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MEASUREMENT REPORT
FCC PART 15 Subpart C (15.225) NFC

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
02/24/2025 - 05/07/2025
Test Report Issue Date:
05/07/2025
Test Site/Location:
Element lab., Columbia, MD, USA
Test Report Serial No.:
1M2502270019-11.A3L

FCC ID:	**A3LSMF966B**
APPLICANT:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SM-F966B
Additional Model(s):	SM-F966B/DS
EUT Type:	Portable Handset
Frequency:	13.56MHz
FCC Classification:	Low Power Communications Device Transmitter (DXX)
FCC Rule Part(s):	Part 15 Subpart C (15.225)
Test Procedure(s):	ANSI C63.10-2013, KDB 484596 D01 v03

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

RJ Ortanez
Executive Vice President

ACCREDITED
CERT #2041.01

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1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 Element Test Location

These measurement tests were conducted at the Element laboratory located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at Element lab located in Columbia, MD 21046, U.S.A.

- Element Washington DC LLC is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- Element Washington DC LLC TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- Element Washington DC LLC facility is a registered (2451B) test laboratory with the site description on file with ISED.

- Element Washington DC LLC is a Recognized U.S. Certification Assessment Body (CAB # US0110) for ISED Canada as designated by NIST under the U.S. and Canada Mutual Recognition Agreements (MRAs).

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2.0 RODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF966B**. The test data contained in this report pertains only to the emissions due to the NFC transmitter of the EUT.

The authorization for these models (SM-F966B and SM-F966B/DS) utilize data referencing from FCC ID: A3LSMF966U (Model SM-F966U) as permitted per KDB 484596 v03. Data referencing data test results are included in Appendix A of this report

Test Device Serial No.: 0167M, 0307M, 0351M, 0348M, 0347M, 0345M

2.2 Device Capabilities

This device contains the following capabilities:

850/1700/1900 WCDMA/HSPA, 850/1900 GSM/GPRS/EDGE Multi-Band LTE, MultiBand 5G NR (FR1), 802.11b/g/n/ac/ax/be WLAN, 802.11a/n/ac/ax/be UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, Wireless Power Transfer, UWB

2.3 Test Configuration

The EUT was set to continuously transmit at 13.56MHz. This was performed using manufacturer software loaded on the phone to allow for continuous transmission. This device was tested in accordance with the guidance of ANSI C63.10-2013. See Sections 3.2 and 3.3 of this test report for a description of the AC line conducted emissions and radiated emissions test setups, respectively.

This device supports three folder configurations: one is with folder fully open, one is where the folder is half open (90 degrees), and one is with folder closed. All configurations are tested, and the worst case radiated emissions data is shown in this report.

2.4 Software and Firmware

The test was conducted with software/firmware version FAV0_F966UFAU0AYB3 installed on the EUT.

2.5 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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3.0 DESCRIPTION OF TEST

3.1 Evaluation Procedure

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) was used in the measurement of the EUT**.**

Deviation from measurement procedure…….....None

3.2 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by ETS Lindgren RF Enclosures. The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 80cm away from the sidewall of the shielded room. Two 10kHz-30MHz, 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room floor. Power to the LISNs is filtered by external high-current high-insertion loss power line filters. The external power line filter is an ETS Lindgren Model LPRX-4X30 (100dB Attenuation, 14kHz-18GHz) and the two EMI/RFI filters are ETS Lindgren Model LRW-2030-S1 (100dB Minimum Insertion Loss, 14kHz – 10GHz). These filters attenuate ambient signal noise from entering the measurement lines. These filters are also bonded to the shielded enclosure.

The EUT is powered from one LISN and the support equipment is powered from the second LISN. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the second LISN. All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion) and draped over the back edge of the test table. All cables were at least 40cm above the horizontal reference groundplane. Power cables for support equipment were routed down to the second LISN while ensuring that that cables were not draped over the second LISN.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer and exploratory measurements were made to determine the frequencies producing the maximum emission from the EUT. The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to peak mode for exploratory measurements while the bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Once the worst case emissions have been identified, the one EUT cable configuration/arrangement and mode of operation that produced these emissions is used for final measurements on the same test site. The analyzer is set to CISPR quasi-peak and average detectors with a 9kHz resolution bandwidth for final measurements.

Line conducted emissions test results are shown in Section 7.6.

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3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33 depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

3.4 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

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4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:
"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."

- The antenna of the EUT are **permanently attached.**
- This unit was tested with its standard battery.

Conclusion:

The EUT complies with the requirement of §15.203.

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5.0 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 uncertainty shown below 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.

Contribution	Expanded Uncertainty (±dB)
Line Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98

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6.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	WL40-1	Conducted Cable Set (40GHz)	2/25/2025	Annual	2/25/2026	WL40-1
-	MD 1M 18 40	EMC Cable and Switch System	2/25/2025	Annual	2/25/2026	MD 1M 18 40
-	ETS-001	EMC Cable and Switch System	12/11/2025	Annual	12/11/2026	ETS-001
-	ETS-002	EMC Cable and Switch System	12/11/2025	Annual	12/11/2026	ETS-002
-	AP2-001	EMC Cable and Switch System	2/25/2025	Annual	2/25/2026	AP2-001
-	AP2-002	EMC Cable and Switch System	2/25/2025	Annual	2/25/2026	AP2-002
Agilent	N9038A	MXE EMI Receiver	9/16/2024	Annual	9/16/2025	MY51210133
Agilent	N9020A	MXA Signal Analyzer	3/22/2024	Annual	3/22/2025	US46470561
Agilent	N9030A	PXA Signal Analyzer (44GHz)	10/16/2024	Annual	10/16/2025	MY49430494
Com-Power	AL-130R	Active Loop Antenna	2/22/2024	Biennial	2/22/2026	121085
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	10/16/2024	Annual	10/16/2025	100342
Rohde & Schwarz	ENV216	Two-Line V-Network	1/31/2023	Biennial	1/31/2025	101379
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	9/11/2024	Biennial	9/11/2026	A051107

Table 6-1. Annual Test Equipment Calibration Schedule

Note:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

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7.0 TEST DATA

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

FCC ID: A3LSMF966B

FCC Classification: Low Power Communications Device Transmitter (DXX)

Frequencies Examined: 13.56MHz

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference	Data Referencing?
2.1049	Occupied Bandwidth	N/A	RADIATED	PASS	Section 7.2	Yes
15.225 (a)(b)(c)	In-Band Emissions	15,848µV/m @ 30m 13.553 – 13.567 MHz 334µV/m @ 30m 13.410 – 13.553 MHz 13.567 – 13.710 MHz 106µV/m @ 30m 13.110 – 13.410 MHz 13.710 – 14.010 MHz		PASS	Section 7.4	Yes
15.225 (d) 15.209	Out-of-Band Emissions	Emissions outside of the specified band (13.110 – 14.010 MHz) must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])		PASS	Section 7.5	Yes
15.225 (e)	Frequency Stability Tolerance	± 0.01% of Operating Frequency	Temperature Chamber	PASS	Section 7.3	Yes
15.207	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits (RSS-Gen)	LINE CONDUCTED	PASS	Section 7.6	No Full Testing

Table 7-1. Summary of Test Results

Note:

1. This unit was tested with its standard battery.
2. Data was leveraged from model SM-F966U for the certification of SM-F966B/DS. See Section 9.0 for spot-check results.

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7.2 Occupied Bandwidth Measurement

§2.1049; RSS-Gen (6.6)

Test Overview and Limit

The occupied bandwidth is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequency.

Test Procedure Used

ANSI C63.10-2013 – Section 6.9.3

Test Settings

1. Spectrum analyzer frequency is set to the nominal EUT channel center frequency.
2. RBW = 1 – 5% OBW
3. VBW ≥ 3 x RBW
4. Reference level set to keep signal from exceeding maximum input mixer level for linear operation.
5. Detector = Peak
6. Trace mode = max hold
7. Sweep = auto couple
8. The trace was allowed to stabilize
9. Using the 99% power bandwidth function of the instrument and report the measured bandwidth.

Test Notes

None.

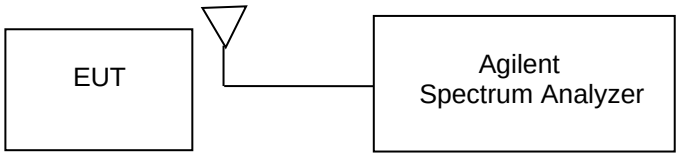

Figure 7-1. Test Instrument & Measurement Setup

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Frequency	Occupied Bandwidth
13.56MHz	191.60kHz

Table 7-2. Occupied Bandwidth Measurement

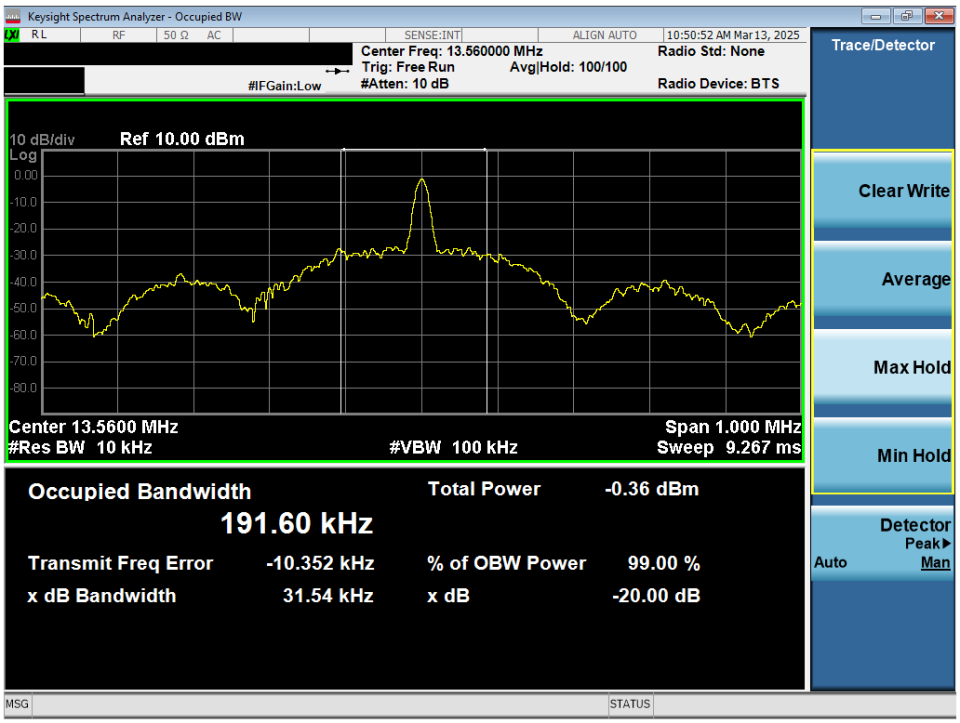

Figure 7-2. Occupied Bandwidth Plot

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7.3 Frequency Stability Test Data

§15.225; RSS-210 (B.6)

Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.10-2013. The frequency stability of the transmitter is measured by:

a.) **Temperature:** The temperature is varied from -20°C to +50°C in 10°C increments using an environmental chamber.

b.) **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.

For Part 15.225, the frequency stability of the transmitter shall be maintained within ±0.01% of the center frequency.

Test Procedure Used

ANSI C63.10-2013 – Section 6.8

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -20°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

Test Notes

None.

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Frequency Stability Test Data
§15.225; RSS-210 (B.6)

OPERATING FREQUENCY: 13,560,000 Hz

REFERENCE VOLTAGE: 4.44 VDC

DEVIATION LIMIT: ± 0.01 % = 1356Hz

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.44	+ 20 (Ref)	13,559,799	-201	-0.0014823
100 %		- 30	13,559,978	-22	-0.0001622
100 %		- 20	13,560,144	144	0.0010620
100 %		- 10	13,559,774	-226	-0.0016667
100 %		0	13,559,441	-559	-0.0041225
100 %		+ 10	13,560,055	55	0.0004056
100 %		+ 20	13,561,001	1,001	0.0073821
100 %		+ 30	13,559,441	-559	-0.0041225
100 %		+ 40	13,560,205	205	0.0015118
100 %		+ 50	13,560,106	106	0.0007817
85 %	3.77	+ 20	13,559,771	-229	-0.0016888
BATT. ENDPOINT	3.67	+ 20	13,560,440	440	0.0032449

Table 7-3. Frequency Stability Test Data

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Frequency Stability Test Data

§15.225; RSS-210 (B.6)

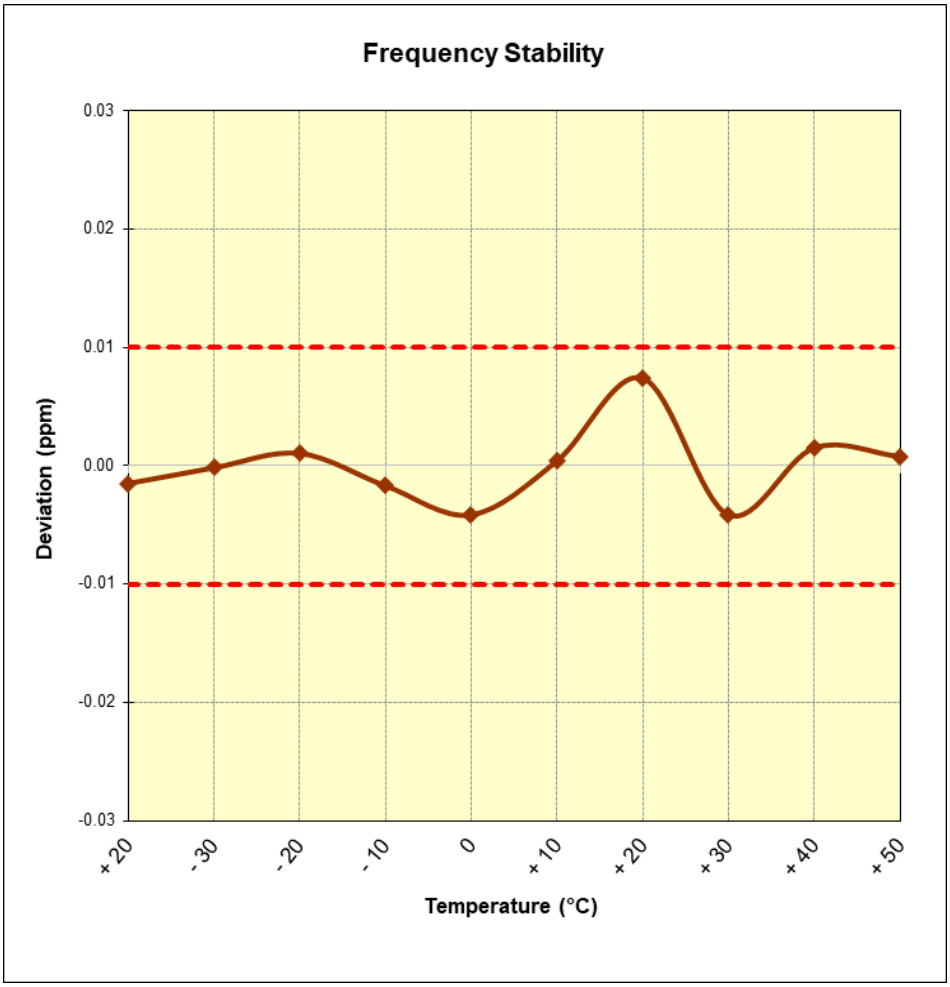

Figure 7-3. Frequency Stability Plot

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7.4 In-Band Radiated Spurious Emission Measurements

§15.225(a)(b)(c); RSS-210 (B.6)

Test Overview and Limit

The EUT was tested from 13.110 – 14.010 MHz. All in-band radiated spurious emissions are measured with a spectrum analyzer connected to a loop antenna while the EUT is operating at appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All in-band emissions appearing in a restricted band as specified in Section 15.225 of the Title 47 CFR must not exceed the limits shown in Table 7-4.

Frequency [MHz]	Field Strength [µV/m]	Measured Distance [Meters]
13.553-13.567 MHz	15,848	30
13.410-13.553 MHz and 13.567-13.710 MHz	334	30
13.110-13.410 MHz and 13.710-14.010 MHz	106	30

Table 7-4. Radiated Limits

Test Procedures Used

ANSI C63.10-2013 – Section 6.4.7

Test Settings

1. RBW = 9kHz
2. VBW ≥ 3 x RBW
3. Detector = peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

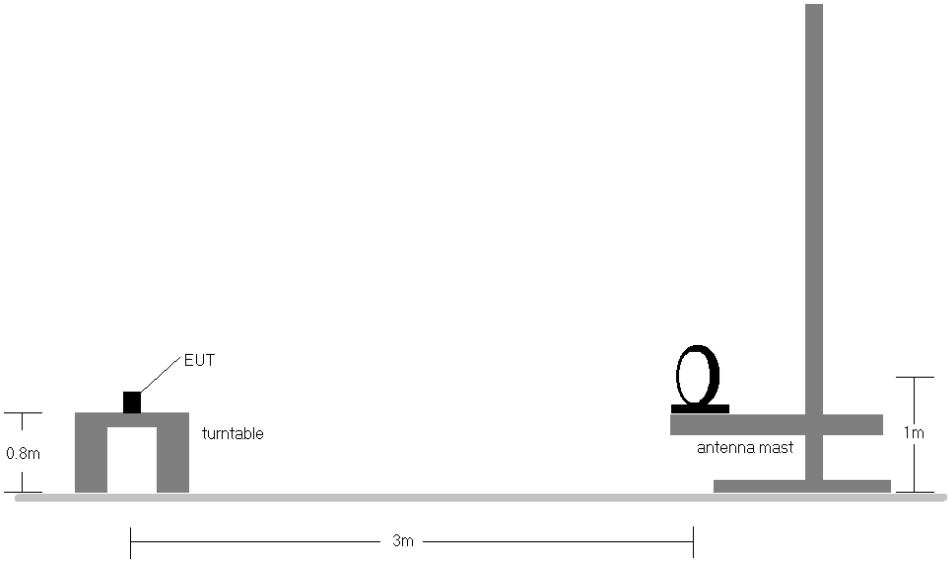

Figure 7-4. Radiated Test Setup

Test Notes:

1. All emissions lying in restricted bands specified in §15.225 and RSS-210 are below the limit shown in Table 7-4.
2. All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.
3. The EUT was positioned in three orthogonal planes to determine the orientation resulting in the worst case emissions.
4. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $20 \log_{10}(30/3)^2 = 40$dB.
5. The spectrum was investigated from 9kHz up to 30MHz using the loop antenna. Only the emissions shown in the table below were found to be significant.
6. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculation

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

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In-Band Radiated Spurious Emission Measurements
§15.225(a)(b)(c); RSS-210 (B.6)

Frequency: 13.56MHz

Measurement Distance: 3 Meters

Frequency [MHz]	Ant. Pol. [X/Y/Z]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	30m Field Strength [dBµV/m]	Limit [µV/m]	Limit [dBµV/m]	Margin [dB]
13.241	Y	100	343	-92.34	14.99	29.65	-10.35	106.00	40.51	-50.86
13.347	Y	100	343	-93.22	15.00	28.78	-11.22	106.00	40.51	-51.72
13.454	Y	100	343	-85.99	15.01	36.02	-3.98	334.00	50.47	-54.45
13.560	Y	100	343	-67.25	15.03	54.78	14.78	15848.00	84.00	-69.22
13.666	Y	100	343	-88.82	15.04	33.22	-6.78	334.00	50.47	-57.26
13.772	Y	100	343	-92.51	15.05	29.54	-10.46	106.00	40.51	-50.97
13.878	Y	100	343	-91.09	15.06	30.97	-9.03	106.00	40.51	-49.54

Table 7-5. In-Band Radiated Measurements

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7.5 Radiated Spurious Emission Measurements, Out-of-Band

§15.209 §15.225(d); RSS-Gen (8.9)

Test Overview and Limit

The EUT was tested from 9kHz up to the 1GHz excluding the band 13.110 – 14.010 MHz.

All out-of-band emissions appearing in a restricted band as specified in Section 15.225 of the Title 47 CFR must not exceed the limits shown in Table 7-6 per Section 15.209.

Frequency	Field Strength [µV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-6. Radiated Limits – Out of band

Test Procedures Used

ANSI C63.10-2013 – Section 6.5.4

Test Settings

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 9kHz for emissions below 30MHz and 100kHz for emissions between 30MHz and 1GHz
3. VBW ≥ 3 x RBW
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

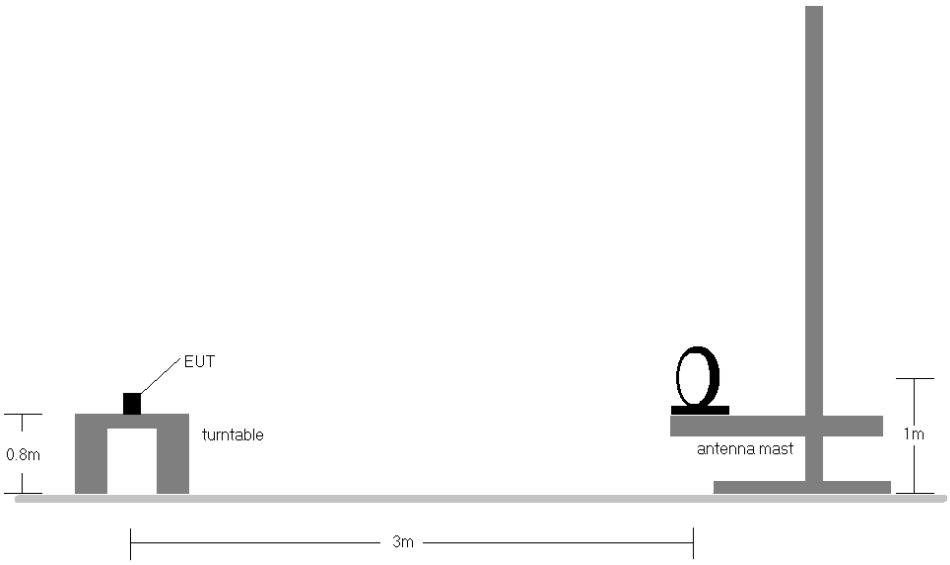

Figure 7-5. Radiated Test Setup < 30MHz

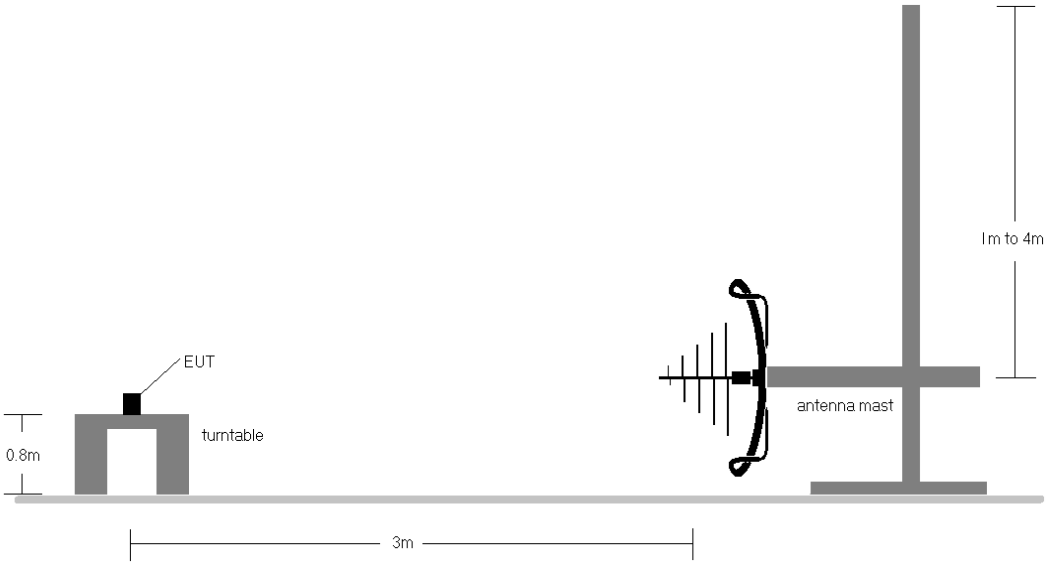

Figure 7-6. Radiated Test Setup > 30MHz

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Test Notes:

1. A loop antenna was used to investigate emissions below 30MHz.
2. Both Vertical and Horizontal polarities of the receive antenna were evaluated with the worst case emissions being reported. Below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
3. The EUT was positioned in three orthogonal planes to determine the orientation resulting in the worst case emissions.
4. The spectrum is measured from 9kHz to the 10th harmonic and the worst-case emissions are reported.
5. No spurious emissions levels were found to be greater than the level of the fundamental.
6. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

Sample Calculation

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB/m]}$
- AFCL $_{[dB/m]}$ = Antenna Factor $_{[dB/m]}$ + Cable Loss $_{[dB]}$
- Margin $_{[dB]}$ = Field Strength Level $_{[dB\mu V/m]}$ – Limit $_{[dB\mu V/m]}$

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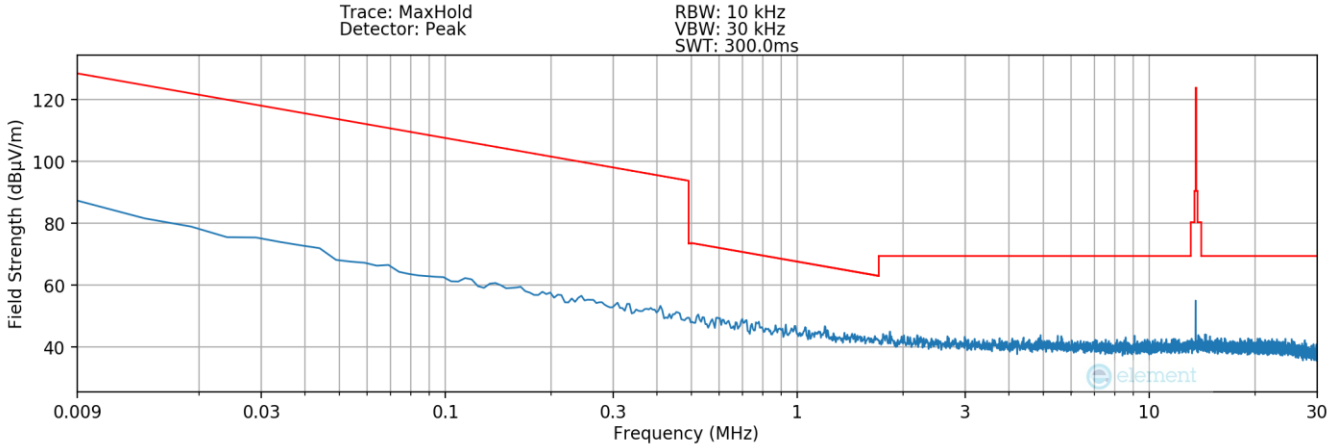
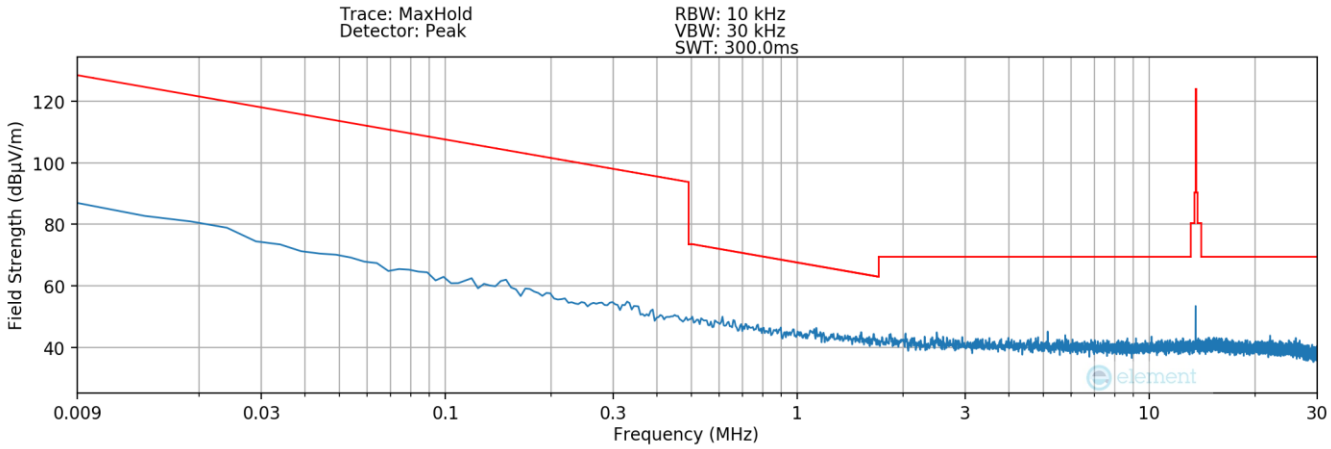
Radiated Spurious Emission Measurements, Out-of-Band

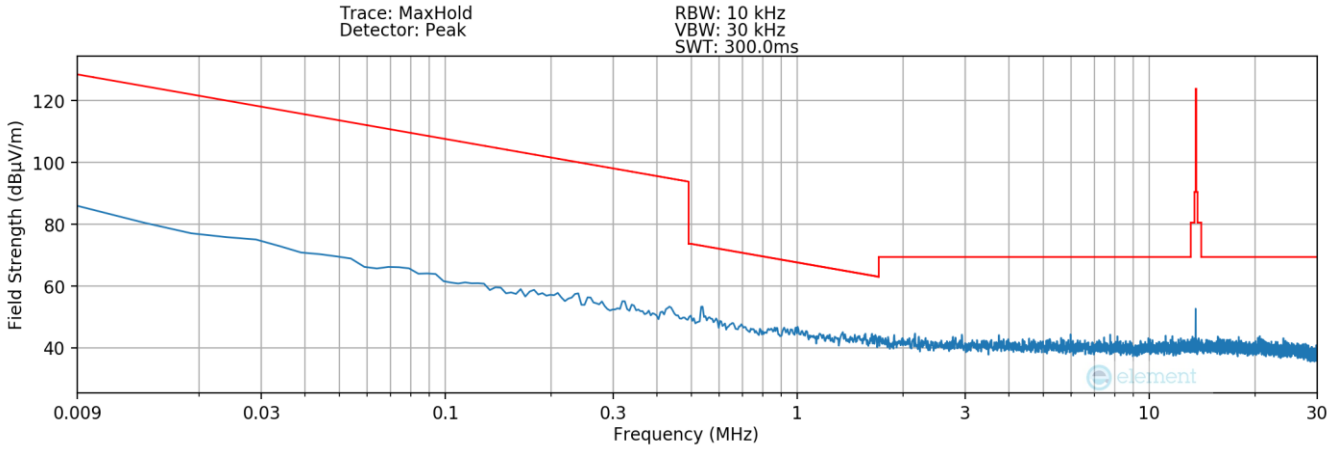
§15.209 §15.225(d); RSS-Gen (8.9)



Plot 7-1. Radiated Spurious Plot 9kHz – 30MHz (Pol. X)



Plot 7-2. Radiated Spurious Plot 9kHz – 30MHz (Pol. Y)



Plot 7-3. Radiated Spurious Plot 9kHz – 30MHz (Pol. Z)

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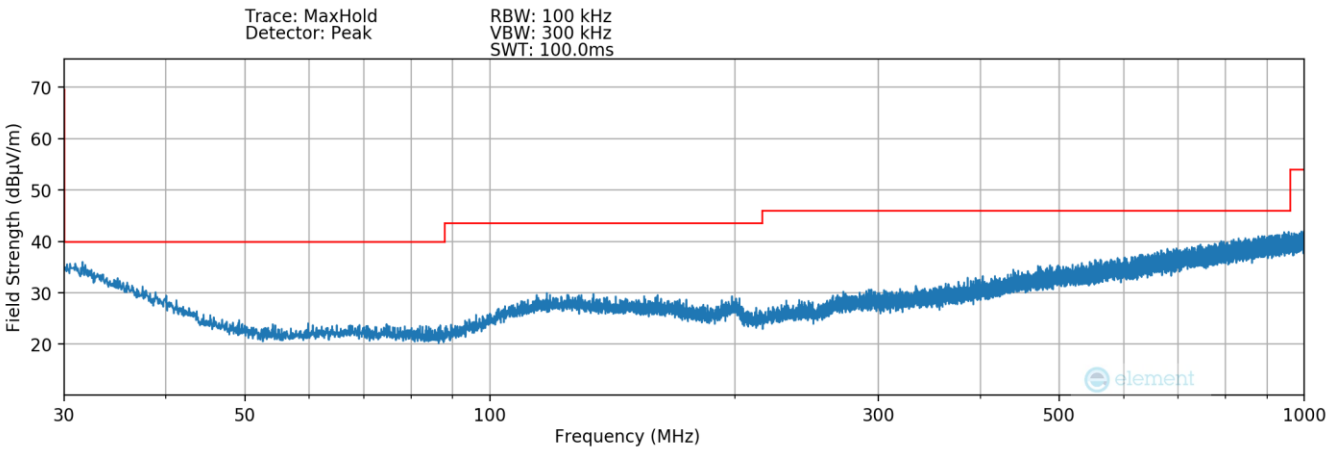
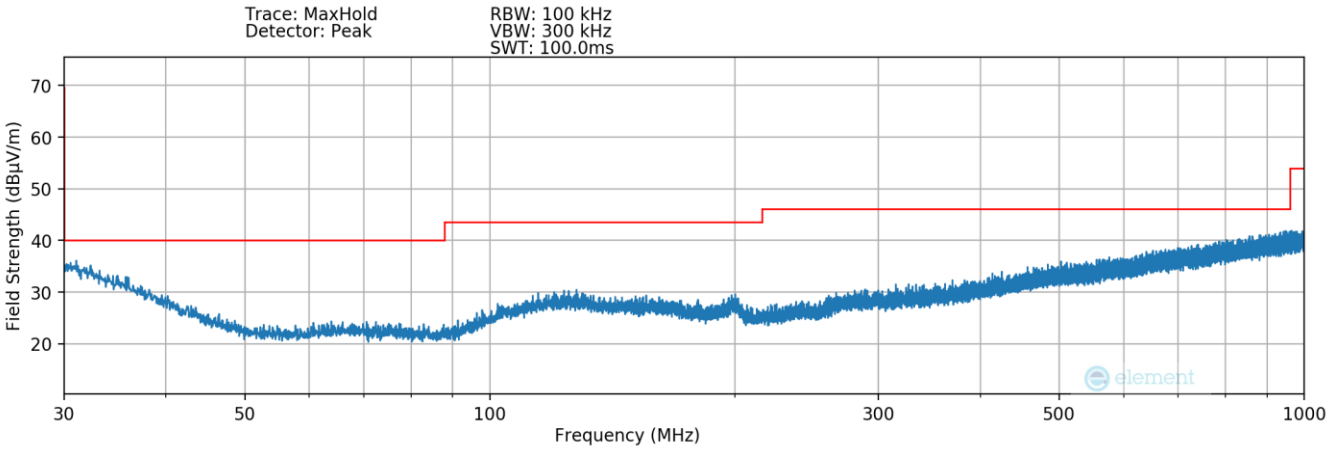


Plot 7-4. Radiated Spurious Plot 30MHz – 1GHz (Pol. H)



Plot 7-5. Radiated Spurious Plot 30MHz – 1GHz (Pol. V)

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Radiated Spurious Emission Measurements, Out-of-Band
§15.209 §15.225(d); RSS-Gen (8.9)

Tx Frequency 13.56MHz

Measurement Distance: 3 Meters

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
27.12	Y	100	19	-81.80	14.99	40.19	69.54	-29.35
40.68	V	-	-	-96.64	19.72	30.08	40.00	-9.92
54.24	V	-	-	-97.88	14.15	23.27	40.00	-16.73
67.80	V	203	29	-97.33	14.75	24.42	40.00	-15.58
81.36	V	-	-	-98.20	14.48	23.28	40.00	-16.72
94.92	V	-	-	-97.85	15.86	25.01	43.52	-18.51
108.48	V	-	-	-97.92	19.25	28.33	43.52	-15.20

Table 7-7. Radiated Measurements

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7.6 Line Conducted Measurement Data

§15.207; RSS-Gen (8.8)

Test Overview and Limit

All AC line conducted spurious emissions are measured with a receiver connected to a grounded LISN while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for conducted spurious emissions. Only the conducted emissions of the configuration that produced the worst case emissions are reported in this section.

All conducted emissions must not exceed the limits shown in the table below, per Section 15.207 and RSS-Gen (8.8).

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 – 5	56	46
5 – 30	60	50

Table 7-8. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.10-2013, Section 6.2

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

Average Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the spurious emission of interest
2. RBW = 9kHz (for emissions from 150kHz – 30MHz)
3. Detector = RMS
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

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Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

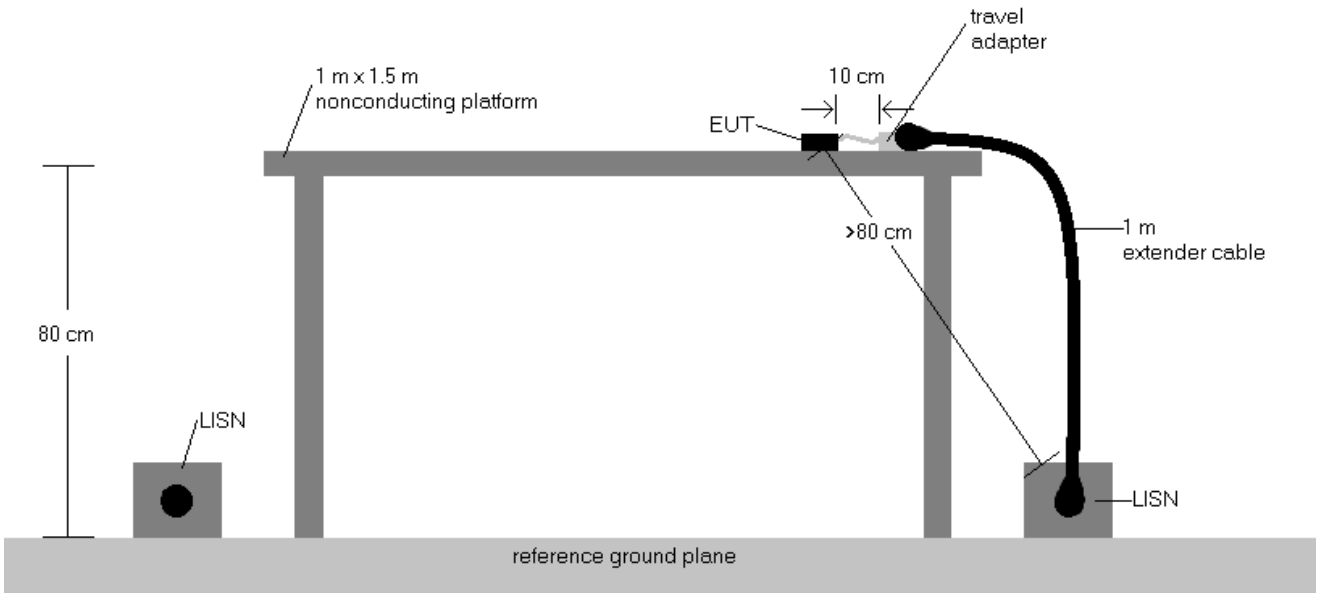

Figure 7-7. Test Instrument & Measurement Setup

Test Notes

1. All modes of operation were investigated and the worst-case emissions are reported using mid channel. The emissions found were not affected by the choice of channel used during testing.
2. The limit for an intentional radiator from 150kHz to 30MHz are specified in 15.207 and RSS-Gen (8.8).
3. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
4. QP/AV Level (dBμV) = QP/AV Analyzer/Receiver Level (dBμV) + Corr. (dB)
5. Margin (dB) = QP/AV Limit (dBμV) - QP/AV Level (dBμV)
6. Traces shown in plot are made using a peak detector.
7. Deviations to the Specifications: None.
8. EUT was tested with the antenna terminated.

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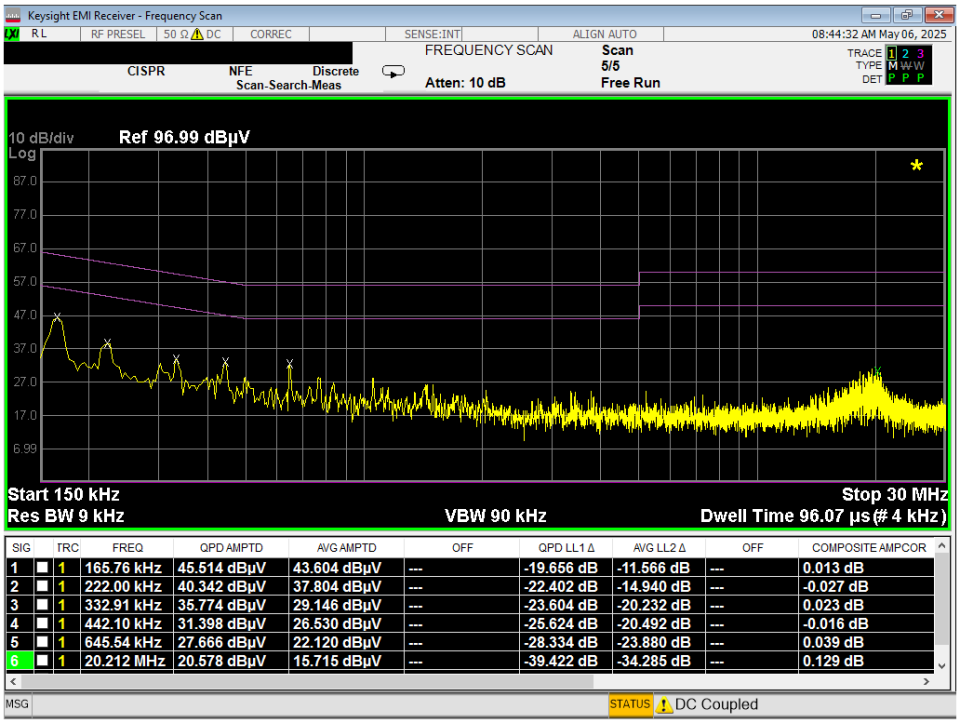
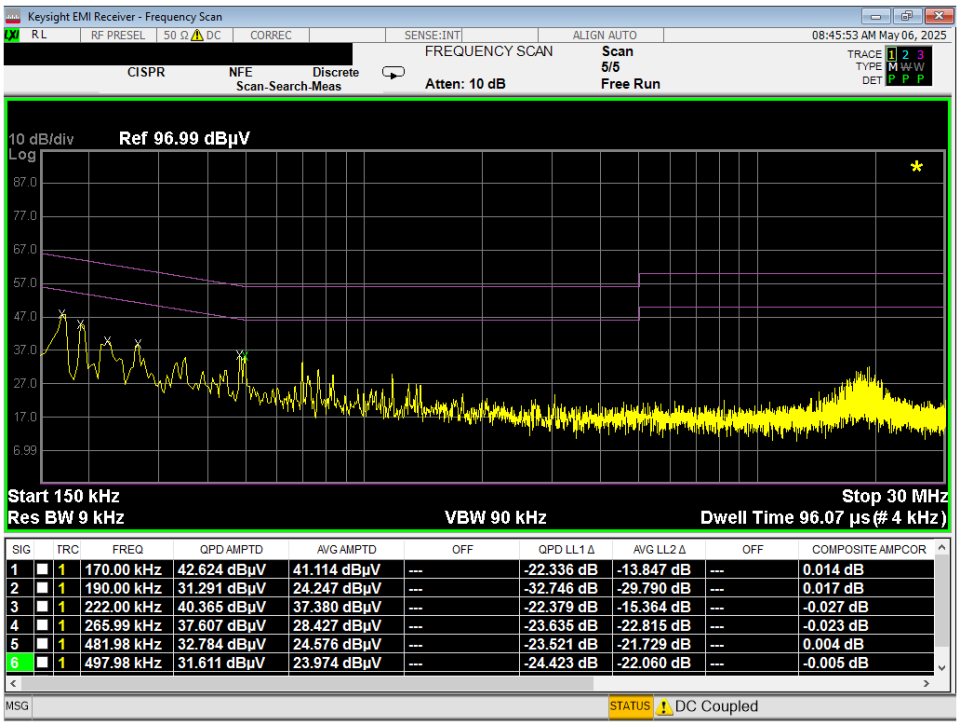


SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	COMPOSITE AMPCOR
1	1	165.76 kHz	45.514 dBµV	43.604 dBµV	---	-19.656 dB	-11.566 dB	---	0.013 dB
2	1	222.00 kHz	40.342 dBµV	37.804 dBµV	---	-22.402 dB	-14.940 dB	---	-0.027 dB
3	1	332.91 kHz	35.774 dBµV	29.146 dBµV	---	-23.604 dB	-20.232 dB	---	0.023 dB
4	1	442.10 kHz	31.398 dBµV	26.530 dBµV	---	-25.624 dB	-20.492 dB	---	-0.016 dB
5	1	645.54 kHz	27.666 dBµV	22.120 dBµV	---	-28.334 dB	-23.880 dB	---	0.039 dB
6	1	20.212 MHz	20.578 dBµV	15.715 dBµV	---	-39.422 dB	-34.285 dB	---	0.129 dB

Plot 7-6. Line-Conducted Test Plot (L1)



SIG	TRC	FREQ	QPD AMPTD	AVG AMPTD	OFF	QPD LL1 Δ	AVG LL2 Δ	OFF	COMPOSITE AMPCOR
1	1	170.00 kHz	42.624 dBµV	41.114 dBµV	---	-22.336 dB	-13.847 dB	---	0.014 dB
2	1	190.00 kHz	31.291 dBµV	24.247 dBµV	---	-32.746 dB	-29.790 dB	---	0.017 dB
3	1	222.00 kHz	40.365 dBµV	37.380 dBµV	---	-22.379 dB	-15.364 dB	---	-0.027 dB
4	1	265.99 kHz	37.607 dBµV	28.427 dBµV	---	-23.635 dB	-22.815 dB	---	-0.023 dB
5	1	481.98 kHz	32.784 dBµV	24.576 dBµV	---	-23.521 dB	-21.729 dB	---	0.004 dB
6	1	497.98 kHz	31.611 dBµV	23.974 dBµV	---	-24.423 dB	-22.060 dB	---	-0.005 dB

Plot 7-7. Line-Conducted Test Plot (N)

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8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF966B** has been tested to show compliance with Part 15 Subpart C (15.225) of the FCC Rules.

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9.0 APPENDIX A – DATA REFERENCING RESULTS

Overview

The spot-check data presented in this section was measured on the variant model following the guidance of the FCC's Data Referencing guidance in KDB 484596 v03. Each spot-check test on the EUT was performed using the same procedure and setting that were used to perform the test on the corresponding reference device. For the worst-case RSE data, the measurement is determined by an actual emission and not by noise floor.

All test cases were performed to verify the variant EUT is still in compliance with the spot-checked results to the reference device and was performed using the guidance of ANSI C63.10-2013.

Notes

1. Each spot check test on the EUT was performed using the same procedure and setting that were used to perform the test on the corresponding reference device.

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Radiated Spot-Checks – SM-F966B/DS

Frequency [MHz]	Ant. Pol. [X/Y/Z]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	30m Field Strength [dBµV/m]	Limit [µV/m]	Limit [dBµV/m]	Margin [dB]
13.560	Y	100	296	-76.43	21.91	52.48	12.48	15848.00	84.00	-71.52

Table 9-1. In-Band RSE Measurements (Spot-check)

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
67.80	V	304	357	-69.81	-15.07	22.12	40.00	-17.88

Table 9-2. RSE Measurements (Spot-check)

Results

FCC Rules	Test Item	Units	Limit	Reference Model: SM-F966U	Variant Model: SM-F966B	Deviation (dB)	Max Deviation (dB)	Pass/Fail
15.225(a)(b)(c)	In-Band Radiated Emissions	dBuV/m	84	14.78	12.48	-2.30	3	PASS
15.209	Radiated Spurious Emissions	dBuV/m	40	24.42	22.12	-2.30	3	PASS

Table 9-3. Summary of Spot-checks

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