

# TEST REPORT

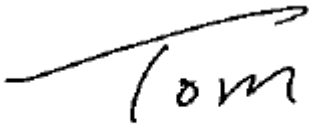

Applicant:	GLORIOUS LLC
Address:	13809 Research Blvd Suite 500 PMB 93206 Austin, TX 78750, USA

Manufacturer or Supplier	GLORIOUS LLC
Address	13809 Research Blvd Suite 500 PMB 93206 Austin, TX 78750, USA
Product:	WIRELESS MOUSE
Brand Name:	GLORIOUS
Model:	MODEL O MINUS WIRELESS
Additional Model & Model Difference	N/A
Date of tests:	Apr. 12, 2021 ~ May 24, 2021

the tests have been carried out according to the requirements of the following standard:

**FCC Part 15, Subpart C, Section 15.249**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

Tested by Tom Chen Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	
Date: Jun 04, 2021	

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## TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>4</b>
<b>1 SUMMARY OF TEST RESULTS.....</b>	<b>5</b>
2 MEASUREMENT UNCERTAINTY .....	5
<b>3 GENERAL INFORMATION .....</b>	<b>6</b>
3.1 GENERAL DESCRIPTION OF EUT .....	6
3.2 DESCRIPTION OF TEST MODES .....	7
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	9
3.4 DESCRIPTION OF SUPPORT UNITS .....	9
<b>4. TEST TYPES AND RESULTS.....</b>	<b>10</b>
<b>4.1 CONDUCTED EMISSION MEASUREMENT .....</b>	<b>10</b>
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	10
4.1.2 TEST INSTRUMENTS.....	10
4.1.3 TEST PROCEDURES .....	11
4.1.4 DEVIATION FROM TEST STANDARD .....	11
4.1.5 TEST SETUP.....	12
4.1.6 EUT OPERATING CONDITIONS .....	12
4.1.7 TEST RESULTS .....	13
<b>4.2 RADIATED EMISSION MEASUREMENT.....</b>	<b>15</b>
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	15
4.2.2 TEST INSTRUMENTS.....	16
4.2.3 TEST PROCEDURES .....	17
4.2.4 DEVIATION FROM TEST STANDARD .....	17
4.2.5 TEST SETUP.....	18
4.2.6 EUT OPERATING CONDITIONS .....	19
4.2.7 TEST RESULTS .....	20
<b>4.3 20DB BANDWIDTH MEASUREMENT .....</b>	<b>27</b>
4.3.1 LIMITS OF 20DB BANDWIDTH MEASUREMENT .....	27
4.3.2 TEST INSTRUMENTS.....	27
4.3.3 TEST PROCEDURE.....	28
4.3.4 DEVIATION FROM TEST STANDARD .....	28
4.3.5 TEST SETUP.....	28
4.3.6 EUT OPERATING CONDITIONS .....	28
4.3.7 TEST RESULTS .....	29



**BUREAU  
VERITAS**

**Test Report No.: RF2104WDG0073-1**

<b>5. PHOTOGRAPHS OF THE TEST CONFIGURATION .....</b>	<b>31</b>
<b>6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>32</b>



Test Report No.: RF2104WDG0073-1

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF2104WDG0073-1	Original release	Jun 04, 2021

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.249)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
§15.203	Antenna Requirement	PASS	No antenna connector is used
§15.207 (a)	Conducted Emission	PASS	Compliant
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant

## 2 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	UNCERTAINTY
Conducted emissions	9kHz~30MHz	3.05dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	4.00dB
	1GHz ~ 18GHz	5.17dB
	18GHz ~ 40GHz	5.07dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	WIRELESS MOUSE
<b>MODEL NO.</b>	MODEL O MINUS WIRELESS
<b>ADDITIONAL MODEL</b>	N/A
<b>FCC ID</b>	2AXP2-OM21
<b>NOMINAL VOLTAGE</b>	DC 3.7V from Li-ion battery or DC 5V from Host Unit
<b>MODULATION TECHNOLOGY</b>	GFSK
<b>OPERATING FREQUENCY</b>	2402-2480MHz
<b>ANTENNA TYPE</b>	Chip Antenna, with 5.54dBi gain
<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE SUPPLIED</b>	USB Cable: Unshielded, Detachable, 2.1m, with one core

**NOTES:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions, but only the worst case was shown in test report.
3. Please refer to the EUT photo document (Reference No.: 2104WDG0073) for detailed product photo.



### 3.2 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and packet type. The worst case was found when the EUT was positioned on Y axis for radiated emission. The EUT was tested under the following mode.

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE<1G	RE≥1G	PLC	BW	
A	-	-	-	√	DC 3.7V from fully battery
B	√	√	√	-	DC 5V from notebook

Where **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission

**RE≥1G**: Radiated Emission above 1GHz  
**BW**: 20db bandwidth

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

TESTED CHANNEL	TESTED FREQUENCY
Low	2402 MHz
Middle	2441 MHz
High	2480 MHz



Channel List

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	59	2461
1	2403	21	2423	41	2443	60	2462
2	2404	22	2424	42	2444	61	2463
3	2405	23	2425	43	2445	62	2464
4	2406	24	2426	44	2446	63	2465
5	2407	25	2427	45	2447	64	2466
6	2408	26	2428	46	2448	65	2467
7	2409	27	2429	47	2449	66	2468
8	2410	28	2430	48	2450	67	2469
9	2411	29	2431	49	2451	68	2470
10	2412	30	2432	50	2452	69	2471
11	2413	31	2433	51	2453	70	2472
12	2414	32	2434	52	2454	71	2473
13	2415	33	2435	53	2455	72	2474
14	2416	34	2436	40	2442	73	2475
15	2417	35	2437	54	2456	74	2476
16	2418	36	2438	55	2457	75	2477
17	2419	37	2439	56	2458	76	2478
18	2420	38	2440	57	2459	77	2479
19	2421	<b>39</b>	<b>2441</b>	58	2460	<b>78</b>	<b>2480</b>

Note: The more detailed channel, please refer to the product specifications

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE	25deg. C, 55%RH	DC 5V from notebook	yoyo
BW	25deg. C, 56%RH	DC 3.7V from fully battery	yoyo
PLC	25deg. C, 54%RH	DC 5V from notebook	Wink Wang



### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart C, Section 15.249**

**ANSI C63.10-2013**

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

### 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	ALIENWARE	ALIENWARE 13 R2	2015AP3711	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	AC Line: Unshielded, Detachable 0.8m; DC Line: Unshielded, Non-detachable 1.8m

## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	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 0.50MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Mar. 17,22
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 17,22
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Mar. 17,22
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Sep. 17,21
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A

**NOTES:**

1. The test was performed in shielded room 553.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

#### 4.1.3 TEST PROCEDURES

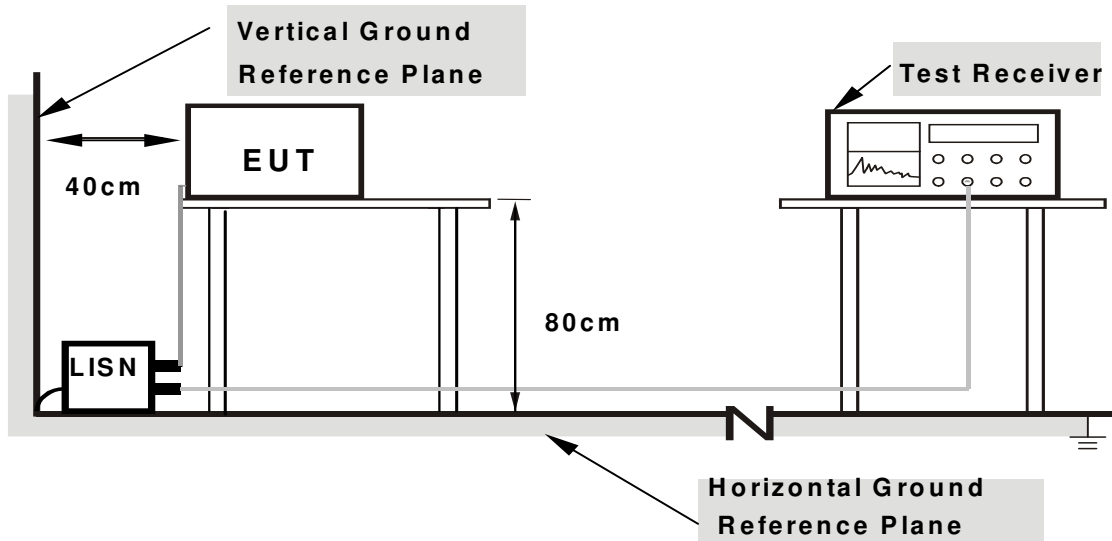
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

**NOTE:** 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 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**

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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

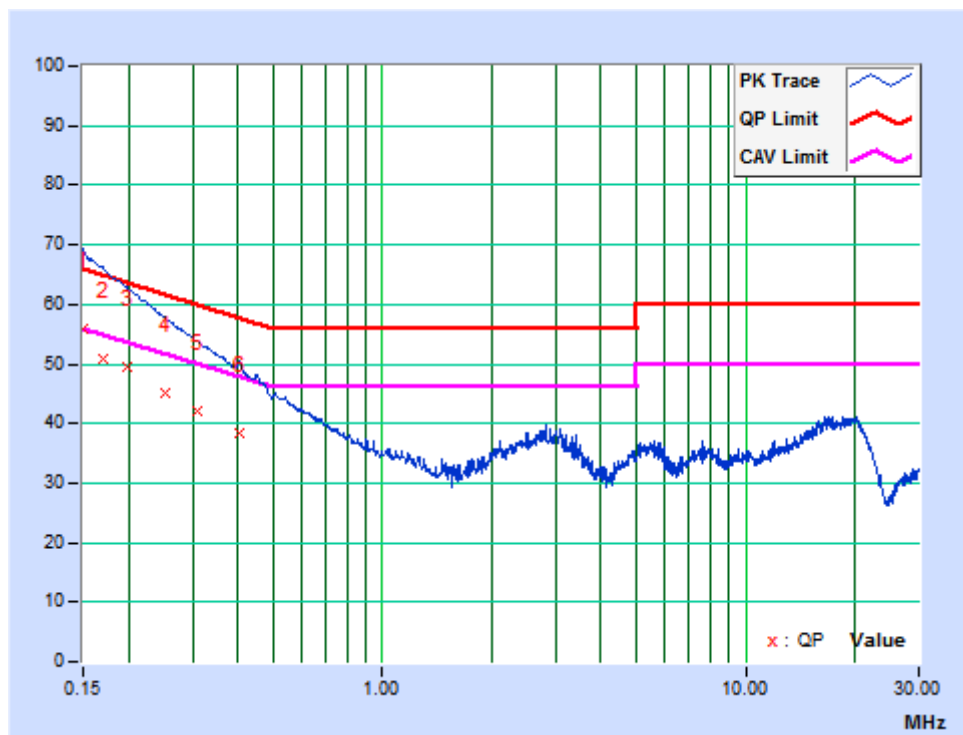
#### 4.1.7 TEST RESULTS

##### CONDUCTED WORST-CASE DATA: TX MIDDLE CHANNEL

<b>PHASE</b>	Line	<b>6dB BANDWIDTH</b>	9kHz
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No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.66	46.07	19.69	55.73	29.35	66.00	56.00	-10.27	-26.65
2	0.17025	9.68	41.31	17.80	50.99	27.48	64.95	54.95	-13.96	-27.47
3	0.19725	9.71	39.76	16.49	49.47	26.20	63.73	53.73	-14.26	-27.53
4	0.25125	9.74	35.47	15.43	45.21	25.17	61.72	51.72	-16.50	-26.54
5	0.30975	9.78	32.35	12.44	42.13	22.22	59.98	49.98	-17.84	-27.75
6	0.40442	9.82	28.53	23.50	38.35	33.32	57.76	47.76	-19.41	-14.44

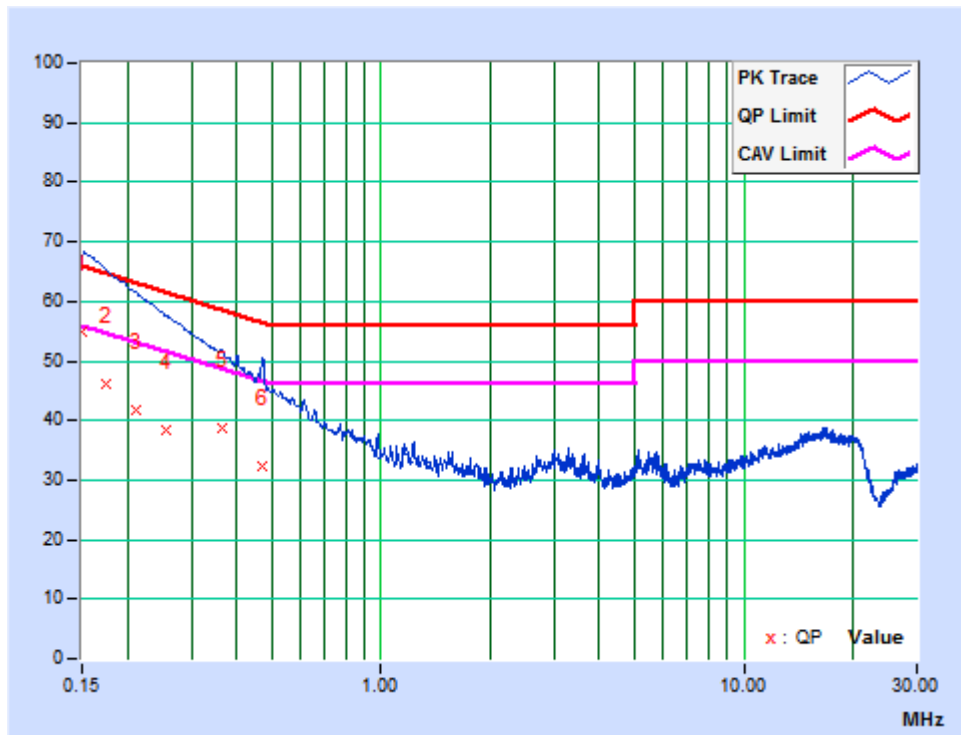
**REMARKS:** The emission levels of other frequencies were very low against the limit.



<b>PHASE</b>	Neutral	<b>6dB BANDWIDTH</b>	9kHz
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No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.66	45.32	12.92	54.98	22.58	66.00	56.00	-11.02	-33.42
2	0.17475	9.68	36.30	11.32	45.98	21.00	64.73	54.73	-18.75	-33.73
3	0.21075	9.72	31.93	11.04	41.65	20.76	63.18	53.18	-21.52	-32.41
4	0.25575	9.74	28.53	6.89	38.27	16.63	61.57	51.57	-23.29	-34.93
5	0.36375	9.81	28.75	7.50	38.56	17.31	58.64	48.64	-20.08	-31.33
6	0.47134	9.84	22.55	12.80	32.39	22.64	56.49	46.49	-24.10	-23.85

**REMARKS:** The emission levels of other frequencies were very low against the limit.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

#### NOTES:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, 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 20dB under any condition of modulation.



#### 4.2.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU40	100449	Mar. 07,22
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV7	102331	May 13, 22
Active Loop Antenna (9KHz -30MHz)	SCHWARZBECK	FMZB 1519B	1519B-045	May 29,21
Amplifier (9KHz -1GHz)	Burgeon	BPA-530	100210	Mar. 14,22
Bilog Antenna (20MHz -2GHz)	Teseq	CBL 6111D	30643	May 29,21
Horn Antenna (1GHz -18GHz)	ETS -Lindgren	3117	00062558	May 29,21
Horn Antenna (18GHz -40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170147	May 09, 22
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	NSEMC003	May 22,22
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
Broadband Preamplifier (1GHz~18GHz)	SCHWARZBECK	BBV9718	305	May 08,22
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Mar. 03,22
Test Software	ADT	ADT_Radiated_V7.6.15.9.2	N/A	N/A
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A

**NOTES:**

1. The test was performed in 966 Chamber.
2. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The horn antenna is used only for the measurement of emission frequency above1GHz if tested.
4. The FCC Site Registration No. is 749762.



#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 1.5 meters (above 1GHz) and 0.8 meters (below 1GHz) above the ground at a 3 meters semi-anechoic chamber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. For below 30MHz, a loop antenna with its vertical plane is place 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.
- g. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

#### NOTES:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The testing of the EUT was performed on all 3 orthogonal axes; the worst-case test configuration was reported on the file test setup photo.

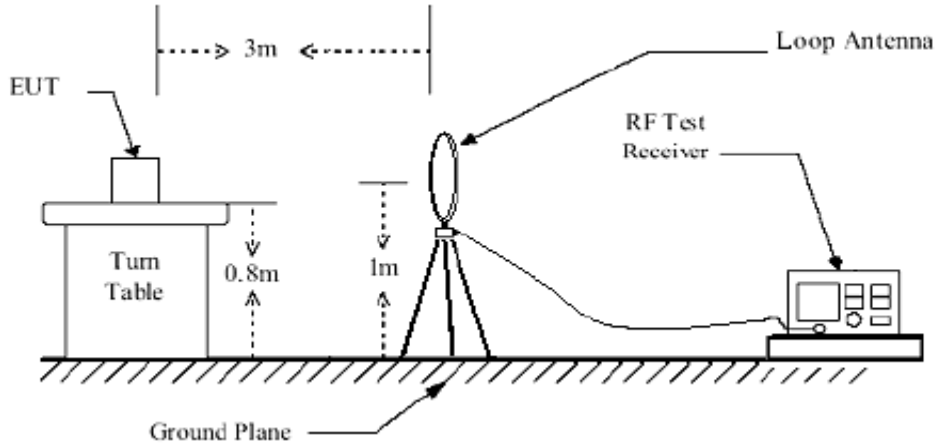
#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

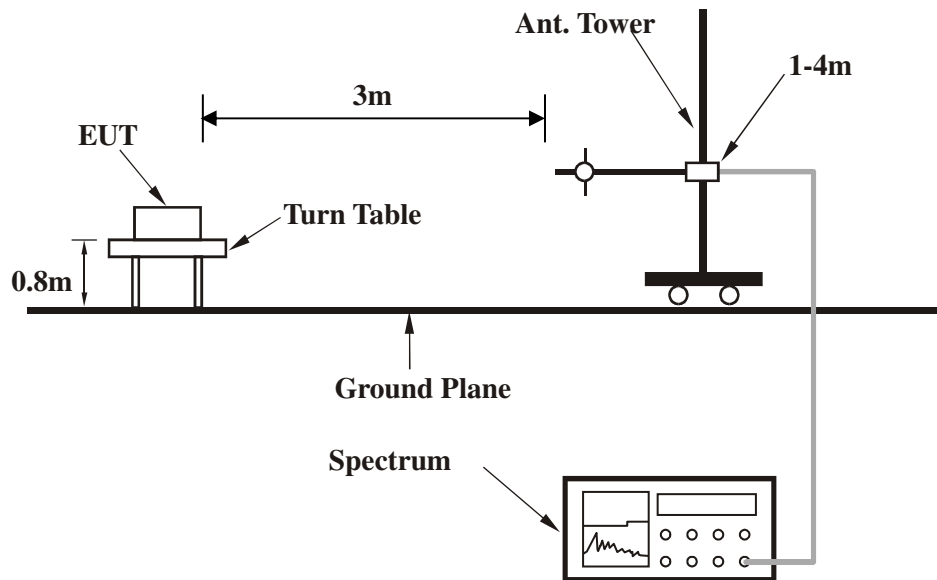


### 4.2.5 TEST SETUP

#### Below 30MHz test setup

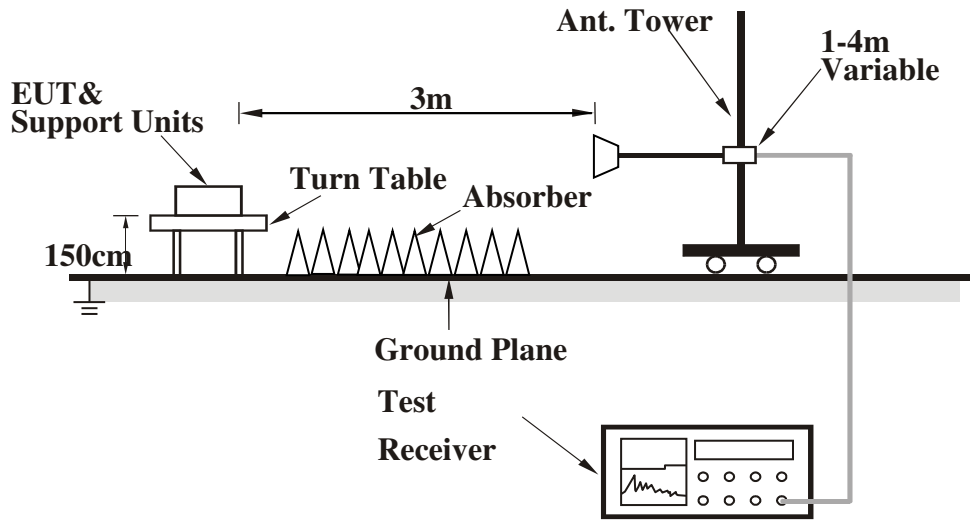


#### Below 1GHz test setup





## Above 1GHz test setup



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

### 4.2.6 EUT OPERATING CONDITIONS

- c) Turned on the power of all equipment.
- d) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

#### 4.2.7 TEST RESULTS

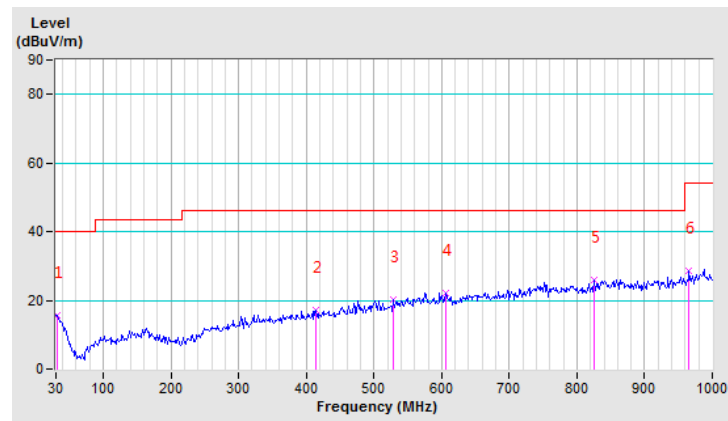
##### BELOW 1GHz WORST-CASE DATA

<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.55	15.76 QP	40.00	-24.24	1.00 H	158	28.39	-12.63
2	413.96	17.08 QP	46.00	-28.92	1.00 H	103	28.16	-11.08
3	528.99	20.36 QP	46.00	-25.64	1.00 H	185	28.86	-8.50
4	606.71	22.10 QP	46.00	-23.90	1.00 H	65	28.69	-6.59
5	825.90	25.86 QP	46.00	-20.14	1.00 H	144	29.13	-3.27
6	965.80	28.70 QP	54.00	-25.30	1.00 H	175	29.46	-0.76

##### 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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.



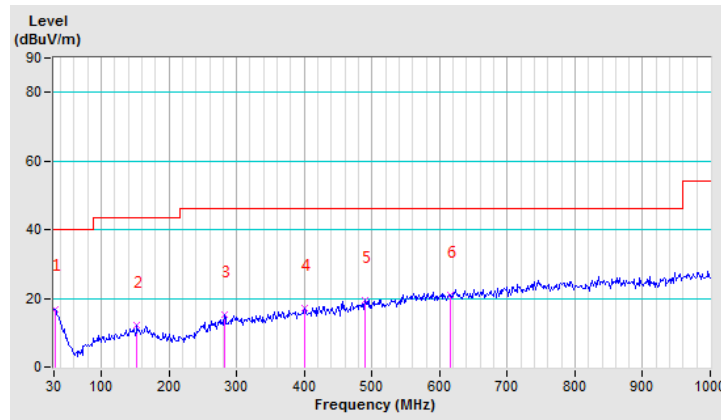


<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Quasi-Peak (QP)
<b>FREQUENCY RANGE</b>	9KHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	31.55	16.94 QP	40.00	-23.06	1.00 V	16	29.57	-12.63
2	152.80	12.11 QP	43.50	-31.39	1.00 V	129	29.56	-17.45
3	281.83	15.34 QP	46.00	-30.66	1.00 V	55	30.51	-15.17
4	399.97	17.04 QP	46.00	-28.96	1.00 V	142	28.54	-11.50
5	490.13	19.34 QP	46.00	-26.66	1.00 V	114	28.91	-9.57
6	616.04	20.87 QP	46.00	-25.13	1.00 V	100	27.46	-6.59

**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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. 9KHz~30MHz have been test and test data more than 20dB margin.
5. Margin value = Emission level – Limit value.





ABOVE 1GHZ WORST-CASE DATA:

<b>CHANNEL</b>	TX Low Channel	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

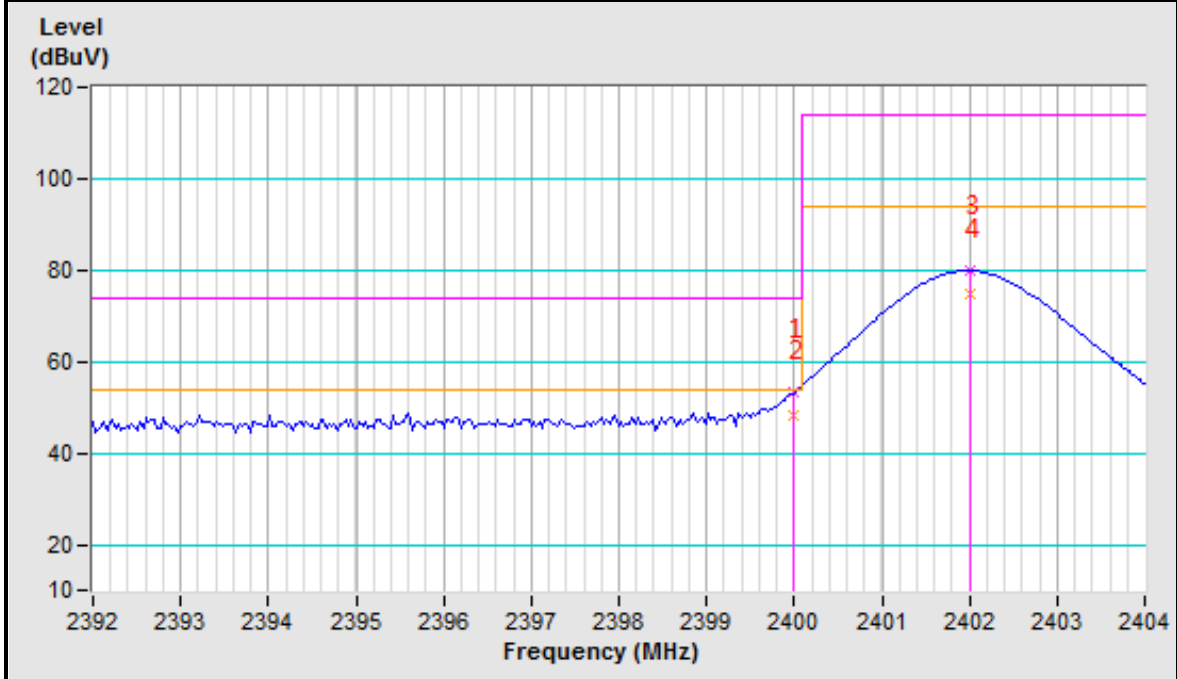
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	53.22 PK	74.00	-20.78	1.00 H	107	48.10	5.12
2	2400.00	48.19 AV	54.00	-5.81	1.00 H	107	43.07	5.12
3	*2402.00	79.85 PK	114.00	-34.15	1.00 H	107	74.72	5.13
4	*2402.00	74.82 AV	94.00	-19.18	1.00 H	107	69.69	5.13
5	4804.00	40.96 PK	74.00	-33.04	1.00 H	198	30.35	10.61
6	4804.00	35.93 AV	54.00	-18.07	1.00 H	198	25.32	10.61
7	7206.00	42.37 PK	74.00	-31.63	1.00 H	198	25.50	16.87
8	7206.00	37.34 AV	54.00	-16.66	1.00 H	198	20.47	16.87

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2400.00	52.64 PK	74.00	-21.36	1.00 V	325	47.52	5.12
2	2400.00	47.61 AV	54.00	-6.39	1.00 V	325	42.49	5.12
3	*2402.00	73.93 PK	114.00	-40.07	1.00 V	325	68.80	5.13
4	*2402.00	68.90 AV	94.00	-25.10	1.00 V	325	63.77	5.13
5	4804.00	40.97 PK	74.00	-33.03	1.00 V	107	30.36	10.61
6	4804.00	35.94 AV	54.00	-18.06	1.00 V	107	25.33	10.61
7	7206.00	45.73 PK	74.00	-28.27	1.00 V	107	28.86	16.87
8	7206.00	40.70 AV	54.00	-13.30	1.00 V	107	23.83	16.87

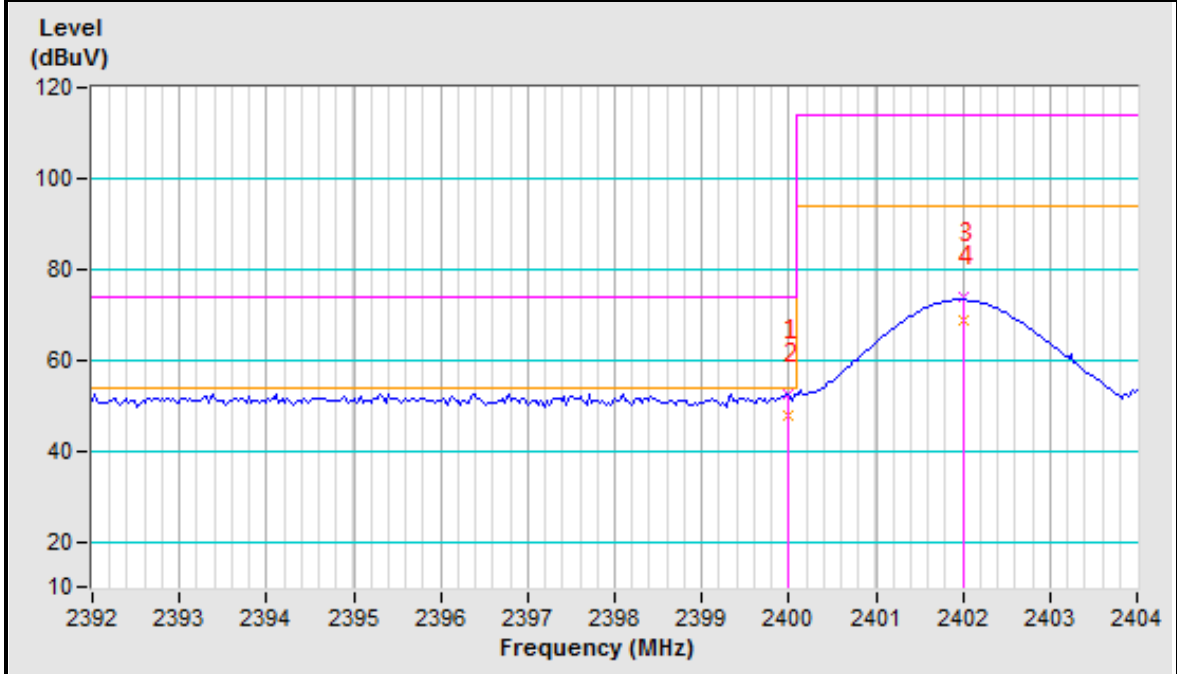
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* " : Fundamental frequency.

**Band edge Plot**

**2402MHz Horizontal**



**2405MHz Vertical**





<b>CHANNEL</b>	TX Middle Channel	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	80.05 PK	114.00	-33.95	1.00 H	113	74.71	5.34
2	*2441.00	75.02 AV	94.00	-18.98	1.00 H	113	69.68	5.34
3	4882.00	42.49 PK	74.00	-31.51	1.00 H	198	31.57	10.92
4	4882.00	37.46 AV	54.00	-16.54	1.00 H	198	26.54	10.92
5	7323.00	40.61 PK	74.00	-33.39	1.00 H	198	23.42	17.19
6	7323.00	35.58 AV	54.00	-18.42	1.00 H	198	18.39	17.19
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2441.00	73.19 PK	114.00	-40.81	1.00 V	163	67.85	5.34
2	*2441.00	68.16 AV	94.00	-25.84	1.00 V	163	62.82	5.34
3	4882.00	41.25 PK	74.00	-32.75	1.00 V	198	30.33	10.92
4	4882.00	36.22 AV	54.00	-17.78	1.00 V	198	25.30	10.92
5	7323.00	33.68 PK	74.00	-40.32	1.00 V	198	16.49	17.19
6	7323.00	28.65 AV	54.00	-25.35	1.00 V	198	11.46	17.19

**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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.





<b>CHANNEL</b>	TX High Channel	<b>DETECTOR FUNCTION</b>	Peak (PK)
<b>FREQUENCY RANGE</b>	1GHz ~ 25GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (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	80.19 PK	114.00	-33.81	1.00 H	187	74.64	5.55
2	*2480.00	75.16 AV	94.00	-18.84	1.00 H	187	69.61	5.55
3	2483.50	47.17 PK	74.00	-26.83	1.00 H	187	41.60	5.57
4	2483.50	42.14 AV	54.00	-11.86	1.00 H	187	36.57	5.57
5	4960.00	32.90 PK	74.00	-41.10	1.00 H	91	21.66	11.24
6	4960.00	27.87 AV	54.00	-26.13	1.00 H	91	16.63	11.24
7	7440.00	35.71 PK	74.00	-38.29	1.00 H	91	18.19	17.52
8	7440.00	30.68 AV	54.00	-23.32	1.00 H	91	13.16	17.52

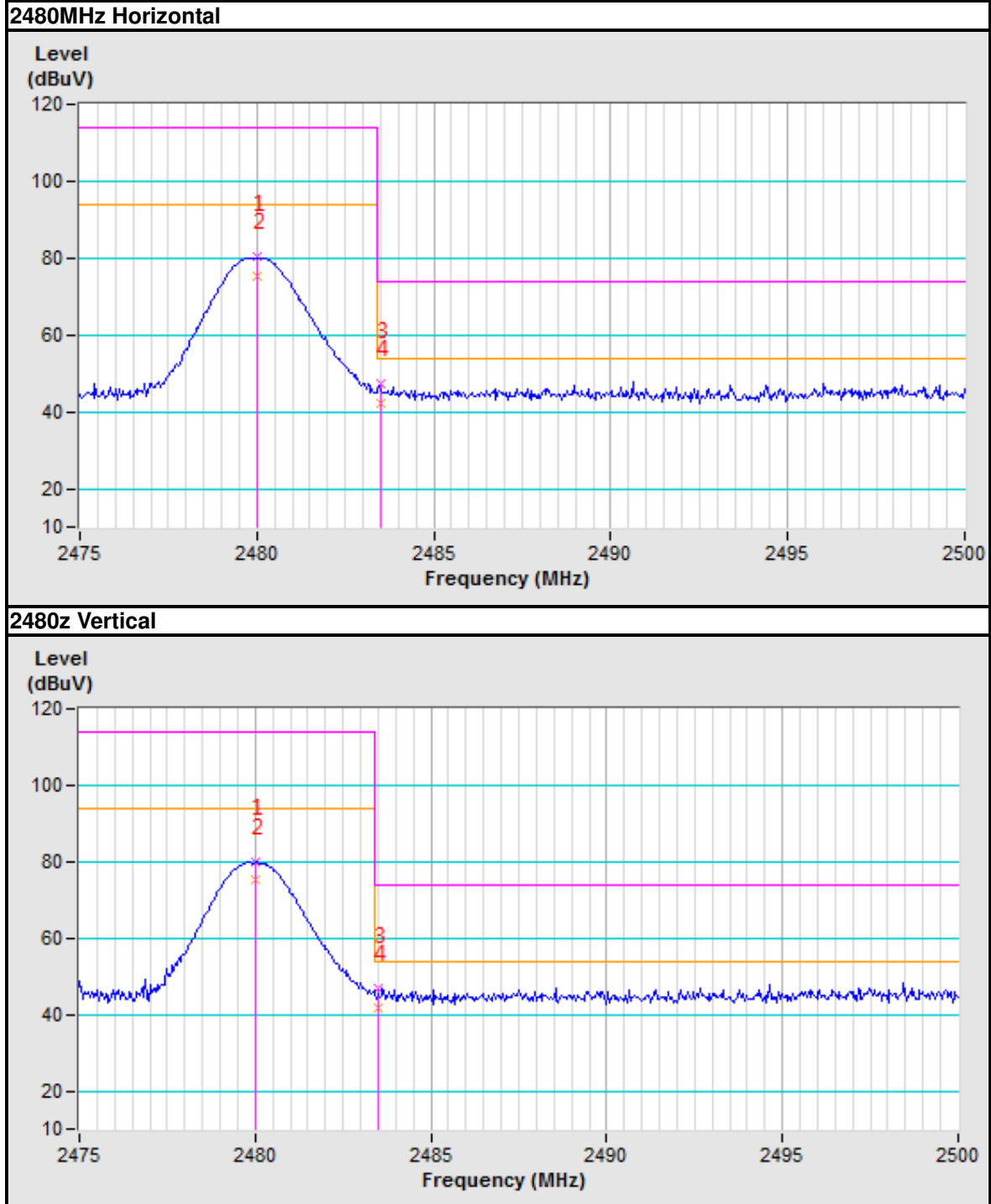
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2480.00	80.09 PK	114.00	-33.91	1.00 V	154	74.54	5.55
2	*2480.00	75.06 AV	94.00	-18.94	1.00 V	154	69.51	5.55
3	2483.50	46.65 PK	74.00	-27.35	1.00 V	154	41.08	5.57
4	2483.50	41.62 AV	54.00	-12.38	1.00 V	154	36.05	5.57
5	4960.00	31.98 PK	74.00	-42.02	1.00 V	266	20.74	11.24
6	4960.00	26.95 AV	54.00	-27.05	1.00 V	266	15.71	11.24
7	7440.00	41.50 PK	74.00	-32.50	1.00 V	177	23.98	17.52
8	7440.00	36.47 AV	54.00	-17.53	1.00 V	266	18.95	17.52

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).
3. The emission levels of other frequencies were greater than 20dB margin.
4. Margin value = Emission level – Limit value.
5. " \* ": Fundamental frequency.



Band edge Plot



### 4.3 20dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

#### 4.3.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	N/A
Power Sensor	Keysight	U2021XA	MY55060018	Jun. 03,21
Power Meter	Anritsu	ML2495A	1139001	Feb. 24,22
Power Sensor	Anritsu	MA2411B	1531155	Feb. 24,22
Digital Multimeter	FLUKE	15B	A1220010DG	N/A
Humid & Temp Programmable Tester	Haida	HD-225T	110807201	Nov. 03,21
Oscilloscope	Agilent	DSO9254A	MY51260160	Aug. 10,21
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101094	Feb. 24,22
Signal Generator	Agilent	N5183A	MY50140980	Aug. 10,21
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Sep. 04,21
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	N/A
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A
DC Source	Keysight	E3642A	MY56146098	N/A

#### NOTES:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

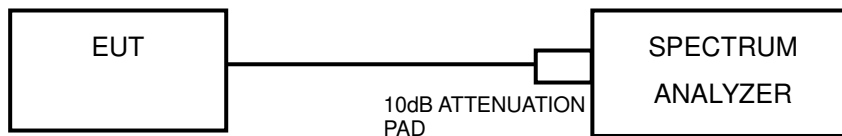
#### 4.3.3 TEST PROCEDURE

- a. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- c. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- d. Repeat above procedures until all frequencies measured were complete.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP



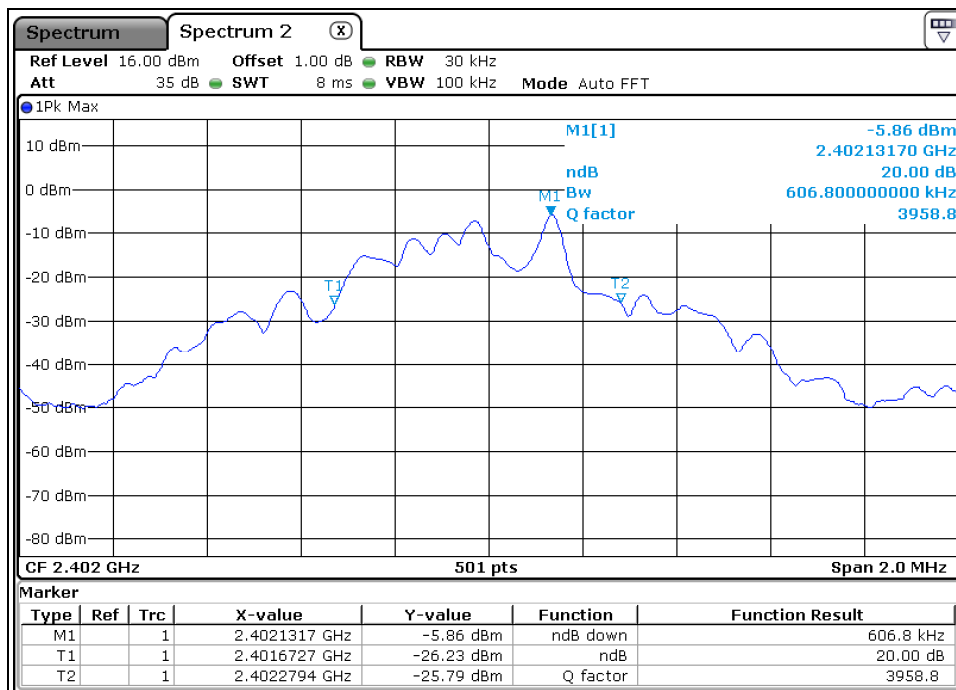
#### 4.3.6 EUT OPERATING CONDITIONS

- a) Turned on the power of all equipment.
- b) EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

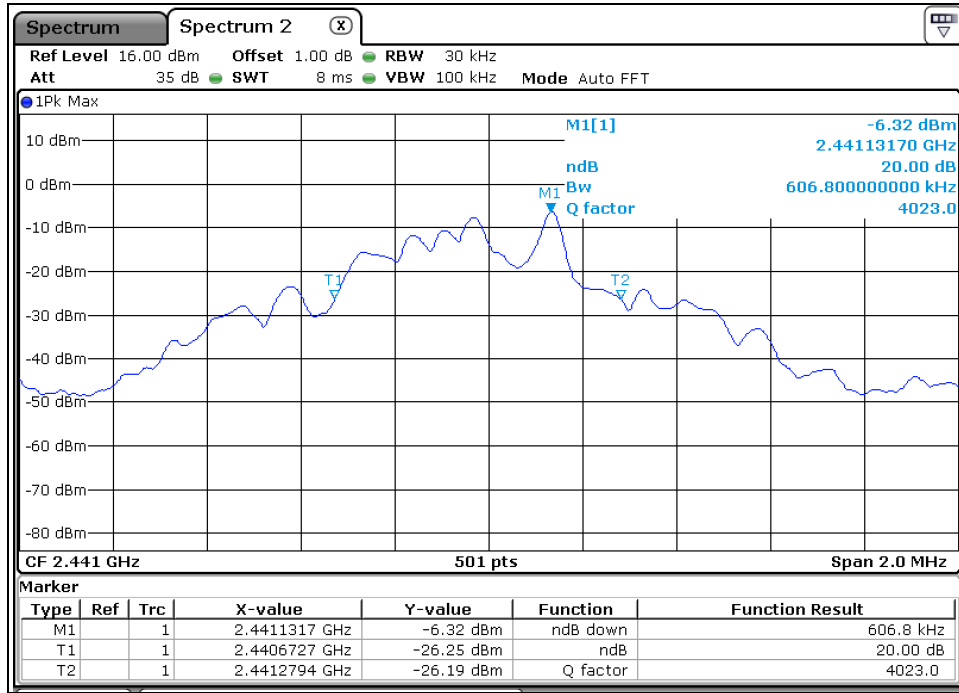
### 4.3.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	0.6068
Middle	2441	0.6068
High	2480	0.6068

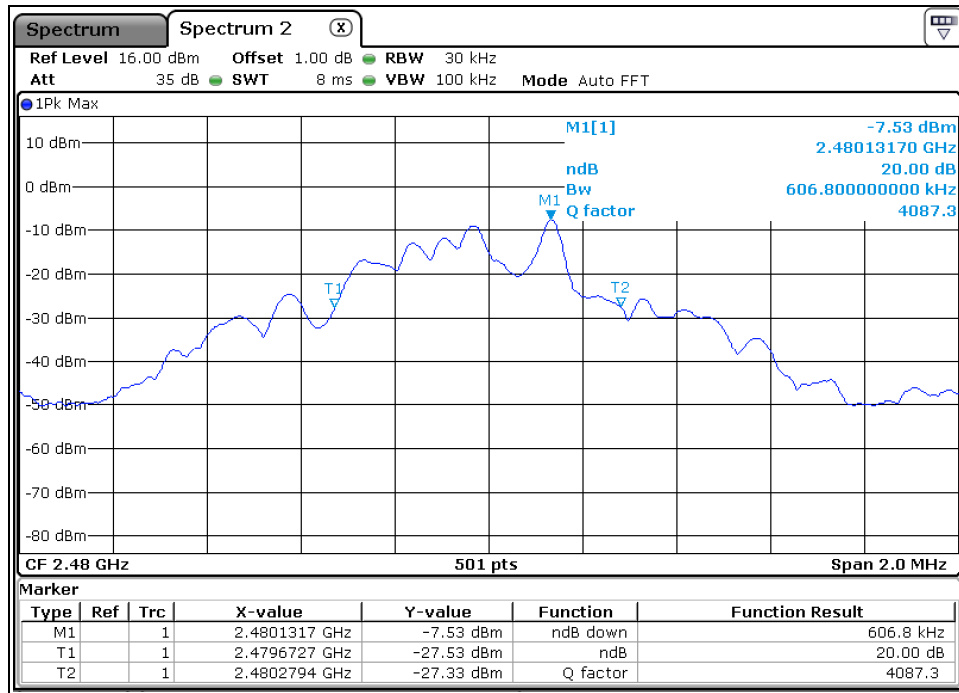
#### Test Data: Low channel



Test Data: Middle channel



Test Data: High channel





Test Report No.: RF2104WDG0073-1

## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



## 6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---