TEST REPORT

Report Number. : 14905094-E1V3

Applicant	:	BELKIN INTERNATIONAL, INC. 555 S. AVIATION BLVD., SUITE 180 EL SEGUNDO, CA 90245, USA
Model	:	WIZ020
FCC ID	:	K7SWIZ020
EUT Description	:	BoostCharge Pro 2-in-1 Wireless Charging Dock with MagSafe
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2023-09-11

Prepared by:
UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538 U.S.A.
TEL: (510) 319-4000
FAX: (510) 661-0888

ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-08-23	Initial Issue	---
V2	2023-09-01	Removed duplicated words from Section 8.3.2. Updated typo 326kHz to 326.5kHz on Section 5.1	Tina Chu
V3	2023-09-11	Updated Section 9 Test Procedure	Tina Chu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	BELKIN INTERNATIONAL, INC. 555 S. AVIATION BLVD., SUITE 180 EL SEGUNDO, CA 90245, USA
EUT DESCRIPTION:	BoostCharge Pro 2-in-1 Wireless Charging Dock with MagSafe
MODEL NUMBER:	WIZ020
BRAND:	belkin
SERIAL NUMBER:	59V00F67D00468
SAMPLE RECEIPT DATE:	2023-08-02
DATE TESTED:	2023-08-03 TO 2023-08-10

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 15 SUBPART C	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document.

Approved & Released For
UL Verification Services Inc. By:

Francisco de Anda
Staff Engineer
Consumer Technology Division
UL Verification Services Inc.

Prepared By:

Gerardo Abrego
Senior Test Engineer
Consumer Technology Division
UL Verification Services Inc.

Reviewed By:

Tina Chu
Senior Project Engineer
Consumer Technology Division
UL Verification Services Inc.

2. TEST METHODOLOGY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

The tests documented in this report were performed in accordance with:
ANSI C63.10-2013
FCC CFR 47 Part 2
FCC CFR 47 Part 15
KDB 414788 D01 Radiated Test Site v01r01

3. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☐	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			

4. DECISION RULES AND MEASUREMENT UNCERTAINTY

4.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

4.2. 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.)

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	2.75%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz (E-field)	2.84 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz (H-field)	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Time Domain Measurements	3.39%
Temperature	0.57˚C
Humidity	3.39%

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a BoostCharge Pro 2-in-1 Wireless Charging Dock with MagSafe with two separate induction coils that can charge two client devices at the same time.

The first coil is used for charging a MagSafe iPhone at 360kHz (15W max), a legacy iPhone at 127.7kHz (7.5W max), and an AirPods Pro case at 127.7kHz (1W max). The second coil is used for charging an Apple watch at either 326.5kHz or 1.778Mhz (5W max). The EUT is powered by a USB-C cable that is connected to a USB-C AC/DC adapter. The cable is tethered to the EUT at the EUT end.

The EUT is sold with 30W single port USB PD Type-C Power Supply.

5.2. MAXIMUM E-FIELD STRENGTH

The transmitter has maximum peak radiated electric field strength as follows:

Fundamental Frequency (kHz)	**E field (300m distance) (dBuV/m)**
326.5 (standby)	-25.96
360 (MagSafe phone 15W)	-22.75
127.7 (Legacy iPhone 7.5W)	-11.93
127.7 (AirPods Pro Case 1W)	-8.83
326.5 (Legacy Watch)	-29.42
Fundamental Frequency	**E field (30m distance) FCC (dBuV/m)**
1778 (New Watch)	7.09

5.3. SOFTWARE AND FIRMWARE

The firmware version installed in the EUT during testing was:
360kHz/127.7kHz: V274
326.5kHz/1.778MHz: V203

5.4. WORST-CASE CONFIGURATION

Testing for MagSafe phone is based on direct contact with no shifts in position due to the embedded magnet in the charger pads.

Legacy phone does not have an embedded magnet, is placed at the maximum power position during the testing.

Even though New AirPods Pro Case has embedded magnet, it is not strong enough to be attached to the charging pad, it is placed at the maximum power position during the testing .

For the entire radiated emissions test, the EUT was tested in desktop mode in the following configurations. The client devices where charging between 20% to 50% state of charge.

Radiated spurious emission 30MHz to 1GHz and AC conducted emissions were performed on Configuration 1, 7 at EUT minimum and maximum load as worst-case.

The following configurations were tested:

Config	Descriptions	Frequency	Client and worst-case orientation
1	EUT is powered by AC/DC adapter.	326.5kHz	No WPT client used. Stand-By.
2	EUT is powered by AC/DC adapter. Direct contact during charging/operating between the EUT & WPT Client(s).	360kHz (15W)	Coil 1: MagSafe Phone. 0 degrees when the lighting connector facing USB cable. Charging pad upright.
3		127.7kHz (7.5W)	Coil 1: Legacy Phone. 270 degrees when the lighting connector is 90 degrees away from USB cable to the right. Charging pad as flatbed position as normal used.
4		127.7kHz (1W)	Coil 1: AirPods Pro Case: 270 degrees when lighting connector 90 degree away from USB cable to the right. Charging pad as flatbed position as normal used.
5		326.5kHz (1W)	Coil 2: Legacy watch. 270 degrees with the digital crown/home button is on the right, 3 o'clock relative to the USB cable.
6		1.778MHz (5W)	Coil 2: Series 8 watch. 0 degree with the digital crown/home button is at top, 12 o'clock relative to the USB cable.
7		360kHz (15W) + 1.778MHz (5W)	Coil 1: MagSafe Phone. 0 degrees when the lighting connector facing USB cable. Charging pad upright. Coil 2: Series 8 watch. 0 degree with the digital crown/home button is at top, 12 o'clock relative to the USB cable.

6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

RADIATED EMISSIONS TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
Antenna, Passive Loop 30Hz - 1MHz	ELECTRO METRICS	EM-6871	219908	2024-05-31	2023-05-31
Antenna, Passive Loop 100KHz - 30MHz	ELECTRO METRICS	EM-6872	219910	2024-05-31	2023-05-31
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	174374	2024-04-30	2023-04-05
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230547	2024-02-29	2023-02-15
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	170647	2023-11-11	2022-11-11
AC MAINS LINE CONDUCTED EMISSIONS TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
LISN	Fischer Custom Communications, Inc`	FCC-LISN-50/250-25-2-01-480V	175765	2024-01-31	2023-01-27
EMI TEST RECEIVER	Rohde & Schwarz	ESR	171646	2024-02-29	2023-02-20
Transient Limiter	TE	TBFL1	207996	2024-08-31	2023-08-10
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Rev 9.5 2023-05-01, 2021-12-07		
AC Line Conducted Software	UL	UL EMC	Rev 9.5 2023-03-03		

7. OCCUPIED BANDWIDTH

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 300Hz. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

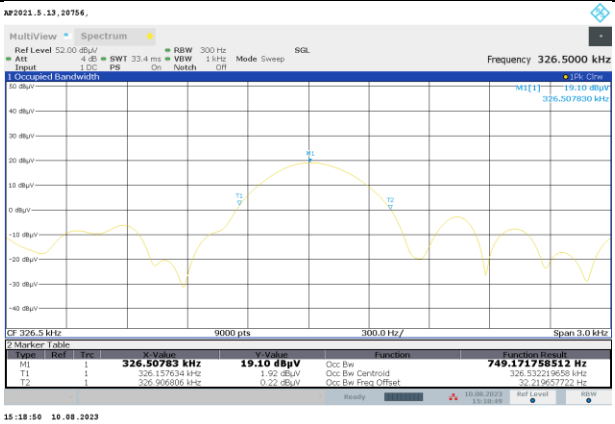
Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

RESULTS

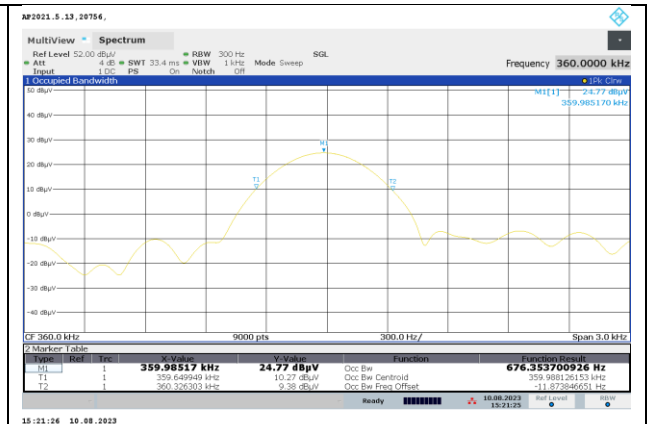
Test Engineer:	JM 28199

Configuration	Frequency (kHz)	99% Bandwidth (Hz)
1	326.5	749.17
2	360	676.35
3	127.7	668.16
4	127.7	660.28
5	326.5	679.67
6	1778	761.34

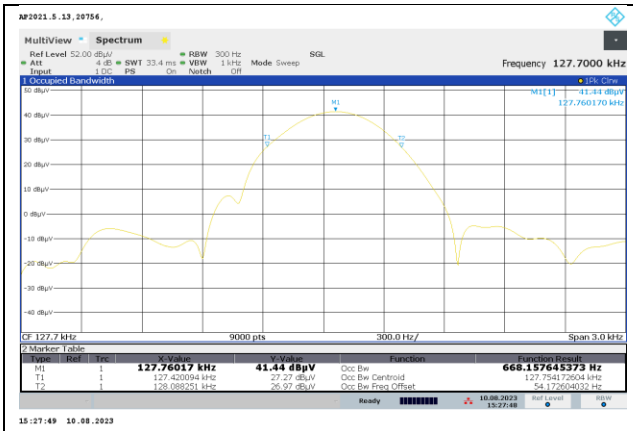
Note: Configuration 1 in standby mode, 1st coil no signal presents. 2nd coil signal presents.



CONFIGURATION 1 (326.5kHz)

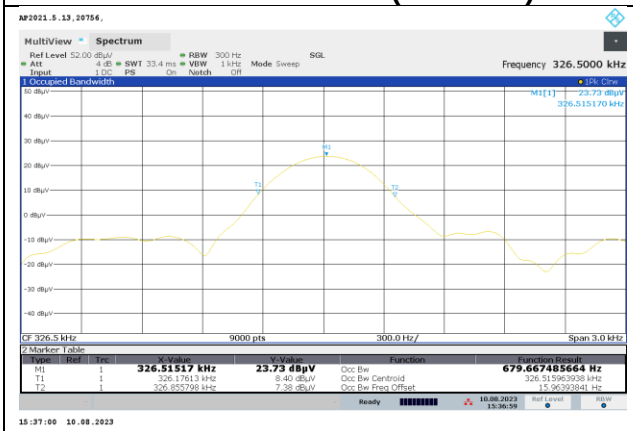


CONFIGURATION 2 (360kHz)

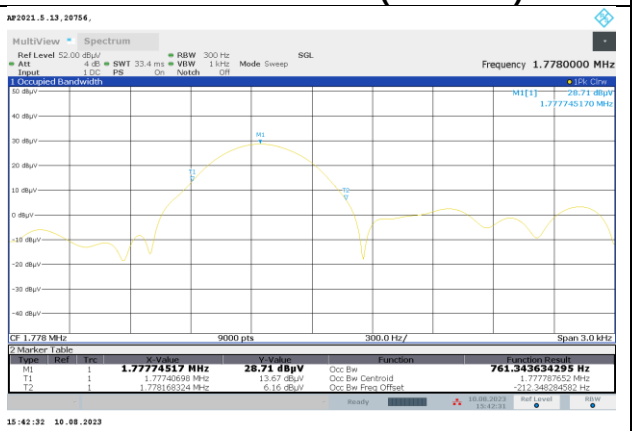


CONFIGURATION 3 (127.7kHz)

CONFIGURATION 4 (127.7kHz)



CONFIGURATION 5 (326.5kHz)



CONFIGURATION 6 (1778kHz)

8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

FCC §15.209 (a)

Frequency (MHz)	Field Strength (microvolts/meter)	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 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only. Blue color trace on plots: Parallel orientation. Green color trace on plots: Perpendicular orientation.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

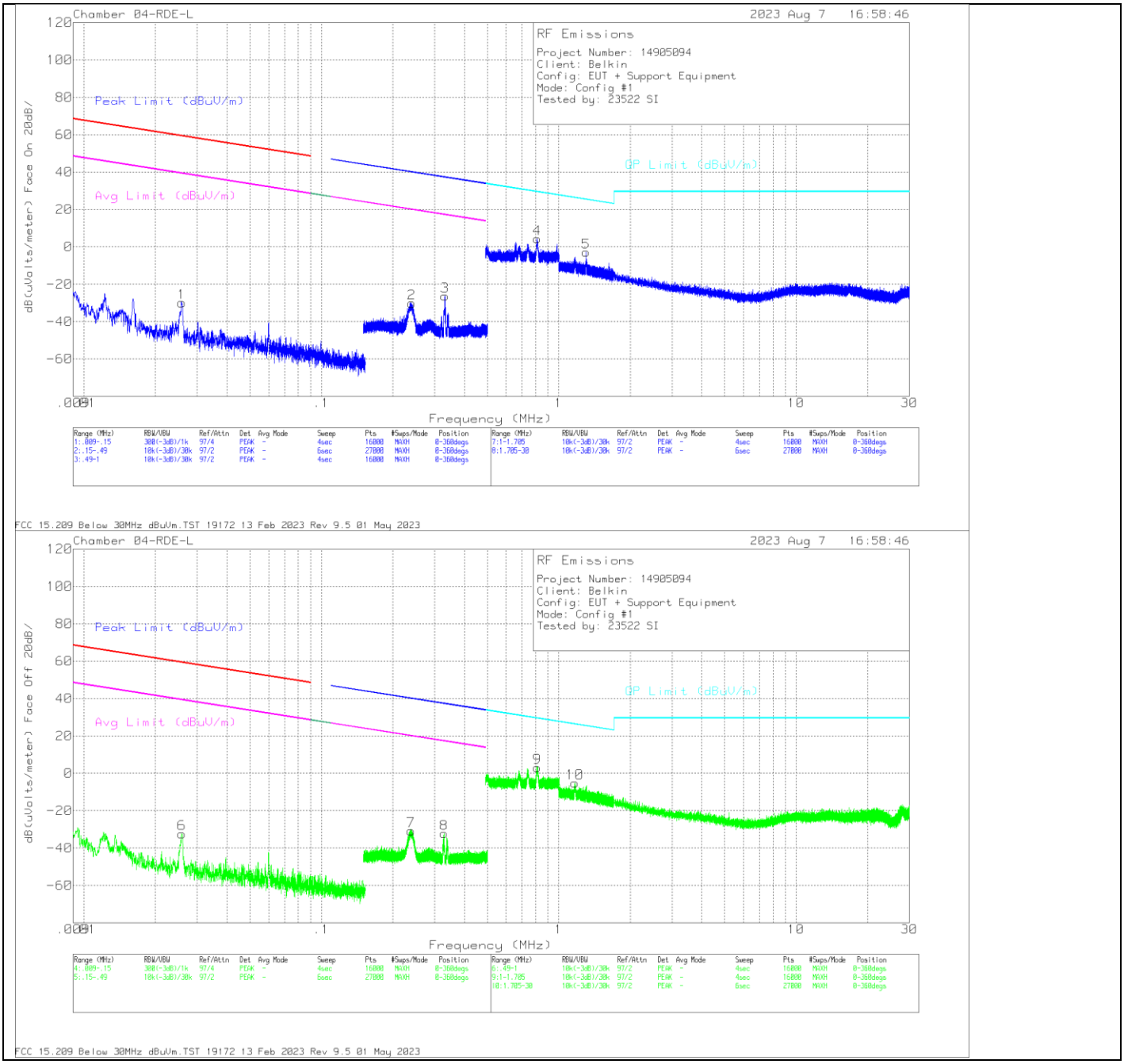
Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

RESULTS

8.2. FCC TX FUNDAMENTAL AND SPURIOUS EMISSIONS FROM 9 kHz TO 30 MHz

8.2.1. CONFIGURATION 1: WPT ON STANDBY

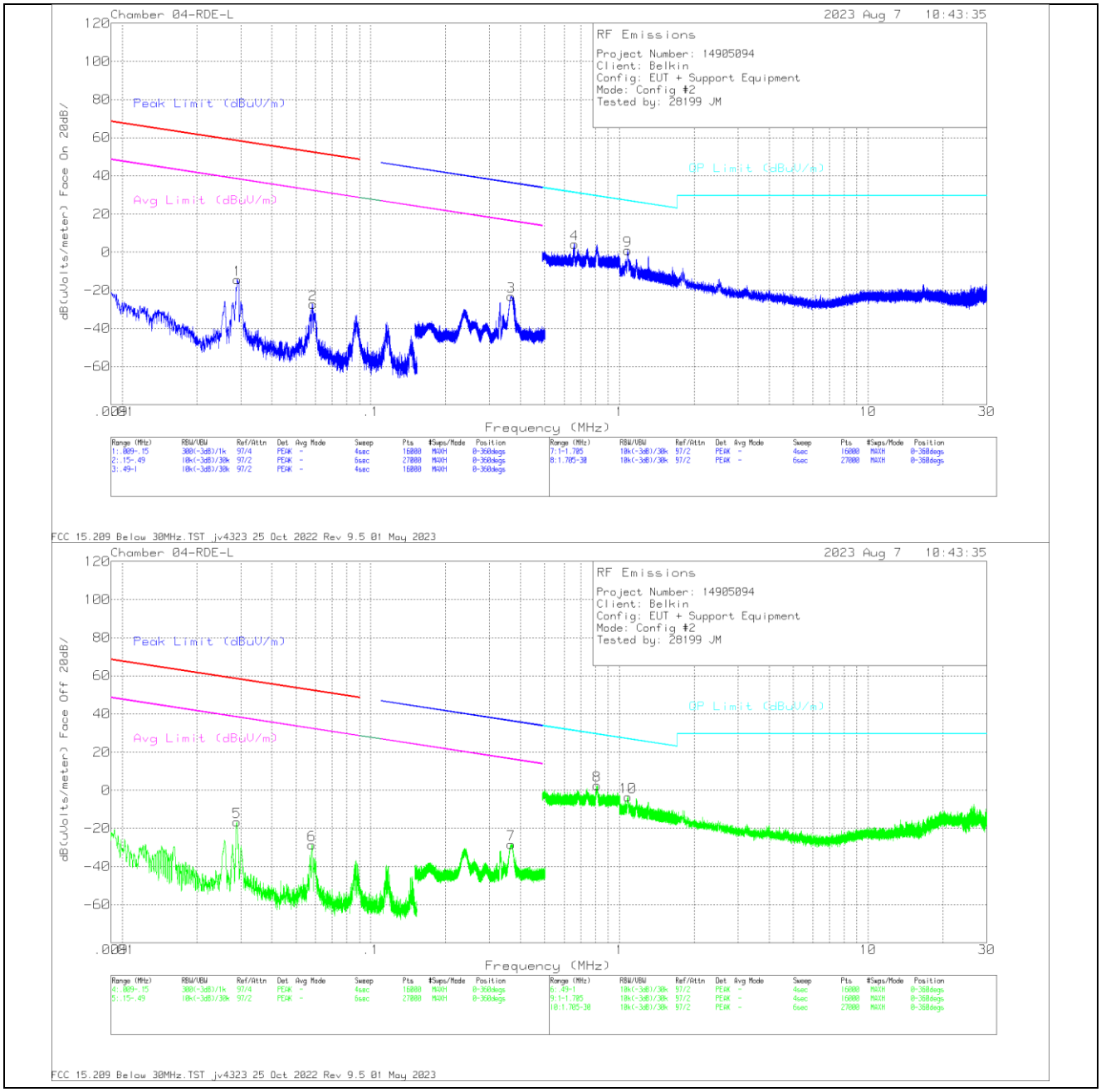


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0258	22.89	Pk	58.5	-111.3	-29.91	59.34	-89.25	39.34	-69.25	-	-	-	-	-	-	0-360
2	.2401	25.64	Pk	56.2	-112	-30.16	-	-	-	-	-	-	40.01	-70.17	20.01	-50.17	0-360
3	.3271	29.74	Pk	56.2	-111.9	**-25.96**	-	-	-	-	-	-	37.32	-63.28	17.32	-43.28	199
4	.8113	19.81	Pk	56.4	-71.9	4.31	-	-	-	-	29.43	-25.12	-	-	-	-	0-360
5	1.3052	23.73	Pk	45.2	-71.8	-2.87	-	-	-	-	25.31	-28.18	-	-	-	-	0-360
6	.0258	20.57	Pk	58.5	-111.4	-32.33	59.34	-91.67	39.34	-71.67	-	-	-	-	-	-	0-360
7	.2385	24.99	Pk	56.2	-112	-30.81	-	-	-	-	-	-	40.06	-70.87	20.06	-50.87	0-360
8	.3275	24.91	Pk	56.2	-111.9	-30.79	-	-	-	-	-	-	37.31	-68.1	17.31	-48.1	275
9	.8121	18.63	Pk	56.4	-71.9	3.13	-	-	-	-	29.42	-26.29	-	-	-	-	0-360
10	1.1693	20.77	Pk	45.9	-71.8	-5.13	-	-	-	-	26.27	-31.4	-	-	-	-	0-360

Pk - Peak detector
** Investigation was performed. Markers 1, 6 are not related to EUT.

8.2.2. CONFIGURATION 2: OPERATING MODE WITH iPhone (360kHz)

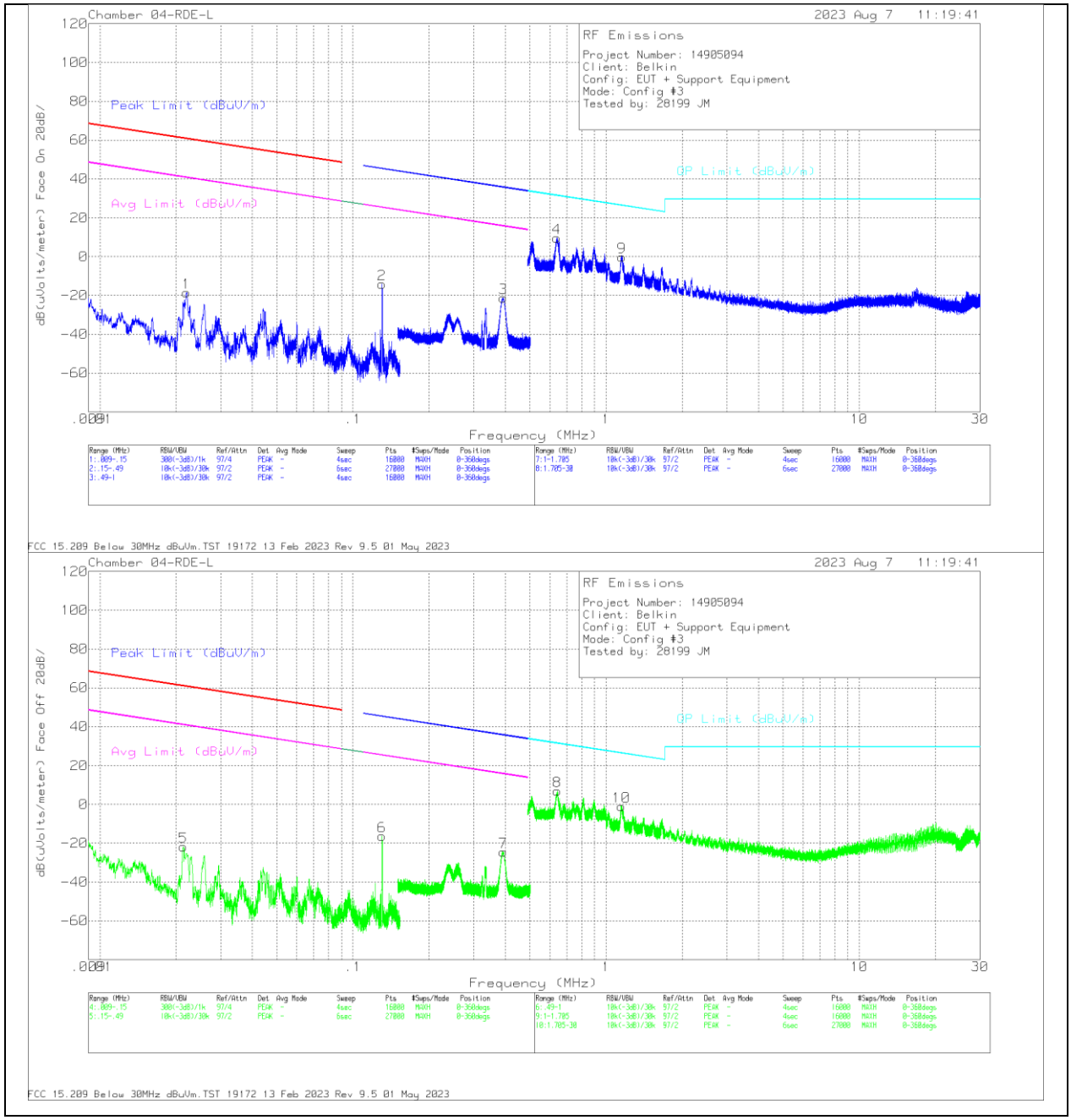


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.029	39.13	Pk	58.1	-111.5	-14.27	58.32	-72.59	38.32	-52.59	-	-	-	-	-	-	0-360
2	.0584	28.23	Pk	56.3	-111.9	-27.37	52.26	-79.63	32.26	-59.63	-	-	-	-	-	-	0-360
3	.3614	32.95	Pk	56.2	-111.9	**-22.75**	-	-	-	-	-	-	36.45	-59.2	16.45	-39.2	21
4	.6585	19.79	Pk	56.4	-71.9	4.29	-	-	-	-	31.24	-26.95	-	-	-	-	0-360
5	.0289	36.77	Pk	58.1	-111.5	-16.63	58.36	-74.99	38.36	-54.99	-	-	-	-	-	-	0-360
6	.058	26.77	Pk	56.4	-111.9	-28.73	52.31	-81.04	32.31	-61.04	-	-	-	-	-	-	0-360
7	.3592	27.82	Pk	56.2	-111.9	-27.88	-	-	-	-	-	-	36.5	-64.38	16.5	-44.38	113
8	.8116	18.16	Pk	56.4	-71.9	2.66	-	-	-	-	29.43	-26.77	-	-	-	-	0-360
9	1.079	26.42	Pk	46.4	-71.8	1.02	-	-	-	-	26.96	-25.94	-	-	-	-	0-360
10	1.0816	21.81	Pk	46.4	-71.8	-3.59	-	-	-	-	26.94	-30.53	-	-	-	-	0-360

Pk - Peak detector

8.2.3. CONFIGURATION 3: OPERATING MODE WITH iPhone (127.7kHz)

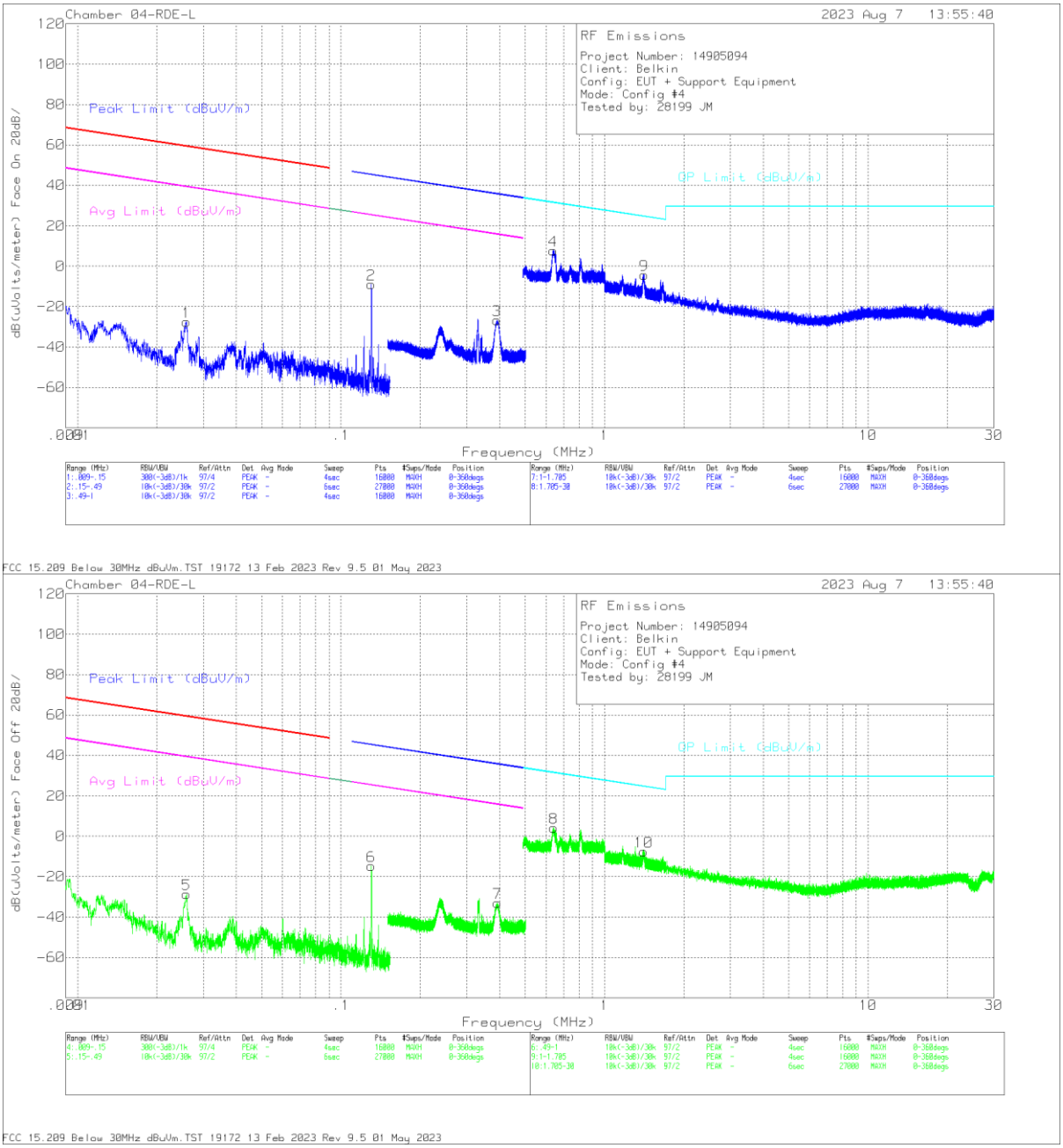


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.022	33.7	Pk	58.9	-111.1	-18.5	60.74	-79.24	40.74	-59.24	-	-	-	-	-	-	0-360
2	.1278	44.27	Pk	55.8	-112	**-11.93**	-	-	-	-	-	-	45.5	-57.43	25.5	-37.43	115
3	.3918	34.38	Pk	56.2	-111.9	-21.32	-	-	-	-	-	-	35.75	-57.07	15.75	-37.07	0-360
4	.6391	25.17	Pk	56.3	-71.9	9.57	-	-	-	-	31.5	-21.93	-	-	-	-	0-360
5	.0214	30.35	Pk	58.9	-111.1	-21.85	60.99	-82.84	40.99	-62.84	-	-	-	-	-	-	0-360
6	.1278	40.99	Pk	55.8	-112	-15.21	-	-	-	-	-	-	45.5	-60.71	25.5	-40.71	30
7	.3931	31.07	Pk	56.2	-111.9	-24.63	-	-	-	-	-	-	35.72	-60.35	15.72	-40.35	0-360
8	.6413	22.57	Pk	56.3	-71.9	6.97	-	-	-	-	31.47	-24.5	-	-	-	-	0-360
9	1.1545	25.7	Pk	46	-71.8	-.1	-	-	-	-	26.38	-26.48	-	-	-	-	0-360
10	1.149	24.72	Pk	46	-71.8	-1.08	-	-	-	-	26.42	-27.5	-	-	-	-	0-360

Pk - Peak detector

8.2.4. CONFIGURATION 4: OPERATING MODE WITH AirPods Pro Case (127.7kHz)

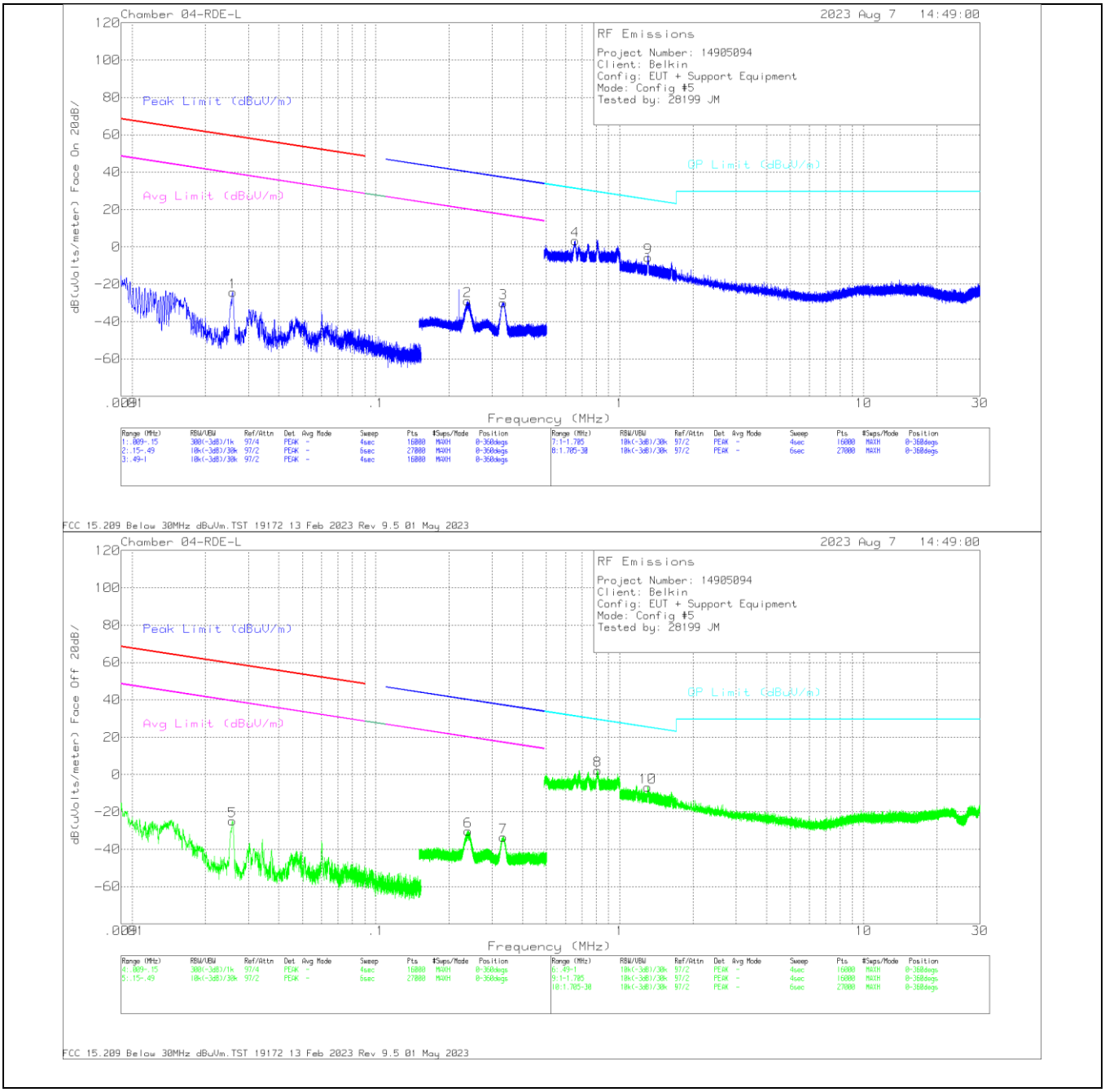


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0259	25.45	Pk	58.5	-111.4	-27.45	59.33	-86.78	39.33	-66.78	-	-	-	-	-	-	0-360
2	.1278	47.37	Pk	55.8	-112	**-8.83**	-	-	-	-	-	-	45.5	-54.33	25.5	-34.33	155
3	.3906	29.09	Pk	56.2	-111.9	-26.61	-	-	-	-	-	-	35.77	-62.38	15.77	-42.38	0-360
4	.6379	23.43	Pk	56.3	-71.9	7.83	-	-	-	-	31.52	-23.69	-	-	-	-	0-360
5	.0259	24.3	Pk	58.5	-111.4	-28.6	59.33	-87.93	39.33	-67.93	-	-	-	-	-	-	0-360
6	.1278	41.91	Pk	55.8	-112	-14.29	-	-	-	-	-	-	45.5	-59.79	25.5	-39.79	238
7	.3917	22.84	Pk	56.2	-111.9	-32.86	-	-	-	-	-	-	35.75	-68.61	15.75	-48.61	0-360
8	.6411	19.76	Pk	56.3	-71.9	4.16	-	-	-	-	31.47	-27.31	-	-	-	-	0-360
9	1.4105	23.04	Pk	44.6	-71.8	-4.16	-	-	-	-	24.64	-28.8	-	-	-	-	0-360
10	1.4053	19.58	Pk	44.7	-71.8	-7.52	-	-	-	-	24.67	-32.19	-	-	-	-	0-360

Pk - Peak detector
** Investigation was performed. Markers 1,5 are not related to EUT.

8.2.5. CONFIGURATION 5: OPERATING MODE WITH Apple Watch (326.5kHz)

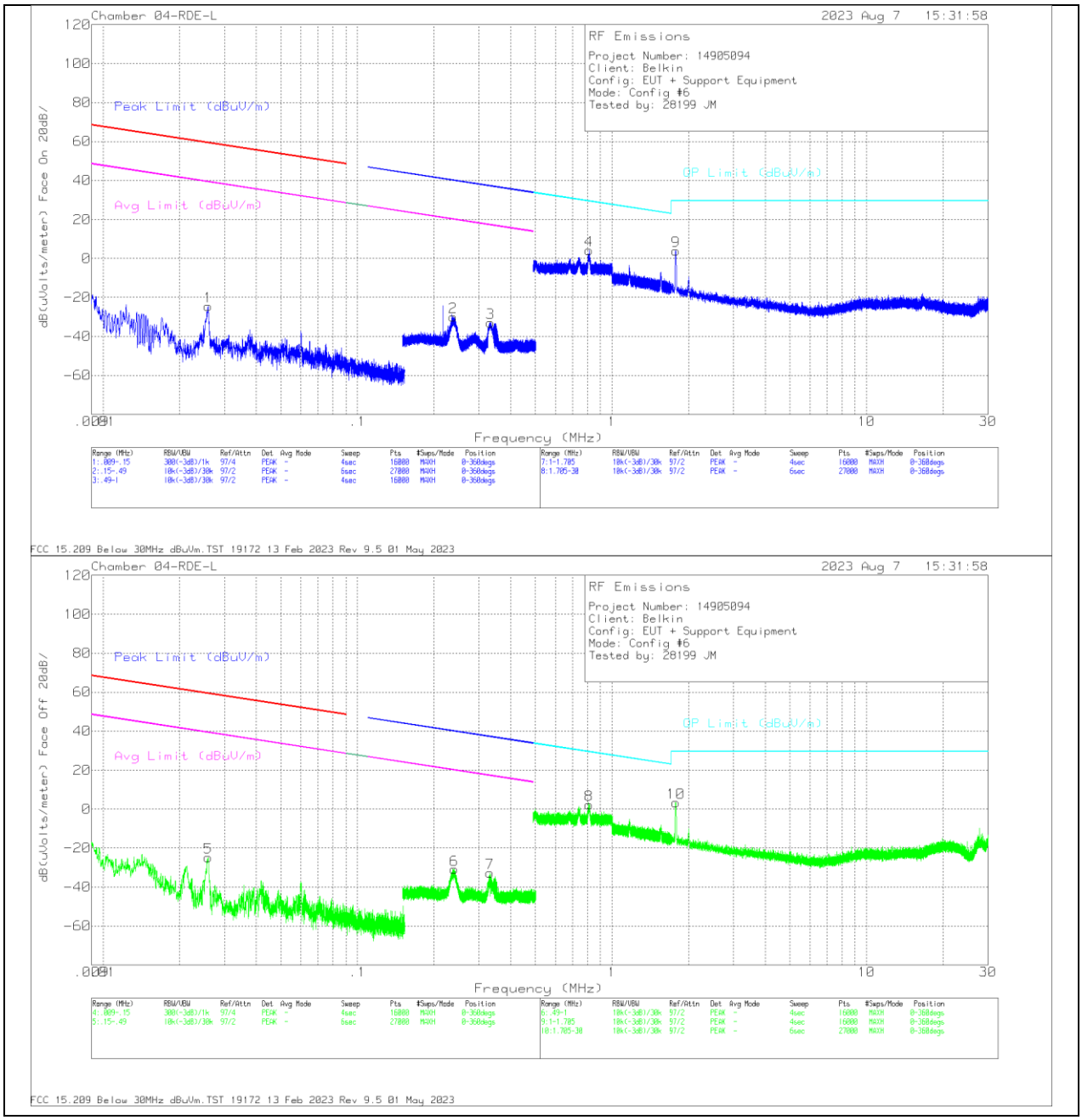


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	**Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)**	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0258	28.72	Pk	58.5	-111.4	-24.18	59.34	-83.52	39.34	-63.52	-	-	-	-	-	-	0-360
2	.2376	26.84	Pk	56.2	-112	-28.96	-	-	-	-	-	-	40.1	-69.06	20.1	-49.06	0-360
3	.3258	26.28	Pk	56.2	-111.9	**-29.42**	-	-	-	-	-	-	37.35	-66.77	17.35	-46.77	343
4	.6563	18.76	Pk	56.4	-71.9	3.26	-	-	-	-	31.27	-28.01	-	-	-	-	0-360
5	.0258	28.07	Pk	58.5	-111.3	-24.73	59.35	-84.08	39.35	-64.08	-	-	-	-	-	-	0-360
6	.2383	25.67	Pk	56.2	-112	-30.13	-	-	-	-	-	-	40.07	-70.2	20.07	-50.2	0-360
7	.3276	22.48	Pk	56.2	-111.9	-33.22	-	-	-	-	-	-	37.3	-70.52	17.3	-50.52	255
8	.812	17.78	Pk	56.4	-71.9	2.28	-	-	-	-	29.42	-27.14	-	-	-	-	0-360
9	1.3104	20.91	Pk	45.2	-71.8	-5.69	-	-	-	-	25.28	-30.97	-	-	-	-	0-360
10	1.3051	19.98	Pk	45.2	-71.8	-6.62	-	-	-	-	25.32	-31.94	-	-	-	-	0-360

Pk - Peak detector
** Investigation was performed. Markers 1,5 are not related to EUT.

8.2.6. CONFIGURATION 6: OPERATING MODE WITH Apple Watch (1.778MHz)

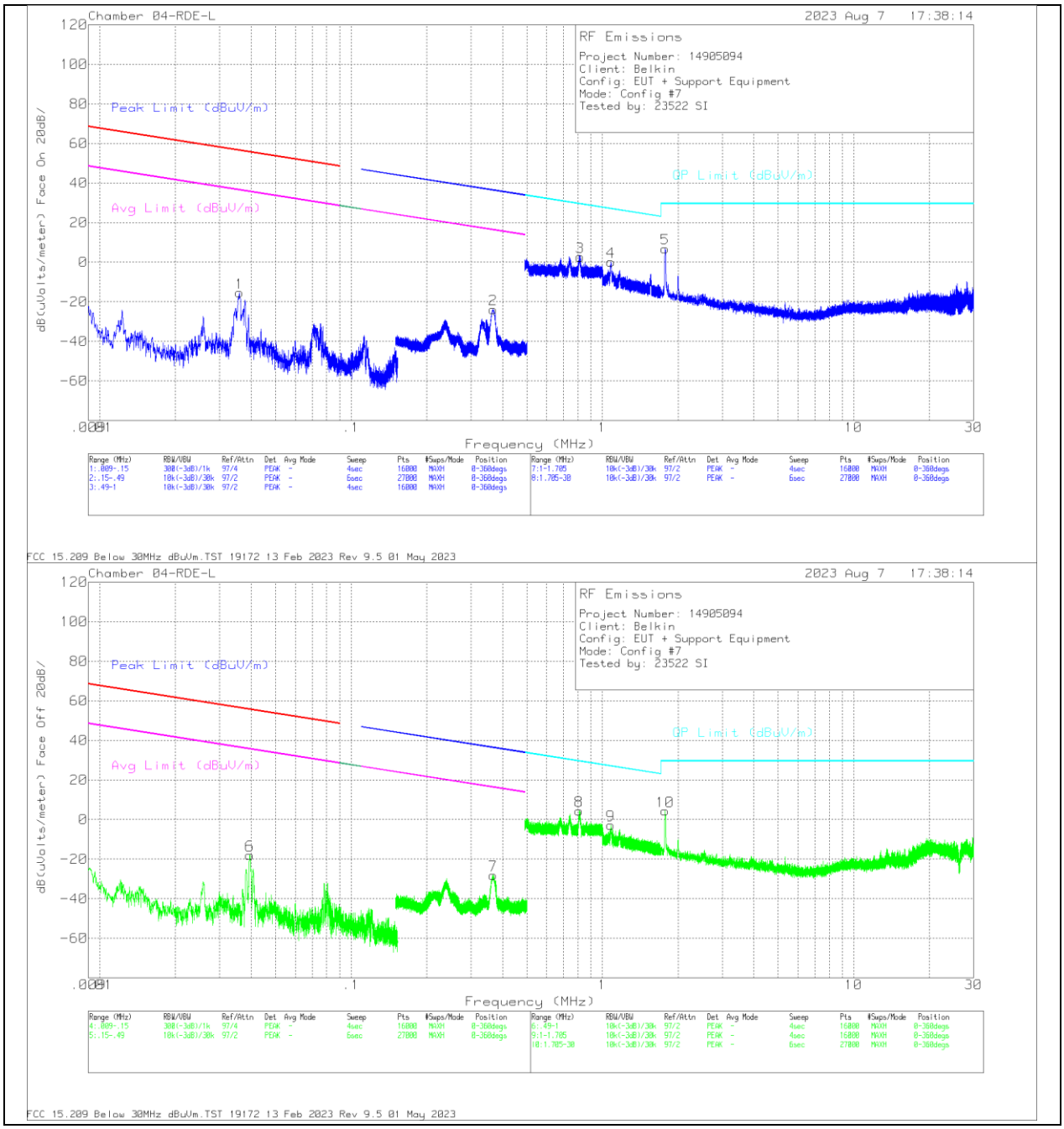


DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0259	28.34	Pk	58.5	-111.4	-24.56	59.34	-83.9	39.34	-63.9	-	-	-	-	-	-	0-360
2	.2371	25.73	Pk	56.2	-112	-30.07	-	-	-	-	-	-	40.12	-70.19	20.12	-50.19	0-360
3	.3329	22.82	Pk	56.2	-111.9	-32.88	-	-	-	-	-	-	37.16	-70.04	17.16	-50.04	0-360
4	.8115	19.57	Pk	56.4	-71.9	4.07	-	-	-	-	29.43	-25.36	-	-	-	-	0-360
5	.0259	28.03	Pk	58.5	-111.4	-24.87	59.34	-84.21	39.34	-64.21	-	-	-	-	-	-	0-360
6	.24	24.87	Pk	56.2	-112	-30.93	-	-	-	-	-	-	40.01	-70.94	20.01	-50.94	0-360
7	.3321	22.94	Pk	56.2	-111.9	-32.76	-	-	-	-	-	-	37.19	-69.95	17.19	-49.95	0-360
8	.8129	17.88	Pk	56.4	-71.9	2.38	-	-	-	-	29.42	-27.04	-	-	-	-	0-360
9	1.7784	36.19	Pk	42.7	-71.8	**7.09**	-	-	-	-	29.5	-22.41	-	-	-	-	1
10	1.7774	33.68	Pk	42.7	-71.8	4.58	-	-	-	-	29.5	-24.92	-	-	-	-	261

Pk - Peak detector
** Investigation was performed. Markers 1,5 are not related to EUT.

8.2.7. CONFIGURATION 7: OPERATING MODE WITH iPhone (360kHz) + Apple Watch (1.778MHz)



DATA

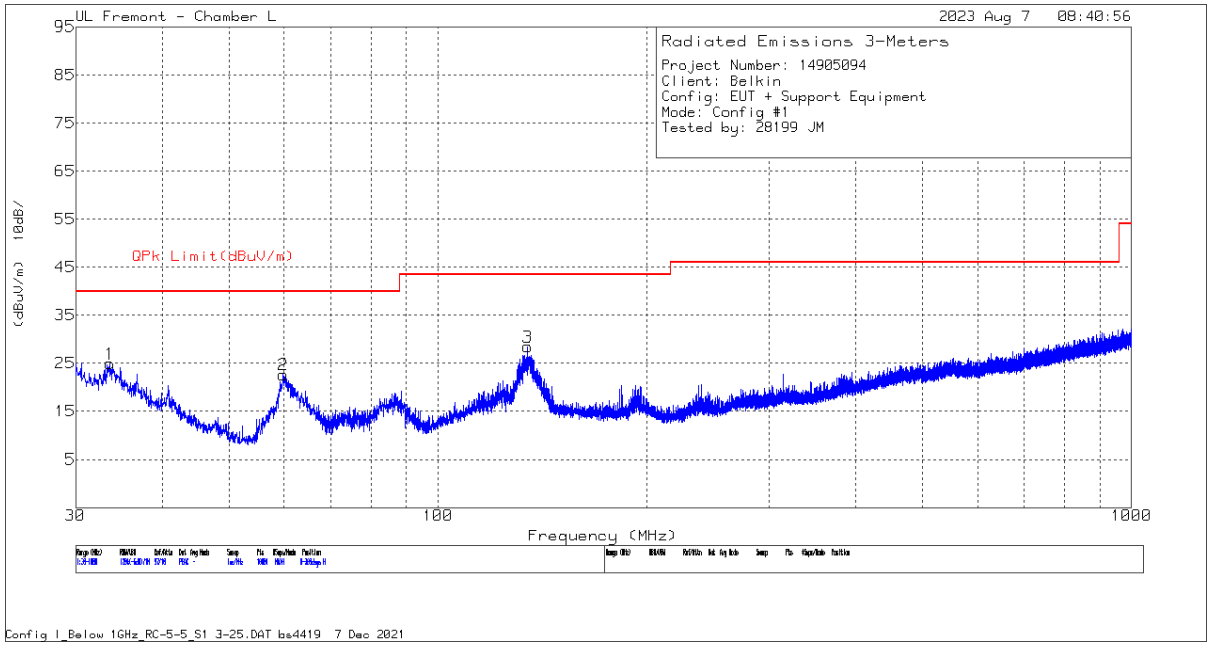
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) (dB)	Gain/Loss/ Dist Corr 300m 20Log or 30m 40Log (dB)	Corrected Reading dB(uVolts/meter)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	QP Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.0359	38.81	Pk	57.5	-111.7	-15.39	56.47	-71.86	36.47	-51.86	-	-	-	-	-	-	0-360
2	.3601	31.77	Pk	56.2	-111.9	-23.93	-	-	-	-	-	-	36.48	-60.41	16.48	-40.41	47
3	.8158	18.19	Pk	56.4	-71.9	2.69	-	-	-	-	29.39	-26.7	-	-	-	-	0-360
4	1.0817	25.61	Pk	46.4	-71.8	.21	-	-	-	-	26.94	-26.73	-	-	-	-	0-360
5	1.7773	36	Pk	42.7	-71.8	6.9	-	-	-	-	29.5	-22.75	-	-	-	-	2
6	.0395	36.65	Pk	57.2	-111.8	-17.95	55.65	-73.6	35.65	-53.6	-	-	-	-	-	-	0-360
7	.3601	25.81	Pk	56.2	-111.9	-29.89	-	-	-	-	-	-	36.48	-66.37	16.48	-46.37	140
8	.8092	19.94	Pk	56.4	-71.9	4.44	-	-	-	-	29.45	-25.01	-	-	-	-	0-360
9	1.0794	22.6	Pk	46.4	-71.8	-2.8	-	-	-	-	26.96	-29.76	-	-	-	-	0-360
10	1.779	33.86	Pk	42.7	-71.8	4.76	-	-	-	-	29.5	-24.74	-	-	-	-	246

Pk - Peak detector

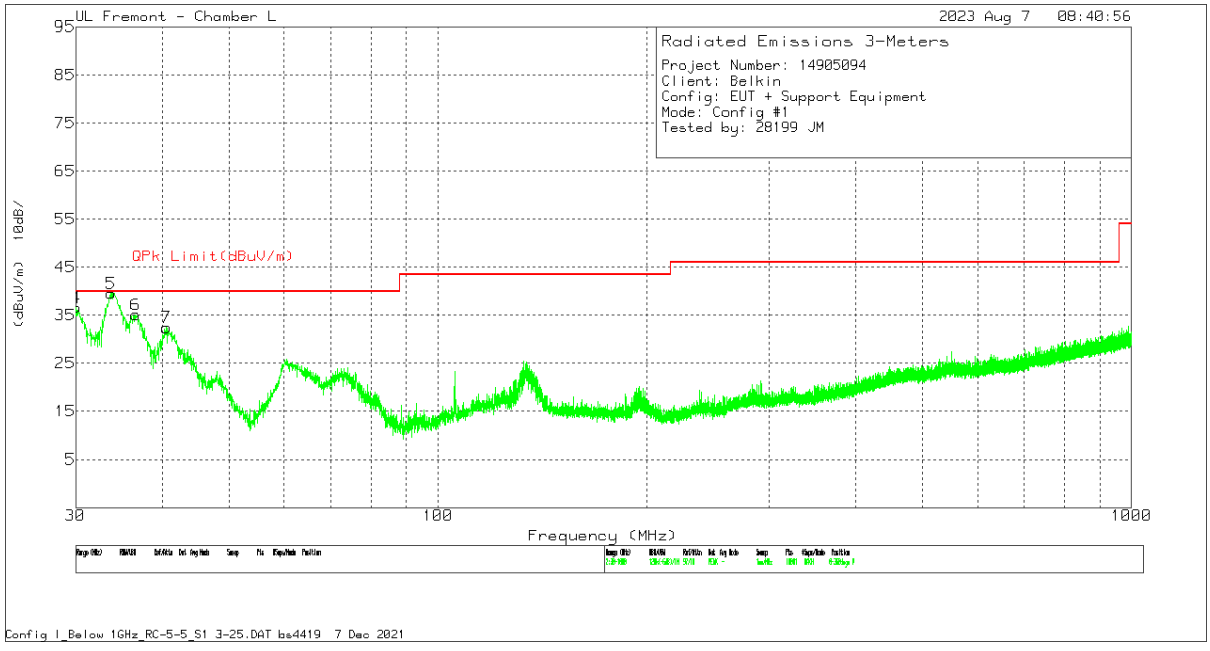
8.3. FCC TX SPURIOUS EMISSION 30 TO 1000 MHz

8.3.1. CONFIGURATION 1: WPT ON STANDBY

HORIZONTAL PLOT



VERTICAL PLOT



DATA

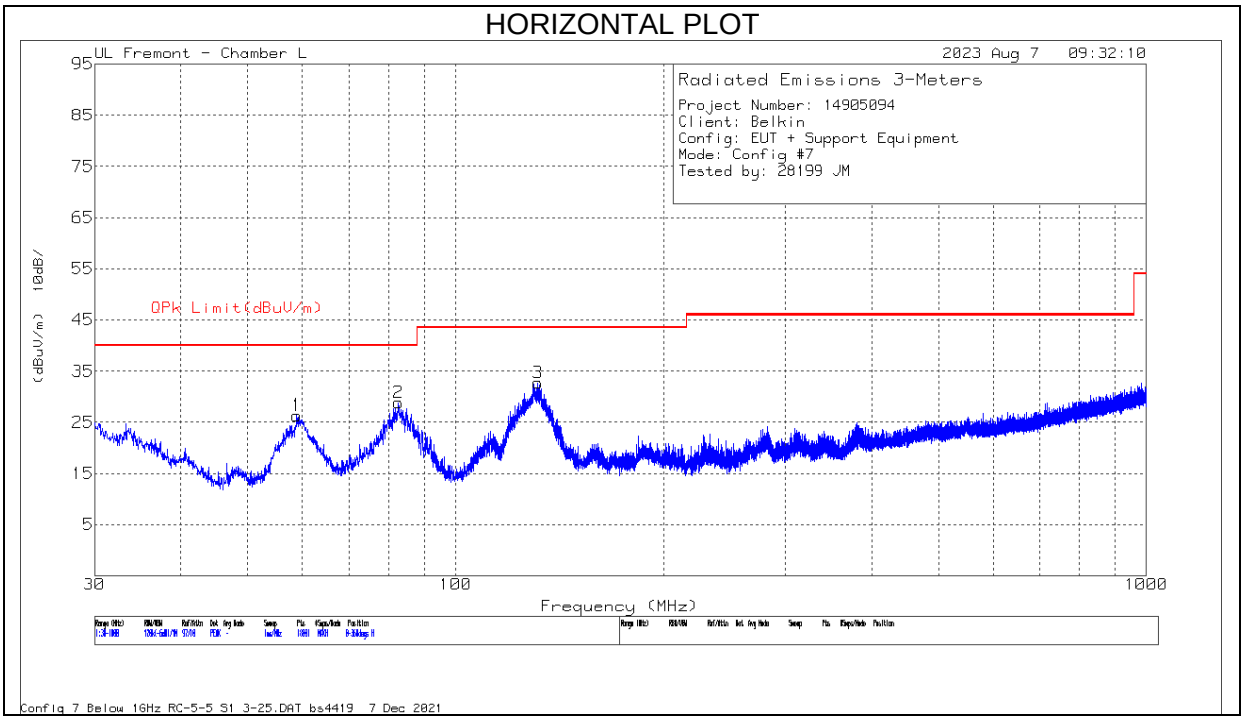
Radiated Emissions

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	174374 ANSI ACF 10 m H UL_(dB)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit(dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	33.6106	31.92	Pk	24.1	-31.1	24.92	40	-15.08	0-360	299	H
2	59.8006	40.06	Pk	13.4	-30.8	22.66	40	-17.34	0-360	400	H
3	134.652	39.24	Pk	19.3	-30.1	28.44	43.52	-15.08	0-360	199	H
4	30.1687	41.9	Pk	26.7	-31.1	37.5	40	-2.5	54	120	V
	30.3579	36.94	Qp	26.5	-31.1	32.34	40	-7.66	54	120	V
5	34.0856	44.38	Pk	23.6	-31.1	36.88	40	-3.12	44	219	V
	34.0757	40.23	Qp	23.6	-31.1	32.73	40	-7.27	60	219	V
6	36.6292	45.15	Pk	22	-31.1	36.05	40	-3.95	101	111	V
	36.5024	40.82	Qp	22.1	-31.1	31.82	40	-8.18	101	111	V
7	40.5622	44.12	Pk	19.3	-31	32.42	40	-7.58	0-360	100	V

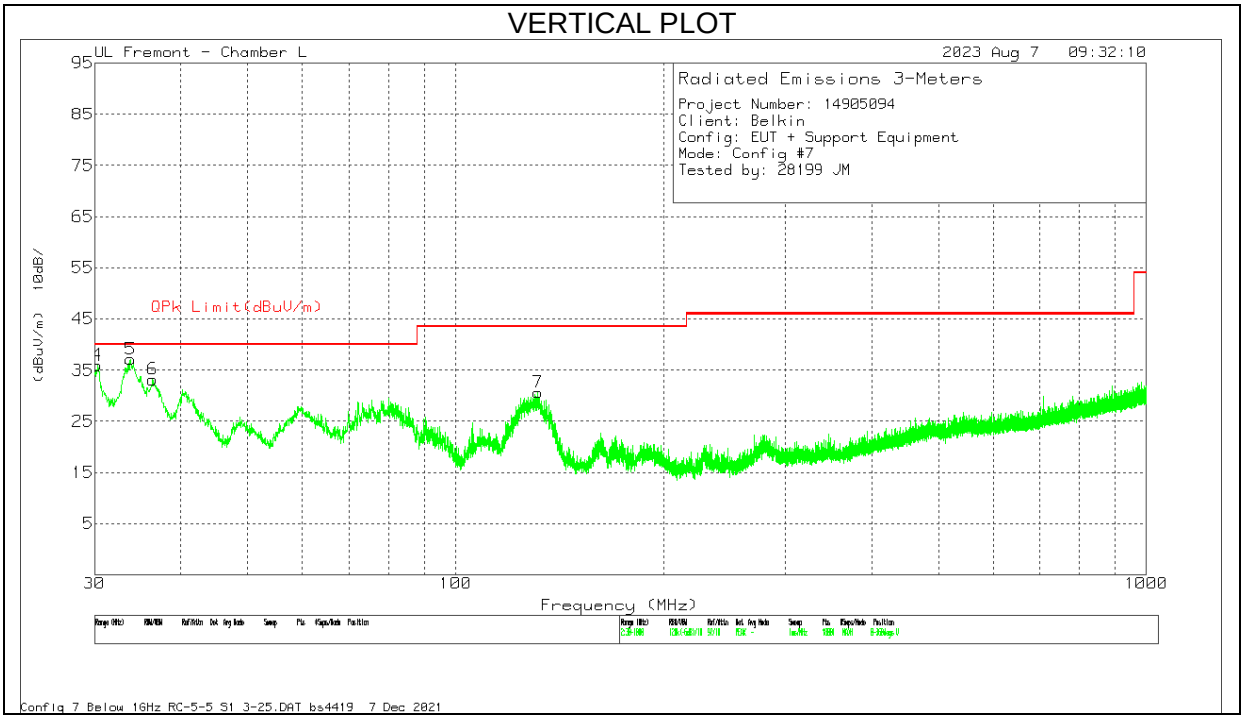
Pk - Peak detector
Qp - Quasi-Peak detector

8.3.2. CONFIGURATION 7: OPERATING MODE WITH iPhone (360kHz) + Apple Watch (1.778MHz)

HORIZONTAL PLOT



VERTICAL PLOT



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	174374 ANSI ACF 10 m H UL_ (dB)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit(dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	58.8845	43.82	Pk	13.3	-30.8	26.32	40	-13.68	0-360	399	H
2	82.5957	45.96	Pk	13.5	-30.6	28.86	40	-11.14	0-360	399	H
3	131.419	43.38	Pk	19.5	-30.2	32.68	43.52	-10.84	0-360	199	H
4	30.434	41.65	Pk	26.4	-31.1	36.95	40	-3.05	107	101	V
	30.4018	37.31	Qp	26.5	-31.1	32.71	40	-7.29	107	101	V
5	33.7909	45.12	Pk	23.9	-31.1	37.92	40	-2.08	107	112	V
	33.6814	41.94	Qp	24	-31.1	34.84	40	-5.16	107	112	V
6	36.4128	42.1	Pk	22.2	-31.1	33.2	40	-6.8	0-360	101	V
7	131.527	41.44	Pk	19.4	-30.2	30.64	43.52	-12.88	0-360	101	V

Pk - Peak detector
Qp - Quasi-Peak detector

9. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

ICES-001 Issue 5 Table 1

Table 1: Conducted emission limits for induction cooking appliances (AC mains terminals)				
Frequency range (MHz)	Appliances rated 120 V, without an earth connection Quasi-peak (dBµV)	Appliances rated 120 V, without an earth connection Average (dBµV)	All other appliances Quasi-peak (dBµV)	All other appliances Average (dBµV)
0.009 – 0.05	122	—	110	—
0.05 – 0.15	102 to 92 *	—	90 to 80 *	—
0.15 – 0.5	72 to 62 *	62 to 52 *	66 to 56 *	56 to 46 *
0.5 – 5	56	46	56	46
5 – 30	60	50	60	50
Note: The more stringent limit applies at transition frequencies. *The limit level in dBµV decreases linearly with the logarithm of frequency.				

TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.10.

The receiver is set to a resolution bandwidth of 200Hz for below 150kHz, 9kHz for 150kHz to 30MHz. Peak detection is used unless otherwise noted as quasi-peak or average.

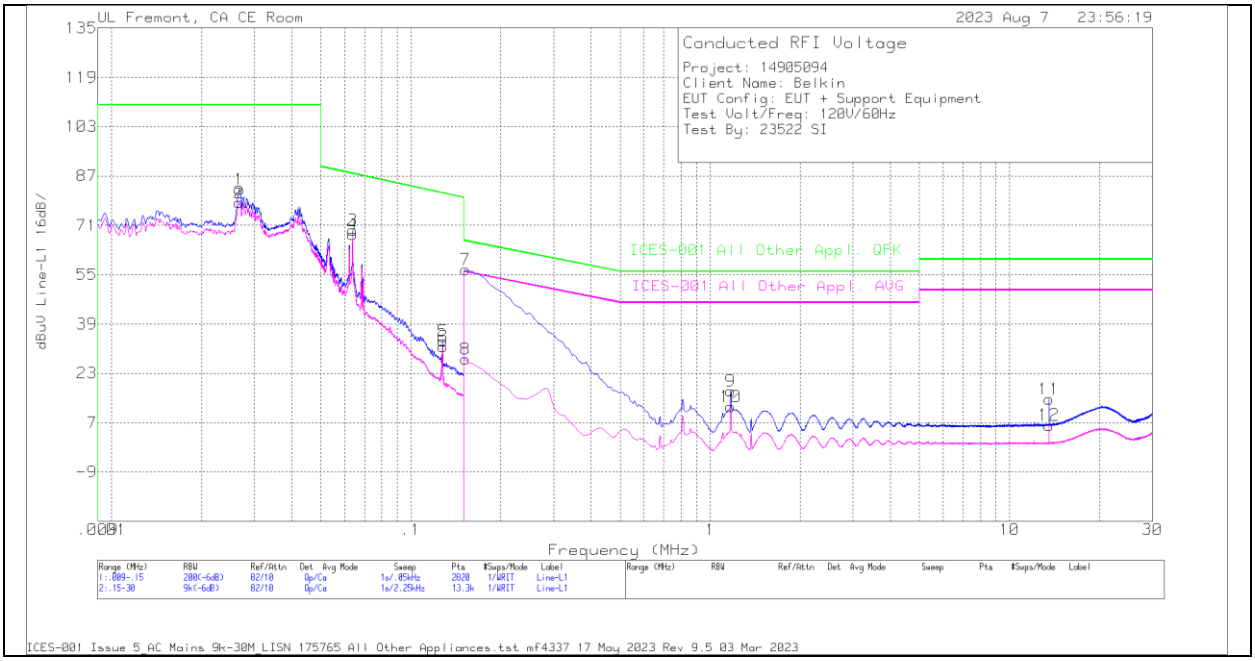
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

Testing range from 9kHz to 30MHz using ICES-001 Issue Table 1 “All other appliances” limit to cover both FCC and ISED frequency range.

9.1. CONFIGURATION 1: WPT ON STANDBY

LINE 1 RESULTS

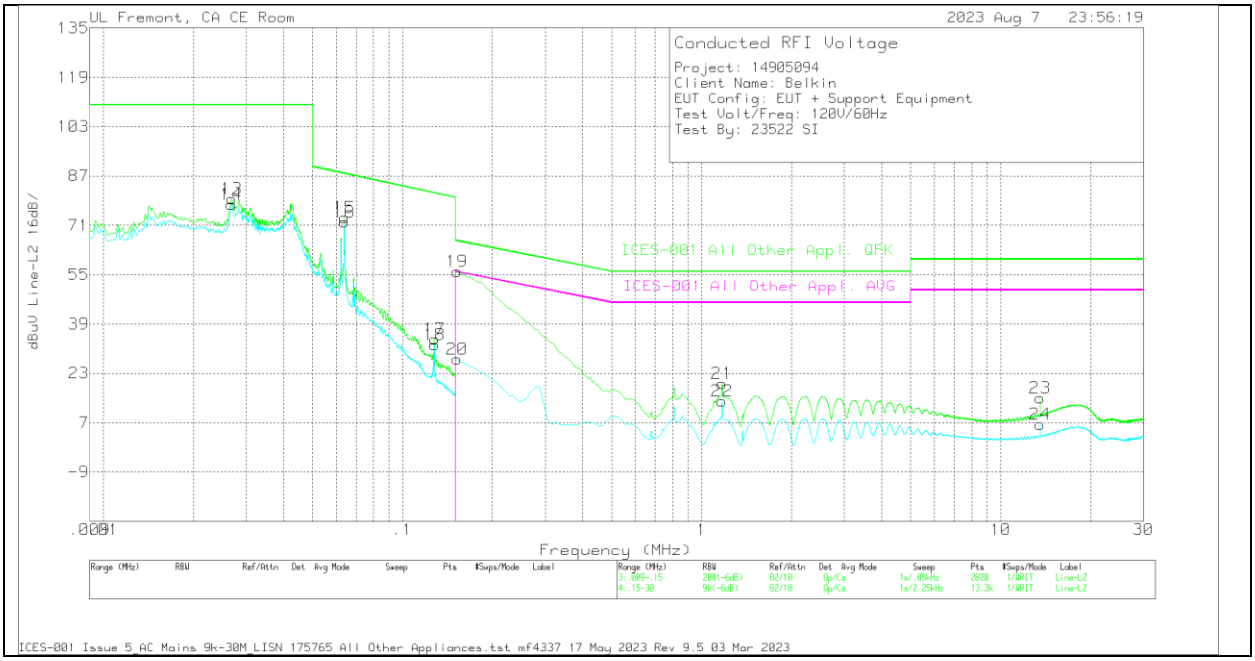


WORST EMISSIONS

Range 1: Line-L1 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv	C1&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
2	.0268	66.7	Ca	.9	0	10.7	78.3	-	-	-	-
4	.064	58.3	Ca	0	0	9.7	68	-	-	-	-
6	.128	22.21	Ca	0	0	9.4	31.61	-	-	-	-
1	.0268	71.09	Qp	.9	0	10.7	82.69	110	-27.31	-	-
3	.064	59.68	Qp	0	0	9.7	69.38	87.76	-18.38	-	-
5	.128	24.09	Qp	0	0	9.4	33.49	81.45	-47.96	-	-
Range 2: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv	C1&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
8	.1523	18.25	Ca	0	0	9.4	27.65	-	-	55.88	-28.23
10	1.1693	2.79	Ca	0	.1	9.3	12.19	-	-	46	-33.81
12	13.56	-3.41	Ca	.1	.2	9.3	6.19	-	-	50	-43.81
7	.1523	47.27	Qp	0	0	9.4	56.67	65.88	-9.21	-	-
9	1.1693	7.84	Qp	0	.1	9.3	17.24	56	-38.76	-	-
11	13.56	4.98	Qp	.1	.2	9.3	14.58	60	-45.42	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



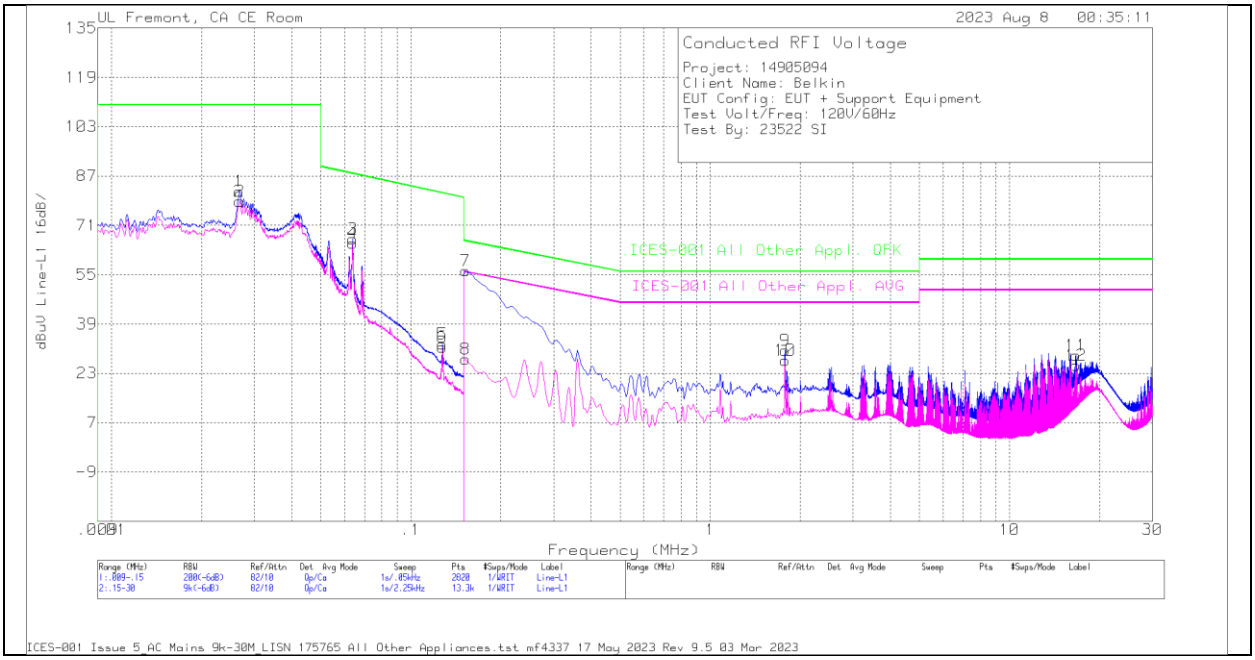
WORST EMISSIONS

Range 3: Line-L2 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN	C2&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
14	.0268	66.17	Ca	.9	0	10.7	77.77	-	-	-	-
16	.064	62.38	Ca	0	0	9.7	72.08	-	-	-	-
18	.128	22.84	Ca	0	0	9.4	32.24	-	-	-	-
13	.0269	68.09	Qp	.9	0	10.7	79.69	110	-30.31	-	-
15	.064	63.73	Qp	0	0	9.7	73.43	87.76	-14.33	-	-
17	.128	24.74	Qp	0	0	9.4	34.14	81.45	-47.31	-	-
Range 4: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN	C2&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
20	.1523	18.16	Ca	0	0	9.4	27.56	-	-	55.88	-28.32
22	1.1693	4.6	Ca	0	.1	9.3	14	-	-	46	-32
24	13.56	-3.04	Ca	.1	.2	9.3	6.56	-	-	50	-43.44
19	.1523	46.73	Qp	0	0	9.4	56.13	65.88	-9.75	-	-
21	1.1693	10.28	Qp	0	.1	9.3	19.68	56	-36.32	-	-
23	13.56	5.48	Qp	.1	.2	9.3	15.08	60	-44.92	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

9.2. CONFIGURATION 7: OPERATING MODE WITH iPhone (360kHz) + Apple Watch (1.778MHz)

LINE 1 RESULTS

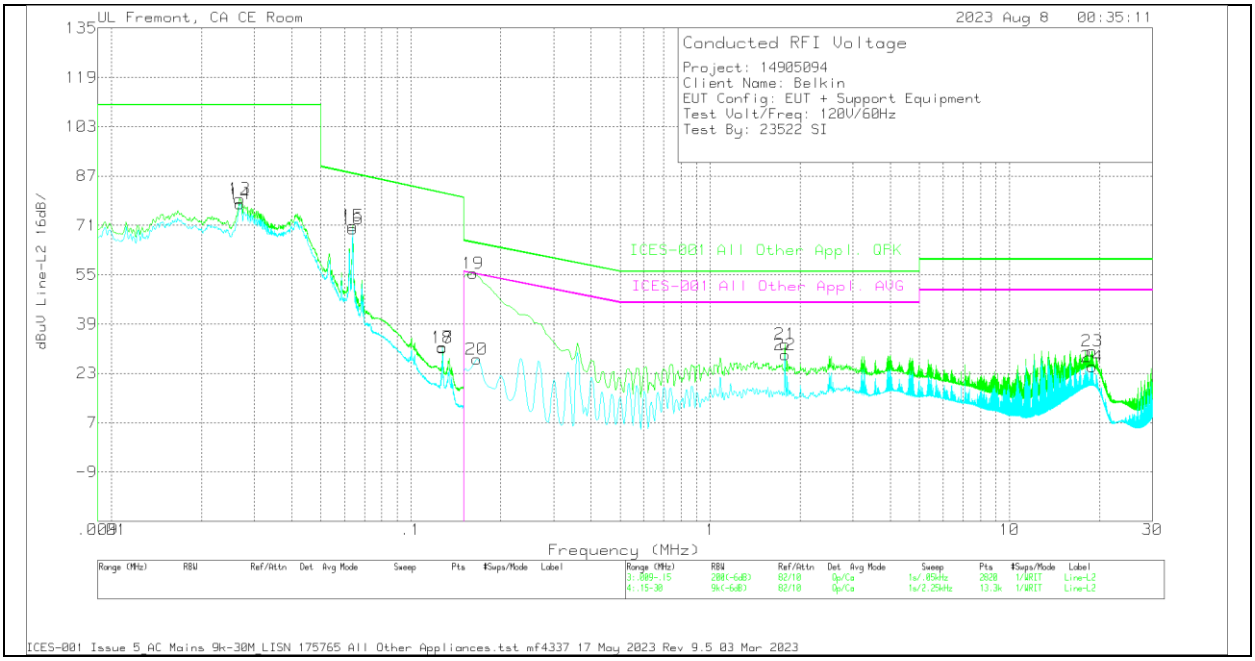


WORST EMISSIONS

Range 1: Line-L1 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv	C1&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
2	.0268	67.26	Ca	.9	0	10.7	78.86	-	-	-	-
4	.0639	55.52	Ca	0	0	9.7	65.22	-	-	-	-
6	.1276	22.16	Ca	0	0	9.4	31.56	-	-	-	-
1	.0268	70.4	Qp	.9	0	10.7	82	110	-28	-	-
3	.0639	56.83	Qp	0	0	9.7	66.53	87.77	-21.24	-	-
5	.1276	23.04	Qp	0	0	9.4	32.44	81.47	-49.03	-	-
Range 2: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L1_LISN.csv	C1&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
8	.1523	18.31	Ca	0	0	9.4	27.71	-	-	55.88	-28.17
10	1.7768	17.85	Ca	0	.1	9.3	27.25	-	-	46	-18.75
12	16.6493	15.91	Ca	.1	.2	9.3	25.51	-	-	50	-24.49
7	.1523	46.77	Qp	0	0	9.4	56.17	65.88	-9.71	-	-
9	1.7768	21.1	Qp	0	.1	9.3	30.5	56	-25.5	-	-
11	16.6493	19.21	Qp	.1	.2	9.3	28.81	60	-31.19	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



WORST EMISSIONS

Range 3: Line-L2 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN	C2&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
14	.0269	66.33	Ca	.9	0	10.7	77.93	-	-	-	-
16	.064	60.14	Ca	0	0	9.7	69.84	-	-	-	-
18	.1276	21.87	Ca	0	0	9.4	31.27	-	-	-	-
13	.0268	67.98	Qp	.9	0	10.7	79.58	110	-30.42	-	-
15	.064	61.24	Qp	0	0	9.7	70.94	87.76	-16.82	-	-
17	.1276	22.13	Qp	0	0	9.4	31.53	81.47	-49.94	-	-
Range 4: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	L2_LISN	C2&C3 cable path loss	207996 Limiter with short cabl	Corrected Reading dBuV	ICES-001 All Other Appl. QPK	Margin (dB)	ICES-001 All Other Appl. AVG	Margin (dB)
20	.1658	18.18	Ca	0	0	9.4	27.58	-	-	55.17	-27.59
22	1.7768	19.67	Ca	0	.1	9.3	29.07	-	-	46	-16.93
24	18.8543	15.45	Ca	.1	.3	9.3	25.15	-	-	50	-24.85
19	.1613	45.97	Qp	0	0	9.4	55.37	65.4	-10.03	-	-
21	1.7768	23.01	Qp	0	.1	9.3	32.41	56	-23.59	-	-
23	18.8543	20.48	Qp	.1	.3	9.3	30.18	60	-29.82	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

10. DESCRIPTION OF TEST SETUP AND SETUP PHOTOS

Please refer to 14905094-EP1 (FCC) for description of test up and setup photo.

END OF TEST REPORT

UL VERIFICATION SERVICES INC. FORM NO: CCSUP4701I
47173 Benicia Street, Fremont, CA 94538, USA TEL:(510) 319-4000 FAX:(510) 661-0888