

FCC NFC REPORT

Certification

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Date of Issue:
November 03, 2022

Test Site/Location:
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Report No.: HCT-RF-2209-FC006-R1

FCC ID: A3LSMS911B

APPLICANT: SAMSUNG Electronics Co., Ltd.

Model: SM-S911B/DS

Additional Model: SM-S911B

EUT Type: Mobile Phone

RF Output Field Strength: 17.99 dB μ V/m @30 m

Frequency of Operation: 13.56 MHz

Modulation type: ASK

FCC Classification: Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s): FCC Part 15.225 Subpart C

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.

Report No.: HCT-RF-2209-FC006-R1

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)

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Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2209-FC006	October 21, 2022	- First Approval Report
HCT-RF-2210-FC006-R1	November 3, 2022	- Page 21, Revised limit for 77.19 MHz

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1. EUT DESCRIPTION

Model	SM-S911B/DS
Additional Model	SM-S911B
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Frequency of Operation	13.56 MHz
Transmit Power	17.99 dB μ V/m @30 m
Modulation Type	ASK
Date(s) of Tests	September 19, 2022 ~ September 26, 2022
Serial number	Radiated: R3CT90BE36R

2. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (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 15.225 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. 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).

DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

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, 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)	2.00 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.40 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.51 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.92 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.48 (Confidence level about 95 %, $k=2$)

7. DESCRIPTION OF TESTS

7.1. Radiated Test

Limit (Operation within the band 13.110 MHz – 14.010 MHz)

Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
13.553 – 13.567	15,848	30
13.410 \leq f \leq 13.553 13.567 \leq f \leq 13.710	334	30
13.110 \leq f \leq 13.410 13.710 \leq f \leq 14.010	106	30

Note:

1. 15,848 $\mu\text{V/m}$ = 84.0dB $\mu\text{V/m}$
2. 334 $\mu\text{V/m}$ = 50.47 dB $\mu\text{V/m}$
3. 106 $\mu\text{V/m}$ = 40.51dB $\mu\text{V/m}$

Limit(Radiated Spurious Emissions)

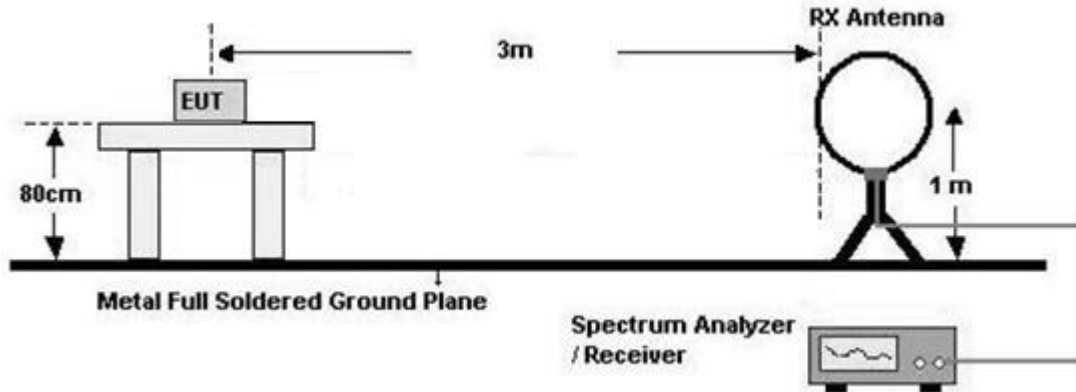
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30-88	* 100	3
88-216	* 150	3
216-960	* 200	3
Above 960	500	3

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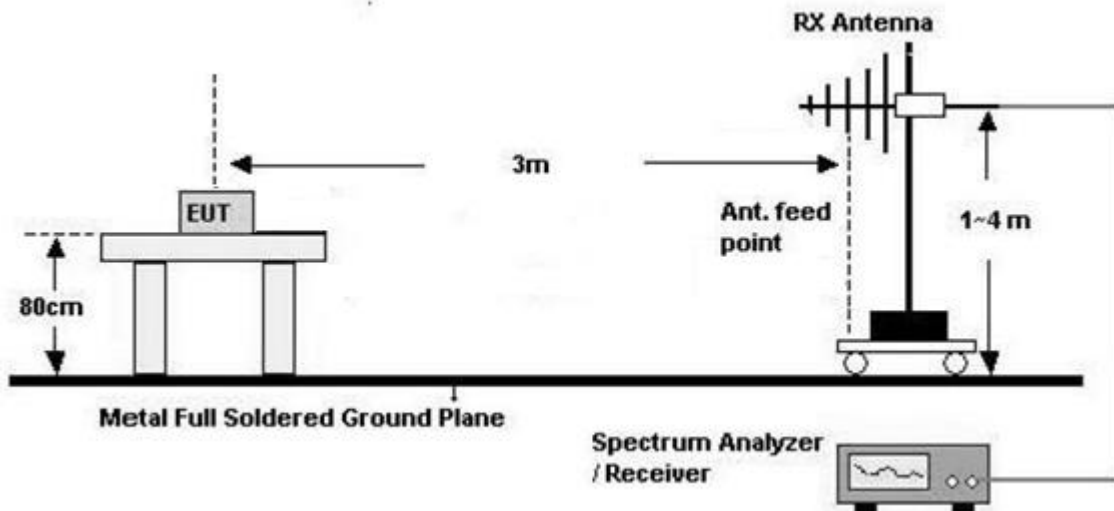
Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.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

Test Configuration

Below 30 MHz



30 MHz - 1 GHz



Test Procedure of in-band

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 turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor = $40\log(3\text{ m}/30\text{ m}) = -40\text{ dB}$
Measurement Distance : 3 m(Below30 MHz)
7. Spectrum Setting

- Detector = Peak
- Trace = Max Hold
- RBW = 9 kHz
- VBW $\geq 3 \times$ RBW

8.Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)

Test Procedure of Radiated spurious emissions(Below30 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 turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
6. Distance Correction Factor(0.009 MHz – 0.490 MHz) = $40\log(3 \text{ m}/300 \text{ m}) = - 80 \text{ dB}$
Measurement Distance : 3 m
7. Distance Correction Factor(0.490 MHz – 30 MHz) = $40\log(3 \text{ m}/30 \text{ m}) = - 40 \text{ dB}$
Measurement Distance : 3 m
8. Spectrum Setting
 - Frequency Range = 9 kHz ~ 30 MHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 9 kHz
 - VBW $\geq 3 \times$ RBW
- 9.Total = Measured Value + Antenna Factor(A.F) + Cable Loss(C.L) + Distance Factor(D.F)
10. 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.

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.

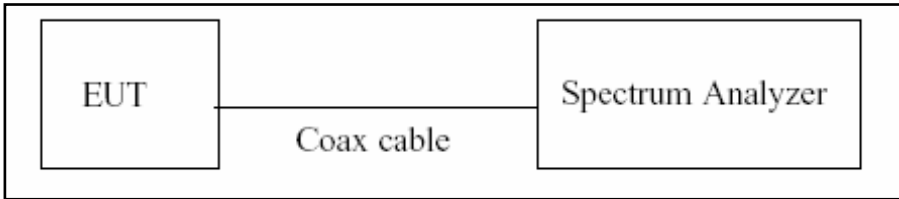
OFS and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

Test Procedure of Radiated spurious emissions(Above30 MHz)

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
 - Frequency Range = 30 MHz ~ 1 GHz
 - Detector = Peak
 - Trace = Maxhold
 - RBW = 100 kHz
 - VBW \geq 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.

7.2. 20 dB Bandwidth

Test Configuration



Test Procedure

The 20 dB bandwidth was measured by using a spectrum analyzer.

(Procedure 6.9.2 in ANSI 63.10-2013)

- 1) RBW = 1%~5% of the OBW
- 2) VBW = approximately three times RBW
- 3) Span = between two times and five times the OBW
- 4) Detector = Peak
- 5) Trace mode = Max hold
- 6) Allow the trace to stabilize

Note :

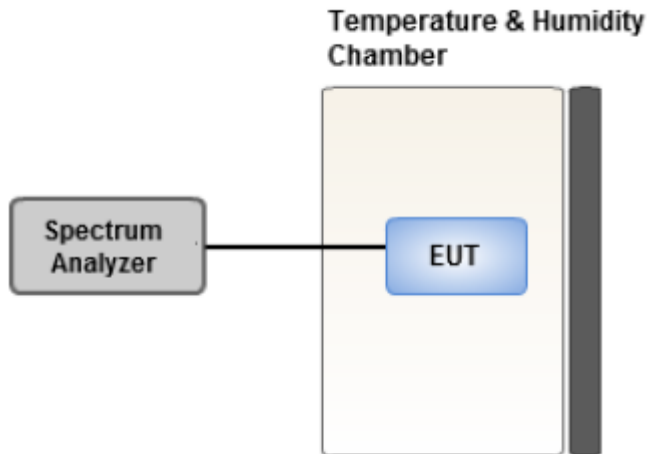
We tested Occupied Bandwidth using the automatic bandwidth measurement capability of a spectrum analyzer.

7.3. Frequency Stability

Limit

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

Test Configuration



Test Procedure.

For battery operated equipment, the equipment tests shall be performed using a new battery.

- 1) Turn the EUT OFF and place it inside the environmental temperature chamber.
For devices that have oscillator heaters, energize only the heater circuit.
- 2) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.
- 3) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.
- 4) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency.

Note:

- 1) Temperature:
The temperature is varied from -20°C to $+50^{\circ}\text{C}$ using an environmental chamber.
- 2) Primary Supply Voltage :
The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment.
For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

7.4. AC Power line 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 μ H/50 ohms line impedance stabilization network (LISN).

Frequency Range (MHz)	Limits (dB μ V)	
	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

7.5. Worst case configuration and mode

Radiated test

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone, Stand alone + external accessories(Earphone, etc)
 - Worst case : Stand alone
2. EUT Axis : X
3. All type and bitrate were investigated and the worst case results are reported.
 - Worst case : Type A, 106 kbps
4. All mode of without tag and with tag were investigated and the worst case configuration results are reported.
 - Worst case : Without Tag
5. All position of loop antenna were investigated and the worst case configuration results are reported.
 - Position : Horizontal, Vertical, Parallel to the ground plane
 - Worst case : Horizontal
6. SM-S911B/DS, SM-S911B were tested and the worst case results are reported.
(Worst case : SM-S911B/DS)

AC Power line Conducted Emissions

1. All modes of operation were investigated and the worst case configuration results are reported.
 - Mode : Stand alone + Earphone + Travel Adapter, Stand alone + Travel Adapter
 - Worst case : Stand alone + Travel Adapter
2. SM-S911B/DS, SM-S911B were tested and the worst case results are reported.
(Worst case : SM-S911B/DS)

20 dB Bandwidth & Frequency Stability

1. All type and bitrate were investigated and the worst case results are reported.
 - Worst case : Type A, 106 kbps
2. SM-S911B/DS, SM-S911B were tested and the worst case results are reported.
(Worst case : SM-S911B/DS)

8. TEST SUMMARY

Regulation	Requirement	Result
Part 15.225 (a)	Radiated Electric Field Emissions (13.553MHz to 13.567MHz)	Pass
Part 15.225 (b)	Radiated Electric Field Emissions (13.410 ≤ f ≤ 13.553, 13.567 ≤ f ≤ 13.710)	Pass
Part 15.225 (c)	Radiated Electric Field Emissions (13.110 ≤ f ≤ 13.410, 13.710 ≤ f ≤ 14.010)	Pass
Part 15.209	Radiated Electric Field Emissions (9kHz to 30MHz)	Pass
Part 15.209	Radiated Electric Field Emissions (30MHz to 1GHz)	Pass
Part 15.225 (e)	Frequency Stability	Pass
Part 15.207	AC power conducted emissions (150kHz to 30MHz)	Pass
Part 15.215 (c)	20 dB Bandwidth	Pass

9. TEST RESULT

9.1. Operation within the band 13.110 MHz – 14.010 MHz

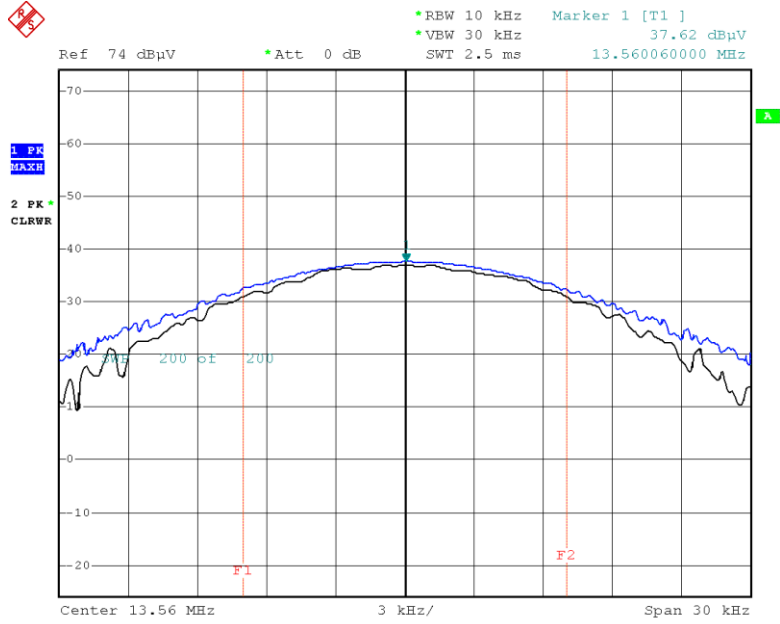
Measured Frequency Range :							
13.553 MHz-13.567 MHz							
Frequency (MHz)	Measured Value (dBμV/m) @3 m	Ant. Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL (H/V)	Total (dBμV/m) @30 m	Limit (dBμV/m) @30 m	Margin (dB)
13.56006	37.62	20.37	-40.00	H	17.99	84.00	66.01
13.55964	36.44	20.37	-40.00	H	16.81	84.00	67.19

Measured Frequency Range :							
13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz							
Frequency (MHz)	Measured Value (dBμV/m) @3 m	Ant. Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL (H/V)	Total (dBμV/m) @30 m	Limit (dBμV/m) @30 m	Margin (dB)
13.55289	31.30	20.37	-40.00	H	11.67	50.47	38.80
13.56711	32.18	20.37	-40.00	H	12.55	50.47	37.92

Measured Frequency Range :							
13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz							
Frequency (MHz)	Measured Value (dBμV/m) @3 m	Ant. Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL (H/V)	Total (dBμV/m) @30 m	Limit (dBμV/m) @30 m	Margin (dB)
13.34862	23.36	20.37	-40.00	H	3.73	40.51	36.78
13.77192	22.32	20.37	-40.00	H	2.69	40.51	37.82

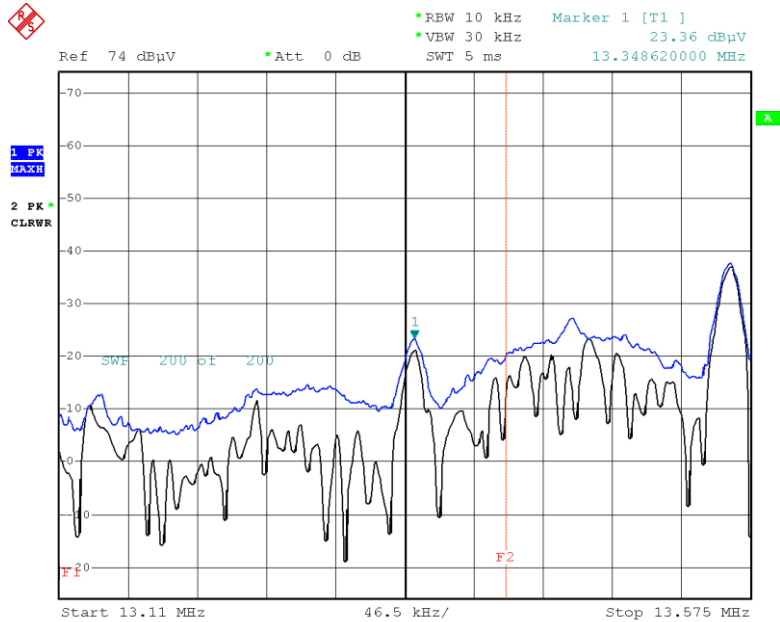
Test Plot

13.553 MHz ~ 13.567 MHz



Date: 24.SEP.2022 08:14:55

Worst Case (13.110 MHz-13.410 MHz)



Date: 24.SEP.2022 09:00:58

Note:

Plot of worst case are only reported.

9.2. Radiated Emission 9kHz – 30 MHz

Measured Frequency Range : 9 kHz - 30 MHz							
Frequency (MHz)	Measured Value (dB μ V/m) @3 m	Ant. Factor +Cable Loss (dB/m)	Distance Correction (dB)	Ant. POL (H/V)	Total (dB μ V/m) @30 m	Limit (dB μ V/m) @30 m	Margin (dB)
0.1500	27.13	20.07	-80.00	H	-32.80	24.08	56.88
14.0890	13.02	20.37	-40.00	H	-6.61	29.54	36.15
26.6507	10.72	20.57	-40.00	H	-8.71	29.54	38.25
26.7106	10.65	18.17	-40.00	V	-11.18	29.54	40.72

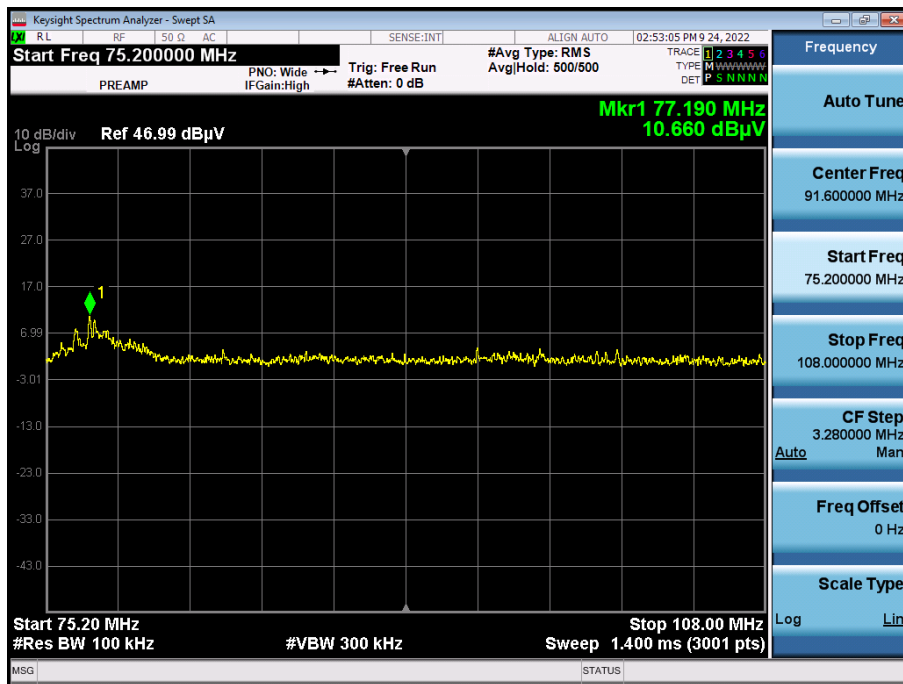
9.3. Radiated Emission 30MHz – 1000 MHz

Measured Frequency Range :							
30 MHz - 1000 MHz							
Frequency (MHz)	Measured Value (dBμV/m) @3 m	Ant. Factor (dB/m)	Cable Loss (dB)	Ant. Pol (H/V)	Total (dBμV/m)	Limit (dBμV/m)	Margin (dB)
33.6470	2.38	18.00	0.55	H	20.93	40.00	19.07
41.6170	3.42	19.00	0.55	V	22.97	40.00	17.04
#73.6970	2.27	16.30	0.75	H	19.32	40.00	20.68
77.1900	10.66	15.40	0.81	V	26.87	40.00	13.13
#120.0020	6.15	16.40	1.01	V	23.56	43.50	19.94
#136.9290	3.72	18.30	1.08	H	23.10	43.50	20.40

Note:

1. # is the result for restricted band.

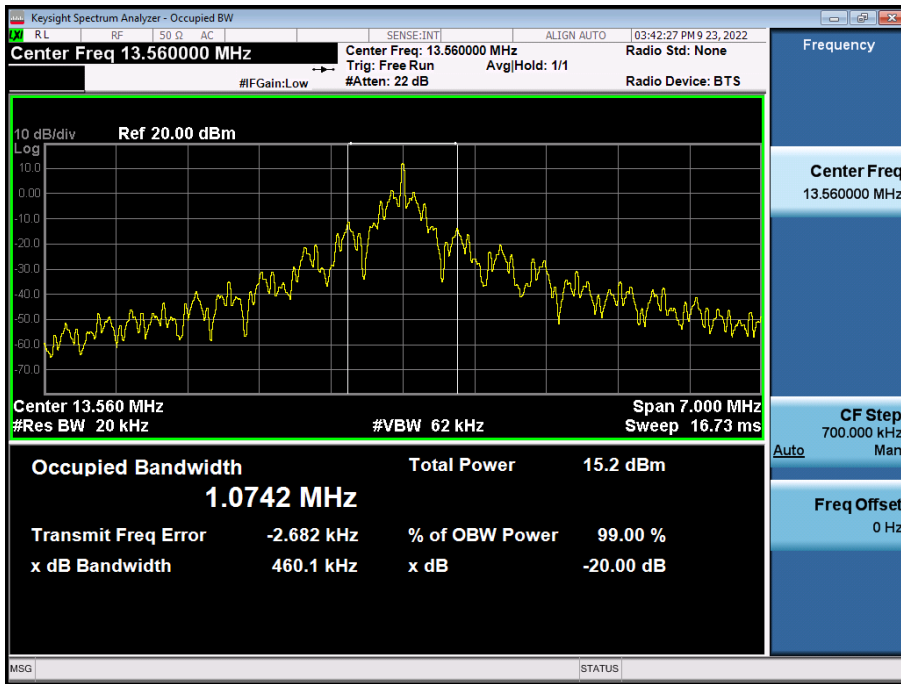
Test Plot



Note:

Plot of worst case are only reported

9.4. 20 dB Bandwidth



9.5. Frequency Stability

Startup

OPERATING FREQUENCY: 13.56 MHz
 REFERENCE VOLTAGE: 3.88 VDC
 DEVIATION LIMIT: ±0.01 % = ± 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560023	23	0.0001669
100%		-10	13.560059	59	0.0004344
100%		0	13.560046	46	0.0003407
100%		+10	13.560038	38	0.0002774
100%		+20(Ref.)	13.560084	84	0.0006205
100%		+30	13.560085	85	0.0006303
100%		+40	13.560021	21	0.0001583
100%		+50	13.560030	30	0.0002186
LOW	3.7	+20	13.560061	61	0.0004513
HIGH	4.4	+20	13.560099	99	0.0007308

2 minutes

PERATING FREQUENCY: 13.56 MHz
 REFERENCE VOLTAGE: 3.88 VDC
 DEVIATION LIMIT: ±0.01 % = ± 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560098	98	0.0007232
100%		-10	13.560084	84	0.0006229
100%		0	13.560036	36	0.0002669
100%		+10	13.560011	11	0.0000809
100%		+20(Ref.)	13.560064	64	0.0004734
100%		+30	13.560013	13	0.0000935
100%		+40	13.560036	36	0.0002629
100%		+50	13.560056	56	0.0004108
LOW		3.7	+20	13.560016	16
HIGH	4.4	+20	13.560089	89	0.0006569

5 minutesOPERATING FREQUENCY: 13.56 MHzREFERENCE VOLTAGE: 3.88 VDCDEVIATION LIMIT: ±0.01 % = ± 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560019	19	0.0001378
100%		-10	13.560010	10	0.0000729
100%		0	13.560094	94	0.0006968
100%		+10	13.560003	3	0.0000236
100%		+20(Ref.)	13.560054	54	0.0003987
100%		+30	13.560094	94	0.0006940
100%		+40	13.560082	82	0.0006044
100%		+50	13.560092	92	0.0006759
LOW	3.7	+20	13.560039	39	0.0002853
HIGH	4.4	+20	13.560030	30	0.0002186

10 minutes

PERATING FREQUENCY: 13.56 MHz
REFERENCE VOLTAGE: 3.88 VDC
DEVIATION LIMIT: ±0.01 % = ± 1356 Hz

Voltage (%)	Power (VDC)	Temp. (°C)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	3.88	-20	13.560005	5	0.0000362
100%		-10	13.560006	6	0.0000437
100%		0	13.560090	90	0.0006624
100%		+10	13.560071	71	0.0005245
100%		+20(Ref.)	13.560064	64	0.0004742
100%		+30	13.560055	55	0.0004051
100%		+40	13.560078	78	0.0005779
100%		+50	13.560049	49	0.0003582
LOW	3.7	+20	13.560052	52	0.0003855
HIGH	4.4	+20	13.560060	60	0.0004414

9.6. POWERLINE CONDUCTED EMISSIONS

Conducted Emissions (Line 1)

NFC MODE (TERM)_L1

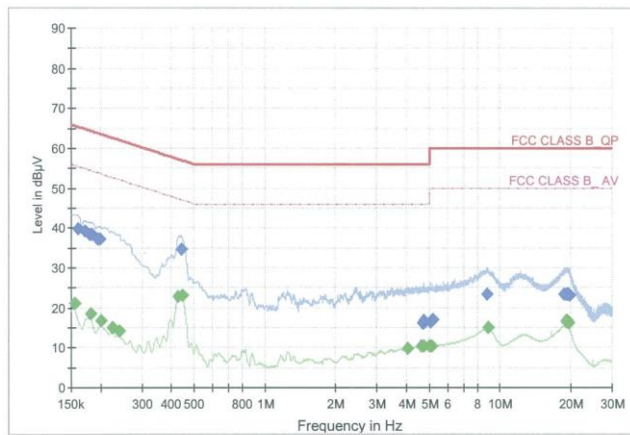
1 / 2

Test Report

Common Information

EUT : SM-S911B/DS
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC MODE (TERM)_L1

Full Spectrum



Preview Result 2-AVG Preview Result 1-PK+ FCC CLASS B_QP
 FCC CLASS B_AV Final_Result QPK Final_Result CAV

Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1613	39.76	65.40	25.64	9.000	L1	OFF	9.7
0.1725	39.16	64.84	25.67	9.000	L1	OFF	9.7
0.1793	38.50	64.52	26.02	9.000	L1	OFF	9.7
0.1838	38.49	64.31	25.83	9.000	L1	OFF	9.7
0.1950	37.29	63.82	26.53	9.000	L1	OFF	9.7
0.1995	37.23	63.63	26.40	9.000	L1	OFF	9.7
0.4425	34.67	57.02	22.34	9.000	L1	OFF	9.7
4.6805	16.11	56.00	39.89	9.000	L1	OFF	9.8
4.7278	16.74	56.00	39.26	9.000	L1	OFF	9.8
4.7413	16.17	56.00	39.83	9.000	L1	OFF	9.8
5.0743	16.57	60.00	43.43	9.000	L1	OFF	9.9
5.1665	16.92	60.00	43.08	9.000	L1	OFF	9.9
8.8498	23.27	60.00	36.73	9.000	L1	OFF	10.0
18.7205	23.49	60.00	36.51	9.000	L1	OFF	10.3
19.1638	23.35	60.00	36.65	9.000	L1	OFF	10.3
19.3303	23.50	60.00	36.50	9.000	L1	OFF	10.3
19.4833	23.42	60.00	36.58	9.000	L1	OFF	10.3
19.6925	23.09	60.00	36.91	9.000	L1	OFF	10.4

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NFC MODE (TERM) _L1

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	20.93	55.75	34.82	9.000	L1	OFF	9.7
0.1815	18.36	54.42	36.06	9.000	L1	OFF	9.7
0.2018	16.73	53.54	36.81	9.000	L1	OFF	9.7
0.2243	14.98	52.66	37.68	9.000	L1	OFF	9.7
0.2400	14.26	52.10	37.84	9.000	L1	OFF	9.7
0.4268	22.85	47.32	24.46	9.000	L1	OFF	9.7
0.4448	23.13	46.97	23.84	9.000	L1	OFF	9.7
4.0573	9.87	46.00	36.13	9.000	L1	OFF	9.8
4.6400	10.34	46.00	35.66	9.000	L1	OFF	9.8
4.7233	10.31	46.00	35.69	9.000	L1	OFF	9.8
4.9888	10.25	46.00	35.75	9.000	L1	OFF	9.8
5.1013	10.26	50.00	39.74	9.000	L1	OFF	9.9
8.8610	14.88	50.00	35.12	9.000	L1	OFF	10.0
19.0693	16.67	50.00	33.33	9.000	L1	OFF	10.3
19.1480	16.67	50.00	33.33	9.000	L1	OFF	10.3
19.2223	16.49	50.00	33.51	9.000	L1	OFF	10.3
19.3213	16.69	50.00	33.31	9.000	L1	OFF	10.3
19.6655	16.07	50.00	33.93	9.000	L1	OFF	10.3

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NFC MODE (UNTERM)_L1

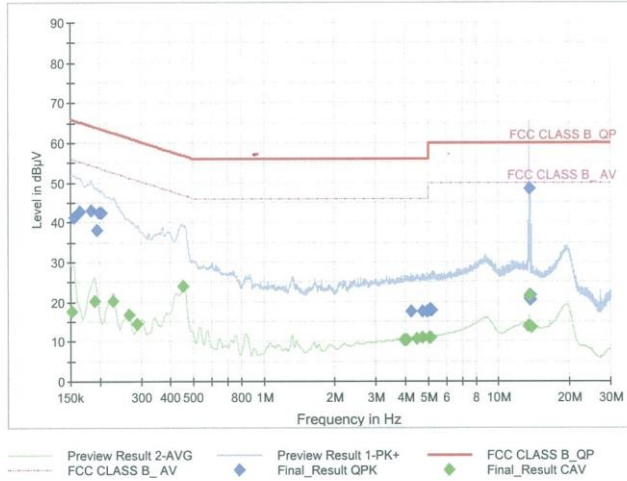
1 / 2

Test Report

Common Information

EUT : SM-S911B/DS
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC MODE (UNTERM)_L1

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	41.37	65.75	24.39	9.000	L1	OFF	9.7
0.1635	42.70	65.28	22.58	9.000	L1	OFF	9.7
0.1838	42.98	64.31	21.33	9.000	L1	OFF	9.7
0.1950	38.19	63.82	25.63	9.000	L1	OFF	9.7
0.1995	42.37	63.63	21.26	9.000	L1	OFF	9.7
0.2040	42.40	63.45	21.05	9.000	L1	OFF	9.7
4.2170	17.67	56.00	38.33	9.000	L1	OFF	9.8
4.7233	17.71	56.00	38.29	9.000	L1	OFF	9.8
4.9393	17.64	56.00	38.36	9.000	L1	OFF	9.8
5.0653	18.02	60.00	41.98	9.000	L1	OFF	9.9
5.1238	18.09	60.00	41.91	9.000	L1	OFF	9.9
5.1710	17.87	60.00	42.13	9.000	L1	OFF	9.9
13.4263	20.80	60.00	39.20	9.000	L1	OFF	10.1
13.4803	20.67	60.00	39.33	9.000	L1	OFF	10.2
13.5208	21.48	60.00	38.52	9.000	L1	OFF	10.2
13.5590	48.44	60.00	11.56	9.000	L1	OFF	10.2
13.5995	21.50	60.00	38.50	9.000	L1	OFF	10.2
13.6378	20.51	60.00	39.49	9.000	L1	OFF	10.2

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NFC MODE (UNTERM)_L1

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	17.52	55.88	38.36	9.000	L1	OFF	9.7
0.1905	20.30	54.02	33.72	9.000	L1	OFF	9.7
0.2265	20.10	52.58	32.48	9.000	L1	OFF	9.7
0.2648	16.70	51.28	34.58	9.000	L1	OFF	9.7
0.2895	14.48	50.54	36.06	9.000	L1	OFF	9.7
0.4538	24.04	46.81	22.76	9.000	L1	OFF	9.7
3.9628	10.36	46.00	35.64	9.000	L1	OFF	9.8
4.0370	10.41	46.00	35.59	9.000	L1	OFF	9.8
4.4960	10.73	46.00	35.27	9.000	L1	OFF	9.8
4.7638	10.91	46.00	35.09	9.000	L1	OFF	9.8
5.0878	11.08	50.00	38.92	9.000	L1	OFF	9.9
5.1238	11.00	50.00	39.00	9.000	L1	OFF	9.9
13.4218	13.84	50.00	36.16	9.000	L1	OFF	10.1
13.5590	21.67	50.00	28.33	9.000	L1	OFF	10.2
13.5748	13.96	50.00	36.04	9.000	L1	OFF	10.2
13.5793	13.88	50.00	36.12	9.000	L1	OFF	10.2
13.6918	13.74	50.00	36.26	9.000	L1	OFF	10.2
13.7750	13.56	50.00	36.44	9.000	L1	OFF	10.2

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Conducted Emissions (Line 2)

NFC MODE (TERM)_N

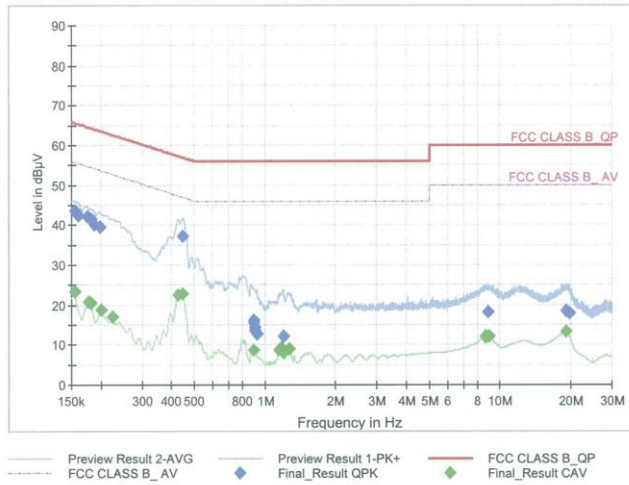
1 / 2

Test Report

Common Information

EUT : SM-S911B/DS
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC MODE (TERM)_N

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	43.52	65.75	22.24	9.000	N	OFF	9.6
0.1613	42.54	65.40	22.86	9.000	N	OFF	9.6
0.1748	42.09	64.73	22.64	9.000	N	OFF	9.6
0.1815	41.45	64.42	22.97	9.000	N	OFF	9.6
0.1883	40.06	64.11	24.06	9.000	N	OFF	9.6
0.1995	39.59	63.63	24.04	9.000	N	OFF	9.6
0.4448	37.09	56.97	19.89	9.000	N	OFF	9.6
0.8960	16.17	56.00	39.83	9.000	N	OFF	9.7
0.9005	15.48	56.00	40.52	9.000	N	OFF	9.7
0.9073	14.46	56.00	41.54	9.000	N	OFF	9.7
0.9118	13.63	56.00	42.37	9.000	N	OFF	9.7
0.9230	12.56	56.00	43.44	9.000	N	OFF	9.7
1.1953	12.09	56.00	43.91	9.000	N	OFF	9.7
8.8745	18.27	60.00	41.73	9.000	N	OFF	10.0
19.1165	18.57	60.00	41.43	9.000	N	OFF	10.4
19.1773	18.58	60.00	41.42	9.000	N	OFF	10.4
19.1885	18.55	60.00	41.45	9.000	N	OFF	10.4
19.7488	17.86	60.00	42.14	9.000	N	OFF	10.5

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NFC MODE (TERM) _N

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	23.31	55.75	32.45	9.000	N	OFF	9.6
0.1770	20.79	54.63	33.83	9.000	N	OFF	9.6
0.1815	20.46	54.42	33.96	9.000	N	OFF	9.6
0.2018	18.73	53.54	34.80	9.000	N	OFF	9.6
0.2243	16.94	52.66	35.72	9.000	N	OFF	9.6
0.4268	22.58	47.32	24.74	9.000	N	OFF	9.6
0.4448	22.78	46.97	24.19	9.000	N	OFF	9.6
0.8960	8.77	46.00	37.23	9.000	N	OFF	9.7
1.1525	8.75	46.00	37.25	9.000	N	OFF	9.7
1.1750	9.25	46.00	36.75	9.000	N	OFF	9.7
1.1953	8.13	46.00	37.87	9.000	N	OFF	9.7
1.2650	9.04	46.00	36.96	9.000	N	OFF	9.7
1.2785	8.81	46.00	37.19	9.000	N	OFF	9.7
8.6743	11.88	50.00	38.12	9.000	N	OFF	10.0
8.6968	11.99	50.00	38.01	9.000	N	OFF	10.0
8.7373	12.00	50.00	38.00	9.000	N	OFF	10.0
9.0095	11.99	50.00	38.01	9.000	N	OFF	10.0
19.1773	13.38	50.00	36.62	9.000	N	OFF	10.4

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NFC MODE (UNTERM)_N

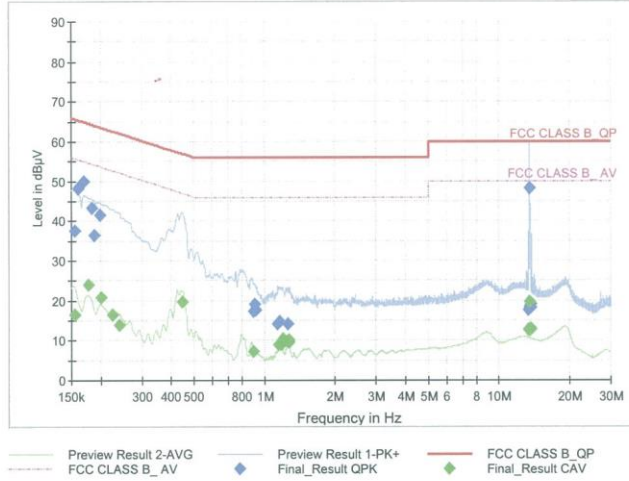
1 / 2

Test Report

Common Information

EUT : SM-S911B/DS
 Manufacturer : SAMSUNG
 Test Site: SHIELD ROOM
 Operating Conditions : NFC MODE (UNTERM)_N

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	37.56	65.75	28.19	9.000	N	OFF	9.6
0.1613	48.15	65.40	17.25	9.000	N	OFF	9.6
0.1703	49.84	64.95	15.11	9.000	N	OFF	9.6
0.1838	43.34	64.31	20.98	9.000	N	OFF	9.6
0.1883	36.44	64.11	27.68	9.000	N	OFF	9.6
0.1995	41.52	63.63	22.11	9.000	N	OFF	9.6
0.8983	17.27	56.00	38.73	9.000	N	OFF	9.7
0.9073	19.01	56.00	36.99	9.000	N	OFF	9.7
0.9163	17.74	56.00	38.26	9.000	N	OFF	9.7
1.1413	14.16	56.00	41.84	9.000	N	OFF	9.7
1.1570	14.59	56.00	41.41	9.000	N	OFF	9.7
1.2538	14.05	56.00	41.95	9.000	N	OFF	9.7
13.3475	17.57	60.00	42.43	9.000	N	OFF	10.2
13.4263	18.10	60.00	41.90	9.000	N	OFF	10.2
13.4825	18.55	60.00	41.45	9.000	N	OFF	10.2
13.5590	48.11	60.00	11.89	9.000	N	OFF	10.2
13.6378	19.04	60.00	40.96	9.000	N	OFF	10.2
13.6918	18.24	60.00	41.76	9.000	N	OFF	10.2

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NFC MODE (UNTERM)_N

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Final Result_CAV

Frequency (MHz)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	16.55	55.75	39.21	9.000	N	OFF	9.6
0.1770	24.04	54.63	30.58	9.000	N	OFF	9.6
0.2018	20.77	53.54	32.77	9.000	N	OFF	9.6
0.2243	16.33	52.66	36.33	9.000	N	OFF	9.6
0.2400	13.90	52.10	38.20	9.000	N	OFF	9.6
0.4448	19.49	46.97	27.49	9.000	N	OFF	9.6
0.8960	7.32	46.00	38.68	9.000	N	OFF	9.7
1.1503	8.98	46.00	37.02	9.000	N	OFF	9.7
1.1728	8.87	46.00	37.13	9.000	N	OFF	9.7
1.1953	10.32	46.00	35.68	9.000	N	OFF	9.7
1.2718	9.51	46.00	36.49	9.000	N	OFF	9.7
1.2763	10.21	46.00	35.79	9.000	N	OFF	9.7
13.3453	12.79	50.00	37.21	9.000	N	OFF	10.2
13.4353	12.77	50.00	37.23	9.000	N	OFF	10.2
13.4780	12.68	50.00	37.32	9.000	N	OFF	10.2
13.5590	19.69	50.00	30.31	9.000	N	OFF	10.2
13.5793	12.84	50.00	37.16	9.000	N	OFF	10.2
13.6940	12.70	50.00	37.30	9.000	N	OFF	10.2

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10. LIST OF TEST EQUIPMENT

Conducted Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
LISN	ENV216	Rohde & Schwarz	102245	08/22/2023	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/07/2023	Annual
Temperature Chamber	SU-642	ESPEC	0093008124	03/04/2023	Annual
Signal Analyzer	N9030A	Keysight	MY55410508	09/06/2023	Annual
DC Power Supply	E3646A	Agilent	MY40002937	12/14/2022	Annual
Attenuator(10 dB)(DC-26.5 GHz)	5910-N-50-010	H+S	00801	10/29/2022	Annual
Software	EMC32	Rohde & Schwarz	N/A	N/A	N/A

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

Radiated Test

Equipment	Model	Manufacturer	Serial No.	Due to Calibration	Calibration Interval
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	EM2090	Emco	060520	N/A	N/A
Turn Table	N/A	Ets	N/A	N/A	N/A
Loop Antenna	FMZB 1513	Rohde & Schwarz	1513-333	03/17/2024	Biennial
Hybrid Antenna	VULB 9168	Schwarzbeck	9168-0895	08/16/2024	Biennial
Horn Antenna	BBHA 9120D	Schwarzbeck	9120D-1191	11/18/2023	Biennial
Spectrum Analyzer	FSP(9 kHz ~ 30 GHz)	Rohde & Schwarz	836650/016	09/06/2023	Annual
Spectrum Analyzer	FSV40-N(9 kHz ~ 30 GHz)	Rohde & Schwarz	101068-SZ	09/07/2023	Annual
ATT(3 dB) + LNA2(6~18 GHz)	18B-03, CBL06185030	WEINSCHEL CERNEX	N/A	12/22/2022	Annual
ATT(10 dB) + LNA1(0.1~18 GHz)	56-10, CBLU1183540B-01	Api tech, CERNEX	N/A	12/22/2022	Annual
Power Amplifier	CBL18265035	CERNEX	22966	12/02/2022	Annual

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.
2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.
3. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5(Version : 2017).

11. ANNEX A_ TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2209-FC006-P