



**MEASUREMENT REPORT  
FCC PART 15C**

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


**Date of Testing:**  
4/4-6/18/2018  
**Test Site/Location:**  
PCTEST Lab. Columbia, MD, USA  
**Test Report Serial No.:**  
1M1804130071-11.A3L

<b>FCC ID:</b>	<b>A3LSMN960KOR</b>
<b>APPLICANT:</b>	<b>Samsung Electronics Co., Ltd.</b>

**Application Type:** Certification  
**Model:** SM-N960N  
**EUT Type:** Portable Handset  
**Frequency Range:** 0.53 – 0.6MHz  
**FCC Classification:** Part 15 Low Power Transmitter Below 1705kHz (DCD)  
**FCC Rule Part(s):** Part 15 Subpart C  
**Test Procedure(s):** ANSI C63.10-2013

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.

  
Randy Ortanez  
President



<b>FCC ID:</b> A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 1 of 24	

# TABLE OF CONTENTS

1.0	Introduction .....	3
1.1	Scope.....	3
1.2	PCTEST Test Location .....	3
1.3	Test Facility / Accreditations .....	3
2.0	PRODUCT INFORMATION .....	4
2.1	Equipment Description.....	4
2.2	Device Capabilities .....	4
2.3	Test Configuration .....	4
2.4	EMI Suppression Device(s)/Modifications.....	4
3.0	DESCRIPTION OF TEST .....	5
3.1	Evaluation Procedure .....	5
3.2	AC Line Conducted Emissions .....	5
3.3	Radiated Emissions .....	6
3.4	Environmental Conditions .....	6
4.0	ANTENNA REQUIREMENTS.....	7
5.0	MEASUREMENT UNCERTAINTY .....	8
6.0	TEST EQUIPMENT CALIBRATION DATA.....	9
7.0	TEST DATA .....	10
7.1	Summary .....	10
7.2	Radiated Spurious Emission Measurements, Out-of-Band.....	11
7.3	Line Conducted Measurement Data .....	20
8.0	CONCLUSION .....	24

<b>FCC ID:</b> A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 2 of 24	

# 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 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility 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 PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.**

- PCTEST is an ISO 17025-2005 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.
- PCTEST 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).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

<b>FCC ID:</b> A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 3 of 24	

## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMN960KOR**. The test data contained in this report pertains only to the emissions generated by the IC of the EUT that transmits in various inductive coupling modes to the S-Pen as explained below in Section 2.3

**Test Device Serial No.:** 02501, 36074

### 2.2 Device Capabilities

This device contains the following capabilities:

850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 802.11b/g/n WLAN, 802.11a/n/ac UNII, Bluetooth (1x, EDR, LE), NFC, ANT+

### 2.3 Test Configuration

The EUT is used with a stylus device (S-PEN). The EUT operates with the S-PEN in three different inductive coupling modes of S-PEN motion detection (Modes 2 and 3) and charging (Mode 1) operating in the range of 0.53 – 0.6MHz. The EUT was set to continuously transmit to the S-PEN in each of the three modes. S-PEN charging mode is also applicable during the device wireless charging condition. Data is additionally included for this condition. 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 and radiated emissions test setups, respectively.

### 2.4 EMI Suppression Device(s)/Modifications

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

<b>FCC ID:</b> A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 4 of 24	

## 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 7.3. Automated test software was used to perform the AC line conducted emissions testing.

FCC ID: A3LSMN960KOR	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 5 of 24

### 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).

FCC ID: A3LSMN960KOR	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 6 of 24

## 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.

FCC ID: A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 7 of 24	

## 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 ( $\pm$ dB)
Line Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98

FCC ID: A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>		<b>Approved by:</b> Quality Manager
<b>Test Report S/N:</b> 1M1804130071-11.A3L	<b>Test Dates:</b> 4/4-6/18/2018	<b>EUT Type:</b> Portable Handset	Page 8 of 24	



## 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
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	6/21/2017	Annual	6/21/2018	RE1
Com-Power	AL-130	9kHz - 30MHz Loop Antenna	10/10/2017	Biennial	10/10/2019	121034
ETS-Lindgren	3816/2NM	Line Impedance Stabilization Network	12/27/2016	Biennial	12/27/2018	114451
Pasternack	NMLC-1	Line Conducted Emissions Cable (NM)	5/31/2017	Annual	5/31/2018	NMLC-1
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/19/2017	Annual	6/19/2018	100342
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	12/28/2016	Biennial	12/28/2018	N/A

**Table 6-1. Annual Test Equipment Calibration Schedule**

**Notes:**

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.

FCC ID: A3LSMN960KOR	 <b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 9 of 24	

## 7.0 TEST DATA

### 7.1 Summary

Company Name: Samsung Electronics Co., Ltd.  
 FCC ID: A3LSMN960KOR  
 FCC Classification: Part 15 Low Power Transmitter Below 1705kHz (DCD)  
 Frequency Range: 0.53 – 0.6MHz

FCC Part Section(s)	RSS Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
15.209	RSS-Gen [8.9]	Out-of-Band Emissions	Emissions must meet the radiated limits detailed in 15.209 (RSS-Gen [8.9])	Radiated	PASS	Section 7.2
15.207	RSS-Gen [8.8]	AC Conducted Emissions 150kHz – 30MHz	< FCC 15.207 limits (RSS-Gen)	LINE CONDUCTED	PASS	Section 7.3

**Table 7-1. Summary of Test Results**

**Note:**

This unit was tested while operating in all three inductive coupling modes.

FCC ID: A3LSMN960KOR			MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 10 of 24		

## 7.2 Radiated Spurious Emission Measurements, Out-of-Band

§15.209; RSS-Gen (8.9)

### Test Overview and Limit

The EUT was tested from 9kHz up to the 30MHz. All measurements up to 30MHz were recorded with a spectrum analyzer employing a quasi-peak detector.

*All out-of-band emissions must not exceed the limits shown in Table 7-2 per Section 15.209.*

Frequency	Field Strength [ $\mu\text{V/m}$ ]	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 7-2. Radiated Limits – Out of band**

### Test Procedures Used

ANSI C63.10-2013 – Section 6.5.4

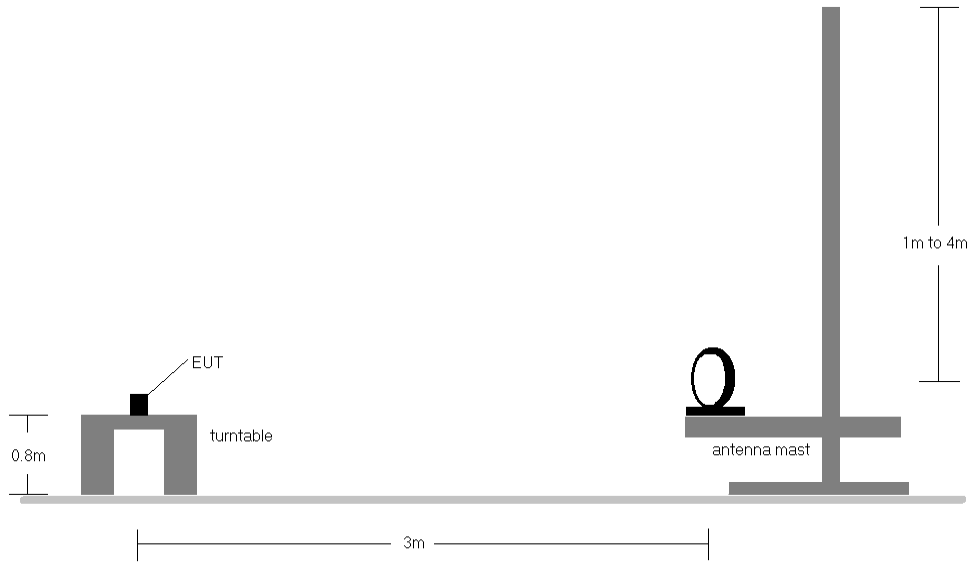
### Test Settings

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

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 11 of 24	

**Test Setup**

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



**Figure 7-1. Radiated Test Setup**

**Test Notes:**

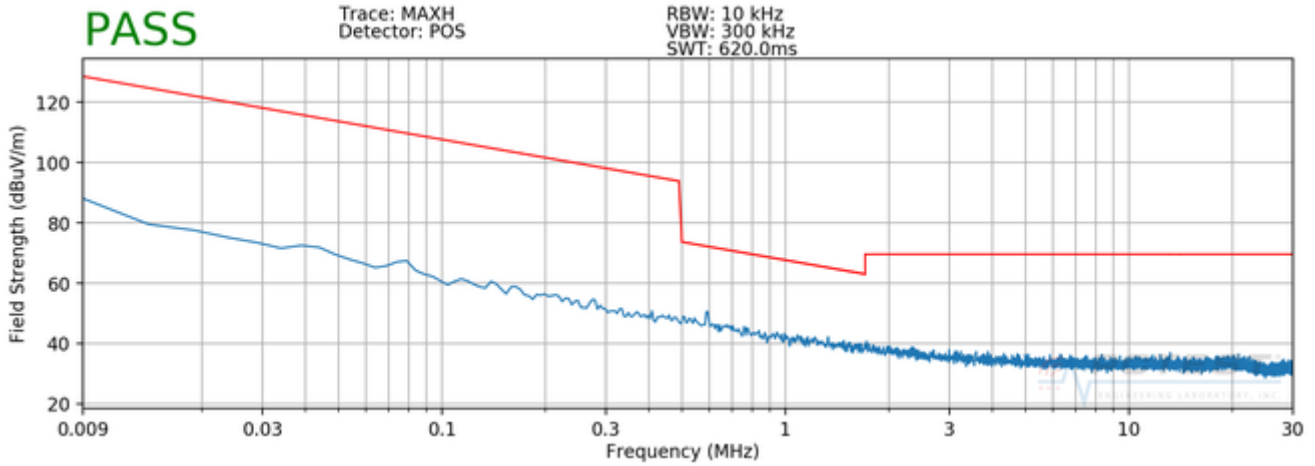
1. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector for emissions below 30MHz.
2. A loop antenna was used to investigate emissions below 30MHz.
3. Below 30MHz the loop antenna was positioned in 3 orthogonal planes (X front, Y side, Z top) to determine the orientation resulting in the worst case emissions.
4. The EUT was positioned in three orthogonal planes to determine the orientation resulting in the worst case emissions.
5. The spectrum is investigated from 9kHz up to 30MHz per §15.33. The worst-case emissions are reported.
6. No spurious emissions levels were found to be greater than the level of the fundamental.
7. The "-" shown in the following RSE tables are used to denote a noise floor measurement.

**Sample Calculation**

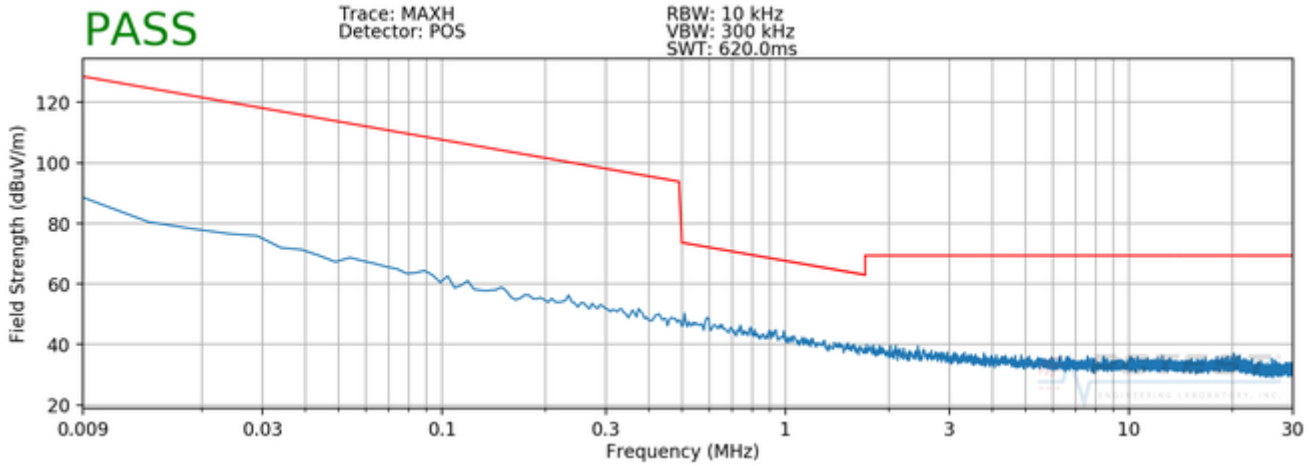
- o Field Strength Level [dB $\mu$ V/m] = Analyzer Level [dBm] + 107 + AFCL [dB/m]
- o AFCL [dB/m] = Antenna Factor [dB/m] + Cable Loss [dB]
- o Margin [dB] = Field Strength Level [dB $\mu$ V/m] – Limit [dB $\mu$ V/m]

FCC ID: A3LSMN960KOR	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 12 of 24

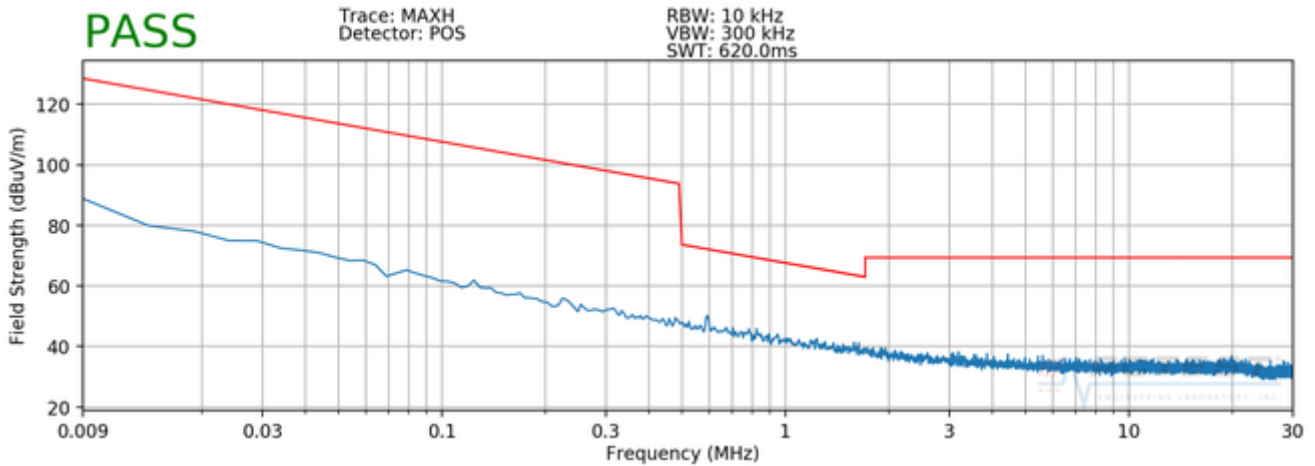
**Radiated Spurious Emission Measurements, Out-of-Band**  
**§15.209; RSS-Gen (8.9)**



**Plot 7-1. Inductive Coupling Mode #1 Radiated Spurious Plot 9kHz – 30MHz (Pol. X)**



**Plot 7-2. Inductive Coupling Mode #1 Radiated Spurious Plot 9kHz – 30MHz (Pol. Y)**



**Plot 7-3. Inductive Coupling Mode #1 Radiated Spurious Plot 9kHz – 30MHz (Pol. Z)**

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 13 of 24

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

Tx Frequency 594kHz

Measurement Distance: 3 Meters

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dB $\mu$ V/m]	Distance Correction Factor [dB]	Corrected Field Strength [dB $\mu$ V/m]	Limit [ $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
0.594	X	100	150	-68.37	14.33	52.96	-40.00	12.96	40.40	32.13	-19.17
1.188	X	-	-	-76.42	14.59	45.17	-40.00	5.17	20.20	26.11	-20.93
1.782	X	-	-	-80.02	14.72	41.70	-40.00	1.70	30.00	29.54	-27.85
2.376	X	-	-	-82.98	14.75	38.77	-40.00	-1.23	30.00	29.54	-30.78
2.970	X	-	-	-82.70	14.74	39.04	-40.00	-0.96	30.00	29.54	-30.50
3.564	X	-	-	-84.76	14.81	37.05	-40.00	-2.95	30.00	29.54	-32.49
4.158	X	-	-	-86.88	14.84	34.96	-40.00	-5.04	30.00	29.54	-34.58
4.752	X	-	-	-88.04	14.79	33.75	-40.00	-6.25	30.00	29.54	-35.79

Table 7-3. Inductive Coupling Mode #1 Radiated Measurements

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 14 of 24	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dB $\mu$ V/m]	Distance Correction Factor [dB]	Corrected Field Strength [dB $\mu$ V/m]	Limit [ $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
0.594	X	100	117	-62.02	14.33	59.31	-40.00	19.31	40.40	32.13	-12.82
1.188	X	100	138	-74.03	14.59	47.56	-40.00	7.56	20.20	26.11	-18.54
1.782	X	100	152	-77.03	14.72	44.69	-40.00	4.69	30.00	29.54	-24.86
2.376	X	100	5	-82.35	14.75	39.40	-40.00	-0.60	30.00	29.54	-30.15
2.970	X	100	145	-82.33	14.74	39.41	-40.00	-0.59	30.00	29.54	-30.13
3.564	X	-	-	-84.56	14.81	37.25	-40.00	-2.75	30.00	29.54	-32.29
4.158	X	-	-	-86.05	14.84	35.79	-40.00	-4.21	30.00	29.54	-33.75
4.752	X	-	-	-87.32	14.79	34.47	-40.00	-5.53	30.00	29.54	-35.07

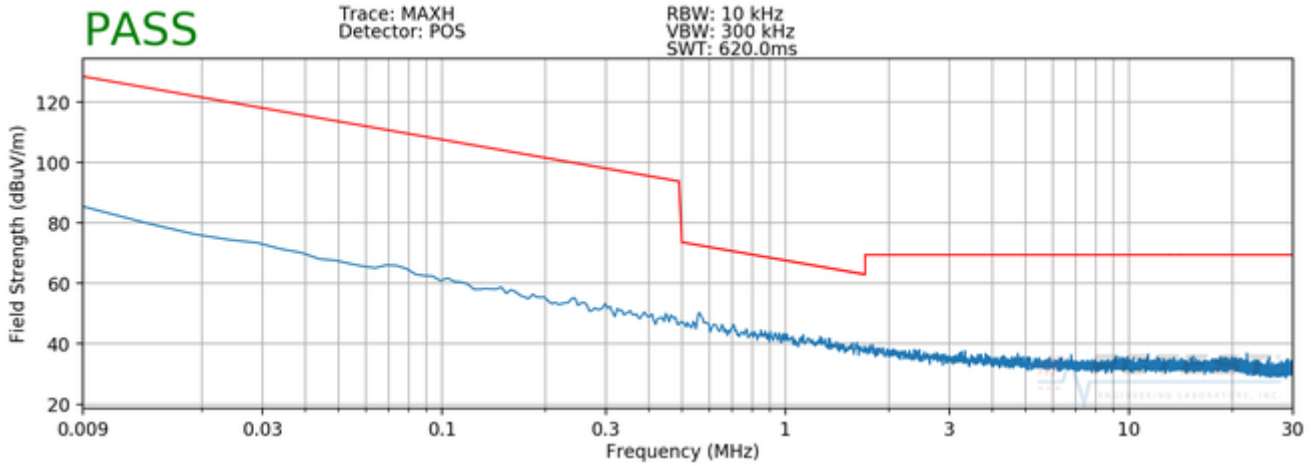
**Table 7-4. Inductive Coupling Mode #1 Radiated Measurements with Wireless Charging Pad**

**Note:**

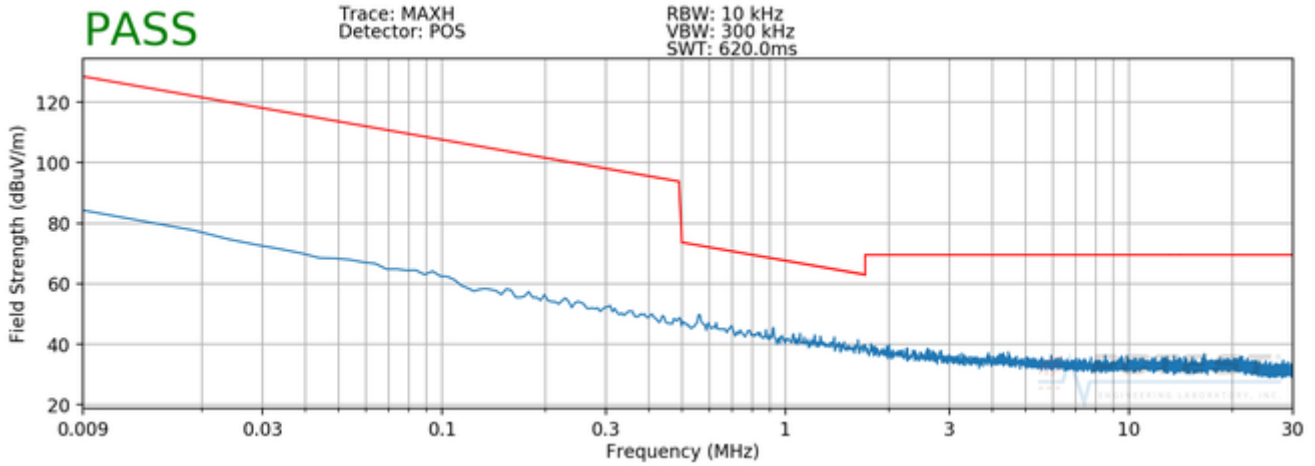
The EUT was placed on the wireless charging pad while operating under normal conditions.

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 15 of 24	

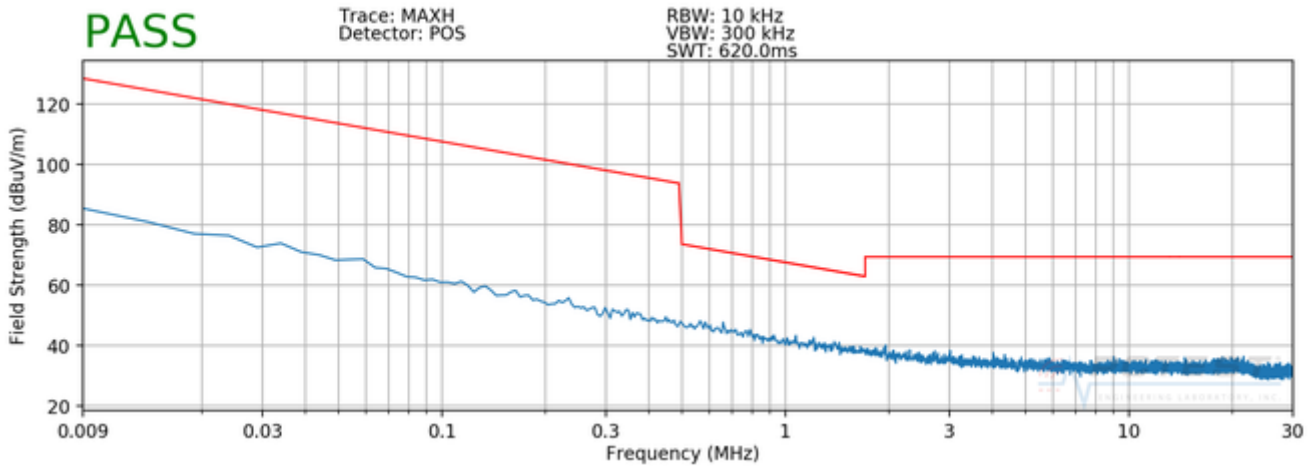
**Radiated Spurious Emission Measurements, Out-of-Band**  
**§15.209; RSS-Gen (8.9)**



**Plot 7-4. Inductive Coupling Mode #2 Radiated Spurious Plot 9kHz – 30MHz (Pol. X)**



**Plot 7-5. Inductive Coupling Mode #2 Radiated Spurious Plot 9kHz – 30MHz (Pol. Y)**



**Plot 7-6. Inductive Coupling Mode #2 Radiated Spurious Plot 9kHz – 30MHz (Pol. Z)**

FCC ID: A3LSMN960KOR	PCTEST ENGINEERING LABORATORY, INC.	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 16 of 24



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

Tx Frequency 531kHz

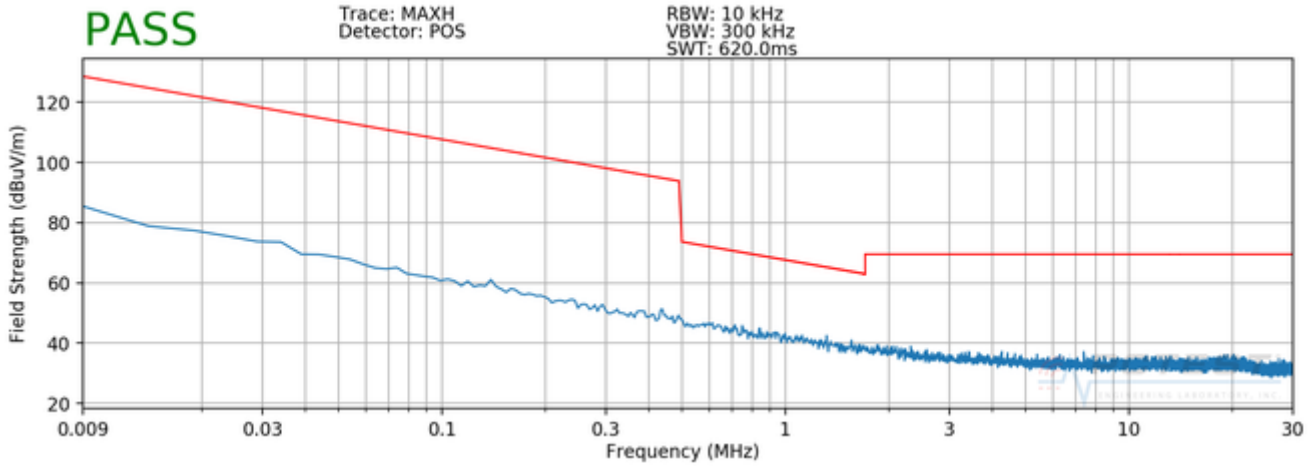
Measurement Distance: 3 Meters

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level [dBm]	AFCL [dB/m]	3m Field Strength [dBµV/m]	Distance Correction Factor	30m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
0.531	X	100	220	-66.14	14.33	55.19	-40.00	15.19	33.10	-17.91
1.062	X	-	-	-76.44	14.56	45.12	-40.00	5.12	27.08	-21.96
1.593	X	-	-	-77.86	14.68	43.82	-40.00	3.82	23.56	-19.74
2.124	X	-	-	-81.88	14.75	39.87	-40.00	-0.13	29.54	-29.67
2.655	X	-	-	-83.53	14.74	38.21	-40.00	-1.79	29.54	-31.33
3.185	X	-	-	-84.26	14.76	37.50	-40.00	-2.50	29.54	-32.04
3.716	X	-	-	-86.66	14.83	35.17	-40.00	-4.83	29.54	-34.37
4.247	X	-	-	-88.47	14.84	33.37	-40.00	-6.63	29.54	-36.18

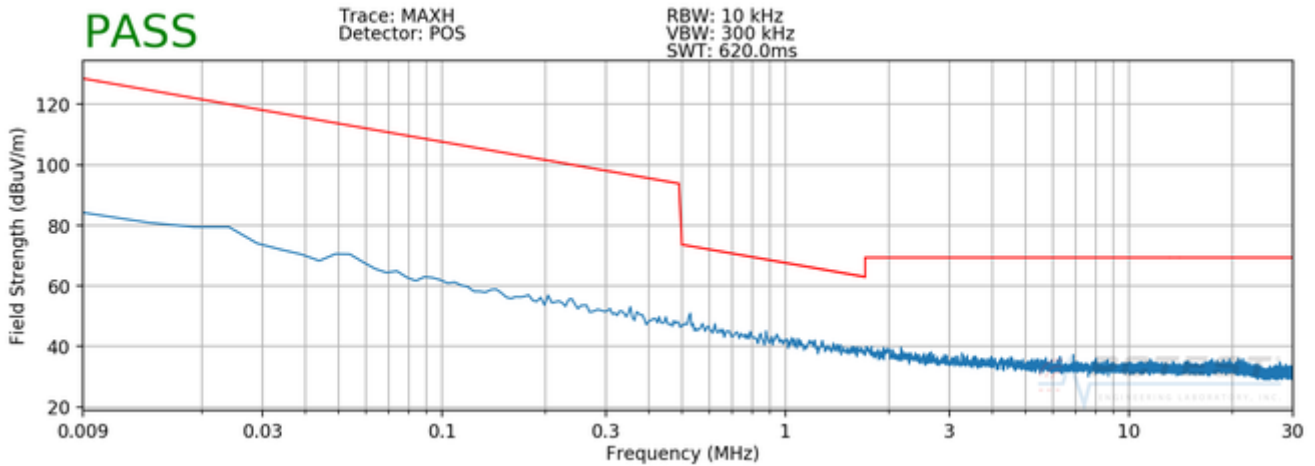
**Table 7-5. Inductive Coupling Mode #2 Radiated Measurements**

FCC ID: A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 17 of 24	

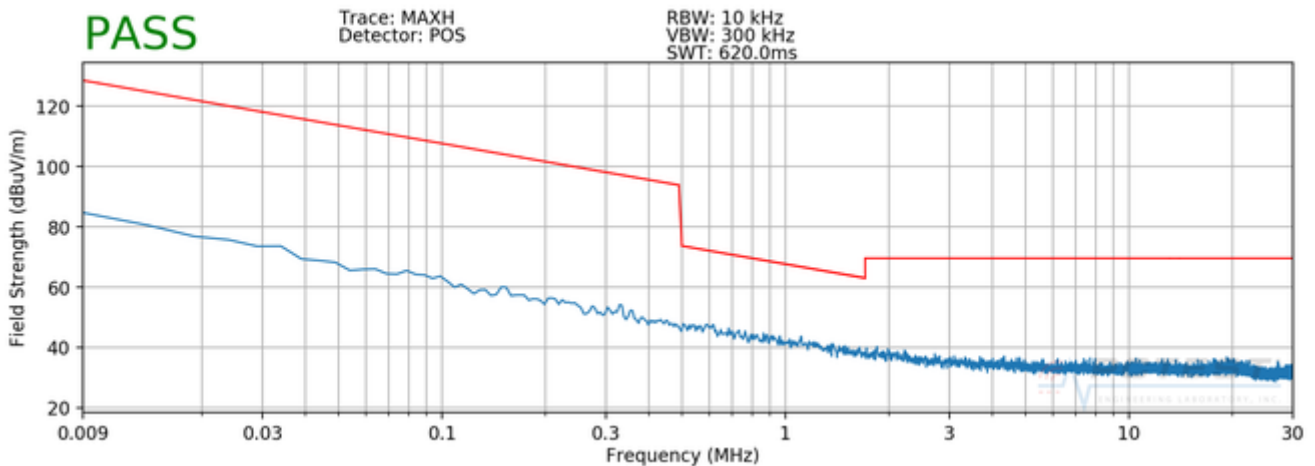
**Radiated Spurious Emission Measurements, Out-of-Band**  
**§15.209; RSS-Gen (8.9)**



**Plot 7-7. Inductive Coupling Mode #3 Radiated Spurious Plot 9kHz – 30MHz (Pol. X)**



**Plot 7-8. Inductive Coupling Mode #3 Spurious Plot 9kHz – 30MHz (Pol. Y)**



**Plot 7-9. Inductive Coupling Mode #3 Radiated Spurious Plot 9kHz – 30MHz (Pol. Z)**

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 18 of 24

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

Tx Frequency 563kHz

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]	Distance Correction Factor	30m Field Strength [dBµV/m]	Limit [dBµV/m]	Margin [dB]
0.563	X	100	312	-58.92	14.33	62.41	-40.00	22.41	32.60	-10.18
1.126	X	-	-	-76.12	14.58	45.46	-40.00	5.46	26.57	-21.12
1.689	X	-	-	-81.58	14.70	40.12	-40.00	0.12	23.05	-22.93
2.252	X	-	-	-83.22	14.75	38.53	-40.00	-1.47	29.54	-31.01
2.815	X	-	-	-85.01	14.74	36.73	-40.00	-3.27	29.54	-32.81
3.377	X	-	-	-85.87	14.79	35.92	-40.00	-4.08	29.54	-33.62
3.940	X	-	-	-85.82	14.85	36.03	-40.00	-3.97	29.54	-33.51
4.503	X	-	-	-88.00	14.81	33.81	-40.00	-6.19	29.54	-35.73

**Table 7-6. Inductive Coupling Mode #3 Radiated Measurements**

FCC ID: A3LSMN960KOR		<b>MEASUREMENT REPORT (CERTIFICATION)</b>			Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 19 of 24	

### 7.3 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 7-7. 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

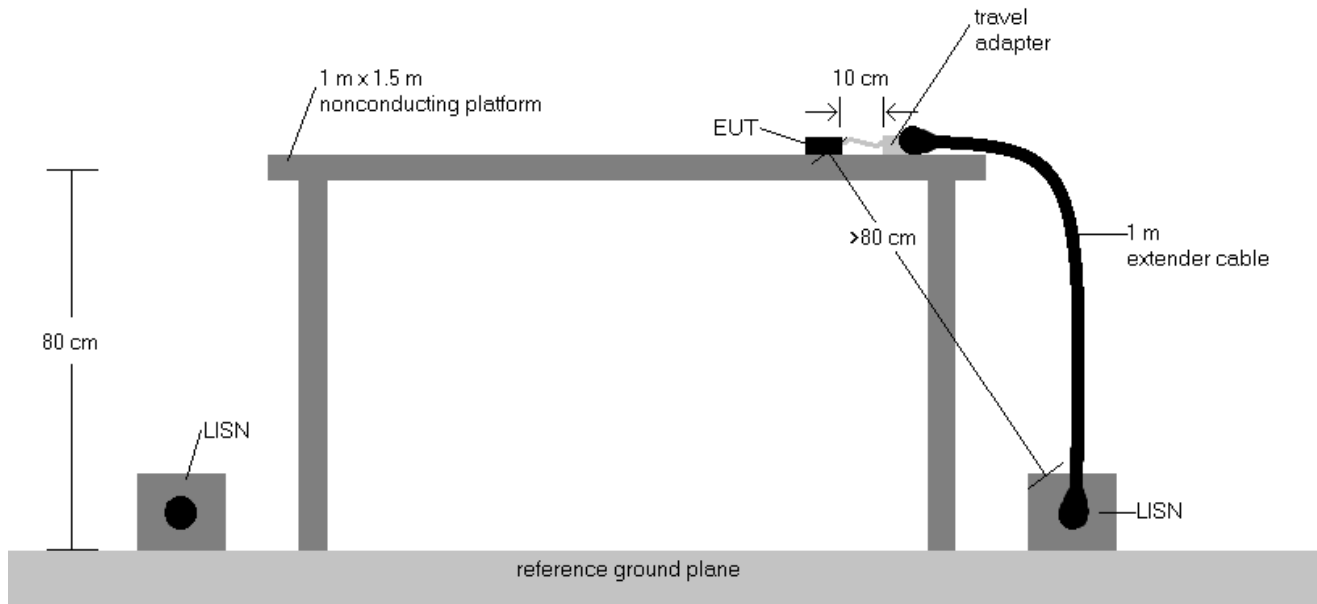
##### Average Field Strength Measurements

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

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 20 of 24	

### Test Setup

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

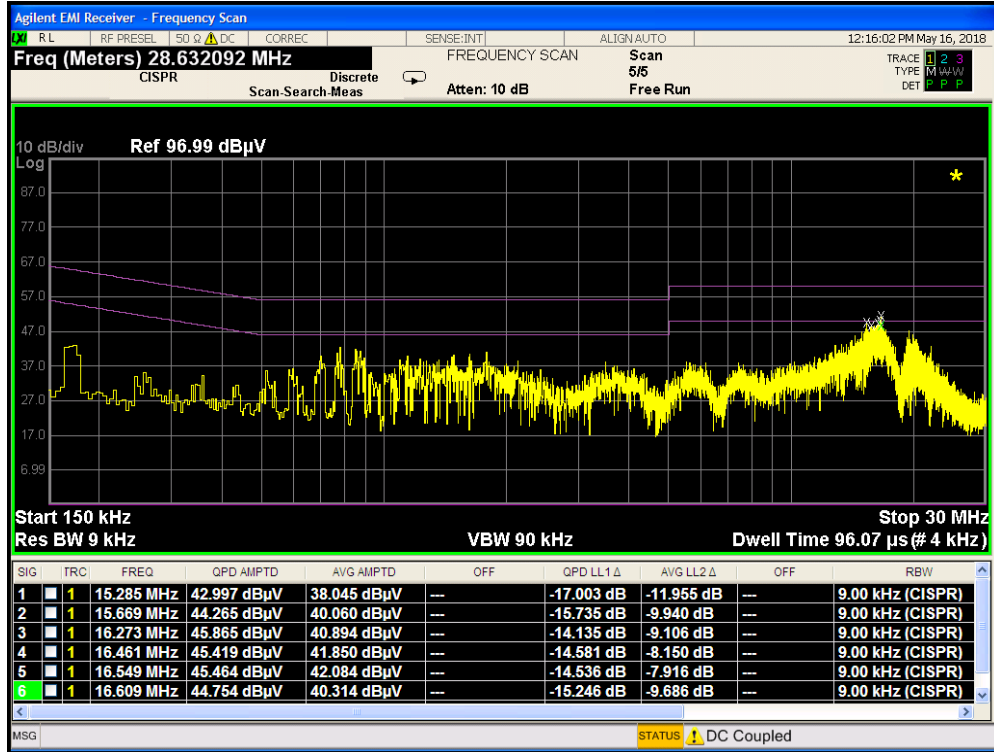


**Figure 7-2. Test Instrument & Measurement Setup**

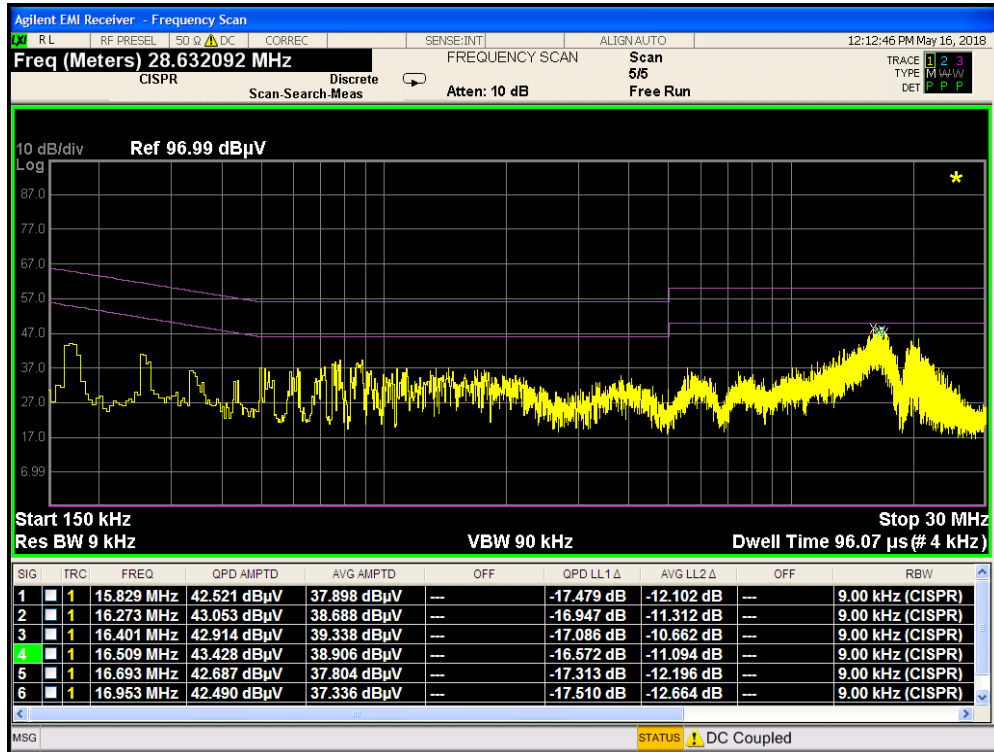
### Test Notes

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.  $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
4.  $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Analyzer/Receiver Level (dB}\mu\text{V)} + \text{Corr. (dB)}$
5.  $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
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.

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 21 of 24

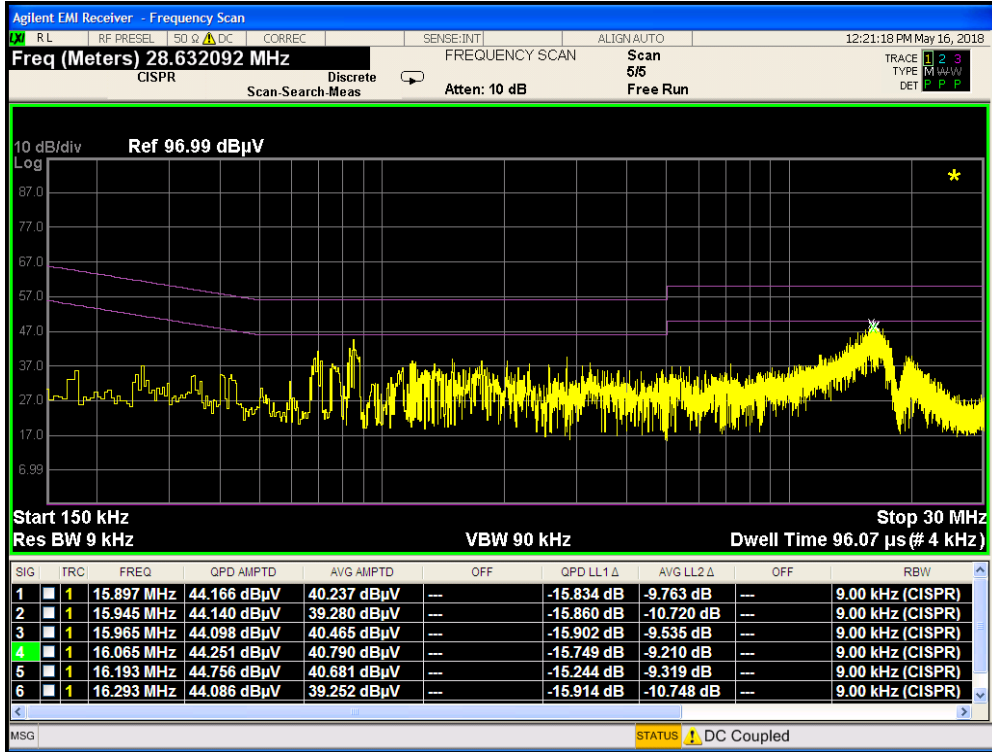


Plot 7-10. Line-Conducted Test Plot with Travel Adapter (L1)

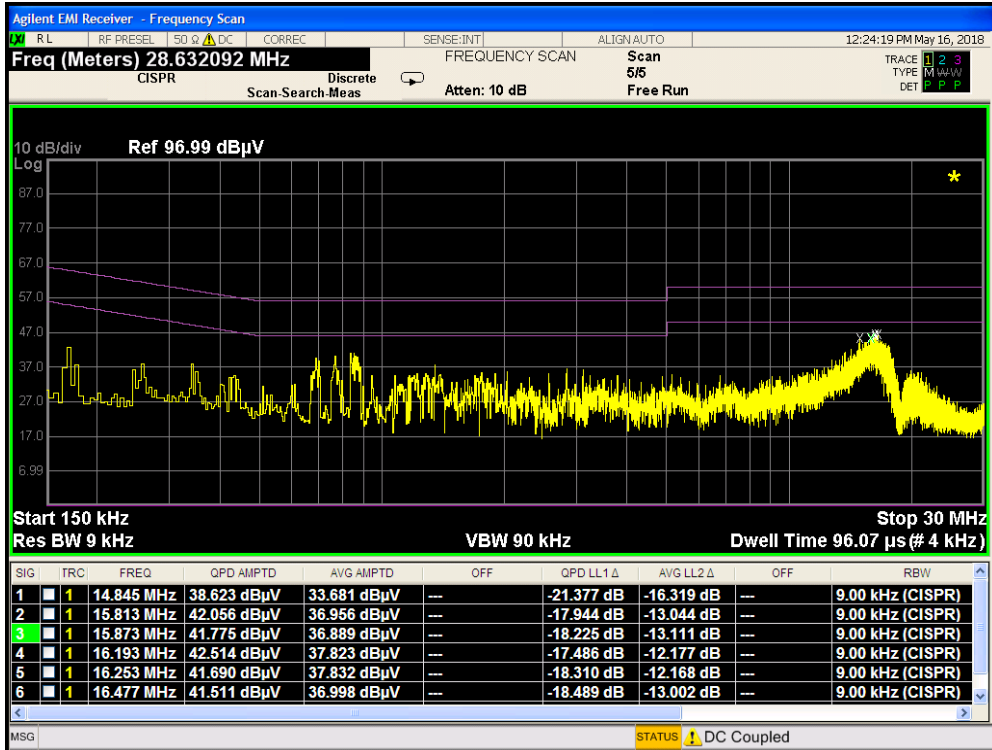


Plot 7-11. Line-Conducted Test Plot with Travel Adapter (N)

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 22 of 24



Plot 7-12. Line-Conducted Test Plot with Wireless Charging Pad (L1)



Plot 7-13. Line-Conducted Test Plot with Wireless Charging Pad (N)

FCC ID: A3LSMN960KOR		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset		Page 23 of 24

## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMN960KOR** has been verified to comply with the requirements specified in Part 15 (§15.207 and §15.209) of the FCC Rules

FCC ID: A3LSMN960KOR	 <b>MEASUREMENT REPORT (CERTIFICATION)</b> 		Approved by: Quality Manager
Test Report S/N: 1M1804130071-11.A3L	Test Dates: 4/4-6/18/2018	EUT Type: Portable Handset	Page 24 of 24