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Applicant: Huizhou Qing Teng Electron Technology Co., Ltd.

He-Bei Village, Lilin Town, Zhongkai Hi-tech Development Zone,

Huizhou City, Guangdong, China

Supplier / Manufacturer: Huizhou Qing Teng Electron Technology Co., Ltd.

He-Bei Village, Lilin Town, Zhongkai Hi-tech Development Zone,

Huizhou City, Guangdong, China

Description of Sample(s) : Submitted sample(s) said to be

Product: Doorbell IP Video Camera

Brand Name: MIKONA Model No.: WVD-01

FCC ID: 2AAWNWVD01BELL

Date Samples Received: 2018-06-25

Date Tested : 2018-06-30 to 2018-11-10

Investigation Requested : Perform ElectroMagnetic Interference measurement in accordance

with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and

ANSI C63.10:2013 for FCC Certification.

Conclusions : The submitted product <u>COMPLIED</u> with the requirements of Federal

Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described

above and on Section 2.2 in this Test Report.

Remarks : WIFI (802.11b, 802.11g, 802.11n20, 802.11n40)





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1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.

EMC Laboratory

Head Office: 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Telephone: 852 2666 1888 Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product: Doorbell IP Video Camera

Manufacturer: Huizhou Qing Teng Electron Technology Co., Ltd.

He-Bei Village, Lilin Town, Zhongkai Hi-tech Development

Zone, Huizhou City, Guangdong, China

Brand Name: MIKONA Model Number: WVD-01

Rating: 5Vd.c. by USB port/ 3.7Vd.c.(18650 battery*2)

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Doorbell IP Video Camera. The transmission signal is digital modulated with channel frequency range 2412-2462MHz.

1.3 Date of Order

2018-06-25

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2018-06-30 to 2018-07-27

1.6 Country of Origin

China



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<u>2.0</u> Technical Details

2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013 for FCC Certification.

2.2 Test Standards and Results Summary Tables

| EMISSION Results Summary | | | | | | | | |
|--|---------------------------|------------------|----------|-------------|-------------|-----|--|--|
| Test Condition | Test Requirement | Test Method | Class / | Т | Test Result | | | |
| | | | Severity | Pass | Failed | N/A | | |
| Output Power of Fundamental Emissions | FCC 47CFR 15.247(b)(3) | ANSI C63.10:2013 | N/A | | | | | |
| Radiated Emissions | FCC 47CFR 15.209 | ANSI C63.10:2013 | N/A | \boxtimes | | | | |
| Conducted Emissions | FCC 47CFR 15.207 | ANSI C63.10:2013 | N/A | \boxtimes | | | | |
| Power Spectral Density | FCC 47CFR 15.247(e) | N/A | N/A | \boxtimes | | | | |
| 6dB Bandwidth | FCC 47CFR 15.247(a)(2) | N/A | N/A | \boxtimes | | | | |
| Band Edge Emissions | FCC 47CFR 15.247(d) | N/A | N/A | \boxtimes | | | | |
| Antenna requirement | FCC 47CFR 15.203 | N/A | N/A | \boxtimes | | | | |

Note: N/A - Not Applicable



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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Output Power

Test Requirement: FCC 47CFR 15.247(b)(3)

Test Method: N/A

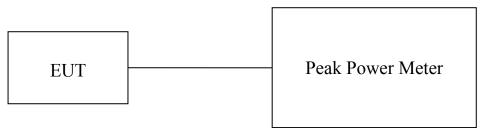
Test Date: 2018-07-25 Mode of Operation: Wifi mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the peak power meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

Test Setup:



Note: a temporary antenna connector was soldered to the RF output.



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Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

| Results of WiFi mode 802.11 b, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power | | | | | |
|---|------|----------|--|--|--|
| Channel Frequency(MHz) Output Power(Watt) | | | | | |
| Low | 2412 | 0.093778 | | | |
| Middle | 2437 | 0.100995 | | | |
| High | 2462 | 0.118987 | | | |

| Results of WiFi mode 802.11 g, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power | | | | | | |
|---|------|----------|--|--|--|--|
| Channel Frequency(MHz) Output Power(Watt) | | | | | | |
| Low | 2412 | 0.090887 | | | | |
| Middle 2437 0.099449 | | | | | | |
| High | 2462 | 0.109977 | | | | |

| Results of WiFi mode 802.11 n20, (2412MHz to 2462MHz) : Pass (TX Unit) Maximum conducted output power | | | | | |
|--|------|----------|--|--|--|
| Channel Frequency(MHz) Output Power(Watt) | | | | | |
| Low | 2412 | 0.070323 | | | |
| Middle | 2437 | 0.077304 | | | |
| High | 2462 | 0.088695 | | | |

| Results of WiFi mode 802.11 n40, (2422MHz to 2452MHz) : Pass (TX Unit) Maximum conducted output power | | | | | | |
|--|------|----------|--|--|--|--|
| Channel Frequency(MHz) Output Power(Watt) | | | | | | |
| Low | 2422 | 0.063009 | | | | |
| Middle | 2437 | 0.062907 | | | | |
| High | 2452 | 0.066896 | | | | |

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB 1GHz to 26GHz 1.7dB



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3.1.2 Radiated Emissions

Test Requirement: FCC 47CFR 15.209
Test Method: ANSI C63.10:2013
Test Date: 2018-07-26, 2018-11-10
Mode of Operation: Tx mode / Wifi mode

Ambient Temperature: 24°C Relative Humidity: 52% Atmospheric Pressure: 101 kPa

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.



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Spectrum Analyzer Setting:

9KHz – 30MHz (Pk & Av) RBW: 10kHz

VBW: 30kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

RBW: 120kHz 30MHz - 1GHz (QP)

> VBW: 120kHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

RBW: 1MHz Above 1GHz (Pk)

> VBW: 1MHz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

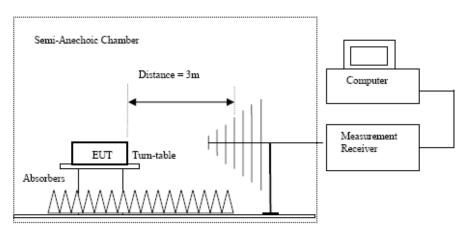
RBW: Above 1GHz (Av) 1MHz

VBW: 10Hz Sweep: Auto

Span: Fully capture the emissions being measured

Trace: Max. hold

Test Setup:



Ground Plane

- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
 Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz hom antennas are used, 9kHz to 30MHz loop antennas are used.

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Limits for Radiated Emissions FCC 47 CFR 15.247]:

| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz] | [µV/m] |
| 0.009-0.490 | 2400/F (kHz) |
| 0.490-1.705 | 24000/F (kHz) |
| 1.705-30 | 30 |
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above960 | 500 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx mode (2412.0 MHz) (802.11b) (9kHz - 30MHz): Pass

| Tesure of The Inc | Result of 1A mode (2-12:0 Mills) (002:115) (7Mils 50Mils). Tuss | | | | | | |
|--------------------------------------|---|------------|----------|----------|-------|----------|--|
| Field Strength of Spurious Emissions | | | | | | | |
| Peak Value | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | |
| | Level | Factor | Strength | Strength | | Polarity | |
| MHz | MHz dBuV dB/m dBuV/m uV/m uV/m | | | | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Wifi mode (2412.0 MHz) (802.11b) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|
| | Peak Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | $dB\mu V$ | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | |
| 4824.0 | 14.7 | 41.5 | 56.2 | 74.0 | 17.8 | Vertical | | |
| 4824.0 | 13.3 | 42.4 | 55.7 | 74.0 | 18.3 | Horizontal | | |
| 7236.0 | 10.3 | 45.1 | 55.4 | 74.0 | 18.6 | Vertical | | |
| 7236.0 | 8.8 | 46.2 | 55.0 | 74.0 | 19.0 | Horizontal | | |
| 9648.0 | 7.5 | 48 | 55.5 | 74.0 | 18.5 | Vertical | | |
| 9648.0 | 5.4 | 48.8 | 54.2 | 74.0 | 19.8 | Horizontal | | |
| 12060.0 | 3.7 | 51.5 | 55.2 | 74.0 | 18.8 | Vertical | | |
| 12060.0 | 2.6 | 52.4 | 55.0 | 74.0 | 19.0 | Horizontal | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | |
| 4824.0 | 2.5 | 41.5 | 44.0 | 54.0 | 10.0 | Vertical | | |
| 4824.0 | -0.1 | 42.4 | 42.3 | 54.0 | 11.7 | Horizontal | | |
| 7236.0 | -3.0 | 45.1 | 42.1 | 54.0 | 11.9 | Vertical | | |
| 7236.0 | -4.9 | 46.2 | 41.3 | 54.0 | 12.7 | Horizontal | | |
| 9648.0 | -6.4 | 48 | 41.6 | 54.0 | 12.4 | Vertical | | |
| 9648.0 | -7.6 | 48.8 | 41.2 | 54.0 | 12.8 | Horizontal | | |
| 12060.0 | -10.0 | 51.5 | 41.5 | 54.0 | 12.5 | Vertical | | |
| 12060.0 | -9.8 | 52.4 | 42.6 | 54.0 | 11.4 | Horizontal | | |

Result of Wifi mode (2437.0 MHz) (802.11b) (9kHz - 30MHz): Pass

| Field Strength of Spurious Emissions | | | | | | |
|---|------------|------------|----------|----------|-------|----------|
| | Peak Value | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field |
| | Level | Factor | Strength | Strength | | Polarity |
| MHz | dBuV | dB/m | dBuV/m | uV/m | uV/m | |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Wifi mode (2437.0 MHz) (802.11b) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | |
|------------|--------------------------------------|------------|----------|--------|--------|------------|--|
| Peak Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | |
| | Level@3m | Factor | Strength | @3m | | Polarity | |
| MHz | dΒμV | dB/m | dBμV/m | dBμV/m | dB | | |
| 4874.0 | 15.0 | 41.6 | 56.6 | 74.0 | 17.4 | Vertical | |
| 4874.0 | 13.9 | 42.5 | 56.4 | 74.0 | 17.6 | Horizontal | |
| 7311.0 | 10.3 | 45.2 | 55.5 | 74.0 | 18.5 | Vertical | |
| 7311.0 | 9.0 | 46.3 | 55.3 | 74.0 | 18.7 | Horizontal | |
| 9748.0 | 7.3 | 48.1 | 55.4 | 74.0 | 18.6 | Vertical | |
| 9748.0 | 7.2 | 48.9 | 56.1 | 74.0 | 17.9 | Horizontal | |
| 12185.0 | 3.4 | 51.6 | 55.0 | 74.0 | 19.0 | Vertical | |
| 12185.0 | 2.6 | 52.5 | 55.1 | 74.0 | 18.9 | Horizontal | |



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| Field Strength of Spurious Emissions Average Value | | | | | | | |
|---|-----------|------------|----------|--------|--------|------------|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | |
| | Level @3m | Factor | Strength | @3m | | Polarity | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | |
| 4874.0 | 0.4 | 41.6 | 42.0 | 54.0 | 12.0 | Vertical | |
| 4874.0 | 0.2 | 42.5 | 42.7 | 54.0 | 11.3 | Horizontal | |
| 7311.0 | -3.1 | 45.2 | 42.1 | 54.0 | 11.9 | Vertical | |
| 7311.0 | -3.8 | 46.3 | 42.5 | 54.0 | 11.5 | Horizontal | |
| 9748.0 | -6.5 | 48.1 | 41.6 | 54.0 | 12.4 | Vertical | |
| 9748.0 | -6.4 | 48.9 | 42.5 | 54.0 | 11.5 | Horizontal | |
| 12185.0 | -9.9 | 51.6 | 41.7 | 54.0 | 12.3 | Vertical | |
| 12185.0 | -10.2 | 52.5 | 42.3 | 54.0 | 11.7 | Horizontal | |

Result of Wifi mode (2462.0 MHz) (802.11b) (9kHz - 30MHz): Pass

| Field Strength of Spurious Emissions | | | | | | | | |
|---|----------|------------|----------|----------|-------|----------|--|--|
| Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dBuV | dB/m | dBuV/m | uV/m | uV/m | | | |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | | | |

Result of Wifi mode (2462.0 MHz) (802.11b) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|------------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| Peak Value | | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | $dB\mu V$ | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4924.0 | 14.8 | 41.4 | 56.2 | 74.0 | 17.8 | Vertical | | | |
| 4924.0 | 12.4 | 42.7 | 55.1 | 74.0 | 18.9 | Horizontal | | | |
| 7386.0 | 8.4 | 45.6 | 54.0 | 74.0 | 20.0 | Vertical | | | |
| 7386.0 | 8.1 | 46.5 | 54.6 | 74.0 | 19.4 | Horizontal | | | |
| 9848.0 | 6.9 | 48.6 | 55.5 | 74.0 | 18.5 | Vertical | | | |
| 9848.0 | 4.9 | 49.7 | 54.6 | 74.0 | 19.4 | Horizontal | | | |
| 12310.0 | 3.3 | 51.7 | 55.0 | 74.0 | 19.0 | Vertical | | | |
| 12310.0 | 3.0 | 52.7 | 55.7 | 74.0 | 18.3 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | | |
| 4924.0 | 1.1 | 41.4 | 42.5 | 54.0 | 11.5 | Vertical | | | | |
| 4924.0 | -0.4 | 42.7 | 42.3 | 54.0 | 11.7 | Horizontal | | | | |
| 7386.0 | -4.0 | 45.6 | 41.6 | 54.0 | 12.4 | Vertical | | | | |
| 7386.0 | -5.1 | 46.5 | 41.4 | 54.0 | 12.6 | Horizontal | | | | |
| 9848.0 | -6.5 | 48.6 | 42.1 | 54.0 | 11.9 | Vertical | | | | |
| 9848.0 | -8.0 | 49.7 | 41.7 | 54.0 | 12.3 | Horizontal | | | | |
| 12310.0 | -10.3 | 51.7 | 41.4 | 54.0 | 12.6 | Vertical | | | | |
| 12310.0 | -11.4 | 52.7 | 41.3 | 54.0 | 12.7 | Horizontal | | | | |

Result of Wifi mode (2412.0 MHz) (802.11g) (9kHz - 30MHz): Pass

| Field Strength of Spurious Emissions | | | | | | | |
|--------------------------------------|---|------------|-------------|-------------|--------|----------|--|
| Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | |
| | Level | Factor | Strength | Strength | | Polarity | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dBμV/m | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Wifi mode (2412.0 MHz) (802.11g) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4824.0 | 14.5 | 41.5 | 56.0 | 74.0 | 18.0 | Vertical | | | |
| 4824.0 | 13.0 | 42.4 | 55.4 | 74.0 | 18.6 | Horizontal | | | |
| 7236.0 | 11.0 | 45.1 | 56.1 | 74.0 | 17.9 | Vertical | | | |
| 7236.0 | 8.3 | 46.2 | 54.5 | 74.0 | 19.5 | Horizontal | | | |
| 9648.0 | 8.1 | 48 | 56.1 | 74.0 | 17.9 | Vertical | | | |
| 9648.0 | 5.8 | 48.8 | 54.6 | 74.0 | 19.4 | Horizontal | | | |
| 12060.0 | 3.5 | 51.5 | 55.0 | 74.0 | 19.0 | Vertical | | | |
| 12060.0 | 2.9 | 52.4 | 55.3 | 74.0 | 18.7 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | | |
| 4824.0 | 0.6 | 41.5 | 42.1 | 54.0 | 11.9 | Vertical | | | | |
| 4824.0 | -1.2 | 42.4 | 41.2 | 54.0 | 12.8 | Horizontal | | | | |
| 7236.0 | -2.7 | 45.1 | 42.4 | 54.0 | 11.6 | Vertical | | | | |
| 7236.0 | -4.2 | 46.2 | 42.0 | 54.0 | 12.0 | Horizontal | | | | |
| 9648.0 | -6.9 | 48 | 41.1 | 54.0 | 12.9 | Vertical | | | | |
| 9648.0 | -7.5 | 48.8 | 41.3 | 54.0 | 12.7 | Horizontal | | | | |
| 12060.0 | -9.3 | 51.5 | 42.2 | 54.0 | 11.8 | Vertical | | | | |
| 12060.0 | -9.7 | 52.4 | 42.7 | 54.0 | 11.3 | Horizontal | | | | |

Result of Wifi mode (2437.0 MHz) (802.11g) (9kHz - 30MHz): Pass

| Field Strength of Spurious Emissions | | | | | | | |
|--------------------------------------|---|------------|----------|-------------|-------------|----------|--|
| Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | |
| | Level | Factor | Strength | Strength | | Polarity | |
| MHz | $dB\mu V$ | dB/m | dBμV/m | $dB\mu V/m$ | $dB\mu V/m$ | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Wifi mode (2437.0 MHz) (802.11g) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|------------|--------------------------------------|------------|----------|--------|--------|------------|--|--|--|
| Peak Value | | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4874.0 | 14.3 | 41.6 | 55.9 | 74.0 | 18.1 | Vertical | | | |
| 4874.0 | 13.1 | 42.5 | 55.6 | 74.0 | 18.4 | Horizontal | | | |
| 7311.0 | 10.0 | 45.2 | 55.2 | 74.0 | 18.8 | Vertical | | | |
| 7311.0 | 9.0 | 46.3 | 55.3 | 74.0 | 18.7 | Horizontal | | | |
| 9748.0 | 7.4 | 48.1 | 55.5 | 74.0 | 18.5 | Vertical | | | |
| 9748.0 | 6.1 | 48.9 | 55.0 | 74.0 | 19.0 | Horizontal | | | |
| 12185.0 | 3.7 | 51.6 | 55.3 | 74.0 | 18.7 | Vertical | | | |
| 12185.0 | 3.9 | 52.5 | 56.4 | 74.0 | 17.6 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | | |
| | Level @3m | Factor | Strength | @3m | _ | Polarity | | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | | |
| 4874.0 | -0.6 | 41.6 | 41.0 | 54.0 | 13.0 | Vertical | | | | |
| 4874.0 | -1.1 | 42.5 | 41.4 | 54.0 | 12.6 | Horizontal | | | | |
| 7311.0 | -3.1 | 45.2 | 42.1 | 54.0 | 11.9 | Vertical | | | | |
| 7311.0 | -4.8 | 46.3 | 41.5 | 54.0 | 12.5 | Horizontal | | | | |
| 9748.0 | -6.3 | 48.1 | 41.8 | 54.0 | 12.2 | Vertical | | | | |
| 9748.0 | -6.7 | 48.9 | 42.2 | 54.0 | 11.8 | Horizontal | | | | |
| 12185.0 | -9.9 | 51.6 | 41.7 | 54.0 | 12.3 | Vertical | | | | |
| 12185.0 | -10.0 | 52.5 | 42.5 | 54.0 | 11.5 | Horizontal | | | | |

Result of Wifi mode (2462.0 MHz) (802.11g) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|---------------|---|------------|-------------|-------------|-------------|----------|--|--|--|
| Average Value | | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | | |
| | Level | Factor | Strength | Strength | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | $dB\mu V/m$ | | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | | |

Result of Wifi mode (2462.0 MHz) (802.11g) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4924.0 | 14.8 | 41.4 | 56.2 | 74.0 | 17.8 | Vertical | | | |
| 4924.0 | 13.1 | 42.7 | 55.8 | 74.0 | 18.2 | Horizontal | | | |
| 7386.0 | 9.4 | 45.6 | 55.0 | 74.0 | 19.0 | Vertical | | | |
| 7386.0 | 7.6 | 46.5 | 54.1 | 74.0 | 19.9 | Horizontal | | | |
| 9848.0 | 7.6 | 48.6 | 56.2 | 74.0 | 17.8 | Vertical | | | |
| 9848.0 | 5.8 | 49.7 | 55.5 | 74.0 | 18.5 | Horizontal | | | |
| 12310.0 | 4.0 | 51.7 | 55.7 | 74.0 | 18.3 | Vertical | | | |
| 12310.0 | 2.5 | 52.7 | 55.2 | 74.0 | 18.8 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | | |
|-----------|--|------------|----------|--------|--------|------------|--|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | | |
| 4924.0 | 1.0 | 41.4 | 42.4 | 54.0 | 11.6 | Vertical | | | | |
| 4924.0 | -0.6 | 42.7 | 42.1 | 54.0 | 11.9 | Horizontal | | | | |
| 7386.0 | -4.0 | 45.6 | 41.6 | 54.0 | 12.4 | Vertical | | | | |
| 7386.0 | -5.1 | 46.5 | 41.4 | 54.0 | 12.6 | Horizontal | | | | |
| 9848.0 | -6.5 | 48.6 | 42.1 | 54.0 | 11.9 | Vertical | | | | |
| 9848.0 | -8.4 | 49.7 | 41.3 | 54.0 | 12.7 | Horizontal | | | | |
| 12310.0 | -9.7 | 51.7 | 42.0 | 54.0 | 12.0 | Vertical | | | | |
| 12310.0 | -11.1 | 52.7 | 41.6 | 54.0 | 12.4 | Horizontal | | | | |

Result of Wifi mode (2412.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

| Field Strength of Spurious Emissions | | | | | | | |
|---|----------|------------|-------------|----------|-------------|----------|--|
| Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | |
| | Level | Factor | Strength | Strength | | Polarity | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | dBμV/m | $dB\mu V/m$ | | |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2412.0 MHz) (802.11n20) (1GHz-25GHz): Pass

| Result of Will I | tesuit 01 Will illoue (2412.0 Will2) (302.111120) (10112-250112). 1 ass | | | | | | | | |
|------------------|---|------------|----------|-------------|--------|------------|--|--|--|
| | Field Strength of Spurious Emissions | | | | | | | | |
| | Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | dBμV/m | $dB\mu V/m$ | dB | | | | |
| 4824.0 | 15.1 | 41.5 | 56.6 | 74.0 | 17.4 | Vertical | | | |
| 4824.0 | 13.1 | 42.4 | 55.5 | 74.0 | 18.5 | Horizontal | | | |
| 7236.0 | 9.9 | 45.1 | 55.0 | 74.0 | 19.0 | Vertical | | | |
| 7236.0 | 9.1 | 46.2 | 55.3 | 74.0 | 18.7 | Horizontal | | | |
| 9648.0 | 8.1 | 48 | 56.1 | 74.0 | 17.9 | Vertical | | | |
| 9648.0 | 5.9 | 48.8 | 54.7 | 74.0 | 19.3 | Horizontal | | | |
| 12060.0 | 5.0 | 51.5 | 56.5 | 74.0 | 17.5 | Vertical | | | |
| 12060.0 | 2.6 | 52.4 | 55.0 | 74.0 | 19.0 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4824.0 | -0.1 | 41.5 | 41.4 | 54.0 | 12.6 | Vertical | | | |
| 4824.0 | -0.2 | 42.4 | 42.2 | 54.0 | 11.8 | Horizontal | | | |
| 7236.0 | -2.4 | 45.1 | 42.7 | 54.0 | 11.3 | Vertical | | | |
| 7236.0 | -4.1 | 46.2 | 42.1 | 54.0 | 11.9 | Horizontal | | | |
| 9648.0 | -6.8 | 48 | 41.2 | 54.0 | 12.8 | Vertical | | | |
| 9648.0 | -7.5 | 48.8 | 41.3 | 54.0 | 12.7 | Horizontal | | | |
| 12060.0 | -9.1 | 51.5 | 42.4 | 54.0 | 11.6 | Vertical | | | |
| 12060.0 | -9.7 | 52.4 | 42.7 | 54.0 | 11.3 | Horizontal | | | |

Result of Wifi mode (2437.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|---------------|---|------------|-------------|-------------|-------------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | $dB\mu V/m$ | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2437.0 MHz) (802.11n20) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | | | Peak Value | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4874.0 | 15.5 | 41.6 | 57.1 | 74.0 | 16.9 | Vertical | | | |
| 4874.0 | 13.7 | 42.5 | 56.2 | 74.0 | 17.8 | Horizontal | | | |
| 7311.0 | 10.4 | 45.2 | 55.6 | 74.0 | 18.4 | Vertical | | | |
| 7311.0 | 9.4 | 46.3 | 55.7 | 74.0 | 18.3 | Horizontal | | | |
| 9748.0 | 7.9 | 48.1 | 56.0 | 74.0 | 18.0 | Vertical | | | |
| 9748.0 | 7.6 | 48.9 | 56.5 | 74.0 | 17.5 | Horizontal | | | |
| 12185.0 | 4.0 | 51.6 | 55.6 | 74.0 | 18.4 | Vertical | | | |
| 12185.0 | 3.7 | 52.5 | 56.2 | 74.0 | 17.8 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4874.0 | 0.4 | 41.6 | 42.0 | 54.0 | 12.0 | Vertical | | | |
| 4874.0 | -0.3 | 42.5 | 42.2 | 54.0 | 11.8 | Horizontal | | | |
| 7311.0 | -3.9 | 45.2 | 41.3 | 54.0 | 12.7 | Vertical | | | |
| 7311.0 | -3.8 | 46.3 | 42.5 | 54.0 | 11.5 | Horizontal | | | |
| 9748.0 | -5.7 | 48.1 | 42.4 | 54.0 | 11.6 | Vertical | | | |
| 9748.0 | -6.8 | 48.9 | 42.1 | 54.0 | 11.9 | Horizontal | | | |
| 12185.0 | -10.3 | 51.6 | 41.3 | 54.0 | 12.7 | Vertical | | | |
| 12185.0 | -11.1 | 52.5 | 41.4 | 54.0 | 12.6 | Horizontal | | | |

Result of Wifi mode (2462.0 MHz) (802.11n20) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|---------------|---|------------|-------------|----------|-------------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | dBμV/m | $dB\mu V/m$ | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2462.0 MHz) (802.11n20) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | | | Peak Value | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4924.0 | 15.0 | 41.4 | 56.4 | 74.0 | 17.6 | Vertical | | | |
| 4924.0 | 12.4 | 42.7 | 55.1 | 74.0 | 18.9 | Horizontal | | | |
| 7386.0 | 8.9 | 45.6 | 54.5 | 74.0 | 19.5 | Vertical | | | |
| 7386.0 | 8.9 | 46.5 | 55.4 | 74.0 | 18.6 | Horizontal | | | |
| 9848.0 | 7.0 | 48.6 | 55.6 | 74.0 | 18.4 | Vertical | | | |
| 9848.0 | 4.9 | 49.7 | 54.6 | 74.0 | 19.4 | Horizontal | | | |
| 12310.0 | 4.0 | 51.7 | 55.7 | 74.0 | 18.3 | Vertical | | | |
| 12310.0 | 3.0 | 52.7 | 55.7 | 74.0 | 18.3 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | |
|-----------|--|------------|----------|--------|--------|------------|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4924.0 | 2.2 | 41.4 | 43.6 | 54.0 | 10.4 | Vertical | | | |
| 4924.0 | -0.5 | 42.7 | 42.2 | 54.0 | 11.8 | Horizontal | | | |
| 7386.0 | -4.0 | 45.6 | 41.6 | 54.0 | 12.4 | Vertical | | | |
| 7386.0 | -5.3 | 46.5 | 41.2 | 54.0 | 12.8 | Horizontal | | | |
| 9848.0 | -6.5 | 48.6 | 42.1 | 54.0 | 11.9 | Vertical | | | |
| 9848.0 | -8.4 | 49.7 | 41.3 | 54.0 | 12.7 | Horizontal | | | |
| 12310.0 | -10.7 | 51.7 | 41.0 | 54.0 | 13.0 | Vertical | | | |
| 12310.0 | -11.2 | 52.7 | 41.5 | 54.0 | 12.5 | Horizontal | | | |

Result of Wifi mode (2422.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|---------------|---|------------|-------------|-------------|-------------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | $dB\mu V/m$ | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2422.0 MHz) (802.11n40) (1GHz-25GHz): Pass

| · | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | | | Peak Value | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | $dB\mu V$ | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4844.0 | 13.5 | 41.5 | 55.0 | 74.0 | 19.0 | Vertical | | | |
| 4844.0 | 12.2 | 42.4 | 54.6 | 74.0 | 19.4 | Horizontal | | | |
| 7266.0 | 10.0 | 45.1 | 55.1 | 74.0 | 18.9 | Vertical | | | |
| 7266.0 | 9.0 | 46.2 | 55.2 | 74.0 | 18.8 | Horizontal | | | |
| 9688.0 | 7.3 | 48 | 55.3 | 74.0 | 18.7 | Vertical | | | |
| 9688.0 | 6.1 | 48.8 | 54.9 | 74.0 | 19.1 | Horizontal | | | |
| 12110.0 | 4.5 | 51.5 | 56.0 | 74.0 | 18.0 | Vertical | | | |
| 12110.0 | 2.8 | 52.4 | 55.2 | 74.0 | 18.8 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4844.0 | -1.4 | 41.5 | 40.1 | 54.0 | 13.9 | Vertical | | | |
| 4844.0 | -3.3 | 42.4 | 39.1 | 54.0 | 14.9 | Horizontal | | | |
| 7266.0 | -4.4 | 45.1 | 40.7 | 54.0 | 13.3 | Vertical | | | |
| 7266.0 | -5.9 | 46.2 | 40.3 | 54.0 | 13.7 | Horizontal | | | |
| 9688.0 | -7.0 | 48 | 41.0 | 54.0 | 13.0 | Vertical | | | |
| 9688.0 | -7.7 | 48.8 | 41.1 | 54.0 | 12.9 | Horizontal | | | |
| 12110.0 | -9.4 | 51.5 | 42.1 | 54.0 | 11.9 | Vertical | | | |
| 12110.0 | -10.9 | 52.4 | 41.5 | 54.0 | 12.5 | Horizontal | | | |

Result of Wifi mode (2437.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|---------------|---|------------|-------------|----------|--------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | dBμV/m | dBμV/m | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2437.0 MHz) (802.11n40) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | | | Peak Value | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4874.0 | 14.2 | 41.6 | 55.8 | 74.0 | 18.2 | Vertical | | | |
| 4874.0 | 12.7 | 42.5 | 55.2 | 74.0 | 18.8 | Horizontal | | | |
| 7311.0 | 10.3 | 45.2 | 55.5 | 74.0 | 18.5 | Vertical | | | |
| 7311.0 | 9.0 | 46.3 | 55.3 | 74.0 | 18.7 | Horizontal | | | |
| 9748.0 | 7.7 | 48.1 | 55.8 | 74.0 | 18.2 | Vertical | | | |
| 9748.0 | 7.1 | 48.9 | 56.0 | 74.0 | 18.0 | Horizontal | | | |
| 12185.0 | 4.3 | 51.6 | 55.9 | 74.0 | 18.1 | Vertical | | | |
| 12185.0 | 3.6 | 52.5 | 56.1 | 74.0 | 17.9 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | |
|-----------|---|------------|----------|--------|--------|------------|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | |
| 4874.0 | -1.6 | 41.6 | 40.0 | 54.0 | 14.0 | Vertical | | | |
| 4874.0 | -1.2 | 42.5 | 41.3 | 54.0 | 12.7 | Horizontal | | | |
| 7311.0 | -4.4 | 45.2 | 40.8 | 54.0 | 13.2 | Vertical | | | |
| 7311.0 | -5.8 | 46.3 | 40.5 | 54.0 | 13.5 | Horizontal | | | |
| 9748.0 | -6.1 | 48.1 | 42.0 | 54.0 | 12.0 | Vertical | | | |
| 9748.0 | -6.8 | 48.9 | 42.1 | 54.0 | 11.9 | Horizontal | | | |
| 12185.0 | -10.2 | 51.6 | 41.4 | 54.0 | 12.6 | Vertical | | | |
| 12185.0 | -11.3 | 52.5 | 41.2 | 54.0 | 12.8 | Horizontal | | | |

Result of Wifi mode (2452.0 MHz) (802.11n40) (9kHz - 30MHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | |
|---------------|---|------------|-------------|-------------|-------------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Field | Limit | E-Field | | |
| | Level | Factor | Strength | Strength | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | $dB\mu V/m$ | | | |
| | Emissions detected are more than 20 dB below the FCC Limits | | | | | | | |

Result of Wifi mode (2452.0 MHz) (802.11n40) (1GHz-25GHz): Pass

| | Field Strength of Spurious Emissions | | | | | | | | |
|-----------|--------------------------------------|------------|-------------|-------------|--------|------------|--|--|--|
| | Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 4904.0 | 14.6 | 41.4 | 56.0 | 74.0 | 18.0 | Vertical | | | |
| 4904.0 | 12.7 | 42.7 | 55.4 | 74.0 | 18.6 | Horizontal | | | |
| 7356.0 | 9.3 | 45.6 | 54.9 | 74.0 | 19.1 | Vertical | | | |
| 7356.0 | 9.2 | 46.5 | 55.7 | 74.0 | 18.3 | Horizontal | | | |
| 9808.0 | 7.1 | 48.6 | 55.7 | 74.0 | 18.3 | Vertical | | | |
| 9808.0 | 5.1 | 49.7 | 54.8 | 74.0 | 19.2 | Horizontal | | | |
| 12260.0 | 4.1 | 51.7 | 55.8 | 74.0 | 18.2 | Vertical | | | |
| 12260.0 | 2.9 | 52.7 | 55.6 | 74.0 | 18.4 | Horizontal | | | |



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| | Field Strength of Spurious Emissions Average Value | | | | | | | | | |
|-----------|--|------------|----------|--------|--------|------------|--|--|--|--|
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | | |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dB | | | | | |
| 4904.0 | 0.7 | 41.4 | 42.1 | 54.0 | 11.9 | Vertical | | | | |
| 4904.0 | -1.4 | 42.7 | 41.3 | 54.0 | 12.7 | Horizontal | | | | |
| 7356.0 | -4.6 | 45.6 | 41.0 | 54.0 | 13.0 | Vertical | | | | |
| 7356.0 | -5.2 | 46.5 | 41.3 | 54.0 | 12.7 | Horizontal | | | | |
| 9808.0 | -6.6 | 48.6 | 42.0 | 54.0 | 12.0 | Vertical | | | | |
| 9808.0 | -8.7 | 49.7 | 41.0 | 54.0 | 13.0 | Horizontal | | | | |
| 12260.0 | -11.1 | 51.7 | 40.6 | 54.0 | 13.4 | Vertical | | | | |
| 12260.0 | -11.3 | 52.7 | 41.4 | 54.0 | 12.6 | Horizontal | | | | |

Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement (9kHz-30MHz): 2.0dB uncertainty (30MHz -1GHz): 4.9dB (1GHz -26GHz): 4.02dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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Radiated Emissions Measurement:

Limit :

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

Result: RF Radiated Emissions (Lowest)-802.11b

| Field Strength of Band-edge Compliance | | | | | | | | |
|--|-----------|------------|-------------|-------------|--------|----------|--|--|
| Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | |
| 2390.0 | 25.8 | 36.8 | 62.6 | 74.0 | 11.4 | Vertical | | |

| | Field Strength of Band-edge Compliance | | | | | | | |
|---------------|--|------------|-------------|-------------|--------|----------|--|--|
| Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | |
| 2390.0 | 5.6 | 36.8 | 42.4 | 54.0 | 11.6 | Vertical | | |

Result: RF Radiated Emissions (Highest) -802.11b

| resure. Iti iti | Activity of Haddeted Emissions (Highest) of the Haddeted Emissions (Highest) | | | | | | | |
|--|--|------------|-------------|-------------|--------|------------|--|--|
| Field Strength of Band-edge Compliance | | | | | | | | |
| Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | |
| 2483.5 | 23.9 | 36.4 | 60.3 | 74.0 | 13.7 | Horizontal | | |

| Field Strength of Band-edge Compliance | | | | | | | |
|--|-----------|------------|----------|-------------|--------|------------|--|
| Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | |
| | Level @3m | Factor | Strength | @3m | | Polarity | |
| MHz | dΒμV | dB/m | dBμV/m | $dB\mu V/m$ | dB | | |
| 2483.5 | 3.3 | 36.4 | 39.7 | 54.0 | 14.3 | Horizontal | |



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Result: RF Radiated Emissions (Lowest)-802.11g

| Result: AT Radiated Emissions (Lowest)-002.11g | | | | | | | | |
|--|-----------|------------|----------|-------------|--------|----------|--|--|
| Field Strength of Band-edge Compliance | | | | | | | | |
| Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | dBμV/m | $dB\mu V/m$ | dB | | | |
| 2390.0 | 26.6 | 36.8 | 63.4 | 74.0 | 10.6 | Vertical | | |

| Field Strength of Band-edge Compliance | | | | | | | | |
|--|---------------|------------|-------------|-------------|--------|----------|--|--|
| | Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | |
| 2390.0 | 6.4 | 36.8 | 43.2 | 54.0 | 10.8 | Vertical | | |

Result: RF Radiated Emissions (Highest) -802.11g

| Field Strength of Band-edge Compliance | | | | | | | | | |
|--|------------|------------|----------|-------|--------|------------|--|--|--|
| | Peak Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | | | | | | | | | |
| 2483.5 | 23.7 | 36.4 | 60.1 | 74.0 | 13.9 | Horizontal | | | |

| | Field Strength of Band-edge Compliance | | | | | | | | |
|-----------|--|------------|-------------|-------------|--------|------------|--|--|--|
| | Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | $dB\mu V/m$ | $dB\mu V/m$ | dB | | | | |
| 2483.5 | 4.0 | 36.4 | 40.4 | 54.0 | 13.6 | Horizontal | | | |



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Result: RF Radiated Emissions (Lowest)-802.11n20

| | Field Strength of Band-edge Compliance | | | | | | | |
|-----------|---|------------|----------|-------|--------|----------|--|--|
| | Peak Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | |
| 2390.0 | 25.5 | 36.8 | 62.3 | 74.0 | 11.7 | Vertical | | |

| Field Strength of Band-edge Compliance | | | | | | | | |
|--|--|--------|----------|------|------|----------|--|--|
| | Average Value | | | | | | | |
| Frequency | Frequency Measured Correction Field Limit Margin E-Field | | | | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | |
| 2390.0 | 4.3 | 36.8 | 41.1 | 54.0 | 12.9 | Vertical | | |

Result: RF Radiated Emissions (Highest) -802.11n20

| Til Hadiated Emissions (Highest) 002111120 | | | | | | | | | |
|--|--|--------|----------|------|------|------------|--|--|--|
| Field Strength of Band-edge Compliance | | | | | | | | | |
| | Peak Value | | | | | | | | |
| Frequency | Frequency Measured Correction Field Limit Margin E-Field | | | | | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | | |
| 2483.5 | 23.4 | 36.4 | 59.8 | 74.0 | 14.2 | Horizontal | | | |

| Field Strength of Band-edge Compliance | | | | | | | | |
|--|---------------|------------|----------|-------------|--------|------------|--|--|
| | Average Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz | dΒμV | dB/m | dBμV/m | $dB\mu V/m$ | dB | | | |
| 2483.5 | 3.2 | 36.4 | 39.6 | 54.0 | 14.4 | Horizontal | | |



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Result: RF Radiated Emissions (Lowest)-802.11n40

| Result: At Radiated Emissions (Lowest)-002.111140 | | | | | | | | |
|---|------------|------------|----------|-------|--------|----------|--|--|
| Field Strength of Band-edge Compliance | | | | | | | | |
| | Peak Value | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | |
| MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | | |
| 2390.0 | 27.1 | 36.8 | 63.9 | 74.0 | 10.1 | Vertical | | |

| | Field Strength of Band-edge Compliance | | | | | | | | |
|-----------|--|--------|----------|------|------|----------|--|--|--|
| | Average Value | | | | | | | | |
| Frequency | Frequency Measured Correction Field Limit Margin E-Field | | | | | | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | | |
| 2390.0 | 5.4 | 36.8 | 42.2 | 54.0 | 11.8 | Vertical | | | |

Result: RF Radiated Emissions (Highest) -802.11n40

| Ë | Result: It! Ruduled Emissions (Highest) 002:111-10 | | | | | | | |
|---|--|-----------|--------|----------|------|------|------------|--|
| | Field Strength of Band-edge Compliance | | | | | | | |
| | Peak Value | | | | | | | |
| | Frequency Measured Correction Field Limit Margin E-Field | | | | | | | |
| | | Level @3m | Factor | Strength | @3m | | Polarity | |
| | MHz $dB\mu V$ dB/m $dB\mu V/m$ $dB\mu V/m$ dB | | | | | | | |
| | 2483.5 | 25.0 | 36.4 | 61.4 | 74.0 | 12.6 | Horizontal | |

| | Field Strength of Band-edge Compliance | | | | | | | | |
|-----------|--|------------|----------|-------------|--------|------------|--|--|--|
| | Average Value | | | | | | | | |
| Frequency | Measured | Correction | Field | Limit | Margin | E-Field | | | |
| | Level @3m | Factor | Strength | @3m | | Polarity | | | |
| MHz | dΒμV | dB/m | dBμV/m | $dB\mu V/m$ | dB | | | | |
| 2483.5 | 3.3 | 36.4 | 39.7 | 54.0 | 14.3 | Horizontal | | | |



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Limits for Radiated Emissions FCC 47 CFR 15.247]:

| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz] | [µV/m] |
| 0.009-0.490 | 2400/F (kHz) |
| 0.490-1.705 | 24000/F (kHz) |
| 1.705-30 | 30 |
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above960 | 500 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WiFi mode (2412MHz, 802.11b) (30MHz - 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases)

Horizontal dBµV/m Limit 80 70 60 50 40 30 Word March March 20 10 0 30.0 100.0 1000.0 MHz



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Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass

| Mesuit of Miri III | esuit of wift mode (2412WHz, 802.11b) (50WHz – 1GHz): Fass | | | | | | | | |
|--------------------|--|--------|--------|-------|-------|--|--|--|--|
| | Radiated Emissions | | | | | | | | |
| Quasi-Peak | | | | | | | | | |
| Emission | E-Field | Level | Limit | Level | Limit | | | | |
| Frequency | Polarity | @3m | @3m | @3m | @3m | | | | |
| MHz | | dBµV/m | dBμV/m | μV/m | μV/m | | | | |
| 30.4 | Horizontal | 30.4 | 40.0 | 33.1 | 100 | | | | |
| 37.7 | Horizontal | 26.1 | 40.0 | 20.2 | 100 | | | | |
| 371.3 | Horizontal | 33.7 | 46.0 | 48.4 | 200 | | | | |
| 445.5 | Horizontal | 39.7 | 46.0 | 96.6 | 200 | | | | |
| 544.6 | Horizontal | 42.6 | 46.0 | 134.9 | 200 | | | | |
| 750.1 | Horizontal | 42.7 | 46.0 | 136.5 | 200 | | | | |



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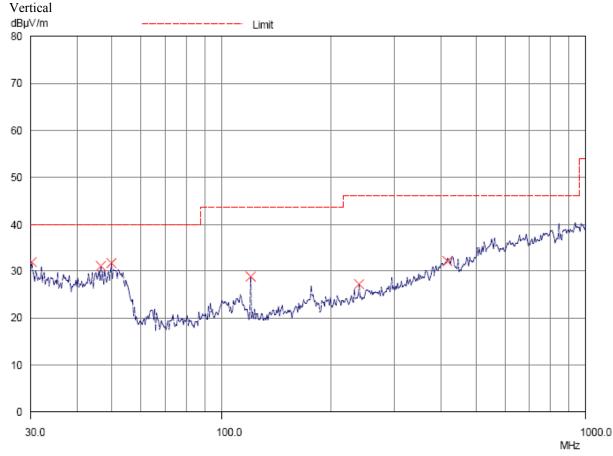
Limits for Radiated Emissions FCC 47 CFR 15.247 Class B]:

| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz] | [µV/m] |
| 0.009-0.490 | 2400/F (kHz) |
| 0.490-1.705 | 24000/F (kHz) |
| 1.705-30 | 30 |
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above960 | 500 |

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results of WiFi mode (2412MHz, 802.11b) (30MHz - 1GHz): Pass

Please refer to the following table for result details(The data is the worst cases)





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Result of WiFi mode (2412MHz, 802.11b) (30MHz – 1GHz): Pass

| Radiated Emissions | | | | | |
|--------------------|----------|--------|--------|-------|-------|
| Quasi-Peak | | | | | |
| Emission | E-Field | Level | Limit | Level | Limit |
| Frequency | Polarity | @3m | @3m | @3m | @3m |
| MHz | | dBµV/m | dBμV/m | μV/m | μV/m |
| 30.1 | Vertical | 31.9 | 40.0 | 39.4 | 100 |
| 46.5 | Vertical | 31.1 | 40.0 | 35.9 | 100 |
| 49.9 | Vertical | 31.7 | 40.0 | 38.5 | 100 |
| 120.0 | Vertical | 28.9 | 43.5 | 27.9 | 150 |
| 237.1 | Vertical | 27.3 | 46.0 | 23.2 | 200 |
| 415.1 | Vertical | 32.2 | 46.0 | 40.7 | 200 |

Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.9dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC 47CFR 15.207 Test Method: ANSI C63.10:2013

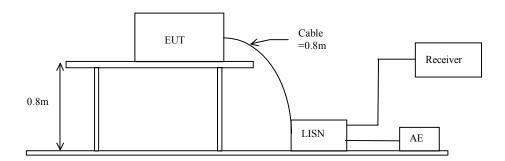
Test Date: 2018-06-30
Mode of Operation: Wifi mode
Test Voltage: 120Va.c. 60Hz

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The test was performed in accordance with ANSI ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

Test Setup:





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Limits for Conducted Emissions (FCC 47 CFR 15.207):

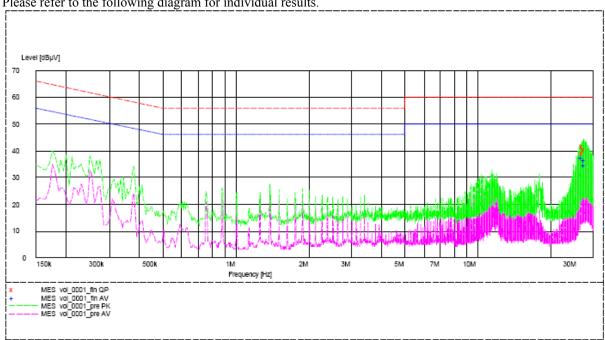
| Frequency Range | Quasi-Peak Limits | Average |
|-----------------|-------------------|-----------|
| [MHz] | [dBµV] | [dBµV] |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

^{*} Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Wifi mode (L): PASS

Please refer to the following diagram for individual results.



| | | Quasi | i-peak | Ave | rage |
|-----------------|-----------|-------|--------|-------|-------|
| Conductor | Frequency | Level | Limit | Level | Limit |
| Live or Neutral | MHz | dΒμV | dΒμV | dΒμV | dΒμV |
| Live | 27.095 | 41.4 | 60.0 | _*_ | _*_ |
| Live | 27.345 | 39.0 | 60.0 | _*_ | _*_ |
| Live | 27.725 | 40.5 | 60.0 | _*_ | _*_ |
| Live | 26.970 | _*_ | _*_ | 37.5 | 50.0 |
| Live | 27.600 | _*_ | _*_ | 36.8 | 50.0 |
| Live | 27.726 | _*_ | _*_ | 34.5 | 50.0 |



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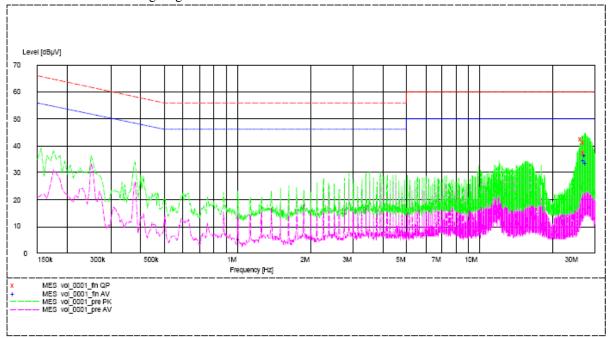
| Frequency Range | Quasi-Peak Limits | Average |
|-----------------|-------------------|-----------|
| [MHz] | [dBµV] | [dBµV] |
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

^{*} Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

Results of Wifi mode (N): PASS

Please refer to the following diagram for individual results.



| | | Quas | i-peak | Ave | rage |
|-----------------|-----------|-------|--------|-------|-------|
| Conductor | Frequency | Level | Limit | Level | Limit |
| Live or Neutral | MHz | dΒμV | dΒμV | dΒμV | dΒμV |
| Neutral | 26.570 | 42.6 | 60.0 | _*_ | _*_ |
| Neutral | 27.070 | 41.0 | 60.0 | _*_ | _*_ |
| Neutral | 27.320 | 37.4 | 60.0 | _*_ | _*_ |
| Neutral | 27.070 | _*_ | _*_ | 34.4 | 50.0 |
| Neutral | 27.575 | _*_ | _*_ | 36.7 | 50.0 |
| Neutral | 27.700 | _*_ | _*_ | 33.6 | 50.0 |

Remarks:

Calculated measurement uncertainty (0.15MHz – 30MHz): 3.25dB

^{-*-} Emission(s) that is far below the corresponding limit line.



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3.1.4 Power Spectral Density

Test Requirement: FCC 47CFR 15.247(e)
Test Method: ANSI C63.10:2013

Test Date: 2018-07-25 Mode of Operation: Wifi mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz, VBW=10KHz, Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold. Measure the Power Spectral Density (PSD) and record the results in dBm.

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF=10log (3 kHz/100 kHz=-15.2dB)

Results of WiFi Mode 802.11 b (Tx:2412MHz to 2462MHz) : Pass (TX Unit) Maximum power spectral density

| Transmitter Frequency | Maximum Power spectral density | Maximum Power spectral density / |
|-----------------------|--------------------------------|----------------------------------|
| (MHz) | level / 3kHz band | 3kHz band limit |
| , , | (dBm) | |
| 2412.0 | -6.69 | 8dBm |
| 2437.0 | -5.11 | 8dBm |
| 2462.0 | -5.87 | 8dBm |



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Results of WiFi Mode 802.11 g (Tx:2412MHz to 2462MHz) : Pass (TX Unit) Maximum power spectral density

| Transmitter Frequency (MHz) | Maximum Power spectral density level / 3kHz band (dBm) | Maximum Power spectral density / 3kHz band limit |
|-----------------------------|--|--|
| 2412.0 | -9.94 | 8dBm |
| 2437.0 | -9.22 | 8dBm |
| 2462.0 | -9.10 | 8dBm |

Results of WiFi Mode 802.11 n20 (Tx:2412MHz to 2462MHz) : Pass (TX Unit) Maximum power spectral density

| Transmitter Frequency | Maximum Power spectral density | Maximum Power spectral density / |
|-----------------------|--------------------------------|----------------------------------|
| (MHz) | level / 3kHz band | 3kHz band limit |
| | (dBm) | |
| 2412.0 | -10.78 | 8dBm |
| 2437.0 | -10.84 | 8dBm |
| 2462.0 | -10.22 | 8dBm |

Results of WiFi Mode 802.11 n40 (Tx:2422MHz to 2452MHz) : Pass (TX Unit) Maximum power spectral density

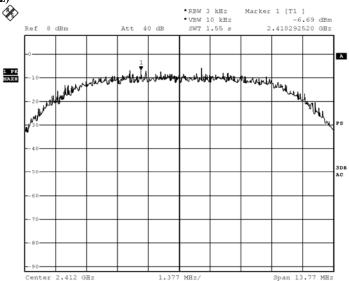
| Transmitter Frequency (MHz) | Maximum Power spectral density level / 3kHz band | Maximum Power spectral density / 3kHz band limit |
|-----------------------------|--|--|
| | (dBm) | |
| 2422.0 | -13.70 | 8dBm |
| 2437.0 | -13.20 | 8dBm |
| 2452.0 | -13.25 | 8dBm |

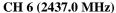


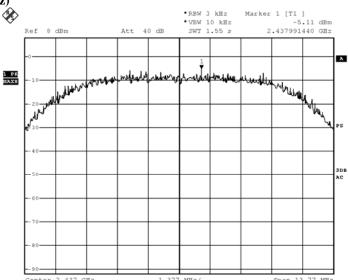
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WiFi mode 802.11 b, (Tx: 2412MHz to 2462MHz)

CH 1 (2412.0 MHz)



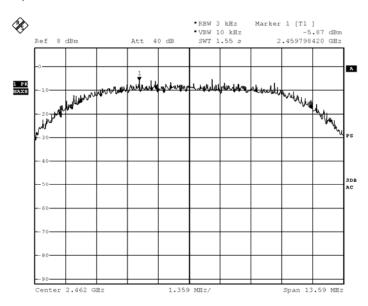




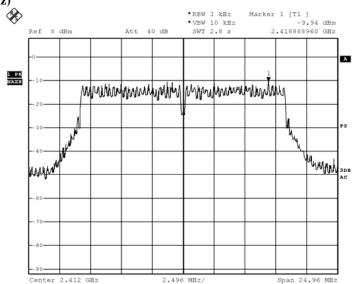


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CH 11 (2462.0 MHz)



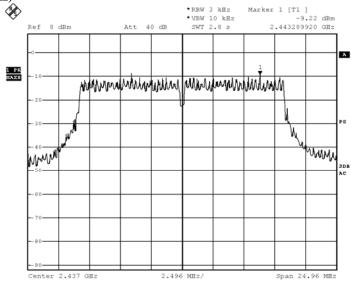
WiFi mode 802.11 g, (Tx:2412MHz to 2462MHz) Ch 1 (2412.0 MHz)



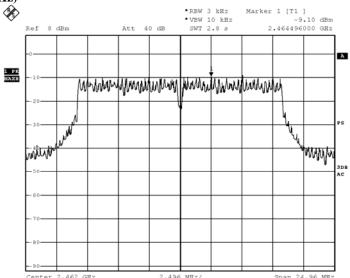


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CH 6 (2437.0 MHz)



CH 11 (2462.0 MHz)

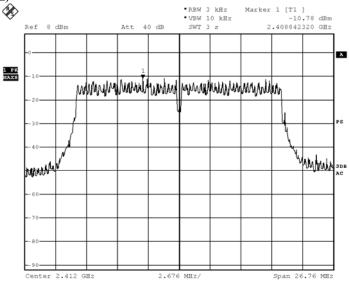




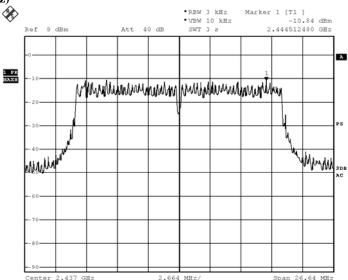
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WiFi mode 802.11 n20, (Tx: 2412MHz to 2462MHz)

CH 1 (2412.0 MHz)



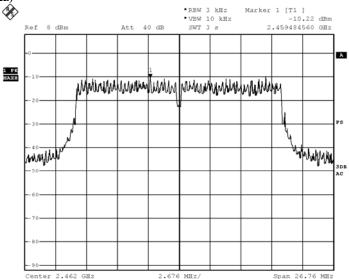
CH 6 (2437.0 MHz)



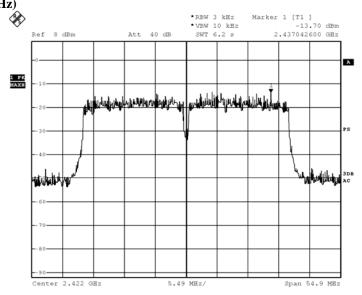


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Ch 11 (2462.0 MHz)



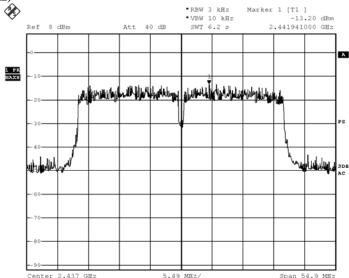
WiFi mode 802.11 n40, (Tx: 2422MHz to 2452MHz) CH 3 (2422.0 MHz)

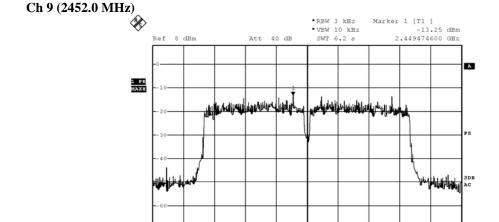




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CH 6 (2437.0 MHz)







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3.1.5 6dB Spectrum Bandwidth Measurement

Test Requirement: FCC 47CFR 15.247(a)(2)
Test Method: ANSI C63.10:2013

Test Date: 2018-07-24 Mode of Operation: WiFi mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

Spectrum Analyzer Setting:

RBW = 100kHz, VBW ≥ 3*RBW, Sweep = Auto couple Detector = Peak, Trace = Max. hold

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

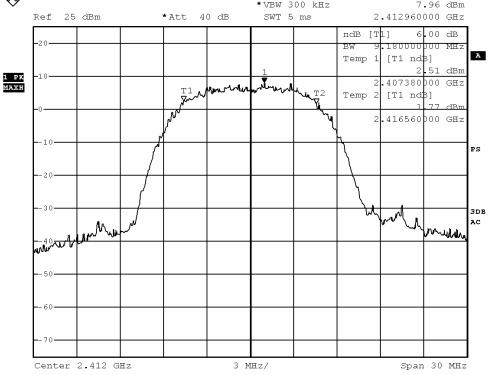


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Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency | 6dB Bandwidth | FCC Limits |
|------------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2412.0 | 9.18 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 b (2412MHz) *RBW 100 kHz Marker 1 [T1] *VBW 300 kHz 7.96 dBm *Att 40 dB 25 dBm SWT 5 ms 2.412960000 GHz Ref ndB [T1] 6.00 dB



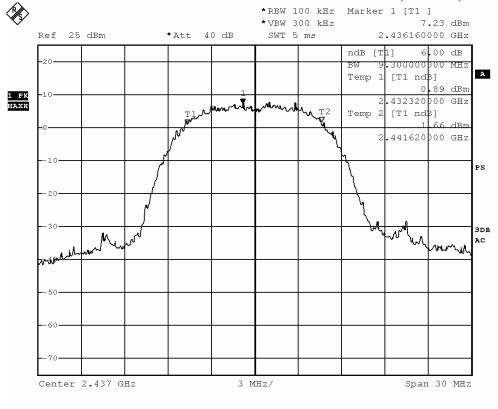


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2437.0 | 9.30 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 b (2437MHz)



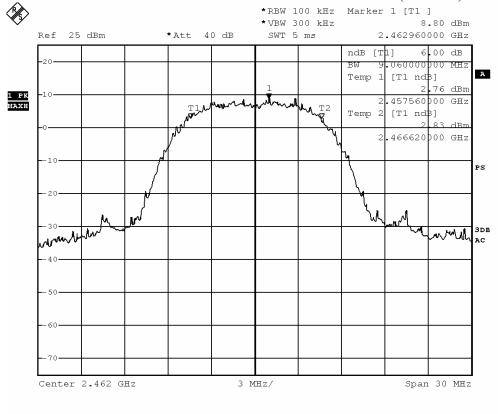


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2462.0 | 9.06 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 b (2462MHz)





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Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency | 6dB Bandwidth | FCC Limits |
|------------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2412.0 | 16.64 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 g (2412MHz) *RBW 100 kHz Marker 1 [T1] *VBW 300 kHz -2.61 dBm 24 dBm *Att 45 dB SWT 5 ms 2.403680000 GHz Ref Marker -20 A 413280 000 GHz 1 PK Maxh 54 dB 640000 000 MHz hydralia france while PS War walland word word with Which white was a fleeted 3DB Center 2.412 GHz Span 40 MHz 4 MHz/

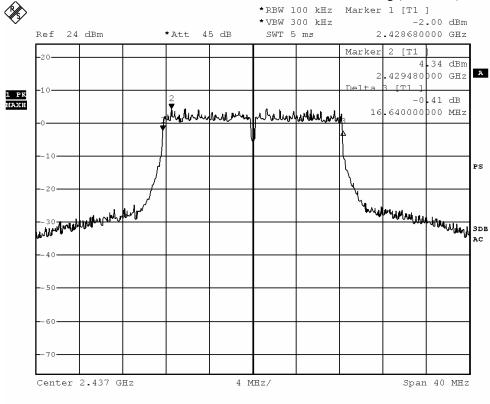


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2437.0 | 16.64 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 g (2437MHz)



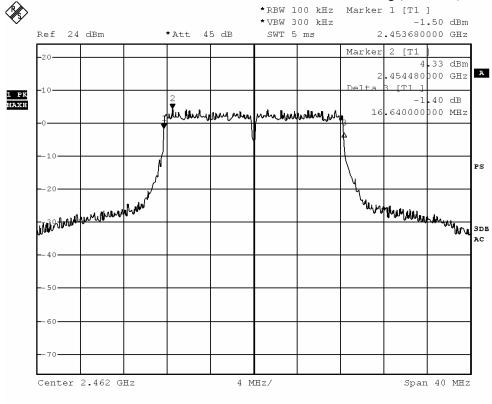


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2462.0 | 16.64 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 g (2462MHz)



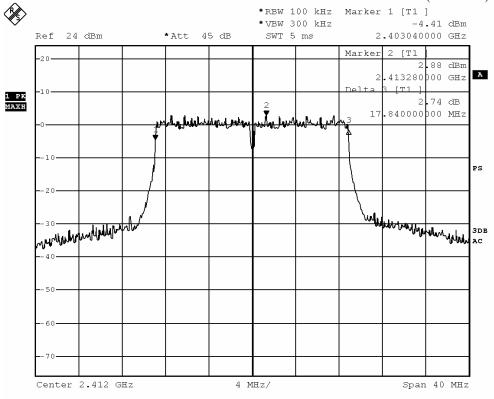


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Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency | 6dB Bandwidth | FCC Limits |
|------------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2412.0 | 17.84 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2412MHz)



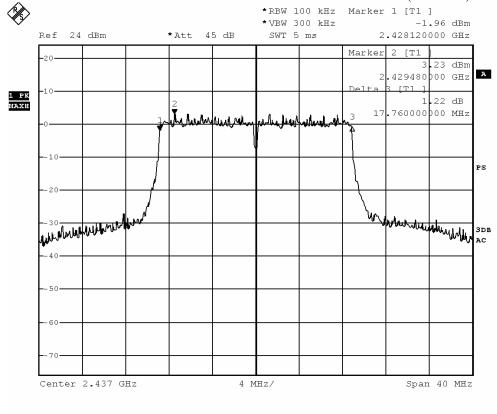


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2437.0 | 17.76 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2437MHz)



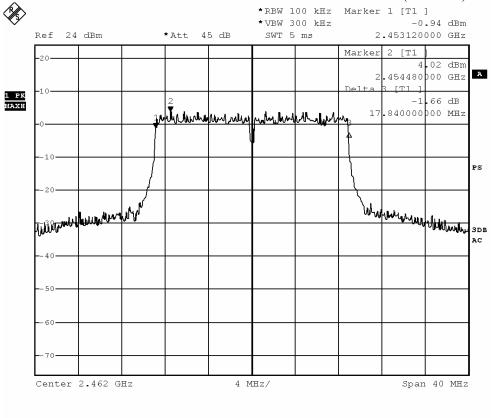


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2462.0 | 17.84 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n20 (2462MHz)



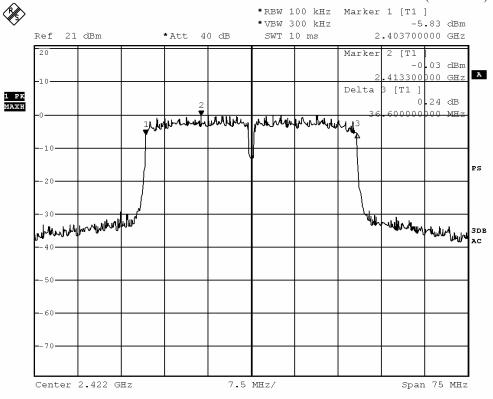


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Limits for 6dB Spectrum Bandwidth Measurement:

| Center Frequency | 6dB Bandwidth | FCC Limits |
|------------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2422.0 | 36.60 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n40 (2422MHz)



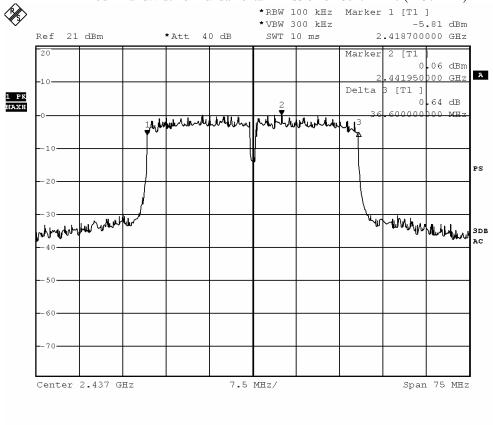


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2437.0 | 36.60 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n40 (2437MHz)



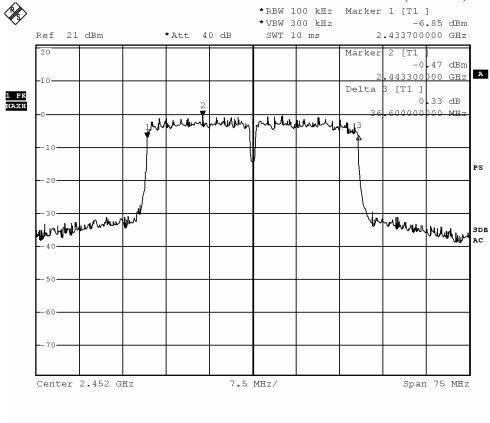


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Limits for 6dB Spectrum Bandwidth Measurement:

| Frequency Range | 6dB Bandwidth | FCC Limits |
|-----------------|---------------|------------|
| [MHz] | [MHz] | [kHz] |
| 2452.0 | 36.60 | > 500 |

6dB Bandwidth of Fundamental Emission on 802.11 n40 (2452MHz)





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3.1.6 Band Edges Measurement

Test Requirement: FCC 47CFR 15.247
Test Method: ANSI C63.10:2013
Test Date: 2018-07-26
Mode of Operation: Wifi mode

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Method:

The band edge is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. The RBW are set to 100kHz and VBW are set to 300kHz for this measurement.

Test Setup:

As Test Setup of clause 3.1.2 in this test report.



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Band-edge Compliance of RF Conducted Emissions Measurement:

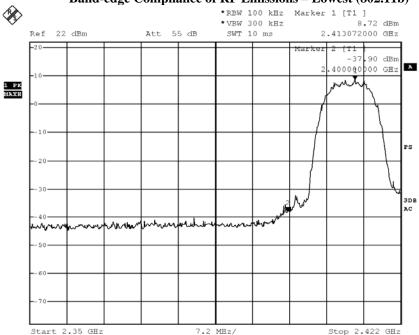
Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report

| Frequency Range | Conducted Emission Attenuated below the | | | | |
|----------------------------------|---|--|--|--|--|
| | Fundamental | | | | |
| [MHz] | [dB] | | | | |
| 2400 – Lowest Fundamental (2402) | 46.60 | | | | |

Band-edge Compliance of RF Emissions – Lowest (802.11b)



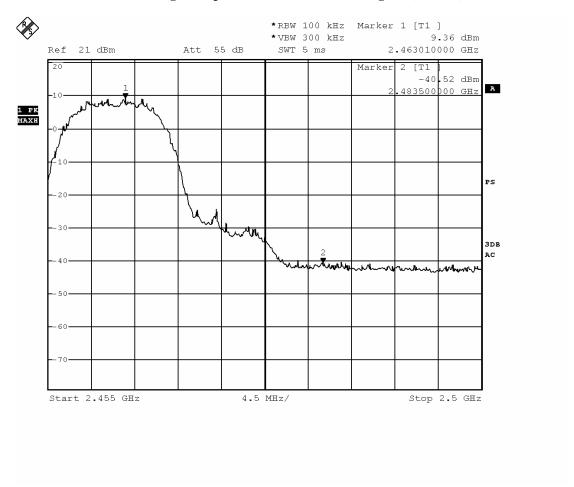


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range Conducted Emission Attenuated below | | | |
|---|-------------|--|--|
| | Fundamental | | |
| [MHz] | [dB] | | |
| 2483.5 - Highest Fundamental (2480) | 49.88 | | |

Band-edge Compliance of RF Emissions – Highest (802.11b)



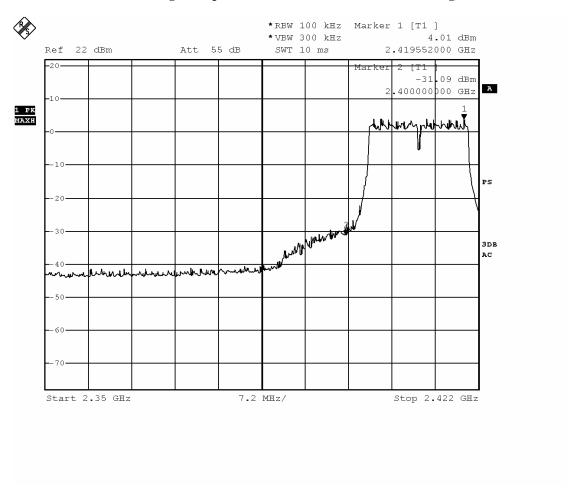


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the | | |
|----------------------------------|---|--|--|
| | Fundamental | | |
| [MHz] | [dB] | | |
| 2400 - Lowest Fundamental (2402) | 35.10 | | |

Band-edge Compliance of RF Emissions - Lowest (802.11g)



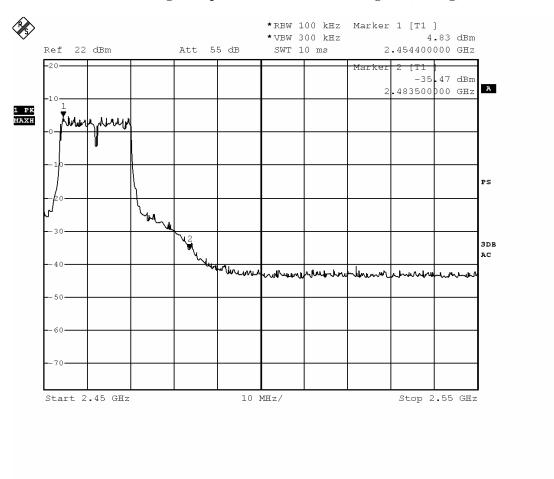


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the |
|-------------------------------------|---|
| | Fundamental |
| [MHz] | [dB] |
| 2483.5 - Highest Fundamental (2480) | 40.30 |

Band-edge Compliance of RF Emissions – Highest (802.11g)



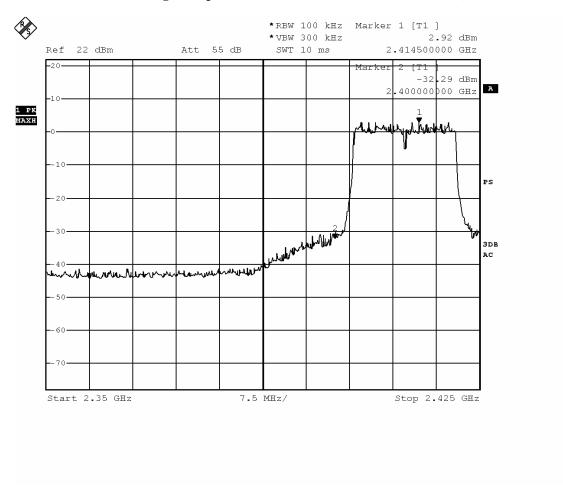


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the | | | |
|----------------------------------|---|--|--|--|
| | Fundamental | | | |
| [MHz] | [dB] | | | |
| 2400 - Lowest Fundamental (2402) | 35.21 | | | |

Band-edge Compliance of RF Emissions - Lowest (802.11n20)



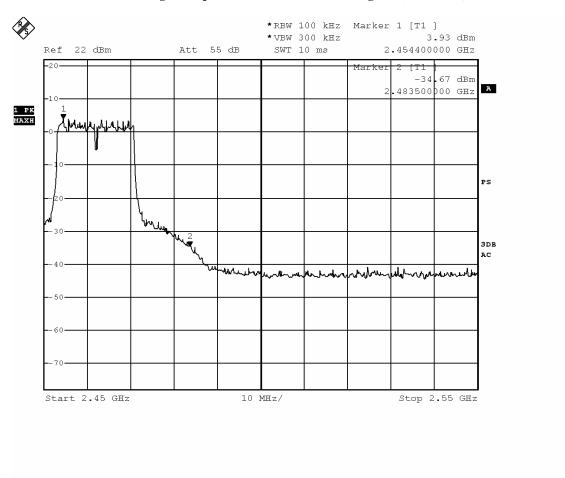


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the |
|-------------------------------------|---|
| 1 5 6 | Fundamental |
| [MHz] | [dB] |
| 2483.5 - Highest Fundamental (2480) | 38.60 |

Band-edge Compliance of RF Emissions - Highest (802.11n20)



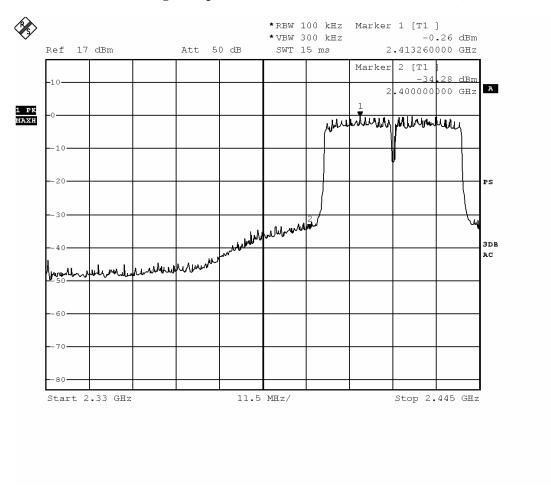


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the | | |
|----------------------------------|---|--|--|
| | Fundamental | | |
| [MHz] | [dB] | | |
| 2400 - Lowest Fundamental (2402) | 34.02 | | |

Band-edge Compliance of RF Emissions - Lowest (802.11n40)



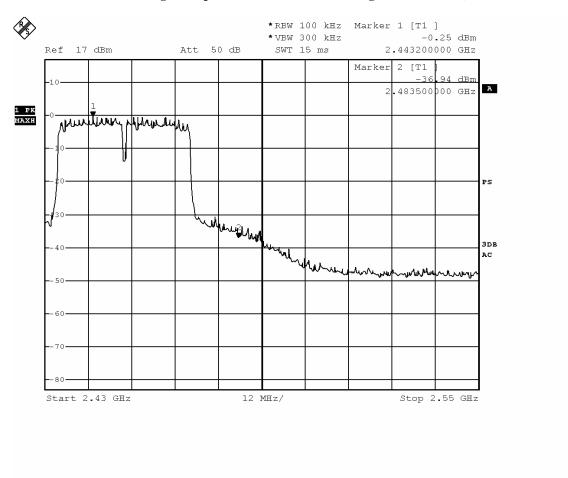


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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range | Conducted Emission Attenuated below the | | |
|-------------------------------------|---|--|--|
| | Fundamental | | |
| [MHz] | [dB] | | |
| 2483.5 - Highest Fundamental (2480) | 36.69 | | |

Band-edge Compliance of RF Emissions - Highest (802.11n40)





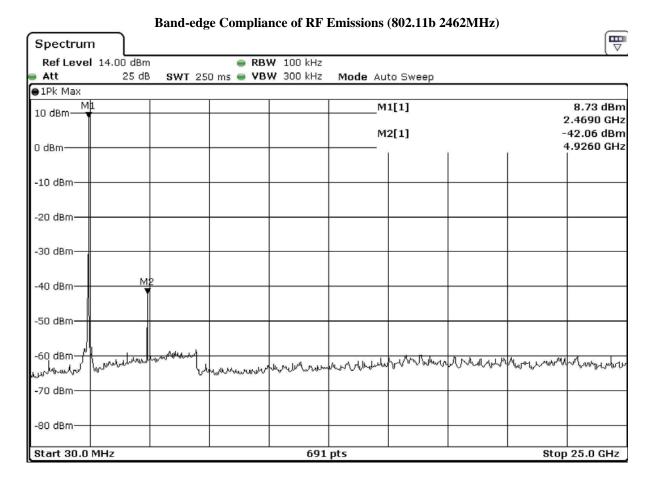
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Band-edge Compliance of RF Conducted Emissions Measurement:

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required.

Remark: Emissions under the fixed frequency mode and hopping mode have been investigated, the worst-case measurement results were recorded in the test report





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Band-edge Compliance of RF Emissions (802.11g 2462MHz) Spectrum Ref Level 14.00 dBm RBW 100 kHz 25 dB SWT 250 ms . VBW 300 kHz Att Mode Auto Sweep ●1Pk Max M1[1] 5.15 dBm 10 dBm 2.4690 GHz M2[1] -47.31 dBm 0 dBm-4.9260 GHz -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm--60 dBm -70 dBm -80 dBm Start 30.0 MHz 691 pts Stop 25.0 GHz

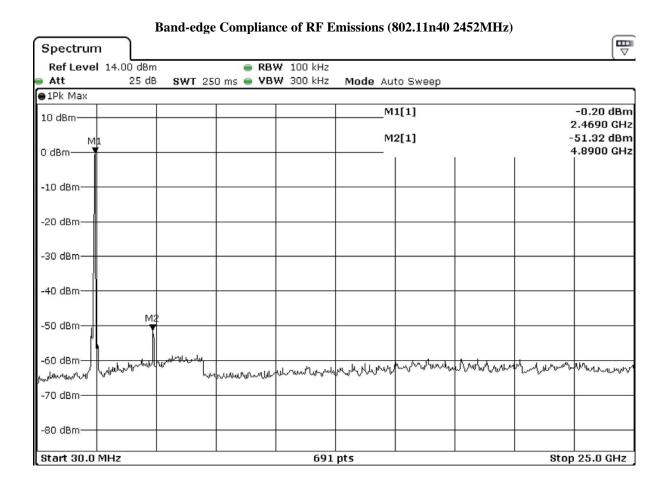


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Band-edge Compliance of RF Emissions (802.11n20 2462MHz) Spectrum Ref Level 14.00 dBm RBW 100 kHz SWT 250 ms - VBW 300 kHz 25 dB Att Mode Auto Sweep ●1Pk Max 3.65 dBm M1[1]10 dBm 2.4690 GHz M2[1] -48.24 dBm 0 dBm-4.9260 GHz -10 dBm -20 dBm -30 dBm -40 dBm -50 dBm--60 dBm -70 dBm -80 dBm-Start 30.0 MHz Stop 25.0 GHz 691 pts



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3.1.7 Antenna Requirement

Ambient Temperature: 25°C Relative Humidity: 51% Atmospheric Pressure: 101 kPa

Test Requirements: § 15.203

Test Specification:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Test Results:

This is PCB antenna. There is no external antenna, the antenna gain = 2412MHz: 2.46dBi/2422MHz: 2.71dBi/2437MHz: 2.58dBi/2452MHz: 2.56dBi/2462MHz: 2.94dBi. User is unable to remove or changed the Antenna.



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Appendix A

List of Measurement Equipment

Radiated Emission

| Radiated Emission | | | | | | | |
|-------------------|---|-----------------------------|---------------------|--------------------|------------|------------|--|
| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL | |
| EM215 | MULTIDEVICE CONTROLLER | EMCO | 2090 | 00024676 | N/A | N/A | |
| EM217 | ELECTRIC POWERED TURNTABLE | EMCO | 2088 | 00029144 | N/A | N/A | |
| EM218 | ANECHOIC CHAMBER | ETS-LINDGREN | FACT-3 | | 2018/01/24 | 2019/01/24 | |
| EM356 | ANTENNA POSITIONING TOWER | ETS-LINDGREN | 2171B | 00150346 | N/A | N/A | |
| EM354 | BICONILOG ANTENNA | ETS-LINDGREN | 3143B | 00142073 | 2018/03/29 | 2020/03/29 | |
| EM229 | EMI TEST RECEIVER | R&S | ESIB40 | 100248 | 2018/06/01 | 2019/06/01 | |
| EM276 | BROADBAND HORN ANTENNA | A-INFOMW | JXTXLB- 10180-SF | J203109090300 7 | 2018/04/27 | 2020/04/27 | |
| EM300 | PYRAMIDAL STANDARD GAIN HORN ANTENNA | ETS-LINDGREN | 3160-09 | 00130130 | 2018/05/13 | 2019/05/13 | |
| EM301 | PYRAMIDAL STANDARD GAIN HORN ANTENNA | ETS-LINDGREN | 3160-10 | 00130988 | 2018/05/13 | 2019/05/13 | |
| EM302 | PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ) | SEIBERSDORF LABORATORIES | POD 16 | 161806/L | 2018/05/11 | 2020/05/11 | |
| EM303 | PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ) | SEIBERSDORF LABORATORIES | POD 618 | 6181908/L | 2018/05/11 | 2020/05/11 | |
| EM353 | LOOP ANTENNA | ETS_LINDGREN | 6502 | 00206533 | 2018/04/16 | 2020/04/16 | |
| EM045 | POWER METER | ROHDE & SCHWARZ | NRVD | 843246/028 | 2017/10/14 | 2018/10/14 | |

Line Conducted

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---------|--|-------------------------------------|-----------|---------------------|------------|------------|
| EM119 | LISN | R & S | ESH3-Z5 | 0831.5518.52 | 2017/11/29 | 2018/11/29 |
| EM145 | EMI TEST RECEIVER | R & S | ESCS 30 | 830245/021 | 2018/06/01 | 2019/06/01 |
| EM179 | IMPULSE LIMITER | ROHDE & SCHWARZ | ESH3-Z2 | 357- 8810.52/54 | 2018/01/11 | 2019/01/11 |
| EM154 | SHIELDING ROOM | SIEMENS MATSUSHITA COMPONENTS | N/A | 803-740-057- 99A | 2017/02/02 | 2022/02/02 |
| N/A | MEASUREMENT AND EVALUATION SOFTWARE | ROHDE & SCHWARZ | BSIB-K1 | V1.20 | N/A | N/A |

Remarks:-

CM Corrective Maintenance

N/A Not Applicable
TBD To Be Determined



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Appendix B

Photographs of EUT

Front View of the product



Inside View of the product



Inner Circuit Bottom View



Rear View of the product



Inner Circuit Top View



Inner Circuit Top View





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Photographs of EUT

Inner Circuit Bottom View



Inner Circuit Bottom View



Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Top View



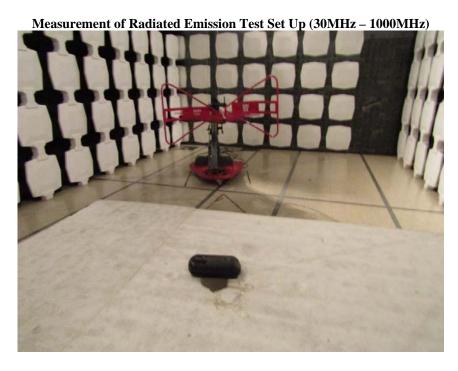


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Photographs of EUT

Measurement of Radiated Emission Test Set Up (9kHz - 30MHz)





The Hong Kong Standards and Testing Centre Limited 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong



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Photographs of EUT

Measurement of Radiated Emission Test Set Up (above 1000MHz)



Measurement of Conducted Emission Test Set Up



***** End of Test Report *****

The Hong Kong Standards and Testing Centre Limited

10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong

Tel: +852 2666 1888 Fax: +852 2664 4353 Email: hkstc@stc.group Website: www.stc.group

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- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders
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