TEST REPORT

Report Number : R14311585-E3

Applicant	:	Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0076, Japan
FCC ID	:	PY7-93060R
EUT Description	:	GSM/WCDMA/LTE 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:
2022-08-11

Prepared by:
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CERT #0751.06

REVISION HISTORY

Rev.	Issue Date	Revisions	Revised By
V1	2022-07-21	Initial Issue	Brian Kiewra
V2	2022-08-11	Note added regarding spurious markers being noise floor to section 8.2.1	Brian Kiewra

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Sony Corporation 1-7-1 Konan Minato-ku Tokyo, 108-0076, Japan
EUT DESCRIPTION:	GSM/WCDMA/LTE Phone with BT, DTS/UNII a/b/g/n/ac/ax, GPS, WPT & NFC
SERIAL NUMBER:	QV770047D5, QV7700G5D5, QV7700D8D5
SAMPLE RECEIPT DATE:	2022-06-07
DATE TESTED:	2022-07-01 to 2022-07-13

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, or any agency of the U.S. government.

Approved & Released
For UL LLC By:

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Consumer Technology Division
UL LLC

Prepared By:

Brian Kiewra
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
☐	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	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 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 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 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE 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 5.13dBuV/m.

5.3. SOFTWARE AND FIRMWARE

The software version used during testing was 0.47 and 0.55.

5.4. WORST-CASE CONFIGURATION AND MODE

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

In addition, Type A, B, F, and V at each supported data rate and with/without a tag were investigated to determine the worst case based on the highest power and spurious emissions. Type A, 106Kbps without tag was determined to be the worst case and therefore Type A, 106Kbps without tag 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 R14311585-EP3 for setup diagrams.

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 1)

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
0.009-30MHz					
AT0079	Active Loop Antenna	ETS-Lindgren	6502	2021-08-19	2022-08-19
30-1000 MHz					
AT0066	Hybrid Broadband Antenna	Sunol Sciences Corp.	JB1	2022-03-01	2023-03-01
Gain-Loss Chains					
C1-SAC01	Gain-loss string: 0.009-30MHz	Various	Various	2022-05-05	2023-05-05
C1-SAC02	Gain-loss string: 25-1000MHz	Various	Various	2022-05-05	2023-05-05
Receiver & Software					
197954	Spectrum Analyzer	Rohde & Schwarz	ESW44	2022-04-14	2023-04-14
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
Additional Equipment used					
s/n 181474341	Environmental Meter	Fisher Scientific	15-077-963	2021-09-27	2022-09-27

Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
HI0096	Environmental Meter	Fisherbrand	14-650-118	2021-09-21	2022-09-22
SA0027	Spectrum Analyzer	Keysight	N9030A	2022-05-24	2023-05-24
-	DC Power Supply	Keysight Technologies	E3633A	-	-
MM0167	True RMS Multimeter	Keysight Technologies	U1232A	2021-08-17	2023-08-17
76023 (EC0225)	Temp/Humid Chamber	Cincinnati Sub-Zero	ZPH-8-3.5-SCT/AC	2022-05-24	2023-05-24
SOFTEMI	Antenna Port Software	UL	Version 2022.5.4		
-	Near Field Probe Kit	ETS	7405	-	-

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

Equipment ID	Description	Manufacturer	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
LISN001	LISN, 50-ohm/50-uH, 2-conductor, 25A	Fischer Custom Com.	FCC-LISN-50-25-2-01-550V	2021-08-16	2022-08-16
75141	EMI Test Receiver 9kHz-7GHz	Rohde & Schwarz	ESCI 7	2021-08-17	2022-08-17
ATA222	Transient Limiter, 0.009-100MHz	Electro-Metrics	EM-7600	2022-04-05	2023-04-05
PS214	AC Power Source	Elgar	CW2501M (s/n 1523A02396)	NA	NA
SOFTEMI	EMI Software	UL	Version 9.5 (18 Oct 2021)		
CDECABLE001	ANSI C63.4 1m extension cable.	UL	Per Annex B of ANSI C63.4	2021-09-13	2022-09-13

7. 20dB BANDWIDTH

LIMITS

None; for reporting purposes only.

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	120.3
424	13.56	1382.0
212	13.56	873.4
106	13.56	437.6

Type B (CE Mode)

Mode Kbps	Frequency (MHz)	20dB Bandwidth (kHz)
848	13.56	28.43
424	13.56	8.231
212	13.56	8.358
106	13.56	8.645

Type F (CE Mode)

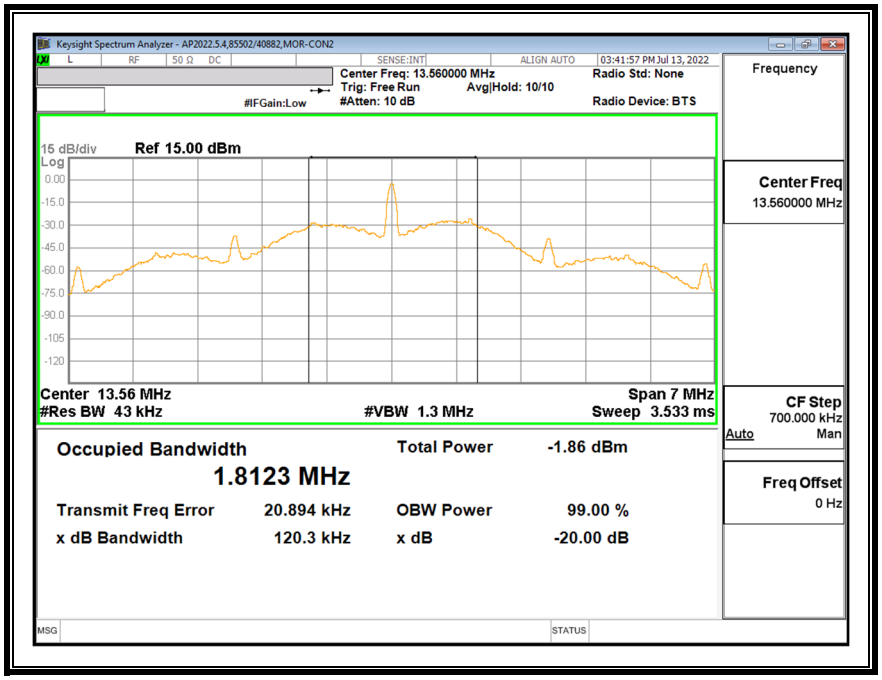
Mode Kbps	Frequency (MHz)	20dB Bandwidth (kHz)
424	13.56	28.29
212	13.56	27.55

Type V (CE Mode)

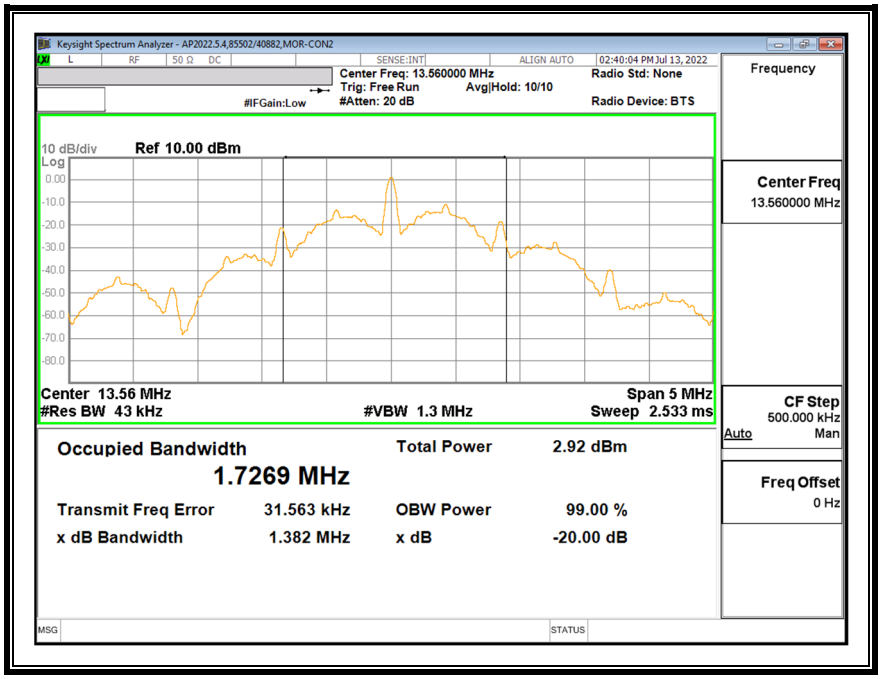
Mode Kbps	Frequency (MHz)	20dB Bandwidth (kHz)
26	13.56	128.0

7.1. Type A (CE Mode)

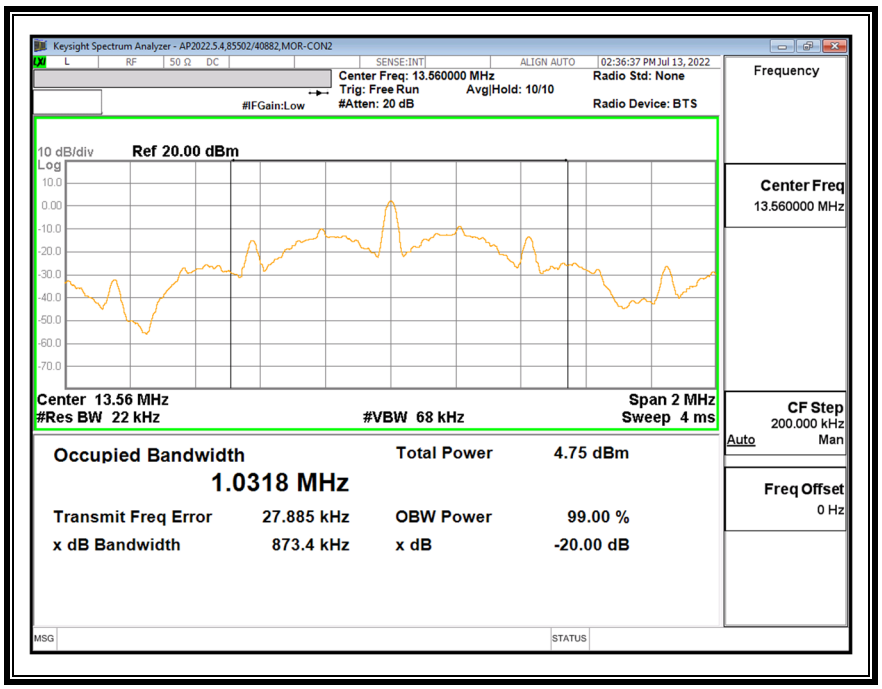
848Kbps



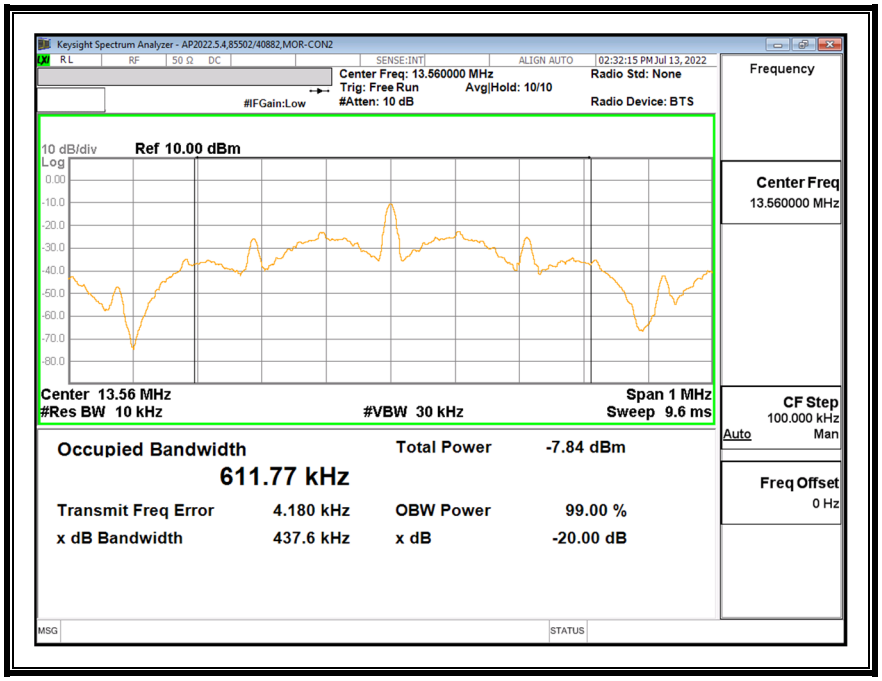
424Kbps



212Kbps

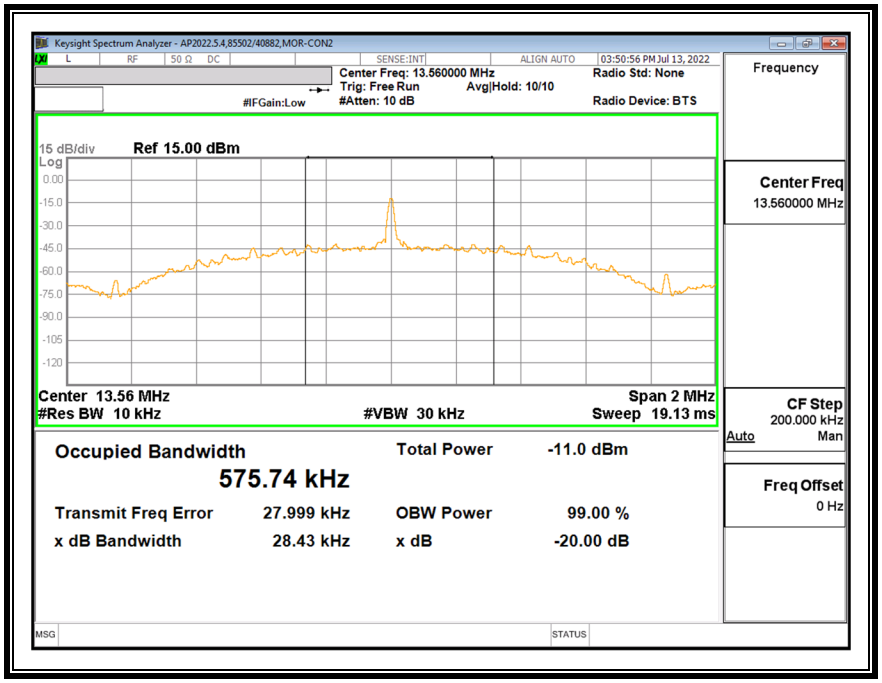


106Kbps

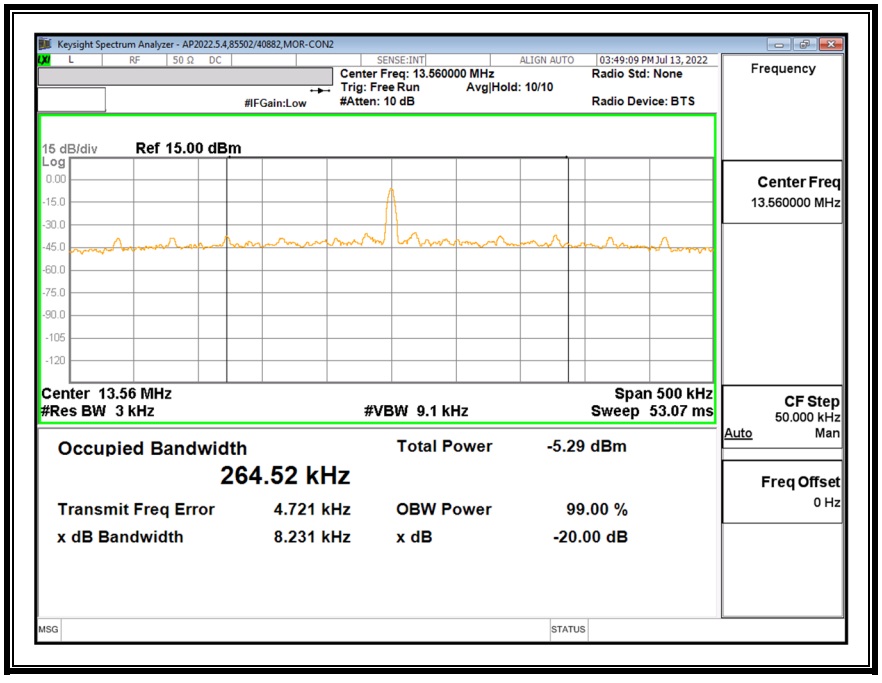


7.2. Type B (CE Mode)

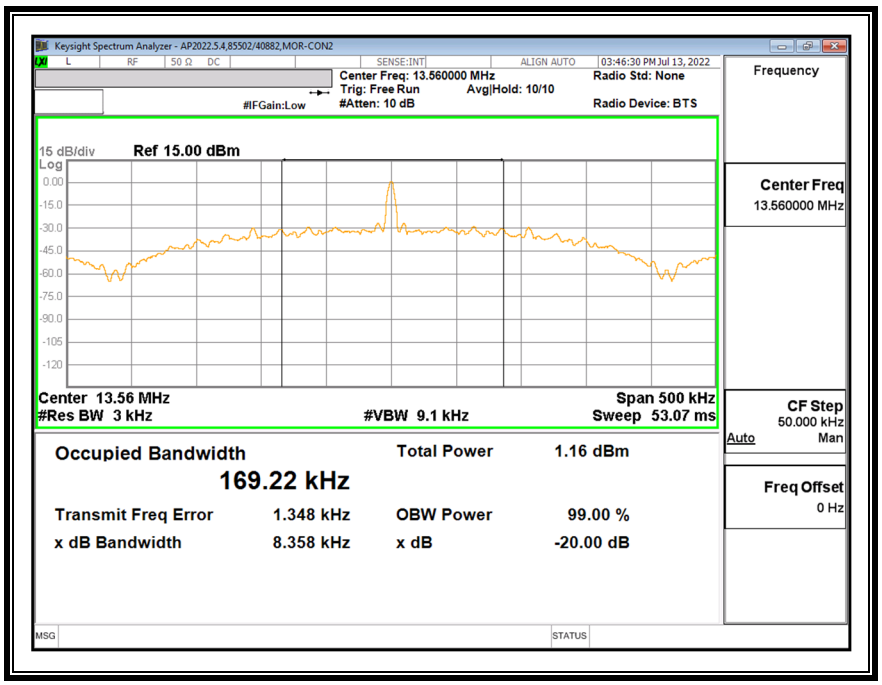
848Kbps



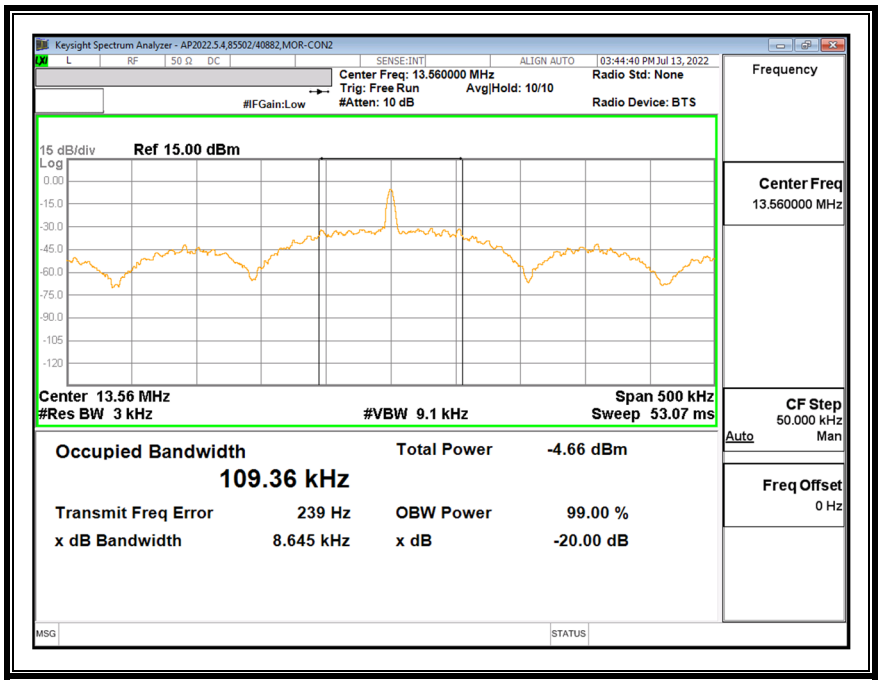
424Kbps



212Kbps

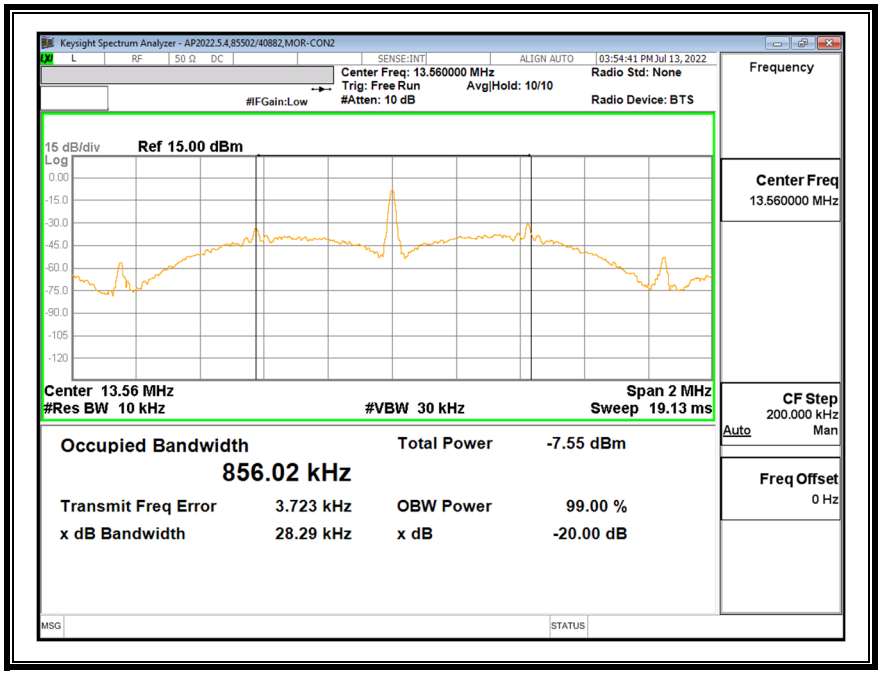


106Kbps

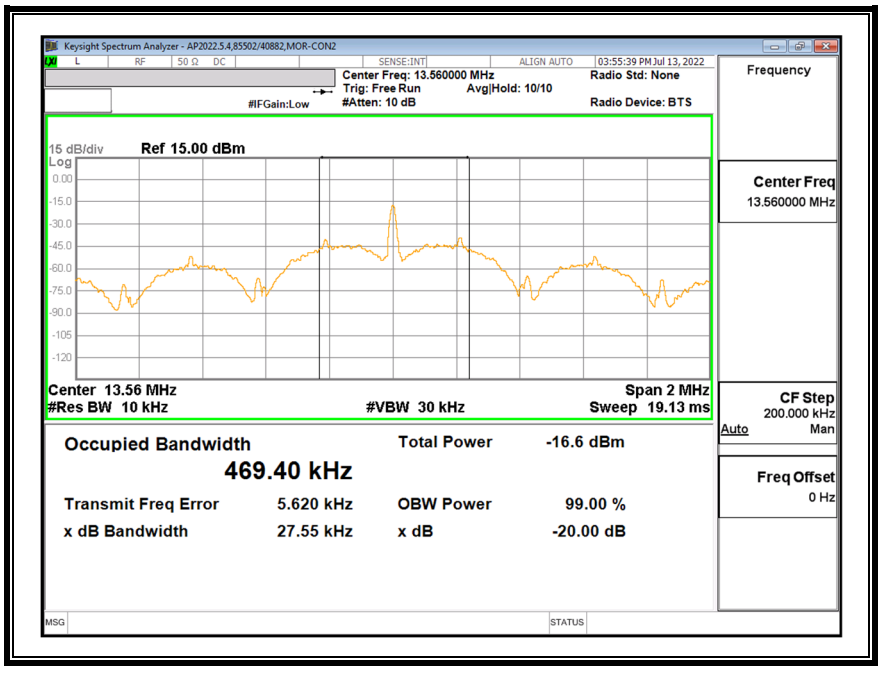


7.3. Type F (CE Mode)

424Kbps

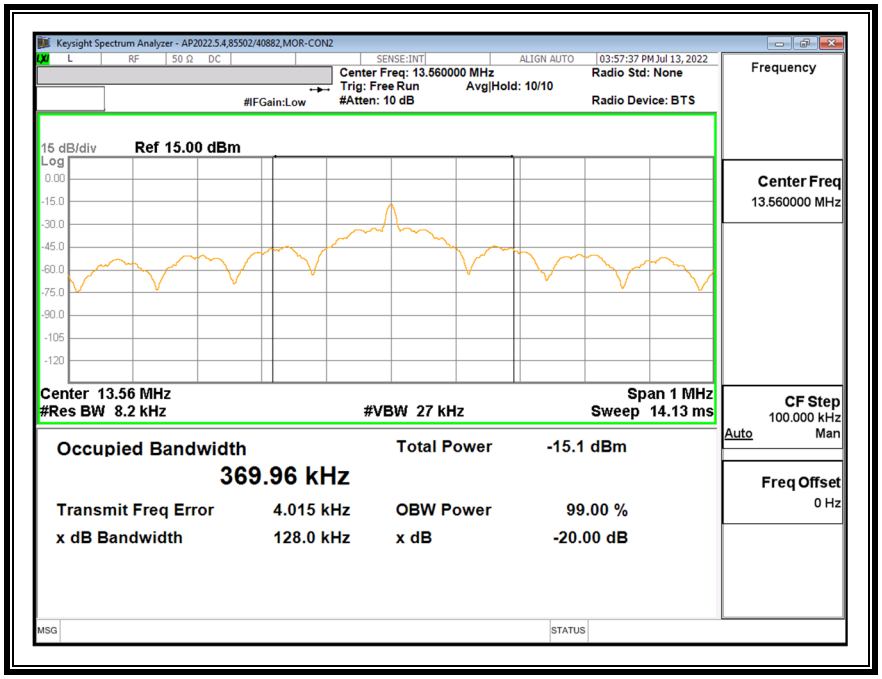


212Kbps



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 (d) The provisions in §§ 15.225, 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

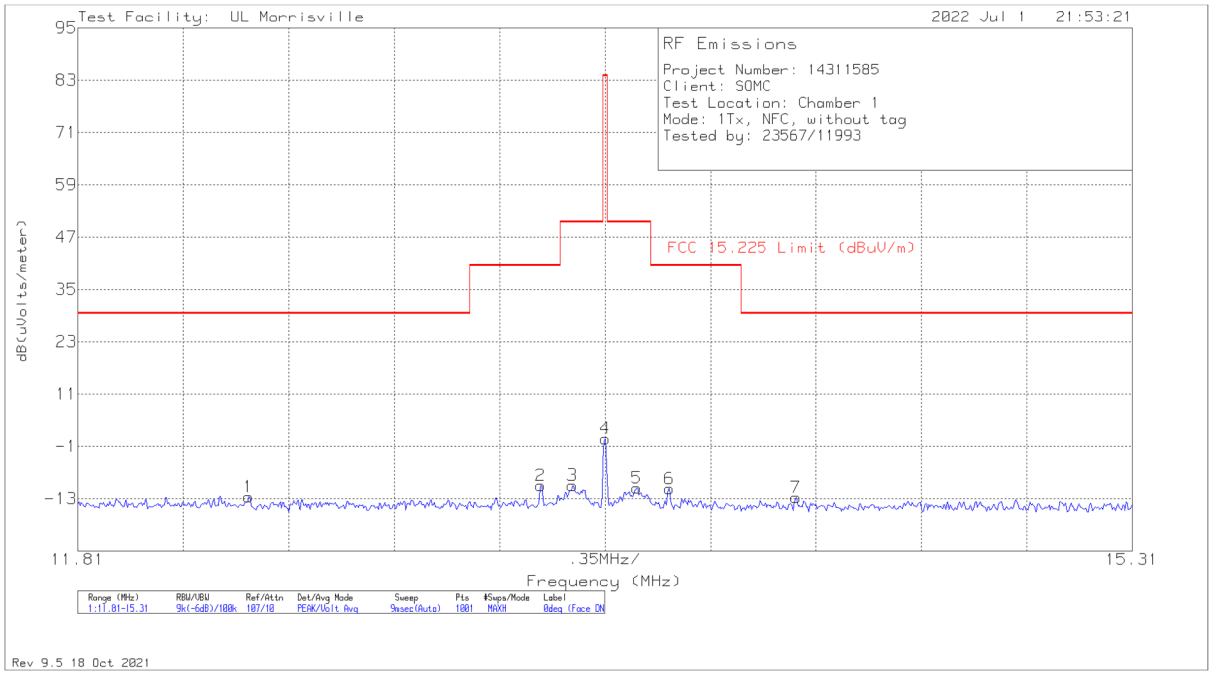
The EUT is an intentional radiator that incorporates a digital device, the highest fundamental frequency generated or used in the device is 13.56 MHz; therefore, the frequency range was investigated from 0.009 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater.

RESULTS

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

8.2.1. Type A (CE Mode)

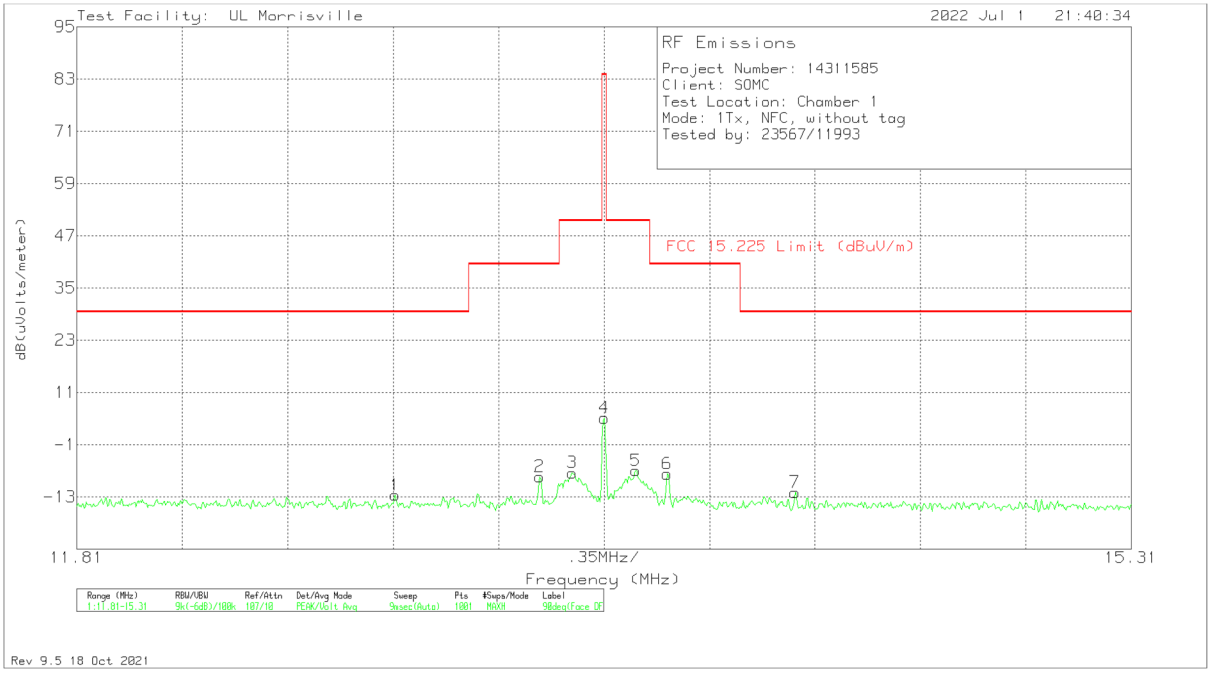
FUNDAMENTAL 106Kbps – Face On, 0 Deg



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/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	12.377	16.38	Pk	10.3	.7	-40	-12.62	29.5	-42.12	356	100	0 degs
2	13.3465	18.99	Pk	10.2	.8	-40	-10.01	40.5	-50.51	356	100	0 degs
3	13.4515	19.03	Pk	10.2	.8	-40	-9.97	50.5	-60.47	356	100	0 degs
4	13.56	29.78	Pk	10.2	.8	-40	.78	84	-83.22	356	100	0 degs
5	13.665	18.4	Pk	10.2	.8	-40	-10.6	50.5	-61.1	356	100	0 degs
6	13.7735	18.36	Pk	10.1	.8	-40	-10.74	40.5	-51.24	356	100	0 degs
7	14.1935	16.37	Pk	10.1	.8	-40	-12.73	29.5	-42.23	356	100	0 degs

Pk - Peak detector

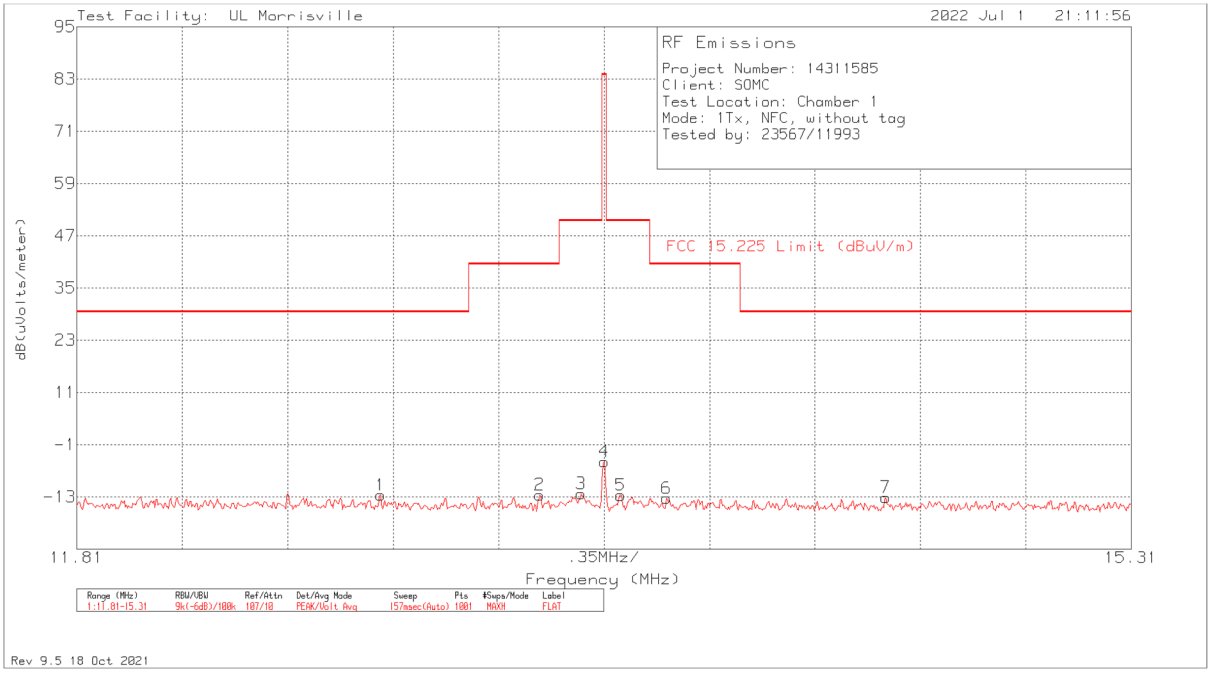
FUNDAMENTAL 106Kbps – Face Off, 90 Deg



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/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	12.867	16.38	Pk	10.3	.7	-40	-12.62	29.5	-42.12	91	100	90 degs
2	13.3465	20.65	Pk	10.2	.8	-40	-8.35	40.5	-48.85	91	100	90 degs
3	13.455	21.54	Pk	10.2	.8	-40	-7.46	50.5	-57.96	91	100	90 degs
4	13.56	34.13	Pk	10.2	.8	-40	5.13	84	-78.87	91	100	90 degs
5	13.665	22.02	Pk	10.2	.8	-40	-6.98	50.5	-57.48	91	100	90 degs
6	13.77	21.38	Pk	10.1	.8	-40	-7.72	40.5	-48.22	91	100	90 degs
7	14.1935	17.14	Pk	10.1	.8	-40	-11.96	29.5	-41.46	91	100	90 degs

Pk - Peak detector

FUNDAMENTAL 106Kbps – Horizontal, Flat

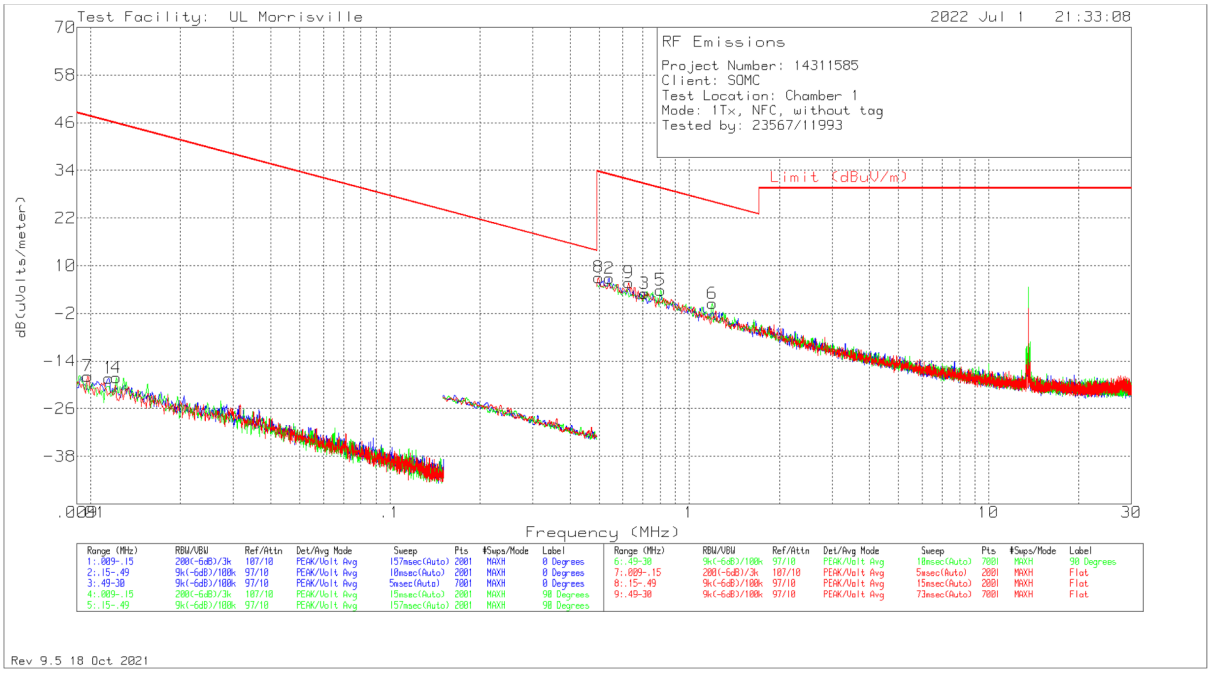


Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0079 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Loop Angle
1	12.818	16.38	Pk	10.3	.7	-40	-12.62	29.5	-42.12	111	100	Flat
2	13.3465	16.46	Pk	10.2	.8	-40	-12.54	40.5	-53.04	111	100	Flat
3	13.483	16.71	Pk	10.2	.8	-40	-12.29	50.5	-62.79	111	100	Flat
4	13.56	24.13	Pk	10.2	.8	-40	-4.87	84	-88.87	111	100	Flat
5	13.61425	16.35	Pk	10.2	.8	-40	-12.65	50.5	-63.15	111	100	Flat
6	13.7665	15.78	Pk	10.1	.8	-40	-13.32	40.5	-53.82	111	100	Flat
7	14.4945	15.97	Pk	10.1	.8	-40	-13.13	29.5	-42.63	111	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	AT0079 (dB/m)	Gain/Loss (dB)	Dist. Corr. Factor (dB)	Corrected Reading dB(uVolts/meter)	Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Loop Angle
7	.00978	43.51	Pk	18.6	.1	-80	-17.79	47.8	-65.59	0-360	Flat
1	.01149	43.78	Pk	17.8	.1	-80	-18.32	46.4	-64.72	0-360	0 degs
4	.0122	44.19	Pk	17.5	.1	-80	-18.21	45.88	-64.09	0-360	90 degs
8	.49843	35.66	Pk	11.2	.2	-40	7.06	33.65	-26.59	0-360	Flat
2	.54059	35.43	Pk	11.2	.2	-40	6.83	32.95	-26.12	0-360	0 degs
9	.62913	34.23	Pk	11.3	.2	-40	5.73	31.63	-25.9	0-360	Flat
3	.70923	31.5	Pk	11.3	.2	-40	3	30.59	-27.59	0-360	0 degs
5	.80198	32.34	Pk	11.3	.2	-40	3.84	29.52	-25.68	0-360	90 degs
6	1.19407	28.96	Pk	11.3	.2	-40	.46	26.06	-25.6	0-360	90 degs

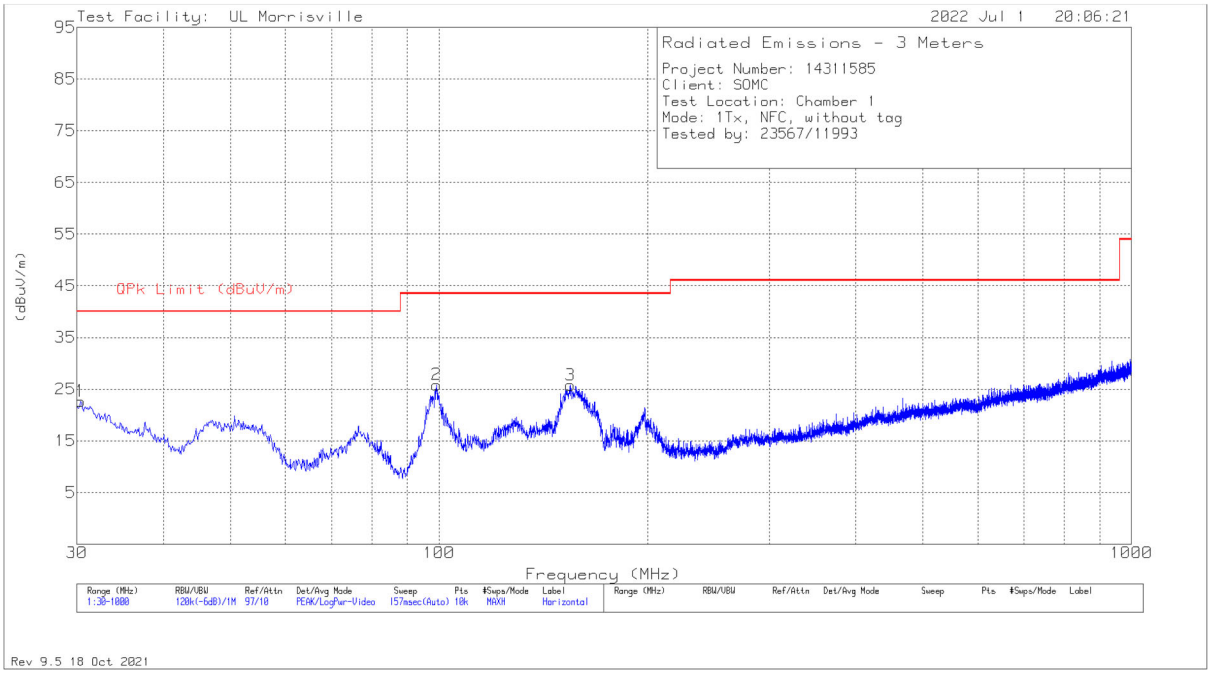
Pk - Peak detector

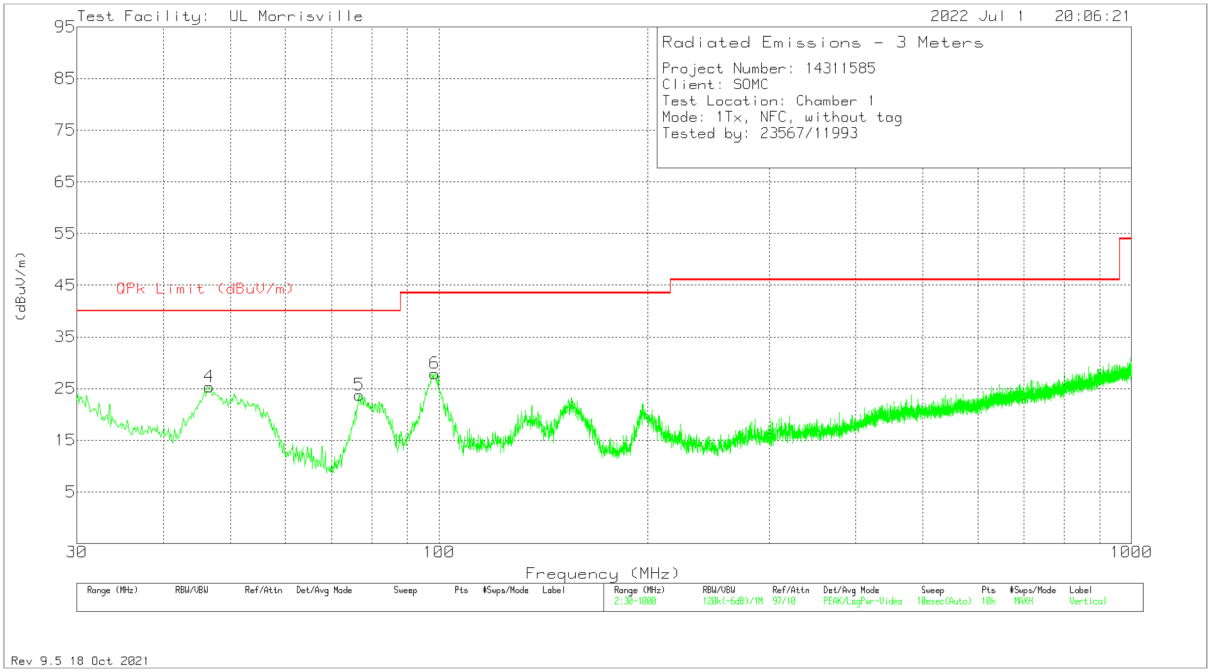
Note: All markers are noise floor.

8.3. TX SPURIOUS EMISSION 30 TO 1000 MHz

8.3.1. Type A (CE Mode)

SPURIOUS EMISSION 106Kbps





Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0066 (dB/m)	Gain/Loss (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30.388	27.25	Pk	26.7	-31.3	22.65	40	-17.35	0-360	299	H
4	46.587	41.45	Pk	15.2	-31.3	25.35	40	-14.65	0-360	100	V
5	76.754	40.76	Pk	13.8	-30.8	23.76	40	-16.24	0-360	100	V
6	98.676	42.63	Pk	15.9	-30.6	27.93	43.52	-15.59	0-360	100	V
2	99.258	40.25	Pk	16.1	-30.5	25.85	43.52	-17.67	0-360	299	H
3	154.936	37.45	Pk	18.2	-29.9	25.75	43.52	-17.77	0-360	299	H

Pk - Peak detector

9. FREQUENCY STABILITY

LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within ±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 maximam 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 A

9.1.1. CE Mode

106Kbps

Reference Frequency: EUT Channel 13.56 MHz @ 20ºC Limit: ± 100 ppm = 1.356 kHz										
Power Supply	Envir. Temp	Frequency Deviation Measureed with Time Elapse								
(Vdc)	(ºC)	Startup (MHz)	Delta (ppm)	@ 2 mins (MHz)	Delta (ppm)	@ 5 mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.89	50	13.5598289	1.779	13.5598292	1.753	13.5598296	1.728	13.5598302	1.683	± 100
3.89	40	13.5598342	1.386	13.5598335	1.439	13.5598331	1.469	13.5598326	1.505	± 100
3.89	30	13.5598567	-0.277	13.5598540	-0.075	13.5598519	0.082	13.5598501	0.215	± 100
3.89	***20***	***13.5598530***	***0.000***	***13.5598530***	***0.002***	***13.5598529***	***0.004***	***13.5598527***	***0.023***	***± 100***
3.89	10	13.5599094	-4.158	13.5599077	-4.033	13.5599067	-3.960	13.5599054	-3.864	± 100
3.89	0	13.5599238	-5.224	13.5599236	-5.207	13.5599232	-5.181	13.5599228	-5.145	± 100
3.89	-10	13.5599127	-4.401	13.5599138	-4.481	13.5599148	-4.555	13.5599154	-4.603	± 100
3.89	-20	13.5599139	-4.496	13.5599046	-3.809	13.5598955	-3.136	13.5598870	-2.507	± 100
4.28	20	13.5598525	0.033	13.5598520	0.073	13.5598524	0.044	13.5598524	0.040	± 100
3.69	20	13.5598526	0.030	13.5598523	0.047	13.5598525	0.037	13.5598525	0.034	± 100

Tested by: 85502/40882
Test date: 2022-07-07

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 50μH/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 (dBμV)	
	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

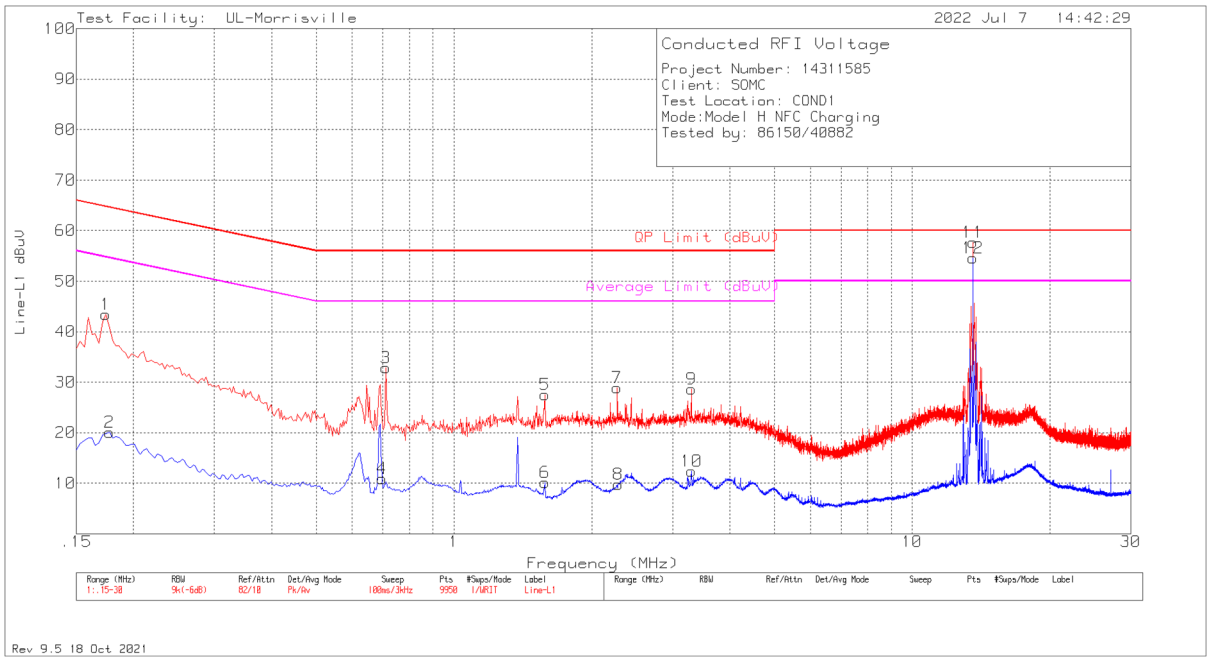
RESULTS

No non-compliance noted:

10.1. Type A (CE Mode)

10.1.1. NORMAL OPERATION, 106Kbps

LINE 1 RESULTS

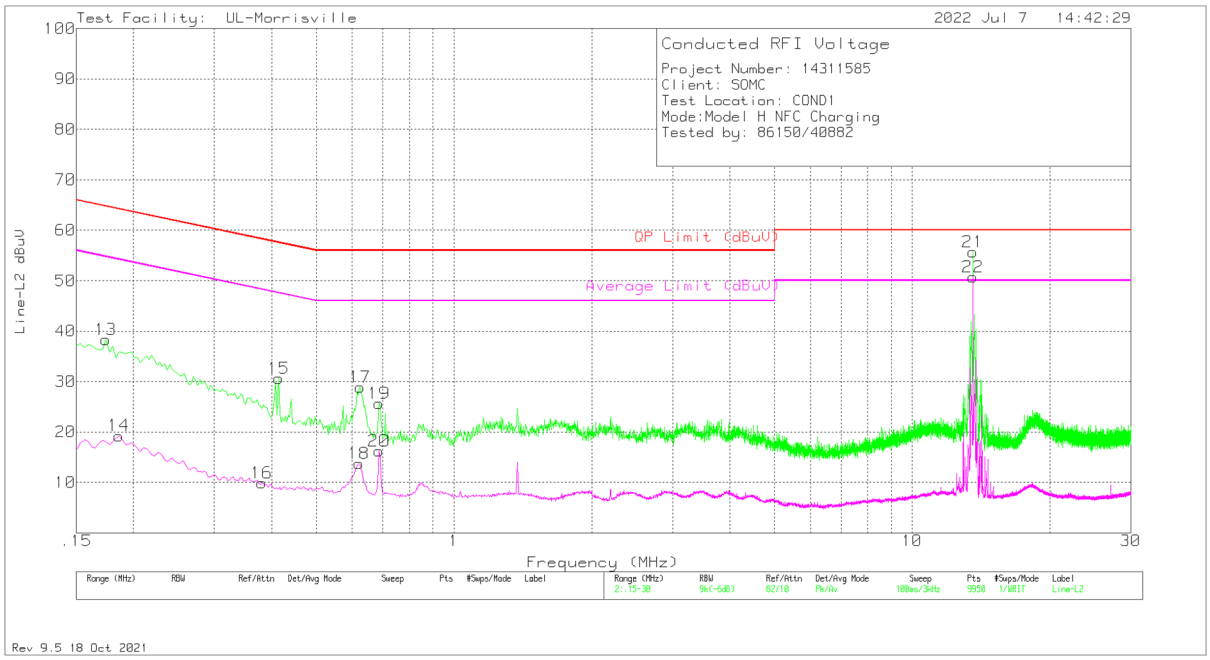


Range 1: Line-L1 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
1	.174	33.39	Pk	.2	9.8	43.39	64.77	-21.38	-	-
2	.177	10.05	Av	.2	9.8	20.05	-	-	54.63	-34.58
4	.696	1.06	Av	0	9.8	10.86	-	-	46	-35.14
3	.711	23.08	Pk	0	9.8	32.88	56	-23.12	-	-
5	1.578	17.71	Pk	0	9.8	27.51	56	-28.49	-	-
6	1.578	.37	Av	0	9.8	10.17	-	-	46	-35.83
7	2.271	19.14	Pk	0	9.8	28.94	56	-27.06	-	-
8	2.283	-.02	Av	0	9.8	9.78	-	-	46	-36.22
9	3.297	18.7	Pk	0	9.9	28.6	56	-27.4	-	-
10	3.3	2.46	Av	0	9.9	12.36	-	-	46	-33.64
11	13.56	46.76	Qp	.1	10	56.86	60	-3.14	-	-
12	13.56	44.48	Av	.1	10	54.58	-	-	**50**	**4.58**

Pk - Peak detector
Av - Average detection
Qp - Quasi-Peak detector

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



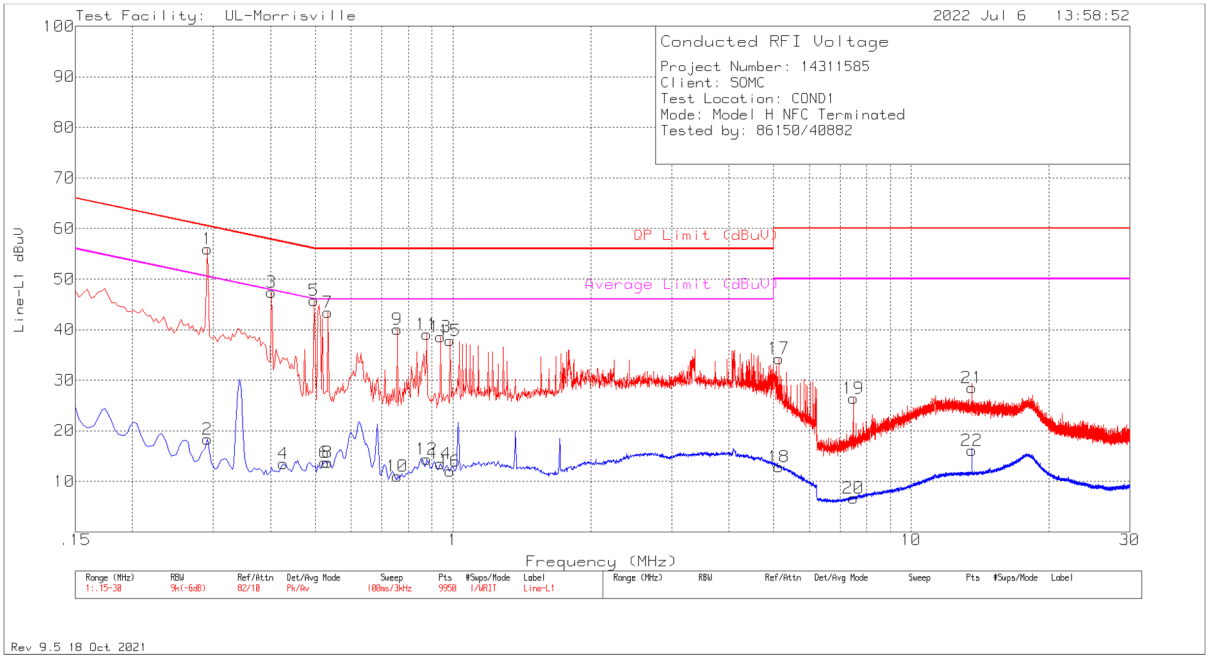
Range 2: Line-L2 .15 - 30MHz										
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN VCF (dB)	Cbl/Limiter (dB)	Corrected Reading dBuV	QP Limit (dBuV)	Margin (dB)	Average Limit (dBuV)	Margin (dB)
13	.174	28.35	Pk	.2	9.8	38.35	64.77	-26.42	-	-
14	.186	9.27	Av	.2	9.8	19.27	-	-	54.21	-34.94
16	.381	.01	Av	.1	9.8	9.91	-	-	48.26	-38.35
15	.414	20.68	Pk	.1	9.8	30.58	57.57	-26.99	-	-
18	.621	3.91	Av	0	9.8	13.71	-	-	46	-32.29
17	.624	19.11	Pk	0	9.8	28.91	56	-27.09	-	-
19	.687	15.86	Pk	0	9.8	25.66	56	-30.34	-	-
20	.687	6.44	Av	0	9.8	16.24	-	-	46	-29.76
21	13.5605	44.28	Qp	.1	10	54.38	60	-5.62	-	-
22	13.56	40.65	Av	.1	10	50.75	-	-	**50**	**.75**

Pk - Peak detector
Qp - Quasi-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

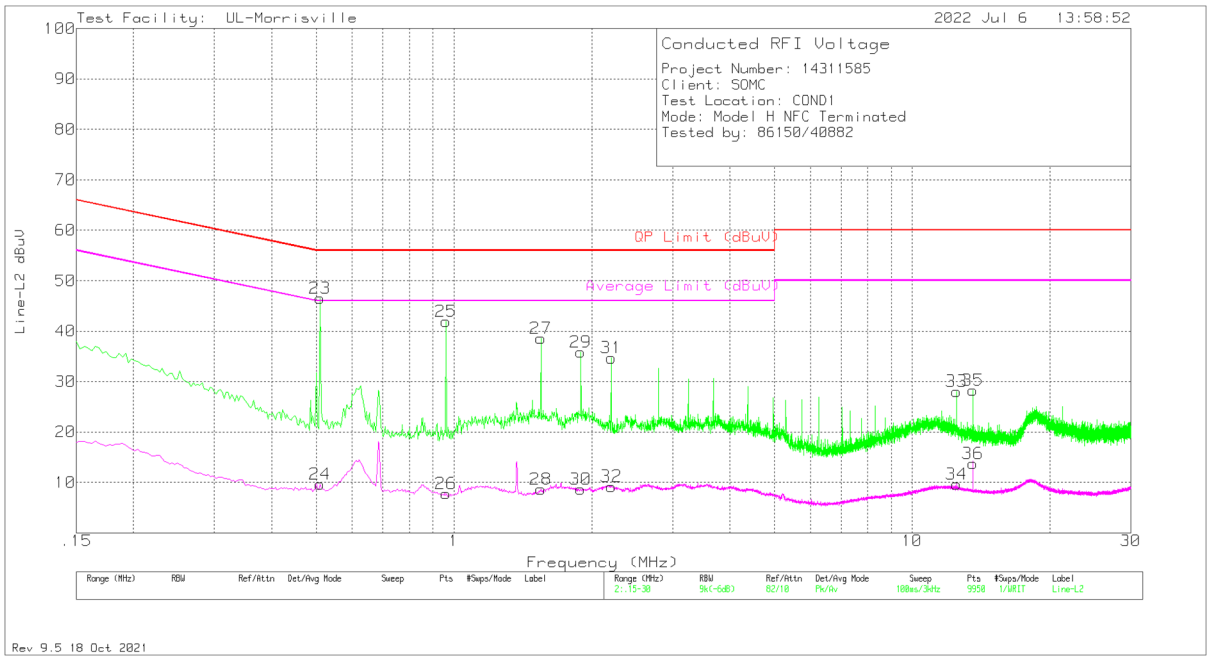
LINE 1 RESULTS



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	.29615	19.82	Qp	.1	9.8	29.72	60.35	-30.63	-	-
2	.291	8.41	Av	.1	9.8	18.31	-	-	50.5	-32.19
3	.402	37.45	Pk	.1	9.8	47.35	57.81	-10.46	-	-
4	.426	3.65	Av	.1	9.8	13.55	-	-	47.33	-33.78
5	.498	36.01	Pk	0	9.8	45.81	56.03	-10.22	-	-
6	.525	4	Av	0	9.8	13.8	-	-	46	-32.2
7	.534	33.58	Pk	0	9.8	43.38	56	-12.62	-	-
8	.534	3.99	Av	0	9.8	13.79	-	-	46	-32.21
9	.756	30.28	Pk	0	9.8	40.08	56	-15.92	-	-
10	.756	1.25	Av	0	9.8	11.05	-	-	46	-34.95
11	.876	29.23	Pk	0	9.8	39.03	56	-16.97	-	-
12	.876	4.54	Av	0	9.8	14.34	-	-	46	-31.66
13	.939	28.73	Pk	0	9.8	38.53	56	-17.47	-	-
14	.939	3.67	Av	0	9.8	13.47	-	-	46	-32.53
15	.984	28.08	Pk	0	9.8	37.88	56	-18.12	-	-
16	.984	2.21	Av	0	9.8	12.01	-	-	46	-33.99
17	5.148	24.39	Pk	0	9.9	34.29	60	-25.71	-	-
18	5.148	2.95	Av	0	9.9	12.85	-	-	50	-37.15
19	7.473	16.36	Pk	.1	10	26.46	60	-33.54	-	-
20	7.473	-3.44	Av	.1	10	6.66	-	-	50	-43.34
21	13.563	18.41	Pk	.1	10	28.51	60	-31.49	-	-
22	13.563	6.05	Av	.1	10	16.15	-	-	50	-33.85

Pk - Peak detector
Qp - Quasi-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)
23	.51	36.7	Pk	0	9.8	46.5	56	-9.5	-	-
24	.51	-.19	Av	0	9.8	9.61	-	-	46	-36.39
25	.96	32.18	Pk	0	9.8	41.98	56	-14.02	-	-
26	.96	-1.96	Av	0	9.8	7.84	-	-	46	-38.16
27	1.548	28.83	Pk	0	9.8	38.63	56	-17.37	-	-
28	1.548	-1.16	Av	0	9.8	8.64	-	-	46	-37.36
29	1.893	26.03	Pk	0	9.8	35.83	56	-20.17	-	-
30	1.893	-1.13	Av	0	9.8	8.67	-	-	46	-37.33
31	2.205	24.87	Pk	0	9.8	34.67	56	-21.33	-	-
32	2.205	-.59	Av	0	9.8	9.21	-	-	46	-36.79
33	12.507	17.98	Pk	.1	10	28.08	60	-31.92	-	-
34	12.507	-.47	Av	.1	10	9.63	-	-	50	-40.37
35	13.563	18.15	Pk	.1	10	28.25	60	-31.75	-	-
36	13.563	3.62	Av	.1	10	13.72	-	-	50	-36.28

Pk - Peak detector
Qp - Quasi-Peak detector
Av - Average detection

11. SETUP PHOTOS

Please refer to R14311585-EP3 for setup photos.

END OF TEST REPORT