Issuing Laboratory:
Intertek Testing Services Hong Kong Limited

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation.

HOKLAS 005
TEST

TEST REPORT

Report Number: 13051888HKG-001

Application
for
Original Grant of 47 CFR Part 15 Certification
Single New of RSS-210 Issue 8 Equipment Certification

2.4GHz Digital Modulation Transceiver (Learning App Tablet)

FCC ID: G2R-1588

IC: 1135D-1588

Prepared and Checked by:

Wong Kwok Yeung, Kenneth
Lead Engineer

Approved by:

Chan Chi Hung, Terry
Assistant Supervisor
July 3, 2013

- The test report only allows to be revised within the retention period unless further standard or the requirement was noticed.
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GENERAL INFORMATION

Applicant Name:	VTech Electronics Ltd.
Applicant Address:	23/F, Tai Ping Industrial Centre, Block 1 57 Ting Kok Road Tai Po N.T. Hong Kong
Manufacturer Address:	Same as Applicant
FCC Specification Standard:	FCC Part 15, October 1, 2011 Edition
FCC ID:	G2R-1588
FCC Model(s):	1588
IC Specification Standard:	RSS-210 Issue 8, December 2010 RSS-Gen Issue 3, December 2010
IC:	1135D-1588
IC Model(s):	1588
Type of EUT:	Digital Transmission System
Description of EUT:	Learning App Tablet
Serial Number:	80-158800~ 80-158899
Sample Receipt Date:	Jun 14, 2013
Date of Test:	Jun 15 – Jun 24, 2013
Report Date:	July 3, 2013
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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Table of Contents

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EXHIBIT 1
SUMMARY OF TEST RESULTS & STATEMENT OF COMPLIANCE

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1.0 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen# Section	Results	Details see section
Antenna Requirement	15.203	7.1.2#	Pass	2.1
Max. Conducted Output Power	15.247(b)(3)&(4)	A8.4(4)	Pass	4.1
Min. 6dB RF Bandwidth	15.247(a)(2)	A8.2(a)	Pass	4.2
Max. Power Density	15.247(e)	A8.2(b)	Pass	4.3
Out of Band Antenna Conducted Emission	15.247(d)	A8.5	Pass	4.4
Radiated Emission in Restricted Bands and Spurious Emissions	15.247(d), 15.209 & 15.109	A8.5	Pass	4.6
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4#	Pass	4.7
Radio Frequency Radiation Exposure	15.247(i)	---	Pass	4.8

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.

1.1 Statement of Compliance

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

FCC Part 15, October 1, 2011 Edition
RSS-210 Issue 8, December 2010
RSS-Gen Issue 3, December 2010

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EXHIBIT 2
GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The Learning App Tablet is a 2.4GHz Digital Modulation Transceiver (Learning App Tablet). For 802.11b mode, it operates at frequency range of 2412MHz to 2462MHz with 11 channels. The maximum bit rate can be up to 11Mbps via direct-sequence spread spectrum (DSSS) modulation. For 802.11g mode, it operates at frequency range of 2412MHz to 2462MHz with 11 channels. The maximum bit rate can be up to 54Mbps via orthogonal frequency division (OFDM) modulation. The EUT is powered by 6VDC 4 x 1.5V "AA" batteries/or 4.8VDC 4 X 1.2V 2000mAh Ni-MH rechargeable batteries and/ or an AC/DC adapter 100-120VAC to 7.5VDC 650mA and/ or 3VDC backup battery.

The antenna used in the EUT is internal, integral and the test sample is a prototype.

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

2.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver (transmitter portion).

The Declaration of the Conformity procedure of peripheral (USB portion) for this transceiver is being processed as the same time of this application.

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2.3 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Preliminary radiated scans and all radiated measurements were performed in Open Area 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 (2009) and KDB Publication No. 558074 D01 v03r01(09-April-2013). All other measurements were made in accordance with the procedures in RSS-Gen Issue 3 (2010).

2.4 Test Facility

The open area test site, AC Power Line conducted measurement facility, and antenna port conducted measurement facility used to collect the radiated data, AC Power Line conducted data, and conductive data are at Roof Top, 2nd Floor, and 5th Floor respectively of Intertek Testing Services Hong Kong Ltd., which is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC and the Industry Canada.

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EXHIBIT 3
SYSTEM TEST CONFIGURATION

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2 System Test Configuration

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit 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 6VDC 4 x 1.5V "AA" batteries/ or 4.8VDC 4 x 1.2V 2000mah Ni-MH rechargeable batteries and/ or an AC/DC adapter 120VAC to 7.5VDC 650mA and/ or 3VDC backup battery.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable. If the EUT 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. Digital circuitry used to control additional functions other than the operation of the transmitter is subject to FCC Part 15 Section 15.109 Limits.

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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.

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 power cord connected to one LISN (Line impedance stabilization network), which provided 50ohm coupling impedance for measuring instrument. Meanwhile, the peripheral or support equipment power cords connected to a separate LISN. The ac powers for all LISNs were obtained from the same power source. 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. Power cords of non-EUT equipment (peripherals) were not bundled. AC power cords of peripheral equipments draped over the rear edge of the table, and routed them down onto the floor of the ac power line conducted emission test site to the second LISN.

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

Different data rates have been tested. Worst case is reported only.

All relevant operation modes have been tested, and the worst case data is included in this report.

All data rates were tested under normal mode of WiFi. Only the worst-case data is shown in the report for DSSS and OFDM modulation types.

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.

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3.3 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

(1) An AC/DC adaptor (120VAC to 7.5VDC 4.9W, Model: S004LAU0750065 (VTech) (Supplied by Client)
(2) Earphone with 1.04 meter cable (Supplied by Client)
(3) USB cable with length of 0.56 meter with ferrite (Supplied by Client)—for termination only.

Description of Accessories:

(1) 4GB Toshiba SD memory card (Supplied by Client)
(2) Game cartridge (Supplied by Client)
(3) 4 X 1.2V 2000mAh Ni-MH rechargeable batteries

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

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EXHIBIT 4
TEST RESULTS

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3 Test Results

4.1 Maximum Conducted Output Power at Antenna Terminals

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

☒ External attenuation and cable loss were compensated for using the OFFSET function of the analyser. The measurement procedure 9.1.2 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, 11 Mbps) Antenna Gain = 0 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel:	19.72	93.76
Middle Channel:	20.29	106.91
High Channel:	20.35	108.39

dBm max. output level = 20.35 dBm

IEEE 802.11g (OFDM, 9 Mbps) Antenna Gain = 0 dBi		
Frequency (MHz)	Output in dBm	Output in mWatt
Low Channel:	23.68	233.35
Middle Channel:	23.90	245.47
High Channel:	24.08	255.86

dBm max. output level = 24.08 dBm

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Cable loss : 0.5 dB External Attenuation : 0 dB

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

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

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

The plots of conducted output power are saved as below.

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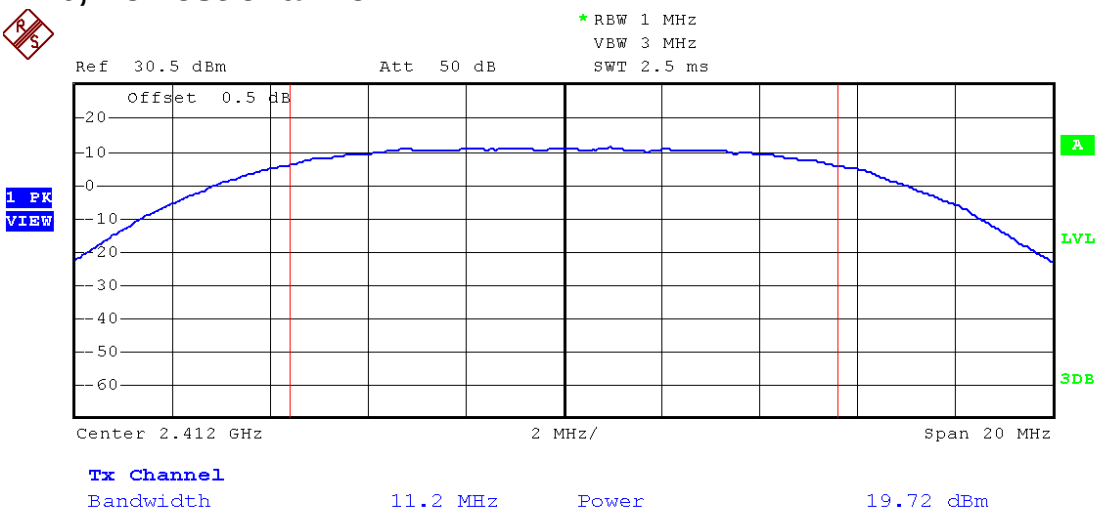
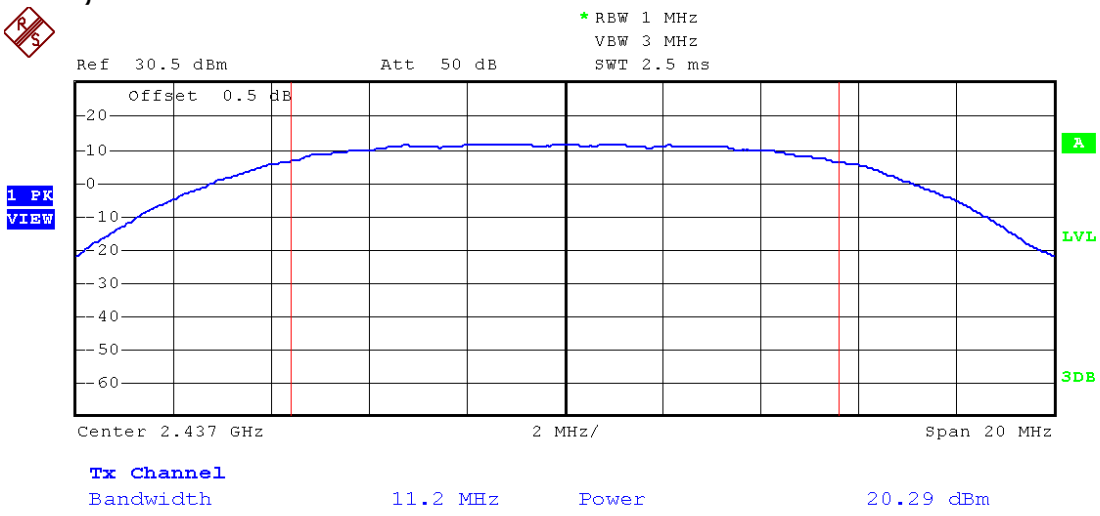
Plots of maximum output power (IEEE 802.11b, DSSS, 11 Mbps)

802.11b, Lowest channel



802.11b, Middle channel



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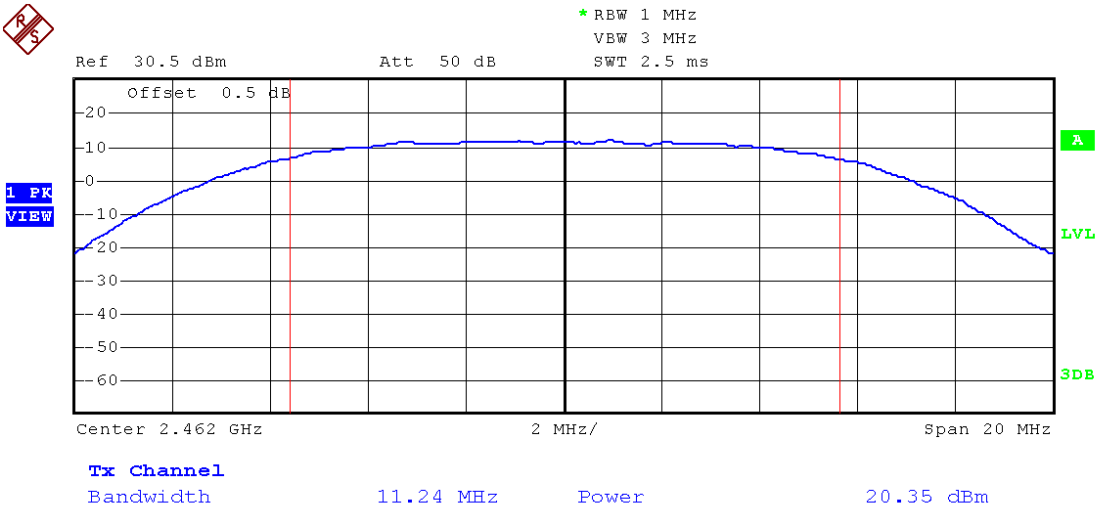
Plots of maximum output power (IEEE 802.11b, DSSS, 11 Mbps)

802.11b, Highest channel



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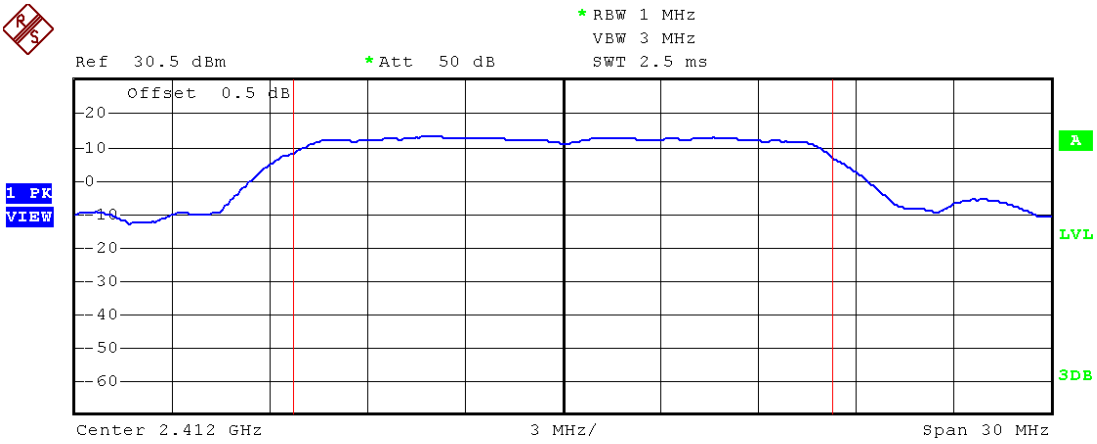
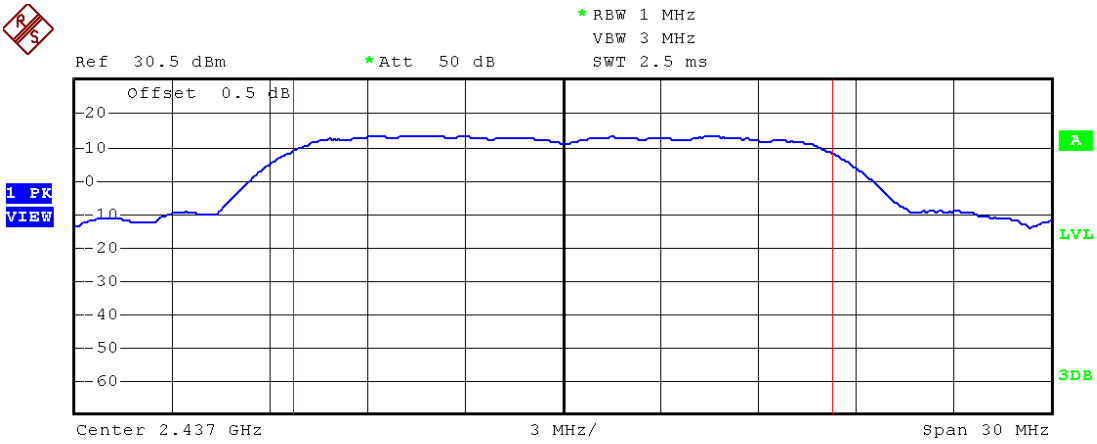
Plots of maximum output power (IEEE 802.11g,OFDM, 9 Mbps)

802.11g, Lowest channel



Tx Channel
Bandwidth 16.6 MHz Power 23.68 dBm

802.11g, Middle channel



Tx Channel
Bandwidth 16.6 MHz Power 23.90 dBm

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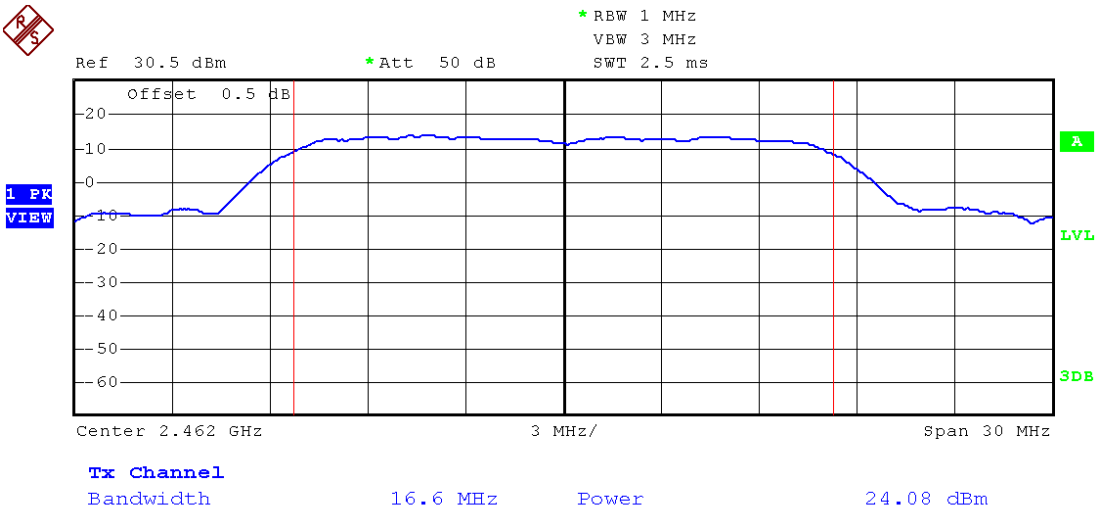
Plots of maximum output power (IEEE 802.11g ,OFDM, 9 Mbps)

802.11g, Highest channel



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4.2 Minimum 6dB RF Bandwidth

The antenna port of the EUT was connected to the input of a spectrum analyzer. The 8.1 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, 11 Mbps)	
Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel: 2412	11.20
Middle Channel: 2437	11.20
High Channel: 2462	11.24

IEEE 802.11g (OFDM, 9 Mbps)	
Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel: 2412	16.6
Middle Channel: 2437	16.6
High Channel: 2462	16.6

Limits :

6 dB bandwidth shall be at least 500kHz

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

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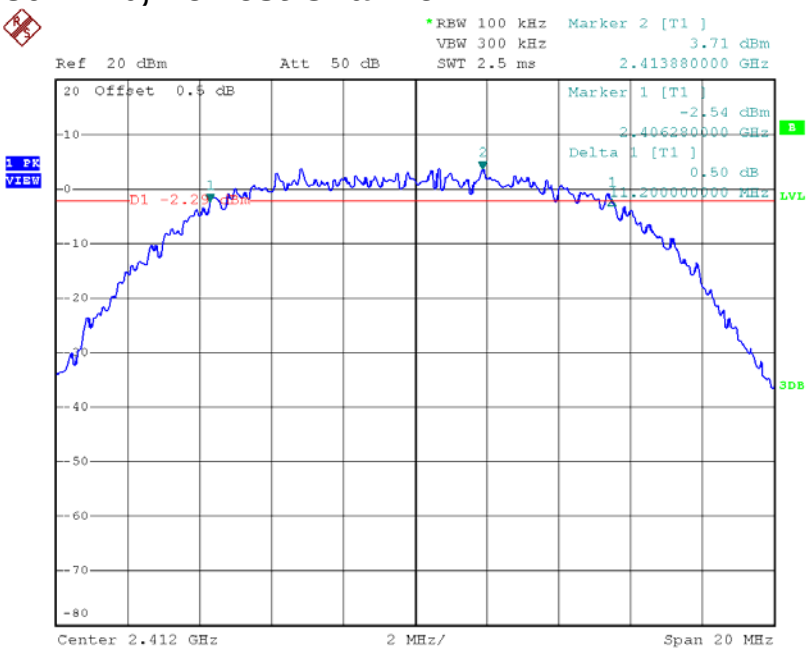
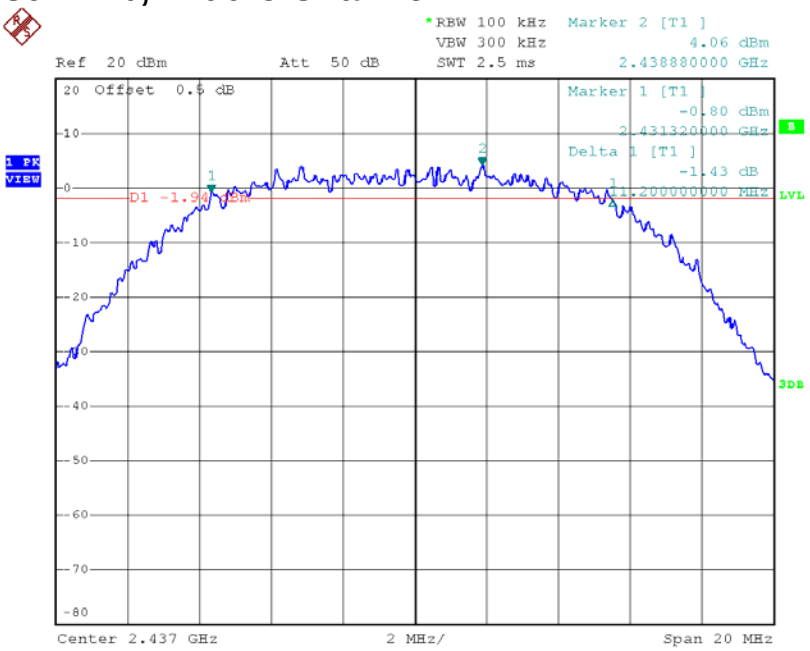
Plots of 6dB RF bandwidth (IEEE 802.11b, DSSS, 11Mbps)

802.11b, Lowest Channel



802.11b, Middle Channel



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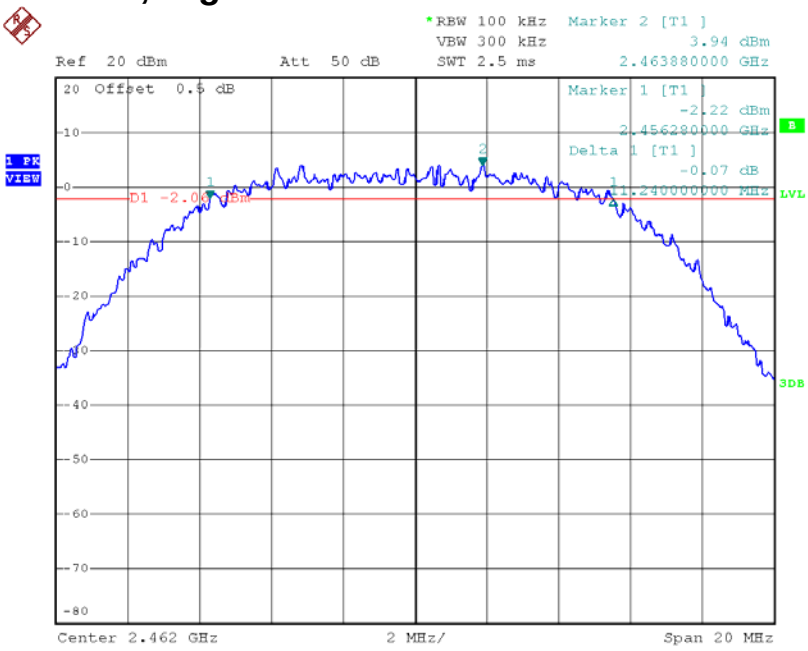
Plots of 6dB RF bandwidth(IEEE 802.11b, DSSS, 11Mbps)

802.11b, Highest Channel



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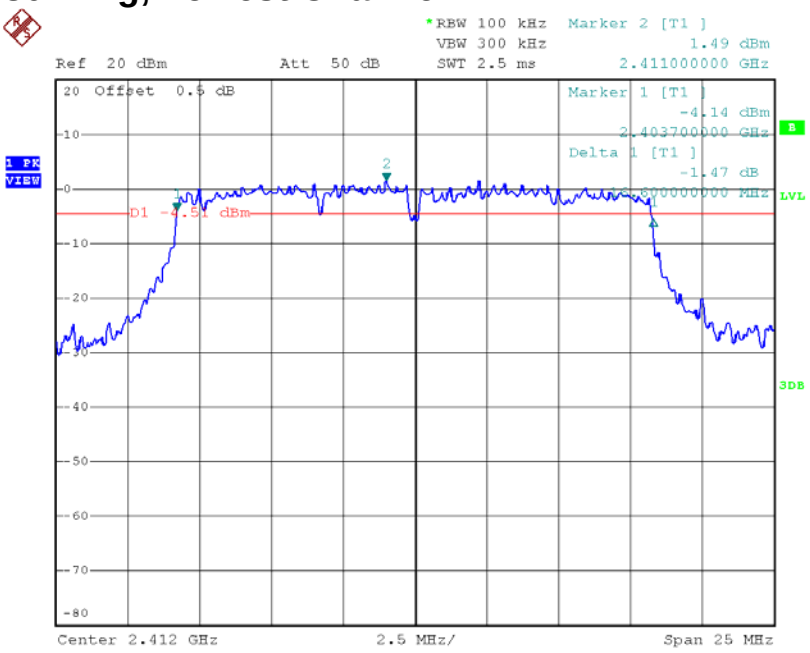
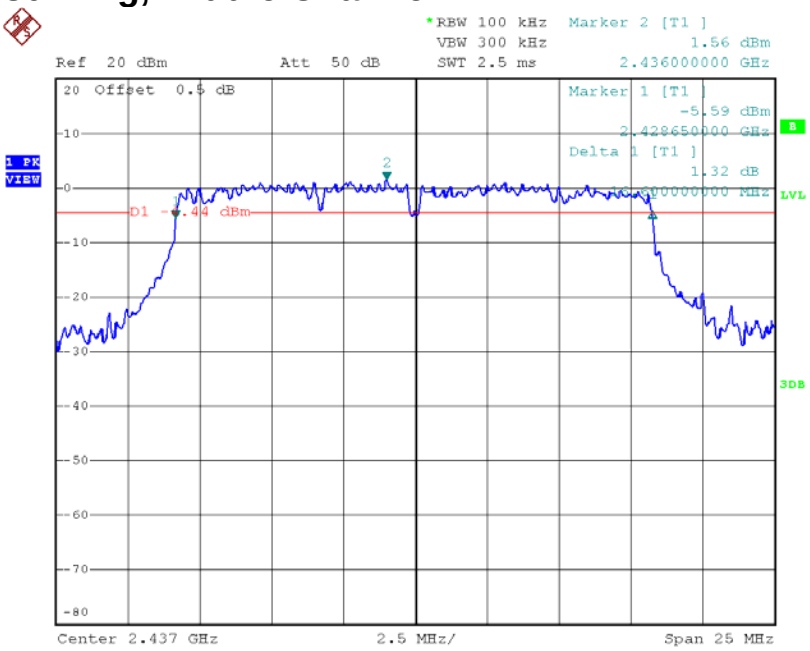
Plots of 6dB RF bandwidth (IEEE 802.11g , OFDM, 9 Mbps)

802.11g, Lowest Channel



802.11g, Middle Channel



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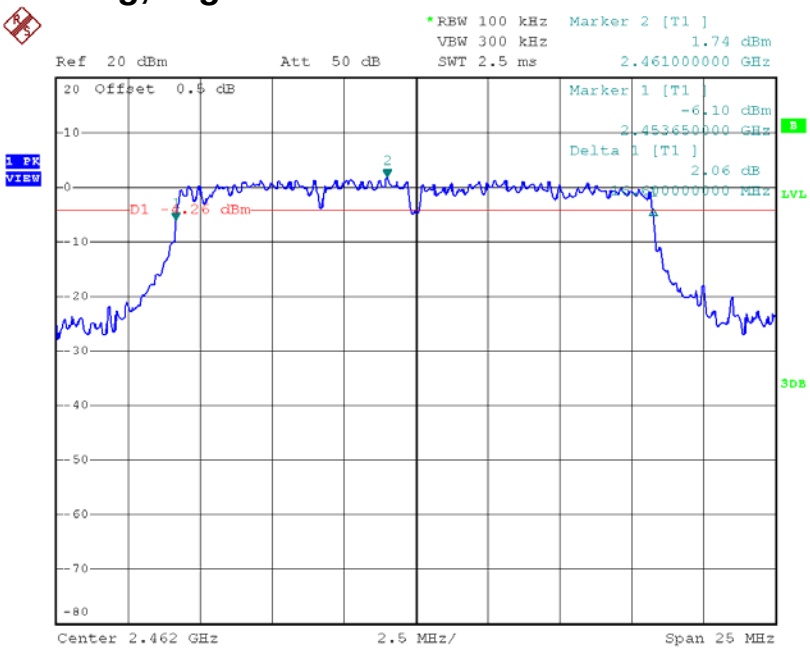
Plots of 6dB RF bandwidth(IEEE 802.11g , OFDM, 9 Mbps)

802.11g, Highest Channel



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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, 11Mbps)	
Frequency (MHz)	PSD in 100kHz (dBm)
Low Channel: 2412	3.48
Middle Channel: 2437	4.15
High Channel: 2462	3.74

IEEE 802.11g (OFDM, 9Mbps)	
Frequency (MHz)	PSD in 100kHz (dBm)
Low Channel: 2412	1.17
Middle Channel: 2437	1.35
High Channel: 2462	1.68

Cable Loss: 0.5 dB

Limit: 8dBm

The plots of power spectral density are as below.

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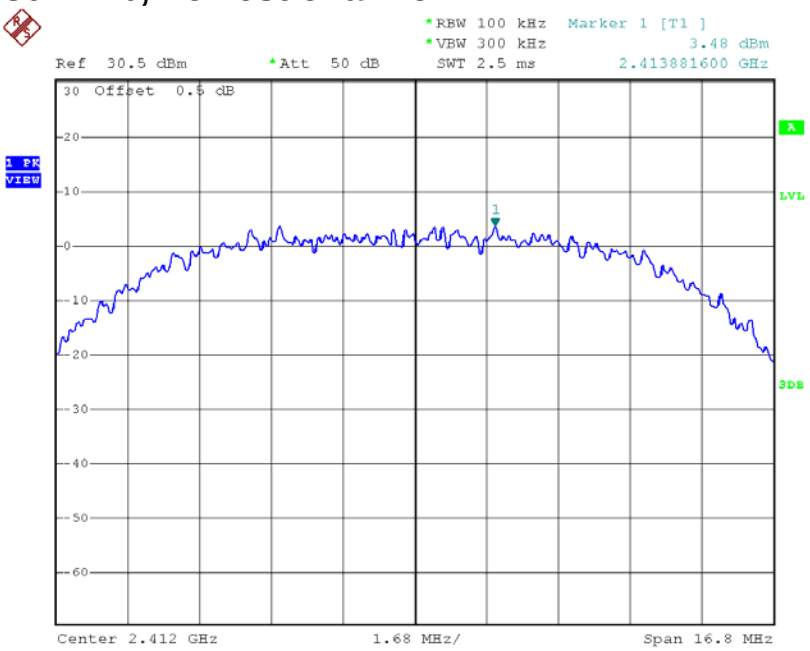
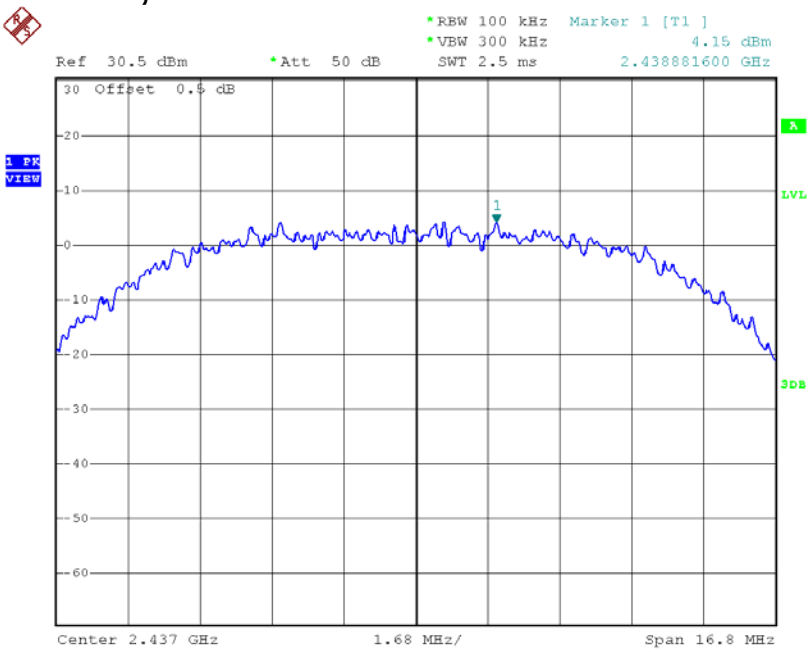
Plots of power spectral density (IEEE 802.11b,DSSS, 11 Mbps)

802.11b, Lowest channel



802.11b, Middle channel



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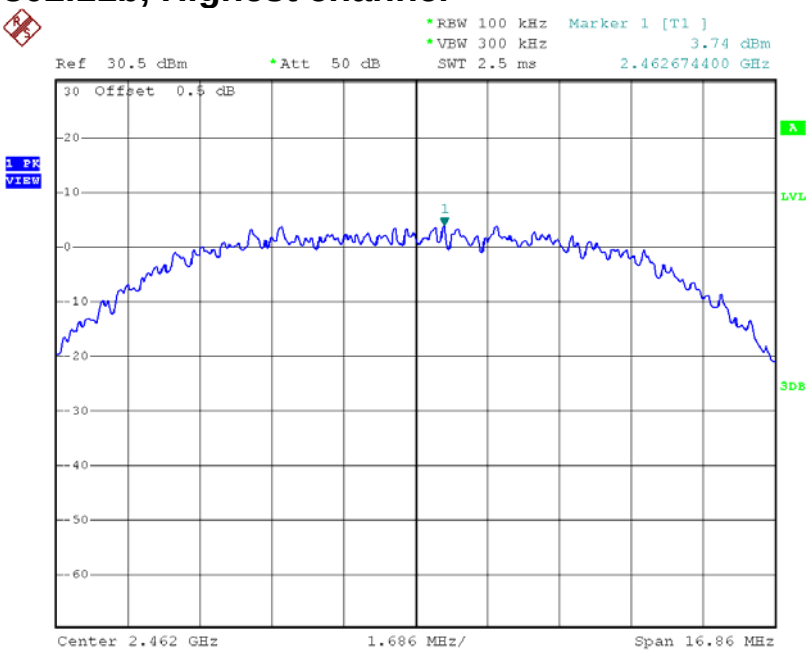
Plots of power spectral density (IEEE 802.11b, DSSS, 11 Mbps)

802.11b, Highest channel



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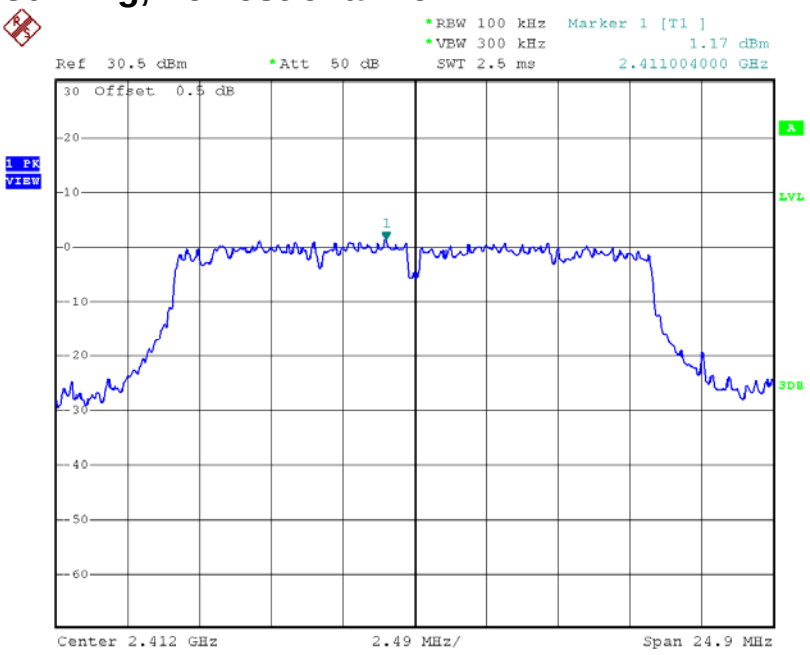
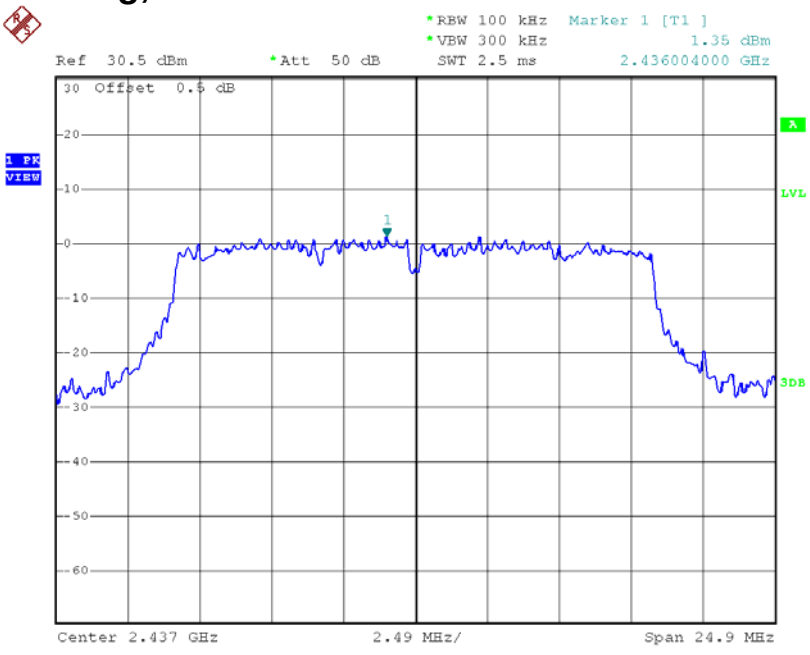
Plots of power spectral density (IEEE 802.11g ,OFDM, 9 Mbps)

802.11g, Lowest channel



802.11g, Middle channel



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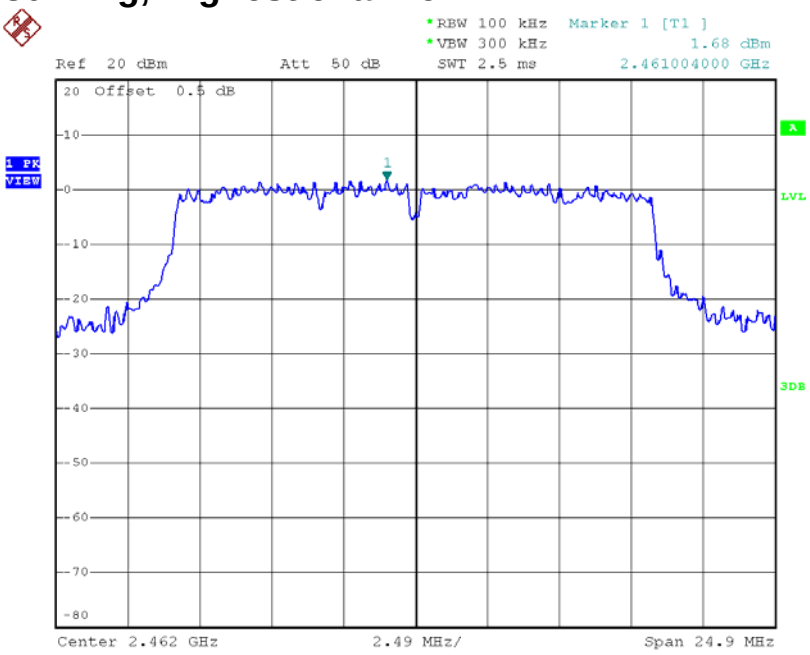
Plots of power spectral density (IEEE 802.11g , OFDM, 9 Mbps)

802.11g, Highest channel



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4.4 Out of Band Conducted Emissions

RBW was set to 1MHz rather than 100KHz in order to increase the measurement speed.

The display line (in red) shown in the following plots denotes the limit at 20dB below maximum measured in-band peak PSD level in 100KHz bandwidth. The traces in the following plots are measured with 1MHz RBW but not 100KHz in measurement range from 10MHz to 2GHz and 2.8GHz to 25GHz.

The measurement procedures under sections 11 of KDB558074 were used.

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

The plots of out of band conducted emissions are as below.

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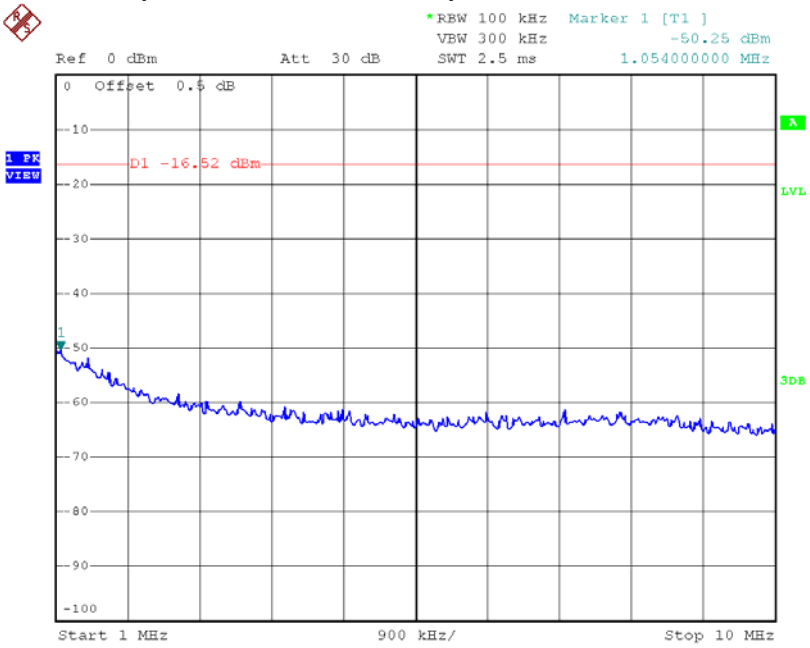
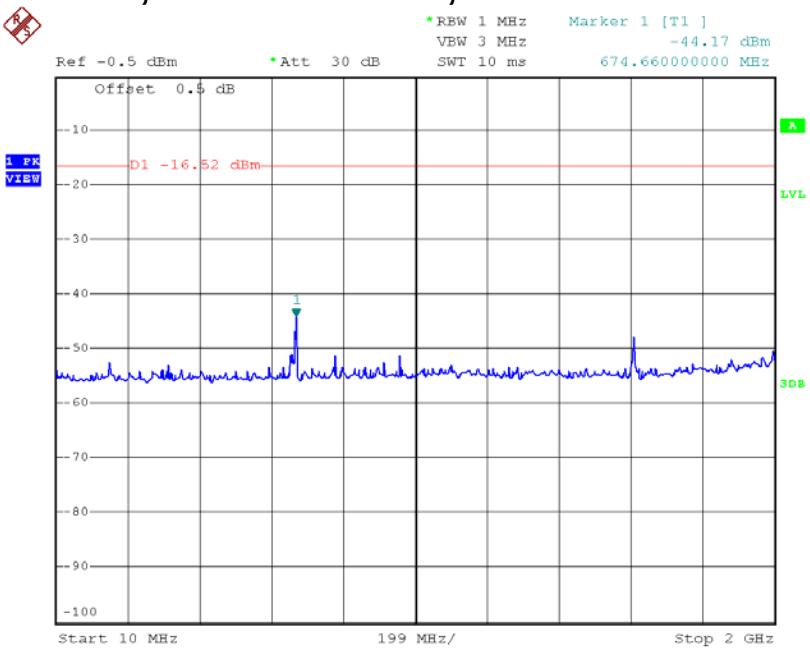
Plots of out of band conducted emissions (IEEE 802.11b, DSSS,11Mbps)

802.11b, Lowest Channel, Plot A



802.11b, Lowest Channel, Plot B



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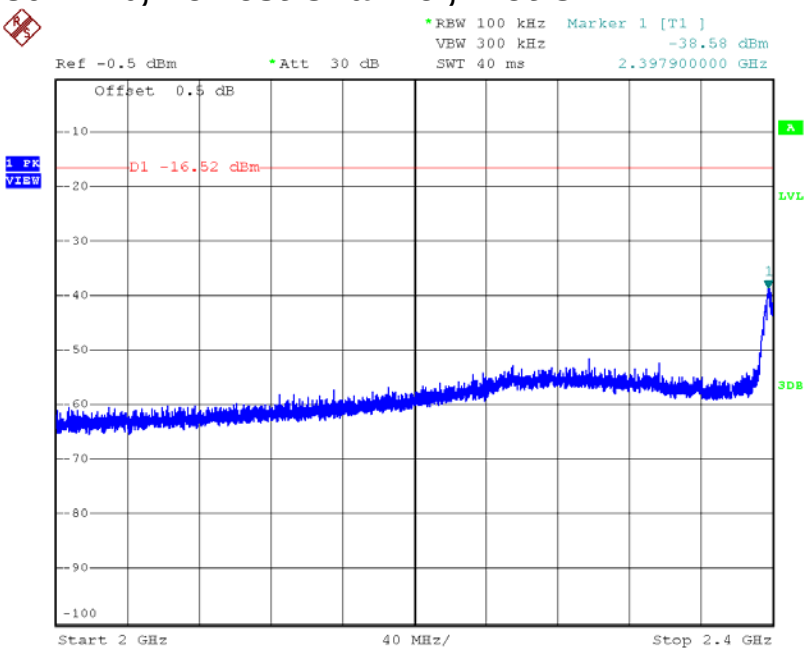
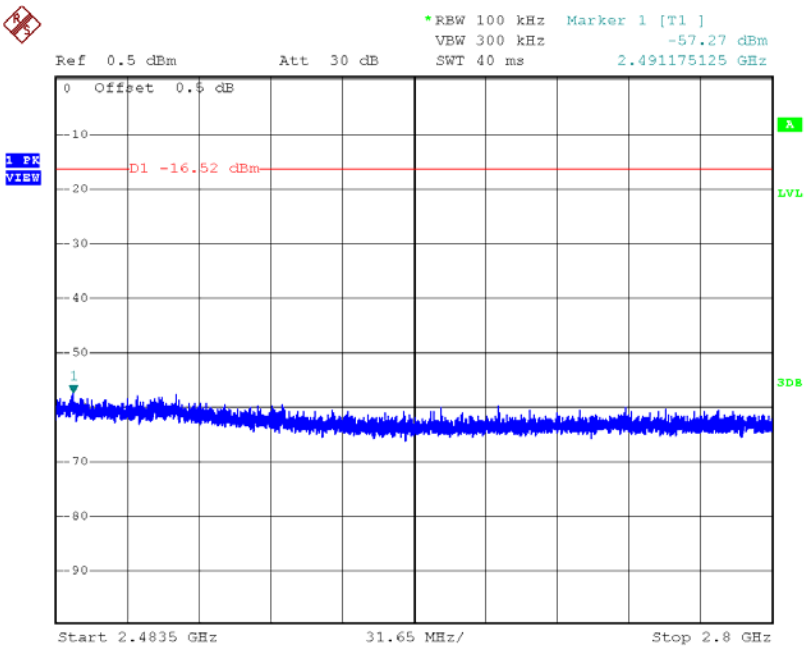
Plots of out of band conducted emissions (IEEE 802.11b, DSSS,11Mbps)

802.11b, Lowest Channel, Plot C



802.11b, Lowest Channel, Plot D



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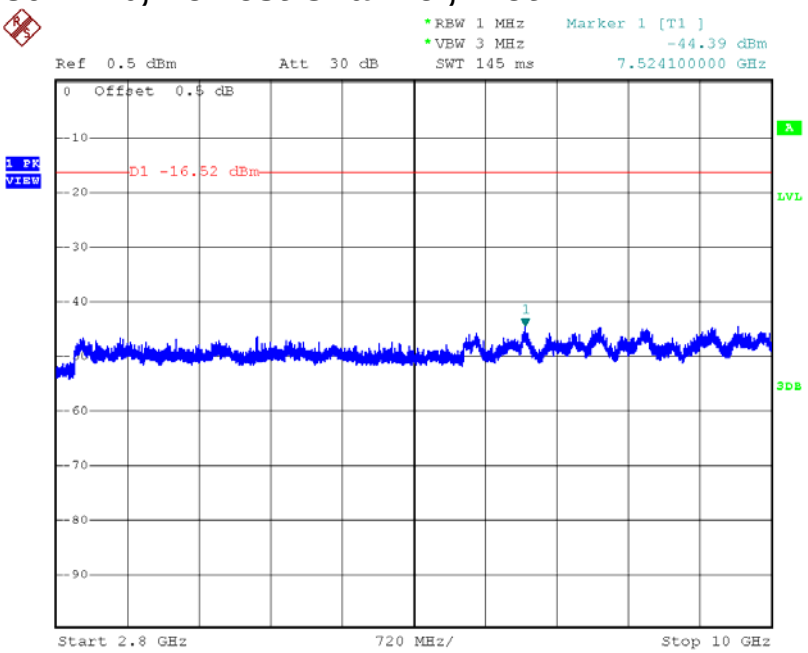
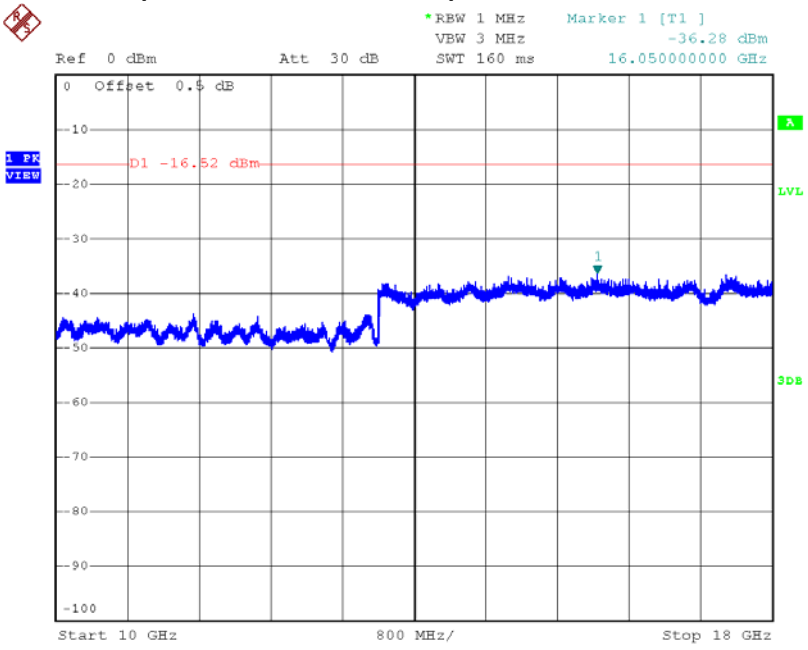
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, Lowest Channel, Plot E



802.11b, Lowest Channel, Plot F



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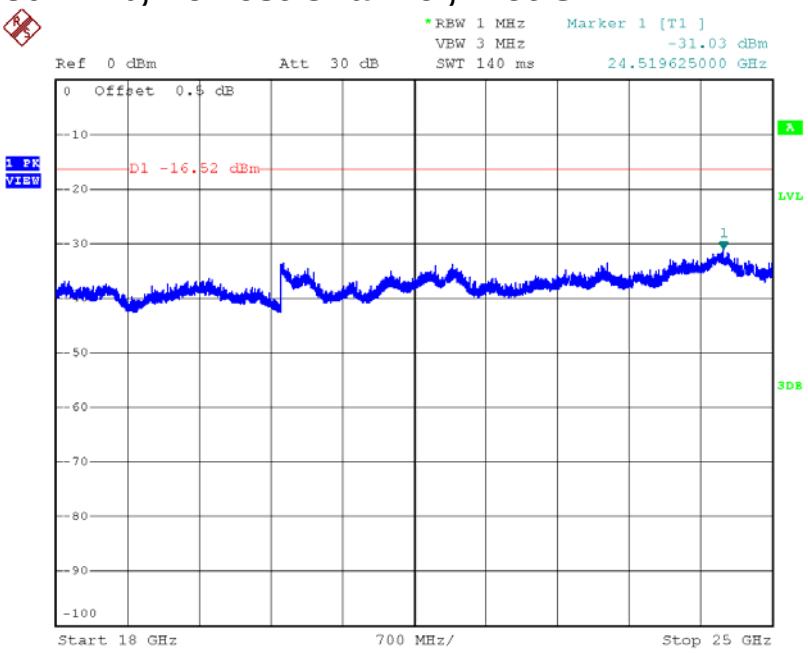
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, Lowest Channel, Plot G



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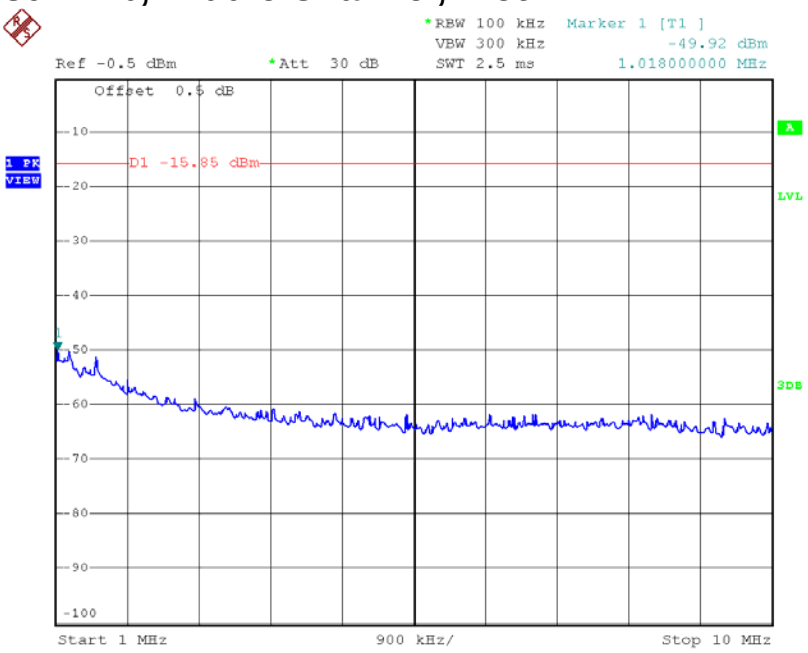
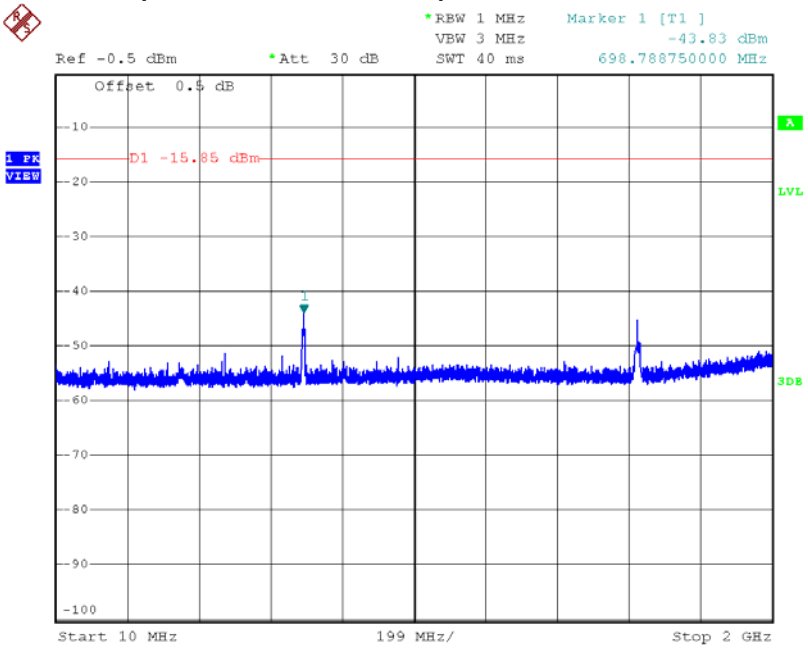
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, Middle Channel, Plot A



802.11b, Middle Channel, Plot B



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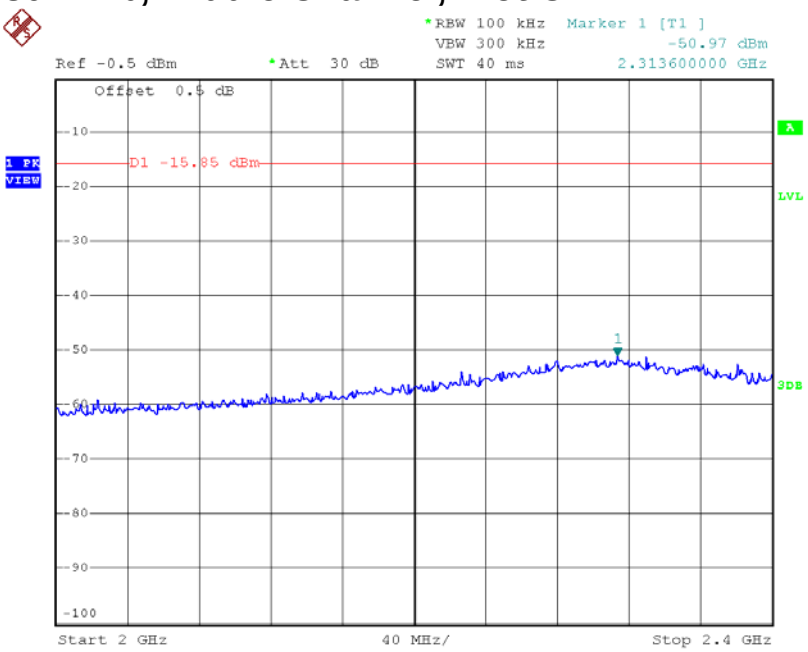
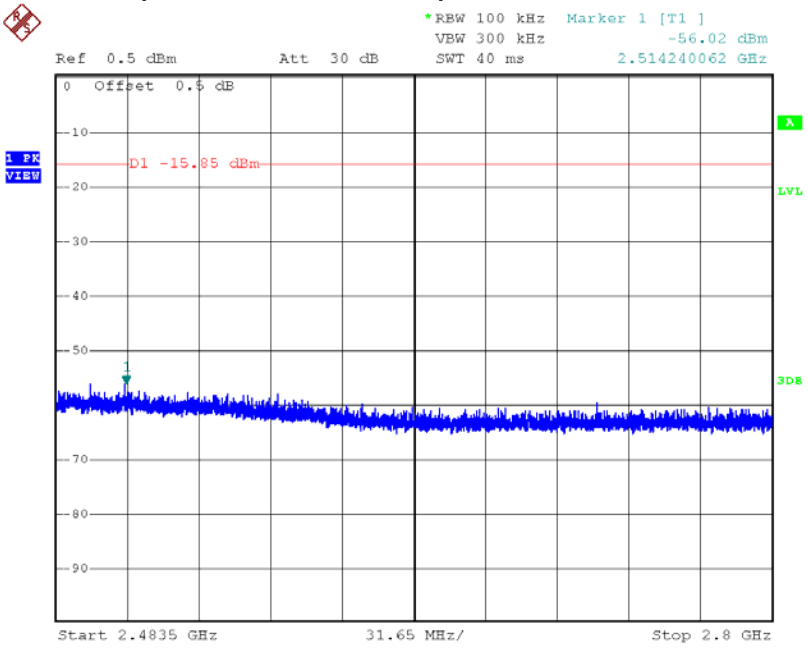
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, Middle Channel, Plot C



802.11b, Middle Channel, Plot D



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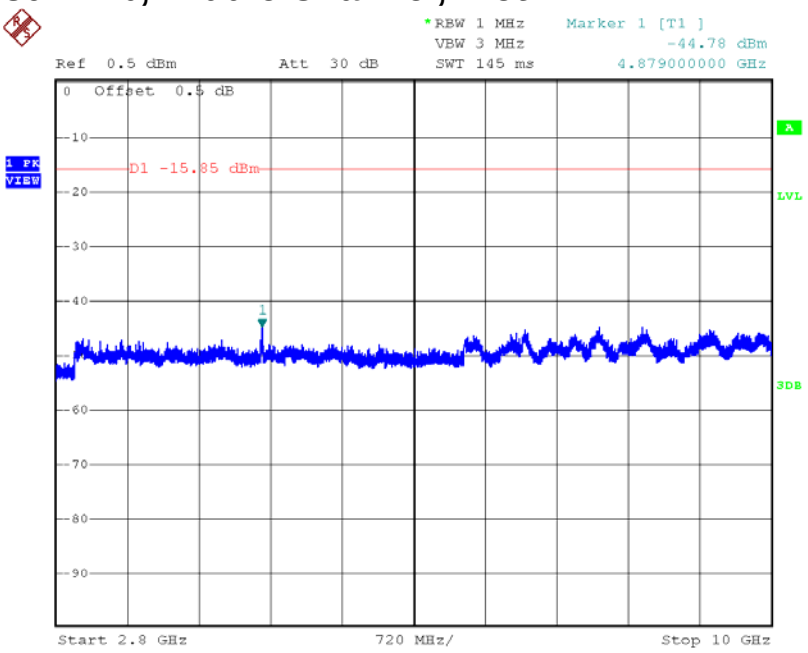
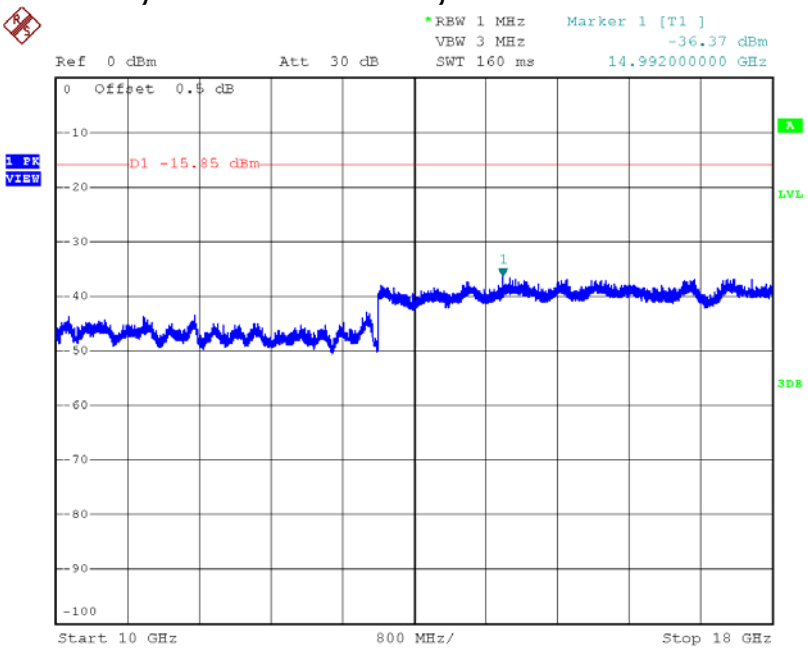
Plots of out of band conducted emissions (IEEE 802.11b,DSSS, 11Mbps)

802.11b, Middle Channel, Plot E



802.11b, Middle Channel, Plot F



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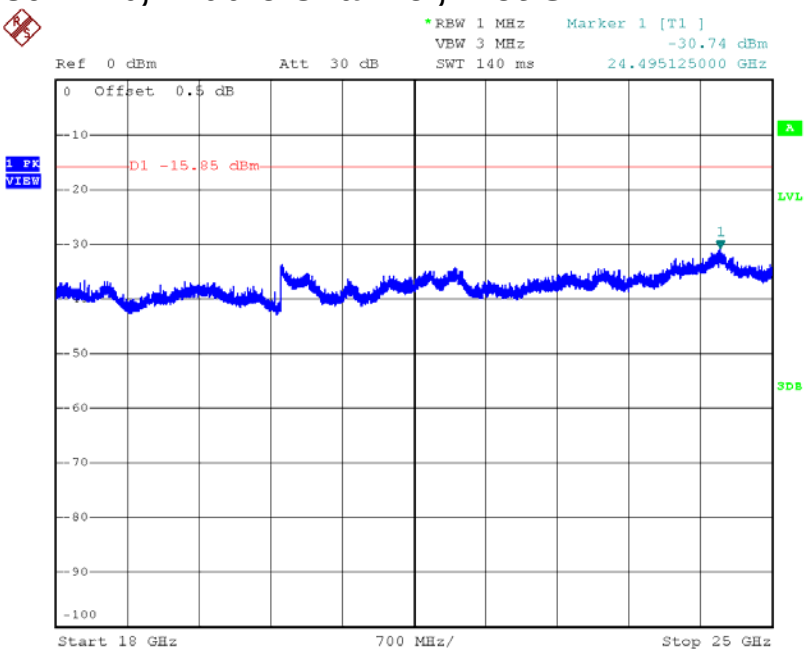
Plots of out of band conducted emissions (IEEE 802.11b,DSSS, 11Mbps)

802.11b, Middle Channel, Plot G



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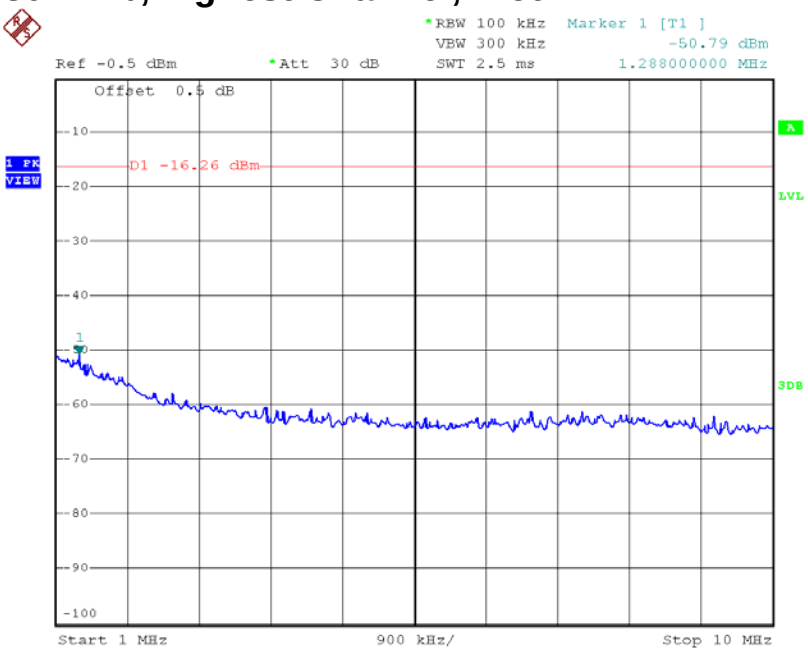
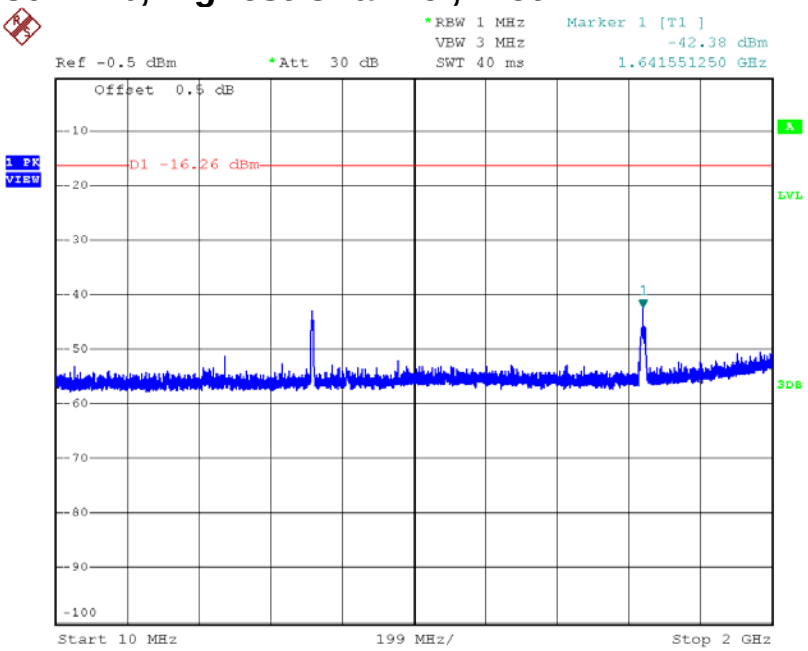
Plots of out of band conducted emissions (IEEE 802.11b,DSSS, 11Mbps)

802.11b, highest Channel, Plot A



802.11b, highest Channel, Plot B



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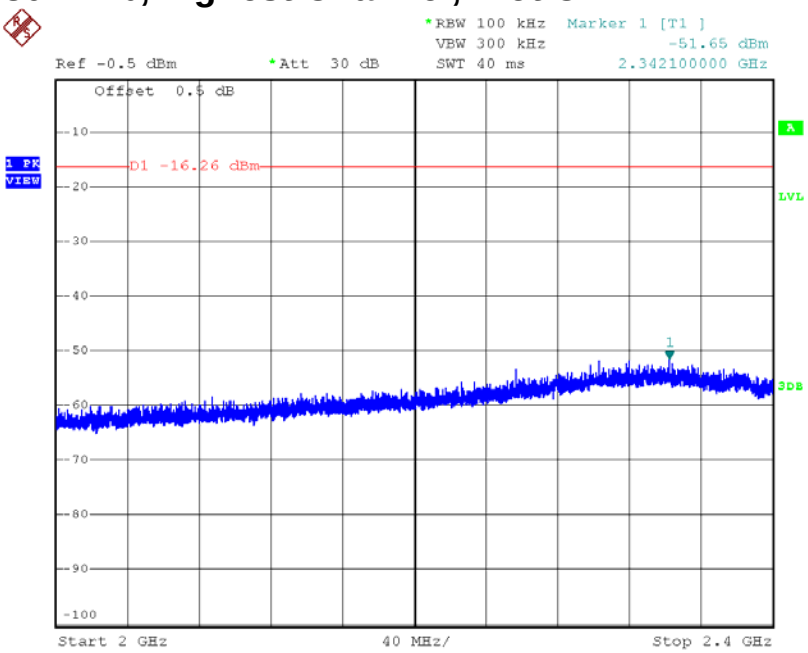
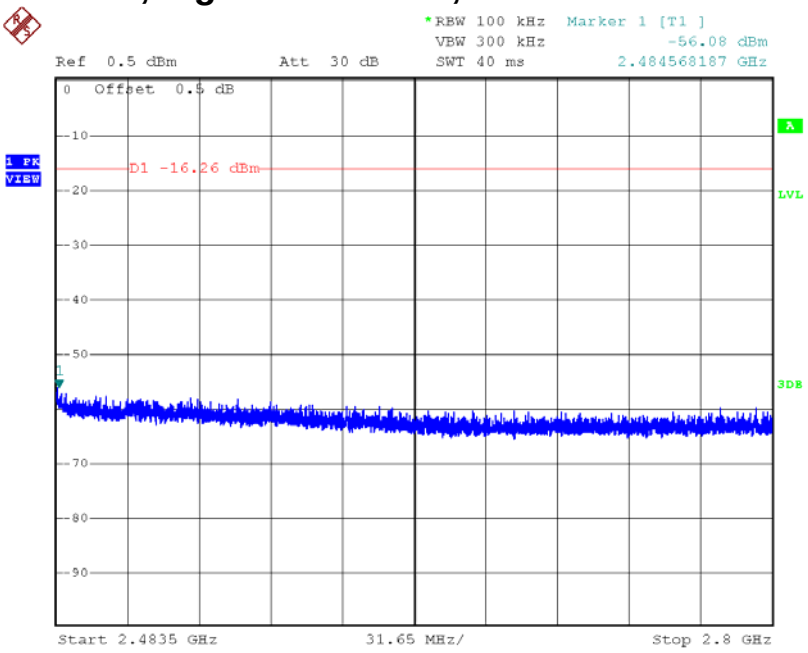
Plots of out of band conducted emissions (IEEE 802.11b,DSSS, 11Mbps)

802.11b, highest Channel, Plot C



802.11b, highest Channel, Plot D



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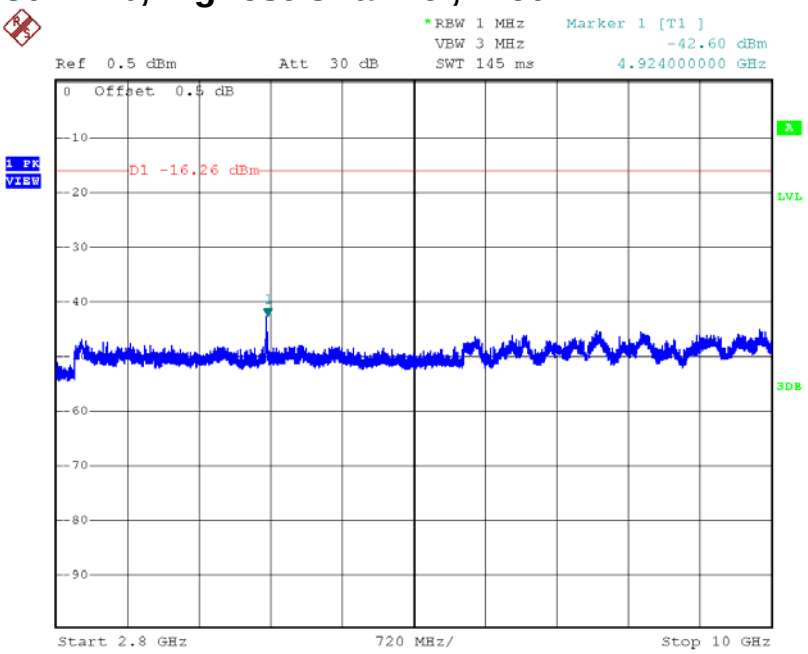
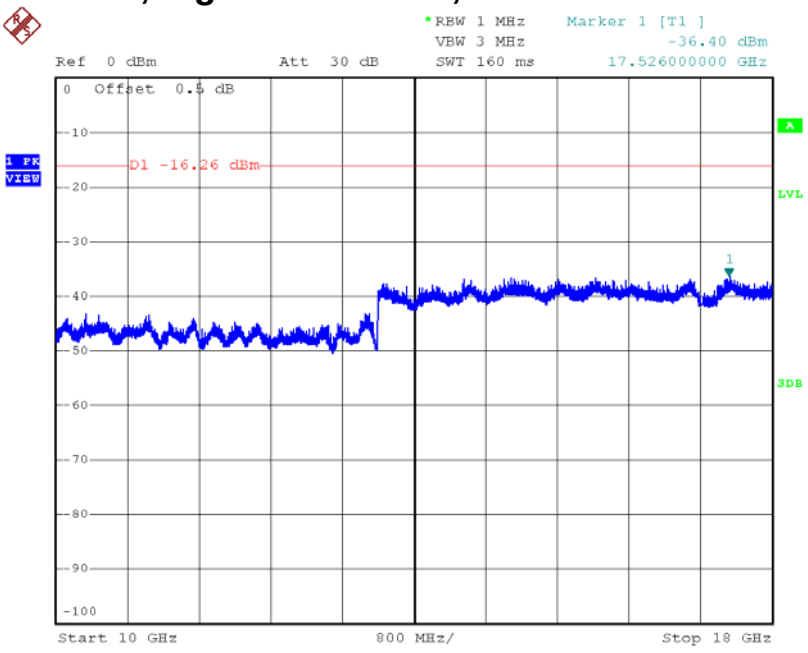
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, highest Channel, Plot E



802.11b, highest Channel, Plot F



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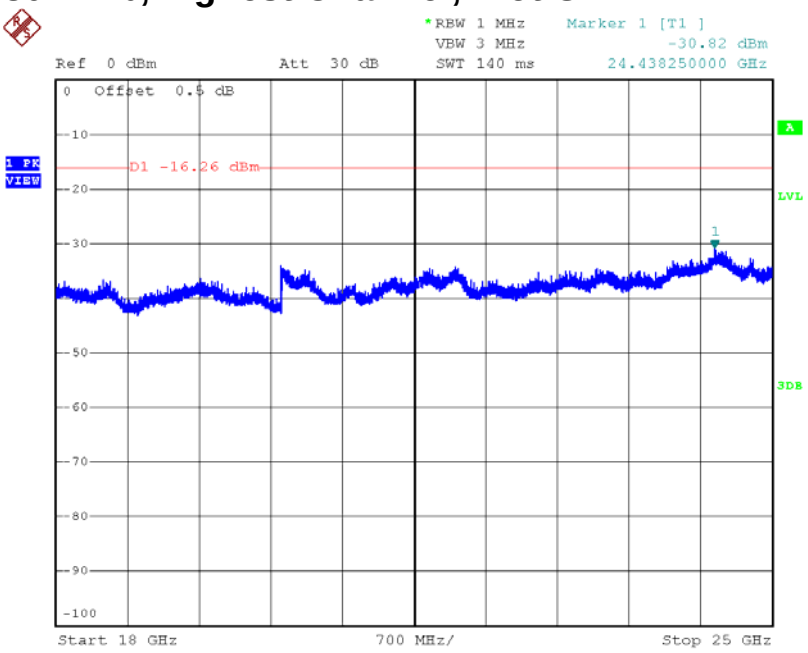
Plots of out of band conducted emissions (IEEE 802.11b,DSSS,11 Mbps)

802.11b, highest Channel, Plot G



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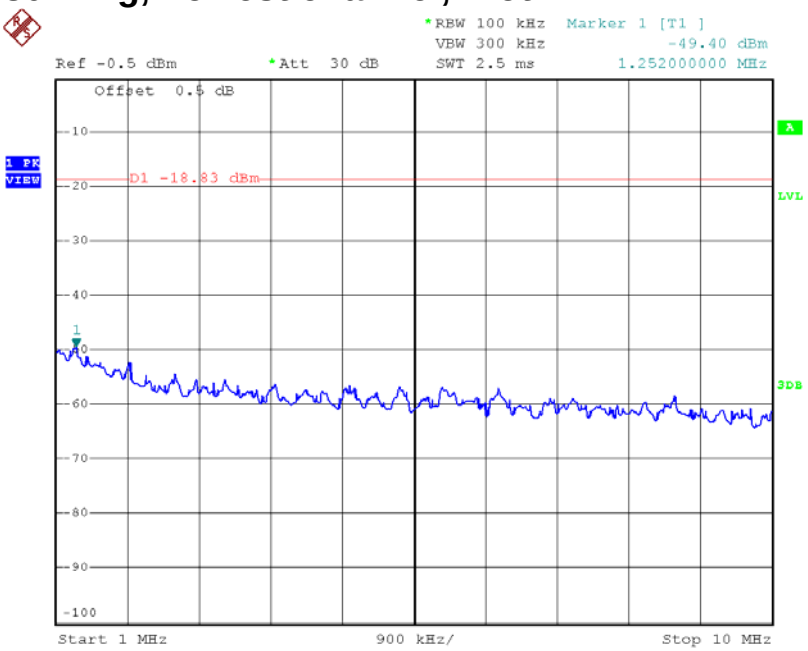
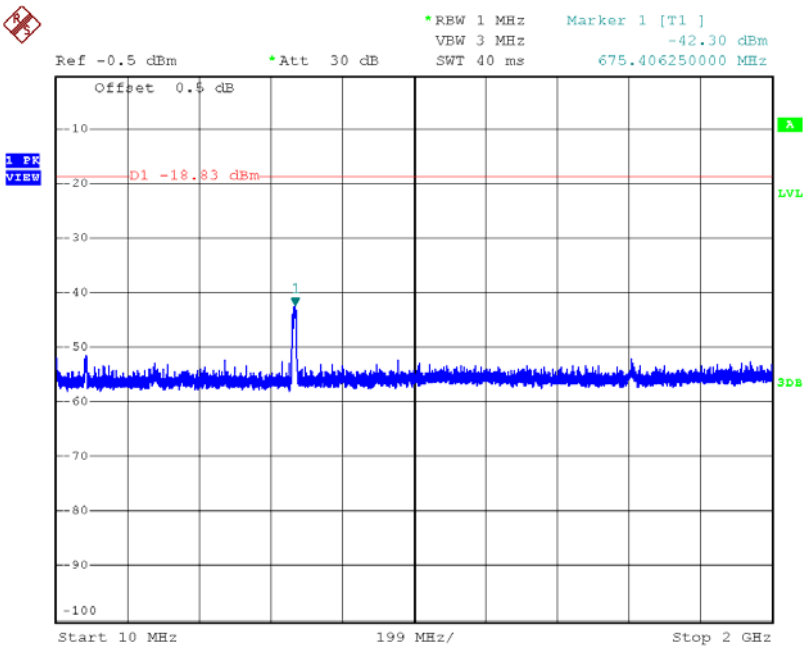
Plots of out of band conducted emissions (IEEE 802.11g,OFDM, 9 Mbps)

802.11g, Lowest channel, Plot A



802.11g, Lowest channel, Plot B



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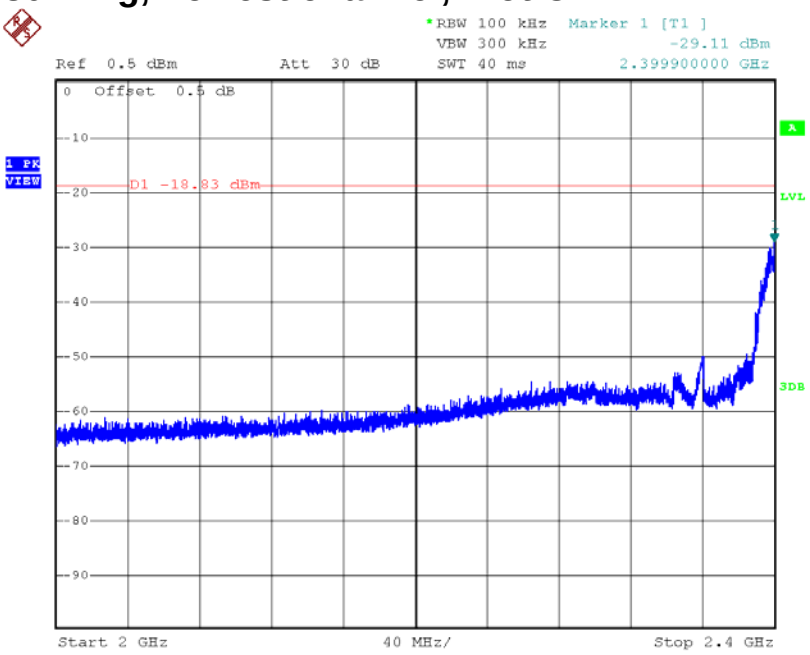
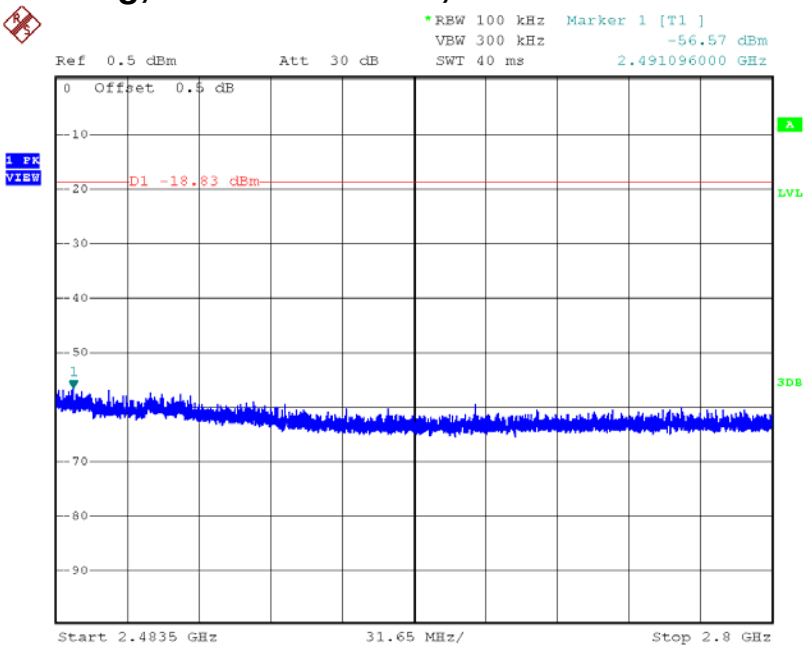
Plots of out of band conducted emissions (IEEE 802.11g,OFDM, 9Mbps)

802.11g, Lowest channel, Plot C



802.11g, Lowest channel, Plot D



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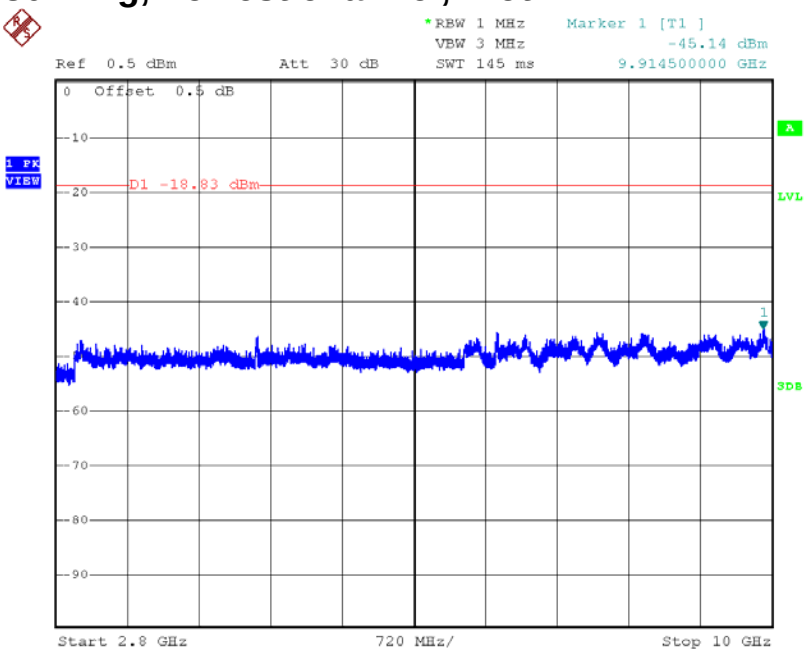
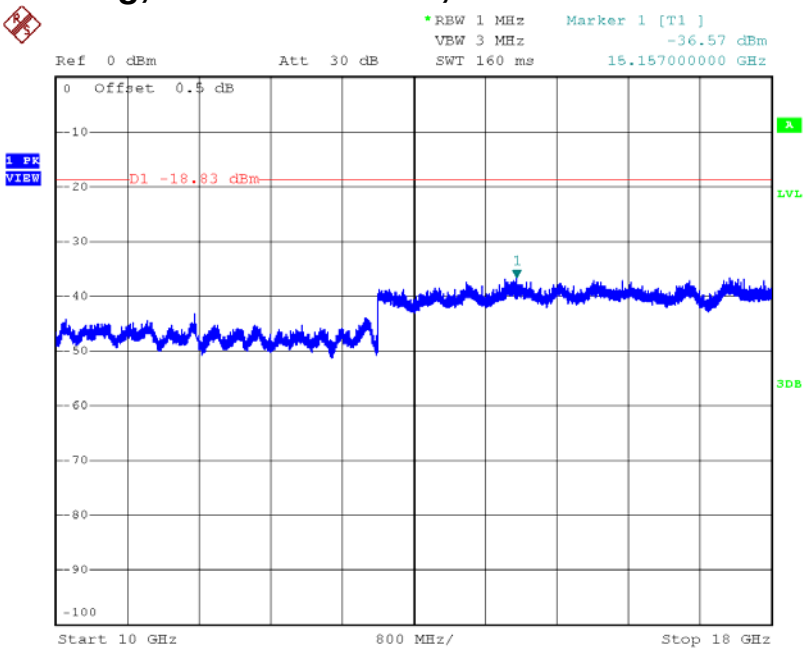
Plots of out of band conducted emissions (IEEE 802.11g, DSSS ,9Mbps)

802.11g, Lowest channel, Plot E



802.11g, Lowest channel, Plot F



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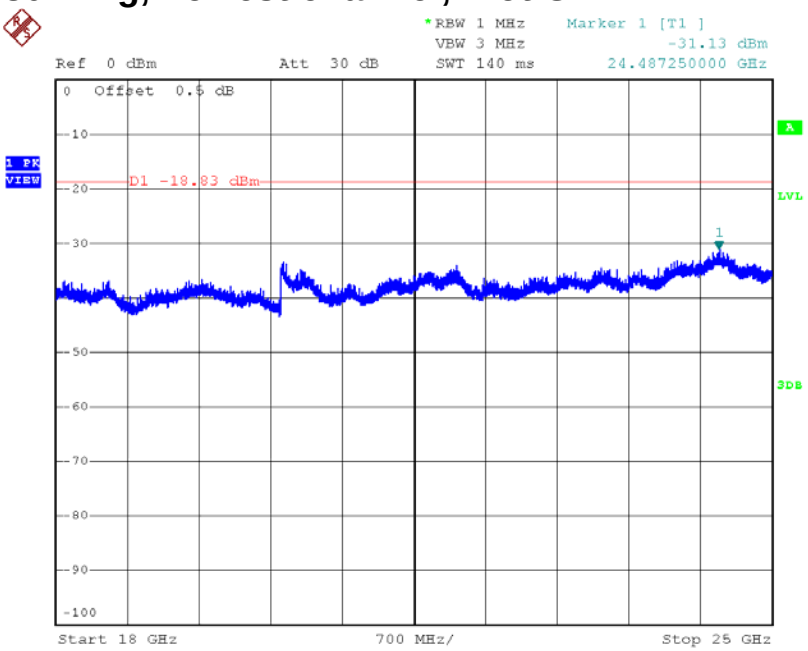
Plots of out of band conducted emissions (IEEE 802.11g,OFDM ,9Mbps)

802.11g, Lowest channel, Plot G



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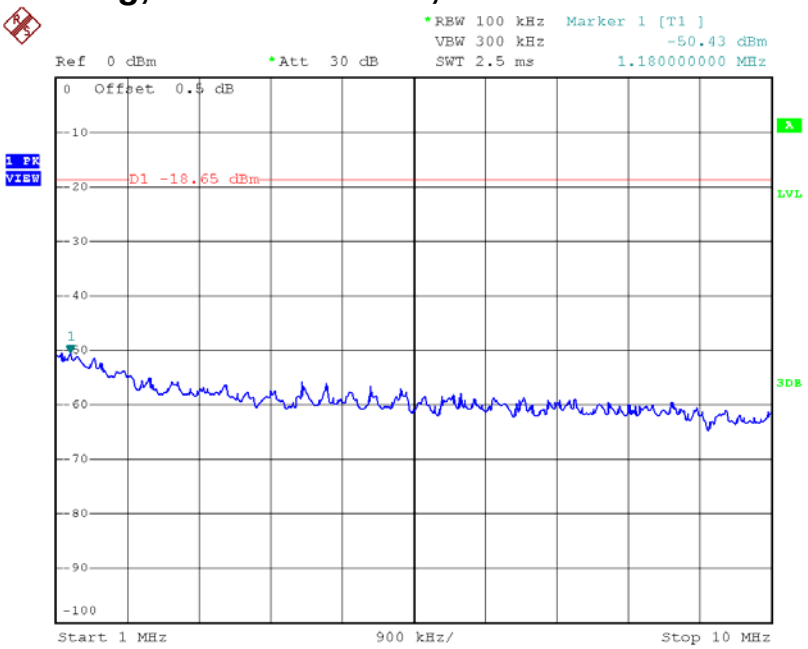
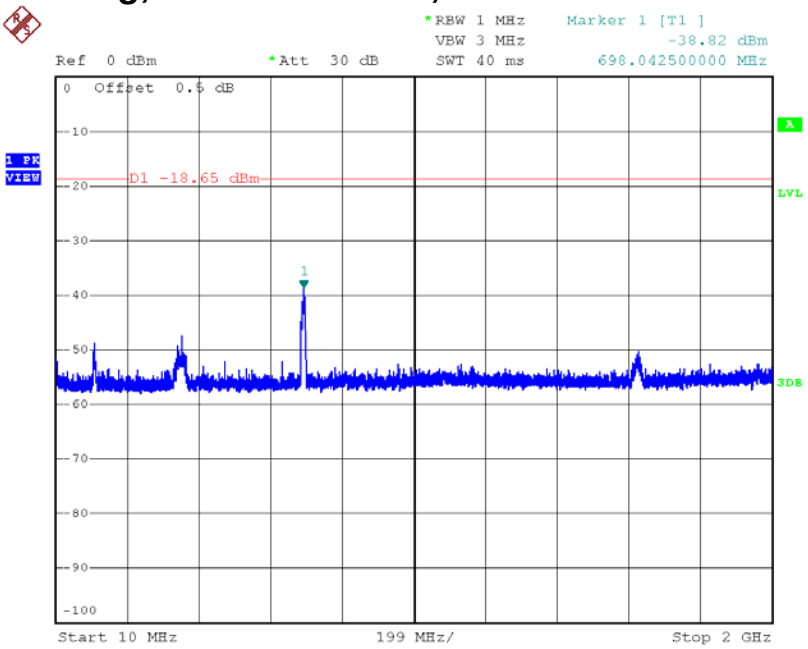
Plots of out of band conducted emissions (IEEE 802.11g,OFDM ,9Mbps)

802.11g, Middle channel, Plot A



802.11g, Middle channel, Plot B



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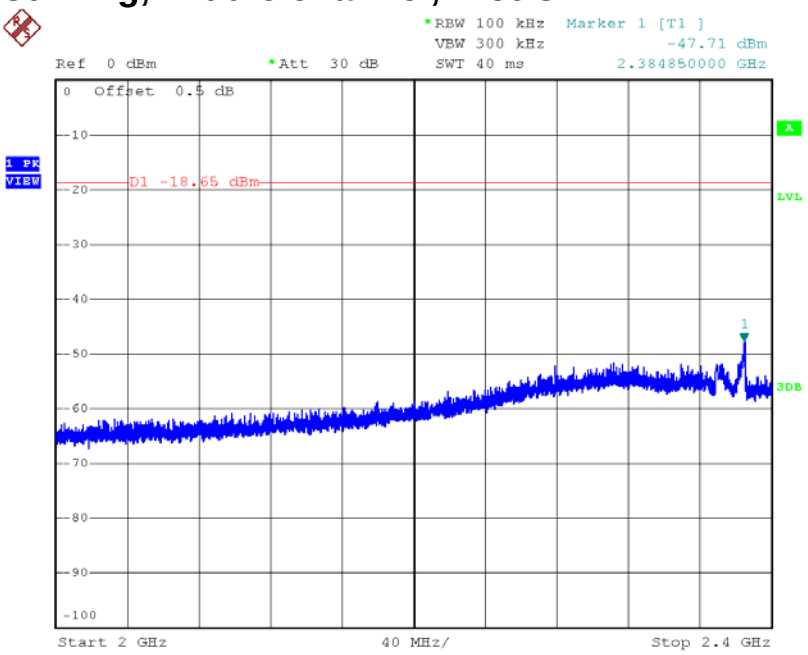
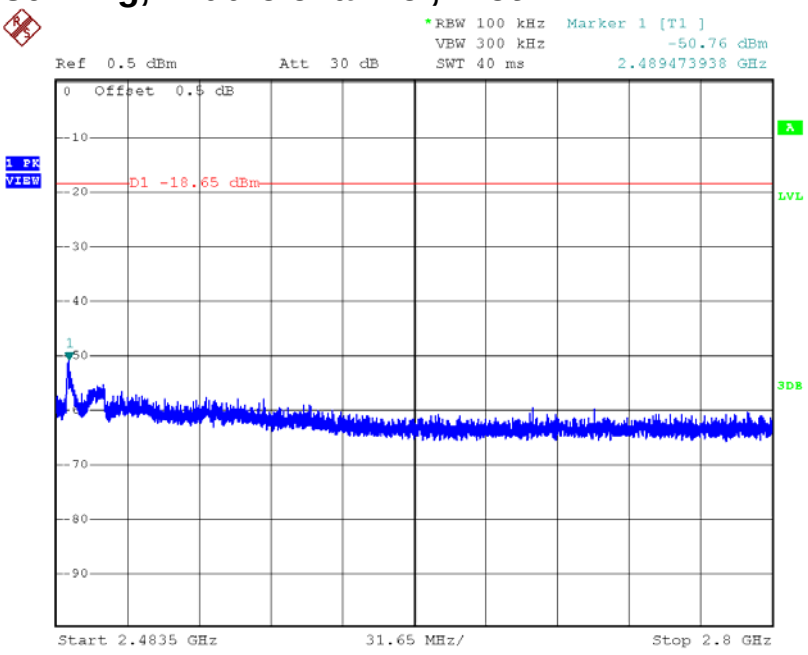
Plots of out of band conducted emissions (IEEE 802.11g,OFDM, 9Mbps)

802.11g, Middle channel, Plot C



802.11g, Middle channel, Plot D



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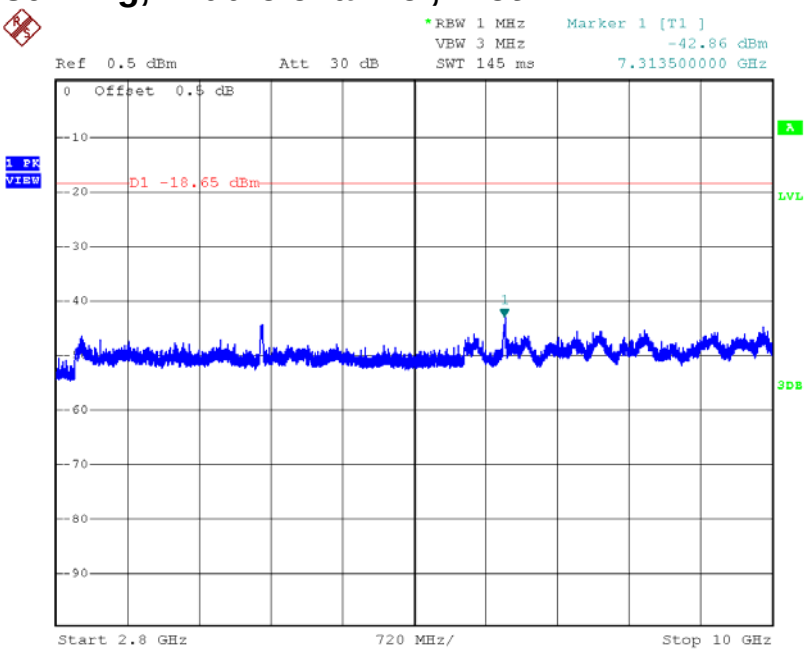
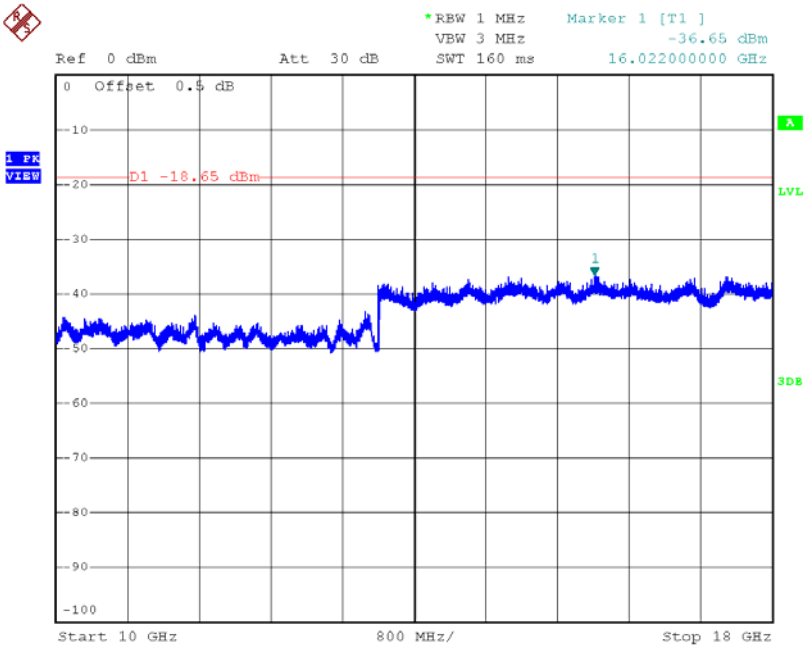
Plots of out of band conducted emissions (IEEE 802.11g,OFDM,9Mbps)

802.11g, Middle channel, Plot E



802.11g, Middle channel, Plot F



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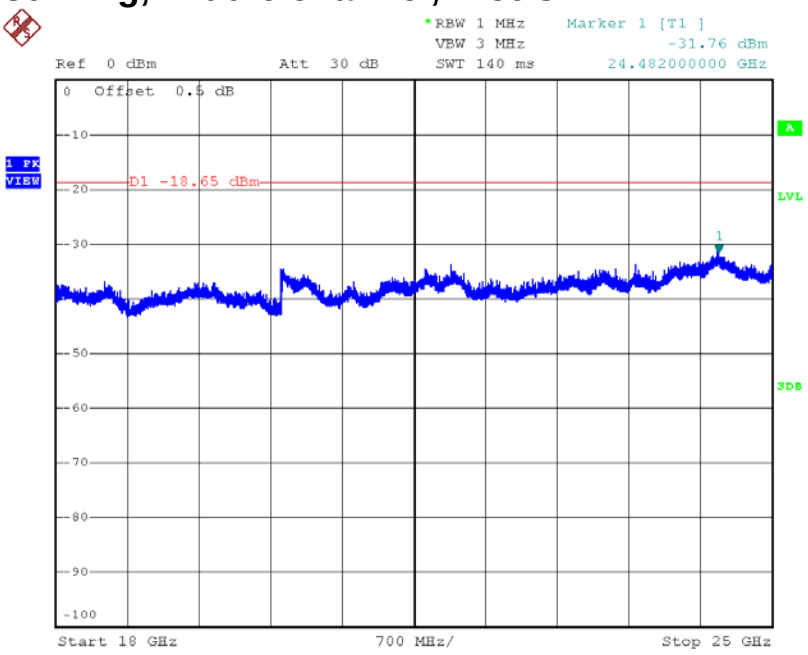
Plots of out of band conducted emissions (IEEE 802.11b,OFDM, 9Mbps)

802.11g, Middle channel, Plot G



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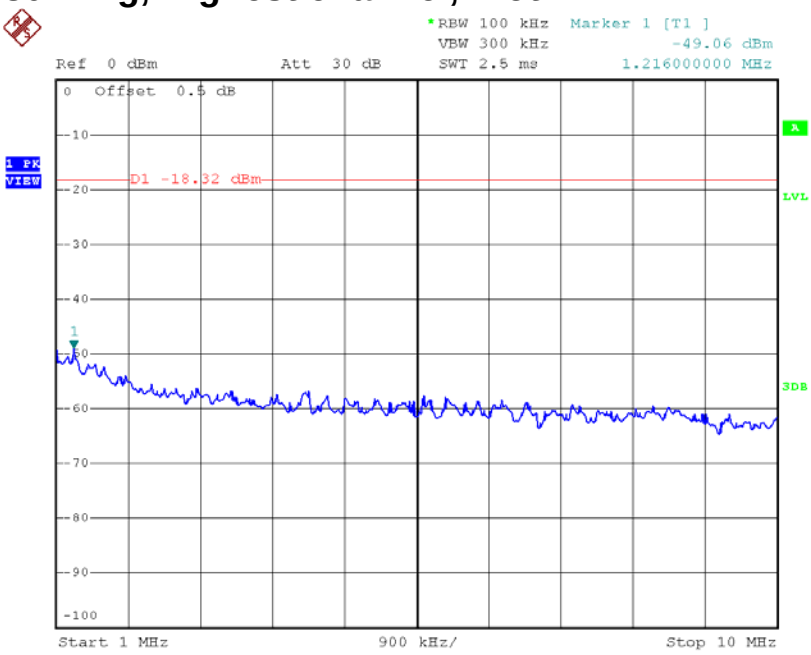
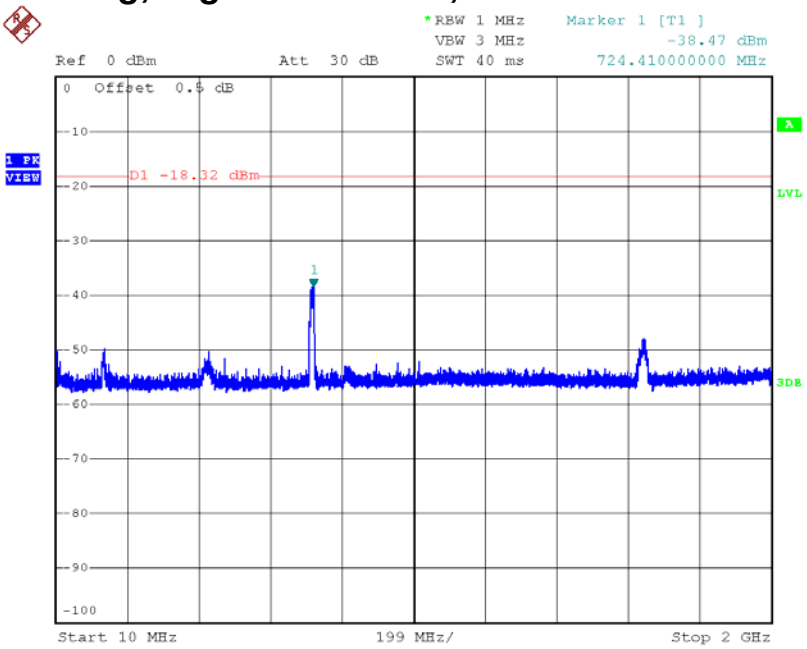
Plots of out of band conducted emissions (IEEE 802.11g,OFDM,9Mbps)

802.11g, Highest channel, Plot A



802.11g, Highest channel, Plot B



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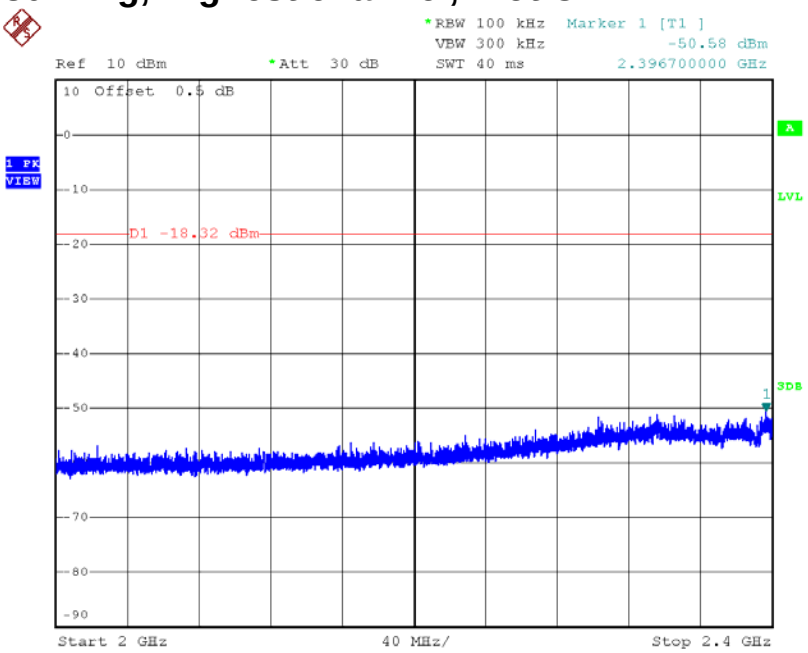
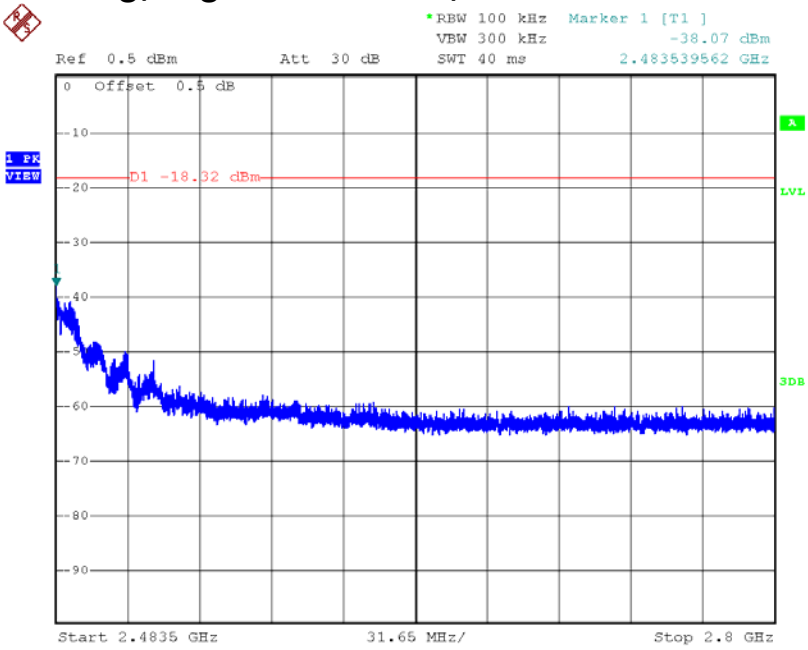
Plots of out of band conducted emissions (IEEE 802.11g,OFDM,9Mbps)

802.11g, Highest channel, Plot C



802.11g, Highest channel, Plot D



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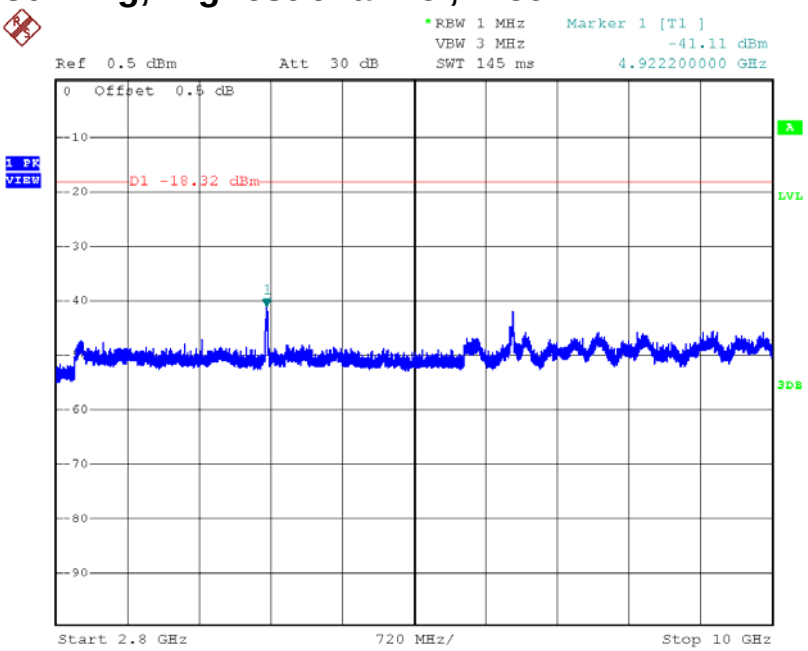
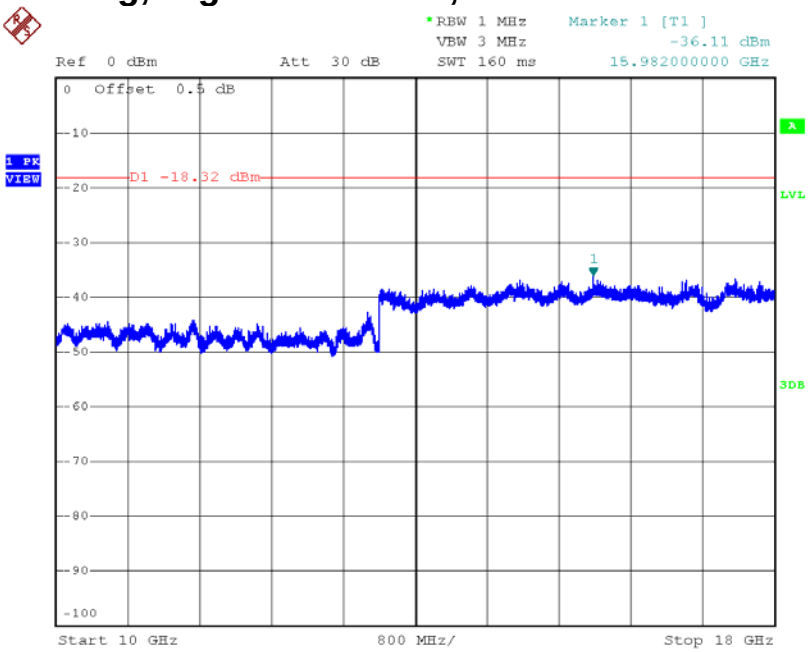
Plots of out of band conducted emissions (IEEE 802.11g,OFDM,9Mbps)

802.11g, Highest channel, Plot E



802.11g, Highest channel, Plot F



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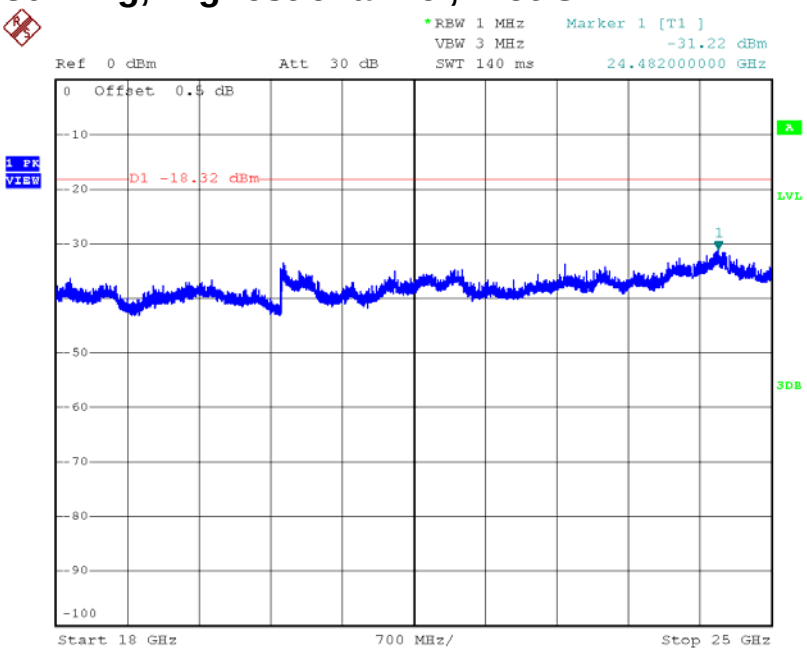
Plots of out of band conducted emissions (IEEE 802.11g,OFDM,9Mbps)

802.11g, Highest channel, Plot G



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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

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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.

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4.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

2390.0MHz

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

4.6.1 Radiated Emission Data

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

Judgement -

Passed by 2.5 dB margin compare with average limit

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4.6.2 Radiated Emissions Data

Mode: Channel 01 - Transmission

Table 1
IEEE 802.11 b (DSSS, 11Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**2390.000**	**53.6**	**33**	**29.4**	**50.0**	**0**	**50.0**	**54.0**	**-4.0**
H	**4824.000**	**34.1**	**33**	**34.9**	**36.0**	**0**	**36.0**	**54.0**	**-18.0**
H	**12060.000**	**39.5**	**33**	**40.5**	**47.0**	**0**	**47.0**	**54.0**	**-7.0**
H	**14472.000**	**41.0**	**33**	**40.0**	**48.0**	**0**	**48.0**	**54.0**	**-6.0**

Remark: Average measurement method is used according to ANSI C63.10.

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)
H	**2390.000**	**64.6**	**33**	**29.4**	**61.0**	**74.0**	**-13.0**
H	**4824.000**	**41.6**	**33**	**34.9**	**43.5**	**74.0**	**-30.5**
H	**12060.000**	**41.0**	**33**	**40.5**	**48.5**	**74.0**	**-25.5**
H	**14472.000**	**43.1**	**33**	**40.0**	**50.1**	**74.0**	**-23.9**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Channel 06 - Transmission

Table 2
IEEE 802.11 b (DSSS, 11 Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**4874.000**	**34.2**	**33**	**34.9**	**36.1**	**0**	**36.1**	**54.0**	**-17.9**
H	**7311.000**	**35.3**	**33**	**37.9**	**40.2**	**0**	**40.2**	**54.0**	**-13.8**
H	**12185.000**	**39.6**	**33**	**40.5**	**47.1**	**0**	**47.1**	**54.0**	**-6.9**

Remark: Average measurement method is used according to ANSI C63.10

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)
H	**4874.000**	**41.8**	**33**	**34.9**	**43.7**	**74.0**	**-30.3**
H	**7311.000**	**39.2**	**33**	**37.9**	**44.1**	**74.0**	**-29.9**
H	**12185.000**	**40.7**	**33**	**40.5**	**48.2**	**74.0**	**-25.8**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Channel 11 - Transmission

Table 3
IEEE 802.11 b (DSSS, 11Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**2483.500**	**42.1**	**33**	**29.4**	**38.5**	**0**	**38.5**	**54.0**	**-15.5**
H	**4924.000**	**34.3**	**33**	**34.9**	**36.2**	**0**	**36.2**	**54.0**	**-17.8**
H	**7386.000**	**35.4**	**33**	**37.9**	**40.3**	**0**	**40.3**	**54.0**	**-13.7**
H	**12310.000**	**39.8**	**33**	**40.5**	**47.3**	**0**	**47.3**	**54.0**	**-6.7**

Remark: Average measurement method is used according to ANSI C63.10

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)
H	**2483.500**	**54.7**	**33**	**29.4**	**51.1**	**74.0**	**-22.9**
H	**4924.000**	**42.0**	**33**	**34.9**	**43.9**	**74.0**	**-30.1**
H	**7386.000**	**39.3**	**33**	**37.9**	**44.2**	**74.0**	**-29.8**
H	**12310.000**	**41.1**	**33**	**40.5**	**48.6**	**74.0**	**-25.4**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Channel 01 - Transmission

Table 4
IEEE 802.11g (OFDM, 9 Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**2390.000**	**55.1**	**33**	**29.4**	**51.5**	**0**	**51.5**	**54.0**	**-2.5**
H	**4824.000**	**33.6**	**33**	**34.9**	**35.5**	**0**	**35.5**	**54.0**	**-18.5**
H	**12060.000**	**39.0**	**33**	**40.5**	**46.5**	**0**	**46.5**	**54.0**	**-7.5**
H	**14472.000**	**40.2**	**33**	**40.0**	**47.2**	**0**	**47.2**	**54.0**	**-6.8**

Remark: Average measurement method is used according to ANSI C63.10

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)
H	**2390.000**	**65.8**	**33**	**29.4**	**62.2**	**74.0**	**-11.8**
H	**4824.000**	**42.2**	**33**	**34.9**	**44.1**	**74.0**	**-29.9**
H	**12060.000**	**42.8**	**33**	**40.5**	**50.3**	**74.0**	**-23.7**
H	**14472.000**	**44.4**	**33**	**40.0**	**51.4**	**74.0**	**-22.6**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Channel 06 - Transmission

Table 5
IEEE 802.11g (OFDM, 9 Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**4874.000**	**33.7**	**33**	**34.9**	**35.6**	**0**	**35.6**	**54.0**	**-18.4**
H	**7311.000**	**35.8**	**33**	**37.9**	**40.7**	**0**	**40.7**	**54.0**	**-13.3**
H	**12185.000**	**39.3**	**33**	**40.5**	**46.8**	**0**	**46.8**	**54.0**	**-7.2**

Remark: Average measurement method is used according to ANSI C63.10

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)
H	**4874.000**	**42.6**	**33**	**34.9**	**44.5**	**74.0**	**-29.5**
H	**7311.000**	**40.9**	**33**	**37.9**	**45.8**	**74.0**	**-28.2**
H	**12185.000**	**42.7**	**33**	**40.5**	**50.2**	**74.0**	**-23.8**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4.Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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Mode: Channel 11 - Transmission

Table 6
IEEE 802.11g (OFDM, 9 Mbps)

Radiated Emission Data

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	**2483.500**	**44.1**	**33**	**29.4**	**40.5**	**0**	**40.5**	**54.0**	**-13.5**
H	**4924.000**	**33.4**	**33**	**34.9**	**35.3**	**0**	**35.3**	**54.0**	**-18.7**
H	**7386.000**	**36.0**	**33**	**37.9**	**40.9**	**0**	**40.9**	**54.0**	**-13.1**
H	**12310.000**	**38.7**	**33**	**40.5**	**46.2**	**0**	**46.2**	**54.0**	**-7.8**

Remark: Average measurement method is used according to ANSI C63.10

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)
H	**2483.500**	**55.1**	**33**	**29.4**	**51.5**	**74.0**	**-22.5**
H	**4924.000**	**42.8**	**33**	**34.9**	**44.7**	**74.0**	**-29.3**
H	**7386.000**	**40.8**	**33**	**37.9**	**45.7**	**74.0**	**-28.3**
H	**12310.000**	**43.2**	**33**	**40.5**	**50.7**	**74.0**	**-23.3**

Remark: Peak detector is used for the emission measurement.

NOTES:

1. 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.

2. Negative value in the margin column shows emission below limit.

3. Horn antenna is used for the emission over 1000MHz.

4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.

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4.6.3 Transmitter Duty Cycle Calculation

Not applicable – No average factor is required.

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

0.366 MHz

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 12.72 dB margin compare with quasi-peak limit

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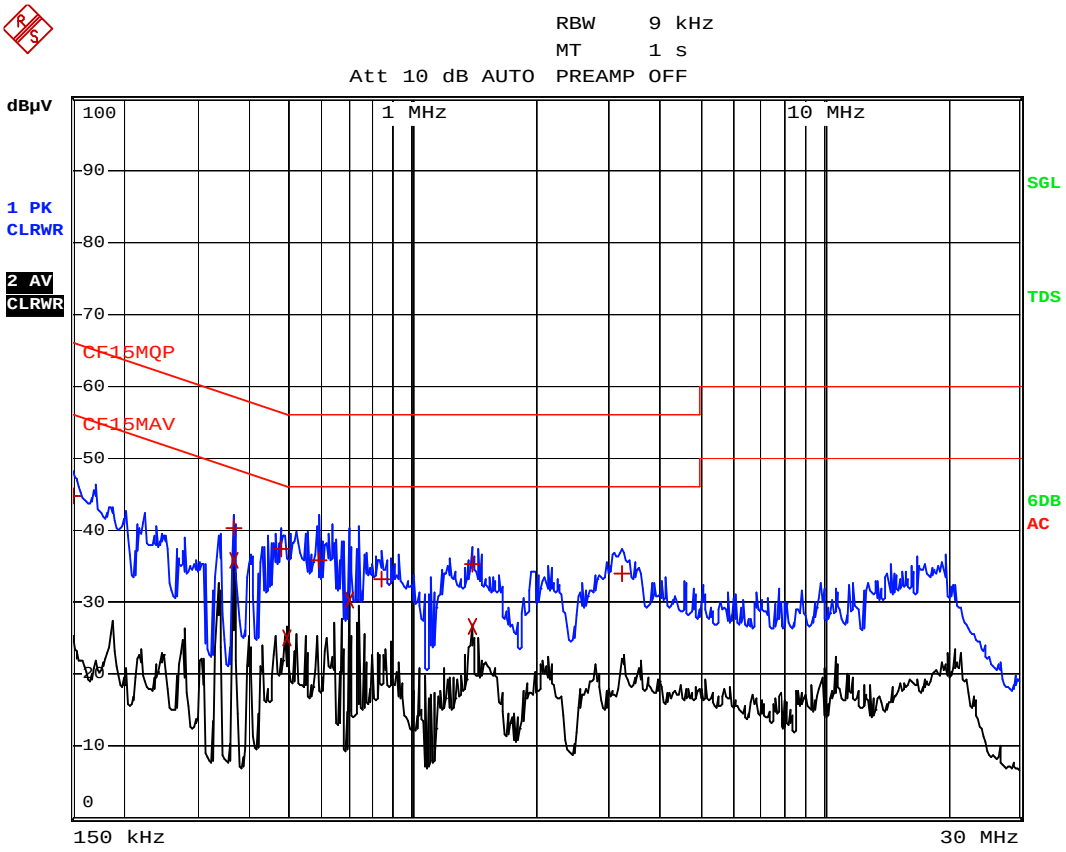
Worst Case: WiFi Transmission -EUT's AC Mains



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Worst Case: WiFi Transmission -EUT's AC Mains

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	150 kHz	44.83	N	-21.16
1	Quasi Peak	366 kHz	40.34	N	-18.24
2	CISPR Average	366 kHz	35.86	L1	-12.72
1	Quasi Peak	478.5 kHz	37.29	N	-19.06
2	CISPR Average	492 kHz	24.95	N	-21.18
1	Quasi Peak	591 kHz	35.70	N	-20.29
2	CISPR Average	703.5 kHz	30.37	L1	-15.62
1	Quasi Peak	843 kHz	33.21	N	-22.78
1	Quasi Peak	1.4055 MHz	35.27	N	-20.72
2	CISPR Average	1.4055 MHz	26.55	L1	-19.44
1	Quasi Peak	3.228 MHz	33.94	L1	-22.05

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4.8 Radio Frequency Radiation Exposure

EUT is subject to the radio frequency exposure requirements specified in FCC Rule §§ 1.1307. It shall be considered to operate in a "general population / uncontrolled" environment.

☐ Output power is less than the applicable low threshold from SAR evaluation. The evaluation calculation results are saved with filename: RF exposure info.pdf

☐ EUT was evaluated for Maximum Permissible Exposure (MPE) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). The evaluation calculation results are saved with filename: RF exposure info.pdf

☒ EUT was evaluated for Specific Absorption Rate (SAR) evaluation compliance according to OET Bulletin 65, Supplement C (Edition 01-01). It is in compliance with the SAR evaluation requirements. A SAR test report was submitted at same time and saved as SAR Report.pdf

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EXHIBIT 5
EQUIPMENT LIST

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5.0 **Equipment List**

1) Radiated Emissions Test

Equipment	Biconical Antenna	Log Periodic Antenna	EMI Test Receiver
Registration No.	EW-0571	EW-0446	EW-2500
Manufacturer	EMCO	EMCO	ROHDESCHWARZ
Model No.	3104C	3146	ESCI
Calibration Date	Apr. 05, 2012	Apr. 30, 2013	Mar. 22, 2013
Calibration Due Date	Oct. 05, 2013	Oct. 30, 2014	Feb. 28, 2014

Equipment	14m Double Shield RF Cable	14m Double Shield RF Cable	Spectrum Analyzer 30GHz
Registration No.	EW-2528	EW-2074	EW-2466
Manufacturer	RADIALL	RADIALL	R&S
Model No.	nm / br5d / sma 14m	N(m)-RG142-BNC(m) L= 14M	FSP30
Calibration Date	Dec. 14, 2012	Dec. 14, 2012	Jul. 6, 2012
Calibration Due Date	Dec. 14, 2013	Dec. 14, 2013	Jul. 6, 2013

Equipment	Double Ridged Guide Antenna	Active Loop H-Field	12m Double Shield RF Cable
Registration No.	EW-1015	EW-0191	EW-2774
Manufacturer	EMCO	EMCO	GREATBILLION
Model No.	3115	6502	SMA m-m ra 12m 40G outdoor
Calibration Date	Mar. 05, 2013	Jan 30, 2013	Oct. 30, 2012
Calibration Due Date	Sep. 05, 2014	Jul 30, 2014	Oct. 30, 2013

Equipment	Pre-Amplifier
Registration No.	EW-2354
Manufacturer	MITEQ
Model No.	12002600-30-10P
Calibration Date	Sep. 22, 2012
Calibration Due Date	Sep. 22, 2013

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2) Conducted Emissions Test

Equipment	EMI Test Receiver	RF Cable	Artificial Mains
Registration No.	EW-2500	EW-2454	EW-2501
Manufacturer	ROHDESCHWARZ	RADIALL	ROHDESCHWARZ
Model No.	ESCI	bnc m st / 142 /bnc m ra 240cm	ENV-216
Calibration Date	Mar. 22, 2013	Jul. 20, 2012	Nov. 30, 2012
Calibration Due Date	Feb. 28, 2014	Jul. 20, 2013	Nov. 30, 2013

3) Conductive Measurement Test

Equipment	Spectrum Analyzer 30GHz
Registration No.	EW-2466
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Jul. 6, 2012
Calibration Due Date	Jul. 6, 2013

END OF TEST REPORT

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