TEST REPORT

Applicant:	SHENZHEN 8BITDO TECH CO., LTD.
Address:	Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou, Nanshan District, Shenzhen, Guangdong, China
Equipment Type:	8BitDo N30 Wireless Charger for Mobile
Model Name:	85DA (refer section 2.4)
Brand Name:	8BITDO
FCC ID:	2AOWF-N30WCM
Test Standard:	47 CFR Part 15 Subpart C
Sample Arrival Date:	Sep. 29, 2022
Test Date:	Oct. 29, 2022 – Oct. 31, 2022
Date of Issue:	Dec. 16, 2022

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Chong **Checked by:** Xia Long **Approved by:** Liao Jianming (Technical Director)

Revision History

Version	Issue Date	Revisions
Rev. 01	Dec. 16, 2022	Initial Issue

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☑ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	SHENZHEN 8BITDO TECH CO., LTD.
Address	Room 210, Building 1, Nanhai Ecool, No.6 Xinghua Road, Shekou, Nanshan District, Shenzhen, Guangdong, China

2.2 Manufacturer Information

Manufacturer	SHENZHEN ONEBITDO TECH CO., LTD.
Address	Room 203, Building 1, Huajian Building, Xinghua Road, Shekou, Shuiwan Community, Zhaoshang Street, Nanshan District, Shenzhen, Guangdong, China

2.3 Factory Information

Factory	Shenzhen Zhongxingda Electronic Co., Ltd.
Address	3-4/F, Bldg 10, Tongfuyu Industrial Zone, Lezhujiao Village, Xixiang, Baoan District, Shenzhen, Guangdong, China

2.4 General Description for Equipment under Test (EUT)

EUT Name	8BitDo N30 Wireless Charger for Mobile
Model Name Under Test	85DA
Series Model Name	85DA01, 85DA02, 85DA03
Description of Model name differentiation	The hardware circuit and software are identical to the basic model, except the color and screen printing of the shell. (this information provided by the customer)
Hardware Version	DS6403V00
Software Version	A9200_9018_V1.67
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Type-C Cable	
	Model No.	N/A
	Length (Approx.)	0.9 m

2.6 Technical Information

Network and Wireless connectivity	Qi

The requirement for the following technical information of the EUT was tested in this report:

Operating Frequency	110.5kHz~148.5kHz
Product Type	☒ Mobile ☐ Portable ☐ Fix Location
Antenna Type	Coil Antenna
About Product	The EUT only support the Qi technology.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 15, Subpart C	Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

3.2 Verdict

No.	Description	FCC Rule	Test Verdict	Result
1	Radiated Emission	15.209,15.215(b)	Pass	Annex A.1
2	Conducted Emission, AC Ports	15.207	Pass	Annex A.2
3	20 dB Bandwidth	15.215(c)	Pass	Annex A.3
Note1: The EUT has two test modes, as follow: Mode1: EUT + Type-C Cable + Adapter + Qi TX Mode2: EUT + Type-C Cable + Adapter + Simulated Load + Qi Link				

3.3 Test Uncertainty

The following measurement 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.

Measurement	Value
Conducted emissions (9 kHz-30 MHz)	4.28 dB
Radiated emissions (9 kHz-30 MHz)	3.22 dB
Radiated emissions (30 MHz-1 GHz)-10m	4.80 dB
Radiated emissions (30 MHz-1 GHz)-3m	4.76 dB
Radiated emissions (1 GHz-18 GHz)-3m	4.88 dB

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

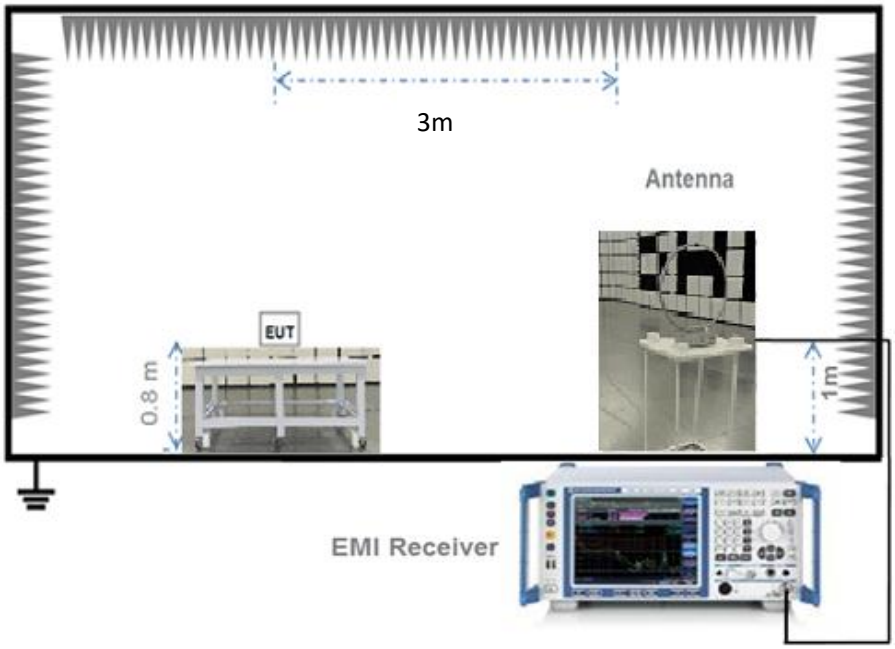
Relative Humidity	30% to 60%	
Atmospheric Pressure	100 kPa to 102 kPa	
Temperature	NT (Normal Temperature)	+22℃ to +25℃
Working Voltage of the EUT	NV (Normal Voltage)	USB 5V, USB 9V, USB 12V

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Cal. Date	Cal. Due
EMI Receiver	ROHDE&SCHWARZ	ESRP	101036	2022.09.09	2023.09.08
Amplifier (30-1GHz)	COM-MV	ZT30-1000M	B2018054558	2022.09.09	2023.09.08
Test Antenna-Loop(9 kHz-30 MHz)	SCHWARZBECK	FMZB 1519	1519-037	2021.04.16	2024.04.15
Test Antenna-Bi-Log	SCHWARZBECK	VULB 9168	9168-01162	2022.08.12	2023.08.11
Anechoic Chamber	EMC Electronic Co., Ltd	20.10*11.60*7.35m	130	2021.08.15	2024.08.14
EMI Receiver	KEYSIGHT	N9010B	MY57110309	2022.09.09	2023.09.08
LISN	SCHWARZBECK	NSLK 8127	8127-687	2022.06.01	2023.05.31
Shielded Room	YiHeng Electronic Co., Ltd	3.5m*3.1m*2.8m	112	2022.02.19	2025.02.18
Test Software	BALUN	BL410_E	V19.918	--	--

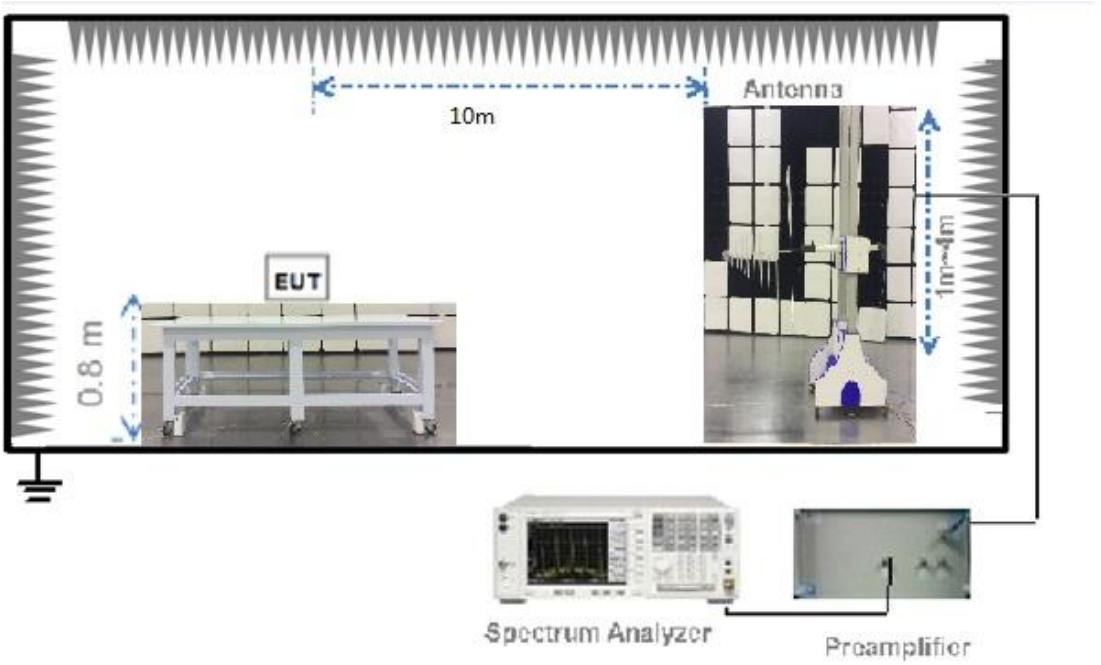
4.3 Test Setups

Test Setup 1



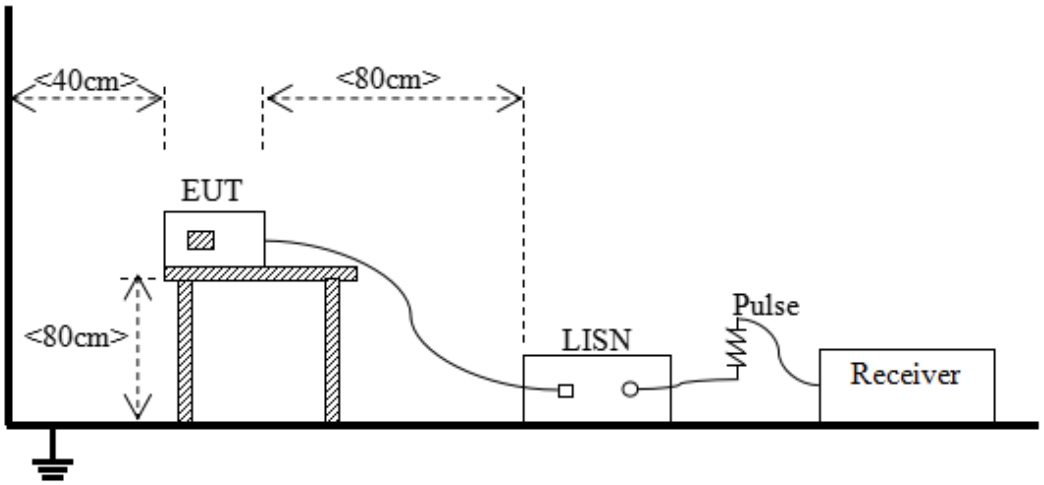
For Radiated Emission Test (Below 30 MHz))

Test Setup 2



(For Radiated Emission Test (30 MHz-1 GHz))

Test Setup 3



(For Conducted Emission, AC Ports Test)

5 TEST ITEMS

5.1 Emission Tests

5.1.1 Radiated Emission

5.1.1.1 Limit

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

1) Field Strength (dBμV/m) = 20*log [Field Strength (μV/m)].

2) In the emission tables above, the tighter limit applies at the band edges.

3) For above 1000 MHz, limit field strength of harmonics: 54 dBμV/m@3 m (AV) and 74 dBμV/m@3 m (PK)

4) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). For example, at the frequency 9 kHz, limit @10m = 20*log (2400/f) + 40log (dlimit/dmeasure) where limit = 300m, dmeasure=10m. limit @10m = 20*log (2400/9) + 40log (300/10) = 107.5 (dBμV/m).

5) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided, When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements). For example, at the frequency 30 MHz, limit @10m = 20*log (100) + 20log (dlimit/dmeasure) where limit = 3m, dmeasure=10m. limit @10m = 20*log (100) + 20log (3/10) = 29.5 (dBμV/m).

5.1.1.2 Test Setup

Refer to 4.3 section (test setup 1 to test setup 2) for radiated emission test, the photo of test setup please refer to ANNEX B.

5.1.1.3 Test Procedure

All Spurious Emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

An initial pre-scan was performed in the chamber using the EMI Receiver in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by Bi-Log antenna with 2 orthogonal polarities.

5.1.1.4 Test Result

Please refer to ANNEX A.1.

NOTE:

1. Results (dBμV/m) = Reading (dBμV/m) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain (dB)

3. Over limit = Results – Limit.

5.1.2 Conducted Emission

5.1.2.1 Test Limit

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

NOTE:

1) The limit is applicable to Class B ITE.
2) The lower limit shall apply at the band edges.
3) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50 MHz.

5.1.2.2 Test Setup

Refer to 4.3 section test (test setup 3) for conducted emission, the photo of test setup please refer to ANNEX B.

5.1.2.3 Test Procedure

The EUT is connected to the power mains through a LISN which provides 50 Ω/50 μH of coupling impedance for the measuring instrument. The test frequency range is from 150 kHz to 30 MHz. The maximum conducted interference is searched using Peak (PK), Quasi-peak (QP) and Average (AV) detectors; the emission levels that are more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed.

Devices subject to Part 15 must be tested for all available U.S. voltages and frequencies (such as a nominal 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz) for which the device is capable of operation. A device rated for 50/60 Hz operation need not be tested at both frequencies provided the radiated and line conducted emissions are the same at both frequencies.

5.1.2.4 Test Result

Please refer to ANNEX A.2.

NOTE**:**

1. Results (dBμV) = Reading (dBμV) + Factor (dB/m)

The reading level is calculated by software which is not shown in the sheet

2. Factor = Insertion loss + Cable loss

3. Over limit = Results – Limit.

5.1.3 20 dB Bandwidth

5.1.3.1 Limit

FCC §15.215(c)

The 20 dB bandwidth is known as the 99% emission bandwidth, or 20 dB bandwidth (10*log1%=20 dB) taking the total RF output power.

5.1.3.2 Test Setup

Refer to 4.3 section test (test setup 1) for test setup description for the antenna port. The photo of test setup please refer to ANNEX B.

5.1.3.3 Test Procedure

Use the following spectrum analyzer settings:

Span = between 2 and 5 times the OBW

RBW = 1%~5% of the OBW

Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate, Allow the trace to stabilize.

5.1.3.4 Test Result

Please refer to ANNEX A.3.

ANNEX A TEST RESULTS

A.1 Radiated Emission

Note [1]: The symbol of "--" in the table which means not application.

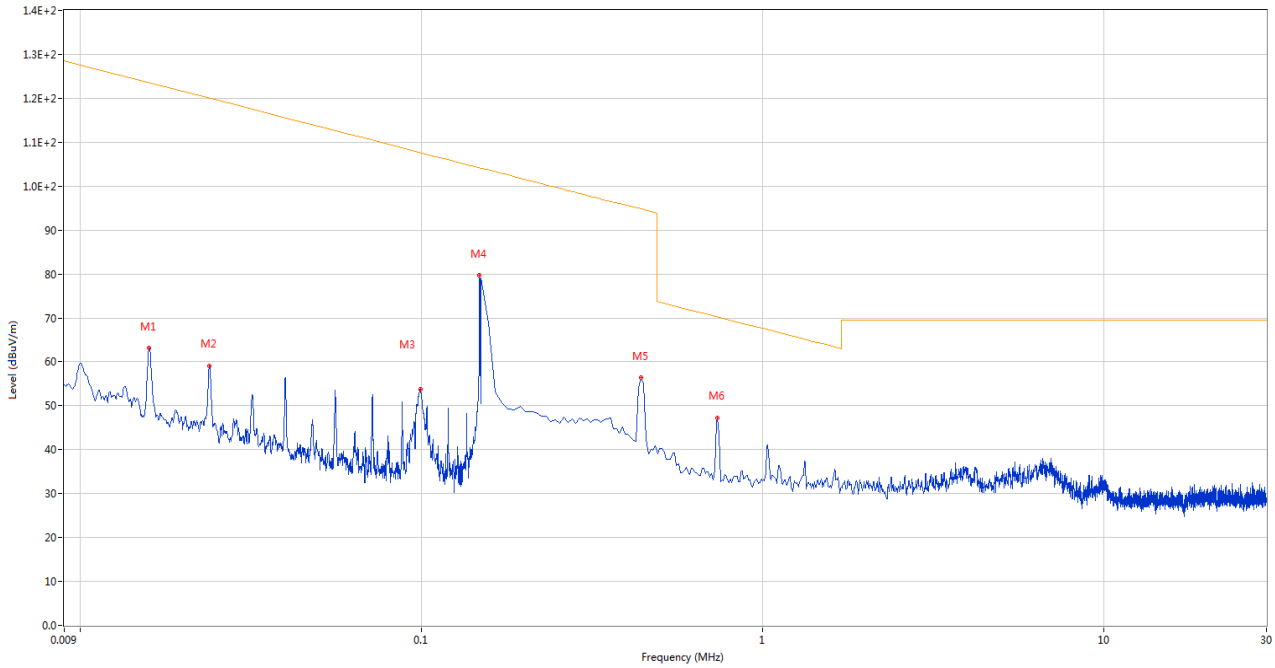
Note [2]: For the test data above 1 GHz, according the ANSI C63.4-2014, where limits are specified for both average and peak (or quasi-peak) detector functions, if the peak (or quasi-peak) measured value complies with the average limit, it is unnecessary to perform an average measurement.

Note [3]: All Radiated Emissions tests were performed in X, Y, Z axis direction of EUT. And only the worst axis test condition was recorded in this test report.

Qi Test Data and Plots

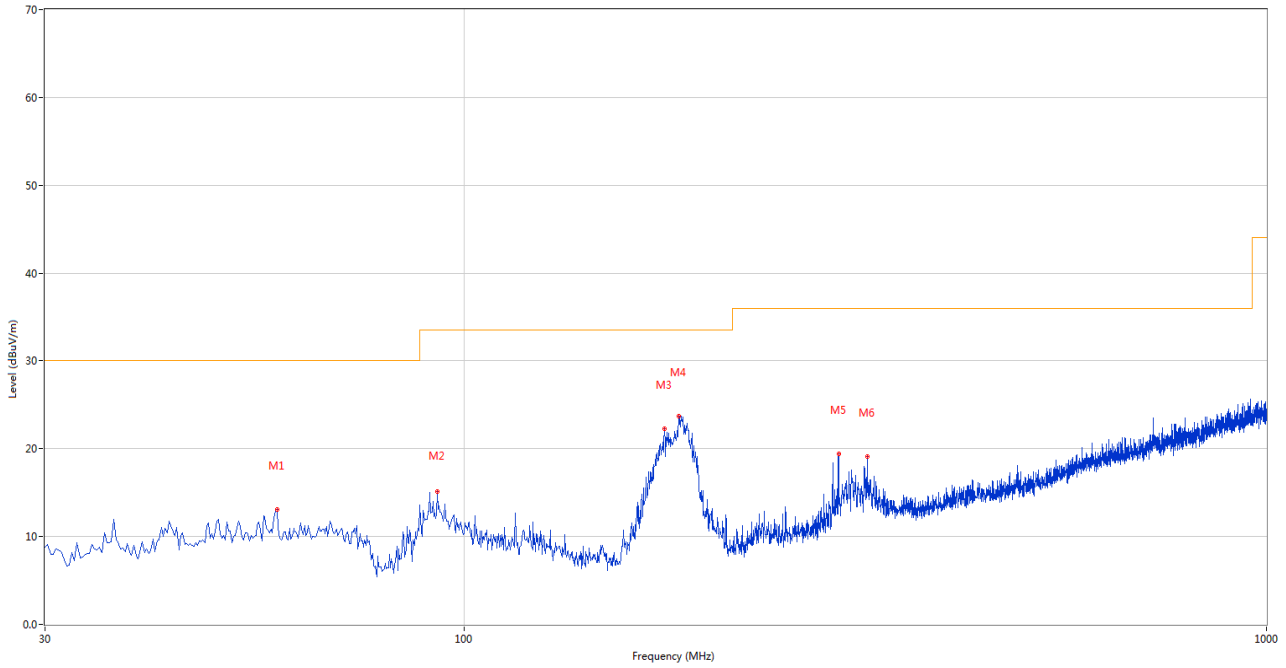
Mode1

A.1.1 Test Antenna LOOP, EUT X axis, 9 kHz –30 MHz



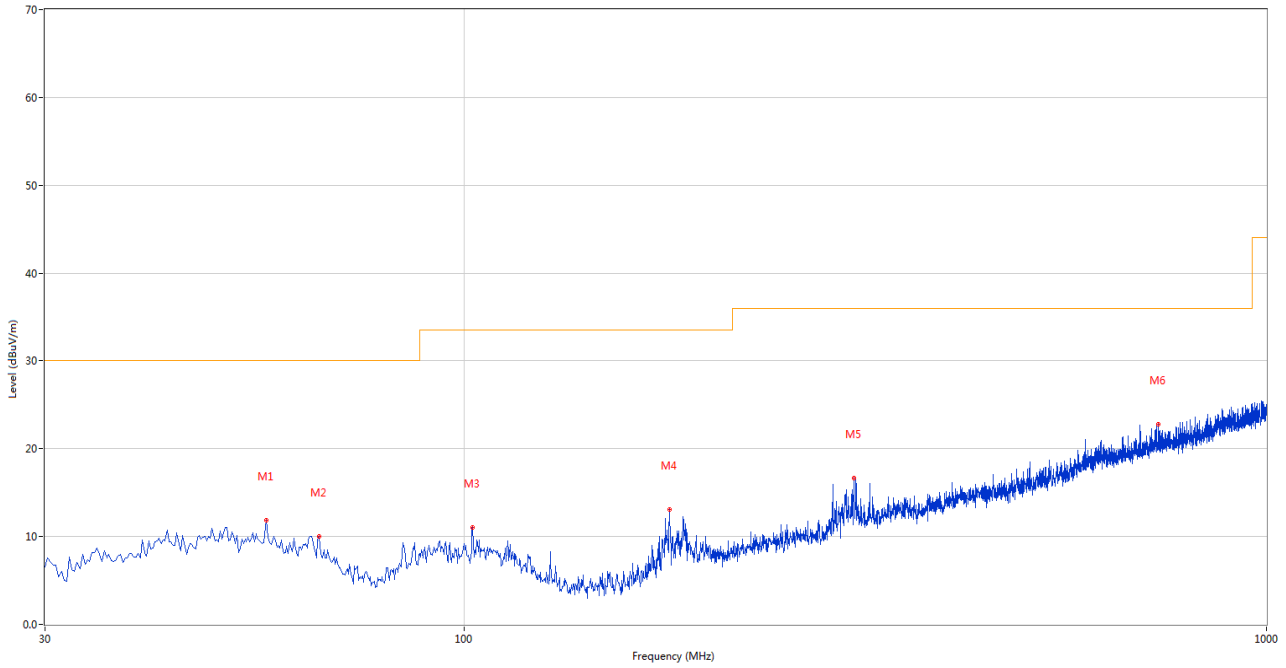
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.016	63.16	20.13	123.6	60.44	Peak	335.00	100	Vertical	Pass
2	0.024	59.15	20.23	120.0	60.85	Peak	360.00	100	Vertical	Pass
3	0.099	53.84	20.17	107.7	53.86	Peak	358.00	100	Vertical	Pass
4	0.148	79.63	20.15	104.2	24.57	Peak	77.00	100	Vertical	N/A
5	0.441	56.32	20.21	94.7	38.38	Peak	209.00	100	Vertical	Pass
6	0.740	47.22	20.42	70.2	22.98	Peak	181.00	100	Vertical	Pass

A.1.2 Test Antenna Vertical, EUT X axis, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	58.365	13.10	-27.44	30.0	16.90	Peak	216.00	100	Vertical	Pass
2	92.549	15.08	-29.14	33.5	18.42	Peak	219.00	100	Vertical	Pass
3	177.646	22.28	-29.87	33.5	11.22	Peak	229.00	100	Vertical	Pass
4	185.161	23.74	-29.24	33.5	9.76	Peak	204.00	100	Vertical	Pass
5	292.804	19.38	-25.31	36.0	16.62	Peak	310.00	100	Vertical	Pass
6	317.776	19.08	-24.79	36.0	16.92	Peak	263.00	100	Vertical	Pass

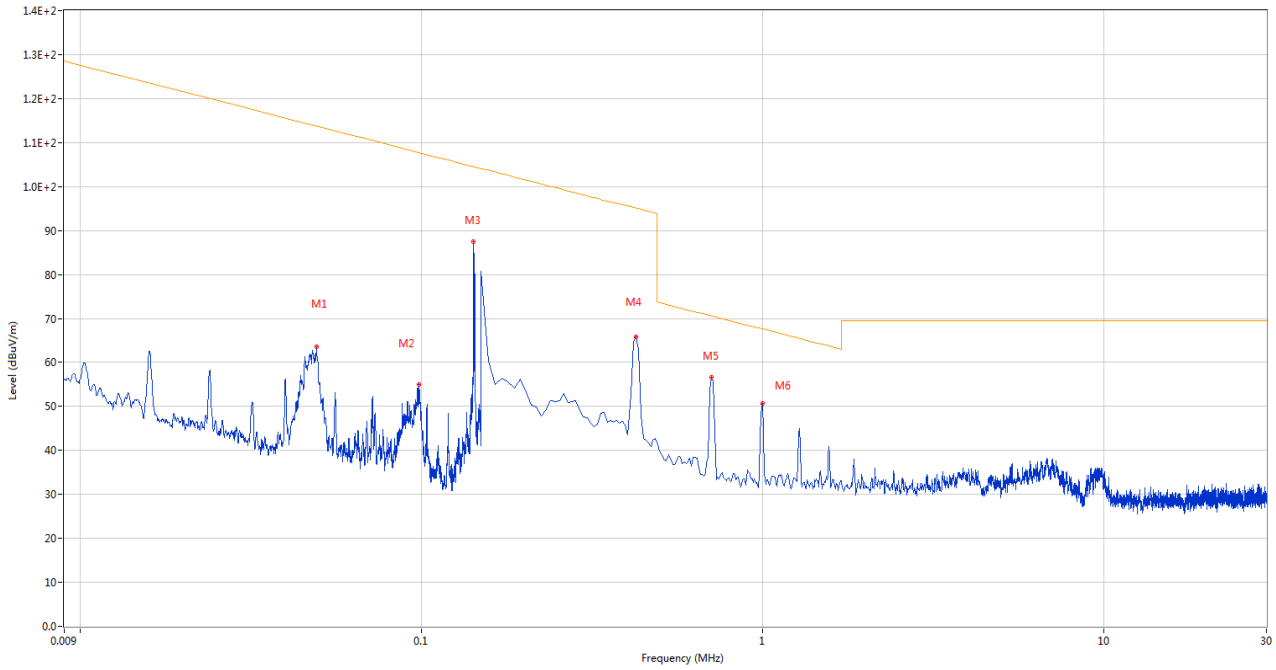
A.1.3 Test Antenna Horizontal, EUT X axis, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	56.668	11.88	-26.99	30.0	18.12	Peak	356.00	100	Horizontal	Pass
2	65.881	10.06	-28.44	30.0	19.94	Peak	331.00	100	Horizontal	Pass
3	102.489	11.05	-28.03	33.5	22.45	Peak	62.00	200	Horizontal	Pass
4	180.070	13.07	-29.87	33.5	20.43	Peak	273.00	200	Horizontal	Pass
5	305.896	16.71	-24.72	36.0	19.29	Peak	341.00	200	Horizontal	Pass
6	733.802	22.79	-15.41	36.0	13.21	Peak	189.00	100	Horizontal	Pass

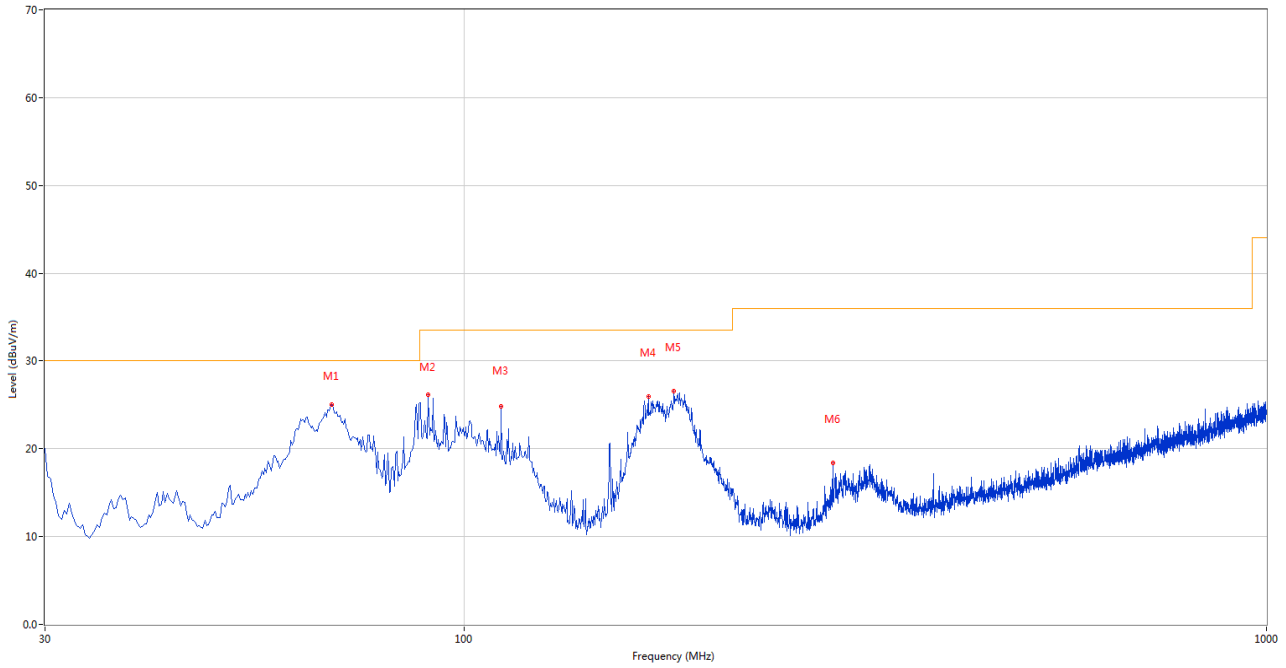
Mode2

A.1.4 Test Antenna LOOP, EUT X axis, 9 kHz –30 MHz



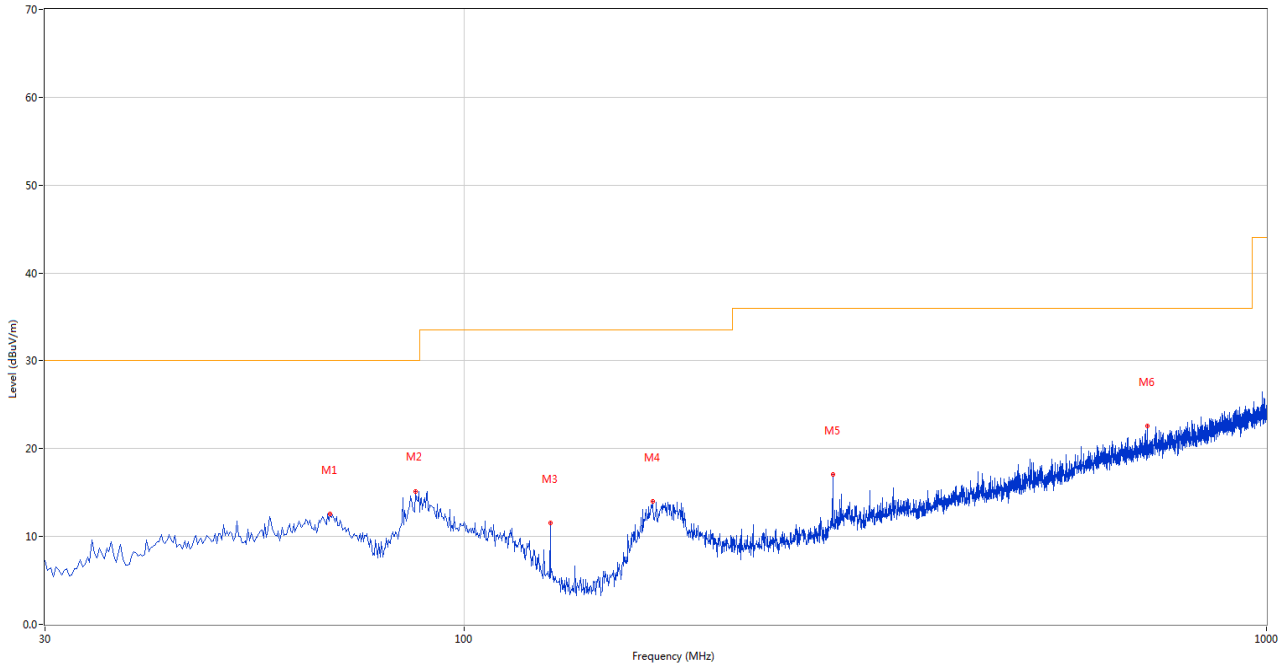
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	0.049	63.56	20.24	113.7	50.14	Peak	356.00	100	Vertical	Pass
2	0.099	54.88	20.16	107.7	52.82	Peak	160.00	100	Vertical	Pass
3	0.143	87.41	20.14	104.5	17.09	Peak	110.00	100	Vertical	N/A
4	0.426	65.71	20.20	95.0	29.29	Peak	99.00	100	Vertical	Pass
5	0.710	56.58	20.41	70.6	14.02	Peak	99.00	100	Vertical	Pass
6	1.001	50.69	20.55	67.6	16.91	Peak	104.00	100	Vertical	Pass

A.1.5 Test Antenna Vertical, EUT X axis, 30 MHz – 1 GHz



No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	68.305	25.03	-29.40	30.0	4.97	Peak	145.00	100	Vertical	Pass
2	90.125	26.14	-29.55	33.5	7.36	Peak	257.00	100	Vertical	Pass
3	111.217	24.82	-28.34	33.5	8.68	Peak	151.00	100	Vertical	Pass
4	169.645	25.92	-30.29	33.5	7.58	Peak	263.00	100	Vertical	Pass
5	182.494	26.62	-29.50	33.5	6.88	Peak	269.00	100	Vertical	Pass
6	287.956	18.36	-25.19	36.0	17.64	Peak	204.00	100	Vertical	Pass

A.1.6 Test Antenna Horizontal, EUT X axis, 30 MHz – 1 GHz



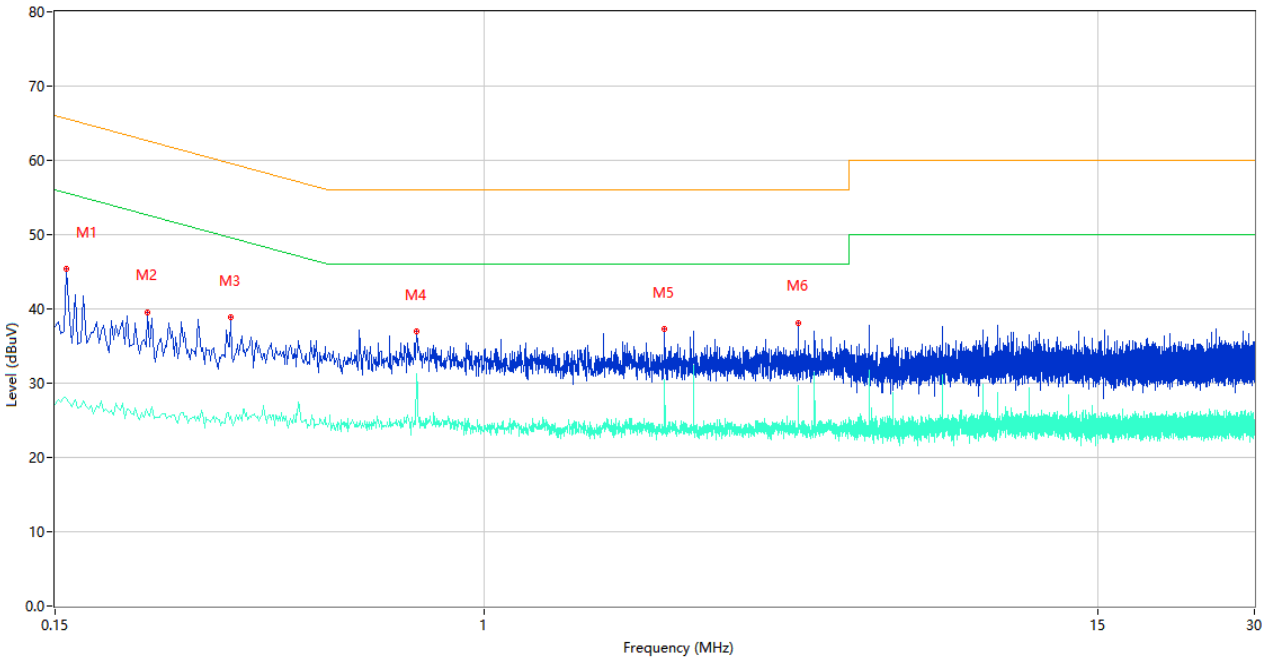
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Detector	Table (Degree)	Height (cm)	Antenna	Verdict
1	68.063	12.60	-29.30	30.0	17.40	Peak	32.00	200	Horizontal	Pass
2	86.973	15.15	-30.62	30.0	14.85	Peak	135.00	200	Horizontal	Pass
3	127.946	11.57	-31.06	33.5	21.93	Peak	257.00	100	Horizontal	Pass
4	171.585	13.96	-30.16	33.5	19.54	Peak	290.00	200	Horizontal	Pass
5	287.956	17.07	-25.19	36.0	18.93	Peak	234.00	200	Horizontal	Pass
6	709.800	22.61	-16.34	36.0	13.39	Peak	53.00	200	Horizontal	Pass

A.2 Conducted Emission

Qi Test Data and Plots

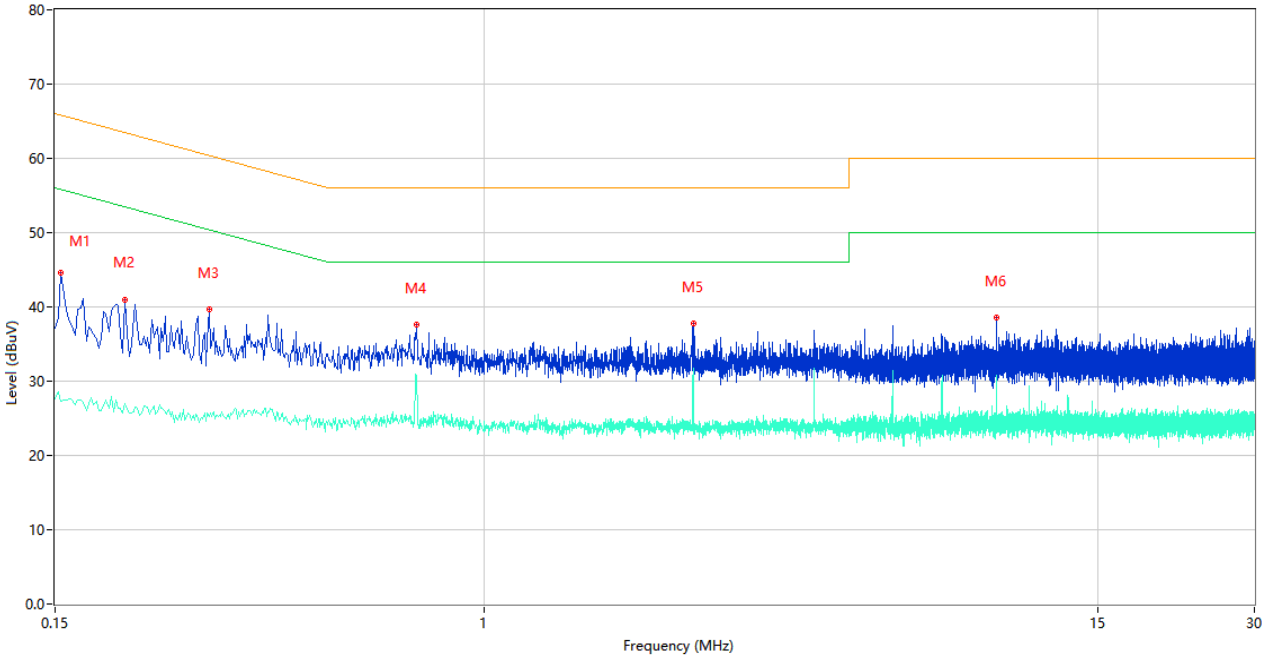
Mode1

A.2.1 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.158	45.38	10.08	65.57	20.19	Peak	L	Pass
1**	0.158	28.00	10.08	55.57	27.57	AV	L	Pass
2	0.226	39.54	10.03	62.60	23.06	Peak	L	Pass
2**	0.226	26.19	10.03	52.60	26.41	AV	L	Pass
3	0.326	38.82	10.50	59.55	20.73	Peak	L	Pass
3**	0.326	25.54	10.50	49.55	24.01	AV	L	Pass
4	0.742	36.94	10.40	56.00	19.06	Peak	L	Pass
4**	0.742	31.30	10.40	46.00	14.70	AV	L	Pass
5	2.218	37.26	10.13	56.00	18.74	Peak	L	Pass
5**	2.218	30.49	10.13	46.00	15.51	AV	L	Pass
6	3.994	38.12	9.99	56.00	17.88	Peak	L	Pass
6**	3.994	28.61	9.99	46.00	17.39	AV	L	Pass

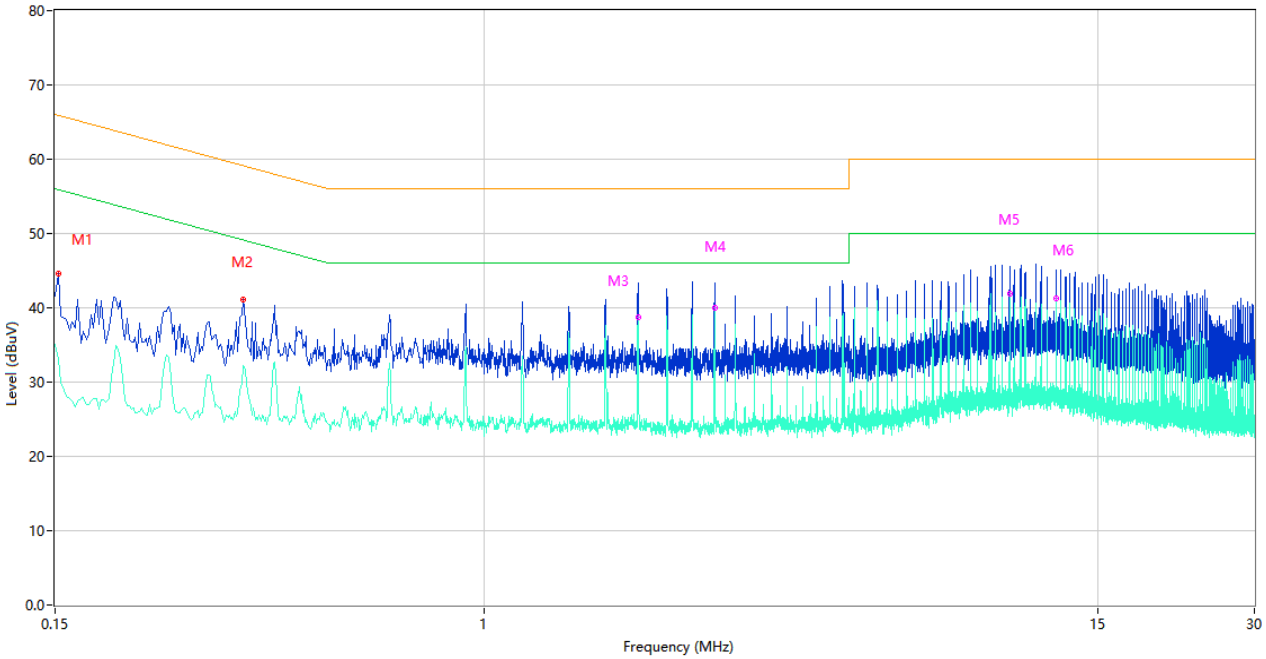
A.2.2 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.154	44.67	10.09	65.78	21.11	Peak	N	Pass
1**	0.154	27.36	10.09	55.78	28.42	AV	N	Pass
2	0.204	41.01	10.05	63.45	22.44	Peak	N	Pass
2**	0.204	27.06	10.05	53.45	26.39	AV	N	Pass
3	0.296	39.67	9.98	60.35	20.68	Peak	N	Pass
3**	0.296	25.22	9.98	50.35	25.13	AV	N	Pass
4	0.742	37.55	10.40	56.00	18.45	Peak	N	Pass
4**	0.742	30.30	10.40	46.00	15.70	AV	N	Pass
5	2.514	37.73	10.23	56.00	18.27	Peak	N	Pass
5**	2.514	31.74	10.23	46.00	14.26	AV	N	Pass
6	9.618	38.56	10.09	60.00	21.44	Peak	N	Pass
6**	9.618	29.27	10.09	50.00	20.73	AV	N	Pass

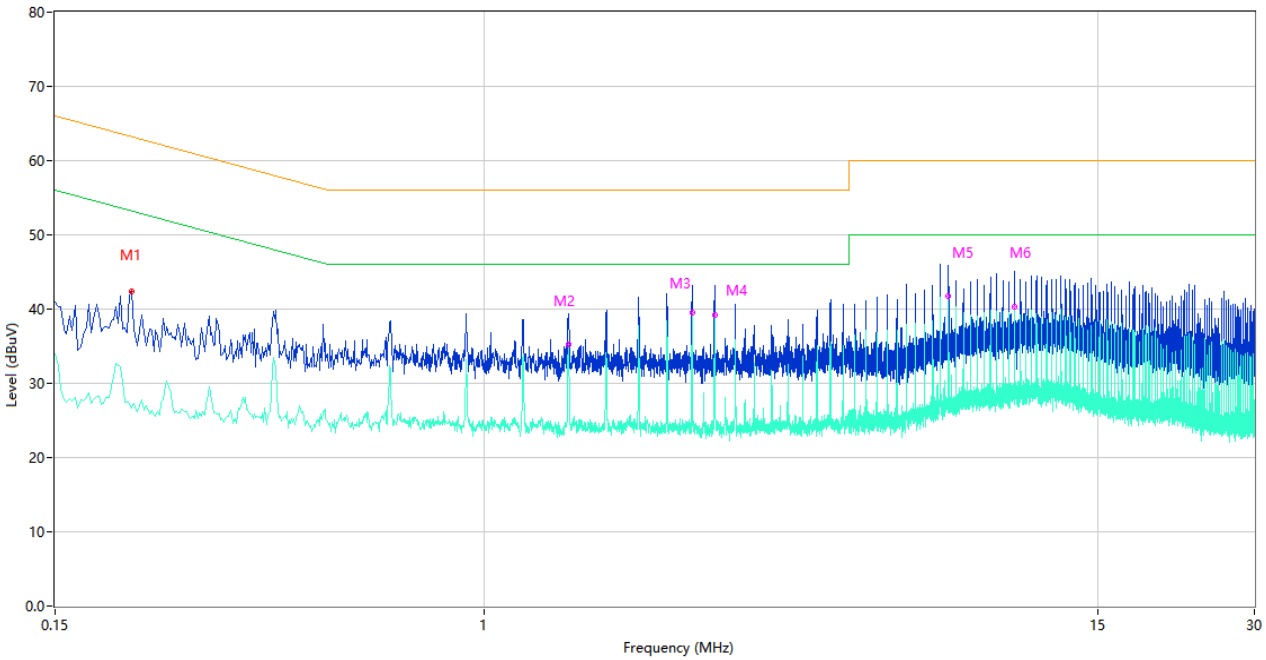
Mode2

A.2.3 L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.152	44.60	10.09	65.89	21.29	Peak	L	Pass
1**	0.152	32.99	10.09	55.89	22.90	AV	L	Pass
2	0.344	41.19	10.85	59.11	17.92	Peak	L	Pass
2**	0.344	32.22	10.85	49.11	16.89	AV	L	Pass
3	1.970	43.29	10.28	56.00	12.71	Peak	L	Pass
3**	1.970	38.71	10.28	46.00	7.29	AV	L	Pass
4	2.766	43.26	10.33	56.00	12.74	Peak	L	Pass
4**	2.766	39.95	10.33	46.00	6.05	AV	L	Pass
5	10.174	44.50	10.32	60.00	15.50	Peak	L	Pass
5**	10.174	41.88	10.32	50.00	8.12	AV	L	Pass
6	12.482	43.96	10.22	60.00	16.04	Peak	L	Pass
6**	12.482	41.26	10.22	50.00	8.74	AV	L	Pass

A.2.4 N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Margin (dB)	Detector	Line	Verdict
1	0.210	42.34	10.05	63.21	20.87	Peak	N	Pass
1**	0.210	26.67	10.05	53.21	26.54	AV	N	Pass
2	1.450	39.28	10.16	56.00	16.72	Peak	N	Pass
2**	1.450	35.24	10.16	46.00	10.76	AV	N	Pass
3	2.502	43.17	10.24	56.00	12.83	Peak	N	Pass
3**	2.502	39.48	10.24	46.00	6.52	AV	N	Pass
4	2.766	43.14	10.33	56.00	12.86	Peak	N	Pass
4**	2.766	39.19	10.33	46.00	6.81	AV	N	Pass
5	7.744	45.29	10.36	60.00	14.71	Peak	N	Pass
5**	7.744	41.77	10.36	50.00	8.23	AV	N	Pass
6	10.406	44.19	10.33	60.00	15.81	Peak	N	Pass
6**	10.406	40.30	10.33	50.00	9.70	AV	N	Pass

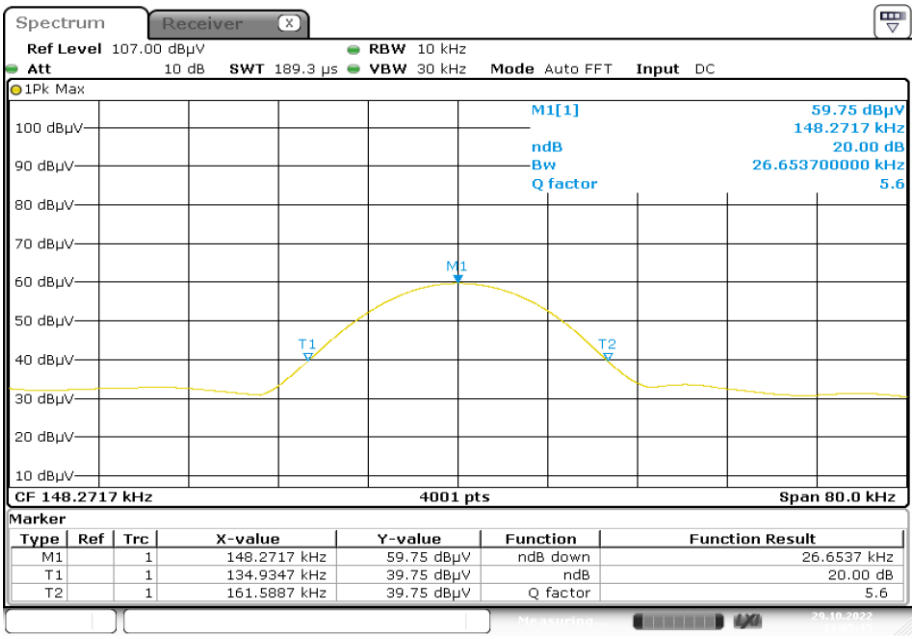
A.3 20 dB Bandwidth

Note: Because the measured signal is CW adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

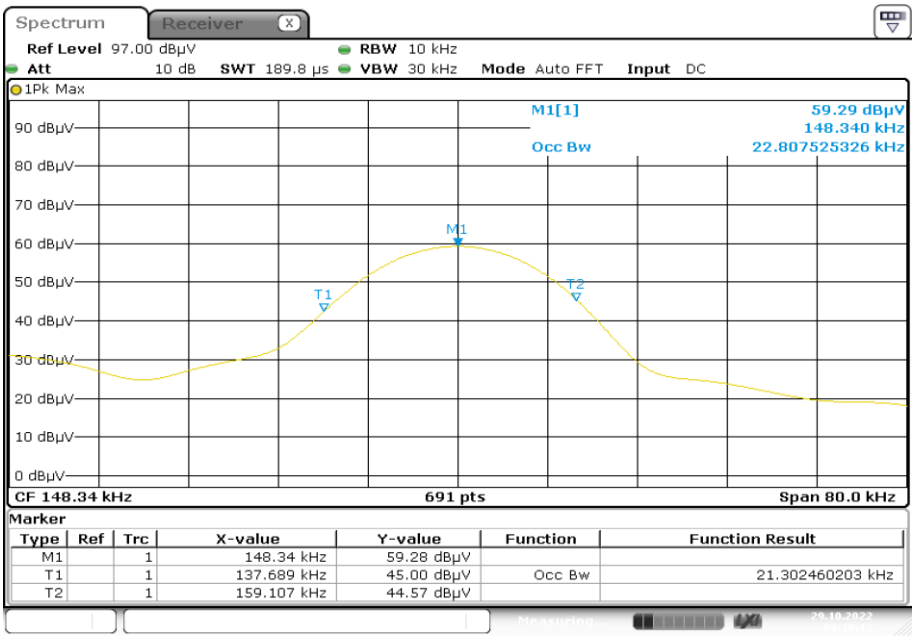
Qi Test Data and Plots

Mode1

Emission Bandwidth

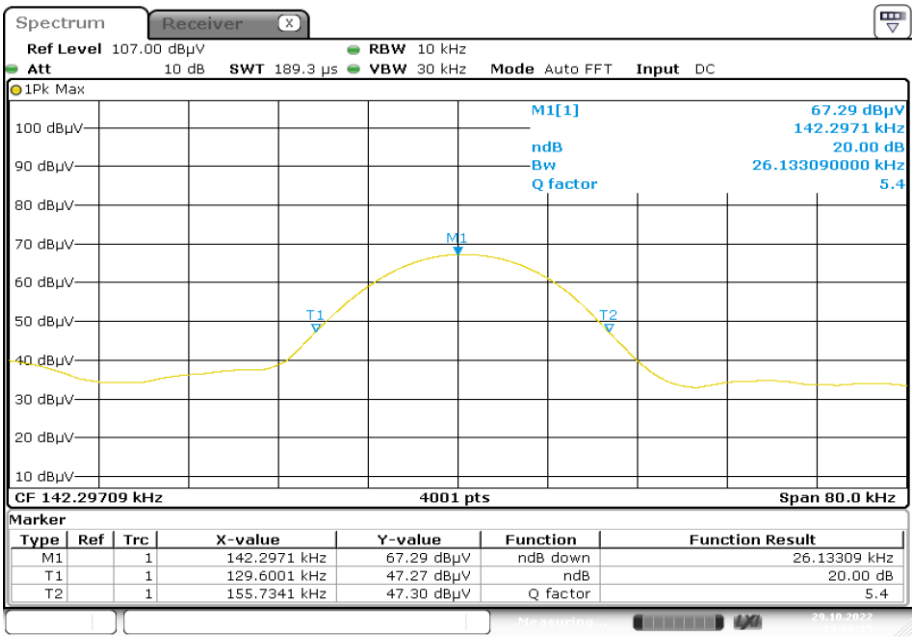


99% Occupied Bandwidth



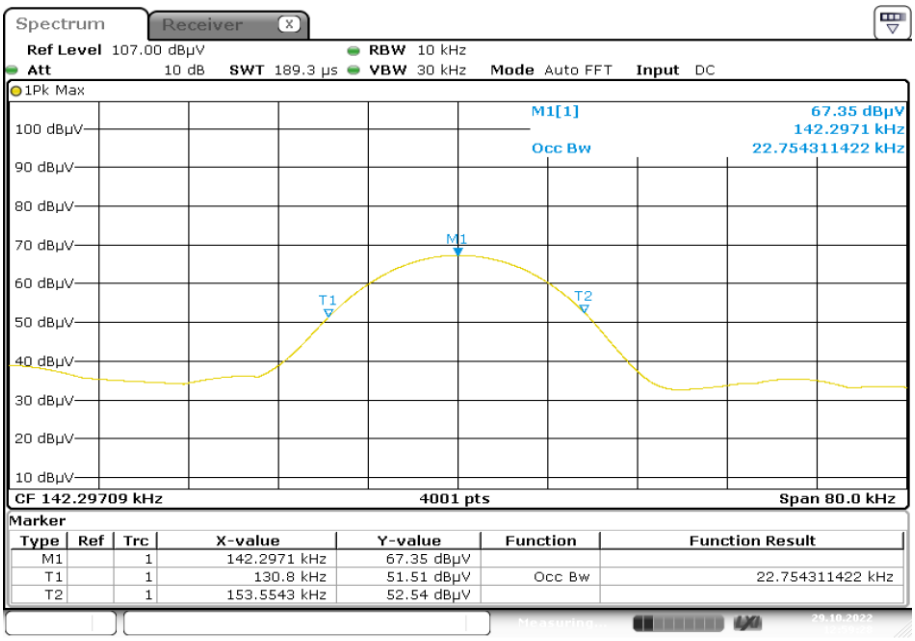
Mode2

Emission Bandwidth



Date: 29.OCT.2022 13:00:14

99% Occupied Bandwidth



Date: 29.OCT.2022 12:59:28

ANNEX B TEST SETUP PHOTOS

Please refer the document “BL-SZ22A0654-AE-2.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ22A0654-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer the document “BL-SZ22A0654-AI.PDF”.

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--END OF REPORT--