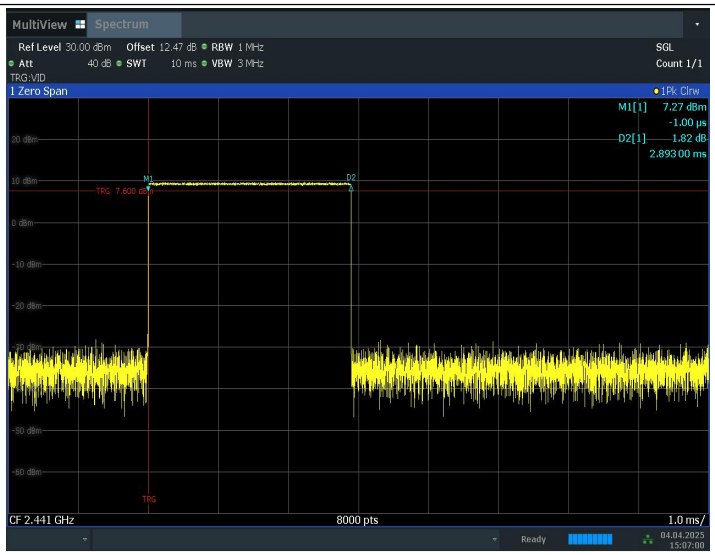
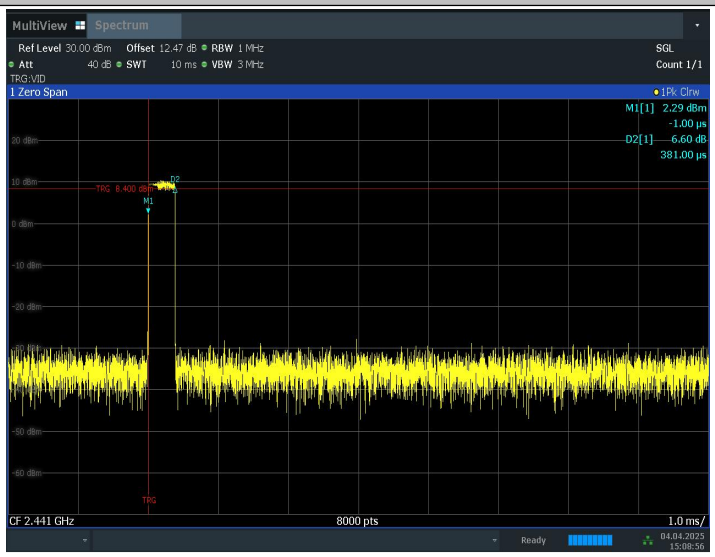


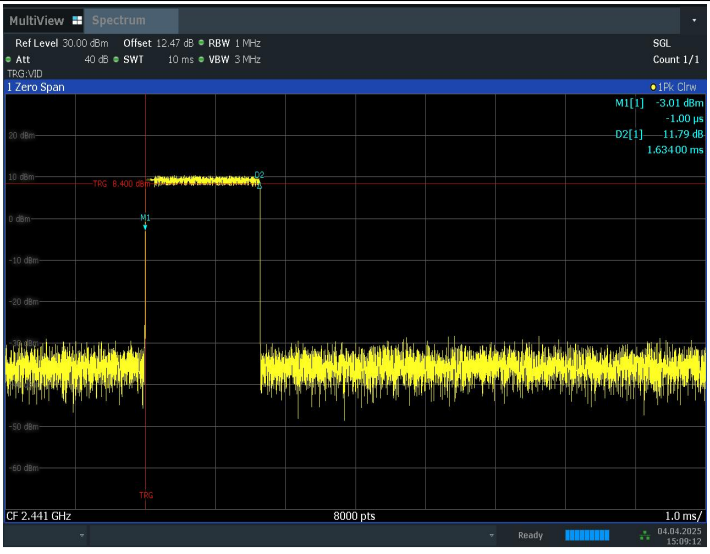
15:07:01 04.04.2025

2DH1_Hop

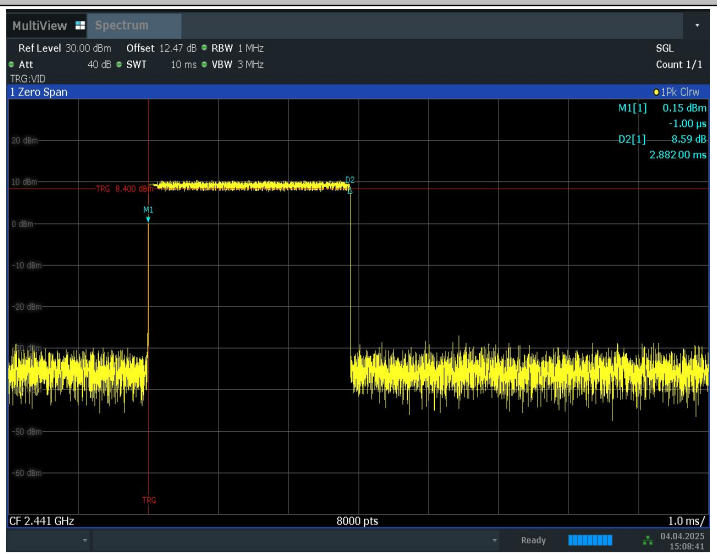
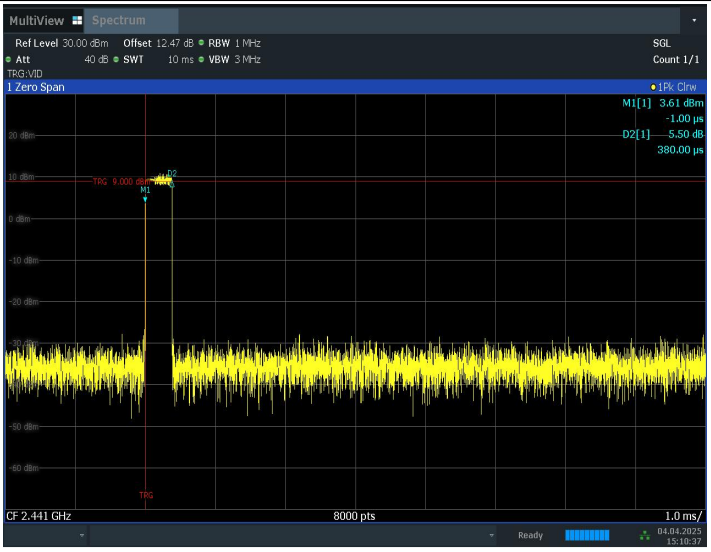


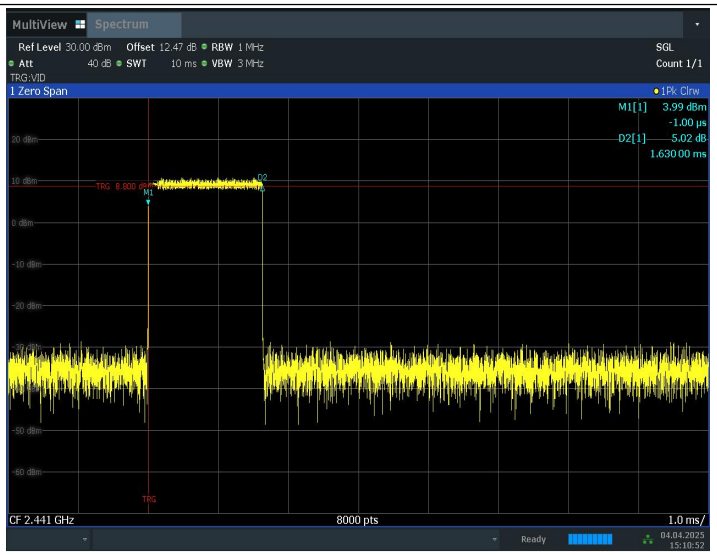
15:08:57 04.04.2025

2DH3_Hop



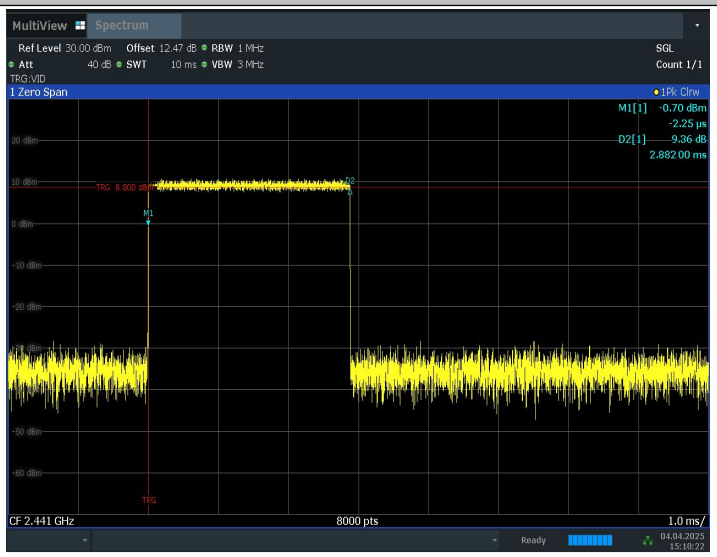
15:09:12 04.04.2025

2DH5_Hop
 15:08:41 04.04.2025
3DH1_Hop
 15:10:38 04.04.2025
3DH3_Hop



15:10:53 04.04.2025

3DH5_Hop



15:10:22 04.04.2025

B.7. 20dB Bandwidth

Method of Measurement: See ANSI C63.10-clause 6.9.2

Measurement Procedure - Unwanted Emissions

1. Set RBW = 30kHz.

2. Set VBW = 100 kHz.

3. Set span to 3MHz

4. Detector = peak.

5. Trace Mode = max hold.

6. Sweep = auto couple.

7. Allow the trace to stabilize (this may take some time, depending on the extent of the span).

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a)(1)	NA *

Use NdB Down function of the SA to measure the 20dB Bandwidth

* Comment: This test case is not required according to the latest FCC 47 CFR Part 15.247. But the test results are necessary for “carrier frequency separation” test case, in Annex A.8.

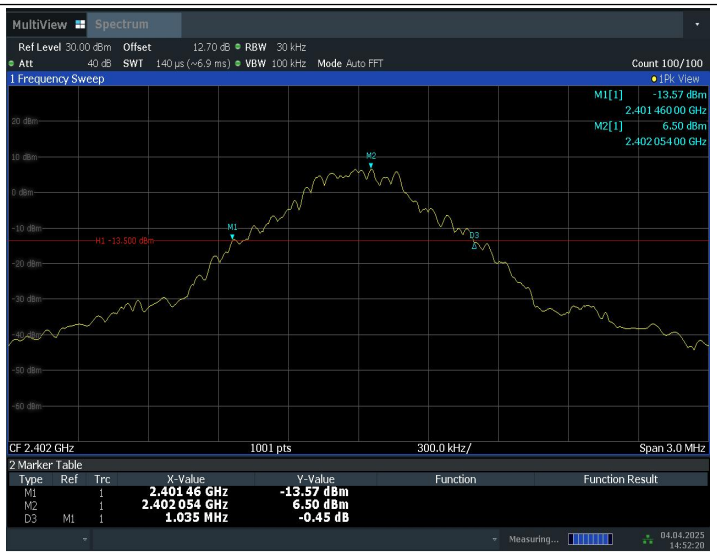
Measurement Results:

TestMode	Antenna	Frequency[MHz]	20db EBW[MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
DH5	Ant1	2402	1.03	2401.46	2402.50	---	---
		2441	1.03	2440.46	2441.49	---	---
		2480	1.03	2479.46	2480.49	---	---
2DH5	Ant1	2402	1.32	2401.34	2402.65	---	---
		2441	1.32	2440.33	2441.65	---	---
		2480	1.32	2479.33	2480.65	---	---
3DH5	Ant1	2402	1.31	2401.34	2402.65	---	---
		2441	1.31	2440.34	2441.65	---	---
		2480	1.31	2479.34	2480.65	---	---

Conclusion: NA

Test graphs as below:

DH5_2402



14:52:21 04.04.2025

DH5_2441

14:53:58 04.04.2025

DH5_2480

14:55:25 04.04.2025

2DH5_2402
 14:57:02 04.04.2025
2DH5_2441
 14:58:39 04.04.2025
2DH5_2480

15:00:06 04.04.2025

3DH5_2402

15:01:43 04.04.2025

3DH5_2441

15:03:21 04.04.2025

3DH5_2480


B.8. Carrier Frequency Separation

Method of Measurement: See ANSI C63.10-clause 7.8.2

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = 3MHz
- RBW=300kHz
- VBW=300kHz
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize

Search the peak marks of the middle frequency and adjacent channel, then record the separation between them.

* Comment: This limit should be over 25 kHz or (2/3) * 20dB bandwidth, whichever is greater.

Measurement Limit:

Standard	Limit(kHz)
FCC 47 CFR Part 15.247(a)(1)	over 25 kHz or (2/3) * 20dB bandwidth

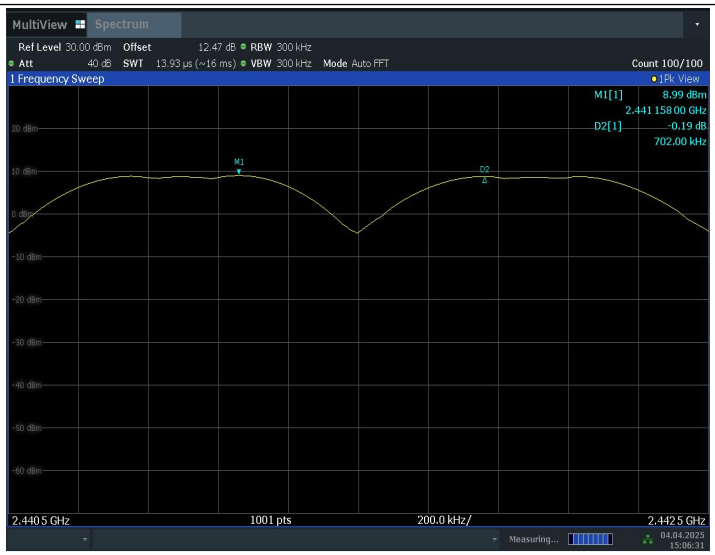
Measurement Result:

TestMode	Frequency[MHz]	Result[MHz]	Limit[MHz]	Verdict
DH5	Hop	0.702	≥0.687	PASS
2DH5	Hop	1.022	≥0.880	PASS
3DH5	Hop	1.362	≥1.310	PASS

Conclusion: PASS

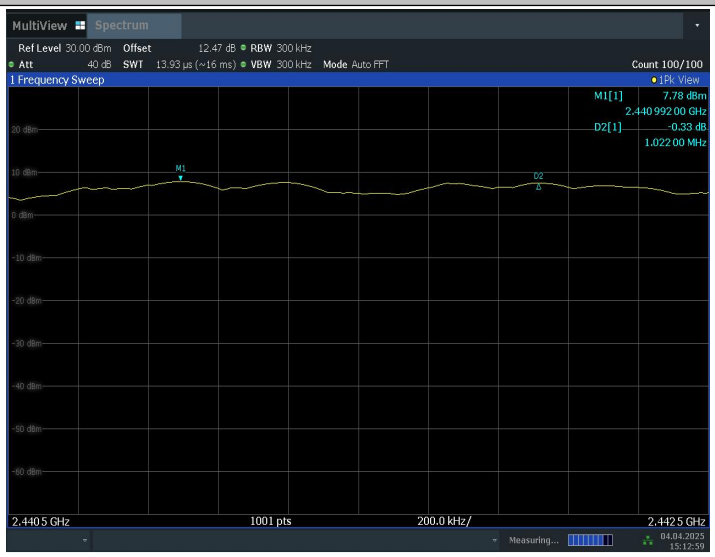
Test graphs as below:

DH5_Hop



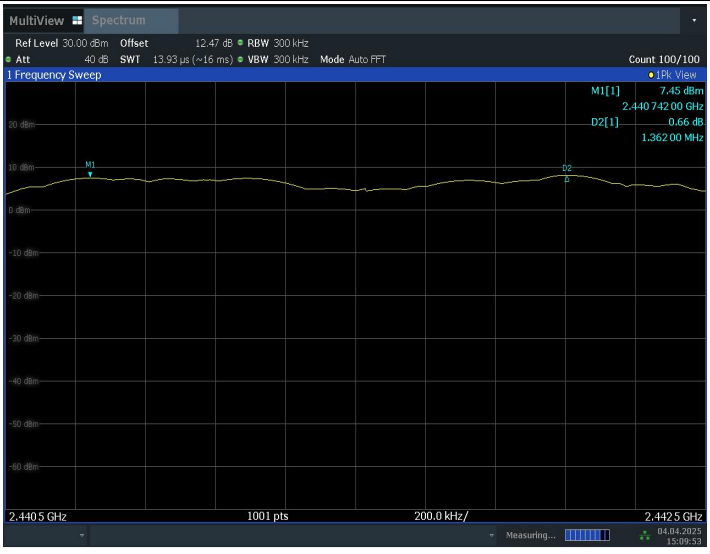
15:06:31 04.04.2025

2DH5_Hop



15:12:59 04.04.2025

3DH5_Hop



15:09:53 04.04.2025

B.9. Number of Hopping Channels

Method of Measurement: See ANSI C63.10-clause 7.8.3

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

- Span = the frequency band of operation
- RBW = 500kHz
- VBW = 500kHz
- Sweep = auto
- Detector function = peak
- Trace = max hold
- Allow the trace to stabilize

It might prove necessary to break the span up into subranges to show clearly all of the hopping frequencies. Compliance of an EUT with the appropriate regulatory limit shall be determined for the number of hopping channels. A plot of the data shall be included in the test report.

Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.247(a) (1)(iii)	At least 15 non-overlapping channels

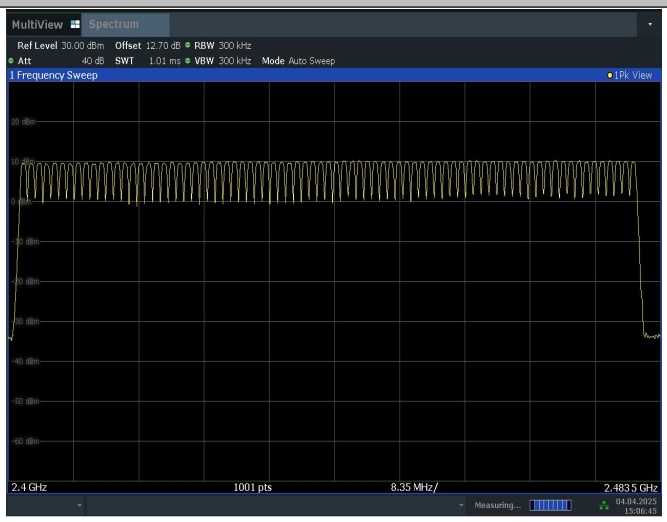
Measurement Result:

TestMode	Frequency[MHz]	Result[Num]	Limit[Num]	Verdict
DH5	Hop	79	≥15	PASS
2DH5	Hop	79	≥15	PASS
3DH5	Hop	79	≥15	PASS

Conclusion: PASS

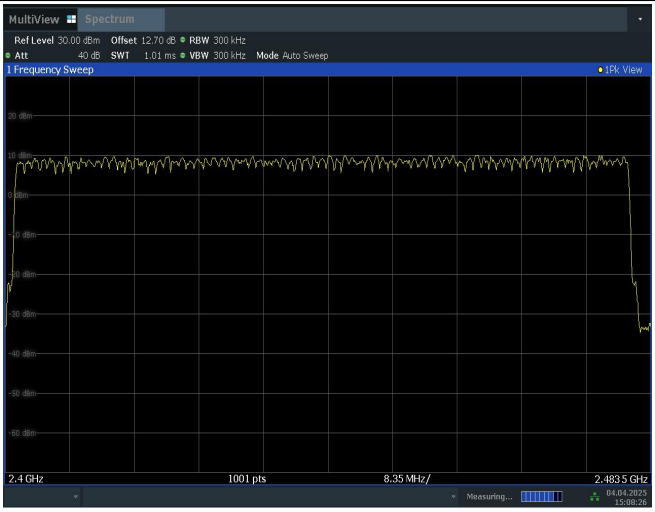
Test graphs as below:

DH5_Ant1_Hop



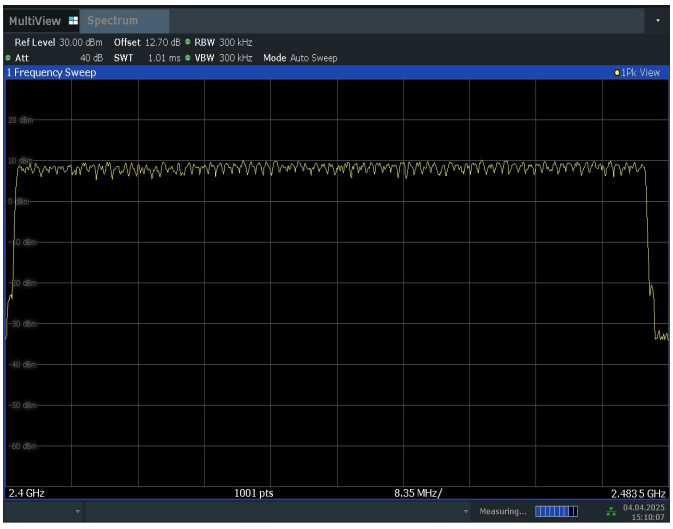
15:06:46 04.04.2025

2DH5_Ant1_Hop



15:08:26 04.04.2025

3DH5_Ant1_Hop



15:10:07 04.04.2025

B.10. AC Powerline Conducted Emission

Summary

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

Method of Measurement:

See Clause 6.2 of ANSI C63.10 specifically.

See Clause 4 and Clause 5 of ANSI C63.10 generally.

The conducted emissions from the AC port of the EUT are measured in a shielding room. The EUT is connected to a Line Impedance Stabilization Network (LISN). An overview sweep with peak detection was performed. The measurements were performed with a quasi-peak detector and if required, an average detector.

The conducted emission measurements were made with the following detector of the test receiver: Quasi-Peak / Average Detector.

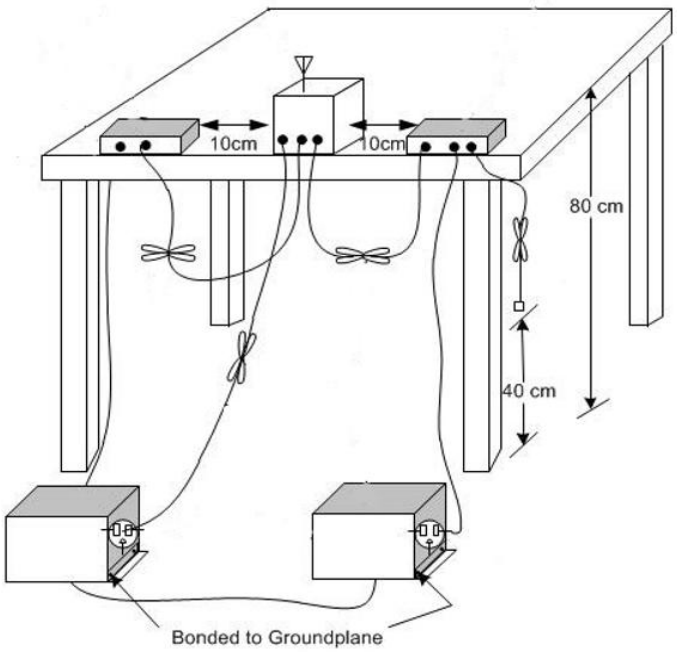
The measurement bandwidth is:

Frequency of Emission (MHz)	RBW/IF bandwidth
0.15-30	9kHz

Test Condition:

Voltage（V）	Frequency（Hz）
120	60

Test setup



EUT ID: UT28a

Measurement Result and limit:

Bluetooth (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	66 to 56	Fig.B.10.1	Fig. B.10.2	P
0.5 to 5	56			
5 to 30	60			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Bluetooth (Average Limit)

Frequency range (MHz)	Average Limit (dBμV)	Result (dBμV)		Conclusion
		With charger		
		bluetooth	Idle	
0.15 to 0.5	56 to 46	Fig.B.10.1	Fig. B.10.2	P
0.5 to 5	46			
5 to 30	50			
NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.				

Conclusion: Pass

Test graphs as below:

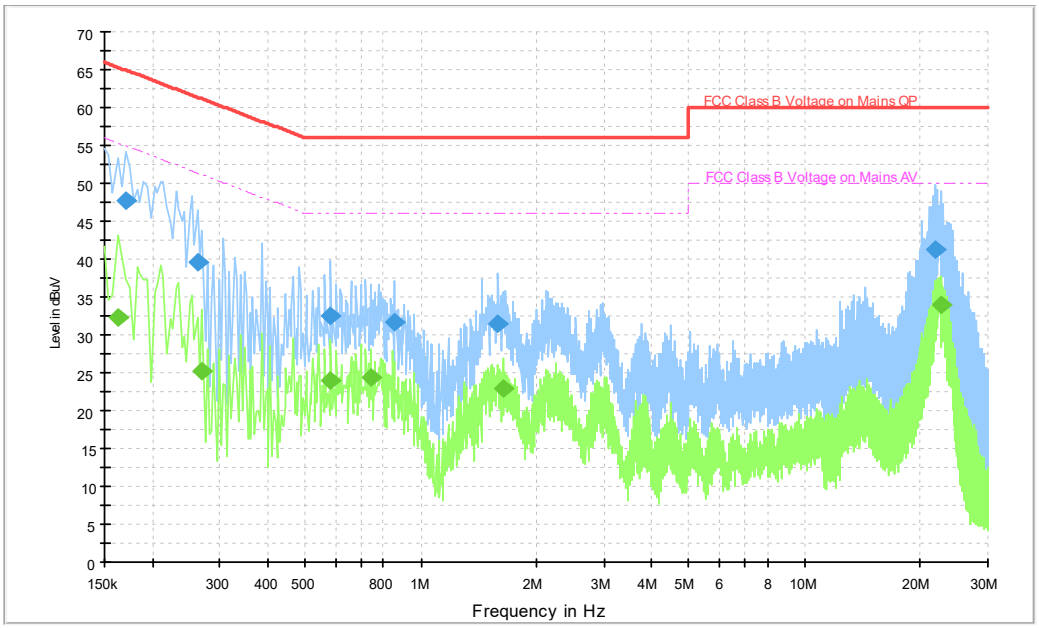


Fig.B.10.1 AC Powerline Conducted Emission- bluetooth

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	47.8	2000.0	9.000	On	N	19.8	17.2	65.0
0.262000	39.5	2000.0	9.000	On	L1	19.9	21.8	61.4
0.582000	32.5	2000.0	9.000	On	N	19.9	23.5	56.0
0.854000	31.7	2000.0	9.000	On	N	19.8	24.3	56.0
1.590000	31.4	2000.0	9.000	On	L1	19.8	24.6	56.0
21.850000	41.2	2000.0	9.000	On	L1	20.1	18.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.162000	32.4	2000.0	9.000	On	N	19.8	23.0	55.4
0.270000	25.2	2000.0	9.000	On	N	19.8	25.9	51.1
0.582000	24.0	2000.0	9.000	On	N	19.9	22.0	46.0
0.738000	24.3	2000.0	9.000	On	N	19.8	21.7	46.0
1.646000	22.8	2000.0	9.000	On	L1	19.8	23.2	46.0
22.710000	34.0	2000.0	9.000	On	N	19.9	16.0	50.0

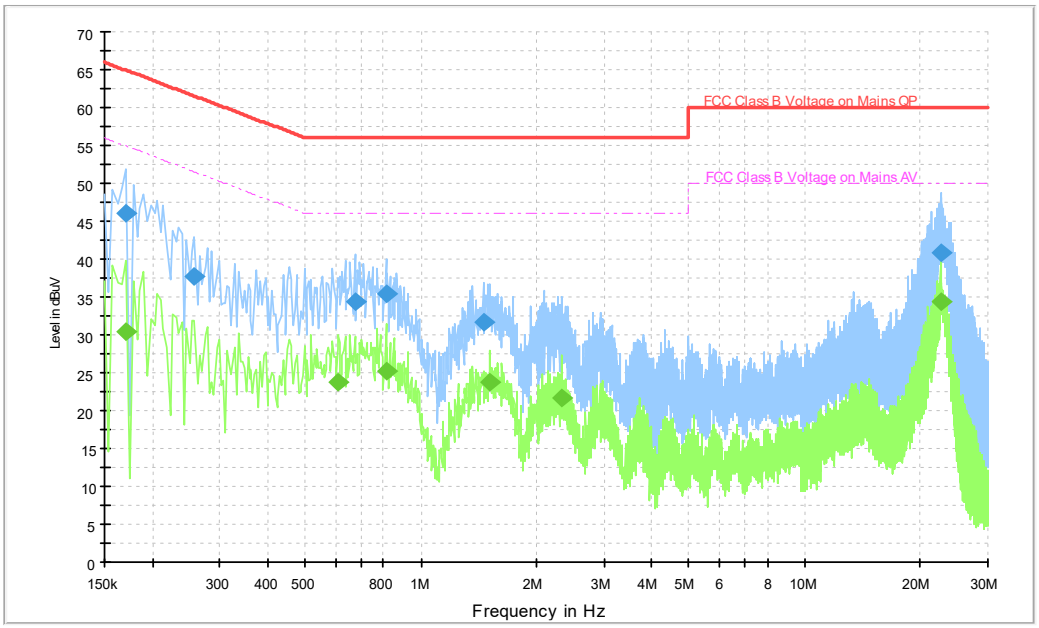


Fig.B.10.2 AC Powerline Conducted Emission-Idle

Note: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	46.1	2000.0	9.000	On	N	19.8	18.8	65.0
0.258000	37.7	2000.0	9.000	On	N	19.8	23.8	61.5
0.674000	34.3	2000.0	9.000	On	L1	20.0	21.7	56.0
0.810000	35.3	2000.0	9.000	On	L1	19.9	20.7	56.0
1.454000	31.7	2000.0	9.000	On	L1	19.9	24.3	56.0
22.542000	40.9	2000.0	9.000	On	L1	20.1	19.1	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.170000	30.3	2000.0	9.000	On	N	19.8	24.6	55.0
0.610000	23.7	2000.0	9.000	On	N	19.9	22.3	46.0
0.810000	25.2	2000.0	9.000	On	L1	19.9	20.8	46.0
1.514000	23.7	2000.0	9.000	On	L1	19.9	22.3	46.0
2.338000	21.7	2000.0	9.000	On	L1	19.8	24.3	46.0
22.542000	34.5	2000.0	9.000	On	L1	20.1	15.5	50.0

B.11. Antenna Requirement

The antenna of the device is permanently attached. There are no provisions for connection to an external antenna.
The unit complies with the requirement of FCC Part 15.203.

ANNEX C: Accreditation Certificate

Accredited Laboratory

A2LA has accredited

TELECOMMUNICATION TECHNOLOGY LABS, CAICT

Beijing, People's Republic of China

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 23rd day of July 2024.

Mr. Trace McInturff, Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 7049.01
Valid to July 31, 2026

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

*****END OF REPORT*****