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TEST REPORT

Report Number: 20101182HKG-001

Application for Original Grant of 47 CFR Part 15 Certification

New Family of RSS-247 Issue 2 Equipment

FCC ID: 2AAFX-M2H5BLE

IC: 11137A-M2H5BLE

Prepared and Checked by:	**Approved by:**
Signed On File Wong Cheuk Ho, Herbert Lead Engineer	Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Limited Wong Kwok Yeung, Kenneth Senior Lead Engineer Date: March 18, 2020

TEST REPORT

GENERAL INFORMATION

Applicant Name:	Deere & Company
Applicant Address:	One John Deere Place Moline Illinois 61265 United States
FCC Specification Standard:	FCC Part 15, October 1, 2019 Edition
FCC ID:	2AAFX-M2H5BLE
FCC Model(s):	PH85239277, PH85239285, PH85239281, PH85239306, PH85239297
IC Specification Standard:	RSS-247 Issue 2, February 2017 RSS-Gen Issue 5 Amendment 1, March 2019
IC:	11137A-M2H5BLE
PMN:	PH85239277, PH85239285, PH85239281, PH85239306, PH85239297
HVIN:	PH85239277, PH85239285, PH85239281, PH85239306, PH85239297
Type of EUT:	Spread Spectrum Transmitter
Description of EUT:	Deere & Company Instrument Cluster with Bluetooth LE (BLE)
Serial Number:	1101127 (radiated emission test) 1101119 (conductive measurement test)
Sample Receipt Date:	October 30, 2020
Date of Test:	October 30, 2020 to December 28, 2020
Report Date:	March 18, 2020
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 / RSS-247 Issue 2 Certification.

TEST REPORT

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TEST REPORT

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	7.1.2#	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 & 15.109	5.5	Pass	4.6
AC Power Line Conducted Emission	15.207 & 15.107	7.2.4#	N/A	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, 2019 Edition
RSS-247 Issue 2, February 2017
RSS-Gen Issue 5 Amendment 1, March 2019

TEST REPORT

2.0 GENERAL DESCRIPTION

2.1 Product Description

The product, Deere & Company Instrument Cluster with Bluetooth LE (BLE), operates on Vehicle Battery (12VDC) & reads vehicle information from the CAN bus and convey that information to user's mobile device via BLE.

The Equipment Under Test (EUT) operates at frequency range of 2402MHz to 2480MHz.

The antenna(s) used in the EUT is internal, integral, inverted-F shaped PCB Trace Antenna, and the test sample is a prototype.

For FCC, the Model(s): PH85239285, PH85239281, PH85239306, PH85239297 are the same as the Model: PH85239277 in electronics/electrical designs including software & firmware, Bluetooth BLE RF portion, PCB layout and construction design/physical design/enclosure as declared by client. The only differences between these models are have reduced features to be sold for marketing purpose as declared by client.

For IC, the Model(s): PH85239285, PH85239281, PH85239306, PH85239297 are the same as the Model: PH85239277 in electronics/electrical designs including software & firmware, Bluetooth BLE RF portion, PCB layout and construction design/physical design/enclosure as declared by client. The only differences between these models are have reduced features to be sold for marketing purpose as declared by client.

The representative model PH85239277 (full features) was selected to test.

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

TEST REPORT

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 v05r01 (11-February-2019). All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 5 Amendment 1, March 2019.

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 SAR, China. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada No.: 2042H.

2.4 Related Submittal(s) Grants

This is an application for certification of a transceiver (Bluetooth BLE portion)

TEST REPORT

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 12VDC (fully charged 12VDC lead acid car battery).

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

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

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

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

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

TEST REPORT

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 3MHz 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.

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.

TEST REPORT

3.3 Details of EUT and Description of Accessories

Details of EUT:

The EUT was powered by 12VDC (fully charged 12VDC lead acid car battery)

Description of Accessories:

(1) Load Box comprises of Switches, LED Indicators, Load resistances, Harness (from JDES)
(2) CAN/LIN Interface from Vector with 1.5m USB cable (Asset No: 0799 3300000436) (Provided by Applicant)
(3) HP Notebook Computer (Adaptor Model: HSTNN-CA15) (Provided by Intertek)

3.4 Measurement Uncertainty

Decision Rule for compliance: For FCC/IC standard, the measured value must be within the limits of applicable standard without accounting for the measurement uncertainty. For EN/IEC/HKTA/HKTC standard, conformity rules will be used as per standard directly excepted EN/IEC 61000-3-2, EN/IEC 61000-3-3, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044. For these excepted or not mentioned standards, Cl 4.2.2 of ILAC-G8:09/2019 decision rules will be reference and guard band will be equal to our measurement uncertainty with 95% confidence level (k=2). In case, the measured value is within guard band region, undetermined decision will be used. The values of the Measurement uncertainty for radiated emission test and RF conducted measurement test are ± 5.3dB and ±0.99dB respectively. The value of the Measurement uncertainty for conducted emission test is ±4.2dB.

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

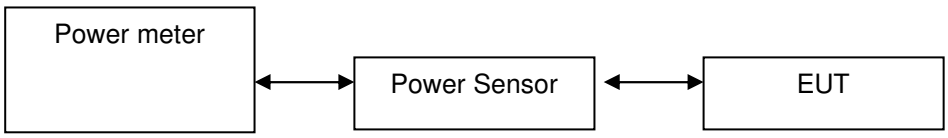
TEST REPORT

4.0 TEST RESULTS

4.1 Maximum Conducted (peak) Output Power at Antenna Terminals

RF Conduct Measurement Test Setup

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



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

☒ The antenna power of the EUT was connected to the input of a power meter. Power was read directly and cable loss correction was added to the reading to the obtain power at the EUT antenna terminals. The measurement procedure 9.1.2 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.

Bluetooth BLE Antenna Gain = 0.3 dBi

Frequency (MHz)		Output in dBm	Output in mWatt
Low Channel:	2402	10.6	11.5
Middle Channel:	2440	10.4	11.0
High Channel:	2480	9.9	9.8

TEST REPORT

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

Cable loss : 0.5 dB External Attenuation : 0 dB

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

Bluetooth BLE
max. conducted (peak) output level = 10.6 dBm

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.

TEST REPORT

4.2 Minimum 6dB RF Bandwidth

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

Bluetooth BLE

Frequency (MHz)	6dB Bandwidth (MHz)
Low Channel: 2402	0.708
Middle Channel: 2440	0.708
High Channel: 2480	0.708

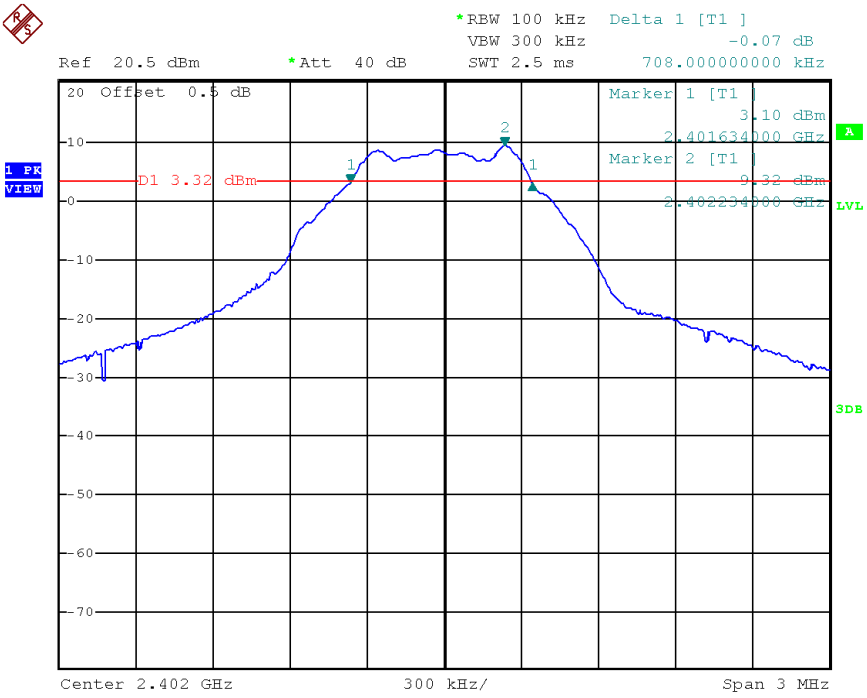
Limits
6 dB bandwidth shall be at least 500kHz

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

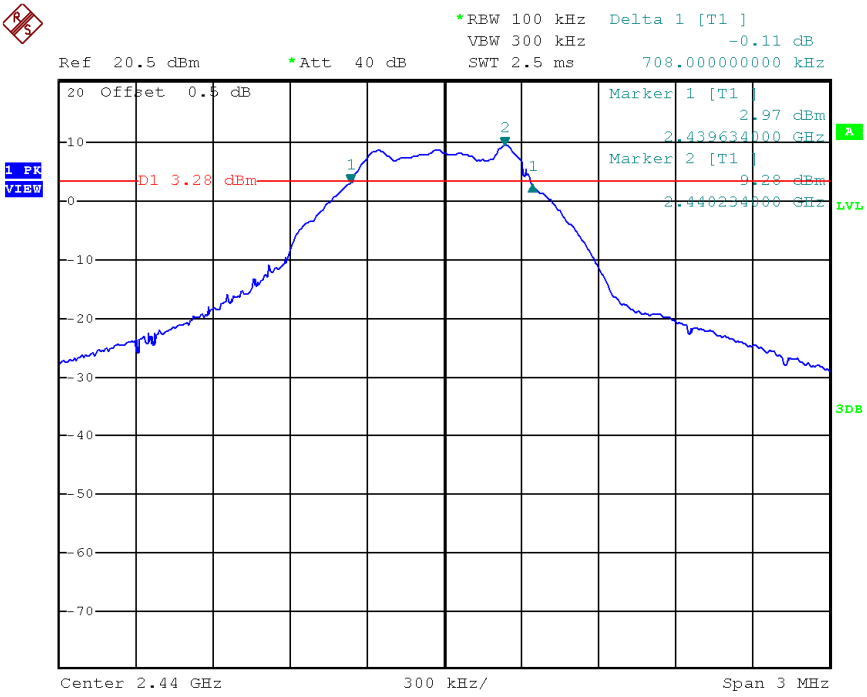
TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

Lowest Channel



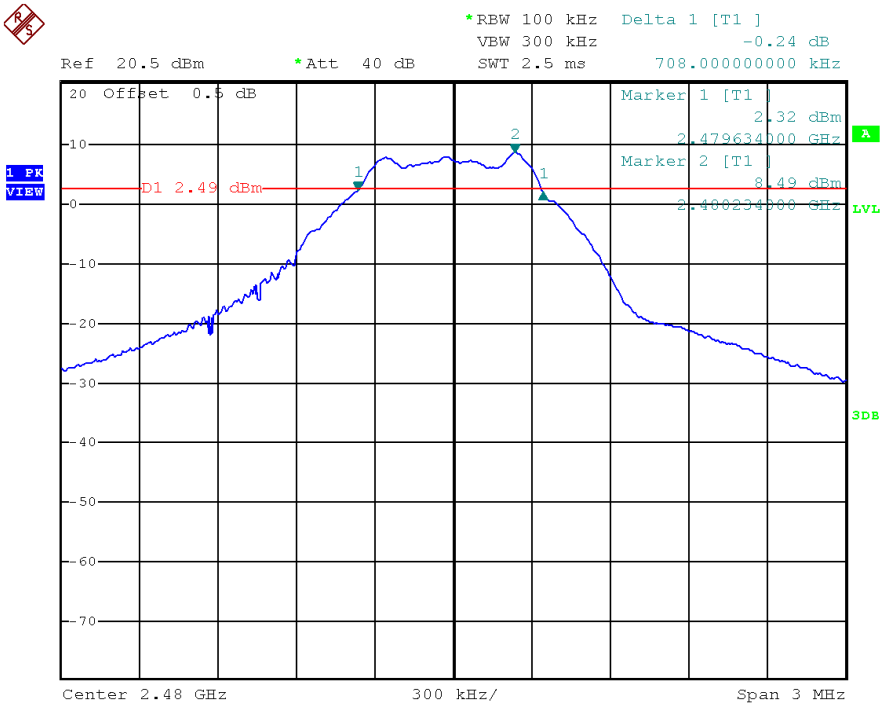
Middle Channel



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

Highest Channel



TEST REPORT

4.3 Maximum Power Spectral Density

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

Bluetooth BLE

Frequency (MHz)	PSD in 100kHz (dBm)	PSD in 3kHz (dBm)
Low Channel: 2402	9.25	-7.25
Middle Channel: 2440	9.30	-7.24
High Channel: 2480	8.45	-7.84

Cable Loss: 0.5 dB

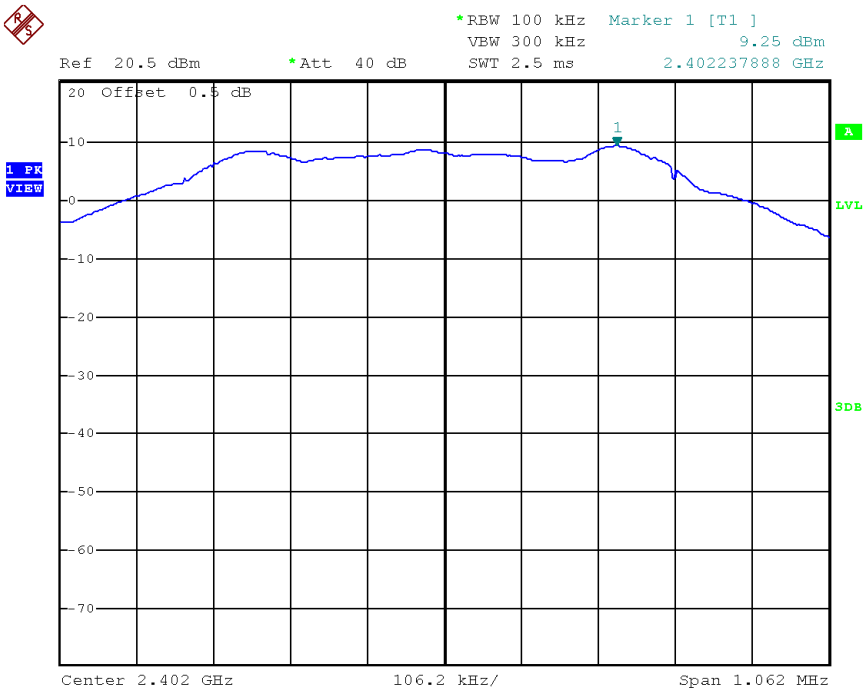
Limit:
8dBm

The plots of power spectral density are as below.

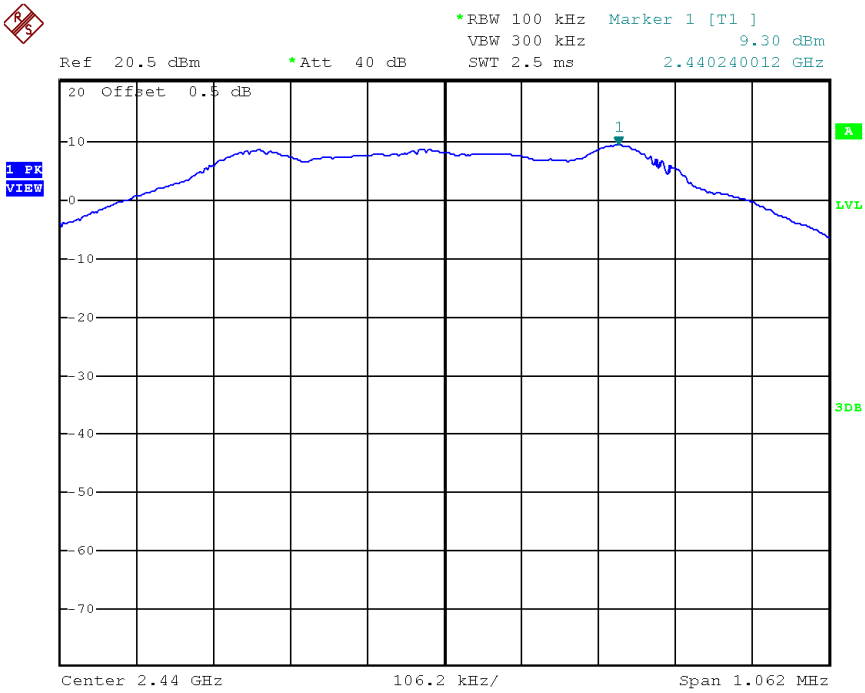
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (100kHz RBW)

Lowest channel



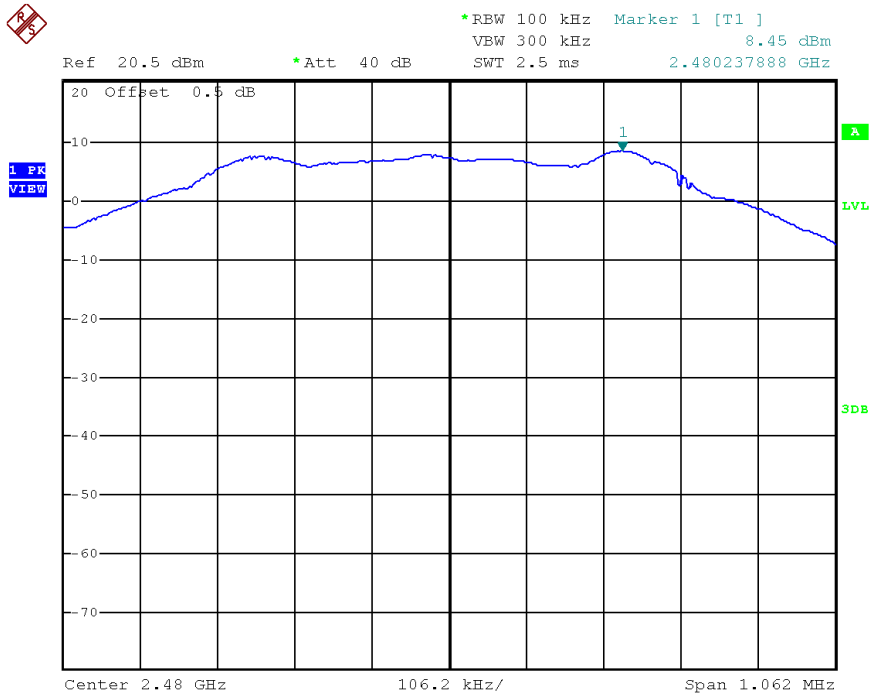
Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (100kHz RBW)

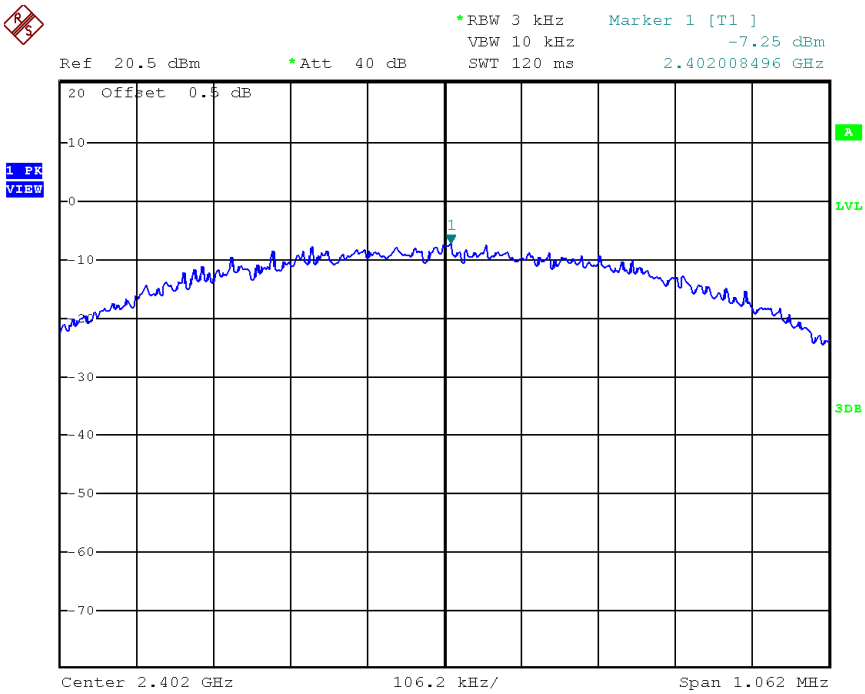
Highest channel



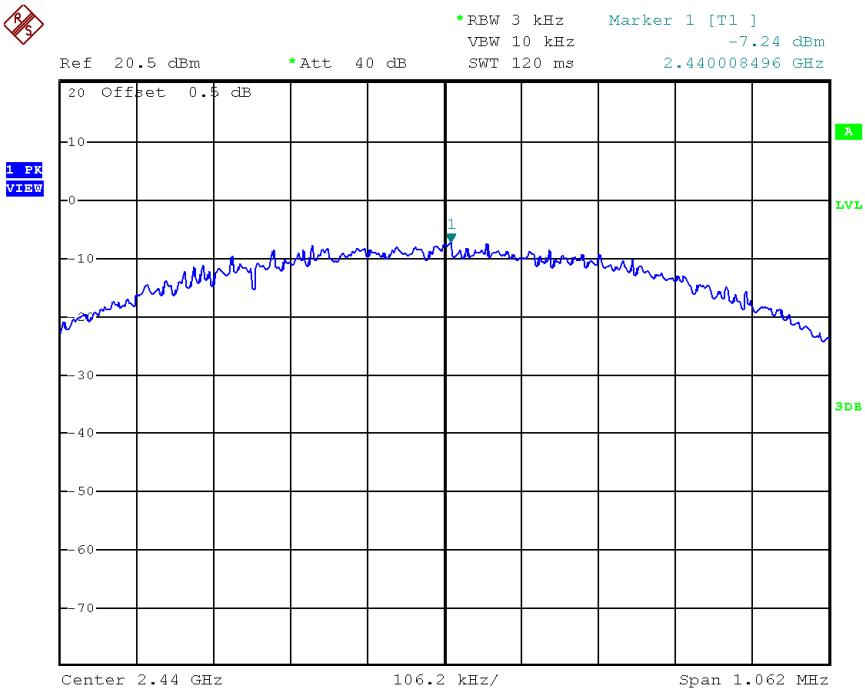
TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (3kHz RBW)

Lowest channel



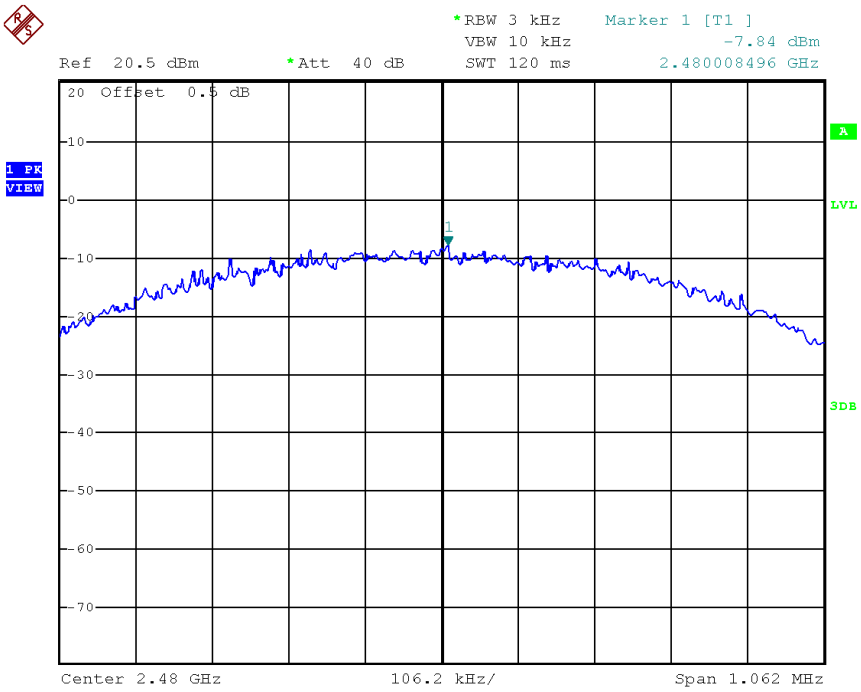
Middle channel



TEST REPORT

PLOTS OF POWER SPECTRAL DENSITY (3kHz RBW)

Highest channel



TEST REPORT

4.4 Out of Band Conducted Emissions

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

The measurement procedures under sections 11 of KDB No.558074 D01 v05r01 (11-February-2019) were used.

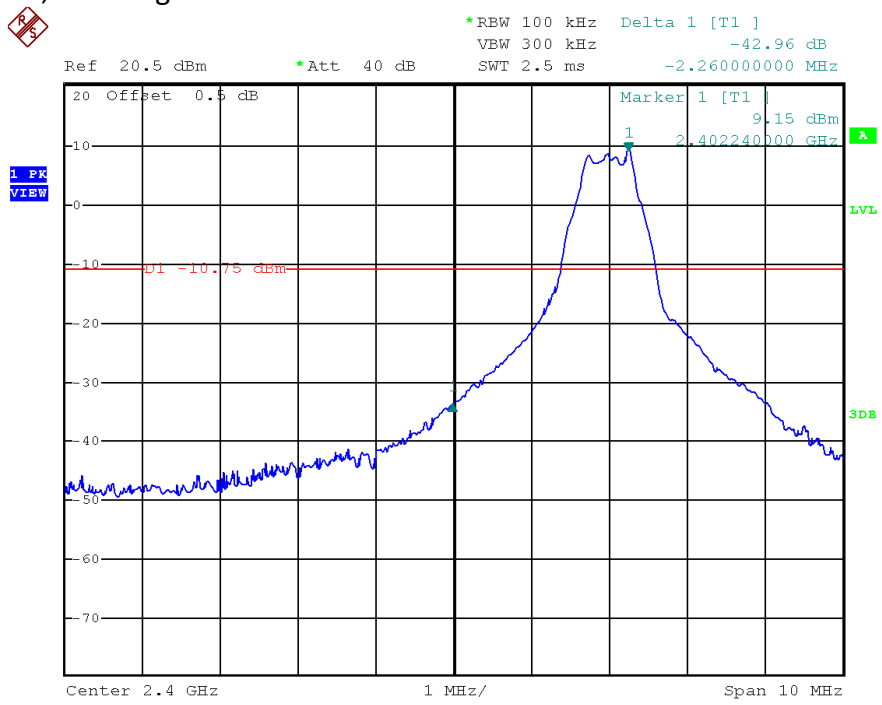
Furthermore, delta measurement technique for measuring bandedge emissions was incorporated in the test of the edge at 2483.5MHz.

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

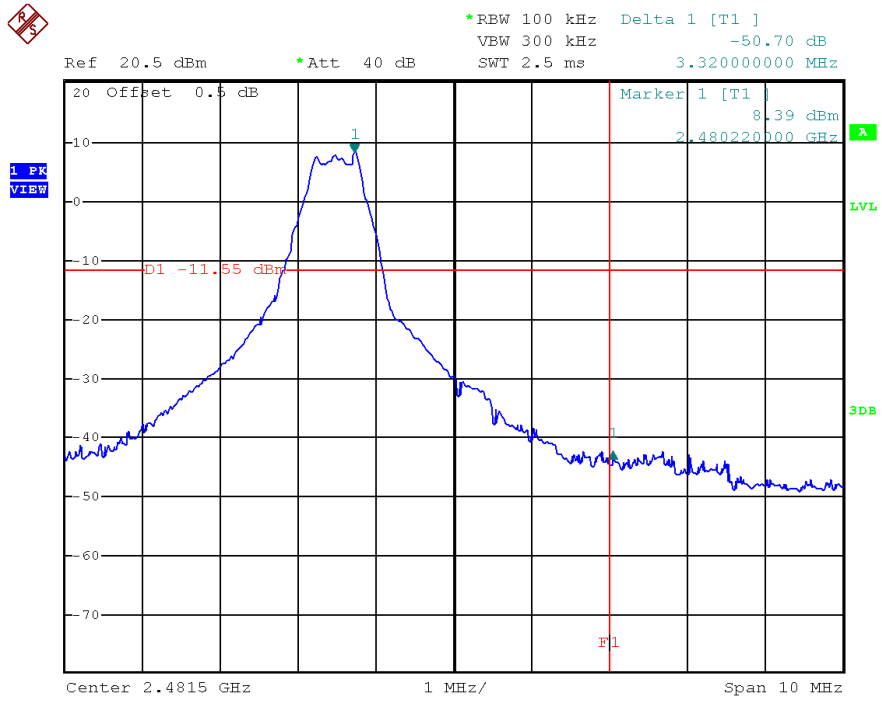
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Lowest Channel, Bandedge



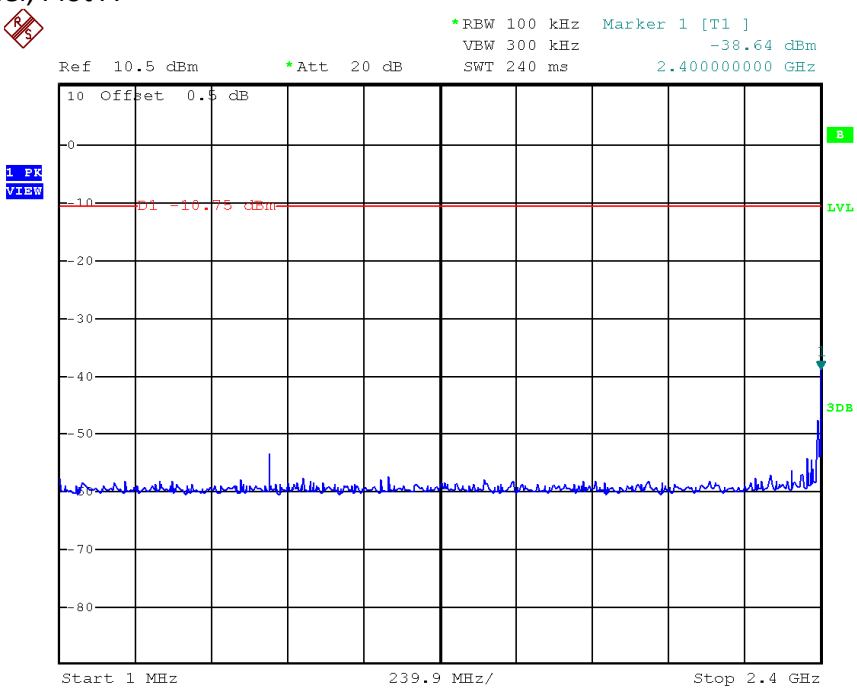
Highest Channel, Bandedge



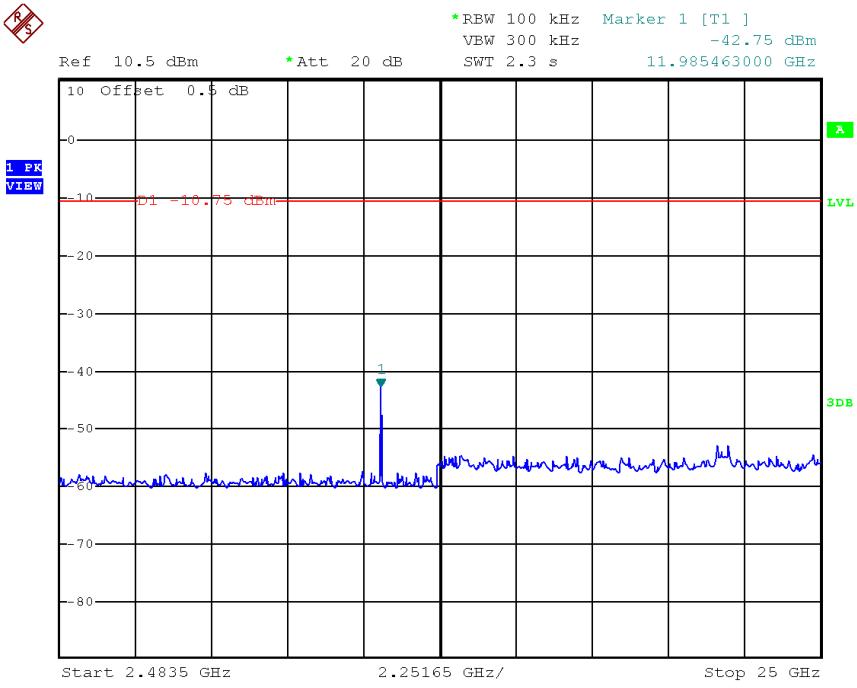
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Lowest Channel, Plot A



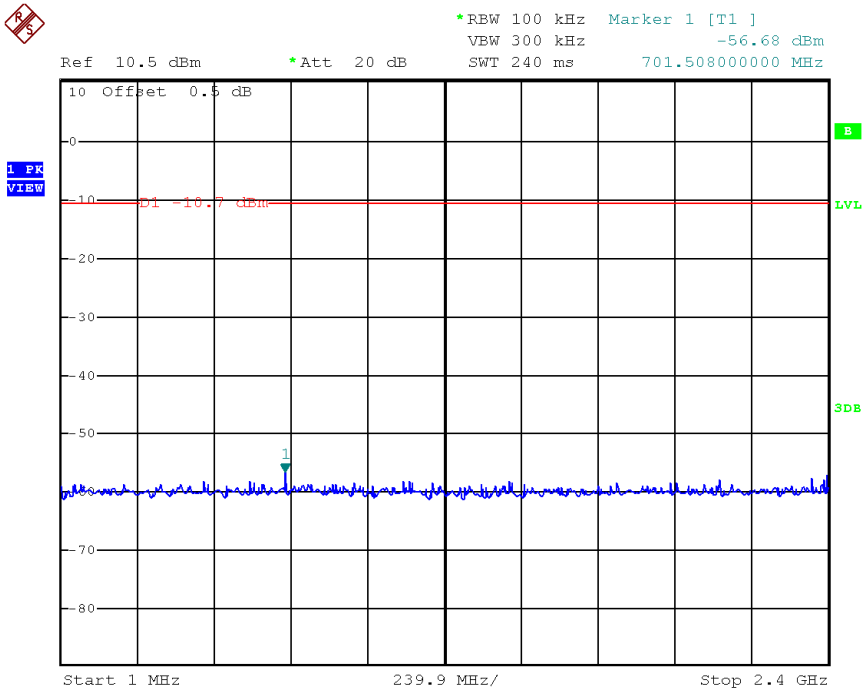
Lowest Channel, Plot B



TEST REPORT

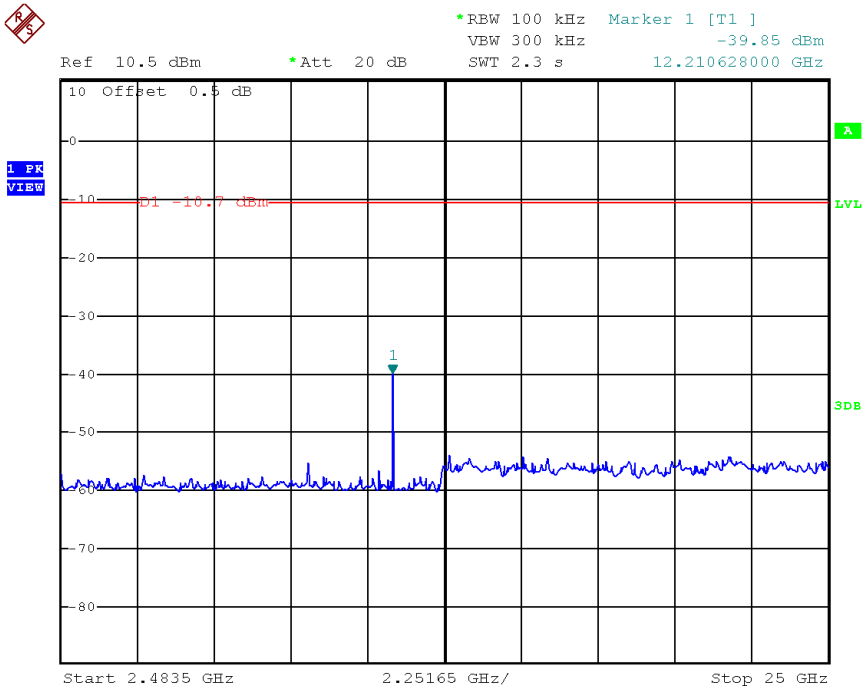
PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Middle Channel, Plot A



Date: 22.DEC.2020 02:32:12

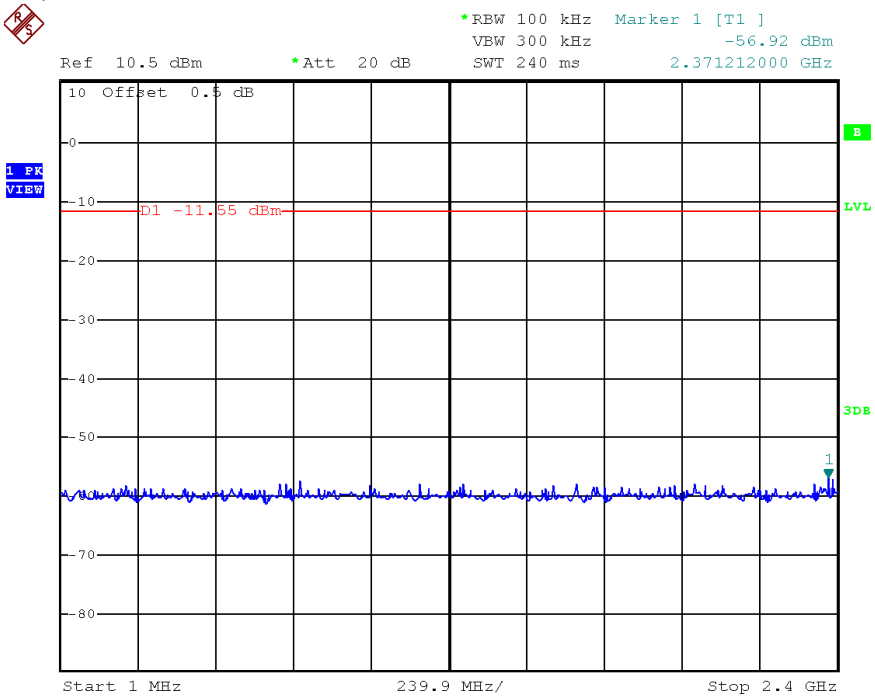
802.11b, Middle Channel, Plot B



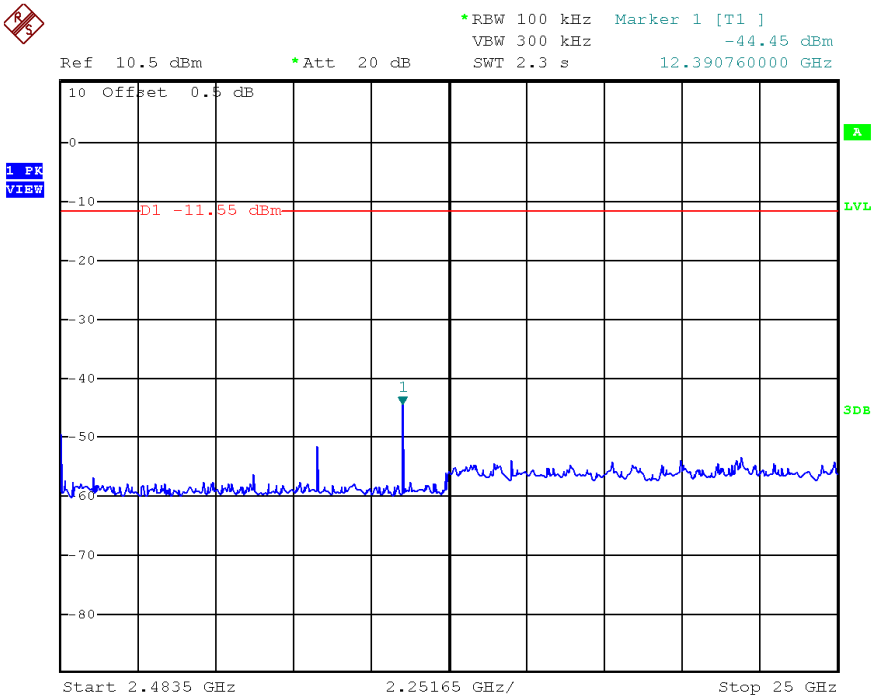
TEST REPORT

PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

Highest Channel, Plot A



Highest Channel, Plot B



TEST REPORT

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

TEST REPORT

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

2390 and 12200 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 1-6 list the significant emission frequencies, the limit and the margin of compliance.

Judgement -

Passed by 0.2 dB margin

TEST REPORT

RADIATED EMISSION DATA

Mode: TX-Channel 2402MHz

Table 1
Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	***2390.000***	***57.4***	***33***	***29.4***	***53.8***	***54.0***	***-0.2***
H	***4804.000***	***43.0***	***33***	***34.9***	***44.9***	***54.0***	***-9.1***
V	***12010.000***	***45.5***	***33***	***40.5***	***53.0***	***54.0***	***-1.0***

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***	***70.9***	***33***	***29.4***	***67.3***	***74.0***	***-6.7***
H	***4804.000***	***50.1***	***33***	***34.9***	***52.0***	***74.0***	***-22.0***
V	***12010.000***	***54.9***	***33***	***40.5***	***62.4***	***74.0***	***-11.6***

NOTES:

1. Peak detector is used for the emission measurement.
2. Average measurement method is according to ANSI C63.10.
3. All measurements were made at 3 meters.
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.

TEST REPORT

Mode: TX-Channel 2440MHz

Table 2
Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	***4880.000***	***45.0***	***33***	***34.9***	***46.9***	***54.0***	***-7.1***
V	***7320.000***	***42.9***	***33***	***37.9***	***47.8***	***54.0***	***-6.2***
V	***12200.000***	***46.3***	***33***	***40.5***	***53.8***	***54.0***	***-0.2***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	***4880.000***	***51.8***	***33***	***34.9***	***53.7***	***74.0***	***-20.3***
V	***7320.000***	***52.3***	***33***	***37.9***	***57.2***	***74.0***	***-16.8***
V	***12200.000***	***55.7***	***33***	***40.5***	***63.2***	***74.0***	***-10.8***

NOTES:

1. Peak detector is used for the emission measurement.
2. Average measurement method is according to ANSI C63.10.
3. All measurements were made at 3 meters.
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.

TEST REPORT

Mode: TX-Channel 2480MHz

Table 3
Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	***2483.500***	***57.2***	***33***	***29.4***	***53.6***	***54.0***	***-0.4***
V	***4960.000***	***49.6***	***33***	***34.9***	***51.5***	***54.0***	***-2.5***
V	***7440.000***	***46.8***	***33***	***37.9***	***51.7***	***54.0***	***-2.3***
V	***12400.000***	***45.8***	***33***	***40.5***	***53.3***	***54.0***	***-0.7***

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	***2483.500***	***71.7***	***33***	***29.4***	***68.1***	***114.0***	***-45.9***
V	***4960.000***	***55.7***	***33***	***34.9***	***57.6***	***74.0***	***-16.4***
V	***7440.000***	***56.9***	***33***	***37.9***	***61.8***	***74.0***	***-12.2***
V	***12400.000***	***55.2***	***33***	***40.5***	***62.7***	***74.0***	***-11.3***

NOTES:
1. Peak detector is used for the emission measurement.
2. Average measurement method is according to ANSI C63.10.
3. All measurements were made at 3 meters.
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.

TEST REPORT

Worst-Case Operating Mode: Bluetooth BLE Operating

Table 4

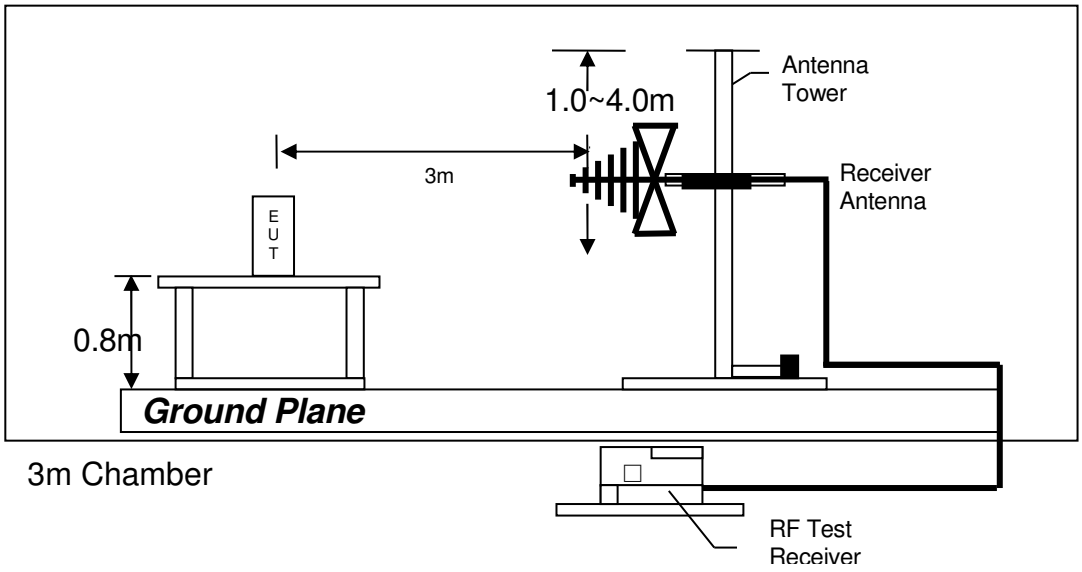
Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	63.844	33.0	16	9.0	26.0	40.0	-14.0
V	71.938	39.3	16	7.0	30.3	40.0	-9.7
H	95.917	35.7	16	12.0	31.7	43.5	-11.8
H	143.884	35.1	16	14.0	33.1	43.5	-10.4
H	***263.779***	***35.2***	***16***	***21.0***	***40.2***	***46.0***	***-5.8***
H	311.736	34.6	16	23.0	41.6	46.0	-4.4
H	***407.664***	***33.3***	***16***	***24.0***	***41.3***	***46.0***	***-4.7***

NOTES:
1. Quasi-Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. 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.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

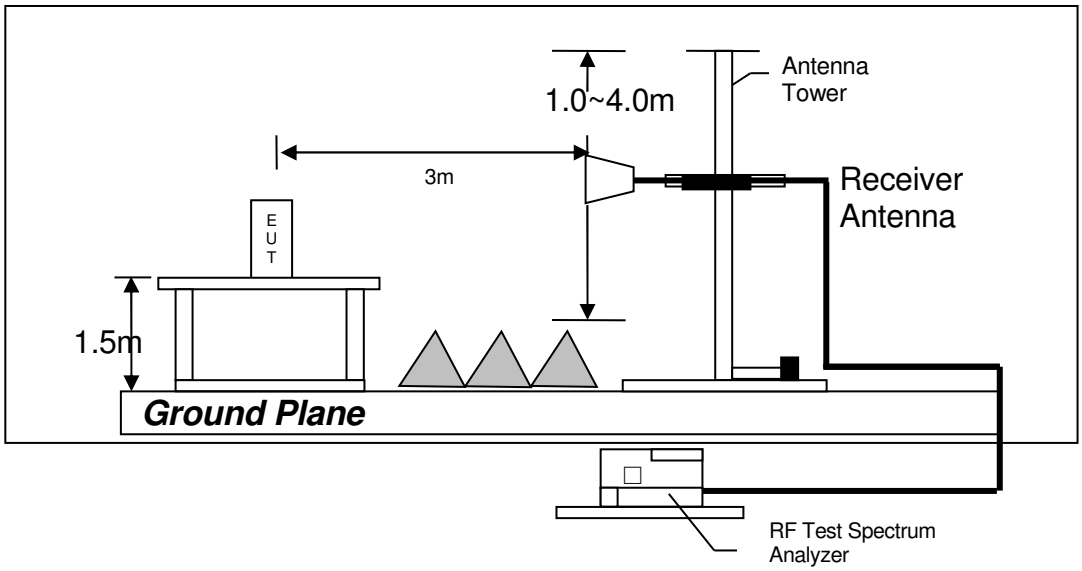
TEST REPORT

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

TEST REPORT

4.6.4 Transmitter Duty Cycle Calculation

Not applicable – No average factor is required.

TEST REPORT

4.7 AC Power Line Conducted Emission

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

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

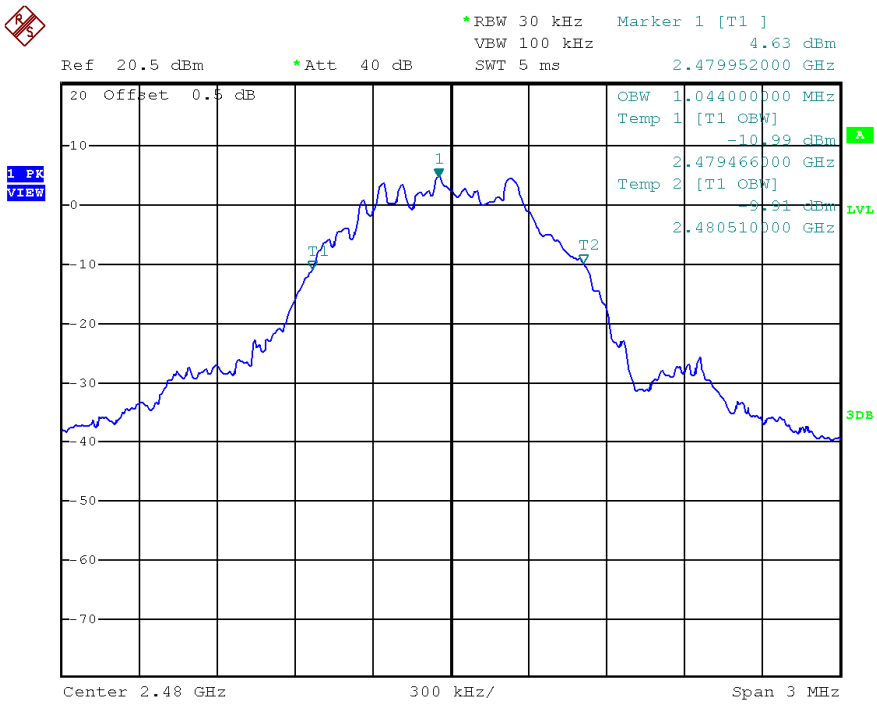
☐ Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

4.8 Occupied Bandwidth

Occupied Bandwidth Results: (Bluetooth BLE)

(802.11b)	Occupied Bandwidth (MHz)
Low Channel: 2402	1.032
Middle Channel: 2440	1.038
High Channel: 2480	1.044

The worst case is shown as below



TEST REPORT

5.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	EMI Test Receiver (9kHz to 3GHz)	Spectrum Analyzer	Biconical Antenna
Registration No.	EW-2500	EW-3281	EW-0571
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ	EMCO
Model No.	ESCI	FSV40	3104C
Calibration Date	January 09, 2020	March 04, 2020	July 23, 2019
Calibration Due Date	January 09, 2021	March 04, 2021	January 23, 2021

Equipment	Log Periodic Antenna	Double Ridged Guide Antenna	RF Cable 14m (1GHz to 26.5GHz)
Registration No.	EW-0447	EW-0194	EW-3151
Manufacturer	EMCO	EMCO	GREATBILLION
Model No.	3146	3115	SMA m/SHF5MPU /SMA m ra14m,26G
Calibration Date	September 25, 2019	September 26, 2019	March 04, 2020
Calibration Due Date	March 25, 2021	March 26, 2021	March 04, 2021

Equipment	14m Double Shield RF Cable (20MHz To 6GHz)	Active Loop H-field (9kHz to 30MHz)	Pyramidal Horn Antenna
Registration No.	EW-2074	EW-2313	EW-0905
Manufacturer	RADIALL	ELECTROMETRI	EMCO
Model No.	nm / RG142 / sma 14m	EM-6876	3160-09
Calibration Date	August 29, 2020	December 17, 2019	July 23, 2019
Calibration Due Date	August 29, 2021	June 17, 2021	January 23, 2021

Equipment	Solid State Low Noise Preamplifier Assembly (1 - 18)GHz
Registration No.	EW-3431
Manufacturer	BONN ELEKTRO
Model No.	BBV 9718 BBV9744 BBV 9721
Calibration Date	November 18, 2020
Calibration Due Date	November 18, 2021

TEST REPORT

2) Conductive Measurement Test

Equipment	RF Cable (up to 40GHz) 1.5m length	RF Power Meter with Power Sensor	Spectrum Analyzer
Registration No.	EW-2774	EW-3309	EW-2466
Manufacturer	N/A	ROHDESCHWARZ	ROHDESCHWARZ
Model No.	SMA-M to SMA-M	NRP-Z81	FSP30
Calibration Date	September 12, 2020	May 18, 2020	September 05, 2020
Calibration Due Date	September 12, 2021	May 18, 2021	September 05, 2021

3) Bandwidth/Bandedge Measurement Test

Equipment	RF Cable (up to 40GHz) 1.5m length	Spectrum Analyzer
Registration No.	EW-2774	EW-2466
Manufacturer	N/A	ROHDESCHWARZ
Model No.	SMA-M to SMA-M	FSP30
Calibration Date	September 12, 2020	September 05, 2020
Calibration Due Date	September 12, 2021	September 05, 2021

END OF TEST REPORT