FCC Test Report

Report No.: AGC01575140201FE04

FCC ID	:	2ABYLSP6020
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	WCDMA mobile phone
BRAND NAME	:	WOO
MODEL NAME	:	SP6020
CLIENT	:	UWIN INNOVATION (HONGKONG) LIMITED
DATE OF ISSUE	:	Mar. 18, 2014
STANDARD(S)	:	FCC Part 15 Rules
REPORT VERSION	:	V1.0

Attestation of ***G***lobal ***C***ompliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Mar. 18, 2014	Valid	Original Report

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1. VERIFICATION OF CONFORMITY

Applicant	UWIN INNOVATION (HONGKONG) LIMITED
Address	Room 206, Block 30, Nantou Checking Point 2nd Road, Wisdomland Business Park, Nanshan District, Shenzhen, China
Manufacturer	Shenzhen Eternity Technology Limited
Address	Block A2, Yingzhan Industrial Park, Longtian Community, Kengzi Street, Pingshan District, Shenzhen, CHINA
Product Designation	WCDMA mobile phone
Brand Name	WOO
Test Model	SP6020
Date of test	Mar. 07, 2014 to Mar. 17, 2014
Deviation	None
Condition of Test Sample	Normal
Report Template	AGCRT-US-BGN/RF (2013-03-01)

We hereby certify that:
The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By	Wall Huang	Mar. 18, 2014
Checked By	Kidd Yang	Mar. 18, 2014
Authorized By	Solger Zhang	Mar. 18, 2014

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “WCDMA mobile phone”. It is designed by way of utilizing the DSSS and OFDM technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	2.412 GHz～2.462GHz
Output Power	IEEE 802.11b:16.46dBm; IEEE 802.11g:13.07dBm; IEEE 802.11n(20):13.7dBm; IEEE 802.11n(40):11.64dBm
Modulation	DSSS(DBPSK/DQPSK/CCK);OFDM(BPSK/QPSK/16-QAM/64-QAM)
Number of channels	11
Hardware Version	Elink-MR601-V2 20131203
Software Version	N/A
Antenna Designation	Integrated Antenna
Antenna Gain	1.2 dBi
Power Supply	DC3.7V by Built-in Li-ion Battery

2.2. TABLE OF CARRIER FREQUENCYS

Frequency Band	Channel Number	Frequency
2400~2483.5MHZ	1	2412 MHZ
	2	2417 MHZ
	3	2422 MHZ
	4	2427 MHZ
	5	2432 MHZ
	6	2437 MHZ
	7	2442 MHZ
	8	2447 MHZ
	9	2452 MHZ
	10	2457 MHZ
	11	2462 MHZ

Note: For 20MHZ bandwidth system use Channel 1 to Channel 11
For 40MHZ bandwidth system use Channel 3 to Channel 9

2.3. IEEE 802.11N MODULATION SCHEME

MCS Index	Nss	Modulation	R	NBPSC	NCBPS		NDBPS		Data rate(Mbps)	
									800nsGI	
					20MHz	40MHz	20MHz	40MHz	20MHz	40MHz
0	1	BPSK	1/2	1	52	108	26	54	6.5	13.5
1	1	QPSK	1/2	2	104	216	52	108	13.0	27.0
2	1	QPSK	3/4	2	104	216	78	162	19.5	40.5
3	1	16-QAM	1/2	4	208	432	104	216	26.0	54.0
4	1	16-QAM	3/4	4	208	432	156	324	39.0	81.0
5	1	64-QAM	2/3	6	312	648	208	432	52.0	108.0
6	1	64-QAM	3/4	6	312	648	234	489	58.5	121.5
7	1	64-QAM	5/6	6	312	648	260	540	65.0	135.0

Symbol	Explanation
NSS	Number of spatial streams
R	Code rate
NBPSC	Number of coded bits per single carrier
NCBPS	Number of coded bits per symbol
NDBPS	Number of data bits per symbol
GI	Guard interval

2.4. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2ABYLSP6020** filing to comply with the FCC Part 15 requirements.

2.5. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4 (2003).
Radiated testing was performed at an antenna to EUT distance 3 meters.
Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.247 rules.

2.6. SPECIAL ACCESSORIES

Refer to section 5.2.

2.7. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.

3. MEASUREMENT UNCERTAINTY

Conducted measurement: +/- 2.75dB

Radiated measurement: +/- 3.2dB

4. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	Low channel TX
2	Middle channel TX
3	High channel TX
4	Normal operating
Note: Transmit by 802.11b with Date rate (1/2/5.5/11) Transmit by 802.11g with Date rate (6/9/12/18/24/36/48/54) Transmit by 802.11n (20MHz) with Date rate (6.5/13/19.5/26/39/52/58.5/65) Transmit by 802.11n (40MHz) with Date rate (13.5/27/40.5/54/81/108/121.5/135)	

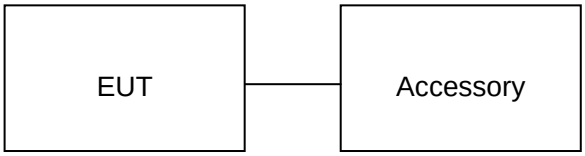
Note:

1. The EUT has been set to operate continuously on the lowest, middle and highest operation frequency individually.
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. For Radiated Emission, 3axis were chosen for testing for each applicable mode.

5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	WCDMA mobile phone	SP6020	FCC ID:2ABYLSP6020	EUT
2	Adapter	SP6020	DC5.0V / 1000mA	Accessory
3	Battery	SP6020	DC3.7V/ 2600 mAh	Accessory
4	Earphone	SP6020	N/A	Accessory
5	USB Cable	SP6020	N/A	Accessory

Note: All the accessories have been used during the test in conduction emission test.

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.247	Peak Output Power	Compliant
§15.247	6 dB Bandwidth	Compliant
§15.247	Conducted Spurious Emission	Compliant
§15.247	Maximum Conducted Output Power SPECTRAL Density	Compliant
§15.209	Radiated Emission	Compliant
§15.247	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

Note: The EUT received power from DC3.7V lithium battery.

6. TEST FACILITY

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	2/F., Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park, Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Description	The test site is constructed and calibrated to meet the FCC requirements in documents ANSI C63.4:2003.

ALL TEST EQUIPMENT LIST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Power Probe	R&S	NRP-Z23	100323	07/17/2013	07/16/2014
RF attenuator	N/A	RFA20db	68	N/A	N/A
Spectrum Analyzer	Agilent	E4440A	US41421290	07/17/2013	07/16/2014
Amplifier	EM	EM30180	0607030	02/27/2014	02/26/2015
Horn Antenna	EM	EM-AH-10180	67	04/21/2013	04/20/2014
Horn Antenna	A.H. Systems Inc.	SAS-574	--	07/17/2013	07/16/2014
EMI Test Receiver	Rohde & Schwarz	ESCI	100694	07/17/2013	07/16/2014
Biological Antenna	A.H. Systems Inc.	SAS-521-4	26	06/07/2013	06/06/2014
Loop Antenna	A.H.	SAS-526B	264	07/14/2013	07/13/2014
LISN	R&S	ESH3-Z5	8389791009	07/17/2013	07/16/2014

7. PEAK OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

For peak power test:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, middle and the bottom operation frequency individually.
4. Use the following spectrum analyzer settings:
   Set the RBW = 1 MHz
   Set the VBW ≥ 3 RBW
   Set the span ≥ 1.5 x DTS bandwidth
   Detector = peak
   Sweep time = auto couple
   Trace mode = max hold
5. Allow the trace to stabilize. Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges.
6. Record the result form the Spectrum Analyzer.

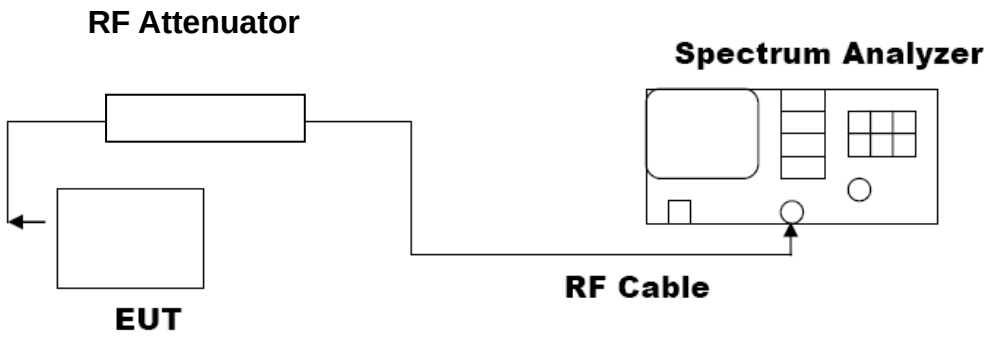
For average power test:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to power probe through an RF attenuator.
3. Connect the power probe to the PC.
4. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
5. Record the maximum power from the software.
6. The maximum peak power shall be less 1 Watt (30dBm).

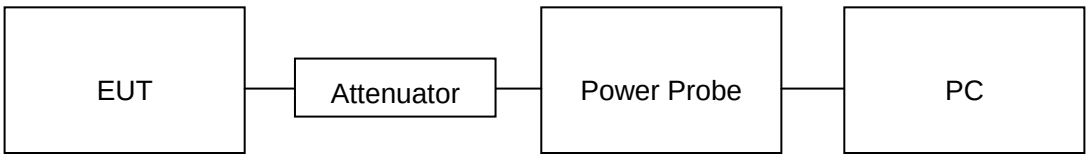
Note：The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements.

7.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

PEAK POWER TEST SETUP



AVERAGE POWER SETUP

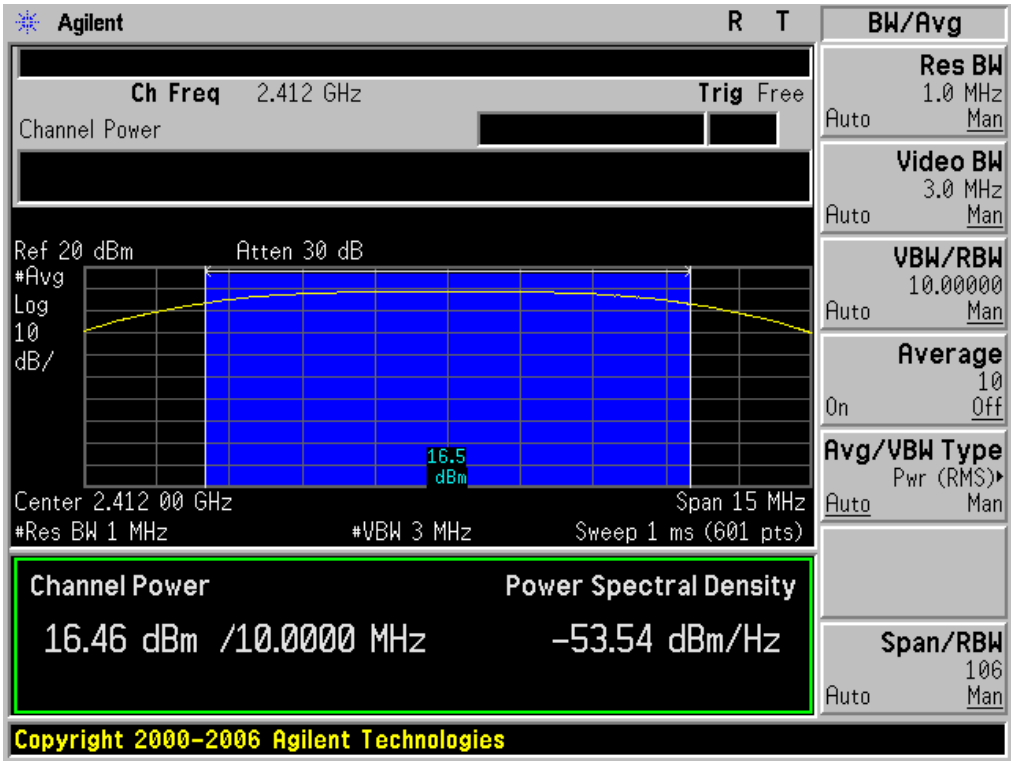


7.3. LIMITS AND MEASUREMENT RESULT

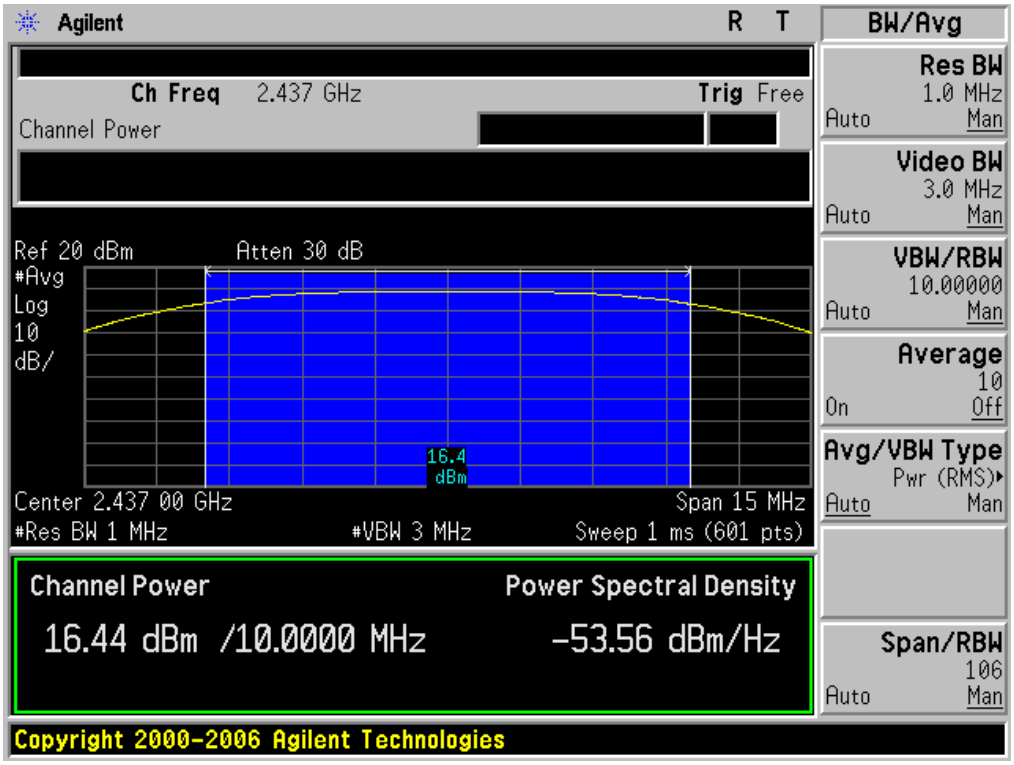
TEST ITEM	PEAK POWER
TEST MODE	802.11b with data rate 1

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	14.48	16.46	30	Pass
2.437	14.46	16.44	30	Pass
2.462	14.47	16.45	30	Pass

CH1



CH6


Agilent
R T
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
16.4
dBm
Center 2.437 00 GHz
Span 15 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
16.44 dBm /10.0000 MHz
Power Spectral Density
-53.56 dBm/Hz
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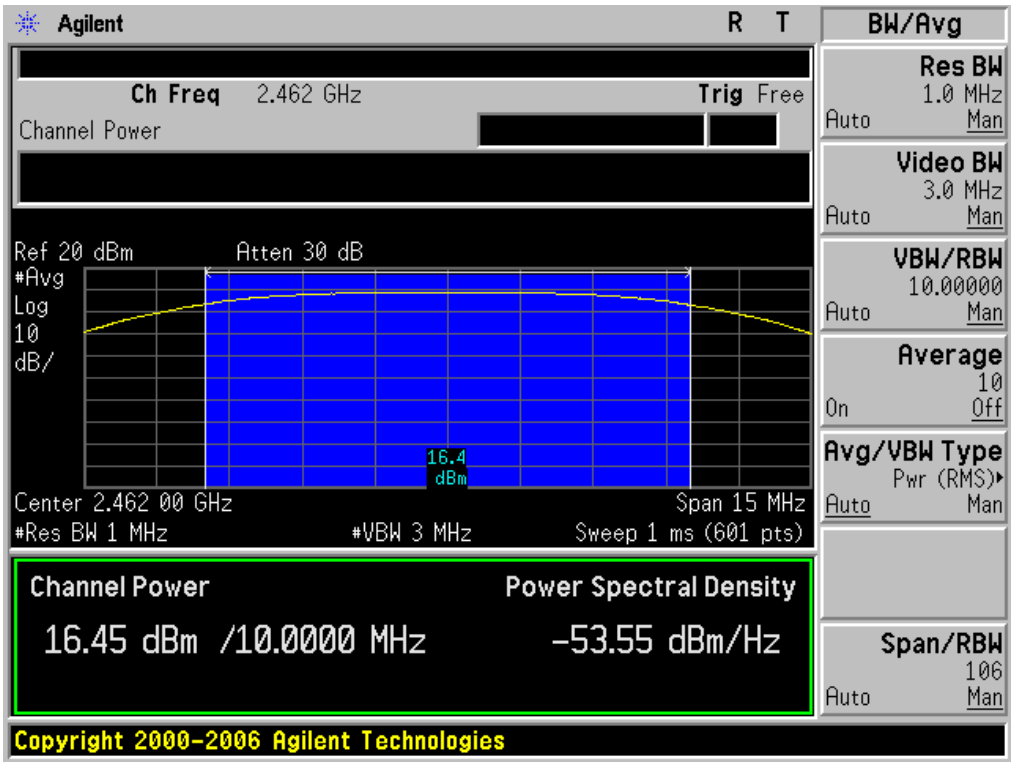
CH11


Agilent
R T
BW/Avg
Ch Freq 2.462 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
16.4
dBm
Center 2.462 00 GHz
Span 15 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
16.45 dBm /10.0000 MHz
Power Spectral Density
-53.55 dBm/Hz
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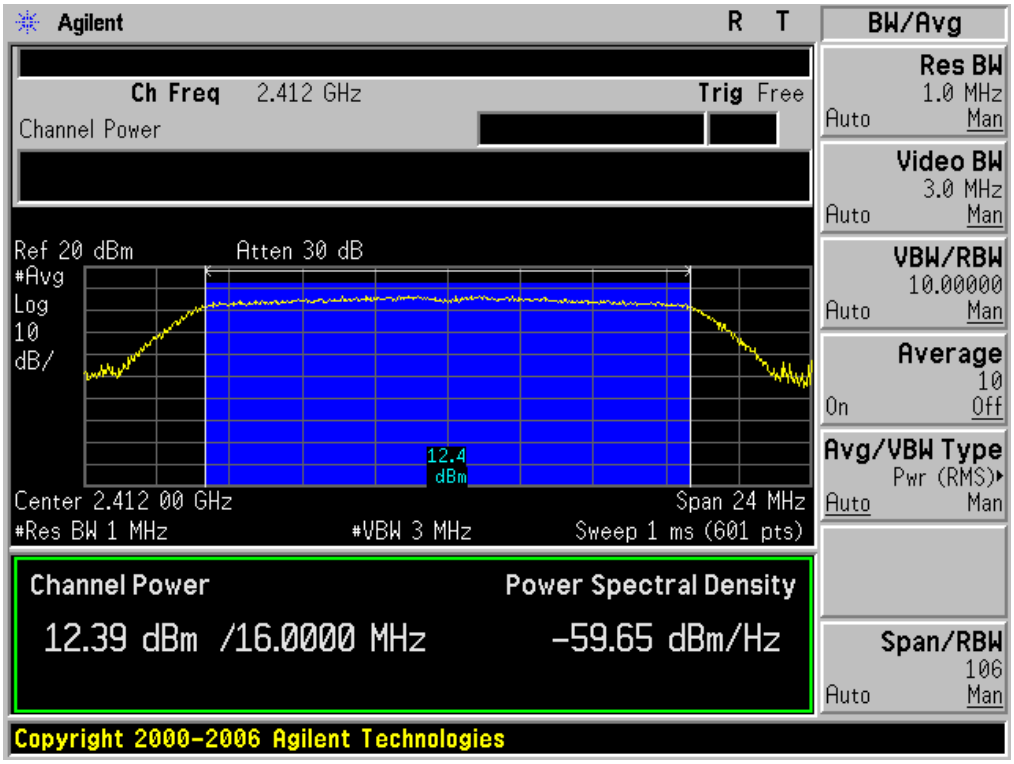
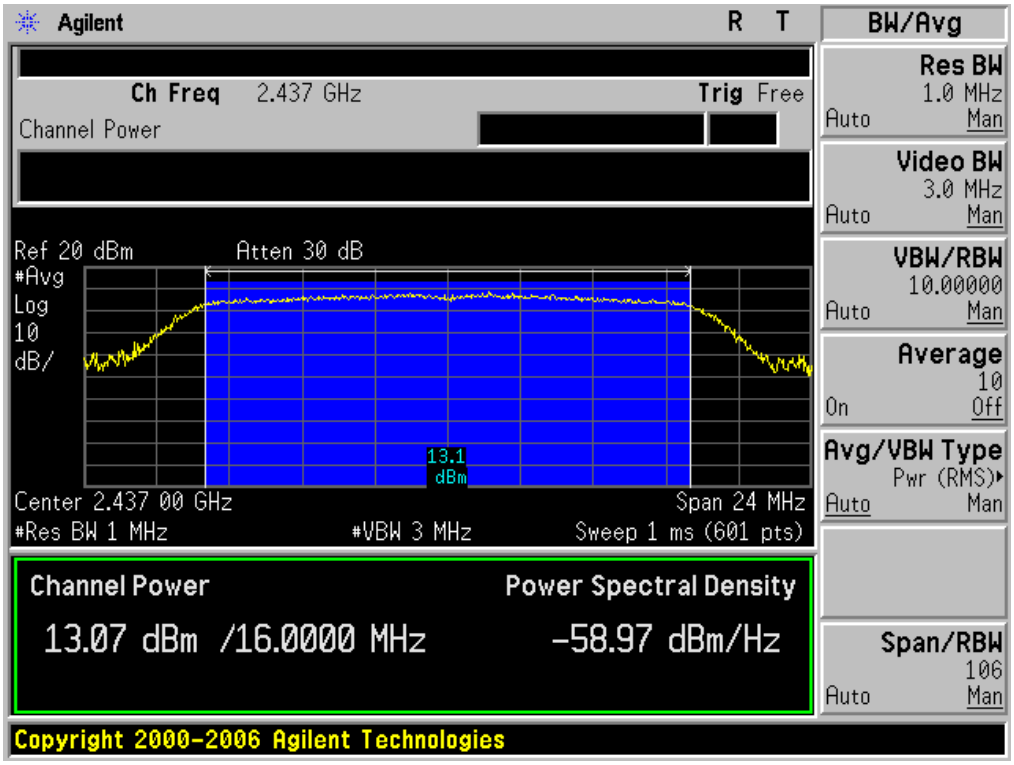
TEST ITEM	PEAK POWER
TEST MODE	802.11g with data rate 6

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	10.41	12.39	30	Pass
2.437	11.09	13.07	30	Pass
2.462	10.1	12.08	30	Pass

CH1



CH6


Agilent
R T
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
13.1
dBm
Center 2.437 00 GHz
Span 24 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.07 dBm /16.0000 MHz
Power Spectral Density
-58.97 dBm/Hz
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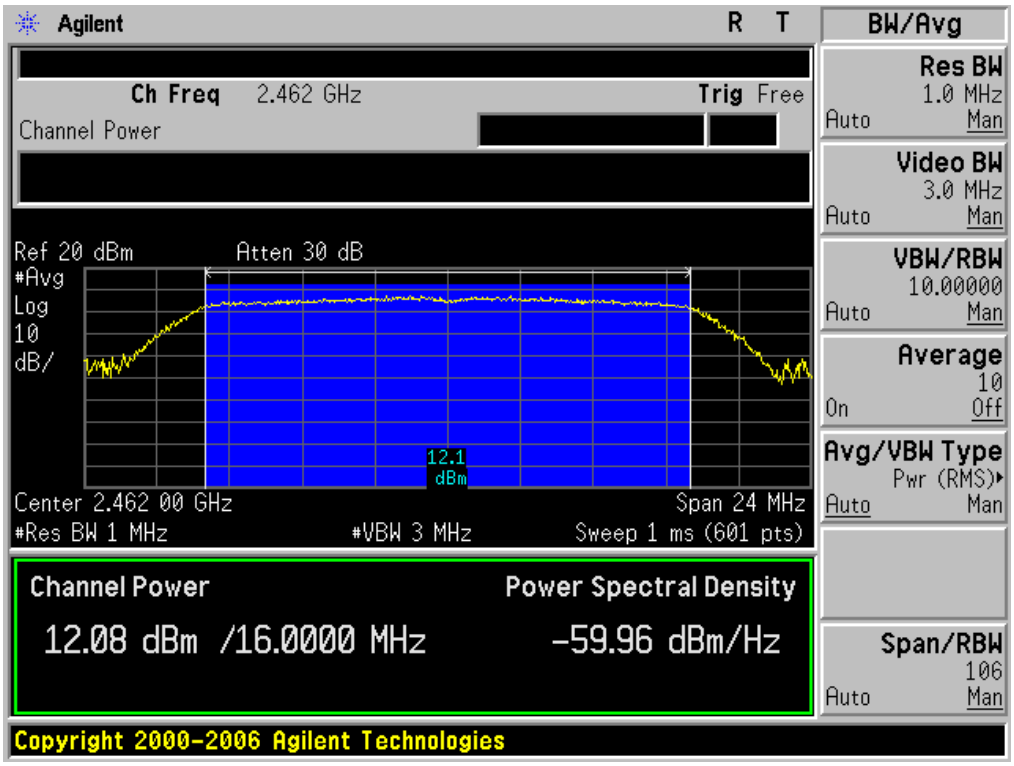
CH11


Agilent
R T
BW/Avg
Ch Freq 2.462 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
12.1
dBm
Center 2.462 00 GHz
Span 24 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.08 dBm /16.0000 MHz
Power Spectral Density
-59.96 dBm/Hz
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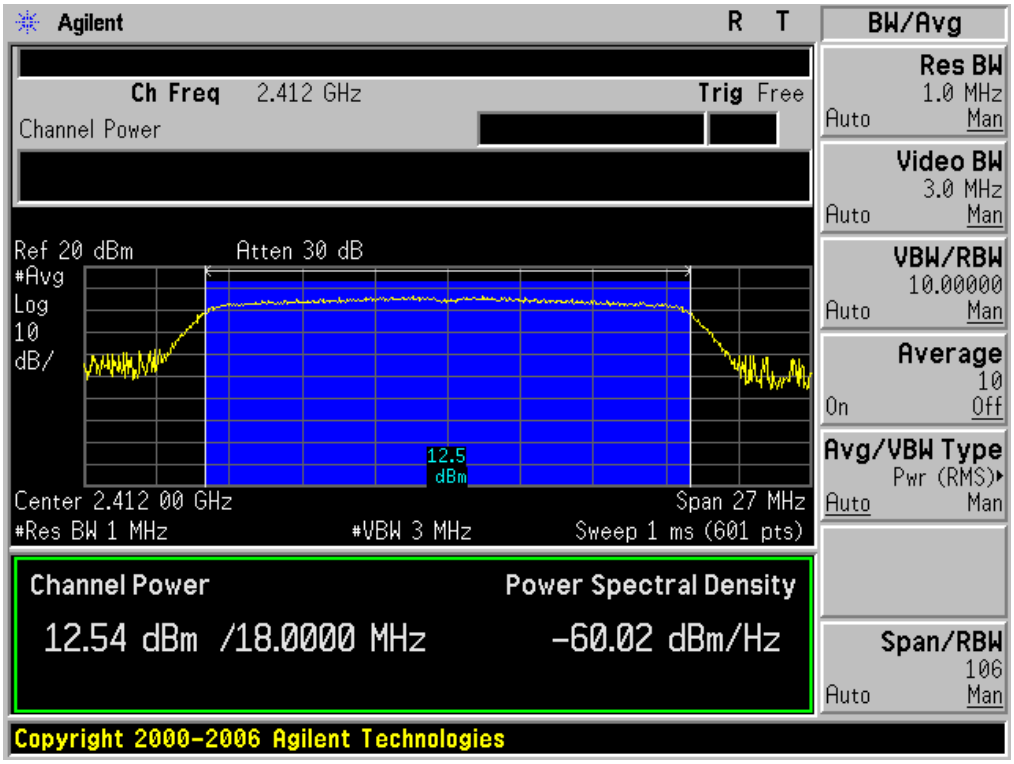
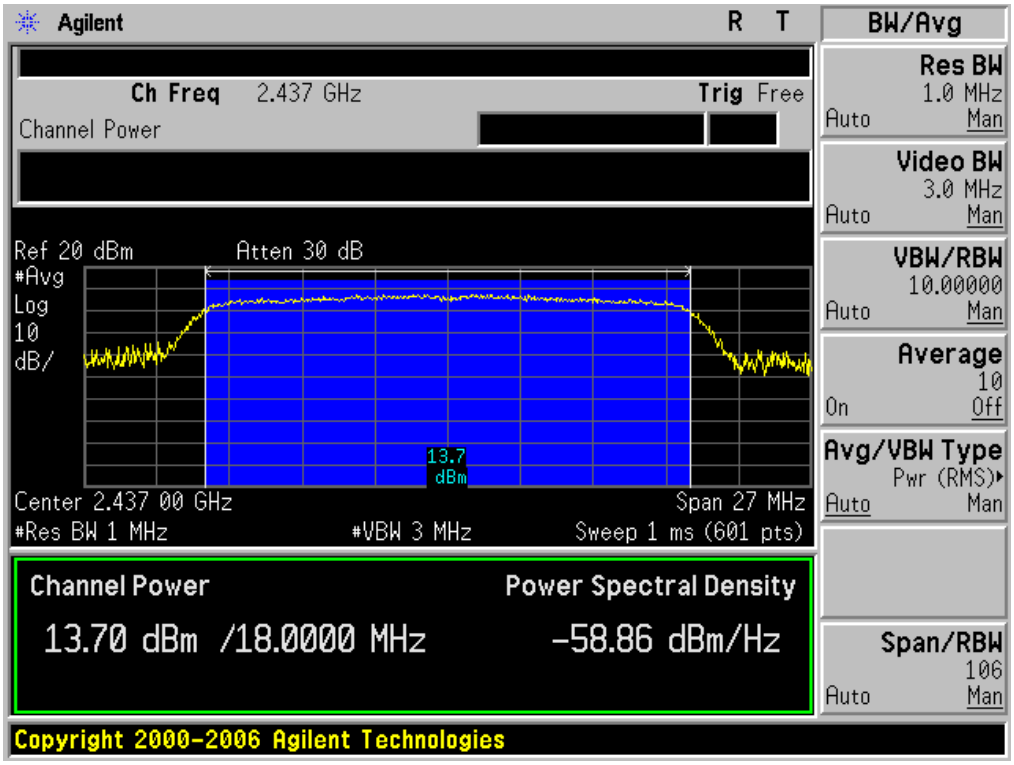
TEST ITEM	PEAK POWER
TEST MODE	802.11n 20 with data rate 6.5

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	Average Power (dBm)	Peak Power (dBm)	Applicable Limits (dBm)	Pass or Fail
2.412	10.56	12.54	30	Pass
2.437	11.72	13.7	30	Pass
2.462	10.17	12.15	30	Pass

CH1



CH6


Agilent
R T
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
13.7
dBm
Center 2.437 00 GHz
Span 27 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
13.70 dBm /18.0000 MHz
Power Spectral Density
-58.86 dBm/Hz
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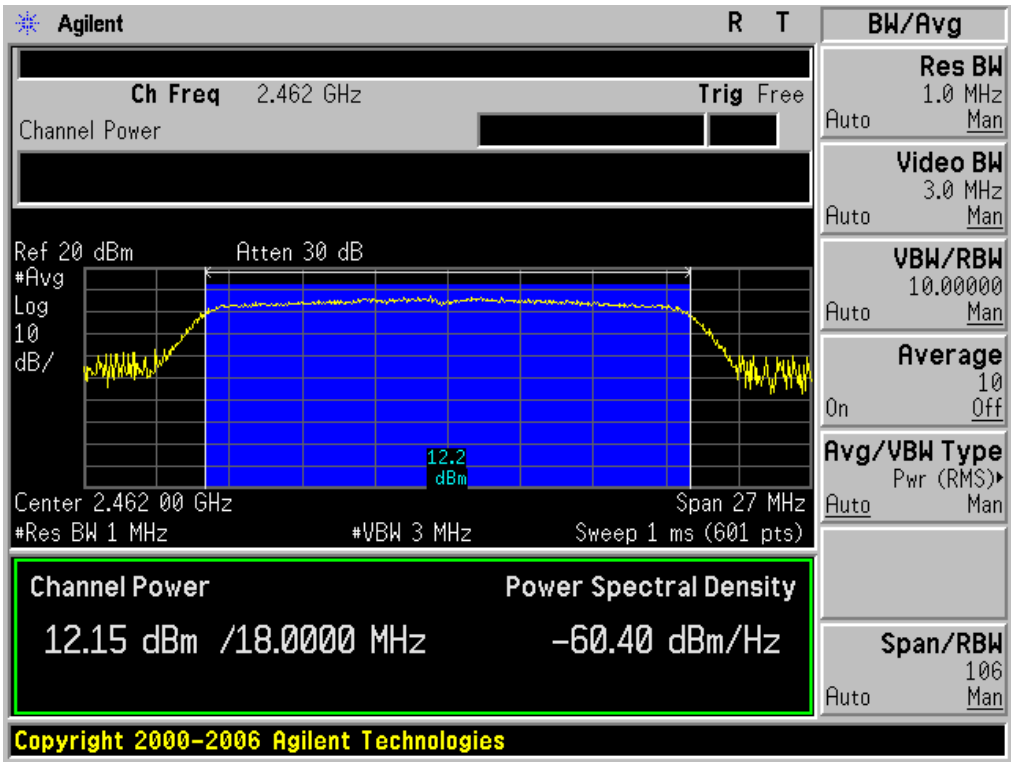
CH11


Agilent
R T
BW/Avg
Ch Freq 2.462 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
12.2
dBm
Center 2.462 00 GHz
Span 27 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
12.15 dBm /18.0000 MHz
Power Spectral Density
-60.40 dBm/Hz
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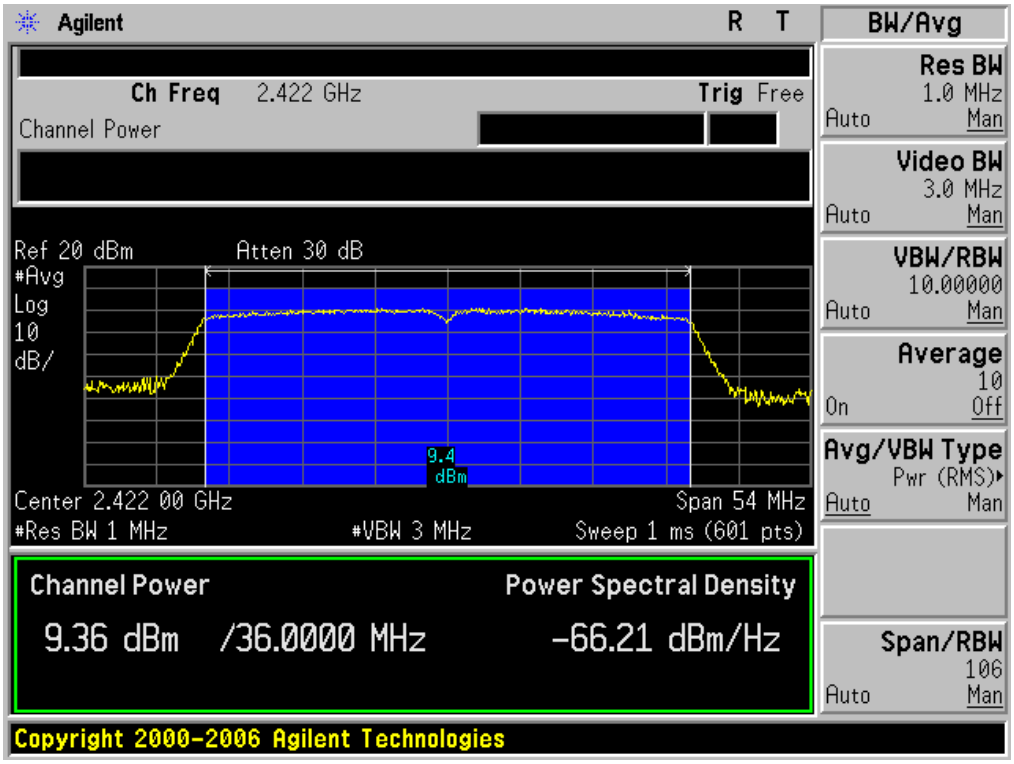
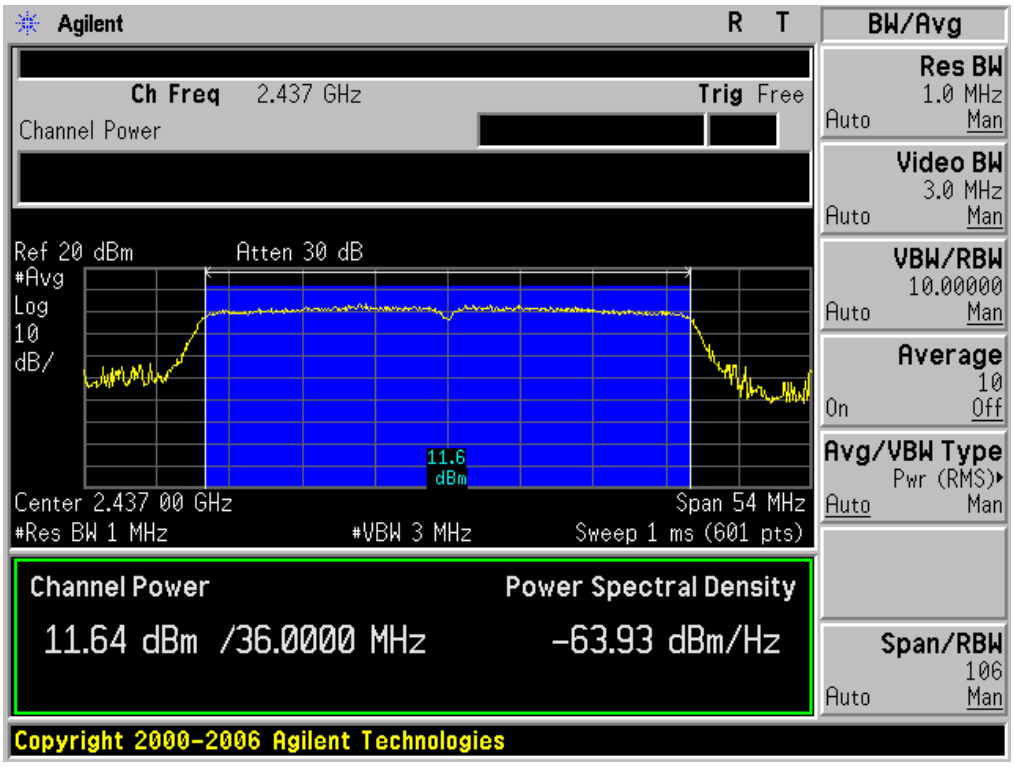
TEST ITEM	PEAK POWER
TEST MODE	802.11n 40 with data rate 13.5

LIMITS AND MEASUREMENT RESULT				
Frequency (GHz)	**Average Power (dBm)**	**Peak Power (dBm)**	**Applicable Limits (dBm)**	**Pass or Fail**
2.422	7.38	9.36	30	Pass
2.437	9.66	11.64	30	Pass
2.452	7.16	9.14	30	Pass

CH3



CH6


Agilent
R T
BW/Avg
Ch Freq 2.437 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
11.6
dBm
Center 2.437 00 GHz
Span 54 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
11.64 dBm /36.0000 MHz
Power Spectral Density
-63.93 dBm/Hz
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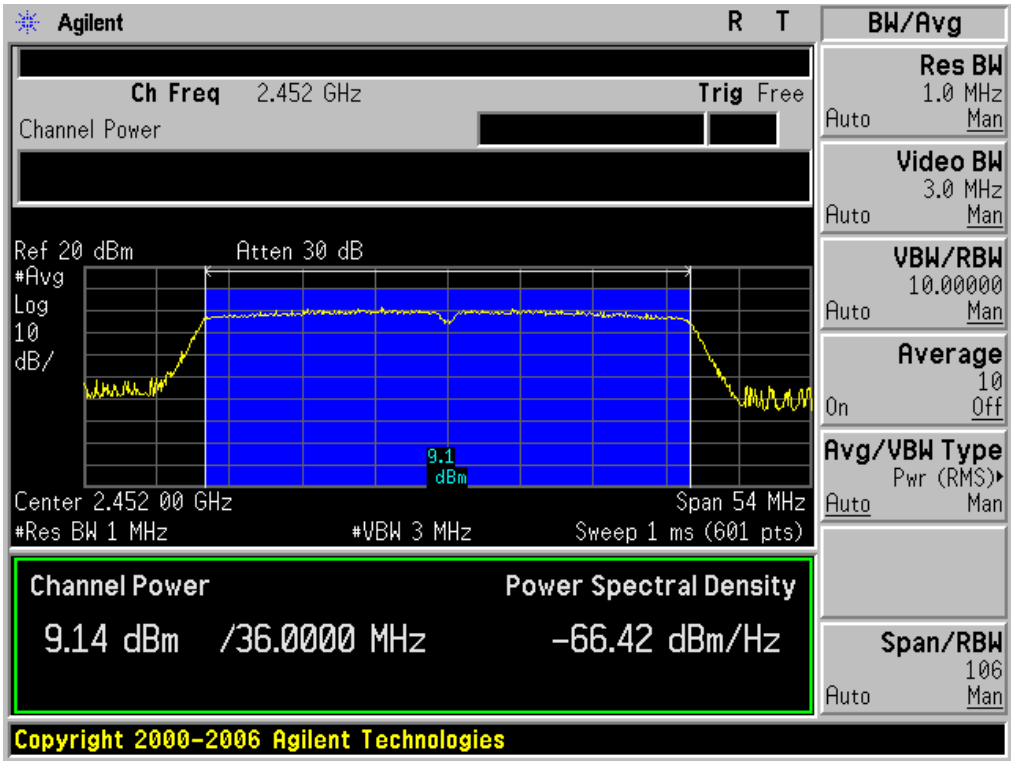
CH9


Agilent
R T
BW/Avg
Ch Freq 2.452 GHz
Trig Free
Channel Power
Res BW
1.0 MHz
Auto Man
Video BW
3.0 MHz
Auto Man
VBW/RBW
10.00000
Auto Man
Average
10
On Off
Avg/VBW Type
Pwr (RMS)
Auto Man
Span/RBW
106
Auto Man
Ref 20 dBm
Atten 30 dB
#Avg
Log
10
dB/
9.1
dBm
Center 2.452 00 GHz
Span 54 MHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 1 ms (601 pts)
Channel Power
9.14 dBm /36.0000 MHz
Power Spectral Density
-66.42 dBm/Hz
Copyright 2000-2006 Agilent Technologies

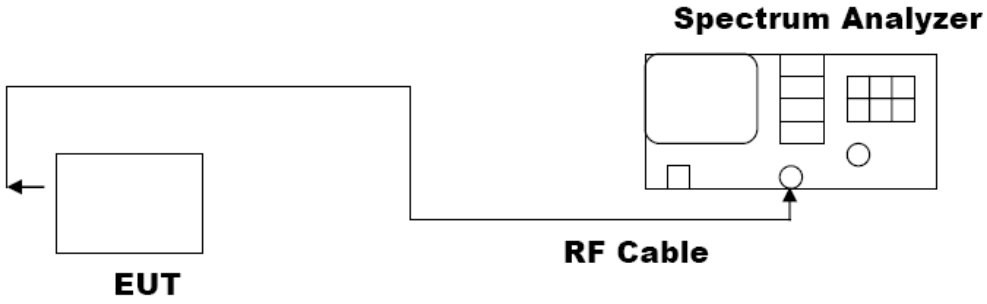
8. 6DB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Centre Frequency = Operation Frequency, RBW= 100 KHz, VBW≥3xRBW.
5. Set SPA Trace 1 Max hold, then View.

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

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3. LIMITS AND MEASUREMENT RESULTS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11b with data rate 11

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	**Applicable Limits**		
	Test Data (MHz)		**Criteria**
>500KHZ	Low Channel	10.054	PASS
	Middle Channel	10.010	PASS
	High Channel	10.023	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11g with data rate 54

LIMITS AND MEASUREMENT RESULT			
Applicable Limits	**Applicable Limits**		
	Test Data (MHz)		**Criteria**
>500KHZ	Low Channel	15.685	PASS
	Middle Channel	15.935	PASS
	High Channel	15.172	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 20 with data rate 65

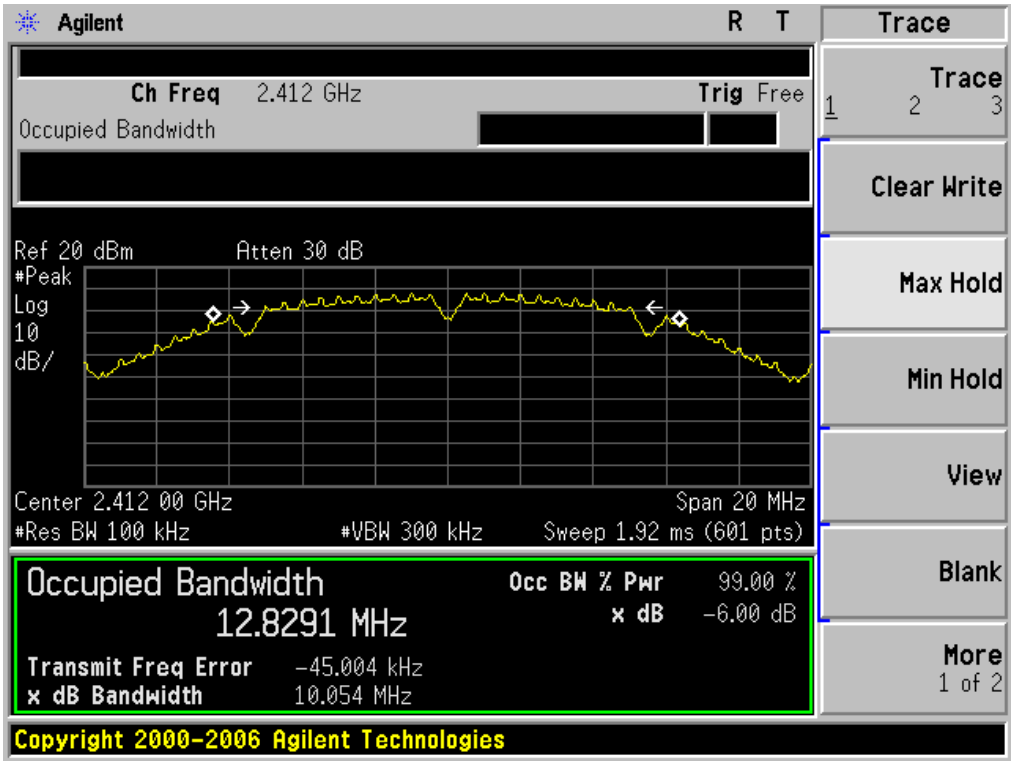
LIMITS AND MEASUREMENT RESULT			
Applicable Limits	**Applicable Limits**		
	Test Data (MHz)		**Criteria**
>500KHZ	Low Channel	15.050	PASS
	Middle Channel	15.141	PASS
	High Channel	15.109	PASS

TEST ITEM	6DB BANDWIDTH
TEST MODE	802.11n 40 with data rate 135

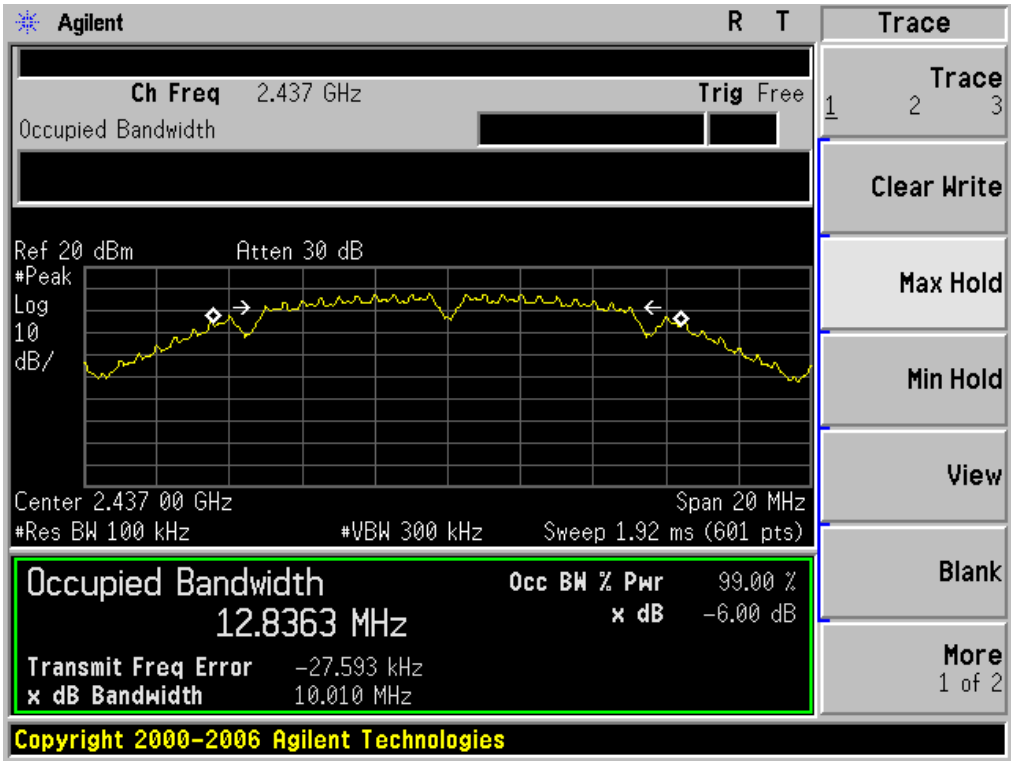
LIMITS AND MEASUREMENT RESULT			
Applicable Limits	**Applicable Limits**		
	Test Data (MHz)		**Criteria**
>500KHZ	Low Channel	35.234	PASS
	Middle Channel	35.267	PASS
	High Channel	35.231	PASS

802.11b TEST RESULT

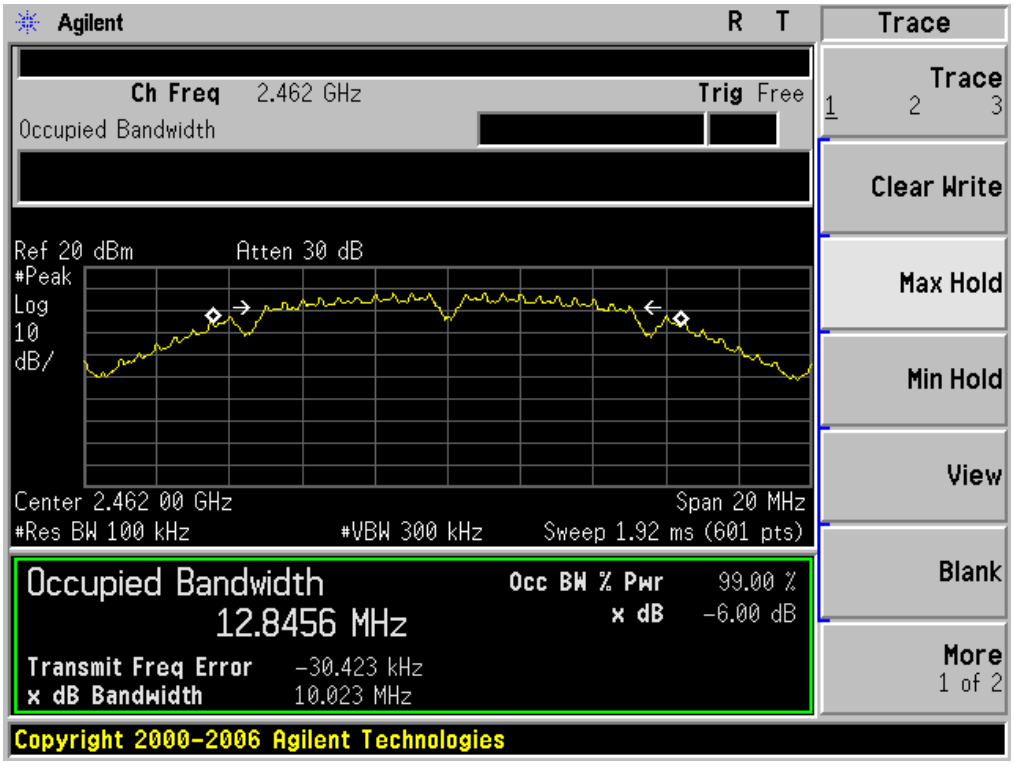
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

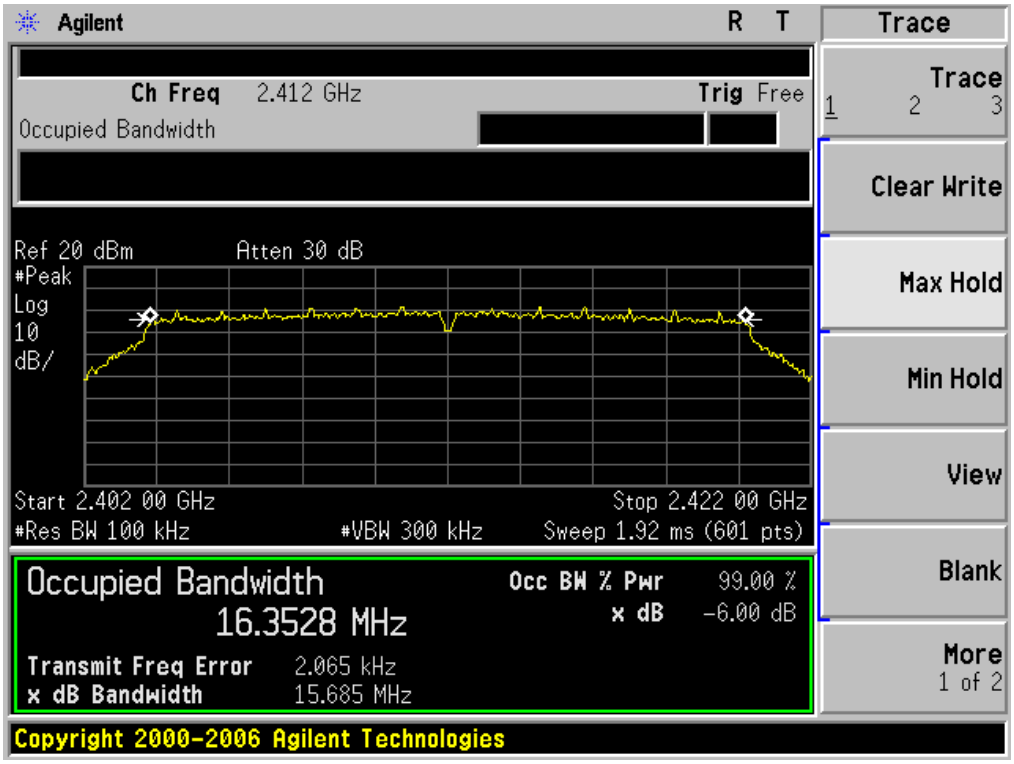


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

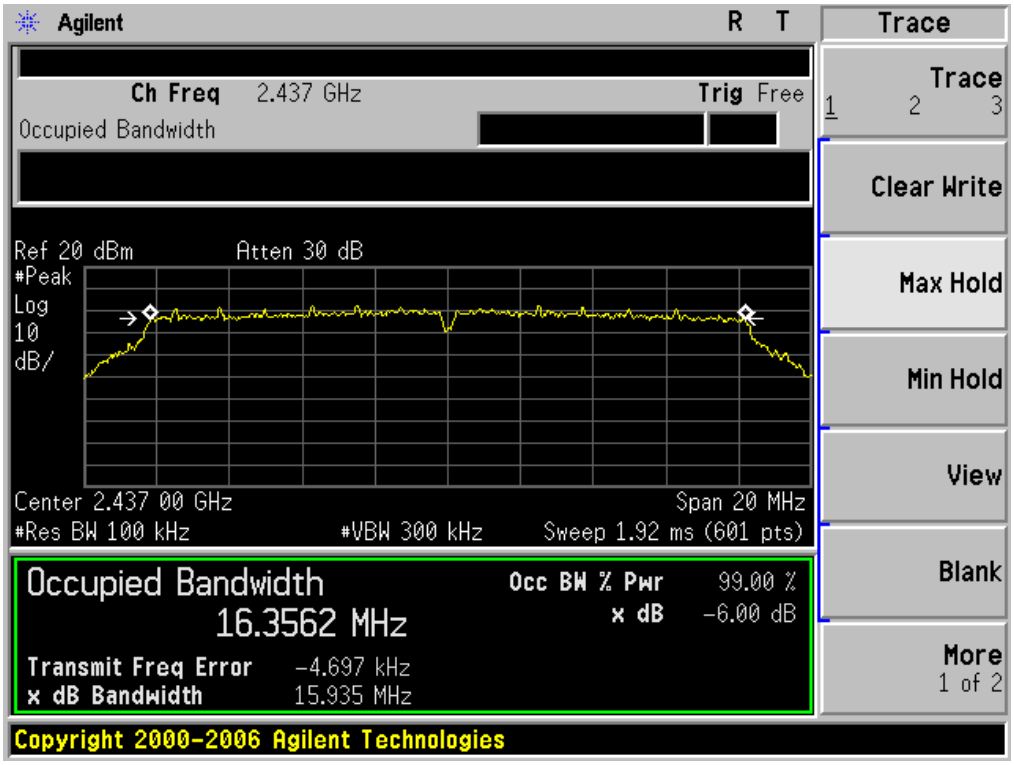


802.11g TEST RESULT

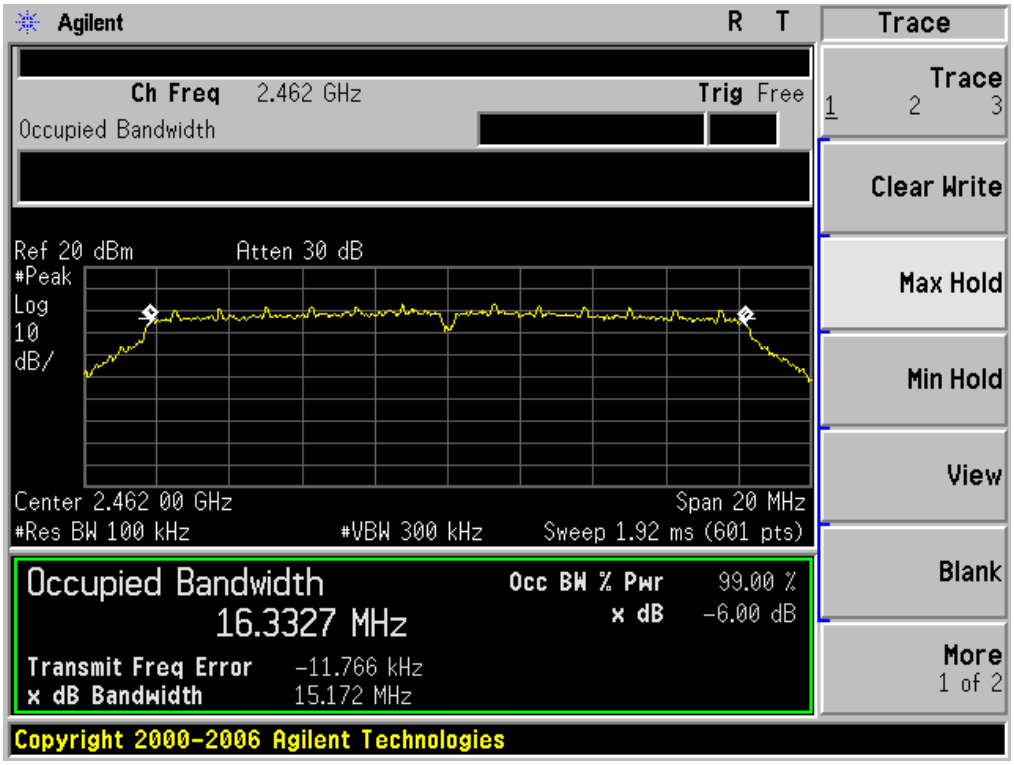
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

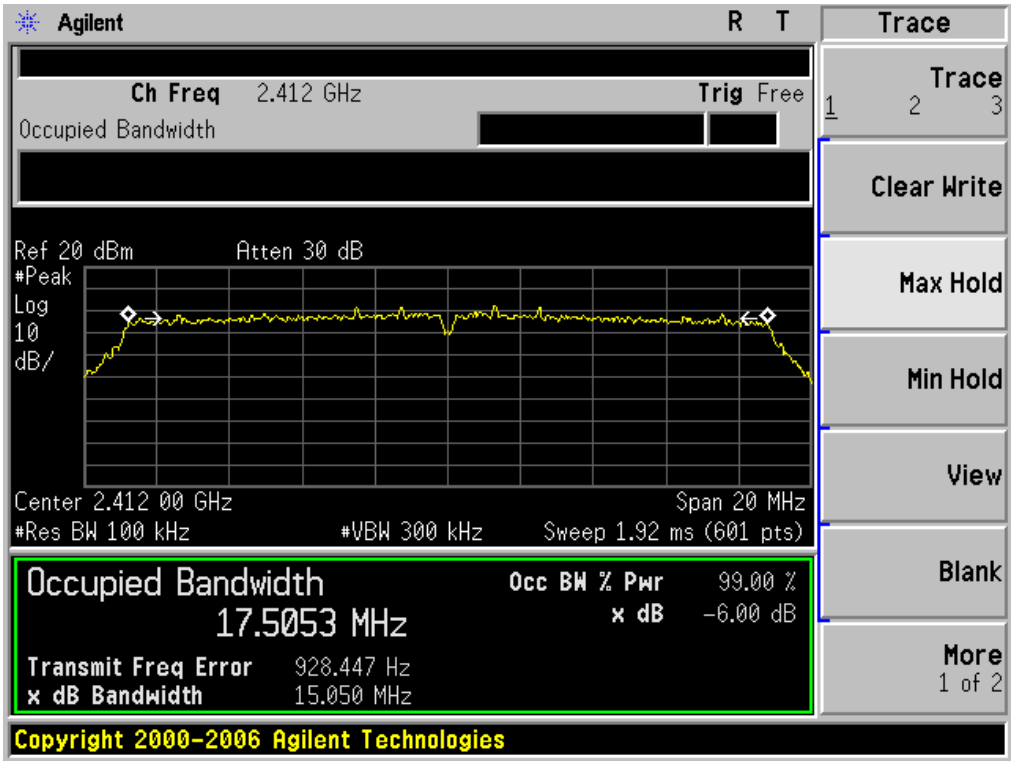


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

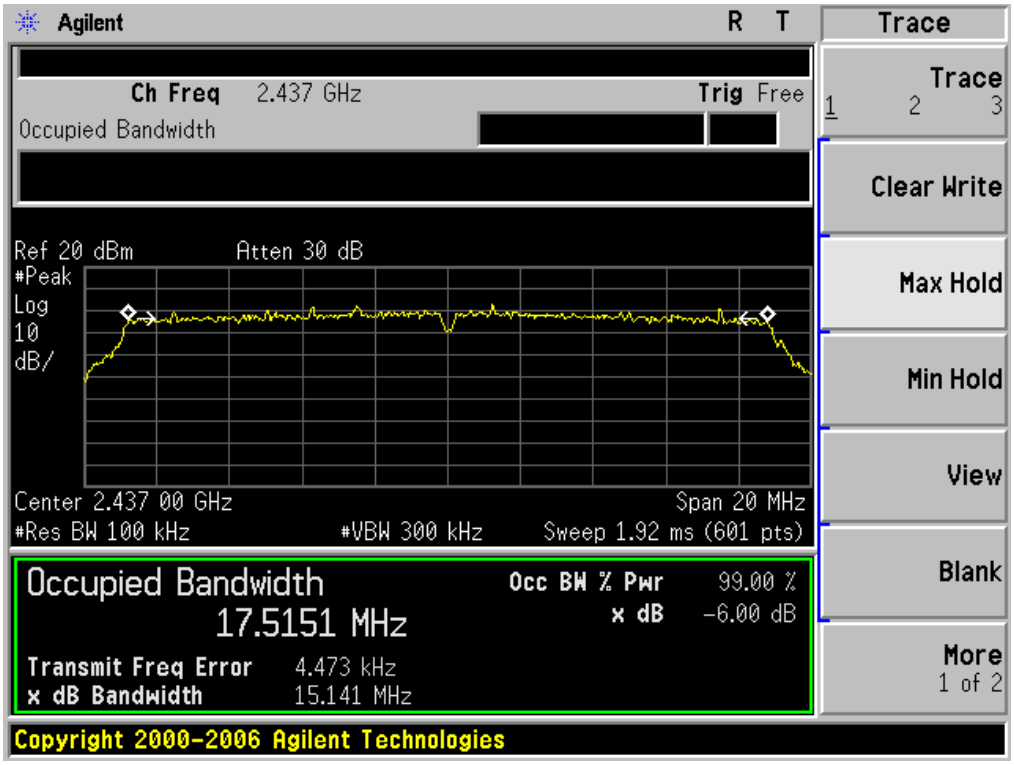


802.11n (20) TEST RESULT

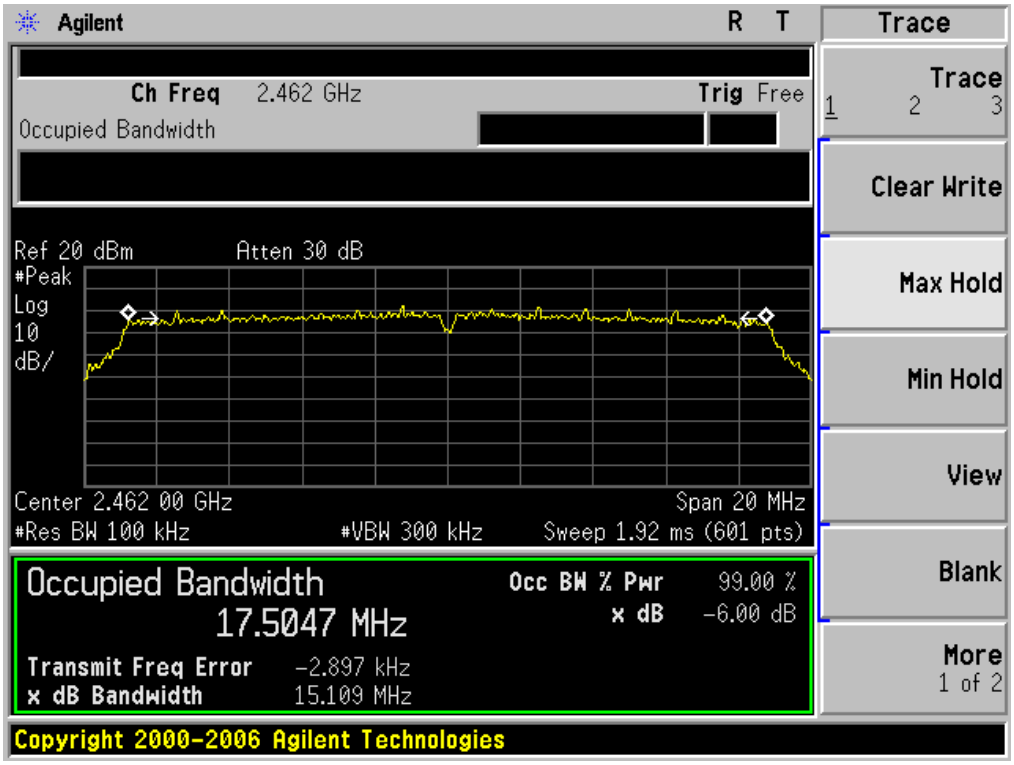
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL

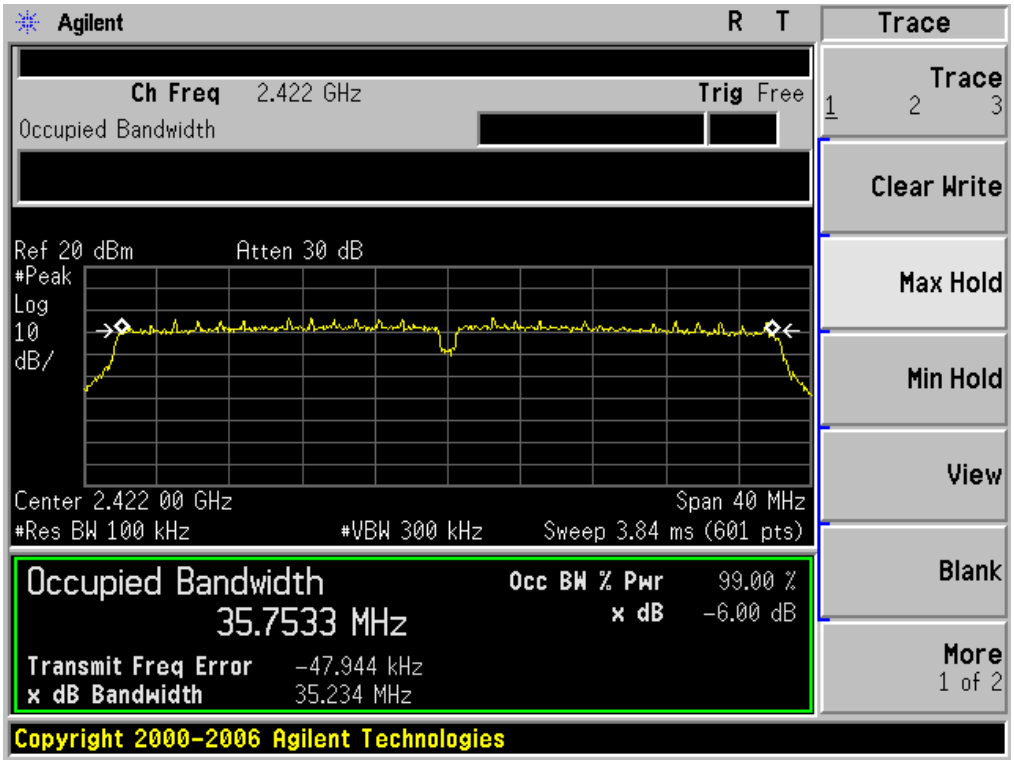


TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL

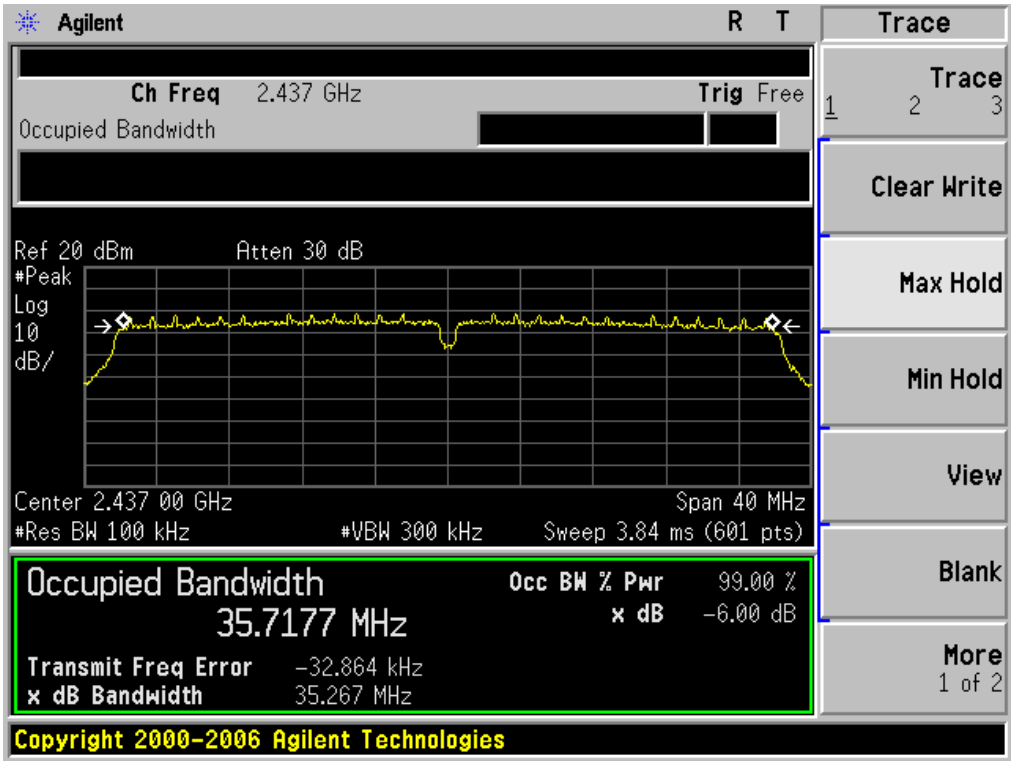


802.11n(40) TEST RESULT

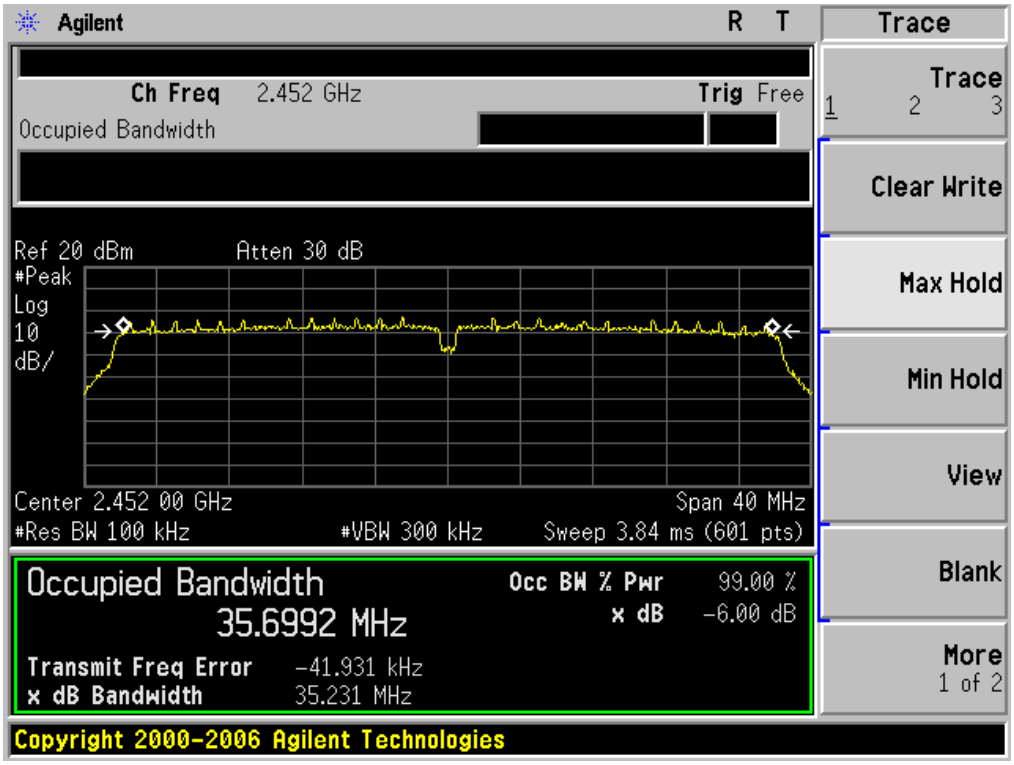
TEST PLOT OF BANDWIDTH FOR LOW CHANNEL



TEST PLOT OF BANDWIDTH FOR MIDDLE CHANNEL



TEST PLOT OF BANDWIDTH FOR HIGH CHANNEL



9. CONDUCTED SPURIOUS EMISSION

9.1. MEASUREMENT PROCEDURE

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
3, Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 558074 for compliance to FCC 47CFR 15.247 requirements. Owing to satisfy the requirements of the number of measurement points, we set the RBW=1MHz, VBW＞RBW, scan up through 10th harmonic, and consider the tested results as the worst case, if the tested results conform to the requirement, we can deem that the real tested results(set the RBW=100KHz, VBW＞RBW) are conform to the requirement.

9.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

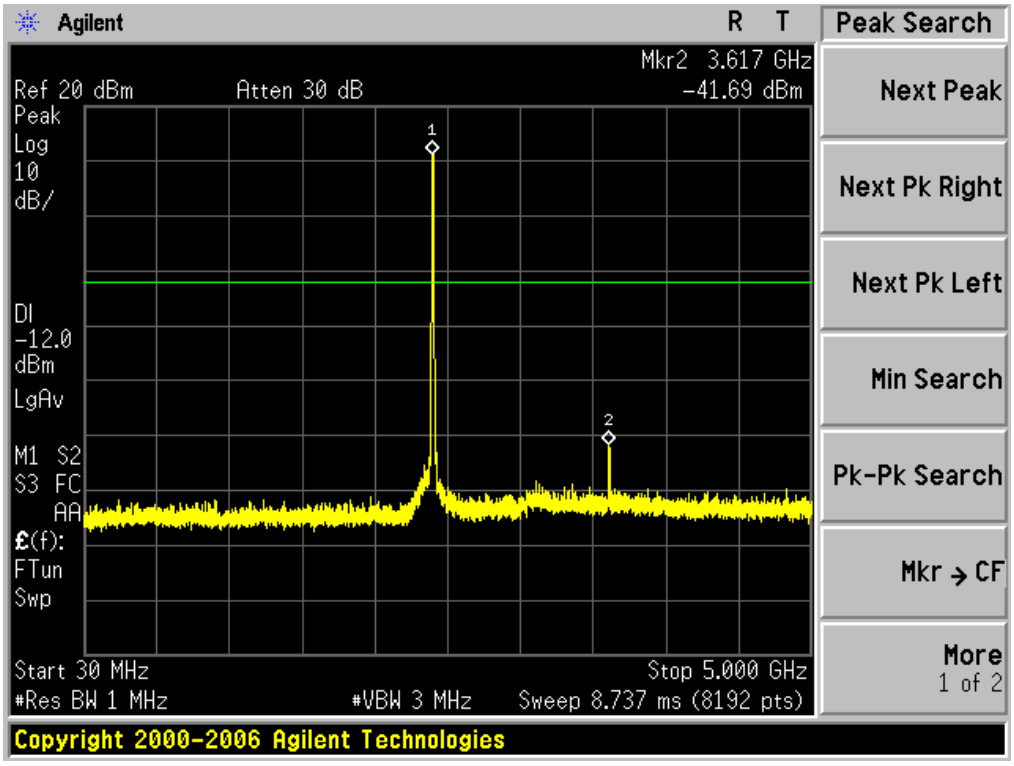
9.3. MEASUREMENT EQUIPMENT USED

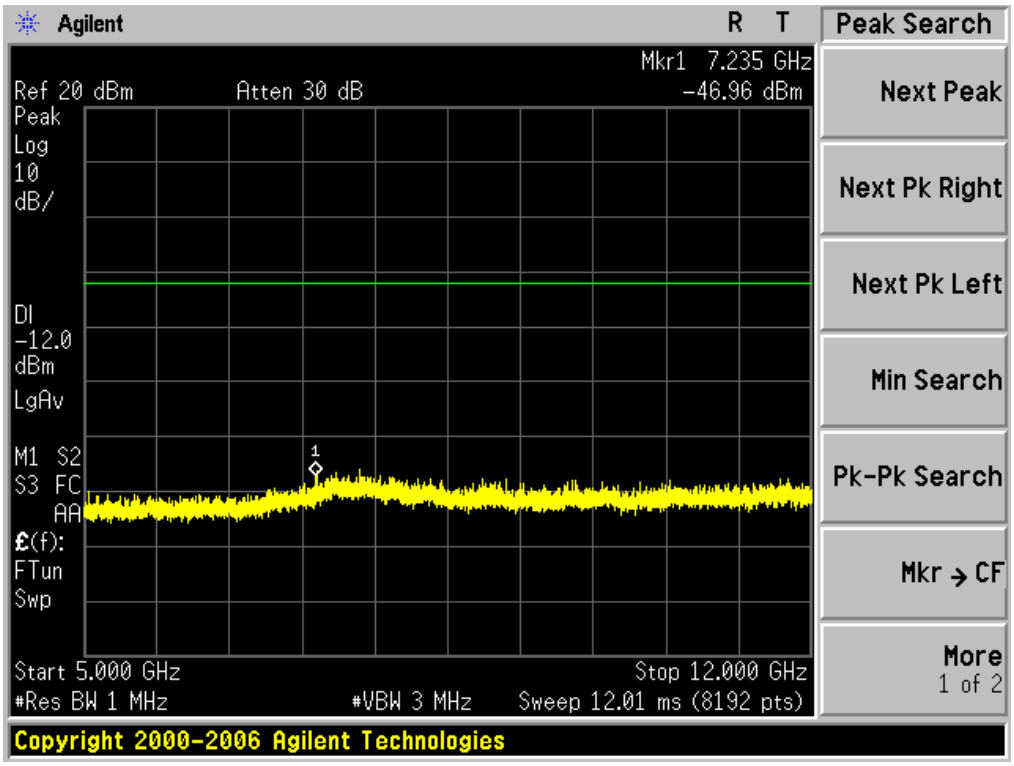
The same as described in section 6.

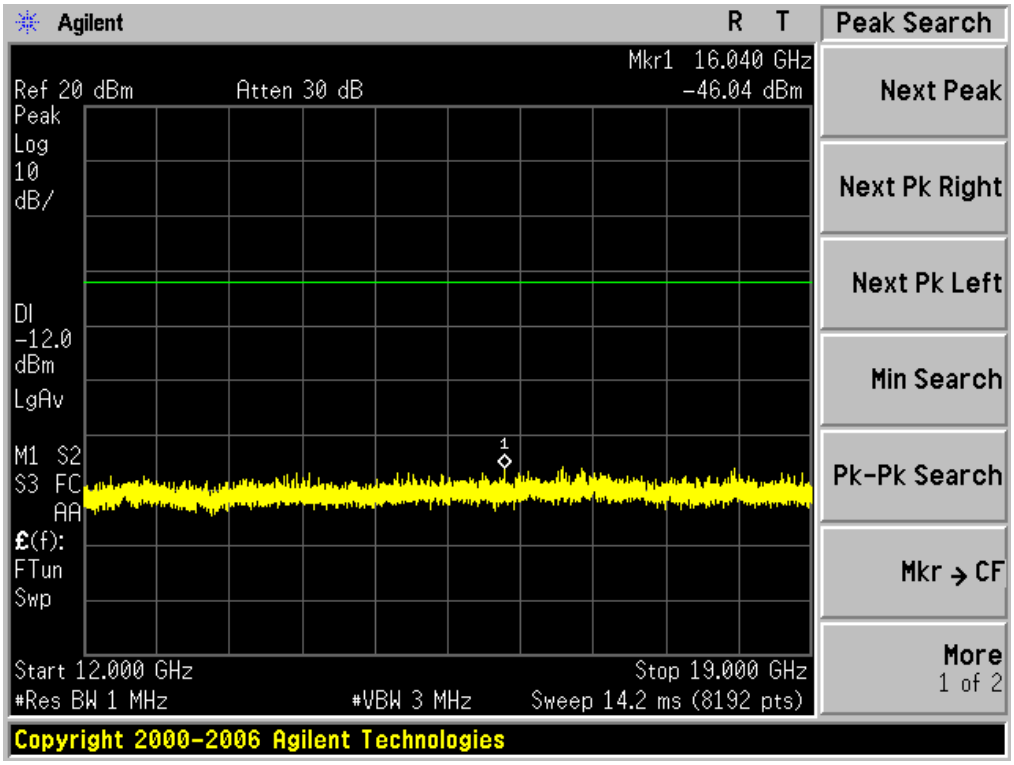
9.4. LIMITS AND MEASUREMENT RESULT

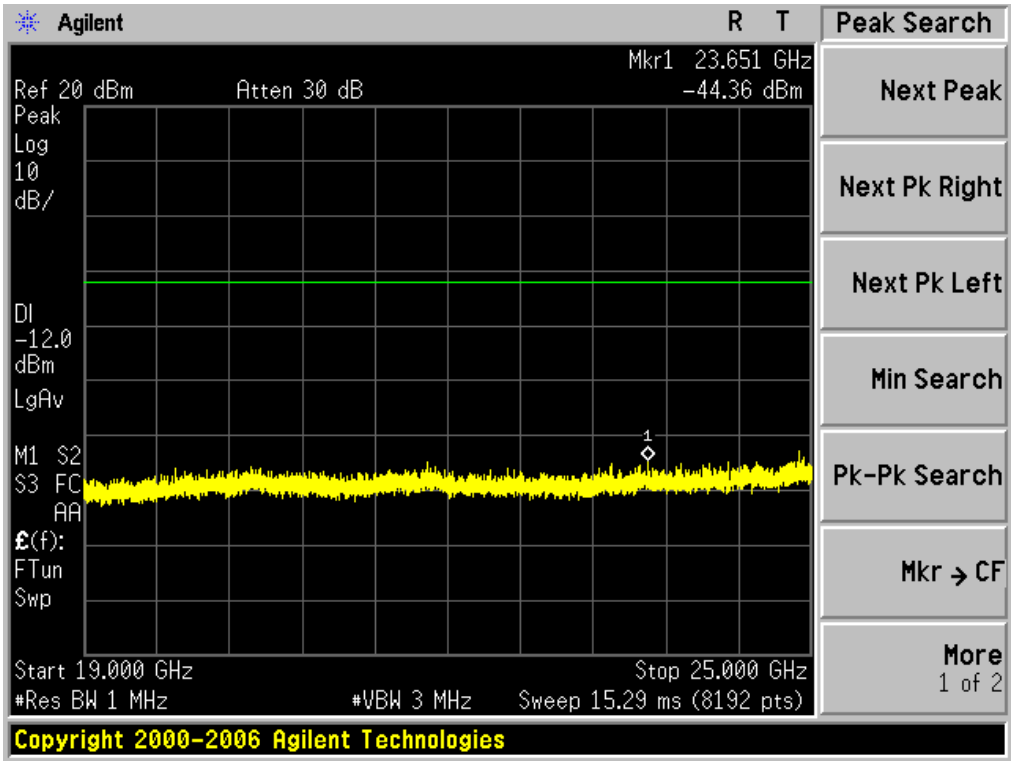
LIMITS AND MEASUREMENT RESULT		
Applicable Limits	**Measurement Result**	
	Test Data	**Criteria**
In any 100 KHz Bandwidth Outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produce by the intentional radiator shall be at least 20 dB below that in 100KHz bandwidth within the band that contains the highest level of the desired power. In addition, radiation 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))	At least -20dBc than the limit Specified on the BOTTOM Channel	PASS
	At least -20dBc than the limit Specified on the TOP Channel	PASS

TEST PLOT OF OUT OF BAND EMISSIONS WITH THE WORST CASE
OF 802.11b FOR MODULATION IN LOW CHANNEL

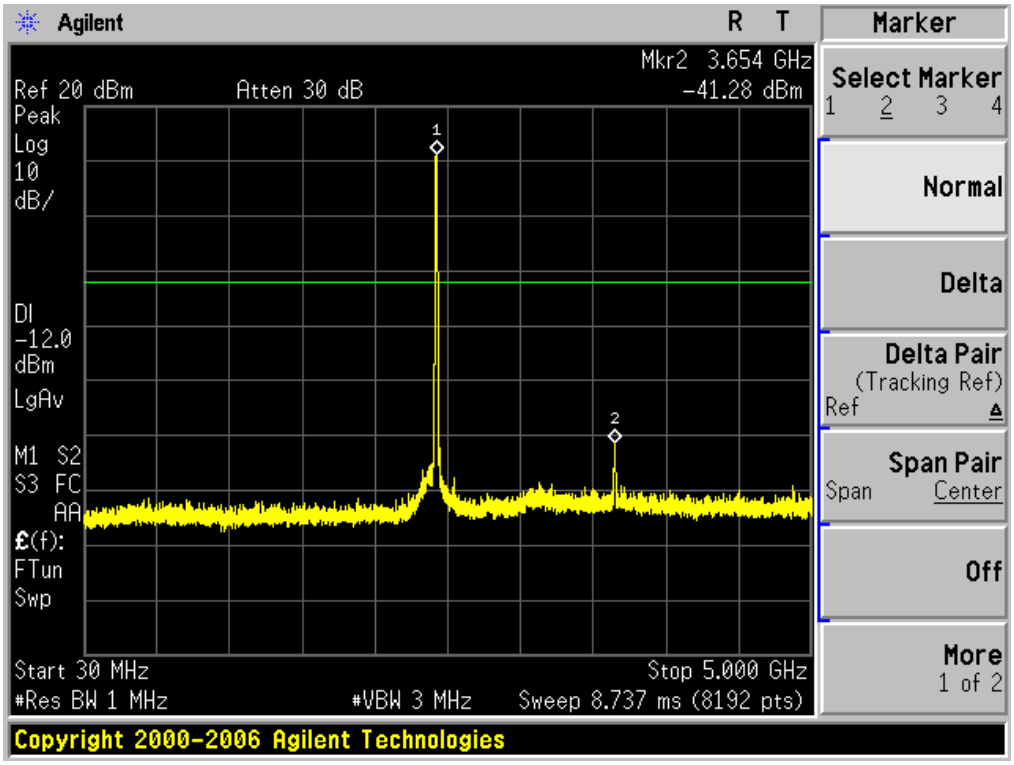


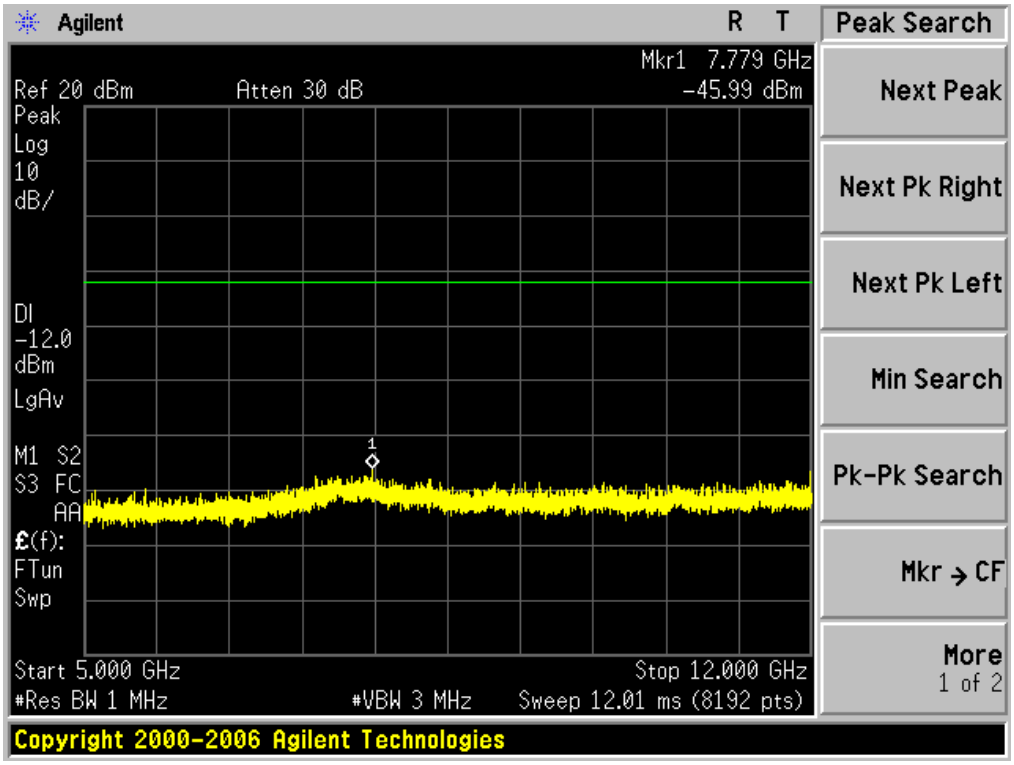


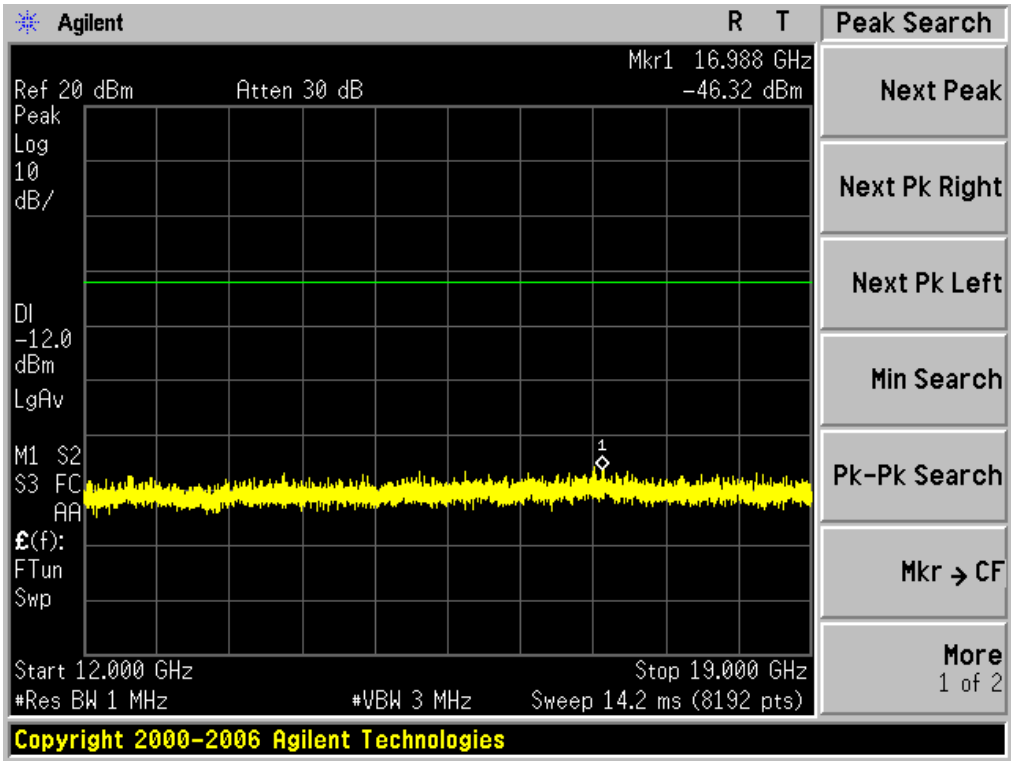

Agilent
R T
Peak Search
Mkr1 16.040 GHz
Ref 20 dBm
Atten 30 dB
-46.04 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
Start 12.000 GHz
Stop 19.000 GHz
More
1 of 2
#Res BW 1 MHz
#VBW 3 MHz
Sweep 14.2 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies

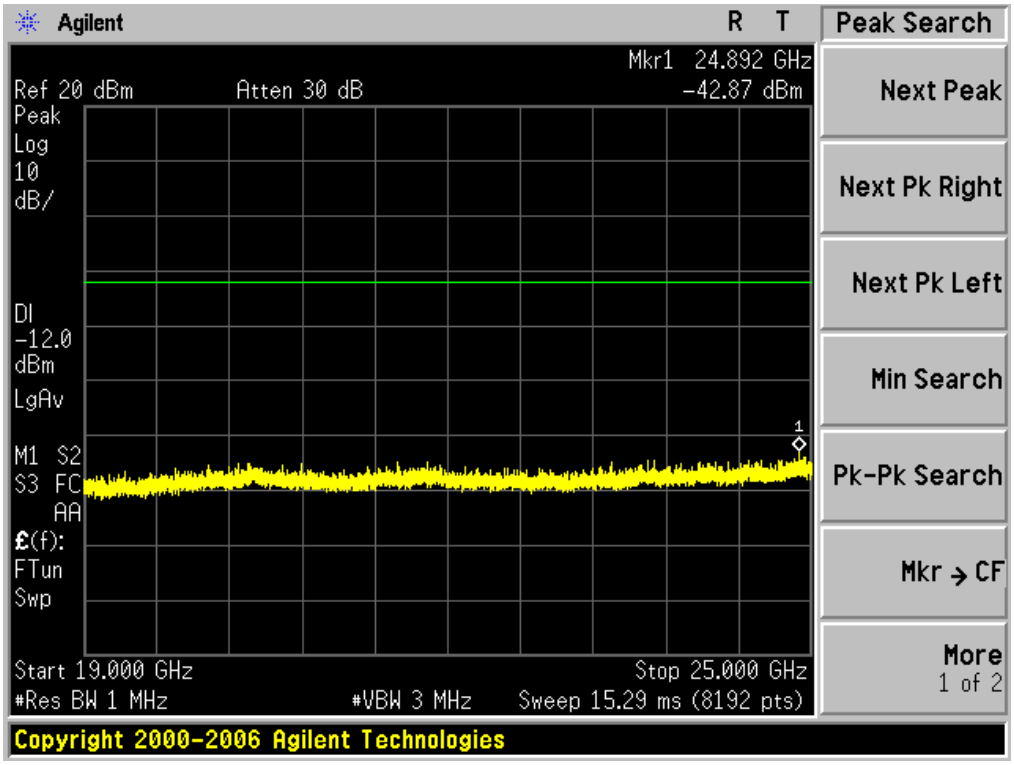

Agilent
R T
Peak Search
Mkr1 23.651 GHz
Ref 20 dBm
Atten 30 dB
-44.36 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
Start 19.000 GHz
Stop 25.000 GHz
More
1 of 2
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.29 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies

TEST PLOT OF OUT OF BAND EMISSIONS
OF 802.11b FOR MODULATION IN MIDDLE CHANNEL



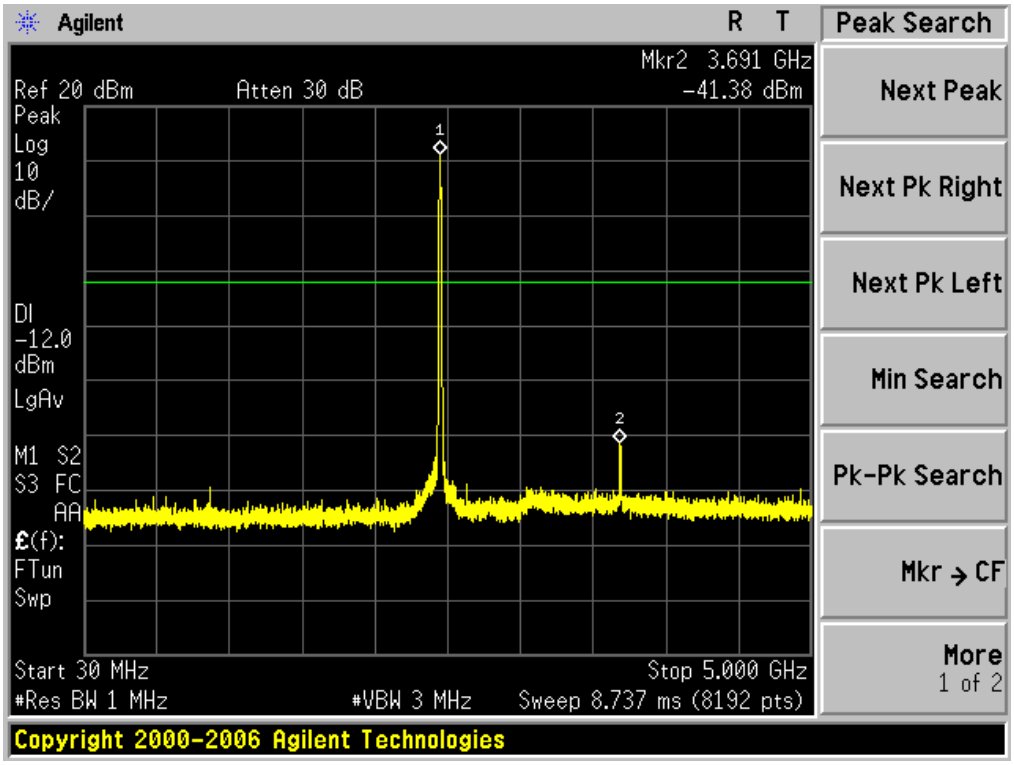


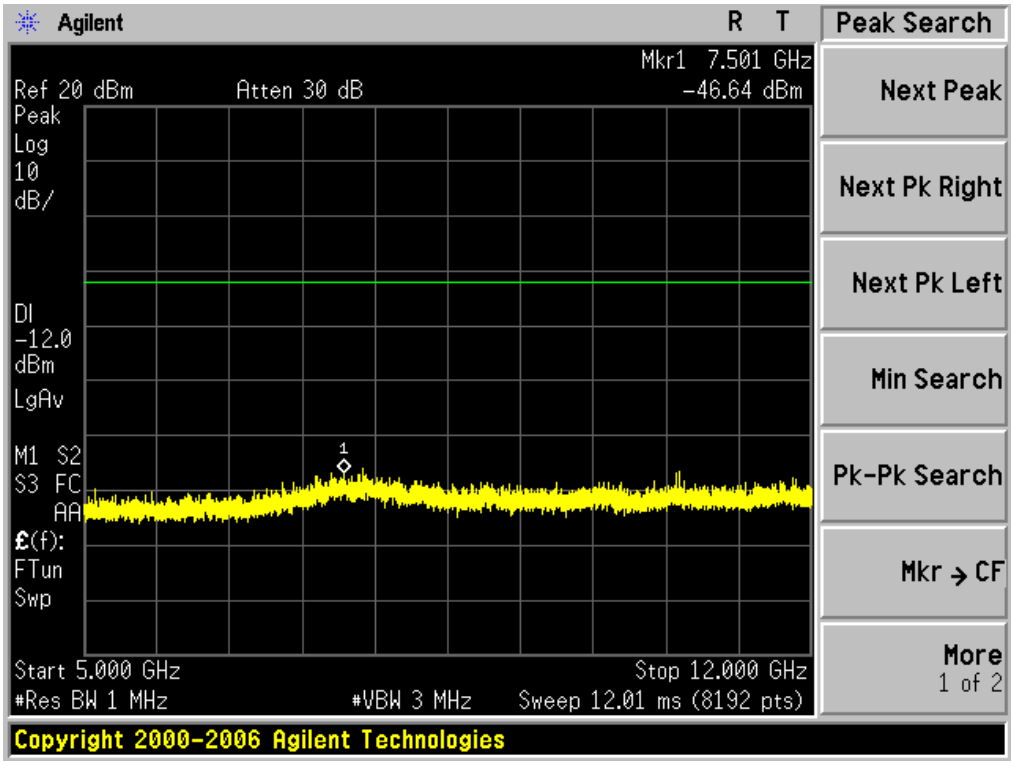

Agilent
R T
Peak Search
Mkr1 16.988 GHz
Ref 20 dBm
Atten 30 dB
-46.32 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
More
1 of 2
Start 12.000 GHz
Stop 19.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 14.2 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies

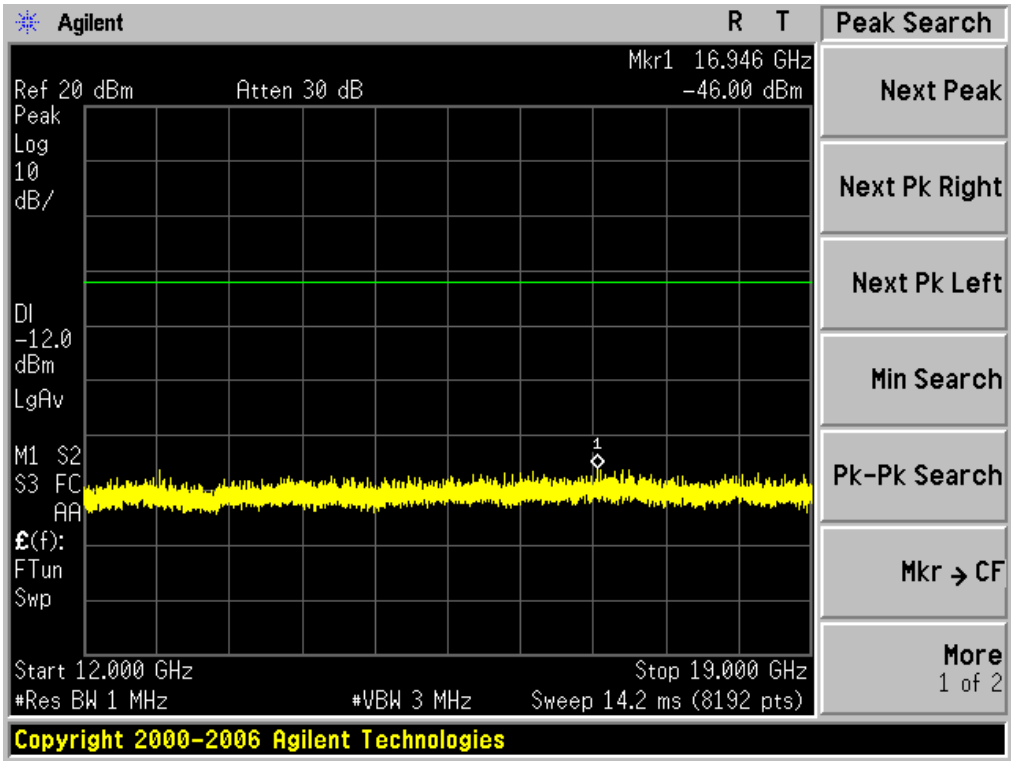

Agilent
R T
Peak Search
Mkr1 24.892 GHz
Ref 20 dBm
Atten 30 dB
-42.87 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
More
1 of 2
Start 19.000 GHz
Stop 25.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.29 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies

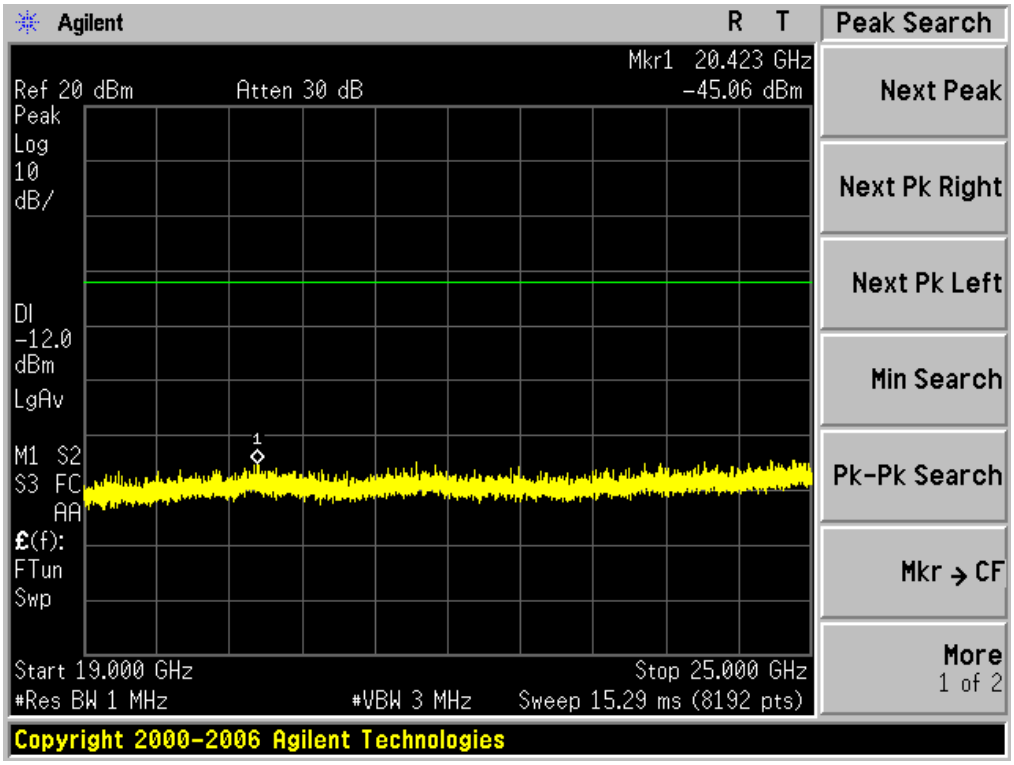
TEST PLOT OF OUT OF BAND EMISSIONS

OF 802.11b FOR MODULATION IN HIGH CHANNEL






Agilent
R T
Peak Search
Mkr1 16.946 GHz
Ref 20 dBm
Atten 30 dB
-46.00 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
Start 12.000 GHz
Stop 19.000 GHz
More
1 of 2
#Res BW 1 MHz
#VBW 3 MHz
Sweep 14.2 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies


Agilent
R T
Peak Search
Mkr1 20.423 GHz
Ref 20 dBm
Atten 30 dB
-45.06 dBm
Next Peak
Peak
Log
10
dB/
Next Pk Right
Next Pk Left
Dl
-12.0
dBm
LgAv
Min Search
M1 S2
S3 FC
AA
Pk-Pk Search
£(f):
FTun
Swp
Mkr → CF
Start 19.000 GHz
Stop 25.000 GHz
More
1 of 2
#Res BW 1 MHz
#VBW 3 MHz
Sweep 15.29 ms (8192 pts)
Copyright 2000-2006 Agilent Technologies

10. MAXIMUM CONDUCTED OUTPUT POWER SPECTRAL DENSITY

10.1 MEASUREMENT PROCEDURE

(1). The EUT was placed on a turn table which is 0.8m above ground plane.
(2). Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
(3). Set the EUT Work on the top, the middle and the bottom operation frequency individually.
(4). Set SPA Trace 1 Max hold, then View.

Note: The method of PKPSD in the KDB 558074 item 10.2 was used in this testing.

10.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

10.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

10.4 LIMITS AND MEASUREMENT RESULT

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11b with data rate 1

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-6.97	8	Pass
Middle Channel	-6.79	8	Pass
High Channel	-7.86	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11g with data rate 6

Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-12.34	8	Pass
Middle Channel	-11.59	8	Pass
High Channel	-11.28	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 20 with data rate 6.5

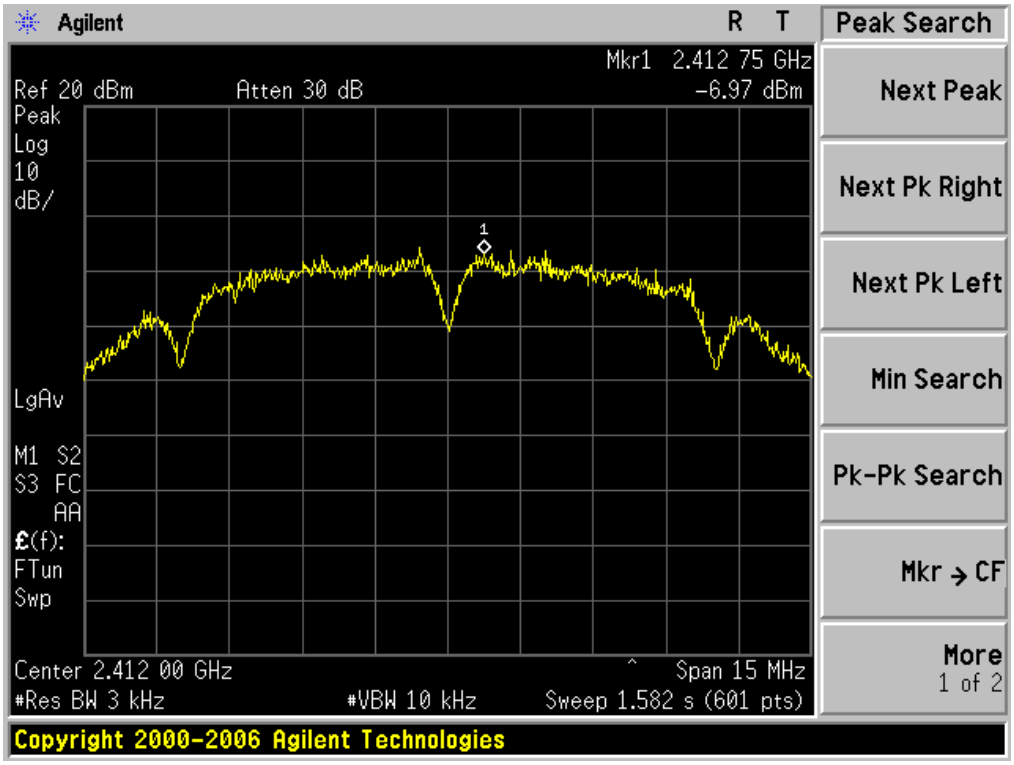
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-13.57	8	Pass
Middle Channel	-11.03	8	Pass
High Channel	-11.23	8	Pass

TEST ITEM	POWER PECTRAL DENSITY
TEST MODE	802.11n 40 with data rate 13.5

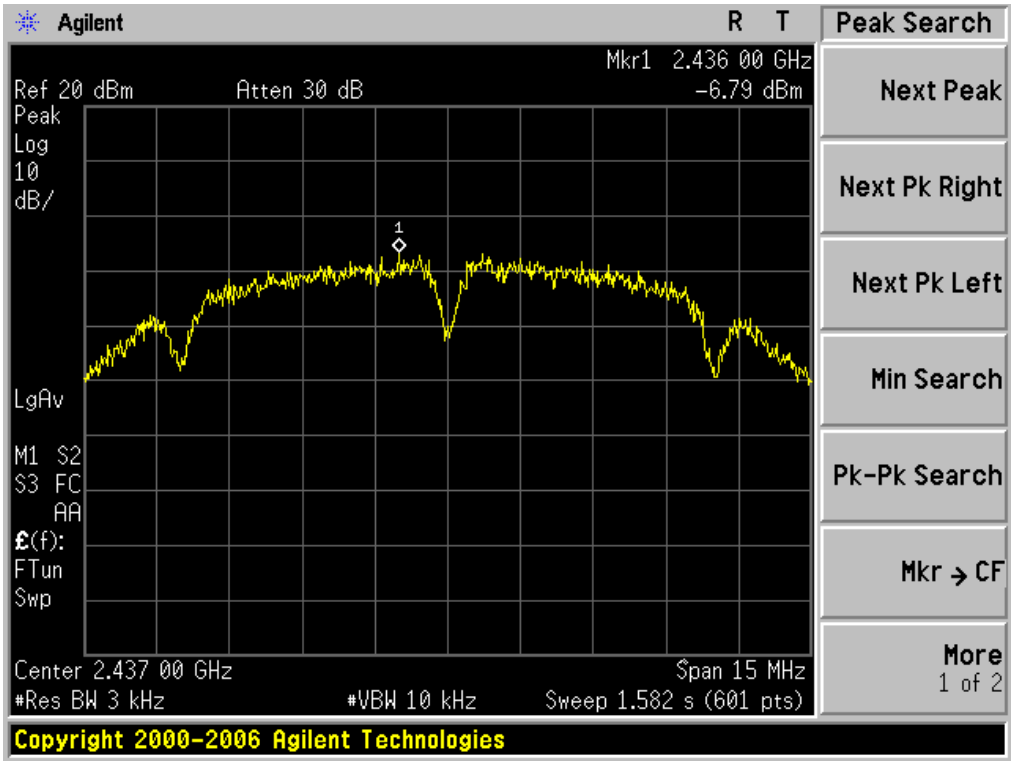
Channel No.	PSD (dBm)	Limit (dBm)	Result
Low Channel	-17.57	8	Pass
Middle Channel	-16.31	8	Pass
High Channel	-17.9	8	Pass

802.11b TEST RESULT

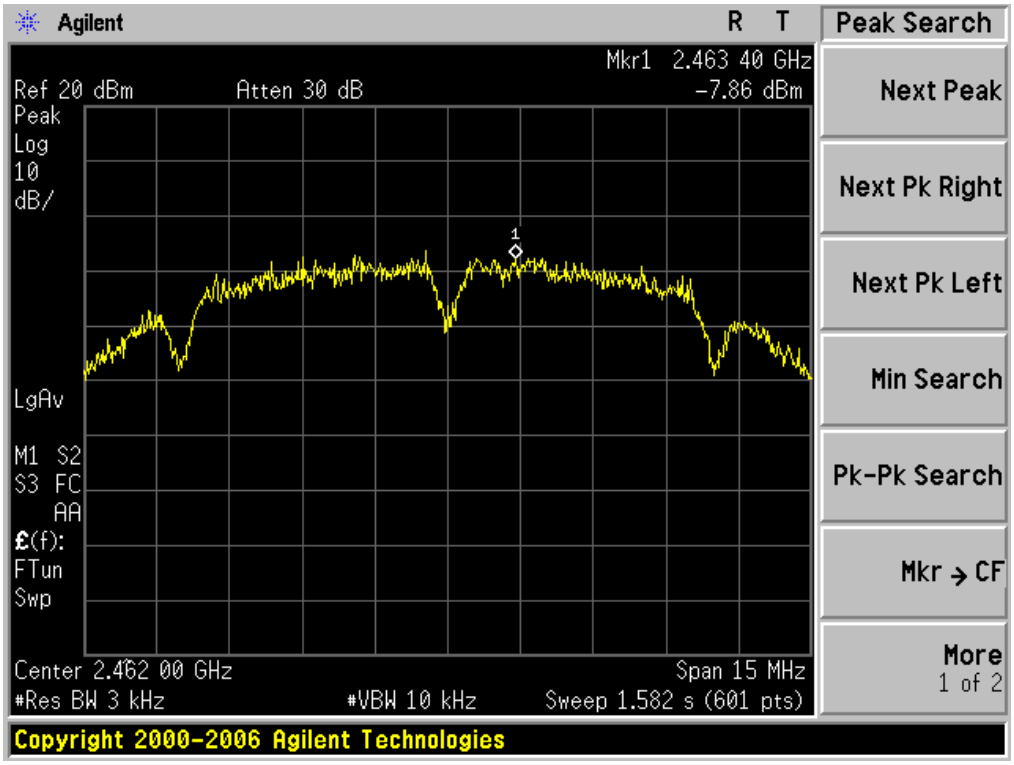
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

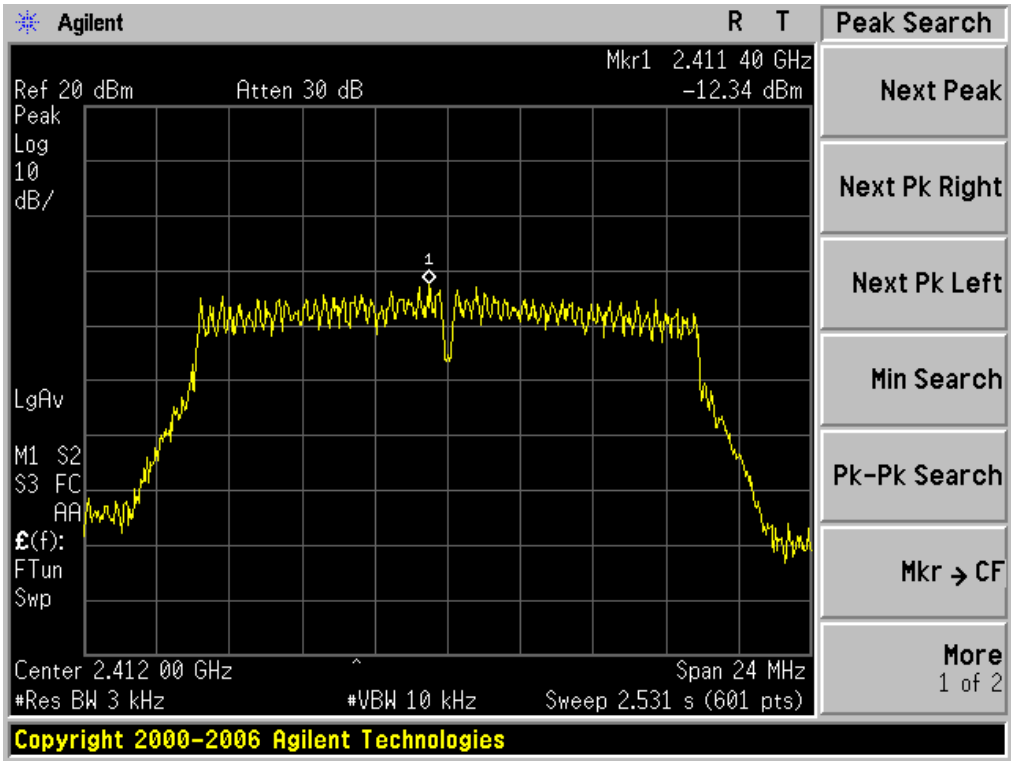


TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

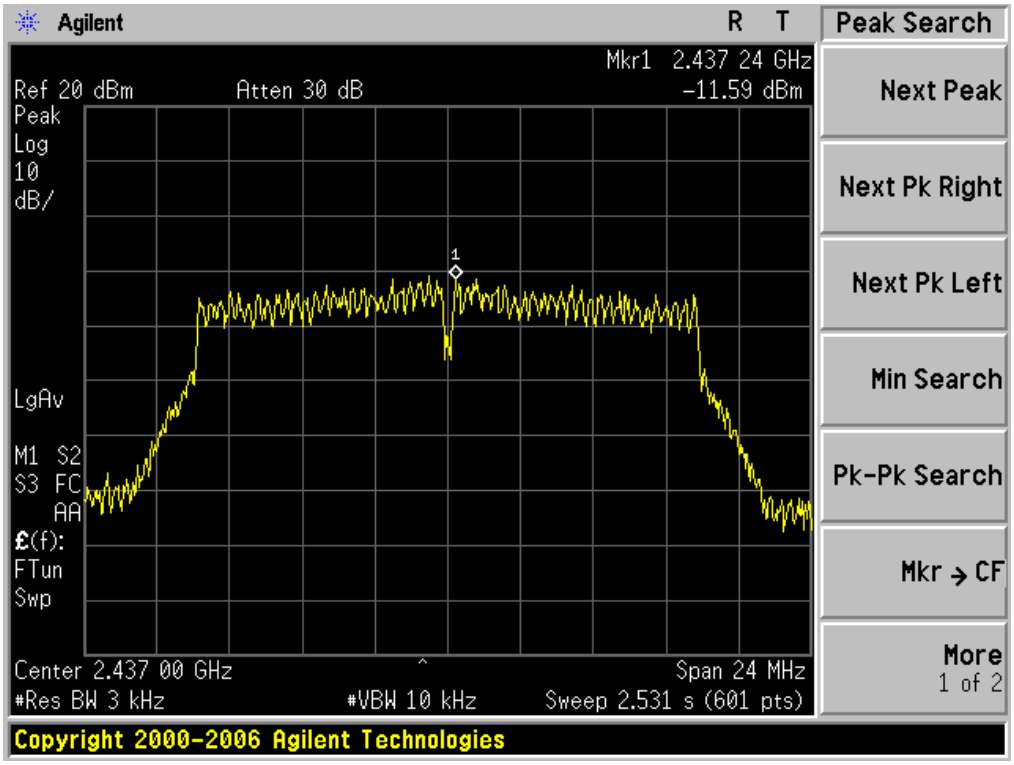


802.11g TEST RESULT

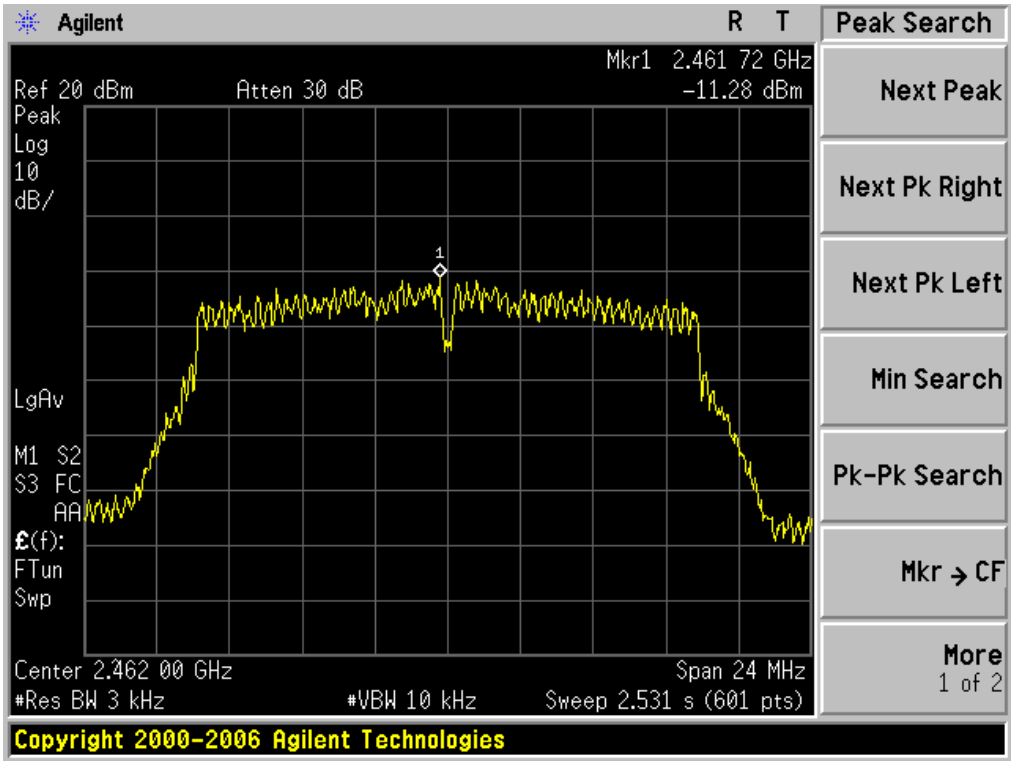
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

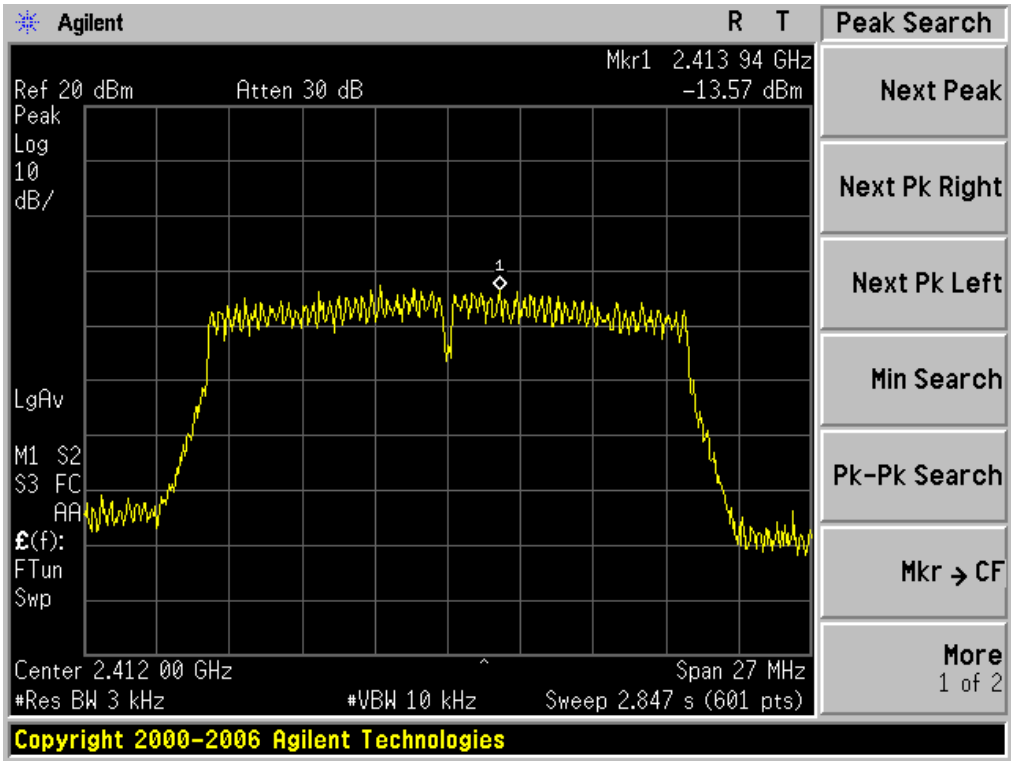


TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

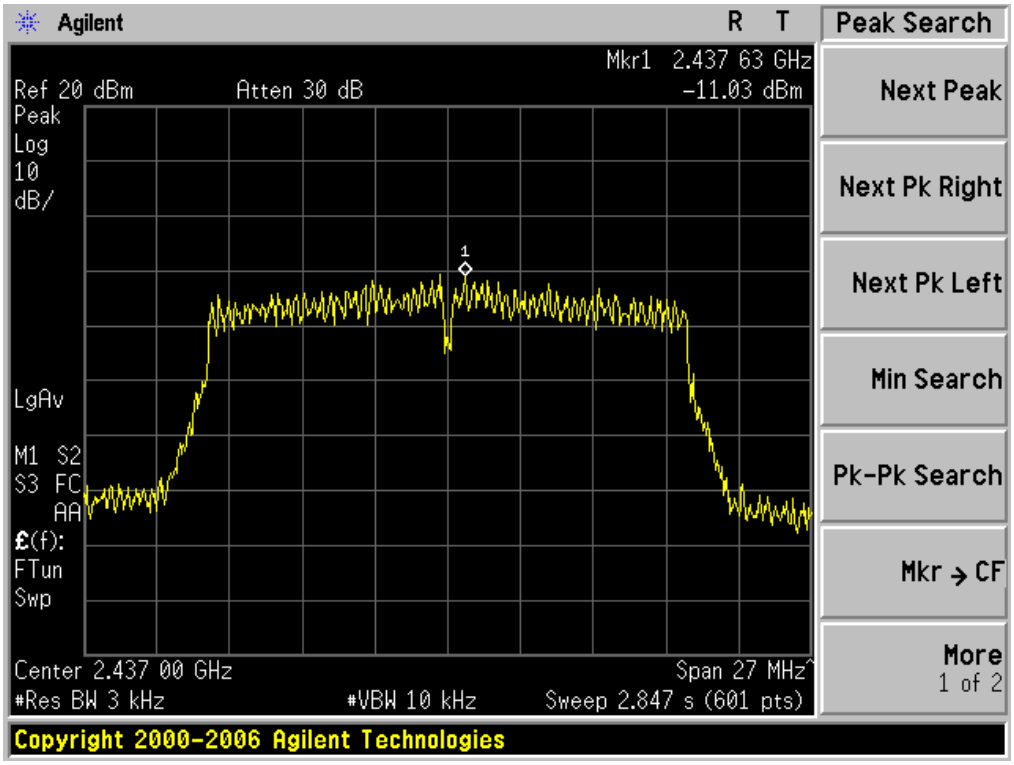


802.11n 20 TEST RESULT

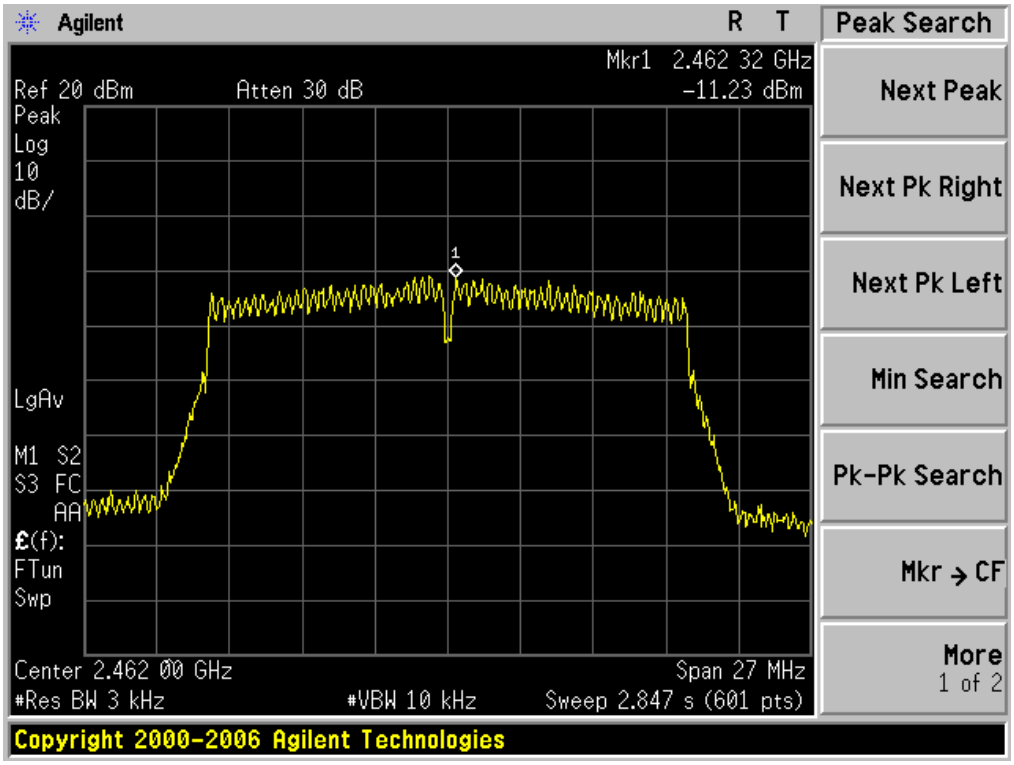
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL

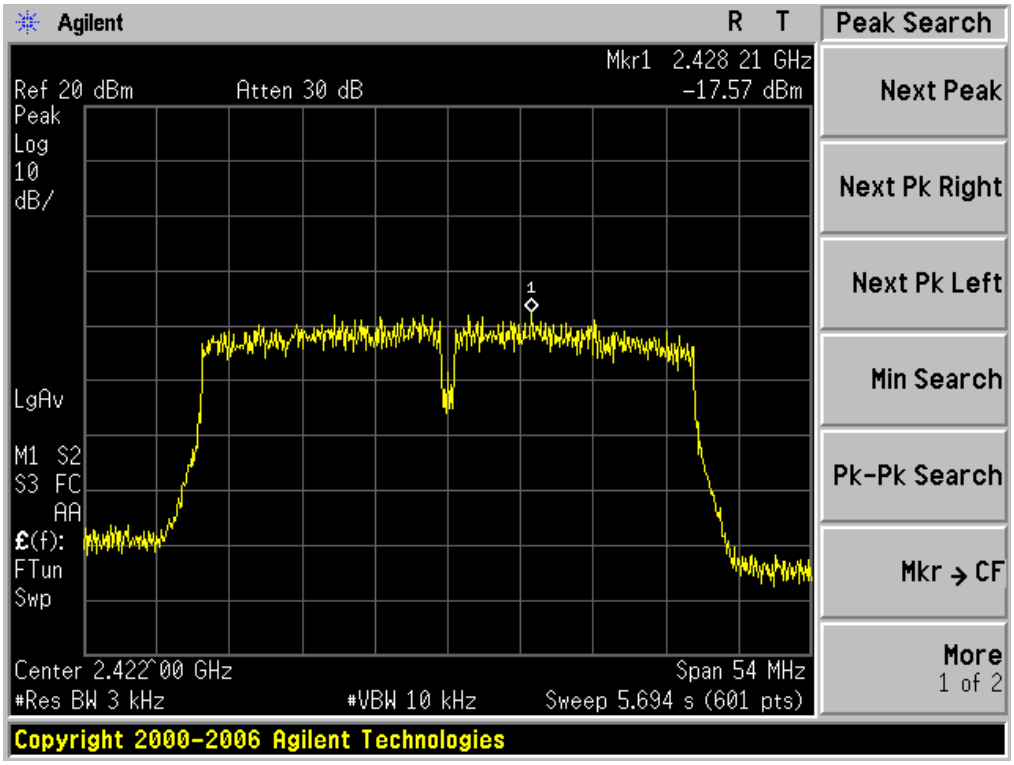


TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL

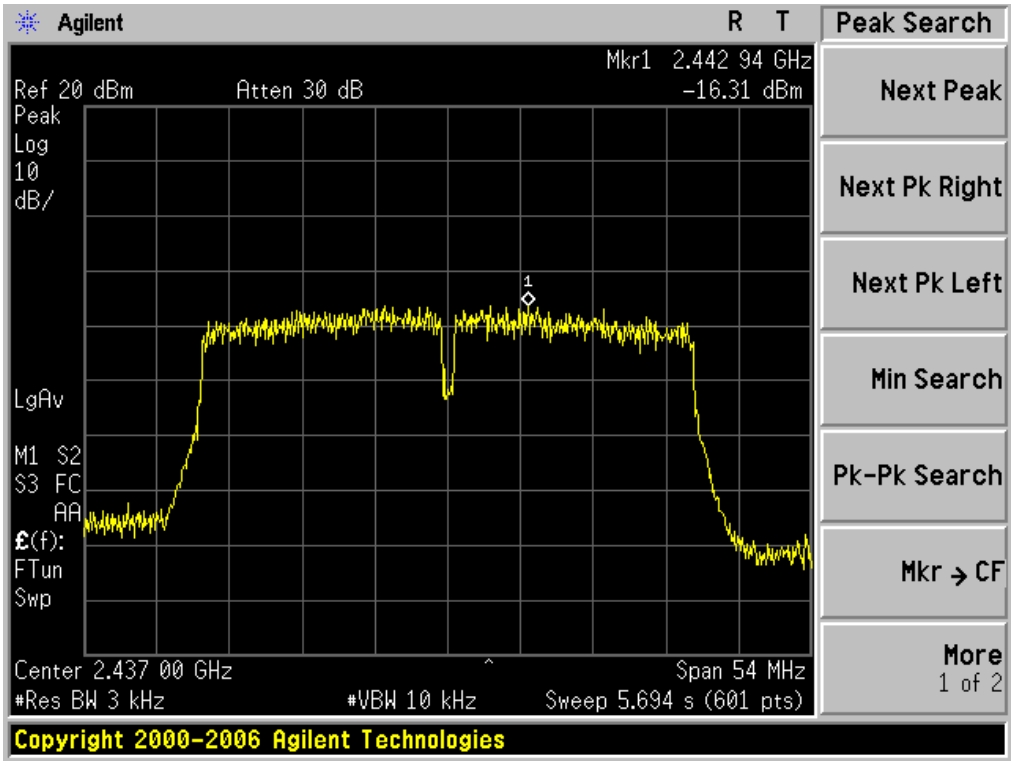


802.11n 40 TEST RESULT

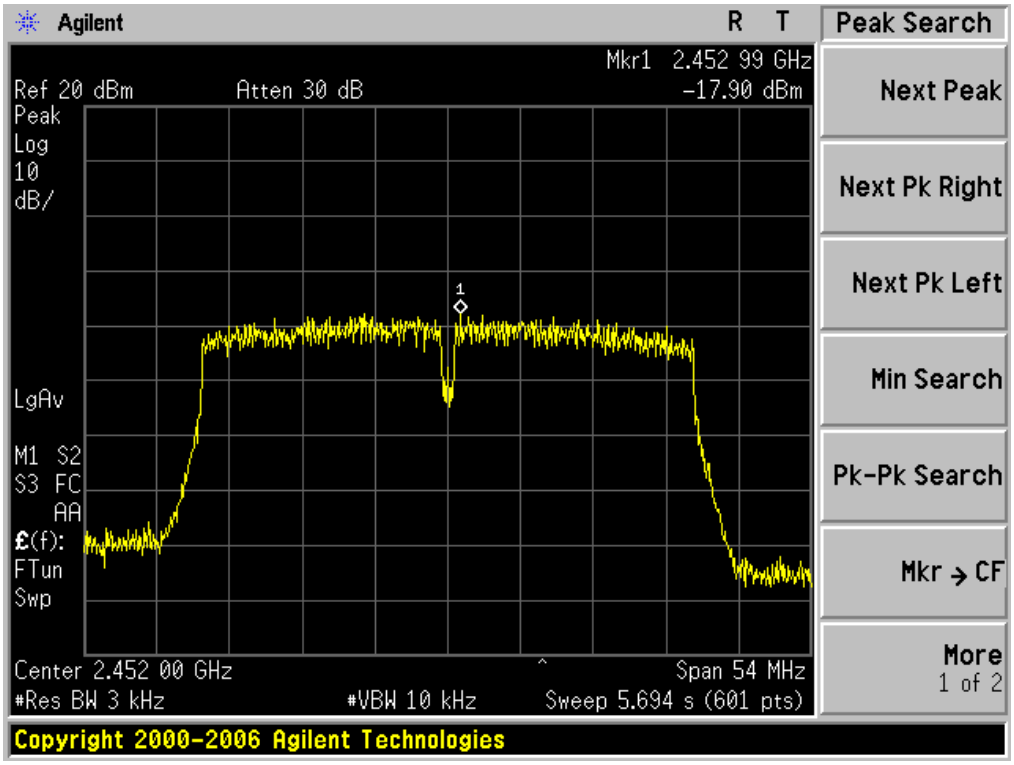
TEST PLOT OF SPECTRAL DENSITY FOR LOW CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR MIDDLE CHANNEL



TEST PLOT OF SPECTRAL DENSITY FOR HIGH CHANNEL



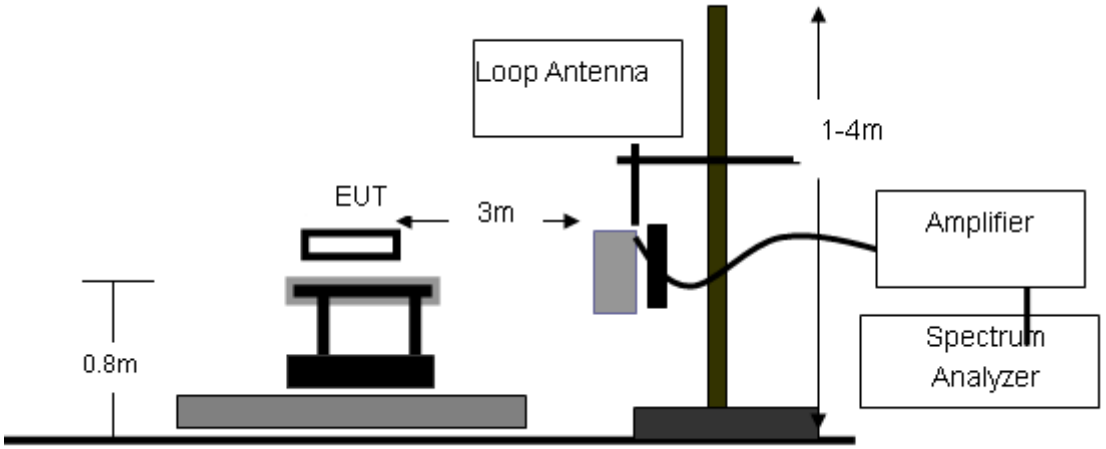
11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

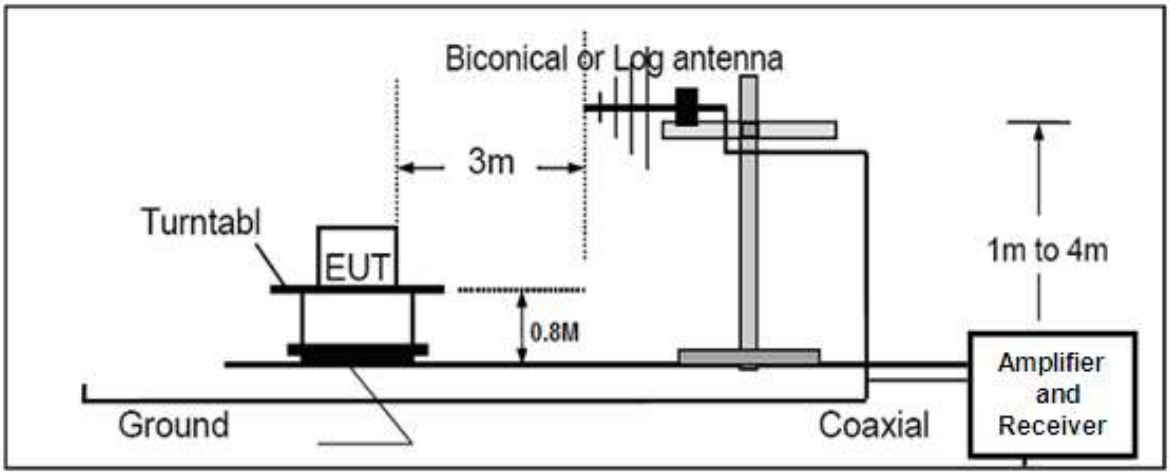
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

11.2. TEST SETUP

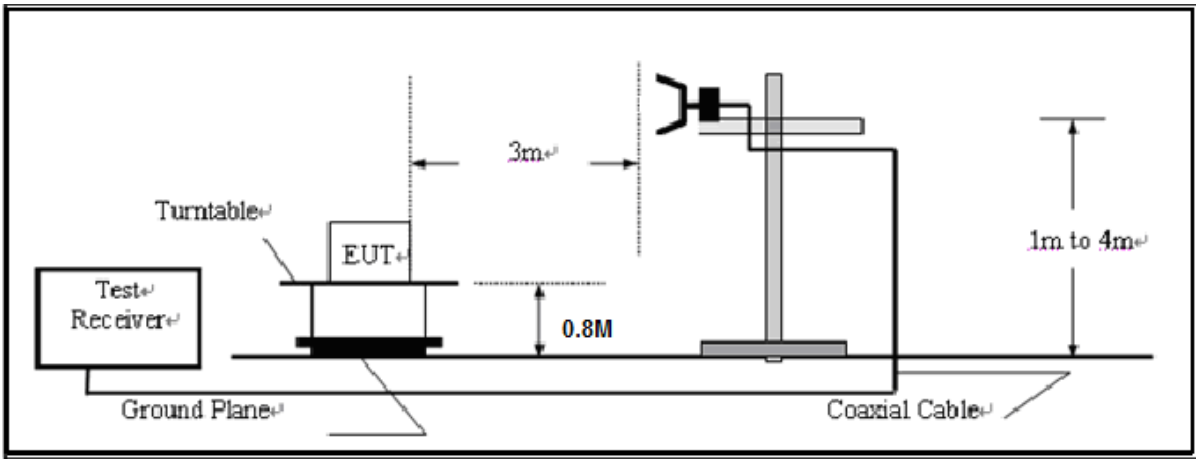
RADIATED EMISSION TEST SETUP BELOW 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table 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

Note: All modes were tested For restricted band radiated emission,
the test records reported below are the worst result compared to other modes.

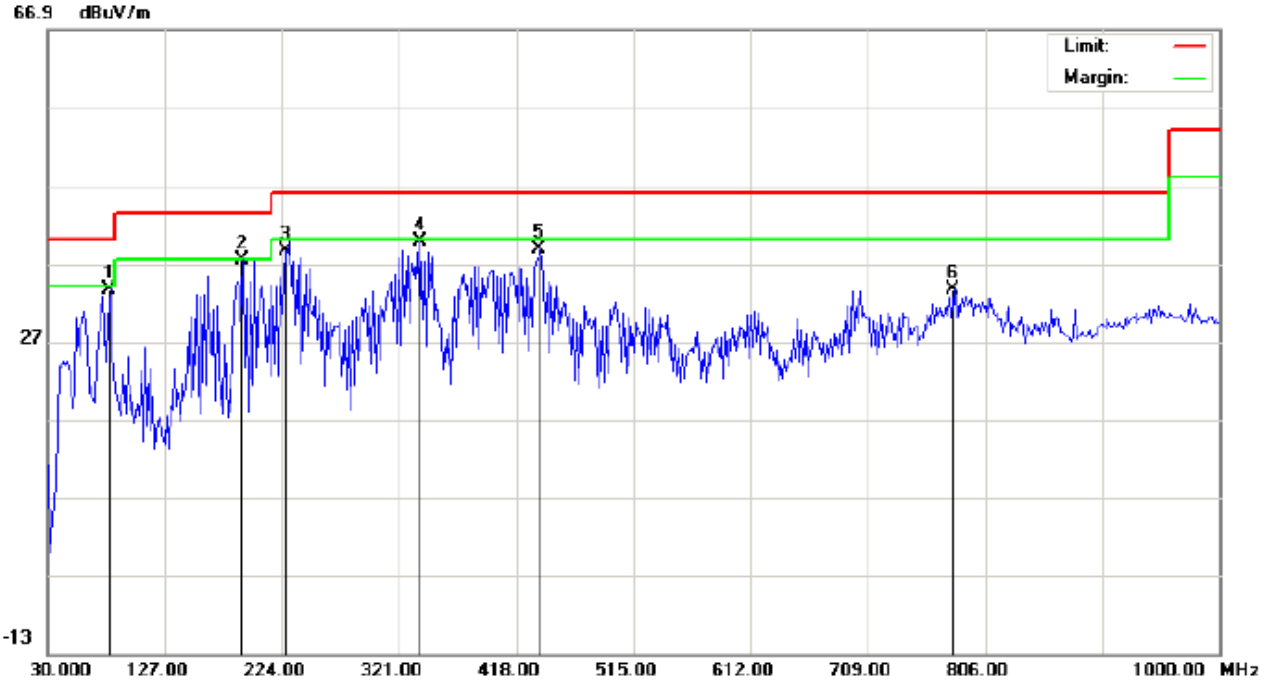
11.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ

EUT	WCDMA mobile phone	**Model Name**	SP6020
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	**Antenna**	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Low Channel TX
Note:

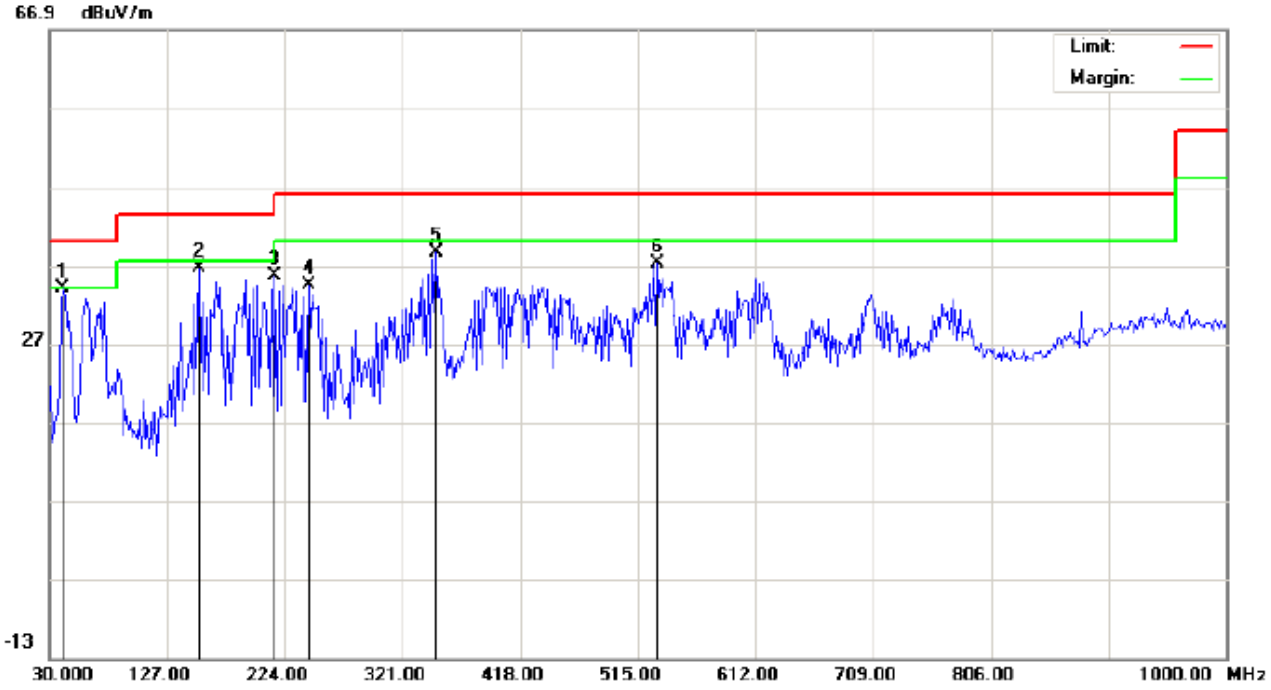
Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		81.7330	23.78	9.73	33.51	40.00	-6.49	peak			
2		191.6665	25.70	11.61	37.31	43.50	-6.19	peak			
3		227.2333	25.65	13.03	38.68	46.00	-7.32	peak			
4	*	338.7832	21.89	17.99	39.88	46.00	-6.12	peak			
5		437.3999	18.69	20.21	38.90	46.00	-7.10	peak			
6		780.1331	6.51	27.05	33.56	46.00	-12.44	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Low Channel TX
Note:

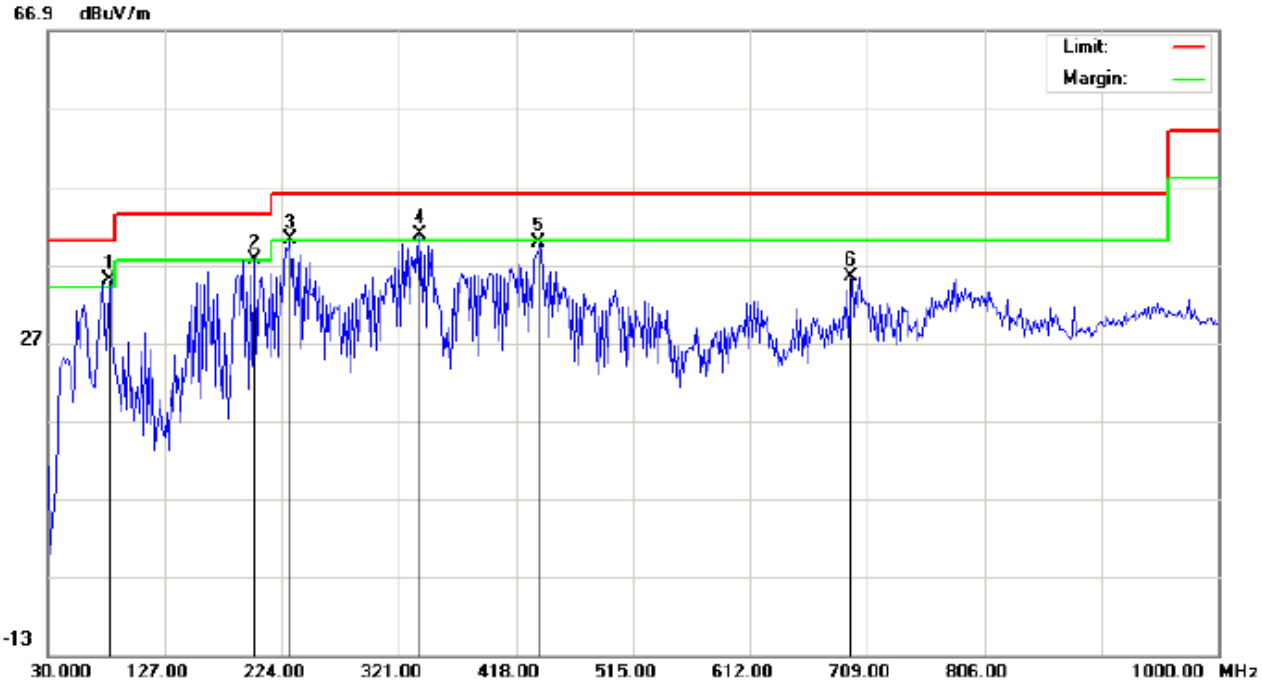
Polarization: *Vertical*
Power: AC 120V/60Hz
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	41.3166	25.24	8.81	34.05	40.00	-5.95	peak			
2		152.8667	21.26	15.28	36.54	43.50	-6.96	peak			
3		215.9165	24.97	10.56	35.53	43.50	-7.97	peak			
4		243.4000	21.09	13.25	34.34	46.00	-11.66	peak			
5		348.4832	19.99	18.64	38.63	46.00	-7.37	peak			
6		531.1666	15.25	21.97	37.22	46.00	-8.78	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Middle Channel TX
Note:

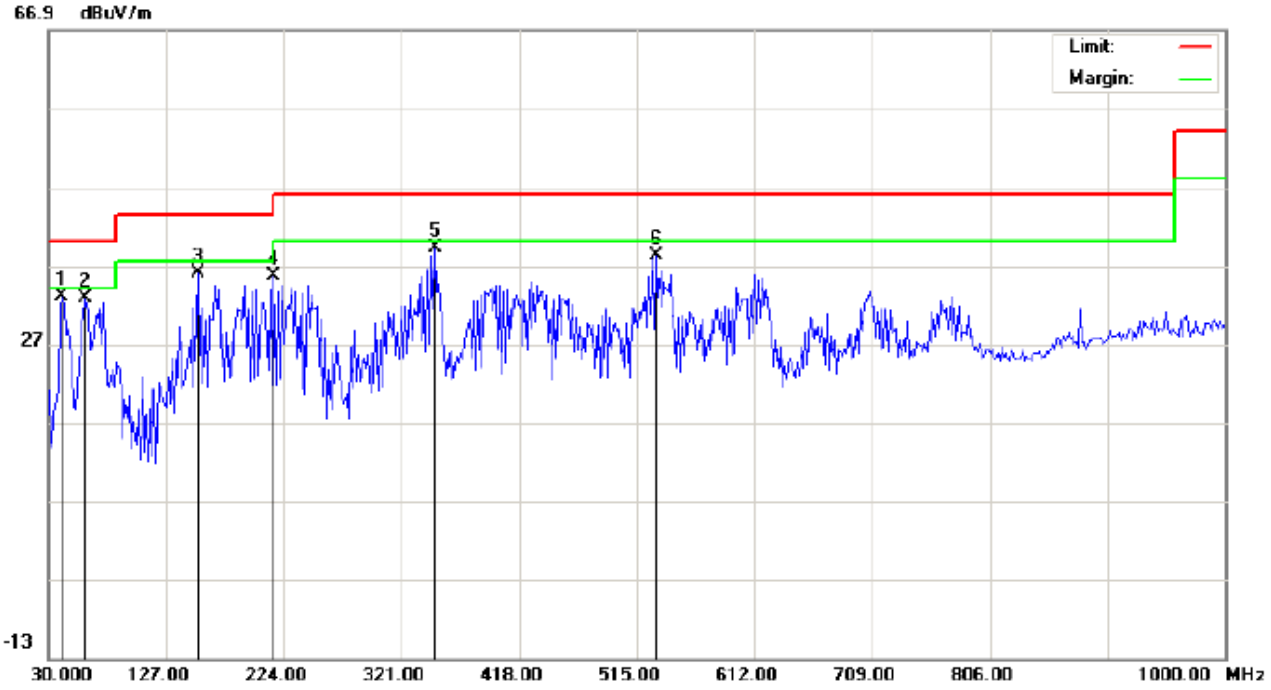
Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	81.7330	25.28	9.73	35.01	40.00	-4.99	peak			
2	!	201.3667	25.62	12.05	37.67	43.50	-5.83	peak			
3	!	230.4667	27.10	13.16	40.26	46.00	-5.74	peak			
4	!	338.7832	22.89	17.99	40.88	46.00	-5.12	peak			
5		437.3999	19.69	20.21	39.90	46.00	-6.10	peak			
6		696.0665	10.37	25.08	35.45	46.00	-10.55	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2437MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Middle Channel TX
Note:

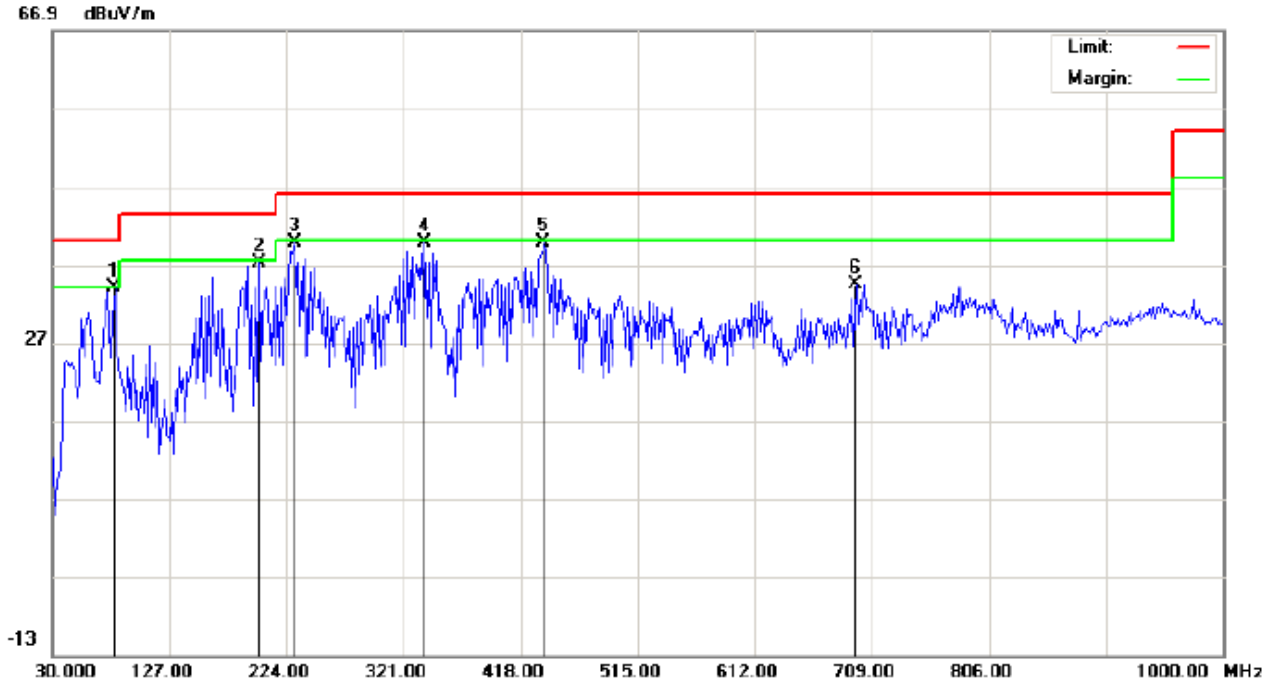
Polarization: *Vertical*
Power: AC 120V/60Hz
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		41.3166	24.24	8.81	33.05	40.00	-6.95	peak			
2		60.7167	24.92	7.87	32.79	40.00	-7.21	peak			
3		152.8667	20.76	15.28	36.04	43.50	-7.46	peak			
4		215.9165	24.97	10.56	35.53	43.50	-7.97	peak			
5	*	348.4832	20.49	18.64	39.13	46.00	-6.87	peak			
6		531.1666	16.25	21.97	38.22	46.00	-7.78	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: High Channel TX
Note:

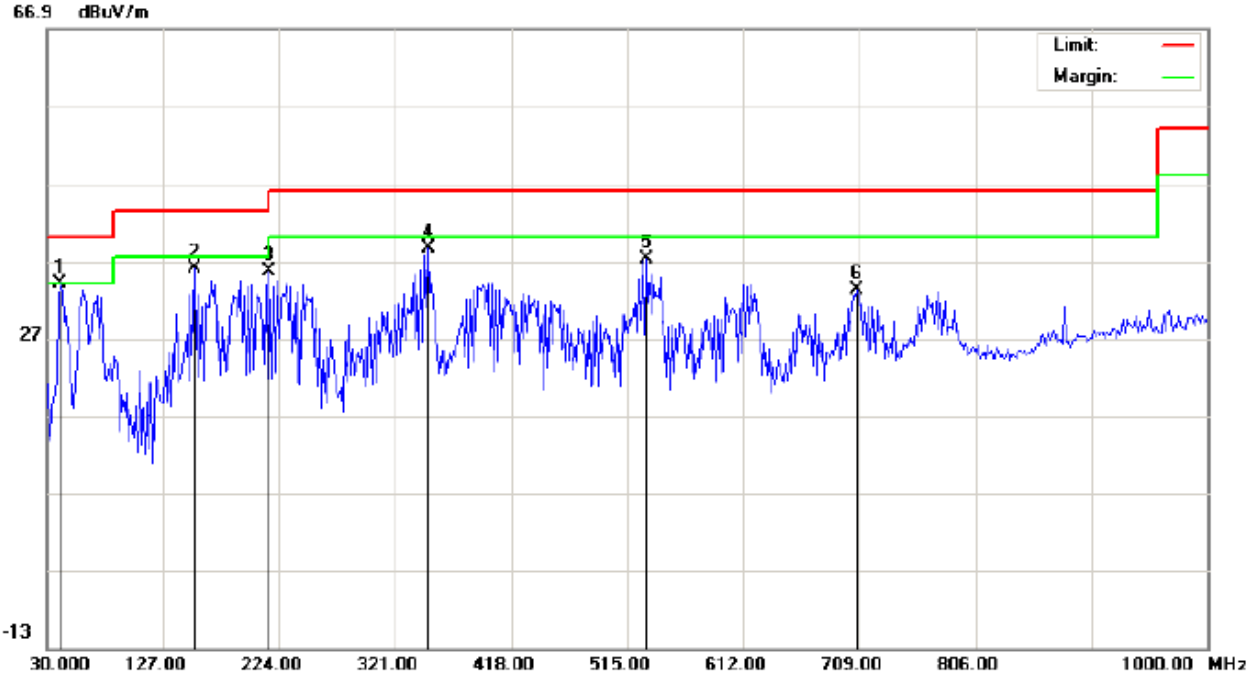
Polarization: *Horizontal*
Power: AC 120V/60Hz
Distance:

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	81.7330	24.28	9.73	34.01	40.00	-5.99	peak			
2		201.3667	25.12	12.05	37.17	43.50	-6.33	peak			
3		230.4667	26.60	13.16	39.76	46.00	-6.24	peak			
4		338.7832	21.89	17.99	39.88	46.00	-6.12	peak			
5		437.3999	19.69	20.21	39.90	46.00	-6.10	peak			
6		696.0665	9.37	25.08	34.45	46.00	-11.55	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2462MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation
EUT: WCDMA mobile phone
M/N: SP6020
Mode: High Channel TX
Note:

Polarization: *Vertical*
Power: AC 120V/60Hz
Distance:

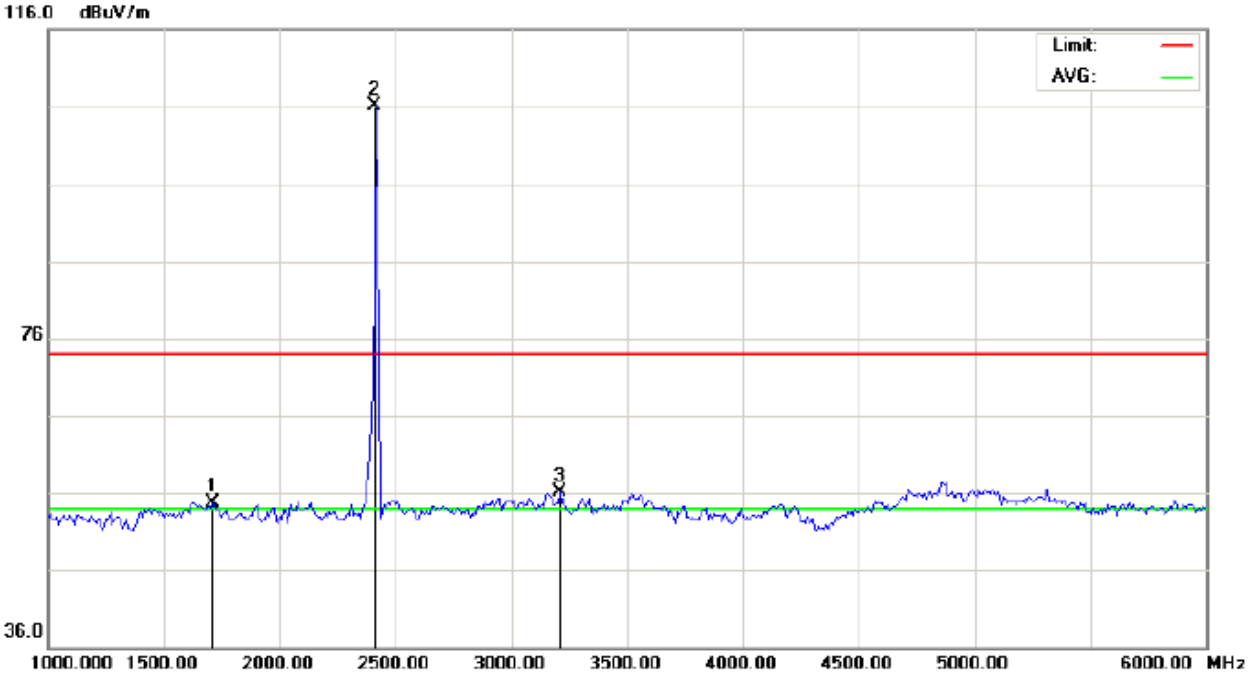
Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	41.3166	25.24	8.81	34.05	40.00	-5.95	peak			
2		152.8667	20.76	15.28	36.04	43.50	-7.46	peak			
3		215.9165	24.97	10.56	35.53	43.50	-7.97	peak			
4		348.4832	19.99	18.64	38.63	46.00	-7.37	peak			
5		531.1666	15.25	21.97	37.22	46.00	-8.78	peak			
6		707.3831	7.78	25.40	33.18	46.00	-12.82	peak			

RESULT: PASS
Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.
2. The “Factor” value can be calculated automatically by software of measurement system.

RADIATED EMISSION ABOVE 1GHZ

EUT	WCDMA mobile phone	**Model Name**	SP6020
Temperature	25°C	**Relative Humidity**	55.4%
Pressure	960hPa	**Test Voltage**	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	**Antenna**	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b Low Channel TX
Note:

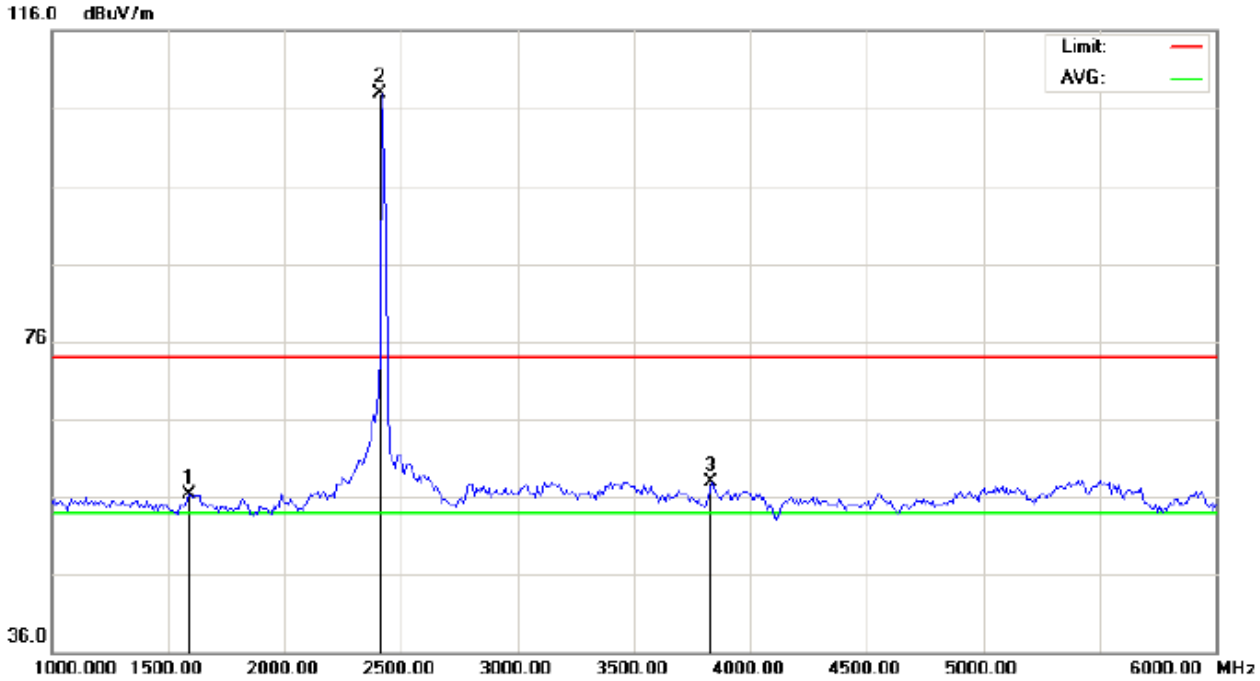
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1708.333	67.89	-13.19	54.70	74.00	-19.30	peak			
2	*	2412.021	115.78	-9.67	106.11	74.00	32.11	peak			
3		3208.333	64.17	-8.16	56.01	74.00	-17.99	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with date rate 1 2412MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b Low Channel TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		1591.667	70.69	-14.42	56.27	74.00	-17.73	peak			
2	*	2412.035	117.57	-9.67	107.90	74.00	33.90	peak			
3		3833.333	63.66	-5.84	57.82	74.00	-16.18	peak			

RESULT: PASS

Note: The other modes radiation emissions have more than 20dB margin.

All modes radiation emission from 6GHz to 25GHz at least have 20dB margin.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

12. BAND EDGE EMISSION

12.1. MEASUREMENT PROCEDURE

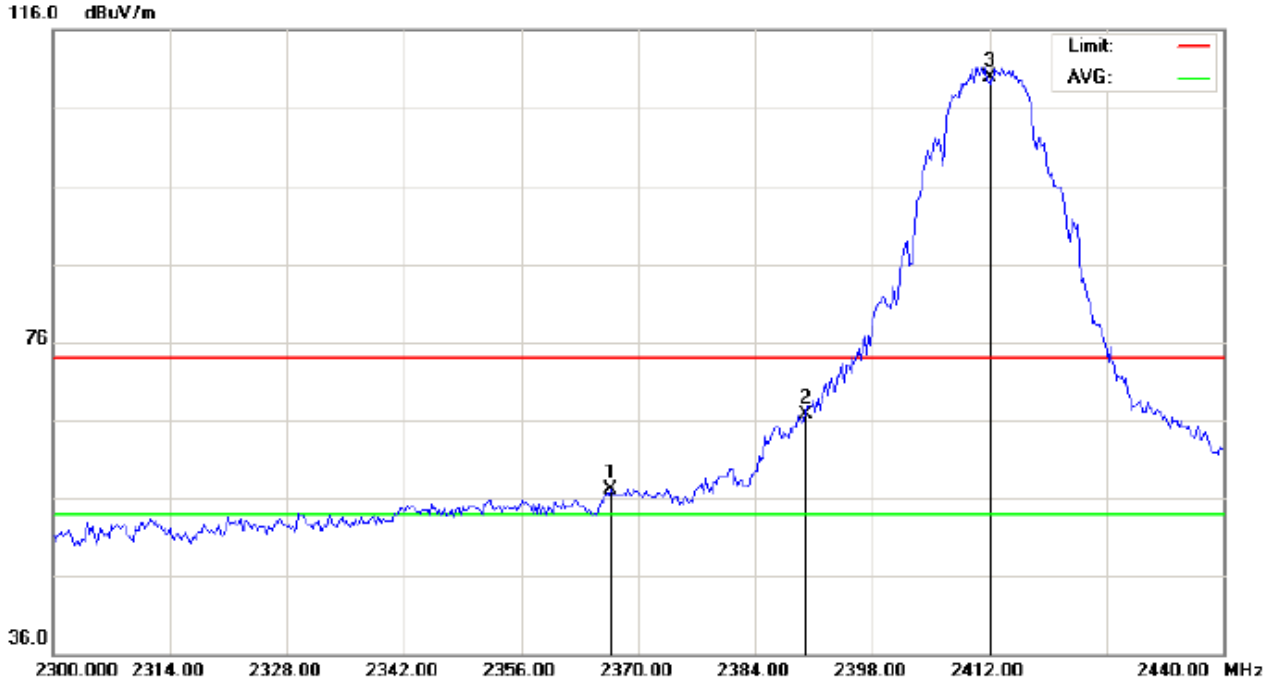
1. Set the EUT Work on the top, the bottom operation frequency individually.
2. Set SPA Start or Stop Frequency = Operation Frequency, RBW>=1%span, VBW>=RBW
3. The band edges was measured and recorded.

12.2. TEST SET-UP

Radiated same as 11.2

12.3. TEST RESULT

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b Low Channel TX
Note:

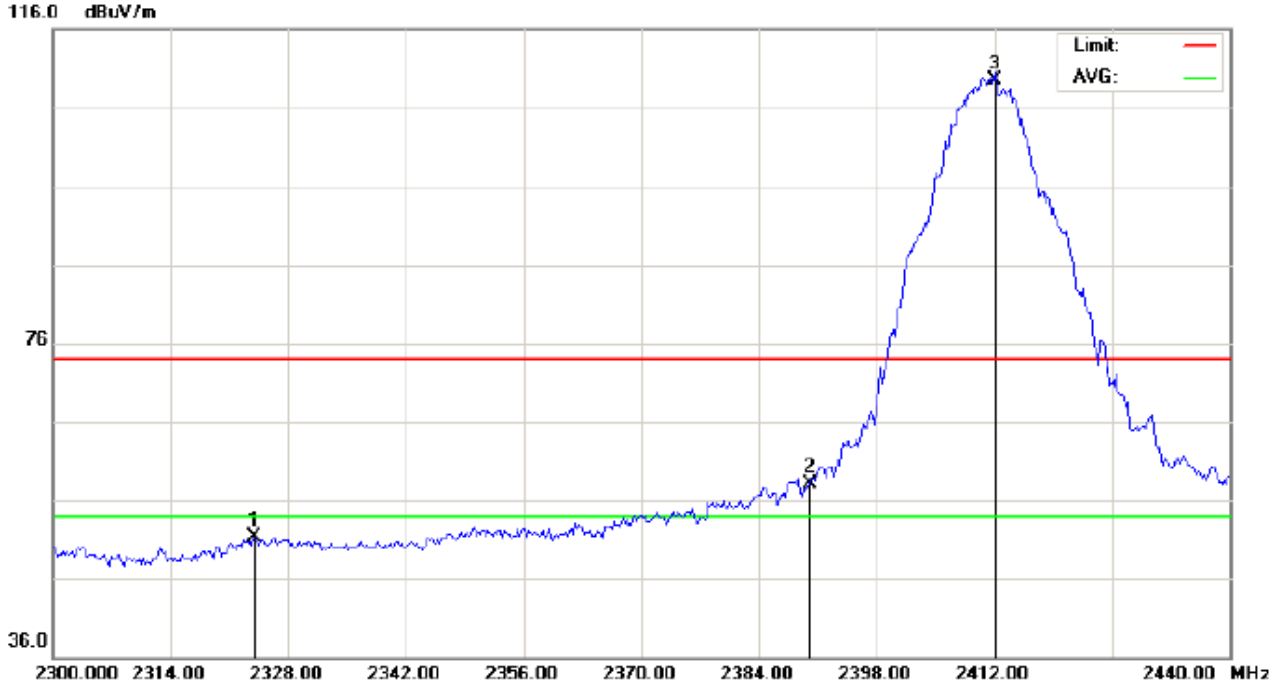
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2366.733	66.87	-9.72	57.15	74.00	-16.85	peak			
2		2390.000	76.40	-9.69	66.71	74.00	-7.29	peak			
3	*	2412.023	119.50	-9.67	109.83	74.00	35.83	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b Low Channel TX
Note:

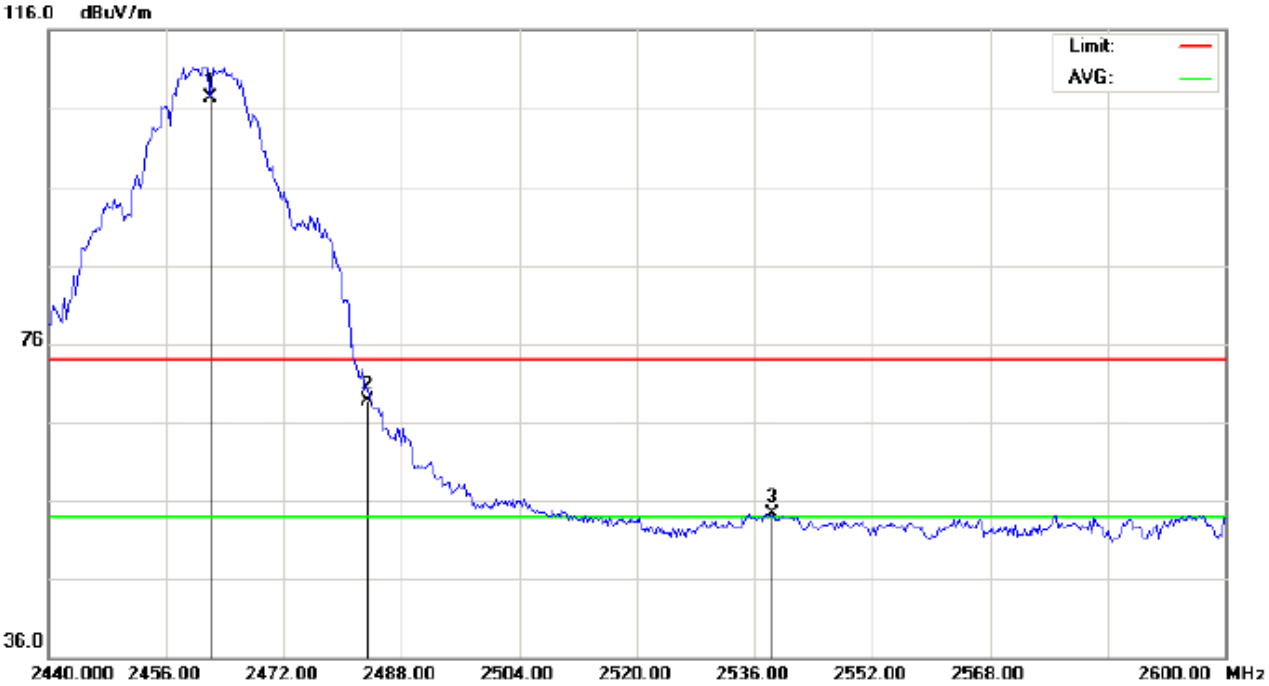
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2324.033	61.02	-9.76	51.26	74.00	-22.74	peak			
2		2390.000	67.77	-9.69	58.08	74.00	-15.92	peak			
3	*	2412.000	119.08	-9.67	109.41	74.00	35.41	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b High Channel TX
Note:

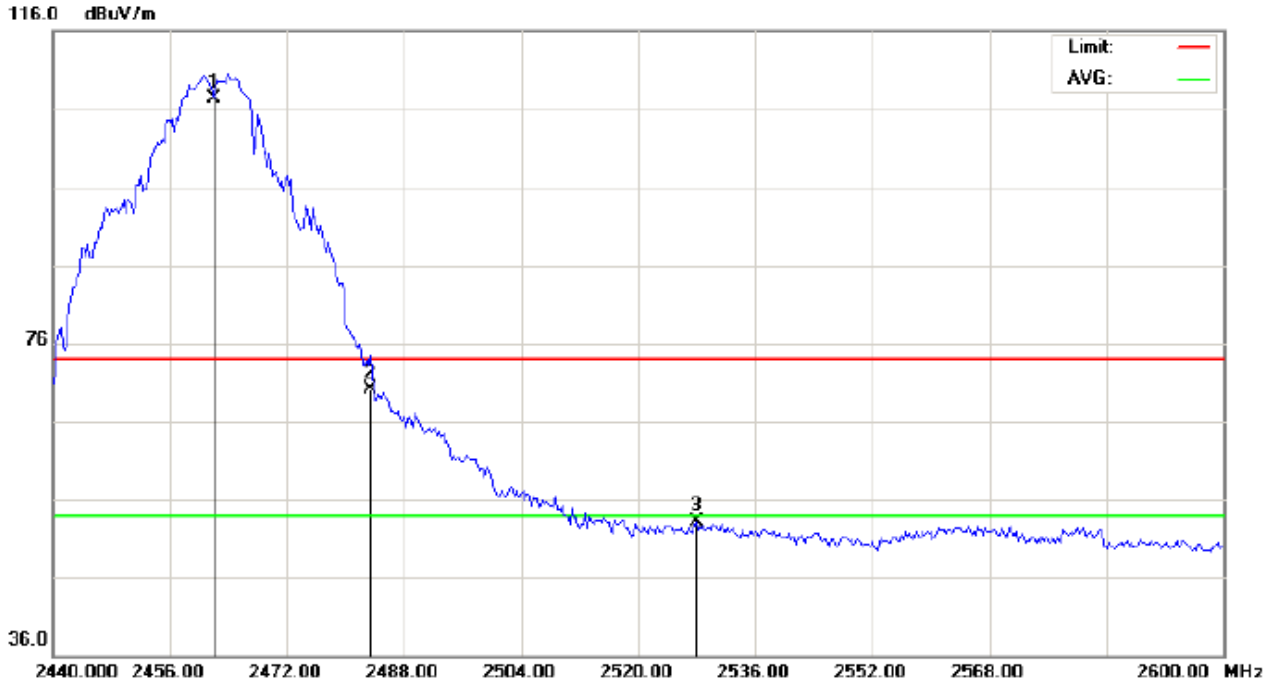
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2462.042	116.89	-9.61	107.28	74.00	33.28	peak			
2		2483.500	78.31	-9.59	68.72	74.00	-5.28	peak			
3		2538.400	63.76	-9.48	54.28	74.00	-19.72	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11b High Channel TX
Note:

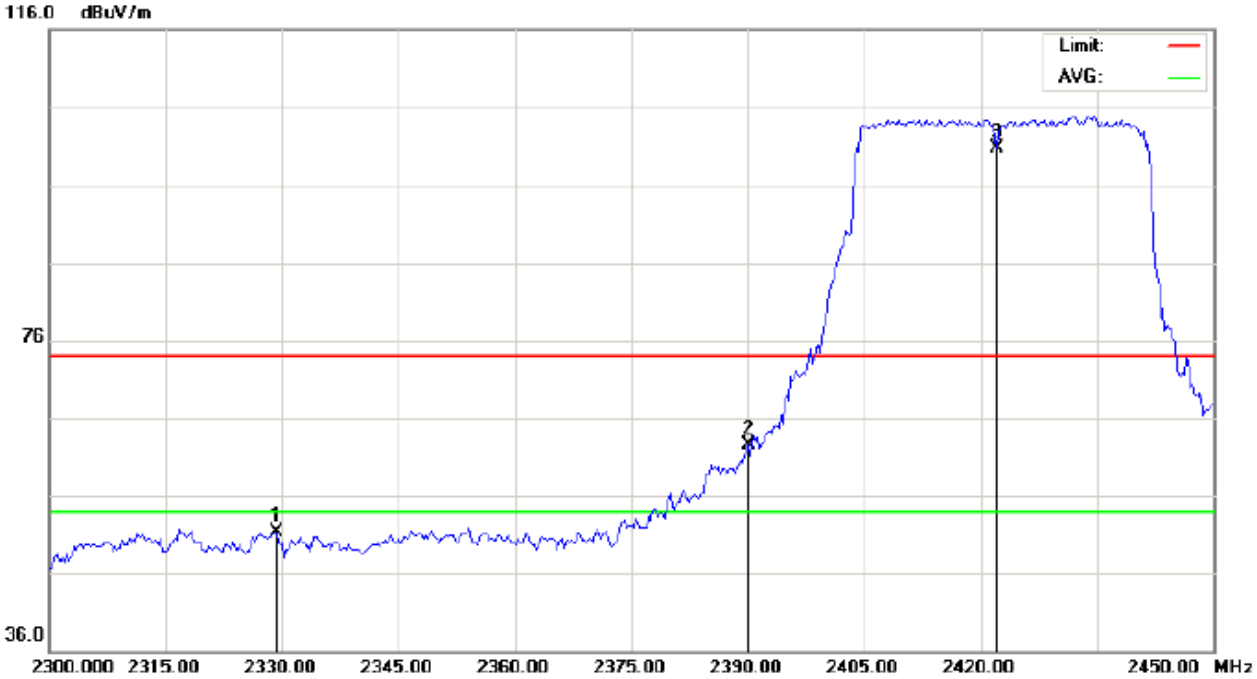
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2462.024	116.92	-9.61	107.31	74.00	33.31	peak			
2		2483.500	79.72	-9.59	70.13	74.00	-3.87	peak			
3		2528.000	62.66	-9.50	53.16	74.00	-20.84	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11n(40) Low Channel TX
Note:

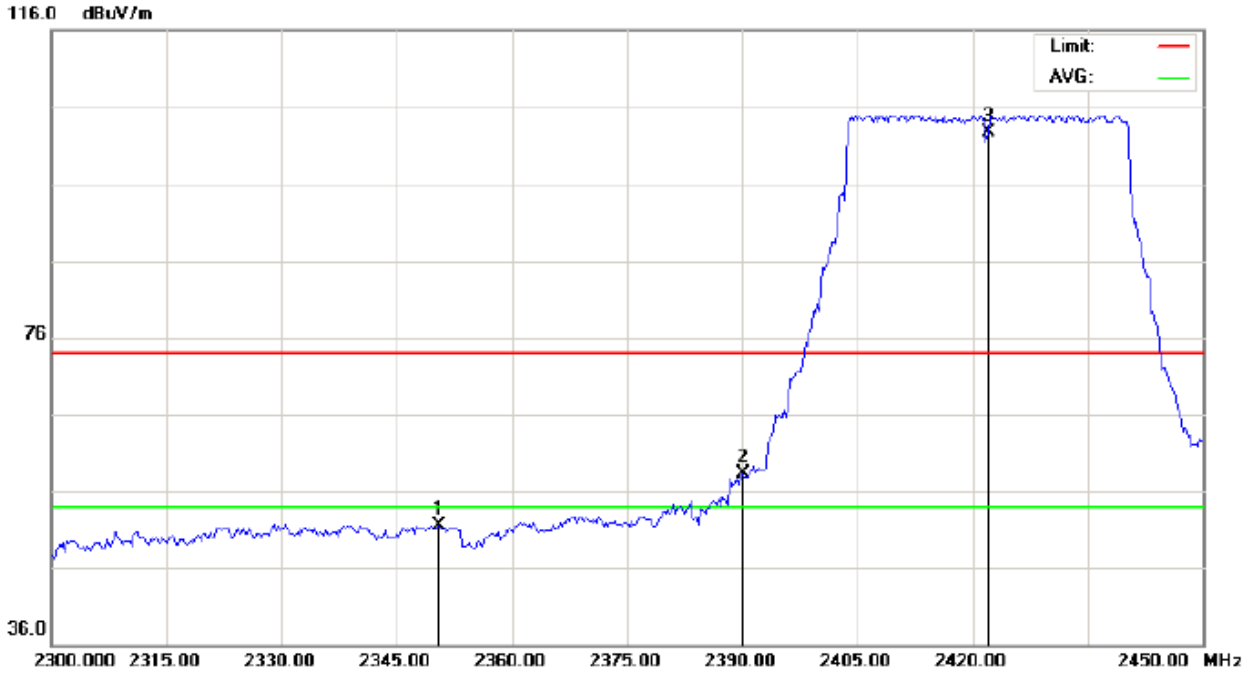
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2329.250	61.08	-9.76	51.32	74.00	-22.68	peak			
2		2390.000	72.21	-9.69	62.52	74.00	-11.48	peak			
3	*	2422.000	110.32	-9.66	100.66	74.00	26.66	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11n(40) Low Channel TX
Note:

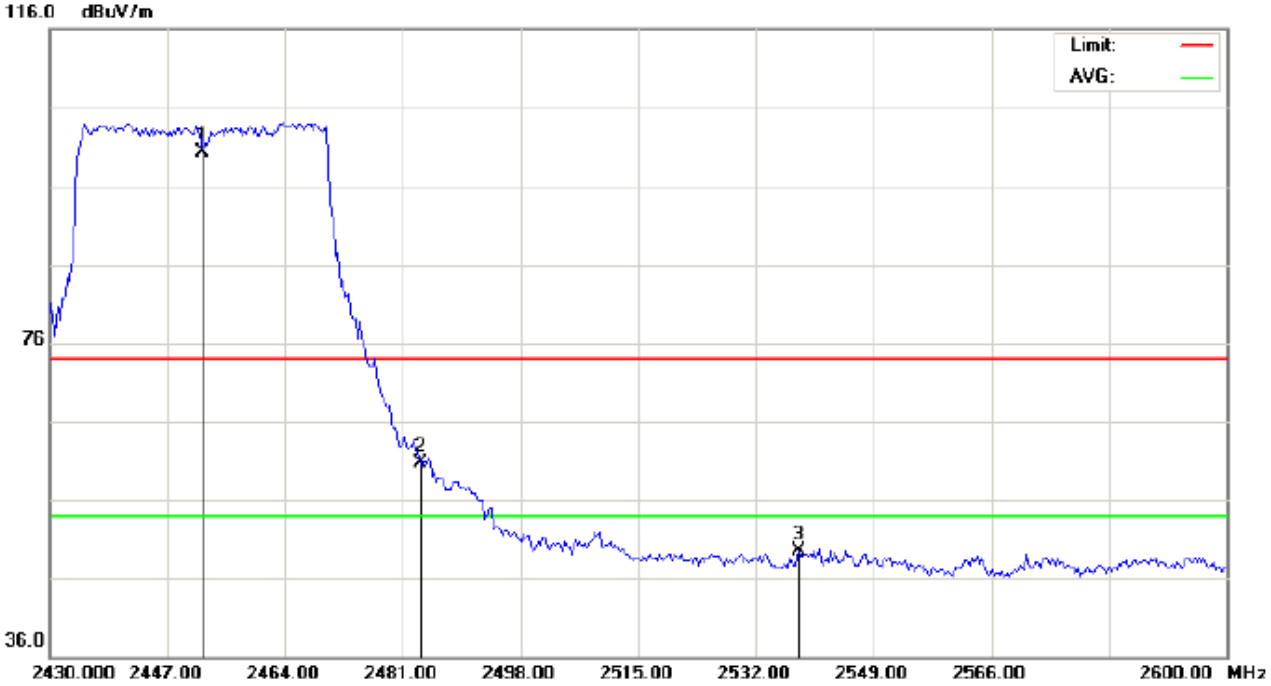
Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1		2350.500	61.27	-9.73	51.54	74.00	-22.46	peak			
2		2390.000	67.90	-9.69	58.21	74.00	-15.79	peak			
3	*	2422.000	112.37	-9.66	102.71	74.00	28.71	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2452MHZ	Antenna	Horizontal



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11n(40) High Channel TX
Note:

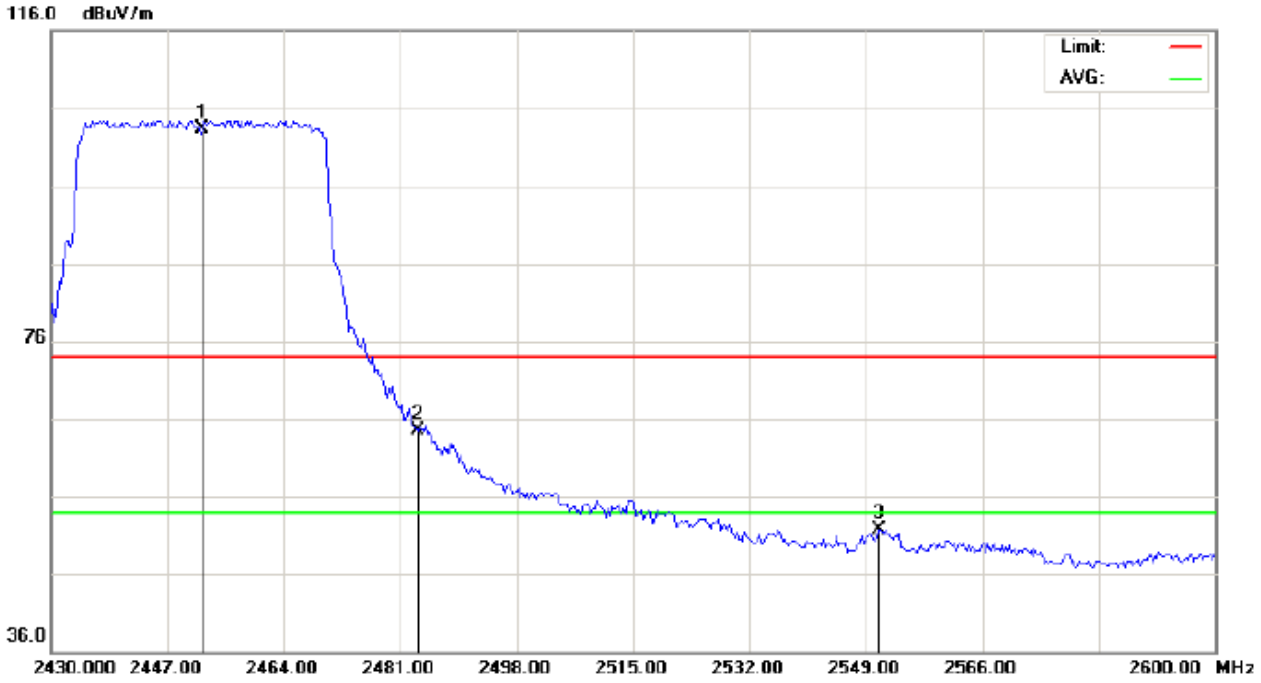
Polarization: *Horizontal*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2452.000	109.97	-9.62	100.35	74.00	26.35	peak			
2		2483.500	70.29	-9.59	60.70	74.00	-13.30	peak			
3		2538.233	58.89	-9.48	49.41	74.00	-24.59	peak			

RESULT: PASS

EUT	WCDMA mobile phone	Model Name	SP6020
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2452MHZ	Antenna	Vertical



Site: site #1
Limit: FCC Class B 3M Radiation above 1GHZ(PK)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: 802.11n(40) High Channel TX
Note:

Polarization: *Vertical*
Power:
Distance: 3m

Temperature: 26
Humidity: 60 %

No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
	-	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	2452.024	112.90	-9.62	103.28	74.00	29.28	peak			
2		2483.500	74.03	-9.59	64.44	74.00	-9.56	peak			
3		2550.983	61.15	-9.45	51.70	74.00	-22.30	peak			

RESULT: PASS

Note: The other modes radiation emission have enough 20dB margin.

Factor = Antenna Factor + Cable loss - Amplifier gain, Over=Measure-Limit.

The “Factor” value can be calculated automatically by software of measurement system.

13. FCC LINE CONDUCTED EMISSION TEST

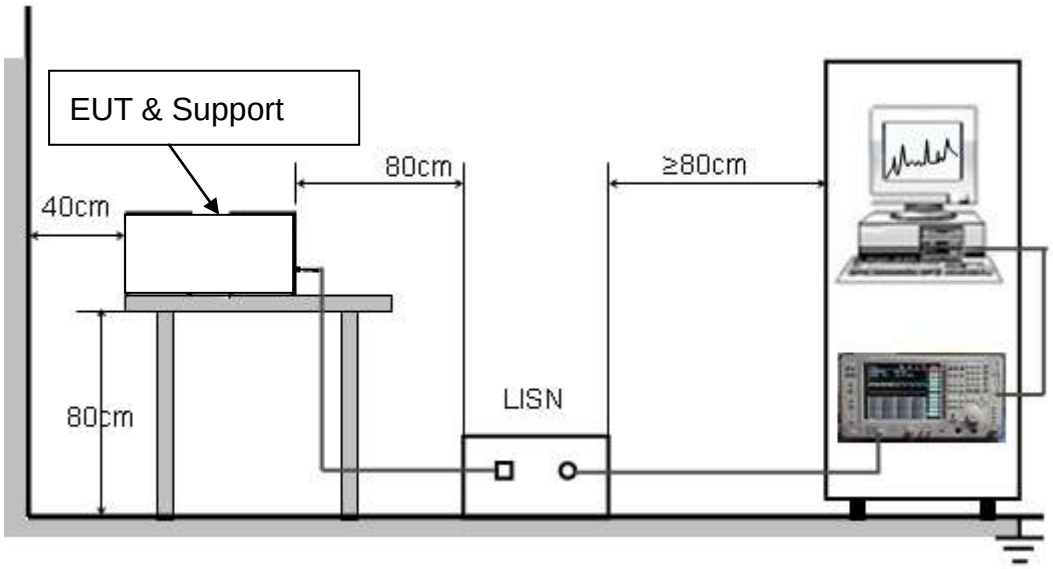
13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

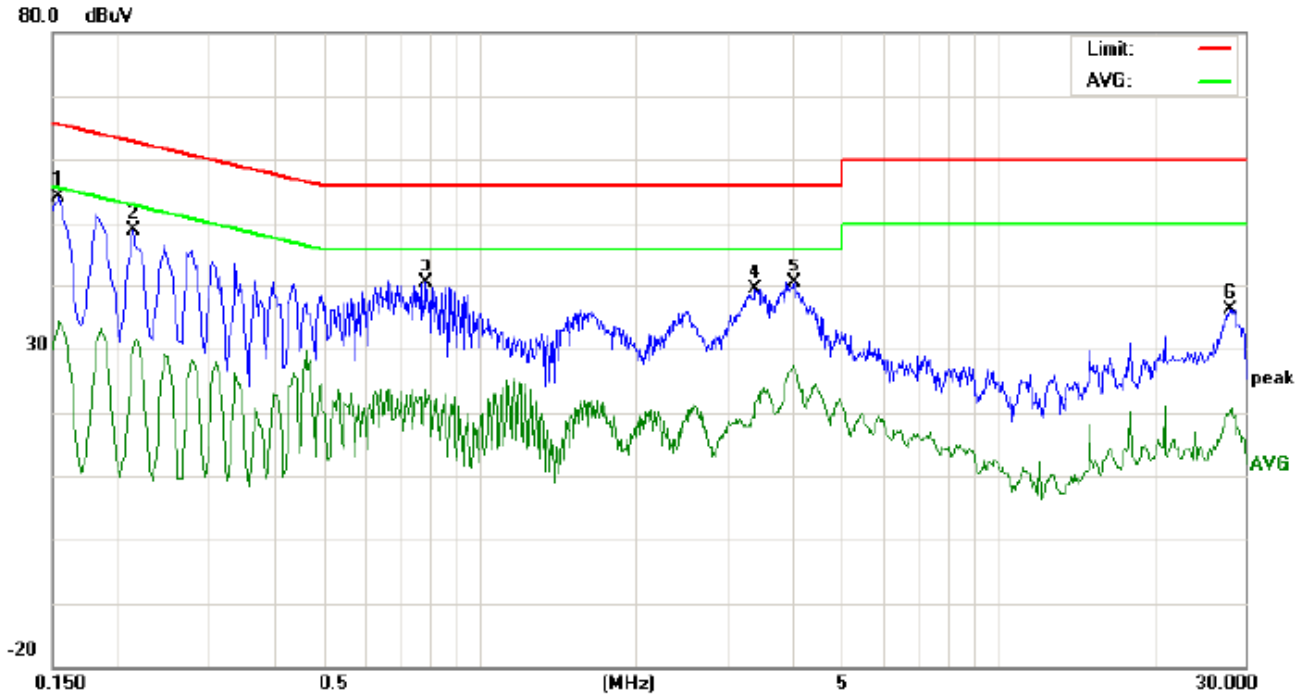
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST LINE 1-L



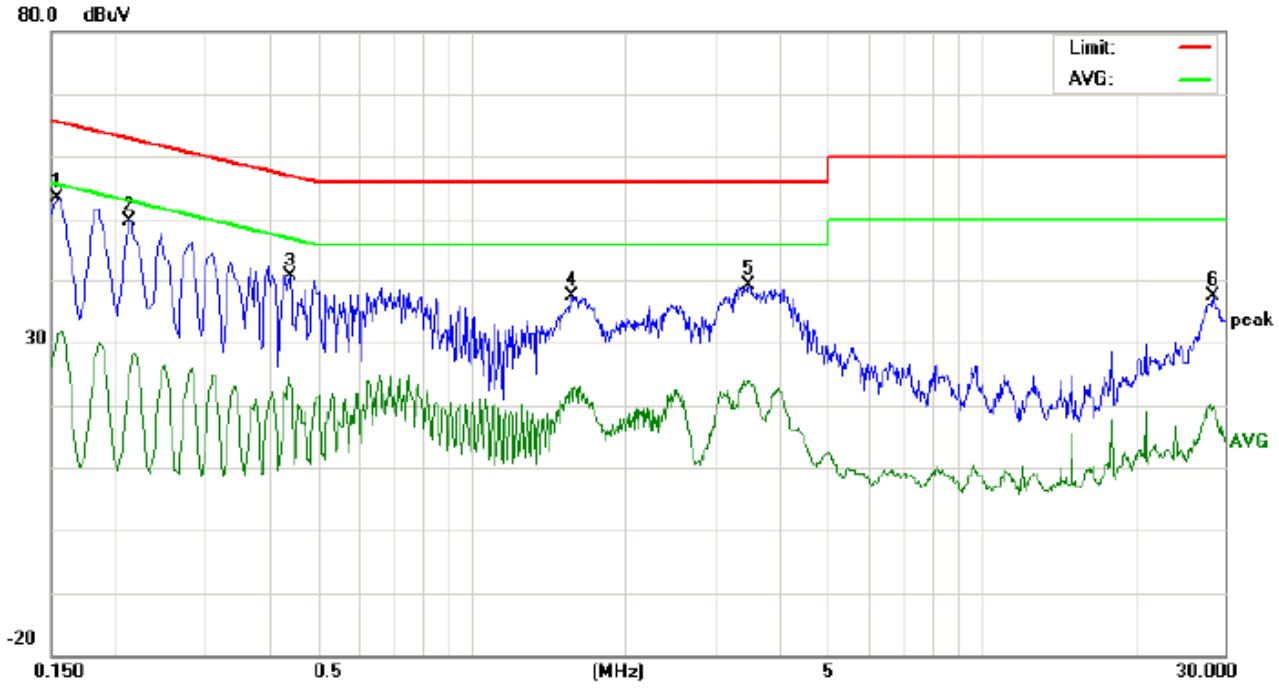
Site: Conduction
Limit: FCC Class B Conduction(QP)
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Normal Operating(WiFi)
Note:

Phase: *L1*
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	44.00		24.20	10.16	54.16		34.36	65.78	55.78	-11.62	-21.42	P	
2	0.2139	38.72		20.21	10.23	48.95		30.44	63.05	53.05	-14.10	-22.61	P	
3	0.7860	30.16		13.22	10.29	40.45		23.51	56.00	46.00	-15.55	-22.49	P	
4	3.4020	28.82		10.82	10.52	39.34		21.34	56.00	46.00	-16.66	-24.66	P	
5	4.0617	30.09		16.49	10.40	40.49		26.89	56.00	46.00	-15.51	-19.11	P	
6	28.1260	26.09		9.91	10.13	36.22		20.04	60.00	50.00	-23.78	-29.96	P	

Line Conducted Emission Test Line 2-N



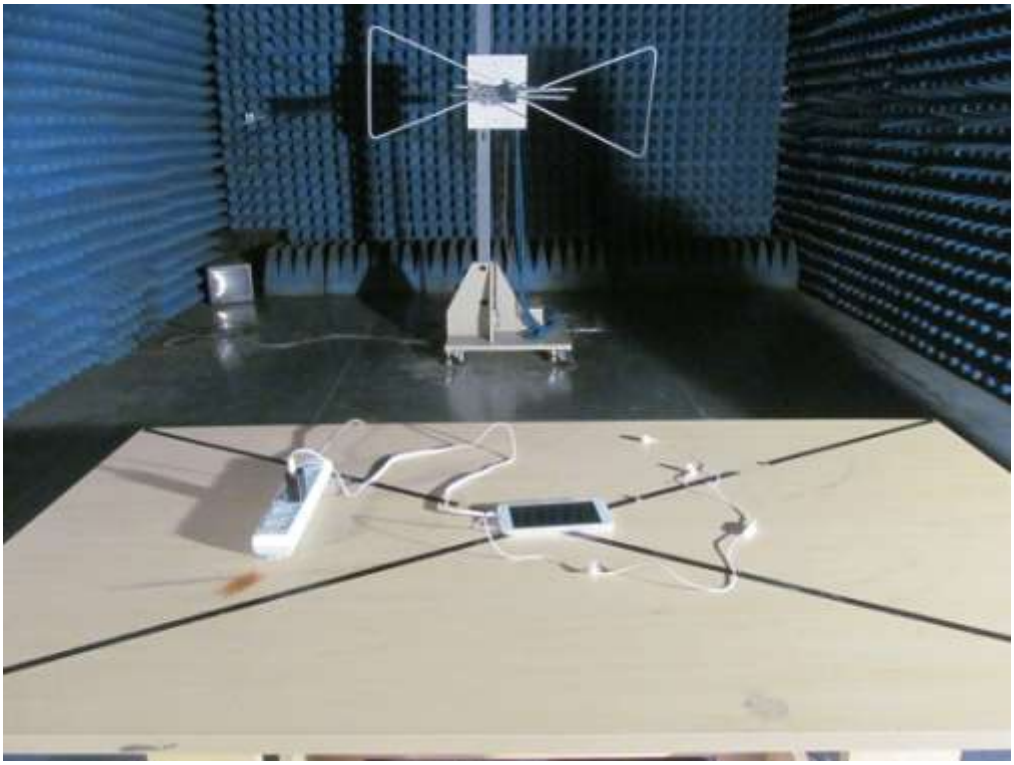
Site: Conduction
Phase: N
Temperature: 26
Limit: FCC Class B Conduction(QP)
Power: AC 120V/60Hz
Humidity: 60 %
EUT: WCDMA mobile phone
M/N: SP6020
Mode: Normal Operating(WiFi)
Note:

No.	Freq. (MHz)	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG	dB	Peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1539	43.21		21.20	10.16	53.37		31.36	65.78	55.78	-12.41	-24.42	P	
2	0.2127	39.42		14.14	10.23	49.65		24.37	63.10	53.10	-13.45	-28.73	P	
3	0.4420	30.18		12.46	10.36	40.54		22.82	57.02	47.02	-16.48	-24.20	P	
4	1.5740	27.02		11.64	10.36	37.38		22.00	56.00	46.00	-18.62	-24.00	P	
5	3.4980	28.58		13.24	10.51	39.09		23.75	56.00	46.00	-16.91	-22.25	P	
6	28.5100	27.21		9.69	10.12	37.33		19.81	60.00	50.00	-22.67	-30.19	P	

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

FCC RADIATED EMISSION TEST SETUP



APPENDIX B: PHOTOGRAPHS OF EUT

All VIEW OF EUT

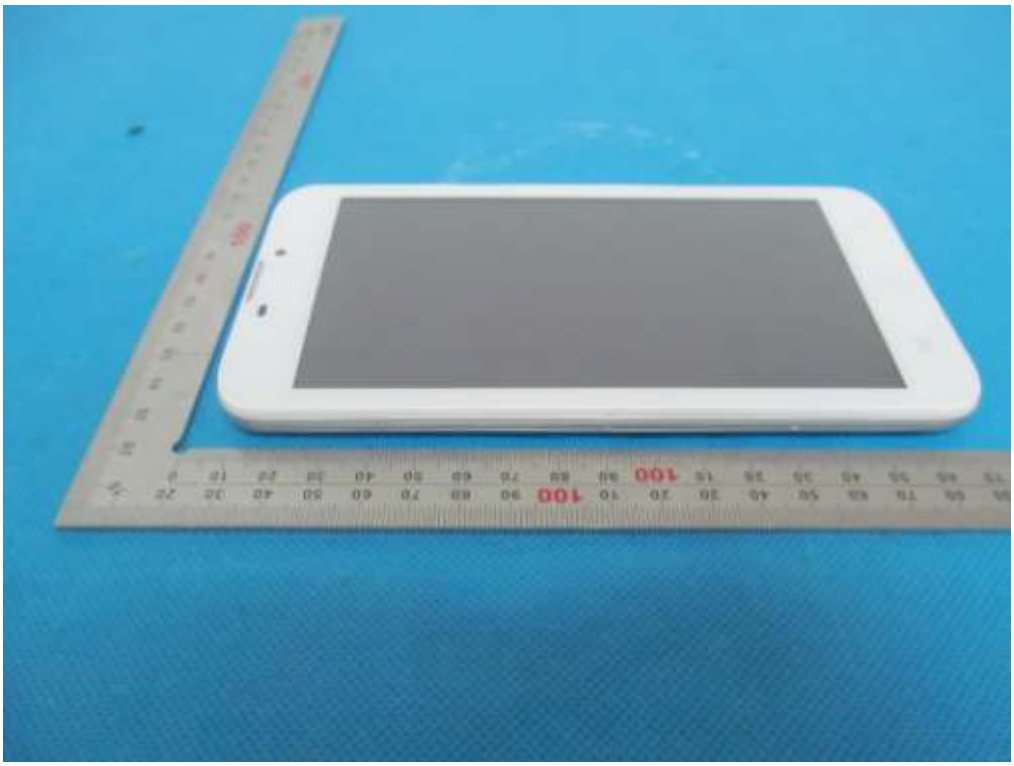
TOP VIEW OF EUT

BOTTOM VIEW OF EUT

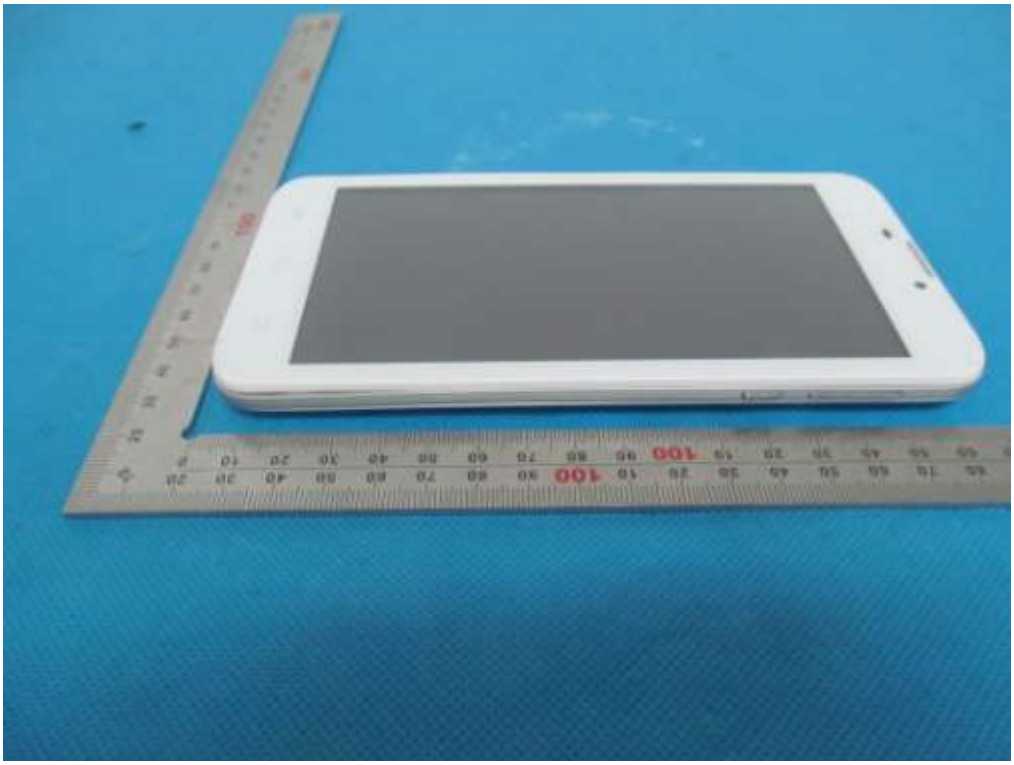
FRONT VIEW OF EUT

BACK VIEW OF EUT

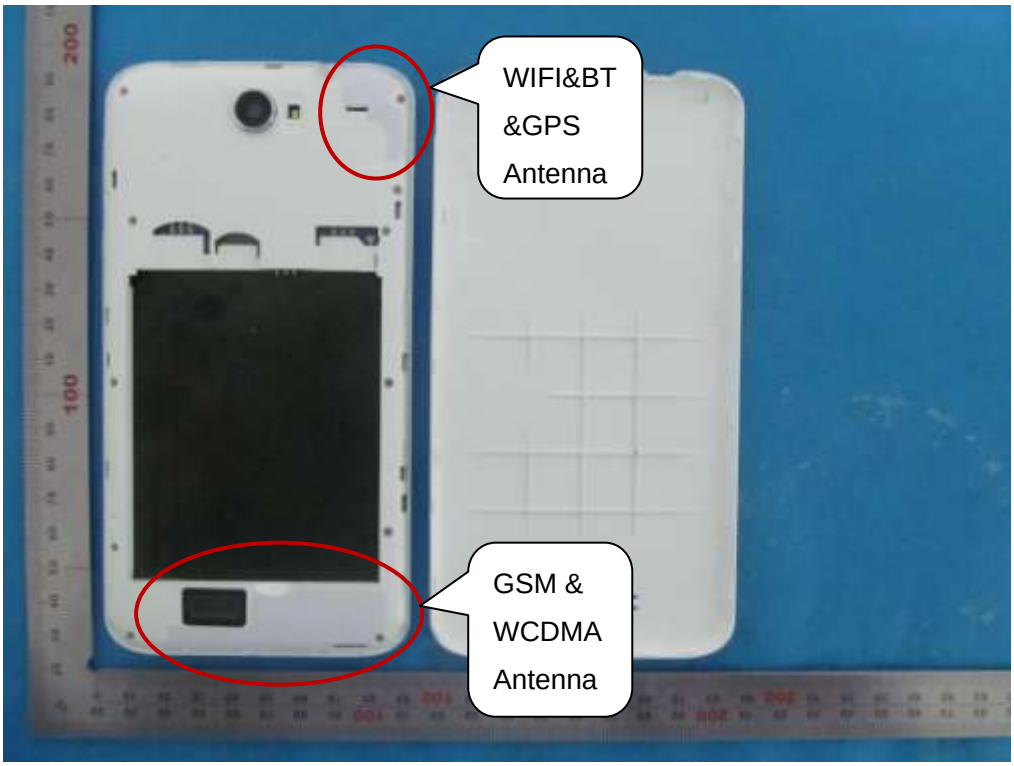
LEFT VIEW OF EUT



RIGHT VIEW OF EUT



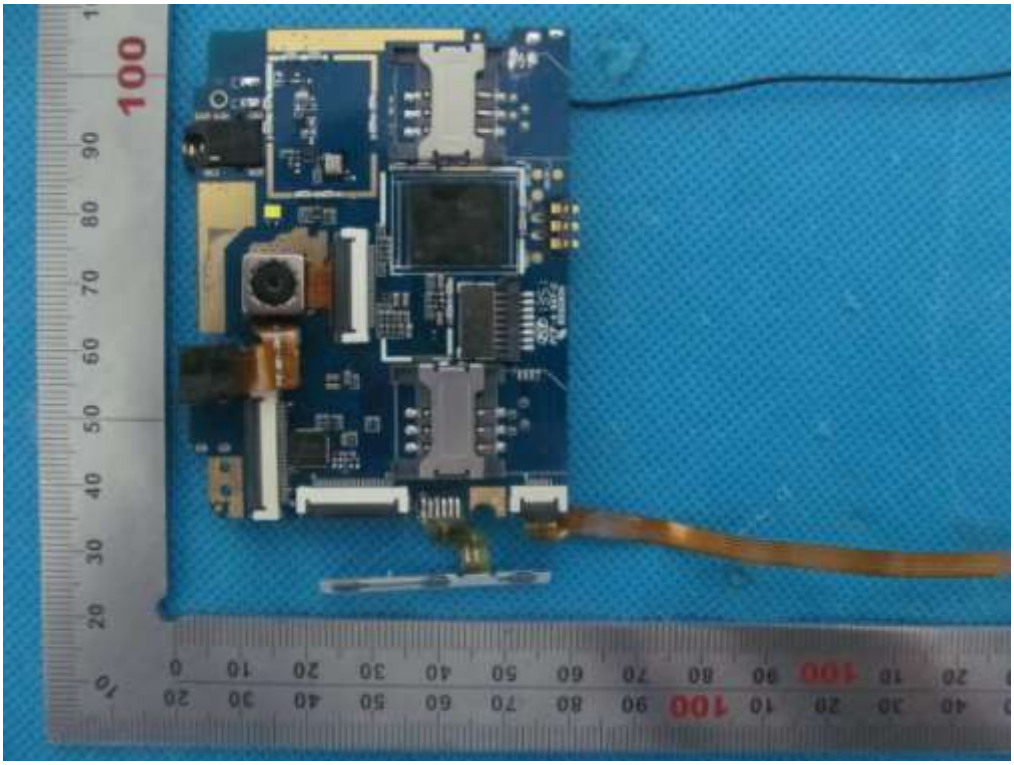
OPEN VIEW OF EUT-1



OPEN VIEW OF EUT-2

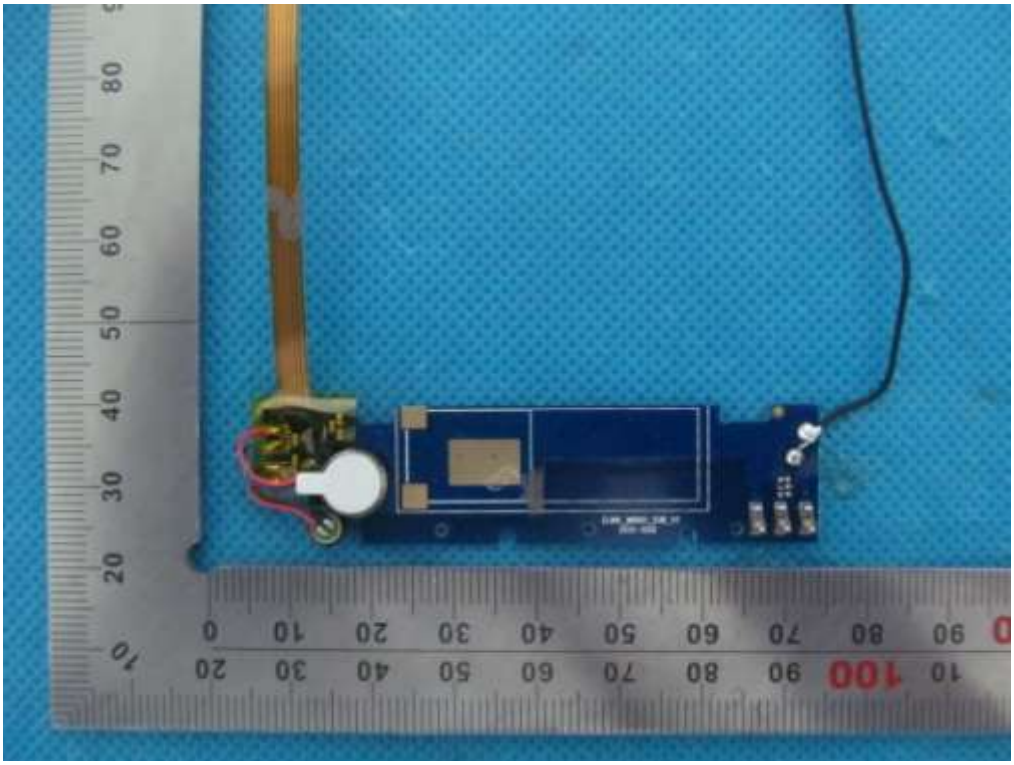
OPEN VIEW OF EUT-3

INTERNAL VIEW OF EUT-1

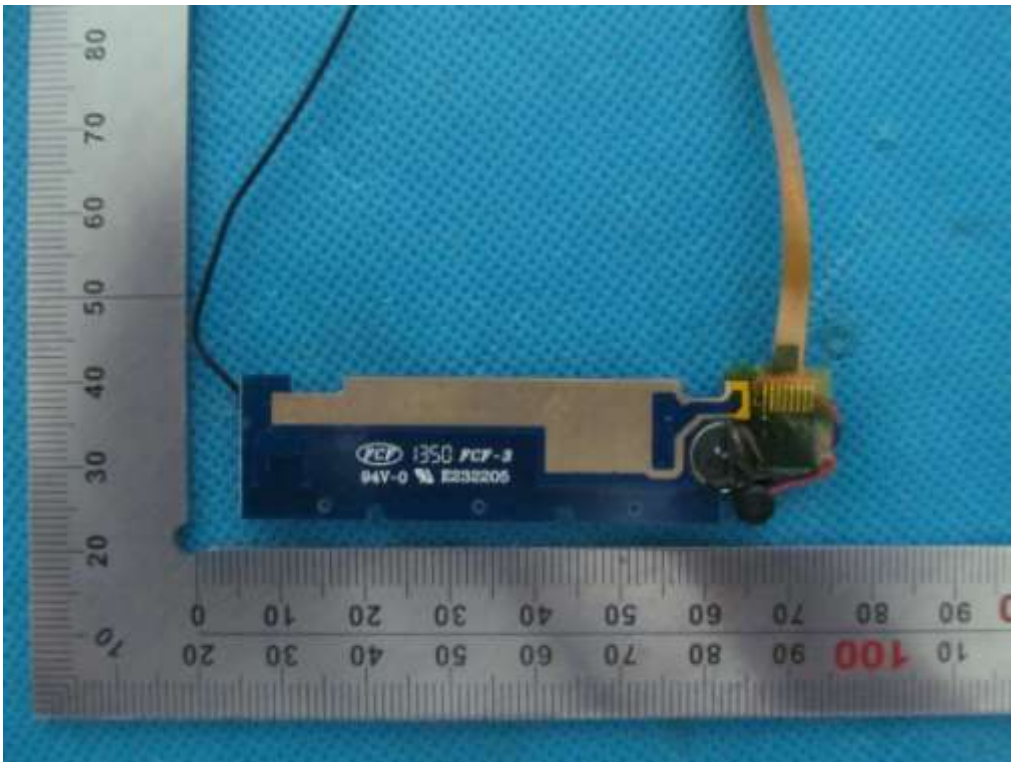


INTERNAL VIEW OF EUT-2

INTERNAL VIEW OF EUT-3



INTERNAL VIEW OF EUT-4



----END OF REPORT----