

Report No.: 23090695HKG-001

VTech Telecommunications Ltd.

Application For Original Grant of 47 CFR Part 15 Certification

Single New of RSS-247 Issue 3 Certification

VoIP Phone

FCC ID: EW780-S212-00

IC: 1135B-80S21200

This report contains the data of 2.4GHz Wi-Fi portion only

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GENERAL INFORMATION

| Grantee: | VTech Telecommunications Ltd. |
|-----------------------------|---|
| Grantee Address: | 23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, |
| | Hong Kong. |
| Manufacturer Name: | VTech (Dongguan) Telecommunications Limited |
| Manufacturer Address: | VTech Science Park, Xia Ling Bei Management Zone, Liaobu, Dongguan, Guangdong, China. |
| FCC Specification Standard: | FCC Part 15, October 1, 2022 Edition |
| FCC ID: | EW780-S212-00 |
| FCC Model(s): | D815 |
| IC Specification Standard: | RSS-247 Issue 3, August 2023 RSS-Gen Issue 5 Amendment 2, February 2021 |
| IC: | 1135B-80S21200 |
| HVIN: | 35-400509BS |
| PMN: | D815 |
| Type of EUT: | Spread Spectrum Transmitter |
| Description of EUT: | VoIP Phone |
| Brand Name: | VTech |
| Sample Receipt Date: | September 27, 2023 |
| Date of Test: | October 12, 2023 to January 12, 2024 |
| Report Date: | April 24, 2024 |
| Environmental Conditions: | Temperature: +10 to 40°C |
| | Relative 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 3 Certification. |
| | This report contains the data of 2.4GHz Wi-Fi portion only |

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SUMMARY OF TEST RESULT

| Test Items | FCC Part 15 Section | RSS-247 / RSS- Gen [#] Section | Test Engineer | Results |
|---|-------------------------------|---|------------------|----------|
| Antenna Requirement | 15.203 | 7.1.2# | N/A | Complied |
| Max. Conducted Output Power (Peak) | 15.247(b)(3)&(4) | 5.4(4) | Rain Wang | Complied |
| Min. 6dB RF Bandwidth | 15.247(a)(2) | 5.2(1) | Rain Wang | Complied |
| Max. Power Density (Average) | 15.247(e) | 5.2(2) | Rain Wang | Complied |
| Out of Band Antenna Conducted Emission | 15.247(d) | 5.5 | Rain Wang | Complied |
| Radiated Emission in Restricted Bands and Spurious Emissions | 15.247(d), 15.209 & 15.109 | 5.5 | Fire Huo | Complied |
| AC Power Line Conducted Emission | 15.207 & 15.107 | 7.2.4 [#] | Linson Xie | Complied |

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.

For all technical data, which can be referred to Annex B – Report cover sheet. For electronic filing, the Annex B – Report cover sheet is saved with filename: Annex B.pdf.

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

FCC Part 15, October 1, 2022 Edition RSS-247 Issue 3, August 2023 RSS-Gen Issue 5 Amendment 2, February 2021



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EXHIBIT 1 GENERAL DESCRIPTION

1.1 Product Description

The D815 (35-400509BS) is a VoIP Phone.

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

For IEEE 802.11b mode, it operates at frequency range of 2412.000 MHz to 2462.000 MHz with 11 channels. It transmits via Direct-sequence spread spectrum (DSSS) modulation. Maximum bit rate can be up to 11Mbps.

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

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

The EUT is powered by 100-240VAC 50/60Hz 0.3A or 100-240VAC 50/60Hz 0.5A adaptor.

The antenna(s) used in the EUT is integral, and the test sample is a prototype. Peak Antenna Gain: 1dBi

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

1.2 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 v05r02 (April 02, 2019) All other measurements were made in accordance with the procedures in 47 CFR Part 2 and RSS-Gen Issue 5 Amendment 2, February 2021.

1.3 Test Facility

The radiated emission (15.209) test site 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, CABID is "HKAP01".

The radiated emission (except 15.209) test site and antenna port conducted measurement facility used to collect the radiated data and conductive data are at Shenzhen UnionTrust Quality and Technology Co., Ltd. at 16/F., Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109. This test facility and site measurement data have been fully placed on file with the FCC and Industry Canada No.: 21600, CABID "HKAP01", "CN0023".



TEST REPORT

1.4 Related Submittal(s) Grants

This is a single application for certification of a transceiver (WiFi Portion).



EXHIBIT 2 SYSTEM TEST CONFIGURATION

2.1 Justification

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

The EUT was powered by 120VAC during test.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the wooden turntable at 0.8m height from the ground plane for emission testing at or below 1GHz and 1.5m for emission measurements above 1GHz. 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 / 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.



2.1 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 power 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 500hm 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.

Different adaptors have been used for testing. 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.

2.2 EUT Exercising Software

The EUT exercise program (Tera Terms Version 4.106) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.



TEST REPORT

2.3 Details of EUT and Description of Accessories

Details of EUT:

An AC/DC Adaptor (provided with the unit) was used to power the device. Their descriptions are listed below.

- (1) An AC adaptor (Model: NBS12E050200UV; Brand Name: MASS POWER; Input: 100-240VAC 50/60Hz 0.3A; Output: 5.0VDC 2.0A 10.0W) (Provided by Applicant)
- (2) An AC adaptor (Model: VT07EUS05200; Brand Name: VTPL; Input: 100-240VAC 50/60Hz 0.5A; Output: 5.0VDC 2.0A 10.0W) (Provided by Applicant)

Description of Accessories:

Not Applicable

2.4 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 61000-3-2, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044.

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



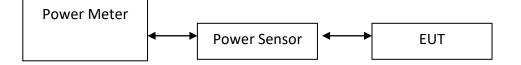
TEST REPORT

EXHIBIT 3 TEST RESULTS

3.1 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 8.3.2.3 was used.

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

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

| Frequency (MHz) | Output in dBm | Output in mW |
|----------------------|---------------|--------------|
| Low Channel: 2412 | 19.27 | 84.53 |
| Middle Channel: 2437 | 19.06 | 80.54 |
| High Channel: 2462 | 18.67 | 73.62 |

IEEE 802.11g (OFDM, 6 Mbps) Peak Antenna Gain = 1 dBi

| Frequency (MHz) | Output in dBm | Output in mW |
|----------------------|---------------|--------------|
| Low Channel: 2412 | 23.80 | 239.88 |
| Middle Channel: 2437 | 23.41 | 219.28 |
| High Channel: 2462 | 23.18 | 207.97 |

IEEE 802.11n (20MHz) (OFDM, MCS0) Peak Antenna Gain = 1 dBi

| Frequency (MHz) | Output in dBm | Output in mW |
|----------------------|---------------|--------------|
| Low Channel: 2412 | 23.37 | 217.27 |
| Middle Channel: 2437 | 22.96 | 197.70 |
| High Channel: 2462 | 22.63 | 183.23 |



3.1 Maximum Conducted (Peak) 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

IEEE 802.11b (DSSS, 1 Mbps) Max. Conducted (Peak) Output Level = 19.27 dBm

IEEE 802.11g (OFDM, 6 Mbps) Max. Conducted (Peak) Output Level = 23.80 dBm

IEEE 802.11n (20MHz) (OFDM, MCS0) Max. Conducted (Peak) Output Level = 23.37 dBm

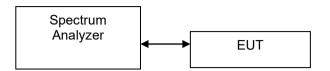
Limits:

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



3.2 Minimum 6dB RF Bandwidth

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 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 | 10.11 |
| Middle Channel: 2437 | 10.10 |
| High Channel: 2462 | 10.11 |

IEEE 802.11g (OFDM, 6 Mbps)

| Frequency (MHz) | 6dB Bandwidth (MHz) |
|----------------------|---------------------|
| Low Channel: 2412 | 16.54 |
| Middle Channel: 2437 | 16.54 |
| High Channel: 2462 | 16.52 |

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

| Frequency (MHz) | 6dB Bandwidth (MHz) |
|----------------------|---------------------|
| Low Channel: 2412 | 17.65 |
| Middle Channel: 2437 | 17.71 |
| High Channel: 2462 | 17.68 |

Limits:

6dB bandwidth shall be at least 500kHz.

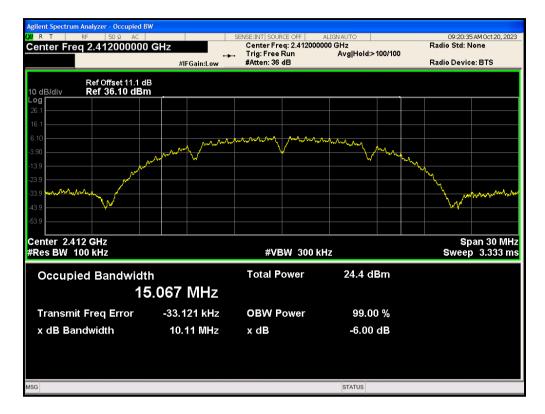
The plots of 6dB RF bandwidth are saved as below.



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11b, Lowest Channel



802.11b, Middle Channel





TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11b, Highest Channel





TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11g, Lowest Channel

| Agilent Spectrum Analyzer - Occupied BW | | SENSE:INT SOURCE OFF Center Freq: 2.412000 → Trig: Free Run #Atten: 36 dB | ALIGNAUTO 1000 GHz Avg Hold: 100/100 | 09:33:26 AMOct 20, 2023 Radio Std: None Radio Device: BTS |
|---|------------|---|---|---|
| Ref Offset 11.1 dB 10 dB/div Ref 36.10 dBm | | | | |
| 26.1 | | | | |
| 6.10 | www.www. | | umun and and and and and and and and and an | 4 |
| -13.9 | | V I | | hand and a |
| -23.9 | | | | - Marine Marine Marine |
| -43.9 | | | | |
| Center 2.412 GHz #Res BW 100 kHz | | #VBW 300 k | (Hz | Span 30 MHz Sweep 3.333 ms |
| Occupied Bandwidth | | Total Power | 23.0 dBm | |
| 16 | .496 MHz | | | |
| Transmit Freq Error | -3.085 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 16.54 MHz | x dB | -6.00 dB | |
| | | | | |
| MSG | | | STATUS | |

802.11g, Middle Channel

| Aglient Spectrum Analyzer - Occupied BW WR R T RE 500 AC Center Freq 2.4370000000 C | GHz #IFGain:Low | SENSE:INT SOUR Center Fre Trig: Free #Atten: 36 | q: 2.43700000 Run | IGNAUTO 0 GHz Avg Hold: 1 | 00/100 | | 09:36:49 Radio Std: N Radio Device | |
|---|--|--|----------------------|---------------------------------|--------|------------|--|-------------------------|
| Ref Offset 11.1 dB 10 dB/div Ref 36.10 dBm | | | | | | - <u>-</u> | | |
| 26.1 | | | | | | | | |
| 6.10 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | mmmmm | manna | an and the second | m | × | | |
| -13.9 | | | / | | | l. | M., . | |
| -23.9 | | | | | | | www.hour | and the party |
| -43.9 | | | | | | | | |
| Center 2.437 GHz #Res BW 100 kHz | | #VE | W 300 kH | z | | | | an 30 MHz) 3.333 ms |
| Occupied Bandwidth | | Total P | ower | 22.6 di | 3m | | | |
| 16. | 490 MHz | | | | | | | |
| Transmit Freq Error | -916 Hz | OBW P | ower | 99.00 | 1% | | | |
| x dB Bandwidth | 16.54 MHz | x dB | | -6.00 | dB | | | |
| MSG | | | | STATUS | | | | |



TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11g, Highest Channel

| Agilent Spectrum Analyzer - Occupied BW W R T RF 50.0 AC Center Freq 2.462000000 C | GHz #IFGain:Low | SENSE:INT SOURCE OFF Center Freq: 2.462000 , Trig: Free Run #Atten: 36 dB | ALIGNAUTO 000 GHz Avg Hold: 100/100 | 09:39:04 AMOct 20, 2023 Radio Std: None Radio Device: BTS |
|--|---|--|---|---|
| Ref Offset 11.1 dB 10 dB/div Ref 36.10 dBm | | | | |
| 26.1 | | | | |
| 6.10 | ,~,,,,;~,^,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | and the state of t | any marine and the second second | м |
| -3.90 | | | | how have a |
| -23.9 -33.9 | | | | mar Mar Marker |
| -43.9 | | | | |
| Center 2.462 GHz #Res BW 100 kHz | | #VBW 300 k | Hz | Span 30 MHz Sweep 3.333 ms |
| Occupied Bandwidth | | Total Power | 22.3 dBm | |
| 16. | 499 MHz | | | |
| Transmit Freq Error | -4.698 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 16.52 MHz | x dB | -6.00 dB | |
| | | | | |
| MSG | | | STATUS | |



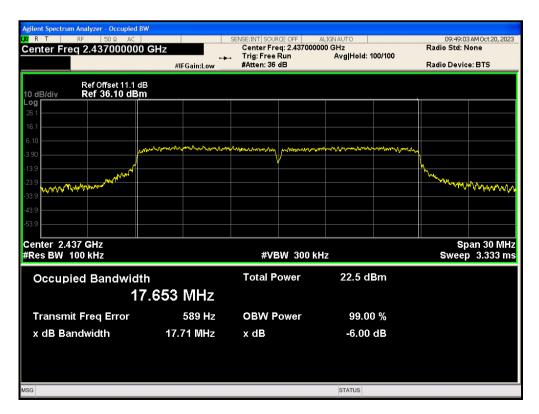
TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

802.11n (20MHz), Lowest Channel

| Agilent Spectrum Analyzer - Occupied BW | | SENSE:INT SOURCE OFF Center Freq: 2.412000 → Trig: Free Run #Atten: 36 dB | ALIGNAUTO 000 GHz Avg Hold: 100/100 | 09:42:06 AM Oct 20, 2023 Radio Std: None Radio Device: BTS |
|---|-----------|---|---|--|
| Ref Offset 11.1 dB 10 dB/div Ref 36.10 dBm | | | | |
| 26.1 16.1 | | | | |
| 6.10 -3.90 | mannente | mmmm mmm | and the second second second | Mng |
| -13.9 -23.9 -33.9 | | | | |
| -33.9 | | | | |
| Center 2.412 GHz | | | | Span 30 MHz |
| #Res BW 100 kHz | | #VBW_300 k | :Hz | Sweep 3.333 ms |
| Occupied Bandwidth | | Total Power | 22.8 dBm | |
| 17 | .646 MHz | | | |
| Transmit Freq Error | 2.948 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 17.65 MHz | x dB | -6.00 dB | |
| MSG | | | STATUS | |

802.11n (20MHz), Middle Channel





TEST REPORT

PLOTS OF 6dB RF BANDWIDTH

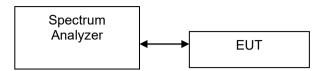
802.11n (20MHz), Highest Channel

| Agilent Spectrum Analyzer - Occupied BV IX R T RF 50 Q AC Center Freq 2.462000000 | | SENSE:INT SOURCE OFF Center Freq: 2.462000 Trig: Free Run #Atten: 36 dB | ALIGNAUTO 1000 GHz Avg Held: 100/100 | 09:51:33 AM Oct 20, 2023 Radio Std: None Radio Device: BTS |
|---|------------------------------------|--|--|--|
| Ref Offset 11.1 dE 10 dB/div Ref 36.10 dBm | | | | |
| 26.1 | | | | |
| 6.10 | water production and a second dama | have write | www.log | ~~ |
| -13.9 | | V | | Mundan and |
| -23.9 -33.9 -33.9 | | | | mannan |
| -53.9 | | | | |
| Center 2.462 GHz #Res BW 100 kHz | | #VBW 300 k | (Hz | Span 30 MHz Sweep 3.333 ms |
| Occupied Bandwidt | | Total Power | 22.2 dBm | |
| 17 | .653 MHz | | | |
| Transmit Freq Error | -419 Hz | OBW Power | 99.00 % | |
| x dB Bandwidth | 17.68 MHz | x dB | -6.00 dB | |
| | | | | |
| MSG | | | STATUS | |



3.3 Minimum Power Spectral Density

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



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

IEEE 802.11b (DSSS, 1 Mbps)

| Frequency (MHz) | PSD in 3kHz (dBm) |
|----------------------|-------------------|
| Low Channel: 2412 | -12.770 |
| Middle Channel: 2437 | -13.302 |
| High Channel: 2462 | -13.770 |

IEEE 802.11g (OFDM, 6 Mbps)

| Frequency (MHz) | PSD in 3kHz (dBm) |
|----------------------|-------------------|
| Low Channel: 2412 | -11.219 |
| Middle Channel: 2437 | -11.470 |
| High Channel: 2462 | -11.823 |

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

| Frequency (MHz) | PSD in 3kHz (dBm) |
|----------------------|-------------------|
| Low Channel: 2412 | -10.052 |
| Middle Channel: 2437 | -10.446 |
| High Channel: 2462 | -10.715 |

Cable Loss: 0.5dB

Limit: 8dBm in 3kHz

The plots of power spectral density are as below.



PLOTS OF POWER SPECTRAL DENSITY

802.11b, Lowest channel



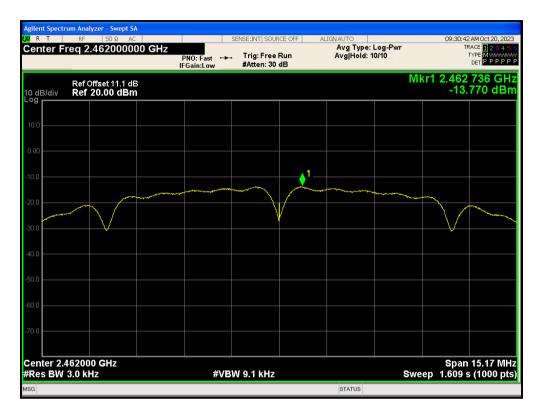
802.11b, Middle channel





PLOTS OF POWER SPECTRAL DENSITY

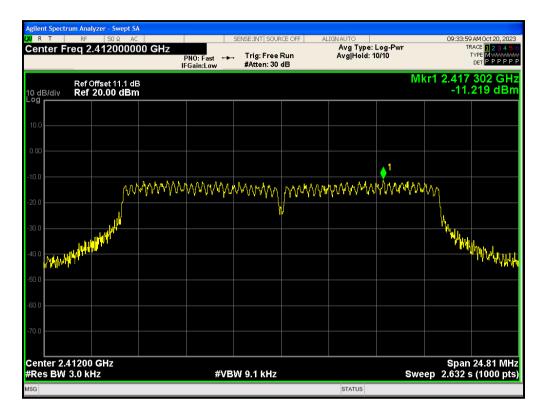
802.11b, Highest channel



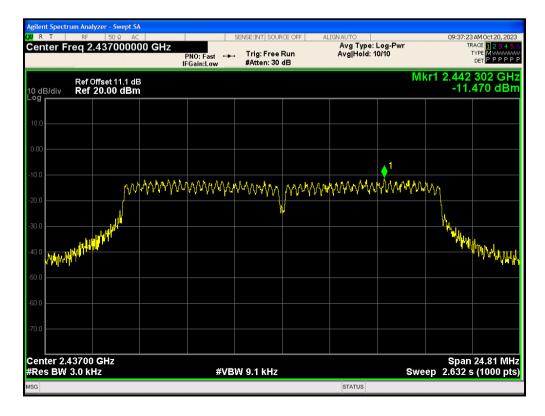


PLOTS OF POWER SPECTRAL DENSITY

802.11g, Lowest channel



802.11g, Middle channel





PLOTS OF POWER SPECTRAL DENSITY

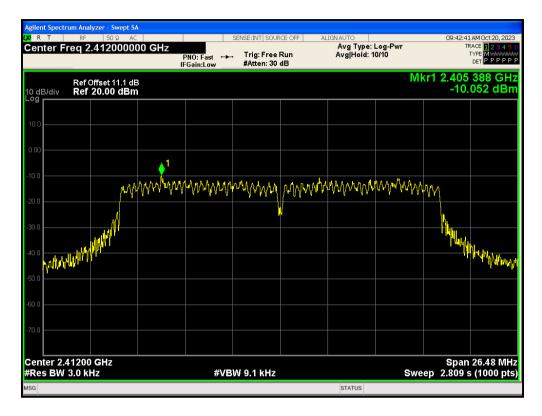
802.11g, Highest channel



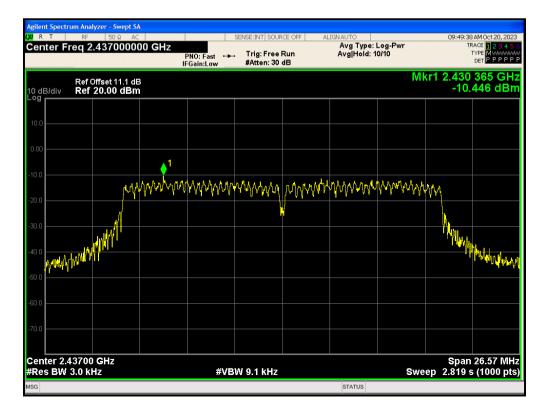


PLOTS OF POWER SPECTRAL DENSITY

802.11n (20MHz), Lowest channel



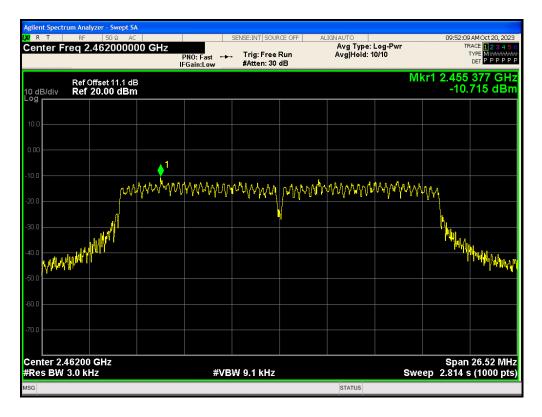
802.11n (20MHz), Middle channel





PLOTS OF POWER SPECTRAL DENSITY

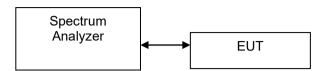
802.11n (20MHz), Highest channel





3.4 Out of Band Conducted Emissions

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



For IEEE 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 for IEEE 802.11b/g/n20MHz.

The measurement procedures under sections 11 of KDB558074 D01 v05r02 (April 2, 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 for IEEE 802.11b/g/n20MHz.

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



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Lowest Channel, PSD in 100k



802.11b, Lowest Channel, Bandedge

| LXI R T | m Analyzer - Swept RF 50 Ω eq 2.3750000 | AC 000 GHz Pi | NO East T | :INT SOURCE OFF rig: Free Run Atten: 36 dB | | e: Log-Pwr d: 100/100 | TRAC TYP | 10ct 20, 2023 E 1 2 3 4 5 6 E MWWWW T P P P P P P |
|--|---|-----------------------------------|---------------------------------|--|--|--------------------------|--|--|
| 10 dB/div Log | Ref Offset 11.1 Ref 25.00 dB | | | | | M | lkr1 2.398 -30.95 | 53 GHz 58 dBm |
| 15.0 5.00 -5.00 -15.0 -25.0 | | | | | | 1.2 | Marine Contraction of the Contra | -12.69 dBm |
| -35.0 -45.0 | | 19 | news frys her to the Aleran | glaphildsmgtine.or.Walled | and a man of the second | | hanna han Hanna hanna | IN SAMO |
| Start 2.310 #Res BW 1 | | | #VBW 3 | 00 kHz | | Sweep | Stop 2.44) 12.47 ms (' | 000 GHz 1001 pts) |
| MKR MODE TRC 1 N 1 2 N 1 3 - - 4 - - 5 - - 6 - - 7 - - 8 - - 9 - - 10 - - 11 - - | | × 2.398 53 GHz 2.400 00 GHz | ¥ -30,958 dBn -32,289 dBn | | FUNCTION WIDTH | FL | UNCTION VALUE | |
| MSG | | | | | STATUS | | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Lowest Channel, Plot

| RT | | 50 Ω AC | | | SENSE:I | INT SOURC | E OFF | ALIGN AUTO | | | | 09:22:06 | 5 AM Oct 20, 20 |
|--------------------|---|-----------------------------|----------------------------|-----------------------|---------|-------------------------|--------------------------|--|------------------|-----------------------------------|---------------------|-----------------|----------------------------|
| enter Fr | req 12.5 | 150000 | I | PNO: Fast Gain:Low | | g: Free R ten: 24 di | | | Type: Hold: 1 | Log-Pwr 0/10 | | | TYPE MWWW DET PPPP |
| dB/div | Ref Offse Ref 25. | t 11.1 dB 0 0 dBm | | | | | | | | | Mkr1 | 24.3 -44. | 20 2 GI 495 dB |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | -12.69 |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | |
| ~ I | | | | | | | | | | | | | |
| .0 | | | te dura i | | | ده بد | the of the second subset | and a state of the | the state of | And the second state of the state | | | |
| | a de se de la companya de la company | | | | | | | | | | uit i deni t | | |
| | | | alaa Shirayada waxaa dhada | | | | | | | | | | |
| o o art 30 N | /IHz 100 kHz | | | #\ | VBW 30 | | | | | | | Stop | 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WID | H | | | Stop 387 s (| 25.00 G (40000 p |
| art 30 M es BW | 100 kHz | | 4.320 2 GHz | Y | | 0 KHz | | FUNCTION WID | H | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WIDT | | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WID | | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WID | | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 M es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WIDT | | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WIDT | | | ep 2.: | Stop 387 s (| 25.00 G (40000 p |
| art 30 IV es BW | 100 kHz | | | Y | (| 0 KHz | | FUNCTION WIDT | | | ep 2.: | Stop 387 s (| 25.00 Gi |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Middle Channel, PSD in 100k



802.11b, Middle Channel, Plot

| Agilent Spect | r <mark>um Analyzer - Swep</mark> RF 50 Ω | t SA | | SENSE:INT SOUR | CE OFF AL | IGNAUTO | | 09:26:05 | AM Oct 20, 2023 |
|-----------------------|--|----------|-------------|----------------|--|---|-------------------------------------|-------------------|--|
| Center F | req 12.51500 | | PNO: Fast 🔸 | | Run | Avg Type: Avg Hold: 1 | | TF | ACE 12345 (TYPE MWWWW DET PPPPF |
| 10 dB/div Log | Ref Offset 11.1 Ref 25.00 dE | dB 3m | | | | | N | 1kr1 24.9 -44. | 35 7 GHz 472 dBm |
| 15.0 | | | | | | | | | |
| 5.00 | | | | | | | | | |
| -5.00 | | | | | | | | | |
| -15.0 | | | | | | | | | -13.24 dBn |
| -25.0 | | | | | | | | | |
| -35.0 | R | | | | | | | | 1 |
| -45.0 | | | | | alda (a. <mark>) a alla (a sua birt</mark> | | ala sun alah tu a | | |
| -55.0 | | | | | فالغور ومعاهلة ويتورونه الا | A STREET, STREE | هم <u>بيانه و کار اور اس مور ال</u> | | |
| | | | | | | | | | |
| Start 30 I #Res BW | MHz 100 kHz | | #VB | W 300 kHz | | | Swee | Stop p 2.387 s | 25.00 GHz (40000 pts |
| MSG | | | | | | STATUS | | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11b, Highest Channel, PSD in 100k



802.11b, Highest Channel, Bandedge

| Agilent Spectrum Analyzer - Swept SA (4) R T RF 50.Ω AC Center Freq 2.495000000 GHz | PNO: Fast Tr | INT SOURCE OFF ig: Free Run tten: 36 dB | ALIGNAUTO Avg Typ Avg Hold | ≘: Log-Pwr : 100/100 | 09:31:15 AM C TRACE TYPE DET | Det 20, 2023 123456 MWWWWW PPPPPPP |
|---|----------------|---|---|-------------------------|---------------------------------------|---|
| Ref Offset 11.1 dB 10 dB/div Ref 25.00 dBm | | | | Μ | kr2 2.483 5 -42.13 | 0 GHz 7 dBm |
| 15.0 | | | | | | |
| -5.00 | | | | | | -13.72 dBm |
| -25.0 | 2 Mar 2 | ~~~~ | พ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ.ศ | | | والاستانات الم |
| -45.0 -55.0 -65.0 | | | | | | |
| Start 2.44000 GHz #Res BW 100 kHz | #VBW 30 | 00 kHz | | Sweep | Stop 2.550 10.53 ms (1 | 00 GHz 001 pts) |
| MKR MODE TRC SCL X | Y | FUNCTION | FUNCTION WIDTH | FUI | NCTION VALUE | ^ |
| 2 N 1 f 2.483 50 GH 3 - - - - 4 - - - - 5 - - - - - 6 - - - - - - 7 - <td< td=""><td>Iz -42.137 dBm</td><td></td><td></td><td></td><td></td><td></td></td<> | Iz -42.137 dBm | | | | | |
| 8 9 10 11 ≰ | | | | | | |
| MSG | | | STATUS | | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

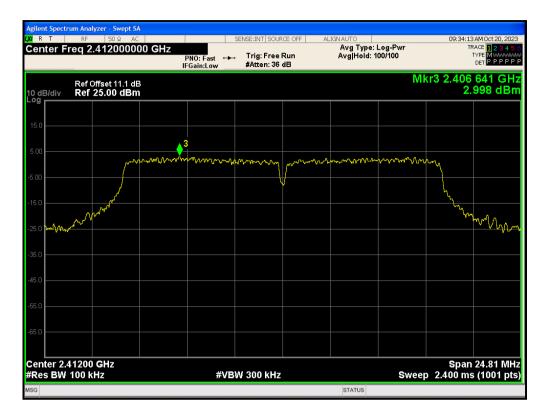
802.11b, Highest Channel, Plot

| | | lyzer - Swept SA | | | | | | | | | | |
|---|------------------------|---------------------------------------|-------------------|-----------------------------|--------|---|-------------------|--|-----------------------|--|--|--------------|
| R T enter F | _{RF} req 1 | 50 Ω AC 2.5150000 | 000 GHz | PNO: Fast • FGain:Low | 📕 Tri | INT SOURCE OF ig: Free Run ten: 24 dB | + AL | IGN AUTO Avg Type Avg Hold: | : Log-Pwr 10/10 | 09 | 0:31:48 AM Oct 20 TRACE 1 2 TYPE MW DET P P | 345 www. |
|) dB/div og r | Ref Ref | Offset 11.1 dE ` 25.00 dB m | 3 | | | | | | | Mkr1 2 | 4.973 8 (44.098 d | GH IBr |
| 5.0 | | | | | | | | | | | | |
| .00 | | | | | | | | | | | | |
| 5.0 | | | | | | | | | | | -13 | 3.72 dl |
| 5.0 | | | | | | | | | | | | |
| 5.0 | | | | | | | | | | | | |
| 5.0 | | | | | | | | يله ف اطلاع أوجعا معامر وله . | an and house building | | | y i i |
| 5.0 | | | | | | | | | | | | |
| 5.0 | | | | | | | a aller an aller | a you a share and a start of the start of th | | And the second sec | | |
| | au- | | | | | | an i Britan Ailan | ر بر می به محمد با تعامیل مشاهد که بر بر بر بی رو ا | | | | 0 |
| tart 30 N | | kHz | | #\ | /BW 30 | 0 kHz | | a province and a second se | | | Stop 25.00 7 s (40000 | GH) pt |
| 5.0 tart 30 N Res BW | 100 | ; | | Y | | O KHZ | FUNC | TION WIDTH | | | Stop 25.00 7 s (40000 | GH) pt |
| tart 30 M Res BW R MODE TF 1 N 1 2 | 100 | ; | × 24.973 8 GHz | Y | | | FUNC | | | s veep 2.38 | Stop 25.00 7 s (40000 | GI-) pt |
| art 30 N Res BW R MODE TR N 1 2 3 4 | 100 | ; | | Y | | | FUNC | TION WIDTH | | s veep 2.38 | Stop 25.00 7 s (40000 | GI-) pt |
| Cart 30 N Res BW R MODE TF 1 N 1 3 3 4 5 5 5 6 | 100 | ; | | Y | | | FUNC | TION WIDTH | | s veep 2.38 | Stop 25.00 7 s (40000 | GI) pt |
| tart 30 M Res BW Res BW 1 N 1 2 3 3 4 5 4 5 6 6 7 7 7 8 9 | 100 | ; | | Y | | | FUNC | TION WIDTH | | s veep 2.38 | Stop 25.00 7 s (40000 | GH) pt |
| art 30 M Res BW R MODE TF N 1 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | 100 | ; | | Y | | | FUNC | TION WIDTH | | s veep 2.38 | Stop 25.00 7 s (40000 | GH) pt |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Lowest Channel, PSD in 100k



802.11g, Lowest Channel, Bandedge

| Agilent Spectr | <mark>um Anal</mark> RF | <mark>lyzer - Swept SA</mark> 50 Ω AC | | | SENSE:INT S | | AL | IGNAUTO | | | 00/34/3 | 34 AM Oct 20, 202 |
|----------------------|----------------------------|--|-------------------|--------------------------|-------------|-----------------|--------------|---------------------|-------|-------|---------------------------------|--------------------------|
| | | .37500000 | 00 GHz | PNO: Fast ↔ FGain:Low | | ee Run | | Avg Typ Avg Hold | | | | TYPE MWWW DET P P P P |
| 10 dB/div | Ref (Ref | Offset 11.1 dE 25.00 dBm | 3 | | | | | | | М | kr2 2.40 -24 | 00 00 GH .345 dBr |
| 15.0 5.00 | | | | | | | | | | | | |
| 5.00 | | | | | | | | | | | | -17.00 dE |
| 25.0 | | | | | | | | - Aler Marth | and T | | [\] ∕n _{frvi} | harroug |
| 45.0 1 | 4-4-qk | w.r.d.a.umv | hat fearer and | yanagati di mangkatin | mahrimm | where have a fu | an aller the | ~~~ | | | | |
| 65.0 | | | | | | | | | | | | |
| itart 2.31 Res BW | | | | #VB | W 300 k | Hz | | | | Sweep | Stop 2 12.47 m | .44000 GH s (1001 pt |
| 1 MODE TP | RC SCL | > | < 2.400 00 GHz | Y -24,345 | | FUNCTION | FUNCT | ION WIDTH | | FU | NCTION VALUE | |
| 3 4 5 | | | | -24.040 | | | | | | | | |
| 6 7 8 | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | |
| SG | | | | | | | | STATUS | | | | <u> </u> |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Lowest Channel, Plot

| RT RF 50 | Swept SA | SENSEI | NT SOURCE OFF | ALIGN AUTO | | 09:35:07 AM Oct 20, 3 |
|---|--|------------------------------------|------------------------------------|----------------|-----------------------|--|
| enter Freq 12.51 | 5000000 GHz | N0 East ⊶ Tri | g: Free Run ten: 24 dB | | e: Log-Pwr : 10/10 | TRACE 123 TYPE MWW DET P P P |
| Ref Offset dB/div Ref 25.00 | 11.1 dB 0 dBm | | | | M | kr1 24.221 5 G -43.730 dl |
| 5.0 | | | | | | |
| 00 | | | | | | |
| .0 | | | | | | -17.0 |
| .0 | | | | | | |
| .0 | | | | | | |
| .0 | | | | | . 10 | |
| | والمارية والمستحد والمحاصف والمستحد والمعا | ويستعيده والاستعالي المرجع والملاط | and the state of the second second | | | |
| | | | | | | |
| art 30 MHz | | #VBW 30 | 0 kHz | | Sweep | Stop 25.00 C 2.387 s (40000) |
| art 30 MHz Res BW 100 kHz | × 24.221.5 GHz | Y | 0 kHz FUNCTION | FUNCTION WIDTH | | Stop 25.00 G 2.387 s (40000) NCTION VALUE |
| art 30 MHz les BW 100 KHz R MODE TRC SCL N 1 f | × 24.221 5 GHz | | | FUNCTION WIDTH | | 2.387 s (40000 |
| art 30 MHz tes BW 100 KHz R MODE TRC, SCL N 1 f | | Y | | FUNCTION WIDTH | | 2.387 s (40000 |
| art 30 MHz tes BW 100 KHz R MODELTRC SCL N 1 f | | Y | | FUNCTION WIDTH | | 2.387 s (40000 |
| art 30 MHz tes BW 100 kHz R MODE TRC SCL N 1 f | | Y | | FUNCTION WIDTH | | 2.387 s (40000 |
| art 30 MHz Res BW 100 KHz R MODE TRC SCL | | Y | | FUNCTION WIDTH | | 2.387 s (40000 |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Middle Channel, PSD in 100k



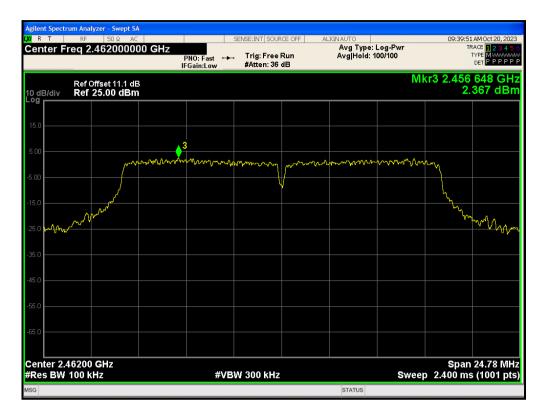
802.11g, Middle Channel, Plot

| | um Analyzer - Swept | | | | | | | | |
|---------------------------|------------------------------------|----------|-------------|---|--|---|---|---|--|
| X R T Center Fi | RF 50Ω A req 12.515000 | 0000 GHz | PNO: Fast 🔸 | SENSE:INT SOUR Trig: Free Atten: 24 o | Run | LIGN AUTO Avg Type: Avg Hold: 1 | 0/10 | TF | AMOct 20, 2023 RACE 1 2 3 4 5 TYPE MWWWW DET P P P P P |
| 0 dB/div | Ref Offset 11.1 c Ref 25.00 dBi | IB n | | | | | I | Vlkr1 24.9 -43. | 28 8 GH 729 dBr |
| 15.0 | | | | | | | | | |
| 5.00 | | | | | | | | | |
| 5.00 | | | | | | | | | |
| 15.0 | | | | | | | | | -17.31 d |
| 25.0 | | | | | | | | | |
| 35.0 | | | | | | | | | |
| 15.0 | | | | | | s | | en la presidente en la constante en la constant | Lander the little |
| 5.0 <mark>Potetine</mark> | | | | aller alle der der der der der der der der der de | ladar di pasili di malia Napara ni bitang | an an airte a thirth an | in the second | an a | and the second |
| 5.0 | | | | | | | | | |
| tart 30 N Res BW | /IHz 100 kHz | | #VB | W 300 kHz | | | Swe | Stop ep 2.387 s | 25.00 GH (40000 pt |
| SG | | | | | | STATUS | | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Highest Channel, PSD in 100k



802.11g, Highest Channel, Bandedge

| Ref Offset 11.1 dB dB/div Ref 25.00 dBm | | | | MI | kr2 2.483 50 GI -35.877 dB |
|---|--|---------------------|-------------------------|-------|------------------------------------|
| .00 | | | | | |
| 50 50 50 50 50 50 50 50 | 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | Milenter generation | yerthy calcury yated as | | 47.63 |
| tart 2.44000 GHz Res BW 100 kHz | #VBW 30 | 00 kHz | | Sweep | Stop 2.55000 G 10.53 ms (1001 p |
| KR MODE TRC SCL X 1 1 1 1 1 2 N 1 1 1 1 2 N 1 | y z _35.877 dBm | FUNCTION | FUNCTION WIDTH | | ICTION VALUE |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11g, Highest Channel, Plot

| | | lyzer - Swept SA | | | | | | | | | |
|--|------------------------|-----------------------------|--|------------------------|--------|--|---------|------------------------------------|-----|----------------------------|---|
| R T enter Fr | _{RF} req 1 | 50 Ω AC 2.5150000 | 000 GHz | PNO: Fast FGain:Low | | INT SOURCE C ig: Free Run ten: 24 dB | | IGN AUTO Avg Type: Avg Hold: | | 09:40 | D:45 AM Oct 20, 20 TRACE 1 2 3 4 TYPE MWWW DET P P P P |
| dB/div | Ref (Ref | Offset 11.1 dE 25.00 dBm | 8 | | | | | | | Mkr1 24. -4 | 959 4 GH 4.135 dB |
| '9 5.0 | | | | | | | | | | | |
| | | | | | | | | | | | |
| .0 | | | | | | | | | | | -17.63 (|
| .0 | | | | | | | | | | | |
| | | | | | | | | | | | |
| i.0 | | | | | | | | | | الطور المتطفا والمروي بطور | Marilla, and property in the |
| .0 | | | | | | | | | | | |
| 5.0 | | | Also Hitl Also a travia | | | | | | | | |
| art 30 N | | i Hz | Alexa dina katan perunda Alexa dina katan perunda | #\ | VBW 30 | 0 KHz | | | | Sto | op 25.00 Gł s (40000 p |
| i.0 i.0 art 30 IV Res BW | 100 k | × | |) Y | (| DO KHZ | N FUNCT | ION WIDTH | Swe | Sto | s (40000 pi |
| art 30 IV es BW | 100 k | × | 4.959 4 GHz |) Y | | | N FUNCT | ION WIDTH | Swe | Sto ep 2.387 | s (40000 pi |
| art 30 M R MODE TR N 1 | 100 k | × | |) Y | (| | N FUNCT | | Swe | Sto ep 2.387 | s (40000 pi |
| i.0 i.0 art 30 IV Res BW | 100 k | × | |) Y | (| | N FUNCT | | Swe | Sto ep 2.387 | s (40000 pi |
| art 30 W les BW R Mode TR N 1 | 100 k | × | |) Y | (| | N FUNCT | | Swe | Sto ep 2.387 | s (40000 pi |
| art 30 M Res BW | 100 k | × | |) Y | (| | N FUNCT | | Swe | Sto ep 2.387 | s (40000 pi |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802. 11n (20MHz), Lowest Channel, PSD in 100k

| | rum Analyzer - Swept SA | | | | | | | |
|-----------|-------------------------------------|---|--|-----|---|---------------|--|------------|
| Center F | RF 50 Ω AC req 2.41200000 | 0 GHz PNO: Fa IFGain:Lo | sense:INT sou st Trig: Free w #Atten: 36 | Run | IGN AUTO Avg Type: Lo Avg Hold: 100 | g-Pwr /100 | 09:42:55 AM Oct 2 TRACE 1 2 TYPE MM DET P P | 345 |
| 10 dB/div | Ref Offset 11.1 dB Ref 25.00 dBm | | | | | Mkr3 | 2.406 626 3.171 c | GHz dBm |
| 15.0 | | | | | | | | |
| 5.00 | | 3 | | | | | | |
| 5.00 | - Junan | ymen han han han han han han han han han ha | vmunamaa | mmm | mm Maran Maran | www.www. | } | |
| 15.0 | mon | | | | | | h | |
| 25.0 | | | | | | | Mury | J.A.P |
| 35.0 | | | | | | | | |
| 15.0 | | | | | | | | |
| i5.0 | | | | | | | | |
| | | | | | | | | |
| Res BW | 41200 GHz 100 kHz | | #VBW 300 kH; | 2 | | Sweep 2 | Span 26.48 .533 ms (1001 | MH 1 pt |
| SG | | | | | STATUS | | | |

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

| LXIRT | um Analyzer - Swept SA RF 50 Ω AC req 2.375000000 |) GHz PNO: Fast IFGain:Low | SENSE:INT SOU | Run | LIGN AUTO Avg Type: Lo Avg Hold: 100 | | 09:43:16 AM Oct 20, 2023 TRACE 2 3 4 5 6 TYPE M WWWW DET P P P P F |
|--------------------------------------|---|---|----------------------------|--|--|--------------|---|
| 10 dB/div Log | Ref Offset 11.1 dB Ref 25.00 dBm | | | | | Mkr | 1 2.397 88 GHz -24.943 dBm |
| 15.0 5.00 | | | | | | pannanapaana | ~ |
| -15.0 -25.0 -35.0 | | | | | 1 7 | <u>}</u> | -16.83 dBm |
| -45.0 | Rhadealadar halannakatan me | holden - Lunden - Marchan Marchan - Mar Marchan - Marchan - Marcha | ๛ฃฃ๛๛๚๛๚๛๛๚๛๛ | and the second sec | | | ······································ |
| Start 2.31 #Res BW | | # | VBW 300 kH | z | | Sweep 1 | Stop 2.44000 GHz 2.47 ms (1001 pts) |
| MKR MODE TR 1 N 1 2 N 1 3 4 | f 2.3 | 397 88 GHz -24. | Y FU 943 dBm 851 dBm | NCTION FUNC | TION WIDTH | FUNCTI | ON VALUE |
| 5 6 7 8 9 10 | | | | | | | |
| 11 KING | | | | | STATUS | | × |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

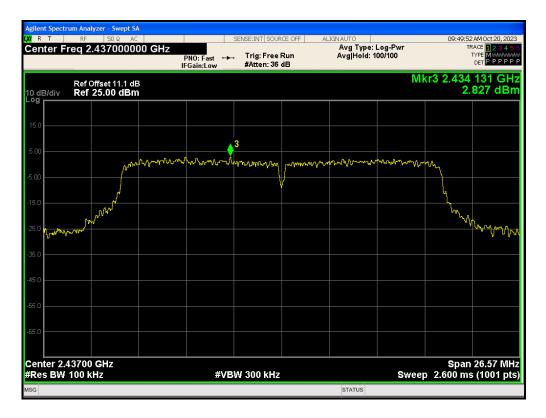
802.11n (20MHz), Lowest Channel, Plot

| | | yzer - Swept SA | | | | | | | | | | | |
|--|-------------------------|------------------------------------|-------------|------------------------|------------|--------------------------------------|-------|-------|--|-----------|---------------------|----------------------------|--|
| X R T Center Fi | _{RF} req 1: | 50 Q AC 2.5150000 | | PNO: Fast FGain:Low | 🛶 Tri | int sour ig: Free l ten: 24 c | Run | ALI | GNAUTO Avg Ty; Avg Hol | d: 10/10 | wr | | 19 AM Oct 20, 202 TRACE 1 2 3 4 5 TYPE MWWW DET P P P P P |
| 10 dB/div | Ref (Ref | 0ffset 11.1 dE 25.00 dBm | | | | | | | | | N | | 891 9 GH .624 dBr |
| 15.0 5.00 | | | | | | | | | | | | | |
| 5.00 | | | | | | | | | | | | | -16.83 dB |
| 25.0 | | | | | | | | | | | | | |
| 35.0 45.0 | | | | | | | | | | at 1 14.1 | | | |
| -65.0 | | | | | un olivit. | | | | and a second | | and a second second | ne alder sonder sonder son | |
| tart 30 N Res BW | | Hz | | #\ | VBW 30 | 0 kHz | | | | | Swee | Stop p 2.387 s | o 25.00 GH (40000 pts |
| MKR MODE TR | RC SCL | >2 | 3.891 9 GHz | -44.6 | 24 dBm | FUN | CTION | FUNCT | ION WIDTH | | FL | JNCTION VALUE | |
| 3 4 5 | | | | | | | | | | | | | |
| 6 7 8 | | | | | | | | | | | | | |
| 9 10 11 11 11 11 11 11 11 11 11 11 11 11 | | | | | | | | | | | | | |
| SG | | | | | | 1111 | | | STATUS | | | | <u>></u> |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Middle Channel, PSD in 100k



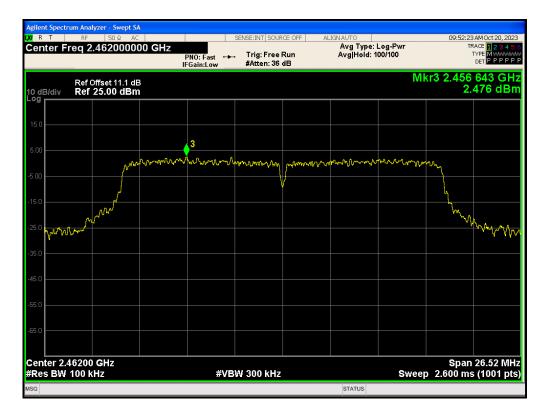
802.11n (20MHz), Middle Channel, Plot

| LXI R T | rum Analyzer - Swept S RF 50 Ω A | C | | SENSE:INT SOUR | CE OFF AL | IGNAUTO | og Pwr | | AM Oct 20, 2023 |
|-----------------------|---------------------------------------|--|-----------------------|------------------------------|--|-------------|---|-------------------|-------------------------|
| Center F | req 12.515000 | Р | NO: Fast 🔸 | Trig: Free l Atten: 24 d | | Avg Hold: 1 | 0/10 | 1 | |
| 10 dB/div Log | Ref Offset 11.1 d Ref 25.00 dBr | | | | | | N | 1kr1 24.3 -43. | 18 3 GH: 910 dBn |
| 15.0 | | | | | | | | | |
| 5.00 | | | | | | | | | |
| -5.00 | | | | | | | | | |
| -15.0 | | | | | | | | | |
| -25.0 | | | | | | | | | -17.17 dBi |
| -35.0 | | | | | | | | | |
| -45.0 | | | | | | | | | ↓ 1 |
| -55.0 | and the second strength of the second | A. Marsh Mandalana J | الديرية المستقل الماس | والمتقاول المراجع والمحاط | linda ya adama dala | | di sa katatan k | | |
| -65.0 | | a all a star all a sea all a s | | Labely Long a House of South | The state of the second se | | .4. | | |
| | | | | | | | | | |
| Start 30 M #Res BW | | | #VB | W 300 kHz | | | Swee | Stop p 2.387 s | 25.00 GHz (40000 pts |
| MSG | | | | | | STATUS | | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Highest Channel, PSD in 100k



802.11n (20MHz), Highest Channel, Bandedge

| Agilent Spectrum Analyzer - Swept SA R T RF 50Ω AC Center Freg 2.495000000 GHz | | INT SOURCE OFF | ALIGNAUTO Avg Type | : Log-Pwr | 09:52:43 AM Oct 20, 2 TRACE 1 2 3 4 |
|---|----------------|-----------------------------|----------------------------------|------------------|--|
| | | ig: Free Run tten: 36 dB | Avg Hold: | 100/100 | |
| Ref Offset 11.1 dB 10 dB/div Ref 25.00 dBm | | | | M | kr2 2.483 50 G -34.954 dE |
| 15.0 5.00 | | | | | |
| -5.00 | | | | | -47.52 |
| -25.0 | mmummer 2 | | | | |
| -45.0 | | LA MANAGERAN | ษาณากฎหารไหวสร้างการเป็นได้ระได้ | hangel-haran-eki | - Marine Marine Marine Contraction |
| -65.0 | | | | | |
| Start 2.44000 GHz #Res BW 100 kHz | #VBW 30 | 00 kHz | | Sweep | Stop 2.55000 G 10.53 ms (1001 p |
| MKR MODE TRC SCL X | Y | FUNCTION | FUNCTION WIDTH | FUI | NCTION VALUE |
| 2 N 1 f 2.483 50 GH 3 - - - - 4 - - - - 5 - - - - - | lz -34.954 dBm | | | | |
| 6 7 8 9 | | | | | |
| | | | | | |
| MSG | | | STATUS | | |



PLOTS OF OUT OF BAND CONDUCTED EMISSIONS

802.11n (20MHz), Highest Channel, Plot

| Agilent Spectrum Analyzer - Swept SA | SENSE:INT SOU | RCE OFF ALIGN AUTO | 09:53:17 AMOct 20 | 1 2023 |
|--|---|-----------------------|------------------------------------|-----------------|
| Center Freq 12.515000000 GHz | PNO: Fast +++ Trig: Free FGain:Low Atten: 24 | Avg Ty Run Avg Hol | pe: Log-Pwr TRACE | 3 4 5 6 |
| Ref Offset 11.1 dB 10 dB/div Ref 25.00 dBm | | | Mkr1 24.999 4 0 -43.605 d | GHz IBm |
| 15.0 5.00 | | | | |
| -5.00 | | | | . <u>52 dBm</u> |
| -25.0 | | | | <u> </u> |
| -45.0 | | | | |
| -65.0 | | | Oton 25.00 | 011- |
| #Res BW 100 kHz | #VBW 300 kHz | | Stop 25.00 Sweep 2.387 s (40000 |) pts |
| MKR MODE TRC SCL X 1 N 1 f 24.999 4 GHz 3 4 5 | | CTION FUNCTION WIDTH | FUNCTION VALUE | |
| 6 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | | | | |
| | | | | > |



3.5 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 $dB\mu V$ |
| | 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 reflects 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 dBμV |
|----|---|--|
| AF | = | 7.4 dB |
| CF | = | 1.6 dB |
| AG | = | 29.0 dB |
| PD | = | 0.0 dB |
| AV | = | -10.0 dB |
| FS | = | 62.0 + 7.4 + 1.6 - 29.0 + 0.0 + -10.0) = 32.0 dBµV/m |

Level in μ V/m = Common Antilogarithm [(32.0 dB μ V/m)/20] = 39.8 μ V/m



3.6 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.

3.6.1 Radiated Emission Configuration Photograph

Worst Case Restricted Band Radiated Emission at 875.050 MHz.

The worst case radiated emission configuration photographs are saved with filename: Setup Photos.pdf

3.6.2 Radiated Emission Data

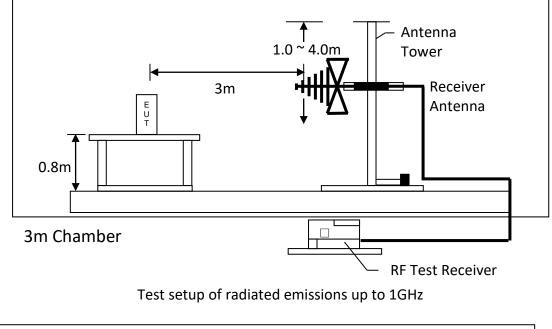
The data in tables 1-10 list the significant emission frequencies, the limit and the margin of compliance.

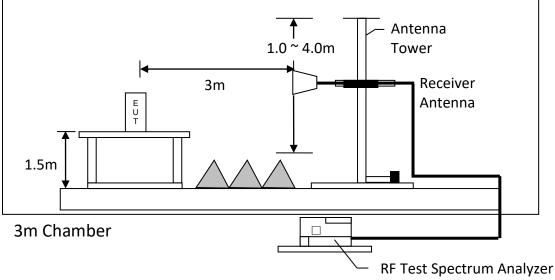
Judgement – Passed by 0.7 dB margin



3.6.3 Radiated Emission Test Setup

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





Test setup of radiated emissions above 1GHz

TEST REPORT

RADIATED EMISSION DATA

| Tabl | e 1: 802.11b_ Cha | nnel 1: | | | | | | |
|------|----------------------|-------------------|--------------------------------|--------------------|-------------------|----------------|----------|--------------------|
| No. | Frequency (MHz) | Reading (dBµV) | Correction factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1 | 4824 | 58.03 | -1.54 | 56.49 | 74.00 | -17.51 | Peak | Horizontal |
| 2 | 4824 | 41.25 | -1.54 | 39.71 | 54.00 | -14.29 | Average | Horizontal |
| 3 | 7236 | 40.17 | 2.29 | 42.46 | 74.00 | -31.54 | Peak | Horizontal |
| 4 | 7236 | 28.25 | 2.29 | 30.54 | 54.00 | -23.46 | Average | Horizontal |
| 5 | 4824 | 56.98 | -1.54 | 55.44 | 74.00 | -18.56 | Peak | Vertical |
| 6 | 4824 | 39.70 | -1.54 | 38.16 | 54.00 | -15.84 | Average | Vertical |
| 7 | 7236 | 41.00 | 2.29 | 43.29 | 74.00 | -30.71 | Peak | Vertical |
| 8 | 7236 | 28.41 | 2.29 | 30.70 | 54.00 | -23.30 | Average | Vertical |
| IEEE | 802.11b_ Cha | nnel 6: | | | | | | |
| 1 | 4874 | 50.17 | -1.47 | 48.70 | 74.00 | -25.30 | Peak | Horizontal |
| 2 | 4874 | 42.08 | -1.47 | 40.61 | 54.00 | -13.39 | Average | Horizontal |
| 3 | 7311 | 39.56 | 2.32 | 41.88 | 74.00 | -32.12 | Peak | Horizontal |
| 4 | 7311 | 28.18 | 2.32 | 30.50 | 54.00 | -23.50 | Average | Horizontal |
| 5 | 4874 | 60.78 | -1.47 | 59.31 | 74.00 | -14.69 | Peak | Vertical |
| 6 | 4874 | 42.42 | -1.47 | 40.95 | 54.00 | -13.05 | Average | Vertical |
| 7 | 7311 | 40.48 | 2.32 | 42.80 | 74.00 | -31.20 | Peak | Vertical |
| 8 | 7311 | 28.01 | 2.32 | 30.33 | 54.00 | -23.67 | Average | Vertical |
| IEEE | 802.11b_ Cha | nnel 11: | | | | | | |
| 1 | 4924 | 50.17 | -1.47 | 48.70 | 74.00 | -25.30 | Peak | Horizontal |
| 2 | 4924 | 34.33 | -1.47 | 32.86 | 54.00 | -21.14 | Average | Horizontal |
| 3 | 7386 | 39.56 | 2.32 | 41.88 | 74.00 | -32.12 | Peak | Horizontal |
| 4 | 7386 | 27.95 | 2.32 | 30.27 | 54.00 | -23.73 | Average | Horizontal |
| 5 | 4924 | 48.37 | -1.41 | 46.96 | 74.00 | -27.04 | Peak | Vertical |
| 6 | 4924 | 31.96 | -1.41 | 30.55 | 54.00 | -23.45 | Average | Vertical |
| 7 | 7386 | 38.89 | 2.36 | 41.25 | 74.00 | -32.75 | Peak | Vertical |
| 8 | 7386 | 26.36 | 2.36 | 28.72 | 54.00 | -25.28 | Average | Vertical |

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.
- 4. Negative value in the margin column shows emission below limit.
- 5. Horn antenna is used for the emission over 1000MHz.
- 6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
- 7. Correct Factor = Antenna Factor + Cable Loss Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.

TEST REPORT

RADIATED EMISSION DATA

| Tabl | e 2: 802.11g_ Cha | nnel 1: | | | | | | |
|------|----------------------|-------------------|--------------------------------|--------------------|-------------------|----------------|----------|--------------------|
| No. | Frequency (MHz) | Reading (dBμV) | Correction factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1 | 4824 | 49.10 | -1.54 | 47.56 | 74.00 | -26.44 | Peak | Horizontal |
| 2 | 4824 | 38.34 | -1.54 | 36.80 | 54.00 | -17.20 | Average | Horizontal |
| 3 | 7236 | 40.09 | 2.29 | 42.38 | 74.00 | -31.62 | Peak | Horizontal |
| 4 | 7236 | 28.13 | 2.29 | 30.42 | 54.00 | -23.58 | Average | Horizontal |
| 5 | 4824 | 48.22 | -1.54 | 46.68 | 74.00 | -27.32 | Peak | Vertical |
| 6 | 4824 | 38.49 | -1.54 | 36.95 | 54.00 | -17.05 | Average | Vertical |
| 7 | 7236 | 40.82 | 2.29 | 43.11 | 74.00 | -30.89 | Peak | Vertical |
| 8 | 7236 | 28.52 | 2.29 | 30.81 | 54.00 | -23.19 | Average | Vertical |
| IEEE | 802.11g_ Cha | nnel 6: | | | | | | |
| 1 | 4874 | 54.45 | -1.47 | 52.98 | 74.00 | -21.02 | Peak | Horizontal |
| 2 | 4874 | 42.48 | -1.47 | 41.01 | 54.00 | -12.99 | Average | Horizontal |
| 3 | 7311 | 40.12 | 2.32 | 42.44 | 74.00 | -31.56 | Peak | Horizontal |
| 4 | 7311 | 28.72 | 2.32 | 31.04 | 54.00 | -22.96 | Average | Horizontal |
| 5 | 4874 | 53.77 | -1.47 | 52.30 | 74.00 | -21.70 | Peak | Vertical |
| 6 | 4874 | 42.34 | -1.47 | 40.87 | 54.00 | -13.13 | Average | Vertical |
| 7 | 7311 | 41.18 | 2.32 | 43.50 | 74.00 | -30.50 | Peak | Vertical |
| 8 | 7311 | 28.46 | 2.32 | 30.78 | 54.00 | -23.22 | Average | Vertical |
| IEEE | 802.11g_ Cha | nnel 11: | | | | | | |
| 1 | 4924 | 50.23 | -1.41 | 48.82 | 74.00 | -25.18 | Peak | Horizontal |
| 2 | 4924 | 32.99 | -1.41 | 31.58 | 54.00 | -22.42 | Average | Horizontal |
| 3 | 7386 | 38.57 | 2.36 | 40.93 | 74.00 | -33.07 | Peak | Horizontal |
| 4 | 7386 | 26.43 | 2.36 | 28.79 | 54.00 | -25.21 | Average | Horizontal |
| 5 | 4924 | 49.88 | -1.41 | 48.47 | 74.00 | -25.53 | Peak | Vertical |
| 6 | 4924 | 32.79 | -1.41 | 31.38 | 54.00 | -22.62 | Average | Vertical |
| 7 | 7386 | 38.88 | 2.36 | 41.24 | 74.00 | -32.76 | Peak | Vertical |
| 8 | 7386 | 26.36 | 2.36 | 28.72 | 54.00 | -25.28 | Average | Vertical |

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.
- 4. Negative value in the margin column shows emission below limit.
- 5. Horn antenna is used for the emission over 1000MHz.
- 6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
- 7. Correct Factor = Antenna Factor + Cable Loss Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.

TEST REPORT

RADIATED EMISSION DATA

| | Table 3: IEEE 802.11n-HT20_ Channel 1: | | | | | | | | | | | |
|------|---|------------------------------|--------------------------------|--------------------|-------------------|----------------|----------|--------------------|--|--|--|--|
| No. | Frequency (MHz) | Chainer Reading (dBµV) | Correction factor (dB/m) | Result (dBµV/m) | Limit (dBµV/m) | Margin (dB) | Detector | Antenna Polaxis | | | | |
| 1 | 4824 | 48.00 | -1.54 | 46.46 | 74.00 | -27.54 | Peak | Horizontal | | | | |
| 2 | 4824 | 36.34 | -1.54 | 34.80 | 54.00 | -19.20 | Average | Horizontal | | | | |
| 3 | 7236 | 40.67 | 2.29 | 42.96 | 74.00 | -31.04 | Peak | Horizontal | | | | |
| 4 | 7236 | 28.08 | 2.29 | 30.37 | 54.00 | -23.63 | Average | Horizontal | | | | |
| 5 | 4824 | 48.55 | -1.54 | 47.01 | 74.00 | -26.99 | Peak | Vertical | | | | |
| 6 | 4824 | 36.16 | -1.54 | 34.62 | 54.00 | -19.38 | Average | Vertical | | | | |
| 7 | 7236 | 40.47 | 2.29 | 42.76 | 74.00 | -31.24 | Peak | Vertical | | | | |
| 8 | 7236 | 28.19 | 2.29 | 30.48 | 54.00 | -23.52 | Average | Vertical | | | | |
| IEEE | 802.11n-HT20 | _ Channel | 6: | | | | | | | | | |
| 1 | 4874 | 54.33 | -1.47 | 52.86 | 74.00 | -21.14 | Peak | Horizontal | | | | |
| 2 | 4874 | 38.84 | -1.47 | 37.37 | 54.00 | -16.63 | Average | Horizontal | | | | |
| 3 | 7311 | 40.97 | 2.32 | 43.29 | 74.00 | -30.71 | Peak | Horizontal | | | | |
| 4 | 7311 | 27.95 | 2.32 | 30.27 | 54.00 | -23.73 | Average | Horizontal | | | | |
| 5 | 4874 | 55.32 | -1.47 | 53.85 | 74.00 | -20.15 | Peak | Vertical | | | | |
| 6 | 4874 | 39.36 | -1.47 | 37.89 | 54.00 | -16.11 | Average | Vertical | | | | |
| 7 | 7311 | 41.82 | 2.32 | 44.14 | 74.00 | -29.86 | Peak | Vertical | | | | |
| 8 | 7311 | 28.29 | 2.32 | 30.61 | 54.00 | -23.39 | Average | Vertical | | | | |
| IEEE | 802.11n-HT20 | _ Channel : | 11: | | | | | | | | | |
| 1 | 4924 | 49.34 | -1.41 | 47.93 | 74.00 | -26.07 | Peak | Horizontal | | | | |
| 2 | 4924 | 32.21 | -1.41 | 30.80 | 54.00 | -23.20 | Average | Horizontal | | | | |
| 3 | 7386 | 39.62 | 2.36 | 41.98 | 74.00 | -32.02 | Peak | Horizontal | | | | |
| 4 | 7386 | 27.09 | 2.36 | 29.45 | 54.00 | -24.55 | Average | Horizontal | | | | |
| 5 | 4924 | 47.25 | -1.41 | 45.84 | 74.00 | -28.16 | Peak | Vertical | | | | |
| 6 | 4924 | 31.51 | -1.41 | 30.10 | 54.00 | -23.90 | Average | Vertical | | | | |
| 7 | 7386 | 38.16 | 2.36 | 40.52 | 74.00 | -33.48 | Peak | Vertical | | | | |
| 8 | 7386 | 26.50 | 2.36 | 28.86 | 54.00 | -25.14 | Average | Vertical | | | | |

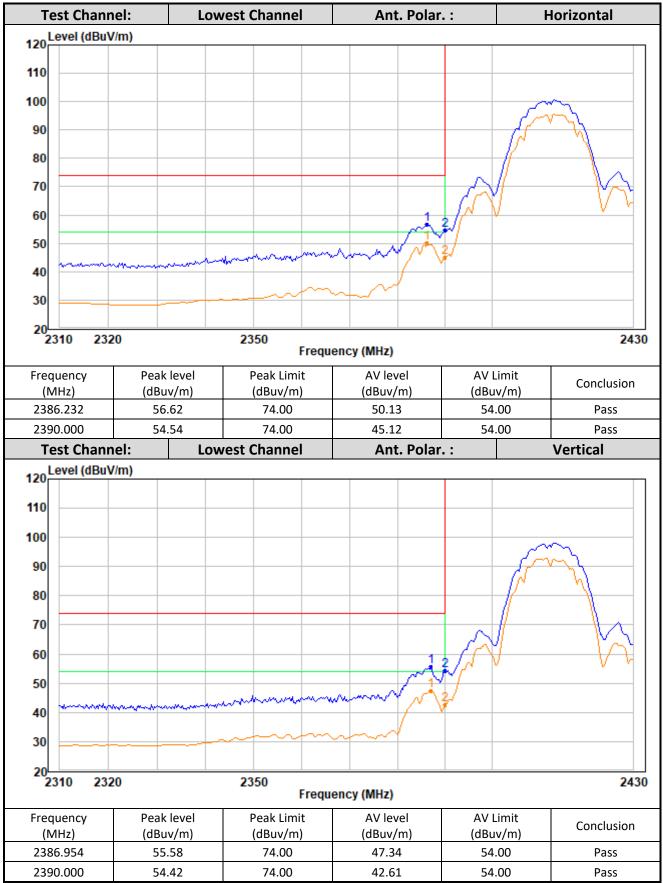
Notes: 1. Peak detector is used for the emission measurement.

- 2. Average detector is used for the average data of emission measurement.
- 3. All measurements were made at 3 meters.
- 4. Negative value in the margin column shows emission below limit.
- 5. Horn antenna is used for the emission over 1000MHz.
- 6. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
- 7. Correct Factor = Antenna Factor + Cable Loss Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.



RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

Table 4, IEEE 802.11b

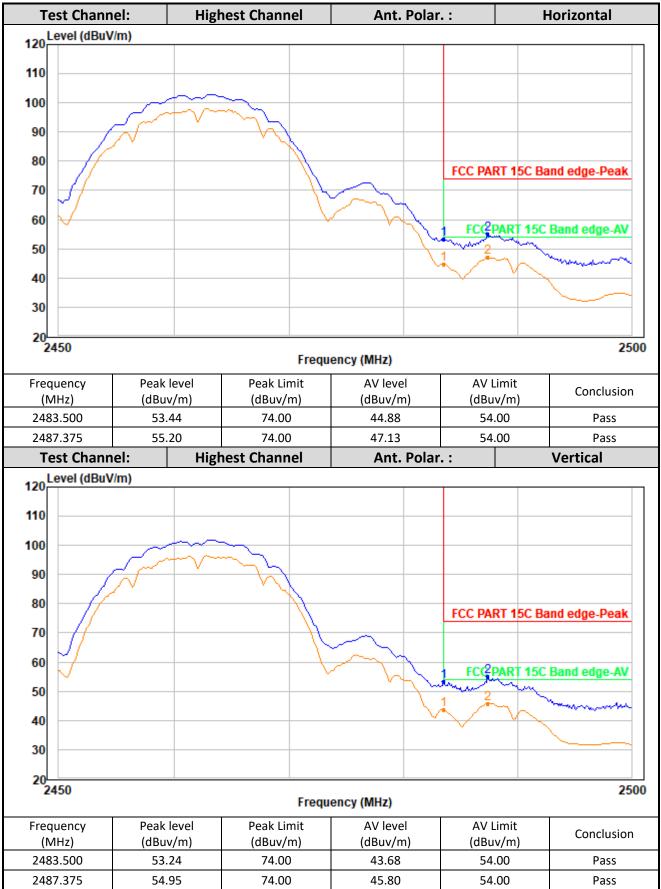


intertek

TEST REPORT

RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

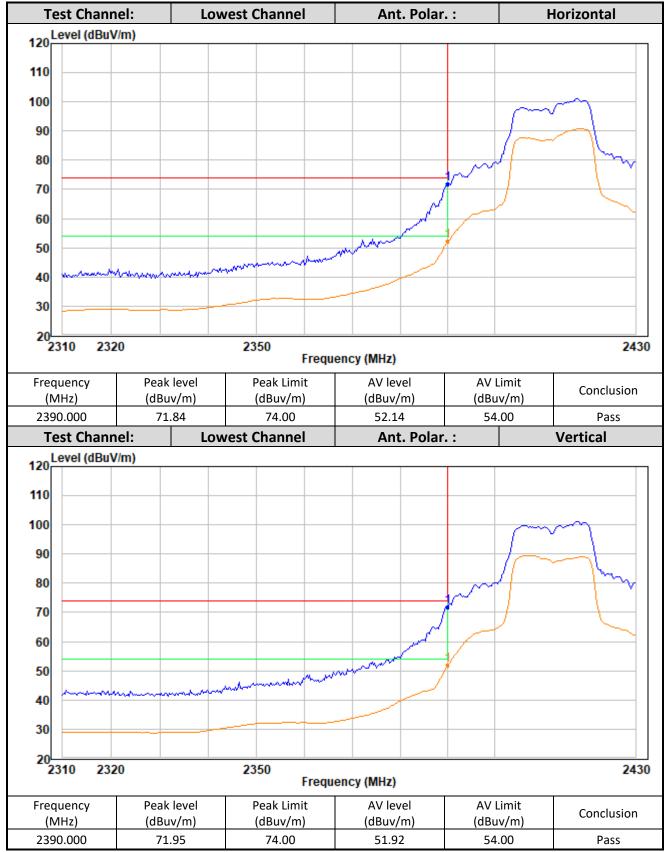
Table 5, IEEE 802.11b





RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

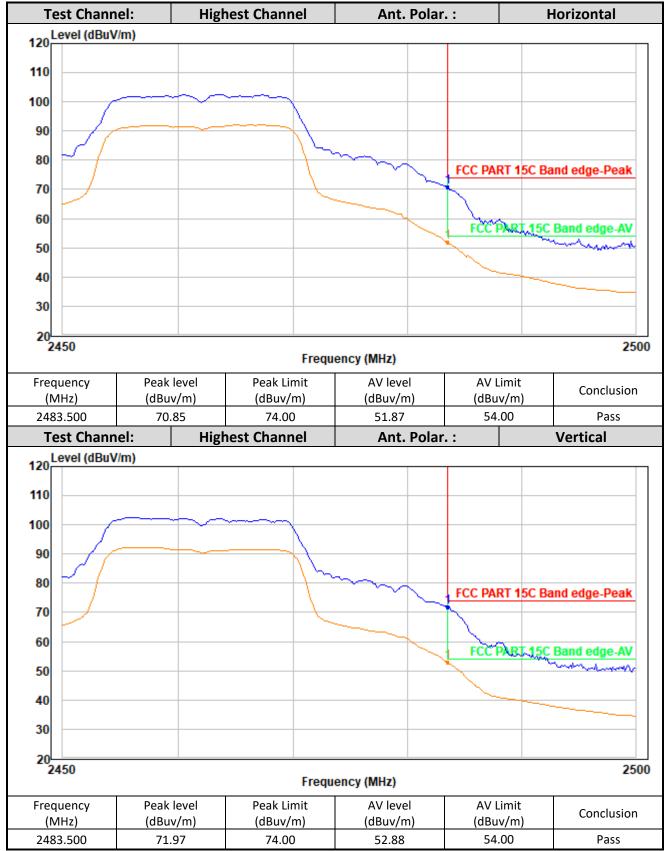
Table 6, IEEE 802.11g



TEST REPORT

RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

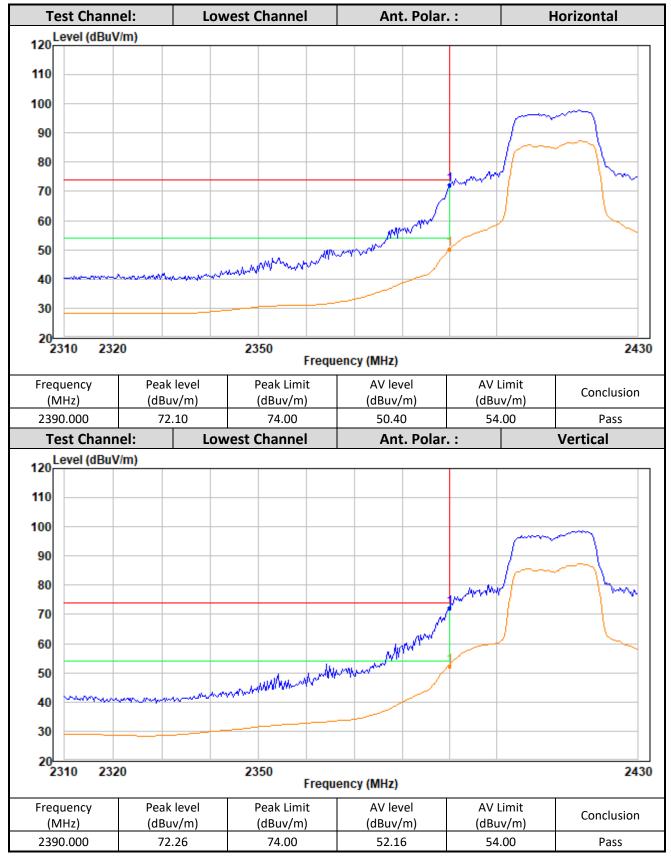
Table 7, IEEE 802.11g





RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

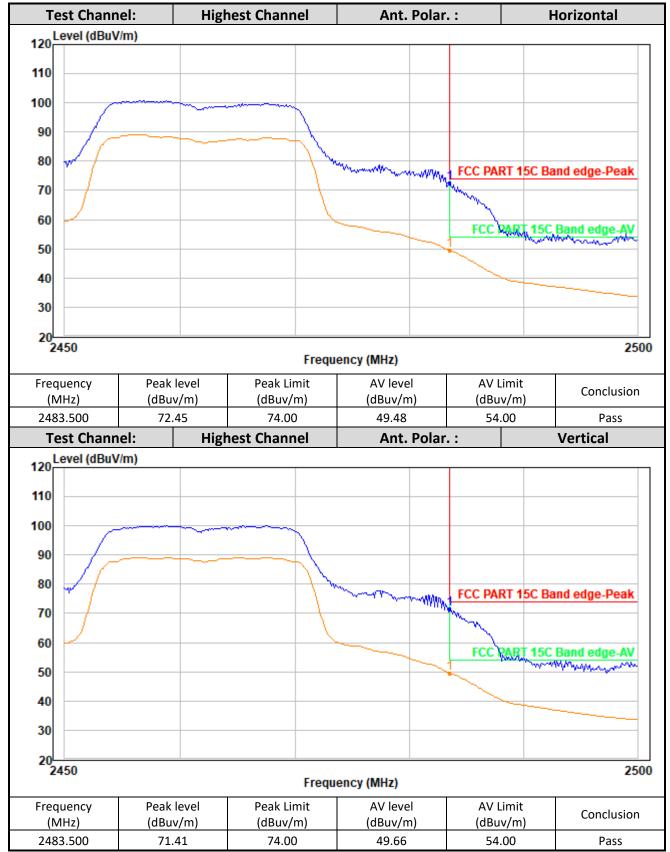
Table 8, IEEE 802.11n-HT20





RADIATED EMISSION DATA (BAND EDGE MEASUREMENTS)

Table 9, IEEE 802.11n-HT20





RADIATED EMISSION DATA

Mode: Charging+Wi-Fi Link

Table 10

| | | | Pre- | Antenna | Net | Limit | |
|--------------|-----------|---------|------|---------|----------|----------|--------|
| | Frequency | Reading | amp | Factor | at 3m | at 3m | Margin |
| Polarization | (MHz) | (dBµV) | (dB) | (dB) | (dBµV/m) | (dBµV/m) | (dB) |
| Н | 31.213 | 27.9 | 16 | 10.0 | 21.9 | 40.0 | -18.1 |
| V | 48.794 | 23.1 | 16 | 11.0 | 18.1 | 40.0 | -21.9 |
| V | 124.939 | 38.5 | 16 | 14.0 | 36.5 | 43.5 | -7.0 |
| V | 145.915 | 34.4 | 16 | 14.0 | 32.4 | 43.5 | -11.1 |
| V | 215.513 | 32.0 | 16 | 17.0 | 33.0 | 43.5 | -10.5 |
| Н | 249.463 | 34.3 | 16 | 20.0 | 38.3 | 46.0 | -7.7 |
| Н | 374.956 | 24.5 | 16 | 24.0 | 32.5 | 46.0 | -13.5 |
| Н | 500.086 | 24.0 | 16 | 26.0 | 34.0 | 46.0 | -12.0 |
| V | 625.095 | 24.3 | 16 | 29.0 | 37.3 | 46.0 | -8.7 |
| Н | 750.050 | 31.1 | 16 | 30.0 | 45.1 | 46.0 | -0.9 |
| Н | 875.050 | 29.3 | 16 | 32.0 | 45.3 | 46.0 | -0.7 |

Notes: 1. Peak and Quasi-Peak detector are used for the emission measurement.

- 2. All measurements were made at 3 meters.
- 3. Negative value in the margin column shows emission below limit.
- 4. Emissions within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-Gen Section 8.10.
- 5. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.



TEST REPORT

3.7 Transmitter Duty Cycle Calculation

Not Applicable – No average factor is required

- 3.8 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.
- 3.8.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration at 0.4200 MHz.

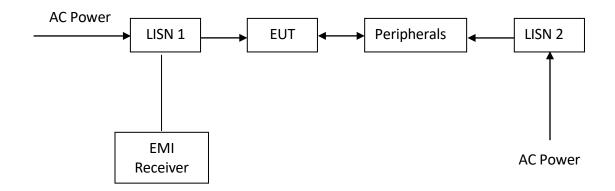
The worst-case line conducted configuration photographs are attached in the Appendix and saved with filename: Setup Photos.pdf.

3.8.2 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 8.5 dB margin

3.8.3 Conducted Emission Test Setup



The EUT along with its peripherals were placed on a $1.0m(W) \times 1.5m(L)$ 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 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

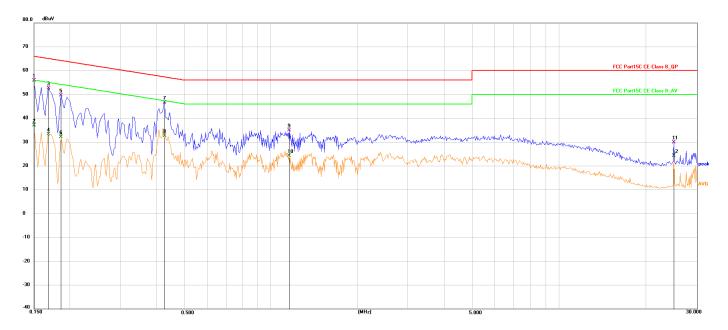
All connecting cables of EUT and peripherals were moved to find the maximum emission.



TEST REPORT

AC POWER LINE CONDUCTED EMISSION

Worst Case: Charging+Wi-Fi Link (N)

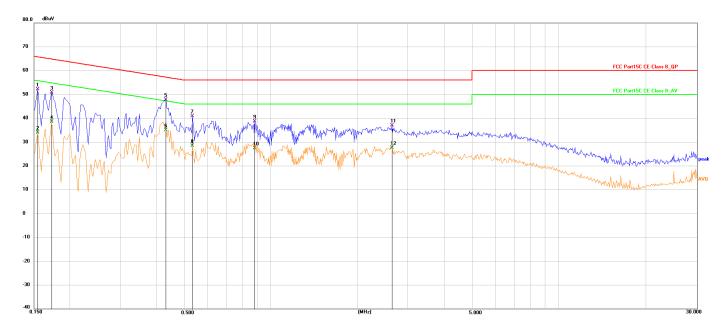


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|--------------------|-------------------|------------------------------|------------------|--------------|----------------|---------|
| 1 | 0.1500 | 45.81 | 10.02 | 55.83 | 66.00 | -10.17 | QP |
| 2 | 0.1500 | 26.91 | 10.02 | 36.93 | 56.00 | -19.07 | Average |
| 3 | 0.1680 | 42.59 | 10.02 | 52.61 | 65.06 | -12.45 | QP |
| 4 | 0.1680 | 23.30 | 10.02 | 33.32 | 55.06 | -21.74 | Average |
| 5 | 0.1860 | 39.65 | 10.00 | 49.65 | 64.21 | -14.56 | QP |
| 6 | 0.1860 | 22.16 | 10.00 | 32.16 | 54.21 | -22.05 | Average |
| 7 | 0.4244 | 36.56 | 10.01 | 46.57 | 57.36 | -10.79 | QP |
| 8 | 0.4244 | 22.53 | 10.01 | 32.54 | 47.36 | -14.82 | Average |
| 9 | 1.1580 | 24.90 | 10.04 | 34.94 | 56.00 | -21.06 | QP |
| 10 | 1.1580 | 14.22 | 10.04 | 24.26 | 46.00 | -21.74 | Average |
| 11 | 25.0034 | 18.65 | 11.29 | 29.94 | 60.00 | -30.06 | QP |
| 12 | 25.0034 | 12.87 | 11.29 | 24.16 | 50.00 | -25.84 | Average |



AC POWER LINE CONDUCTED EMISSION

Worst Case: Charging+Wi-Fi Link (L1)

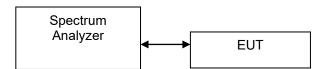


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|--------------------|-------------------|------------------------------|------------------|--------------|----------------|---------|
| 1 | 0.1545 | 42.11 | 10.03 | 52.14 | 65.75 | -13.61 | QP |
| 2 | 0.1545 | 24.00 | 10.03 | 34.03 | 55.75 | -21.72 | Average |
| 3 | 0.1725 | 40.82 | 10.03 | 50.85 | 64.84 | -13.99 | QP |
| 4 | 0.1725 | 28.43 | 10.03 | 38.46 | 54.84 | -16.38 | Average |
| 5 | 0.4290 | 37.69 | 10.02 | 47.71 | 57.27 | -9.56 | QP |
| 6 | 0.4290 | 24.92 | 10.02 | 34.94 | 47.27 | -12.33 | Average |
| 7 | 0.5325 | 30.90 | 10.02 | 40.92 | 56.00 | -15.08 | QP |
| 8 | 0.5325 | 18.39 | 10.02 | 28.41 | 46.00 | -17.59 | Average |
| 9 | 0.8790 | 28.65 | 10.03 | 38.68 | 56.00 | -17.32s | QP |
| 10 | 0.8790 | 17.30 | 10.03 | 27.33 | 46.00 | -18.67 | Average |
| 11 | 2.6295 | 26.88 | 10.10 | 36.98 | 56.00 | -19.02 | QP |
| 12 | 2.6295 | 17.42 | 10.10 | 27.52 | 46.00 | -18.48 | Average |



OCCUPIED BANDWIDTH

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



Occupied Bandwidth Results: (IEEE 802.11b)

| Frequency (MHz) | | Occupied Bandwidth (MHz) |
|-----------------|------|--------------------------|
| Low Channel: | 2412 | 15.095 |
| Middle Channel: | 2437 | 15.092 |
| High Channel: | 2462 | 15.088 |

Occupied Bandwidth Results: (IEEE 802.11g)

| Frequency (MHz) | | Occupied Bandwidth (MHz) |
|-----------------|------|--------------------------|
| Low Channel: | 2412 | 16.772 |
| Middle Channel: | 2437 | 16.815 |
| High Channel: | 2462 | 16.805 |

Occupied Bandwidth Results: (IEEE 802.11n (20MHz))

| Frequency (MHz) | | Occupied Bandwidth (MHz) |
|-----------------|------|--------------------------|
| Low Channel: | 2412 | 17.820 |
| Middle Channel: | 2437 | 17.847 |
| High Channel: | 2462 | 17.854 |

The plots of occupied bandwidth are saved as below.



TEST REPORT

PLOTS OF OCCUPIED BANDWIDTH

802.11b, Lowest Channel

| Center Freq 2.412000000 | GHz #IFGain:Low | SENSE:INT SOURCE OFF Center Freq: 2.412000 Trig: Free Run #Atten: 26 dB | ALIGNAUTO 000 GHz Avg Hold: 100/100 | 09:19:53 AM Oct 20, 202 Radio Std: None Radio Device: BTS |
|---|--------------------|--|---|--|
| Ref Offset 11.1 di 10 dB/div Ref 31.10 dBn | | | | Mkr2 2.419518 GH: -3.5335 dBn |
| _og 21.1 | | | | |
| 11.1 | | | ····· 2 | |
| 1.10 | - line | | 2 min and 2 | |
| 18.90 | <u></u> | | × | M. |
| 28.9 | | | | |
| 38.9 | | | | - John Marine Ma |
| 48.9 | | | | |
| 58.9 | | | | |
| Center 2.412 GHz #Res BW 300 kHz | | #VBW 910 k | Hz | Span 30 MH Sweep 1.333 m |
| Occupied Bandwidt | h | Total Power | 21.5 dBm | |
| 15 | 5.095 MHz | | | |
| Transmit Freq Error | -27.207 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 18.75 MHz | x dB | -26.00 dB | |
| | | | | |
| | | | | |
| 15G | | | STATUS | |

802.11b, Middle Channel

| glient Spectrum Analyzer - Occupied B R T RF 50 Q AC ienter Freq 2.437000000 | | SENSE:INT SOURCE OFF Center Freq: 2.4370000 . Trig: Free Run #Atten: 26 dB | ALIGNAUTO 100 GHz Avg Hold: 100/100 | 09:24:43 AM Oct 20, 2023 Radio Std: None Radio Device: BTS |
|--|-------------|--|---|--|
| Ref Offset 11.1 di 0 dB/div Ref 31.10 dBn | | | 1 | Wkr2 2.444515 GHz -4.3172 dBm |
| og | | | | |
| 1.10 | 1 | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | |
| | | | | M. |
| | | | | - warm |
| 8.9 | | | | |
| enter 2.437 GHz Res BW 300 kHz | | #VBW 910 k | Hz | Span 30 MH Sweep 1.333 m |
| Occupied Bandwidt | | Total Power | 20.8 dBm | |
| 15 | 5.092 MHz | | | |
| Transmit Freq Error | -28.743 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 18.76 MHz | x dB | -26.00 dB | |
| | | | | |

802.11b, Highest Channel

| 1 | | ~~~~~ | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | ~~ | Mkr | -4.7 | 9512 GH 7793 dBr |
|-------------|-------------|--|--|---------------------------------------|---|---|--|
| 1 | ······\/ | ~~~~ | ·····_ | ~~ | 2 | 1 | |
| 2 | | ~~~~ | | m | 2 My | <u>\</u> | |
| | | | | | M | 1 | |
| | | | | | | 4 | ~~~~ |
| | | | | | | | |
| | | | | | | ~~ | |
| | | | | | | | |
| | #VBV | V 910 ki | łz | | | | pan 30 MH p 1.333 m |
| | Total Po | wer | 20.3 di | Зm | | | |
| 88 MHz | | | | | | | |
| -28.599 kHz | OBW Po | wer | 99.00 |) % | | | |
| 18.74 MHz | x dB | | -26.00 | dB | | | |
| | | | | | | | |
| | | | | | | | |
| | -28.599 kHz | Total Po 88 MHz -28.599 kHz OBW Po | Total Power 88 MHz -28.599 kHz OBW Power | 88 MHz -28.599 kHz OBW Power 99.00 | Total Power 20.3 dBm 88 MHz -28.599 kHz OBW Power 99.00 % 18.74 MHz x dB -26.00 dB | Total Power 20.3 dBm 88 MHZ -28.599 kHz OBW Power 99.00 % 18.74 MHz x dB -26.00 dB | #VBW 910 kHz Sweet Total Power 20.3 dBm 88 MHz |



TEST REPORT

PLOTS OF OCCUPIED BANDWIDTH

802.11g, Lowest Channel

| 0 dBddw Ref 31.10 dBm 10 dBddw Ref 31.10 dBm 211 111 111 111 111 111 111 11 | o Device: BTS |
|--|-----------------------------|
| 221 221 221 221 221 221 221 221 | 2.420364 GH -0.74323 dB |
| Center 2.412 CH2 Res BW 910 kHz Cocupied Bandwidth 16.772 MHz | |
| A control of the second | |
| Center 2.412 GHz RRes BW 300 KHz #VBW 910 KHz Occupied Bandwidth Total Power 22.7 dBm 16.772 MHz | |
| 22 chief 2.412 CH2 Res BW 300 kH2 #VBW 910 kH2 Coccupied Bandwidth Total Power 22.7 dBm 16.772 MH2 | Putter autor |
| Center 2.412 GHz Res BW 300 kHz Coccupied Bandwidth 16.772 MHz | |
| Res BW 300 kHz #VBW 910 kHz Res BW 300 kHz 2.7 dBm Occupied Bandwidth Total Power 22.7 dBm 16.772 MHz | |
| Occupied Bandwidth Total Power 22.7 dBm 16.772 MHz | |
| 16.772 MHz | Span 30 MI Sweep 1.333 n |
| | |
| Transmit Freq Error -19.078 kHz OBW Power 99.00 % | |
| | |
| x dB Bandwidth 25.07 MHz x dB -26.00 dB | |
| | |

802.11g, Middle Channel

| gilent Spectrum Analyzer - Occupied E | w | | | |
|---|--------------|-----------------------------------|-------------------|---|
| R T RF 50 Q AC Center Freq 2.437000000 |) GHz | Center Freq: 2.4370000 | ALIGN AUTO | 09:36:38 AM Oct 20, 2023 Radio Std: None |
| | #IFGain:Low | . Trig: Free Run #Atten: 26 dB | Avg Hold: 100/100 | Radio Device: BTS |
| Ref Offset 11.1 d 0 dB/div Ref 31.10 dBr | | | | Mkr2 2.445388 GHz -1.8850 dBm |
| 21.1 | | | | |
| 11.1 | ¹ | and the second second | | ¢ ² |
| 3.90 | | | | |
| 16.9 When we have a start | | | | and the second second second |
| 18.9 | | | | |
| 8.9 | | | | |
| 8.9 | | | | |
| enter 2.437 GHz Res BW 300 kHz | | #VBW 910 k | Hz | Span 30 MH Sweep 1.333 m |
| Occupied Bandwidt | :h | Total Power | 22.2 dBm | |
| 10 | 6.815 MHz | | | |
| Transmit Freq Error | -18.344 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 24.86 MHz | x dB | -26.00 dB | |
| | | | | |
| | | | | |
| | | | STATUS | |

802.11g, Highest Channel

| R T RF SD Q AS enter Freq 2.462000000 | GHz //IFGain:Low | SENSE:INT SOURCE OFF Center Freq: 2.4620000 Trig: Free Run #Atten: 26 dB | ALIGNAUTO 000 GHz Avg Hold: 100/100 | 09:38:53 AM Oct 20, 203 Radio Std: None Radio Device: BTS |
|--|---------------------------|--|---|--|
| Ref Offset 11.1 df 0 dB/div Ref 31.10 dBn | | | | Mkr2 2.47037 GH -2.3711 dBr |
| 1.1 | Junior | and the state of t | manterioraliser | 2 |
| 90 5.9 7.10 6.9 | | | | And the second s |
| 89 | | | | |
| enter 2.462 GHz Res BW 300 kHz | | #VBW 910 k | Hz | Span 30 MH Sweep 1.333 m |
| Occupied Bandwidt | ^h 6.805 MHz | Total Power | 21.9 dBm | |
| Transmit Freq Error | -29.366 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 25.40 MHz | x dB | -26.00 dB | |
| 3 | | | STATUS | |



TEST REPORT

802.11n (20MHz), Lowest Channel

| enter Freq 2.412000000 | | SENSE:INT SOURCE OFF Center Freq: 2.412000 Trig: Free Run #Atten: 26 dB | 0000 GHz Avg Hold: 100/100 | Radio Std: None Radio Device: BTS |
|--|--|--|---|--|
| | #IFGain:Low | #Atten: 26 dB | | |
| Ref Offset 11.1 dB 0 dB/div Ref 31.10 dBm | | | | Mkr2 2.420904 GH -1.3076 dBr |
| og 21.1 | | | | |
| 11.1 | | | | 2 |
| L10 | and the second | and the second | and the half and a second s | ~ * * |
| .90 | | | | |
| 18.9 Withmany and a start of the | | | | The state of the street of the |
| 18.9 | | | | 1.1 |
| 18.9 | | | | |
| 8.9 | | | | |
| | | | | |
| Center 2.412 GHz Res BW 300 kHz | | #VBW 9101 | kHz | Span 30 MH Sweep 1.333 m |
| | | | 22.6 dBm | |
| Occupied Bandwidth | | Total Power | 22.6 dBm | |
| 1/ | .820 MHz | | | |
| Transmit Freq Error | -5.221 kHz | OBW Power | 99.00 % | |
| | 22.74 MHz | x dB | -26.00 dB | |
| x dB Bandwidth | | | | |
| x dB Bandwidth | | | | |
| x dB Bandwidth | | | | |

802.11n (20MHz), Middle Channel

| Ilent Spectrum Analyzer - Occupied BV R T RF 50.0 AC | y | SENSE: INT SOURCE OFF | ALIGNAUTO | 09:48:52 AM Oct 20, 202 |
|---|---|--|----------------------------------|--|
| enter Freq 2.437000000 | GHz #IEGain:l ow | Center Freq: 2.43 Trig: Free Run #Atten: 26 dB | 7000000 GHz Avg Hold: 100/100 | Radio Std: None Radio Device: BTS |
| Ref Offset 11.1 dE | | | | Mkr2 2.445916 GH -1.1939 dBi |
| Pg | ر. باله مورو ^م العام (عارض معامر) | | | 2 |
| 10 90 83 84 Mandharyony/MyAron Million | | | | and the second s |
| 39 11 11 11 11 11 11 11 11 11 11 11 11 11 | | | | |
| enter 2.437 GHz | | | | Span 30 MH |
| Res BW 300 kHz | | #VBW 91 | l0 kHz | Sweep 1.333 n |
| Occupied Bandwidth 17 | .847 MHz | Total Power | 22.1 dBm | |
| Transmit Freq Error | -4.508 kHz | OBW Power | 99.00 % | |
| x dB Bandwidth | 23.09 MHz | x dB | -26.00 dB | |
| 1 | | | STATUS | |

802.11n (20MHz), Highest Channel

| Aglient Spectrum Analyzer - Occupied BW Carley R T RE 50.0 AC Center Freq 2.462000000 | | SENSE:INT SOURCE OFF Center Freq: 2.462000 . Trig: Free Run #Atten: 26 dB | ALIGNAUTO 000 GHz Avg Held: 100/100 | 09:51:23 AM Oct 20, 2023 Radio Std: None Radio Device: BTS |
|---|--|--|---|--|
| Ref Offset 11.1 dB 10 dB/div Ref 31.10 dBm Log | | | | Mkr2 2.470925 GHz -2.1208 dBm |
| 21.7 | frankter andere and | the second second | | 2 |
| -8.90 -18.9 -28.9 | | | | Manual provided by the last and by the last an |
| -38.9 -48.9 -68.9 | | | | |
| Center 2.462 GHz #Res BW 300 kHz | | #VBW 910 k | Hz | Span 30 MHz Sweep 1.333 ms |
| Occupied Bandwidth 17 | 854 MHz | Total Power | 21.8 dBm | |
| Transmit Freq Error | 848 Hz | OBW Power | 99.00 % | |
| x dB Bandwidth | 23.18 MHz | x dB | -26.00 dB | |
| MSG | | | STATUS | |



EXHIBIT 4 EQUIPMENT LIST

1) Radiated Emissions Test

| Radiated Emission Test - 3M Chamber | | | | | | | |
|-------------------------------------|---|--------------------|------------|-----------------------------------|--------------|---------------|--|
| Used | Equipment | Manufacturer | Model No. | Serial Number | Cal. date | Cal. Due date | |
| | 3m Chamber & Accessory Equipment | ETS-Lindgren | 3m | Euroshiedpn- CT001270- 1317 | 11-Nov-2023 | 10-Nov-2026 | |
| \boxtimes | Broadband Antenna | ETS-Lindgren | 3142E | 00201566 | 30-Oct-2023 | 29-Oct-2024 | |
| \boxtimes | 6dB Attenuator | Talent | RA6A5-N-18 | 18103001 | 30-Oct-2023 | 29-Oct-2024 | |
| \boxtimes | Pre-amplifier | HP | 8447F | 2805A02960 | 31-Oct-2023 | 30-Oct-2024 | |
| | Receiver | ROHDE & SCHWARZ | ESIB26 | 100114 | 27-Oct-2023 | 26-Oct-2024 | |
| | Double-Ridged Waveguide Horn Antenna (Pre-amplifier) 高频 | ETS- LINDGREN | 3117-PA | 00201541 | 16- Apr-2023 | 15- Apr-2025 | |
| \boxtimes | Pre-amplifier | ETS-Lindgren | 00118385 | 00201874 | 31-Oct-2023 | 30-Oct-2024 | |
| | Multi device Controller | ETS-Lindgren | 7006-001 | 00160105 | N/A | N/A | |
| \boxtimes | Test Software | Audix | e3 | Software Version: 9.160323 | | 0323 | |

| Equipment | Signal and Spectrum Analyzer (10Hz to 40GHz) | Biconical Antenna (30MHz to 300MHz) | EMI Test Receiver 7GHz |
|----------------------|---|--|------------------------|
| Registration No. | EW-3016 | EW-3242 | EW-3603 |
| Manufacturer | ROHDESCHWARZ | EMCO | ROHDESCHWARZ |
| Model No. | FSV40 | 3110C | ESR7 |
| Calibration Date | December 13, 2022 | May 26, 2021 | December 06, 2022 |
| Calibration Due Date | March 13, 2024 | February 26, 2024 | March 06, 2024 |

| Equipment | Log Periodic Antenna | 14m Double Shield RF Cable (20MHz to 6GHz) |
|----------------------|----------------------|--|
| Registration No. | EW-3243 | EW-2074 |
| Manufacturer | EMCO | RADIALL |
| Model No. | 3148B | N(m)-RG142-BNC(m) |
| | | L=14M |
| Calibration Date | June 03, 2021 | December 10, 2021 |
| Calibration Due Date | March 30, 2024 | March 10, 2024 |



EXHIBIT 4 EQUIPMENT LIST (CONT'D)

2) Conducted Emissions Test

| Conducted Emission Test | | | | | | | |
|-------------------------|----------------|--------------|-----------|-----------------------------------|-------------|---------------|--|
| Used | Equipment | Manufacturer | Model No. | Serial Number | Cal. date | Cal. Due date | |
| \boxtimes | LISN | R&S | ESH2-Z5 | 860014/024 | 27-Oct-2023 | 26-Oct-2024 | |
| \boxtimes | LISN | ETS-Lindgren | 3816/2SH | 00201088 | 27-Oct-2023 | 26-Oct-2024 | |
| \boxtimes | ISN | Schwarzbeck | NTFM 8158 | NTFM 8158#113 | 27-Oct-2023 | 26-Oct-2024 | |
| \boxtimes | Receiver | R&S | ESR7 | 101181 | 27-Oct-2023 | 26-Oct-2024 | |
| \boxtimes | Pulse Limiter | R&S | ESH3-Z2 | 0357.8810.54 | 27-Oct-2023 | 26-Oct-2024 | |
| | Shielding room | ETS-Lindgren | 843 | Euroshiedpn- CT001270- 1246 | 5-Nov-2021 | 4-Nov-2024 | |
| \boxtimes | Test Software | EZ-EMC | EZ-CON | Software Version: EMC-CON 3A1.1 | | | |

3) Control Software for Radiated Emission

| Software Information | |
|----------------------|--------------|
| Software Name | EMC32 |
| Manufacturer | ROHDESCHWARZ |
| Software version | 10.50.40 |

4) RF test

| RF test | | | | | | | |
|-------------|---|--------------|-----------|----------------|------------|---------------|--|
| Used | Equipment | Manufacturer | Model No. | Serial Number | Cal. date | Cal. Due date | |
| \boxtimes | EXA Spectrum Analyzer | KEYSIGHT | N9010A | MY51440197 | 2023-04-14 | 2024-04-13 | |
| \boxtimes | USB Wideband Power Sensor | KEYSIGHT | U2021XA | MY55430035 | 2023-10-27 | 2024-10-26 | |
| \boxtimes | EXG-B RF Analog Signal Generator | KEYSIGHT | N5171B | MY53051777 | 2023-10-27 | 2024-10-26 | |
| \boxtimes | MXG X-Series RF Vector Signal Generator | KEYSIGHT | N5182B | MY51350267 | 2023-10-27 | 2024-10-26 | |
| \boxtimes | Temp & Humidity chamber | Votisch | VT4002 | 58566133290020 | 2023-04-14 | 2024-04-13 | |

END OF TEST REPORT