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MEASUREMENT REPORT FCC Part 15F ULTRA WIDEBAND

Applicant Name:

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

Date of Testing:

6/21 – 7/1/2021 **Test Site/Location:** PCTEST Lab. Yongin-Si, Gyeonggi-do, South Korea **Test Report Serial No.:** 1K2106280021-01.A3L

FCC ID:

APPLICANT:

A3LSMF926U

Samsung Electronics Co., Ltd.

Application Type: Model: Additional Models: EUT Type: FCC Classification: FCC Rule Parts(s): UWB Classification: Test Procedure(s): Class II Permissive Change: Original Grant Date: Class II Permissive Change SM-F926U SM-F926U1 Portable Handset Ultra Wideband (UWB) FCC Part 15 Subpart F (15.519, 15.521) Hand-held Communication Device ANSI C63.10-2013, KDB 393764 D01 Please see FCC change document 6/23/2021

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.10-2013 (See Test Report). These measurements were performed with no deviation from the standards. 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.

Prepared by

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Reviewed by Reviewed by

FCC ID: A3LSMF926U		Rout to be part of @ element (CLASS II PERMISSIVE CHANGE)				Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 1 of 40		
1K2106280021-01.A3L	6/21 - 7/1/2021	5/21 – 7/1/2021 Portable Headset		Page 1 of 40		
© 2021 PCTEST				V 9.0 02/01/2019		



TABLE OF CONTENTS

1.0	Intro	duction	. 3
	1.1	Scope	3
	1.2	PCTEST Test Location	.3
	1.3	Test Facility / Accreditations	.3
2.0	PRC	DUCT 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
	2.5	Antenna Description	.4
	2.6	Software and Firmware	.4
3.0	DES	CRIPTION OF TESTS	. 5
	3.1	Evaluation Procedure	.5
	3.2	Radiated Emissions	.5
	3.3	Environmental Conditions	.5
4.0	Ante	nna Requirements	. 6
5.0	Mea	surement Uncertainty	.7
6.0	TES	T EQUIPMENT CALIBRATION DATA	. 8
7.0	TES	Т ДАТА	. 9
	7.1	Summary	9
	7.2	Peak Power and Maximum Average Emissions	10
	7.3	Radiated Measurement Data above 960MHz	21
	7.4	Radiated Spurious Emissions Measurements – Below 1GHz	35
8.0	CON	ICLUSION	40

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 2 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 2 of 40
© 2021 PCTEST				V 9.0 02/01/2019



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 Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 16954, South Korea. 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 located in Yongin-si, Gyeonggi-do, 16954, South Korea.

- PCTEST is an ISO 17025-2017 accredited test facility under the National Voluntary Laboratory Accreditation Program (NVLAP) with Certificate number 600143-0 for Specific Absorption Rate (SAR), 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 (26168) test laboratory with the site description on file with ISED.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 3 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		raye 3 01 40
@ 2024 DOTEST				V 0 0 00/04/0010



2.0 **PRODUCT INFORMATION**

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMF926U**. The test data contained in this report pertains only to the EUT's ultra-wideband transmitter.

Test Device Serial No.: 1368M

2.2 Device Capabilities

This device contains the following capabilities:

800/850/1900 CDMA/EVDO Rev. 0/A (BC0, BC1, BC10), 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 Section 10 of ANSI C63.10-2013. The EUT setup procedures of ANSI C63.10-203 were used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Section 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups.

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.

The Equipment Under Test (EUT) was capable of operating on two antennas in two separate modes [HPRF, preamble 27] and [BPRF, preamble 9~12]. Care was taken to ensure the worst-case modes were investigated and reported.

For more information, please see Section 7.0 for test data and the test setup photos document for the test setup photographs.

2.4 EMI Suppression Device(s)/Modifications

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

2.5 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain [dBi]	Antenna 2 Gain [dBi]		
6.5	-5.45	-6.62		
8.0	-3.55	-3.84		
Table 0.4 Maximum Daals Antanna Oain				

Table 2-1. Maximum Peak Antenna Gain

2.6 Software and Firmware

The test was conducted with firmware version F926USQU0AUCE installed on the EUT.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 4 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 4 of 40
@ 2024 DOTEST				1/ 0 0 00/01/2010



3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2014) was used in the measurement of the EUT.

Deviation from measurement procedure.....None

3.2 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 Clause 5, Figure 5.7 of ANSI C63.4-2014. A raised turntable is used for radiated measurement. It 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. 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(b)(1) 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.

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.

3.3 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: A3LSMF926U	Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 5 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 5 of 40
© 2021 PCTEST	·	•		V 9 0 02/01/2019



4.0 ANTENNA REQUIREMENTS

Except from §15.203 of the FCC Rules/Regulations:

"An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall 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(s) of the EUT are permanently attached
- There are no provisions for a connection to an external antenna

The EUT complies with the requirements of §15.203.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga C of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 6 of 40
© 2021 PCTEST			V 0 0 02/01/2010



5.0 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 (±dB)
Radiated Disturbance (<1GHz)	3.01
Radiated Disturbance (>1GHz)	5.56
Radiated Disturbance (>18GHz)	3.16

FCC ID: A3LSMF926U	Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 7 of 40
1K2106280021-01.A3L 6/21 - 7/1/2021 Portal		Portable Headset		Page 7 of 40
© 2021 PCTEST				V 9 0 02/01/2019



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
Huber+Suhner	SF102/11SK/11SK/1500	RF Cable		N/A		SN 804225/2
Huber+Suhner	SF102/11SK/11SK/2000	RF Cable		N/A		SN 804223/2
Mini-Circuits	BW-N10W5+	Attenuator	6/29/2020	Annual	6/28/2021	1607
Mini-Circuits	BW-N10W5+	Attenuator	6/29/2020	Annual	6/28/2021	1607
NARDA	180-442A-KF	Horn Antenna (Small)	11/20/2020	Biennial	11/19/2020	T058701-03
Rohde & Schwarz	TS-PR1840	Preamplifier	6/29/2020	Annual	6/28/2021	100049
Rohde & Schwarz	FSW43	Signal & Spectrum Analyzer	9/17/2020	Annual	9/16/2021	101250
Rohde & Schwarz	TS-SFUNIT-Rx	Shielded Filter Unit	2/19/2021	Annual	2/18/2022	102131
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	7/9/2019	Biennial	7/8/2021	9162-217
Sunol Sciences	DRH-118	Horn Antenna	8/9/2019	Biennial	<mark>8/8/2021</mark>	A102416-1

Table 6-1.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.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 8 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 8 of 40
© 2021 PCTEST			V 0 0 02/01/2010



7.0 TEST DATA

7.1 Summary

Company Name:	Samsung Electronics Co., Ltd.
FCC ID:	A3LSMF926U
FCC Classification:	<u>Ultra-Wideband (UWB)</u>

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference	
§15.519(e)	Maximum Peak Power	< 0dBm EIRP in 50MHz BW				Section 7.2
§15.519(c)	Maximum Average Emission in the range of 3100 – 10600 MHz	< -41.3 EIRP in dBm				Section 7.2
§15.519(c)	Radiated Emissions Above 960MHz	See table in 15.519(c) for details	Radiated	PASS	Section 7.3	
§15.519(d)	Radiated Emissions in the 1164 – 1240Mhz and 1559 – 1610MHz GPS Bands	< -85.3 EIRP in dBm			Section 7.3	
§15.519(c), §15.519(a)	Radiate Emissions Below 960MHz	Emissions in restricted bands must meet the radiated limits detailed in 15.209			Section 7.4	

Table 7-1. Summary of Test Results

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 0 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 9 of 40
© 2021 PCTEST			V 9 0 02/01/2019



7.2 Peak Power and Maximum Average Emissions §15.519(e), §15.519(c)

Test Overview and Limit

15.519 (3)(e) There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP.

15.519 (3)(c) The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
3100 - 10600	-41.3

Test Procedures Used

ANSI C63.10-2013

Test Settings

Peak:

- 1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
- 2. RBW = 50MHz, VBW = 80MHz
- 3. Detector = Peak
- 4. Sweep time = auto coupled
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

Average:

- 1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz, VBW = 3MHz
- 3. Detector = Average-RMS (for Average)
- 4. Sweep time = 2s
- 5. Sweep Points = 2001 (1ms integration period per measurement bin)
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

FCC ID: A3LSMF926U	Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 10 of 10
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 10 of 40
@ 2024 DOTEST				1/000001/0010



RESULTS – BPRF

ANT	СН	MODE	Preamble	Meas. Ant.	FM[GHz]	Peak Power (dBm/50MHz)	Peak Limit (dBm/50MHz)	Margin [dB]
1	5	SPO	9	Н	6.7410	-2.99	0	-2.99
1	9	SPO	9	V	7.9867	-1.73	0	-1.73
2	5	SPO	9	Н	6.5026	-3.71	0	-3.71
2	9	SPO	10	V	7.9942	-1.59	0	-1.59

Table 7-2. BPRF Highest Peak Power Results

ANT	СН	MODE	Preamble	Meas. Ant.	FM[GHz]	Average Power (dBm)	Average Limit (dBm)	Margin [dB]
1	5	SP1	11	Н	6.684902	-43.04	-41.3	-1.74
I	9	SP1	12	Н	8.125631	-42.91	-41.3	-1.61
2	5	SP3	9	Н	6.560464	-42.82	-41.3	-1.52
2	9	SP3	9	V	7.9867	-42.89	-41.3	-1.59

Table 7-3. BPRF Highest Average Power Results

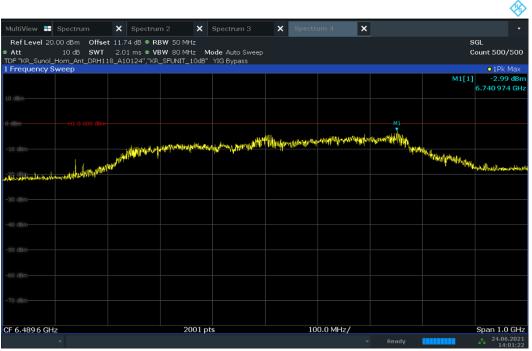
Sample Calculation:

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter

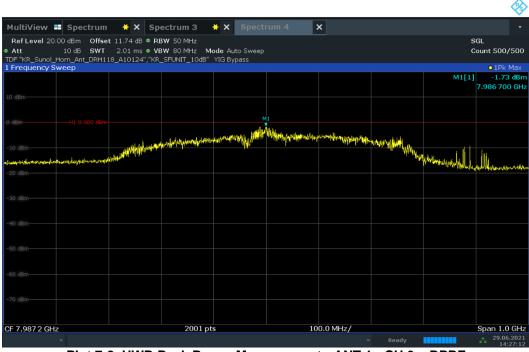
RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) - 104.8

FCC ID: A3LSMF926U	Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 11 of 10
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 11 of 40
© 2021 PCTEST				V 9 0 02/01/2019





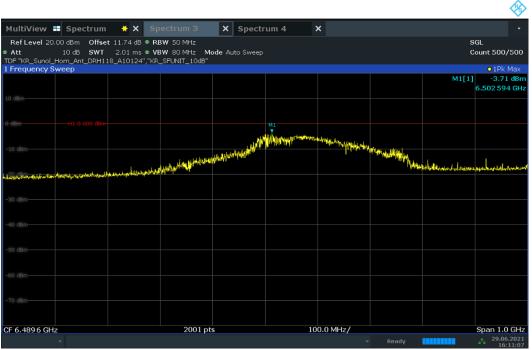
Plot 7-1. UWB Peak Power Measurement - ANT 1 - CH.5 - BPRF



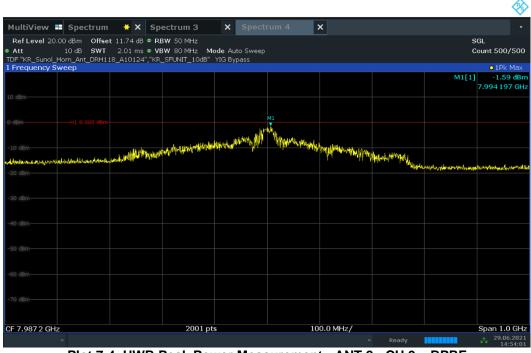
Plot 7-2. UWB Peak Power Measurement - ANT 1 - CH.9 – BPRF

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 12 of 10
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 12 of 40
© 2021 PCTEST				V 9.0 02/01/2019





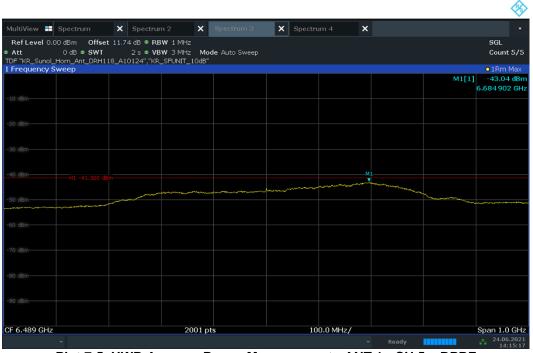
Plot 7-3. UWB Peak Power Measurement - ANT 2 - CH.5 - BPRF



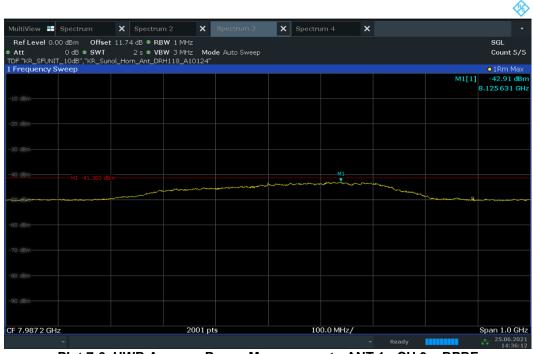
Plot 7-4. UWB Peak Power Measurement - ANT 2 - CH.9 – BPRF

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 12 of 10
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 13 of 40
© 2021 PCTEST	-			V 9.0 02/01/2019





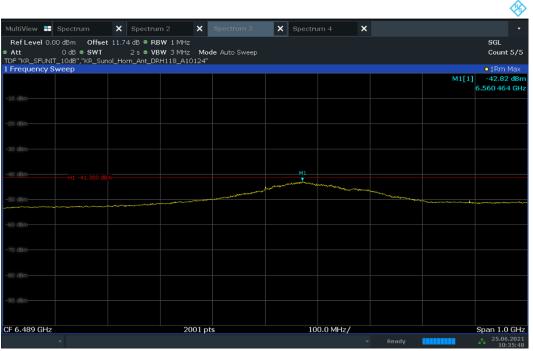
Plot 7-5. UWB Average Power Measurement - ANT 1 - CH.5 - BPRF



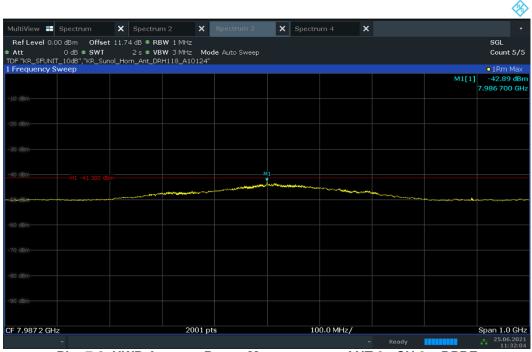
Plot 7-6. UWB Average Power Measurement - ANT 1 - CH.9 - BPRF

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 14 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 14 of 40
© 2021 PCTEST				V 9.0 02/01/2019





Plot 7-7. UWB Average Power Measurement - ANT 2 - CH.5 - BPRF





FCC ID: A3LSMF926U	PCTEST Proud to be part of @ eleme		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 15 of 10
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 15 of 40
© 2021 PCTEST				V 9.0 02/01/2019



RESULTS – HPRF

ANT	СН	MODE	Preamble	Meas. Ant.	FM[GHz]	Peak Power (dBm/50MHz)	Peak Limit (dBm/50MHz)	Margin [dB]
1	5	SPO	27	Н	6.6130	-7.11	0	-7.11
I	9	SPO	27	V	7.9857	-5.64	0	-5.64
h	5	SPO	27	Н	6.6080	-7.28	0	-7.28
2	9	SPO	27	Н	7.9870	-5.47	0	-5.47

Table 7-4. HPRF Highest Peak Power Results

ANT	СН	MODE	Preamble	Meas. Ant.	FM[GHz]	Average Power (dBm)	Average Limit (dBm)	Margin [dB]
1	5	SP3	27	Н	6.6484	-43.26	-41.3	-1.96
1	9	SP3	27	Н	8.1671	-43.24	-41.3	-1.94
2	5	SP3	27	Н	6.5595	-43.09	-41.3	-1.79
2	9	SP0	27	Н	7.9872	-43.16	-41.3	-1.86

Table 7-5. HPRF Highest Average Power Results

Sample Calculation

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter

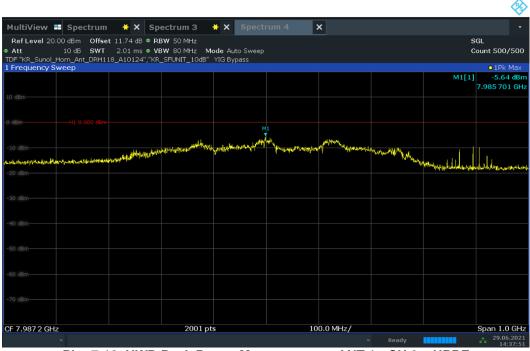
RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) - 104.8

FCC ID: A3LSMF926U	Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 16 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 16 of 40
© 2021 PCTEST				V 9 0 02/01/2019





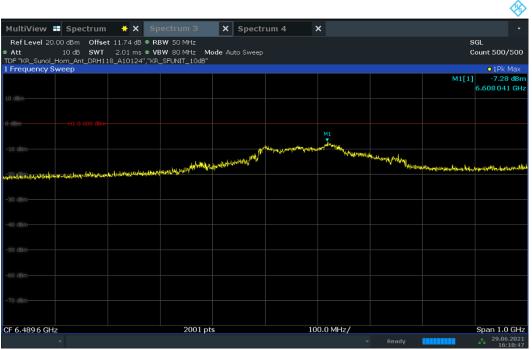
Plot 7-9. UWB Peak Power Measurement - ANT 1 - CH.5 - HPRF



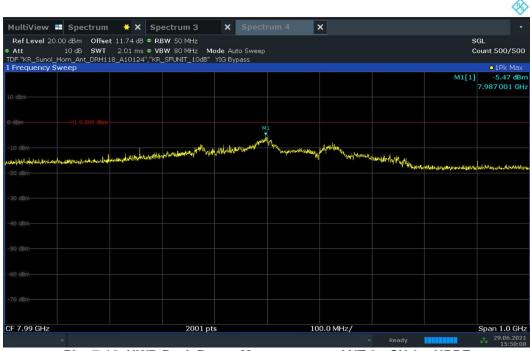
Plot 7-10. UWB Peak Power Measurement - ANT 1 - CH.9 – HPRF

FCC ID: A3LSMF926U	Proud to be part of @ elem		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 17 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 17 of 40
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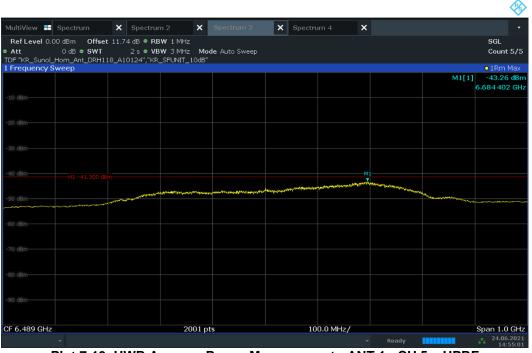
Plot 7-11. UWB Peak Power Measurement - ANT 2 - CH.5 – HPRF



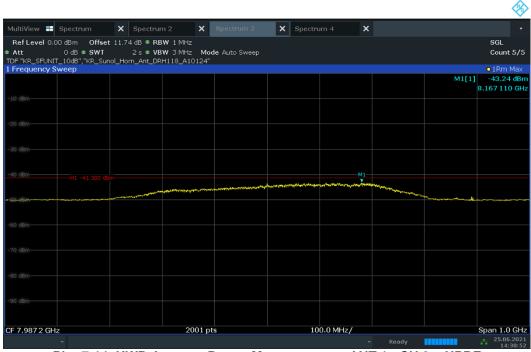
Plot 7-12. UWB Peak Power Measurement - ANT 2 - CH.9 – HPRF

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Test Report S/N:	Test Dates:	EUT Type:		Dage 19 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 18 of 40
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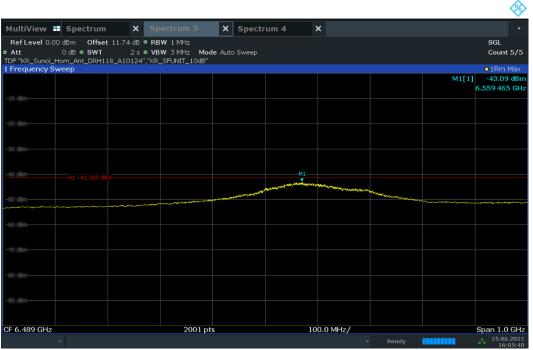
Plot 7-13. UWB Average Power Measurement - ANT 1 - CH.5 – HPRF



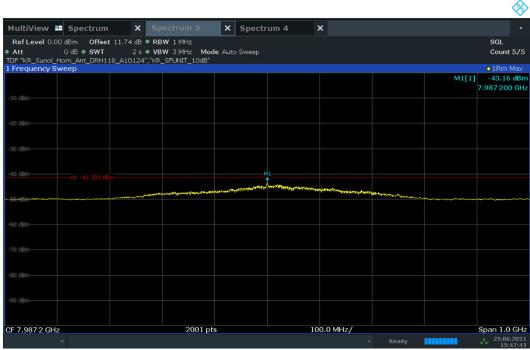
Plot 7-14. UWB Average Power Measurement - ANT 1 - CH.9 – HPRF

FCC ID: A3LSMF926U	Proud to be part of @ elem		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 10 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 19 of 40
© 2021 PCTEST				V 9 0 02/01/2019





Plot 7-15. UWB Average Power Measurement - ANT 2 - CH.5 - HPRF



Plot 7-16. UWB Average Power Measurement - ANT 2 - CH.9 – HPRF

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Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 20 of 40
© 2021 PCTEST				V 9.0 02/01/2019



7.3 Radiated Measurement Data above 960MHz §15.519 (c), §15.519(d), §15.209(a)

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

§15.519(c)

Frequency in MHz	EIRP in dBm			
960-1610	-75.3			
1610-1990	-63.3			
1990-3100	-61.3			
3100-10600	-41.3			
Above 10600	-61.3			
Table 7-6. Above 960MHz	Table 7-6. Above 960MHz Average Limits			

§15.519(d)

Frequency in MHz	EIRP in dBm			
1164-1240	-85.3			
1559-1610	-85.3			
Table 7-7 Above 060MHz Average Limits				

Table 7-7. Above 960MHz Average Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Average EIRP Measurements

- 1. Analyzer frequency set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz (30kHz for emissions in the GPS bands)
- 3. VBW = 3MHz (100kHz for the emissions in the GPS bands)
- 4. Detector = RMS
- 5. Sweep time = auto couple
- 6. Trace mode = Max hold
- 7. Trace was allowed to stabilize

Test Setup

The EUT and measurement equipment were set up as shown test setup photos provided.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 21 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	ortable Headset	
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Test Notes

- 1. All modes of operation and settings (Preamble, Packet Type, etc) were investigated and the worst-case emissions are reported.
- 2. The RBW for measurements in the GPS Bands were reduced to 30kHz in order to prove compliance.
- 3. 1000 ~ 18000 MHz and above 18000 MHz pre-scan plots were conducted at 0.7 and 0.6 meter respectively. The plots are only for the purpose of spurious emission identification.
- 4. All readings are calibrated by a signal generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
- 5. AFCL (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)

Sample Calculation

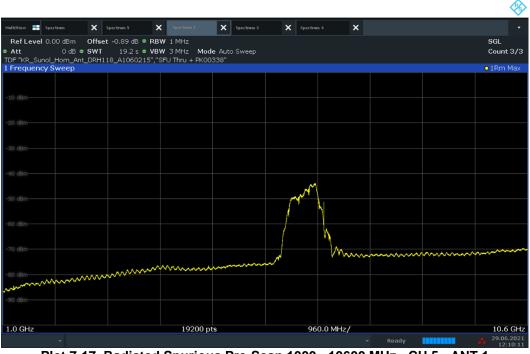
The raw radiated spurious level is converted to field strength in dBuV/m. Then, the EIRP RSE level is calculated by applying the additional factors shown below for a test distance of 3 meter

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) - 104.8

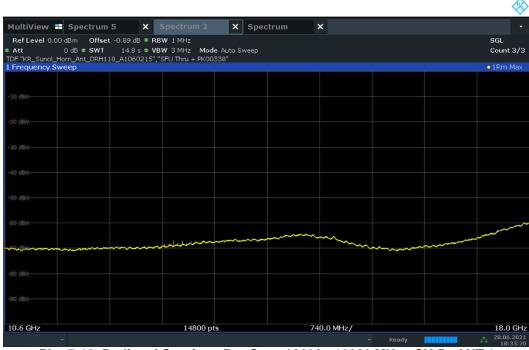
FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 22 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		raye 22 01 40
@ 2024 DOTEOT				V 0 0 00/01/0010

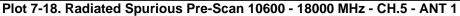


Channel 5 ANTENNA 1:









FCC ID: A3LSMF926U			SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 23 of 40
© 2021 PCTEST		·		V 9.0 02/01/2019



ulti¥iew 믐 S	Spectrum	X Spectrum 5	×	Spectrum 2	X Spectrum 3	X Spe	ctrum 4	×			
Att	0 dB	Offset -0.8 SWT DBH118 A10	1 s 🗢 VBW		lode Auto Swe	ep					SGL Count 5/
Frequency			.00210 , 0. 0								o 1 Rm Max
:0 dBm											
30 dBm											
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han rahfhan tar fa Aran 40a	and the second sec	for an officer of the first of the	and the strengthered	an and a state of the state of	horned hand had a stand of a stand	and the apply and an apply and and the	a sumpliment and day of the	and and and a state of	a e colo contra a fratilita	and the second second	
.164 GHz				1001 pts			7.6 MHz/				1.24 GF

Plot 7-19. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.5 - ANT 1 – GPS band



Plot 7-20. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.5 - ANT 1 – GPS band

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 04 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 24 of 40
© 2021 PCTEST	•			V 9.0 02/01/2019



MultiView 📰 Spectrum 5				•
Ref Level 0.00 dBm Offset -2.24 0 Att 0 dB • SWT 22 'DF "KR_R&S_40GHz_Horn_SN-T058702	s VBW 3 MHz Mode Auto Swee			SGL Count 2/2
Frequency Sweep				●1Rm Max
50 dBm				
As a second s		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	n_rms	
Mart Saconart and the state of				
90 dBm				
18.0 GHz	22000 pts	2.2 GHz/		40.0 GHz

Plot 7-21. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.5 - ANT 1

Channel:	5									
Frequency (MHz):	6500									
Preamble	11									
Config	SP1									
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1430	RMS	V	-	-	-72.71	-9.70	-12.64	-83.30	-75.30	-8.00
1898	RMS	V	-	-	-72.72	-8.13	-12.64	-81.75	-63.30	-18.45
3095	RMS	V	-	-	-81.88	-5.07	-12.64	-87.84	-61.30	-26.54
10600	RMS	V	-	-	-76.34	7.28	-12.64	-69.95	-41.30	-28.65
12979	RMS	V	150	354	-74.84	8.67	-12.64	-67.07	-61.30	-5.77
39563	RMS	V	-	-	-65.28	1.68	-13.98	-65.84	-61.30	-4.54

Table 7-8. Radiated Spurious Emissions CH. 5 – ANT1

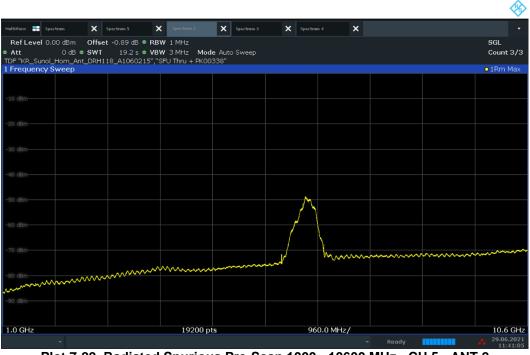
Channel:	5]								
Frequency (MHz):	6500]								
Preamble	11]								
Config	SP1]								
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	307	-80.45	-11.59	-12.64	-92.94	-85.30	-7.64
1226	RMS	V	-	-	-86.44	-11.46	-12.64	-98.80	-85.30	-13.50
1238	RMS	V	-	-	-86.52	-11.39	-12.64	-98.81	-85.30	-13.51
1562	RMS	Н	-	-	-87.21	-9.28	-12.64	-97.39	-85.30	-12.09
1600	RMS	Н	150	307	-84.45	-9.42	-12.64	-94.76	-85.30	-9.46
1609	RMS	Н	-	-	-86.60	-9.48	-12.64	-96.98	-85.30	-11.68

Table 7-9. Radiated Spurious Emissions CH. 5 – ANT1 – GPS BANDs

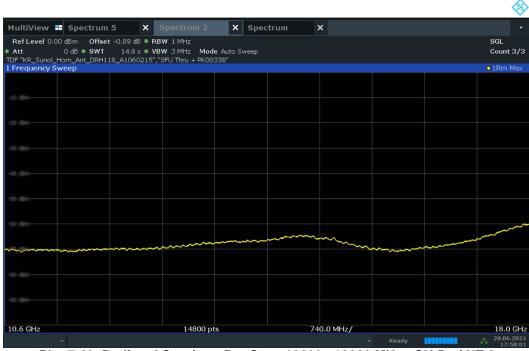
FCC ID: A3LSMF926U	Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 25 of 40
© 2021 PCTEST				V 9.0 02/01/2019



Channel 5 ANTENNA 2:







Plot 7-23. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5 - ANT 2

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Test Report S/N:	Test Dates:	EUT Type:		Dogo 26 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 26 of 40
© 2021 PCTEST	-			V 9.0 02/01/2019



fulti¥iew 📑		X Spectrum 5	×		X Spectrum	·* X		×			
Att	0 dB	Offset -0.3 SWT _DRH118_A10	1 s 🗢 VB	W 100 kHz	Mode Auto S	veep					SGL Count 5/5
Frequenc		_DKHII6_AIU	, 5F	o mru + PKO							o 1Rm Max
50 dBm											
and the second of the second o	Marine Marine and Ma	and the second	and and a second	when the when the second	2040 Martin Martin	www.worknenspace.rev	United and the second	runphhanan	hallen of the of the second	polen Magnetic market and the second s	- marked all many should be for the
.164 GHz				1001 p	ts		7.6 MHz	/	Ready		1.24 GH

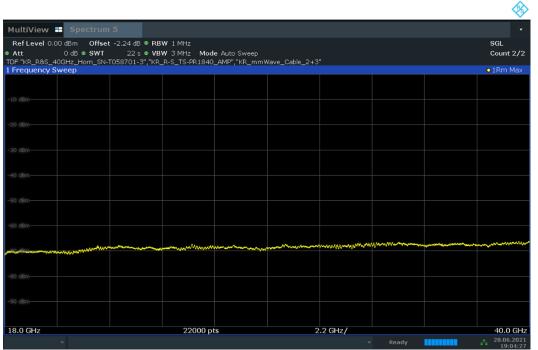
Plot 7-24. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.5 - ANT 2 – GPS band



Plot 7-25. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.5 - ANT 2 – GPS band

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ eleme		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 27 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 27 of 40
© 2021 PCTEST				V 9.0 02/01/2019





Plot 7-26. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.5 - ANT 2

Channel:	5									
Frequency (MHz):	6500									
Preamble	9									
Config	SP3									
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1519	RMS	н	-	-	-72.81	-9.51	-12.64	-83.22	-75.30	-7.92
1893	RMS	н	-	-	-72.73	-8.14	-12.64	-81.77	-63.30	-18.47
3095	RMS	н	-	-	-72.95	-5.07	-12.64	-78.92	-61.30	-17.62
10600	RMS	н	-	-	-76.40	7.28	-12.64	-70.02	-41.30	-28.72
12979	RMS	н	-	-	-77.10	8.67	-12.64	-69.33	-61.30	-8.03
39564	RMS	н	-	-	-65.53	1.66	-13.98	-66.10	-61.30	-4.80
		Table 7	10 Radia	ted Sour	ious Emis	ssions CH	$15 - \Delta N^{-1}$	Г2		

Table 7-10. Radiated Spurious Emissions CH. 5 – ANT2

Channel:	5								
Frequency (MHz):	6500								
Preamble	9								
Config	SP3								
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]
1200	RMS	V	150	16	-82.28	-11.59	-12.64	-94.77	-85.30
1237	RMS	V	-	-	-86.26	-11.40	-12.64	-98.56	-85.30
1239	RMS	V	-	-	-86.30	-11.38	-12.64	-98.58	-85.30
1594	RMS	н	-	-	-86.75	-9.40	-12.64	-97.05	-85.30
1600	RMS	Н	150	16	-80.91	-9.42	-12.64	-91.23	-85.30
1608	RMS	н	-	-	-86.69	-9.48	-12.64	-97.07	-85.30

Table 7-11. Radiated Spurious Emissions CH. 5 – ANT2 – GPS BANDs

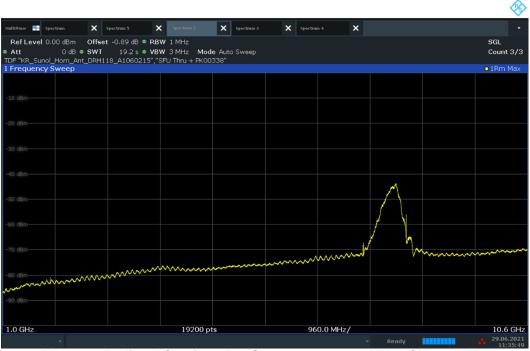
FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 28 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 28 01 40
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Margin [dB]

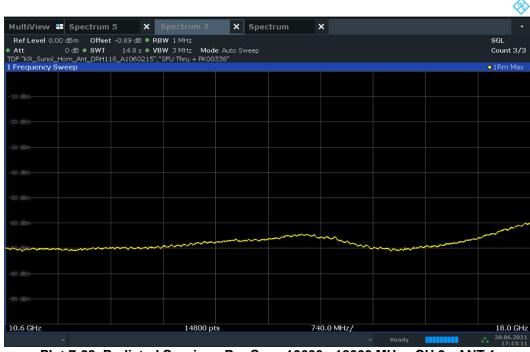
-9.47 -13.26 -13.28 -11.75 -5.93 -11.77



Channel 9 ANTENNA 1:



Plot 7-27. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 1



Plot 7-28. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.9 - ANT 1

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 29 of 40
© 2021 PCTEST	•			V 9.0 02/01/2019



ulti¥iew 井	Spectrum	×	Spectrum 5	×	Spectrum 2	×		×	Spectrum 4	×			
					BW 30 kHz								SGL
Att DF "KR_Sur		3 - SW 1 t_DRH1:			B₩ 100 kHz FU Thru + PK0		Auto Sweep						Count 5/
Frequenc			-										o 1 Rm Max
O.O. Albert J. H.												A	n in the second second
Contraction of the Contraction	and an all a start of the start	the order the	and the second secon	man	and the second second second	for for the former of	W Maland Marcalo	- and a straight of the	and a second work	an A group M	and a contracted a California		here where the second second
.164 GHz					1001 p	ts			7.6 MH	z/	, Ready		1.24 G

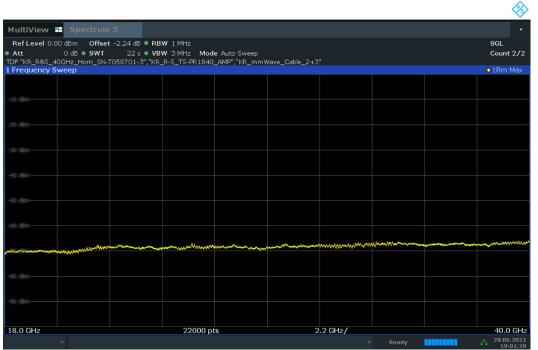
Plot 7-29. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.9 - ANT 1 – GPS band

								<u> </u>
Multi¥iew 📑 Spectrum	X Spectrum 5	Spectrum 2	X Spectrum 3	× Spectro	m 4 🗙			
Ref Level -10.00 dBm Att 0 dB TDF "KR_Sunol_Horn_Ant	• SWT 1 s • V	/BW 100 kHz N		:p				SGL Count 5/5
1 Frequency Sweep	_DN1118_A1000215 ,	SI O IIII	50					o1Rm Max
-60 dBm								
-100 dBm	shall an all and the second	mpahanpaanaa	Mar aproximente	monomenter	mounter	ware follow the ball and the	hinternation	w.M.M.M.M.
1.559 GHz		1001-1			1 Mila /			1 61 64
1.559 GHz		1001 pts		3	.1 MHz/	Ready		1.61 GH:

Plot 7-30. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.9 - ANT 1 – GPS band

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 20 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 30 of 40
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Plot 7-31. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.9 - ANT 1

Channel:	9									
Frequency (MHz):	8000									
Preamble	12									
Config	SP1									
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1556	RMS	н	-	-	-73.05	-9.27	-12.64	-83.21	-75.30	-7.91
1867	RMS	н	-	-	-71.75	-8.17	-12.64	-80.82	-63.30	-17.52
3096	RMS	н	-	-	-72.99	-5.06	-12.64	-78.95	-61.30	-17.65
10600	RMS	н	-	-	-76.39	7.28	-12.64	-70.01	-41.30	-28.71
15974	RMS	н	-	-	-75.57	6.74	-12.64	-69.73	-61.30	-8.43
39957	RMS	н	-	-	-65.76	2.03	-13.98	-65.97	-61.30	-4.67
	•	Table 7	12 Dadia	tod Cour	ious Emis	aiona Cl		Г4		

Table 7-12. Radiated Spurious Emissions CH. 9 – ANT1

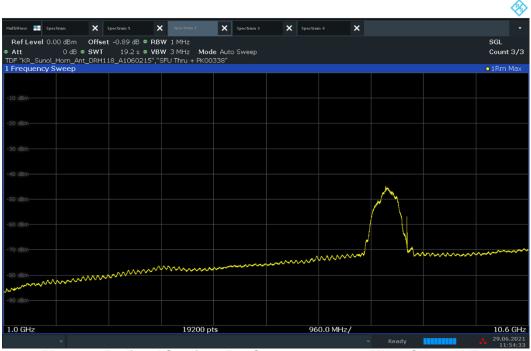
1									
1									
Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
RMS	V	150	62	-82.42	-11.59	-12.64	-94.91	-85.30	-9.61
RMS	V	-	-	-86.54	-11.44	-12.64	-98.88	-85.30	-13.58
RMS	V	-	-	-86.69	-11.40	-12.64	-98.98	-85.30	-13.68
RMS	Н	-	-	-86.92	-9.39	-12.64	-97.21	-85.30	-11.91
RMS	Н	150	62	-85.12	-9.42	-12.64	-95.44	-85.30	-10.14
RMS	Н	-	-	-86.82	-9.46	-12.64	-97.18	-85.30	-11.88
R R R	MS MS MS MS	MMS V MMS V MMS H MMS H	MS V - MS V - MS H - MS H 150	MS V - - MS V - - - MS H - - - MS H 0.00000000000000000000000000000000000	MS V - - -86.54 MS V - - -86.69 MS H - - -86.92 MS H 150 62 -85.12	MS V - - -86.54 -11.44 MS V - - -86.69 -11.40 MS H - - -86.92 -9.39 MS H 150 62 -85.12 -9.42	MS V - - -86.54 -11.44 -12.64 MS V - - -86.69 -11.40 -12.64 MS H - - -86.92 -9.39 -12.64 MS H 150 62 -85.12 -9.42 -12.64	MS V - - -86.54 -11.44 -12.64 -98.88 MS V - - -86.69 -11.40 -12.64 -98.98 MS H - - -86.92 -93.99 -12.64 -97.21 MS H 150 62 -85.12 -9.42 -12.64 -95.44	MS V - - -86.54 -11.44 -12.64 -98.88 -85.30 MS V - - -86.69 -11.40 -12.64 -98.98 -85.30 MS H - - -86.92 -9.39 -12.64 -97.21 -85.30 MS H 150 62 -85.12 -9.42 -12.64 -97.21 -85.30

Table 7-13. Radiated Spurious Emissions CH. 9 – ANT1 – GPS BANDs

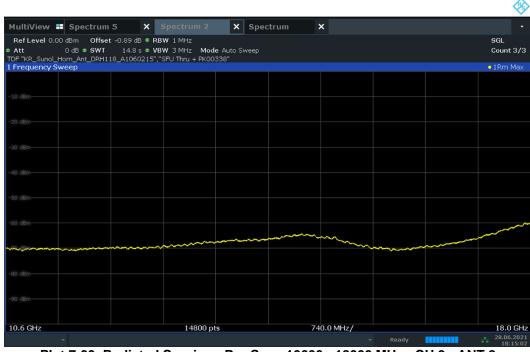
FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 21 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 31 of 40
@ 2021 DCTEST				V 0 0 02/01/2010



Channel 9 ANTENNA 2:



Plot 7-32. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 2



Plot 7-33. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.9 - ANT 2

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 32 of 40
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fulti¥iew 📑 Spectrum 🗙 Spectru	im 5 🗙 Spectrum 2 🗙	Spectrum 3 X Spect	um 4 🗙		
Ref Level -10.00 dBm Offset - Att 0 dB ● SWT DF "KR_Sunol_Horn_Ant_DRH118_A	1 s ⊂ VBW 100 kHz Mode	Auto Sweep			SGL Count 5/5
Frequency Sweep	11060215 , SFO INFO + PRO0558				• 1 Rm Max
0 d8m					
Sall and a state of the second s	กระหว่างสามารถให้และเป็นหางไทยสามารถได้	and the second and the second		and the second	magnonmont
.164 GHz	1001 pts		7.6 MHz/		1.24 GF

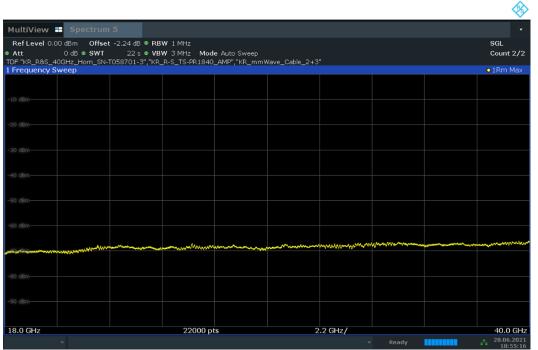
Plot 7-34. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.9 - ANT 2 – GPS band

lti¥iew 📕		Spectrum 5	× Spe		× Spectrum	n 3 🗙	Spectrum 4	×			
Ref Level Att		Offset -0.89 d SWT 1			lode Auto S	ween					SGL Count 5,
DF "KR_Sun	ol_Horn_Ant_I	DRH118_A10602				noop					
Frequenc	/ Sweep										o1Rm Ma
0 d8m											
0 dBm											
mohrow	monorman	kallageneration	manuman	montalenation	materia	mmun	manulan	makinghan	Manna	hymme	www.
.559 GHz				1001 pts			5.1 MH				1.61 G

Plot 7-35. Radiated Spurious Pre-Scan 1559 - 1610 MHz – CH 9 - ANT 2 – GPS band

FCC ID: A3LSMF926U			SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 22 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 33 of 40
© 2021 PCTEST	·			V 9.0 02/01/2019





Plot 7-36. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.9 - ANT 2

Channel:	5									
Frequency (MHz):	8000]								
Preamble	9									
Config	SP3									
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1556	RMS	V	-	-	-73.02	-9.27	-12.64	-83.19	-75.30	-7.89
1895	RMS	V	-	-	-72.63	-8.13	-12.64	-81.66	-63.30	-18.36
3098	RMS	V	-	-	-72.94	-5.03	-12.64	-78.87	-61.30	-17.57
10600	RMS	V	-	-	-76.39	7.28	-12.64	-70.01	-41.30	-28.71
15974	RMS	V	-	-	-75.50	6.74	-12.64	-69.66	-61.30	-8.36
39959	RMS	V	-	-	-65.82	2.01	-13.98	-66.05	-61.30	-4.75
		Table 7	-14. Radia	ted Spur	ious Emis	sions Cl	H. 9 – AN	Γ2		,
Channel:	5									

Frequency (MHz):	8000									
Preamble	9									
Config	SP3									
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	1	-81.17	-11.59	-12.64	-93.66	-85.30	-8.36
1227	RMS	V	-	-	-86.45	-11.45	-12.64	-98.80	-85.30	-13.50
1238	RMS	V	-	-	-85.68	-11.39	-12.64	-97.97	-85.30	-12.67
1561	RMS	V	-	-	-86.60	-9.27	-12.64	-96.77	-85.30	-11.47
1567	RMS	V	-	-	-87.27	-9.29	-12.64	-97.46	-85.30	-12.16
1600	RMS	V	150	1	-84.12	-9.42	-12.64	-94.44	-85.30	-9.14
	Table 7.45 Redicted Enurious Emissions CH 0 ANT2 CRE RANDS									

Table 7-15. Radiated Spurious Emissions CH. 9 – ANT2 – GPS BANDs

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 24 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Page 34 of 40
@ 2024 DOTECT				1/ 0 0 00/01/0010



7.4 Radiated Spurious Emissions Measurements – Below 1GHz §15.209(a), §15.519(c); RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna 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 radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR and Table 6 of RSS-Gen (8.10) must not exceed the limits shown in Table 7-18 per Section 15.209 and RSS-Gen (8.9).

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 7-16. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 120kHz (for emissions from 30MHz 1GHz)
- 3. Detector = quasi-peak
- 4. Sweep time = auto couple
- 5. Trace mode = max hold
- 6. Trace was allowed to stabilize

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 25 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 35 of 40
© 2021 PCTEST	•	•		V 9 0 02/01/2019



Test Setup

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

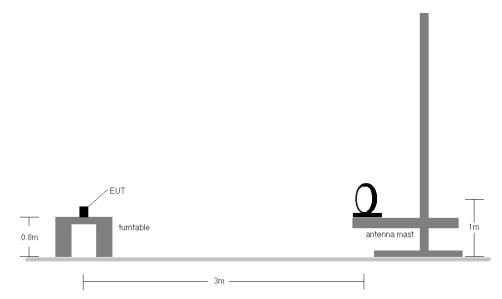
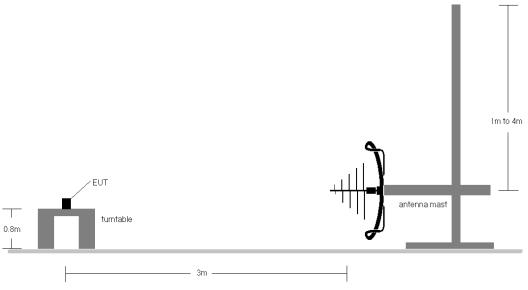
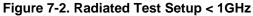


Figure 7-1. Radiated Test Setup < 30Mhz





FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element		SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Baga 26 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 36 of 40
© 2021 PCTEST				V 9 0 02/01/2019

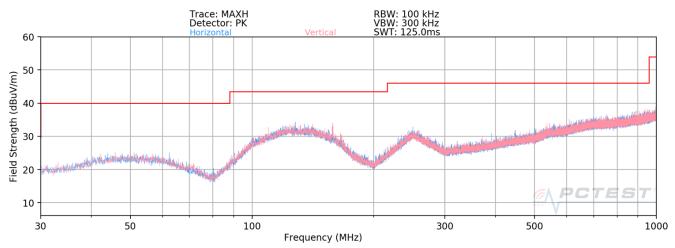


Test Notes

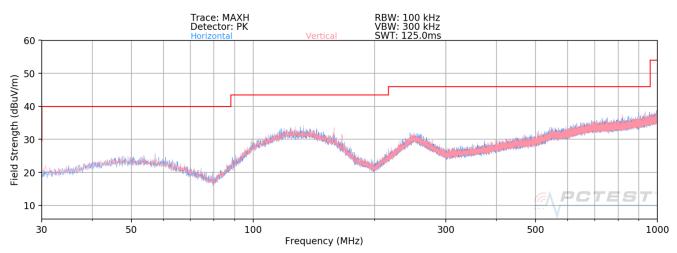
- 1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-15.
- 2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
- 3. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
- 4. Emissions were measured at a 3 meter test distance.
- 5. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
- 6. No spurious emissions were detected within 20dB of the limit below 30MHz.
- 7. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
- The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 27 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 37 of 40
© 2021 PCTEST			\/ 0 0 02/01/2010

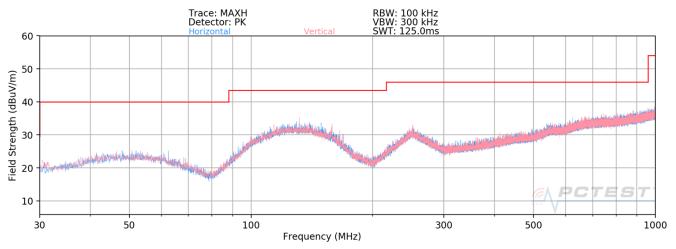








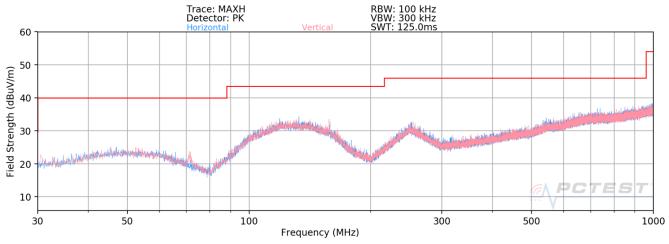






FCC ID: A3LSMF926U	Proud to be part of element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 29 of 40
1K2106280021-01.A3L	6/21 - 7/1/2021	Portable Headset		Page 38 of 40
© 2021 PCTEST				V 9 0 02/01/2019





Plot 7-40. 30MHz - 1 GHz Pre-Scan Plots ANT2 - CH 9

FCC ID: A3LSMF926U	Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 39 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset		Fage 39 01 40
© 2021 PCTEST				V 9 0 02/01/2019



8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMF926U** has been tested to comply with the requirements specified in §15.519 and §15.521 of the FCC rules.

FCC ID: A3LSMF926U	PCTEST Proud to be part of @ element	MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 40 of 40
1K2106280021-01.A3L	6/21 – 7/1/2021	Portable Headset	Page 40 of 40
© 2021 PCTEST			V 9.0 02/01/2019