

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
Report No.: RFBBUI-WTW-P21040655Z-3
FCC ID: TX2-RTL8852BE
Product: 11ax RTL8852BE Combo module
Brand: REALTEK
Model No.: RTL8852BE
Received Date: 2024/2/6
Test Date: 2024/3/21 ~ 2024/5/27
Issued Date: 2024/5/31

Applicant: Realtek Semiconductor Corp.

Address: No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan

FCC Registration / 723255 / TW2022

Designation Number:

Approved by: _____

May Chen / Manager

Date: _____

2024/5/31

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Prepared by : Phoenix Huang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBBUI-WTW-P21040655Z-3	Original release.	2024/5/31

1 Certificate

Product: 11ax RTL8852BE Combo module

Brand: REALTEK

Test Model: RTL8852BE

Sample Status: Engineering sample

Applicant: Realtek Semiconductor Corp.

Test Date: 2024/3/21 ~ 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 1 below
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note 1 below
15.247(d)	Conducted Out of Band Emissions	N/A	Refer to Note 1 below
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -16.59 dB at 0.15781 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -4.7 dB at 896.21 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -8.0 dB at 2483.50 MHz
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

Note:

1. Only RF Output Power, AC Power Conducted Emissions and Unwanted Emissions test items were performed for this addendum. The others testing data refer to original test report.
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	-	1.1 dB
AC Power Conducted Emissions	150 kHz ~ 30 MHz	1.9 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.1 dB
	30 MHz ~ 1 GHz	5.1 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.1 dB
	18 GHz ~ 40 GHz	5.3 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	11ax RTL8852BE Combo module
Brand	REALTEK
Test Model	RTL8852BE
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 2 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	17.061 mW (12.32 dBm)

Note:

- This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RFBBUI-WTW-P21040655E-3 as the following:
 - ◆ Add PCIe+USB E-Key for dual antenna SKU.
 - ◆ Add component (R4) for identified voltage in the new interface.
 - ◆ Software change.
- According to above conditions, only RF Output Power, AC Power Conducted Emissions and Unwanted Emissions test items need to be performed and all data was tested to meet the requirements.
- There are Bluetooth and WLAN (2.4 GHz & 5 GHz) technology used for the EUT.
- Simultaneously transmission condition.

Condition	Technology	
1	WLAN (5 GHz)	Bluetooth

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

- The EUT has below HW SKU configuration, as below table:

Original		
SKU No.	Interface	Description
1	PCIe + USB (AE-Key)	Single antenna port
2	PCIe + USB (AE-Key)	Dual antenna port
3	PCIe + UART (E-Key)	Dual antenna port
Newly		
SKU No.	Interface	Description
4	PCIe + USB (E-Key)	Dual antenna port

- 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.

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Frequency Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
1	Chain 0	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-JP326-MHF4300	3.5	2.4~2.4835	PIFA	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
2	Chain 0	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-C38H1-MHF4300	3	2.4~2.4835	Dipole	i-pex(MHF)	300
				5	5.15~5.85			
				5	5.875~7.125			
3	Chain 0	ARISTOTLE	RFA-27-JP378-4B-200	3.38	2.4~2.4835	Monopole	i-pex(MHF)	200
				4.81	5.15~5.85			
				4.86	5.875~7.125			
	Chain 1	ARISTOTLE	RFA-27-JP378-4B-200	3.38	2.4~2.4835	Monopole	i-pex(MHF)	200
				4.81	5.15~5.85			
				4.86	5.875~7.125			

Note: The Bluetooth technology will fix transmission on Chain 1.

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

3.3 Channel List

40 channels are provided to this EUT:

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

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture)
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Following channel(s) was (were) selected for the final test as listed below:

Test Item	EUT Configure Mode	Power Profile	Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power	-	High	BT-LE 1M	0, 19, 39	GFSK	1Mb/s
			BT-LE 2M	1, 19, 38	GFSK	2Mb/s
AC Power Conducted Emissions	A	High	BT-LE 2M	1	GFSK	2Mb/s
Unwanted Emissions below 1 GHz	A, B, C	High	BT-LE 2M	1	GFSK	2Mb/s
Unwanted Emissions above 1 GHz	A, B, C	High	BT-LE 2M	1, 19, 38	GFSK	2Mb/s
EUT Configure Mode:	A	PIFA antenna with PCIe + USB E key interface + dual antenna port				
	B	Dipole antenna with PCIe + USB E key interface + dual antenna port				
	C	Monopole antenna with PCIe + USB E key interface + dual antenna port				

Note:

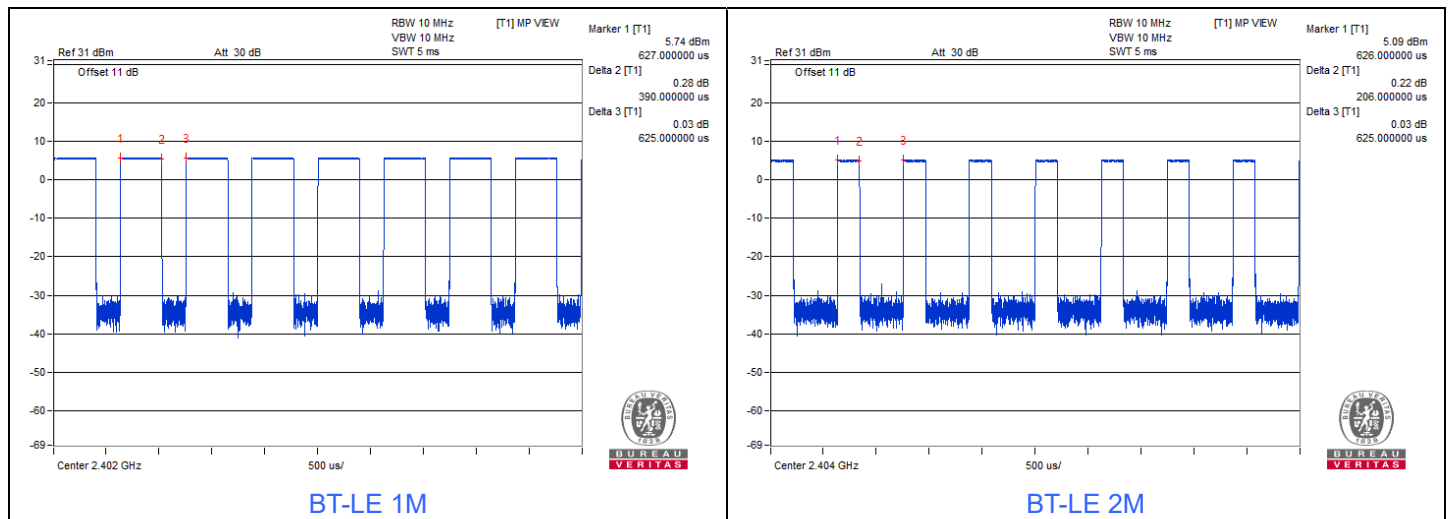
1. Bluetooth technology will fix transmission on Chain 1.
2. In the original report: For EUT antennas, the worst case was found when positioned on (X / Y / Z axis):
 - PIFA antenna: X-axis,
 - Dipole antenna: Y-axis used for typical placement,
 - Monopole antenna: Y-axis



3.5 Duty Cycle of Test Signal

BT-LE 1M: Duty cycle = $0.39 \text{ ms} / 0.625 \text{ ms} \times 100\% = 62.4\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 2.05 \text{ dB}$

BT-LE 2M: Duty cycle = $0.206 \text{ ms} / 0.625 \text{ ms} \times 100\% = 33.0\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 4.82 \text{ dB}$

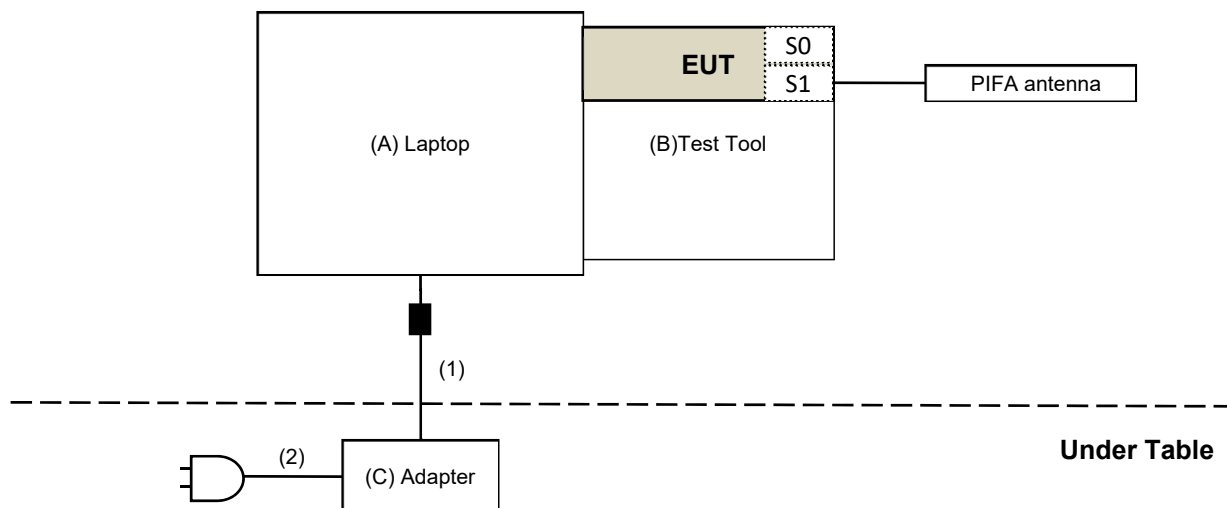


3.6 Test Program Used and Operation Descriptions

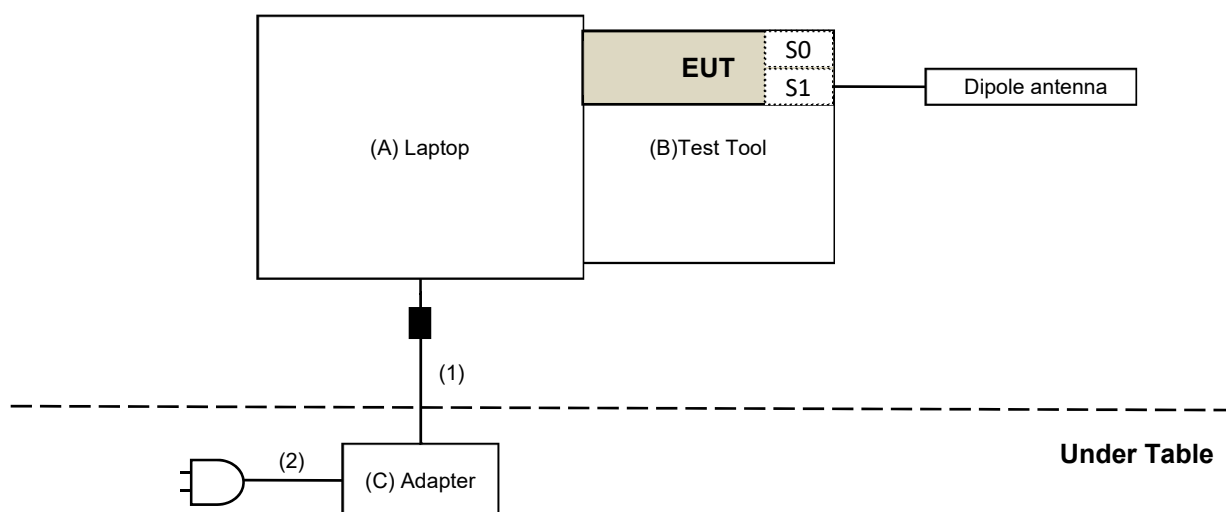
Controlling software (Bluetooth RF test tool (5.2.4.7)) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices

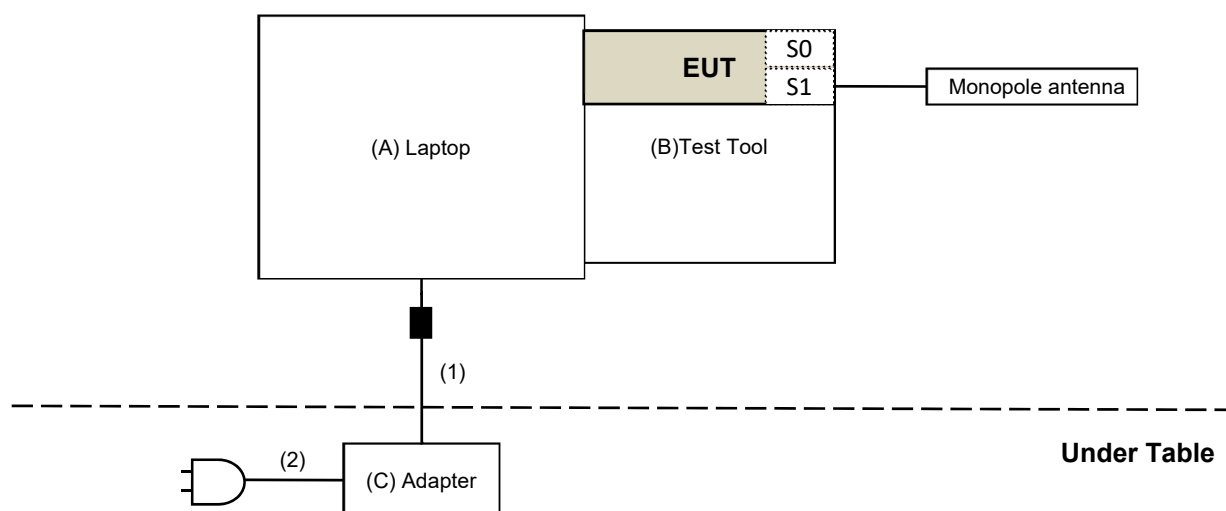
Mode A



Mode B



Mode C



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B	Test Tool	Realtek	N/A	N/A	N/A	Supplied by applicant
C	Adapter	DELL	LA65NS2-01	N/A	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	No	1	Provided by Lab
2	AC Cable	1	1	No	0	Provided by Lab

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
Pulse Power Sensor Anritsu	MA2411B	1726434	2023/6/19	2024/6/18
RF Power Meter Anritsu	ML2495A	1529002	2023/6/17	2024/6/16

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2024/5/24

4.2 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance Telegartner	50 ohm	3	2023/10/20	2024/10/19
EMI Test Receiver R&S	ESCS 30	847124/029	2023/10/18	2024/10/17
Fixed Attenuator STI	STI02-2200-10	005	2024/2/19	2025/2/18
LISN R&S	ESH3-Z5	835239/001	2023/4/6	2024/4/5
		848773/004	2023/10/13	2024/10/12
RF Coaxial Cable JYEBAO	5D-FB	COCCAB-001	2024/2/19	2025/2/18
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2024/3/21 ~ 2024/3/22

4.3 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0842	2023/10/12	2024/10/11
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR7	102026	2023/4/6	2024/4/5
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2023/12/12	2024/12/11
Loop Antenna Electro-Metrics	EM-6879	264	2024/2/23	2025/2/22
Preamplifier EMCI	EMC330N	980538	2023/4/6	2024/4/5
	EMC001340	980142	2024/2/19	2025/2/18
PXA Signal Analyzer Keysight	N9030B	MY57141948	2023/5/19	2024/5/18
RF Coaxial Cable JYEBAO	5D-FB	LOOPCAB-001	2024/2/19	2025/2/18
		LOOPCAB-002	2024/2/19	2025/2/18
RF Coaxial Cable PEWC	8D	966-5-1	2023/4/6	2024/4/5
		966-5-2	2023/4/6	2024/4/5
		966-5-3	2023/4/6	2024/4/5
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2024/3/22 ~ 2024/3/25

4.4 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR7	102026	2024/3/25	2025/3/24
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2023/11/12	2024/11/11
	BBHA 9170	9170-739	2023/11/12	2024/11/11
Preamplifier EMCI	EMC12630SE	980509	2024/1/29	2025/1/28
	EMC184045SE	980387	2023/8/9	2024/8/8
PXA Signal Analyzer Keysight	N9030B	MY57141948	2024/5/20	2025/5/19
RF Coaxial Cable EMCI	EMC102-KM-KM-1200	160924	2024/1/29	2025/1/28
	EMC102-KM-KM-4000	200214	2024/1/29	2025/1/28
	EMC104-SM-SM-1500	180503	2024/3/16	2025/3/15
	EMC104-SM-SM-2000	180501	2024/3/16	2025/3/15
	EMC104-SM-SM-6000	180506	2024/3/16	2025/3/15
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2024/5/27

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 AC Power Conducted Emissions

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.3 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).

5.4 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

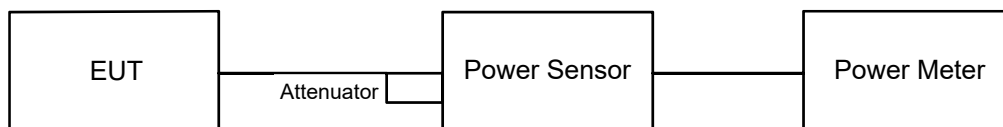
Notes:

3. The lower limit shall apply at the transition frequencies.
4. Emission level (dBuV/m) = 20 log Emission level (uV/m).
5. 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:

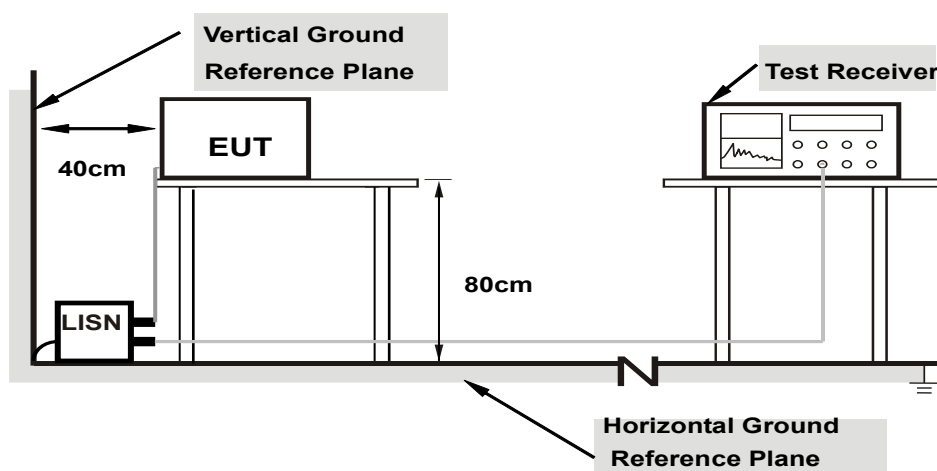
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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 AC Power Conducted Emissions

6.2.1 Test Setup



Note: 1.Support units were connected to second LISN.

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

6.2.2 Test Procedure

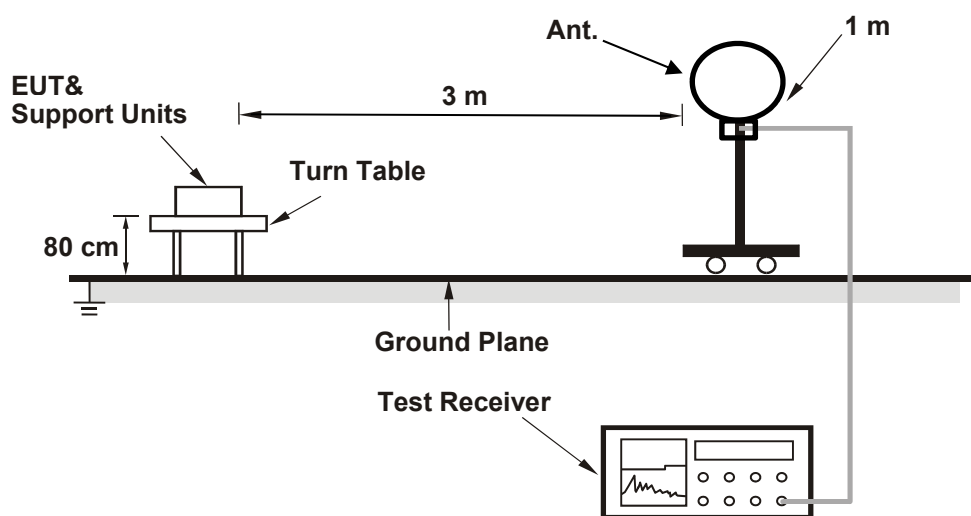
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

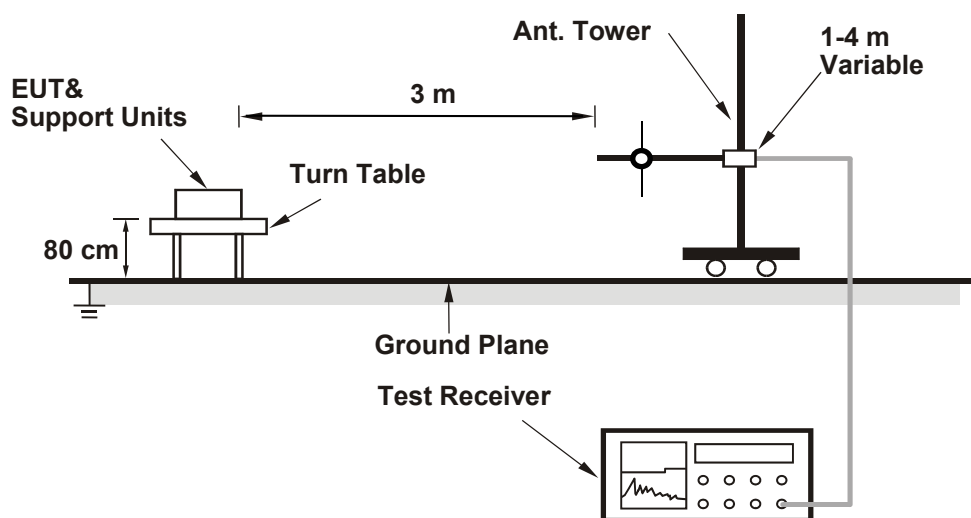
6.3 Unwanted Emissions below 1 GHz

6.3.1 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).

6.3.2 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

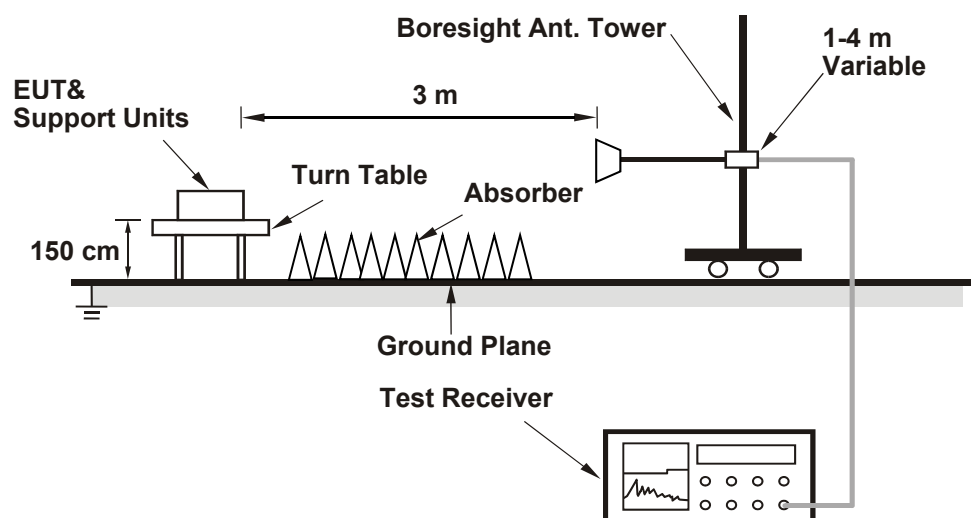
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the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

6.4 Unwanted Emissions above 1 GHz

6.4.1 Test Setup



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

6.4.2 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:	3.3 Vdc	Environmental Conditions:	26°C, 63% RH	Tested By:	Katina Lu
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For Peak Power

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	16.904	12.28	30	Pass
19	2440	17.061	12.32	30	Pass
39	2480	16.596	12.20	30	Pass

Note: The antenna gain is 3.5 dBi < 6 dBi, so the output power limit shall not be reduced.

BT-LE 2M

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
1	2404	17.022	12.31	30	Pass
19	2440	16.788	12.25	30	Pass
38	2478	16.634	12.21	30	Pass

Note: The antenna gain is 3.5 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	16.144	12.08
19	2440	15.996	12.04
39	2480	15.959	12.03

BT-LE 2M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2404	16.106	12.07
19	2440	15.959	12.03
38	2478	15.922	12.02

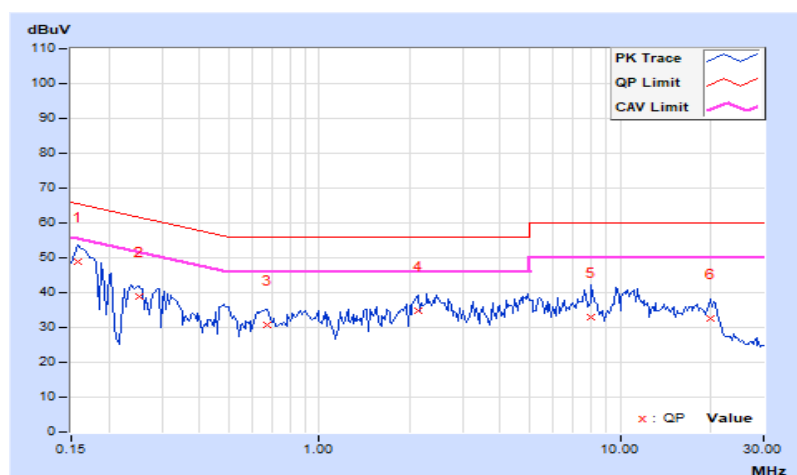
7.2 AC Power Conducted Emissions

RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	21°C, 71% RH
Tested By	Willy Lin		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.93	39.06	21.00	48.99	30.93	65.58	55.58	-16.59	-24.65
2	0.25156	9.93	28.87	14.41	38.80	24.34	61.71	51.71	-22.91	-27.37
3	0.66953	9.96	20.86	10.57	30.82	20.53	56.00	46.00	-25.18	-25.47
4	2.13281	10.03	24.93	15.25	34.96	25.28	56.00	46.00	-21.04	-20.72
5	8.02734	10.35	22.63	14.97	32.98	25.32	60.00	50.00	-27.02	-24.68
6	20.02734	11.14	21.50	15.40	32.64	26.54	60.00	50.00	-27.36	-23.46

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

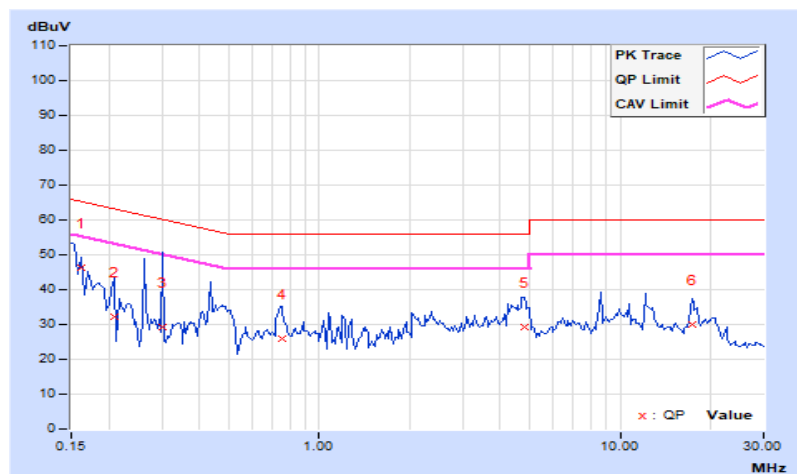


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	21°C, 71% RH
Tested By	Willy Lin		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	9.99	36.18	17.79	46.17	27.78	65.38	55.38	-19.21	-27.60
2	0.20859	9.99	22.20	9.95	32.19	19.94	63.26	53.26	-31.07	-33.32
3	0.30234	10.00	19.37	5.12	29.37	15.12	60.18	50.18	-30.81	-35.06
4	0.75156	10.02	16.00	5.03	26.02	15.05	56.00	46.00	-29.98	-30.95
5	4.79297	10.19	19.00	11.90	29.19	22.09	56.00	46.00	-26.81	-23.91
6	17.37109	10.77	19.13	12.93	29.90	23.70	60.00	50.00	-30.10	-26.30

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



7.3 Unwanted Emissions below 1 GHz

Mode A

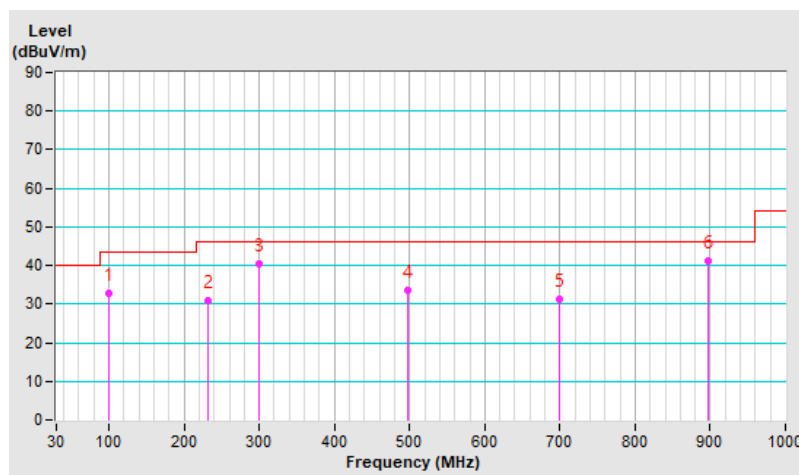
RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	21°C, 67% RH
Tested By	Willy Lin		

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	99.62	32.9 QP	43.5	-10.6	3.00 H	279	55.2	-22.3
2	232.37	31.0 QP	46.0	-15.0	1.00 H	92	51.1	-20.1
3	299.30	40.3 QP	46.0	-5.7	1.00 H	105	57.4	-17.1
4	497.88	33.7 QP	46.0	-12.3	2.00 H	0	46.0	-12.3
5	698.40	31.2 QP	46.0	-14.8	1.00 H	181	39.5	-8.3
6	896.21	41.3 QP	46.0	-4.7	1.00 H	282	47.0	-5.7

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 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.

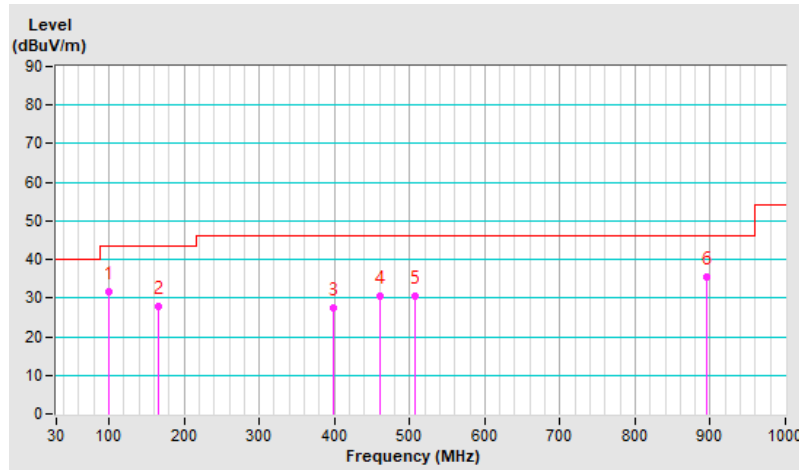


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	21°C, 67% RH
Tested By	Willy Lin		

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	99.77	31.7 QP	43.5	-11.8	1.00 V	360	53.9	-22.2
2	166.16	27.7 QP	43.5	-15.8	1.00 V	60	45.4	-17.7
3	399.08	27.5 QP	46.0	-18.5	1.00 V	188	42.0	-14.5
4	460.90	30.5 QP	46.0	-15.5	1.00 V	188	43.5	-13.0
5	507.00	30.4 QP	46.0	-15.6	1.00 V	180	42.4	-12.0
6	896.19	35.6 QP	46.0	-10.4	3.00 V	234	41.3	-5.7

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 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.



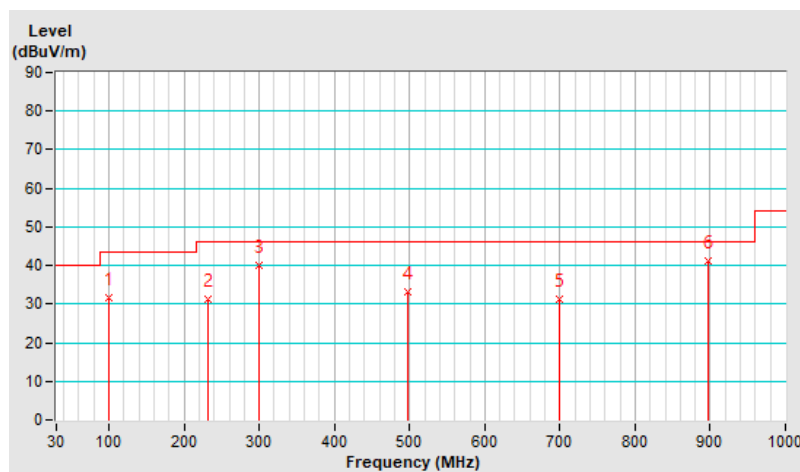
Mode B

RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	20°C, 66% RH
Tested By	Willy Lin		

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	99.30	31.5 QP	43.5	-12.0	1.00 H	272	53.8	-22.3
2	232.50	31.4 QP	46.0	-14.6	1.00 H	296	51.4	-20.0
3	299.40	40.1 QP	46.0	-5.9	2.00 H	360	57.2	-17.1
4	496.70	33.0 QP	46.0	-13.0	1.50 H	184	45.3	-12.3
5	698.60	31.2 QP	46.0	-14.8	1.00 H	266	39.5	-8.3
6	896.50	41.0 QP	46.0	-5.0	1.00 H	281	46.8	-5.8

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.

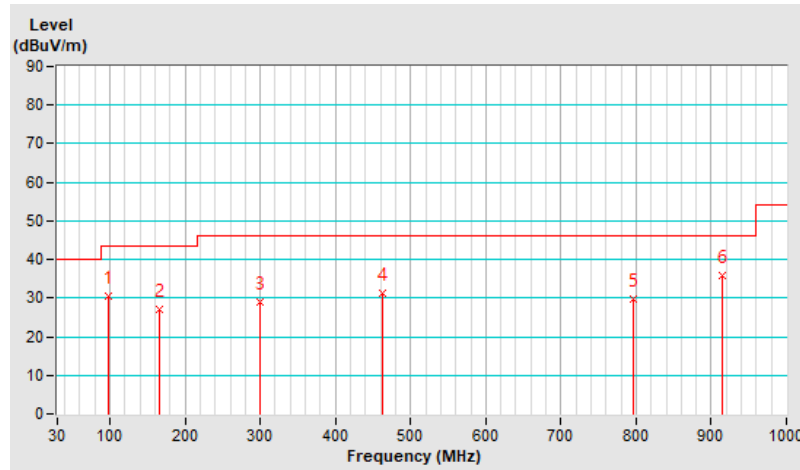


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	20°C, 66% RH
Tested By	Willy Lin		

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	98.40	30.5 QP	43.5	-13.0	2.00 V	12	53.0	-22.5
2	165.90	27.0 QP	43.5	-16.5	1.00 V	44	44.7	-17.7
3	299.60	28.8 QP	46.0	-17.2	1.50 V	153	45.9	-17.1
4	462.00	31.1 QP	46.0	-14.9	2.00 V	197	44.0	-12.9
5	796.50	29.7 QP	46.0	-16.3	1.00 V	27	36.5	-6.8
6	914.40	35.7 QP	46.0	-10.3	1.50 V	195	41.2	-5.5

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 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.



Mode C

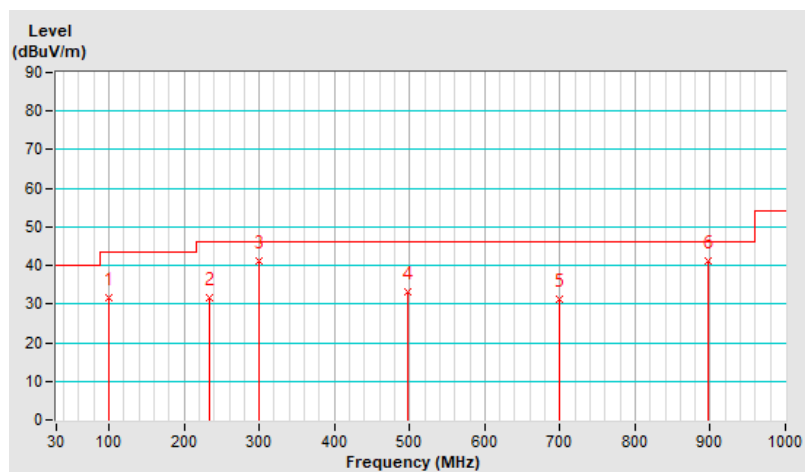
RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	20°C, 66% RH
Tested By	Willy Lin		

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	99.10	31.5 QP	43.5	-12.0	1.00 H	267	53.9	-22.4
2	232.80	31.6 QP	46.0	-14.4	1.00 H	269	51.6	-20.0
3	300.60	41.1 QP	46.0	-4.9	2.00 H	360	58.1	-17.0
4	496.70	33.2 QP	46.0	-12.8	1.50 H	184	45.5	-12.3
5	698.80	31.2 QP	46.0	-14.8	1.00 H	260	39.5	-8.3
6	896.40	41.0 QP	46.0	-5.0	1.00 H	272	46.8	-5.8

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.

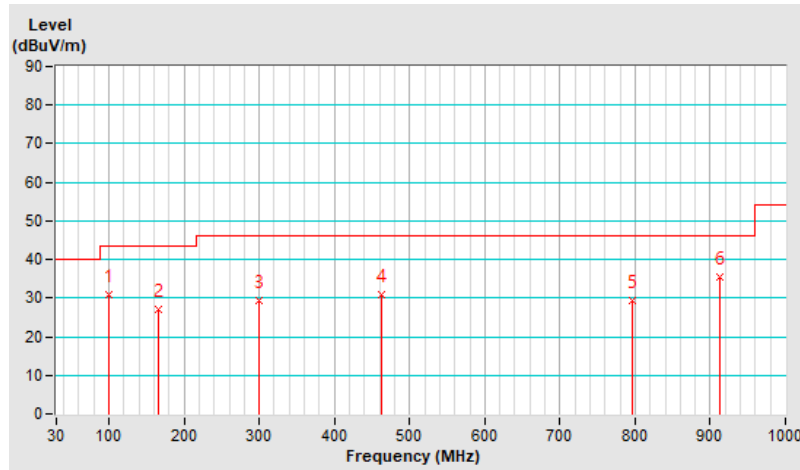


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	20°C, 66% RH
Tested By	Willy Lin		

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	99.30	30.9 QP	43.5	-12.6	2.00 V	18	53.2	-22.3
2	165.30	27.1 QP	43.5	-16.4	1.00 V	32	44.8	-17.7
3	299.60	29.3 QP	46.0	-16.7	1.50 V	176	46.4	-17.1
4	462.60	30.8 QP	46.0	-15.2	2.00 V	194	43.7	-12.9
5	796.00	29.4 QP	46.0	-16.6	1.00 V	48	36.2	-6.8
6	913.60	35.4 QP	46.0	-10.6	1.50 V	167	40.9	-5.5

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 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.



7.4 Unwanted Emissions above 1 GHz

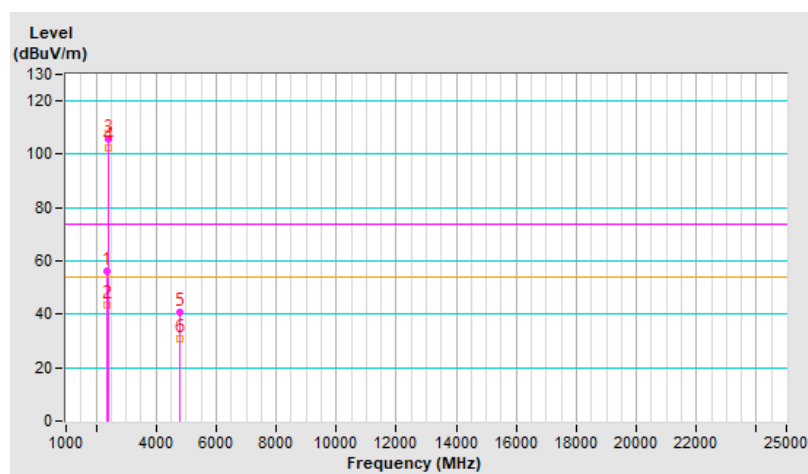
Mode A

RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	2382.20	56.1 PK	74.0	-17.9	1.04 H	318	59.7	-3.6
2	2382.20	43.3 AV	54.0	-10.7	1.04 H	318	46.9	-3.6
3	*2404.00	105.9 PK			1.04 H	318	109.5	-3.6
4	*2404.00	102.7 AV			1.04 H	318	106.3	-3.6
5	4808.00	40.5 PK	74.0	-33.5	1.33 H	164	38.8	1.7
6	4808.00	30.6 AV	54.0	-23.4	1.33 H	164	28.9	1.7

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.

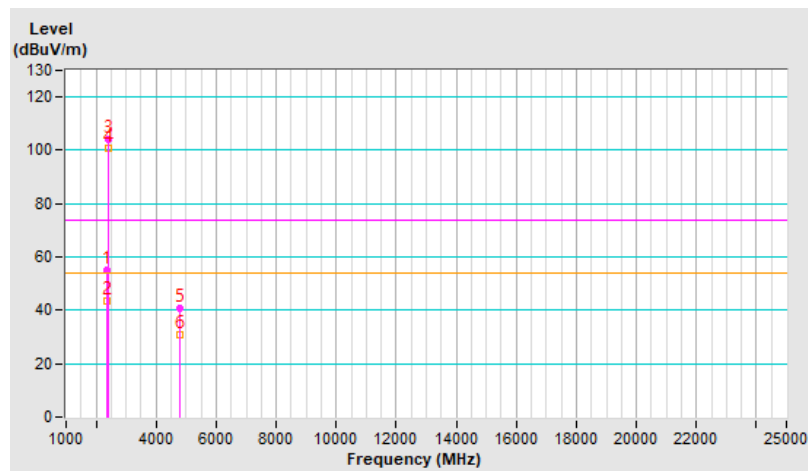


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	2356.10	55.3 PK	74.0	-18.7	2.09 V	66	58.8	-3.5
2	2356.10	43.3 AV	54.0	-10.7	2.09 V	66	46.8	-3.5
3	*2404.00	104.0 PK			2.09 V	66	107.6	-3.6
4	*2404.00	101.0 AV			2.09 V	66	104.6	-3.6
5	4808.00	40.8 PK	74.0	-33.2	1.06 V	104	39.1	1.7
6	4808.00	30.9 AV	54.0	-23.1	1.06 V	104	29.2	1.7

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.

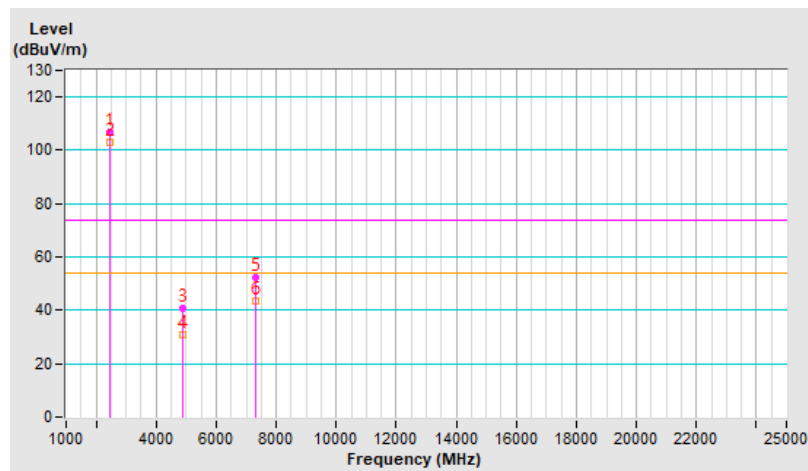


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	106.7 PK			1.07 H	348	110.1	-3.4
2	*2440.00	103.2 AV			1.07 H	348	106.6	-3.4
3	4880.00	40.7 PK	74.0	-33.3	1.41 H	146	39.2	1.5
4	4880.00	30.6 AV	54.0	-23.4	1.41 H	146	29.1	1.5
5	7320.00	52.5 PK	74.0	-21.5	1.45 H	36	44.9	7.6
6	7320.00	43.3 AV	54.0	-10.7	1.45 H	36	35.7	7.6

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.

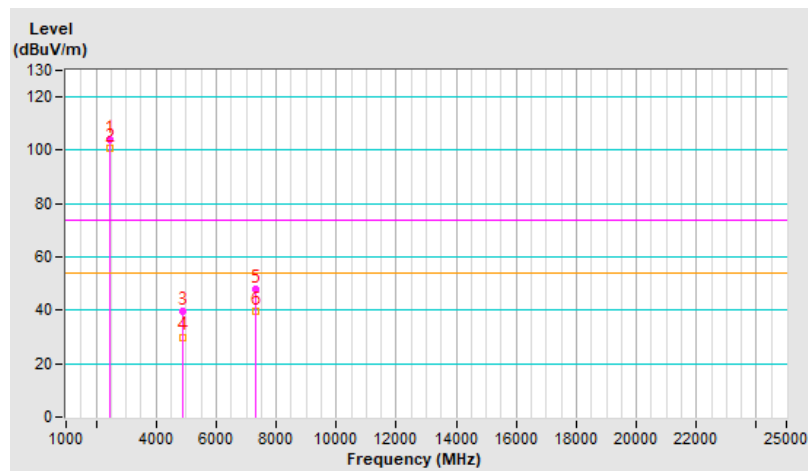


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	103.9 PK			2.16 V	85	107.3	-3.4
2	*2440.00	100.9 AV			2.16 V	85	104.3	-3.4
3	4880.00	39.4 PK	74.0	-34.6	1.03 V	125	37.9	1.5
4	4880.00	30.0 AV	54.0	-24.0	1.03 V	125	28.5	1.5
5	7320.00	48.1 PK	74.0	-25.9	3.87 V	318	40.5	7.6
6	7320.00	39.4 AV	54.0	-14.6	3.87 V	318	31.8	7.6

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.

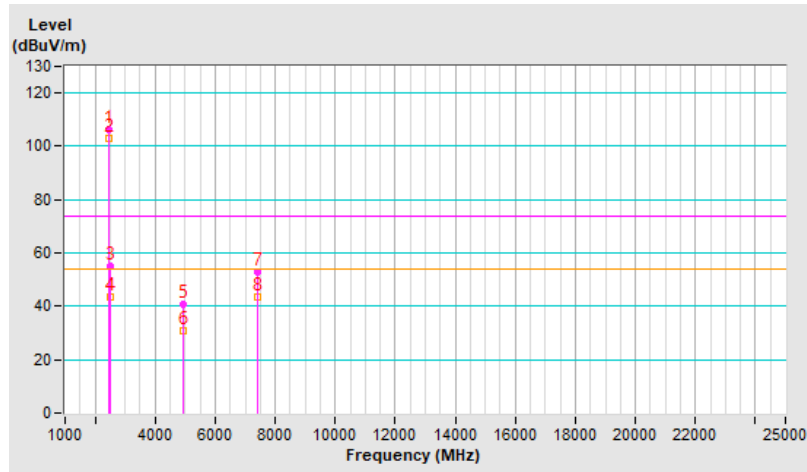


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	*2478.00	106.2 PK			1.13 H	344	109.6	-3.4
2	*2478.00	102.8 AV			1.13 H	344	106.2	-3.4
3	2483.50	55.2 PK	74.0	-18.8	1.13 H	344	58.6	-3.4
4	2483.50	43.4 AV	54.0	-10.6	1.13 H	344	46.8	-3.4
5	4956.00	40.6 PK	74.0	-33.4	1.44 H	147	38.9	1.7
6	4956.00	30.8 AV	54.0	-23.2	1.44 H	147	29.1	1.7
7	7434.00	52.7 PK	74.0	-21.3	1.46 H	20	45.0	7.7
8	7434.00	43.4 AV	54.0	-10.6	1.46 H	20	35.7	7.7

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.

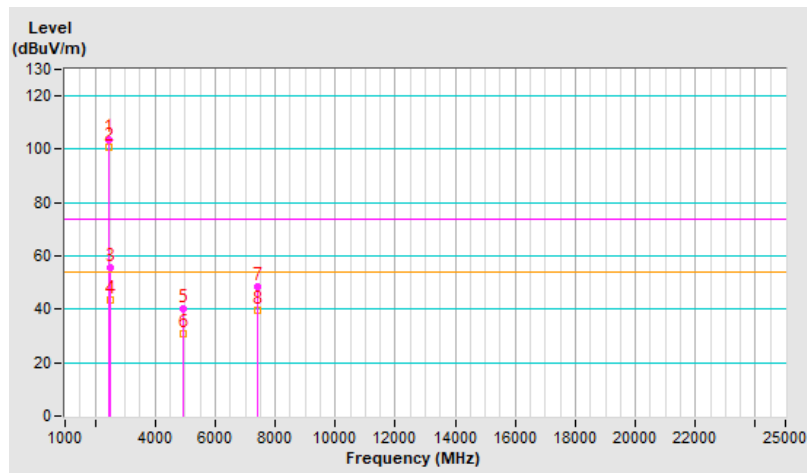


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	*2478.00	103.8 PK			2.18 V	72	107.2	-3.4
2	*2478.00	100.7 AV			2.18 V	72	104.1	-3.4
3	2491.20	55.4 PK	74.0	-18.6	2.18 V	72	58.8	-3.4
4	2491.20	43.3 AV	54.0	-10.7	2.18 V	72	46.7	-3.4
5	4956.00	40.0 PK	74.0	-34.0	1.00 V	103	38.3	1.7
6	4956.00	30.7 AV	54.0	-23.3	1.00 V	103	29.0	1.7
7	7434.00	48.4 PK	74.0	-25.6	3.95 V	324	40.7	7.7
8	7434.00	39.6 AV	54.0	-14.4	3.95 V	324	31.9	7.7

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.



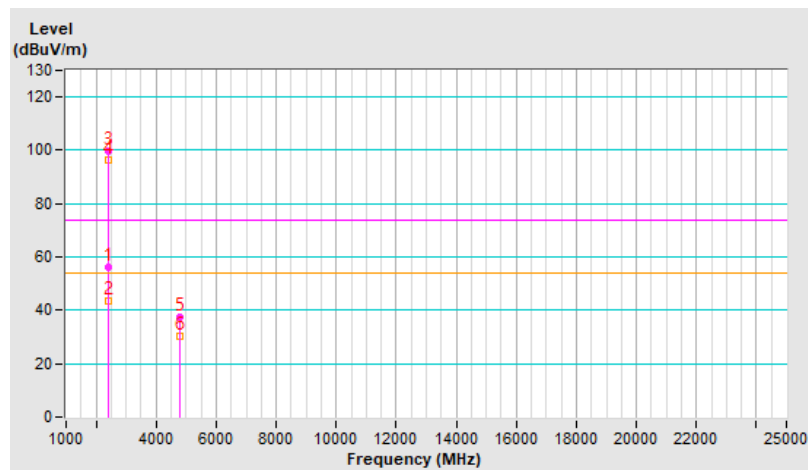
Mode B

RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	56.1 PK	74.0	-17.9	1.07 H	148	59.7	-3.6
2	2390.00	43.4 AV	54.0	-10.6	1.07 H	148	47.0	-3.6
3	*2404.00	99.9 PK			1.07 H	148	103.5	-3.6
4	*2404.00	96.6 AV			1.07 H	148	100.2	-3.6
5	4808.00	37.5 PK	74.0	-36.5	1.53 H	157	35.8	1.7
6	4808.00	30.2 AV	54.0	-23.8	1.53 H	157	28.5	1.7

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.

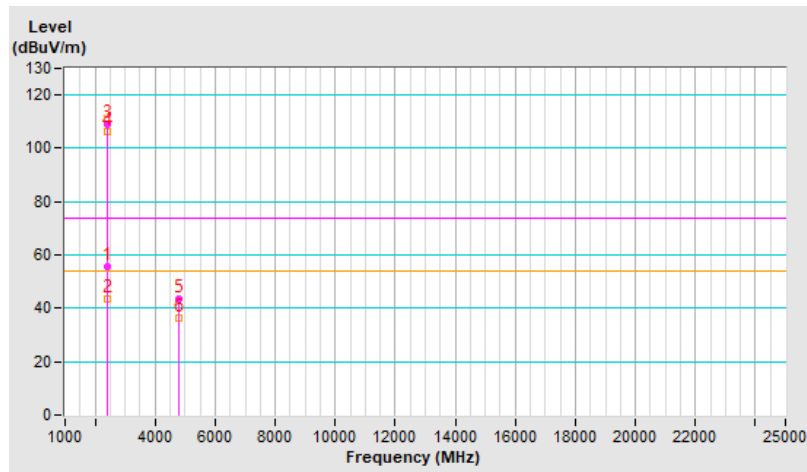


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	2387.00	55.8 PK	74.0	-18.2	1.56 V	321	59.4	-3.6
2	2387.00	43.5 AV	54.0	-10.5	1.56 V	321	47.1	-3.6
3	*2404.00	109.0 PK			1.56 V	321	112.6	-3.6
4	*2404.00	106.1 AV			1.56 V	321	109.7	-3.6
5	4808.00	43.6 PK	74.0	-30.4	1.24 V	297	41.9	1.7
6	4808.00	36.5 AV	54.0	-17.5	1.24 V	297	34.8	1.7

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.

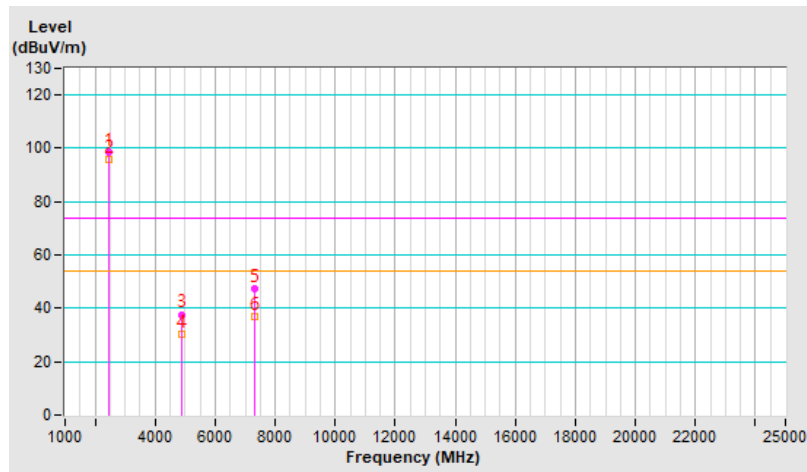


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	98.8 PK			1.45 H	162	102.2	-3.4
2	*2440.00	95.6 AV			1.45 H	162	99.0	-3.4
3	4880.00	37.7 PK	74.0	-36.3	1.46 H	116	36.2	1.5
4	4880.00	30.4 AV	54.0	-23.6	1.46 H	116	28.9	1.5
5	7320.00	47.3 PK	74.0	-26.7	1.80 H	191	39.7	7.6
6	7320.00	37.1 AV	54.0	-16.9	1.80 H	191	29.5	7.6

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.

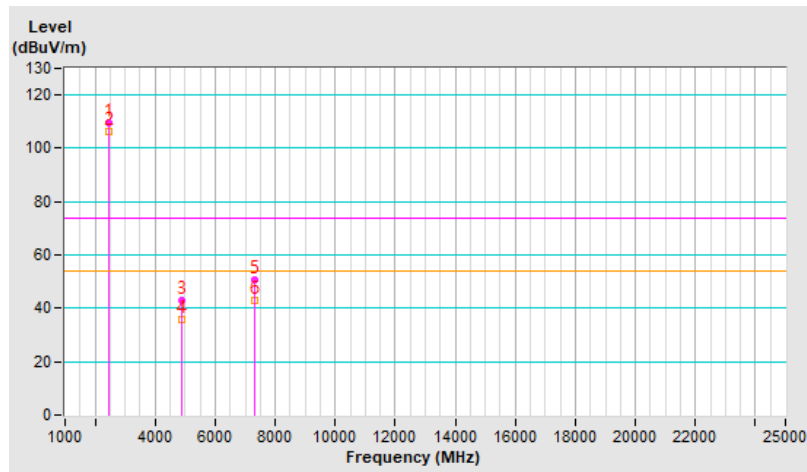


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	109.6 PK			1.66 V	215	113.0	-3.4
2	*2440.00	106.4 AV			1.66 V	215	109.8	-3.4
3	4880.00	43.1 PK	74.0	-30.9	1.21 V	308	41.6	1.5
4	4880.00	35.7 AV	54.0	-18.3	1.21 V	308	34.2	1.5
5	7320.00	50.8 PK	74.0	-23.2	1.64 V	273	43.2	7.6
6	7320.00	43.0 AV	54.0	-11.0	1.64 V	273	35.4	7.6

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.

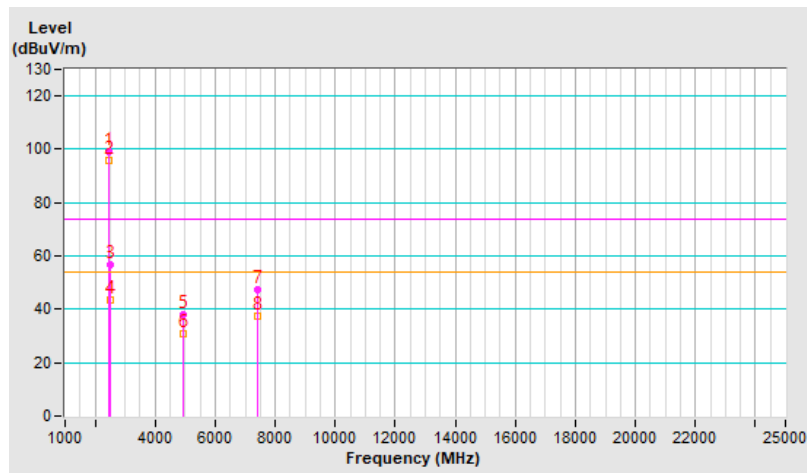


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	*2478.00	99.0 PK			1.47 H	146	102.4	-3.4
2	*2478.00	95.7 AV			1.47 H	146	99.1	-3.4
3	2486.44	56.9 PK	74.0	-17.1	1.47 H	146	60.3	-3.4
4	2486.44	43.3 AV	54.0	-10.7	1.47 H	146	46.7	-3.4
5	4956.00	37.9 PK	74.0	-36.1	1.53 H	132	36.2	1.7
6	4956.00	30.6 AV	54.0	-23.4	1.53 H	132	28.9	1.7
7	7434.00	47.6 PK	74.0	-26.4	1.73 H	190	39.9	7.7
8	7434.00	37.5 AV	54.0	-16.5	1.73 H	190	29.8	7.7

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.



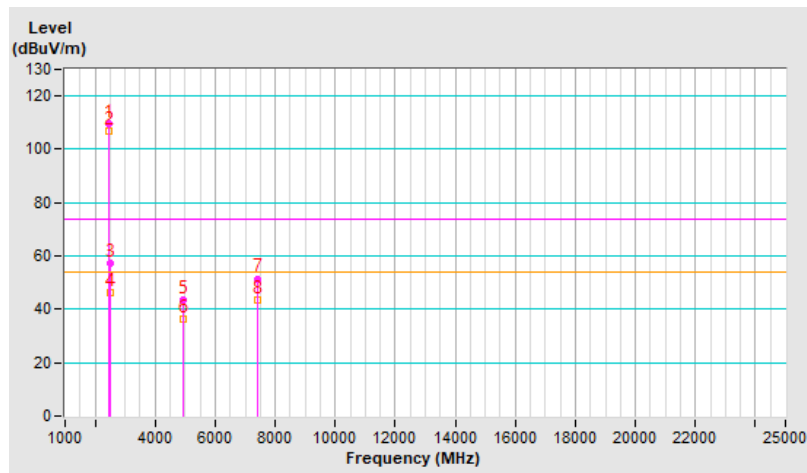


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Willy Lin		

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	*2478.00	109.8 PK			1.46 V	299	113.2	-3.4
2	*2478.00	106.8 AV			1.46 V	299	110.2	-3.4
3	2483.50	57.1 PK	74.0	-16.9	1.46 V	299	60.5	-3.4
4	2483.50	46.0 AV	54.0	-8.0	1.46 V	299	49.4	-3.4
5	4956.00	43.4 PK	74.0	-30.6	1.24 V	293	41.7	1.7
6	4956.00	36.4 AV	54.0	-17.6	1.24 V	293	34.7	1.7
7	7434.00	51.5 PK	74.0	-22.5	1.61 V	269	43.8	7.7
8	7434.00	43.6 AV	54.0	-10.4	1.61 V	269	35.9	7.7

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.



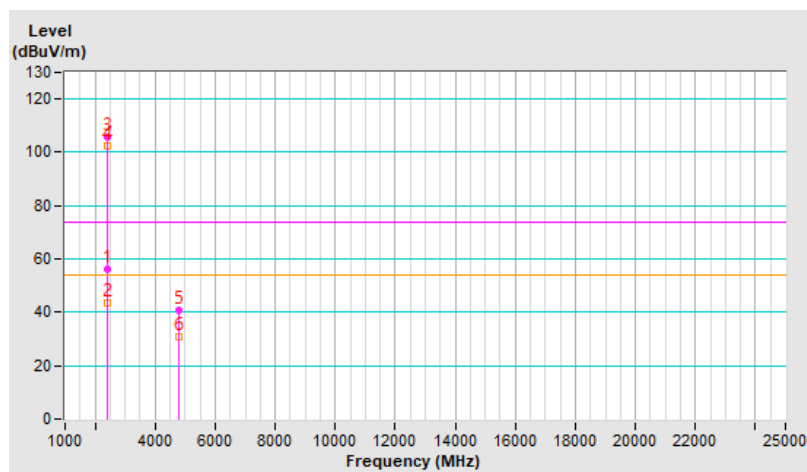
Mode C

RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	56.2 PK	74.0	-17.8	2.01 H	272	59.8	-3.6
2	2390.00	43.3 AV	54.0	-10.7	2.01 H	272	46.9	-3.6
3	*2404.00	105.5 PK			2.01 H	272	109.1	-3.6
4	*2404.00	102.3 AV			2.01 H	272	105.9	-3.6
5	4808.00	40.8 PK	74.0	-33.2	2.46 H	150	39.1	1.7
6	4808.00	30.7 AV	54.0	-23.3	2.46 H	150	29.0	1.7

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.

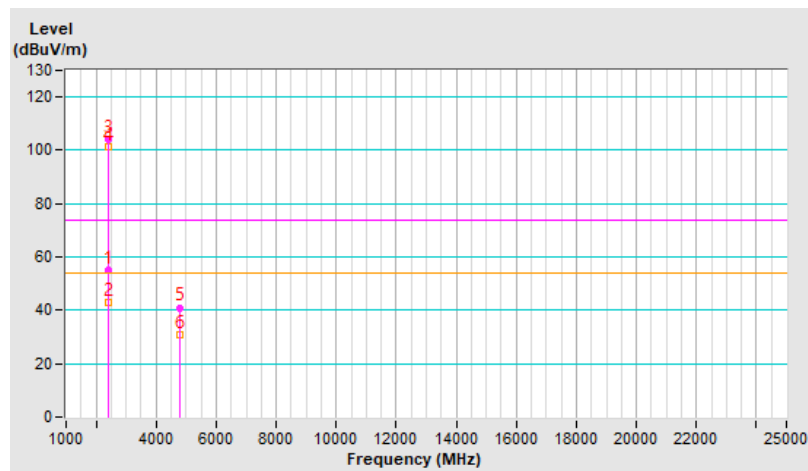


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	55.1 PK	74.0	-18.9	3.22 V	200	58.7	-3.6
2	2390.00	42.9 AV	54.0	-11.1	3.22 V	200	46.5	-3.6
3	*2404.00	104.0 PK			3.22 V	200	107.6	-3.6
4	*2404.00	101.3 AV			3.22 V	200	104.9	-3.6
5	4808.00	41.0 PK	74.0	-33.0	1.95 V	227	39.3	1.7
6	4808.00	30.8 AV	54.0	-23.2	1.95 V	227	29.1	1.7

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.

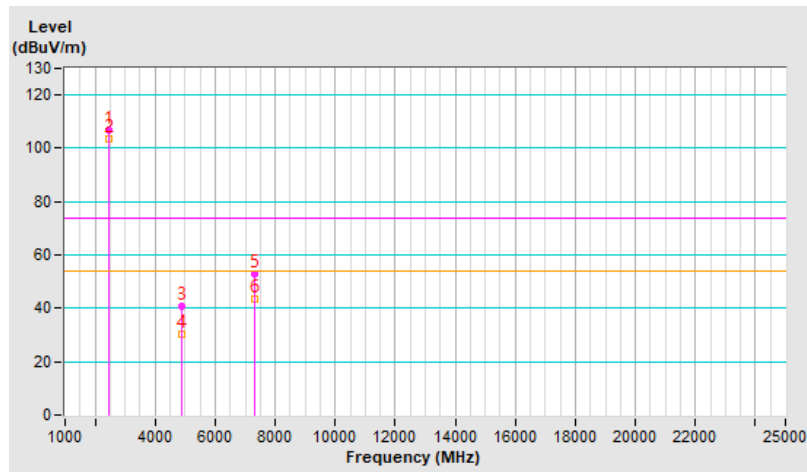


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	106.9 PK			1.86 H	273	110.3	-3.4
2	*2440.00	103.5 AV			1.86 H	273	106.9	-3.4
3	4880.00	40.8 PK	74.0	-33.2	2.57 H	111	39.3	1.5
4	4880.00	30.5 AV	54.0	-23.5	2.57 H	111	29.0	1.5
5	7320.00	52.9 PK	74.0	-21.1	3.04 H	93	45.3	7.6
6	7320.00	43.6 AV	54.0	-10.4	3.04 H	93	36.0	7.6

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.

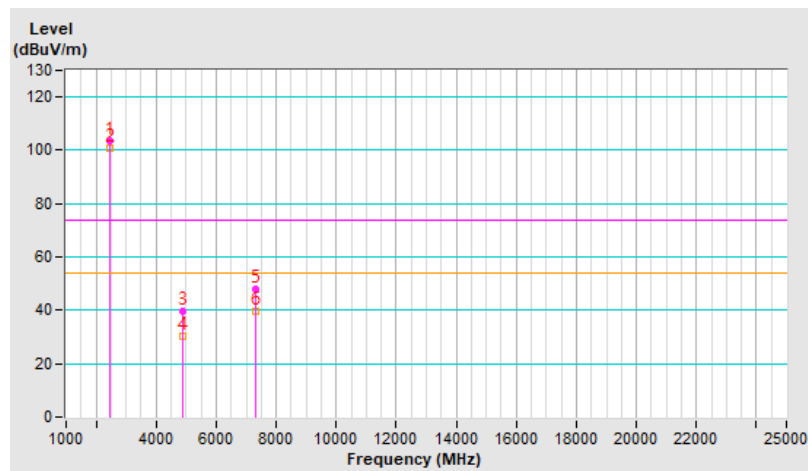


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	103.7 PK			3.22 V	202	107.1	-3.4
2	*2440.00	100.7 AV			3.22 V	202	104.1	-3.4
3	4880.00	39.6 PK	74.0	-34.4	2.03 V	245	38.1	1.5
4	4880.00	30.2 AV	54.0	-23.8	2.03 V	245	28.7	1.5
5	7320.00	48.0 PK	74.0	-26.0	2.58 V	206	40.4	7.6
6	7320.00	39.6 AV	54.0	-14.4	2.58 V	206	32.0	7.6

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.



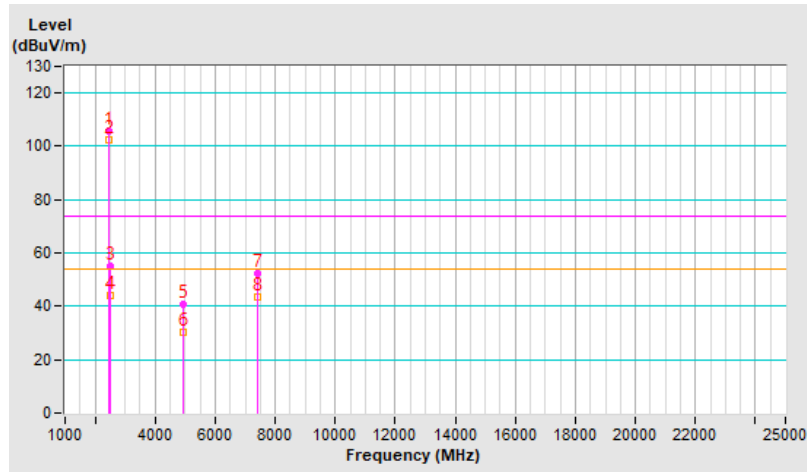


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	*2478.00	105.7 PK			1.89 H	264	109.1	-3.4
2	*2478.00	102.5 AV			1.89 H	264	105.9	-3.4
3	2483.50	55.3 PK	74.0	-18.7	1.89 H	264	58.7	-3.4
4	2483.50	43.8 AV	54.0	-10.2	1.89 H	264	47.2	-3.4
5	4956.00	40.6 PK	74.0	-33.4	2.61 H	119	38.9	1.7
6	4956.00	30.5 AV	54.0	-23.5	2.61 H	119	28.8	1.7
7	7434.00	52.5 PK	74.0	-21.5	3.07 H	97	44.8	7.7
8	7434.00	43.5 AV	54.0	-10.5	3.07 H	97	35.8	7.7

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.



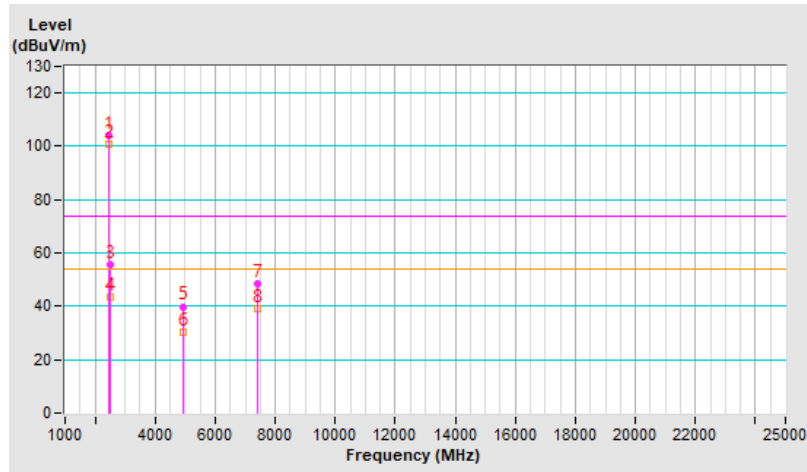


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 66 % RH
Tested By	Sampson Chen		

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	*2478.00	103.9 PK			3.25 V	191	107.3	-3.4
2	*2478.00	100.7 AV			3.25 V	191	104.1	-3.4
3	2483.50	55.5 PK	74.0	-18.5	3.25 V	191	58.9	-3.4
4	2483.50	43.7 AV	54.0	-10.3	3.25 V	191	47.1	-3.4
5	4956.00	39.9 PK	74.0	-34.1	2.03 V	248	38.2	1.7
6	4956.00	30.5 AV	54.0	-23.5	2.03 V	248	28.8	1.7
7	7434.00	48.3 PK	74.0	-25.7	2.60 V	198	40.6	7.7
8	7434.00	39.3 AV	54.0	-14.7	2.60 V	198	31.6	7.7

Remarks:

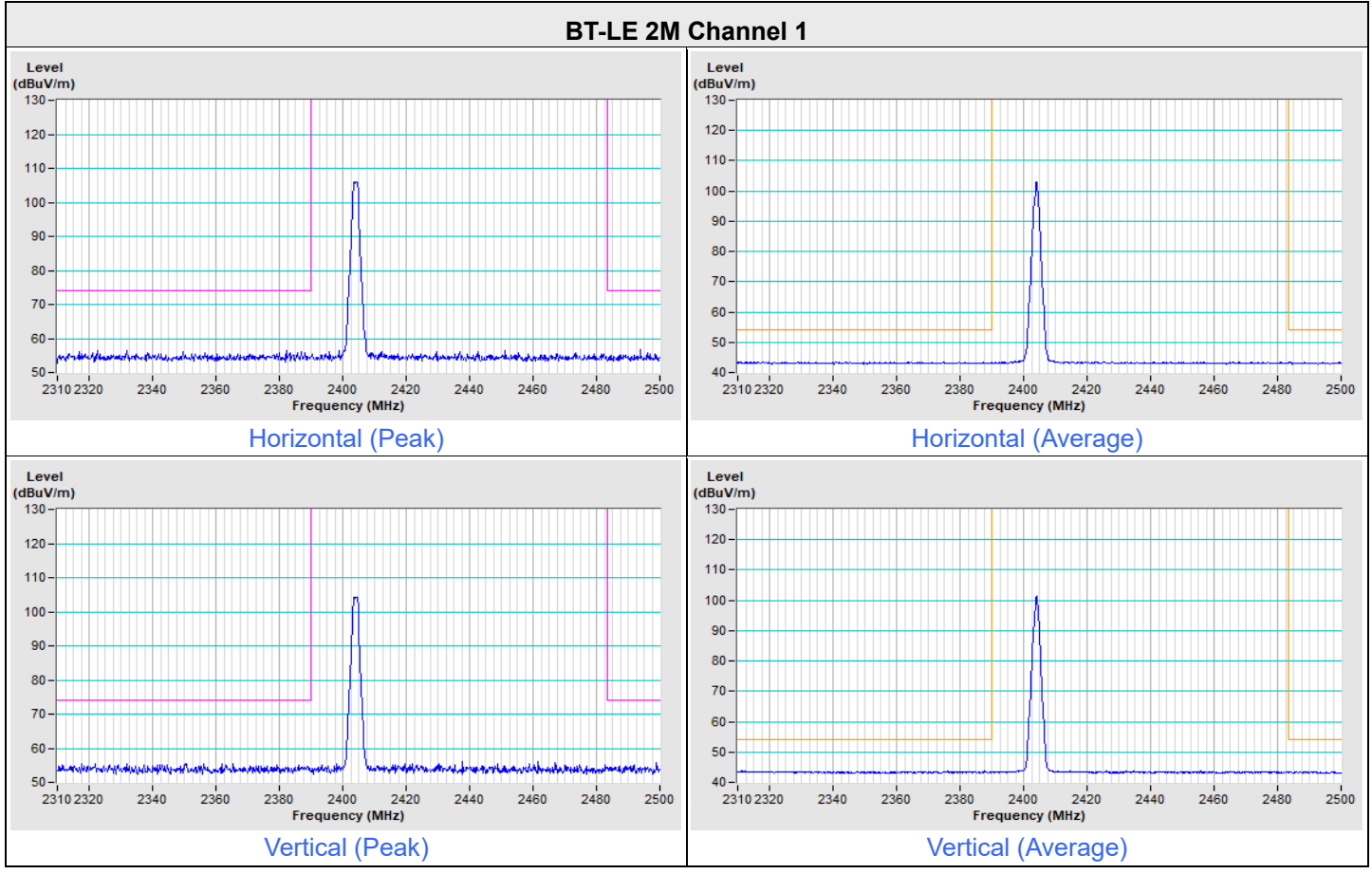
1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency,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



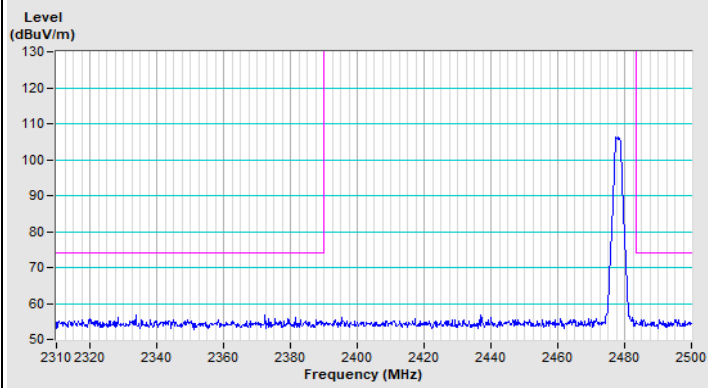
Plot of Band Edge

Mode A

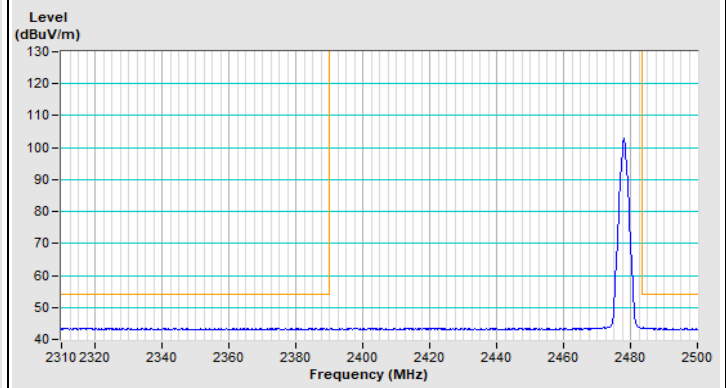
Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
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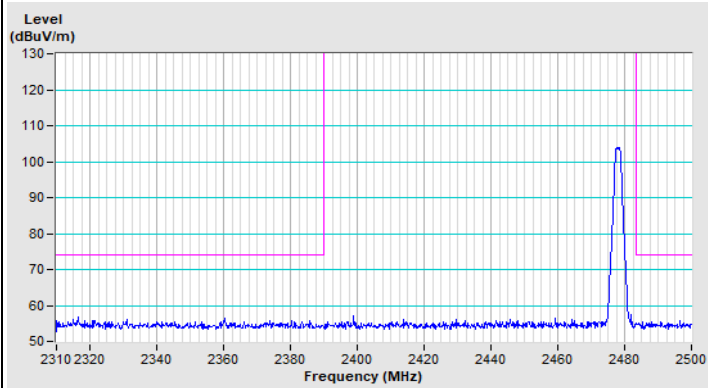
BT-LE 2M Channel 38



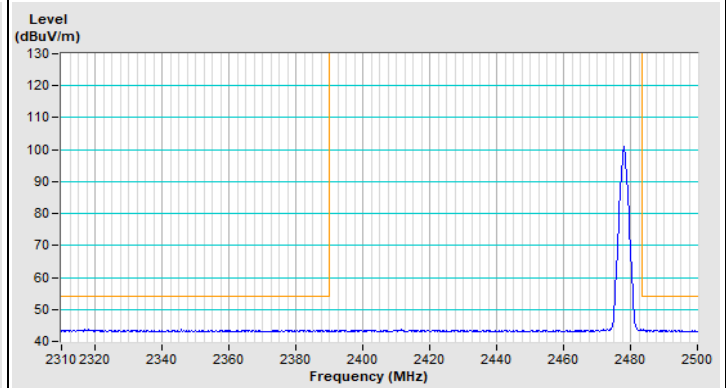
Horizontal (Peak)



Horizontal (Average)



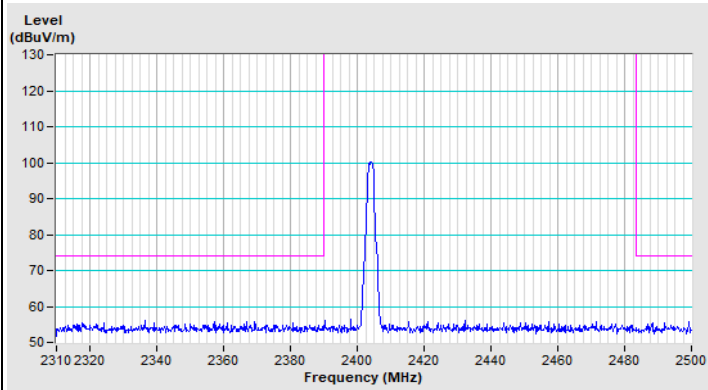
Vertical (Peak)



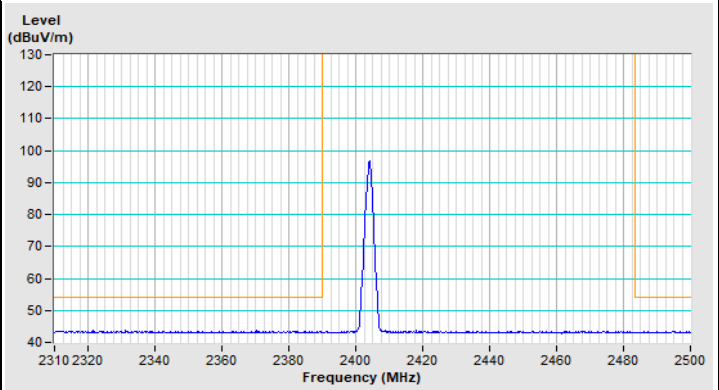
Vertical (Average)

Mode B

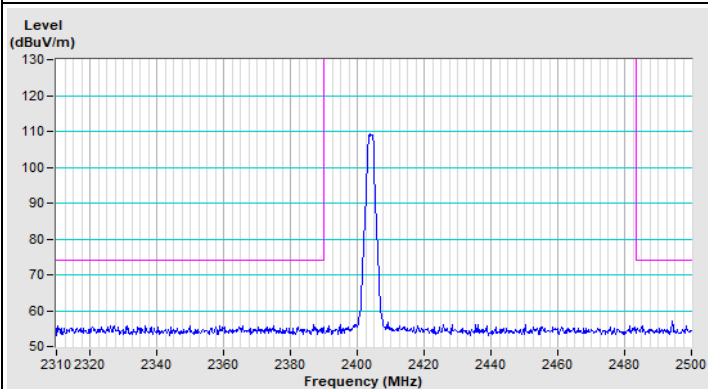
BT-LE 2M Channel 1



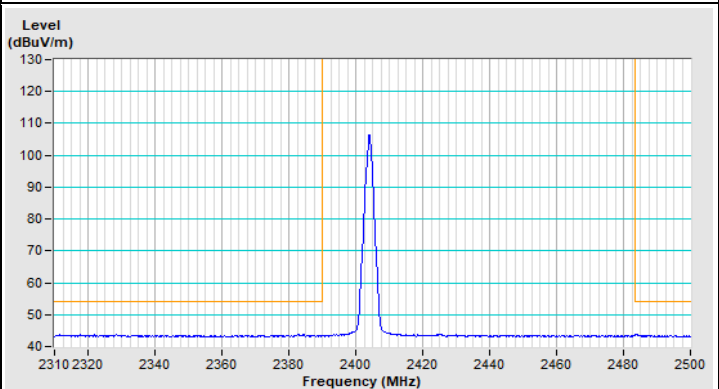
Horizontal (Peak)



Horizontal (Average)

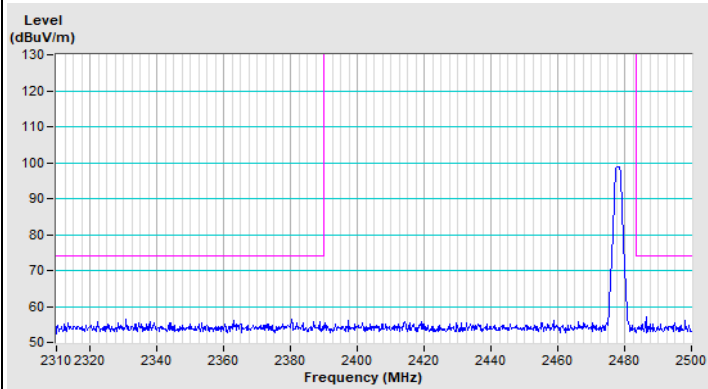


Vertical (Peak)

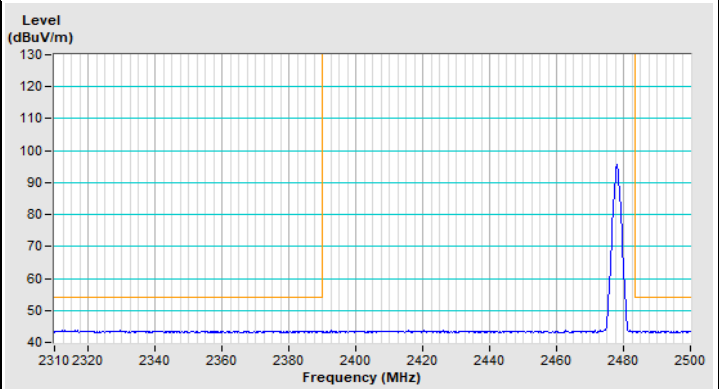


Vertical (Average)

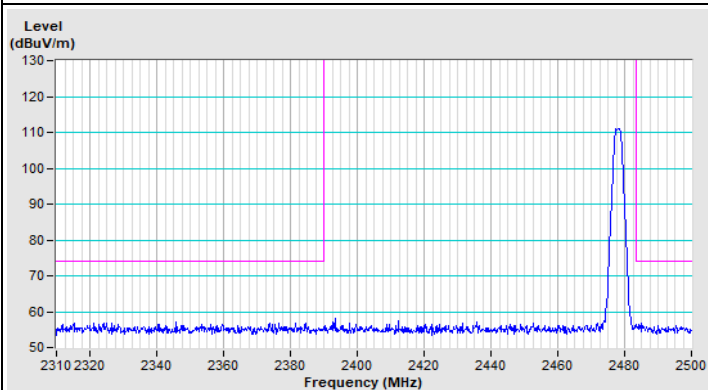
BT-LE 2M Channel 38



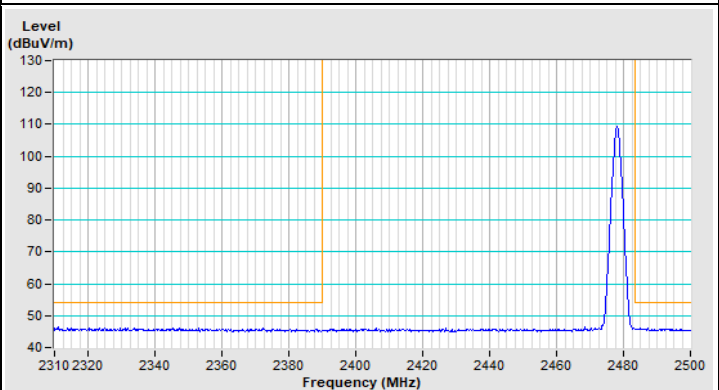
Horizontal (Peak)



Horizontal (Average)



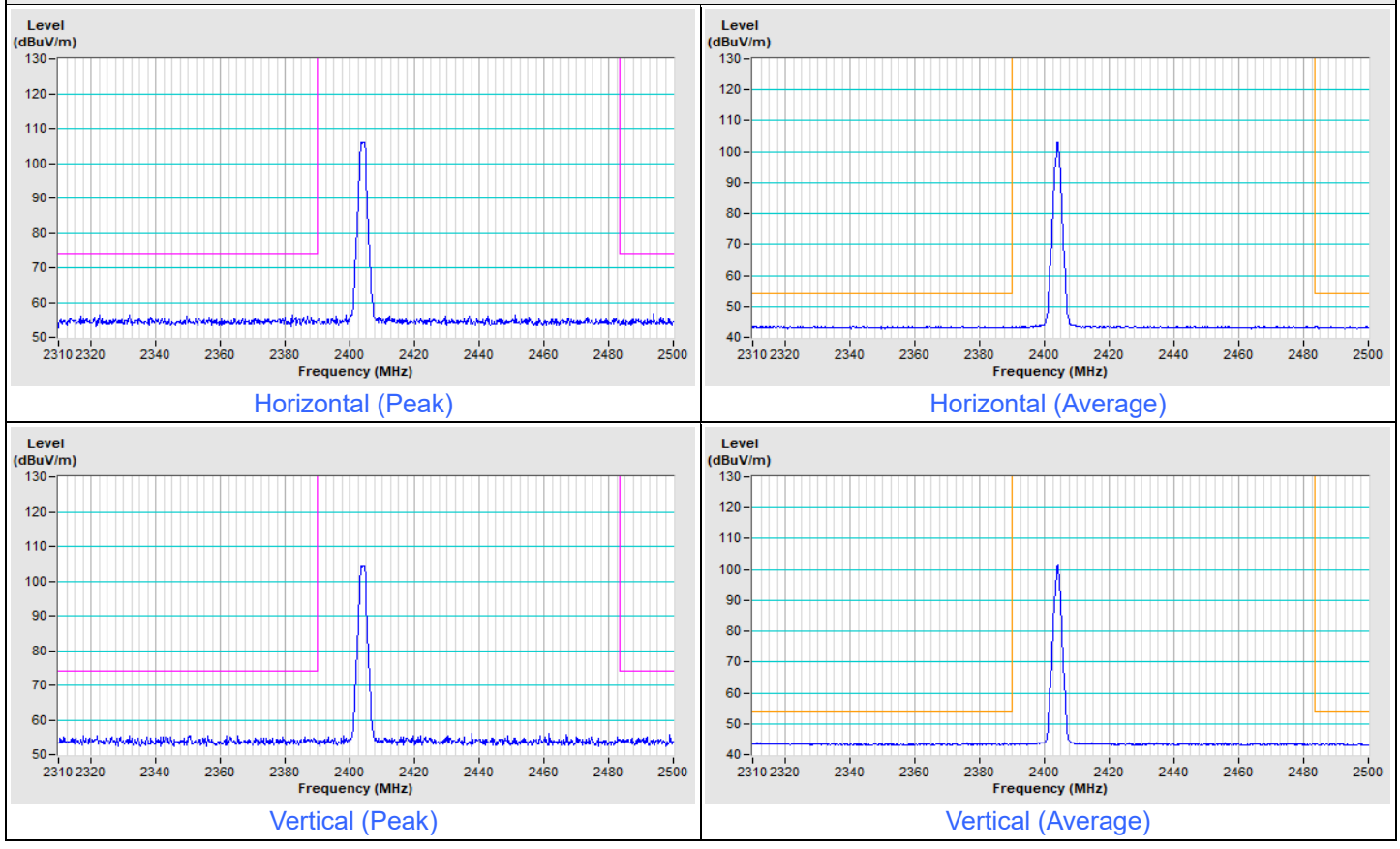
Vertical (Peak)



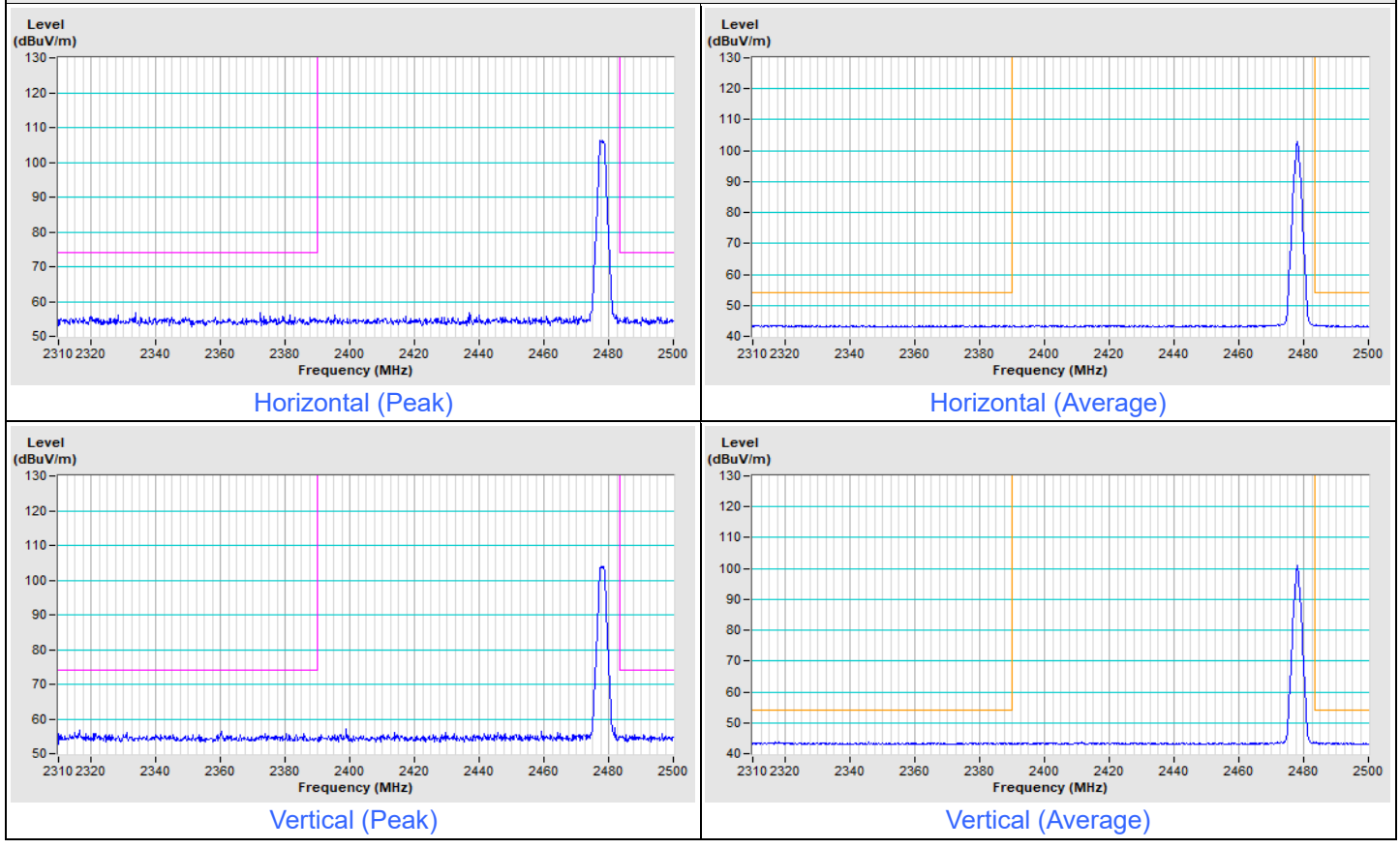
Vertical (Average)

Mode C

BT-LE 2M Channel 1



BT-LE 2M Channel 38



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.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

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

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