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TEST REPORT

Report Number: 17040084HKG-001

Application
for
Original Grant of 47 CFR Part 15 Certification
Single New of RSS-247 Issue 2 Equipment

Ultimate Lightning McQueen

FCC ID: SXO-C001

IC: 10016A-C001

This report contains the data of WLAN (WiFi) portion only.

Prepared and Checked by:

Approved by:

Signed On File

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April 24, 2017

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GENERAL INFORMATION

Applicant Name:	Sphero HK Limited
Applicant Address:	4/F, 299QRC, 287-299 Queen's Road Central, Sheung Wan, Hong Kong.
FCC Specification Standard:	FCC Part 15, October 1, 2015 Edition
FCC ID:	SXO-C001
FCC Model(s):	C001
IC Specification Standard:	RSS-247 Issue 2, February 2017 RSS-Gen Issue 4, November 2014
IC:	10016A-C001
PMN:	C001
HVIN:	C001
Type of EUT:	Spread Spectrum Transmitter
Description of EUT:	Ultimate Lightning McQueen
Serial Number:	N/A
Sample Receipt Date:	April 03, 2017
Date of Test:	April 03, 2017 to April 07, 2017
Report Date:	April 24, 2017
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

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EXHIBIT 1 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

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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(1)	Pass	4.2
Max. Power Density (average)	15.247(e)	5.2(2)	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	5.5	Pass	4.6
AC Power Line Conducted Emission	15.207	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, 2015 Edition
RSS-247 Issue 2, February 2017
RSS-Gen Issue 4, November 2014

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EXHIBIT 2 GENERAL DESCRIPTION

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2.0 General Description

2.1 Product Description

The C001 (C001) is an Ultimate Lightning McQueen. The EUT contains both WLAN (WiFi) and Bluetooth (Bluetooth 4.0) modules. An iOS/ Android App installed in Smartphone can connect with the EUT via Bluetooth and WiFi. It has sound and light during normal play. It is installed with light and touch sensor. It can be controlled to move forward/ backward and turn left/ right by the App. The EUT is power by a 120VAC to 15VDC 1000mA adaptor and/ or a 12V rechargeable battery.

For WLAN (WiFi) module:

The Equipment Under Test (EUT) operates at frequency range of 2412MHz to 2462MHz with 11 channels.

For 802.11b mode, it operates at frequency range of 2412.000MHz to 2462.000MHz 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 2412.000MHz to 2462.000MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can be up to 54Mbps.

For 802.11n (with 20MHz bandwidth) mode, it operates at frequency range of 2412.000MHz to 2462.000MHz with 11 channels. It transmits via Orthogonal Frequency Division Multiplexing (OFDM) modulation. Maximum bit rate can support up to 65Mbps.

For Bluetooth module:

For Bluetooth 4.0 BLE mode, it occupies a frequency range from 2402MHz to 2480MHz (40 channels with channel spacing of 2MHz). It transmits via GFSK modulation.

Antenna Type: Internal, Integral

For electronic filing, the brief 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 v03r05 (08-April-2016) All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 4 (2014).

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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)

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EXHIBIT 3 SYSTEM TEST CONFIGURATION

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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 a 120VAC to 15V 1000mA adaptor and/ or a 12V rechargeable battery.

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

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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. 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.

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

For simultaneous transmission, both WiFi and Bluetooth portions are also switched on when taking radiated emission for determining worst-case spurious emission.

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 and/or a battery (provided with the unit) was used to power the device. Their description are listed below.

- (1) An AC adaptor (120VAC 60Hz 500mA to 15VDC 1000mA, Model: SEI1501000VU) (Provided by Client)
- (2) A 12V rechargeable battery

Description of Accessories:

- (1) iPod Touch (Model: A1509, FCC ID: BCG-A1421, Brand: Apple)
(Provided by client)

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 $\pm 5.3\text{dB}$ and $\pm 0.99\text{dB}$ respectively. The value of the Measurement uncertainty for conducted emission test is $\pm 4.2\text{dB}$.

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.

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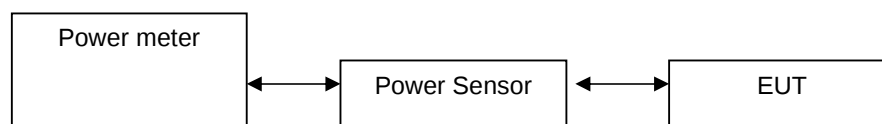
EXHIBIT 4 TEST RESULTS

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4.0 Test Results

RF Conduct Measurement Test Setup

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



4.1 Maximum Conducted (peak) Output Power at Antenna Terminals

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 obtain power at the EUT antenna terminals. 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, 1 Mbps) Antenna Gain = 2.19 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	12.83	19.187
Middle Channel:	2437	12.12	16.293
High Channel:	2462	11.35	13.646

IEEE 802.11g (OFDM, 6 Mbps) Antenna Gain = 2.19 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	16.37	43.351
Middle Channel:	2437	18.35	68.391
High Channel:	2462	17.06	50.816

IEEE 802.11n (20MHz) (OFDM, MCS0) Antenna Gain = 2.19 dBi			
Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2412	18.71	74.302
Middle Channel:	2437	17.82	60.534
High Channel:	2462	17.42	55.208

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

Cable loss : 1.0 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 = 12.83 dBm

IEEE 802.11g (OFDM, 9 Mbps)
max. conducted (peak) output level = 18.35 dBm

IEEE 802.11n (20MHz) (OFDM, MCS0)
max. conducted (peak) output level = 18.71 dBm

Limits:

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

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

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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 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	8.4
Middle Channel:	2437	8.3
High Channel:	2462	8.4

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

IEEE 802.11n (20MHz) (OFDM, MCS0)		
Frequency (MHz)		6dB Bandwidth (MHz)
Low Channel:	2412	17.8
Middle Channel:	2437	17.8
High Channel:	2462	17.8

Limits

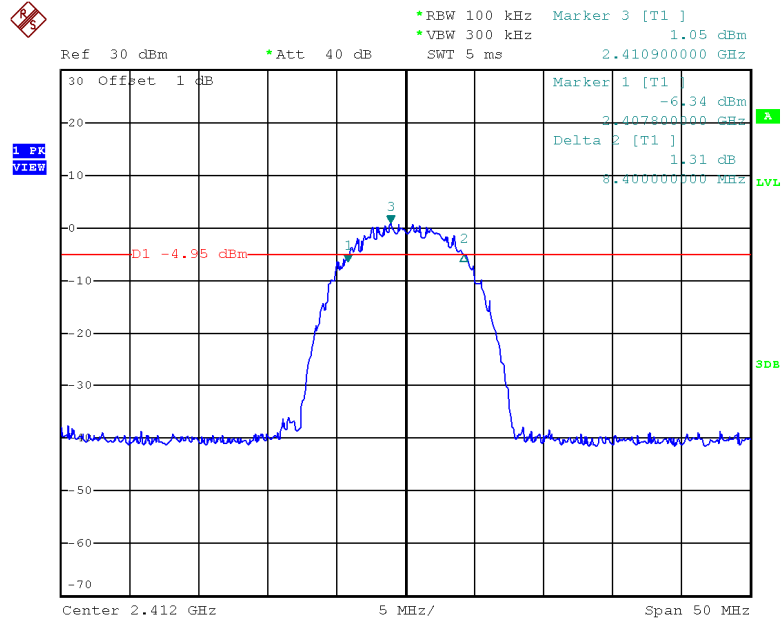
6 dB bandwidth shall be at least 500kHz

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

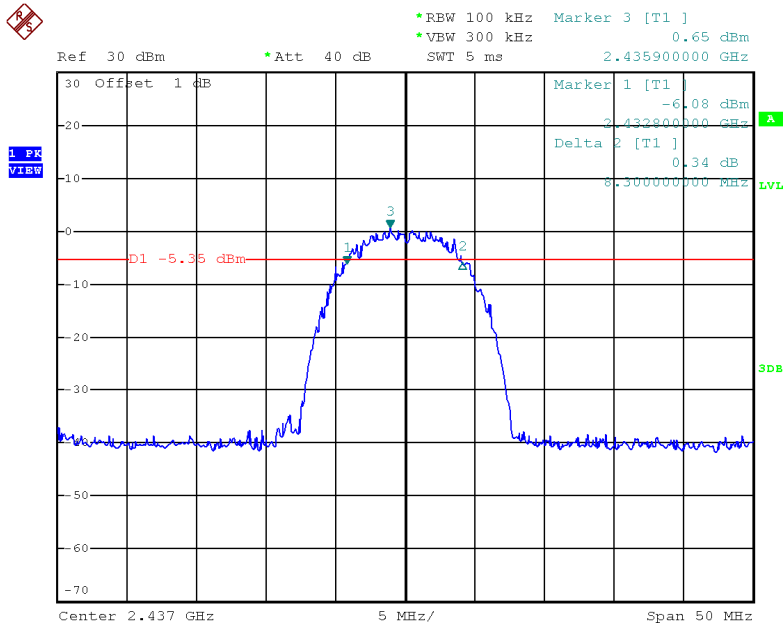
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Plots of 6dB RF bandwidth

802.11b, Lowest Channel



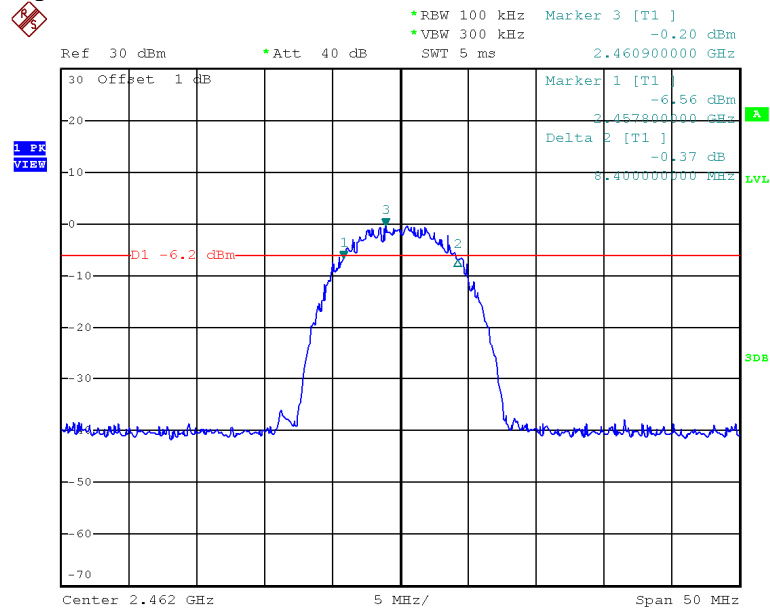
802.11b, Middle Channel



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Plots of 6dB RF bandwidth

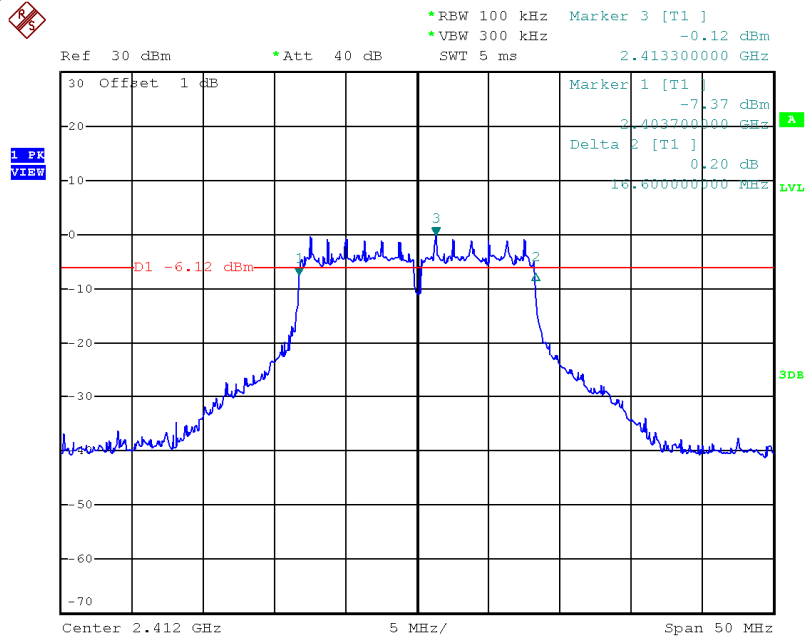
802.11b, Highest Channel



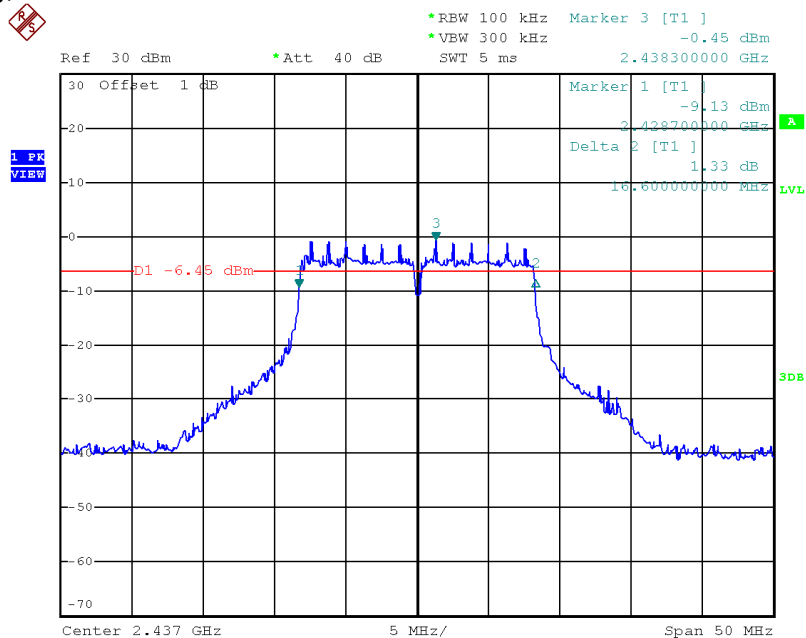
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Plots of 6dB RF bandwidth

802.11g, Lowest Channel



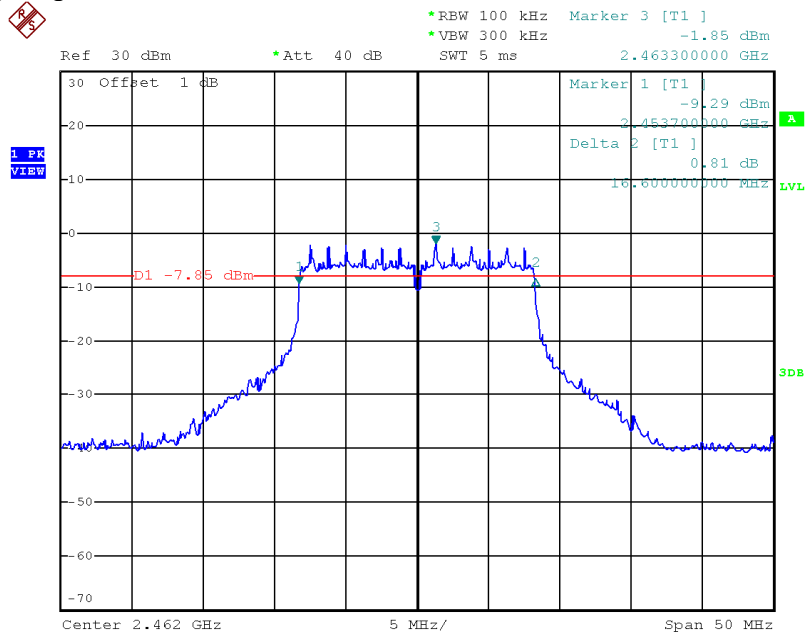
802.11g, Middle Channel



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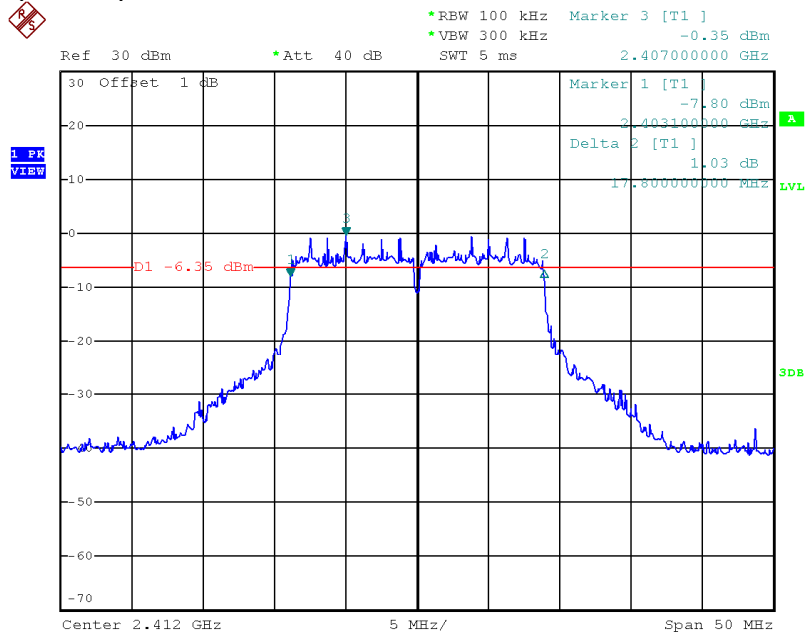
Plots of 6dB RF bandwidth

802.11g, Highest Channel

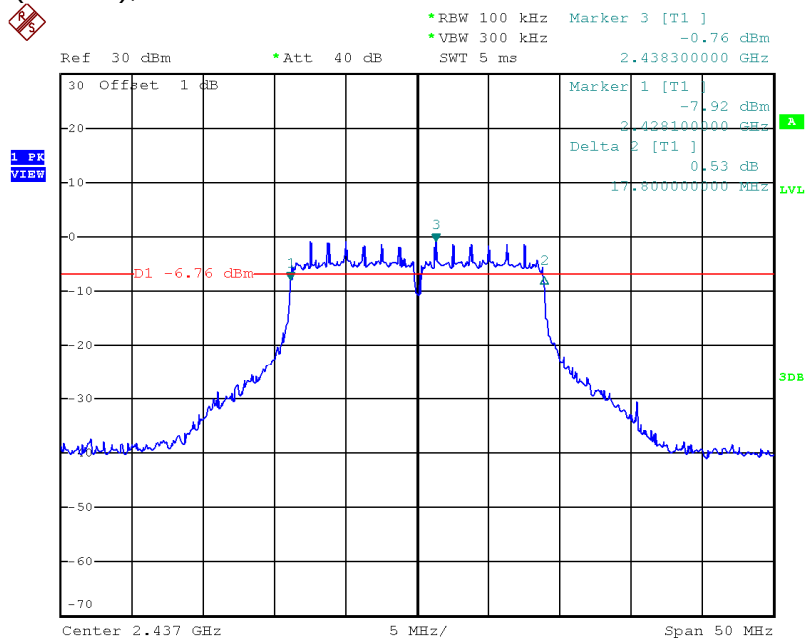


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Plots of 6dB RF bandwidth 802.11n (20MHz), Lowest Channel

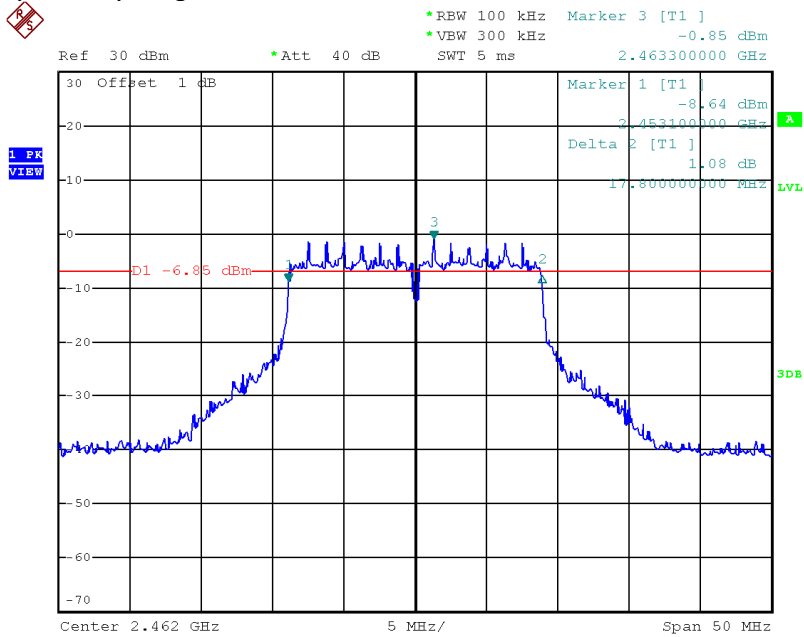


802.11n (20MHz), Middle Channel



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Plots of 6dB RF bandwidth 802.11n (20MHz), 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-1 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)
Low Channel:	2412	1.02
Middle Channel:	2437	0.56
High Channel:	2462	-0.14

IEEE 802.11g (OFDM, 6 Mbps)		
Frequency (MHz)		PSD in 100kHz (dBm)
Low Channel:	2412	-0.12
Middle Channel:	2437	-0.72
High Channel:	2462	-1.86

IEEE 802.11n (20MHz) (OFDM, MCS0)		
Frequency (MHz)		PSD in 100kHz (dBm)
Low Channel:	2412	-0.34
Middle Channel:	2437	-0.81
High Channel:	2462	-1.08

Cable Loss: 1.0 dB

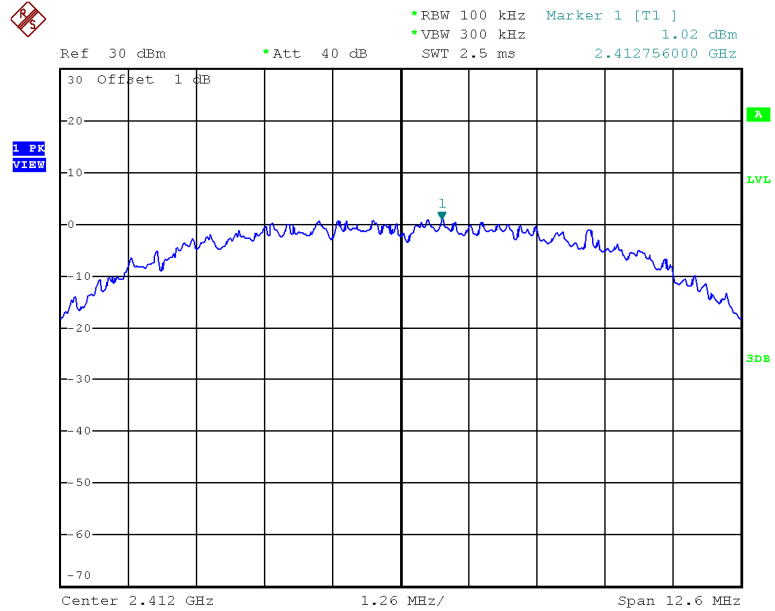
Limit:
8dBm

The plots of power spectral density are as below.

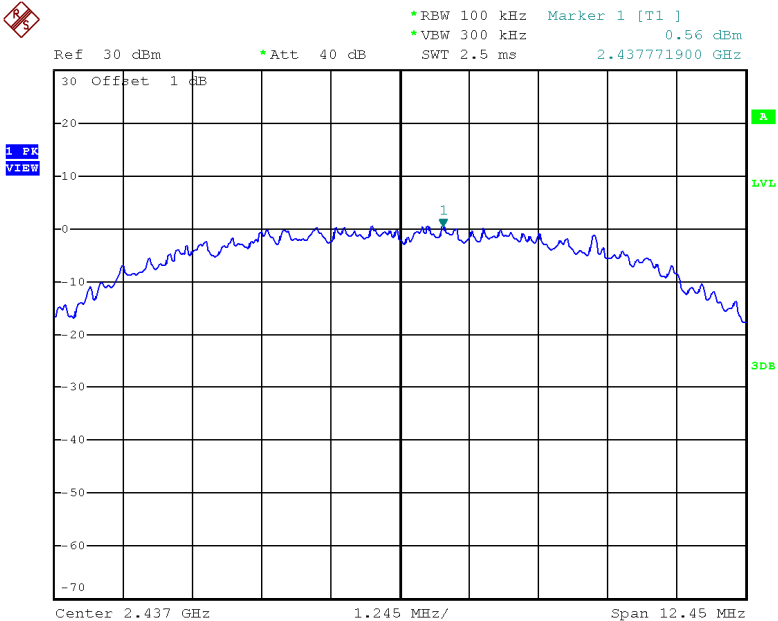
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Plots of power spectral density

802.11b, Lowest channel



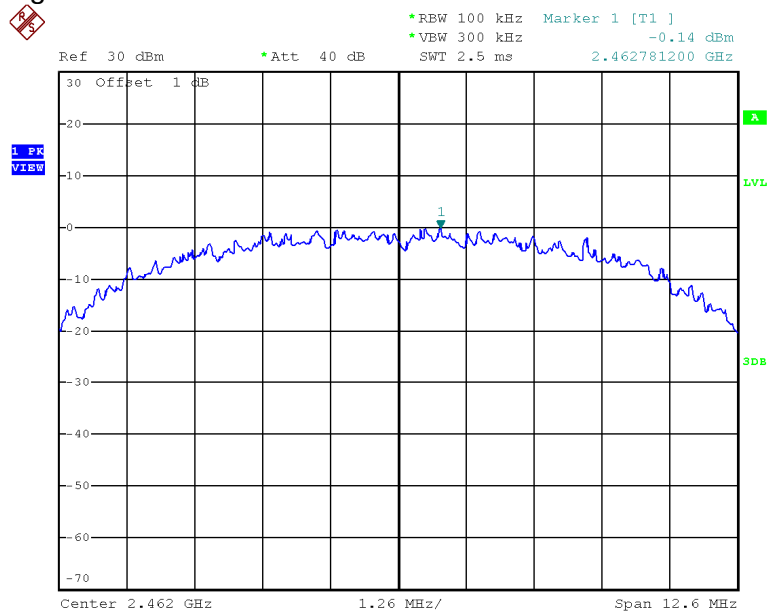
802.11b, Middle channel



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Plots of power spectral density

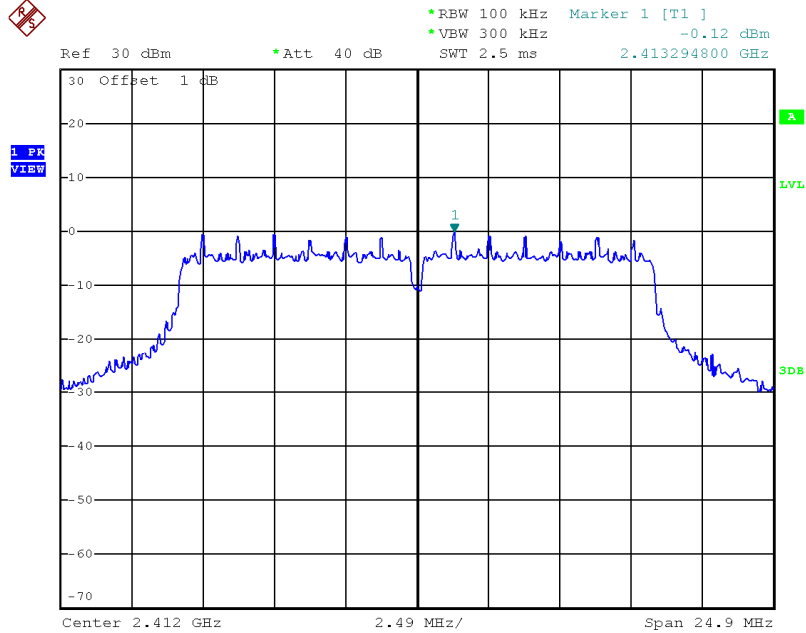
802.11b, Highest channel



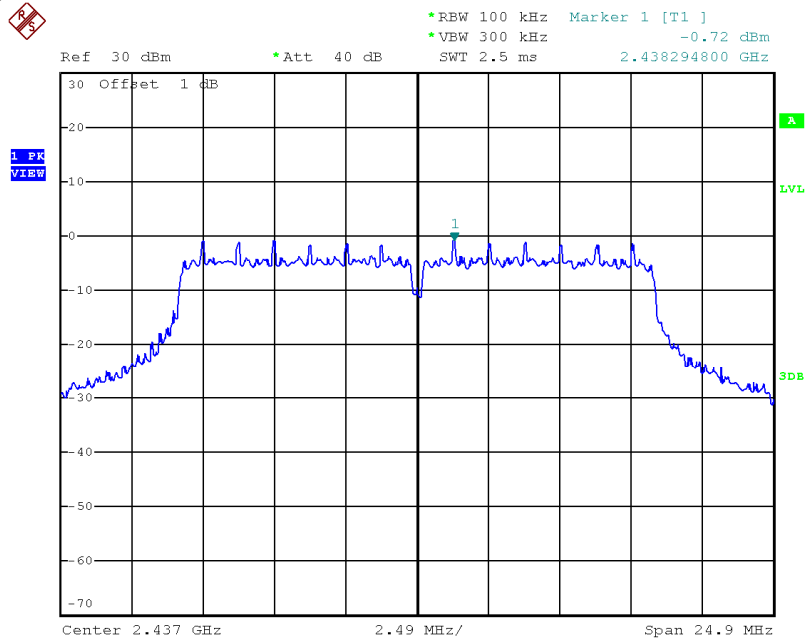
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Plots of power spectral density

802.11g, Lowest channel



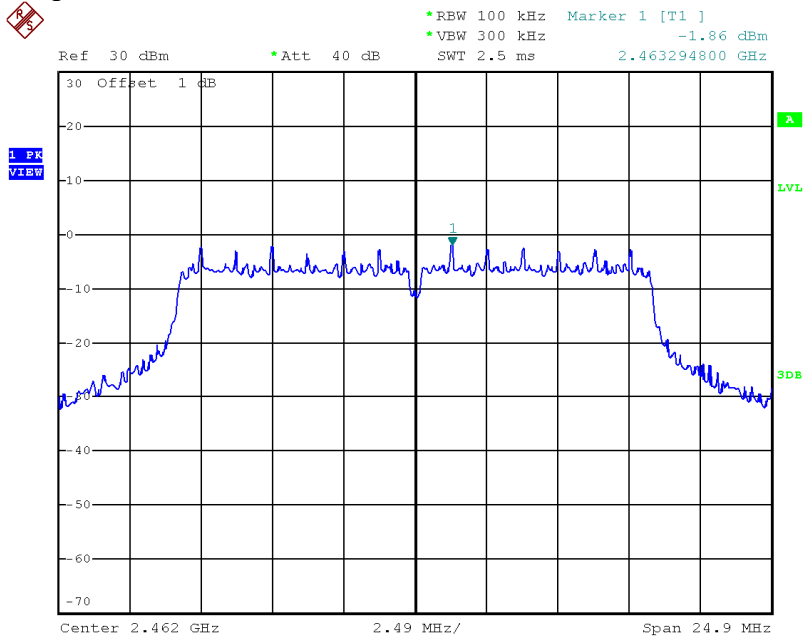
802.11g, Middle channel



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Plots of power spectral density

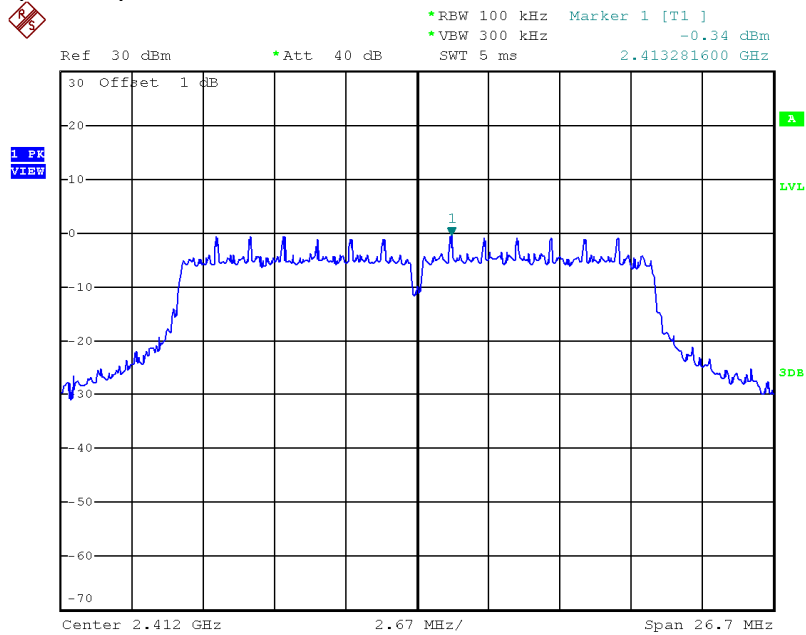
802.11g, Highest channel



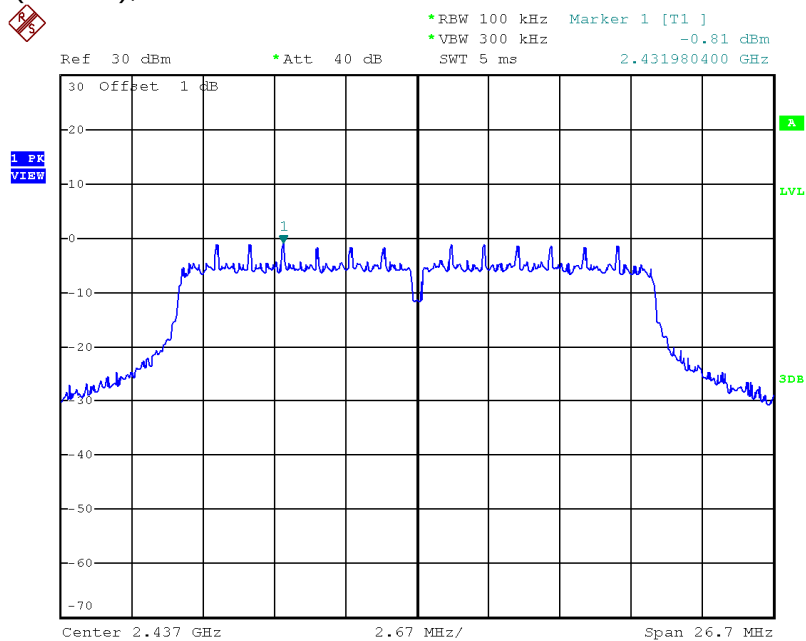
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Plots of power spectral density

802.11n (20MHz), Lowest channel



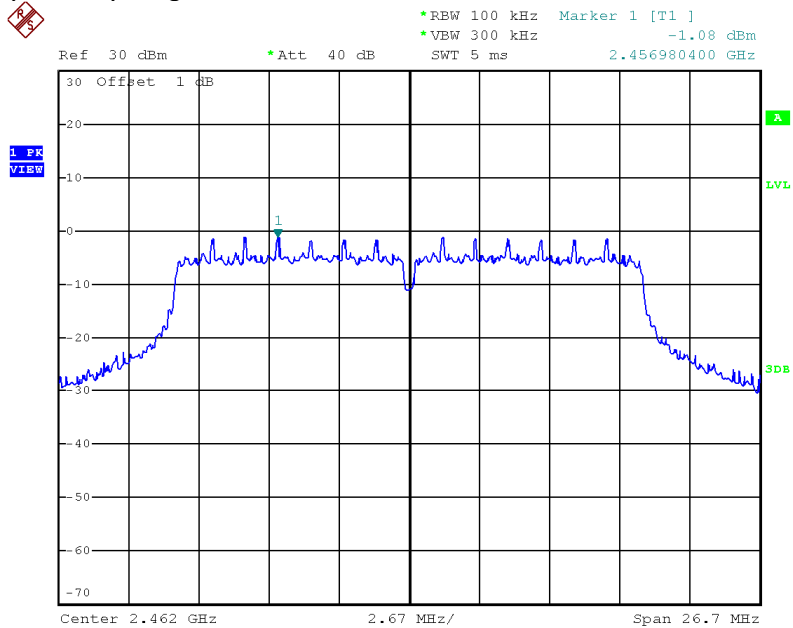
802.11n (20MHz), Middle channel



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Plots of power spectral density

802.11n (20MHz), Highest channel



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4.4 Out of Band Conducted Emissions

For 802.11b/g/n20MHz, 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.

The measurement procedures under sections 11 of KDB558074 D01 v03r05 (08-April-2016) were used.

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

Limits:

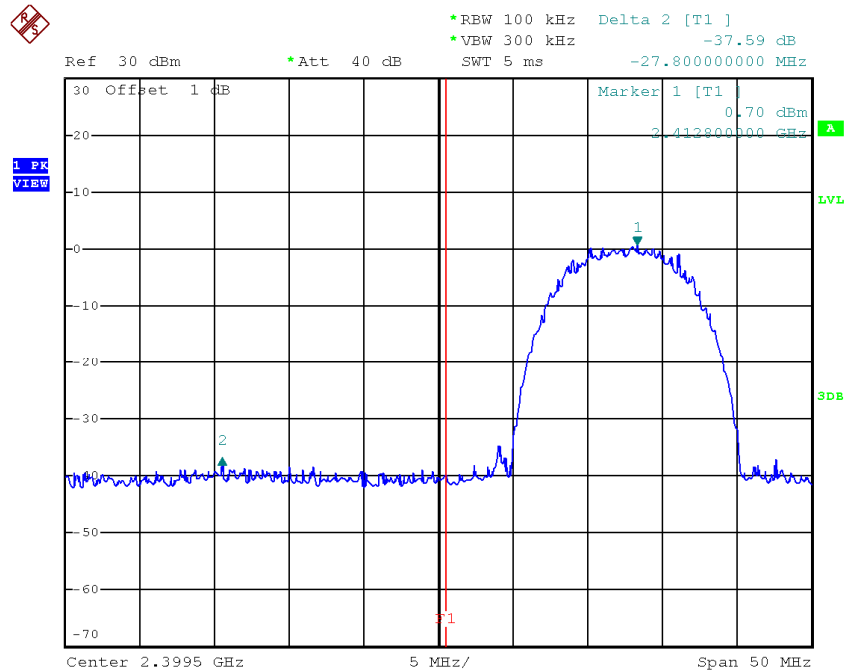
All spurious emission and up to the tenth harmonic was measured and they were found to be at least 20dB for 802.11b,g,n20MHz below the maximum measured in-band peak PSD level.

The plots of reference level measurement and out of band conducted emissions are as below.

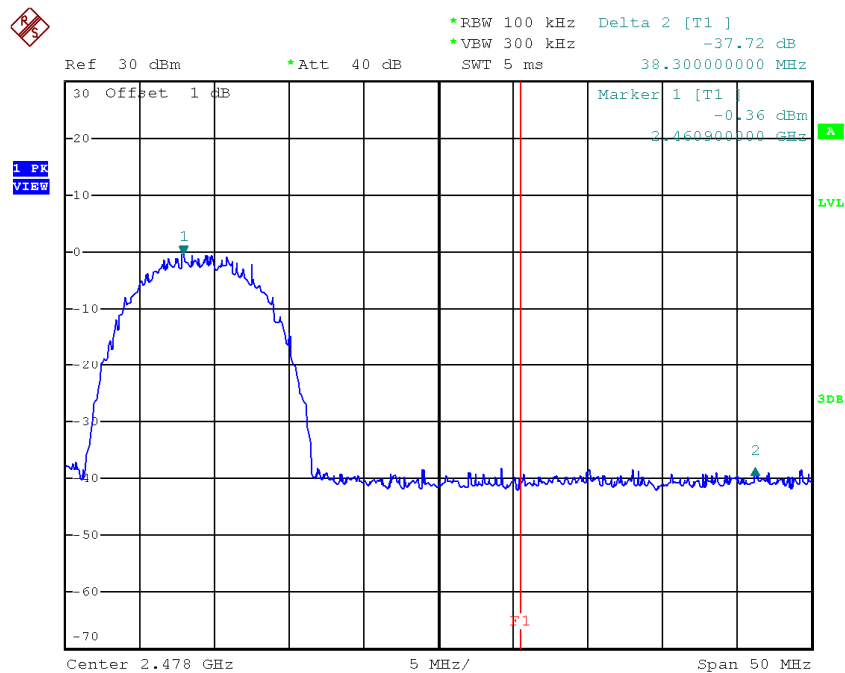
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Plots of bandedge

802.11b, Lowest channel



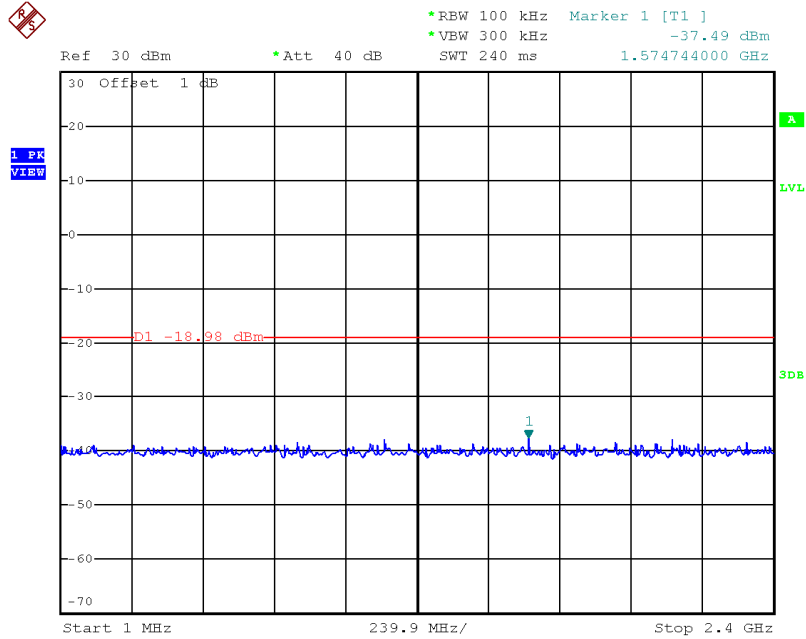
802.11b, Highest channel



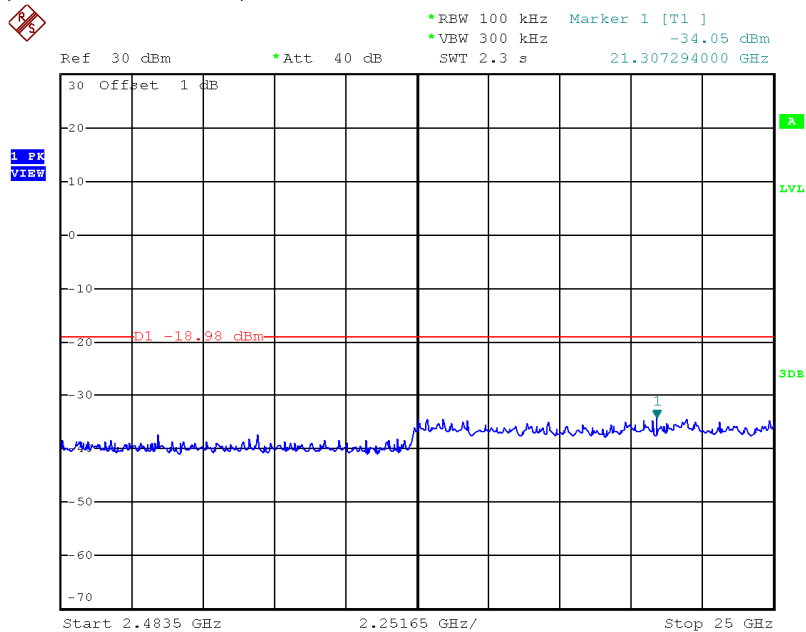
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Plots of out of band conducted emissions

802.11b, Lowest Channel, Plot A



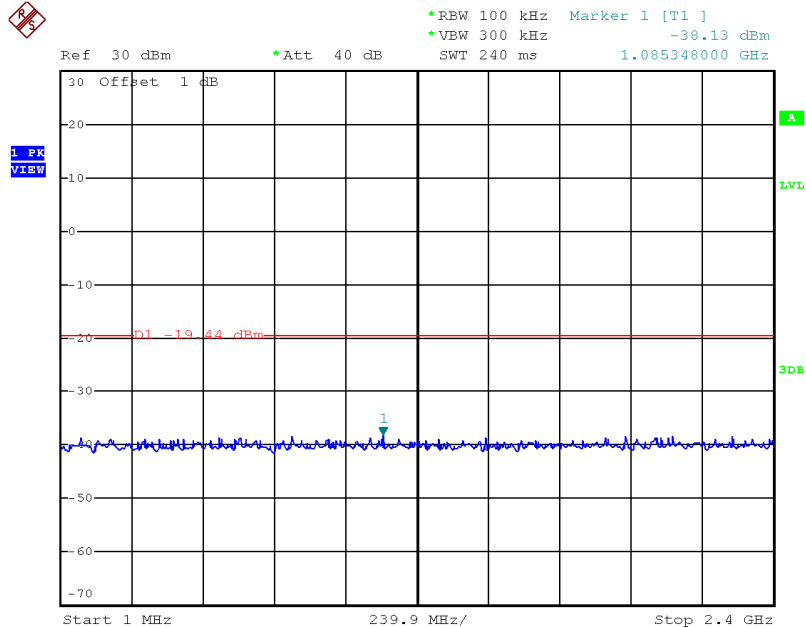
802.11b, Lowest Channel, Plot B



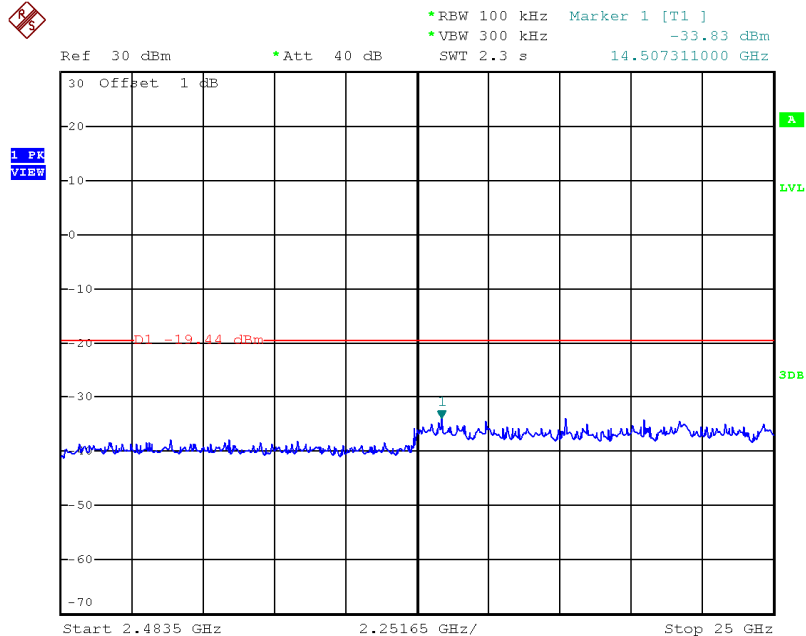
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Plots of out of band conducted emissions

802.11b, Middle Channel, Plot A



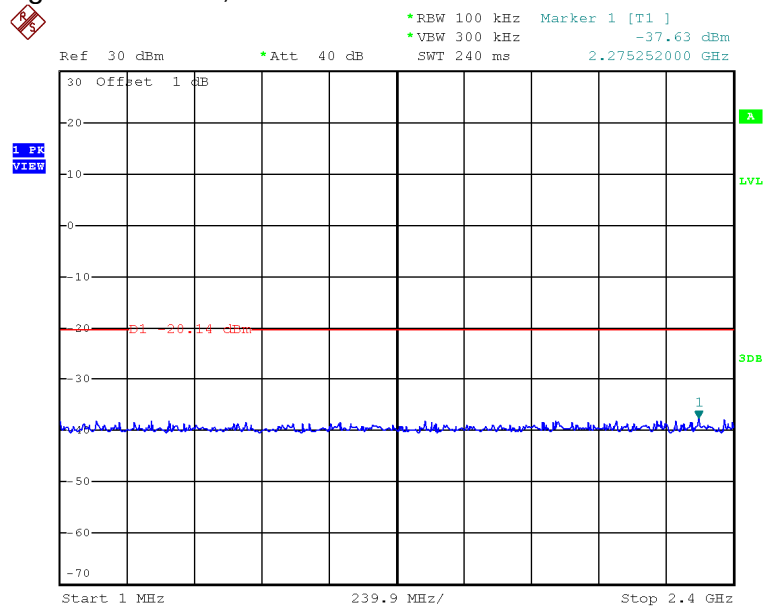
802.11b, Middle Channel, Plot B



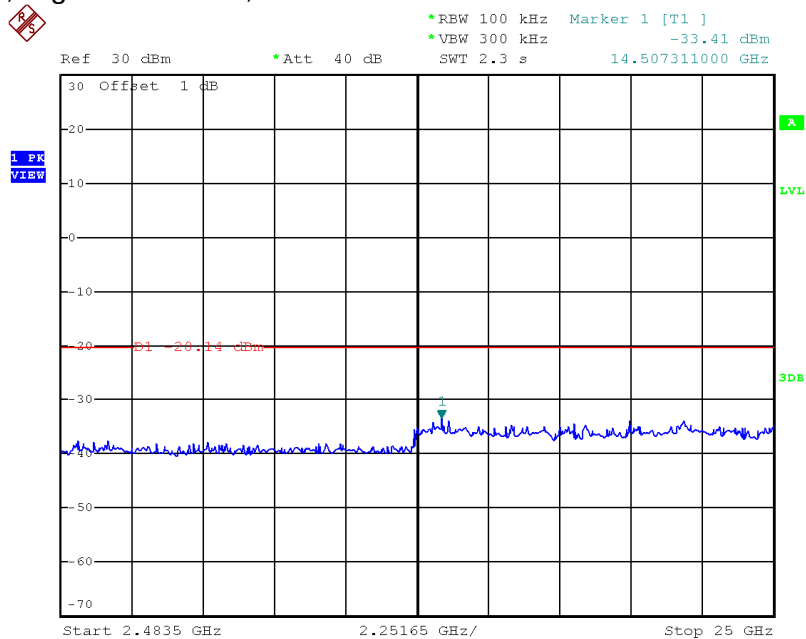
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Plots of out of band conducted emissions

802.11b, Highest Channel, Plot A



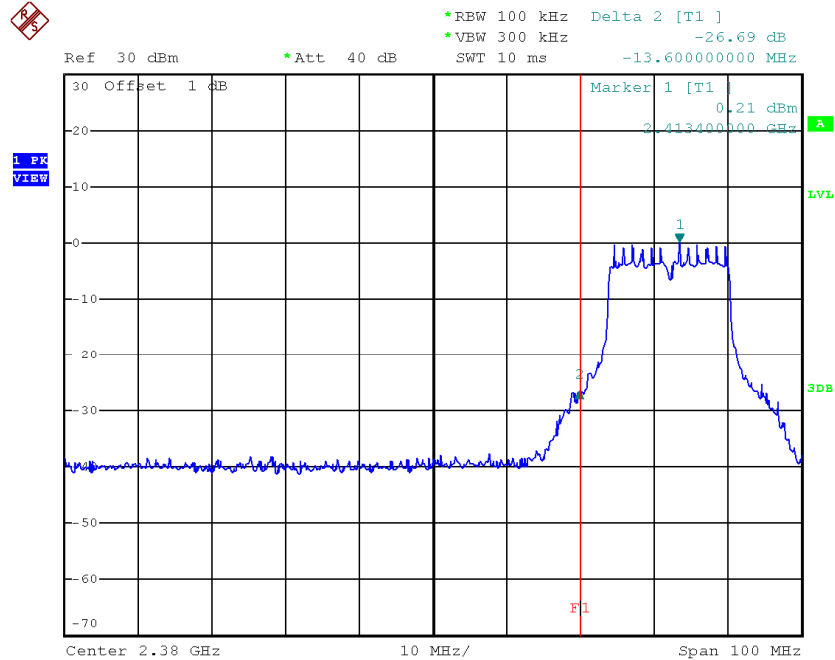
802.11b, Highest Channel, Plot B



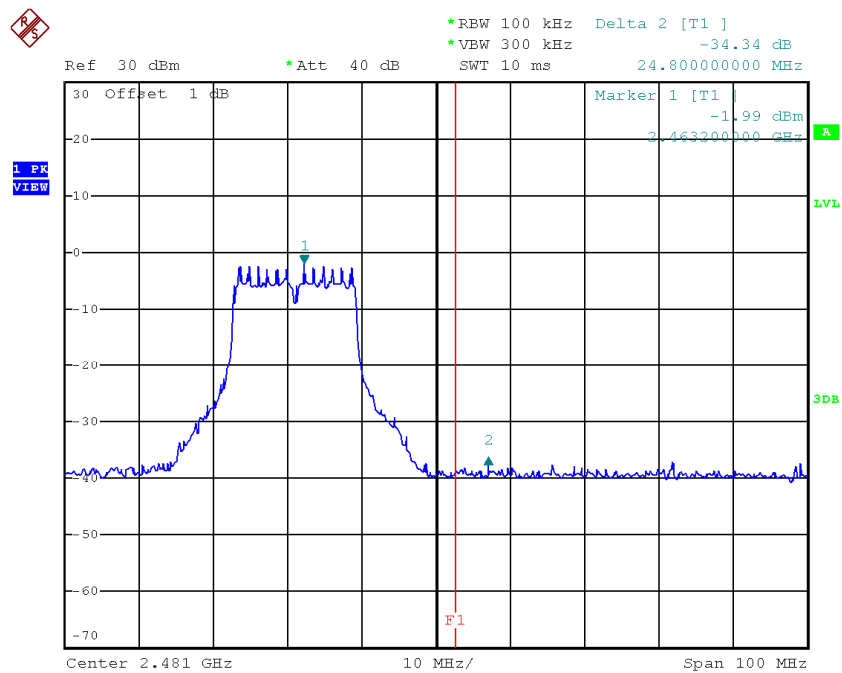
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Plots of bandedge

802.11b, Lowest channel



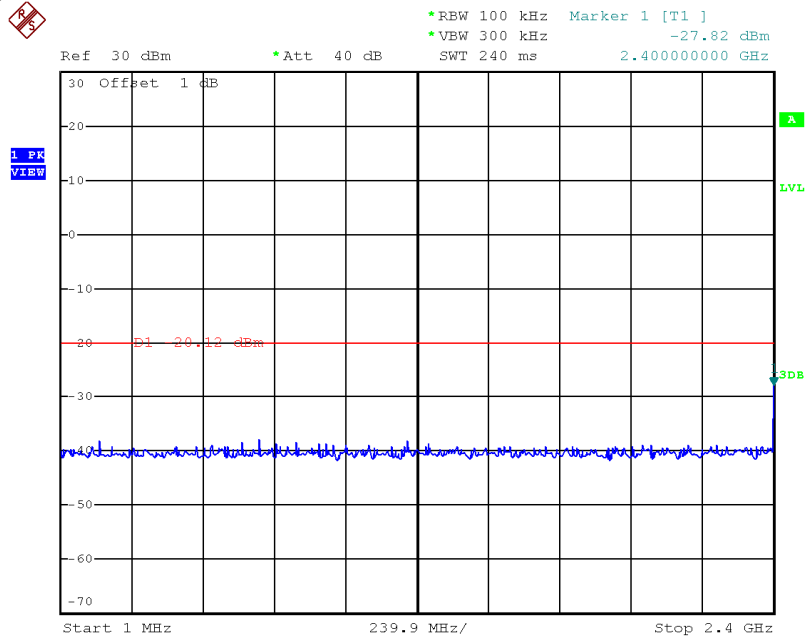
802.11b, Highest channel



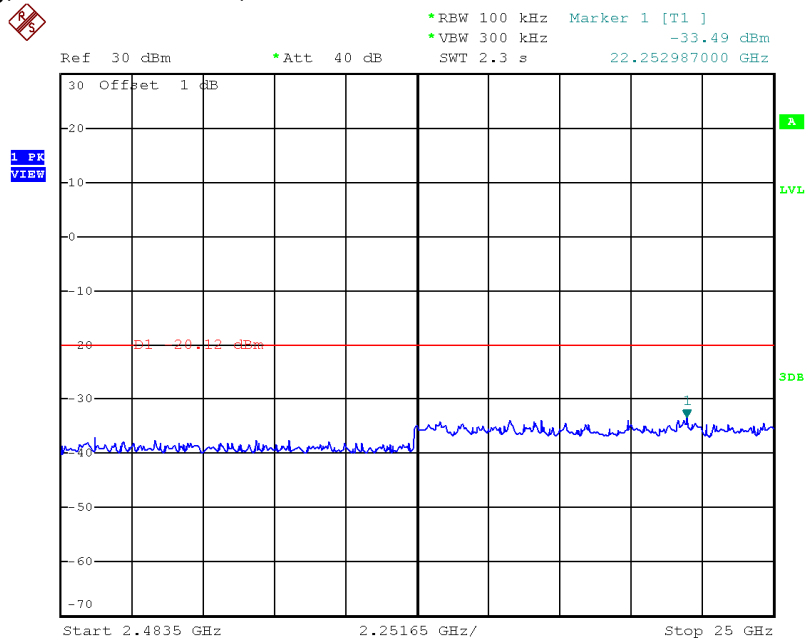
INTERTEK TESTING SERVICES

Plots of out of band conducted emissions

802.11g, Lowest Channel, Plot A



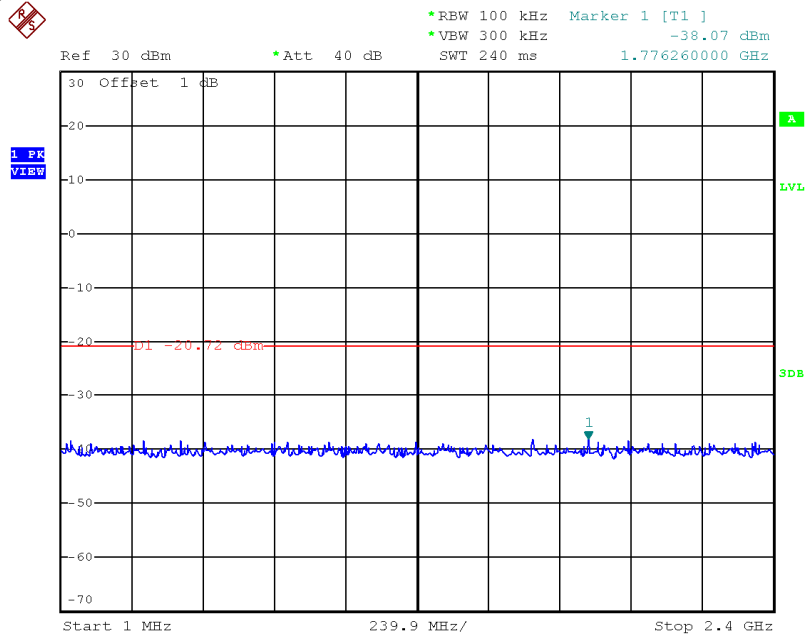
802.11g, Lowest Channel, Plot B



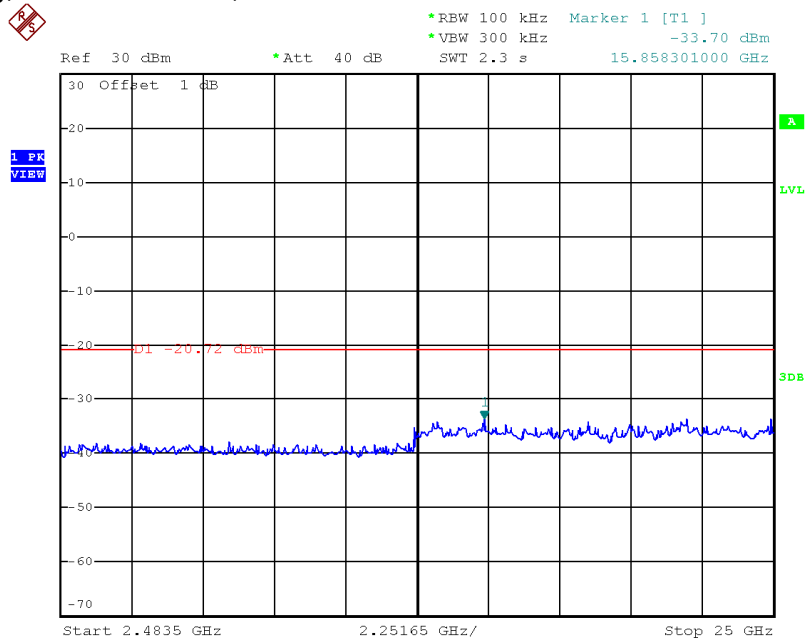
INTERTEK TESTING SERVICES

Plots of out of band conducted emissions

802.11g, Middle Channel, Plot A



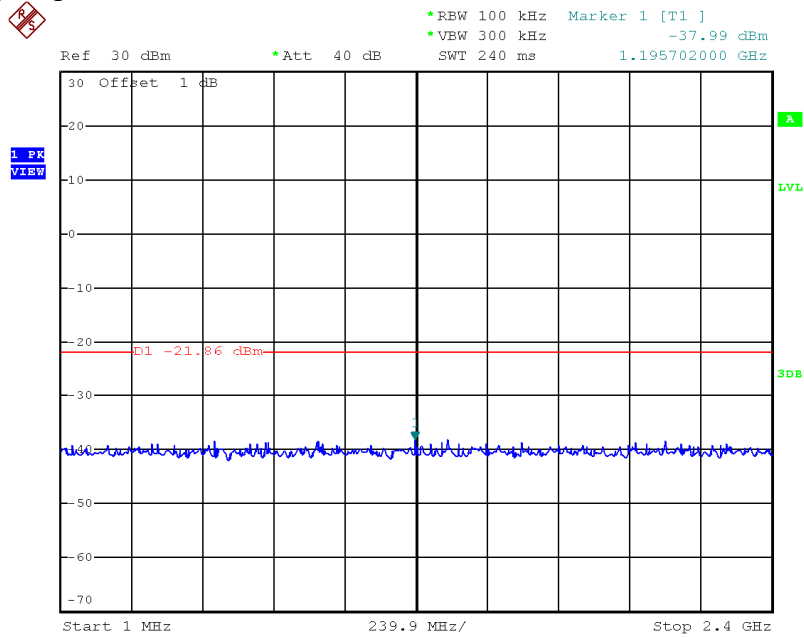
802.11g, Middle Channel, Plot B



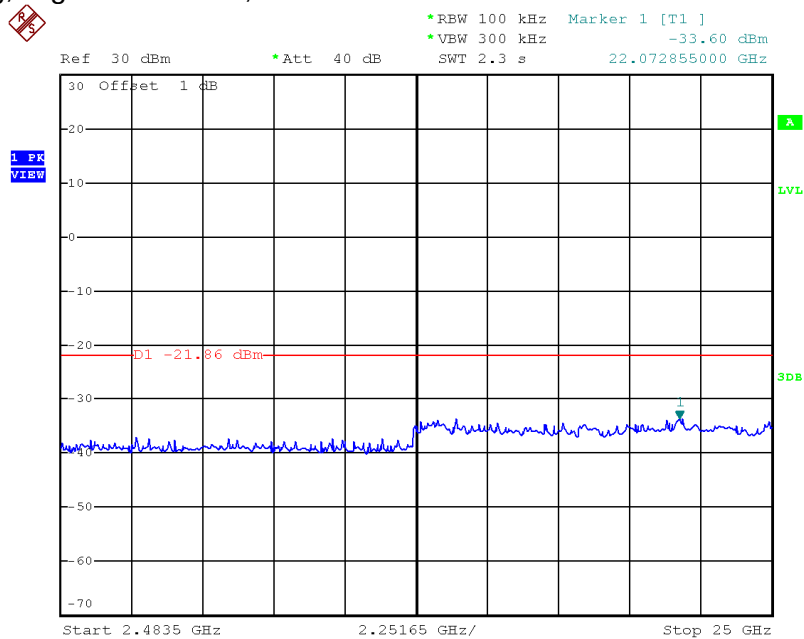
INTERTEK TESTING SERVICES

Plots of out of band conducted emissions

802.11g, Highest Channel, Plot A



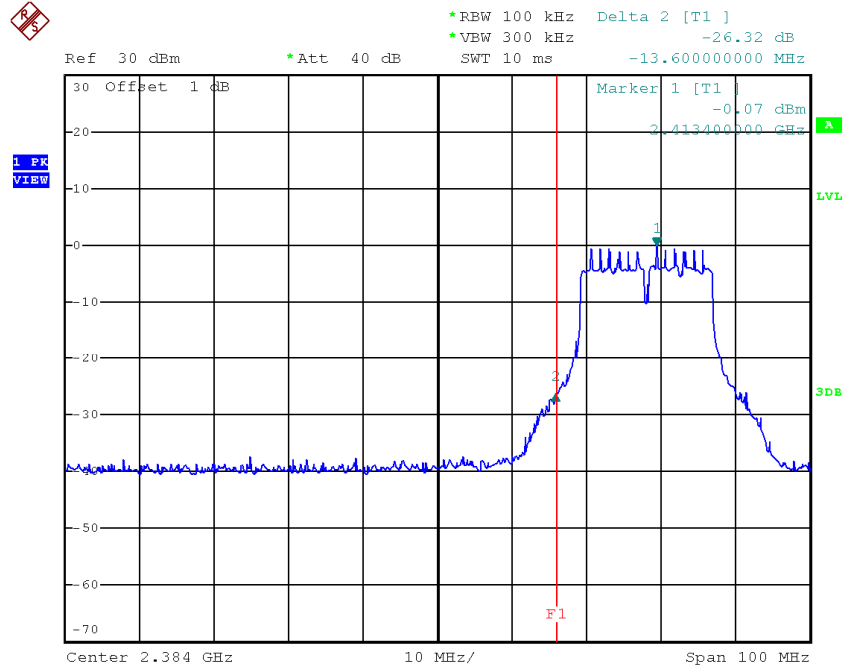
802.11g, Highest Channel, Plot B



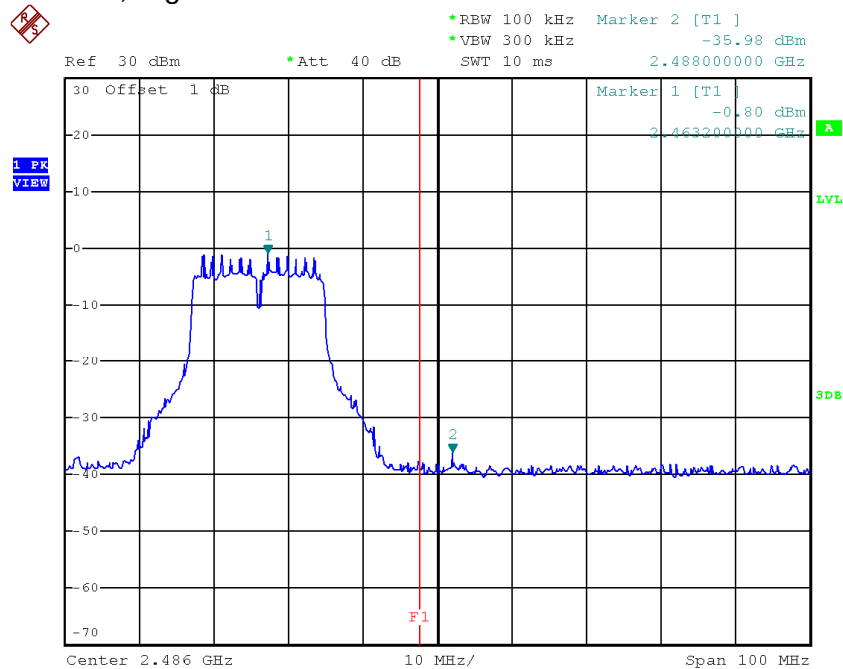
INTERTEK TESTING SERVICES

Plots of bandedge

802.11b, Lowest channel



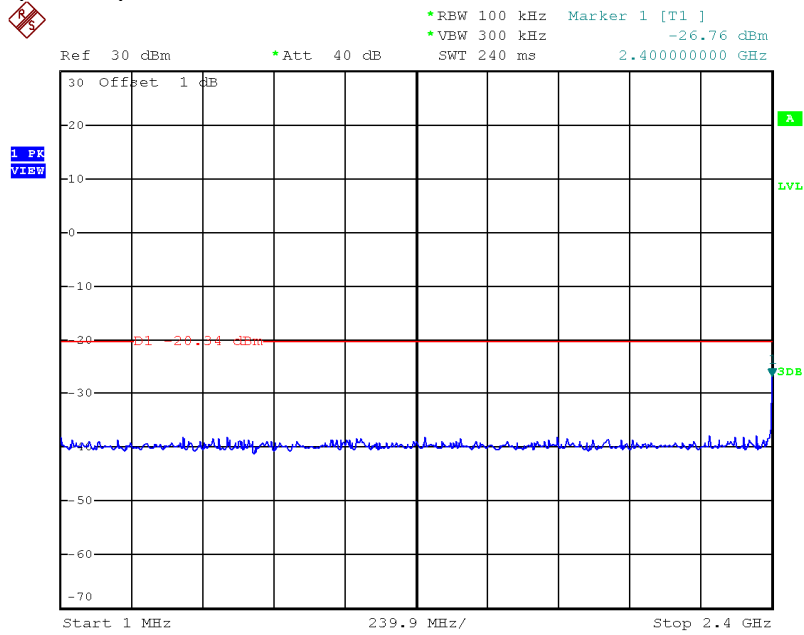
802.11b, Highest channel



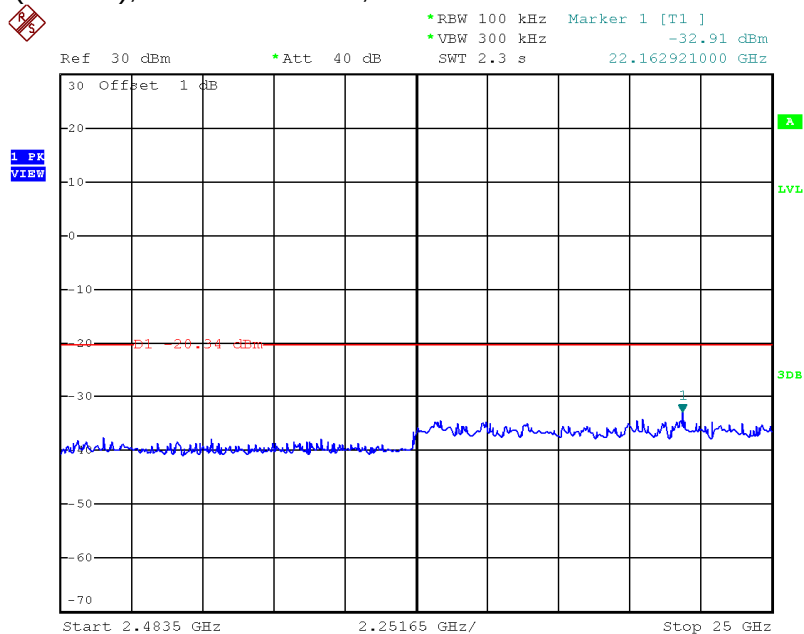
INTERTEK TESTING SERVICES

Plots of out of band conducted emissions

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



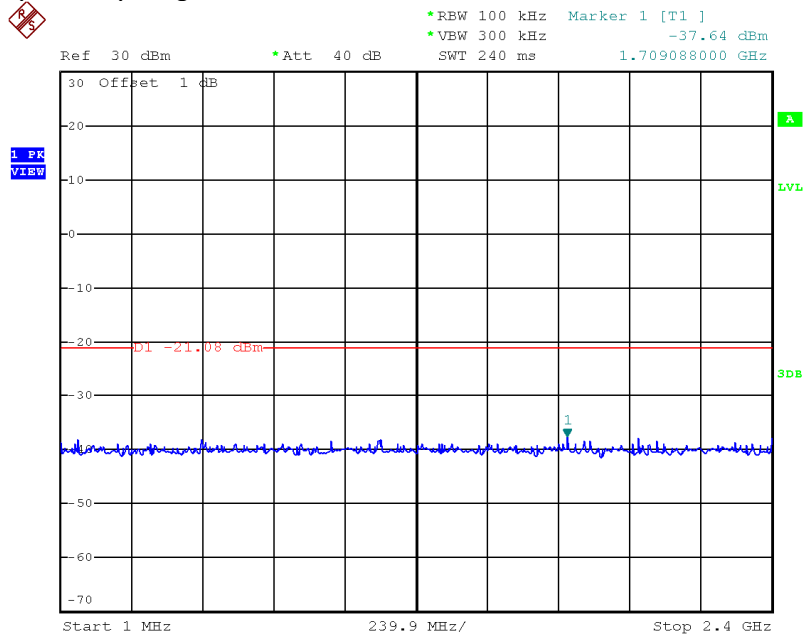
802.11n (20MHz), Lowest Channel, Plot B



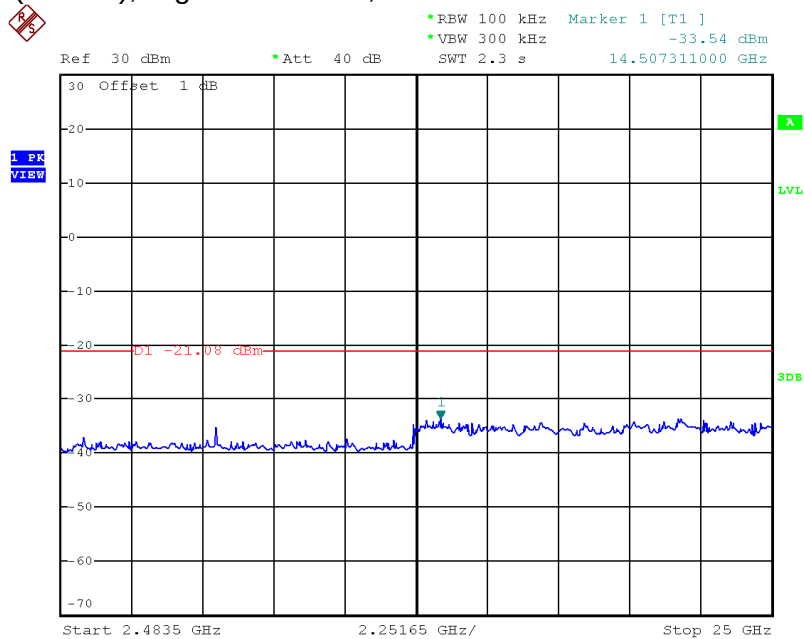
INTERTEK TESTING SERVICES

Plots of out of band conducted emissions

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



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



INTERTEK TESTING SERVICES

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 dB μ V/m
 RA = Receiver Amplitude (including preamplifier) in dB μ V
 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 dB μ V 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 dB μ V/m. This value in dB μ V/m is converted to its corresponding level in μ V/m.

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

$$FS = 62.0 + 7.4 + 1.6 - 29.0 + 0.0 + (-10.0) = 32.0 \text{ dB}\mu\text{V/m}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32.0 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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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.

4.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission
at

51.340 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 1-10 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 6.4 dB margin

INTERTEK TESTING SERVICES

Mode: TX-Channel 01

Table 1
IEEE 802.11b (DSSS, 1 Mbps)

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2390.000</i>	<i>49.8</i>	<i>33</i>	<i>29.4</i>	<i>46.2</i>	<i>54.0</i>	<i>-7.8</i>
<i>H</i>	<i>4824.000</i>	<i>42.6</i>	<i>33</i>	<i>34.9</i>	<i>44.5</i>	<i>54.0</i>	<i>-9.5</i>
<i>H</i>	<i>12060.000</i>	<i>31.8</i>	<i>33</i>	<i>40.5</i>	<i>39.3</i>	<i>54.0</i>	<i>-14.7</i>
<i>H</i>	<i>14472.000</i>	<i>33.2</i>	<i>33</i>	<i>40.0</i>	<i>40.2</i>	<i>54.0</i>	<i>-13.8</i>

Polarization	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)
<i>H</i>	<i>2390.000</i>	<i>59.8</i>	<i>33</i>	<i>29.4</i>	<i>56.2</i>	<i>74.0</i>	<i>-17.8</i>
<i>H</i>	<i>4824.000</i>	<i>49.9</i>	<i>33</i>	<i>34.9</i>	<i>51.8</i>	<i>74.0</i>	<i>-22.2</i>
<i>H</i>	<i>12060.000</i>	<i>44.0</i>	<i>33</i>	<i>40.5</i>	<i>51.5</i>	<i>74.0</i>	<i>-22.5</i>
<i>H</i>	<i>14472.000</i>	<i>45.6</i>	<i>33</i>	<i>40.0</i>	<i>52.6</i>	<i>74.0</i>	<i>-21.4</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 06

Table 2
IEEE 802.11b (DSSS, 1 Mbps)

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>4874.000</i>	<i>42.4</i>	<i>33</i>	<i>34.9</i>	<i>44.3</i>	<i>54.0</i>	<i>-9.7</i>
<i>H</i>	<i>7311.000</i>	<i>35.9</i>	<i>33</i>	<i>37.9</i>	<i>40.8</i>	<i>54.0</i>	<i>-13.2</i>
<i>H</i>	<i>12185.000</i>	<i>32.0</i>	<i>33</i>	<i>40.5</i>	<i>39.5</i>	<i>54.0</i>	<i>-14.5</i>

Polarization	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)
<i>H</i>	<i>4874.000</i>	<i>49.7</i>	<i>33</i>	<i>34.9</i>	<i>51.6</i>	<i>74.0</i>	<i>-22.4</i>
<i>H</i>	<i>7311.000</i>	<i>43.7</i>	<i>33</i>	<i>37.9</i>	<i>48.6</i>	<i>74.0</i>	<i>-25.4</i>
<i>H</i>	<i>12185.000</i>	<i>44.1</i>	<i>33</i>	<i>40.5</i>	<i>51.6</i>	<i>74.0</i>	<i>-22.4</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 11

Table 3
IEEE 802.11b (DSSS, 1 Mbps)

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2483.500</i>	<i>49.9</i>	<i>33</i>	<i>29.4</i>	<i>46.3</i>	<i>54.0</i>	<i>-7.7</i>
<i>H</i>	<i>4924.000</i>	<i>42.4</i>	<i>33</i>	<i>34.9</i>	<i>44.3</i>	<i>54.0</i>	<i>-9.7</i>
<i>H</i>	<i>7386.000</i>	<i>35.7</i>	<i>33</i>	<i>37.9</i>	<i>40.6</i>	<i>54.0</i>	<i>-13.4</i>
<i>H</i>	<i>12310.000</i>	<i>31.6</i>	<i>33</i>	<i>40.5</i>	<i>39.1</i>	<i>54.0</i>	<i>-14.9</i>

Polarization	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)
<i>H</i>	<i>2483.500</i>	<i>59.9</i>	<i>33</i>	<i>29.4</i>	<i>56.3</i>	<i>74.0</i>	<i>-17.7</i>
<i>H</i>	<i>4924.000</i>	<i>49.6</i>	<i>33</i>	<i>34.9</i>	<i>51.5</i>	<i>74.0</i>	<i>-22.5</i>
<i>H</i>	<i>7386.000</i>	<i>43.3</i>	<i>33</i>	<i>37.9</i>	<i>48.2</i>	<i>74.0</i>	<i>-25.8</i>
<i>H</i>	<i>12310.000</i>	<i>43.8</i>	<i>33</i>	<i>40.5</i>	<i>51.3</i>	<i>74.0</i>	<i>-22.7</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 01

Table 4
IEEE 802.11g (OFDM, 6 Mbps)

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2390.000</i>	<i>50.2</i>	<i>33</i>	<i>29.4</i>	<i>46.6</i>	<i>54.0</i>	<i>-7.4</i>
<i>V</i>	<i>4824.000</i>	<i>34.4</i>	<i>33</i>	<i>34.9</i>	<i>36.3</i>	<i>54.0</i>	<i>-17.7</i>
<i>H</i>	<i>12060.000</i>	<i>32.0</i>	<i>33</i>	<i>40.5</i>	<i>39.5</i>	<i>54.0</i>	<i>-14.5</i>
<i>H</i>	<i>14472.000</i>	<i>33.0</i>	<i>33</i>	<i>40.0</i>	<i>40.0</i>	<i>54.0</i>	<i>-14.0</i>

Polarization	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)
<i>H</i>	<i>2390.000</i>	<i>62.8</i>	<i>33</i>	<i>29.4</i>	<i>59.2</i>	<i>74.0</i>	<i>-14.8</i>
<i>V</i>	<i>4824.000</i>	<i>50.2</i>	<i>33</i>	<i>34.9</i>	<i>52.1</i>	<i>74.0</i>	<i>-21.9</i>
<i>H</i>	<i>12060.000</i>	<i>44.2</i>	<i>33</i>	<i>40.5</i>	<i>51.7</i>	<i>74.0</i>	<i>-22.3</i>
<i>H</i>	<i>14472.000</i>	<i>45.2</i>	<i>33</i>	<i>40.0</i>	<i>52.2</i>	<i>74.0</i>	<i>-21.8</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 06

Table 5
IEEE 802.11g (OFDM, 6 Mbps)

Radiated Emission Data

Polarization	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	34.7	33	34.9	36.6	54.0	-17.4
H	7311.000	31.1	33	37.9	36.0	54.0	-18.0
H	12185.000	31.8	33	40.5	39.3	54.0	-14.7

Polarization	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	50.5	33	34.9	52.4	74.0	-21.6
H	7311.000	45.8	33	37.9	50.7	74.0	-23.3
H	12185.000	44.0	33	40.5	51.5	74.0	-22.5

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 11

Table 6
IEEE 802.11g (OFDM, 6 Mbps)

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2483.500</i>	<i>50.8</i>	<i>33</i>	<i>29.4</i>	<i>47.2</i>	<i>54.0</i>	<i>-6.8</i>
<i>V</i>	<i>4924.000</i>	<i>34.5</i>	<i>33</i>	<i>34.9</i>	<i>36.4</i>	<i>54.0</i>	<i>-17.6</i>
<i>H</i>	<i>7386.000</i>	<i>30.9</i>	<i>33</i>	<i>37.9</i>	<i>35.8</i>	<i>54.0</i>	<i>-18.2</i>
<i>H</i>	<i>12310.000</i>	<i>31.9</i>	<i>33</i>	<i>40.5</i>	<i>39.4</i>	<i>54.0</i>	<i>-14.6</i>

Polarization	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)
<i>H</i>	<i>2483.500</i>	<i>63.7</i>	<i>33</i>	<i>29.4</i>	<i>60.1</i>	<i>74.0</i>	<i>-13.9</i>
<i>V</i>	<i>4924.000</i>	<i>50.4</i>	<i>33</i>	<i>34.9</i>	<i>52.3</i>	<i>74.0</i>	<i>-21.7</i>
<i>H</i>	<i>7386.000</i>	<i>45.4</i>	<i>33</i>	<i>37.9</i>	<i>50.3</i>	<i>74.0</i>	<i>-23.7</i>
<i>H</i>	<i>12310.000</i>	<i>44.0</i>	<i>33</i>	<i>40.5</i>	<i>51.5</i>	<i>74.0</i>	<i>-22.5</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 01

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

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2390.000</i>	<i>50.3</i>	<i>33</i>	<i>29.4</i>	<i>46.7</i>	<i>54.0</i>	<i>-7.3</i>
<i>H</i>	<i>4824.000</i>	<i>35.5</i>	<i>33</i>	<i>34.9</i>	<i>37.4</i>	<i>54.0</i>	<i>-16.6</i>
<i>H</i>	<i>12060.000</i>	<i>32.1</i>	<i>33</i>	<i>40.5</i>	<i>39.6</i>	<i>54.0</i>	<i>-14.4</i>
<i>H</i>	<i>14472.000</i>	<i>33.1</i>	<i>33</i>	<i>40.0</i>	<i>40.1</i>	<i>54.0</i>	<i>-13.9</i>

Polarization	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)
<i>H</i>	<i>2390.000</i>	<i>63.0</i>	<i>33</i>	<i>29.4</i>	<i>59.4</i>	<i>74.0</i>	<i>-14.6</i>
<i>H</i>	<i>4824.000</i>	<i>51.6</i>	<i>33</i>	<i>34.9</i>	<i>53.5</i>	<i>74.0</i>	<i>-20.5</i>
<i>H</i>	<i>12060.000</i>	<i>44.2</i>	<i>33</i>	<i>40.5</i>	<i>51.7</i>	<i>74.0</i>	<i>-22.3</i>
<i>H</i>	<i>14472.000</i>	<i>45.4</i>	<i>33</i>	<i>40.0</i>	<i>52.4</i>	<i>74.0</i>	<i>-21.6</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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.
 7. Horn antenna is used for the emission over 1000MHz.
 8. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 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.

INTERTEK TESTING SERVICES

Mode: TX-Channel 06

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

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>4874.000</i>	<i>35.2</i>	<i>33</i>	<i>34.9</i>	<i>37.1</i>	<i>54.0</i>	<i>-16.9</i>
<i>H</i>	<i>7311.000</i>	<i>29.1</i>	<i>33</i>	<i>37.9</i>	<i>34.0</i>	<i>54.0</i>	<i>-20.0</i>
<i>H</i>	<i>12185.000</i>	<i>31.7</i>	<i>33</i>	<i>40.5</i>	<i>39.2</i>	<i>54.0</i>	<i>-14.8</i>

Polarization	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)
<i>H</i>	<i>4874.000</i>	<i>51.4</i>	<i>33</i>	<i>34.9</i>	<i>53.3</i>	<i>74.0</i>	<i>-20.7</i>
<i>H</i>	<i>7311.000</i>	<i>44.4</i>	<i>33</i>	<i>37.9</i>	<i>49.3</i>	<i>74.0</i>	<i>-24.7</i>
<i>H</i>	<i>12185.000</i>	<i>43.9</i>	<i>33</i>	<i>40.5</i>	<i>51.4</i>	<i>74.0</i>	<i>-22.6</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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.
 7. 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 Section 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.

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Mode: TX-Channel 11

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

Radiated Emission Data

Polarization	Frequency (MHz)	Reading (dBμV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Average Limit at 3m (dBμV/m)	Margin (dB)
<i>H</i>	<i>2483.000</i>	<i>50.9</i>	<i>33</i>	<i>29.4</i>	<i>47.3</i>	<i>54.0</i>	<i>-6.7</i>
<i>H</i>	<i>4924.000</i>	<i>35.6</i>	<i>33</i>	<i>34.9</i>	<i>37.5</i>	<i>54.0</i>	<i>-16.5</i>
<i>H</i>	<i>7386.000</i>	<i>29.5</i>	<i>33</i>	<i>37.9</i>	<i>34.4</i>	<i>54.0</i>	<i>-19.6</i>
<i>H</i>	<i>12310.000</i>	<i>31.8</i>	<i>33</i>	<i>40.5</i>	<i>39.3</i>	<i>54.0</i>	<i>-14.7</i>

Polarization	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)
<i>H</i>	<i>2483.500</i>	<i>63.9</i>	<i>33</i>	<i>29.4</i>	<i>60.3</i>	<i>74.0</i>	<i>-13.7</i>
<i>H</i>	<i>4924.000</i>	<i>51.7</i>	<i>33</i>	<i>34.9</i>	<i>53.6</i>	<i>74.0</i>	<i>-20.4</i>
<i>H</i>	<i>7386.000</i>	<i>44.7</i>	<i>33</i>	<i>37.9</i>	<i>49.6</i>	<i>74.0</i>	<i>-24.4</i>
<i>H</i>	<i>12310.000</i>	<i>43.9</i>	<i>33</i>	<i>40.5</i>	<i>51.4</i>	<i>74.0</i>	<i>-22.6</i>

- NOTES:
1. Peak detector is used for the emission measurement.
 2. Average detector is used for the average data of emission measurement
 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 Section 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.

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Mode: Charging & Playing

Table 10

Radiated Emission Data

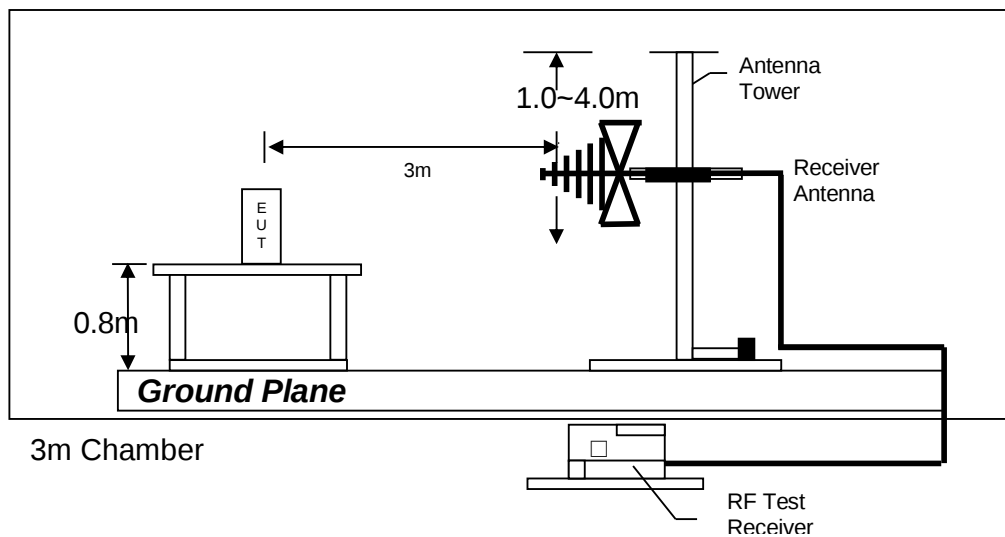
Polarization	Frequency (MHz)	Reading (dBμV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBμV/m)	Limit at 3m (dBμV/m)	Margin (dB)
V	35.456	36.0	16	10.0	30.0	40.0	-10.0
V	44.792	38.0	16	10.0	32.0	40.0	-8.0
V	51.340	38.6	16	11.0	33.6	40.0	-6.4
V	200.720	35.1	16	16.0	35.1	43.5	-8.4
V	204.721	35.5	16	16.0	35.5	43.5	-8.0
V	212.723	33.7	16	17.0	34.7	43.5	-8.8
H	360.042	25.8	16	24.0	33.8	46.0	-12.2

- NOTES:
1. Peak detector is used for the emission measurement.
 2. 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.
 3. Negative value in the margin column shows emission below limit.
 4. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.

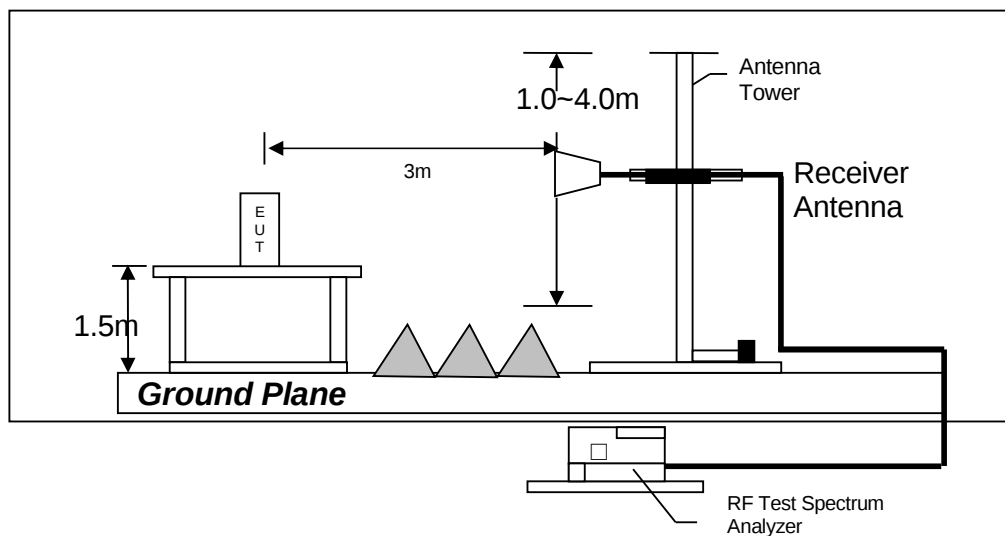
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4.6.3 Radiated Emission Test Setup

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

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4.6.4 Transmitter Duty Cycle Calculation

Not applicable – No average factor is required.

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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

4.767 MHz

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

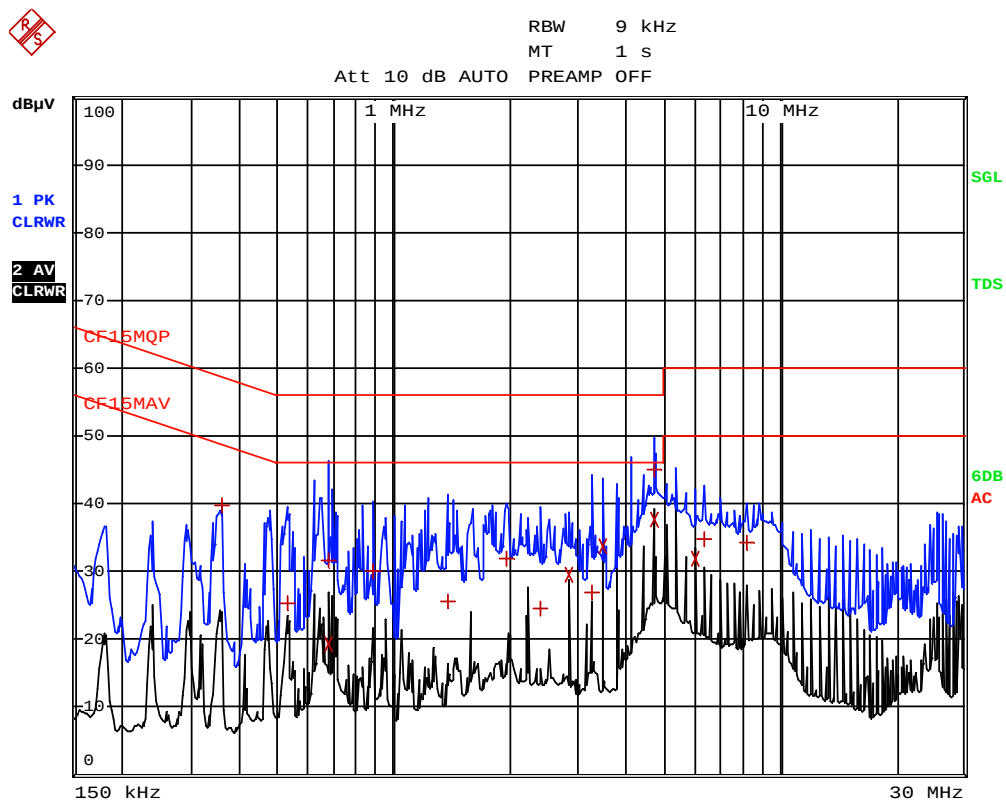
4.7.2 AC Power Line Conducted Emission Data

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

Passed by 8.31 dB margin compare with CISPR Average limit

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Worst Case: Charging & Touch Sensor



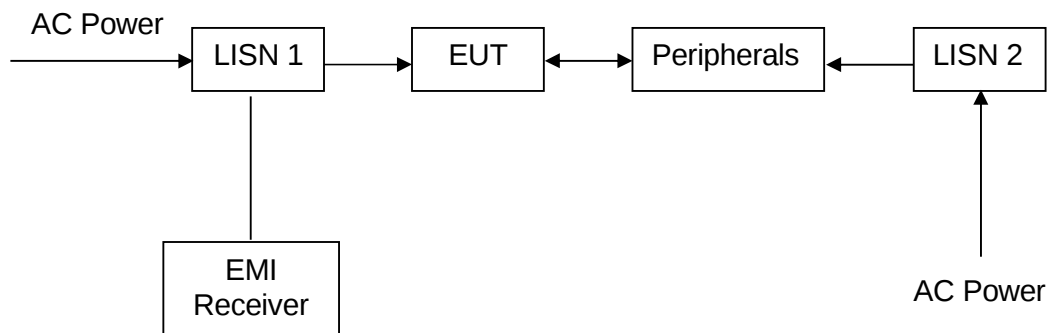
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Worst Case: Charging & Touch Sensor

EDIT PEAK LIST (Final Measurement Results)					
Trace1:	CF15MQP				
Trace2:	CF15MAV				
Trace3:	---				
TRACE	FREQUENCY	LEVEL	dBμV	DELTA	LIMIT dB
1 Quasi Peak	357 kHz	39.74	N	-19.05	
1 Quasi Peak	532.5 kHz	25.38	L1	-30.61	
1 Quasi Peak	676.5 kHz	31.58	L1	-24.41	
2 CISPR Average	676.5 kHz	19.26	N	-26.73	
1 Quasi Peak	883.5 kHz	30.07	L1	-25.93	
1 Quasi Peak	1.383 MHz	25.62	N	-30.37	
1 Quasi Peak	1.9725 MHz	31.85	L1	-24.14	
1 Quasi Peak	2.409 MHz	24.62	N	-31.37	
2 CISPR Average	2.859 MHz	29.44	L1	-16.55	
1 Quasi Peak	3.282 MHz	27.02	L1	-28.98	
2 CISPR Average	3.4935 MHz	33.61	N	-12.38	
1 Quasi Peak	4.767 MHz	45.08	L1	-10.91	
2 CISPR Average	4.767 MHz	37.68	N	-8.31	
2 CISPR Average	6.036 MHz	31.96	N	-18.03	
1 Quasi Peak	6.3555 MHz	34.68	N	-25.31	
1 Quasi Peak	8.259 MHz	34.26	N	-25.73	

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4.7.3 Conducted Emission Test Setup



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EXHIBIT 5 EQUIPMENT LIST

INTERTEK TESTING SERVICES

5.0 Equipment List

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	BiConiLog Antenna - 26MHz to 6000MHz
Registration No.	EW-3156	EW-2253	EW-3061
Manufacturer	R&S	R&S	EMCO
Model No.	ESR26	FSP40	3142E
Calibration Date	Dec. 06, 2016	Jun. 15, 2016	Sep. 23, 2016
Calibration Due Date	Dec. 06, 2017	Jun. 15, 2017	Sep. 23, 2017

Equipment	Double Ridged Guide Antenna	Broad-Band Horn Antenna
Registration No.	EW-1133	EW-1679
Manufacturer	EMCO	SCHWARZBECK
Model No.	3115	BBHA9170
Calibration Date	Nov. 05, 2015	Jun. 28, 2016
Calibration Due Date	May 05, 2017	Jun. 28, 2017

2) Conducted Emissions Test

Equipment	EMI Test Receiver (9kHz to 26.5GHz)	Artificial Mains	Pulse Limiter
Registration No.	EW-3156	EW-0192	EW-3248
Manufacturer	R&S	R&S	R&S
Model No.	ESR26	ESH3-Z5	E3H3-Z2
Calibration Date	Dec. 06, 2016	Aug. 26, 2016	Oct. 12, 2016
Calibration Due Date	Dec. 06, 2017	Aug. 26, 2017	Oct. 12, 2017

3) Conductive Measurement Test

Equipment	RF Power Meter with Power Sensor (50MHz - 18GHz)	Spectrum Analyzer
Registration No.	EW-2270	EW-2249
Manufacturer	AGILENTTECH	R&S
Model No.	N1911A	FSP30
Calibration Date	Jan. 04, 2017	Dec. 23, 2016
Calibration Due Date	Jan. 04, 2018	Nov. 27, 2017

END OF TEST REPORT