

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Report No.: RFBAOZ-WTW-P22010912A-1

FCC ID: HBW-GDOCAMF1

Product: Camera Module

Brand: Chamberlain

Model No.: GDOCAMF1

Received Date: 2024/5/8

Test Date: 2024/5/23 ~ 2024/5/27

Issued Date: 2024/7/3

Applicant: The Chamberlain Group, LLC

Address: 300 Windsor Drive Oak Brook, IL 60523

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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FCC Registration / 788550 / TW0003

Designation Number:

Approved by: _____

Jeremy Lin

Jeremy Lin / Project Engineer

, Date: _____

2024/7/3

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Prepared by : Gina Liu / Specialist



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Release Control Record

| Issue No. | Description | Date Issued |
|-------------------------|-------------------|-------------|
| RFBAOZ-WTW-P22010912A-1 | Original release. | 2024/7/3 |

Report Issue History Record

| Issue No. | Description | Date Issued |
|-------------------------|---|-------------|
| RFBIBJ-WTW-P22010912-1 | Original Release | 2022/5/4 |
| RFBIBJ-WTW-P22010912A-1 | <ol style="list-style-type: none">1. BT shielding change from (Frame+ COVER) to Soldering Cover) for SKU 22. Add 2nd source for SKU 2<ol style="list-style-type: none">a. Flash/ IC/power IC vendor changeb. BT Matching component/MCU vendor changec. 2.4G/5G RF component and diplexer vendor change | 2024/7/3 |

1 Certificate

Product: Camera Module

Brand: Chamberlain

Test Model: GDOCAMF1

Sample Status: Engineering sample

Applicant: The Chamberlain Group, LLC

Test Date: 2024/5/23 ~ 2024/5/27

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)

Measurement ANSI C63.10-2013

procedure: KDB 558074 D01 15.247 Meas Guidance v05r02

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (Section 15.247) | | | |
|--|---------------------------------|--------|---|
| Standard / Clause | Test Item | Result | Remark |
| 15.247(b) | RF Output Power | Pass | Meet the requirement of limit. |
| 15.247(e) | Power Spectral Density | N/A | Refer to Note |
| 15.247(a)(2) | 6 dB Bandwidth | N/A | Refer to Note |
| 15.247(d) | Conducted Out of Band Emissions | N/A | Refer to Note |
| 15.207 | AC Power Conducted Emissions | N/A | Refer to Note |
| 15.205 / 15.209 / 15.247(d) | Unwanted Emissions below 1 GHz | Pass | Minimum passing margin is -10.3 dB at 34.85 MHz |
| 15.205 / 15.209 / 15.247(d) | Unwanted Emissions above 1 GHz | Pass | Minimum passing margin is -4.9 dB at 2483.50 MHz |
| 15.203 | Antenna Requirement | Pass | Antenna connector is ipex not a standard connector. |

Note:

- Only test item of Unwanted Emissions and RF Output Power were performed for this report. Other testing data please refer to BV CPS report no.: RFBIBJ-WTW-P22010912-1.
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Specification | Expanded Uncertainty (k=2) (±) |
|--------------------------------|-----------------|-----------------------------------|
| RF Output Power | - | 1.371 dB |
| Unwanted Emissions below 1 GHz | 9 kHz ~ 30 MHz | 3.59 dB |
| | 30 MHz ~ 1 GHz | 3.64 dB |
| Unwanted Emissions above 1 GHz | 1 GHz ~ 18 GHz | 2.29 dB |
| | 18 GHz ~ 40 GHz | 2.29 dB |

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description

| | |
|-----------------------|--|
| Product | Camera Module |
| Brand | Chamberlain |
| Test Model | GDOCAMF1 |
| Status of EUT | Engineering sample |
| Power Supply Rating | Input: 100-240 Vac, 50-60 Hz, 0.3 A (from power board) Output: 5.0 Vdc, 1.0 A |
| Modulation Type | CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM |
| Modulation Technology | DSSS, OFDM |
| Transfer Rate | 802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to 150.0 Mbps |
| Operating Frequency | 2.412 GHz ~ 2.462 GHz |
| Number of Channel | 802.11b, 802.11g, 802.11n (HT20):11 802.11n (HT40):7 |
| Output Power | 77.983 mW (18.92 dBm) |

Note:

1. This report is issued as a supplementary report to the original report no.: RFBIBJ-WTW-P22010912-1. The differences compared with original report are refer as below. Therefore, only test item of Unwanted Emissions and RF Output Power were performed for this report.

- BT shielding change from (Frame+ COVER) to Soldering Cover) for SKU 2
- Add 2nd source for SKU 2
 - a. Flash/ IC/power IC vendor change
 - b. BT Matching component/MCU vendor change
 - c. 2.4G/5G RF component and diplexer vendor change

2. There're 2 SKU for the EUT listed as below.

| SKU | Model | Part number | Description |
|-----|----------|-------------|---------------------------------------|
| 1 | GDOCAMF1 | EVT RTK | Audio Amplifier-Realtek_ALC105-VF-CGT |
| 2 | | EVT TI | Audio Amplifier-TI_ TPA2011D1YFFR |

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

| Antenna No. | Brand | Model | Gain (dBi) | Antenna Type | Connector Type |
|-------------|-------|------------------------|-----------------|--------------|----------------|
| | | | 2400~2483.5 MHz | | |
| 1 | PSA | ASC_RFPCA511512IMLB301 | 4.3 | PCB | ipex(MHF) |

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The EUT incorporates a SISO function:

| 2.4 GHz Band | | |
|-----------------|-----------------------|-----|
| Modulation Mode | TX & RX Configuration | |
| 802.11b | 1TX | 1RX |
| 802.11g | 1TX | 1RX |
| 802.11n (HT20) | 1TX | 1RX |
| 802.11n (HT40) | 1TX | 1RX |

3.3 Channel List

11 channels are provided for 802.11b, 802.11g, 802.11n (HT20):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 1 | 2412 MHz | 7 | 2442 MHz |
| 2 | 2417 MHz | 8 | 2447 MHz |
| 3 | 2422 MHz | 9 | 2452 MHz |
| 4 | 2427 MHz | 10 | 2457 MHz |
| 5 | 2432 MHz | 11 | 2462 MHz |
| 6 | 2437 MHz | | |

7 channels are provided for 802.11n (HT40):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 3 | 2422 MHz | 7 | 2442 MHz |
| 4 | 2427 MHz | 8 | 2447 MHz |
| 5 | 2432 MHz | 9 | 2452 MHz |
| 6 | 2437 MHz | | |

3.4 Power Setting

| Power Setting | | | | | |
|---------------|---------|---------|----------------|---------|----------------|
| Channel | 802.11b | 802.11g | 802.11n (HT20) | Channel | 802.11n (HT40) |
| 1 | 42 | 44 | 43 | 3 | 43 |
| 6 | 42 | 48 | 46 | 6 | 46 |
| 11 | 42 | 43 | 42 | 9 | 42 |

3.5 Test Mode Applicability and Tested Channel Detail

Following channel(s) was (were) selected for the final test as listed below:

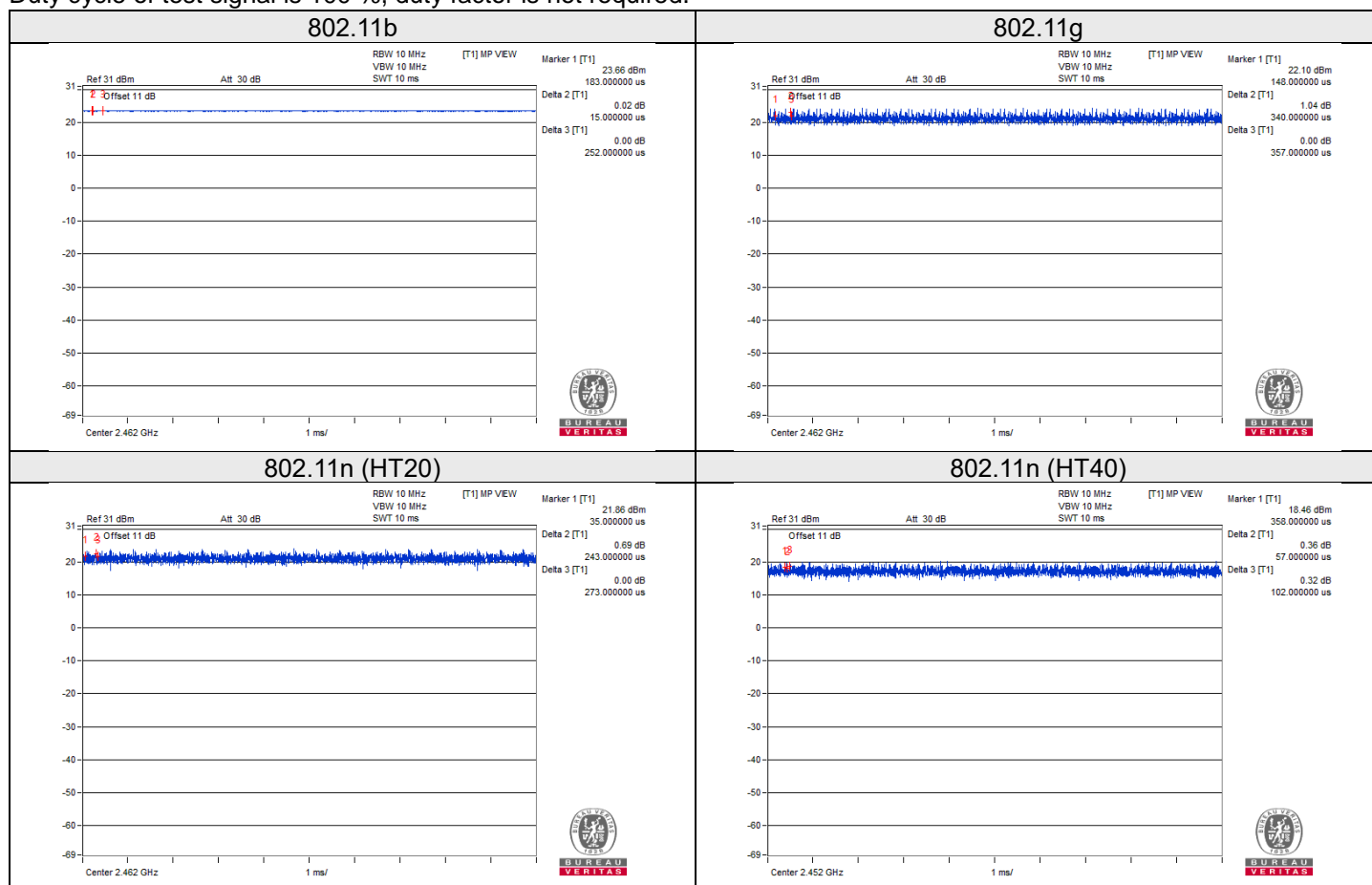
| Test Item | Mode | Tested Channel | Modulation | Data Rate Parameter |
|--------------------------------|----------------|----------------|------------|---------------------|
| RF Output Power | 802.11b | 1, 6, 11 | DBPSK | 1Mb/s |
| | 802.11g | 1, 6, 11 | BPSK | 6Mb/s |
| | 802.11n (HT20) | 1, 6, 11 | BPSK | MCS0 |
| | 802.11n (HT40) | 3, 6, 9 | BPSK | MCS0 |
| Unwanted Emissions below 1 GHz | 802.11b | 11 | DBPSK | 1Mb/s |
| Unwanted Emissions above 1 GHz | 802.11b | 1, 6, 11 | DBPSK | 1Mb/s |

Note:

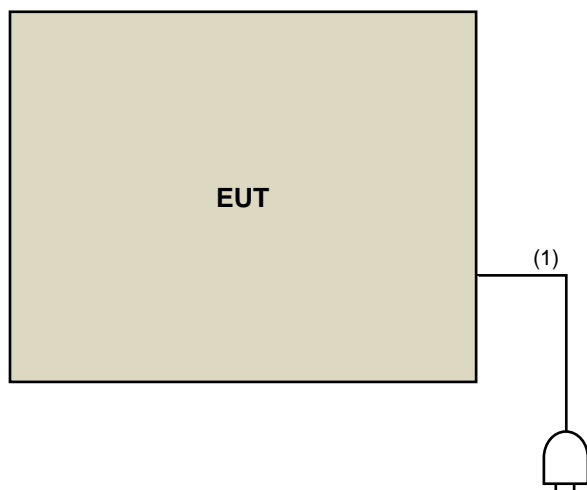
1. The SKU 2 for the EUT has been re-tested as the above test item.
2. For unwanted emission test item, the tested channel was chosen the maximum output power as mode represent to report.

3.6 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.



3.7 Connection Diagram of EUT and Peripheral Devices



Under Table

3.8 Configuration of Peripheral Devices and Cable Connections

| ID | Cable Descriptions | Qty. | Length (m) | Shielding (Yes/No) | Cores (Qty.) | Remarks |
|----|--------------------|------|------------|--------------------|--------------|-----------------------|
| 1. | AC power cable | 1 | 1.8 | N | 0 | Supplied by applicant |

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 RF Output Power

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|-----------------------------------|-----------|------------|--------------------|---------------------|
| Peak Power Analyzer Keysight | 8990B | MY51000485 | 2024/1/21 | 2025/1/20 |
| Wideband Power Sensor Keysight | N1923A | MY58020002 | 2024/1/18 | 2025/1/17 |
| | | MY58140009 | 2024/1/18 | 2025/1/17 |

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/5/27

4.2 Unwanted Emissions below 1 GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|-----------------------------------|------------------------------|--------------|--------------------|---------------------|
| Antenna Tower inn-co GmbH | MA 4000 | 010303 | N/A | N/A |
| Bi_Log Antenna Schwarzbeck | VULB 9168 | 9168-155 | 2023/10/13 | 2024/10/12 |
| EMI Test Receiver R&S | ESR3 | 102782 | 2023/12/7 | 2024/12/6 |
| Loop Antenna Electro-Metrics | EM-6879 | 269 | 2023/9/23 | 2024/9/22 |
| Loop Antenna TESEQ | HLA 6121 | 45745 | 2023/8/8 | 2024/8/7 |
| Preamplifier Agilent | 8447D | 2944A10631 | 2024/5/1 | 2025/4/30 |
| Preamplifier EMCI | EMC001340 | 980201 | 2023/9/27 | 2024/9/26 |
| RF Coaxial Cable Woken | 8D-FB | Cable-CH4-01 | 2023/7/8 | 2024/7/7 |
| Signal & Spectrum Analyzer R&S | FSW43 | 101582 | 2024/4/12 | 2025/4/11 |
| Software BV ADT | ADT_Radiated_ V7.6.15.9.5 | N/A | N/A | N/A |
| Turn Table BV ADT | TT100 | TT93021705 | N/A | N/A |
| Turn Table Controller BV ADT | SC100 | SC93021705 | N/A | N/A |

Notes:

1. The test was performed in HY - 966 chamber 3.
2. Tested Date: 2024/5/24

4.3 Unwanted Emissions above 1 GHz

| Description Manufacturer | Model No. | Serial No. | Calibrated Date | Calibrated Until |
|---------------------------------------|------------------------------|----------------------|--------------------|---------------------|
| Antenna Tower inn-co GmbH | MA 4000 | 010303 | N/A | N/A |
| Boresight antenna tower fixture BV | BAF-02 | 5 | N/A | N/A |
| EMI Test Receiver R&S | ESR3 | 102782 | 2023/12/7 | 2024/12/6 |
| Horn Antenna Schwarzbeck | BBHA 9120D | 9120D-408 | 2023/11/12 | 2024/11/11 |
| | BBHA 9170 | 9170-480 | 2023/11/12 | 2024/11/11 |
| | | BBHA9170241 | 2023/10/16 | 2024/10/15 |
| | | BBHA9170243 | 2023/11/12 | 2024/11/11 |
| Preamplifier EMCI | EMC 184045 | 980116 | 2023/9/27 | 2024/9/26 |
| Preamplifier Keysight | 83017A | MY53270295 | 2024/5/1 | 2025/4/30 |
| RF Coaxial Cable EMCI | EMC102-KM-KM-600 | 150928 | 2023/7/8 | 2024/7/7 |
| | EMC102-KM-KM-3000 | 150929 | 2023/7/8 | 2024/7/7 |
| RF Coaxial Cable HUBER+SUHNER | SUCOFLEX 104 | Cable-CH4-03(250724) | 2024/5/1 | 2025/4/30 |
| | Sucoflex 104 | MY 13380+295012/04 | 2024/5/1 | 2025/4/30 |
| Signal & Spectrum Analyzer R&S | FSW43 | 101582 | 2024/4/12 | 2025/4/11 |
| Software BV ADT | ADT_Radiated_ V7.6.15.9.5 | N/A | N/A | N/A |
| Turn Table BV ADT | TT100 | TT93021705 | N/A | N/A |
| Turn Table Controller BV ADT | SC100 | SC93021705 | N/A | N/A |

Notes:

1. The test was performed in HY - 966 chamber 3.
2. Tested Date: 2024/5/23 ~ 2024/5/24

5 Limits of Test Items

5.1 RF Output Power

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

5.2 Unwanted Emissions below 1 GHz

Radiated emissions up to 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30 dB below the highest level of the desired power:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| 0.009 ~ 0.490 | 2400/F(kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F(kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.3 Unwanted Emissions above 1 GHz

Radiated emissions above 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30 dB below the highest level of the desired power:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|-------------------|-----------------------------------|-------------------------------|
| Above 960 | 500 | 3 |

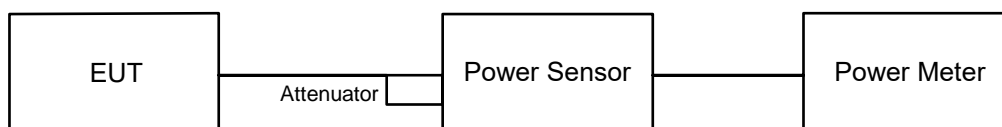
Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



6.1.2 Test Procedure

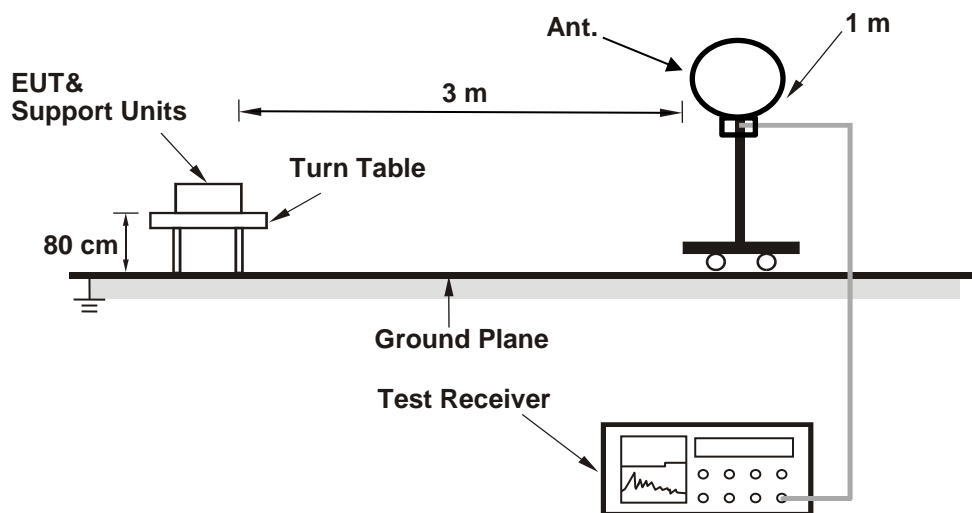
Average Power:

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

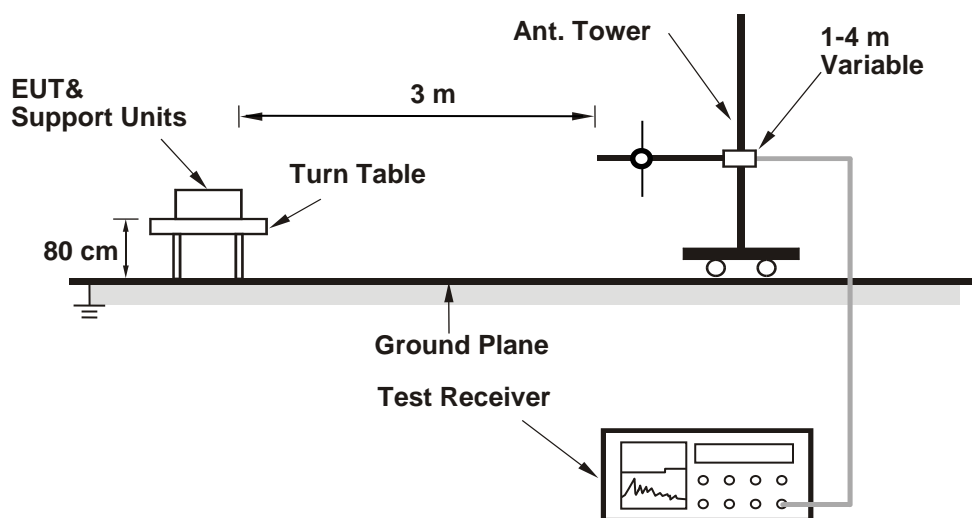
6.2 Unwanted Emissions below 1 GHz

6.2.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.2.2 Test Procedure

For Radiated emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30 MHz

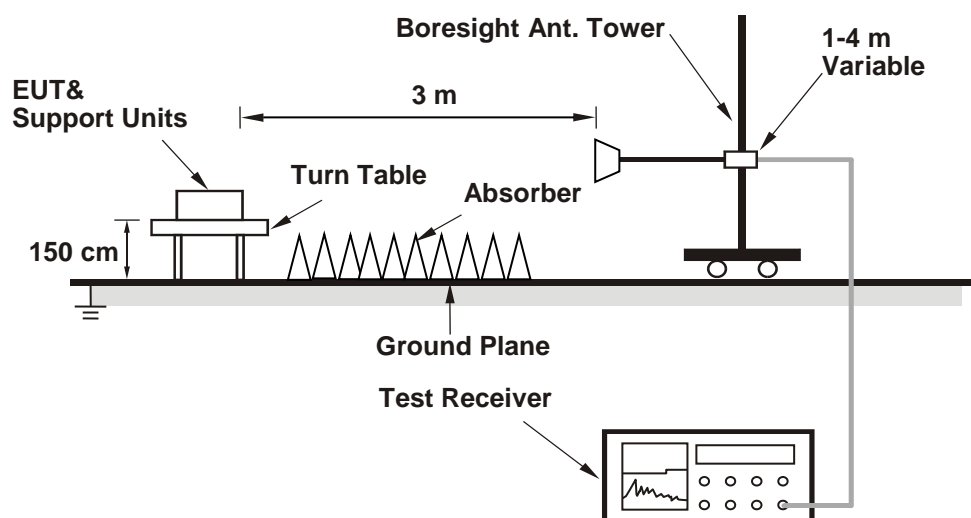
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

6.3 Unwanted Emissions above 1 GHz

6.3.1 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.3.2 Test Procedure

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Notes:

- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
- For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

| | | | | | |
|--------------|----------------|---------------------------|--------------|------------|--------------------|
| Input Power: | 120 Vac, 60 Hz | Environmental Conditions: | 25°C, 60% RH | Tested By: | Luis Lee/Wayne Lin |
|--------------|----------------|---------------------------|--------------|------------|--------------------|

802.11b

| Chan. | Chan. Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Power Limit (dBm) | Test Result |
|-------|-------------------|--------------------|---------------------|-------------------|-------------|
| 1 | 2412 | 66.069 | 18.20 | 30 | Pass |
| 6 | 2437 | 74.131 | 18.70 | 30 | Pass |
| 11 | 2462 | 77.983 | 18.92 | 30 | Pass |

Note: The antenna gain is 4.3 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11g

| Chan. | Chan. Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Power Limit (dBm) | Test Result |
|-------|-------------------|--------------------|---------------------|-------------------|-------------|
| 1 | 2412 | 38.019 | 15.80 | 30 | Pass |
| 6 | 2437 | 58.884 | 17.70 | 30 | Pass |
| 11 | 2462 | 42.658 | 16.30 | 30 | Pass |

Note: The antenna gain is 4.3 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11n (HT20)

| Chan. | Chan. Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Power Limit (dBm) | Test Result |
|-------|-------------------|--------------------|---------------------|-------------------|-------------|
| 1 | 2412 | 32.359 | 15.10 | 30 | Pass |
| 6 | 2437 | 45.709 | 16.60 | 30 | Pass |
| 11 | 2462 | 38.905 | 15.90 | 30 | Pass |

Note: The antenna gain is 4.3 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11n (HT40)

| Chan. | Chan. Freq. (MHz) | Average Power (mW) | Average Power (dBm) | Power Limit (dBm) | Test Result |
|-------|-------------------|--------------------|---------------------|-------------------|-------------|
| 3 | 2422 | 33.884 | 15.30 | 30 | Pass |
| 6 | 2437 | 48.978 | 16.90 | 30 | Pass |
| 9 | 2452 | 35.975 | 15.56 | 30 | Pass |

Note: The antenna gain is 4.3 dBi < 6 dBi, so the output power limit shall not be reduced.

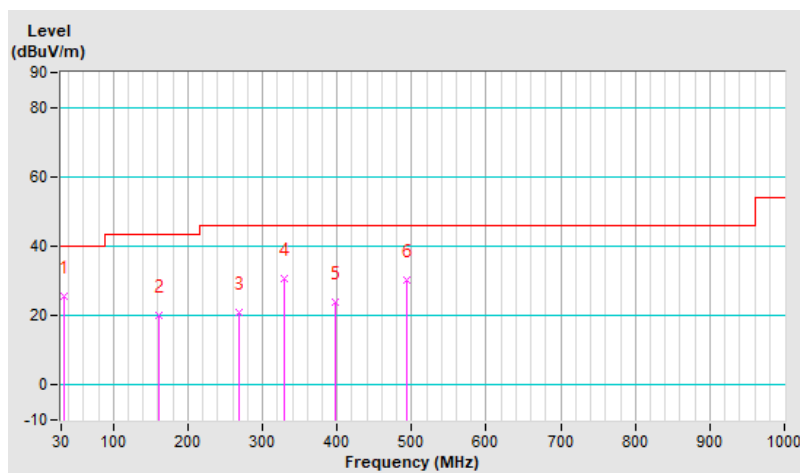
7.2 Unwanted Emissions below 1 GHz

| | | | |
|-----------------|----------------|-------------------------------|-------------------------------|
| RF Mode | 802.11b | Channel | CH 11 : 2462 MHz |
| Frequency Range | 30 MHz ~ 1 GHz | Detector Function & Bandwidth | QP: RB=120kHz, DET=Quasi-Peak |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 24 °C, 68 % RH |
| Tested By | Luis Lee | | |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 34.85 | 25.8 QP | 40.0 | -14.2 | 1.49 H | 265 | 35.8 | -10.0 |
| 2 | 161.92 | 20.1 QP | 43.5 | -23.4 | 1.01 H | 130 | 28.6 | -8.5 |
| 3 | 268.62 | 20.8 QP | 46.0 | -25.2 | 1.01 H | 35 | 29.1 | -8.3 |
| 4 | 328.76 | 30.6 QP | 46.0 | -15.4 | 1.49 H | 345 | 37.5 | -6.9 |
| 5 | 397.63 | 23.7 QP | 46.0 | -22.3 | 1.49 H | 265 | 29.4 | -5.7 |
| 6 | 493.66 | 30.1 QP | 46.0 | -15.9 | 1.49 H | 185 | 34.1 | -4.0 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

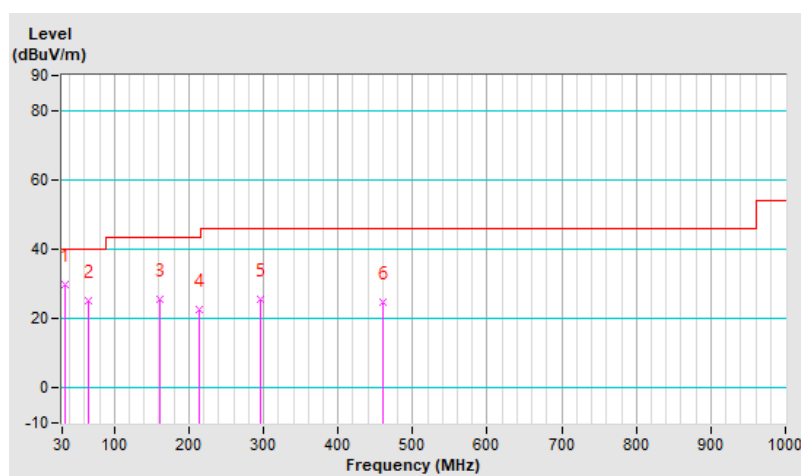


| | | | |
|-----------------|----------------|-------------------------------|-------------------------------|
| RF Mode | 802.11b | Channel | CH 11 : 2462 MHz |
| Frequency Range | 30 MHz ~ 1 GHz | Detector Function & Bandwidth | QP: RB=120kHz, DET=Quasi-Peak |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 24 °C, 68 % RH |
| Tested By | Luis Lee | | |

| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 34.85 | 29.7 QP | 40.0 | -10.3 | 1.00 V | 231 | 39.7 | -10.0 |
| 2 | 65.89 | 25.3 QP | 40.0 | -14.7 | 1.00 V | 0 | 35.4 | -10.1 |
| 3 | 161.92 | 25.7 QP | 43.5 | -17.8 | 1.49 V | 17 | 34.2 | -8.5 |
| 4 | 214.30 | 22.5 QP | 43.5 | -21.0 | 1.00 V | 154 | 33.8 | -11.3 |
| 5 | 296.75 | 25.5 QP | 46.0 | -20.5 | 1.00 V | 73 | 33.0 | -7.5 |
| 6 | 460.68 | 24.9 QP | 46.0 | -21.1 | 1.49 V | 237 | 29.3 | -4.4 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.3 Unwanted Emissions above 1 GHz

| | | | |
|------------------------|----------------|--|--|
| RF Mode | 802.11b | Channel | CH 1 : 2412 MHz |
| Frequency Range | 1 GHz ~ 25 GHz | Detector Function & Bandwidth | PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 24 °C, 68 % RH |
| Tested By | Luis Lee | | |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 61.8 PK | 74.0 | -12.2 | 1.00 H | 19 | 26.9 | 34.9 |
| 2 | 2390.00 | 48.4 AV | 54.0 | -5.6 | 1.00 H | 19 | 13.5 | 34.9 |
| 3 | *2412.00 | 106.0 PK | | | 1.00 H | 19 | 71.0 | 35.0 |
| 4 | *2412.00 | 103.4 AV | | | 1.00 H | 19 | 68.4 | 35.0 |
| 5 | 4824.00 | 51.6 PK | 74.0 | -22.4 | 1.00 H | 259 | 38.1 | 13.5 |
| 6 | 4824.00 | 41.1 AV | 54.0 | -12.9 | 1.00 H | 259 | 27.6 | 13.5 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | 2390.00 | 61.3 PK | 74.0 | -12.7 | 1.00 V | 166 | 26.4 | 34.9 |
| 2 | 2390.00 | 48.0 AV | 54.0 | -6.0 | 1.00 V | 166 | 13.1 | 34.9 |
| 3 | *2412.00 | 102.9 PK | | | 1.00 V | 166 | 67.9 | 35.0 |
| 4 | *2412.00 | 100.4 AV | | | 1.00 V | 166 | 65.4 | 35.0 |
| 5 | 4824.00 | 51.4 PK | 74.0 | -22.6 | 1.42 V | 310 | 37.9 | 13.5 |
| 6 | 4824.00 | 40.7 AV | 54.0 | -13.3 | 1.42 V | 310 | 27.2 | 13.5 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

| | | | |
|------------------------|----------------|--|--|
| RF Mode | 802.11b | Channel | CH 6 : 2437 MHz |
| Frequency Range | 1 GHz ~ 25 GHz | Detector Function & Bandwidth | PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 24 °C, 68 % RH |
| Tested By | Luis Lee | | |

| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 106.4 PK | | | 1.00 H | 23 | 71.4 | 35.0 |
| 2 | *2437.00 | 103.9 AV | | | 1.00 H | 23 | 68.9 | 35.0 |
| 3 | 4874.00 | 51.9 PK | 74.0 | -22.1 | 1.00 H | 233 | 38.2 | 13.7 |
| 4 | 4874.00 | 41.2 AV | 54.0 | -12.8 | 1.00 H | 233 | 27.5 | 13.7 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2437.00 | 102.3 PK | | | 1.00 V | 169 | 67.3 | 35.0 |
| 2 | *2437.00 | 99.8 AV | | | 1.00 V | 169 | 64.8 | 35.0 |
| 3 | 4874.00 | 51.5 PK | 74.0 | -22.5 | 1.38 V | 320 | 37.8 | 13.7 |
| 4 | 4874.00 | 40.8 AV | 54.0 | -13.2 | 1.38 V | 320 | 27.1 | 13.7 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

| | | | |
|-----------------|----------------|-------------------------------|--|
| RF Mode | 802.11b | Channel | CH 11 : 2462 MHz |
| Frequency Range | 1 GHz ~ 25 GHz | Detector Function & Bandwidth | PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak |
| Input Power | 120 Vac, 60 Hz | Environmental Conditions | 24 °C, 68 % RH |
| Tested By | Luis Lee | | |

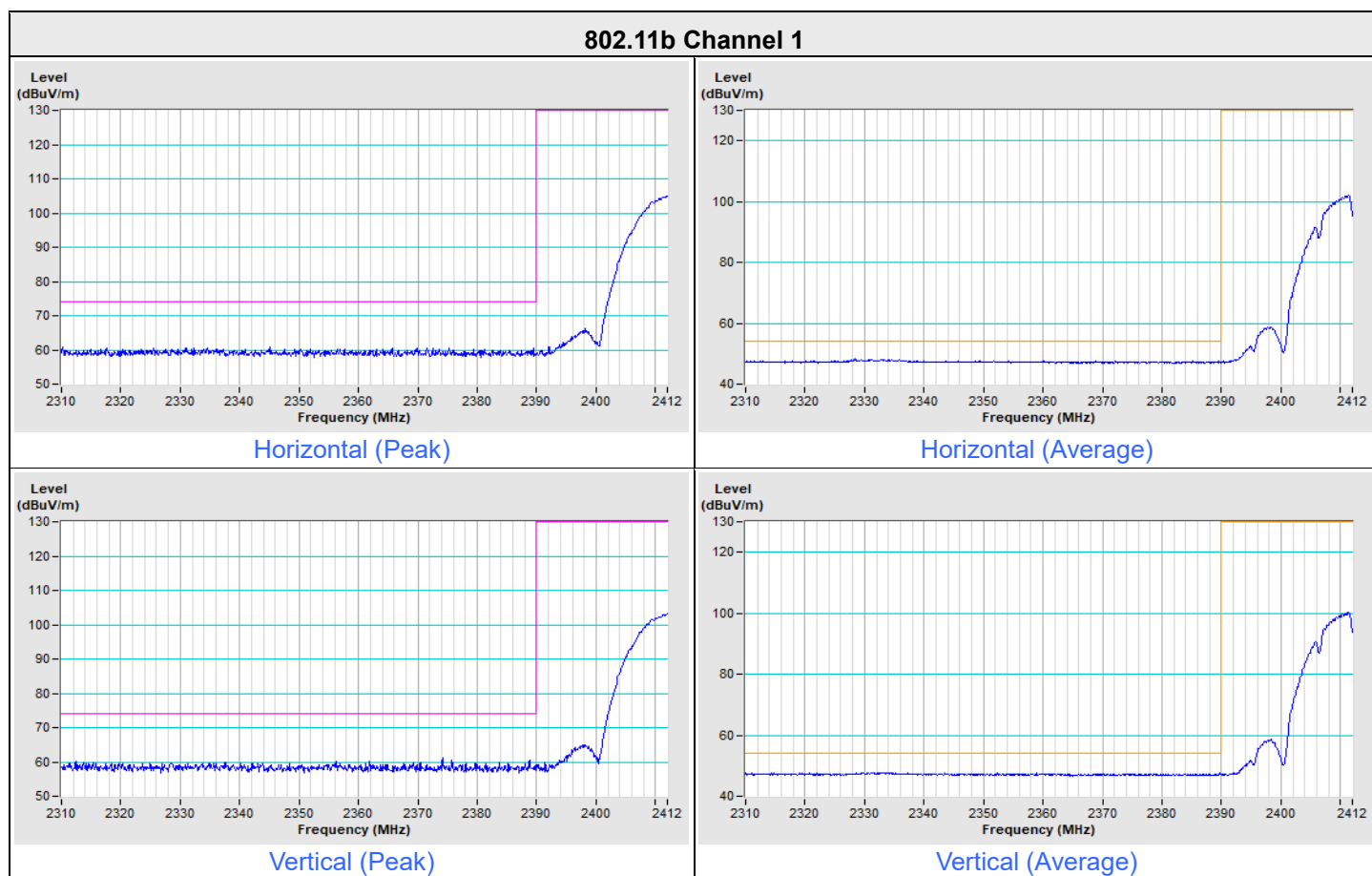
| Antenna Polarity & Test Distance : Horizontal at 3 m | | | | | | | | |
|--|-----------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|--------------------------|
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 106.4 PK | | | 1.00 H | 22 | 71.2 | 35.2 |
| 2 | *2462.00 | 103.8 AV | | | 1.00 H | 22 | 68.6 | 35.2 |
| 3 | 2483.50 | 60.2 PK | 74.0 | -13.8 | 1.00 H | 22 | 25.1 | 35.1 |
| 4 | 2483.50 | 49.1 AV | 54.0 | -4.9 | 1.00 H | 22 | 14.0 | 35.1 |
| 5 | 4924.00 | 51.8 PK | 74.0 | -22.2 | 1.05 H | 266 | 38.2 | 13.6 |
| 6 | 4924.00 | 41.2 AV | 54.0 | -12.8 | 1.05 H | 266 | 27.6 | 13.6 |
| Antenna Polarity & Test Distance : Vertical at 3 m | | | | | | | | |
| No | Frequency (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Correction Factor (dB/m) |
| 1 | *2462.00 | 102.2 PK | | | 1.01 V | 172 | 67.0 | 35.2 |
| 2 | *2462.00 | 99.4 AV | | | 1.01 V | 172 | 64.2 | 35.2 |
| 3 | 2483.50 | 59.8 PK | 74.0 | -14.2 | 1.01 V | 172 | 24.7 | 35.1 |
| 4 | 2483.50 | 49.0 AV | 54.0 | -5.0 | 1.01 V | 172 | 13.9 | 35.1 |
| 5 | 4924.00 | 51.5 PK | 74.0 | -22.5 | 1.42 V | 315 | 37.9 | 13.6 |
| 6 | 4924.00 | 40.9 AV | 54.0 | -13.1 | 1.42 V | 315 | 27.3 | 13.6 |

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

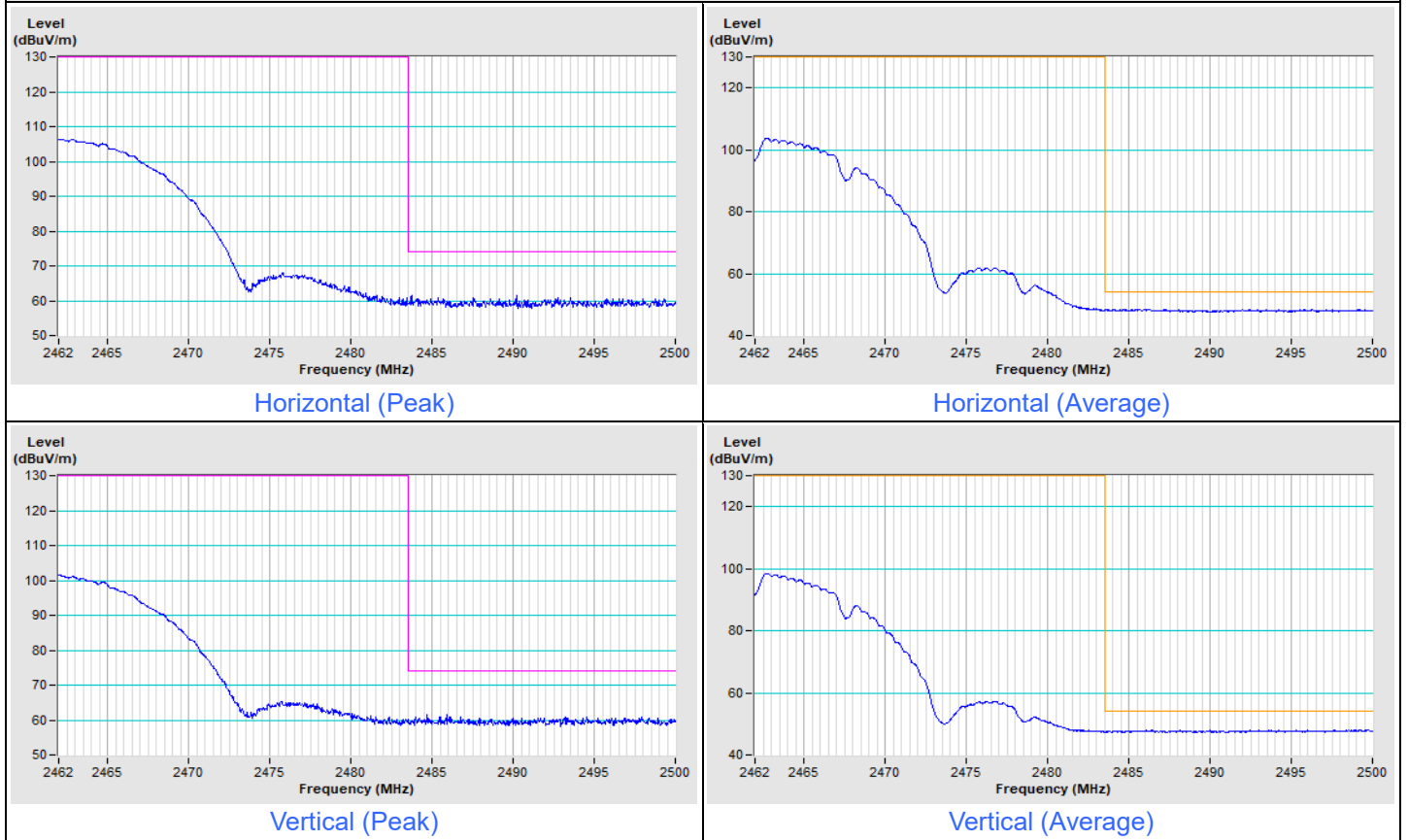
Plot of Band Edge

| | | | |
|-----------------|----------------------|-------------------------------|--|
| Frequency Range | 2.31 GHz ~ 2.412 GHz | Detector Function & Bandwidth | PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak |
|-----------------|----------------------|-------------------------------|--|



| | | | |
|-----------------|---------------------|-------------------------------|--|
| Frequency Range | 2.462 GHz ~ 2.5 GHz | Detector Function & Bandwidth | PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak |
|-----------------|---------------------|-------------------------------|--|

802.11b Channel 11



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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