

# TEST REPORT

## CERTIFICATE OF CONFORMITY

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

**Report No.:** RFBAOZ-WTW-P22010912A

**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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kewi Shan Dist., Taoyuan City 33383, Taiwan

**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	Original release.	2024/7/3

## Report Issue History Record

Issue No.	Description	Date Issued
RFBIBJ-WTW-P22010912	Original Release	2022/5/4
RFBIBJ-WTW-P22010912A	<ol style="list-style-type: none"> <li>1. BT shielding change from (Frame+ COVER) to Soldering Cover) for SKU 2</li> <li>2. Add 2nd source for SKU 2               <ol style="list-style-type: none"> <li>a. Flash/ IC/power IC vendor change</li> <li>b. BT Matching component/MCU vendor change</li> <li>c. 2.4G/5G RF component and diplexer vendor change</li> </ol> </li> </ol>	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 -12.1 dB at 35.82 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -5.4 dB at 2483.50 MHz
15.203	Antenna Requirement	Pass	Antenna connector is ipex not a standard connector.

Note:

1. 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.
2. 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:

Parameter	Specification	Uncertainty (±)
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	GFSK
Transfer Rate	2 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	1.028 mW (0.12 dBm)

Note:

1. This report is issued as a supplementary report to the original report no.: RFBIBJ-WTW-P22010912. 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_RFFPA252104IMLB301	4.25	PCB	ipex(MHF)

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

### 3.3 Channel List

40 channels are provided for BT-LE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

### 3.4 Power Setting

Channel	Power Setting
0	Default
19	Default
39	Default

### 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	BT-LE 2M	0, 19, 39	GFSK	2Mb/s
Unwanted Emissions below 1 GHz	BT-LE 2M	0	GFSK	2Mb/s
Unwanted Emissions above 1 GHz	BT-LE 2M	0, 19, 39	GFSK	2Mb/s

Note:

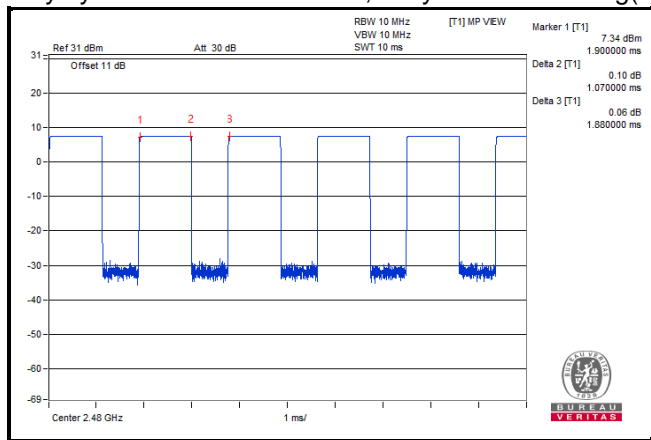
1. The SKU 2 for the EUT has been re-tested as the above test item.
2. For unwanted emission test item, the tested channel was chosen the maximum output power as mode represent to report.



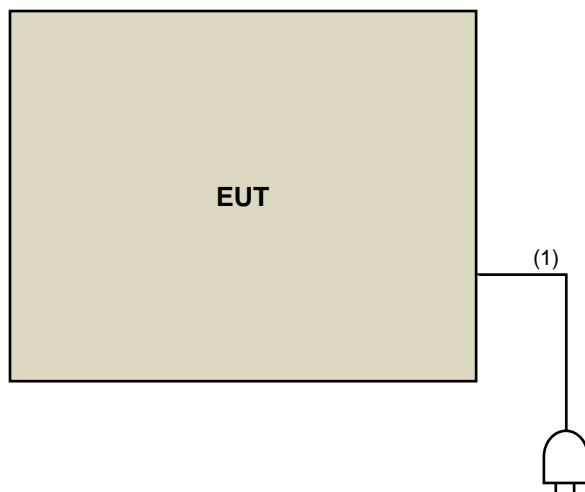
### 3.6 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor shall be considered.

$$\text{Duty cycle} = 1.07/1.88 = 0.569, \text{ Duty factor} = 10 * \log(1/0.569) = 2.45$$



### 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

## 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 20 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 20 dB below the highest level of the desired power:

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

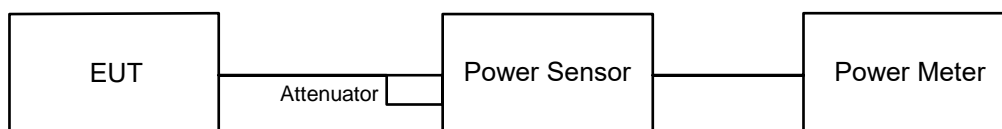
Notes:

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

##### Peak Power:

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

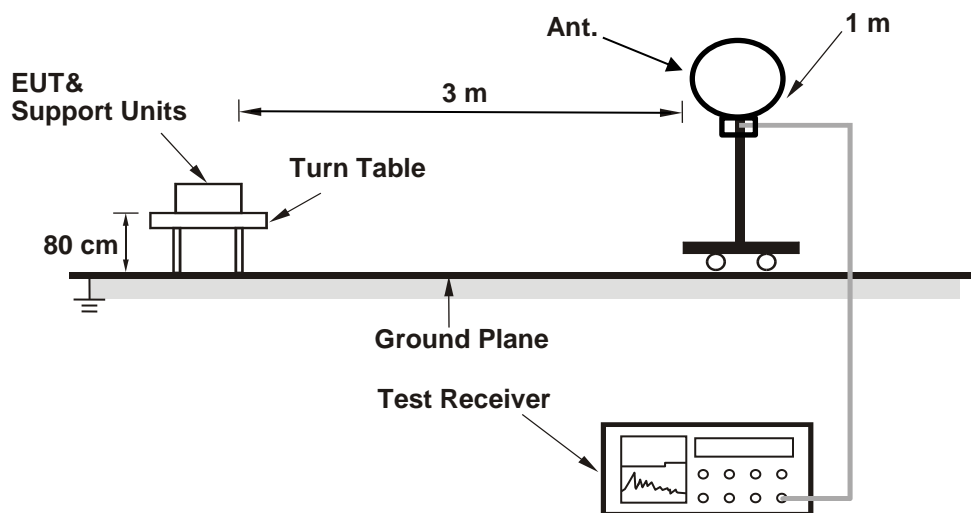
##### Average Power:

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.

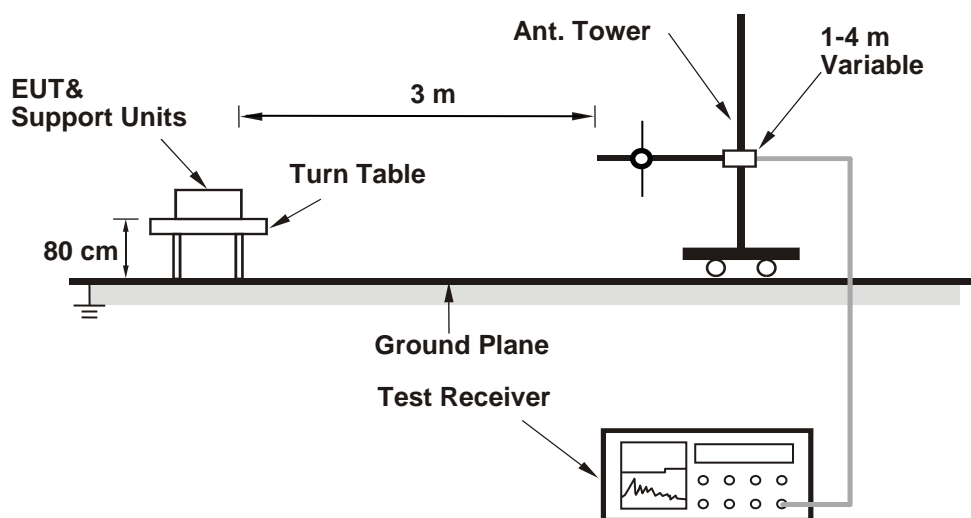
## 6.2 Unwanted Emissions below 1 GHz

### 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

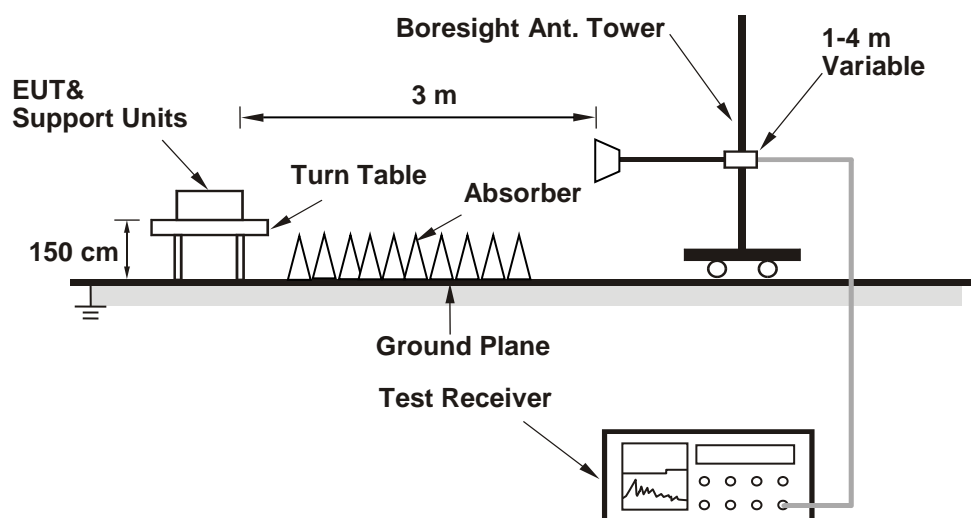
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the 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/spectrum analyzer 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 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
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#### For Peak Power

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	1.028	0.12	30	Pass
19	2440	0.9078	-0.42	30	Pass
39	2480	0.7962	-0.99	30	Pass

Note: The antenna gain is 4.25 dBi < 6 dBi, so the output power limit shall not be reduced.

#### For Average Power

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	0.9954	-0.02
19	2440	0.875	-0.58
39	2480	0.7603	-1.19

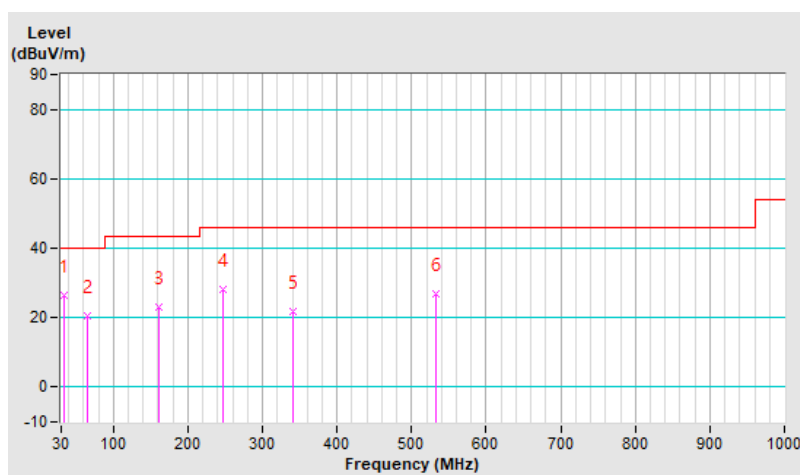
## 7.2 Unwanted Emissions below 1 GHz

RF Mode	BT-LE 2M	Channel	CH 0 : 2402 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	26.3 QP	40.0	-13.7	1.01 H	18	36.3	-10.0
2	65.89	20.6 QP	40.0	-19.4	1.49 H	131	30.7	-10.1
3	161.92	23.2 QP	43.5	-20.3	1.49 H	278	31.7	-8.5
4	247.28	28.3 QP	46.0	-17.7	1.49 H	234	37.7	-9.4
5	340.40	21.8 QP	46.0	-24.2	1.01 H	120	28.6	-6.8
6	532.46	26.9 QP	46.0	-19.1	1.49 H	207	30.1	-3.2

### 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.

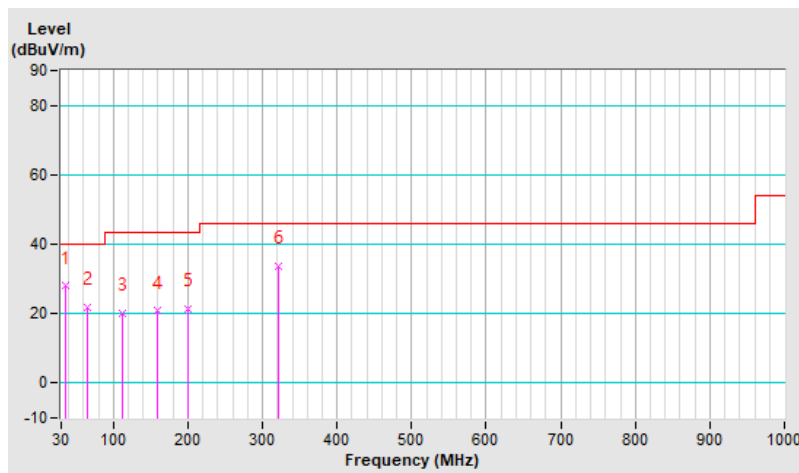


<b>RF Mode</b>	BT-LE 2M	<b>Channel</b>	CH 0 : 2402 MHz
<b>Frequency Range</b>	30 MHz ~ 1 GHz	<b>Detector Function &amp; Bandwidth</b>	QP: RB=120kHz, DET=Quasi-Peak
<b>Input Power</b>	120 Vac, 60 Hz	<b>Environmental Conditions</b>	24 °C, 68 % RH
<b>Tested By</b>	Luis Lee		

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	35.82	27.9 QP	40.0	-12.1	1.49 V	94	37.8	-9.9
2	65.89	21.9 QP	40.0	-18.1	1.00 V	19	32.0	-10.1
3	112.45	20.2 QP	43.5	-23.3	1.00 V	56	31.9	-11.7
4	159.98	20.7 QP	43.5	-22.8	1.00 V	287	29.3	-8.6
5	200.72	21.5 QP	43.5	-22.0	1.00 V	6	33.1	-11.6
6	321.97	33.5 QP	46.0	-12.5	1.49 V	66	40.4	-6.9

**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

<b>RF Mode</b>	BT-LE 2M	<b>Channel</b>	CH 0 : 2402 MHz
<b>Frequency Range</b>	1 GHz ~ 25 GHz	<b>Detector Function &amp; Bandwidth</b>	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
<b>Input Power</b>	120 Vac, 60 Hz	<b>Environmental Conditions</b>	24 °C, 68 % RH
<b>Tested By</b>	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	60.7 PK	74.0	-13.3	1.67 H	127	25.8	34.9
2	2390.00	47.4 AV	54.0	-6.6	1.67 H	127	12.5	34.9
3	*2402.00	97.9 PK			1.67 H	127	63.1	34.8
4	*2402.00	95.1 AV			1.67 H	127	60.3	34.8
5	4804.00	53.5 PK	74.0	-20.5	2.51 H	247	39.9	13.6
6	4804.00	41.5 AV	54.0	-12.5	2.51 H	247	27.9	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	2390.00	60.3 PK	74.0	-13.7	1.20 V	189	25.4	34.9
2	2390.00	47.1 AV	54.0	-6.9	1.20 V	189	12.2	34.9
3	*2402.00	92.7 PK			1.20 V	189	57.9	34.8
4	*2402.00	89.8 AV			1.20 V	189	55.0	34.8
5	4804.00	51.9 PK	74.0	-22.1	1.48 V	229	38.3	13.6
6	4804.00	39.9 AV	54.0	-14.1	1.48 V	229	26.3	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.



<b>RF Mode</b>	BT-LE 2M	<b>Channel</b>	CH 19 : 2440 MHz
<b>Frequency Range</b>	1 GHz ~ 25 GHz	<b>Detector Function &amp; Bandwidth</b>	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
<b>Input Power</b>	120 Vac, 60 Hz	<b>Environmental Conditions</b>	24 °C, 68 % RH
<b>Tested By</b>	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	*2440.00	97.5 PK			1.46 H	155	62.5	35.0
2	*2440.00	94.6 AV			1.46 H	155	59.6	35.0
3	4880.00	51.4 PK	74.0	-22.6	2.48 H	244	37.7	13.7
4	4880.00	39.5 AV	54.0	-14.5	2.48 H	244	25.8	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	*2440.00	92.4 PK			1.28 V	188	57.4	35.0
2	*2440.00	89.3 AV			1.28 V	188	54.3	35.0
3	4880.00	51.8 PK	74.0	-22.2	1.50 V	233	38.1	13.7
4	4880.00	39.9 AV	54.0	-14.1	1.50 V	233	26.2	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.



<b>RF Mode</b>	BT-LE 2M	<b>Channel</b>	CH 39 : 2480 MHz
<b>Frequency Range</b>	1 GHz ~ 25 GHz	<b>Detector Function &amp; Bandwidth</b>	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
<b>Input Power</b>	120 Vac, 60 Hz	<b>Environmental Conditions</b>	24 °C, 68 % RH
<b>Tested By</b>	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	*2480.00	97.7 PK			1.75 H	159	62.6	35.1
2	*2480.00	95.0 AV			1.75 H	159	59.9	35.1
3	2483.50	59.1 PK	74.0	-14.9	1.75 H	159	24.0	35.1
4	<b>2483.50</b>	<b>48.6 AV</b>	<b>54.0</b>	<b>-5.4</b>	<b>1.75 H</b>	<b>159</b>	<b>13.5</b>	<b>35.1</b>
5	4960.00	53.1 PK	74.0	-20.9	2.49 H	245	39.5	13.6
6	4960.00	41.2 AV	54.0	-12.8	2.49 H	245	27.6	13.6

**Antenna Polarity & Test Distance : Vertical at 3 m**

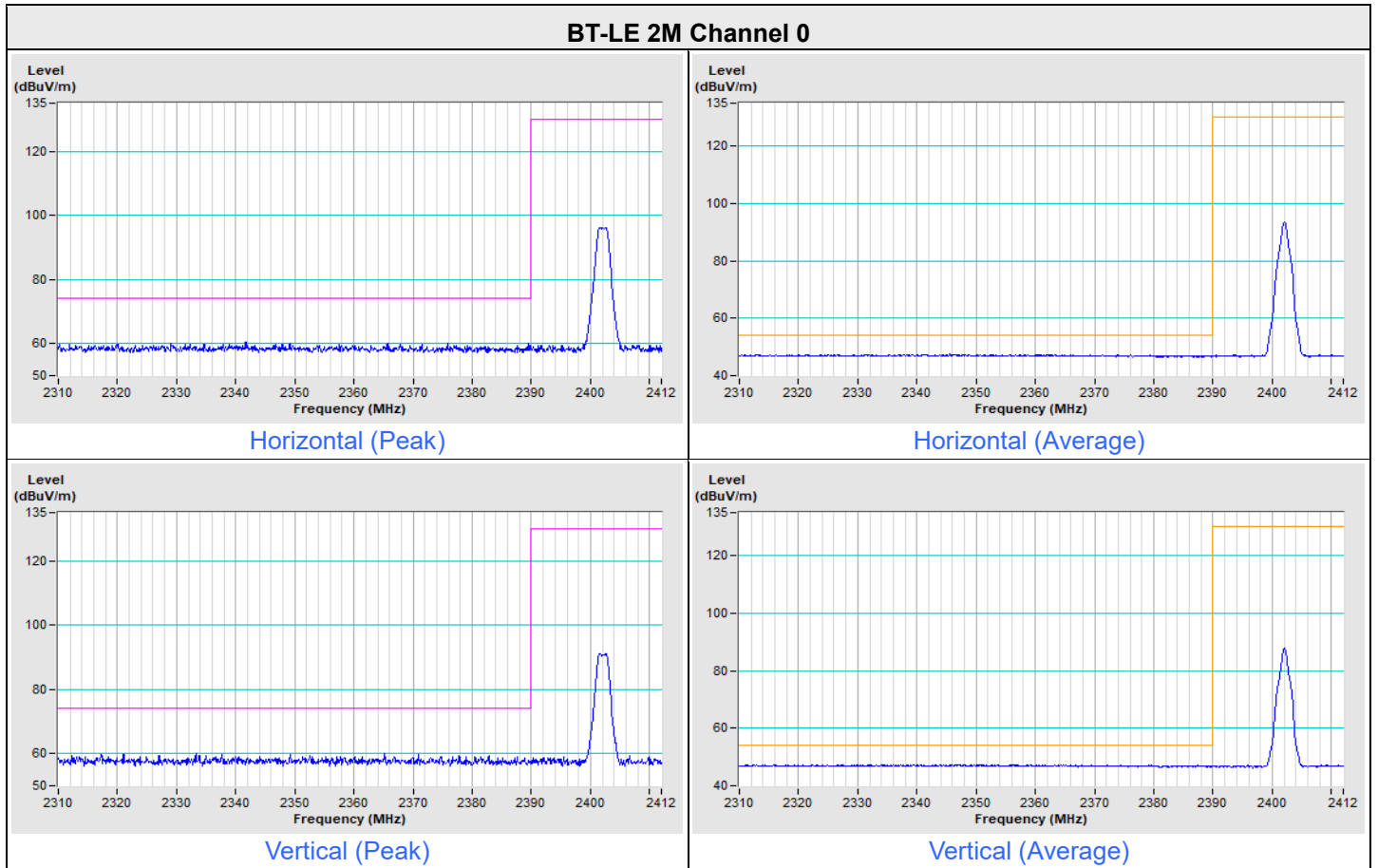
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	92.5 PK			1.25 V	190	57.4	35.1
2	*2480.00	89.6 AV			1.25 V	190	54.5	35.1
3	2483.50	59.0 PK	74.0	-15.0	1.25 V	190	23.9	35.1
4	2483.50	48.3 AV	54.0	-5.7	1.25 V	190	13.2	35.1
5	4960.00	52.7 PK	74.0	-21.3	1.47 V	231	39.1	13.6
6	4960.00	40.8 AV	54.0	-13.2	1.47 V	231	27.2	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.

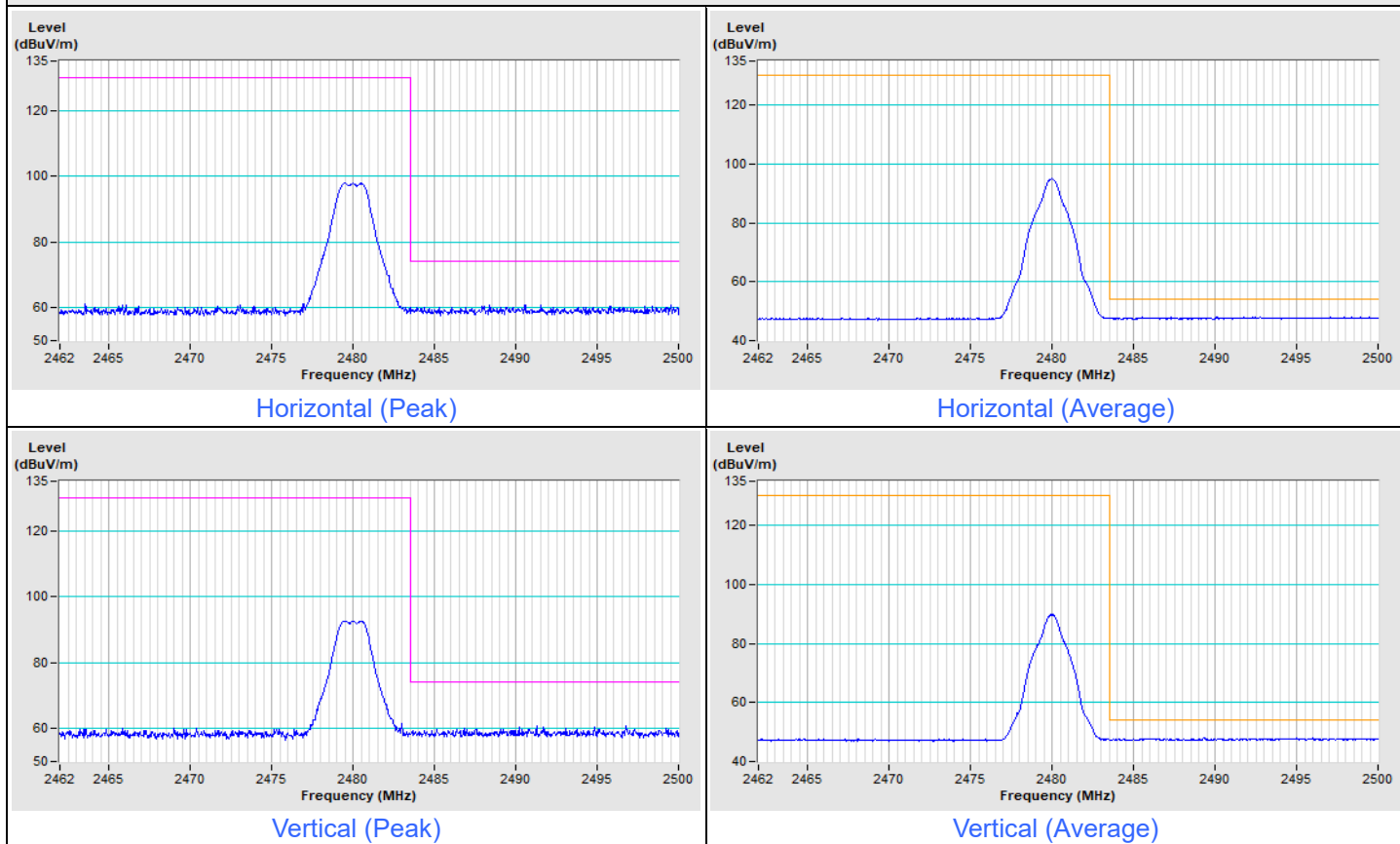
### Plot of Band Edge

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=1 kHz, DET=Peak
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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=1 kHz, DET=Peak
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**BT-LE 2M Channel 39**





## 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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