

TEST REPORT

Report Number: R14634918-E10

Applicant : Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

FCC ID : PY7-12907W

EUT Description : GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:
2023-03-15

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REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2023-02-23	Initial Issue	Brian Kiewra
V2	2023-03-07	Added clarification to section 5.4 that with and without tag was investigated.	Brian Kiewra
V3	2023-03-15	Revised 30-1000MHz data in section 8.3	Brian Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Sony Corporation
1-7-1 Konan Minato-ku
Tokyo, 108-0075, Japan

EUT DESCRIPTION: GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax,
GPS, WPT & NFC

SERIAL NUMBER: QV7700HMFN, QV77008AFN, QV77002NFN

SAMPLE RECEIPT DATE: 2022-12-12

DATE TESTED: 2023-01-23 to 2023-03-15

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Complies

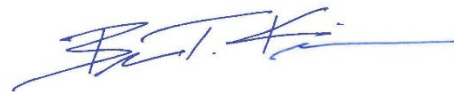
UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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 LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 UL LLC By:

Prepared By:



Mike Antola
Staff Engineer
Consumer Technology Division
UL LLC

Project Engineer
Consumer Technology Division
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, FCC CFR 47 Part 2, and FCC CFR 47 Part 15.

3. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification # 0751.06, 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
<input type="checkbox"/>	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
<input checked="" type="checkbox"/>	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A		27265	

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)	141.2 Hz
Occupied Channel Bandwidth	1.22%
RF output power, conducted	1.3 dB (PK) 0.45 dB (AV)
Power Spectral Density, conducted	2.47 dB
Unwanted Emissions, conducted	1.94 dB
All emissions, radiated	6.01 dB
Conducted Emissions (0.150-30MHz) - LISN	3.40 dB
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	1.70%

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

4.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:

Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.

$$36.5 \text{ dBuV} + 0 \text{ dB} + 10.1 \text{ dB} + 0 \text{ dB} = 46.6 \text{ dBuV}$$

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC. This test report covers NFC testing.

5.2. MAXIMUM ELECTRIC FIELD STRENGTH

Testing was performed at a distance of 3m. The transmitter has a maximum peak radiated magnetic field strength as follows:

The maximum E-field reading at 30m is 16.04dBuV/m.

5.3. SOFTWARE AND FIRMWARE

The software version used during testing was 0.94.

5.4. WORST-CASE CONFIGURATION AND MODE

The fundamental of the EUT was investigated under three orthogonal orientations X (Flatbed), Y (Landscape), and Z (Portrait). The Z (Portrait) orientation was determined to be the worst-case orientation.

In addition, Type A, B, F, and V at each supported data rate and with and without a tag were investigated to determine the worst case based on the highest power and spurious emissions. Type B, 106Kbps and with tag was determined to be the worst case and therefore was selected for all final tests.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are 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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Headphones	Sony	MDR-EX15AP	NA	NA
USB Cable	Sony	XQZ-UB1	NA	NA
AC Adapter	Sony	XQZ-UC1	1821W34209856	NA
NFC Tag	Hicarer	NTAG215	B091Z6NtN8	NA

I/O CABLES

I/O Cable List						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB-C	Non-Shielded	<3m	Connected to power supply
2	3.5mm	1	3.5mm Audio	Non-Shielded	<1m	Connected to headphones

TEST SETUP

Test software on the EUT exercised the radio.

SETUP DIAGRAM

Please refer to R14634918-EP10 for setup diagram.

6. TEST AND MEASUREMENT EQUIPMENT

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

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 2)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
AT0059	Active Loop Antenna	ETS-Lindgren	6502	2022-09-29	2023-09-29
Gain-Loss Chains					
C2-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-10	2023-05-10
Receiver & Software					
197955	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-03-08	2023-03-08
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
210642	Environmental Meter	Fisher Scientific	15-077-963 s/n 210701942	2021-08-16	2023-08-16

Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville – Chamber 4)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
30-1000 MHz					
90629 (AT0075)	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB3	2023-01-06	2024-01-06
Gain-Loss Chains					
207639	Gain-loss string: 25-1000MHz	Various	Various	2022-05-20	2023-05-20
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2023-02-02	2024-02-02
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
21642	Environmental Meter	Fisher Scientific	15-077-963 (s/n 210701692)	2021-08-16	2023-08-16

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
SA0025	Spectrum Analyzer	Keysight Technologies	N9030A	2022-05-02	2023-05-02
HI0090	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
76023 (EC0225)	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2023-01-20	2024-01-20
MM0167 (PRE0126458)	True RMS Multimeter	Agilent	U1232A	2021-08-17	2023-08-17
MY62176088	DC Regulated Power Supply	Keysight Technologies	E3633A	NA	NA
SOFTEMI	Antenna Port Software	UL	Version 2022.8.16		
-	Near Field Probe Kit	ETS	7405	-	-

Test Equipment Used - Line-Conducted Emissions – Voltage (Morrisville – Conducted 1)

Equipment ID	Description	Manufacturer/Brand	Model Number	Last Cal.	Next Cal.
CBL087	Coax cable, RG223, N-male to BNC-male, 20-ft.	Pasternack	PE3W06143-240	2022-04-05	2023-04-05
HI0091	Environmental Meter	Fisher Scientific	15-077-963	2022-07-20	2023-07-20
LISN003	LISN, 50-ohm/50-uH, 250uH 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50/250-25-2-01	2022-08-01	2023-08-01
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2022-08-03	2023-08-03
ATA222	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2022-04-05	2023-04-05
PS215	AC Power Source	Elgar	CW2501M (s/n 1523A02397)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		

7. 20dB BANDWIDTH

LIMITS

§15.215 (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1-5% of the 20dB bandwidth. 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

Type A (CE Mode)

Mode Kbps	Frequency (MHz)	20dB Bandwidth (KHz)
848	13.56	961.7
424	13.56	1360.0
212	13.56	869.7
106	13.56	436.6

Type B (CE Mode)

Mode Kbps	Frequency (MHz)	20dB Bandwidth (KHz)
848	13.56	27.26
424	13.56	7.846
212	13.56	7.943
106	13.56	8.254

Type F (CE Mode)

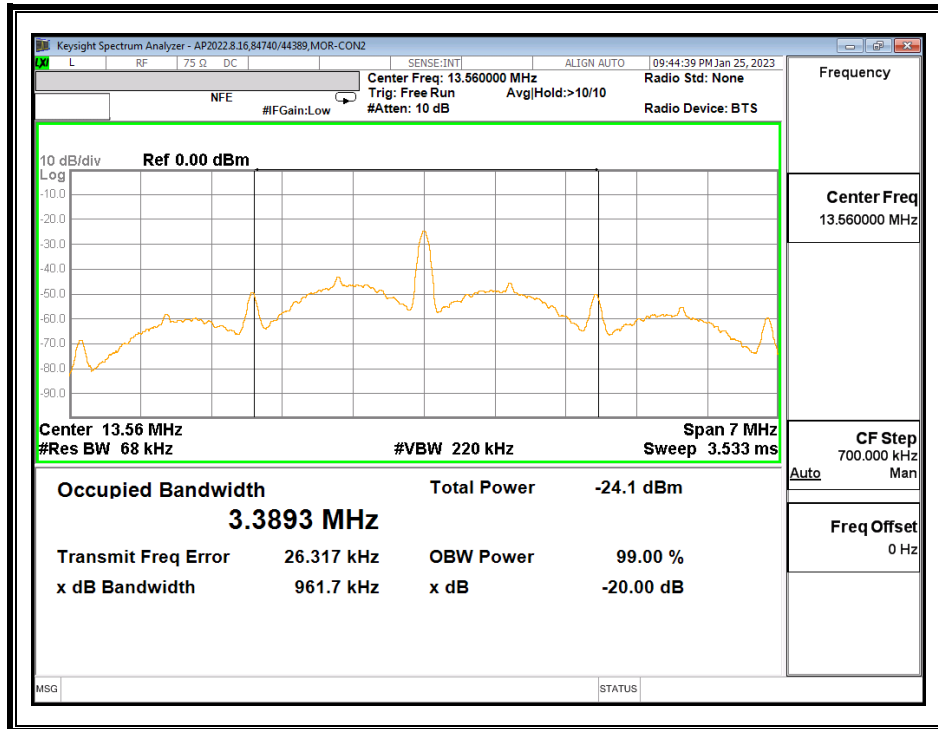
Mode Kbps	Frequency (MHz)	20dB Bandwidth (KHz)
424	13.56	27.33
212	13.56	26.51

Type V (CE Mode)

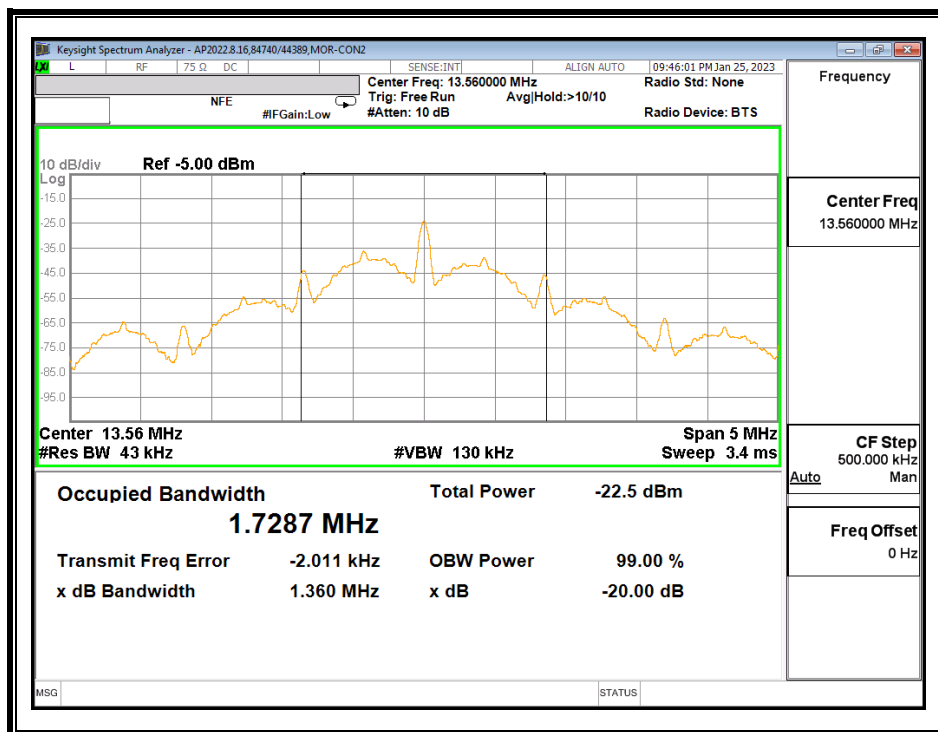
Mode Kbps	Frequency (MHz)	20dB Bandwidth (KHz)
26	13.56	125.8

7.1. Type A (CE Mode)

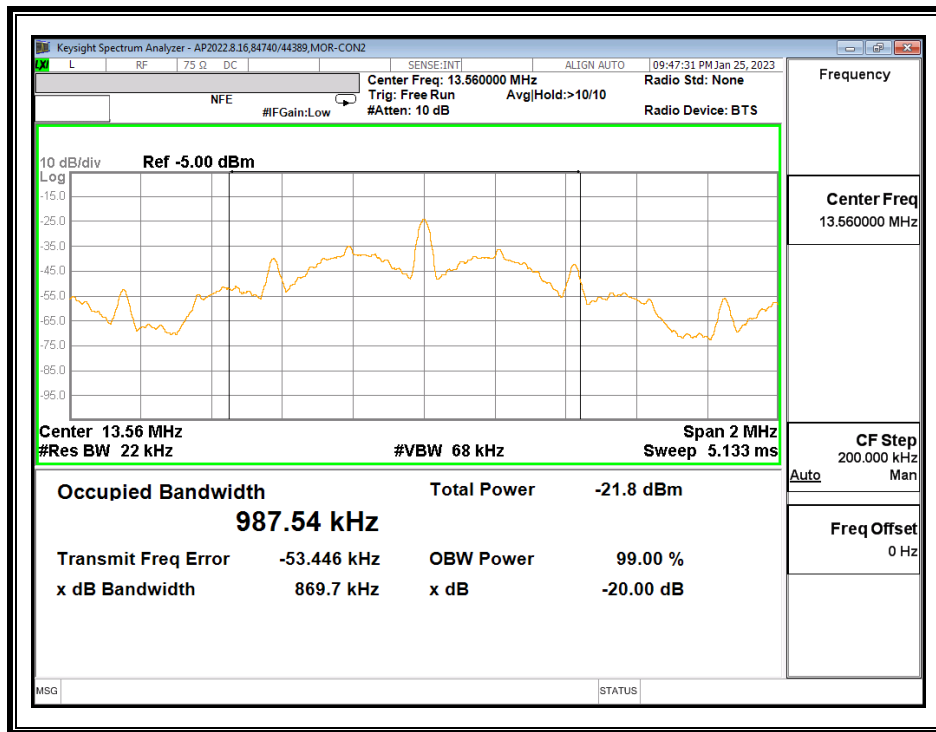
848Kbps



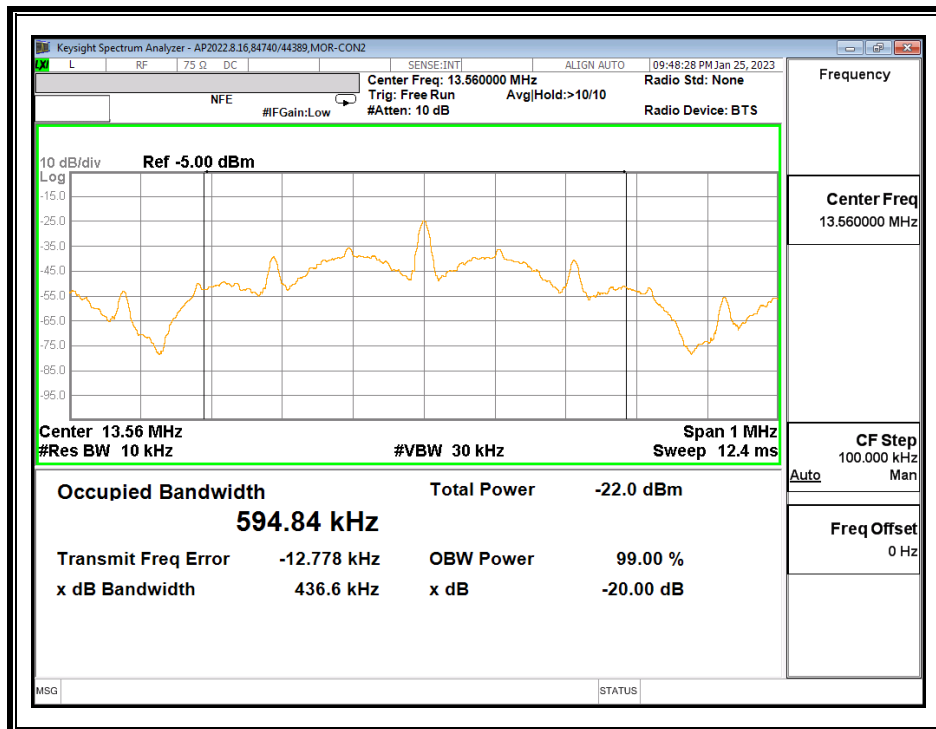
424Kbps



212Kbps

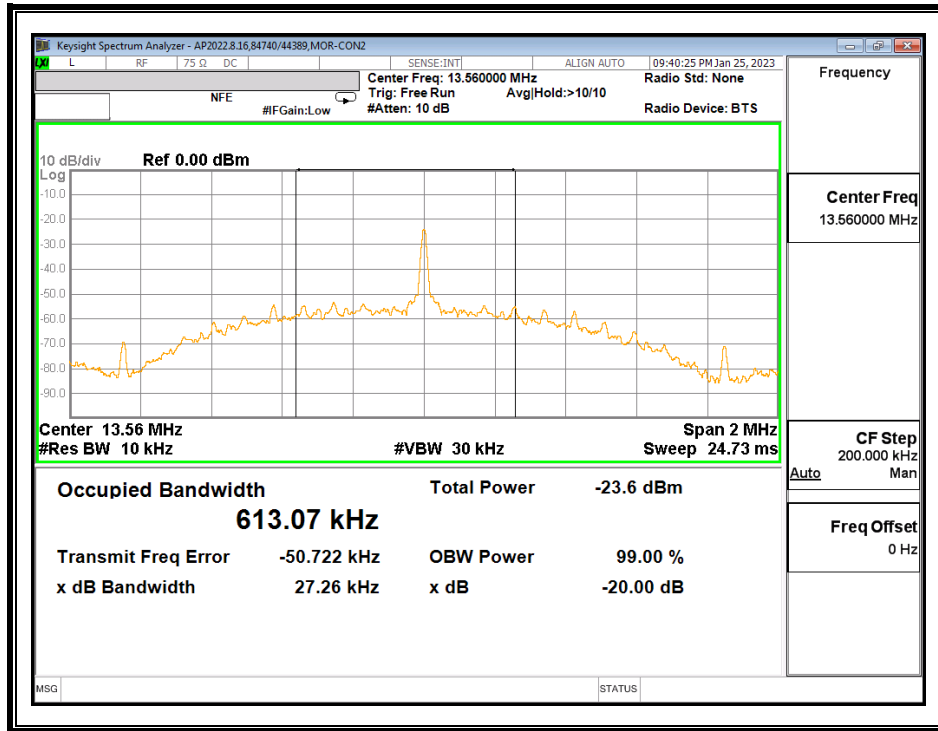


106Kbps

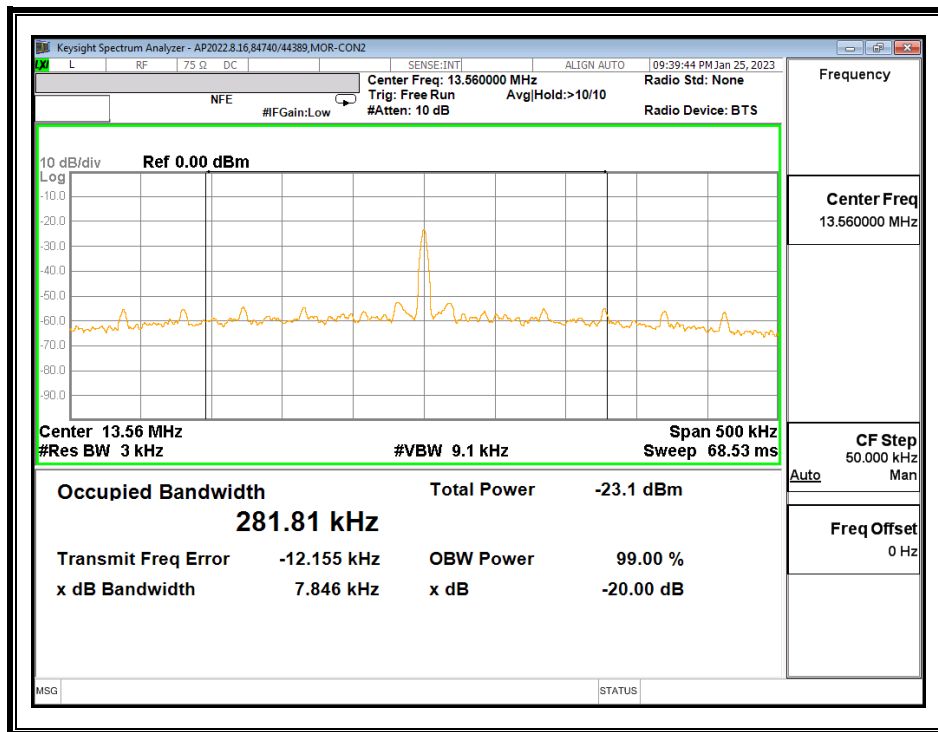


7.2. Type B (CE Mode)

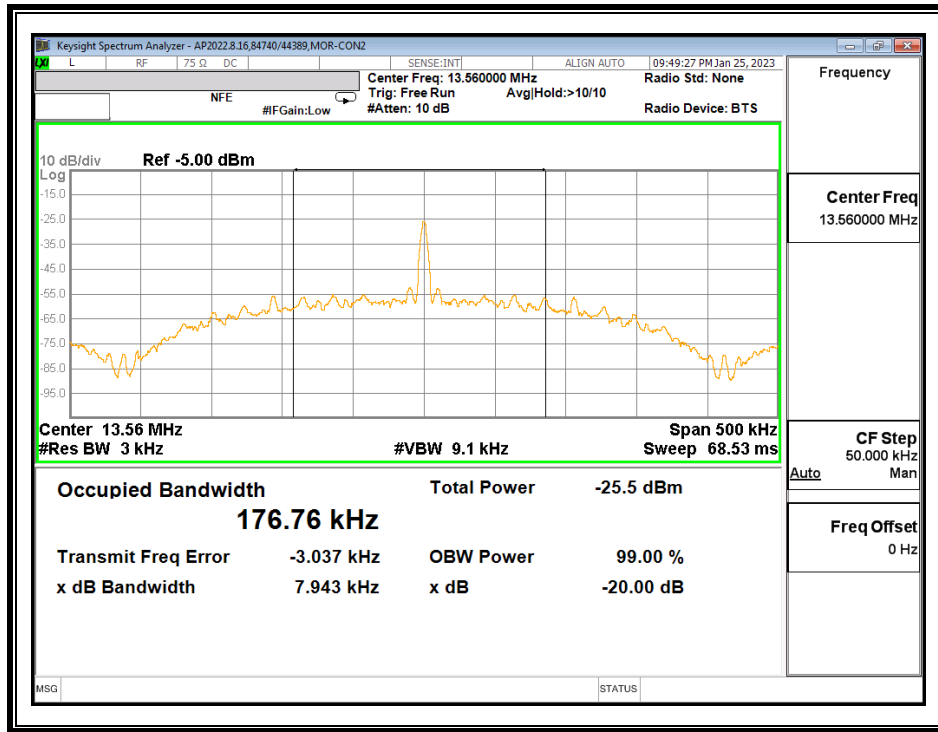
848Kbps



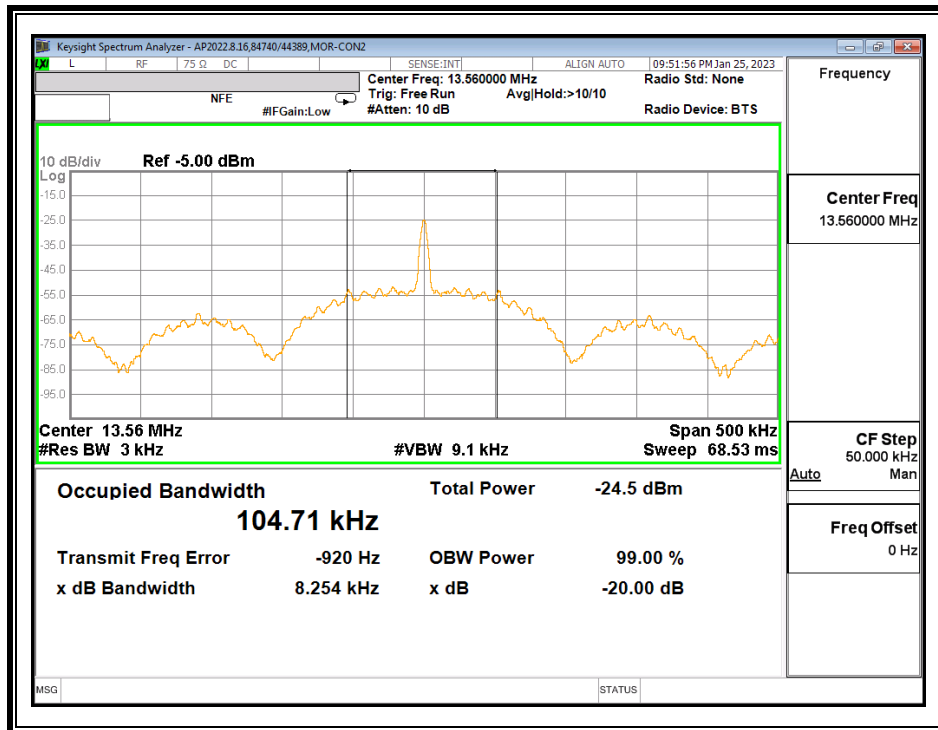
424Kbps



212Kbps

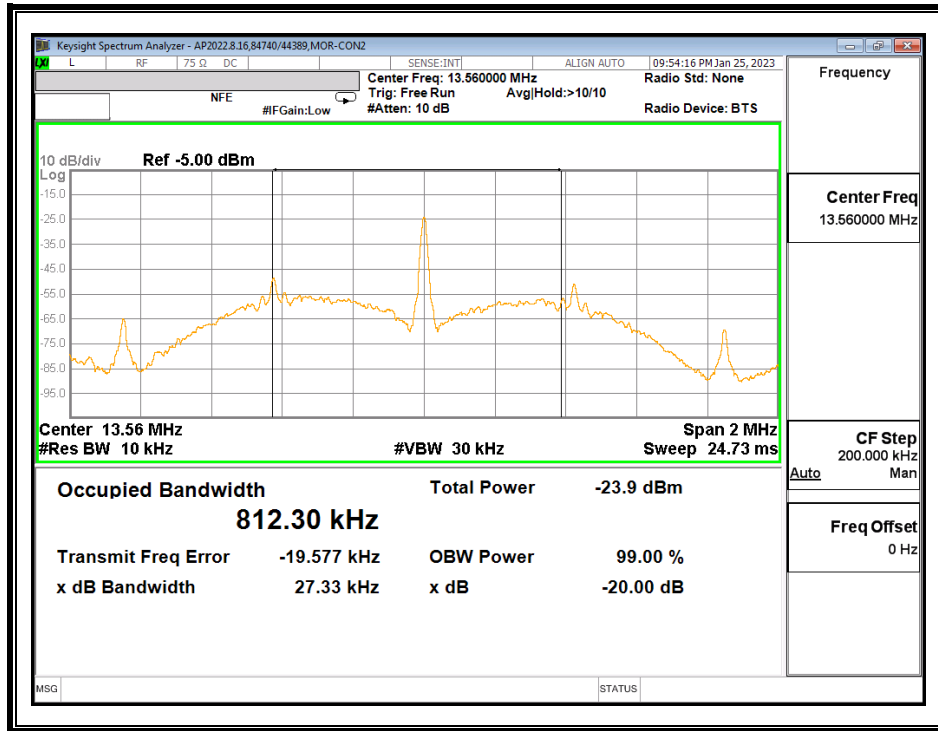


106Kbps

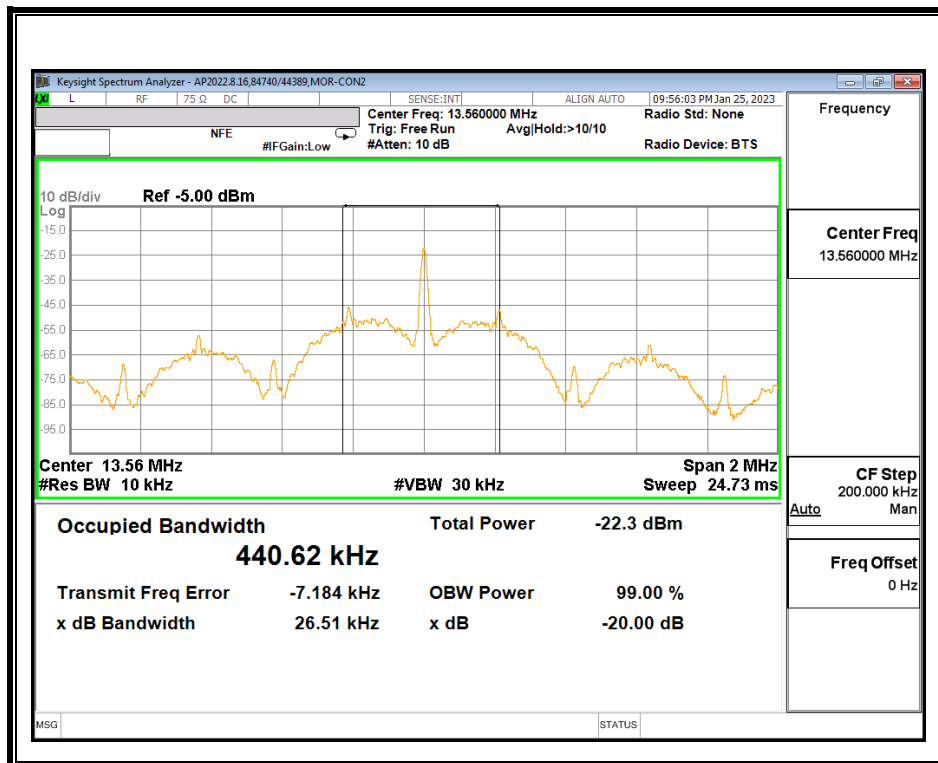


7.3. Type F (CE Mode)

424Kbps

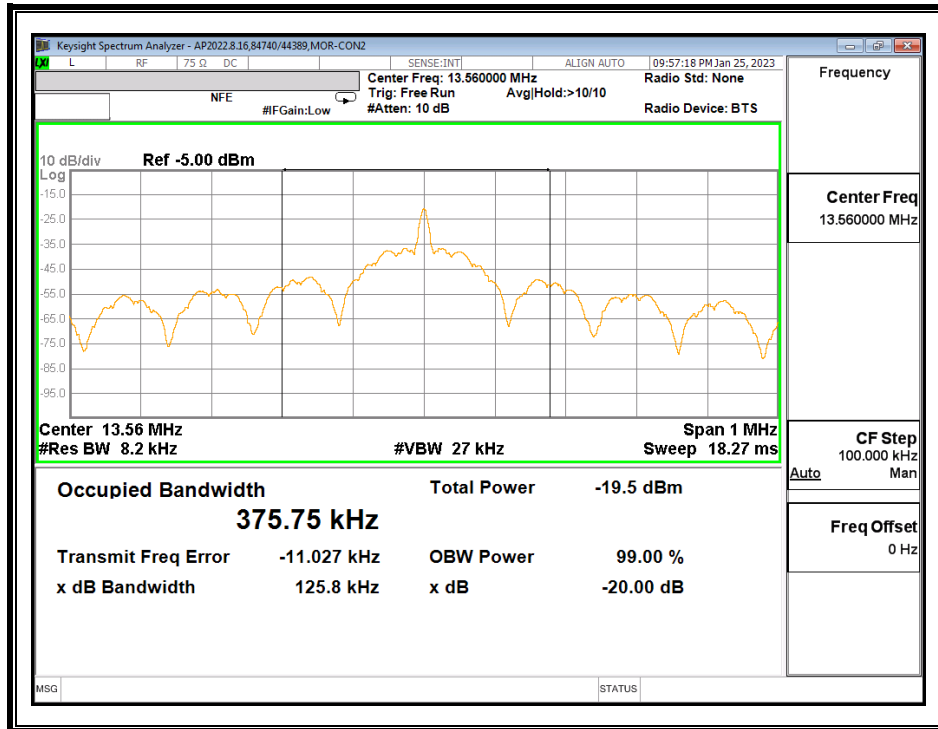


212Kbps



7.4. Type V (CE Mode)

26Kbps



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

§15.225

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the filed strength from uV/m to dBuV/m is:

Limit (dBuV/m) = 20 log limit (uV/m)

§15.209 (d) The emission limits shown the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (e) The provisions in §§ 15.31, 15.33, and 15.35, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

TEST PROCEDURE

ANSI C63.10, 2013

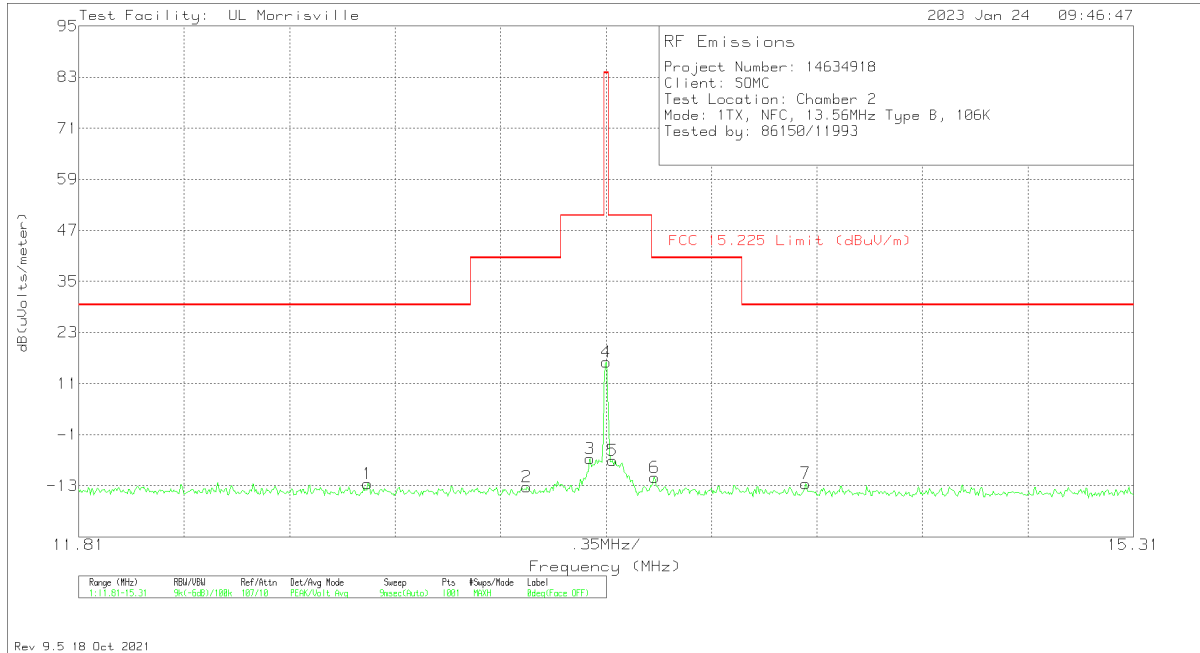
The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 13.56 MHz; therefore, the frequency range was investigated from 0.15 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater.

RESULTS

8.2. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.009 - 30 MHz)

8.2.1. Type B (CE Mode)

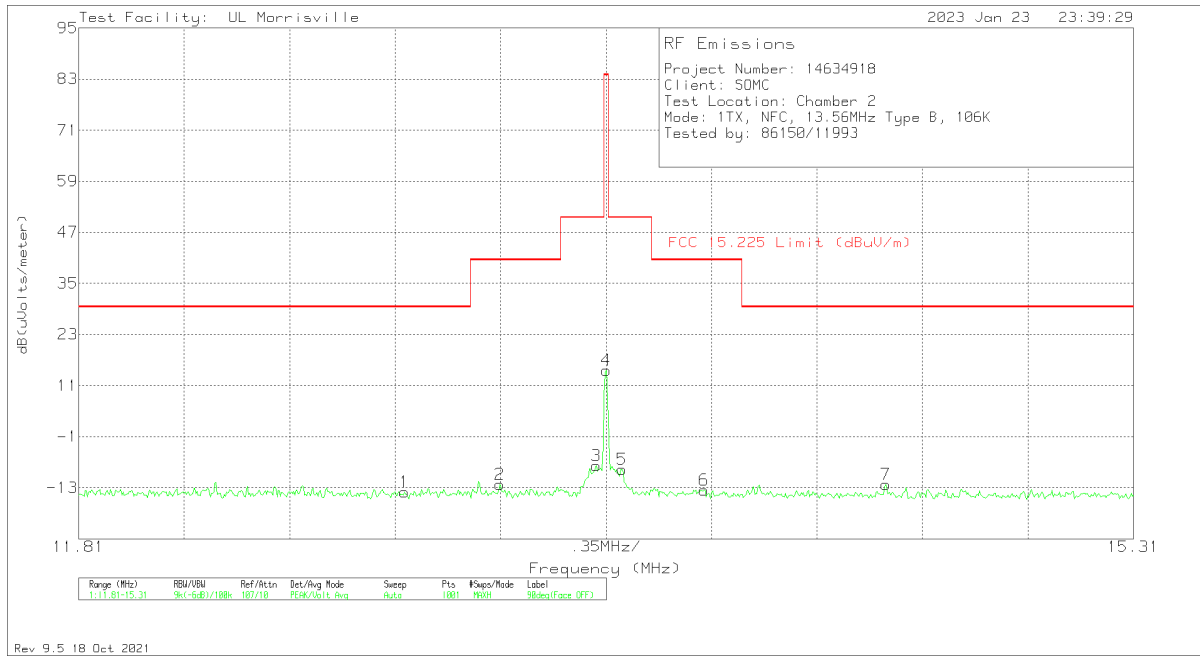
FUNDAMENTAL 106Kbps – Face On, 0 Deg



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	12.769	15.92	Pk	10.9	.7	-40	-12.48	29.5	-41.98	113	100	0 degs
2	13.2975	15.07	Pk	10.9	.7	-40	-13.33	40.5	-53.83	113	100	0 degs
3	13.5075	21.77	Pk	10.9	.7	-40	-6.63	50.5	-57.13	113	100	0 degs
4	13.56	44.44	Pk	10.9	.7	-40	16.04	84	-67.96	113	100	0 degs
5	13.581	21.32	Pk	10.9	.7	-40	-7.08	50.5	-57.58	113	100	0 degs
6	13.721	17.33	Pk	10.9	.7	-40	-11.07	40.5	-51.57	113	100	0 degs
7	14.2215	15.93	Pk	10.9	.7	-40	-12.47	29.5	-41.97	113	100	0 degs

Pk - Peak detector

FUNDAMENTAL 106Kbps – Face Off, 90 Deg

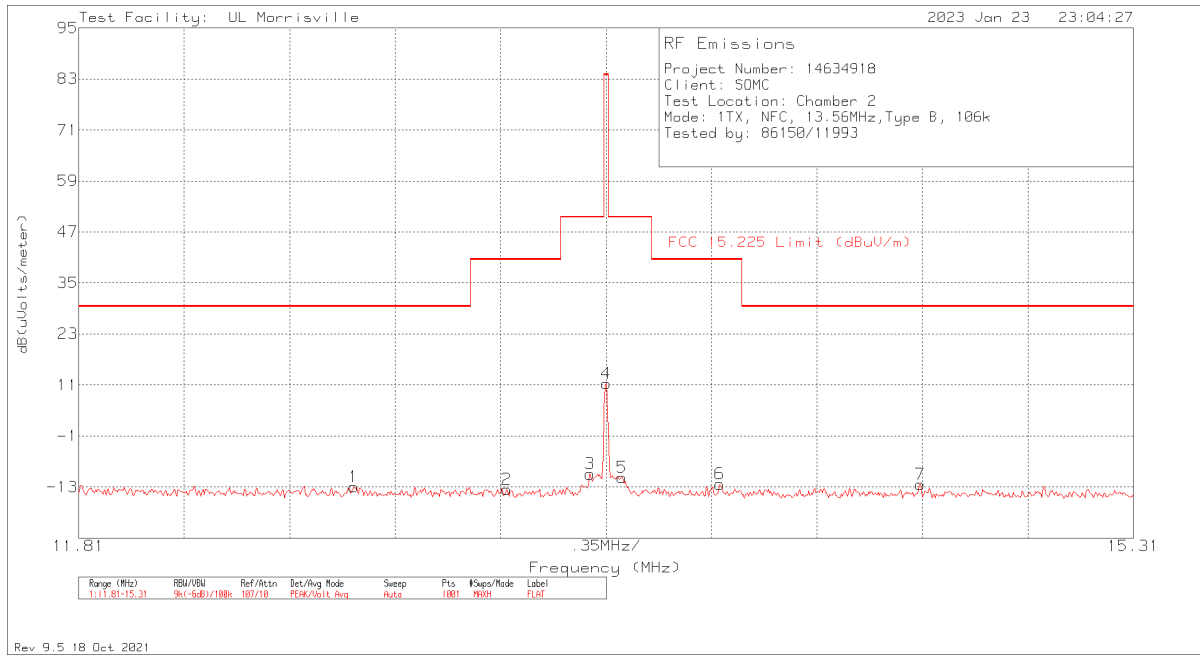


Rev 9.5 18 Oct 2021

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	12.8915	14.36	Pk	10.9	.7	-40	-14.04	29.5	-43.54	193	100	90 degs
2	13.2065	16.11	Pk	10.9	.7	-40	-12.29	40.5	-52.79	193	100	90 degs
3	13.5285	20.62	Pk	10.9	.7	-40	-7.78	50.5	-58.28	193	100	90 degs
4	13.56	43.02	Pk	10.9	.7	-40	14.62	84	-69.38	193	100	90 degs
5	13.6125	19.68	Pk	10.9	.7	-40	-8.72	50.5	-59.22	193	100	90 degs
6	13.8855	14.8	Pk	10.9	.7	-40	-13.6	40.5	-54.1	193	100	90 degs
7	14.4875	16.08	Pk	10.9	.8	-40	-12.22	29.5	-41.72	193	100	90 degs

Pk - Peak detector

FUNDAMENTAL106Kbps – Horizontal, Flat

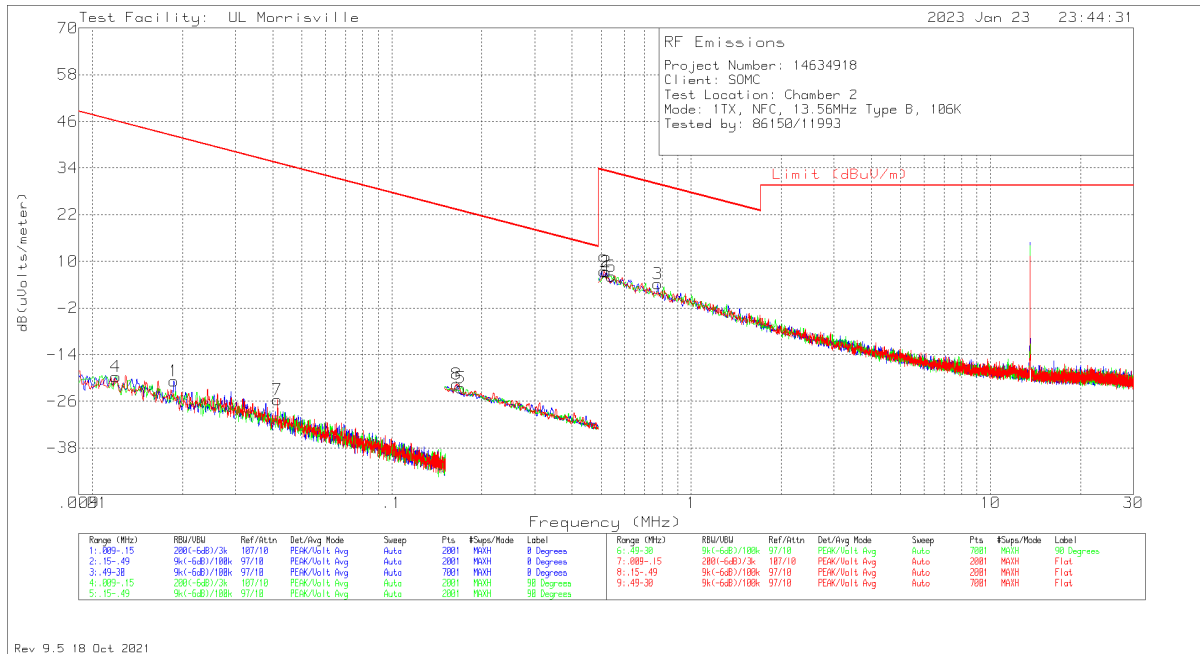


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	12.7235	15.48	Pk	10.9	.7	-40	-12.92	29.5	-42.42	312	100	Flat
2	13.231	14.8	Pk	10.9	.7	-40	-13.6	40.5	-54.1	312	100	Flat
3	13.5075	18.44	Pk	10.9	.7	-40	-9.96	50.5	-60.46	312	100	Flat
4	13.56	39.72	Pk	10.9	.7	-40	11.32	84	-72.68	312	100	Flat
5	13.6125	17.58	Pk	10.9	.7	-40	-10.82	50.5	-61.32	312	100	Flat
6	13.938	16.08	Pk	10.9	.7	-40	-12.32	40.5	-52.82	312	100	Flat
7	14.603	15.91	Pk	10.9	.8	-40	-12.39	29.5	-41.89	312	100	Flat

Pk - Peak detector

SPURIOUS EMISSION 106Kbps

Note: All measurements were made at a test distance of 3 m. The measured data was extrapolated from the test distance (3m) to the specification distance (300 m from 9-490 kHz and 30 m from 490 kHz – 30 MHz) to clearly show the relative levels of fundamental and spurious emissions and demonstrate compliance with the requirement that the level of any spurious emissions be below the level of the intentionally transmitted signal. The extrapolation factor for the limits were 40*Log (test distance / specification distance).



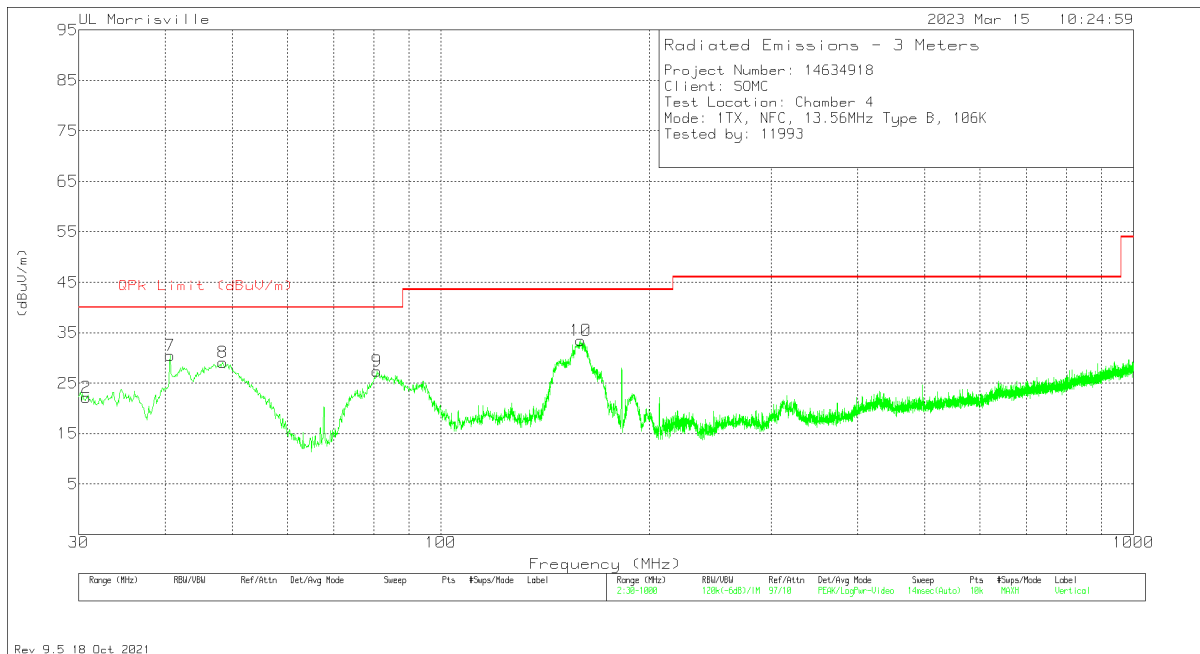
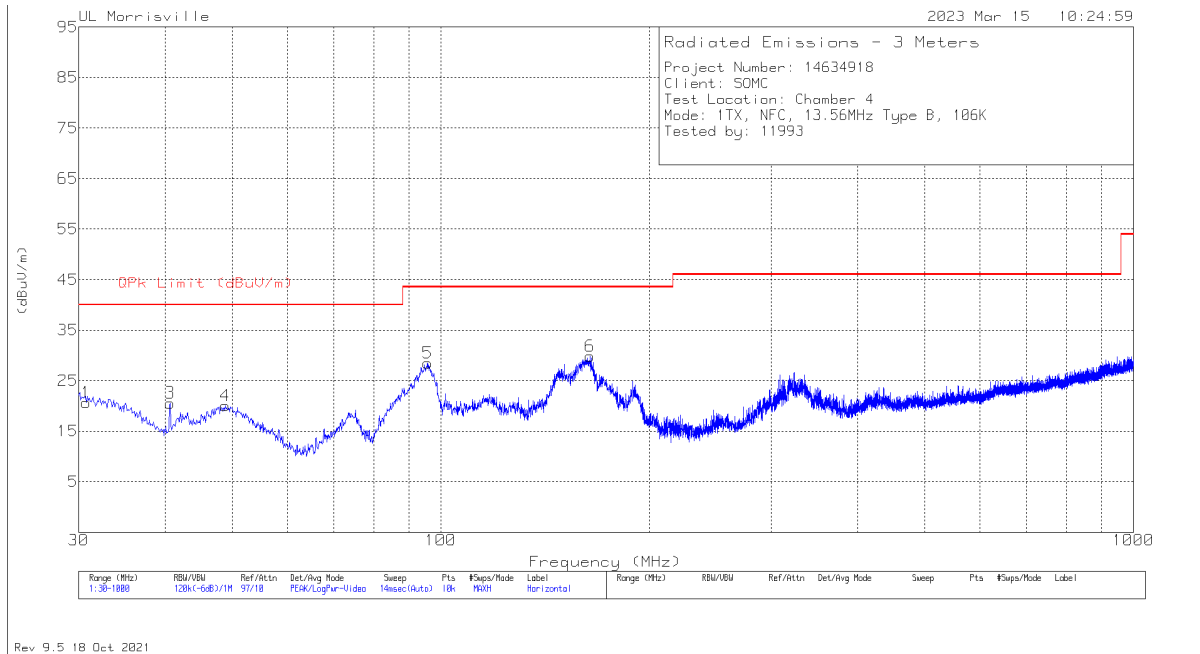
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0059 (dBuV/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	QP/AV Limit (dBuV/m)	PK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
4	.01198	41.99	Pk	18.3	.1	-80	-19.61	46.03	66.03	-65.64	0-360	90 degs
1	.01873	44.13	Pk	15	.1	-80	-20.77	42.16	62.16	-62.93	0-360	0 degs
7	.04145	41.9	Pk	12.3	.1	-80	-25.7	35.25	55.25	-60.95	0-360	Flat
8	.16488	47.65	Pk	10.6	.1	-80	-21.65	23.26	43.26	-44.91	0-360	Flat
5	.17023	46.77	Pk	10.6	.1	-80	-22.53	22.98	42.98	-45.51	0-360	90 degs
9	.51108	36.83	Pk	10.5	.1	-40	7.43	33.43	-	-26	0-360	Flat
2	.51951	36.66	Pk	10.5	.1	-40	7.26	33.29	-	-26.03	0-360	0 degs
6	.54059	35.51	Pk	10.6	.1	-40	6.21	32.95	-	-26.74	0-360	90 degs
3	.77247	33.37	Pk	10.6	.2	-40	4.17	29.85	-	-25.68	0-360	0 degs

Pk - Peak detector

8.3. TX SPURIOUS EMISSION 30 TO 1000 MHz

8.3.1. Type B (CE Mode)

SPURIOUS EMISSION 106Kbps



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	90629 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	30.778	21.41	Qp	26.5	-31.7	16.21	40	-23.79	37	203	V
1	30.78	20.93	Qp	26.5	-31.7	15.73	40	-24.27	51	180	H
3	40.67	33	Pk	19.2	-31.6	20.6	40	-19.4	0-360	200	H
7	40.67	42.86	Pk	19.2	-31.6	30.46	40	-9.54	0-360	100	V
8	48.43	45.97	Pk	14.6	-31.5	29.07	40	-10.93	0-360	100	V
4	48.818	37.1	Pk	14.5	-31.5	20.1	40	-19.9	0-360	300	H
9	80.925	43.69	Pk	14.6	-30.9	27.39	40	-12.61	0-360	100	V
5	95.669	43.58	Pk	15.8	-30.9	28.48	43.52	-15.04	0-360	100	H
10	159.0585	45.09	Pk	18.6	-30.2	33.49	43.52	-10.03	0-360	100	V
6	164.248	41.56	Pk	18.3	-30	29.86	43.52	-13.66	0-360	100	H

Qp - Quasi-Peak detector

Pk - Peak detector

9. FREQUENCY STABILITY

LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency, over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from the minimum to the maximum of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

TEST PROCEDURE

ANSI C63.10-2013 Clause 6.8

RESULTS

No non-compliance noted.

9.1. Type B 106Kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measured with Time Elapse								
(Vdc)	(°C)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.89	50	13.5599076	1.577	13.5599060	1.693	13.5599050	1.763	13.5599041	1.831	± 100
3.89	40	13.5599310	-0.149	13.5599271	0.139	13.5599235	0.401	13.5599196	0.689	± 100
3.89	30	13.5599559	-1.985	13.5599515	-1.664	13.5599494	-1.505	13.5599466	-1.299	± 100
3.89	20	13.5599290	0.000	13.5599299	-0.068	13.5599313	-0.176	13.5599335	-0.338	± 100
3.89	10	13.5600277	-7.283	13.5600225	-6.898	13.5600188	-6.629	13.5600137	-6.252	± 100
3.89	0	13.5600498	-8.916	13.5600458	-8.619	13.5600442	-8.496	13.5600411	-8.269	± 100
3.89	-10	13.5600585	-9.555	13.5600582	-9.534	13.5600576	-9.486	13.5600566	-9.413	± 100
3.89	-20	13.5600560	-9.366	13.5600572	-9.458	13.5600578	-9.501	13.5600576	-9.486	± 100
4.28	20	13.5599331	-0.303	13.5599335	-0.335	13.5599343	-0.398	13.5599357	-0.495	± 100
3.69	20	13.5599385	-0.707	13.5599388	-0.728	13.5599402	-0.829	13.5599416	-0.935	± 100

Tested by: 85502/44389

Test date: 2023-01-25

10. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Notes:
1. The lower limit shall apply at the transition frequencies
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

TEST PROCEDURE

ANSI C63.10:2013

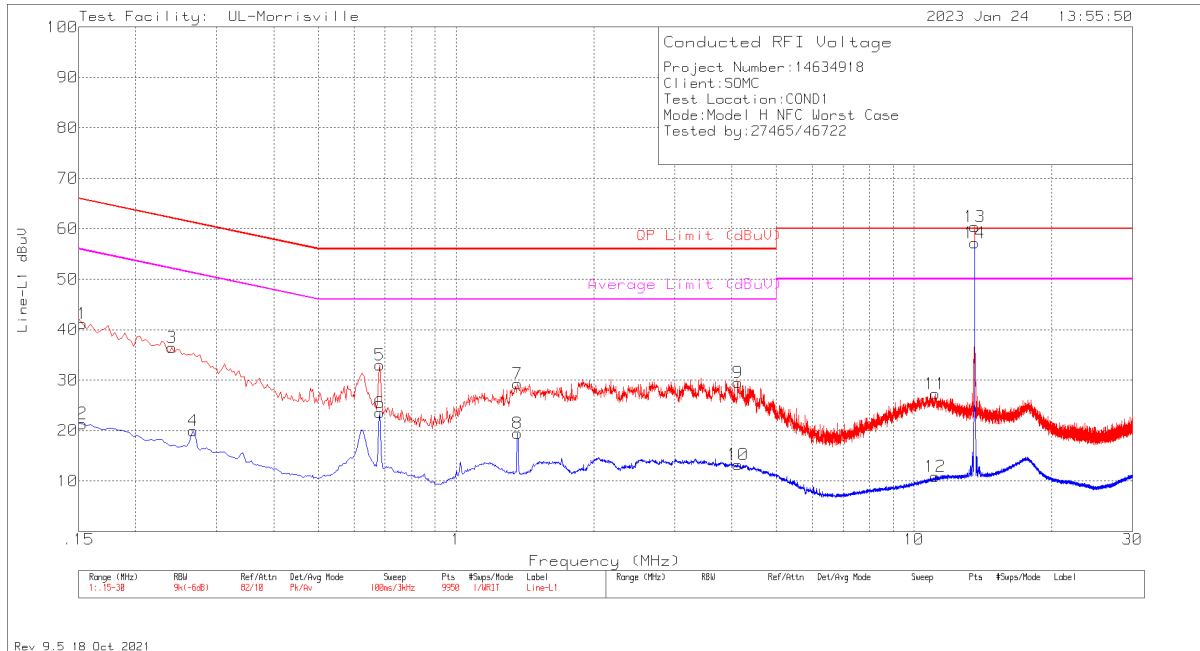
RESULTS

No non-compliance noted:

10.1. Type B 106Kbps (CE Mode)

10.1.1. NORMAL OPERATION, 106Kbps

LINE 1 RESULTS

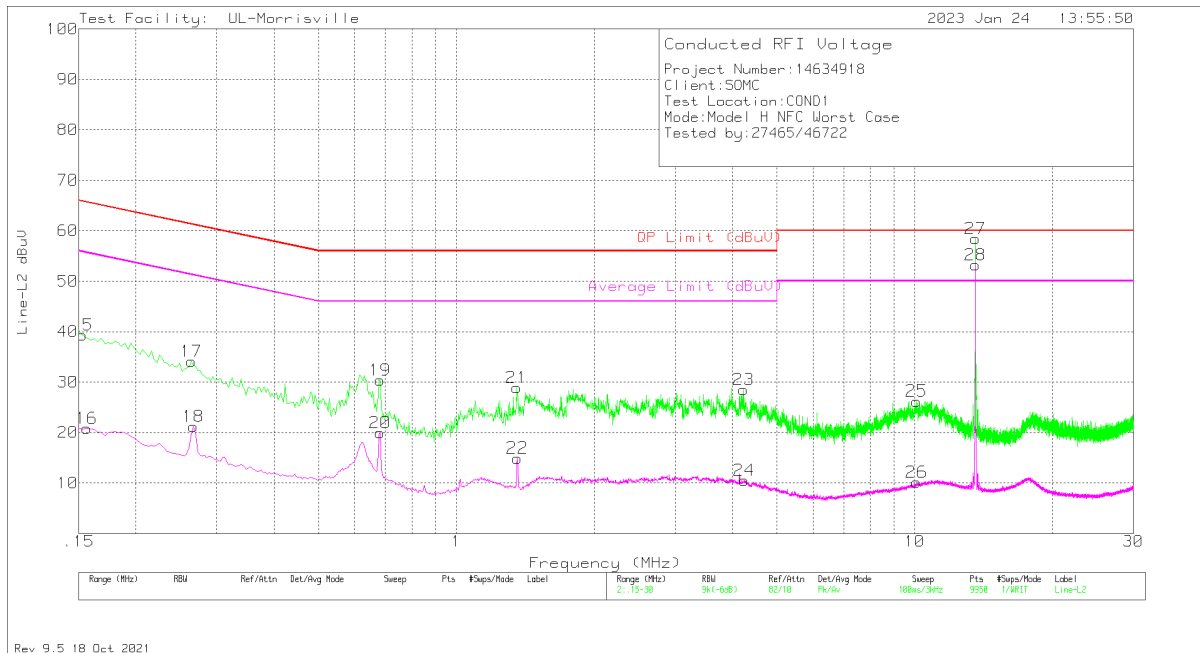


Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.153	31.18	Pk	.2	9.8	41.18	65.84	-24.66	-	-
2	.153	11.38	Av	.2	9.8	21.38	-	-	55.84	-34.46
3	.24	26.58	Pk	.1	9.8	36.48	62.1	-25.62	-	-
4	.267	10.08	Av	.1	9.8	19.98	-	-	51.21	-31.23
5	.681	23.23	Pk	0	9.8	33.03	56	-22.97	-	-
6	.681	13.79	Av	0	9.8	23.59	-	-	46	-22.41
7	1.362	19.42	Pk	0	9.8	29.22	56	-26.78	-	-
8	1.362	9.61	Av	0	9.8	19.41	-	-	46	-26.59
9	4.122	19.63	Pk	0	9.9	29.53	56	-26.47	-	-
10	4.128	3.31	Av	0	9.9	13.21	-	-	46	-32.79
12	11.112	.75	Av	.1	10	10.85	-	-	50	-39.15
11	11.121	17.22	Pk	.1	10	27.32	60	-32.68	-	-
13	13.56	50.38	Pk	.1	10	60.48	60	.48	-	-
14	13.56	47.13	Av	.1	10	57.23	-	-	50	7.23

Pk - Peak detector
 Av - Average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicate that when the antenna terminal is terminated the fundamental amplitude is lowered below the limit line.

LINE 2 RESULTS



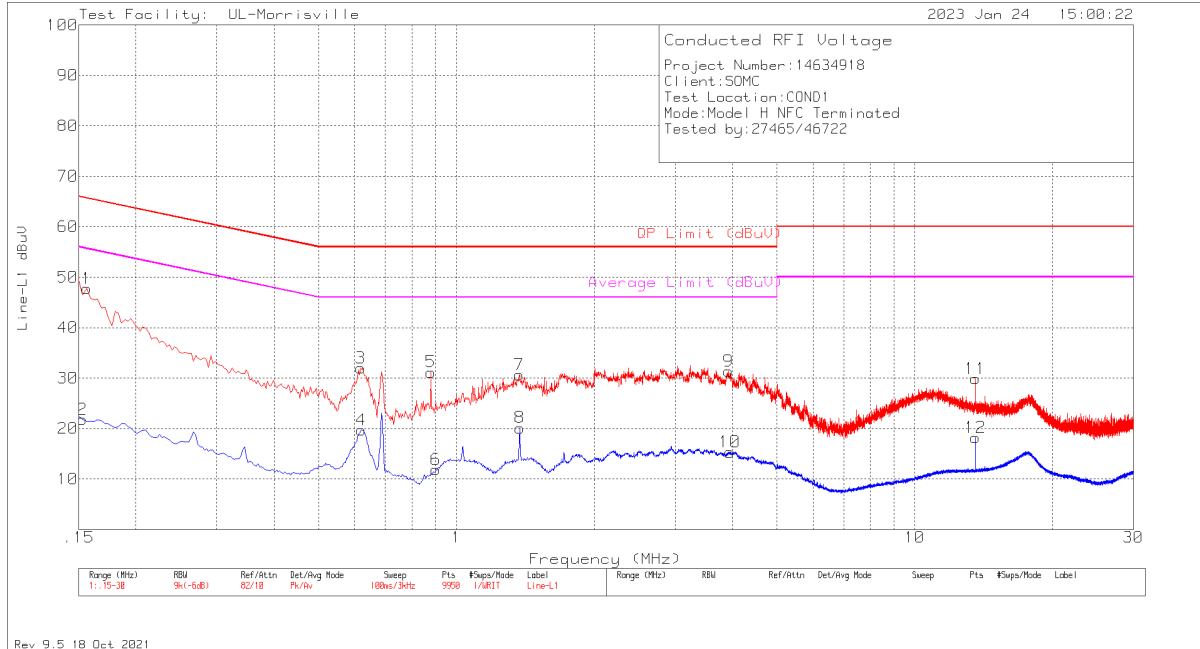
Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
15	.153	29.31	Pk	.2	9.8	39.31	65.84	-26.53	-	-
16	.156	10.78	Av	.2	9.8	20.78	-	-	55.67	-34.89
17	.264	24.25	Pk	.1	9.8	34.15	61.3	-27.15	-	-
18	.267	11.33	Av	.1	9.8	21.23	-	-	51.21	-29.98
19	.681	20.6	Pk	0	9.8	30.4	56	-25.6	-	-
20	.681	10.17	Av	0	9.8	19.97	-	-	46	-26.03
21	1.353	19.05	Pk	0	9.8	28.85	56	-27.15	-	-
22	1.359	5.12	Av	0	9.8	14.92	-	-	46	-31.08
23	4.227	18.62	Pk	0	9.9	28.52	56	-27.48	-	-
24	4.242	.59	Av	0	9.9	10.49	-	-	46	-35.51
25	10.098	16.12	Pk	.1	10	26.22	60	-33.78	-	-
26	10.107	-.01	Av	.1	10	10.09	-	-	50	-39.91
27	13.56	48.35	Pk	.1	10	58.45	60	-1.55	-	-
28	13.56	43.09	Av	.1	10	53.19	-	-	50	3.19

Pk - Peak detector
 Av - Average detection

Note: 13.56MHz is a fundamental frequency of the EUT. Data under the following section indicate that when the antenna terminal is terminated the fundamental amplitude is lowered below the limit line.

10.1.2. NORMAL OPERATION WITH ANTENNA PORT TERMINATED

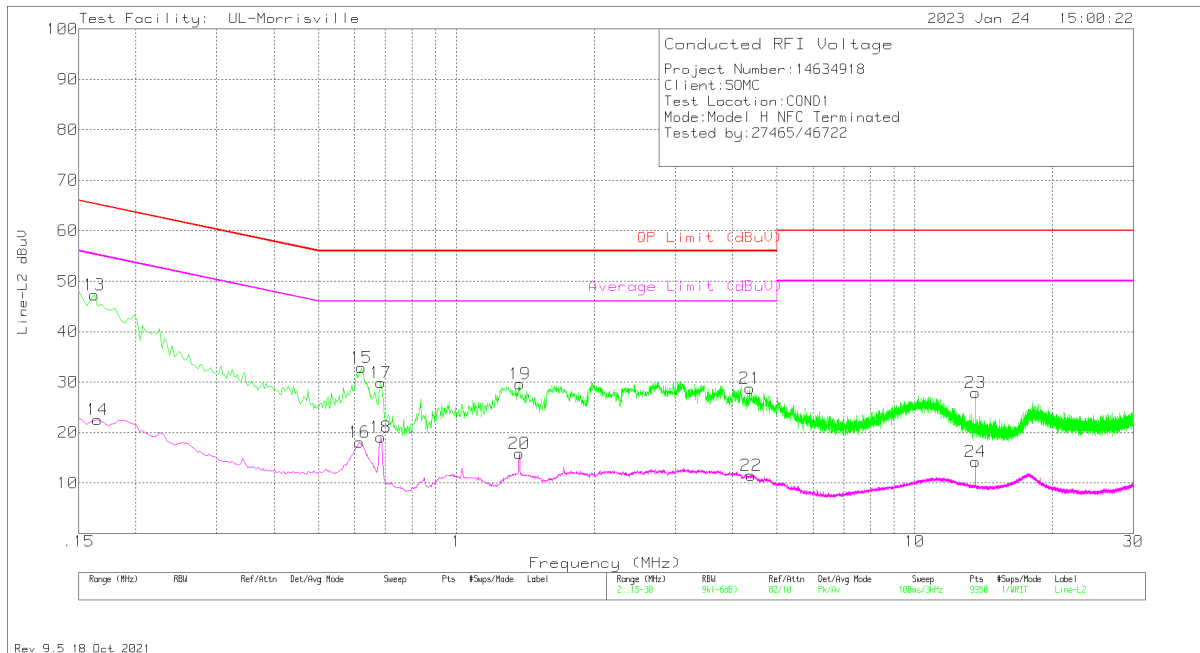
LINE 1 RESULTS



Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.156	37.77	Pk	.2	9.8	47.77	65.67	-17.9	-	-
2	.153	11.76	Av	.2	9.8	21.76	-	-	55.84	-34.08
3	.618	22.17	Pk	0	9.8	31.97	56	-24.03	-	-
4	.621	9.94	Av	0	9.8	19.74	-	-	46	-26.26
5	.879	21.39	Pk	0	9.8	31.19	56	-24.81	-	-
6	.903	2.11	Av	0	9.8	11.91	-	-	46	-34.09
7	1.371	20.81	Pk	0	9.8	30.61	56	-25.39	-	-
8	1.374	10.34	Av	0	9.8	20.14	-	-	46	-25.86
9	3.924	21.51	Pk	0	9.9	31.41	56	-24.59	-	-
10	3.951	5.4	Av	0	9.9	15.3	-	-	46	-30.7
11	13.56	19.78	Pk	.1	10	29.88	-	-	-	-
12	13.56	8.11	Av	.1	10	18.21	-	-	-	-

Pk - Peak detector
 Av - Average detection

LINE 2 RESULTS



Range 2: Line-L2 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.162	37.32	Pk	.2	9.8	47.32	65.36	-18.04	-	-
14	.165	12.55	Av	.2	9.8	22.55	-	-	55.21	-32.66
15	.621	23.11	Pk	0	9.8	32.91	56	-23.09	-	-
16	.615	8.24	Av	0	9.8	18.04	-	-	46	-27.96
17	.684	20.09	Pk	0	9.8	29.89	56	-26.11	-	-
18	.684	9.29	Av	0	9.8	19.09	-	-	46	-26.91
19	1.374	19.8	Pk	0	9.8	29.6	56	-26.4	-	-
20	1.371	6.09	Av	0	9.8	15.89	-	-	46	-30.11
21	4.365	18.83	Pk	0	9.9	28.73	56	-27.27	-	-
22	4.392	1.63	Av	0	9.9	11.53	-	-	46	-34.47
23	13.563	17.8	Pk	.1	10	27.9	-	-	-	-
24	13.56	4.12	Av	.1	10	14.22	-	-	-	-

Pk - Peak detector

Av - Average detection

11. SETUP PHOTOS

Please refer to R14634918-EP10 for setup photos.

END OF TEST REPORT