

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
Report No.: RFBBUI-WTW-P23070201-2 R1
FCC ID: TX2-RTL8922AE
Product: 11be RTL8922AE Combo module
Brand: REALTEK
Model No.: RTL8922AE
Received Date: 2023/6/27
Test Date: 2023/6/27 ~ 2023/11/17
Issued Date: 2023/12/1
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
Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
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: _____, **Date:** 2023/12/1
May Chen / Manager

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Prepared by : Phoenix Huang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBBUI-WTW-P23070201-2	Original release.	2023/10/24
RFBBUI-WTW-P23070201-2 R1	1. Update the test results of all test items (except for AC Power Conducted Emissions & Unwanted Emissions below 1 GHz test items) in high power mode. 2. Add antenna (Model: RFA-57-JP805-4B-300) information.	2023/12/1

1 Certificate

Product: 11be RTL8922AE Combo module

Brand: REALTEK

Test Model: RTL8922AE

Sample Status: Engineering sample

Applicant: Realtek Semiconductor Corp.

Test Date: 2023/6/27 ~ 2023/11/17

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	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -12.86 dB at 25.87500 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -3.9 dB at 142.70 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -6.5 dB at 2381.94 MHz
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note: 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	Expanded Uncertainty (k=2) (±)
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.6 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	11be RTL8922AE Combo module
Brand	REALTEK
Test Model	RTL8922AE
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	125 kbps / 500 kbps / 1 Mbps / 2 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	19.055 mW (12.8 dBm)

Note:

1. There are Bluetooth and WLAN (2.4 GHz & 5 GHz & 6 GHz) technology used for the EUT.
2. Simultaneously transmission condition.

1TX		
Condition	Technology	
	S0 (Chain 1)	S1 (Chain 0)
1	WLAN (5 GHz)_H	Bluetooth + WLAN (5 GHz)_L
2	WLAN (5 GHz)_L	Bluetooth + WLAN (5 GHz)_H
3	WLAN (5 GHz)_L	Bluetooth + WLAN (6 GHz)
4	WLAN (6 GHz)	Bluetooth + WLAN (5 GHz)_L
5	WLAN (6 GHz)	Bluetooth + WLAN (5 GHz)_H
6	WLAN (5 GHz)_H	Bluetooth + WLAN (6 GHz)
7	WLAN (2.4 GHz)	WLAN (5 GHz) Full
8	WLAN (2.4 GHz)	WLAN (6 GHz)
9	WLAN (5 GHz) Full	Bluetooth
10	WLAN (6 GHz)	Bluetooth
2TX		
1	WLAN (5 GHz)_L	WLAN (5 GHz)_L + Bluetooth
2	WLAN (5 GHz)_H	WLAN (5 GHz)_H + Bluetooth
3	WLAN (6 GHz)	WLAN (6 GHz) + Bluetooth

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

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 Set	RF Port No.	Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	1/2	Chain0/1	REALTEK	RTK-ANT-0022	3.4	2.4~2.4835	PIFA	IPEX, MHF4	300
					5	5.15~5.895			
					5	5.925~7.125			
2	1/2	Chain0/1	ARISTOTLE	RFA-57-JP805-4B-300	-1.87	5.15~5.895	PIFA	IPEX, MHF4	300
					-1.88	5.925~7.125			

Note: The antenna set 1 was selected for the final test.

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

3.3 Channel List

40 channels are provided for BT-LE:

RF Channel	RF Center Frequency	Channel Index	Channels Type for BT 5.x	
			2Msym/s with Data Rate 2Mbps	1Msym/s with Data Rate 1Mbps / 500kbps / 125kbps
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	*	●

* The channels 2402 MHz, 2426 MHz and 2480 MHz are used for primary advertising only, and these advertisement packets are never being sent over the 2Msym/s.

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. PIFA antenna can be used in the following ways: X / Y / Z axis. Pre-scan in these ways and find the worst case as a representative test condition. 2. BT LE-1M, LE-Coded S=2, LE-Coded S=8 of these modes under the same 1 Msym/s modulation scheme, but the data rates are different; based on the same modulation scheme, pre-scan all of these modes and find the worst case as a representative test mode (except Output power and Power Density test item) 3. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.
Worst Case:	1. PIFA antenna the worst case was found when positioned on (X / Y / Z axis): ➤ Unwanted Emissions below 1 GHz: Z axis ➤ Unwanted Emissions above 1 GHz: Z axis 2. For 1Msym/s modulation scheme the worst mode is: LE-Coded S=8

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

Test Item	Power profile	Mode	Transmitter Configuration	Tested Channel	Modulation	Data Rate Parameter
RF Output Power / Power Spectral Density	Low	LE-Coded S=2	Fixed Tx Chain 0	0, 19, 39	GFSK	125kb/s
		LE-Coded S=8		0, 19, 39		500kb/s
		BT-LE 1M		0, 19, 39		1Mb/s
		BT-LE 2M		1, 19, 38		2Mb/s
	High	LE-Coded S=2		0, 19, 39		125kb/s
		LE-Coded S=8		0, 19, 39		500kb/s
		BT-LE 1M		0, 19, 39		1Mb/s
		BT-LE 2M		1, 19, 38		2Mb/s
6 dB Bandwidth / Conducted Out of Band Emissions	Low	LE-Coded S=8	Fixed Tx Chain 0	0, 19, 39	GFSK	500kb/s
		BT-LE 2M		1, 19, 38		2Mb/s
	High	LE-Coded S=8	Fixed Tx Chain 0	0, 19, 39		500kb/s
		BT-LE 2M		1, 19, 38		2Mb/s
AC Power Conducted Emissions	Low	BT-LE 2M	Fixed Tx Chain 0	1	GFSK	2Mb/s
	High	BT-LE 2M		1		2Mb/s
Unwanted Emissions below 1 GHz	Low	BT-LE 2M	Fixed Tx Chain 0	1	GFSK	2Mb/s
	High	BT-LE 2M		1		2Mb/s
Unwanted Emissions above 1 GHz	Low	LE-Coded S=8	Fixed Tx Chain 0	0, 19, 39	GFSK	500kb/s
		BT-LE 2M		1, 19, 38		2Mb/s
	High	LE-Coded S=8		0, 19, 39	GFSK	500kb/s
		BT-LE 2M		1, 19, 38		2Mb/s

Note: Bluetooth's power profile has Low/ High of two configurations. All of the test items were performed to be tested.

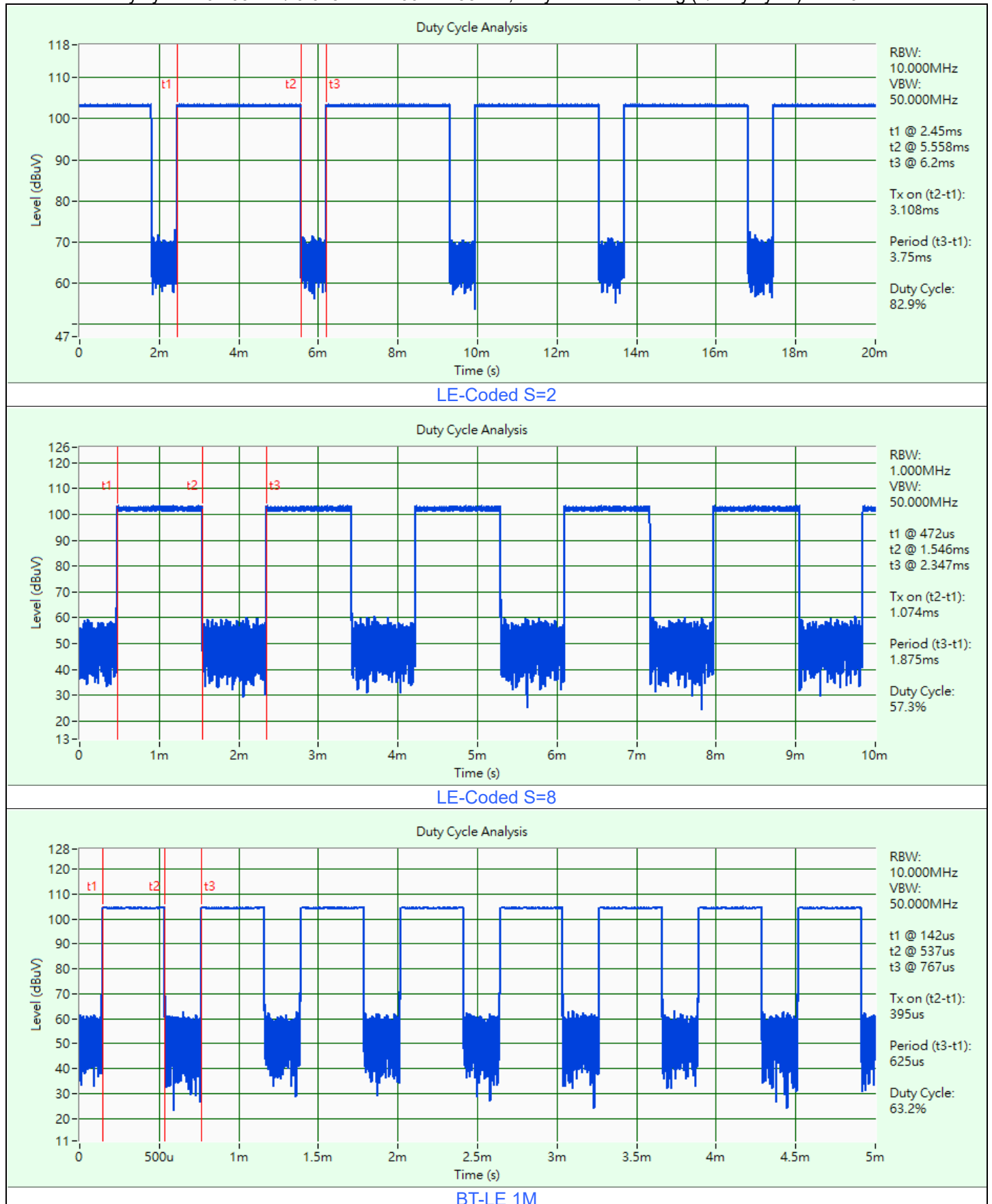
3.5 Duty Cycle of Test Signal

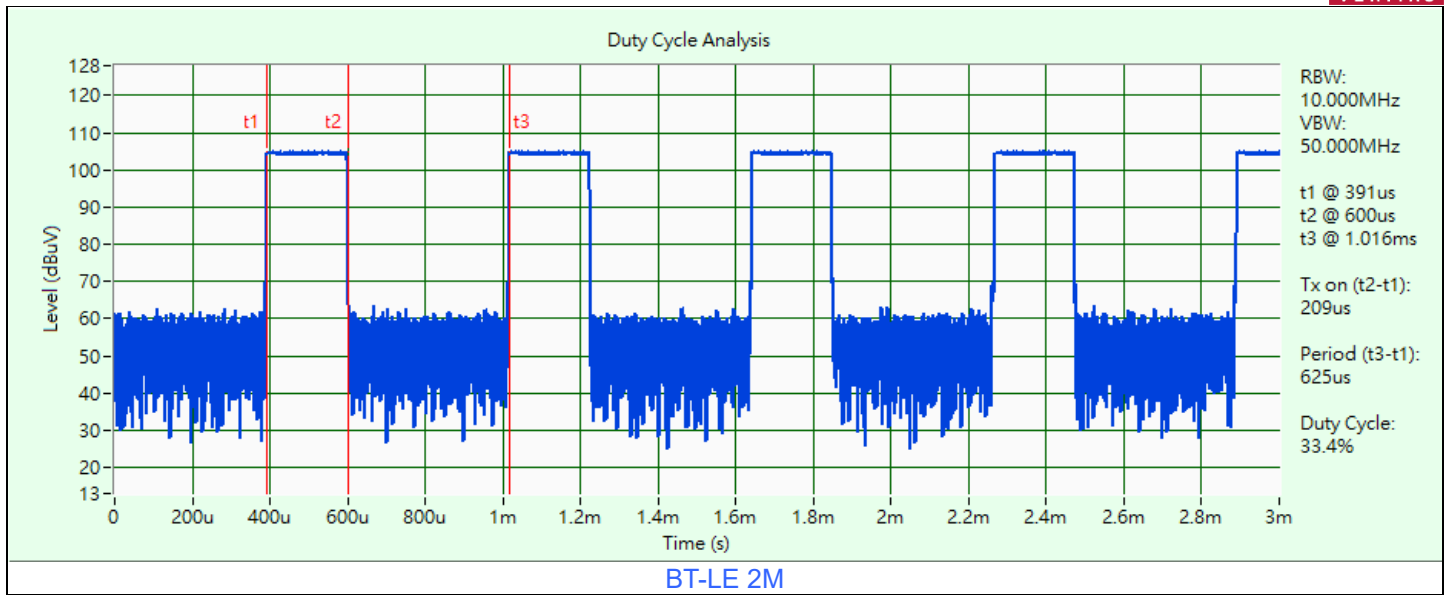
LE-Coded S=2: Duty cycle = 3.108 ms / 3.75 ms x 100% = 82.9%, duty factor = 10 * log (1/Duty cycle) = 0.82 dB

LE-Coded S=8: Duty cycle = 1.074 ms / 1.875 ms x 100% = 57.3%, duty factor = 10 * log (1/Duty cycle) = 2.42 dB

BT-LE 1M: Duty cycle = 0.395 ms / 0.625 ms x 100% = 63.2%, duty factor = 10 * log (1/Duty cycle) = 1.99 dB

BT-LE 2M: Duty cycle = 0.209 ms / 0.625 ms x 100% = 33.4%, duty factor = 10 * log (1/Duty cycle) = 4.76 dB

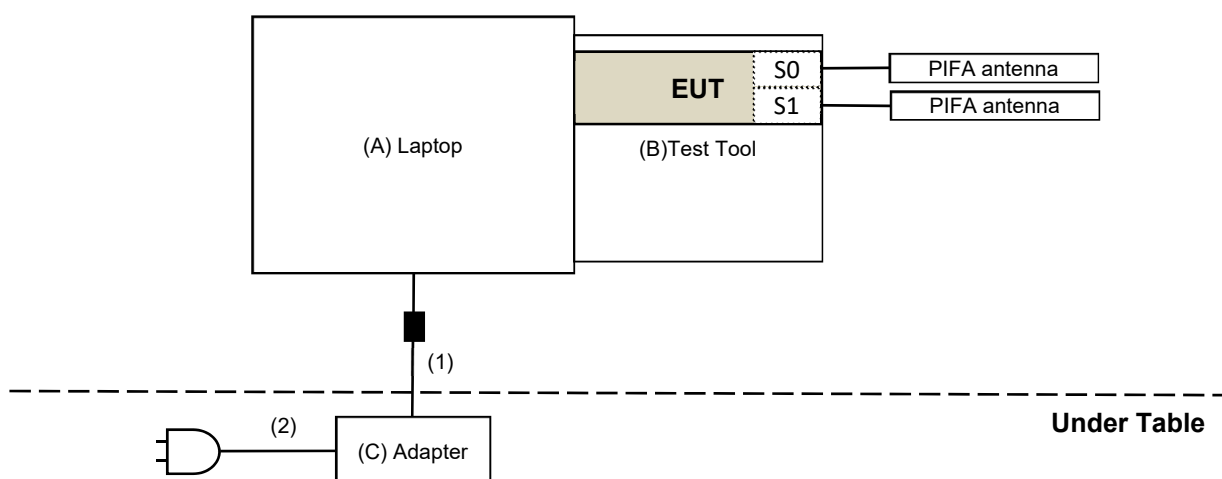




3.6 Test Program Used and Operation Descriptions

Controlling software (Bluetooth RF test tool (5.2.3.79)) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	E5420	FHNS4S1	N/A	Provided by Lab
B	Test Tool	Realtek	N/A	N/A	N/A	Supplied by applicant
C	Adapter	Dell	LA65NS1-00	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
Power Meter Anritsu	ML2495A	1529002	2023/6/17	2024/6/16
Pulse Power Sensor Anritsu	MA2411B	1726434	2023/6/19	2024/6/18

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/6/27 ~ 2023/11/7

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112409	2023/2/18	2024/2/17
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2023/6/27 ~ 2023/11/7

4.3 6 dB Bandwidth

Refer to section 4.2 to get information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance	N/A	EMC-01	2022/9/27	2023/9/26
EMI Test Receiver R&S	ESCS 30	847124/029	2022/10/14	2023/10/13
Fixed Attenuator STI	STI02-2200-10	005	2023/7/1	2024/6/30
LISN R&S	ESH3-Z5	848773/004	2022/10/18	2023/10/17
RF Coaxial Cable JYEBAO	5D-FB	COCCAB-001	2023/7/1	2024/6/30
Software BVADT	BVADT_Conc_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2023/8/22

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0842	2022/10/24	2023/10/23
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR3	102528	2023/2/10	2024/2/9
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2022/12/28	2023/12/27
Loop Antenna Electro-Metrics	EM-6879	264	2023/2/21	2024/2/20
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
Preamplifier EMCI	EMC330N	980538	2023/4/6	2024/4/5
	EMC001340	980142	2023/5/8	2024/5/7
PXA Signal Analyzer Keysight	N9030B	MY57141948	2023/5/19	2024/5/18
RF Coaxial Cable JYEBAO	5D-FB	LOOPCAB-001	2022/12/19	2023/12/18
		LOOPCAB-002	2022/12/19	2023/12/18
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: 2023/8/16

4.7 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	ESR3	102528	2023/2/10	2024/2/9
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2022/11/13 2023/11/12	2023/11/12 2024/11/11
	BBHA 9170	9170-739	2022/11/13 2023/11/12	2023/11/12 2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60112410	2023/3/6	2024/3/5
Preamplifier EMCI	EMC12630SE	980509	2023/4/7	2024/4/6
	EMC184045SE	980387	2022/12/28	2023/12/27
RF Coaxial Cable EMCI	EMC-KM-KM-4000	200214	2023/2/20	2024/2/19
	EMC102-KM-KM-1200	160924	2022/12/28	2023/12/27
	EMC104-SM-SM-1500	180503	2023/4/7	2024/4/6
	EMC104-SM-SM-2000	180501	2023/4/7	2024/4/6
	EMC104-SM-SM-6000	180506	2023/4/7	2024/4/6
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: 2023/7/26 ~ 2023/11/17

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 Power Spectral Density

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz.

5.3 6 dB Bandwidth

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

5.4 Conducted Out of Band Emissions

Below 20 dB of the highest emission level of operating band (in 100 kHz Resolution Bandwidth).

5.5 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.

5.6 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).

5.7 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

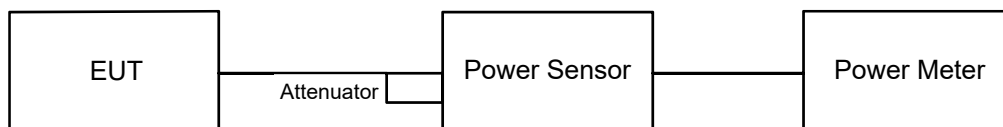
Notes:

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:

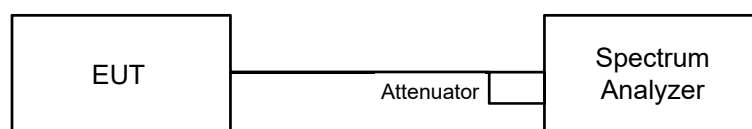
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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 Power Spectral Density

6.2.1 Test Setup

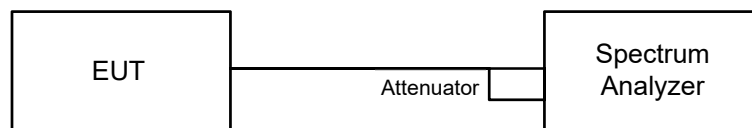


6.2.2 Test Procedure

- Set analyzer center frequency to DTS channel center frequency.
- Set the span to 1.5 times the DTS bandwidth.
- Set the RBW to: 3 kHz.
- Set the VBW $\geq 3 \times$ RBW.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level within the RBW.

6.3 6 dB Bandwidth

6.3.1 Test Setup

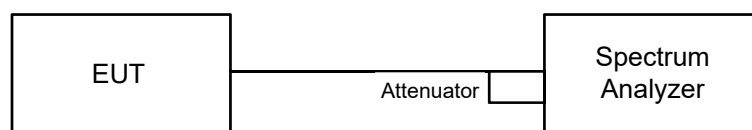


6.3.2 Test Procedure

- Set resolution bandwidth (RBW) = 100 kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.4 Conducted Out of Band Emissions

6.4.1 Test Setup



6.4.2 Test Procedure

MEASUREMENT PROCEDURE REF

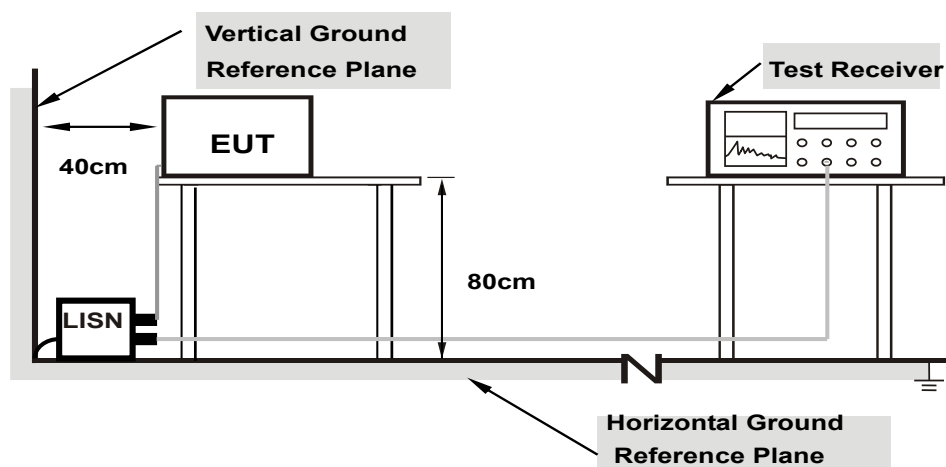
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

- Set RBW = 100 kHz.
- Set VBW ≥ 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

6.5 AC Power Conducted Emissions

6.5.1 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).

6.5.2 Test Procedure

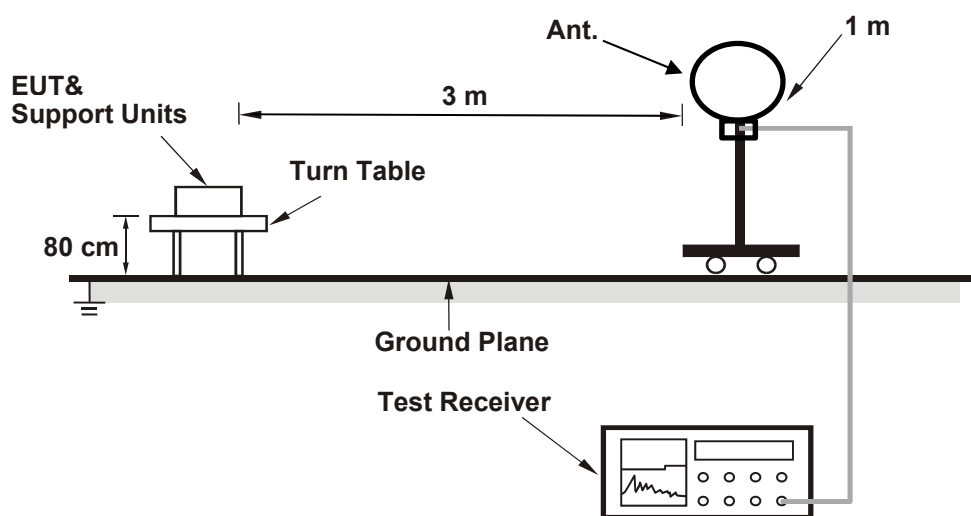
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The 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.

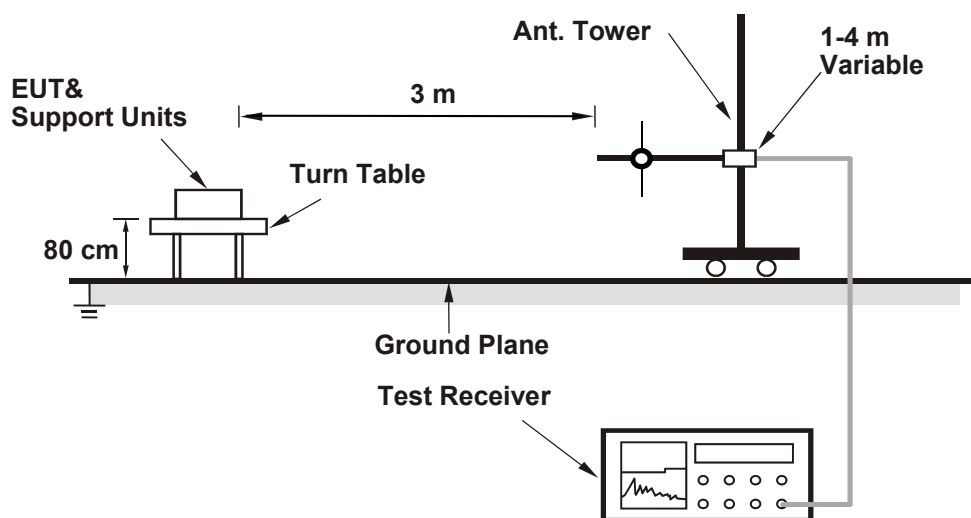
6.6 Unwanted Emissions below 1 GHz

6.6.1 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).

6.6.2 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

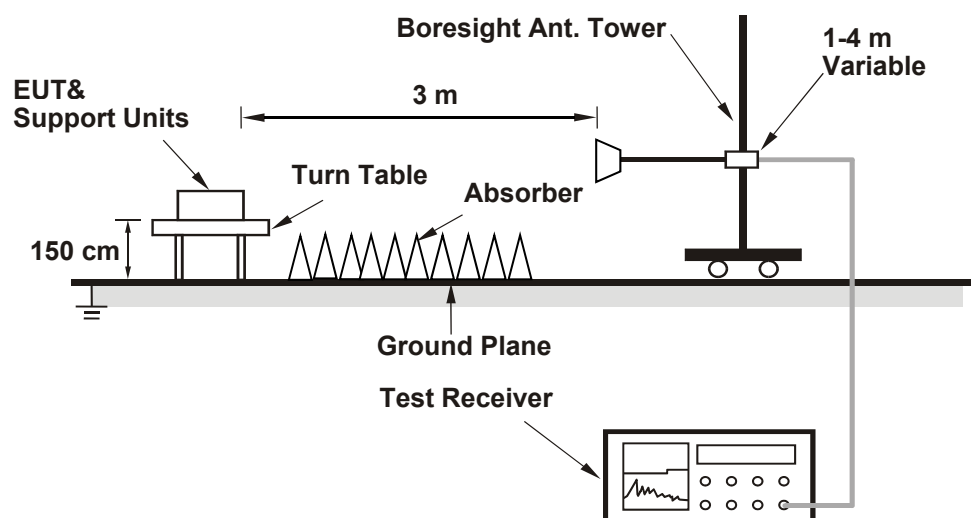
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the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

6.7 Unwanted Emissions above 1 GHz

6.7.1 Test Setup



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

6.7.2 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

Low Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung
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For Peak Power

LE-Coded S=2

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	4.656	6.68	30	Pass
19	2440	4.406	6.44	30	Pass
39	2480	4.592	6.62	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	4.842	6.85	30	Pass
19	2440	4.375	6.41	30	Pass
39	2480	4.613	6.64	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	4.775	6.79	30	Pass
19	2440	4.365	6.40	30	Pass
39	2480	4.592	6.62	30	Pass

Note: The antenna gain is 3.4 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	4.764	6.78	30	Pass
19	2440	4.477	6.51	30	Pass
38	2478	4.677	6.70	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

LE-Coded S=2

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	4.375	6.41
19	2440	4.036	6.06
39	2480	4.266	6.30

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	4.406	6.44
19	2440	4.083	6.11
39	2480	4.295	6.33

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	4.355	6.39
19	2440	4.055	6.08
39	2480	4.276	6.31

BT-LE 2M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2404	4.426	6.46
19	2440	4.14	6.17
38	2478	4.345	6.38

High Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Katina Lu
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For Peak Power

LE-Coded S=2

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	18.707	12.72	30	Pass
19	2440	18.365	12.64	30	Pass
39	2480	18.621	12.70	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	19.055	12.80	30	Pass
19	2440	18.493	12.67	30	Pass
39	2480	18.664	12.71	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	18.88	12.76	30	Pass
19	2440	18.535	12.68	30	Pass
39	2480	18.836	12.75	30	Pass

Note: The antenna gain is 3.4 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	19.055	12.80	30	Pass
19	2440	18.621	12.70	30	Pass
38	2478	18.923	12.77	30	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

LE-Coded S=2

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	18.197	12.60
19	2440	17.783	12.50
39	2480	18.072	12.57

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	18.408	12.65
19	2440	17.865	12.52
39	2480	18.155	12.59

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	18.281	12.62
19	2440	17.989	12.55
39	2480	18.155	12.59

BT-LE 2M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
1	2404	18.408	12.65
19	2440	17.947	12.54
38	2478	18.197	12.60

7.2 Power Spectral Density

Low Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung
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LE-Coded S=2

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	0.39	8	Pass
19	2440	0.06	8	Pass
39	2480	0.27	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-0.12	8	Pass
19	2440	-0.06	8	Pass
39	2480	-0.30	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 1M

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-10.16	8	Pass
19	2440	-9.89	8	Pass
39	2480	-8.95	8	Pass

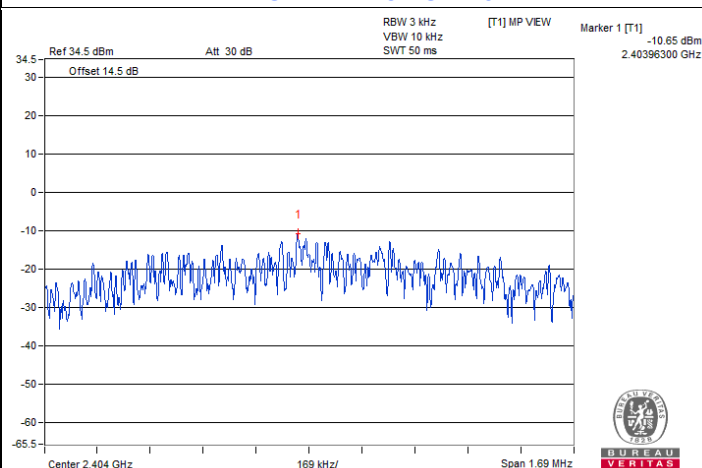
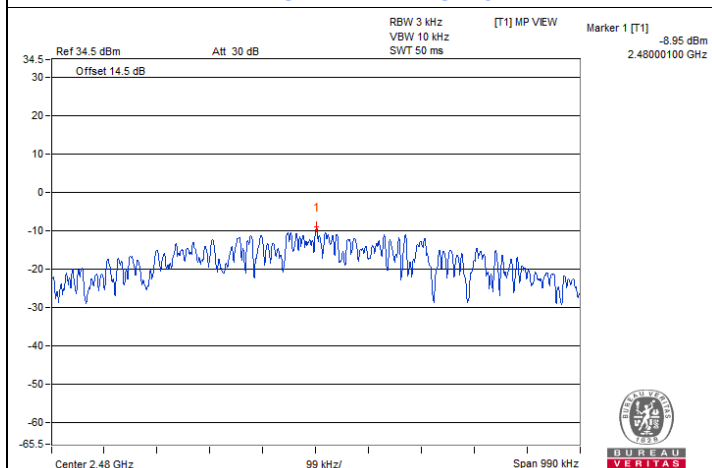
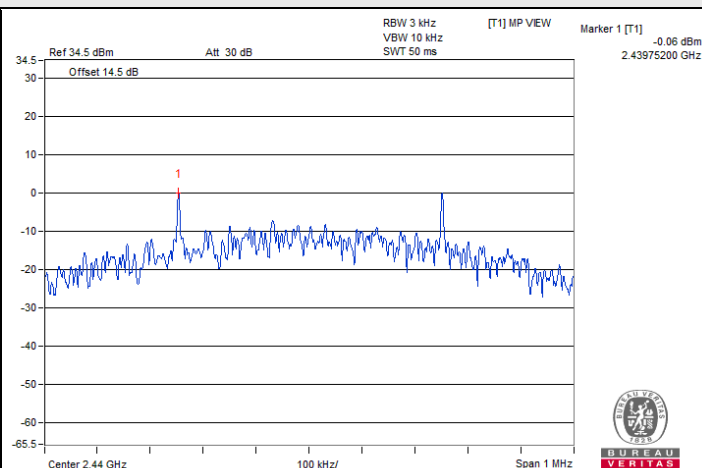
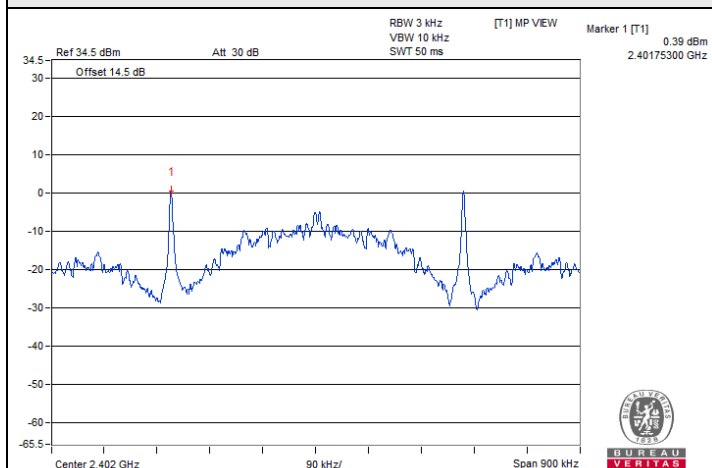
Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 2M

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
1	2404	-10.65	8	Pass
19	2440	-11.75	8	Pass
38	2478	-11.56	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

Spectrum Plot of Maximum Value



High Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Katina Lu
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LE-Coded S=2

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	6.18	8	Pass
19	2440	6.32	8	Pass
39	2480	6.33	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

LE-Coded S=8

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	6.35	8	Pass
19	2440	6.47	8	Pass
39	2480	6.58	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 1M

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-1.25	8	Pass
19	2440	-0.91	8	Pass
39	2480	-1.72	8	Pass

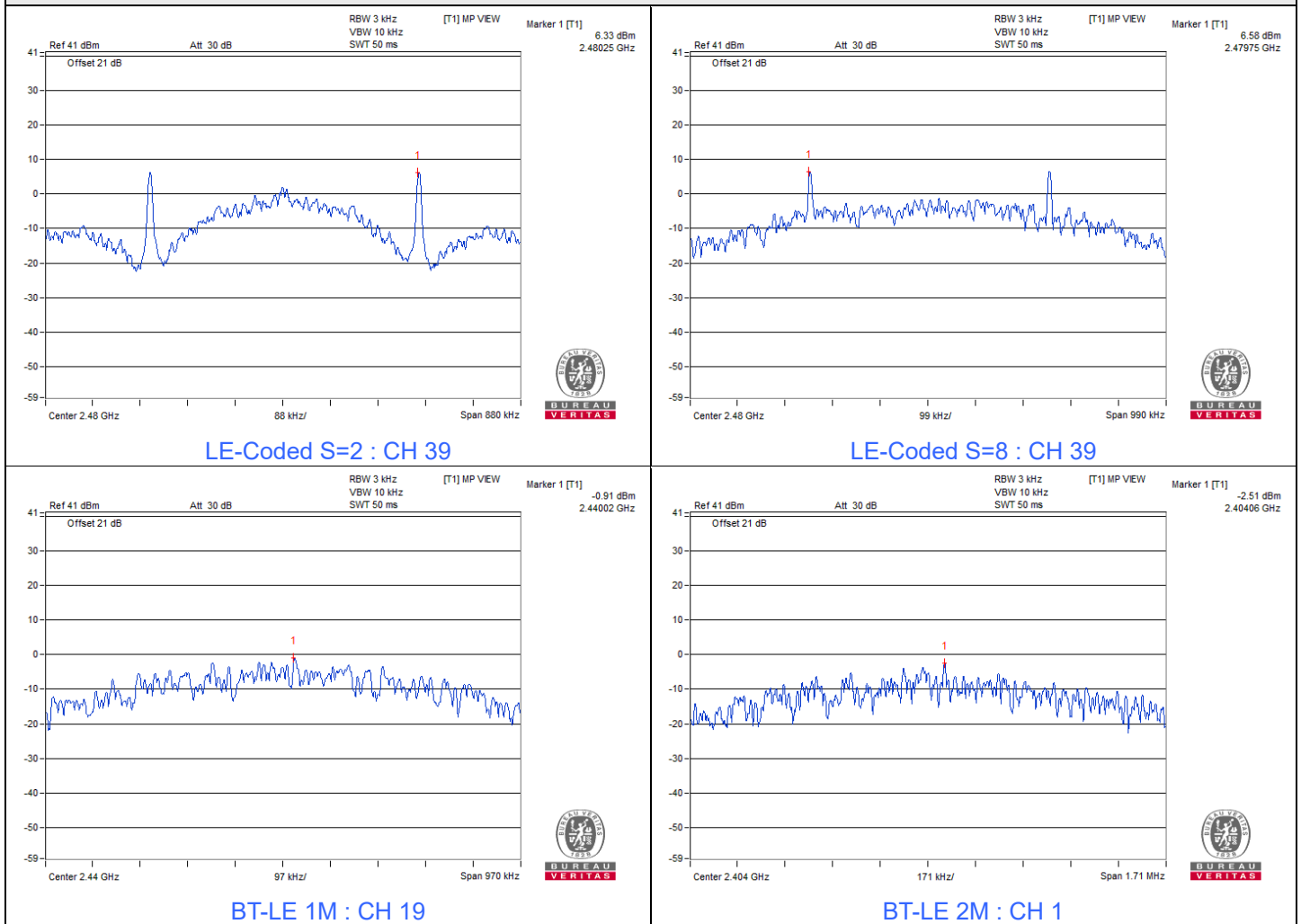
Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 2M

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
1	2404	-2.51	8	Pass
19	2440	-2.63	8	Pass
38	2478	-3.43	8	Pass

Note: The antenna gain is 3.4 dBi < 6 dBi, so the power density limit shall not be reduced.

Spectrum Plot of Maximum Value



7.3 6 dB Bandwidth

Low Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung
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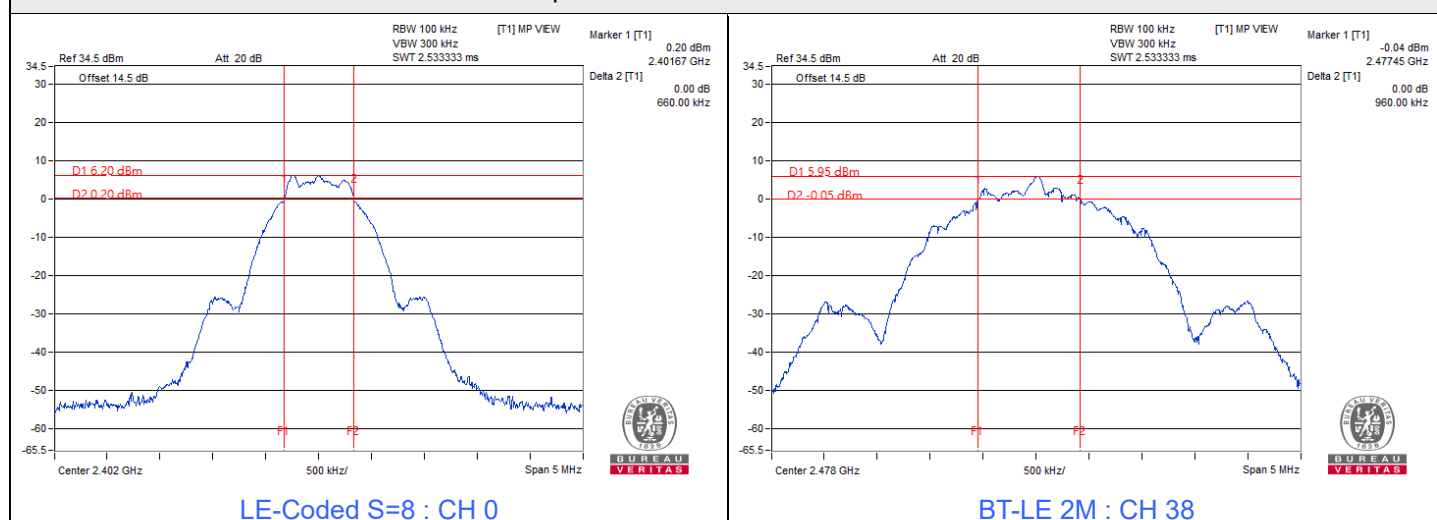
LE-Coded S=8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	0.66	0.5	Pass
19	2440	0.67	0.5	Pass
39	2480	0.67	0.5	Pass

BT-LE 2M

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
1	2404	1.13	0.5	Pass
19	2440	1.11	0.5	Pass
38	2478	0.96	0.5	Pass

Spectrum Plot of Minimum Value



High Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Katina Lu
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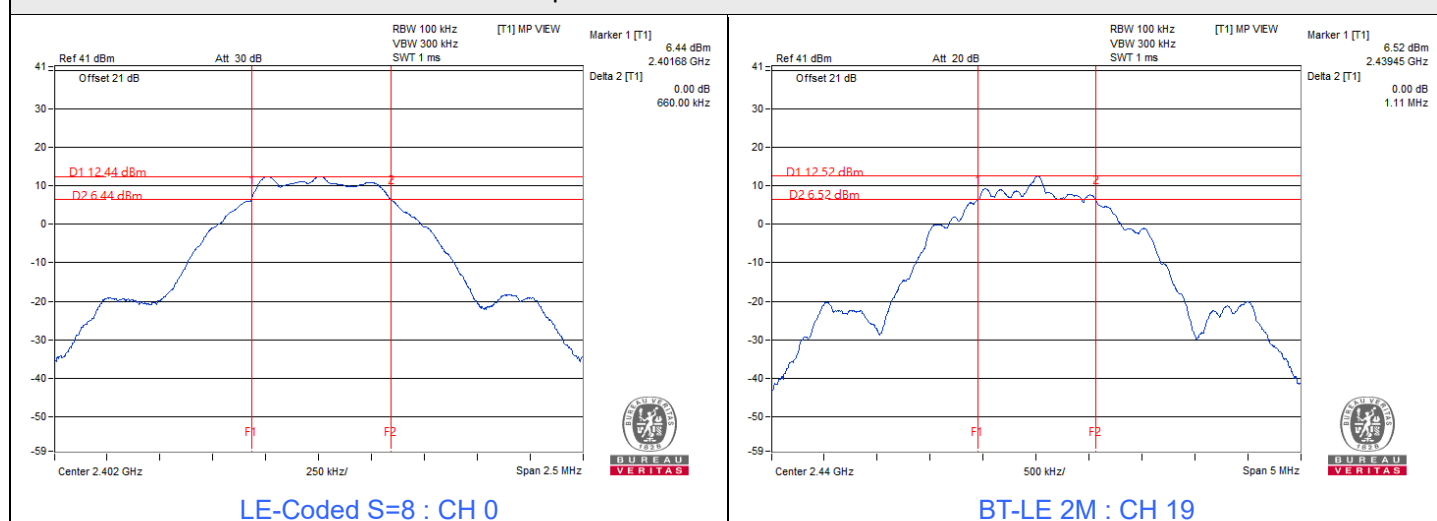
LE-Coded S=8

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	0.66	0.5	Pass
19	2440	0.66	0.5	Pass
39	2480	0.66	0.5	Pass

BT-LE 2M

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
1	2404	1.14	0.5	Pass
19	2440	1.11	0.5	Pass
38	2478	1.13	0.5	Pass

Spectrum Plot of Minimum Value

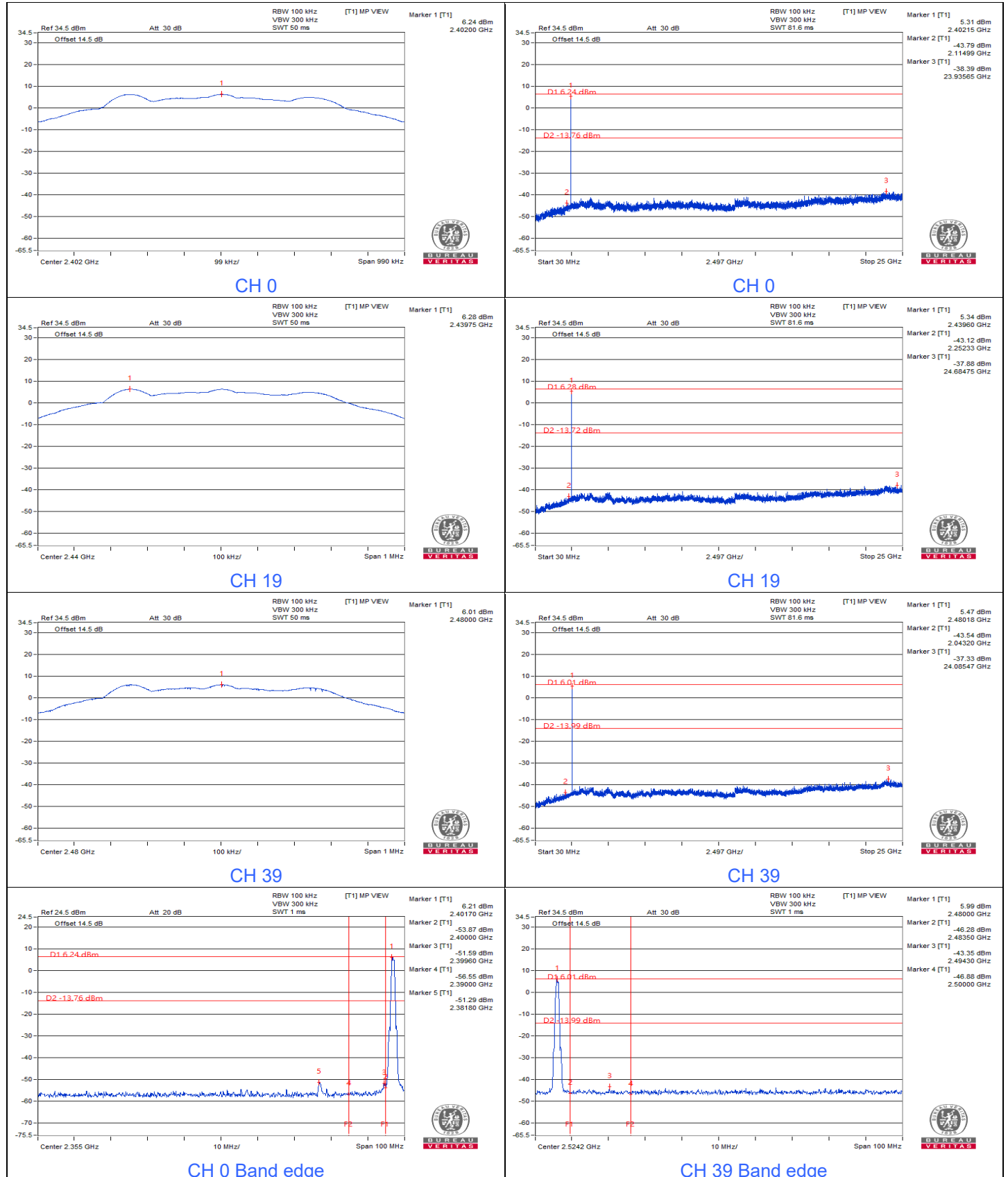


7.4 Conducted Out of Band Emissions

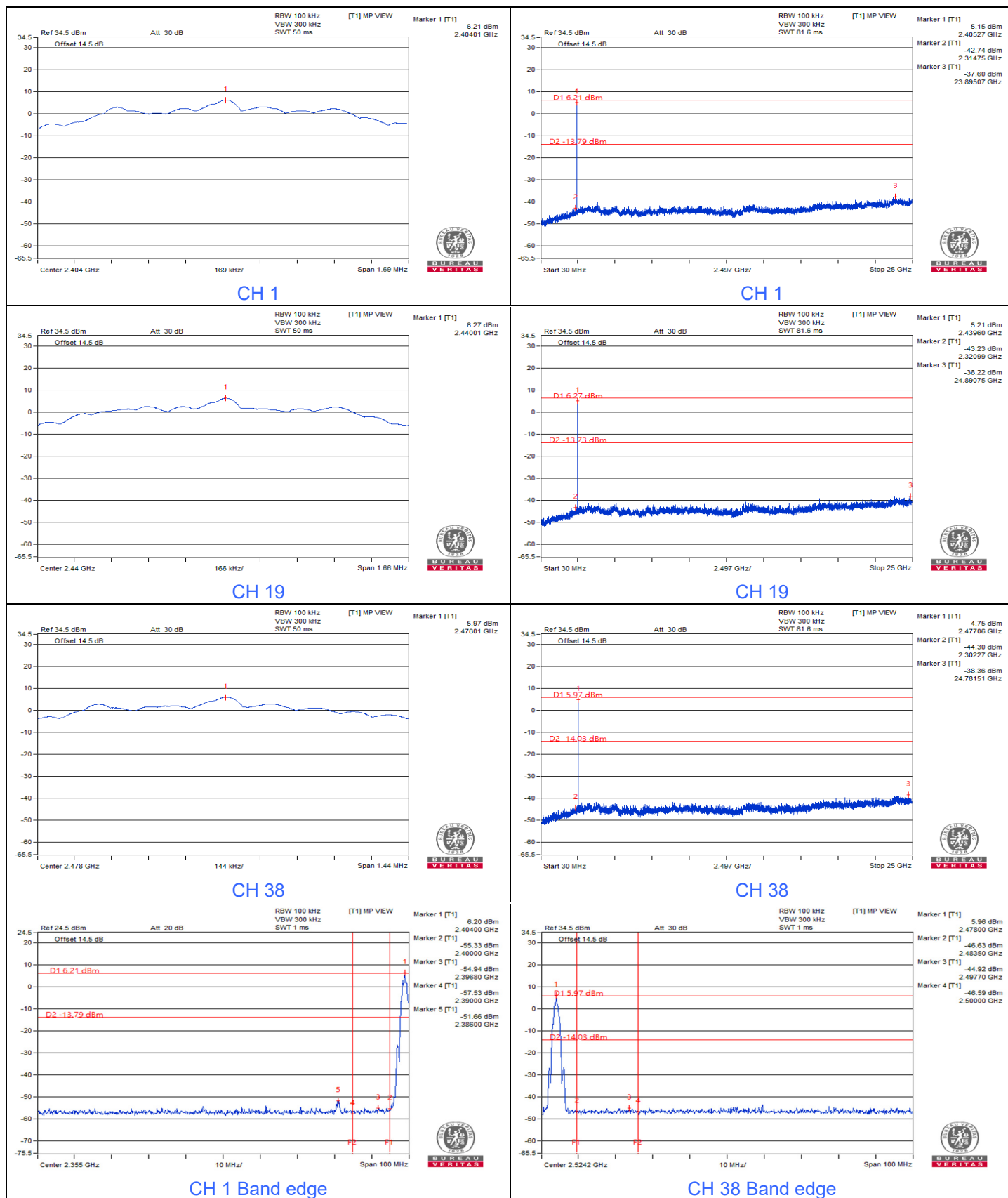
Low Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Dolly Chung
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LE-Coded S=8



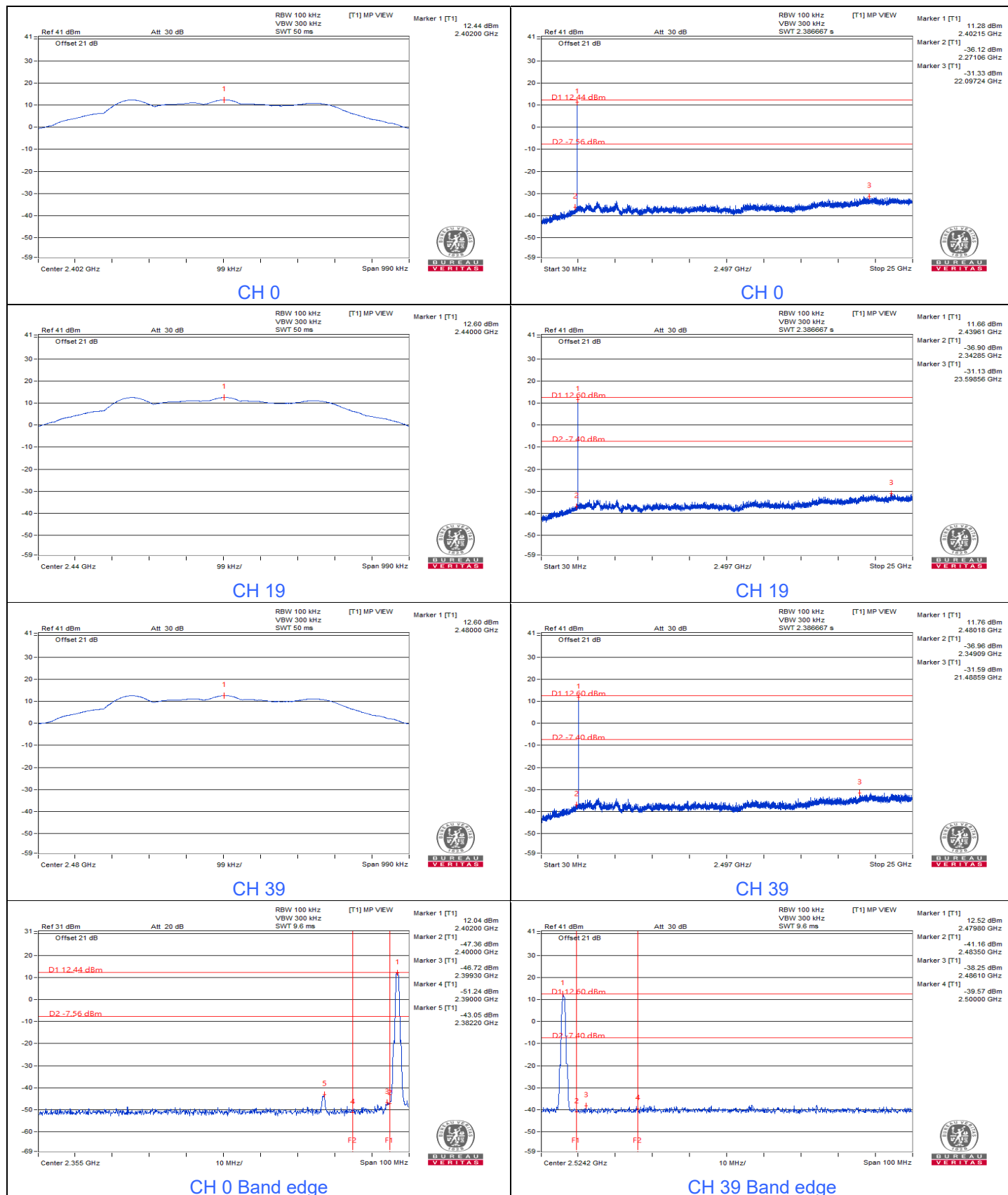
BT-LE 2M



High Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Katina Lu
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LE-Coded S=8



BT-LE 2M



7.5 AC Power Conducted Emissions

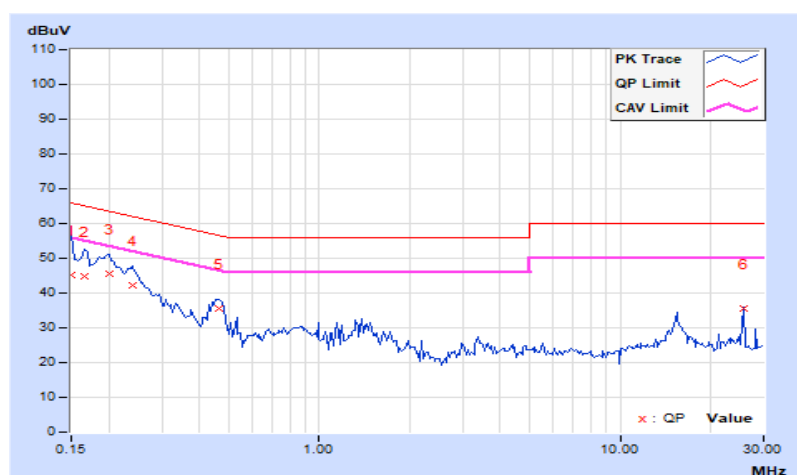
Low Power

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	23°C, 76% RH
Tested By	Andy Ho		

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	0.15000	9.95	35.26	25.51	45.21	35.46	66.00	56.00	-20.79	-20.54
2	0.16562	9.94	34.95	20.37	44.89	30.31	65.18	55.18	-20.29	-24.87
3	0.20078	9.94	35.47	21.71	45.41	31.65	63.58	53.58	-18.17	-21.93
4	0.23984	9.94	32.13	22.70	42.07	32.64	62.10	52.10	-20.03	-19.46
5	0.46250	9.95	25.61	14.32	35.56	24.27	56.65	46.65	-21.09	-22.38
6	25.87500	11.19	24.24	23.91	35.43	35.10	60.00	50.00	-24.57	-14.90

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

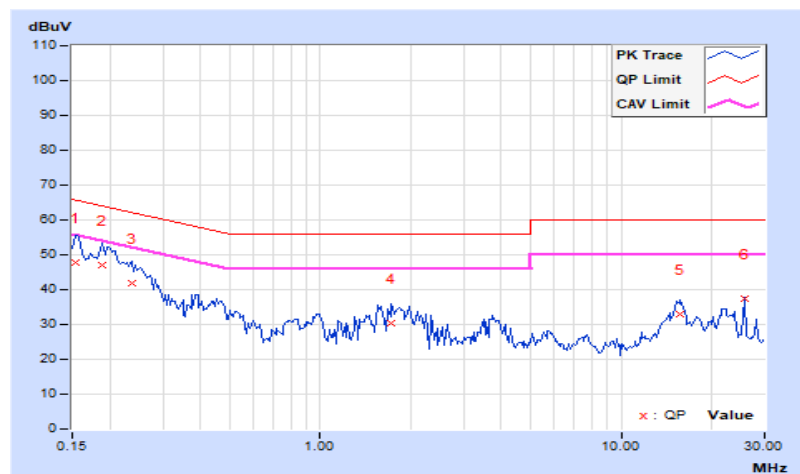


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 76% RH
Tested By	Andy Ho		

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	0.15391	9.99	37.97	24.18	47.96	34.17	65.79	55.79	-17.83	-21.62
2	0.18906	9.99	37.10	29.40	47.09	39.39	64.08	54.08	-16.99	-14.69
3	0.23594	9.99	31.97	22.08	41.96	32.07	62.24	52.24	-20.28	-20.17
4	1.72656	10.05	20.37	12.59	30.42	22.64	56.00	46.00	-25.58	-23.36
5	15.76953	10.64	22.46	15.58	33.10	26.22	60.00	50.00	-26.90	-23.78
6	25.87500	10.89	26.59	26.25	37.48	37.14	60.00	50.00	-22.52	-12.86

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



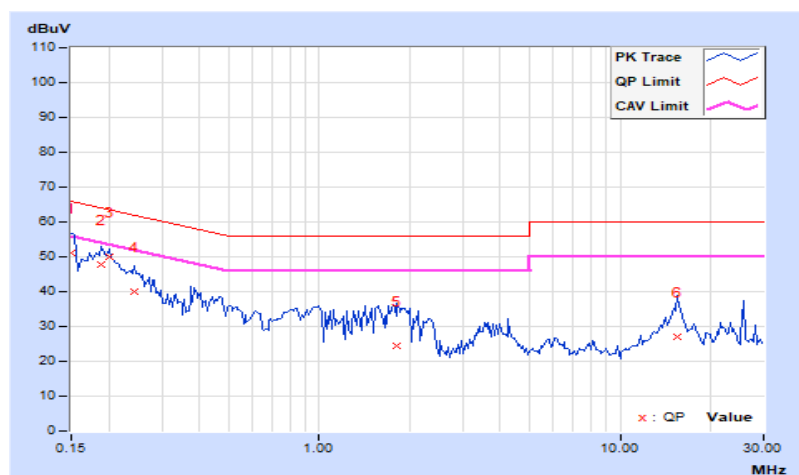
High Power

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	23°C, 76% RH
Tested By	Andy Ho		

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	0.15000	9.95	41.20	28.01	51.15	37.96	66.00	56.00	-14.85	-18.04
2	0.18906	9.94	38.01	29.42	47.95	39.36	64.08	54.08	-16.13	-14.72
3	0.20078	9.94	40.01	29.22	49.95	39.16	63.58	53.58	-13.63	-14.42
4	0.24375	9.94	30.20	17.82	40.14	27.76	61.97	51.97	-21.83	-24.21
5	1.81250	10.00	14.39	6.23	24.39	16.23	56.00	46.00	-31.61	-29.77
6	15.54688	10.75	16.27	9.13	27.02	19.88	60.00	50.00	-32.98	-30.12

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

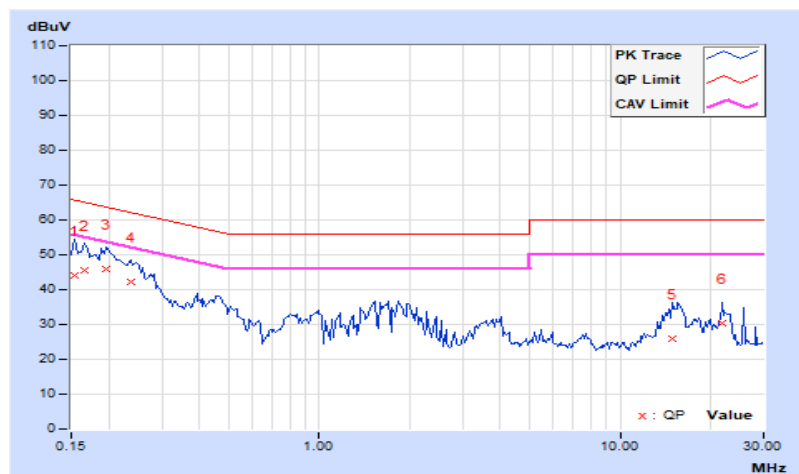


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	23°C, 76% RH
Tested By	Andy Ho		

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	0.15391	9.99	34.16	22.25	44.15	32.24	65.79	55.79	-21.64	-23.55
2	0.16562	9.99	35.48	20.09	45.47	30.08	65.18	55.18	-19.71	-25.10
3	0.19687	9.99	35.79	25.45	45.78	35.44	63.74	53.74	-17.96	-18.30
4	0.23594	9.99	32.18	17.22	42.17	27.21	62.24	52.24	-20.07	-25.03
5	14.94922	10.61	15.50	8.73	26.11	19.34	60.00	50.00	-33.89	-30.66
6	21.86719	10.81	19.40	10.22	30.21	21.03	60.00	50.00	-29.79	-28.97

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



7.6 Unwanted Emissions below 1 GHz

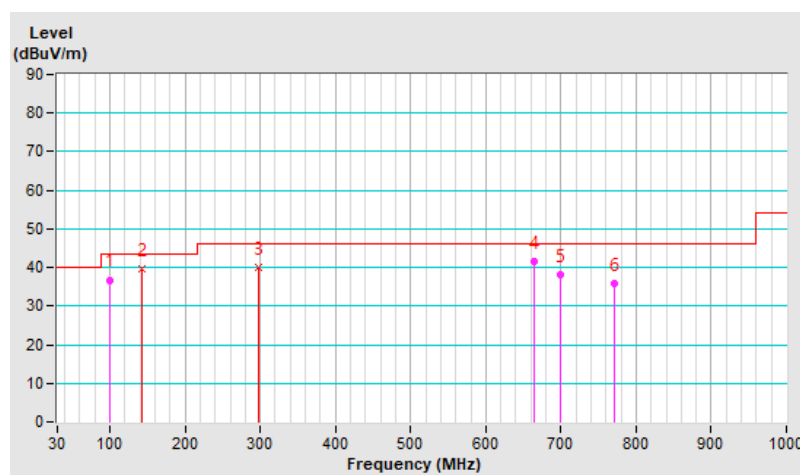
Low Power

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	22°C, 65% 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	100.73	36.8 QP	43.5	-6.7	1.50 H	213	54.0	-17.2
2	142.70	39.6 QP	43.5	-3.9	1.00 H	297	52.8	-13.2
3	297.63	40.1 QP	46.0	-5.9	3.00 H	63	52.8	-12.7
4	665.10	41.5 QP	46.0	-4.5	3.00 H	127	45.7	-4.2
5	700.04	38.1 QP	46.0	-7.9	2.50 H	211	42.1	-4.0
6	770.71	35.7 QP	46.0	-10.3	3.00 H	222	38.0	-2.3

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.

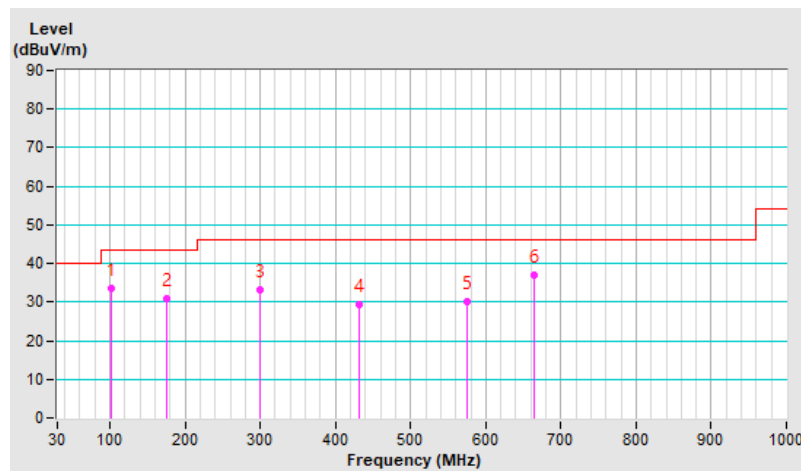


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22°C, 65% RH
Tested By	Willy lin		

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	100.87	33.6 QP	43.5	-9.9	1.00 V	206	50.8	-17.2
2	176.05	30.9 QP	43.5	-12.6	1.50 V	294	45.1	-14.2
3	299.45	33.3 QP	46.0	-12.7	1.50 V	100	45.9	-12.6
4	430.88	29.3 QP	46.0	-16.7	3.00 V	129	38.1	-8.8
5	574.99	30.1 QP	46.0	-15.9	2.50 V	271	36.5	-6.4
6	664.55	37.1 QP	46.0	-8.9	2.00 V	212	41.3	-4.2

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.



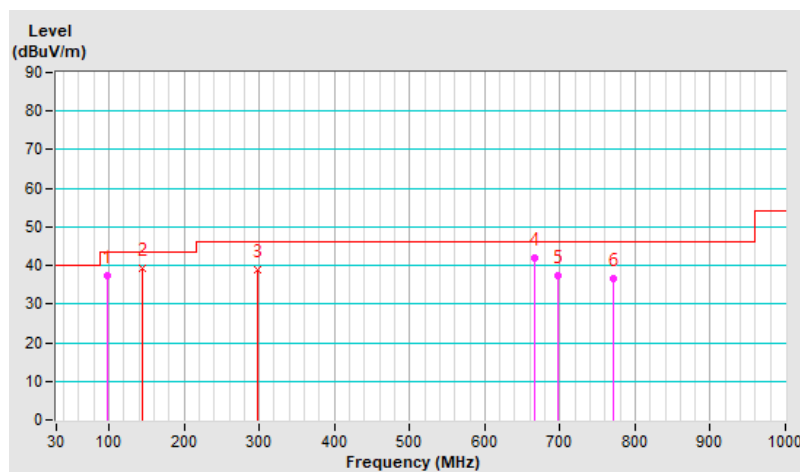
High Power

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	22°C, 65% 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	98.79	37.4 QP	43.5	-6.1	1.50 H	211	55.0	-17.6
2	144.14	39.2 QP	43.5	-4.3	3.00 H	290	52.4	-13.2
3	296.88	38.9 QP	46.0	-7.1	2.00 H	70	51.6	-12.7
4	665.41	42.0 QP	46.0	-4.0	3.00 H	132	46.2	-4.2
5	698.19	37.2 QP	46.0	-8.8	2.00 H	213	41.2	-4.0
6	770.93	36.5 QP	46.0	-9.5	3.00 H	214	38.8	-2.3

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.

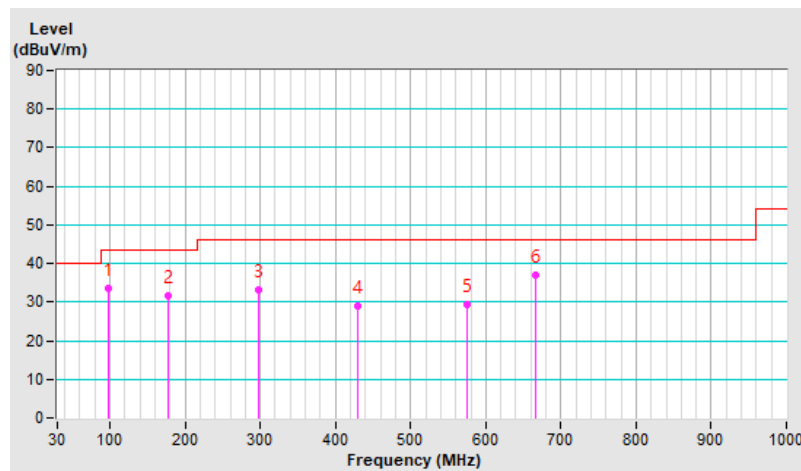


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22°C, 65% RH
Tested By	Willy lin		

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	98.66	33.5 QP	43.5	-10.0	3.00 V	213	51.1	-17.6
2	177.57	31.6 QP	43.5	-11.9	2.50 V	295	46.0	-14.4
3	298.21	33.2 QP	46.0	-12.8	1.50 V	68	45.8	-12.6
4	430.18	29.0 QP	46.0	-17.0	1.50 V	126	37.9	-8.9
5	575.05	29.2 QP	46.0	-16.8	1.00 V	214	35.6	-6.4
6	666.57	36.9 QP	46.0	-9.1	3.00 V	219	41.1	-4.2

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.



7.7 Unwanted Emissions above 1 GHz

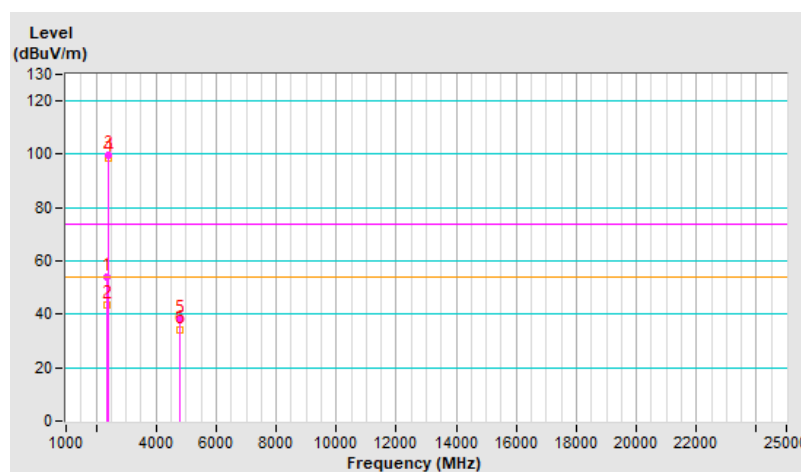
Low Power

RF Mode	LE-Coded S=8	Channel	CH 0 : 2402 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, 73% RH
Tested By	Louis Yang		

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	2381.84	53.9 PK	74.0	-20.1	1.00 H	360	56.6	-2.7
2	2381.84	43.5 AV	54.0	-10.5	1.00 H	360	46.2	-2.7
3	*2402.00	99.7 PK			1.00 H	360	102.5	-2.8
4	*2402.00	98.5 AV			1.00 H	360	101.3	-2.8
5	4804.00	38.2 PK	74.0	-35.8	1.04 H	180	36.1	2.1
6	4804.00	34.3 AV	54.0	-19.7	1.04 H	180	32.2	2.1

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.

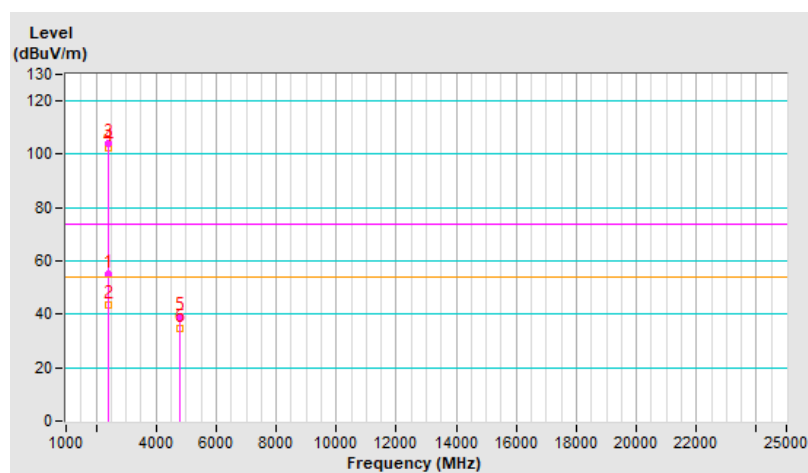


RF Mode	LE-Coded S=8	Channel	CH 0 : 2402 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	55.3 PK	74.0	-18.7	1.00 V	360	58.1	-2.8
2	2390.00	43.7 AV	54.0	-10.3	1.00 V	360	46.5	-2.8
3	*2402.00	104.3 PK			1.00 V	360	107.1	-2.8
4	*2402.00	102.5 AV			1.00 V	360	105.3	-2.8
5	4804.00	38.8 PK	74.0	-35.2	1.43 V	135	36.7	2.1
6	4804.00	34.7 AV	54.0	-19.3	1.43 V	135	32.6	2.1

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.

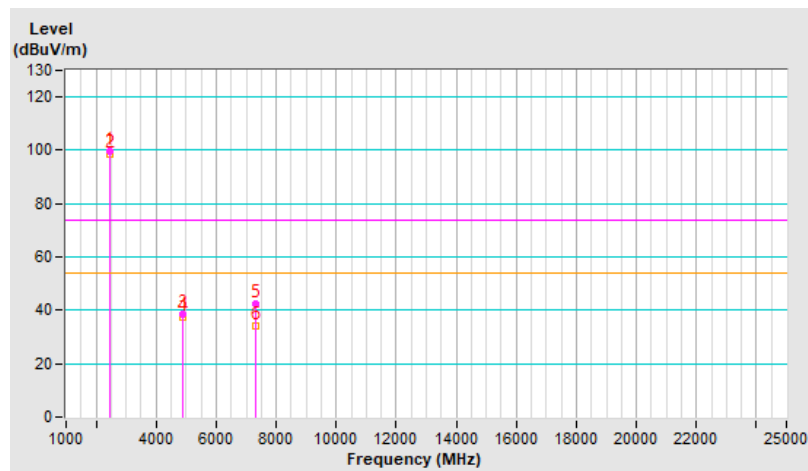


RF Mode	LE-Coded S=8	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	99.6 PK			1.94 H	350	102.4	-2.8
2	*2440.00	98.8 AV			1.94 H	350	101.6	-2.8
3	4880.00	38.5 PK	74.0	-35.5	1.08 H	188	36.4	2.1
4	4880.00	37.6 AV	54.0	-16.4	1.08 H	188	35.5	2.1
5	7320.00	42.5 PK	74.0	-31.5	1.00 H	126	34.8	7.7
6	7320.00	34.1 AV	54.0	-19.9	1.00 H	126	26.4	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.

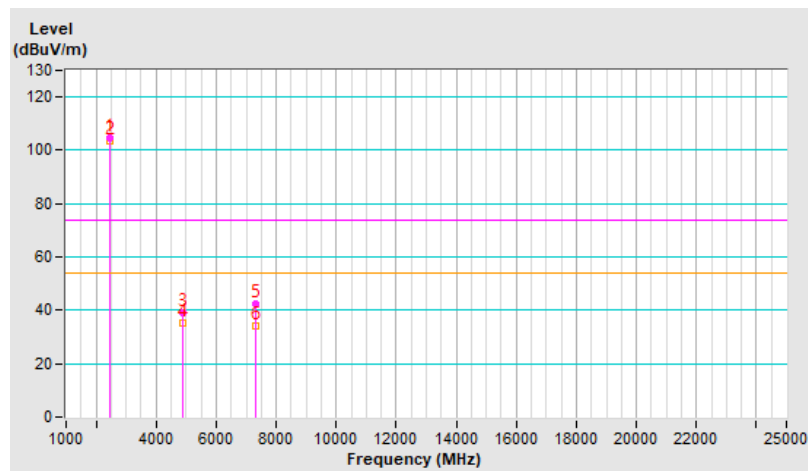


RF Mode	LE-Coded S=8	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	104.4 PK			1.06 V	360	107.2	-2.8
2	*2440.00	103.4 AV			1.06 V	360	106.2	-2.8
3	4880.00	38.9 PK	74.0	-35.1	1.34 V	127	36.8	2.1
4	4880.00	35.4 AV	54.0	-18.6	1.34 V	127	33.3	2.1
5	7320.00	42.4 PK	74.0	-31.6	1.15 V	320	34.7	7.7
6	7320.00	34.3 AV	54.0	-19.7	1.15 V	320	26.6	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.

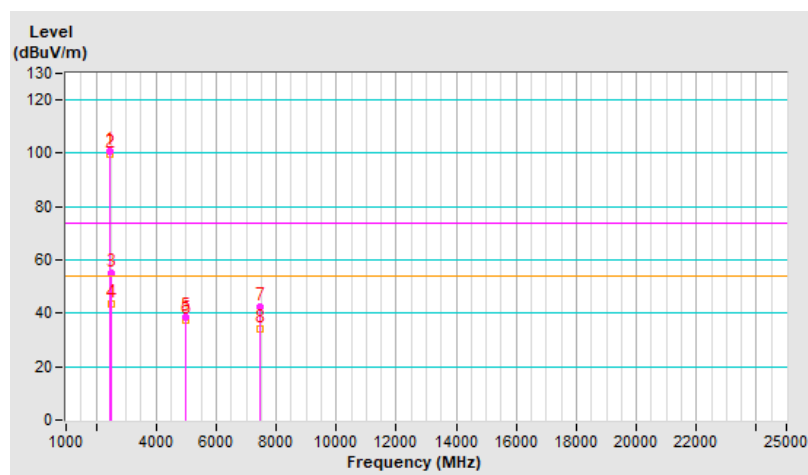


RF Mode	LE-Coded S=8	Channel	CH 39 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	100.7 PK			1.02 H	360	103.3	-2.6
2	*2480.00	99.5 AV			1.02 H	360	102.1	-2.6
3	2485.09	54.9 PK	74.0	-19.1	1.02 H	360	57.5	-2.6
4	2485.09	43.6 AV	54.0	-10.4	1.02 H	360	46.2	-2.6
5	4960.00	38.6 PK	74.0	-35.4	1.07 H	190	36.4	2.2
6	4960.00	37.5 AV	54.0	-16.5	1.07 H	190	35.3	2.2
7	7440.00	42.3 PK	74.0	-31.7	1.01 H	123	34.5	7.8
8	7440.00	34.2 AV	54.0	-19.8	1.01 H	123	26.4	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

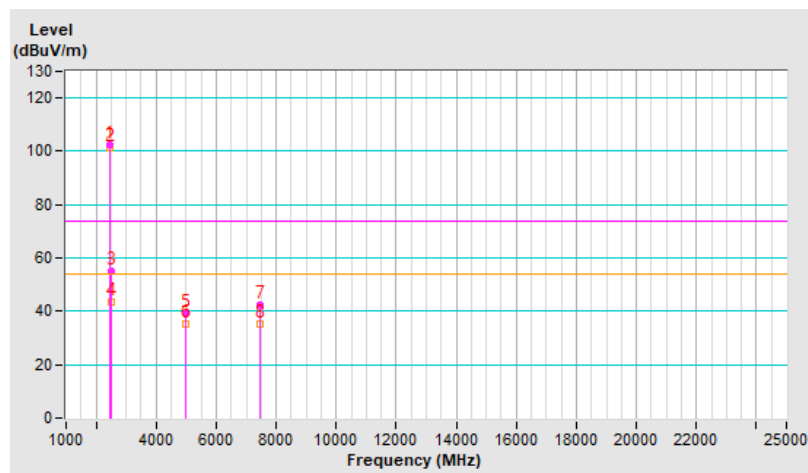


RF Mode	LE-Coded S=8	Channel	CH 39 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	102.6 PK			1.01 V	360	105.2	-2.6
2	*2480.00	101.5 AV			1.01 V	360	104.1	-2.6
3	2485.09	55.0 PK	74.0	-19.0	1.01 V	360	57.6	-2.6
4	2485.09	43.5 AV	54.0	-10.5	1.01 V	360	46.1	-2.6
5	4960.00	39.1 PK	74.0	-34.9	1.35 V	143	36.9	2.2
6	4960.00	35.4 AV	54.0	-18.6	1.35 V	143	33.2	2.2
7	7440.00	42.4 PK	74.0	-31.6	1.12 V	328	34.6	7.8
8	7440.00	35.2 AV	54.0	-18.8	1.12 V	328	27.4	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

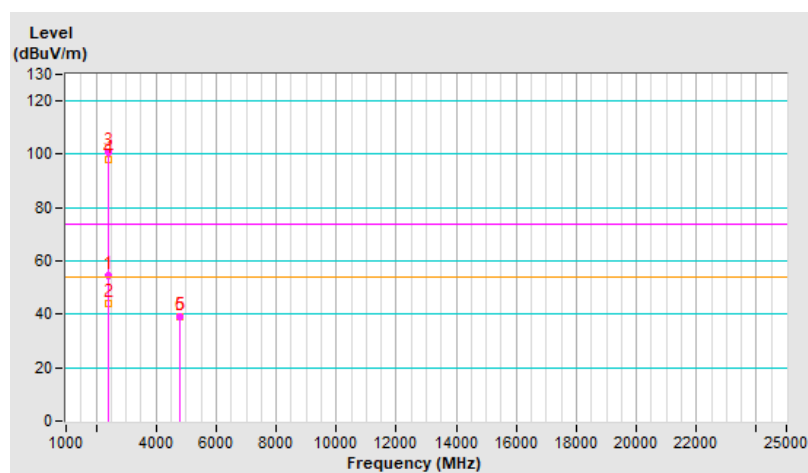


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	54.4 PK	74.0	-19.6	1.02 H	331	57.2	-2.8
2	2390.00	44.3 AV	54.0	-9.7	1.02 H	331	47.1	-2.8
3	*2404.00	100.8 PK			1.02 H	331	103.6	-2.8
4	*2404.00	98.1 AV			1.02 H	331	100.9	-2.8
5	4808.00	39.0 PK	74.0	-35.0	1.06 H	196	37.0	2.0
6	4808.00	38.9 AV	54.0	-15.1	1.06 H	196	36.9	2.0

Remarks:

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

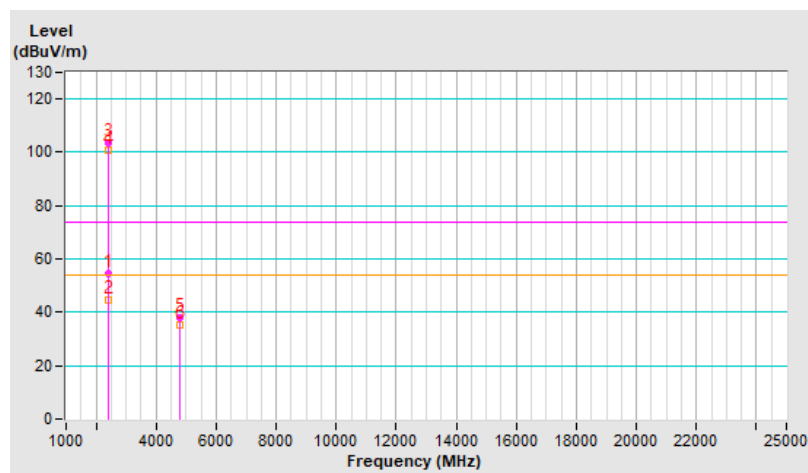


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	2386.23	54.5 PK	74.0	-19.5	1.02 V	360	57.2	-2.7
2	2386.23	44.5 AV	54.0	-9.5	1.02 V	360	47.2	-2.7
3	*2404.00	103.7 PK			1.02 V	360	106.5	-2.8
4	*2404.00	100.6 AV			1.02 V	360	103.4	-2.8
5	4808.00	38.2 PK	74.0	-35.8	1.38 V	131	36.2	2.0
6	4808.00	35.3 AV	54.0	-18.7	1.38 V	131	33.3	2.0

Remarks:

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

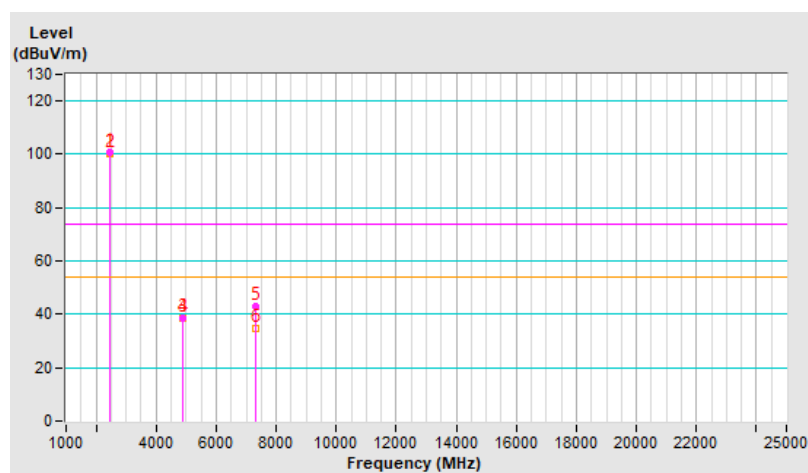


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	100.9 PK			1.02 H	335	103.7	-2.8
2	*2440.00	100.2 AV			1.02 H	335	103.0	-2.8
3	4880.00	38.5 PK	74.0	-35.5	1.07 H	179	36.4	2.1
4	4880.00	38.5 AV	54.0	-15.5	1.07 H	179	36.4	2.1
5	7320.00	43.0 PK	74.0	-31.0	1.04 H	113	35.3	7.7
6	7320.00	34.7 AV	54.0	-19.3	1.04 H	113	27.0	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.

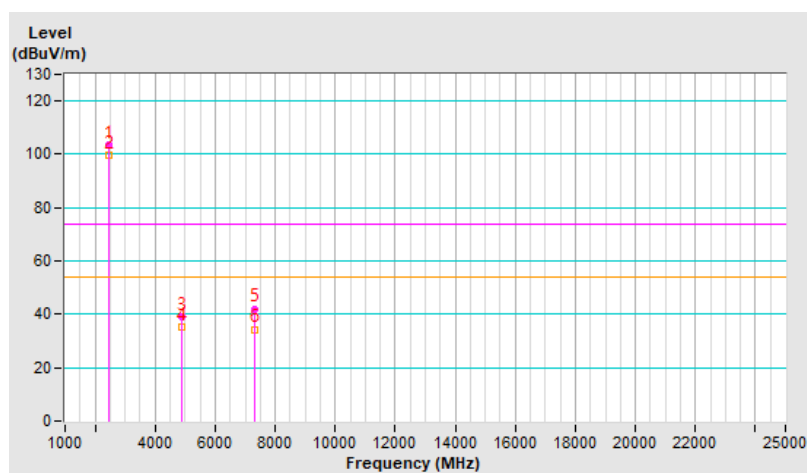


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	103.4 PK			1.00 V	336	106.2	-2.8
2	*2440.00	99.5 AV			1.00 V	336	102.3	-2.8
3	4880.00	38.9 PK	74.0	-35.1	1.40 V	141	36.8	2.1
4	4880.00	35.4 AV	54.0	-18.6	1.40 V	141	33.3	2.1
5	7320.00	42.1 PK	74.0	-31.9	1.16 V	317	34.4	7.7
6	7320.00	34.4 AV	54.0	-19.6	1.16 V	317	26.7	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.

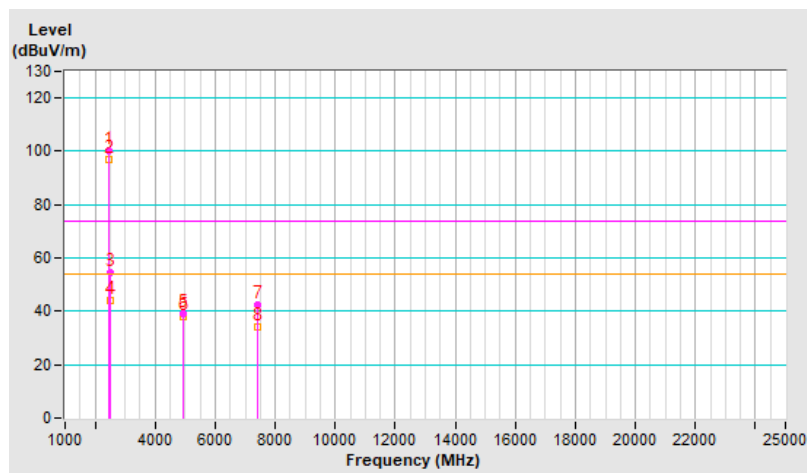


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	100.2 PK			1.00 H	360	102.8	-2.6
2	*2478.00	97.1 AV			1.00 H	360	99.7	-2.6
3	2483.50	54.5 PK	74.0	-19.5	1.00 H	360	57.1	-2.6
4	2483.50	44.0 AV	54.0	-10.0	1.00 H	360	46.6	-2.6
5	4956.00	39.1 PK	74.0	-34.9	1.06 H	195	36.9	2.2
6	4956.00	38.2 AV	54.0	-15.8	1.06 H	195	36.0	2.2
7	7434.00	42.5 PK	74.0	-31.5	1.07 H	113	34.7	7.8
8	7434.00	34.2 AV	54.0	-19.8	1.07 H	113	26.4	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

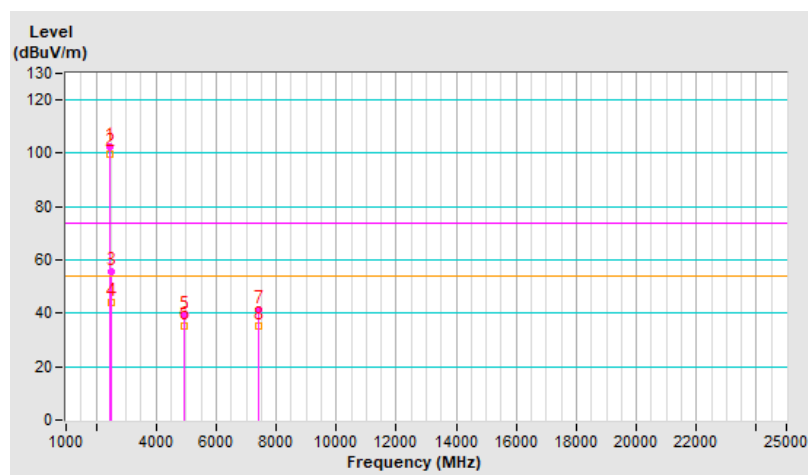


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24°C, 73% RH
Tested By	Louis Yang		

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	102.4 PK			1.05 V	360	105.0	-2.6
2	*2478.00	100.0 AV			1.05 V	360	102.6	-2.6
3	2483.50	55.4 PK	74.0	-18.6	1.05 V	360	58.0	-2.6
4	2483.50	44.0 AV	54.0	-10.0	1.05 V	360	46.6	-2.6
5	4956.00	39.3 PK	74.0	-34.7	1.38 V	142	37.1	2.2
6	4956.00	35.2 AV	54.0	-18.8	1.38 V	142	33.0	2.2
7	7434.00	41.5 PK	74.0	-32.5	1.09 V	317	33.7	7.8
8	7434.00	35.1 AV	54.0	-18.9	1.09 V	317	27.3	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.



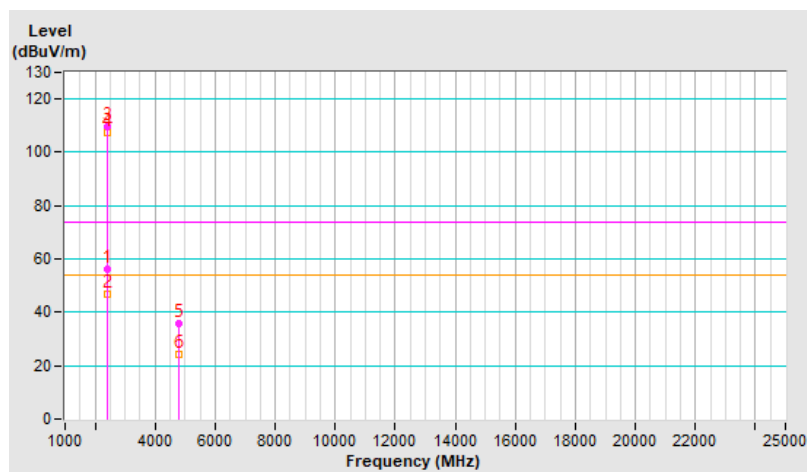
High Power

RF Mode	LE-Coded S=8	Channel	CH 0 : 2402 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	29°C, 78% RH
Tested By	Louis Yang		

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	1.76 H	149	58.9	-2.8
2	2390.00	46.7 AV	54.0	-7.3	1.76 H	149	49.5	-2.8
3	*2402.00	109.4 PK			1.76 H	149	112.2	-2.8
4	*2402.00	107.3 AV			1.76 H	149	110.1	-2.8
5	4804.00	35.6 PK	74.0	-38.4	1.23 H	344	33.5	2.1
6	4804.00	24.1 AV	54.0	-29.9	1.23 H	344	22.0	2.1

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.

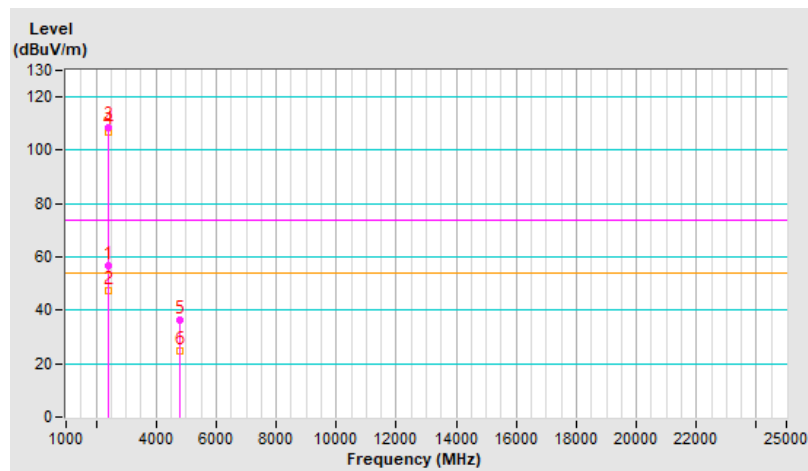


RF Mode	LE-Coded S=8	Channel	CH 0 : 2402 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	56.5 PK	74.0	-17.5	1.59 V	342	59.3	-2.8
2	2390.00	47.3 AV	54.0	-6.7	1.59 V	342	50.1	-2.8
3	*2402.00	108.8 PK			1.59 V	342	111.6	-2.8
4	*2402.00	107.1 AV			1.59 V	342	109.9	-2.8
5	4804.00	36.1 PK	74.0	-37.9	1.25 V	335	34.0	2.1
6	4804.00	24.9 AV	54.0	-29.1	1.25 V	335	22.8	2.1

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.

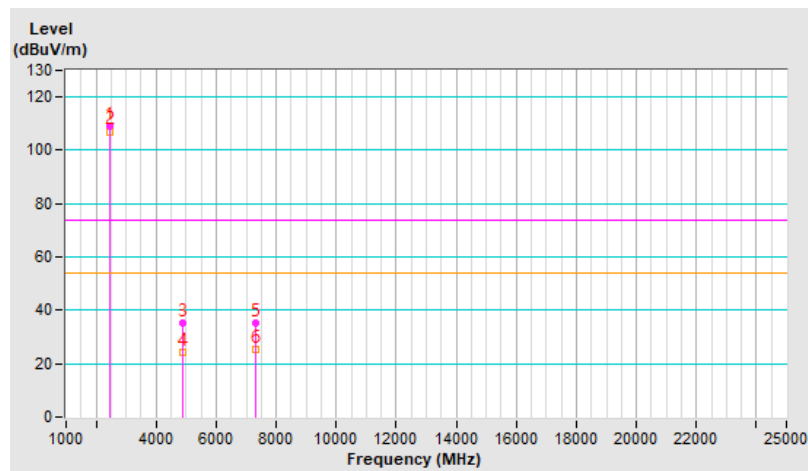


RF Mode	LE-Coded S=8	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	109.0 PK			1.79 H	149	111.8	-2.8
2	*2440.00	107.1 AV			1.79 H	149	109.9	-2.8
3	4880.00	35.2 PK	74.0	-38.8	1.19 H	342	33.1	2.1
4	4880.00	24.0 AV	54.0	-30.0	1.19 H	342	21.9	2.1
5	7320.00	35.3 PK	74.0	-38.7	1.54 H	360	27.6	7.7
6	7320.00	25.3 AV	54.0	-28.7	1.54 H	360	17.6	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.

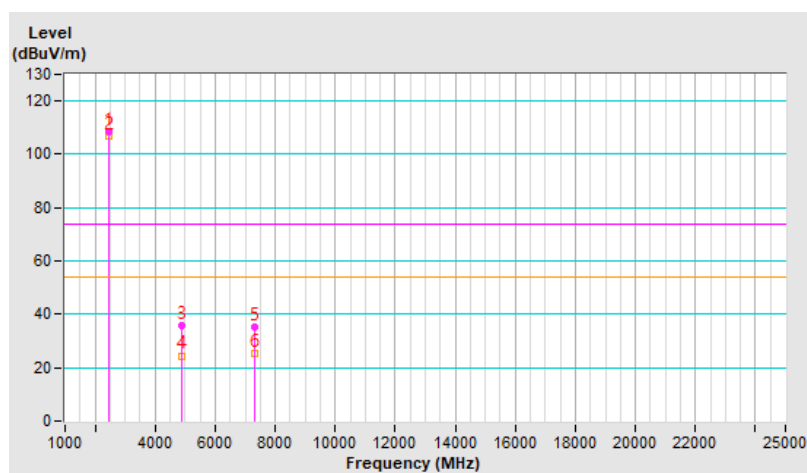


RF Mode	LE-Coded S=8	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	108.4 PK			1.58 V	357	111.2	-2.8
2	*2440.00	106.8 AV			1.58 V	357	109.6	-2.8
3	4880.00	35.6 PK	74.0	-38.4	1.24 V	341	33.5	2.1
4	4880.00	24.5 AV	54.0	-29.5	1.24 V	341	22.4	2.1
5	7320.00	35.4 PK	74.0	-38.6	1.50 V	360	27.7	7.7
6	7320.00	25.2 AV	54.0	-28.8	1.50 V	360	17.5	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.

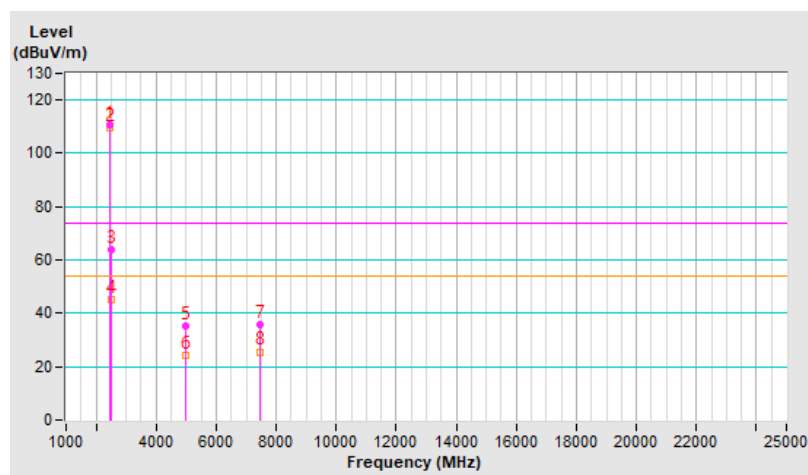


RF Mode	LE-Coded S=8	Channel	CH 39 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	110.9 PK			1.08 H	158	113.5	-2.6
2	*2480.00	109.8 AV			1.08 H	158	112.4	-2.6
3	2483.50	63.7 PK	74.0	-10.3	1.08 H	158	66.3	-2.6
4	2483.50	44.9 AV	54.0	-9.1	1.08 H	158	47.5	-2.6
5	4960.00	35.0 PK	74.0	-39.0	1.29 H	344	32.8	2.2
6	4960.00	24.0 AV	54.0	-30.0	1.29 H	344	21.8	2.2
7	7440.00	35.6 PK	74.0	-38.4	1.51 H	360	27.8	7.8
8	7440.00	25.6 AV	54.0	-28.4	1.51 H	360	17.8	7.8

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

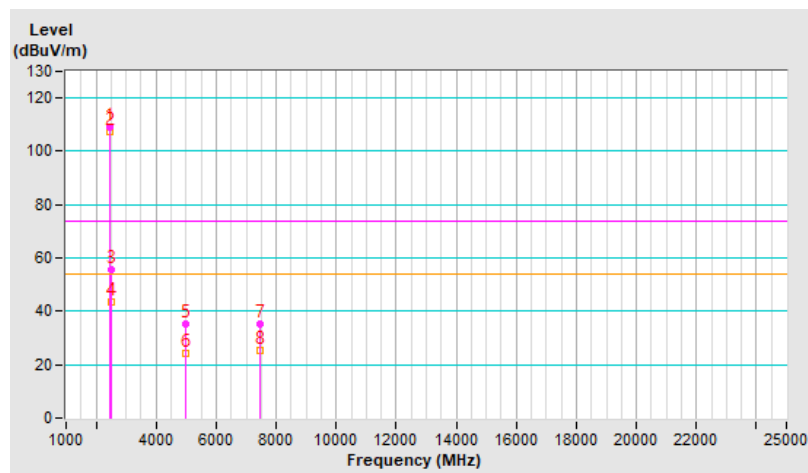


RF Mode	LE-Coded S=8	Channel	CH 39 : 2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	109.2 PK			1.40 V	341	111.8	-2.6
2	*2480.00	107.5 AV			1.40 V	341	110.1	-2.6
3	2483.50	55.8 PK	74.0	-18.2	1.40 V	341	58.4	-2.6
4	2483.50	43.4 AV	54.0	-10.6	1.40 V	341	46.0	-2.6
5	4960.00	35.1 PK	74.0	-38.9	1.29 V	351	32.9	2.2
6	4960.00	24.1 AV	54.0	-29.9	1.29 V	351	21.9	2.2
7	7440.00	35.0 PK	74.0	-39.0	1.52 V	360	27.2	7.8
8	7440.00	25.1 AV	54.0	-28.9	1.52 V	360	17.3	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

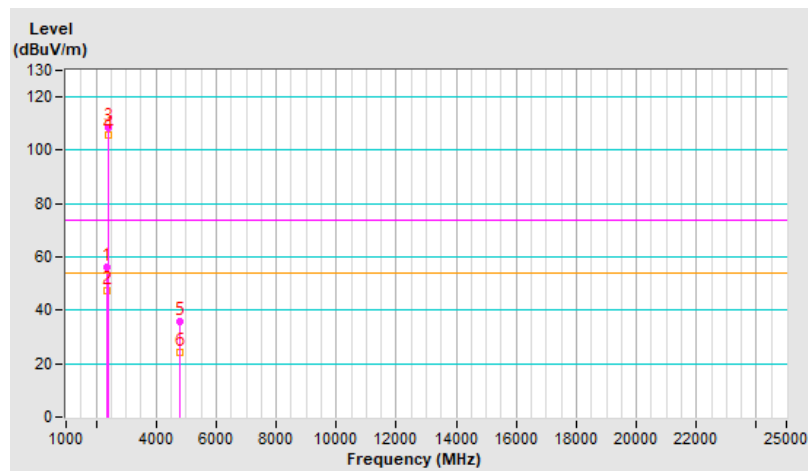


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	2381.94	56.1 PK	74.0	-17.9	1.29 H	148	58.8	-2.7
2	2381.94	47.5 AV	54.0	-6.5	1.29 H	148	50.2	-2.7
3	*2404.00	108.5 PK			1.29 H	148	111.3	-2.8
4	*2404.00	105.5 AV			1.29 H	148	108.3	-2.8
5	4808.00	35.7 PK	74.0	-38.3	1.20 H	329	33.7	2.0
6	4808.00	24.4 AV	54.0	-29.6	1.20 H	329	22.4	2.0

Remarks:

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

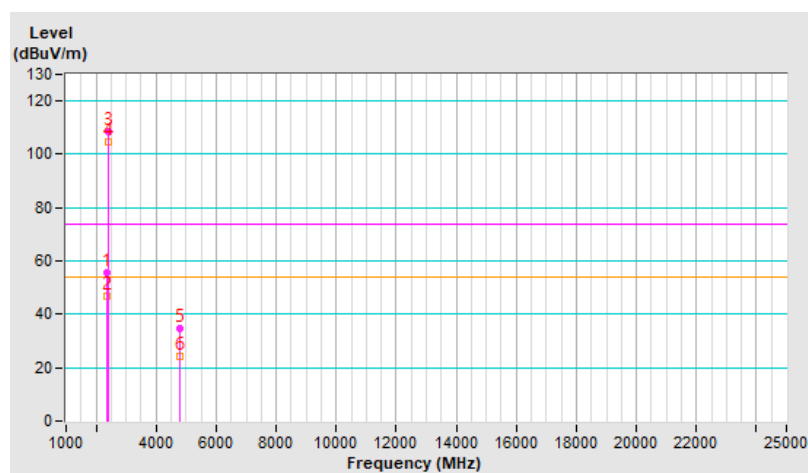


RF Mode	BT-LE 2M	Channel	CH 1 : 2404 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	2380.89	55.5 PK	74.0	-18.5	1.50 V	341	58.2	-2.7
2	2380.89	46.7 AV	54.0	-7.3	1.50 V	341	49.4	-2.7
3	*2404.00	108.3 PK			1.50 V	341	111.1	-2.8
4	*2404.00	104.7 AV			1.50 V	341	107.5	-2.8
5	4808.00	34.9 PK	74.0	-39.1	1.22 V	345	32.9	2.0
6	4808.00	24.0 AV	54.0	-30.0	1.22 V	345	22.0	2.0

Remarks:

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

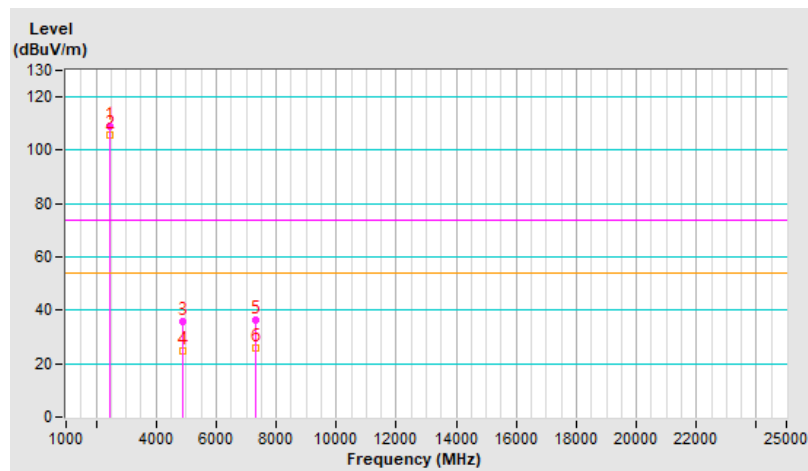


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	109.0 PK			1.27 H	141	111.8	-2.8
2	*2440.00	105.9 AV			1.27 H	141	108.7	-2.8
3	4880.00	35.9 PK	74.0	-38.1	1.26 H	346	33.8	2.1
4	4880.00	24.6 AV	54.0	-29.4	1.26 H	346	22.5	2.1
5	7320.00	36.3 PK	74.0	-37.7	1.45 H	360	28.6	7.7
6	7320.00	26.0 AV	54.0	-28.0	1.45 H	360	18.3	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.

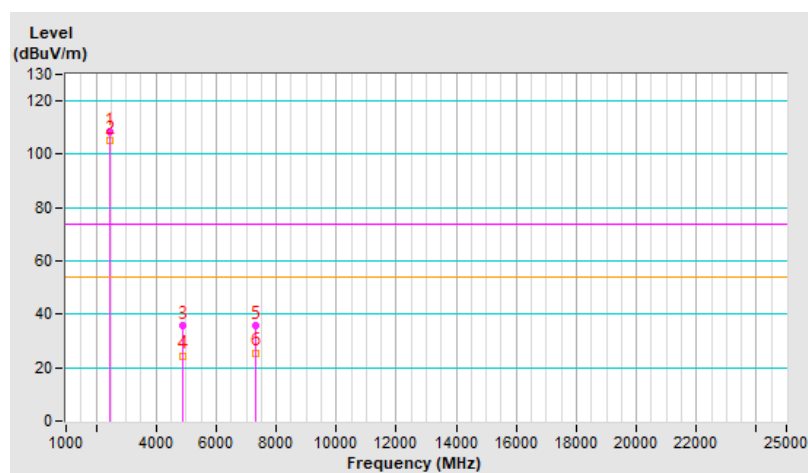


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	108.5 PK			1.47 V	336	111.3	-2.8
2	*2440.00	105.0 AV			1.47 V	336	107.8	-2.8
3	4880.00	35.6 PK	74.0	-38.4	1.25 V	340	33.5	2.1
4	4880.00	24.5 AV	54.0	-29.5	1.25 V	340	22.4	2.1
5	7320.00	35.8 PK	74.0	-38.2	1.49 V	360	28.1	7.7
6	7320.00	25.6 AV	54.0	-28.4	1.49 V	360	17.9	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.

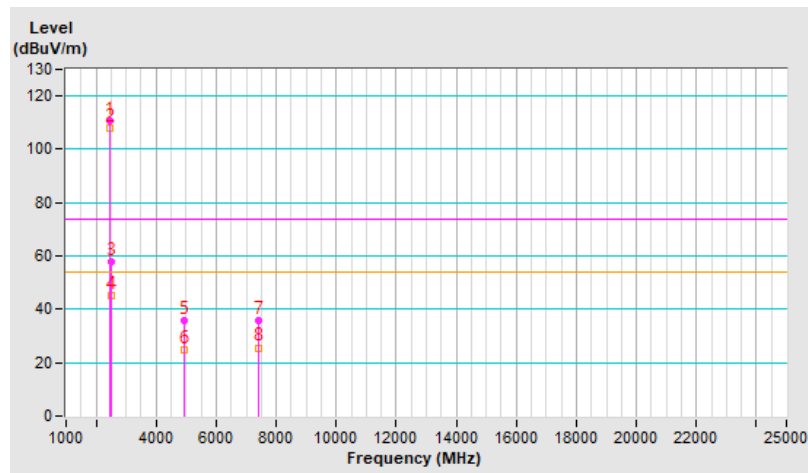


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	110.7 PK			1.40 H	149	113.3	-2.6
2	*2478.00	107.8 AV			1.40 H	149	110.4	-2.6
3	2483.50	57.7 PK	74.0	-16.3	1.40 H	149	60.3	-2.6
4	2483.50	45.3 AV	54.0	-8.7	1.40 H	149	47.9	-2.6
5	4956.00	35.8 PK	74.0	-38.2	1.28 H	342	33.6	2.2
6	4956.00	24.8 AV	54.0	-29.2	1.28 H	342	22.6	2.2
7	7434.00	35.9 PK	74.0	-38.1	1.43 H	360	28.1	7.8
8	7434.00	25.6 AV	54.0	-28.4	1.43 H	360	17.8	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

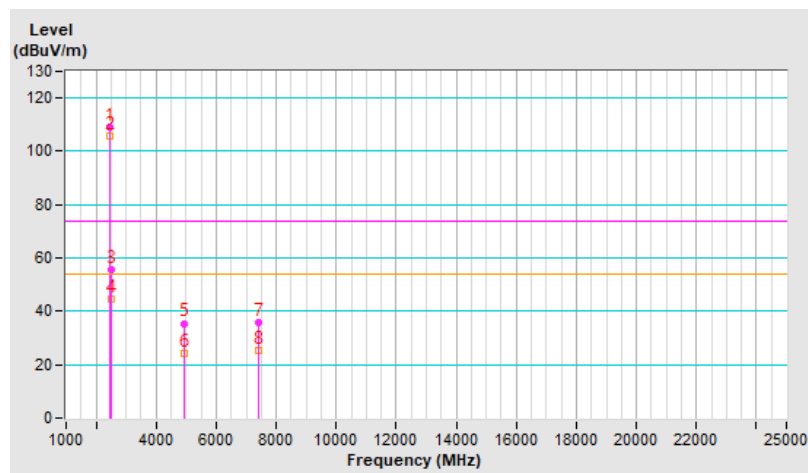


RF Mode	BT-LE 2M	Channel	CH 38 : 2478 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=5.1 kHz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	29°C, 78% RH
Tested By	Louis Yang		

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	109.0 PK			1.48 V	342	111.6	-2.6
2	*2478.00	105.8 AV			1.48 V	342	108.4	-2.6
3	2483.50	55.6 PK	74.0	-18.4	1.48 V	342	58.2	-2.6
4	2483.50	44.7 AV	54.0	-9.3	1.48 V	342	47.3	-2.6
5	4956.00	35.5 PK	74.0	-38.5	1.23 V	338	33.3	2.2
6	4956.00	24.4 AV	54.0	-29.6	1.23 V	338	22.2	2.2
7	7434.00	35.6 PK	74.0	-38.4	1.44 V	360	27.8	7.8
8	7434.00	25.2 AV	54.0	-28.8	1.44 V	360	17.4	7.8

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.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

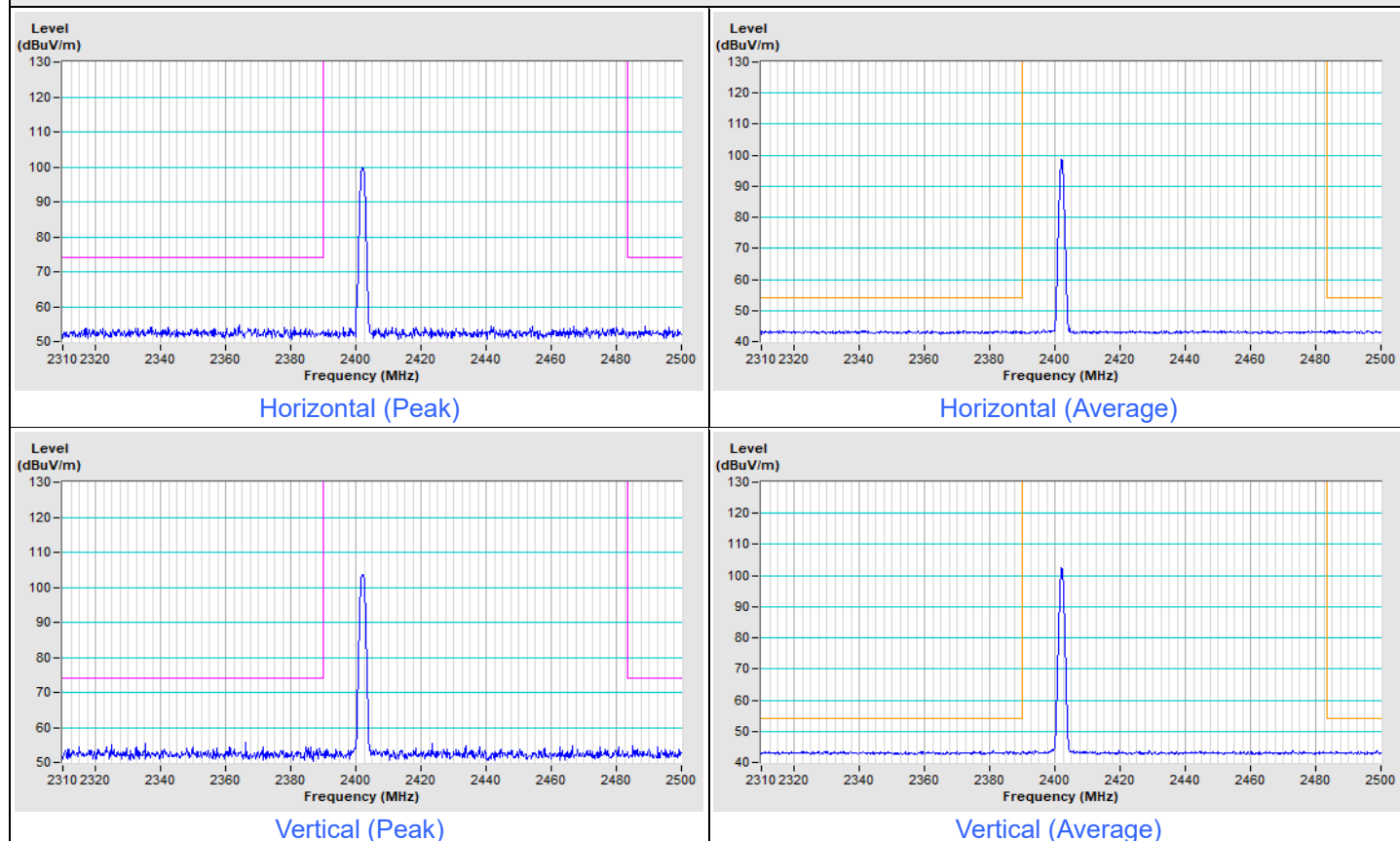


Plot of Band Edge

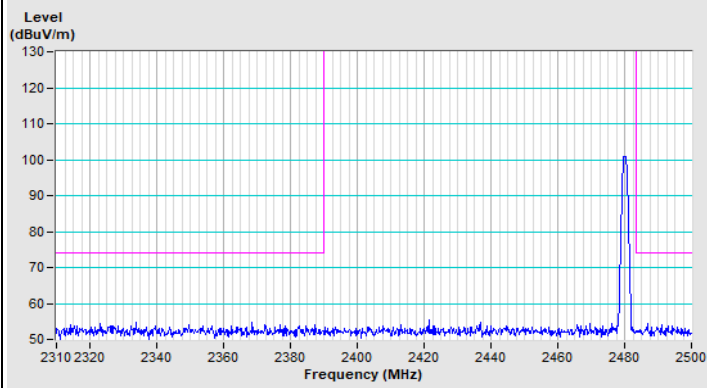
Low Power

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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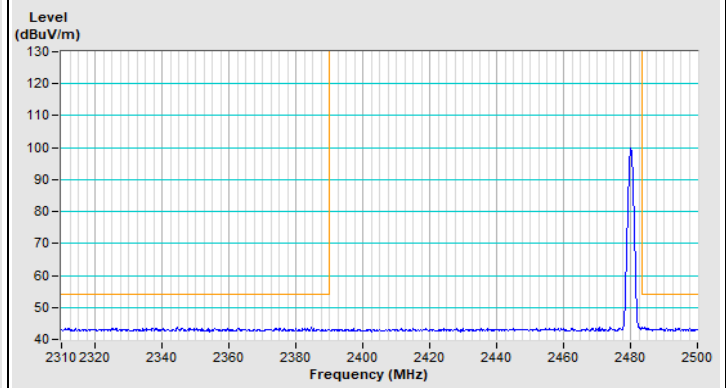
LE-Coded S=8 Channel 0



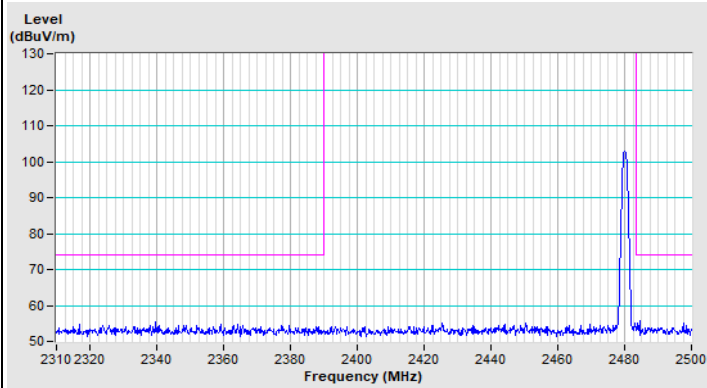
LE-Coded S=8 Channel 39



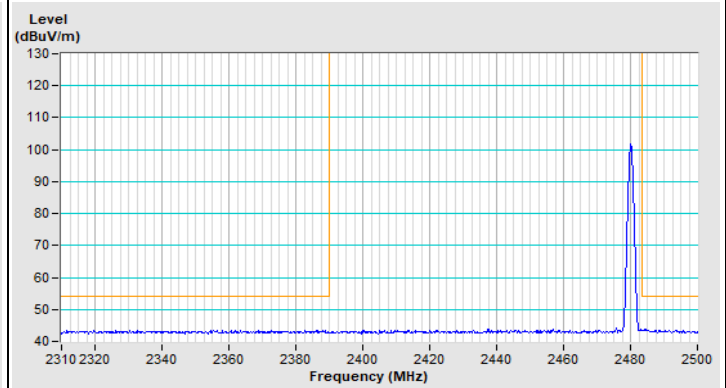
Horizontal (Peak)



Horizontal (Average)



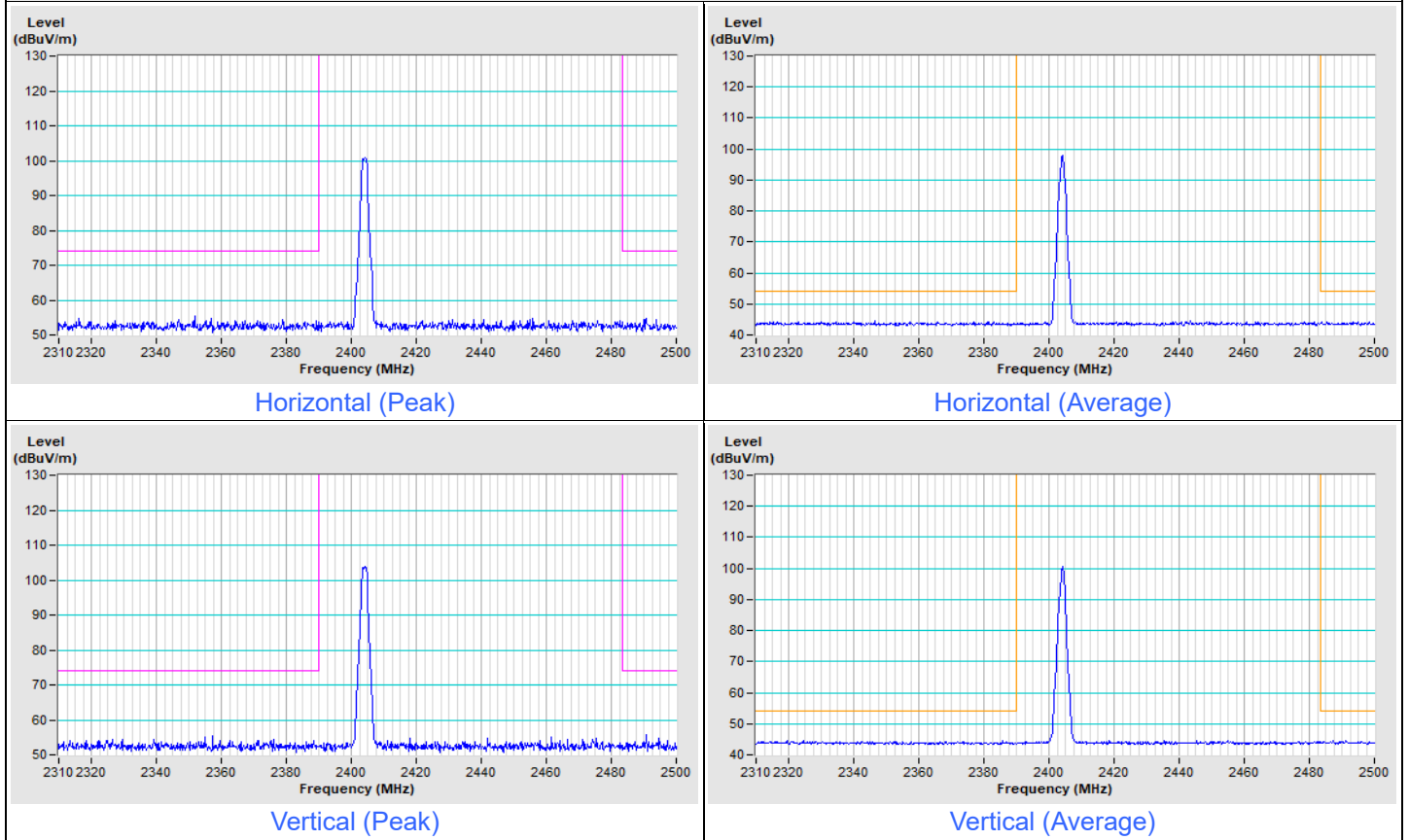
Vertical (Peak)



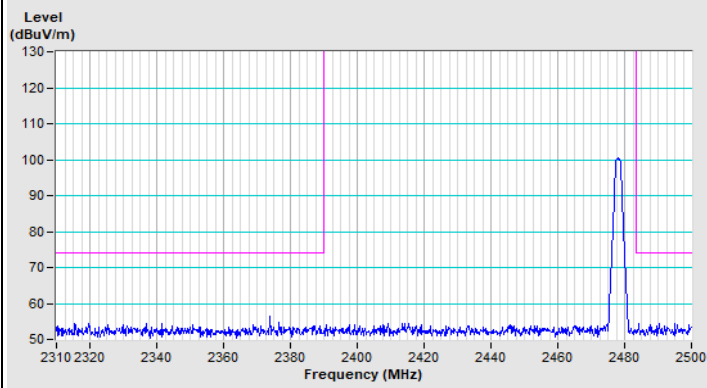
Vertical (Average)

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=5.1 kHz, DET=Peak
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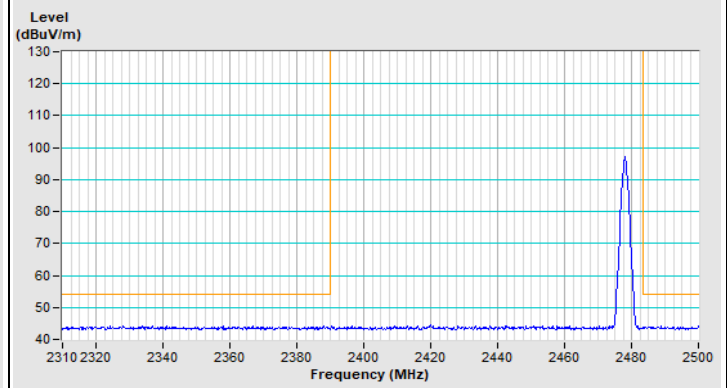
BT-LE 2M Channel 1



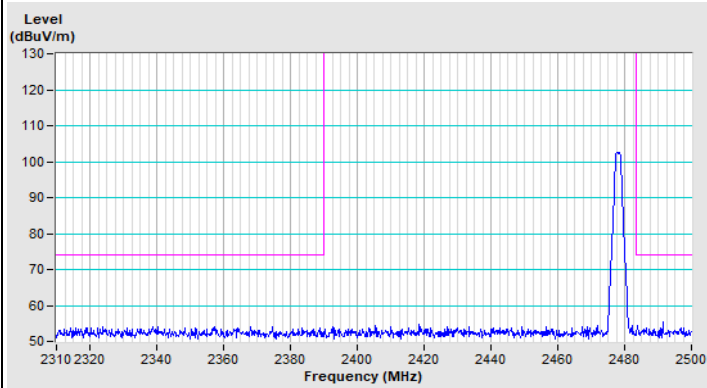
BT-LE 2M Channel 38



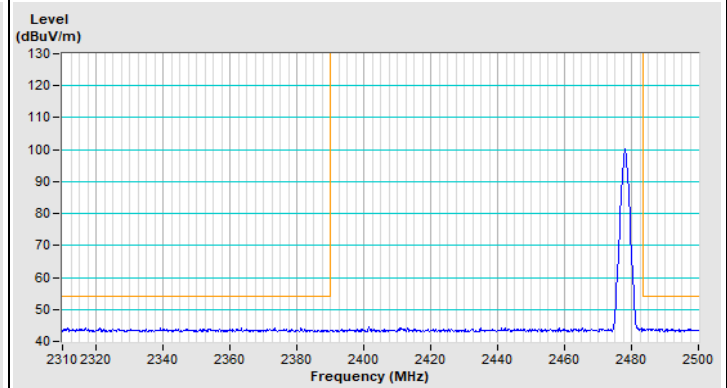
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)

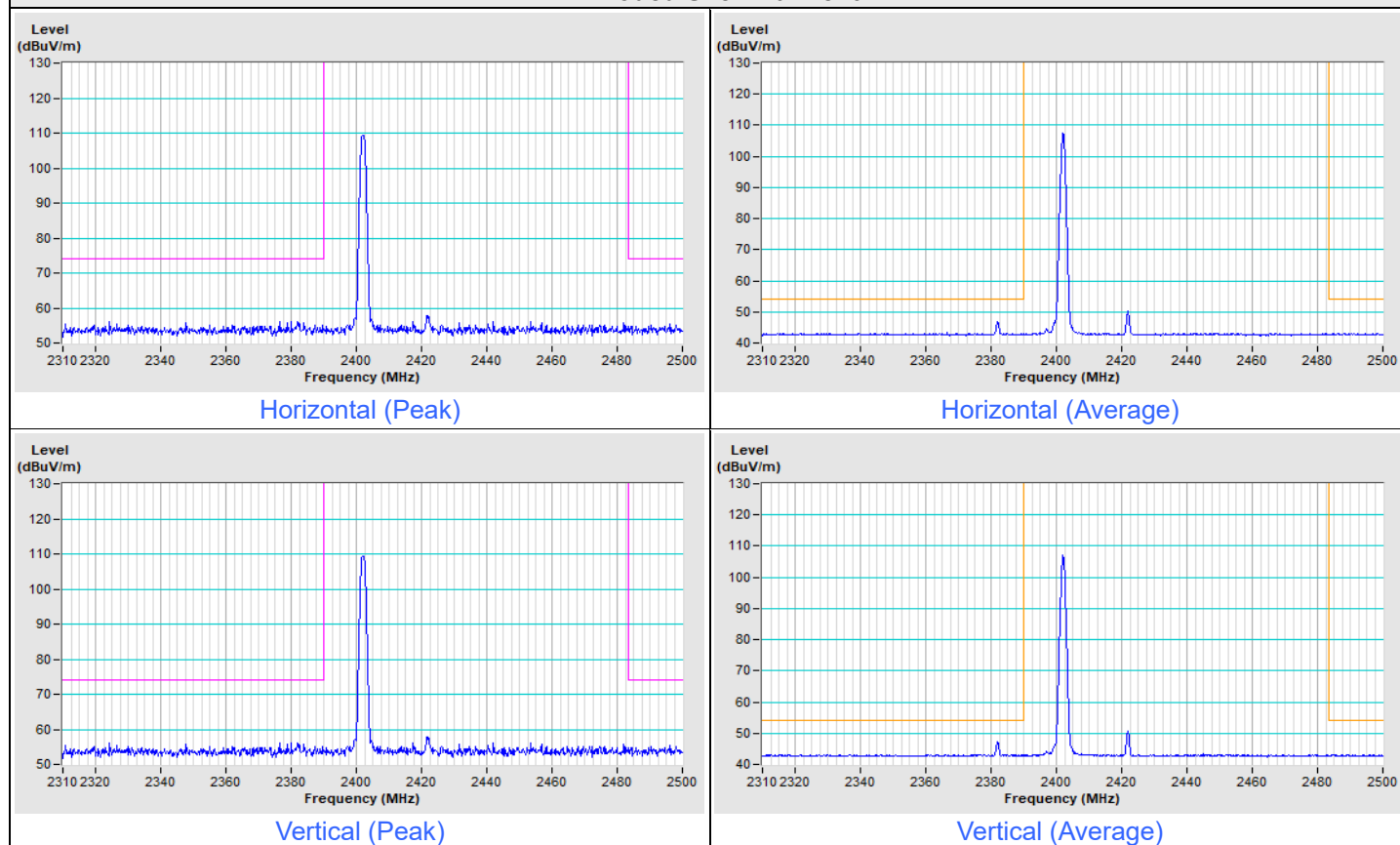


Vertical (Average)

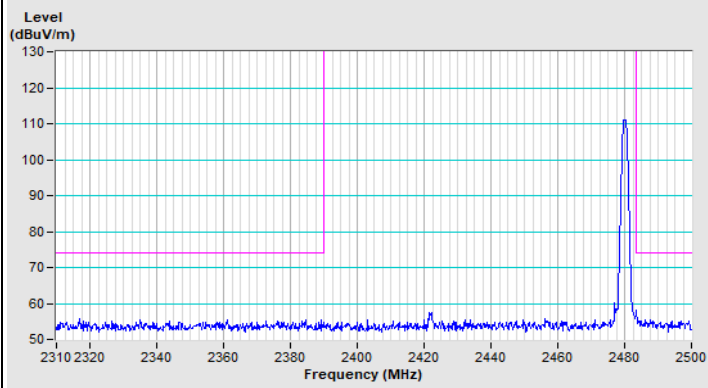
High Power

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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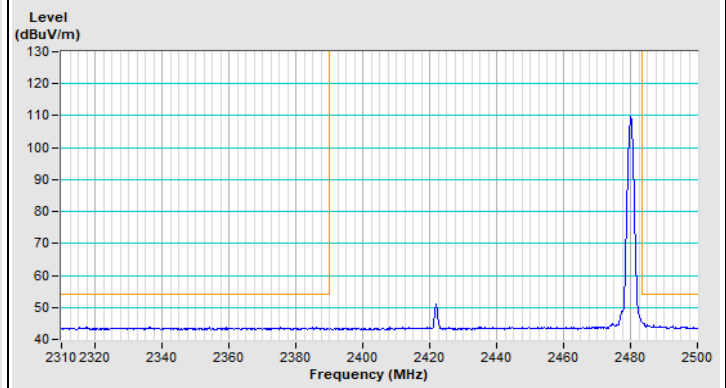
LE-Coded S=8 Channel 0



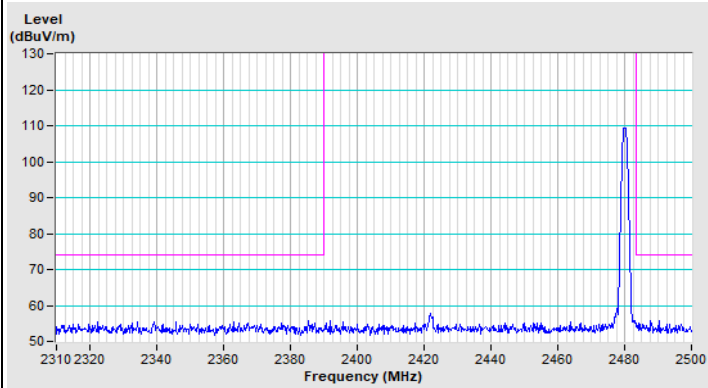
LE-Coded S=8 Channel 39



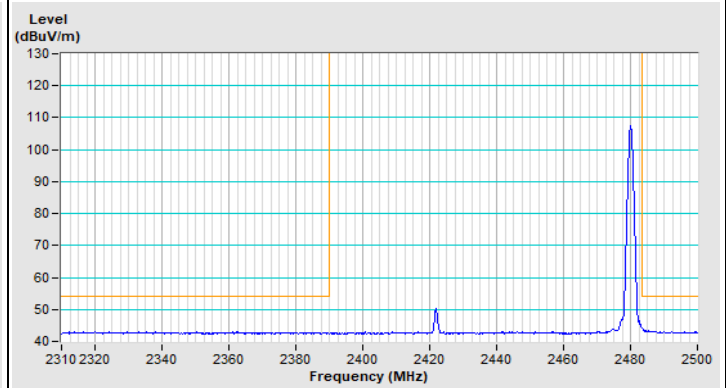
Horizontal (Peak)



Horizontal (Average)



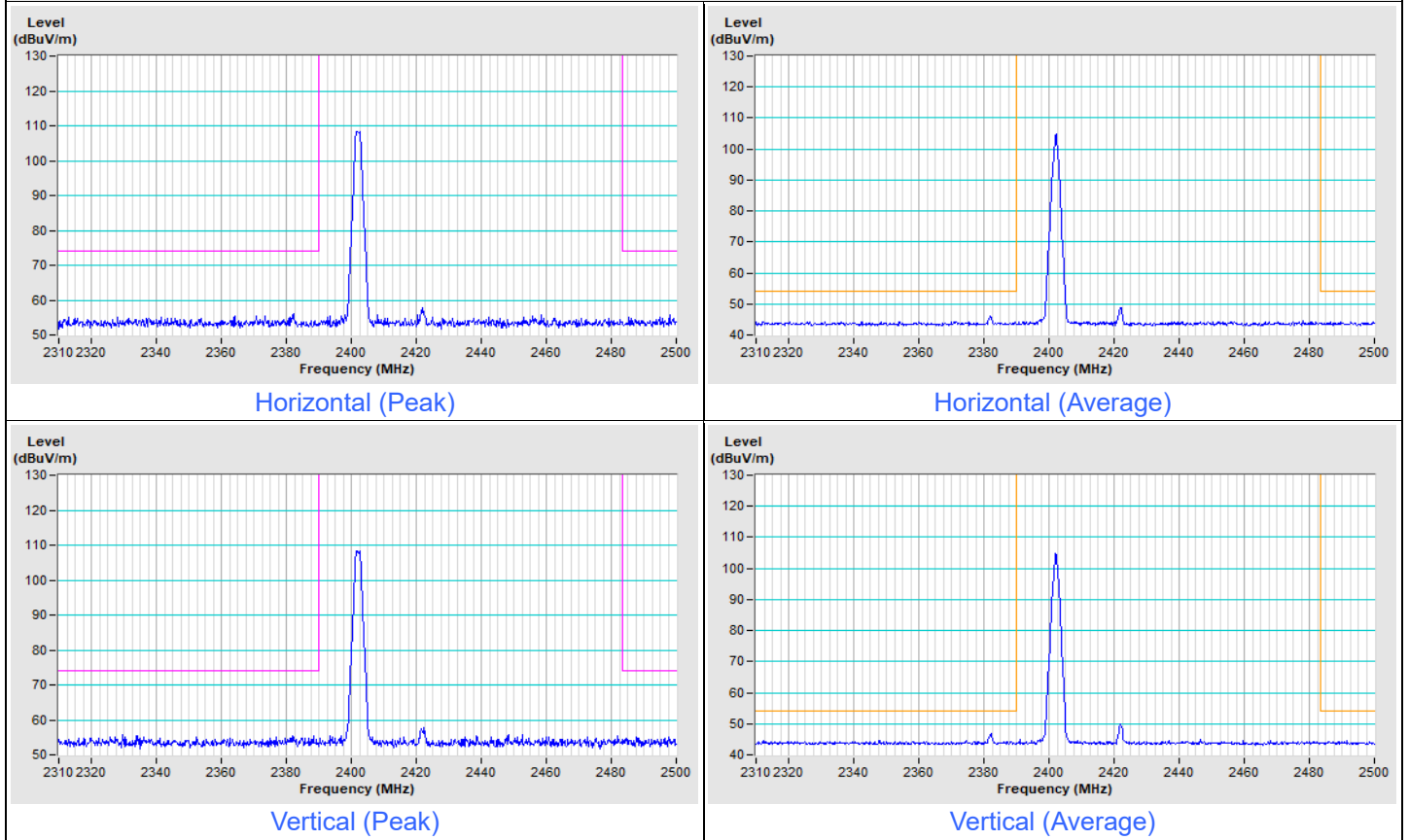
Vertical (Peak)



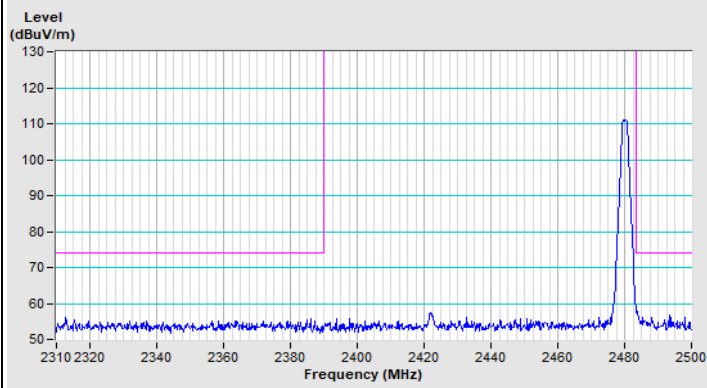
Vertical (Average)

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=5.1 kHz, DET=Peak
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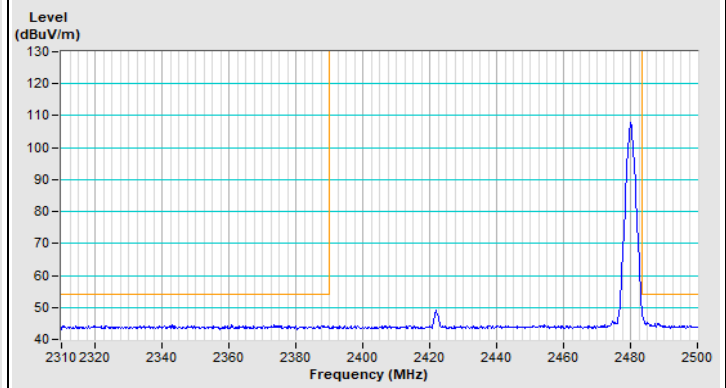
BT-LE 2M Channel 1



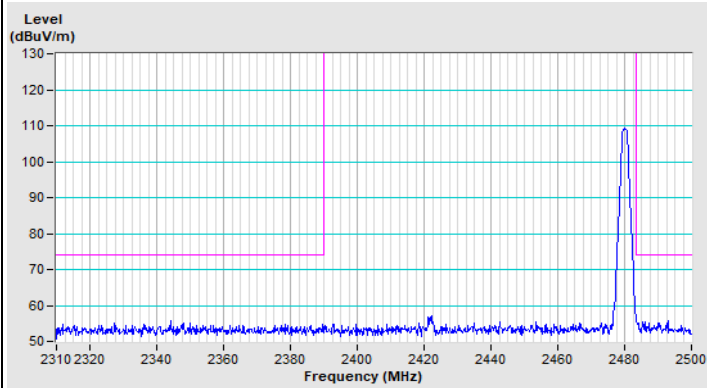
BT-LE 2M Channel 38



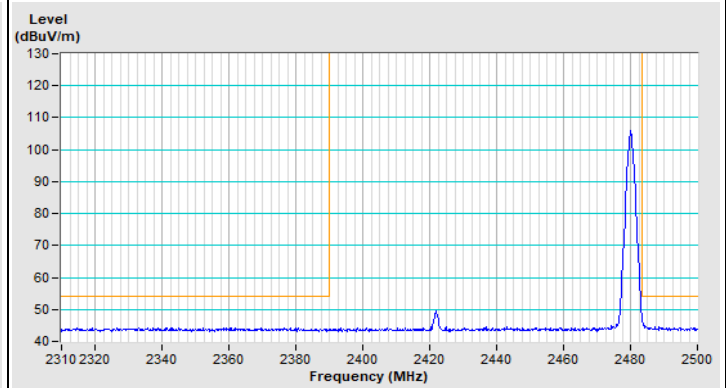
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



Vertical (Average)

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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Fax: 886-3-6668323

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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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