Testing Laboratory
1163

FCC COMPLIANCE TEST REPORT

Technical Statement of Conformity
in accordance with FCC Part 15 Subpart C

The Product

Equipment Under Test	:	Bluetooth LE scanner Trigger
Model Number	:	FP2
Product Series	:	N/A
Report Number	:	HA225149-RA
Issue Date	:	15-Sep-2022

is produced by
Mobility Sound Technology LTD.
5F, No.100, Jian 1st Road, ZhongHe Dist., New Taipei City #23585, Taiwan

HongAn TECHNOLOGY CO., LTD.
HongAn TECHNOLOGY EMC Laboratory
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BSMI Registration No.: SL2-IN-E-0023, SL2-A1-E-0023, SL2-IS-E-0023, SL2-R1-E-0023, SL2-R2-E-0023, SL2-L1-E-0023
VCCI Registration No.: R-12156, C-12329, T-10219, G-10696
FCC Designation No.: TW1071, TW1163, TW1136
TAF Accreditation No.: 1163
IC assigned Code: 11226A-2
ISED CAB identifier: TW1163

Caution :

This report sets forth our findings solely with respect to the test sample. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment. Please note that the measurement uncertainty are provided for informational purpose only and are not used in determining the Pass/Fail results. This test report shall not be reproduced written approval of HongAn TECHNOLOGY EMC Laboratory. The relevant information of the content of this test report is provided by the customer. For the correctness, appropriateness or completeness of the information provided by the customer, if there is any doubt or error, which will affect the validity of the results of this test report, the laboratory will not be liable Related responsibilities.

Contents

Release control Record

Report Version	**Description**	**Issued Date**
V00	Original release.	15-Sep-2022

Test Result Certification

Applicant	: Mobility Sound Technology LTD.
Address of Applicant	: 5F, No.100, Jian 1st Road, ZhongHe Dist., New Taipei City #23585, Taiwan
Manufacturer	: Mobility Sound Technology LTD.
Address of Manufacturer	: 5F, No.100, Jian 1st Road, ZhongHe Dist., New Taipei City #23585, Taiwan
Trade Name	: MobilitySound
Equipment Under Test	: Bluetooth LE scanner trigger
Model Number	: FP2
Product Series	: N/A
FCC ID	: XTS-FP2
Filing Type	: Certification
Sample Received Date	: 10-Aug-2022
Test Standard	:

☒ FCC Part 15 Subpart C §15.249

Deviations from standard test methods & any other specifications : NONE

Remark:

1. This report details the results of the test carried out on one sample.
2. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in both ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.203, 15.207, 15.209, 15.249.
3. This report applies to the above sample only and shall not be reproduced in part without written approval of HongAn Technology Co., Ltd.
4. Test Location (HA2): HongAn Technology EMC Laboratory, No.15-1 Cweishuh Keng, Cweipin Village, Linkou Dist., New Taipei City, Taiwan, R.O.C. FCC Designation No.: TW1071, TW1163.
5. Test Location (HA5): HongAn Technology EMC Laboratory, 2F, No.146, Jian Yi Rd., Chung-Ho Dist., New Taipei City, Taiwan, R.O.C. FCC Designation No.: TW1136.

Tested by: Tony Huang 2022-09-12

Andrew Lin / ENG. Dept. Staff

Approved by: Eason.Hsieh **Date:** 2022-09-15

Eason Hsieh / Section Manager

Summary of Test Result

	Test Item	Applicable Standard	Test Result
1	Antenna Requirement	FCC part 15 subpart C §203	Compliance
2	Conducted Emission	FCC part 15 subpart C §207	Compliance
3	Restricted Band of Operation	FCC part 15 subpart C §205	Compliance
4	Radiated Emission	FCC part 15 subpart C §209	Compliance
5	Field Strength	FCC part 15 subpart C §249(a)	Compliance
6	Out of Band Emission	FCC part 15 subpart C §249(d)	Compliance
7	20dB Bandwidth	FCC part 15 subpart C §215(c)	Compliance

1 General Description

1.1 Description of EUT

<table>
<tr><td>Equipment Under Test</td><td>:</td><td>Bluetooth LE scanner trigger</td></tr>
<tr><td>Model Number of EUT</td><td>:</td><td>FP2</td></tr>
<tr><td>Product Series</td><td>:</td><td>N/A</td></tr>
<tr><td>Power Supply</td><td>:</td><td>Input: USB DC 5 V; lithium battery: DC 3.7 V</td></tr>
<tr><td>Frequency Range</td><td>:</td><td>2402~2480 MHz</td></tr>
<tr><td>Number of Channels</td><td>:</td><td>BLE:40 Channels</td></tr>
<tr><td>Carrier Frequency of Each Channel</td><td>:</td><td>
<table>
<tr><td>00</td><td>2402</td><td>10</td><td>2422</td><td>20</td><td>2442</td><td>30</td><td>2462</td></tr>
<tr><td>01</td><td>2404</td><td>11</td><td>2424</td><td>21</td><td>2444</td><td>31</td><td>2464</td></tr>
<tr><td>02</td><td>2406</td><td>12</td><td>2426</td><td>22</td><td>2446</td><td>32</td><td>2466</td></tr>
<tr><td>03</td><td>2408</td><td>13</td><td>2428</td><td>23</td><td>2448</td><td>33</td><td>2468</td></tr>
<tr><td>04</td><td>2410</td><td>14</td><td>2430</td><td>24</td><td>2450</td><td>34</td><td>2470</td></tr>
<tr><td>05</td><td>2412</td><td>15</td><td>2432</td><td>25</td><td>2452</td><td>35</td><td>2472</td></tr>
<tr><td>06</td><td>2414</td><td>16</td><td>2434</td><td>26</td><td>2454</td><td>36</td><td>2474</td></tr>
<tr><td>07</td><td>2416</td><td>17</td><td>2436</td><td>27</td><td>2456</td><td>37</td><td>2476</td></tr>
<tr><td>08</td><td>2418</td><td>18</td><td>2438</td><td>28</td><td>2458</td><td>38</td><td>2478</td></tr>
<tr><td>09</td><td>2420</td><td>19</td><td>2440</td><td>29</td><td>2460</td><td>39</td><td>2480</td></tr>
</table>
</td></tr>
<tr><td>Antenna Specification</td><td>:</td><td>Printed Antenna/ Gain: 1.54 dBi</td></tr>
<tr><td>Modulation Technique</td><td>:</td><td>FHSS
BLE : GFSK</td></tr>
<tr><td>Transmit Data Rate</td><td>:</td><td>BLE : 1Mbps</td></tr>
<tr><td>Specification</td><td>:</td><td>Dimensions : 4.19 cm (L) X 3.87 cm (W) X 3.2 cm (H)
Weight : 30 g
Intended Function : The EUT is a scanner trigger.
Product Variance : N/A.</td></tr>
</table>

1.2 Test Instruments

HA2 (RE)					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI7	100931	28-Jul-2022	27-Jul-2023
Spectrum Analyzer	R&S	FSV 40	101296	06-Apr-2022	05-Apr-2023
Preamplifier	SCHAFFNER	CPA 9231A	0405	17-Dec-2021	16-Dec-2022
Preamplifier(1-18GHz)	EMCI	EMC051845SE	980692	06-Dec-2021	05-Dec-2022
Preamplifier(18~40GHz)	EMCI	EMC184045SE	980699	12-May-2022	11-May-2023
Loop Antenna	EMCO	6502	9202-2717	06-Sep-2021	05-Sep-2022
Bilog Antenna(3m)	TESEQ	CBL6111D	47016	22-Jul-2022	21-Jul-2023
Horn Antenna	EMCO	3115	9912-5992	24-Feb-2022	23-Feb-2023
Horn Antenna	Com-Power	AH-840	101042	14-May-2022	13-May-2023
Cable	HongAn	8D-FB	HA2-10MSite	19-Aug-2022	18-Aug-2023
RF Cable(1~18GHz)	EMCI	EMC104-SM-NM-1000	191104	05-Dec-2021	04-Dec-2022
RF Cable(1~18GHz)	EMCI	EMC104-SM-NM-8000	191103	09-Dec-2021	08-Dec-2022
RF Cable(18~40GHz)	EMCI	EMC102-KM-KM-1000	200301	12-May-2022	11-May-2023
RF Cable(18~40GHz)	WiSPEC	291LKA2292-8000	WSP-C-202205-001	02-Jun-2022	01-Jun-2023
Software	Audix	e3 (ver 6.101006a)	N/A	N/A	N/A

HA5 (CE)					
Instrument Name	Manufacture	Model Number	Serial Number	Last Cal. Date	Next Cal. Date
EMI Test Receiver	R&S	ESCI	100615	21-Jul-2022	20-Jul-2023
LISN	EMCIS	LN2-16	LN04023	28-Jun-2022	27-Jun-2023
LISN	SCHWARZBECK	NSLK 8127	01019	26-Jul-2022	25-Jul-2023
LISN+Adapter	SCHWARZBECK	NSLK 8127	01019	26-Jul-2022	25-Jul-2023
Cable	HARBOUR	RG 400	1.5m	07-Jul-2022	06-Jul-2023
Software	Audix	e3 (ver 6.101006e)	N/A	N/A	N/A

※ The test equipments used are calibrated and can be traced to National ITRI and International Standards.

1.3 Auxiliary Equipments

1.3.1. Provided by HongAn Technology Co., Ltd. for Test.

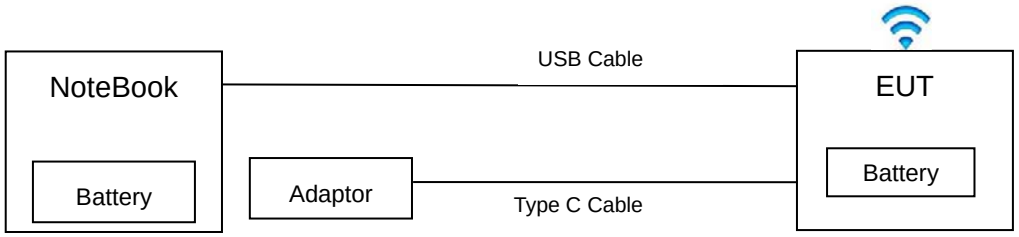
No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Power Cord
01	NoteBook	N61J	N61JV-021A520M	R31018	ASUS	Power Cord: Adapter to Notebook: Non-shielded Detachable, 1.8m, With Core AC to Adapter: Non-shielded Detachable, 1.8m, Without Core
02	Adapter	PSAA10A-050Q	N/A	R33084	PHIHONG	Input:100-240Vac,0.5A,50-60Hz Output:5Vdc,2A

1.3.2. Provided by the Manufacturer

No.	Equipment	Model No.	Serial No.	EMC Approved	Brand	Specification
01	USB Cable	N/A	N/A	N/A	N/A	Non-shielded,Detachable 0.9m,w/o core
02	Type C Cable	N/A	N/A	N/A	N/A	Non-Shielded; Detachable, 1m w/o core

1.4 EUT SETUP

1.4.1 SETUP for Radiated Test



Note: Main Test Sample: FP2

1.5 Identifying the Final Test Mode

Mode 1: BLE(1Mbps) 2402 MHz TX
Mode 2: BLE(1Mbps) 2442 MHz TX
Mode 3: BLE(1Mbps) 2480 MHz TX

Note:

1. After pre-test, we identified that the Test Mode 1 was most likely to produce the maximum transmitting power and cause maximum disturbance. Therefore, the Final Assessment was performed for the worst case.
2. The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of

the measurements.

3. Channel Low (2402 MHz), Mid (2442 MHz) and High (2480 MHz) were chosen for full testing.
4. According to its specifications, the EUT must comply with the requirements of the Section 15.203, 15.207, 15.209 and 15.249 under the FCC Rules Part 15 Subpart C.
5. Test Software: Blue teraterm-4.74; RF parameter setting：BLE: Channel 00 , 39 , 78 / Data Rate : 1 Mbps / TX POWER：0.

1.6 Final Test Mode

Conducted Emission: Mode1.
Radiated Emission (30~1000 MHz): Mode1.
Radiated Emission (1~26.5GHz): All Modes.

1.7 Condition of Power Supply

DC 5V through AC to DC Adapter

1.8 EUT Configuration

1. Setup the EUT as shown in Sec.1.4 Block Diagram.
2. Turn on the power of all equipments.
3. Activate the selected Final Test Mode.

1.9 Test Methodology

The tests documented in this report were performed in accordance with ANSI C63.10 (2013) and FCC CFR 47 15.203, 15.207, 15.209 and 15.249.

1.10 General Test Procedures

Conducted Emissions

The EUT is set according to the requirements in Section 6.2 of ANSI C63.10 (2013).

Radiated Emissions

The EUT is set according to the requirements in Section 6.3 of ANSI C63.10 (2013).

1.11 Modification

N/A

1.12 FCC Part 15.205 restricted bands of operations

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37635-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	([2])
13.36-13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

[2] Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2 Power line Conducted Emission Measurement

2.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

2.2 Test Arrangement and Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

2.3 Limit (§ 15.207)

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency (MHz)	Limits (dBuV)	
	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.0	56	46
5.0 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

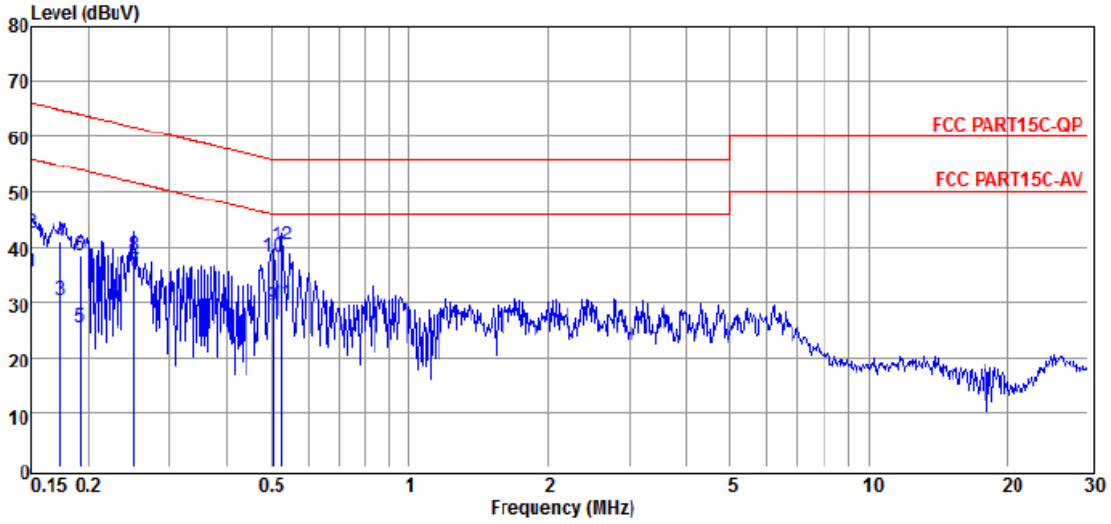
2.4 Test Result

Compliance

The final test data are shown on the following page(s).

Conducted Emission Test Data

Test Site	:	HA5	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1	Tested by	:	Tony Huang
Power Line	:	Line	EUT Position	:	X axis



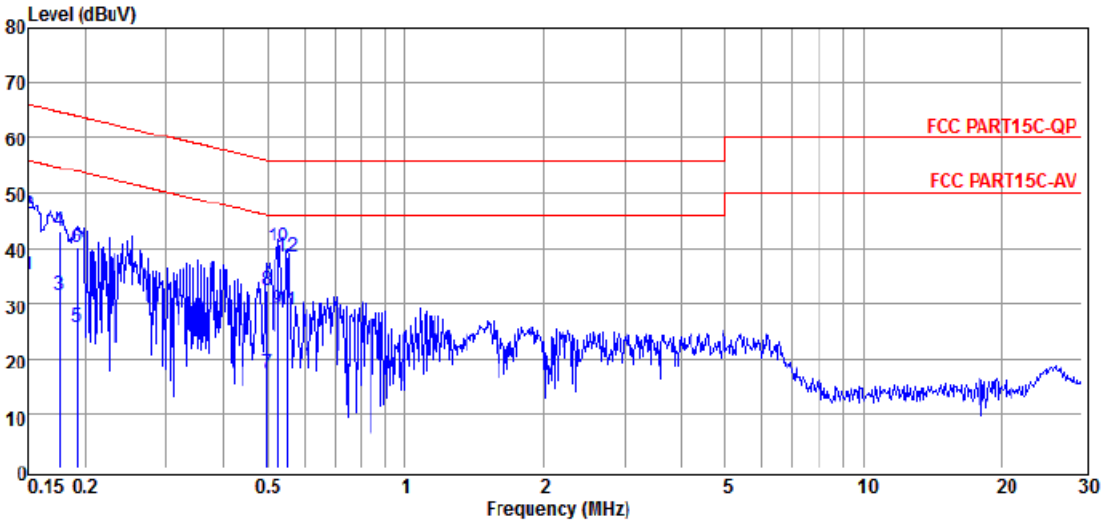
No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.150	35.35	0.10	35.45	56.00	-20.55	LINE	Average
2	0.150	42.55	0.10	42.65	66.00	-23.35	LINE	QP
3	0.174	30.40	0.10	30.50	54.77	-24.27	LINE	Average
4	0.174	40.78	0.10	40.88	64.77	-23.89	LINE	QP
5	0.191	25.25	0.10	25.35	53.98	-28.63	LINE	Average
6	0.191	38.38	0.10	38.48	63.98	-25.50	LINE	QP
7	0.251	35.47	0.10	35.57	51.73	-16.16	LINE	Average
8	0.251	38.34	0.10	38.44	61.73	-23.29	LINE	QP
9	0.502	29.30	0.11	29.41	46.00	-16.59	LINE	Average
10	0.502	38.15	0.11	38.26	56.00	-17.74	LINE	QP
11	0.529	29.73	0.11	29.84	46.00	-16.16	LINE	Average
12	0.529	40.41	0.11	40.52	56.00	-15.48	LINE	QP

Note 1. C.F (Correction Factor) = LISN Factor + Cable loss.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Conducted Emission Test Data

Test Site	:	HA5	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1	Tested by	:	Tony Huang
Power Line	:	Neutral	EUT Position	:	X axis



No.	Freq MHz	Reading dBµV	C.F dB	Result dBµV	Limit dBµV	Margin dB	Power Line	Remark
1	0.150	35.03	0.08	35.11	56.00	-20.89	NEUTRAL	Average
2	0.150	46.26	0.08	46.34	66.00	-19.66	NEUTRAL	QP
3	0.176	31.39	0.07	31.46	54.68	-23.22	NEUTRAL	Average
4	0.176	43.08	0.07	43.15	64.68	-21.53	NEUTRAL	QP
5	0.191	25.80	0.07	25.87	53.98	-28.11	NEUTRAL	Average
6	0.191	40.06	0.07	40.13	63.98	-23.85	NEUTRAL	QP
7	0.497	17.38	0.08	17.46	46.05	-28.59	NEUTRAL	Average
8	0.497	32.28	0.08	32.36	56.05	-23.69	NEUTRAL	QP
9	0.527	29.04	0.08	29.12	46.00	-16.88	NEUTRAL	Average
10	0.527	40.34	0.08	40.42	56.00	-15.58	NEUTRAL	QP
11	0.552	28.82	0.09	28.91	46.00	-17.09	NEUTRAL	Average
12	0.552	38.31	0.09	38.40	56.00	-17.60	NEUTRAL	QP

Note 1. C.F (Correction Factor) = LISN Factor + Cable loss.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

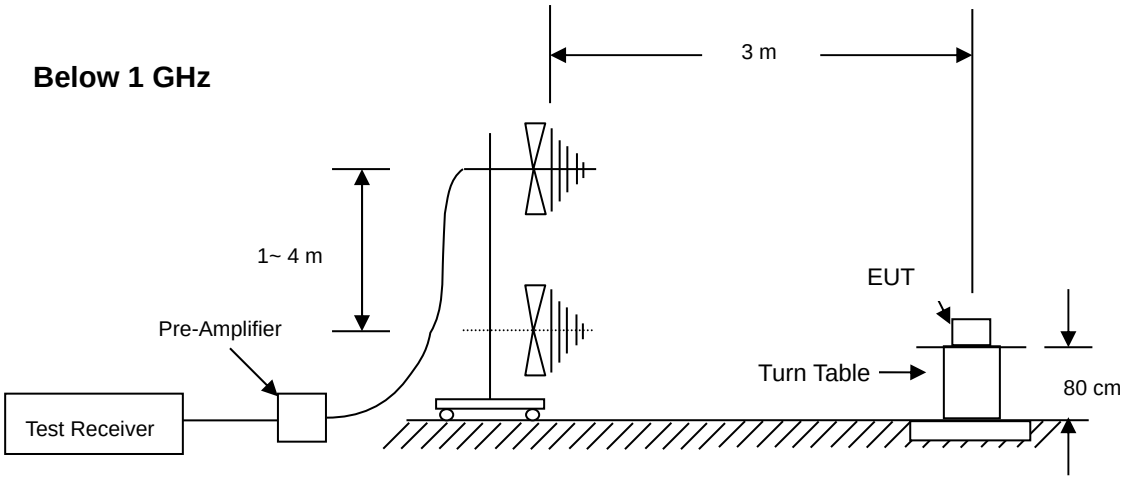
3 Radiated Emission Test

3.1 Test Instruments

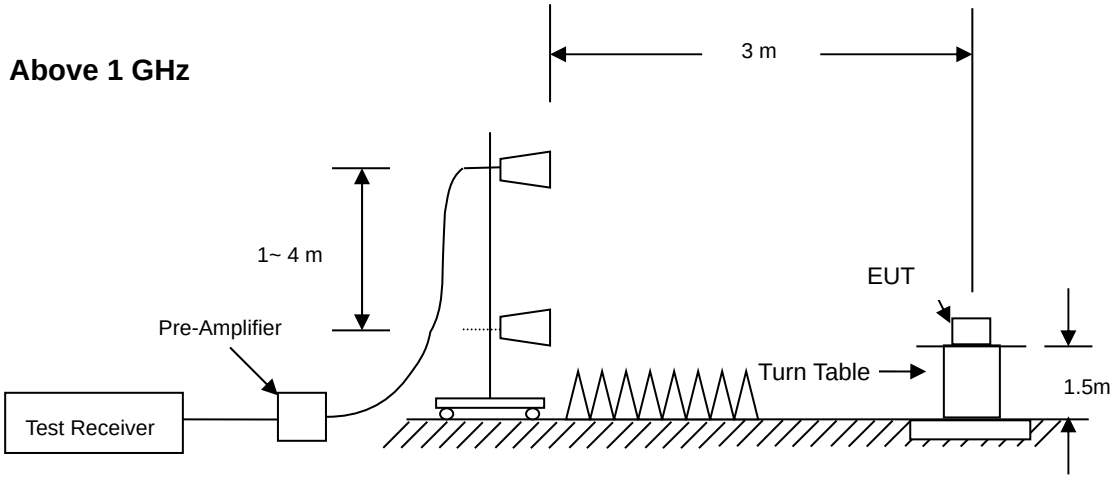
Refer to Sec. 1.2 Test Instruments.

3.2 Test Arrangement and Procedure

Below 1 GHz



Above 1 GHz



1. The EUT is placed on a turntable, which is 0.8 m (below 1GHz) and 1.5m (above 1GHz) above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
4. Maxium procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer. Refer to each test results for detail setting up.

7. Repeat above procedures until the meausreemnts for all frequencies are complete.

3.3 Limit of Field Strength of Fundamental (§ 15.249)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field strength of fundamental (microvolts/ meter)	Field strength of harmonics (meters)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

Note:

1. Field strength limits are specified at a distance of 3 meters.
2. For frequencies above 1000 MHz, the field strength limits in above table are based on average limits. 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.

3.4 Limit of Spurious Emission (§ 15.209)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is lesser attenuation.

Frequency (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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g.§§ 15.231 and 15.241.

3.5 Test Result

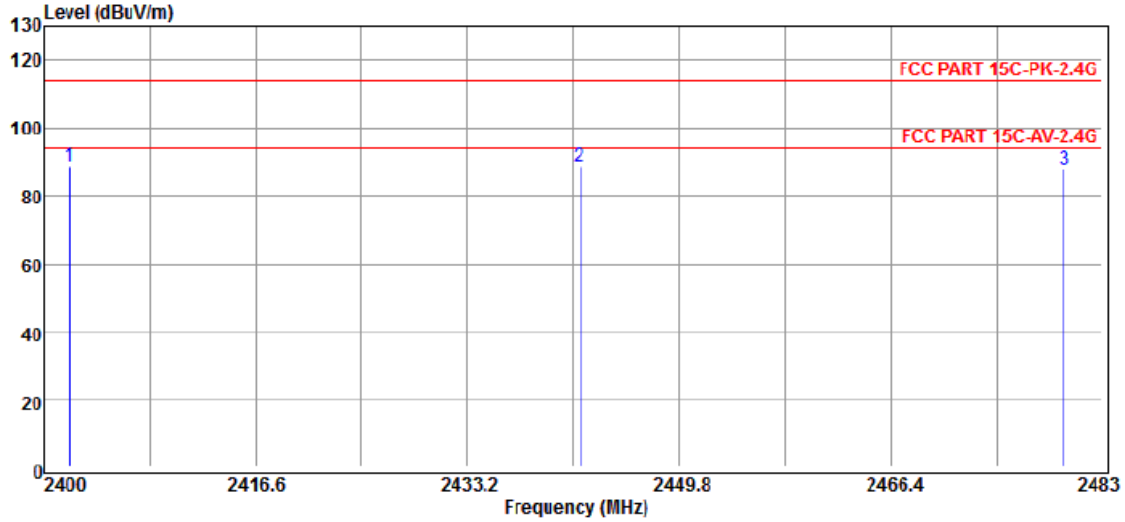
Compliance

The final test data are shown on the following page(s).

The 9kHz-30MHz spurious emission is under limit 20dB more.

Radiated Emission Test Data (Field Strength of Fundamental)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00, 20, 39	Frequency	:	2402, 2442, 2480 MHz
Test Mode	:	1, 2, 3(1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	2402.000	104.93	-16.15	88.78	94.00	-5.22	HORIZONTAL	Peak
2	2442.000	104.81	-16.04	88.77	94.00	-5.23	HORIZONTAL	Peak
3	2480.000	103.25	-15.74	87.51	94.00	-6.49	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

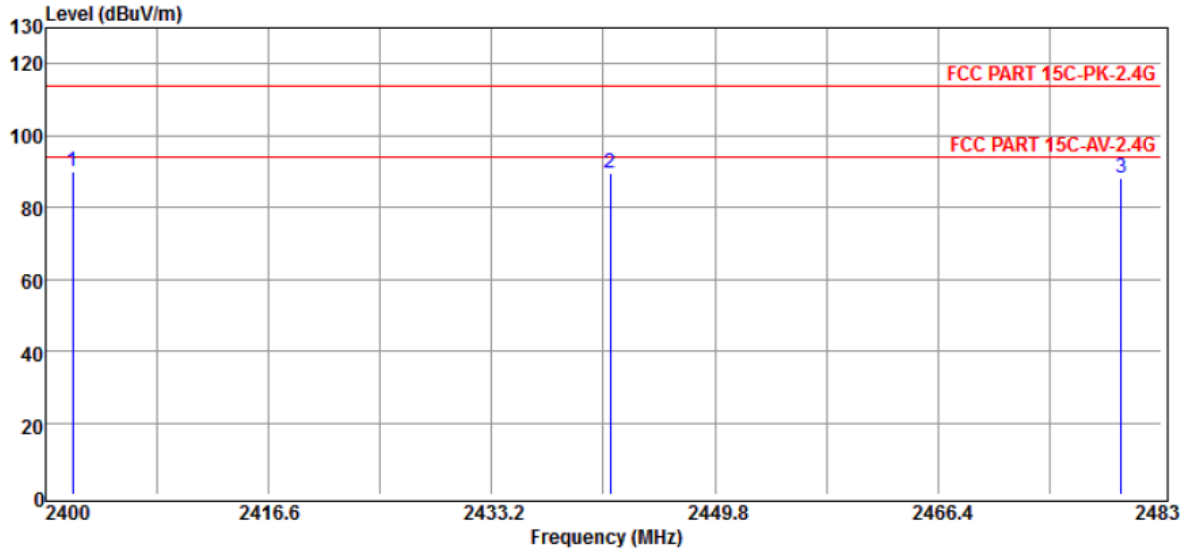
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 3MHz, VBW =10MHz, Sweep = AUTO.
   Note: Because the 20 dB Bandwidth is over 1MHz, the RBW setting of measuring Field strength of Fundamental should be 3MHz, and VBW should be at 10 MHz.

Radiated Emission Test Data (Field Strength of Fundamental)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00, 20, 39	Frequency	:	2402, 2442, 2480 MHz
Test Mode	:	1, 2, 3(1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBμV	dB/m	dBμV/m	dBμV/m	dB	Pol.	
1	2402.000	106.31	-16.15	90.16	94.00	-3.84	VERTICAL	Peak
2	2442.000	105.47	-16.04	89.43	94.00	-4.57	VERTICAL	Peak
3	2480.000	103.95	-15.74	88.21	94.00	-5.79	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

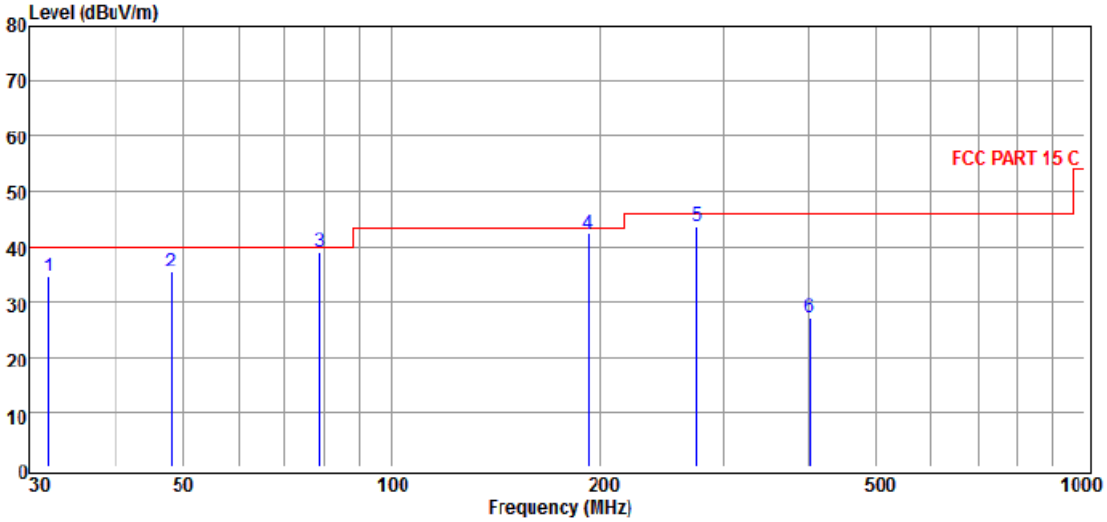
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   Peak Setting 1GHz to 10th harmonics of fundamental, RBW = 3MHz, VBW =10MHz, Sweep = AUTO.
   Note: Because the 20 dB Bandwidth is over 1MHz, the RBW setting of measuring Field strength of Fundamental should be 3MHz, and VBW should be at 10 MHz.

Radiated Emission Test Data (Below 1 GHz)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	31.955	38.97	-4.36	34.61	40.00	-5.39	HORIZONTAL	Peak
2	47.994	48.78	-13.26	35.52	40.00	-4.48	HORIZONTAL	Peak
3	78.689	54.46	-15.53	38.93	40.00	-1.07	HORIZONTAL	Peak
4	191.745	55.78	-13.36	42.42	43.50	-1.08	HORIZONTAL	Peak
5	276.124	53.22	-9.37	43.85	46.00	-2.15	HORIZONTAL	Peak
6	400.432	33.22	-5.98	27.24	46.00	-18.76	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

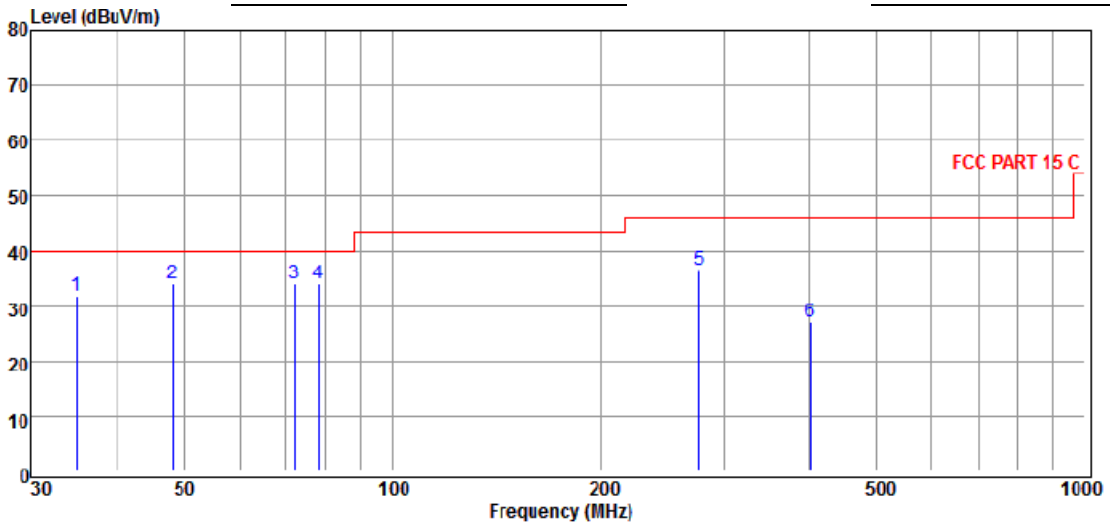
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 30 MHz to 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
4. All readings are Peak values. None of the peak value reading exceeds the Q.P. limit. Hence, Q.P. reading was not measured.
5. The IF bandwidth of SPA between 30 MHz to 1 GHz was 100 kHz.

Radiated Emission Test Data (Below 1 GHz)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	34.882	37.83	-5.98	31.85	40.00	-8.15	VERTICAL	Peak
2	47.994	47.23	-13.26	33.97	40.00	-6.03	VERTICAL	Peak
3	72.084	50.72	-16.58	34.14	40.00	-5.86	VERTICAL	Peak
4	78.139	49.80	-15.70	34.10	40.00	-5.90	VERTICAL	Peak
5	277.094	45.83	-9.37	36.46	46.00	-9.54	VERTICAL	Peak
6	400.432	33.15	-5.98	27.17	46.00	-18.83	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

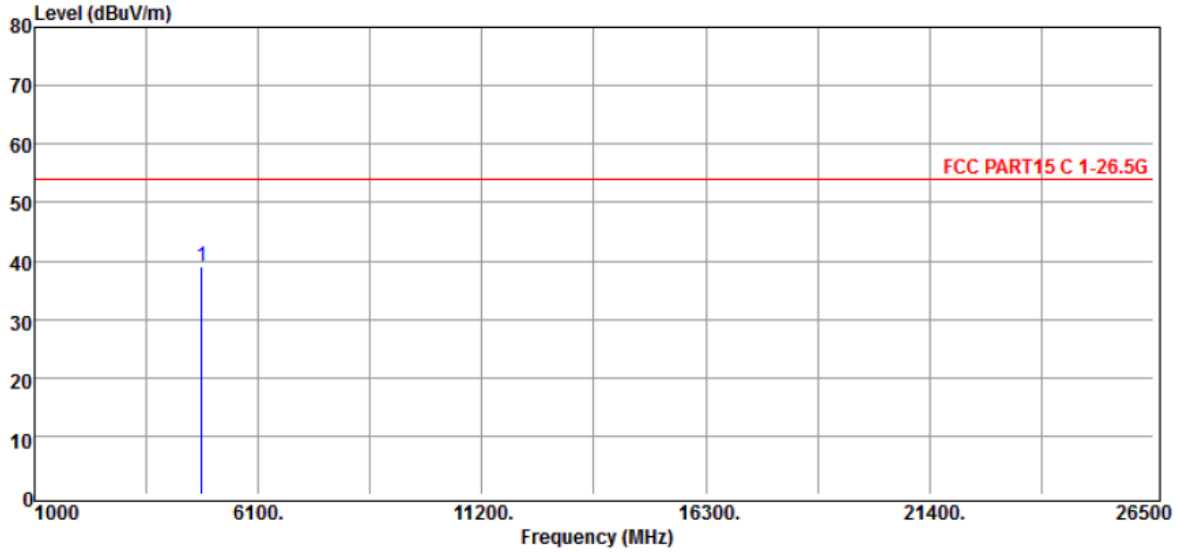
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 30 MHz to 1 GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode.
3. Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20 dB below the permissible limits or the field strength is too small to be measured.
4. All readings are Peak values. None of the peak value reading exceeds the Q.P. limit. Hence, Q.P. reading was not measured.
5. The IF bandwidth of SPA between 30 MHz to 1 GHz was 100 kHz.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4804.000	49.35	-10.34	39.01	54.00	-14.99	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

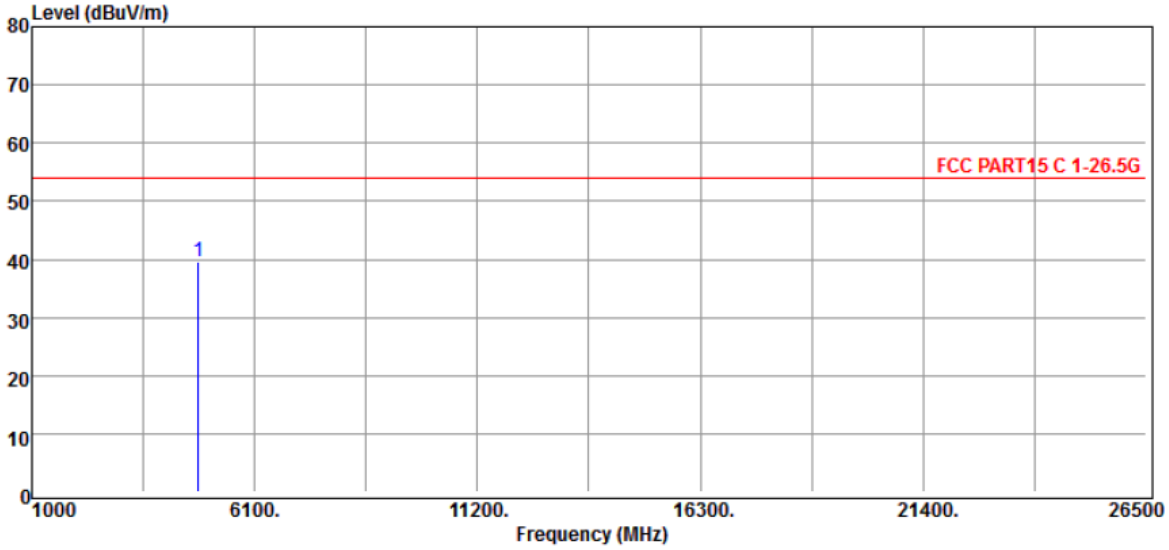
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4804.000	49.95	-10.34	39.61	54.00	-14.39	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

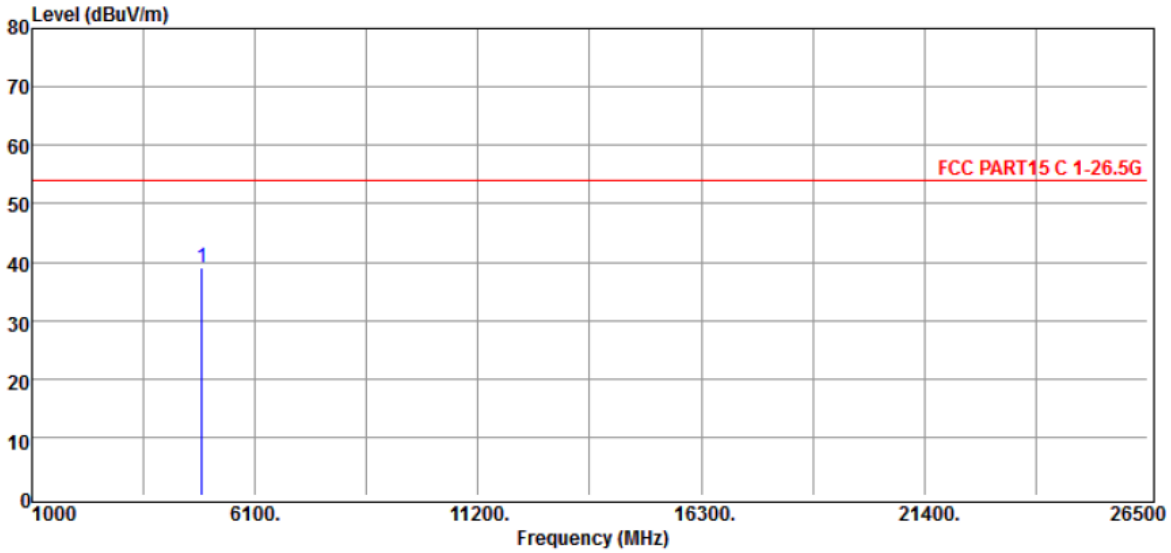
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	20	Frequency	:	2442 MHz
Test Mode	:	2 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4884.000	48.94	-10.04	38.90	54.00	-15.10	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

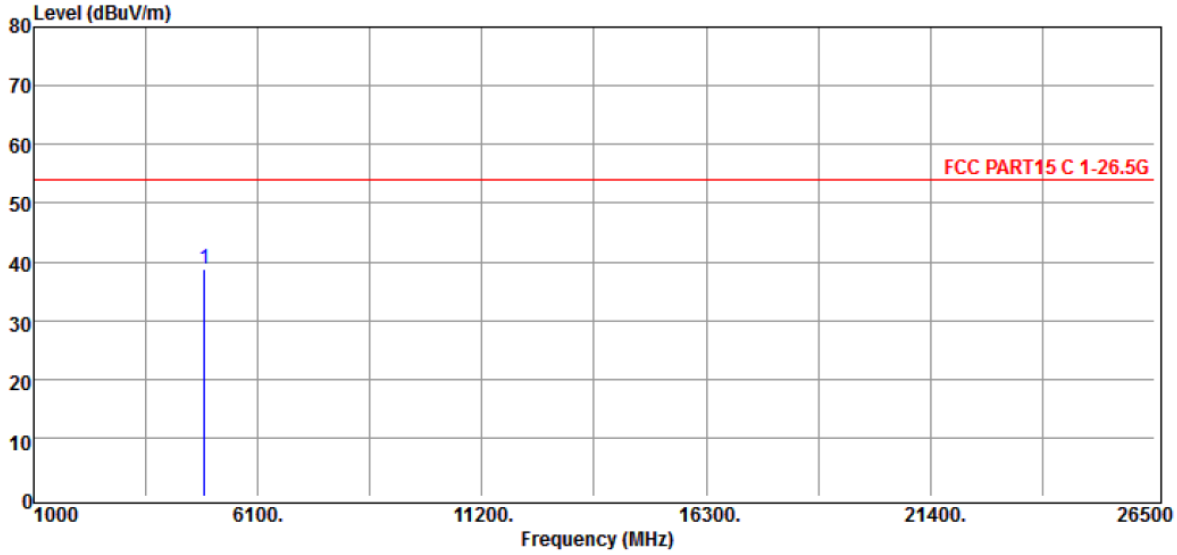
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	20	Frequency	:	2442 MHz
Test Mode	:	2 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4884.000	48.89	-10.04	38.85	54.00	-15.15	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

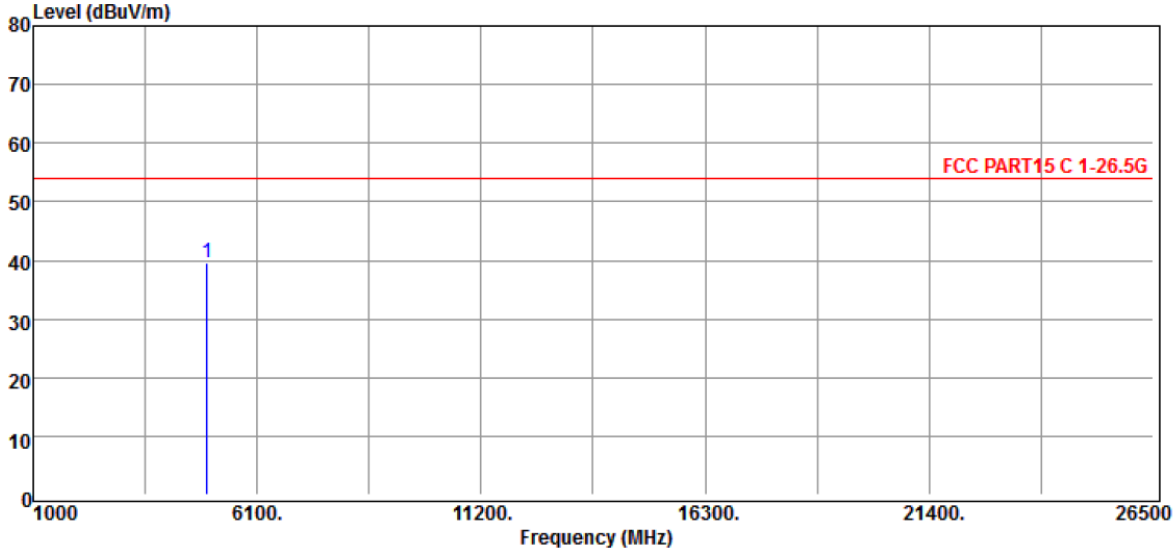
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	39	Frequency	:	2480 MHz
Test Mode	:	3 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4960.000	49.34	-9.80	39.54	54.00	-14.46	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

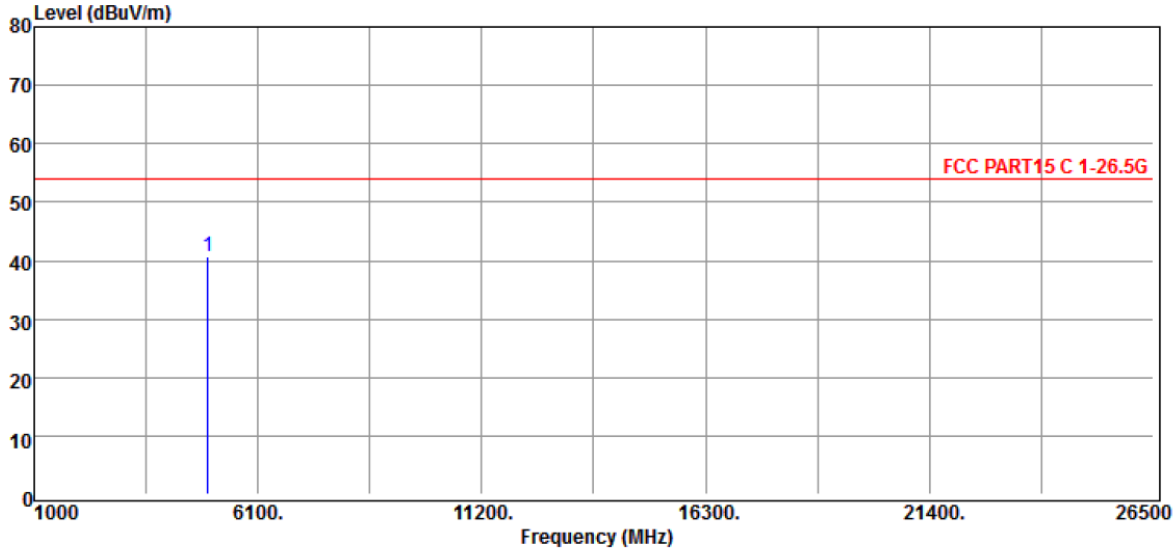
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Radiated Emission Test Data (Above and Field Strength to 10th Harmonic)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	39	Frequency	:	2480 MHz
Test Mode	:	3 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	4960.000	50.48	-9.80	40.68	54.00	-13.32	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

4 Out of Band Emission Test

4.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

4.2 Test Arrangement and Procedure

Refer to Sec. 3.2.

4.3 Limit of Field Strength of Fundamental (§ 15.249(d))

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

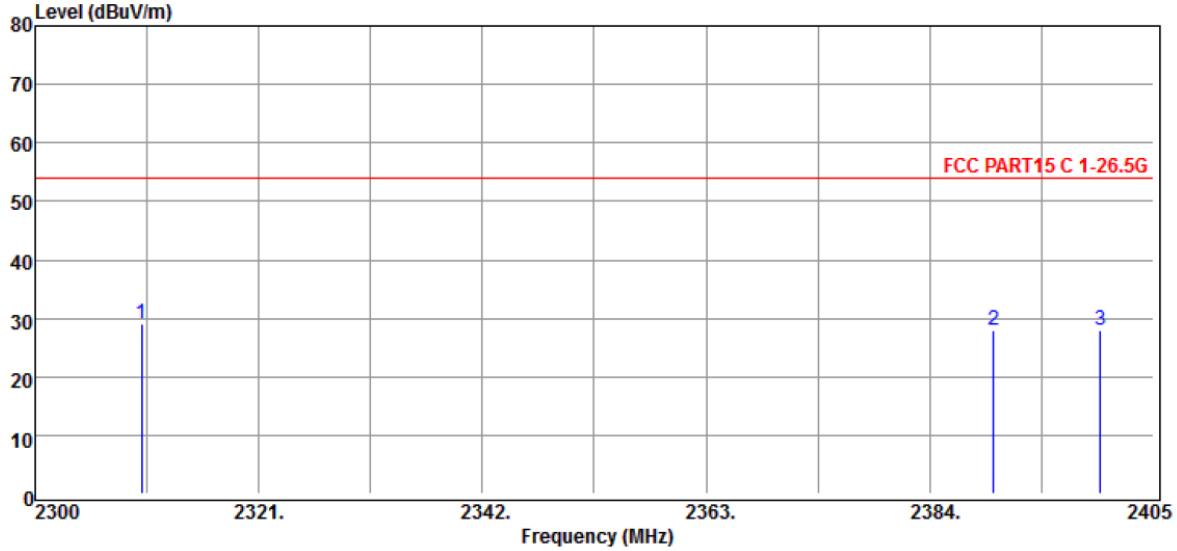
4.4 Test Result

Compliance

The final test data are shown on the following page(s).

Band-Edge Test Data (Lower Edge)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	2310.000	45.19	-16.21	28.98	54.00	-25.02	HORIZONTAL	Peak
2	2390.000	44.05	-16.14	27.91	54.00	-26.09	HORIZONTAL	Peak
3	2400.000	44.14	-16.16	27.98	54.00	-26.02	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

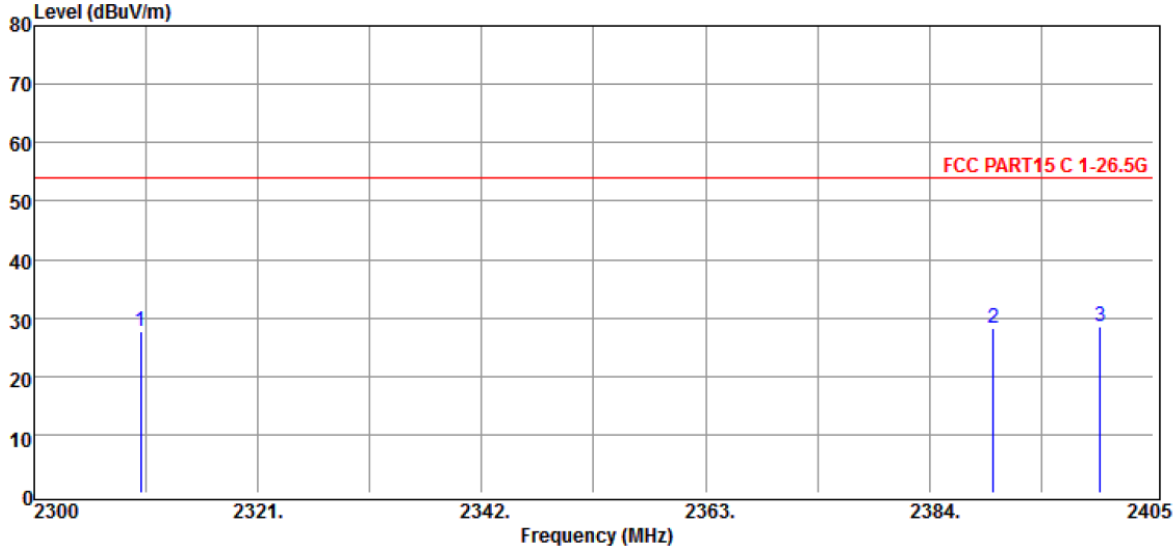
Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Band-Edge Test Data (Lower Edge)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	2310.000	43.80	-16.21	27.59	54.00	-26.41	VERTICAL	Peak
2	2390.000	44.39	-16.14	28.25	54.00	-25.75	VERTICAL	Peak
3	2400.000	44.79	-16.16	28.63	54.00	-25.37	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

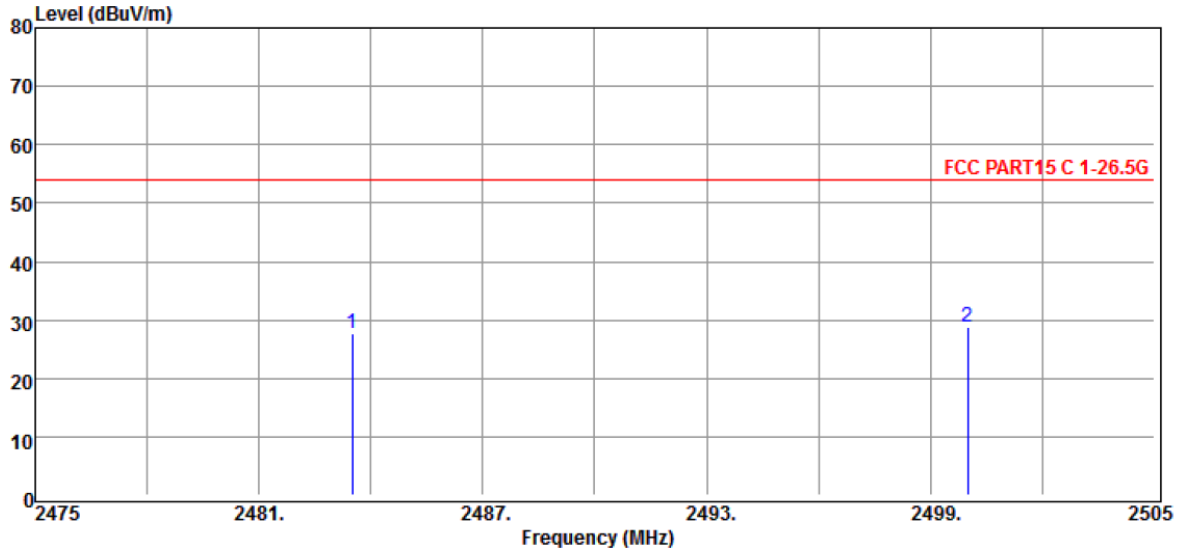
Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:

   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Band-Edge Test Data (Upper Edge)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	39	Frequency	:	2480 MHz
Test Mode	:	3 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Horizontal	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	2483.500	43.28	-15.71	27.57	54.00	-26.43	HORIZONTAL	Peak
2	2500.000	44.42	-15.57	28.85	54.00	-25.15	HORIZONTAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

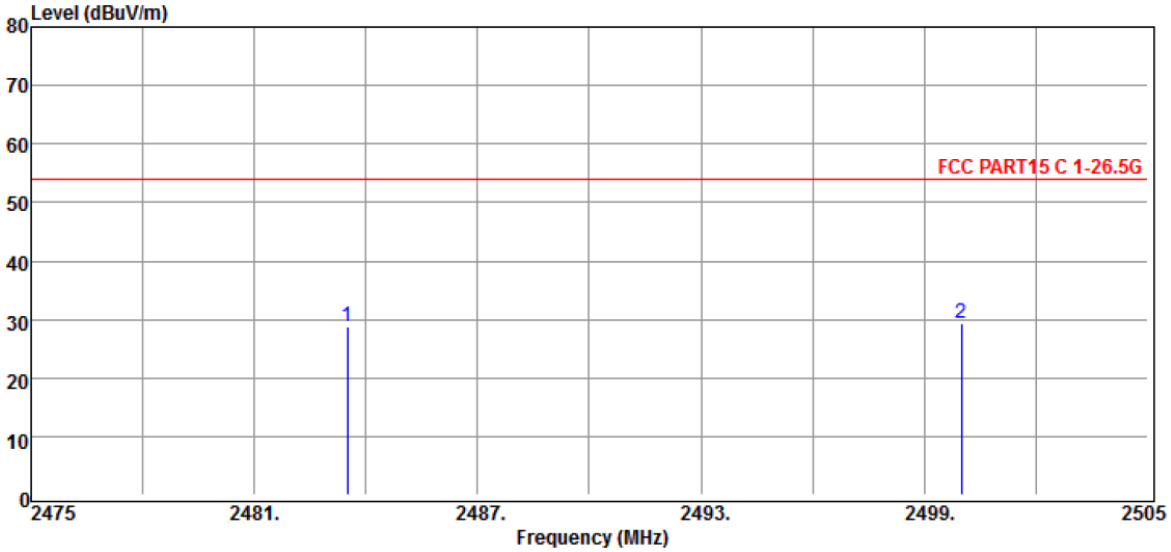
Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

Band-Edge Test Data (Upper Edge)

Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	39	Frequency	:	2480 MHz
Test Mode	:	3 (1Mbps)	Tested by	:	Tony Huang
Polarization	:	Vertical	EUT Position	:	X axis



No.	Freq	Reading	C.F	Result	Limit	Margin	Antenna	Remark
	MHz	dBµV	dB/m	dBµV/m	dBµV/m	dB	Pol.	
1	2483.500	44.47	-15.71	28.76	54.00	-25.24	VERTICAL	Peak
2	2500.000	44.91	-15.57	29.34	54.00	-24.66	VERTICAL	Peak

Note 1. C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain.

Note 2. Margin = Result - Limit ; Result = Reading + C.F.

Remark：

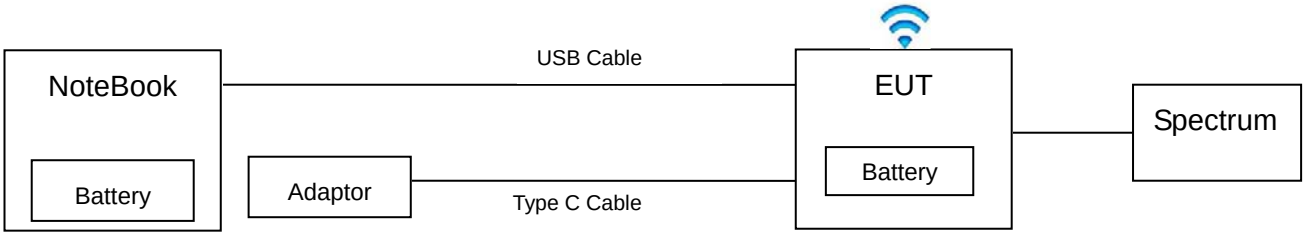
1. Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.
2. Measurements above show only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20dB from the applicable limit) and considered that's already beyond the background noise floor.
3. Radiated emissions measured in frequency above 1000 MHz were made with an instrument using Peak detector mode and average detector mode of the emission shown in Actual FS column.
4. All readings are Peak values. None of the peak value reading exceeds the A.V. limit. Hence, A.V. reading was not measured.
5. Spectrum setting:
   (a) Peak Setting 1GHz to 10th harmonics of fundamental, RBW = VBW = 1MHz, Sweep = AUTO.

5 20 dB Bandwidth

5.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

5.2 Test Arrangement and Procedure



1. The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).
2. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. Measured the -20 dB bandwidth and plotted the graph.

5.3 Limit

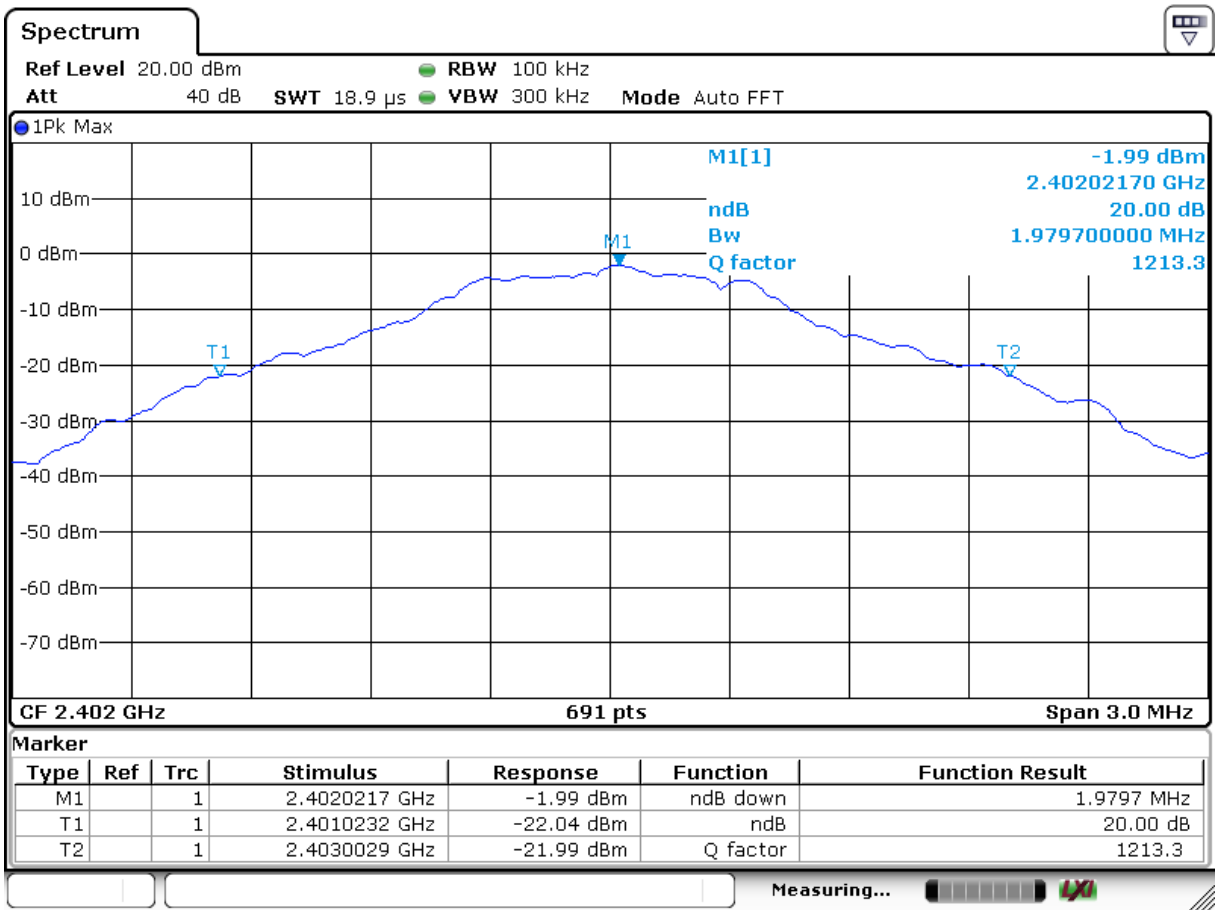
None; For report purpose only.

5.4 Test Result

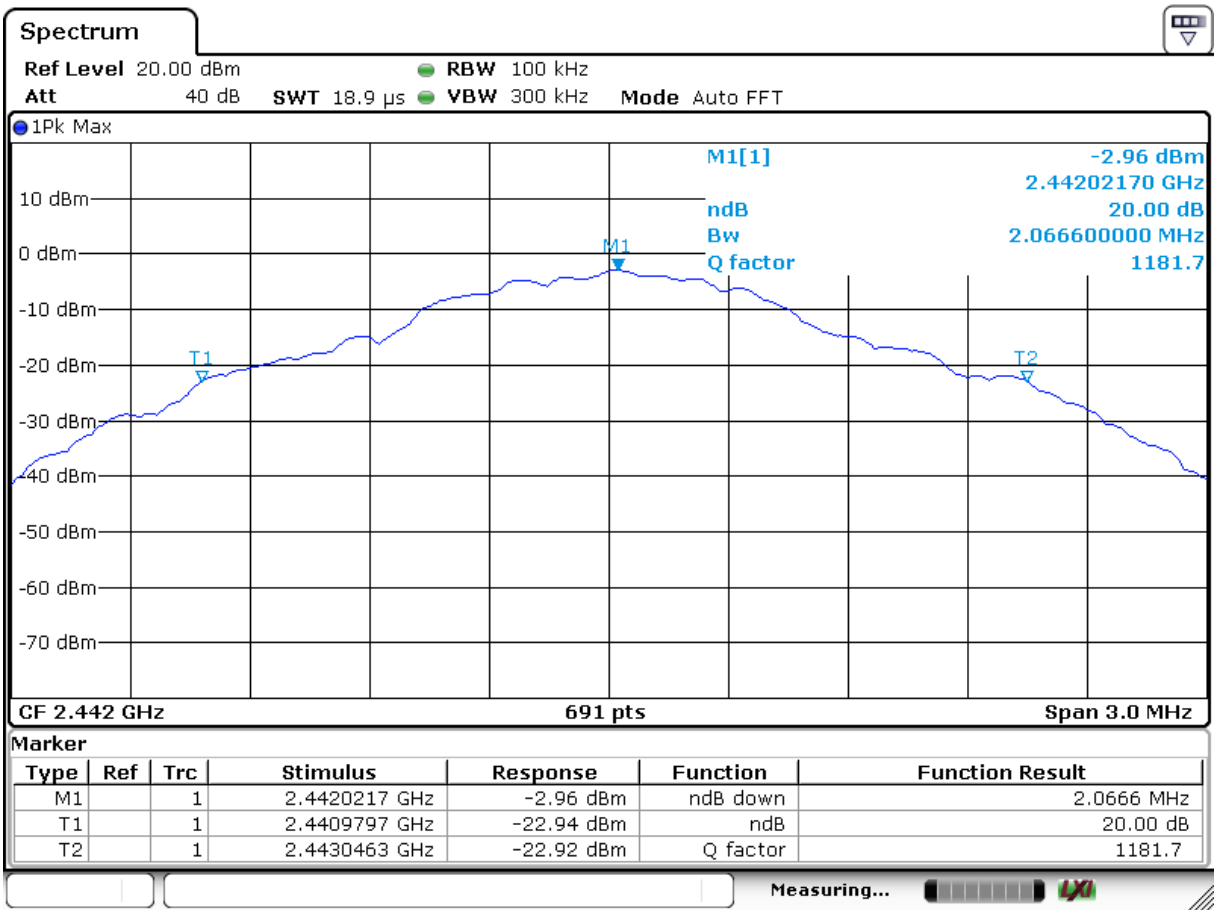
No non-compliance noted.

The final test data are shown on the following page(s).

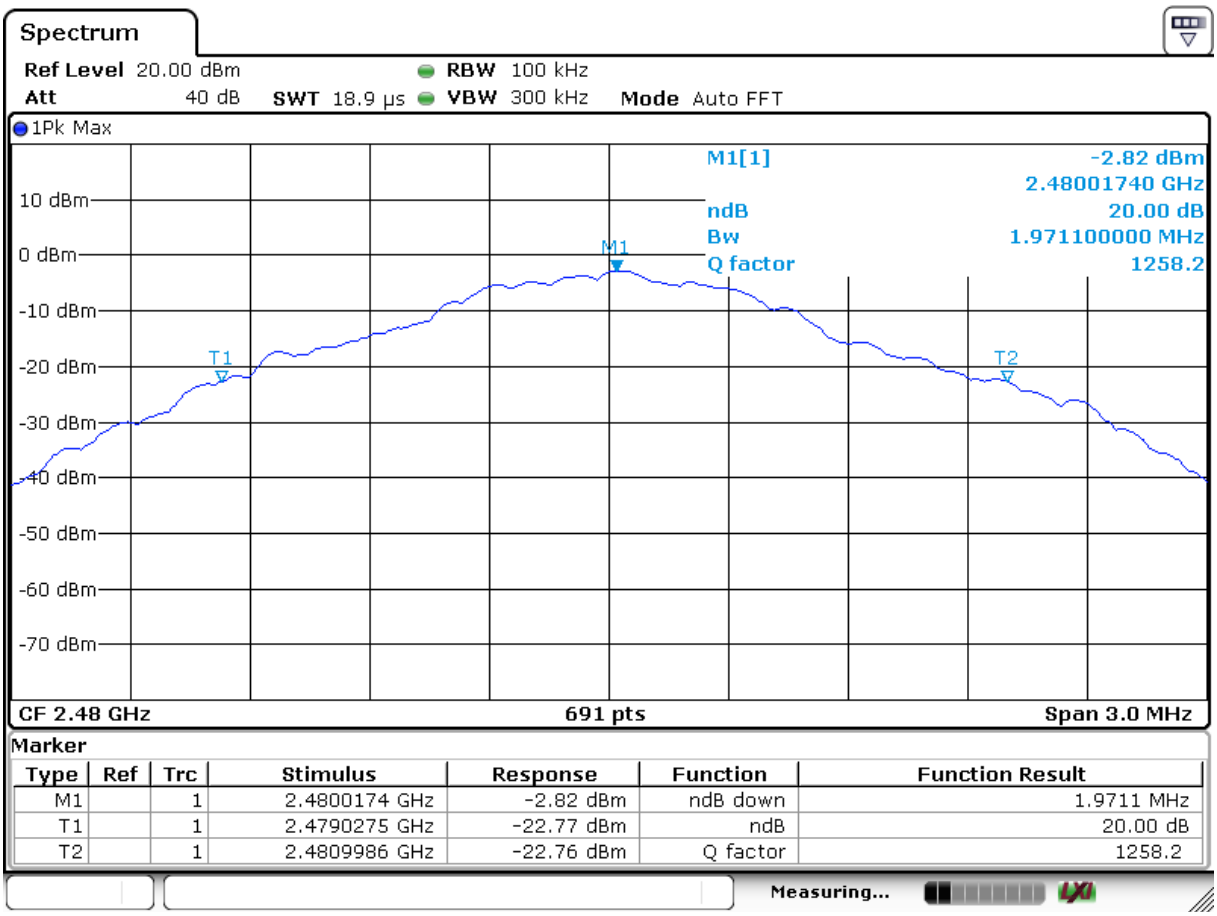
Test Site	:	HA2	Test Date	:	2022-08-31
Temperature	:	24℃	Humidity	:	58%
Channel	:	00	Frequency	:	2402 MHz
Test Mode	:	1 (1Mbps)	Tested by	:	Tony Huang



Test Mode : 2 Channel : 20



Test Mode : 3 Channel : 39



6 Antenna requirement

6.1 Limit (§ 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a uniue coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

6.2 Test Result

Compliance.

The EUT applies a Printed antenna.

----------End Of Test Report----------