

## FCC Test Report

**Report No.:** RFBCEE-WTW-P21110658

**FCC ID:** 2A3ULTR120W

**Model No.:** TR 120-W

**Received Date:** Jan. 03, 2022

**Test Date:** Jan. 05 ~ Apr. 12, 2022

**Issued Date:** Jun. 17, 2022

**Applicant:** Sonova Consumer Hearing GmbH

**Address:** Am Labor 1, 30900 Wedemark, Germany

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

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33383, Taiwan

**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RFBCEE-WTW-P21110658	Original Release	Jun. 17, 2022



## 2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -11.01 dB at 0.48063 MHz.
15.205 & 209	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.6 dB at 4960.00 MHz.
15.247(d)	Band Edge Measurement	Pass	Meet the requirement of limit.
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Reference only
15.247(b)	Conducted Power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note:

- For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
- 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	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

### 2.2 Modification Record

There were no modifications required for compliance.

### 3 General Information

#### 3.1 General Description of EUT

<b>Test Item Description</b>	TV Headphones
<b>Product Name</b>	TV Headphones (RS 120-W)
<b>Brand Name</b>	SENNHEISER
<b>Model No.</b>	TR 120-W
<b>Status of EUT</b>	Engineering Sample
<b>Power Ratings</b>	9Vdc, 0.3A max from adapter
<b>Power Supply (Nominal &amp; Testing)</b>	9Vdc, 0.3A max
<b>Operating Temperature range</b>	0°C ~ +40°C
<b>Modulation Type</b>	GFSK
<b>Transmission Technology</b>	DSSS
<b>Technology</b>	Bluetooth
<b>Operating Frequency</b>	2402 - 2480MHz (for Frequency Band: 2400-2483.5MHz)
<b>Channel Spacing</b>	2MHz
<b>Channel Bandwidth</b>	80MHz
<b>Data Transfer Rate</b>	Bluetooth LE 5.2: 1Mbps at Channel No. 37-39 (LE 1M) Bluetooth LE 5.2: 2Mbps at Channel No. 0-36 (LE 2M)
<b>Number of Channel</b>	40
<b>Maximum Output Power</b>	Bluetooth LE 5.2 (1Mbps): 6.668 mW (8.24dBm) Bluetooth LE 5.2 (2Mbps): 6.653 mW (8.23dBm)
<b>Antenna Type</b>	Planar Inverted-F Antennas (PIFA)
<b>Antenna Gain</b>	Antenna 1: 0.84dBi Antenna 2: 1.65dBi (two antennas, using only one at a time)
<b>HW Version</b>	V0.4
<b>SW Version</b>	V3.1.0
<b>Antenna Connector</b>	N/A
<b>Cable Supplied</b>	Non-detachable 2m shielded Stereo RCA audio cable (without core) at transmitter

Note:

1. The Transmitter of EUT use following devices: (Support unit)

<b>Device Name</b>	Headphones
<b>Brand Name</b>	SENNHEISER
<b>Model No.</b>	HDR 120-W

2. The Transmitter of EUT uses following adapter:

<b>External power supply Type No.NT9-3AW</b>	
<b>Brand Name</b>	SENNHEISER
<b>Model No.</b>	PSAC03R-090
<b>Input Power</b>	100-240Vac, 50-60Hz, 0.1A
<b>Output Power</b>	9Vdc, 0.3A max
<b>Power Line</b>	1.5m DC cable with core attached on adapter

3. Power setting is as below:

<b>Modulation type: GFSK</b>		
<b>Channel</b>	<b>Power Setting</b>	<b>Gain Setting</b>
<b>Bluetooth LE 5.2 (1Mbps)</b>		
0	pos0dBm	10
12	pos0dBm	10
39	pos0dBm	10
<b>Bluetooth LE 5.2 (2Mbps)</b>		
1	pos0dBm	10
19	pos0dBm	10
38	pos0dBm	10

4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or User's Manual.



### 3.2 Description of Test Modes

40 channels are provided to this EUT:

RF Channel	RF Center Frequency	Channel Index	Channels Type for BT 5.2	
			Maximum Data Rate 2Mbps	Maximum Data Rate 1Mbps
0	2402 MHz	37		●
1	2404 MHz	0	●	
2	2406 MHz	1	●	
3	2408 MHz	2	●	
4	2410 MHz	3	●	
5	2412 MHz	4	●	
6	2414 MHz	5	●	
7	2416 MHz	6	●	
8	2418 MHz	7	●	
9	2420 MHz	8	●	
10	2422 MHz	9	●	
11	2424 MHz	10	●	
12	2426 MHz	38		●
13	2428 MHz	11	●	
14	2430 MHz	12	●	
15	2432 MHz	13	●	
16	2434 MHz	14	●	
17	2436 MHz	15	●	
18	2438 MHz	16	●	
19	2440 MHz	17	●	
20	2442 MHz	18	●	
21	2444 MHz	19	●	
22	2446 MHz	20	●	
23	2448 MHz	21	●	
24	2450 MHz	22	●	
25	2452 MHz	23	●	
26	2454 MHz	24	●	
27	2456 MHz	25	●	
28	2458 MHz	26	●	
29	2460 MHz	27	●	
30	2462 MHz	28	●	
31	2464 MHz	29	●	
32	2466 MHz	30	●	
33	2468 MHz	31	●	
34	2470 MHz	32	●	
35	2472 MHz	33	●	
36	2474 MHz	34	●	
37	2476 MHz	35	●	
38	2478 MHz	36	●	
39	2480 MHz	39		●

### 3.2.1 Test Mode Applicability and Tested Channel Detail

<LE 1M>

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	-	-	-	√	Config. 1 + Ant. 1
B	√	√	√	√	Config. 1 + Ant. 2

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz      **RE<1G**: Radiated Emission below 1 GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

**Note:** “-” means no effect.

**Note:** The EUT pre-tested the output power of Ant. 1 and Ant. 2, and found that the output power of Ant. 2 was the worst, so the final test was chosen and given in the test report.

**Note:** For radiated emission (below 1GHz) and Power Line Conducted Emission, we had pre-test at LE 1M and LE 2M, test mode at LE 1M was the worst case and only this mode was presented in the report

#### **Radiated Emission Test (Above 1 GHz):**

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	0, 12, 39	0, 12, 39	GFSK	1

#### **Antenna Port Conducted Measurement:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	0, 12, 39	0, 12, 39	GFSK	1

**Radiated Emission Test (Below 1 GHz):**

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	0, 12, 39	39	GFSK	1

**Power Line Conducted Emission Test:**

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	0, 12, 39	39	GFSK	1

**Antenna Port Conducted Measurement:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
A, B	0, 12, 39	0, 19, 39	GFSK	1

<LE 2M>

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
A	-	-	-	√	Config. 1 + Ant. 1
B	√	-	-	√	Config. 1 + Ant. 2

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz      **RE<1G**: Radiated Emission below 1 GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

**Note:** "-" means no effect.

**Note:** For radiated emission (below 1GHz) and Power Line Conducted Emission, we had pre-test at LE 1M and LE 2M, test mode at LE 1M was the worst case and only this mode was presented in the report

**Radiated Emission Test (Above 1 GHz):**

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
B	1 to 38 (excluding 12)	1, 19, 38	GFSK	2

**Antenna Port Conducted Measurement:**

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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).
- Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type	Data Rate (Mbps)
A, B	1 to 38 (excluding 12)	1, 19, 38	GFSK	2

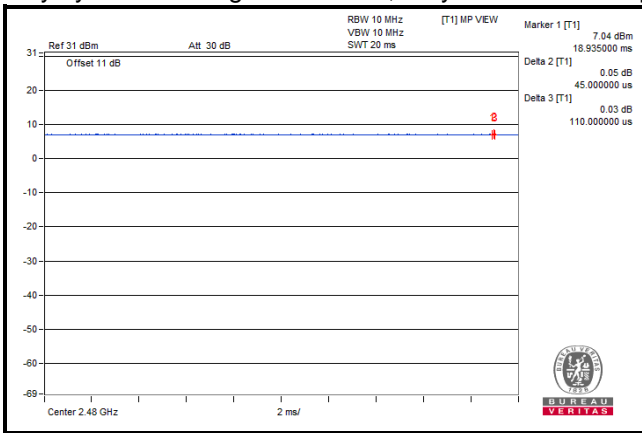
**Test Condition:**

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	23 deg. C, 66 % RH	120 Vac, 60 Hz	Thomas Cheng / Tim Chen
RE<1G	23 deg. C, 66 % RH	120 Vac, 60Hz	Vincent Chen / Tim Chen
PLC	21 deg. C, 60 % RH	120 Vac, 60 Hz	Thomas Cheng / Adair Peng
APCM	25 deg. C, 60 % RH	120 Vac, 60Hz	Chun Wu

### 3.3 Duty Cycle of Test Signal

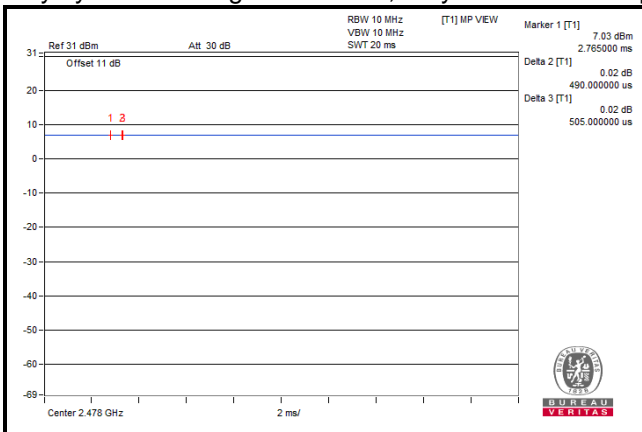
<LE 1M>

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



<LE 2M>

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



### 3.4 Description of Support Units

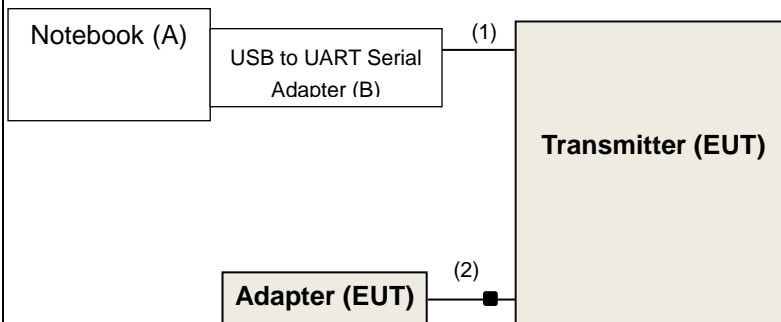
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Notebook	HP	11-u018TU	8CG70505V9	N/A	--
B	USB to UART Serial Adapter	N/A	N/A	N/A	N/A	Provided by Client

No.	Cable Descriptions	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Qty.)	Remark
1.	Console Cable	1	1	N	0	Provided by Client
2.	DC Cable	1	1.5	N	1	Provided by Client

#### 3.4.1 Configuration of System under Test

Mode A, B



### 3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

#### Test Standard:

##### FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

#### References Test Guidance:

##### KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

## 4 Test Types and Results

### 4.1 Radiated Emission and Bandedge Measurement

#### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions 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

**Note:**

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.

## 4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Spectrum Analyzer Agilent	N9010A	MY52220314	Dec. 03, 2021	Dec. 02, 2022
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 12, 2021	Apr. 11, 2022
			Apr. 11, 2022	Apr. 10, 2023
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 14, 2021	Nov. 13, 2022
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 14, 2021	Nov. 13, 2022
BILOG Antenna SCHWARZBECK	VULB 9168	9168-472	Oct. 28, 2021	Oct. 27, 2022
Fixed Attenuator WOKEN	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
Loop Antenna	EM-6879	269	Sep. 16, 2021	Sep. 17, 2022
Preamplifier EMCI	EMC001340	980201	Sep. 15, 2021	Sep. 14, 2022
Preamplifier EMCI	EMC 012645	980115	Oct. 05, 2021	Oct. 04, 2022
Preamplifier EMCI	EMC 330H	980112	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable EMCI	EMC104-SM-SM-8000	171005	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1000(140807)	Oct. 05, 2021	Oct. 04, 2022
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 05, 2021	Oct. 04, 2022
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Peak Power Analyzer KEYSIGHT	8990B	MY51000485	Jan. 18, 2022	Jan. 17, 2023
Wideband Power Sensor KEYSIGHT	N1923A	MY58020002	Jan. 17, 2022	Jan. 16, 2023
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100979	Mar. 29, 2021	Mar. 28, 2022
			Mar. 25, 2022	Mar. 24, 2023

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Chamber 10.



#### 4.1.3 Test Procedures

##### **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 a 3 meter chamber room. 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.

##### **Note:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

##### **For Radiated Emission above 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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.
- f. The test-receiver system was set to peak and average detected 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.

##### **Note:**

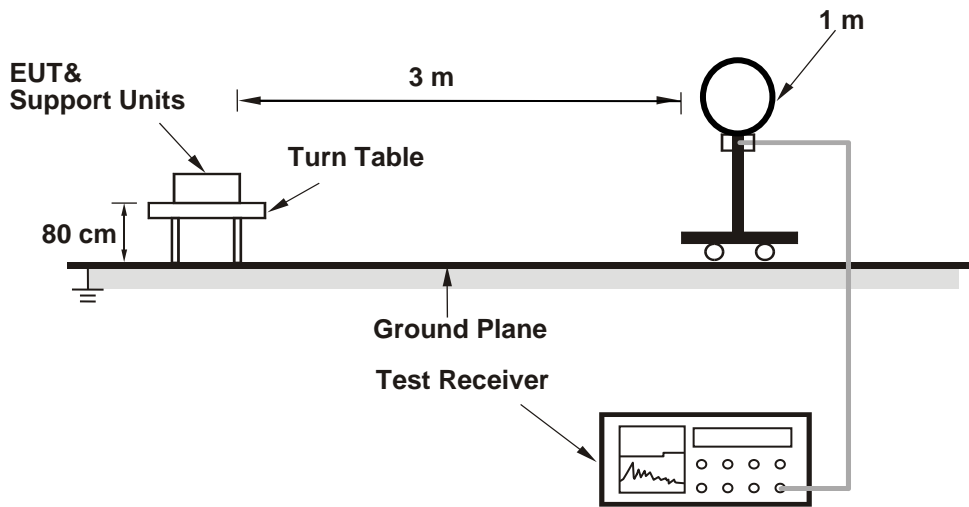
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. 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. (LE 1M: RBW = 1 MHz, VBW = 10Hz ; LE 2M: RBW = 1 MHz, VBW = 10Hz)
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 Deviation from Test Standard

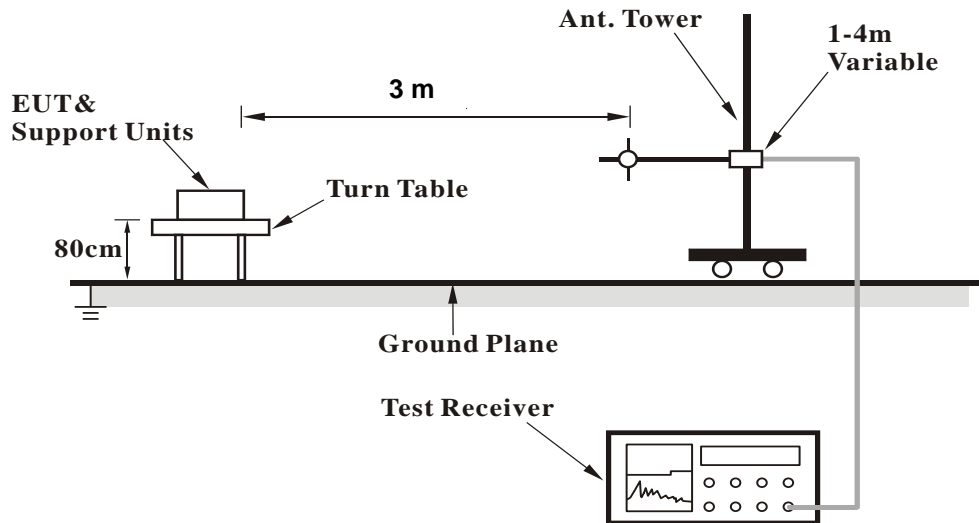
No deviation.

4.1.5 Test Set Up

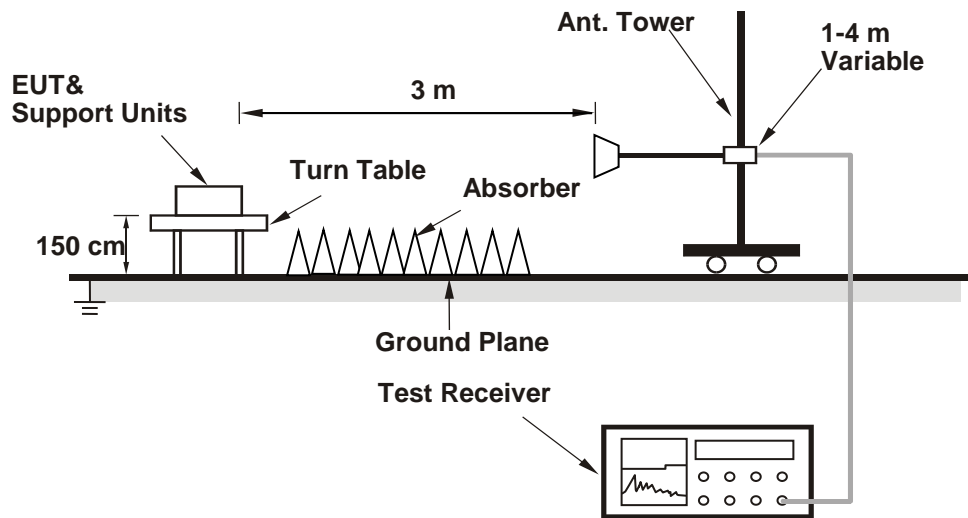
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



**<Radiated Emission above 1 GHz>**



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

**4.1.6 EUT Operating Conditions**

- a. Placed the EUT on the testing table.
- b. Set the EUT under transmission condition continuously at specific channel frequency.

#### 4.1.7 Test Results

##### Mode B

##### Above 1 GHz Data:

##### <LE 1M>

<b>RF Mode</b>	TX BT-LE 1M	<b>Channel</b>	CH 0 : 2402 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

##### 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	57.2 PK	74.0	-16.8	3.87 H	272	26.3	30.9
2	2390.00	46.0 AV	54.0	-8.0	3.87 H	272	15.1	30.9
3	*2402.00	101.8 PK			3.87 H	272	70.9	30.9
4	*2402.00	101.2 AV			3.87 H	272	70.3	30.9
5	4804.00	51.5 PK	74.0	-22.5	2.34 H	34	67.2	-15.7
6	4804.00	45.8 AV	54.0	-8.2	2.34 H	34	61.5	-15.7

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

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	2.50 V	297	26.1	30.9
2	2390.00	45.9 AV	54.0	-8.1	2.50 V	297	15.0	30.9
3	*2402.00	94.3 PK			2.50 V	297	63.4	30.9
4	*2402.00	93.5 AV			2.50 V	297	62.6	30.9
5	4804.00	51.3 PK	74.0	-22.7	3.25 V	48	67.0	-15.7
6	4804.00	45.6 AV	54.0	-8.4	3.25 V	48	61.3	-15.7

##### 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.

<b>RF Mode</b>	TX BT-LE 1M	<b>Channel</b>	CH 12 : 2426 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**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	*2426.00	103.2 PK			3.65 H	295	72.3	30.9
2	*2426.00	102.7 AV			3.65 H	295	71.8	30.9
3	4852.00	51.9 PK	74.0	-22.1	1.24 H	327	67.8	-15.9
4	4852.00	47.4 AV	54.0	-6.6	1.24 H	327	63.3	-15.9

**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	*2426.00	95.5 PK			2.50 V	336	64.6	30.9
2	*2426.00	94.7 AV			2.50 V	336	63.8	30.9
3	4852.00	51.6 PK	74.0	-22.4	3.31 V	51	67.5	-15.9
4	4852.00	47.3 AV	54.0	-6.7	3.31 V	51	63.2	-15.9

**Remarks:**

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

<b>RF Mode</b>	TX BT-LE 1M	<b>Channel</b>	CH 39 : 2480 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**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	103.6 PK			3.60 H	266	72.8	30.8
2	*2480.00	102.7 AV			3.60 H	266	71.9	30.8
3	2483.50	57.8 PK	74.0	-16.2	3.60 H	266	27.0	30.8
4	2483.50	47.2 AV	54.0	-6.8	3.60 H	266	16.4	30.8
5	4960.00	53.8 PK	74.0	-20.2	4.00 H	326	69.7	-15.9
<b>6</b>	<b>4960.00</b>	<b>49.4 AV</b>	<b>54.0</b>	<b>-4.6</b>	<b>4.00 H</b>	<b>326</b>	<b>65.3</b>	<b>-15.9</b>

**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	96.6 PK			2.50 V	334	65.8	30.8
2	*2480.00	95.7 AV			2.50 V	334	64.9	30.8
3	2483.50	57.3 PK	74.0	-16.7	2.50 V	334	26.5	30.8
4	2483.50	46.4 AV	54.0	-7.6	2.50 V	334	15.6	30.8
5	4960.00	52.6 PK	74.0	-21.4	3.03 V	51	68.5	-15.9
6	4960.00	48.2 AV	54.0	-5.8	3.03 V	51	64.1	-15.9

**Remarks:**

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

<LE 2M>

<b>RF Mode</b>	TX BT-LE 2M	<b>Channel</b>	CH 1 : 2404 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**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	56.8 PK	74.0	-17.2	3.70 H	300	25.9	30.9
2	2390.00	46.1 AV	54.0	-7.9	3.70 H	300	15.2	30.9
3	*2404.00	102.1 PK			3.70 H	300	71.2	30.9
4	*2404.00	100.0 AV			3.70 H	300	69.1	30.9
5	4808.00	51.6 PK	74.0	-22.4	2.62 H	325	67.3	-15.7
6	4808.00	44.8 AV	54.0	-9.2	2.62 H	325	60.5	-15.7

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

No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2390.00	56.7 PK	74.0	-17.3	2.54 V	328	25.8	30.9
2	2390.00	46.0 AV	54.0	-8.0	2.54 V	328	15.1	30.9
3	*2404.00	94.1 PK			2.54 V	328	63.2	30.9
4	*2404.00	92.0 AV			2.54 V	328	61.1	30.9
5	4808.00	50.7 PK	74.0	-23.3	3.13 V	66	66.4	-15.7
6	4808.00	44.5 AV	54.0	-9.5	3.13 V	66	60.2	-15.7

**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.

<b>RF Mode</b>	TX BT-LE 2M	<b>Channel</b>	CH 19 : 2440 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**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	102.8 PK			3.70 H	300	71.9	30.9
2	*2440.00	100.7 AV			3.70 H	300	69.8	30.9
3	4880.00	52.3 PK	74.0	-21.7	2.86 H	324	68.2	-15.9
4	4880.00	45.8 AV	54.0	-8.2	2.86 H	324	61.7	-15.9

**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	97.0 PK			2.60 V	336	66.1	30.9
2	*2440.00	94.7 AV			2.60 V	336	63.8	30.9
3	4880.00	51.7 PK	74.0	-22.3	3.30 V	264	67.6	-15.9
4	4880.00	44.9 AV	54.0	-9.1	3.30 V	264	60.8	-15.9

**Remarks:**

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



<b>RF Mode</b>	TX BT-LE 2M	<b>Channel</b>	CH 38 : 2478 MHz
<b>Frequency Range</b>	1GHz ~ 25GHz	<b>Detector Function</b>	Peak (PK) Average (AV)

**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	102.9 PK			3.63 H	268	72.1	30.8
2	*2478.00	100.8 AV			3.63 H	268	70.0	30.8
3	2483.50	59.1 PK	74.0	-14.9	3.63 H	268	28.3	30.8
4	2483.50	48.5 AV	54.0	-5.5	3.63 H	268	17.7	30.8
5	4956.00	53.7 PK	74.0	-20.3	2.61 H	328	69.6	-15.9
6	4956.00	48.0 AV	54.0	-6.0	2.61 H	328	63.9	-15.9

**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	98.3 PK			3.22 V	334	67.5	30.8
2	*2478.00	96.1 AV			3.22 V	334	65.3	30.8
3	2483.50	58.0 PK	74.0	-16.0	3.22 V	334	27.2	30.8
4	2483.50	46.9 AV	54.0	-7.1	3.22 V	334	16.1	30.8
5	4956.00	52.2 PK	74.0	-21.8	3.30 V	261	68.1	-15.9
6	4956.00	46.2 AV	54.0	-7.8	3.30 V	261	62.1	-15.9

**Remarks:**

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

**9 kHz ~ 30 MHz Data:**

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

**30 MHz ~ 1 GHz Worst-Case Data:**

Mode B

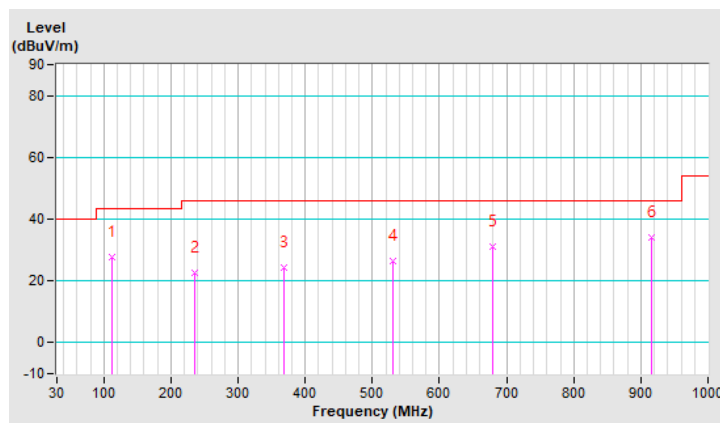
<LE 1M>

<b>RF Mode</b>	TX BT-LE 1M	<b>Channel</b>	CH 39 : 2480 MHz
<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function</b>	Quasi-Peak (QP)

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	111.48	27.90 QP	43.50	-15.60	1.56 H	91	42.97	-15.07
2	235.64	22.79 QP	46.00	-23.21	2.32 H	251	37.85	-15.06
3	368.53	24.29 QP	46.00	-21.71	1.87 H	331	34.20	-9.91
4	530.52	26.63 QP	46.00	-19.37	1.05 H	157	32.28	-5.65
5	679.90	31.02 QP	46.00	-14.98	2.26 H	18	33.01	-1.99
6	915.61	34.10 QP	46.00	-11.90	1.05 H	351	32.12	1.98

**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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

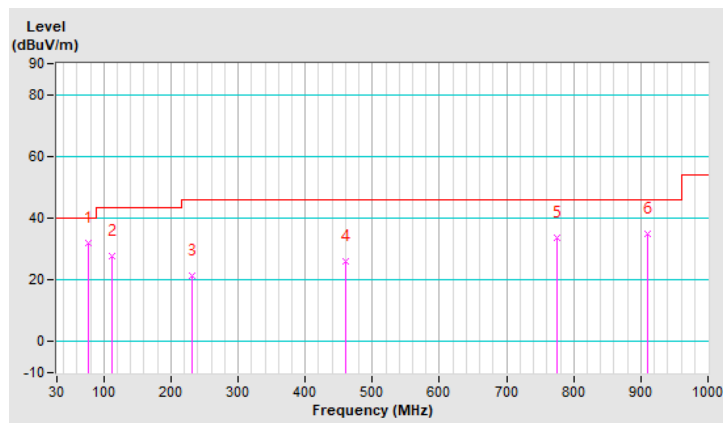


<b>RF Mode</b>	TX BT-LE 1M	<b>Channel</b>	CH 39 : 2480 MHz
<b>Frequency Range</b>	30MHz ~ 1GHz	<b>Detector Function</b>	Quasi-Peak (QP)

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	77.53	31.91 QP	40.00	-8.09	1.41 V	126	48.87	-16.96
2	111.48	27.90 QP	43.50	-15.60	2.62 V	91	42.97	-15.07
3	231.76	21.41 QP	46.00	-24.59	3.37 V	274	36.98	-15.57
4	460.68	26.17 QP	46.00	-19.83	1.51 V	2	33.24	-7.07
5	775.93	33.63 QP	46.00	-12.37	2.06 V	18	33.71	-0.08
6	910.76	34.99 QP	46.00	-11.01	1.95 V	232	33.09	1.90

**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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



## 4.2 Conducted Emission Measurement

### 4.2.1 Limits of Conducted Emission Measurement

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

- Note: 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.

### 4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 20, 2021	Dec. 19, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2021	Sep. 03, 2022
LISN/AMN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 28, 2021	Jan. 27, 2022
Test Receiver ROHDE & SCHWARZ	ESR3	102783	Dec. 20, 2021	Dec. 19, 2022
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. The test was performed in HwaYa Shielded Room 2 (Conduction 2).  
 3. The VCCI Site Registration No. is C-12047.

### 4.2.3 Test Procedures

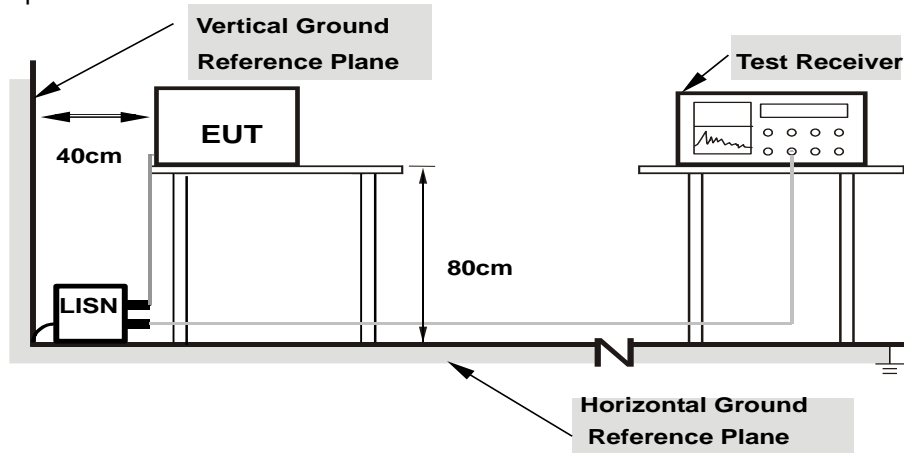
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance 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.

#### 4.2.4 Deviation from Test Standard

No deviation.

#### 4.2.5 Test Setup



**Note: 1.Support units were connected to second LISN.  
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80  
from other units and other metal planes**

#### 4.2.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Set the EUT under transmission condition continuously at specific channel frequency.

4.2.7 Test Results

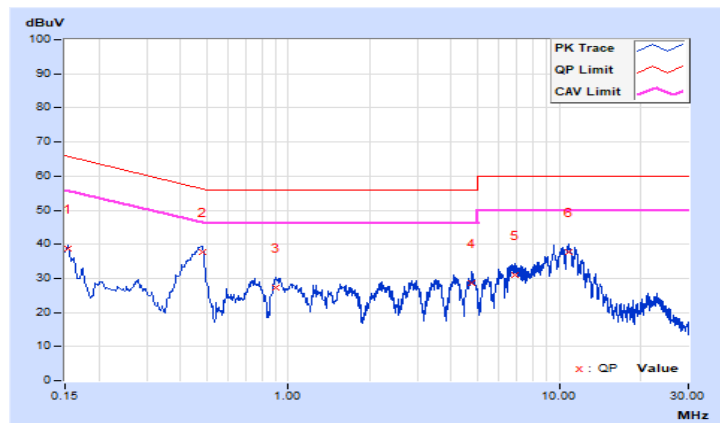
Mode B  
<LE 1M>

<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	21 °C, 60% RH
<b>Tested by</b>	Thomas Cheng	<b>Test Date</b>	2022/1/11

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	0.15400	10.12	28.62	24.55	38.74	34.67	65.78	55.78	-27.04	-21.11
<b>2</b>	<b>0.48063</b>	<b>10.23</b>	<b>27.32</b>	<b>25.09</b>	<b>37.55</b>	<b>35.32</b>	<b>56.33</b>	<b>46.33</b>	<b>-18.78</b>	<b>-11.01</b>
3	0.89739	10.27	16.85	14.44	27.12	24.71	56.00	46.00	-28.88	-21.29
4	4.77000	10.40	18.07	11.00	28.47	21.40	56.00	46.00	-27.53	-24.60
5	6.84600	10.44	20.39	8.65	30.83	19.09	60.00	50.00	-29.17	-30.91
6	10.81000	10.51	27.15	15.28	37.66	25.79	60.00	50.00	-22.34	-24.21

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

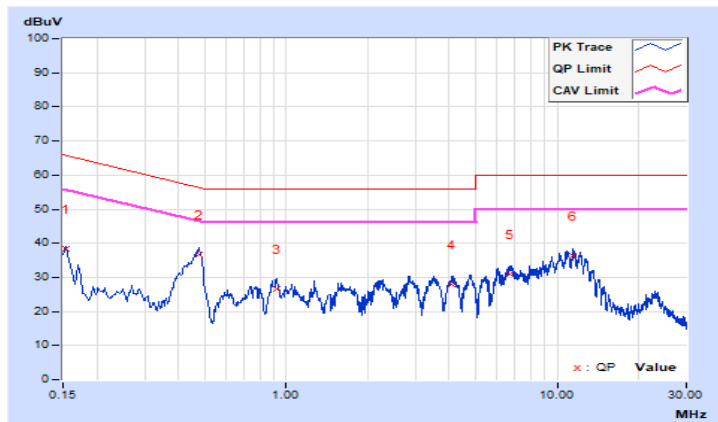


<b>Frequency Range</b>	150kHz ~ 30MHz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9kHz
<b>Input Power</b>	120Vac, 60Hz	<b>Environmental Conditions</b>	21 °C, 60% RH
<b>Tested by</b>	Thomas Cheng	<b>Test Date</b>	2022/1/11

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	0.15400	10.14	28.14	23.49	38.28	33.63	65.78	55.78	-27.50	-22.15
2	0.47684	10.25	26.42	22.63	36.67	32.88	56.39	46.39	-19.72	-13.51
3	0.92134	10.28	16.21	11.66	26.49	21.94	56.00	46.00	-29.51	-24.06
4	4.09400	10.41	17.66	11.20	28.07	21.61	56.00	46.00	-27.93	-24.39
5	6.67400	10.49	20.33	12.10	30.82	22.59	60.00	50.00	-29.18	-27.41
6	11.46200	10.62	25.78	18.74	36.40	29.36	60.00	50.00	-23.60	-20.64

**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

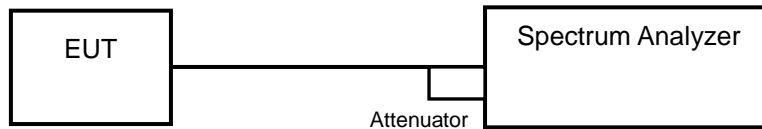


### 4.3 6 dB Bandwidth Measurement

#### 4.3.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 Test Setup



#### 4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 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

#### 4.3.5 Deviation from Test Standard

No deviation.

#### 4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

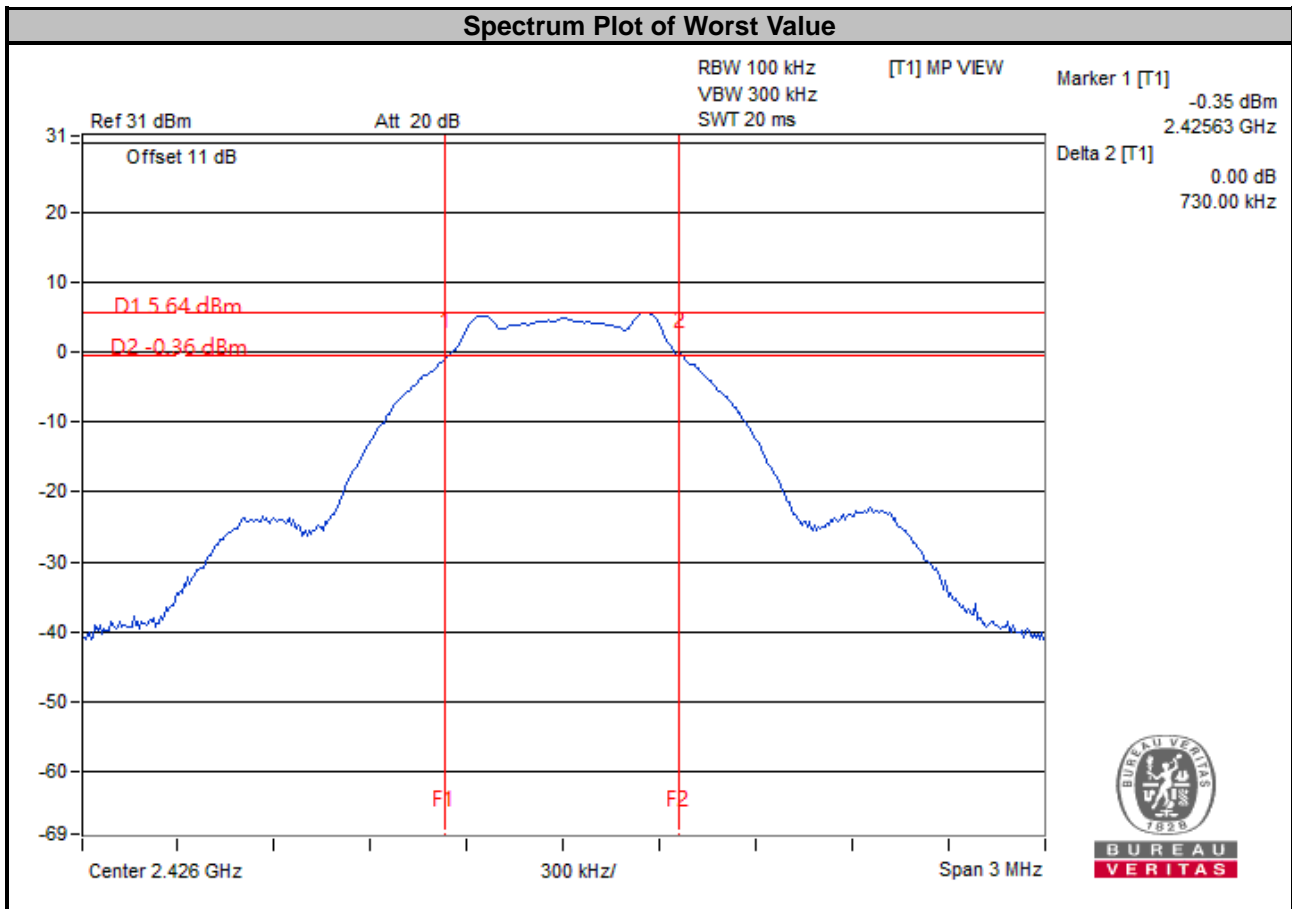


4.3.7 Test Results

Mode B

<LE 1M>

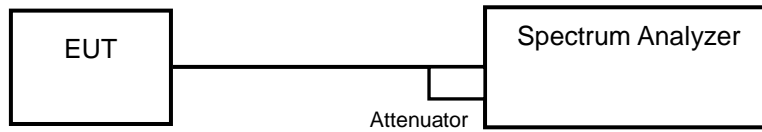
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
0	2402	0.74	0.5	Pass
12	2426	0.73	0.5	Pass
39	2480	0.73	0.5	Pass





## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Test Setup



### 4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to sampling. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

### 4.4.4 Deviation from Test Standard

No deviation.

### 4.4.5 EUT Operating Conditions

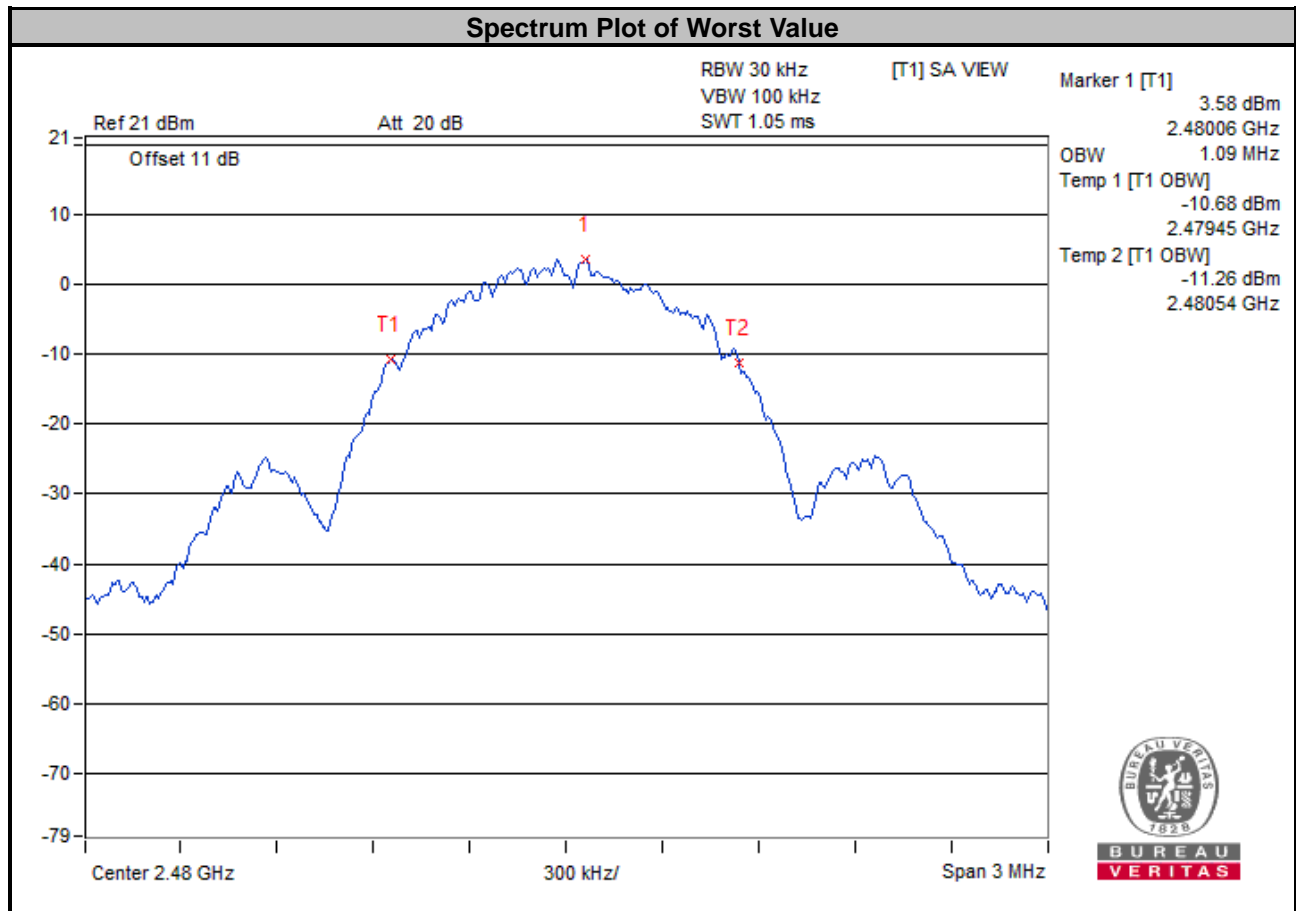
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.4.6 Test Results

Mode B

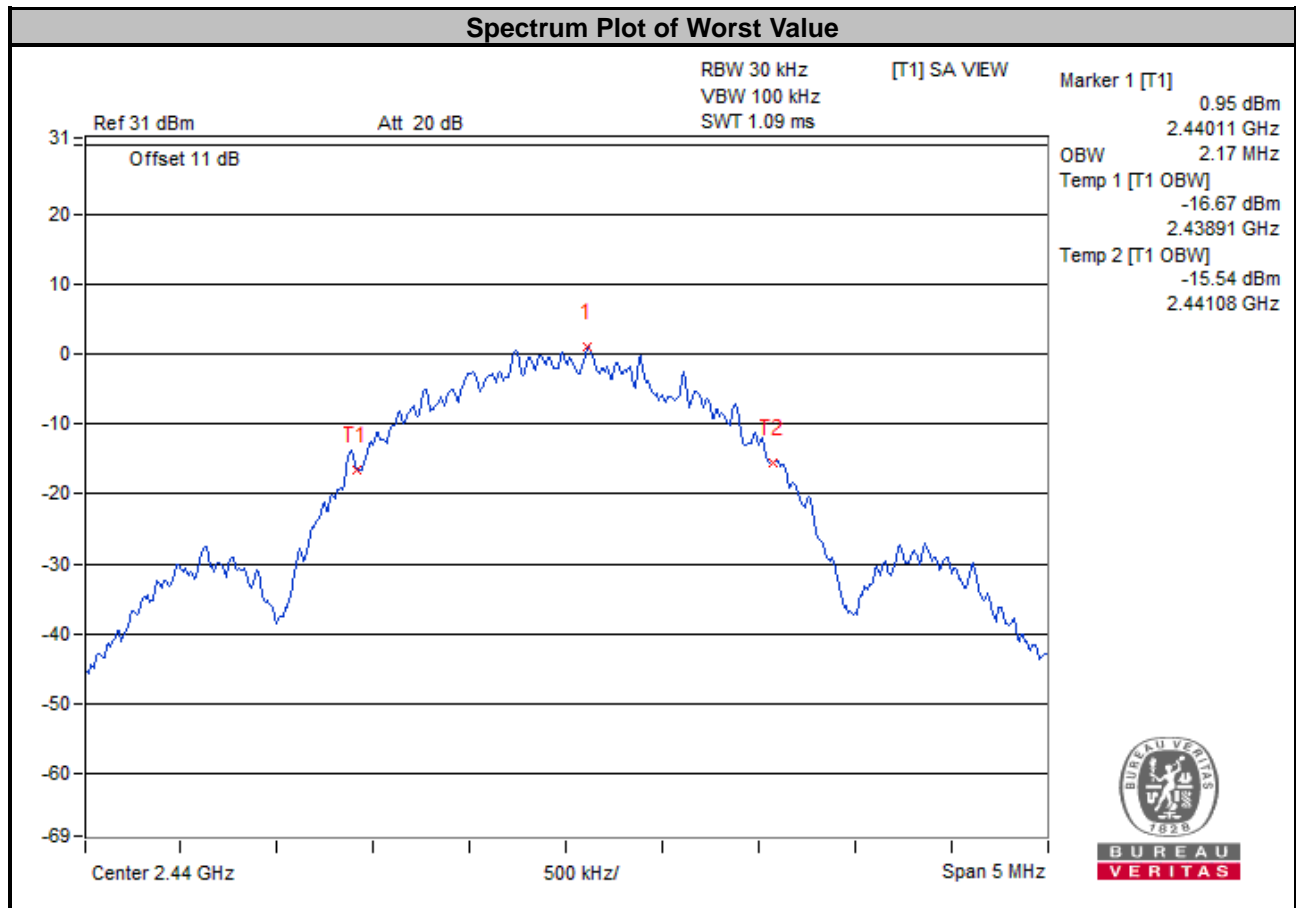
<LE 1M>

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
0	2402	1.07	Pass
12	2426	1.08	Pass
39	2480	1.09	Pass



<LE 2M>

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	Pass / Fail
1	2404	2.16	Pass
19	2440	2.17	Pass
38	2478	2.16	Pass

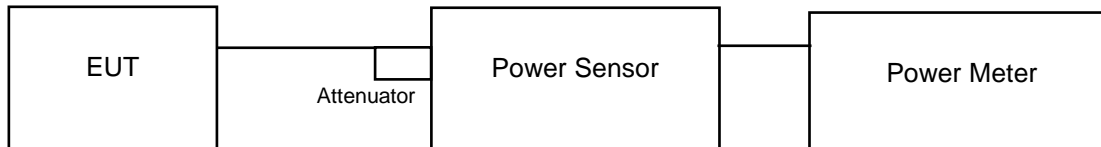


## 4.5 Conducted Output Power Measurement

### 4.5.1 Limits of Conducted Output Power Measurement

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

### 4.5.2 Test Setup



### 4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 Test Procedures

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 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.

### 4.5.5 Deviation from Test Standard

No deviation.

### 4.5.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

#### 4.5.7 Test Results

##### Mode A

##### <LE 1M>

Channel	Freq. (MHz)	Peak Power		Average Power		Power Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
0	2402	3.17	5.01	3.083	4.89	30	Pass
12	2426	3.656	5.63	3.589	5.55	30	Pass
39	2480	4.864	6.87	4.742	6.76	30	Pass

##### <LE 2M>

Channel	Freq. (MHz)	Peak Power		Average Power		Power Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2404	3.17	5.01	2.972	4.73	30	Pass
19	2440	4.083	6.11	3.954	5.97	30	Pass
38	2478	4.887	6.89	4.753	6.77	30	Pass

##### Mode B

##### <LE 1M>

Channel	Freq. (MHz)	Peak Power		Average Power		Power Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
0	2402	4.592	6.62	4.487	6.52	30	Pass
12	2426	5.508	7.41	5.395	7.32	30	Pass
39	2480	6.668	8.24	6.501	8.13	30	Pass

##### <LE 2M>

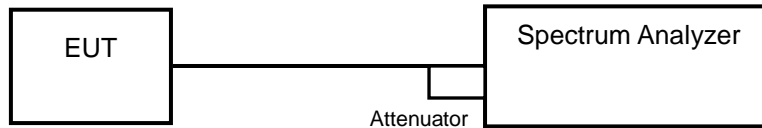
Channel	Freq. (MHz)	Peak Power		Average Power		Power Limit (dBm)	Pass / Fail
		(mW)	(dBm)	(mW)	(dBm)		
1	2404	4.477	6.51	4.295	6.33	30	Pass
19	2440	5.794	7.63	5.689	7.55	30	Pass
38	2478	6.653	8.23	6.561	8.17	30	Pass

## 4.6 Power Spectral Density Measurement

### 4.6.1 Limits of Power Spectral Density Measurement

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz band during any time interval of continuous transmission.

### 4.6.2 Test Setup



### 4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 Test Procedure

- a. Set analyzer center frequency to DTS channel center frequency.
- b. Set the span to 1.5 times the DTS bandwidth.
- c. Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d. Set the VBW  $\geq 3 \times \text{RBW}$ .
- e. Detector = peak.
- f. Sweep time = auto couple.
- g. Trace mode = max hold.
- h. Allow trace to fully stabilize.
- i. Use the peak marker function to determine the maximum amplitude level within the RBW.

### 4.6.5 Deviation from Test Standard

No deviation.

### 4.6.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

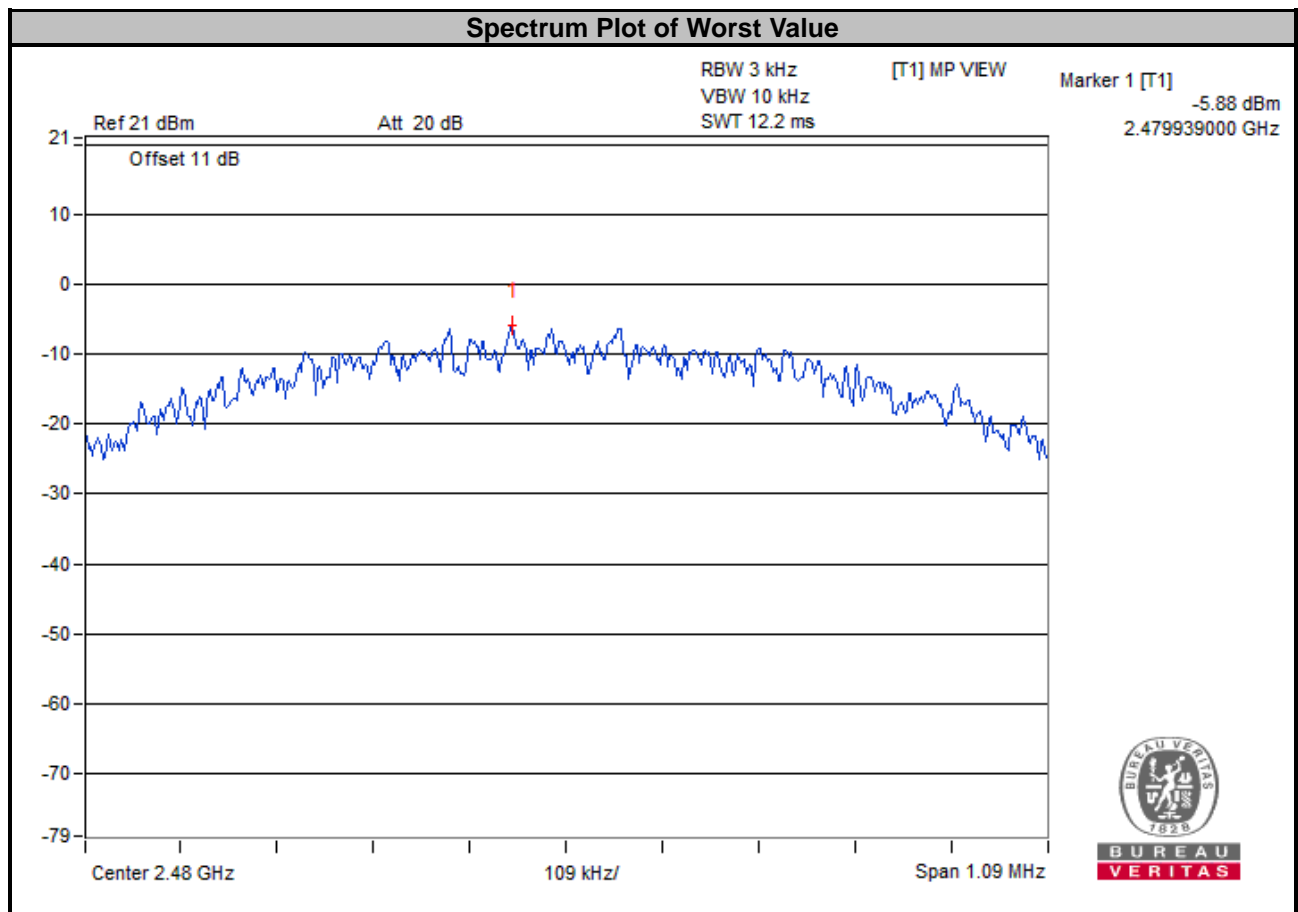


4.6.7 Test Results

Mode B

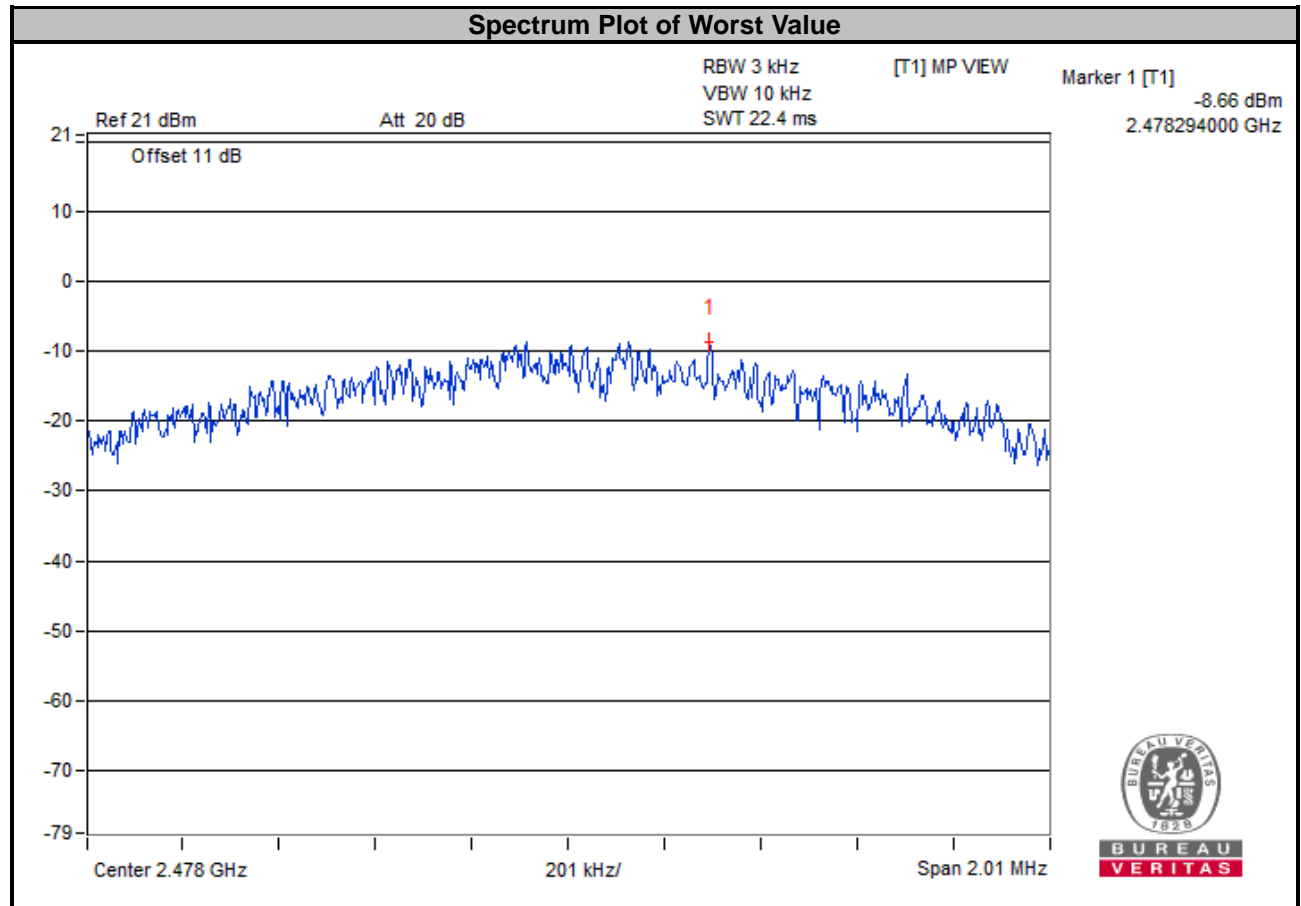
<LE 1M>

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
0	2402	-7.77	8	Pass
12	2426	-6.61	8	Pass
39	2480	-5.88	8	Pass



<LE 2M>

Channel	Frequency (MHz)	PSD (dBm/3 kHz)	Limit (dBm/3 kHz)	Pass / Fail
1	2404	-10.80	8	Pass
19	2440	-9.94	8	Pass
38	2478	-8.66	8	Pass

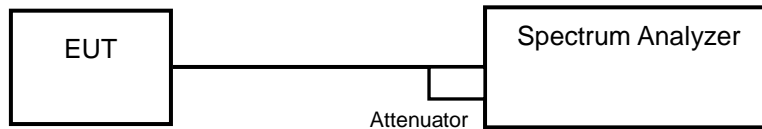


## 4.7 Conducted Out of Band Emission Measurement

### 4.7.1 Limits of Conducted Out of Band Emission Measurement

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

### 4.7.2 Test Setup



### 4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

### 4.7.4 Test Procedure

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

#### MEASUREMENT PROCEDURE OOBE

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep = auto couple.
5. Trace Mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum amplitude level.

### 4.7.5 Deviation from Test Standard

No deviation.

### 4.7.6 EUT Operating Condition

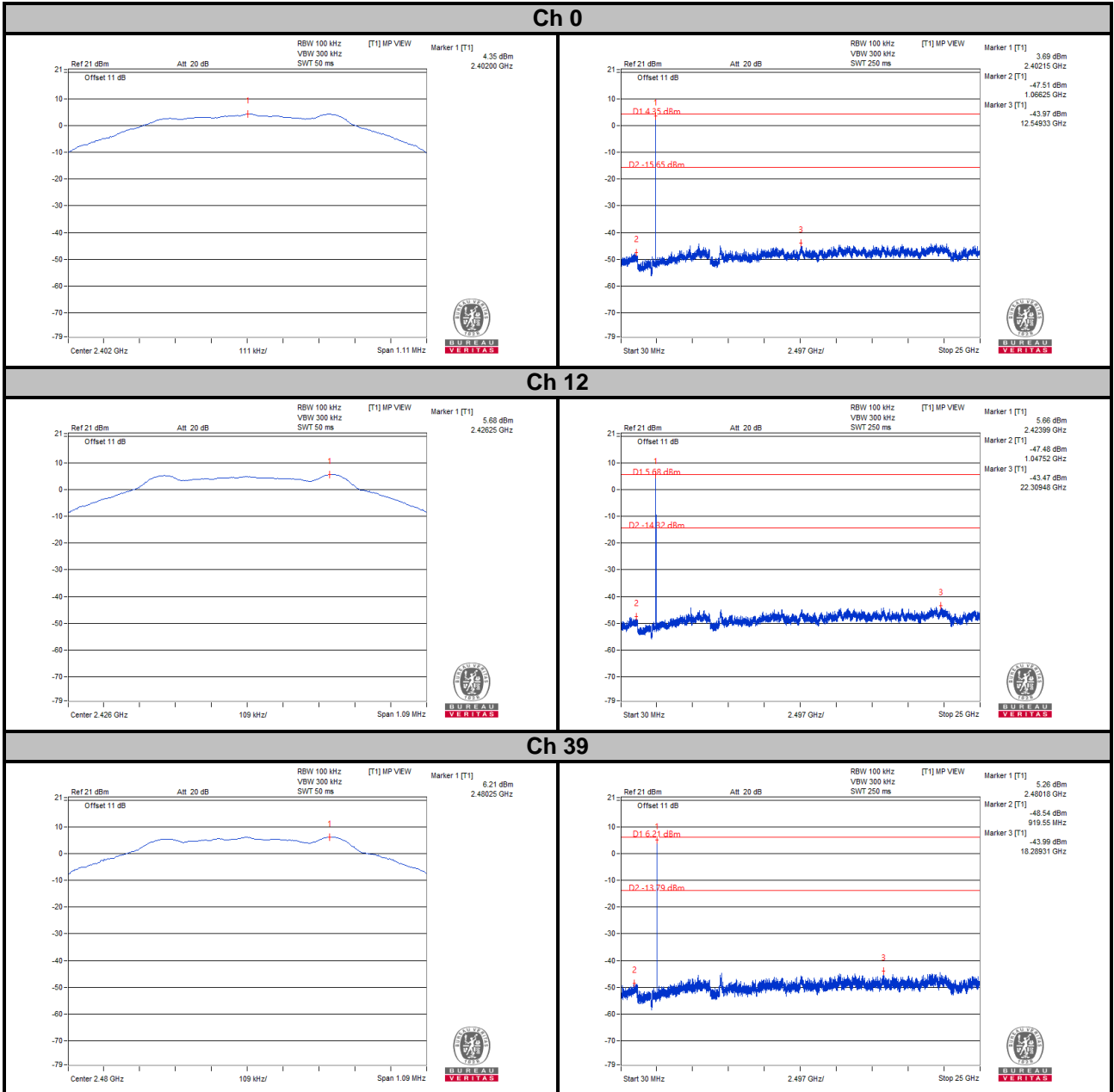
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 4.7.7 Test Results

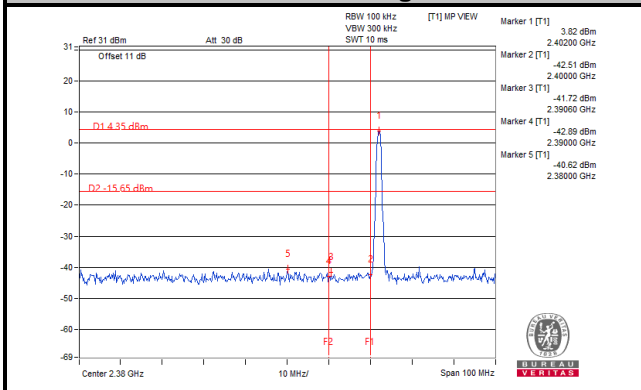
The spectrum plots are attached on the following images. D1 line indicates the highest level, D2 line indicates the 20 dB offset below D1. It shows compliance with the requirement.

#### Mode B

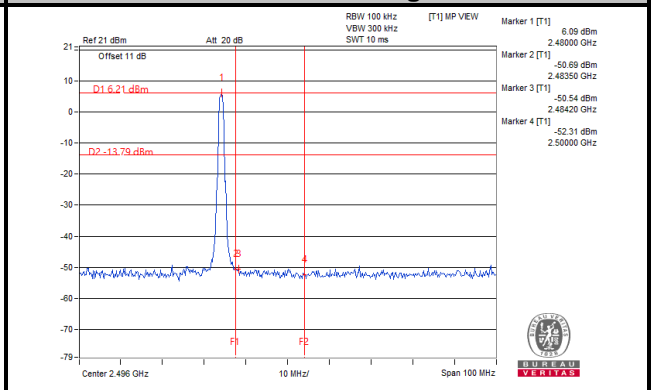
<LE 1M>



### Ch 0 Band Edge

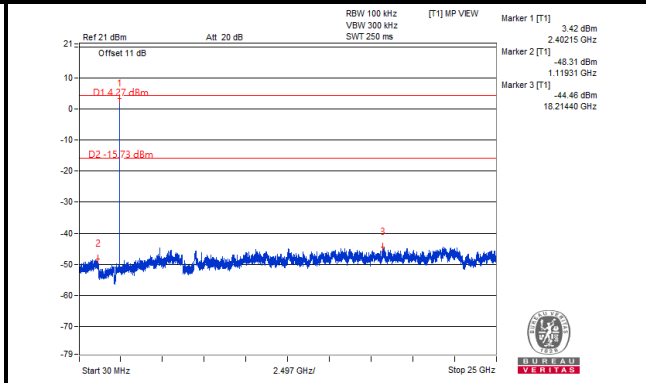
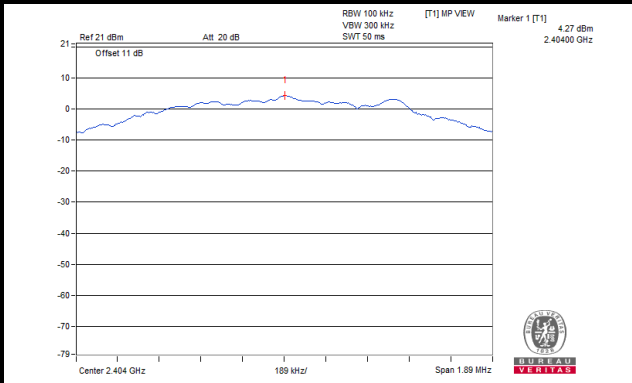


### Ch 39 Band Edge

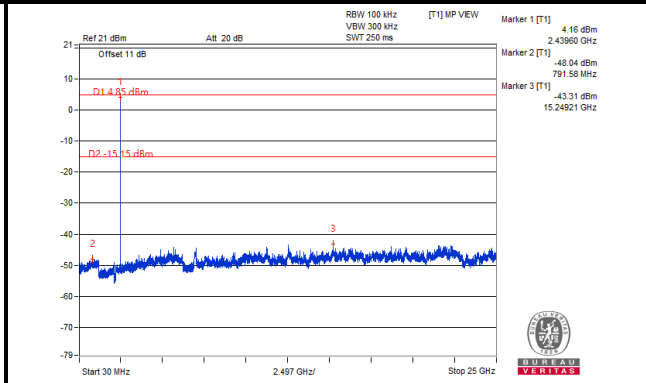
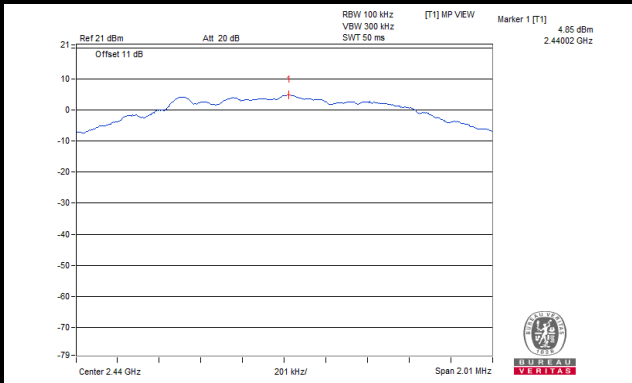


<LE 2M>

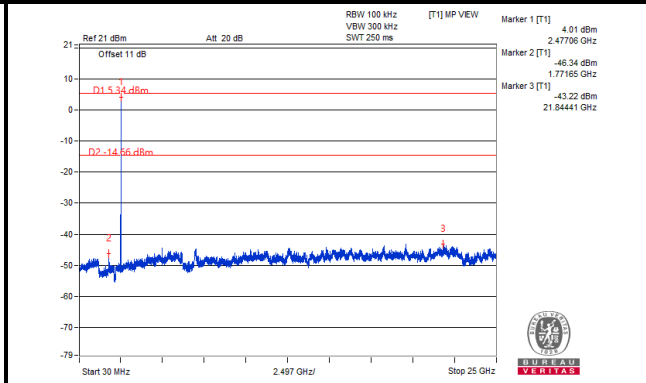
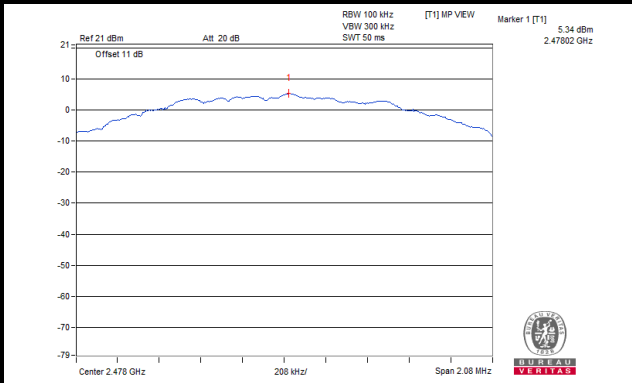
Ch 1



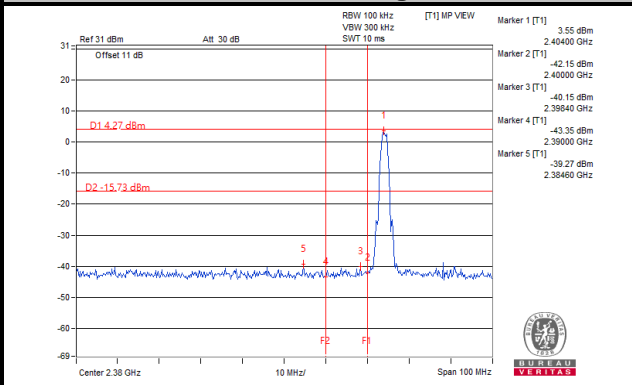
Ch 19



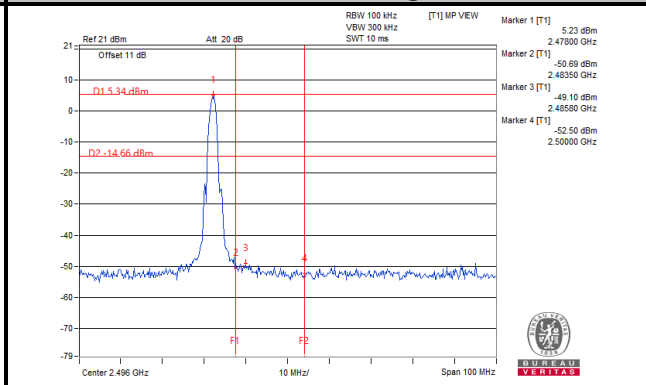
Ch 38



Ch 1 Band Edge



Ch 38 Band Edge



## 5 Photographs of the Test Configuration

Please refer to the attached file (Reference no.: RFBCEE-WTW-P21110658 (TSup photo)).

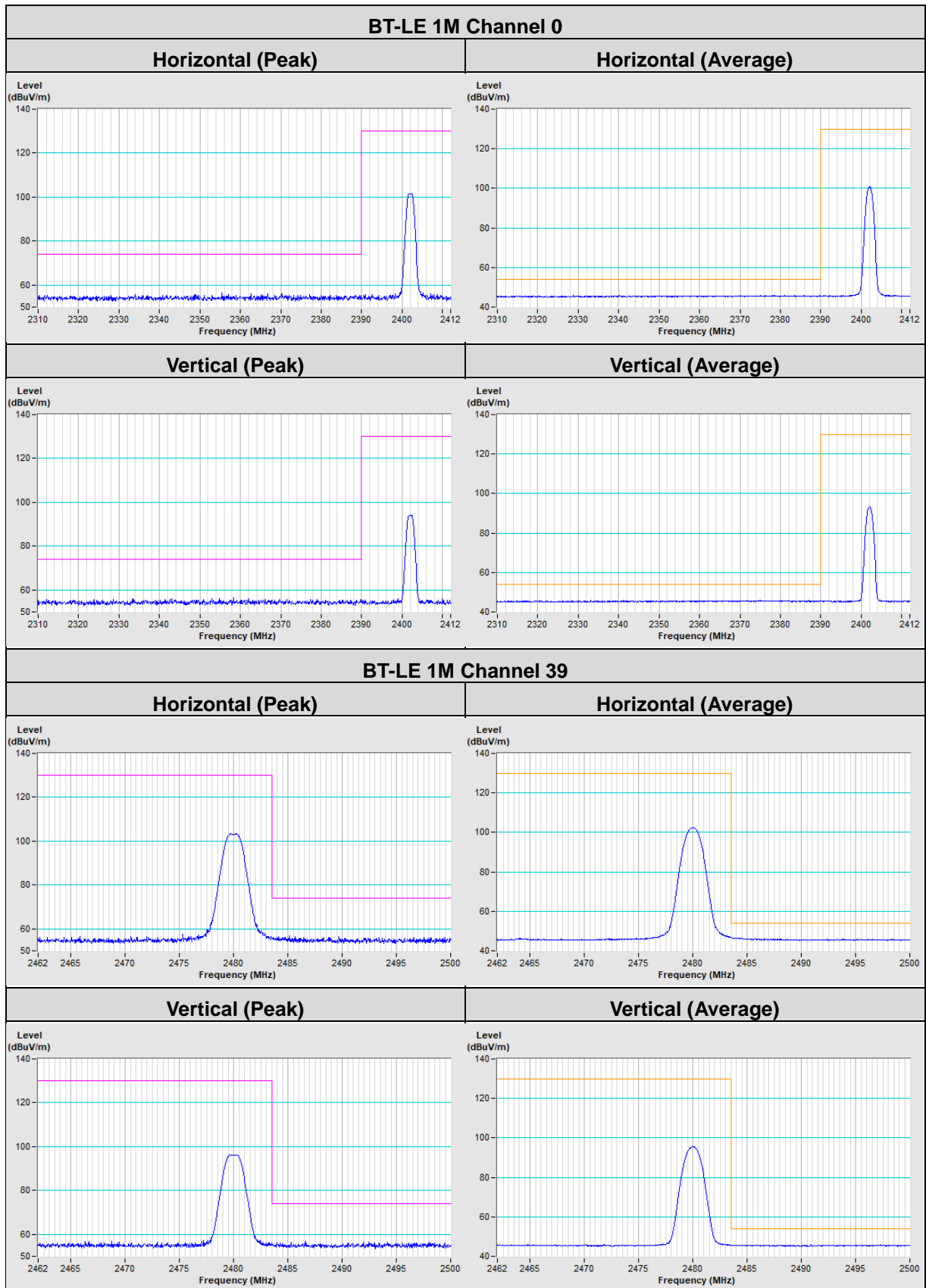
## 6 Construction Photos of EUT

Please refer to the attached file (BCEE-WTW-P21110658 (EUT photo)).

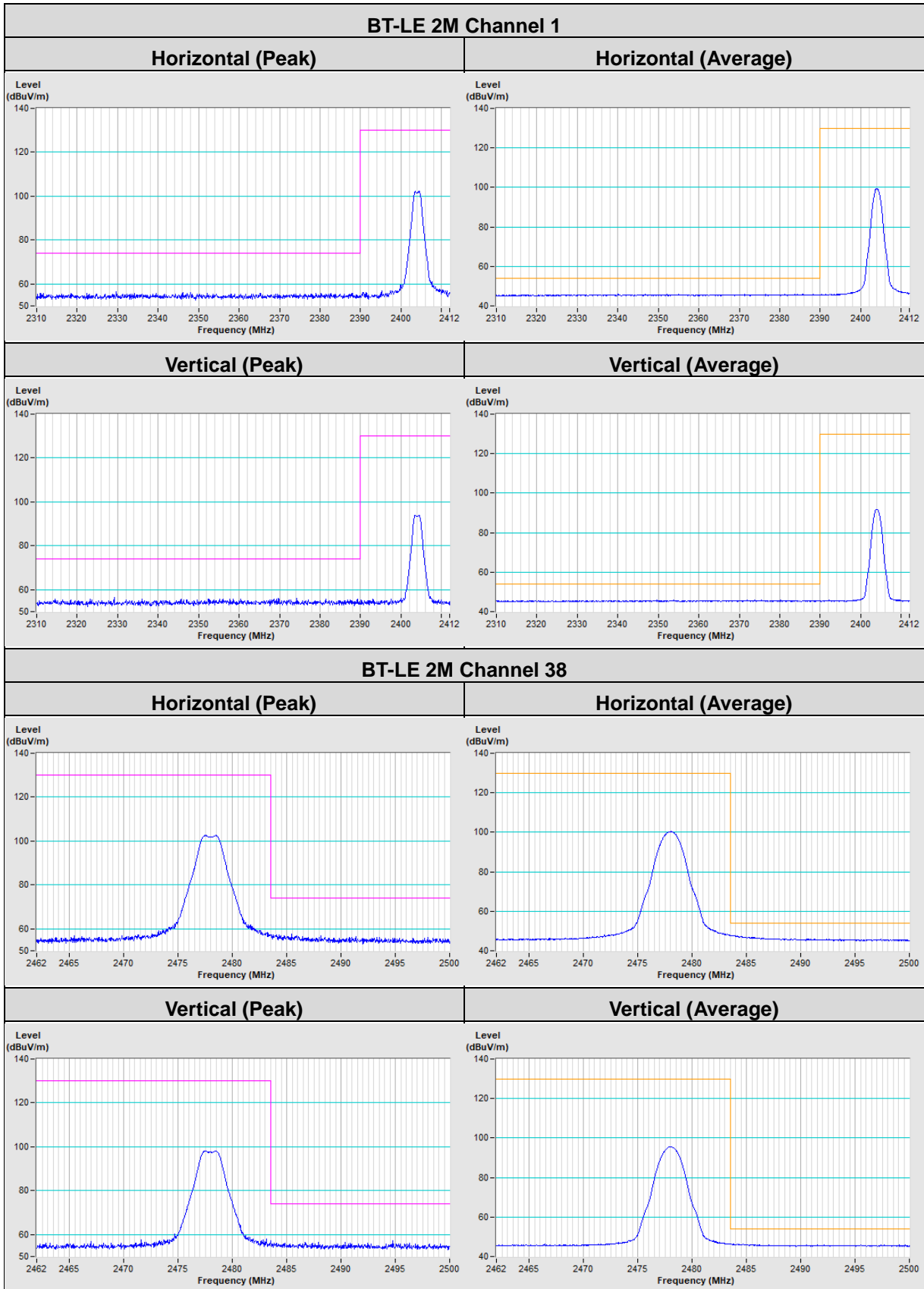


# Annex A- Band Edge Measurement

Mode B  
<LE 1M>



<LE 2M>



## Appendix – Information of the Testing Laboratories

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

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

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