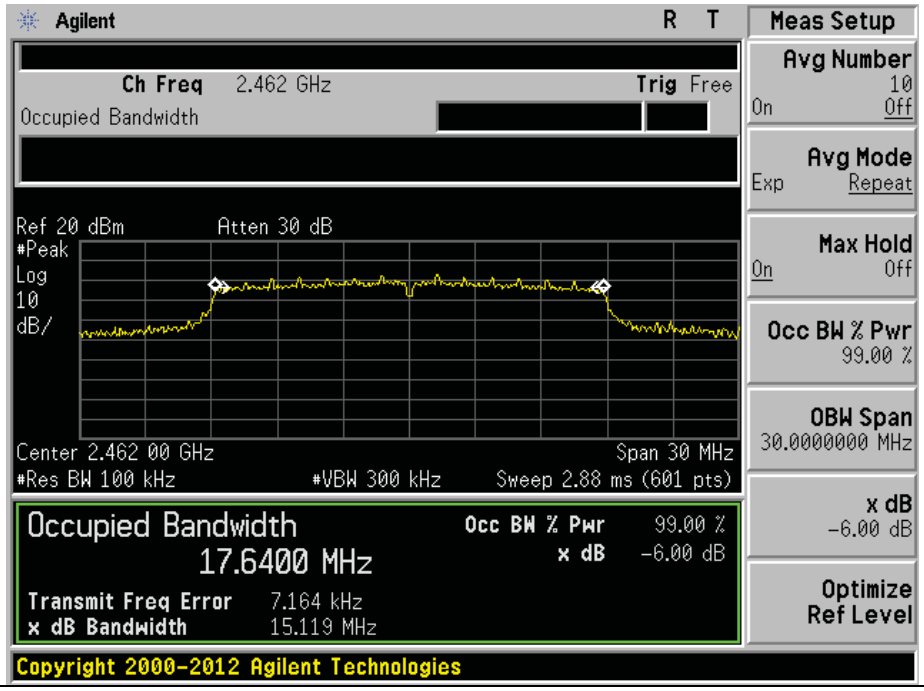
TX CH 01



TX CH 06



TX CH 11

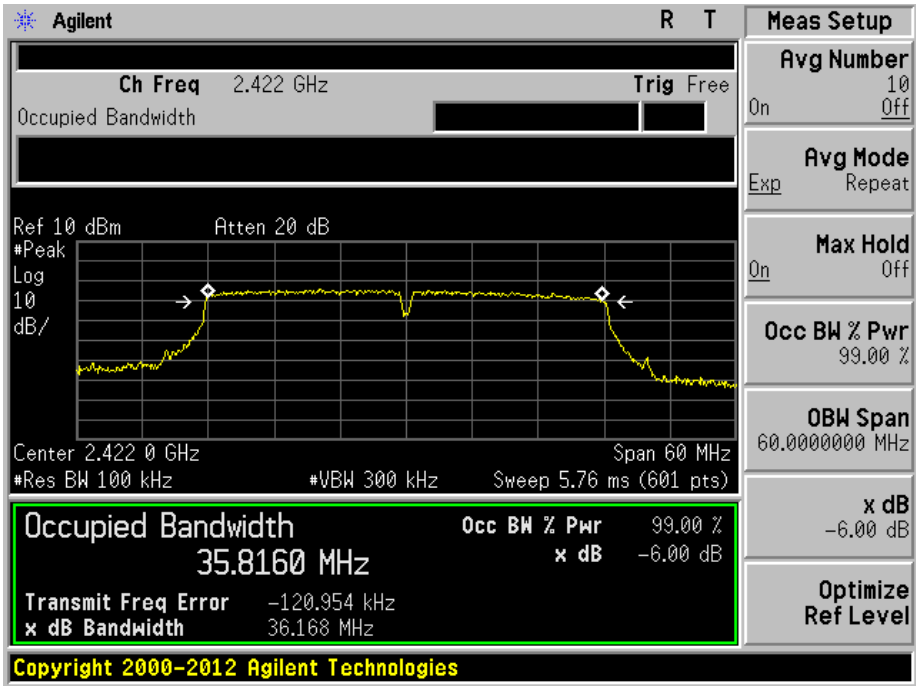

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
x dB
-6.00 dB
Occupied Bandwidth
17.6400 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error 7.164 kHz
x dB Bandwidth 15.119 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(40M)		

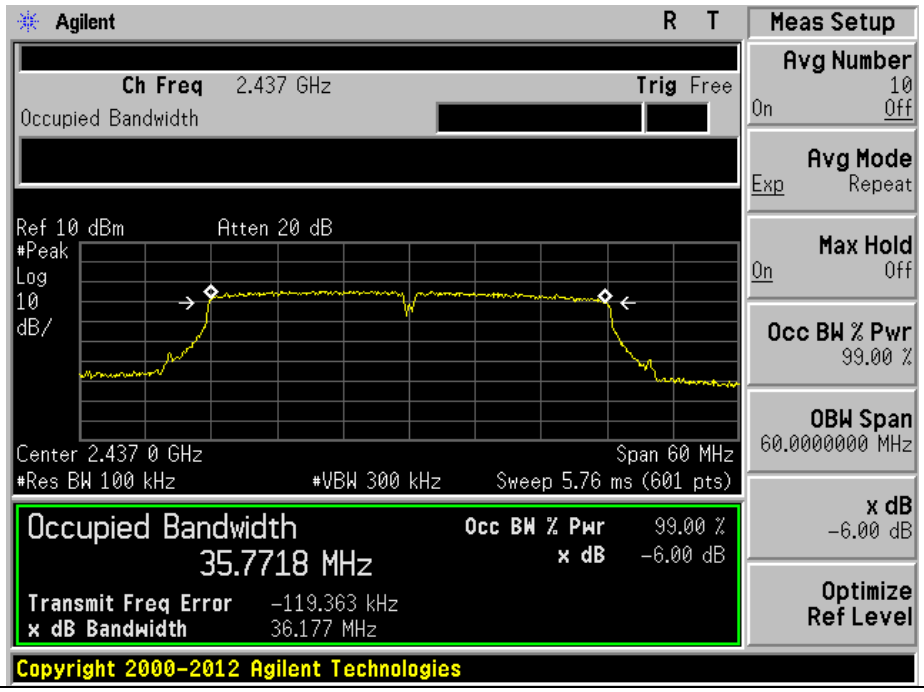
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2422	Ant.1	36.168	500	Pass
		Ant.2	36.352	500	Pass
Middle	2437	Ant.1	36.177	500	Pass
		Ant.2	35.235	500	Pass
High	2452	Ant.1	36.199	500	Pass
		Ant.2	35.325	500	Pass

Ant.1

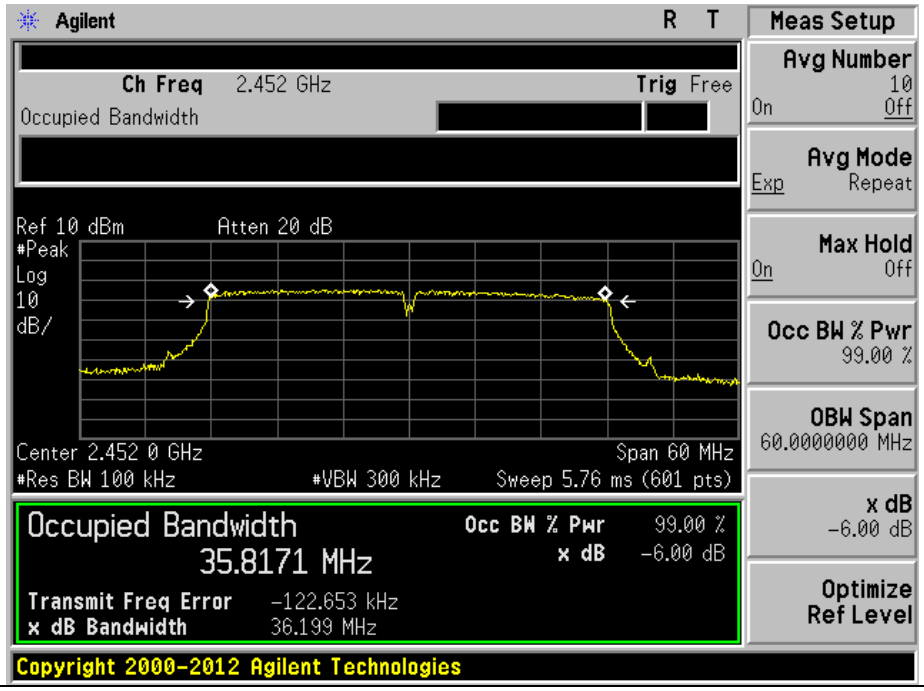
TX CH 03



TX CH 06

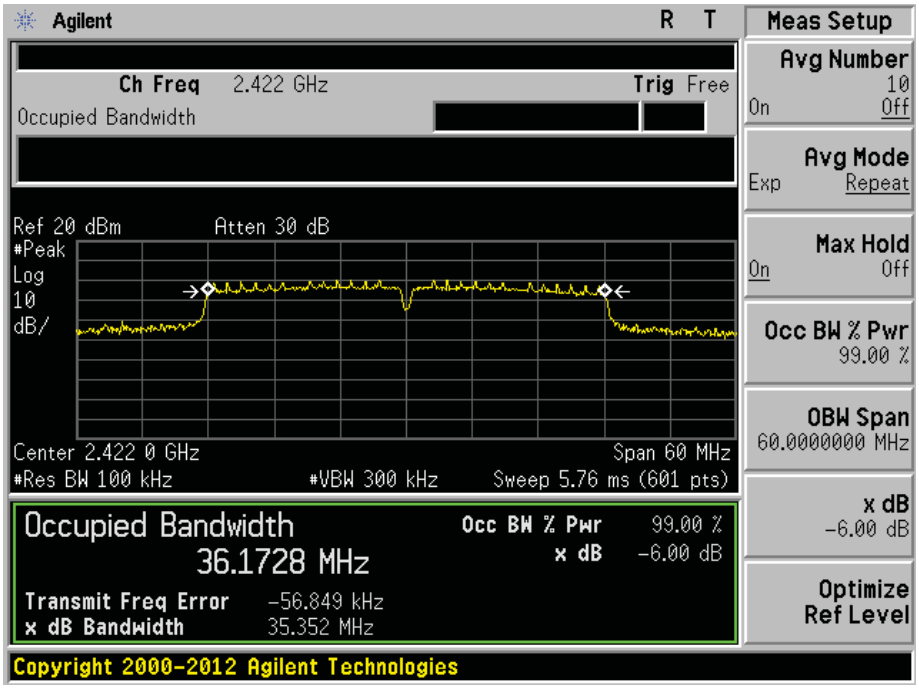


TX CH 09

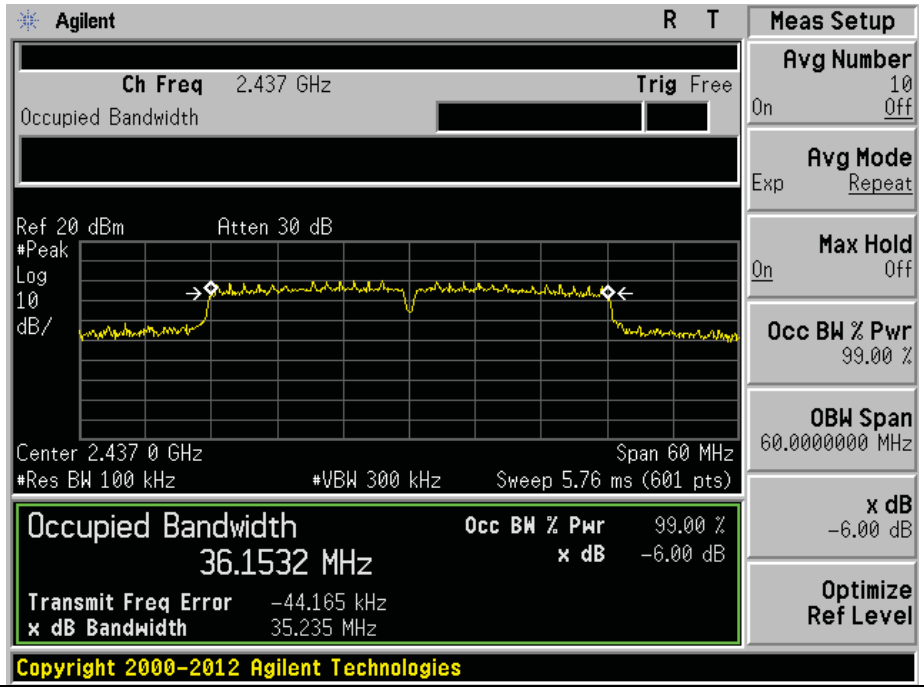


Ant.2

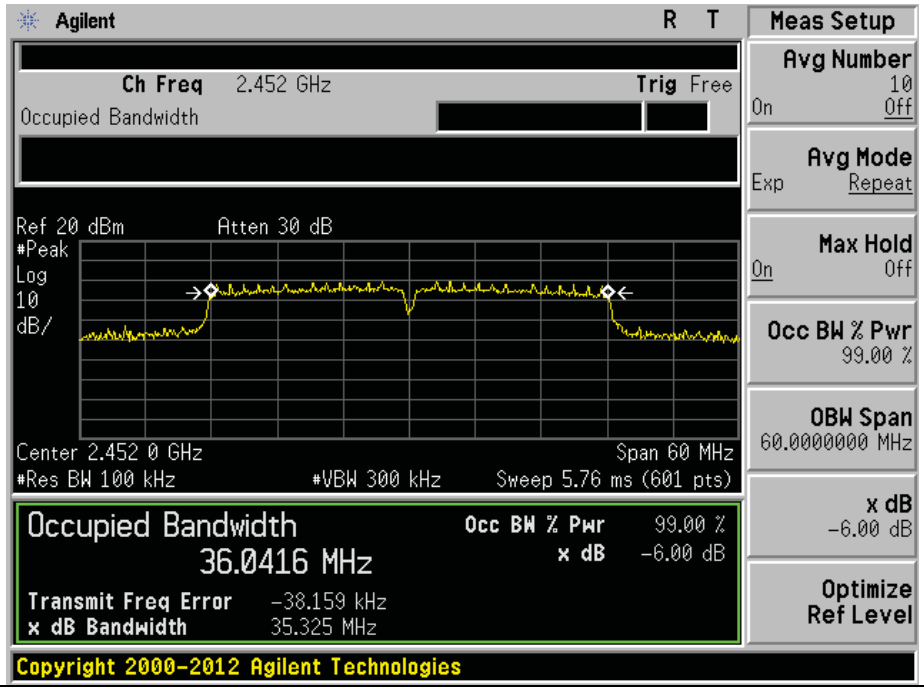
TX CH 03



TX CH 06



TX CH 09


Agilent
R T
Meas Setup
Ch Freq 2.452 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
60.0000000 MHz
Center 2.452 0 GHz
Span 60 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 5.76 ms (601 pts)
Occupied Bandwidth
36.0416 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error -38.159 kHz
x dB Bandwidth 35.325 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

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

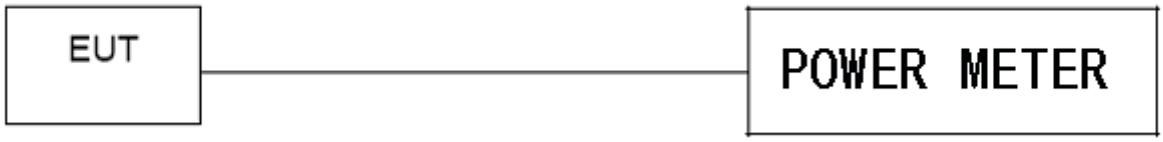
6.1.1 TEST PROCEDURE

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 5V from PC

	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	1.82	1.52	2.95	4.70	30
		Ant.2	1.55	1.43			
	2437	Ant.1	1.61	1.45	2.85	4.55	30
		Ant.2	1.46	1.40			
	2462	Ant.1	1.40	1.38	2.80	4.47	30
		Ant.2	1.52	1.42			
802.11g	2412	Ant.1	0.97	1.25	2.37	3.75	30
		Ant.2	0.49	1.12			
	2437	Ant.1	0.79	1.20	2.25	3.52	30
		Ant.2	0.21	1.05			
	2462	Ant.1	0.33	1.08	2.08	3.18	30
		Ant.2	0.00	1.00			
802.11n20	2412	Ant.1	0.61	1.15	2.22	3.47	30
		Ant.2	0.29	1.07			
	2437	Ant.1	0.00	1.00	2.10	3.22	30
		Ant.2	0.41	1.10			
	2462	Ant.1	0.41	1.10	2.30	3.62	30
		Ant.2	0.79	1.20			
802.11n40	2422	Ant.1	-0.36	0.92	1.82	2.59	30
		Ant.2	-0.46	0.90			
	2437	Ant.1	-0.56	0.88	1.78	2.50	30
		Ant.2	-0.46	0.90			
	2452	Ant.1	-0.71	0.85	1.65	2.17	30
		Ant.2	-0.97	0.80			

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)).

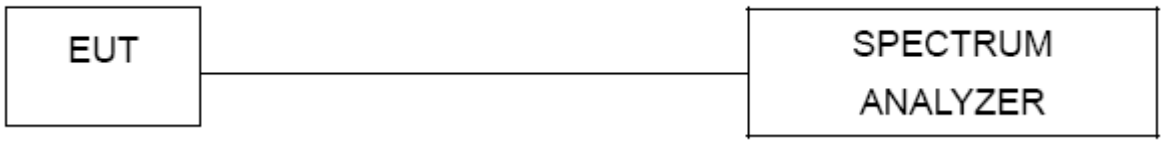
7.2 TEST PROCEDURE

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



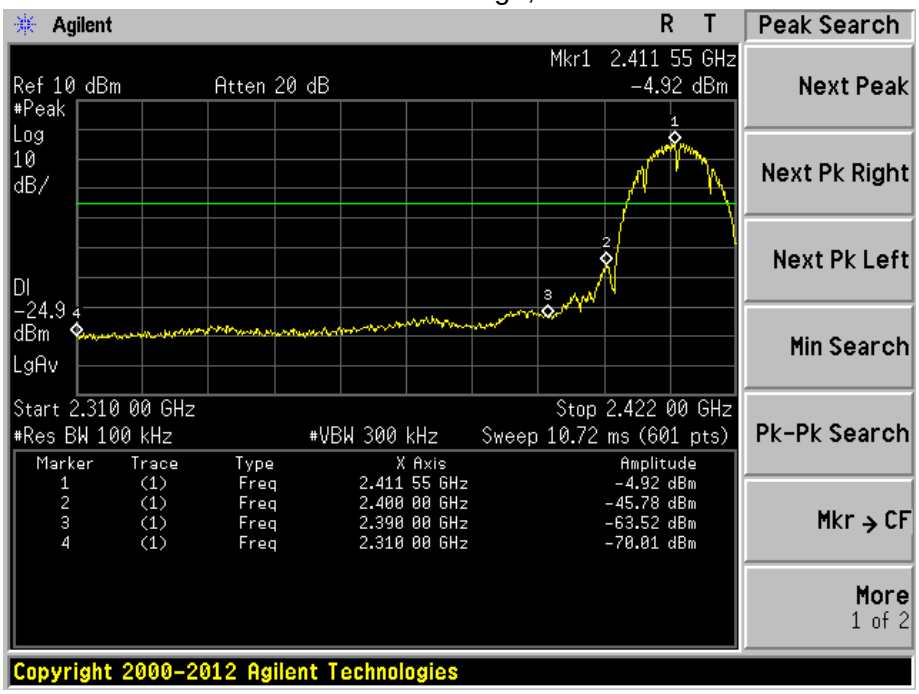
7.5 EUT OPERATION CONDITIONS

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.

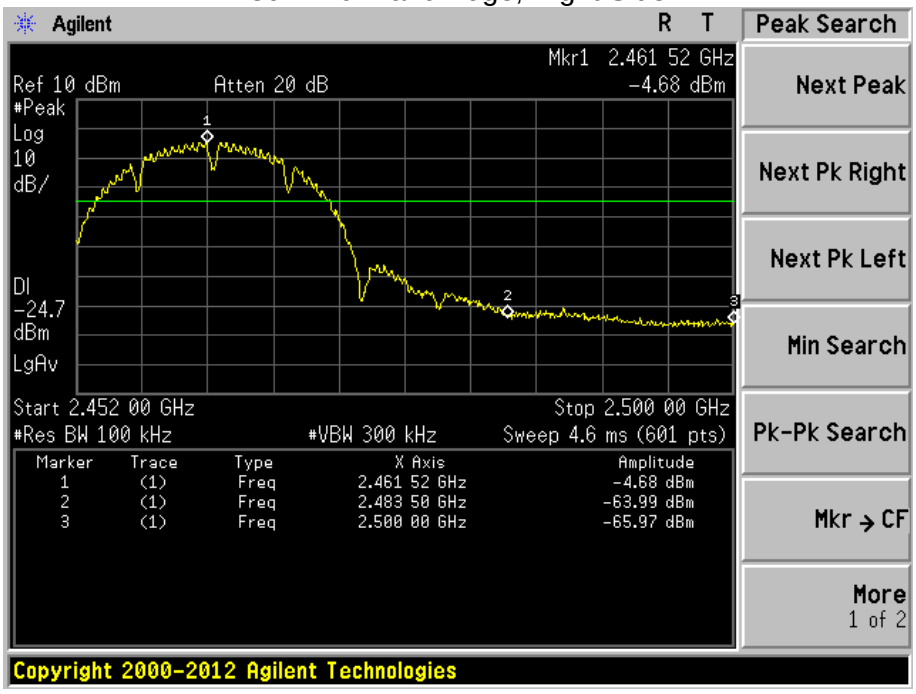
7.1 TEST RESULTS

Ant.1

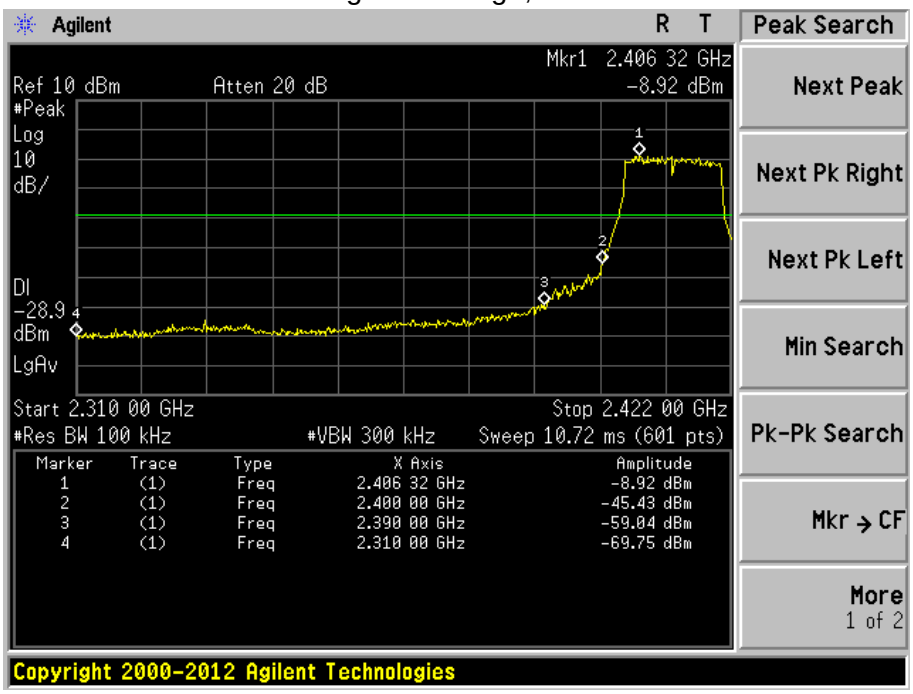
802.11b: Band Edge, Left Side



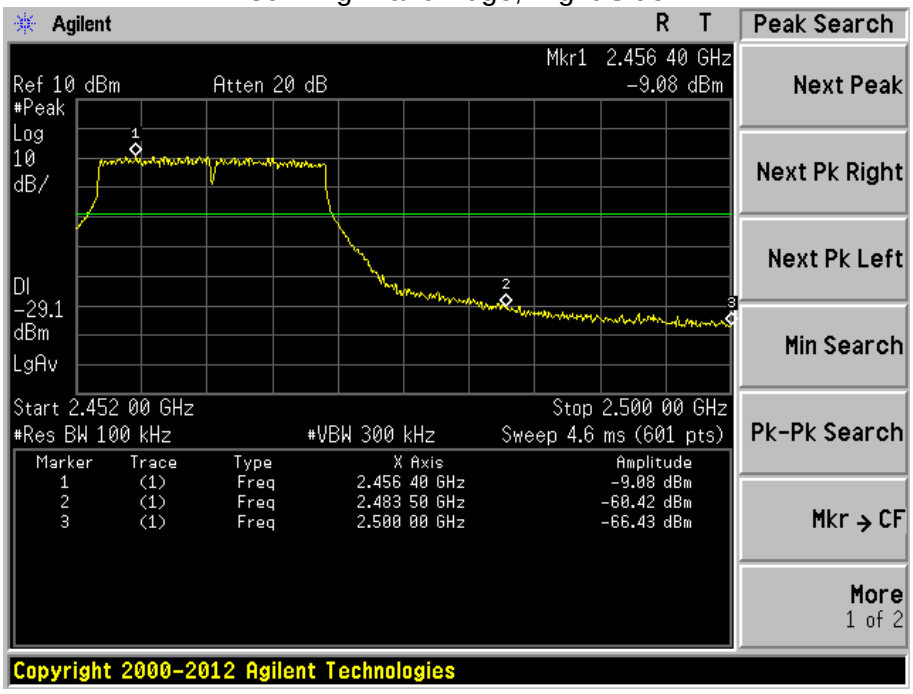
802.11b: Band Edge, Right Side



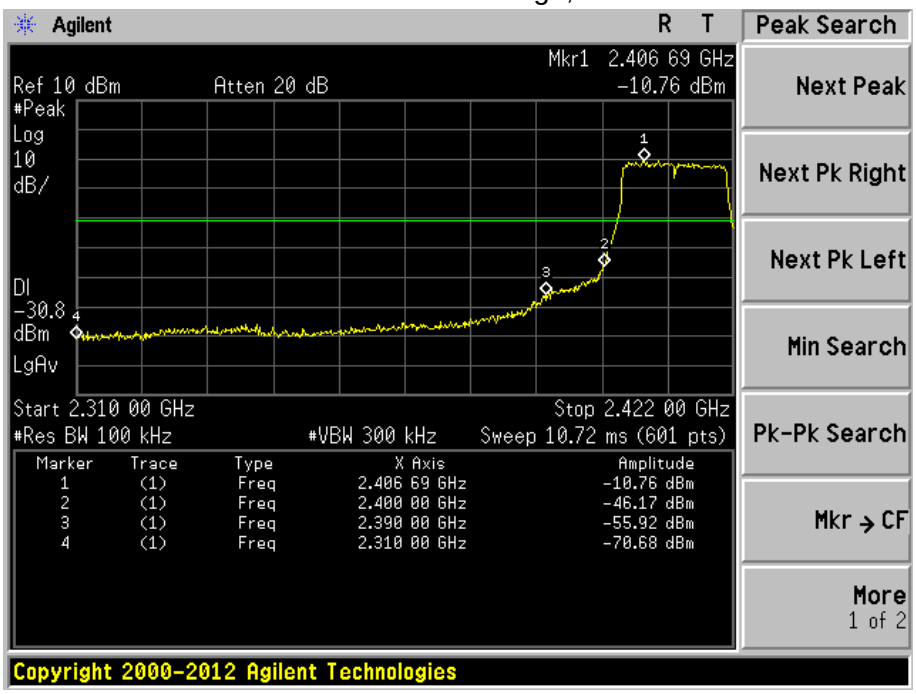
802.11g: Band Edge, Left Side



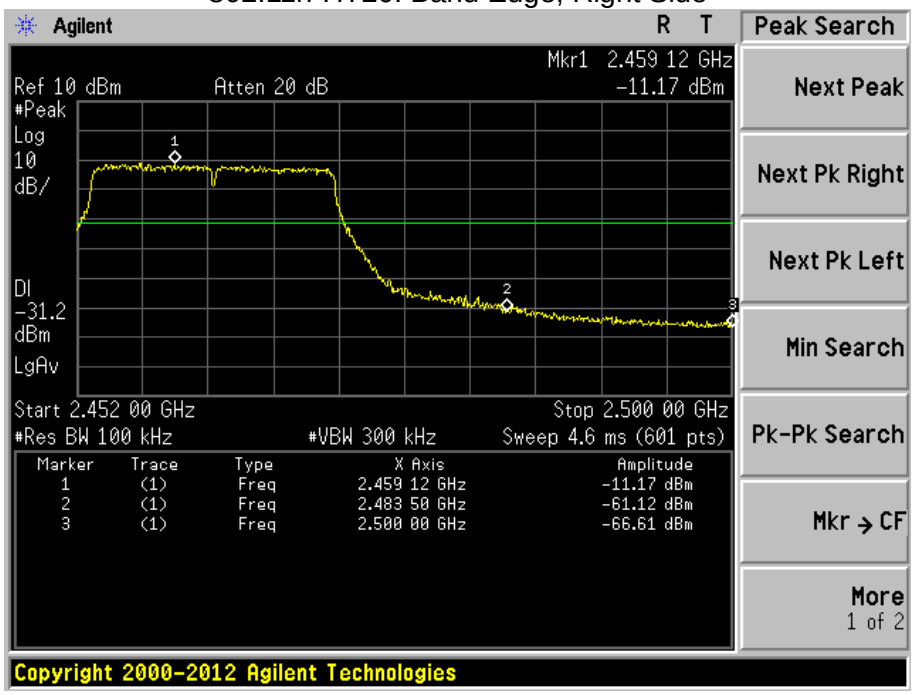
802.11g: Band Edge, Right Side



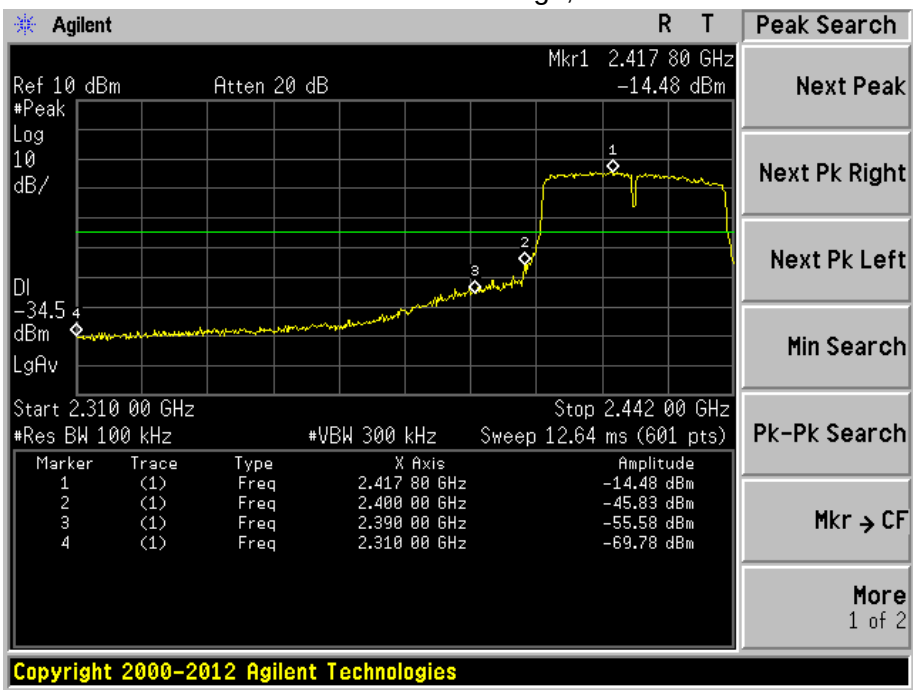
802.11n-HT20: Band Edge, Left Side



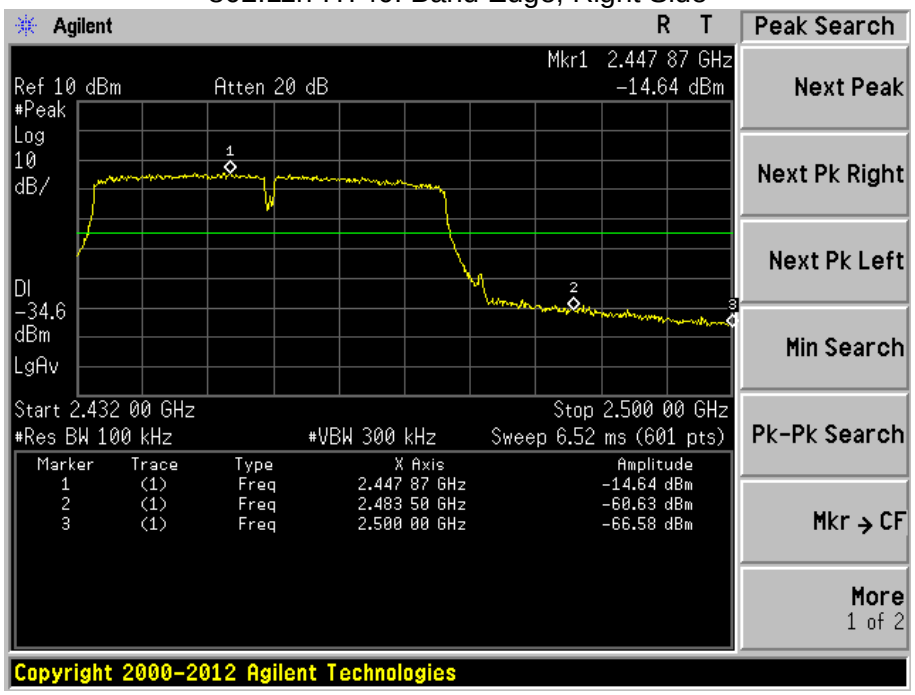
802.11n-HT20: Band Edge, Right Side



802.11n-HT40: Band Edge, Left Side

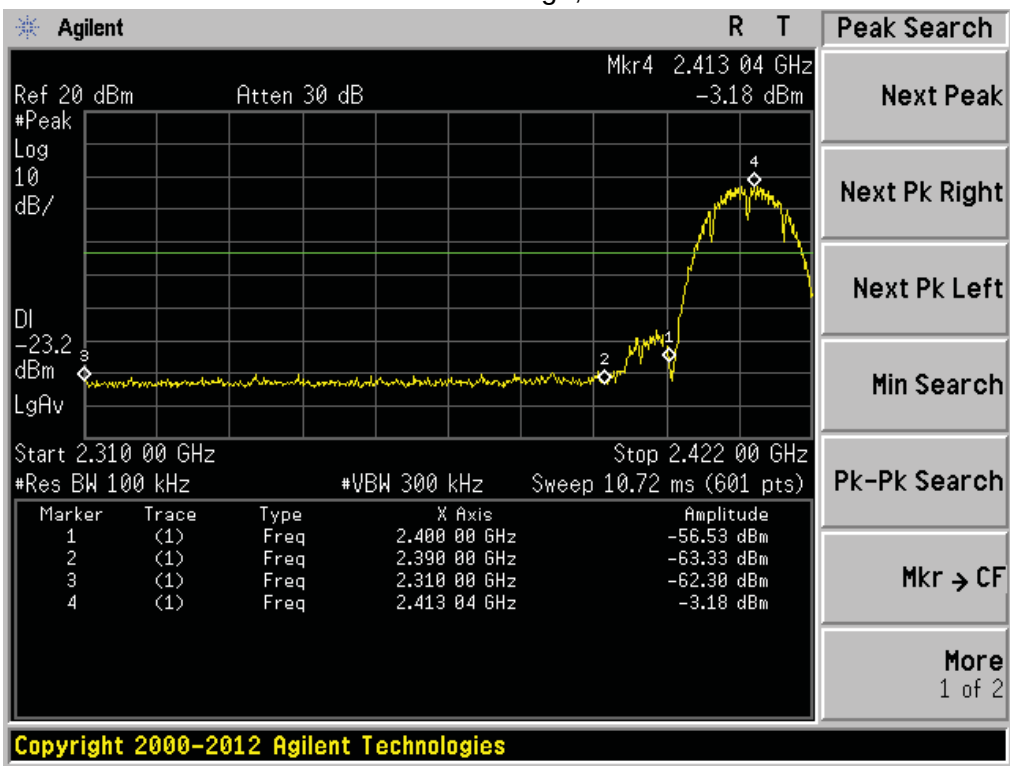


802.11n-HT40: Band Edge, Right Side

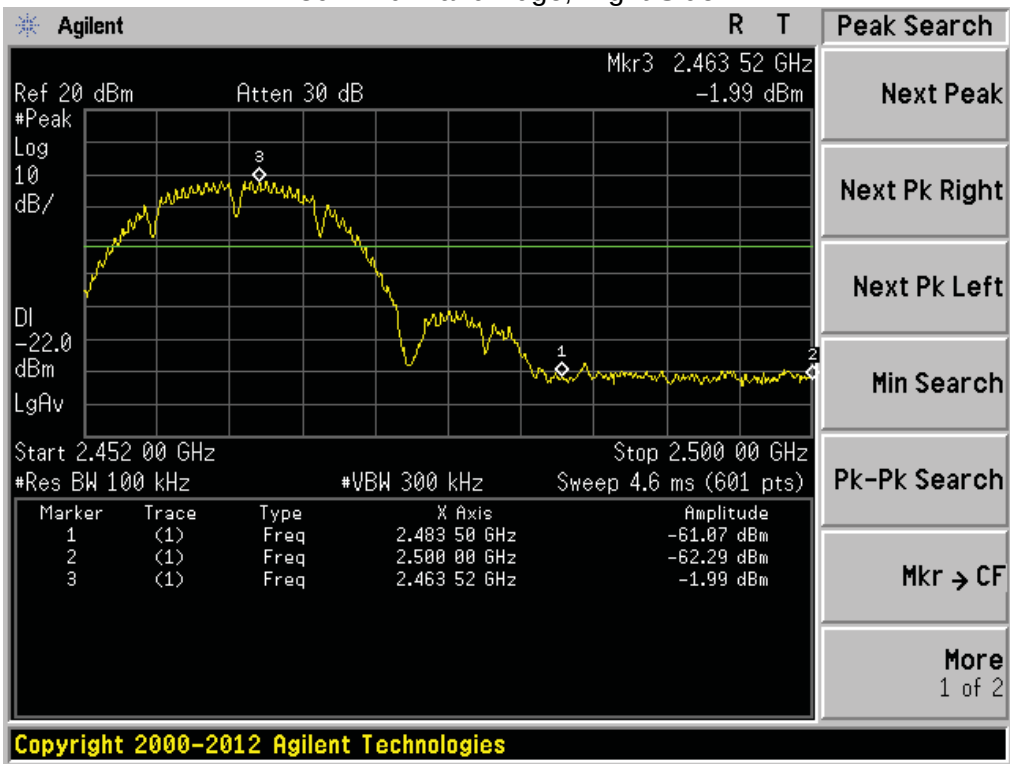


Ant.2

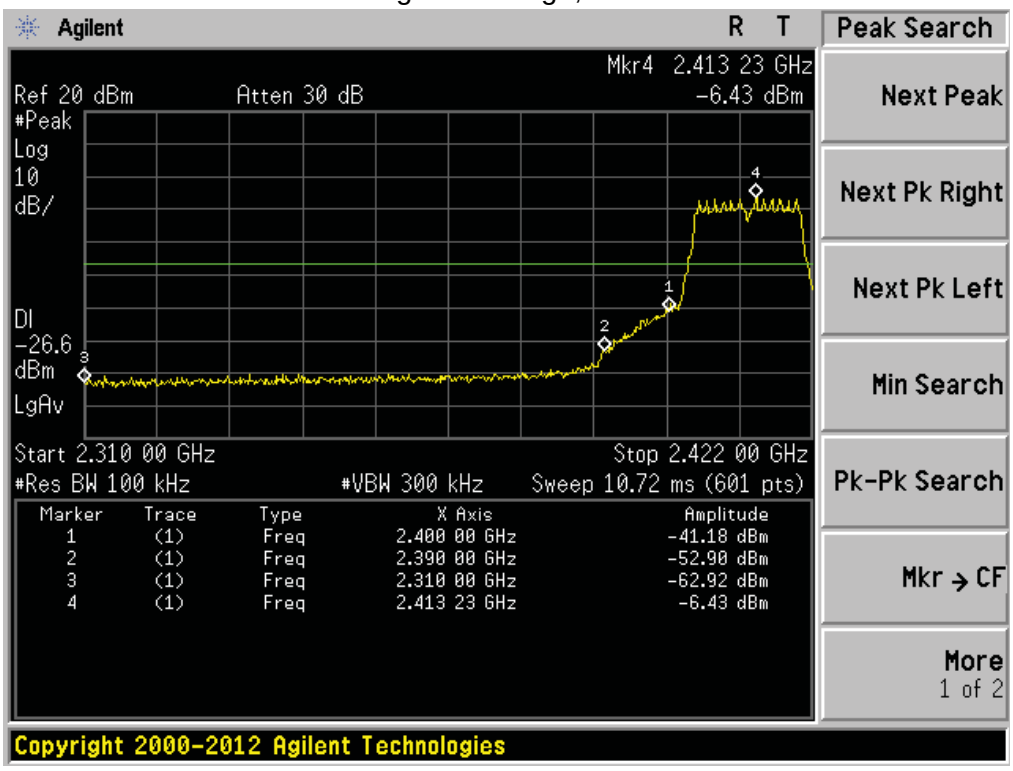
802.11b: Band Edge, Left Side



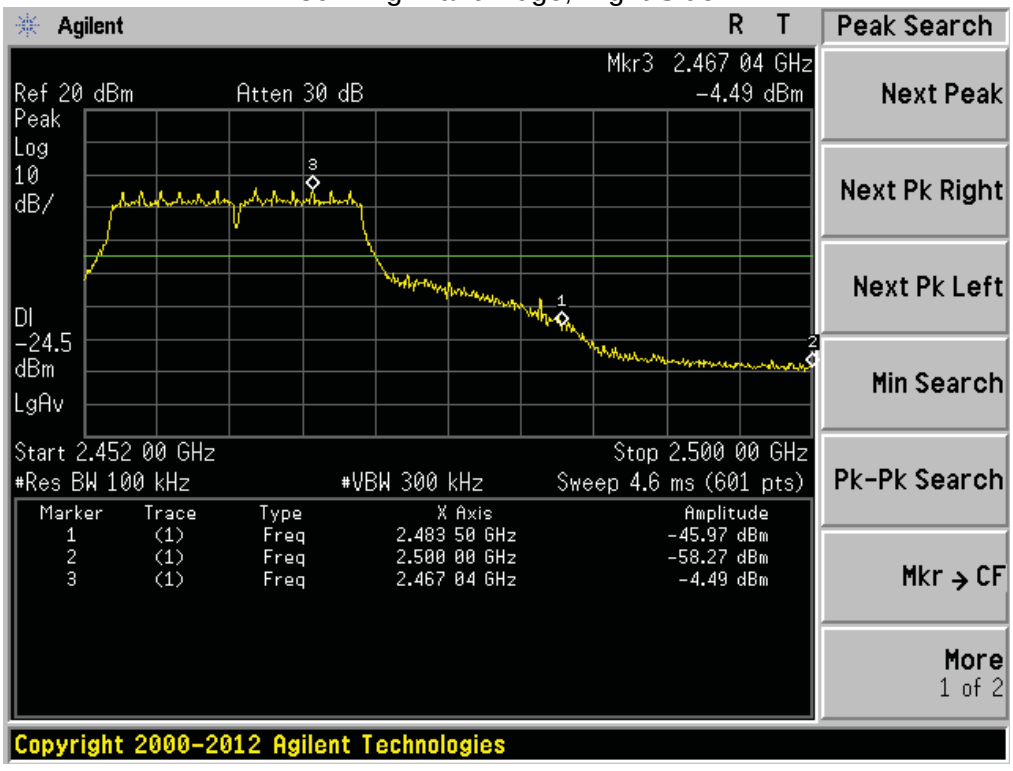
802.11b: Band Edge, Right Side



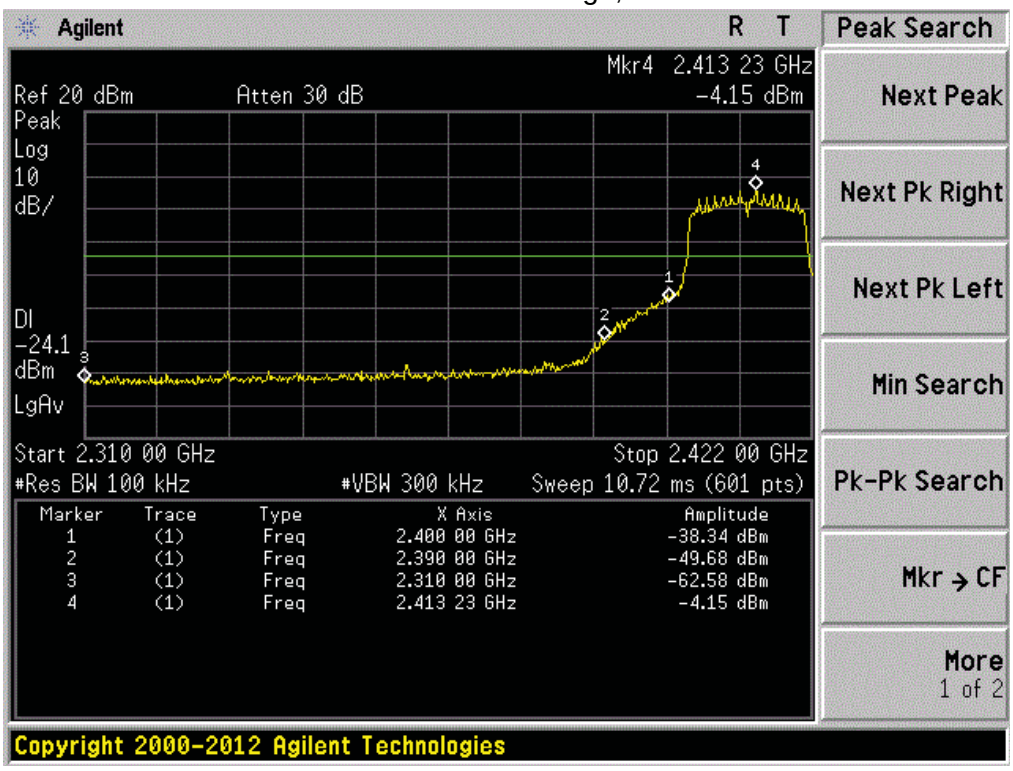
802.11g: Band Edge, Left Side



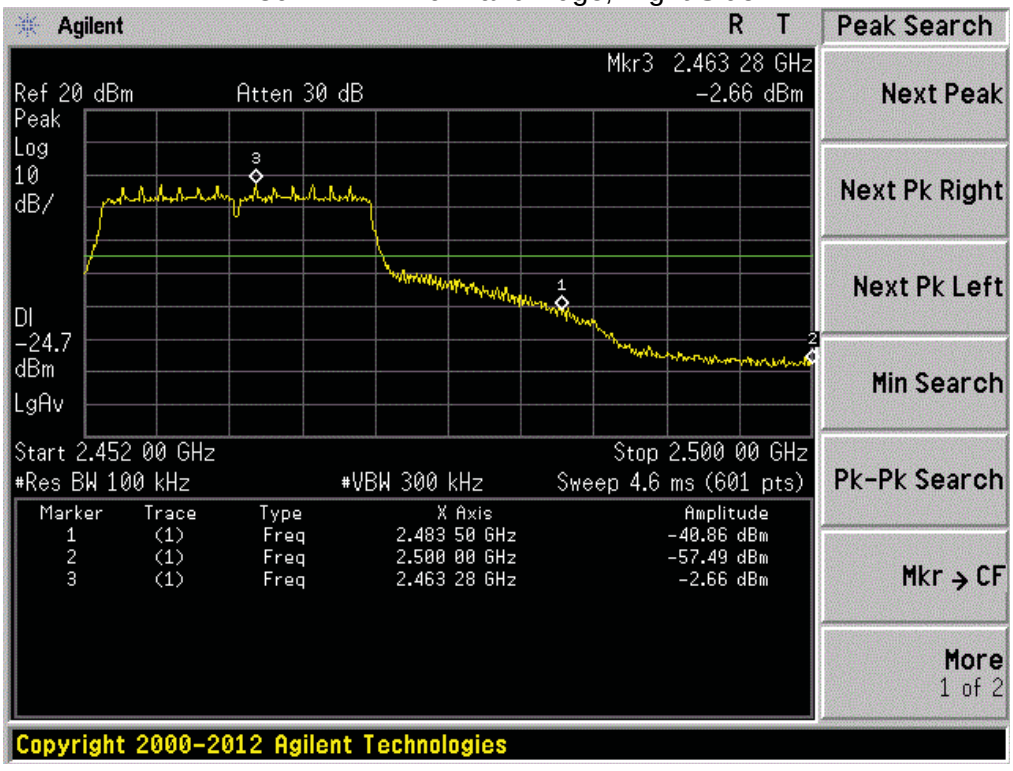
802.11g: Band Edge, Right Side



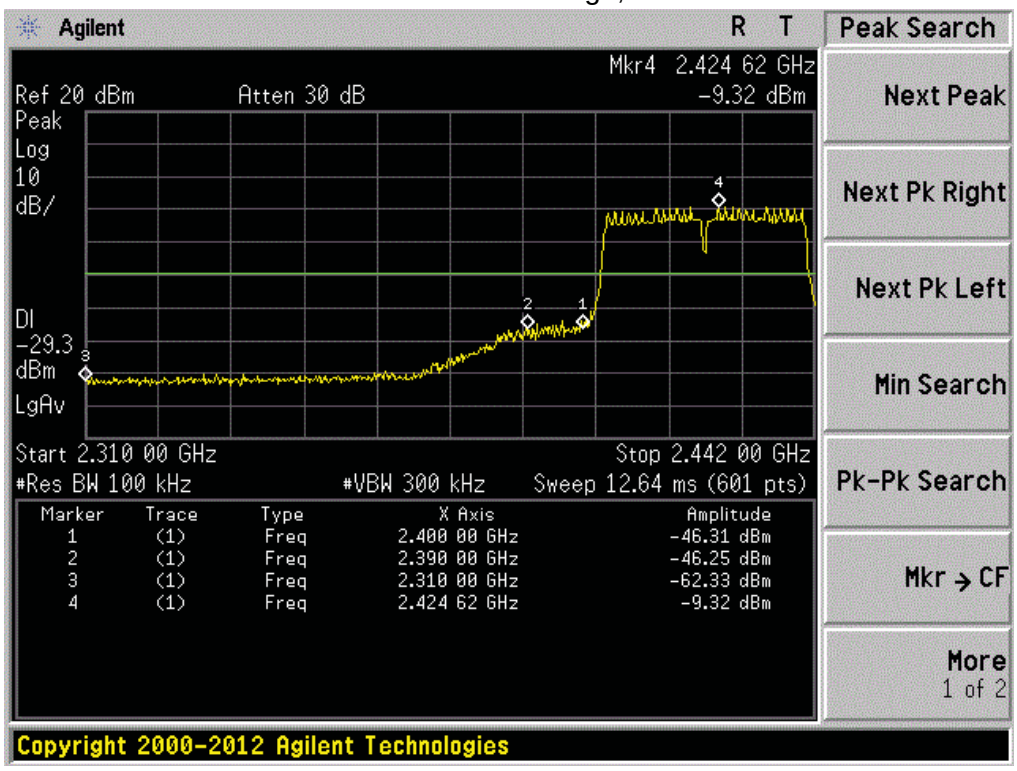
802.11n-HT20: Band Edge, Left Side



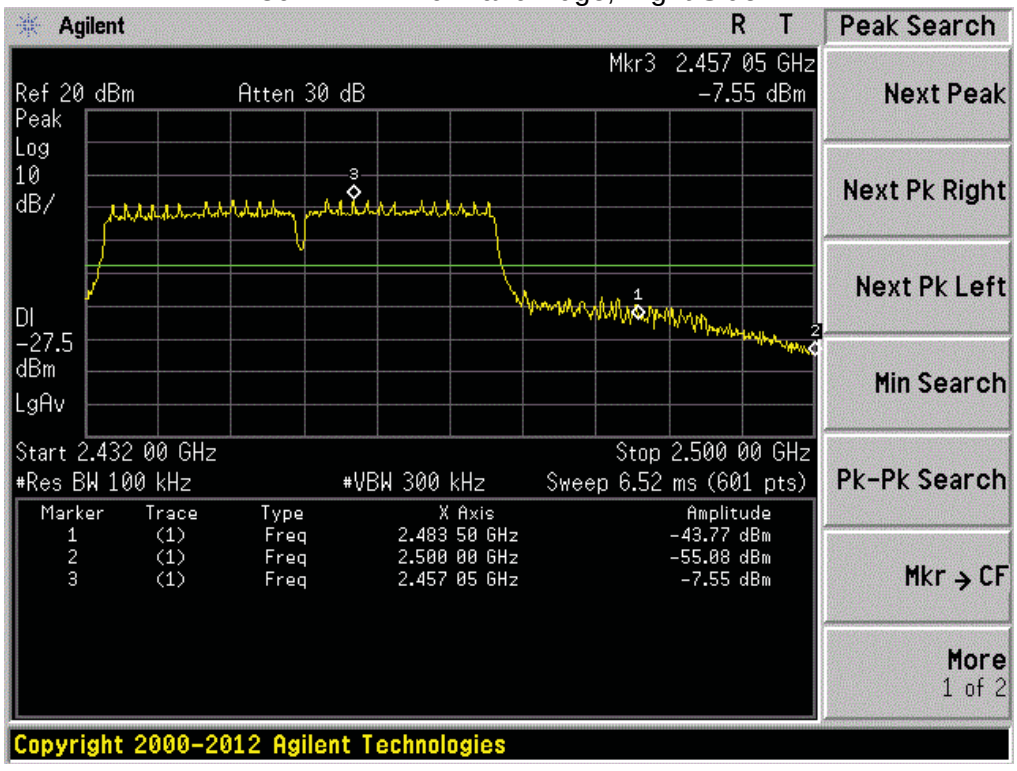
802.11n-HT20: Band Edge, Right Side



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.

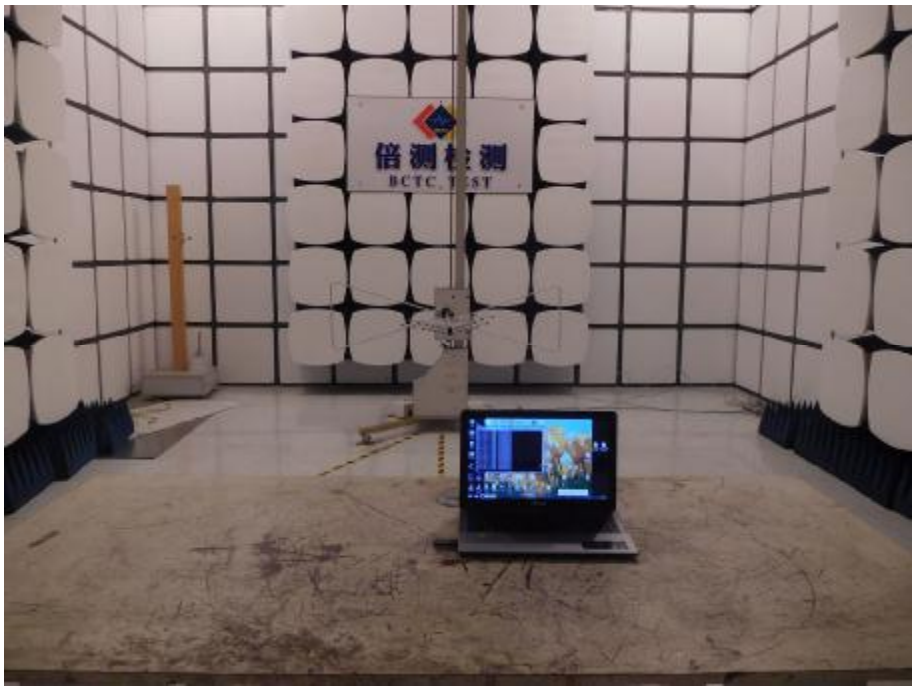
8.2 EUT ANTENNA

The EUT antenna is Integrated (PCB) antenna. It complies with the standard requirement.

9. EUT TEST PHOTO

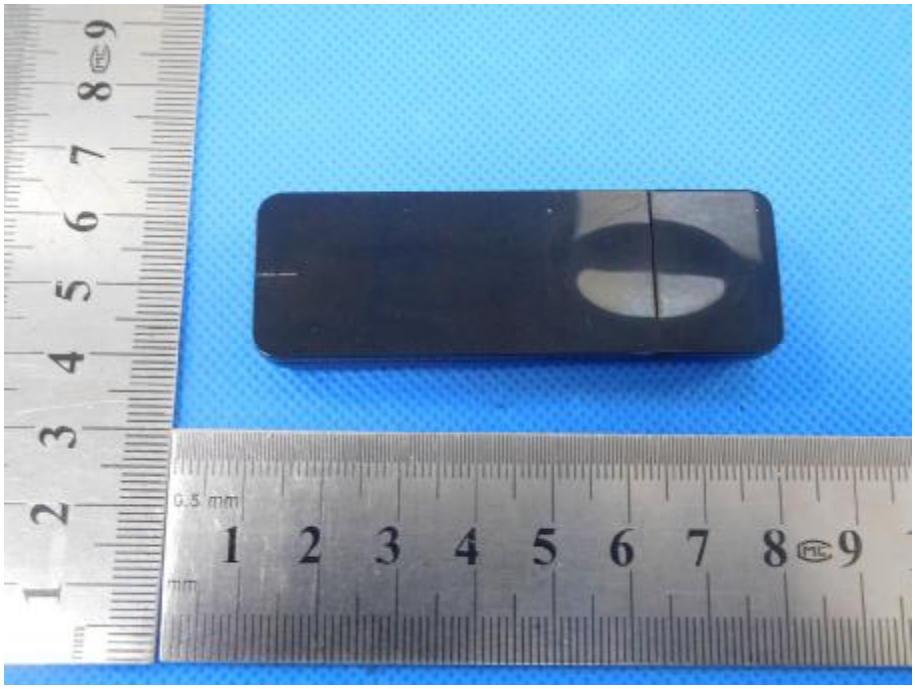
Conducted Measurement Photos

Radiated Measurement Photos



Radiated Measurement Photos

10. EUT PHOTO



※※※※※ **END OF REPORT** ※※※※※

FCC Part 15C Test Report

FCC ID: YWTWF5572N4B

Product Name:	300Mbps Wifi Adapter
Trademark:	N/A
Model Name :	GWF-4B06
Prepared For : Address :	Shenzhen Ogemray Technology Co., Ltd. 3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Prepared By : Address :	Shenzhen BCTC Technology Co., Ltd. No.101,Yousong Road,Longhua New District, Shenzhen,China
Test Date:	Jul. 06– Jul. 13, 2016
Date of Report :	Jul. 13, 2016
Report No.:	BCTC-160608467E

TEST RESULT CERTIFICATION

Applicant's name	:	Shenzhen Ogemray Technology Co., Ltd.
Address	:	3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Manufacture's Name	:	Shenzhen Ogemray Technology Co., Ltd.
Address	:	3F-4F, Plant 5, Dongwu Industrial Area,North of Donghuan 1st Road, Longhua office, Longhua New District, Shenzhen , Guangdong, China
Product description		
Product name	:	300Mbps Wifi Adapter
Model and/or type reference	:	GWF-4B06
Standards	:	FCC Part15.247 ANSI C63.10:2013 KDB 558074 D01 DTS Meas Guidance v03r03

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.

This report shall not be reproduced except in full, without the written approval of BCTC, this document may be altered or revised by BCTC, personal only, and shall be noted in the revision of the document.

Testing Engineer	:	Eric Yang
Reviewer (Supervisor)	:	Jade Yang
Approved & Authorized Signer(Manager)	:	Carson Zhang

Table of Contents

Page

1 . SUMMARY OF TEST RESULTS 5

1.1 TEST FACILITY 6

1.2 MEASUREMENT UNCERTAINTY 6

2 . GENERAL INFORMATION 7

2.1 GENERAL DESCRIPTION OF EUT 7

2.2 DESCRIPTION OF TEST MODES 8

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 9

2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE) 9

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS 10

3 . EMC EMISSION TEST 11

3.1 CONDUCTED EMISSION MEASUREMENT 11

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS 11

3.1.2 TEST PROCEDURE 11

3.1.3 DEVIATION FROM TEST STANDARD 11

3.1.4 TEST SETUP 12

3.1.5 EUT OPERATING CONDITIONS 12

3.1.6 TEST RESULTS 13

3.2 RADIATED EMISSION MEASUREMENT 15

3.2.1 RADIATED EMISSION LIMITS 15

3.2.2 TEST PROCEDURE 16

3.2.3 DEVIATION FROM TEST STANDARD 16

3.2.4 TEST SETUP 16

3.2.5 EUT OPERATING CONDITIONS 17

3.2.6 TEST RESULTS (BETWEEN 9KHZ – 30 MHZ) 18

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ) 19

3.2.8 TEST RESULTS (1GHZ~25GHZ) 21

3.3 RADIATED BAND EMISSION MEASUREMENT 25

3.3.1 TEST REQUIREMENT: 25

3.3.2 TEST PROCEDURE 25

3.3.3 DEVIATION FROM TEST STANDARD 26

3.3.4 TEST SETUP 26

3.3.5 EUT OPERATING CONDITIONS 26

4 . POWER SPECTRAL DENSITY TEST 31

Table of Contents

Page

4.1 APPLIED PROCEDURES / LIMIT 31
4.1.1 TEST PROCEDURE 31
4.1.2 DEVIATION FROM STANDARD 31
4.1.3 TEST SETUP 31
4.1.4 EUT OPERATION CONDITIONS 31
4.1.5 TEST RESULTS 32

5 . BANDWIDTH TEST 48
5.1 APPLIED PROCEDURES / LIMIT 48
5.1.1 TEST PROCEDURE 48
5.1.2 DEVIATION FROM STANDARD 48
5.1.3 TEST SETUP 48
5.1.4 EUT OPERATION CONDITIONS 48
5.1.5 TEST RESULTS 49

6 . PEAK OUTPUT POWER TEST 65
6.1 APPLIED PROCEDURES / LIMIT 65
6.1.1 TEST PROCEDURE 65
6.1.2 DEVIATION FROM STANDARD 65
6.1.3 TEST SETUP 65
6.1.4 EUT OPERATION CONDITIONS 65
6.1.5 TEST RESULTS 66

7 . 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE 67
7.1 APPLICABLE STANDARD 67
7.2 TEST PROCEDURE 67
7.3 DEVIATION FROM STANDARD 67
7.4 TEST SETUP 67
7.5 EUT OPERATION CONDITIONS 68
7.1 TEST RESULTS 68

8 . ANTENNA REQUIREMENT 77
8.1 STANDARD REQUIREMENT 77
8.2 EUT ANTENNA 77

9 . EUT TEST PHOTO 78

10 . EUT PHOTO 80

APPENDIX-PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS

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 ± 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	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	300Mbps Wifi Adapter
Trade Name	N/A
Model Name	GWF-4B06
Model Difference	N/A
Product Description	The EUT is a 300Mbps Wifi Adapter 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.
Power	DC 5V
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	PCB Antenna	N/A	2.0	
2	N/A	N/A	PCB Antenna	N/A	2.0	

Note1: Directional Gain=2dBi+10log(2)=5.01dBi

Note2: The EUT incorporates a mimo funtion. Physically, the EUT provide two completed transmitter and two receivers.

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

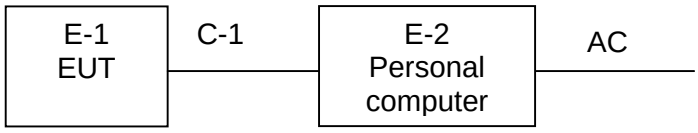
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n20 CH1/ CH6/ CH11
Mode 4	802.11n40 CH3/ CH6/ CH9

Note:

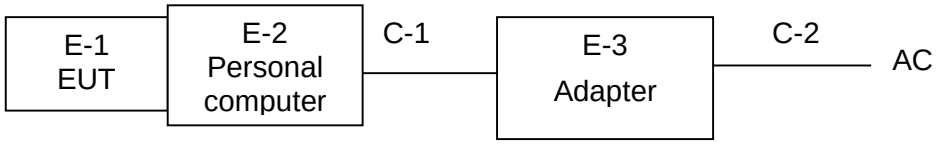
(1) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported.

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	300Mbps Wifi Adapter	N/A	GWF-4B06	N/A	EUT
E-2	Personal computer	N/A	X550C	N/A	N/A
E-3	Adapter	N/A	AD887520	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.5M	DC cable unshielded
C-2	NO	NO	0.2M	AC cable 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	2016.07.06	2017.07.05
5	Spectrum Analyzer	Agilent	N9020A	MY5051041	2016.07.06	2017.07.05
6	Horn Antenna	SCHWARZBECK	9120D	9120D-1275	2015.08.25	2016.08.24
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2016.07.06	2017.07.05
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	PLGWF-4B 0630/B	1029	2016.07.06	2017.07.05
11	Power Meter	R&S	NRVS	100696	2016.07.06	2017.07.05
12	Power Sensor	R&S	NRV-Z55	161905	2016.07.06	2017.07.05
13	RF cables	R&S	N/A	N/A	2016.07.06	2017.07.05

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	2016.06.06	2017.06.05
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	2016.06.07	2017.06.06
5	RF cables	R&S	R204	R20X	2016.07.06	2017.07.05

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.

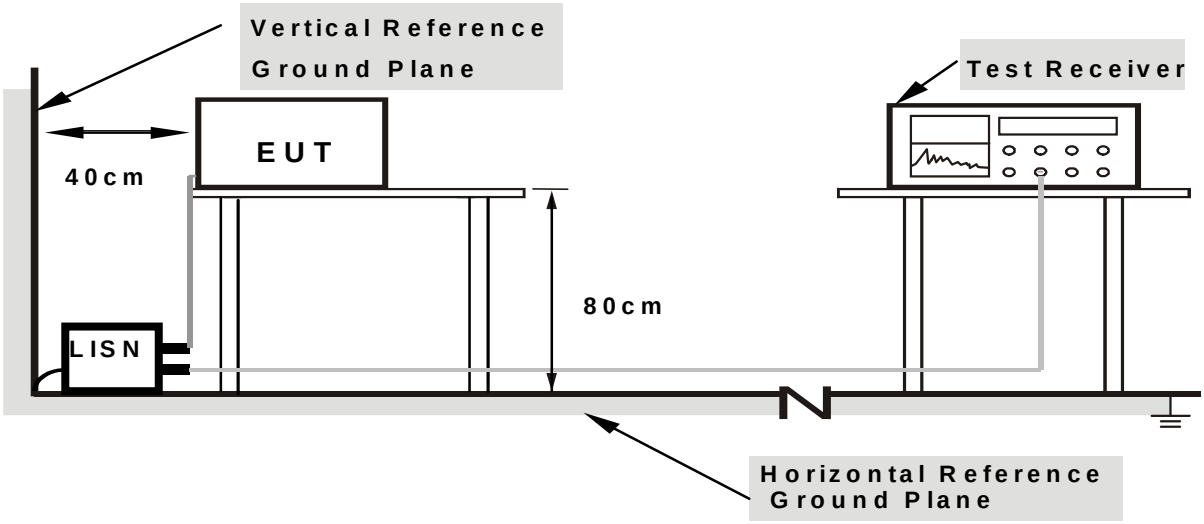
d. LISN at least 80 cm from nearest part of EUT chassis.

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 from other units and other metal planes

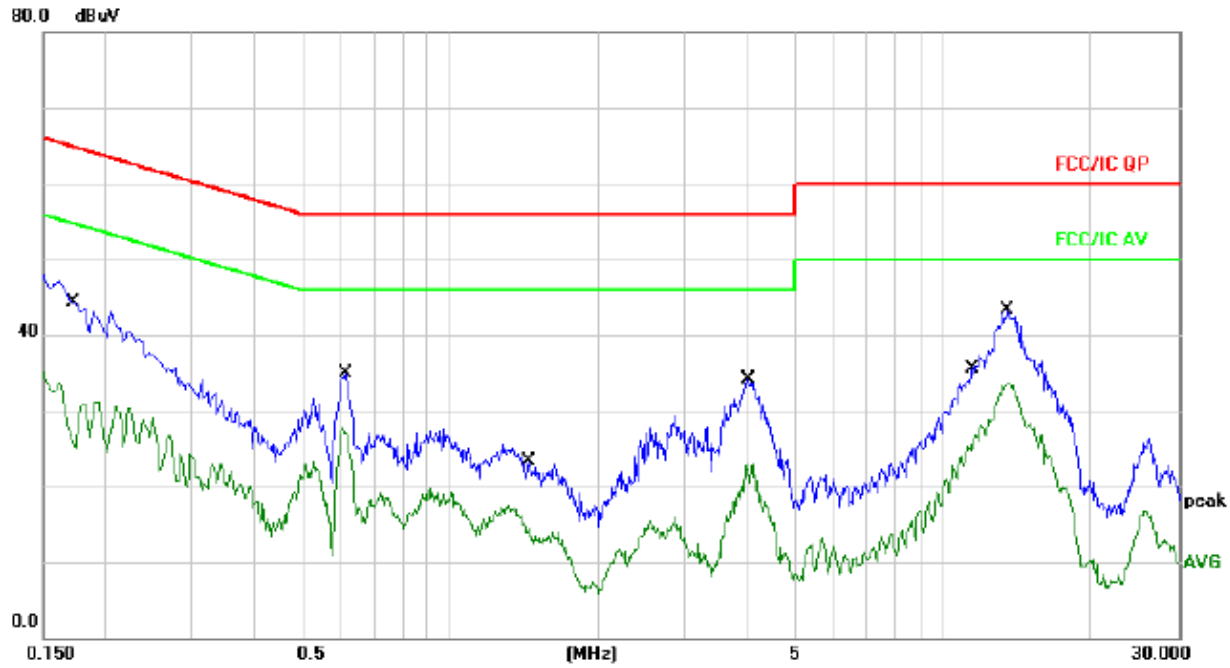
3.1.5 EUT OPERATING CONDITIONS

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

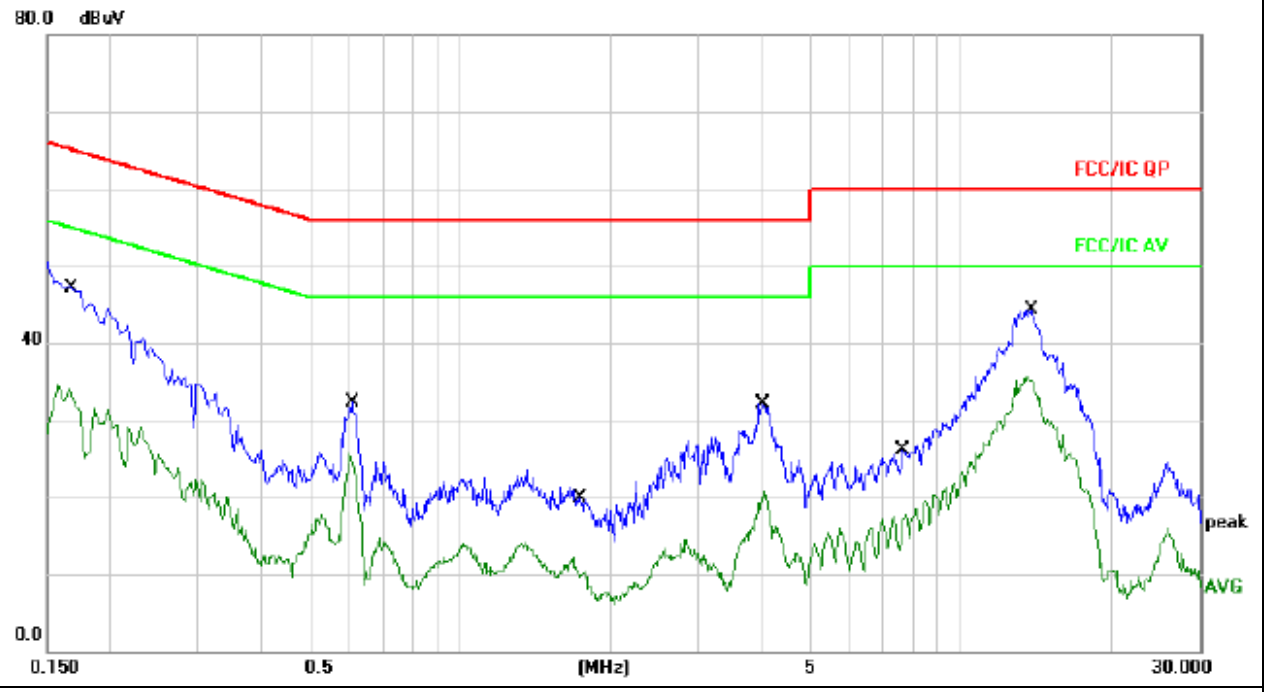
Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from PC	Test Mode：	Mode 5



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		0.1749	33.87	10.06	43.93	64.72	-20.79	QP	
2		0.1749	21.00	10.06	31.06	54.72	-23.66	AVG	
3		0.6140	24.82	10.13	34.95	56.00	-21.05	QP	
4		0.6140	8.98	10.13	19.11	46.00	-26.89	AVG	
5		1.4460	13.18	10.17	23.35	56.00	-32.65	QP	
6		1.4460	3.77	10.17	13.94	46.00	-32.06	AVG	
7		4.0380	24.00	10.16	34.16	56.00	-21.84	QP	
8		4.0380	7.99	10.16	18.15	46.00	-27.85	AVG	
9		11.4980	25.47	10.13	35.60	60.00	-24.40	QP	
10		11.4980	16.04	10.13	26.17	50.00	-23.83	AVG	
11	*	13.5140	33.17	10.14	43.31	60.00	-16.69	QP	
12		13.5140	21.77	10.14	31.91	50.00	-18.09	AVG	

Temperature：	26℃	Relative Humidity：	54%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from PC	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		0.1700	36.75	10.06	46.81	64.96	-18.15	QP	
2		0.1700	22.30	10.06	32.36	54.96	-22.60	AVG	
3		0.6100	22.20	10.13	32.33	56.00	-23.67	QP	
4		0.6100	13.89	10.13	24.02	46.00	-21.98	AVG	
5		1.7420	9.72	10.18	19.90	56.00	-36.10	QP	
6		1.7420	-0.25	10.18	9.93	46.00	-36.07	AVG	
7		4.0220	21.95	10.16	32.11	56.00	-23.89	QP	
8		4.0220	4.31	10.16	14.47	46.00	-31.53	AVG	
9		7.6700	16.10	10.10	26.20	60.00	-33.80	QP	
10		7.6700	8.50	10.10	18.60	50.00	-31.40	AVG	
11	*	13.8460	34.19	10.14	44.33	60.00	-15.67	QP	
12		13.8460	20.86	10.14	31.00	50.00	-19.00	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:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic 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 (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.
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.

Above 1GHz test procedure as below:

g. 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).
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel

Note:

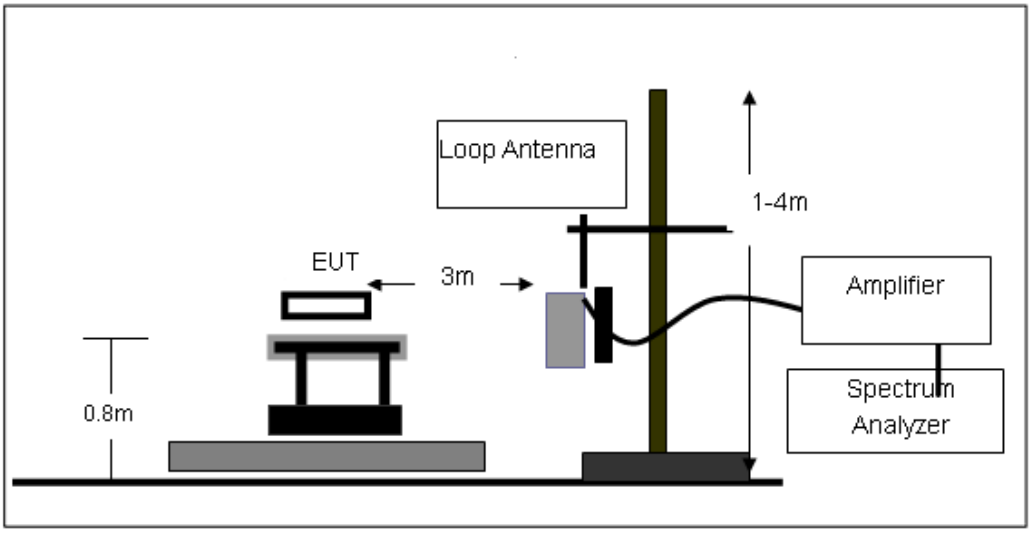
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported
We pretest AC 120V and AC 240V, the worst voltage was AC 120V and the data recording in t he report.

3.2.3 DEVIATION FROM TEST STANDARD

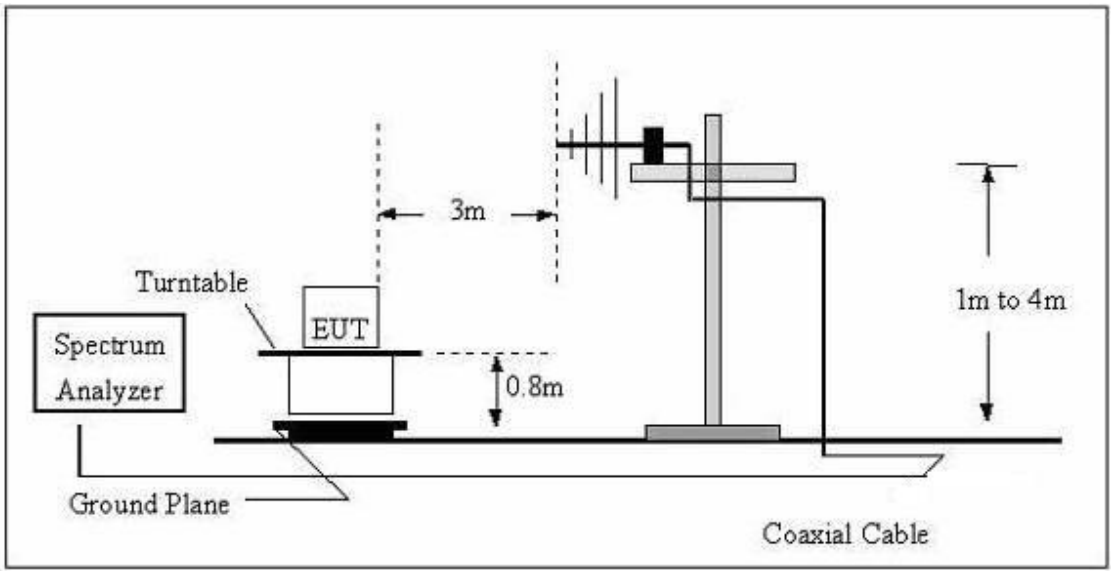
No deviation

3.2.4 TEST SETUP

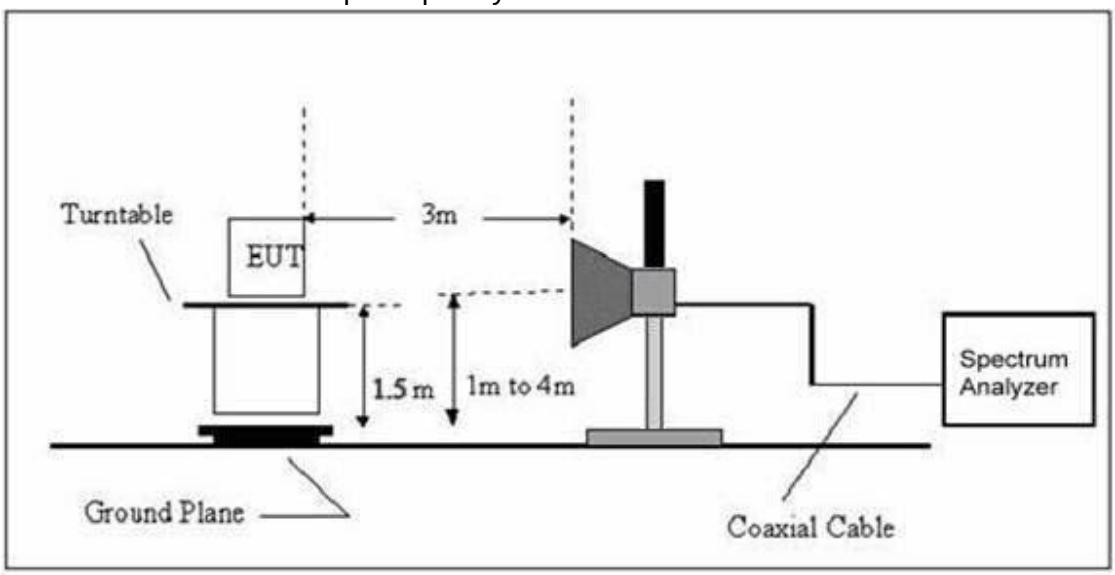
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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 Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 5V from PC
Test Mode ：	Mode 5	Polarization :	--

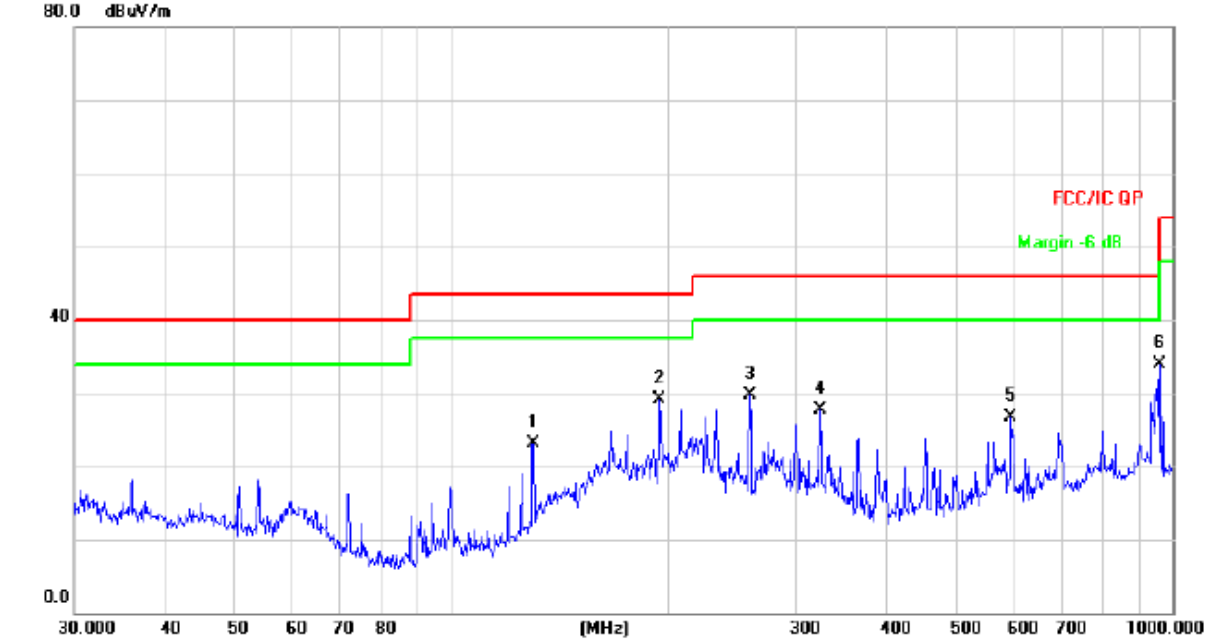
Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

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 (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.2.7 TEST RESULTS (BETWEEN 30MHZ – 1GHZ)

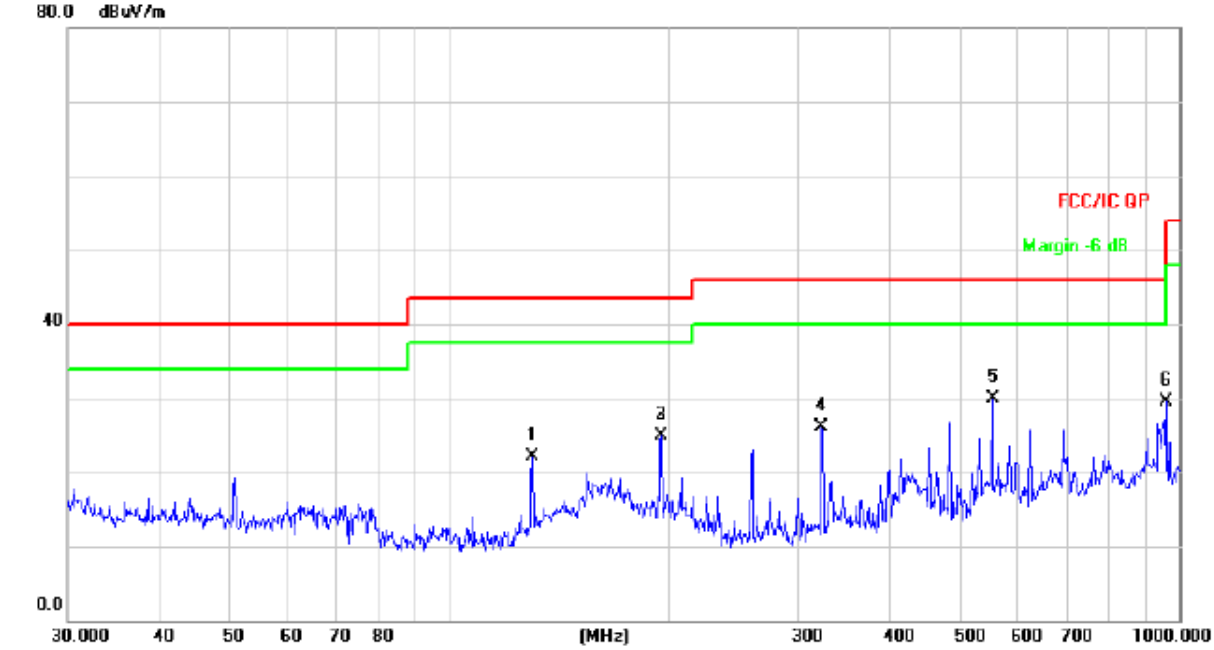
Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Horizontal
Test Voltage :	DC 5V from PC		
Test Mode :	Mode 5		



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	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.9226	37.25	-14.11	23.14	43.50	-20.36	QP			
2	*	194.4534	44.88	-15.86	29.02	43.50	-14.48	QP			
3		259.2338	43.67	-13.94	29.73	46.00	-16.27	QP			
4		324.4561	39.74	-11.95	27.79	46.00	-18.21	QP			
5		597.2234	32.44	-5.77	26.67	46.00	-19.33	QP			
6		962.1623	34.39	-0.42	33.97	54.00	-20.03	QP			

Temperature :	26℃	Relative Humidity :	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 5V from PC		
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	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		129.9226	36.13	-14.11	22.02	43.50	-21.48	QP			
2		195.1365	40.82	-15.90	24.92	43.50	-18.58	QP			
3		195.1365	40.82	-15.90	24.92	43.50	-18.58	QP			
4		323.3204	38.04	-11.98	26.06	46.00	-19.94	QP			
5	*	554.8254	36.78	-6.96	29.82	46.00	-16.18	QP			
6		962.1623	29.86	-0.42	29.44	54.00	-24.56	QP			

3.2.8 TEST RESULTS (1GHZ~25GHZ)

802.11b

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2412							
V	4824.00	66.01	39.55	7.85	25.66	59.97	74	-14.03	PK
V	4824.00	49.47	39.55	7.85	25.66	43.43	54	-10.57	AV
V	7236.00	66.25	38.33	7.52	24.55	59.99	74	-14.01	PK
V	7236.00	47.55	38.33	7.52	24.55	41.29	54	-12.71	AV
V	15450.00	50.83	35.23	6.75	26.59	48.94	74	-25.06	PK
H	4824.00	63.05	39.55	7.85	25.66	57.01	74	-16.99	PK
H	4824.00	49.28	39.55	7.85	25.66	43.24	54	-10.76	AV
H	7236.00	69.01	38.33	7.52	23.55	61.75	74	-12.25	PK
H	7236.00	50.81	38.33	7.52	23.22	43.22	54	-10.78	AV
H	15450.00	45.69	35.45	6.75	27.88	44.87	74	-29.13	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	65.56	38.89	7.57	25.45	59.69	74	-14.31	PK
V	4874.00	48.65	38.89	7.57	25.45	42.78	54	-11.22	AV
V	7311.00	66.68	38.78	7.35	24.78	60.03	74	-13.97	PK
V	7311.00	48.25	38.78	7.35	24.78	41.60	54	-12.40	AV
V	15450.00	52.36	35.89	6.42	26.47	49.36	74	-24.64	PK
H	4874.00	64.89	38.89	7.57	25.45	59.02	74	-14.98	PK
H	4874.00	49.55	38.89	7.57	25.45	43.68	54	-10.32	AV
H	7311.00	70.35	38.78	7.35	24.78	63.70	74	-10.30	PK
H	7311.00	48.81	38.78	7.35	24.78	42.16	54	-11.84	AV
H	15450.00	48.69	36.68	6.45	26.65	45.11	74	-28.89	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2462							
V	4924.00	67.56	38.75	7.46	25.45	61.72	74	-12.28	PK
V	4924.00	48.65	38.75	7.46	25.45	42.81	54	-11.19	AV
V	7386.00	68.68	38.65	7.22	24.78	62.03	74	-11.97	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.36	35.58	6.35	26.47	50.60	74	-23.40	PK
H	4924.00	66.89	38.75	7.46	25.45	61.05	74	-12.95	PK
H	4924.00	50.59	38.75	7.46	25.45	44.75	54	-9.25	AV
H	7386.00	69.35	38.65	7.22	24.78	62.70	74	-11.30	PK
H	7386.00	48.56	38.65	7.22	24.78	41.91	54	-12.09	AV
H	15450.00	49.69	36.42	6.32	26.65	46.24	74	-27.76	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   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 (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2412							
V	4824.00	66.23	39.55	7.85	25.66	60.19	74	-13.81	PK
V	4824.00	49.58	39.55	7.85	25.66	43.54	54	-10.46	AV
V	7236.00	66.39	38.33	7.52	24.55	60.13	74	-13.87	PK
V	7236.00	47.67	38.33	7.52	24.55	41.41	54	-12.59	AV
V	15450.00	50.95	35.23	6.75	26.59	49.06	74	-24.94	PK
H	4824.00	63.25	39.55	7.85	25.66	57.21	74	-16.79	PK
H	4824.00	49.49	39.55	7.85	25.66	43.45	54	-10.55	AV
H	7236.00	69.35	38.33	7.52	23.55	62.09	74	-11.91	PK
H	7236.00	50.47	38.33	7.52	23.22	42.88	54	-11.12	AV
H	15450.00	45.78	35.45	6.75	27.88	44.96	74	-29.04	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
V	4874.00	48.96	38.89	7.57	25.45	43.09	54	-10.91	AV
V	7311.00	66.45	38.78	7.35	24.78	59.80	74	-14.20	PK
V	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
V	15450.00	52.59	35.89	6.42	26.47	49.59	74	-24.41	PK
H	4874.00	64.23	38.89	7.57	25.45	58.36	74	-15.64	PK
H	4874.00	49.75	38.89	7.57	25.45	43.88	54	-10.12	AV
H	7311.00	70.89	38.78	7.35	24.78	64.24	74	-9.76	PK
H	7311.00	48.78	38.78	7.35	24.78	42.13	54	-11.87	AV
H	15450.00	48.75	36.68	6.45	26.65	45.17	74	-28.83	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2462							
V	4924.00	67.89	38.75	7.46	25.45	62.05	74	-11.95	PK
V	4924.00	48.45	38.75	7.46	25.45	42.61	54	-11.39	AV
V	7386.00	68.57	38.65	7.22	24.78	61.92	74	-12.08	PK
V	7386.00	49.78	38.65	7.22	24.78	43.13	54	-10.87	AV
V	15450.00	53.66	35.58	6.35	26.47	50.90	74	-23.10	PK
H	4924.00	66.55	38.75	7.46	25.45	60.71	74	-13.29	PK
H	4924.00	50.44	38.75	7.46	25.45	44.60	54	-9.40	AV
H	7386.00	69.37	38.65	7.22	24.78	62.72	74	-11.28	PK
H	7386.00	48.88	38.65	7.22	24.78	42.23	54	-11.77	AV
H	15450.00	49.74	36.42	6.32	26.65	46.29	74	-27.71	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
   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	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2412							
V	4824.00	67.22	39.55	7.85	25.66	61.18	74	-12.82	PK
V	4824.00	48.88	39.55	7.85	25.66	42.84	54	-11.16	AV
V	7236.00	66.95	38.33	7.52	24.55	60.69	74	-13.31	PK
V	7236.00	48.56	38.33	7.52	24.55	42.30	54	-11.70	AV
V	15450.00	51.45	35.23	6.75	26.59	49.56	74	-24.44	PK
H	4824.00	68.25	39.55	7.85	25.66	62.21	74	-11.79	PK
H	4824.00	49.44	39.55	7.85	25.66	43.40	54	-10.60	AV
H	7236.00	69.31	38.33	7.52	23.55	62.05	74	-11.95	PK
H	7236.00	52.41	38.33	7.52	23.22	44.82	54	-9.18	AV
H	15450.00	47.32	35.45	6.75	27.88	46.50	74	-27.50	PK

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2437							
V	4874.00	66.94	38.89	7.57	25.45	61.07	74	-12.93	PK
V	4874.00	49.56	38.89	7.57	25.45	43.69	54	-10.31	AV
V	7311.00	67.25	38.78	7.35	24.78	60.60	74	-13.40	PK
V	7311.00	47.55	38.78	7.35	24.78	40.90	54	-13.10	AV
V	15450.00	52.11	35.89	6.42	26.47	49.11	74	-24.89	PK
H	4874.00	65.78	38.89	7.57	25.45	59.91	74	-14.09	PK
H	4874.00	49.71	38.89	7.57	25.45	43.84	54	-10.16	AV
H	7311.00	69.56	38.78	7.35	24.78	62.91	74	-11.09	PK
H	7311.00	48.77	38.78	7.35	24.78	42.12	54	-11.88	AV
H	15450.00	49.25	36.68	6.45	26.65	45.67	74	-28.33	PK

Polar (H/V)	Frequency	Meter Reading	Pre-amplifier	Cable Loss	Antenna Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
		operation frequency:2462							
V	4924.00	68.25	38.75	7.46	25.45	62.41	74	-11.59	PK
V	4924.00	50.78	38.75	7.46	25.45	44.94	54	-9.06	AV
V	7386.00	67.56	38.65	7.22	24.78	60.91	74	-13.09	PK
V	7386.00	49.25	38.65	7.22	24.78	42.60	54	-11.40	AV
V	15450.00	53.22	35.58	6.35	26.47	50.46	74	-23.54	PK
H	4924.00	66.11	38.75	7.46	25.45	60.27	74	-13.73	PK
H	4924.00	50.35	38.75	7.46	25.45	44.51	54	-9.49	AV
H	7386.00	69.78	38.65	7.22	24.78	63.13	74	-10.87	PK
H	7386.00	48.96	38.65	7.22	24.78	42.31	54	-11.69	AV
H	15450.00	50.47	36.42	6.32	26.65	47.02	74	-26.98	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
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 (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2422							
V	4844.000	68.11	39.55	7.77	25.66	61.99	74	-12.01	PK
V	4844.000	48.44	39.55	7.77	25.66	42.32	54	-11.68	AV
V	7266.000	67.25	38.33	7.30	24.55	60.77	74	-13.23	PK
V	7266.000	48.86	38.33	7.30	24.55	42.38	54	-11.62	AV
V	15450.00	51.75	35.23	6.60	26.59	49.71	74	-24.29	PK
H	4844.000	68.78	39.55	7.77	25.66	62.66	74	-11.34	PK
H	4844.000	49.98	39.55	7.77	25.66	43.86	54	-10.14	AV
H	7266.000	69.74	38.33	7.30	23.55	62.26	74	-11.74	PK
H	7266.000	52.62	38.33	7.30	23.22	44.81	54	-9.19	AV
H	15450.00	48.58	35.45	6.60	27.88	47.61	74	-26.39	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2437							
V	4874.00	66.74	38.89	7.57	25.45	60.87	74	-13.13	PK
V	4874.00	49.35	38.89	7.57	25.45	43.48	54	-10.52	AV
V	7311.00	67.35	38.78	7.35	24.78	60.70	74	-13.30	PK
V	7311.00	47.57	38.78	7.35	24.78	40.92	54	-13.08	AV
V	15450.00	52.48	35.89	6.42	26.47	49.48	74	-24.52	PK
H	4874.00	65.68	38.89	7.57	25.45	59.81	74	-14.19	PK
H	4874.00	49.25	38.89	7.57	25.45	43.38	54	-10.62	AV
H	7311.00	69.23	38.78	7.35	24.78	62.58	74	-11.42	PK
H	7311.00	48.71	38.78	7.35	24.78	42.06	54	-11.94	AV
H	15450.00	49.63	36.68	6.42	26.65	46.02	74	-27.98	PK

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre-amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
		operation frequency:2452							
V	4904.00	68.66	38.75	7.38	25.45	62.74	74	-11.26	PK
V	4904.00	50.85	38.75	7.38	25.45	44.93	54	-9.07	AV
V	7356.00	67.32	38.65	7.15	24.78	60.60	74	-13.40	PK
V	7356.00	49.47	38.65	7.15	24.78	42.75	54	-11.25	AV
V	15450.00	53.69	35.58	6.25	26.47	50.83	74	-23.17	PK
H	4904.00	66.36	38.75	7.38	25.45	60.44	74	-13.56	PK
H	4904.00	50.47	38.75	7.38	25.45	44.55	54	-9.45	AV
H	7356.00	69.69	38.65	7.15	24.78	62.97	74	-11.03	PK
H	7356.00	48.75	38.65	7.15	24.78	42.03	54	-11.97	AV
H	15450.00	50.25	36.42	6.25	26.65	46.73	74	-27.27	PK

Remark:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,
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.

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:

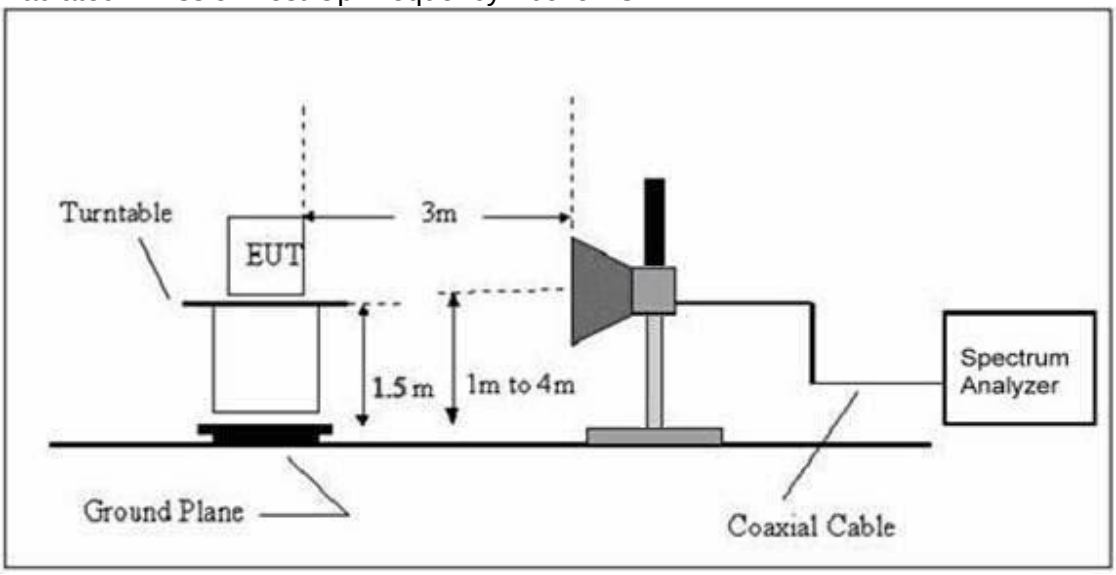
Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

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 (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2412							
V	2390.00	38.05	13.83	51.88	74.00	-22.12	PK
V	2390.00	26.43	13.83	40.26	54.00	-13.74	AV
V	2400.00	38.26	13.85	52.11	74.00	-21.89	PK
V	2400.00	25.99	13.85	39.84	54.00	-14.16	AV
H	2390.00	38.35	13.83	52.18	74.00	-21.82	PK
H	2390.00	26.46	13.83	40.29	54.00	-13.71	AV
V	2400.00	38.21	13.85	52.06	74.00	-21.94	PK
V	2400.00	26.40	13.85	40.25	54.00	-13.75	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	38.26	14.02	52.28	74.00	-21.72	PK
V	2483.50	26.68	14.02	40.70	54.00	-13.30	AV
V	2500.00	38.20	14.06	52.26	74.00	-21.74	PK
V	2500.00	26.10	14.06	40.16	54.00	-13.84	AV
H	2483.50	38.39	14.02	52.41	74.00	-21.59	PK
H	2483.50	26.72	14.02	40.74	54.00	-13.26	AV
H	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
H	2500.00	26.98	14.06	41.04	54.00	-12.96	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	37.74	13.83	51.57	74.00	-22.43	PK
V	2390.00	26.21	13.83	40.04	54.00	-13.96	AV
V	2400.00	37.95	13.85	51.80	74.00	-22.20	PK
V	2400.00	25.79	13.85	39.64	54.00	-14.36	AV
H	2390.00	38.04	13.83	51.87	74.00	-22.13	PK
H	2390.00	26.24	13.83	40.07	54.00	-13.93	AV
V	2400.00	37.90	13.85	51.75	74.00	-22.25	PK
V	2400.00	26.18	13.85	40.03	54.00	-13.97	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	37.95	14.02	51.97	74.00	-22.03	PK
V	2483.50	26.46	14.02	40.48	54.00	-13.52	AV
V	2500.00	37.89	14.06	51.95	74.00	-22.05	PK
V	2500.00	25.89	14.06	39.95	54.00	-14.05	AV
H	2483.50	38.08	14.02	52.10	74.00	-21.90	PK
H	2483.50	26.50	14.02	40.52	54.00	-13.48	AV
H	2500.00	37.69	14.06	51.75	74.00	-22.25	PK
H	2500.00	26.76	14.06	40.82	54.00	-13.18	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	37.85	13.83	51.68	74.00	-22.32	PK
V	2390.00	26.29	13.83	40.12	54.00	-13.88	AV
V	2400.00	38.06	13.85	51.91	74.00	-22.09	PK
V	2400.00	25.86	13.85	39.71	54.00	-14.29	AV
H	2390.00	38.15	13.83	51.98	74.00	-22.02	PK
H	2390.00	26.32	13.83	40.15	54.00	-13.85	AV
V	2400.00	38.01	13.85	51.86	74.00	-22.14	PK
V	2400.00	26.26	13.85	40.11	54.00	-13.89	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	38.06	14.02	52.08	74.00	-21.92	PK
V	2483.50	26.54	14.02	40.56	54.00	-13.44	AV
V	2500.00	38.00	14.06	52.06	74.00	-21.94	PK
V	2500.00	25.96	14.06	40.02	54.00	-13.98	AV
H	2483.50	38.19	14.02	52.21	74.00	-21.79	PK
H	2483.50	26.58	14.02	40.60	54.00	-13.40	AV
H	2500.00	37.80	14.06	51.86	74.00	-22.14	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(40MHz)

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2422							
V	2390.00	38.17	13.83	52.00	74.00	-22.00	PK
V	2390.00	26.51	13.83	40.34	54.00	-13.66	AV
V	2400.00	38.38	13.85	52.23	74.00	-21.77	PK
V	2400.00	26.07	13.85	39.92	54.00	-14.08	AV
H	2390.00	38.46	13.83	52.29	74.00	-21.71	PK
H	2390.00	26.54	13.83	40.37	54.00	-13.63	AV
V	2400.00	38.33	13.85	52.18	74.00	-21.82	PK
V	2400.00	26.48	13.85	40.33	54.00	-13.67	AV

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Detector Type
operation frequency:2452							
V	2483.50	38.38	14.02	52.40	74.00	-21.60	PK
V	2483.50	26.76	14.02	40.78	54.00	-13.22	AV
V	2500.00	38.32	14.06	52.38	74.00	-21.62	PK
V	2500.00	26.18	14.06	40.24	54.00	-13.76	AV
H	2483.50	38.50	14.02	52.52	74.00	-21.48	PK
H	2483.50	26.80	14.02	40.82	54.00	-13.18	AV
H	2500.00	38.12	14.06	52.18	74.00	-21.82	PK
H	2500.00	27.06	14.06	41.12	54.00	-12.88	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

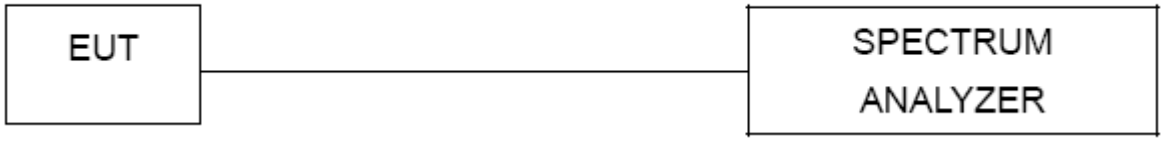
4.1.1 TEST PROCEDURE

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 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 3 x 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.

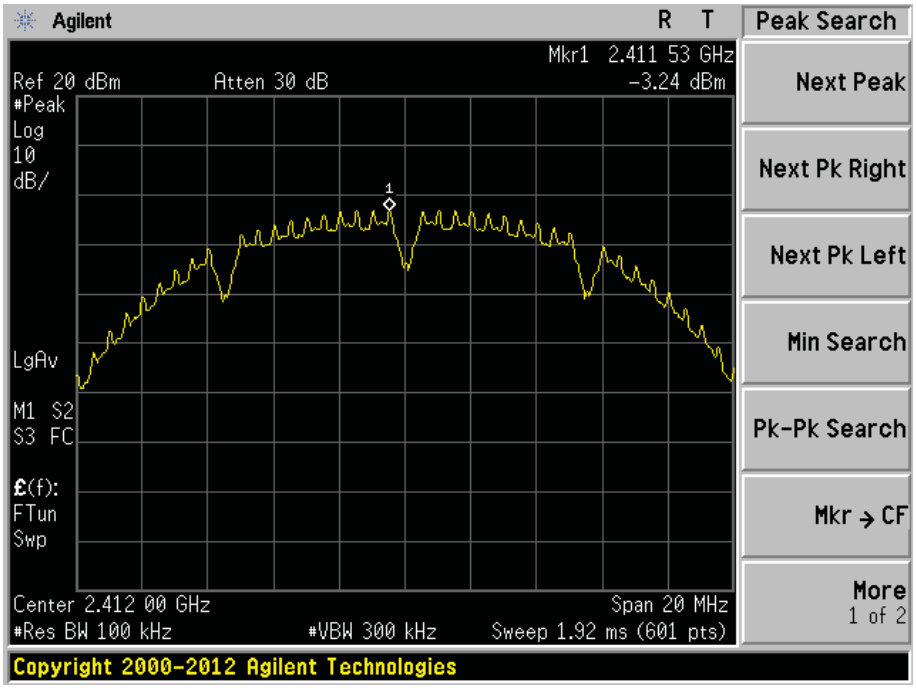
4.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX b Mode		

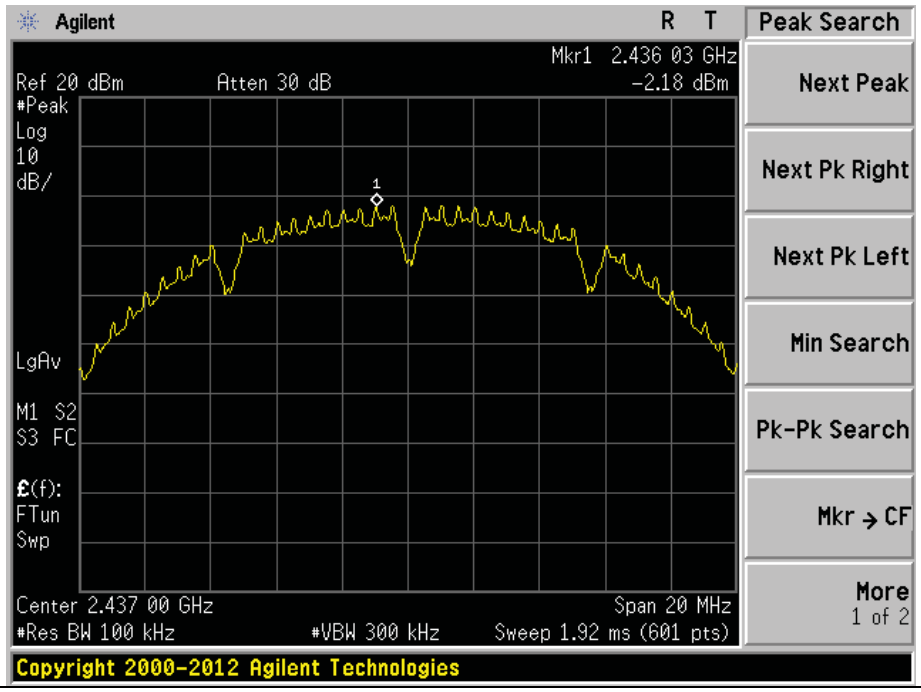
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-3.24	-0.61	8	PASS
	Ant.2	-3.93			
2437 MHz	Ant.1	-2.18	0.04	8	PASS
	Ant.2	-3.96			
2462 MHz	Ant.1	-1.83	0.79	8	PASS
	Ant.2	-2.70			

Ant. 1

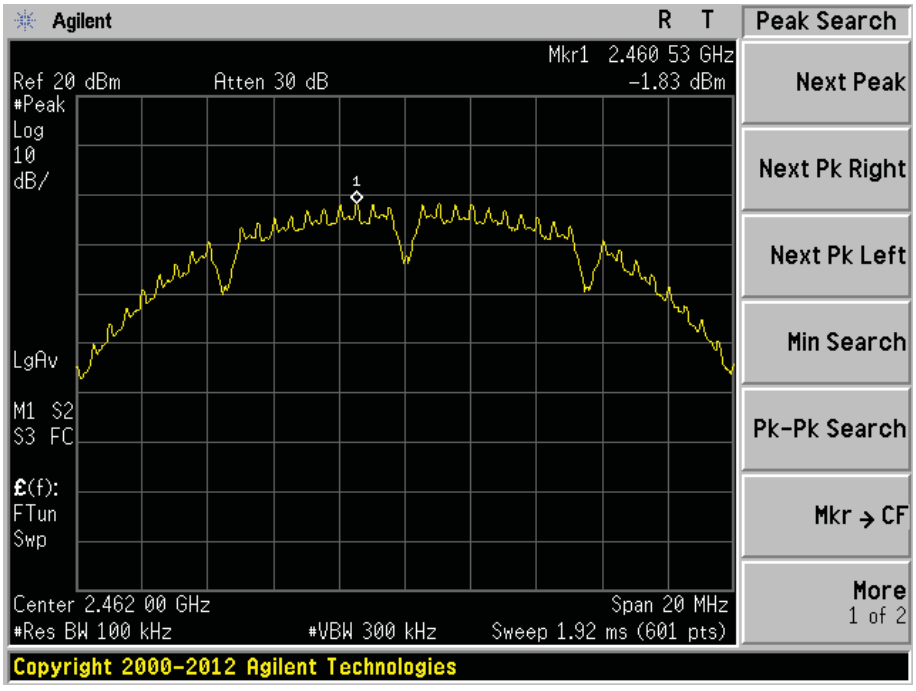
TX CH01



TX CH06

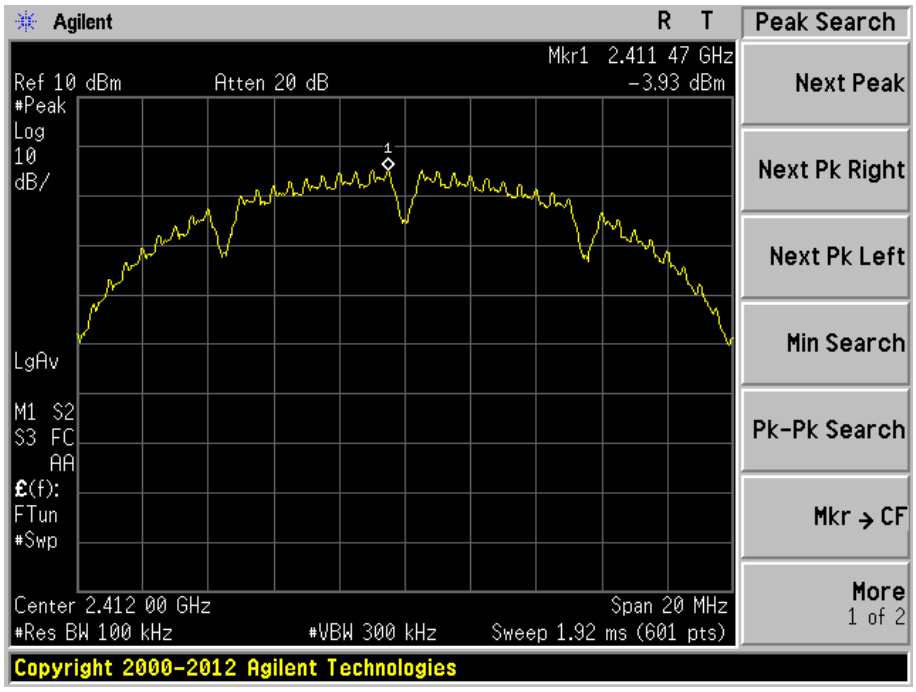


TX CH11

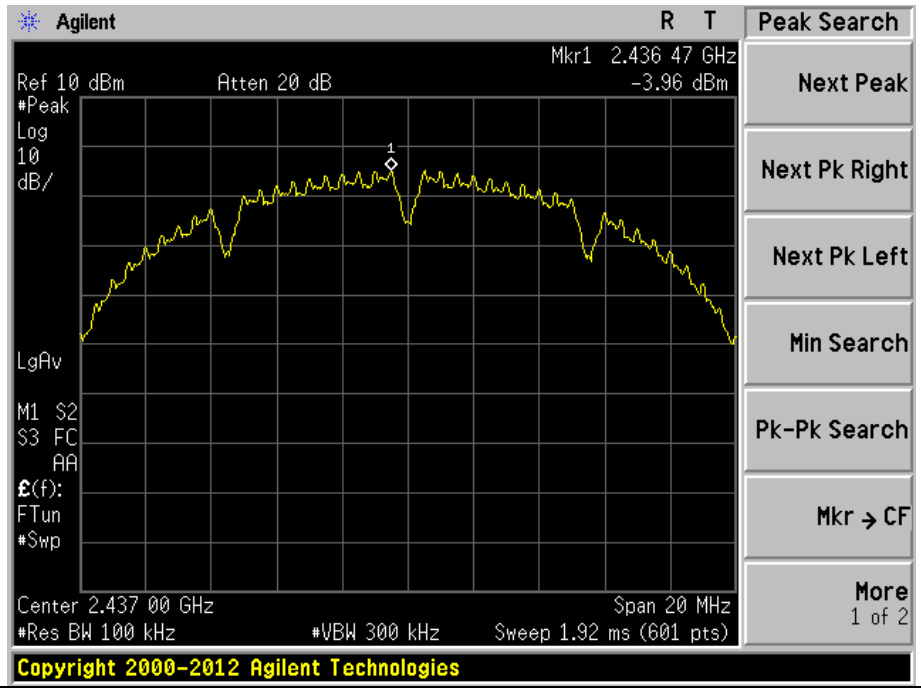


Ant. 2

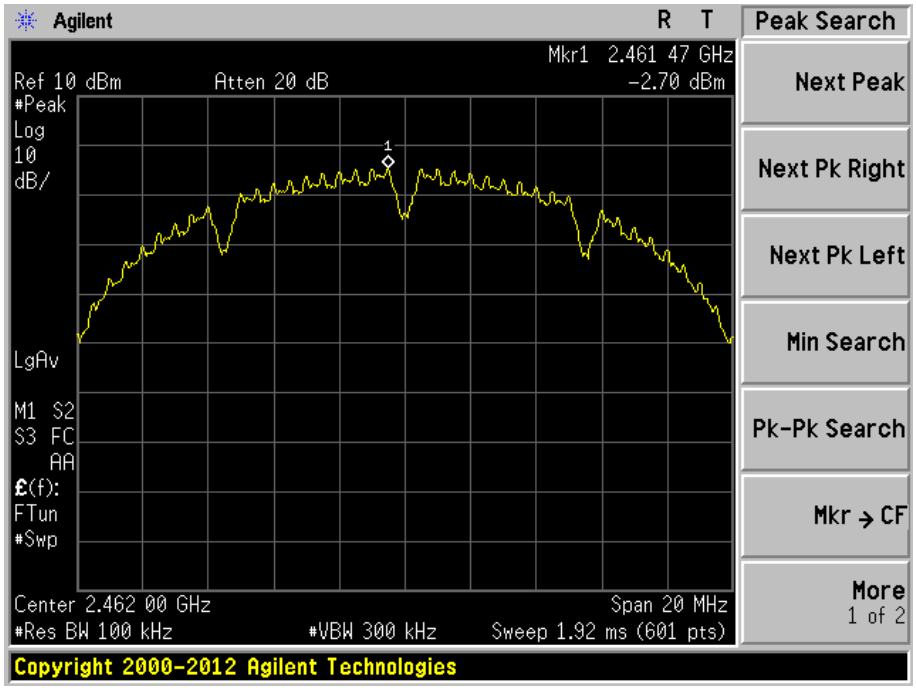
TX CH01



TX CH06



TX CH11

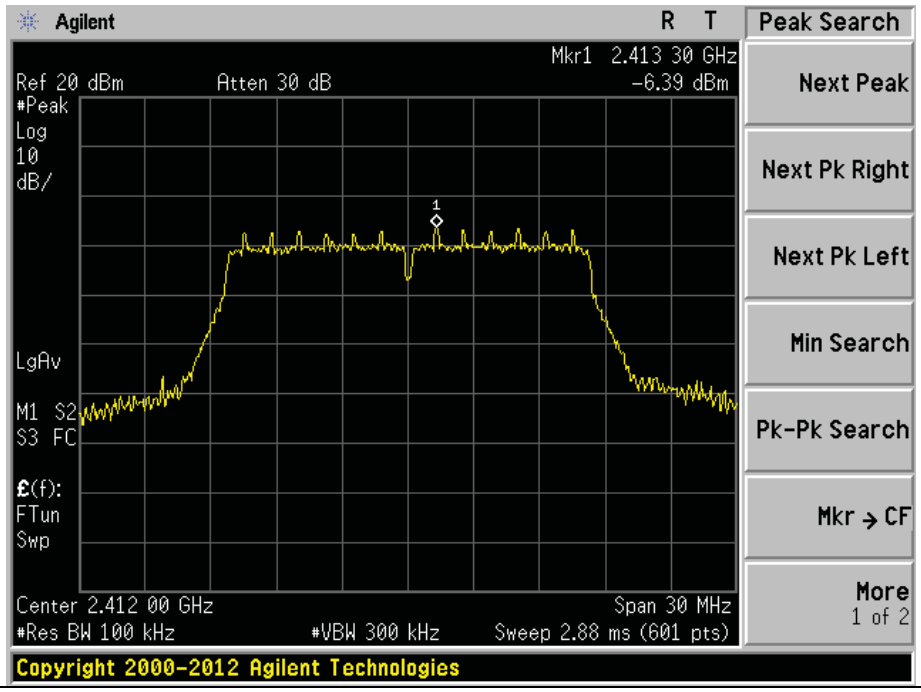

Agilent
R T
Peak Search
Mkr1 2.461 47 GHz
Ref 10 dBm
Atten 20 dB
-2.70 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 20 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.92 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX g Mode		

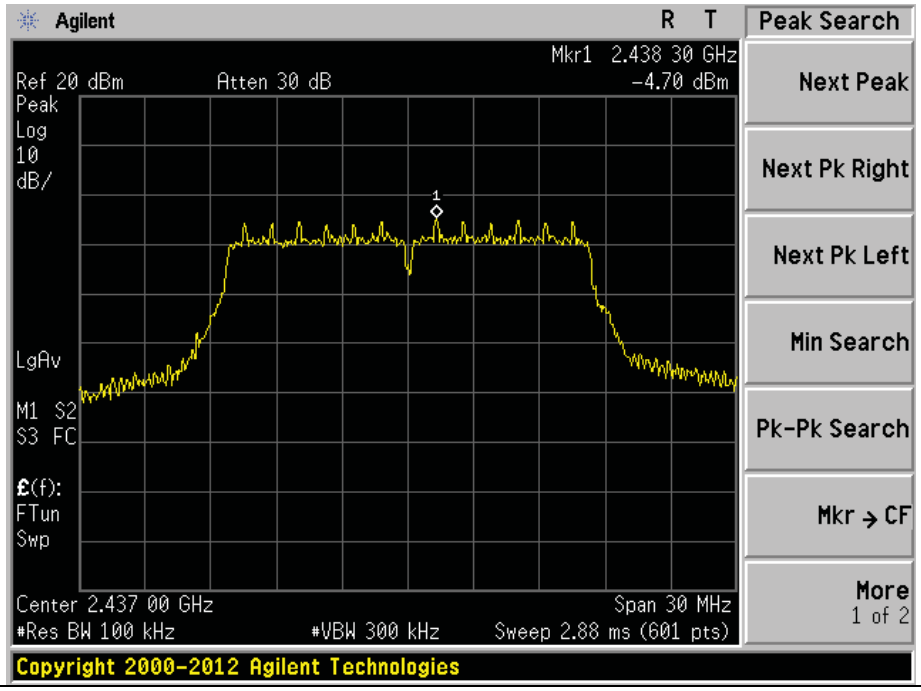
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-6.39	-3.10	8	PASS
	Ant.2	-5.85			
2437 MHz	Ant.1	-4.70	-1.37	8	PASS
	Ant.2	-4.11			
2462 MHz	Ant.1	-4.70	-1.87	8	PASS
	Ant.2	-5.14			

Ant.1

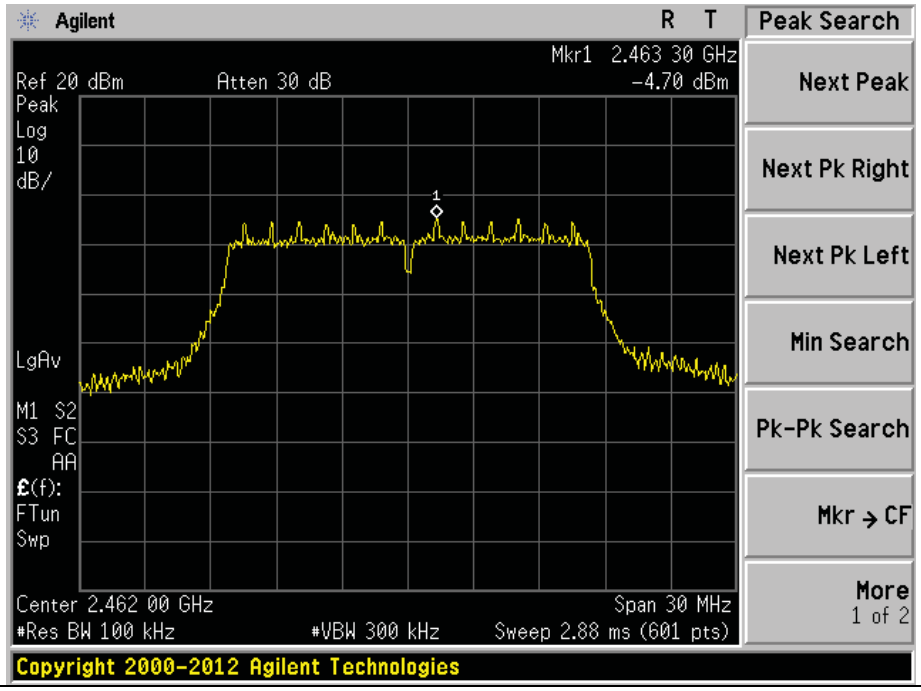
TX CH01



TX CH06

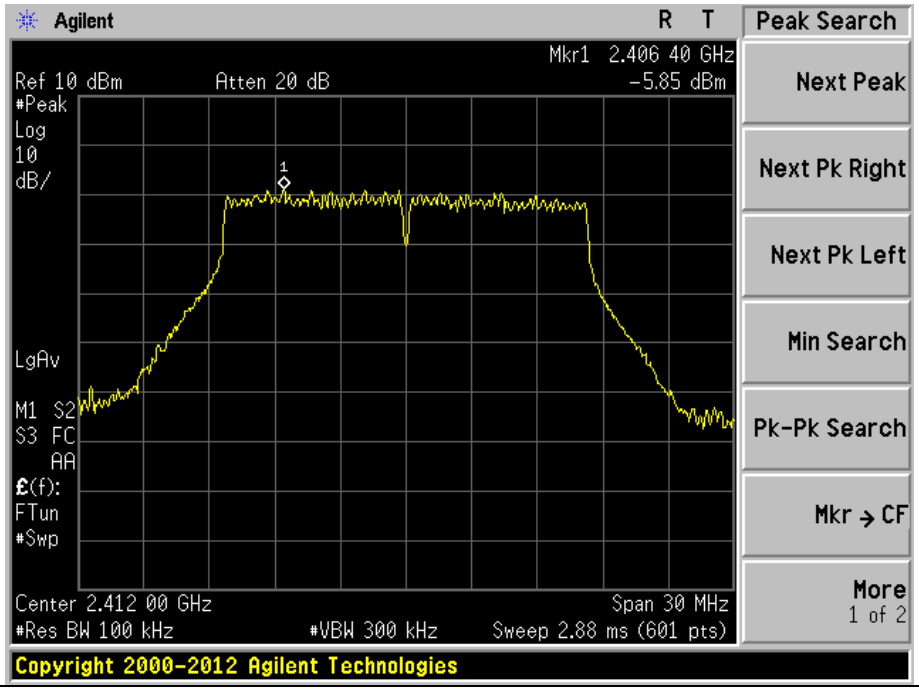


TX CH11

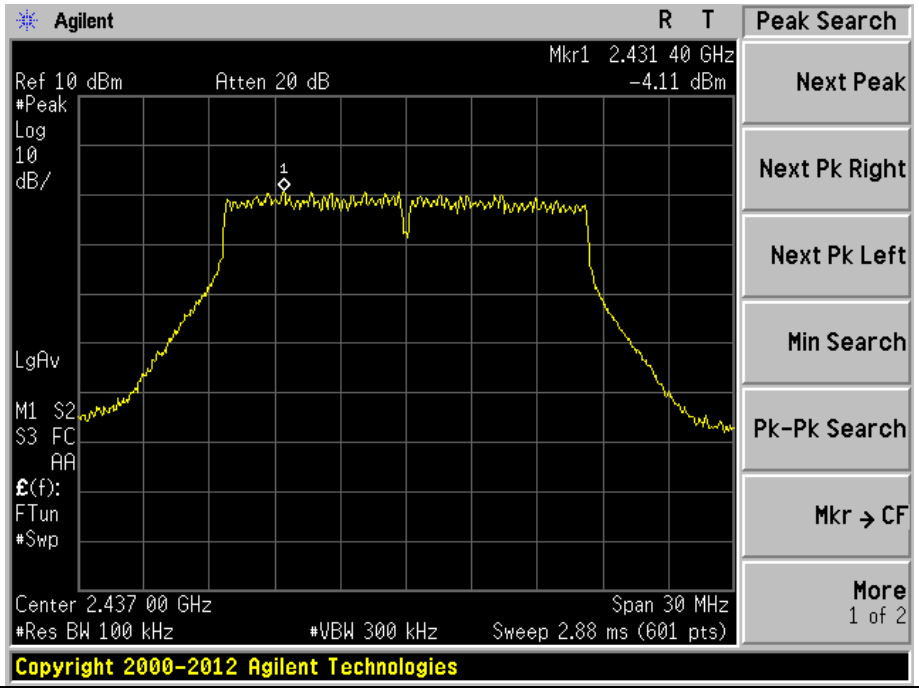


Ant.2

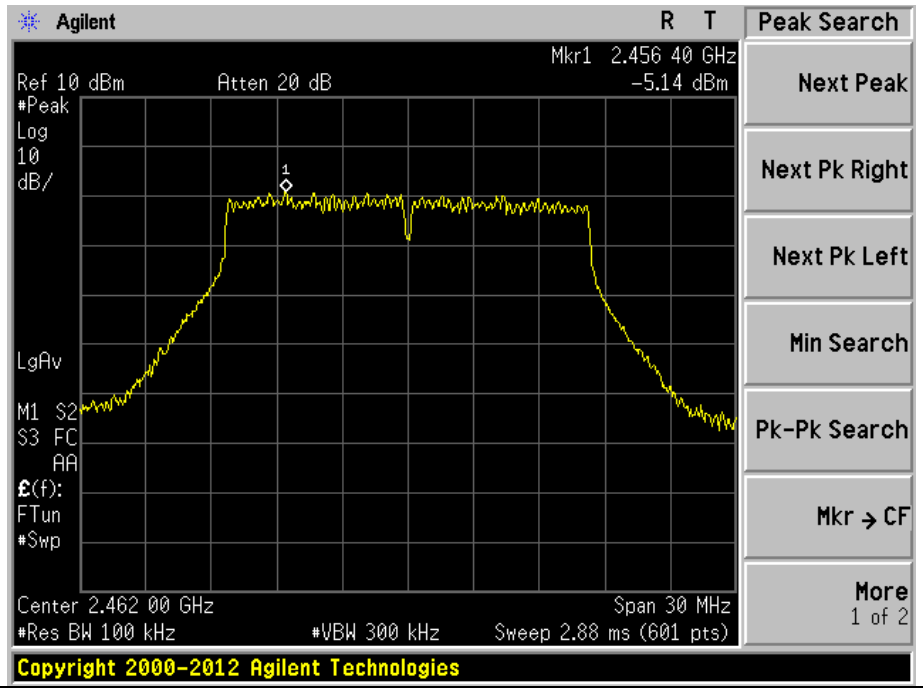
TX CH01



TX CH06



TX CH11

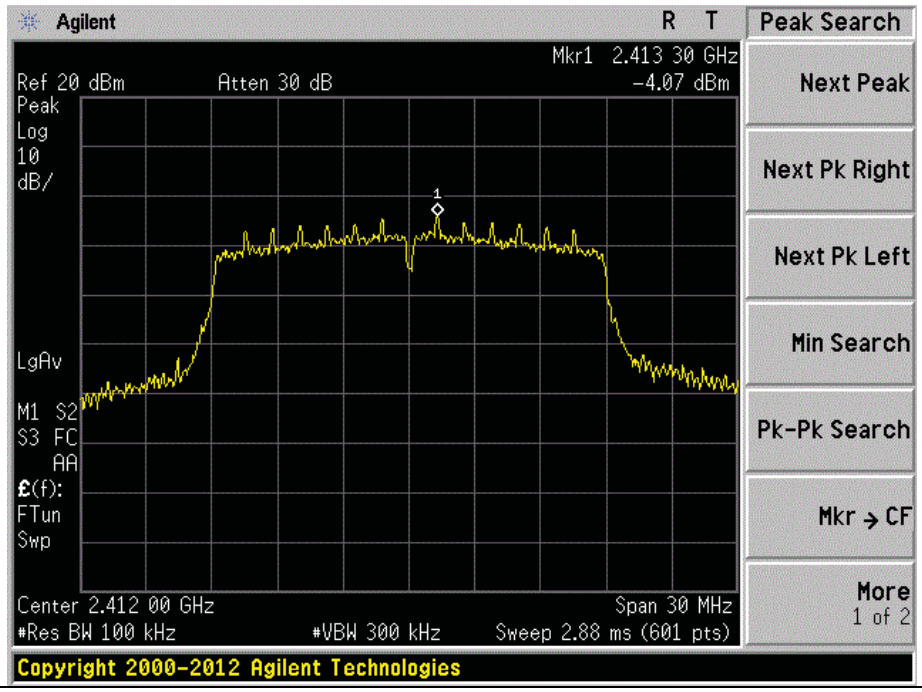

Agilent
R T
Peak Search
Mkr1 2.456 40 GHz
Ref 10 dBm
Atten 20 dB
-5.14 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
AA
£(f):
FTun
#Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(20M)		

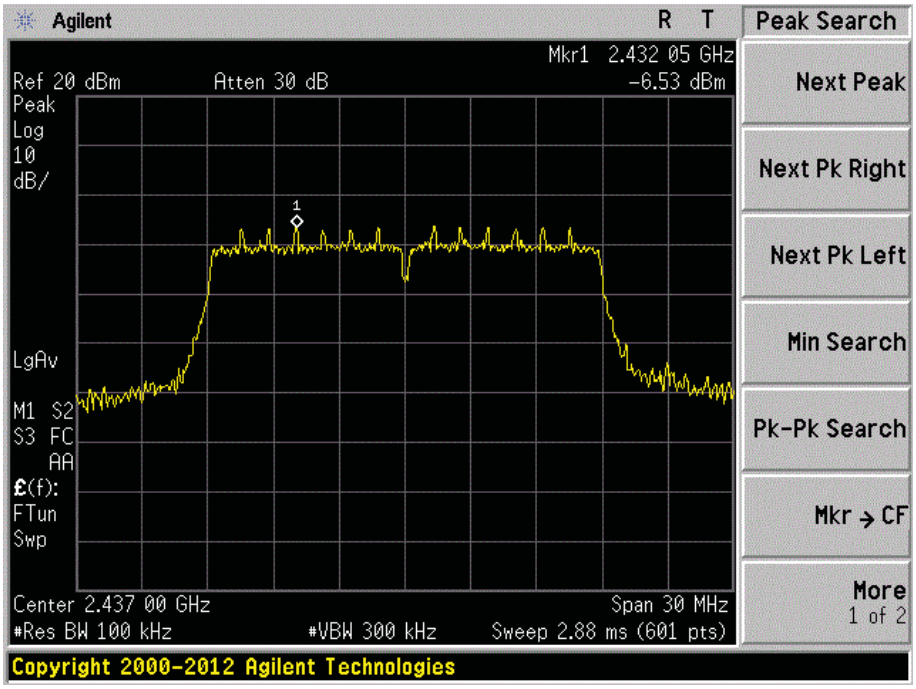
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2412 MHz	Ant.1	-4.07	-3.28	8	PASS
	Ant.2	-10.76			
2437 MHz	Ant.1	-6.53	-4.77	8	PASS
	Ant.2	-11.19			
2462 MHz	Ant.1	-4.87	-3.87	8	PASS
	Ant.2	-11.15			

Ant.1

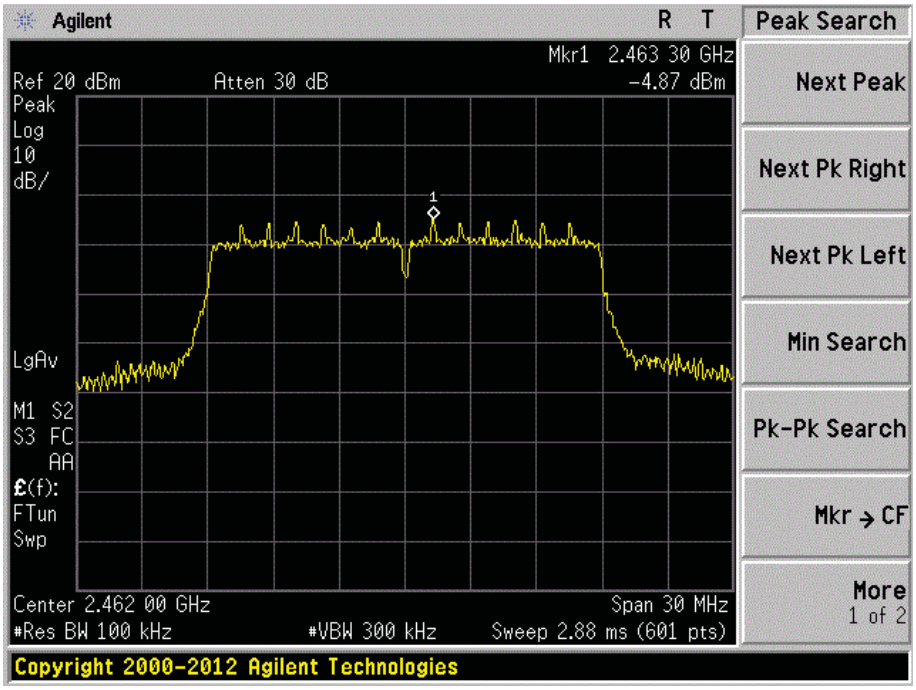
TX CH01



TX CH06

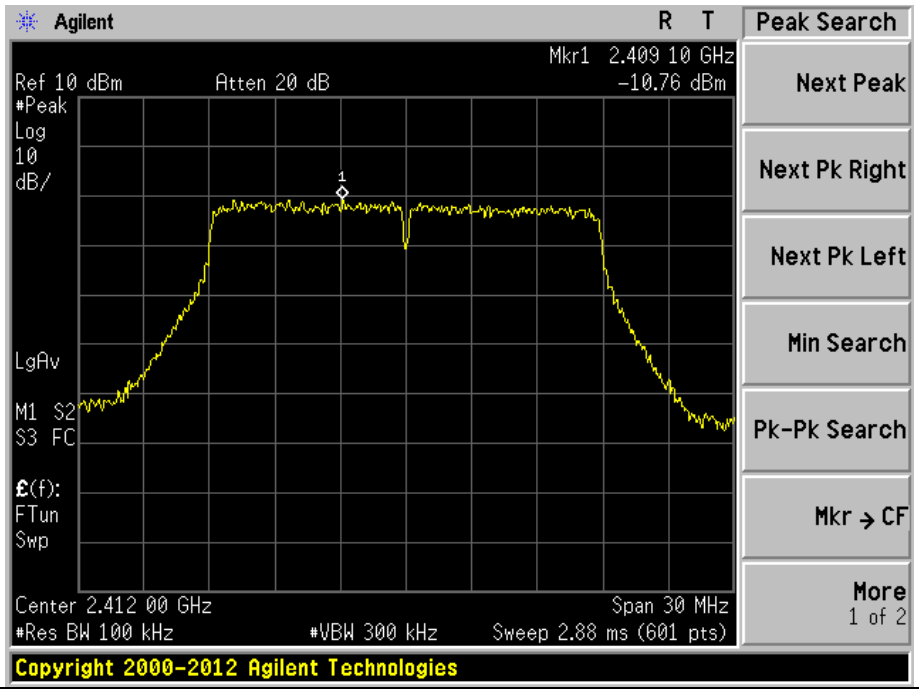


TX CH11

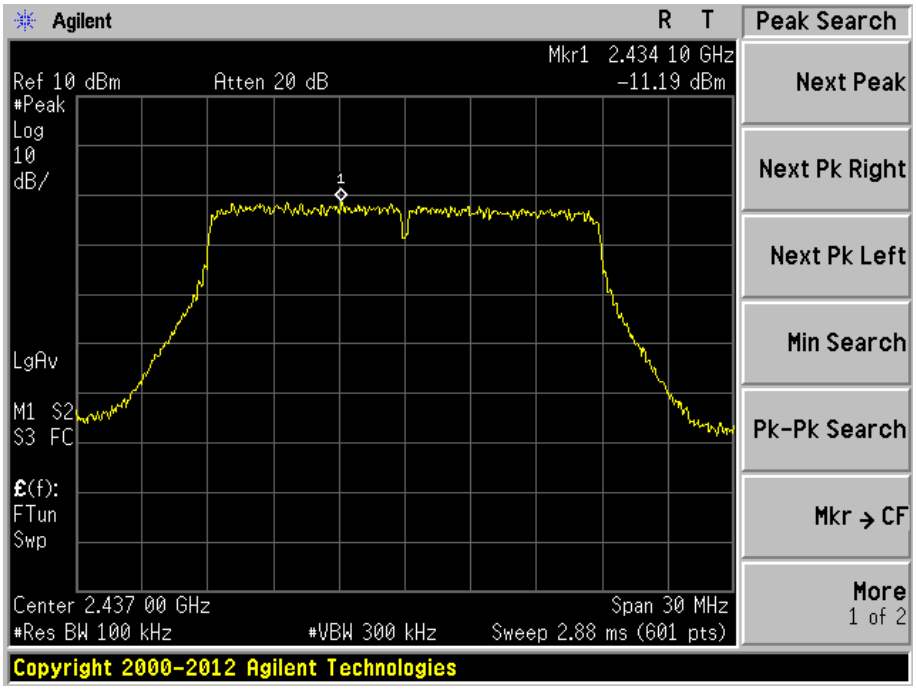


Ant.2

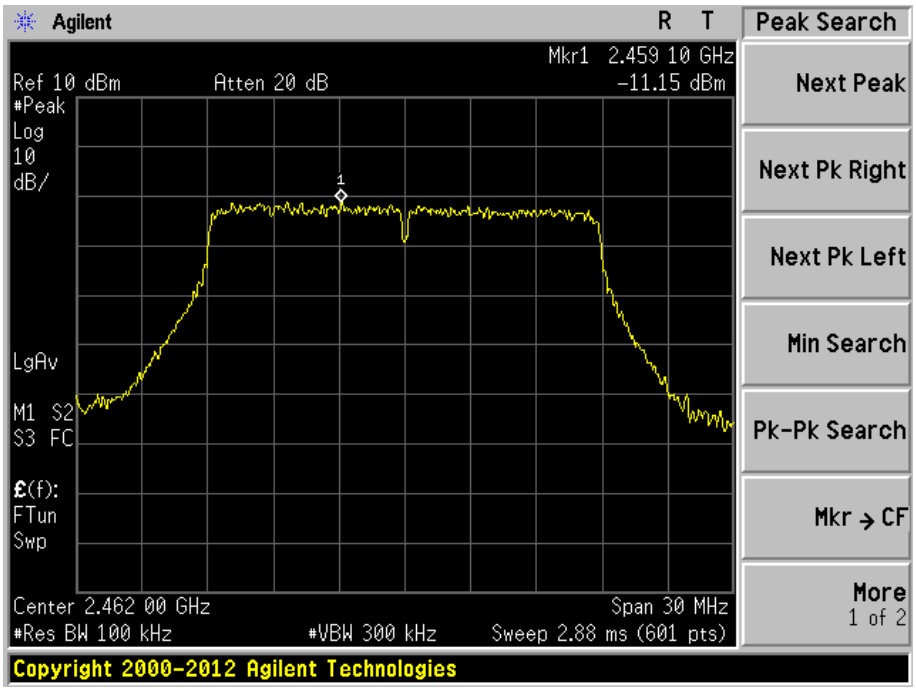
TX CH01



TX CH06



TX CH11

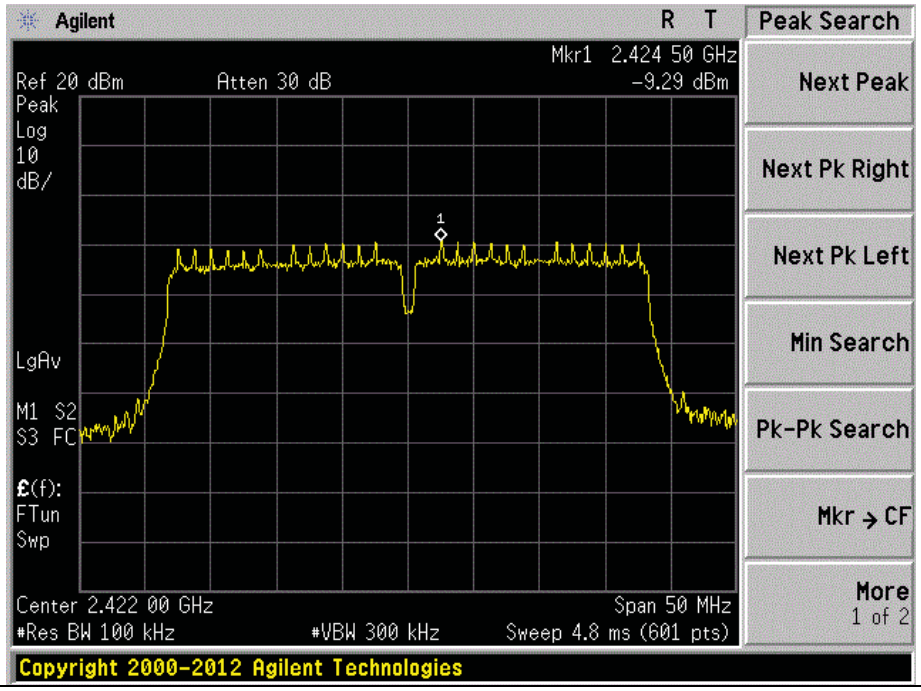

Agilent
R T
Peak Search
Mkr1 2.459 10 GHz
Ref 10 dBm
Atten 20 dB
-11.15 dBm
#Peak
Log
10
dB/
Next Peak
Next Pk Right
Next Pk Left
Min Search
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(40M)		

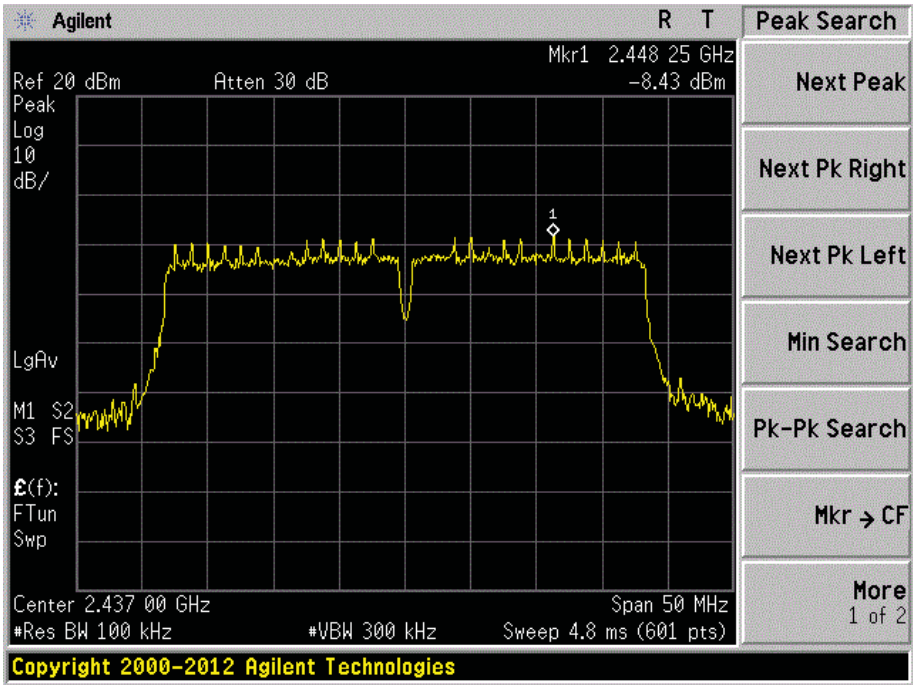
Frequency	Read Level (dBm)		Total Power Spectral Density(dBm)	Limit (dBm)	Result
2422 MHz	Ant.1	-9.29	-7.21	8	PASS
	Ant.2	-11.39			
2437 MHz	Ant.1	-8.43	-6.78	8	PASS
	Ant.2	-11.56			
2452 MHz	Ant.1	-7.83	-6.38	8	PASS
	Ant.2	-11.71			

Ant.1

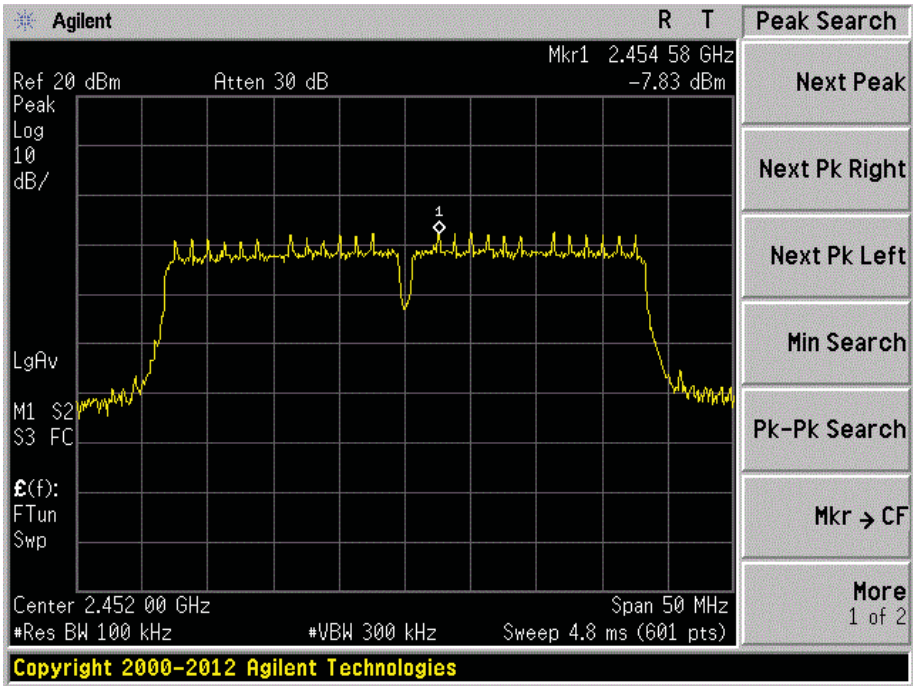
TX CH03



TX CH06

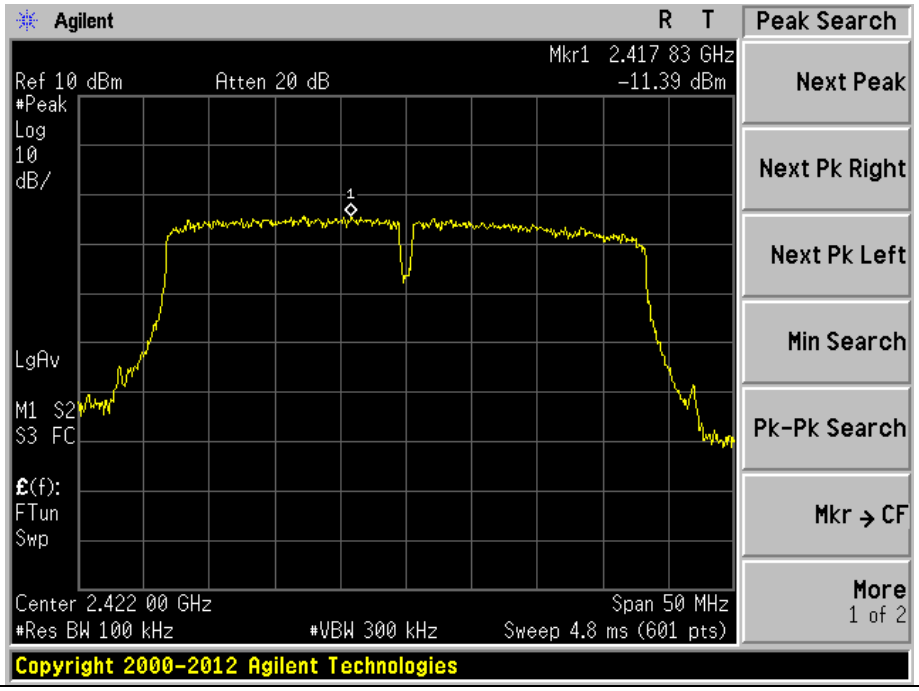


TX CH09

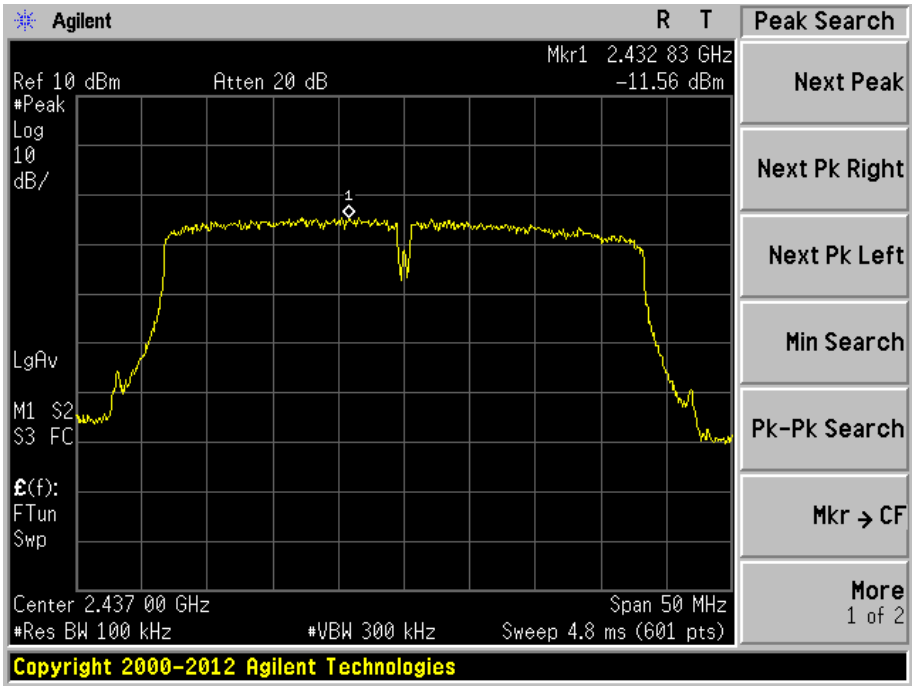


Ant.2

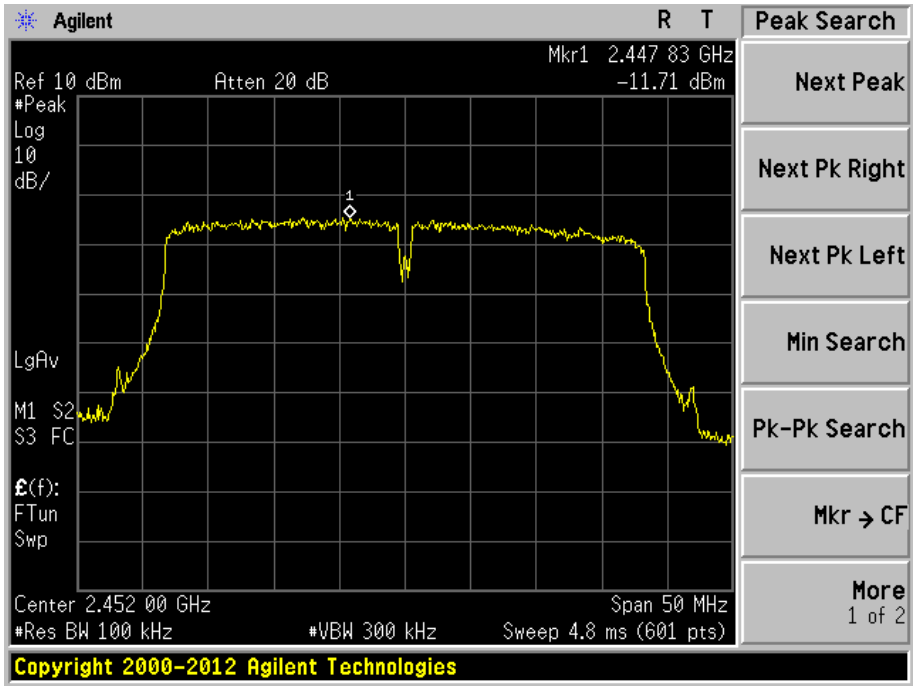
TX CH03



TX CH06



TX CH09


Agilent
R T
Peak Search
Mkr1 2.447 83 GHz
Ref 10 dBm
Atten 20 dB
-11.71 dBm
#Peak
Log
10
dB/
LgAv
M1 S2
S3 FC
£(f):
FTun
Swp
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.452 00 GHz
Span 50 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 4.8 ms (601 pts)
Copyright 2000-2012 Agilent Technologies

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	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

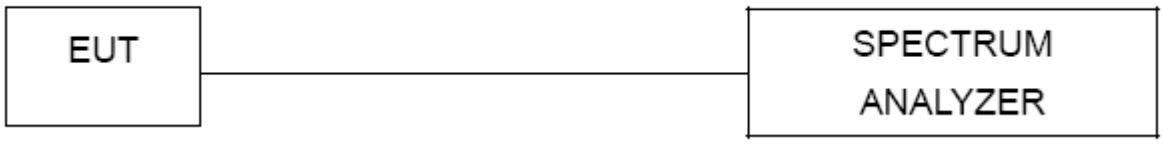
5.1.1 TEST PROCEDURE

1. Set RBW = 100 kHz.
2. Set the video bandwidth (VBW) ≥ 3 x 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.

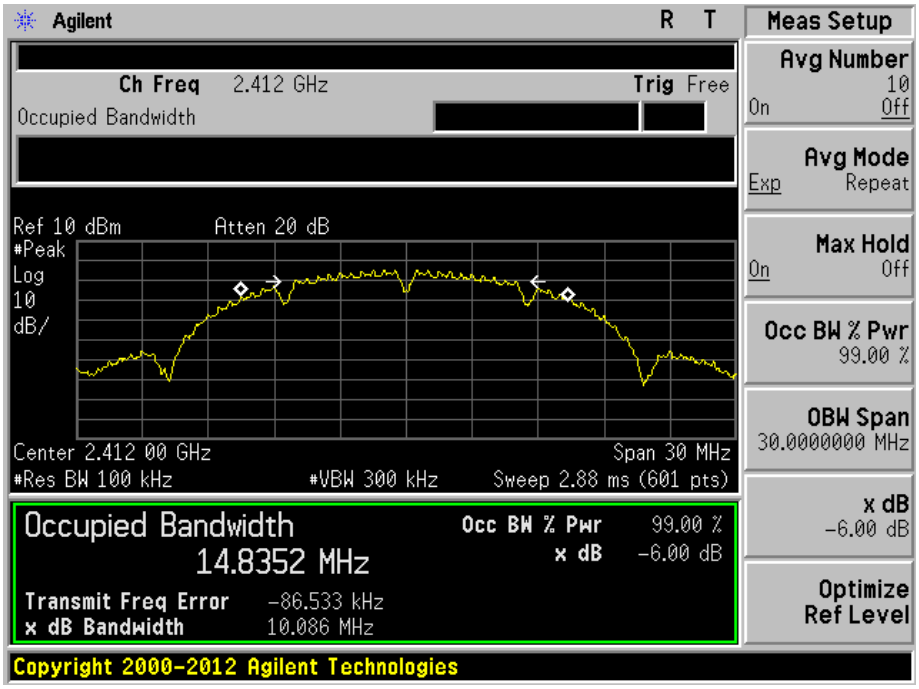
5.1.5 TEST RESULTS

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX b Mode		

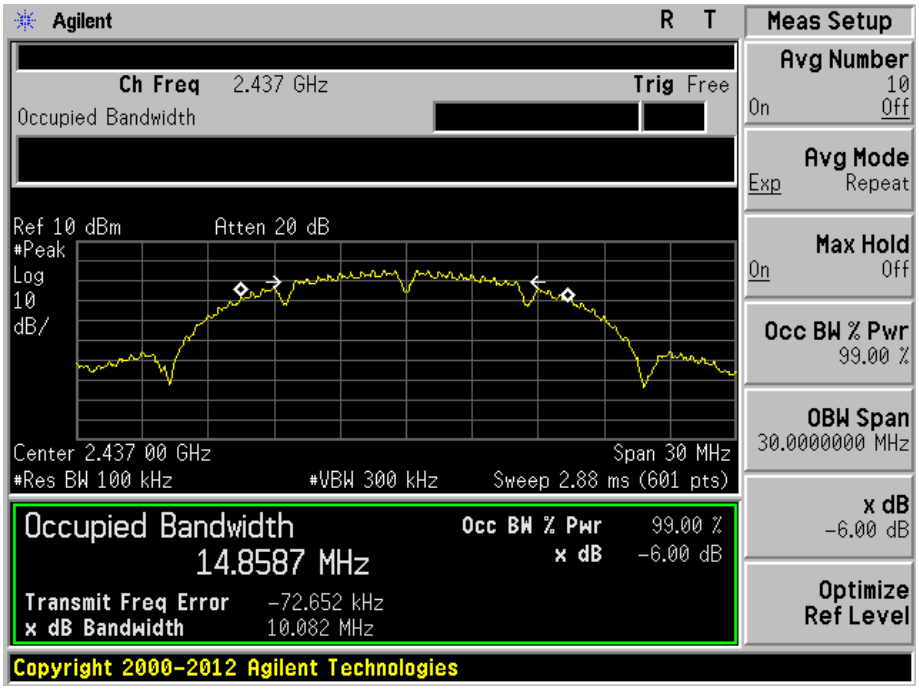
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	10.086	500	Pass
		Ant.2	10.112	500	Pass
Middle	2437	Ant.1	10.082	500	Pass
		Ant.2	10.134	500	Pass
High	2462	Ant.1	10.086	500	Pass
		Ant.2	10.146	500	Pass

Ant.1

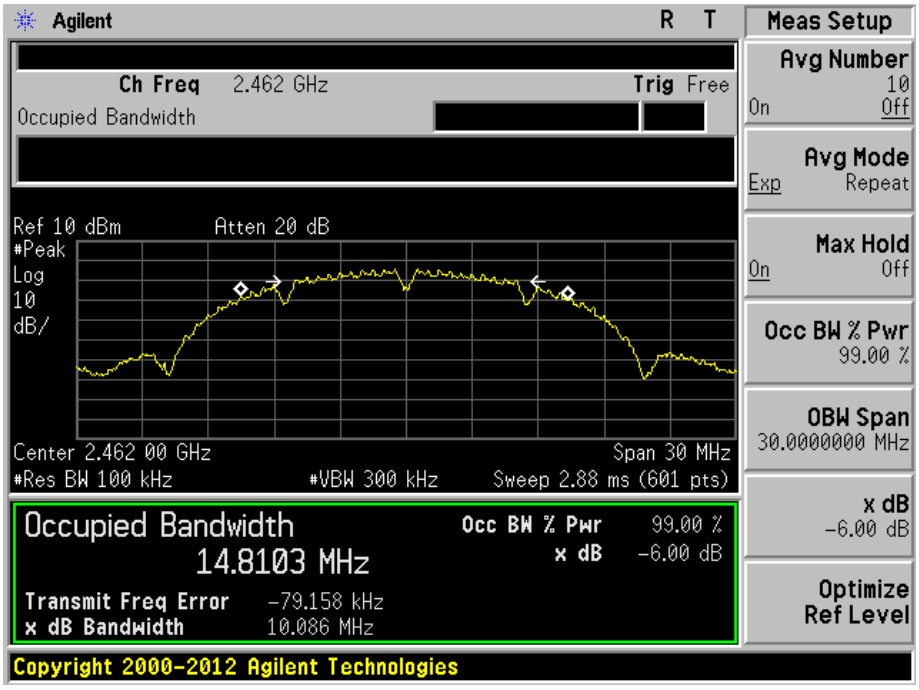
TX CH 01



TX CH 06

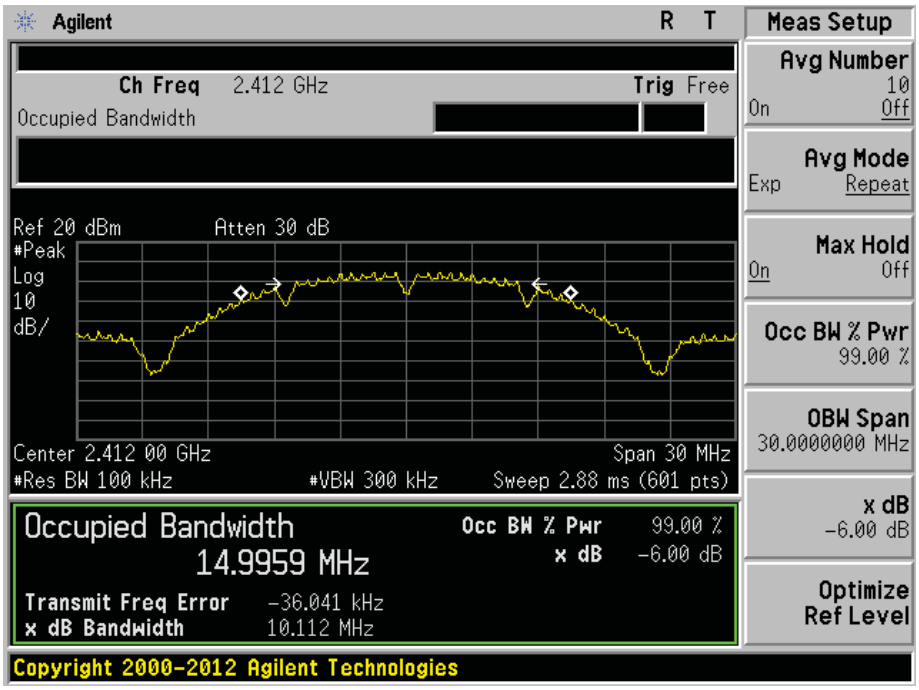


TX CH 11

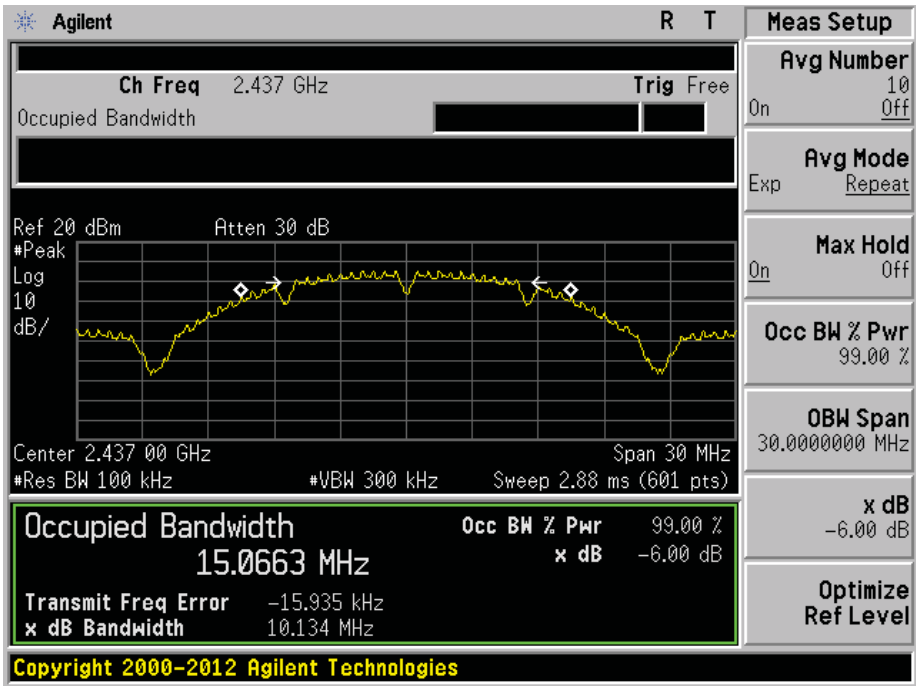


Ant.2

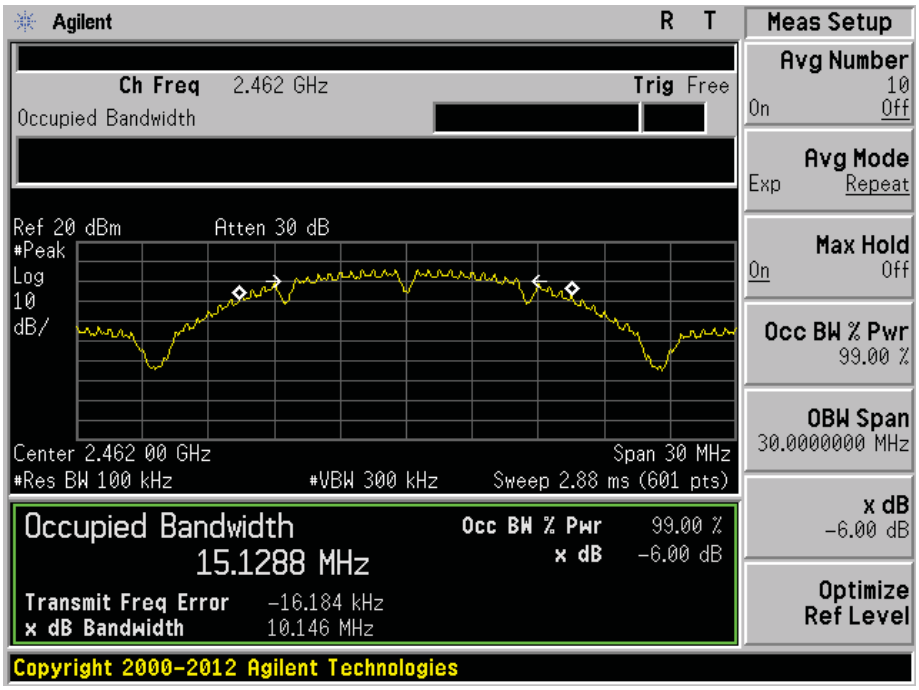
TX CH 01



TX CH 06



TX CH 11

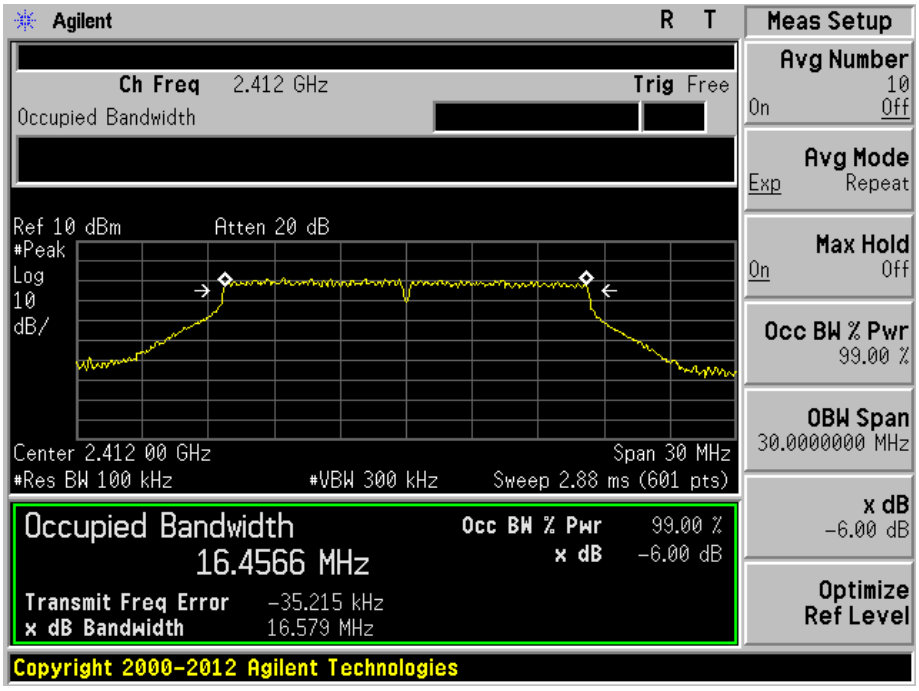

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
x dB
-6.00 dB
Occupied Bandwidth
15.1288 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error -16.184 kHz
x dB Bandwidth 10.146 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX g Mode		

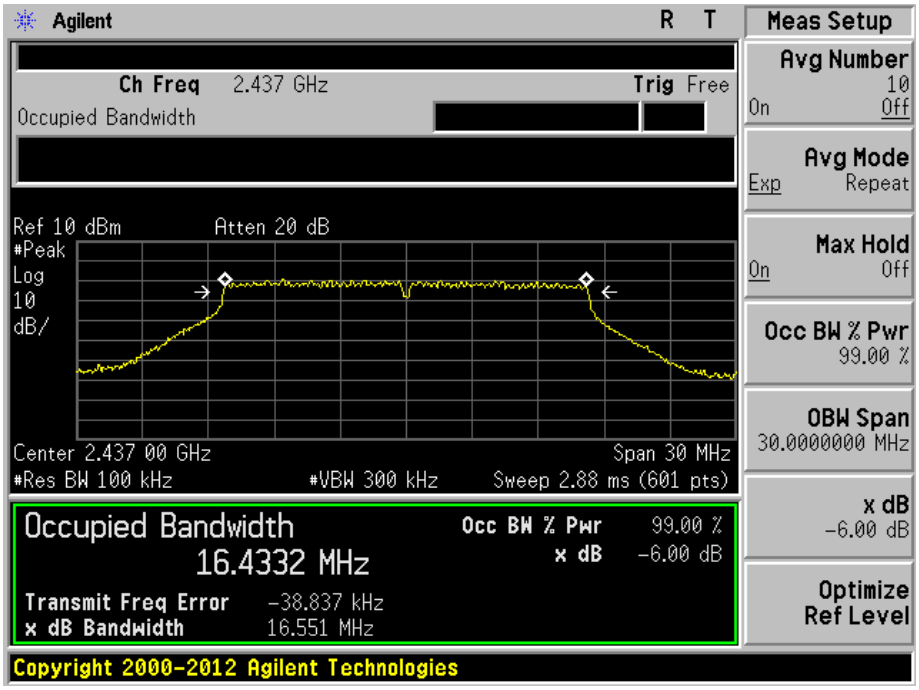
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	16.579	500	Pass
		Ant.2	16.438	500	Pass
Middle	2437	Ant.1	16.551	500	Pass
		Ant.2	15.142	500	Pass
High	2462	Ant.1	16.574	500	Pass
		Ant.2	15.155	500	Pass

Ant.1

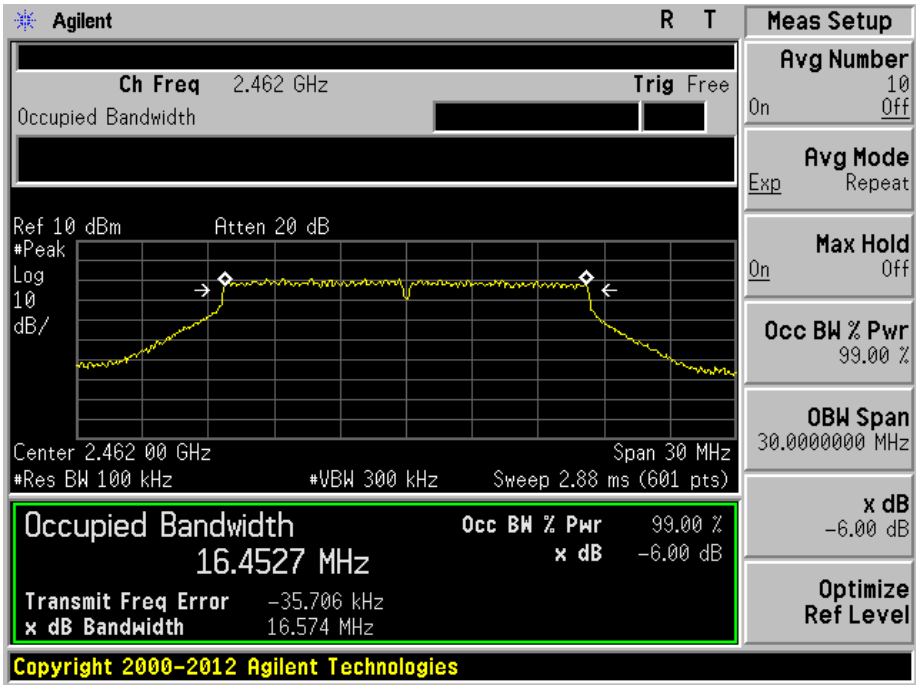
TX CH 01



TX CH 06

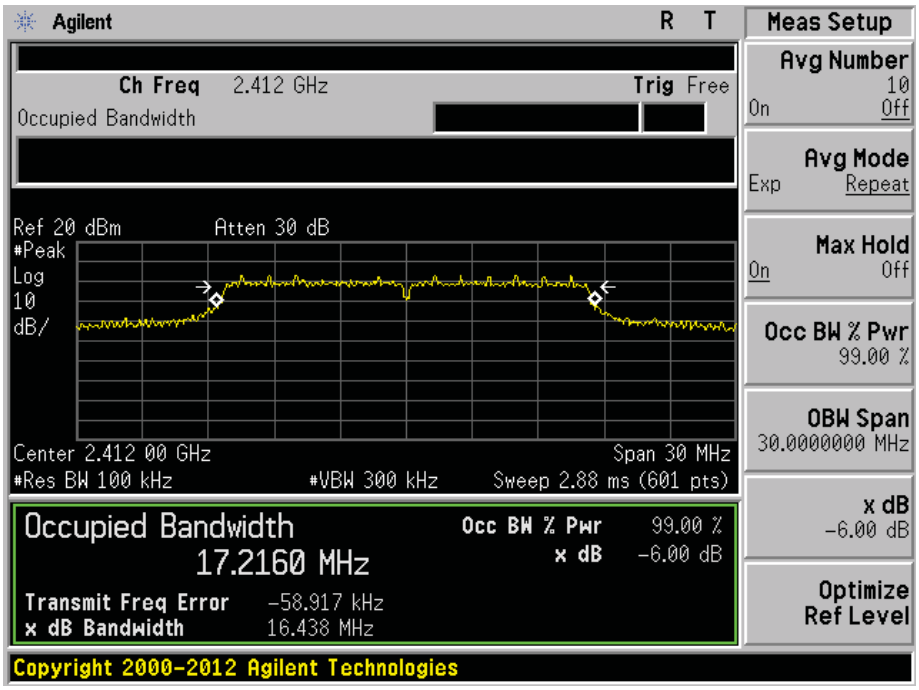


TX CH 11

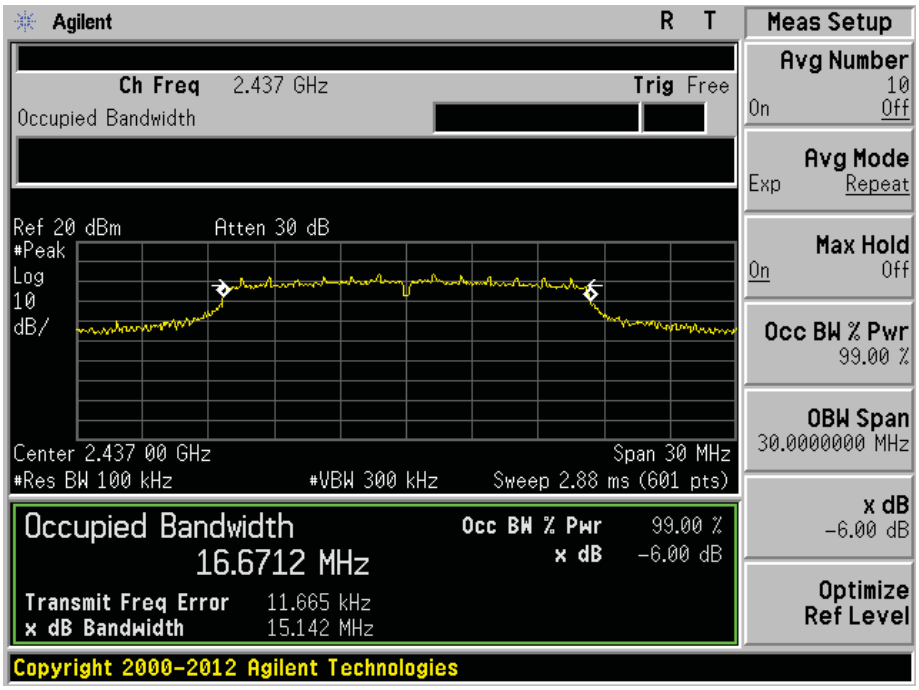


Ant.2

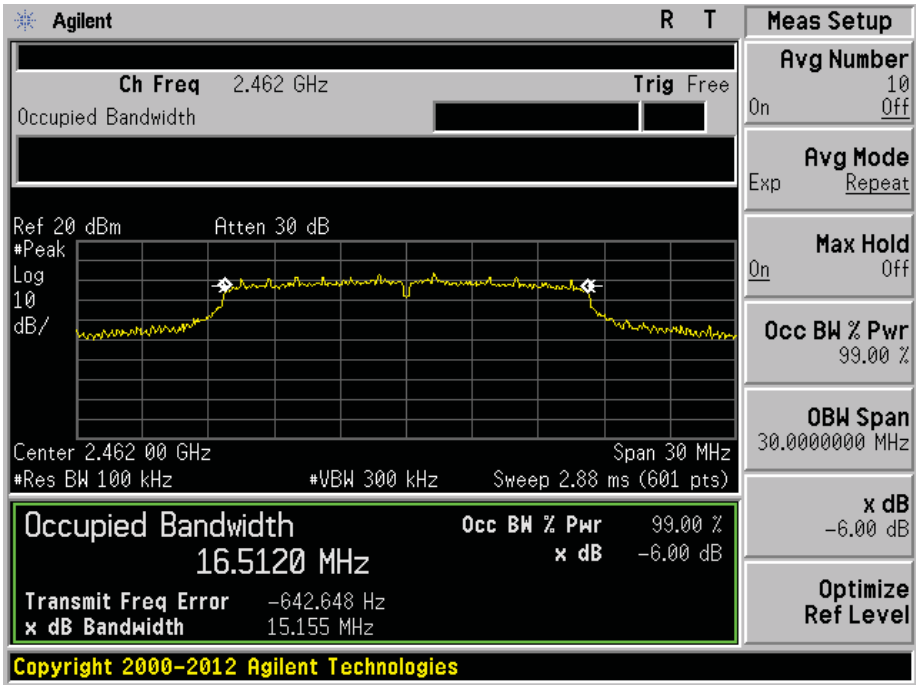
TX CH 01



TX CH 06



TX CH 11

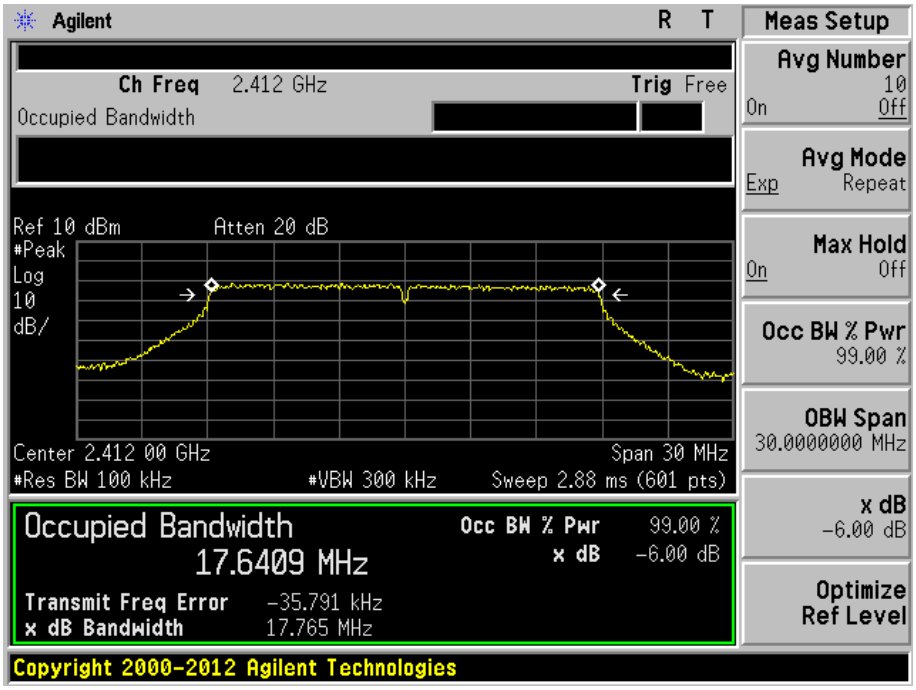

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
Occupied Bandwidth
16.5120 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error -642.648 Hz
x dB Bandwidth 15.155 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(20M)		

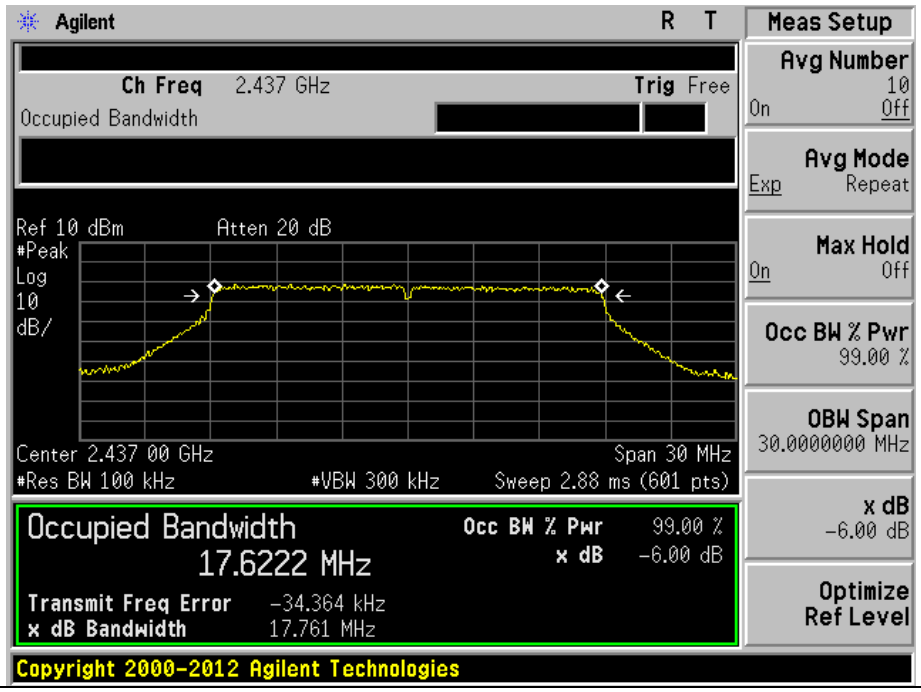
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2412	Ant.1	17.765	500	Pass
		Ant.2	16.101	500	Pass
Middle	2437	Ant.1	17.761	500	Pass
		Ant.2	15.188	500	Pass
High	2462	Ant.1	17.760	500	Pass
		Ant.2	15.119	500	Pass

Ant.1

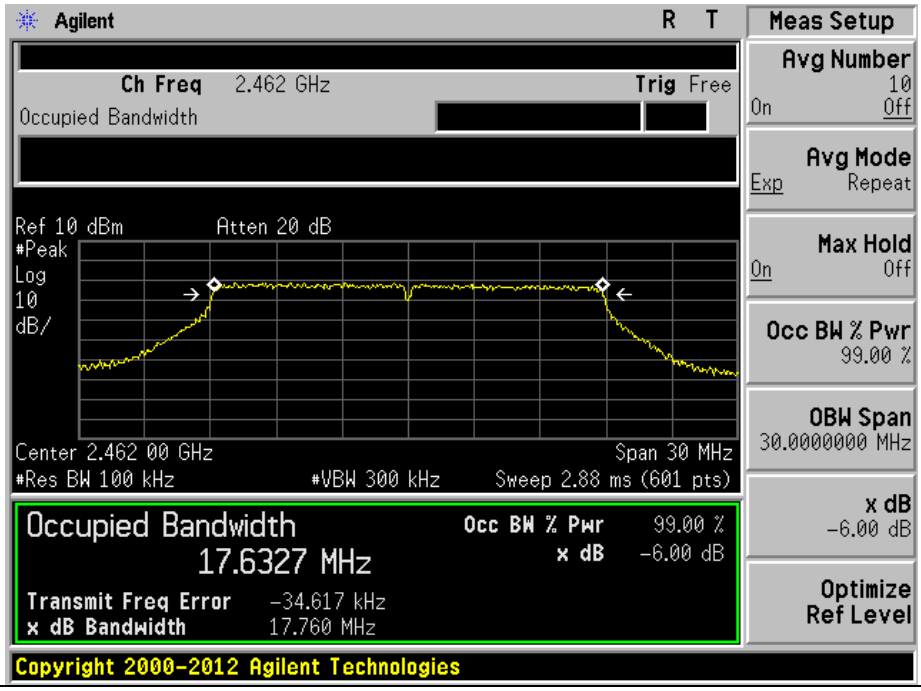
TX CH 01



TX CH 06

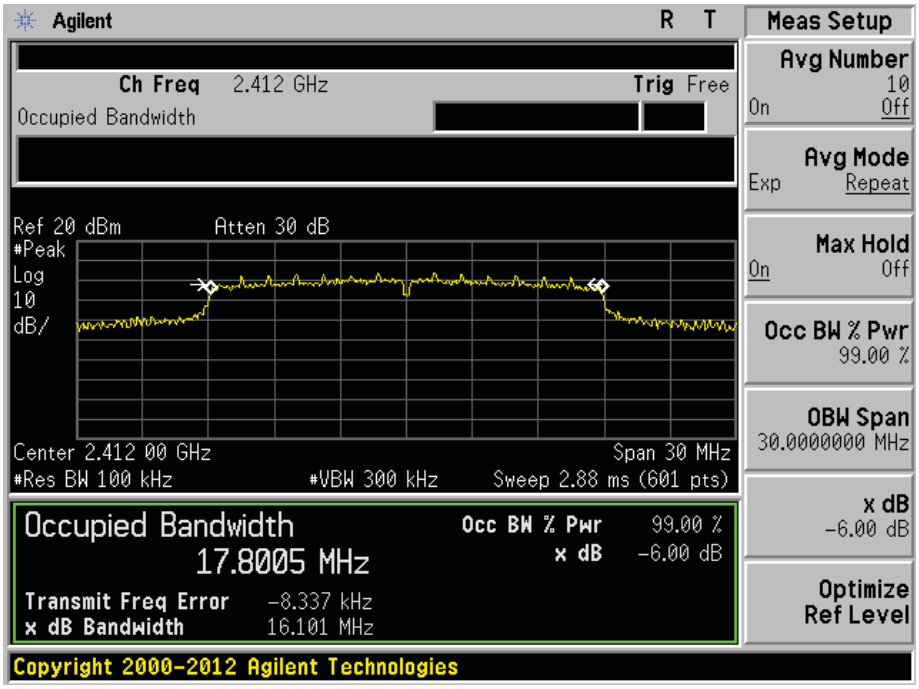


TX CH 11

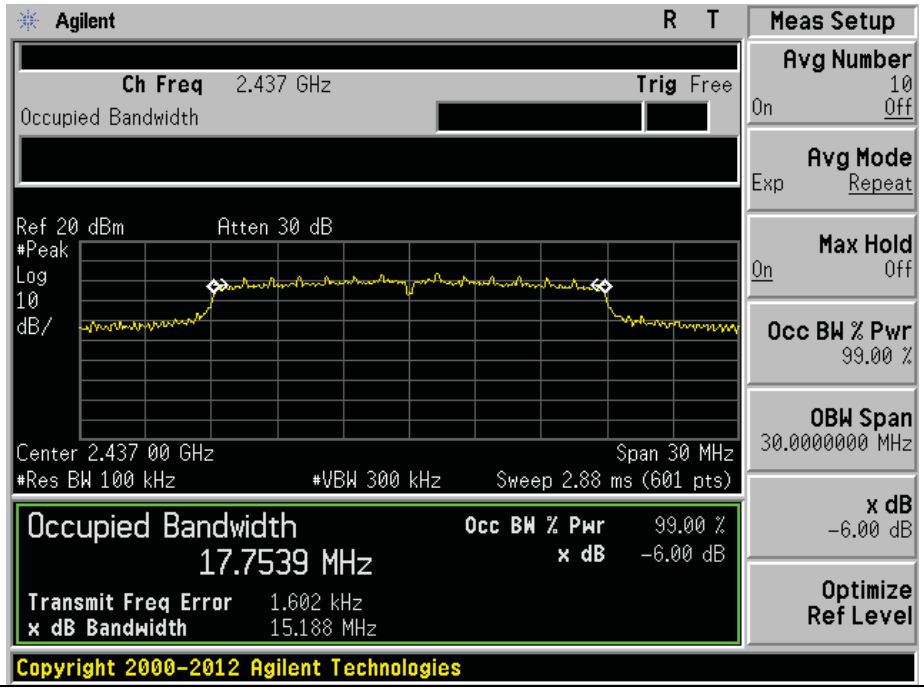


Ant.2

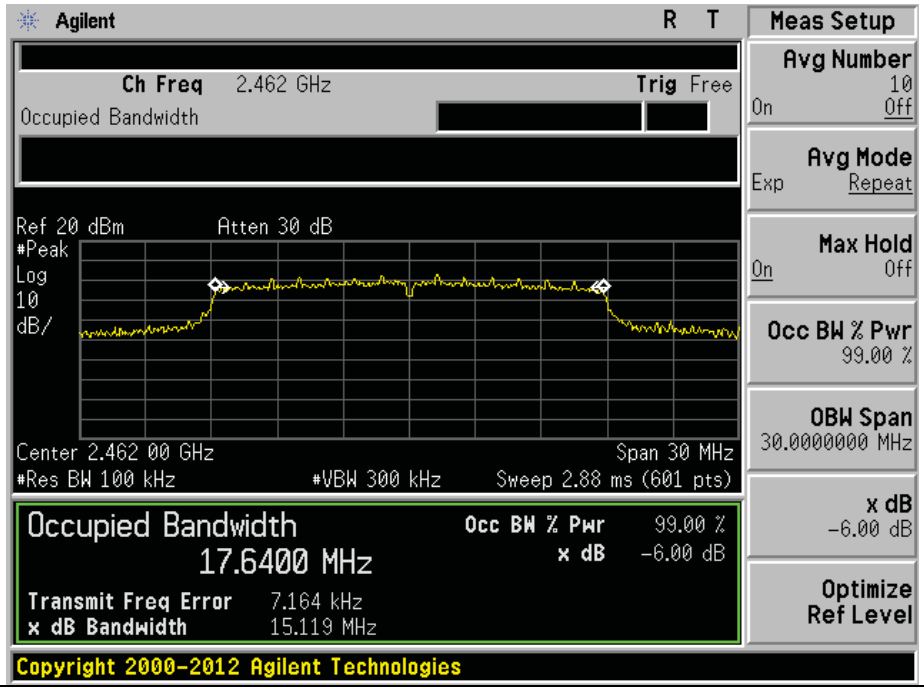
TX CH 01



TX CH 06



TX CH 11

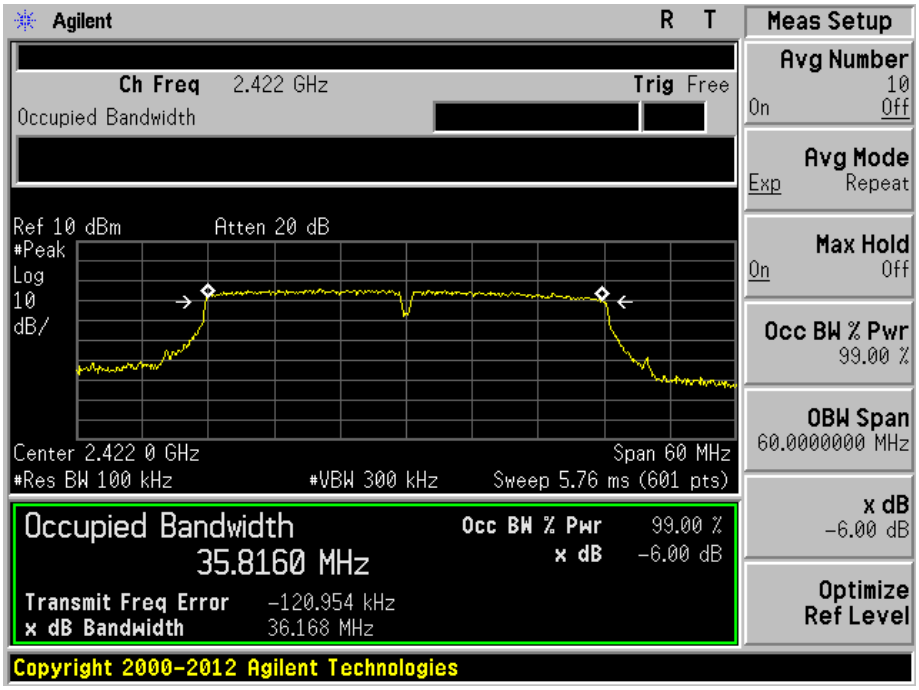

Agilent
R T
Meas Setup
Ch Freq 2.462 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
30.0000000 MHz
Center 2.462 00 GHz
Span 30 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.88 ms (601 pts)
x dB
-6.00 dB
Occupied Bandwidth
17.6400 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
Transmit Freq Error 7.164 kHz
x dB Bandwidth 15.119 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

Temperature :	25℃	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from PC
Test Mode :	TX n Mode(40M)		

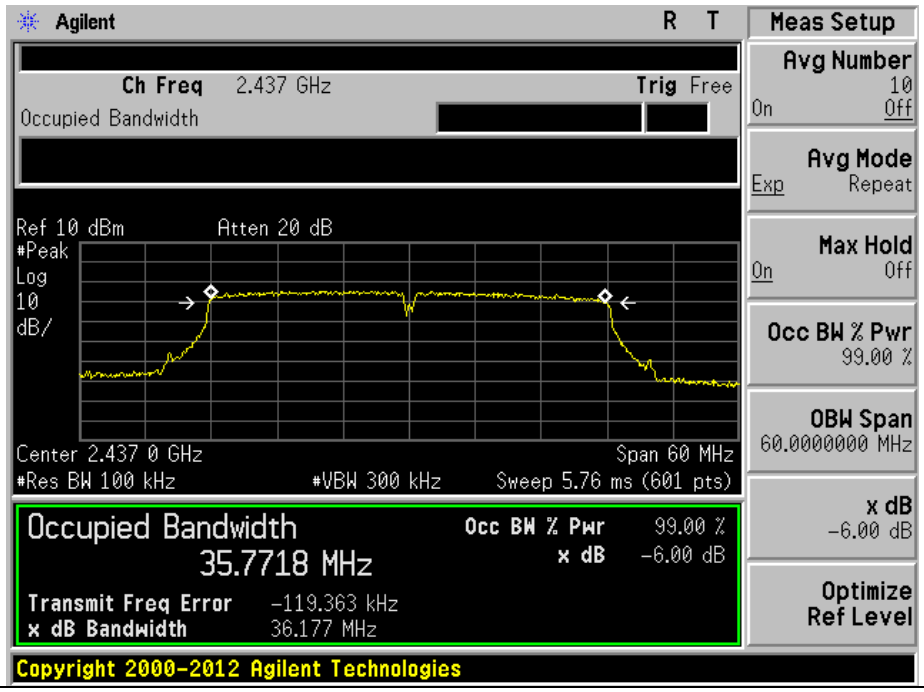
Channel	Frequency (MHz)	6dB bandwidth (MHz)		Limit (kHz)	Result
Low	2422	Ant.1	36.168	500	Pass
		Ant.2	36.352	500	Pass
Middle	2437	Ant.1	36.177	500	Pass
		Ant.2	35.235	500	Pass
High	2452	Ant.1	36.199	500	Pass
		Ant.2	35.325	500	Pass

Ant.1

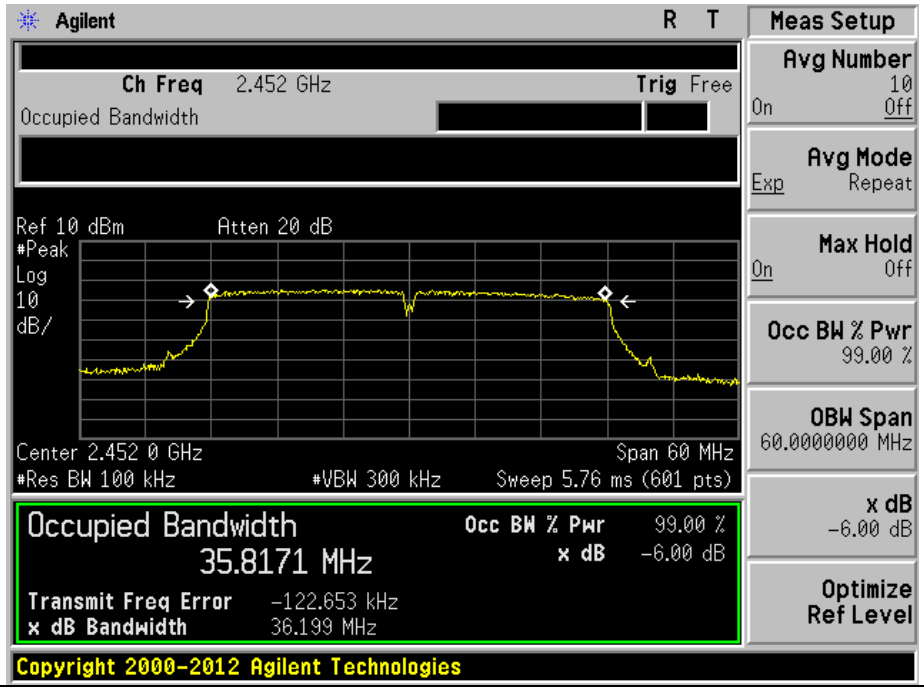
TX CH 03



TX CH 06

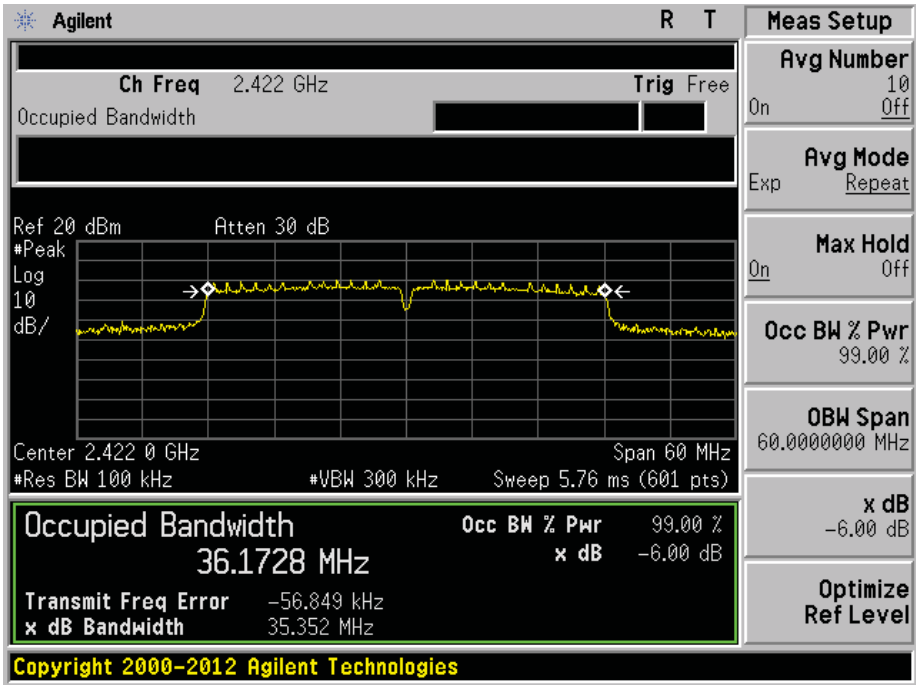


TX CH 09

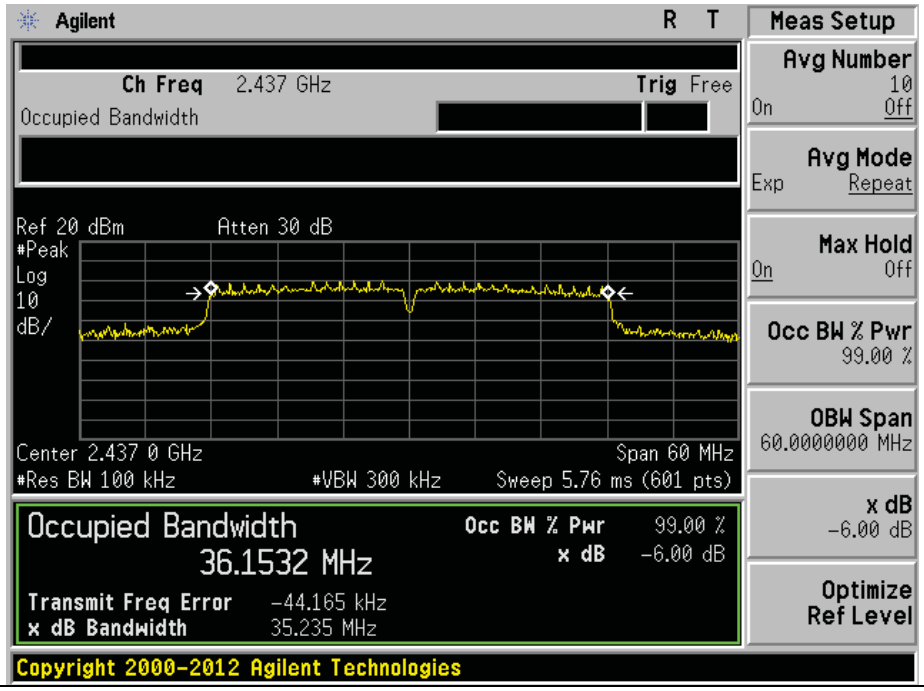


Ant.2

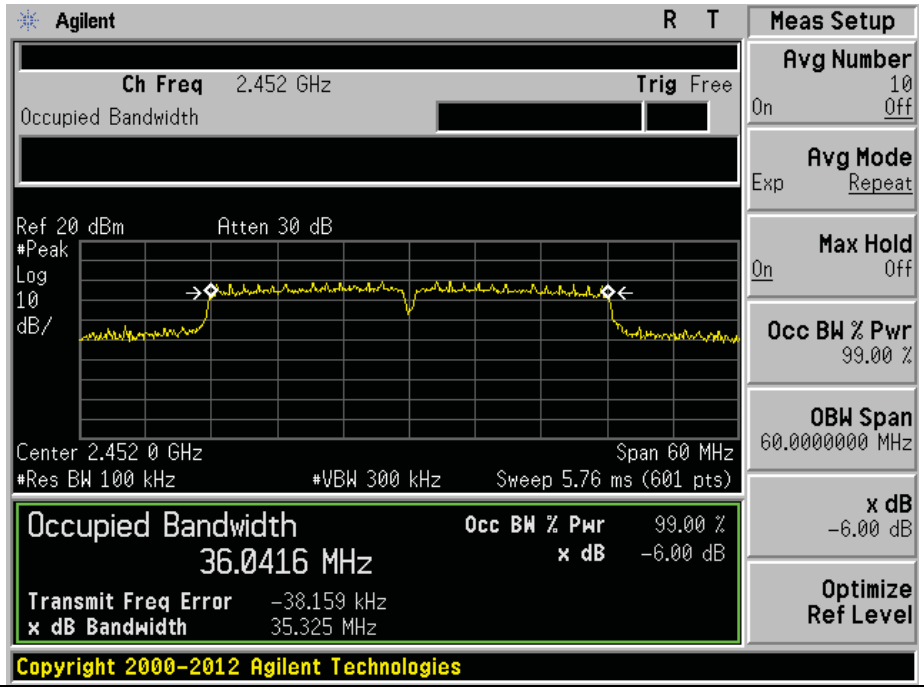
TX CH 03



TX CH 06



TX CH 09


Agilent
R T
Meas Setup
Ch Freq 2.452 GHz
Trig Free
Occupied Bandwidth
Avg Number
10
On Off
Avg Mode
Exp Repeat
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Max Hold
On Off
Occ BW % Pwr
99.00 %
OBW Span
60.0000000 MHz
Center 2.452 0 GHz
Span 60 MHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 5.76 ms (601 pts)
Occupied Bandwidth
36.0416 MHz
Occ BW % Pwr 99.00 %
x dB -6.00 dB
x dB
-6.00 dB
Transmit Freq Error -38.159 kHz
x dB Bandwidth 35.325 MHz
Optimize
Ref Level
Copyright 2000-2012 Agilent Technologies

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

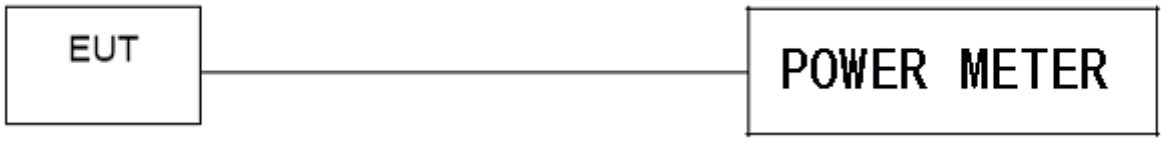
6.1.1 TEST PROCEDURE

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 5V from PC

	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	1.82	1.52	2.95	4.70	30
		Ant.2	1.55	1.43			
	2437	Ant.1	1.61	1.45	2.85	4.55	30
		Ant.2	1.46	1.40			
	2462	Ant.1	1.40	1.38	2.80	4.47	30
		Ant.2	1.52	1.42			
802.11g	2412	Ant.1	0.97	1.25	2.37	3.75	30
		Ant.2	0.49	1.12			
	2437	Ant.1	0.79	1.20	2.25	3.52	30
		Ant.2	0.21	1.05			
	2462	Ant.1	0.33	1.08	2.08	3.18	30
		Ant.2	0.00	1.00			
802.11n20	2412	Ant.1	0.61	1.15	2.22	3.47	30
		Ant.2	0.29	1.07			
	2437	Ant.1	0.00	1.00	2.10	3.22	30
		Ant.2	0.41	1.10			
	2462	Ant.1	0.41	1.10	2.30	3.62	30
		Ant.2	0.79	1.20			
802.11n40	2422	Ant.1	-0.36	0.92	1.82	2.59	30
		Ant.2	-0.46	0.90			
	2437	Ant.1	-0.56	0.88	1.78	2.50	30
		Ant.2	-0.46	0.90			
	2452	Ant.1	-0.71	0.85	1.65	2.17	30
		Ant.2	-0.97	0.80			

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)).

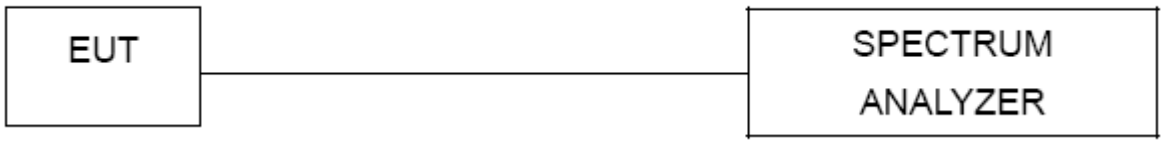
7.2 TEST PROCEDURE

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



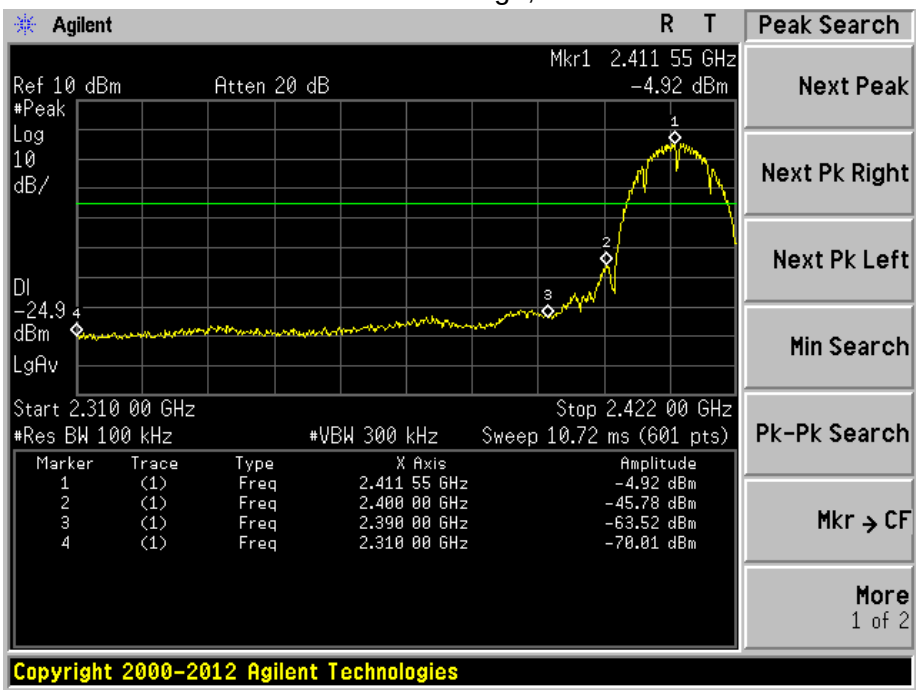
7.5 EUT OPERATION CONDITIONS

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.

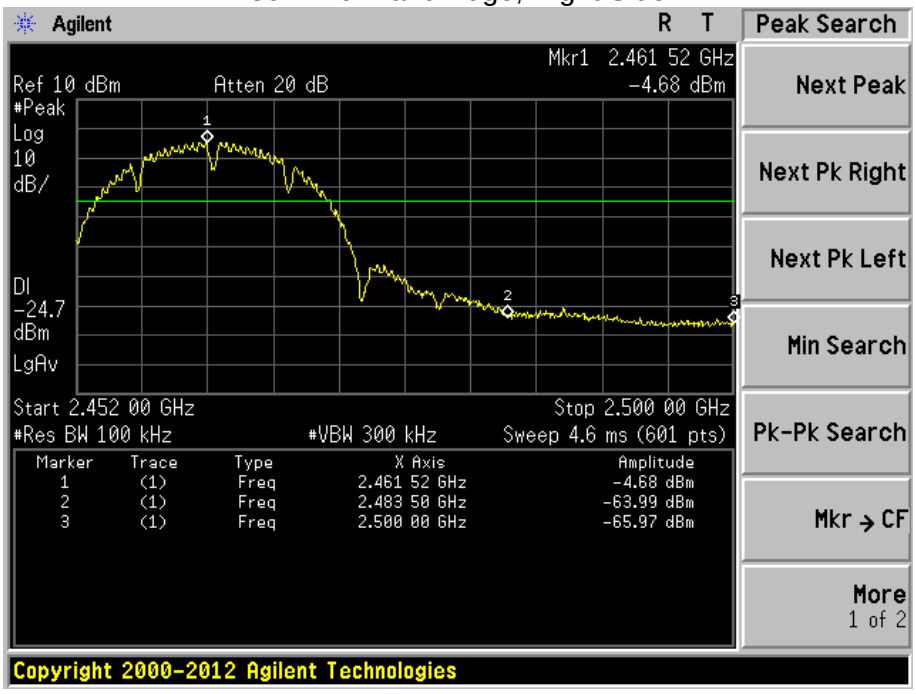
7.1 TEST RESULTS

Ant.1

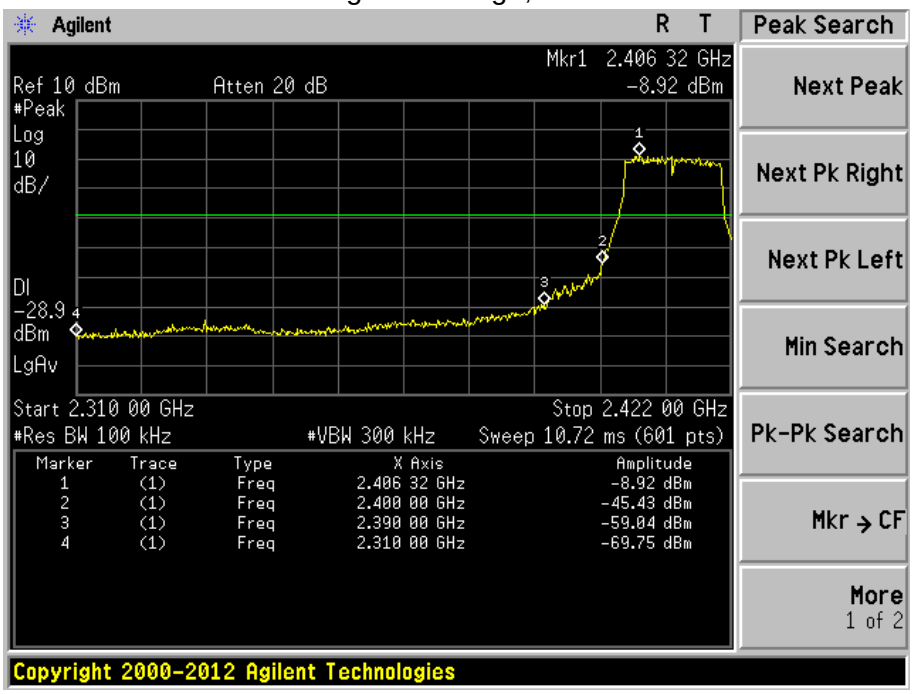
802.11b: Band Edge, Left Side



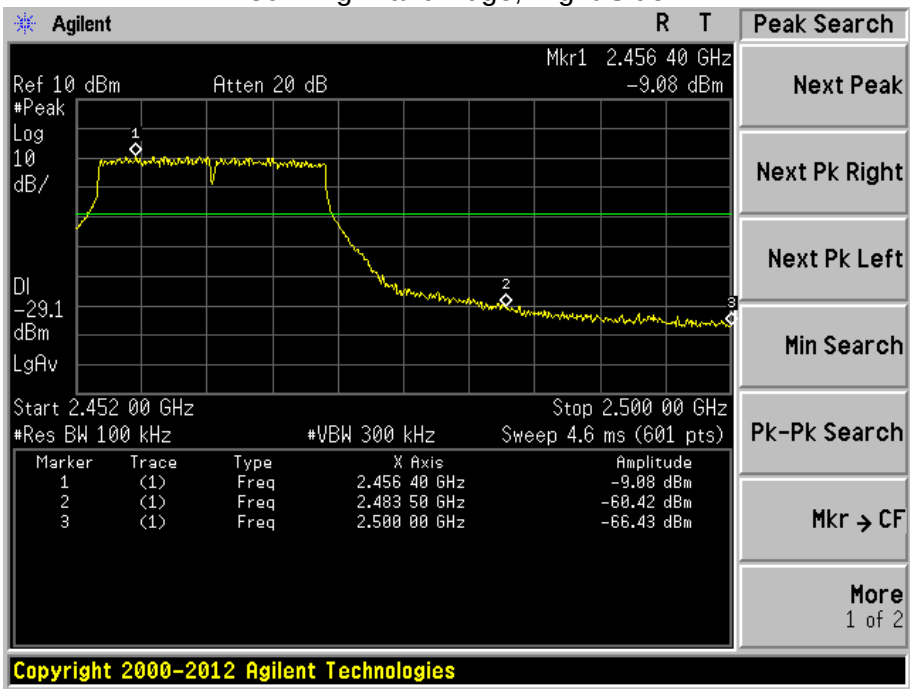
802.11b: Band Edge, Right Side



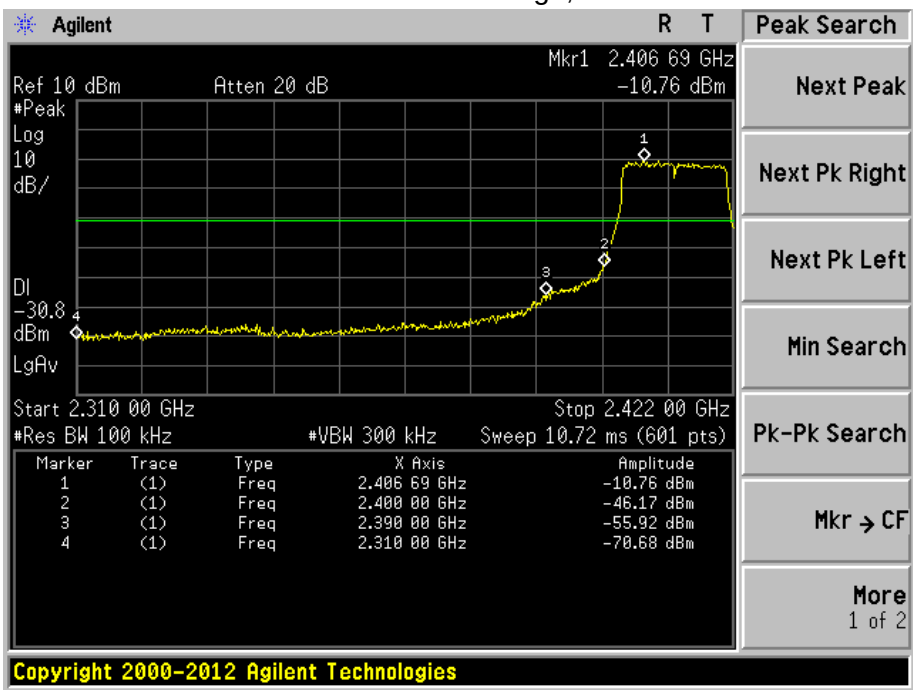
802.11g: Band Edge, Left Side



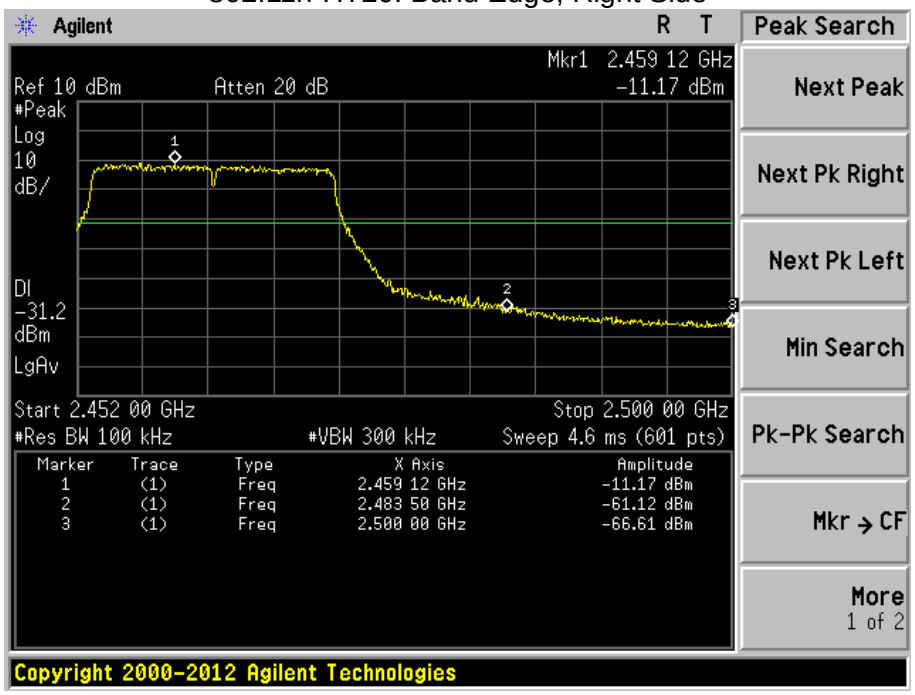
802.11g: Band Edge, Right Side



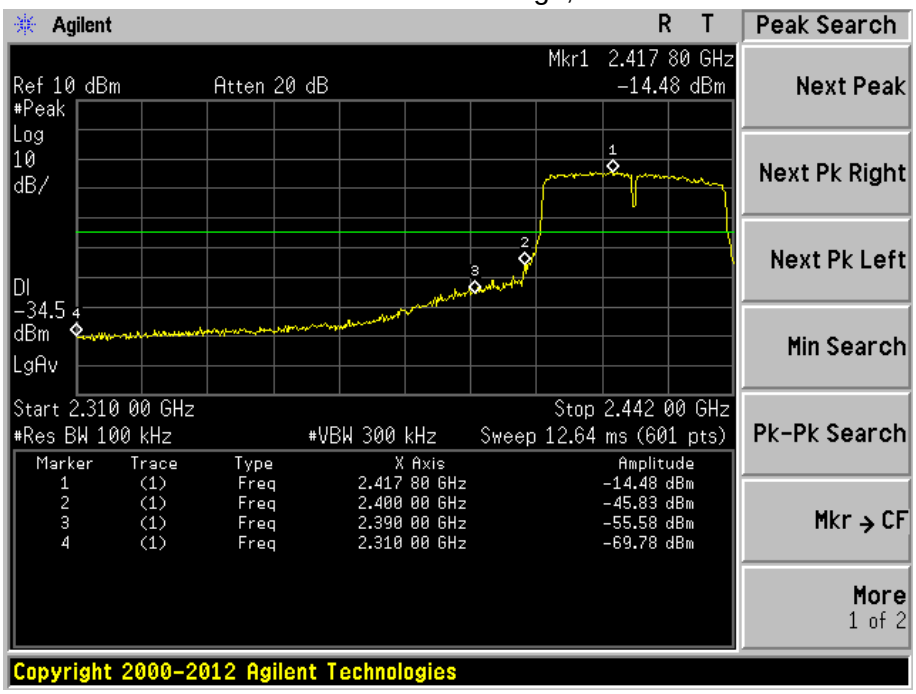
802.11n-HT20: Band Edge, Left Side



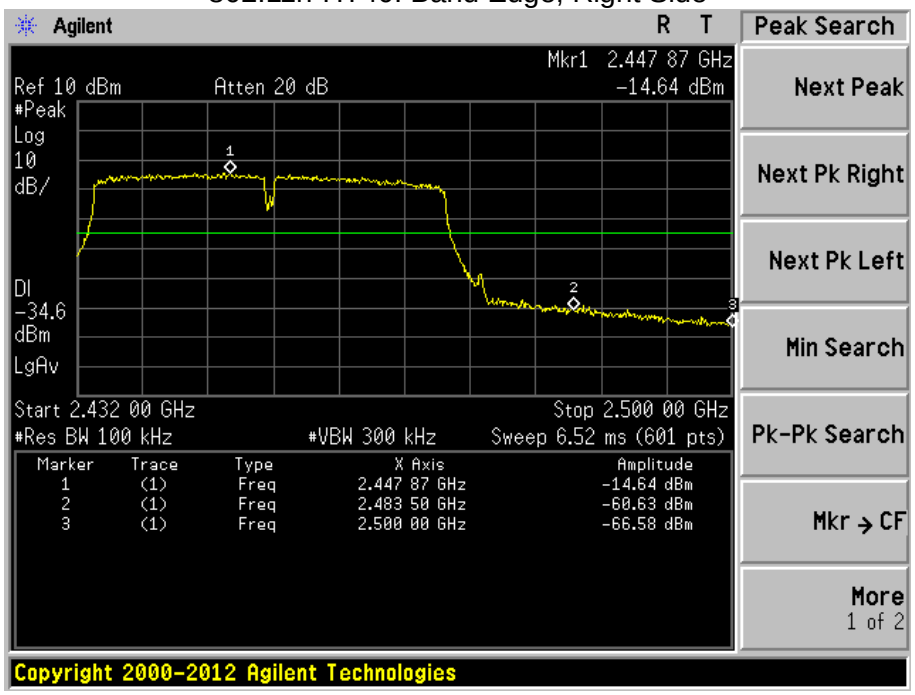
802.11n-HT20: Band Edge, Right Side



802.11n-HT40: Band Edge, Left Side

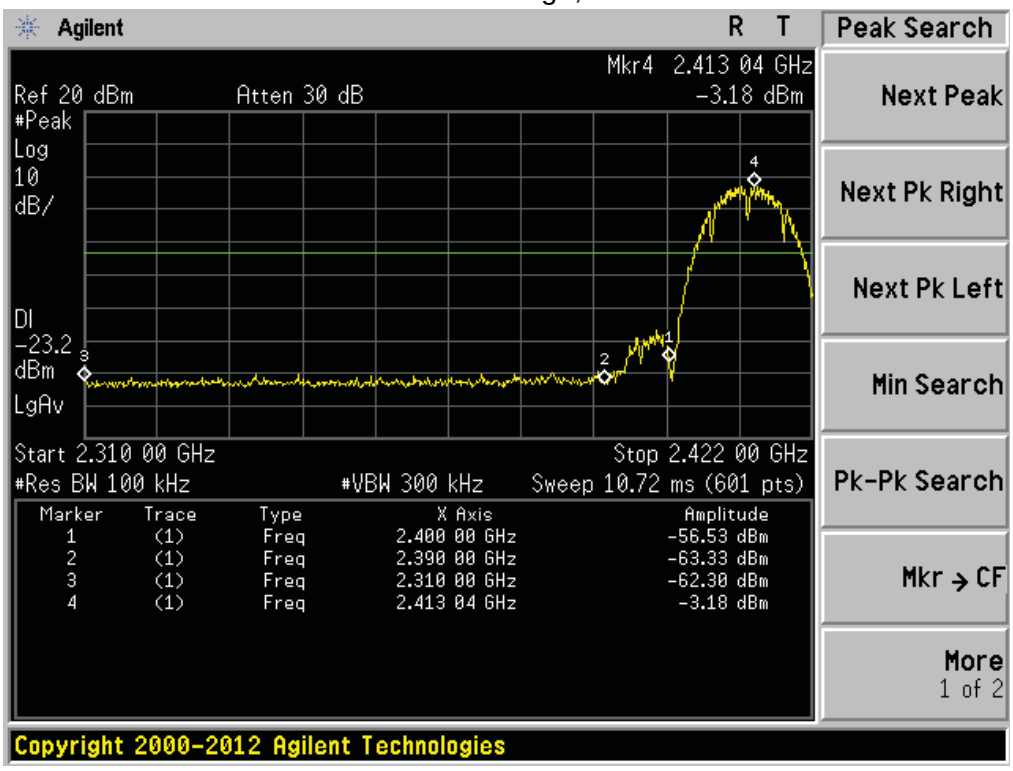


802.11n-HT40: Band Edge, Right Side

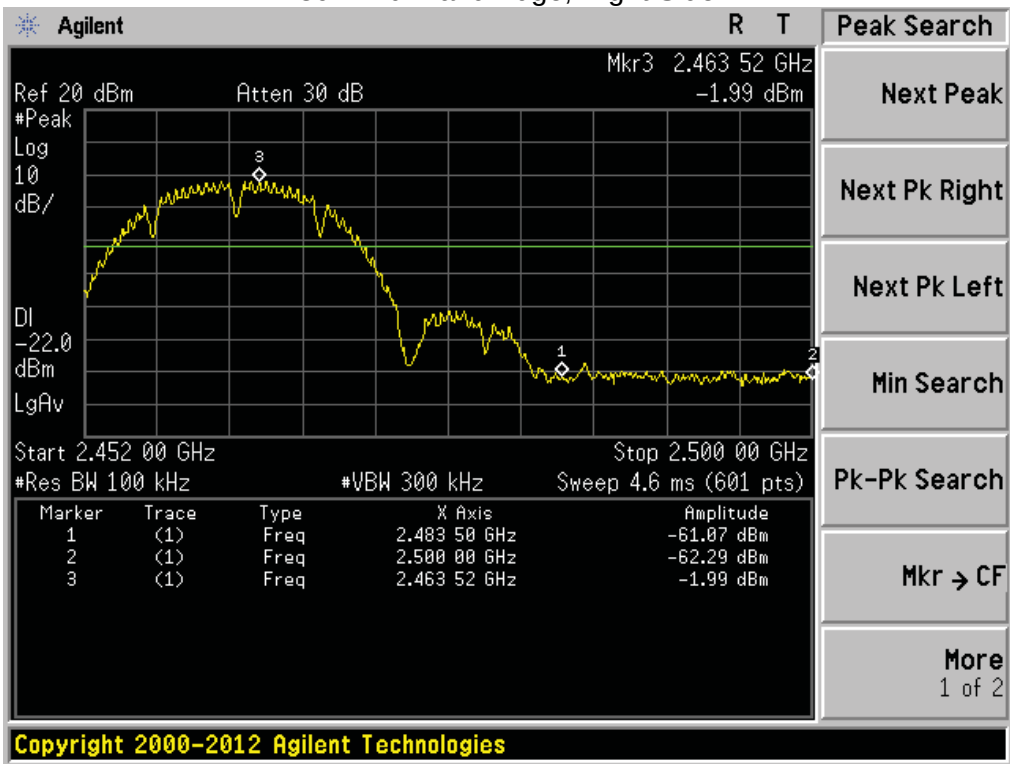


Ant.2

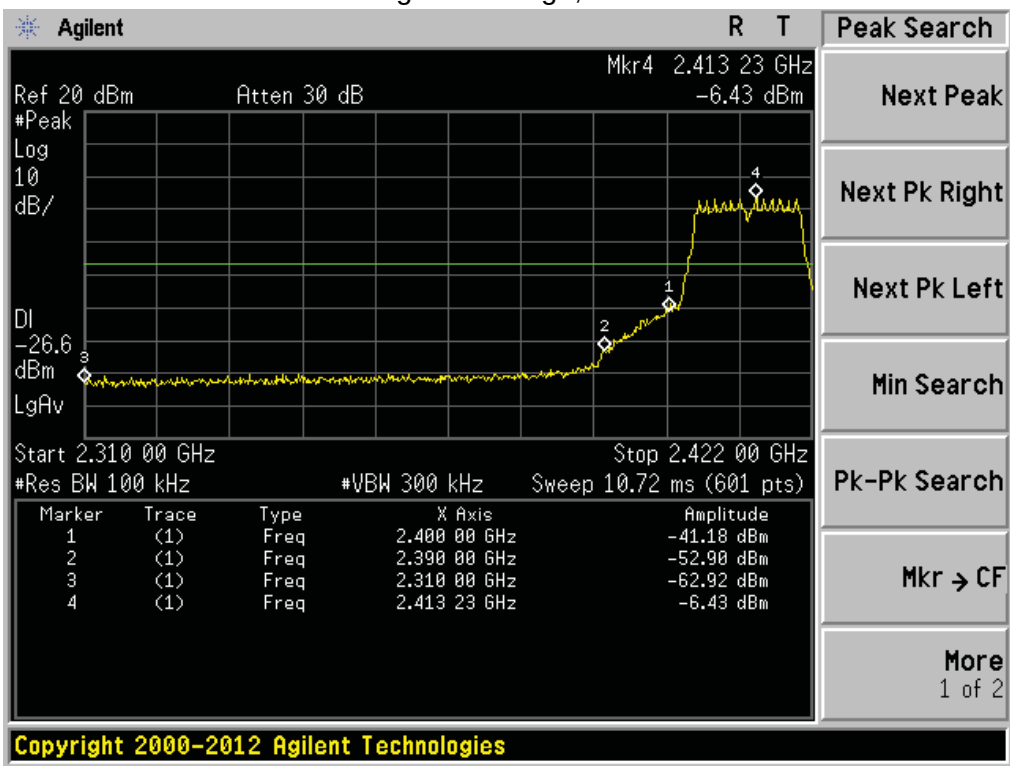
802.11b: Band Edge, Left Side



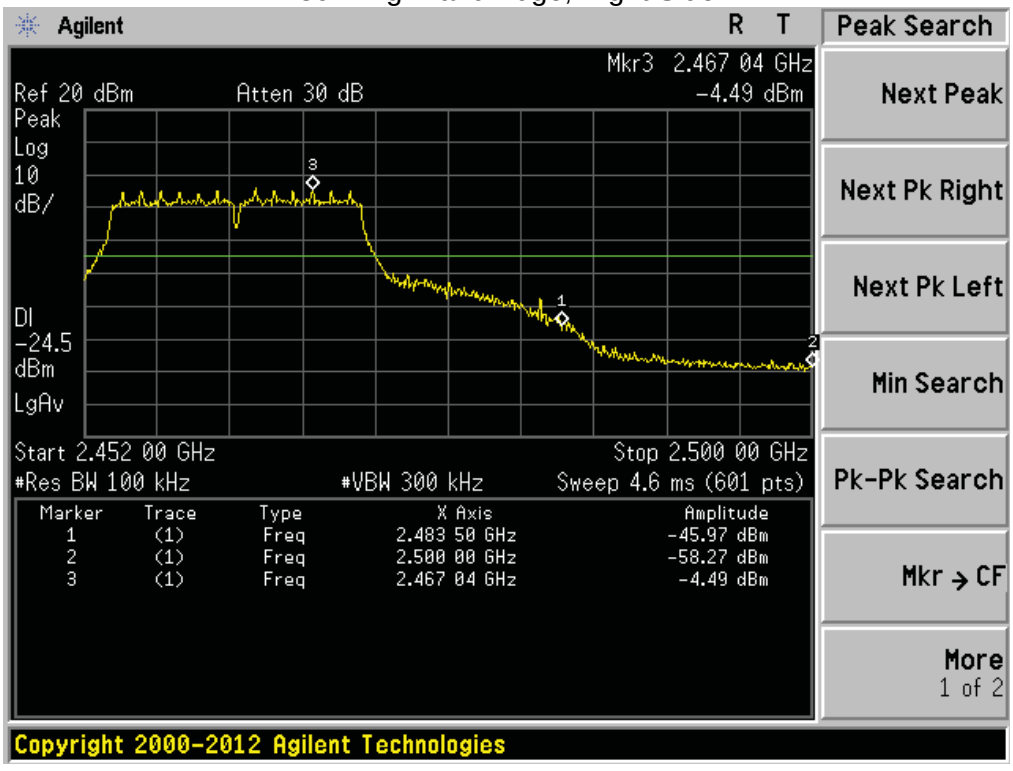
802.11b: Band Edge, Right Side



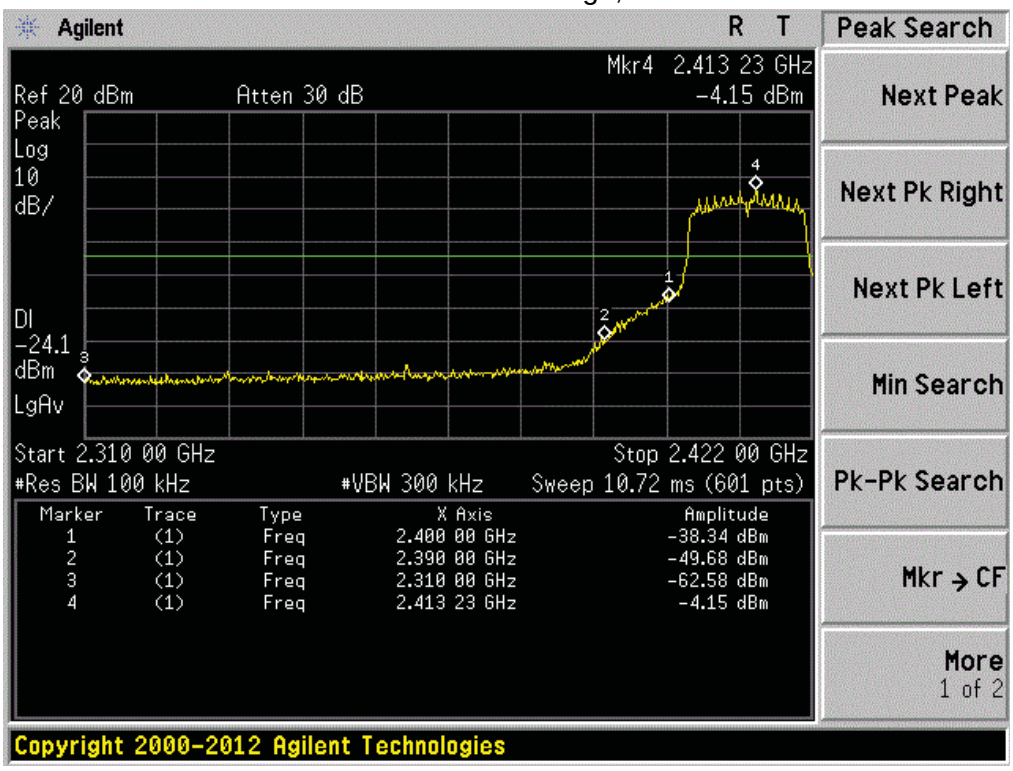
802.11g: Band Edge, Left Side



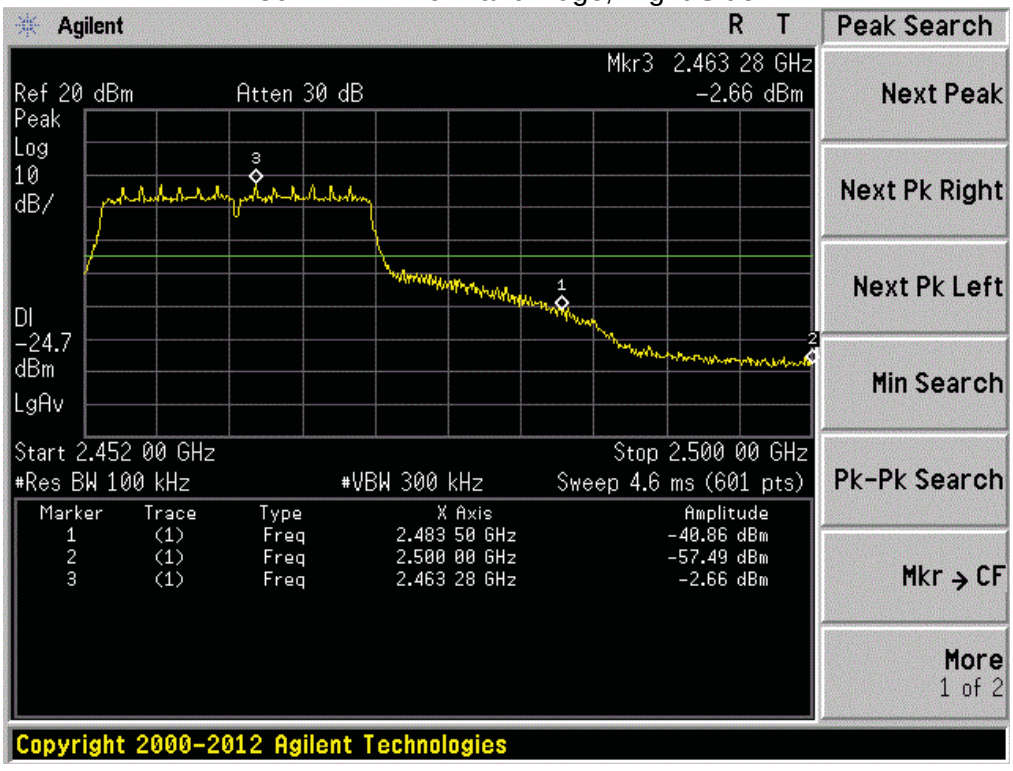
802.11g: Band Edge, Right Side



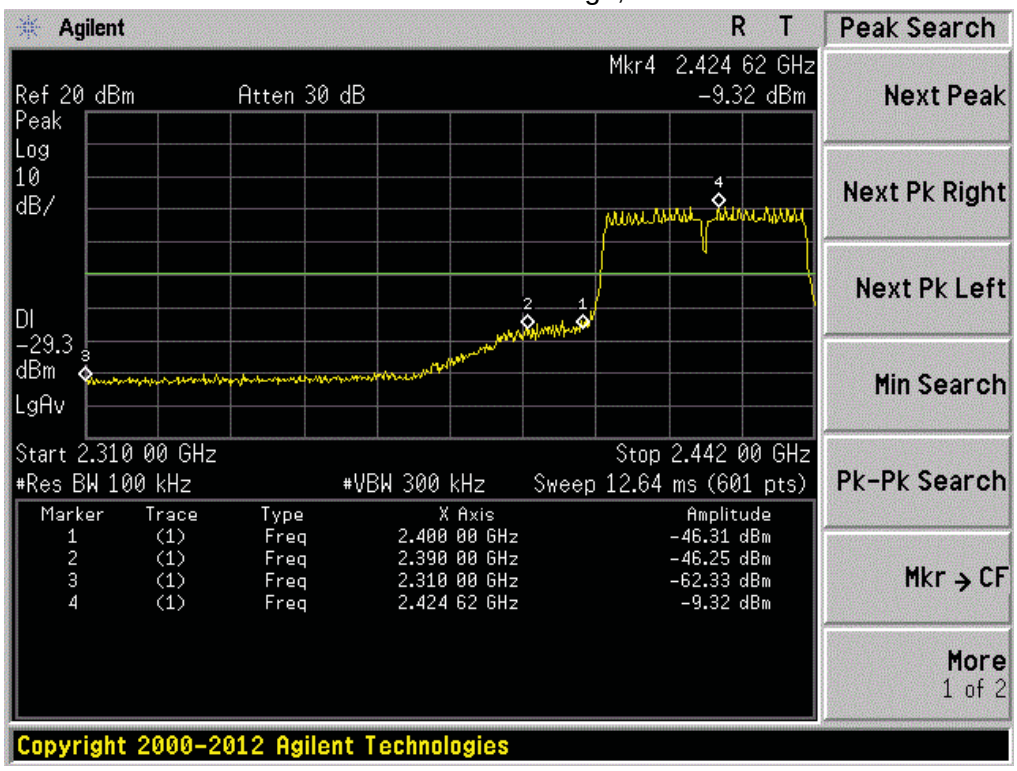
802.11n-HT20: Band Edge, Left Side



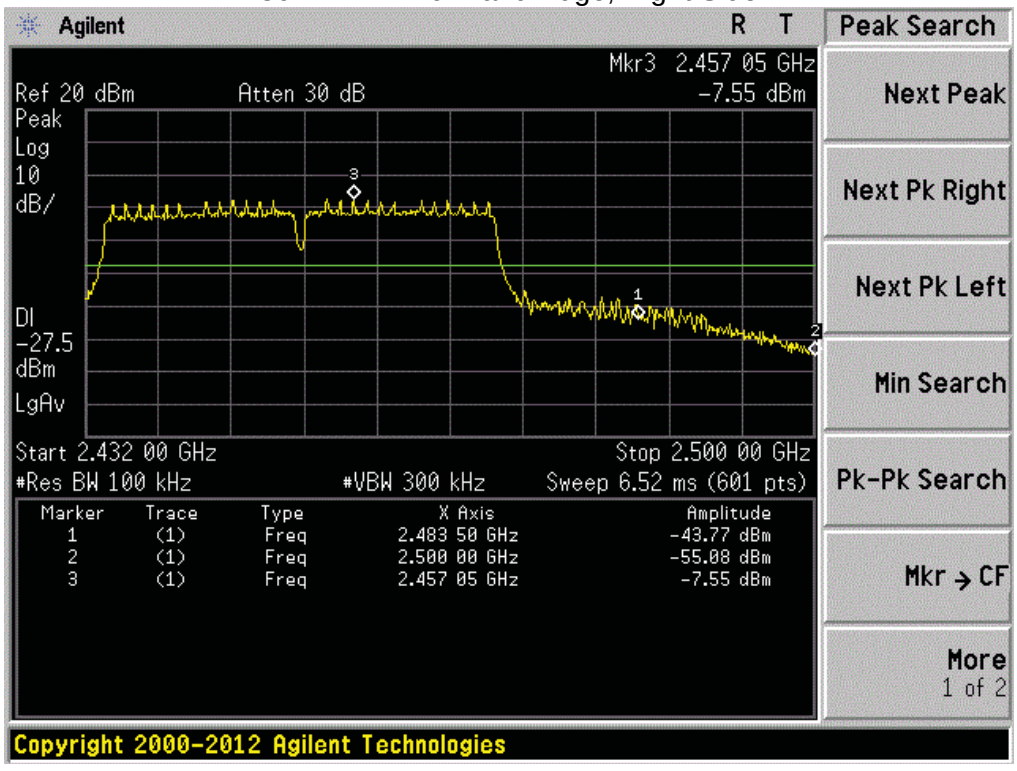
802.11n-HT20: Band Edge, Right Side



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.

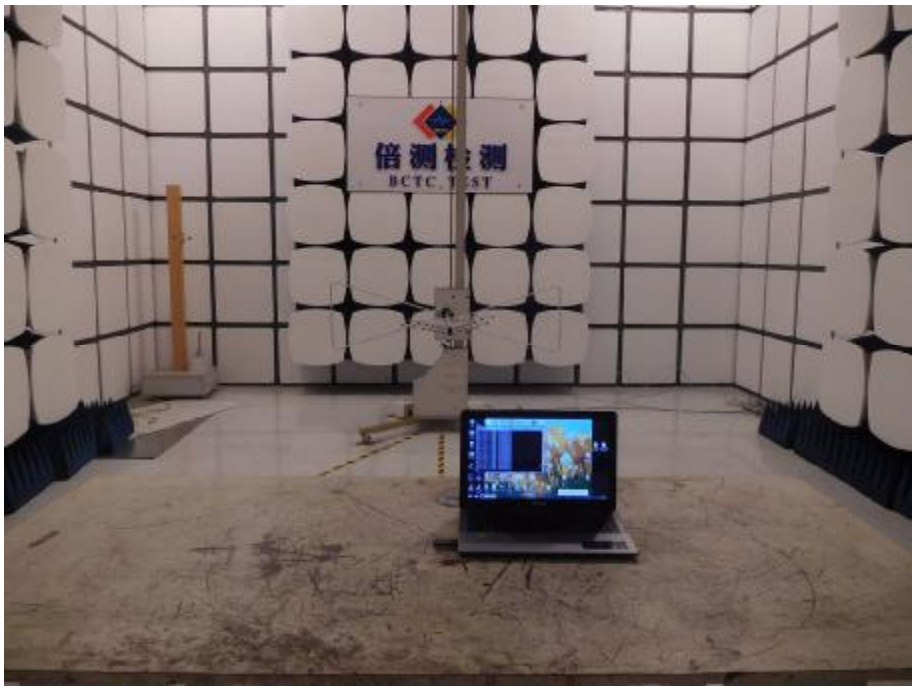
8.2 EUT ANTENNA

The EUT antenna is Integrated (PCB) antenna. It complies with the standard requirement.

9. EUT TEST PHOTO

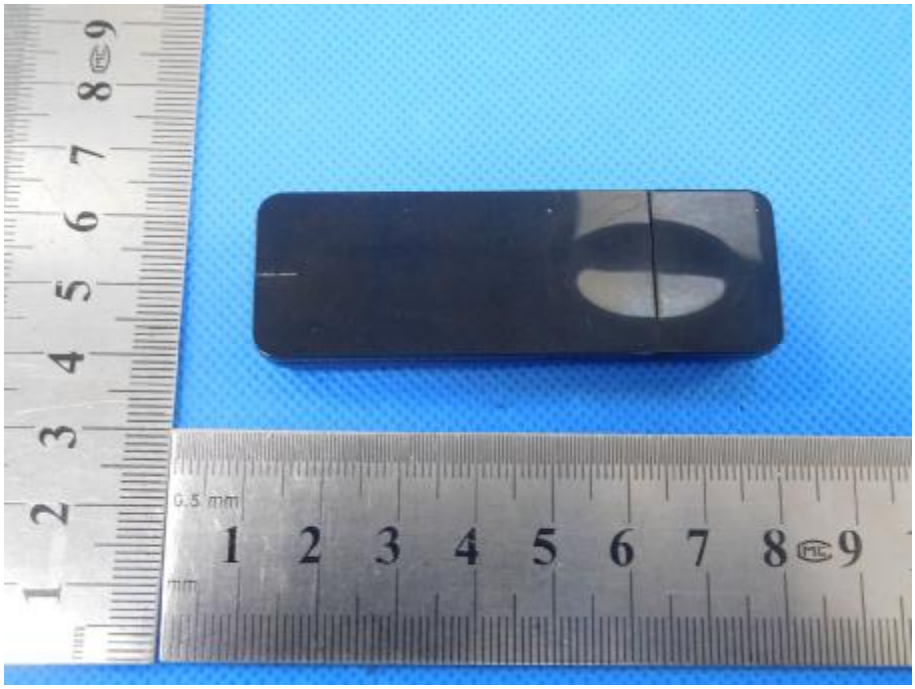
Conducted Measurement Photos

Radiated Measurement Photos



Radiated Measurement Photos

10. EUT PHOTO



※※※※※ **END OF REPORT** ※※※※※