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FCC WPT REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
July 09, 2020

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2006-FC089-R1

FCC ID:	**A3LSMN980F**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

According to the Evaluation report, all of the data contained herein is reused from the reference FCC ID : A3LSMN981B report.

Model:	SM-N980F/DS
Additional Model	SM-N980F
EUT Type:	Mobile Phone
Frequency of Operation & Max. Transmit Power:	110 kHz ~ 148 kHz(Power sharing) : 7.49 dBuV/m @300 m 590 kHz ~ 625 kHz(S-pen Charging) : 13.46 dBuV/m @300 m
FCC Classification:	Part 15 Low Power Transmitter Below 1705 kHz (DCD)
FCC Rule Part(s):	FCC Part 15, Subpart C (15.209)

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

REVIEWED BY

Report prepared by : Jung Ki Lim
Engineer of Telecommunication Testing Center

Report approved by : Kwon Jeong
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2006-FC089	June 30, 2020	- First Approval Report
HCT-RF-2006-FC089-R1	July 09, 2020	- Added the information of S-pen - Emission BW Test Procedure and Test Results have been deleted. - Added note (page 22,23)

Table of Contents

1. EUT DESCRIPTION

Model	SM-N981F/DS
Additional Model	SM-N981F
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Battery Information	Model: EB-BN-980ABY Type: Li-ion Battery
Travel Adapter Information	Model : EP-TA800 Manufacture: SOLUM
Data Cable Information	Model : EP-DG980BBE Manufacture: RFTech
S-Pen Information	- Model : EJ-PN980 - Manufacturer : SAMSUNG - FCC ID : A3LEJPN980
Frequency of Operation	110 kHz ~ 148 kHz(Power sharing) 590 kHz ~ 625 kHz(S-pen Charging)
Max. Transmit Power	7.49 dBuV/m @300 m (Power sharing) 13.46 dBuV/m @300 m (S-pen Charging)
Date(s) of Tests	May 12, 2020 ~ June 23, 2020

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Device (ANSI C63.10-2013) is used in the measurement of the test device.

EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C.

GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane below 1GHz. Above 1GHz with 1.5m using absorbers between the EUT and receive antenna. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.6.5 of ANSI C63.10. (Version: 2013).

3. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

Espectially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2017).

4. FACILITIES AND ACCREDITATIONS

FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil,

Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA.

The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2014) and CISPR Publication 22.

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032).

EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

(1) The antennas of this E.U.T are permanently attached.

(2) The E.U.T Complies with the requirement of §15.203

6. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05

7. Worst case configuration

Mode	EUT State	Position of Client device	Battery of Client device	Client device
Power sharing (S-pen is fully charged condition)	Charging from EUT to Client device	Aligned	***1 % ~ 20 %***	Phone
			20 % ~ 50 %	
			90 % ~ 100 %	
		Cross	***1 % ~ 20 %***	
			20 % ~ 50 %	
			90 % ~ 100 %	
	Charging from EUT(Charging from TA) to Client device	Aligned	***1 % ~ 20 %***	
			20 % ~ 50 %	
			90 % ~ 100 %	
		Cross	***1 % ~ 20 %***	
			20 % ~ 50 %	
			90 % ~ 100 %	
S-pen Charging (Inserted into the EUT)	Charging from EUT to Client device	Aligned	Non-fully charged condition	S-pen
	Charging from EUT(Charging from TA) to Client device			
Simultaneous charging	Charging from EUT to Client device	**Note5**	**Note4**	Phone & S-Pen
	Charging from EUT(Charging from TA) to Client device			

Note:

1. Client device:

Of Phone and Wearable device, we tested on Phone.

2. Client device:

Phone	S-pen
- Model : SM-G986B/DS - Manufacturer : SAMSUNG - FCC ID : A3LSMG986B	- Model : EJ-PN980 - Manufacturer : SAMSUNG - FCC ID : A3LEJPN980

3. 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.

4. Battery of Phone(Client device):
   All modes of operation were investigated and the worst case configuration results are reported.
   (Worstcase : 1 % ~ 20 % of Battery)
   For S-pen, both fully charged and non-fully charged condition were investigated,
   test were performed non-fully charged condition as worst case.
5. All position of Phone(Client device) were investigated and the worst position results are reported.
   (Worstcase : Phone-Aligned, S-pen-Aligned)
6. All position of loop antenna were investigated and the worst position results are reported.
   - Position : Horizontal, Vertical, Parallel to the ground plane
   - Worst Position : Horizontal
7. The EUT was tested in three orthogonal axis(X, Y, Z) and the worst position results are reported.
   - Axis : X, Y, Z
   - Worst Axis : X
8. SM-N981F/DS, SM-N981F were tested and the worst case results are reported.
(Worst case : SM-N981F/DS)

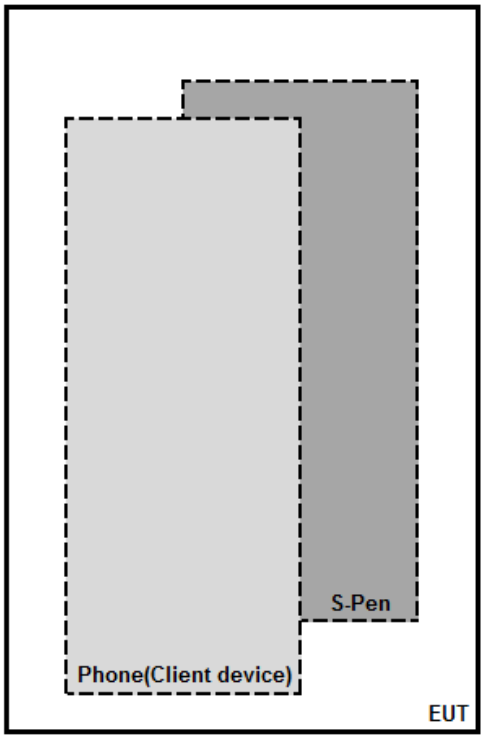
AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
   - Mode : EUT + External accessories(Earphone, etc) + Travel Adapter + Phone(Client device)
     , EUT + Travel Adapter + Phone(Client device)
   - Worstcase : EUT + Travel Adapter + Phone(Client device)
2. SM-N981F/DS, SM-N981F were tested and the worst case results are reported.
(Worst case : SM-N981F/DS)

Test Setup Diagram:

1. Power sharing mode

Aligned



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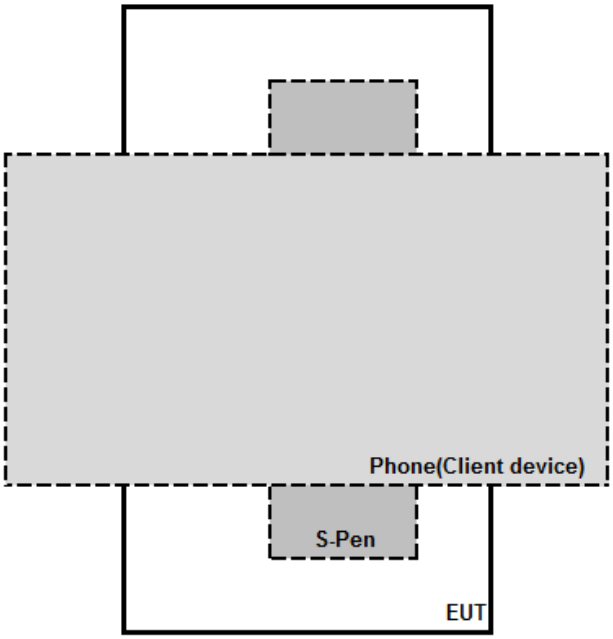
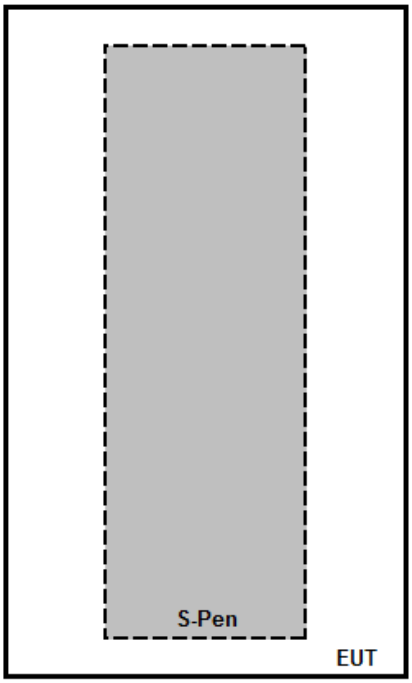
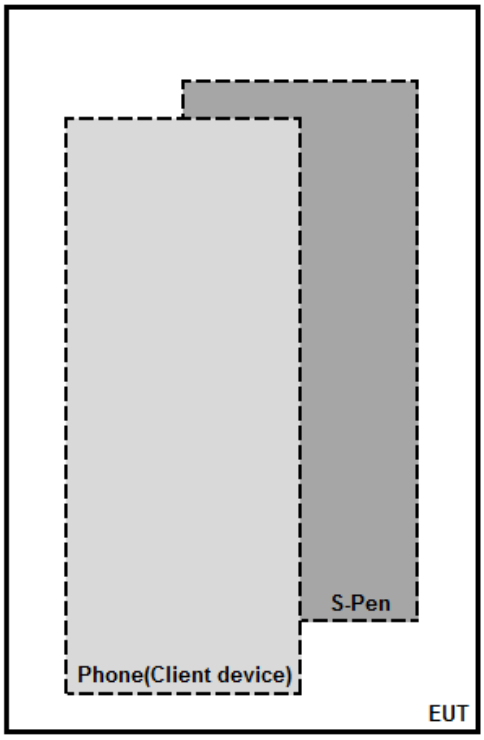


2. S-pen charging mode



3. Simutaneous charging mode

Aligned



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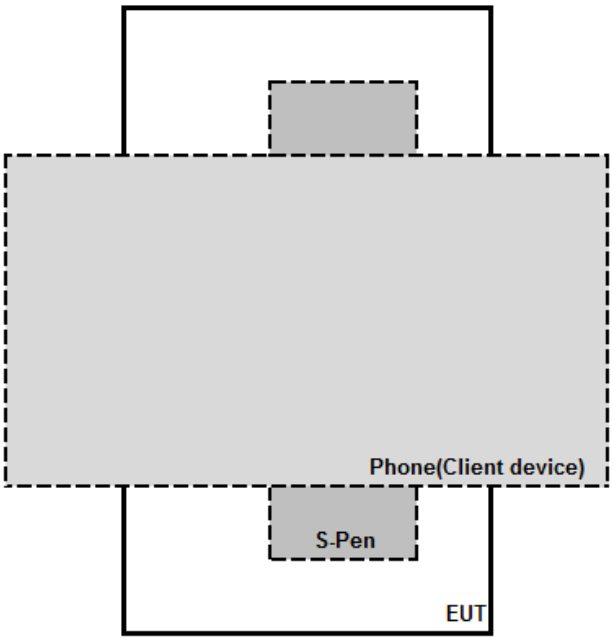


8. TEST SUMMARY

Test Description	FCC Rule	Limit	Condition	Result
Radiated emission	§15.209	cf. Section 9	Radiated	Pass
AC Power Line Conducted Emission	§15.207	cf. Section 10		Pass

9. RADIATED EMISSION MEASUREMENT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emissipn of interst
2. RBW :
   9kHz – 150kHz : 300Hz
   150kHz – 30MHz : 10kHz
   30MHz – 1GHz : 100kHz
3. VBW : ≥ 3 x RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit(FCC)

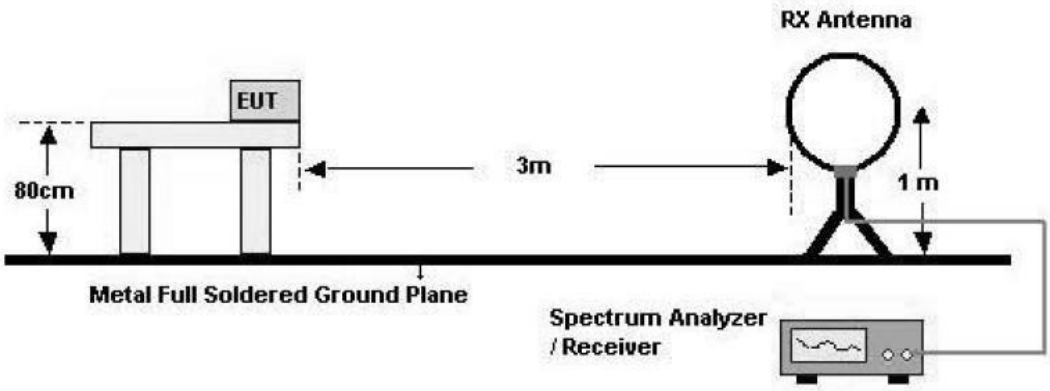
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) uV/m@300 m
	0.490 ~1.705	24000/F(kHz) uV/m@30 m
	1.705 ~ 30	30 uV/m@30 m
	30 ~ 88	100 ** uV/m@3 m
	88 ~ 216	150 ** uV/m@3 m
	216 ~ 960	200 ** uV/m@3 m
	Above 960	500 uV/m@3 m

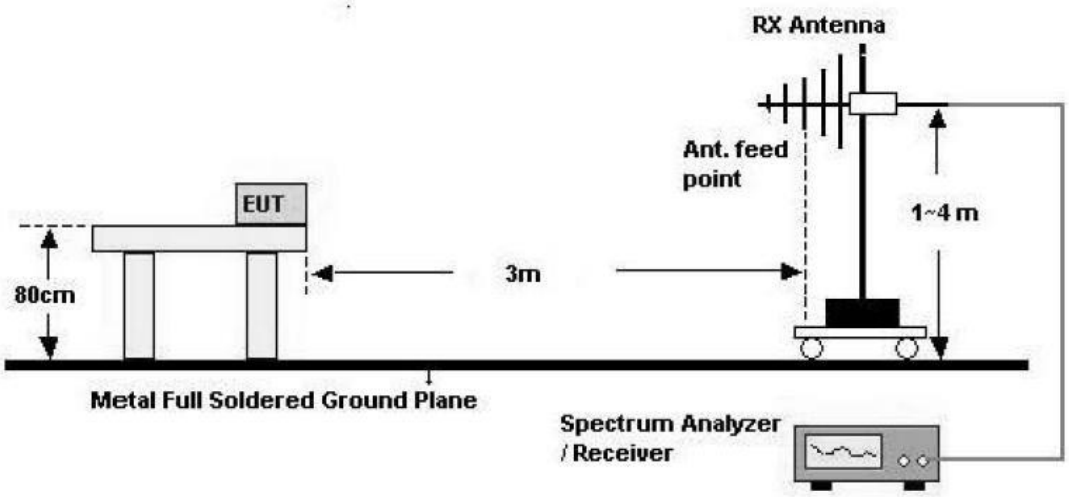
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

Test Set-up

Below 30 MHz



30 MHz - 1 GHz



Test Procedure of Radiated spurious emissions(Below 30 MHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The loop antenna was placed at a location 3 m from the EUT.
3. The EUT is placed on a turntable, which is 0.8m above ground plane.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization and Parallel to the ground plane in detecting antenna.
5. The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:
   * Result level(dBμV/m@30m)
     = Reading level(dBμV/m@3m) + Ant factor(dB/m) + Cable Loss(dB) – Distance Correction Factor.
6. Distance Correction
   * 0.009 MHz – 0.490 MHz :
     40log(3 m/300 m) = - 80 dB
   * 0.490 MHz – 30MHz :
     40log(3 m/30 m) = - 40 dB
7. Plots were taken without using any correction factors.
8. The worst case plots are reported.

KDB 414788 OFS and Chamber Correlation Justification

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

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

Test Procedure of Radiated spurious emissions(Below 1GHz)

1. The EUT was placed on a non-conductive table located on semi-anechoic chamber.
2. The EUT is placed on a turntable, which is 0.8m above ground plane.
3. The Hybrid antenna was placed at a location 3m from the EUT, which is varied from 1m to 4m to find out the highest emissions.
4. We have done x, y, z planes in EUT and horizontal and vertical polarization in detecting antenna.
5. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Spectrum Setting
   (1) Measurement Type(Peak):
   - Measured Frequency Range : 30 MHz – 1 GHz
   - Detector = Peak
   - Trace = Maxhold
   - RBW = 100 kHz
   - VBW ≥ 3 x RBW
7. Total = Reading Value + Antenna Factor(A.F) + Cable Loss(C.L)
8. Measurement value only up to 6 maximum emissions noted, or would be lesser if no specific emissions from the EUT are recorded (ie: margin > 20 dB from the applicable limit) and considered that's already beyond the background noise floor.

▣Test Result

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11.548	32.073	17.8	0.42	-80	-29.71	46.35	76.06
# 112.75	68.623	17.1	0.42	-80	6.14	26.56	20.42
114.75	30.268	17.1	0.42	-80	-32.21	26.41	58.62
338.1	47.369	17.1	0.42	-80	-15.11	17.03	32.14
3054	17.057	17.8	0.42	-40	-4.72	29.54	34.26

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
9	32.788	18.8	0.42	-80	-27.99	48.52	76.51
# 112.8	69.971	17.1	0.42	-80	7.49	26.56	19.07
114.8	31.079	17.1	0.42	-80	-31.40	26.41	57.81
338.1	48.571	17.1	0.42	-80	-13.91	17.03	30.94
3054	17.102	17.8	0.42	-40	-4.68	29.54	34.22

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
9.273	32.921	17.9	0.42	-80	-28.76	48.26	77.02
# 112.80	66.333	17.1	0.42	-80	3.85	26.56	22.71
114.8	32.1	17.1	0.42	-80	-30.38	26.41	56.79
338.1	44.674	17.1	0.42	-80	-17.81	17.03	34.84
3054	16.063	17.8	0.42	-40	-5.72	29.54	35.26

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Cross
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
9	32.311	17.9	0.42	-80	-29.37	48.52	77.89
# 112.85	68.868	17.1	0.42	-80	6.39	26.56	20.17
114.85	35.003	17.1	0.42	-80	-27.48	26.40	53.88
338.1	48.98	17.1	0.42	-80	-13.50	17.03	30.53
3054	14.907	17.8	0.42	-40	-6.87	29.54	36.41

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone
3. Position: Cross
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
19.374	34.646	17.8	0.42	-80	-27.13	41.86	68.99
106.45	16.013	17.1	0.42	-80	-46.47	27.06	73.53
# 594.6	35.880	17.1	0.42	-40	13.40	32.12	18.72
8.022	15.299	18.0	0.42	-40	-6.28	29.54	35.82

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to S-pen
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
19.283	35.338	17.8	0.42	-80	-26.44	41.90	68.34
105.05	15.466	17.1	0.42	-80	-47.01	27.18	74.19
# 591.75	35.941	17.1	0.42	-40	13.46	32.16	18.70
7.995	16.701	18	0.42	-40	-4.88	29.54	34.42

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to S-pen
3. Position: Aligned
4. 30 MHz – 1GHz : No Critical peaks found

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
10.547	35.502	17.8	0.42	-80	-26.28	47.14	73.42
# 113.65	67.76	17.1	0.42	-80	5.28	26.49	21.21
115.65	28.081	17.1	0.42	-80	-34.40	26.34	60.74
340.95	46.487	17.1	0.42	-80	-15.99	16.95	32.94
# 594.6	31.475	17.1	0.42	-40	9.00	31.12	22.13
3.081	18.336	17.8	0.42	-40	-3.44	29.54	32.98

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone & S-Pen
3. Position: All position of Phone(Client device) were investigated and the worst position results are reported. (Worstcase : Phone-Aligned, S-pen-Aligned)
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device. All fundamental frequency were investigated and the worst results are reported.
6. 340.95 kHz is the 3rd harmonic of 110-148kHz
7. 10.547 kHz is higher than fundamental level (s-pen). However, it is noise floor level and looks like higher than due to chamber characteristic.

Frequency (kHz)	Reading Level (dBuV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11.821	34.797	17.8	0.42	-80	-26.98	46.15	73.13
# 113.65	69.863	17.1	0.42	-80	7.38	26.49	19.11
115.6	33.719	17.1	0.42	-80	-28.76	26.34	55.10
340.95	47.888	17.1	0.42	-80	-14.59	16.95	31.54
# 594.6	31.777	17.1	0.42	-40	9.30	31.12	21.82
3.081	20.463	17.8	0.42	-40	-1.32	29.54	30.86

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone & S-Pen
3. Position: All position of Phone(Client device) were investigated and the worst position results are reported. (Worstcase : Phone-Aligned, S-pen-Aligned)
4. 30 MHz – 1GHz : No Critical peaks found
5. The fundamental frequency(110kHz – 148kHz) varies depending on the position of client device. All fundamental frequency were investigated and the worst results are reported.
6. 340.95 kHz is the 3rd harmonic of 110-148kHz
7. 11.821 kHz is higher than fundamental level (s-pen). However, it is noise floor level and looks like higher than due to chamber characteristic.

▣Test Plot

In order to simplify the report, the worst case results are reported.

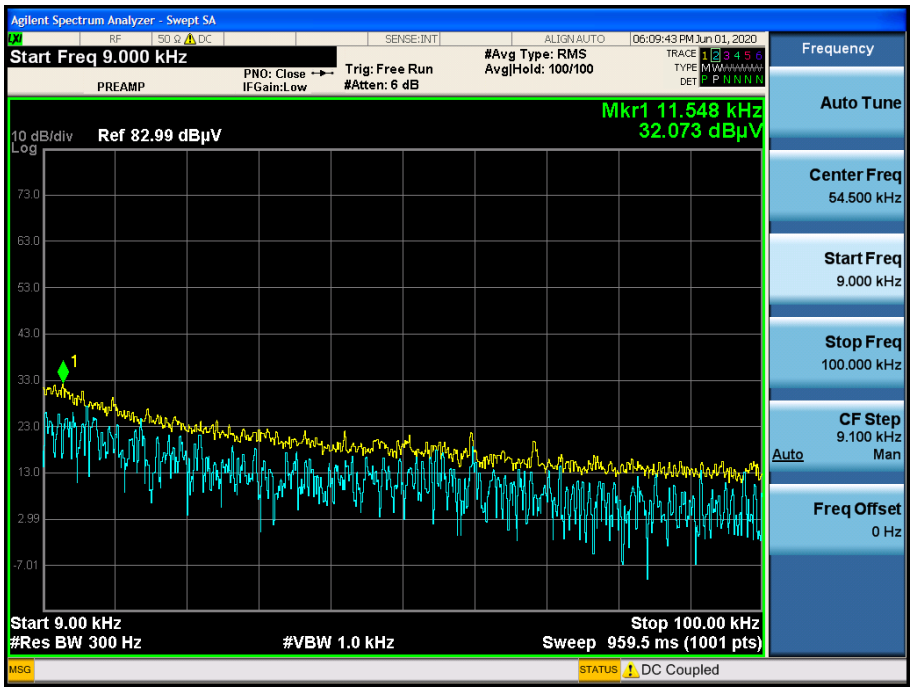
1. Power sharing

Worst case

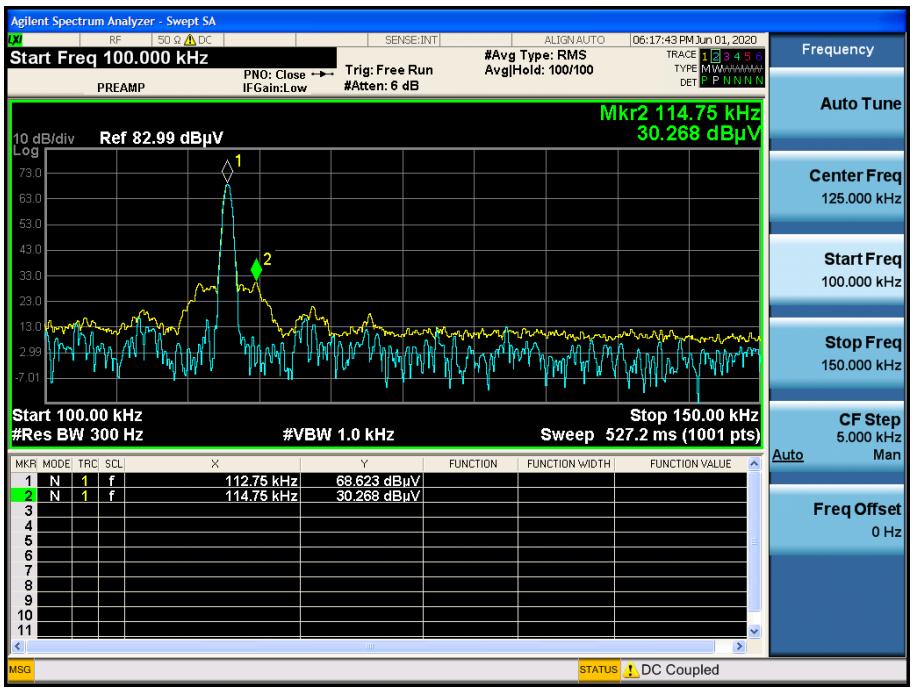
- EUT Mode: Charging from EUT to Phone

- Position: Aligned

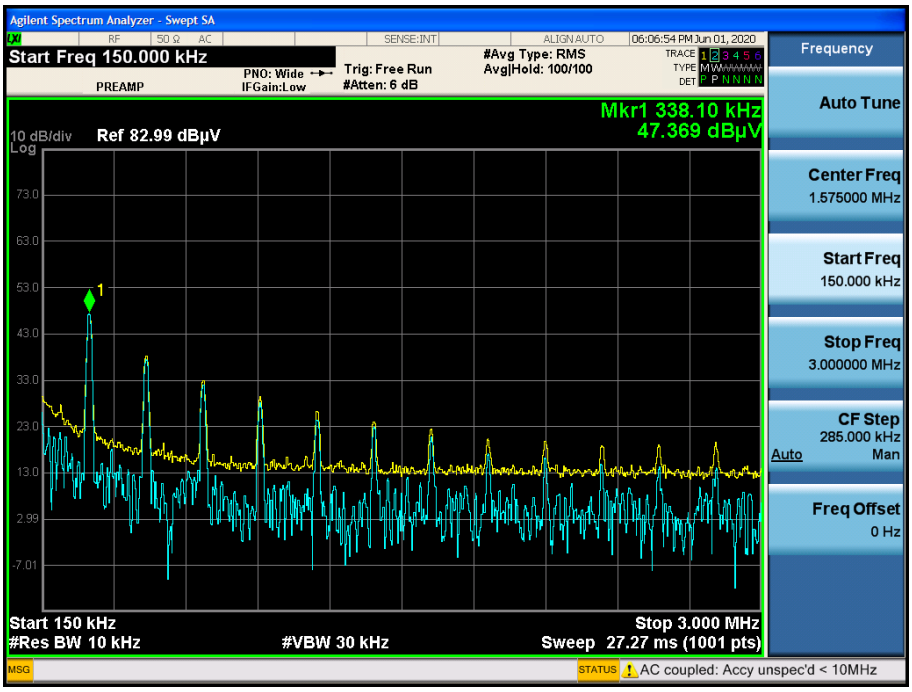
Frequency Range : 9 kHz – 100kHz



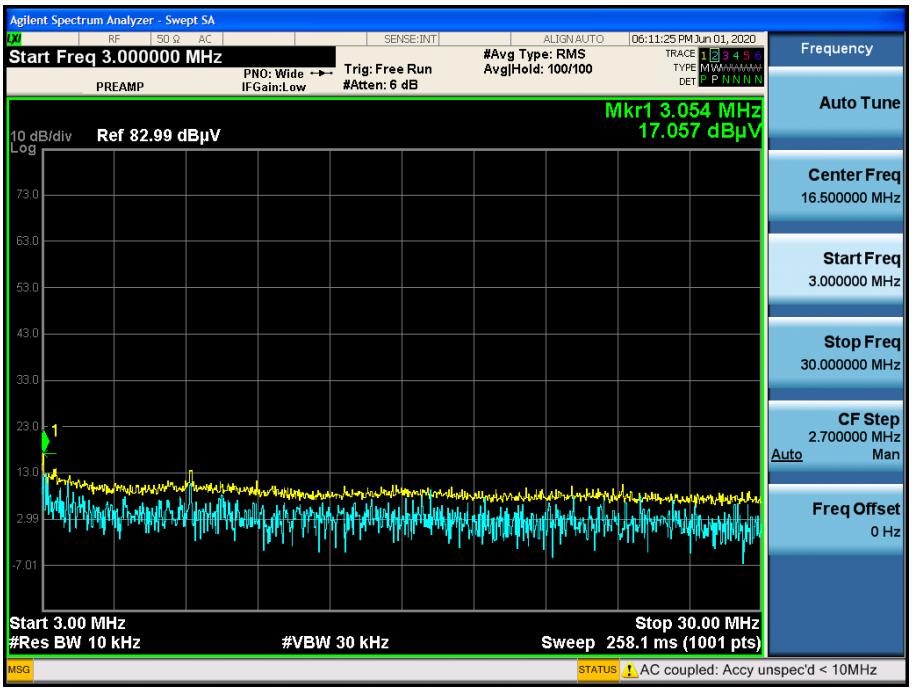
Frequency Range : 100 kHz – 150kHz



Frequency Range : 150 kHz – 3 MHz

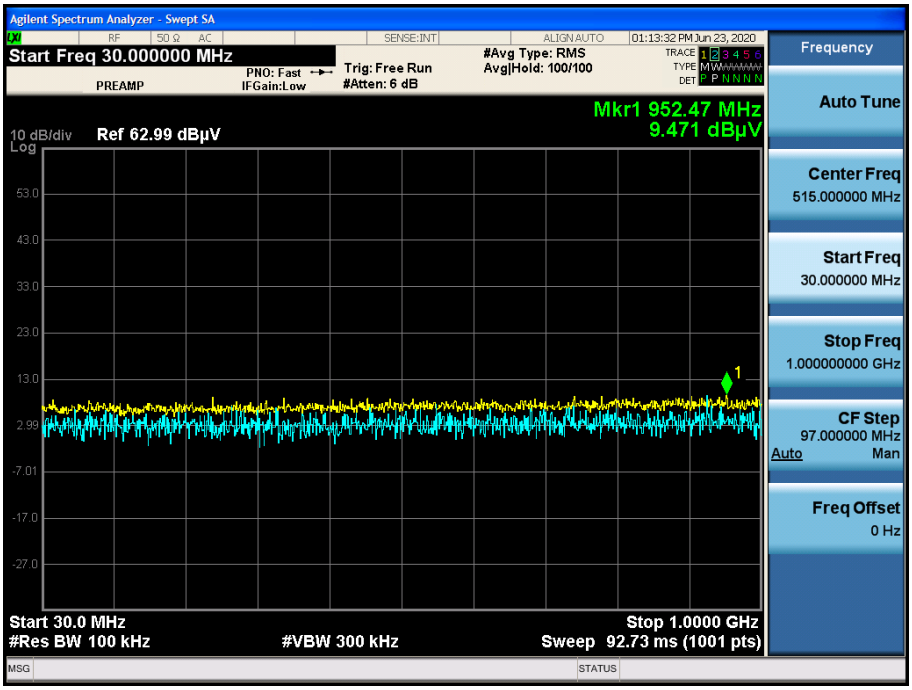


Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

(30 MHz – 1GHz : No Critical peaks found)

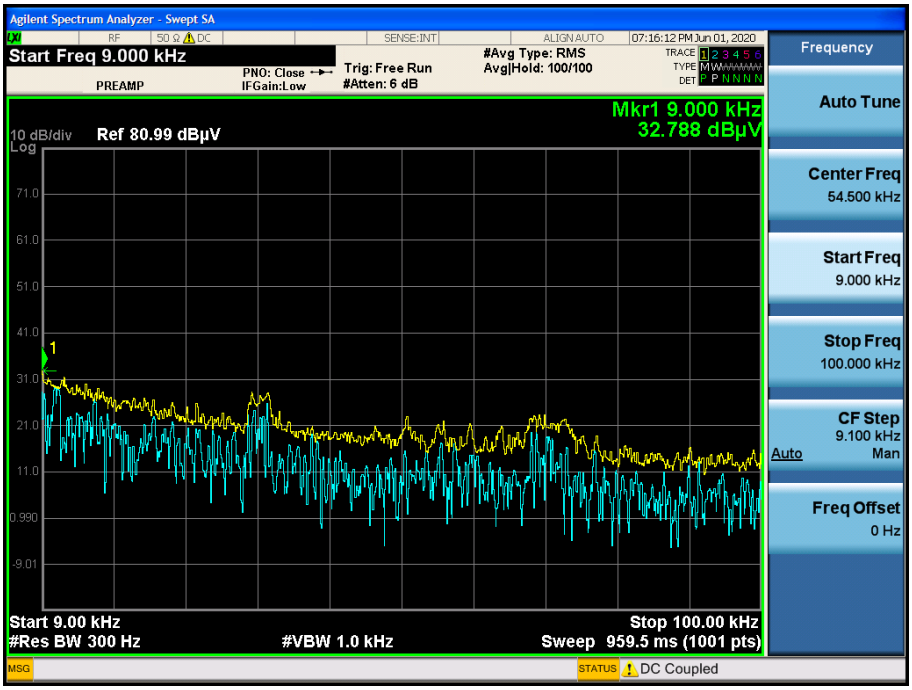


Note :

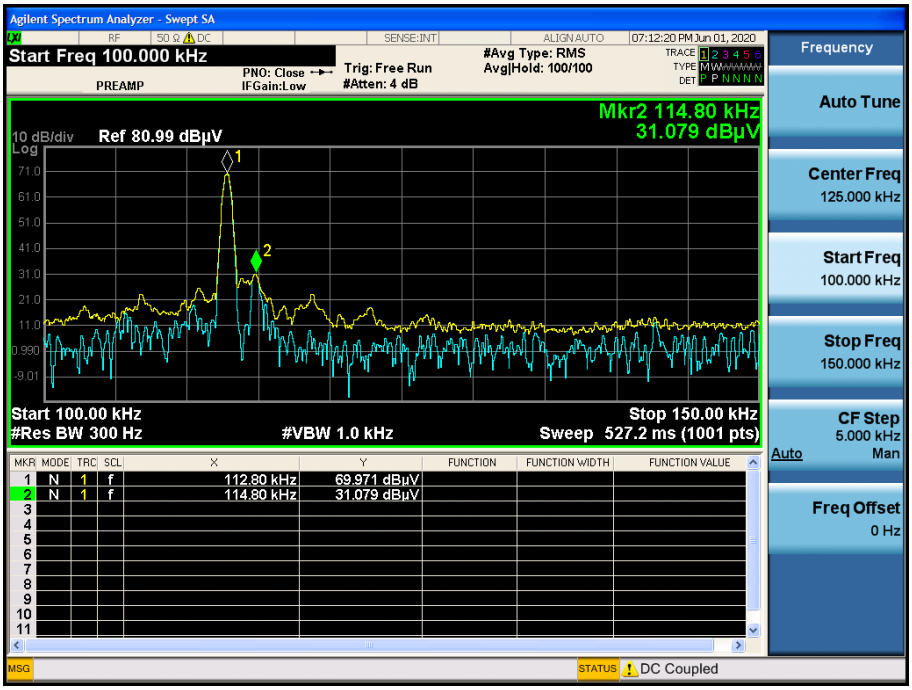
In order to simplify the report, attached plots were only the worstcase

- EUT Mode: Charging from EUT(Charging from TA) to Phone
- Position: Aligned

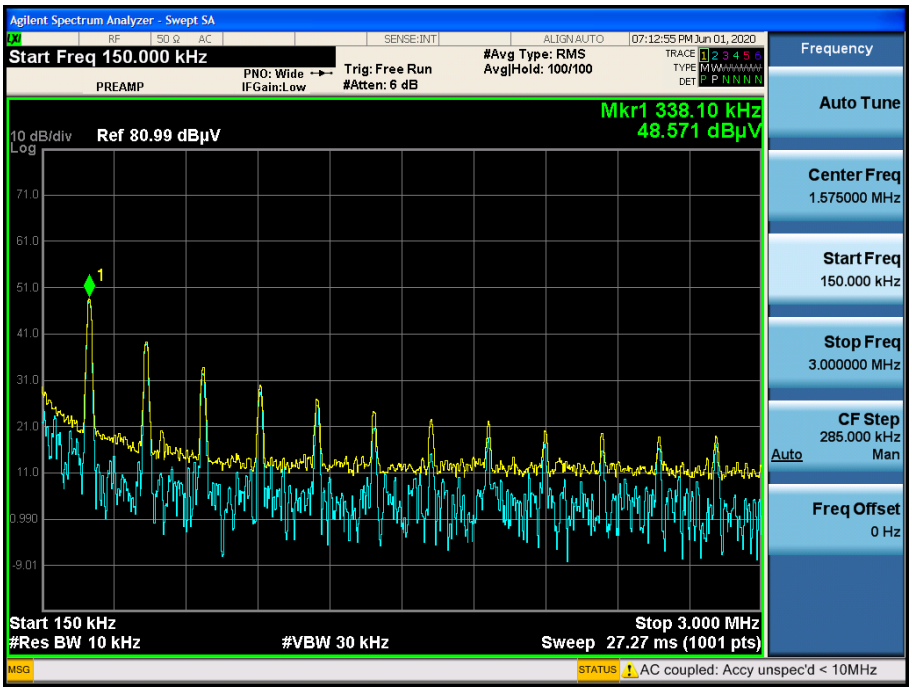
Frequency Range : 9 kHz – 100kHz



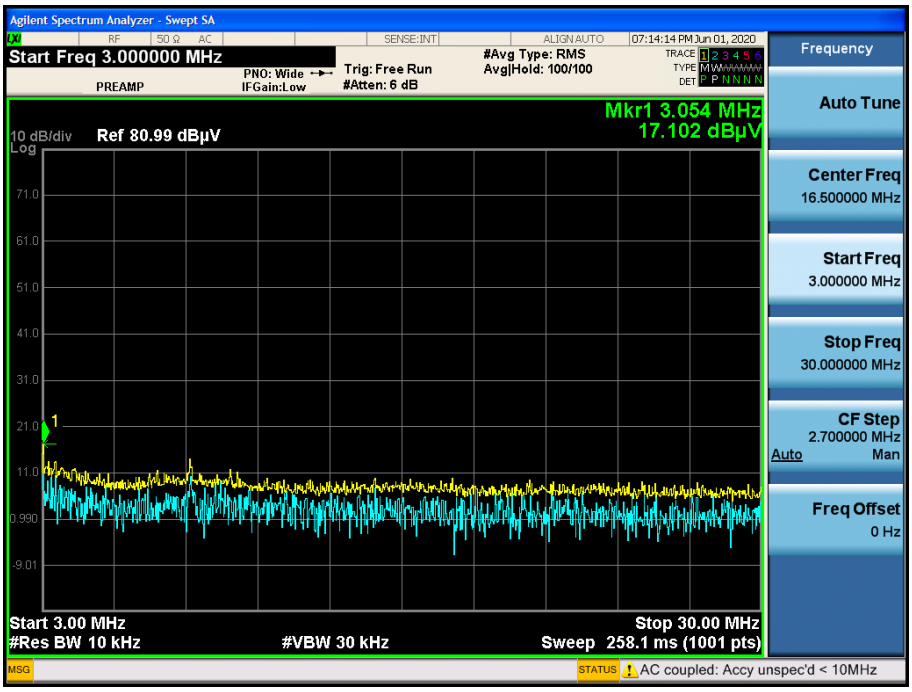
Frequency Range : 100 kHz – 150kHz



Frequency Range : 150 kHz – 3 MHz

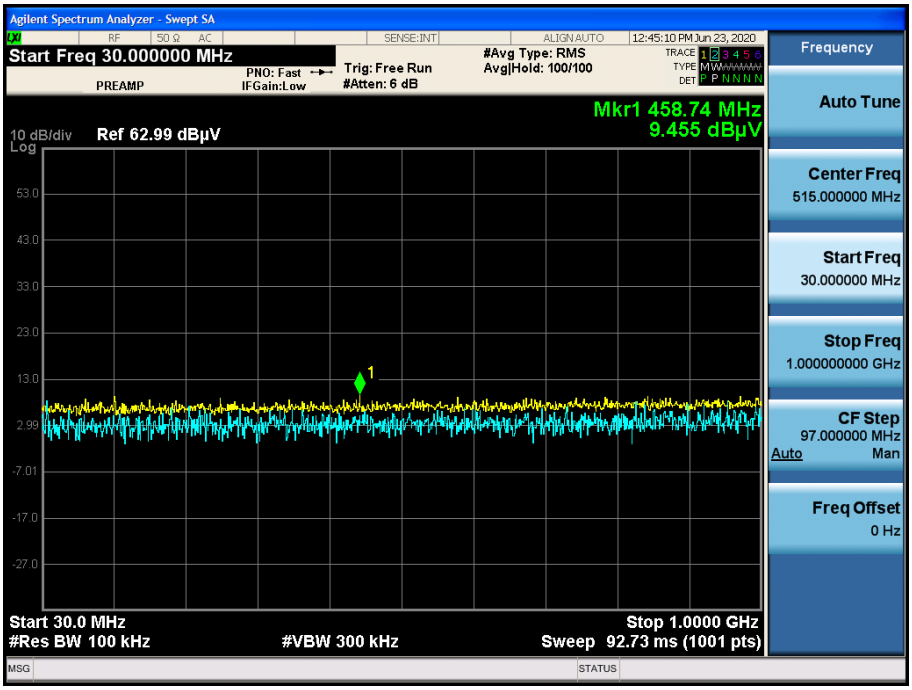


Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

(30 MHz – 1GHz : No Critical peaks found)



Note :

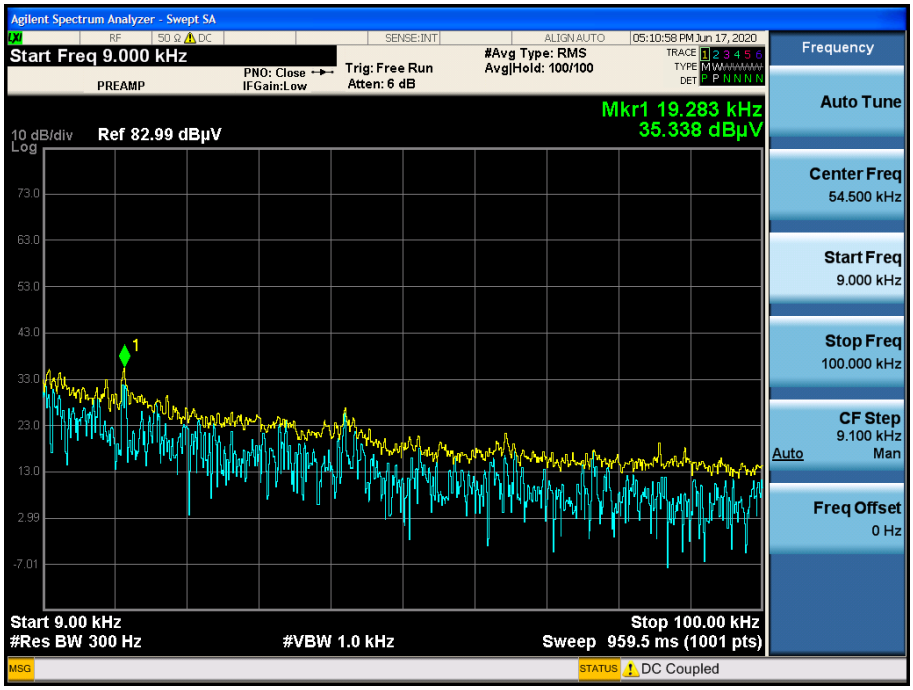
In order to simplify the report, attached plots were only the worstcase

2. S-pen Charging

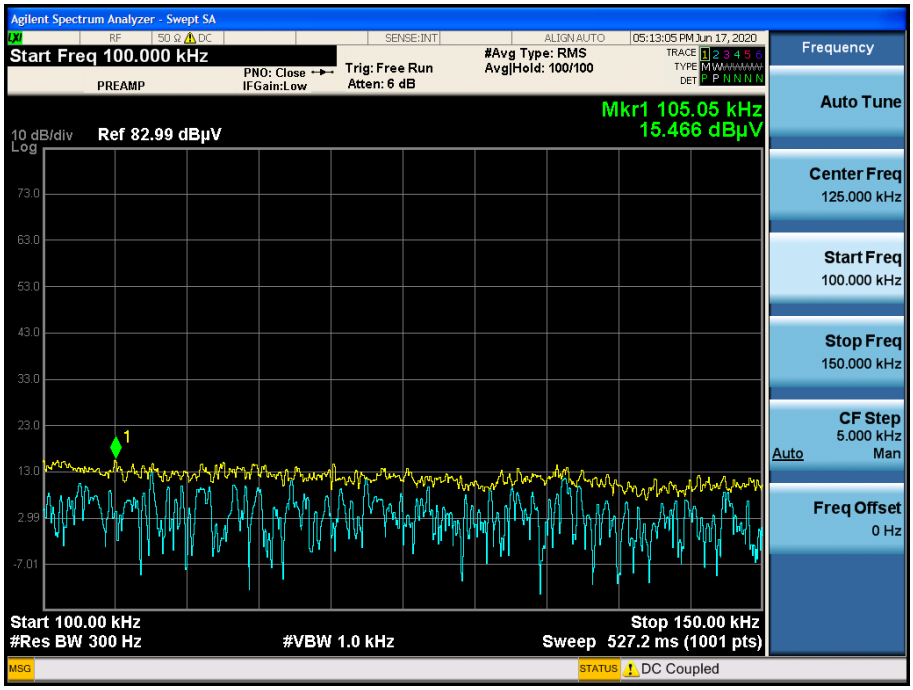
Worst case

- EUT Mode: Charging from EUT(Charging from TA) to S-pen
- Position: Aligned

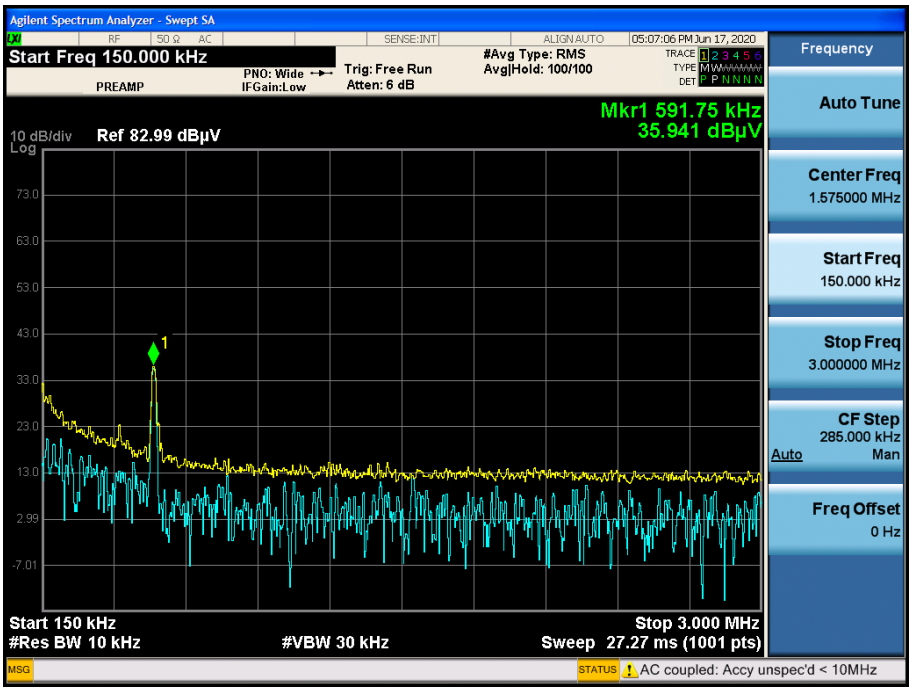
Frequency Range : 9 kHz – 100kHz



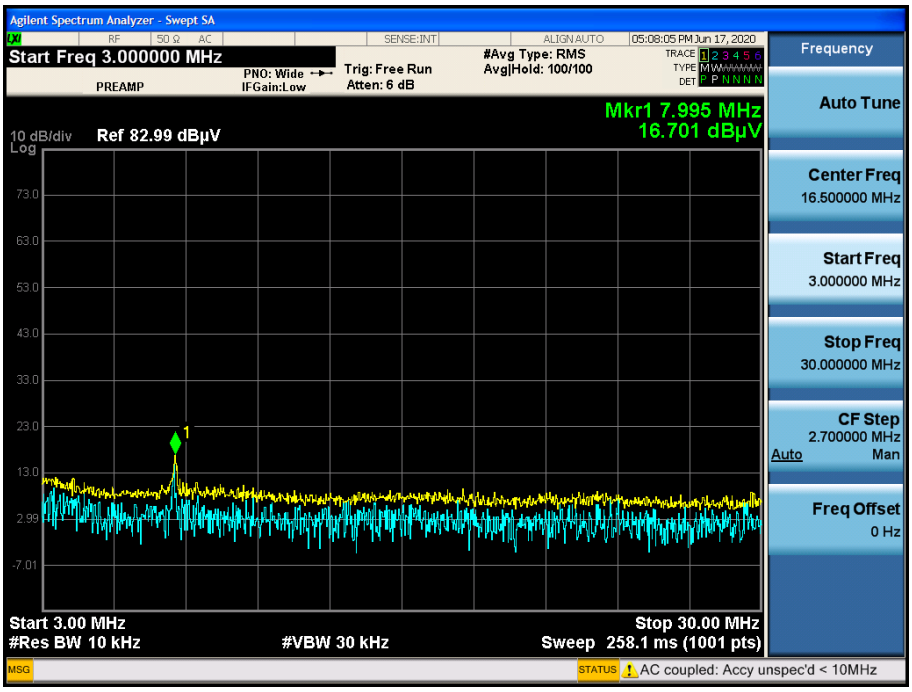
Frequency Range : 100 kHz – 150kHz



Frequency Range : 150 kHz – 3 MHz

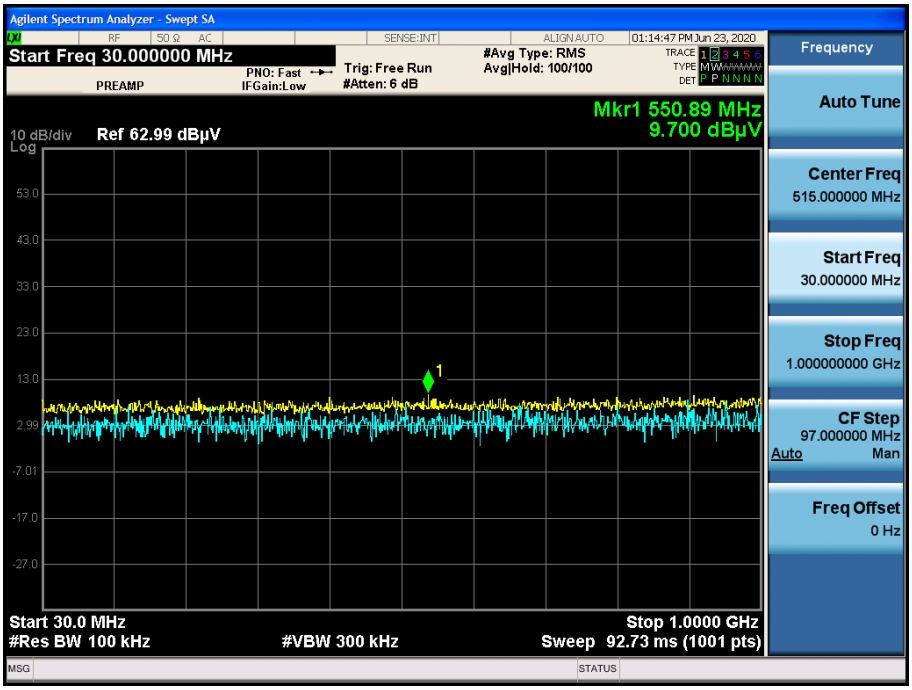


Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

(30 MHz – 1GHz : No Critical peaks found)



Note :

In order to simplify the report, attached plots were only the worstcase

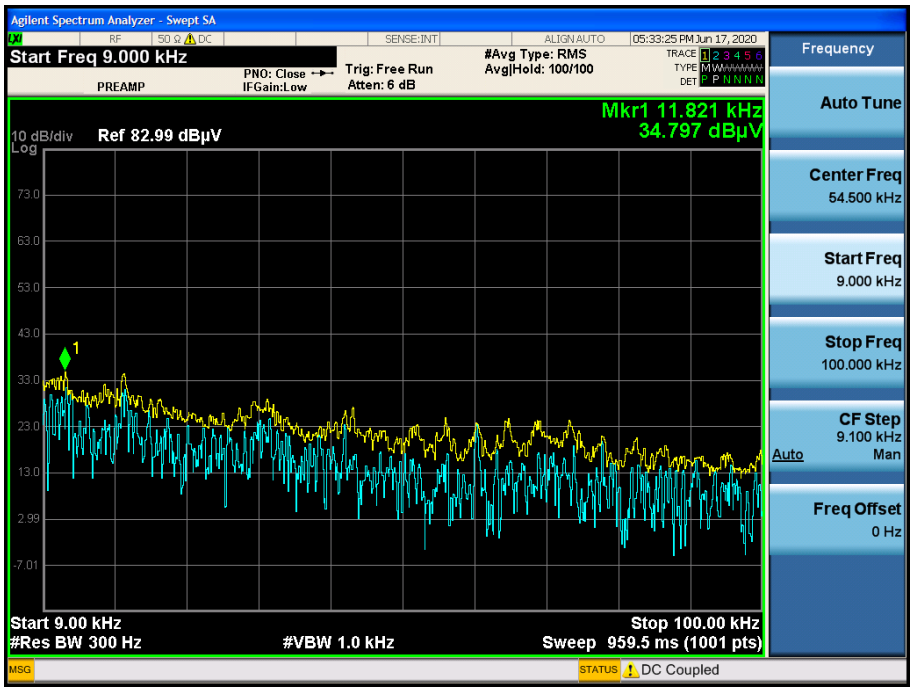
3. Simultaneous charging

Worst case

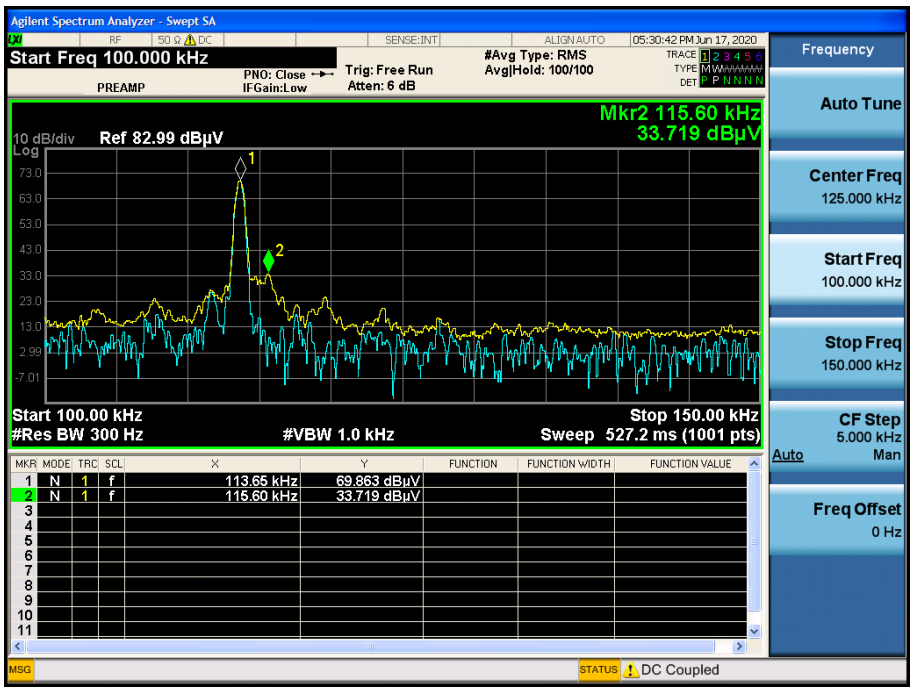
- EUT Mode: Charging from EUT(Charging from TA) to Phone & S-Pen
- Position: All position of Phone(Client device) were investigated and the worst position results are reported.

(Worstcase : Phone-Aligned, S-pen-Aligned)

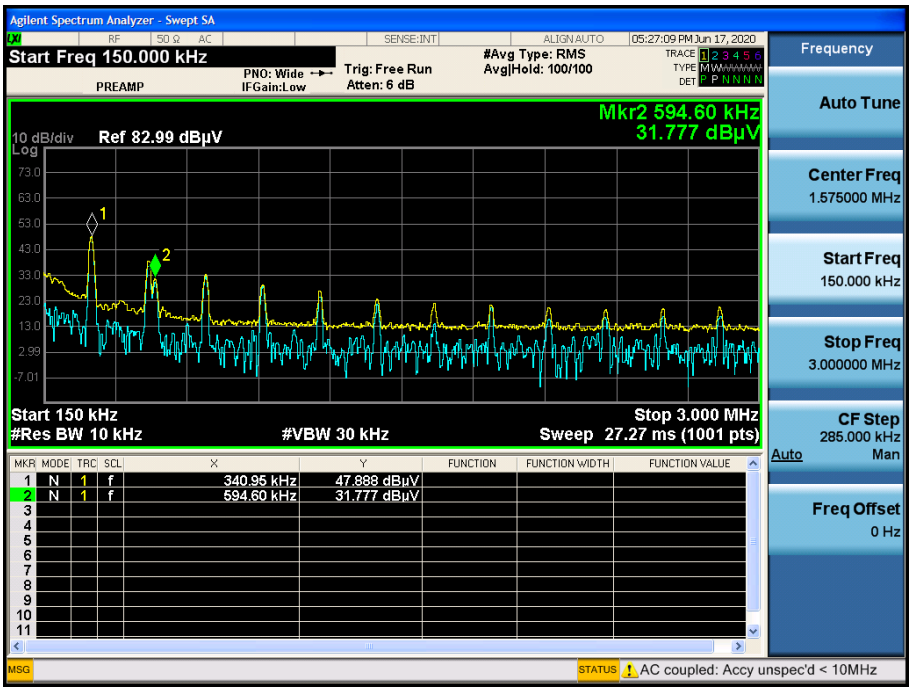
Frequency Range : 9 kHz – 100kHz



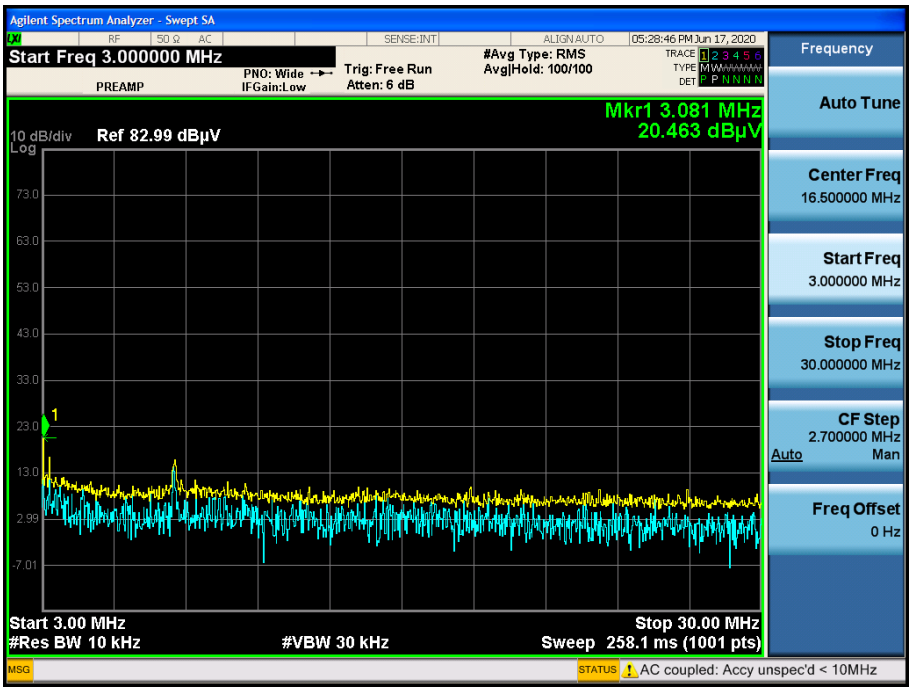
Frequency Range : 100 kHz – 150kHz



Frequency Range : 150 kHz – 3 MHz

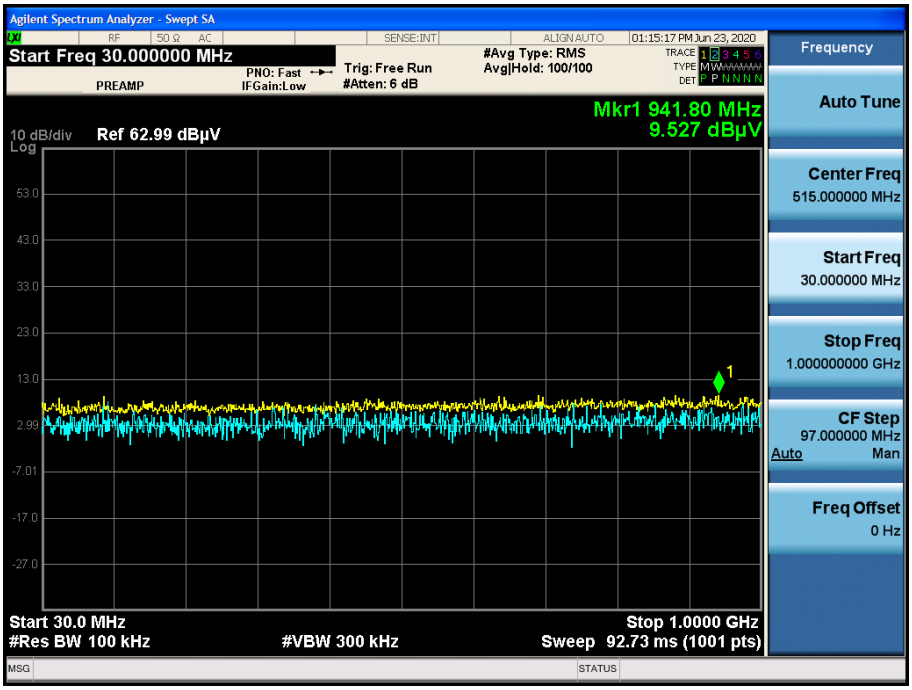


Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

(30 MHz – 1GHz : No Critical peaks found)



Note :

In order to simplify the report, attached plots were only the worstcase

10. POWERLINE CONDUCTE EMISSIONS

Limit

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 μH/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56[a]	56 to 46[a]
0.50 to 5	56	46
5 to 30	60	50

[a]Decreases with the logarithm of the frequency.

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Annex A for the actual connections between EUT and support equipment.

Test Procedure

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors : Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
   - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
   - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

Test Result & Plot (Mode: Power sharing)

Conducted Emissions (Line 1)

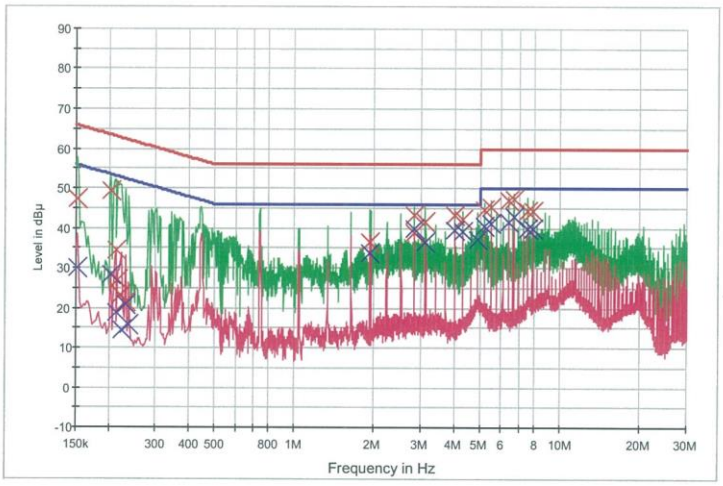
POWER SHARING CROSS 1% - 20%_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	POWER SHARING CROSS 1% - 20%_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	47.3	9.000	Off	L1	9.8	18.6	65.9
0.204000	49.4	9.000	Off	L1	9.8	14.0	63.4
0.212000	34.3	9.000	Off	L1	9.8	28.9	63.1
0.216000	26.9	9.000	Off	L1	9.8	36.1	63.0
0.220000	23.1	9.000	Off	L1	9.8	39.8	62.8
0.230000	21.5	9.000	Off	L1	9.8	41.0	62.4
1.928000	36.5	9.000	Off	L1	9.9	19.5	56.0
2.820000	43.4	9.000	Off	L1	9.9	12.6	56.0
2.824000	38.9	9.000	Off	L1	9.9	17.1	56.0
3.118000	41.5	9.000	Off	L1	9.9	14.5	56.0
4.008000	43.2	9.000	Off	L1	10.0	12.8	56.0
4.304000	42.2	9.000	Off	L1	10.0	13.8	56.0
5.196000	44.7	9.000	Off	L1	10.0	15.3	60.0
5.492000	45.3	9.000	Off	L1	10.0	14.7	60.0
6.382000	46.9	9.000	Off	L1	10.1	13.1	60.0
6.680000	47.2	9.000	Off	L1	10.1	12.8	60.0
7.570000	44.1	9.000	Off	L1	10.1	15.9	60.0
7.868000	44.3	9.000	Off	L1	10.1	15.7	60.0

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POWER SHARING CROSS 1% - 20%_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	29.9	9.000	Off	L1	9.8	26.0	55.9
0.204000	28.4	9.000	Off	L1	9.8	25.1	53.4
0.212000	18.7	9.000	Off	L1	9.8	34.5	53.1
0.222000	14.6	9.000	Off	L1	9.8	38.2	52.7
0.230000	20.8	9.000	Off	L1	9.8	31.7	52.4
0.238000	15.9	9.000	Off	L1	9.8	36.3	52.2
1.930000	33.9	9.000	Off	L1	9.9	12.1	46.0
2.820000	39.8	9.000	Off	L1	9.9	6.2	46.0
3.118000	36.3	9.000	Off	L1	9.9	9.7	46.0
4.008000	39.4	9.000	Off	L1	10.0	6.6	46.0
4.304000	39.0	9.000	Off	L1	10.0	7.0	46.0
4.898000	37.0	9.000	Off	L1	10.0	9.0	46.0
5.196000	40.5	9.000	Off	L1	10.0	9.5	50.0
5.492000	41.1	9.000	Off	L1	10.0	8.9	50.0
6.384000	41.6	9.000	Off	L1	10.1	8.4	50.0
6.680000	43.0	9.000	Off	L1	10.1	7.0	50.0
7.570000	39.7	9.000	Off	L1	10.1	10.3	50.0
7.868000	40.0	9.000	Off	L1	10.1	10.0	50.0

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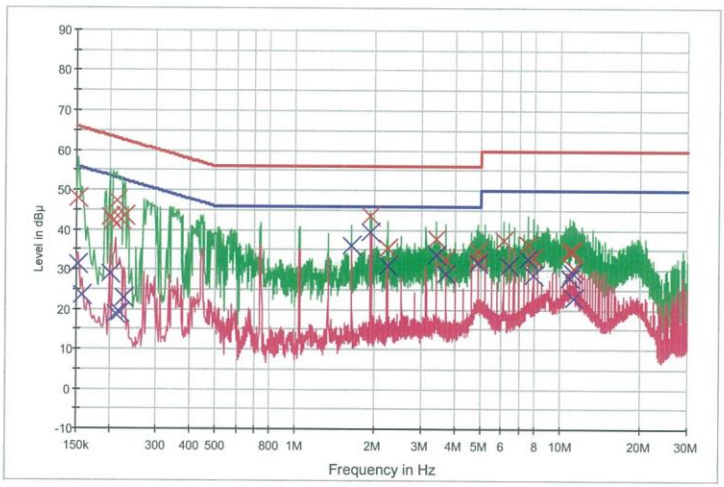
POWER SHARING ALIGNED 1% - 20%_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	POWER SHARING ALIGNED 1% - 20%_L1

FCC CLASS B_Exten Cable



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	48.0	9.000	Off	L1	9.8	17.9	65.9
0.200000	43.3	9.000	Off	L1	9.8	20.3	63.6
0.206000	42.2	9.000	Off	L1	9.8	21.1	63.4
0.212000	47.4	9.000	Off	L1	9.8	15.7	63.1
0.220000	42.4	9.000	Off	L1	9.8	20.4	62.8
0.228000	43.6	9.000	Off	L1	9.8	18.9	62.5
1.930000	43.5	9.000	Off	L1	9.9	12.5	56.0
2.228000	35.4	9.000	Off	L1	9.9	20.6	56.0
3.414000	37.8	9.000	Off	L1	9.9	18.2	56.0
3.712000	32.8	9.000	Off	L1	10.0	23.2	56.0
4.896000	34.8	9.000	Off	L1	10.0	21.2	56.0
4.902000	32.2	9.000	Off	L1	10.0	23.8	56.0
6.088000	37.3	9.000	Off	L1	10.1	22.7	60.0
7.568000	36.4	9.000	Off	L1	10.1	23.6	60.0
7.866000	33.1	9.000	Off	L1	10.1	26.9	60.0
10.834000	34.7	9.000	Off	L1	10.2	25.3	60.0
11.130000	34.8	9.000	Off	L1	10.3	25.2	60.0
11.296000	30.3	9.000	Off	L1	10.3	29.7	60.0

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POWER SHARING ALIGNED 1% - 20%_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	31.2	9.000	Off	L1	9.8	24.7	55.9
0.158000	23.5	9.000	Off	L1	9.8	32.0	55.6
0.200000	29.0	9.000	Off	L1	9.8	24.6	53.6
0.210000	18.7	9.000	Off	L1	9.8	34.5	53.2
0.218000	19.2	9.000	Off	L1	9.8	33.7	52.9
0.226000	23.0	9.000	Off	L1	9.8	29.6	52.6
1.632000	36.2	9.000	Off	L1	9.9	9.8	46.0
1.930000	39.4	9.000	Off	L1	9.9	6.6	46.0
2.228000	31.1	9.000	Off	L1	9.9	14.9	46.0
3.414000	33.7	9.000	Off	L1	9.9	12.3	46.0
3.712000	29.0	9.000	Off	L1	10.0	17.0	46.0
4.898000	31.7	9.000	Off	L1	10.0	14.3	46.0
6.382000	31.1	9.000	Off	L1	10.1	18.9	50.0
7.570000	32.6	9.000	Off	L1	10.1	17.4	50.0
7.868000	28.5	9.000	Off	L1	10.1	21.5	50.0
10.834000	28.0	9.000	Off	L1	10.2	22.0	50.0
11.132000	29.4	9.000	Off	L1	10.3	20.6	50.0
11.296000	23.0	9.000	Off	L1	10.3	27.0	50.0

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Conducted Emissions (Line 2)

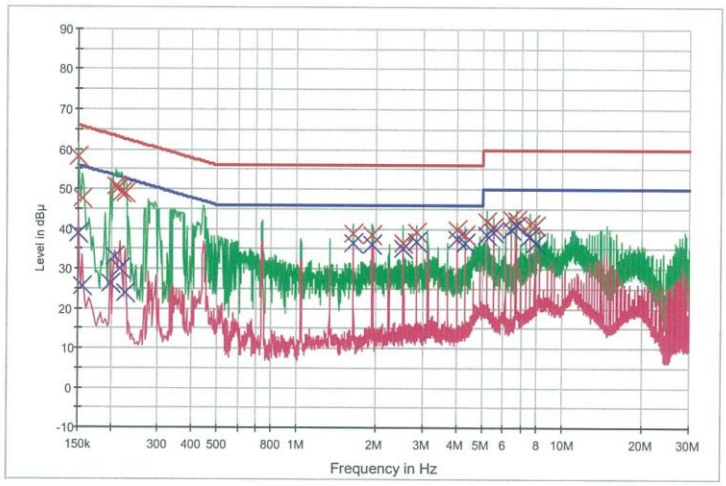
POWER SHARING CROSS 1% - 20%_N 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	POWER SHARING CROSS 1% - 20%_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	58.1	9.000	Off	N	9.8	7.9	66.0
0.156000	47.7	9.000	Off	N	9.8	18.0	65.7
0.208000	50.8	9.000	Off	N	9.8	12.4	63.3
0.212000	50.4	9.000	Off	N	9.8	12.8	63.1
0.218000	48.9	9.000	Off	N	9.8	14.0	62.9
0.226000	48.9	9.000	Off	N	9.8	13.6	62.6
1.632000	38.7	9.000	Off	N	9.9	17.3	56.0
1.930000	38.4	9.000	Off	N	9.9	17.6	56.0
2.522000	36.4	9.000	Off	N	9.9	19.6	56.0
2.820000	39.1	9.000	Off	N	9.9	16.9	56.0
4.008000	39.9	9.000	Off	N	10.0	16.1	56.0
4.304000	38.6	9.000	Off	N	10.0	17.4	56.0
5.196000	41.8	9.000	Off	N	10.0	18.2	60.0
5.492000	40.6	9.000	Off	N	10.0	19.4	60.0
6.382000	42.5	9.000	Off	N	10.1	17.5	60.0
6.680000	42.2	9.000	Off	N	10.1	17.8	60.0
7.572000	41.1	9.000	Off	N	10.1	18.9	60.0
7.868000	40.9	9.000	Off	N	10.2	19.1	60.0

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POWER SHARING CROSS 1% - 20%_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.7	9.000	Off	N	9.8	17.3	56.0
0.156000	25.7	9.000	Off	N	9.8	30.0	55.7
0.198000	26.2	9.000	Off	N	9.8	27.5	53.7
0.206000	33.0	9.000	Off	N	9.8	20.3	53.4
0.216000	30.1	9.000	Off	N	9.8	22.9	53.0
0.226000	23.8	9.000	Off	N	9.8	28.8	52.6
1.632000	36.4	9.000	Off	N	9.9	9.6	46.0
1.930000	36.1	9.000	Off	N	9.9	9.9	46.0
2.524000	35.0	9.000	Off	N	9.9	11.0	46.0
2.820000	36.6	9.000	Off	N	9.9	9.4	46.0
4.008000	37.4	9.000	Off	N	10.0	8.6	46.0
4.306000	36.4	9.000	Off	N	10.0	9.6	46.0
5.196000	38.4	9.000	Off	N	10.0	11.6	50.0
5.492000	39.1	9.000	Off	N	10.0	10.9	50.0
6.382000	39.9	9.000	Off	N	10.1	10.1	50.0
6.680000	40.9	9.000	Off	N	10.1	9.1	50.0
7.570000	38.1	9.000	Off	N	10.1	11.9	50.0
7.868000	36.6	9.000	Off	N	10.2	13.4	50.0

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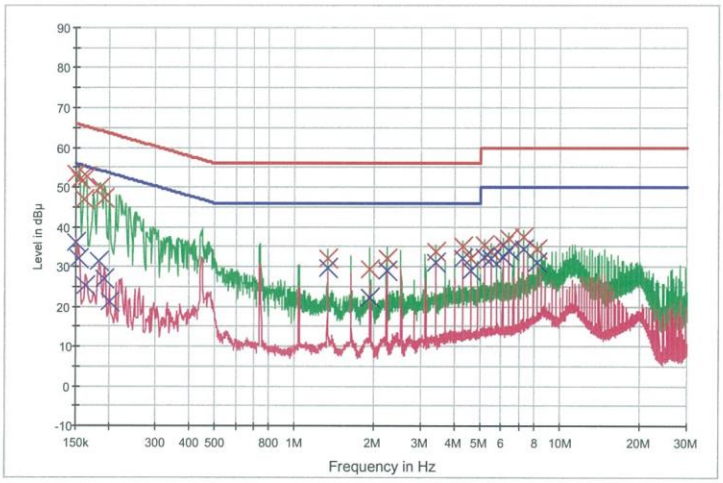
HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	POWER SHARING ALIGNED 1% - 20%_N

FCC CLASS B_Exten Cable



FCC CLASS B_QP
Preview Result 2-AVG
FCC CLASS B_ AV
Final Result 1-QPK
Preview Result 1-PK+
Final Result 2-CAV

Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	53.5	9.000	Off	N	9.8	12.5	66.0
0.156000	51.9	9.000	Off	N	9.8	13.8	65.7
0.160000	47.1	9.000	Off	N	9.8	18.3	65.5
0.164000	52.6	9.000	Off	N	9.8	12.6	65.3
0.186000	49.8	9.000	Off	N	9.8	14.4	64.2
0.192000	47.4	9.000	Off	N	9.8	16.6	63.9
1.334000	32.0	9.000	Off	N	9.8	24.0	56.0
1.928000	29.4	9.000	Off	N	9.9	26.6	56.0
2.226000	32.0	9.000	Off	N	9.9	24.0	56.0
3.414000	33.7	9.000	Off	N	9.9	22.3	56.0
4.304000	35.0	9.000	Off	N	10.0	21.0	56.0
4.602000	31.9	9.000	Off	N	10.0	24.1	56.0
5.196000	35.3	9.000	Off	N	10.0	24.7	60.0
5.494000	33.6	9.000	Off	N	10.0	26.4	60.0
6.086000	35.3	9.000	Off	N	10.1	24.7	60.0
6.382000	37.1	9.000	Off	N	10.1	22.9	60.0
7.272000	37.4	9.000	Off	N	10.1	22.6	60.0
8.164000	34.3	9.000	Off	N	10.2	25.7	60.0

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POWER SHARING ALIGNED 1% - 20%_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	36.1	9.000	Off	N	9.8	19.9	56.0
0.154000	32.2	9.000	Off	N	9.8	23.6	55.8
0.162000	25.4	9.000	Off	N	9.8	30.0	55.4
0.184000	31.3	9.000	Off	N	9.8	23.0	54.3
0.192000	26.9	9.000	Off	N	9.8	27.0	53.9
0.200000	21.3	9.000	Off	N	9.8	32.3	53.6
1.336000	29.7	9.000	Off	N	9.8	16.3	46.0
1.928000	22.1	9.000	Off	N	9.9	23.9	46.0
2.226000	29.1	9.000	Off	N	9.9	16.9	46.0
3.414000	31.0	9.000	Off	N	9.9	15.0	46.0
4.304000	32.2	9.000	Off	N	10.0	13.8	46.0
4.602000	29.0	9.000	Off	N	10.0	17.0	46.0
5.196000	32.4	9.000	Off	N	10.0	17.6	50.0
5.492000	32.1	9.000	Off	N	10.0	17.9	50.0
6.086000	32.3	9.000	Off	N	10.1	17.7	50.0
6.382000	34.2	9.000	Off	N	10.1	15.8	50.0
7.272000	34.4	9.000	Off	N	10.1	15.6	50.0
8.164000	30.9	9.000	Off	N	10.2	19.1	50.0

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Test Result & Plot (Mode: S-pen Charging)

Conducted Emissions (Line 1)

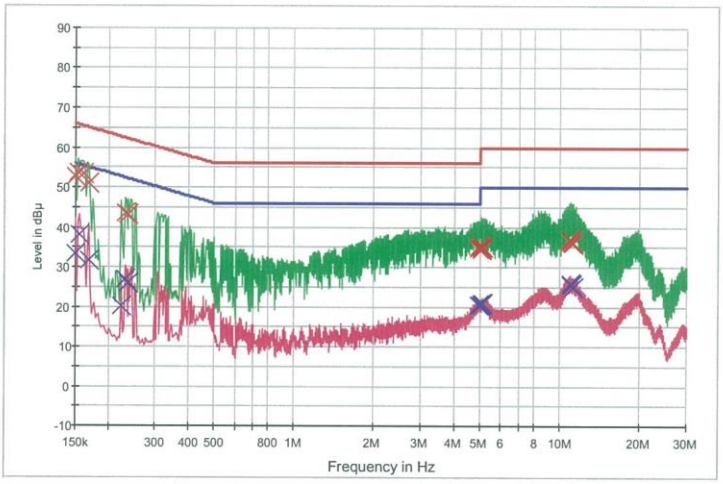
S-PEN CHARGING MODE_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	S-PEN CHARGING L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.150000	52.8	9.000	Off	L1	9.8	13.2	66.0
0.154000	53.9	9.000	Off	L1	9.8	11.9	65.8
0.160000	53.3	9.000	Off	L1	9.8	12.2	65.5
0.168000	50.9	9.000	Off	L1	9.8	14.1	65.1
0.232000	43.7	9.000	Off	L1	9.8	18.7	62.4
0.238000	43.1	9.000	Off	L1	9.8	19.1	62.2
4.948000	34.8	9.000	Off	L1	10.0	21.2	56.0
4.960000	35.1	9.000	Off	L1	10.0	20.9	56.0
5.062000	34.3	9.000	Off	L1	10.0	25.7	60.0
5.082000	34.7	9.000	Off	L1	10.0	25.3	60.0
5.092000	35.1	9.000	Off	L1	10.0	24.9	60.0
5.128000	35.0	9.000	Off	L1	10.0	25.0	60.0
10.842000	36.7	9.000	Off	L1	10.2	23.3	60.0
10.942000	36.8	9.000	Off	L1	10.2	23.2	60.0
10.952000	36.6	9.000	Off	L1	10.2	23.4	60.0
10.976000	36.4	9.000	Off	L1	10.2	23.6	60.0
11.072000	36.0	9.000	Off	L1	10.3	24.0	60.0
11.270000	36.0	9.000	Off	L1	10.3	24.0	60.0

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S-PEN CHARGING MODE_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - CAV (dB)	Limit - CAV (dBµV)
0.150000	33.5	9.000	Off	L1	9.8	22.5	56.0
0.156000	38.0	9.000	Off	L1	9.8	17.7	55.7
0.168000	31.7	9.000	Off	L1	9.8	23.4	55.1
0.224000	20.3	9.000	Off	L1	9.8	32.3	52.7
0.232000	26.9	9.000	Off	L1	9.8	25.4	52.4
0.238000	26.1	9.000	Off	L1	9.8	26.1	52.2
4.948000	20.5	9.000	Off	L1	10.0	25.5	46.0
4.960000	20.4	9.000	Off	L1	10.0	25.6	46.0
5.016000	20.6	9.000	Off	L1	10.0	29.4	50.0
5.082000	20.7	9.000	Off	L1	10.0	29.3	50.0
5.092000	20.7	9.000	Off	L1	10.0	29.3	50.0
5.110000	20.9	9.000	Off	L1	10.0	29.1	50.0
10.908000	26.1	9.000	Off	L1	10.2	23.9	50.0
10.942000	25.8	9.000	Off	L1	10.2	24.2	50.0
10.976000	25.7	9.000	Off	L1	10.2	24.3	50.0
11.002000	25.7	9.000	Off	L1	10.3	24.3	50.0
11.072000	25.6	9.000	Off	L1	10.3	24.4	50.0
11.270000	25.0	9.000	Off	L1	10.3	25.0	50.0

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Conducted Emissions (Line 2)

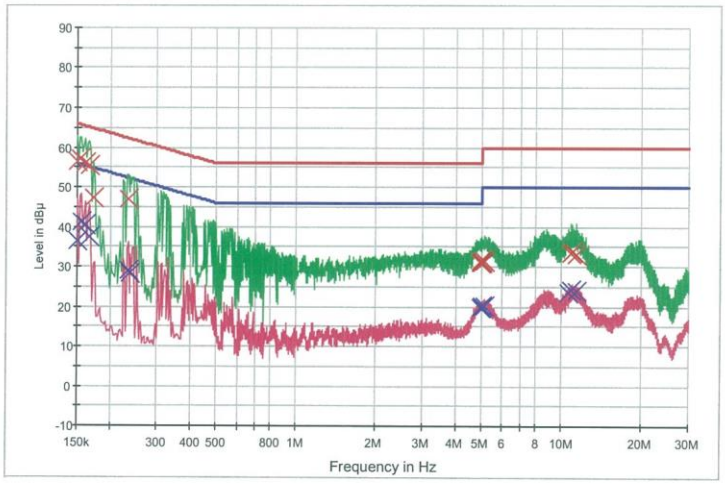
S-PEN CHARGING MODE_N 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	S-PEN CHARGING MODE_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	56.4	9.000	Off	N	9.8	9.6	66.0
0.154000	57.2	9.000	Off	N	9.8	8.6	65.8
0.160000	56.2	9.000	Off	N	9.8	9.2	65.5
0.166000	55.6	9.000	Off	N	9.8	9.6	65.2
0.172000	47.4	9.000	Off	N	9.8	17.5	64.9
0.234000	46.9	9.000	Off	N	9.8	15.4	62.3
4.934000	31.2	9.000	Off	N	10.0	24.8	56.0
4.968000	31.1	9.000	Off	N	10.0	24.9	56.0
4.998000	31.1	9.000	Off	N	10.0	24.9	56.0
5.014000	31.2	9.000	Off	N	10.0	28.8	60.0
5.040000	31.5	9.000	Off	N	10.0	28.5	60.0
5.110000	31.5	9.000	Off	N	10.0	28.5	60.0
10.834000	33.4	9.000	Off	N	10.3	26.6	60.0
10.874000	33.6	9.000	Off	N	10.3	26.4	60.0
10.896000	33.5	9.000	Off	N	10.3	26.5	60.0
11.000000	33.6	9.000	Off	N	10.3	26.4	60.0
11.300000	33.1	9.000	Off	N	10.3	26.9	60.0
11.418000	32.9	9.000	Off	N	10.3	27.1	60.0

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S-PEN CHARGING MODE_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	36.5	9.000	Off	N	9.8	19.5	56.0
0.156000	41.1	9.000	Off	N	9.8	14.6	55.7
0.160000	40.5	9.000	Off	N	9.8	14.9	55.5
0.166000	37.5	9.000	Off	N	9.8	17.6	55.2
0.234000	29.0	9.000	Off	N	9.8	23.3	52.3
0.238000	28.2	9.000	Off	N	9.8	23.9	52.2
4.956000	19.8	9.000	Off	N	10.0	26.2	46.0
4.968000	19.8	9.000	Off	N	10.0	26.2	46.0
4.998000	19.8	9.000	Off	N	10.0	26.2	46.0
5.014000	19.8	9.000	Off	N	10.0	30.2	50.0
5.032000	20.1	9.000	Off	N	10.0	29.9	50.0
5.120000	20.2	9.000	Off	N	10.0	29.8	50.0
10.584000	23.5	9.000	Off	N	10.3	26.5	50.0
10.834000	24.3	9.000	Off	N	10.3	25.7	50.0
10.858000	24.3	9.000	Off	N	10.3	25.7	50.0
10.874000	24.3	9.000	Off	N	10.3	25.7	50.0
10.896000	24.3	9.000	Off	N	10.3	25.7	50.0
11.300000	24.1	9.000	Off	N	10.3	25.9	50.0

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Test Result & Plot (Mode: Simultaneous charging)

Conducted Emissions (Line 1)

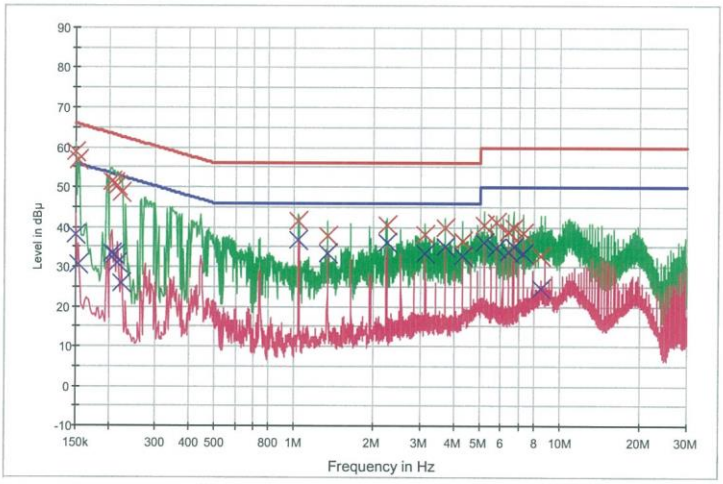
SIMUTANEOUS CHARGING ALIGNED 1% - 20%_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	SIMUTANEOUS CHARGING ALIGNED 1% - 20%_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	58.7	9.000	Off	L1	9.8	7.3	66.0
0.154000	56.7	9.000	Off	L1	9.8	9.0	65.8
0.206000	51.4	9.000	Off	L1	9.8	11.9	63.4
0.210000	51.2	9.000	Off	L1	9.8	12.0	63.2
0.216000	50.2	9.000	Off	L1	9.8	12.7	63.0
0.224000	48.6	9.000	Off	L1	9.8	14.1	62.7
1.038000	41.4	9.000	Off	L1	9.8	14.6	56.0
1.334000	37.7	9.000	Off	L1	9.9	18.3	56.0
2.226000	40.6	9.000	Off	L1	9.9	15.4	56.0
3.116000	38.1	9.000	Off	L1	9.9	17.9	56.0
3.710000	39.8	9.000	Off	L1	10.0	16.2	56.0
4.304000	36.4	9.000	Off	L1	10.0	19.6	56.0
5.194000	40.6	9.000	Off	L1	10.0	19.4	60.0
5.786000	41.1	9.000	Off	L1	10.0	18.9	60.0
6.382000	38.9	9.000	Off	L1	10.1	21.1	60.0
6.678000	39.7	9.000	Off	L1	10.1	20.3	60.0
7.272000	38.6	9.000	Off	L1	10.1	21.4	60.0
8.462000	32.8	9.000	Off	L1	10.2	27.2	60.0

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SIMUTANEOUS CHARGING ALIGNED 1% - 20%_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	38.1	9.000	Off	L1	9.8	17.9	56.0
0.154000	30.7	9.000	Off	L1	9.8	25.1	55.8
0.206000	33.4	9.000	Off	L1	9.8	19.9	53.4
0.210000	33.2	9.000	Off	L1	9.8	20.0	53.2
0.216000	30.9	9.000	Off	L1	9.8	22.1	53.0
0.224000	25.8	9.000	Off	L1	9.8	26.9	52.7
1.038000	36.9	9.000	Off	L1	9.8	9.1	46.0
1.336000	33.4	9.000	Off	L1	9.9	12.6	46.0
2.226000	35.9	9.000	Off	L1	9.9	10.1	46.0
3.116000	33.3	9.000	Off	L1	9.9	12.7	46.0
3.710000	35.1	9.000	Off	L1	10.0	10.9	46.0
4.304000	32.7	9.000	Off	L1	10.0	13.3	46.0
5.194000	36.2	9.000	Off	L1	10.0	13.8	50.0
5.788000	34.7	9.000	Off	L1	10.0	15.3	50.0
6.382000	33.6	9.000	Off	L1	10.1	16.4	50.0
6.678000	35.1	9.000	Off	L1	10.1	14.9	50.0
7.272000	33.6	9.000	Off	L1	10.1	16.4	50.0
8.462000	24.7	9.000	Off	L1	10.2	25.3	50.0

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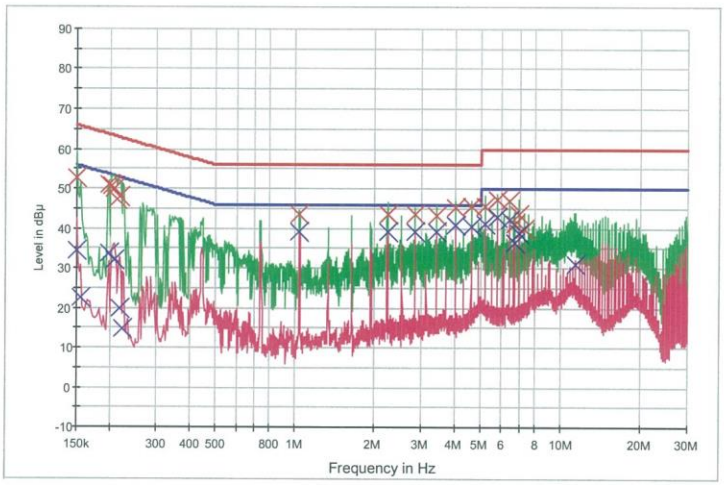
SIMUTANEOUS CHARGING CROSS 1% - 20%_L1 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	SIMUTANEOUS CHARGING CROSS 1% - 20%_L1

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	52.7	9.000	Off	L1	9.8	13.3	66.0
0.198000	51.2	9.000	Off	L1	9.8	12.5	63.7
0.204000	50.6	9.000	Off	L1	9.8	12.8	63.4
0.208000	50.0	9.000	Off	L1	9.8	13.3	63.3
0.212000	47.3	9.000	Off	L1	9.8	15.9	63.1
0.218000	48.0	9.000	Off	L1	9.8	14.9	62.9
1.038000	43.4	9.000	Off	L1	9.8	12.6	56.0
2.226000	43.5	9.000	Off	L1	9.9	12.5	56.0
2.820000	43.7	9.000	Off	L1	9.9	12.3	56.0
3.412000	43.4	9.000	Off	L1	9.9	12.6	56.0
4.006000	45.1	9.000	Off	L1	10.0	10.9	56.0
4.600000	45.5	9.000	Off	L1	10.0	10.5	56.0
5.192000	45.5	9.000	Off	L1	10.0	14.5	60.0
5.786000	47.3	9.000	Off	L1	10.0	12.7	60.0
6.380000	46.8	9.000	Off	L1	10.1	13.2	60.0
6.676000	41.2	9.000	Off	L1	10.1	18.8	60.0
6.972000	43.4	9.000	Off	L1	10.1	16.6	60.0
7.268000	39.8	9.000	Off	L1	10.1	20.2	60.0

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SIMUTANEOUS CHARGING CROSS 1% - 20%_L1 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	34.4	9.000	Off	L1	9.8	21.6	56.0
0.156000	22.6	9.000	Off	L1	9.8	33.0	55.7
0.198000	33.6	9.000	Off	L1	9.8	20.1	53.7
0.208000	32.0	9.000	Off	L1	9.8	21.3	53.3
0.218000	19.8	9.000	Off	L1	9.8	33.1	52.9
0.224000	14.7	9.000	Off	L1	9.8	38.0	52.7
1.038000	39.0	9.000	Off	L1	9.8	7.0	46.0
2.226000	39.1	9.000	Off	L1	9.9	6.9	46.0
2.820000	39.0	9.000	Off	L1	9.9	7.0	46.0
3.412000	39.0	9.000	Off	L1	9.9	7.0	46.0
4.006000	40.7	9.000	Off	L1	10.0	5.3	46.0
4.598000	40.6	9.000	Off	L1	10.0	5.4	46.0
5.192000	41.3	9.000	Off	L1	10.0	8.7	50.0
5.786000	42.8	9.000	Off	L1	10.0	7.2	50.0
6.380000	42.2	9.000	Off	L1	10.1	7.8	50.0
6.676000	36.6	9.000	Off	L1	10.1	13.4	50.0
6.972000	38.7	9.000	Off	L1	10.1	11.3	50.0
11.424000	30.9	9.000	Off	L1	10.3	19.1	50.0

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Conducted Emissions (Line 2)

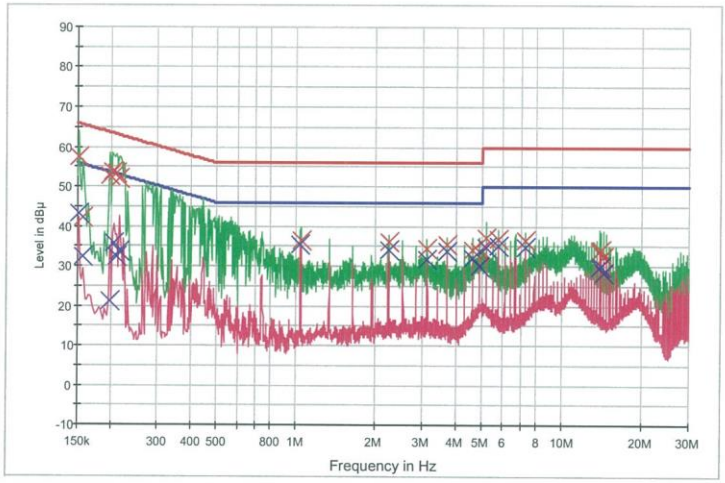
SIMUTANEOUS CHARGING ALIGNED 1% - 20%_N 1 / 2

HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	SIMUTANEOUS CHARGING ALIGNED 1% - 20%_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	57.5	9.000	Off	N	9.8	8.4	65.9
0.158000	42.3	9.000	Off	N	9.8	23.3	65.6
0.198000	52.6	9.000	Off	N	9.8	11.1	63.7
0.204000	53.9	9.000	Off	N	9.8	9.6	63.4
0.210000	53.3	9.000	Off	N	9.8	9.9	63.2
0.216000	52.1	9.000	Off	N	9.8	10.9	63.0
1.040000	36.4	9.000	Off	N	9.8	19.6	56.0
2.226000	36.1	9.000	Off	N	9.9	19.9	56.0
3.116000	34.4	9.000	Off	N	9.9	21.6	56.0
3.710000	35.5	9.000	Off	N	10.0	20.5	56.0
4.598000	34.1	9.000	Off	N	10.0	21.9	56.0
4.896000	33.9	9.000	Off	N	10.0	22.1	56.0
5.194000	37.0	9.000	Off	N	10.0	23.0	60.0
5.786000	36.8	9.000	Off	N	10.1	23.2	60.0
7.270000	36.5	9.000	Off	N	10.1	23.5	60.0
13.802000	33.7	9.000	Off	N	10.4	26.3	60.0
14.098000	34.0	9.000	Off	N	10.4	26.0	60.0
14.396000	32.4	9.000	Off	N	10.4	27.6	60.0

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SIMUTANEOUS CHARGING ALIGNED 1% - 20%_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	43.2	9.000	Off	N	9.8	12.7	55.9
0.158000	32.4	9.000	Off	N	9.8	23.2	55.6
0.198000	21.2	9.000	Off	N	9.8	32.5	53.7
0.206000	35.9	9.000	Off	N	9.8	17.5	53.4
0.210000	32.5	9.000	Off	N	9.8	20.7	53.2
0.216000	33.6	9.000	Off	N	9.8	19.3	53.0
1.038000	35.3	9.000	Off	N	9.8	10.7	46.0
2.226000	34.1	9.000	Off	N	9.9	11.9	46.0
3.116000	31.7	9.000	Off	N	9.9	14.3	46.0
3.710000	33.7	9.000	Off	N	10.0	12.3	46.0
4.600000	31.9	9.000	Off	N	10.0	14.1	46.0
4.896000	30.1	9.000	Off	N	10.0	15.9	46.0
5.194000	34.6	9.000	Off	N	10.0	15.4	50.0
5.786000	34.9	9.000	Off	N	10.1	15.1	50.0
7.270000	34.7	9.000	Off	N	10.1	15.3	50.0
13.802000	29.8	9.000	Off	N	10.4	20.2	50.0
14.098000	30.0	9.000	Off	N	10.4	20.0	50.0
14.396000	28.2	9.000	Off	N	10.4	21.8	50.0

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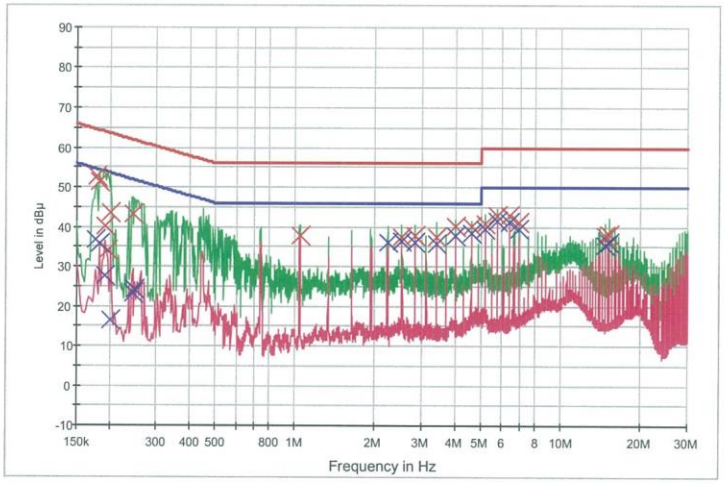
HCT TEST Report

Common Information

EUT:	SM-N981B/DS
Manufacturer:	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions:	SIMUTANEOUS CHARGING CROSS 1% - 20%_N

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.178000	52.7	9.000	Off	N	9.8	11.9	64.6
0.182000	51.5	9.000	Off	N	9.8	12.9	64.4
0.192000	40.2	9.000	Off	N	9.8	23.7	63.9
0.196000	34.2	9.000	Off	N	9.8	29.6	63.8
0.202000	43.5	9.000	Off	N	9.8	20.0	63.5
0.244000	43.3	9.000	Off	N	9.8	18.7	62.0
1.040000	38.0	9.000	Off	N	9.8	18.0	56.0
2.524000	37.5	9.000	Off	N	9.9	18.5	56.0
2.818000	37.8	9.000	Off	N	9.9	18.2	56.0
3.414000	37.4	9.000	Off	N	9.9	18.6	56.0
4.006000	40.2	9.000	Off	N	10.0	15.8	56.0
4.600000	40.3	9.000	Off	N	10.0	15.7	56.0
5.192000	40.9	9.000	Off	N	10.0	19.1	60.0
5.786000	43.0	9.000	Off	N	10.1	17.0	60.0
6.380000	42.8	9.000	Off	N	10.1	17.2	60.0
6.974000	41.3	9.000	Off	N	10.1	18.7	60.0
14.688000	37.7	9.000	Off	N	10.4	22.3	60.0
15.284000	38.1	9.000	Off	N	10.5	21.9	60.0

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SIMUTANEOUS CHARGING CROSS 1% - 20%_N 2 / 2

Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.176000	36.9	9.000	Off	N	9.8	17.8	54.7
0.182000	35.6	9.000	Off	N	9.8	18.8	54.4
0.192000	27.7	9.000	Off	N	9.8	26.2	53.9
0.202000	16.3	9.000	Off	N	9.8	37.2	53.5
0.244000	23.4	9.000	Off	N	9.8	28.6	52.0
0.248000	24.3	9.000	Off	N	9.8	27.5	51.8
2.226000	36.1	9.000	Off	N	9.9	9.9	46.0
2.522000	36.6	9.000	Off	N	9.9	9.4	46.0
2.820000	36.0	9.000	Off	N	9.9	10.0	46.0
3.414000	35.6	9.000	Off	N	9.9	10.4	46.0
4.006000	37.9	9.000	Off	N	10.0	8.1	46.0
4.600000	38.6	9.000	Off	N	10.0	7.4	46.0
5.192000	39.4	9.000	Off	N	10.0	10.6	50.0
5.786000	41.5	9.000	Off	N	10.1	8.5	50.0
6.380000	41.2	9.000	Off	N	10.1	8.8	50.0
6.974000	39.6	9.000	Off	N	10.1	10.4	50.0
14.688000	35.3	9.000	Off	N	10.4	14.7	50.0
15.282000	35.9	9.000	Off	N	10.5	14.1	50.0

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11. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/26/2019	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	03/22/2019	Biennial	760
Schwarzbeck	VULB 9160 / TRILOG Antenna	08/09/2018	Biennial	9160-3368
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	04/27/2020	Annual	100854
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/26/2019	Annual	101068-SZ
Agilent	N9020A / Signal Analyzer	05/11/2020	Annual	MY51110085
Api tech.	18B-03 / Attenuator (3 dB)	03/02/2020	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	03/02/2020	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	03/02/2020	Annual	22964

13. Annex A_TEST SETUP PHOTO

Please refer to test setup photo file no. as follows;

No.	Description
1	HCT-RF-2006-FC089-P