2/F., Garment Centre,
576 Castle Peak Road, Kowloon,
Hong Kong.

Telephone: (852) 2173 8888
Facsimile: (852) 2785 5487
www.intertek.com

TEST REPORT

Report Number: 17091090HKG-001

Application for Original Grant of 47 CFR Part 15 Certification

Single New of RSS-247 Issue 2 Equipment

FCC ID: VLJ-MBP87SN

IC: 4522A-MBP87SN

PREPARED AND CHECKED BY:	APPROVED BY:
Signed On File Wong Cheuk Ho, Herbert Lead Engineer	Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Ltd. Wong Kwok Yeung, Kenneth Senior Lead Engineer Date: November 28, 2017

TEST REPORT

GENERAL INFORMATION

Applicant Name:	Binatone Electronics International Limited
Applicant Address:	Floor 23A, 9 Des Voeux Road West, Sheung Wan, Hong Kong.
FCC Specification Standard:	FCC Part 15, October 1, 2016 Edition
FCC ID:	VLJ-MBP87SN
FCC Model(s):	MBP87SN
IC Specification Standard:	RSS-247 Issue 2, February 2017 RSS-Gen Issue 4, November 2014
IC:	4522A-MBP87SN
PMN:	Smart Air Purifier
HVIN:	MBP87SN
Type of EUT:	Spread Spectrum Transmitter
Description of EUT:	Smart Air Purifier
Serial Number:	N/A
Sample Receipt Date:	September 22, 2017
Date of Test:	September 22, 2017 to October 23, 2017
Report Date:	November 28, 2017
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

TEST REPORT

TABLE OF CONTENTS

TEST REPORT

EXHIBIT 1 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.1 Summary of Test Results

TEST ITEMS	FCC PART 15 SECTION	RSS-247/ RSS-GEN# SECTION	RESULTS	DETAILS SEE SECTION
Antenna Requirement	15.203	8.3#	Pass	2.1
Max. Conducted Output Power (Peak)	15.247(b)(3)&(4)	5.4(4)	Pass	4.1
Min. 6dB RF Bandwidth	15.247(a)(2)	5.2(a)	Pass	4.2
Max. Power Density (average)	15.247(e)	5.2(b)	Pass	4.3
Out of Band Antenna Conducted Emission	15.247(d)	5.5	Pass	4.4
Radiated Emission in Restricted Bands and Spurious Emissions	15.247(d), 15.209 & 15.109	5.5	Pass	4.6
AC Power Line Conducted Emission	15.207 & 15.107	8.8#	Pass	4.7

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over expected variations in temperature and supply voltage were considered.

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standard:

FCC Part 15, October 1, 2016 Edition
RSS-247 Issue 2, February 2017
RSS-Gen Issue 4, November 2014

TEST REPORT

EXHIBIT 2 GENERAL DESCRIPTION

2.0 GENERAL DESCRIPTION

2.1 Product Description

The Equipment Under Test (EUT) is a Smart Air Purifier, equipped with a WLAN module. After connecting the EUT to the WLAN network, user can control the Smart Air Purifier and monitor the air quality of the premise via the mobile apps. The EUT contains UV lamp for killing germs. The EUT is powered by 120VAC.

The tested model is MBP87SN.

For 802.11b mode, it operates at frequency range of 2412MHz to 2462MHz with 11 channels. It transmits via direct-sequence spread spectrum (DSSS) modulation. Maximum bit rate can be up to 11Mbps. For 802.11g mode, it operates at frequency range of 2412MHz to 2462MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps. For 802.11n (HT20 with 20MHz bandwidth) mode, it operates at frequency range of 2412MHz to 2462MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation (mcs0 to mcs7). Maximum bit rate can support up to 65Mbps. For 802.11n (HT40 with 40MHz bandwidth) mode, it operates at frequency range of 2422MHz to 2452MHz with 9 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation (mcs0 to mcs7). Maximum bit rate can support up to 130Mbps.

The antenna(s) used in the EUT is integral, internal.

The circuit description is saved with filename: descri.pdf.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in radiated emission test sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. Antenna port conducted measurements were performed according to ANSI C63.10 (2013) and KDB Publication No.558074 D01 v04 (05-April-2017) All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 4 (2014).

2.3 Test Facility

The radiated emission test site and antenna port conducted measurement facility used to collect the radiated data and conductive data are at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada No.: 2042V-1.

2.4 Related Submittal(s) Grants

This is a single application for certification of a transceiver (WiFi portion). The Declaration of the Conformity procedure of RF lighting for this transceiver is being processed as the same time of this application.

TEST REPORT

EXHIBIT 3 SYSTEM TEST CONFIGURATION

3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit / receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT was powered by 120VAC.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the base unit attached to peripherals, they were connected and operational (as typical as possible).

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Radiated emission measurement for transmitter were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209 / RSS-247 2.5. Digital circuitries used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 / RSS-247 Section 5.5 Limits.

3.1 Justification – Cont'd

Detector function for radiated emissions was in peak mode. Average readings, when required, were taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in section 4.8.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was referred to Exhibit 4.8.3. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were manipulated to find the maximum emission.

All setting of data rate for 802.11b/g/n(HT20)/n(HT40) of WiFi mode had been considered, and worst case test data are shown on this test report.

3.2 EUT Exercising Software

The EUT exercise program (if any) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

3.3 Details of EUT and Description of Accessories

Details of EUT:

1. The EUT is powered by 120VAC

Description of Accessories:

There are no accessories for compliance of this product.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test at a level of confidence of 95% has been considered. The values of the Measurement uncertainty for radiated emission test and RF conducted measurement test are ± 5.3dB and ±0.99dB respectively. The value of the Measurement uncertainty for conducted emission test is ±4.2dB.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

TEST REPORT

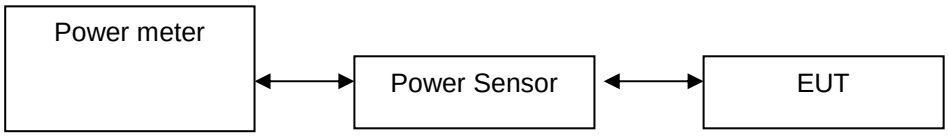
EXHIBIT 4 TEST RESULTS

4.0 TEST RESULTS

4.1 Maximum Conducted (peak) Output Power at Antenna Terminals

RF Conduct Measurement Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



The antenna port of the EUT was connected to the input of a spectrum analyzer.

☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to the obtain power at the EUT antenna terminals. The measurement procedure 9.1.3 was used.

☐ The EUT should be configured to transmit continuously (at a minimum duty cycle of 98%) at full power over the measurement duration. The measurement procedure AVG1 was used.

IEEE 802.11b (DSSS, 1 Mbps) Antenna Gain = 0 dBi

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	24.4	275.4
Middle Channel:	2437	24.8	302.0
High Channel:	2462	24.6	288.4

IEEE 802.11g (OFDM, 6 Mbps) Antenna Gain = 0 dBi

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	22.6	182.0
Middle Channel:	2437	22.8	190.5
High Channel:	2462	23.0	199.5

IEEE 802.11n (20MHz) (OFDM, MCS0) Antenna Gain = 0 dBi

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	22.8	190.5
Middle Channel:	2437	23.0	199.5
High Channel:	2462	22.6	182.0

TEST REPORT

4.1 Maximum Conducted Output Power at Antenna Terminals – Cont'd

IEEE 802.11n (40MHz) (OFDM, MCS0) Antenna Gain = 0 dBi

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2422	20.8	120.2
Middle Channel:	2437	20.8	120.2
High Channel:	2452	20.6	114.8

Cable loss : 0.5 dB External Attenuation : 0 dB

Cable loss, external attenuation: ☒ included in OFFSET function
☐ added to SA raw reading

IEEE 802.11b (DSSS, 1 Mbps)
max. conducted (peak) output level = 24.8 dBm

IEEE 802.11g (OFDM, 9 Mbps)
max. conducted (peak) output level = 23.0 dBm

IEEE 802.11n (20MHz) (OFDM, MCS0)
max. conducted (peak) output level = 23.0 dBm

IEEE 802.11n (40MHz) (OFDM, MCS0)
max. conducted (peak) output level = 20.8 dBm

Limits:
☒ 1W (30dBm) for antennas with gains of 6dBi or less

☐ ___W (___dBm) for antennas with gains more than 6dBi

TEST REPORT

4.2 Minimum 6dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. The EBW measurement procedure was used. A PEAK output reading was taken, a DISPLAY line was drawn 6dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

IEEE 802.11b (DSSS, 1 Mbps)

	Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel:	2412	8.8
Middle Channel:	2437	8.8
High Channel:	2462	8.8

IEEE 802.11g (OFDM, 6 Mbps)

	Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel:	2412	16.64
Middle Channel:	2437	16.68
High Channel:	2462	16.64

IEEE 802.11n (20MHz) (OFDM, MCS0)

	Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel:	2412	17.76
Middle Channel:	2437	17.72
High Channel:	2462	17.76

IEEE 802.11n (40MHz) (OFDM, MCS0)

	Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel:	2422	36.72
Middle Channel:	2437	36.68
High Channel:	2452	36.68

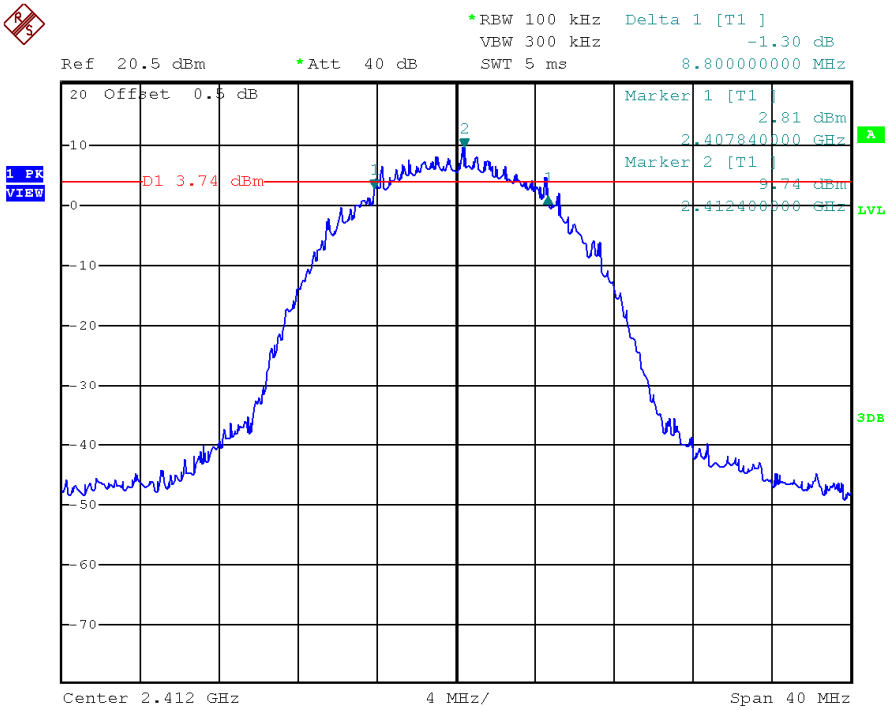
Limits
6 dB bandwidth shall be at least 500kHz

The plots of 6dB RF bandwidth are saved as below.

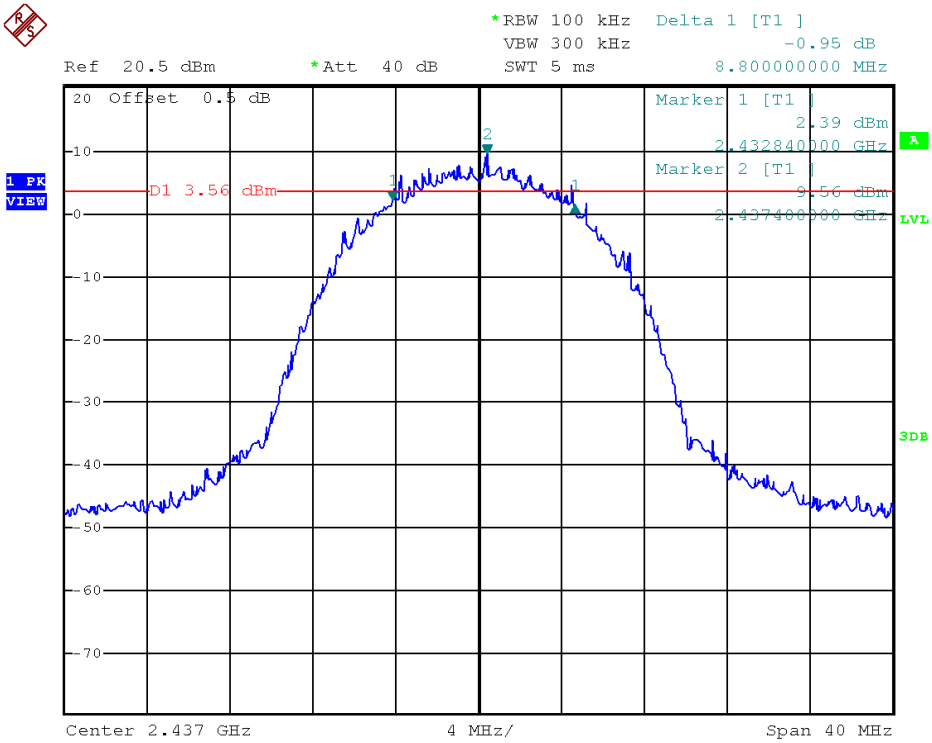
TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11b, Lowest Channel



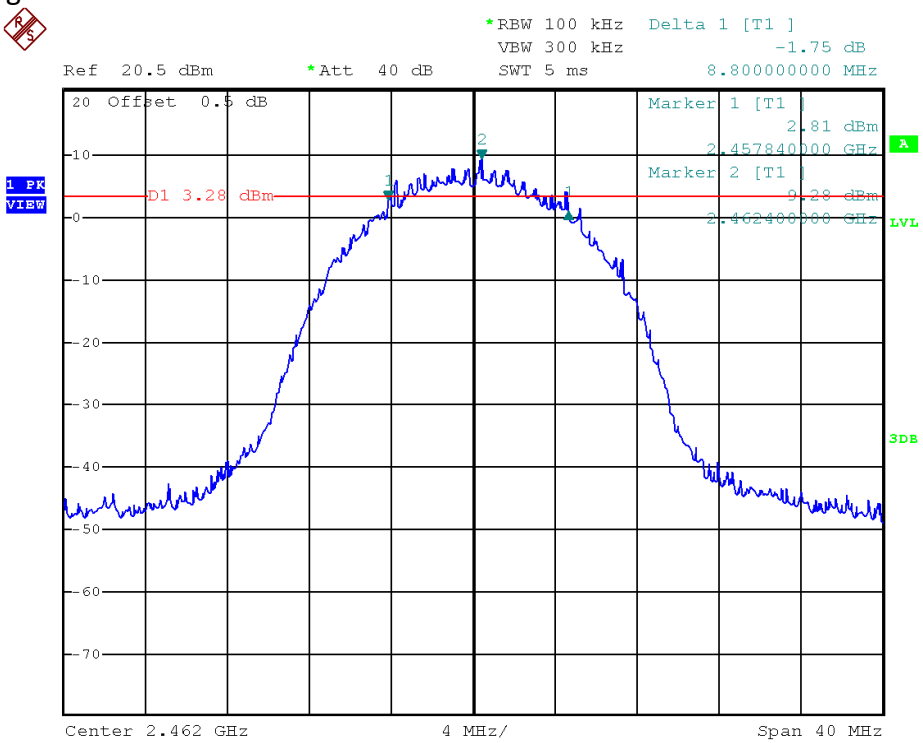
802.11b, Middle Channel



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

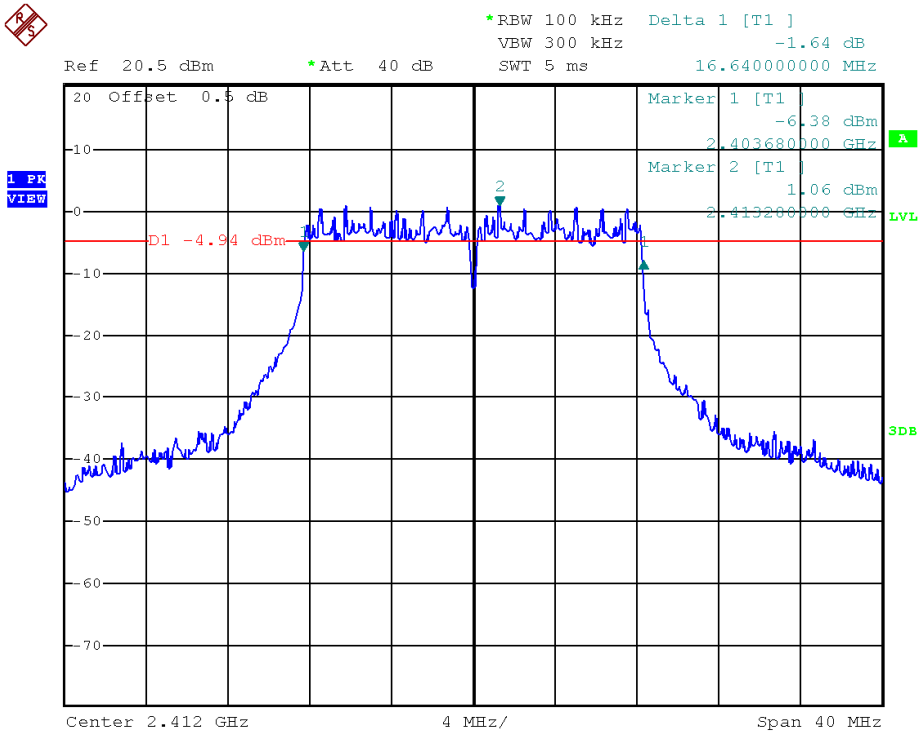
802.11b, Highest Channel



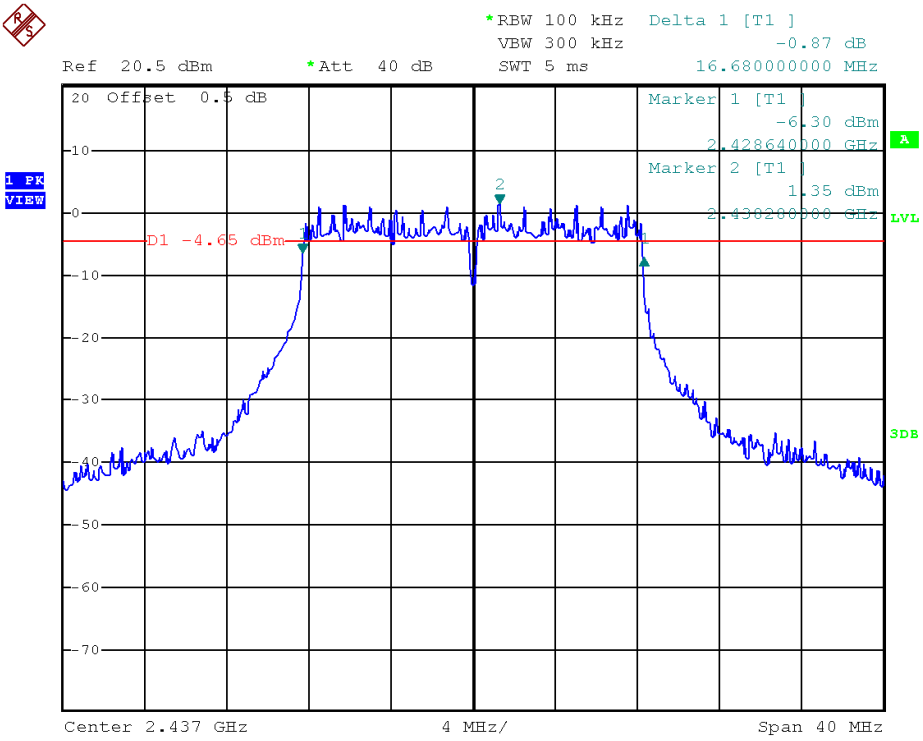
TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11g, Lowest Channel



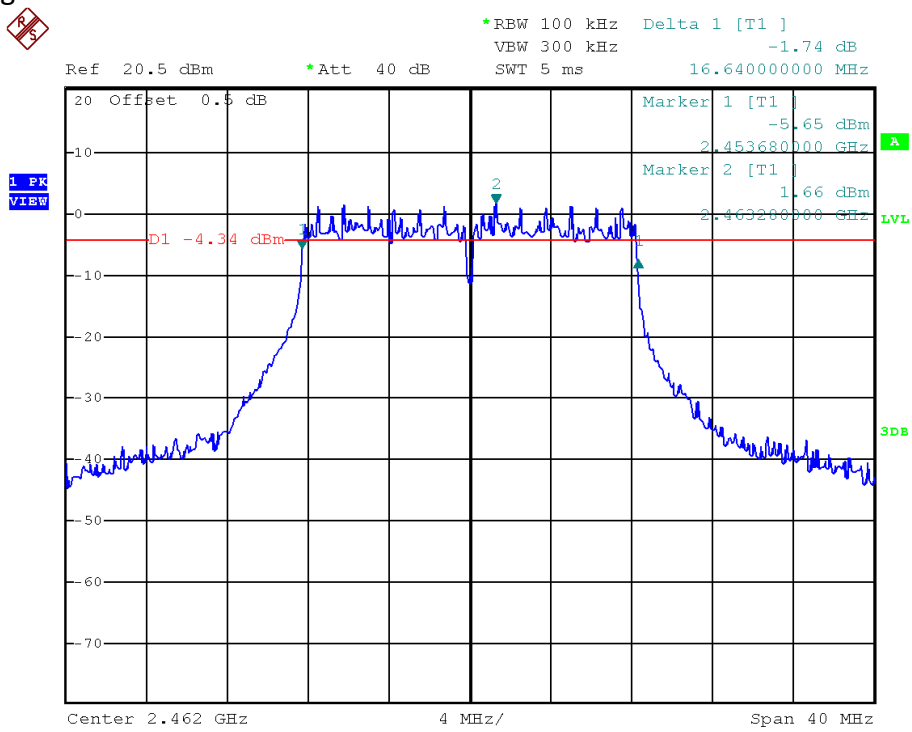
802.11g, Middle Channel



TEST REPORT

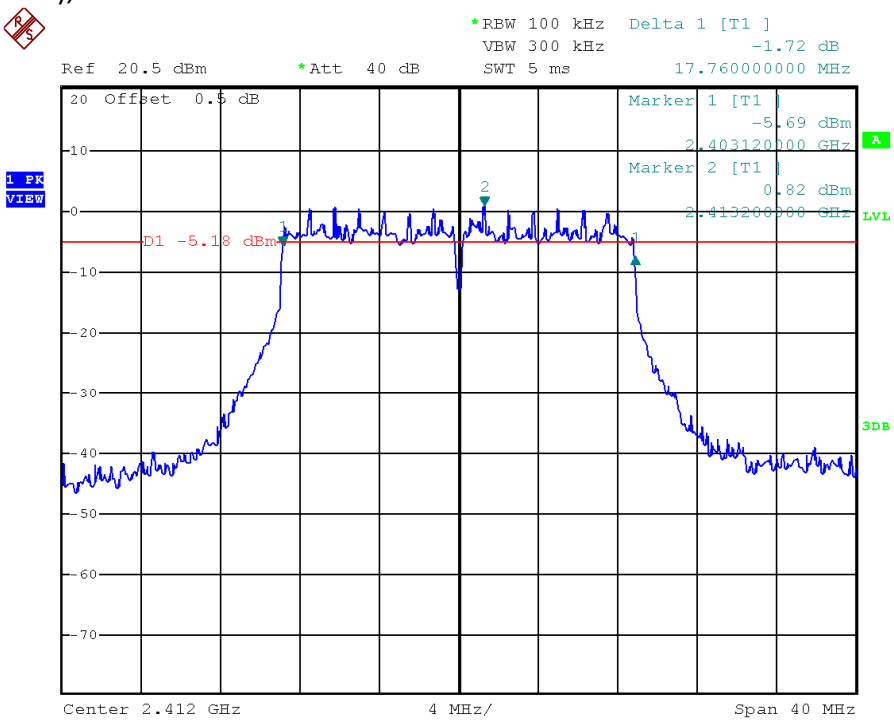
PLOTS OF 6dB RF BANDWIDTH

802.11g, Highest Channel

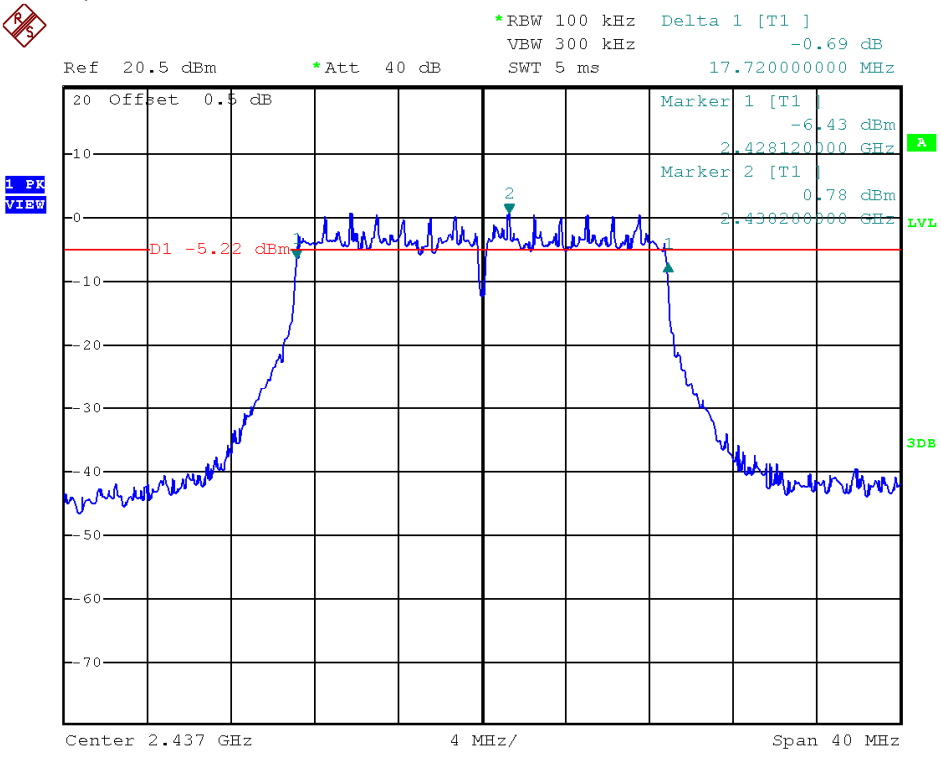


PLOTS OF 6dB RF BANDWIDTH

802.11n (20MHz), Lowest Channel



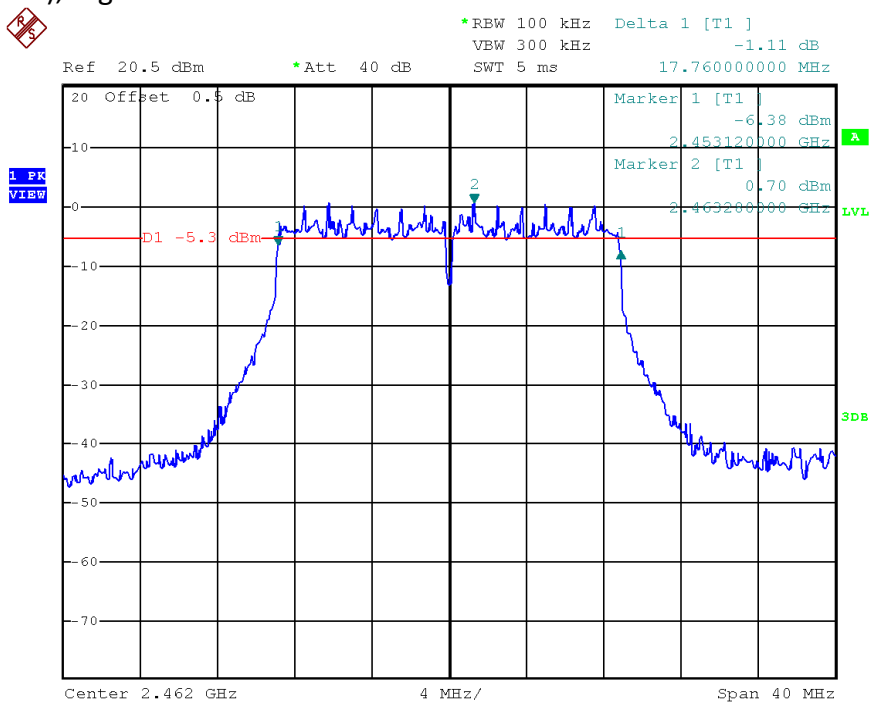
802.11n (20MHz), Middle Channel



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

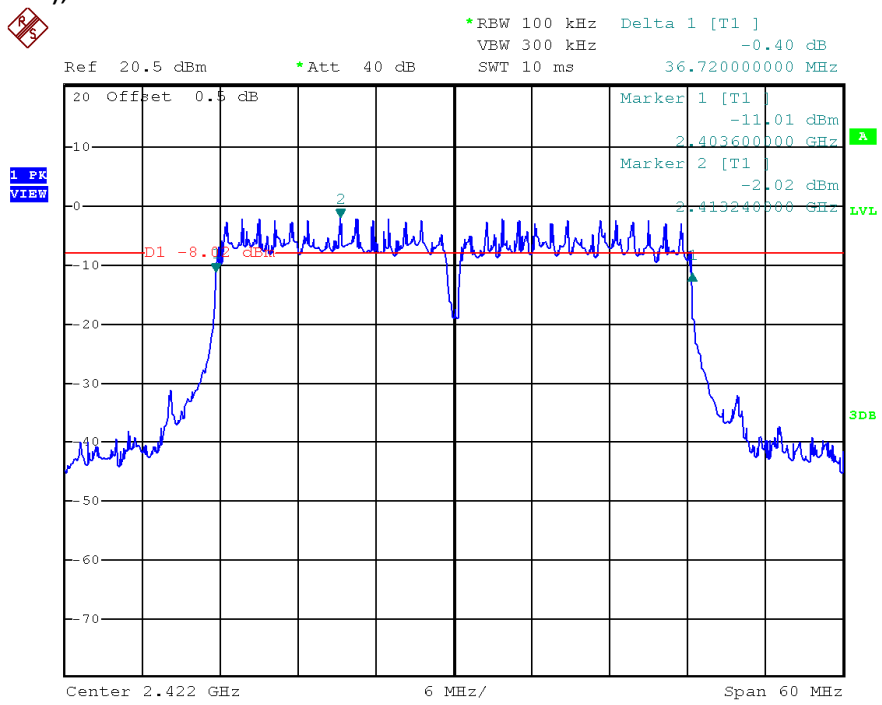
802.11n (20MHz), Highest Channel



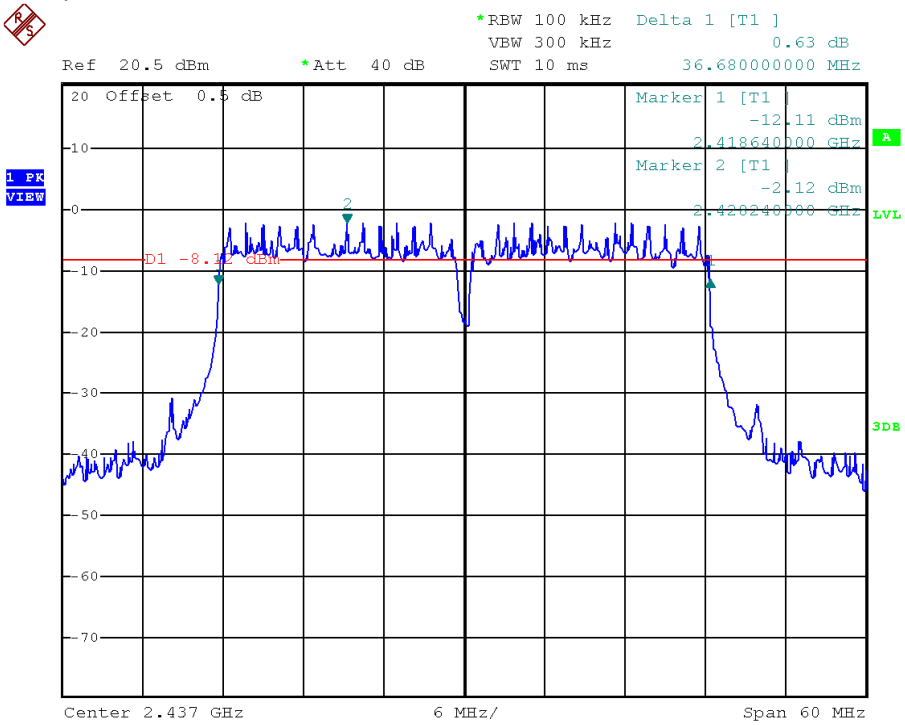
TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11n (40MHz), Lowest Channel



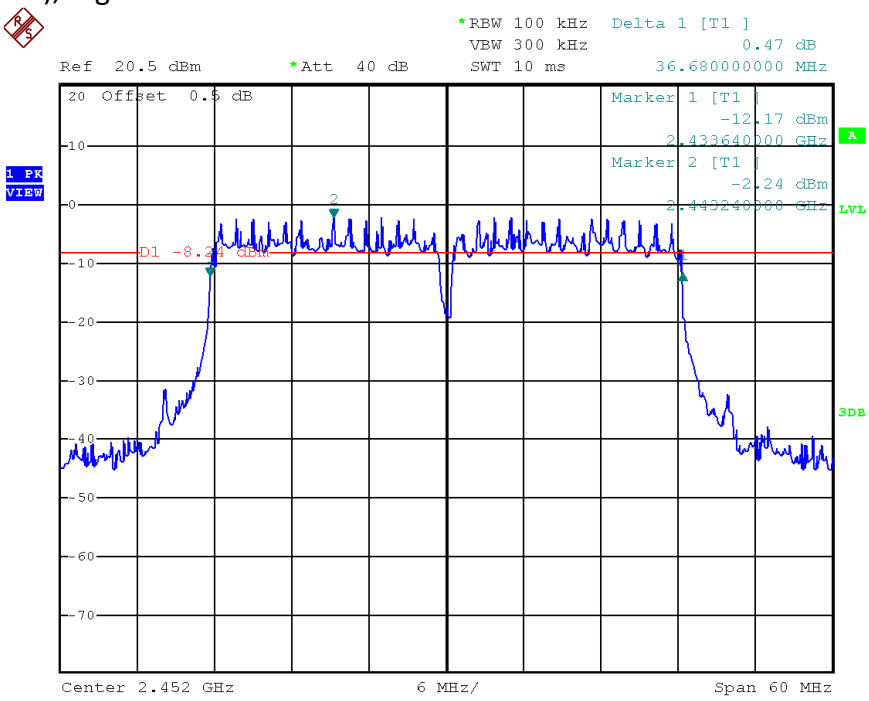
802.11n (40MHz), Middle Channel



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11n (40MHz), Highest Channel



TEST REPORT

4.3 Maximum Power Spectral Density

Antenna output of the EUT was coupled directly to spectrum analyzer. The measurement procedure 10.2 PKPSD was used. If an external attenuator and/or cable was used, these losses are compensated for using the OFFSET function of the analyser.

IEEE 802.11b (DSSS, 1 Mbps)

Frequency (MHz)		PSD in 100kHz (dBm)	PSD in 3kHz (dBm)
Low Channel:	2412	10.90	-5.05
Middle Channel:	2437	9.84	-5.65
High Channel:	2462	10.65	-5.50

IEEE 802.11g (OFDM, 6 Mbps)

Frequency (MHz)		PSD in 100kHz (dBm)
Low Channel:	2412	1.28
Middle Channel:	2437	1.24
High Channel:	2462	1.28

IEEE 802.11n (20MHz) (OFDM, MCS0)

Frequency (MHz)		PSD in 100kHz (dBm)
Low Channel:	2412	0.52
Middle Channel:	2437	0.34
High Channel:	2462	0.52

IEEE 802.11n (40MHz) (OFDM, MCS0)

Frequency (MHz)		PSD in 100kHz (dBm)
Low Channel:	2422	-2.00
Middle Channel:	2437	-2.24
High Channel:	2452	-2.24

Cable Loss: 0.5 dB

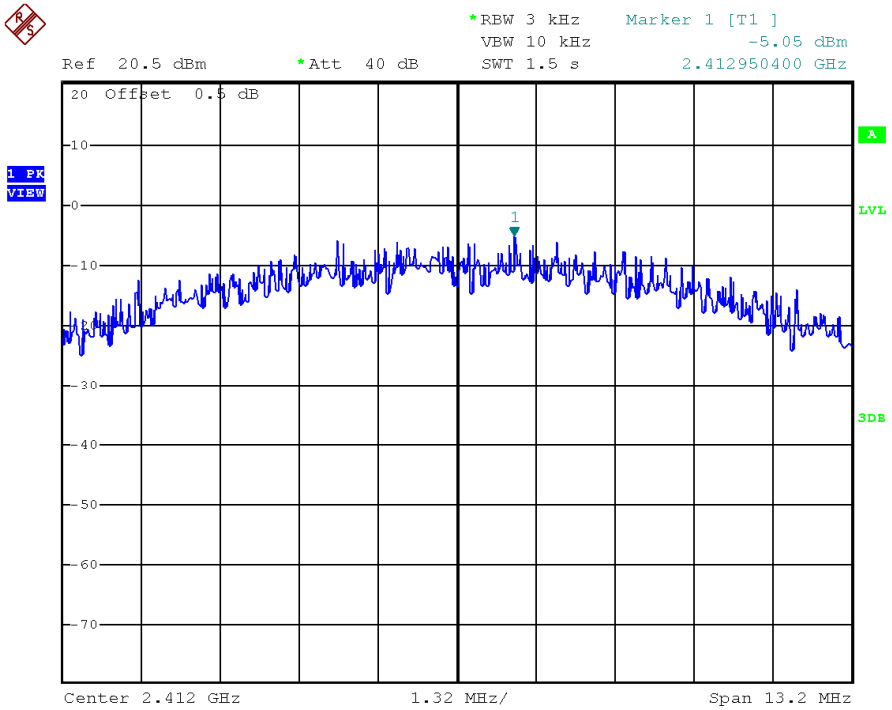
Limit:
8dBm

The plots of power spectral density are as below.

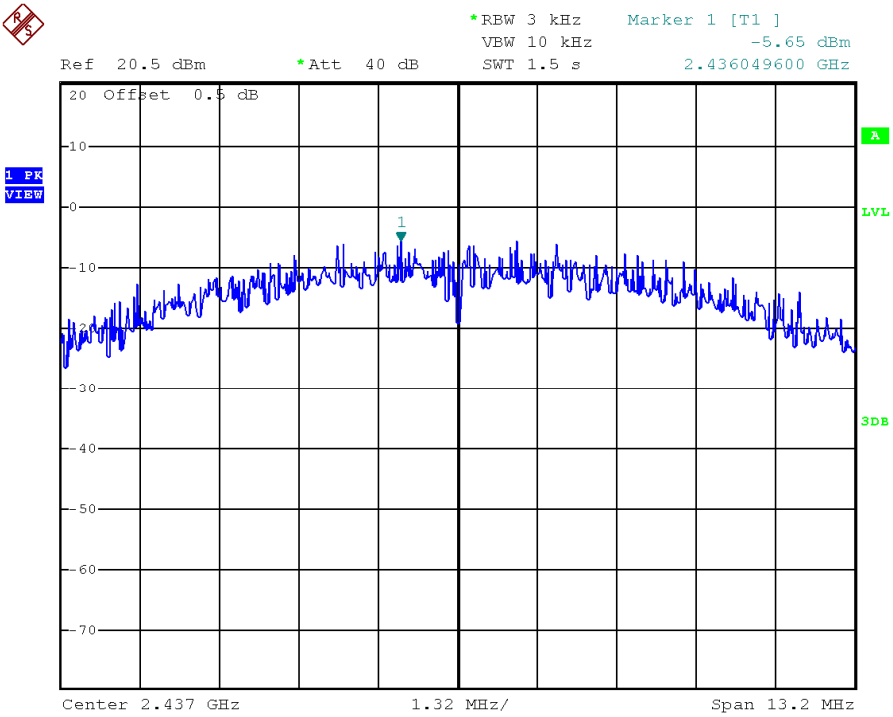
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (3kHz RBW)

802.11b, Lowest channel



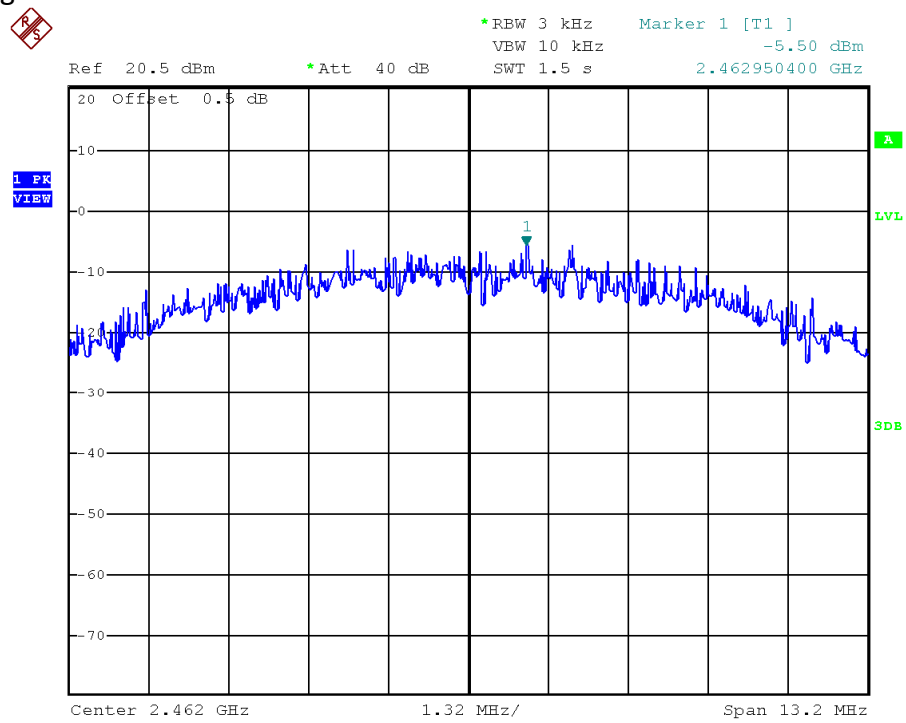
802.11b, Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (3kHz RBW)

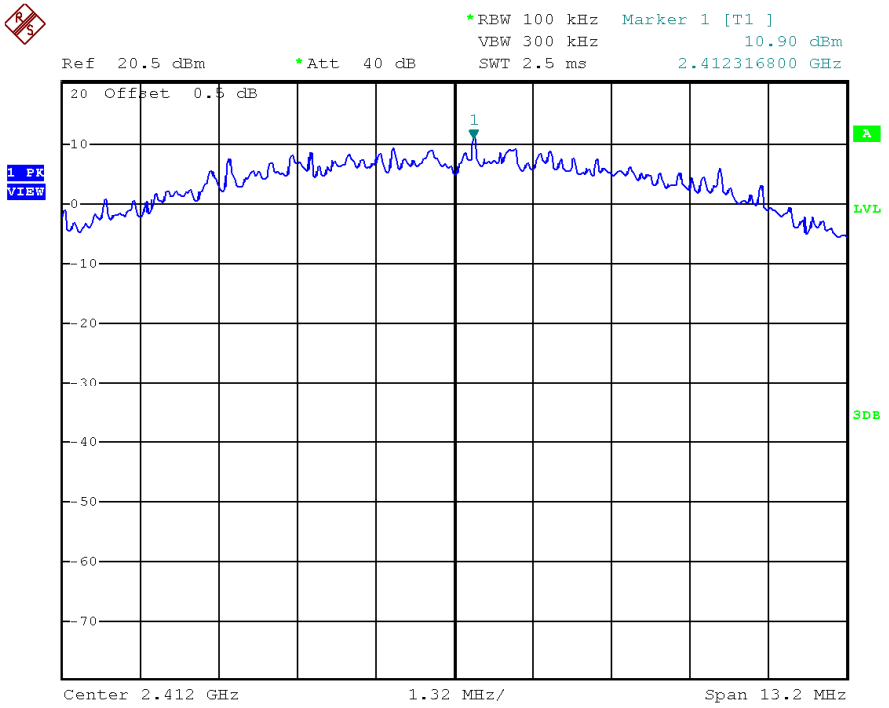
802.11b, Highest channel



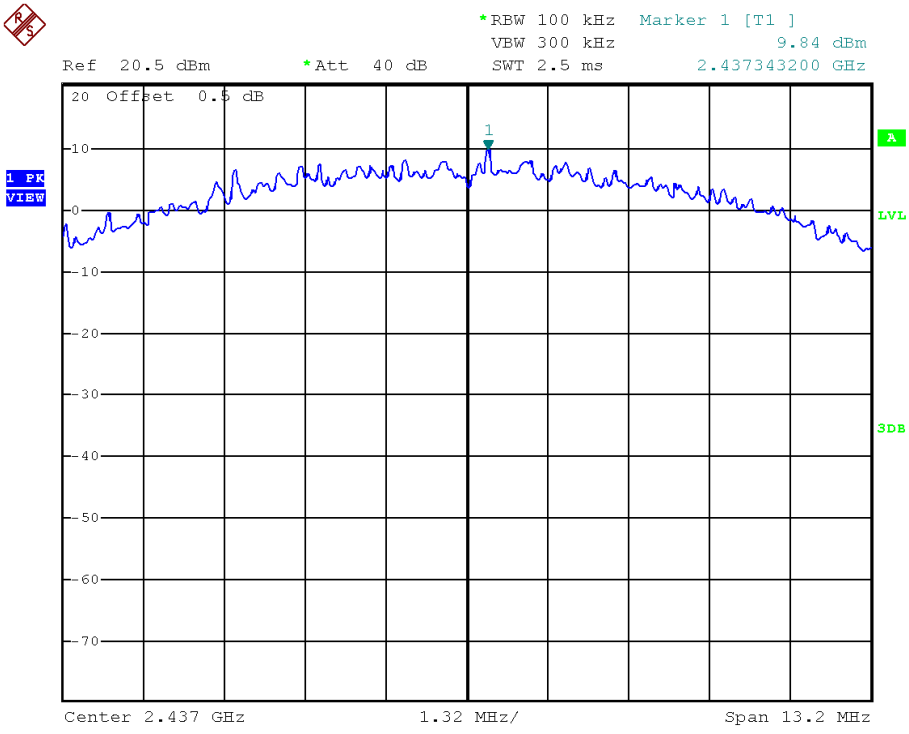
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (100kHz RBW)

802.11b, Lowest channel



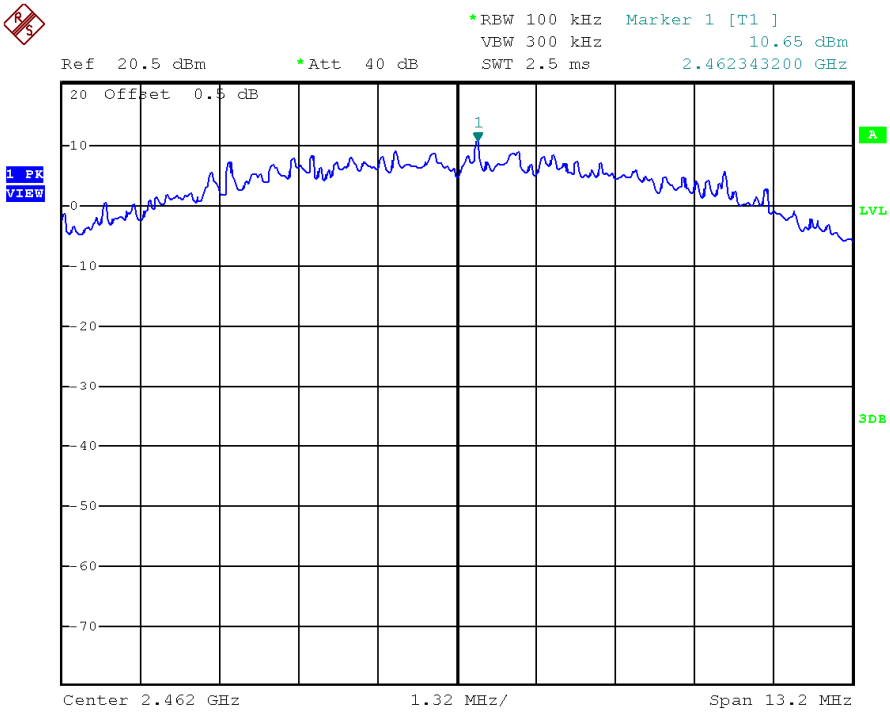
802.11b, Middle channel



TEST REPORT

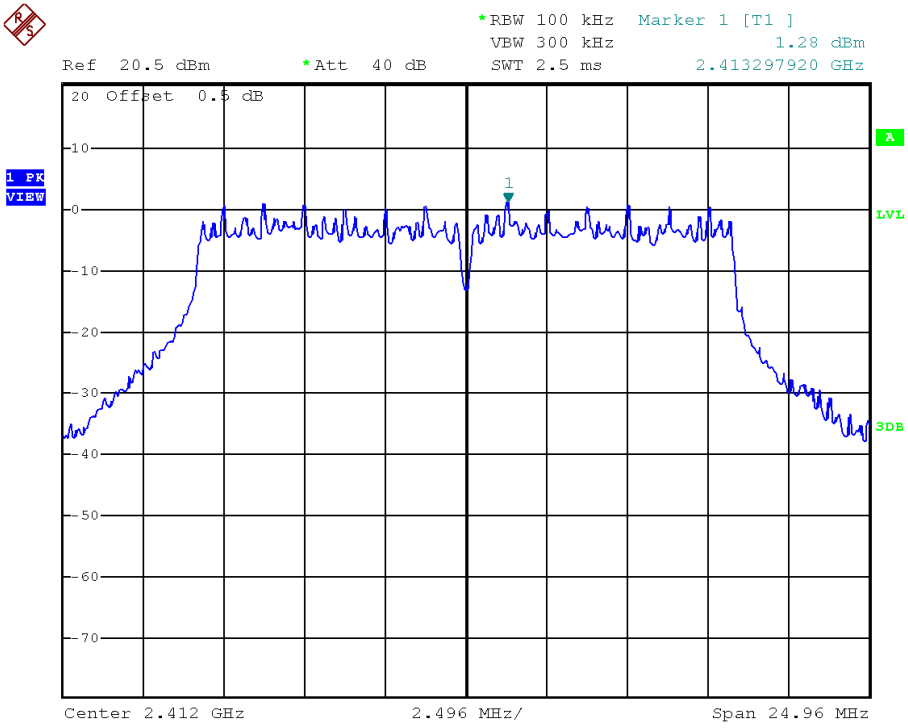
PLOTS OF POWER SPECTRAL DENSITY (100kHz RBW)

802.11b, Highest channel

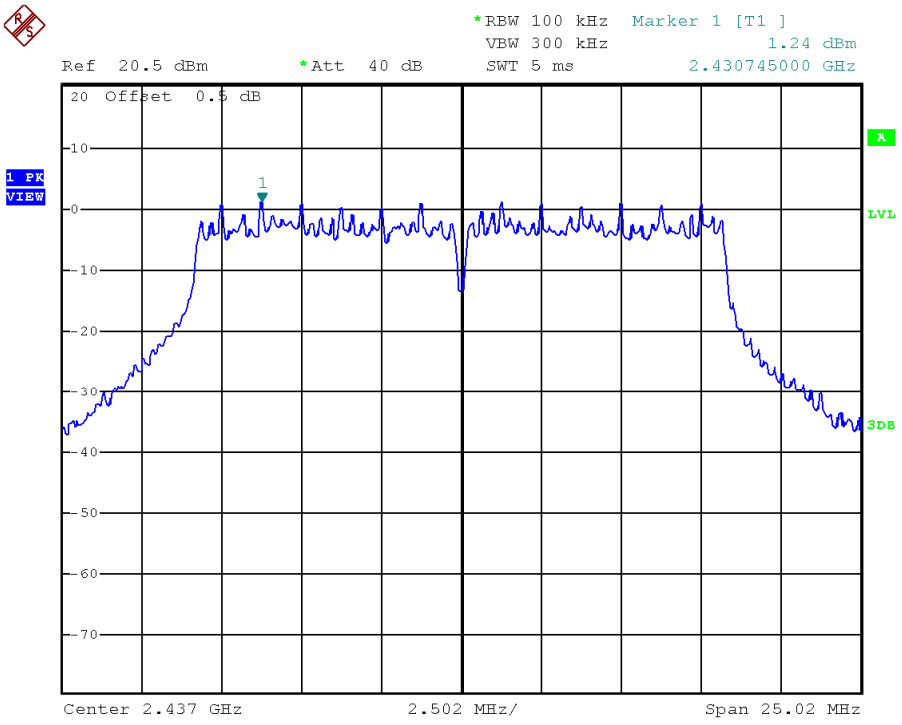


PLOTS OF POWER SPECTRAL DENSITY

802.11g, Lowest channel



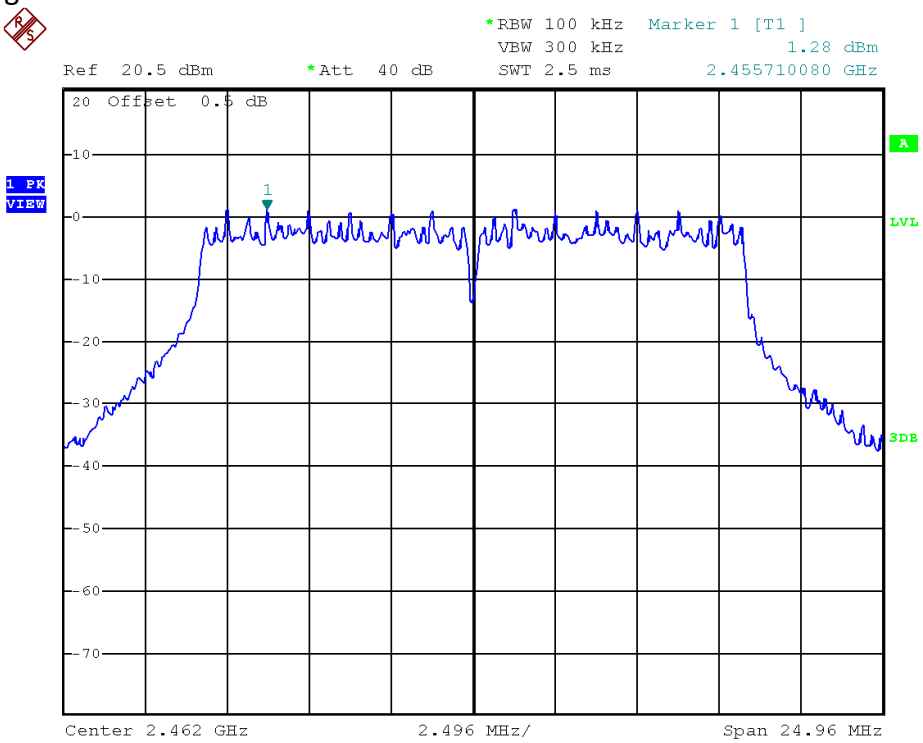
802.11g, Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY

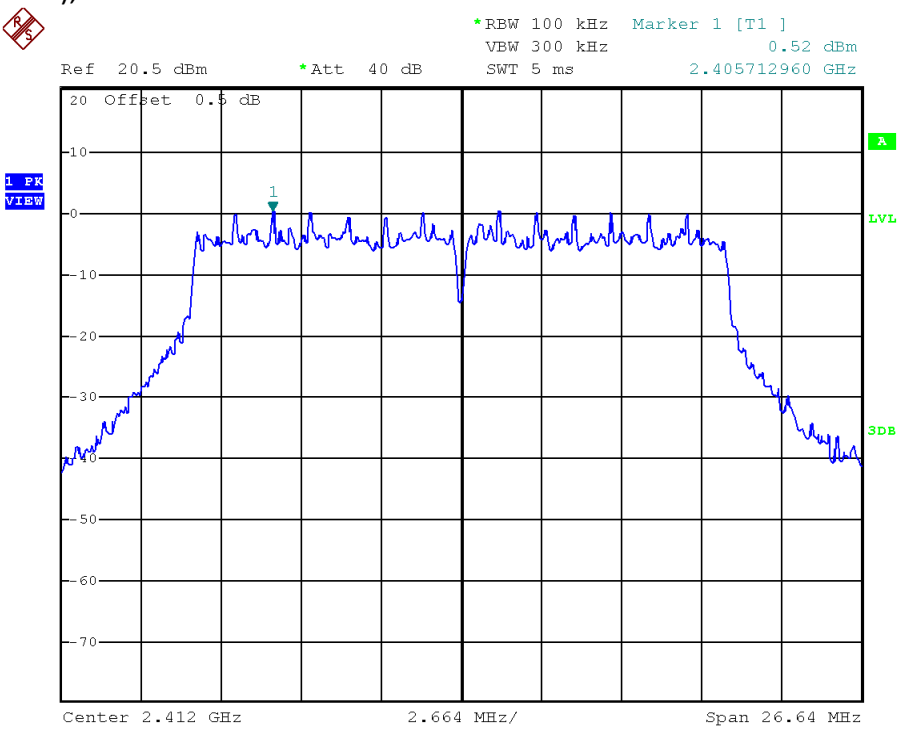
802.11g, Highest channel



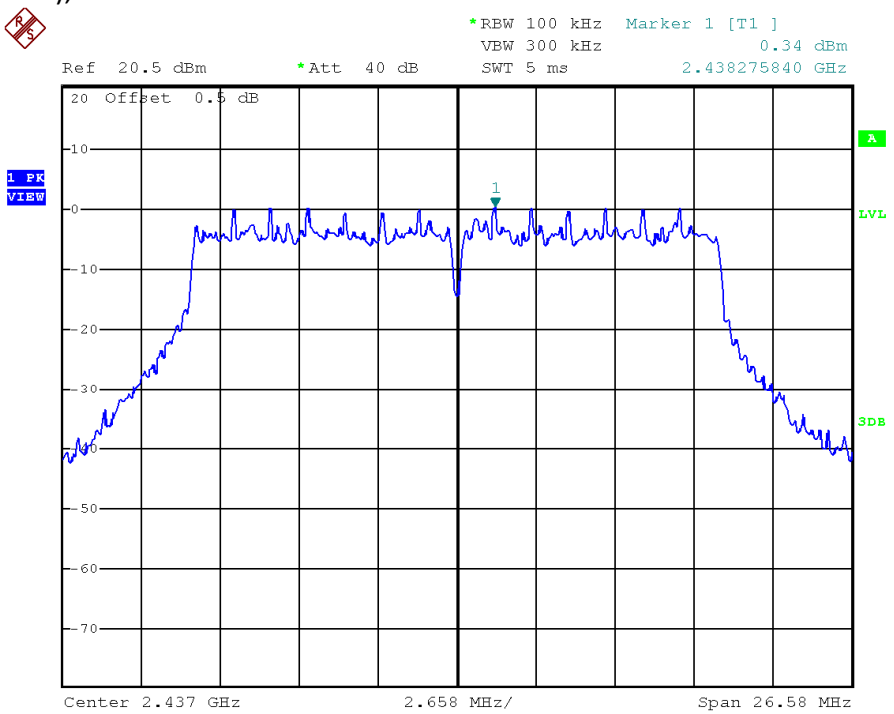
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY

802.11n (20MHz), Lowest channel



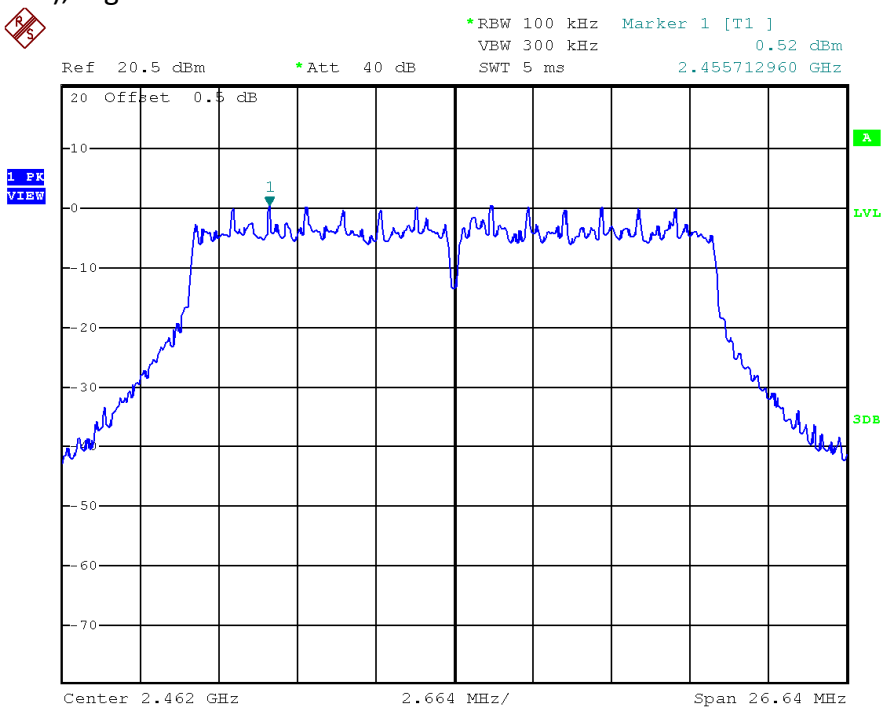
802.11n (20MHz), Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY

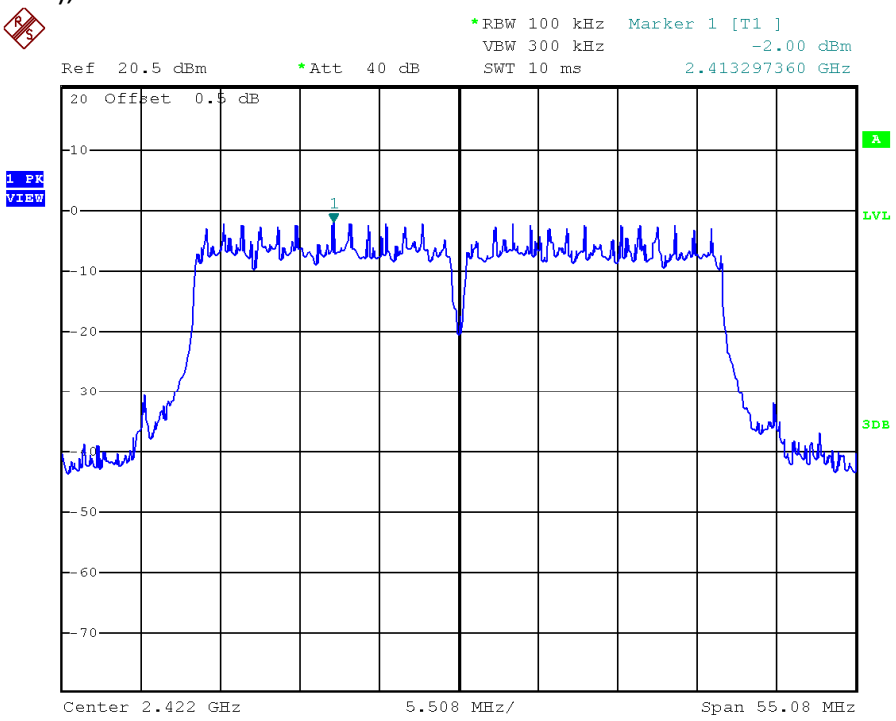
802.11n (20MHz), Highest channel



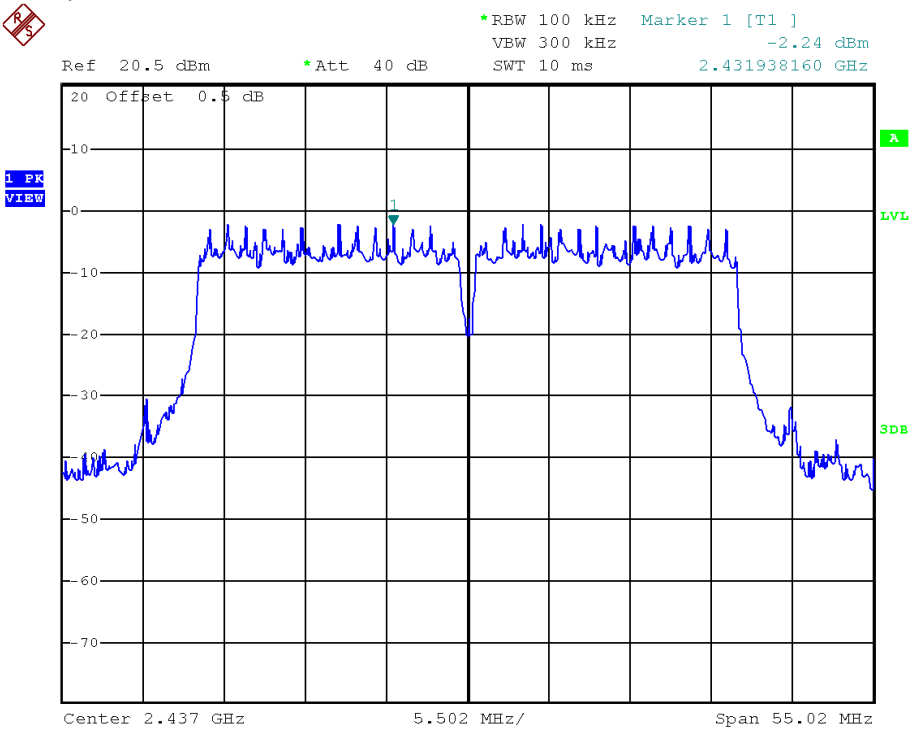
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY

802.11n (40MHz), Lowest channel



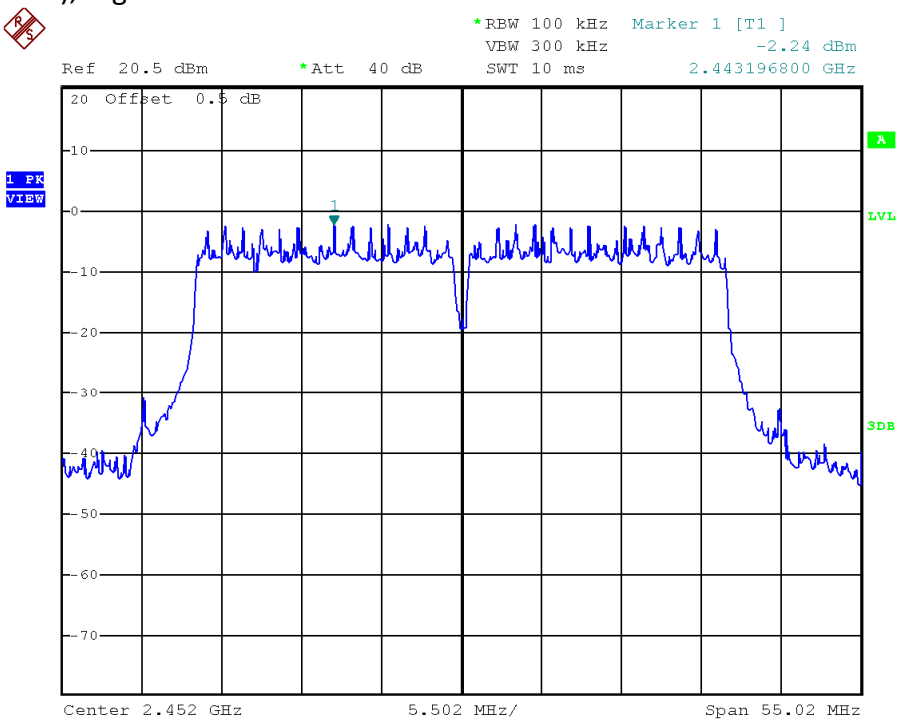
802.11n (40MHz), Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY

802.11n (20MHz), Highest channel



4.4 Out of Band Conducted Emissions

For 802.11b/g/n20/n40MHz, the maximum conducted (peak) output power was used to demonstrate compliance as described in 9.1. Then the display line (in red) shown in the following plots denotes the limit at 20dB below maximum measured in-band peak PSD level in 100 KHz bandwidth for 802.11b/g/n20/n40MHz.

The measurement procedures under sections 11 of KDB558074 D01 v04 (05-April-2017) were used.

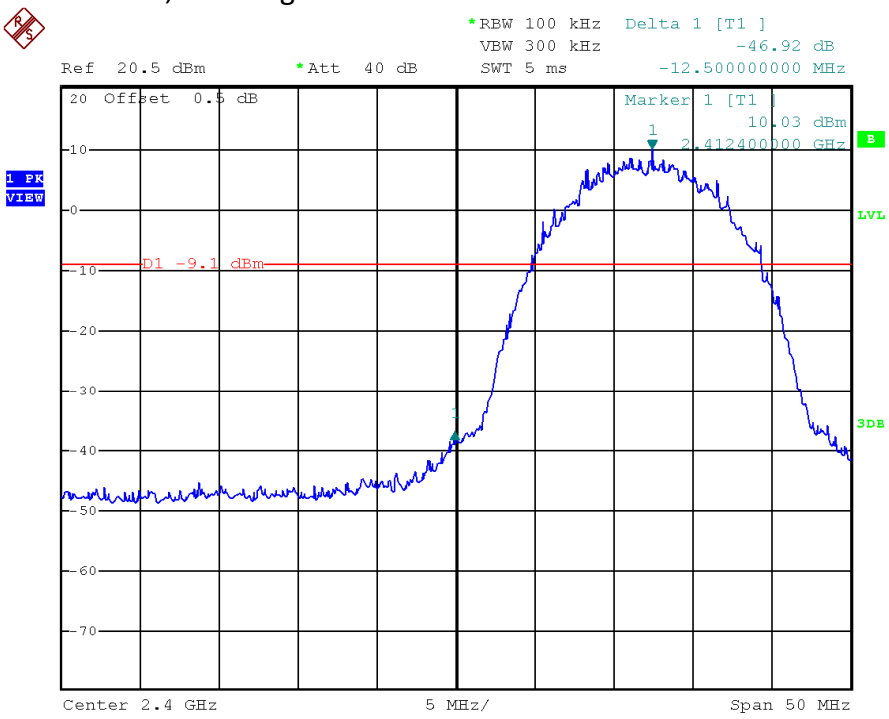
Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

Limits:
All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB for 802.11b,g,n20MHz, n40MHz below the maximum measured in-band peak PSD level.

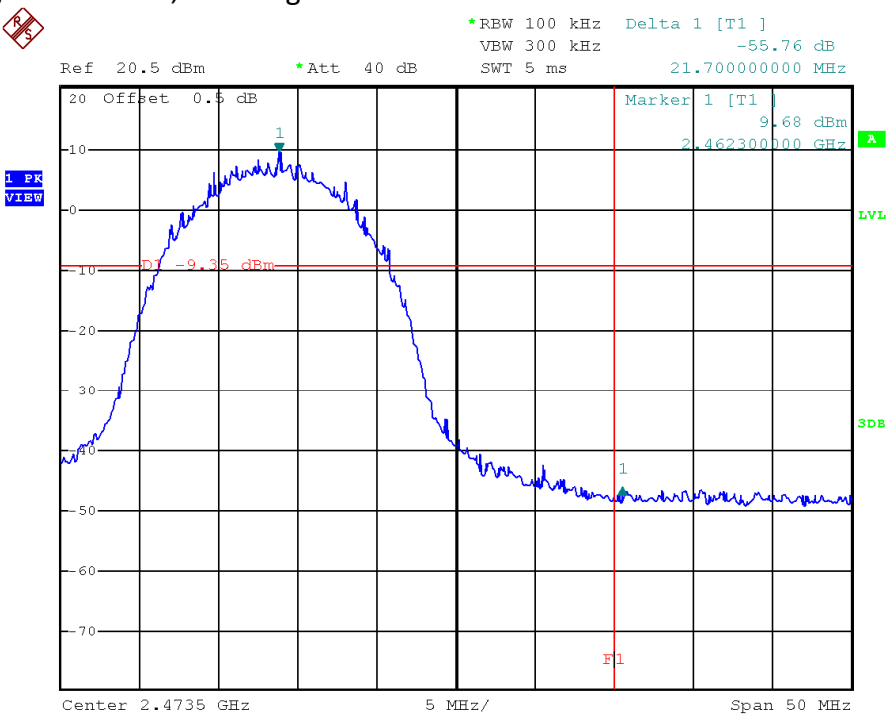
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Lowest Channel, Bandedge



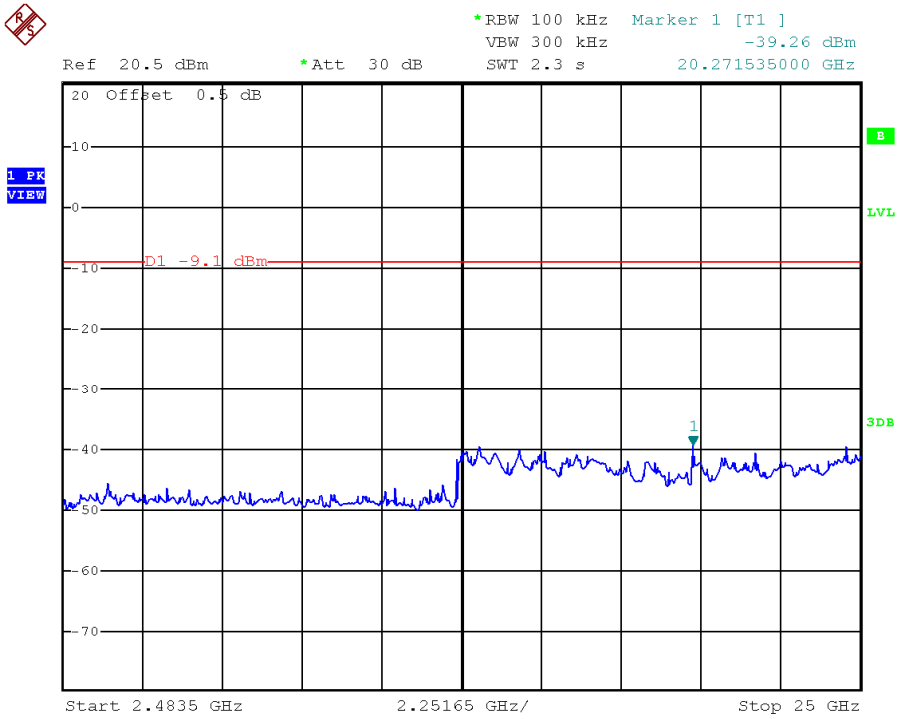
802.11b, Highest Channel, Bandedge



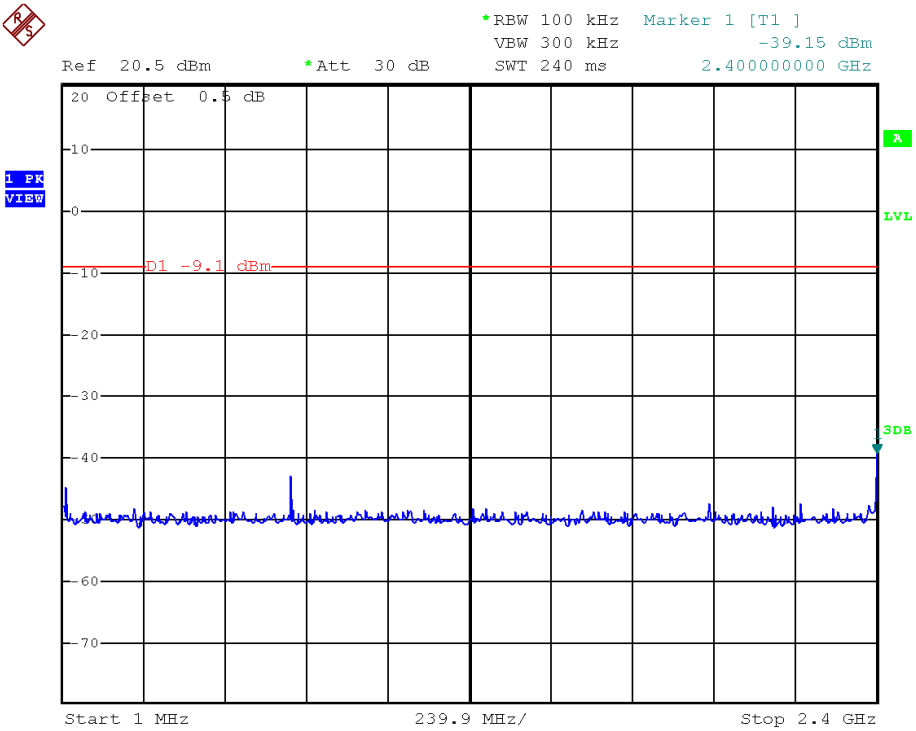
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Lowest Channel, Plot A



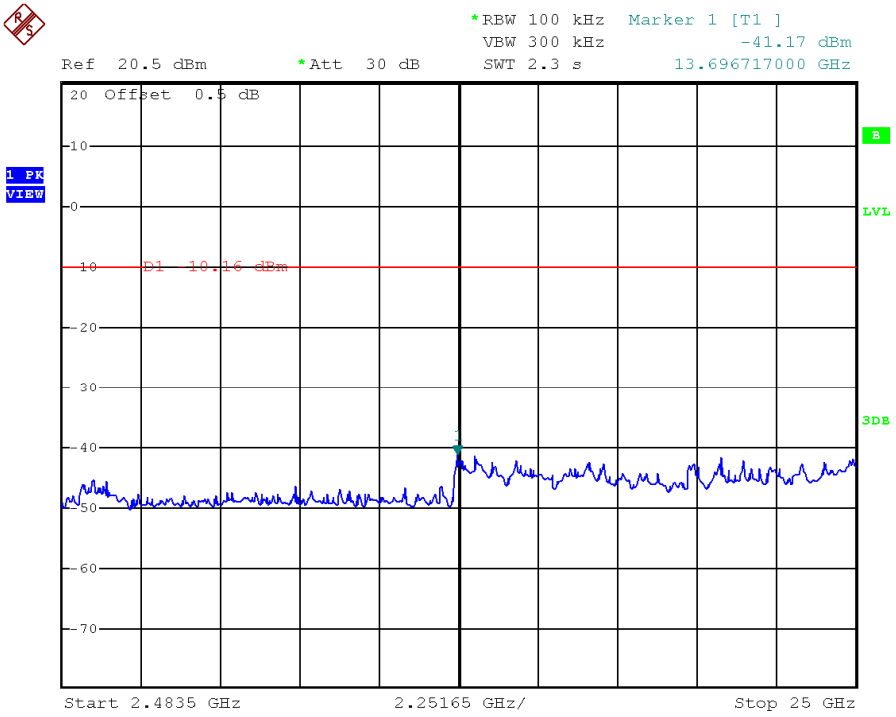
802.11b, Lowest Channel, Plot B



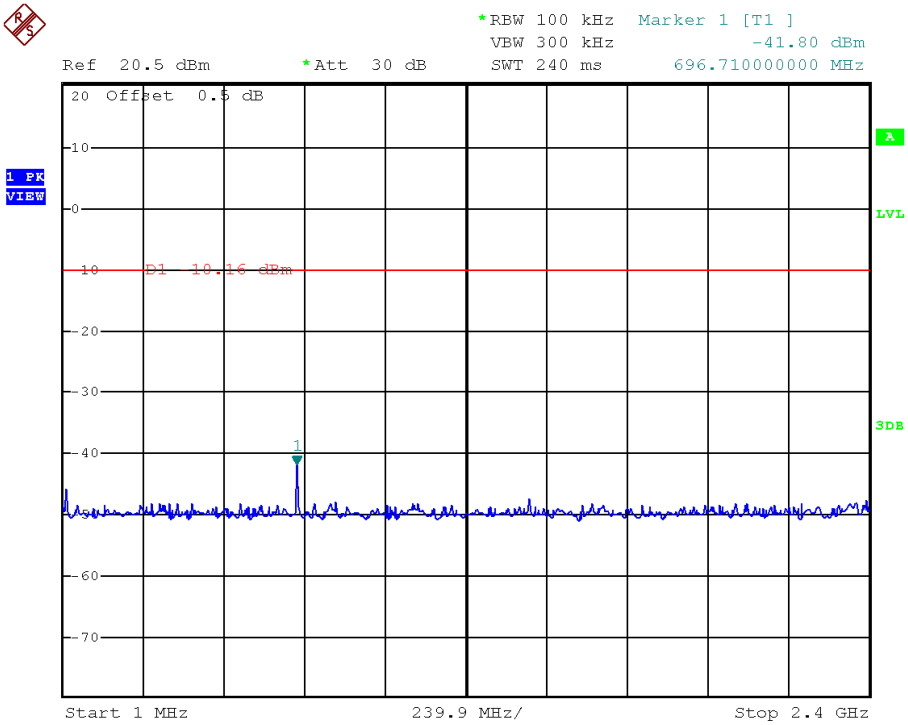
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Middle Channel, Plot A

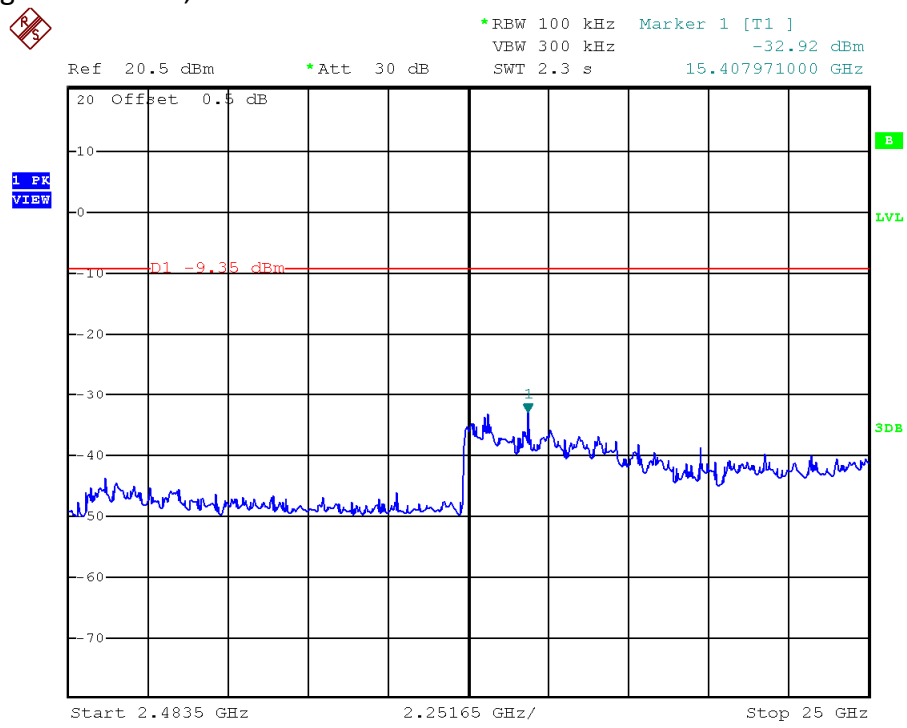


802.11b, Middle Channel, Plot B

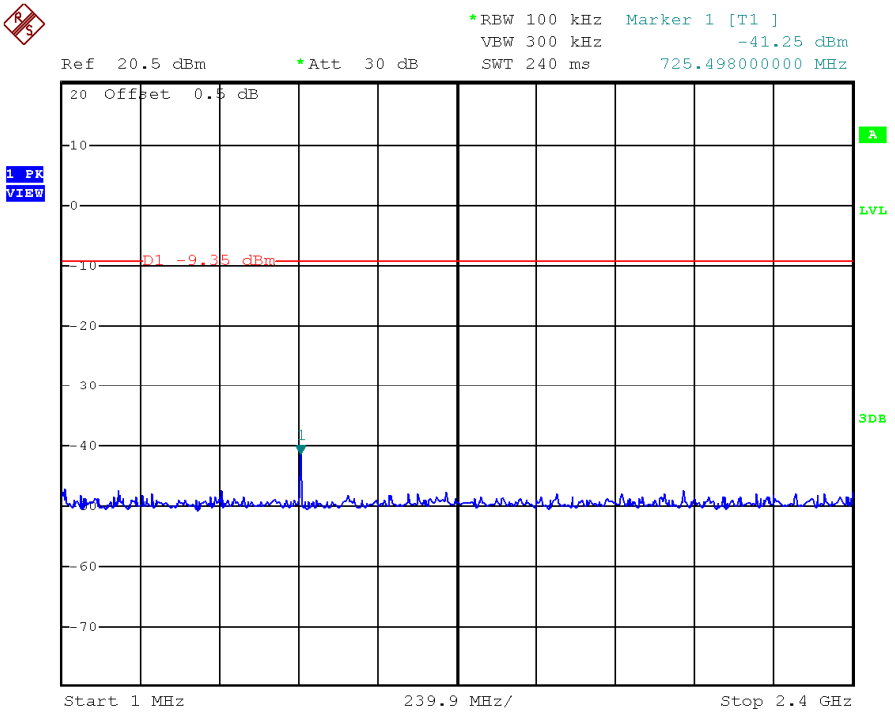


PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Highest Channel, Plot A



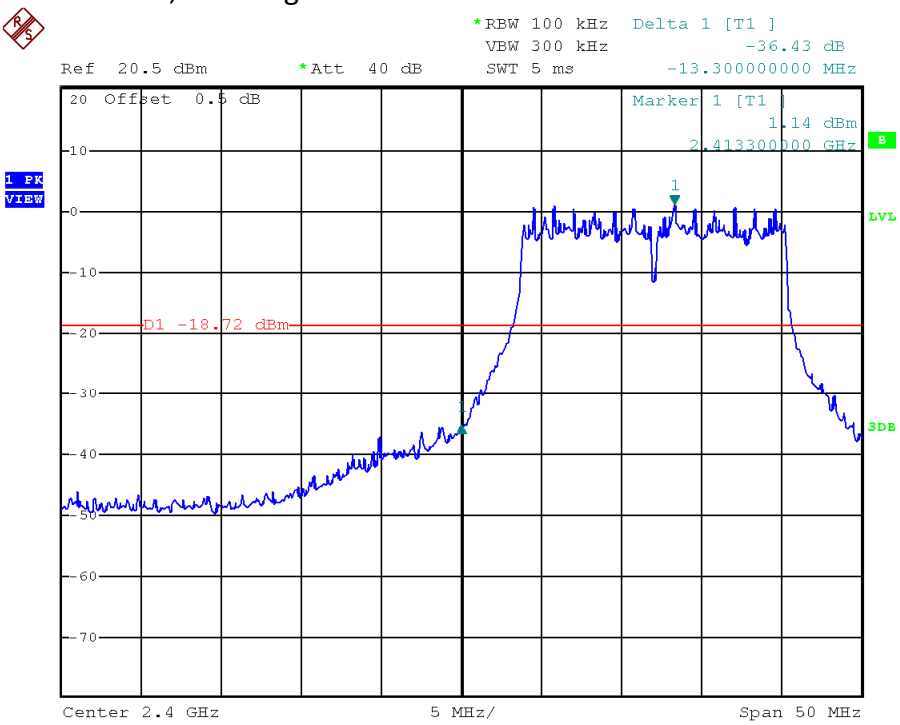
802.11b, Highest Channel, Plot B



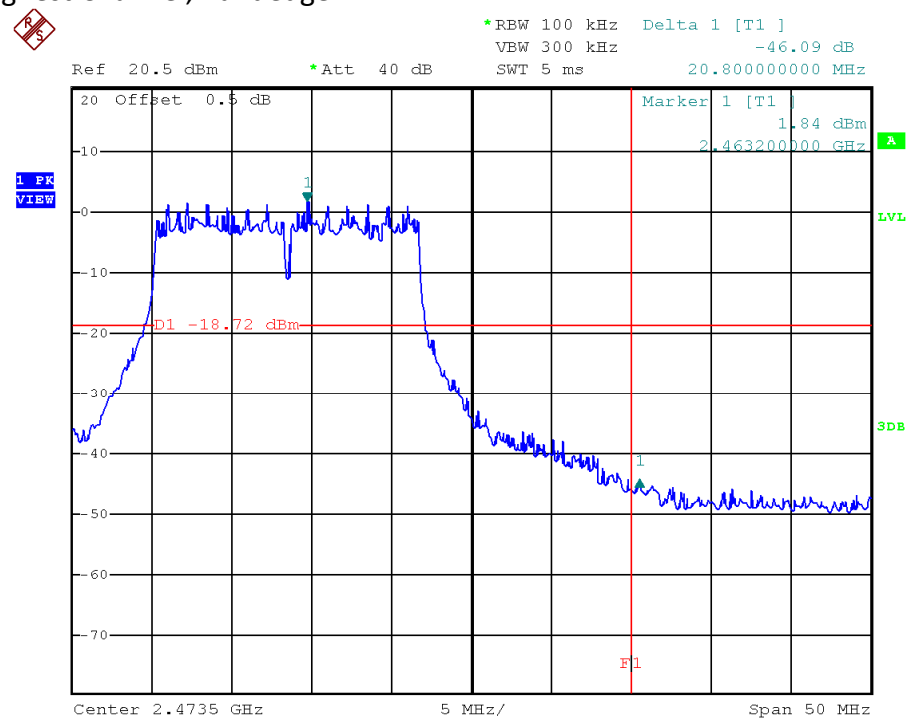
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Lowest Channel, Bandedge



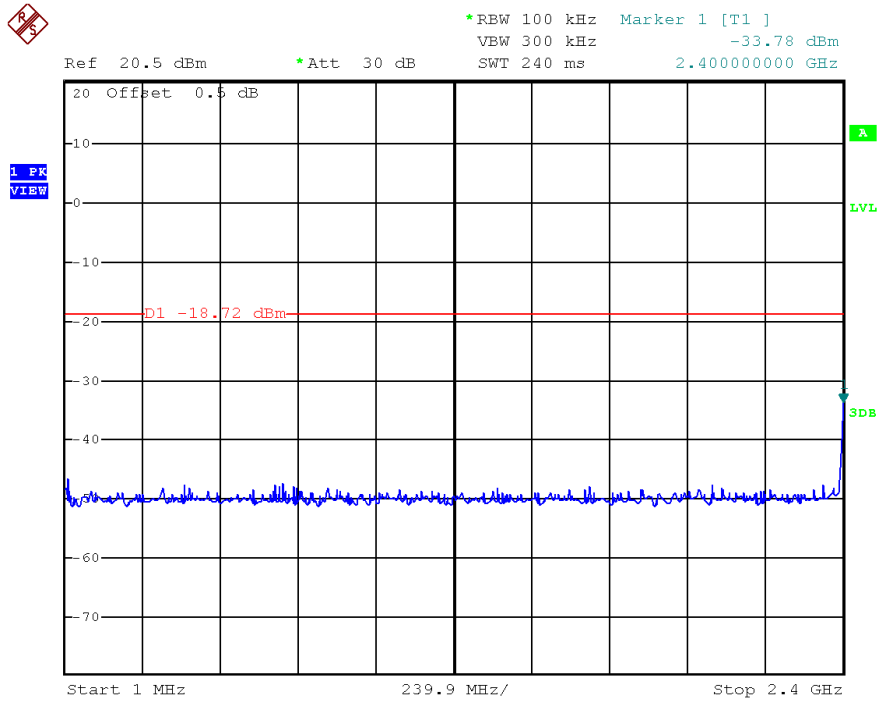
802.11g, Highest Channel, Bandedge



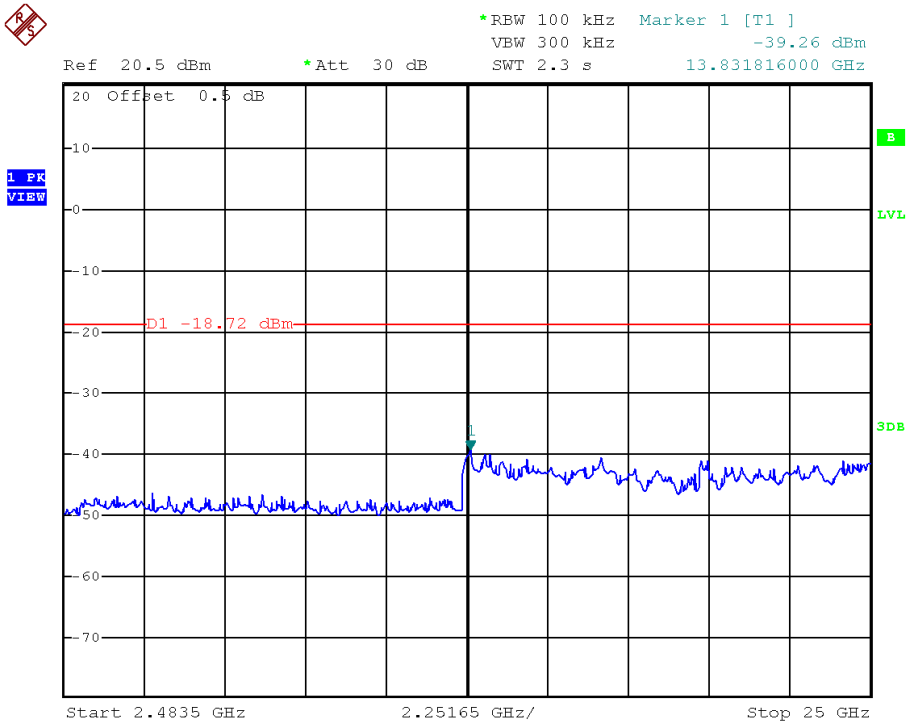
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Lowest Channel, Plot A



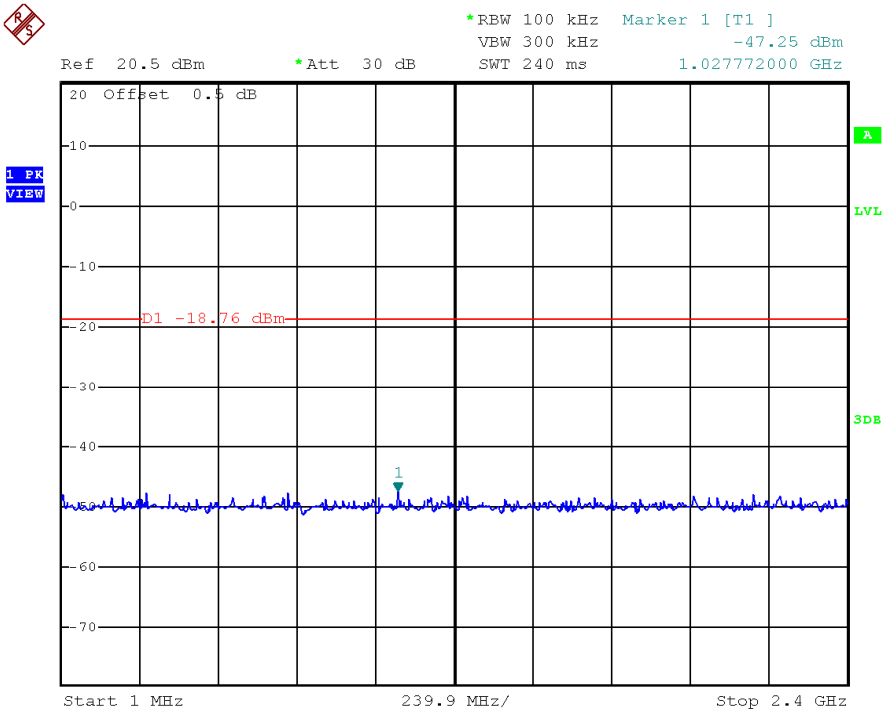
802.11g, Lowest Channel, Plot B



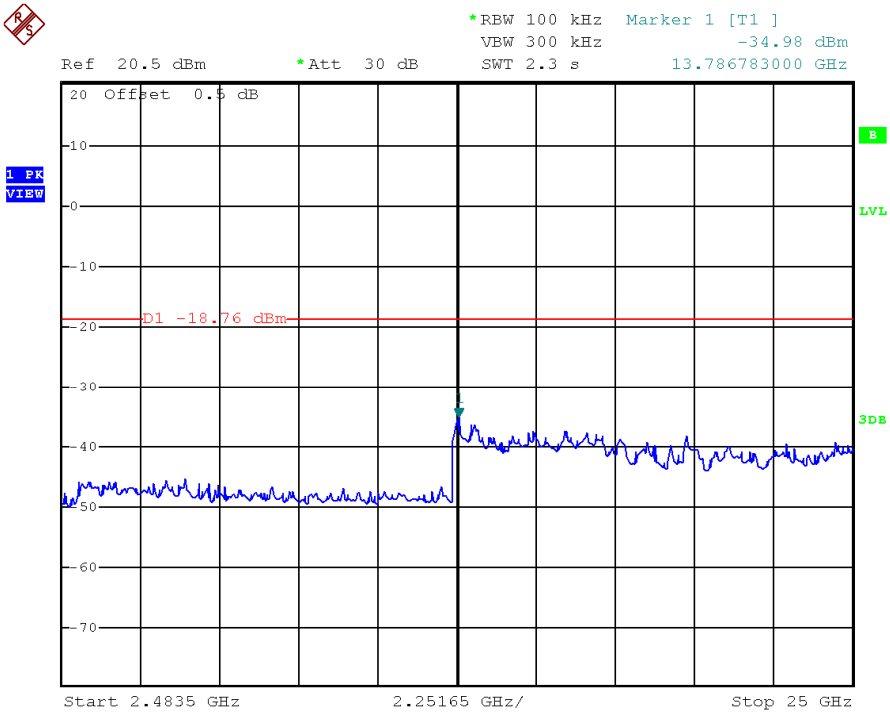
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Middle Channel, Plot A



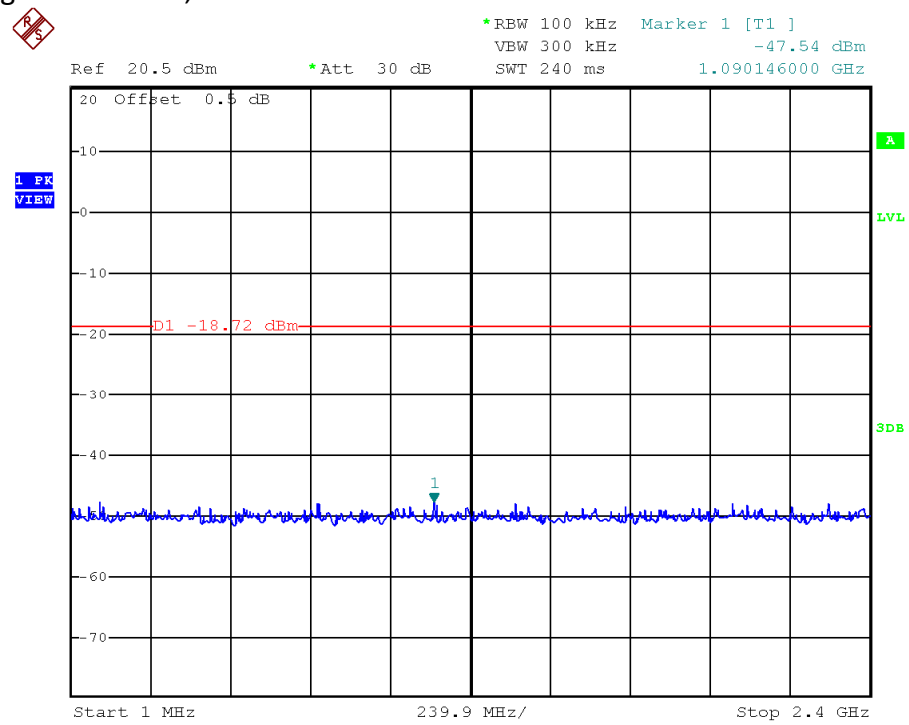
802.11g, Middle Channel, Plot B



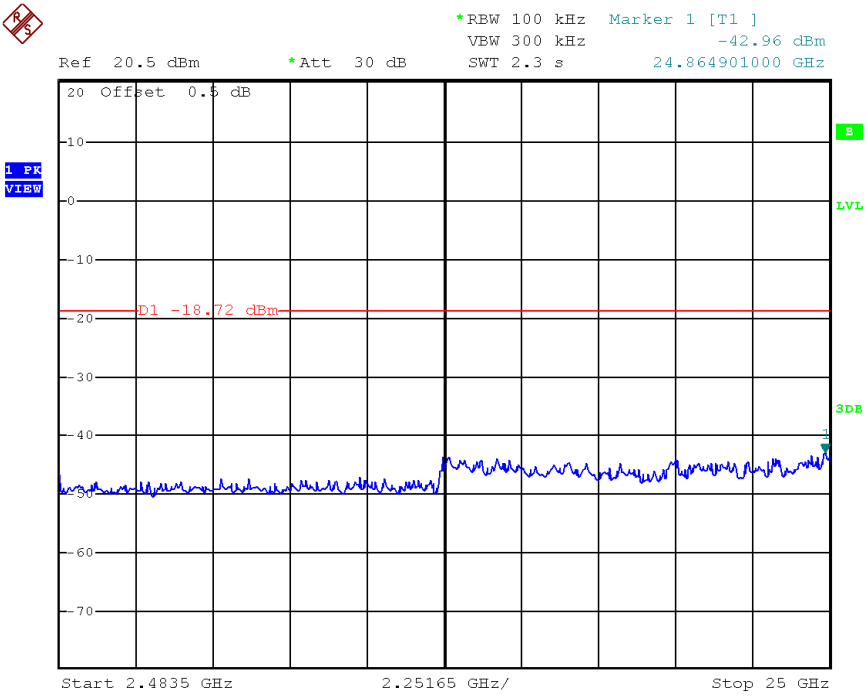
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Highest Channel, Plot A



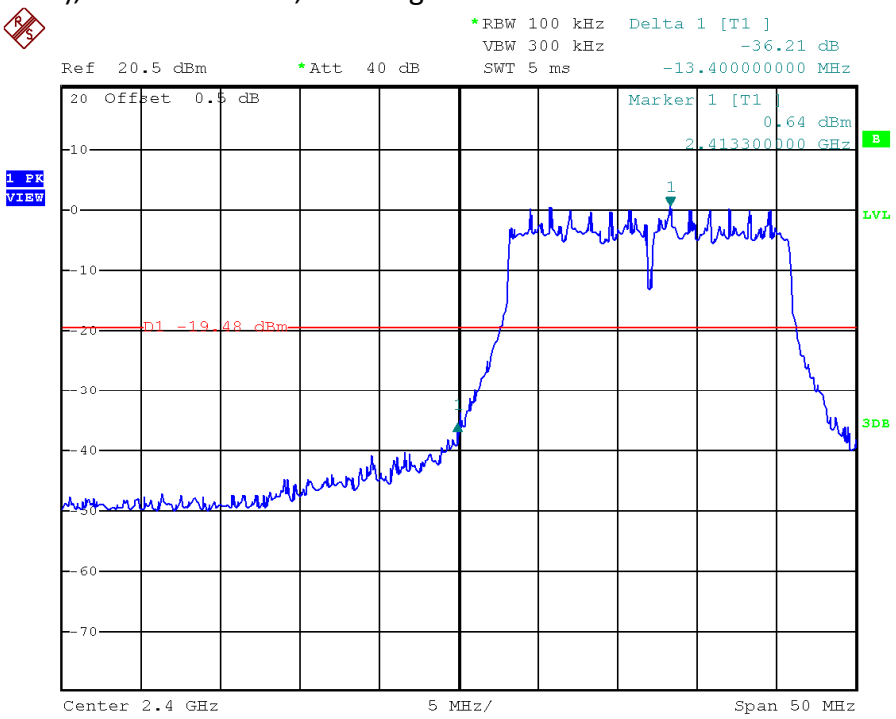
802.11g, Highest Channel, Plot B



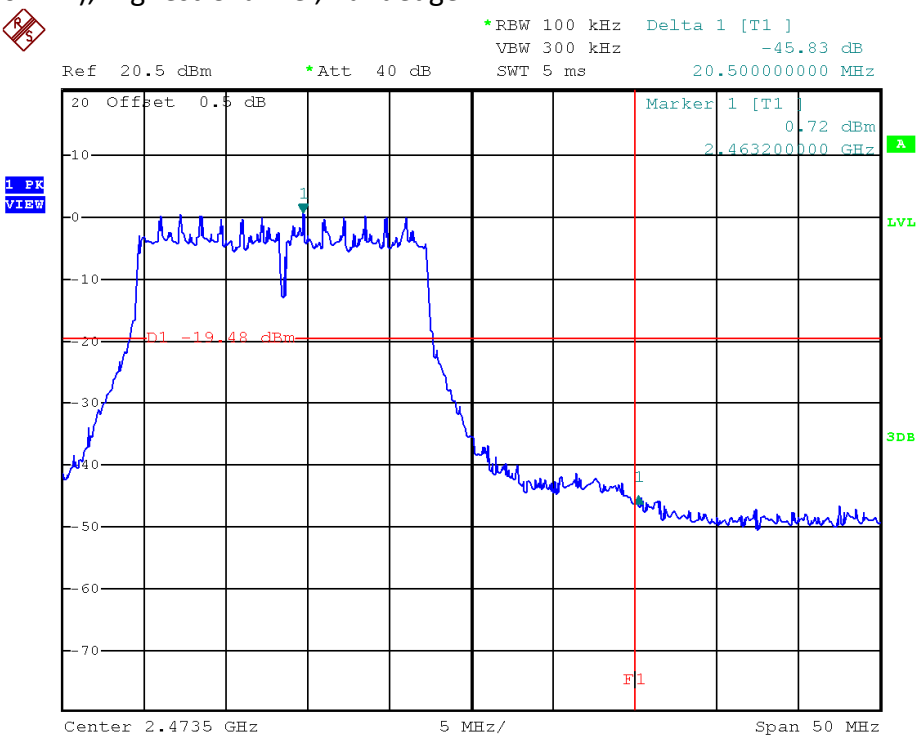
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802. 11n (20MHz), Lowest Channel, Bandedge

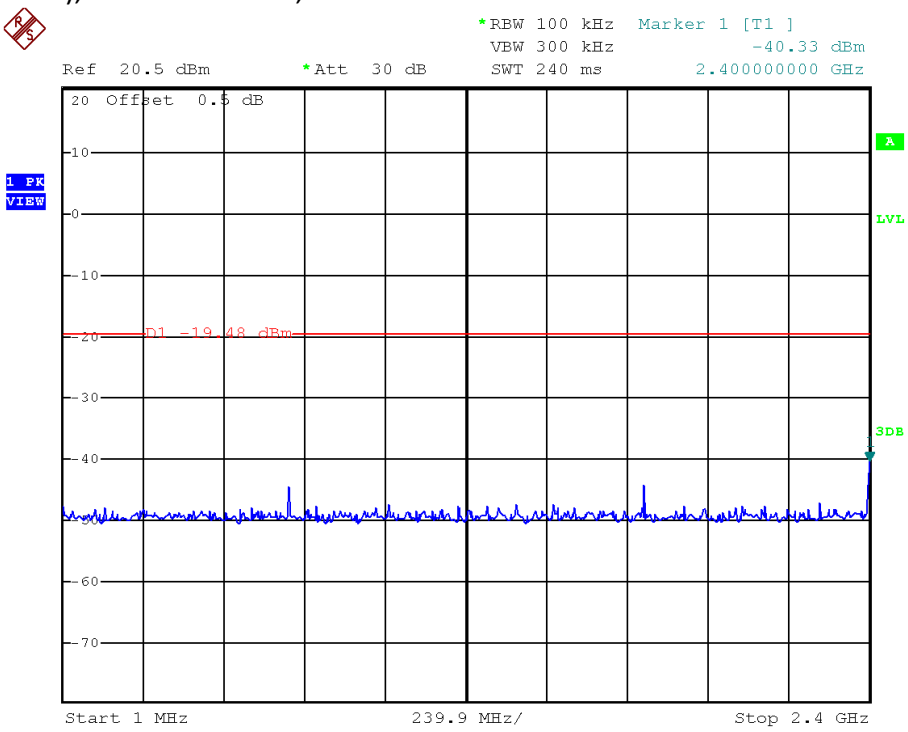


802. 11n (20MHz), Highest Channel, Bandedge

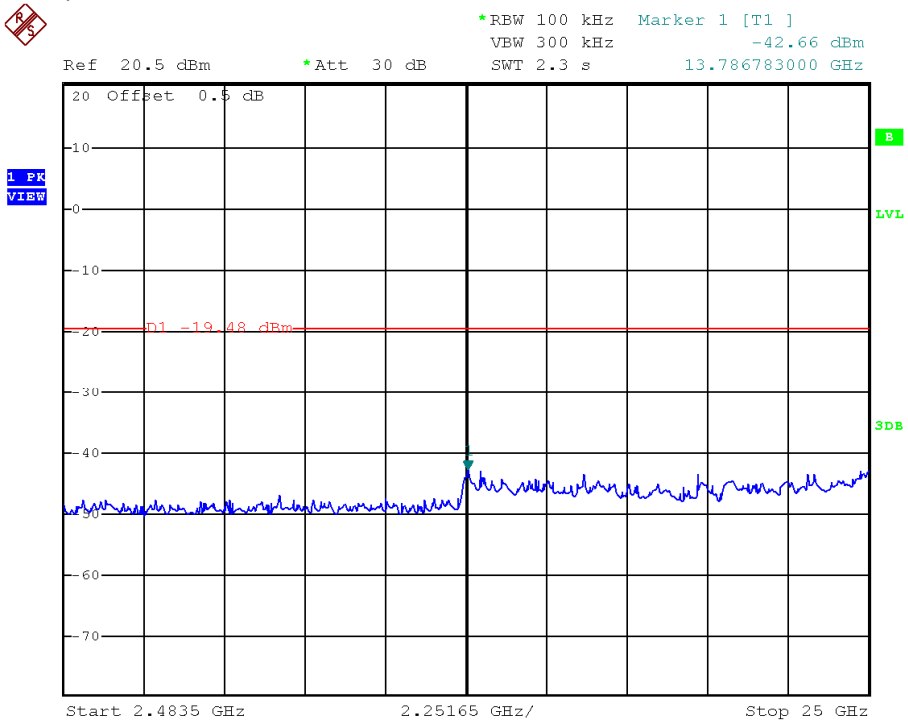


PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Lowest Channel, Plot A



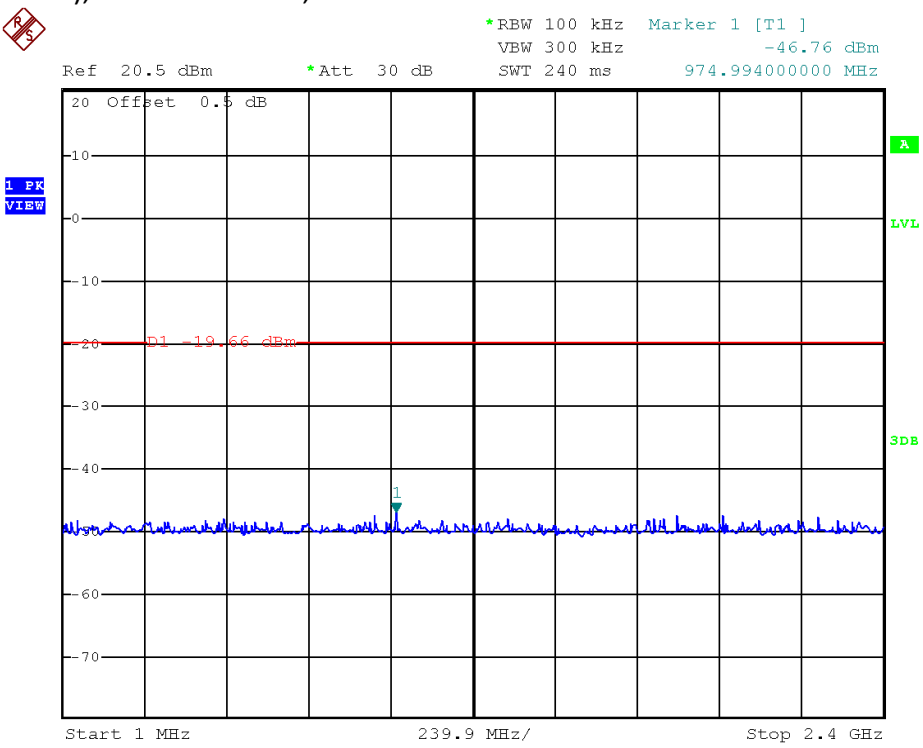
802.11n (20MHz), Lowest Channel, Plot B



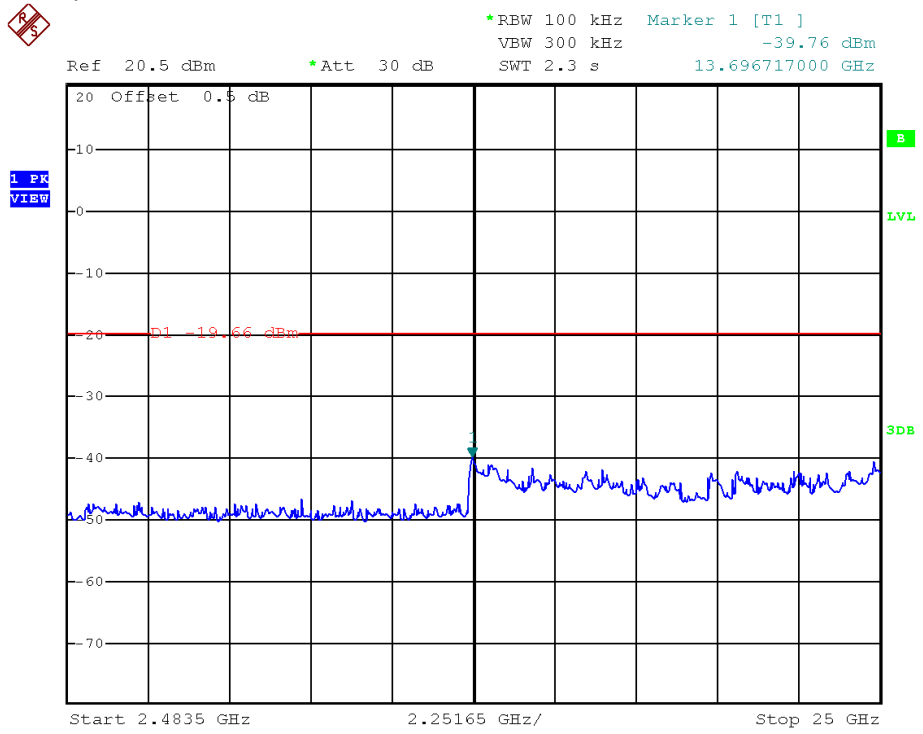
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Middle Channel, Plot A



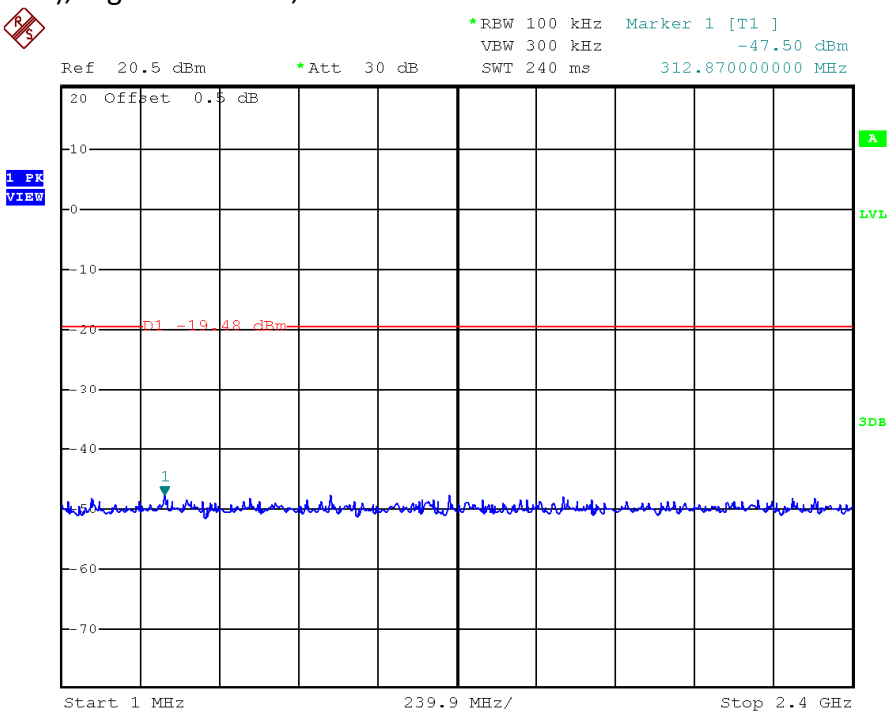
802.11n (20MHz), Middle Channel, Plot B



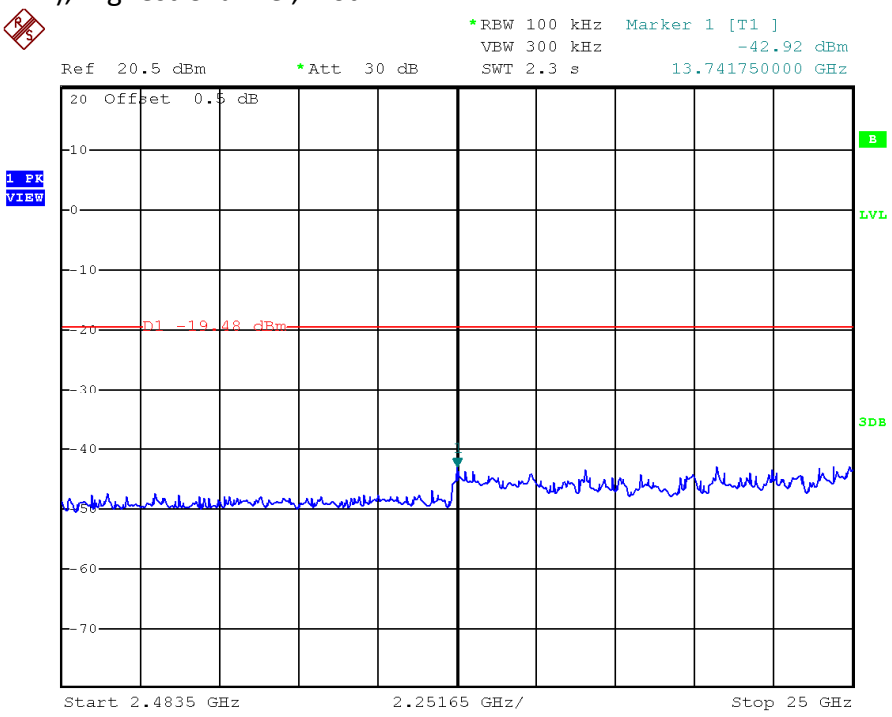
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Highest Channel, Plot A



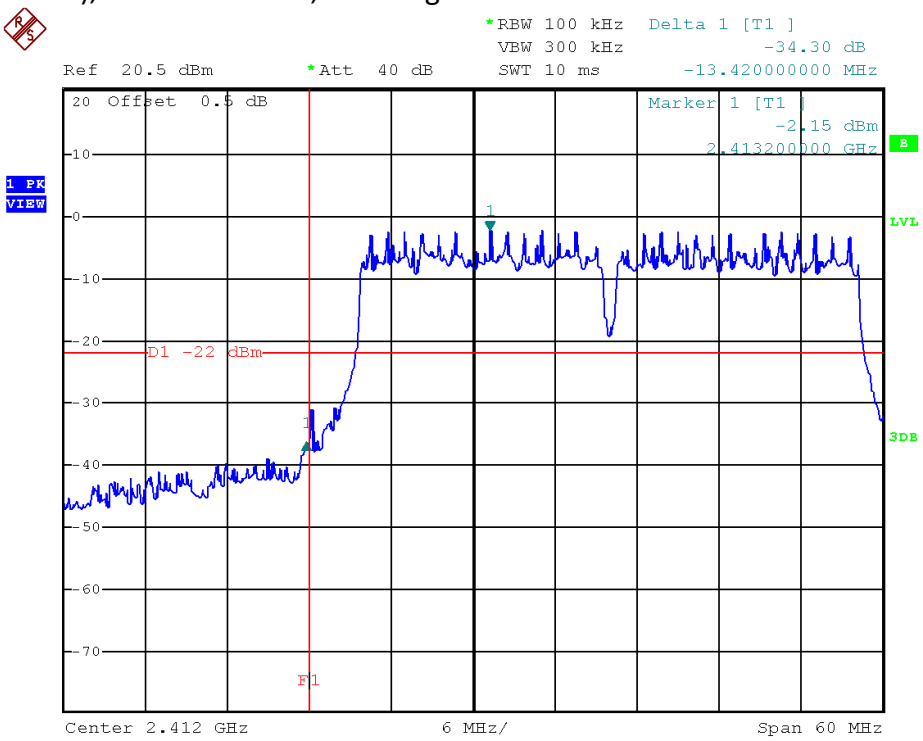
802.11n (20MHz), Highest Channel, Plot B



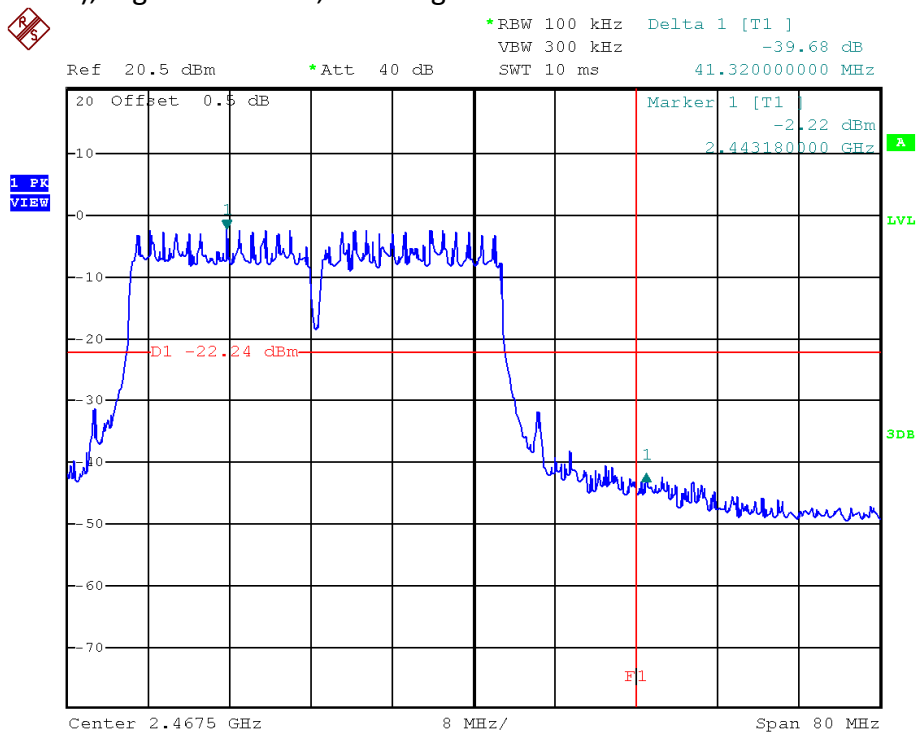
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802. 11n (40MHz), Lowest Channel, Bandedge



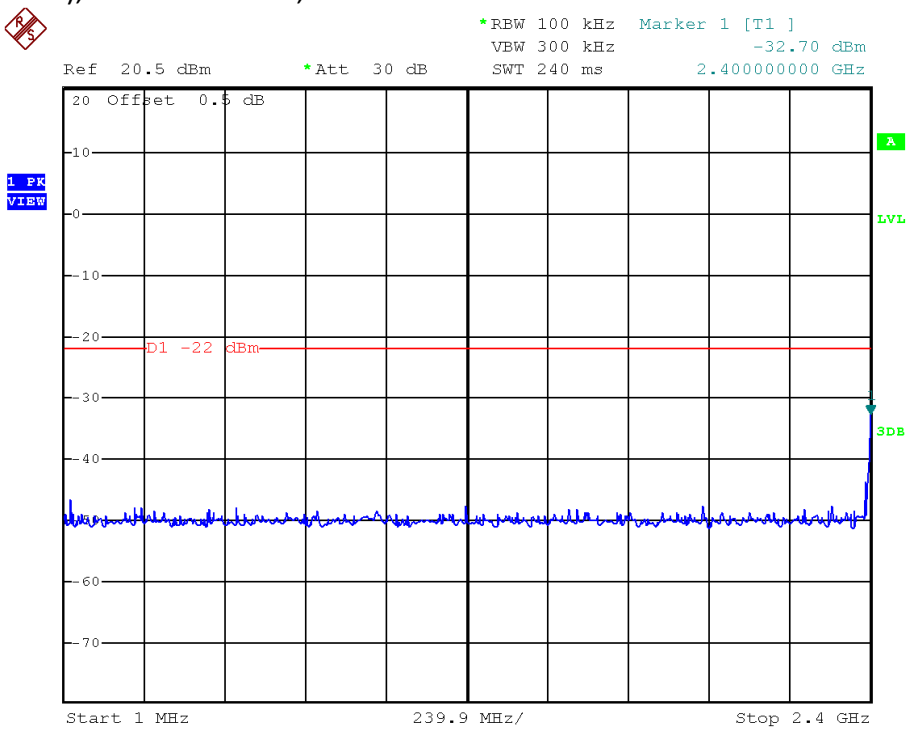
802. 11n (40MHz), Highest Channel, Bandedge



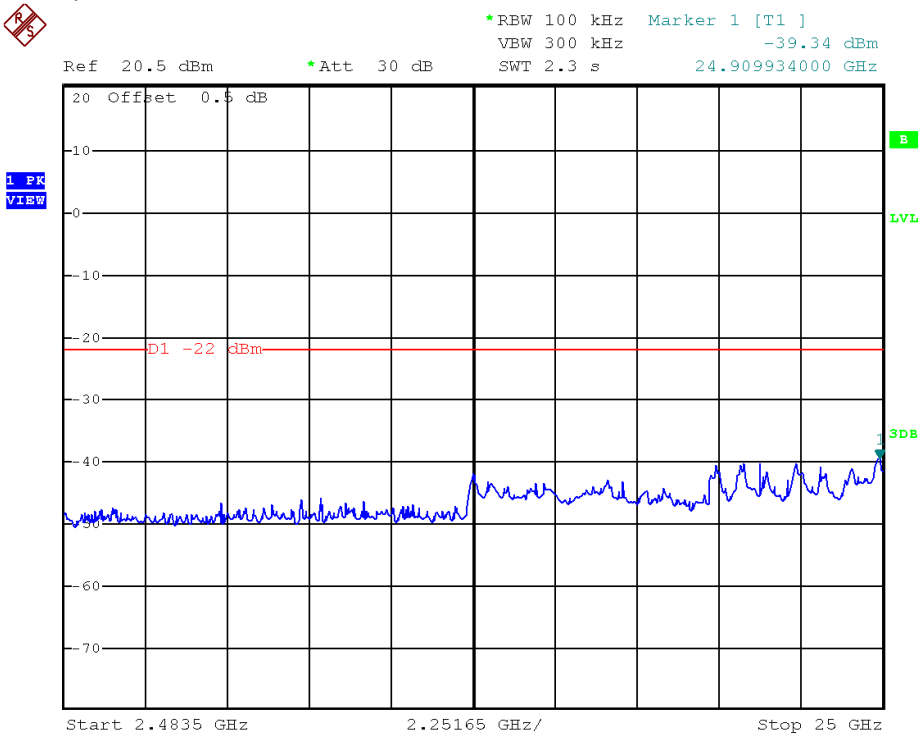
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (40MHz), Lowest Channel, Plot A



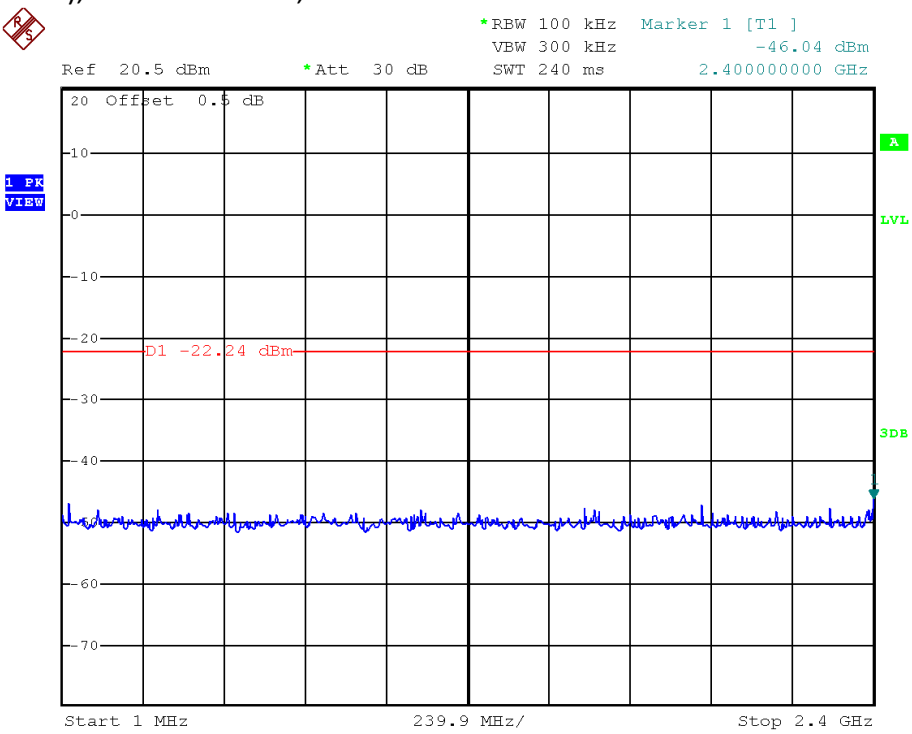
802.11n (40MHz), Lowest Channel, Plot B



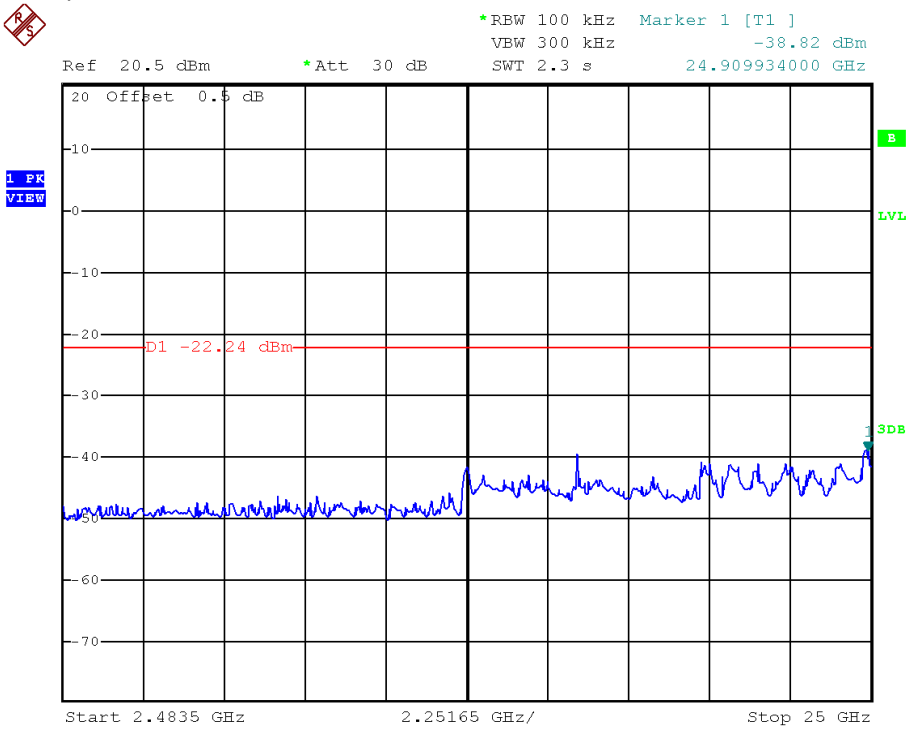
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (40MHz), Middle Channel, Plot A



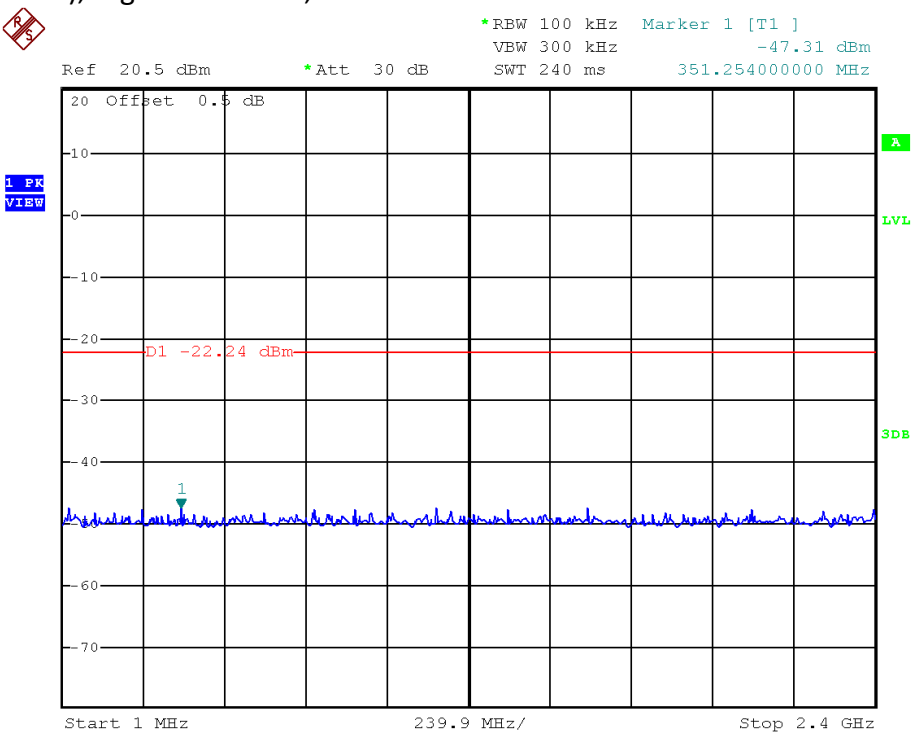
802.11n (40MHz), Middle Channel, Plot B



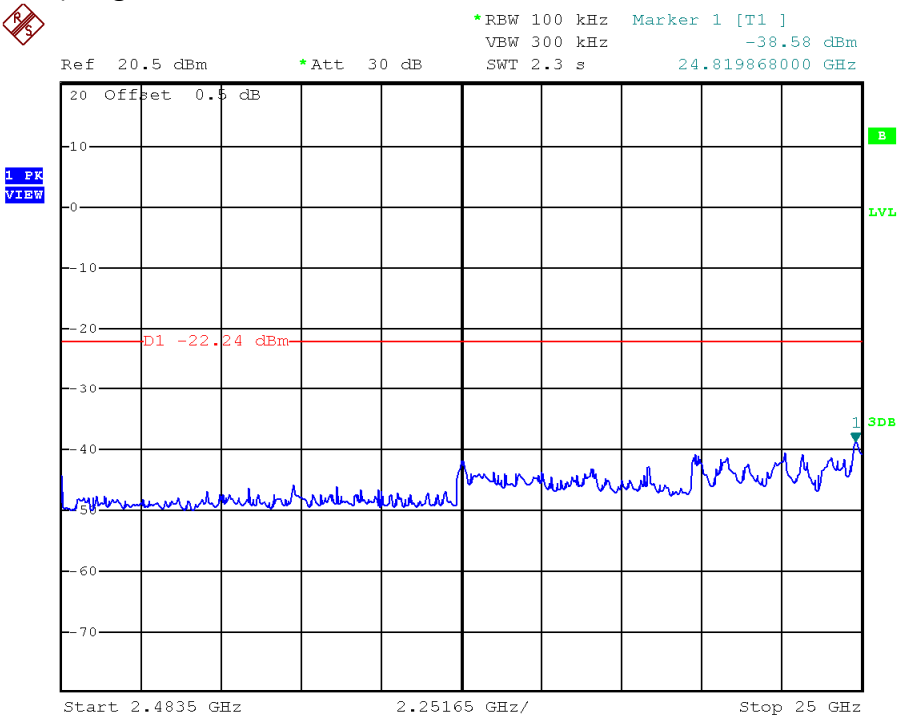
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (40MHz), Highest Channel, Plot A



802.11n (40MHz), Highest Channel, Plot B



4.5 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD + AV

Example
Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29.0 dB is subtracted. The pulse desensitization factor of the spectrum analyzer is 0.0 dB, and the resultant average factor is -10.0 dB. The net field strength for comparison to the appropriate emission limit is 32.0 dBµV/m. This value in dBµV/m is converted to its corresponding level in µV/m.

RA = 62.0 dBµV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0.0 dB
AV = -10 dB

FS = 62.0 + 7.4 + 1.6 – 29.0 + 0.0 + (-10.0) = 32.0 dBµV/m

Level in µV/m = Common Antilogarithm [(32.0 dBµV/m)/20] = 39.8 µV/m

4.6 Transmitter Radiated Emissions in Restricted Bands and Spurious Emissions

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

4.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

2483.5 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.6.2 Radiated Emission Data

The data in tables 1-13 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 1.2 dB margin

TEST REPORT

RADIATED EMISSION DATA

Mode: TX-Channel 01

Table 1
IEEE 802.11b (DSSS, 1 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***55.0***	***33***	***29.4***	***51.4***	***54.0***	***-2.6***
V	***4824.000***	***31.1***	***33***	***34.9***	***33.0***	***54.0***	***-21.0***
V	***12060.000***	***32.2***	***33***	***40.5***	***39.7***	***54.0***	***-14.3***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***68.3***	***33***	***29.4***	***64.7***	***74.0***	***-9.3***
V	***4824.000***	***43.2***	***33***	***34.9***	***45.1***	***74.0***	***-28.9***
V	***12060.000***	***44.1***	***33***	***40.5***	***51.6***	***74.0***	***-22.4***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 06

Table 2
IEEE 802.11b (DSSS, 1 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***31.8***	***33***	***34.9***	***33.7***	***54.0***	***-20.3***
V	***7311.000***	***38.6***	***33***	***37.9***	***43.5***	***54.0***	***-10.5***
V	***12185.000***	***32.8***	***33***	***40.5***	***40.3***	***54.0***	***-13.7***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***43.7***	***33***	***34.9***	***45.6***	***74.0***	***-28.4***
V	***7311.000***	***53.3***	***33***	***37.9***	***58.2***	***74.0***	***-15.8***
V	***12185.000***	***44.6***	***33***	***40.5***	***52.1***	***74.0***	***-21.9***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Mode: TX-Channel 11

Table 3
IEEE 802.11b (DSSS, 1 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***55.4***	***33***	***29.4***	***51.8***	***54.0***	***-2.2***
V	***4924.000***	***33.6***	***33***	***34.9***	***35.5***	***54.0***	***-18.5***
V	***7386.000***	***36.4***	***33***	***37.9***	***41.3***	***54.0***	***-12.7***
V	***12310.000***	***31.9***	***33***	***40.5***	***39.4***	***54.0***	***-14.6***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***68.5***	***33***	***29.4***	***64.9***	***74.0***	***-9.1***
V	***4924.000***	***45.1***	***33***	***34.9***	***47.0***	***74.0***	***-27.0***
V	***7386.000***	***50.2***	***33***	***37.9***	***55.1***	***74.0***	***-18.9***
V	***12310.000***	***44.2***	***33***	***40.5***	***51.7***	***74.0***	***-22.3***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Mode: TX-Channel 01

Table 4
IEEE 802.11g (OFDM, 6 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***55.7***	***33***	***29.4***	***52.1***	***54.0***	***-1.9***
V	***4824.000***	***29.3***	***33***	***34.9***	***31.2***	***54.0***	***-22.8***
V	***12060.000***	***32.6***	***33***	***40.5***	***40.1***	***54.0***	***-13.9***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***72.2***	***33***	***29.4***	***68.6***	***74.0***	***-5.4***
V	***4824.000***	***40.7***	***33***	***34.9***	***42.6***	***74.0***	***-31.4***
V	***12060.000***	***44.7***	***33***	***40.5***	***52.2***	***74.0***	***-21.8***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 06

Table 5
IEEE 802.11g (OFDM, 6 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***29.0***	***33***	***34.9***	***30.9***	***54.0***	***-23.1***
V	***7311.000***	***28.7***	***33***	***37.9***	***33.6***	***54.0***	***-20.4***
V	***12185.000***	***33.1***	***33***	***40.5***	***40.6***	***54.0***	***-13.4***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***40.4***	***33***	***34.9***	***42.3***	***74.0***	***-31.7***
V	***7311.000***	***44.4***	***33***	***37.9***	***49.3***	***74.0***	***-24.7***
V	***12185.000***	***45.3***	***33***	***40.5***	***52.8***	***74.0***	***-21.2***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 11

Table 6
IEEE 802.11g (OFDM, 6 Mbps)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***56.0***	***33***	***29.4***	***52.4***	***54.0***	***-1.6***
V	***4924.000***	***28.9***	***33***	***34.9***	***30.8***	***54.0***	***-23.2***
V	***7386.000***	***28.3***	***33***	***37.9***	***33.2***	***54.0***	***-20.8***
V	***12310.000***	***32.3***	***33***	***40.5***	***39.8***	***54.0***	***-14.2***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***70.9***	***33***	***29.4***	***67.3***	***74.0***	***-6.7***
V	***4924.000***	***40.2***	***33***	***34.9***	***42.1***	***74.0***	***-31.9***
V	***7386.000***	***44.1***	***33***	***37.9***	***49.0***	***74.0***	***-25.0***
V	***12310.000***	***44.5***	***33***	***40.5***	***52.0***	***74.0***	***-22.0***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Mode: TX-Channel 01

Table 7
IEEE 802.11n (20MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***55.9***	***33***	***29.4***	***52.3***	***54.0***	***-1.7***
V	***4824.000***	***28.9***	***33***	***34.9***	***30.8***	***54.0***	***-23.2***
V	***12060.000***	***32.0***	***33***	***40.5***	***39.5***	***54.0***	***-14.5***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***72.1***	***33***	***29.4***	***68.5***	***74.0***	***-5.5***
V	***4824.000***	***40.0***	***33***	***34.9***	***41.9***	***74.0***	***-32.1***
V	***12060.000***	***44.1***	***33***	***40.5***	***51.6***	***74.0***	***-22.4***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 06

Table 8
IEEE 802.11n (20MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***29.1***	***33***	***34.9***	***31.0***	***54.0***	***-23.0***
V	***7311.000***	***28.1***	***33***	***37.9***	***33.0***	***54.0***	***-21.0***
V	***12185.000***	***32.6***	***33***	***40.5***	***40.1***	***54.0***	***-13.9***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***40.3***	***33***	***34.9***	***42.2***	***74.0***	***-31.8***
V	***7311.000***	***43.1***	***33***	***37.9***	***48.0***	***74.0***	***-26.0***
V	***12185.000***	***44.5***	***33***	***40.5***	***52.0***	***74.0***	***-22.0***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

Mode: TX-Channel 11

Table 9
IEEE 802.11n (20MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***56.4***	***33***	***29.4***	***52.8***	***54.0***	***-1.2***
V	***4924.000***	***29.2***	***33***	***34.9***	***31.1***	***54.0***	***-22.9***
V	***7386.000***	***28.4***	***33***	***37.9***	***33.3***	***54.0***	***-20.7***
V	***12310.000***	***32.6***	***33***	***40.5***	***40.1***	***54.0***	***-13.9***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***71.4***	***33***	***29.4***	***67.8***	***74.0***	***-6.2***
V	***4924.000***	***40.4***	***33***	***34.9***	***42.3***	***74.0***	***-31.7***
V	***7386.000***	***43.3***	***33***	***37.9***	***48.2***	***74.0***	***-25.8***
V	***12310.000***	***44.6***	***33***	***40.5***	***52.1***	***74.0***	***-21.9***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 01

Table 10
IEEE 802.11n (40MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***56.2***	***33***	***29.4***	***52.6***	***54.0***	***-1.4***
V	***4844.000***	***28.5***	***33***	***34.9***	***30.4***	***54.0***	***-23.6***
V	***12110.000***	***33.1***	***33***	***40.5***	***40.6***	***54.0***	***-13.4***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2390.000***	***71.5***	***33***	***29.4***	***67.9***	***74.0***	***-6.1***
V	***4844.000***	***39.8***	***33***	***34.9***	***41.7***	***74.0***	***-32.3***
V	***12110.000***	***44.9***	***33***	***40.5***	***52.4***	***74.0***	***-21.6***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 06

Table 11
IEEE 802.11n (40MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***28.4***	***33***	***34.9***	***30.3***	***54.0***	***-23.7***
V	***7311.000***	***28.2***	***33***	***37.9***	***33.1***	***54.0***	***-20.9***
V	***12185.000***	***32.8***	***33***	***40.5***	***40.3***	***54.0***	***-13.7***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***4874.000***	***39.6***	***33***	***34.9***	***41.5***	***74.0***	***-32.5***
V	***7311.000***	***43.0***	***33***	***37.9***	***47.9***	***74.0***	***-26.1***
V	***12185.000***	***44.6***	***33***	***40.5***	***52.1***	***74.0***	***-21.9***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: TX-Channel 11

Table 12
IEEE 802.11n (40MHz) (OFDM, MCS0)

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***55.8***	***33***	***29.4***	***52.2***	***54.0***	***-1.8***
V	***4904.000***	***29.1***	***33***	***34.9***	***31.0***	***54.0***	***-23.0***
V	***7356.000***	***28.3***	***33***	***37.9***	***33.2***	***54.0***	***-20.8***
V	***12260.000***	***32.1***	***33***	***40.5***	***39.6***	***54.0***	***-14.4***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
V	***2483.500***	***70.1***	***33***	***29.4***	***66.5***	***74.0***	***-7.5***
V	***4904.000***	***40.2***	***33***	***34.9***	***42.1***	***74.0***	***-31.9***
V	***7356.000***	***43.2***	***33***	***37.9***	***48.1***	***74.0***	***-25.9***
V	***12260.000***	***44.0***	***33***	***40.5***	***51.5***	***74.0***	***-22.5***

NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.
7. For the measurement of radiated emission, summation method was used which numerical integrating (in terms of linear power) over the transmitter occupied bandwidth.
8. For the linear power measurement, data in 1MHz spacing was collected by spectrum analyzer with 1MHz resolution bandwidth.

TEST REPORT

Mode: Air Purifier operating with WiFi

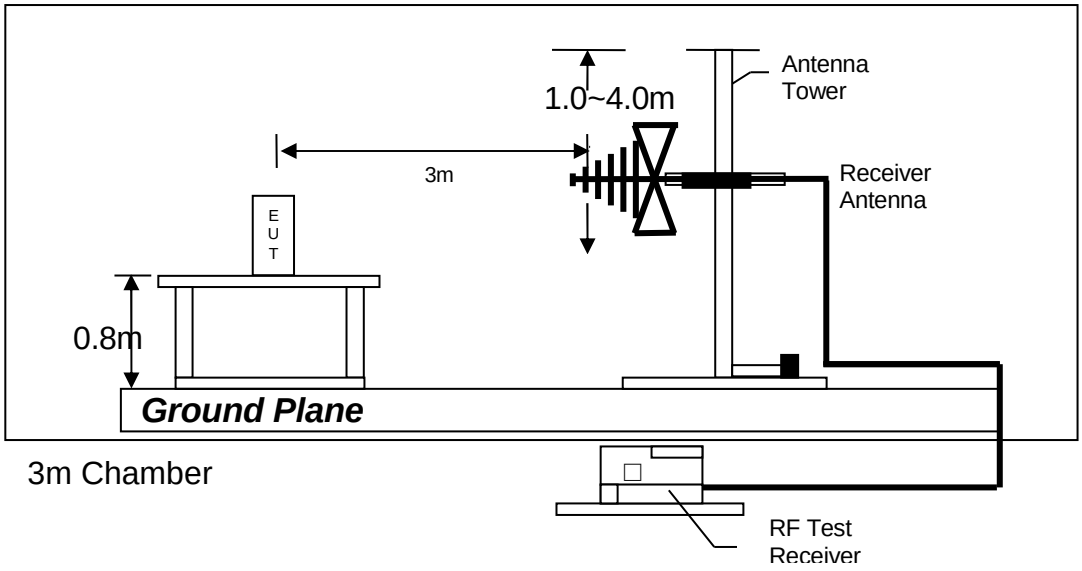
Table 13

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	47.750	38.4	16	11.0	33.4	40.0	-6.6
V	63.850	37.0	16	9.0	30.0	40.0	-10.0
V	96.050	39.0	16	12.0	35.0	43.5	-8.5
V	144.000	36.3	16	14.0	34.3	43.5	-9.2
V	160.100	38.5	16	16.0	38.5	43.5	-5.0
V	191.950	37.7	16	16.0	37.7	43.5	-5.8
V	***250.000***	***33.1***	***16***	***20.0***	***37.1***	***46.0***	***-8.9***
V	311.600	24.9	16	23.0	31.9	46.0	-14.1
V	375.000	26.1	16	24.0	34.1	46.0	-11.9
V	500.000	28.6	16	26.0	38.6	46.0	-7.4
V	625.000	25.1	16	29.0	38.1	46.0	-7.9

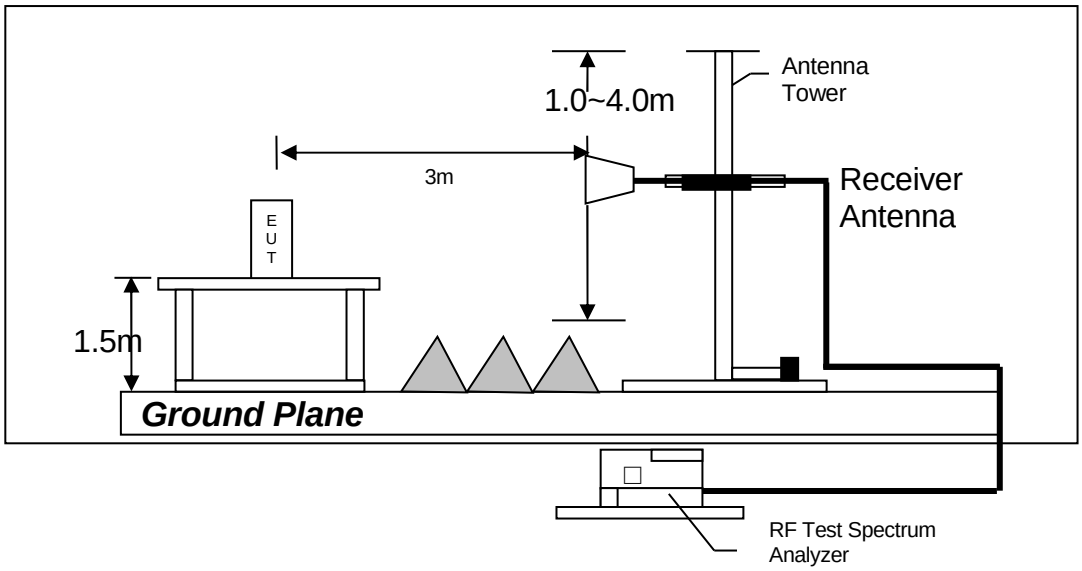
NOTES:
1. Peak detector is used for the peak emission measurement.
2. Average measurement method is according to ANSI C63.10
3. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
4. Negative value in the margin column shows emission below limit.
5. Horn antenna is used for the emission over 1000MHz.
6. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen 8.10.

4.6.3 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



Test setup of radiated emissions up to 1GHz



Test setup of radiated emissions above 1GHz

4.6.4 Transmitter Duty Cycle Calculation

Not applicable – No average factor is required.

TEST REPORT

4.7 AC Power Line Conducted Emission

☐ Not applicable – EUT is only powered by battery for operation.

☒ EUT connects to AC power line. Emission Data is listed in following pages.

☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.7.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

267 kHz

The worst case line conducted configuration photographs are attached in the Appendix and saved with filename: config photos.pdf

4.7.2 AC Power Line Conducted Emission Data

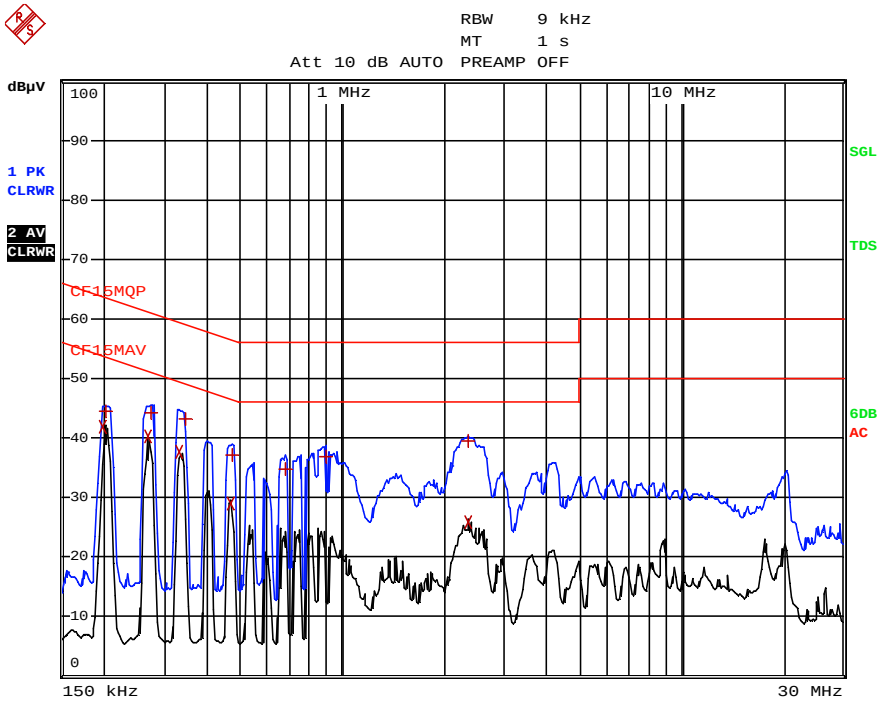
The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

Passed by 10.85 dB margin compare with CISPR Average limit

TEST REPORT

AC POWER LINE CONDUCTED EMISSION

Worst Case: Air Purifier operating with WiFi



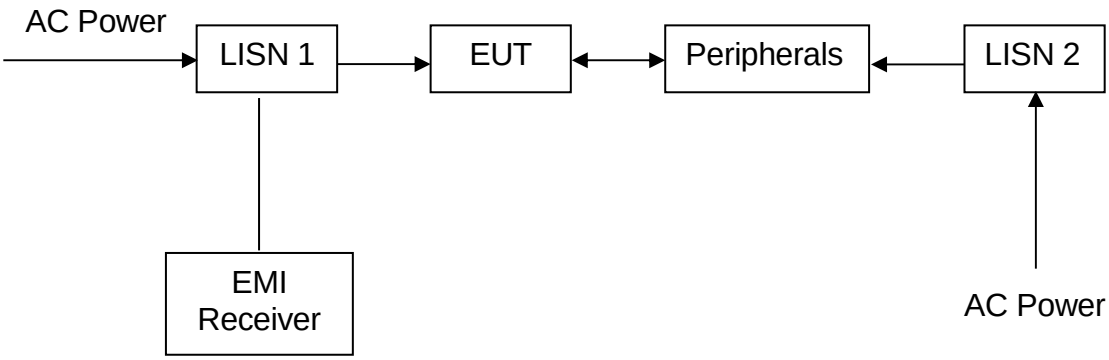
Worst Case: Air Purifier operating with WiFi

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
2	CISPR Average	199.5 kHz	41.99	L1	-11.64
1	Quasi Peak	204 kHz	44.35	L1	-19.08
2	CISPR Average	267 kHz	40.35	L1	-10.85
1	Quasi Peak	276 kHz	44.26	N	-16.66
2	CISPR Average	334.5 kHz	37.73	L1	-11.60
1	Quasi Peak	343.5 kHz	43.16	L1	-15.95
2	CISPR Average	465 kHz	29.06	L1	-17.53
1	Quasi Peak	474 kHz	37.21	N	-19.23
1	Quasi Peak	681 kHz	34.84	L1	-21.15
1	Quasi Peak	892.5 kHz	36.85	N	-19.14
1	Quasi Peak	2.3415 MHz	39.43	N	-16.56
2	CISPR Average	2.346 MHz	25.81	L1	-20.18

4.7.3 Conducted Emission Test Setup



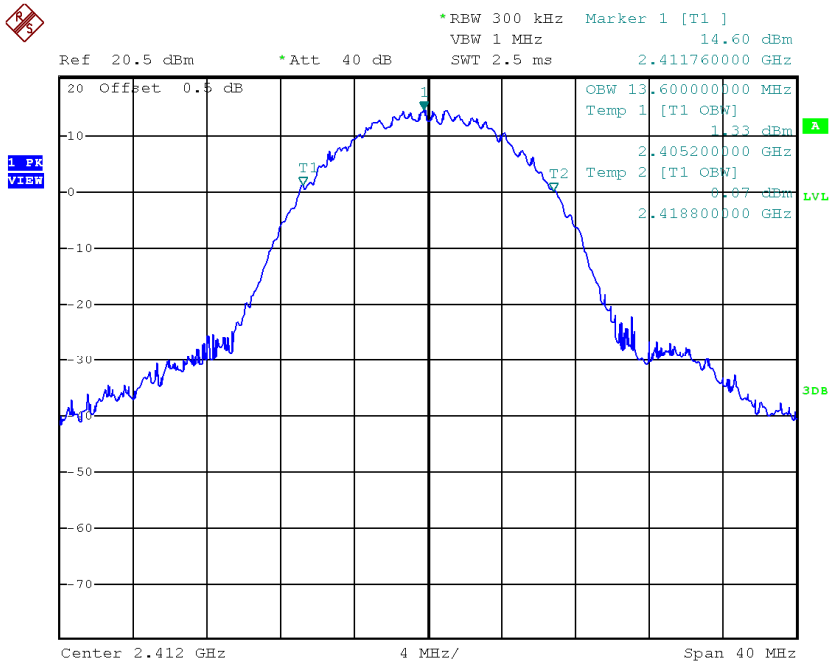
TEST REPORT

4.8 Occupied Bandwidth

Occupied Bandwidth Results: (802.11b)

(802.11b)	Occupied Bandwidth (MHz)
Low Channel: 2412	13.60
Middle Channel: 2437	13.52
High Channel: 2462	13.44

The worst case is shown as below

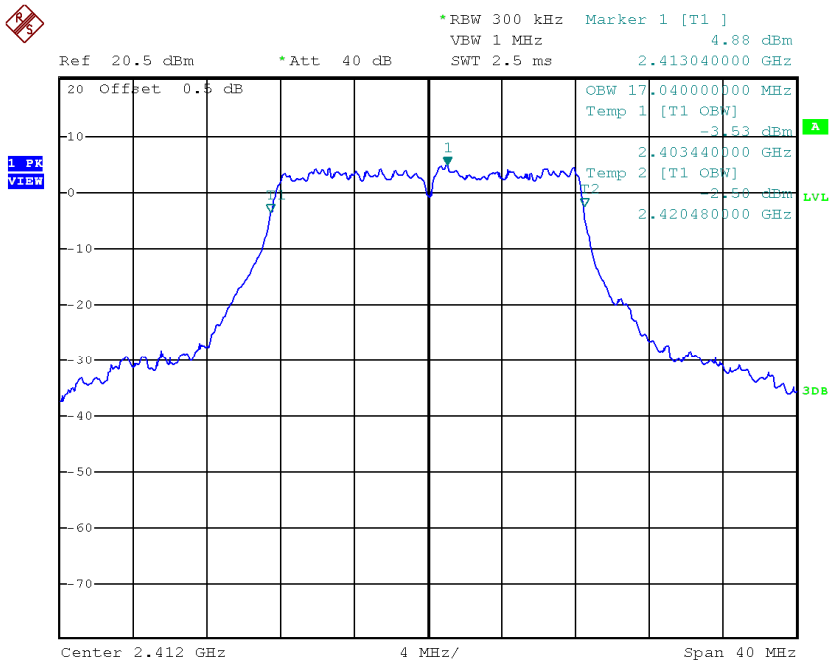


TEST REPORT

Occupied Bandwidth Results: (802.11g)

(802.11g)	Occupied Bandwidth (MHz)
Low Channel: 2412	17.04
Middle Channel: 2437	16.96
High Channel: 2462	17.04

The worst case is shown as below

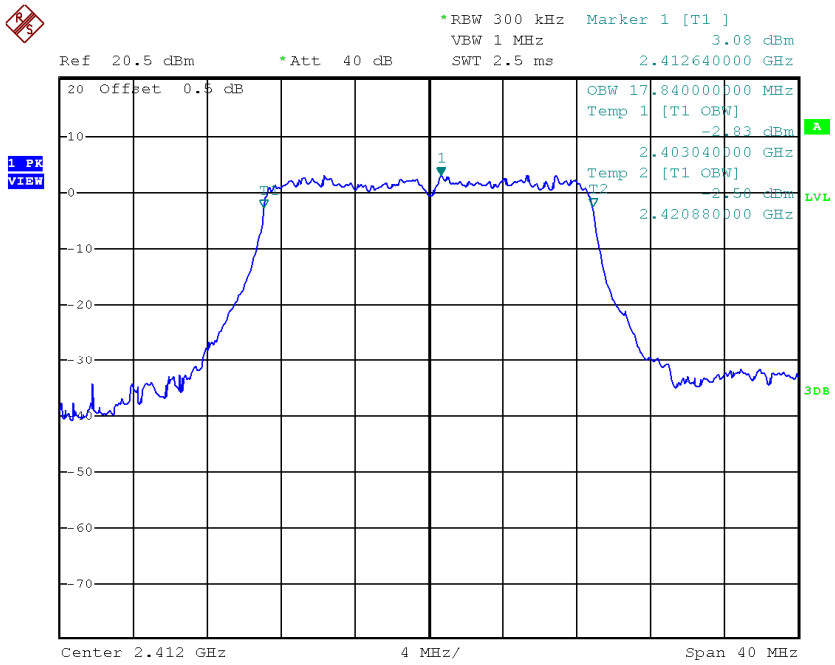


TEST REPORT

Occupied Bandwidth Results: (802.11n HT20)

(802.11n HT20)	Occupied Bandwidth (MHz)
Low Channel: 2412	17.84
Middle Channel: 2437	17.84
High Channel: 2462	17.84

The worst case is shown as below

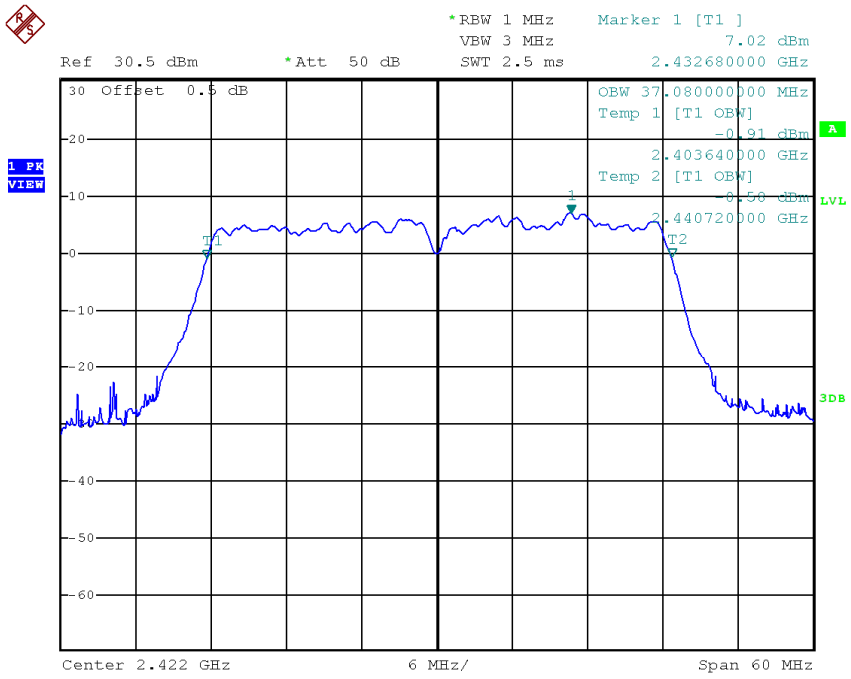


TEST REPORT

Occupied Bandwidth Results: (802.11n HT40)

(802.11n HT40)	Occupied Bandwidth (MHz)
Low Channel: 2422	37.08
Middle Channel: 2437	36.96
High Channel: 2452	36.84

The worst case is shown as below



TEST REPORT

EXHIBIT 5 EQUIPMENT LIST

5.0 EQUIPMENT LIST

1) Radiated Emissions Test

EQUIPMENT	EMI Test Receiver (9kHz to 26.5GHz)	BICONICAL ANTENNA	LOG PERIODIC ANTENNA
Registration No.	EW-3156	EW-0954	EW-0446
Manufacturer	ROHDESCHWARZ	EMCO	EMCO
Model No.	ESR26	3104C	3146
Calibration Date	Dec. 06. 2016	Jul. 07, 2016	Jul. 15, 2016
Calibration Due Date	Dec. 06, 2017	Jan. 07, 2018	Jan. 15, 2018

EQUIPMENT	SPECTRUM ANALYZER	Pyramidal Horn Antenna	DOUBLE RIDGED GUIDE ANTENNA
Registration No.	EW-2249	EW-0905	EW-0194
Manufacturer	R&S	EMCO	EMCO
Model No.	FSP30	3160-09	3115
Calibration Date	Dec. 23, 2016	Aug. 18, 2017	Aug. 10, 2016
Calibration Due Date	Nov, 27. 2017	Feb. 18, 2019	Feb. 10, 2018

Equipment	Active Loop H-field (9kHz to 30MHz)	RF Cable 9kHz to 1000MHz	RF Cable (up to 40GHz)
Registration No.	EW-2313	EW-3170	EW-3155
Manufacturer	ELECTROMETRI	N/A	N/A
Model No.	EM-6876	9kHz to 1000MHz	1-40 GHz
Calibration Date	Jun. 27, 2016	Mar. 20, 2017	Dec. 05, 2016
Calibration Due Date	Dec. 27, 2017	Mar. 20, 2018	Dec. 05, 2017

Equipment	Notch Filter (cutoff frequency 2.4GHz to 2.5GHz)	RF Pre-amplifier (9kHz to 40GHz)
Registration No.	EW-2213	EW-3006
Manufacturer	MICROTRONICS	SCHWARZBECK
Model No.	BRM50701-02	BBV 9744
Calibration Date	May. 26, 2017	Mar. 23, 2017
Calibration Due Date	May. 26, 2018	Mar. 23, 2018

TEST REPORT

2) Conducted Emissions Test

Equipment	EMI Test Receiver	RF Cable 9kHz to 1000MHz	LISN
Registration No.	EW-3156	EW-3170	EW-2874
Manufacturer	ROHDESCHWARZ	N/A	R&S
Model No.	ESR26	9kHz to 1000MHz	ENV-216
Calibration Date	Dec. 06. 2016	Mar. 20, 2017	Mar. 16, 2017
Calibration Due Date	Dec. 06, 2017	Mar. 20, 2018	Mar. 16, 2018

3) Conductive Measurement Test

Equipment	Spectrum Analyzer	RF Cable (up to 40GHz) 1.5m length	RF Power Meter with Power Sensor (N1921A)
Registration No.	EW-2249	EW-3104	EW-2270
Manufacturer	R&S	N/A	AGILENTTECH
Model No.	FSP30	SMA-M to SMA-M	N1911A
Calibration Date	Dec. 23, 2016	Feb. 28, 2017	Jan. 04, 2017
Calibration Due Date	Nov, 27. 2017	Feb. 28, 2018	Jan. 04, 2018