

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: RFBDWM-WTW-P24050507-1

FCC ID: 2AUWW-HALOWA2

Product: Halo Collar 4

Brand: Halo

Model No.: Halo 4

Received Date: 2024/5/26

Test Date: 2024/7/1 ~ 2024/7/12

Issued Date: 2024/8/20

Applicant: Protecct Animals with Satellites, LLC

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FCC Registration / (1) 788550 / TW0003

Designation Number: (2) 281270 / TW0032

Approved by:

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, Date:

2024/8/20

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Prepared by : Vera Huang / Specialist



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Release Control Record

Issue No.	Description	Date Issued
RFBDWM-WTW-P24050507-1	Original Release	2024/8/20

1 Certificate

Product: Halo Collar 4

Brand: Halo

Test Model: Halo 4

Sample Status: Engineering sample

Applicant: Protecct Animals with Satellites, LLC

Test Date: 2024/7/1 ~ 2024/7/12

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 -15.67 dB at 0.17400 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -4.6 dB at 298.62 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.3 dB at 2483.50 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:

Measurement	Specification	Expanded Uncertainty (k=2) (±)
RF Output Power	-	1.371 dB
Power Spectral Density	-	1.017 dB
6 dB Bandwidth	-	206.5 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB
AC Power Conducted Emissions	9 kHz ~ 30 MHz	2.90 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3 dB
	30 MHz ~ 1 GHz	2.93 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	1.76 dB
	18 GHz ~ 40 GHz	1.77 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	Halo Collar 4
Brand	Halo
Test Model	Halo 4
Status of EUT	Engineering sample
Power Supply Rating	5 Vdc from adapter
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Module: RS9116W 1 Mbps / 2 Mbps / 125 kbps / 500 kbps Module: NRF52840 2 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	Module: RS9116W BT-LE 1M : 2.624 mW (4.19 dBm) BT-LE 2M : 2.624 mW (4.19 dBm) BT-LE 125k : 2.642 mW (4.22 dBm) BT-LE 500k : 2.636 mW (4.21 dBm) Module: NRF52840 BT-LE 2M : 5.929 mW (7.73 dBm)

Note:

1. The following modules can be configured in the EUT.

Item	Brand	Model	Specification
WWAN module	Quectel	BG770A-GL	Cat-M1
BT + WiFi module	Silicon labs	RS9116W	b/g/n+BT LE
BT module	Nordic	NRF52840	BT LE

2. The EUT uses following accessories.

Charging dock	Brand	VSO
	Model	N-841-079-05000002
Type C cable	Brand	VSO
	Model	N801-000-00025635
	Signal Line	1.2M with shielding

3. WWAN, WLAN, BT function cannot transmission at the same time.

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

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Antenna No.	RF Chain No.	Antenna Net Gain (dBi)	Frequency range	Antenna Type	Connector Type	Remark
1	BT0	-0.9	2.4~2.4835GHz	Chip	None (like solder)	For Module: RS9116W
2	BT1	2.3	2.4~2.4835GHz	Chip	None (like solder)	For Module: NRF52840

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

3.3 Channel List

40 channels are provided for BT-LE:

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

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. 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). 2. EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis. Pre-scan these ways and find the worst case as a representative test condition.
Worst Case:	X-axis/ Y-axis/ Z-axis Worst Condition: Y-axis for Mode A & B

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

Test Item	EUT Configure Mode	Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power / Power Spectral Density	A	BT-LE 1M	0, 19, 39	GFSK	1Mb/s
		BT-LE 2M	0, 19, 39	GFSK	2Mb/s
		BT-LE 125k	0, 19, 39	GFSK	125kb/s
		BT-LE 500k	0, 19, 39	GFSK	500kb/s
	B	BT-LE 2M	0, 19, 39	GFSK	2Mb/s
6 dB Bandwidth / Conducted Out of Band Emissions	A	BT-LE 1M	0, 19, 39	GFSK	1Mb/s
		BT-LE 2M	0, 19, 39	GFSK	2Mb/s
		BT-LE 125k	0, 19, 39	GFSK	125kb/s
		BT-LE 500k	0, 19, 39	GFSK	500kb/s
	B	BT-LE 2M	0, 19, 39	GFSK	2Mb/s
AC Power Conducted Emissions	A	BT-LE 125k	19	GFSK	125kb/s
	B	BT-LE 2M	19	GFSK	2Mb/s
Unwanted Emissions below 1 GHz	A	BT-LE 125k	19	GFSK	125kb/s
	B	BT-LE 2M	19	GFSK	2Mb/s
Unwanted Emissions above 1 GHz	A	BT-LE 125k	0, 19, 39	GFSK	125kb/s
	B	BT-LE 2M	19	GFSK	2Mb/s
EUT Configure Mode	A	Module: RS9116W			
	B	Module: NRF52840			

3.5 Duty Cycle of Test Signal

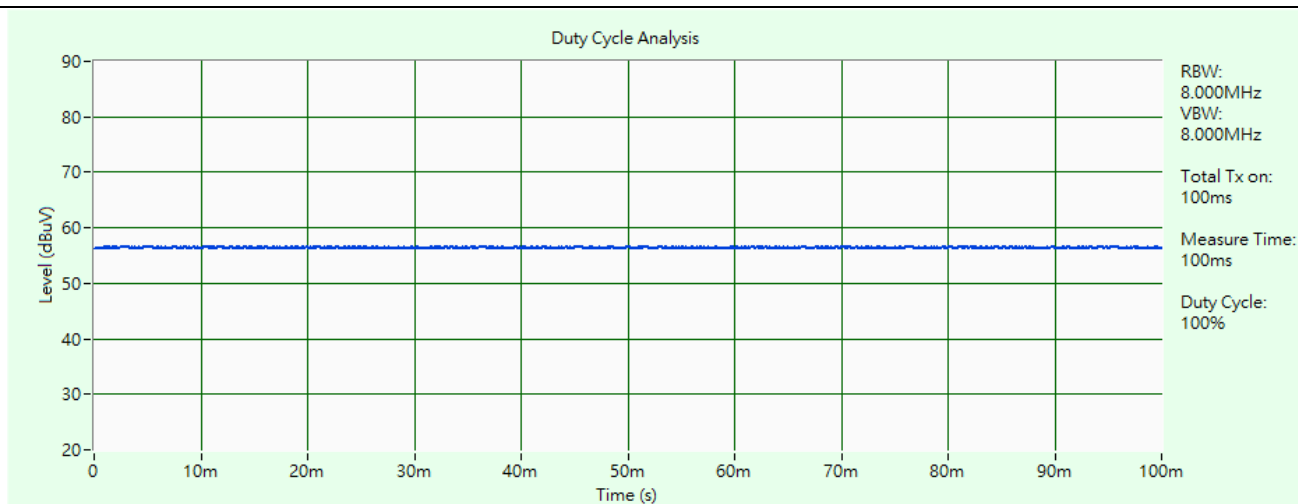
Mode A

BT-LE 1M: Duty cycle = 100 ms / 100 ms x 100% = 100.0%

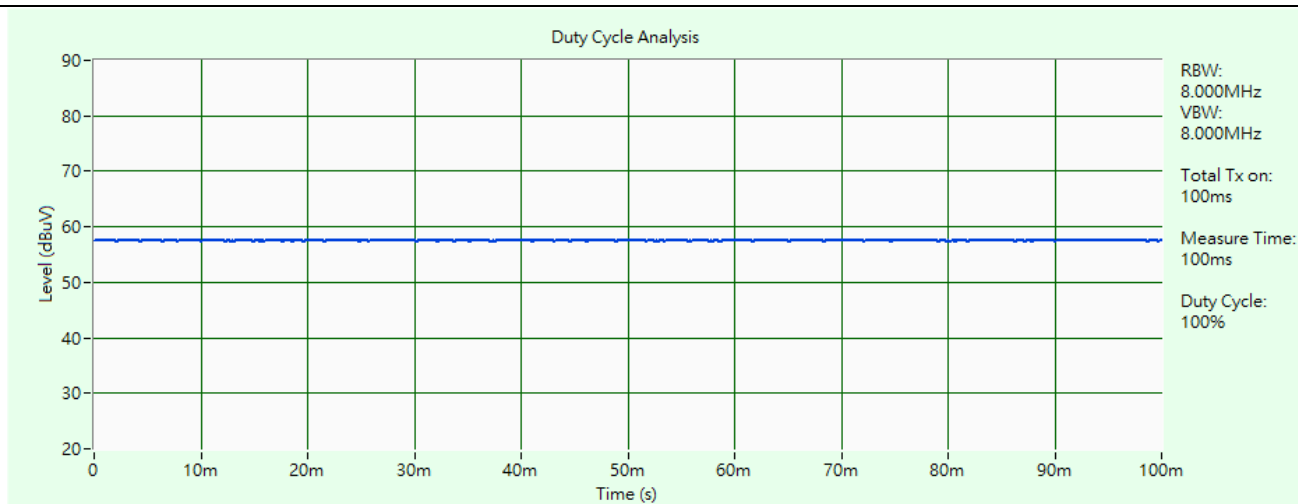
BT-LE 2M: Duty cycle = 100 ms / 100 ms x 100% = 100.0%

BT-LE 125k: Duty cycle = 100 ms / 100 ms x 100% = 100.0%

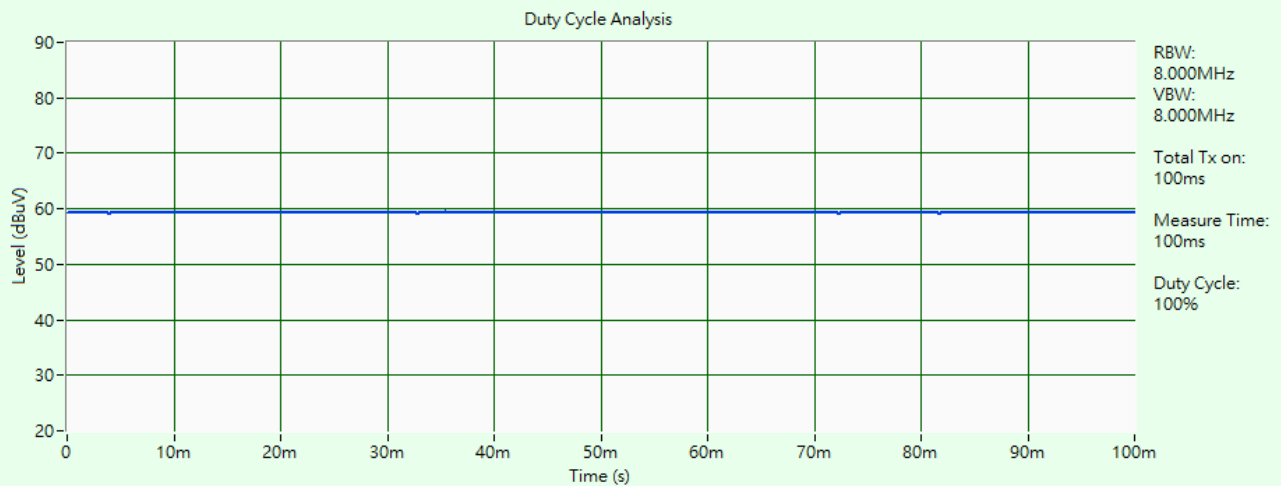
BT-LE 500k: Duty cycle = 100 ms / 100 ms x 100% = 100.0%



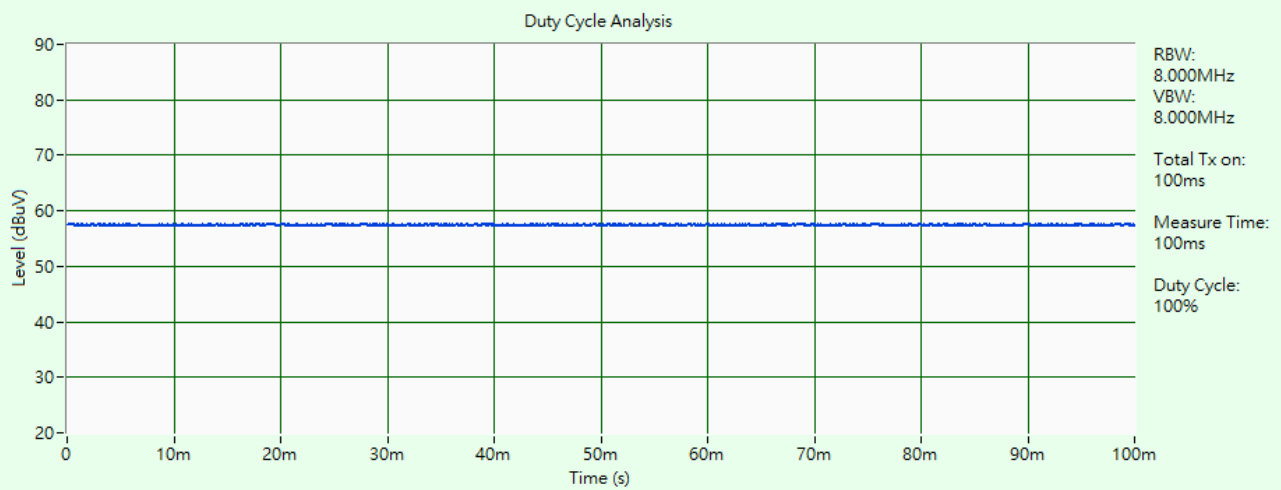
BT-LE 1M



BT-LE 2M



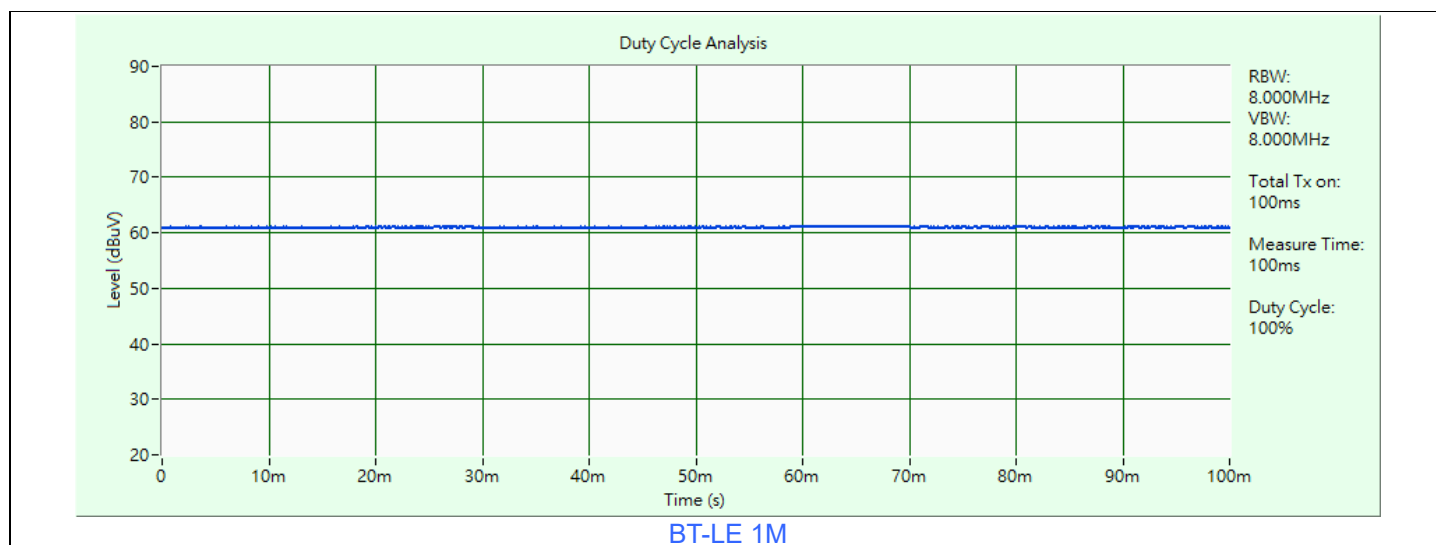
BT-LE 125k



BT-LE 500k

Mode B

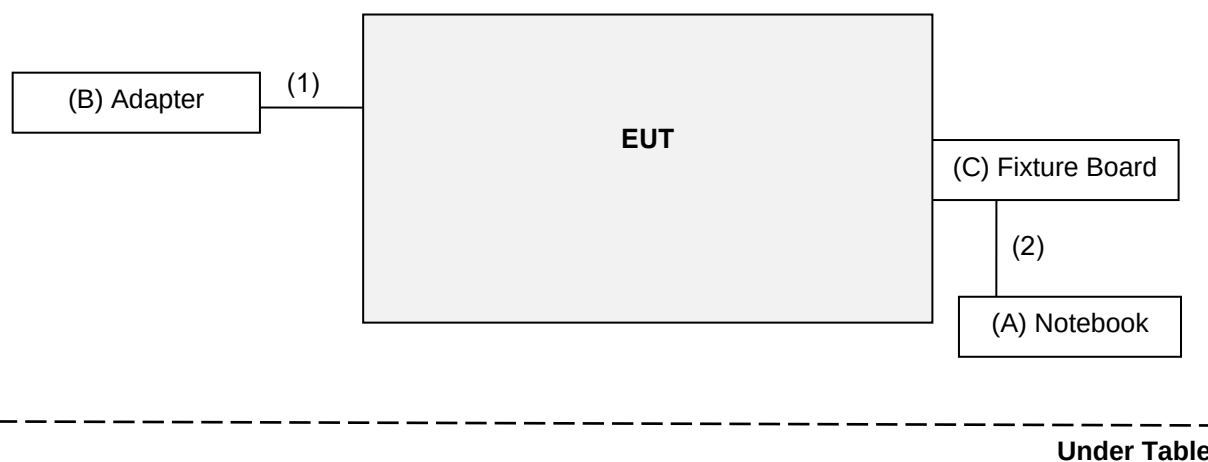
BT-LE 2M: Duty cycle = 100 ms / 100 ms x 100% = 100.0%



3.6 Test Program Used and Operation Descriptions

Controlling software SSCOM V5.13.1 (for Module: RS9116W) and Tera Term version 4.105 (for Module: NRF52840) 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.	Notebook	Lenovo	L440	R9-OGHURS	N/A	Provided by Lab (for RF Setup)
B.	Adapter	Apple	A1720	FNT912201EHL9J911	N/A	Provided by Lab
C.	Fixture Board	N/A	N/A	N/A	N/A	Supplied by applicant (for RF Setup)

No.	Cable Descriptions	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Qty.)	Remark
1.	Type C Cable	1	1.2	Yes	0	Accessory of the EUT (for RF Setup)
2.	USB typeC Cable	1	1	No	0	Supplied by applicant

4 Test Instruments

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

4.1 RF Output Power

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

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/7/12

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Signal & Spectrum Analyzer R&S	FSV3044	101105	2024/2/27	2025/2/26
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2024/7/12

4.3 6 dB Bandwidth

Refer to section 4.2 to get the tested date and information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get the tested date and information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance HUBER+SUHNER	E1-011315	13	2023/11/22	2024/11/21
50 ohm terminal resistance	E1-011279	04	2023/11/22	2024/11/21
	E1-011280	05	2023/11/22	2024/11/21
DC-LISN Schwarzbeck	NNBM 8126G	8126G-069	2023/11/7	2024/11/6
EMI Test Receiver R&S	ESCI	100613	2023/12/4	2024/12/3
Fixed Attenuator Mini-Circuits	HAT-10+	PAD-COND1-01	2024/1/6	2025/1/5
LISN R&S	ENV216	101826	2024/3/25	2025/3/24
	ESH3-Z5	100311	2023/9/6	2024/9/5
RF Coaxial Cable Woken	5D-FB	Cable-cond1-01	2024/1/6	2025/1/5
Software BVADT	BVADT_Cond_ V7.4.1.0	N/A	N/A	N/A
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2023/8/31	2024/8/30

Notes:

1. The test was performed in HY - Conduction 1.
2. Tested Date: 2024/7/8

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-1213	2023/10/13	2024/10/12
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Loop Antenna Electro-Metrics	EM-6879	269	2023/9/23	2024/9/22
Loop Antenna TESEQ	HLA 6121	45745	2023/8/8	2024/8/7
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC330N	980782	2024/1/15	2025/1/14
	EMC001340	980201	2023/9/27	2024/9/26
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201233	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-3000	201235	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-9000	201236(with PAD)	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/7/4

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFT-151SS-0.5T	N/A	N/A	N/A
EMI Test Receiver R&S	ESR3	102782	2023/12/7	2024/12/6
Horn Antenna RFSPIN	DRH18-E	210103A18E	2023/11/12	2024/11/11
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2023/11/12	2024/11/11
MXA Signal Analyzer Keysight	N9020B	MY60110513	2023/12/22	2024/12/21
Preamplifier EMCI	EMC118A45SE	980808	2023/12/28	2024/12/27
	EMC184045SE	980788	2024/1/15	2025/1/14
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2024/1/15	2025/1/14
	EMC101G-KM-KM-3000	201258	2024/1/15	2025/1/14
	EMC101G-KM-KM-5000	201261	2024/1/15	2025/1/14
	EMC104-SM-SM-1000	210102	2024/1/15	2025/1/14
	EMC104-SM-SM-3000	201231	2024/1/15	2025/1/14
	EMC104-SM-SM-9000	201243	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MF-7802BS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208674	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 8.
2. Tested Date: 2024/7/1 ~ 2024/7/2

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:

- The lower limit shall apply at the transition frequencies.
- 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:

- The lower limit shall apply at the transition frequencies.
- 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

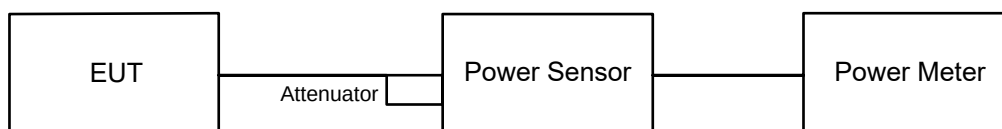
Notes:

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

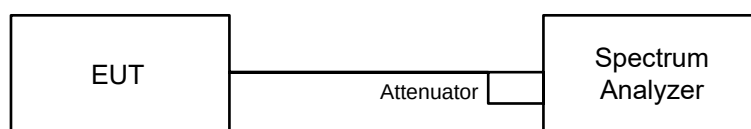
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

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

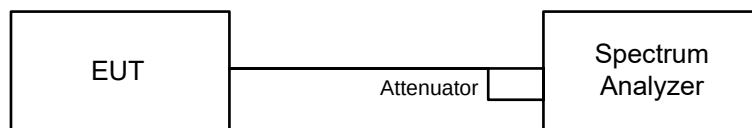


6.2.2 Test Procedure

- 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

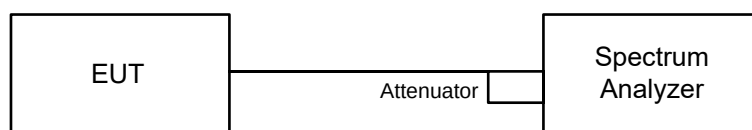


6.3.2 Test Procedure

- 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

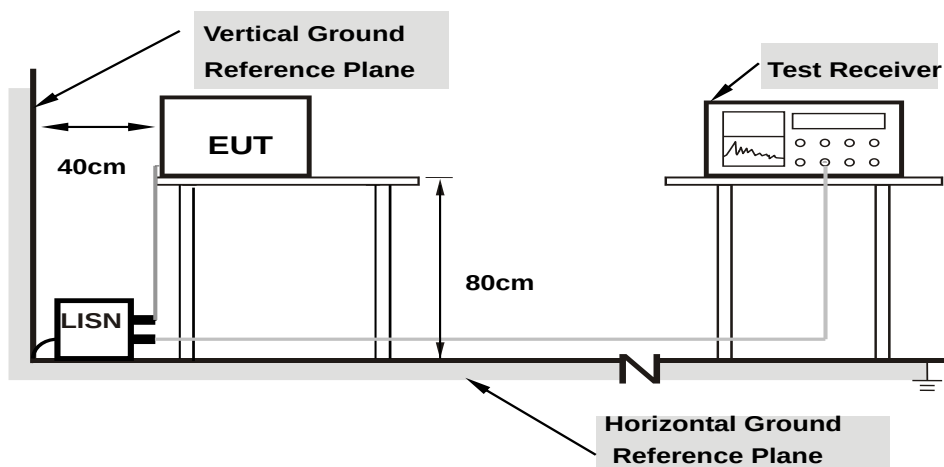
- Set the RBW = 100 kHz.
- Set the VBW ≥ 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

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

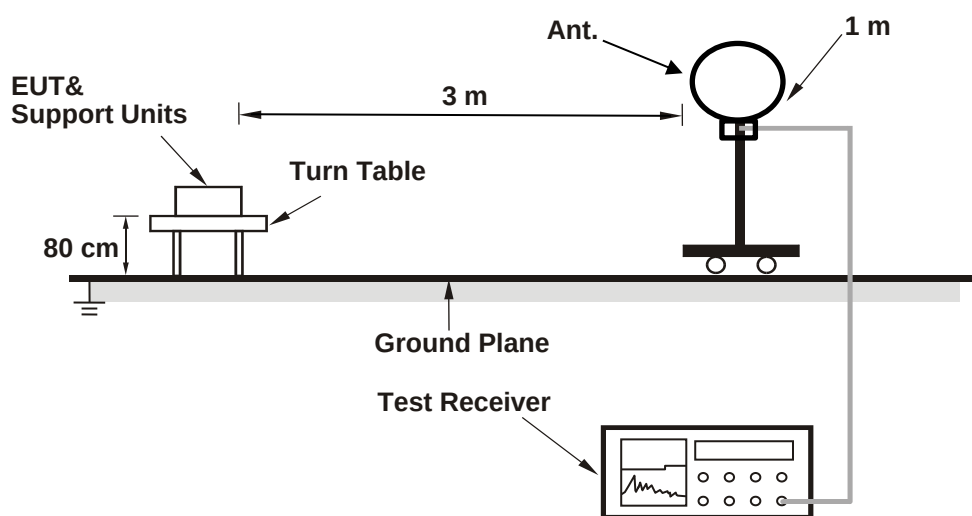
- The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The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

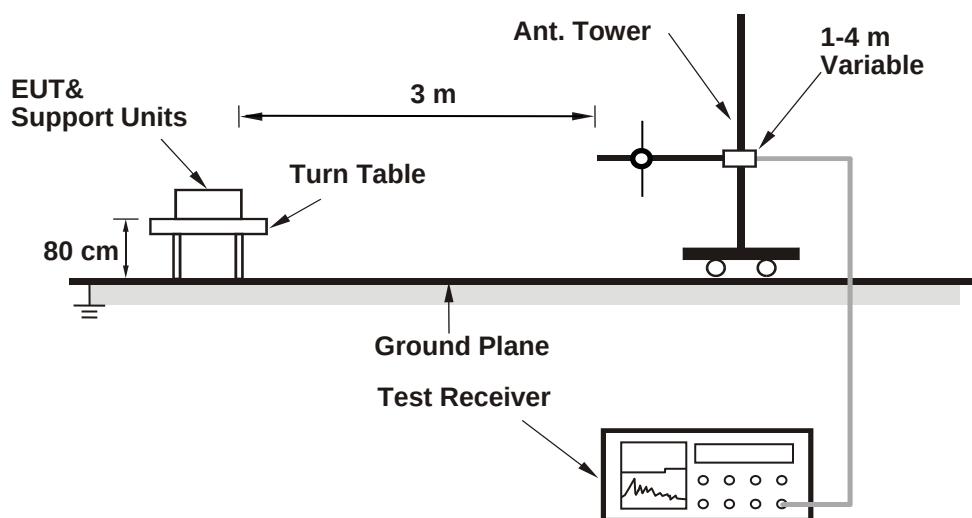
6.6 Unwanted Emissions below 1 GHz

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:

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

For Radiated emission above 30 MHz

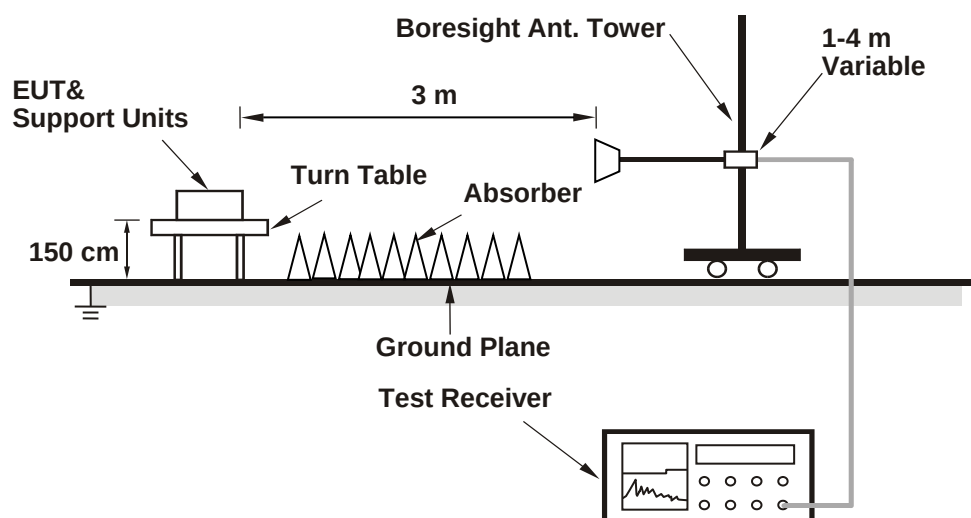
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the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

- a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
- b. 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

Input Power:	5 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin
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Mode A

For Peak Power

BT-LE 1M

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	2.366	3.74	30	Pass
19	2440	2.624	4.19	30	Pass
39	2480	2.118	3.26	30	Pass

Note: The antenna gain is -0.9 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
0	2402	2.366	3.74	30	Pass
19	2440	2.624	4.19	30	Pass
39	2480	0.3864	-4.13	30	Pass

Note: The antenna gain is -0.9 dBi < 6 dBi, so the output power limit shall not be reduced.

BT-LE 125k

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	2.382	3.77	30	Pass
19	2440	2.642	4.22	30	Pass
39	2480	2.014	3.04	30	Pass

Note: The antenna gain is -0.9 dBi < 6 dBi, so the output power limit shall not be reduced.

BT-LE 500k

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	2.382	3.77	30	Pass
19	2440	2.636	4.21	30	Pass
39	2480	2.018	3.05	30	Pass

Note: The antenna gain is -0.9 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	2.344	3.70
19	2440	2.6	4.15
39	2480	2.099	3.22

BT-LE 2M

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.344	3.70
19	2440	2.6	4.15
39	2480	0.3802	-4.20

BT-LE 125k

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.36	3.73
19	2440	2.624	4.19
39	2480	2	3.01

BT-LE 500k

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.355	3.72
19	2440	2.612	4.17
39	2480	2.004	3.02

Mode B

For Peak Power

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	5.715	7.57	30	Pass
19	2440	5.929	7.73	30	Pass
39	2480	4.775	6.79	30	Pass

Note: The antenna gain is 2.3 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	5.649	7.52
19	2440	5.848	7.67
39	2480	4.764	6.78

7.2 Power Spectral Density

Input Power:	5 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin
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Mode A

BT-LE 1M

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-8.55	8	Pass
19	2440	-8.06	8	Pass
39	2480	-9.03	8	Pass

Note: The antenna gain is -0.9 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
0	2402	-9.94	8	Pass
19	2440	-9.50	8	Pass
39	2480	-17.75	8	Pass

Note: The antenna gain is -0.9 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 125k

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-2.06	8	Pass
19	2440	-1.57	8	Pass
39	2480	-2.82	8	Pass

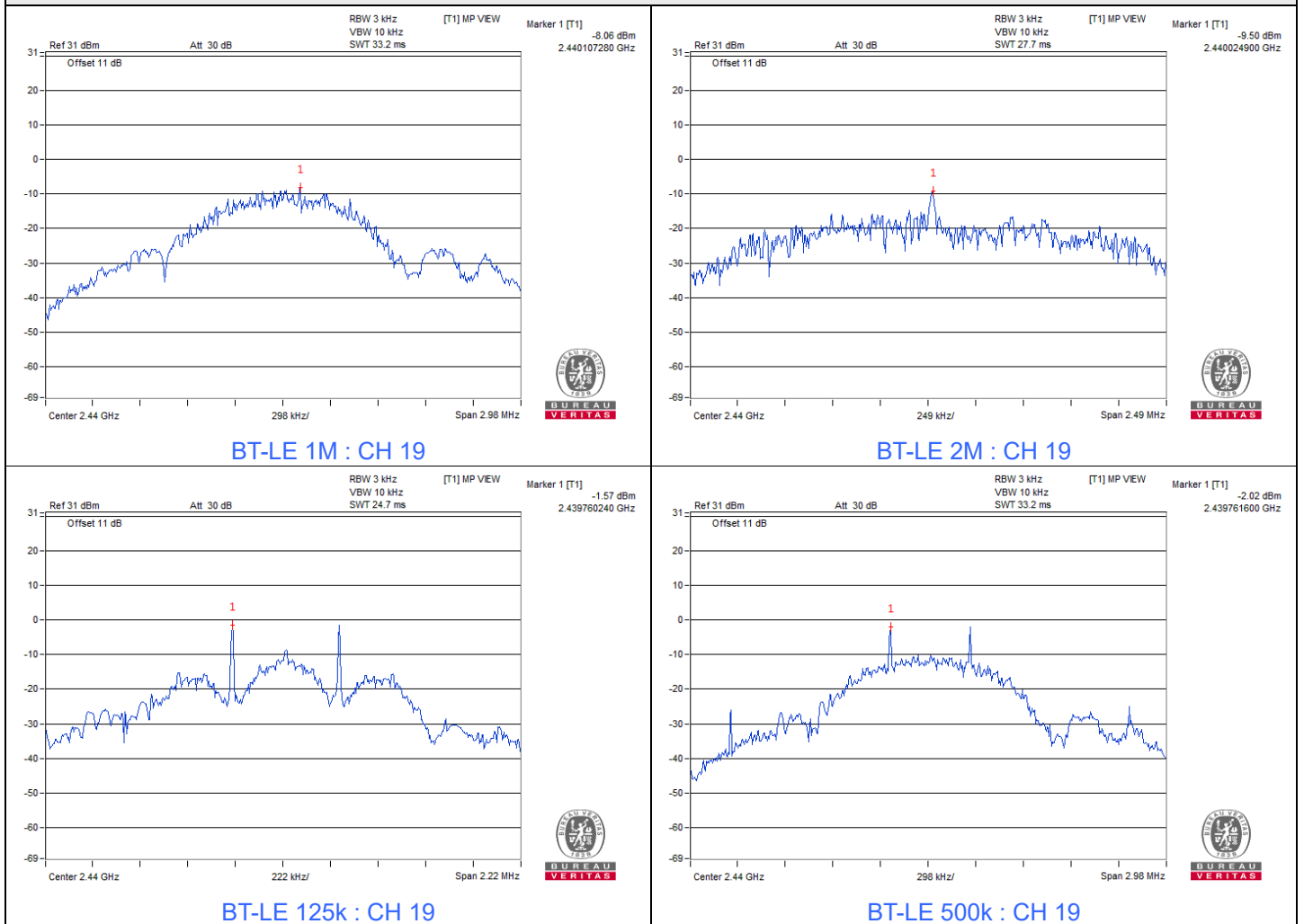
Note: The antenna gain is -0.9 dBi < 6 dBi, so the power density limit shall not be reduced.

BT-LE 500k

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-2.51	8	Pass
19	2440	-2.02	8	Pass
39	2480	-3.20	8	Pass

Note: The antenna gain is -0.9 dBi < 6 dBi, so the power density limit shall not be reduced.

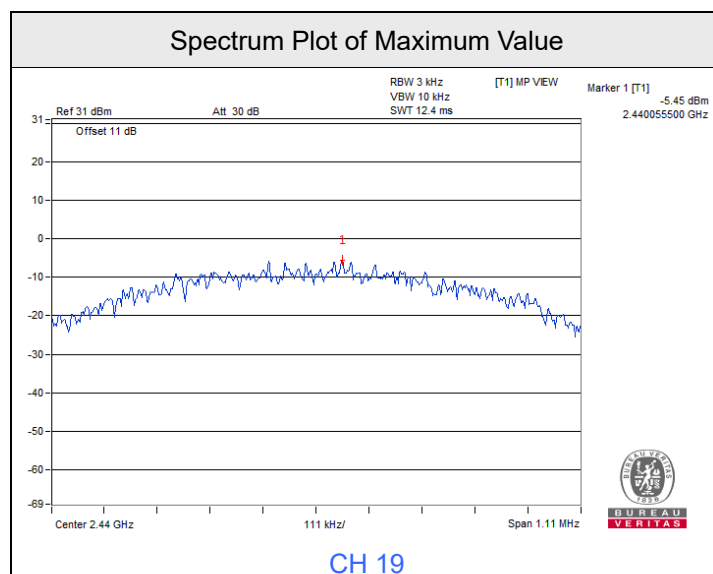
Spectrum Plot of Maximum Value



Mode B

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-5.59	8	Pass
19	2440	-5.45	8	Pass
39	2480	-6.33	8	Pass

Note: The antenna gain is 2.3 dBi < 6 dBi, so the power density limit shall not be reduced.



7.3 6 dB Bandwidth

Input Power:	5 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin
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Mode A

BT-LE 1M

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	2.05	0.5	Pass
19	2440	1.99	0.5	Pass
39	2480	2.26	0.5	Pass

BT-LE 2M

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	1.65	0.5	Pass
19	2440	1.66	0.5	Pass
39	2480	1.18	0.5	Pass

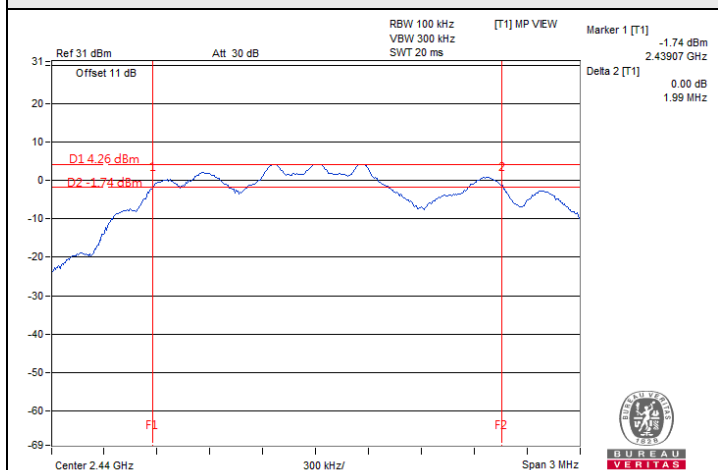
BT-LE 125k

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	1.56	0.5	Pass
19	2440	1.48	0.5	Pass
39	2480	1.77	0.5	Pass

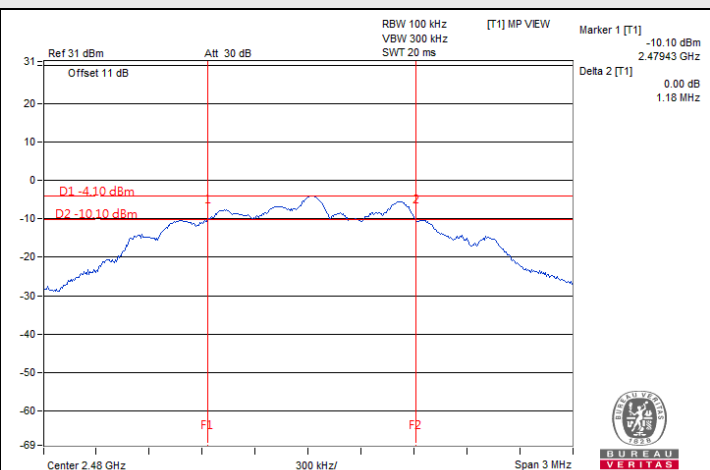
BT-LE 500k

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	2.05	0.5	Pass
19	2440	1.99	0.5	Pass
39	2480	2.27	0.5	Pass

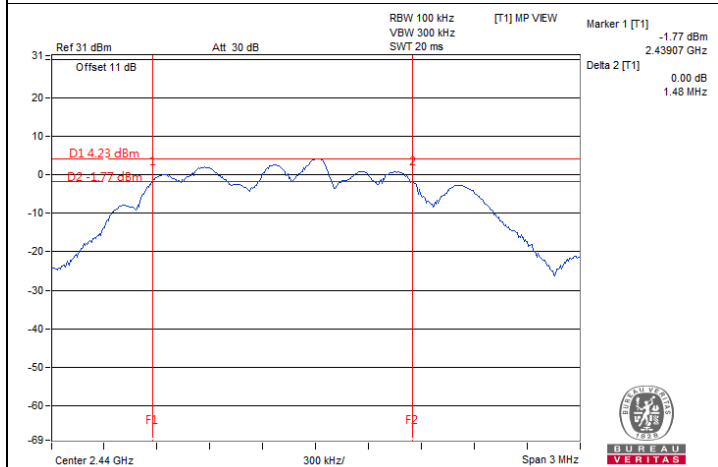
Spectrum Plot of Minimum Value



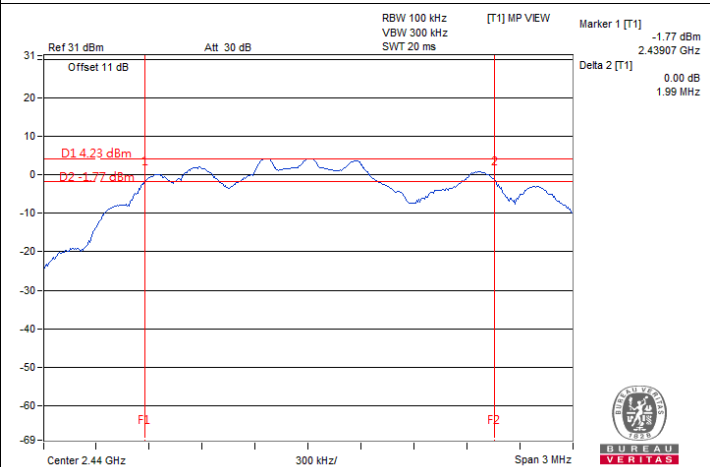
BT-LE 1M : CH 19



BT-LE 2M : CH 39



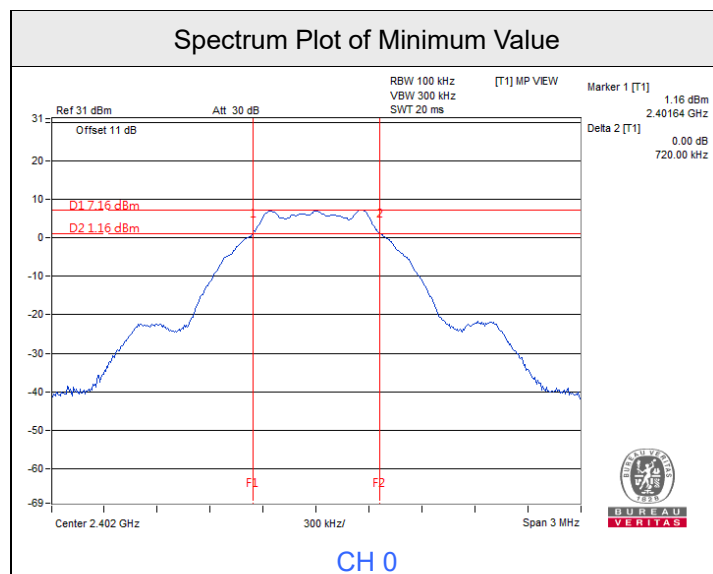
BT-LE 125k : CH 19



BT-LE 500k : CH 19

Mode B

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	0.72	0.5	Pass
19	2440	0.74	0.5	Pass
39	2480	0.73	0.5	Pass

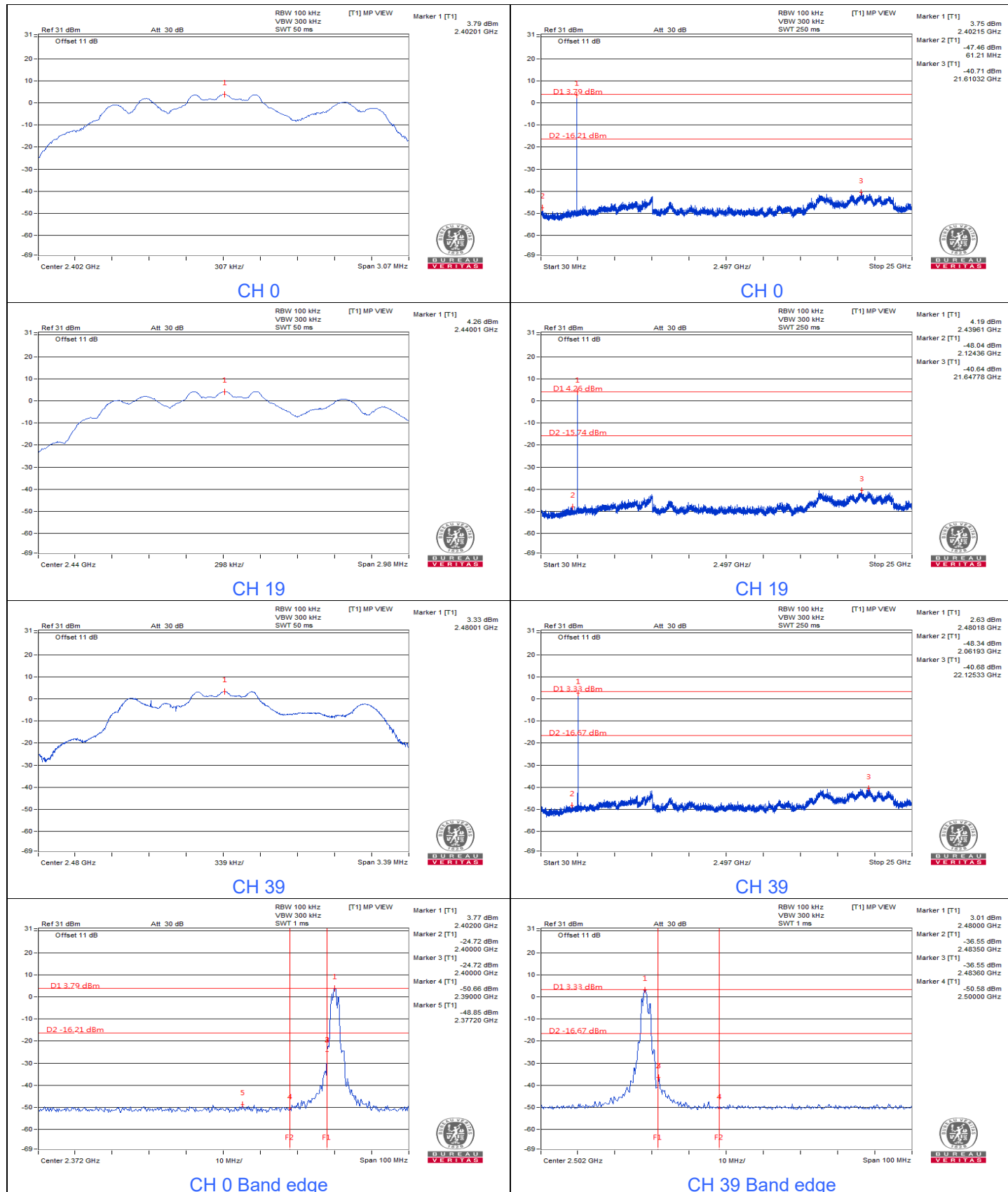


7.4 Conducted Out of Band Emissions

Input Power:	5 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Gary Lin
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Mode A

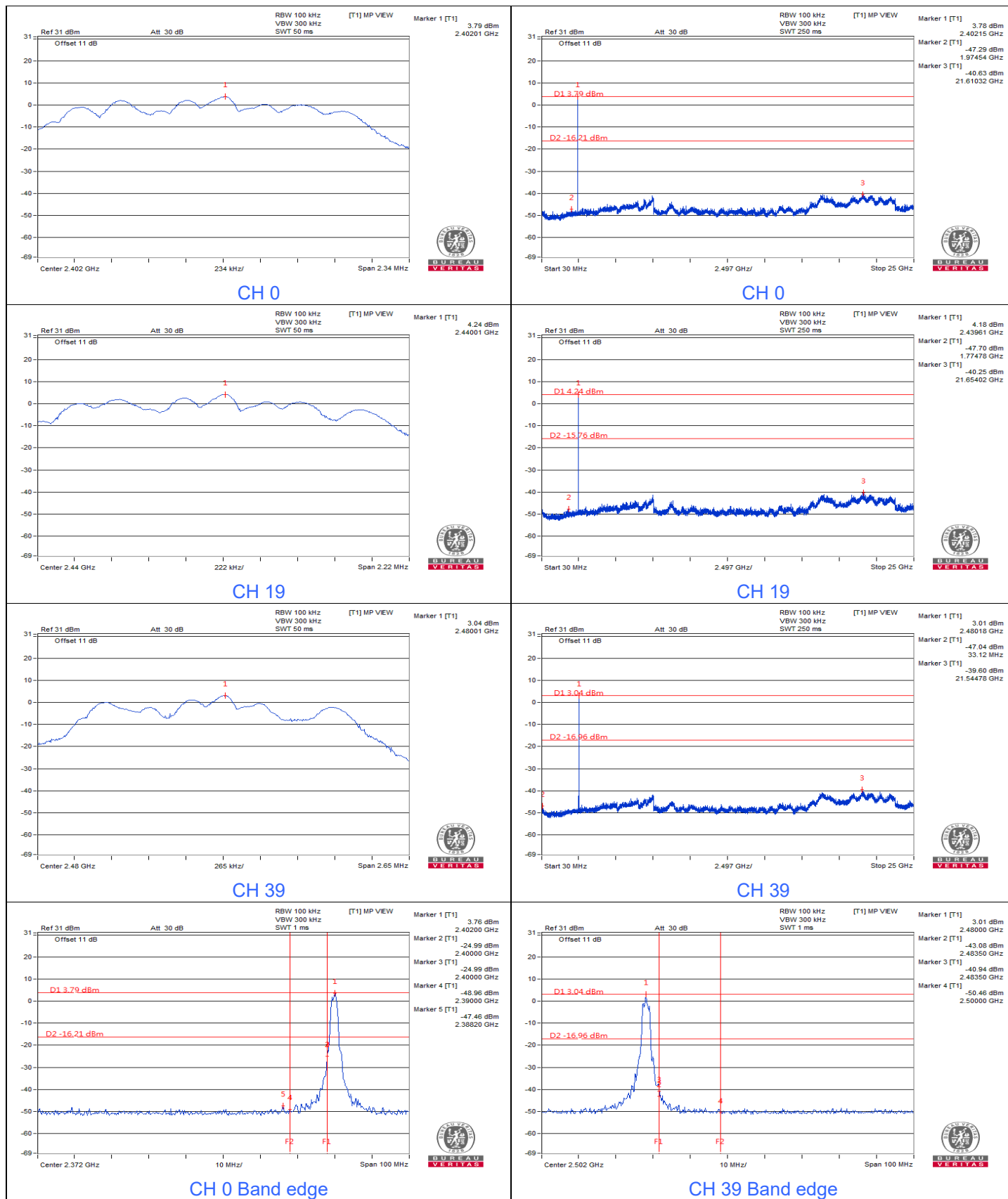
BT-LE 1M



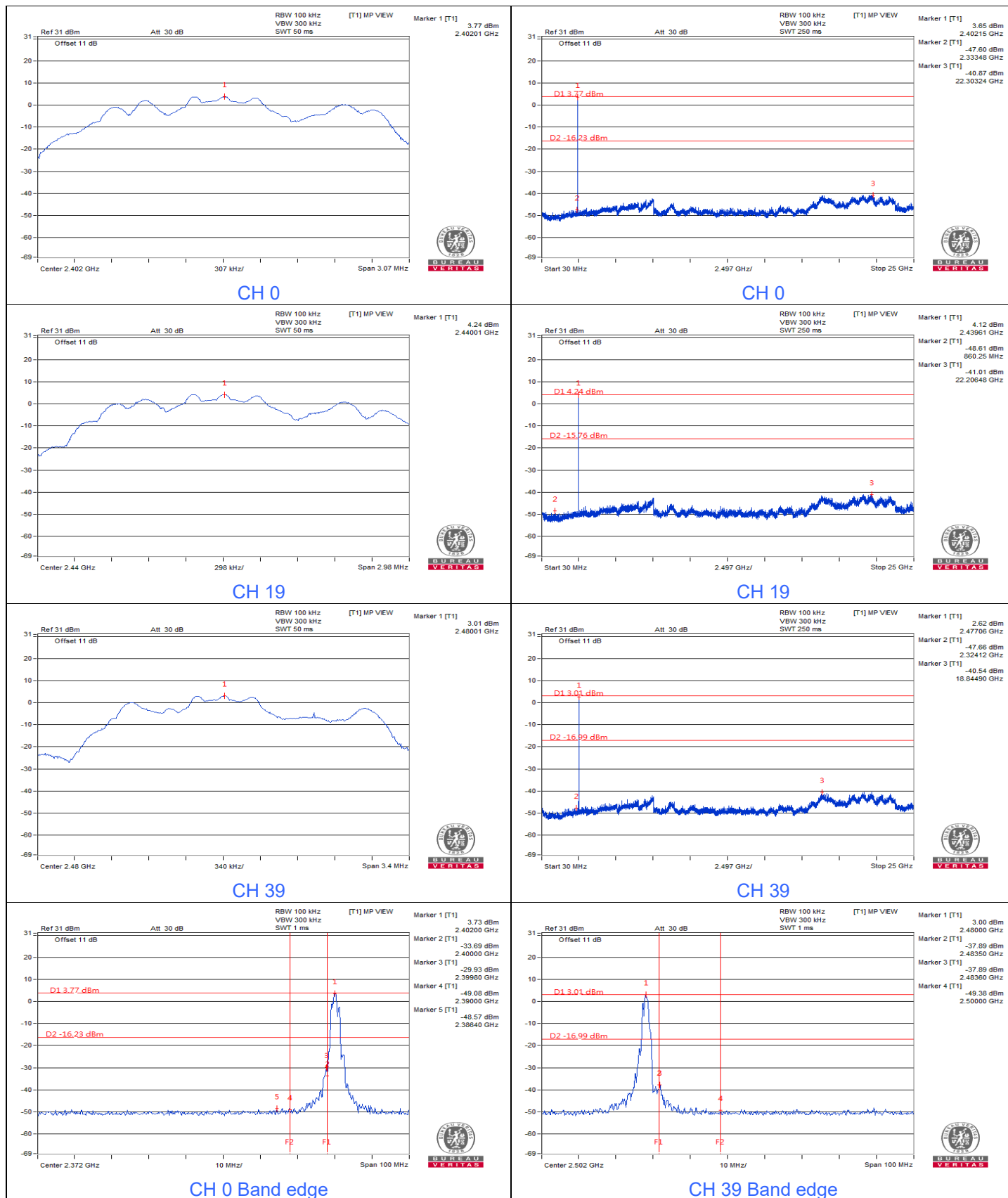
BT-LE 2M



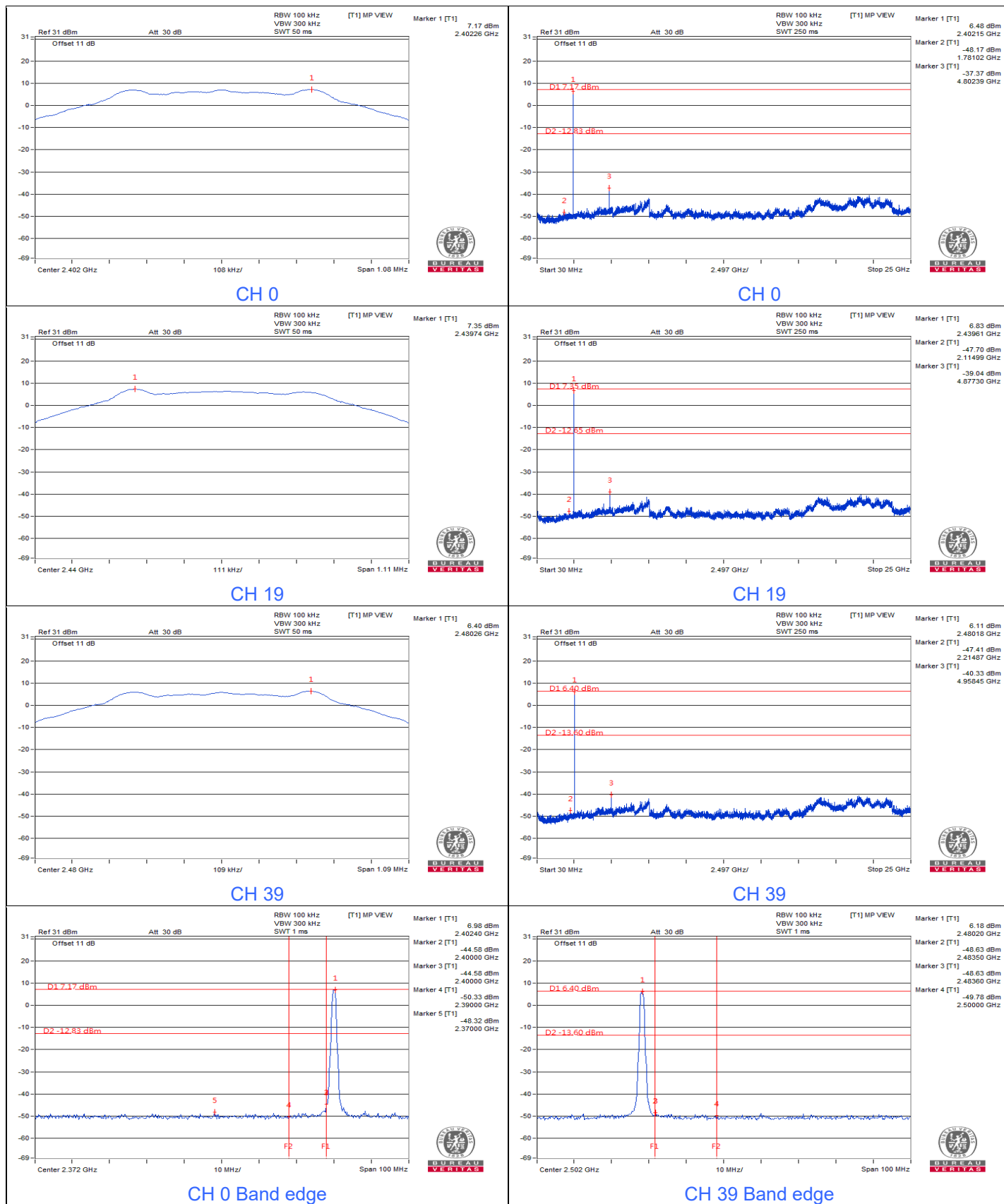
BT-LE 125k



BT-LE 500k



Mode B



7.5 AC Power Conducted Emissions

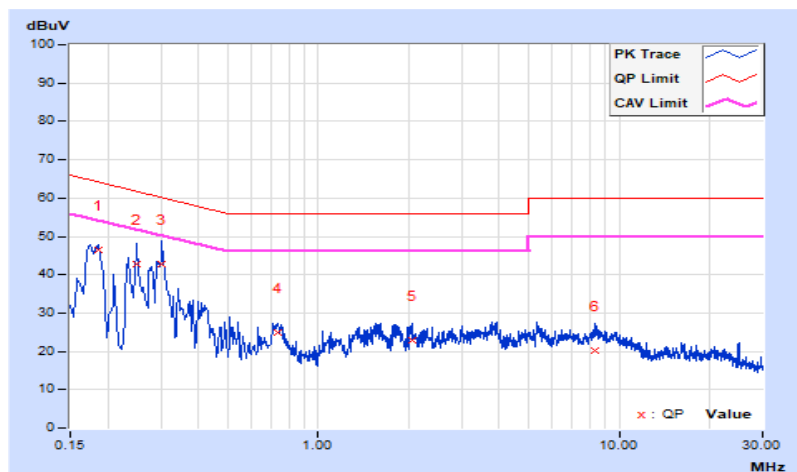
Mode A

RF Mode	BT-LE 125K	Channel	CH 19 : 2440 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Li		

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	0.18568	9.72	36.72	27.11	46.44	36.83	64.23	54.23	-17.79	-17.40
2	0.25000	9.75	32.90	24.16	42.65	33.91	61.76	51.76	-19.11	-17.85
3	0.30151	9.78	32.90	22.02	42.68	31.80	60.20	50.20	-17.52	-18.40
4	0.73800	9.86	14.94	9.33	24.80	19.19	56.00	46.00	-31.20	-26.81
5	2.05400	9.96	12.89	4.47	22.85	14.43	56.00	46.00	-33.15	-31.57
6	8.36600	10.12	10.00	4.68	20.12	14.80	60.00	50.00	-39.88	-35.20

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

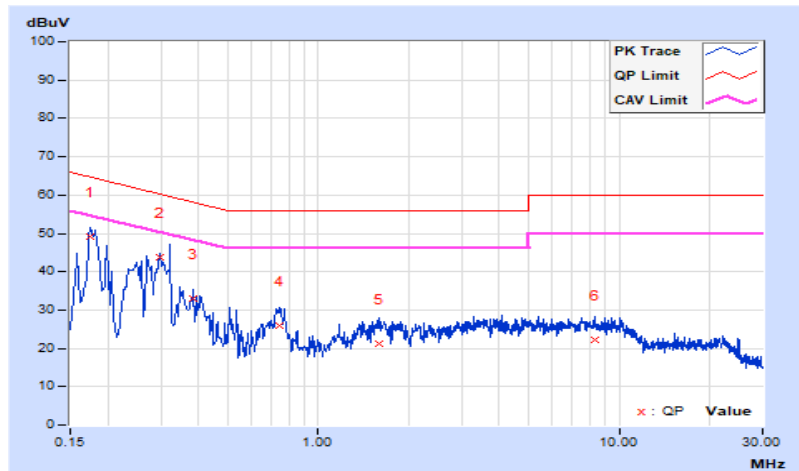


RF Mode	BT-LE 125K	Channel	CH 19 : 2440 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Li		

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	0.17400	9.70	39.40	27.50	49.10	37.20	64.77	54.77	-15.67	-17.57
2	0.29800	9.79	33.87	22.75	43.66	32.54	60.30	50.30	-16.64	-17.76
3	0.38600	9.86	22.97	8.63	32.83	18.49	58.15	48.15	-25.32	-29.66
4	0.74600	9.90	16.02	11.67	25.92	21.57	56.00	46.00	-30.08	-24.43
5	1.58600	9.95	11.38	5.16	21.33	15.11	56.00	46.00	-34.67	-30.89
6	8.35000	10.18	11.93	6.50	22.11	16.68	60.00	50.00	-37.89	-33.32

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



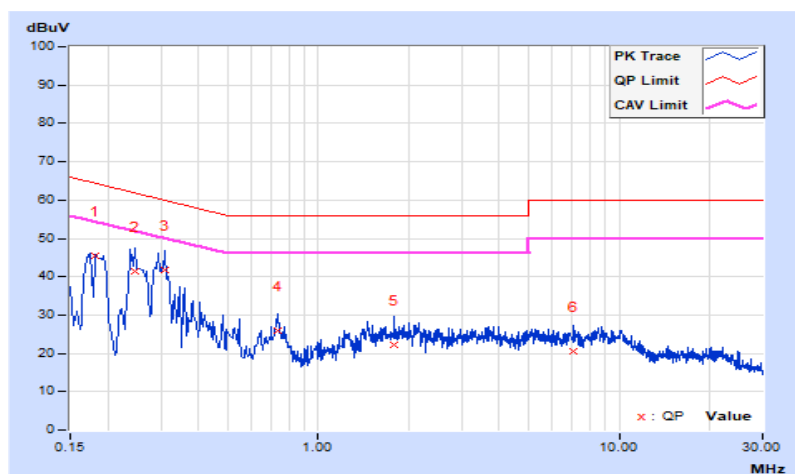
Mode B

RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Li		

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	0.18200	9.72	35.77	26.63	45.49	36.35	64.39	54.39	-18.90	-18.04
2	0.24600	9.75	31.79	19.99	41.54	29.74	61.89	51.89	-20.35	-22.15
3	0.31000	9.78	32.13	21.04	41.91	30.82	59.97	49.97	-18.06	-19.15
4	0.73000	9.86	16.15	10.34	26.01	20.20	56.00	46.00	-29.99	-25.80
5	1.79000	9.94	12.21	4.89	22.15	14.83	56.00	46.00	-33.85	-31.17
6	7.06186	10.09	10.37	5.10	20.46	15.19	60.00	50.00	-39.54	-34.81

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

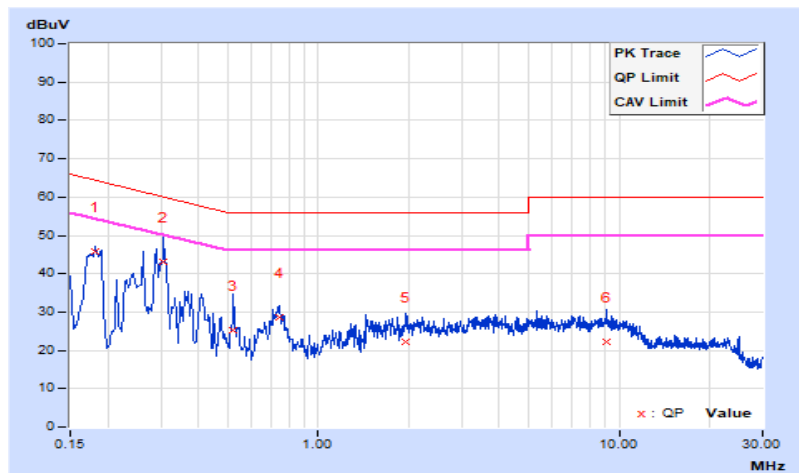


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Karl Li		

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	0.18200	9.70	36.14	26.85	45.84	36.55	64.39	54.39	-18.55	-17.84
2	0.30600	9.79	33.25	20.39	43.04	30.18	60.08	50.08	-17.04	-19.90
3	0.52200	9.88	15.29	4.70	25.17	14.58	56.00	46.00	-30.83	-31.42
4	0.74200	9.90	18.69	13.15	28.59	23.05	56.00	46.00	-27.41	-22.95
5	1.95800	9.97	12.19	4.91	22.16	14.88	56.00	46.00	-33.84	-31.12
6	9.05400	10.20	12.04	6.72	22.24	16.92	60.00	50.00	-37.76	-33.08

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

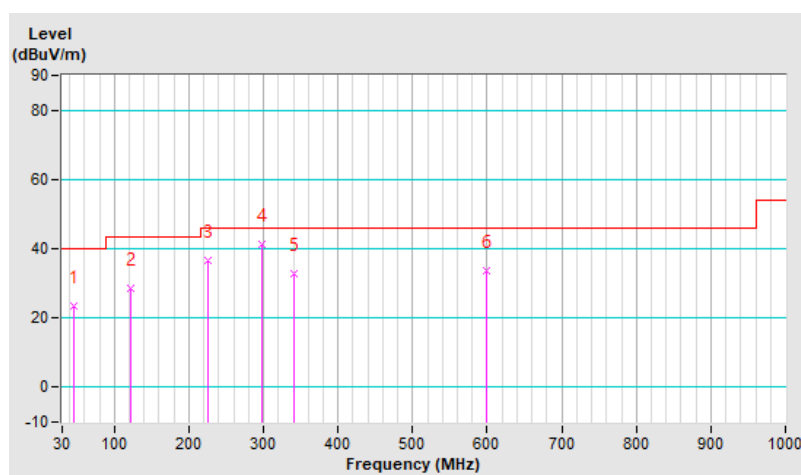
Mode A

RF Mode	BT-LE 125K	Channel	CH 19 : 2440 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	45.52	23.6 QP	40.0	-16.4	2.00 H	200	36.4	-12.8
2	121.18	28.5 QP	43.5	-15.0	1.99 H	139	43.4	-14.9
3	225.94	36.8 QP	46.0	-9.2	1.51 H	44	52.9	-16.1
4	298.62	41.4 QP	46.0	-4.6	1.01 H	119	54.0	-12.6
5	341.37	32.9 QP	46.0	-13.1	1.01 H	142	44.4	-11.5
6	598.42	33.7 QP	46.0	-12.3	1.51 H	145	39.2	-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.

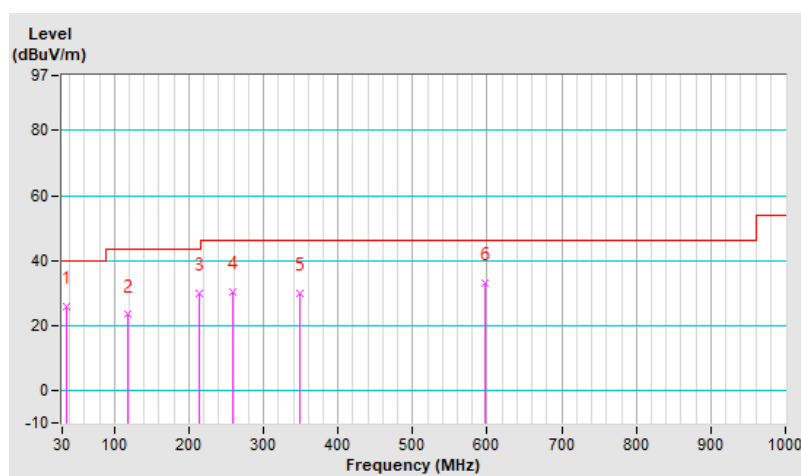


RF Mode	BT-LE 125K	Channel	CH 19 : 2440 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	36.79	26.0 QP	40.0	-14.0	1.00 V	125	39.7	-13.7
2	117.30	23.3 QP	43.5	-20.2	1.49 V	303	38.6	-15.3
3	214.30	30.0 QP	43.5	-13.5	1.49 V	76	46.6	-16.6
4	257.95	30.3 QP	46.0	-15.7	1.99 V	96	44.3	-14.0
5	349.13	30.1 QP	46.0	-15.9	1.00 V	81	41.5	-11.4
6	597.45	33.1 QP	46.0	-12.9	1.00 V	93	38.6	-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.



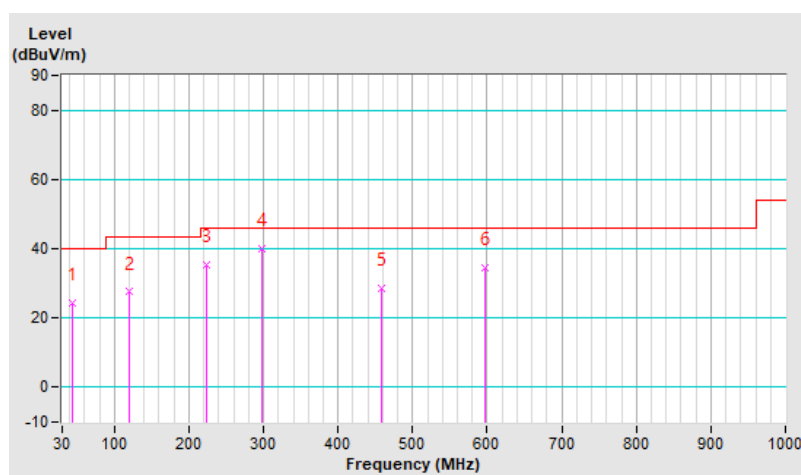
Mode B

RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	44.55	24.5 QP	40.0	-15.5	1.99 H	166	37.5	-13.0
2	120.21	27.5 QP	43.5	-16.0	1.49 H	138	42.6	-15.1
3	224.00	35.5 QP	46.0	-10.5	1.00 H	133	51.8	-16.3
4	298.69	40.1 QP	46.0	-5.9	1.00 H	23	52.7	-12.6
5	457.77	28.6 QP	46.0	-17.4	1.99 H	150	37.0	-8.4
6	596.48	34.3 QP	46.0	-11.7	1.49 H	145	39.8	-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.

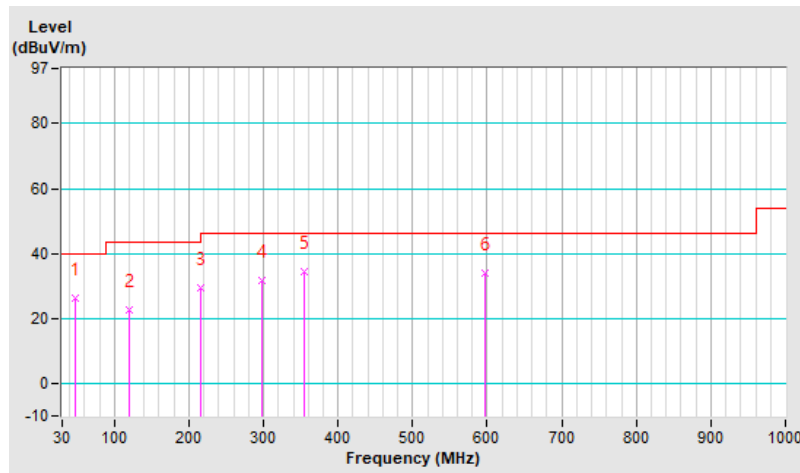


RF Mode	BT-LE 2M	Channel	CH 19 : 2440 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	48.43	26.4 QP	40.0	-13.6	1.01 V	206	39.1	-12.7
2	120.21	22.8 QP	43.5	-20.7	1.01 V	302	37.9	-15.1
3	215.27	29.3 QP	43.5	-14.2	2.00 V	103	45.9	-16.6
4	298.69	31.8 QP	46.0	-14.2	1.51 V	169	44.4	-12.6
5	353.98	34.6 QP	46.0	-11.4	1.01 V	94	46.0	-11.4
6	597.45	34.2 QP	46.0	-11.8	1.51 V	69	39.7	-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.



7.7 Unwanted Emissions above 1 GHz

Mode A

RF Mode	BT-LE 1M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	57.7 PK	74.0	-16.3	1.00 H	359	25.3	32.4
2	2390.00	46.8 AV	54.0	-7.2	1.00 H	359	14.4	32.4
3	*2402.00	98.0 PK			1.00 H	359	65.5	32.5
4	*2402.00	97.9 AV			1.00 H	359	65.4	32.5
5	4804.00	50.5 PK	74.0	-23.5	1.50 H	6	40.3	10.2
6	4804.00	39.7 AV	54.0	-14.3	1.50 H	6	29.5	10.2
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	58.2 PK	74.0	-15.8	1.06 V	153	25.8	32.4
2	2390.00	46.8 AV	54.0	-7.2	1.06 V	153	14.4	32.4
3	*2402.00	94.6 PK			1.06 V	153	62.1	32.5
4	*2402.00	94.5 AV			1.06 V	153	62.0	32.5
5	4804.00	50.4 PK	74.0	-23.6	1.39 V	22	40.2	10.2
6	4804.00	39.3 AV	54.0	-14.7	1.39 V	22	29.1	10.2

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

RF Mode	BT-LE 1M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	99.3 PK			1.31 H	0	66.9	32.4
2	*2440.00	99.2 AV			1.31 H	0	66.8	32.4
3	4880.00	50.8 PK	74.0	-23.2	1.61 H	39	40.5	10.3
4	4880.00	39.7 AV	54.0	-14.3	1.61 H	39	29.4	10.3
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	98.4 PK			3.50 V	295	66.0	32.4
2	*2440.00	98.3 AV			3.50 V	295	65.9	32.4
3	4880.00	50.7 PK	74.0	-23.3	1.55 V	21	40.4	10.3
4	4880.00	39.6 AV	54.0	-14.4	1.55 V	21	29.3	10.3

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

RF Mode	BT-LE 1M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	99.7 PK			1.51 H	9	67.2	32.5
2	*2480.00	99.6 AV			1.51 H	9	67.1	32.5
3	2483.50	62.1 PK	74.0	-11.9	1.51 H	9	29.6	32.5
4	2483.50	53.6 AV	54.0	-0.4	1.51 H	9	21.1	32.5
5	4960.00	50.0 PK	74.0	-24.0	1.13 H	247	39.4	10.6
6	4960.00	39.3 AV	54.0	-14.7	1.13 H	247	28.7	10.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	98.0 PK			3.40 V	294	65.5	32.5
2	*2480.00	97.9 AV			3.40 V	294	65.4	32.5
3	2483.50	61.4 PK	74.0	-12.6	3.40 V	294	28.9	32.5
4	2483.50	52.6 AV	54.0	-1.4	3.40 V	294	20.1	32.5
5	4960.00	49.9 PK	74.0	-24.1	1.75 V	59	39.3	10.6
6	4960.00	39.2 AV	54.0	-14.8	1.75 V	59	28.6	10.6

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 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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	57.8 PK	74.0	-16.2	1.00 H	0	25.4	32.4
2	2390.00	47.2 AV	54.0	-6.8	1.00 H	0	14.8	32.4
3	*2402.00	97.7 PK			1.00 H	0	65.2	32.5
4	*2402.00	97.6 AV			1.00 H	0	65.1	32.5
5	4804.00	49.0 PK	74.0	-25.0	1.67 H	100	38.8	10.2
6	4804.00	39.5 AV	54.0	-14.5	1.67 H	100	29.3	10.2
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	58.8 PK	74.0	-15.2	1.56 V	154	26.4	32.4
2	2390.00	47.2 AV	54.0	-6.8	1.56 V	154	14.8	32.4
3	*2402.00	94.4 PK			1.56 V	154	61.9	32.5
4	*2402.00	94.3 AV			1.56 V	154	61.8	32.5
5	4804.00	48.9 PK	74.0	-25.1	2.29 V	100	38.7	10.2
6	4804.00	39.4 AV	54.0	-14.6	2.29 V	100	29.2	10.2

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.
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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	99.4 PK			1.32 H	0	67.0	32.4
2	*2440.00	99.3 AV			1.32 H	0	66.9	32.4
3	4880.00	51.0 PK	74.0	-23.0	1.83 H	62	40.7	10.3
4	4880.00	39.7 AV	54.0	-14.3	1.83 H	62	29.4	10.3
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	98.4 PK			3.51 V	294	66.0	32.4
2	*2440.00	98.3 AV			3.51 V	294	65.9	32.4
3	4880.00	50.9 PK	74.0	-23.1	1.52 V	321	40.6	10.3
4	4880.00	39.6 AV	54.0	-14.4	1.52 V	321	29.3	10.3

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

RF Mode	BT-LE 2M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	91.6 PK			1.95 H	0	59.1	32.5
2	*2480.00	91.5 AV			1.95 H	0	59.0	32.5
3	2483.50	61.1 PK	74.0	-12.9	1.95 H	0	28.6	32.5
4	2483.50	52.6 AV	54.0	-1.4	1.95 H	0	20.1	32.5
5	4960.00	50.3 PK	74.0	-23.7	3.00 H	182	39.7	10.6
6	4960.00	39.5 AV	54.0	-14.5	3.00 H	182	28.9	10.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	89.0 PK			1.51 V	152	56.5	32.5
2	*2480.00	88.9 AV			1.51 V	152	56.4	32.5
3	2483.50	59.7 PK	74.0	-14.3	1.51 V	152	27.2	32.5
4	2483.50	50.7 AV	54.0	-3.3	1.51 V	152	18.2	32.5
5	4960.00	50.2 PK	74.0	-23.8	1.86 V	71	39.6	10.6
6	4960.00	39.4 AV	54.0	-14.6	1.86 V	71	28.8	10.6

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 125K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	58.4 PK	74.0	-15.6	1.00 H	7	26.0	32.4
2	2390.00	46.6 AV	54.0	-7.4	1.00 H	7	14.2	32.4
3	*2402.00	98.1 PK			1.00 H	7	65.6	32.5
4	*2402.00	97.1 AV			1.00 H	7	64.6	32.5
5	4804.00	50.5 PK	74.0	-23.5	1.04 H	111	40.3	10.2
6	4804.00	39.1 AV	54.0	-14.9	1.04 H	111	28.9	10.2
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	57.8 PK	74.0	-16.2	1.49 V	155	25.4	32.4
2	2390.00	46.5 AV	54.0	-7.5	1.49 V	155	14.1	32.4
3	*2402.00	96.5 PK			1.49 V	155	64.0	32.5
4	*2402.00	95.7 AV			1.49 V	155	63.2	32.5
5	4804.00	50.4 PK	74.0	-23.6	1.90 V	52	40.2	10.2
6	4804.00	39.0 AV	54.0	-15.0	1.90 V	52	28.8	10.2

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

RF Mode	BT-LE 125K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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			1.35 H	9	67.2	32.4
2	*2440.00	98.3 AV			1.35 H	9	65.9	32.4
3	4880.00	50.5 PK	74.0	-23.5	1.50 H	5	40.2	10.3
4	4880.00	39.5 AV	54.0	-14.5	1.50 H	5	29.2	10.3
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	96.6 PK			1.60 V	155	64.2	32.4
2	*2440.00	95.4 AV			1.60 V	155	63.0	32.4
3	4880.00	50.4 PK	74.0	-23.6	1.39 V	16	40.1	10.3
4	4880.00	39.4 AV	54.0	-14.6	1.39 V	16	29.1	10.3

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

RF Mode	BT-LE 125K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	98.7 PK			3.12 H	8	66.2	32.5
2	*2480.00	97.5 AV			3.12 H	8	65.0	32.5
3	2483.50	62.1 PK	74.0	-11.9	3.12 H	8	29.6	32.5
4	2483.50	53.7 AV	54.0	-0.3	3.12 H	8	21.2	32.5
5	4960.00	50.7 PK	74.0	-23.3	2.13 H	94	40.1	10.6
6	4960.00	39.7 AV	54.0	-14.3	2.13 H	94	29.1	10.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	96.1 PK			1.49 V	153	63.6	32.5
2	*2480.00	95.1 AV			1.49 V	153	62.6	32.5
3	2483.50	61.6 PK	74.0	-12.4	1.49 V	153	29.1	32.5
4	2483.50	52.4 AV	54.0	-1.6	1.49 V	153	19.9	32.5
5	4960.00	50.6 PK	74.0	-23.4	1.99 V	20	40.0	10.6
6	4960.00	39.6 AV	54.0	-14.4	1.99 V	20	29.0	10.6

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 500K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	57.6 PK	74.0	-16.4	1.00 H	3	25.2	32.4
2	2390.00	46.7 AV	54.0	-7.3	1.00 H	3	14.3	32.4
3	*2402.00	97.9 PK			1.00 H	3	65.4	32.5
4	*2402.00	97.8 AV			1.00 H	3	65.3	32.5
5	4804.00	50.3 PK	74.0	-23.7	3.34 H	65	40.1	10.2
6	4804.00	39.5 AV	54.0	-14.5	3.34 H	65	29.3	10.2
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	57.3 PK	74.0	-16.7	1.49 V	154	24.9	32.4
2	2390.00	46.5 AV	54.0	-7.5	1.49 V	154	14.1	32.4
3	*2402.00	96.4 PK			1.49 V	154	63.9	32.5
4	*2402.00	96.3 AV			1.49 V	154	63.8	32.5
5	4804.00	50.2 PK	74.0	-23.8	1.18 V	23	40.0	10.2
6	4804.00	39.4 AV	54.0	-14.6	1.18 V	23	29.2	10.2

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

RF Mode	BT-LE 500K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	99.1 PK			1.31 H	3	66.7	32.4
2	*2440.00	99.0 AV			1.31 H	3	66.6	32.4
3	4880.00	50.7 PK	74.0	-23.3	2.23 H	194	40.4	10.3
4	4880.00	39.6 AV	54.0	-14.4	2.23 H	194	29.3	10.3
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	96.6 PK			1.56 V	155	64.2	32.4
2	*2440.00	96.5 AV			1.56 V	155	64.1	32.4
3	4880.00	50.6 PK	74.0	-23.4	3.67 V	241	40.3	10.3
4	4880.00	39.5 AV	54.0	-14.5	3.67 V	241	29.2	10.3

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

RF Mode	BT-LE 500K	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	99.5 PK			1.51 H	0	67.0	32.5
2	*2480.00	99.4 AV			1.51 H	0	66.9	32.5
3	2483.50	62.3 PK	74.0	-11.7	1.51 H	0	29.8	32.5
4	2483.50	53.6 AV	54.0	-0.4	1.51 H	0	21.1	32.5
5	4960.00	50.9 PK	74.0	-23.1	1.81 H	126	40.3	10.6
6	4960.00	40.0 AV	54.0	-14.0	1.81 H	126	29.4	10.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	96.1 PK			1.50 V	154	63.6	32.5
2	*2480.00	96.0 AV			1.50 V	154	63.5	32.5
3	2483.50	61.7 PK	74.0	-12.3	1.50 V	154	29.2	32.5
4	2483.50	51.8 AV	54.0	-2.2	1.50 V	154	19.3	32.5
5	4960.00	50.8 PK	74.0	-23.2	1.50 V	34	40.2	10.6
6	4960.00	39.9 AV	54.0	-14.1	1.50 V	34	29.3	10.6

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.

Mode B

RF Mode	BT-LE 2M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	57.8 PK	74.0	-16.2	2.93 H	153	25.4	32.4
2	2390.00	46.6 AV	54.0	-7.4	2.93 H	153	14.2	32.4
3	*2402.00	96.7 PK			2.93 H	153	64.2	32.5
4	*2402.00	96.0 AV			2.93 H	153	63.5	32.5
5	4804.00	50.8 PK	74.0	-23.2	2.92 H	293	40.6	10.2
6	4804.00	40.1 AV	54.0	-13.9	2.92 H	293	29.9	10.2
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	57.6 PK	74.0	-16.4	1.00 V	295	25.2	32.4
2	2390.00	46.6 AV	54.0	-7.4	1.00 V	295	14.2	32.4
3	*2402.00	96.9 PK			1.00 V	295	64.4	32.5
4	*2402.00	96.2 AV			1.00 V	295	63.7	32.5
5	4804.00	50.1 PK	74.0	-23.9	1.50 V	45	39.9	10.2
6	4804.00	38.8 AV	54.0	-15.2	1.50 V	45	28.6	10.2

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.
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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2440.00	97.6 PK			1.00 H	157	65.2	32.4
2	*2440.00	96.9 AV			1.00 H	157	64.5	32.4
3	4880.00	50.5 PK	74.0	-23.5	1.50 H	11	40.2	10.3
4	4880.00	39.3 AV	54.0	-14.7	1.50 H	11	29.0	10.3
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	97.7 PK			1.00 V	263	65.3	32.4
2	*2440.00	96.9 AV			1.00 V	263	64.5	32.4
3	4880.00	50.4 PK	74.0	-23.6	2.03 V	301	40.1	10.3
4	4880.00	39.2 AV	54.0	-14.8	2.03 V	301	28.9	10.3

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

RF Mode	BT-LE 2M	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=10 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Charles Hsiao		

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	98.5 PK			1.73 H	158	66.0	32.5
2	*2480.00	97.8 AV			1.73 H	158	65.3	32.5
3	2483.50	58.4 PK	74.0	-15.6	1.73 H	158	25.9	32.5
4	2483.50	47.4 AV	54.0	-6.6	1.73 H	158	14.9	32.5
5	4960.00	51.0 PK	74.0	-23.0	1.00 H	159	40.4	10.6
6	4960.00	39.9 AV	54.0	-14.1	1.00 H	159	29.3	10.6
7	7440.00	60.3 PK	74.0	-13.7	1.02 H	319	44.8	15.5
8	7440.00	51.2 AV	54.0	-2.8	1.02 H	319	35.7	15.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2480.00	98.6 PK			1.34 V	262	66.1	32.5
2	*2480.00	97.9 AV			1.34 V	262	65.4	32.5
3	2483.50	58.3 PK	74.0	-15.7	1.34 V	262	25.8	32.5
4	2483.50	47.4 AV	54.0	-6.6	1.34 V	262	14.9	32.5
5	4960.00	50.9 PK	74.0	-23.1	1.53 V	12	40.3	10.6
6	4960.00	39.8 AV	54.0	-14.2	1.53 V	12	29.2	10.6
7	7440.00	61.3 PK	74.0	-12.7	1.09 V	46	45.8	15.5
8	7440.00	53.0 AV	54.0	-1.0	1.09 V	46	37.5	15.5

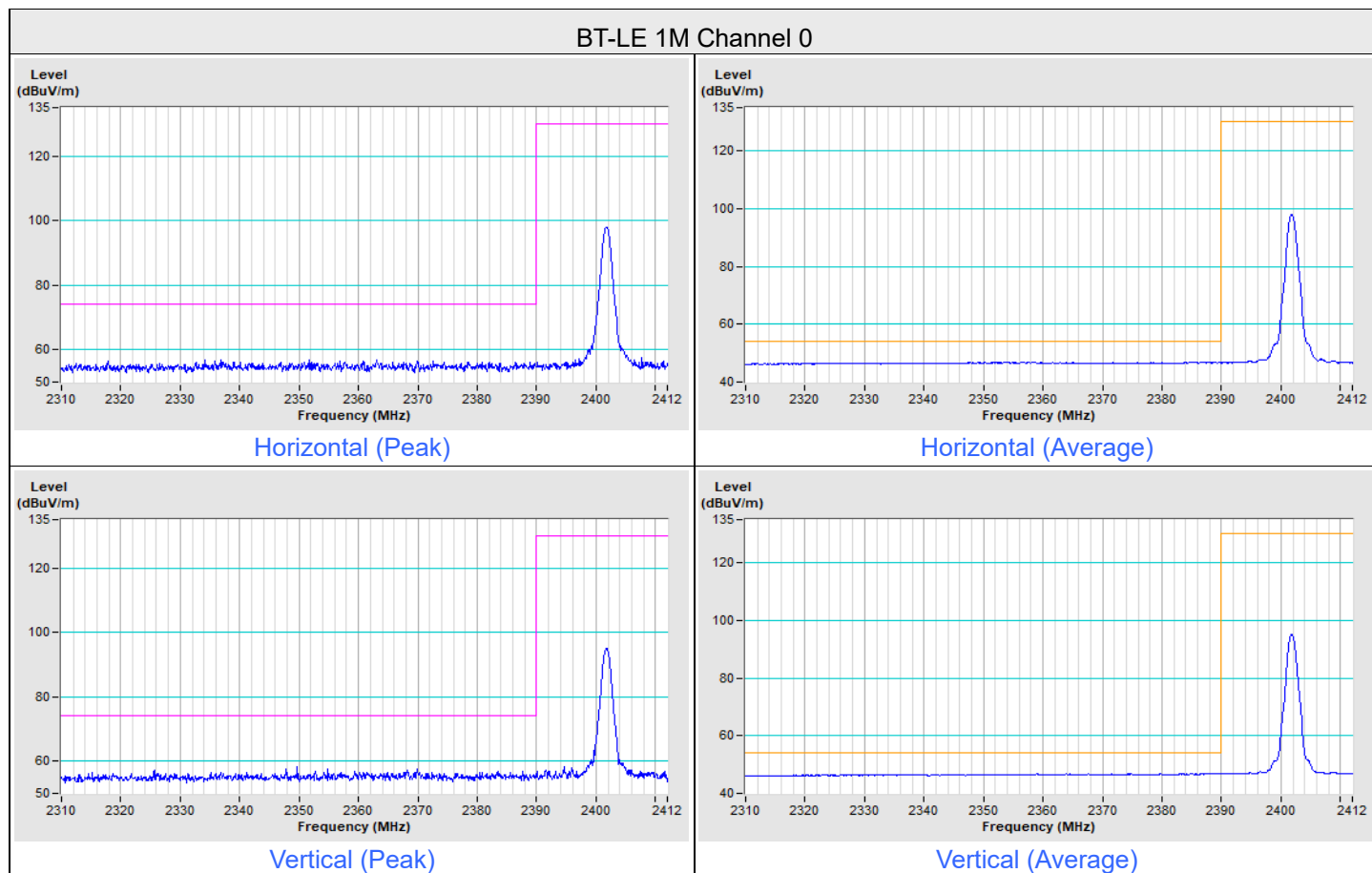
Remarks:

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

Plot of Band Edge

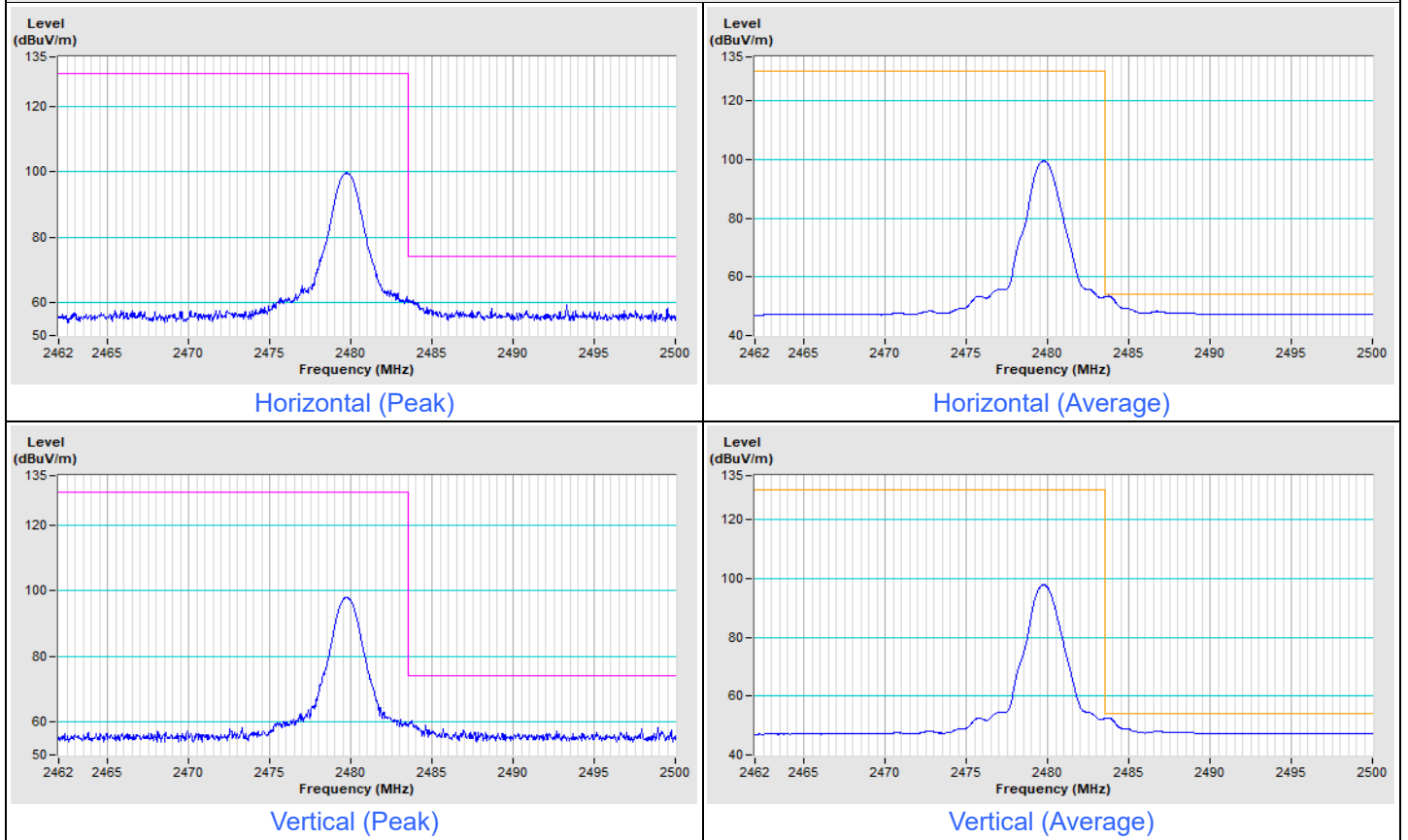
Mode A

Frequency Range	2.31 GHz ~ 2.412 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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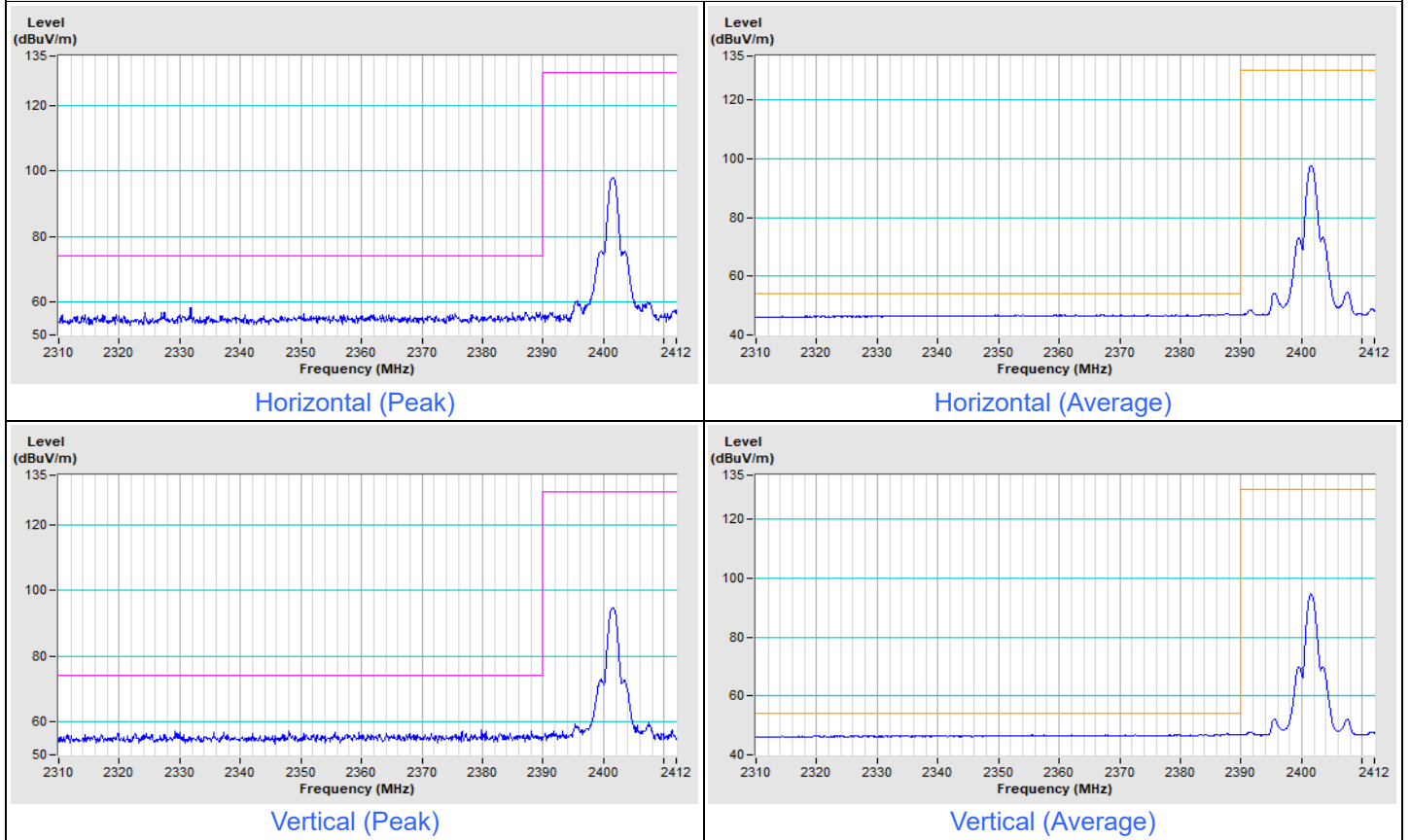
Frequency Range	2.462 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 1M Channel 39



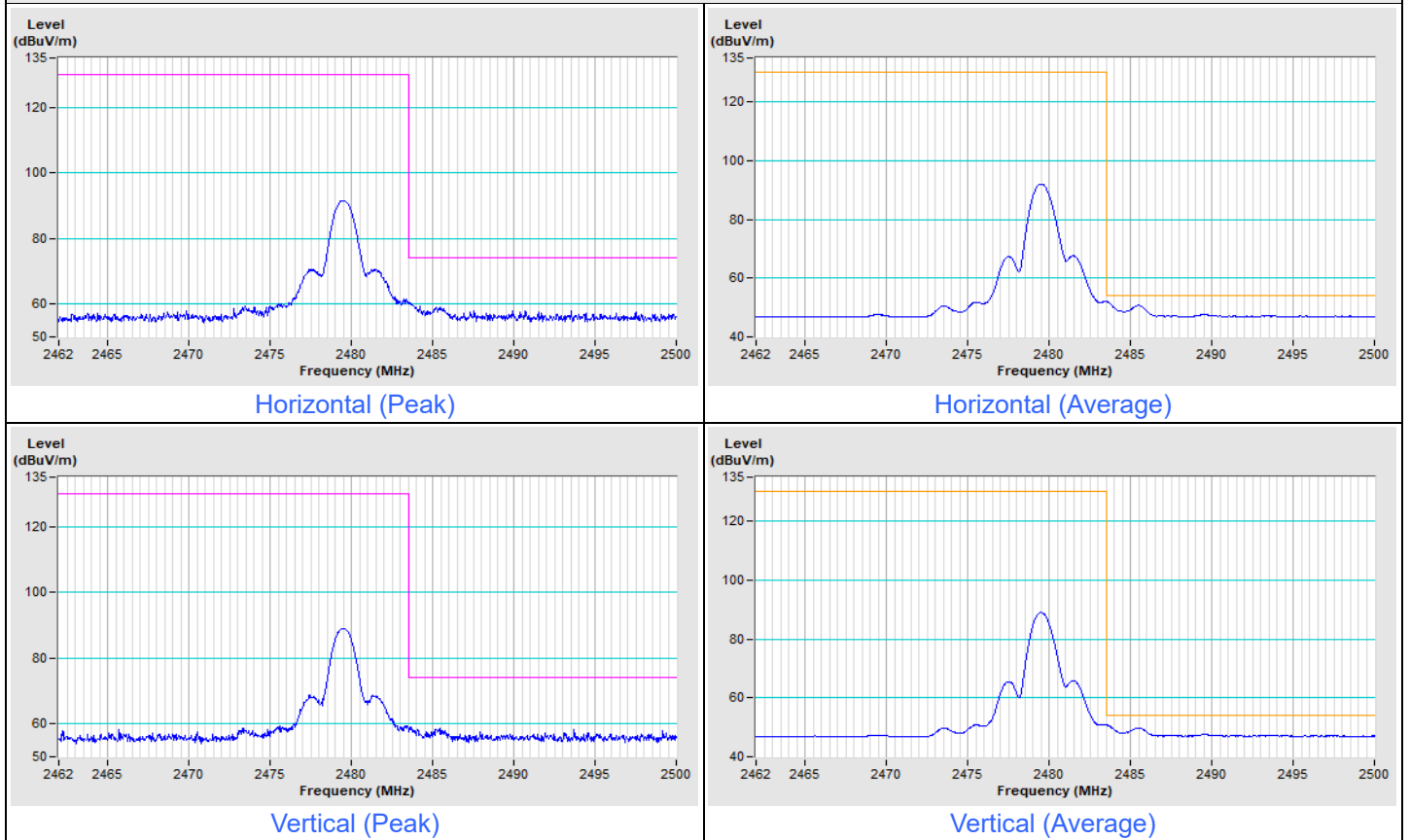
Frequency Range	2.31 GHz ~ 2.412 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 2M Channel 0



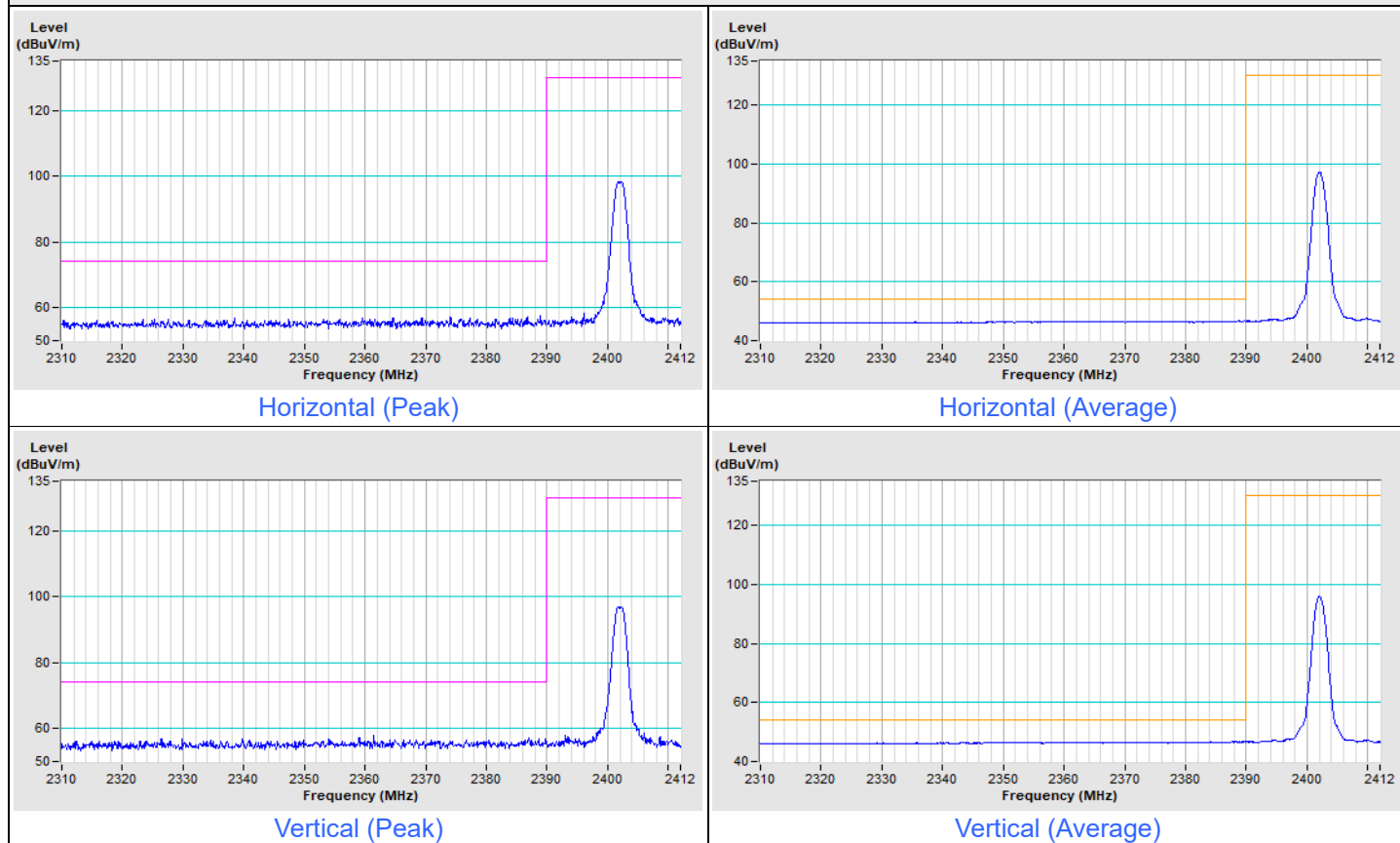
Frequency Range	2.462 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 2M Channel 39



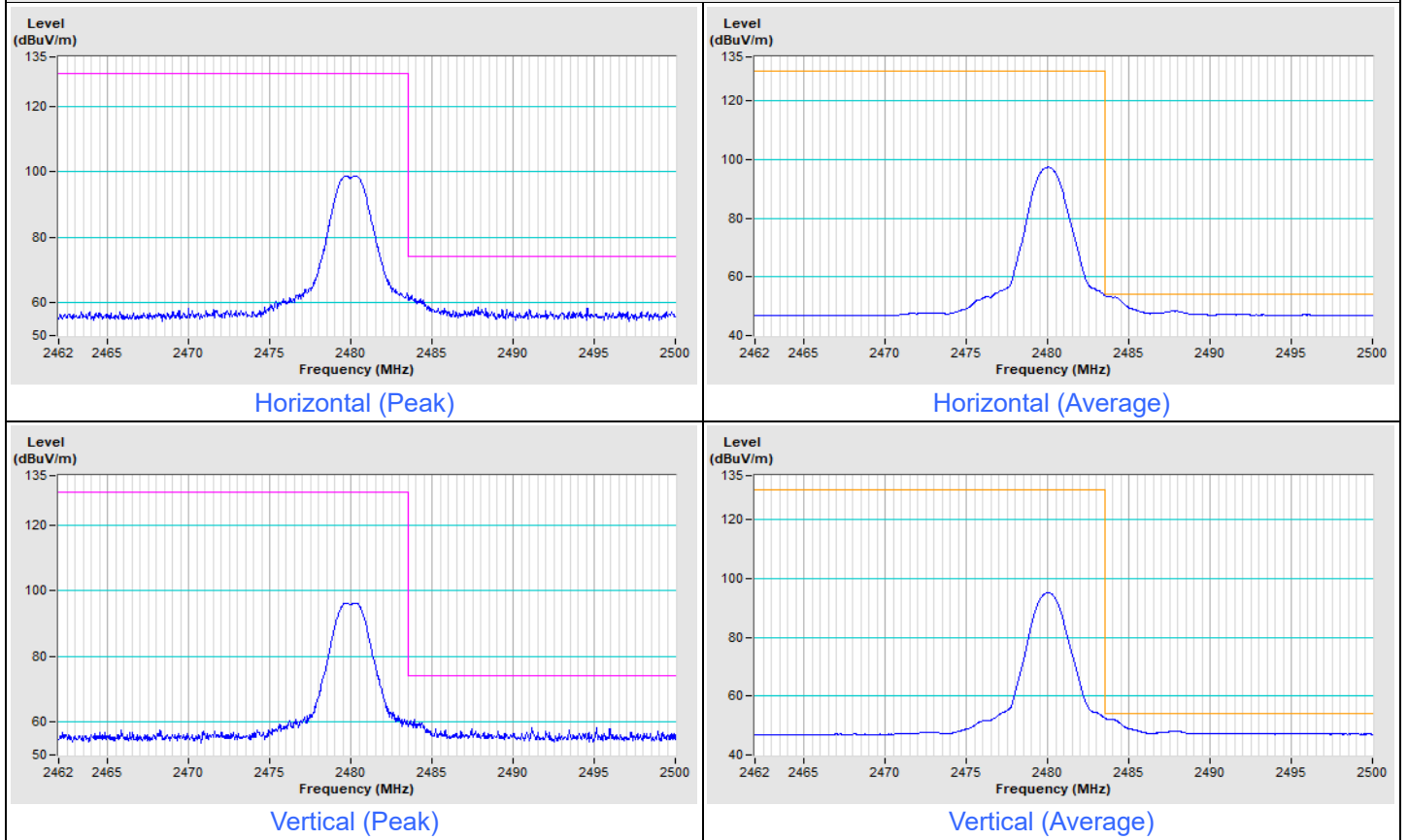
Frequency Range	2.31 GHz ~ 2.412 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 125K Channel 0



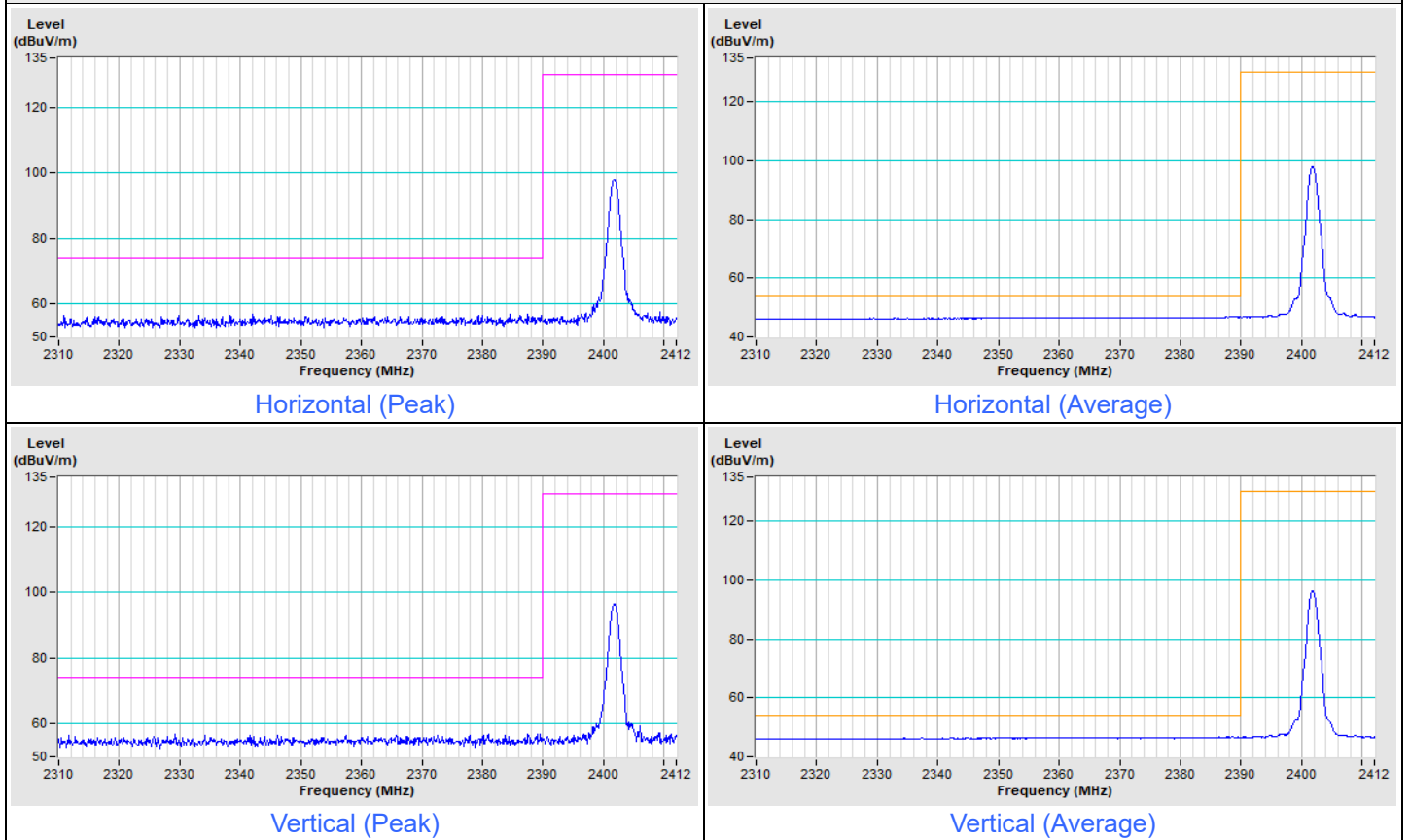
Frequency Range	2.462 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 125K Channel 39



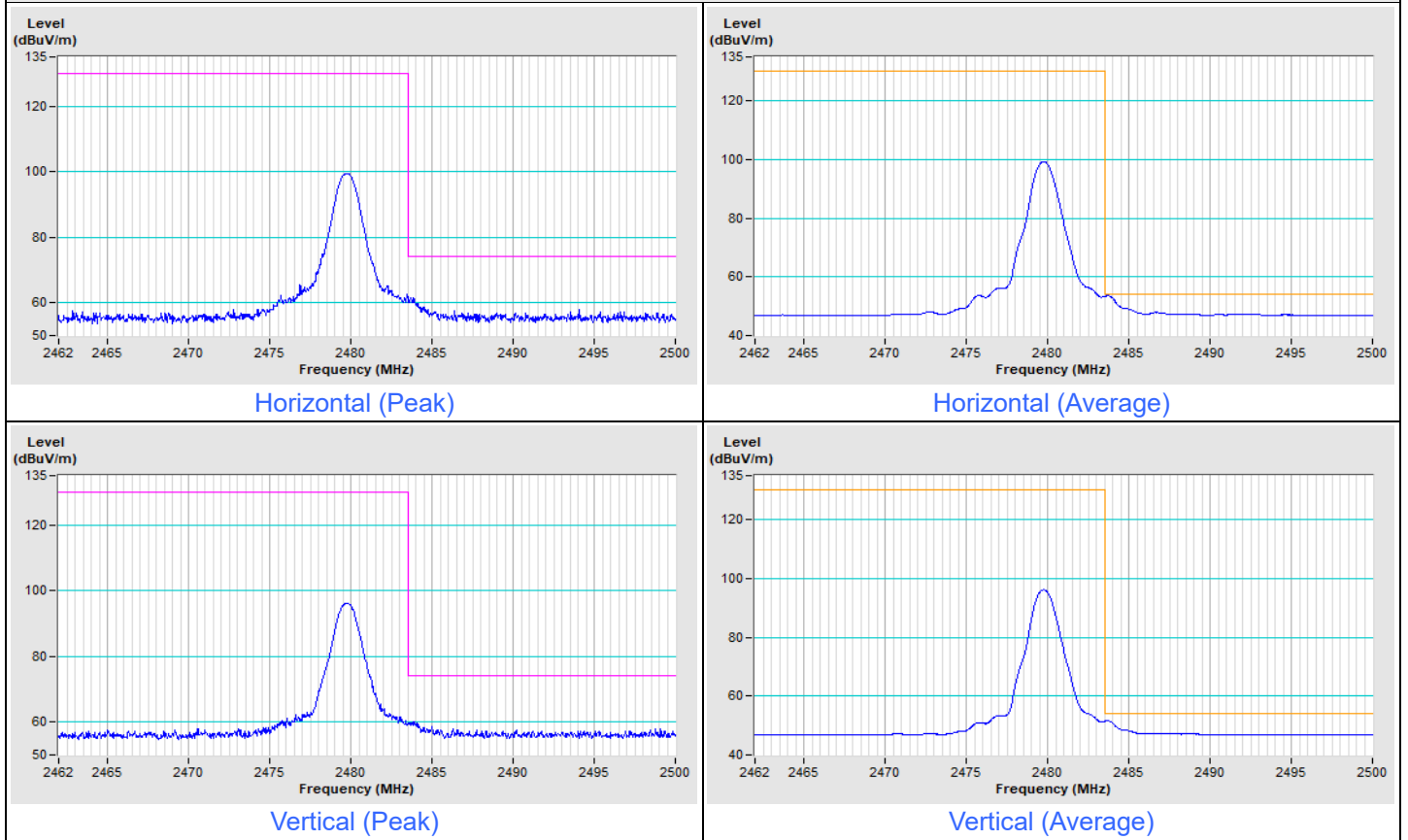
Frequency Range	2.31 GHz ~ 2.412 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 500K Channel 0



Frequency Range	2.462 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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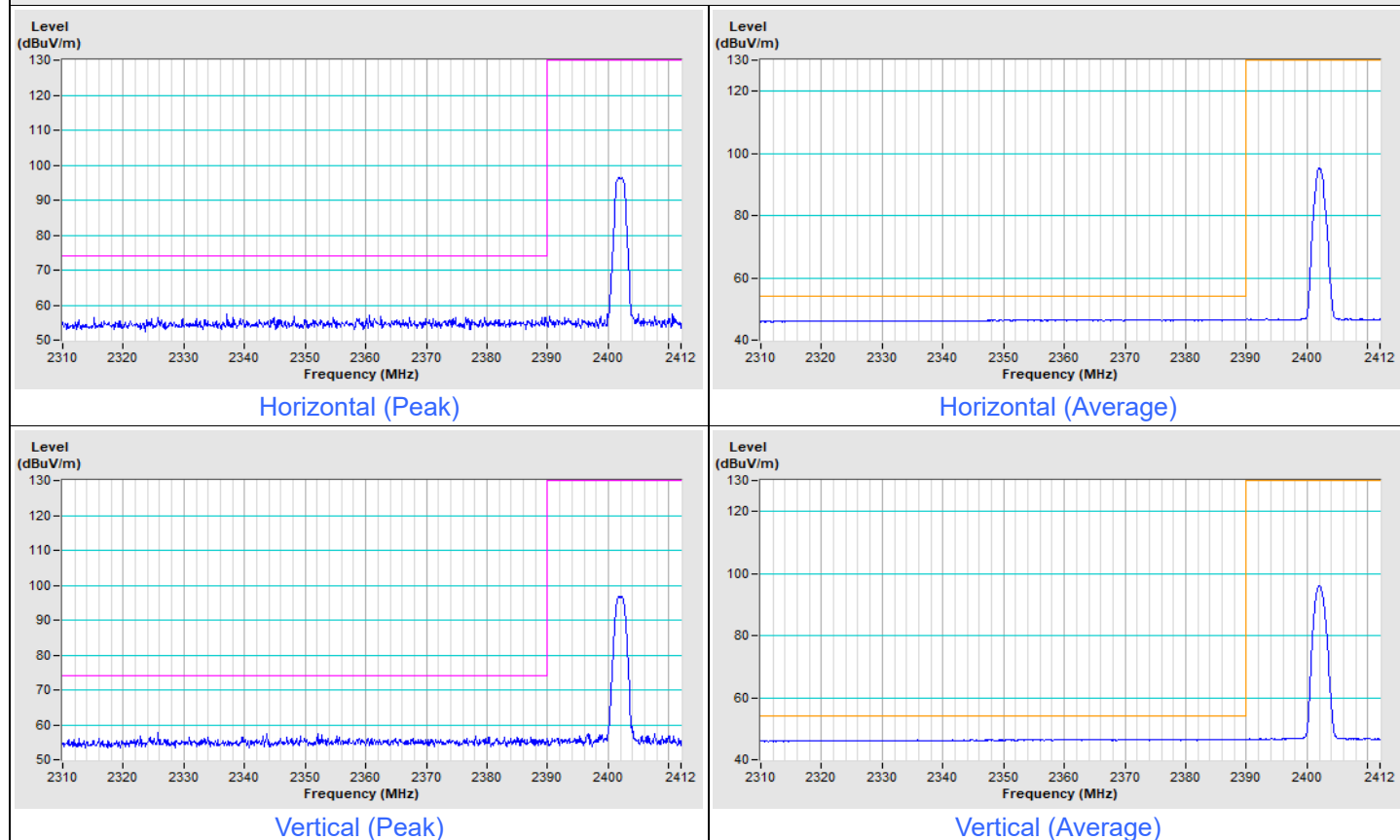
BT-LE 500K Channel 39



Mode B

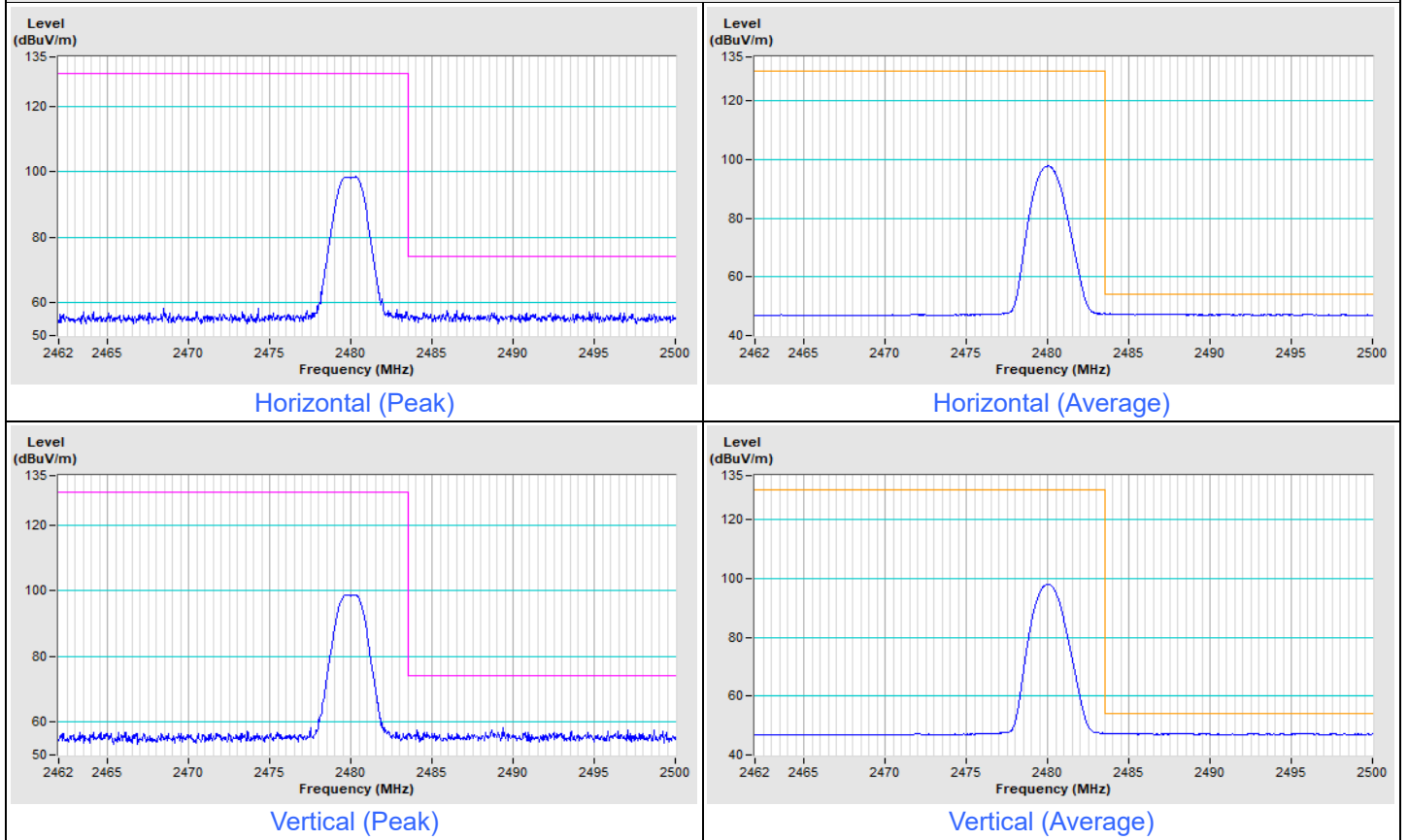
Frequency Range	2.31 GHz ~ 2.412 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 2M Channel 0



Frequency Range	2.462 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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BT-LE 2M Channel 39



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

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

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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