

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:

03/26/21 - 06/09/21

Test Site/Location:

PCTEST Lab. Yongin-Si, Gyeonggi-do, South Korea

Test Report Serial No.:

1M2104190044-10.A3L

FCC ID:

A3LSMF926B

APPLICANT:

Samsung Electronics Co., Ltd.

Application Type:

Certification

Model:

SM-F926B

Additional Model(s):

SM-F926B/DS

EUT Type:

Portable Handset

FCC Classification:

Ultra Wideband (UWB)

FCC Rule Parts(s):

FCC Part 15 Subpart F (15.519, 15.521)

UWB Classification:

Hand-held Communication Device

Test Procedure(s):

ANSI C63.10-2013, KDB 393764 D01

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



Reviewed by

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Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 1 of 82

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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 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 ISSED Standards (RSS).
- PCTEST facility is a registered (26168) 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 EUT's ultra-wideband transmitter.

Test Device Serial No.: 1280S

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 (n5, n66), 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	-4.83	-3.85
8.0	-0.24	-3.61

Table 2-1. Maximum Peak Antenna Gain

2.6 Software and Firmware

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

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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 AC Line Conducted Emissions

The line-conducted facility is located inside a 10'x16'x9' shielded enclosure. The shielded enclosure is manufactured by SY cooperation RF Enclosures. The line-conducted facility is located inside a 7m x 3.66m x 2.7m shielded enclosure. 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 7.7. The EMI Receiver mode of the R&S ESW was used to perform AC line conducted emissions testing. Automated test software was used to perform the AC line conducted emissions testing. Automated measurement software utilized is Rohde & Schwarz EMC32, Version 10.20.01.

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3.3 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with 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.

3.4 Environmental Conditions

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

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4.0 ANTENNA REQUIREMENTS

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.

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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 ($\pm$ dB)
Conducted Disturbance	3.09
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07

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6.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9030A	PXA Signal Analyzer (26.5GHz)	6/29/2020	Annual	6/29/2021	MY49432391
Com-Power	CGC-510E	Conducted Comb Generator	7/1/2020	Annual	7/1/2021	311876
Com-Power	CG-515	Comb generator (1 & 5 MHz STEP)	6/30/2020	Annual	6/30/2021	26010060
Com-Power	CGO-5100B	Comb generator (100 MHz STEP)		N/A		CGO-5100B
ETS-Lindgren	3110C	Bioconical Antenna	7/9/2020	Biennial	7/9/2022	211248
Huber+Suhner	SF102/11SK/11SK/2000	RF Cable		N/A		SN 804223/2
Huber+Suhner	SF102/11SK/11SK/1500	RF Cable		N/A		SN 804225/2
Rohde & Schwarz	TS-SFUNIT-Rx	Shielded Filter Unit	2/19/2021	Annual	2/19/2022	102131
Rohde & Schwarz	180-442A-FK	Horn (Small)	11/20/2020	Biennial	11/20/2022	T058701-3
Rohde & Schwarz	TS-SFUNIT-TxA	Controller		N/A		102131
Rohde & Schwarz	SCU08F-40	Amplifier		N/A		8400007
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	7/9/2019	Biennial	7/9/2021	9162-217
Sunol Sciences	DRH-118	Antenna	8/9/2019	Biennial	8/9/2021	A102416-1
Pasternack	NC-100	Torque Wrench (8in-lbs)	8/5/2020	Biennial	8/5/2022	NA

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

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7.0 TEST DATA

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

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FCC Classification: Ultra-Wideband (UWB)

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
§15.503, §15.519 (b)	10dB Bandwidth	$\geq 500\text{MHz}$	RADIATED	PASS	Section 7.2
§15.519(a)(1)	Cessation Time	Transmission shall cease in less than 10s		PASS	Section 7.3
§15.519(e)	Maximum Peak Power	$< 0\text{dBm EIRP in } 50\text{MHz BW}$			Section 7.4
§15.519(c)	Maximum Average Emission in the range of 3100 – 10600 MHz	$< -41.3\text{ EIRP in dBm}$			Section 7.4
§15.519(c)	Radiated Emissions Above 960MHz	See table in 15.519(c) for details			Section 7.4, 7.5
§15.519(d)	Radiated Emissions in the 1164 – 1240Mhz and 1559 – 1610MHz GPS Bands	$< -85.3\text{ EIRP in dBm}$			Section 7.5
§15.519(c), §15.519(a)	Radiate Emissions Below 960MHz	Emissions in restricted bands must meet the radiated limits detailed in 15.209			Section 7.6
§15.207	AC Conducted Emissions 150kHz – 30MHz	$< \text{FCC } 15.207\text{ limits (RSS-Gen)}$	LINE CONDUCTED	PASS	Section 7.7

Table 7-1. Summary of Test Results

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7.2 10dB Bandwidth

§15.503(a), §15.519(b)

Test Overview and Limit

Per the definition of 15.503, the UWB Bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna.

The 10dB bandwidth of the UWB signal must remain fully within the 3100 – 10,600MHz band. The 10dB bandwidth of the UWB signal must also be greater than or equal to 500MHz.

Test Procedures Used

ANSI C63.10-2013 Section 10.1

Test Settings

1. RBW = 1MHz
2. VBW = 3MHz
3. Detector = Peak
4. Span was set wide enough to capture the 10dB points of the signal
5. Trace mode = max hold
6. Sweep = 2s
7. The trace was allowed to stabilize

Test Setup

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



Figure 7-1. Test Instrument and Measurement Setup

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Frequency [GHz]	Channel	Preamble Id	Config	Mode	F _M [GHz]	F _L [GHz]	F _H [GHz]	F _C [GHz]	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
6.5	5	9	SP0	BPRF	6.646	6.225	6.836	6.531	611	500	Pass
		9	SP1	BPRF	6.645	6.239	6.835	6.537	597	500	Pass
		9	SP3	BPRF	6.689	6.208	6.800	6.504	592	500	Pass
		10	SP0	BPRF	6.490	6.297	6.800	6.548	503	500	Pass
		10	SP1	BPRF	6.490	6.297	6.834	6.565	537	500	Pass
		10	SP3	BPRF	6.689	6.209	6.868	6.538	659	500	Pass
		11	SP0	BPRF	6.677	6.209	6.869	6.539	660	500	Pass
		11	SP1	BPRF	6.679	6.208	6.857	6.533	649	500	Pass
		11	SP3	BPRF	6.699	6.209	6.803	6.506	595	500	Pass
		12	SP0	BPRF	6.681	6.213	6.850	6.531	637	500	Pass
		12	SP1	BPRF	6.681	6.209	6.844	6.527	636	500	Pass
		12	SP3	BPRF	6.689	6.209	6.800	6.505	591	500	Pass
		27	SP0	HPRF	6.491	6.220	6.779	6.500	559	500	Pass
		27	SP1	HPRF	6.491	6.224	6.797	6.510	573	500	Pass
		27	SP3	HPRF	6.677	6.208	6.801	6.505	594	500	Pass
8.0	9	9	SP0	BPRF	8.377	7.594	8.380	7.987	785	500	Pass
		9	SP1	BPRF	8.377	7.595	8.380	7.987	785	500	Pass
		9	SP3	BPRF	8.377	7.594	8.380	7.987	786	500	Pass
		10	SP0	BPRF	7.987	7.595	8.381	7.988	785	500	Pass
		10	SP1	BPRF	7.987	7.595	8.380	7.987	785	500	Pass
		10	SP3	BPRF	8.377	7.595	8.380	7.987	785	500	Pass
		11	SP0	BPRF	8.377	7.594	8.380	7.987	786	500	Pass
		11	SP1	BPRF	8.377	7.595	8.380	7.987	785	500	Pass
		11	SP3	BPRF	8.378	7.595	8.381	7.988	786	500	Pass
		12	SP0	BPRF	8.377	7.594	8.380	7.987	786	500	Pass
		12	SP1	BPRF	8.378	7.595	8.381	7.988	785	500	Pass
		12	SP3	BPRF	8.378	7.595	8.380	7.987	784	500	Pass
		27	SP0	HPRF	8.377	7.594	8.380	7.987	785	500	Pass
		27	SP1	HPRF	8.377	7.595	8.381	7.988	786	500	Pass
		27	SP3	HPRF	8.378	7.595	8.379	7.987	784	500	Pass

Table 7-2. UWB 10dB Bandwidth Summary [ANT 1]

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Bandwidth Results



Plot 7-1. BANDWIDTH Plot – CH.5 - SP0 – Preamble 9



Plot 7-2. BANDWIDTH Plot – CH.5 – SP1 – Preamble 9

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Plot 7-3. BANDWIDTH Plot – CH.5 – SP3 – Preamble 9



Plot 7-4. BANDWIDTH Plot – CH.5 - SP0 – Preamble 10

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Plot 7-5. BANDWIDTH Plot – CH.5 – SP1 – Preamble 10



Plot 7-6. BANDWIDTH Plot – CH.5 – SP3 – Preamble 10

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Plot 7-74. BANDWIDTH Plot – CH.5 - SP0 – Preamble 11



Plot 7-5. BANDWIDTH Plot – CH.5 – SP1 – Preamble 11

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Plot 7-6. BANDWIDTH Plot – CH.5 – SP3 – Preamble 11



Plot 7-10. BANDWIDTH Plot – CH.5 - SP0 – Preamble 12

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Plot 7-11. BANDWIDTH Plot – CH.5 – SP1 – Preamble 12



Plot 7-12. BANDWIDTH Plot – CH.5 – SP3 – Preamble 12

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Plot 7-13. BANDWIDTH Plot – CH.5 - SP0 – Preamble 27



Plot 7-14. BANDWIDTH Plot – CH.5 – SP1 – Preamble 27

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Plot 7-15. BANDWIDTH Plot – CH.5 – SP3 – Preamble 27

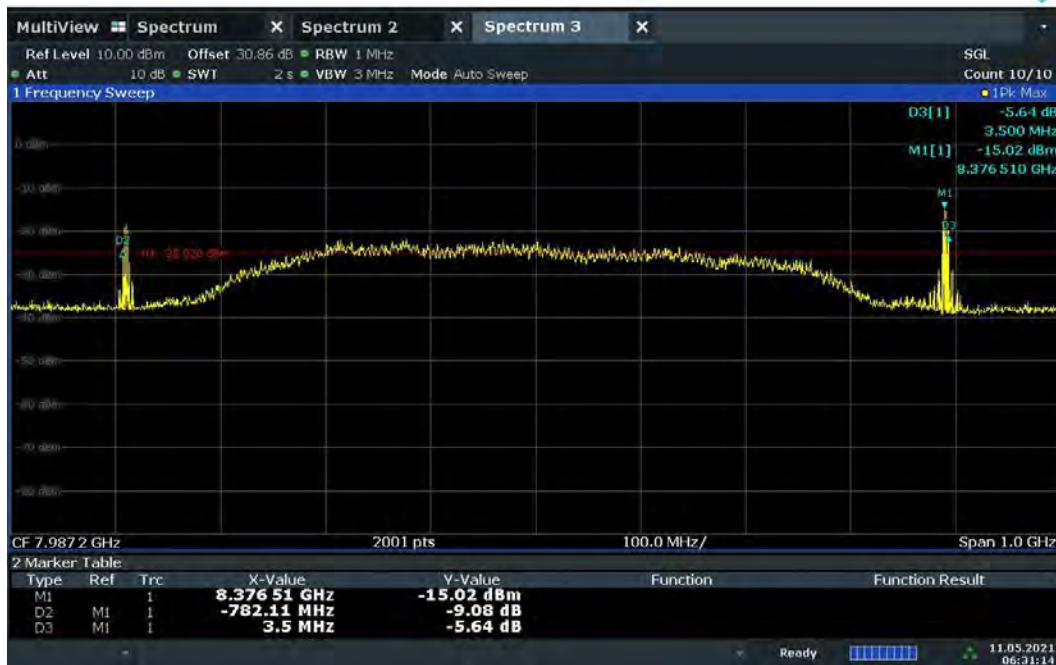


Plot 7-16. BANDWIDTH Plot – CH.9 - SP0 – Preamble 9

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 20 of 82



Plot 7-17. BANDWIDTH Plot – CH.9 – SP1 – Preamble 9



Plot 7-18. BANDWIDTH Plot – CH.9 – SP3 – Preamble 9

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 21 of 82

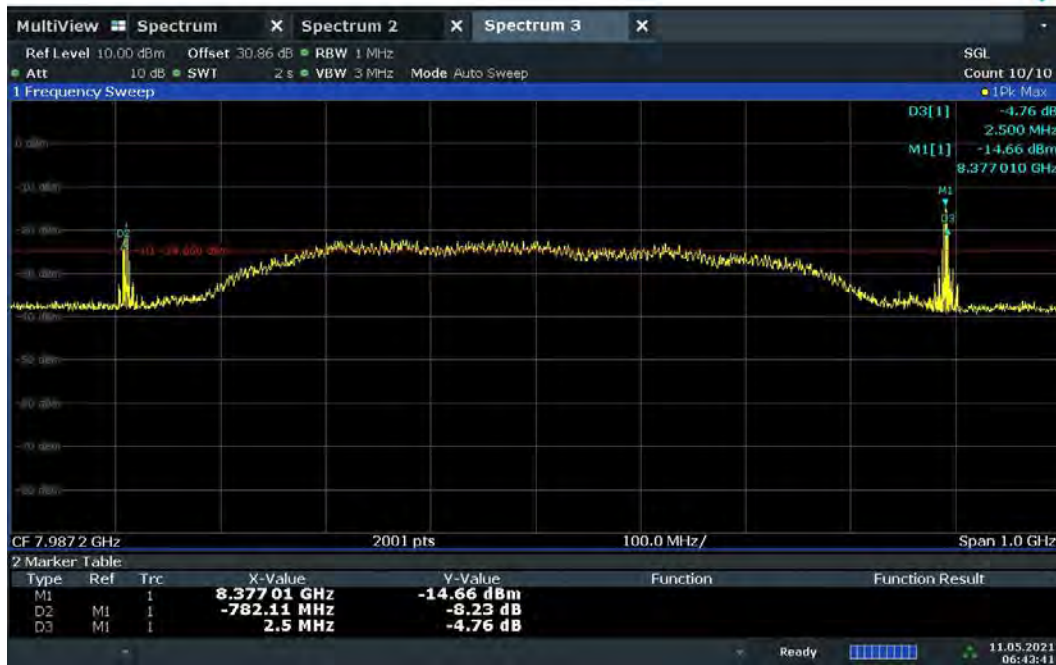


Plot 7-19. BANDWIDTH Plot – CH.9 - SP0 – Preamble 10



Plot 7-20. BANDWIDTH Plot – CH.9 – SP1 – Preamble 10

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 22 of 82



Plot 7-21. BANDWIDTH Plot – CH.9 – SP3 – Preamble 10

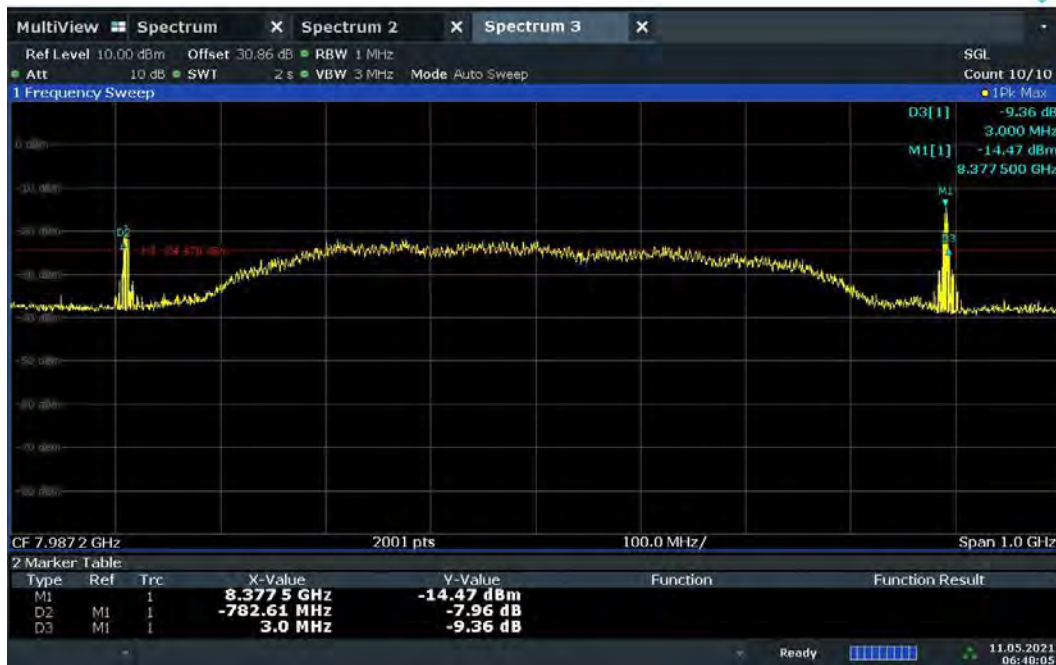


Plot 7-22. BANDWIDTH Plot – CH.9 - SP0 – Preamble 11

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 23 of 82

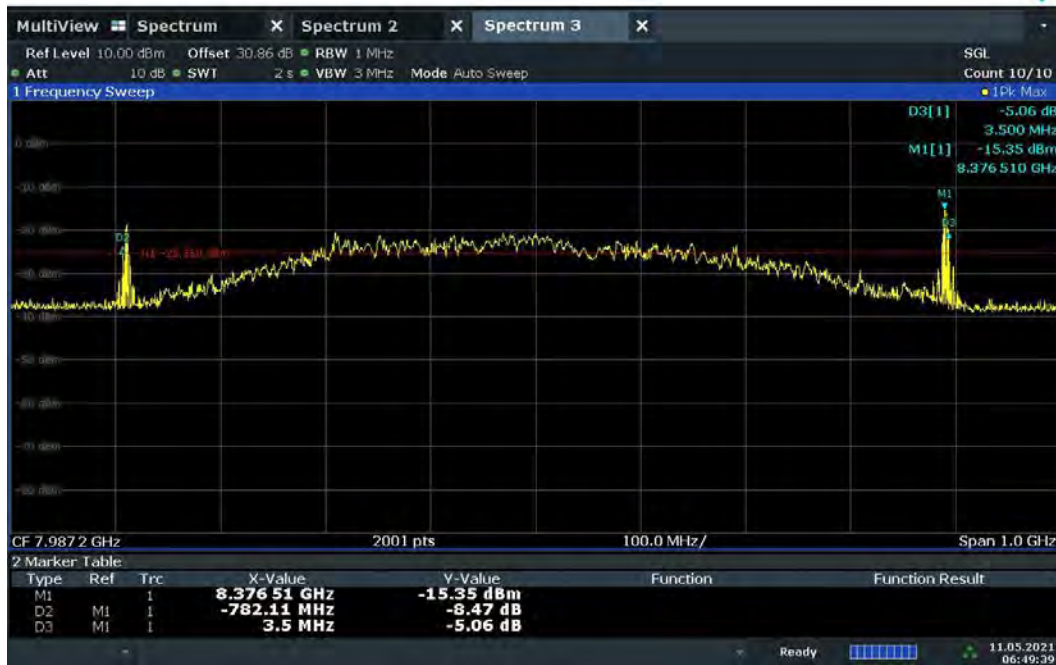


Plot 7-23. BANDWIDTH Plot – CH.9 – SP1 – Preamble 11

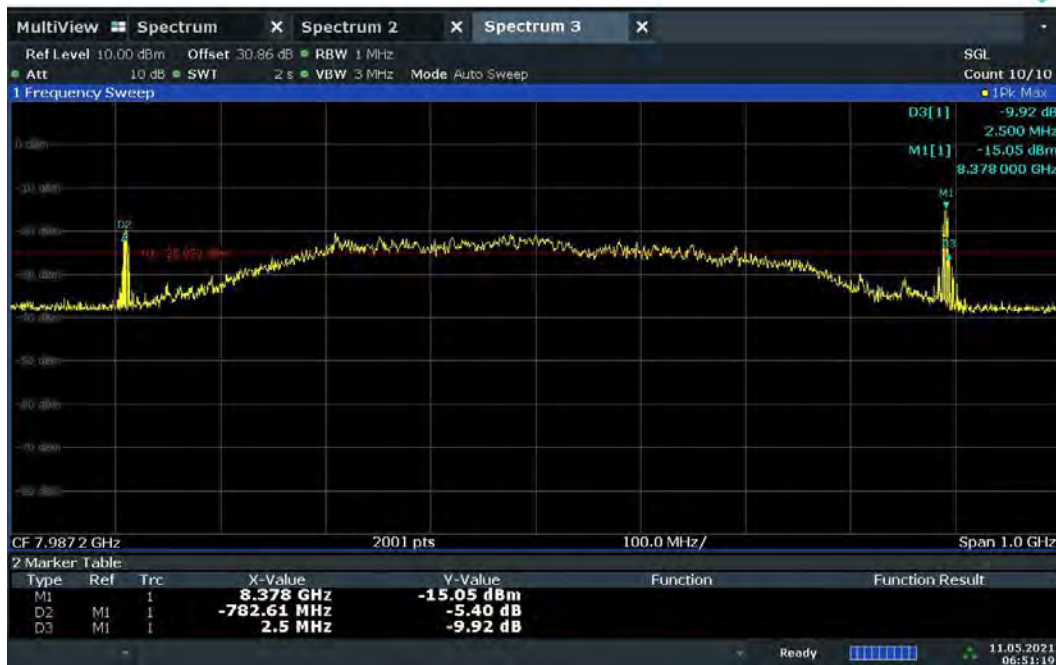


Plot 7-24. BANDWIDTH Plot – CH.9 – SP3 – Preamble 11

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 24 of 82

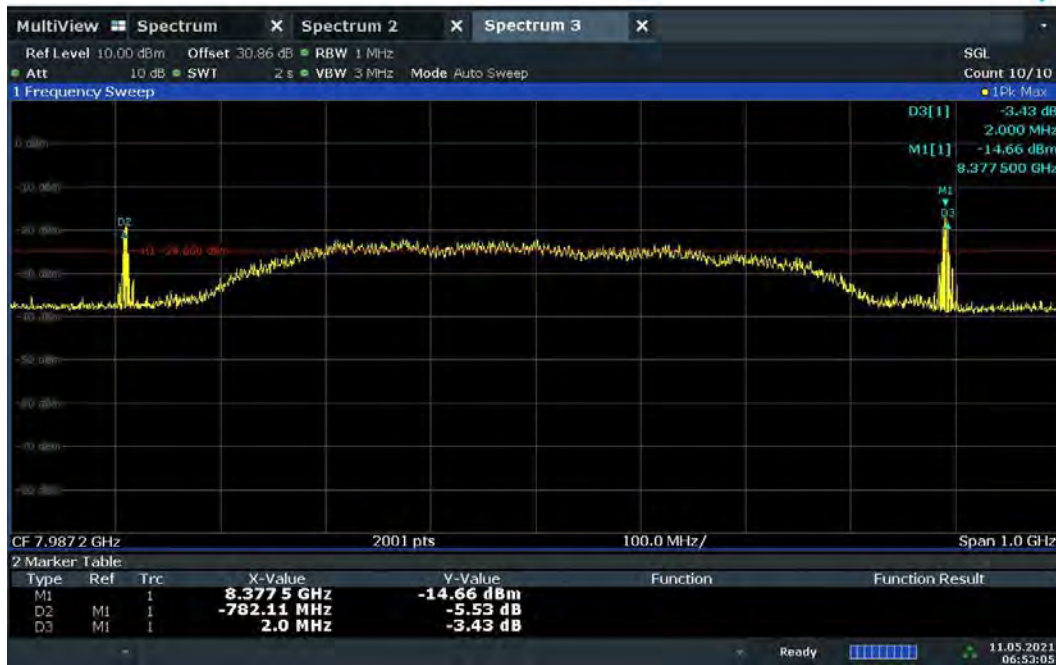


Plot 7-25. BANDWIDTH Plot – CH.9 - SP0 – Preamble 12



Plot 7-26. BANDWIDTH Plot – CH.9 – SP1 – Preamble 12

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 25 of 82

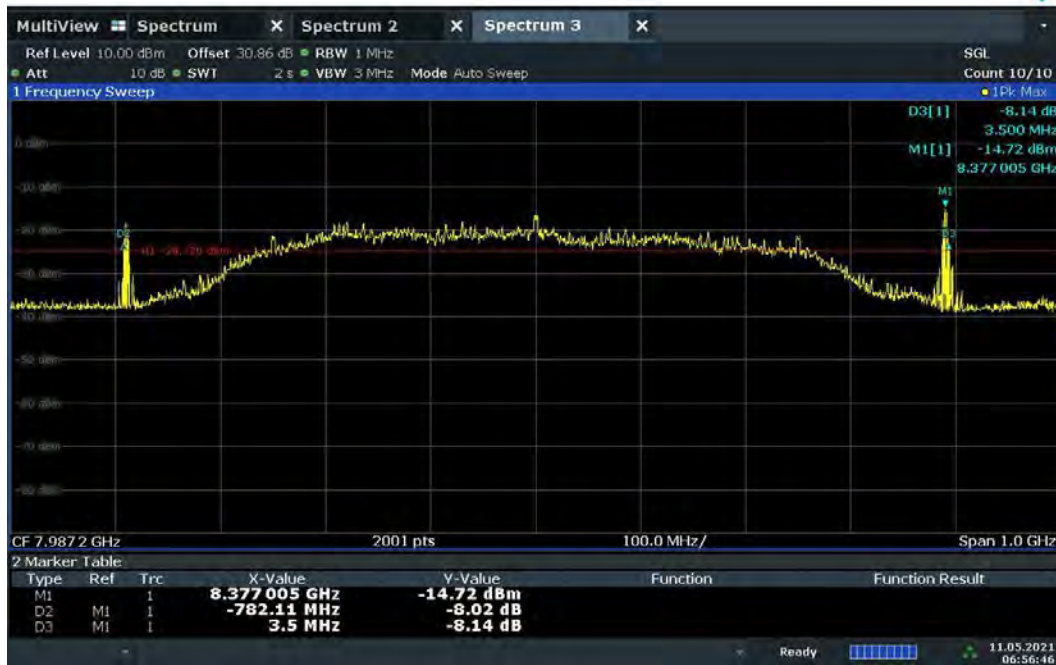


Plot 7-27. BANDWIDTH Plot – CH.9 – SP3 – Preamble 12

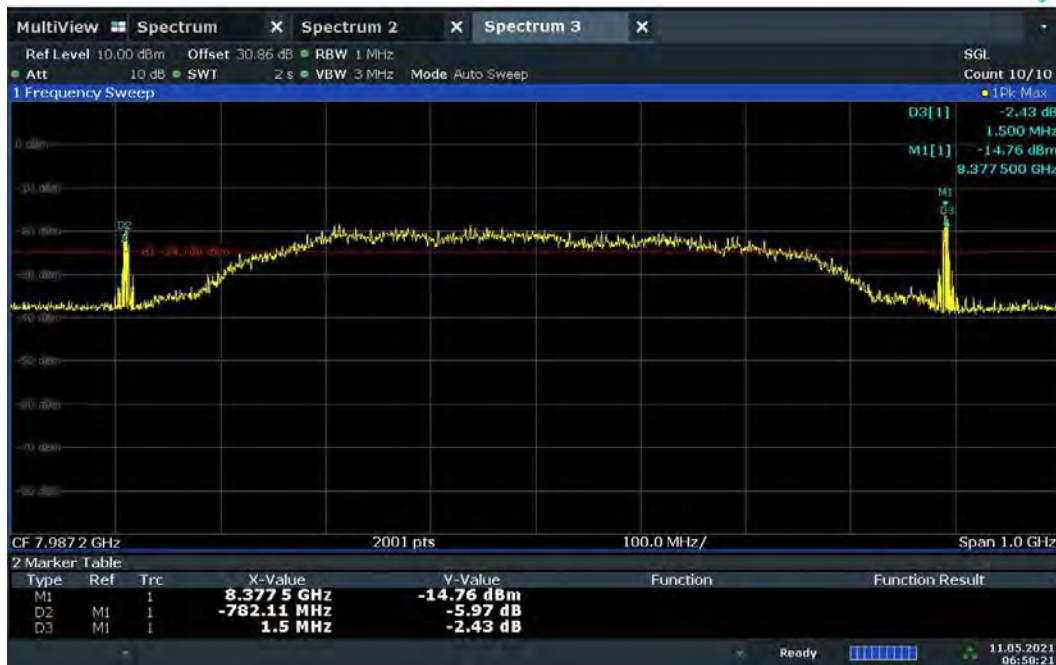


Plot 7-28. BANDWIDTH Plot – CH.9 - SP0 – Preamble 27

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 26 of 82



Plot 7-29. BANDWIDTH Plot – CH.9 – SP1 – Preamble 27



Plot 7-30. BANDWIDTH Plot – CH.9 – SP3 – Preamble 27

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 27 of 82

Frequency [GHz]	Channel	Config	Payload	Mode	F _M [GHz]	F _L [GHz]	F _H [GHz]	F _C [GHz]	Measured Bandwidth [MHz]	Minimum Bandwidth [MHz]	Pass / Fail
6.5	5	9	SP0	BPRF	6.646	6.098	6.881	6.490	783	500	Pass
		9	SP1	BPRF	6.645	6.098	6.880	6.489	782	500	Pass
		9	SP3	BPRF	6.603	6.099	6.882	6.491	783	500	Pass
		10	SP0	BPRF	6.490	6.099	6.881	6.490	782	500	Pass
		10	SP1	BPRF	6.490	6.099	6.881	6.490	782	500	Pass
		10	SP3	BPRF	6.603	6.099	6.881	6.490	782	500	Pass
		11	SP0	BPRF	6.880	6.098	6.880	6.489	783	500	Pass
		11	SP1	BPRF	6.603	6.101	6.883	6.492	782	500	Pass
		11	SP3	BPRF	6.603	6.353	6.876	6.615	524	500	Pass
		12	SP0	BPRF	6.586	6.099	6.881	6.490	782	500	Pass
		12	SP1	BPRF	6.586	6.100	6.882	6.491	782	500	Pass
		12	SP3	BPRF	6.603	6.363	6.877	6.620	514	500	Pass
		27	SP0	HPRF	6.575	6.100	6.882	6.491	782	500	Pass
		27	SP1	HPRF	6.575	6.373	6.879	6.626	506	500	Pass
		27	SP3	HPRF	6.677	6.232	6.887	6.559	655	500	Pass
8.0	9	9	SP0	BPRF	8.048	7.594	8.381	7.987	786	500	Pass
		9	SP1	BPRF	8.024	7.595	8.236	7.915	640	500	Pass
		9	SP3	BPRF	8.051	7.736	8.249	7.992	513	500	Pass
		10	SP0	BPRF	7.987	7.595	8.180	7.888	585	500	Pass
		10	SP1	BPRF	7.987	7.599	8.180	7.890	581	500	Pass
		10	SP3	BPRF	8.017	7.694	8.204	7.949	510	500	Pass
		11	SP0	BPRF	7.597	7.594	8.228	7.911	634	500	Pass
		11	SP1	BPRF	8.087	7.598	8.248	7.923	650	500	Pass
		11	SP3	BPRF	8.377	7.739	8.379	8.059	640	500	Pass
		12	SP0	BPRF	8.066	7.594	8.380	7.987	786	500	Pass
		12	SP1	BPRF	8.083	7.596	8.238	7.917	642	500	Pass
		12	SP3	BPRF	8.081	7.599	8.249	7.924	650	500	Pass
		27	SP0	HPRF	8.073	7.736	8.239	7.987	502	500	Pass
		27	SP1	HPRF	8.057	7.600	8.239	7.919	639	500	Pass
		27	SP3	HPRF	8.050	7.597	8.229	7.913	632	500	Pass

Table 7-3. UWB 10dB Bandwidth Summary [ANT 2]

FCC ID: A3LSMF926B	 MEASUREMENT REPORT (CERTIFICATION) 		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset	Page 28 of 82

Bandwidth Results



Plot 7-31. BANDWIDTH Plot – CH.5 - SP0 – Preamble 9



Plot 7-32. BANDWIDTH Plot – CH.5 – SP1 – Preamble 9

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 29 of 82



Plot 7-33. BANDWIDTH Plot – CH.5 – SP3 – Preamble 9



Plot 7-34. BANDWIDTH Plot – CH.5 - SP0 – Preamble 10

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 30 of 82



Plot 7-35. BANDWIDTH Plot – CH.5 – SP1 – Preamble 10



Plot 7-36. BANDWIDTH Plot – CH.5 – SP3 – Preamble 10

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 31 of 82



Plot 7-37. BANDWIDTH Plot – CH.5 - SP0 – Preamble 11



Plot 7-38. BANDWIDTH Plot – CH.5 – SP1 – Preamble 11

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 32 of 82



Plot 7-39. BANDWIDTH Plot – CH.5 – SP3 – Preamble 11



Plot 7-40. BANDWIDTH Plot – CH.5 - SP0 – Preamble 12

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 33 of 82



Plot 7-41. BANDWIDTH Plot – CH.5 – SP1 – Preamble 12



Plot 7-42. BANDWIDTH Plot – CH.5 – SP3 – Preamble 12

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 34 of 82



Plot 7-43. BANDWIDTH Plot – CH.5 - SP0 – Preamble 27

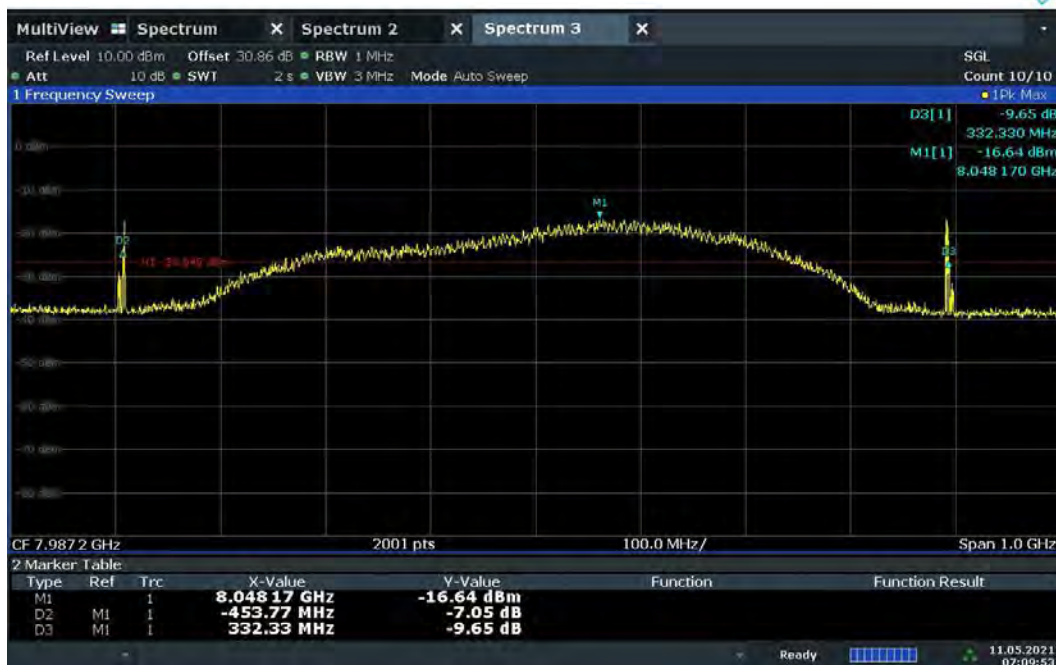


Plot 7-44. BANDWIDTH Plot – CH.5 – SP1 – Preamble 27

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 35 of 82



Plot 7-45. BANDWIDTH Plot – CH.5 – SP3 – Preamble 27



Plot 7-46. BANDWIDTH Plot – CH.9 - SP0 – Preamble 9

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 36 of 82



Plot 7-47. BANDWIDTH Plot – CH.9 – SP1 – Preamble 9



Plot 7-48. BANDWIDTH Plot – CH.9 – SP3 – Preamble 9

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 37 of 82



Plot 7-49. BANDWIDTH Plot – CH.9 - SP0 – Preamble 10



Plot 7-50. BANDWIDTH Plot – CH.9 – SP1 – Preamble 10

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 38 of 82



Plot 7-51. BANDWIDTH Plot – CH.9 – SP3 – Preamble 10

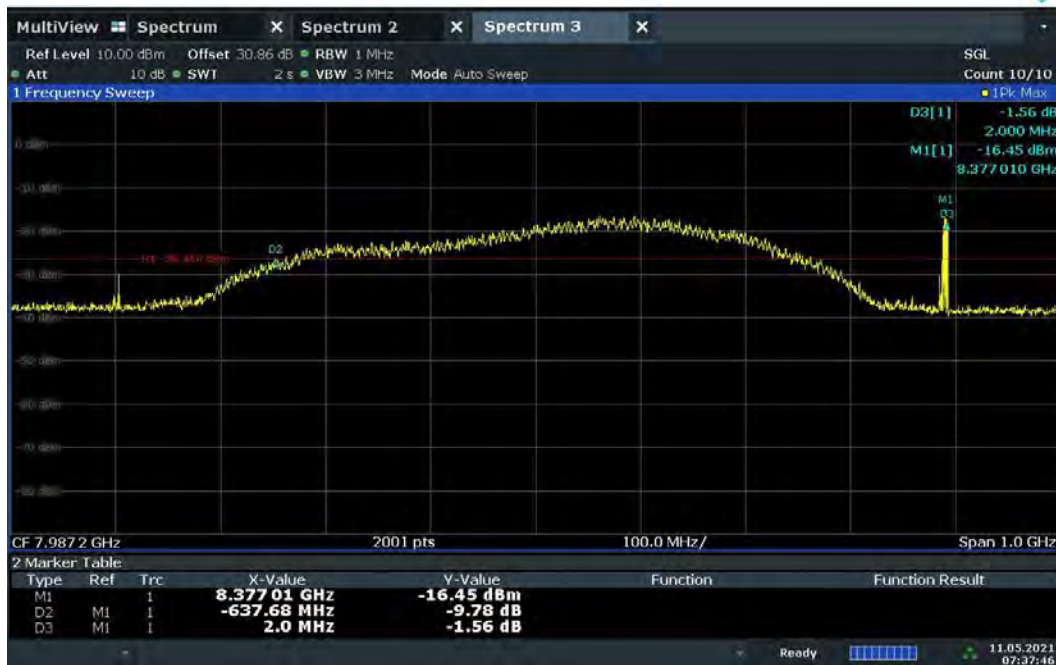


Plot 7-52. BANDWIDTH Plot – CH.9 - SP0 – Preamble 11

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 39 of 82

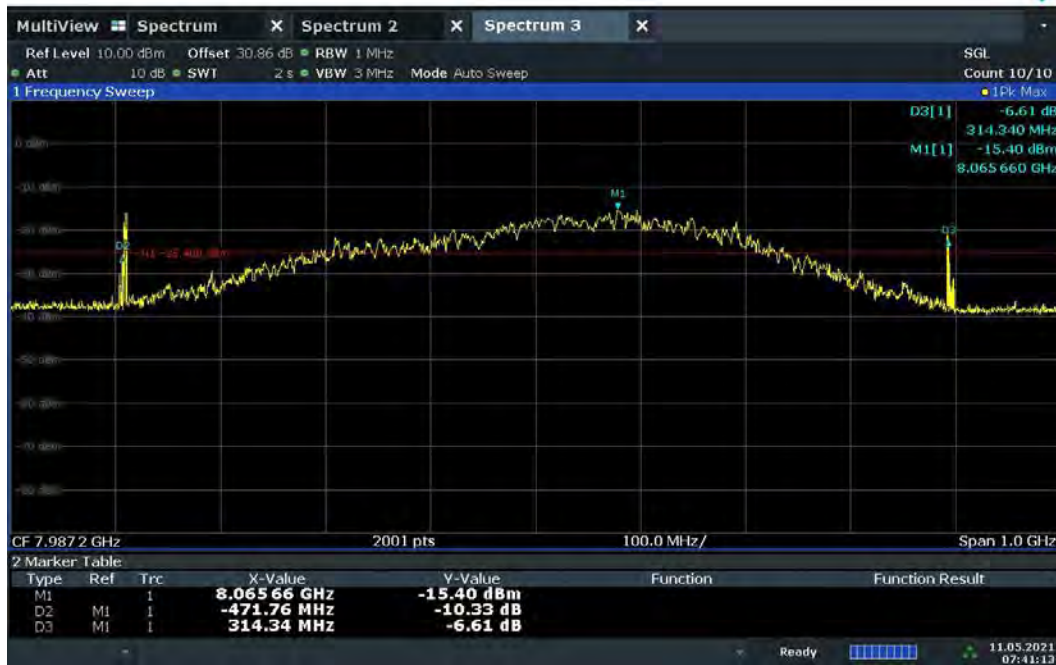


Plot 7-53. BANDWIDTH Plot – CH.9 – SP1 – Preamble 11



Plot 7-54. BANDWIDTH Plot – CH.9 – SP3 – Preamble 11

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 40 of 82

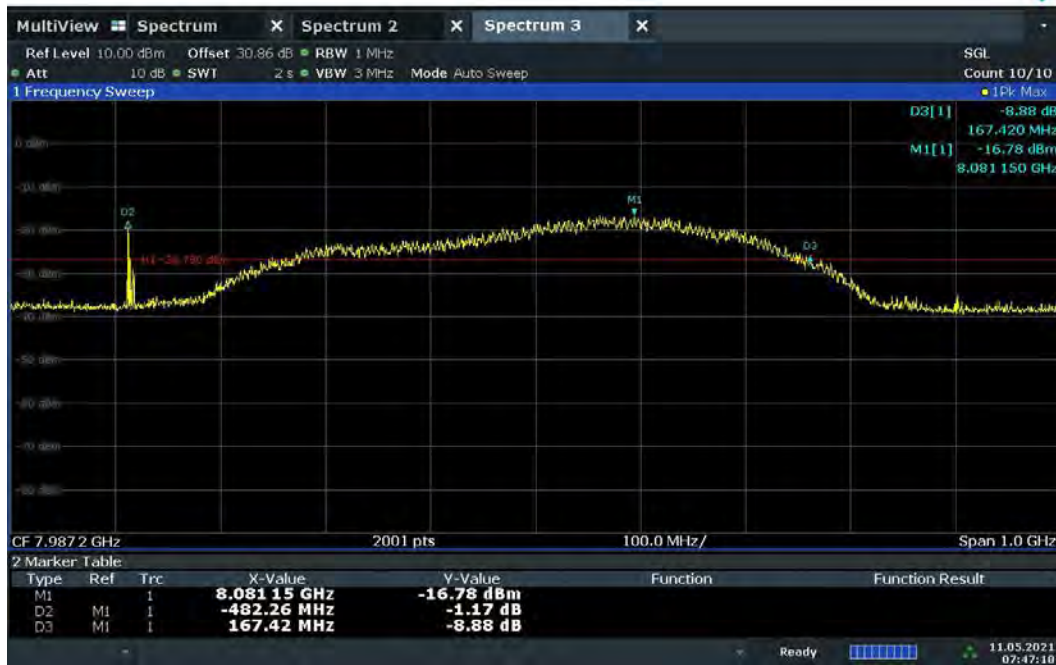


Plot 7-55. BANDWIDTH Plot – CH.9 - SP0 – Preamble 12

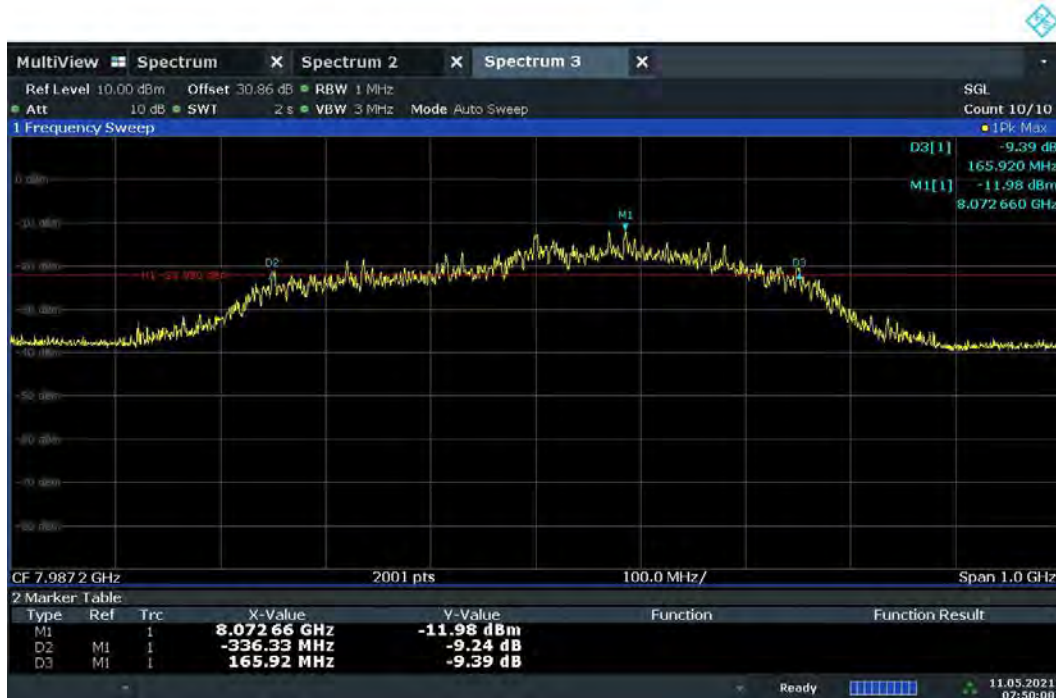


Plot 7-56. BANDWIDTH Plot – CH.9 – SP1 – Preamble 12

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 41 of 82



Plot 7-57. BANDWIDTH Plot – CH.9 – SP3 – Preamble 12



Plot 7-58. BANDWIDTH Plot – CH.9 - SP0 – Preamble 27

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 42 of 82



Plot 7-59. BANDWIDTH Plot – CH.9 – SP1 – Preamble 27



Plot 7-60. BANDWIDTH Plot – CH.9 – SP3 – Preamble 27

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 43 of 82

7.3 Cessation Time

§15.519(a)(1)

Test Overview and Limit

§15.519(a)(1) A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgment from the associated receiver that its transmission is being received an acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

Test Settings

1. RBW = 1MHz
2. VBW = 3MHz
3. Span = 0 Span Mode
4. Sweep time shall be sufficient to demonstrate EUTs compliance with the rule part.
5. Vertical Markers are placed to indicate the point in which the receiver ceases acknowledging the EUT and the point 10s after.

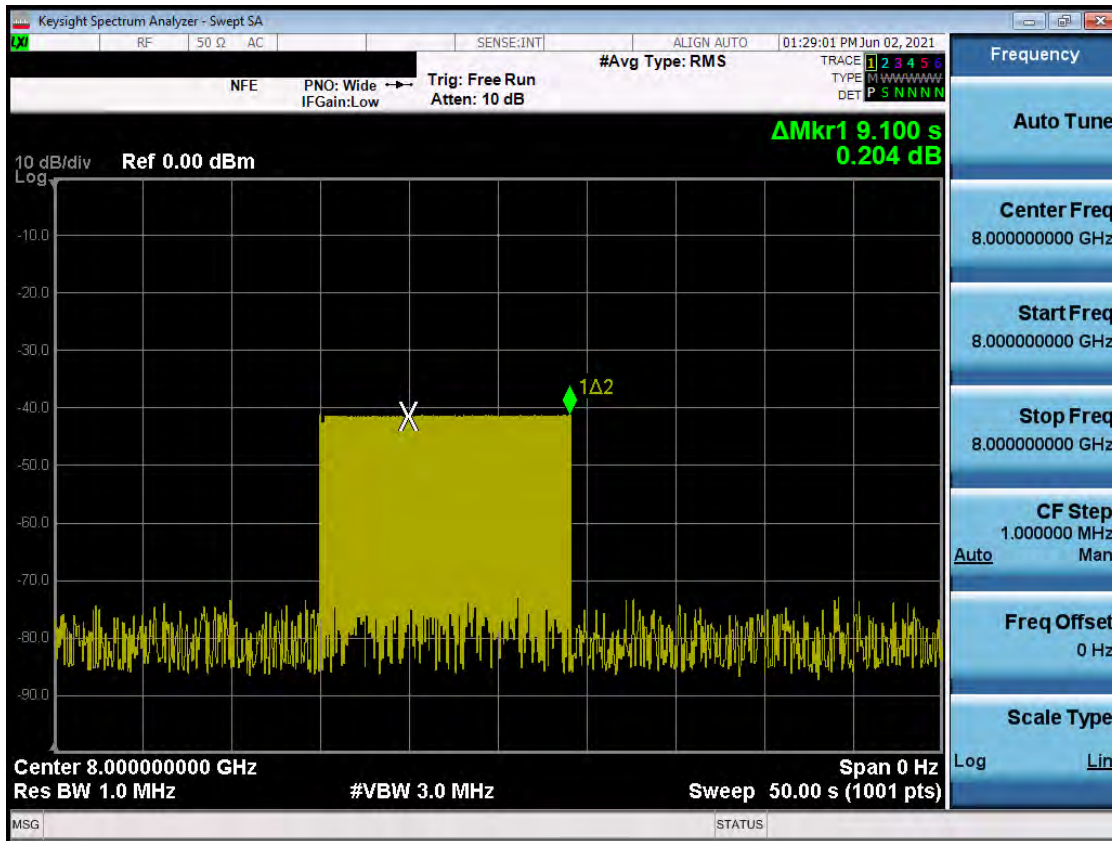
Test Setup

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



Figure 7-2. Test Instrument and Measurement Setup

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 44 of 82



Plot 7-61. Cessation Time Plot

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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7.4 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: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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RESULTS – BPRF

ANT	CH	MODE	Preamble	Meas. Ant.	FM [GHz]	Peak power [dBm/50MHz]	Peak limit [dBm/50MHz]	Margin [dB]
1	5	SP0	9	H	6.729	-2.67	0.00	-2.67
	9	SP0	10	H	7.984	-1.69	0.00	-1.69
2	5	SP0	12	V	6.618	-4.47	0.00	-4.47
	9	SP1	9	V	8.002	-3.78	0.00	-3.78

Table 7-4. BPRF Highest Peak Power Results

ANT	CH	MODE	Preamble	Meas. Ant.	FM [GHz]	Average power [dBm]	Average limit [dBm]	Margin [dB]
1	5	SP3	12	H	6.685	-42.90	-41.3	-1.60
	9	SP1	11	H	8.111	-43.01	-41.3	-1.71
2	5	SP3	10	V	6.601	-42.92	-41.3	-1.62
	9	SP3	9	V	8.041	-42.81	-41.3	-1.51

Table 7-5. 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

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Plot 7-62. UWB Peak Power Measurement - ANT 1 - CH.5 – BPRF



Plot 7-63. UWB Peak Power Measurement - ANT 1 - CH.9 – BPRF

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 48 of 82



Plot 7-64. UWB Peak Power Measurement - ANT 2 - CH.5 – BPRF

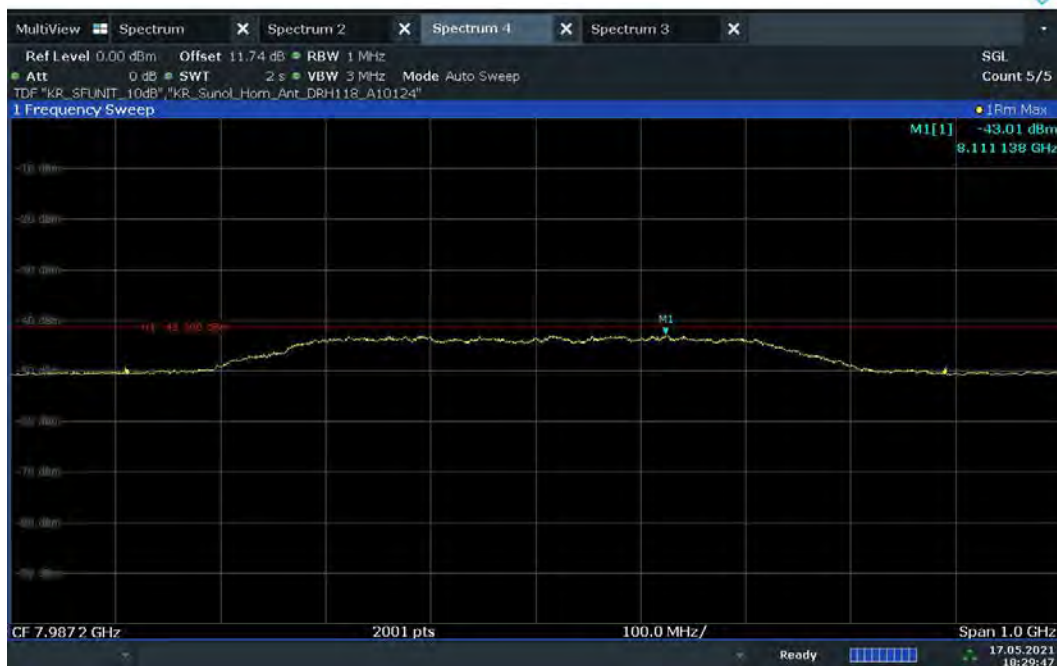


Plot 7-65. UWB Peak Power Measurement - ANT 2 - CH.9 – BPRF

FCC ID: A3LSMF926B	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset	Page 49 of 82

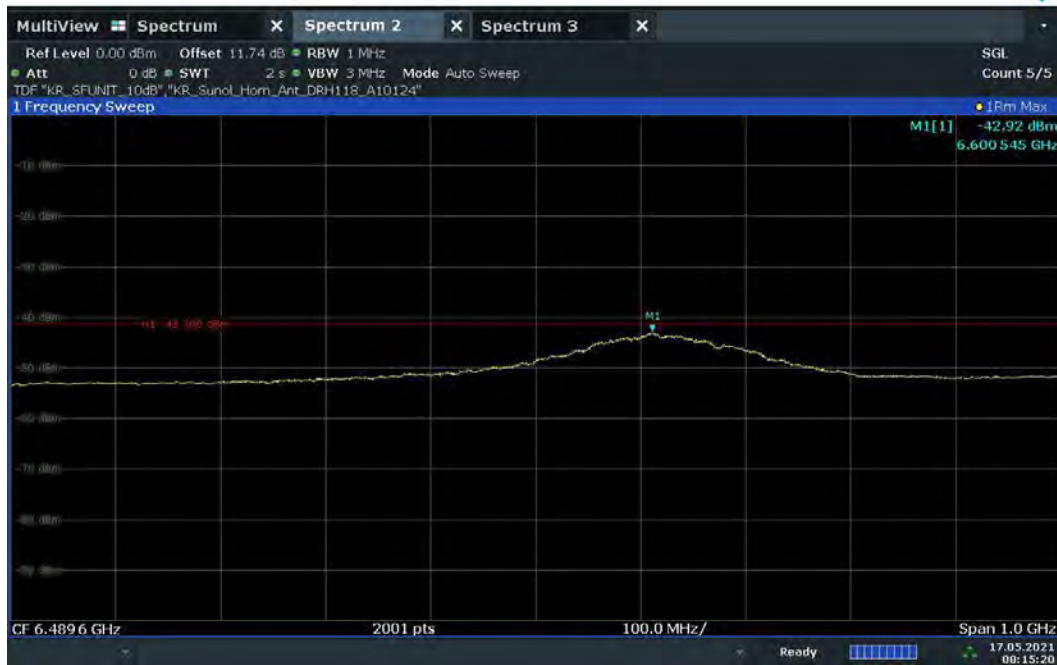


Plot 7-66. UWB Average Power Measurement - ANT 1 - CH.5 – BPRF

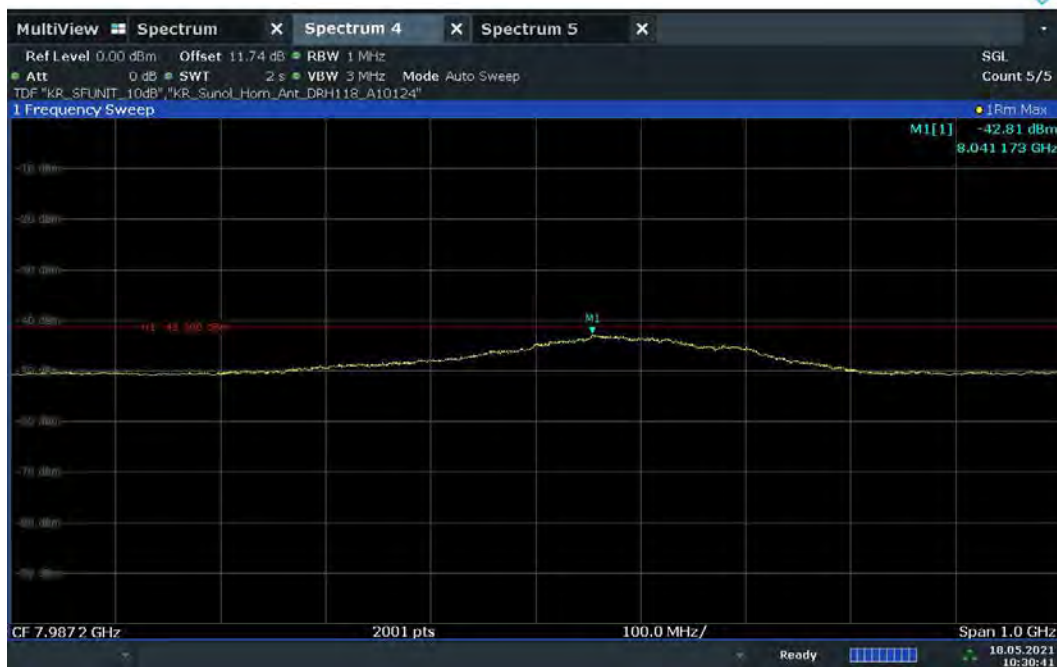


Plot 7-67. UWB Average Power Measurement - ANT 1 - CH.9 – BPRF

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 50 of 82



Plot 7-68. UWB Average Power Measurement - ANT 2 - CH.5 - BPRF



Plot 7-69. UWB Average Power Measurement - ANT 2 - CH.9 - BPRF

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 51 of 82

RESULTS – HPRF

ANT	CH	MODE	Preamble	Meas. Ant.	FM [GHz]	Peak power [dBm/50MHz]	Peak limit [dBm/50MHz]	Margin [dB]
1	5	SP0	27	H	6.737	-7.05	0.00	-7.05
	9	SP0	27	H	8.108	-5.96	0.00	-5.96
2	5	SP0	27	V	6.612	-5.82	0.00	-5.82
	9	SP0	27	H	8.105	-6.80	0.00	-6.80

Table 7-6. HPRF Highest Peak Power Results

ANT	CH	MODE	Preamble	Meas. Ant.	FM [GHz]	Average power [dBm]	Average limit [dBm]	Margin [dB]
1	5	SP3	27	H	6.698	-42.81	-41.3	-1.51
	9	SP1	27	H	8.108	-43.18	-41.3	-1.88
2	5	SP3	27	V	6.602	-43.09	-41.3	-1.79
	9	SP3	27	H	8.042	-42.90	-41.3	-1.60

Table 7-7. 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

$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 52 of 82



Plot 7-70. UWB Peak Power Measurement - ANT 1 - CH.5 – HPRF



Plot 7-71. UWB Peak Power Measurement - ANT 1 - CH.9 – HPRF

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 53 of 82



Plot 7-72. UWB Peak Power Measurement - ANT 2 - CH.5 – HPRF

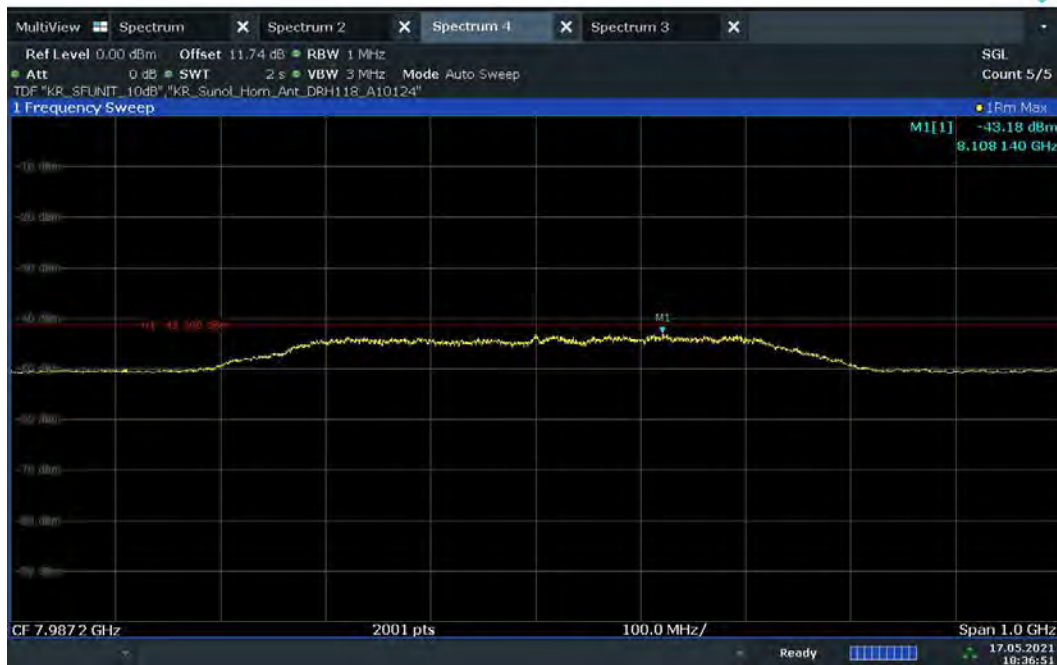


Plot 7-73. UWB Peak Power Measurement - ANT 2 - CH.9 – HPRF

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 54 of 82



Plot 7-74. UWB Average Power Measurement - ANT 1 - CH.5 – HPRF

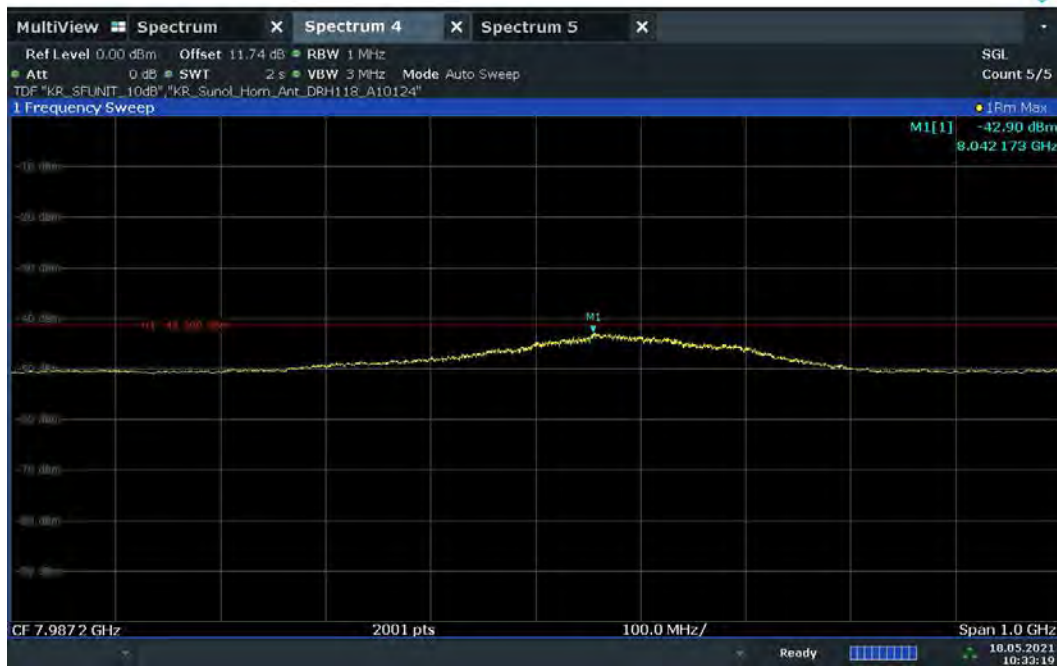


Plot 7-75. UWB Average Power Measurement - ANT 1 - CH.9 – HPRF

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 55 of 82



Plot 7-76. UWB Average Power Measurement - ANT 2 - CH.5 – HPRF



Plot 7-77. UWB Average Power Measurement - ANT 2 - CH.9 – HPRF

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 56 of 82

7.5 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 7-8. Above 960MHz Average Limits

§15.519(d)

Frequency in MHz	EIRP in dBm
1164-1240	-85.3
1559-1610	-85.3

Table 7-9. 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: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 57 of 82

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 final measurements were made at 0.7 meters.
5. All readings are calibrated by a signal generator with accuracy traceable to the National Institute of Standards and Technology (NIST).
6. AFCL (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)

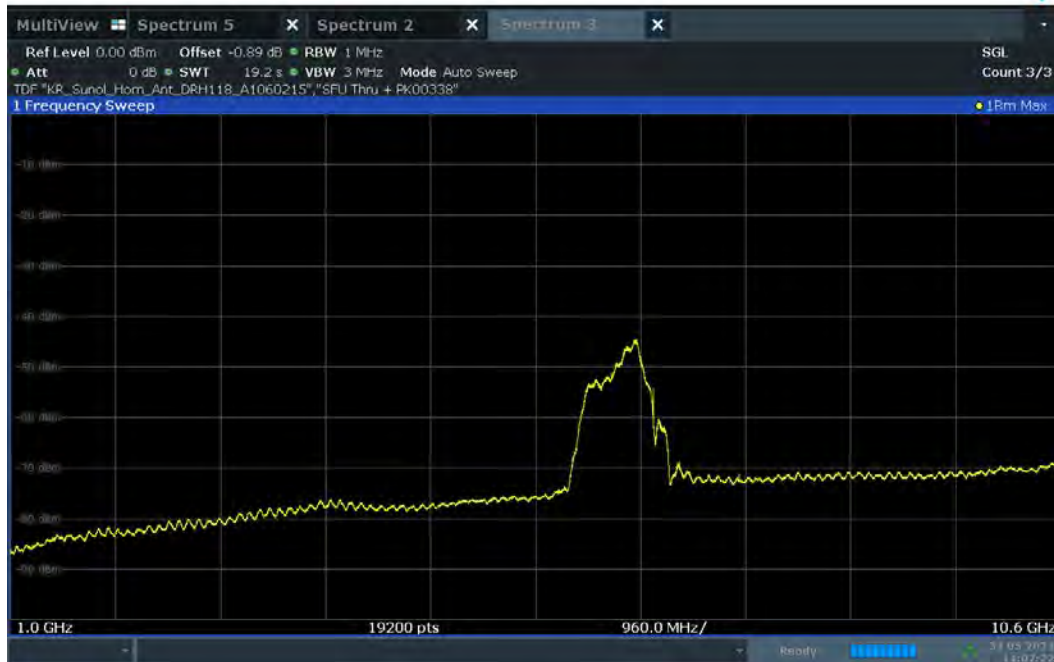
Sample Calculation

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

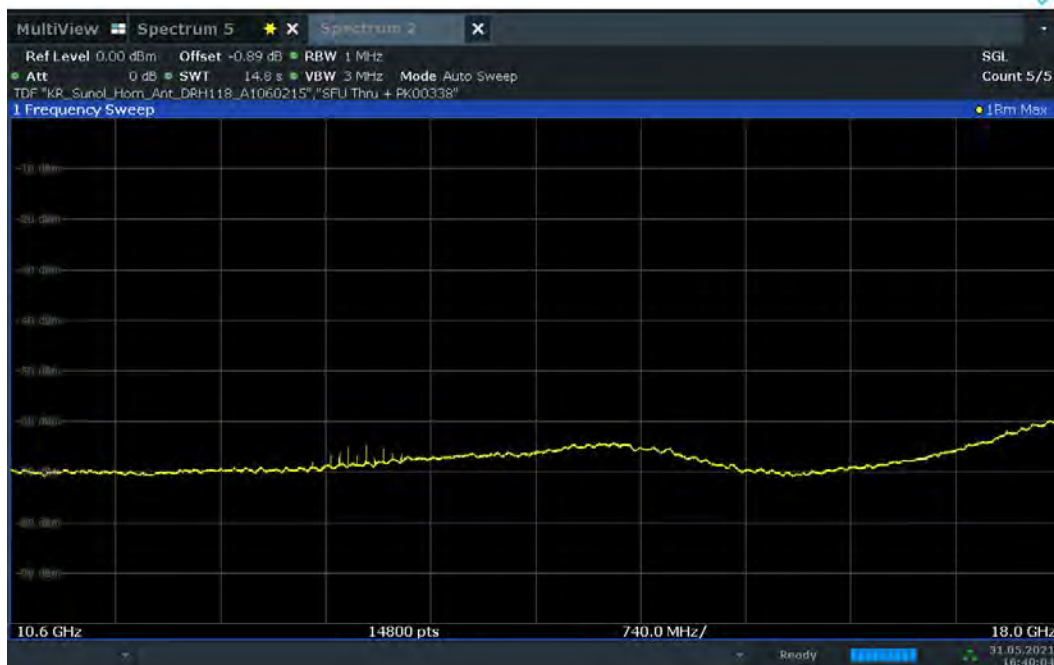
$$\text{RSE EIRP (dBm)} = \text{Analyzer Level (dBm)} + 107 + \text{AFCL (dB/m)} + 20\text{Log(Dm)} - 104.8$$

FCC ID: A3LSMF926B	 PCTEST [®] Proud to be part of  element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 58 of 82

Channel 5 ANTENNA 1:



Plot 7-78. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.5 - ANT 1



Plot 7-79. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5 - ANT 1

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 59 of 82

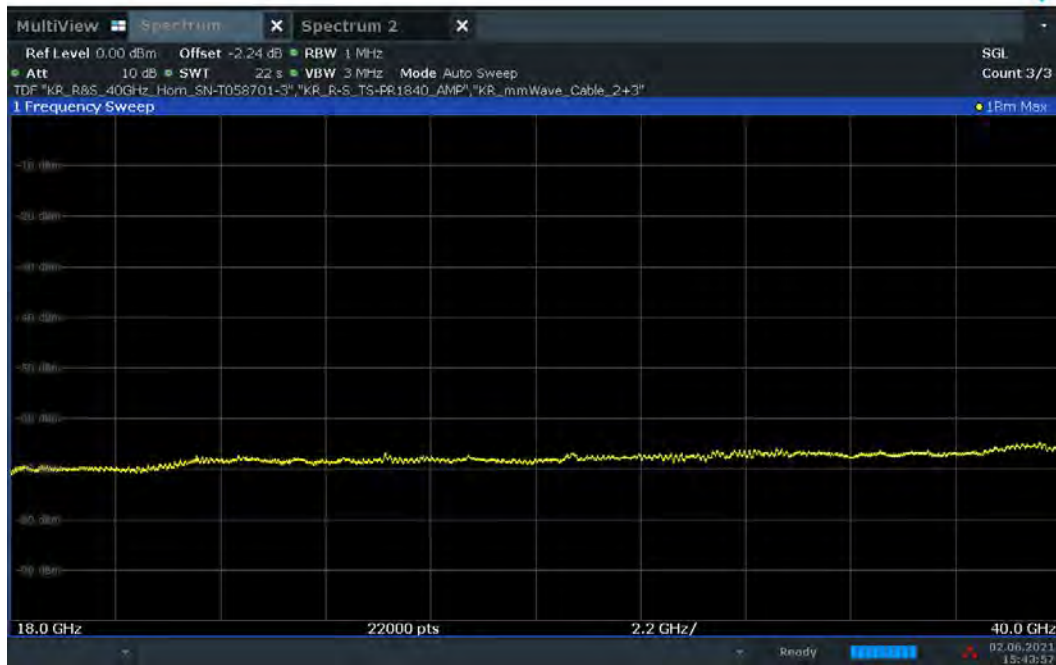


Plot 7-80. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.5 - ANT 1 – GPS band



Plot 7-81. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.5 - ANT 1 – GPS band

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 60 of 82



Plot 7-82. Radiated Spurious Pre-Scan 18 – 26.5 GHz - CH.5 - ANT 1

Channel	5
Frequency	6500
Preamble ID	12
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]
5460	RMS	V	-	-	-74.56	-1.23	-12.64	-76.69	-41.30	-35.39
8000	RMS	V	-	-	-75.06	4.10	-12.64	-71.86	-41.30	-30.56
10600	RMS	V	-	-	-75.82	7.28	-12.64	-69.43	-41.30	-28.13
12979	RMS	V	150	224	-72.90	8.67	-12.64	-65.13	-61.30	-3.83
14742	RMS	V	-	-	-75.80	12.40	-12.64	-64.30	-61.30	-3.00

Table 7-10. Radiated Spurious Emissions CH. 5 – ANT1

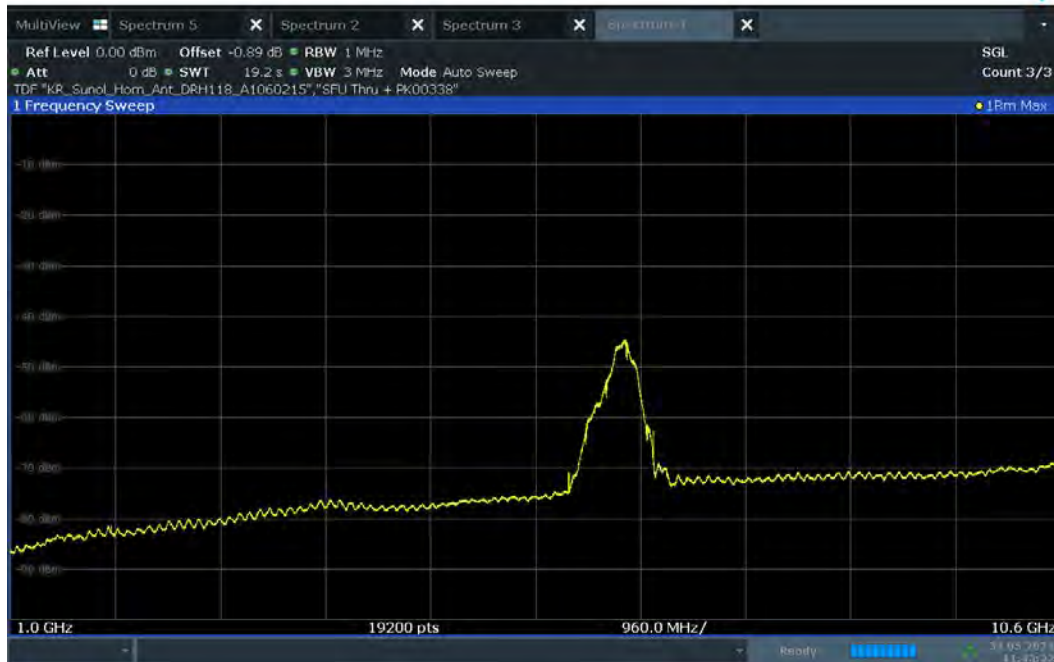
Channel	5
Frequency	6500
Preamble ID	12
Config	SP3

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]
1165	RMS	V	-	-	-86.52	-11.69	-12.64	-99.11	-85.30	-13.81
1219	RMS	V	-	-	-86.63	-11.49	-12.64	-99.02	-85.30	-13.72
1237	RMS	V	-	-	-86.81	-11.40	-12.64	-99.11	-85.30	-13.81
1559	RMS	V	-	-	-86.99	-9.28	-12.64	-97.17	-85.30	-11.87
1600	RMS	V	-	-	-84.35	-9.42	-12.64	-94.67	-85.30	-9.37
1610	RMS	V	-	-	-86.99	-9.49	-12.64	-97.38	-85.30	-12.08

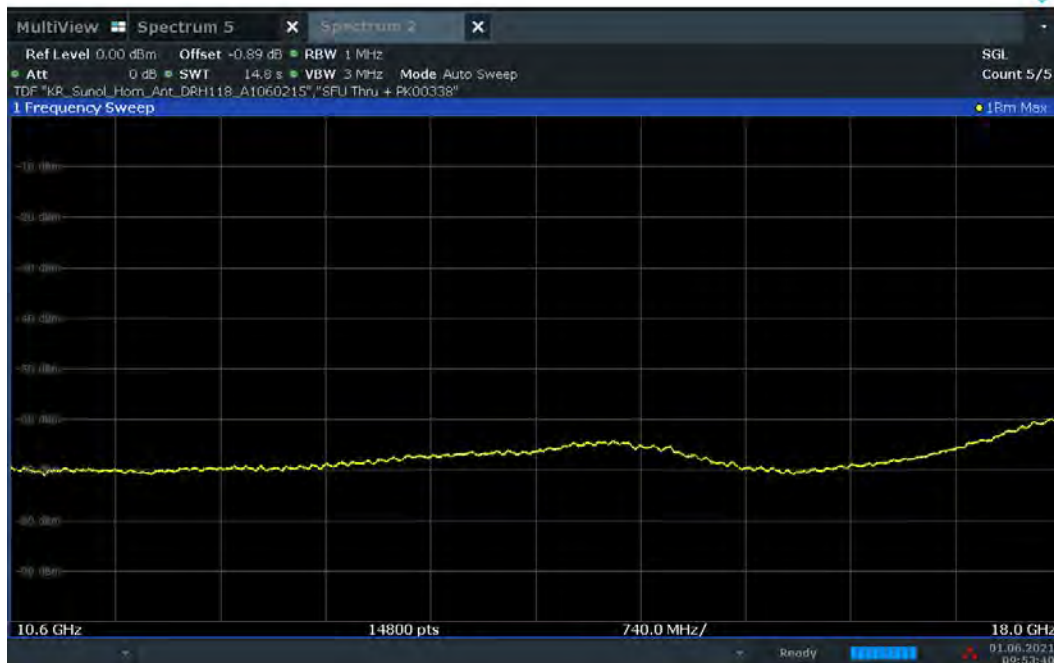
Table 7-11. Radiated Spurious Emissions CH. 5 – ANT1 – GPS BANDS

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 61 of 82

Channel 5 ANTENNA 2:



Plot 7-83. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.5 - ANT 2

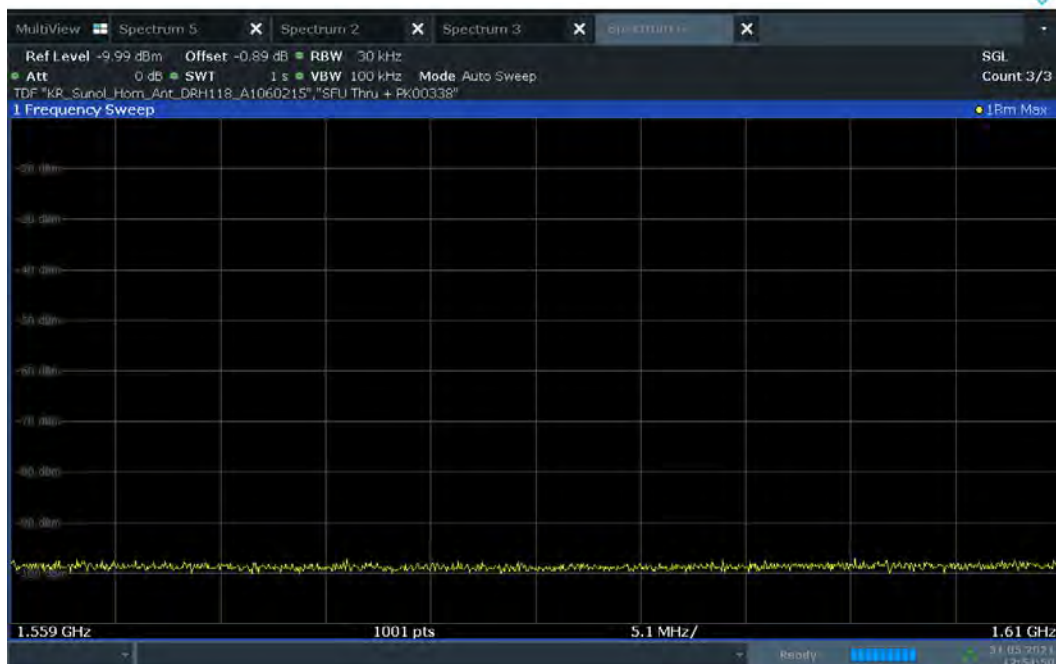


Plot 7-84. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5 - ANT 2

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 62 of 82

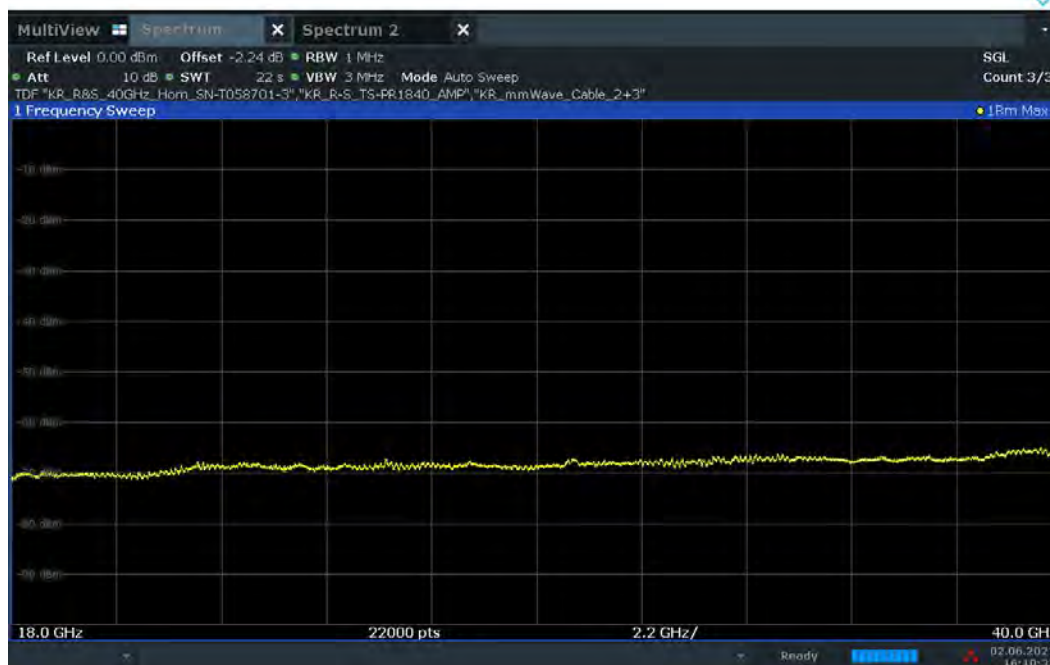


Plot 7-85. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.5 - ANT 2 – GPS band



Plot 7-86. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.5 - ANT 2 – GPS band

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 63 of 82



Plot 7-87. Radiated Spurious Pre-Scan 18 – 26.5 GHz - CH.5 - ANT 2

Channel	5
Frequency	6500
Preamble ID	10
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]
5460	RMS	H	-	-	-74.36	-1.23	-12.64	-76.49	-41.30	-35.19
8000	RMS	H	-	-	-74.89	4.10	-12.64	-71.69	-41.30	-30.39
10200	RMS	H	-	-	-76.06	6.58	-12.64	-70.38	-41.30	-29.08
10600	RMS	H	-	-	-74.37	5.79	-12.64	-69.48	-41.30	-28.18
14566	RMS	H	-	-	-75.74	12.16	-12.64	-64.48	-61.30	-3.18

Table 7-12. Radiated Spurious Emissions CH. 5 – ANT2

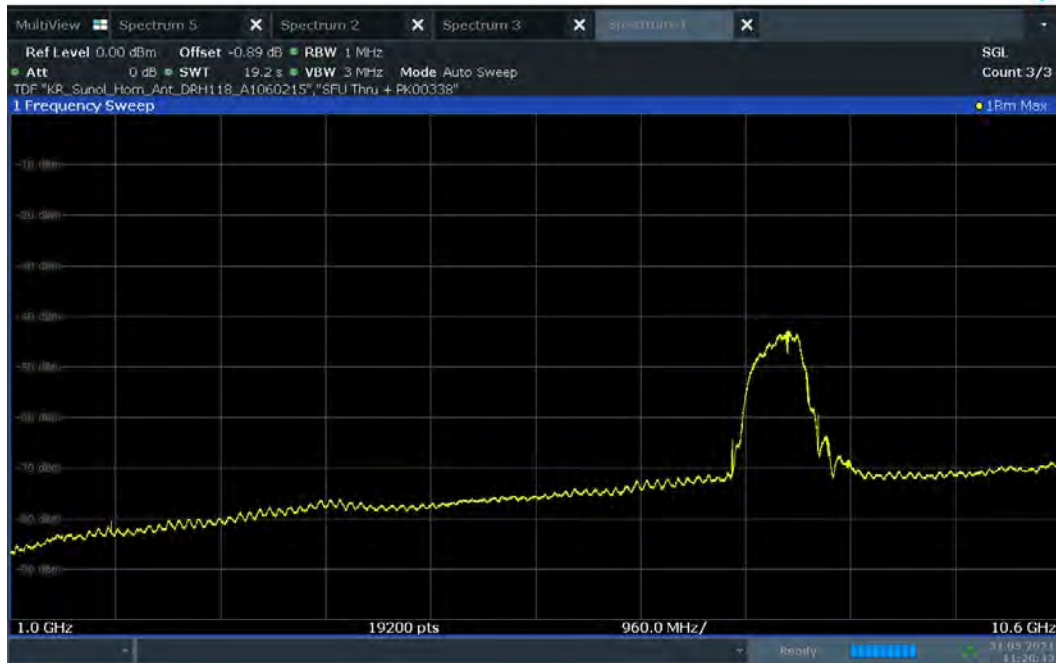
Channel	5
Frequency	6500
Preamble ID	10
Config	SP3

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]
1217	RMS	H	-	-	-86.66	-11.50	-12.64	-99.06	-85.30	-13.76
1227	RMS	H	-	-	-86.09	-11.45	-12.64	-98.44	-85.30	-13.14
1238	RMS	H	-	-	-86.55	-11.39	-12.64	-98.84	-85.30	-13.54
1562	RMS	H	-	-	-87.05	-9.28	-12.64	-97.23	-85.30	-11.93
1575	RMS	H	-	-	-87.05	-9.31	-12.64	-97.26	-85.30	-11.96
1600	RMS	H	-	-	-86.81	-9.42	-12.64	-97.13	-85.30	-11.83

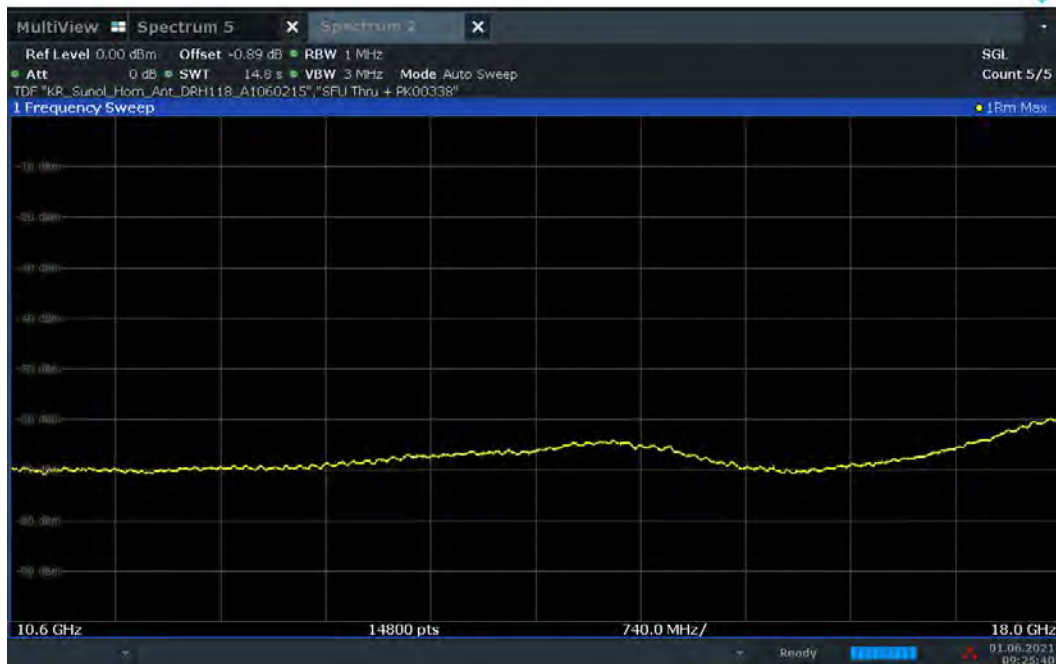
Table 7-13. Radiated Spurious Emissions CH. 5 – ANT2 – GPS BANDS

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 64 of 82

Channel 9 ANTENNA 1:



Plot 7-88. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 1



Plot 7-89. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.9 - ANT 1

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 65 of 82

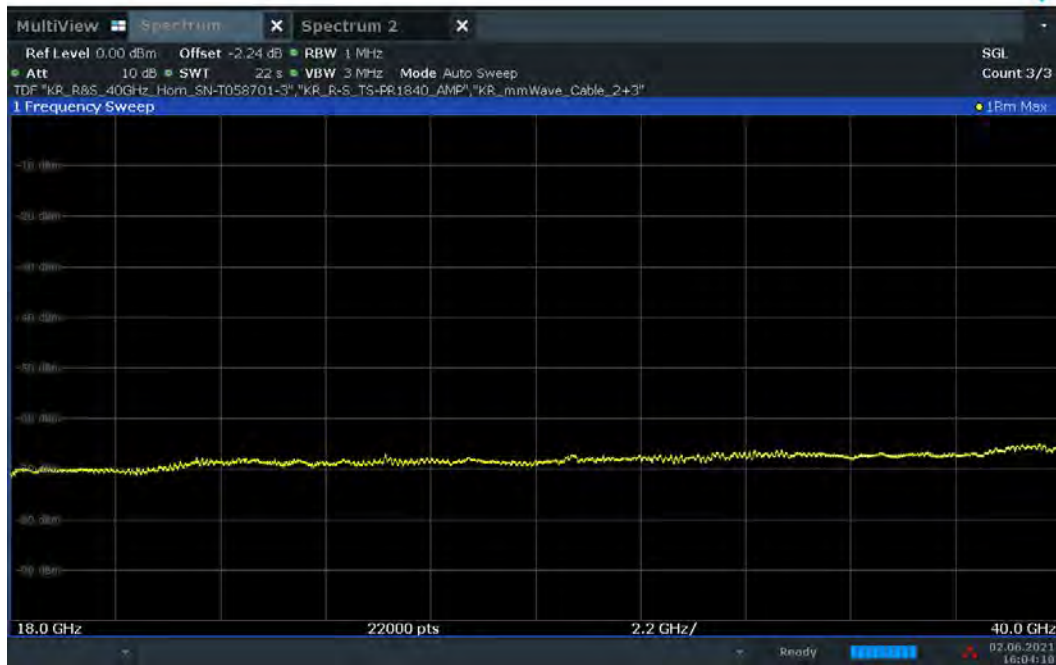


Plot 7-90. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.9 - ANT 1 – GPS band



Plot 7-91. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.9 - ANT 1 – GPS band

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 66 of 82



Plot 7-92. Radiated Spurious Pre-Scan 18 – 26.5 GHz - CH.9 - ANT 1

Channel	9
Frequency	8000
Preamble ID	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]
1050	RMS	H	-	-	-72.74	-12.18	-12.64	-85.82	-75.30	-10.52
2908	RMS	H	-	-	-72.91	-6.19	-12.64	-80.00	-61.30	-18.70
6731	RMS	H	-	-	-74.67	2.81	-12.64	-72.76	-41.30	-31.46
10600	RMS	H	-	-	-75.85	7.28	-12.64	-69.47	-41.30	-28.17
14791	RMS	H	-	-	-75.94	12.36	-12.64	-64.48	-61.30	-3.18

Table 7-14. Radiated Spurious Emissions CH. 9 – ANT1

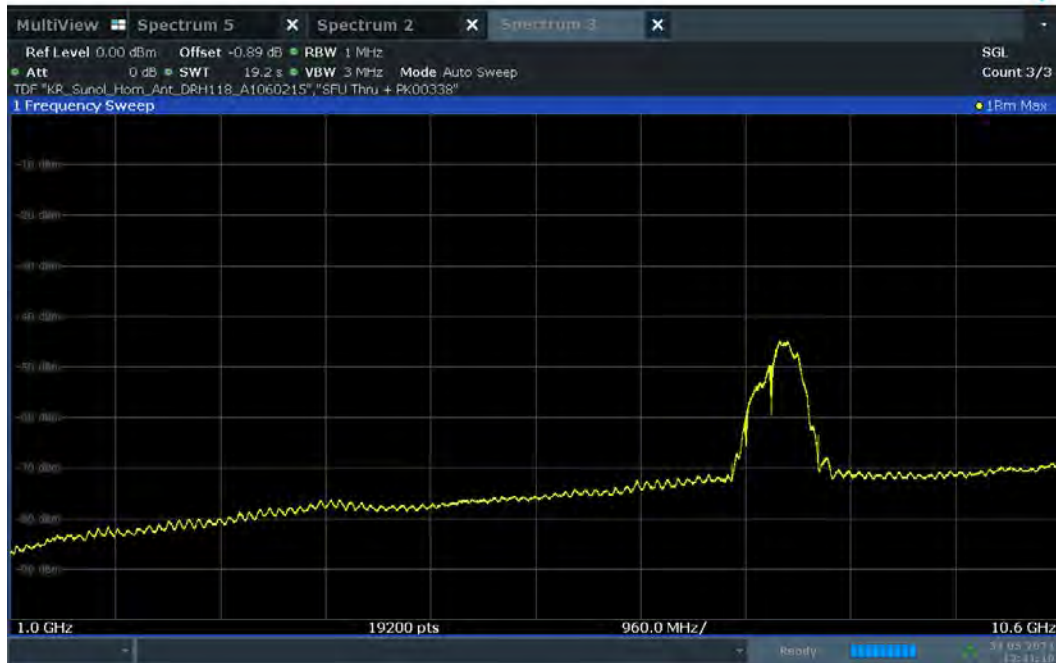
Channel	9
Frequency	8000
Preamble ID	11
Config	SP1

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]
1199	RMS	H	-	-	-86.72	-11.60	-12.64	-99.22	-85.30	-13.92
1233	RMS	H	-	-	-86.64	-11.41	-12.64	-98.95	-85.30	-13.65
1239	RMS	H	-	-	-86.76	-11.38	-12.64	-99.04	-85.30	-13.74
1563	RMS	H	-	-	-86.59	-9.28	-12.64	-96.77	-85.30	-11.47
1593	RMS	H	-	-	-86.55	-9.39	-12.64	-96.84	-85.30	-11.54
1600	RMS	H	-	-	-86.87	-9.42	-12.64	-97.19	-85.30	-11.89

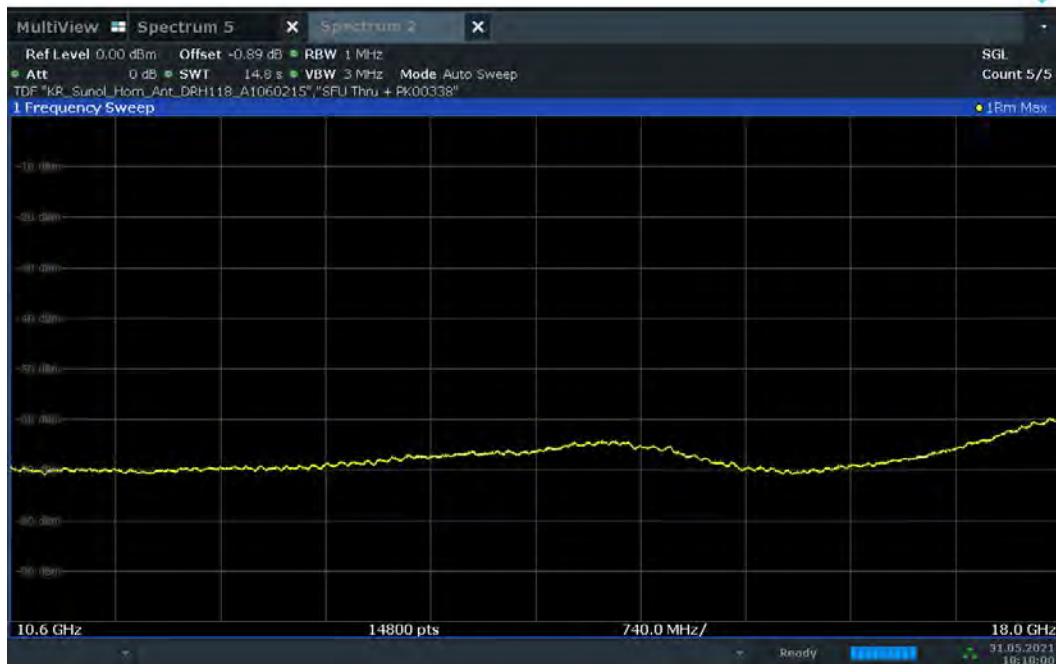
Table 7-15. Radiated Spurious Emissions CH. 9 – ANT1 – GPS BANDS

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 67 of 82

Channel 9 ANTENNA 2:

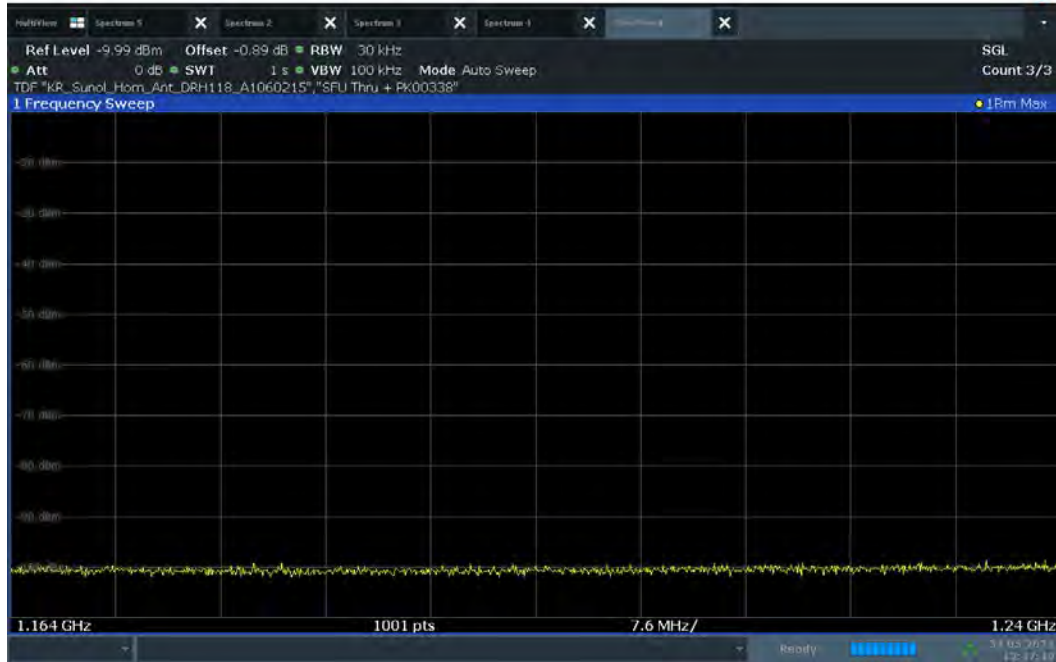


Plot 7-93. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 2

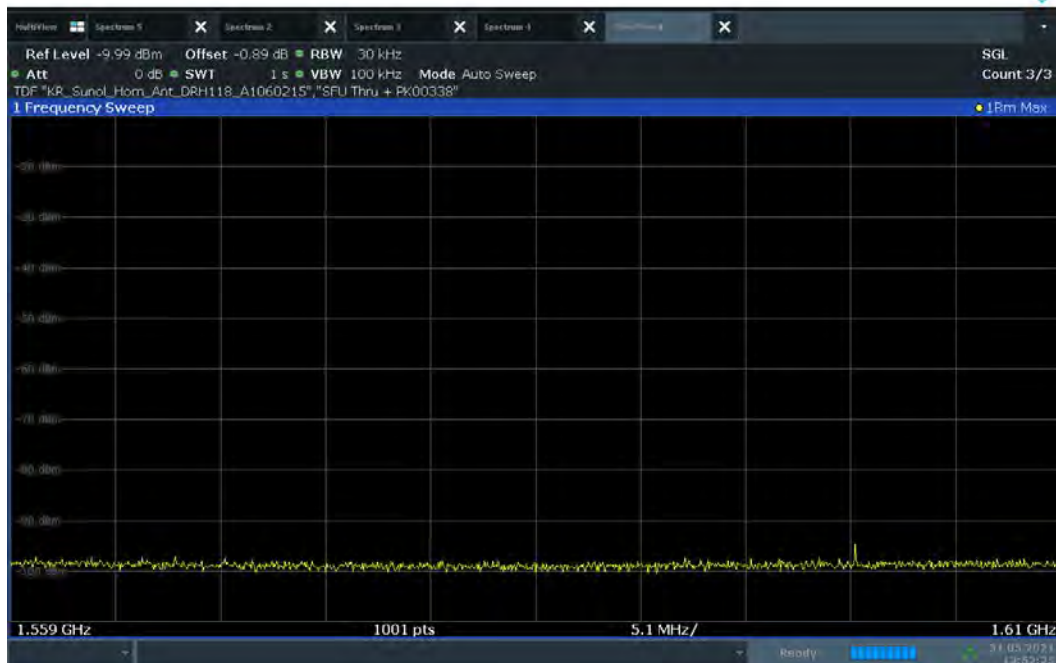


Plot 7-94. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.9 - ANT 2

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 68 of 82

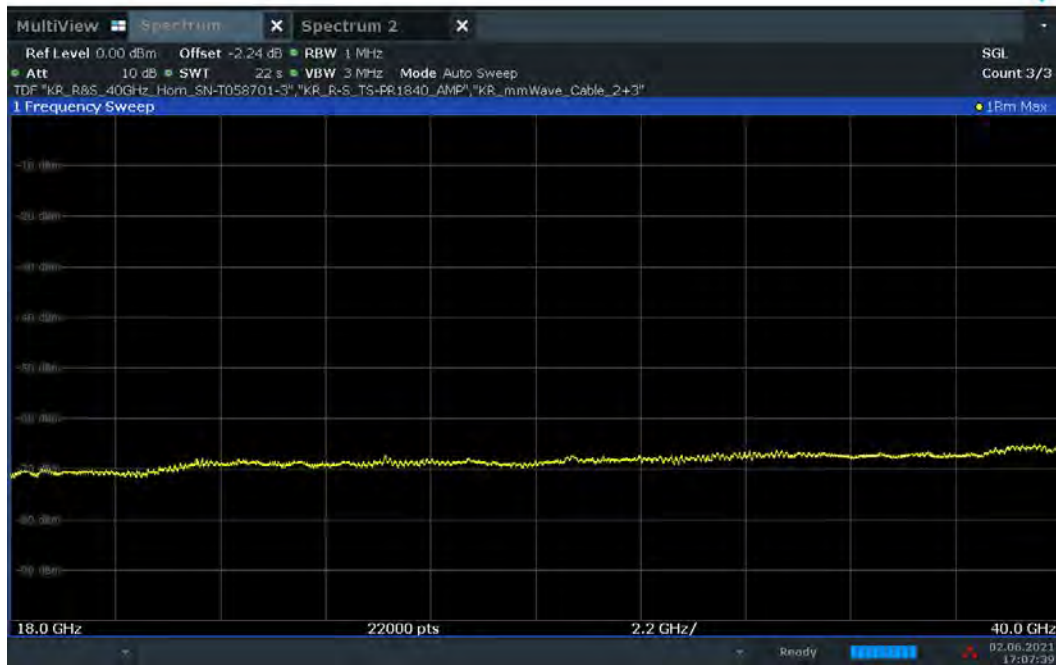


Plot 7-95. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.9 - ANT 2 – GPS band



Plot 7-96. Radiated Spurious Pre-Scan 1559 - 1610 MHz – CH 9 - ANT 2 – GPS band

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 69 of 82



Plot 7-97. Radiated Spurious Pre-Scan 18 – 26.5 GHz - CH.9 - ANT 2

Channel	9
Frequency	8000
Preamble ID	12
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]
1410	RMS	V	-	-	-73.28	-9.75	-12.64	-83.93	-75.30	-8.63
2540	RMS	V	-	-	-72.88	-6.75	-12.64	-80.53	-61.30	-19.23
6500	RMS	V	-	-	-75.16	0.83	-12.64	-75.23	-41.30	-33.93
10600	RMS	V	-	-	-74.37	5.79	-12.64	-69.48	-41.30	-28.18
14775	RMS	V	-	-	-75.76	12.36	-12.64	-64.30	-61.30	-3.00

Table 7-16. Radiated Spurious Emissions CH. 9 – ANT2

Channel	9
Frequency	8000
Preamble ID	12
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]
1181	RMS	V	-	-	-86.61	-11.67	-12.64	-99.18	-85.30	-13.88
1229	RMS	V	-	-	-86.72	-11.44	-12.64	-99.06	-85.30	-13.76
1239	RMS	V	-	-	-86.42	-11.38	-12.64	-98.70	-85.30	-13.40
1567	RMS	V	-	-	-86.97	-9.29	-12.64	-97.16	-85.30	-11.86
1591	RMS	V	-	-	-87.01	-9.38	-12.64	-97.29	-85.30	-11.99
1600	RMS	V	-	-	-84.45	-9.42	-12.64	-94.77	-85.30	-9.47

Table 7-17. Radiated Spurious Emissions CH. 9 – ANT2 – GPS BANDS

FCC ID: A3LSMF926B	PCTEST Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: 1M2104190044-10.A3L	Test Dates: 03/26/21 - 06/09/21	EUT Type: Portable Headset		Page 70 of 82

7.6 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 7-18. 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

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Test Setup

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

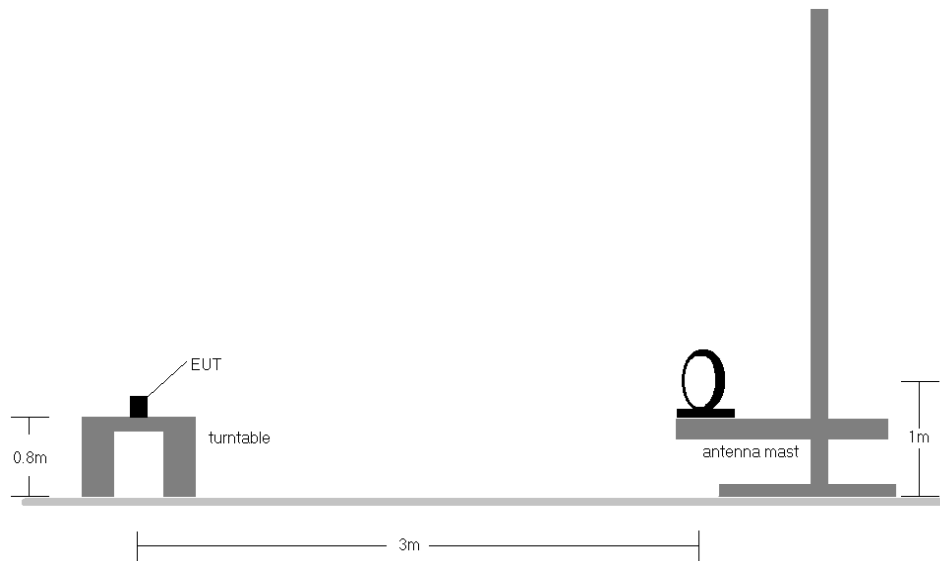


Figure 7-3. Radiated Test Setup < 30Mhz

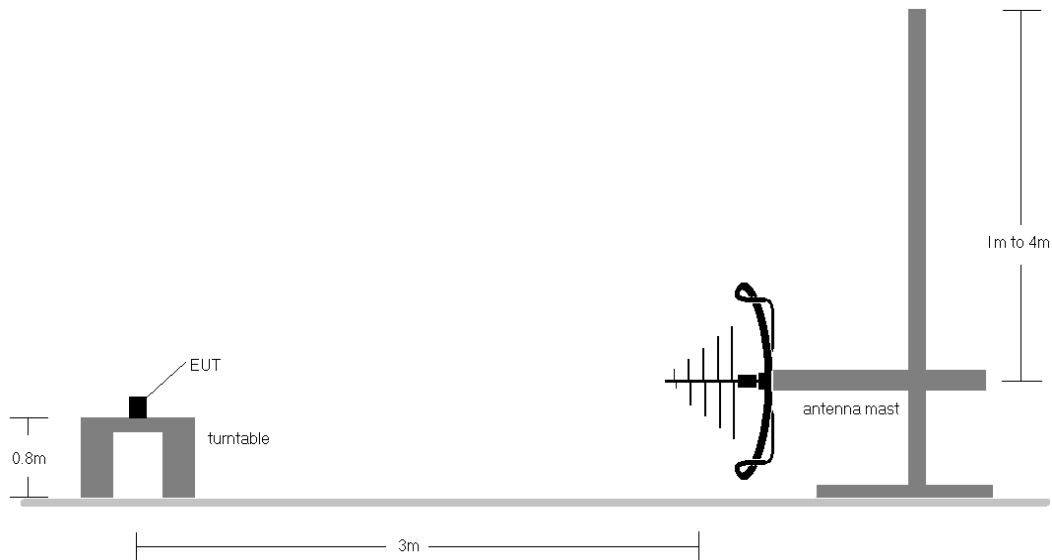


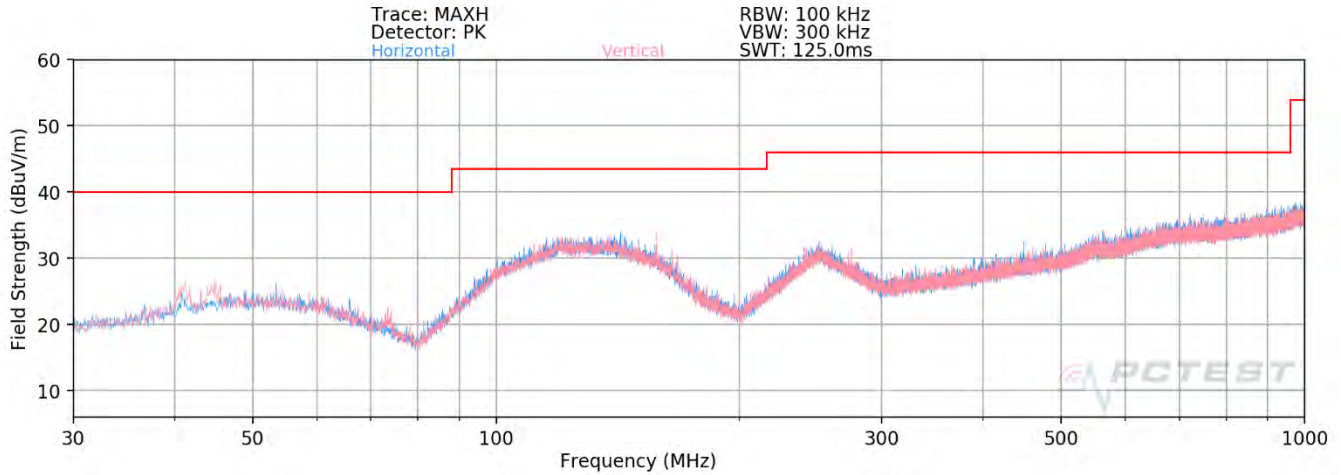
Figure 7-4. Radiated Test Setup < 1GHz

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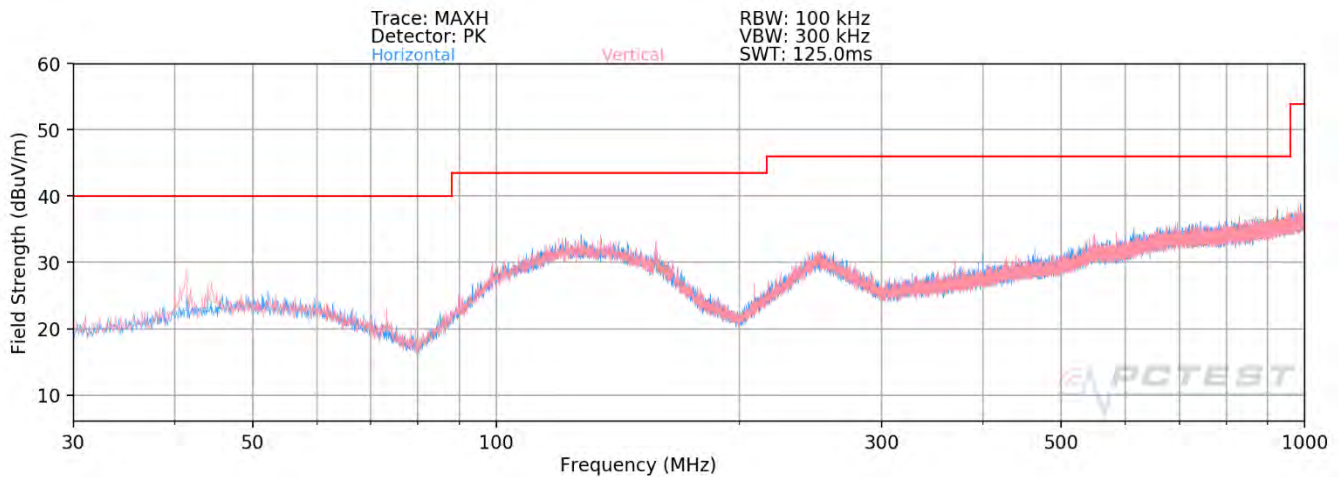
Test Notes

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.
8. 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.

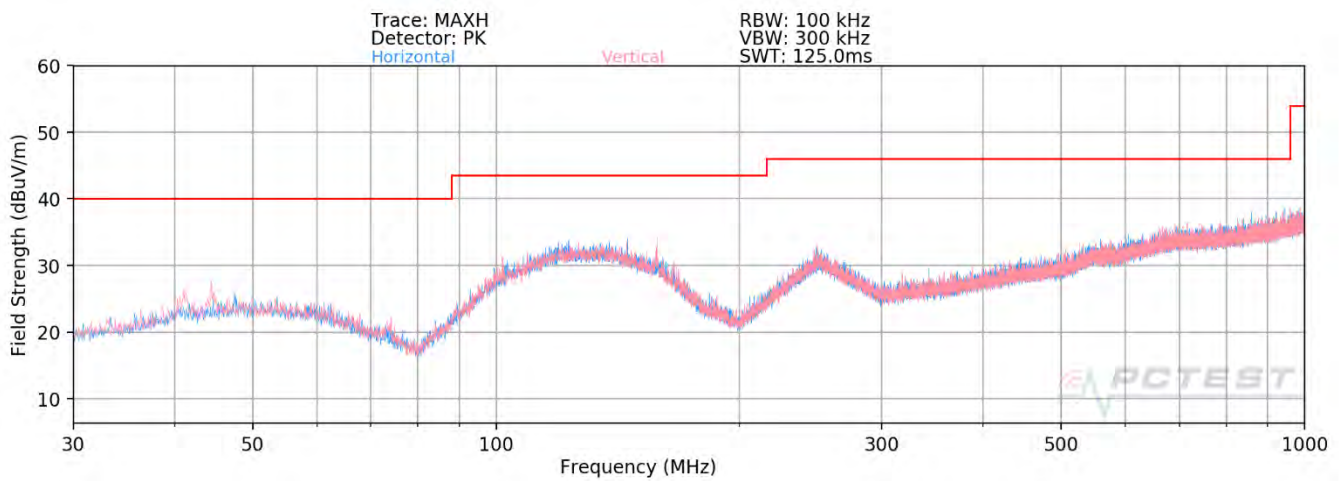
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Plot 7-98. 30MHz - 1 GHz Pre-Scan Plots ANT1 – CH 5

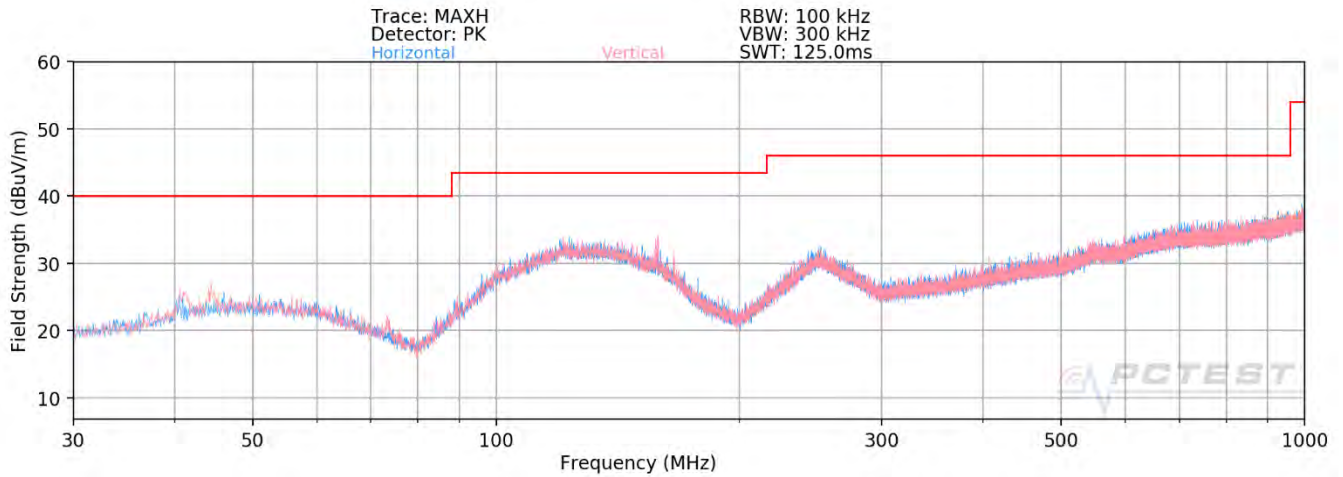


Plot 7-99. 30MHz - 1 GHz Pre-Scan Plots ANT1 – CH 9



Plot 7-100. 30MHz - 1 GHz Pre-Scan Plots ANT2 – CH 5

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Plot 7-101. 30MHz - 1 GHz Pre-Scan Plots ANT2 – CH 5

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7.7 Line Conducted Measurement Data

§15.207

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 emissions must not exceed the limits shown in Table 7-19 per FCC 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 7-19. Conducted Limits

*Decreases with the logarithm of the frequency.

Test Procedures Used

ANSI C63.4-2014

Test Settings

Quasi-Peak Field Strength Measurements

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

Average Field Strength Measurements

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

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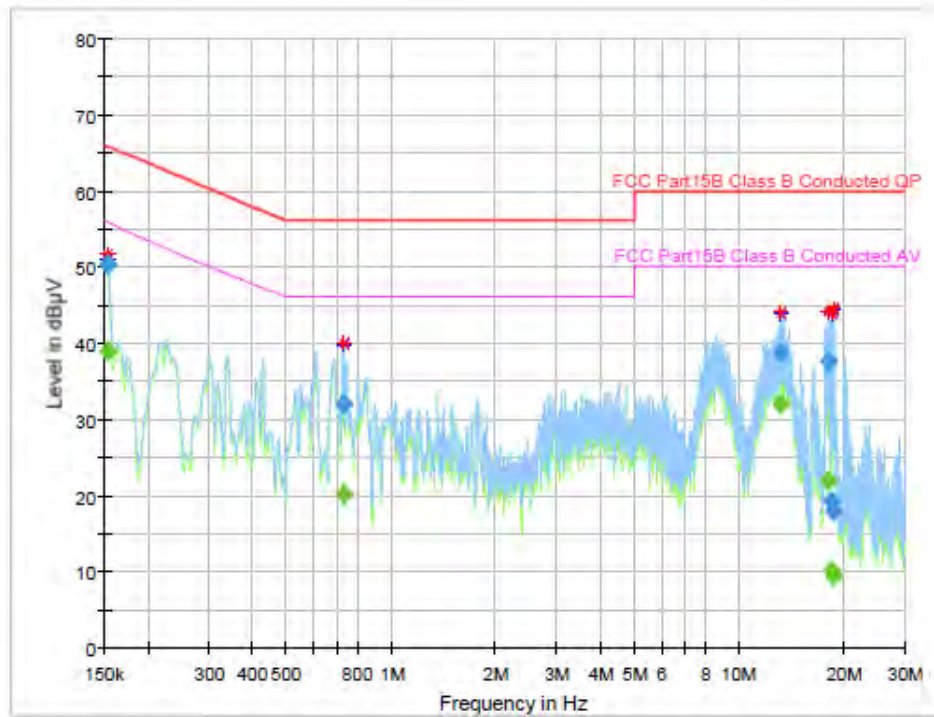
Test Setup

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

Test Notes

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.107 and ICES-003.
3. L1 = Phase; N = Neutral
4. $\text{Corr. (dB)} = \text{Cable loss (dB)} + \text{LISN insertion factor (dB)}$
5. $\text{QP/AV Level (dB}\mu\text{V)} = \text{QP/AV Reading (dB}\mu\text{V)} + \text{Factor (dB)}$
6. $\text{Margin (dB)} = \text{QP/AV Limit (dB}\mu\text{V)} - \text{QP/AV Level (dB}\mu\text{V)}$
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.

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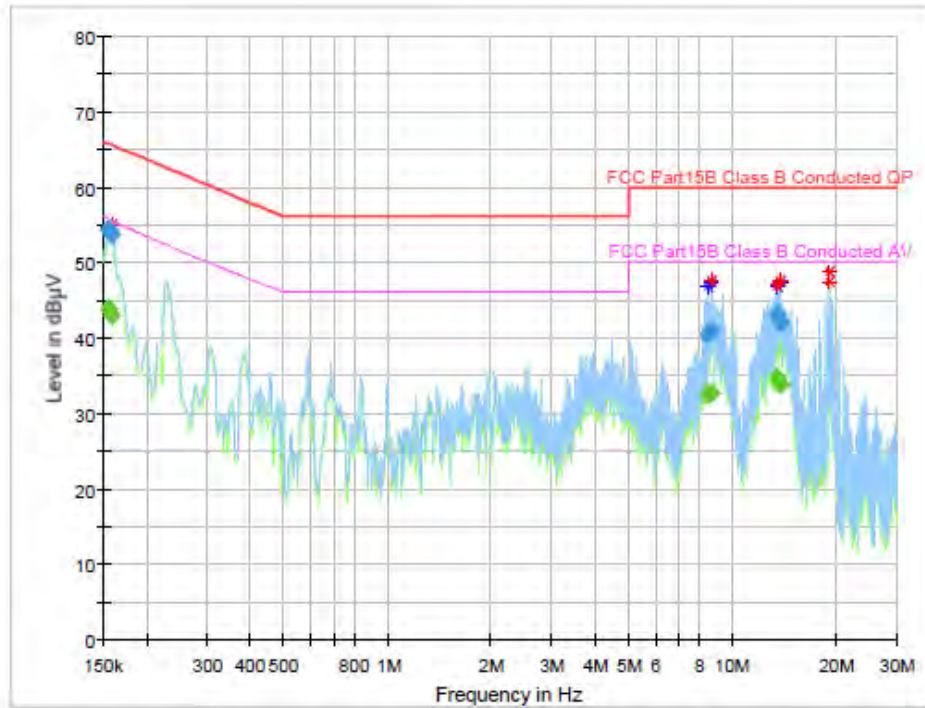


Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.152985	—	38.88	55.82	16.94	1000.0	9.000	L1	9.8
0.152985	50.28	—	65.84	15.55	1000.0	9.000	L1	9.8
0.729090	—	20.06	46.00	25.94	1000.0	9.000	L1	9.9
0.729090	32.03	—	56.00	23.97	1000.0	9.000	L1	9.9
13.164600	—	31.87	50.00	18.13	1000.0	9.000	L1	10.0
13.164600	38.70	—	60.00	21.30	1000.0	9.000	L1	10.0
18.170445	—	21.99	50.00	28.01	1000.0	9.000	L1	10.0
18.170445	37.62	—	60.00	22.38	1000.0	9.000	L1	10.0
18.510735	—	10.04	50.00	39.96	1000.0	9.000	L1	10.0
18.510735	19.27	—	60.00	40.73	1000.0	9.000	L1	10.0
18.692820	—	9.33	50.00	40.67	1000.0	9.000	L1	10.0
18.692820	17.94	—	60.00	42.06	1000.0	9.000	L1	10.0

Plot 7-102. Line Conducted Plot (L1) ANT 1 – CH 5

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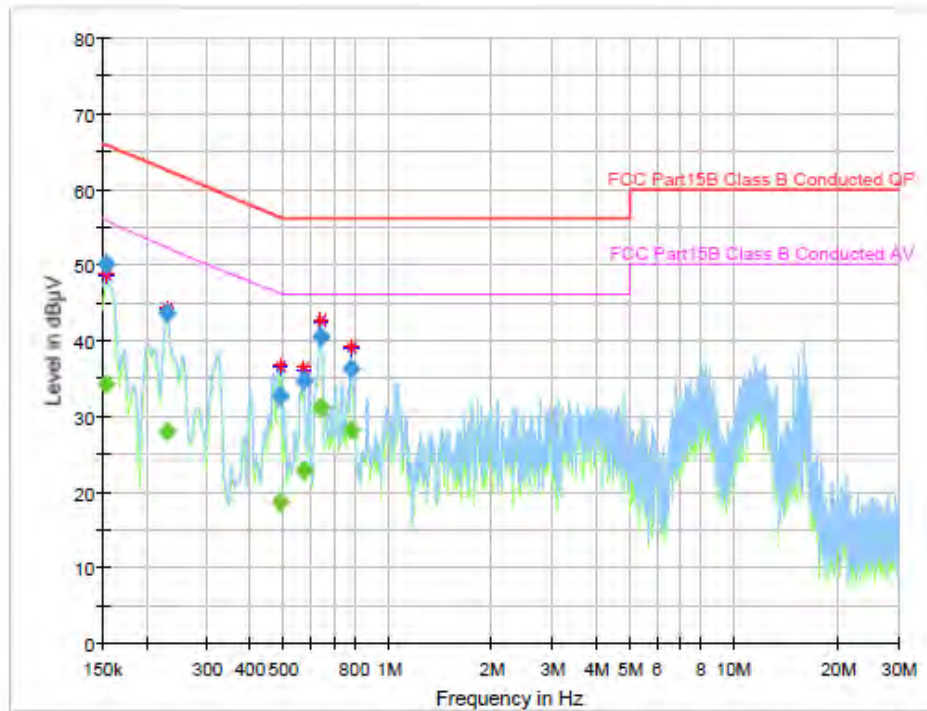


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155970	—	43.78	55.64	11.87	1000.0	9.000	N	9.8
0.155970	54.28	—	65.68	11.40	1000.0	9.000	N	9.8
0.158955	—	42.97	55.47	12.50	1000.0	9.000	N	9.9
0.158955	53.54	—	65.52	11.98	1000.0	9.000	N	9.9
8.493075	—	32.40	50.00	17.60	1000.0	9.000	N	9.9
8.493075	40.54	—	60.00	19.46	1000.0	9.000	N	9.9
8.722920	—	32.63	50.00	17.37	1000.0	9.000	N	9.9
8.722920	40.99	—	60.00	19.01	1000.0	9.000	N	9.9
13.519815	—	34.72	50.00	15.28	1000.0	9.000	N	10.0
13.519815	43.10	—	60.00	16.90	1000.0	9.000	N	10.0
13.851150	—	33.78	50.00	16.22	1000.0	9.000	N	10.0
13.851150	42.06	—	60.00	17.94	1000.0	9.000	N	10.0

Plot 7-103. Line Conducted Plot (N) ANT 1 – CH 5

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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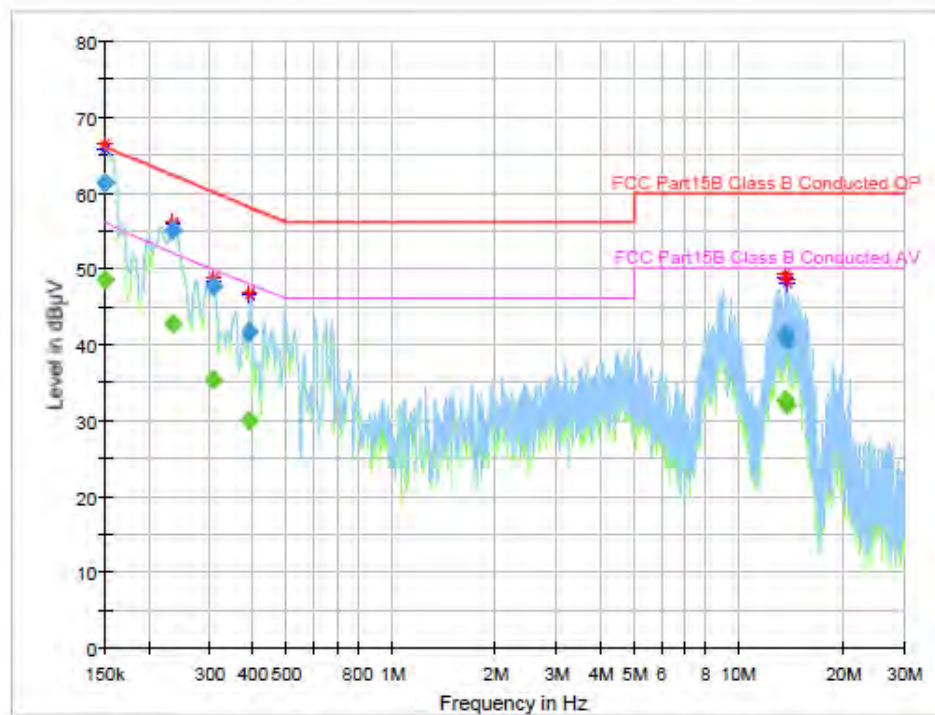


Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.152985	—	34.28	55.82	21.54	1000.0	9.000	L1	9.8
0.152985	49.95	—	65.84	15.89	1000.0	9.000	L1	9.8
0.230595	—	27.82	52.20	24.38	1000.0	9.000	L1	9.7
0.230595	43.50	—	62.43	18.93	1000.0	9.000	L1	9.7
0.490290	—	18.64	46.15	27.51	1000.0	9.000	L1	10.0
0.490290	32.68	—	56.16	23.49	1000.0	9.000	L1	10.0
0.570885	—	22.78	46.00	23.22	1000.0	9.000	L1	10.0
0.570885	34.61	—	56.00	21.39	1000.0	9.000	L1	10.0
0.639540	—	31.05	46.00	14.95	1000.0	9.000	L1	10.0
0.639540	40.54	—	56.00	15.46	1000.0	9.000	L1	10.0
0.782820	—	28.12	46.00	17.88	1000.0	9.000	L1	9.9
0.782820	36.21	—	56.00	19.79	1000.0	9.000	L1	9.9

Plot 7-104. Line Conducted Plot (L1) ANT 2 – CH 5

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager
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Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	—	48.51	56.00	7.49	1000.0	9.000	N	9.7
0.150000	61.27	—	66.00	4.73	1000.0	9.000	N	9.7
0.236565	—	42.77	51.98	9.21	1000.0	9.000	N	9.7
0.236565	55.05	—	62.22	7.17	1000.0	9.000	N	9.7
0.308205	—	35.23	49.78	14.56	1000.0	9.000	N	9.7
0.308205	47.51	—	60.02	12.51	1000.0	9.000	N	9.7
0.391785	—	29.96	47.87	17.91	1000.0	9.000	N	10.0
0.391785	41.62	—	58.03	16.41	1000.0	9.000	N	10.0
13.701900	—	32.73	50.00	17.27	1000.0	9.000	N	10.0
13.701900	41.38	—	60.00	18.62	1000.0	9.000	N	10.0
13.800405	—	32.02	50.00	17.98	1000.0	9.000	N	10.0
13.800405	40.40	—	60.00	19.60	1000.0	9.000	N	10.0

Plot 7-105. Line Conducted Plot (N) ANT 2 – CH 5

FCC ID: A3LSMF926B		MEASUREMENT REPORT (CERTIFICATION)		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** has been tested to comply with the requirements specified in §15.519 and §15.521 of the FCC rules.

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