



CERTIFICATION TEST REPORT

REPORT NUMBER : 11760905-E7V1

APPLICANT : SONY MOBILE COMMUNICATIONS INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA -KU,TOKYO, 140-0002, JAPAN

FCC ID : PY7-32042D

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

TEST STANDARD(S) : FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

July 26, 2017

Prepared by:

UL Verification Services Inc.
47173 Benicia Street
Fremont, CA 94538, U.S.A.
TEL: (510) 771-1000
FAX: (510) 661-0888



NVLAP Lab code: 200246-0

Revision History

Ver.	Issue Date	Revisions	Revised By
V1	07/26/17	Initial Issue	D. Corona

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION.....	5
4. CALIBRATION AND UNCERTAINTY	6
4.1. MEASURING INSTRUMENT CALIBRATION	6
4.2. SAMPLE CALCULATION.....	6
4.3. MEASUREMENT UNCERTAINTY	6
5. EQUIPMENT UNDER TEST	7
5.1. DESCRIPTION OF EUT.....	7
5.2. MAXIMUM FIELD STRENGTH	7
5.3. DESCRIPTION OF AVAILABLE ANTENNAS	7
5.4. SOFTWARE AND FIRMWARE	7
5.5. WORST-CASE CONFIGURATION AND MODE.....	7
5.6. MODIFICATIONS	7
5.7. DESCRIPTION OF TEST SETUP.....	8
6. TEST AND MEASUREMENT EQUIPMENT	10
7. OCCUPIED BANDWIDTH.....	11
8. RADIATED EMISSION TEST RESULTS.....	17
8.1. LIMITS AND PROCEDURE	17
8.1.1. FUNDAMENTAL EMISSION MASK (11.56 – 15.56MHz).....	19
8.1.2. SPURIOUS EMISSIONS (0.09 – 30MHz)	21
8.1.3. TX SPURIOUS EMISSIONS (30 – 1000MHz)	22
9. AC MAINS LINE CONDUCTED EMISSIONS.....	24
10. FREQUENCY STABILITY	29
11. SETUP PHOTOS	30

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SONY MOBILE COMMUNICATIONS, INC.
4-12-3 HIGASHI-SHINAGAWA,
SHINAGAWA –KU, TOKYO, 140-0002, JAPAN

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

SERIAL NUMBER: 1051929 (Radiated unit), 1051932 (Antenna terminated)

DATE TESTED: JULY 14 to 24, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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 NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:



DAN CORONIA
CONSUMER TECHNOLOGY DIVISION
WISE PROJECT LEAD
UL VERIFICATION SERVICES INC

Prepared By:



GLENN ESCANO
CONSUMER TECHNOLOGY DIVISION
WISE LAB ENGINEER
UL VERIFICATION SERVICES INC

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

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street		47266 Benicia Street	
<input type="checkbox"/>	Chamber A (IC:2324B-1)	<input type="checkbox"/>	Chamber D (IC:22541-1)
<input checked="" type="checkbox"/>	Chamber B (IC:2324B-2)	<input type="checkbox"/>	Chamber E (IC: 22541-2)
<input type="checkbox"/>	Chamber C (IC:2324B-3)	<input type="checkbox"/>	Chamber F (IC: 22541-3)
		<input type="checkbox"/>	Chamber G (IC: 22541-4)
		<input type="checkbox"/>	Chamber H (IC: 22541-5)

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

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, GPS & NFC

5.2. MAXIMUM FIELD STRENGTH

The testing was performed at 3 meter. The transmitter maximum E-field at 30 meter distance is 18 dBuV/m which is converted from the 3 meter data.

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes loop antenna.

5.4. SOFTWARE AND FIRMWARE

The software version installed in the EUT during testing was 0.274.

5.5. WORST-CASE CONFIGURATION AND MODE

Radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y, Z, it was determined that Z-Axis orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z-Axis orientation.

5.6. MODIFICATIONS

No modifications were made during testing.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	SONY	UCH 20	3416W45305756	NA
Headphones	SONY	N/A	N/A	N/A

I/O CABLES

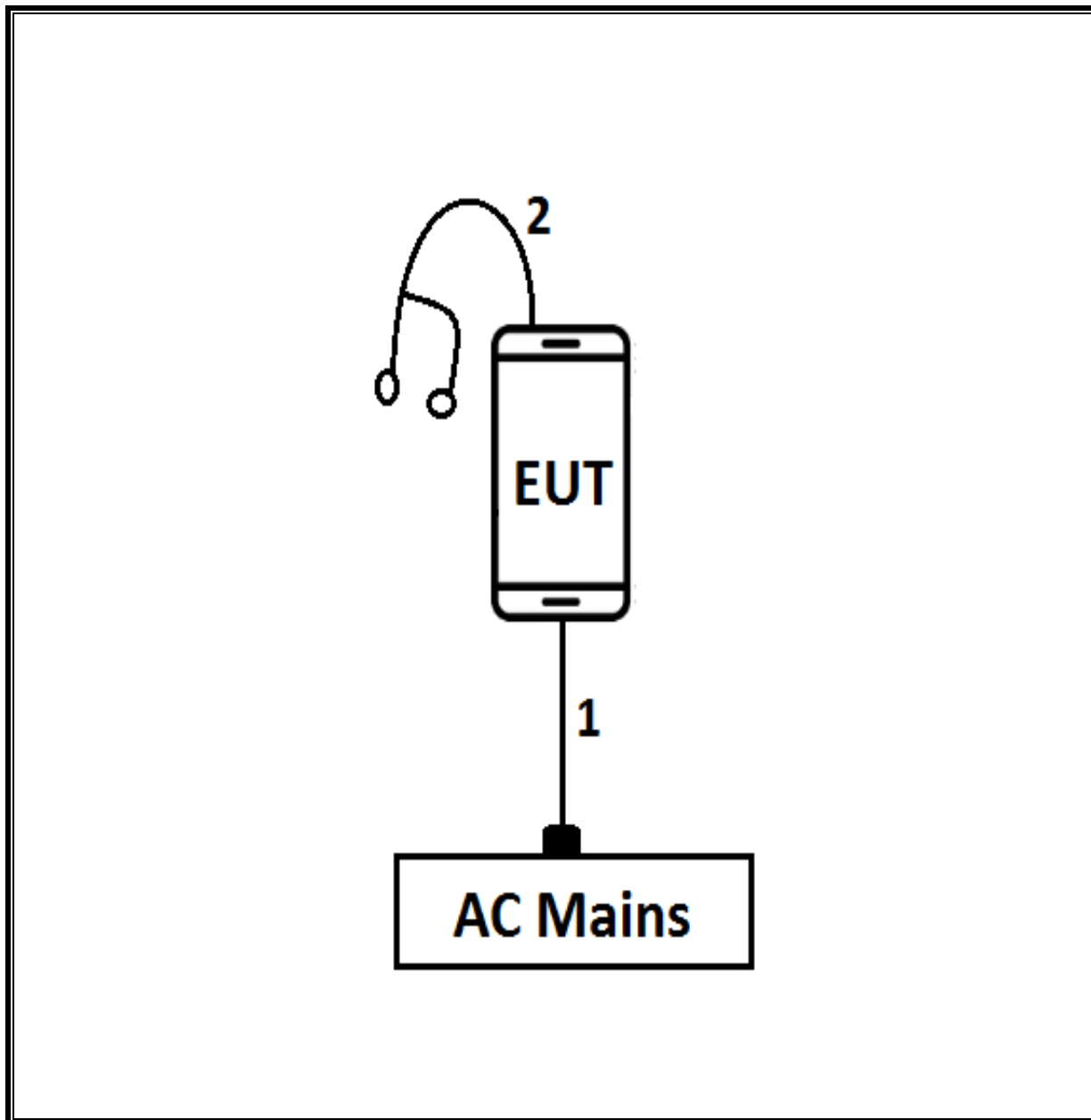
I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	USB	1	USB	Shielded	3	N/A
2	Audio	1	3.5mm	Shielded	1	N/A

TEST SETUP

The EUT is setup as a standalone device. Test software exercised the radio card.

SETUP DIAGRAM FOR TESTS

RADIATED AND AC LINE CONDUCTED EMISSIONS SETUP DIAGRAM



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Antenna, Broadband Hybrid, 30MHz to 2000MHz w/4dB Pad	Sunol Sciences Corp.	JB3	T1477	7/07/2018
Antenna, Active Loop 9kHz-30MHz	ETS-Lindgren	6502	T1683	02/17/2018
Amplifier, 10kHz-1GHz	Agilent (Keysight) Technologies	8447D	T300	11/10/2017
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T907	01/23/2018
Spectrum Analyzer, PXA, 3Hz to 44GHz	Agilent (Keysight) Technologies	N9030A	T1450	01/10/2018
Temperature Chamber	Thermotron Industries	SE-600-10-10	T80	08/21/2017
EMI Test Receiver	Rohde & Schwarz	ESR	T1436	01/18/2018
LISN	Fischer Custom Communications	FCC-LISN-50/250-25-2-01	T1310	06/08/2018
Transient Limiter	COM-POWER	LIT-930	T1457	02/24/2018

Test Software List			
Description	Manufacturer	Model	Version
Antenna Port Software	UL	UL RF	Ver 5.1.1, July 15, 2016
Radiated Emissions Software	UL	UL EMC	Ver 9.5, Dec 01, 2016

NOTE: *testing is completed before equipment calibration expiration date.

7. OCCUPIED BANDWIDTH

LIMITS

For reporting purposes only. Tested per ANSI C63.10 (6.9.3)

RESULTS

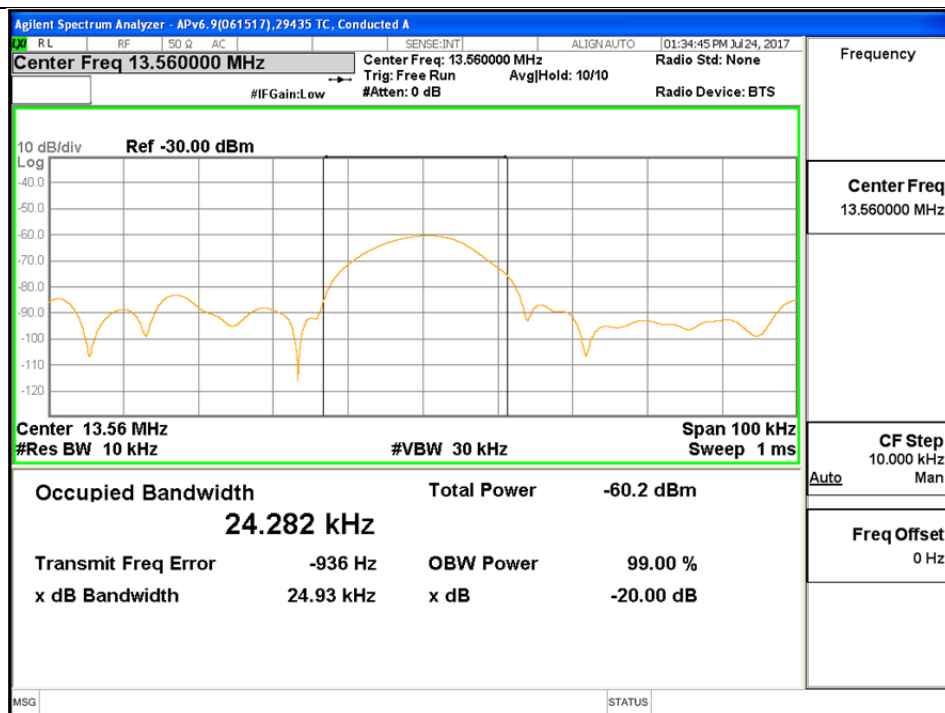
ID:	29435 TC	Date:	7/24/17
------------	----------	--------------	---------

Frequency (MHz)	Modulation	Data Rate (kbps)	99% Bandwidth (kHz)	20dB Bandwidth (kHz)
13.56	Type A	106	24.282	24.93
		212	22.363	25.25
		424	21.502	24.71
		848	21.155	24.89
	Type B	106	23.120	24.23
		212	22.183	25.64
		424	21.324	24.87
		848	21.211	24.65
	Type F	212	21.334	25.16
		424	21.327	25.20

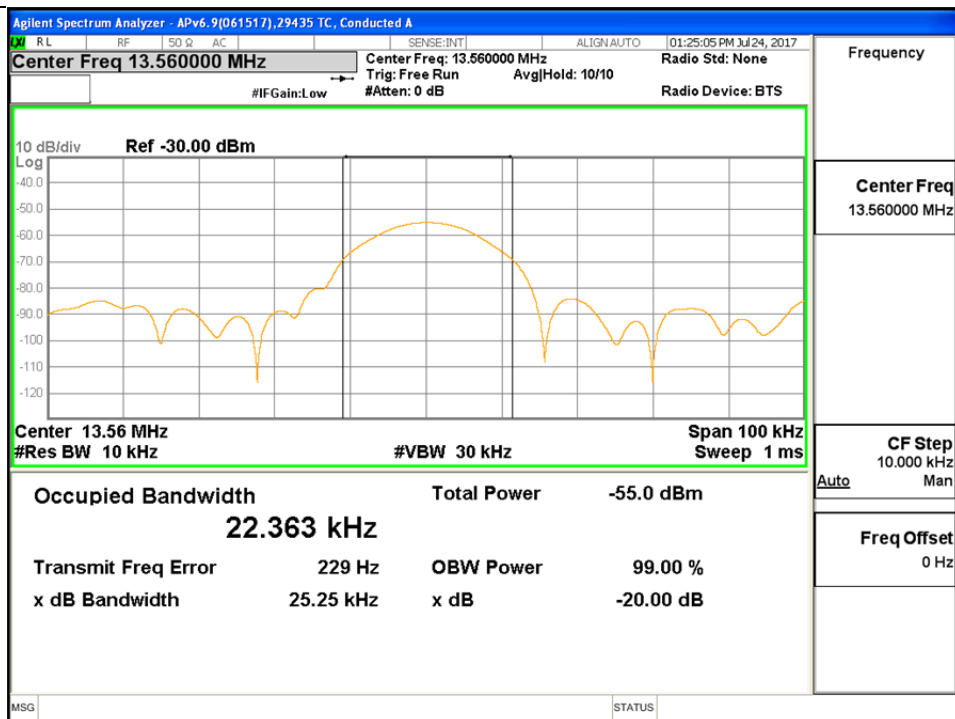
Note: Measured signal is CW adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

99% & 20dB Bandwidth

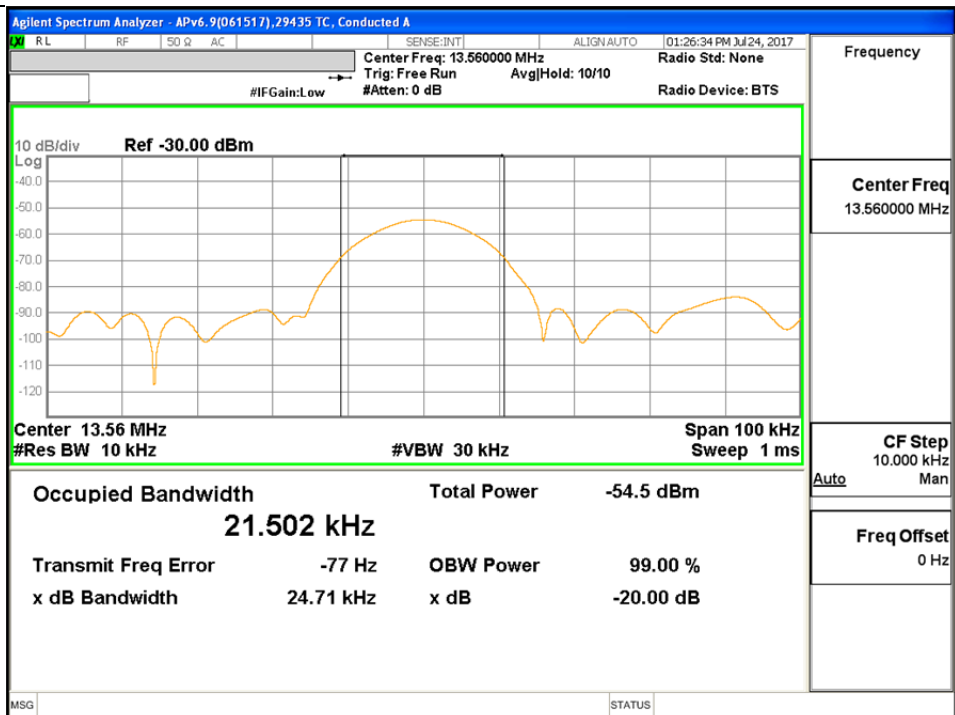
99% & 20dB BANDWIDTH TYPE A 106k



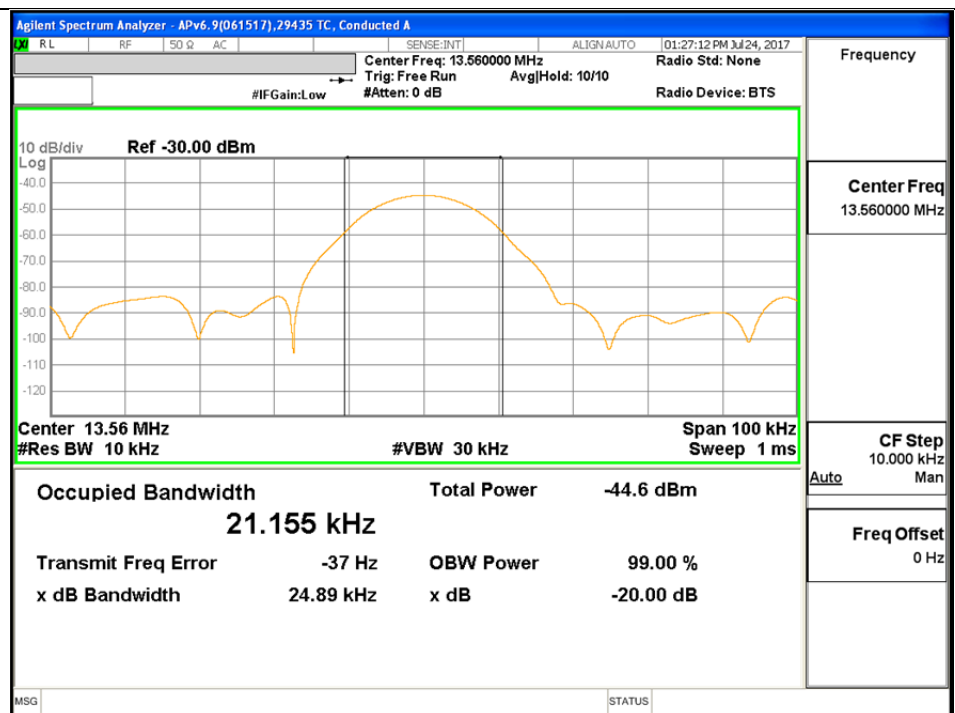
99% & 20dB BANDWIDTH TYPE A 212k



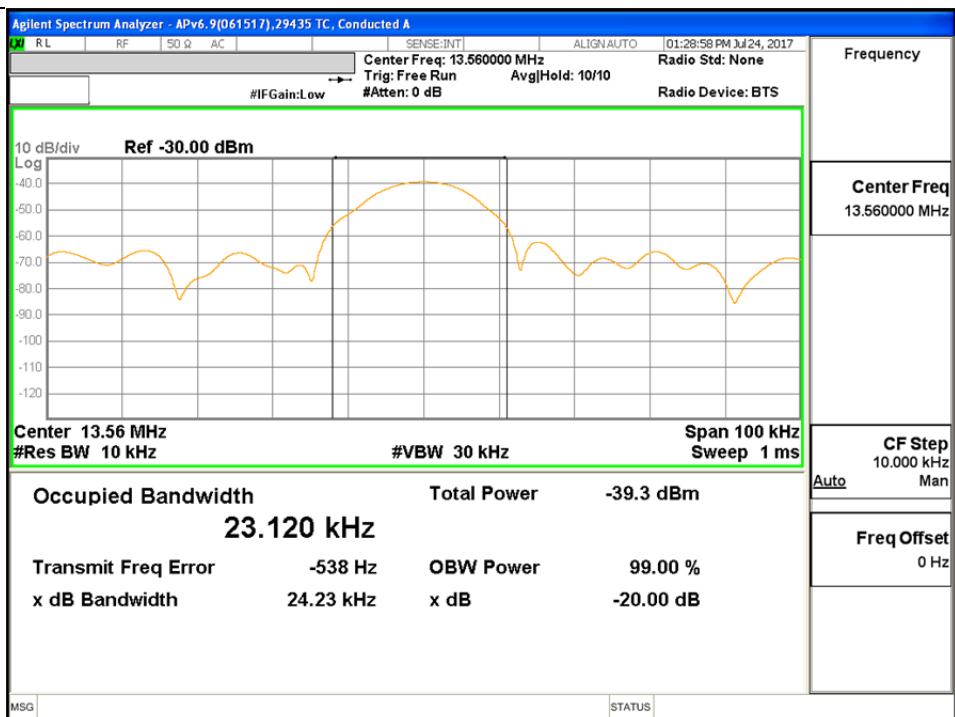
99% & 20dB BANDWIDTH TYPE A 424k



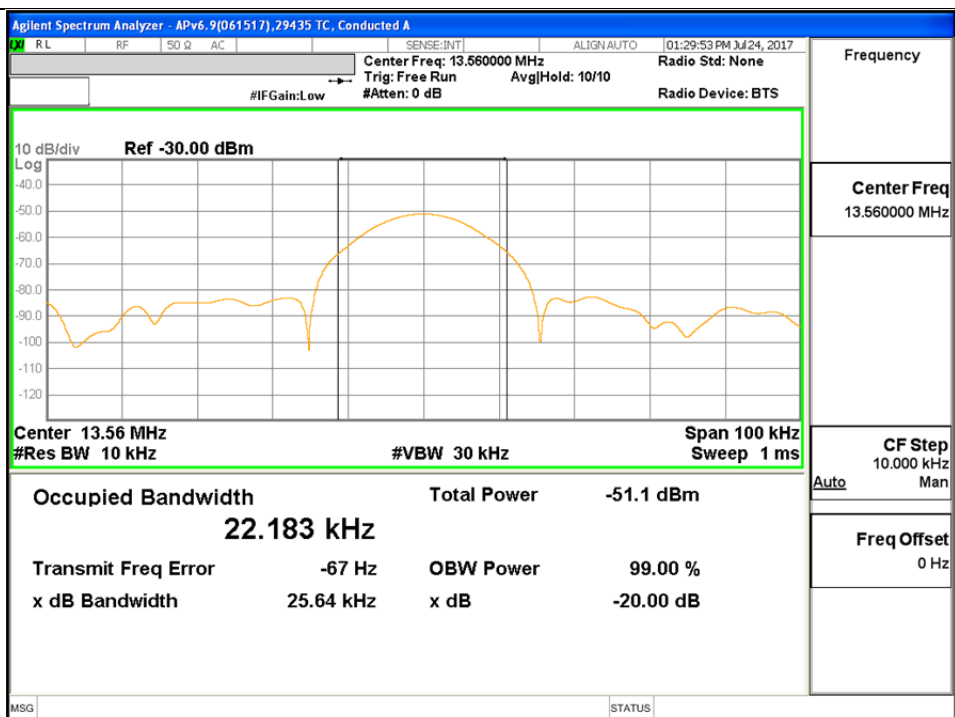
99% & 20dB BANDWIDTH TYPE A 848k



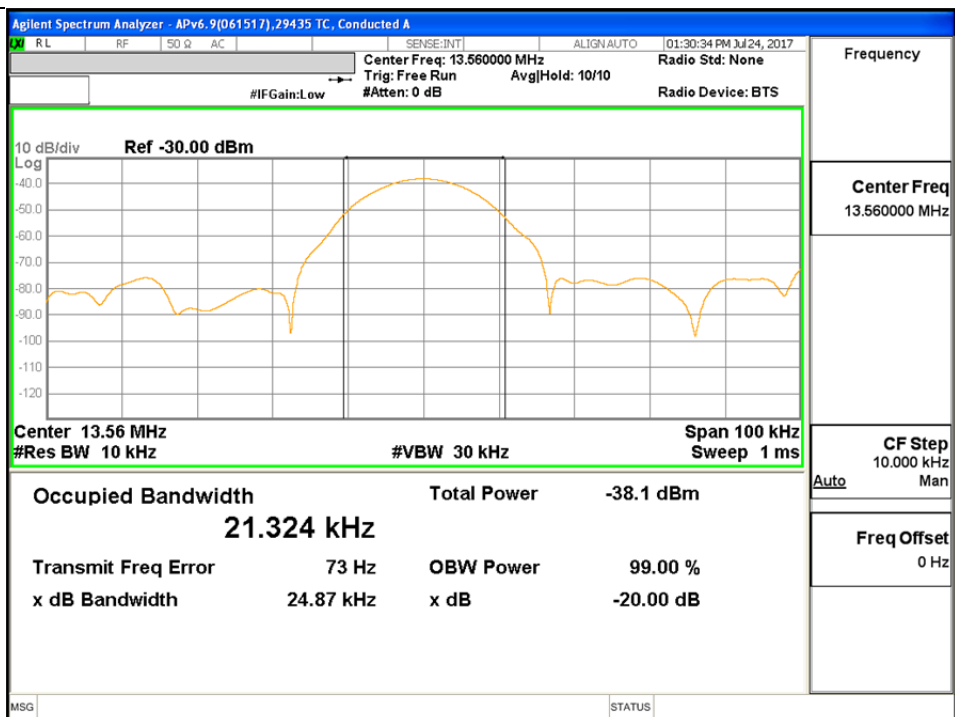
99% & 20dB BANDWIDTH TYPE B 106k



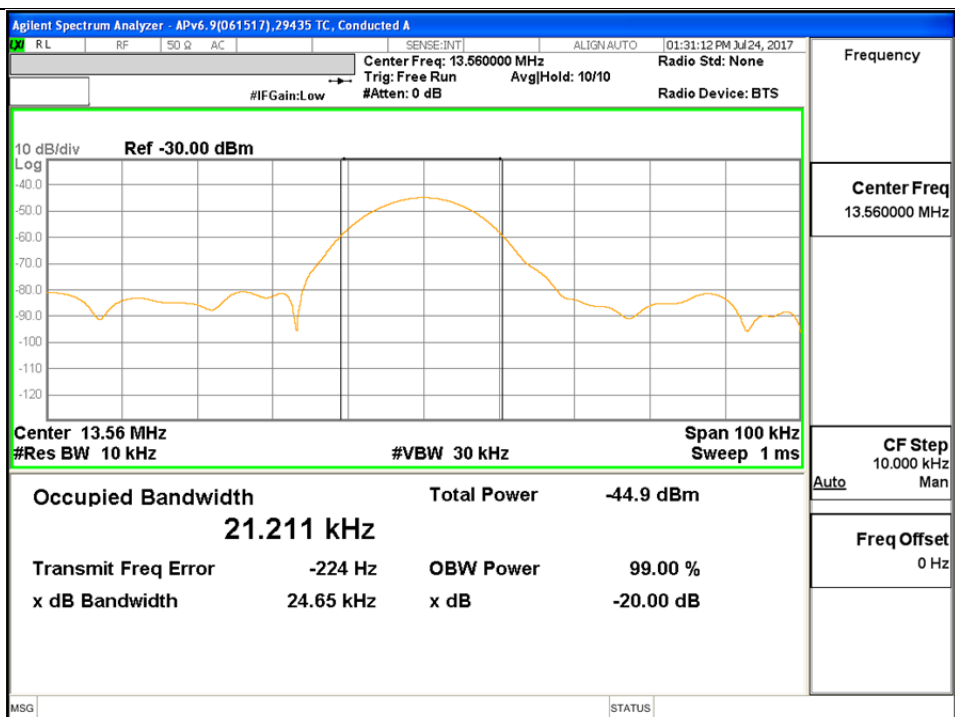
99% & 20dB BANDWIDTH TYPE B 212k



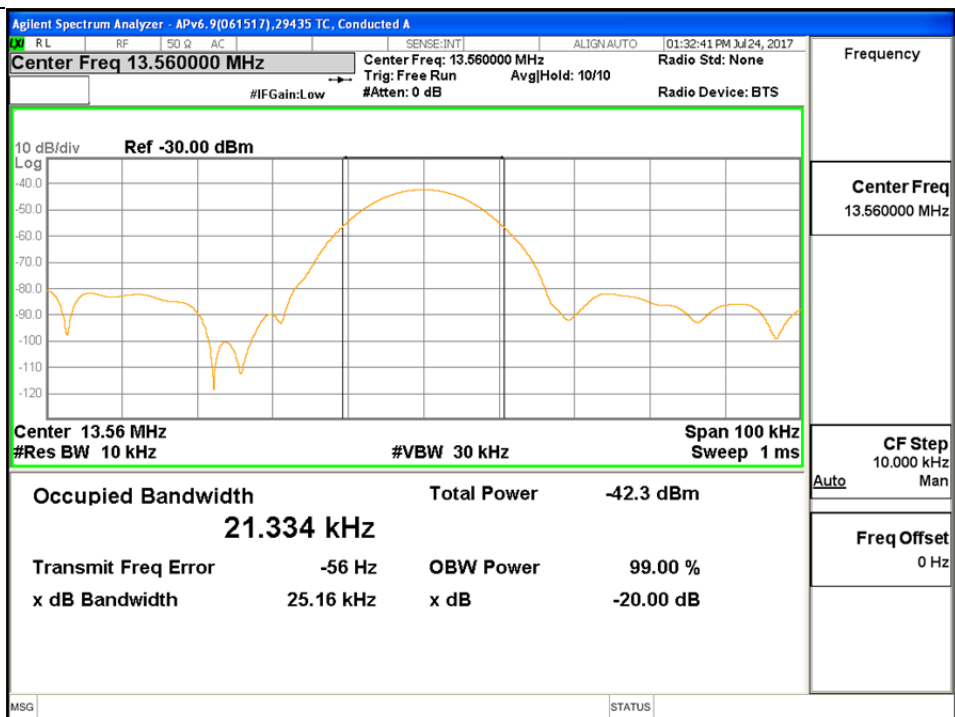
99% & 20dB BANDWIDTH TYPE B 424k



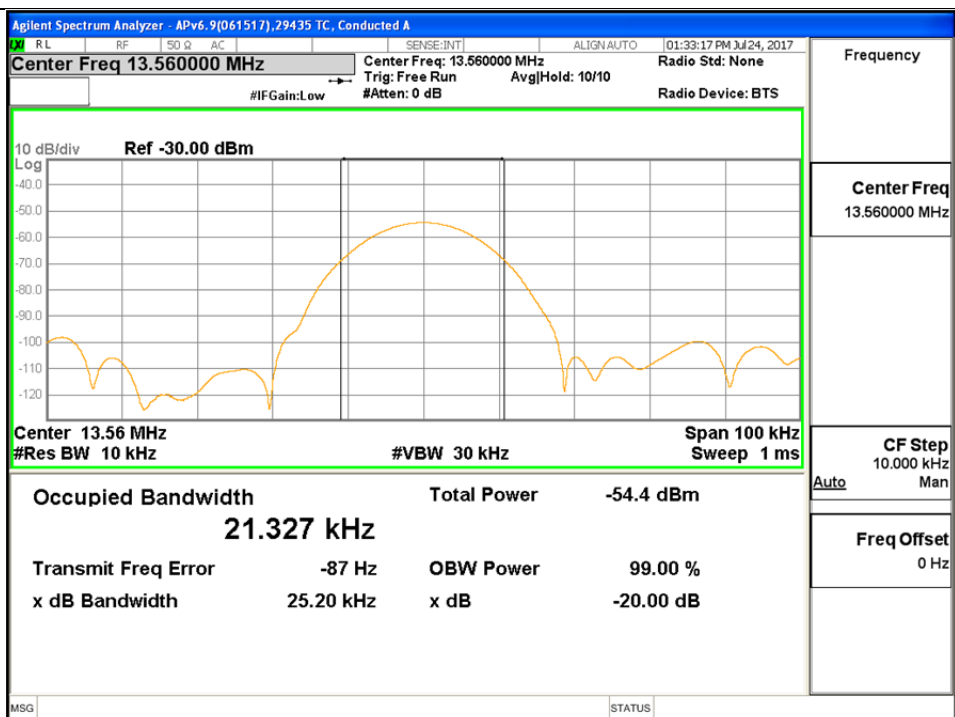
99% & 20dB BANDWIDTH TYPE B 848k



99% & 20dB BANDWIDTH TYPE F 212k



99% & 20dB BANDWIDTH TYPE F 424k



8. RADIATED EMISSION TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMIT

§15.225, 15.209

(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 field strength from µV/m to dBµV/m is:

Limit (dBµV/m) = 20 log limit (µV/m)

In addition:

§15.209 (d) The emission limits shown at 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. The frequency range was investigated from 0.15 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater (1000MHz)

RESULTS

No non-compliance noted:

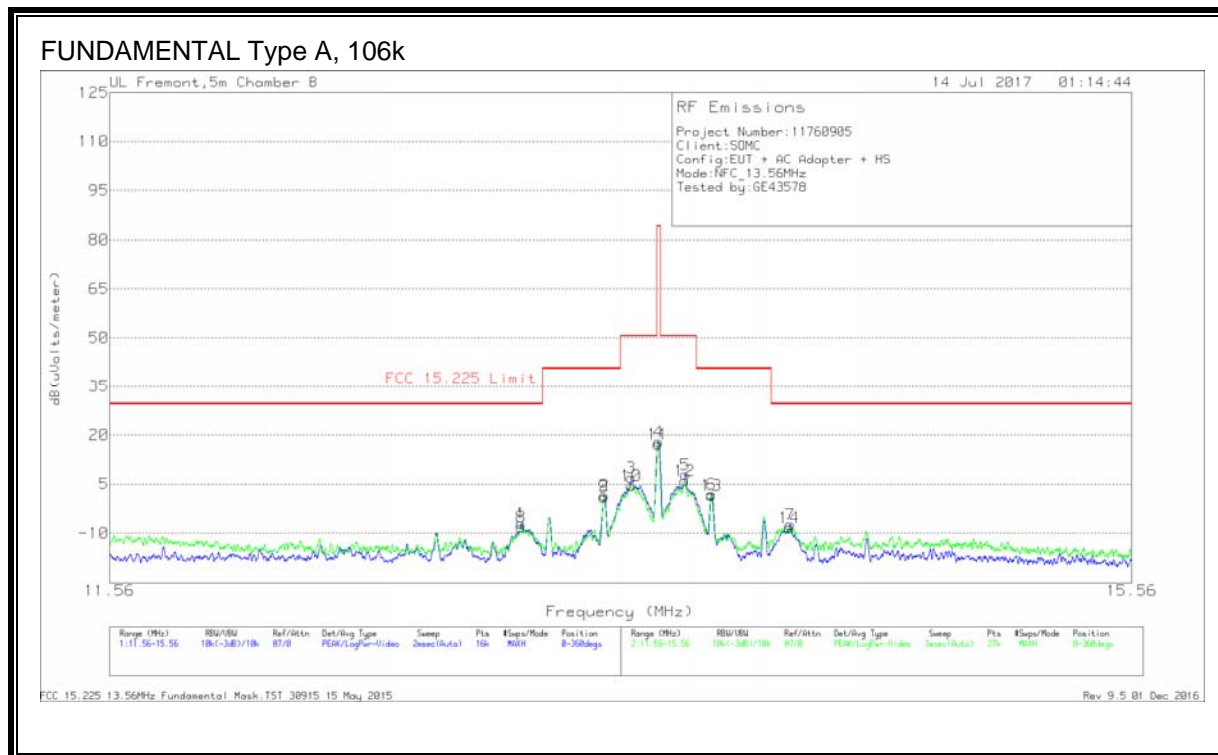
KDB 414788 OATS and Chamber Correlation Justification

Device is a Smart Phone.

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

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

8.1.1. FUNDAMENTAL EMISSION MASK (11.56 – 15.56MHz)



Note: All data rate Field Strength was investigated and Type A, 106k found to have the highest Field Strength results and represents as the worst case data rate.

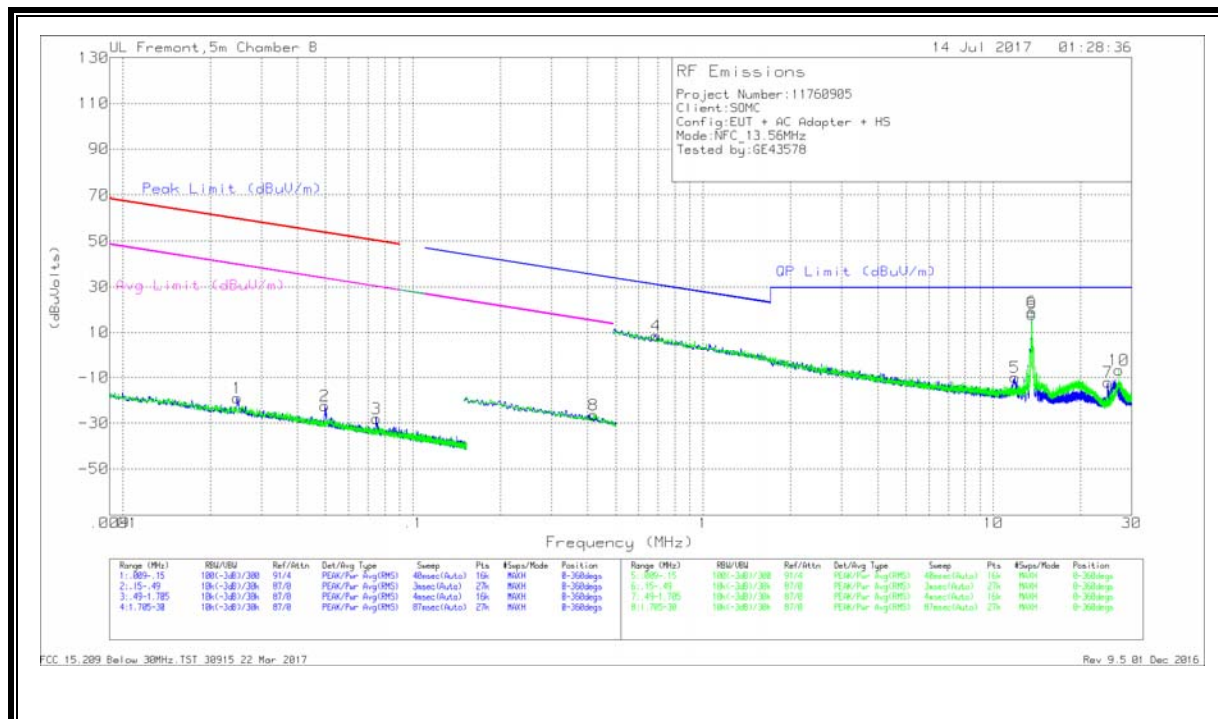
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	PK Margin (dB)	Azimuth (Degs)	Polarity
1	13.02975	20.65	Pk	10.7	1.6	-40	-7.05	29.54	-36.59	0-360	Face-On
8	13.03023	19.62	Pk	10.7	1.6	-40	-8.08	29.54	-37.62	0-360	Face-Off
9	13.34629	28.81	Pk	10.7	1.6	-40	1.11	40.51	-39.4	0-360	Face-Off
2	13.34763	29.33	Pk	10.7	1.6	-40	1.63	40.51	-38.88	0-360	Face-On
10	13.45233	32.25	Pk	10.7	1.6	-40	4.55	50.5	-45.95	0-360	Face-Off
3	13.454	34.69	Pk	10.7	1.6	-40	6.99	50.5	-43.51	0-360	Face-On
11	*13.55793	44.98	Pk	10.6	1.6	-40	17.18	84	-66.82	0-360	Face-Off
4	*13.55963	45.8	Pk	10.6	1.6	-40	18	84	-66	0-360	Face-On
12	13.66375	33.9	Pk	10.6	1.6	-40	6.1	50.5	-44.4	0-360	Face-Off
5	13.66588	35.66	Pk	10.6	1.6	-40	7.86	50.5	-42.64	0-360	Face-On
13	13.76942	29.42	Pk	10.6	1.6	-40	1.62	40.51	-38.89	0-360	Face-Off
6	13.77163	29.77	Pk	10.6	1.6	-40	1.97	40.51	-38.54	0-360	Face-On
14	14.08584	19.45	Pk	10.6	1.6	-40	-8.35	29.54	-37.89	0-360	Face-Off
7	14.08938	20.46	Pk	10.6	1.6	-40	-7.34	29.54	-36.88	0-360	Face-On

* - Indicates fundamental frequency

Pk - Peak detector

8.1.2. SPURIOUS EMISSIONS (0.09 – 30MHz)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.02474	45.62	Pk	14	1.4	-80	-18.98	59.72	-78.7	39.72	-58.7	-	-	-	-	0-360
2	.04965	43.99	Pk	12.1	1.4	-80	-22.51	53.67	-76.18	33.67	-56.18	-	-	-	-	0-360
3	.07488	38.63	Pk	11.8	1.4	-80	-28.17	50.1	-78.27	30.1	-58.27	-	-	-	-	0-360
8	.41904	40.37	Pk	11.6	1.5	-80	-26.53	-	-	-	-	35.16	-61.69	15.16	-41.69	0-360

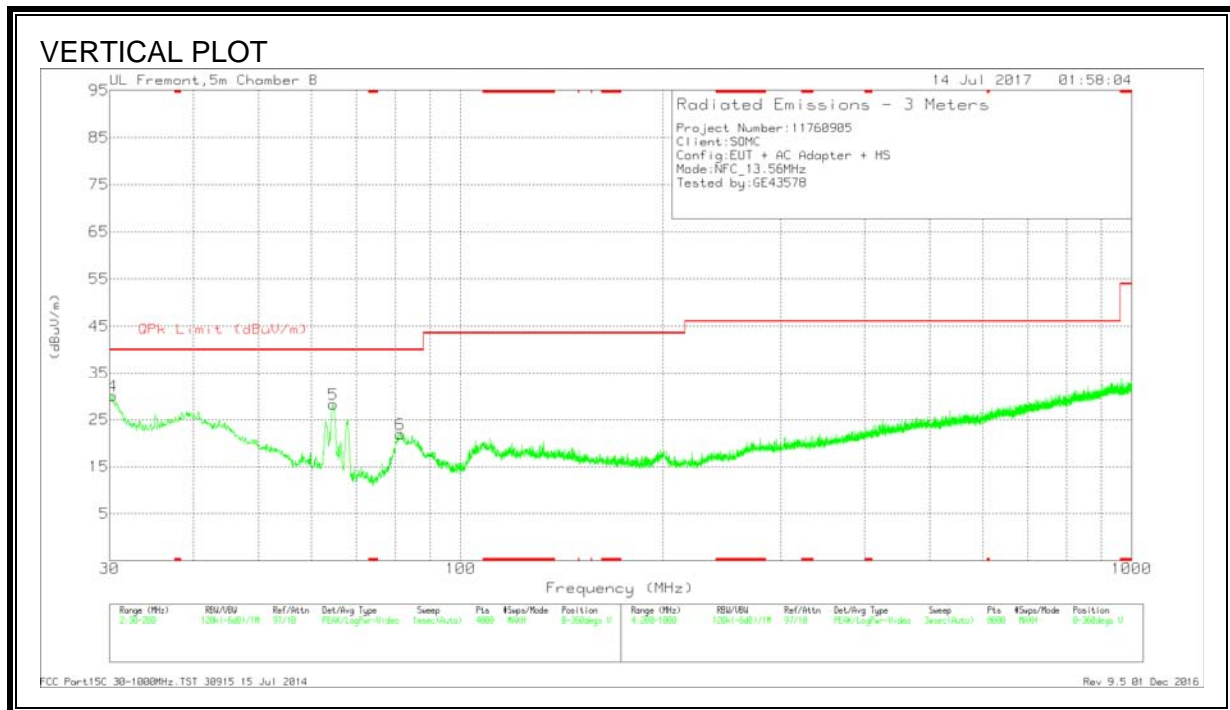
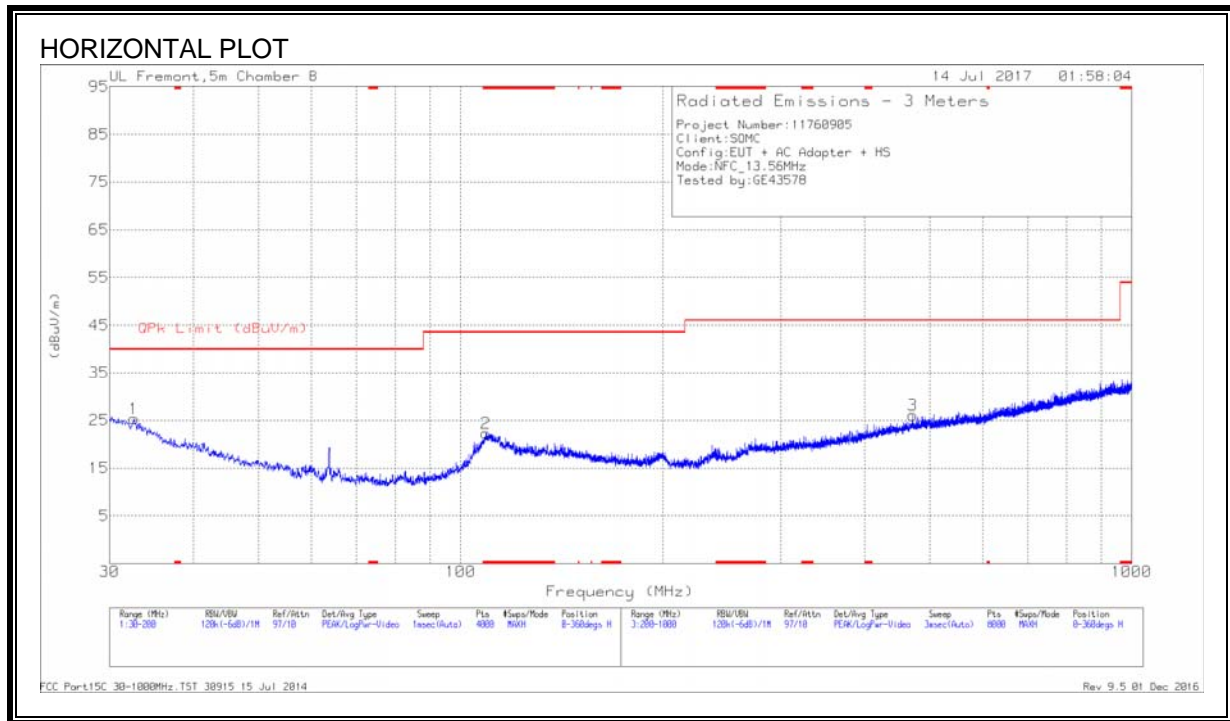
Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (dB/m)	Cbl (dB)	Dist Corr (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
4	.68775	35.4	Pk	11.6	1.5	-40	8.5	30.86	-22.36	0-360
5	11.86222	17.89	Pk	10.6	1.6	-40	-9.91	29.5	-39.41	0-360
9	*13.55893	46.06	Pk	10.4	1.6	-40	18.06	29.5	-11.44	0-360
6	*13.55945	47.04	Pk	10.4	1.6	-40	19.04	29.5	-10.46	0-360
7	24.77829	17.18	Pk	9	1.7	-40	-12.12	29.5	-41.62	0-360
10	27.12005	22.82	Pk	8.8	1.7	-40	-6.68	29.5	-36.18	0-360

* - Indicates fundamental frequency

Pk - Peak detector

8.1.3. TX SPURIOUS EMISSIONS (30 – 1000MHz)



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T899 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 109.0705	33.62	Pk	16.5	-27.8	22.32	43.52	-21.2	0-360	300	H
4	30.2976	33.51	Pk	25.3	-28.8	30.01	40	-9.99	0-360	100	V
1	32.6357	30.58	Pk	23.6	-28.8	25.38	40	-14.62	0-360	200	H
5	64.604	44.44	Pk	12.1	-28.3	28.24	40	-11.76	0-360	100	V
6	81.3533	38.9	Pk	11.1	-28.1	21.9	40	-18.1	0-360	100	V
3	471.6353	30.55	Pk	21.3	-25.8	26.05	46.02	-19.97	0-360	300	H

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

Pk - Peak detector

9. 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.		

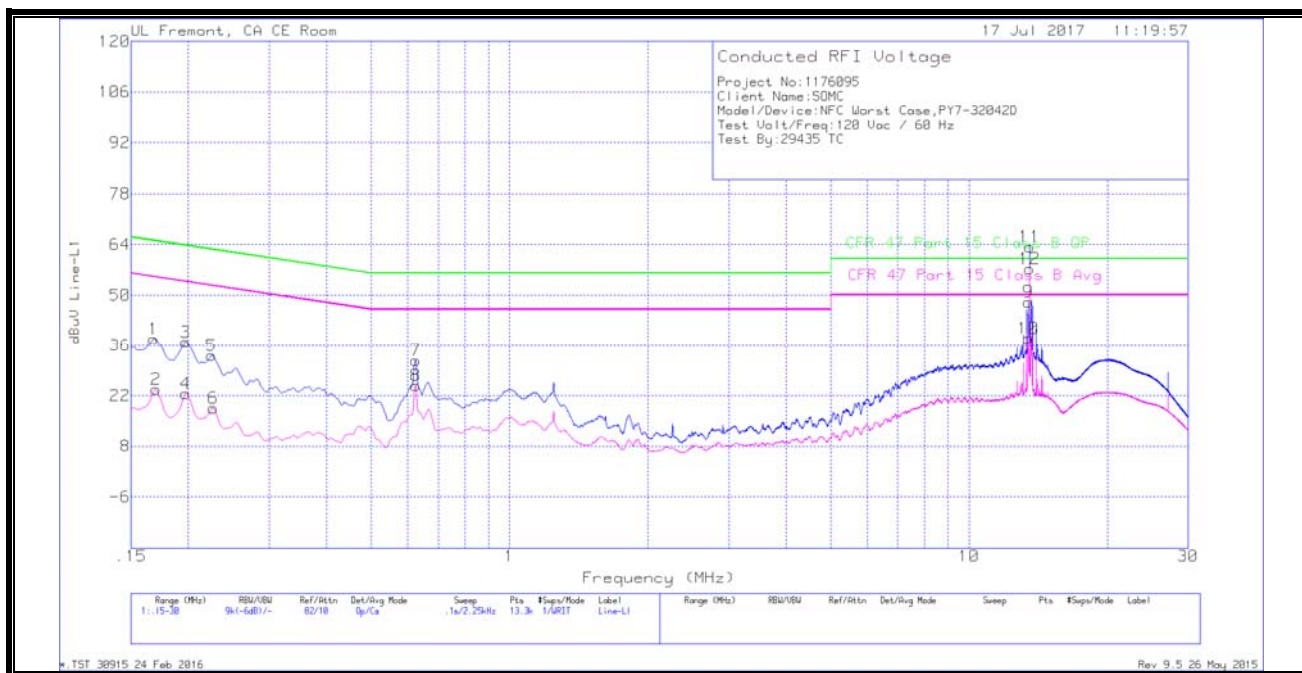
TEST PROCEDURE

ANSI C63.10

RESULTS

No non-compliance noted.

EUT WITH ANTENNA - LINE 1 RESULTS



WORST EMISSIONS

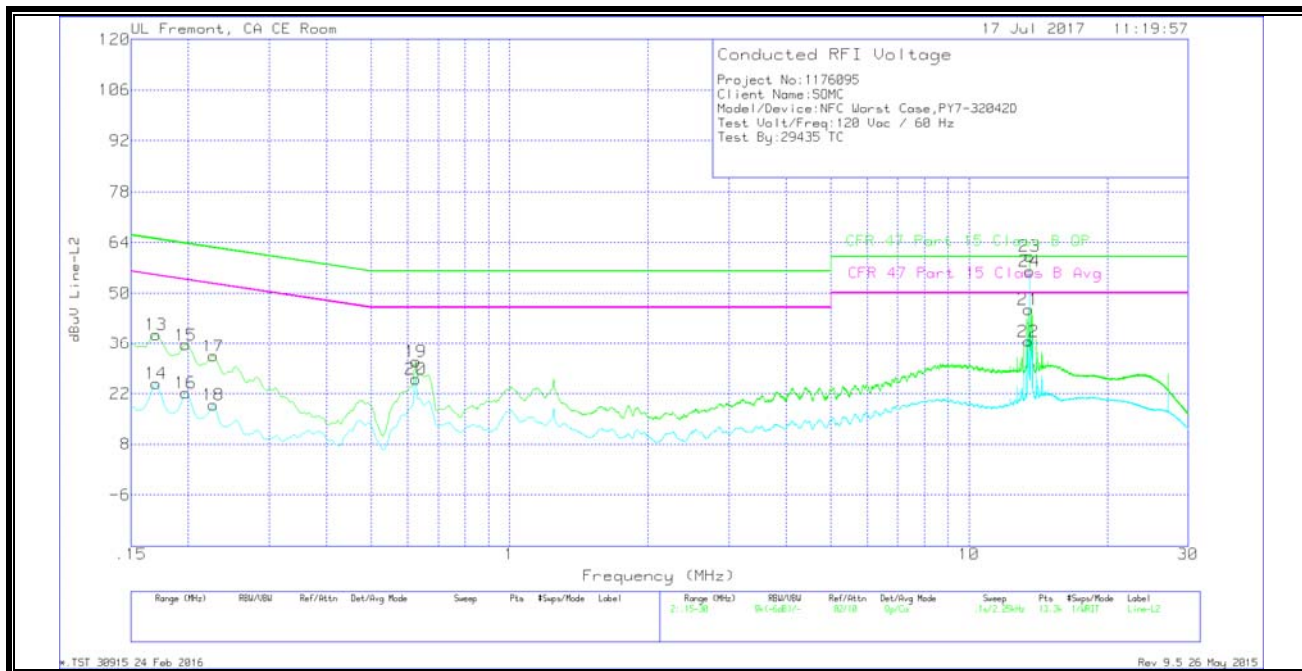
Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.168	27.6	Qp	.1	0	10.1	37.8	65.06	-27.26	-	-
2	.17025	13.54	Ca	0	.1	10.1	23.74	-	-	54.95	-31.21
3	.19725	26.71	Qp	0	.1	10.1	36.91	63.73	-26.82	-	-
4	.19725	12.38	Ca	0	.1	10.1	22.58	-	-	53.73	-31.15
5	.22425	22.96	Qp	0	.1	10.1	33.16	62.66	-29.5	-	-
6	.2265	8.35	Ca	0	.1	10.1	18.55	-	-	52.58	-34.03
7	.62475	21.63	Qp	0	.1	10.1	31.83	56	-24.17	-	-
8	.62475	14.65	Ca	0	.1	10.1	24.85	-	-	46	-21.15
9	13.45425	37.67	Qp	.1	.2	10.2	48.17	60	-11.83	-	-
10	13.45425	27.49	Ca	.1	.2	10.2	37.99	-	-	50	-12.01
11	13.56	52.86	Qp	.1	.2	10.2	63.36	60	3.36	-	-
12	13.56	46.87	Ca	.1	.2	10.2	57.37	-	-	50	7.37

Qp - Quasi-Peak detector

Ca - CISPR average detection

Note: Markers 9 and 10 are the 13.56MHz NFC Fundamental

EUT WITH ANTENNA-LINE 2 RESULTS



WORST EMISSIONS

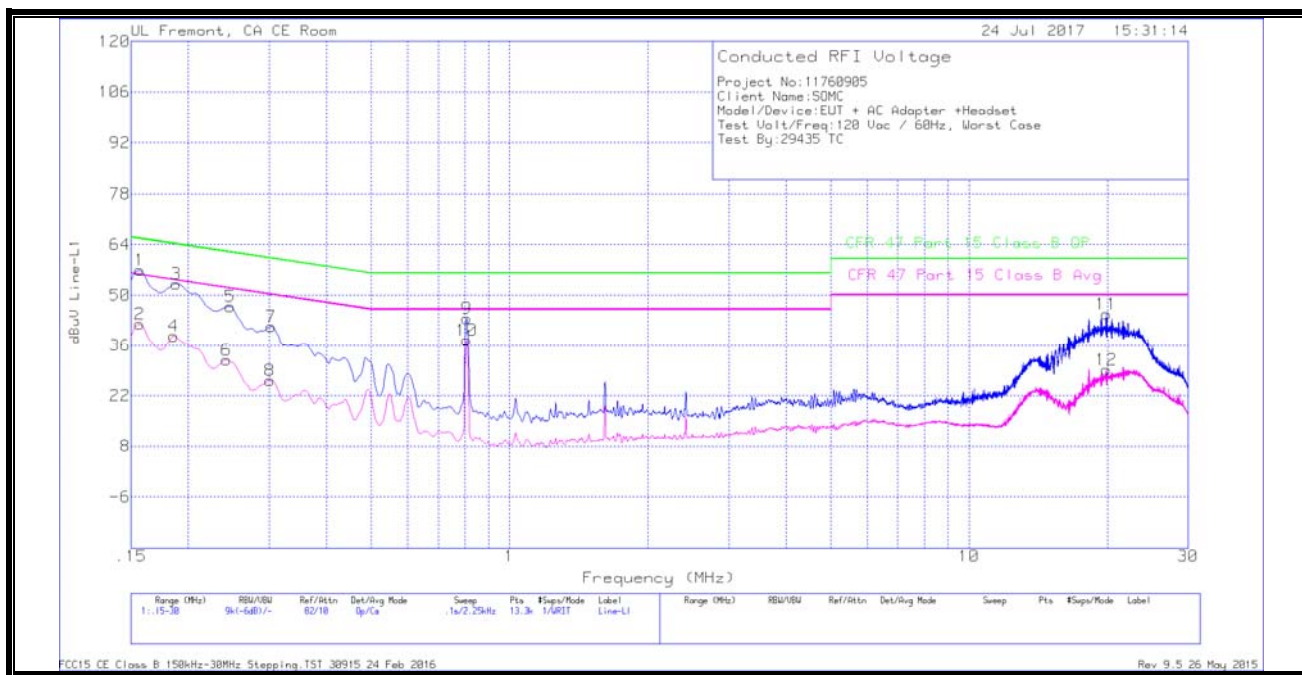
Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.17025	28.36	Qp	0	.1	10.1	38.56	64.95	-26.39	-	-
14	.17025	14.52	Ca	0	.1	10.1	24.72	-	-	54.95	-30.23
15	.19725	25.37	Qp	0	.1	10.1	35.57	63.73	-28.16	-	-
16	.19725	12.06	Ca	0	.1	10.1	22.26	-	-	53.73	-31.47
17	.2265	22.18	Qp	0	.1	10.1	32.38	62.58	-30.2	-	-
18	.2265	8.64	Ca	0	.1	10.1	18.84	-	-	52.58	-33.74
19	.62475	20.63	Qp	0	.1	10.1	30.83	56	-25.17	-	-
20	.62475	15.86	Ca	0	.1	10.1	26.06	-	-	46	-19.94
21	13.45425	34.96	Qp	.1	.2	10.2	45.46	60	-14.54	-	-
22	13.45425	26.16	Ca	.1	.2	10.2	36.66	-	-	50	-13.34
23	13.56	49.75	Qp	.1	.2	10.2	60.25	60	.25	-	-
24	13.56	45.64	Ca	.1	.2	10.2	56.14	-	-	50	6.14

Qp - Quasi-Peak detector

Ca - CISPR average detection

Note: Markers 21 and 22 are the 13.56MHz NFC Fundamental

EUT WITH ANTENNA PORT TERMINATED -LINE 1 RESULTS



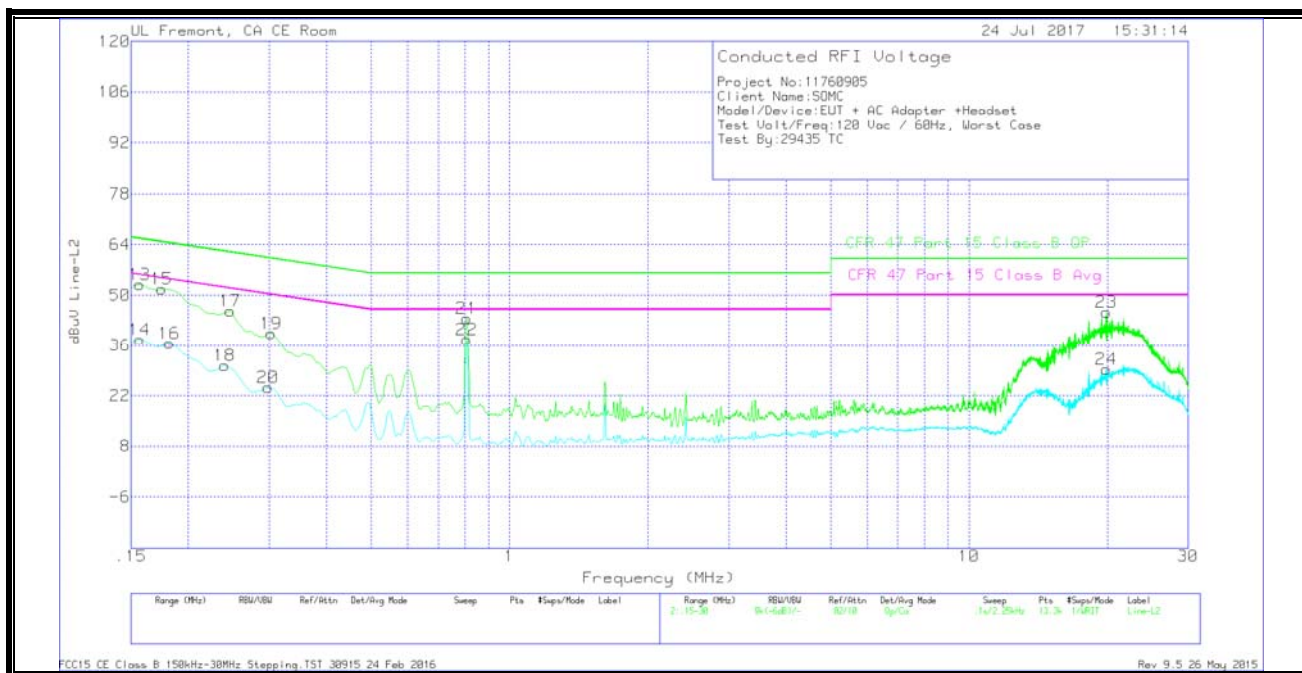
WORST EMISSIONS

Range 1: Line-L1 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L1	LC Cables C1&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
1	.15675	46.61	Qp	.1	.1	10.1	56.91	65.63	-8.72	-	-
2	.15675	31.64	Ca	.1	.1	10.1	41.94	-	-	55.63	-13.69
3	.18825	42.94	Qp	0	.1	10.1	53.14	64.11	-10.97	-	-
4	.186	28.42	Ca	0	.1	10.1	38.62	-	-	54.21	-15.59
5	.24675	36.72	Qp	0	.1	10.1	46.92	61.87	-14.95	-	-
6	.24225	21.79	Ca	0	.1	10.1	31.99	-	-	52.02	-20.03
7	.303	31.12	Qp	0	.1	10.1	41.32	60.16	-18.84	-	-
8	.30075	16.02	Ca	0	.1	10.1	26.22	-	-	50.22	-24
9	.807	33.35	Qp	0	.1	10.1	43.55	56	-12.45	-	-
10	.807	27.31	Ca	0	.1	10.1	37.51	-	-	46	-8.49
11	19.92075	34.07	Qp	.1	.3	10.3	44.77	60	-15.23	-	-
12	19.923	18.4	Ca	.1	.3	10.3	29.1	-	-	50	-20.9

Qp - Quasi-Peak detector

Ca - CISPR average detection

EUT WITH ANTENNA PORT TERMINATED -LINE 2 RESULTS



WORST EMISSIONS

Range 2: Line-L2 .15 - 30MHz											
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	LISN L2	LC Cables C2&C3	Limiter (dB)	Corrected Reading dBuV	CFR 47 Part 15 Class B QP	QP Margin (dB)	CFR 47 Part 15 Class B Avg	Av(CISPR) Margin (dB)
13	.15675	42.8	Qp	0	.1	10.1	53	65.63	-12.63	-	-
14	.15675	27.43	Ca	0	.1	10.1	37.63	-	-	55.63	-18
15	.17475	41.46	Qp	0	.1	10.1	51.66	64.73	-13.07	-	-
16	.1815	26.46	Ca	0	.1	10.1	36.66	-	-	54.42	-17.76
17	.24675	35.44	Qp	0	.1	10.1	45.64	61.87	-16.23	-	-
18	.24	20.08	Ca	0	.1	10.1	30.28	-	-	52.1	-21.82
19	.303	29.25	Qp	0	.1	10.1	39.45	60.16	-20.71	-	-
20	.2985	14.01	Ca	0	.1	10.1	24.21	-	-	50.28	-26.07
21	.807	33.39	Qp	0	.1	10.1	43.59	56	-12.41	-	-
22	.807	27.44	Ca	0	.1	10.1	37.64	-	-	46	-8.36
23	19.9275	34.71	Qp	0	.3	10.3	45.31	60	-14.69	-	-
24	19.9275	18.76	Ca	0	.3	10.3	29.36	-	-	50	-20.64

Qp - Quasi-Peak detector

Ca - CISPR average detection

10. 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 -10 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% 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

RESULTS

ID:	45256 JB	Date:	07/14/17
------------	----------	--------------	----------

No non-compliance noted.

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)
3.80	50	13.5596642	4.137	13.5596611	4.366	13.5596578	4.609	13.5596541	4.882	± 100
3.80	40	13.5596981	1.637	13.5596958	1.807	13.5596909	2.168	13.5596855	2.566	± 100
3.80	30	13.5597394	-1.409	13.5597336	-0.981	13.5597320	-0.863	13.5597259	-0.413	± 100
3.80	20	13.5597203	0.000	13.5597200	0.022	13.5597179	0.177	13.5597175	0.206	± 100
3.80	10	13.5597972	-5.671	13.5597958	-5.568	13.5597903	-5.162	13.5597901	-5.147	± 100
3.80	0	13.5598221	-7.507	13.5598203	-7.375	13.5598180	-7.205	13.5598166	-7.102	± 100
3.80	-10	13.5597734	-3.916	13.5597937	-5.413	13.5598106	-6.659	13.5598224	-7.529	± 100
3.23	20	13.5596503	5.162	13.5596523	5.015	13.5596553	4.794	13.5596596	4.476	± 100
4.37	20	13.5596596	4.476	13.5596620	4.299	13.5596647	4.100	13.5596706	3.665	± 100