



FCC PART 15C TEST REPORT No.I21Z70567-IOT01

for

SAMSUNG Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE/5G NR Phone with Bluetooth, WLAN

SM-A226B/DSN

With

FCC ID: ZCASMA226BN1

Hardware Version: REV1.1

Software Version: A226B.001

Issued Date: 2021-12-09

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: ctl_terminals@caict.ac.cn, website: www.caict.ac.cn



REPORT HISTORY

Report Number	Revision	Description	Issue Date
I21Z70567-IOT01	Rev.0	1st edition	2021-12-09

CONTENTS

1. TEST LABORATORY	5
1.1. INTRODUCTION & ACCREDITATION	5
1.2. TESTING LOCATION	5
1.3. TESTING ENVIRONMENT.....	6
1.4. PROJECT DATE	6
1.5. SIGNATURE.....	6
2. CLIENT INFORMATION.....	7
2.1. APPLICANT INFORMATION	7
2.2. MANUFACTURER INFORMATION	7
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	8
3.1. ABOUT EUT	8
3.2. INTERNAL IDENTIFICATION OF EUT	8
3.3. INTERNAL IDENTIFICATION OF AE.....	8
3.4. GENERAL DESCRIPTION.....	10
3.5. INTERPRETATION OF THE TEST ENVIRONMENT.....	10
4. REFERENCE DOCUMENTS	10
4.1. DOCUMENTS SUPPLIED BY APPLICANT	10
4.2. REFERENCE DOCUMENTS FOR TESTING.....	10
5. TEST RESULTS	11
5.1. SUMMARY OF TEST RESULTS	11
5.2. STATEMENTS.....	11
5.3. EXPLANATION OF RE-USE OF TEST DATA	11
6. TEST FACILITIES UTILIZED	12
7. MEASUREMENT UNCERTAINTY	13
7.1. MAXIMUM OUTPUT POWER.....	13
7.2. PEAK POWER SPECTRAL DENSITY.....	13
7.3. DTS 6-DB SIGNAL BANDWIDTH.....	13
7.4. BAND EDGES COMPLIANCE.....	13
7.5. TRANSMITTER SPURIOUS EMISSION	13
7.6. AC POWER-LINE CONDUCTED EMISSION	13
ANNEX A: EUT PARAMETERS.....	13
ANNEX B: DETAILED TEST RESULTS.....	14
B.1. MEASUREMENT METHOD.....	14
B.2. MAXIMUM OUTPUT POWER.....	15



B.2.1. PEAK OUTPUT POWER-CONDUCTED 15

B.3. PEAK POWER SPECTRAL DENSITY 17

B.4. DTS 6-DB SIGNAL BANDWIDTH..... 23

B.5. BAND EDGES COMPLIANCE 29

B.6. TRANSMITTER SPURIOUS EMISSION 33

 B.6.1 TRANSMITTER SPURIOUS EMISSION – CONDUCTED..... 33

 B.6.2 TRANSMITTER SPURIOUS EMISSION - RADIATED 73

B.7. AC POWER-LINE CONDUCTED EMISSION..... 84

ANNEX C: ACCREDITATION CERTIFICATE 88



1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (ISED#: 24849). The detail accreditation scope can be found on NVLAP website.

1.2. Testing Location

Conducted test Location 1:CTTL(Huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China100191

Radiated testing Location1: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology
Development Area, Beijing, P. R. China 100176

Radiated testing Location2: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

1.3. Testing Environment

Normal Temperature: 15-35°C

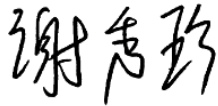
Relative Humidity: 20-75%

1.4. Project date

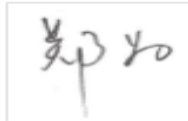
Testing Start Date: 2021-02-09

Testing End Date: 2021-12-09

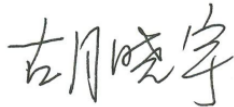
1.5. Signature



Xie Xiuzhen
(Prepared this test report)



Zheng Wei
(Reviewed this test report)



Hu Xiaoyu
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: SAMSUNG Electronics Co., Ltd.
Address: Samsung R5, Maetan dong 129, Samsung ro
Youngtong gu, Suwon city 443 742, Korea
Contact: Kobe Cho
Email: ggobi.cho@samsung.com
Telephone: +82 - 10 - 2722 - 4159
Fax: /

2.2. Manufacturer Information

Company Name: SAMSUNG Electronics Co., Ltd.
Address: Samsung R5, Maetan dong 129, Samsung ro
Youngtong gu, Suwon city 443 742, Korea
Contact: Kobe Cho
Email: ggobi.cho@samsung.com
Telephone: +82 - 10 - 2722 – 4159
Fax: /

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE/5G NR Phone with Bluetooth,WLAN
Model name	SM-A226B/DSN
FCC ID	ZCASMA226BN1
With WLAN Function	Yes
Frequency Band	ISM 2400MHz~2483.5MHz
Type of Modulation	DSSS/CCK/OFDM
Number of Channels	11
Antenna Gain	-2.035dBi
MAX Conducted Power	25.98dBm
Power Supply	3.85V

3.2. Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
UT26a	/	REV1.1	A226B.001
UT33a	/	REV1.1	A226B.001
UT16a	/	REV1.1	A226B.001

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE

AE ID*	Description
AE1	Charger1
AE2	Charger2
AE3	Charger3
AE4	USB cable1
AE5	USB cable1
AE6	USB cable1
AE7	USB cable1
AE8	battery

AE1

Model	EP-TA200
Manufacturer	RFTECH
Length of cable	/



AE2

Model	EP-TA200
Manufacturer	Dongwon
Length of cable	/

AE3

Model	EP-TA200
Manufacturer	SOLUM
Length of cable	/

AE4

Model	EP-DR140AWE
Manufacturer	RFTECH Co., Ltd.
Length of cable	/

AE5

Model	EP-DR140AWE
Manufacturer	Ningbo Broad Telecommunication Co., Ltd
Length of cable	/

AE6

Model	EP-DR140AWE
Manufacturer	DONGGUAN KSD CO.,LTD
Length of cable	/

AE7

Model	EP-DR140AWE
Manufacturer	CRESYN HANOI Co.,Ltd
Length of cable	/

AE8

Model	SCUD-WT-W1
Manufacturer	SCUD(Fujian)Electronic Co.,Ltd.
Capacitance	4900mAh
Nominal voltage	3.85V

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

The Equipment under Test (EUT) is a model of Multi-band GSM/WCDMA/LTE/5G NR Phone with Bluetooth, WLAN with integrated antenna and inbuilt battery.

It has Bluetooth (EDR) function.

It consists of normal options: travel charger, USB cable.

Manual and specifications of the EUT were provided to fulfil the test.

Samples undergoing test were selected by the client.

3.5. Interpretation of the Test Environment

For the test methods, the test environment uncertainty figures correspond to an expansion factor $k=2$.

Measurement Uncertainty

Parameter	Uncertainty
temperature	0.48°C
humidity	2 %
DC voltages	0.003V

4. Reference Documents

4.1. Documents supplied by applicant

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part15	FCC CFR 47, Part 15, Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5 MHz, and 5725-5850 MHz.	2018
ANSI C63.10	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON	2013
KDB 558074 D01	DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

5. Test Results

5.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.247 (b)	/	BR
Peak Power Spectral Density	15.247 (e)	/	BR
Occupied 6dB Bandwidth	15.247 (a)	/	BR
Band Edges Compliance	15.247 (d)	/	BR
Transmitter Spurious Emission - Conducted	15.247 (d)	/	BR
Transmitter Spurious Emission - Radiated	15.247, 15.205, 15.209	/	BR
AC Powerline Conducted Emission	15.107, 15.207	/	BR

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NP	Not Perform, The test was not performed by CTTL
BR	Re-use test data from basic model report.
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

5.2. Statements

The test cases as listed in section 5.1 of this report for the EUT specified in section 3 was performed by CTTL and according to the standards or reference documents listed in section 4.2

The EUT met all requirements of the standards or reference documents, and only the WLAN function was tested in this report.

5.3. Explanation of re-use of test data

The Equipment Under Test (EUT) model SM-A226B/DSN (FCC ID: ZCASMA226BN1) is a variant product of SM-A226B/DSN (FCC ID: ZCASMA226BN), according to the declaration of changes provided by the applicant and FCC KDB publication 484596 D01, spot check measurements (output power and radiated spurious emission) were performed on this device, all the other test results are derived from test report No.I21Z70103-IOT10.

For detail differences between two models please refer the Declaration of Changes document.

For this report, if the test cases listed above are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	T nom	26°C
Voltage	V nom	3.85V(By battery)
Humidity	H nom	20-75%

6. Test Facilities Utilized

Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2022-05-24
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2021-05-19
3	Test Receiver	ESCI 3	100344	Rohde & Schwarz	1 year	2022-02-23
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100376	R&S	1 year	2021-09-04
2	BiLog Antenna	VULB9163	9163-482	Schwarzbeck	1 year	2021-11-04
3	Dual-Ridge Waveguide Horn Antenna	3117	00139065	ETS-Lindgren	1 year	2021-10-11
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2021-08-05

7. Measurement Uncertainty

7.1. Maximum Output Power

Measurement Uncertainty: 0.387dB,k=1.96

7.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

7.3. DTS 6-dB Signal Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

7.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

7.5. Transmitter Spurious Emission

Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

7.6. AC Power-line Conducted Emission

Measurement Uncertainty : 3.08dB,k=2

ANNEX A: EUT parameters

Disclaimer: the antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

ANNEX B: Detailed Test Results

B.1. Measurement Method

B.1.1. Conducted Measurements

Connect the EUT to the test system as Fig.A.1.1.1 shows.

Set the EUT to the required work mode.

Set the EUT to the required channel.

Set the Vector Signal Analyzer and start measurement.

Record the values. Vector Signal Analyzer

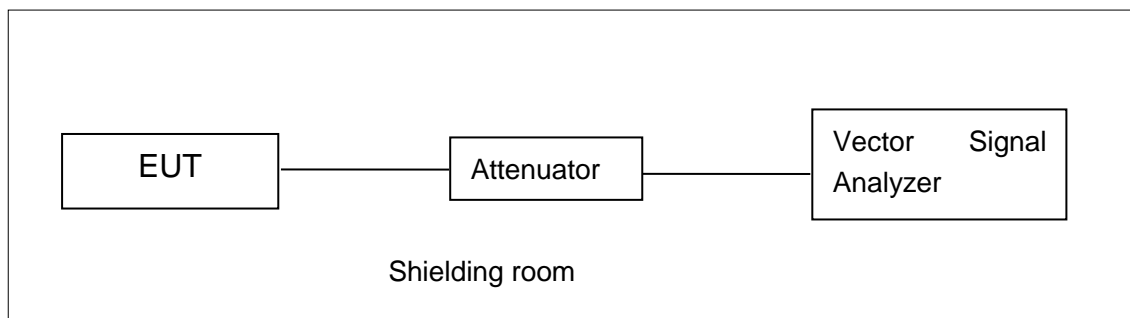


Fig.B.1.1.1: Test Setup Diagram for Conducted Measurements

B.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;

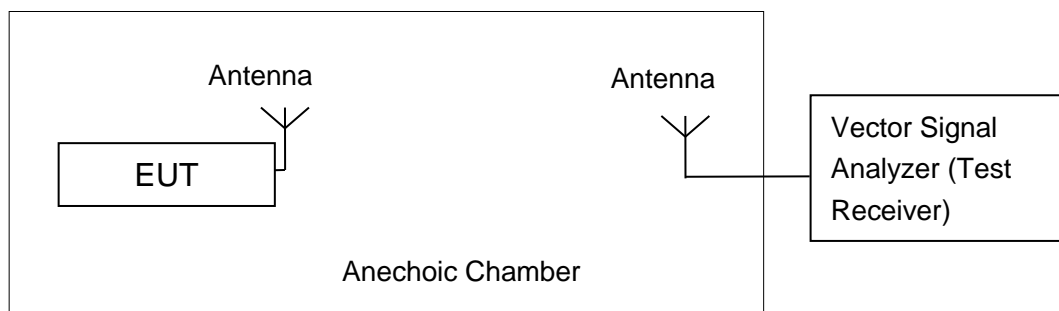


Fig.B.1.2.1: Test Setup Diagram for Radiated Measurements

B.2. Maximum Output Power

Method of Measurement: See ANSI C63.10-2013-clause 11.9.1.2

- a) Set the RBW = 1 MHz.
- b) Set the VBW = 3 MHz.
- c) Set the span $\geq [1.5 \times \text{DTS bandwidth}]$.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector).

Measurement Limit:

Standard	Limit (dBm)
FCC CRF Part 15.247(b)	< 30

EUT ID: UT16a

B.2.1. Peak Output Power-conducted

Measurement Results:

802.11b/g mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11b	1	21.01	/	/
	2	21.27	/	/
	5.5	22.83	/	/
	11	24.78	25.09	24.82
802.11g	6	25.23	/	/
	9	25.24	25.98	25.50
	12	25.08	/	/
	18	24.57	/	/
	24	24.35	/	/
	36	23.93	/	/
	48	23.81	/	/
	54	23.47	/	/

The data rate 11Mbps and 9Mbps are selected as worse condition, and the following cases are performed with this condition.

802.11n-HT20 mode

Mode	Data Rate (Index)	Test Result (dBm)		
		2412MHz (Ch1)	2437MHz (Ch6)	2462 MHz (Ch11)
802.11n (20MHz)	MCS0	25.32	25.37	24.01
	MCS1	25.04	/	/
	MCS2	24.63	/	/
	MCS3	24.31	/	/
	MCS4	23.92	/	/
	MCS5	23.77	/	/
	MCS6	23.63	/	/
	MCS7	23.15	/	/

The data rate MCS0 is selected as worse condition, and the following cases are performed with this condition.

The duty cycle of all mode are 100%.

The spot check result of average output power is 18.35dBm (802.11b 1Mbps ch11 prototype result: 18.98dBm).

Conclusion: Pass

B.3. Peak Power Spectral Density

Method of Measurement: See ANSI C63.10-2013-clause 11.10.2

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to RBW = 3 kHz.
- d) Set the VBW = 10 kHz.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.

Measurement Limit:

Standard	Limit
FCC CRF Part 15.247(e)	< 8 dBm/3 kHz

Measurement Results:

802.11b/g mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
		Fig.	Value	
802.11b	1	Fig.B.3.1	-4.88	P
	6	Fig.B.3.2	-5.07	P
	11	Fig.B.3.3	-5.01	P
802.11g	1	Fig.B.3.4	-7.45	P
	6	Fig.B.3.5	-7.62	P
	11	Fig.B.3.6	-7.72	P

802.11n-HT20 mode

Mode	Channel	Power Spectral Density (dBm/3 kHz)		Conclusion
		Fig.	Value	
802.11n (HT20)	1	Fig.B.3.7	-8.44	P
	6	Fig.B.3.8	-8.81	P
	11	Fig.B.3.9	-9.41	P

Conclusion: Pass

Test graphs as below:

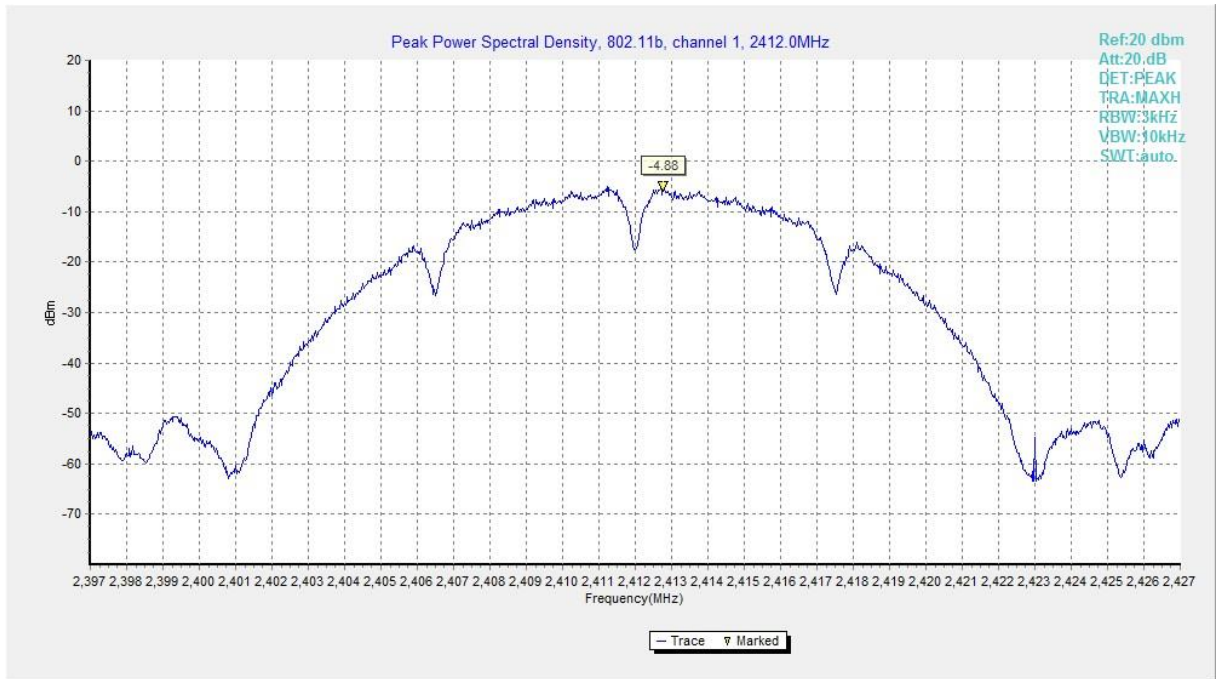


Fig.B.3.1 Power Spectral Density(802.11b,Ch1)



Fig.B.3.2 Power Spectral Density (802.11b, Ch 6)

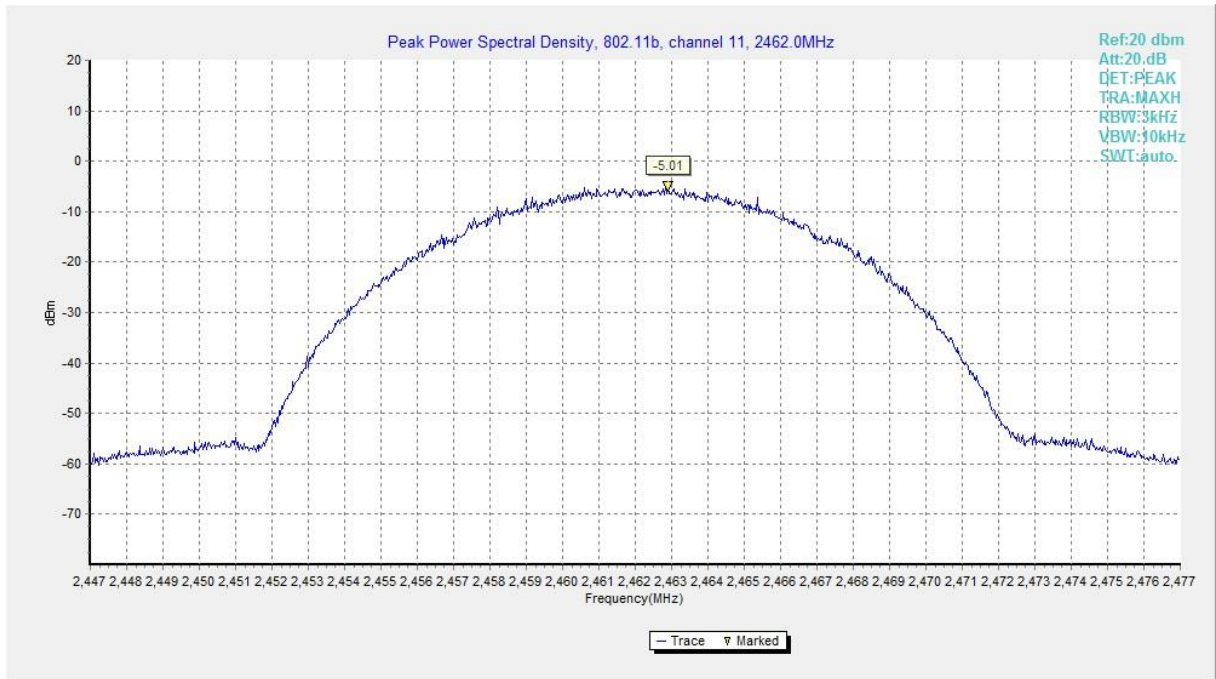


Fig.B.3.3 Power Spectral Density (802.11b, Ch 11)

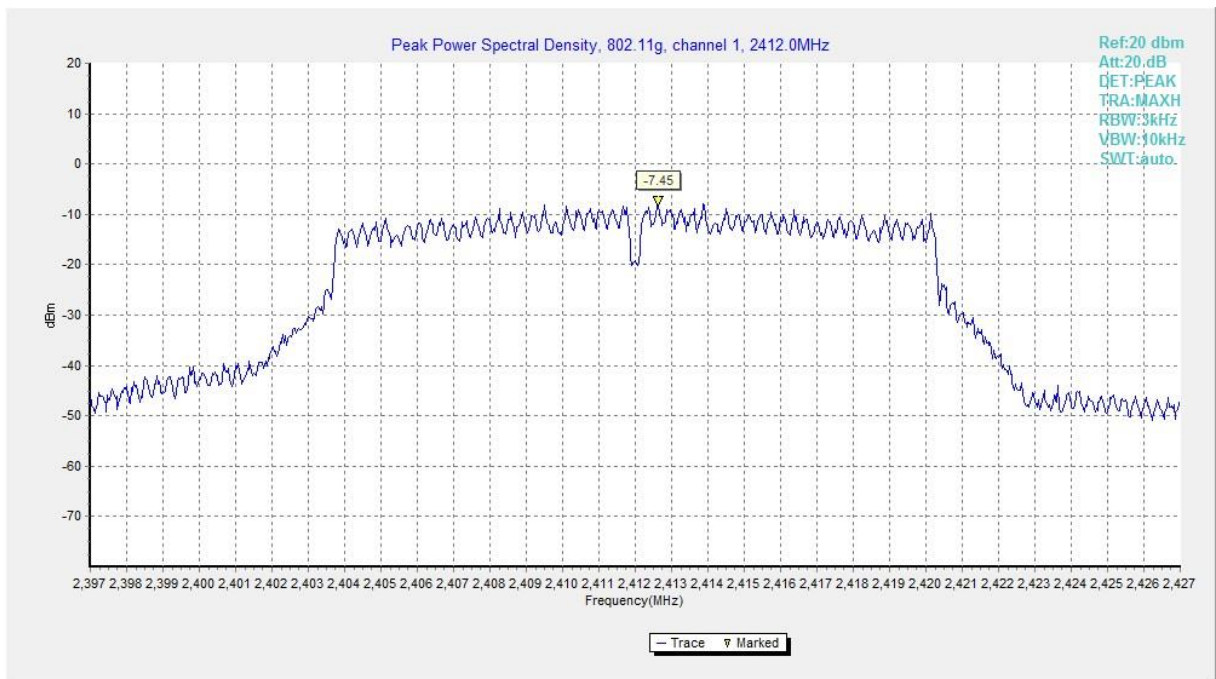


Fig.B.3.4 Power Spectral Density (802.11g, Ch 1)

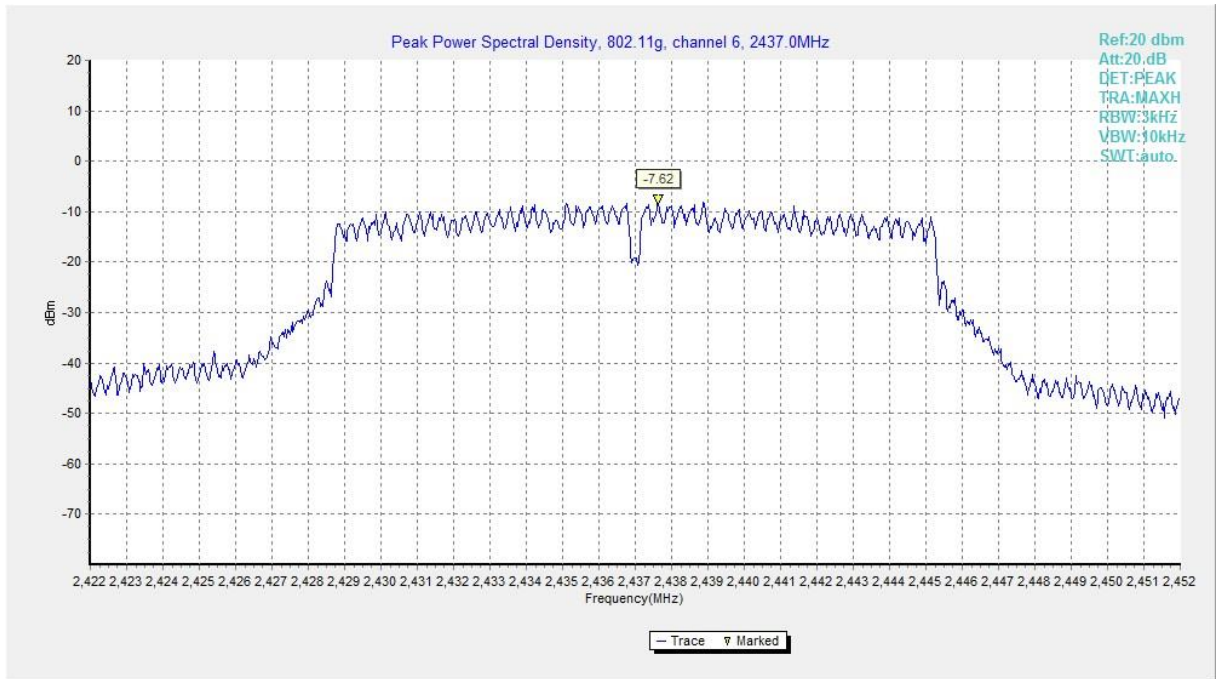


Fig.B.3.5 Power Spectral Density (802.11g, Ch 6)

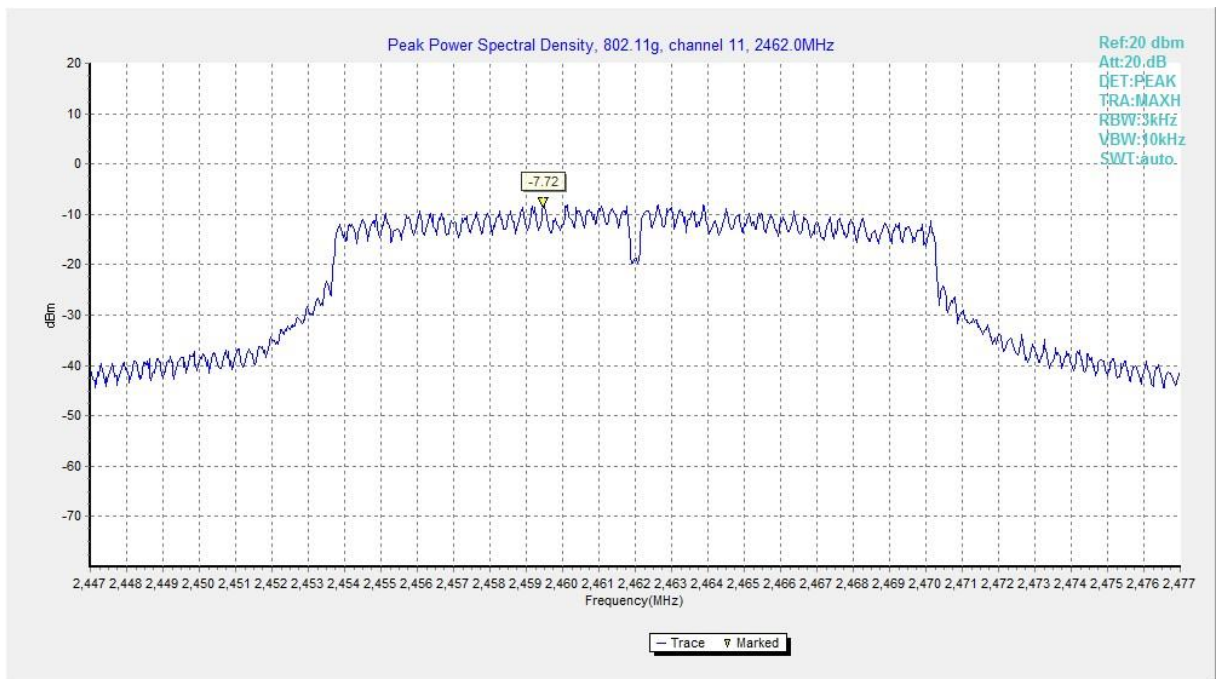


Fig.B.3.6 Power Spectral Density (802.11g, Ch 11)

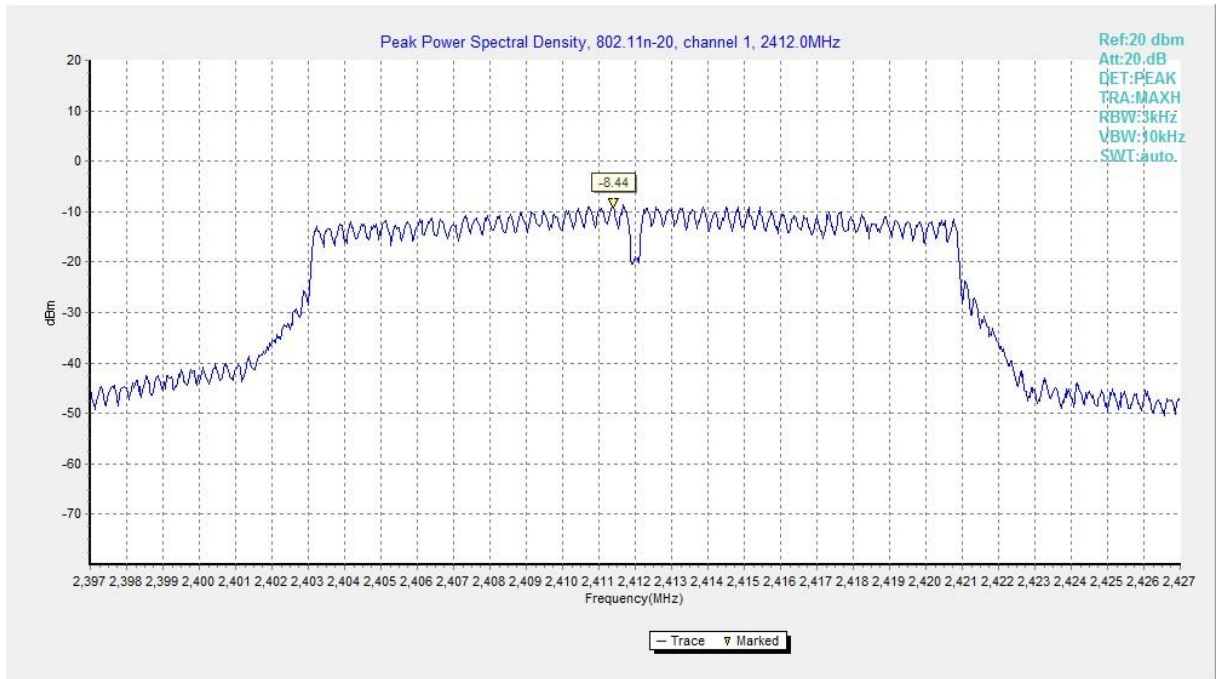


Fig.B.3.7 Power Spectral Density (802.11n-HT20, Ch 1)

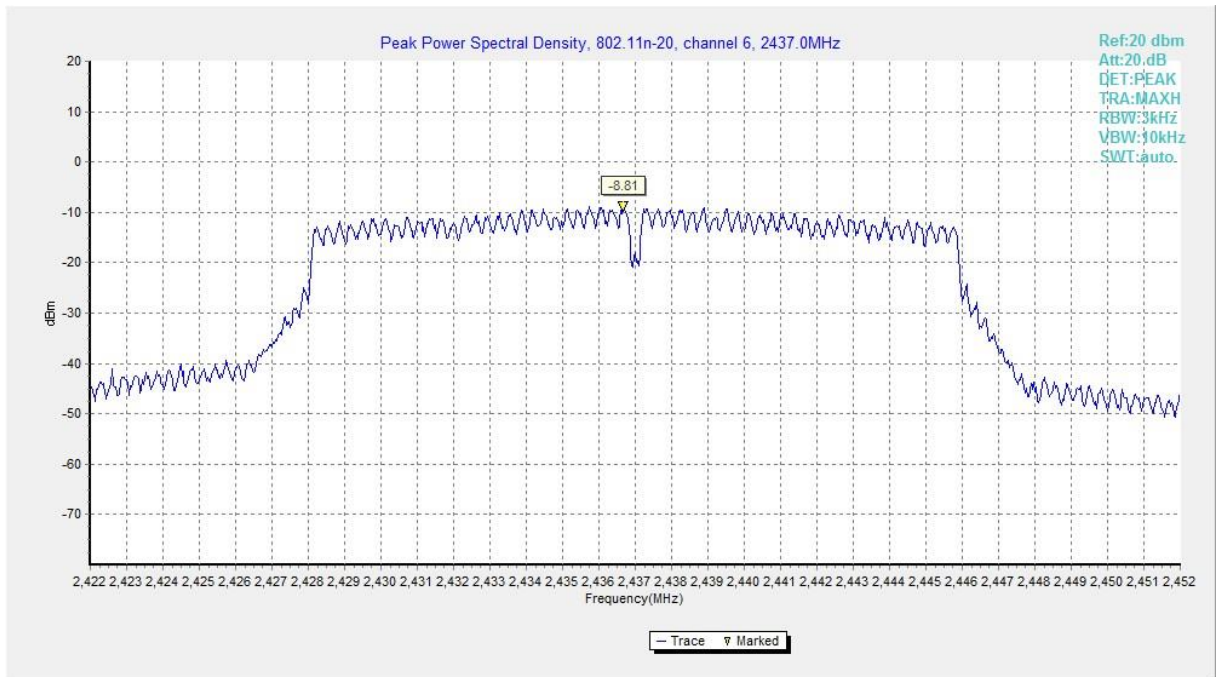


Fig.B.3.8 Power Spectral Density (802.11n-HT20, Ch 6)

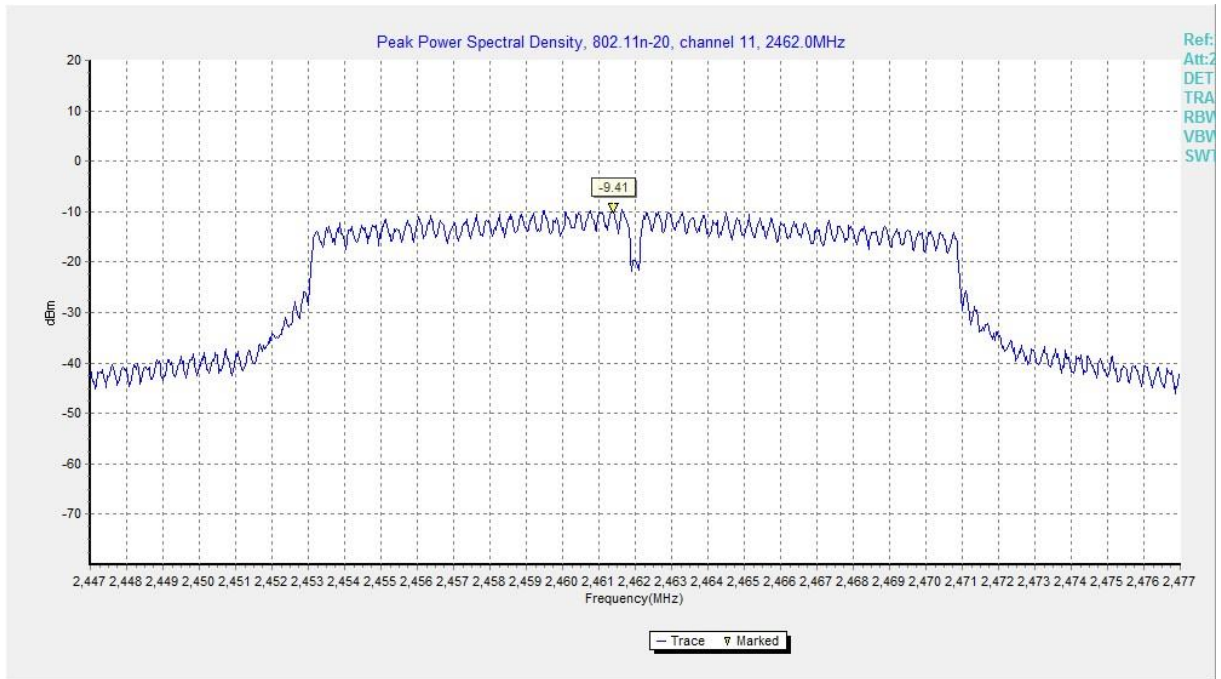


Fig.B.3.9 Power Spectral Density (802.11n-HT20, Ch 11)

B.4. DTS 6-dB Signal Bandwidth

Method of Measurement: See ANSI C63.10-2013 section 11.8.1.

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) = 300 kHz.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) 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.

Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.247 (a)	≥ 500

EUT ID: UT16a

Measurement Result:

802.11b/g mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11b	1	Fig.B.4.1	8.55	P
	6	Fig.B.4.2	7.80	P
	11	Fig.B.4.3	8.05	P
802.11g	1	Fig.B.4.4	16.35	P
	6	Fig.B.4.5	16.35	P
	11	Fig.B.4.6	16.40	P

802.11n-HT20 mode

Mode	Channel	Occupied 6dB Bandwidth (MHz)		conclusion
802.11n (HT20)	1	Fig.B.4.7	17.70	P
	6	Fig.B.4.8	17.65	P
	11	Fig.B.4.9	17.60	P

Conclusion: Pass

Test graphs as below:



Fig.B.4.1 Occupied 6dB Bandwidth(802.11b,Ch 1)

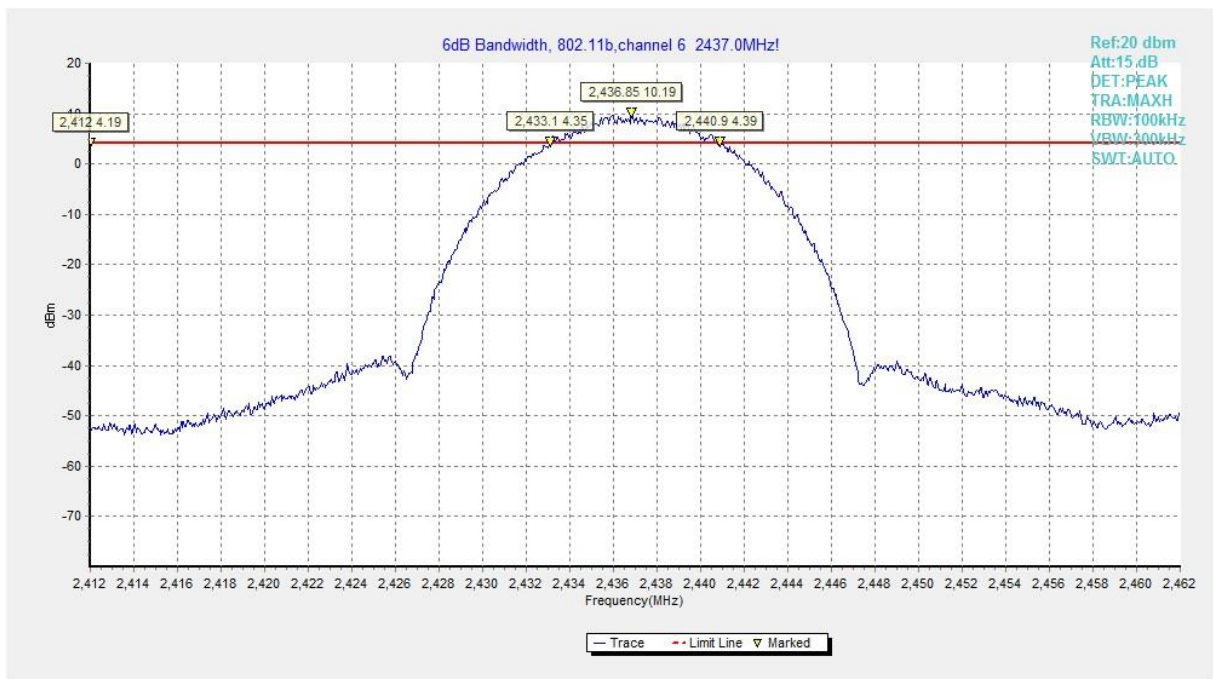


Fig.B.4.2 Occupied 6dB Bandwidth (802.11b, Ch 6)



Fig.B.4.3 Occupied 6dB Bandwidth (802.11b, Ch 11)

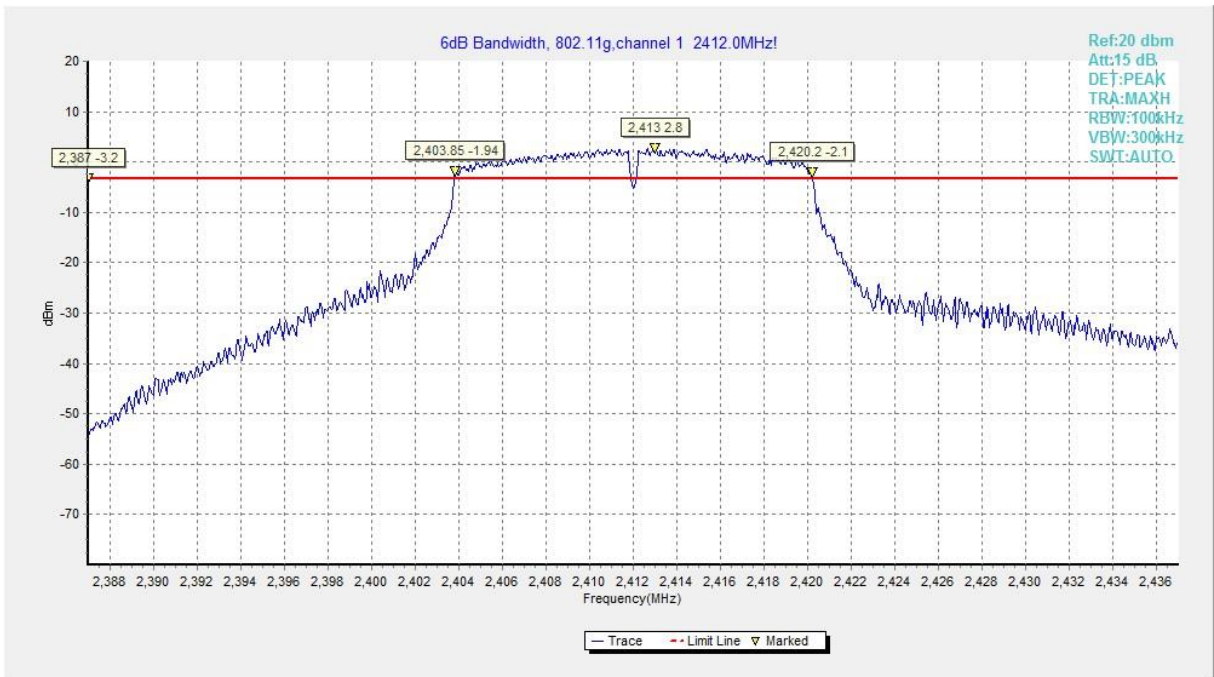


Fig.B.4.4 Occupied 6dB Bandwidth (802.11g, Ch 1)

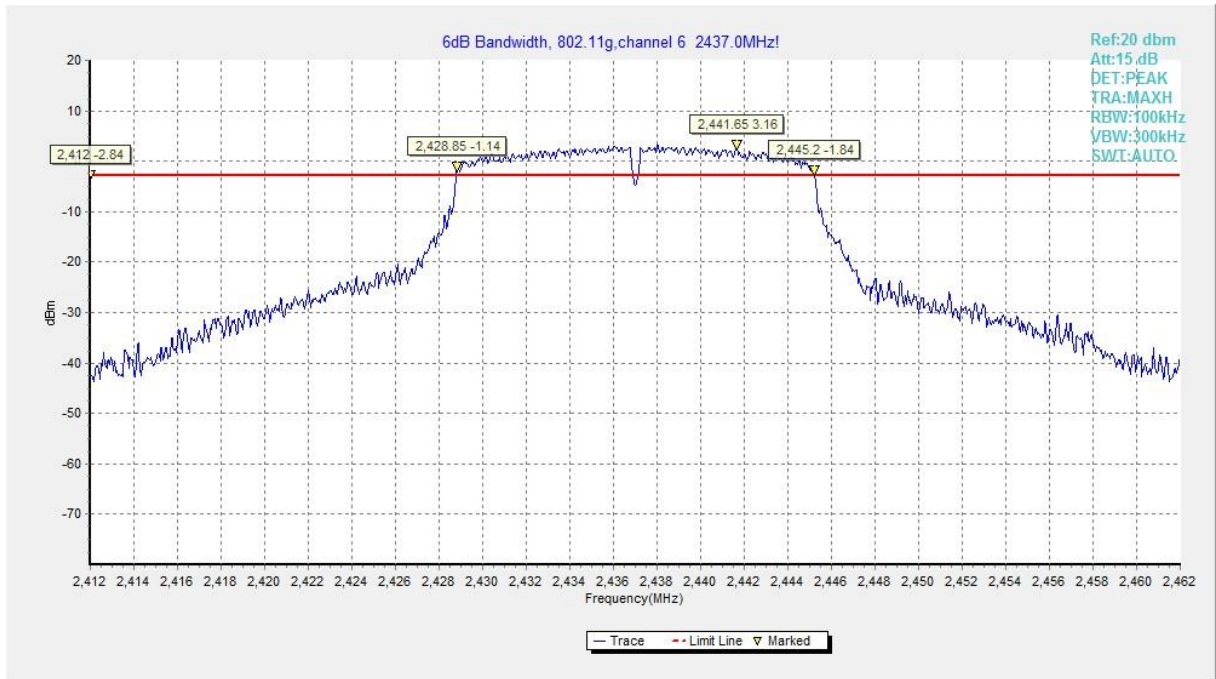


Fig.B.4.5 Occupied 6dB Bandwidth (802.11g, Ch 6)

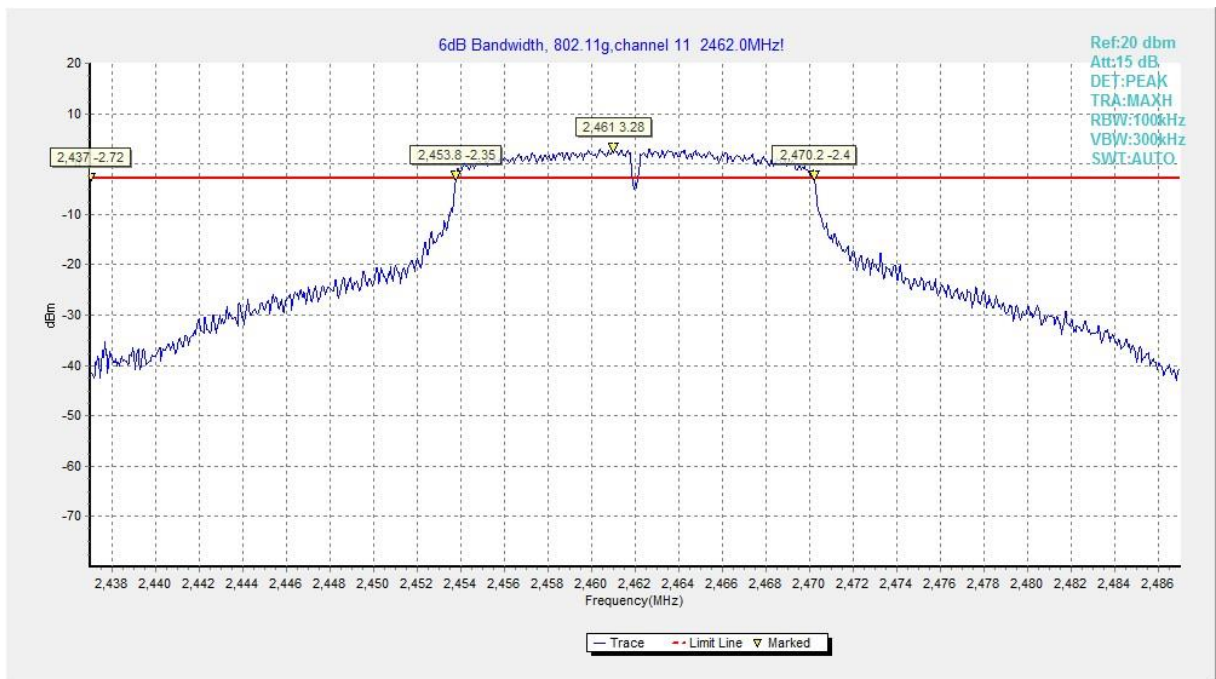


Fig.B.4.6 Occupied 6dB Bandwidth (802.11g, Ch 11)

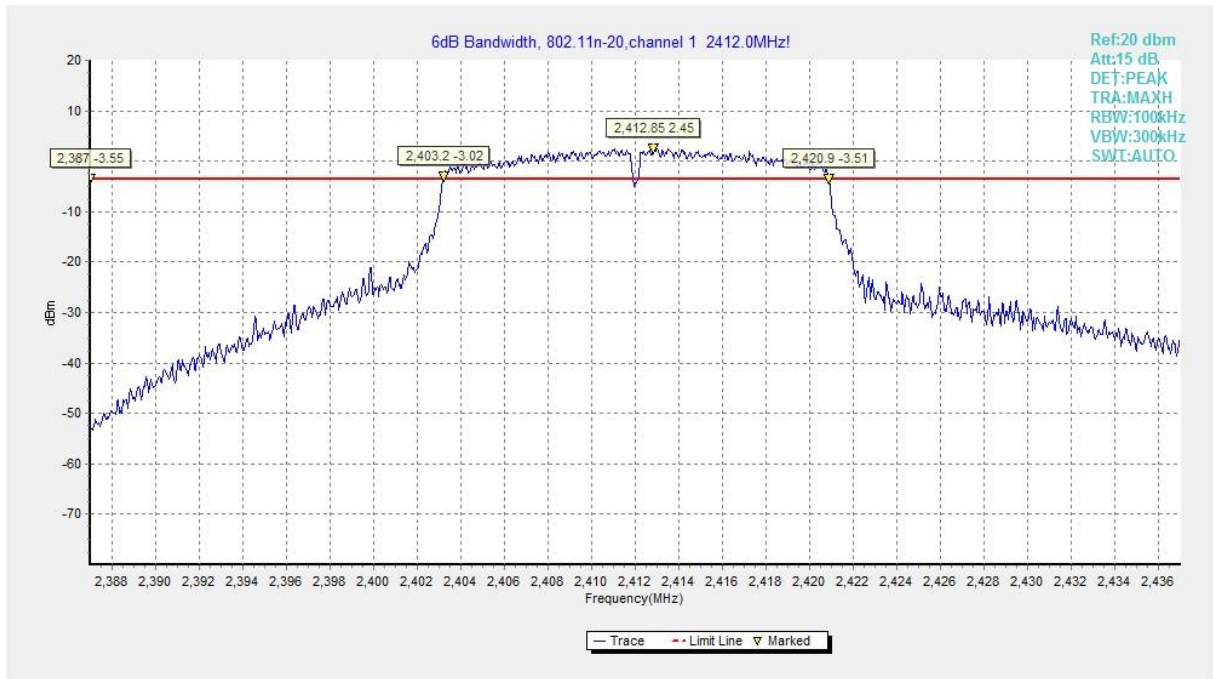


Fig.B.4.7 Occupied 6dB Bandwidth (802.11n-20MHz, Ch 1)

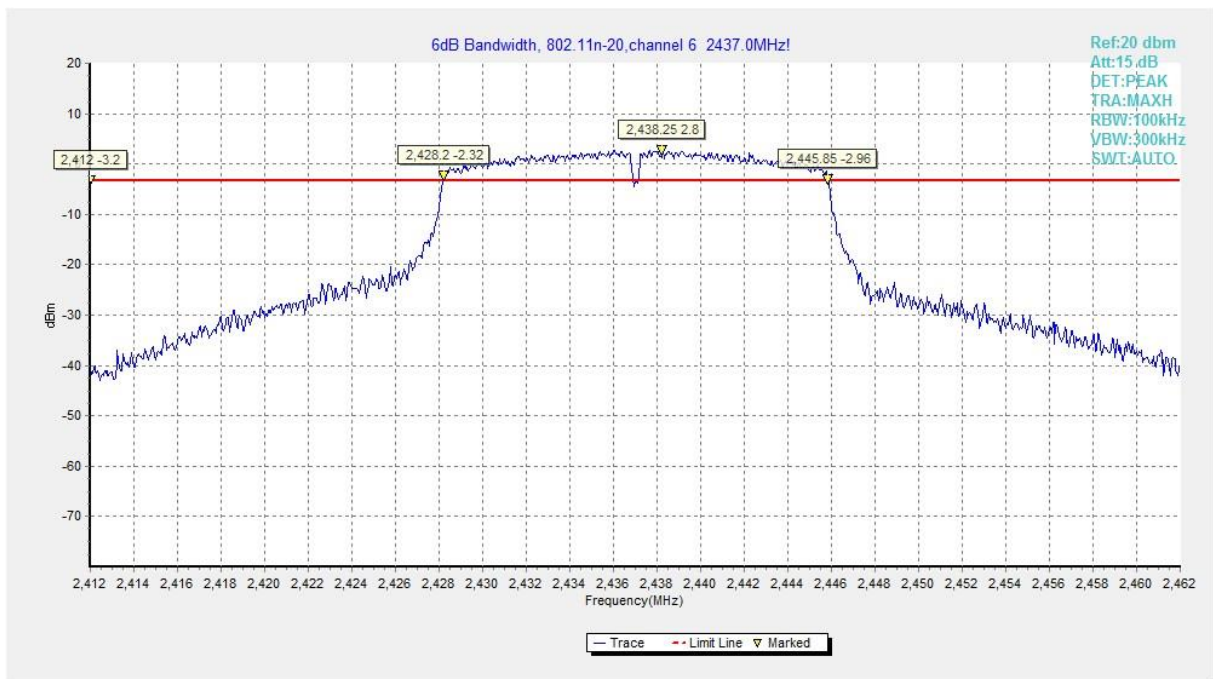


Fig.B.4.8 Occupied 6dB Bandwidth (802.11n-HT20, Ch 6)

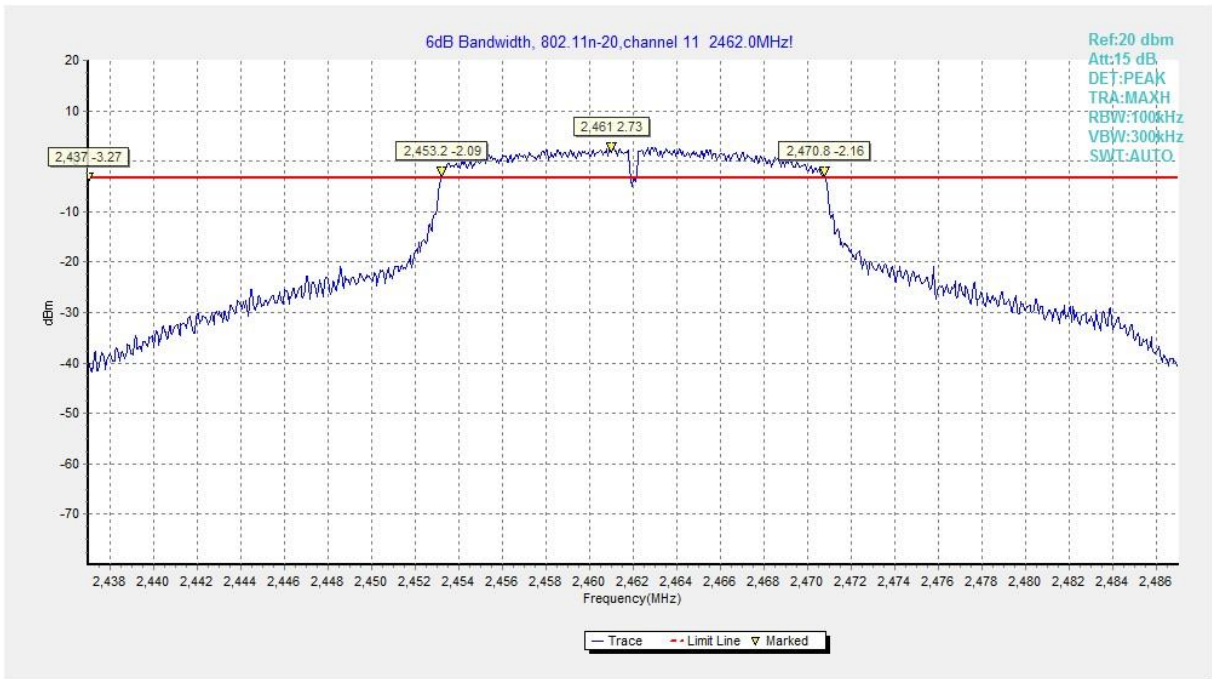


Fig.B.4.9 Occupied 6dB Bandwidth (802.11n-HT20, Ch 11)

B.5. Band Edges Compliance

Method of Measurement: See ANSI C63.10-2013-clause 6.10.4

Connect the spectrum analyzer to the EUT using an appropriate RF cable connected to the EUT output. Configure the spectrum analyzer settings as described below.

- a) Set Span = 100MHz
- b) Sweep Time: coupled
- c) Set the RBW= 100 kHz
- c) Set the VBW= 300 kHz
- d) Detector: Peak
- e) Trace: Max hold

Measurement Limit:

Standard	Limit (dBc)
FCC 47 CFR Part 15.247 (d)	> 20

EUT ID: UT16a

Measurement Result:

802.11b/g mode

Mode	Channel	Test Results	Conclusion
802.11b	1	Fig.B.5.1	P
	11	Fig.B.5.2	P
802.11g	1	Fig.B.5.3	P
	11	Fig.B.5.4	P

802.11n-HT20 mode

Mode	Channel	Test Results	Conclusion
802.11n (HT20)	1	Fig.B.5.5	P
	11	Fig.B.5.6	P

Conclusion: Pass

Test graphs as below:

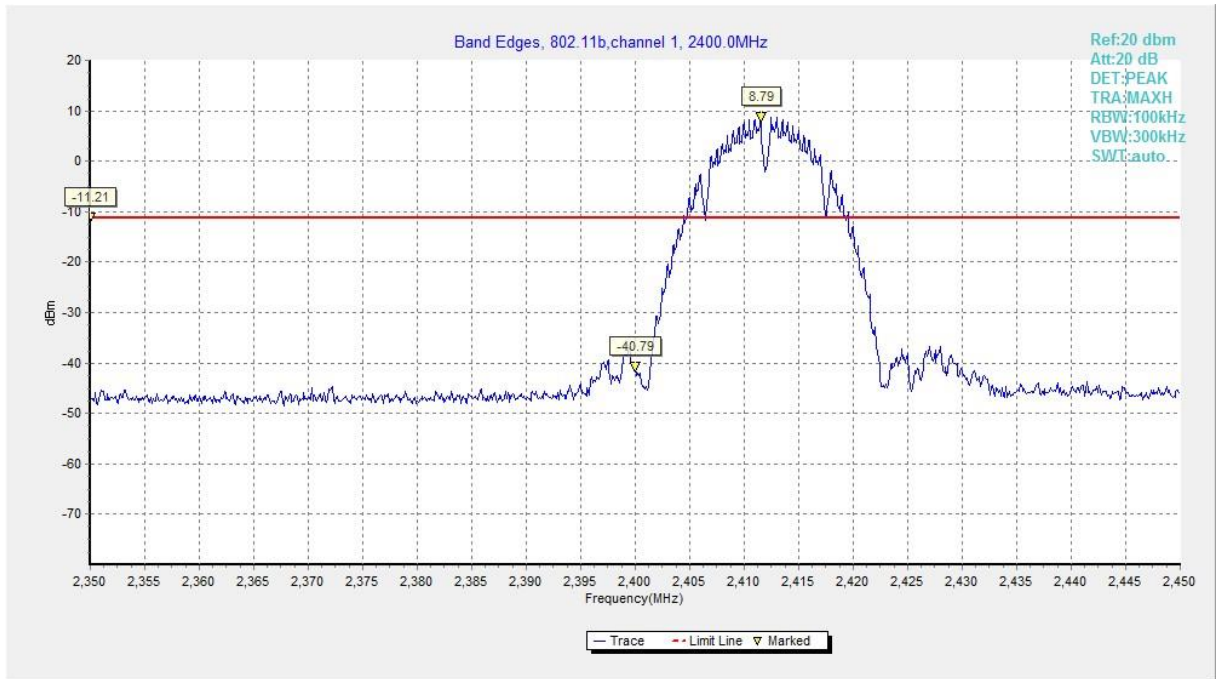


Fig.B.5.1 Band Edges (802.11b, Ch 1)

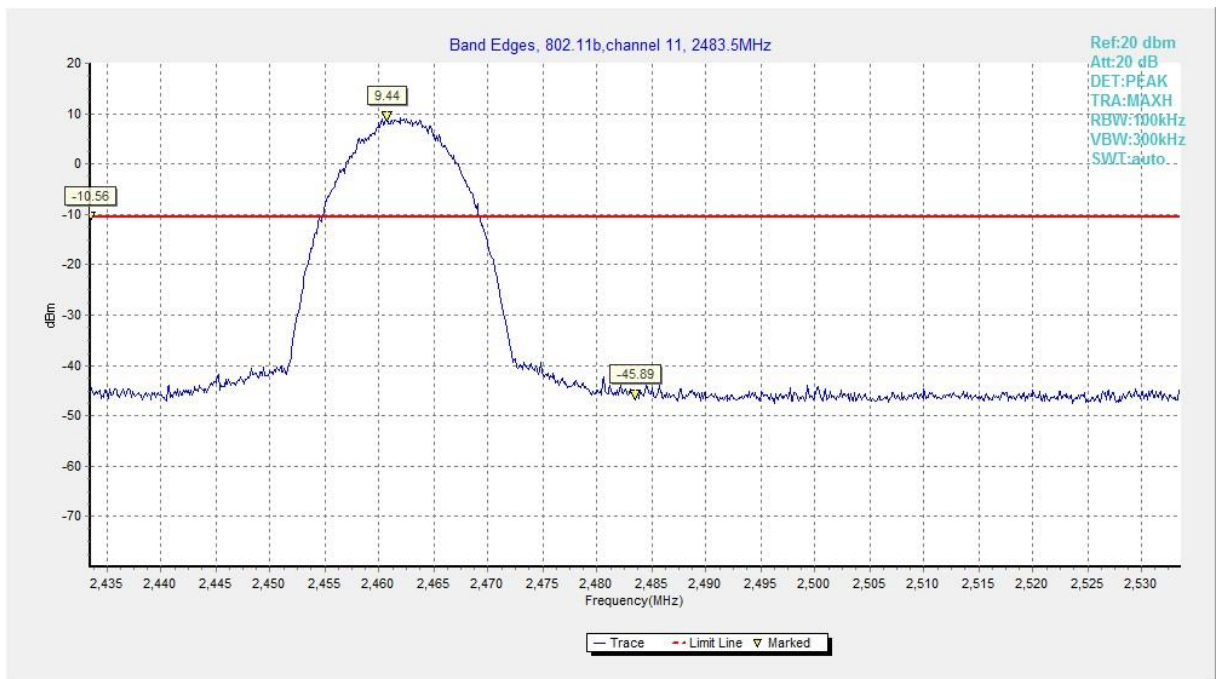


Fig.B.5.2 Band Edges (802.11b, Ch 11)

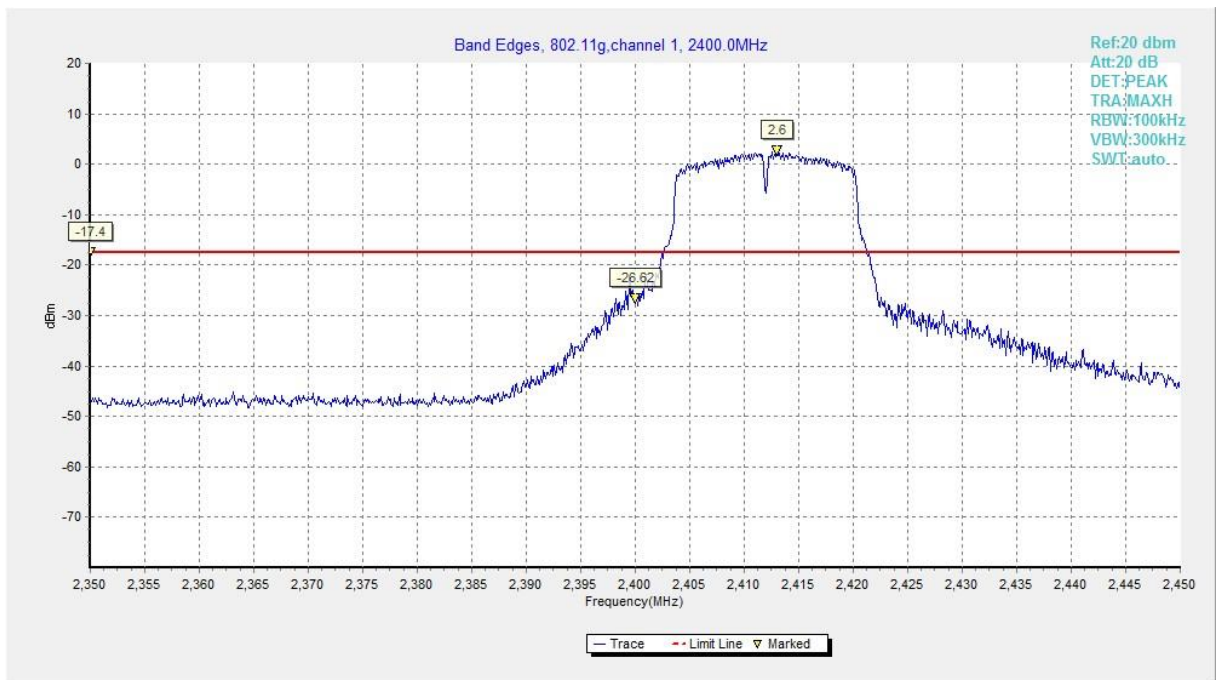


Fig.B.5.3 Band Edges (802.11g, Ch 1)

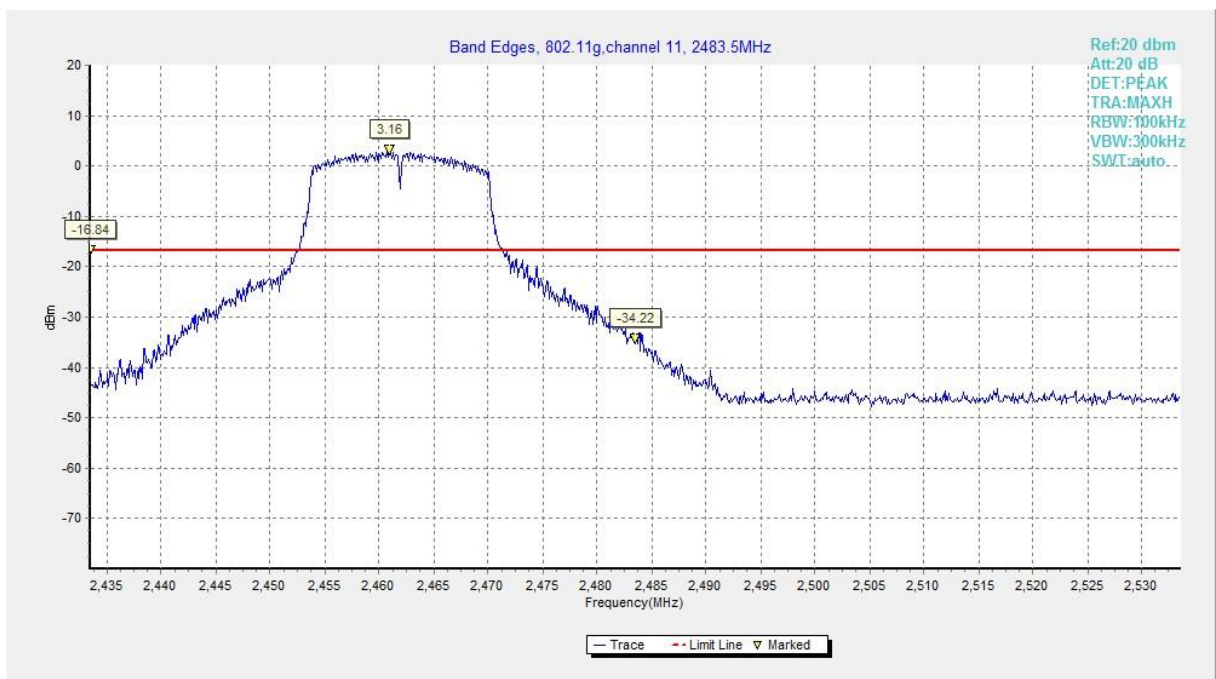


Fig.B.5.4 Band Edges (802.11g, Ch 11)

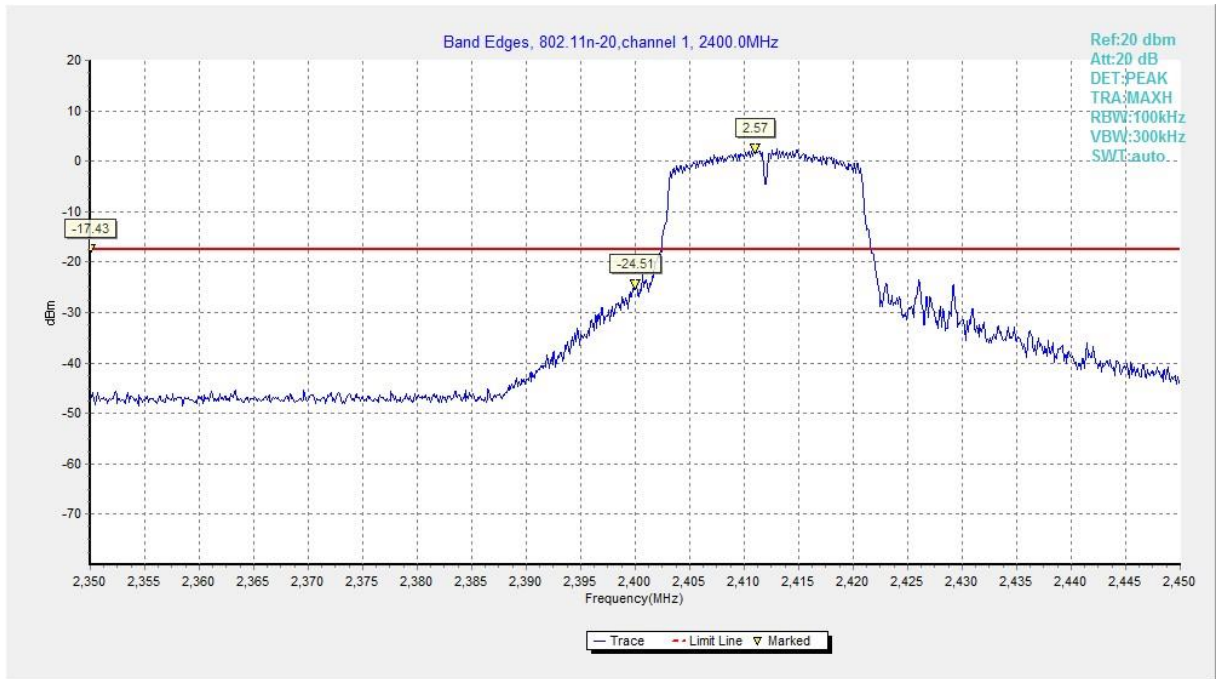


Fig.B.5.5 Band Edges (802.11n-HT20, Ch 1)



Fig.B.5.6 Band Edges (802.11n-HT20, Ch 11)

B.6. Transmitter Spurious Emission

B.6.1 Transmitter Spurious Emission – Conducted

Method of Measurement: See ANSI C63.10-2013-clause 11.11

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency
- b) Set the span to ≥ 1.5 times the DTS bandwidth
- c) Set the RBW= 100 kHz
- d) Set the VBW= 300 kHz
- e) Detector = Peak
- f) Sweep time = auto couple
- g) Trace mode = max hold
- h) Allow trace to fully stabilize
- i) Use the peak marker function to determine the maximum PSD level

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Establish an emission level by using the following procedure:

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW = 300 kHz.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11. Report the three highest emissions relative to the limit.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247 (d)	20dB below peak output power in 100 kHz bandwidth

EUT ID: UT16a

Measurement Results:

802.11b mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11b	1	2.412 GHz	Fig.B.6.1.1	P
		30 MHz ~ 1 GHz	Fig.B.6.1.2	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.3	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.4	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.5	P
		10 GHz ~ 15 GHz	Fig.B.6.1.6	P
		15 GHz ~ 20 GHz	Fig.B.6.1.7	P
		20 GHz ~ 26 GHz	Fig.B.6.1.8	P
	6	2.437 GHz	Fig.B.6.1.9	P
		30 MHz ~ 1 GHz	Fig.B.6.1.10	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.11	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.12	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.13	P
		10 GHz ~ 15 GHz	Fig.B.6.1.14	P
		15 GHz ~ 20 GHz	Fig.B.6.1.15	P
		20 GHz ~ 26 GHz	Fig.B.6.1.16	P
	11	2.462 GHz	Fig.B.6.1.17	P
		30 MHz ~ 1 GHz	Fig.B.6.1.18	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.19	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.20	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.21	P
		10 GHz ~ 15 GHz	Fig.B.6.1.22	P
		15 GHz ~ 20 GHz	Fig.B.6.1.23	P
		20 GHz ~ 26 GHz	Fig.B.6.1.24	P

802.11g mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11g	1	2.412 GHz	Fig.B.6.1.25	P
		30 MHz ~ 1 GHz	Fig.B.6.1.26	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.27	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.28	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.29	P
		10 GHz ~ 15 GHz	Fig.B.6.1.30	P
		15 GHz ~ 20 GHz	Fig.B.6.1.31	P
		20 GHz ~ 26 GHz	Fig.B.6.1.32	P
	6	2.437 GHz	Fig.B.6.1.33	P
		30 MHz ~ 1 GHz	Fig.B.6.1.34	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.35	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.36	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.37	P
		10 GHz ~ 15 GHz	Fig.B.6.1.38	P
		15 GHz ~ 20 GHz	Fig.B.6.1.39	P
		20 GHz ~ 26 GHz	Fig.B.6.1.40	P
	11	2.462 GHz	Fig.B.6.1.41	P
		30 MHz ~ 1 GHz	Fig.B.6.1.42	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.43	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.44	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.45	P
		10 GHz ~ 15 GHz	Fig.B.6.1.46	P
		15 GHz ~ 20 GHz	Fig.B.6.1.47	P
		20 GHz ~ 26 GHz	Fig.B.6.1.48	P

802.11n-HT20 mode

MODE	Channel	Frequency Range	Test Results	Conclusion
802.11n (HT20)	1	2.412 GHz	Fig.B.6.1.49	P
		30 MHz ~ 1 GHz	Fig.B.6.1.50	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.51	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.52	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.53	P
		10 GHz ~ 15 GHz	Fig.B.6.1.54	P
		15 GHz ~ 20 GHz	Fig.B.6.1.55	P
		20 GHz ~ 26 GHz	Fig.B.6.1.56	P
	6	2.437 GHz	Fig.B.6.1.57	P
		30 MHz ~ 1 GHz	Fig.B.6.1.58	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.59	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.60	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.61	P
		10 GHz ~ 15 GHz	Fig.B.6.1.62	P
		15 GHz ~ 20 GHz	Fig.B.6.1.63	P
		20 GHz ~ 26 GHz	Fig.B.6.1.64	P
	11	2.462 GHz	Fig.B.6.1.65	P
		30 MHz ~ 1 GHz	Fig.B.6.1.66	P
		1 GHz ~ 2.5 GHz	Fig.B.6.1.67	P
		2.5 GHz ~ 7.5 GHz	Fig.B.6.1.68	P
		7.5 GHz ~ 10 GHz	Fig.B.6.1.69	P
		10 GHz ~ 15 GHz	Fig.B.6.1.70	P
		15 GHz ~ 20 GHz	Fig.B.6.1.71	P
		20 GHz ~ 26 GHz	Fig.B.6.1.72	P

Conclusion: Pass

Test graphs as below:

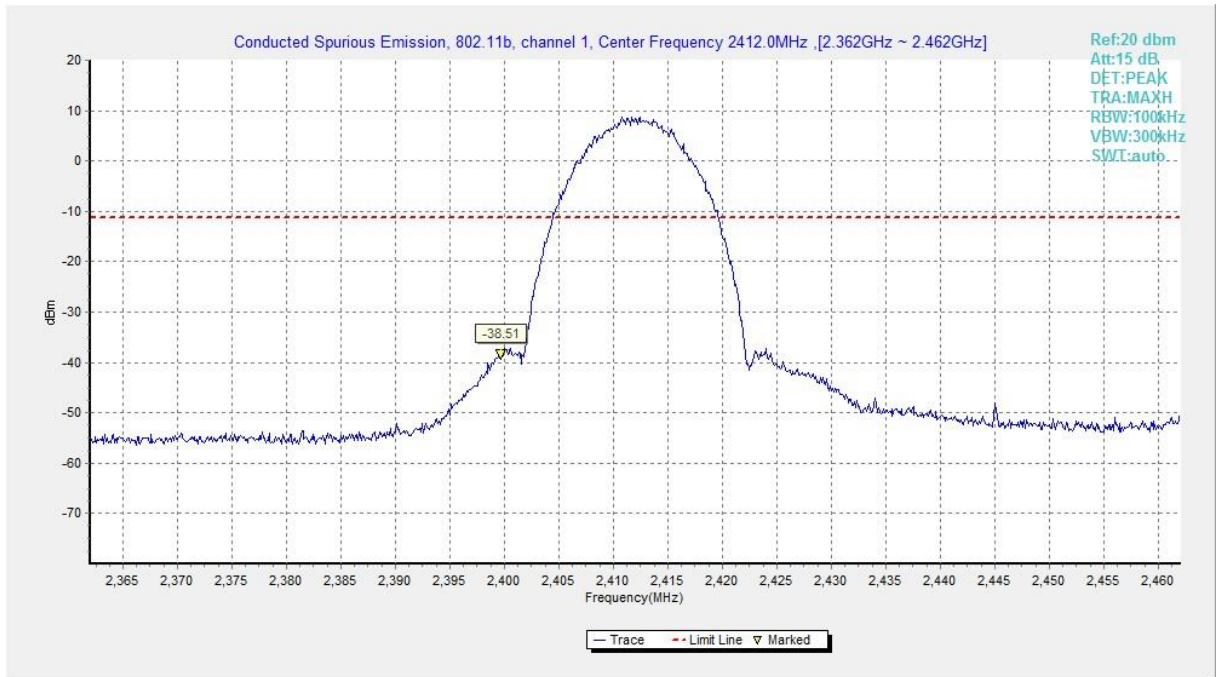


Fig.B.6.1.1 Transmitter Spurious Emission - Conducted (802.11b, Ch1, Center Frequency)

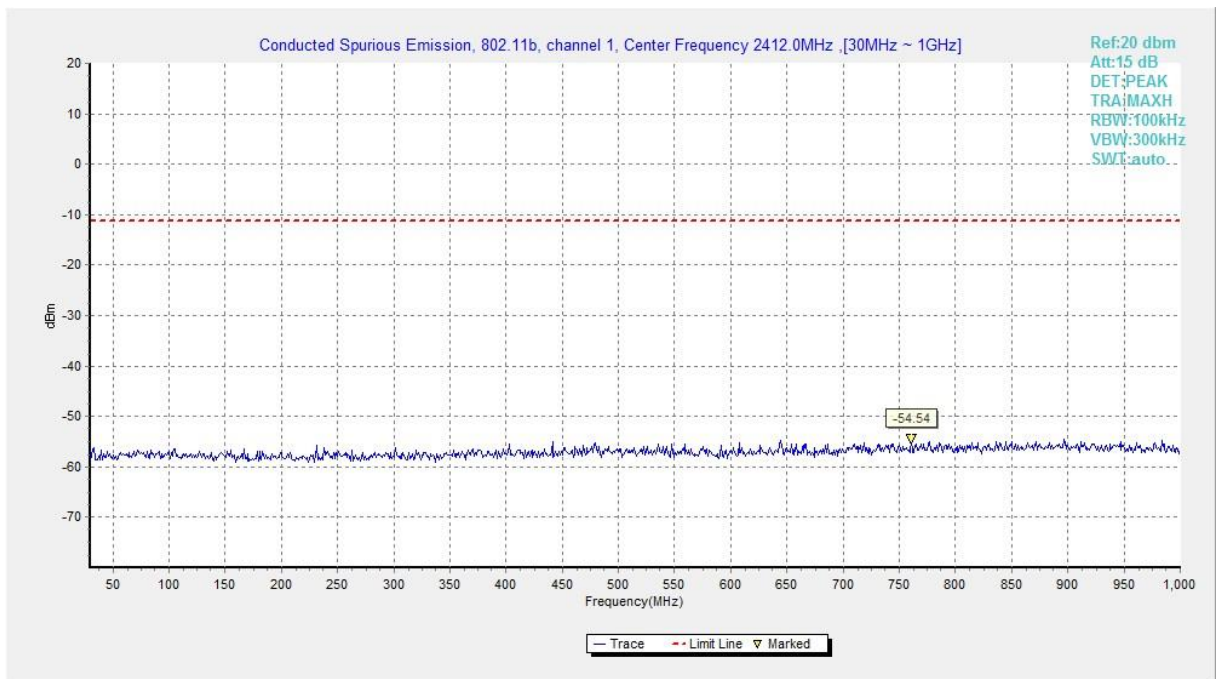


Fig.B.6.1.2 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 30 MHz-1 GHz)

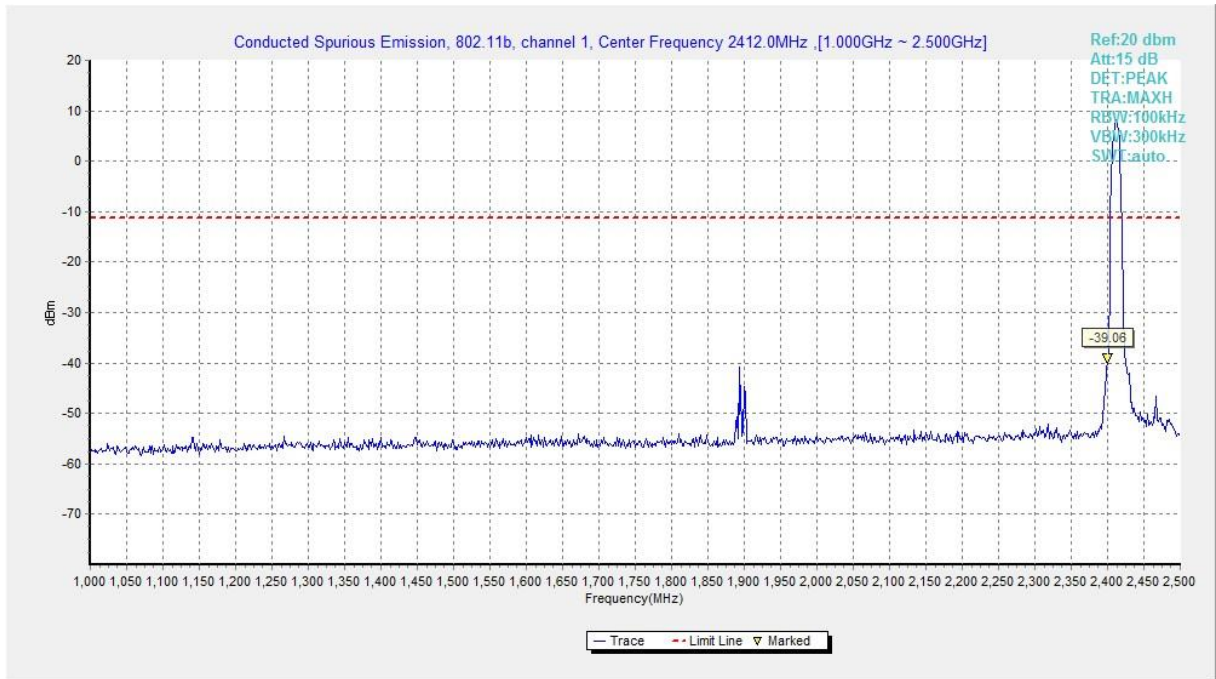


Fig.B.6.1.3 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 1 GHz-2.5 GHz)

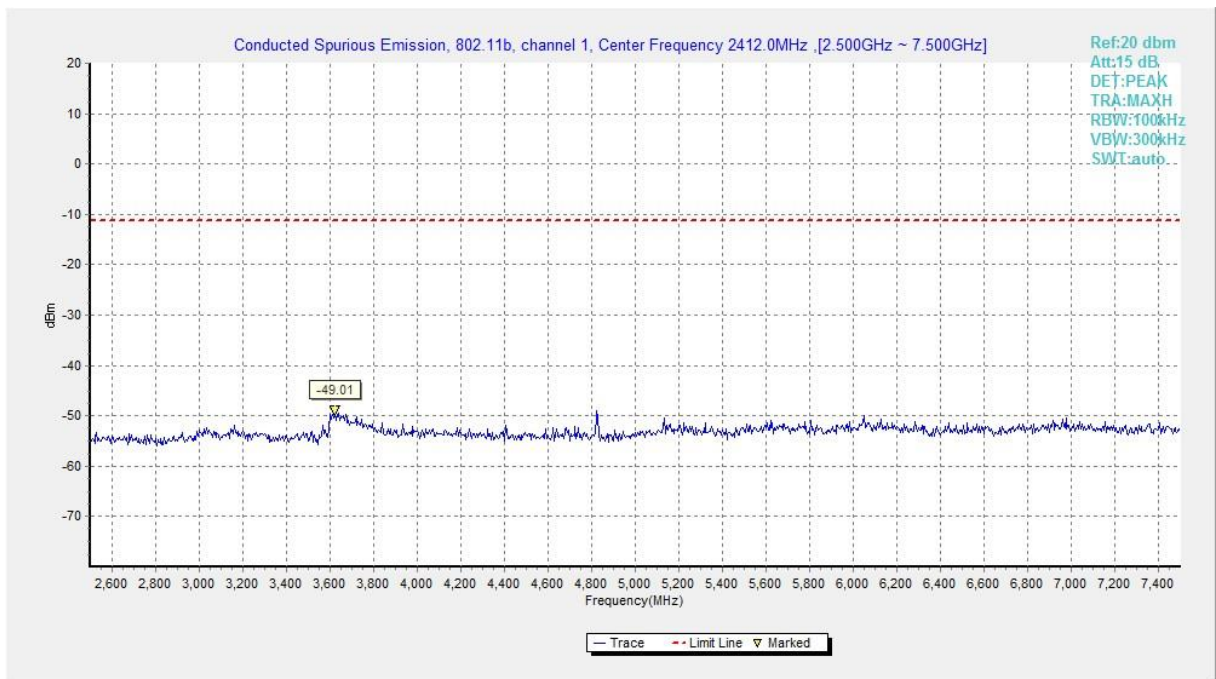


Fig.B.6.1.4 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 2.5 GHz-7.5 GHz)

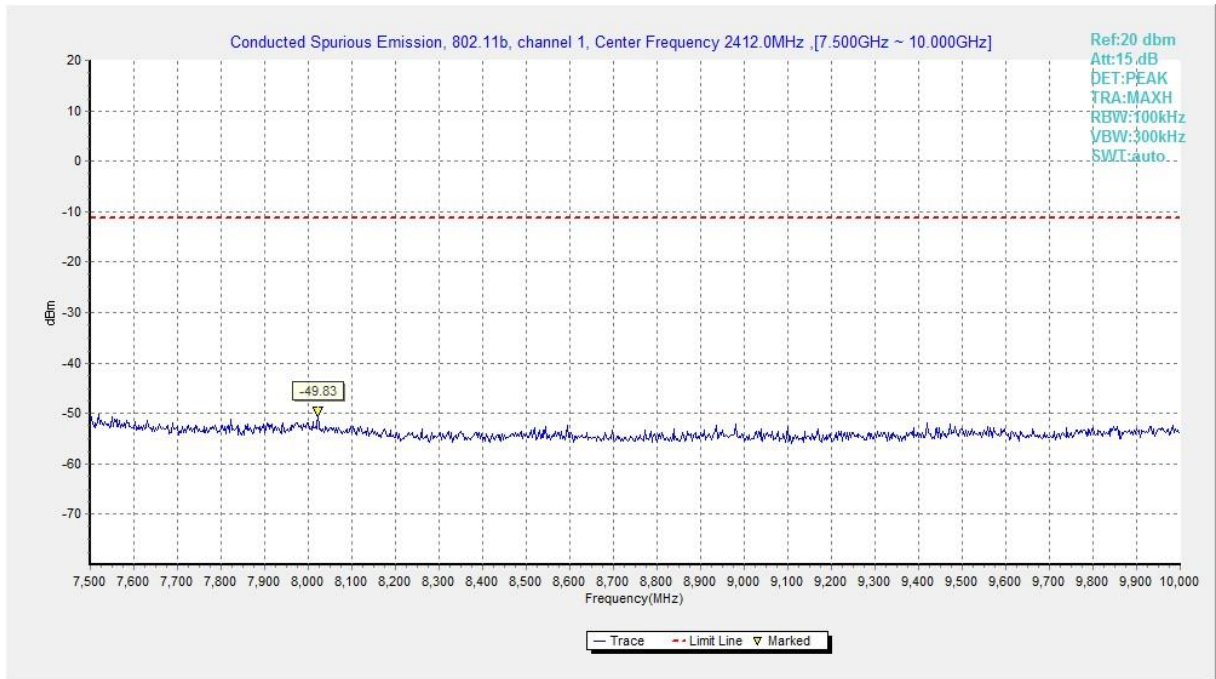


Fig.B.6.1.5 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 7.5 GHz-10 GHz)

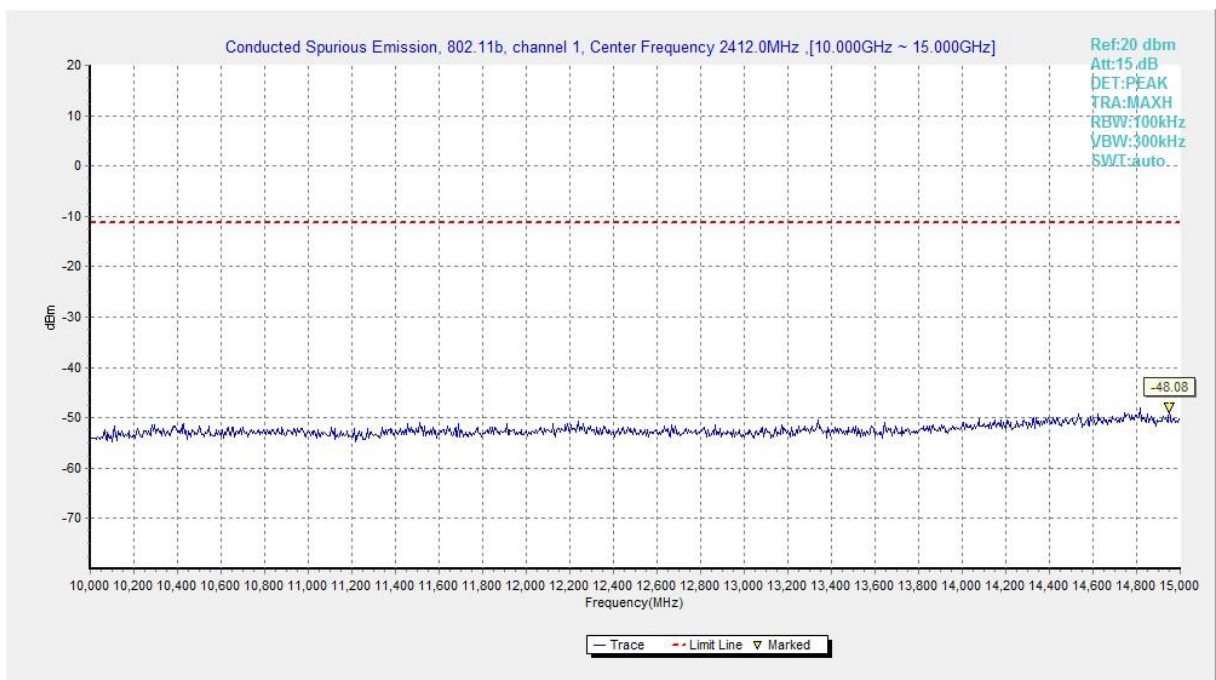


Fig.B.6.1.6 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 10 GHz-15 GHz)

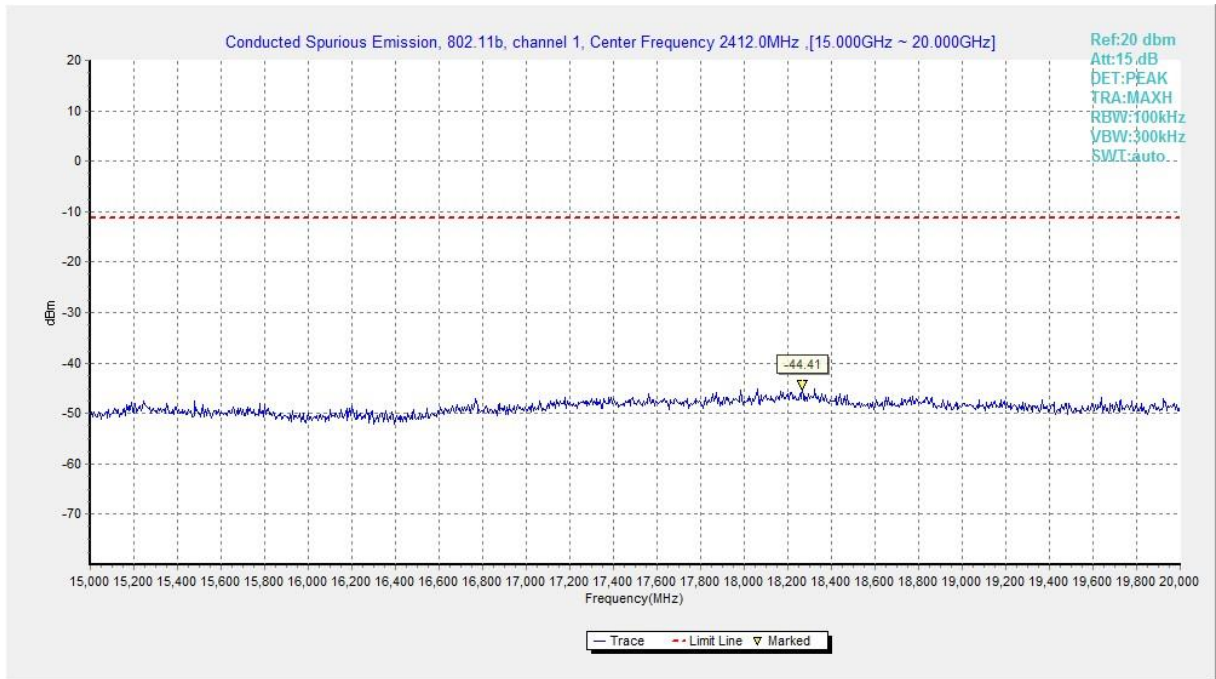


Fig.B.6.1.7 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 15 GHz-20 GHz)

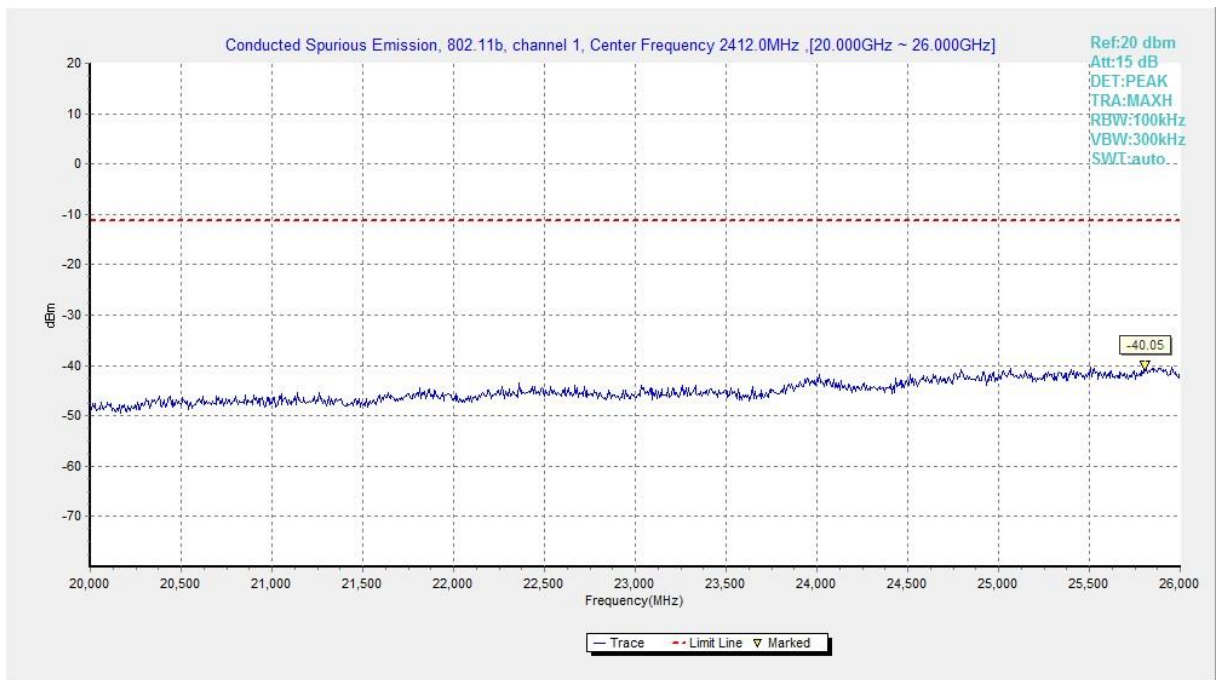


Fig.B.6.1.8 Transmitter Spurious Emission - Conducted (802.11b, Ch1, 20 GHz-26 GHz)

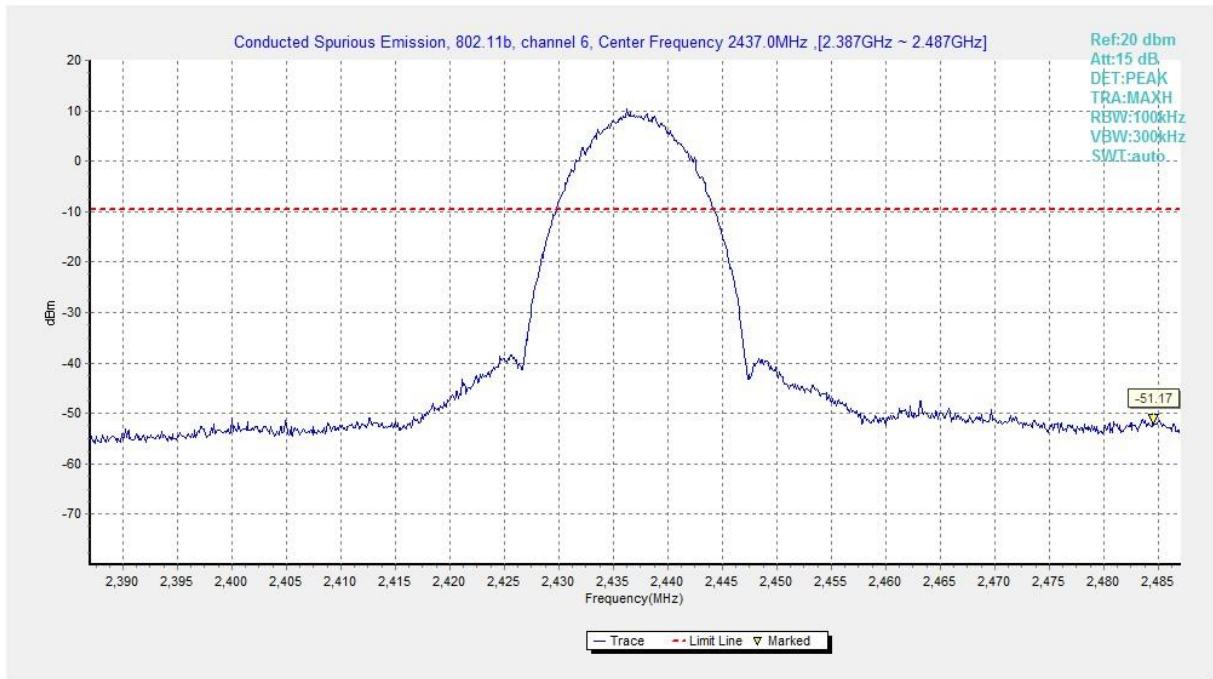


Fig.B.6.1.9 Transmitter Spurious Emission - Conducted (802.11b, Ch6, Center Frequency)

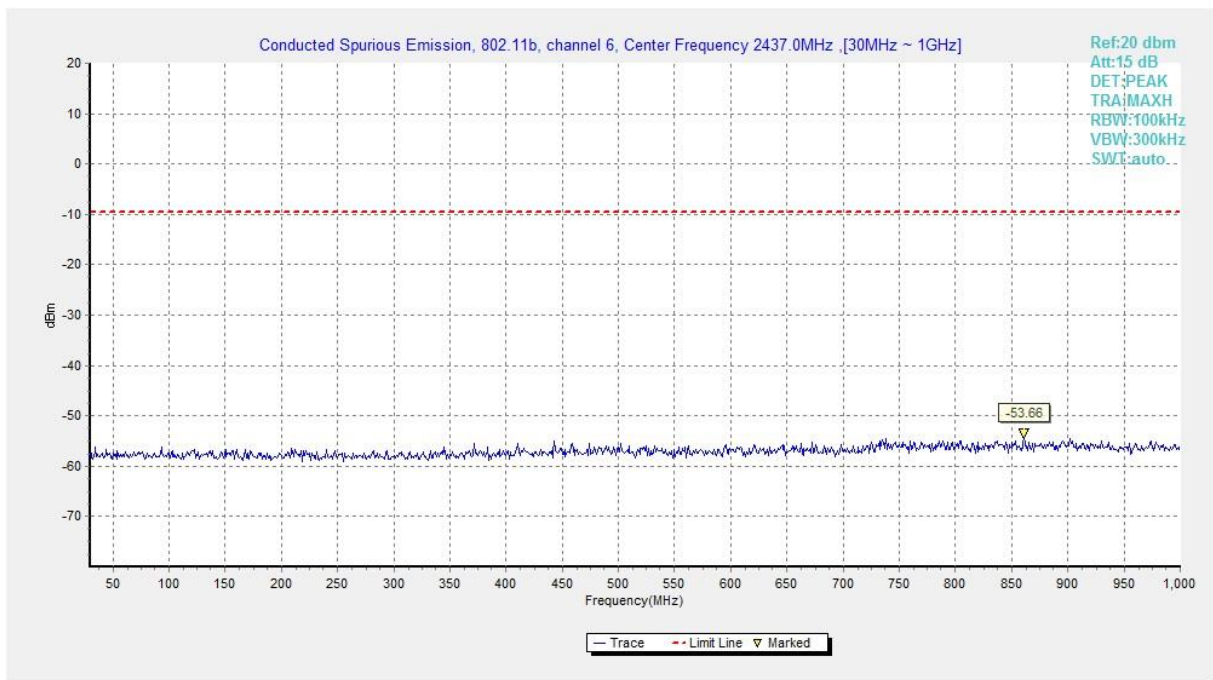


Fig.B.6.1.10 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 30 MHz-1 GHz)

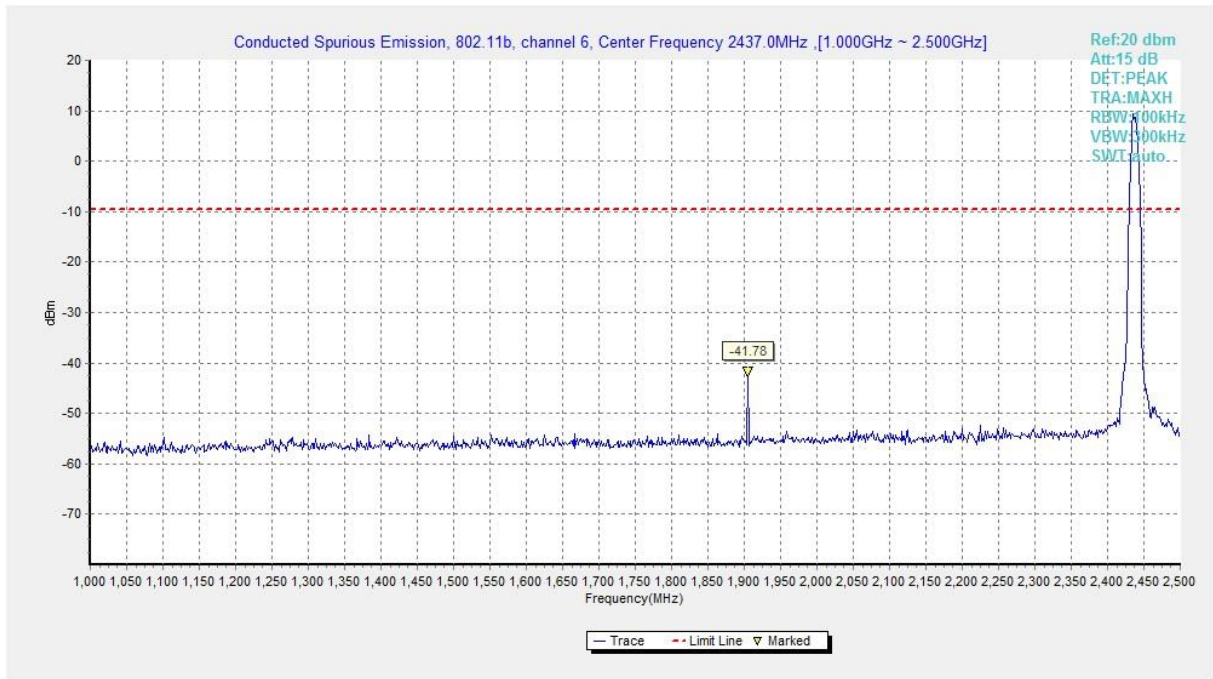


Fig.B.6.1.11 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 1 GHz-2.5 GHz)

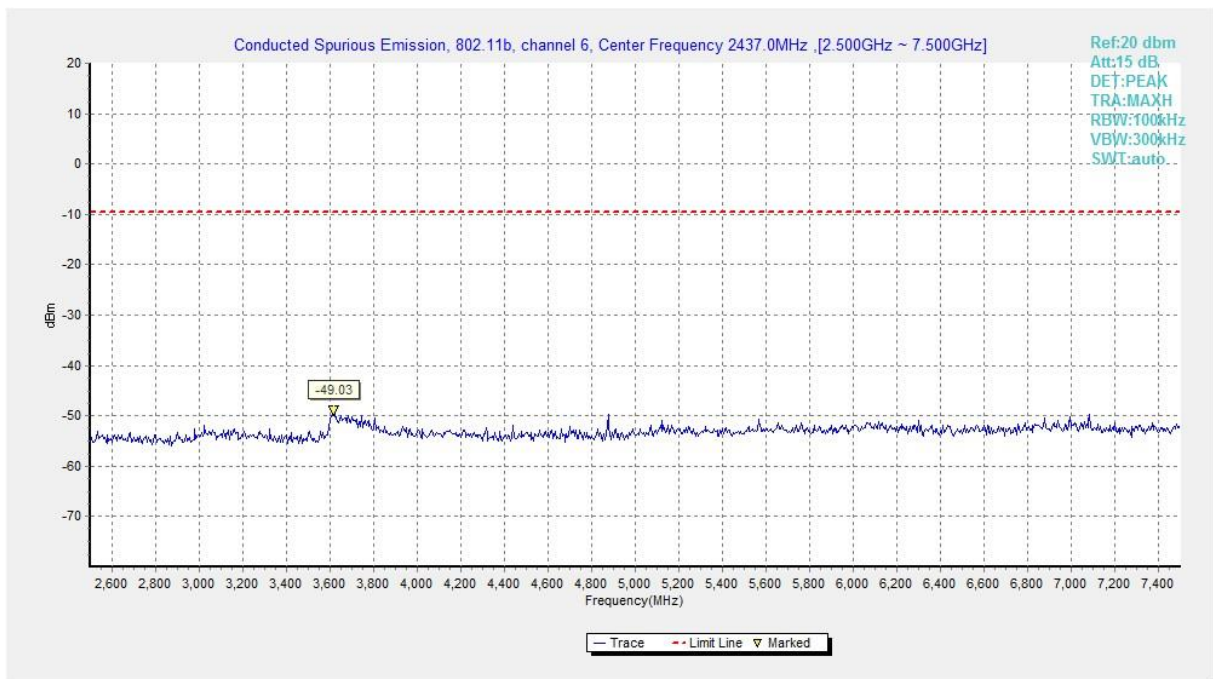


Fig.B.6.1.12 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 2.5 GHz-7.5 GHz)

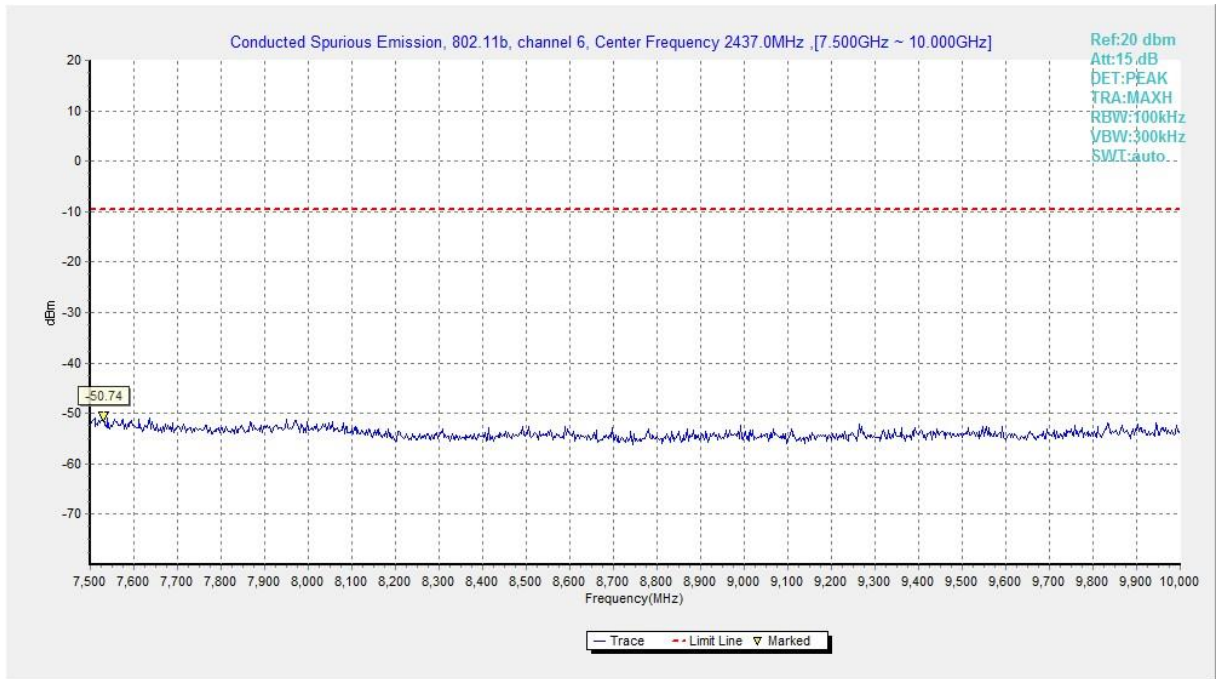


Fig.B.6.1.13 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 7.5 GHz-10 GHz)

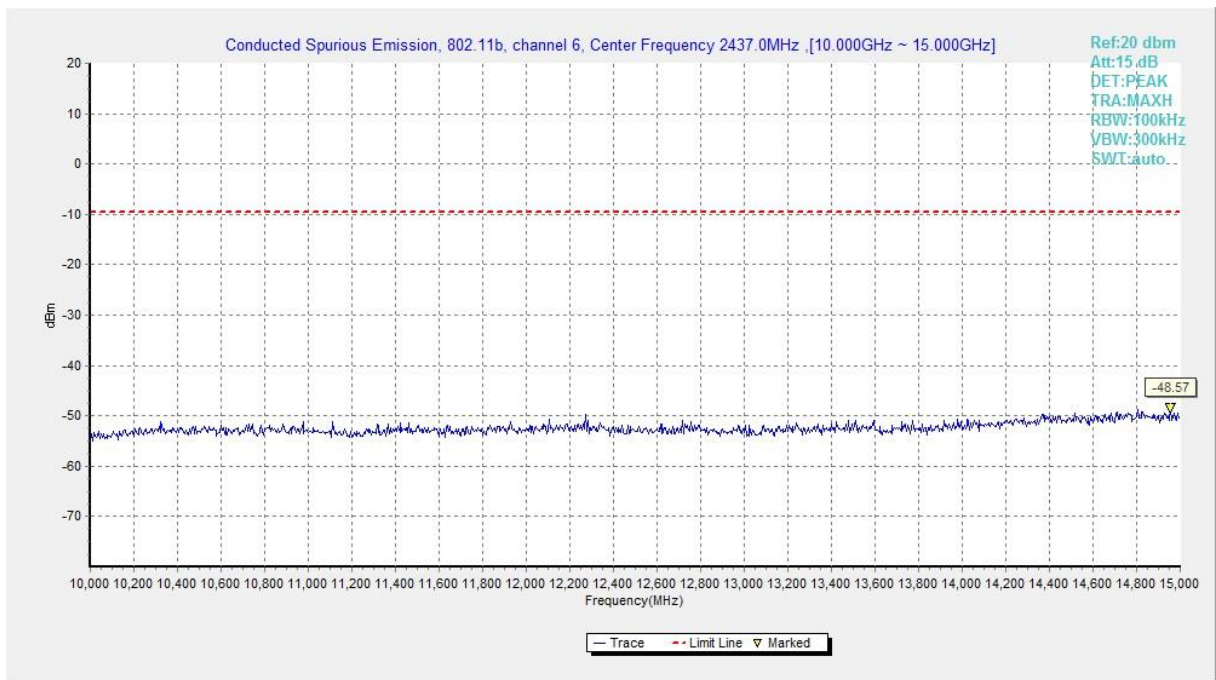


Fig.B.6.1.14 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 10 GHz-15 GHz)

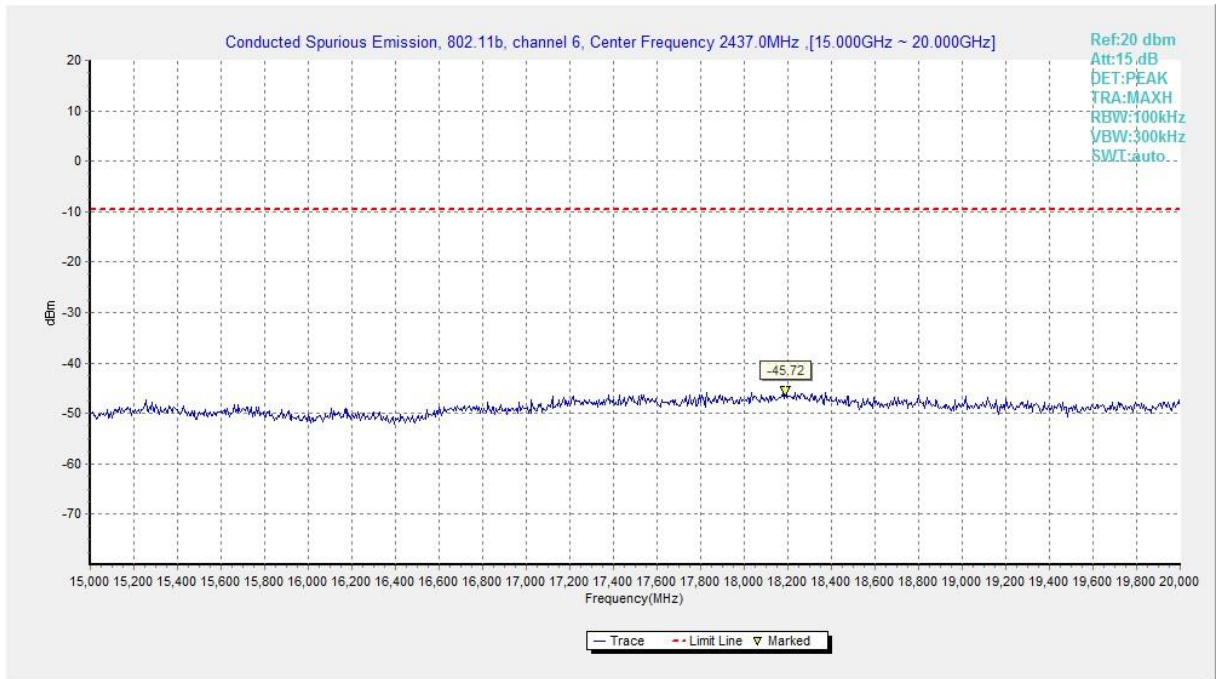


Fig.B.6.1.15 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 15 GHz-20 GHz)

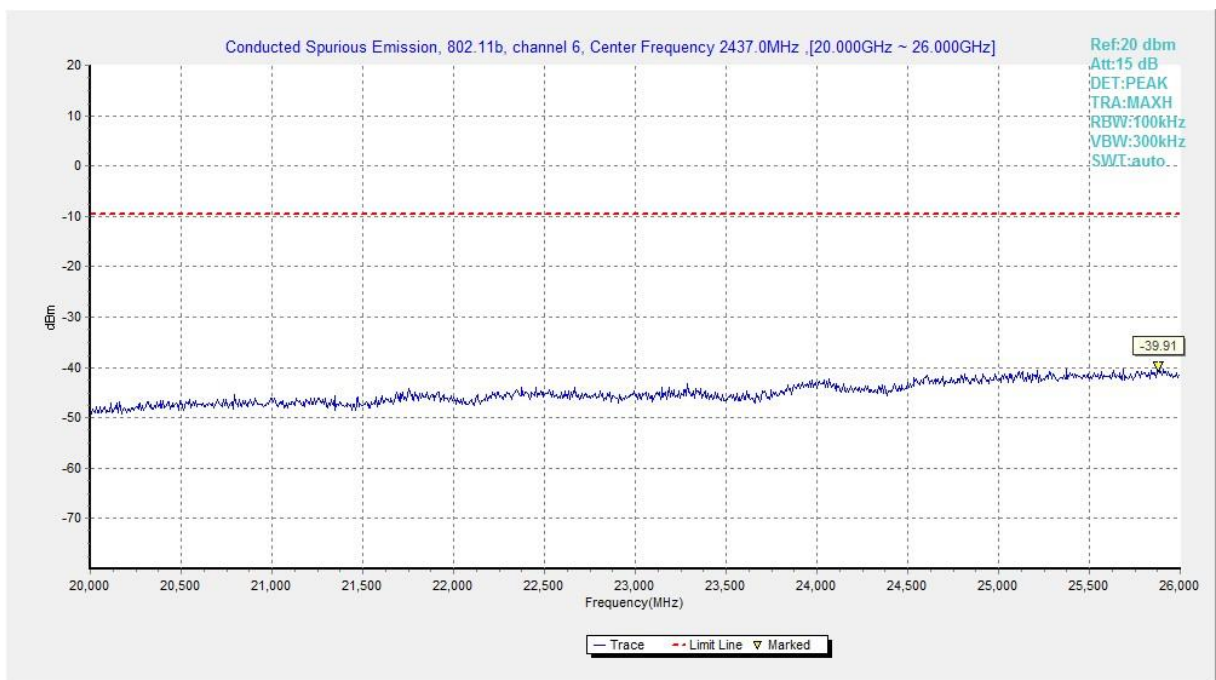


Fig.B.6.1.16 Transmitter Spurious Emission - Conducted (802.11b, Ch6, 20 GHz-26 GHz)

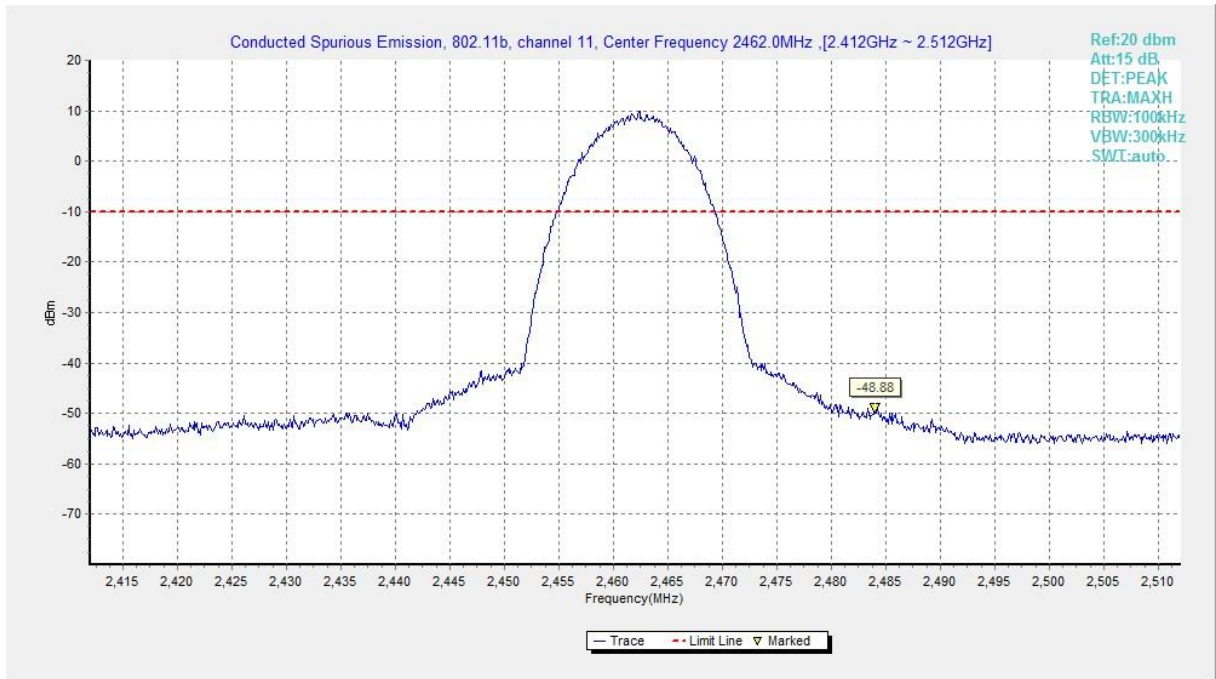


Fig.B.6.1.17 Transmitter Spurious Emission - Conducted (802.11b, Ch11, Center Frequency)

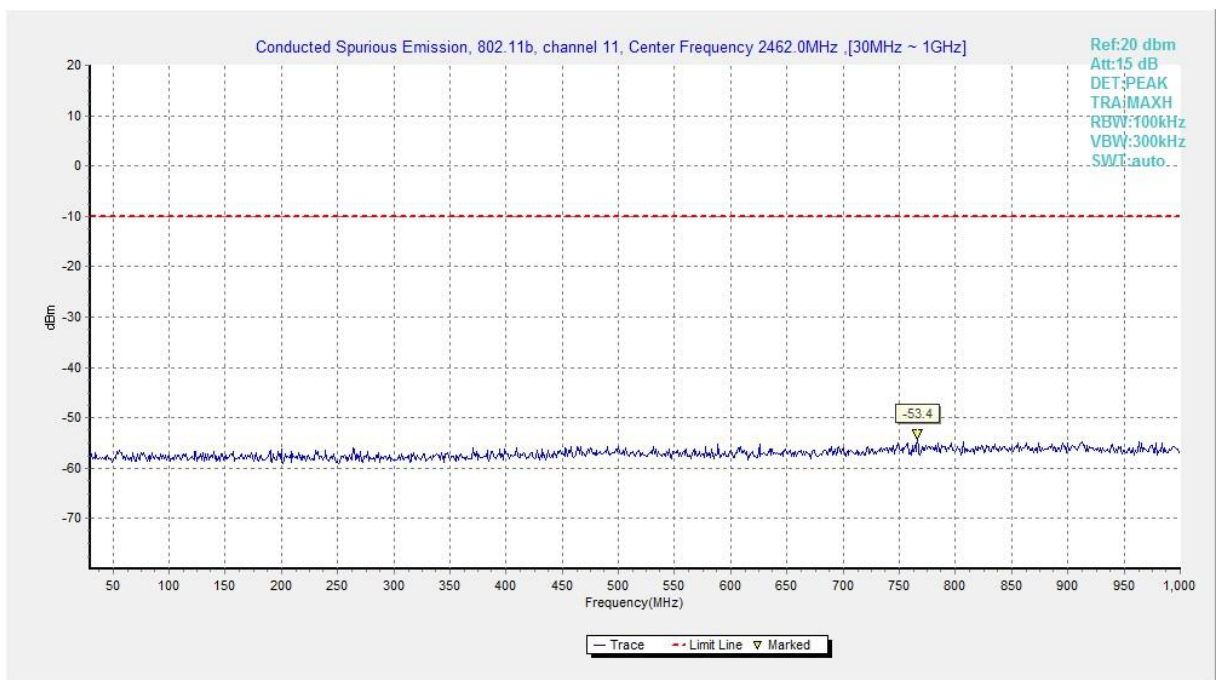


Fig.B.6.1.18 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 30 MHz-1 GHz)

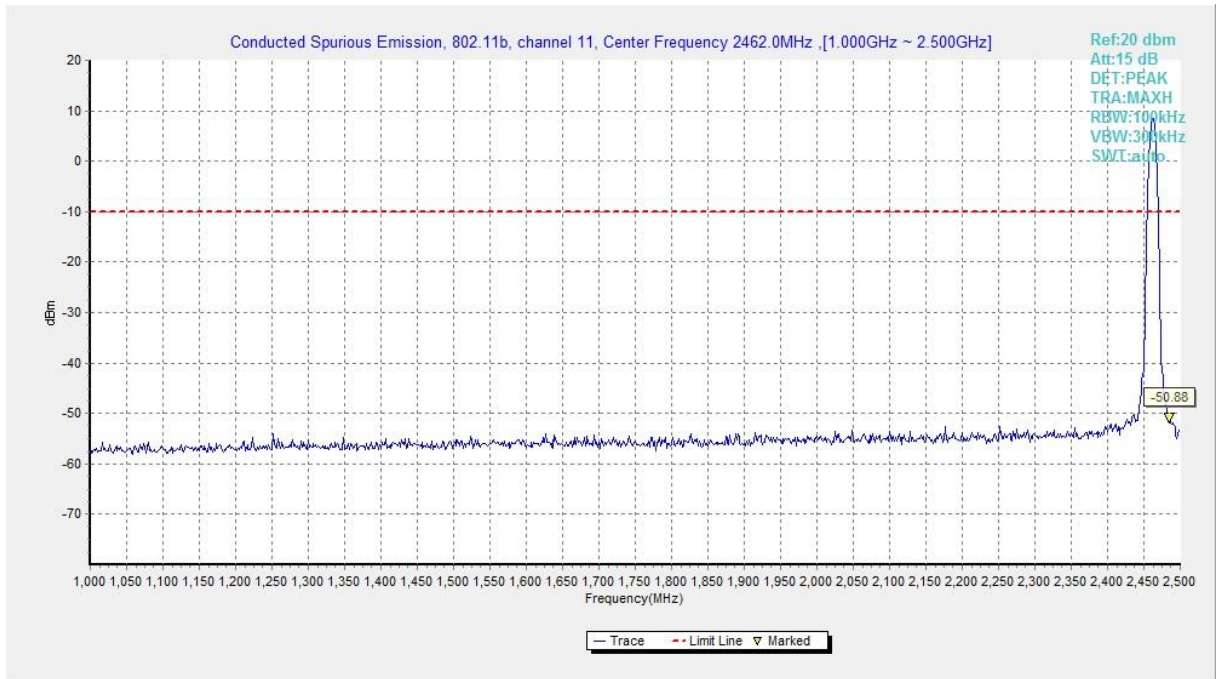


Fig.B.6.1.19 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 1 GHz-2.5 GHz)

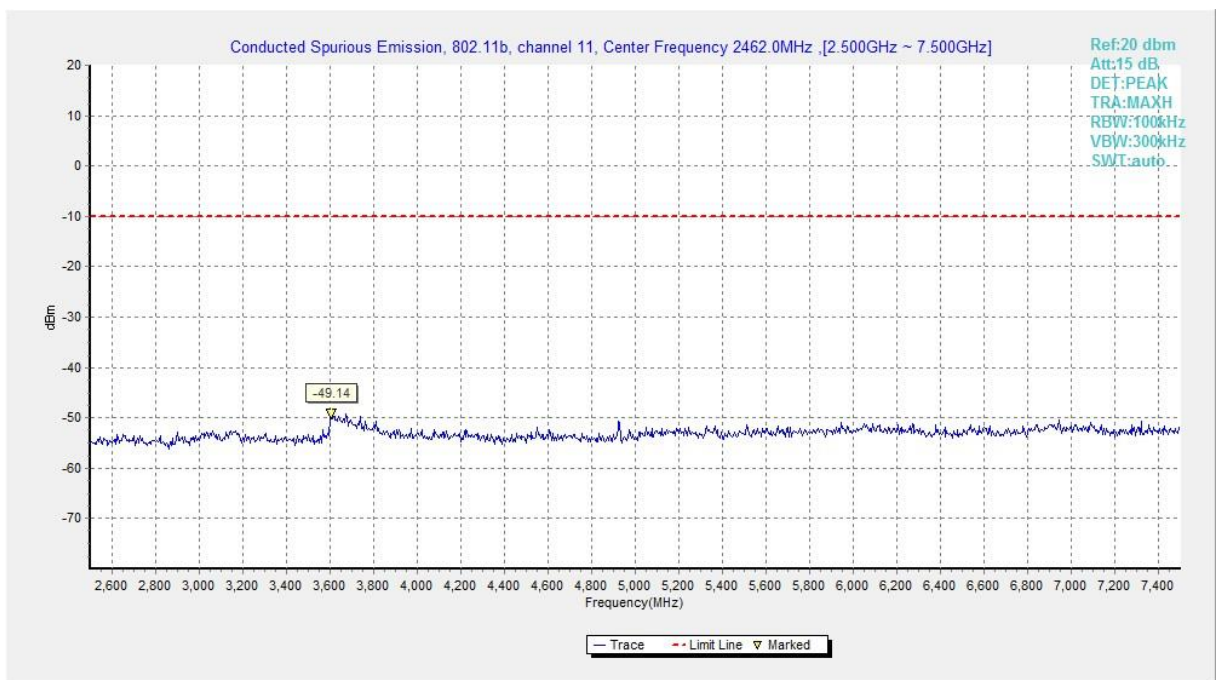


Fig.B.6.1.20 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 2.5 GHz-7.5 GHz)

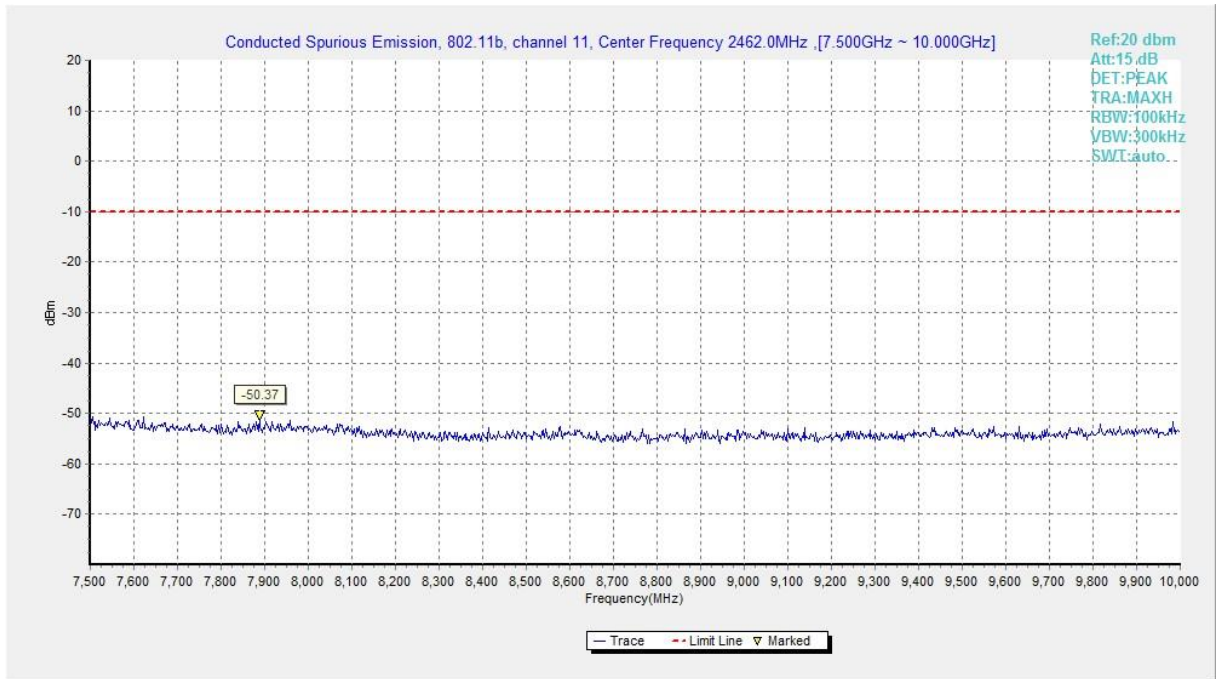


Fig.B.6.1.21 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 7.5 GHz-10 GHz)

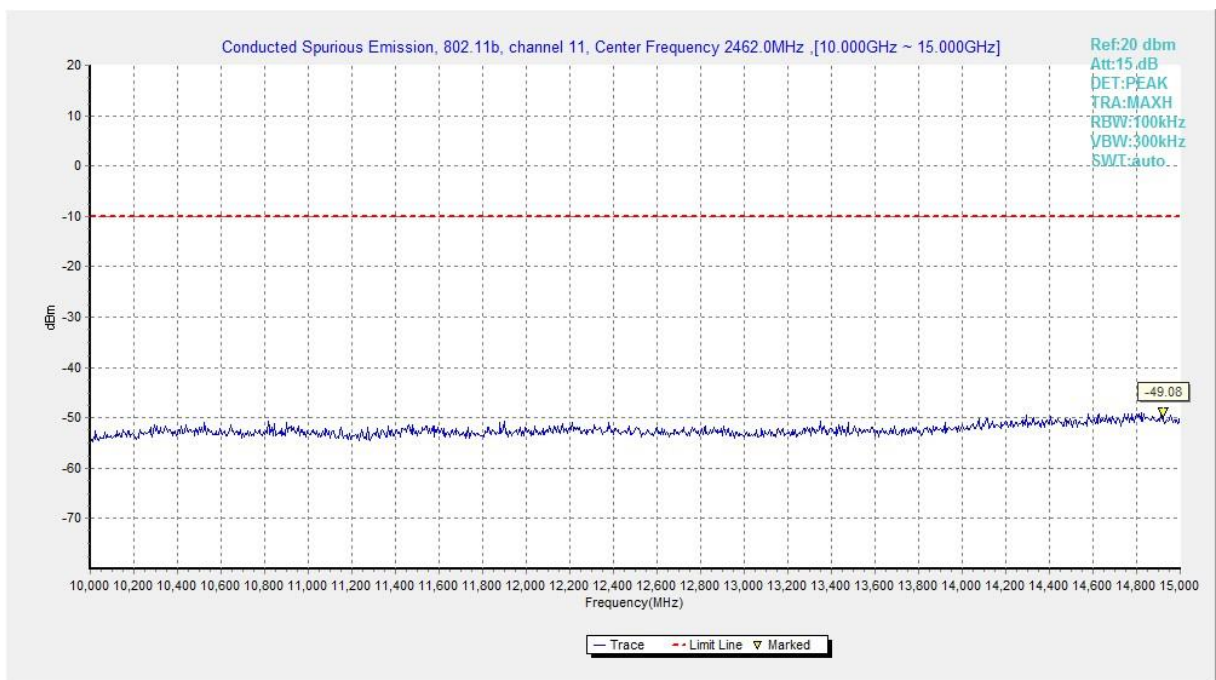


Fig.B.6.1.22 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 10 GHz-15 GHz)

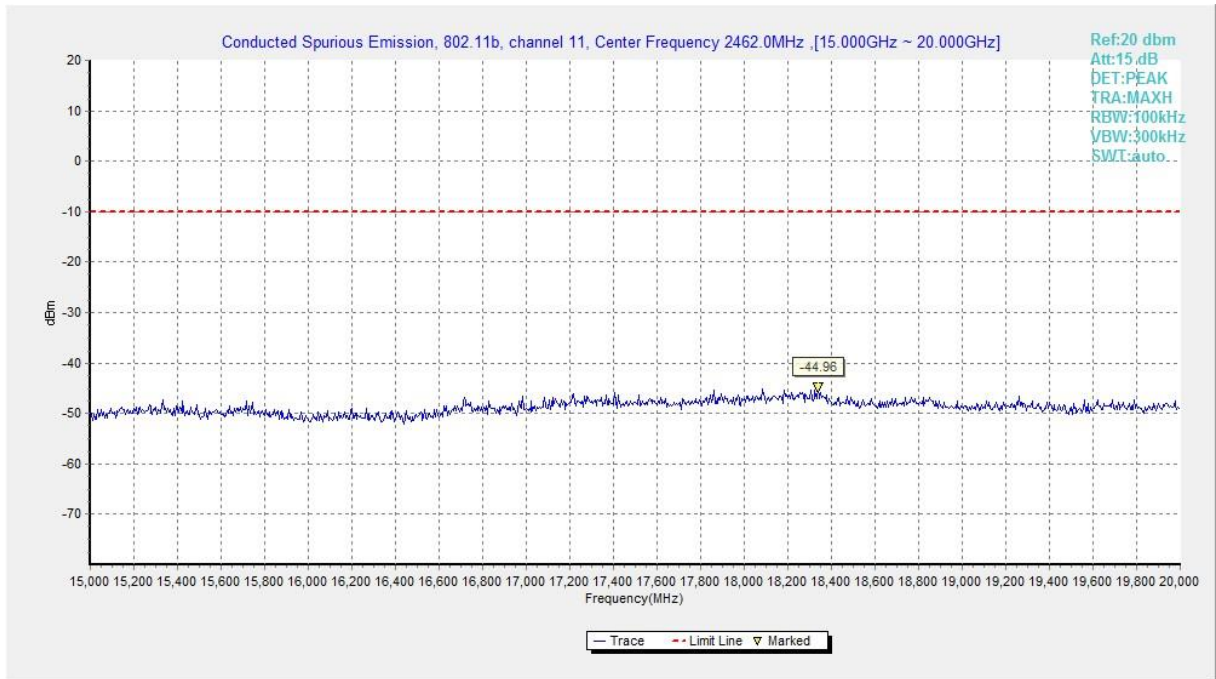


Fig.B.6.1.23 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 15 GHz-20 GHz)

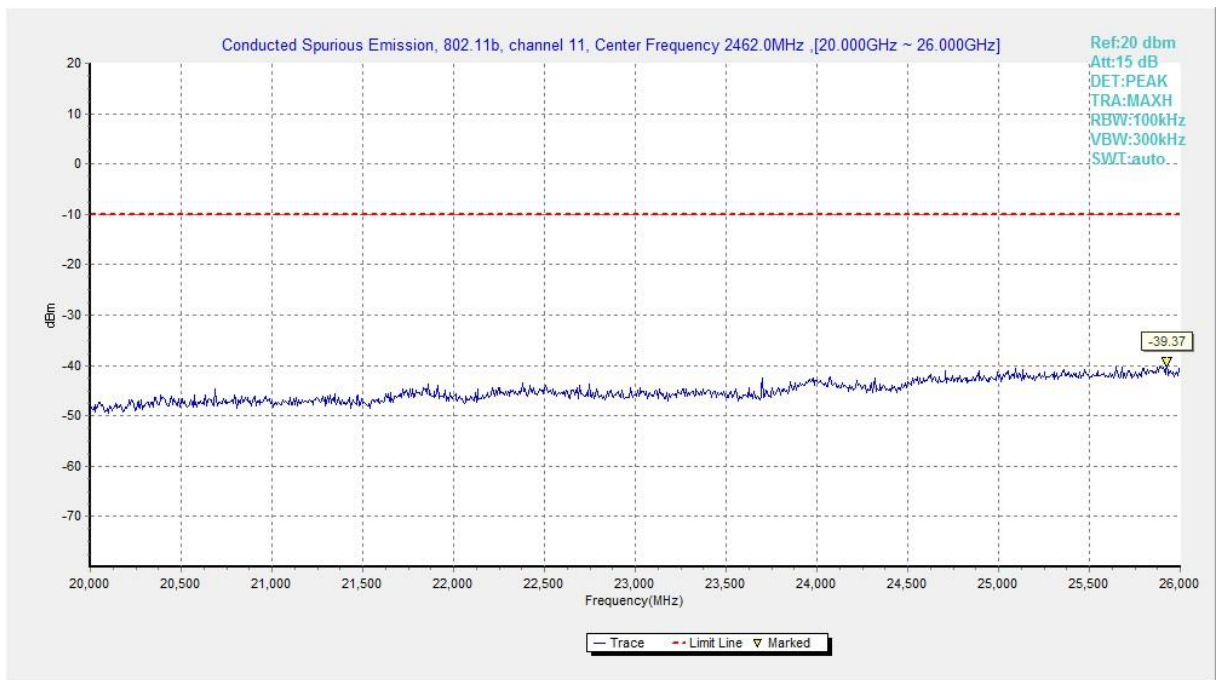


Fig.B.6.1.24 Transmitter Spurious Emission - Conducted (802.11b, Ch11, 20 GHz-26 GHz)

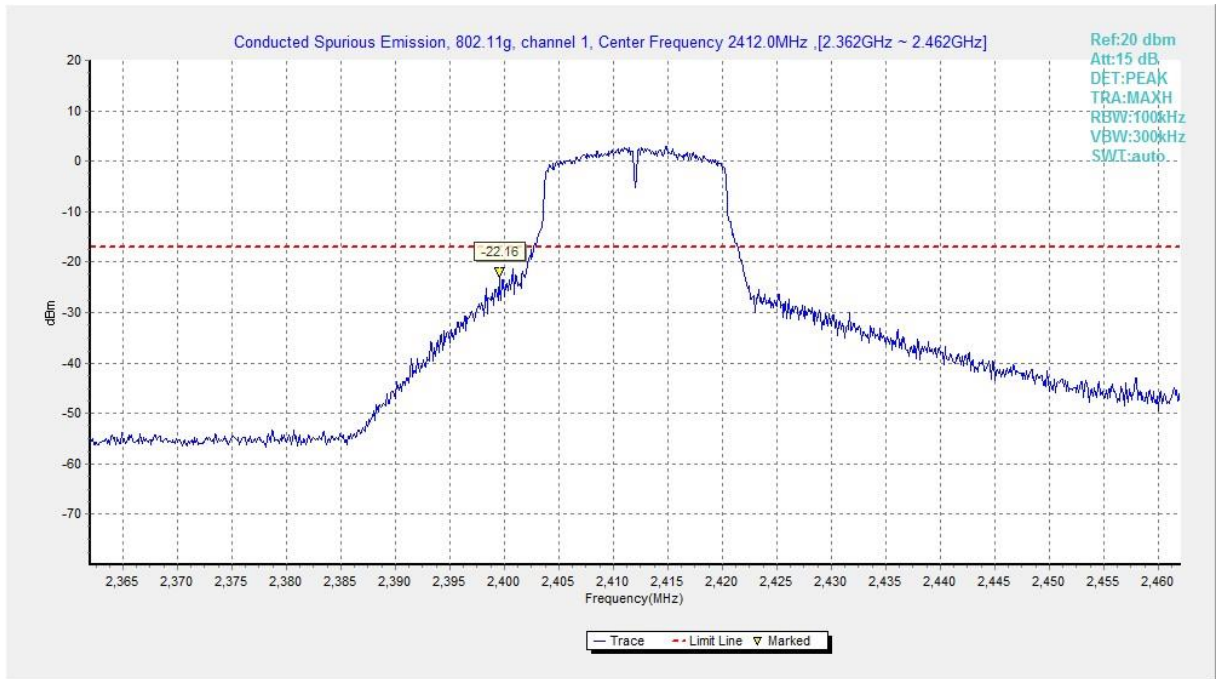


Fig.B.6.1.25 Transmitter Spurious Emission - Conducted (802.11g, Ch1, Center Frequency)

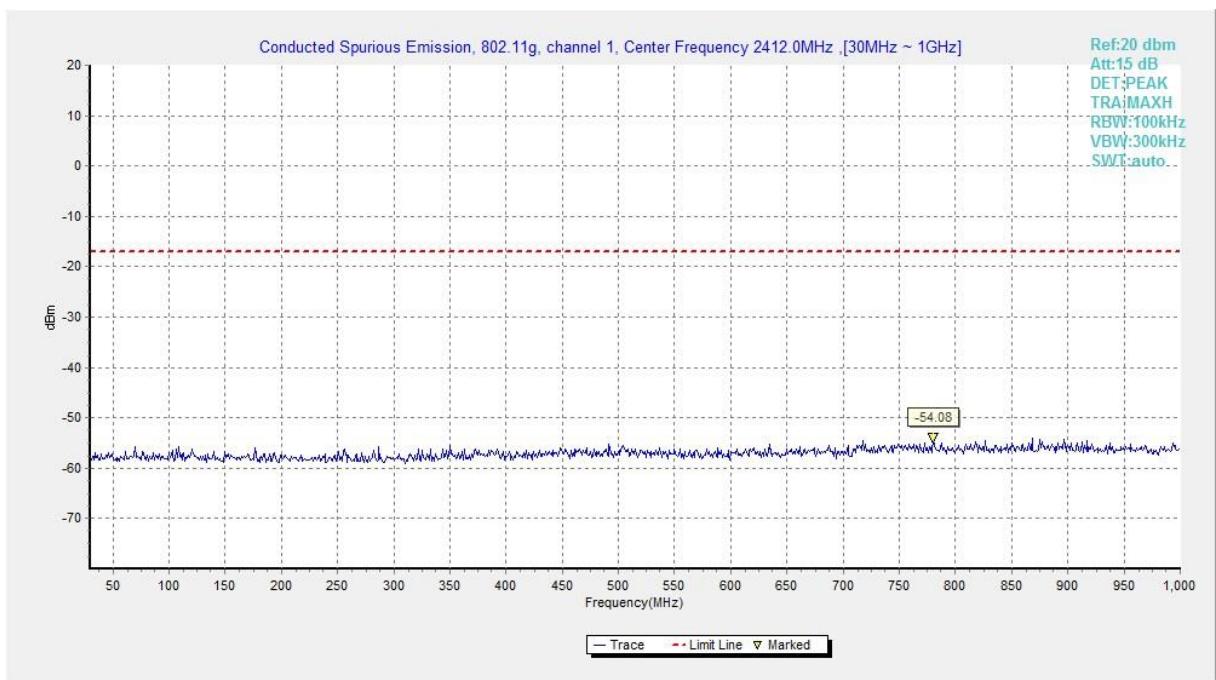


Fig.B.6.1.26 Transmitter Spurious Emission - Conducted (802.11g, Ch1, 30 MHz-1 GHz)