

TEST REPORT

Report Number : 15412975-E1V1

Applicant : APPLE, INC.
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S. A

Model : A2844

FCC ID : BCGA2844

IC : 579C-A2844

EUT Description : Wireless Charger

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
ISED RSS-216 ISSUE 2
ISED RSS-GEN ISSUE 5 + A1 + A2

Date Of Issue:
2024/07/25

Prepared by:
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REPORT REVISION HISTORY

Rev.		Issue Date		Revisions		Revised By
V1		2024/07/25		Initial Issue		Kevin Yong

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: APPLE, INC.
ONE APPLE PARK WAY
CUPERTINO, CA 95014

EUT DESCRIPTION: Wireless Charger

MODEL: A2844

FCC ID: BCGA2844

IC ID: 579C-A2844

BRAND: APPLE

SERIAL NUMBER: Q0XLYX4X20

SAMPLE RECEIPT DATE: 2024/06/28

DATE TESTED: 2024/06/29 TO 2024/07/18

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Complies
ISED RSS-216 Issue 2	Complies
ISED RSS-GEN Issue 5 + A1 + A2	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. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released For
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Senior Lab Engineer
Consumer Technology Division
UL Verification Services Inc

Prepared By:



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Senior Test Engineer
Consumer Technology Division
UL Verification Services Inc

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with:

- FCC CFR 47 Part 2
- FCC CFR 47 Part 15
- ANSI C63.10-2013
- KDB 414788 D01 Radiated Test Site v01r01
- RSS-GEN Issue 5 + A1 + A2
- RSS-216 Issue 2

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 3: 843 Auburn Court, Fremont, CA 94538 USA			
☒	Building 4: 47658 Kato Rd, Fremont, CA 94538 USA			
☐	Building 5: 47670 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	UNCERTAINTY
Occupied Bandwidth	1.20%
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	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The magnetic charger inductively charges apple watch. There is an apple custom made connector between charging puck and USB-C boot. The custom connector cannot be combined with any other off the shelf connector.

5.2. MAXIMUM E-FIELD and H-FIELD

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

Fundamental Frequency (kHz)	Mode	E-field (300m distance) FCC (dB μ V/m)	H-field (3m distance) IC (dB μ A/m)
326.5	Operating	-29.01	1.52
1777.778		4.19	-7.85
326.5	Standby	-21.21	10.52

5.3. WORST-CASE CONFIGURATION AND MODE

The EUT is a wireless magnetic charger which is connected to the AC/DC adapter via USB-C cable and the inductive charging coil to charge WPT accessories (Load). For the entire radiated emissions test, the EUT was investigated on the following configurations:

1. At its natural orientation with load on the EUT. Max charging power from Tx is 5W

The worst case was natural orientation with Load on the EUT.

CONFIGURATION	MODE	DESCRIPTION
1	Standby	EUT, powered by AC/DC adapter via USB-C cable
2	Operating (LOAD #1) • EUT w/ 326.5 kHz Fundamental	EUT powered by AC/DC Adapter via USB-C cable with a Load at charging mode
3	Operating (LOAD #2) • EUT w/ 1.7778 MHz Fundamental	EUT powered by AC/DC Adapter via USB-C cable with a Load at charging mode

For below 30MHz & 1GHz tests, the EUT was connected to AC power adapter as the worst case. For AC line conducted emission, test was investigated with AC power adapter. The EUT was tested on standby and operation modes. During operational mode, EUT was tested with Load.

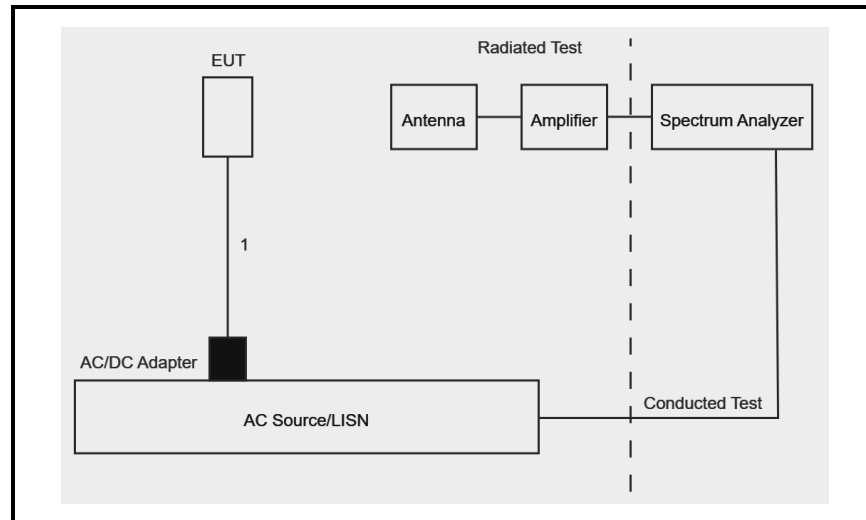
For below 30MHz testing, investigation was done on three antenna orientations: RX antenna Face-On, Face-Off and Horizontal (parallel to ground). The worst-case configurations were determined on RX antenna Face-On and Face-Off; therefore, all final tests were performed using these two orientations.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 300 m open area test site. Therefore, sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.

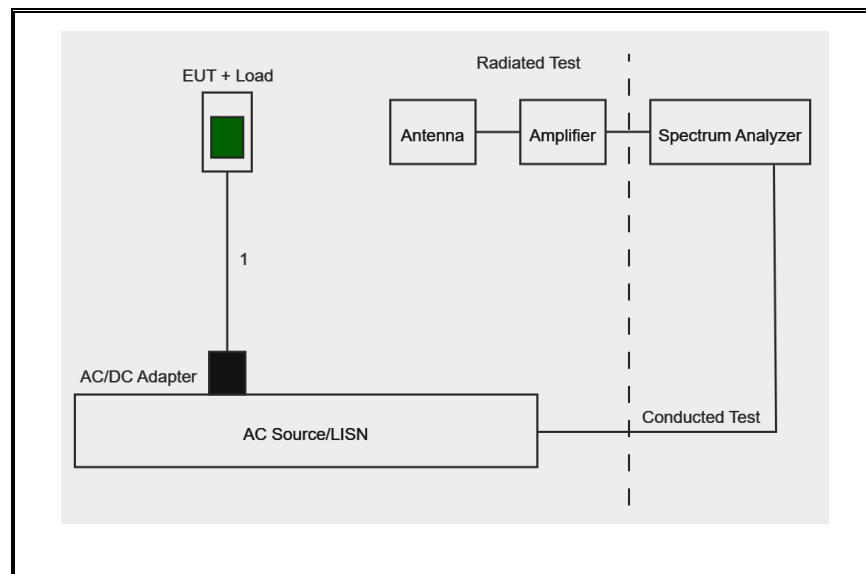
5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC/DC adapter	Apple	N/A	C4H0313063ZPF4FAZ	N/A
WPT Accessory (Load #1)	Apple	N/A	HWRCPJW49N	N/A
WPT Accessory (Load #2)	Apple	N/A	NQ0NTKX2PM	N/A

STANDBY MODE SETUP



OPERATING MODE SETUP



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
ESW, EMI Test Receiver, 1Hz – 44GHz	Rohde & Schwarz	ESW	235266	2025/02/28	2024/02/28
Antenna, Broadband Hybrid, 30MHz to 3GHz	Sunol Sciences Corp.	JB3	230634	2025/01/31	2024/01/31
Antenna, Passive Loop 30Hz – 1MHz	Electro-Metrics	EM-6871	170013	2024/07/31	2023/07/31
Antenna, Passive Loop 100kHz – 30MHz	Electro-Metrics	EM-6872	170015	2024/07/31	2023/07/31
Link File, @3m, 9kHz-1000MHz Hybrid Path Loss	UL-FR1	Port 0 Factors	212011	2024/12/31	2023/12/31
Sniffer Probe	Electro Metrics	EM-6992	N/A	N/A	N/A

AC Line Conducted					
Description	Manufacturer	Model	ID Num	Cal Due	Last Cal
EMI TEST RECEIVER 9kHz - 3.6GHz	Rohde & Schwarz	ESR	171646	2025/02/28	2024/02/28
LISN for Conducted Emissions	Fischer Custom Communications, Inc	FCC-LISN-50/250-25-2-01-480V	175765	2025/01/31	2024/01/31
Transient Limiter	TE	TBFL1	207996	2024/08/31	2023/08/31
UL AUTOMATION SOFTWARE					
Radiated Software	UL	UL EMC	Ver 9.5, 21 May 2024		
Conducted Software	UL	UL EMC	2024.2.23		
AC Line Conducted Software	UL	UL EMC	Ver 9.5, 03 Mar 2023		

7. OCCUPIED BANDWIDTH

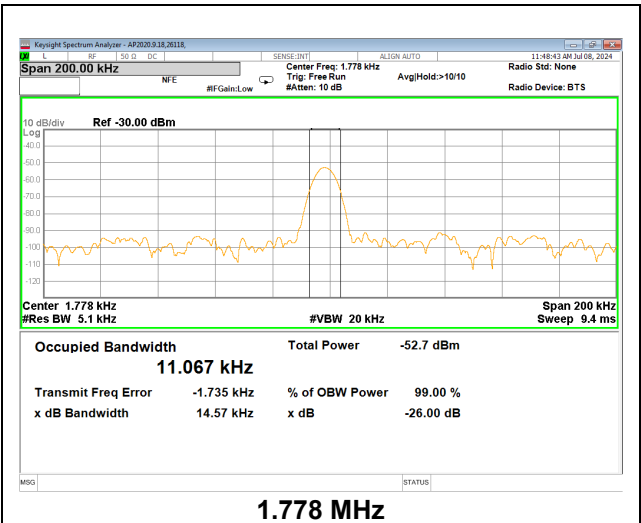
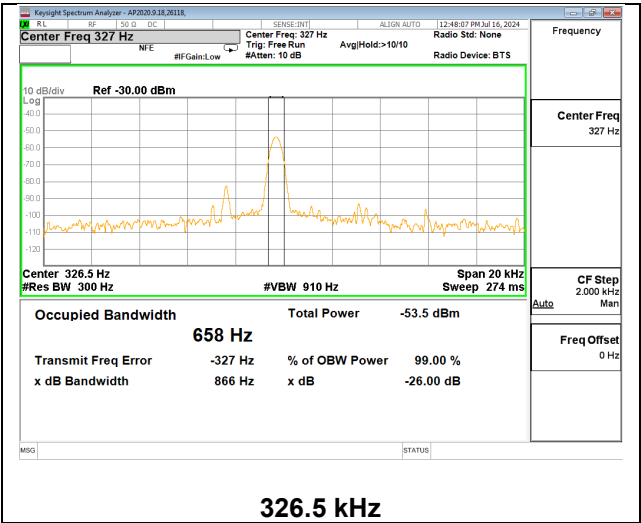
TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer.

- Load #1 - 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.
- Load #2 - The RBW is set to 5.1kHz. 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



8. RADIATED EMISSION TEST RESULTS

LIMITS

FCC §15.209 (a) (d)
ICES-001 Section 3.3.4, IC RSS-216 6.2.2, and IC RSS-GEN Sections 8.9 and 8.10.

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.		

ICES-001 Issue 5 Table 2 & Table 4:

Table 2: Magnetic field strength radiated emission limits for induction cooking appliances

Frequency Range (MHz)	Quai-Peak, at 3m Distance (dBµA/m)
0.009 - 0.07	69
0.07 - 0.15	69 to 39 *
0.15 - 30	39 to 7 *
* The limit level in dBµA/m decreases linearly with the logarithm of frequency.	

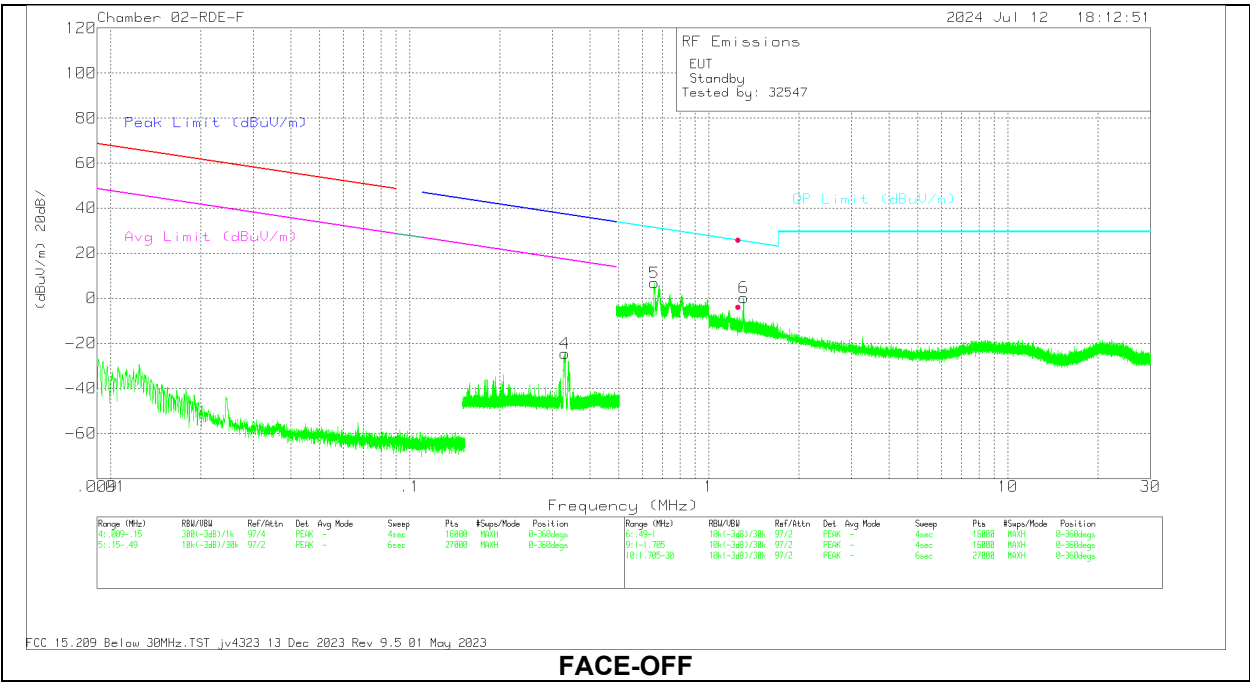
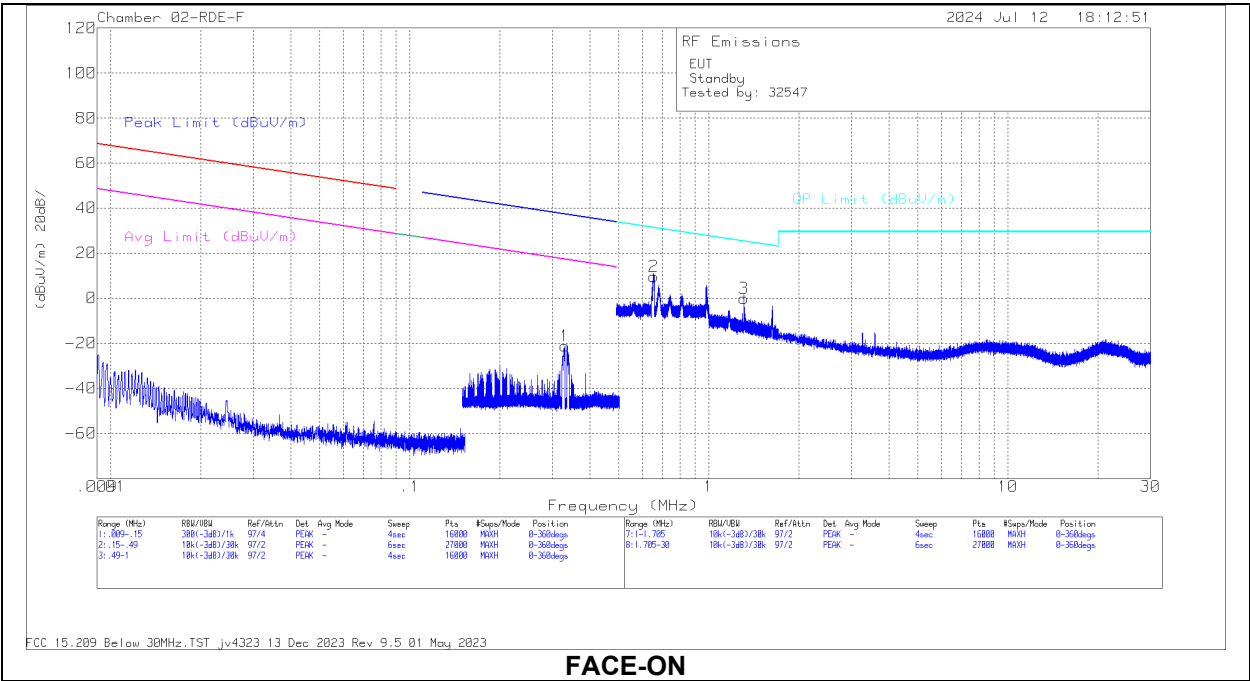
Table 4: Electric field strength radiated emission limits for induction cooking appliances

Frequency Range (MHz)	OATS or SAC * 10 m measurement distance Quasi-peak (dBµV/m)	OATS or SAC * 3 m measurement distance Quasi-peak (dBµV/m)	FAR * 3 m measurement distance Quasi-peak (dBµV/m)
30 - 230	30	40	42 to 35 **
230 - 1000	37	47	42
Note: The more stringent limit applies at the transition frequency.			
* OATS = open-area test site, SAC = semi-anechoic chamber, FAR = fully-anechoic room (see CSA CISPR 11:19).			
** The limit level in dBµV/m decreases linearly with the logarithm of frequency.			

RESULTS

8.1. STANDBY MODE

8.1.1. FCC TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz - 30 MHz)



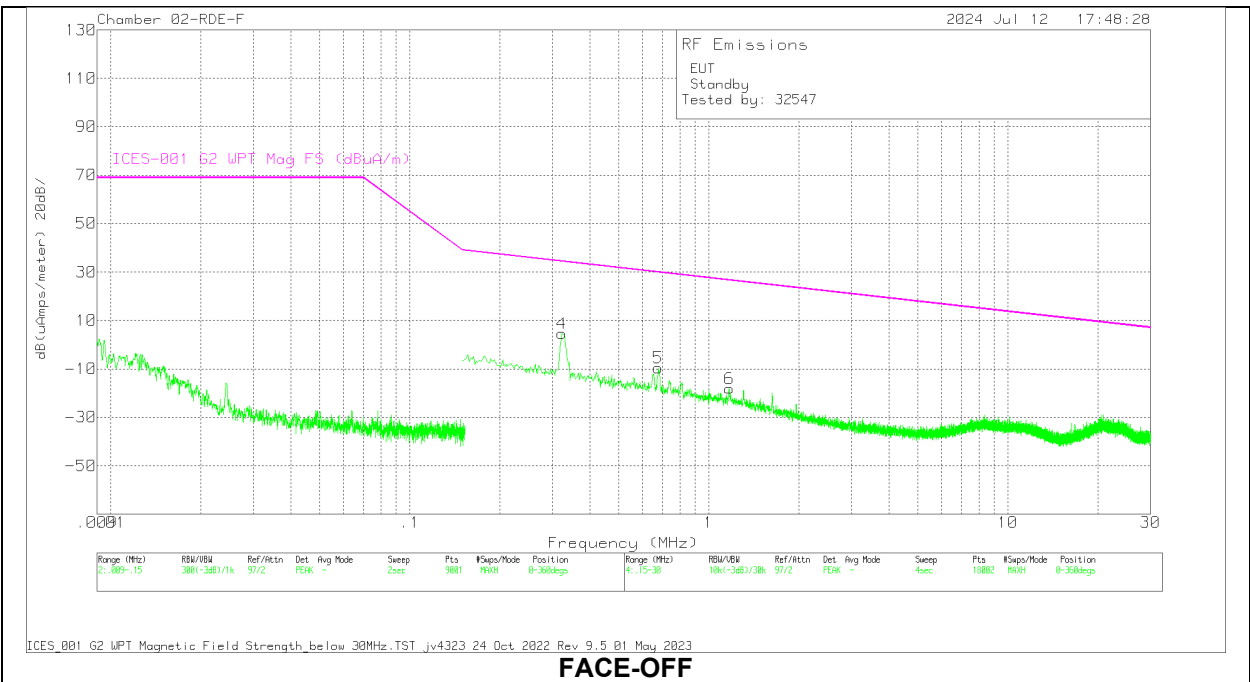
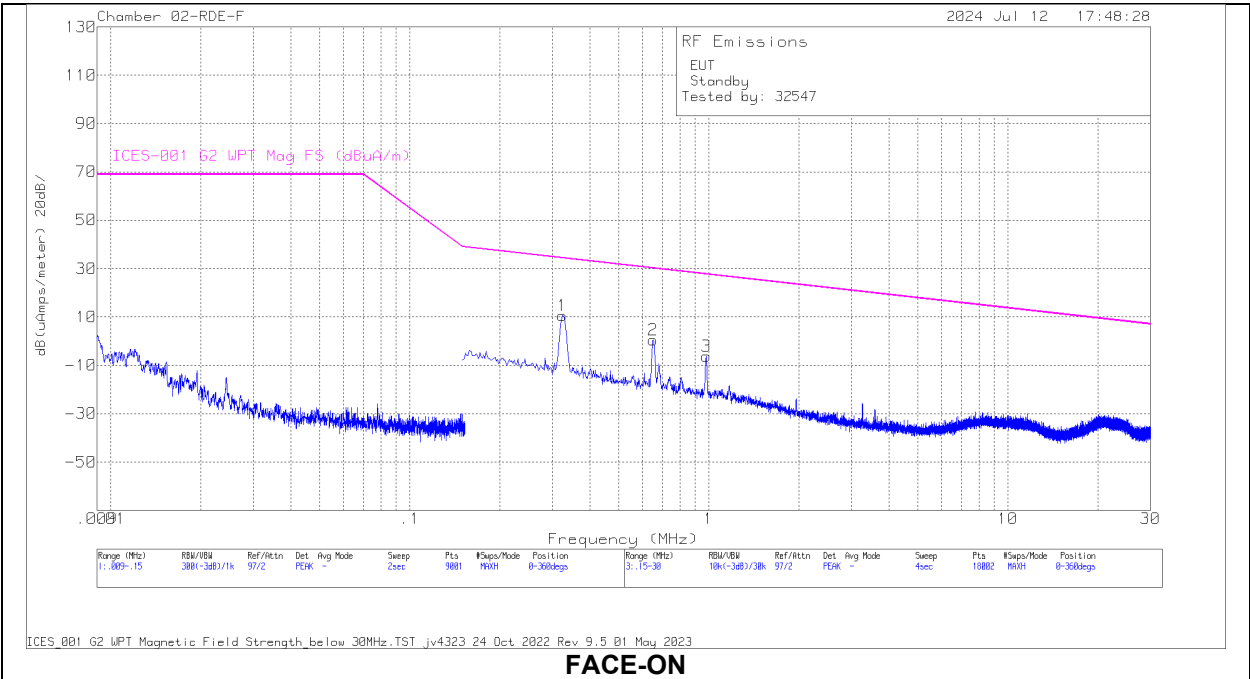
DATA

Marker	Frequen cy (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) dB/m	Cbl (dB)	Dist Corr 300m	Correcte d Reading (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.33	35.09	Pk	56.3	-32.6	-80	-21.21	37.24	-58.45	17.24	-38.45	0-360	Face-On
4	.3307	31.87	Pk	56.3	-32.6	-80	-24.43	37.22	-61.65	17.22	-41.65	0-360	Face-Off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) dB/m	Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
2	.6536	25.95	Pk	56.3	-32.5	-40	9.75	31.31	-21.56	0-360	Face-On
5	.6576	22.99	Pk	56.3	-32.5	-40	6.79	31.25	-24.46	0-360	Face-Off
6	1.3069	27.37	Pk	45.2	-32.3	-40	.27	25.3	-25.03	0-360	Face-Off
3	1.3111	27.15	Pk	45.2	-32.3	-40	.05	25.28	-25.23	0-360	Face-On

Pk - Peak detector

8.1.2. IC/ICES-001 TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz – 30 MHz)

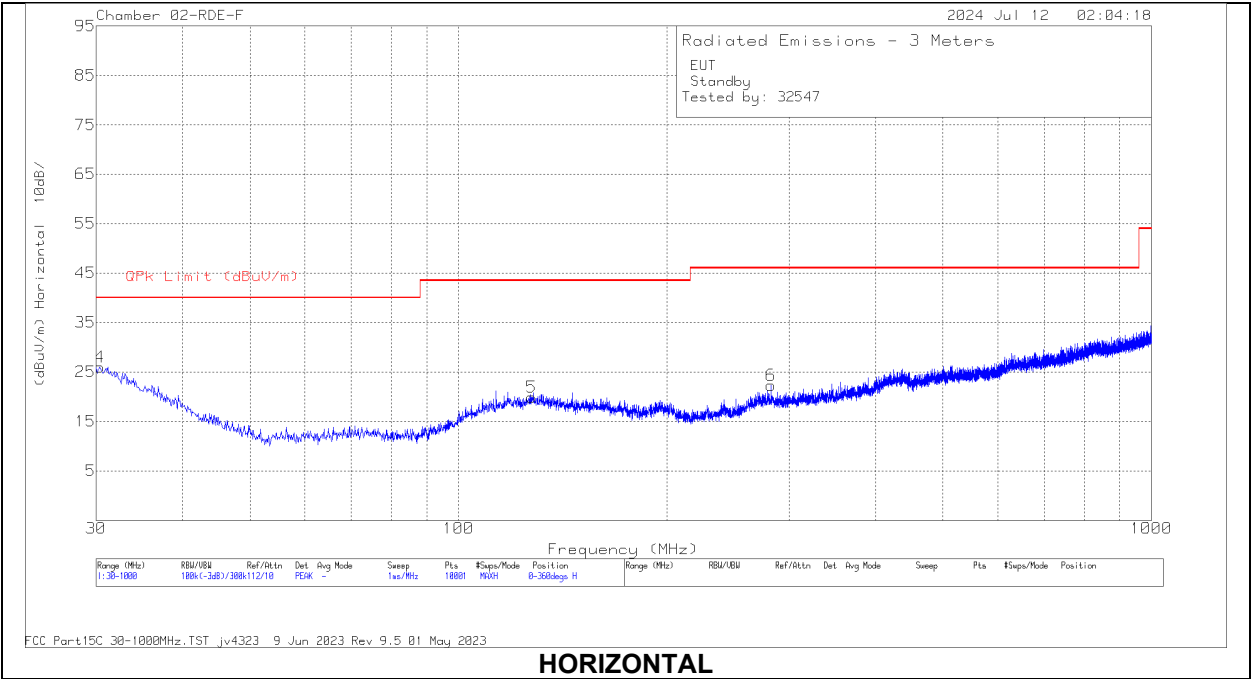


DATA

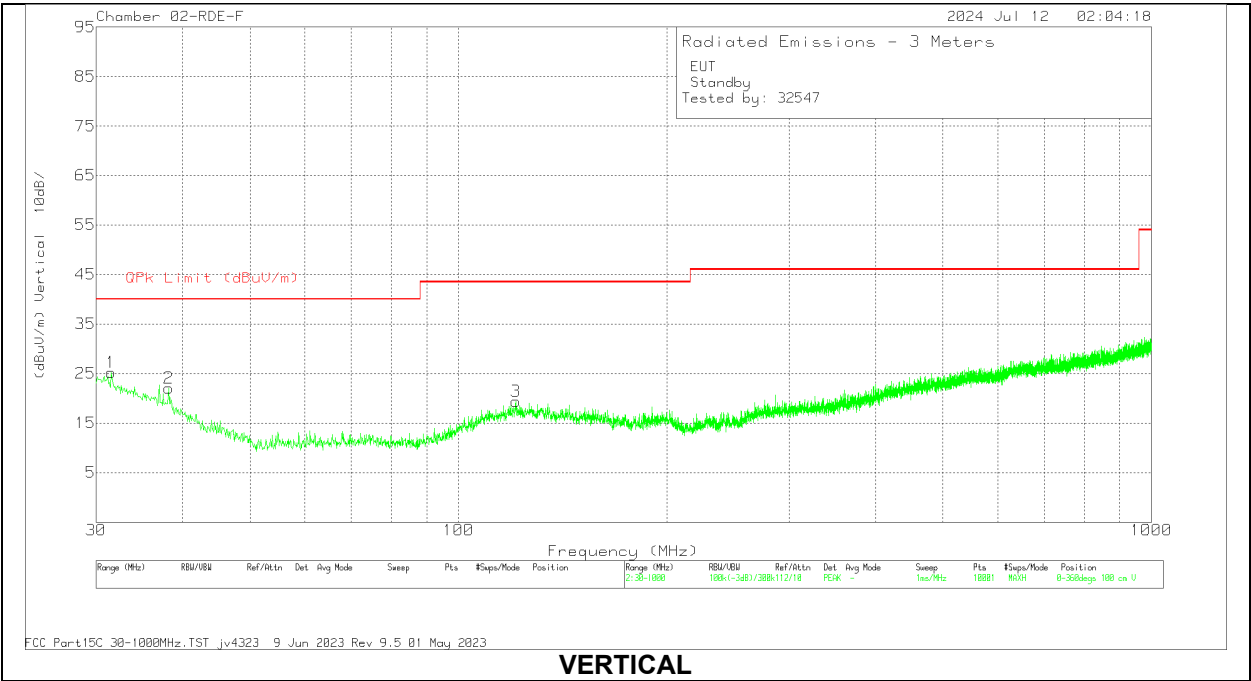
Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	Loop Antenna H(ACF) dB/m	Cbl (dB)	Corrected Reading dB(uAmps /meter)	ICES-001 G2 WPT Mag FS (dBUA/m)	Margin (dB)	Azimuth (Degs)	Marker	Polarity
4	.3224	32.75	Pk	4.4	-32.6	4.55	34.38	-29.83	0-360	4	Face Off
1	.3241	38.82	Pk	4.3	-32.6	10.52	34.35	-23.83	0-360	1	Face On
2	.6524	34.51	Pk	-1.4	-32.5	.61	30.12	-29.51	0-360	2	Face On
5	.6772	24.63	Pk	-1.7	-32.5	-9.57	29.9	-39.47	0-360	5	Face Off
3	.979	30.89	Pk	-4.6	-32.5	-6.21	27.67	-33.88	0-360	3	Face On
6	1.1697	19.98	Pk	-5.6	-32.4	-18.02	26.6	-44.62	0-360	6	Face Off

Pk - Peak detector

8.1.3. FCC TX SPURIOUS EMISSION (30 - 1000 MHz)



HORIZONTAL



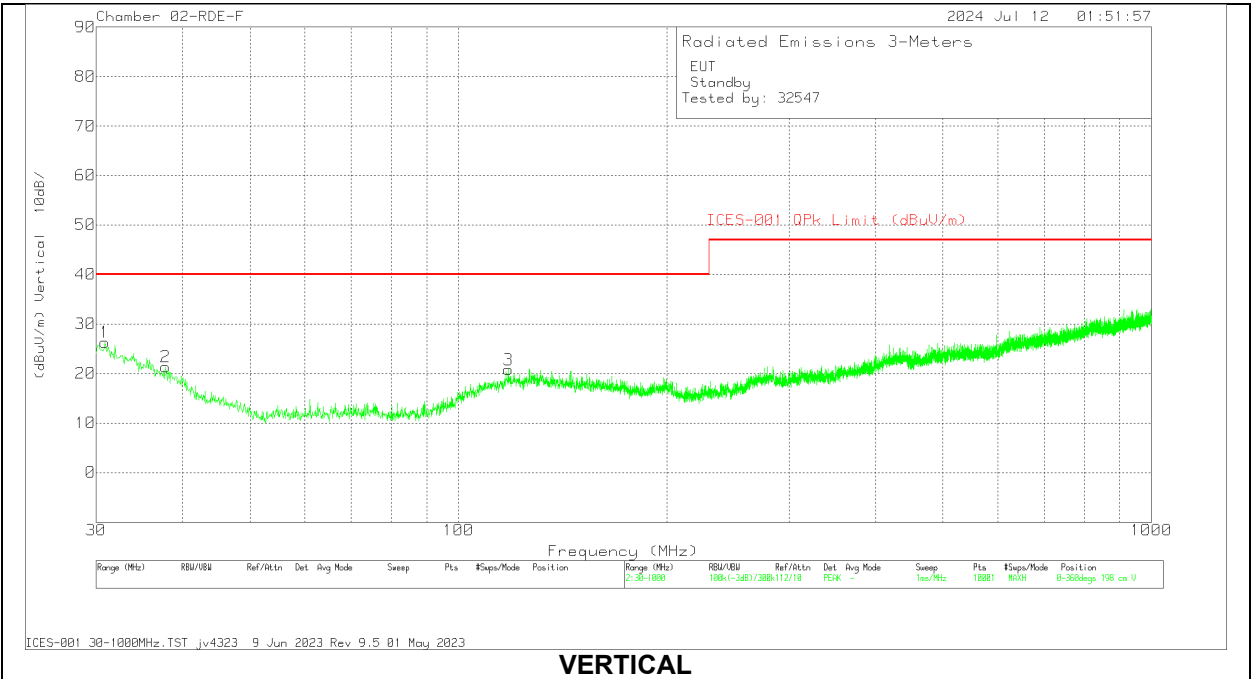
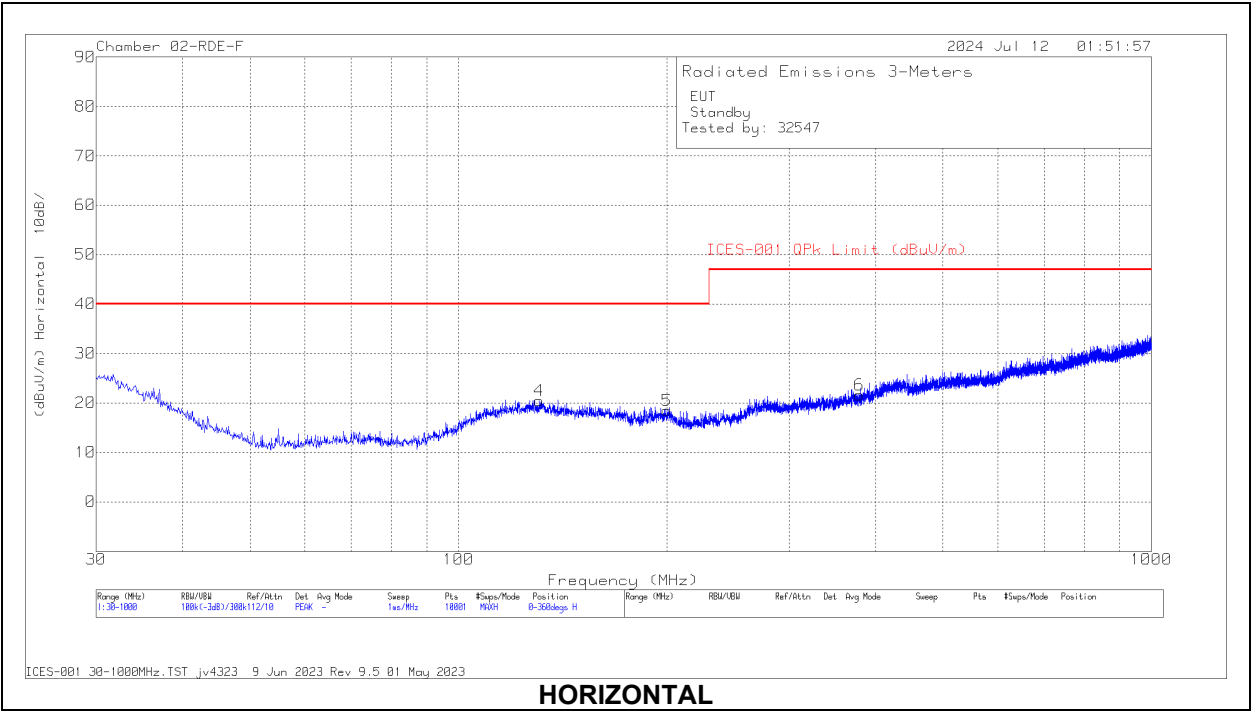
VERTICAL

DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB/m) 10m H	CBL/AMP (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 127.485	31.25	Pk	19.6	-30.9	19.95	43.52	-23.57	0-360	299	H
6	* 282.491	33.42	Pk	19.1	-30.2	22.32	46.02	-23.7	0-360	199	H
2	* 38.148	33.26	Pk	20.7	-31.9	22.06	40	-17.94	0-360	100	V
3	* 121.083	30.64	Pk	19.6	-30.8	19.44	43.52	-24.08	0-360	100	V
4	30.388	31.31	Pk	26.6	-31.9	26.01	40	-13.99	0-360	299	H
1	31.552	31.25	Pk	25.7	-31.7	25.25	40	-14.75	0-360	199	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector

8.1.4. IC/ICES-001 TX SPURIOUS EMISSION (30 - 1000 MHz)



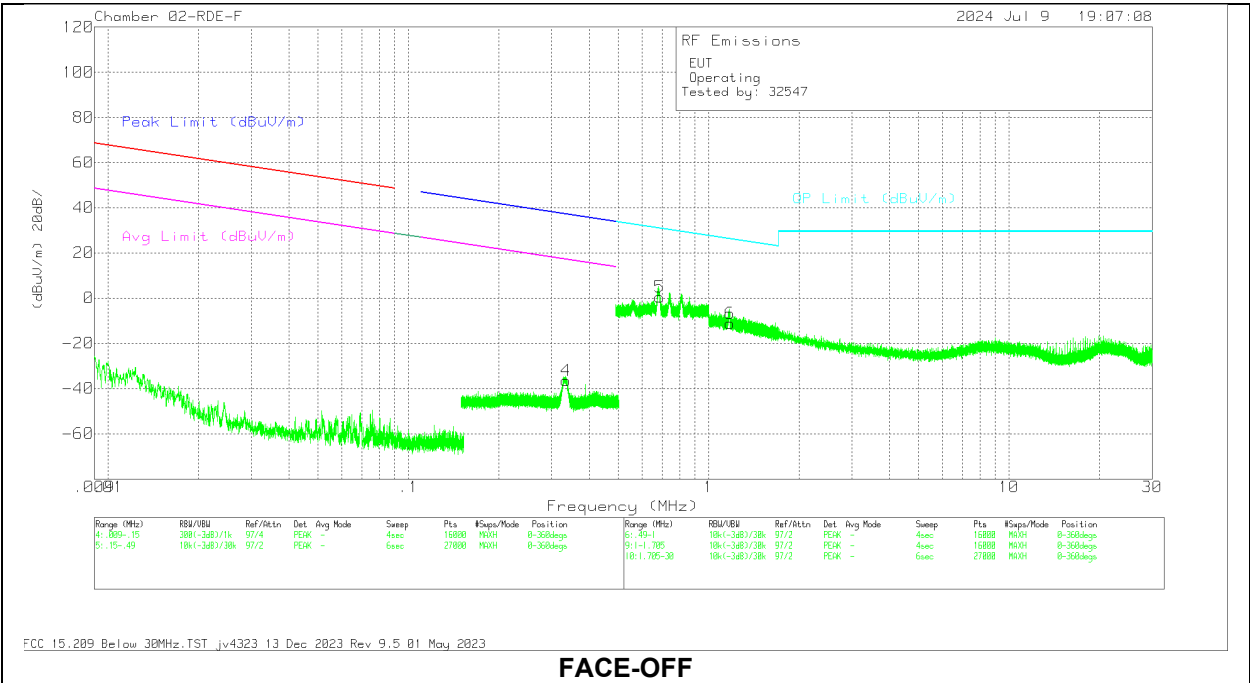
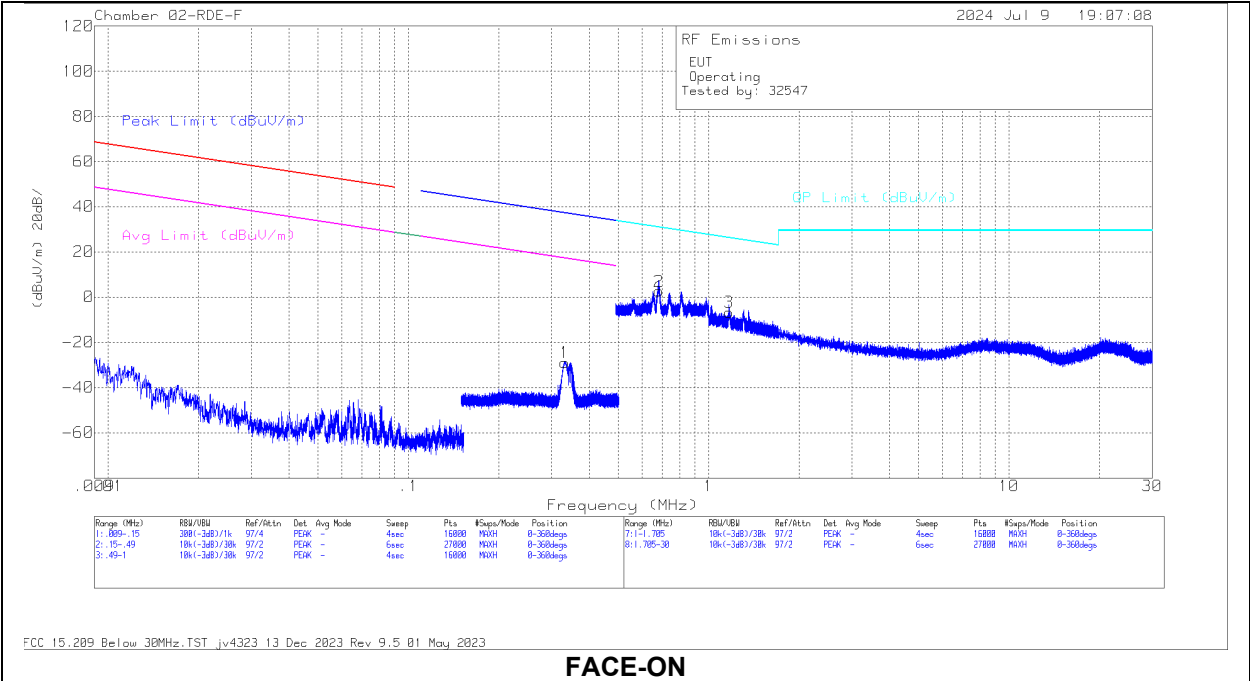
DATA**Radiated Emissions**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	204044 ACF (dB/m)	Hybrid Path 30MHz-1000MHz (dB)	Corrected Reading (dBuV/m)	ICES-001 QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.1568	22.26	Qp	25.4	-31	16.66	40	-23.34	156	232	V
2	79.31	37.3	Qp	13.5	-30.4	20.4	40	-19.6	323	100	V
4	92.62	27.83	Qp	14.4	-30.3	11.93	40	-28.07	312	103	H
3	97.641	34.38	Qp	15.7	-30.2	19.88	40	-20.12	321	114	V
5	203.552	28.18	Qp	17.4	-29.3	16.28	40	-23.72	36	101	H
6	336.607	20.21	Qp	19.8	-28.4	11.61	47	-35.39	102	129	H

Qp - Quasi-Peak detector

8.2. OPERATING MODE (LOAD #1)

8.2.1. FCC TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz - 30 MHz)



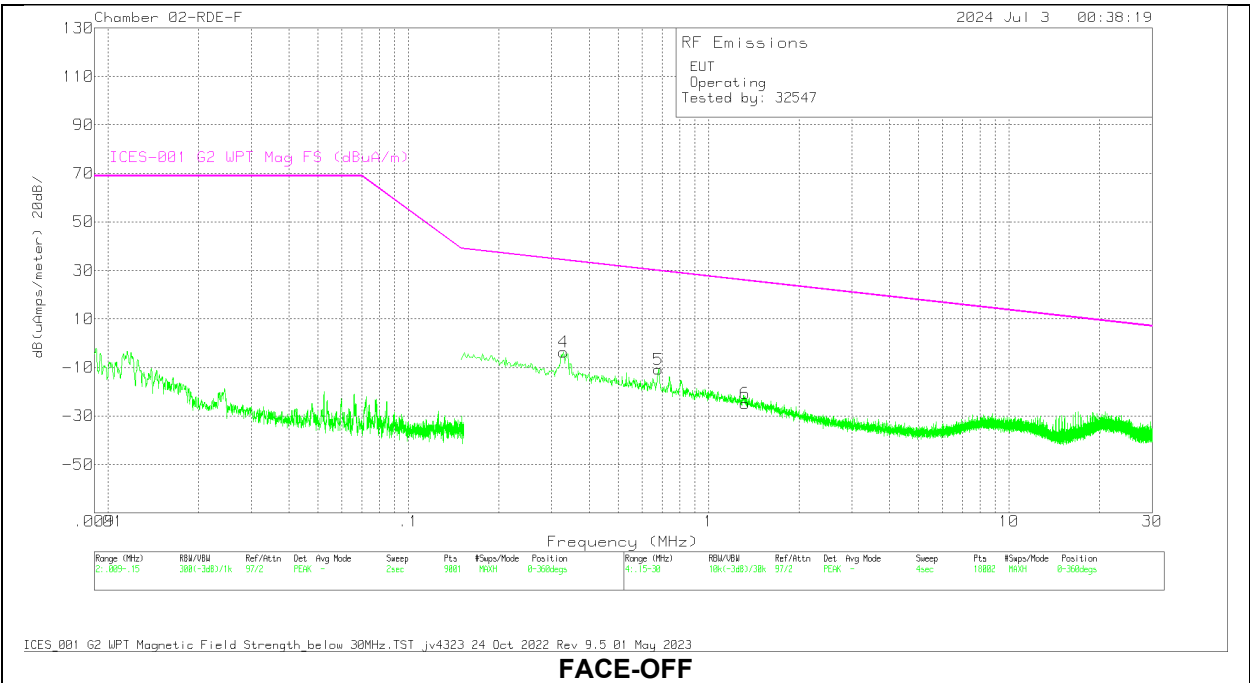
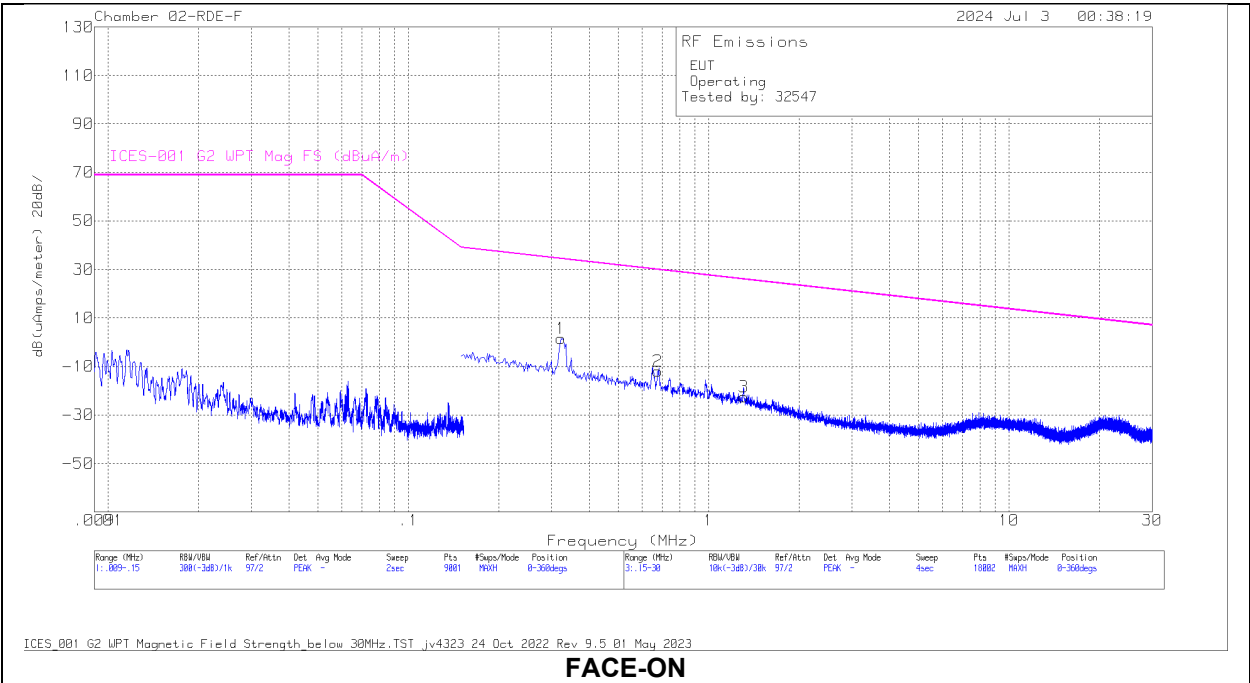
DATA

Marker	Frequ ncy (MHz)	Meter Readin g (dBuV)	Det	Loop Antenna E(ACF) dB/m	Cbl (dB)	Dist Corr 300m (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/ m)	Margin (dB)	Avg Limit (dBuV/ m)	Margin (dB)	Azimut h (Degs)	Polarity
1	.3323	27.29	Pk	56.3	-32.6	-80	-29.01	37.18	-66.19	17.18	-46.19	0-360	Face On
4	.3353	19.91	Pk	56.3	-32.6	-80	-36.39	37.1	-73.49	17.1	-53.49	0-360	Face Off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) dB/m	Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
2	.6822	18.81	Pk	56.3	-32.5	-40	2.61	30.93	-28.32	0-360	Face On
5	.6855	16.83	Pk	56.3	-32.5	-40	.63	30.89	-30.26	0-360	Face Off
3	1.1692	19.82	Pk	45.9	-32.4	-40	-6.68	26.27	-32.95	0-360	Face On
6	1.1777	15.32	Pk	45.9	-32.4	-40	-11.18	26.2	-37.38	0-360	Face Off

Pk - Peak detector

8.2.2. IC/ICES-001 TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz - 30 MHz)



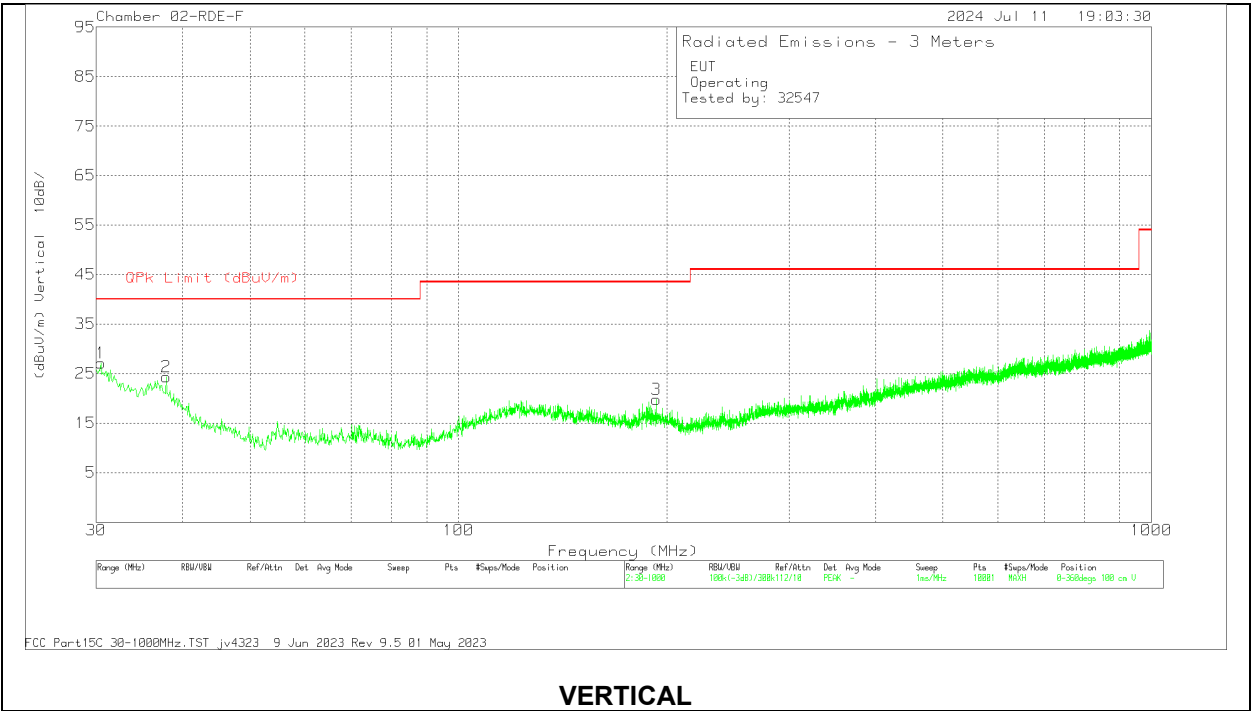
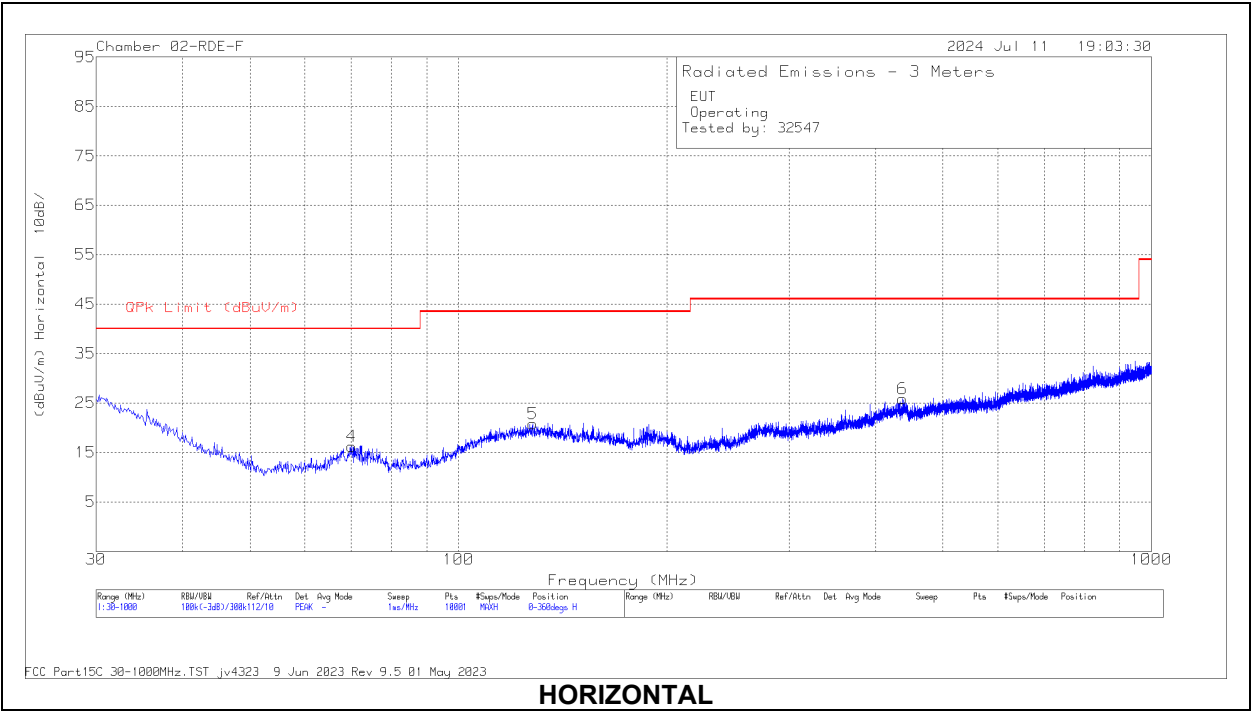
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna H(ACF) dB/m	Cbl (dB)	Corrected Reading dB(uAmps /meter)	ICES-001 G2 WPT Mag FS (dBuA/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.3224	29.72	Pk	4.4	-32.6	1.52	34.38	-32.86	0-360	Face on
4	.3291	24.72	Pk	4.2	-32.6	-3.68	34.26	-37.94	0-360	Face off
2	.6756	22.31	Pk	-1.7	-32.5	-11.89	29.91	-41.8	0-360	Face on
5	.6806	23.44	Pk	-1.7	-32.5	-10.76	29.87	-40.63	0-360	Face off
3	1.3089	16.17	Pk	-6.3	-32.3	-22.43	25.92	-48.35	0-360	Face on
6	1.3222	13.76	Pk	-6.4	-32.3	-24.94	25.86	-50.8	0-360	Face off

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

8.2.3. FCC TX SPURIOUS EMISSION (30 - 1000 MHz)



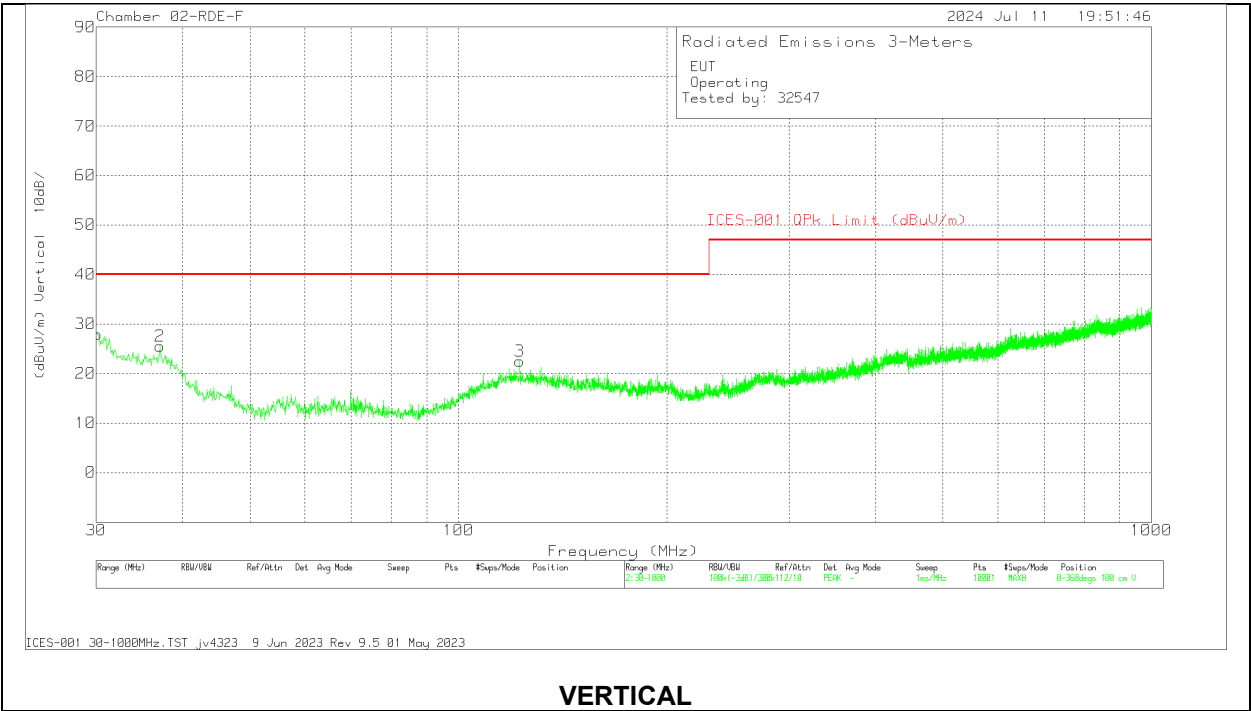
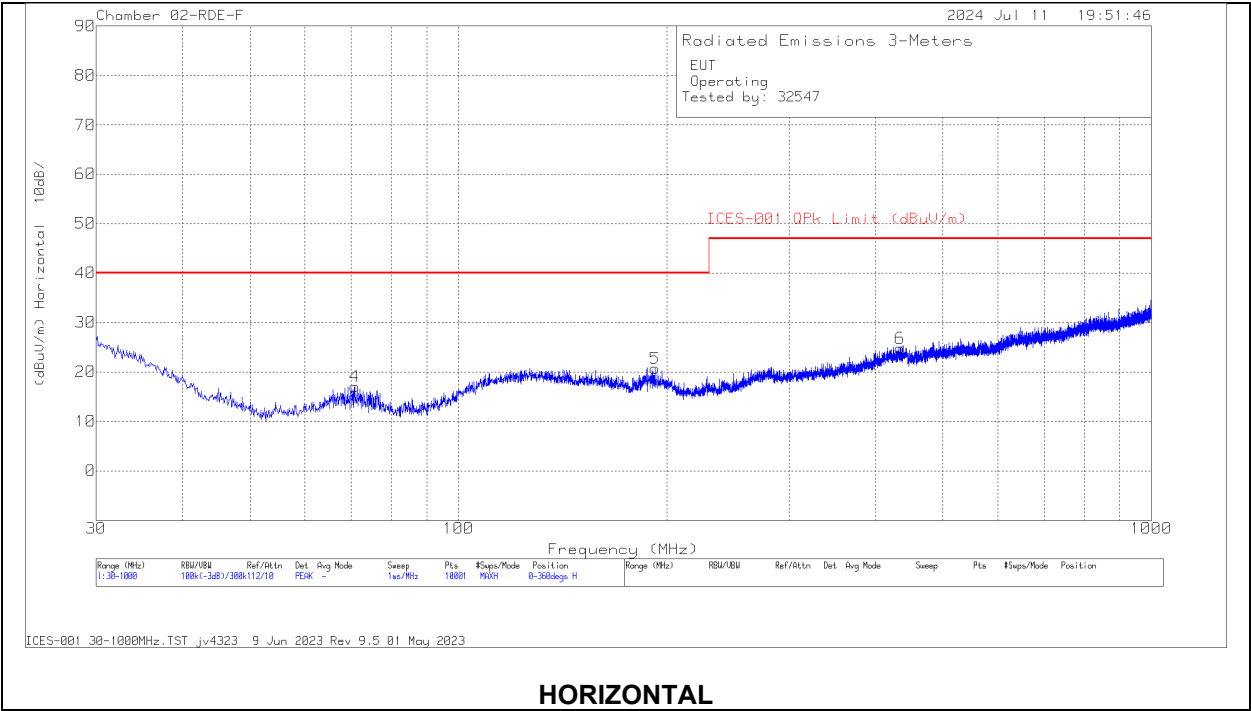
DATA**Radiated Emissions**

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB/m) 10m H	CBL/AMP (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 129.965	25.54	Qp	19.5	-31.1	13.94	43.52	-29.58	142	226	H
1	30.3546	28.43	Qp	26.6	-31.9	23.13	40	-16.87	227	101	V
2	38.8594	30.04	Qp	20.2	-31.8	18.44	40	-21.56	42	113	V
4	69.5373	31.09	Qp	13.9	-31.3	13.69	40	-26.31	179	195	H
3	192.264	22.58	Qp	17.3	-30.3	9.58	43.52	-33.94	348	146	V
6	443.74	21.27	Qp	22.4	-29.5	14.17	46.02	-31.85	34	124	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Qp - Quasi-Peak detector

8.2.4. IC/ICES-001 TX SPURIOUS EMISSION (30 - 1000 MHz)



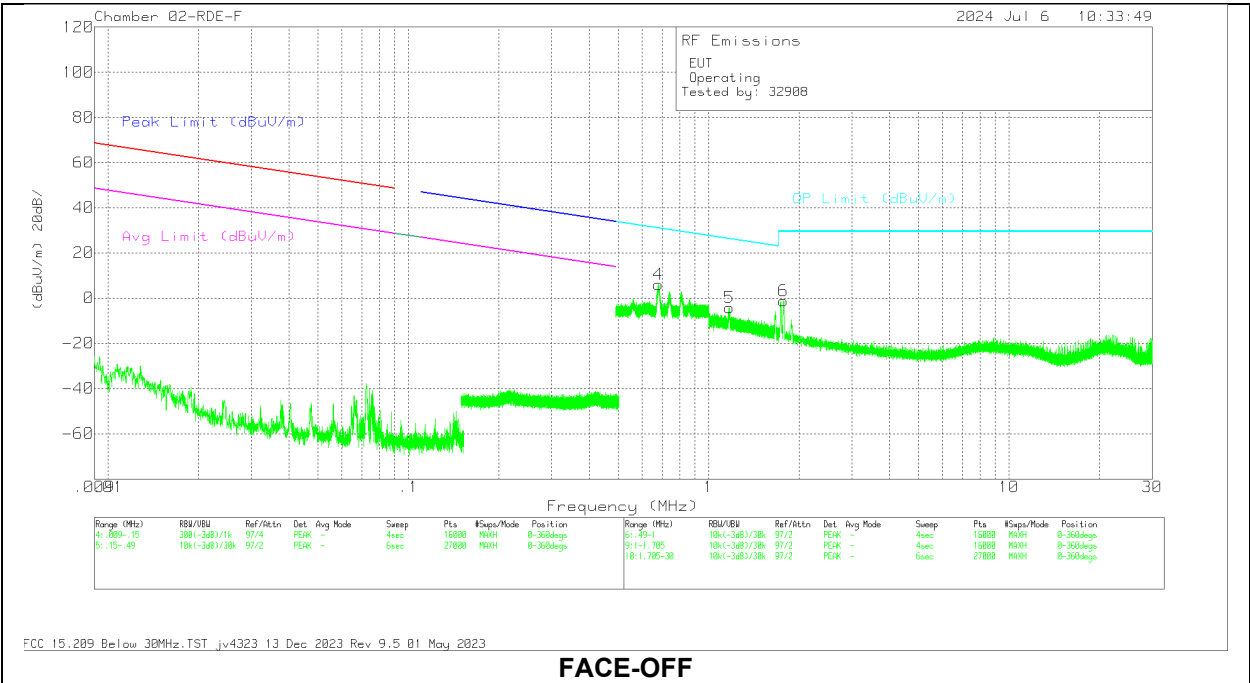
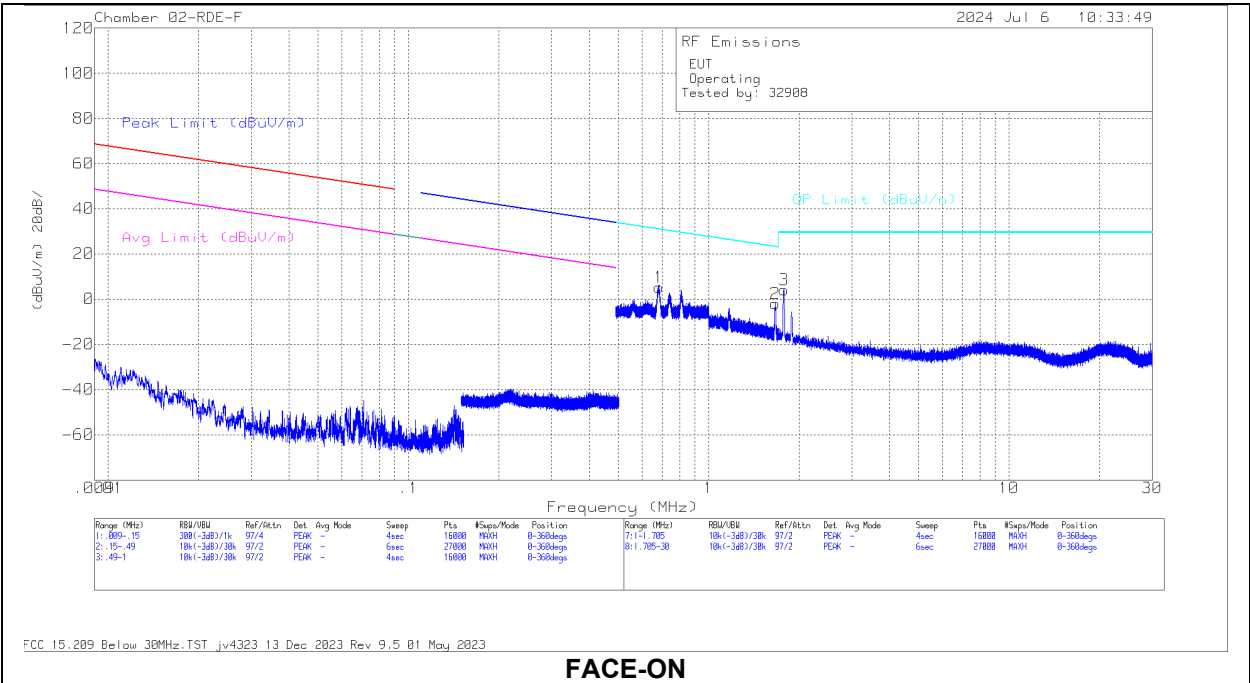
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB/m) 10m H	CBL/AMP (dB)	Corrected Reading (dBuV/m)	ICES-001 QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.007	27.95	Qp	26.1	-31.7	22.35	40	-17.65	271	106	V
2	38.5101	29.23	Qp	20.5	-31.8	17.93	40	-22.07	325	127	V
4	69.5361	31.8	Qp	13.9	-31.3	14.4	40	-25.6	5	249	H
3	119.212	25.59	Qp	19.5	-31.1	13.99	40	-26.01	109	122	V
5	192.485	25.17	Qp	17.4	-30.3	12.27	40	-27.73	18	109	H
6	435.09	21.28	Qp	22.2	-29.6	13.88	47	-33.12	350	201	H

Qp - Quasi-Peak detector

8.3. OPERATING MODE (LOAD #2)

8.3.1. FCC TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz - 30 MHz)

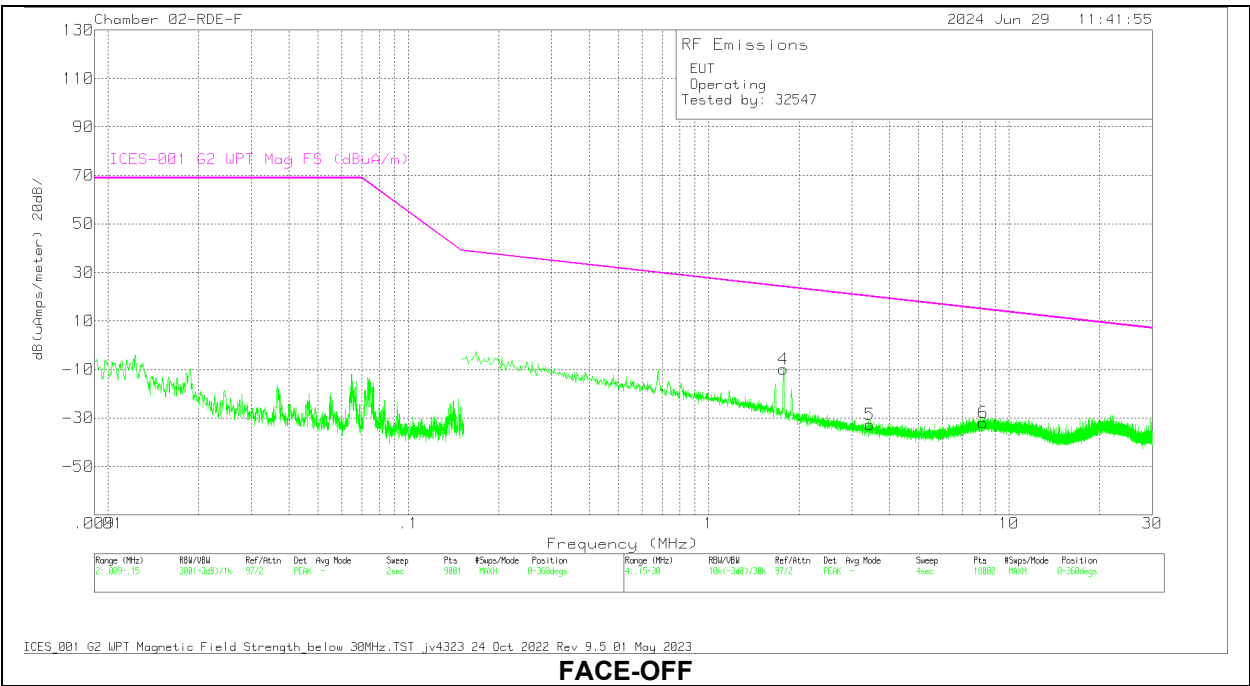
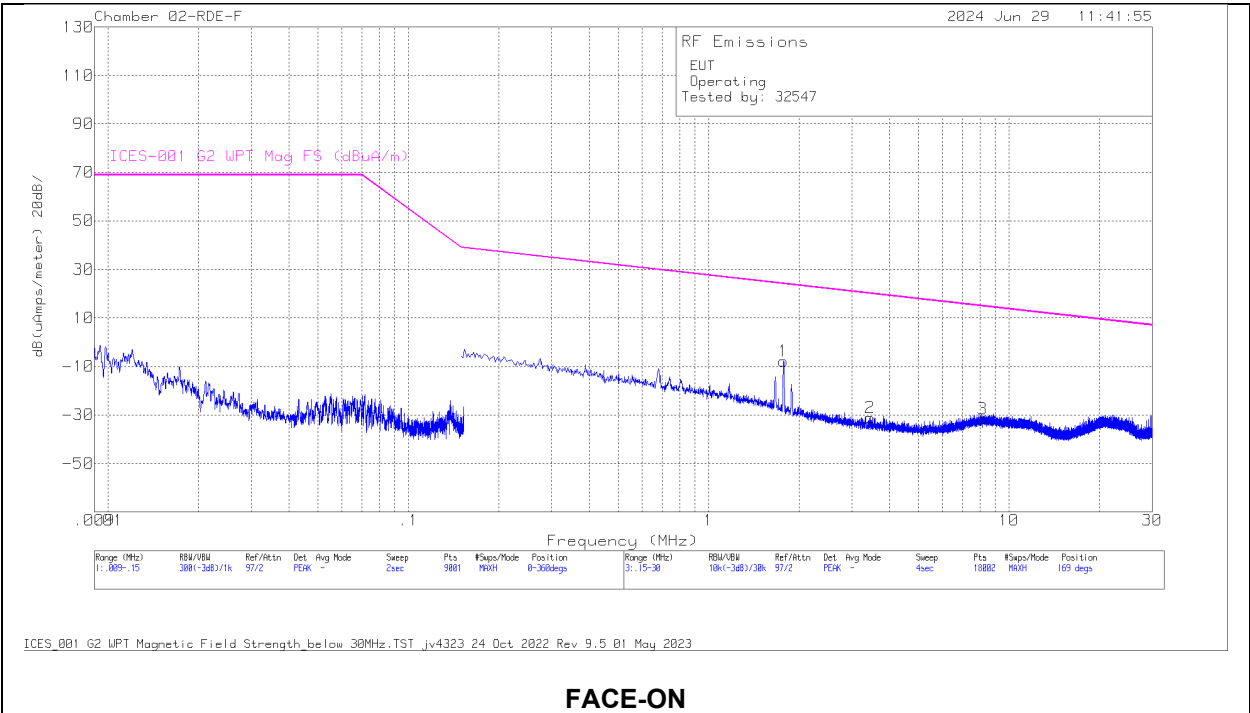


DATA

Marker	Frequen cy (MHz)	Meter Reading (dBuV)	Det	Loop Antenna E(ACF) dB/m	Cbl (dB)	Dist Corr (dB) 40Log	Correcte d Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
4	.6799	22.24	Pk	56.3	-32.5	-40	6.04	30.96	-24.92	0-360	Face Off
1	.683	21.48	Pk	56.3	-32.5	-40	5.28	30.92	-25.64	0-360	Face On
5	1.1706	22.29	Pk	45.9	-32.4	-40	-4.21	26.26	-30.47	0-360	Face Off
2	1.6641	26.98	Pk	43.3	-32.2	-40	-1.92	23.21	-25.13	0-360	Face On
6	1.7773	28.36	Pk	42.7	-32.3	-40	-1.24	29.5	-30.74	0-360	Face Off
3	1.7784	33.79	Pk	42.7	-32.3	-40	4.19	29.5	-25.31	0-360	Face On

Pk - Peak detector

8.3.2. IC/ICES-001 TX FUNDAMENTAL & SPURIOUS EMISSIONS (9 kHz - 30 MHz)



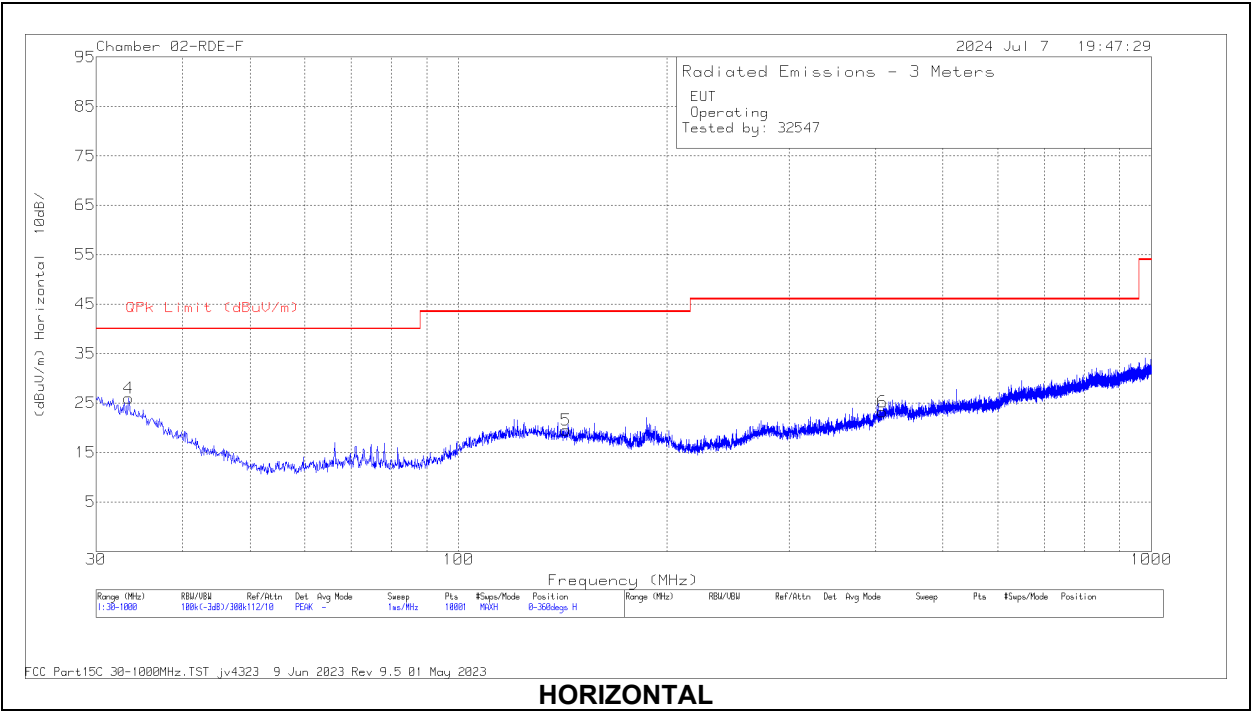
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna H(ACF) dB/m	Cbl (dB)	Corrected Reading dB(uAmps /meter)	ICES-001 G2 WPT Mag FS (dBuA/m)	Margin (dB)	Azimuth (Degs)	Polarity
4	1.7748	31.21	Pk	-8.7	-32.4	-9.89	24.08	-33.97	0-360	Face Off
5	3.4395	12.98	Pk	-13.4	-32.3	-32.72	20.08	-52.8	0-360	Face Off
6	8.2129	17.21	Pk	-16.8	-32.2	-31.79	14.82	-46.61	0-360	Face Off

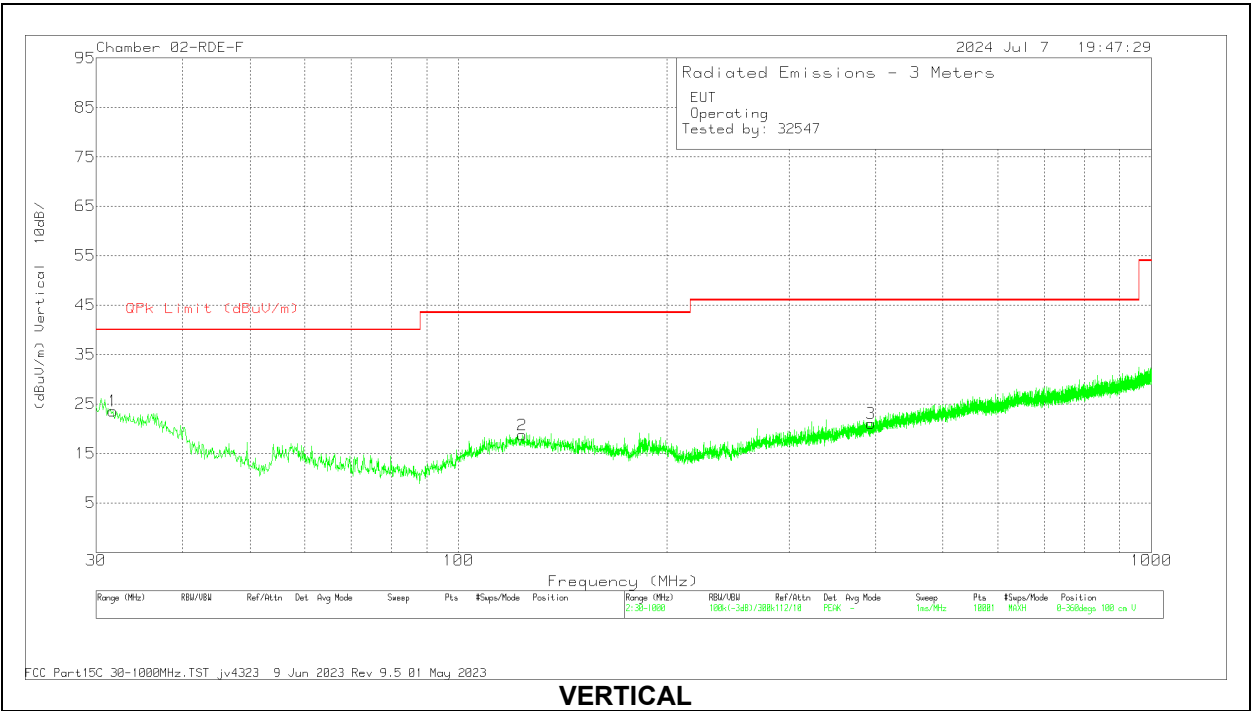
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna H(ACF) dB/m	Cbl (dB)	Corrected Reading dB(uAmps /meter)	ICES-001 G2 WPT Mag FS (dBuA/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	1.7765	33.25	Pk	-8.8	-32.3	-7.85	24.07	-31.92	334	Face On
2	3.4428	14.55	Pk	-13.4	-32.3	-31.15	20.08	-51.23	16	Face On
3	8.178	17.22	Pk	-16.8	-32.1	-31.68	14.85	-46.53	334	Face On

Pk - Peak detector

8.3.3. FCC TX SPURIOUS EMISSION (30 - 1000 MHz)



HORIZONTAL



VERTICAL

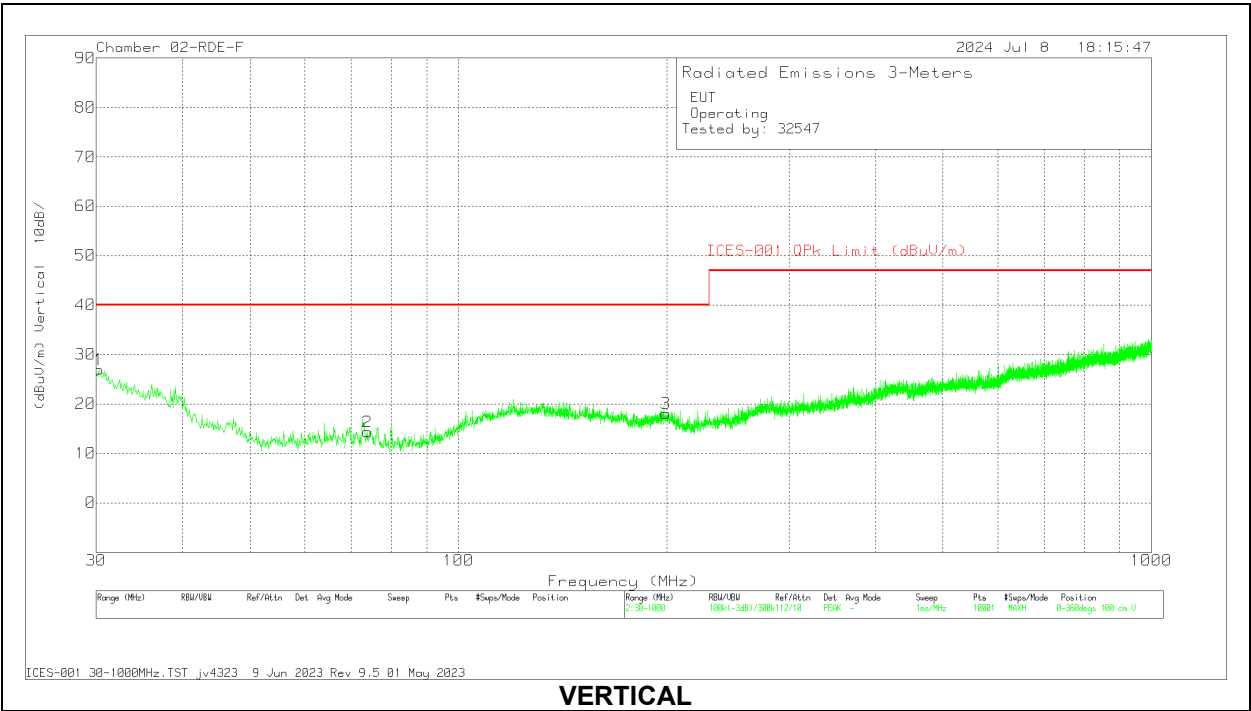
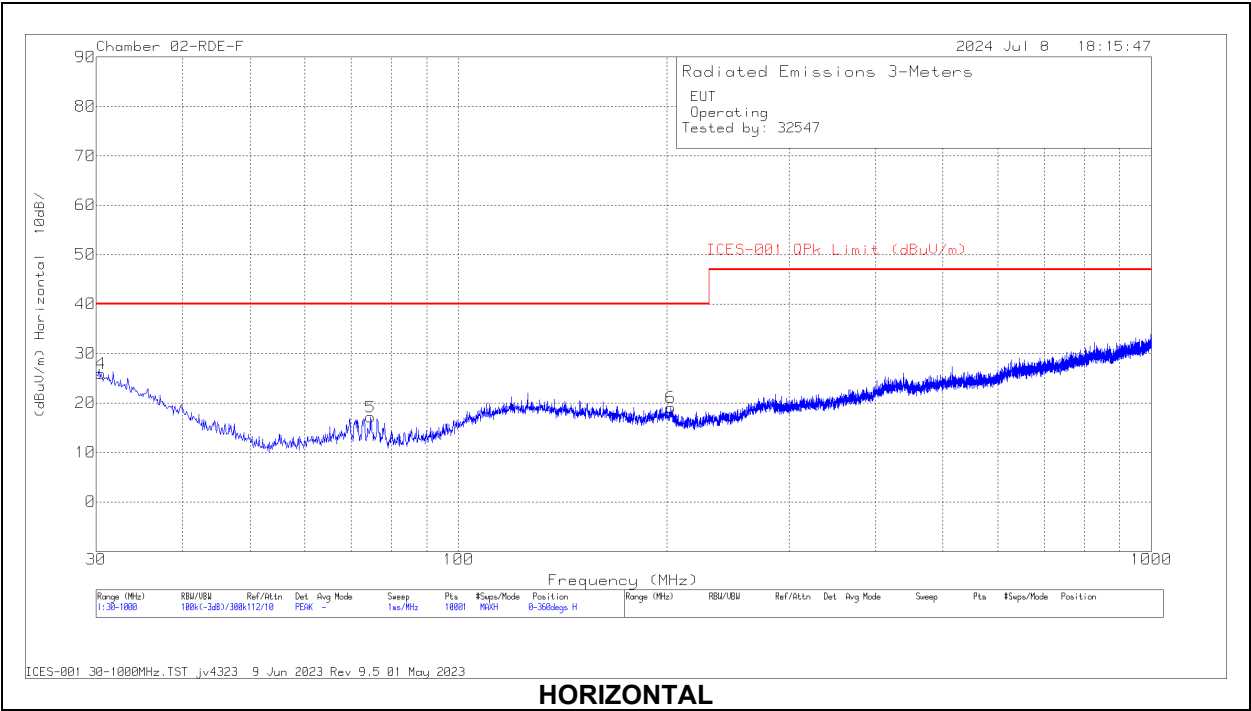
DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB/m) 10m H	CBL/AMP (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
6	* 409.318	21.34	Qp	21.7	-29.7	13.34	46.02	-32.68	321	376	H
2	* 123.415	22.2	Qp	19.7	-31.2	10.7	43.52	-32.82	254	107	V
1	31.7499	21.77	Qp	25.6	-31.7	15.67	40	-24.33	150	262	V
4	33.0505	21.6	Qp	24.6	-31.7	14.5	40	-25.5	119	387	H
5	143.005	22.17	Qp	18.7	-30.9	9.97	43.52	-33.55	166	348	H
3	394.121	21.3	Qp	21	-29.7	12.6	46.02	-33.42	93	371	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Qp - Quasi-Peak detector

8.3.4. IC/ICES-001 TX SPURIOUS EMISSION (30 - 1000 MHz)



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	230634 ACF (dB/m) 10m H	CBL/AMP (dB)	Corrected Reading (dBuV/m)	ICES-001 QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	30.3805	22.21	Qp	26.6	-31.9	16.91	40	-23.09	42	146	H
5	74.7728	24.27	Qp	13.8	-31.4	6.67	40	-33.33	155	297	H
6	202.002	21.6	Qp	17.6	-30.2	9	40	-31	88	122	H
1	30.1417	22.38	Qp	26.7	-32	17.08	40	-22.92	143	389	V
2	74.0455	22.49	Qp	13.8	-31.2	5.09	40	-34.91	57	340	V
3	199.19	21.45	Qp	18	-30.4	9.05	40	-30.95	160	204	V

Qp - Quasi-Peak detector

9. AC POWER 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 100V, without an earth connection Quasi-peak (dBµV)	Appliances rated 100V, 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, from 9kHz to 150kHz, resolution bandwidth of 9kHz from 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

Note: The limits on the plots from 150kHz – 30MHz cover both ICES-001 and FCC Part 15.207.

9.1. **STANDBY MODE**

LINE 1 RESULTS



DATA

Trace Markers

Range 1: Line-L1 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Trms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
2	.01	30.24	Ca	4.6	-.3	12.7	47.24	-	-	-	-
4	.0237	-1.15	Ca	1.3	0	10.8	10.95	-	-	-	-
6	.0625	-9.83	Ca	.3	0	9.8	.27	-	-	-	-
1	.01	33.34	Qp	4.6	-.3	12.7	50.34	122	-71.66	-	-
3	.0239	3.91	Qp	1.3	0	10.8	16.01	122	-105.99	-	-
5	.0625	-5.07	Qp	.3	0	9.8	5.03	99.97	-94.94	-	-

Range 2: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Trms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
8	.3255	-8.86	Ca	0	0	9.4	.54	-	-	55.57	-55.03
10	.8093	-4.12	Ca	0	.1	9.3	5.28	-	-	46	-40.72
12	15.5096	-10.55	Ca	.1	.2	9.4	-.85	-	-	50	-50.85
7	.3255	-.8	Qp	0	0	9.4	8.6	65.57	-56.97	-	-
9	.8093	.61	Qp	0	.1	9.3	10.01	56	-45.99	-	-
11	15.5085	-4.88	Qp	.1	.2	9.4	4.82	60	-55.18	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



DATA

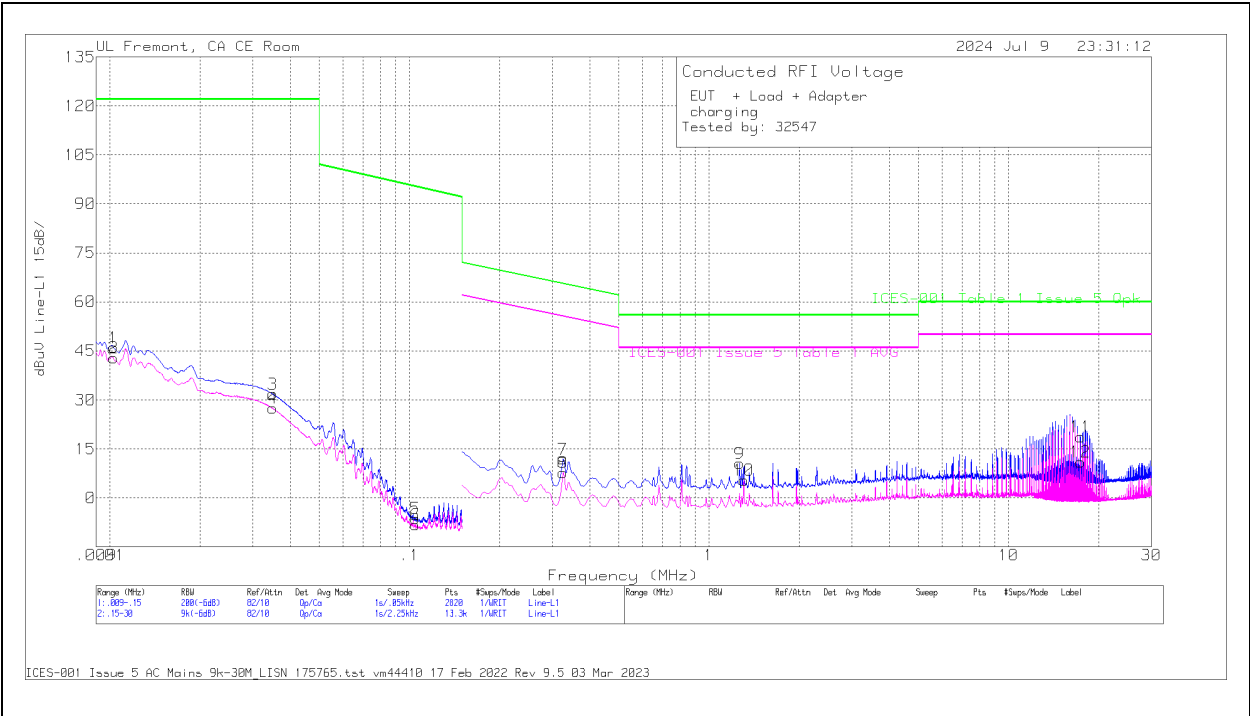
Range 3: Line-L2 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
14	.0094	24.13	Ca	4.9	0	14.6	43.63	-	-	-	-
16	.0241	-2.38	Ca	1.2	0	10.8	9.62	-	-	-	-
18	.0596	-9.24	Ca	.3	0	9.8	.86	-	-	-	-
13	.0094	25.7	Qp	4.9	0	14.6	45.2	122	-76.8	-	-
15	.0241	3.44	Qp	1.2	0	10.8	15.44	122	-106.56	-	-
17	.0597	-4.28	Qp	.3	0	9.8	5.82	100.39	-94.57	-	-

Range 4: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
20	.321	-9.22	Ca	0	.1	9.4	.28	-	-	55.68	-55.4
22	.8093	-4.18	Ca	0	0	9.3	5.12	-	-	46	-40.88
24	15.918	-10.45	Ca	.1	.3	9.3	-.75	-	-	50	-50.75
19	.3255	-2.72	Qp	0	.1	9.4	6.78	65.57	-58.79	-	-
21	.8093	.64	Qp	0	0	9.3	9.94	56	-46.06	-	-
23	15.9203	-4.57	Qp	.1	.3	9.3	5.13	60	-54.87	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

9.2. OPERATING MODE (LOAD #1)

LINE 1 RESULTS



DATA

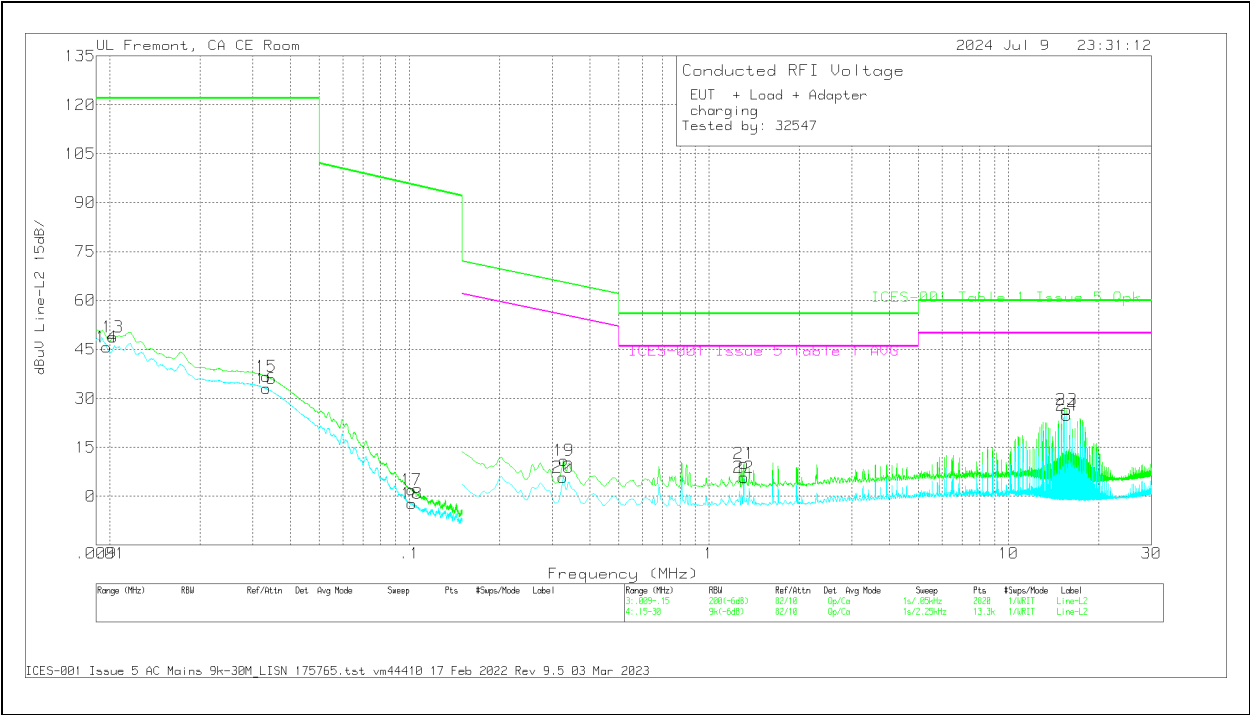
Trace Markers

Range 1: Line-L1 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
2	.0103	26.15	Ca	4.5	-.3	12.5	42.85	-	-	-	-
4	.0349	16.13	Ca	.7	.1	10.5	27.43	-	-	-	-
6	.1047	-17.84	Ca	.1	0	9.6	-8.14	-	-	-	-
1	.0103	29.33	Qp	4.5	-.3	12.5	46.03	122	-75.97	-	-
3	.0349	20.53	Qp	.7	.1	10.5	31.83	122	-90.17	-	-
5	.1047	-15.95	Qp	.1	0	9.6	-6.25	95.28	-101.53	-	-

Range 2: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
8	.3255	-1.64	Ca	0	0	9.4	7.76	-	-	55.57	-47.81
10	1.3065	-3.97	Ca	0	0	9.4	5.43	-	-	46	-40.57
12	17.3625	1.27	Ca	.1	.2	9.4	10.97	-	-	50	-39.03
7	.3255	2.46	Qp	0	0	9.4	11.86	65.57	-53.71	-	-
9	1.266	1.13	Qp	0	0	9.4	10.53	56	-45.47	-	-
11	17.3625	8.96	Qp	.1	.2	9.4	18.66	60	-41.34	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS



DATA

Range 3: Line-L2 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
14	.0098	27.56	Ca	4.7	.1	13.4	45.76	-	-	-	-
16	.0333	21.59	Ca	.7	.1	10.6	32.99	-	-	-	-
18	.1018	-11.9	Ca	.1	0	9.6	-2.2	-	-	-	-
13	.0103	31.77	Qp	4.5	.1	12.5	48.87	122	-73.13	-	-
15	.0333	25.32	Qp	.7	.1	10.6	36.72	122	-85.28	-	-
17	.1017	-7.7	Qp	.1	0	9.6	2	95.54	-93.54	-	-

Range 4: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
20	.3255	-3.7	Ca	0	.1	9.4	5.8	-	-	55.57	-49.77
22	1.3065	-3.51	Ca	0	0	9.4	5.89	-	-	46	-40.11
24	15.6728	15.05	Ca	.1	.2	9.4	24.75	-	-	50	-25.25
19	.3278	1.45	Qp	0	.1	9.4	10.95	65.51	-54.56	-	-
21	1.3065	.71	Qp	0	0	9.4	10.11	56	-45.89	-	-
23	15.6728	16.81	Qp	.1	.2	9.4	26.51	60	-33.49	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

9.3. OPERATING MODE (LOAD #2)

LINE 1 RESULTS



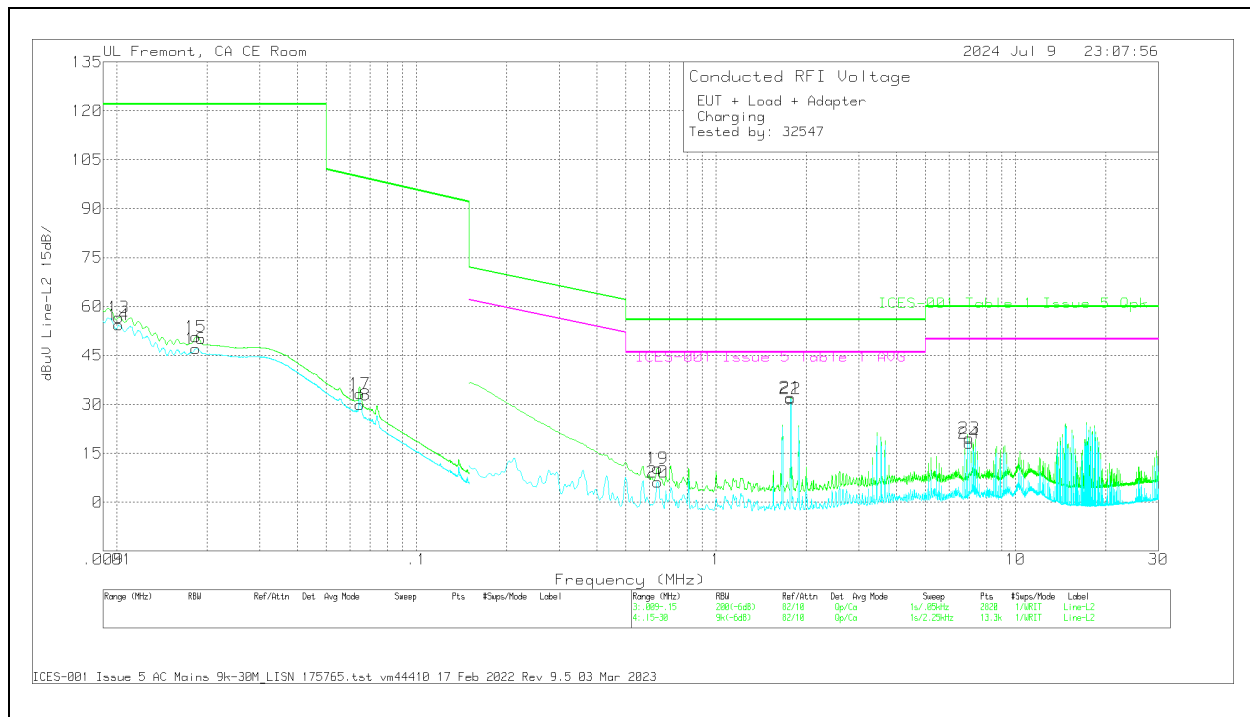
DATA

Trace Markers

Range 1: Line-L1 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
2	.0104	32.02	Ca	4.4	-.3	12.4	48.52	-	-	-	-
4	.0179	26.97	Ca	2	-.1	11.2	40.07	-	-	-	-
6	.0592	10.21	Ca	.3	0	9.8	20.31	-	-	-	-
1	.0104	34.79	Qp	4.4	-.3	12.4	51.29	122	-70.71	-	-
3	.0179	30.67	Qp	2	-.1	11.2	43.77	122	-78.23	-	-
5	.0592	14.12	Qp	.3	0	9.8	24.22	100.47	-76.25	-	-

Range 2: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading dBuV	ICES-001 Table 1 Issue 5 Qpk dBuV	Margin (dB)	ICES-001 Issue 5 Table 1 AVG dBuV	Margin (dB)
8	.6405	-1.99	Ca	0	.1	9.4	7.51	-	-	46	-38.49
10	1.7768	19.39	Ca	0	.1	9.4	28.89	-	-	46	-17.11
12	7.017	-6.07	Ca	0	.2	9.4	3.53	-	-	50	-46.47
7	.6405	1.55	Qp	0	.1	9.4	11.05	56	-44.95	-	-
9	1.7385	22.91	Qp	0	.1	9.4	32.41	56	-23.59	-	-
11	7.0215	-4.4	Qp	0	.2	9.4	9.16	60	-50.84	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

LINE 2 RESULTS**DATA**

Range 3: Line-L2 .009 - .15MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
14	.0102	37.16	Ca	4.6	.1	12.5	54.36	-	-	-	-
16	.0183	33.97	Ca	1.9	0	11.2	47.07	-	-	-	-
18	.0649	19.9	Ca	.2	0	9.8	29.9	-	-	-	-
13	.0102	39.51	Qp	4.6	.1	12.5	56.71	122	-65.29	-	-
15	.0184	37.66	Qp	1.9	0	11.2	50.76	122	-71.24	-	-
17	.0649	23.26	Qp	.2	0	9.8	33.26	99.63	-66.37	-	-

Range 4: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN (dB)	Cbl (dB)	Tms Limiter (dB)	Corrected Reading (dBuV)	ICES-001 Table 1 Issue 5 Qpk (dBuV)	Margin (dB)	ICES-001 Issue 5 Table 1 AVG (dBuV)	Margin (dB)
20	.6383	-3.28	Ca	0	.1	9.4	6.22	-	-	46	-39.78
22	1.7768	22.29	Ca	0	.1	9.4	31.79	-	-	46	-14.21
24	6.999	8.49	Ca	0	.2	9.4	18.09	-	-	50	-31.91
19	.6383	.86	Qp	0	.1	9.4	10.36	56	-45.64	-	-
21	1.7768	22.58	Qp	0	.1	9.4	32.08	56	-23.92	-	-
23	6.999	10.06	Qp	0	.2	9.4	19.66	60	-40.34	-	-

Qp - Quasi-Peak detector
Ca - CISPR average detection

10. SETUP PHOTOS

Please refer to 15412975-EP1V1 for setup photos.

END OF TEST REPORT