TEST REPORT

Report Number. : 13094578-E9V1

Applicant	:	Samsung Electronics Co., Ltd. 129 Samsung-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 16677, Korea
Model	:	SM-N770F/DS and SM-N770F
FCC ID	:	A3LSMN770F
EUT Description	:	GSM/WCDMA/LTE Phablet with BT, DTS/UNII a/b/g/n/ac, NFC, ANT+ and WPT
Test Standard(s)	:	FCC 47 CFR PART 15 SUBPART C

Date Of Issue:

November 27, 2019

Prepared by:
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NVLAP TESTING
NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	11/27/2019	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	Samsung Electronics Co., Ltd. 129 Samsung-Ro, Yeongtong-Gu, Suwon-Si, Gyeonggi-Do, 16677, Korea
EUT DESCRIPTION:	GSM/WCDMA/LTE Phablet with BT, DTS/UNII a/b/g/n/ac, NFC ANT+ and WPT
MODEL NAME:	SM-N770F/DS and SM-N770F
SERIAL NUMBER:	R38MA039QFA
DATE TESTED:	NOVEMBER 25, 2019

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

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. 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
Operations Leader
UL Verification Services Inc.

Reviewed By:

Steven Tran
Project 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, and 47658 Kato Road, 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	47658 Kato Rd
☐ Chamber A (ISED:2324B-1)	☐ Chamber D (ISED:22541-1)	☐ Chamber I (ISED:2324A-5)
☐ Chamber B (ISED:2324B-2)	☐ Chamber E (ISED:22541-2)	☐ Chamber J (ISED:2324A-6)
☐ Chamber C (ISED:2324B-3)	☐ Chamber F (ISED:22541-3)	☒ Chamber K (ISED:2324A-1)
	☐ Chamber G (ISED:22541-4)	☐ Chamber L (ISED:2324A-3)
	☐ Chamber H (ISED:22541-5)	

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers above are covered under Industry Canada company address and respective code

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.52 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.94 dB
Radiated Disturbance, 1 to 6 GHz	± 3.86 dB
Radiated Disturbance, 6 to 18 GHz	± 4.23 dB
Radiated Disturbance, 18 to 26 GHz	± 5.30 dB
Radiated Disturbance, 26 to 40 GHz	± 5.23 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a The EUT is a GSM/WCDMA/LTE Phablet with BT, DTS/UNII a/b/g/n/ac, NFC and ANT+.

5.2. MAXIMUM OUTPUT POWER

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

Fundamental Frequency (KHz)	Mode	E field (300m distance) FCC (dBuV/m)
593-625	Charging	9.98

5.3. SOFTWARE AND FIRMWARE

The test utility software used during testing was N770F.001.

5.4. WORST-CASE CONFIGURATION AND MODE

WORST-CASE CONFIGURATION AND MODE FOR FINAL TEST

The EUT is a single frequency magnetic charger enclosed in a plastic case. For the entire radiated emissions test, the EUT was examined with the following configuration:

Configuration	Mode	Descriptions
1	Operating (With Phone)	EUT and S-Pen
2	Operating (With Phone with TA)	EUT and S-Pen powered by AC/DC adapter

AC power line conducted emissions were also investigated on the following configurations.

Configuration	Mode	Descriptions
1	Operating (With Phone and TA)	EUT and S-Pen powered by AC/DC adapter

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.

5.5. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS

SUPPORT EQUIPMENT & PERIPHERALS LIST			
Description	**Manufacturer**	**Model**	**Serial Number**
Travel Adapter	Samsung	EP-TA800	R37M3531XX1SE3
USB Data Cable	Samsung	N/A	N/A

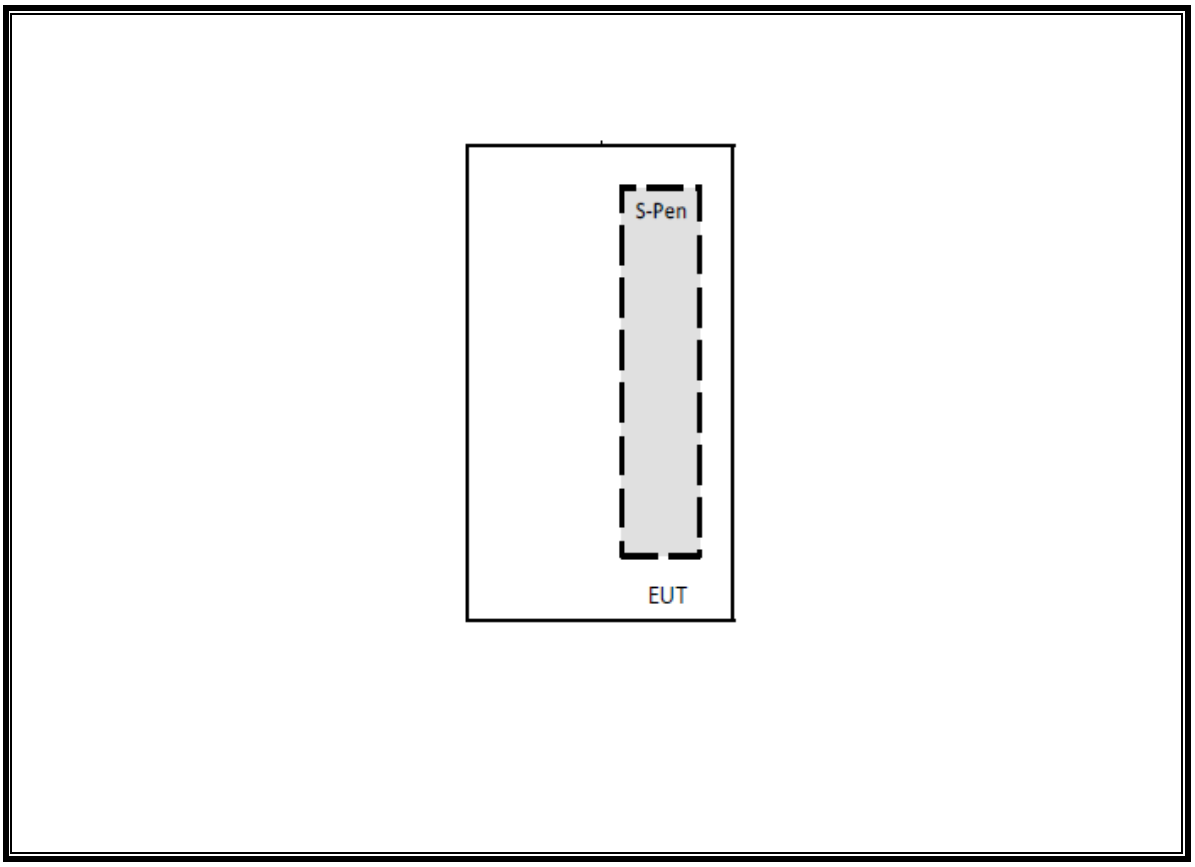
I/O CABLES

N/A

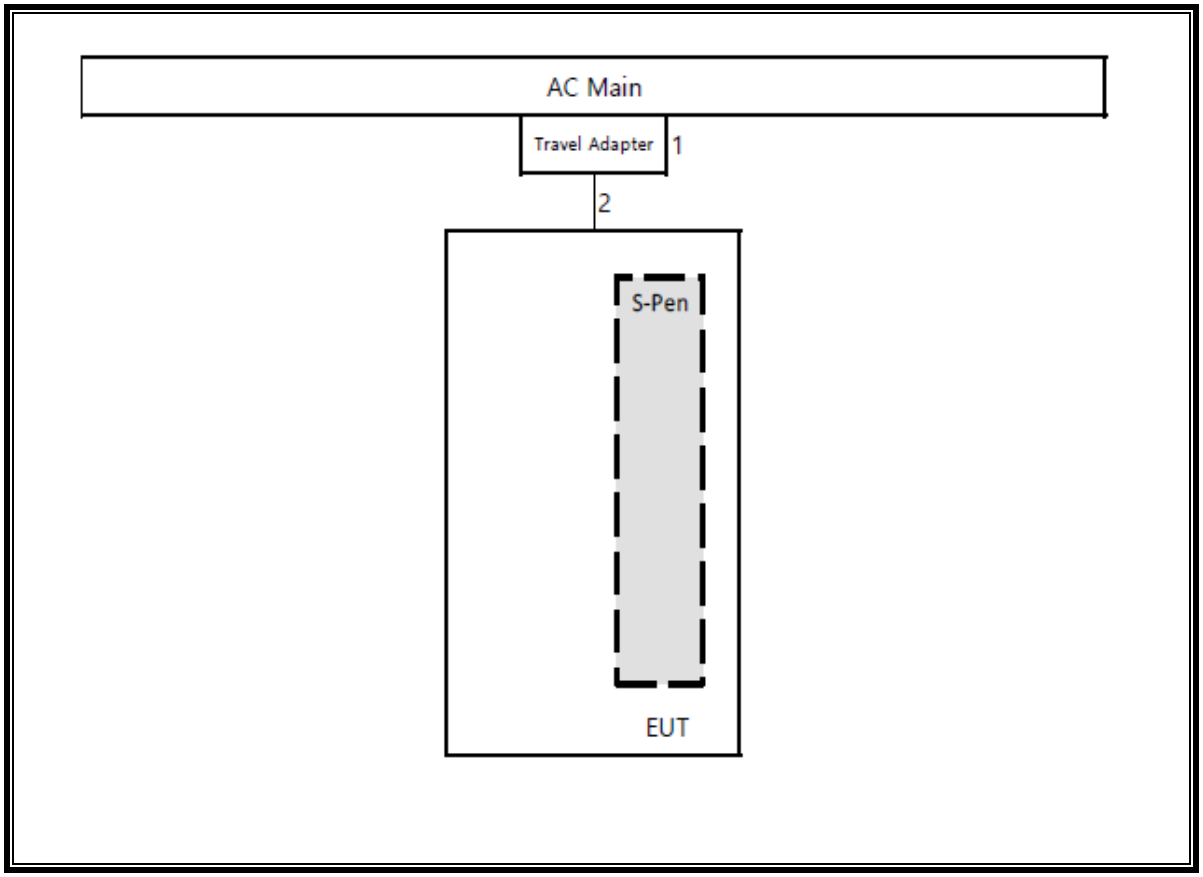
TEST SETUP

Please see the following configurations for the test setups. Both configurations indicate that the EUT is directly connected to an AC/DC adapter.

CONFIGURATION 1: OPERATING MODE WITH S-PEN



CONFIGURATION 2: OPERATING MODE WITH S-PEN AND TRAVEL ADAPTER



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**	**ID Num**	**Cal Due**	**Last Cal**
Amplifier, 9kHz to 1GHz, 32dB	Sonoma Instrument	310	175953	12/13/2019	12/13/2018
EMI Receiver	Rohde & Schwarz	ESR	T1436	02/14/2020	02/14/2019
L.I.S.N.	FCC INC.	FCC LISN 50/250	T1310	01/24/2020	01/24/2019
Antenna, Passive Loop 30Hz to 1MHz	ELETRO METRICS	EM-6871	PRE0179466	05/31/2020	05/31/2019
Antenna, Passive Loop 100KHz to 30MHz	ELETRO METRICS	EM-6872	PRE0179468	05/31/2020	05/31/2019
EMI Test Receiver	Rohde & Schwarz	ESW44	PRE0179372	02/16/2020	02/16/2019

Test Software List			
Description	**Manufacturer**	**Model**	**Version**
Radiated Software	UL	UL EMC	Ver 9.5, June 15, 2019

7. RADIATED EMISSION TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

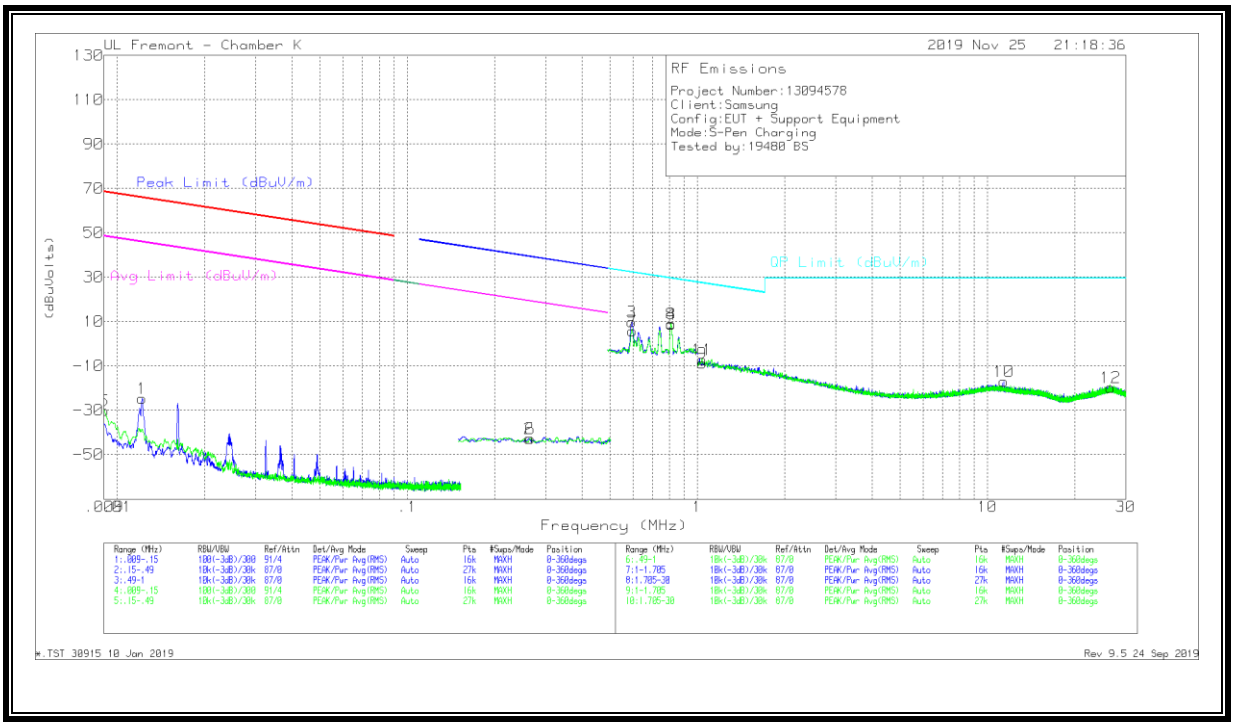
FCC §15.209 (a)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (m)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30
30–88	100	3
88 to 216	150	3
216 to 960	200	3
Above 960 MHz	500	3
Note: The lower limit shall apply at the transition frequency.		

RESULTS

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

7.2.1. OPERATING CONFIGURATION WITH S-PEN (Standalone)



DATA

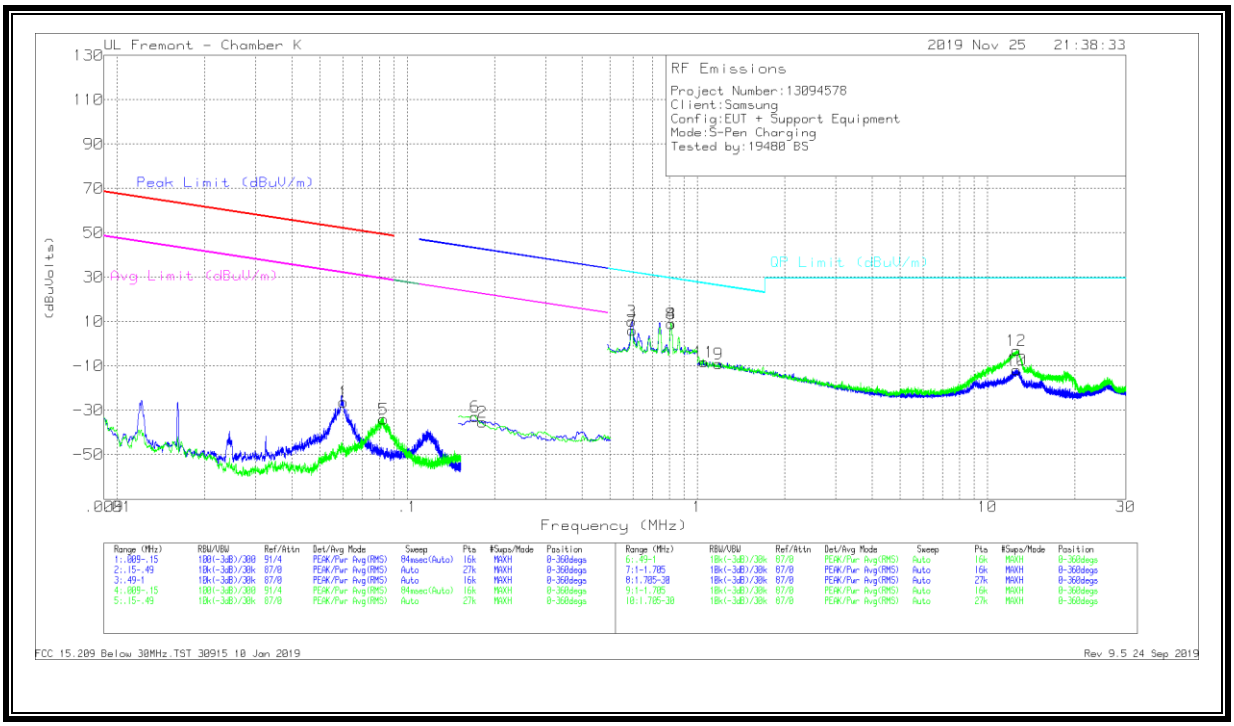
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 300m	Corrected Reading (dBuVolts)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
1	.01218	27.27	Pk	59.9	-31.8	-80	-24.63	65.87	-90.5	45.87	-70.5	-	-	-	-	0-360	Face-On
2	.26285	13.17	Pk	56.1	-32.1	-80	-42.83	-	-	-	-	39.22	-82.05	19.22	-62.05	0-360	Face-On
5	.00901	20.44	Pk	61.2	-31.8	-80	-30.16	68.49	-98.65	48.49	-78.65	-	-	-	-	0-360	Face-Off
6	.26597	13.25	Pk	56.1	-32.1	-80	-42.75	-	-	-	-	39.12	-81.87	19.12	-61.87	0-360	Face-Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
3*	.5943	25.87	Pk	56	-32.1	-40	9.77	32.13	-22.36	0-360	Face-On
4	.81278	24.68	Pk	56.1	-32.1	-40	8.68	29.42	-20.74	0-360	Face-On
7*	.59685	21.92	Pk	56	-32.1	-40	5.82	32.09	-26.27	0-360	Face-Off
8	.81072	24.99	Pk	56.1	-32.1	-40	8.99	29.44	-20.45	0-360	Face-Off
9	1.03857	16.82	Pk	46.6	-32.1	-40	-8.68	27.29	-35.97	0-360	Face-On
10	11.40634	20.29	Pk	34.4	-31.8	-40	-17.11	29.5	-46.61	0-360	Face-On
11	1.03806	18.45	Pk	46.6	-32.1	-40	-7.05	27.3	-34.35	0-360	Face-Off
12	26.61177	18.13	Pk	33.7	-31.6	-40	-19.77	29.5	-49.27	0-360	Face-Off

Pk - Peak detector
*fundamental signal

7.2.2. OPERATING CONFIGURATION WITH S-PEN (Travel Adapter)



DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	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)	Polarity
1	.06018	29.77	Pk	56	-32.2	-80	-26.43	52	-78.43	32	-58.43	-	-	-	-	0-360	Face-On
2	.18128	20.76	Pk	56	-32.1	-80	-35.34	-	-	-	-	42.45	-77.79	22.45	-57.79	0-360	Face-On
5	.08277	22.74	Pk	55.5	-32.2	-80	-33.96	49.23	-83.19	29.23	-63.19	-	-	-	-	0-360	Face-Off
6	.17155	23.34	Pk	55.9	-32.1	-80	-32.86	-	-	-	-	42.93	-75.79	22.93	-55.79	0-360	Face-Off

Pk - Peak detector

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Loop Antenna (ACF)	Cables w/ PRE0186650	Dist Corr 30m (dB) 40Log	Corrected Reading (dBuVolts)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Polarity
3*	.59523	26.08	Pk	56	-32.1	-40	9.98	32.11	-22.13	0-360	Face-On
4	.81043	25.1	Pk	56.1	-32.1	-40	9.1	29.44	-20.34	0-360	Face-On
7*	.59602	22.09	Pk	56	-32.1	-40	5.99	32.1	-26.11	0-360	Face-Off
8	.81275	24.99	Pk	56.1	-32.1	-40	8.99	29.42	-20.43	0-360	Face-Off
9	1.18357	17.32	Pk	45.8	-32.1	-40	-8.98	26.16	-35.14	0-360	Face-On
10	12.6283	25.88	Pk	34.2	-31.8	-40	-11.72	29.5	-41.22	0-360	Face-On
11	1.05388	17.34	Pk	46.5	-32.1	-40	-8.26	27.17	-35.43	0-360	Face-Off
12	12.57066	34.61	Pk	34.2	-31.8	-40	-2.99	29.5	-32.49	0-360	Face-Off

Pk - Peak detector
*fundamental signal

8. 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.

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.

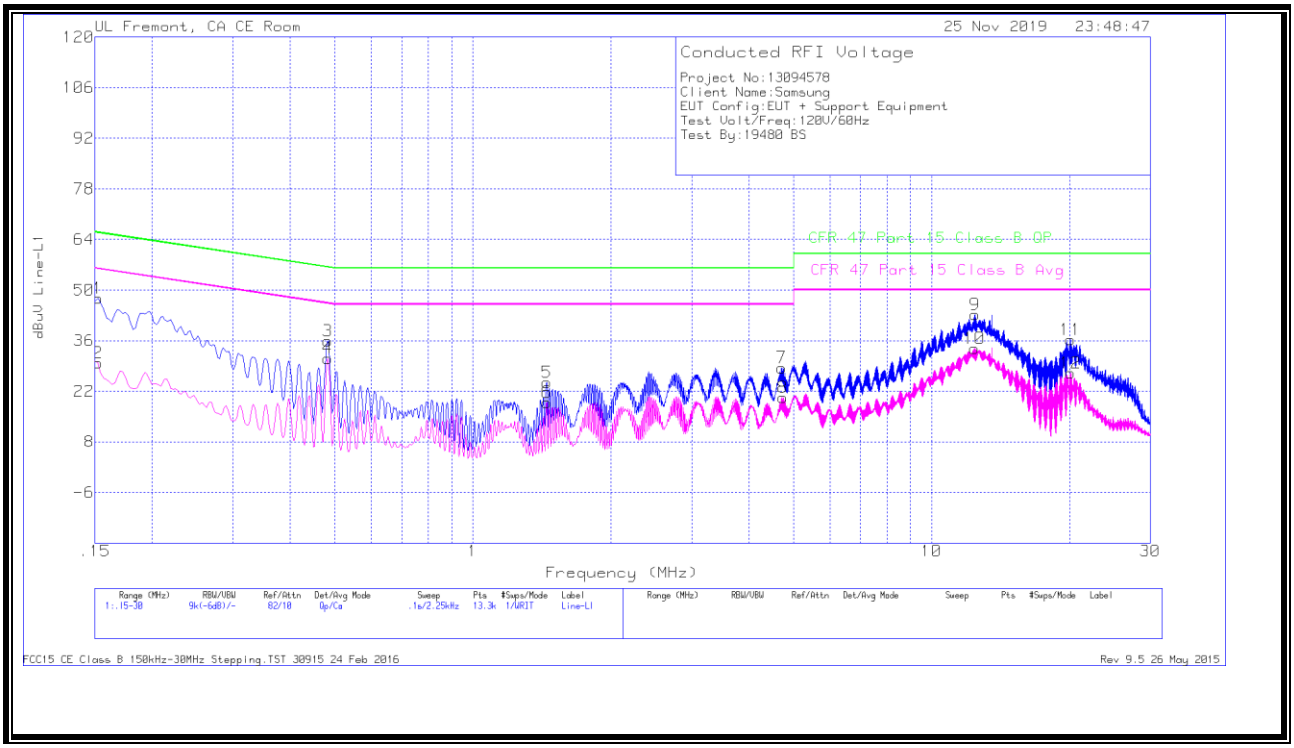
The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

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

RESULTS

8.1. OPERATING CONFIGURATION WITH S-PEN (Travel Adapter)

LINE 1 RESULTS



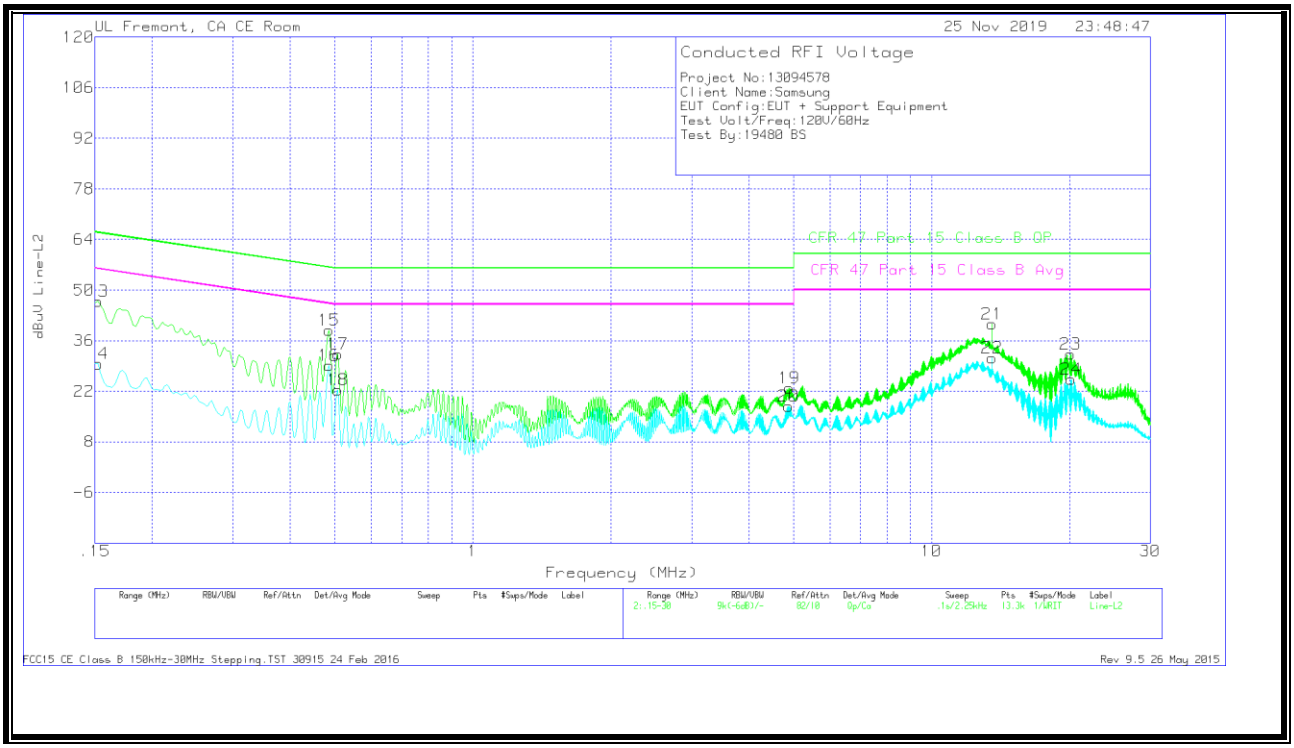
WORST EMISSIONS

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	.15225	37.49	Qp	.1	0	10.1	47.69	65.88	-18.19	-	-
2	.15225	19.63	Ca	.1	0	10.1	29.83	-	-	55.88	-26.05
3	.483	25.89	Qp	0	0	10.1	35.99	56.29	-20.3	-	-
4	.483	21.04	Ca	0	0	10.1	31.14	-	-	46.29	-15.15
5	1.44825	14.18	Qp	0	.1	10.1	24.38	56	-31.62	-	-
6	1.44825	8.77	Ca	0	.1	10.1	18.97	-	-	46	-27.03
7	4.71975	18.33	Qp	0	.1	10.1	28.53	56	-27.47	-	-
8	4.74	10.01	Ca	0	.1	10.1	20.21	-	-	46	-25.79
9	12.44175	32.7	Qp	.1	.2	10.2	43.2	60	-16.8	-	-
10	12.41925	23.33	Ca	.1	.2	10.2	33.83	-	-	50	-16.17
11	20.07825	25.58	Qp	.1	.3	10.3	36.28	60	-23.72	-	-
12	20.121	16.39	Ca	.1	.3	10.3	27.09	-	-	50	-22.91

Qp - Quasi-Peak detector
Ca - CISPR average detection

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	.15225	36.64	Qp	.1	0	10.1	46.84	65.88	-19.04	-	-
14	.15225	19.38	Ca	.1	0	10.1	29.58	-	-	55.88	-26.3
15	.48525	28.76	Qp	0	0	10.1	38.86	56.25	-17.39	-	-
16	.48525	19.1	Ca	0	0	10.1	29.2	-	-	46.25	-17.05
17	.50775	22.21	Qp	0	0	10.1	32.31	56	-23.69	-	-
18	.50775	12.19	Ca	0	0	10.1	22.29	-	-	46	-23.71
19	4.8975	12.61	Qp	0	.1	10.1	22.81	56	-33.19	-	-
20	4.875	7.7	Ca	0	.1	10.1	17.9	-	-	46	-28.1
21	13.56	30.15	Qp	.1	.2	10.2	40.65	60	-19.35	-	-
22	13.56	20.78	Ca	.1	.2	10.2	31.28	-	-	50	-18.72
23	20.10975	21.63	Qp	.1	.3	10.3	32.33	60	-27.67	-	-
24	20.1525	14.67	Ca	.1	.3	10.3	25.37	-	-	50	-24.63

Qp - Quasi-Peak detector
Ca - CISPR average detection