

FCC WPT REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

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Date of Issue:
May 24, 2023

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

Report No.: HCT-RF-2305-FC059-R1

FCC ID:	A3LSMF946B
APPLICANT:	SAMSUNG Electronics Co., Ltd.

Model: SM-F946B/DS

Additional Model: SM-F946B

EUT Type: Mobile Phone

Frequency Range: Power sharing: 110 kHz ~ 148 kHz
Digitizer: 531.25 kHz – 593.75 kHz

Max. Transmit Power: Power sharing: 7.370 dBuV/m @300 m
Digitizer: 12.36 dBµV/m @30 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.

Report No.: HCT-RF-2305-FC059-R1

REVIEWED BY



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

* The report shall not be reproduced except in full(only partly) without approval of the laboratory.

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2305-FC059	May 19, 2023	- First Approval Report
HCT-RF-2305-FC059-R1	May 24, 2023	- Page 10, Added The worst case configuration Mode

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1. EUT DESCRIPTION

Model	SM-F946B/DS
Additional Model	SM-F946B
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Frequency of Operation	110 kHz ~ 148 kHz 531.25 kHz ~ 593.75 kHz
Mode of Operation	1. Power sharing: 110 kHz ~ 148 kHz 2. S-pen Digitizer - Button : 531.25 kHz - Writing, Hover : 593.75 kHz
Max. Transmit Power	Power sharing: 7.370 dBuV/m @300 m Digitizer: 12.36 dBμV/m @30 m
Date(s) of Tests	March 24 2023 ~ May 19, 2023
Serial number	723cc3597a4d7ece

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)	1.90 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (9 kHz ~ 30 MHz)	4.14 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (30 MHz ~ 1 GHz)	5.82 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (1 GHz ~ 18 GHz)	5.74 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (18 GHz ~ 40 GHz)	5.76 (Confidence level about 95 %, $k=2$)
Radiated Disturbance (Above 40 GHz)	5.52 (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	Charging from EUT to Client device (See Note 1)	Aligned	1 % ~ 20 % (See Note 6)	Phone (See Note 1)
			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 %	

Mode	EUT State	Mode of client device	Client device
S-pen Digitizer	Stand alone	Button, Hover, Writing	S-pen
	Stand alone + AC adapter		

Note:

1. Client device:
Of Phone, earbuds and Wearable device, we tested on Phone.
2. Phone (Client device):
 - Model : SM-G986B/DS
 - Manufacturer : SAMSUNG
 - FCC ID : A3LSMG986B
3. S-pen (Client device):
 - Model : EJ-PF946
 - Manufacturer : WACOM
4. S-pen charging:
EUT is not supported S-pen charging

5. 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.

6. Battery of Client device:

All modes of operation were investigated and the worst case configuration results are reported.
(Worstcase : 1 % ~ 20 % of Battery)

7. The EUT was tested in three modes(Open, Half-open, Closed), the worst case configuration results are reported.

- Mode: Open, Half-open, Closed

- Worst case : Closed Mode

8. 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

9. The EUT was tested in three orthogonal axis(X, Y, Z) and the worst position results are reported.

- Axis : X, Y, Z

- Worst Axis : Y, Z

10. SM-F946B/DS, SM-F946B were tested and the worst case results are reported.

(Worst case : SM-F946B/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) + Travel Adapter + S-Pen(Client device),
EUT + Travel Adapter + S-Pen(Client device)

- Worstcase : EUT + Travel Adapter + S-Pen(Client device)

2. SM-F946B/DS, SM-F946B were tested and the worst case results are reported.

(Worst case : SM-F946B/DS)

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
Emission bandwidth.	§2.1049	<u>See note1</u>		<u>See note1</u>

Note:

1. For reporting purposes only.

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 : $\geq 3 \times$ RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit

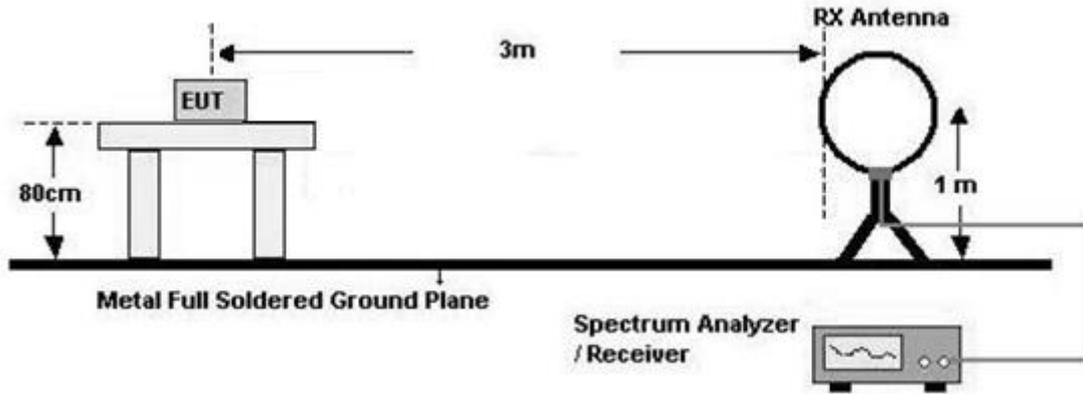
Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

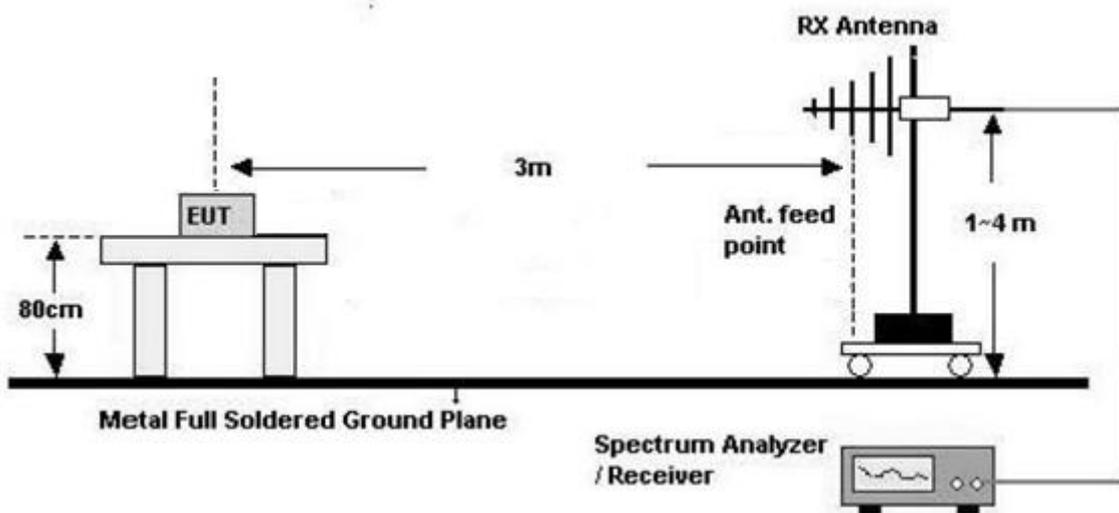
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, 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 Value(dBμV/m@30 m)
 - = Measured Value(dBμV/m@3 m) + Ant factor(dB/m) + Cable Loss(dB)
 - Distance Correction Factor(dB)
6. Distance Correction
 - * 0.009 MHz – 0.490 MHz :
 - $40\log(3\text{ m}/300\text{ m}) = - 80\text{ dB}$
 - * 0.490 MHz – 30 MHz :
 - $40\log(3\text{ m}/30\text{ m}) = - 40\text{ dB}$
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 \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.

Test Result
Closed Mode

Frequency (kHz)	Reading Level (dB μ V/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
19.477	34.38	19.20	0.45	-80.00	-25.97	41.81	67.78
#113.870	62.04	19.60	0.54	-80.00	2.18	26.48	24.30
115.853	32.42	19.60	0.54	-80.00	-27.44	26.33	53.77
341.360	41.4	19.50	0.56	-80.00	-18.54	16.94	35.48
2740.440	11.86	20.00	0.74	-40.00	-7.4	29.54	36.94

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 (dB μ V/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
41.340	41.25	19.60	0.54	-80.00	-18.61	35.28	53.89
#113.870	67.23	19.60	0.54	-80.00	7.370	26.48	19.11
115.237	53.04	19.60	0.54	-80.00	-6.82	26.37	33.19
341.361	47.01	19.50	0.56	-80.00	-12.93	16.94	29.87
29950.520	13.86	20.00	0.74	-40.00	-5.40	29.54	34.94

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.

■ Test Result (Digitizer S-pen)

Frequency (kHz)	Reading Level (dB μ V/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
10.856	33.55	19.20	0.45	-80.00	-26.8	46.89	73.69
162.54	27.01	19.50	0.56	-80.00	-32.93	23.39	56.32
#593.75	31.96	19.50	0.55	-40.00	12.01	32.14	20.13
821.5	17.18	19.50	0.65	-40.00	-2.67	29.31	31.98

Note

1. Mode: Hover, Writing
2. "#": Fundamental Frequency
3. EUT state: Stand alone
4. 30 MHz – 1GHz : No Critical peaks found

Frequency (kHz)	Reading Level (dB μ V/m)@3m	Ant.Factor (dB/m)	Cable Loss (dB)	Distance Correction (dB)	Result Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
9.916	34.04	19.20	0.45	-80.00	-26.31	47.68	73.99
153.18	29.47	19.50	0.56	-80.00	-30.47	23.90	54.37
#593.75	32.14	19.50	0.55	-40.00	12.19	32.12	19.93
821.5	17.68	19.50	0.65	-40.00	-2.17	29.31	31.48

Note

1. Mode: Hover, Writing
2. "#": Fundamental Frequency
3. EUT state: Stand alone + AC adapter
4. 30 MHz – 1GHz : 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)
9.96	34.40	19.20	0.45	-80.00	-25.95	47.64	73.59
163.74	26.89	19.50	0.56	-80.00	-33.05	23.32	56.37
#531.25	32.31	19.50	0.55	-40.00	12.36	33.09	20.73
831.3	17.09	19.50	0.65	-40.00	-2.76	29.21	31.97

Note

1. Mode: Button
2. "#": Fundamental Frequency
3. EUT state: Stand alone
4. 30 MHz – 1GHz : 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)
25.186	39.85	19.60	0.39	-80.00	-20.16	39.58	59.74
156.78	30.37	19.50	0.56	-80.00	-29.57	23.70	53.27
#531.25	32.30	19.50	0.55	-40.00	12.35	33.07	20.72
811.7	15.91	19.50	0.55	-40.00	-4.04	29.42	33.46

Note

1. Mode: Button
2. "#": Fundamental Frequency
3. EUT state: Stand alone + AC adapter
4. 30 MHz – 1GHz : No Critical peaks found

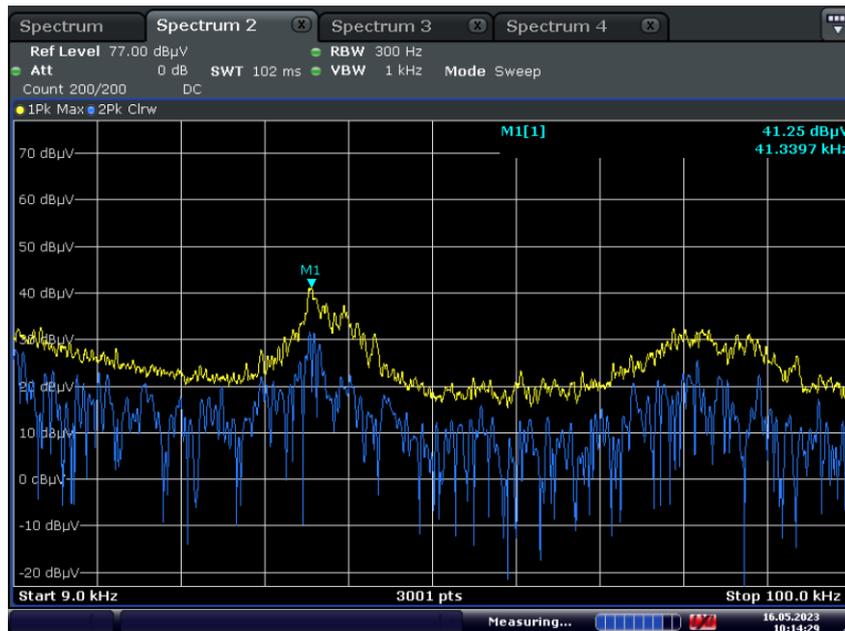
Test Plot

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

Worst case

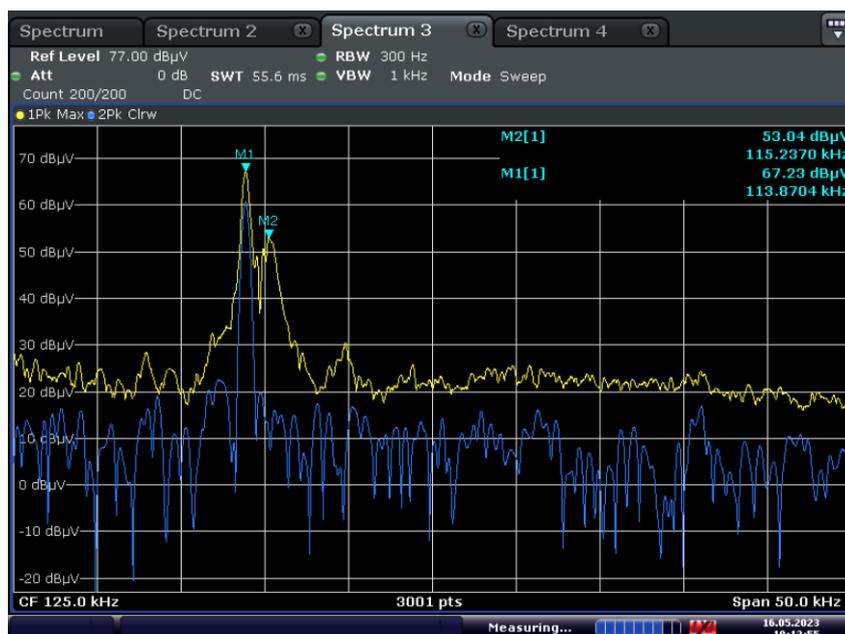
- EUT Mode: Charging from EUT(Charging from TA) to Phone
- Position: Cross

Frequency Range : 9 kHz – 100kHz



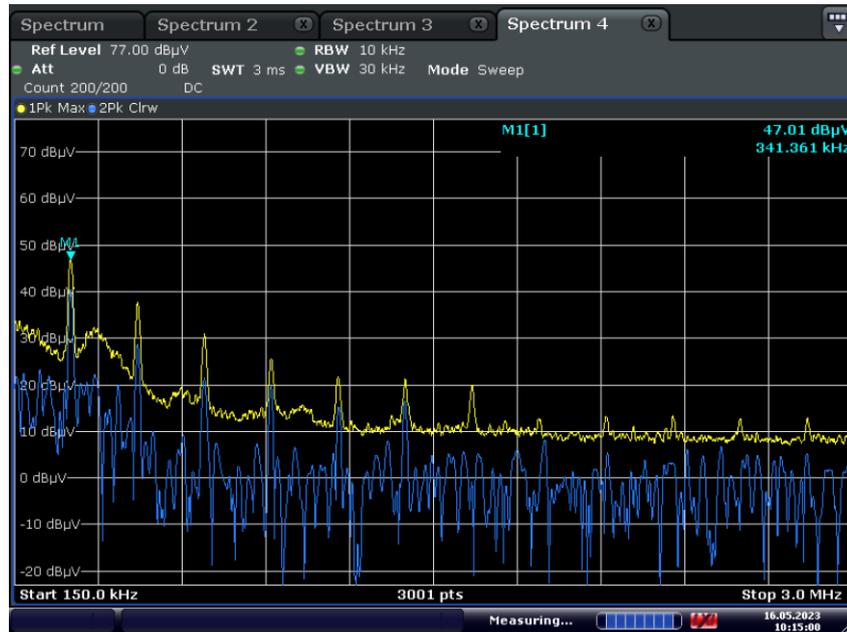
Date: 16.MAY.2023 10:14:29

Frequency Range : 100 kHz – 150kHz



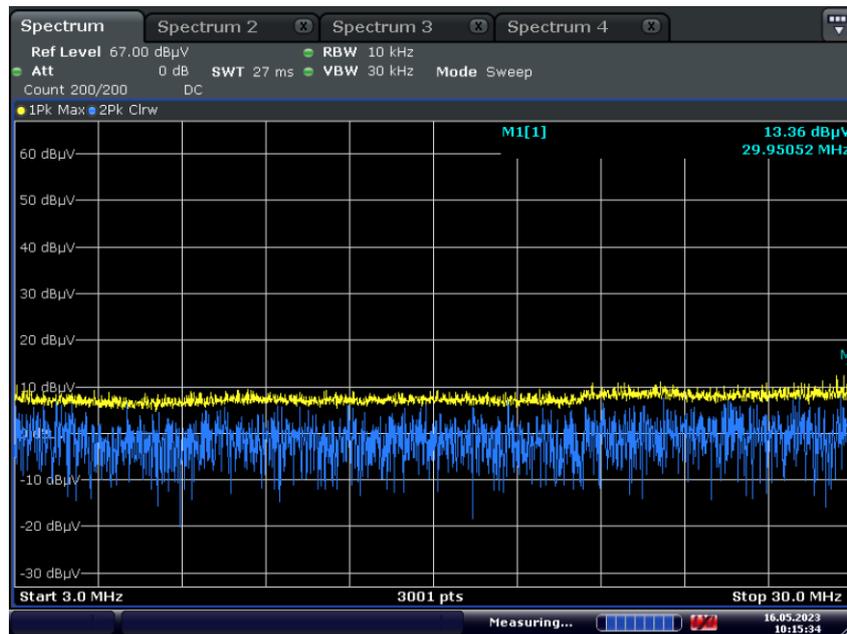
Date: 16.MAY.2023 10:13:56

Frequency Range : 150 kHz – 3 MHz



Date: 16.MAY.2023 10:15:00

Frequency Range : 3 MHz – 30 MHz



Date: 16.MAY.2023 10:15:35

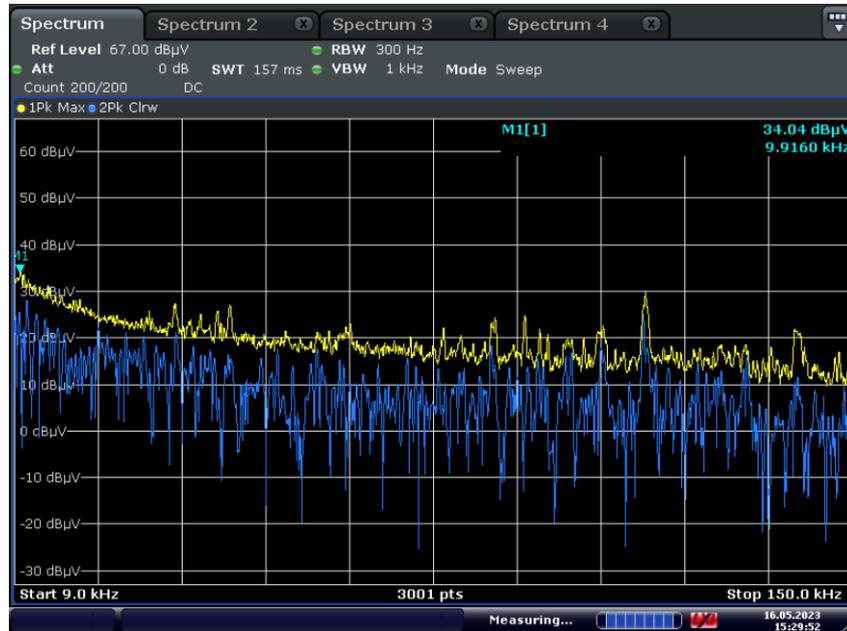
Frequency Range : 30 MHz – 1 GHz
(30 MHz – 1GHz : No Critical peaks found)

Test Plot (Digitizer S-pen)

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

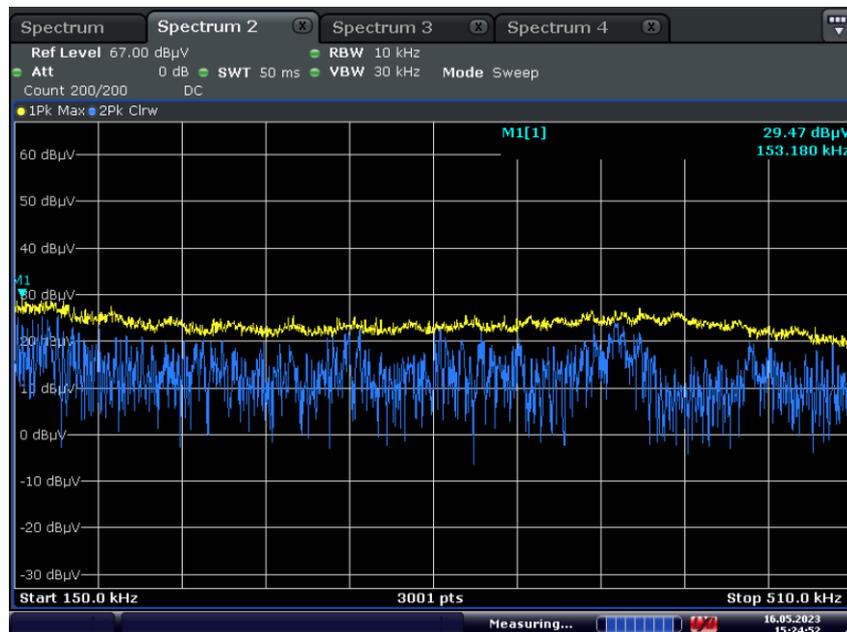
(Worst case: Hover, Writing_ Stand alone + AC adapter)

Frequency Range : 9 kHz – 150 kHz



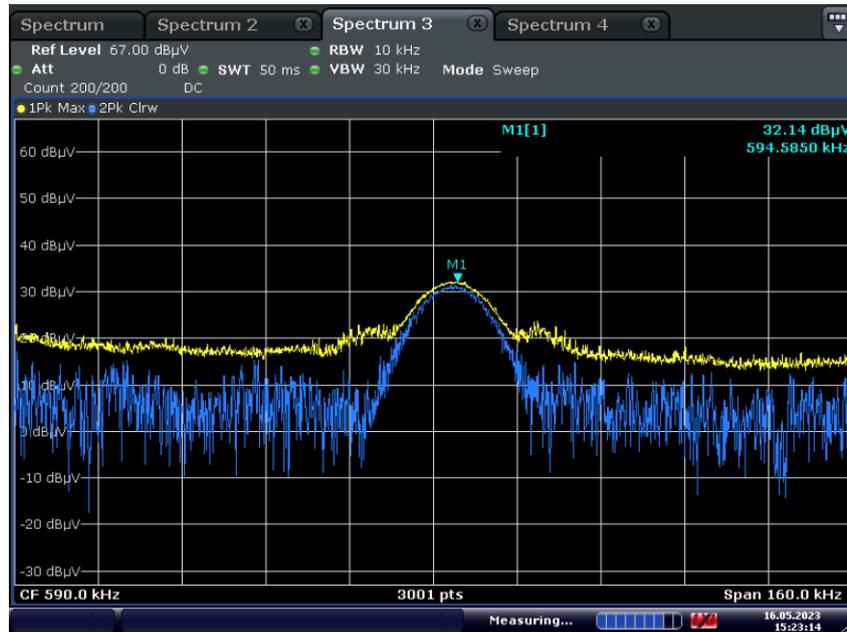
Date: 16.MAY.2023 15:29:52

Frequency Range : 150 kHz – 510 kHz



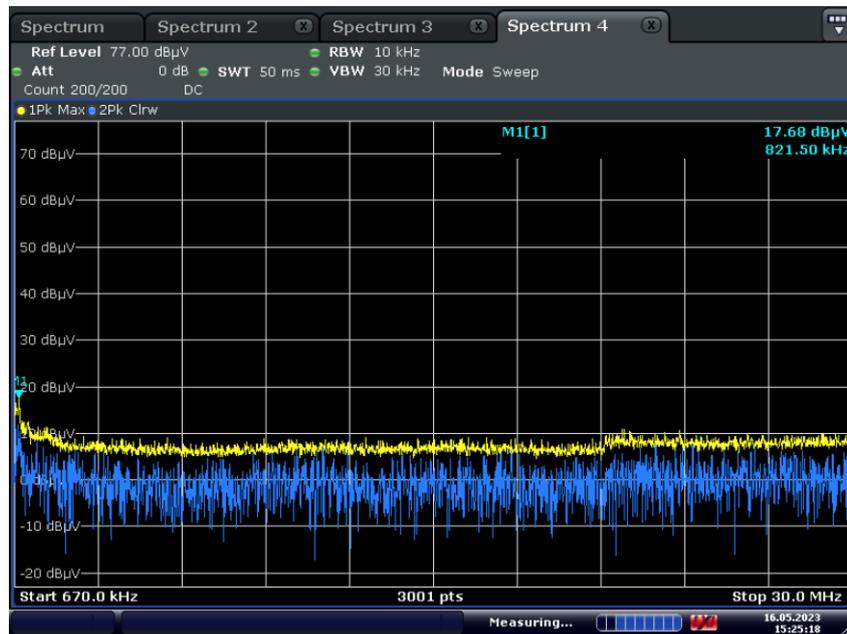
Date: 16.MAY.2023 15:24:52

Frequency Range : 510 kHz – 670 kHz



Date: 16.MAY.2023 15:23:15

Frequency Range : 670 kHz – 3 MHz



Date: 16.MAY.2023 15:25:19

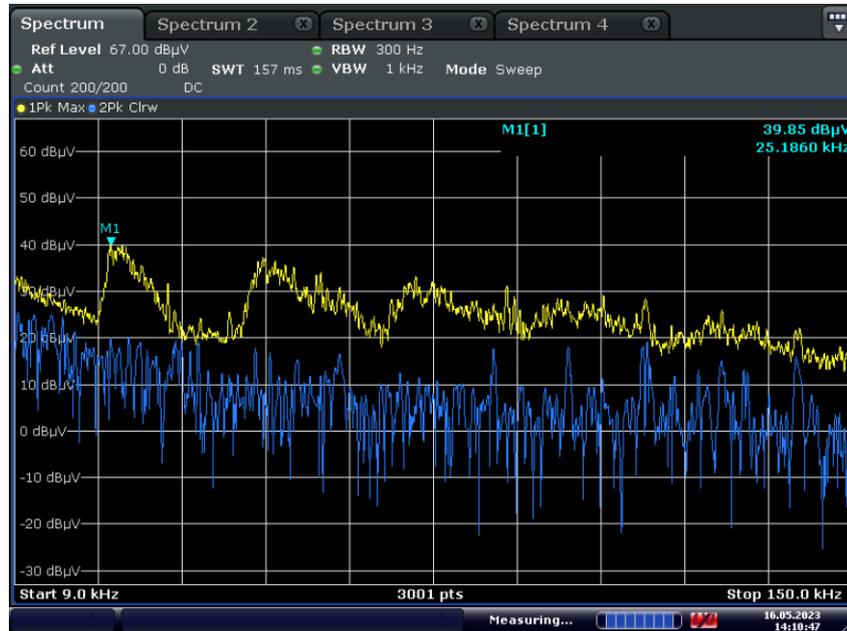
Frequency Range : 30 MHz – 1 GHz
(30 MHz – 1GHz : No Critical peaks found)

Test Plot (Digitizer S-pen)

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

(Worst case: Button_ Stand alone + AC adapter)

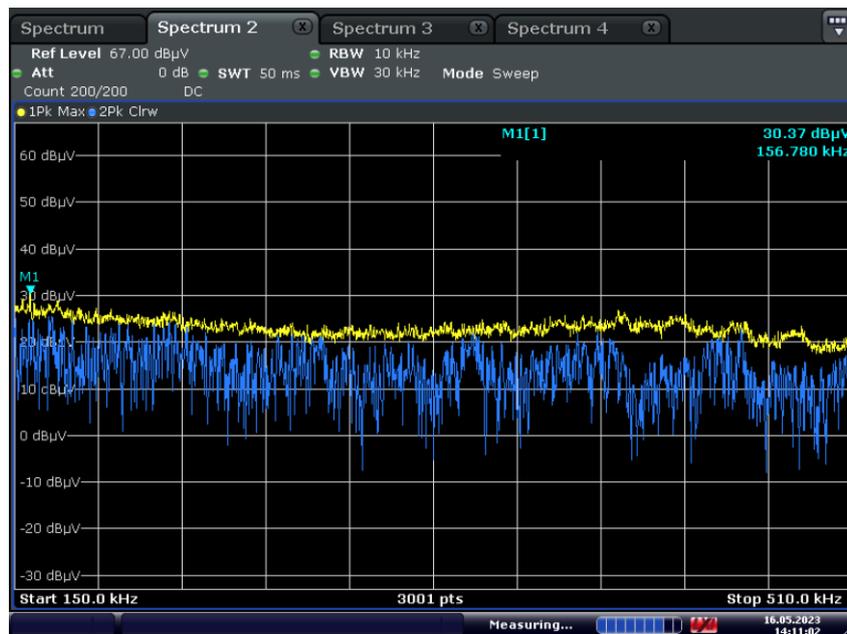
Frequency Range : 9 kHz – 150 kHz



Date: 16.MAY.2023 14:10:48

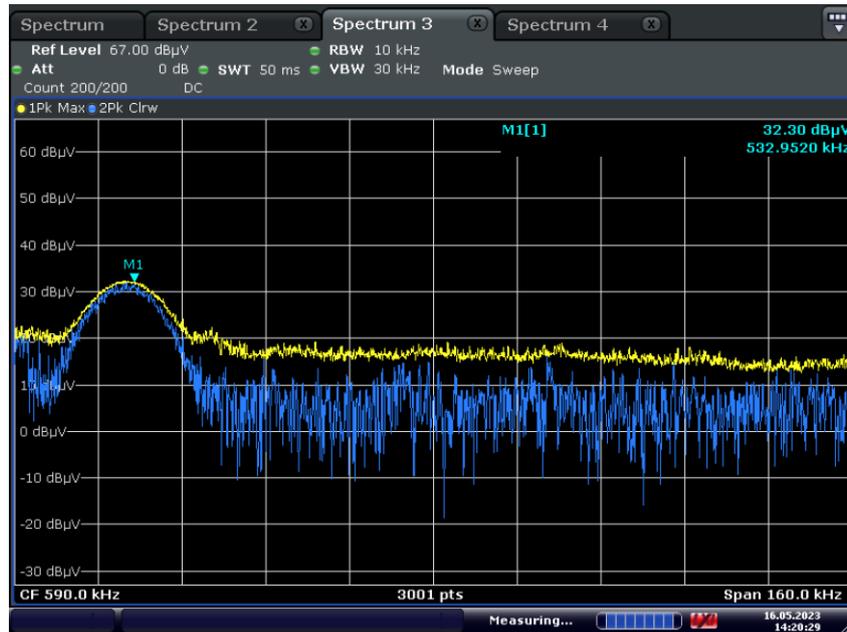
Frequency Range : 150 kHz – 510 kHz

9



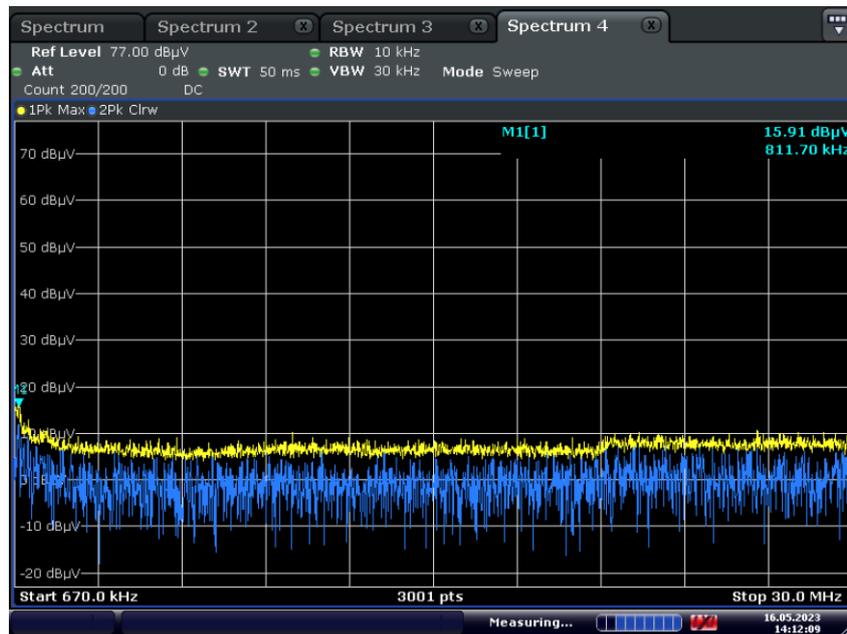
Date: 16.MAY.2023 14:11:03

Frequency Range : 510 kHz – 670 kHz



Date: 16.MAY.2023 14:20:29

Frequency Range : 670 kHz – 3 MHz



Date: 16.MAY.2023 14:12:09

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

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 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

☐ **Test Result & Plot**

Mode: WPT

Test

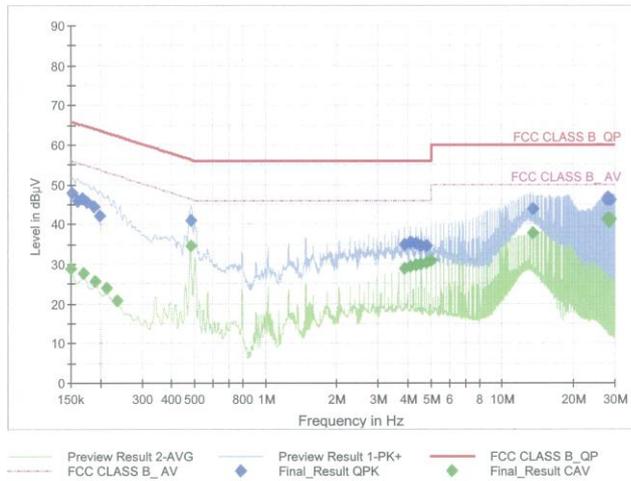
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Test Report

Common Information

EUT : SM-F946B/DS
 Operating Conditions : WPT Crossed Mode
 Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	47.75	65.88	18.13	1000.0	9.000	L1	OFF	9.7
0.1613	45.84	65.40	19.56	1000.0	9.000	L1	OFF	9.7
0.1680	46.48	65.06	18.58	1000.0	9.000	L1	OFF	9.7
0.1748	45.55	64.73	19.18	1000.0	9.000	L1	OFF	9.7
0.1883	44.50	64.11	19.61	1000.0	9.000	L1	OFF	9.7
0.1995	42.16	63.63	21.47	1000.0	9.000	L1	OFF	9.7
0.4830	40.92	56.29	15.37	1000.0	9.000	L1	OFF	9.7
3.8728	34.82	56.00	21.18	1000.0	9.000	L1	OFF	9.8
4.1000	35.40	56.00	20.60	1000.0	9.000	L1	OFF	9.8
4.3273	35.22	56.00	20.78	1000.0	9.000	L1	OFF	9.8
4.5568	34.69	56.00	21.31	1000.0	9.000	L1	OFF	9.8
4.7818	34.68	56.00	21.32	1000.0	9.000	L1	OFF	9.8
13.4398	43.73	60.00	16.27	1000.0	9.000	L1	OFF	10.1
27.6755	46.19	60.00	13.81	1000.0	9.000	L1	OFF	10.6
27.9028	46.38	60.00	13.62	1000.0	9.000	L1	OFF	10.6
28.1300	46.66	60.00	13.35	1000.0	9.000	L1	OFF	10.6
28.3595	46.49	60.00	13.51	1000.0	9.000	L1	OFF	10.6
28.5868	46.28	60.00	13.72	1000.0	9.000	L1	OFF	10.6

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Test

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	28.85	56.00	27.15	1000.0	9.000	L1	OFF	9.7
0.1703	27.70	54.95	27.25	1000.0	9.000	L1	OFF	9.7
0.1905	25.78	54.02	28.23	1000.0	9.000	L1	OFF	9.7
0.2130	23.80	53.09	29.29	1000.0	9.000	L1	OFF	9.7
0.2355	20.89	52.25	31.37	1000.0	9.000	L1	OFF	9.7
0.4808	34.67	46.33	11.66	1000.0	9.000	L1	OFF	9.7
3.8728	28.78	46.00	17.22	1000.0	9.000	L1	OFF	9.8
4.1000	29.36	46.00	16.64	1000.0	9.000	L1	OFF	9.8
4.3273	29.75	46.00	16.25	1000.0	9.000	L1	OFF	9.8
4.5545	30.02	46.00	15.98	1000.0	9.000	L1	OFF	9.8
4.7840	30.38	46.00	15.62	1000.0	9.000	L1	OFF	9.8
5.0113	30.75	50.00	19.25	1000.0	9.000	L1	OFF	9.8
13.4398	37.72	50.00	12.28	1000.0	9.000	L1	OFF	10.1
27.6755	41.13	50.00	8.87	1000.0	9.000	L1	OFF	10.6
27.9028	41.12	50.00	8.88	1000.0	9.000	L1	OFF	10.6
28.1300	41.57	50.00	8.43	1000.0	9.000	L1	OFF	10.6
28.3573	40.69	50.00	9.31	1000.0	9.000	L1	OFF	10.6
28.5868	41.26	50.00	8.74	1000.0	9.000	L1	OFF	10.6

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Test

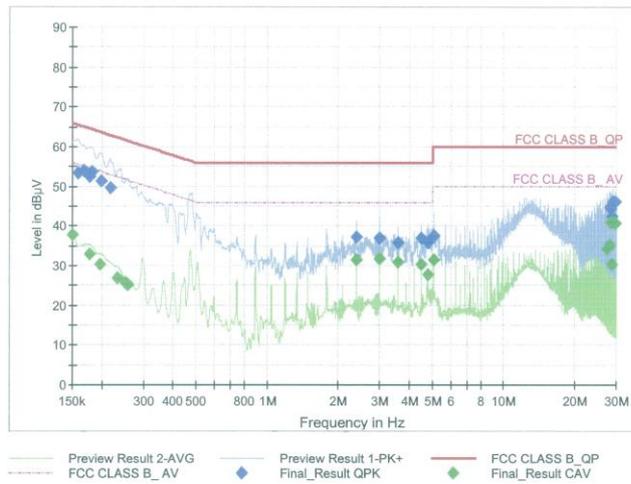
1 / 2

Test Report

Common Information

EUT : SM-F946B/DS
 Operating Conditions : WPT Aligned Mode
 Comment :

Full Spectrum



Final Result QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1590	53.50	65.52	12.02	1000.0	9.000	N	OFF	9.6
0.1680	53.80	65.06	11.26	1000.0	9.000	N	OFF	9.6
0.1770	52.58	64.63	12.04	1000.0	9.000	N	OFF	9.6
0.1815	53.55	64.42	10.86	1000.0	9.000	N	OFF	9.6
0.1995	51.47	63.63	12.16	1000.0	9.000	N	OFF	9.6
0.2175	49.75	62.91	13.16	1000.0	9.000	N	OFF	9.6
2.3855	37.34	56.00	18.66	1000.0	9.000	L1	OFF	9.7
2.9818	36.94	56.00	19.06	1000.0	9.000	L1	OFF	9.8
3.5780	35.70	56.00	20.30	1000.0	9.000	L1	OFF	9.8
4.4735	36.90	56.00	19.10	1000.0	9.000	L1	OFF	9.8
4.7705	35.65	56.00	20.35	1000.0	9.000	L1	OFF	9.8
5.0698	37.50	60.00	22.50	1000.0	9.000	L1	OFF	9.8
28.0288	44.58	60.00	15.42	1000.0	9.000	L1	OFF	10.6
28.3258	45.02	60.00	14.98	1000.0	9.000	L1	OFF	10.6
28.3303	44.39	60.00	15.61	1000.0	9.000	L1	OFF	10.6
28.6273	42.42	60.00	17.58	1000.0	9.000	L1	OFF	10.6
28.9243	46.15	60.00	13.85	1000.0	9.000	L1	OFF	10.6
29.5205	46.06	60.00	13.94	1000.0	9.000	L1	OFF	10.6

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Test

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Final Result CAV

Frequency (MHz)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1500	37.74	56.00	18.26	1000.0	9.000	L1	OFF	9.7
0.1770	32.90	54.63	21.72	1000.0	9.000	N	OFF	9.6
0.1973	30.16	53.73	23.56	1000.0	9.000	N	OFF	9.6
0.2333	26.78	52.33	25.55	1000.0	9.000	N	OFF	9.6
0.2513	25.63	51.72	26.09	1000.0	9.000	N	OFF	9.6
0.2580	25.23	51.50	26.27	1000.0	9.000	N	OFF	9.6
2.3855	31.46	46.00	14.54	1000.0	9.000	L1	OFF	9.7
2.9818	31.66	46.00	14.34	1000.0	9.000	L1	OFF	9.8
3.5780	30.81	46.00	15.19	1000.0	9.000	L1	OFF	9.8
4.4735	30.22	46.00	15.78	1000.0	9.000	L1	OFF	9.8
4.7705	27.65	46.00	18.35	1000.0	9.000	L1	OFF	9.8
5.0698	31.54	50.00	18.46	1000.0	9.000	L1	OFF	9.8
27.4348	34.35	50.00	15.65	1000.0	9.000	L1	OFF	10.6
28.0310	35.22	50.00	14.78	1000.0	9.000	L1	OFF	10.6
28.3280	40.87	50.00	9.13	1000.0	9.000	L1	OFF	10.6
28.6273	30.26	50.00	19.74	1000.0	9.000	L1	OFF	10.6
28.9243	40.84	50.00	9.16	1000.0	9.000	L1	OFF	10.6
29.5205	40.63	50.00	9.37	1000.0	9.000	L1	OFF	10.6

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Mode: Digitizer S-pen

Test

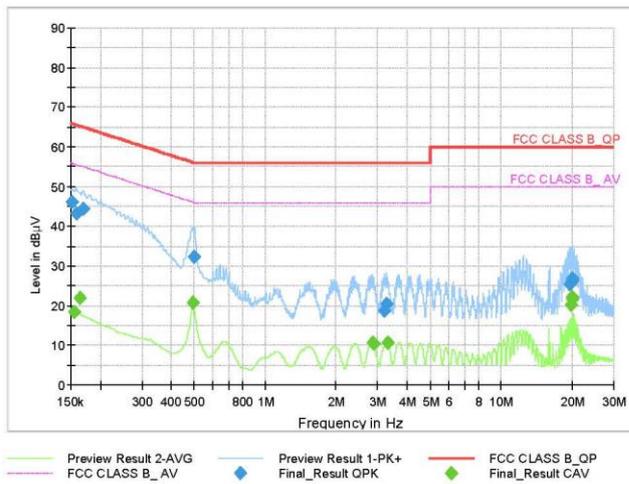
1/1

Test Report

Common Information

EUT : SM-F946B/DS
Operating Conditions : Digitizer Mode
Comment :

Full Spectrum



Final Result_QPK

Frequency (MHz)	QuasiPeak (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1523	46.10	65.88	19.78	1000.0	9.000	N	OFF	9.6
0.1590	43.23	65.52	22.29	1000.0	9.000	N	OFF	9.6
0.1703	44.40	64.95	20.55	1000.0	9.000	N	OFF	9.6
0.5023	32.29	56.00	23.71	1000.0	9.000	N	OFF	9.6
3.2113	18.76	56.00	37.24	1000.0	9.000	L1	OFF	9.8
3.2833	20.36	56.00	35.64	1000.0	9.000	L1	OFF	9.8
19.6048	25.51	60.00	34.49	1000.0	9.000	L1	OFF	10.3
20.0593	26.38	60.00	33.62	1000.0	9.000	L1	OFF	10.4
20.1065	26.69	60.00	33.31	1000.0	9.000	L1	OFF	10.4

Final Result_CAV

Frequency (MHz)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.1545	18.50	55.75	37.26	1000.0	9.000	L1	OFF	9.7
0.1635	21.92	55.28	33.36	1000.0	9.000	L1	OFF	9.7
0.4965	20.73	46.06	25.32	1000.0	9.000	L1	OFF	9.7
2.8513	10.68	46.00	35.32	1000.0	9.000	L1	OFF	9.8
2.8805	10.43	46.00	35.57	1000.0	9.000	L1	OFF	9.8
3.3170	10.56	46.00	35.44	1000.0	9.000	L1	OFF	9.8
19.7353	20.20	50.00	29.80	1000.0	9.000	L1	OFF	10.3
20.0458	21.65	50.00	28.35	1000.0	9.000	L1	OFF	10.4
20.1088	22.34	50.00	27.66	1000.0	9.000	L1	OFF	10.4

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11. EMISSION BANDWIDTH PLOT

Test Settings

1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
2. RBW : 300 Hz
(Because the measured signal is CW/CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.)
3. VBW : $\geq 3 \times$ RBW
4. Sweep time : Auto couple
5. Detector : Peak
6. Trace : Maxhold
7. Trace was allowed to stabilize

Limit

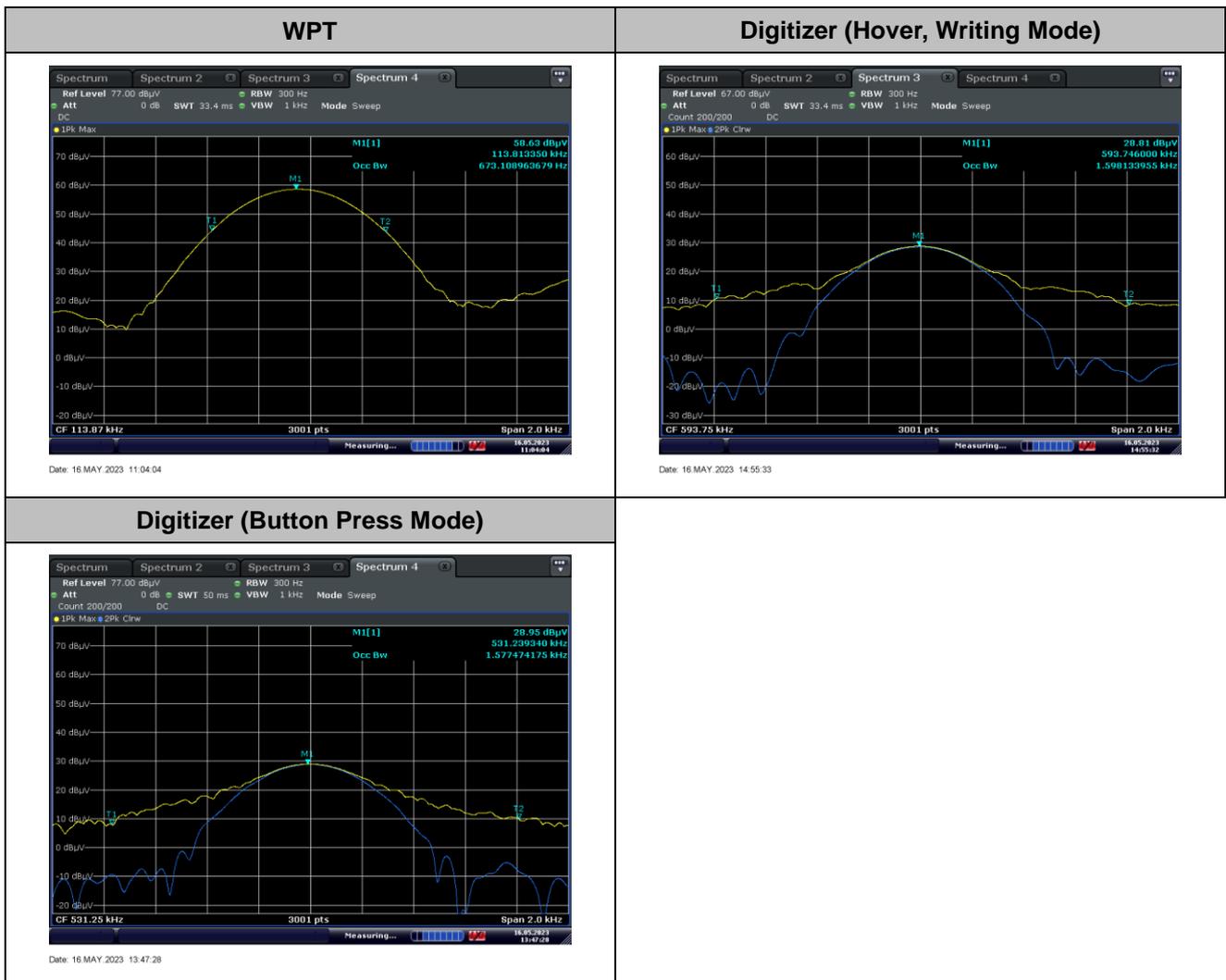
None

(for reporting purposes only.)

Test Result

EUT Mode	Test Frequency (kHz)	Occupied Bandwidth (kHz)
WPT	113.81	673.109
Digitizer (Hover, Writing Mode)	593.75	1.598
Digitizer (Button Press Mode)	531.25	1.577

Test Plot



12. LIST OF TEST EQUIPMENT

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
LISN	ENV216	Rohde & Schwarz	102245	08/22/2023	Annual
EMI Test Receiver	ESR	Rohde & Schwarz	101910	06/07/2023	Annual
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
Spectrum Analyzer	FSP(9 kHz ~ 30 GHz)	Rohde & Schwarz	836650/016	09/06/2023	Annual
Spectrum Analyzer	FSVA40(10 Hz ~ 40 GHz)	Rohde & Schwarz	101502	03/17/2024	Annual
ATT(3 dB) + LNA2(6~18 GHz)	18B-03, CBL06185030	WEINSCHL CERNEX	N/A	12/05/2023	Annual
ATT(10 dB) + LNA1(0.1~18 GHz)	56-10, CBLU1183540B-01	Api tech, CERNEX	N/A	12/05/2023	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).

13. Annex A_TEST SETUP PHOTO

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

No.	Description
1	HCT-RF-2305-FC059-P