



CERTIFICATION TEST REPORT

Report Number. : 4789633488-E7V1

Applicant : SAMSUNG ELECTRONICS CO., LTD.
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,
GYEONGGI-DO, 16677, KOREA

Model : SM-G996B/DS, SM-G996B

FCC ID : A3LSMG996B

EUT Description : GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax,
UWB, WPT and NFC

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

Date Of Issue:

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ACCREDITED

Testing Laboratory

TL-637

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.
EUT DESCRIPTION: GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC
MODEL NUMBER: SM-G996B/DS, SM-G996B
SERIAL NUMBER: R3CN811JB9F (Radiated)
DATE TESTED: OCT 6, 2020 – NOV 06, 2020;

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

UL Korea, Ltd. 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 Korea, Ltd. 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 Korea, Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Korea, Ltd. 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 IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For
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Junwhan Lee
Suwon Lab Engineer
UL Korea, Ltd.

Tested By:



Hyunsik Yun
Suwon Lab Engineer
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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 15.
3. ANSI C63.10-2013.
4. 414788 D01 Radiated Test Site v01r01

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 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.

218 Maeyeong-ro	
<input type="checkbox"/>	Chamber 1
<input checked="" type="checkbox"/>	Chamber 2
<input type="checkbox"/>	Chamber 3

UL Korea, Ltd. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

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:

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

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	3.01 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.72 dB
Radiated Disturbance, 30 MHz to 1 GHz	4.26 dB

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

4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Procedure 1, Clause 4.4.2 in IEC Guide 115:2007.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE/5G NR Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC. This test report addresses the DXX (NFC) operational mode.

This report covers the Samsung models SM-G996B/DS and SM-G996B. These models are identical in hardware except SM-G996B has single SIM tray. With some pre-scan, model SM-G996B/DS was set for final test.

5.2. MAXIMUM E-FIELD STRENGTH

The testing was performed at 3 meter. The transmitter maximum E-field at 30m distance is 17.88 dBuV/m which convert from 3 meter data.

5.3. WORST-CASE CONFIGURATION AND MODE

The NFC function was tested at its' fundamental and only operational frequency of 13.56 MHz.

The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that the Y orientation was the worst-case orientation; therefore all final radiated testing was performed with the EUT in the Y orientation while generating continuous emissions.

The fundamental level of the EUT was investigated each type and bitrate. All test was performed worst case condition(type A and bit rate 106 kbps).

Radiated(fundamental level and spurious emissions) tests were performed both without reading a passive tag condition[test mode] and with reading a passive tag condition.

5.4. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37N39603S8SE3	N/A
Data Cable	SAMSUNG	EP-DN980	N/A	N/A

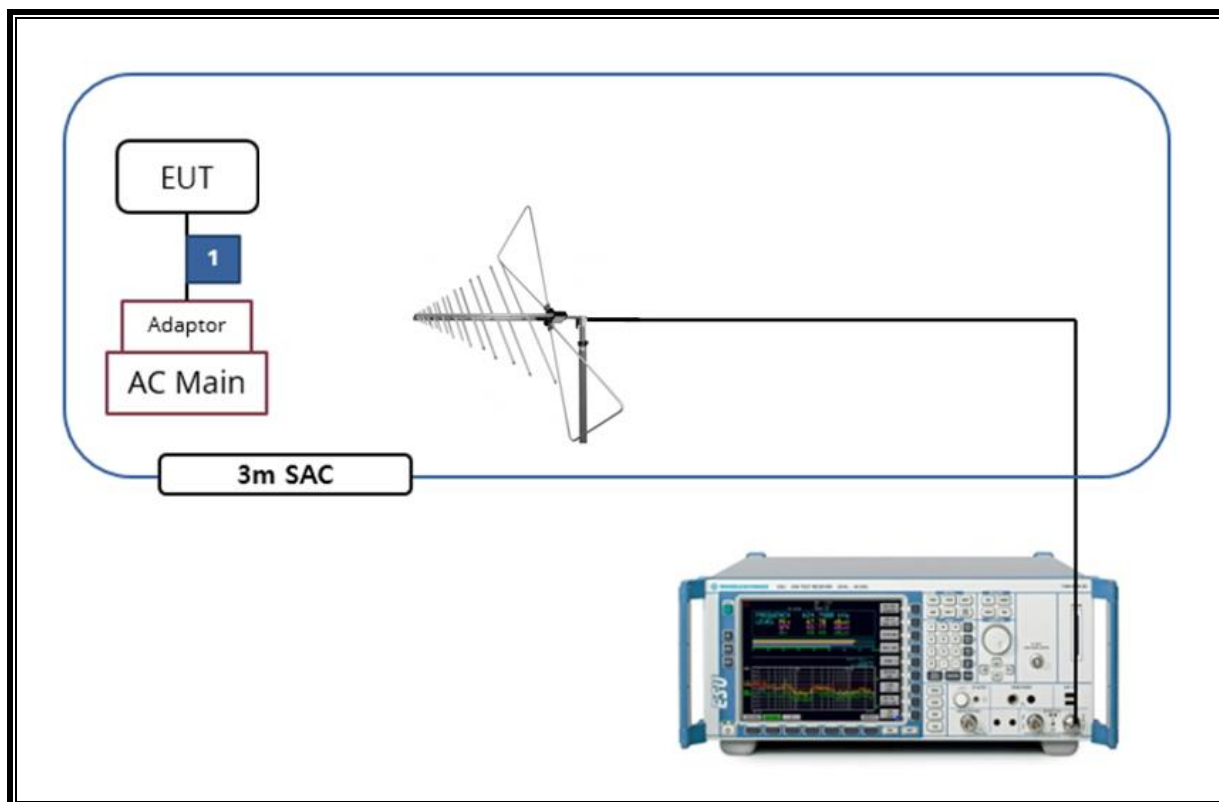
I/O CABLE

I/O Cable List						
Cable No.	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC Power	1	C Type	Shielded	1.0 m	N/A

The EUT is a stand-alone device configured and tested in a worst-case setup.

Note: Worst case is using worst case orientation with AC charger attached to the EUT with NFC signal continuously transmitting.

SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)



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	S/N	Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-13-22
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-13-22
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-03-21
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-03-21
Spectrum Analyzer, 7 GHz	Agilent / HP	N9010A	MY54200580	08-05-21
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-03-21
DC Power Supply	Agilent / HP	E3640A	MY54226395	08-05-21
Temperature Chamber	ESPEC	SH-642	93001109	08-04-21
LISN	R&S	ENV216	101837	08-06-21
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
UL Software				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

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

§15.225

Operation within the band 13.110 – 14.010MHz

TEST PROCEDURE

The spectrum analyzer connected receive antenna and the EUT placed on near the receive antenna. The RBW is set to 10KHz. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

Frequency [MHz]	20 dB Bandwidth [kHz]
13.56	439.10

20dB Bandwidth Plot



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)

In addition:

§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

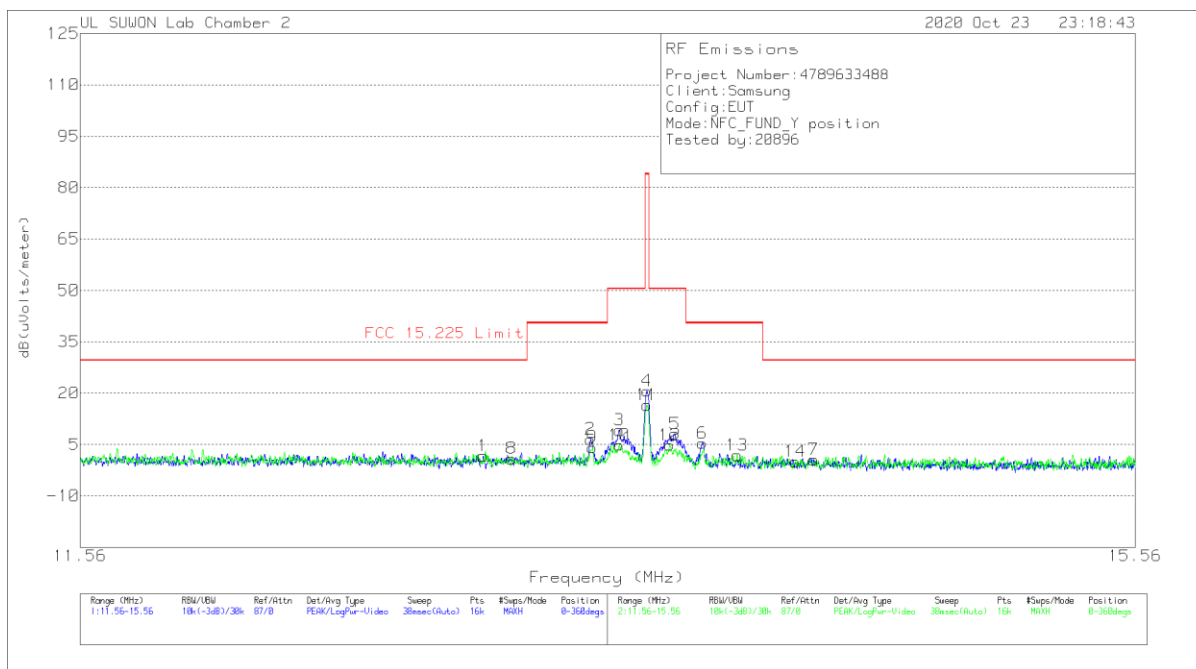
ANSI C63.10-2013

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. 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:

8.1.1. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 – 30 MHz)



Trace Markers

[Face On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Dist Corr 30m	Cable Loss	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	Margin (dB)	Azimuth (Degs)
1	12.94938	21.16	Pk	20	-40	.5	1.66	29.54	-27.88	0-360
2	13.34663	26.07	Pk	20	-40	.5	6.57	40.51	-33.94	0-360
3	13.45463	28.7	Pk	20	-40	.5	9.2	50.5	-41.3	0-360
**4	13.56038	40.18	Pk	20	-40	.5	20.68	84	-63.32	0-360
5	13.66788	27.51	Pk	20	-40	.6	8.11	50.5	-42.39	0-360
6	13.77338	24.78	Pk	20	-40	.6	5.38	40.51	-35.13	0-360
7	14.213	19.96	Pk	20	-40	.6	.56	29.54	-28.98	0-360

[Face Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Dist Corr 30m	Cable Loss	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	Margin (dB)	Azimuth (Degs)
8	13.05325	20.41	Pk	20	-40	.5	.91	29.54	-28.63	0-360
9	13.35388	23.64	Pk	20	-40	.5	4.14	40.51	-36.37	0-360
10	13.45488	24.31	Pk	20	-40	.5	4.81	50.5	-45.69	0-360
**11	13.56	36.03	Pk	20	-40	.5	16.53	84	-67.47	0-360
12	13.64788	24.23	Pk	20	-40	.6	4.83	50.5	-45.67	0-360
13	13.90938	21.27	Pk	20	-40	.6	1.87	40.51	-38.64	0-360
14	14.13925	19.43	Pk	20	-40	.6	.03	29.54	-29.51	0-360

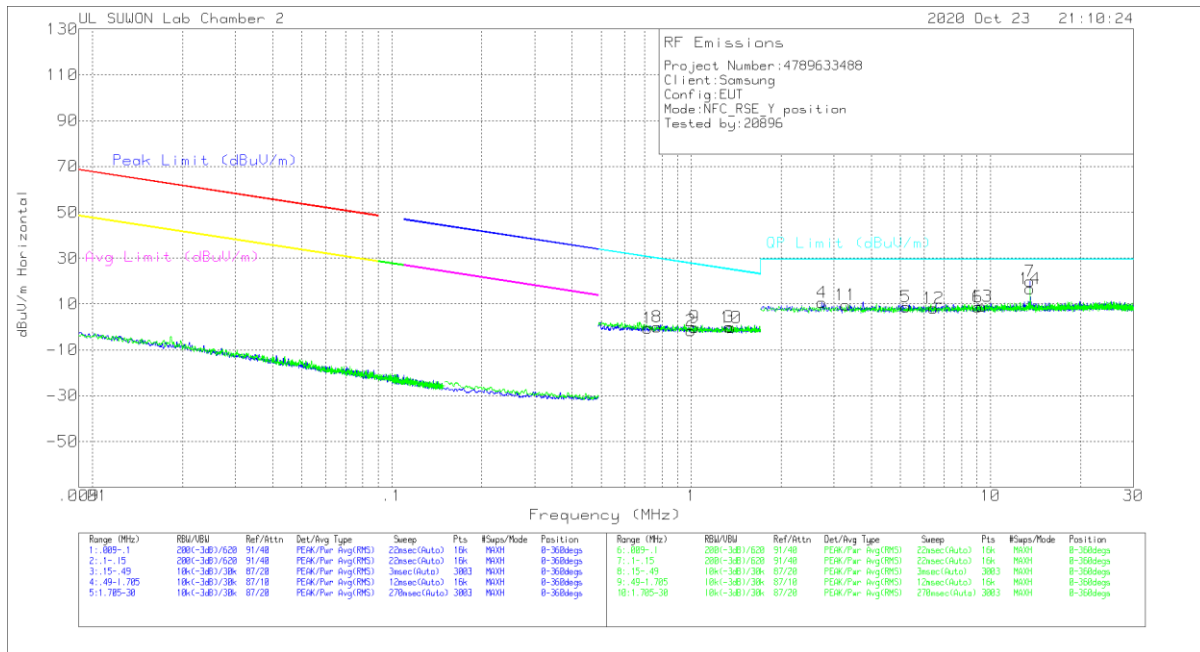
Pk - Peak detector

**Fundamental

Note 1 : Although these tests were performed other than open filed 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.

Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

8.1.2. SPURIOUS EMISSION 0.009 TO 30 MHz



Trace Markers

[Face On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBuV/m	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.7153	19.76	Pk	19.7	.1	-40	-.44	30.52	-30.96	0-360
2	.99696	18.43	Pk	19.8	.2	-40	-1.57	27.65	-29.22	0-360
3	1.33964	19.88	Pk	19.8	.2	-40	-.12	25.09	-25.21	0-360
4	2.73233	30.56	Pk	19.9	.3	-40	10.76	29.5	-18.74	0-360
5	5.2111	28.59	Pk	19.8	.3	-40	8.69	29.5	-20.81	0-360
6	9.07535	28.18	Pk	20	.5	-40	8.68	29.5	-20.82	0-360
**7	13.56165	39.39	Pk	20	.5	-40	19.89	29.5	-9.61	0-360

[Face Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBuV/m	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	.77059	20.11	Pk	19.8	.2	-40	.11	29.88	-29.77	0-360
9	1.02861	19.85	Pk	19.8	.2	-40	-.15	27.38	-27.53	0-360
10	1.35997	19.84	Pk	19.8	.2	-40	-.16	24.96	-25.12	0-360
11	3.27898	29.3	Pk	19.9	.3	-40	9.5	29.5	-20	0-360
12	6.4552	27.95	Pk	19.9	.4	-40	8.25	29.5	-21.25	0-360
13	9.32983	28.55	Pk	20	.5	-40	9.05	29.5	-20.45	0-360
**14	13.56165	36.13	Pk	20	.5	-40	16.63	29.5	-12.87	0-360

Pk - Peak detector

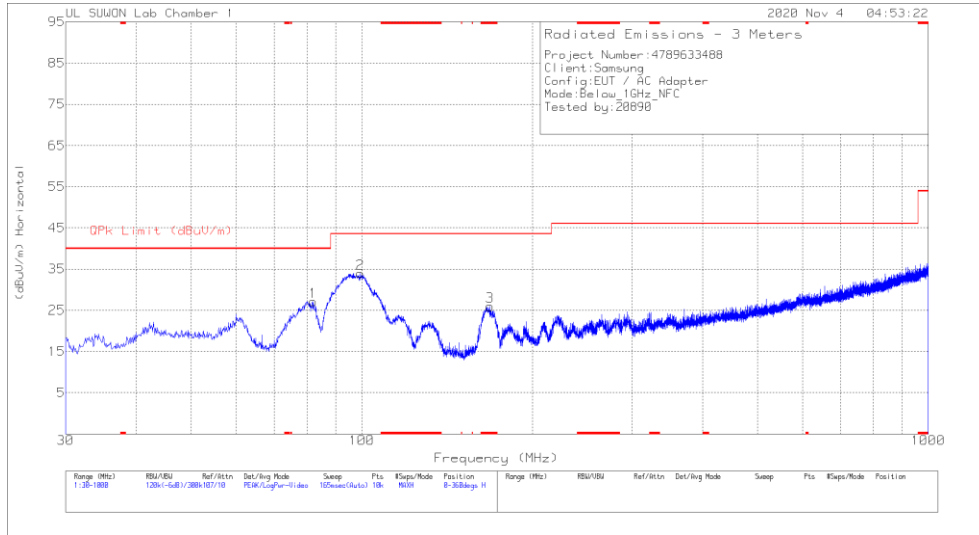
** Fundamental

Note 1: The data for marker number 7 and 14 are the fundamental signal.
Please refer to section 8.1.1 about the fundamental level.
Frequency range 0.009MHz ~ 0.490MHz, only noise floor level and more than 20dB margin.

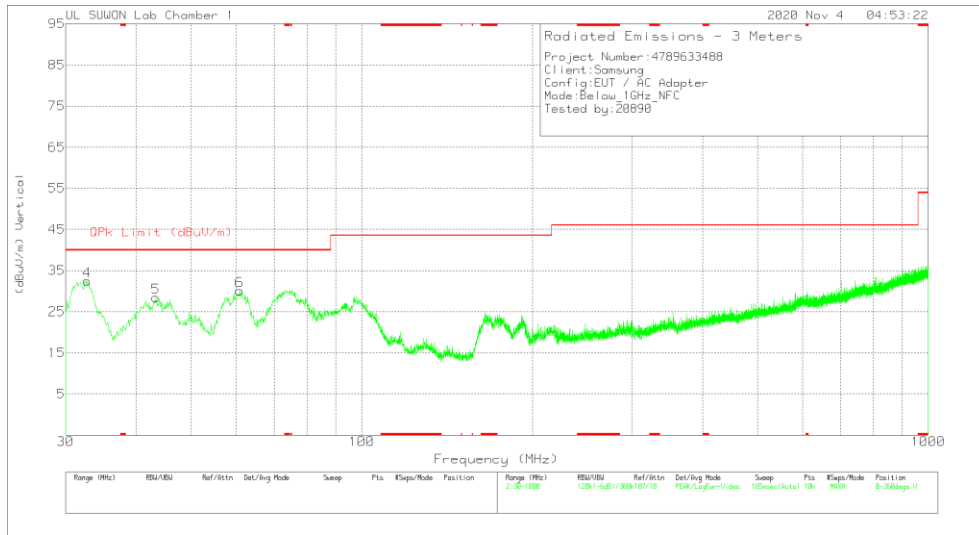
Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

8.1.3. TX SPURIOUS EMISSION 30 TO 1000 MHz

HORIZONTAL



VERTICAL

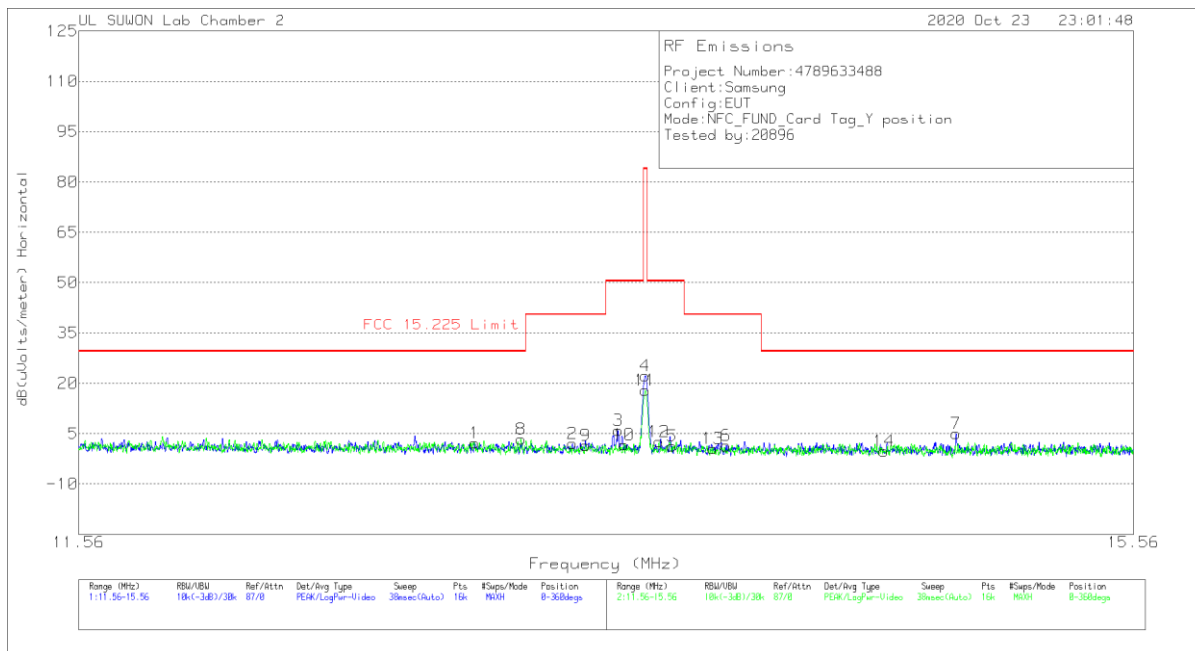


Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G[dB]	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	81.992	44.03	Pk	13	-29.9	27.13	40	-12.87	0-360	200	H
2	99.452	46.33	Pk	17.4	-29.8	33.93	43.52	-9.59	0-360	200	H
3	* 168.225	40.33	Pk	14.5	-28.9	25.93	43.52	-17.59	0-360	200	H
4	32.716	47.38	Pk	15.7	-30.6	32.48	40	-7.52	0-360	100	V
5	43.289	39.46	Pk	19.4	-30.4	28.46	40	-11.54	0-360	100	V
6	60.846	42.02	Pk	18.4	-30.3	30.12	40	-9.88	0-360	100	V

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

8.1.4. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 – 30 MHz) [EUT with passive TAG mode]



Trace Markers

[Face On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Dist Corr 30m	Cable Loss	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	Margin (dB)	Azimuth (Degs)
1	12.92438	21.7	Pk	20	-40	.5	2.2	29.54	-27.34	0-360
2	13.28513	21.48	Pk	20	-40	.5	1.98	40.51	-38.53	0-360
3	13.4575	25.43	Pk	20	-40	.5	5.93	50.5	-44.57	0-360
**4	13.56113	41.76	Pk	20	-40	.5	22.26	84	-61.74	0-360
5	13.66275	20.63	Pk	20	-40	.6	1.23	50.5	-49.27	0-360
6	13.873	20.79	Pk	20	-40	.6	1.39	40.51	-39.12	0-360
7	14.80188	24.45	Pk	20	-40	.6	5.05	29.54	-24.49	0-360

[Face Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Dist Corr 30m	Cable Loss	Corrected Reading dB(uVolts/meter)	FCC 15.225 Limit	Margin (dB)	Azimuth (Degs)
8	13.09388	22.92	Pk	20	-40	.5	3.42	29.54	-26.12	0-360
9	13.33375	20.97	Pk	20	-40	.5	1.47	40.51	-39.04	0-360
10	13.47825	21.16	Pk	20	-40	.5	1.66	50.5	-48.84	0-360
**11	13.56075	37.36	Pk	20	-40	.5	17.86	84	-66.14	0-360
12	13.61313	21.92	Pk	20	-40	.6	2.52	50.5	-47.98	0-360
13	13.82238	20.03	Pk	20	-40	.6	.63	40.51	-39.88	0-360
14	14.50463	19.22	Pk	20	-40	.6	-.18	29.54	-29.72	0-360

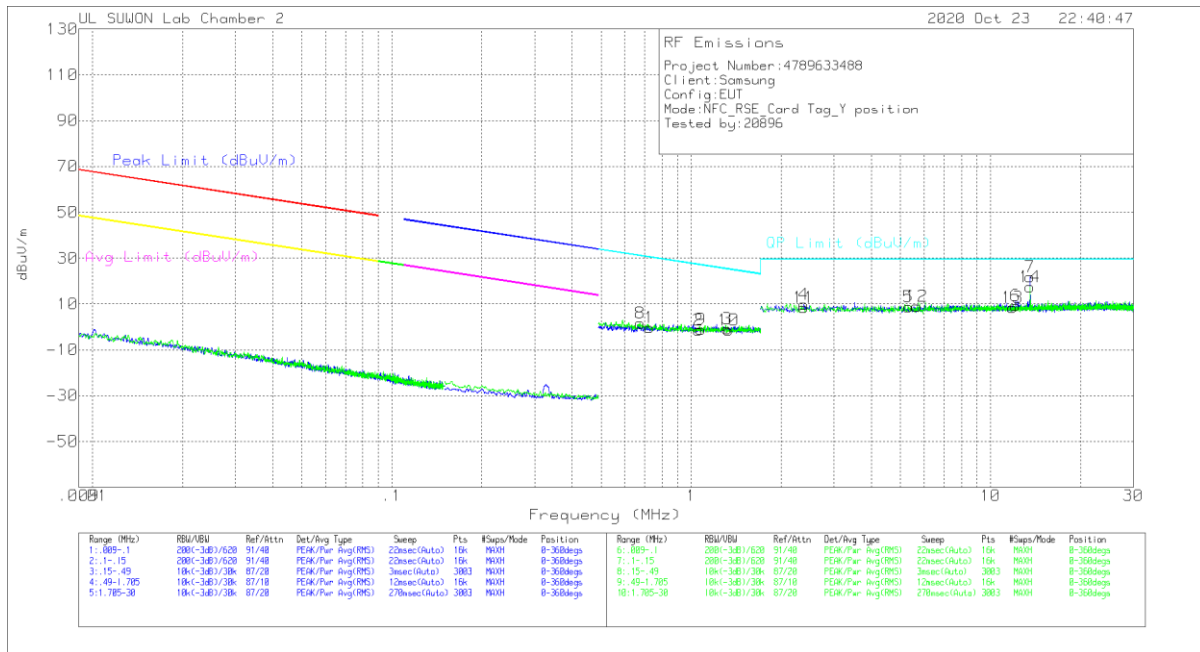
Pk - Peak detector

**Fundamental

Note 1: Although these tests were performed other than open filed 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.

Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

8.1.5. SPURIOUS EMISSION 0.09 TO 30 MHz [EUT with passive TAG mode]



Trace Markers

[Face On]

Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBUV/m	QP Limit (dBUV/m)	Margin (dB)	Azimuth (Degs)
1	.72507	19.91	Pk	19.7	.1	-40	-.29	30.41	-30.7	0-360
2	1.05643	18.73	Pk	19.8	.2	-40	-1.27	27.15	-28.42	0-360
3	1.32121	19.28	Pk	19.8	.2	-40	-.72	25.21	-25.93	0-360
4	2.37418	29.68	Pk	19.9	.2	-40	9.78	29.5	-19.72	0-360
5	5.31478	28.6	Pk	19.8	.4	-40	8.8	29.5	-20.7	0-360
6	12.1102	28.79	Pk	20	.5	-40	9.29	29.5	-20.21	0-360
**7	13.56165	41.29	Pk	20	.5	-40	21.79	29.5	-7.71	0-360

[Face Off]

Marker	Frequency (MHz)	Meter Reading (dBUV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBUV/m	QP Limit (dBUV/m)	Margin (dB)	Azimuth (Degs)
8	.67441	21.88	Pk	19.7	.1	-40	1.68	31.03	-29.35	0-360
9	1.0793	18.79	Pk	19.8	.2	-40	-1.21	26.96	-28.17	0-360
10	1.33364	18.51	Pk	19.8	.2	-40	-1.49	25.13	-26.62	0-360
11	2.37418	28.35	Pk	19.9	.2	-40	8.45	29.5	-21.05	0-360
12	5.67293	28.8	Pk	19.8	.4	-40	9	29.5	-20.5	0-360
13	11.85573	27.93	Pk	20	.5	-40	8.43	29.5	-21.07	0-360
**14	13.56165	37.08	Pk	20	.5	-40	17.58	29.5	-11.92	0-360

Pk - Peak detector

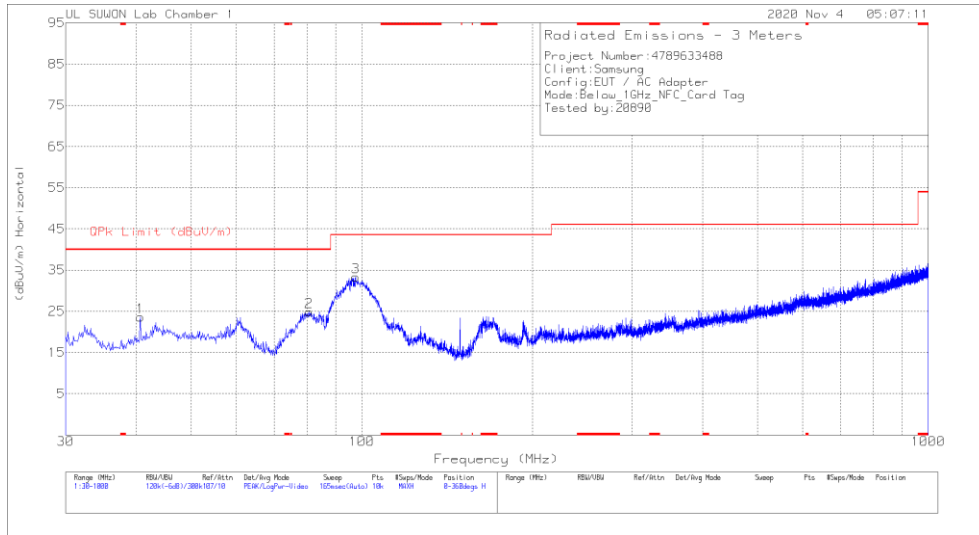
** Fundamental

Note 1: The data for marker number 7 and 14 are the fundamental signal.
Please refer to section 8.1.4 about the fundamental level.
Frequency range 0.009MHz ~ 0.490MHz, only noise floor level and more than 20dB margin.

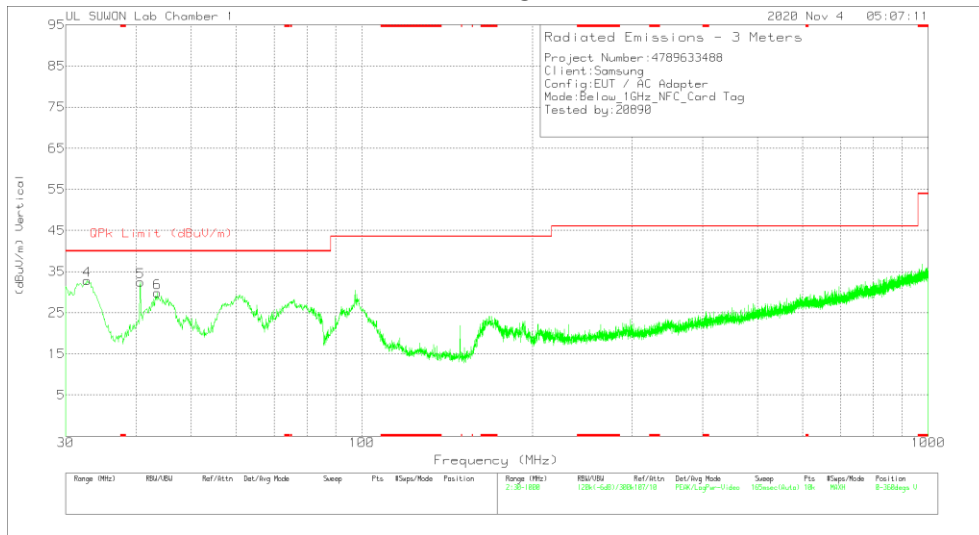
Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

8.1.6. TX SPURIOUS EMISSION 30 TO 1000 MHz [EUT with passive TAG mode]

HORIZONTAL



VERTICAL



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	VULB9163_750	Below_1G[dB]	Corrected Reading (dBuV/m)	QPK Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	40.67	35.4	Pk	18.8	-30.6	23.6	40	-16.4	0-360	400	H
2	80.731	42.21	Pk	12.7	-30.1	24.81	40	-15.19	0-360	300	H
3	97.512	45.82	Pk	17.2	-29.7	33.32	43.52	-10.2	0-360	300	H
4	32.716	47.77	Pk	15.7	-30.6	32.87	40	-7.13	0-360	100	V
5	40.67	44.22	Pk	18.8	-30.6	32.42	40	-7.58	0-360	100	V
6	43.58	41.27	Pk	19.4	-30.8	29.87	40	-10.13	0-360	100	V

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

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.

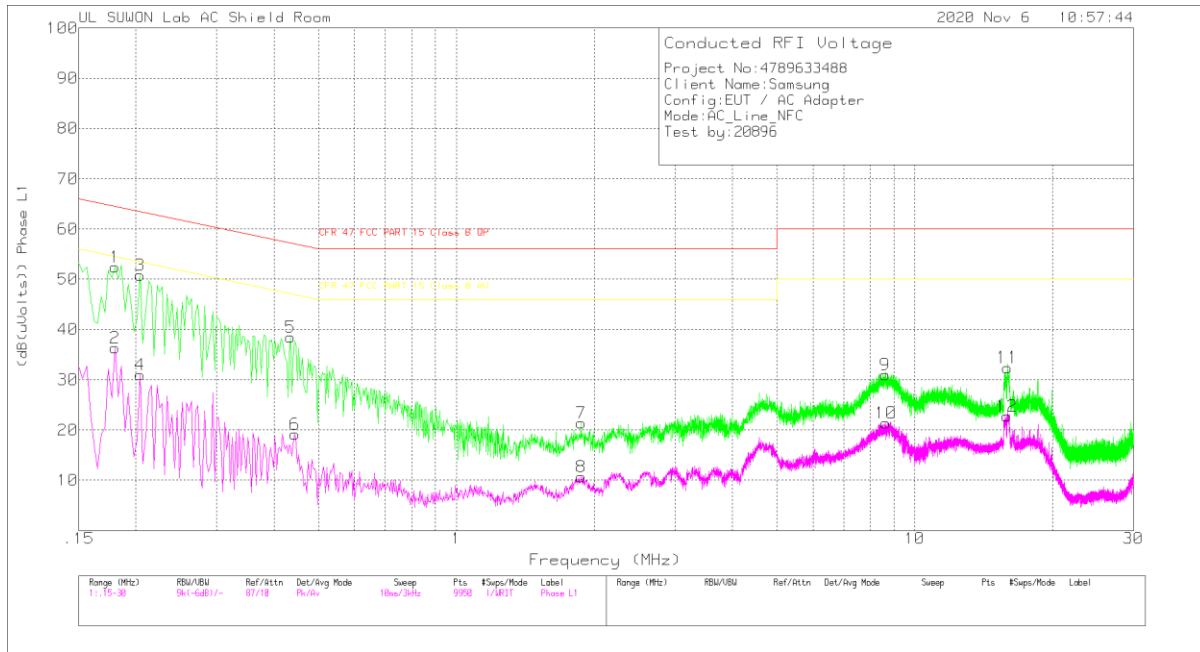
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

WORST EMISSIONS

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

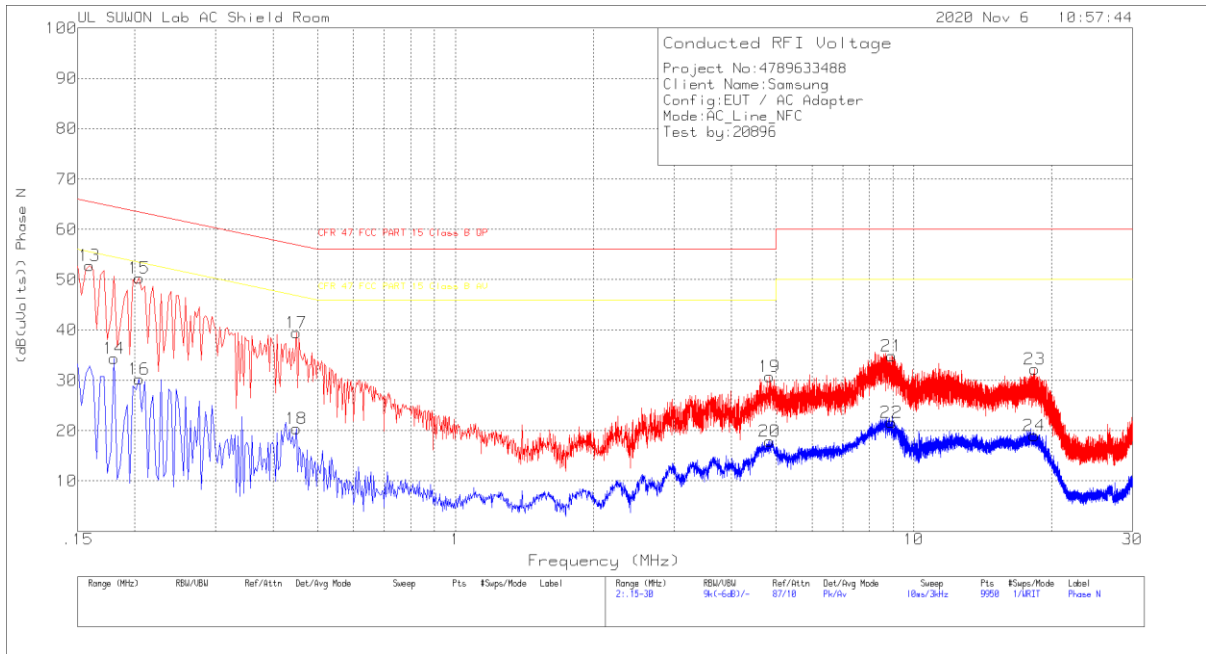
Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_L1[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
1	.18	42.25	Pk	10	.2	52.45	64.49	-12.04	-	-
2	.18	26.15	Av	10	.2	36.35	-	-	54.49	-18.14
3	.204	40.75	Pk	9.9	.2	50.85	63.45	-12.6	-	-
4	.204	20.84	Av	9.9	.2	30.94	-	-	53.45	-22.51
5	.435	28.41	Pk	9.9	.2	38.51	57.16	-18.65	-	-
6	.444	9.01	Av	9.9	.2	19.11	-	-	46.99	-27.88
7	1.872	11.42	Pk	9.7	.3	21.42	56	-34.58	-	-
8	1.872	.67	Av	9.7	.3	10.67	-	-	46	-35.33
9	8.619	20.81	Pk	9.9	.3	31.01	60	-28.99	-	-
10	8.646	11.23	Av	9.9	.3	21.43	-	-	50	-28.57
11	15.909	21.92	Pk	10.1	.4	32.42	60	-27.58	-	-
12	15.891	12.3	Av	10.1	.4	22.8	-	-	50	-27.2

Pk - Peak detector

Av - Average detection

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_Wit h EX_N[dB]	CABLELOS S(dB)	Corrected Reading (dB(uVolts))	CFR 47 FCC PART 15 Class B QP	Margin (dB)	CFR 47 FCC PART 15 Class B AV	Margin (dB)
13	.159	42.85	Pk	9.9	.1	52.85	65.52	-12.67	-	-
14	.18	24.16	Av	10	.2	34.36	-	-	54.49	-20.13
15	.204	40.23	Pk	9.9	.2	50.33	63.45	-13.12	-	-
16	.204	20.16	Av	9.9	.2	30.26	-	-	53.45	-23.19
17	.45	29.37	Pk	9.9	.2	39.47	56.88	-17.41	-	-
18	.45	10.25	Av	9.9	.2	20.35	-	-	46.88	-26.53
19	4.842	20.67	Pk	9.8	.3	30.77	56	-25.23	-	-
20	4.845	7.77	Av	9.8	.3	17.87	-	-	46	-28.13
21	8.943	24.51	Pk	9.9	.4	34.81	60	-25.19	-	-
22	8.94	11.37	Av	9.9	.4	21.67	-	-	50	-28.33
23	18.33	21.58	Pk	10.2	.4	32.18	60	-27.82	-	-
24	18.327	8.47	Av	10.2	.4	19.07	-	-	50	-30.93

Pk - Peak detector

Av - 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 -20 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 §6.8

RESULTS

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: ± 100 ppm = 1.356 kHz										
Power Supply (Vdc)	Envir. Temp (°C)	Frequency Deviation Measured with Time Elapse								
		Start up (MHz)	Delta (ppm)	@ 2mins (MHz)	Delta (ppm)	@ 5mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.88	50	13.560639744	-0.052	13.560639778	-0.055	13.560639582	-0.040	13.560639254	-0.016	100
3.88	40	13.560639260	-0.016	13.560639276	-0.018	13.560639416	-0.028	13.560639557	-0.038	100
3.88	30	13.560639193	-0.011	13.560639114	-0.006	13.560639166	-0.009	13.560639228	-0.014	100
3.88	20	13.560639038	0	13.560639221	-0.013	13.560639223	-0.014	13.560639234	-0.014	100
3.88	10	13.560639578	-0.040	13.560639602	-0.042	13.560639634	-0.044	13.560639630	-0.044	100
3.88	0	13.560639635	-0.044	13.560639676	-0.047	13.560639962	-0.068	13.560640171	-0.084	100
3.88	-10	13.560640998	-0.145	13.560641352	-0.171	13.560641510	-0.182	13.560641563	-0.186	100
3.88	-20	13.560641001	-0.145	13.560640923	-0.139	13.560640902	-0.137	13.560640884	-0.136	100
3.88	-30	13.560641376	-0.172	13.560641288	-0.166	13.560640754	-0.127	13.560640132	-0.081	100

Reference Frequency: EUT Channel 13.56 MHz @ 20°C Limit: ± 100 ppm = 1.356 kHz										
Power Supply (Vdc)	Envir. Temp (°C)	Frequency Deviation Measured with Time Elapse								
		Start up (MHz)	Delta (ppm)	@ 2mins (MHz)	Delta (ppm)	@ 5mins (MHz)	Delta (ppm)	@ 10 mins (MHz)	Delta (ppm)	Limit (ppm)
3.88	20	13.560639038	0	13.560639221	-0.013	13.560639223	-0.014	13.560639234	-0.014	100
4.42	20	13.560639228	-0.014	13.560639235	-0.015	13.560639239	-0.015	13.560639237	-0.015	100
3.65	20	13.560639242	-0.015	13.560639250	-0.016	13.560639244	-0.015	13.560639248	-0.015	100

No non-compliance noted.

END OF TEST REPORT