

CERTIFICATION TEST REPORT

Report Number. : S-4791547073-E8V2

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

Model : SM-A366E/DS, SM-A366E

FCC ID : A3LSMA366E

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

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

Date Of Issue:

2025-01-03

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Revision History

Rev.	Issue Date	Revisions	Presented By
V1	2025-01-03	Initial issue	David(Dongwook) Jung
V2	2025-01-06	Updated to address TCB's question	David(Dongwook) Jung

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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 and NFC

MODEL NUMBER: SM-A366E/DS, SM-A366E

SERIAL NUMBER: 8b11ae3c50347ece, 8b11ae3d37347ece (CONDUCTED);
R3CXB0GBYZJ, R3CXB0GBYXM (RADIATED);

DATE TESTED: 2024-12-03 – 2025-01-03

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
47 CFR 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
UL KOREA LTD. By:



Seokhwan Hong
Suwon Lab Engineer
UL KOREA LTD.

Tested By:



David(Dongwook) Jung
Suwon Lab Engineer
UL KOREA LTD.

2. TEST METHODOLOGY

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

1. FCC 47 CFR Part 2.
2. FCC 47 CFR Part 15.
3. ANSI C63.10-2020.
4. KDB 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	
☐	Chamber 1(3m semi-anechoic chamber)
☒	Chamber 2(3m semi-anechoic chamber)
☒	Chamber 3(3m semi-anechoic chamber)
☐	Chamber 4(3m Full-anechoic chamber)
☐	Chamber 5(3m Full-anechoic chamber)

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:

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

Corrected Reading (dBuV) = Meter Reading (dBuV) + External Cable (dB) +
Cableloss (dB)

46.62 dBuV + 9.8 dB + 0.1 dB = 56.52 dBuV

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Occupied Bandwidth	0.04 %
Frequency Stability	5.3×10^{-8} Hz
Conducted Disturbance, 0.15 to 30 MHz	2.80 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.69 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.92 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 Clause 4.4.3 in IEC Guide 115:2023.

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 and NFC. This test report addresses the DXX (NFC) operational mode.

Representative model	Difference	Derivative model
		SM-A366E
SM-A366E/DS	Hardware	Different Sim Tray
	Software	Same as SM-A366E/DS

The model SM-A366E/DS was used for final testing and is representative of the test results in this report.

5.2. MAXIMUM E-FIELD STRENGTH

The testing was performed at 3 meter. The transmitter maximum E-field at 30m distance is 12.73 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.

Worst case of antenna axis:

NFC with tag mode	NFC without tag mode
Y	Y

The fundamental level of the EUT was investigated each type and bitrate. All test was performed worst case condition.

- ISO/IEC 14443-A(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

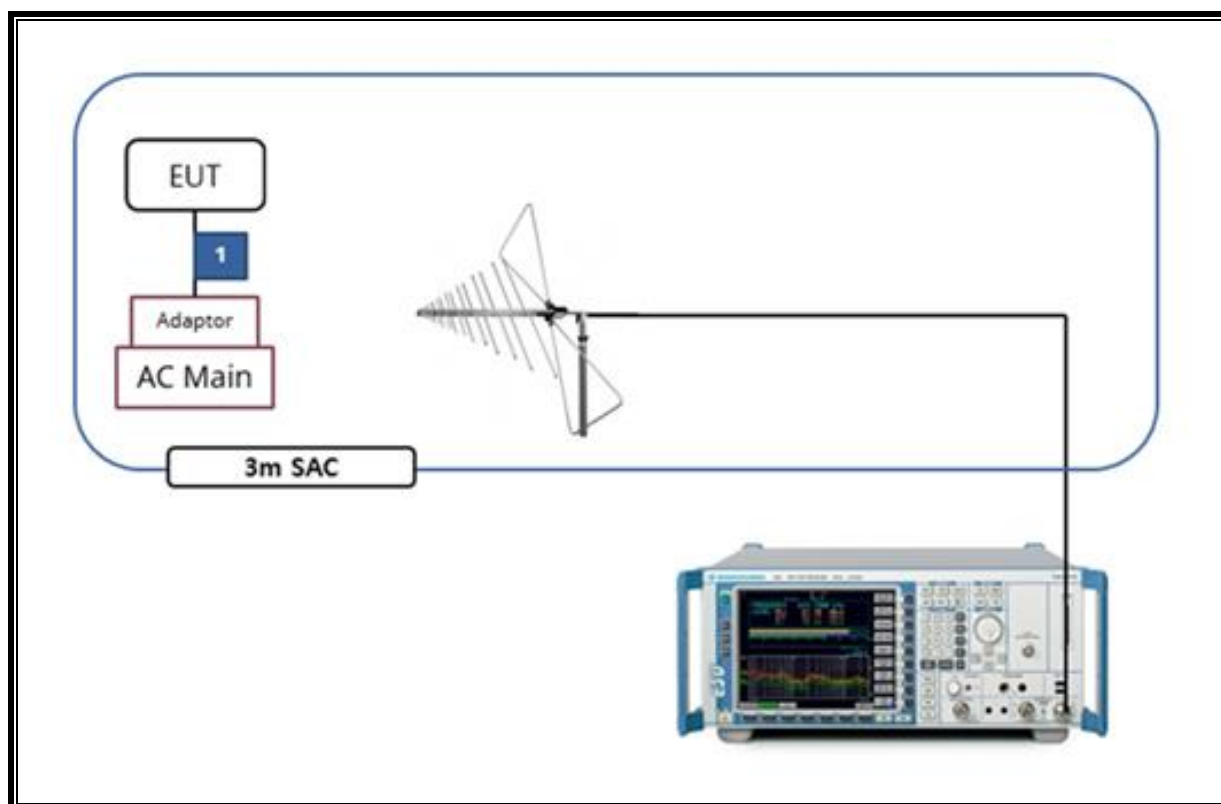
Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Charger	SAMSUNG	EP-TA800	R37TC7A00JBDKA	N/A
Data Cable	SAMSUNG	EP-DN980	GH39-02115A	N/A

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.

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	VULB 9163	845	2026-07-30
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB 9163	749	2026-08-12
Preamplifier, 1000 MHz	Sonoma	310N	341282	2025-07-22
Preamplifier, 1000 MHz	Sonoma	310N	351741	2025-07-22
Spectrum Analyzer, 7 GHz	Agilent / HP	N9010A	MY54200580	2025-07-23
Spectrum Analyzer, 44 GHz	KEYSIGHT	N9030A	MY54170614	2025-07-24
EMI Test Receive, 3 GHz	R&S	ESR 3	101832	2025-07-22
DC Power Supply	Agilent / HP	E3640A	MY54226395	2025-07-24
Temperature Chamber	ESPEC	SH-642	93001109	2025-07-23
LISN	R&S	ENV216	101836	2025-07-22
LISN	R&S	ENV216	101837	2025-07-22
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2E	100900	2025-07-25
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 1-5% of emission BW. The VBW is set to 3 times the RBW. The sweep time is coupled.

RESULTS

Frequency [MHz]	20 dB Bandwidth [kHz]
13.56	439

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 field strength from µV/m to dBuV/m is:

Limit (dBuV/m) = 20 log limit (µV/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

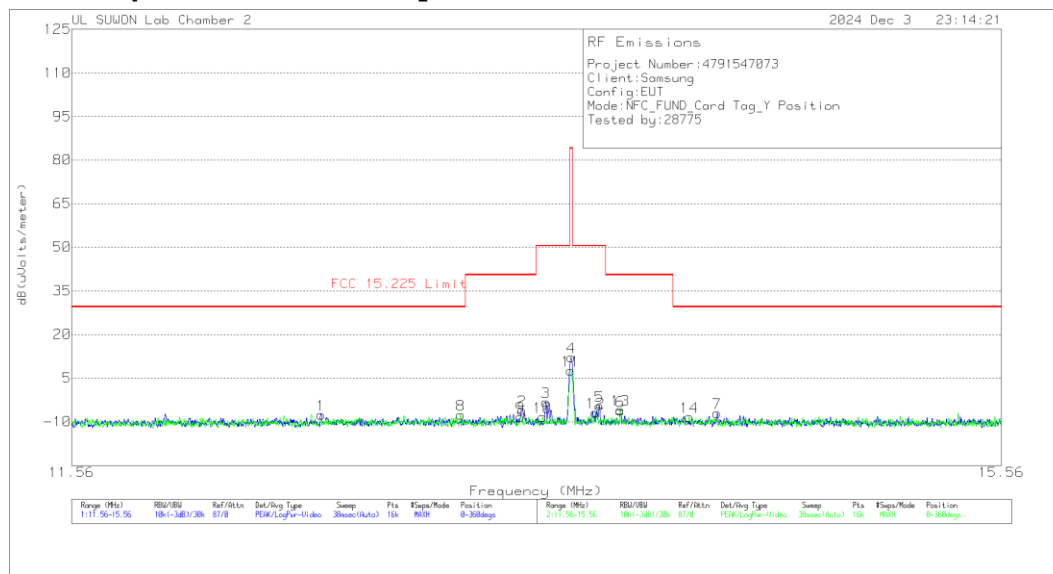
ANSI C63.10-2020

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) [EUT with passive TAG mode]



Trace Markers

Face on

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna (dB/m)	Dist Corr 30m(dB)	Cable Loss (dB)	Corrected Reading (dBuV/m)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	12.52	11.86	Pk	20.1	-40	.5	-7.54	29.54	-37.08	0-360
2	13.34988	13.43	Pk	20.1	-40	.5	-5.97	40.51	-46.48	0-360
3	13.45163	16.22	Pk	20.1	-40	.5	-3.18	50.5	-53.68	0-360
**4	13.56038	31.56	Pk	20.1	-40	.5	12.16	84	-71.84	0-360
5	13.68313	14.85	Pk	20.1	-40	.6	-4.45	50.5	-54.95	0-360
6	13.77638	13.14	Pk	20.1	-40	.6	-6.16	40.51	-46.67	0-360
7	14.20913	12.3	Pk	20.1	-40	.6	-7	29.54	-36.54	0-360

Face off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna (dB/m)	Dist Corr 30m(dB)	Cable Loss (dB)	Corrected Reading (dBuV/m)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	13.09038	11.88	Pk	20.1	-40	.5	-7.52	29.54	-37.06	0-360
9	13.34338	11.14	Pk	20.1	-40	.5	-8.26	40.51	-48.77	0-360
10	13.4375	11.11	Pk	20.1	-40	.5	-8.29	50.5	-58.79	0-360
**11	13.55988	26.96	Pk	20.1	-40	.5	7.56	84	-76.44	0-360
12	13.66638	12.44	Pk	20.1	-40	.6	-6.86	50.5	-57.36	0-360
13	13.77538	13.42	Pk	20.1	-40	.6	-5.88	40.51	-46.39	0-360
14	14.08213	10.91	Pk	20.1	-40	.6	-8.39	29.54	-37.93	0-360

Pk - Peak detector

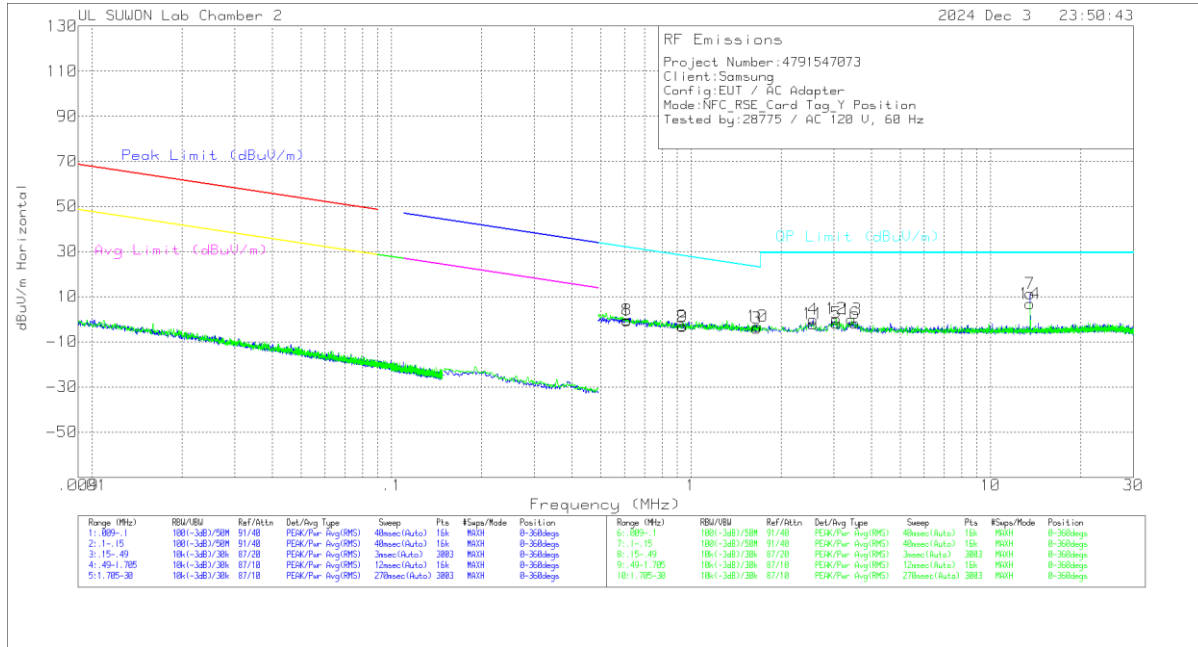
**Fundamental

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 [EUT with passive TAG mode]



Trace Markers Face on

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna(dB/m)	Cable Loss (dB)	Dist Corr 30m(dB)	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.61289	19.32	Pk	19.9	.1	-40	-.68	31.86	-32.54	0-360
2	.93582	16.95	Pk	19.9	.2	-40	-2.95	28.2	-31.15	0-360
3	1.65877	15.8	Pk	20	.2	-40	-.4	23.24	-27.24	0-360
4	2.56268	19.58	Pk	20.1	.3	-40	-.02	29.5	-29.52	0-360
5	3.0622	17.88	Pk	20.1	.3	-40	-1.72	29.5	-31.22	0-360
6	3.53345	17.81	Pk	20.1	.3	-40	-1.79	29.5	-31.29	0-360
**7	13.56165	30.84	Pk	20	.5	-40	11.34	29.5	-18.16	0-360

Face off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna(dB/m)	Cable Loss (dB)	Dist Corr 30m(dB)	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	.61137	19.6	Pk	19.9	.1	-40	-.4	31.88	-32.28	0-360
9	.93931	16.66	Pk	19.9	.2	-40	-3.24	28.16	-31.4	0-360
10	1.66504	16.61	Pk	20	.2	-40	-3.19	23.21	-26.4	0-360
11	2.56268	17.67	Pk	20.1	.3	-40	-1.93	29.5	-31.43	0-360
12	3.05278	19.76	Pk	20.1	.3	-40	.16	29.5	-29.34	0-360
13	3.4392	19.56	Pk	20.1	.3	-40	-.04	29.5	-29.54	0-360
**14	13.56165	26.43	Pk	20	.5	-40	6.93	29.5	-22.57	0-360

Pk - Peak detector

**Fundamental

Note 1: The data for marker number 7 and 14 are the fundamental signal.

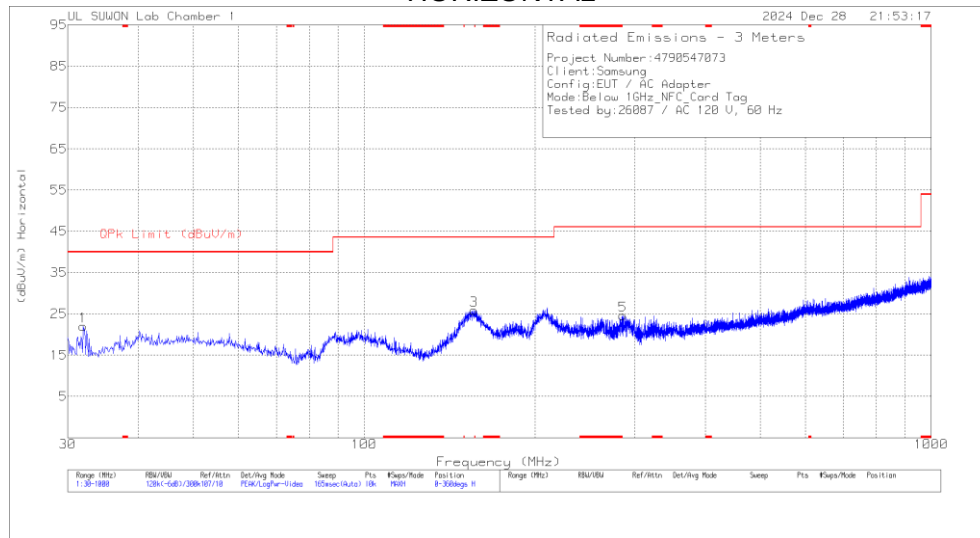
Please refer to section 8.1.1 about the fundamental level.

Frequency range 0.009MHz ~ 0.490MHz, only noise floor level and more than 20dB margin.

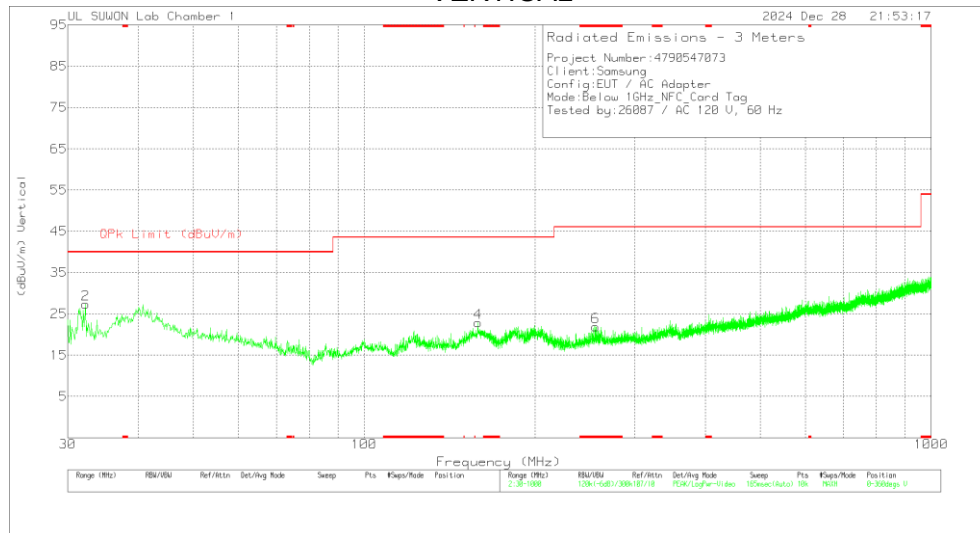
Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

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

HORIZONTAL



VERTICAL

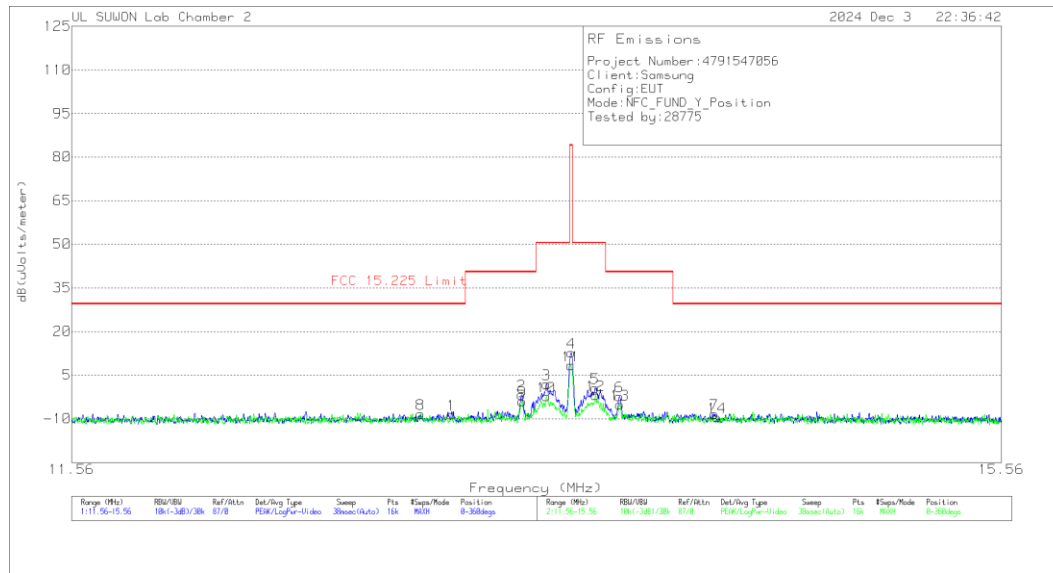


Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Antenna_750_Fact or(dB/m)	Below_1G_Path Loss(dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	31.94	37.6	Pk	15.6	-31.2	22	40	-18	0-360	100	H
3	156.197	41.41	Pk	14.1	-29.6	25.91	43.52	-17.61	0-360	100	H
5	285.789	34.41	Pk	18.8	-28.6	24.61	46.02	-21.41	0-360	100	H
2	32.231	43.01	Pk	15.6	-31.2	27.41	40	-12.59	0-360	200	V
4	158.719	38.33	Pk	14.2	-29.6	22.93	43.52	-20.59	0-360	200	V
6	* 256.204	32.4	Pk	18.3	-28.8	21.9	46.02	-24.12	0-360	200	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 without passive TAG mode]



Trace Markers

Face on

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna (dB/m)	Dist Corr 30m(dB)	Cable Loss (dB)	Corrected Reading (dBuV/m)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	13.051	10.9	Pk	20.1	-40	.5	-8.5	29.54	-38.04	0-360
2	13.34763	17.72	Pk	20.1	-40	.5	-1.68	40.51	-42.19	0-360
3	13.45413	21.29	Pk	20.1	-40	.5	1.89	50.5	-48.61	0-360
**4	13.56088	32.13	Pk	20.1	-40	.5	12.73	84	-71.27	0-360
5	13.66538	19.91	Pk	20.1	-40	.6	.61	50.5	-49.89	0-360
6	13.77113	16.99	Pk	20.1	-40	.6	-2.31	40.51	-42.82	0-360
7	14.19538	10.94	Pk	20.1	-40	.6	-8.36	29.54	-37.9	0-360

Face off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna (dB/m)	Dist Corr 30m(dB)	Cable Loss (dB)	Corrected Reading (dBuV/m)	FCC 15.225 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	12.92388	11.13	Pk	20.1	-40	.5	-8.27	29.54	-37.81	0-360
9	13.34888	15.44	Pk	20.1	-40	.5	-3.96	40.51	-44.47	0-360
10	13.45438	17.06	Pk	20.1	-40	.5	-2.34	50.5	-52.84	0-360
**11	13.56	27.7	Pk	20.1	-40	.5	8.3	84	-75.7	0-360
12	13.66663	17.39	Pk	20.1	-40	.6	-1.91	50.5	-52.41	0-360
13	13.77263	14.13	Pk	20.1	-40	.6	-5.17	40.51	-45.68	0-360
14	14.20838	9.89	Pk	20.1	-40	.6	-9.41	29.54	-38.95	0-360

Pk - Peak detector

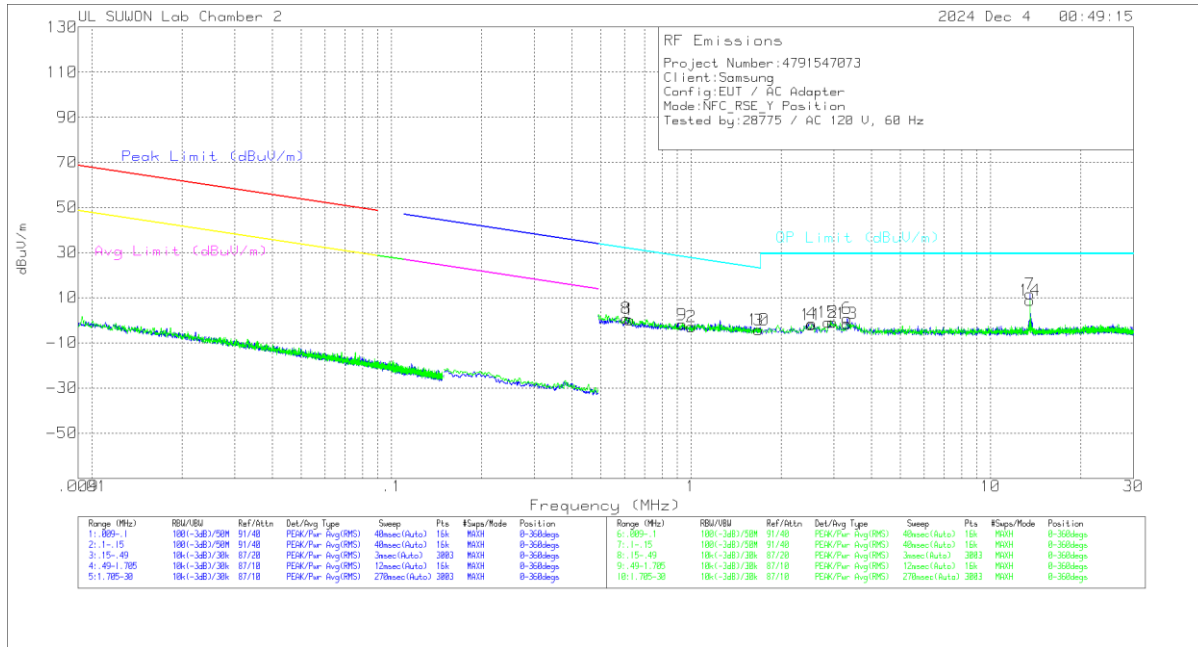
**Fundamental

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 without passive TAG mode]



Trace Markers Face on

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna(dB/m)	Cable Loss (dB)	Dist Corr 30m(dB)	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.62361	20.3	Pk	19.9	.1	-40	.3	31.71	-31.41	0-360
2	1.00475	17.11	Pk	19.9	.2	-40	-2.79	27.58	-30.37	0-360
3	1.68229	15.47	Pk	20	.2	-40	-4.33	23.12	-27.45	0-360
4	2.5344	18.15	Pk	20.1	.3	-40	-1.45	29.5	-30.95	0-360
5	2.96795	18.76	Pk	20.1	.3	-40	-.84	29.5	-30.34	0-360
6	3.31668	20.35	Pk	20.1	.3	-40	.75	29.5	-28.75	0-360
**7	13.56165	31.2	Pk	20	.5	-40	11.7	29.5	-17.8	0-360

Face off

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna(dB/m)	Cable Loss (dB)	Dist Corr 30m(dB)	Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	.60962	20.76	Pk	19.9	.1	-40	.76	31.91	-31.15	0-360
9	.9349	18.06	Pk	19.9	.2	-40	-1.84	28.2	-30.04	0-360
10	1.6791	15.69	Pk	20	.2	-40	-4.11	23.13	-27.24	0-360
11	2.52498	17.54	Pk	20.1	.3	-40	-2.06	29.5	-31.56	0-360
12	2.86428	18.74	Pk	20.1	.3	-40	-.86	29.5	-30.36	0-360
13	3.31668	18.28	Pk	20.1	.3	-40	-1.32	29.5	-30.82	0-360
**14	13.56165	28.39	Pk	20	.5	-40	8.89	29.5	-20.61	0-360

Pk - Peak detector

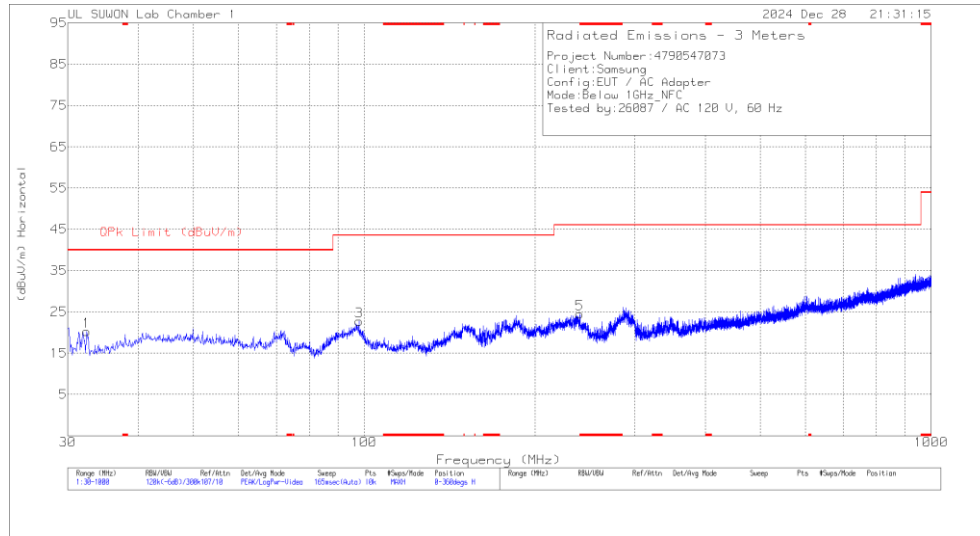
**Fundamental

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.

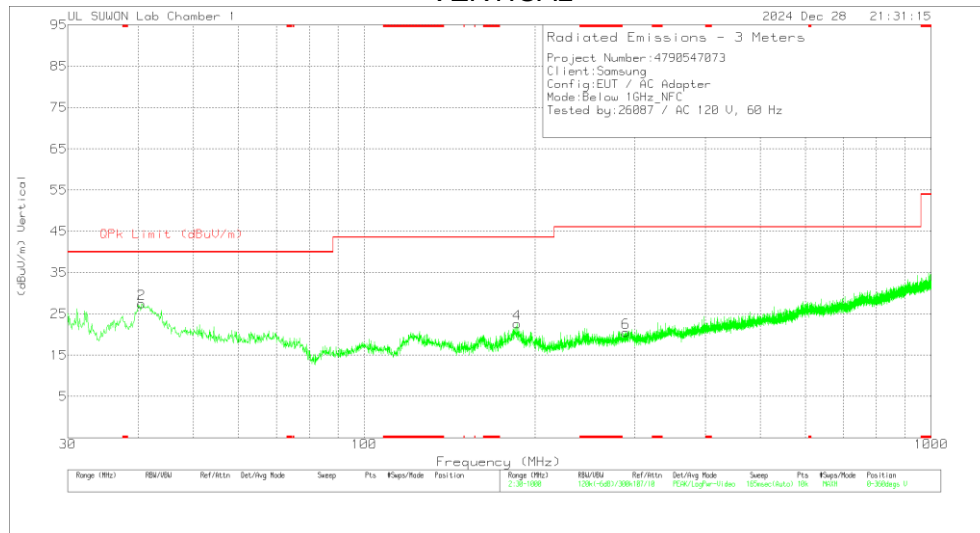
Note 2: Radiated test were investigated with three receiving antenna axes: Face-on, Face-off and horizontal (parallel to the ground plane) and the worse orientations of Face-on and Face-off were set for final test.

8.1.6. TX SPURIOUS EMISSION 30 TO 1000 MHz [EUT without passive TAG mode]

HORIZONTAL



VERTICAL



Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	Antenna_750_Fact or(dB/m)	Below_1G_Path Loss(dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	32.425	35.72	Pk	15.7	-31.2	20.22	40	-19.78	0-360	300	H
3	97.9	35.86	Pk	17.1	-30.2	22.76	43.52	-20.76	0-360	200	H
5	* 240.005	35.44	Pk	18	-29	24.44	46.02	-21.58	0-360	100	H
2	40.476	39.75	Pk	18.7	-31	27.45	40	-12.55	0-360	200	V
4	186.17	36.18	Pk	15.8	-29.4	22.58	43.52	-20.94	0-360	200	V
6	289.184	30.26	Pk	18.9	-28.6	20.56	46.02	-25.46	0-360	200	V

* - 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

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.

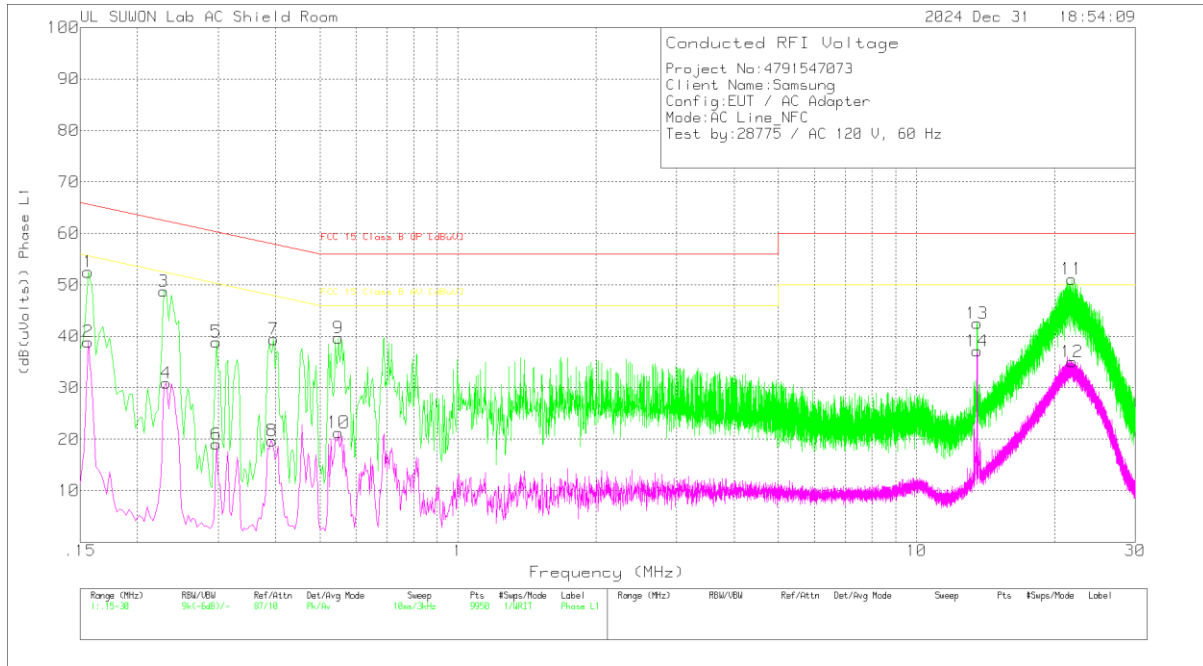
Line conducted data is recorded for both NEUTRAL and HOT lines.

RESULTS

No non-compliance noted:

WORST EMISSIONS(non-Terminated)

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading [dBuV]	Det	101836_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
1	.156	42.7	Pk	9.7	.1	52.5	65.67	-13.17	-	-
2	.156	29.11	Av	9.7	.1	38.91	-	-	55.67	-16.76
3	.228	39.03	Pk	9.6	.1	48.73	62.52	-13.79	-	-
4	.231	21.21	Av	9.6	.1	30.91	-	-	52.41	-21.5
5	.297	29.19	Pk	9.6	.1	38.89	60.33	-21.44	-	-
6	.297	9.35	Av	9.6	.1	19.05	-	-	50.33	-31.28
7	.396	29.63	Pk	9.7	.1	39.43	57.94	-18.51	-	-
8	.393	9.89	Av	9.7	.1	19.69	-	-	48	-28.31
9	.549	29.76	Pk	9.8	.1	39.66	56	-16.34	-	-
10	.549	11.38	Av	9.8	.1	21.28	-	-	46	-24.72
11	21.819	41.12	Pk	9.7	.3	51.12	60	-8.88	-	-
12	21.846	25.06	Av	9.7	.3	35.06	-	-	50	-14.94
13	13.56	32.5	Pk	9.7	.3	42.5	60	-17.5	-	-
14	13.56	27.12	Av	9.7	.3	37.12	-	-	50	-12.88

Pk - Peak detector

Av - Average detection

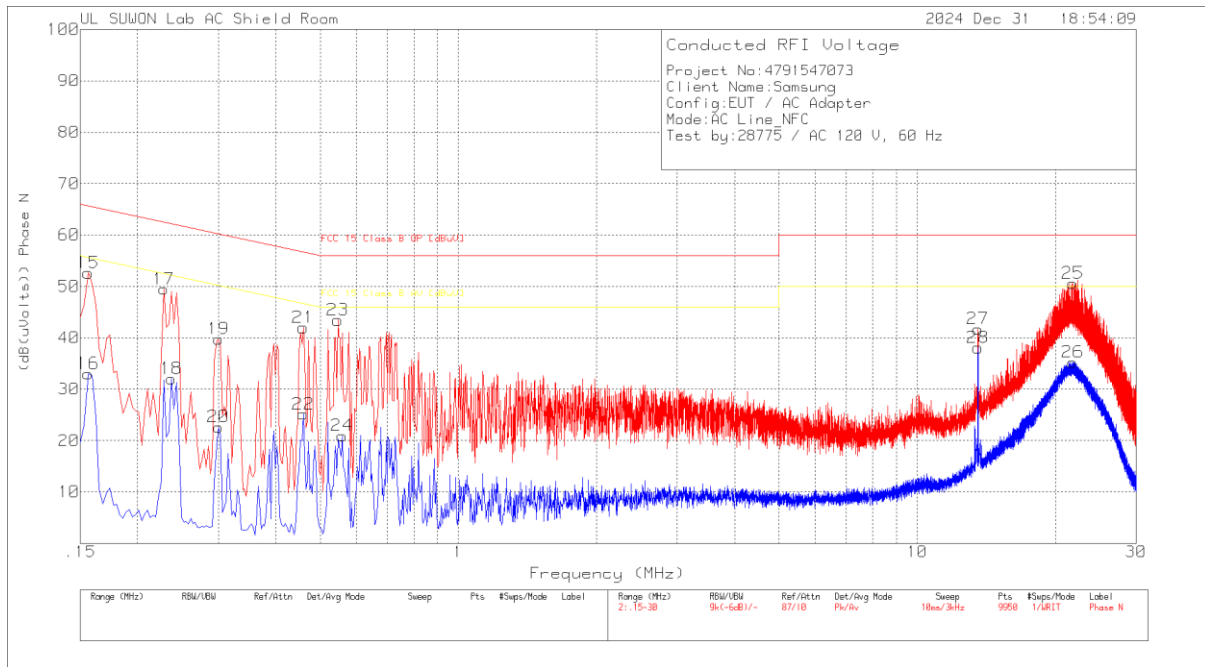
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading [dBuV]	Det	101836_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
21.8192	33.63	Qp	9.7	.3	43.63	60	-16.37	-	-

Qp - Quasi-Peak detector

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading [dBuV]	Det	101836_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
15	.156	42.82	Pk	9.7	.1	52.62	65.67	-13.05	-	-
16	.156	23.22	Av	9.7	.1	33.02	-	-	55.67	-22.65
17	.228	39.79	Pk	9.6	.1	49.49	62.52	-13.03	-	-
18	.237	22.35	Av	9.6	.1	32.05	-	-	52.2	-20.15
19	.3	30.07	Pk	9.6	.1	39.77	60.24	-20.47	-	-
20	.3	12.95	Av	9.6	.1	22.65	-	-	50.24	-27.59
21	.459	32.19	Pk	9.7	.1	41.99	56.71	-14.72	-	-
22	.459	15.34	Av	9.7	.1	25.14	-	-	46.71	-21.57
23	.546	33.56	Pk	9.8	.1	43.46	56	-12.54	-	-
24	.558	11.14	Av	9.7	.1	20.94	-	-	46	-25.06
25	21.822	40.6	Pk	9.7	.3	50.6	60	-9.4	-	-
26	21.822	25.25	Av	9.7	.3	35.25	-	-	50	-14.75
27	13.557	31.82	Pk	9.6	.3	41.72	60	-18.28	-	-
28	13.56	28.18	Av	9.6	.3	38.08	-	-	50	-11.92

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

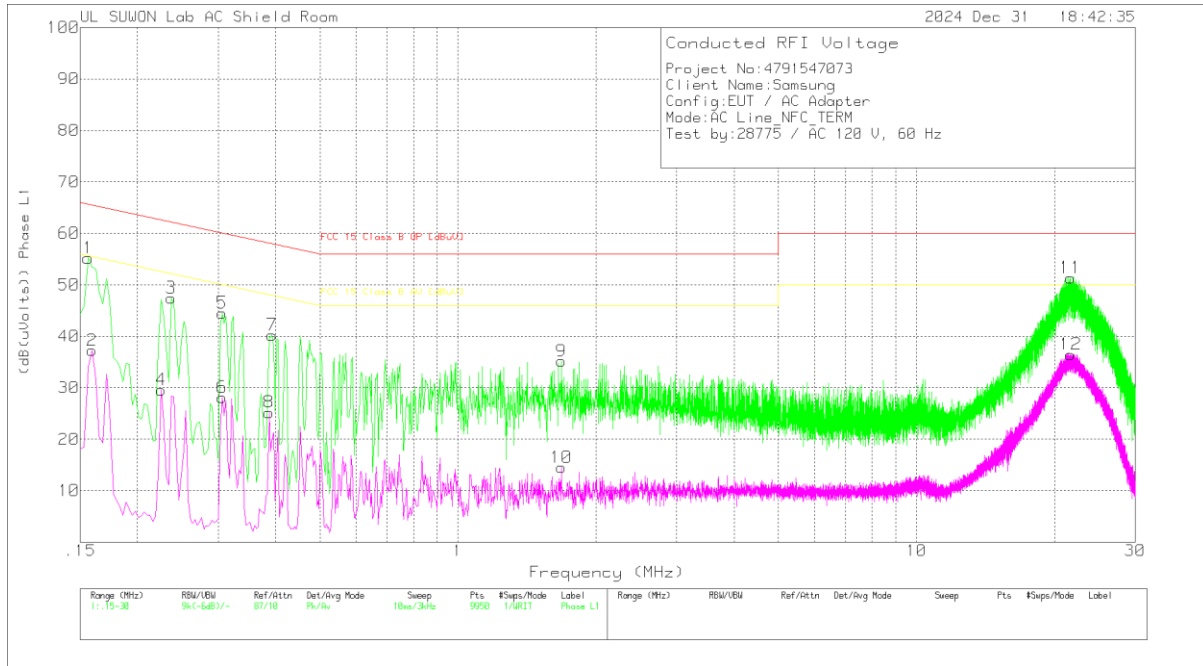
Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading [dBuV]	Det	101836_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
21.8222	30.42	Qp	9.7	.3	40.42	60	-19.58	-	-

Qp - Quasi-Peak detector

WORST EMISSIONS(Terminated)

LINE 1 PLOT



LINE 1 RESULTS

Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading [dBuV]	Det	101836_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
1	.156	45.4	Pk	9.7	.1	55.2	65.67	-10.47	-	-
2	.159	27.46	Av	9.7	.1	37.26	-	-	55.52	-18.26
3	.237	37.74	Pk	9.6	.1	47.44	62.2	-14.76	-	-
4	.225	19.79	Av	9.7	.1	29.59	-	-	52.63	-23.04
5	.306	34.8	Pk	9.6	.1	44.5	60.08	-15.58	-	-
6	.306	18.43	Av	9.6	.1	28.13	-	-	50.08	-21.95
7	.393	30.42	Pk	9.7	.1	40.22	58	-17.78	-	-
8	.387	15.42	Av	9.7	.1	25.22	-	-	48.13	-22.91
9	1.68	25.49	Pk	9.6	.1	35.19	56	-20.81	-	-
10	1.68	4.82	Av	9.6	.1	14.52	-	-	46	-31.48
11	21.66	41.36	Pk	9.7	.3	51.36	60	-8.64	-	-
12	21.69	26.46	Av	9.7	.3	36.46	-	-	50	-13.54

Pk - Peak detector

Av - Average detection

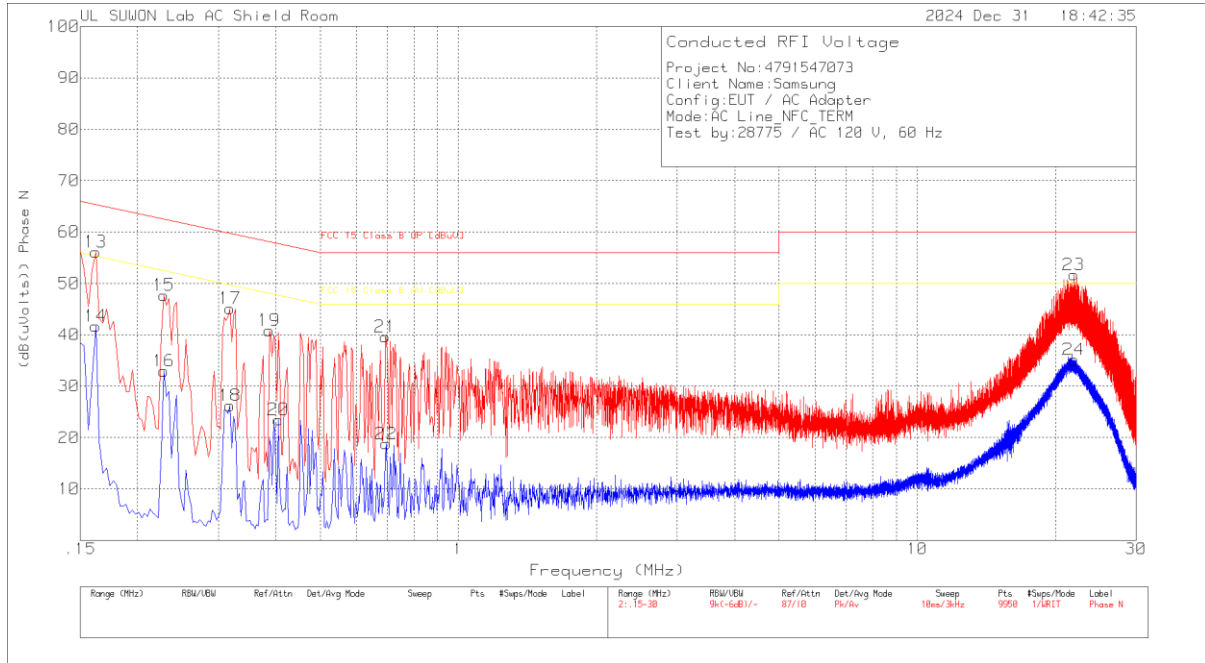
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading [dBuV]	Det	101836_L1 [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
21.6593	34.3	Qp	9.7	.3	44.3	60	-15.7	-	-

Qp - Quasi-Peak detector

LINE 2 PLOT



LINE 2 RESULTS

Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading [dBuV]	Det	101836_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
13	.162	46.21	Pk	9.8	.1	56.11	65.36	-9.25	-	-
14	.162	31.78	Av	9.8	.1	41.68	-	-	55.36	-13.68
15	.228	37.99	Pk	9.6	.1	47.69	62.52	-14.83	-	-
16	.228	23.24	Av	9.6	.1	32.94	-	-	52.52	-19.58
17	.318	35.41	Pk	9.6	.1	45.11	59.76	-14.65	-	-
18	.318	16.51	Av	9.6	.1	26.21	-	-	49.76	-23.55
19	.387	31.03	Pk	9.7	.1	40.83	58.13	-17.3	-	-
20	.405	13.66	Av	9.7	.1	23.46	-	-	47.75	-24.29
21	.693	29.8	Pk	9.7	.1	39.6	56	-16.4	-	-
22	.696	8.99	Av	9.7	.1	18.79	-	-	46	-27.21
23	21.918	41.67	Pk	9.7	.3	51.67	60	-8.33	-	-
24	21.918	25.14	Av	9.7	.3	35.14	-	-	50	-14.86

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading [dBuV]	Det	101836_N [dB]	Cable Loss [dB]	Corrected Reading [dBuV]	FCC 15 Class B QP [dBuV]	Margin (dB)	FCC 15 Class B AV [dBuV]	Margin (dB)
.16125	43.76	Qp	9.8	.1	53.66	65.4	-11.74	-	-
21.9182	31.52	Qp	9.7	.3	41.52	60	-18.48	-	-

Qp - Quasi-Peak detector

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

Test Date	2024-12-26
Test Engineer	33535

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	13.559967648	-1.255	13.559965928	-1.382	13.559966232	-1.359	13.559965628	-1.404	100
3.88	40	13.559969087	-1.149	13.559969315	-1.132	13.559968762	-1.173	13.559968279	-1.208	100
3.88	30	13.559979671	-0.368	13.559981584	-0.227	13.559982288	-0.175	13.559983314	-0.099	100
3.88	20	13.559984662	0.000	13.559988705	0.298	13.559997145	0.921	13.559997013	0.911	100
3.88	10	13.560016991	2.384	13.560020301	2.628	13.560023784	2.885	13.560034105	3.646	100
3.88	0	13.560047703	4.649	13.560047573	4.639	13.560048233	4.688	13.560048425	4.702	100
3.88	-10	13.560051525	4.931	13.560051429	4.924	13.560051822	4.953	13.560051754	4.948	100
3.88	-20	13.560029179	3.283	13.560031525	3.456	13.560042325	4.252	13.560038485	3.969	100
3.88	-30	13.560002652	1.327	13.560003525	1.391	13.560018585	2.502	13.560016252	2.330	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)
3.70	20	13.560003525	1.391	13.560002256	1.297	13.560001925	-0.118	13.560002141	-0.102	100
3.88	20	13.559984662	0.000	13.559988705	0.298	13.559997145	-0.471	13.559997013	-0.480	100
4.45	20	13.559999252	1.076	13.559996252	0.855	13.559998252	-0.389	13.559999314	-0.311	100

No non-compliance noted.

END OF TEST REPORT