



Part 27 MEASUREMENT REPORT

Applicant Name:

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

Date of Testing:

7/12 – 7/22/2021

Test Site/Location:

PCTEST Lab. Columbia, MD, USA

Test Report Serial No.:

1M2106280075-03.A3L

FCC ID:

A3LSMF926B

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Class II Permissive Change

Model:

SM-F926B

Additional Model(s):

SM-F926B/DS

EUT Type:

Portable Handset

FCC Classification:

PCS Licensed Transmitter Held to Ear (PCE)

FCC Rule Part:

27

Test Procedure(s):

ANSI C63.26-2015, ANSI/TIA-603-E-2016, KDB 971168 D01 v03r01,
KDB 648474 D03 v01r04

Class II Permissive Change:

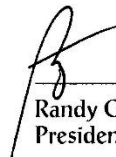
Please see FCC change document

Original Grant Date:

07/15/2021

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 §2.947. 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





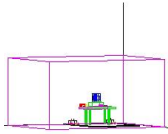

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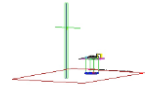
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RSS-130 / RSS-139



Mode	Bandwidth	Modulation	Tx Frequency Range [MHz]	ERP		EIRP	
				Max. Power [W]	Max. Power [dBm]	Max. Power [W]	Max. Power [dBm]
LTE Band 12/17	10 MHz	QPSK	704.0 - 711.0	0.048	16.79	0.078	18.94
		16QAM	704.0 - 711.0	0.037	15.63	0.060	17.78
	5 MHz	QPSK	701.5 - 713.5	0.047	16.73	0.077	18.88
		16QAM	701.5 - 713.5	0.037	15.64	0.060	17.79
LTE Band 12	3 MHz	QPSK	700.5 - 714.5	0.045	16.58	0.075	18.73
		16QAM	700.5 - 714.5	0.035	15.43	0.057	17.58
	1.4 MHz	QPSK	699.7 - 715.3	0.046	16.64	0.076	18.79
		16QAM	699.7 - 715.3	0.036	15.52	0.065	18.12
LTE Band 13	10 MHz	QPSK	782.0	0.079	19.00	0.130	21.15
		16QAM	782.0	0.064	18.03	0.104	20.18
	5 MHz	QPSK	779.5 - 784.5	0.085	19.31	0.140	21.46
		16QAM	779.5 - 784.5	0.068	18.30	0.111	20.45

Overview Table (<1GHz Bands)

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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 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 17025-2017 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.
- 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 ISSED Standards (RSS).
- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISSED.

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2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF926B**. The test data contained in this report pertains only to the emissions due to the EUT's licensed transmitters that operate under the provisions of Part 27.

Test Device Serial No.: 0429M, 0405M

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration



The EUT was tested per the guidance of ANSI/TIA-603-E-2016 and KDB 971168 D01 v03r01. See Section TEST RESULTS of this test report for a description of the radiated and antenna port conducted emissions tests.

This device supports two configurations: one is with screen open and one is with screen closed. Both configurations are tested, and the worst case radiated emissions data is shown in this report.

This device supports two additional antenna configurations for LTE Low bands [AFS operation]: open is with two antennas transmitting from one feed (AntA + AntB), and one is with a singular antenna transmitting (AntA). Both configurations are tested, and the worst case radiated emissions data is shown in this report.

2.4 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 TESTS

3.1 Evaluation Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-E-2016) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v03r01) were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious 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. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

The equipment under test was transmitting while connected to its integral antenna and is placed on a wooden turntable 80cm above the ground plane and 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v03r01.



Per the guidance of ANSI/TIA-603-E-2016, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d [\text{dBm}] = P_g [\text{dBm}] - \text{cable loss} [\text{dB}] + \text{antenna gain} [\text{dBd/dBi}]$$

Where, P_d is the dipole equivalent power, P_g is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to $P_g [\text{dBm}] - \text{cable loss} [\text{dB}]$.

For fundamental radiated power measurements, the guidance of KDB 971168 D01 v03r01 is used to record the EUT power level that is subsequently matched via the aforementioned substitution method given in ANSI/TIA-603-E-2016.



All radiated measurements are performed in a chamber that meets the site requirements per ANSI C63.4-2014. Additionally, radiated emissions below 30MHz are also validated on an Open Area Test Site to assert correlation with the chamber measurements per the requirements of KDB 474788 D01.

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4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. 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)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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5.0 TEST EQUIPMENT CALIBRATION DATA



Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurement 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
-	AP2	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	AP2
-	ETS	EMC Cable and Switch System	3/4/2021	Annual	3/4/2022	ETS
-	LTx4	Licensed Transmitter Cable Set	3/12/2021	Annual	3/12/2022	LTx4
-	LTx5	Licensed Transmitter Cable Set	3/3/2021	Annual	3/3/2022	LTx5
Anritsu	MT8821C	Radio Communication Analyzer	N/A			6201381794
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	4/20/2021	Biennial	4/20/2023	00125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	3/12/2020	Biennial	3/12/2022	128337
Keysight Technologies	N9030A	PXA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Keysight Technologies	N9030A	PXA Signal Analyzer	10/16/2020	Annual	10/16/2021	MY54490576
Rohde & Schwarz	CMW500	Radio Communication Tester	N/A			112347
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	9/9/2020	Annual	9/9/2021	100348
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	1/21/2021	Annual	1/21/2022	101716
Sunol	JB6	LB6 Antenna	11/13/2020	Biennial	11/13/2022	A082816

Table 5-1. Test Equipment

Notes:

Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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6.0 SAMPLE CALCULATIONS

Emission Designator

$\pi/2$ -BPSK Modulation

Emission Designator = 8M52G7D

NR BW = 8.52 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QPSK Modulation

Emission Designator = 8M62G7D

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 8M45W7D

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated



7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

Spurious Radiated Emission – LTE Band

Example: Middle Channel LTE Mode 2nd Harmonic (1564 MHz)

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So, 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.50 dBm so this harmonic was 25.50 dBm - (-24.80) = 50.30 dBc.

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7.0 TEST RESULTS

7.1 Summary



Company Name: Samsung Electronics Co., Ltd.
 FCC ID: A3LSMF926B
 FCC Classification: PCS Licensed Transmitter Held to Ear (PCE)
 Mode(s): LTE

Test Condition	Test Description	FCC Part Section(s)	Test Limit	Test Result	Reference
RADIATED	Effective Radiated Power (LTE Band 13)	27.50(b)(10)	≤ 3 Watts max. ERP	PASS	Section 7.2
	Effective Radiated Power (LTE Band 12)	27.50(c)(10)	≤ 3 Watts max. ERP	PASS	Section 7.2
	Radiated Spurious Emissions (LTE Band 13)	2.1053, 27.53(c), 27.53(f)	Undesirable emissions must meet the limits detailed in sections 27.53(c) and 27.53(f)	PASS	Section 7.3
	Radiated Spurious Emissions (LTE Band 12)	2.1053, 27.53(g)	$\geq 43 + 10 \log (P[\text{Watts}])$ dB of attenuation below transmitter power	PASS	Section 7.3

Table 7-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in Section 7.0 were taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables, directional couplers, and attenuators used as part of the system to maintain a link between the call box and the EUT at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.
- 4) For conducted spurious emissions, automated test software was used to measure emissions and capture the corresponding plots necessary to show compliance. The measurement software utilized is PCTEST 2G/3G Automation Version 4.2

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7.2 Radiated Power (ERP/EIRP)

Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at maximum power, and at the appropriate frequencies.



Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.2.1

ANSI/TIA-603-E-2016 – Section 2.2.17

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $\geq 2 \times$ span / RBW
6. Detector = RMS
7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
9. Trace mode = trace averaging (RMS) over 100 sweeps
10. The 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.

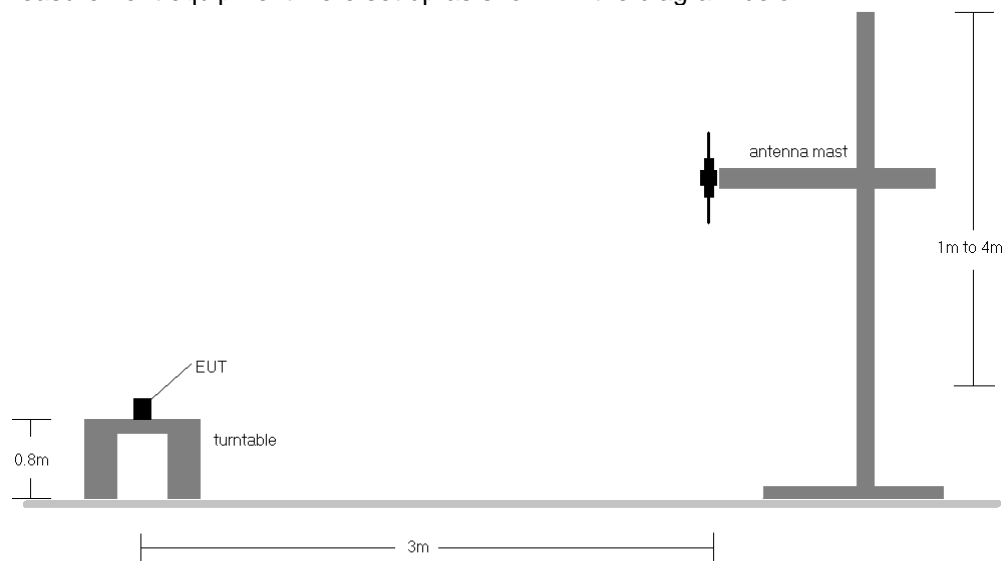


Figure 7-1. Radiated Test Setup <1GHz

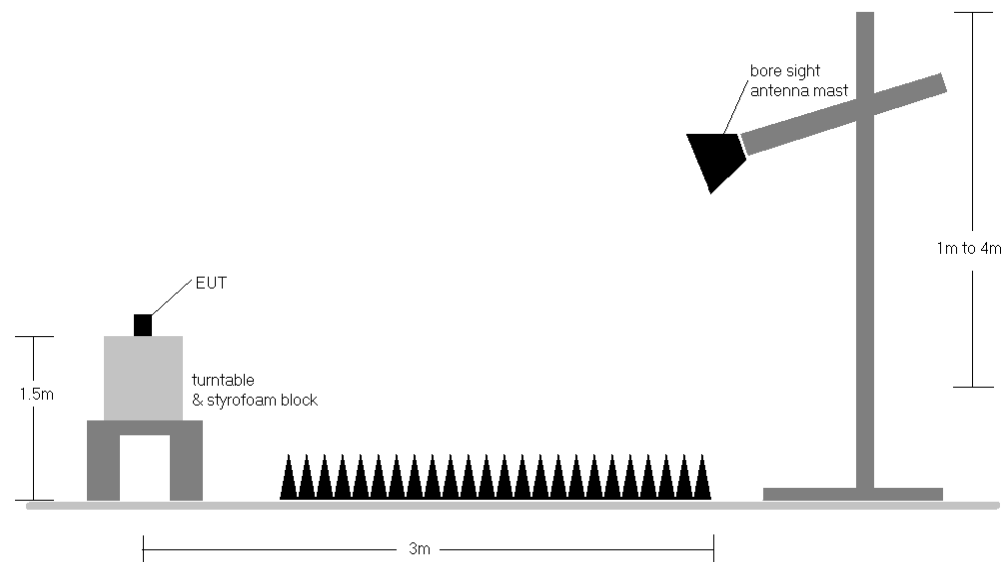




Figure 7-2. Radiated Test Setup >1GHz

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Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

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Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	H	306	323	3.48	1 / 49	14.07	17.55	0.057	36.99	-19.44	15.40	0.035	34.77	-19.37
		707.5	H	283	326	3.52	1 / 49	15.42	18.94	0.078	36.99	-18.05	16.79	0.048	34.77	-17.98
		711.0	H	281	325	3.57	1 / 49	13.62	17.19	0.052	36.99	-19.80	15.04	0.032	34.77	-19.73
	16-QAM	704.0	H	306	323	3.48	1 / 49	14.30	17.78	0.060	36.99	-19.21	15.63	0.037	34.77	-19.14
5 MHz	QPSK	701.5	H	306	323	3.45	1 / 12	13.98	17.43	0.055	36.99	-19.56	15.28	0.034	34.77	-19.49
		707.5	H	283	326	3.52	1 / 0	15.35	18.88	0.077	36.99	-18.11	16.73	0.047	34.77	-18.04
		713.5	H	281	325	3.70	1 / 12	13.65	17.35	0.054	36.99	-19.64	15.20	0.033	34.77	-19.57
	16-QAM	701.5	H	306	323	3.45	1 / 12	14.34	17.79	0.060	36.99	-19.20	15.64	0.037	34.77	-19.13
10 MHz	Opposite Pol.	707.5	V	159	146	3.52	1 / 49	11.33	14.85	0.031	36.99	-22.14	12.70	0.019	34.77	-22.07
	Closed	707.5	H	149	110	3.52	1 / 49	13.32	16.84	0.048	36.99	-20.15	14.69	0.029	34.77	-20.08
	WCP	707.5	V	159	214	3.52	1 / 49	10.64	14.16	0.026	36.99	-22.83	12.01	0.016	34.77	-22.76

Table 7-2. ERP Data (LTE Band 12/17 – AntA + AntB)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
3 MHz	QPSK	700.5	H	306	323	3.39	1 / 7	14.29	17.68	0.059	36.99	-19.31	15.53	0.036	34.77	-19.24
		707.5	H	283	326	3.52	1 / 0	15.20	18.73	0.075	36.99	-18.26	16.58	0.045	34.77	-18.20
		714.5	H	281	325	3.71	1 / 14	13.51	17.22	0.053	36.99	-19.77	15.07	0.032	34.77	-19.71
	16-QAM	700.5	H	306	323	3.39	1 / 7	14.19	17.58	0.057	36.99	-19.41	15.43	0.035	34.77	-19.34
1.4 MHz	QPSK	699.7	H	306	323	3.33	1 / 3	14.15	17.48	0.056	36.99	-19.51	15.33	0.034	34.77	-19.44
		707.5	H	283	326	3.52	1 / 3	15.26	18.79	0.076	36.99	-18.20	16.64	0.046	34.77	-18.13
		715.3	H	281	325	3.72	1 / 5	13.34	17.06	0.051	36.99	-19.93	14.91	0.031	34.77	-19.86
	16-QAM	699.7	H	306	323	3.33	1 / 3	14.35	17.67	0.059	36.99	-19.32	15.52	0.036	34.77	-19.25

Table 7-3. ERP Data (LTE Band 12 – AntA + AntB)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	704.0	H	279	107	3.48	1 / 49	10.09	13.57	0.023	36.99	-23.42	11.42	0.014	34.77	-23.35
		707.5	H	287	304	3.52	1 / 49	10.93	14.45	0.028	36.99	-22.54	12.30	0.017	34.77	-22.47
		711.0	H	279	304	3.57	1 / 25	10.54	14.11	0.026	36.99	-22.88	11.96	0.016	34.77	-22.81
	16-QAM	711.0	H	279	304	3.57	1 / 49	10.28	13.85	0.024	36.99	-23.14	11.70	0.015	34.77	-23.07
5 MHz	QPSK	701.5	H	279	107	3.45	1 / 12	10.00	13.45	0.022	36.99	-23.54	11.30	0.013	34.77	-23.47
		707.5	H	287	304	3.52	1 / 0	10.86	14.39	0.027	36.99	-22.80	12.24	0.017	34.77	-22.53
		713.5	H	279	304	3.70	1 / 12	10.57	14.27	0.027	36.99	-22.72	12.12	0.016	34.77	-22.65
	16-QAM	713.5	H	279	304	3.70	1 / 12	9.78	13.48	0.022	36.99	-23.51	11.33	0.014	34.77	-23.44
10 MHz	Opposite Pol.	707.5	V	133	315	3.52	1 / 49	9.88	13.40	0.022	36.99	-23.59	11.25	0.013	34.77	-23.52
	WCP	707.5	H	172	222	3.52	1 / 49	9.84	13.36	0.022	36.99	-23.63	11.21	0.013	34.77	-23.56

Table 7-4. ERP Data (LTE Band 12/17 – AntA)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
3 MHz	QPSK	700.5	H	279	107	3.39	1 / 7	10.31	13.70	0.023	36.99	-23.29	11.55	0.014	34.77	-23.22
		707.5	H	287	304	3.52	1 / 0	10.71	14.24	0.027	36.99	-22.75	12.09	0.016	34.77	-22.69
		714.5	H	279	304	3.71	1 / 14	10.43	14.14	0.026	36.99	-22.85	11.99	0.016	34.77	-22.79
	16-QAM	714.5	H	279	304	3.71	1 / 14	9.97	13.68	0.023	36.99	-23.31	11.53	0.014	34.77	-23.24
1.4 MHz	QPSK	699.7	H	279	107	3.33	1 / 3	10.17	13.50	0.022	36.99	-23.49	11.35	0.014	34.77	-23.42
		707.5	H	287	304	3.52	1 / 3	10.77	14.30	0.027	36.99	-22.69	12.15	0.016	34.77	-22.62
		715.3	H	279	304	3.72	1 / 5	10.26	13.98	0.025	36.99	-23.01	11.83	0.015	34.77	-22.94
	16-QAM	715.3	H	279	304	3.72	1 / 5	10.01	13.73	0.024	36.99	-23.26	11.58	0.014	34.77	-23.19



Table 7-5. ERP Data (LTE Band 12 – AntA)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	H	235	326	6.09	1 / 49	15.06	21.15	0.130	36.99	-15.84	19.00	0.079	34.77	-15.77
	16-QAM	782.0	H	235	326	6.09	1 / 49	14.09	20.18	0.104	36.99	-16.81	18.03	0.064	34.77	-16.74
5 MHz	QPSK	779.5	H	235	326	5.97	1 / 24	15.25	21.22	0.132	36.99	-15.77	19.07	0.081	34.77	-15.70
		782.0	H	235	326	6.09	1 / 12	15.11	21.20	0.132	36.99	-15.79	19.05	0.080	34.77	-15.72
		784.5	H	235	326	6.17	1 / 24	15.29	21.46	0.140	36.99	-15.53	19.31	0.085	34.77	-15.46
	16-QAM	782.0	H	235	326	6.09	1 / 12	14.36	20.45	0.111	36.99	-16.54	18.30	0.068	34.77	-16.47
10 MHz	Opposite Pol.	782.0	V	235	31	6.09	1 / 49	12.40	18.49	0.071	36.99	-18.50	16.34	0.043	34.77	-18.43
	Closed	782.0	H	237	331	6.09	1 / 49	14.01	20.10	0.102	36.99	-16.89	17.95	0.062	34.77	-16.82
	WCP	782.0	H	224	87	6.09	1 / 49	11.61	17.70	0.059	36.99	-19.29	15.55	0.036	34.77	-19.22

Table 7-6. ERP Data (LTE Band 13 – AntA + AntB)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
10 MHz	QPSK	782.0	H	253	307	6.09	1 / 25	11.03	17.12	0.052	36.99	-19.87	14.97	0.031	34.77	-19.80
	16-QAM	782.0	H	253	307	6.09	1 / 25	10.49	16.58	0.046	36.99	-20.41	14.43	0.028	34.77	-20.34
5 MHz	QPSK	779.5	H	253	307	5.97	1 / 24	11.22	17.19	0.052	36.99	-19.80	15.04	0.032	34.77	-19.73
		782.0	H	253	307	6.09	1 / 12	11.08	17.17	0.052	36.99	-19.82	15.02	0.032	34.77	-19.75
		784.5	H	253	307	6.17	1 / 24	11.26	17.43	0.055	36.99	-19.56	15.28	0.034	34.77	-19.49
	Opposite Pol.	782.0	V	126	237	6.09	1 / 25	10.86	16.95	0.050	36.99	-20.04	14.80	0.030	34.77	-19.97
10 MHz	Closed	782.0	H	249	333	6.09	1 / 25	10.21	16.30	0.043	36.99	-20.69	14.15	0.026	34.77	-20.62
	WCP	782.0	H	147	226	6.09	1 / 25	9.87	15.96	0.039	36.99	-21.03	13.81	0.024	34.77	-20.96

Table 7-7. ERP Data (LTE Band 13 – AntA)

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7.3 Radiated Spurious Emissions Measurements

Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power, and at the appropriate frequencies.



Test Procedures Used

KDB 971168 D01 v03r01 – Section 5.8

ANSI/TIA-603-E-2016 – Section 2.2.12

Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $\geq 2 \times$ span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The 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.

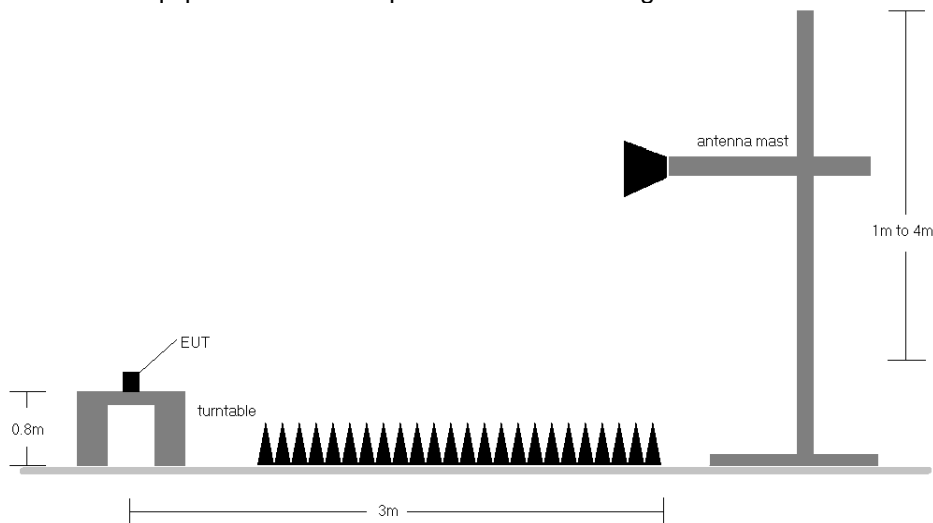


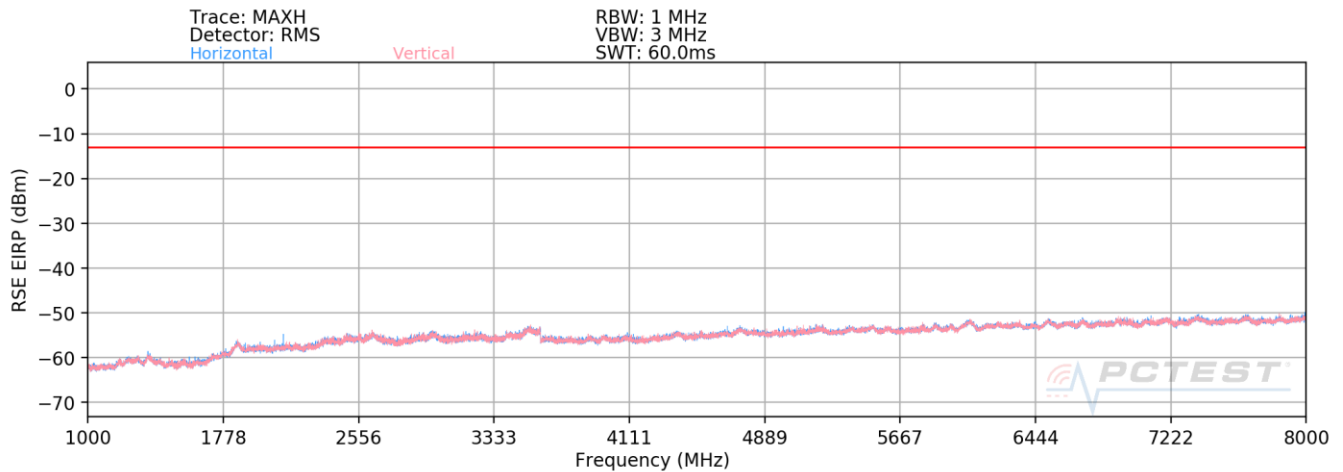
Figure 7-3. Test Instrument & Measurement Setup

Test Notes

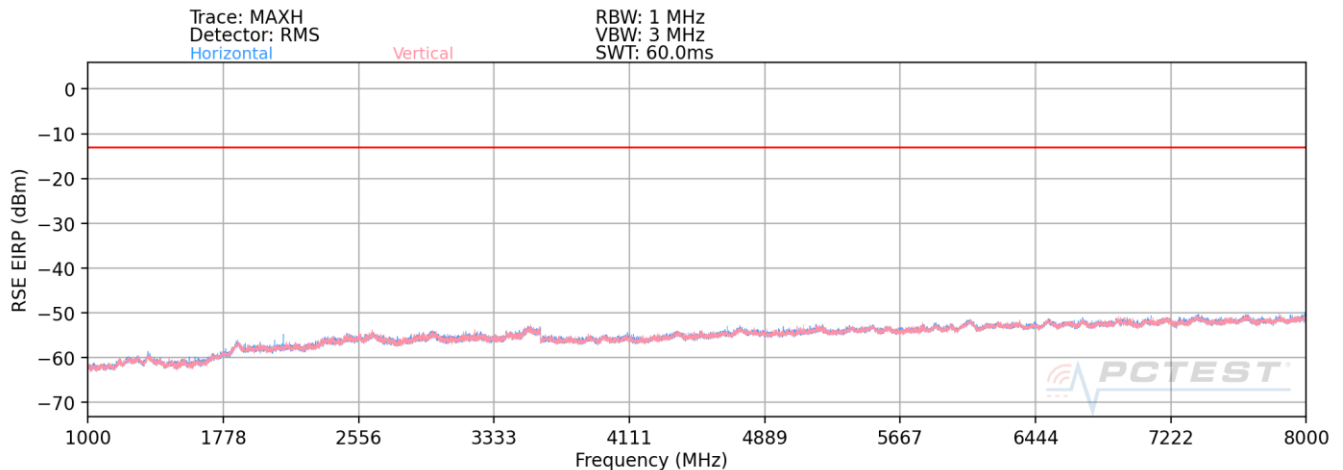
- Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 - $E(\text{dB}\mu\text{V/m}) = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$
 - $\text{EIRP (dBm)} = E(\text{dB}\mu\text{V/m}) + 20\log D - 104.8$; where D is the measurement distance in meters.
- The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- This unit was tested with its standard battery.
- The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- The "-" shown in the following RSE tables are used to denote a noise floor measurement.

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LTE Band 12/17 – AntA + AntB



Plot 7-1. Radiated Spurious Plot (LTE Band 12/17 – AntA + AntB) – Open



Plot 7-2. Radiated Spurious Plot (LTE Band 12/17 – AntA + AntB) - Closed

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.0	H	269	79	-69.39	-2.25	35.36	-59.89	-13.00	-46.89
2112.0	H	193	121	-69.75	0.93	38.18	-57.08	-13.00	-44.08
2816.0	H	-	-	-68.47	1.97	40.50	-54.76	-13.00	-41.76
3520.0	H	-	-	-74.10	3.43	36.33	-58.93	-13.00	-45.93

Table 7-8. Radiated Spurious Data (LTE Band 12 – Low Channel – AntA + AntB)

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
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Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	H	156	340	-68.15	-2.27	36.58	-58.68	-13.00	-45.68
2122.5	H	185	129	-68.69	0.95	39.26	-56.00	-13.00	-43.00
2830.0	H	-	-	-69.29	1.98	39.69	-55.57	-13.00	-42.57
3537.5	H	-	-	-68.34	3.70	42.36	-52.90	-13.00	-39.90

Table 7-9. Radiated Spurious Data (LTE Band 12/17 – Mid Channel – AntA + AntB)

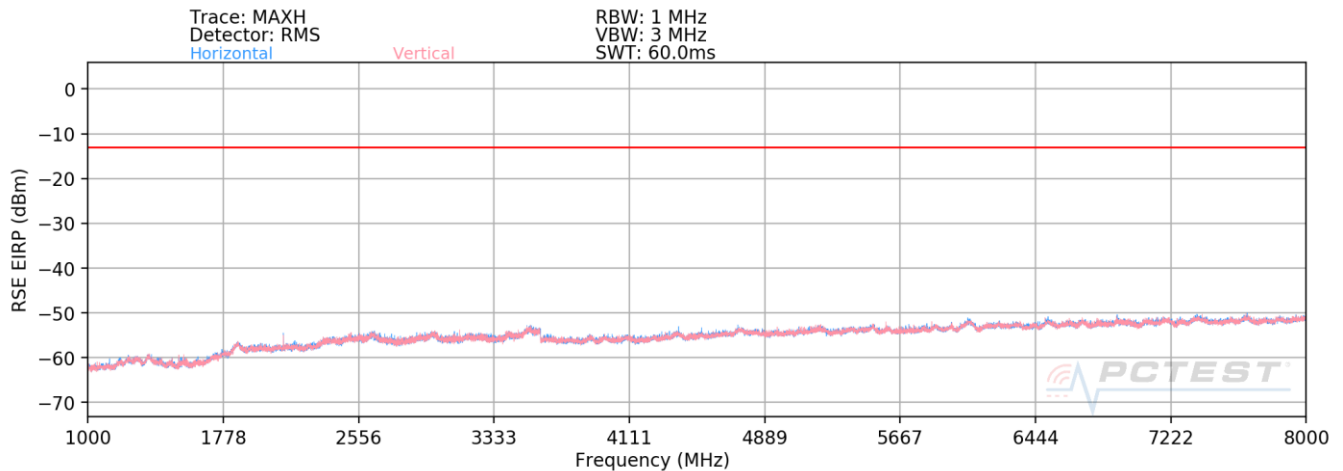
Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1422.0	H	146	340	-68.47	-2.40	36.13	-59.13	-13.00	-46.13
2133.0	H	400	370	-69.35	1.01	38.66	-56.60	-13.00	-43.60
2844.0	H	-	-	-68.88	2.04	40.16	-55.09	-13.00	-42.09
3555.0	H	-	-	-68.35	3.30	41.95	-53.30	-13.00	-40.30

Table 7-10. Radiated Spurious Data (LTE Band 12/17 – High Channel – AntA + AntB)

FCC ID: A3LSMF926B	 <p>MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)</p>		 <p>Approved by: Technical Manager</p>
Test Report S/N: 1M2106280075-03.A3L	Test Dates: 7/12 – 7/22/2021	EUT Type: Portable Handset	

LTE Band 12/17 – AntA



Plot 7-3. Radiated Spurious Plot (LTE Band 12/17 – AntA)

Bandwidth (MHz):	10
Frequency (MHz):	704.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1408.0	H	165	53	-68.43	-2.25	36.32	-58.93	-13.00	-45.93
2112.0	H	238	171	-64.82	0.93	43.11	-52.15	-13.00	-39.15
2816.0	H	-	-	-69.09	1.97	39.88	-55.38	-13.00	-42.38
3520.0	H	-	-	-67.96	3.43	42.47	-52.79	-13.00	-39.79

Table 7-11. Radiated Spurious Data (LTE Band 12 – Low Channel – AntA)

Bandwidth (MHz):	10
Frequency (MHz):	707.5
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	H	151	195	-69.06	-2.27	35.67	-59.59	-13.00	-46.59
2122.5	H	133	173	-69.12	0.95	38.83	-56.43	-13.00	-43.43
2830.0	H	-	-	-68.61	1.98	40.37	-54.89	-13.00	-41.89
3537.5	H	-	-	-70.51	3.70	40.19	-55.07	-13.00	-42.07




Table 7-12. Radiated Spurious Data (LTE Band 12/17 – Mid Channel – AntA)

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
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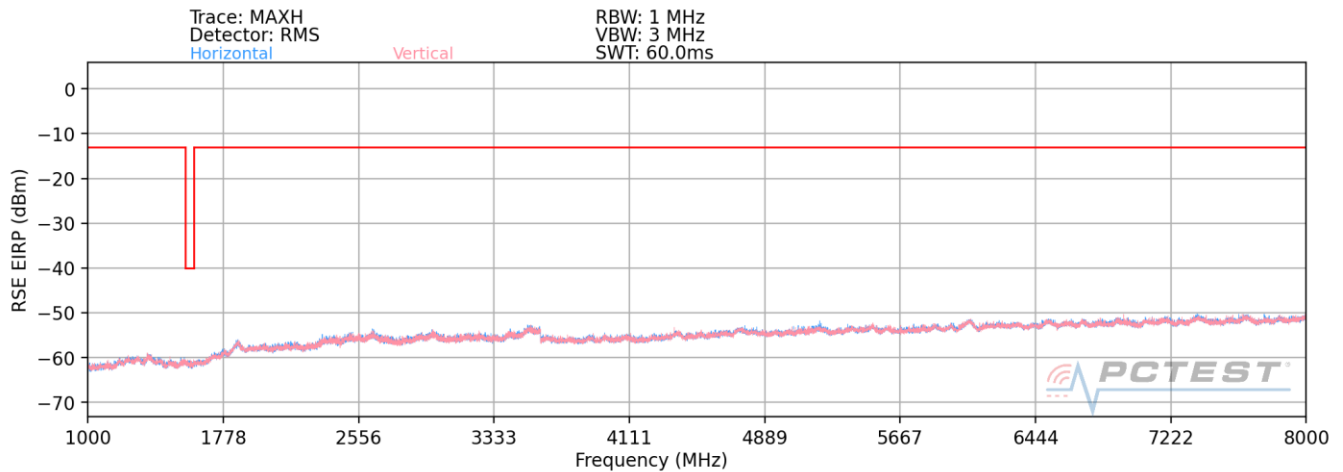
Bandwidth (MHz):	10
Frequency (MHz):	711.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1422.0	H	169	155	-69.21	-2.40	35.39	-59.87	-13.00	-46.87
2133.0	H	315	269	-69.60	1.01	38.41	-56.85	-13.00	-43.85
2844.0	H	-	-	-74.80	2.04	34.24	-61.01	-13.00	-48.01
3555.0	H	-	-	-68.93	3.30	41.37	-53.88	-13.00	-40.88

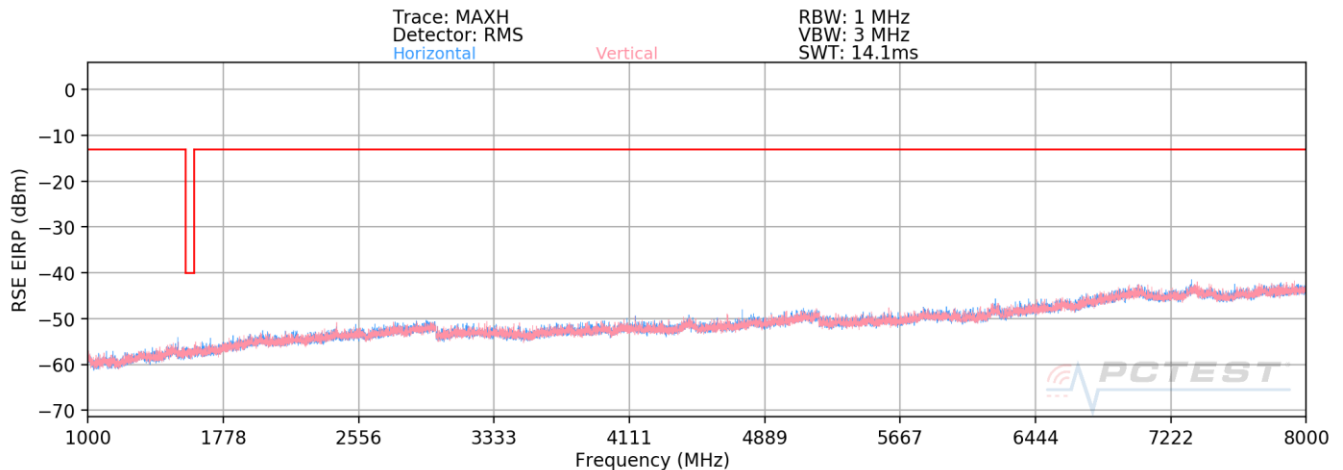
Table 7-13. Radiated Spurious Data (LTE Band 12/17 – High Channel – AntA)

FCC ID: A3LSMF926B	 Proud to be part of 		MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Technical Manager
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LTE Band 13 – AntA + AntB



Plot 7-4. Radiated Spurious Plot (LTE Band 13 – AntA + AntB) – Open



Plot 7-5. Radiated Spurious Plot (LTE Band 13 – AntA + AntB) – Closed

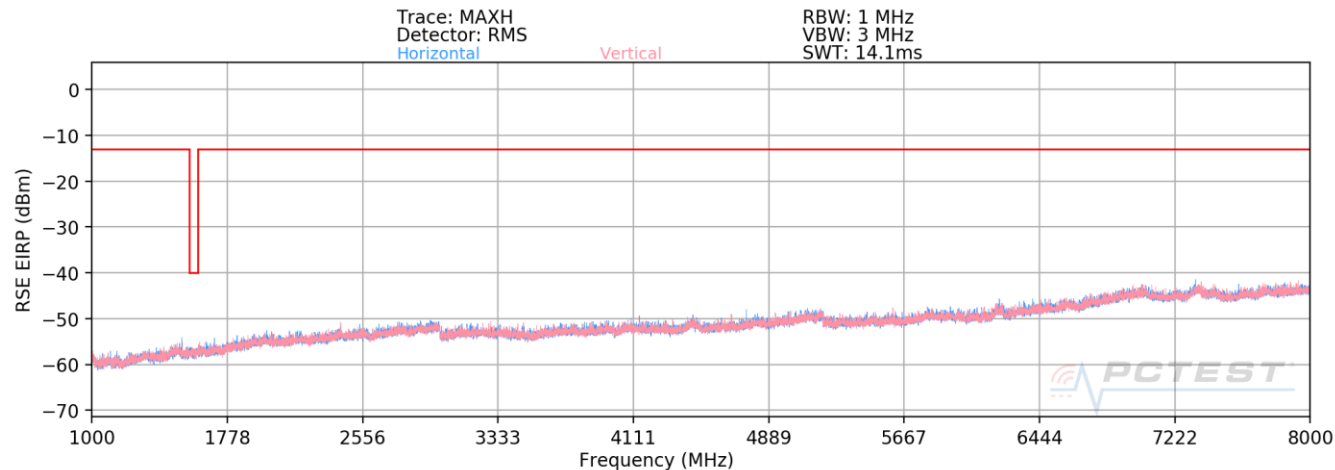
Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.0	H	243	303	-69.60	-2.52	34.88	-60.38	-40.00	-20.38
2346.0	H	142	149	-66.47	1.72	42.25	-53.01	-13.00	-40.01
3128.0	H	-	-	-69.24	2.42	40.18	-55.07	-13.00	-42.07
3910.0	H	-	-	-76.75	3.48	33.73	-61.53	-13.00	-48.53

Table 7-14. Radiated Spurious Data (LTE Band 13 – Mid Channel – AntA + AntB)

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
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LTE Band 13 – AntA



Plot 7-6. Radiated Spurious Plot (LTE Band 13 – AntA)

Bandwidth (MHz):	10
Frequency (MHz):	782.0
RB / Offset:	1 / 25



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.0	H	396	340	-70.81	-2.52	33.67	-61.59	-40.00	-21.59
2346.0	H	145	304	-65.18	1.72	43.54	-51.72	-13.00	-38.72
3128.0	H	-	-	-71.41	2.42	38.01	-57.24	-13.00	-44.24
3910.0	H	398	57	-76.53	3.48	33.95	-61.31	-13.00	-48.31
4692.0	H	-	-	-76.31	4.65	35.34	-59.92	-13.00	-46.92
5474.0	H	-	-	-77.00	6.28	36.28	-58.98	-13.00	-45.98

Table 7-15. Radiated Spurious Data (LTE Band 13 – Mid Channel – AntA)

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
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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: A3LSMF926B** complies with all the requirements of Part 27 of the FCC rules.

FCC ID: A3LSMF926B	 <small>Proud to be part of element</small>	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Technical Manager
Test Report S/N: 1M2106280075-03.A3L	Test Dates: 7/12 – 7/22/2021	EUT Type: Portable Handset		Page 23 of 23