

RADIO PERFORMANCE TEST REPORT

Test Report No. : OT-23N-RWD-001
Reception No. : 2309003183
Applicant : Samsung Electronics Co Ltd
Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States
Manufacturer : Samsung Electronics Co Ltd
Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do 16677, Korea
Type of Equipment : Wi-Fi/BT Transceiver
FCC ID. : A3LWCD730M
Model Name : WCD730M
Multiple Model Name : N/A
Serial number : N/A
Total page of Report : 34 pages (including this page)
Date of Incoming : October 04, 2023
Date of issue : November 01, 2023

SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C Section 15.247**

This test report only contains the result of a single test of the sample supplied for the examination.

It is not a generally valid assessment of the features of the respective products of the mass-production.

This report is not correlated with the "KS Q ISO/IEC 17025 and KOLAS accreditation" of Korean Laboratory Accreditation Scheme.





Tested by
 Ju-Yun, Park / Sr. Engineer
 ONETECH Corp.

Reviewed by
 Tae-Ho, Kim / Chief Engineer
 ONETECH Corp.

Approved by
 Jae-Ho, Lee / Chief Engineer
 ONETECH Corp.

CONTENTS

	Page
1. VERIFICATION OF COMPLIANCE	5
2. TEST SUMMARY	6
2.1 TEST ITEMS AND RESULTS	6
2.2 ADDITIONS, DEVIATIONS, EXCLUSIONS FROM STANDARDS	6
2.3 RELATED SUBMITTAL(S) / GRANT(S)	6
2.4 PURPOSE OF THE TEST	6
2.5 TEST METHODOLOGY	6
2.6 TEST FACILITY	6
3. GENERAL INFORMATION	7
3.1 PRODUCT DESCRIPTION	7
3.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT	11
4. EUT MODIFICATIONS	11
5. SYSTEM TEST CONFIGURATION	12
5.1 JUSTIFICATION	12
5.2 PERIPHERAL EQUIPMENT	12
5.3 MODE OF OPERATION DURING THE TEST	12
5.4 CONFIGURATION OF TEST SYSTEM	13
5.5 ANTENNA REQUIREMENT	13
6. MEASUREMENT UNCERTAINTY	13
7. PRELIMINARY TEST	14
7.1 AC POWER LINE CONDUCTED EMISSIONS TESTS	14
7.2 GENERAL RADIATED EMISSIONS TESTS	14
8. MINIMUM 6 dB BANDWIDTH	15
8.1 OPERATING ENVIRONMENT	15
8.2 TEST SET-UP	15
8.3 TEST DATE	15
8.4 TEST DATA FOR 1 MBPS	15
8.5 TEST DATA FOR 2 MBPS	15
9. MAXIMUM PEAK OUTPUT POWER	16
9.1 OPERATING ENVIRONMENT	16
9.2 TEST SET-UP	16
9.3 TEST DATE	16

9.4 TEST DATA FOR 1 MBPS	16
9.5 TEST DATA FOR 2 MBPS	16
10. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND	17
10.1 OPERATING ENVIRONMENT	17
10.2 TEST SET-UP FOR CONDUCTED MEASUREMENT	17
10.3 TEST SET-UP FOR RADIATED MEASUREMENT.....	17
10.4 TEST DATE	17
10.5 TEST DATA FOR CONDUCTED EMISSION	17
10.6 TEST DATA FOR RADIATED EMISSION.....	18
10.6.1 Radiated Emission which fall in the Restricted Band.....	18
10.6.2 Spurious & Harmonic Radiated Emission.....	20
11. PEAK POWER SPECTRAL DENSITY	24
11.1 OPERATING ENVIRONMENT	24
11.2 TEST SET-UP	24
11.3 TEST DATE	24
11.4 TEST DATA FOR 1 MBPS	24
11.5 TEST DATA FOR 2 MBPS	24
12. RADIATED EMISSION TEST	25
12.1 OPERATING ENVIRONMENT	25
12.2 TEST SET-UP	25
12.3 TEST DATE	25
12.4 TEST DATA FOR 30 MHz ~ 1 000 MHz	26
12.4.1 Test data for Bluetooth LE	26
12.5 TEST DATA FOR BELOW 30 MHz	28
12.6 TEST DATA FOR ABOVE 1 GHz	28
13. CONDUCTED EMISSION TEST	29
13.1 OPERATING ENVIRONMENT	29
13.2 TEST SET-UP	29
13.3 TEST DATE	29
13.4 TEST DATA.....	30
13.4.1 Test data for Bluetooth LE	30
13.4.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)	32
14. LIST OF TEST EQUIPMENT	34

※ Please refer to the Annex section for All test plots

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-23N-RWD-001	November 01, 2023	Initial Release	All

1. VERIFICATION OF COMPLIANCE

Applicant : Samsung Electronics Co Ltd

Address : 19 Chapin Rd., Building D, Pine Brook, New Jersey, 07058, United States

Contact Person : Youngjoong, Noh / Principal Engineer

Telephone No. : +82-31-277-0598

FCC ID : A3LWCD730M

Model Name : WCD730M

Brand Name : 

Serial Number : N/A

Date : November 01, 2023

EQUIPMENT CLASS	DTS – DIGITAL TRNSMISSION SYSTEM
E.U.T. DESCRIPTION	Modular Transmitter, Wi-Fi/BT Transceiver
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SUBPART C Section 15.247 KDB 558074 D01 15.247 Meas Guidance v05r02
Modifications on the Equipment to Achieve Compliance	None
Final Test was Conducted On	3 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.247 (a) (2)	Minimum 6 dB Bandwidth	Met the Limit / PASS
15.247 (b) (3)	Maximum Peak Conducted Output Power	Met the Limit / PASS
15.247 (d)	100 kHz Bandwidth Outside the Frequency Band	Met the Limit / PASS
15.247 (d)	Radiated Emission which fall in the Restricted Band	Met the Limit / PASS
15.247 (e)	Peak Power Spectral Density	Met the Limit / PASS
15.209	Radiated Emission Limits	Met the Limit / PASS
15.207	Conducted Limits	Met the Limit / PASS
15.203	Antenna Requirement	Met requirement / PASS

2.2 Additions, deviations, exclusions from standards

No additions, deviations or exclusions have been made from standard.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.247.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-20122/ C-14617/ G-10666/ T-11842

-. Lab Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

3. GENERAL INFORMATION

3.1 Product Description

The Samsung Electronics Co Ltd, Model WCD730M (referred to as the EUT in this report) is a Wi-Fi/BT Transceiver. The product specification described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Wi-Fi/BT Transceiver	
Temperature Range	-20 °C ~ 50 °C	
OPERATING FREQUENCY	Bluetooth LE	2 402 MHz ~ 2 480 MHz
	Bluetooth	2 402 MHz ~ 2 480 MHz
	WLAN 2.4 GHz	2 412 MHz ~ 2 472 MHz (802.11b/g/n(HT20))
	WLAN	5 180 MHz ~ 5 240 MHz (802.11a/n(HT20)/ac(VHT20))
	5 150 MHz ~	5 190 MHz ~ 5 230 MHz (802.11n(HT40)/ac(VHT40))
	5 250 MHz Band	5 210 MHz (802.11ac(VHT80))
	WLAN	5 260 MHz ~ 5 320 MHz (802.11a/n(HT20)/ac(VHT20))
	5 250 MHz ~	5 270 MHz ~ 5 310 MHz (802.11n(HT40)/ac(VHT40))
	5 350 MHz Band	5 290 MHz (802.11ac(VHT80))
	WLAN	5 500 MHz ~ 5 720 MHz (802.11a/n(HT20)/ac(VHT20))
	5 470 MHz ~	5 510 MHz ~ 5 710 MHz (802.11n(HT40)/ac(VHT40))
	5 725 MHz Band	5 530 MHz ~ 5 690 MHz (802.11ac(VHT80))
	WLAN	5 745 MHz ~ 5 825 MHz (802.11a/n(HT20)/ac(VHT20))
	5 725 MHz ~	5 755 MHz ~ 5 795 MHz (802.11n(HT40)/ac(VHT40))
	5 850 MHz Band	5 775 MHz (802.11ac(VHT80))
MODULATION TYPE	Bluetooth LE	GFSK for 1 Mbps / 2 Mbps
	Bluetooth	GFSK for 1Mbps, $\pi/4$ -DQPSK for 2Mbps, 8-DPSK for 3Mbps
	WLAN 2.4 GHz	802.11b: DSSS Modulation(DBPSK/DQPSK/CCK) 802.11g/n(HT20): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)
	WLAN 5 GHz	802.11a/n(HT20)/n(HT40)/ac(VHT80): OFDM Modulation(BPSK/QPSK/16QAM/64QAM)

RF OUTPUT POWER	Bluetooth LE	1 Mbps	9.98 dBm
		2 Mbps	9.89 dBm
	Bluetooth	1 Mbps	10.97 dBm
		2 Mbps	10.51 dBm
		3 Mbps	10.53 dBm
	WLAN 2.4 GHz	Antenna 1	18.08 dBm(802.11b) 15.61 dBm(802.11g) 15.01 dBm(802.11n_HT20)
		Antenna 2	20.59 dBm(802.11b) 16.75 dBm(802.11g) 16.61 dBm(802.11n_HT20)
		Multiple Antenna	18.77 dBm(802.11g) 18.72 dBm(802.11n_HT20)
	WLAN 5 150 MHz ~ 5 250 MHz Band	Antenna 1	12.31 dBm(802.11a) 12.38 dBm(802.11n_HT20) 14.12 dBm(802.11n_HT40) 12.73 dBm(802.11ac_VHT80)
		Antenna 2	12.08 dBm(802.11a) 12.08 dBm(802.11n_HT20) 14.21 dBm(802.11n_HT40) 13.14 dBm(802.11ac_VHT80)
		Multiple Antenna	15.16 dBm(802.11a) 15.24 dBm(802.11n_HT20) 17.08 dBm(802.11n_HT40) 15.95 dBm(802.11ac_VHT80)
	WLAN 5 250 MHz ~ 5 350 MHz Band	Antenna 1	15.75 dBm(802.11a) 15.56 dBm(802.11n_HT20) 14.73 dBm(802.11n_HT40) 12.16 dBm(802.11ac_VHT80)
		Antenna 2	15.75 dBm(802.11a) 15.55 dBm(802.11n_HT20) 14.61 dBm(802.11n_HT40) 12.08 dBm(802.11ac_VHT80)
		Multiple Antenna	18.76 dBm(802.11a) 18.57 dBm(802.11n_HT20) 17.60 dBm(802.11n_HT40) 15.13 dBm(802.11ac_VHT80)

RF OUTPUT POWER	WLAN 5 470 MHz ~ 5 725 MHz Band	Antenna 1	14.38 dBm(802.11a) 14.81 dBm(802.11n_HT20) 14.26 dBm(802.11n_HT40) 10.22 dBm(802.11ac_VHT80)
		Antenna 1_Straddle	8.30 dBm(802.11a) 9.04 dBm(802.11n_HT20) 8.64 dBm(802.11n_HT40) 9.43 dBm(802.11ac_VHT80)
		Antenna 2	15.71 dBm(802.11a) 16.41 dBm(802.11n_HT20) 15.71 dBm(802.11n_HT40) 12.03 dBm(802.11ac_VHT80)
		Antenna 2_Straddle	10.51 dBm(802.11a) 11.10 dBm(802.11n_HT20) 10.86 dBm(802.11n_HT40) 11.96 dBm(802.11ac_VHT80)
		Multiple Antenna	18.11 dBm(802.11a) 18.69 dBm(802.11n_HT20) 17.97 dBm(802.11n_HT40) 14.23 dBm(802.11ac_VHT80)
		Multiple Antenna _Straddle	12.55 dBm(802.11a) 13.20 dBm(802.11n_HT20) 12.90 dBm(802.11n_HT40) 13.89 dBm(802.11ac_VHT80)

RF OUTPUT POWER	WLAN 5 725 MHz ~ 5 850 MHz Band	Antenna 1	11.65 dBm(802.11a) 12.51 dBm(802.11n_HT20) 12.85 dBm(802.11n_HT40) 11.75 dBm(802.11ac_VHT80)
		Antenna 1_Straddle	0.48 dBm(802.11a) 1.71 dBm(802.11n_HT20) -3.17 dBm(802.11n_HT40) -4.98 dBm(802.11ac_VHT80)
		Antenna 2	14.18 dBm(802.11a) 15.01 dBm(802.11n_HT20) 15.55 dBm(802.11n_HT40) 14.25 dBm(802.11ac_VHT80)
		Antenna 2_Straddle	2.76 dBm(802.11a) 3.73 dBm(802.11n_HT20) -1.00 dBm(802.11n_HT40) -2.61 dBm(802.11ac_VHT80)
		Multiple Antenna	16.11 dBm(802.11a) 16.95 dBm(802.11n_HT20) 17.42 dBm(802.11n_HT40) 16.19 dBm(802.11ac_VHT80)
		Multiple Antenna _Straddle	4.78 dBm(802.11a) 5.85 dBm(802.11n_HT20) 1.06 dBm(802.11n_HT40) -0.62 dBm(802.11ac_VHT80)

ANTENNA TYPE	Chip Antenna		
ANTENNA GAIN	Bluetooth LE	-1.82 dBi	
	Bluetooth	-1.82 dBi	
	WLAN 2.4 GHz	Antenna 1	0.71 dBi
		Antenna 2	1.38 dBi
		Multiple Antenna	4.07 dBi
	5 150 MHz ~ 5 250 MHz Band	Antenna 1	1.39 dBi
		Antenna 2	1.43 dBi
		Multiple Antenna	4.42 dBi
	5 250 MHz ~ 5 350 MHz Band	Antenna 1	1.43 dBi
		Antenna 2	1.43 dBi
		Multiple Antenna	4.44 dBi
	5 470 MHz ~ 5 725 MHz Band	Antenna 1	1.40 dBi
		Antenna 2	1.43 dBi
		Multiple Antenna	4.43 dBi
	5 725 MHz ~ 5 850 MHz Band	Antenna 1	1.32 dBi
		Antenna 2	1.41 dBi
		Multiple Antenna	4.38 dBi
List of each Osc. or crystal Freq.(Freq. >= 1 MHz)		40 MHz	

3.2 Alternative type(s)/model(s); also covered by this test report.

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
WCD730M	Basic: MIC and Accelation sensor at the top side.	☒
	Option 1: This model is identical to the basic model except for the removal MIC.	☐
	Option 2: This model is identical to the basic model except for the removal MIC and Accelation sensor at the top side.	☐

Note: 1. Applicant consigns only basic model to test, therefore this test report just guarantees the units, which have been tested.

2. The Applicant/manufacture is responsible for the compliance of all variants.

4. EUT MODIFICATIONS

-. None

5. SYSTEM TEST CONFIGURATION

5.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	Samsung Electronics Co Ltd	HDWB-2470 V1.0	N/A

5.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
WCD730M	Samsung Electronics Co Ltd	Wi-Fi/BT Transceiver (EUT)	
Ideapad320	LENOVO	Notebook PC	EUT
ADL45WCE	CHICONY POWER TECHNOLOGY(SUZHOU) CO.,LTD.	AC Adapter	

5.3 Mode of operation during the test

For the testing, software used to control the EUT for staying in continuous transmitting is programmed.

For final testing, the EUT was set at 2 402 MHz, 2 440 MHz, and 2 480 MHz to get a maximum emission levels from the EUT. The EUT was moved throughout the XY, XZ, and YZ planes and the worst case is “XY” axis, but the worst data was recorded in this report.

-. Frequency / Channel Operations

Channel	Frequency
0	2 402
19	2 440
39	2 480

-. Duty Cycle

Mode	Tx On Time [ms]	Tx Off Time [ms]	Duty Cycle [%]	Correction Factor [dB]
Bluetooth LE [1 Mbps]	2.120	0.380	84.80	0.72
Bluetooth LE [2 Mbps]	1.060	0.820	56.38	2.49

Note – Duty Cycle : (Tx On Time / (Tx On Time + Tx Off Time)) * 100

Correction Factor : 10 * Log(1 / (Duty Cycle / 100))

5.4 Configuration of Test System

Line Conducted Test: The EUT was connected to USB and the power of USB was connected to Notebook PC. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

Radiated Emission Test: Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter Semi Anechoic Chamber.

The turntable was rotated through 360 degrees and the EUT was tested by positioned three orthogonal planes to obtain the highest reading on the field strength meter. Once maximum reading was determined, the search antenna was raised and lowered in both vertical and horizontal polarization.

5.5 Antenna Requirement

For intentional device, according to section 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.

Antenna Construction:

The antenna of the EUT is a Chip Antenna on the main board in the EUT, so no consideration of replacement by the user.

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013. All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (dB)
Conducted Output Power	0.68
Conducted Spurious Emission < 26.5 GHz	1.60
Power Spectral Density	1.55
Line Conducted Disturbance (150 kHz ~ 30 MHz)	2.00
Radiated Disturbance (9 kHz ~ 30 MHz)	4.09
Radiated Disturbance (30 MHz ~ 1 GHz)	3.98
Radiated Disturbance (1 GHz ~ 18 GHz)	5.56
Radiated Disturbance (18 GHz ~ 40 GHz)	5.65

7. PRELIMINARY TEST

7.1 AC Power line Conducted Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

8.2 General Radiated Emissions Tests

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

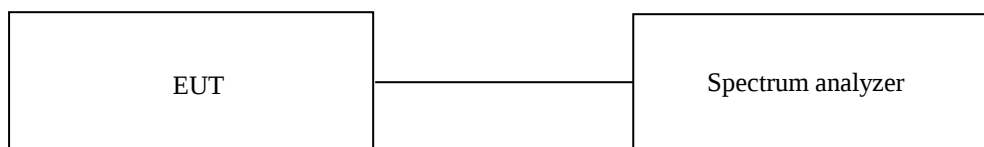
8. MINIMUM 6 dB BANDWIDTH

8.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

8.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6 dB.



8.3 Test Date

October 04, 2023 ~ October 20, 2023

8.4 Test data for 1 Mbps

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	679.30	500.00	179.30
Middle	2 440.00	684.30	500.00	184.30
High	2 480.00	689.30	500.00	189.30

Remark. Margin = Measured Value - Limit

8.5 Test data for 2 Mbps

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (kHz)	LIMIT (kHz)	MARGIN (kHz)
Low	2 402.00	1 259.00	500.00	759.00
Middle	2 440.00	1 239.00	500.00	739.00
High	2 480.00	1 249.00	500.00	749.00

Remark. Margin = Measured Value – Limit

9. MAXIMUM PEAK OUTPUT POWER

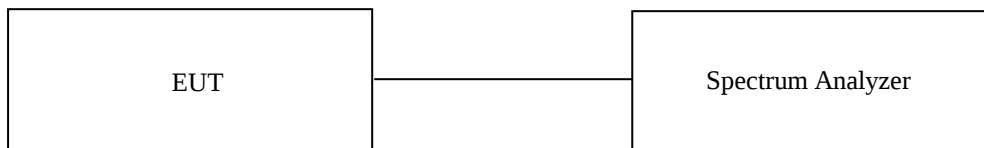
9.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

9.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $\geq$ DTS Bandwidth, the video bandwidth is set to 3 times the resolution bandwidth.



9.3 Test Date

October 04, 2023 ~ October 20, 2023

9.4 Test data for 1 Mbps

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	8.65	30.00	21.35
MIDDLE	2 440.00	9.42	30.00	20.58
HIGH	2 480.00	9.98	30.00	20.02

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

9.5 Test data for 2 Mbps

-. Test Result : Pass

CHANNEL	FREQUENCY (MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
LOW	2 402.00	8.57	30.00	21.43
MIDDLE	2 440.00	9.34	30.00	20.66
HIGH	2 480.00	9.89	30.00	20.11

Remark. Margin = Limit – Measured Value (=Receiver Reading + Cable Loss)

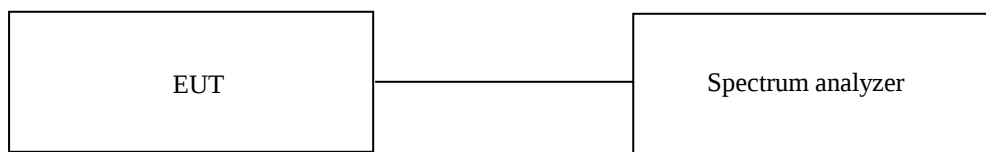
10. 100 kHz BANDWIDTH OUTSIDE THE FREQUENCY BAND

10.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

10.2 Test set-up for conducted measurement

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, the video bandwidth is set to 3 times the resolution bandwidth and peak detection was used.



10.3 Test set-up for radiated measurement

The radiated emissions measurements were performed on the 3 m semi anechoic chamber. The EUT was placed on turntable approximately 1.5 m above the ground plane.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and maximum emission levels at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for horizontal and vertical polarization of the receiving antenna.

10.4 Test Date

October 04, 2023 ~ October 20, 2023

10.5 Test data for conducted emission

For Test data for conducted emission, please refer to the Annex.

10.6 Test data for radiated emission

10.6.1 Radiated Emission which fall in the Restricted Band

10.6.1.1 Test data for 1 Mbps

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Measurement distance : 3 m
- . Duty Cycle : 84.80 %
- . Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 371.990	53.32	Peak	H	27.56	6.90	42.55	10.43	-	55.66	74.00	18.34
2 383.850	41.13	Average	H	27.53	6.96	42.55	10.42	0.72	44.21	54.00	9.79
2 318.130	53.30	Peak	V	27.79	6.73	42.57	10.44	-	55.69	74.00	18.31
2 389.550	41.07	Average	V	27.52	7.04	42.54	10.43	0.72	44.24	54.00	9.76
Test Data for High Channel											
2 486.000	53.32	Peak	H	27.53	6.98	42.51	10.45	-	55.77	74.00	18.23
2 483.590	41.69	Average	H	27.53	6.98	42.51	10.45	0.72	44.86	54.00	9.14
2 489.240	53.22	Peak	V	27.52	7.07	42.50	10.44	-	55.75	74.00	18.25
2 483.630	41.53	Average	V	27.53	6.98	42.51	10.45	0.72	44.70	54.00	9.30

Tabulated test data for Restricted Band

Remark: "H": Horizontal, "V": Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{ATT} + \text{Duty Factor}$$

10.6.1.2 Test data for 2 Mbps

- Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- Video bandwidth : 3 MHz for Peak and Average Mode
- Measurement distance : 3 m
- Duty Cycle : 56.38 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	ATT (dB)	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel											
2 370.340	53.04	Peak	H	27.56	6.90	42.55	10.43	-	55.38	74.00	18.62
2 379.530	40.96	Average	H	27.54	6.96	42.55	10.42	2.49	45.82	54.00	8.18
2 314.730	52.78	Peak	V	27.81	6.67	42.57	10.42	-	55.11	74.00	18.89
2 310.690	41.07	Average	V	27.84	6.67	42.58	10.42	2.49	45.91	54.00	8.09
Test Data for High Channel											
2 484.410	53.56	Peak	H	27.53	6.98	42.51	10.45	-	56.01	74.00	15.97
2 483.510	42.13	Average	H	27.53	6.98	42.51	10.45	2.49	47.07	54.00	3.05
2 490.940	53.62	Peak	V	27.52	7.07	42.50	10.44	-	56.15	74.00	15.88
2 483.510	41.81	Average	V	27.53	6.98	42.51	10.45	2.49	46.75	54.00	3.34

Tabulated test data for Restricted Band

Remark: “H”: Horizontal, “V”: Vertical

$$\text{Margin (dB)} = \text{Limits (dB}\mu\text{V/m)} - \text{Total Level (dB}\mu\text{V/m)}$$

$$\text{Total Level} = \text{Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{AMP Gain} + \text{ATT} + \text{Duty Factor}$$

10.6.2 Spurious & Harmonic Radiated Emission

10.6.2.1 Test data for 1 Mbps

- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
1 MHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 84.80 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 804.120	49.85	Peak	H	31.21	10.40	41.84	-	49.62	74.00	24.38
4 804.150	39.52	Average	H	31.21	10.40	41.84	0.72	40.01	54.00	13.99
7 205.400	51.31	Peak	H	36.41	12.93	41.80	-	58.85	74.00	15.15
7 206.690	42.17	Average	H	36.41	12.93	41.80	0.72	50.43	54.00	3.57
4 800.420	49.31	Peak	V	31.20	10.40	41.84	-	49.07	74.00	24.93
4 803.860	37.36	Average	V	31.21	10.40	41.84	0.72	37.85	54.00	16.15
7 207.170	51.66	Peak	V	36.41	12.93	41.80	-	59.20	74.00	14.80
7 206.500	41.11	Average	V	36.41	12.93	41.80	0.72	49.37	54.00	4.63
Test Data for Middle Channel										
4 884.310	49.54	Peak	H	31.30	10.31	41.82	-	49.33	74.00	24.67
4 883.100	37.87	Average	H	31.30	10.31	41.82	0.72	38.38	54.00	15.62
7 319.660	50.47	Peak	H	36.30	12.63	41.80	-	57.60	74.00	16.40
7 319.500	41.13	Average	H	36.30	12.63	41.80	0.72	48.98	54.00	5.02
4 879.920	50.02	Peak	V	31.30	10.31	41.82	-	49.81	74.00	24.19
4 881.340	37.44	Average	V	31.30	10.31	41.82	0.72	37.95	54.00	16.05
7 320.710	49.87	Peak	V	36.30	12.63	41.80	-	57.00	74.00	17.00
7 320.620	39.20	Average	V	36.30	12.63	41.80	0.72	47.05	54.00	6.95

Test Data for High Channel										
4 957.310	49.22	Peak	H	31.21	10.41	41.81	-	49.03	74.00	24.97
4 960.390	37.30	Average	H	31.22	10.41	41.81	0.72	37.84	54.00	16.16
7 441.770	48.26	Peak	H	36.57	13.86	41.80	-	56.89	74.00	17.11
7 439.850	36.29	Average	H	36.56	13.86	41.80	0.72	45.63	54.00	8.37
4 963.030	49.12	Peak	V	31.23	10.41	41.81	-	48.95	74.00	25.05
4 955.350	37.22	Average	V	31.21	10.41	41.81	0.72	37.75	54.00	16.25
7 443.390	48.80	Peak	V	36.57	13.86	41.80	-	57.43	74.00	16.57
7 443.730	36.48	Average	V	36.57	13.86	41.80	0.72	45.83	54.00	8.17

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss – AMP Gain + Duty Factor

10.6.2.2 Test data for 2 Mbps

- Resolution bandwidth : 1 MHz for Peak and Average Mode for the emissions fall in restricted band,
1 MHz for Peak Mode for the emissions outside restricted band
- Video bandwidth : 3 MHz for Peak and Average Mode
- Frequency range : 1 GHz ~ 26.5 GHz
- Measurement distance : 3 m
- Duty Cycle : 56.38 %
- Result : PASSED

Frequency (MHz)	Reading (dBμV)	Detector Mode	Ant. Pol. (H/V)	Ant. Factor	Cable Loss	AMP Gain	Duty Factor (dB)	Total (dBμV/m)	Limits (dBμV/m)	Margin (dB)
Test Data for Low Channel										
4 803.130	49.69	Peak	H	31.21	10.40	41.84	-	49.46	74.00	24.54
4 803.090	37.62	Average	H	31.21	10.40	41.84	2.49	39.88	54.00	14.12
7 207.580	50.99	Peak	H	36.42	12.93	41.80	-	58.54	74.00	15.46
7 207.440	39.07	Average	H	36.41	12.93	41.80	2.49	49.10	54.00	4.90
4 800.210	49.90	Peak	V	31.20	10.40	41.84	-	49.66	74.00	24.34
4 803.270	37.43	Average	V	31.21	10.40	41.84	2.49	39.69	54.00	14.31
7 204.730	50.50	Peak	V	36.41	12.93	41.80	-	58.04	74.00	15.96
7 204.600	39.72	Average	V	36.41	12.93	41.80	2.49	49.75	54.00	4.25
Test Data for Middle Channel										
4 879.220	50.01	Peak	H	31.30	10.31	41.82	-	49.80	74.00	24.20
4 880.620	38.53	Average	H	31.30	10.31	41.82	2.49	40.81	54.00	13.19
7 321.250	49.81	Peak	H	36.30	12.63	41.80	-	56.94	74.00	17.06
7 321.370	38.89	Average	H	36.30	12.63	41.80	2.49	48.51	54.00	5.49
4 883.720	49.98	Peak	V	31.30	10.31	41.82	-	49.77	74.00	24.23
4 882.300	37.39	Average	V	31.30	10.31	41.82	2.49	39.67	54.00	14.33
7 318.880	49.87	Peak	V	36.30	12.63	41.80	-	57.00	74.00	17.00
7 321.210	38.39	Average	V	36.30	12.63	41.80	2.49	48.01	54.00	5.99

Test Data for High Channel										
4 955.990	49.43	Peak	H	31.21	10.41	41.81	-	49.24	74.00	24.76
4 957.420	37.44	Average	H	31.21	10.41	41.81	2.49	39.74	54.00	14.26
7 444.680	48.67	Peak	H	36.58	13.86	41.80	-	57.31	74.00	16.69
7 444.920	36.51	Average	H	36.58	13.86	41.80	2.49	47.64	54.00	6.36
4 956.100	49.52	Peak	V	31.21	10.41	41.81	-	49.33	74.00	24.67
4 957.950	37.37	Average	V	31.22	10.41	41.81	2.49	39.68	54.00	14.32
7 444.880	48.92	Peak	V	36.58	13.86	41.80	-	57.56	74.00	16.44
7 440.500	36.46	Average	V	36.56	13.86	41.80	2.49	47.57	54.00	6.43

Remark: "H": Horizontal, "V": Vertical

Margin (dB) = Limits (dBμV/m) - Total Level (dBμV/m)

Total Level = Reading + Antenna Factor + Cable Loss – AMP Gain + Duty Factor

11. PEAK POWER SPECTRAL DENSITY

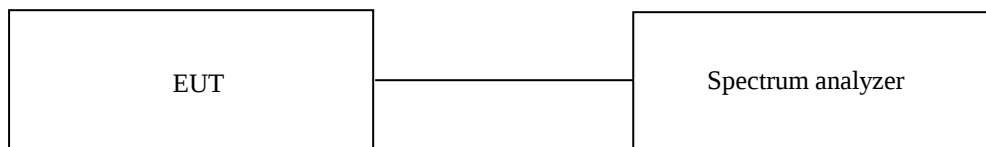
11.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

11.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer.

The resolution bandwidth is set to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, the video bandwidth is set to 3 times the resolution bandwidth.



11.3 Test Date

October 04, 2023 ~ October 20, 2023

11.4 Test data for 1 Mbps

-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-8.15	8.00	16.15
Middle	2 440.00	-7.62	8.00	15.62
High	2 480.00	-7.09	8.00	15.09

Remark. Margin = Limit – Measured value

11.5 Test data for 2 Mbps

-. Test Result : Pass

-. Operating Condition : Continuous transmitting mode

CHANNEL	FREQUENCY(MHz)	MEASURED VALUE (dBm)	LIMIT (dBm)	MARGIN (dB)
Low	2 402.00	-12.51	8.00	20.51
Middle	2 440.00	-10.55	8.00	18.55
High	2 480.00	-11.29	8.00	19.29

Remark. Margin = Limit – Measured value

12. RADIATED EMISSION TEST

12.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

12.2 Test set-up

The radiated emissions measurements were on the 3 m semi anechoic chamber. The EUT and other support equipment were placed on a non-conductive turntable above the ground plane. The interconnecting cables from outside test site were inserted into ferrite clamps at the point where the cables reach the turntable.

The frequency spectrum from 30 MHz to 26.5 GHz was scanned and emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

12.3 Test Date

October 04, 2023 ~ October 20, 2023

12.4 Test data for 30 MHz ~ 1 000 MHz

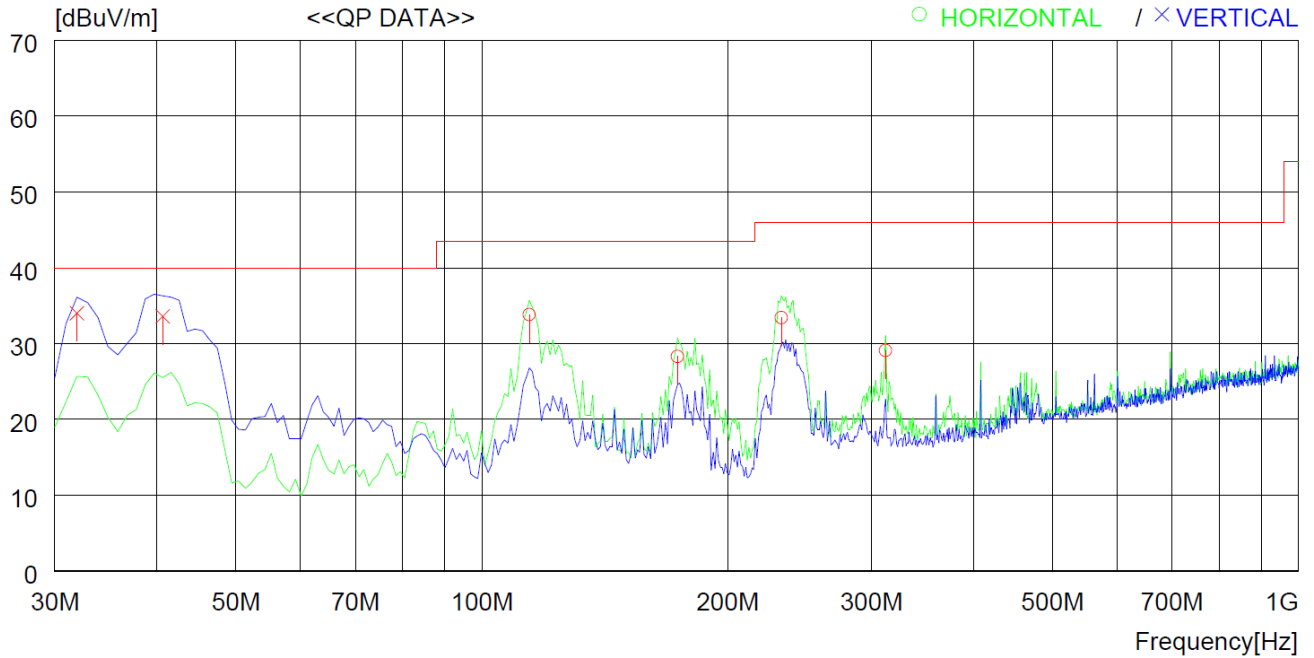
12.4.1 Test data for Bluetooth LE

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP [dBuV]	FACTOR [dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	114.390	46.5	17.7	1.6	32.0	33.8	43.5	9.7	300	0
2	173.560	41.5	16.9	1.9	32.0	28.3	43.5	15.2	200	248
3	232.730	46.3	16.8	2.3	32.0	33.4	46.0	12.6	200	359
4	312.270	39.0	19.4	2.7	32.0	29.1	46.0	16.9	200	328
----- Vertical -----										
5	31.940	44.8	20.6	0.9	32.3	34.0	40.0	6.0	300	49
6	40.670	48.1	16.7	0.9	32.1	33.6	40.0	6.4	300	288

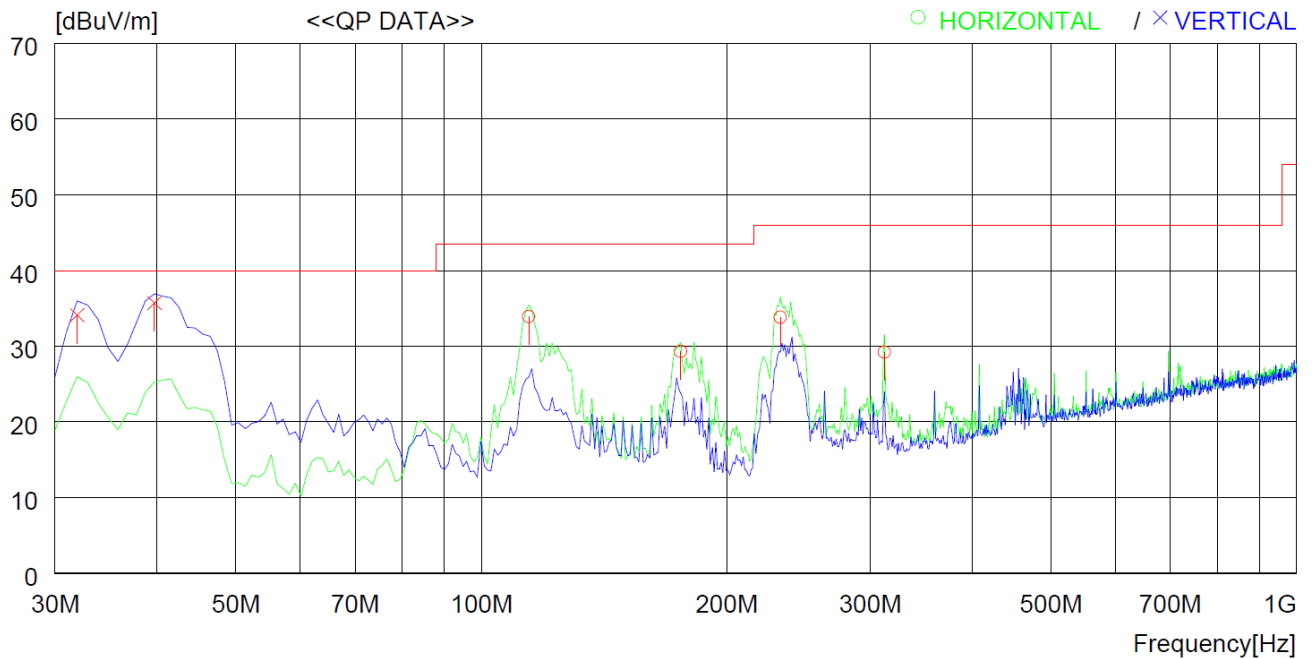
12.4.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.247

Result : PASSED

EUT : Wi-Fi/BT Transceiver

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	QP	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
		[dBuV]	[dB]							
----- Horizontal -----										
1	114.390	46.6	17.7	1.6	32.0	33.9	43.5	9.6	300	0
2	175.500	42.5	16.8	2.0	32.0	29.3	43.5	14.2	200	263
3	232.730	46.7	16.8	2.3	32.0	33.8	46.0	12.2	200	359
4	312.270	39.1	19.4	2.7	32.0	29.2	46.0	16.8	100	0
----- Vertical -----										
5	31.940	44.9	20.6	0.9	32.3	34.1	40.0	5.9	300	152
6	39.700	49.8	17.1	0.9	32.1	35.7	40.0	4.3	300	112

12.5 Test data for Below 30 MHz

- . Resolution bandwidth : 200 Hz (from 9 kHz to 0.15 MHz), 9 kHz (from 0.15 MHz to 30 MHz)
- . Frequency range : 9 kHz ~ 30 MHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

12.6 Test data for above 1 GHz

- . Resolution bandwidth : 1 MHz and Peak Detector for Peak Mode
1 MHz and RMS Detector for Average Mode
- . Video bandwidth : 3 MHz for Peak and Average Mode
- . Frequency range : 1 GHz ~ 26.5 GHz
- . Measurement distance : 3 m
- . Operating mode : Transmitting mode

Frequency (MHz)	Reading (dBμV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBμV/m)	Limits (dBμV/m)	Margin (dB)
Emission from the EUT more than 20 dB below the limit in each frequency range.									

13. CONDUCTED EMISSION TEST

13.1 Operating environment

Temperature : 22 °C
Relative humidity : 41 % R.H.

13.2 Test set-up

The EUT was placed on a wooden table, 0.8 m height above the floor. Power was fed to the EUT through a 50 Ω / 50 μ H + 5 Ω Artificial Mains Network (AMN). The ground plane was electrically bonded to the reference ground system and all power lines were filtered from ambient.

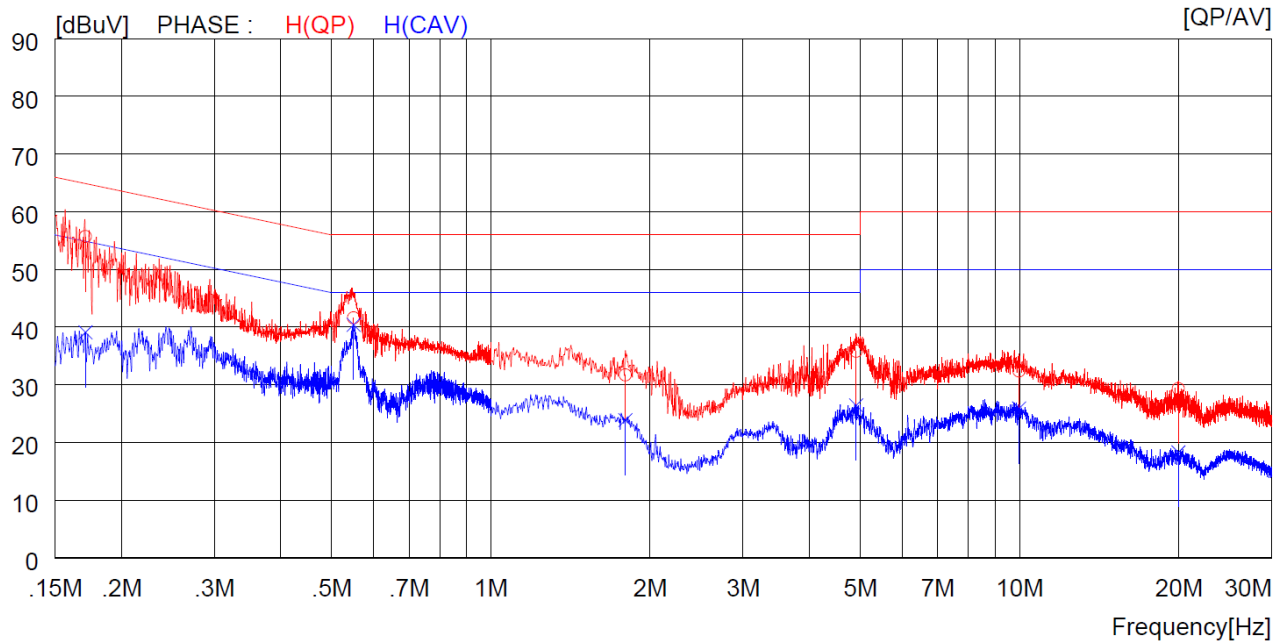
13.3 Test Date

October 04, 2023 ~ October 20, 2023

13.4 Test data

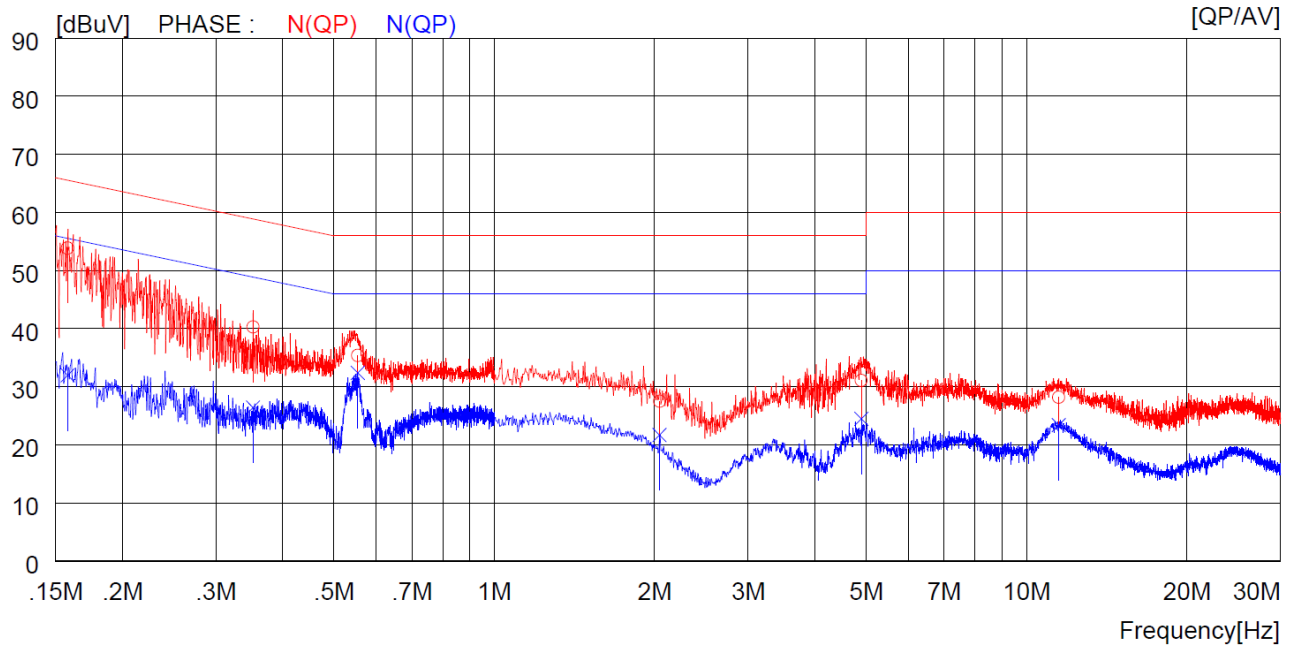
13.4.1 Test data for Bluetooth LE

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.17100	45.6	----	10.1	55.7	----	64.9	----	9.2	----	H (QP)
2	0.55000	31.5	----	10.1	41.6	----	56.0	----	14.4	----	H (QP)
3	1.79600	21.6	----	10.1	31.7	----	56.0	----	24.3	----	H (QP)
4	4.90800	25.5	----	10.3	35.8	----	56.0	----	20.2	----	H (QP)
5	9.98000	21.9	----	10.5	32.4	----	60.0	----	27.6	----	H (QP)
6	19.97000	18.8	----	10.5	29.3	----	60.0	----	30.7	----	H (QP)
7	0.17100	----	29.0	10.1	----	39.1	----	54.9	----	15.8	H (CAV)
8	0.55000	----	30.3	10.1	----	40.4	----	46.0	----	5.6	H (CAV)
9	1.79600	----	13.8	10.1	----	23.9	----	46.0	----	22.1	H (CAV)
10	4.90800	----	16.1	10.3	----	26.4	----	46.0	----	19.6	H (CAV)
11	9.98000	----	15.4	10.5	----	25.9	----	50.0	----	24.1	H (CAV)
12	19.97000	----	7.8	10.5	----	18.3	----	50.0	----	31.7	H (CAV)

-. Tested Line : NEUTRAL LINE



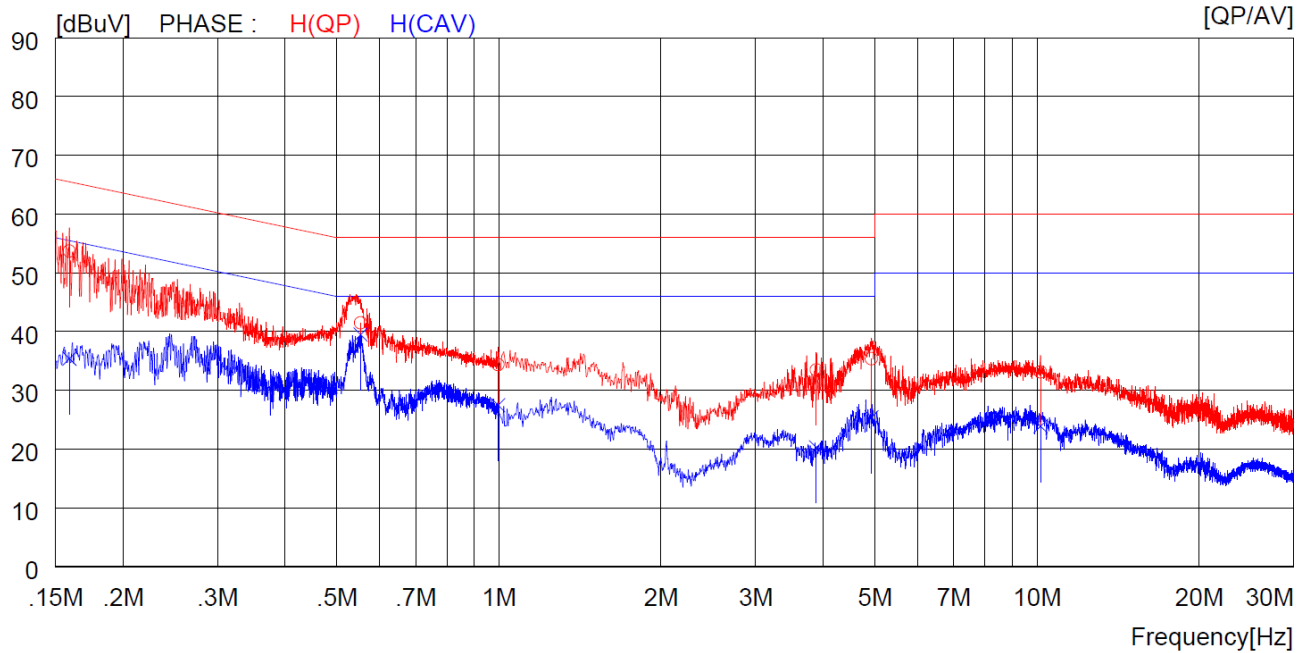
NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15800	43.8	----	10.1	53.9	----	65.6	----	11.7	----	N (QP)
2	0.35200	30.2	----	10.1	40.3	----	58.9	----	18.6	----	N (QP)
3	0.55400	25.3	----	10.1	35.4	----	56.0	----	20.6	----	N (QP)
4	2.04400	17.2	----	10.3	27.5	----	56.0	----	28.5	----	N (QP)
5	4.89600	20.8	----	10.3	31.1	----	56.0	----	24.9	----	N (QP)
6	11.49000	17.7	----	10.5	28.2	----	60.0	----	31.8	----	N (QP)
7	0.15800	----	21.9	10.1	----	32.0	----	55.6	----	23.6	NCAV)
8	0.35200	----	16.3	10.1	----	26.4	----	48.9	----	22.5	NCAV)
9	0.55400	----	22.3	10.1	----	32.4	----	46.0	----	13.6	NCAV)
10	2.04400	----	11.4	10.3	----	21.7	----	46.0	----	24.3	NCAV)
11	4.89600	----	14.2	10.3	----	24.5	----	46.0	----	21.5	NCAV)
12	11.49000	----	12.9	10.5	----	23.4	----	50.0	----	26.6	NCAV)

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

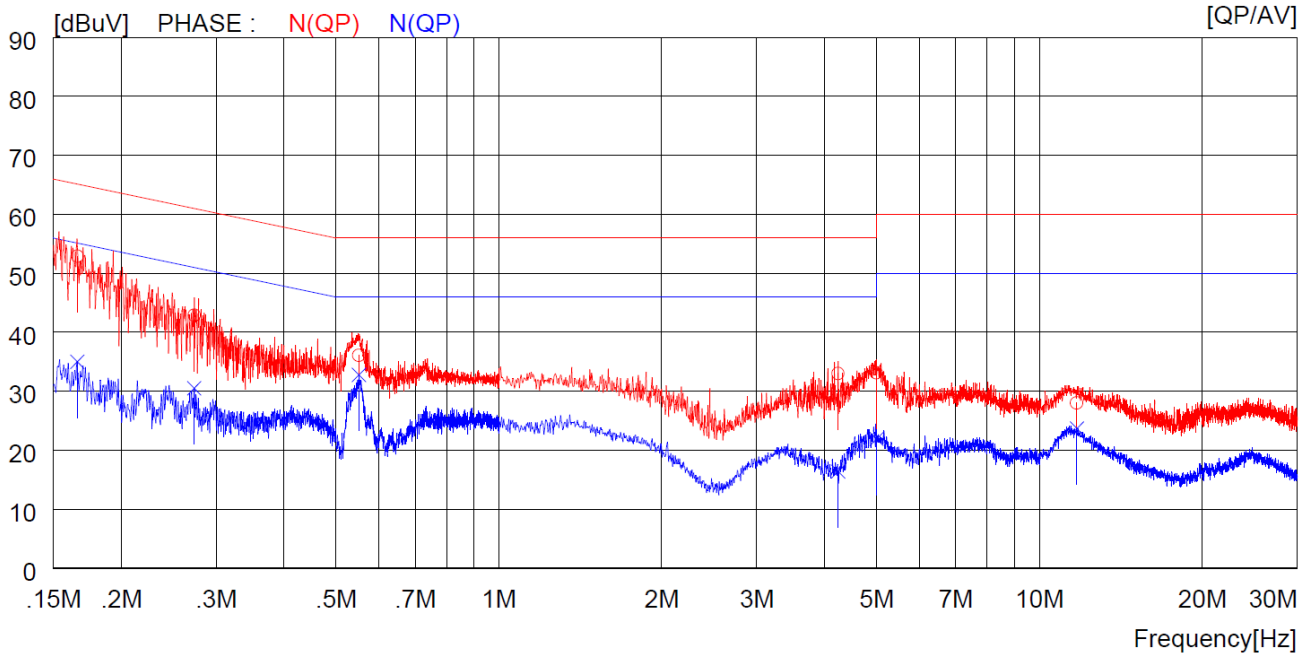
13.4.2 Test data for Intermodulation Mode(Bluetooth LE + WLAN 2.4 GHz + WLAN 5 GHz)

- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz
- Tested Line : HOT LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15900	43.6	----	10.1	53.7	----	65.5	----	11.8	----	H (QP)
2	0.55300	31.4	----	10.1	41.5	----	56.0	----	14.5	----	H (QP)
3	0.99600	24.3	----	10.1	34.4	----	56.0	----	21.6	----	H (QP)
4	3.88800	23.2	----	10.3	33.5	----	56.0	----	22.5	----	H (QP)
5	4.92400	25.1	----	10.3	35.4	----	56.0	----	20.6	----	H (QP)
6	10.15000	22.6	----	10.5	33.1	----	60.0	----	26.9	----	H (QP)
7	0.15900	----	25.3	10.1	----	35.4	----	55.5	----	20.1	H (CAV)
8	0.55300	----	29.4	10.1	----	39.5	----	46.0	----	6.5	H (CAV)
9	0.99600	----	17.4	10.1	----	27.5	----	46.0	----	18.5	H (CAV)
10	3.88800	----	10.0	10.3	----	20.3	----	46.0	----	25.7	H (CAV)
11	4.92400	----	15.1	10.3	----	25.4	----	46.0	----	20.6	H (CAV)
12	10.15000	----	13.4	10.5	----	23.9	----	50.0	----	26.1	H (CAV)

-. Tested Line : NEUTRAL LINE



NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.16600	42.8	----	10.1	52.9	----	65.2	----	12.3	----	N (QP)
2	0.27300	32.8	----	10.1	42.9	----	61.0	----	18.1	----	N (QP)
3	0.55100	26.0	----	10.1	36.1	----	56.0	----	19.9	----	N (QP)
4	4.24400	22.7	----	10.3	33.0	----	56.0	----	23.0	----	N (QP)
5	4.99600	22.8	----	10.3	33.1	----	56.0	----	22.9	----	N (QP)
6	11.73000	17.5	----	10.5	28.0	----	60.0	----	32.0	----	N (QP)
7	0.16600	----	24.9	10.1	----	35.0	----	55.2	----	20.2	NCAV
8	0.27300	----	20.4	10.1	----	30.5	----	51.0	----	20.5	NCAV
9	0.55100	----	22.7	10.1	----	32.8	----	46.0	----	13.2	NCAV
10	4.24400	----	6.1	10.3	----	16.4	----	46.0	----	29.6	NCAV
11	4.99600	----	11.6	10.3	----	21.9	----	46.0	----	24.1	NCAV
12	11.73000	----	13.2	10.5	----	23.7	----	50.0	----	26.3	NCAV

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

14. LIST OF TEST EQUIPMENT

Model Number	Manufacturer	Description	Serial Number	Last Cal.(Interval)
FSV40-N	Rohde & Schwarz	Signal Analyzer	102196	Apr. 03, 2023 (1Y)
FSVA40	Rohde & Schwarz	Signal Analyzer	101598	Apr. 03, 2023 (1Y)
ESU	Rohde & Schwarz	EMI Test Receiver	100261	Mar. 06, 2023 (1Y)
310N	Sonoma Instrument	Pre-Amplifier	392756	Oct. 16, 2023 (1Y)
SCU18	Rohde & Schwarz	Pre-Amplifier	102266	Jul. 11, 2023 (1Y)
SCU40A	Rohde & Schwarz	Pre-Amplifier	100436	Jan. 18, 2023 (1Y)
DT2000-2t	Innco System	Turn Table	N/A	N/A
MA-4640-XPET	Innco System	Antenna Master	MA4640/652/43100318/P	N/A
CO3000	Innco System	Controller	1026/40960617/P	N/A
FMZB 1513	Schwarzbeck	Loop Antenna	1513-235	Mar. 24, 2022 (2Y)
HLP-2008	TDK	Hybrid Antenna	131316	Mar. 07, 2022 (2Y)
BBHA9120D	Schwarzbeck	Horn Antenna	9120D-1366	Jun. 22, 2023 (1Y)
BBHA9170	Schwarzbeck	Horn Antenna	BBHA9170178	Jan. 04, 2023 (1Y)
HPF 3GHz	Rohde & Schwarz	High Pass Filter	N/A	Jan. 16, 2023 (1Y)
10 dB Attenuator	Rohde & Schwarz	10 dB Attenuator	14100882-4	Jul. 11, 2023 (1Y)
ESCI	Rohde & Schwarz	EMI TEST RECEIVER	101012	Sep. 26, 2023 (1Y)
NSLK8128	Schwarzbeck	AMN	8128216	Mar. 14, 2023 (1Y)
ESH3-Z2	Rohde & Schwarz	PULSE LIMITER	100655	Mar. 13, 2023 (1Y)