RF MEASUREMENT REPORT

FCC ID:	HD5-CT32X0
Applicant:	Honeywell International Inc
Product:	Mobile Computer
Model No.:	CT32X0
Brand Name:	Honeywell
FCC Classification:	Part 15 Low Power Communication Device Transmitter (DXX)
FCC Rule Part(s):	Part 15 Subpart C (Section 15.225)
Result:	Complies
Received Date:	2024-12-26
Test Date:	2025-02-18 ~ 2025-02-26

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.

Revision History

Report No.	Version	Description	Issue Date	Note
2412RSU045-U10	V01	Initial Report	2025-03-10	Valid

CONTENTS

1. General Information

1.1. Applicant

Honeywell International Inc

9680 Old Bailes Rd. Fort Mill, SC 29707 United States

1.2. Manufacturer

Honeywell International Inc

9680 Old Bailes Rd. 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 Location (Suzhou - Wujiang)** Building 1, No.1 Xingdong Road, Wujiang, Suzhou, Jiangsu, People's Republic of 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: 3261 FCC: 291082, TW3261 ISED: TW3261

1.4. Product Information

Product Name	Mobile Computer
Model No.	CT32X0
Brand Name	Honeywell
EUT Identification No.	20241226Sample#15
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Bluetooth Specification	V5.2 dual mode
NFC	13.56 MHz
Power Type	By Li-ion Battery
Accessories	
Rechargeable Li-ion Battery	Model No.: EDA52-BAT-US Nominal Voltage: 3.8V Rated Capacity: 17.1 Wh, 4500 mAh
Adapter	Model No.: ADS-12B-06 05010E Input: 100-240 V ~ 50/60 Hz, Max 0.3 A Output: 5 V ⎓ 2 A 10.0 W
Remarks: 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

Frequency Range	13.56 MHz
Channel Number	1
Type of Modulation	ASK

2. Test Configuration

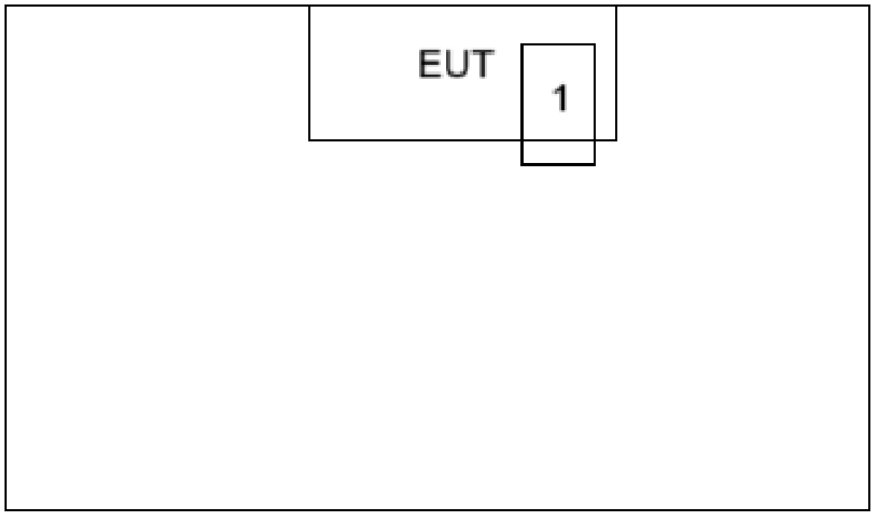
2.1. Test Mode

Test Mode
Mode 1: Operating Mode

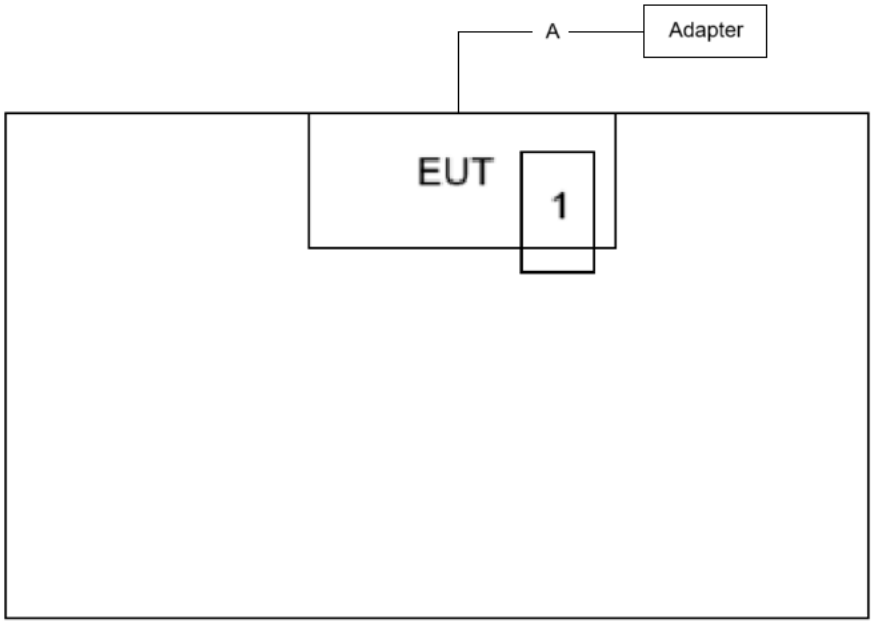
2.2. Test Configuration and Software

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

Connection Diagram – Radiated Emission testing



Product		Manufacturer	Model No.
1	NFC Card	N/A	N/A

Connection Diagram – AC Conducted Emissions			
			
Cable Type		Cable Description	Length
A	USB Cable	Shielded	1.2m
Product		Manufacturer	Model No.
1	NFC Card	N/A	N/A

2.3. Applied Standards

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

- FCC Part 15.225
- 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 this 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
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2025-12-05	SIP-AC3
Signal Analyzer	Keysight	N9010B	MRTSUE06559	1 year	2025-05-08	SIP-AC3
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2025-10-16	SIP-AC3
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2025-07-29	SIP-AC3
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2025-12-19	SIP-AC3
Active Loop Antenna	Schwarzbeck	FMZB 1519-60 D	MRTSUE07075	1 year	2025-11-19	SIP-AC3/SIP-SR1
Two-Line V-Network	R&S	ENV216	MRTSUE06003	1 year	2025-05-08	SIP-SR2
EMI Test Receiver	R&S	ESR3	MRTSUE06612	1 year	2025-05-08	SIP-SR2
Thermohygrometer	testo	608-H1	MRTSUE06621	1 year	2025-10-29	SIP-SR2
Shielding Room	MIX-BEP	SIP-SR2	MRTSUE06949	5 years	2029-10-13	SIP-SR2
Signal Analyzer	Keysight	N9021B	MRTSUE06915	1 year	2025-05-08	SIP-SR1
Temperature Chamber	BAOYT	BYG-80CL	MRTSUE06932	1 year	2026-01-21	SIP-SR1
Shielding Room	MIX-BEP	SIP-SR1	MRTSUE06948	N/A	N/A	SIP-SR1

Software	Version	Function
e3	230711	RE & CE
Controller_MF 7802BS	1.02	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 Emission Measurement
The maximum measurement uncertainty is evaluated as: Coaxial: 9kHz~30MHz: 2.61dB Coplanar: 9kHz~30MHz: 2.62dB Horizontal: 30MHz~200MHz: 3.79dB Vertical: 30MHz~200MHz: 4.06dB

6. Test Result

6.1. Summary

FCC Part Section(s)	Test Description	Test Condition	Verdict
15.225 (a), (b), (c)	In-Band Emission	Radiated	Pass
15.225(d)	Out-Band Emission		Pass
15.215(c)	20dB Bandwidth		Pass
15.225(e)	Frequency Tolerance		Pass
15.207	AC Conducted Emissions 150kHz - 30MHz	Line Conducted	Pass

Note: 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. In-band Emission Measurement

6.2.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.225		
Frequency (MHz)	Distance (m)	Level (μV/m)
13.553 ~13.567	30	15848
13.410 ~13.553, 13.567 ~13.710	30	334
13.110 ~13.410, 13.710 ~14.010	30	106
Note 1: The lower limit shall apply at the transition frequency. Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.		

6.2.2. Test Procedure

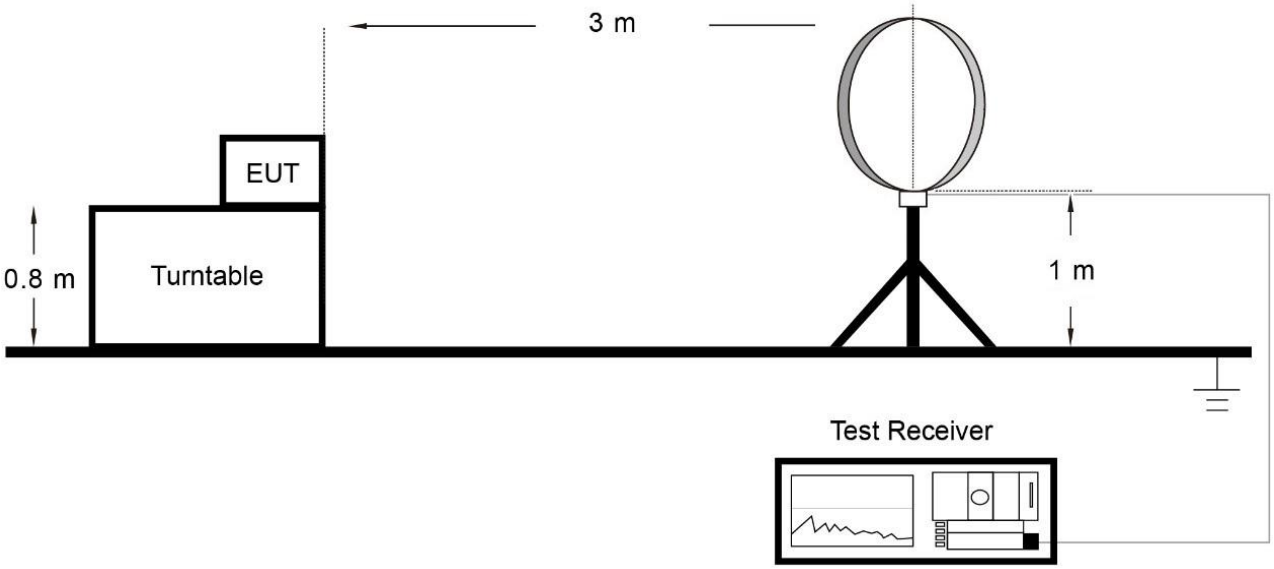
ANSI C63.10 - 2013 - Section 6.4

6.2.3. Test Setting

1. RBW = 9kHz or 10kHz
2. VBW = 3 * RBW
3. Detector = Peak
4. Trace mode = Max hold
5. Sweep = Auto couple
6. Allow the trace to stabilize

6.2.4. Test Setup

9kHz ~ 30MHz Test Setup:



6.2.5. Test Result

Refer to Appendix A.1.

6.3. Out-band Emission Measurement

6.3.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.209		
Frequency (MHz)	Distance (m)	Level (μV/m)
0.009 - 0.490	300	2400/F (kHz)
0.490 - 1.705	30	24000/F (kHz)
1.705 - 30	30	30
30 - 88	3	100
88 - 216	3	150
Note 1: The lower limit shall apply at the transition frequency. Note 2: Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.		

6.3.2. Test Procedure

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)

6.3.3. 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

Peak Measurement

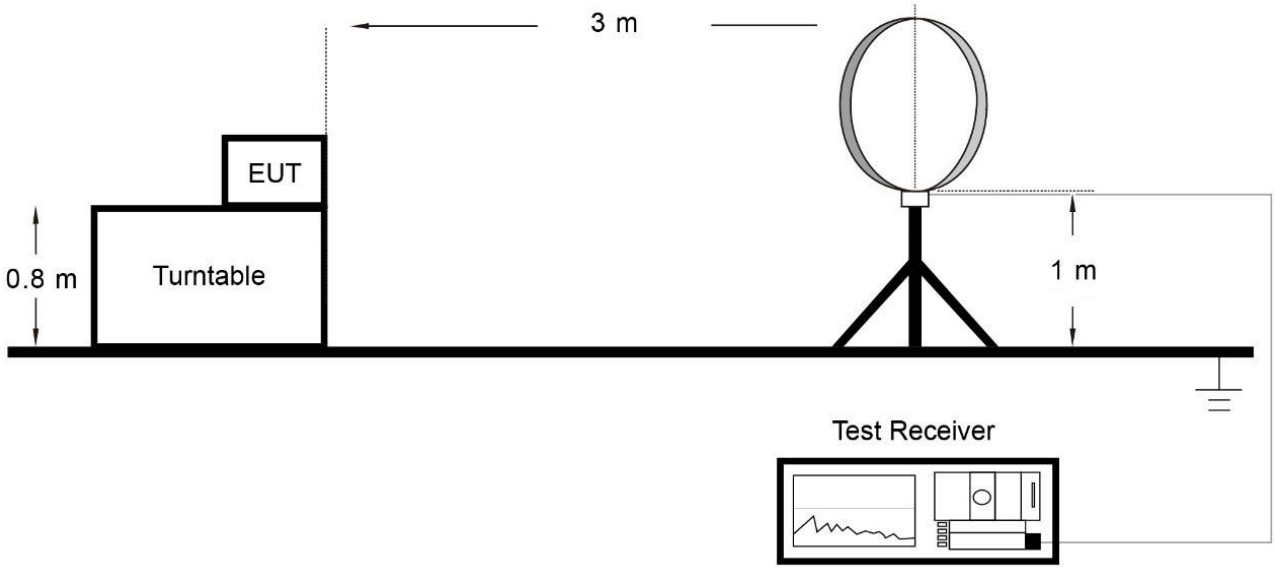
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in Table 1
3. VBW = 3 * RBW
4. Detector = Peak
5. Trace mode = Max hold
6. Sweep = Auto couple
7. Allow the trace to stabilize

Quasi-Peak Measurement

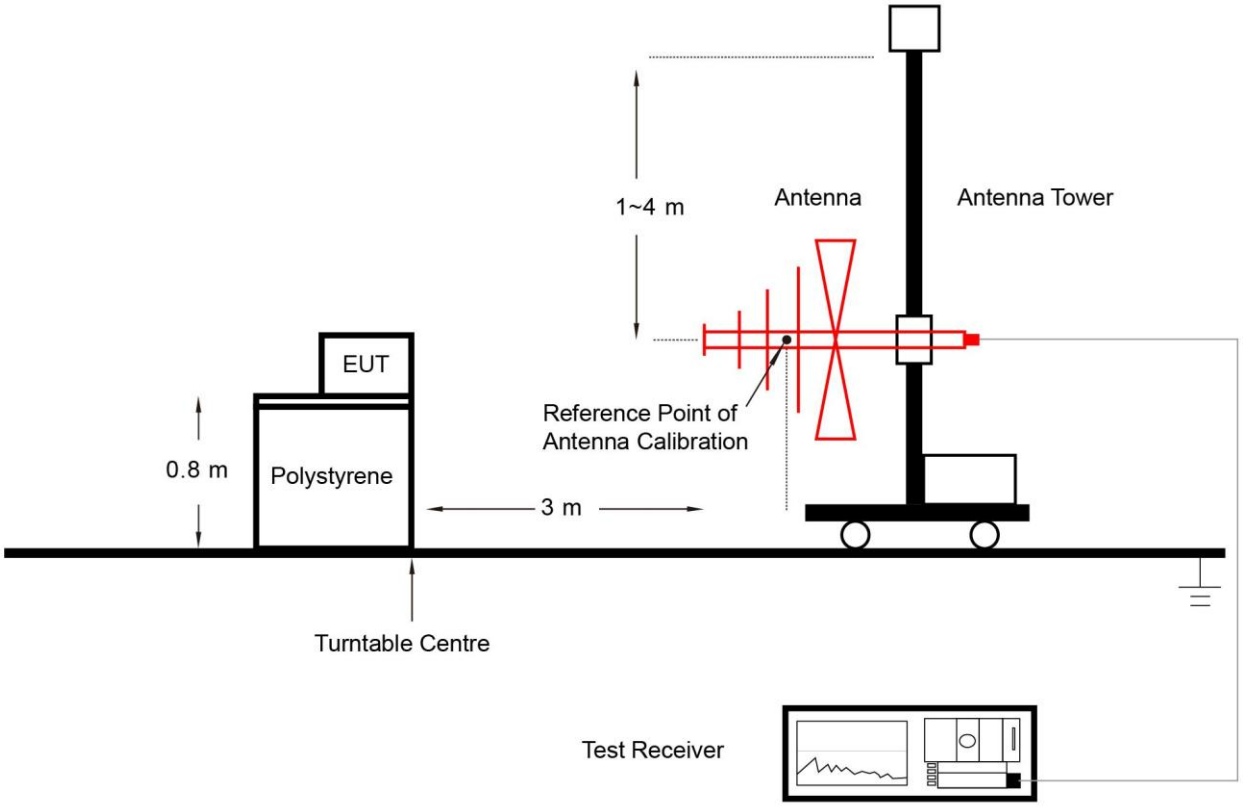
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. Span was set greater than 1MHz
3. RBW = as specified in Table 1
4. Detector = CISPR quasi-peak
5. Sweep time = auto couple
6. Trace was allowed to stabilize

6.3.4. Test Setup

9kHz ~ 30MHz Test Setup:



Above 30MHz Test Setup:



6.3.5. Test Result

Refer to Appendix A.2.

6.4. Occupied Bandwidth Measurement

6.4.1. Test Limit

The occupied bandwidth is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequency.

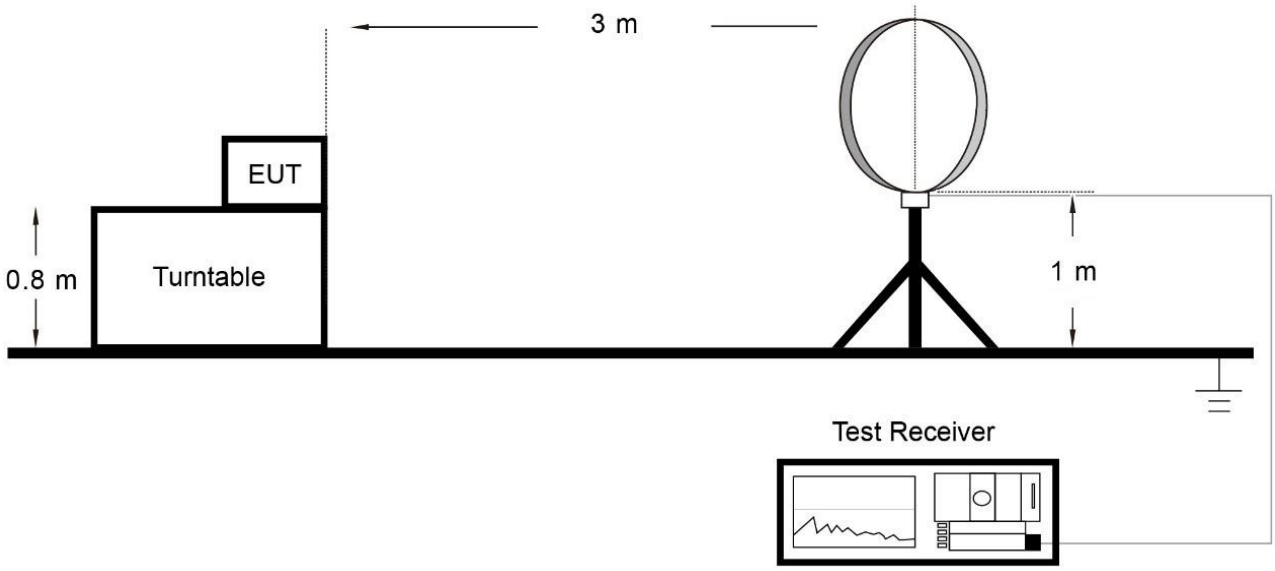
6.4.2. Test Procedure

ANSI C63.10-2013 - Section 6.9.2

6.4.3. Test Setting

1. Set RBW ≥ 1% to 5% of the 20dB bandwidth
2. VBW = approximately three times RBW
3. Span = approximately 2 to 5 times the 20dB bandwidth
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

6.4.4. Test Setup



6.4.5. Test Result

Refer to Appendix A.3.

6.5. Frequency Tolerence Measurement

6.5.1. Test Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

6.5.2. Test Procedure

ANSI C63.10-2013 - Section 6.8

6.5.3. Test Setting

Frequency Stability Under Temperature Variations:

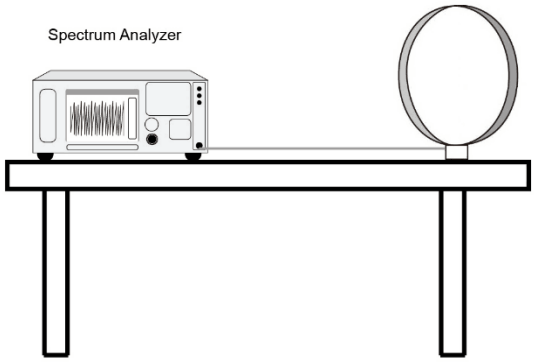
The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to highest. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C decreased per stage until the lowest temperature reached.

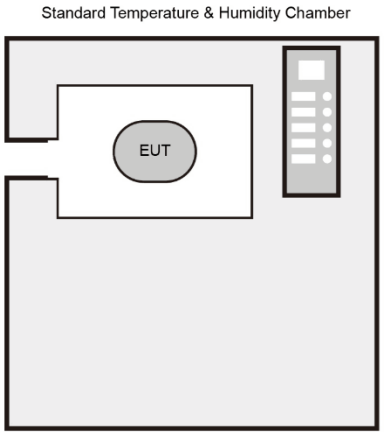
Frequency Stability Under Voltage Variations:

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation (±15%) and endpoint, record the maximum frequency change. For hand-carried battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

6.5.4. Test Setup





6.5.5. Test Result

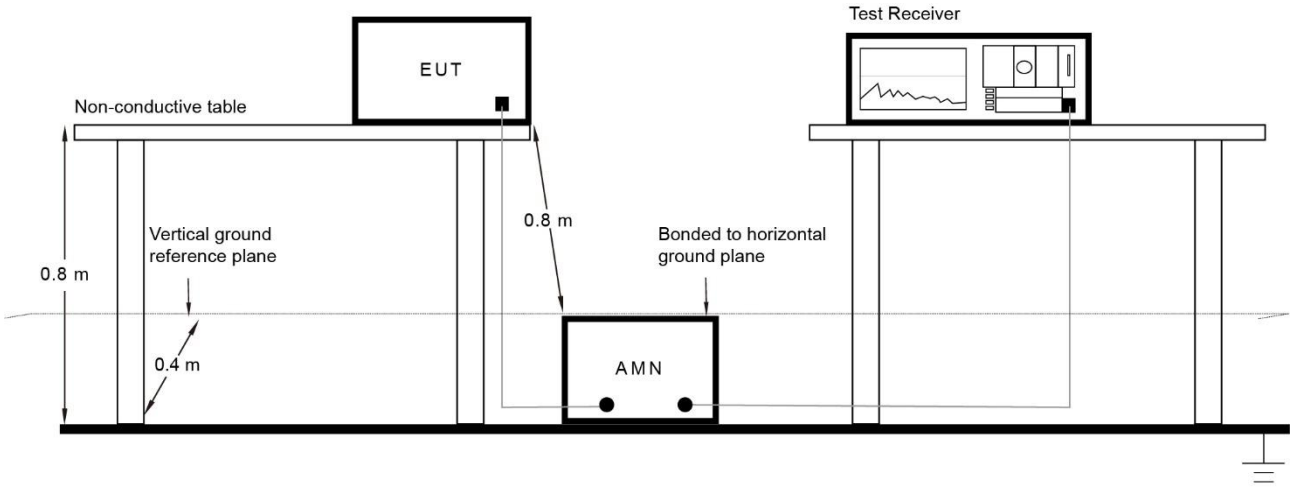
Refer to Appendix A.4.

6.6. AC Conducted Emissions Measurement

6.6.1. Test Limit

FCC Part 15 Subpart C Paragraph 15.207		
Frequency (MHz)	QP (dBμV)	AV (dBμV)
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.		

6.6.2. Test Setup



6.6.3. Test Result

Refer to Appendix A.5.

Appendix A - Test Result

A.1 In-band Emission Test Result

Test Site	SIP-AC3	Test Date	2025-02-23
Test Engineer	Mero Zhou	Test Mode	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level@3m (dBμV/m)	Measure Level@30m (dBμV/m)	Limit (dBμV/m)	Margin [dB]	Detector	Polarization
13.399	16.150	19.820	35.970	-4.030	40.506	-44.536	Peak	Coaxial
13.552	25.430	19.840	45.270	5.270	50.475	-45.205	Peak	Coaxial
13.560	31.680	19.840	51.520	11.520	83.999	-72.479	Peak	Coaxial
13.568	26.320	19.840	46.160	6.160	50.475	-44.315	Peak	Coaxial
13.718	16.440	19.870	36.310	-3.690	40.506	-44.196	Peak	Coaxial
13.408	15.440	19.820	35.260	-4.740	40.506	-45.246	Peak	Coplanar
13.551	19.920	19.840	39.760	-0.240	50.475	-50.715	Peak	Coplanar
13.561	27.220	19.840	47.060	7.060	83.999	-76.939	Peak	Coplanar
13.569	21.620	19.840	41.460	1.460	50.475	-49.015	Peak	Coplanar
13.716	14.700	19.870	34.570	-5.430	40.506	-45.936	Peak	Coplanar

Notes

1. All measurements were performed using a loop antenna. The antenna was positioned in two orthogonal (coaxial and coplanar) and the position with the highest emission level was recorded.
2. Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
   Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
3. Measurements were tested at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear extrapolation factor (40 dB/decade) as specified in &15.31(f)(2).
   Extrapolation Factor = 40*Log (30/3) = 40 dB
4. All measurements were recorded using an EMI test receiver employing a peak detector.

A.2 Out-Band Emission Test Result

Test Site	SIP-AC3	Test Date	2025-02-18
Test Engineer	Mero Zhou	Test Mode	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Factor (dB/m)	Measure Level@3m (dBμV/m)	Measure Level@300m or 30m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector	Polarization
0.010	31.370	20.690	52.070	-27.930	47.604	-75.534	Peak	Coaxial
0.063	17.140	19.770	36.910	-43.090	31.617	-74.707	Peak	Coaxial
1.647	19.110	19.710	38.820	-1.180	23.270	-24.450	Peak	Coaxial
16.512	17.640	20.090	37.720	-2.280	29.542	-31.822	Peak	Coaxial
0.010	37.200	20.690	57.890	-22.110	47.604	-69.714	Peak	Coplanar
1.078	19.800	19.600	39.400	-0.600	26.952	-27.552	Peak	Coplanar
0.050	18.710	19.850	38.560	-41.440	33.625	-75.065	Peak	Coplanar
1.078	19.800	19.600	39.400	-0.600	26.952	-27.552	Peak	Coplanar
20.077	17.310	20.020	37.330	-2.670	29.542	-32.212	Peak	Coplanar

Notes:

1. Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)
   Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)
2. Measurements were tested at 3m and the data was extrapolated to the specified measurement distance of 30m or 300m using the square of an inverse linear extrapolation factor (40 dB/decade) as specified in &15.31(f)(2). Extrapolation Factor = 40*Log (300/3) = 80 dB for range 0.009 ~ 0.490MHz,
   Extrapolation Factor = 40*Log (30/3) = 40 dB for range 0.490 ~ 30MHz,
3. Below 30MHz measurement was performed using a loop antenna. The antenna was positioned in two orthogonal (Coaxial and Coplanar) and the position with the highest emission level was recorded.
4. All measurements were recorded using an EMI test receiver employing a peak detector.

Out-Band Emission Above 30MHz							
Polarization	Frequency (MHz)	Reading Level (dBμV/m)	Factor (dB)	Measure Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
Horizontal	50.039	-7.920	18.660	10.740	40.000	-29.260	QP
Horizontal	145.861	-7.480	18.260	10.780	43.500	-32.720	QP
Horizontal	382.991	-8.360	20.680	12.320	46.000	-33.680	QP
Horizontal	507.546	-7.170	23.420	16.250	46.000	-29.750	QP
Horizontal	727.060	-8.170	27.780	19.610	46.000	-26.390	QP
Horizontal	947.431	-7.990	30.240	22.250	46.000	-23.750	QP
Vertical	40.673	3.800	18.080	21.880	40.000	-18.120	QP
Vertical	67.794	1.200	16.770	17.970	40.000	-22.030	QP
Vertical	146.117	-8.470	18.270	9.800	43.500	-33.700	QP
Vertical	442.828	-8.250	22.150	13.900	46.000	-32.100	QP
Vertical	625.297	-8.300	26.280	17.980	46.000	-28.020	QP
Vertical	868.521	-8.140	29.400	21.260	46.000	-24.740	QP

Note 1: Measure Level (dBμV/m) = Reading Level (dBμV) + Factor (dB/m)

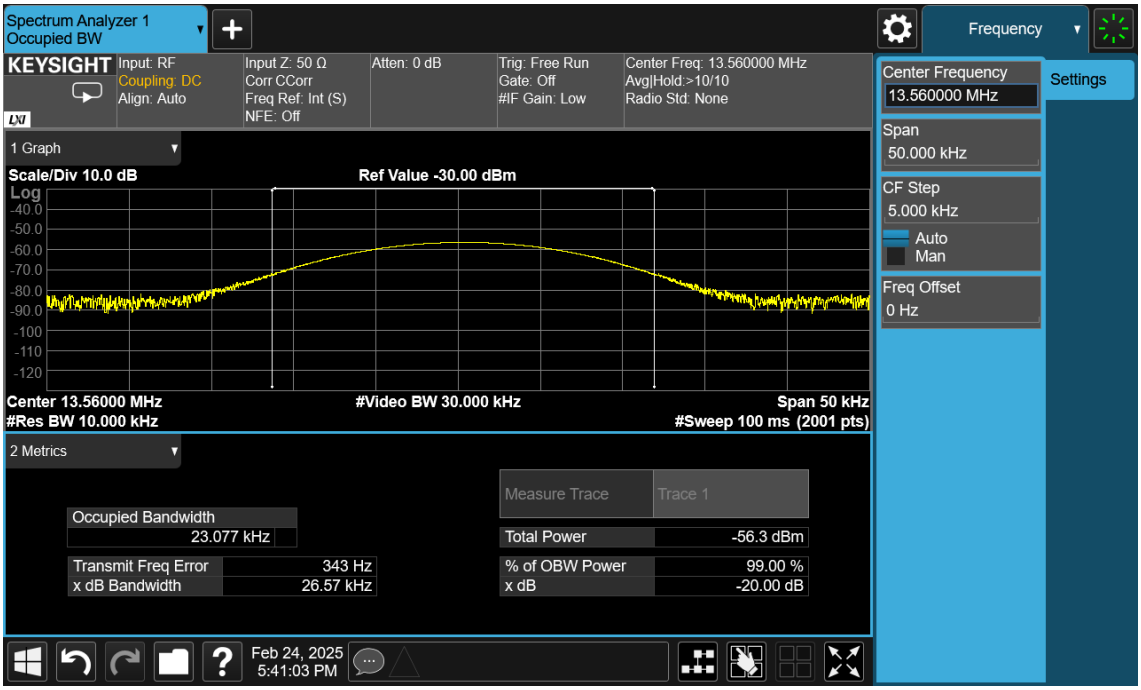
Note 2: Factor (dB/m) = Cable Loss (dB) + Antenna Factor (dB/m)

A.3 Occupied Bandwidth Test Result

Test Site	SIP-AC3	Test Date	2025-02-24
Test Engineer	Mero Zhou	Test Mode	Mode 1

Frequency (MHz)	20dB Occupied Bandwidth (kHz)
13.56	26.57

20dB Occupied Bandwidth



A.4 Frequency Tolerance Test Result

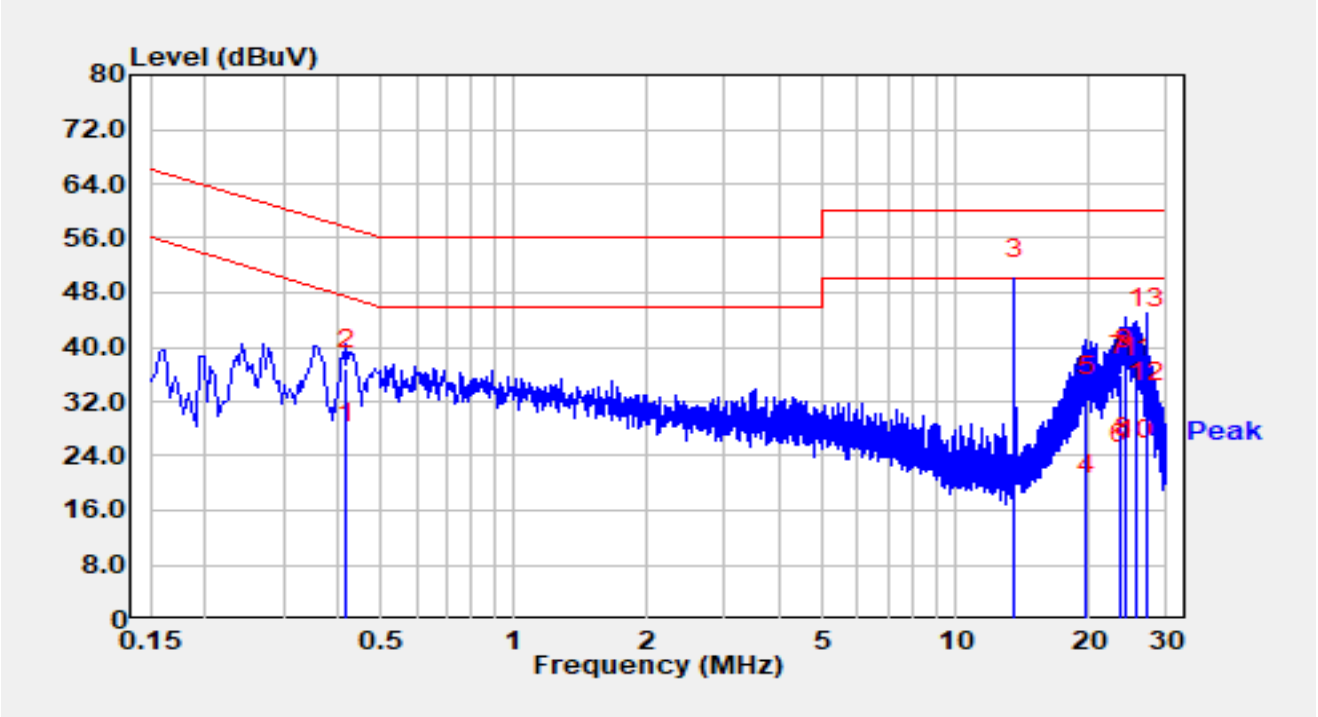
Test Site	SIP-SR1	Test Date	2025-02-26
Test Engineer	Alisa Deng	Test Mode	Mode 1

Reference Voltage: 3.8V					
Voltage (%)	Power Battery	Temp (°C)	Frequency Deviation (Hz)	Deviation Limit	Test Result
100%	3.8V	-20	400.057	-1356 ~ 1356Hz	Pass
		-10	374.207	-1356 ~ 1356Hz	Pass
		0	332.034	-1356 ~ 1356Hz	Pass
		+10	302.332	-1356 ~ 1356Hz	Pass
		+20	262.645	-1356 ~ 1356Hz	Pass
		+30	251.675	-1356 ~ 1356Hz	Pass
		+40	248.567	-1356 ~ 1356Hz	Pass
		+50	248.454	-1356 ~ 1356Hz	Pass
End Point Note	3.5V	+ 20	306.000	-1356 ~ 1356Hz	Pass
115%	4.18V	+ 20	304.107	-1356 ~ 1356Hz	Pass

Note: The operating voltage is provided by the manufacturer.

A.5 AC Conducted Emissions Test Result

Site	SIP-SR2	Test Date	2025-02-26
Temperature	20.9 °C	Humidity	40.5 %
Limit	FCC Part 15.207_CE_Mains	Test Engineer	Henry Wang
Factor	ENV216_101684_E	Polarity	Line
EUT	Mobile Computer	Test Voltage	AC 120V/60Hz
Test Mode	Mode 1		

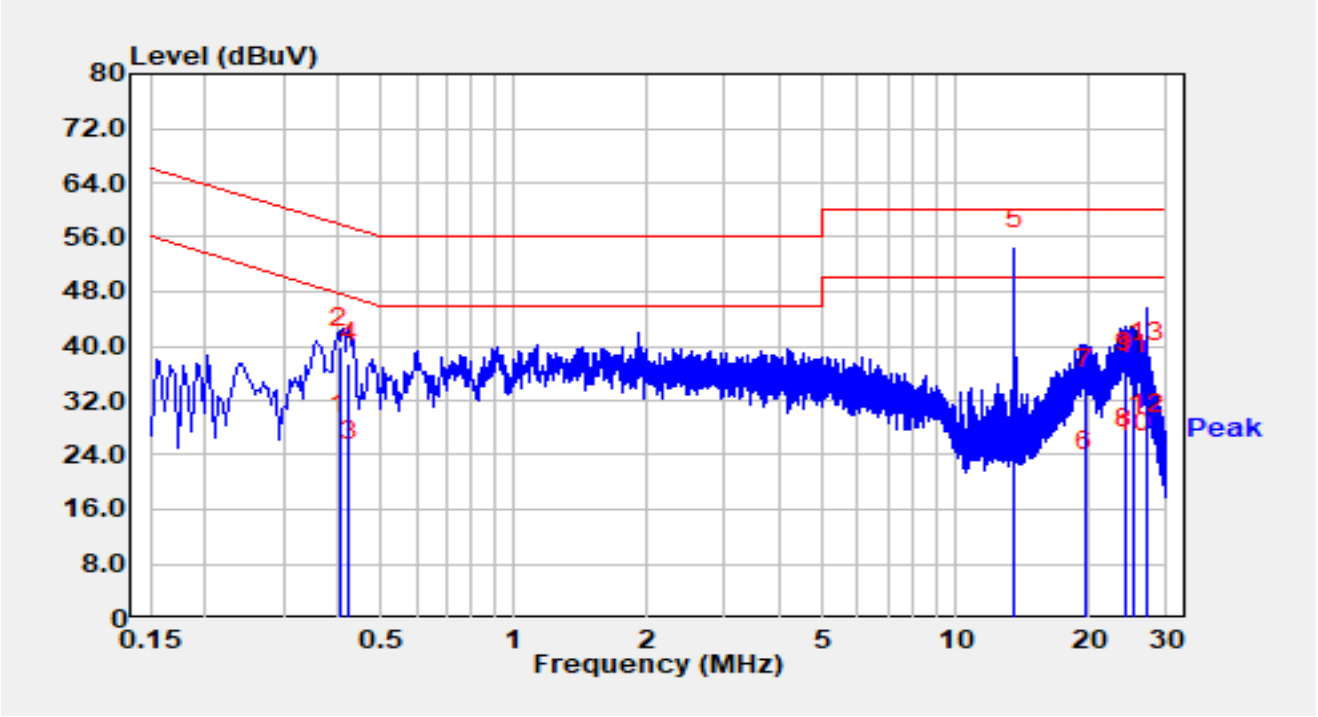


No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.418	15.85	9.82	25.67	-21.82	47.49	Average
2		0.418	26.89	9.82	36.71	-20.77	57.49	QP
3		13.561	39.02	10.97	49.99	N/A	N/A	Peak
4		19.801	7.09	11.18	18.28	-31.72	50.00	Average
5		19.801	21.54	11.18	32.72	-27.28	60.00	QP
6		23.444	11.54	11.27	22.80	-27.20	50.00	Average
7		23.444	24.62	11.27	35.89	-24.11	60.00	QP
8		24.216	12.52	11.28	23.80	-26.20	50.00	Average
9		24.216	25.39	11.28	36.67	-23.33	60.00	QP
10		25.696	11.99	11.32	23.31	-26.69	50.00	Average
11		25.696	24.25	11.32	35.58	-24.42	60.00	QP
12		27.120	20.56	11.36	31.92	-18.08	50.00	Average
13	*	27.120	31.28	11.36	42.65	-17.35	60.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBμV) = Reading (dBμV) + C.F (dB).
4. The point (3) is NFC fundamental frequency that is not evaluated in this standard.

Site	SIP-SR2	Test Date	2025-02-26
Temperature	20.9 °C	Humidity	40.5 %
Limit	FCC Part 15.207_CE_Mains	Test Engineer	Henry Wang
Factor	ENV216_101684_E	Polarity	Neutral
EUT	Mobile Computer	Test Voltage	AC 120V/60Hz
Test Mode	Mode 1		



No	Mark	Frequency (MHz)	Reading (dBµV)	C.F (dB)	Measurement (dBµV)	Margin (dB)	Limit (dBµV)	Detector
1		0.402	17.36	9.81	27.17	-20.64	47.81	Average
2	*	0.402	29.99	9.81	39.80	-18.01	57.81	QP
3		0.422	13.34	9.81	23.15	-24.26	47.41	Average
4		0.422	27.71	9.81	37.52	-19.89	57.41	QP
5		13.561	43.19	11.02	54.21	N/A	N/A	Peak
6		19.633	10.43	11.25	21.68	-28.32	50.00	Average
7		19.633	22.42	11.25	33.67	-26.33	60.00	QP
8		24.130	13.54	11.40	24.94	-25.06	50.00	Average
9		24.130	24.68	11.40	36.08	-23.92	60.00	QP
10		25.164	12.86	11.39	24.25	-25.75	50.00	Average
11		25.164	24.24	11.39	35.63	-24.37	60.00	QP
12		27.116	15.56	11.49	27.05	-22.95	50.00	Average
13		27.116	25.98	11.49	37.47	-22.53	60.00	QP

Notes:

1. " * ", means this data is the worst emission level.
2. C.F (dB) = LISN Factor (dB) + Cable Loss (dB).
3. Measurement (dBμV) = Reading (dBμV) + C.F (dB).
4. The point (5) is NFC fundamental frequency that is not evaluated in this standard.

Appendix B - Test Setup Photograph

Refer to “2412RSU045-UT” file.

Appendix C - EUT Photograph

Refer to “2412RSU045-UE” file.

The End