



CERTIFICATION TEST REPORT

Report Number. : 4789497455-E8V2

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

Model : SM-N985F/DS, SM-N985F

FCC ID : A3LSMN985F

EUT Description : GSM/WCDMA/LTE 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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Testing Laboratory

TL-637

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	07/02/20	Initial issue	Sangyun Kim
V2	07/08/20	Updated to address TCB's question	Sangyun Kim

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SAMSUNG ELECTRONICS CO., LTD.

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

MODEL: SM-N985F/DS, SM-N985F

SERIAL NUMBER: R3CN40CD4FP (RADIATED)
R38N406WGAX (Spot Check);

DATE TESTED: JUN 19, 2020 – JUN 23, 2020 (Original)
JUN 23, 2020 (Spot Check);

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.

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1.1. INTRODUCTION OF TEST DATA REUSE

This report referenced from the FCC ID: A3LSMN986B DCD WPT(FCC CFR 47 Part 15C). And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

1.2. DIFFERENCE

The FCC ID: A3LSMN985F shares the same enclosure and circuit board as FCC ID: A3LSMN986B. The WPT antennas and surrounding circuitry and layout are identical between these two units.

After confirming through preliminary radiated emissions that the performance of the FCC ID: A3LSMN986B remains representative of FCC ID: A3LSMN985F. The test data of FCC ID: A3LSMN986B being submitted for this application to cover WPT features.

1.3. SPOT CHECK VERIFICATION DATA

Band	Test Item	Mode	Frequency	Test Limit	Original model	Spot-check model	Deviation	Remark
					SM-N986B/DS Results FCC ID : A3LSMN986B	SM-N985F/DS Results FCC ID : A3LSMN985F		
WPT (110 to 148kHz)	FUND.	Power Sharing	0.11 MHz	46.76 dBuV/m	2.00 dBuV/m	1.26 dBuV/m	-0.74 dB	-
	RSE	Power Sharing	0.55 MHz	32.74 dBuV/m	17.29 dBuV/m	11.32 dBuV/m	-5.97 dB	-
WPT (590 - 625kHz)	FUND.	Charging S-Pen	0.59 MHz	32.13 dBuV/m	18.12 dBuV/m	15.47 dBuV/m	-2.65 dB	-
	RSE	Charging S-Pen	1.98 MHz	29.5 dBuV/m	8.80 dBuV/m	10.17 dBuV/m	1.37 dB	-

Comparison of two models, upper deviation is within 3dB range and all test results are under FCC Technical Limits.

1.4. REFERENCE DETAIL

Reference application that contains the reused reference data in the individual test reports:

Equipment Class	Reference FCC ID (Parent)	Application Type	Reference Test report number	Exhibit Type	Variant Test Report Number	Data Re-used
PCE	A3LSMN986B	Original Grant	4789468331-E2	Test Report	4789497455-E2	All
DTS	A3LSMN986B	Original Grant	4789468331-E3 (802.11b/g/n/ax)	Test Report	4789497455-E3 (802.11b/g/n/ax)	All
			4789468331-E4 Bluetooth LE	Test Report	4789497455-E4 Bluetooth LE	All
DSS	A3LSMN986B	Original Grant	4789468331-E5 (Bluetooth)	Test Report	4789497455-E5 (Bluetooth)	All
NII	A3LSMN986B	Original Grant	4789468331-E6 (802.11a/n/ac/ax)	Test Report	4789497455-E6 (802.11a/n/ac/ax)	All
DXX	A3LSMN986B	Original Grant	4789468331-E7 (NFC)	Test Report	4789497455-E7 (NFC)	All
DCD	A3LSMN986B	Original Grant	4789468331-E8 (WPT)	Test Report	4789497455-E8 (WPT)	All

For this application the data reuse is summarized below for each equipment class:

Equipment Class	Reference FCC ID (Parent)	Application Type	Test Item	Data Re-used
PCE	A3LSMN986B	Original Grant	WWAN	All except SAR (full test), HAC (full test)
DTS	A3LSMN986B	Original Grant	BLE	All
			WLAN	All except SAR (full test), HAC (full test)
			WLAN 802.11ax	All except HAC (full test)
DSS	A3LSMN986B	Original Grant	BT	All except SAR (full test)
NII	A3LSMN986B	Original Grant	WLAN	All except SAR (full test), HAC (full test)
			WLAN 802.11ax	All except HAC (full test)
DXX	A3LSMN986B	Original Grant	NFC	All
DCD	A3LSMN986B	Original Grant	WPT	All except RF exposure

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. 680106 D01 RF Exposure Wireless Charging Apps v03.
5. KDB 484596 D01 Referencing Test Data v01

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
☒	Chamber 2
☐	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:

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

4.3. MEASUREMENT UNCERTAINTY

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

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	2.35 dB
Radiated Disturbance, 9 kHz to 30 MHz	1.72 dB
Radiated Disturbance, 30 MHz to 1 GHz	3.49 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 Phone + BT/BLE, DTS/UNII a/b/g/n/ac/ax, UWB, WPT and NFC.

This test report addresses the wireless low power Transmitter(DCD) operational mode.

This report covers the Samsung models SM-N986B/DS and SM-N986B.

These models are identical in hardware except SM-N986B has single SIM tray.

With some pre-scan, model SM-N986B/DS was set for final test.

5.2. MAXIMUM E-FIELD STRENGTH

- Power sharing mode

Fundamental Frequency (KHz)	Mode	E field (300m distance) FCC (dBuV/m)
110 - 148	Charging	2.00

- S-pen charging mode

Fundamental Frequency (KHz)	Mode	E field (30m distance) FCC (dBuV/m)
590 - 625	Charging	18.12

5.3. PRELIMINARY TEST CONFIGURATIONS

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

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

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

5.4. WORST-CASE CONFIGURATION AND MODE

Mode 1	Test Case	Description
Power sharing mode (S-pen is fully charged condition)	1	Charging from EUT to Phone
	2	Charging from EUT(Charging from TA) to Phone
	3	Charging from EUT to Phone (Cross position)
	4	Charging from EUT(Charging from TA) to Phone (Cross position)
	5	Charging from EUT to Wearable device
	6	Charging from EUT(Charging from TA) to Wearable device

Mode 2	Test Case	Description
S-pen Charging mode	7	Charging from EUT to S-Pen
	8	Charging from EUT(Charging from TA) to S-Pen

Mode 3	Test Case	Description
Simutaneous charging mode(Power sharing and S-pen charging)	9	Charging from EUT to Phone (Cross position) and Charging from EUT to S-Pen
	10	Charging from EUT to Phone (Cross position) and Charging from EUT to S-Pen(EUT was Charging from TA)

For radiated test, test case 1/3/5/7/9, the EUT can operate the power sharing mode when battery level is over 30%. Because test results are not different between fully charged status and battery level 30% status(EUT condition), test were performed fully charged condition.

Also according to current client device's(Phone and Wearable device) battery level, test results are different. Because the test results were worst when the battery level was 1%~20%, tests were performed when the battery level was 1%~20%.(Client device)

For S-pen, both fully charged and non-fully charged condition were investigated, test case 7/8/9 were performed non-fully charged condition as worst case.

During radiated test for test case 1/3/5/7/9, the EUT didn't connected AC adapter, but for AC line conducted test for all test case was performed with connected with AC adapter.

For power sharing mode, test results of case 4 is worst and S-pen Charging mode, test results of case 8 is worst, so this test report described test case 4, test case 8 and test case 10.

5.5. MODIFICATIONS

No modifications were made during testing.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT & PERIPHERALS

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID/DoC
Tavel Adapter	Samsung	EP-TA800	R37N39301T8SE3	DoC
USB Data Cable	Samsung	EP-DG980	-	-
Mobile Phone	Samsung	SM-G986B	R3CMB0C70XN	A3LSMG986B
Wearable Device	Samsung	SM-R835	RFAM90ZXFTF	A3LSMR835

I/O CABLES

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	1.1m	N/A

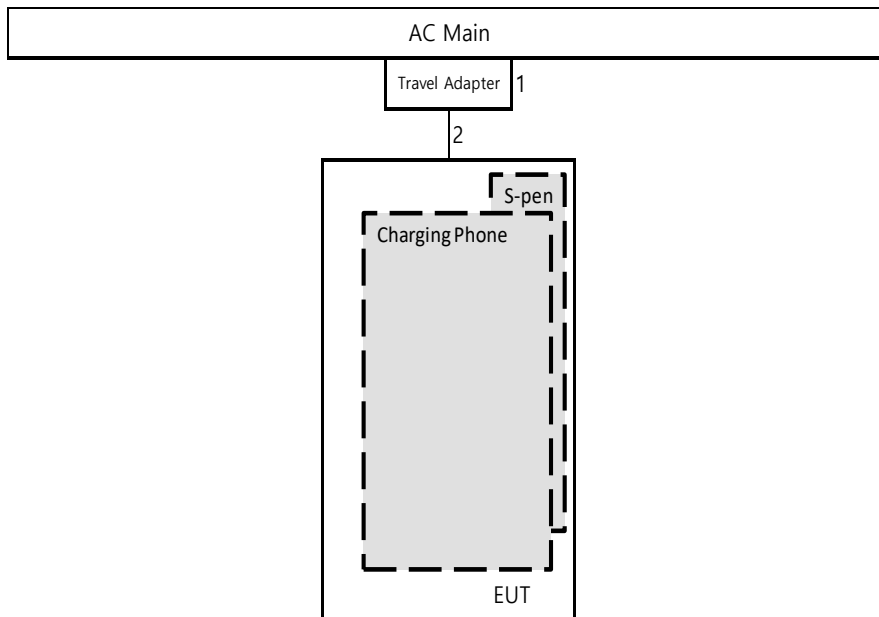
TEST SETUP

The EUT is installed in a typical configuration. Charging from EUT.

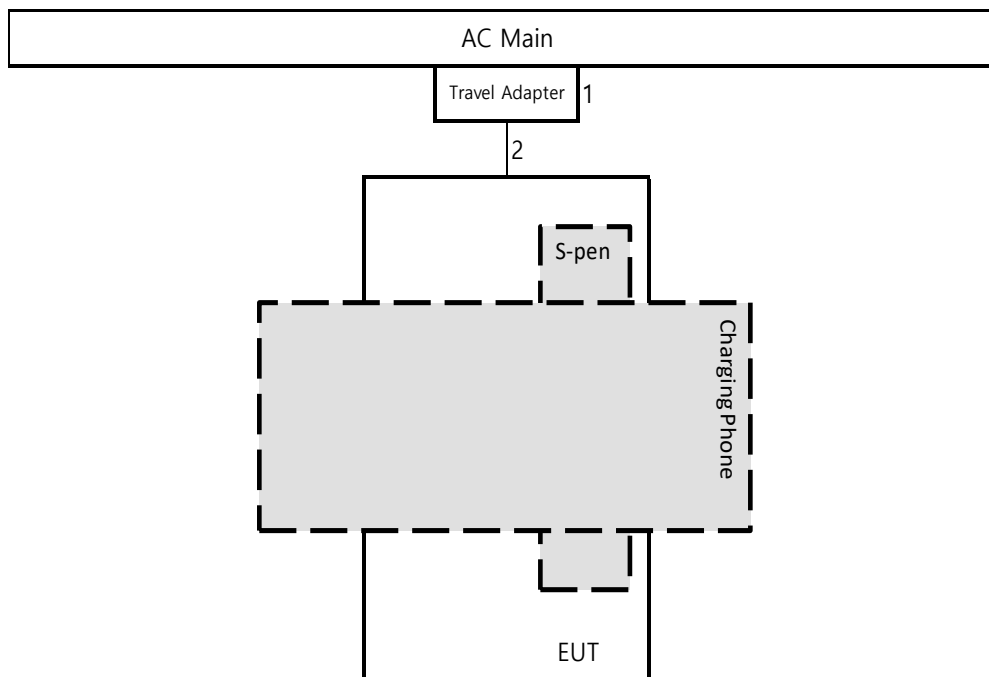
TEST SETUP DIAGRAM

NOTE : Test case 1/3/5/7/9, EUT did not connected with Travel adapter(AC Main) in below set-up diagram for radiated test.

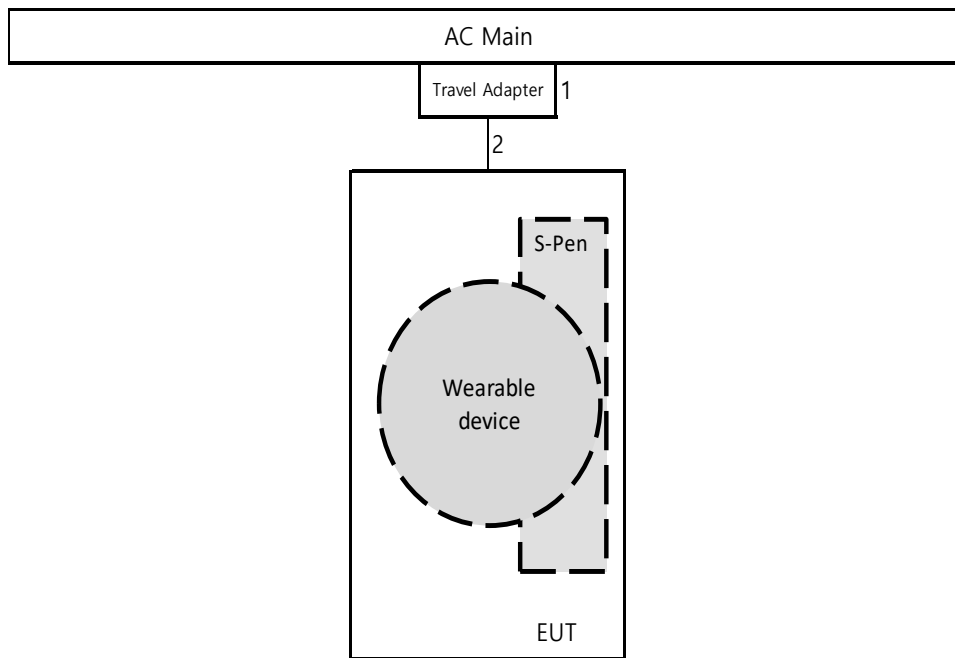
- Test Case1 and 2 : Charging Phone(S-pen is fully charged condition)



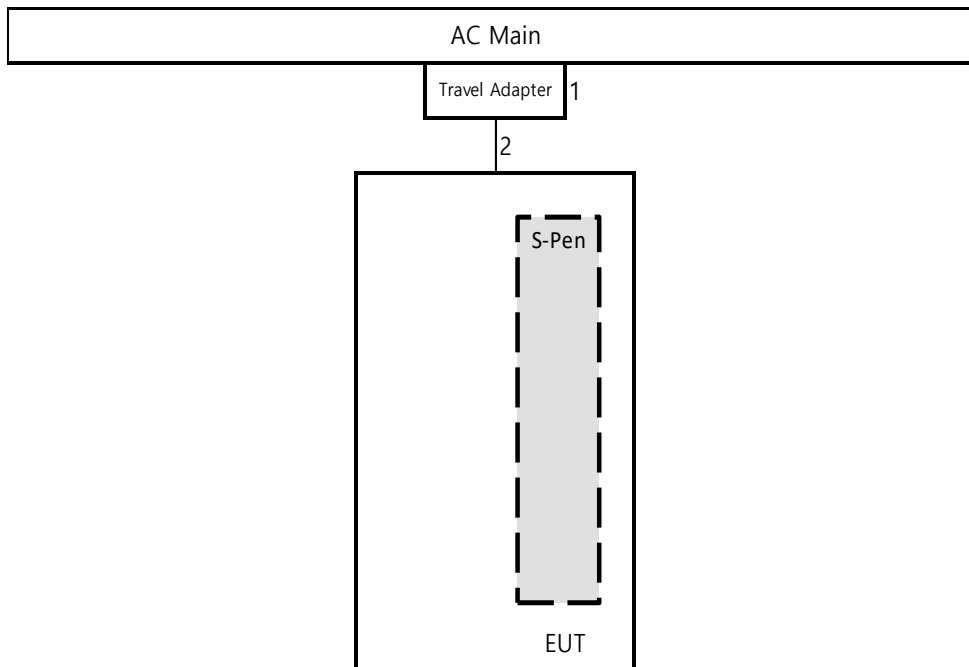
- Test Case 3 and 4 : Charging Phone(Cross position, S-pen is fully charged condition)



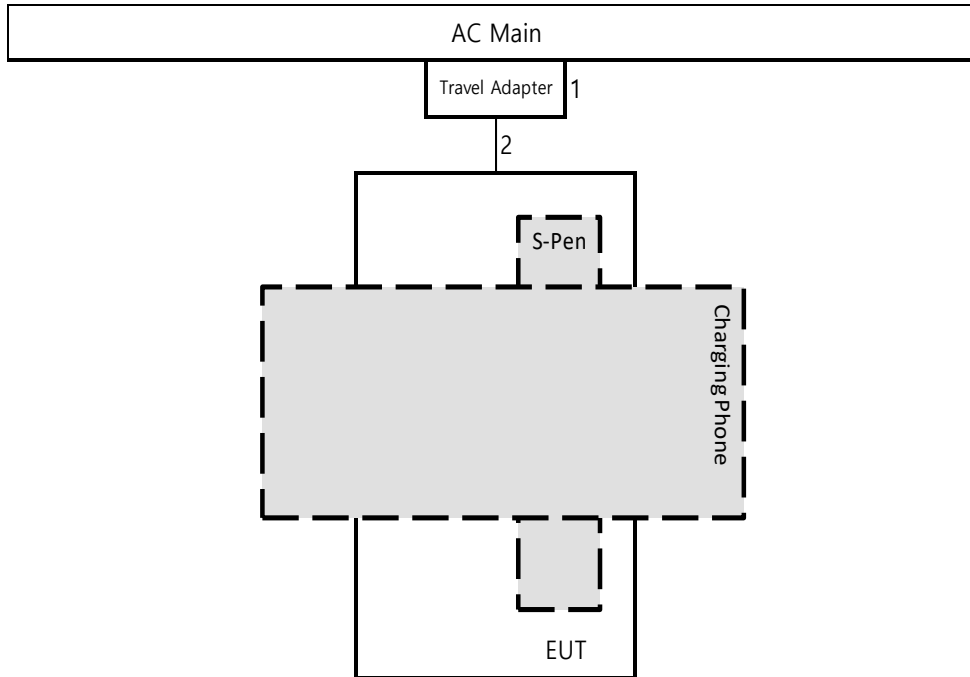
- Test Case 5 and 6 : Charging Wearable device(S-pen is fully charged condition)



- Test Case 7 and 8 : S-Pen Charging



- Test case 9 and 10 : Simultaneous charging (Power sharing and S-pen charging)



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	New Cal Due
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	750	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	749	08-04-20
Antenna, Bilog, 30MHz-1GHz	SCHWARZBECK	VULB9163	845	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00167211	08-04-20
Antenna, Horn, 18 GHz	ETS	3115	00161451	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168724	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00168717	08-04-20
Antenna, Horn, 18 GHz	ETS	3117	00205959	08-04-20
Antenna, Horn, 40 GHz	ETS	3116C	00166155	08-14-20
Antenna, Horn, 40 GHz	ETS	3116C	00168645	10-02-21
Preamplifier	ETS	3116C-PA	00168841	08-08-20
Preamplifier, 1000 MHz	Sonoma	310N	341282	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	351741	08-05-20
Preamplifier, 1000 MHz	Sonoma	310N	370599	08-05-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1876511	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	1896138	08-06-20
Preamplifier, 18 GHz	Miteq	AFS42-00101800-25-S-42	2029169	08-06-20
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54170614	08-06-20
Spectrum Analyzer, 44 GHz	Agilent / HP	N9030A	MY54490312	08-06-20
Spectrum Analyzer, 43.5 GHz	R&S	FSW43	104089	08-06-20
Average Power Sensor	Agilent / HP	U2000	MY54270007	08-09-20
Attenuator	PASTERNAK	PE7087-10	A001	08-08-20
Attenuator	PASTERNAK	PE7087-10	A008	08-08-20
Attenuator	PASTERNAK	PE7004-10	2	08-06-20
Attenuator	PASTERNAK	PE7087-10	A009	08-08-20
EMI Test Receive, 40 GHz	R&S	ESU40	100439	08-06-20
EMI Test Receive, 40 GHz	R&S	ESU40	100457	08-06-20
EMI Test Receive, 44 GHz	R&S	ESW44	101590	08-05-20
EMI Test Receive, 3 GHz	R&S	ESR3	101832	08-05-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	009	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	015	08-06-20
Low Pass Filter 5GHz	Micro-Tronics	LPS17541	020	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	010	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	015	08-06-20
High Pass Filter 3GHz	Micro-Tronics	HPM17543	020	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	009	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	016	08-06-20
High Pass Filter 6GHz	Micro-Tronics	HPS17542	021	08-06-20
LISN	R&S	ENV-216	101837	08-09-20
Antenna, Loop, 9kHz-30MHz	R&S	HFH2-Z2	100418	10-02-21
Antenna, Loop, 9kHz-30MHz				
Description	Manufacturer	Model	Version	
Radiated software	UL	UL EMC	Ver 9.5	
AC Line Conducted software	UL	UL EMC	Ver 9.5	

7. APPLICABLE LIMITS AND TEST RESULTS

7.1. RADIATED EMISSIONS

TEST PROCEDURE

ANSI C63.10: 2013

The highest clock frequency generated or used in the EUT is 600 kHz therefore the frequency range was investigated from 9 kHz to 30 MHz.

LIMIT

FCC §15.209 (a)

ICES-001 Section 6.2, IC RSS-216 6.2.2, and IC RSS-GEN Sections 8.9 and 8.10.

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.		

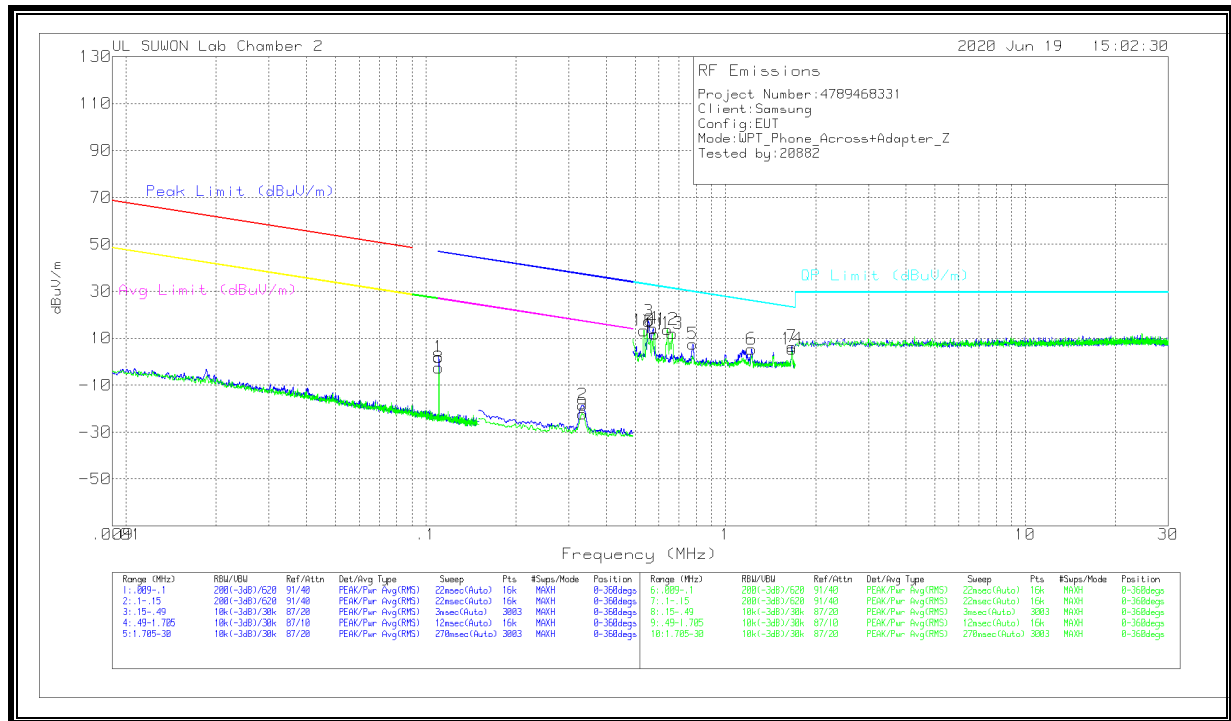
RESULTS

The EUT belongs to Test Case 4 and 8 and 10.

Although these tests were performed other than open field test site, adequate comparison measurements were confirmed against 300 m open field 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.

RADIATED EMISSIONS 9 KHz to 30 MHz(Power sharing mode Test Case 4)



TEST DATA

Trace Markers

[Face-On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
**1	.11056	62.1	Pk	19.8	.1	-80	2	46.76	-44.76	26.76	-24.76	0-360
2	.33413	41.78	Pk	19.7	.1	-80	-18.42	37.13	-55.55	17.13	-35.55	0-360

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)
3	.55388	37.49	Pk	19.7	.1	-40	17.29	32.74	-15.45	0-360
4	.57379	34.44	Pk	19.7	.1	-40	14.24	32.43	-18.19	0-360
5	.77755	27.59	Pk	19.8	.2	-40	7.59	29.8	-22.21	0-360
6	1.22169	25.37	Pk	19.8	.2	-40	5.37	25.89	-20.52	0-360
7	1.66899	26.46	Pk	19.8	.2	-40	6.46	23.18	-16.72	0-360

[Face-Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
**8	.11055	57.54	Pk	19.8	.1	-80	-2.56	46.76	-49.32	26.76	-29.32	0-360
9	.33346	37.85	Pk	19.7	.1	-80	-22.35	37.15	-59.5	17.15	-39.5	0-360

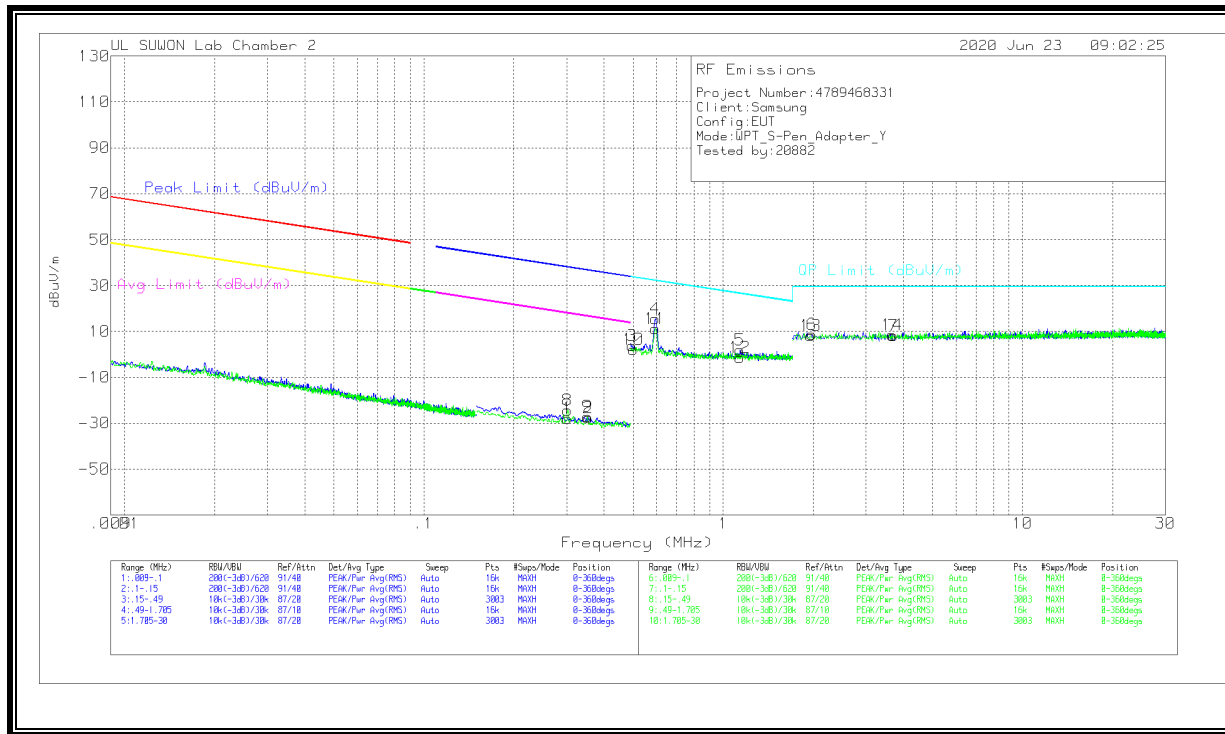
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBuV/m	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
10	.5345	33.49	Pk	19.7	.1	-40	13.29	33.05	-19.76	0-360
11	.58067	31.89	Pk	19.7	.1	-40	11.69	32.33	-20.64	0-360
12	.64132	33.91	Pk	19.7	.1	-40	13.71	31.47	-17.76	0-360
13	.66438	32.31	Pk	19.7	.1	-40	12.11	31.16	-19.05	0-360
14	1.66735	25.42	Pk	19.8	.2	-40	5.42	23.19	-17.77	0-360

Pk - Peak detector

** Fundamental

Note : 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.

RADIATED EMISSIONS 9 KHz to 30 MHz(S-pen charging mode Test case 8)



TEST DATA

Trace Markers

[Face-On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
1	.30142	32.38	Pk	19.7	.1	-80	-27.82	38.03	-65.85	18.03	-45.85	0-360
2	.35442	32.65	Pk	19.7	.1	-80	-27.55	36.62	-64.17	16.62	-44.17	0-360

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)
3	.49627	24.07	Pk	19.7	.1	-40	3.87	33.69	-29.82	0-360
**4	.59393	35.69	Pk	19.7	.1	-40	15.49	32.13	-16.64	0-360
5	1.13877	21.85	Pk	19.8	.2	-40	1.85	26.5	-24.65	0-360
6	1.97833	28.8	Pk	19.8	.2	-40	8.8	29.5	-20.7	0-360
7	3.7031	28.01	Pk	19.9	.3	-40	8.21	29.5	-21.29	0-360

[Face-Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
8	.30261	35.9	Pk	19.7	.1	-80	-24.3	37.99	-62.29	17.99	-42.29	0-360
9	.35176	33.18	Pk	19.7	.1	-80	-27.02	36.68	-63.7	16.68	-43.7	0-360

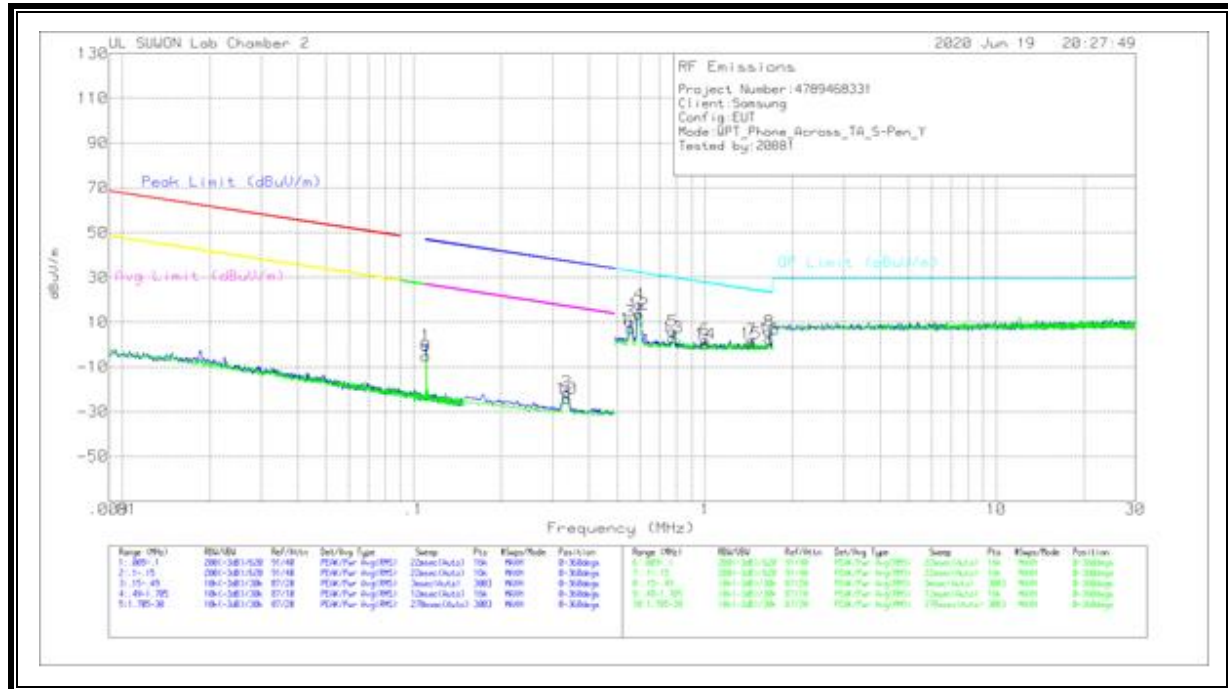
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 30m	Corrected Reading dBuV/m	QP Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
10	.50037	22.39	Pk	19.7	.1	-40	2.19	33.62	-31.43	0-360
**11	.59366	31.41	Pk	19.7	.1	-40	11.21	32.14	-20.93	0-360
12	1.13741	18.73	Pk	19.8	.2	-40	-1.27	26.51	-27.78	0-360
13	1.95948	28.24	Pk	19.8	.2	-40	8.24	29.5	-21.26	0-360
14	3.67483	28.25	Pk	19.9	.3	-40	8.45	29.5	-21.05	0-360

Pk - Peak detector

** Fundamental

Note 1: 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.

RADIATED EMISSIONS 9 KHz to 30 MHz(Simutaneous charging mode Test Case 10)



TEST DATA

Trace Markers

[Face On]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
*1	.11053	59.87	Pk	19.8	.1	-80	-.23	46.76	-46.99	26.76	-26.99	0-360
2	.33509	39.23	Pk	19.7	.1	-80	-20.97	37.11	-58.08	17.11	-38.08	0-360

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)
3	.55247	30.51	Pk	19.7	.1	-40	10.31	32.76	-22.45	0-360
**4	.59458	38.32	Pk	19.7	.1	-40	18.12	32.12	-14	0-360
5	.77679	25.91	Pk	19.8	.2	-40	5.91	29.81	-23.9	0-360
6	1.00114	22.28	Pk	19.8	.2	-40	2.28	27.61	-25.33	0-360
7	1.44904	22.04	Pk	19.8	.2	-40	2.04	24.41	-22.37	0-360
8	1.66568	25.91	Pk	19.8	.2	-40	5.91	23.2	-17.29	0-360

[Face Off]

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	HFH2-Z2_Loop Antenna	Cable Loss	Dist Corr 300m	Corrected Reading dBuV/m	Peak Limit (dBuV/m)	Margin (dB)	Avg Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)
*9	.11053	54.91	Pk	19.8	.1	-80	-5.19	46.76	-51.95	26.76	-31.95	0-360
10	.33526	36.05	Pk	19.7	.1	-80	-24.15	37.1	-61.25	17.1	-41.25	0-360

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)
11	.55616	27.3	Pk	19.7	.1	-40	7.1	32.7	-25.6	0-360
**12	.59401	33.76	Pk	19.7	.1	-40	13.56	32.13	-18.57	0-360
13	.77812	23.14	Pk	19.8	.2	-40	3.14	29.79	-26.65	0-360
14	1.00137	20.32	Pk	19.8	.2	-40	.32	27.61	-27.29	0-360
15	1.4427	20.46	Pk	19.8	.2	-40	.46	24.45	-23.99	0-360
16	1.66397	22.46	Pk	19.8	.2	-40	2.46	23.21	-20.75	0-360

Pk - Peak detector

*Power Sharing Fundamental

**S-Pen Fundamental

Note 1 : 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.

7.2. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.10: 2013

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.

LIMIT

FCC §15.207 (a)

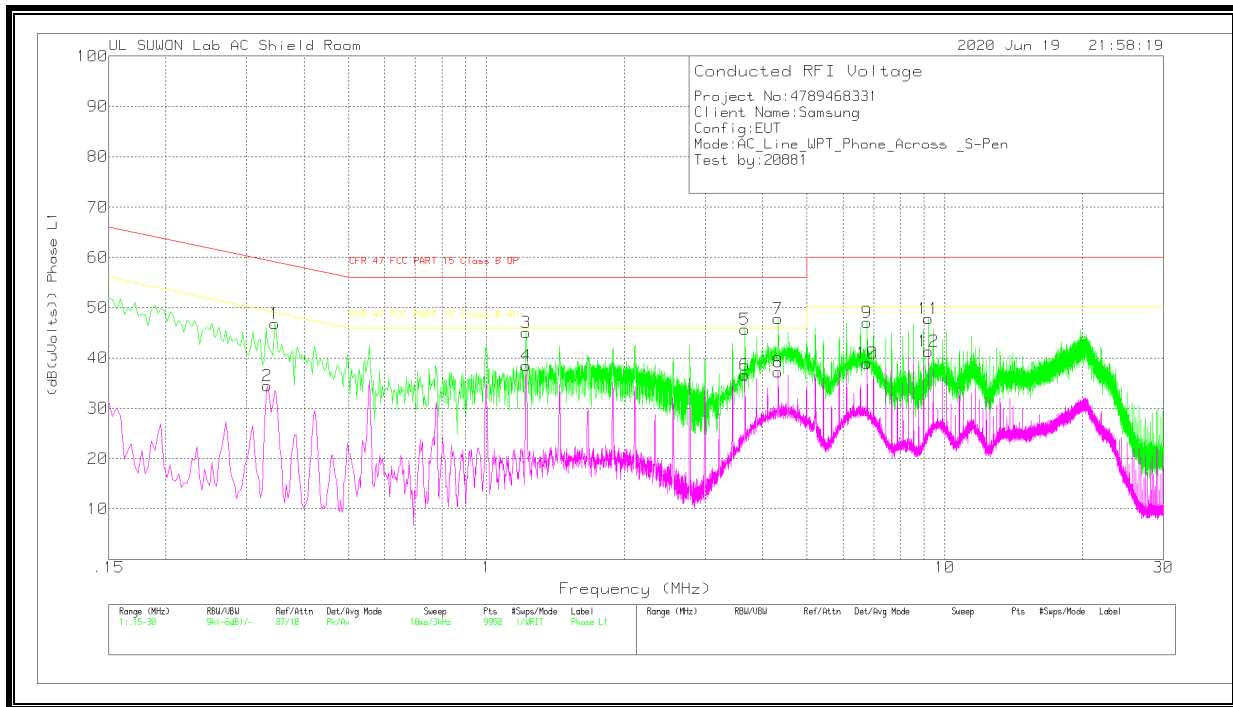
Frequency range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50
*Decreases with the logarithm of the frequency.		

RESULTS

The EUT belongs to Test Case 3 and 7.

6 WORST EMISSIONS(Power sharing mode Test Case 10)

Line-L1 .15 - 30MHz



LINE 1 RESULTS

Trace Markers

Range 1: Phase L1 .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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	.345	36.72	Pk	9.9	.2	46.82	59.08	-12.26	-	-
2	.333	24.47	Av	9.8	.2	34.47	-	-	49.38	-14.91
3	1.221	34.98	Pk	9.8	.3	45.08	56	-10.92	-	-
4	1.221	28.34	Av	9.8	.3	38.44	-	-	46	-7.56
5	3.663	35.57	Pk	9.8	.3	45.67	56	-10.33	-	-
6	3.663	26.45	Av	9.8	.3	36.55	-	-	46	-9.45
7	4.329	37.76	Pk	9.8	.3	47.86	56	-8.14	-	-
8	4.329	27.13	Av	9.8	.3	37.23	-	-	46	-8.77
9	6.771	36.87	Pk	9.9	.3	47.07	60	-12.93	-	-
10	6.771	28.75	Av	9.9	.3	38.95	-	-	50	-11.05
11	9.213	37.53	Pk	9.9	.4	47.83	60	-12.17	-	-
12	9.213	31	Av	9.9	.4	41.3	-	-	50	-8.7

Pk - Peak detector

Av - Average detection

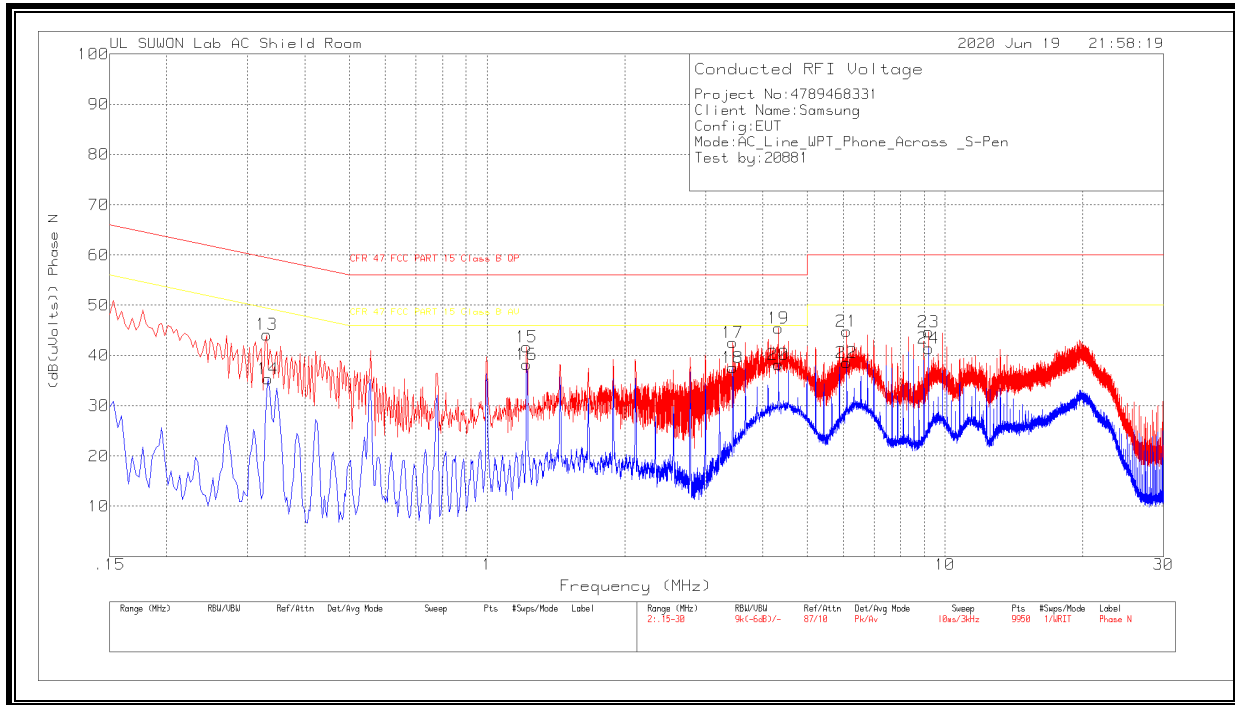
Quasi-Peak Emissions

Range 1: Phase L1 .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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)
1.22175	31.67	Qp	9.8	.3	41.77	56	-14.23	-	-
3.66375	31.94	Qp	9.8	.3	42.04	56	-13.96	-	-
4.32825	29.06	Qp	9.8	.3	39.16	56	-16.84	-	-
9.21225	31.71	Qp	9.9	.4	42.01	60	-17.99	-	-

Qp - Quasi-Peak detector

Line-L2 .15 - 30MHz



LINE 2 RESULTS

Trace Markers

Range 2: Phase N .15 - 30MHz

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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	.33	34.14	Pk	9.8	.2	44.14	59.45	-15.31	-	-
14	.333	25.31	Av	9.8	.2	35.31	-	-	49.38	-14.07
15	1.221	31.58	Pk	9.8	.3	41.68	56	-14.32	-	-
16	1.221	28.14	Av	9.8	.3	38.24	-	-	46	-7.76
17	3.441	32.53	Pk	9.8	.3	42.63	56	-13.37	-	-
18	3.441	27.5	Av	9.8	.3	37.6	-	-	46	-8.4
19	4.329	35.33	Pk	9.8	.3	45.43	56	-10.57	-	-
20	4.329	28.14	Av	9.8	.3	38.24	-	-	46	-7.76
21	6.102	34.75	Pk	9.8	.3	44.85	60	-15.15	-	-
22	6.105	28.52	Av	9.8	.3	38.62	-	-	50	-11.38
23	9.213	34.45	Pk	9.9	.4	44.75	60	-15.25	-	-
24	9.213	31.1	Av	9.9	.4	41.4	-	-	50	-8.6

Pk - Peak detector

Av - Average detection

Quasi-Peak Emissions

Range 2: Phase N .15 - 30MHz

Frequency (MHz)	Meter Reading (dBuV)	Det	101836_With 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)
1.22175	21.1	Qp	9.8	.3	31.2	56	-24.8	-	-
3.44025	26.64	Qp	9.8	.3	36.74	56	-19.26	-	-
4.32825	26.29	Qp	9.8	.3	36.39	56	-19.61	-	-
9.21225	29.41	Qp	9.9	.4	39.71	60	-20.29	-	-

Qp - Quasi-Peak detector

END OF TEST REPORT