



RF MEASUREMENT REPORT

FCC ID: HD5-IH45

Applicant: Honeywell International Inc.
Honeywell Safety and Productivity Solutions

Product: Handheld UHF RFID Reader

Model No.: IH45

Brand Name: Honeywell

FCC Classification: Digital Transmission System (DTS)

FCC Rule Part(s): Part 15 Subpart C (Section 15.247)

Result: Complies

Received Date: 2023-01-13

Test Date: 2023-03-07 ~ 2023-04-12

Reviewed By:

Jame Yuan

Approved By:

Robin Wu



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2212RSU051-U1	V01	Initial Report	2023-04-12	Valid

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1. General Information

1.1. Applicant

Honeywell International Inc.
Honeywell Safety and Productivity Solutions
9680 Old Baires Road, Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc.
Honeywell Safety and Productivity Solutions
9680 Old Baires Road, Fort Mill, SC 29707 United States

1.3. Testing Facility

☒	Test Site – MRT Suzhou Laboratory Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian’edang Rd., Wuzhong Economic Development Zone, Suzhou, China Laboratory Location (Suzhou - SIP) 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China Laboratory Accreditations A2LA: 3628.01 CNAS: L10551 FCC: CN1166 ISED: CN0001 VCCI: ☐ R-20025 ☐ G-20034 ☐ C-20020 ☐ T-20020 ☐ R-20141 ☐ G-20134 ☐ C-20103 ☐ T-20104
☒	Test Site – MRT Shenzhen Laboratory Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China Laboratory Accreditations A2LA: 3628.02 CNAS: L10551 FCC: CN1284 ISED: CN0105
☐	Test Site – MRT Taiwan Laboratory Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Laboratory Accreditations TAF: L3261-190725 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Handheld UHF RFID Reader
Model No.	IH45
EUT Identification No.	20230303Sample#06
Bluetooth Specification	BLE Only
RFID Specification	902MHz ~ 928MHz (UHF RFID)
Working Voltage	Power by Li-ion Battery
Accessories	
Home Base	Model No.: CT40-HB Input Power: 12V, 3A Output Power: 5V, 2A
Rechargeable Li-ion Battery	Model No.: BAT-EDA50US Capacitance: 15.2Wh, 4000mAh Rated Voltage: 3.8V
Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Radio Specification under Test

Bluetooth Frequency	2402 ~ 2480MHz
Channel Number	40
Type of modulation	GFSK
Data Rate	1Mbps & 2Mbps
Antenna Type	PIFA Antenna
Antenna Gain	1.85dBi

1.6. Working Frequencies

Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz
03	2408 MHz	04	2410 MHz	05	2412 MHz
06	2414 MHz	07	2416 MHz	08	2418 MHz
09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz
15	2432 MHz	16	2434 MHz	17	2436 MHz
18	2438 MHz	19	2440 MHz	20	2442 MHz
21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz
27	2456 MHz	28	2458 MHz	29	2460 MHz
30	2462 MHz	31	2464 MHz	32	2466 MHz
33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz
39	2480 MHz	--	--	--	--

2. Test Configuration

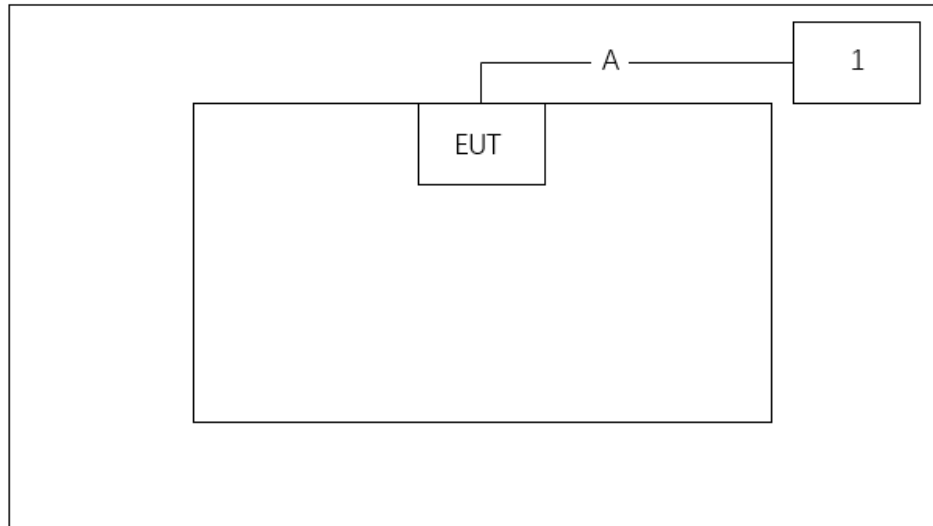
2.1. Test Mode

Mode 1: Transmit by BLE-1Mbps
Mode 2: Transmit by BLE-2Mbps

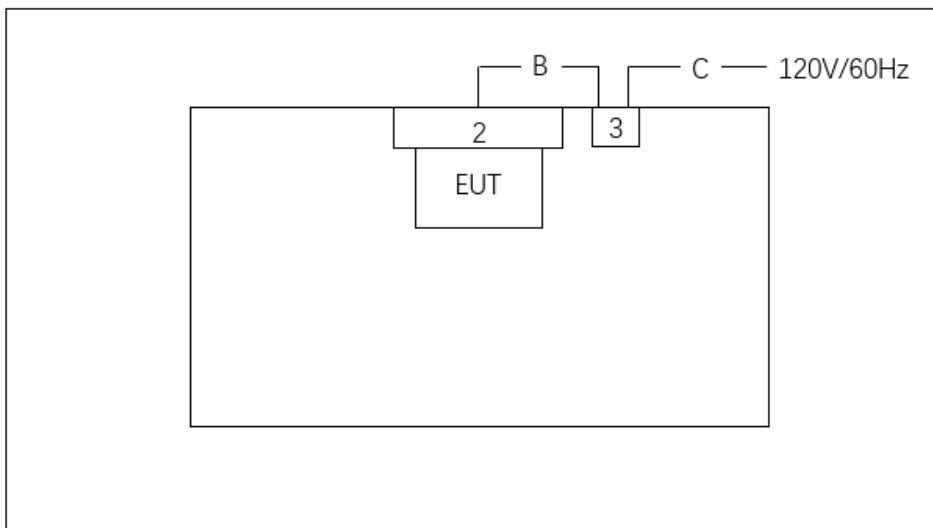
2.1. Test System Connection Diagram

The device was tested per the guidance ANSI C63.10: 2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram – Radiated Emission testing



Connection Diagram – AC Conducted Emissions



Cable Type		Cable Spec.	Length
A	USB Cable	Shielding	>10.0m
B	Power Cable	Non-Shielding	1.2m
C	Power Cable	Non-Shielding	1.5m
Product		Manufacturer	Model No.
1	Notebook	Lenovo	E431
2	Home Base	Honeywell	CT40-HB
3	Adapter	SHENZHEN HONOR	ADS-65LSI-12-1 12036E

2.2. Test Software

The test utility software used during testing was “RF Testing Tool”, and the version was 1.1.0.87.

2.3. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15.247
- KDB 558074 D01v05r02
- ANSI C63.10-2013

2.4. Test Environment Condition

Ambient Temperature	15 ~ 35°C
Relative Humidity	20 ~75%RH

3. Antenna Requirements

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

Conclusion:

The unit complies with the requirement of §15.203.

4. Measuring Instrument

Instrument	Manufacturer	Model No.	Asset No.	Cali. Interval	Cali. Due Date	Test Site
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06292	1 year	2023-10-18	NS-AC1
Anechoic Chamber	BOOMWAVE	NS-AC1	MRTSUE06496	1 year	2023-07-23	NS-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06572	1 year	2023-04-01	NS-AC1
				1 year	2024-03-31	NS-AC1
TRILOG Antenna	Schwarzbeck	VULB 9162	MRTSUE06573	1 year	2023-06-21	NS-AC1
Preamplifier	Schwarzbeck	BBV 9718	MRTSUE06574	1 year	2023-07-11	NS-AC1
EMI Test Receiver	R&S	ESR3	MRTSUE06575	1 year	2023-06-19	NS-AC1
Preamplifier	EMCI	EMC184045SE	MRTSUE06641	1 year	2024-01-12	NS-AC1
Thermohygrometer	testo	608-H1	MRTSUE11020	1 year	2023-05-15	NS-AC1
Thermohygrometer	testo	608-H1	MRTSUE11104	1 year	2023-05-03	NS-AC1
Signal Analyzer	Keysight	N9020A	MRTSUE10065	1 year	2023-12-20	NS-AC1/NS-TR2
USB Power Sensor	Keysight	U2021XA	MRTSUE06581	1 year	2023-07-13	NS-TR2
Thermohygrometer	DELI	NO.8813	MRTSUE06783	1 year	2023-12-28	NS-TR2
Attenuator	MVE	MVE2213	MRTSUE11069	1 year	2023-06-09	NS-TR2
EMI Test Receiver	R&S	ESR7	MRTSUE06001	1 year	2023-12-28	WZ-AC1
Horn Antenna	Schwarzbeck	BBHA 9120D	MRTSUE06023	1 year	2023-08-22	WZ-AC1
Preamplifier	Agilent	83017A	MRTSUE06076	1 year	2023-05-08	WZ-AC1
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06172	1 year	2023-06-21	WZ-AC1
Anechoic Chamber	TDK	WZ-AC1	MRTSUE06212	1 year	2023-04-21	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE06403	1 year	2023-06-06	WZ-AC1
Signal Analyzer	Keysight	N9010B	MRTSUE06607	1 year	2023-12-28	WZ-AC1
Thermohygrometer	testo	608-H1	MRTSUE11039	1 year	2023-11-01	WZ-AC1
Loop Antenna	Schwarzbeck	FMZB 1519	MRTSUE06025	1 year	2023-09-29	WZ-AC1
Two-Line V-Network	R&S	ENV216	MRTSUE06002	1 year	2023-06-04	WZ-SR2
Shielding Room	MIX-BEP	WZ-SR2	MRTSUE06215	5 years	2026-12-20	WZ-SR2
Thermohygrometer	testo	608-H1	MRTSUE06404	1 year	2023-06-06	WZ-SR2
Four-Line V-Network	R&S	ENV432	MRTSUE06615	1 year	2023-10-08	WZ-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06909	1 year	2023-10-27	WZ-SR2

Software	Version	Function
EMI V3	V 3.0.0	EMI Test Software
Agilent Power Panel	V 3.9	Power
Controller_T-E-TAC-2	1.02	RE Antenna & Turntable
Controller_MF 7802	2.03C	RE Antenna & Turntable

5. Decision Rules and Measurement Uncertainty

5.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.
(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
The maximum measurement uncertainty is evaluated as: 9kHz~150kHz: 3.58dB 150kHz~30MHz: 3.20dB
Radiated Disturbance
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.59dB Coplanar: 9kHz~30MHz: 2.60dB Horizontal: 30MHz~200MHz: 3.85dB 200MHz~1GHz: 4.36dB 1GHz~40GHz: 4.98dB Vertical: 30MHz~200MHz: 4.06dB 200MHz~1GHz: 5.28dB 1GHz~40GHz: 4.91dB
Spurious Emissions, Conducted
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.3dB
Output Power
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 1.5dB
Power Spectrum Density
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 2.3dB
Occupied Bandwidth
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 3.2%

6. Test Result

6.1. Summary

FCC Section(s)	Test Description	Test Condition	Verdict
15.247(a)(2)	6dB Bandwidth	Conducted	Pass
15.247(b)(3)	Output Power		Pass
15.247(e)	Power Spectral Density		Pass
15.247(d)	Band Edge / Out-of-Band Emissions		Pass
15.205 15.209	General Field Strength (Restricted Bands and Radiated Emission)	Radiated	Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Notes:

1. The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
2. For radiated emission test, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

6.2. 6dB Bandwidth Measurement

6.2.1. Test Limit

The minimum 6dB bandwidth shall be at least 500 kHz.

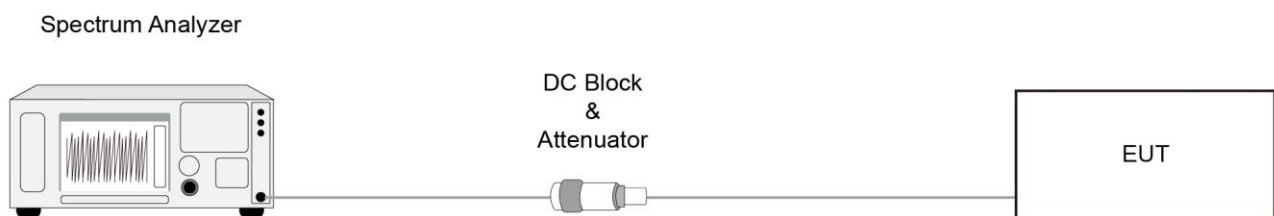
6.2.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.8

6.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 6$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3. $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

6.2.4. Test Setup



6.2.5. Test Result

Refer to Appendix A.2.

6.3. Output Power Measurement

6.3.1. Test Limit

The maximum output power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

6.3.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.9.1.3

ANSI C63.10 - 2013 - Section 11.9.2.3.2

6.3.3. Test Setting

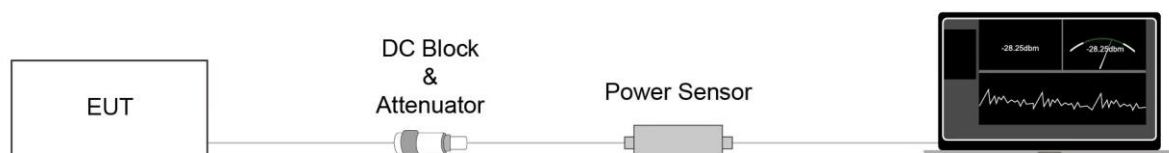
Method PKPM1 (Peak Power Measurement of Signals with DTS BW $\leq$ 50MHz)

Peak power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The pulse sensor employs a VBW = 50MHz so this method was only used for signals whose DTS bandwidth was less than or equal to 50MHz.

Average Power Measurement

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

6.3.4. Test Setup



6.3.5. Test Result

Refer to Appendix A.3.

6.4. Power Spectral Density Measurement

6.4.1. Test Limit

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

The same method of determining the conducted output power shall be used to determine the power spectral density.

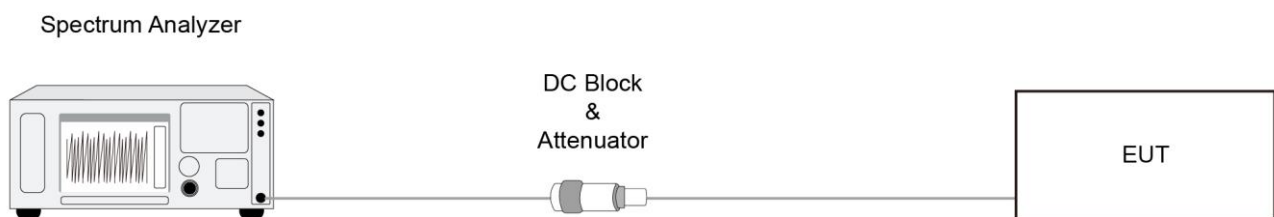
6.4.2. Test Procedure

ANSI C63.10-2013 Section 11.10.2

6.4.3. Test Setting

1. Analyzer was set to the center frequency of the DTS channel under investigation
2. Span = 1.5 times the DTS channel bandwidth
3. RBW = 3kHz
4. VBW = 10kHz
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Trace was allowed to stabilize

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.4.

6.5. Conducted Band Edge and Out-of-Band Emissions Measurement

6.5.1. Test Limit

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

6.5.2. Test Procedure

ANSI C63.10-2013 - Section 11.11

6.5.3. Test Setting

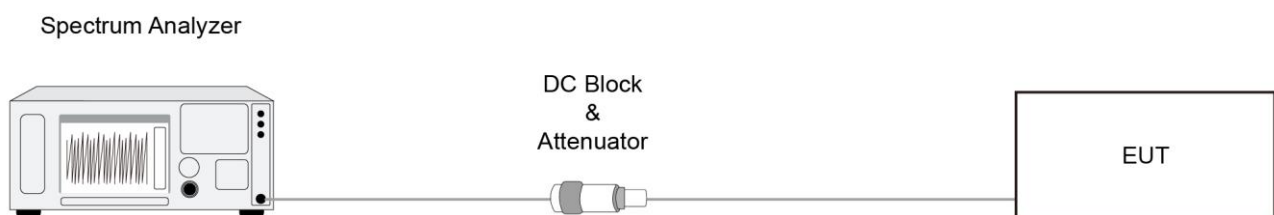
Reference level measurement

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to ≥ 1.5 times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW $\geq 3 \times$ RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

Emission level measurement

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

6.5.4. Test Setup



6.5.5. Test Result

Refer to Appendix A.5.

6.6. Radiated Spurious Emission Measurement

6.6.1. Test Limit

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.6.2. Test Procedure

ANSI C63.10 - 2013 - Section 11.11 & 11.12

ANSI C63.10 - 2013 - Section 6.3 (General Requirements)

ANSI C63.10 - 2013 - Section 6.4 (Standard test method below 30MHz)

ANSI C63.10 - 2013 - Section 6.5 (Standard test method above 30MHz to 1GHz)

ANSI C63.10 - 2013 - Section 6.6 (Standard test method above 1GHz)

6.6.3. Test Setting

Table 1 - RBW as a function of frequency

Frequency	RBW
9 ~ 150 kHz	200 ~ 300 Hz
0.15 ~ 30 MHz	9 ~ 10 kHz
30 ~ 1000 MHz	100 ~ 120 kHz
> 1000MHz	1MHz

Quasi-Peak Measurements below 1GHz

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

Peak Measurements above 1GHz

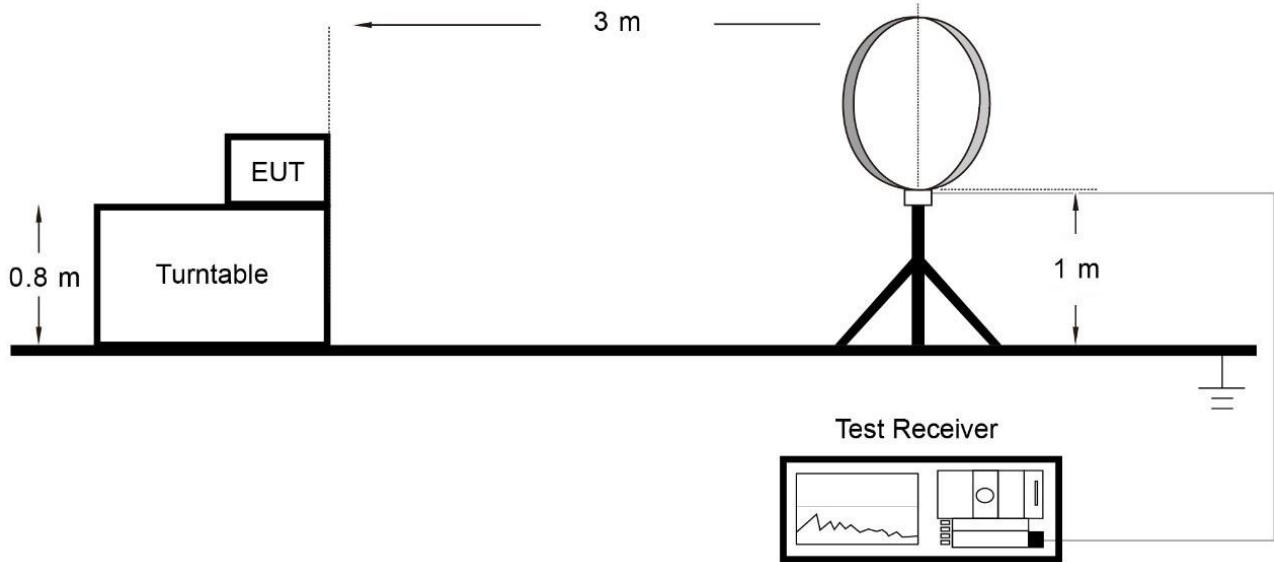
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Measurements above 1GHz (Method VB)

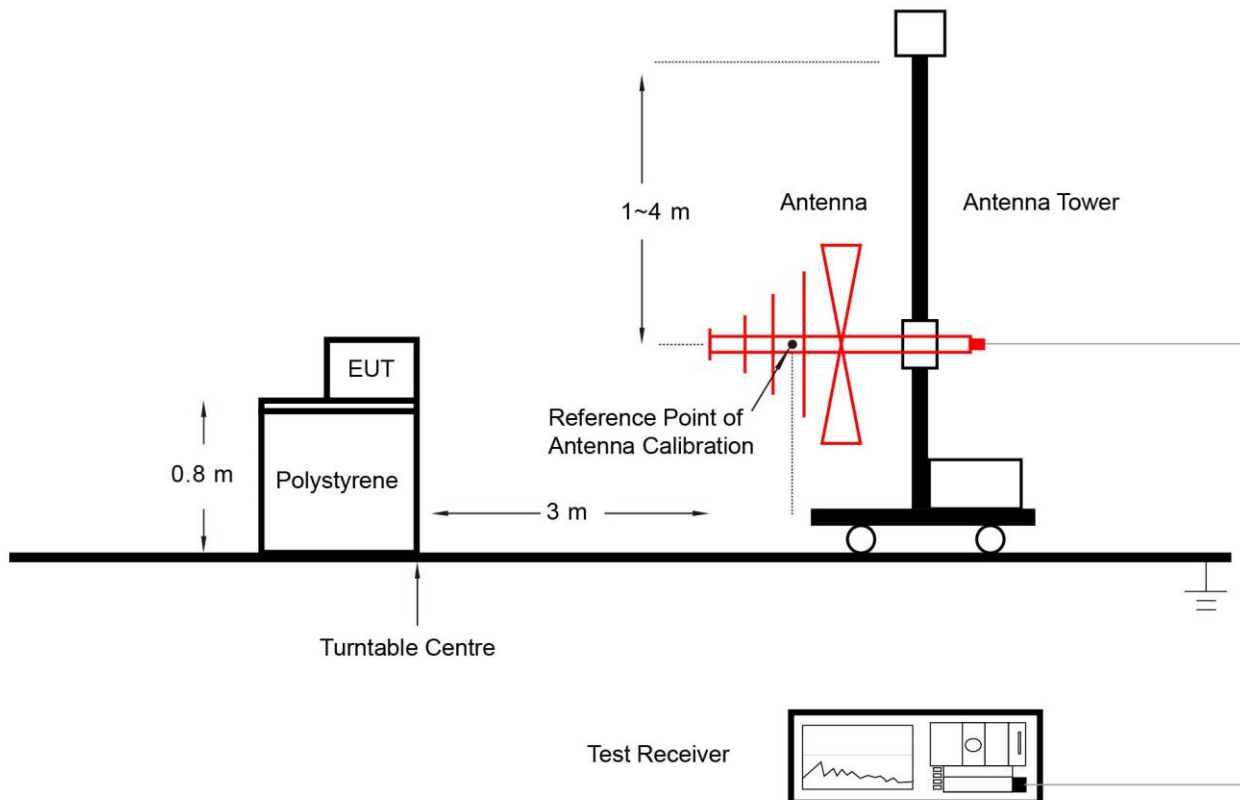
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW; If the EUT is configured to transmit with duty cycle $\geq 98\%$, set VBW = 10 Hz.
If the EUT duty cycle is $< 98\%$, set VBW $\geq 1/T$. T is the minimum transmission duration.
4. Detector = Peak
5. Sweep time = auto
6. Trace mode = max hold
7. Trace was allowed to stabilize

6.6.4. Test Setup

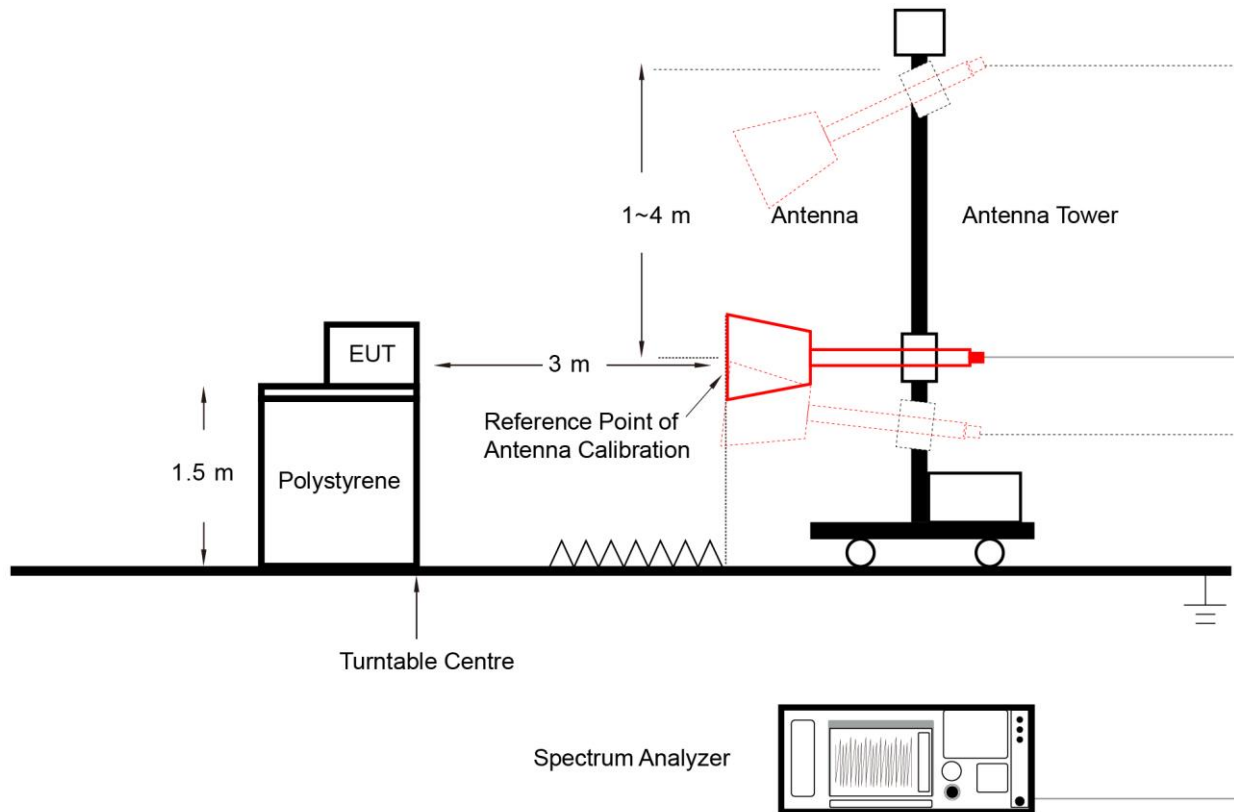
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



6.6.5. Test Result

Refer to Appendix A.6.

6.7. Radiated Restricted Band Edge Measurement

6.7.1. Test Limit

For 15.205 requirement:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a) of FCC part 15, must also comply with the radiated emission limits specified in Section 15.209(a).

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (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
8.37625 - 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	--	--	--

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47CFR must not exceed the limits shown in Table per Section 15.209.

FCC Part 15 Subpart C Paragraph 15.209		
Frequency [MHz]	Field Strength [uV/m]	Measured Distance [Meters]
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 - 30	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

6.7.2. Test Procedure

ANSI C63.10-2013 Section 6.3 & 6.6 & 11.13

6.7.3. Test Setting

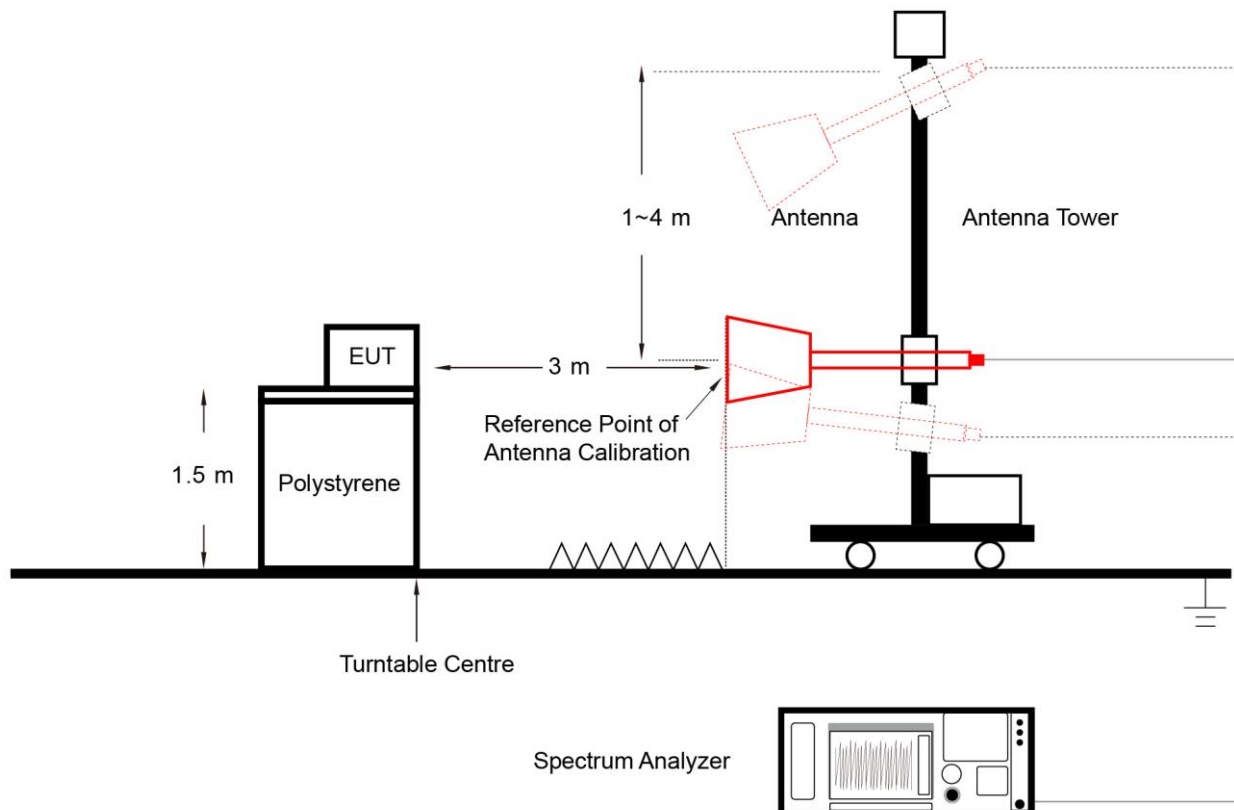
Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW $\geq 1/T$
4. As an alternative, the instrument may be set to linear detector mode. Ensure that video filtering is applied in linear voltage domain (rather than in a log or dB domain). Some instruments require linear display mode in order to accomplish this. Others have a setting for Average-VBW Type, which can be set to "Voltage" regardless of the display mode
5. Detector = Peak
6. Sweep time = auto
7. Trace mode = max hold
8. Allow max hold to run for at least 50 times (1/duty cycle) traces

6.7.4. Test Setup



6.7.5. Test Result

Refer to Appendix A.7.

6.8. AC Conducted Emissions Measurement

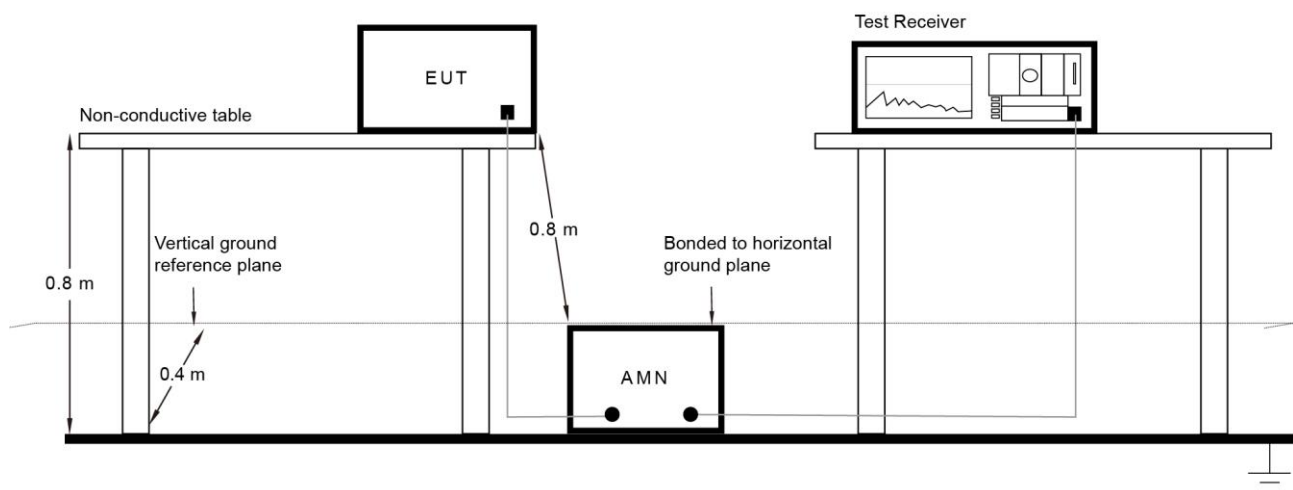
6.8.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz.

6.8.2. Test Setup



6.8.3. Test Result

Refer to Appendix A.8.

Appendix A - Test Result

A.1 Duty Cycle Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2023-04-10		

Test Mode	Duty Cycle
BLE-1Mbps	61.96%
BLE-2Mbps	31.41%
Duty Cycle (T = Transmission Duration)	
BLE-1Mbps (T = 387.6µs)	BLE-2Mbps (T = 197.2µs)



Marker 3 Δ 625.600 µs

Ref Offset 11.6 dB
Ref 20.00 dBm

ΔMkr3 625.6 µs
0.04 dB

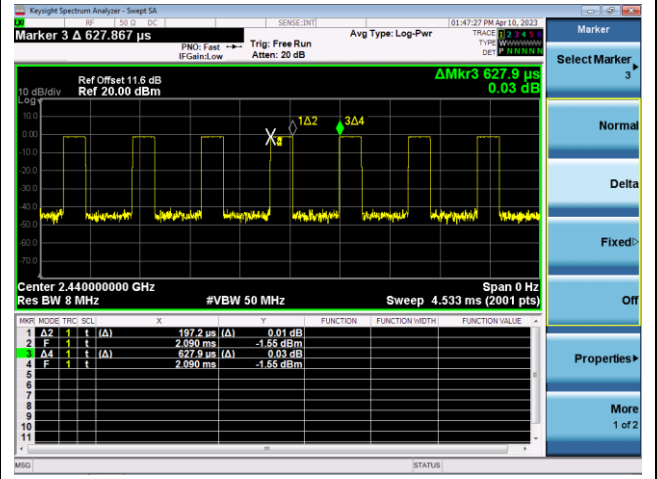
Center 2.440000000 GHz
Res BW 8 MHz
#VBW 50 MHz
Sweep 4.533 ms (2001 pts)

Marker 3 Δ 625.600 µs

Ref Offset 11.6 dB
Ref 20.00 dBm

ΔMkr3 625.6 µs
0.04 dB

Center 2.440000000 GHz
Res BW 8 MHz
#VBW 50 MHz
Sweep 4.533 ms (2001 pts)



Marker 3 Δ 627.867 µs

Ref Offset 11.6 dB
Ref 20.00 dBm

ΔMkr3 627.9 µs
0.03 dB

Center 2.440000000 GHz
Res BW 8 MHz
#VBW 50 MHz
Sweep 4.533 ms (2001 pts)

Marker 3 Δ 627.867 µs

Ref Offset 11.6 dB
Ref 20.00 dBm

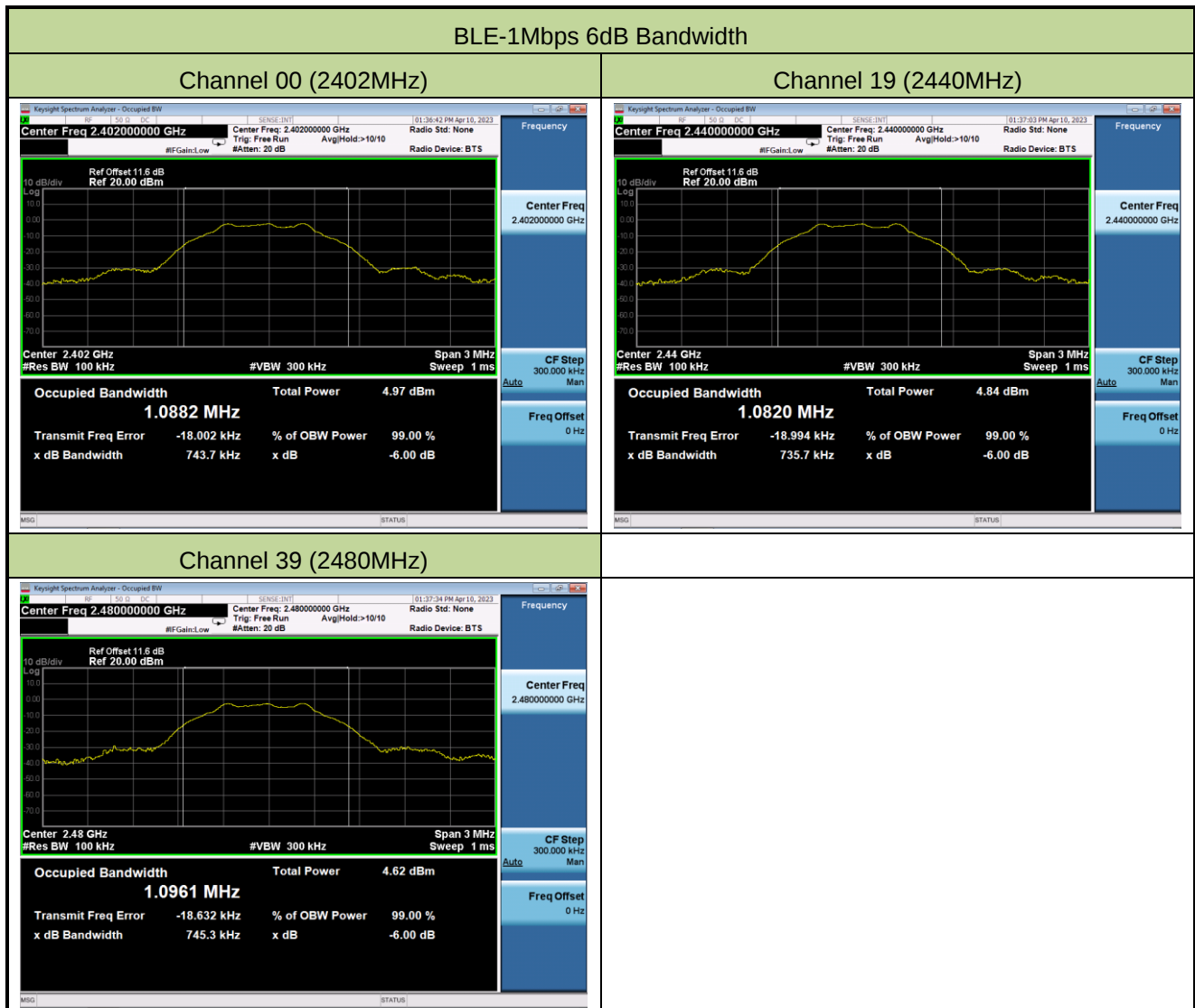
ΔMkr3 627.9 µs
0.03 dB

Center 2.440000000 GHz
Res BW 8 MHz
#VBW 50 MHz
Sweep 4.533 ms (2001 pts)

A.2 6dB Bandwidth Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2023-04-10		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
BLE	1Mbps	00	2402	0.7437	≥ 0.5
BLE	1Mbps	19	2440	0.7357	≥ 0.5
BLE	1Mbps	39	2480	0.7453	≥ 0.5
BLE	2Mbps	00	2402	1.275	≥ 0.5
BLE	2Mbps	19	2440	1.270	≥ 0.5
BLE	2Mbps	39	2480	1.276	≥ 0.5



BLE-2Mbps 6dB Bandwidth

Channel 00 (2402MHz)



Channel 19 (2440MHz)



Channel 39 (2480MHz)



A.3 Output Power Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2023-04-10		

Test Result of Peak Output Power

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Peak Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	-1.22	≤ 30.00	Pass
BLE	1Mbps	19	2440	-1.29	≤ 30.00	Pass
BLE	1Mbps	39	2480	-1.49	≤ 30.00	Pass
BLE	2Mbps	00	2402	-1.19	≤ 30.00	Pass
BLE	2Mbps	19	2440	-1.30	≤ 30.00	Pass
BLE	2Mbps	39	2480	-1.43	≤ 30.00	Pass

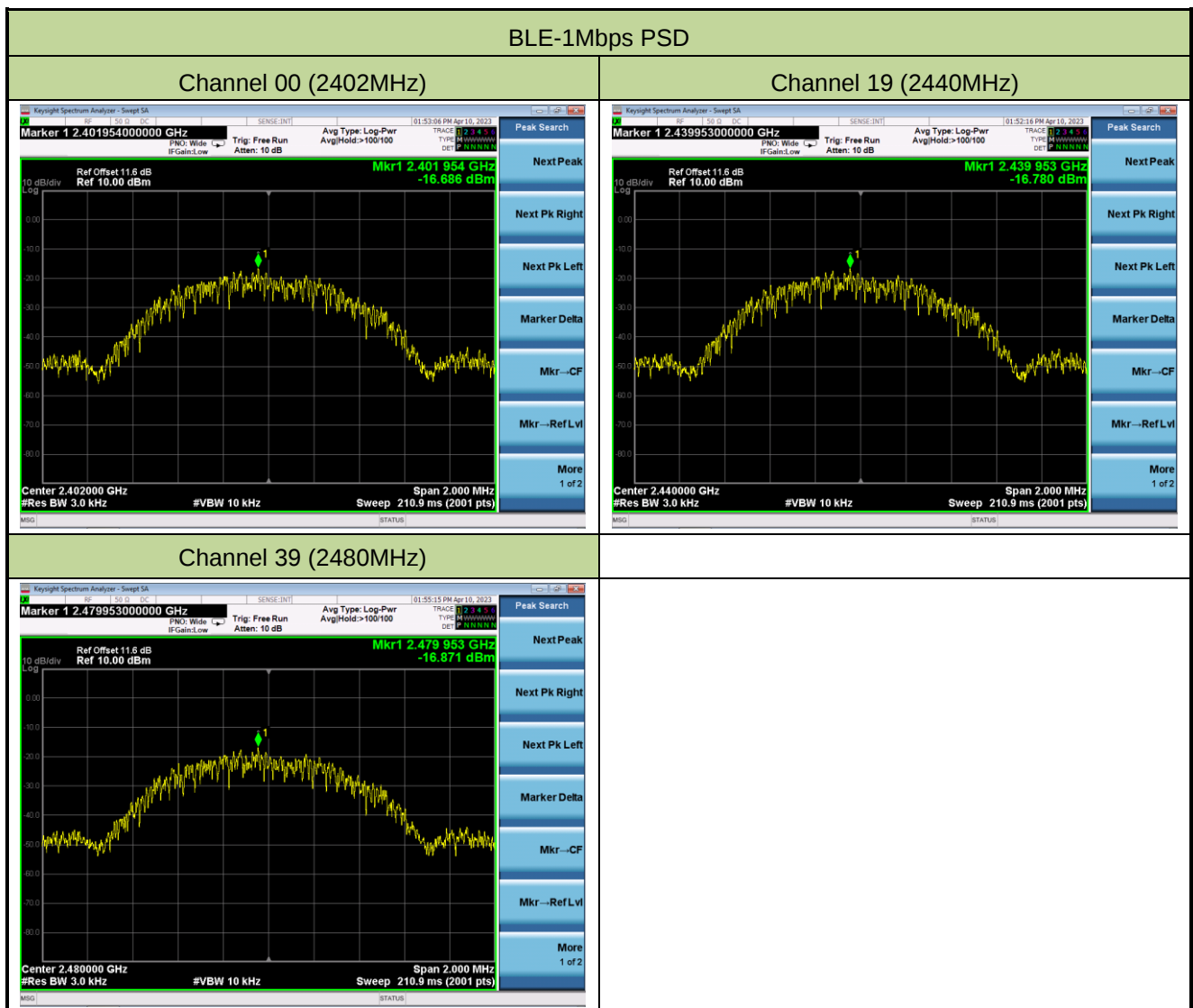
Test Result of Average Output Power (Reporting Only)

Test Mode	Data Rate	Channel No.	Frequency (MHz)	Average Power (dBm)	Limit (dBm)	Result
BLE	1Mbps	00	2402	-1.58	≤ 30.00	Pass
BLE	1Mbps	19	2440	-1.70	≤ 30.00	Pass
BLE	1Mbps	39	2480	-1.86	≤ 30.00	Pass
BLE	2Mbps	00	2402	-1.56	≤ 30.00	Pass
BLE	2Mbps	19	2440	-1.70	≤ 30.00	Pass
BLE	2Mbps	39	2480	-1.85	≤ 30.00	Pass

A.4 Power Spectral Density Test Result

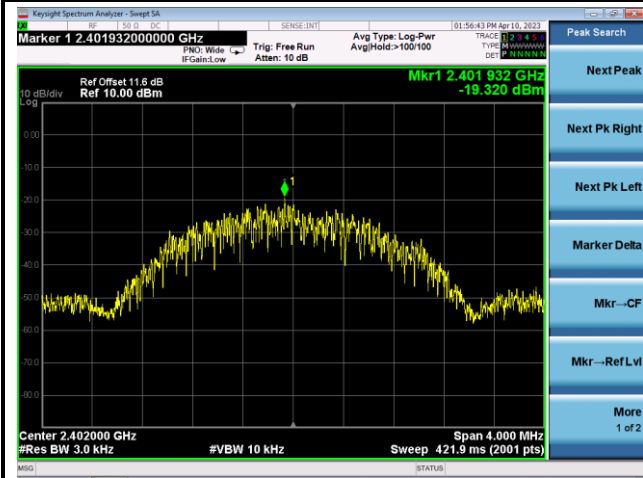
Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2023-04-10		

Test Mode	Data Rate	Channel No.	Frequency (MHz)	PSD Result (dBm / 3kHz)	Limit (dBm / 3kHz)	Result
BLE	1Mbps	00	2402	-16.686	≤ 8.00	Pass
BLE	1Mbps	19	2440	-16.780	≤ 8.00	Pass
BLE	1Mbps	39	2480	-16.871	≤ 8.00	Pass
BLE	2Mbps	00	2402	-19.320	≤ 8.00	Pass
BLE	2Mbps	19	2440	-19.439	≤ 8.00	Pass
BLE	2Mbps	39	2480	-19.601	≤ 8.00	Pass

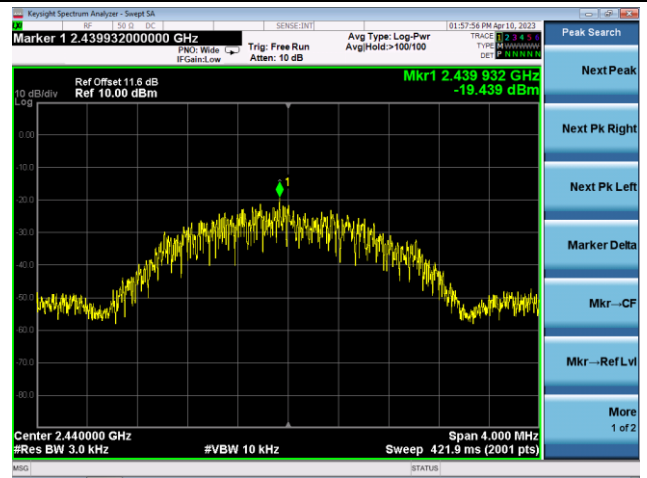


BLE-2Mbps PSD

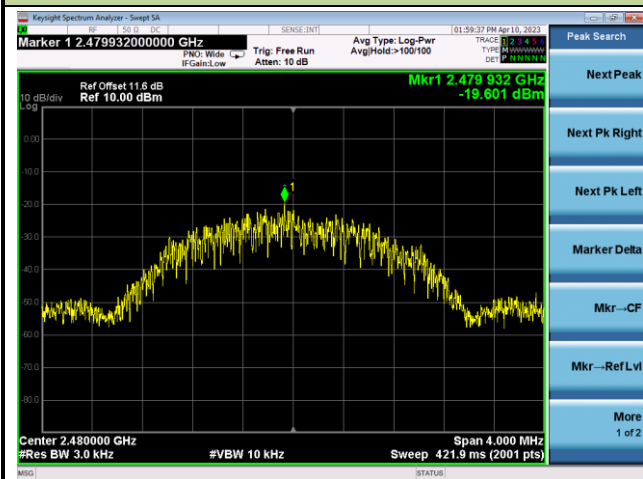
Channel 00 (2402MHz)



Channel 19 (2440MHz)



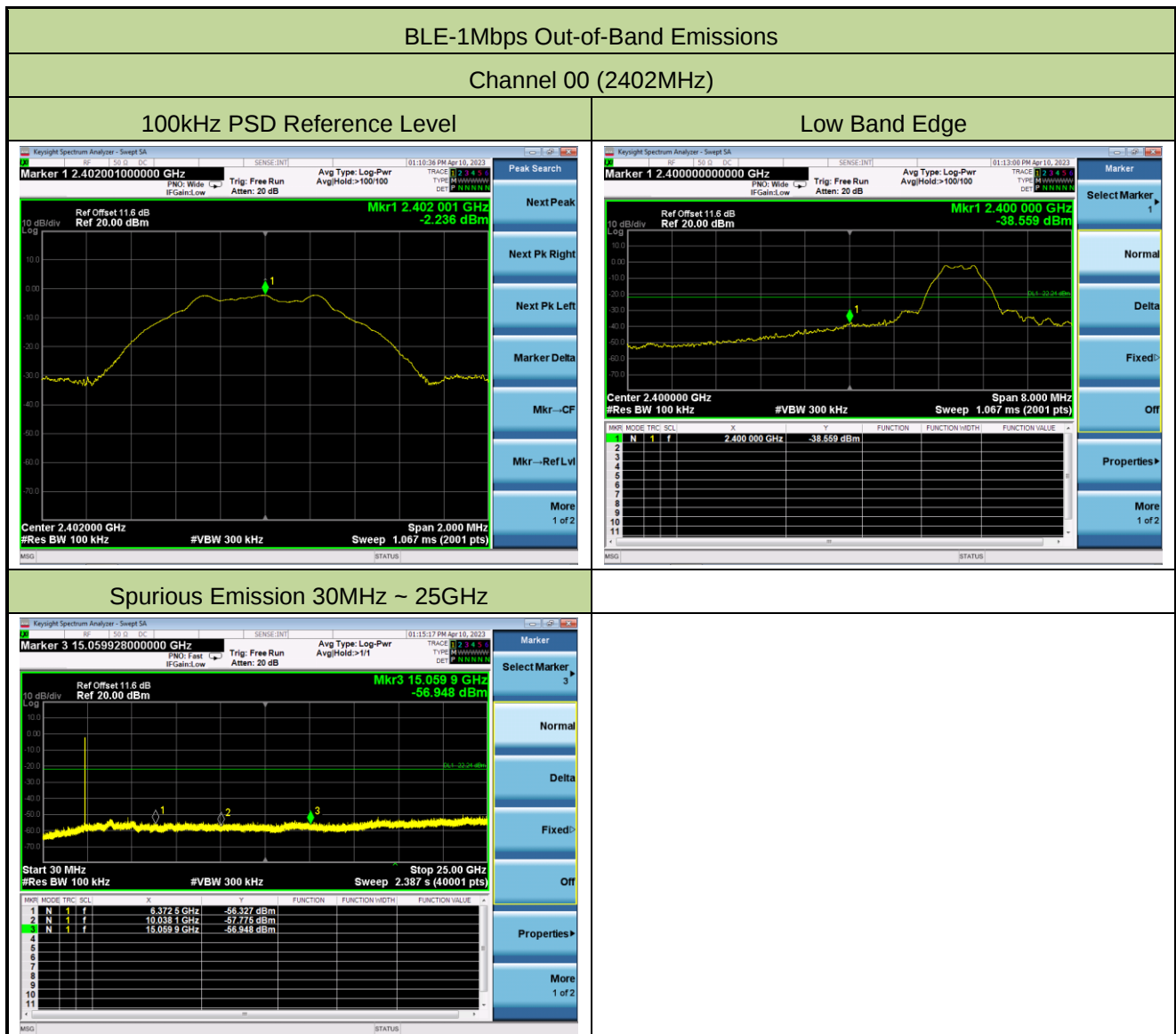
Channel 39 (2480MHz)



A.5 Conducted Band Edge and Out-of-Band Emissions Test Result

Test Site	NS-TR2	Test Engineer	Summer Tang
Test Date	2023-04-10		

Test Mode	Data Rate / Mbps	Channel No.	Frequency (MHz)	Limit (dBc)	Result
BLE	1	00	2402	20	Pass
BLE	1	19	2440	20	Pass
BLE	1	39	2480	20	Pass
BLE	2	00	2402	20	Pass
BLE	2	19	2440	20	Pass
BLE	2	39	2480	20	Pass

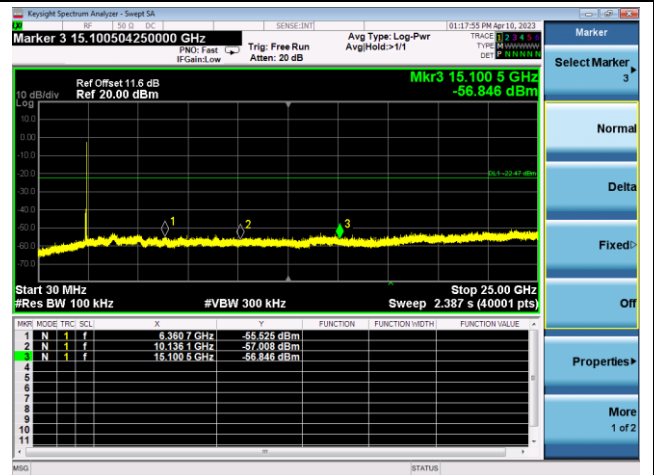


Channel 19 (2440MHz)

100kHz PSD Reference Level



Spurious Emission 30MHz ~ 25GHz



Channel 39 (2480MHz)

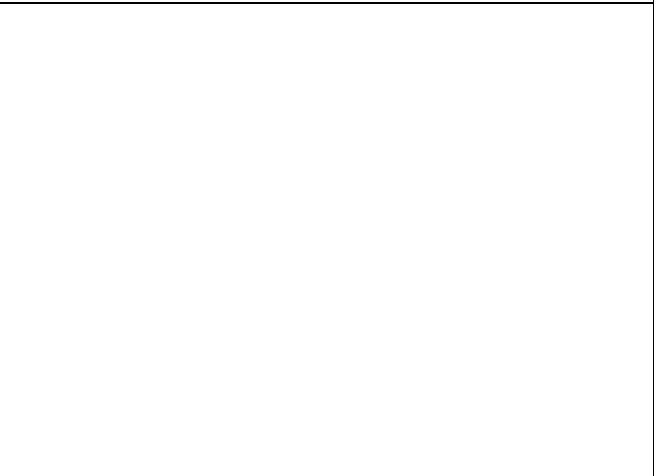
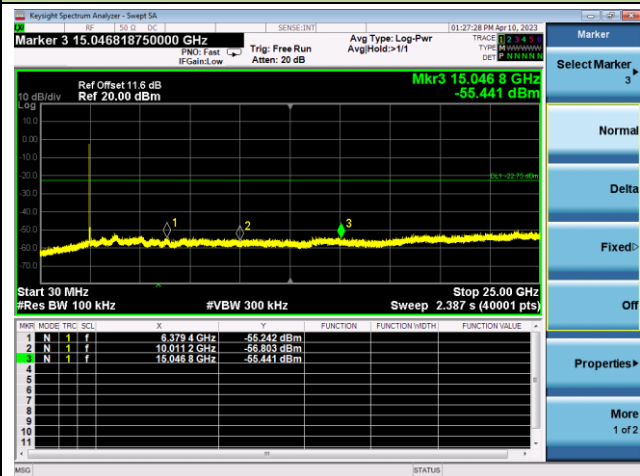
100kHz PSD Reference Level



High Band Edge



Spurious Emission 30MHz ~ 25GHz



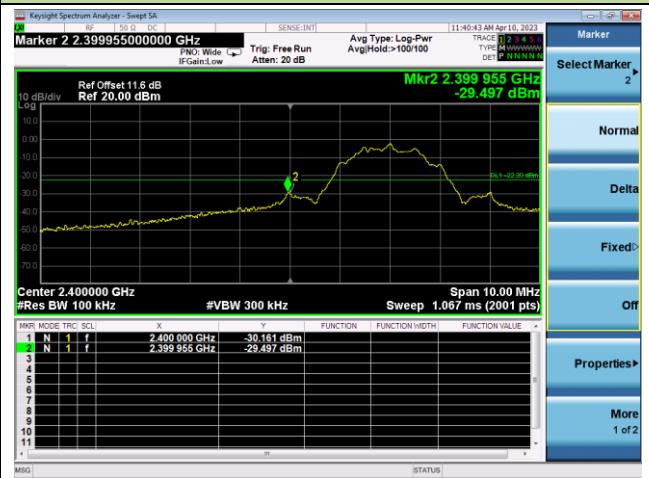
BLE-2Mbps Out-of-Band Emissions

Channel 00 (2402MHz)

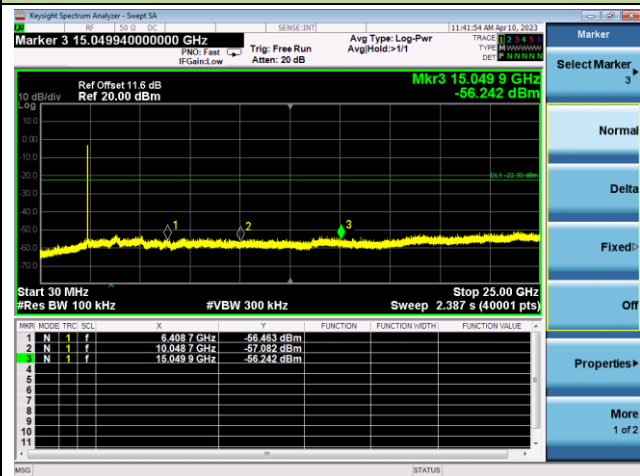
100kHz PSD Reference Level



Low Band Edge



Spurious Emission 30MHz ~ 25GHz

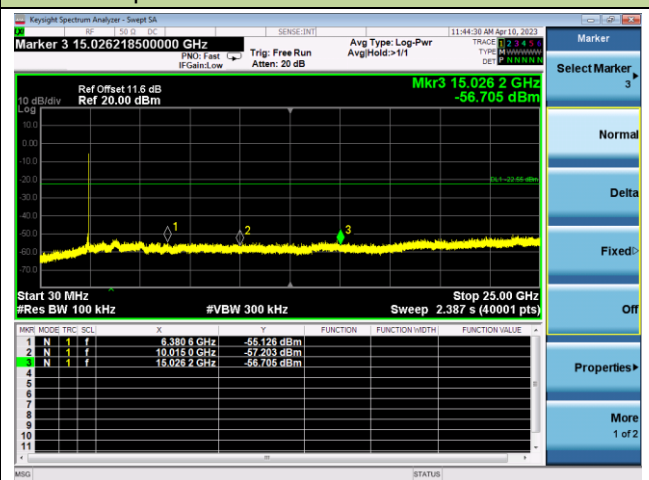


Channel 19 (2440MHz)

100kHz PSD Reference Level



Spurious Emission 30MHz ~ 25GHz

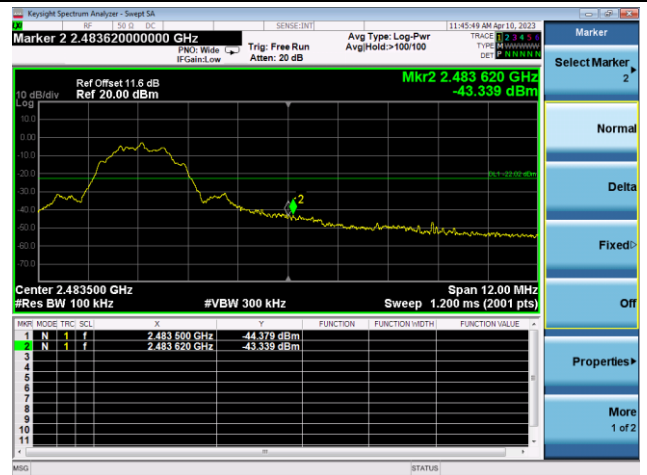


Channel 39 (2480MHz)

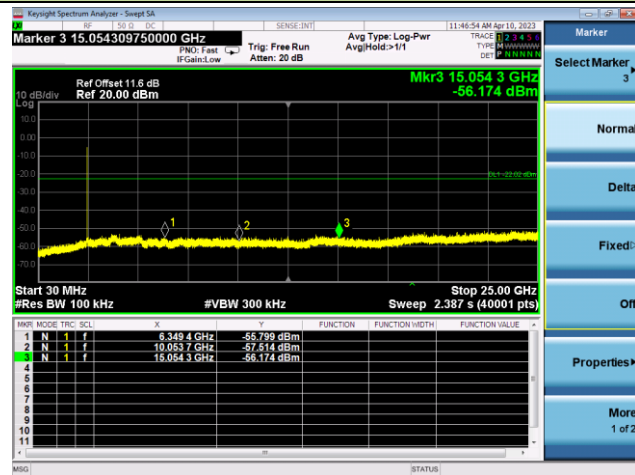
100kHz PSD Reference Level



High Band Edge



Spurious Emission 30MHz ~ 25GHz



A.6 Radiated Spurious Emission Test Result

Test Site	NS-AC1	Test Engineer	Ted Chen
Test Date	2023-03-16	Test Mode:	BLE-1Mbps
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	4808.0	44.0	1.5	45.5	74.0	-28.5	Peak	Horizontal
	7205.0	38.4	9.4	47.8	74.0	-26.2	Peak	Horizontal
	10792.0	36.5	14.9	51.4	74.0	-22.6	Peak	Horizontal
	4799.5	43.9	1.5	45.4	74.0	-28.6	Peak	Vertical
	7205.0	43.0	9.4	52.4	74.0	-21.6	Peak	Vertical
	7205.3	39.3	9.4	48.7	54.0	-5.3	AV	Vertical
	10724.0	36.0	14.8	50.8	74.0	-23.2	Peak	Vertical
19	4876.0	41.1	1.5	42.6	74.0	-31.4	Peak	Horizontal
	7587.5	36.8	9.5	46.3	74.0	-27.7	Peak	Horizontal
	11931.0	37.4	14.4	51.8	74.0	-22.2	Peak	Horizontal
	4884.5	43.3	1.5	44.8	74.0	-29.2	Peak	Vertical
	7315.5	39.9	9.5	49.4	74.0	-24.6	Peak	Vertical
	11038.5	36.1	15.2	51.3	74.0	-22.7	Peak	Vertical
39	4961.0	40.5	1.8	42.3	74.0	-31.7	Peak	Horizontal
	5156.5	39.7	2.6	42.3	74.0	-31.7	Peak	Horizontal
	10137.5	37.5	13.4	50.9	74.0	-23.1	Peak	Horizontal
	4961.0	42.7	1.8	44.5	74.0	-29.5	Peak	Vertical
	7222.0	37.0	9.2	46.2	74.0	-27.8	Peak	Vertical
	10613.5	36.6	14.4	51.0	74.0	-23.0	Peak	Vertical

Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

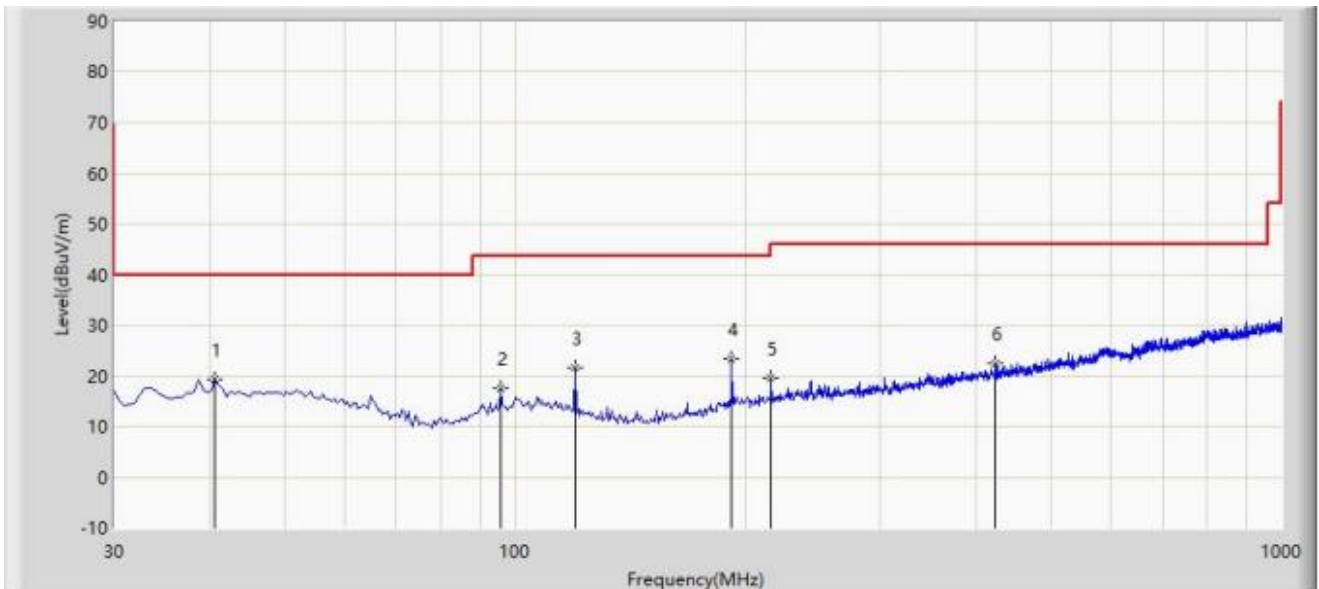
Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)

Test Site	NS-AC1	Test Engineer	Ted Chen
Test Date	2023-04-10	Test Mode:	BLE-2Mbps
Remark:	1. Average measurement was not performed if peak level lower than average limit. 2. Other frequency was 20dB below limit line within 1-18GHz, there is not show in the report.		

Test Channel	Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
00	4808.0	44.2	1.4	45.6	74.0	-28.4	Peak	Horizontal
	7205.0	37.7	9.5	47.2	74.0	-26.8	Peak	Horizontal
	8726.5	37.4	12.2	49.6	74.0	-24.4	Peak	Horizontal
	4799.5	41.0	1.5	42.5	74.0	-31.5	Peak	Vertical
	7205.0	40.2	9.5	49.7	74.0	-24.3	Peak	Vertical
	9398.0	37.9	11.8	49.7	74.0	-24.3	Peak	Vertical
19	4884.5	42.1	1.5	43.6	74.0	-30.4	Peak	Horizontal
	7876.5	39.0	9.1	48.1	74.0	-25.9	Peak	Horizontal
	10545.5	37.5	13.8	51.3	74.0	-22.7	Peak	Horizontal
	4876.0	41.5	1.5	43.0	74.0	-31.0	Peak	Vertical
	7315.5	38.8	9.5	48.3	74.0	-25.7	Peak	Vertical
	9483.0	38.4	11.7	50.1	74.0	-23.9	Peak	Vertical
39	4961.0	43.0	1.8	44.8	74.0	-29.2	Peak	Horizontal
	7460.0	35.8	10.3	46.1	74.0	-27.9	Peak	Horizontal
	9457.5	39.0	11.4	50.4	74.0	-23.6	Peak	Horizontal
	4961.0	42.1	1.8	43.9	74.0	-30.1	Peak	Vertical
	8004.0	37.5	9.3	46.8	74.0	-27.2	Peak	Vertical
	9483.0	38.1	11.7	49.8	74.0	-24.2	Peak	Vertical
Note: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m) Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m) - Pre_Amplifier Gain (dB)								

The Result of Radiated Emission below 1GHz:

Site: NS-AC1	Test Date: 2023-03-16
Limit: FCC_Part15.209_RSE(3m)	Engineer: Ted Chen
Probe: NS-AC1_VULB9162	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		40.670	19.152	1.599	-20.848	40.000	17.553	PK
2		95.960	17.450	2.265	-26.050	43.500	15.185	PK
3		119.725	21.615	7.147	-21.885	43.500	14.469	PK
4	*	191.990	23.410	7.788	-20.090	43.500	15.623	PK
5		215.755	19.573	3.721	-23.927	43.500	15.852	PK
6		423.820	22.537	1.510	-23.463	46.000	21.027	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

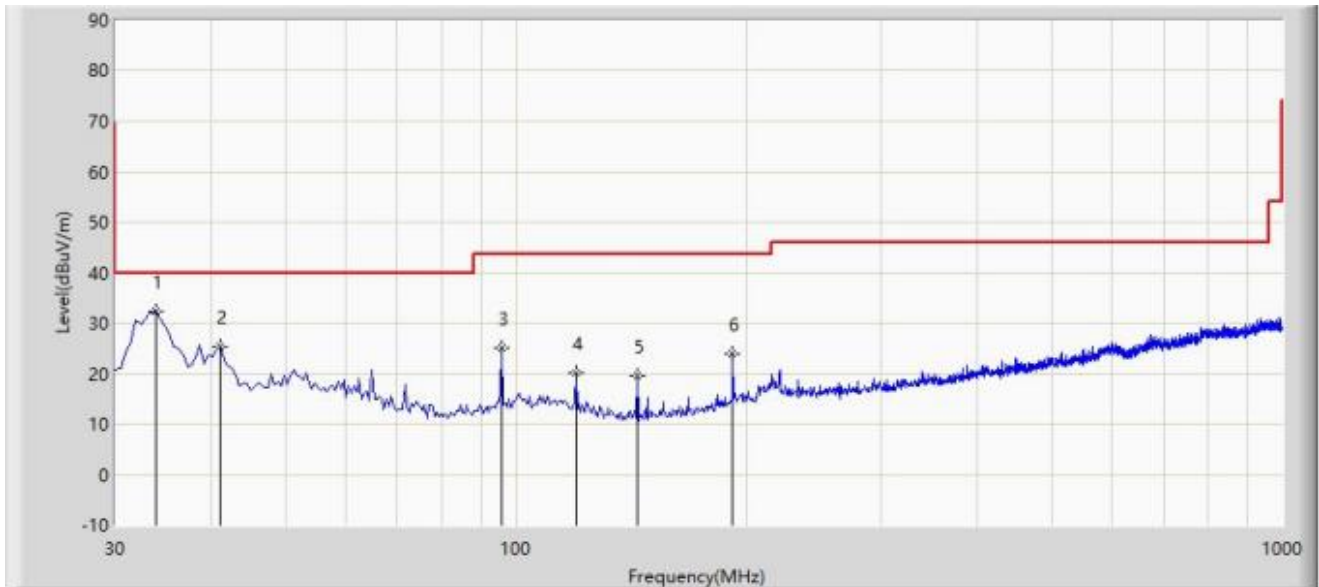
Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Note 5: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

Site: NS-AC1	Test Date: 2023-03-16
Limit: FCC_Part15.209_RSE(3m)	Engineer: Ted Chen
Probe: NS-AC1_VULB9162	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	33.880	32.456	17.079	-7.544	40.000	15.377	PK
2		41.155	25.218	7.569	-14.782	40.000	17.649	PK
3		95.960	25.109	9.924	-18.391	43.500	15.185	PK
4		119.725	20.148	5.680	-23.352	43.500	14.469	PK
5		143.975	19.659	7.400	-23.841	43.500	12.260	PK
6		191.990	23.918	8.296	-19.582	43.500	15.623	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

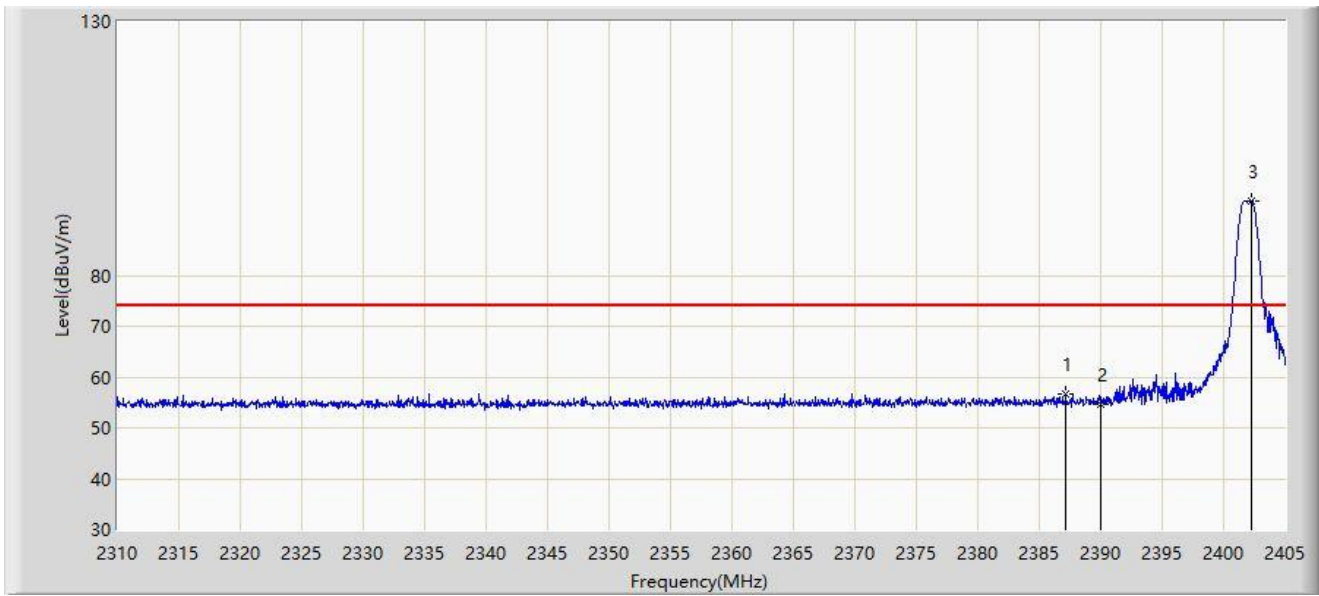
Note 4: Quasi-Peak measurement was not performed when peak measure level was lower than the quasi-peak limit.

Note 5: The amplitude of radiated emissions (frequency range from 9kHz to 30MHz and 18GHz to 25GHz) is that proximity to ambient noise, which also are attenuated more than 20 dB below the permissible value.

Therefore, the data is not presented in the report.

A.7 Radiated Restricted Band Edge Test Result

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2402MHz	



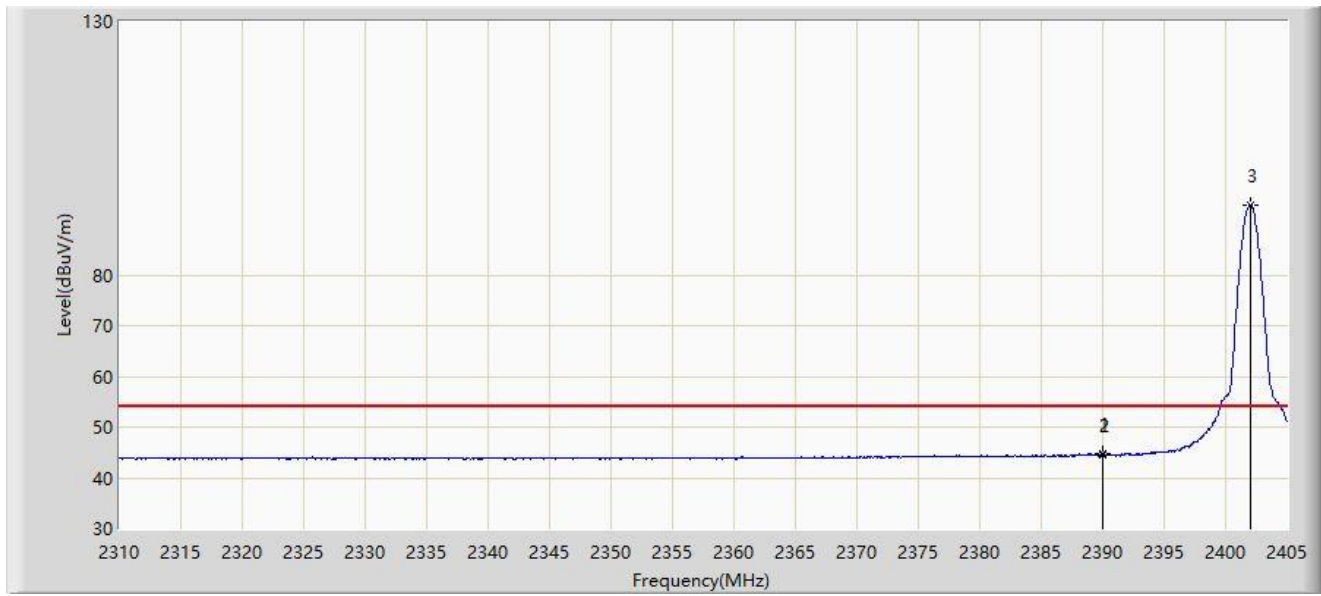
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2387.140	56.806	25.957	-17.194	74.000	30.849	PK
2		2390.000	54.718	23.895	-19.282	74.000	30.823	PK
3		2402.245	94.755	63.941	N/A	N/A	30.814	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2402MHz	



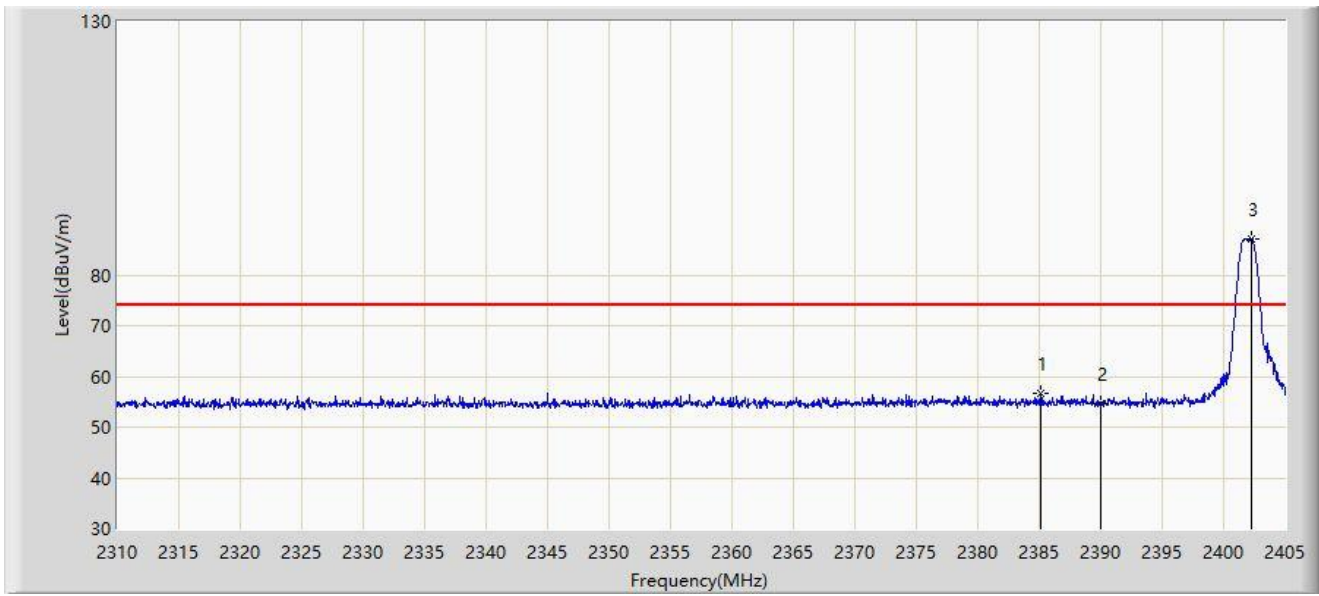
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2389.942	44.750	13.926	-9.250	54.000	30.824	AV
2		2390.000	44.622	13.799	-9.378	54.000	30.823	AV
3		2402.008	93.827	63.014	N/A	N/A	30.813	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2402MHz	



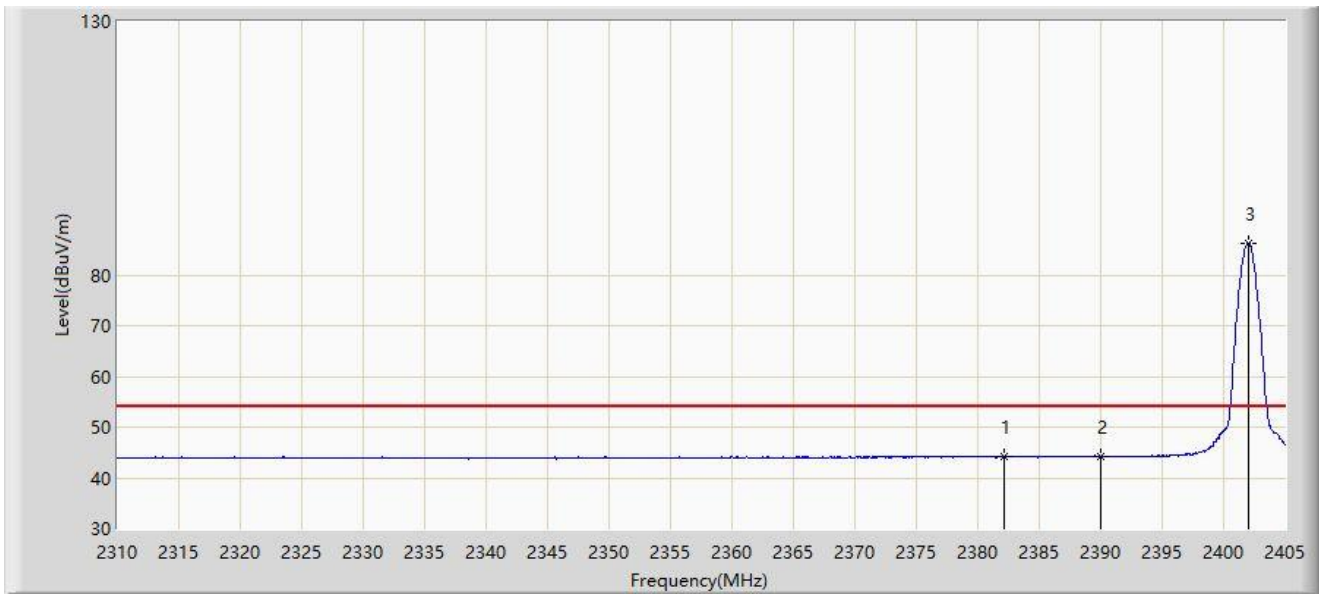
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2385.097	56.586	25.719	-17.414	74.000	30.867	PK
2		2390.000	54.761	23.938	-19.239	74.000	30.823	PK
3		2402.245	87.169	56.355	N/A	N/A	30.814	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2402MHz	



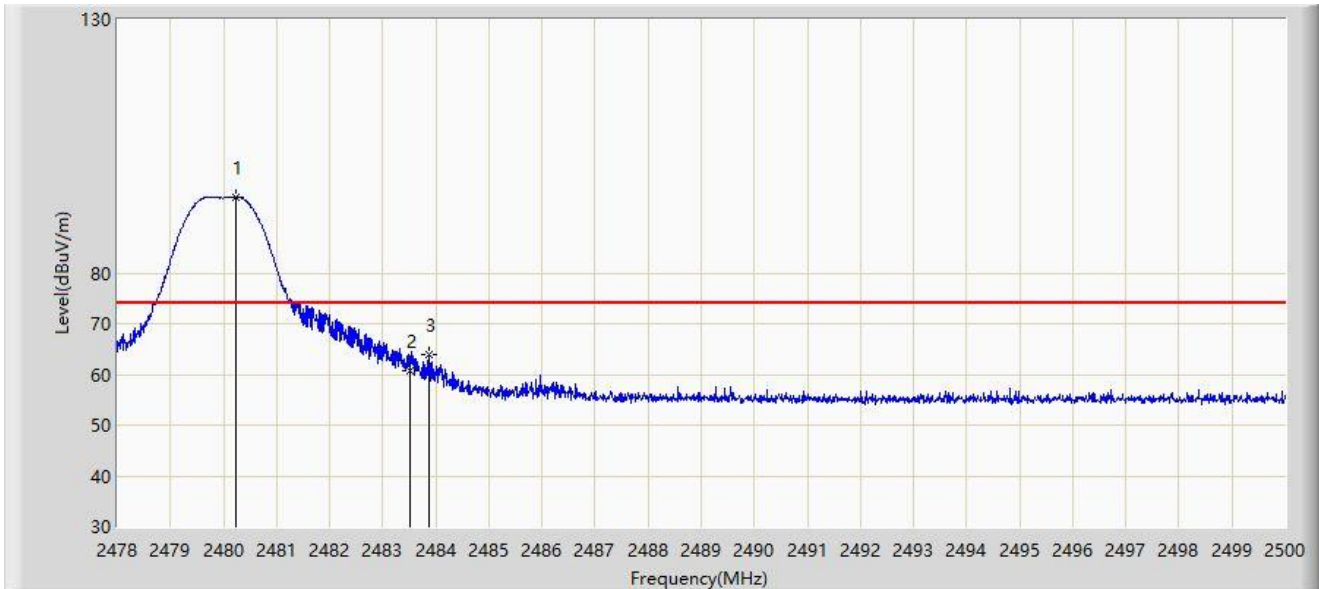
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2382.200	44.330	13.437	-9.670	54.000	30.893	AV
2		2390.000	44.267	13.444	-9.733	54.000	30.823	AV
3		2402.008	86.225	55.412	N/A	N/A	30.813	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2480MHz	



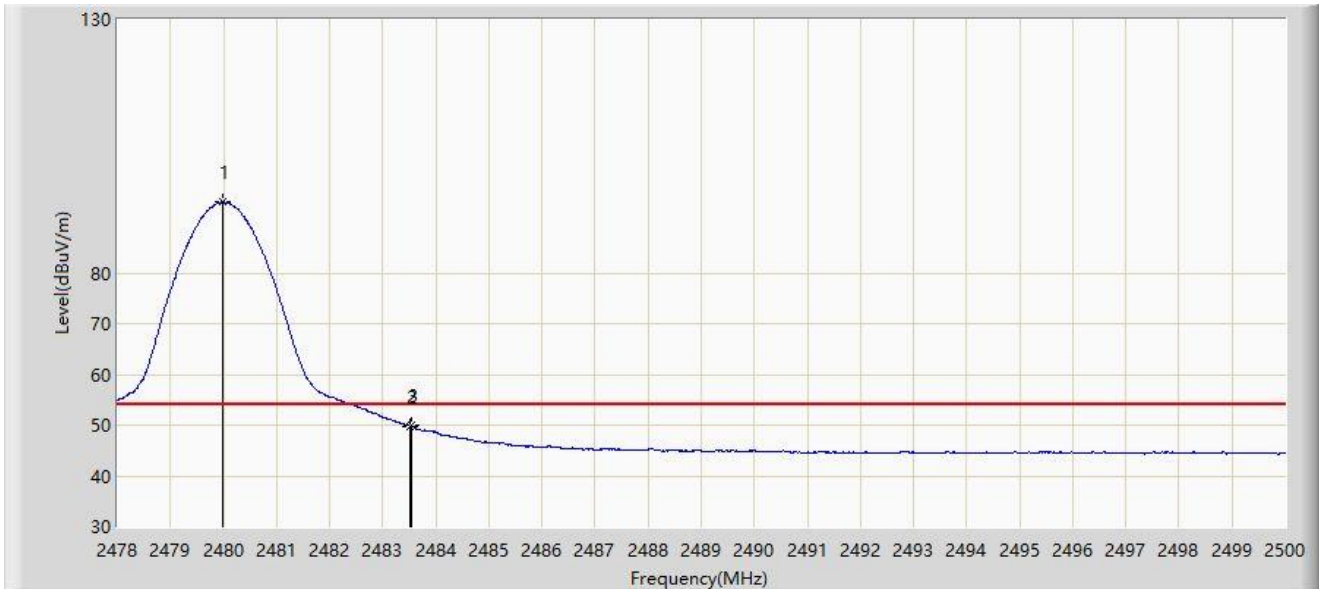
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2480.244	95.055	64.322	N/A	N/A	30.732	PK
2		2483.500	60.773	30.038	-13.227	74.000	30.734	PK
3	*	2483.863	63.950	33.215	-10.050	74.000	30.735	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2480MHz	



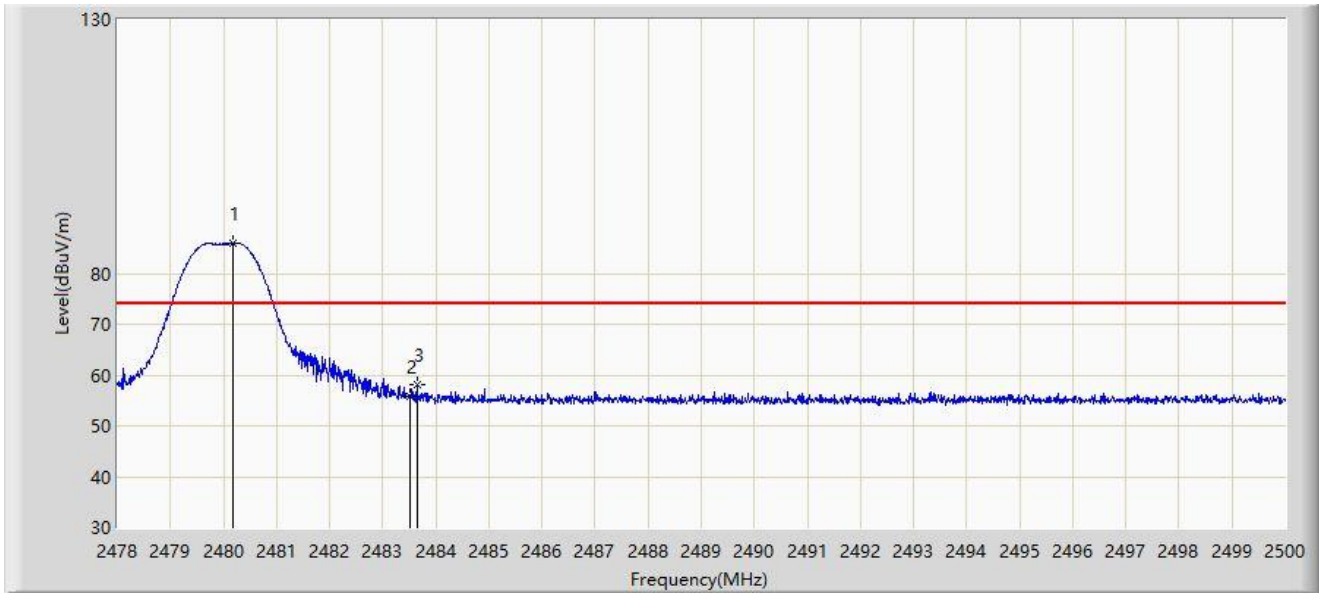
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.991	93.948	63.215	N/A	N/A	30.733	AV
2		2483.500	49.799	19.064	-4.201	54.000	30.734	AV
3	*	2483.533	49.886	19.151	-4.114	54.000	30.735	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2480MHz	



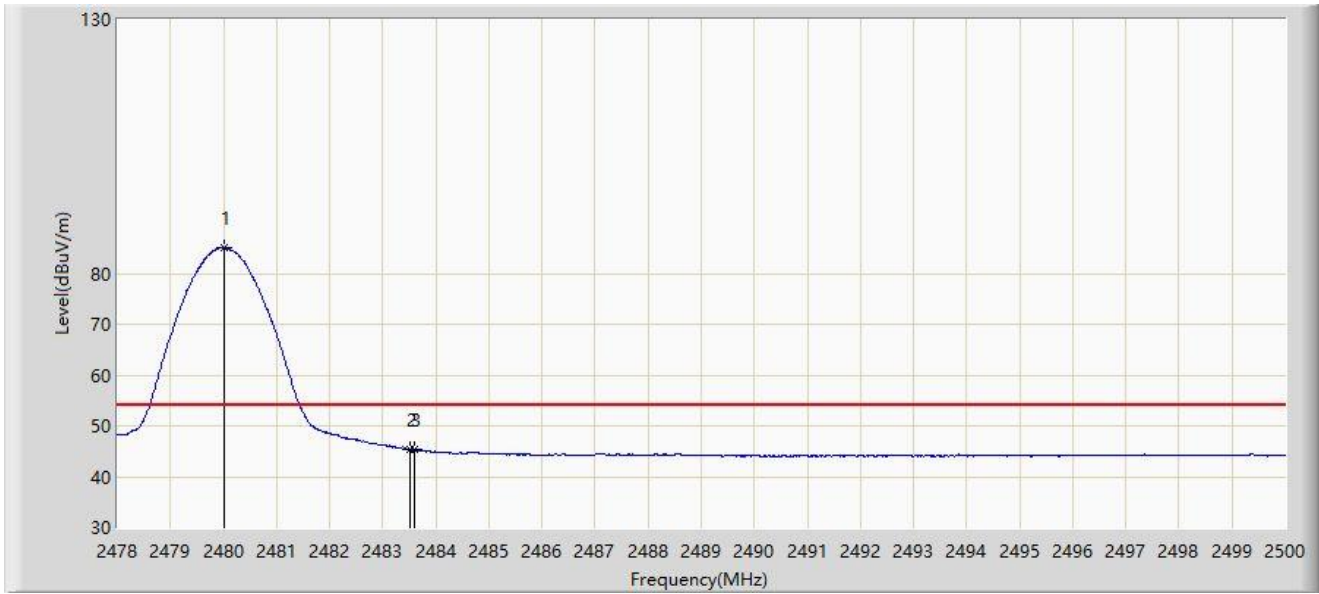
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2480.189	86.067	55.334	N/A	N/A	30.733	PK
2		2483.500	55.938	25.203	-18.062	74.000	30.734	PK
3	*	2483.643	58.173	27.438	-15.827	74.000	30.735	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-03-17
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 1M at 2480MHz	



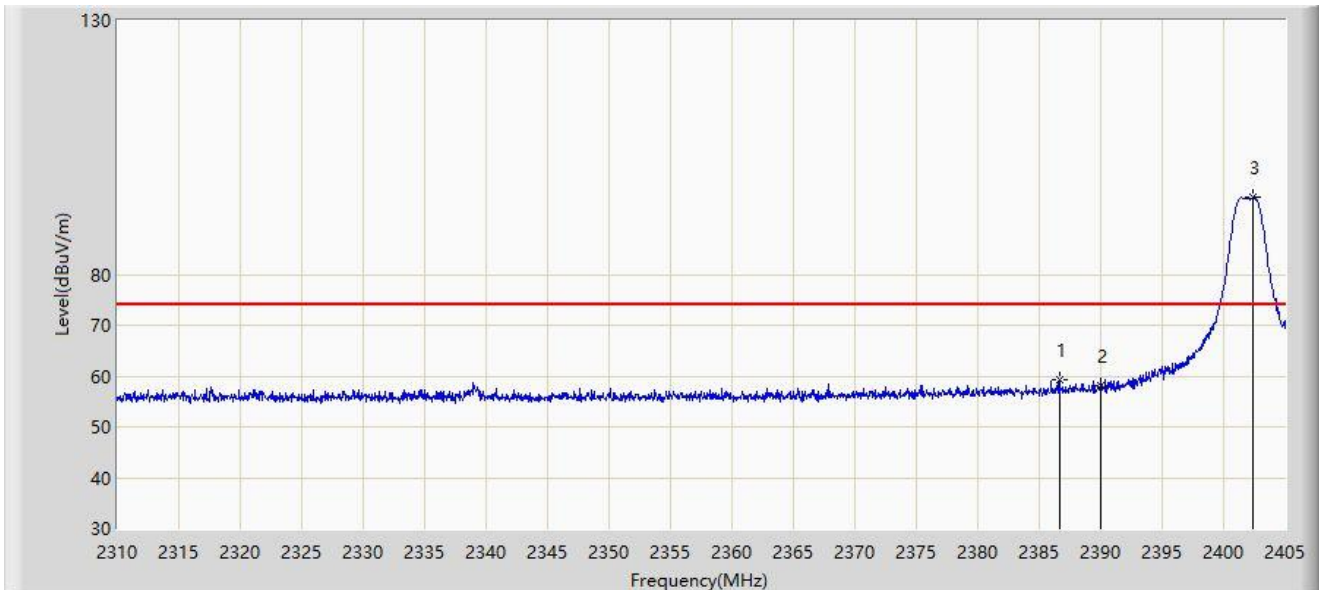
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2480.002	85.064	54.331	N/A	N/A	30.733	AV
2		2483.500	45.302	14.567	-8.698	54.000	30.734	AV
3	*	2483.599	45.360	14.625	-8.640	54.000	30.735	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-04-10
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2402MHz	



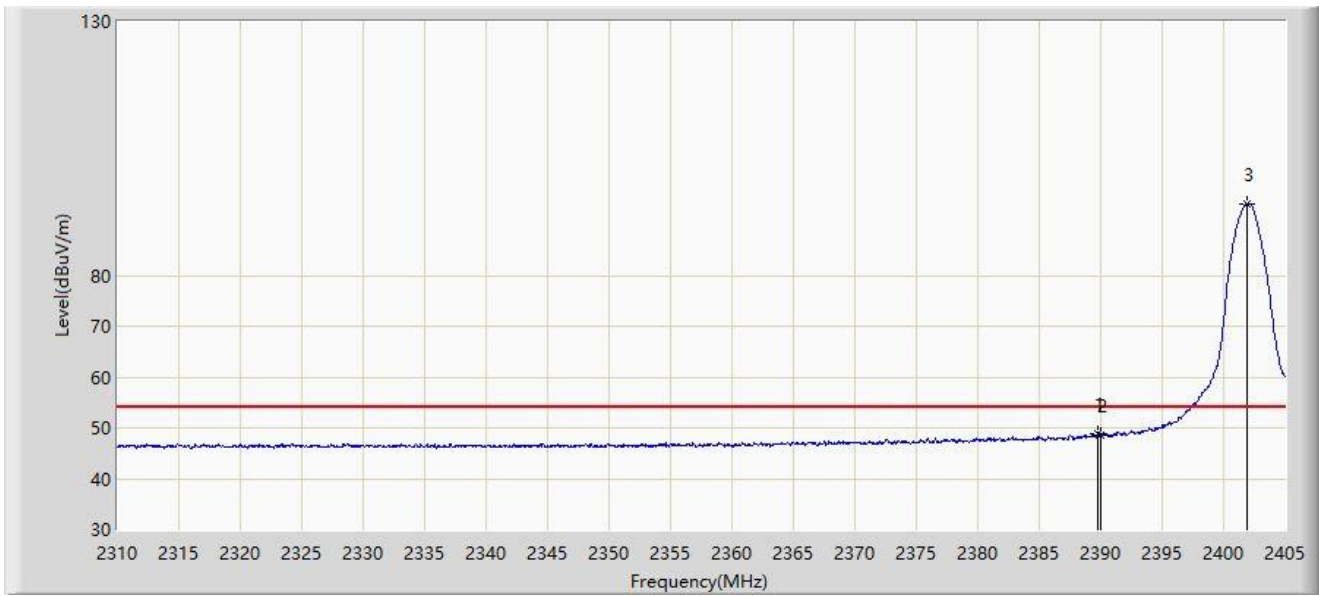
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2386.665	59.296	28.416	-14.704	74.000	30.880	PK
2		2390.000	58.043	27.192	-15.957	74.000	30.850	PK
3		2402.435	95.156	64.316	N/A	N/A	30.840	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-04-10
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2402MHz	



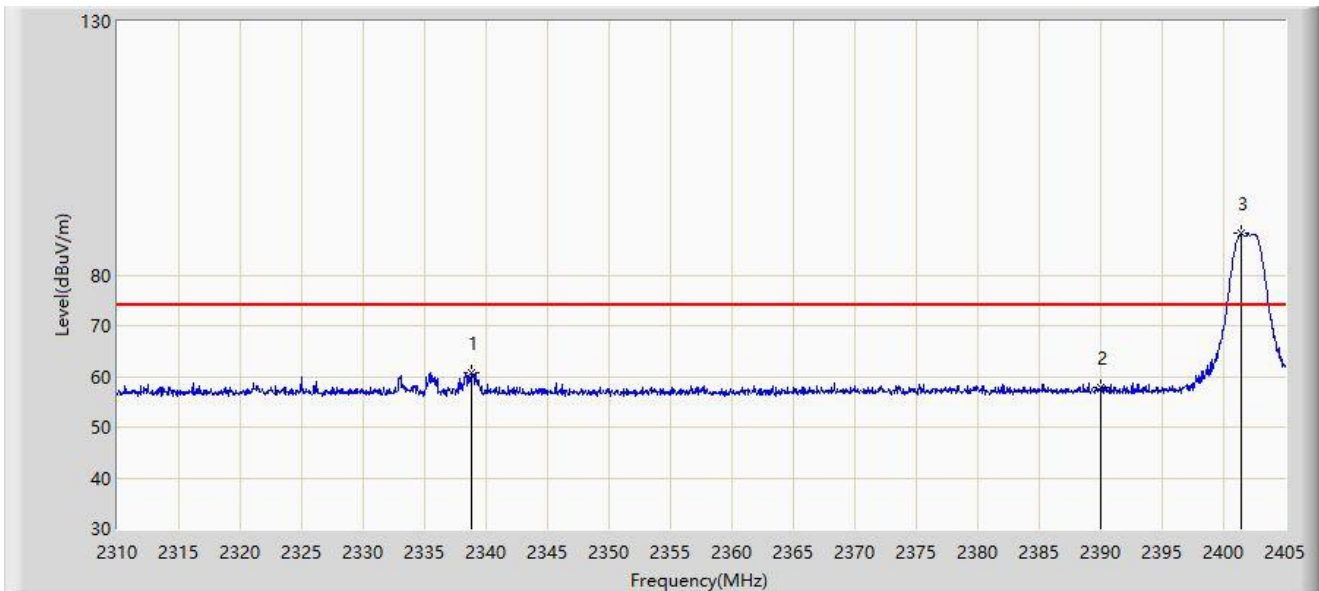
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2389.705	48.723	17.870	-5.277	54.000	30.853	AV
2		2390.000	48.674	17.823	-5.326	54.000	30.850	AV
3		2401.960	94.128	63.290	N/A	N/A	30.839	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-04-10
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2402MHz	



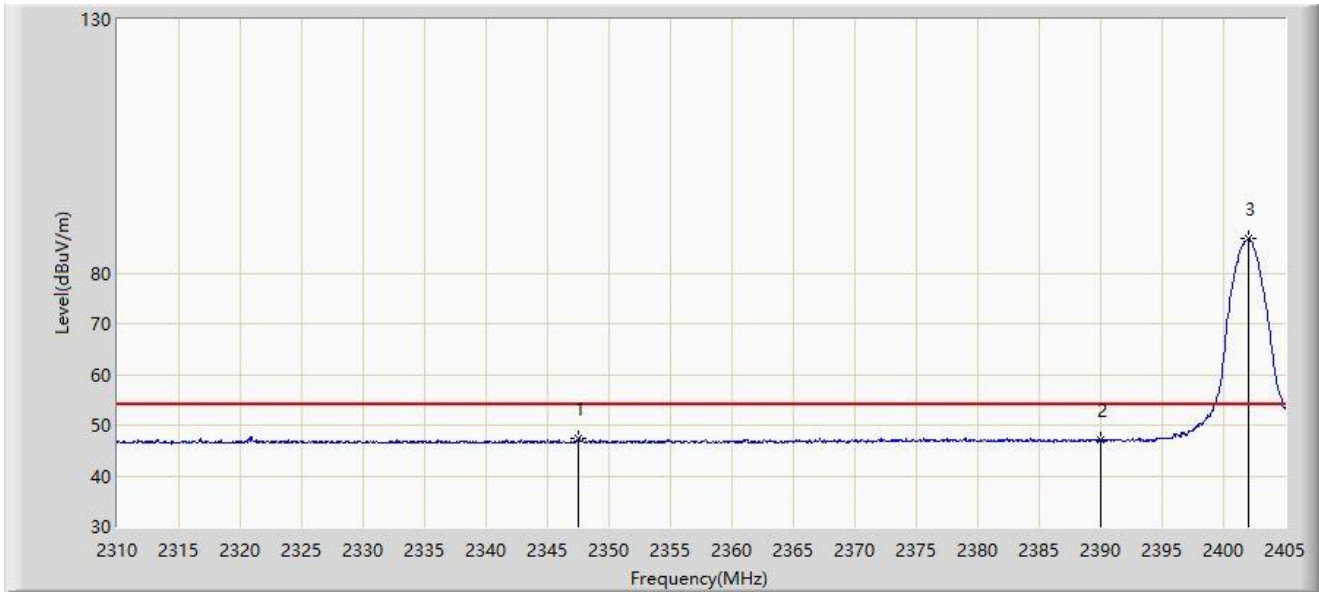
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2338.785	60.599	29.641	-13.401	74.000	30.958	PK
2		2390.000	57.688	26.837	-16.312	74.000	30.850	PK
3		2401.485	88.148	57.311	N/A	N/A	30.837	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: NS-AC1	Test Date: 2023-04-10
Limit: FCC_2.4G_RE(3m)	Engineer: Ted Chen
Probe: NS-AC1_BBHA9120D_2111_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2402MHz	



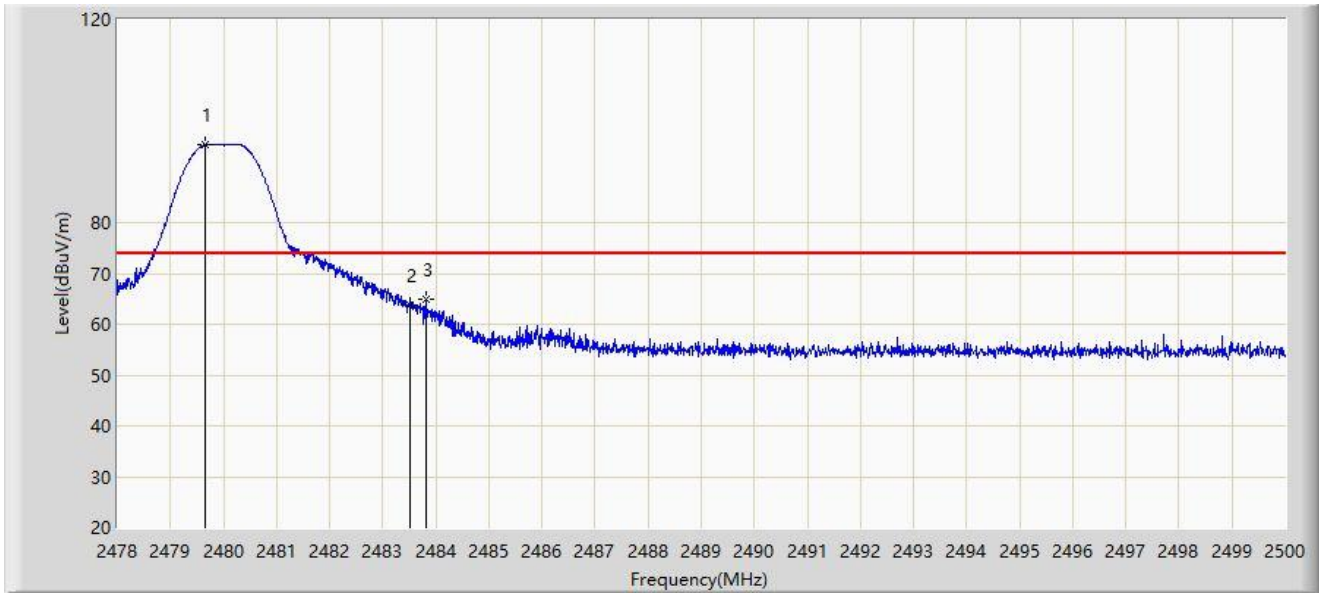
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1	*	2347.525	47.319	16.405	-6.681	54.000	30.914	AV
2		2390.000	47.110	16.259	-6.890	54.000	30.850	AV
3		2402.008	86.713	55.874	N/A	N/A	30.839	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-03-07
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2480MHz	



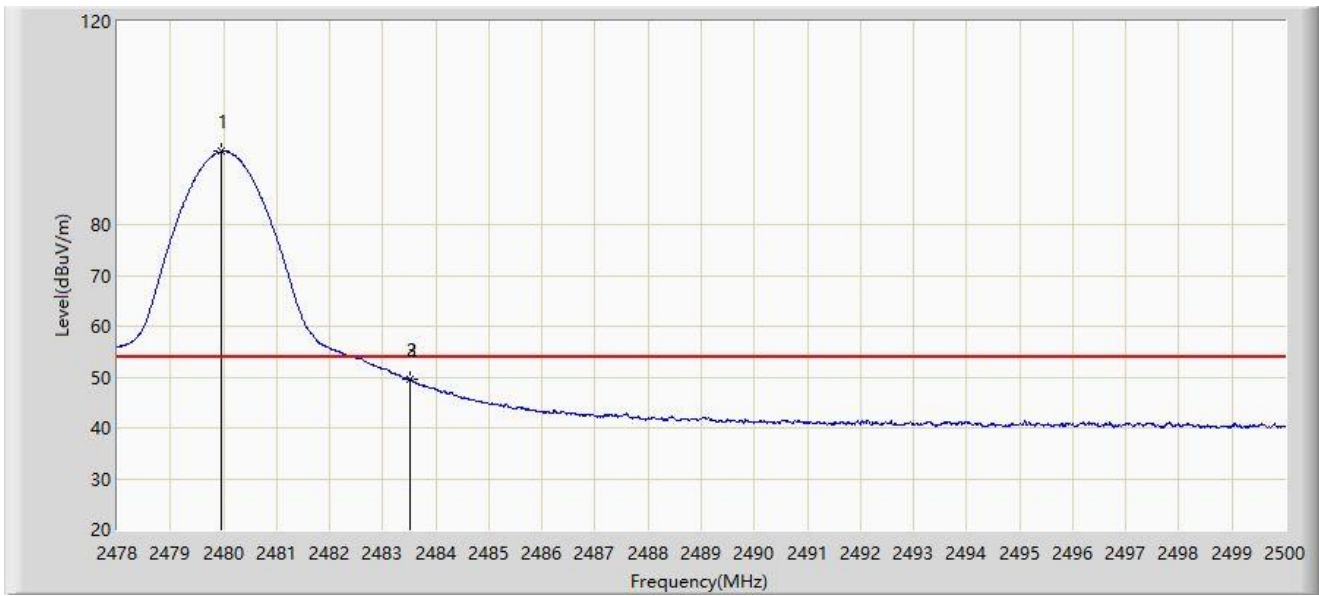
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.650	95.336	64.438	N/A	N/A	30.898	PK
2		2483.500	63.857	32.966	-10.143	74.000	30.892	PK
3	*	2483.819	64.892	34.001	-9.108	74.000	30.891	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-03-07
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Horizontal
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2480MHz	



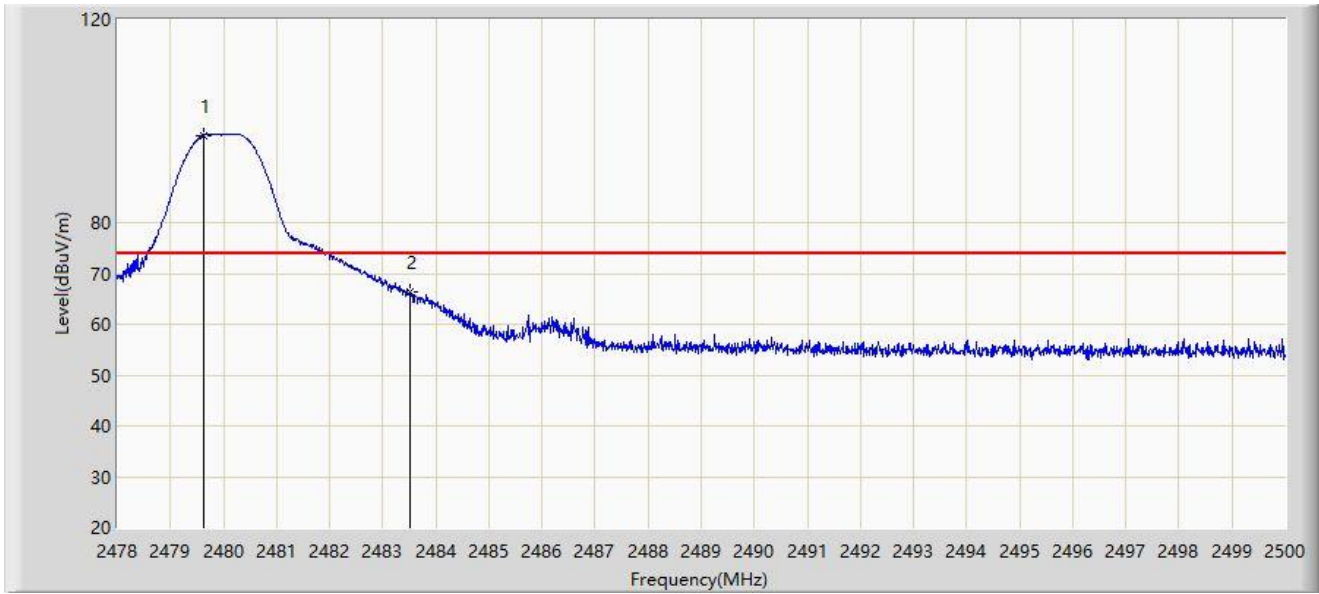
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.958	94.391	63.494	N/A	N/A	30.897	AV
2		2483.500	49.561	18.670	-4.439	54.000	30.892	AV
3	*	2483.511	49.614	18.723	-4.386	54.000	30.892	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-03-07
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2480MHz	



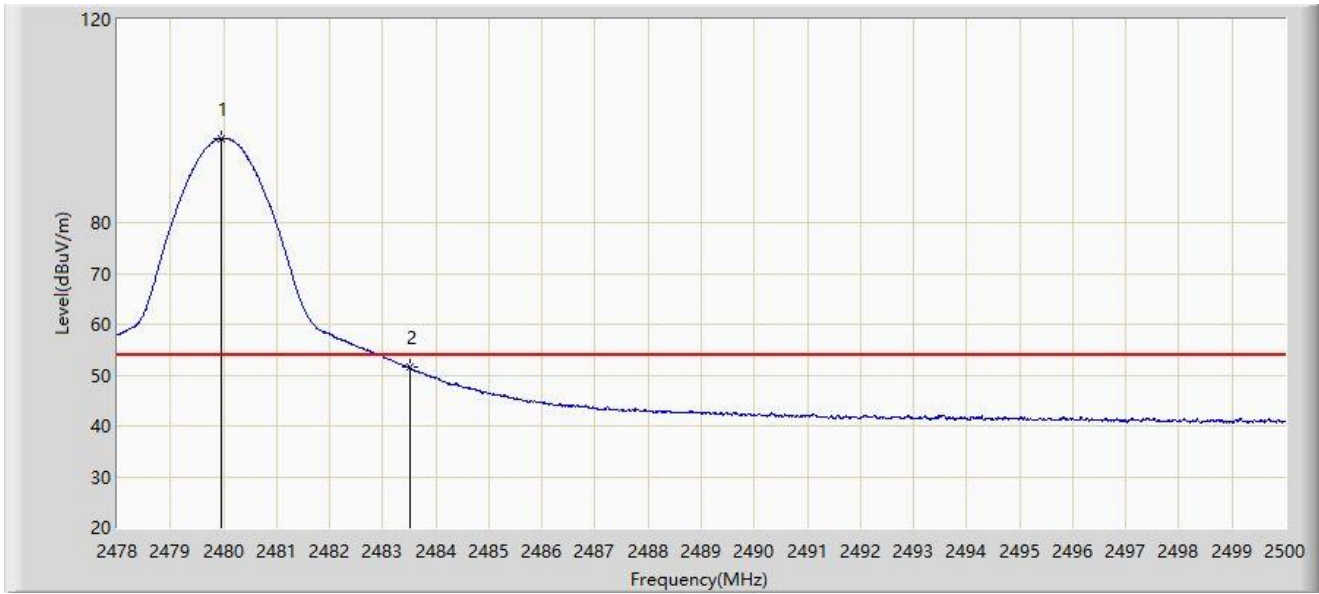
No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.628	97.210	66.312	N/A	N/A	30.898	PK
2	*	2483.500	66.350	35.459	-7.650	74.000	30.892	PK

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

Site: WZ-AC1	Test Date: 2023-03-07
Limit: FCC_2.4G_RE(3m)	Engineer: Carl Jiang
Probe: BBHA9120D_1167_1-18GHz	Polarity: Vertical
EUT: Handheld UHF RFID Reader	Power: By Battery
Test Mode: Transmit by BLE 2M at 2480MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV/m)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV/m)	Factor (dB/m)	Type
1		2479.958	96.560	65.663	N/A	N/A	30.897	AV
2	*	2483.500	51.487	20.596	-2.513	54.000	30.892	AV

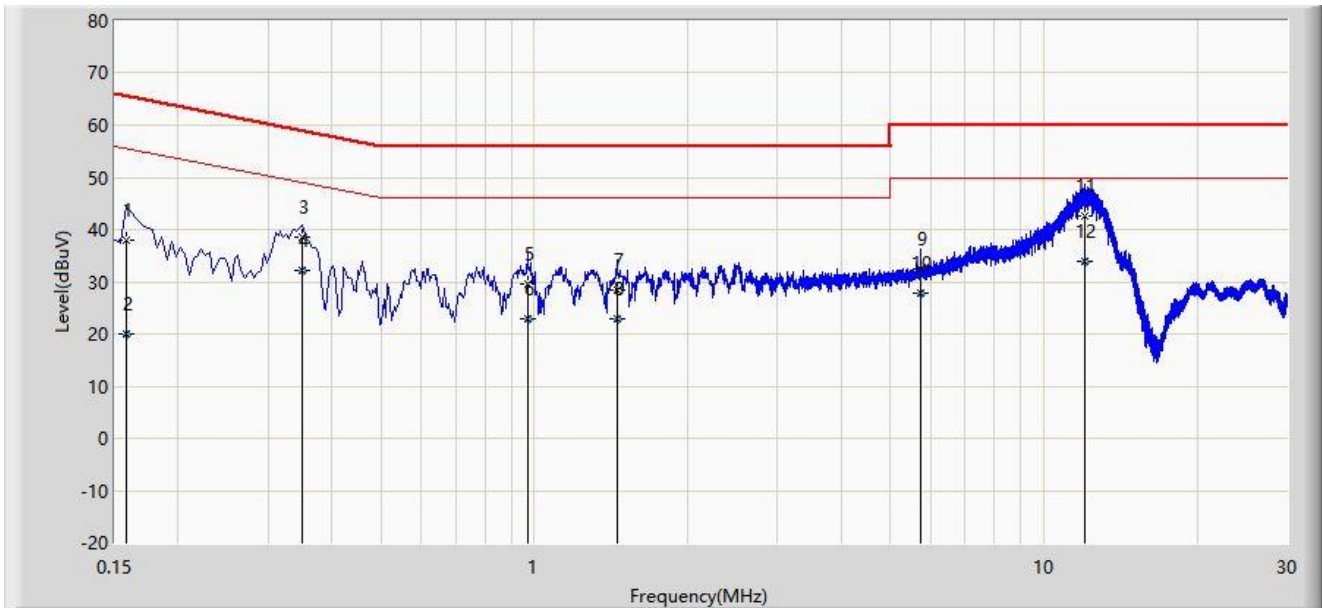
Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m).

Note 3: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m).

A.8 AC Conducted Emissions Test Result

Site: WZ-SR2	Test Date: 2023-04-12
Limit: FCC_Part15.207_CE_AC Power	Engineer: Alin Zhou
Probe: ENV216_101683_Filter Off_C	Polarity: Line
EUT: UHF RFID handheld reader	Power: AC 120V/60Hz
Test Mode: Transmit by BLE 1M at 2440MHz	



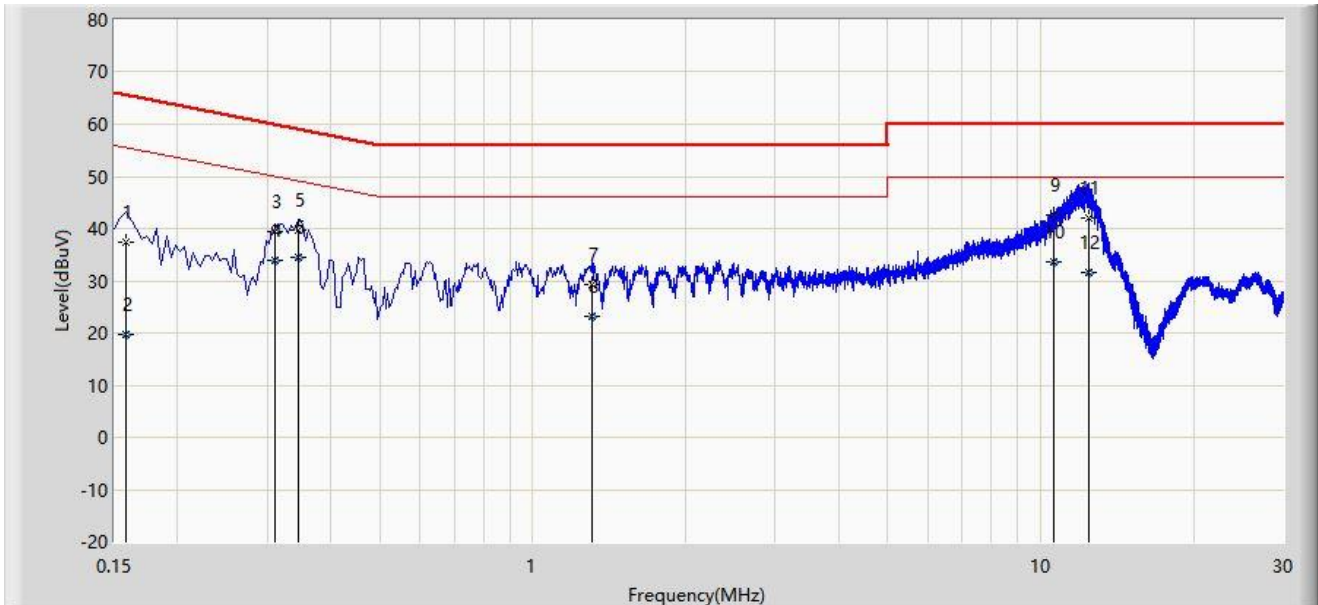
No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.158	37.966	28.410	-27.603	65.568	9.556	QP
2		0.158	19.881	10.326	-35.687	55.568	9.556	AV
3		0.350	38.480	28.847	-20.483	58.962	9.633	QP
4		0.350	32.318	22.685	-16.645	48.962	9.633	AV
5		0.970	29.422	19.445	-26.578	56.000	9.978	QP
6		0.970	23.028	13.051	-22.972	46.000	9.978	AV
7		1.450	28.376	18.384	-27.624	56.000	9.992	QP
8		1.450	22.764	12.772	-23.236	46.000	9.992	AV
9		5.722	32.327	22.206	-27.673	60.000	10.121	QP
10		5.722	27.751	17.629	-22.249	50.000	10.121	AV
11		12.050	42.539	32.184	-17.461	60.000	10.355	QP
12	*	12.050	33.918	23.563	-16.082	50.000	10.355	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB).

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Site: WZ-SR2	Test Date: 2023-04-12
Limit: FCC_Part15.207_CE_AC Power	Engineer: Alin Zhou
Probe: ENV216_101683_Filter Off_C	Polarity: Neutral
EUT: UHF RFID handheld reader	Power: AC 120V/60Hz
Test Mode: Transmit by BLE 1M at 2440MHz	



No	Mark	Frequency (MHz)	Measure Level (dBμV)	Reading Level (dBμV)	Margin (dB)	Limit (dBμV)	Factor (dB)	Type
1		0.158	37.340	27.753	-28.228	65.568	9.588	QP
2		0.158	19.669	10.082	-35.899	55.568	9.588	AV
3		0.310	39.544	29.894	-20.427	59.970	9.650	QP
4		0.310	33.891	24.241	-16.080	49.970	9.650	AV
5		0.346	39.568	29.897	-19.489	59.058	9.671	QP
6	*	0.346	34.581	24.910	-14.477	49.058	9.671	AV
7		1.310	29.185	19.202	-26.815	56.000	9.983	QP
8		1.310	23.122	13.139	-22.878	46.000	9.983	AV
9		10.602	42.466	32.101	-17.534	60.000	10.365	QP
10		10.602	33.662	23.297	-16.338	50.000	10.365	AV
11		12.394	42.050	31.671	-17.950	60.000	10.379	QP
12		12.394	31.728	21.349	-18.272	50.000	10.379	AV

Note 1: " * ", means this data is the worst emission level.

Note 2: Measure Level (dBμV) = Reading Level (dBμV) + Factor (dB).

Note 3: Factor (dB) = Cable Loss (dB) + LISN Factor (dB).

Appendix B - Test Setup Photograph

Refer to “2212RSU051-UT” file.

Appendix C - EUT Photograph

Refer to “2212RSU051-UE” file.

The End
