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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:
November 08, 2021

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

Report No.: HCT-RF-2110-FC062-R2

FCC ID:	**A3LSMN981B1**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**

Model:	SM-N981B/DS
Additional Model:	SM-N981B
EUT Type:	Mobile Phone
Frequency of Operation & Max. Transmit Power:	110 kHz ~ 148 kHz(Power sharing) : 5.34 dBμV/m @300 m 590 kHz ~ 625 kHz(S-pen Charging) : 13.89 dBμV/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)

Engineering Statement:

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. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Jin Gwan Lee
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
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 (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2110-FC062	October 29, 2021	- First Approval Report
HCT-RF-2110-FC062-R1	November 04, 2021	- Revised the FCC ID - Revised the EUT Exercise on page 6 - Revised the Worst case configuration on page 9.10 - Added text to notes on page 21-23 - Deleted Emission Bandwidth Test - AC Power Line revised
HCT-RF-2110-FC062-R2	November 08, 2021	- Page 19, 20, 22, 23, 24 Added a note

Table of Contents

1. EUT DESCRIPTION

Model	SM-N981B/DS
Additional Model	SM-N981B
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Frequency of Operation	110 kHz ~ 148 kHz(Power sharing) 590 kHz ~ 625 kHz(S-pen Charging)
Max. Transmit Power	5.34 dBμV/m @300 m (Power sharing) 13.89 dBμV/m @300 m (S-pen Charging)
Date(s) of Tests	September 27, 2021 ~ October 27, 2021
Serial number	Radiated: UIR1409M Conducted: UIR1403M

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 15.205, 15.207 and 15.209 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 30 MHz 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 1 GHz. Above 1 GHz with 1.5 m 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 equipment's, which is traceable to recognized national standards.

Especially, 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 (Confidence level about 95 %, k=2)
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40 (Confidence level about 95 %, k=2)
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80 (Confidence level about 95 %, k=2)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70 (Confidence level about 95 %, k=2)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.05 (Confidence level about 95 %, k=2)

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	Aligned	***1 % ~ 20 %***	Phone & S-Pen
			20 % ~ 50 %	
			90 % ~ 100 %	
	Charging from EUT(Charging from TA) to Client device	Cross	***1 % ~ 20 %***	
			20 % ~ 50 %	
			90 % ~ 100 %	

Note:

1. Client device:

All Client device of operation were investigated and the worst case configuration results are reported.

(Worst Case : Phone)

2. Client device:

Phone	S-pen	Watch
- Model : SM-G986B/DS - Manufacturer : SAMSUNG - FCC ID : A3LSMG986B	- Model : EJ-PN980 - Manufacturer : SAMSUNG - FCC ID : A3LEJPN980	- Model :SM-R835F - Manufacturer : SAMSUNG - FCC ID : A3LR835

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 and Watch, 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 : Simultaneous Phone-Cross)
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-N981B/DS, SM-N981B were tested and the worst case results are reported.
(Worst case : SM-N981B/DS)

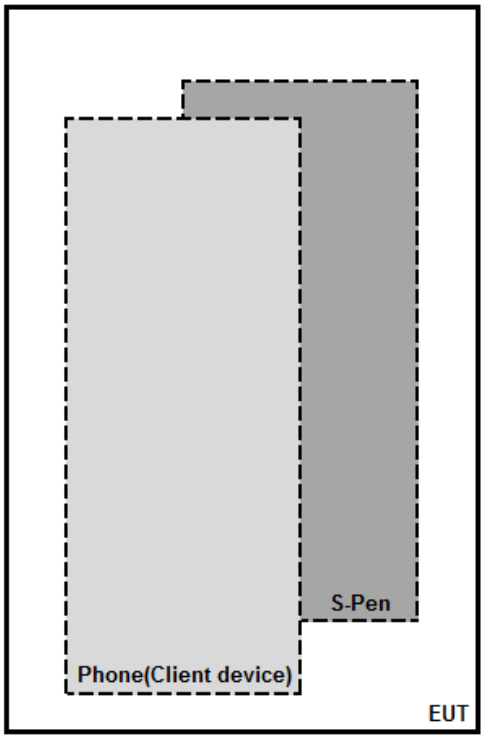
AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Power sharing : EUT + Travel Adapter + Phone(Client device) + Internal accessorie (S-Pen Full Charged)
 - Simultaneous charging : EUT + Travel Adapter + Phone(Client device) + Internal accessorie (S-Pen Low Charged)
 - S-pen Charging : EUT + Travel Adapter + Internal accessorie (S-Pen)
2. SM-N981B/DS, SM-N981B were tested and the worst case results are reported.
(Worst case : SM-N981B/DS)

Test Setup Diagram:

1. Power sharing mode

Aligned



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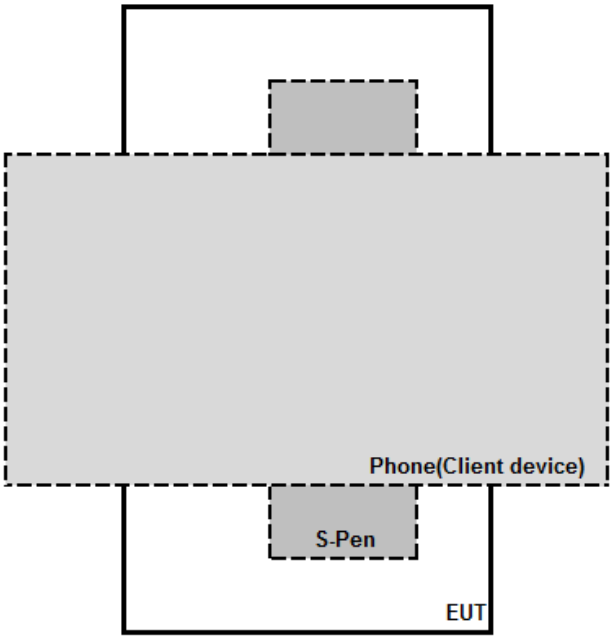
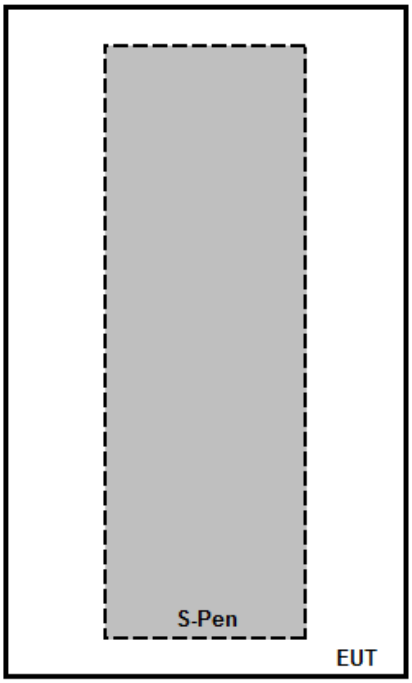
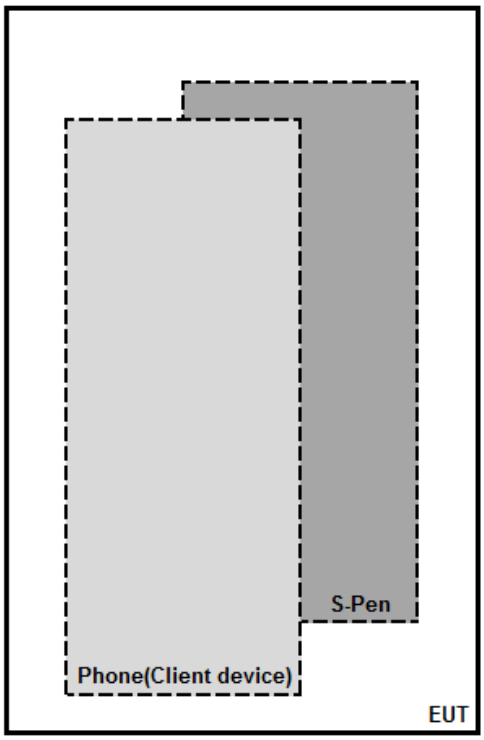


2. S-pen charging mode



3. Simultaneous charging mode

Aligned



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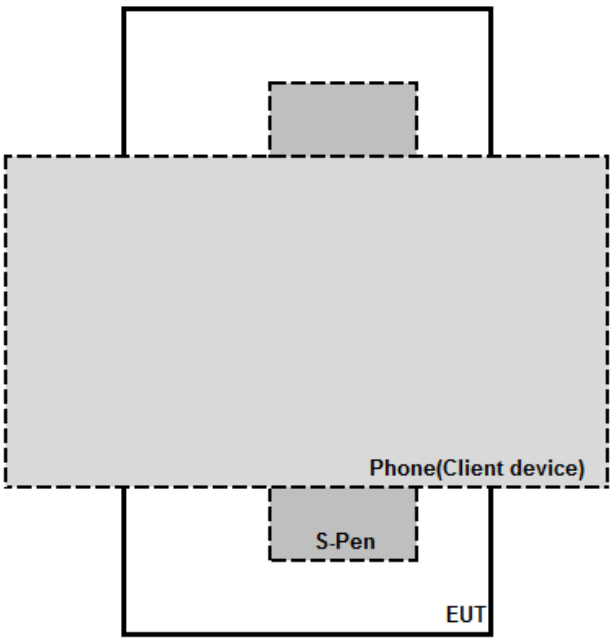


8. TEST SUMMARY

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 emission of interest.
2. RBW :
   9 kHz – 150 kHz : 300 Hz
   150 kHz – 30 MHz : 10 kHz
   30 MHz – 1G Hz : 100 kHz
3. VBW : ≥ 3 x RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit(FCC)

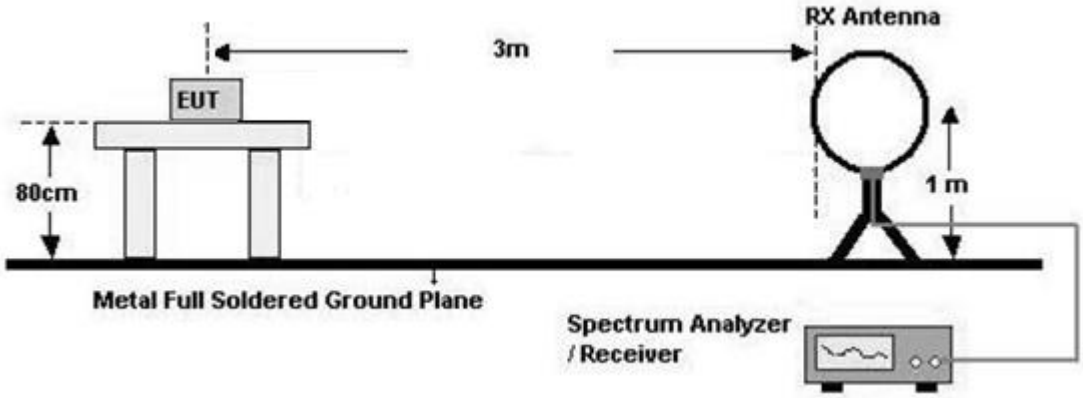
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

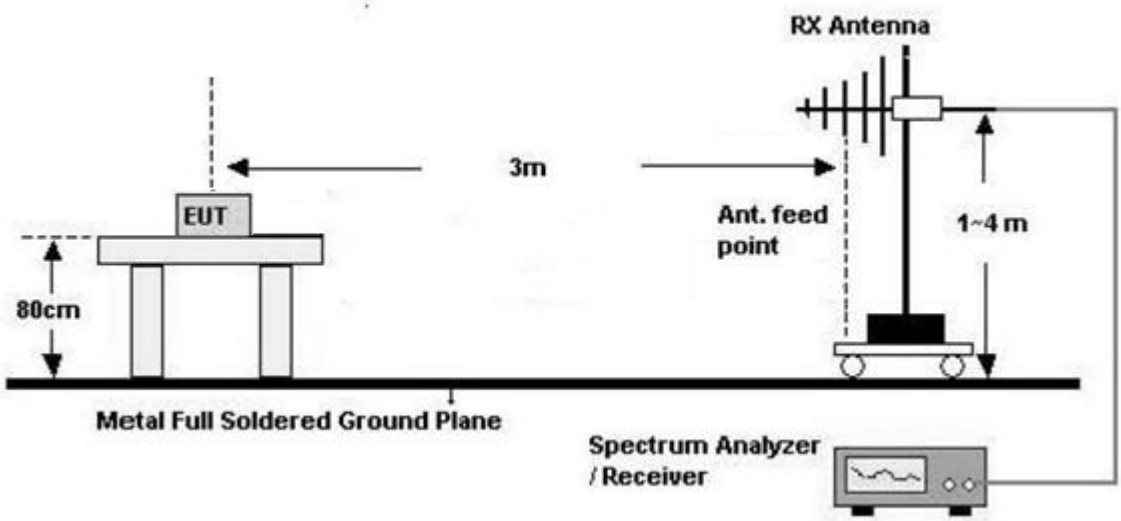
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, 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 0.8 m 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@30 m)
     = Measured level(dBµV/m@3 m) + 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 – 30 MHz :
     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 1 GHz)

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 3 m 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 = Measured 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 (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
9.091	34.479	18.9	0.47	-80	-26.151	48.43	74.58
# 113.100	62.821	19.3	0.47	-80	2.591	26.53	23.94
115.150	26.993	19.3	0.47	-80	-33.237	26.38	59.62
340.950	43.092	19.2	0.47	-80	-17.238	16.95	34.19
4.188	10.010	19.5	0.47	-40	-10.020	29.54	39.56

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Aligned
4. 30 MHz – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.
6. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
46.128	41.872	19.3	0.47	-80	-18.358	34.32	52.68
#113.100	65.568	19.3	0.47	-80	5.338	26.53	21.20
101.300	31.779	19.3	0.47	-80	-28.451	27.49	55.94
338.100	44.496	19.2	0.47	-80	-15.834	17.02	32.86
3.054	14.230	19.4	0.47	-40	-5.900	29.54	35.44

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.
6. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBµV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
9.000	35.103	18.9	0.47	-80	-25.527	48.52	74.05
# 113.050	62.309	19.3	0.47	-80	2.079	26.54	24.46
115.100	35.711	19.3	0.47	-80	-24.519	26.38	50.90
338.100	41.910	19.2	0.47	-80	-18.420	17.02	35.44
3.054	10.191	19.5	0.47	-40	-9.839	29.54	39.38

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT to Phone
3. Position: Cross
4. 30 MHz – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.
6. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBµV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
39.576	40.424	19.3	0.47	-80	-19.806	35.66	55.46
# 113.100	64.798	19.3	0.47	-80	4.568	26.53	21.97
114.950	30.529	19.3	0.47	-80	-29.701	26.39	56.10
340.950	45.127	19.2	0.47	-80	-15.203	16.95	32.15
3.0540	14.335	19.4	0.47	-40	-5.795	29.54	35.34

Note

1. “#” Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to Phone
3. Position: Cross
4. 30 MHz – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.
6. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
9.182	33.17	18.9	0.47	-80.00	-27.460	48.43	75.89
115.150	25.228	19.3	0.47	-80.00	-35.002	26.53	61.54
# 591.750	34.167	19.2	0.47	-40.00	13.837	32.16	18.32
3108	9.445	19.4	0.47	-40.00	-10.685	29.54	40.23

Note

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

Frequency (kHz)	Reading Level (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
74.156	41.889	19.3	0.47	-80.00	-18.341	34.32	52.67
144.800	26.333	19.3	0.47	-80.00	-33.897	26.53	60.43
150.000	36.545	19.3	0.47	-80.00	-23.685	27.49	51.18
# 594.600	34.221	19.2	0.47	-40.00	13.891	32.12	18.23
3216	10.085	19.4	0.47	-40.00	-10.045	29.54	39.59

Note

1. "#" Fundamental Frequency
2. EUT Mode: Charging from EUT(Charging from TA) to S-pen
3. Position: Aligned
4. 30 MHz – 1 GHz : No Critical peaks found
5. 74.156 kHz and 150 kHz are 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 (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
32.818	10.001	18.9	0.47	-80	-50.629	37.28	87.91
# 113.100	61.580	19.3	0.47	-80	1.350	26.53	25.18
340.950	40.470	19.2	0.47	-80	-19.860	16.95	36.81
# 594.600	33.507	19.2	0.47	-40	13.177	32.12	18.94
3054	10.927	19.4	0.47	-40	-9.203	29.54	38.74

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 – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device. All fundamental frequency were investigated and the worst results are reported.
6. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
47.402	39.088	19.3	0.47	-80	-21.142	34.09	55.23
# 113.100	64.063	19.3	0.47	-80	3.833	26.53	22.70
115.050	26.991	19.2	0.47	-80	-33.339	26.39	59.73
338.100	42.594	19.2	0.47	-80	-17.736	17.02	34.76
# 594.600	33.470	19.2	0.47	-40	13.140	32.12	18.98
3054	13.731	19.4	0.47	-40	-6.399	29.54	35.94

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 – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.
6. 47.402 kHz is higher than fundamental level (s-pen). However, it is noise floor level and looks like higher than due to chamber characteristic.
7. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBμV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
10.183	32.843	18.9	0.47	-80	-27.787	47.45	75.23
# 113.100	63.460	19.3	0.47	-80	3.230	26.53	23.30
115.100	35.435	19.3	0.47	-80	-24.795	26.38	51.18
340.950	43.035	19.2	0.47	-80	-17.295	16.95	34.25
# 594.600	35.809	19.2	0.47	-40	15.479	32.12	16.64
3054	12.704	19.4	0.47	-40	-7.426	29.54	36.97

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-Cross, S-pen-Aligned)
4. 30 MHz – 1 GHz : 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. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

Frequency (kHz)	Reading Level (dBµV/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)
39.667	40.314	19.3	0.47	-80	-19.916	35.64	55.55
# 113.100	**65.007**	19.3	0.47	-80	4.777	26.53	21.76
114.000	34.507	19.2	0.47	-80	-25.823	26.47	52.29
333.100	44.802	19.2	0.47	-80	-15.528	17.15	32.68
# 594.600	35.936	19.2	0.47	-40	15.606	32.12	16.51
3054	12.998	19.4	0.47	-40	-7.132	29.54	36.67

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-Cross, S-pen-Aligned)
4. 30 MHz – 1 GHz : No Critical peaks found
5. The fundamental frequency(110 kHz – 148 kHz) varies depending on the position of client device.
   All fundamental frequency were investigated and the worst results are reported.
6. 39.667 kHz is higher than fundamental level (s-pen). However, it is noise floor level and looks like higher than due to chamber characteristic.
7. Emission raised from the 3rd harmonic of 110-148 kHz in 330-444 kHz.

▣Test Plot

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

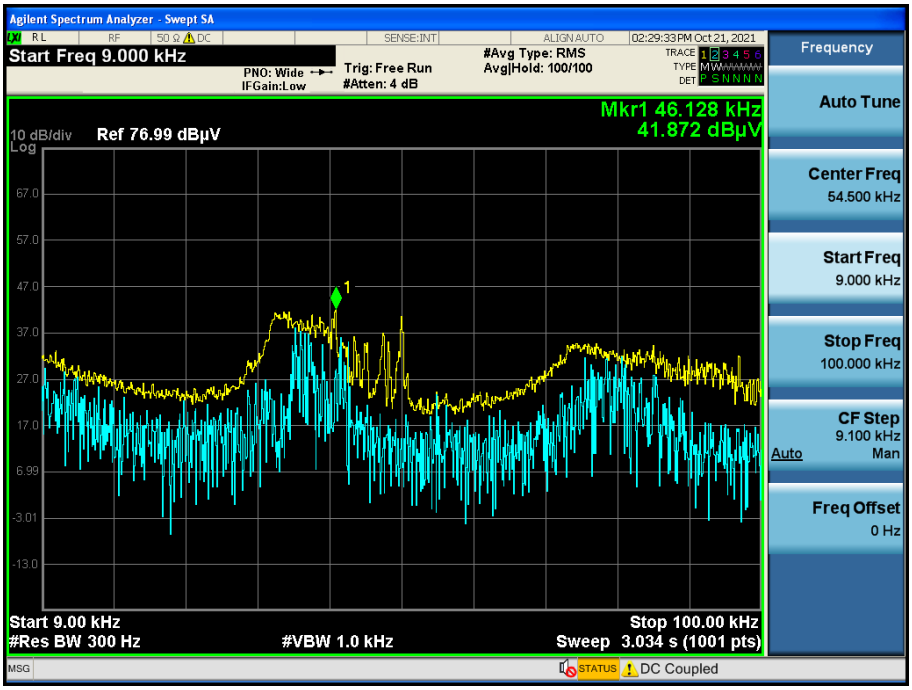
1. Power sharing

Worst case

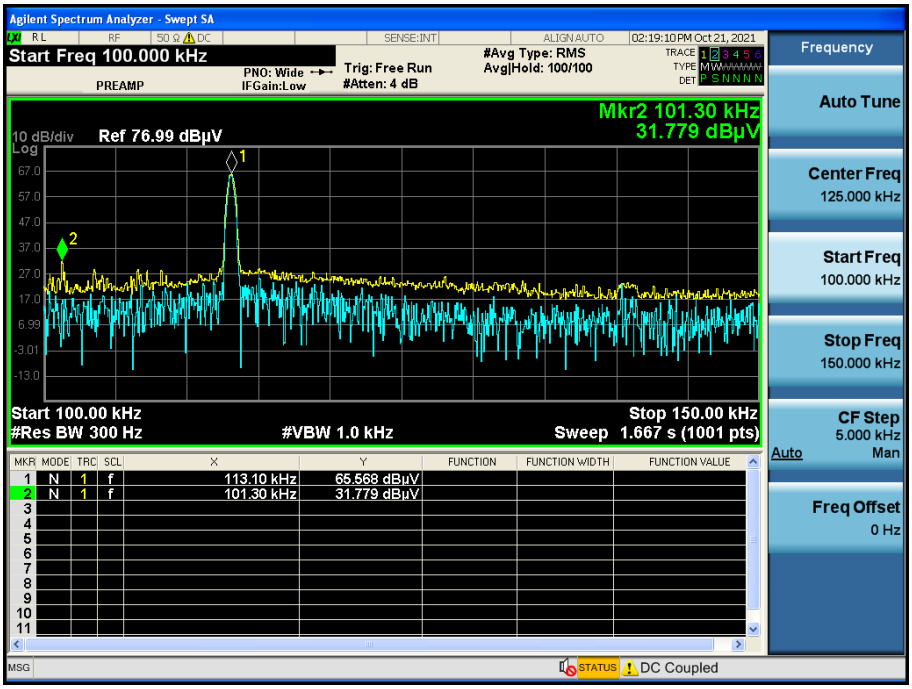
- EUT Mode: Charging from EUT(Charging from TA) to Phone

- Position: Aligned

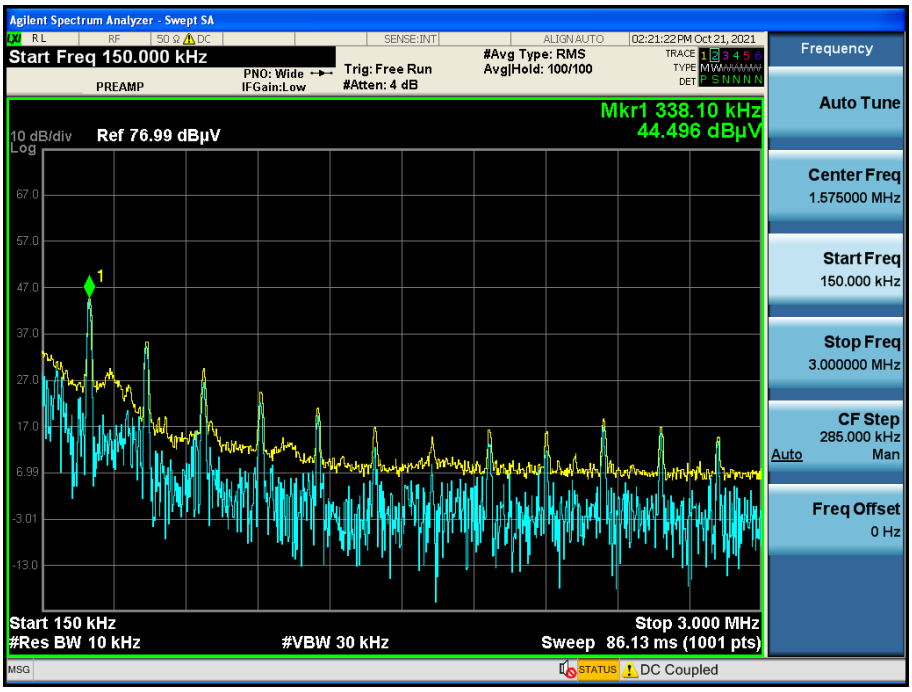
Frequency Range : 9 kHz – 100 kHz



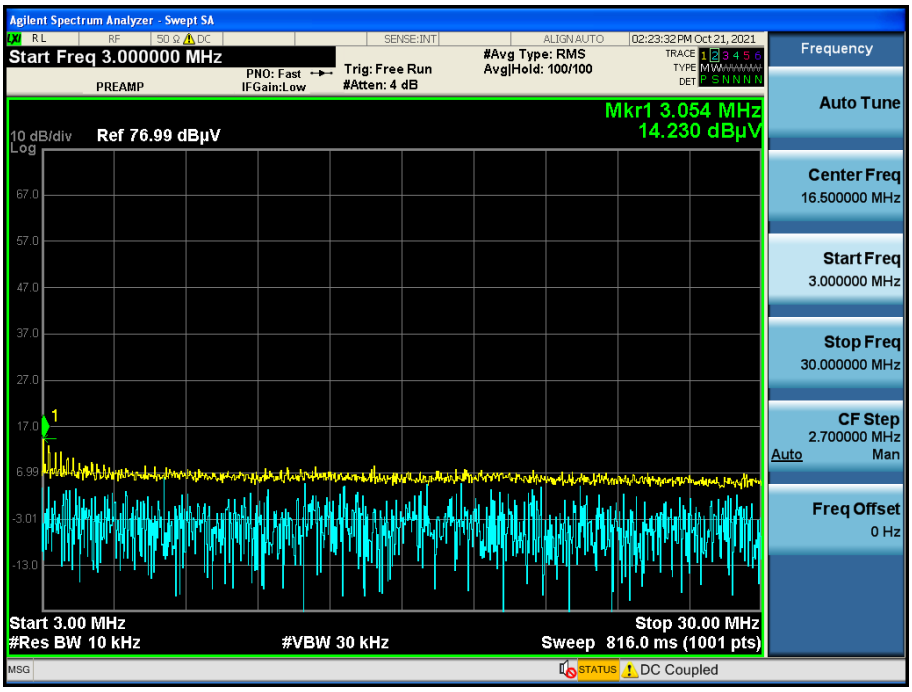
Frequency Range : 100 kHz – 150 kHz



Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

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

Note :

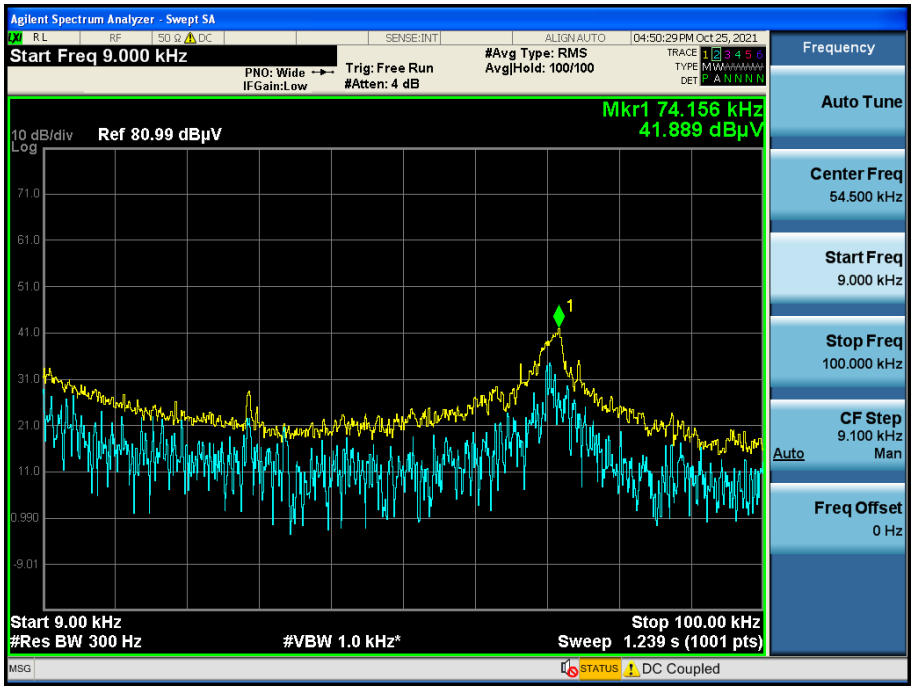
In order to simplify the report, attached plots were only the worstcase

2. S-pen Charging

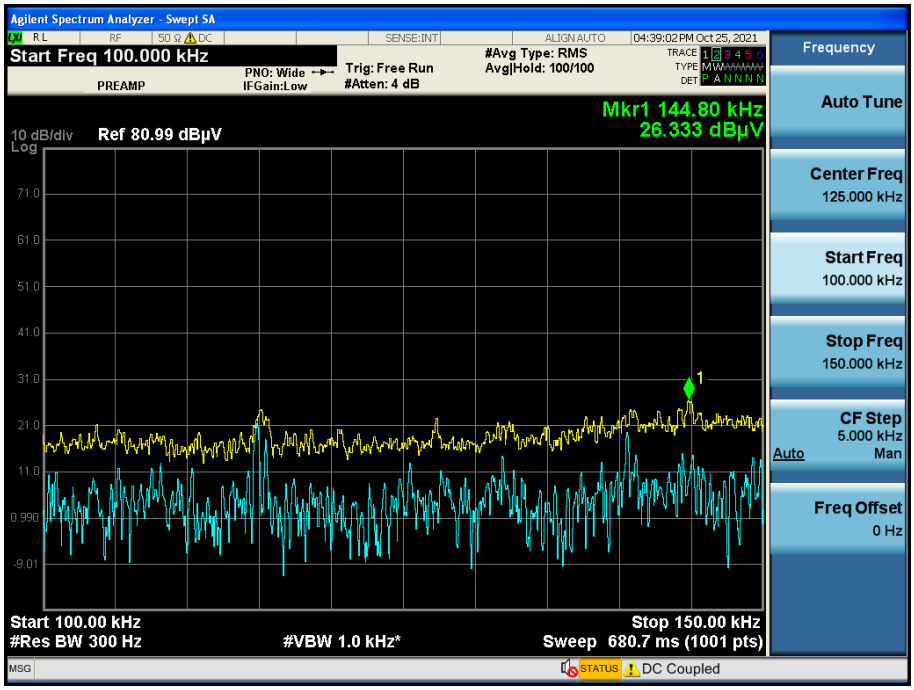
Worst case

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

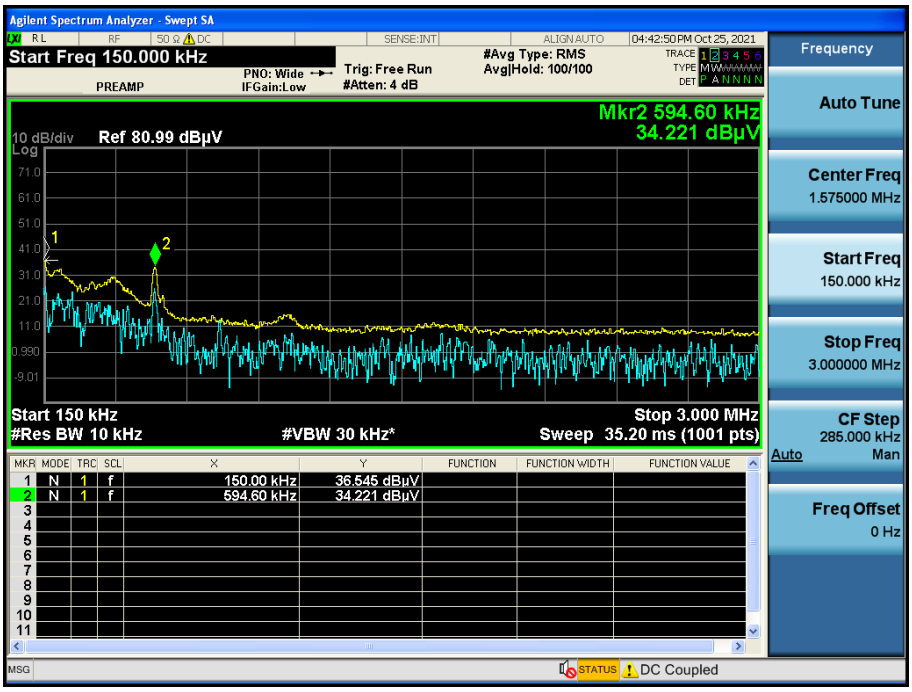
Frequency Range : 9 kHz – 100 kHz



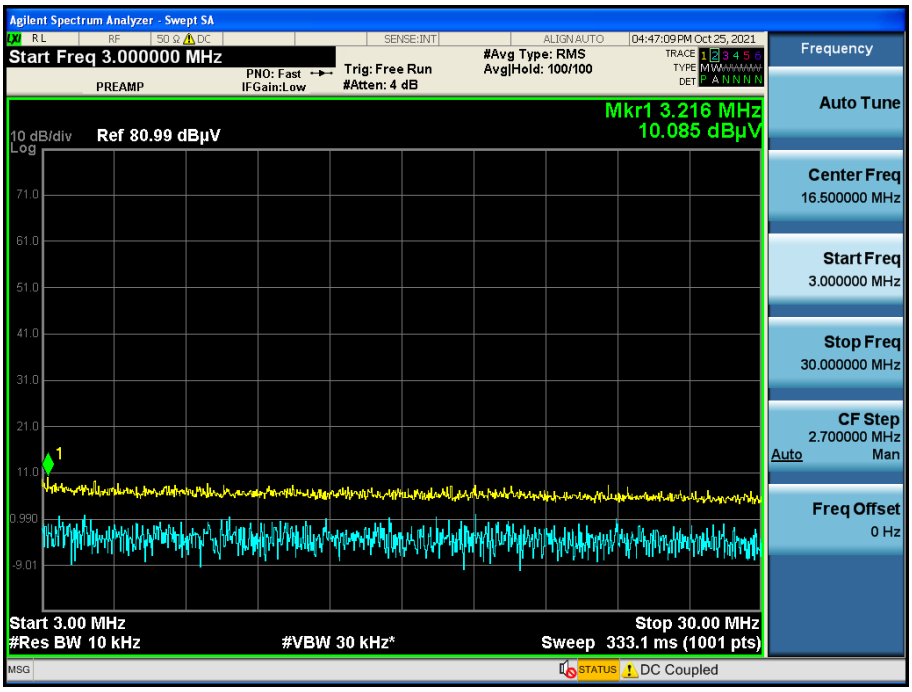
Frequency Range : 100 kHz – 150 kHz



Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

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

Note :

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

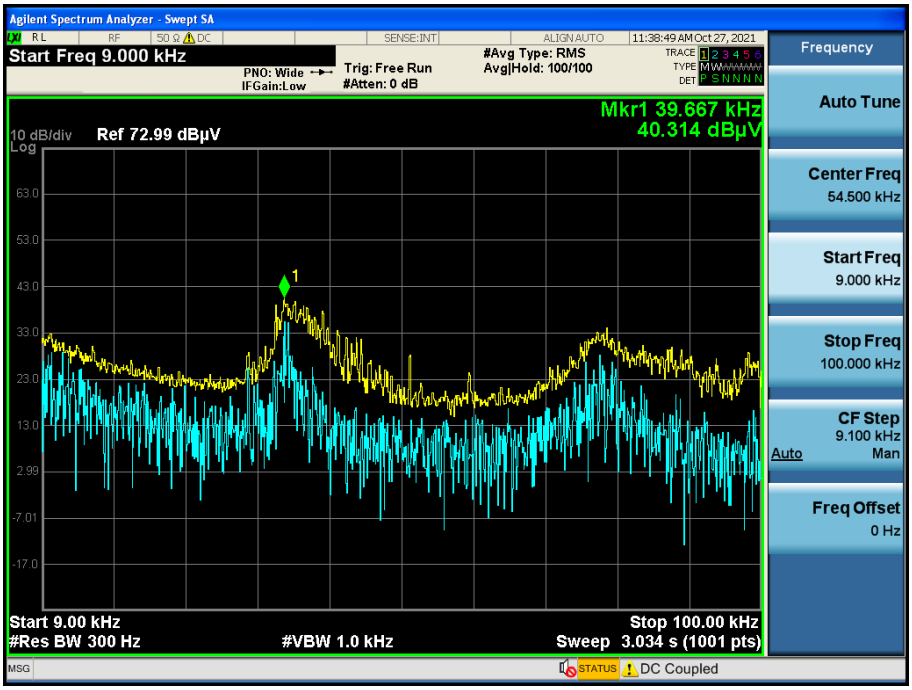
3. Simultaneous charging

Worst case

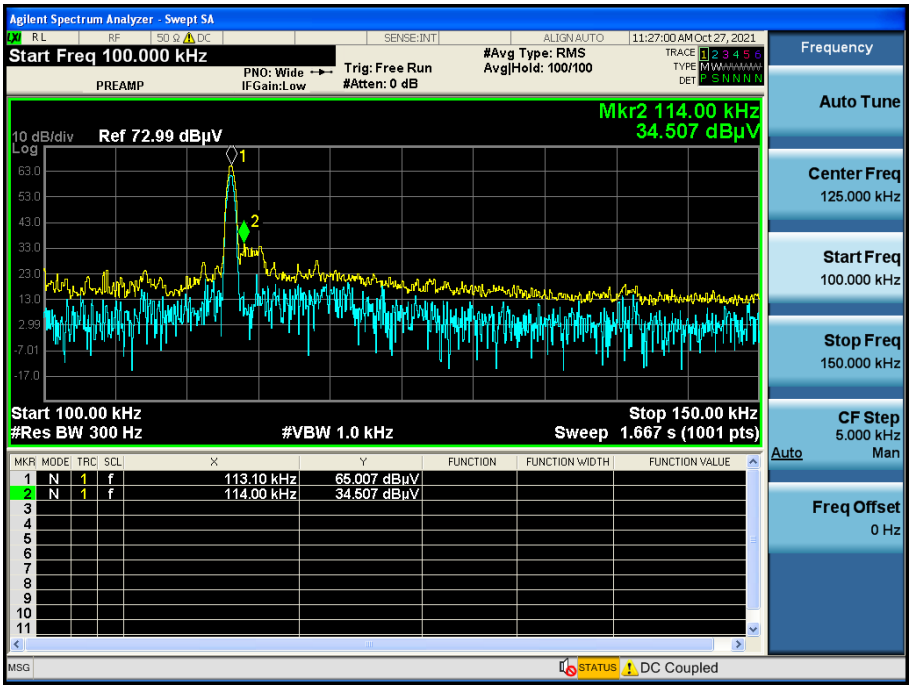
- EUT Mode: Charging from EUT(Charging from TA) to Phone & S-Pen
- Position: All position of Phone(Client device) were investigated and the worst position results are reported.

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

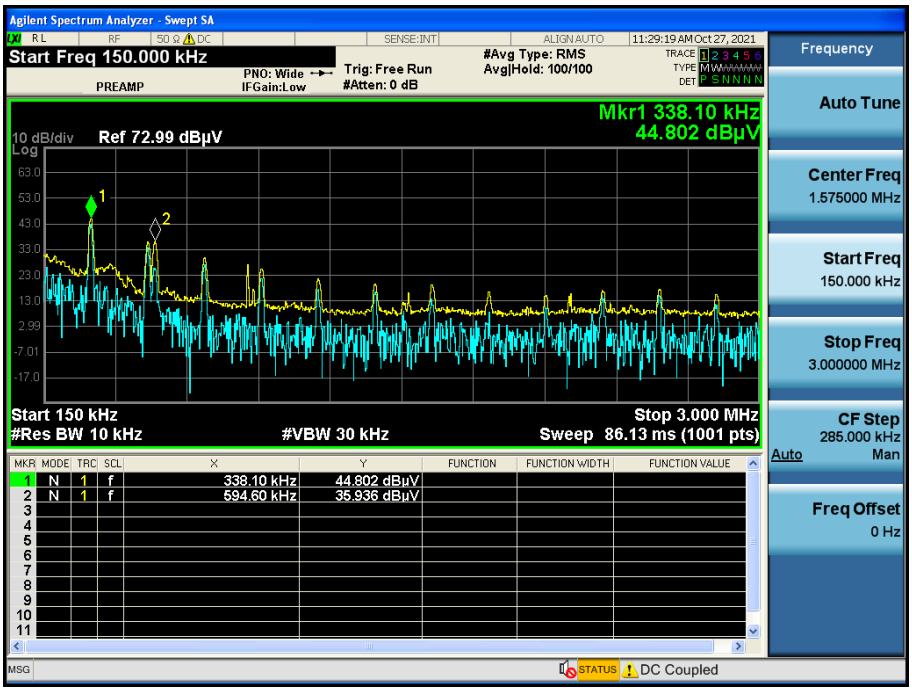
Frequency Range : 9 kHz – 100 kHz



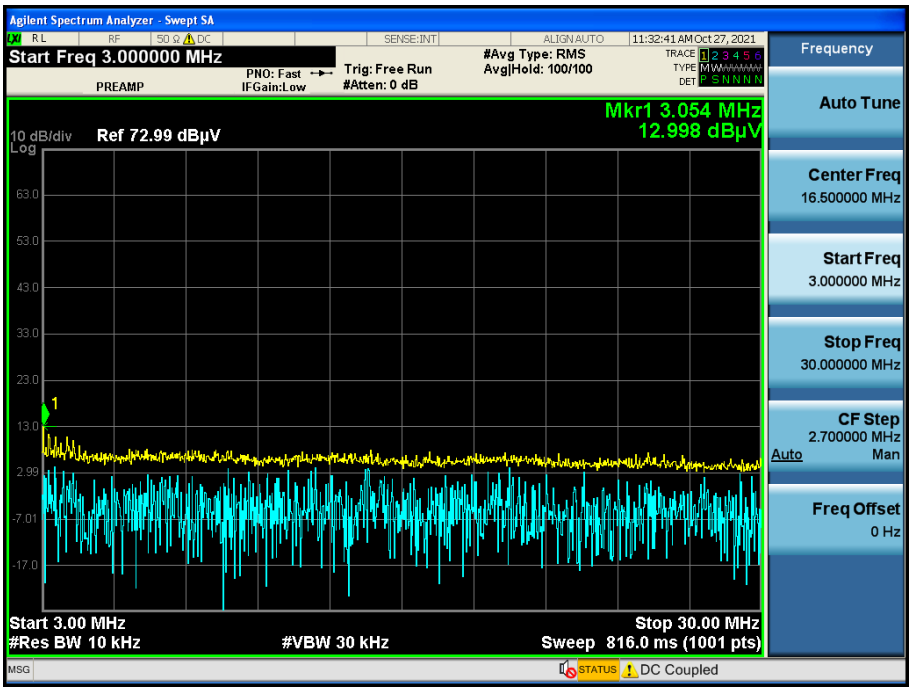
Frequency Range : 100 kHz – 150 kHz



Frequency Range : 150 kHz – 3 MHz



Frequency Range : 3 MHz – 30 MHz



Frequency Range : 30 MHz – 1 GHz

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

Note :

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

10. POWERLINE CONDUCTED 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) = Measured Value + Correction Factor

Test Result & Plot (Mode: Power sharing)

Conducted Emissions (Line 1)

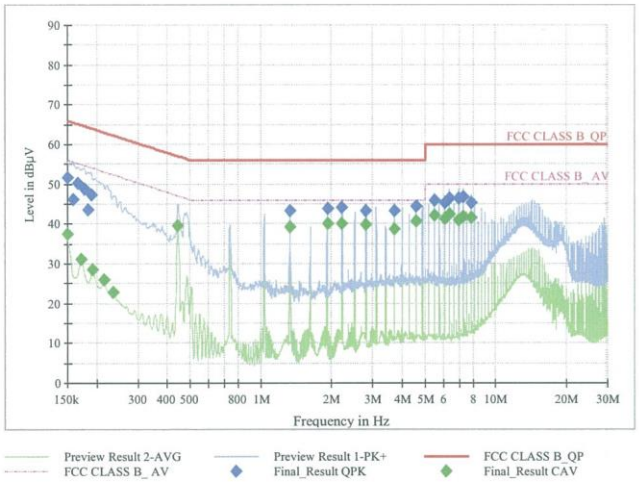
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	WPT(PHONE TO PHONE)_CROSS_L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	51.54	66.00	14.46	9.000	L1	OFF	9.6
0.1590	46.22	65.52	19.30	9.000	L1	OFF	9.6
0.1658	50.26	65.17	14.91	9.000	L1	OFF	9.6
0.1770	48.86	64.63	15.77	9.000	L1	OFF	9.6
0.1838	43.61	64.31	20.70	9.000	L1	OFF	9.6
0.1905	47.30	64.02	16.71	9.000	L1	OFF	9.6
1.3303	43.16	56.00	12.84	9.000	L1	OFF	9.7
1.9220	43.96	56.00	12.04	9.000	L1	OFF	9.7
2.2168	44.11	56.00	11.89	9.000	L1	OFF	9.7
2.8085	43.34	56.00	12.66	9.000	L1	OFF	9.8
3.6950	43.13	56.00	12.87	9.000	L1	OFF	9.8
4.5838	44.51	56.00	11.49	9.000	L1	OFF	9.9
5.4703	45.89	60.00	14.11	9.000	L1	OFF	9.9
6.0620	45.26	60.00	14.74	9.000	L1	OFF	9.9
6.3568	46.45	60.00	13.55	9.000	L1	OFF	9.9
6.9485	46.51	60.00	13.49	9.000	L1	OFF	9.9
7.2455	46.75	60.00	13.25	9.000	L1	OFF	9.9
7.8350	45.37	60.00	14.63	9.000	L1	OFF	10.0

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	37.62	56.00	18.38	9.000	L1	OFF	9.6
0.1725	31.05	54.84	23.79	9.000	L1	OFF	9.6
0.1928	28.49	53.92	25.43	9.000	L1	OFF	9.6
0.2153	26.02	53.00	26.98	9.000	L1	OFF	9.6
0.2355	22.81	52.25	29.44	9.000	L1	OFF	9.6
0.4425	39.48	47.02	7.53	9.000	L1	OFF	9.6
1.3303	39.10	46.00	6.90	9.000	L1	OFF	9.7
1.9220	40.03	46.00	5.97	9.000	L1	OFF	9.7
2.2168	40.23	46.00	5.77	9.000	L1	OFF	9.7
2.8085	39.73	46.00	6.27	9.000	L1	OFF	9.8
3.6950	38.75	46.00	7.25	9.000	L1	OFF	9.8
4.5838	40.54	46.00	5.46	9.000	L1	OFF	9.9
5.4703	41.98	50.00	8.02	9.000	L1	OFF	9.9
6.0620	41.37	50.00	8.63	9.000	L1	OFF	9.9
6.3568	42.47	50.00	7.53	9.000	L1	OFF	9.9
6.9485	41.08	50.00	8.92	9.000	L1	OFF	9.9
7.2455	41.75	50.00	8.25	9.000	L1	OFF	9.9
7.8350	41.59	50.00	8.41	9.000	L1	OFF	10.0

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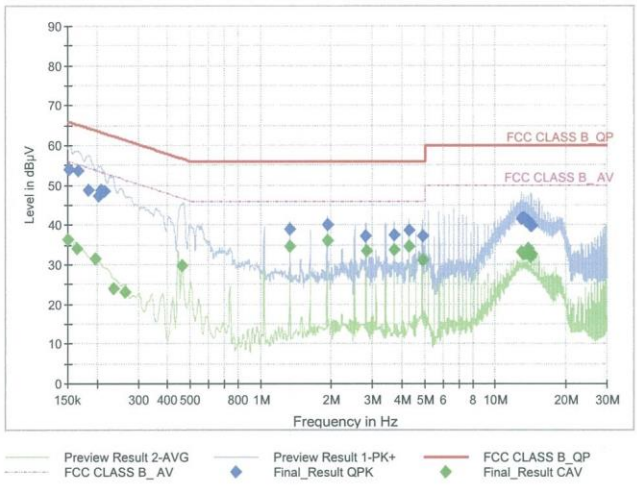
Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	WPT(PHONE TO PHONE)_ALIGNED_L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	53.81	65.88	12.07	9.000	L1	OFF	9.6
0.1658	53.59	65.17	11.59	9.000	L1	OFF	9.6
0.1838	48.73	64.31	15.58	9.000	L1	OFF	9.6
0.2040	47.44	63.45	16.01	9.000	L1	OFF	9.6
0.2085	48.76	63.27	14.50	9.000	L1	OFF	9.6
0.2153	48.48	63.00	14.52	9.000	L1	OFF	9.6
1.3303	38.82	56.00	17.18	9.000	L1	OFF	9.7
1.9220	40.12	56.00	15.88	9.000	L1	OFF	9.7
2.8085	37.21	56.00	18.79	9.000	L1	OFF	9.8
3.6973	37.58	56.00	18.42	9.000	L1	OFF	9.8
4.2890	38.64	56.00	17.36	9.000	L1	OFF	9.8
4.8808	37.16	56.00	18.84	9.000	L1	OFF	9.9
12.8660	41.51	60.00	18.49	9.000	L1	OFF	10.2
13.1653	41.86	60.00	18.14	9.000	L1	OFF	10.2
13.4578	40.86	60.00	19.14	9.000	L1	OFF	10.2
13.7525	41.08	60.00	18.92	9.000	L1	OFF	10.2
14.0495	39.75	60.00	20.25	9.000	L1	OFF	10.2
14.3443	39.79	60.00	20.21	9.000	L1	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	36.43	56.00	19.57	9.000	L1	OFF	9.6
0.1635	34.04	55.28	21.24	9.000	L1	OFF	9.6
0.1973	31.40	53.73	22.32	9.000	L1	OFF	9.6
0.2355	23.92	52.25	28.33	9.000	L1	OFF	9.6
0.2625	23.13	51.35	28.22	9.000	L1	OFF	9.6
0.4628	29.79	46.64	16.85	9.000	L1	OFF	9.6
1.3303	34.76	46.00	11.24	9.000	L1	OFF	9.7
1.9220	36.13	46.00	9.87	9.000	L1	OFF	9.7
2.8108	33.41	46.00	12.59	9.000	L1	OFF	9.8
3.6973	33.65	46.00	12.35	9.000	L1	OFF	9.8
4.2890	34.59	46.00	11.41	9.000	L1	OFF	9.8
4.8808	31.30	46.00	14.70	9.000	L1	OFF	9.9
12.8660	33.21	50.00	16.79	9.000	L1	OFF	10.2
13.1630	32.56	50.00	17.44	9.000	L1	OFF	10.2
13.4578	32.80	50.00	17.20	9.000	L1	OFF	10.2
13.7548	33.94	50.00	16.06	9.000	L1	OFF	10.2
14.0495	32.09	50.00	17.91	9.000	L1	OFF	10.2
14.3443	32.72	50.00	17.28	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

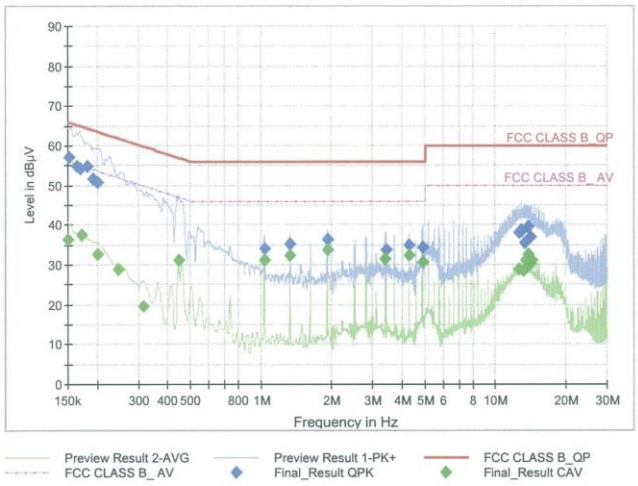
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	WPT(PHONE TO PHONE)_ALIGNED_N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	57.05	65.88	8.83	9.000	N	OFF	9.6
0.1635	54.84	65.28	10.45	9.000	N	OFF	9.6
0.1703	54.34	64.95	10.61	9.000	N	OFF	9.6
0.1815	54.79	64.42	9.63	9.000	N	OFF	9.6
0.1928	51.53	63.92	12.38	9.000	N	OFF	9.6
0.2018	50.69	63.54	12.84	9.000	N	OFF	9.6
1.0355	34.16	56.00	21.84	9.000	N	OFF	9.7
1.3303	35.11	56.00	20.89	9.000	N	OFF	9.7
1.9220	36.39	56.00	19.61	9.000	N	OFF	9.7
3.4025	33.76	56.00	22.24	9.000	N	OFF	9.8
4.2890	34.95	56.00	21.05	9.000	N	OFF	9.8
4.8785	34.41	56.00	21.59	9.000	N	OFF	9.9
12.6118	38.19	60.00	21.81	9.000	N	OFF	10.2
12.8638	38.26	60.00	21.74	9.000	N	OFF	10.2
12.9020	38.52	60.00	21.48	9.000	N	OFF	10.2
13.4218	35.60	60.00	24.40	9.000	N	OFF	10.2
13.7525	39.44	60.00	20.56	9.000	N	OFF	10.2
14.0473	37.04	60.00	22.96	9.000	N	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	36.26	56.00	19.74	9.000	N	OFF	9.6
0.1725	37.48	54.84	17.36	9.000	N	OFF	9.6
0.2018	32.64	53.54	20.89	9.000	N	OFF	9.6
0.2468	28.91	51.87	22.95	9.000	N	OFF	9.6
0.3143	19.49	49.86	30.36	9.000	N	OFF	9.6
0.4448	31.03	46.97	15.94	9.000	N	OFF	9.6
1.0355	31.26	46.00	14.74	9.000	N	OFF	9.7
1.3303	32.40	46.00	13.60	9.000	N	OFF	9.7
1.9220	33.78	46.00	12.22	9.000	N	OFF	9.7
3.4003	31.34	46.00	14.66	9.000	N	OFF	9.8
4.2890	32.25	46.00	13.75	9.000	N	OFF	9.8
4.8808	30.49	46.00	15.51	9.000	N	OFF	9.9
12.6118	28.83	50.00	21.17	9.000	N	OFF	10.2
13.1338	28.58	50.00	21.42	9.000	N	OFF	10.2
13.4555	31.30	50.00	18.70	9.000	N	OFF	10.2
13.7525	32.49	50.00	17.51	9.000	N	OFF	10.2
14.0495	30.19	50.00	19.81	9.000	N	OFF	10.2
14.3443	31.26	50.00	18.74	9.000	N	OFF	10.3

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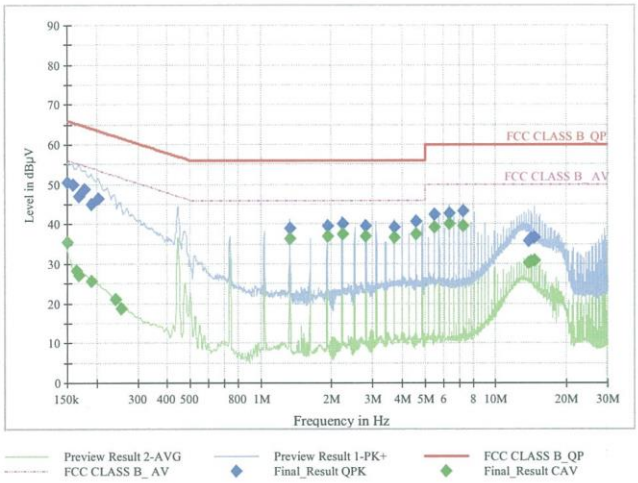
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	WPT(PHONE TO PHONE)_CROSS_N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	50.37	66.00	15.63	9.000	N	OFF	9.6
0.1590	49.84	65.52	15.68	9.000	N	OFF	9.6
0.1680	47.12	65.06	17.94	9.000	N	OFF	9.6
0.1770	48.69	64.63	15.93	9.000	N	OFF	9.6
0.1905	45.13	64.02	18.88	9.000	N	OFF	9.6
0.2040	46.39	63.45	17.06	9.000	N	OFF	9.6
1.3303	39.02	56.00	16.98	9.000	N	OFF	9.7
1.9220	39.42	56.00	16.58	9.000	N	OFF	9.7
2.2190	40.03	56.00	15.97	9.000	N	OFF	9.7
2.8085	39.52	56.00	16.48	9.000	N	OFF	9.8
3.6973	39.24	56.00	16.76	9.000	N	OFF	9.8
4.5838	40.57	56.00	15.43	9.000	N	OFF	9.8
5.4703	42.26	60.00	17.74	9.000	N	OFF	9.9
6.3590	42.68	60.00	17.32	9.000	N	OFF	9.9
7.2455	43.26	60.00	16.74	9.000	N	OFF	9.9
13.7525	35.82	60.00	24.18	9.000	N	OFF	10.2
14.0473	36.36	60.00	23.64	9.000	N	OFF	10.2
14.6390	36.55	60.00	23.45	9.000	N	OFF	10.3

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	35.51	56.00	20.49	9.000	N	OFF	9.6
0.1635	28.14	55.28	27.14	9.000	N	OFF	9.6
0.1680	27.05	55.06	28.01	9.000	N	OFF	9.6
0.1905	25.56	54.02	28.45	9.000	N	OFF	9.6
0.2400	20.99	52.10	31.10	9.000	N	OFF	9.6
0.2535	18.74	51.64	32.90	9.000	N	OFF	9.6
1.3303	36.32	46.00	9.68	9.000	N	OFF	9.7
1.9220	36.98	46.00	9.02	9.000	N	OFF	9.7
2.2190	37.64	46.00	8.36	9.000	N	OFF	9.7
2.8085	36.84	46.00	9.16	9.000	N	OFF	9.8
3.6973	36.65	46.00	9.35	9.000	N	OFF	9.8
4.5838	37.58	46.00	8.42	9.000	N	OFF	9.8
5.4703	39.24	50.00	10.76	9.000	N	OFF	9.9
6.3590	40.21	50.00	9.79	9.000	N	OFF	9.9
7.2455	39.65	50.00	10.35	9.000	N	OFF	9.9
13.7525	30.22	50.00	19.78	9.000	N	OFF	10.2
14.0473	30.71	50.00	19.29	9.000	N	OFF	10.2
14.6390	30.91	50.00	19.09	9.000	N	OFF	10.3

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

Conducted Emissions (Line 1)

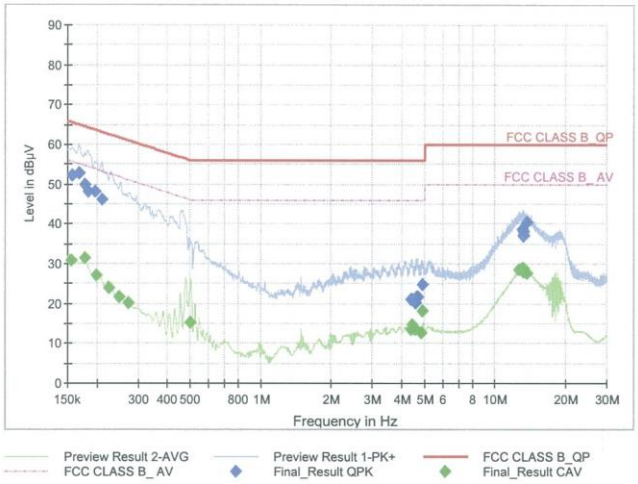
Test 1 / 2

Test Report

Common Information

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

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1568	52.24	65.63	13.39	9.000	L1	OFF	9.6
0.1680	52.71	65.06	12.34	9.000	L1	OFF	9.6
0.1770	49.90	64.63	14.72	9.000	L1	OFF	9.6
0.1838	48.06	64.31	16.26	9.000	L1	OFF	9.6
0.1973	48.07	63.73	15.65	9.000	L1	OFF	9.6
0.2108	46.14	63.18	17.03	9.000	L1	OFF	9.6
4.3880	21.07	56.00	34.93	9.000	L1	OFF	9.8
4.4083	21.06	56.00	34.94	9.000	L1	OFF	9.8
4.6018	20.29	56.00	35.71	9.000	L1	OFF	9.9
4.6355	21.56	56.00	34.44	9.000	L1	OFF	9.9
4.6625	21.52	56.00	34.48	9.000	L1	OFF	9.9
4.9145	24.92	56.00	31.08	9.000	L1	OFF	9.9
13.0798	38.52	60.00	21.48	9.000	L1	OFF	10.2
13.1563	38.19	60.00	21.81	9.000	L1	OFF	10.2
13.1765	36.81	60.00	23.19	9.000	L1	OFF	10.2
13.1855	37.21	60.00	22.79	9.000	L1	OFF	10.2
13.2035	36.96	60.00	23.04	9.000	L1	OFF	10.2
13.6940	40.40	60.00	19.60	9.000	L1	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	30.92	55.75	24.84	9.000	L1	OFF	9.6
0.1770	31.52	54.63	23.11	9.000	L1	OFF	9.6
0.1995	27.10	53.63	26.53	9.000	L1	OFF	9.6
0.2243	24.02	52.66	28.64	9.000	L1	OFF	9.6
0.2490	21.72	51.79	30.07	9.000	L1	OFF	9.6
0.2715	20.17	51.07	30.91	9.000	L1	OFF	9.6
0.5023	15.25	46.00	30.75	9.000	L1	OFF	9.7
4.3903	13.57	46.00	32.43	9.000	L1	OFF	9.8
4.4083	14.78	46.00	31.22	9.000	L1	OFF	9.8
4.6018	13.63	46.00	32.37	9.000	L1	OFF	9.9
4.8673	12.60	46.00	33.40	9.000	L1	OFF	9.9
4.8853	18.24	46.00	27.76	9.000	L1	OFF	9.9
12.6793	28.69	50.00	21.31	9.000	L1	OFF	10.2
12.9785	28.71	50.00	21.29	9.000	L1	OFF	10.2
13.1068	28.90	50.00	21.10	9.000	L1	OFF	10.2
13.2035	28.91	50.00	21.09	9.000	L1	OFF	10.2
13.2463	28.03	50.00	21.97	9.000	L1	OFF	10.2
13.6648	27.56	50.00	22.44	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

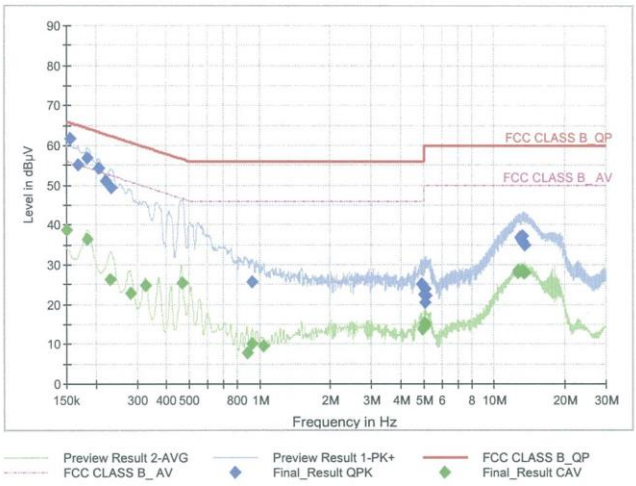
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	S-PEN CHARGING MODE N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	61.62	65.75	4.14	9.000	N	OFF	9.6
0.1680	55.10	65.06	9.96	9.000	N	OFF	9.6
0.1838	56.76	64.31	7.56	9.000	N	OFF	9.6
0.2063	54.25	63.36	9.11	9.000	N	OFF	9.6
0.2198	51.02	62.83	11.81	9.000	N	OFF	9.6
0.2333	49.46	62.33	12.87	9.000	N	OFF	9.6
0.9230	25.64	56.00	30.36	9.000	N	OFF	9.7
4.9168	25.19	56.00	30.81	9.000	N	OFF	9.9
4.9910	22.37	56.00	33.63	9.000	N	OFF	9.9
5.0518	20.40	60.00	39.60	9.000	N	OFF	9.9
5.0968	23.84	60.00	36.16	9.000	N	OFF	9.9
5.1508	22.33	60.00	37.67	9.000	N	OFF	9.9
12.8503	36.80	60.00	23.20	9.000	N	OFF	10.2
12.8975	36.77	60.00	23.23	9.000	N	OFF	10.2
13.1338	37.11	60.00	22.89	9.000	N	OFF	10.2
13.1810	35.84	60.00	24.16	9.000	N	OFF	10.2
13.4173	35.23	60.00	24.77	9.000	N	OFF	10.2
13.4645	34.80	60.00	25.20	9.000	N	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	38.58	56.00	17.42	9.000	N	OFF	9.6
0.1838	36.30	54.31	18.01	9.000	N	OFF	9.6
0.2310	26.16	52.41	26.26	9.000	N	OFF	9.6
0.2805	22.92	50.80	27.88	9.000	N	OFF	9.6
0.3255	24.83	49.57	24.74	9.000	N	OFF	9.6
0.4650	25.48	46.60	21.12	9.000	N	OFF	9.6
0.8825	7.87	46.00	38.13	9.000	N	OFF	9.7
0.9275	10.10	46.00	35.90	9.000	N	OFF	9.7
1.0400	9.46	46.00	36.54	9.000	N	OFF	9.7
4.9865	13.89	46.00	32.11	9.000	N	OFF	9.9
5.0495	14.78	50.00	35.22	9.000	N	OFF	9.9
5.0968	15.16	50.00	34.84	9.000	N	OFF	9.9
12.6163	27.97	50.00	22.03	9.000	N	OFF	10.2
12.6613	28.63	50.00	21.37	9.000	N	OFF	10.2
13.1293	28.49	50.00	21.51	9.000	N	OFF	10.2
13.2755	28.13	50.00	21.87	9.000	N	OFF	10.2
13.4195	27.92	50.00	22.08	9.000	N	OFF	10.2
13.4623	27.92	50.00	22.08	9.000	N	OFF	10.2

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Test Result & Plot (Mode: Simultaneous charging)

Conducted Emissions (Line 1)

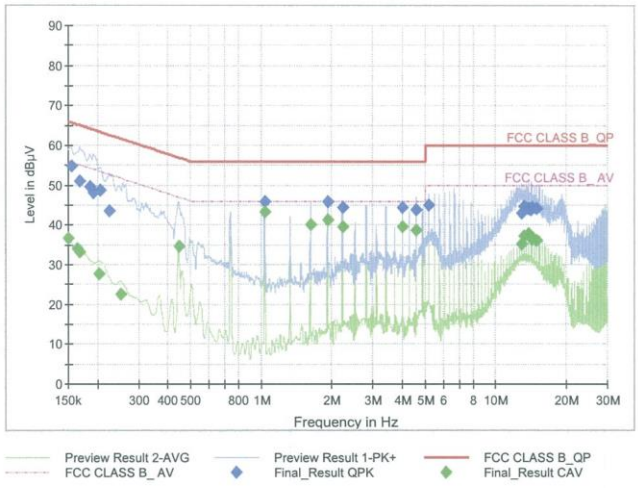
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	SIMULTANEOUS CHARGING MODE_ALIGNED_L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	54.70	65.75	11.05	9.000	L1	OFF	9.6
0.1680	51.20	65.06	13.86	9.000	L1	OFF	9.6
0.1860	49.51	64.21	14.70	9.000	L1	OFF	9.6
0.1928	48.26	63.92	15.66	9.000	L1	OFF	9.6
0.2063	48.69	63.36	14.66	9.000	L1	OFF	9.6
0.2243	43.58	62.66	19.08	9.000	L1	OFF	9.6
1.0355	45.85	56.00	10.15	9.000	L1	OFF	9.7
1.9220	46.00	56.00	10.00	9.000	L1	OFF	9.7
2.2190	44.32	56.00	11.68	9.000	L1	OFF	9.7
3.9920	44.51	56.00	11.49	9.000	L1	OFF	9.8
4.5838	43.92	56.00	12.08	9.000	L1	OFF	9.9
5.1755	45.10	60.00	14.90	9.000	L1	OFF	9.9
12.8660	43.12	60.00	16.88	9.000	L1	OFF	10.2
13.1608	44.79	60.00	15.21	9.000	L1	OFF	10.2
13.7525	44.20	60.00	15.80	9.000	L1	OFF	10.2
14.0495	43.94	60.00	16.06	9.000	L1	OFF	10.2
14.3420	44.38	60.00	15.62	9.000	L1	OFF	10.2
14.9360	44.20	60.00	15.80	9.000	L1	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	36.58	56.00	19.42	9.000	L1	OFF	9.6
0.1635	33.96	55.28	21.32	9.000	L1	OFF	9.6
0.1680	33.16	55.06	21.90	9.000	L1	OFF	9.6
0.2040	27.65	53.45	25.80	9.000	L1	OFF	9.6
0.2513	22.43	51.72	29.29	9.000	L1	OFF	9.6
0.4448	34.49	46.97	12.48	9.000	L1	OFF	9.6
1.0355	43.22	46.00	2.78	9.000	L1	OFF	9.7
1.6273	39.97	46.00	6.03	9.000	L1	OFF	9.7
1.9220	41.16	46.00	4.84	9.000	L1	OFF	9.7
2.2190	39.57	46.00	6.43	9.000	L1	OFF	9.7
3.9920	39.52	46.00	6.48	9.000	L1	OFF	9.8
4.5838	38.62	46.00	7.38	9.000	L1	OFF	9.9
12.8638	35.09	50.00	14.91	9.000	L1	OFF	10.2
13.1608	37.30	50.00	12.70	9.000	L1	OFF	10.2
13.7525	37.82	50.00	12.18	9.000	L1	OFF	10.2
14.0473	36.93	50.00	13.07	9.000	L1	OFF	10.2
14.3420	36.46	50.00	13.54	9.000	L1	OFF	10.2
14.9338	36.13	50.00	13.87	9.000	L1	OFF	10.2

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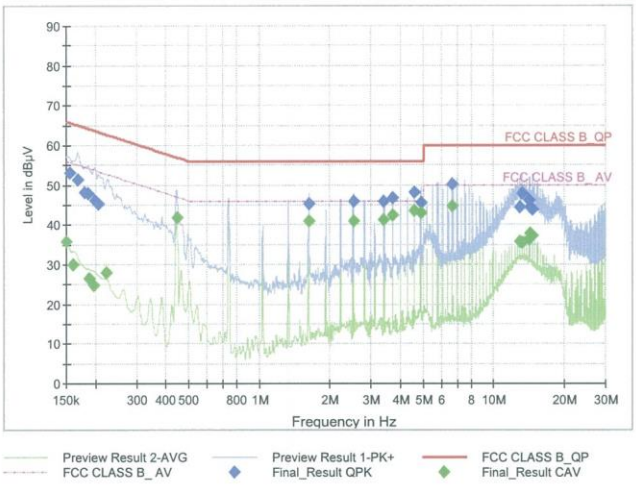
Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	SIMULTANEOUS CHARGING MODE_CROSS_L1
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	52.96	65.75	12.79	9.000	L1	OFF	9.6
0.1680	51.29	65.06	13.77	9.000	L1	OFF	9.6
0.1793	48.12	64.52	16.40	9.000	L1	OFF	9.6
0.1860	47.87	64.21	16.34	9.000	L1	OFF	9.6
0.1995	46.29	63.63	17.34	9.000	L1	OFF	9.6
0.2063	45.21	63.36	18.15	9.000	L1	OFF	9.6
1.6273	45.31	56.00	10.69	9.000	L1	OFF	9.7
2.5138	45.88	56.00	10.12	9.000	L1	OFF	9.8
3.4003	45.99	56.00	10.01	9.000	L1	OFF	9.8
3.6973	46.67	56.00	9.33	9.000	L1	OFF	9.8
4.5838	48.18	56.00	7.82	9.000	L1	OFF	9.9
4.8808	45.52	56.00	10.48	9.000	L1	OFF	9.9
6.6560	50.06	60.00	9.94	9.000	L1	OFF	9.9
12.8660	44.31	60.00	15.69	9.000	L1	OFF	10.2
13.1608	47.85	60.00	12.15	9.000	L1	OFF	10.2
14.0473	46.20	60.00	13.80	9.000	L1	OFF	10.2
14.3443	44.45	60.00	15.55	9.000	L1	OFF	10.2
14.6413	43.89	60.00	16.11	9.000	L1	OFF	10.2

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	35.80	56.00	20.20	9.000	L1	OFF	9.6
0.1613	30.12	55.40	25.28	9.000	L1	OFF	9.6
0.1883	26.64	54.11	27.47	9.000	L1	OFF	9.6
0.1973	24.74	53.73	28.99	9.000	L1	OFF	9.6
0.2220	28.11	52.74	24.63	9.000	L1	OFF	9.6
0.4448	41.94	46.97	5.03	9.000	L1	OFF	9.6
1.6273	40.84	46.00	5.16	9.000	L1	OFF	9.7
2.5138	41.10	46.00	4.90	9.000	L1	OFF	9.8
3.4003	41.21	46.00	4.79	9.000	L1	OFF	9.8
3.6973	42.44	46.00	3.56	9.000	L1	OFF	9.8
4.5838	43.61	46.00	2.39	9.000	L1	OFF	9.9
4.8808	43.10	46.00	2.90	9.000	L1	OFF	9.9
6.6538	44.85	50.00	5.15	9.000	L1	OFF	9.9
12.8660	35.68	50.00	14.32	9.000	L1	OFF	10.2
13.1608	35.56	50.00	14.44	9.000	L1	OFF	10.2
14.0495	36.42	50.00	13.58	9.000	L1	OFF	10.2
14.3443	37.68	50.00	12.32	9.000	L1	OFF	10.2
14.6413	37.13	50.00	12.87	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

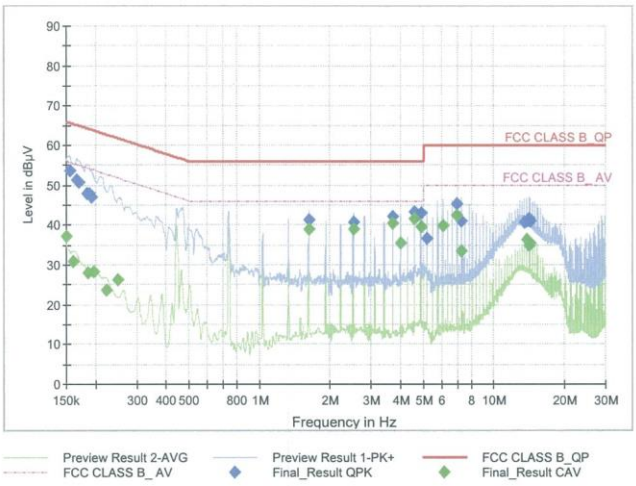
Test 1 / 2

Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	SIMULTANEOUS CHARGING MODE_CROSS_N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	53.53	65.75	12.23	9.000	N	OFF	9.6
0.1658	51.43	65.17	13.75	9.000	N	OFF	9.6
0.1703	50.91	64.95	14.04	9.000	N	OFF	9.6
0.1838	47.99	64.31	16.32	9.000	N	OFF	9.6
0.1883	47.76	64.11	16.35	9.000	N	OFF	9.6
0.1928	47.01	63.92	16.91	9.000	N	OFF	9.6
1.6273	41.28	56.00	14.72	9.000	N	OFF	9.7
2.5138	40.73	56.00	15.27	9.000	N	OFF	9.8
3.6973	42.15	56.00	13.85	9.000	N	OFF	9.8
4.5838	43.18	56.00	12.82	9.000	N	OFF	9.8
4.8808	43.11	56.00	12.89	9.000	N	OFF	9.9
5.1755	36.70	60.00	23.30	9.000	N	OFF	9.9
6.9508	45.39	60.00	14.61	9.000	N	OFF	9.9
7.2455	40.90	60.00	19.10	9.000	N	OFF	9.9
13.4555	40.62	60.00	19.38	9.000	N	OFF	10.2
13.7525	40.95	60.00	19.05	9.000	N	OFF	10.2
14.0473	41.59	60.00	18.41	9.000	N	OFF	10.2
14.3443	41.07	60.00	18.93	9.000	N	OFF	10.3

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Test 2 / 2

Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	37.08	56.00	18.92	9.000	N	OFF	9.6
0.1613	30.79	55.40	24.61	9.000	N	OFF	9.6
0.1860	28.00	54.21	26.21	9.000	N	OFF	9.6
0.1973	28.26	53.73	25.47	9.000	N	OFF	9.6
0.2220	23.58	52.74	29.16	9.000	N	OFF	9.6
0.2490	26.13	51.79	25.66	9.000	N	OFF	9.6
1.6273	38.91	46.00	7.09	9.000	N	OFF	9.7
2.5138	39.09	46.00	6.91	9.000	N	OFF	9.8
3.6973	40.28	46.00	5.72	9.000	N	OFF	9.8
3.9920	35.40	46.00	10.60	9.000	N	OFF	9.8
4.5838	41.65	46.00	4.35	9.000	N	OFF	9.8
4.8808	39.63	46.00	6.37	9.000	N	OFF	9.9
6.0620	39.80	50.00	10.20	9.000	N	OFF	9.9
6.9508	42.30	50.00	7.70	9.000	N	OFF	9.9
7.2455	33.59	50.00	16.41	9.000	N	OFF	9.9
13.7525	36.40	50.00	13.60	9.000	N	OFF	10.2
14.0473	34.86	50.00	15.14	9.000	N	OFF	10.2
14.3443	35.58	50.00	14.42	9.000	N	OFF	10.3

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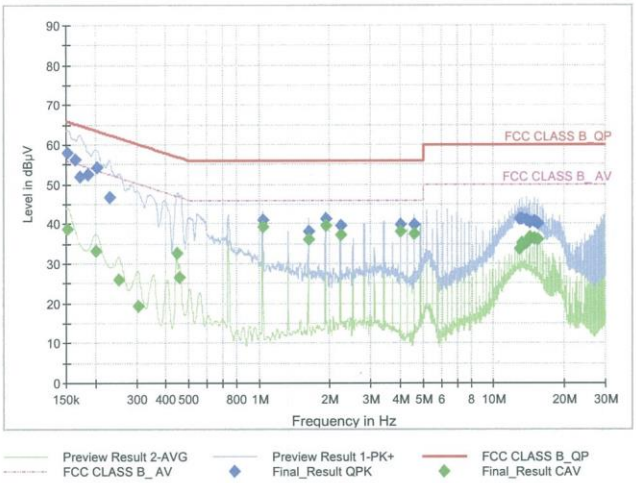
Test Report

Common Information

EUT :	SM-N981B/DS
Manufacturer :	SAMSUNG
Test Site:	SHIELD ROOM
Operating Conditions :	SIMULTANEOUS CHARGING MODE_ALIGNED_N
Operator Name:	
Comment:	

Full Spectrum



Final_Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	58.08	65.88	7.80	9.000	N	OFF	9.6
0.1635	56.11	65.28	9.17	9.000	N	OFF	9.6
0.1725	51.99	64.84	12.85	9.000	N	OFF	9.6
0.1860	52.37	64.21	11.84	9.000	N	OFF	9.6
0.2040	54.17	63.45	9.28	9.000	N	OFF	9.6
0.2288	46.64	62.50	15.86	9.000	N	OFF	9.6
1.0355	41.02	56.00	14.98	9.000	N	OFF	9.7
1.6273	38.11	56.00	17.89	9.000	N	OFF	9.7
1.9220	41.36	56.00	14.64	9.000	N	OFF	9.7
2.2190	39.46	56.00	16.54	9.000	N	OFF	9.7
3.9920	39.69	56.00	16.31	9.000	N	OFF	9.8
4.5838	39.90	56.00	16.10	9.000	N	OFF	9.8
12.8660	41.34	60.00	18.66	9.000	N	OFF	10.2
13.1608	41.30	60.00	18.70	9.000	N	OFF	10.2
13.7503	41.10	60.00	18.90	9.000	N	OFF	10.2
14.3420	40.31	60.00	19.69	9.000	N	OFF	10.3
14.9338	40.63	60.00	19.37	9.000	N	OFF	10.3
15.5255	40.09	60.00	19.91	9.000	N	OFF	10.3

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Final_Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	38.54	55.88	17.33	9.000	N	OFF	9.6
0.2018	33.25	53.54	20.29	9.000	N	OFF	9.6
0.2513	25.84	51.72	25.87	9.000	N	OFF	9.6
0.3030	19.47	50.16	30.69	9.000	N	OFF	9.6
0.4448	32.74	46.97	14.24	9.000	N	OFF	9.6
0.4560	26.40	46.77	20.36	9.000	N	OFF	9.6
1.0355	39.10	46.00	6.90	9.000	N	OFF	9.7
1.6273	35.94	46.00	10.06	9.000	N	OFF	9.7
1.9220	39.38	46.00	6.62	9.000	N	OFF	9.7
2.2190	37.35	46.00	8.65	9.000	N	OFF	9.7
3.9920	37.99	46.00	8.01	9.000	N	OFF	9.8
4.5838	37.50	46.00	8.50	9.000	N	OFF	9.8
12.8638	33.78	50.00	16.22	9.000	N	OFF	10.2
13.1608	35.07	50.00	14.93	9.000	N	OFF	10.2
13.7525	35.24	50.00	14.76	9.000	N	OFF	10.2
14.3420	36.66	50.00	13.34	9.000	N	OFF	10.3
14.9338	36.44	50.00	13.56	9.000	N	OFF	10.3
15.5255	35.95	50.00	14.05	9.000	N	OFF	10.3

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11. LIST OF TEST EQUIPMENT

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/23/2022	Annual
Test Receiver	ESCI	Rohde & Schwarz	100033	06/15/2022	Annual
Controller (Antenna mast)	CO3000	Innco system	CO3000-4p	N/A	N/A
Antenna Position Tower	MA4640/800-XP-EP	Innco system	N/A	N/A	N/A
Controller	2090	Emco	060520	N/A	N/A
Turn Table	Turn Table	Ets	N/A	N/A	N/A
Loop Antenna	Loop Antenna	Rohde & Schwarz	1513-333	03/19/2022	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	09/04/2022	Biennial
Spectrum Analyzer	FSP	Rohde & Schwarz	836650/016	09/13/2022	Annual
Signal Analyzer	N9020A	Agilent	MY50200093	11/1722	Annual
Attenuator (10 dB) 56-10	CBLU1183540B-01 56-10	CERNEX WEINSCHEL	N/A	12/23/2021	Annual
Broadband Low Noise Amplifier Attenuator (3 dB)	CBL06185030 18B-03	CERNEX Api tech.	N/A	12/23/2021	Annual
Power Amplifier	CBL26405040	CERNEX	25956	03/23/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/04/2021	Annual

12. Annex A_TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2110-FC062-P