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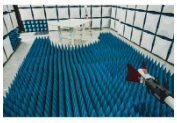

# MEASUREMENT REPORT
## FCC Part 15F ULTRA WIDEBAND

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

**Date of Testing:**
10/5 – 10/17/2023
**Test Report Issue Date:**
11/3/2023
**Test Site/Location:**
Element Lab. Yongin-Si, Gyeonggi-do, South Korea
**Test Report Serial No.:**
1M22308210092-12.A3L

| | |
|---|---|
| **FCC ID:** | **A3LSMS928U** |
| **APPLICANT:** | **Samsung Electronics Co., Ltd.** |

| | |
|---|---|
| **Application Type:** | Certification |
| **Model:** | SM-S928U |
| **Additional Models:** | SM-S928U1 |
| **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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# 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 Element Test Location

These measurement tests were conducted at the Element Suwon Laboratory 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 Element Materials Technology Suwon, Ltd. located in Yongin-si, Gyeonggi-do, 16954, South Korea.**

- Element Materials Technology Suwon, Ltd. is an ISO 17025-2017 accredited test facility under the American Association for Laboratory Accreditation(A2LA) with Certificate number 2041.04 for Specific Absorption Rate (SAR), and Electromagnetic Compatibility (EMC) & Telecommunications testing for FCC and Innovation, Science, and Economic Development Canada rules.

- Element Materials Technology Suwon, Ltd. facility is accredited, designated, and recognized in accordance with the provision of Radio Wave Act and International Standard ISO/IEC 17025:2017 under the National Radio Research Agency.

  - Designation Number / CABID: KR0169
  - Test Firm Registration Number of FCC: 417945
  - Test Firm Registration Number of ISED: 26168

# 2.0 PRODUCT INFORMATION

## 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMS928U**. The test data contained in this report pertains only to the EUT's ultra-wideband transmitter.

**Test Device Serial No.:** 0842M

## 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 (FR1 and FR2), 802.11b/g/n/ax/be WLAN, 802.11a/n/ac/ax/be UNII (5GHz and 6GHz), Bluetooth (1x, EDR, LE), NFC, UWB, Wireless Power Transfer

## 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 C63.10-2013 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, respectively.

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 Gain [dBi] |
|---|---|
| 6.5 | -4.65 |
| 8.0 | -4.84 |

**Table 2-1. Maximum Peak Antenna Gain**

## 2.6 Software and Firmware

The test was conducted with firmware version S928USQU0AWJ4 installed on the EUT.

# 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.

## 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 414788 D01 v01r01.

## 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).

# 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.

# 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) |
|---|---|
| Conducted Disturbance | 3.09 |
| Radiated Disturbance (<1GHz) | 4.10 |
| Radiated Disturbance (>1GHz) | 4.82 |

# 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 | 2023-07-06 | Annual | 2024-07-05 | MY48432391 |
| Com-Power | AL-130 | 9kHz - 30MHz Loop Antenna | 2022-10-21 | Biennial | 2024-10-20 | 10160045 |
| 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 | 2023-04-06 | Annual | 2024-04-05 | 2106 |
| Mini-Circuits | BW-N10W5+ | Attenuator | 2023-04-06 | Annual | 2024-04-05 | 2106 |
| NARDA | 180-442A-KF | Horn Antenna (Small) | 2022-11-23 | Biennial | 2024-11-22 | T058701-03 |
| Rohde & Schwarz | TS-PR1840 | Preamplifier | 2023-07-06 | Annual | 2024-07-05 | 100049 |
| Rohde & Schwarz | ENV216 | Two-Line V-Network | 2023-04-07 | Annual | 2024-04-06 | 101319 |
| Rohde & Schwarz | ESW | EMI Test Receiver | 2023-07-05 | Annual | 2024-07-04 | 101761 |
| Rohde & Schwarz | FSW43 | Signal & Spectrum Analyzer | 2023-01-13 | Annual | 2024-01-12 | 101955 |
| Rohde & Schwarz | TS-SFUNIT-Rx | Shielded Filter Unit | 2023-01-13 | Annual | 2024-01-12 | 102131 |
| Schwarzbeck | VULB9162 | Broadband TRILOG Antenna | 2023-06-01 | Biennial | 2025-05-31 | 9162-217 |
| Sunol Sciences | DRH-118 | Horn Antenna | 2023-07-13 | Biennial | 2025-07-12 | 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.

# 7.0 TEST DATA

## 7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

FCC ID: A3LSMS928U

FCC Classification: Ultra-Wideband (UWB)

| FCC Part Section(s) | Test Description | Test Limit | Test Condition | Test Result | Reference |
|---|---|---|---|---|---|
| §15.503, §15.519 (b) | 10dBc Bandwidth | ≥ 500MHz | 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 | < 0dBm EIRP in 50MHz BW | | | Section 7.4 |
| §15.519(c) | Maximum Average Emission in the range of 3100 – 10600 MHz | < -41.3 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 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 | < FCC 15.207 limits (RSS-Gen) | LINE CONDUCTED | PASS | Section 7.7 |

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

## 7.2 10dBc Bandwidth Measurement

**§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 Measurment Setup**

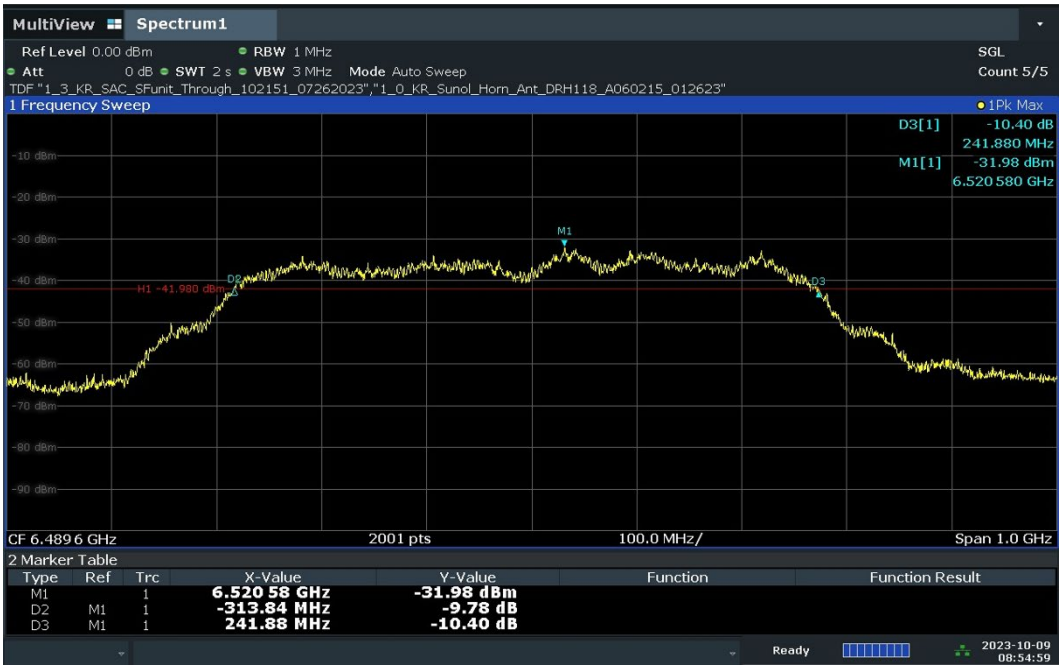
| Frequency [GHz] | Channel | Preamble ID | Config | Mode | $F_M$ [GHz] | $F_L$ [GHz] | $F_H$ [GHz] | Fc [GHz] | Measured Bandwidth [MHz] | Minimum Bandwidth [MHz] | Pass / Fail |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6.5 | 5 | 9 | SP0 | BPRF | 6.646 | 6.212 | 6.763 | 6.487 | 551.08 | 500 | Pass |
| | | 9 | SP1 | BPRF | 6.645 | 6.207 | 6.762 | 6.485 | 555.22 | 500 | Pass |
| | | 9 | SP3 | BPRF | 6.521 | 6.207 | 6.762 | 6.485 | 555.72 | 500 | Pass |
| | | 10 | SP0 | BPRF | 6.491 | 6.233 | 6.747 | 6.490 | 514.24 | 500 | Pass |
| | | 10 | SP1 | BPRF | 6.491 | 6.233 | 6.746 | 6.490 | 512.74 | 500 | Pass |
| | | 10 | SP3 | BPRF | 6.521 | 6.206 | 6.762 | 6.484 | 556.72 | 500 | Pass |
| | | 11 | SP0 | BPRF | 6.518 | 6.211 | 6.768 | 6.490 | 556.73 | 500 | Pass |
| | | 11 | SP1 | BPRF | 6.518 | 6.207 | 6.768 | 6.488 | 560.71 | 500 | Pass |
| | | 11 | SP3 | BPRF | 6.521 | 6.206 | 6.764 | 6.485 | 557.72 | 500 | Pass |
| | | 12 | SP0 | BPRF | 6.514 | 6.208 | 6.769 | 6.488 | 561.22 | 500 | Pass |
| | | 12 | SP1 | BPRF | 6.521 | 6.206 | 6.767 | 6.486 | 560.22 | 500 | Pass |
| | | 12 | SP3 | BPRF | 6.521 | 6.206 | 6.764 | 6.485 | 557.22 | 500 | Pass |
| | | 27 | SP0 | HPRF | 6.525 | 6.211 | 6.764 | 6.488 | 552.72 | 500 | Pass |
| | | 27 | SP1 | HPRF | 6.552 | 6.205 | 6.766 | 6.486 | 560.72 | 500 | Pass |
| | | 27 | SP3 | HPRF | 6.600 | 6.206 | 6.766 | 6.486 | 559.72 | 500 | Pass |
| 8.0 | 9 | 9 | SP0 | BPRF | 7.831 | 7.708 | 8.253 | 7.981 | 544.73 | 500 | Pass |
| | | 9 | SP1 | BPRF | 7.831 | 7.706 | 8.258 | 7.982 | 551.23 | 500 | Pass |
| | | 9 | SP3 | BPRF | 7.831 | 7.702 | 8.269 | 7.985 | 566.72 | 500 | Pass |
| | | 10 | SP0 | BPRF | 7.831 | 7.716 | 8.257 | 7.986 | 541.23 | 500 | Pass |
| | | 10 | SP1 | BPRF | 7.833 | 7.706 | 8.253 | 7.980 | 546.73 | 500 | Pass |
| | | 10 | SP3 | BPRF | 7.831 | 7.703 | 8.269 | 7.986 | 565.72 | 500 | Pass |
| | | 11 | SP0 | BPRF | 7.763 | 7.705 | 8.266 | 7.985 | 560.72 | 500 | Pass |
| | | 11 | SP1 | BPRF | 7.763 | 7.704 | 8.268 | 7.986 | 564.22 | 500 | Pass |
| | | 11 | SP3 | BPRF | 7.831 | 7.702 | 8.270 | 7.986 | 567.22 | 500 | Pass |
| | | 12 | SP0 | BPRF | 7.796 | 7.704 | 8.265 | 7.984 | 560.22 | 500 | Pass |
| | | 12 | SP1 | BPRF | 7.839 | 7.704 | 8.268 | 7.986 | 563.72 | 500 | Pass |
| | | 12 | SP3 | BPRF | 7.831 | 7.703 | 8.269 | 7.986 | 565.72 | 500 | Pass |
| | | 27 | SP0 | HPRF | 7.730 | 7.702 | 8.261 | 7.982 | 558.72 | 500 | Pass |
| | | 27 | SP1 | HPRF | 7.745 | 7.703 | 8.263 | 7.983 | 559.72 | 500 | Pass |
| | | 27 | SP3 | HPRF | 7.925 | 7.704 | 8.265 | 7.984 | 560.72 | 500 | Pass |

**Table 7-2. UWB 10dBc Bandwidth Summary**

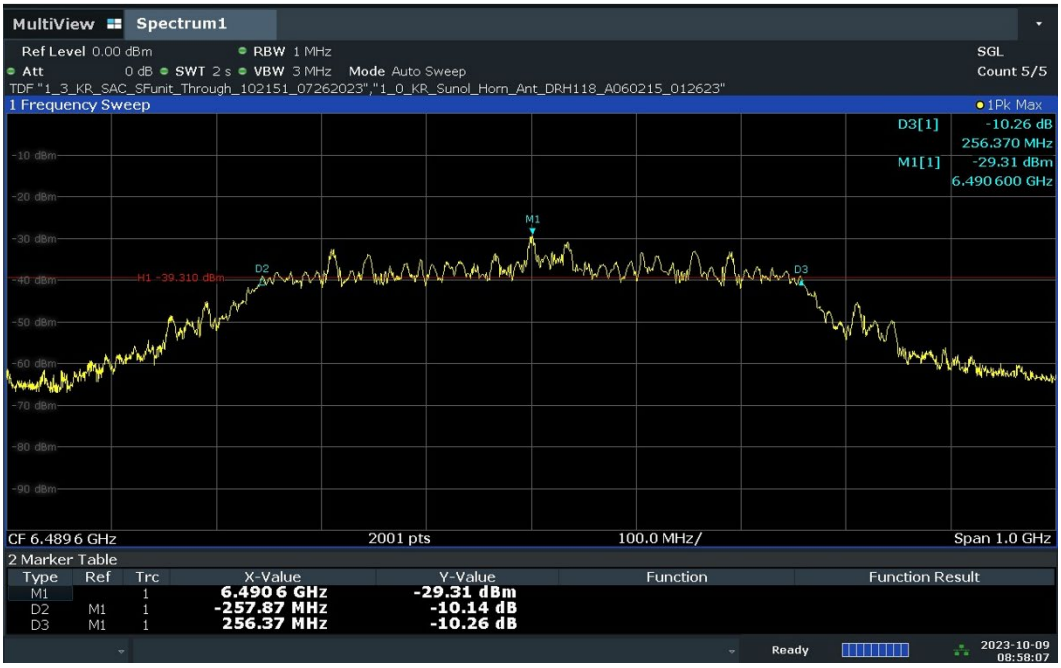
## 10dBc Bandwidth Results


**Plot 7-1. 10dBc Bandwidth – CH.5 - SP0 – Preamble 9**

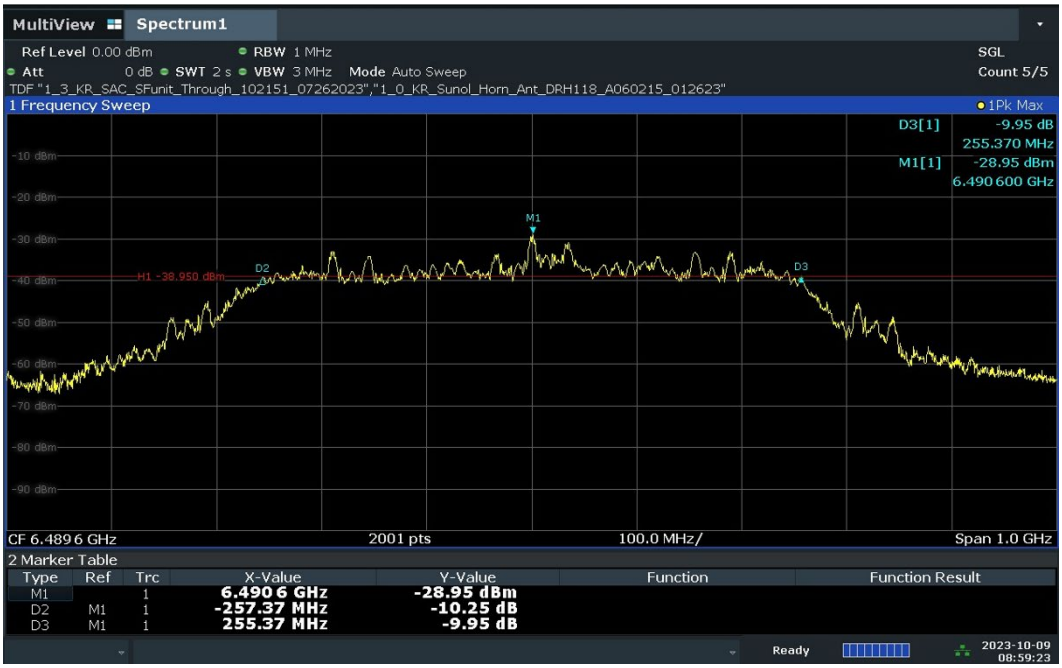

**Plot 7-2. 10dBc Bandwidth – CH.5 – SP1 – Preamble 9**



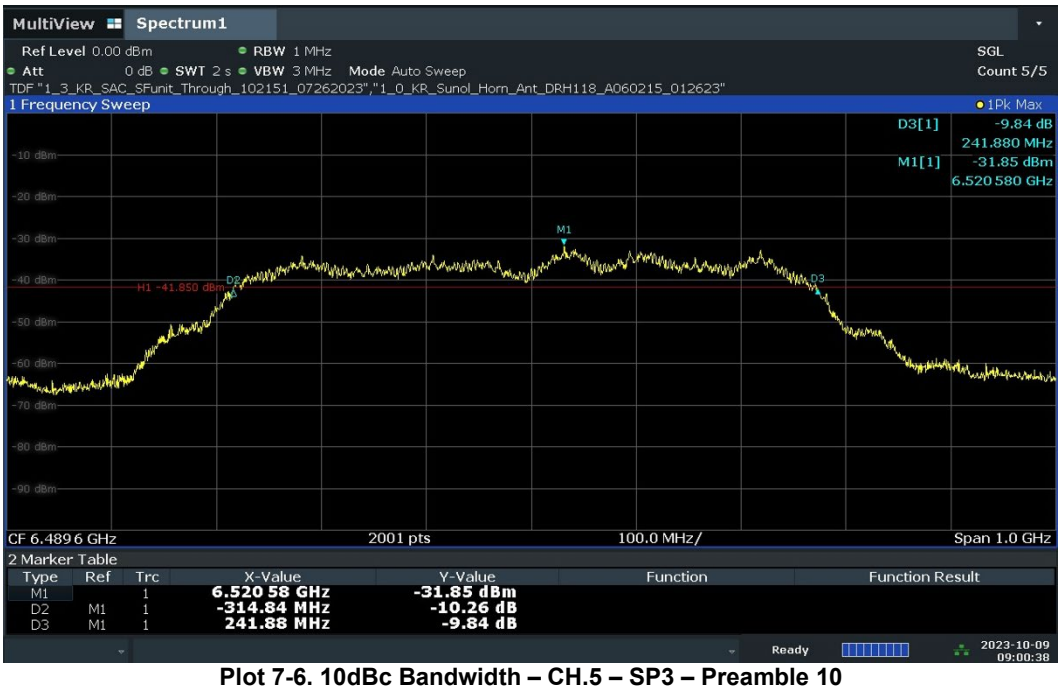

**Plot 7-3. 10dBc Bandwidth – CH.5 – SP3 – Preamble 9**




**Plot 7-4. 10dBc Bandwidth – CH.5 - SP0 – Preamble 10**




**Plot 7-5. 10dBc Bandwidth – CH.5 – SP1 – Preamble 10**



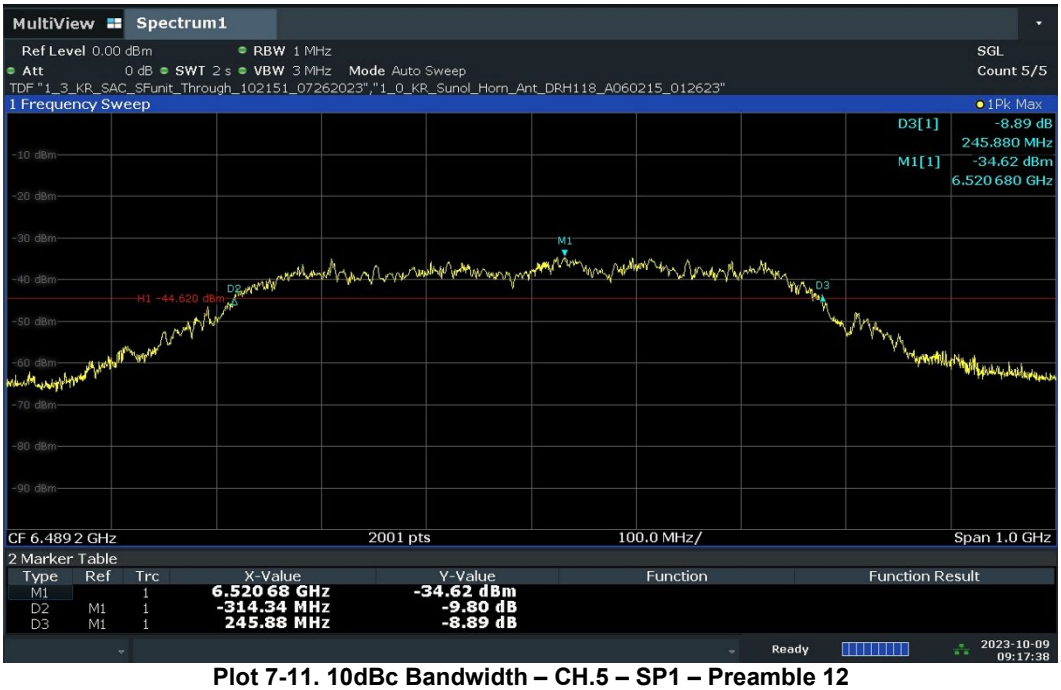

**Plot 7-6. 10dBc Bandwidth – CH.5 – SP3 – Preamble 10**


**Plot 7-7. 10dBc Bandwidth – CH.5 - SP0 – Preamble 11**

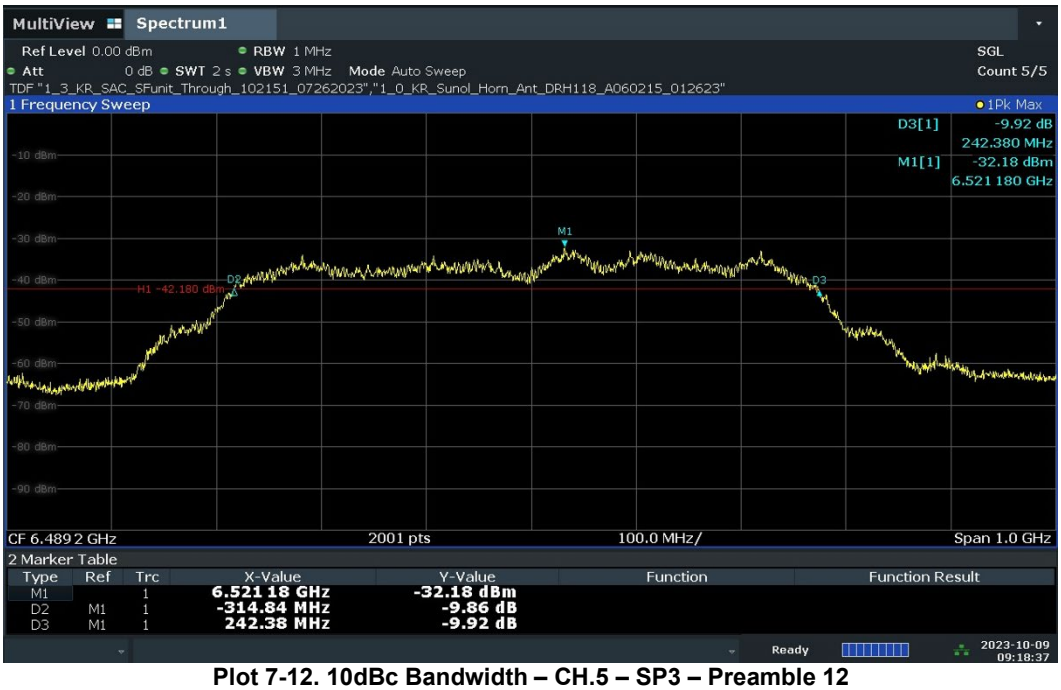

**Plot 7-8. 10dBc Bandwidth – CH.5 – SP1 – Preamble 11**


**Plot 7-9. 10dBc Bandwidth – CH.5 – SP3 – Preamble 11**

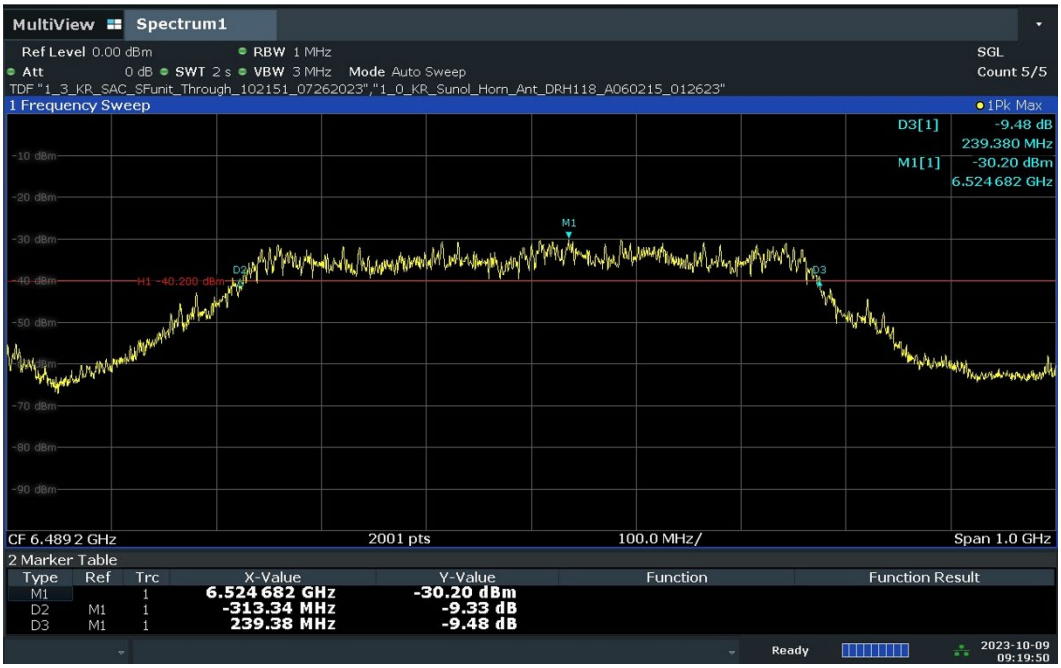

**Plot 7-10. 10dBc Bandwidth – CH.5 - SP0 – Preamble 12**




**Plot 7-11. 10dBc Bandwidth – CH.5 – SP1 – Preamble 12**




**Plot 7-12. 10dBc Bandwidth – CH.5 – SP3 – Preamble 12**

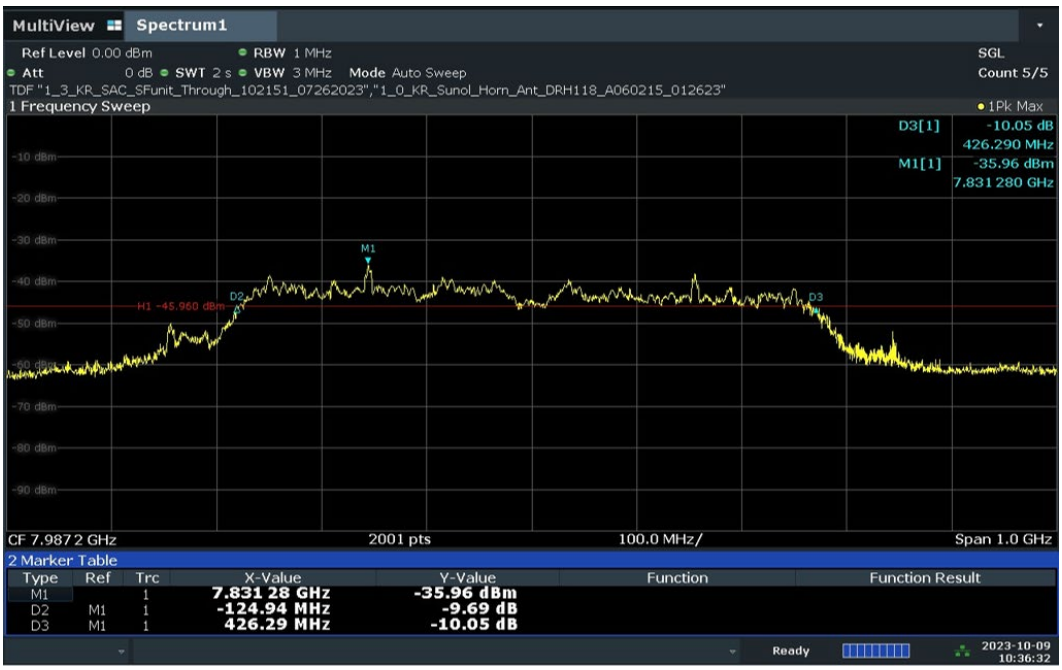



**Plot 7-13. 10dBc Bandwidth – CH.5 - SP0 – Preamble 27**

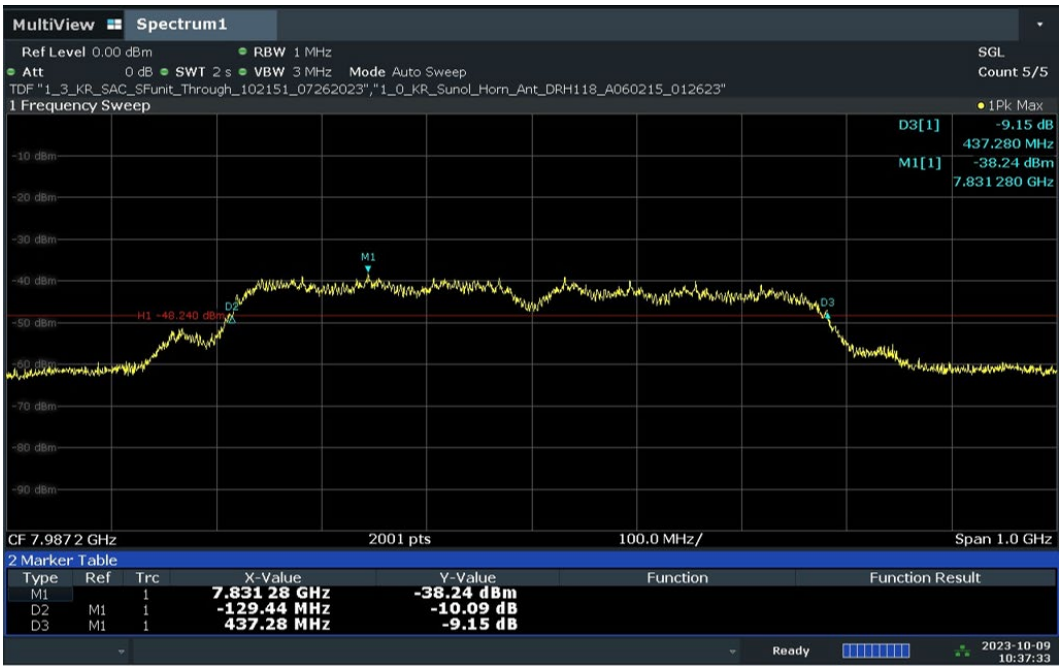

**Plot 7-14. 10dBc Bandwidth – CH.5 – SP1 – Preamble 27**


**Plot 7-15. 10dBc Bandwidth – CH.5 – SP3 – Preamble 27**

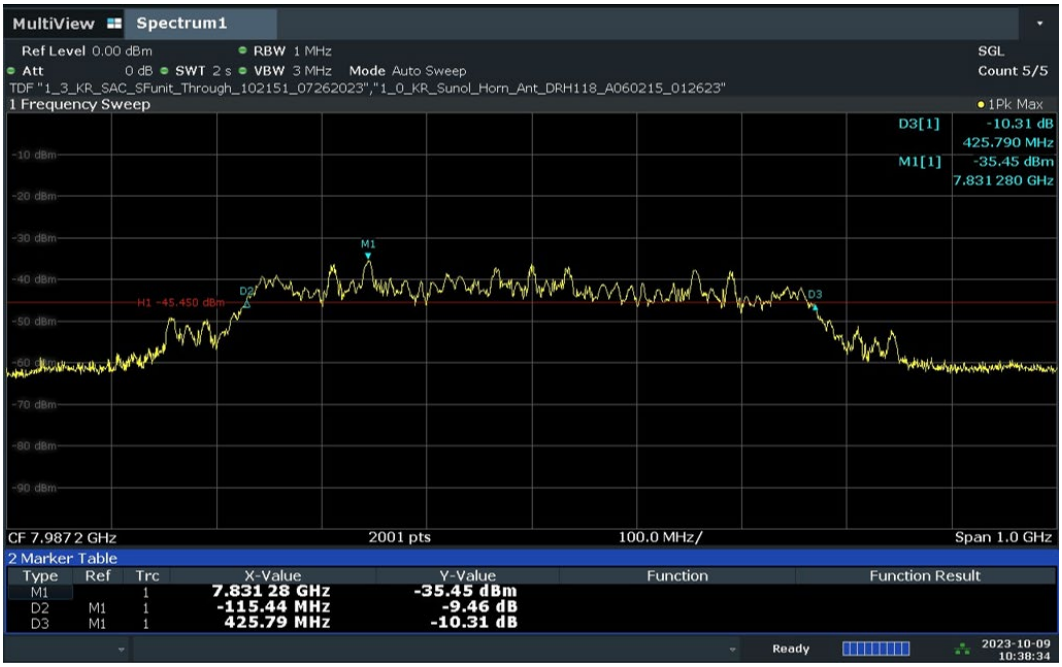

**Plot 7-16. 10dBc Bandwidth – CH.9 - SP0 – Preamble 9**



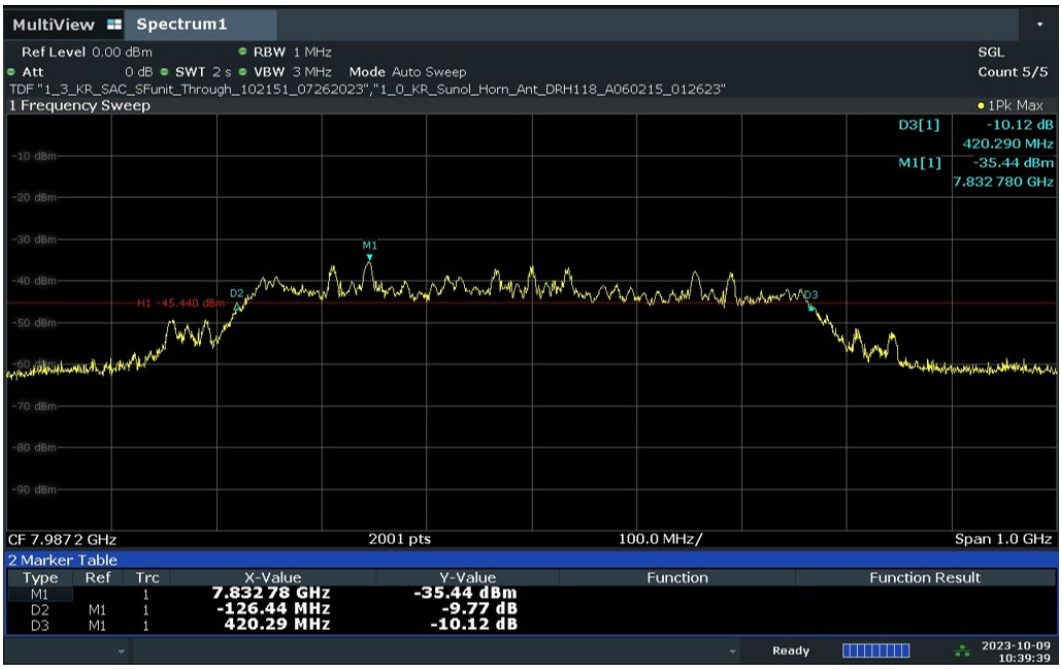

**Plot 7-17. 10dBc Bandwidth – CH.9 – SP1 – Preamble 9**



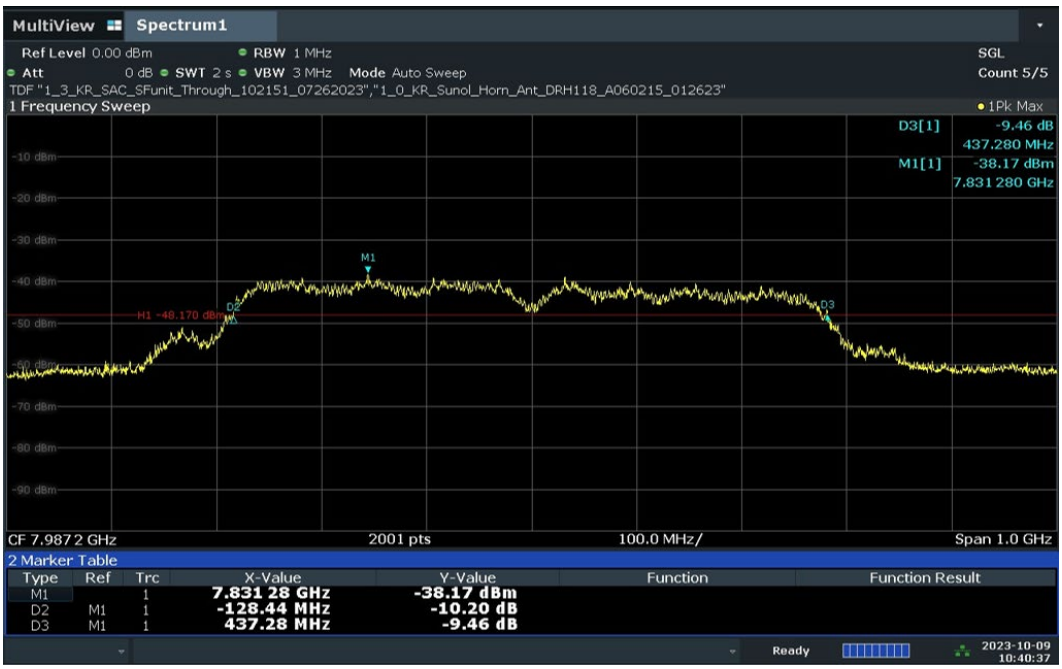

**Plot 7-18. 10dBc Bandwidth – CH.9 – SP3 – Preamble 9**




**Plot 7-19. 10dBc Bandwidth – CH.9 - SP0 – Preamble 10**

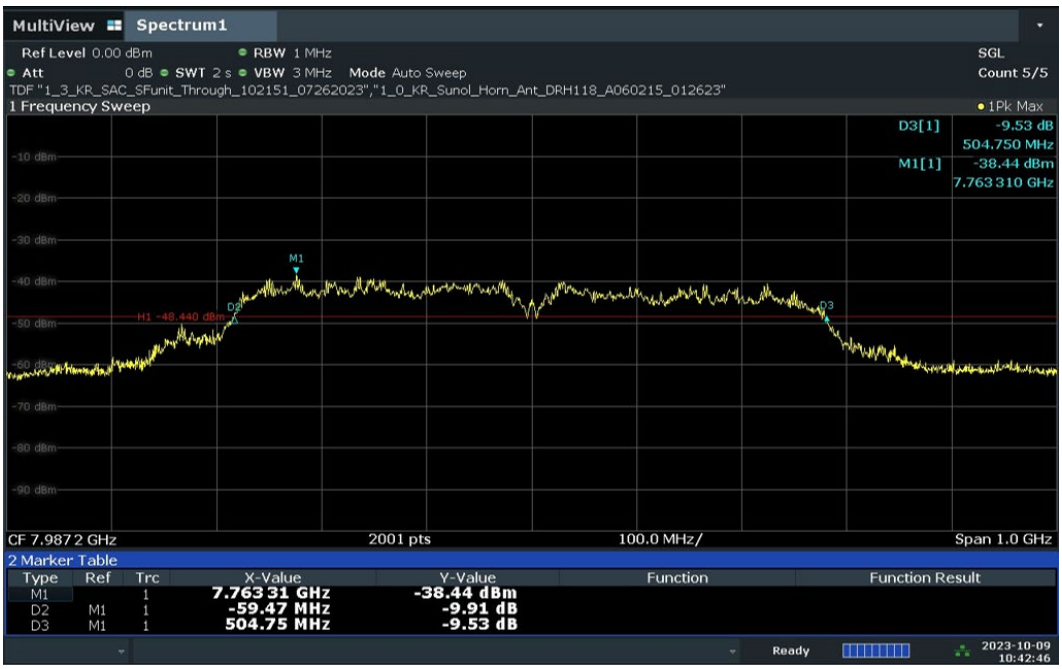



**Plot 7-20. 10dBc Bandwidth – CH.9 – SP1 – Preamble 10**



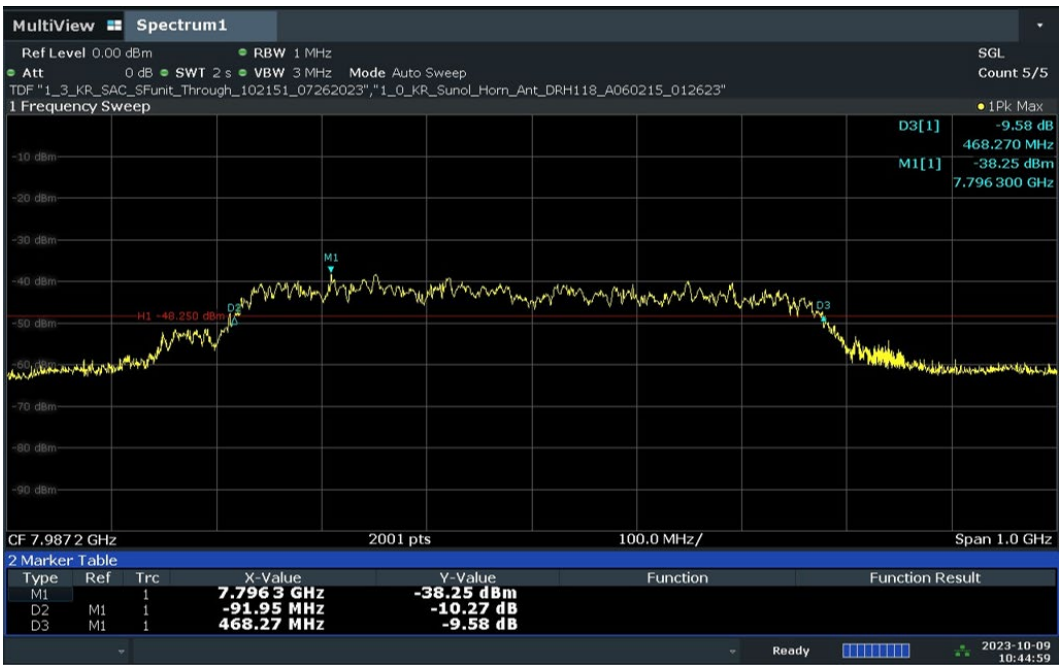

**Plot 7-21. 10dBc Bandwidth – CH.9 – SP3 – Preamble 10**


**Plot 7-22. 10dBc Bandwidth – CH.9 - SP0 – Preamble 11**




**Plot 7-23. 10dBc Bandwidth – CH.9 – SP1 – Preamble 11**

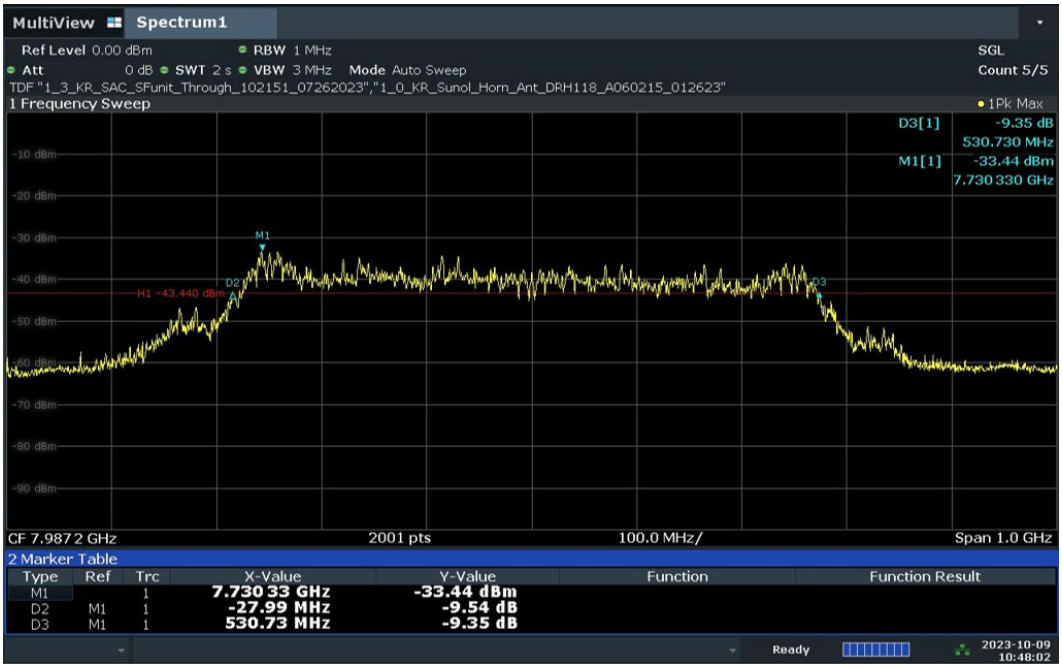

**Plot 7-24. 10dBc Bandwidth – CH.9 – SP3 – Preamble 11**




**Plot 7-25. 10dBc Bandwidth – CH.9 - SP0 – Preamble 12**


**Plot 7-26. 10dBc Bandwidth – CH.9 – SP1 – Preamble 12**


**Plot 7-27. 10dBc Bandwidth – CH.9 – SP3 – Preamble 12**




**Plot 7-28. 10dBc Bandwidth – CH.9 - SP0 – Preamble 27**


**Plot 7-29. 10dBc Bandwidth – CH.9 – SP1 – Preamble 27**


**Plot 7-30. 10dBc Bandwidth – CH.9 – SP3 – Preamble 27**

## 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.

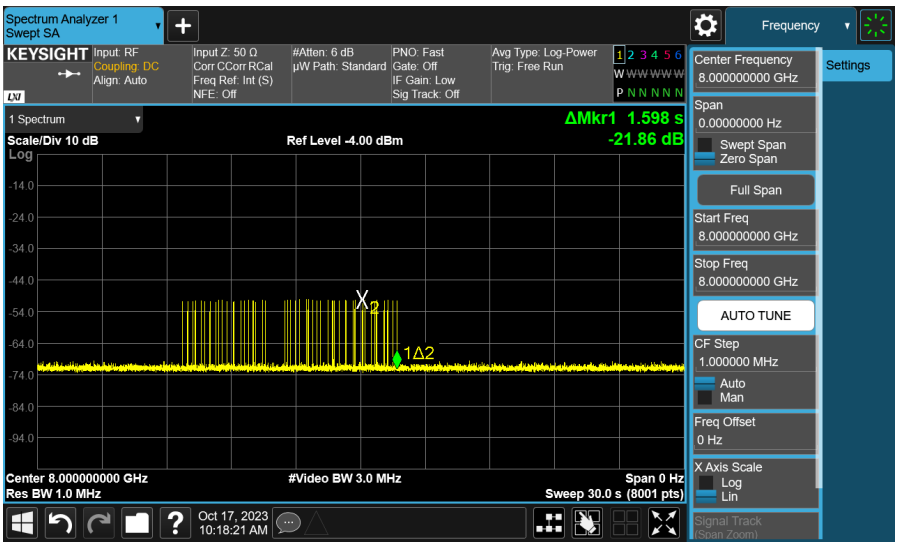
### Test Settings

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.

### Test Setup

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


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




**Plot 7-31. Cessation Time Plot**

## Test Note

X2 represents the EUT for UWB stop receiving, and 1Δ2 shows the EUT for UWB cease transmitting.

## 7.4 Peak Power and Maximum Average Emissions

**§15.519(e), §15.519(c)**

### Test Overview and Limit

15.519 (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 (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 |

**Table 7-3. Average EIRP Limit**

### 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)
4. Sweep time = No more than 1ms integration period over measurement bin
5. Trace mode = max hold
6. Trace was allowed to stabilize

**Test Note**

All combinations of HPRF/BPRF, power mode, and preamble are investigated for average and peak EIRP measurements. Only the worst case combinations are reported for each channel and each antenna.

**RESULTS – BPRF**

| CH | MODE | Preamble | Meas. Ant. | Peak Power (dBm/50MHz) | Peak Limit (dBm/50MHz) | Margin [dB] |
|---|---|---|---|---|---|---|
| 5 | SP0 | 10 | H | -1.58 | 0 | -1.58 |
| 9 | SP0 | 10 | H | -1.53 | 0 | -1.53 |

**Table 7-4. BPRF Highest Peak Power Results**

| CH | MODE | Preamble | Meas. Ant. | Average Power (dBm) | Average Limit (dBm) | Margin [dB] |
|---|---|---|---|---|---|---|
| 5 | SP3 | 10 | H | -42.96 | -41.3 | -1.66 |
| 9 | SP3 | 10 | H | -42.82 | -41.3 | -1.52 |

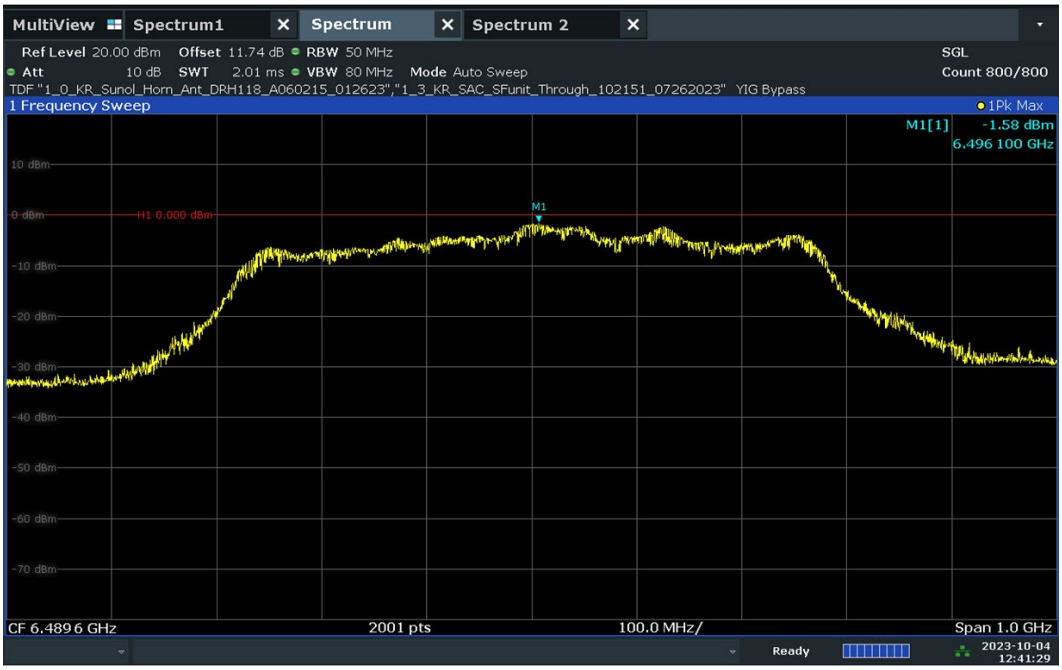
**Table 7-5. BPRF Highest Average Power Results**

## Sample Calculation:

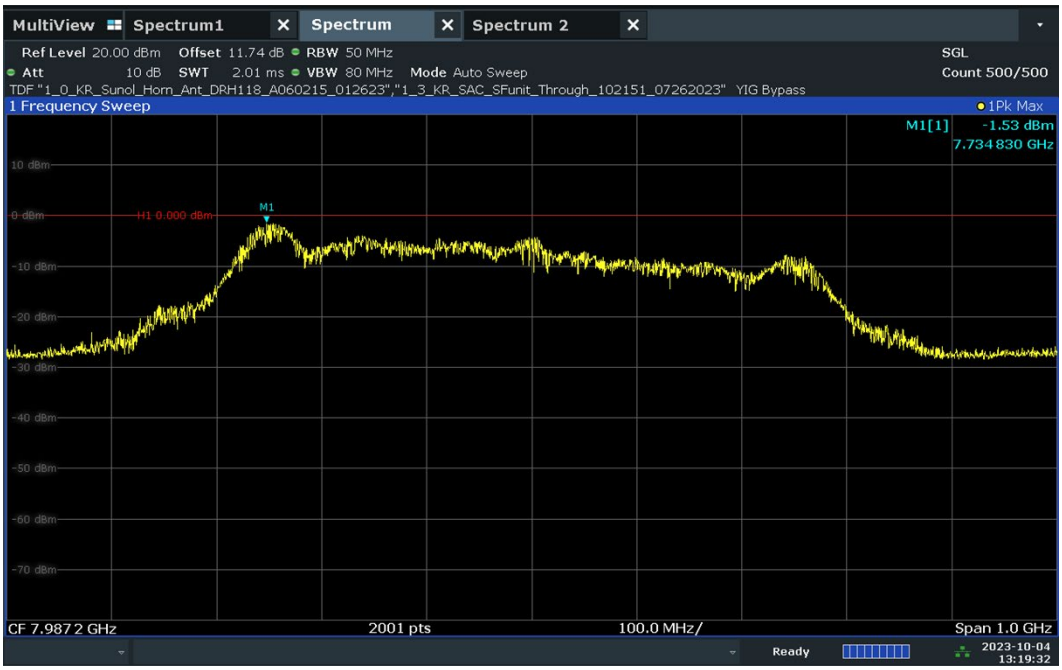
The raw radiated spurious level is converted to field strength in dBuV/m. Then, the EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter.

.

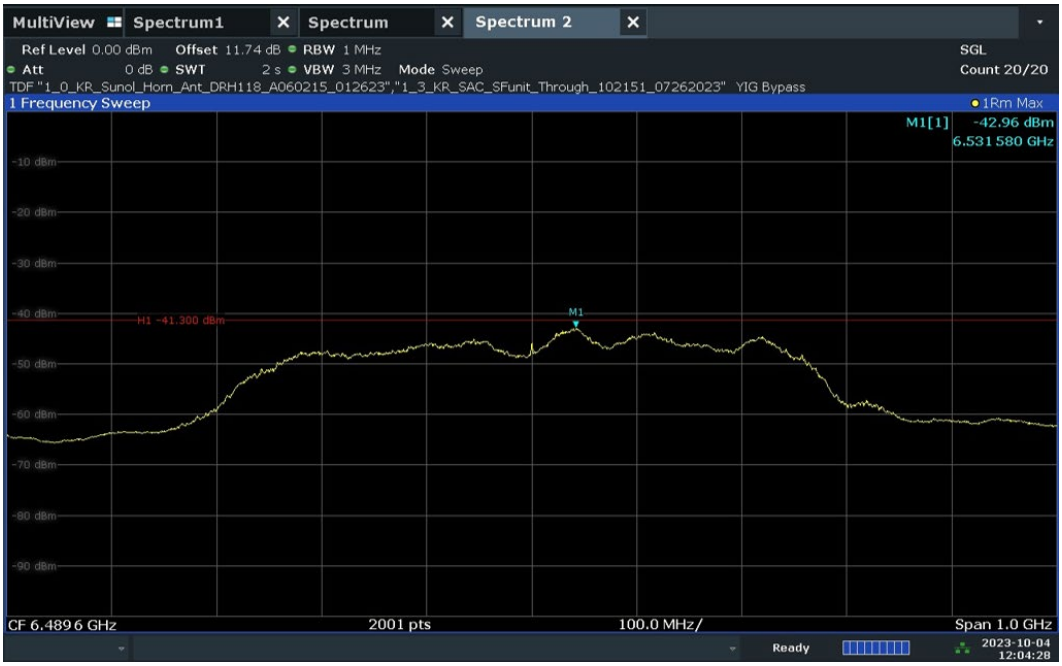
**RSE EIRP (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8




**Plot 7-32. UWB Peak Power Measurement - CH.5 – BPRF**




**Plot 7-33. UWB Peak Power Measurement - CH.9 – BPRF**




**Plot 7-34. UWB Average Power Measurement - CH.5 – BPRF**


**Plot 7-35. UWB Average Power Measurement - CH.9 – BPRF**

**RESULTS – HPRF**

| CH | MODE | Preamble | Meas. Ant. | Peak Power (dBm/50MHz) | Peak Limit (dBm/50MHz) | Margin [dB] |
|---|---|---|---|---|---|---|
| 5 | SP0 | 27 | H | -6.39 | 0 | -6.39 |
| 9 | SP0 | 27 | H | -5.19 | 0 | -5.19 |

**Table 7-6. HPRF Highest Peak Power Results**

| CH | MODE | Preamble | Meas. Ant. | Average Power (dBm) | Average Limit (dBm) | Margin [dB] |
|---|---|---|---|---|---|---|
| 5 | SP0 | 27 | H | -43.16 | -41.3 | -1.86 |
| 9 | SP0 | 27 | H | -42.80 | -41.3 | -1.5 |

**Table 7-7. HPRF Highest Average Power Results**

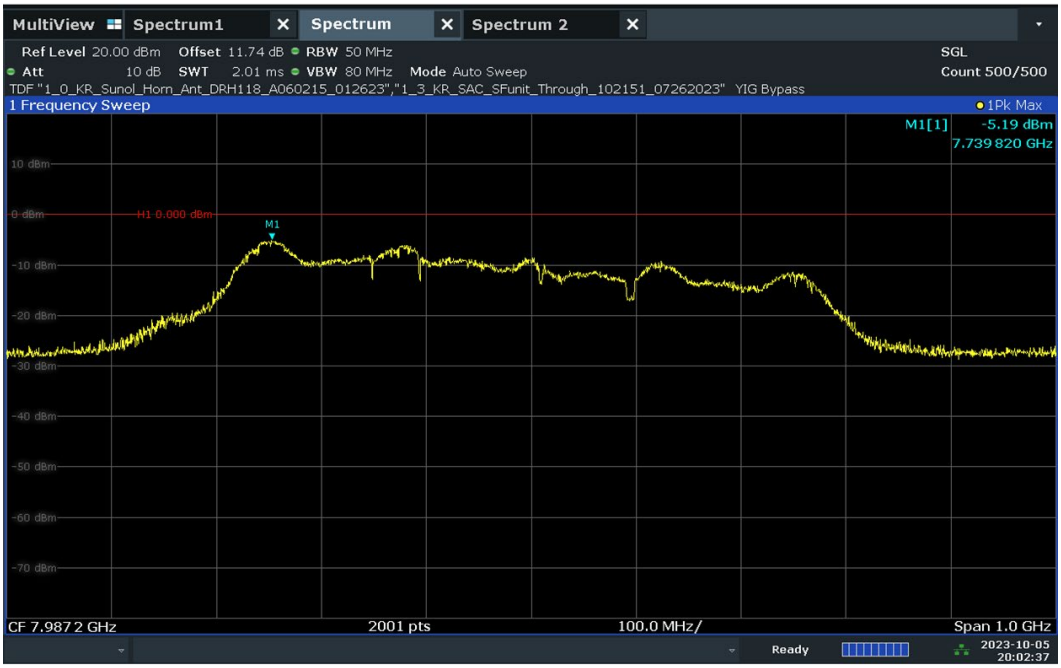
## Sample Calculation

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

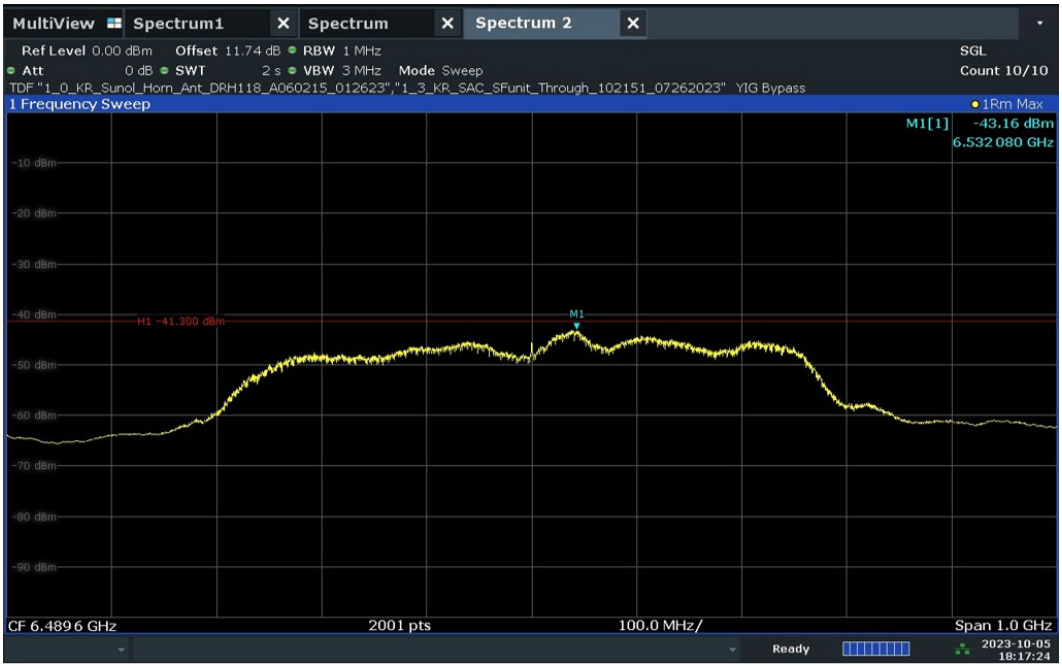
.

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

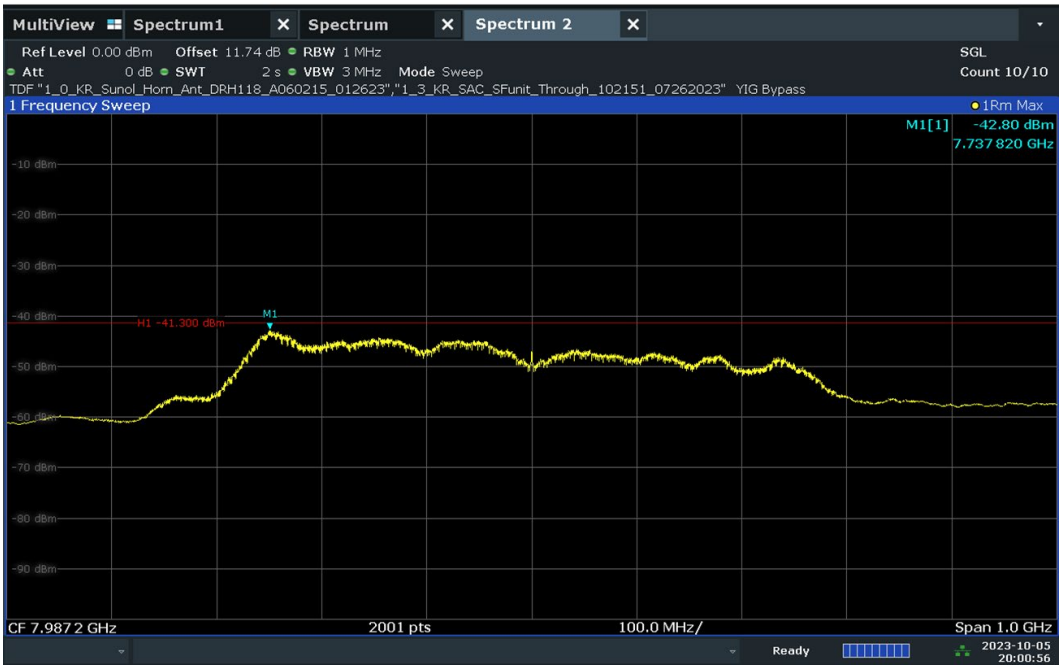

**Plot 7-36. UWB Peak Power Measurement - CH.5 – HPRF**




**Plot 7-37. UWB Peak Power Measurement - CH.9 – HPRF**




**Plot 7-38. UWB Average Power Measurement - CH.5 – HPRF**




**Plot 7-39. UWB Average Power Measurement - CH.9 – HPRF**

## 7.5 Radiated Measurement Data above 960MHz

**§15.519 (c), §15.519(d)**

### 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 = No more than 1ms integration period over each measurement bin
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.

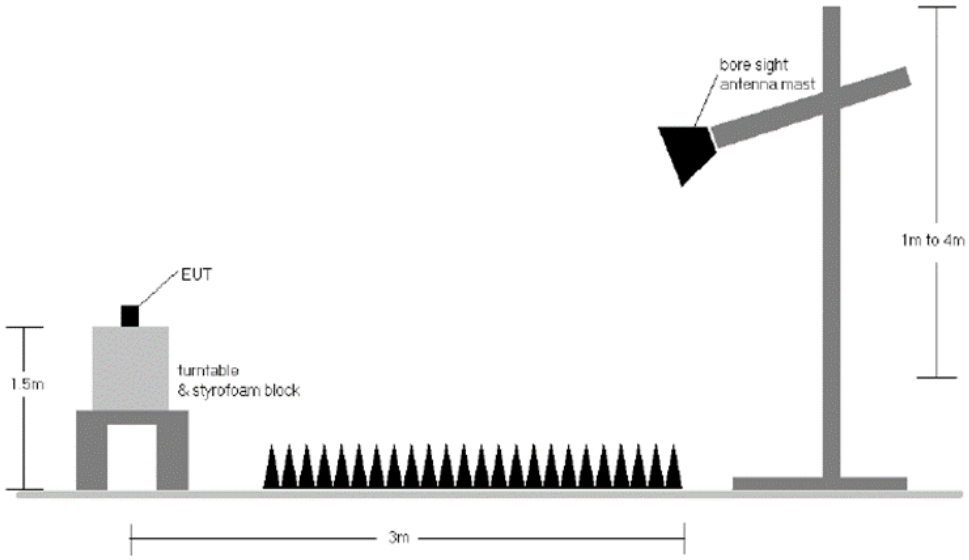



**Figure 7-3. Radiated Test Setup > 1GHz**

## Test Notes

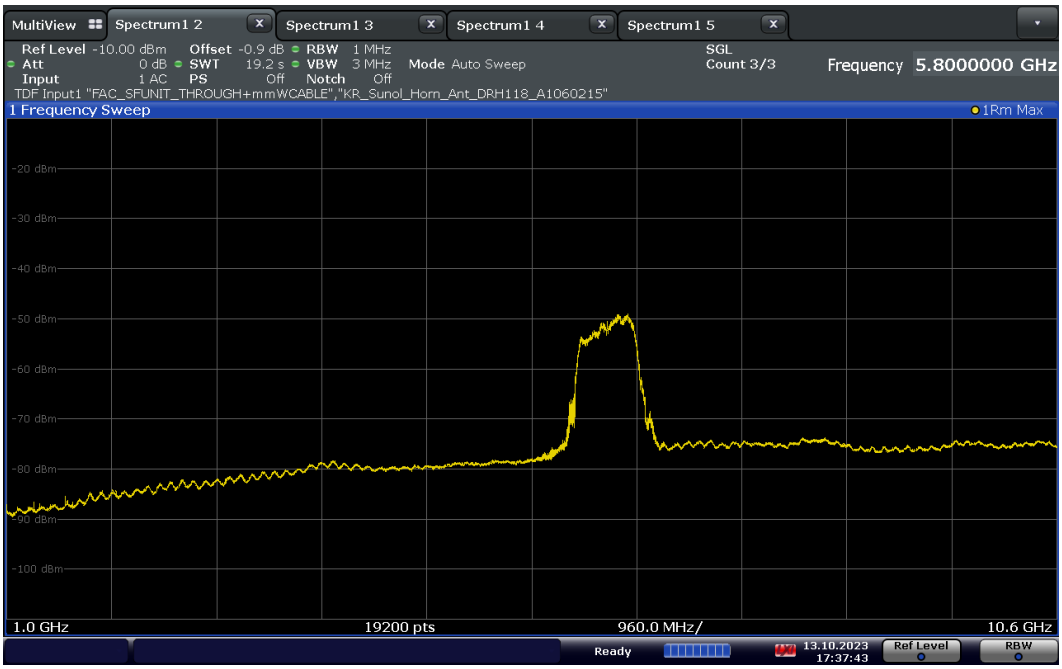
1. All modes of operation and settings (Preamble, Packet Type, etc) were investigated and the worst-case emissions are reported.
2. The RBW for measurements in the GPS Bands were reduced to 30kHz in order to prove compliance.
3. 1000 ~ 18000 MHz and above 18000 MHz pre-scan plots were conducted at 0.7 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 and 0.6 meters respectively.
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

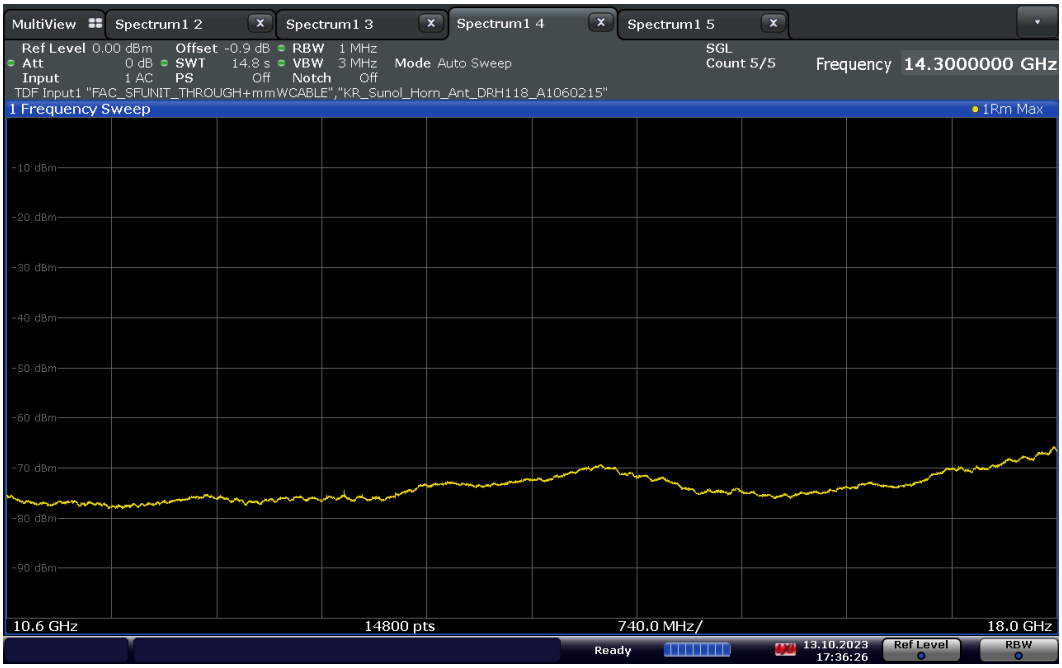
The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE level is calculated by applying the additional factors shown below for a test distance of 3 meter.

**Spurious Emission Level (dBm)** = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

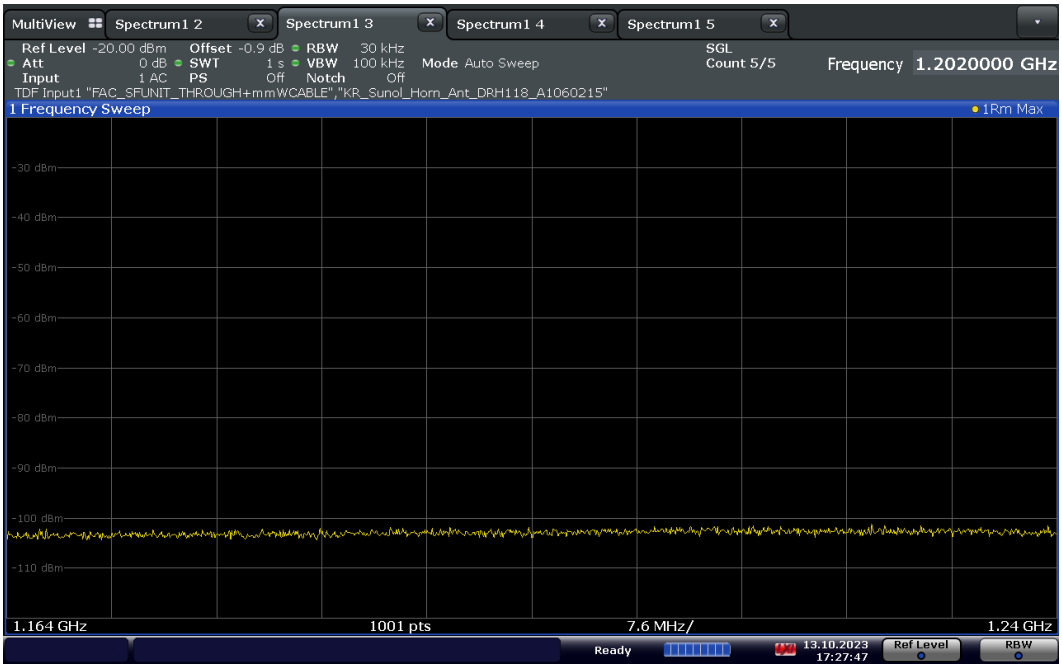
## Channel 5



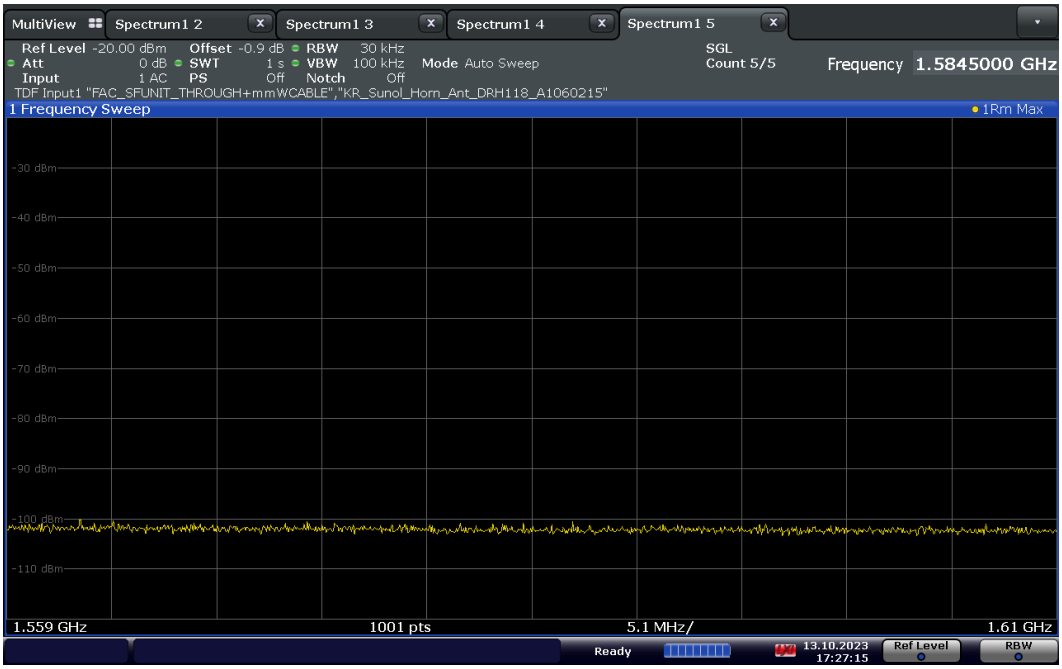

**Plot 7-40. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.5**



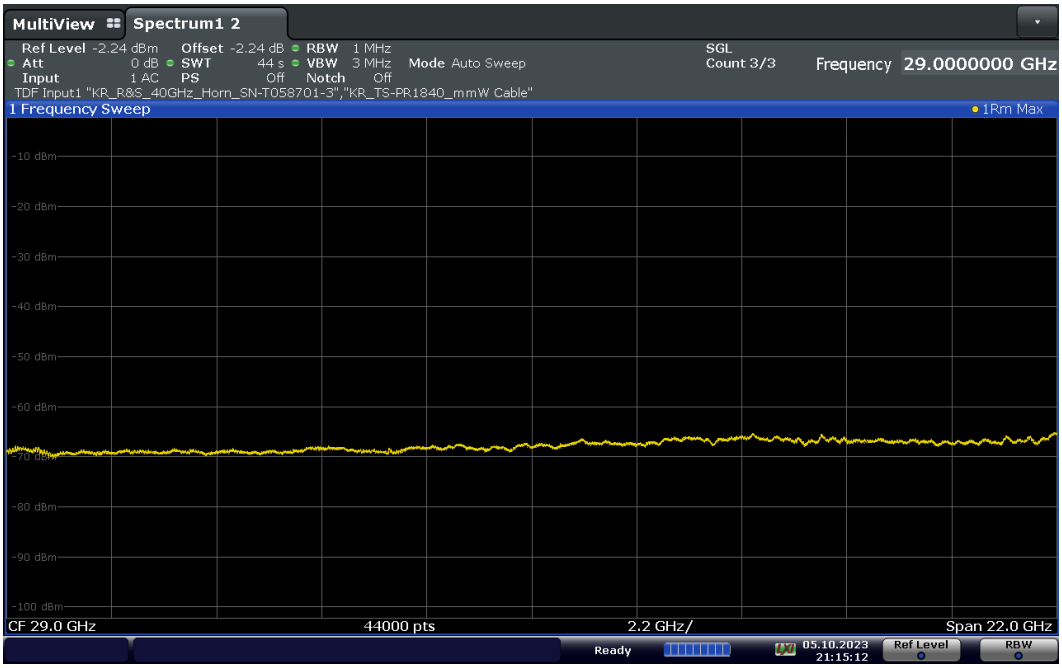

**Plot 7-41. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5**




**Plot 7-42. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.5 – GPS band**




**Plot 7-43. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.5 – GPS band**




**Plot 7-44. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.5**

| | |
|---|---|
| **Channel:** | 5 |
| **Frequency (MHz):** | 6489.6 |
| **Preamble ID** | 10 |
| **Config** | SP3 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Spurious Emission Level[dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|---|
| 1305 | RMS | H | - | - | -86.05 | -75.30 | -10.75 |
| 1955 | RMS | H | - | - | -84.63 | -63.30 | -21.33 |
| 3046 | RMS | H | - | - | -81.58 | -61.30 | -20.28 |
| 10521 | RMS | H | - | - | -75.04 | -41.30 | -33.74 |
| 17879 | RMS | H | - | - | -66.09 | -61.30 | -4.79 |
| 39949 | RMS | H | - | - | -65.08 | -61.30 | -3.78 |

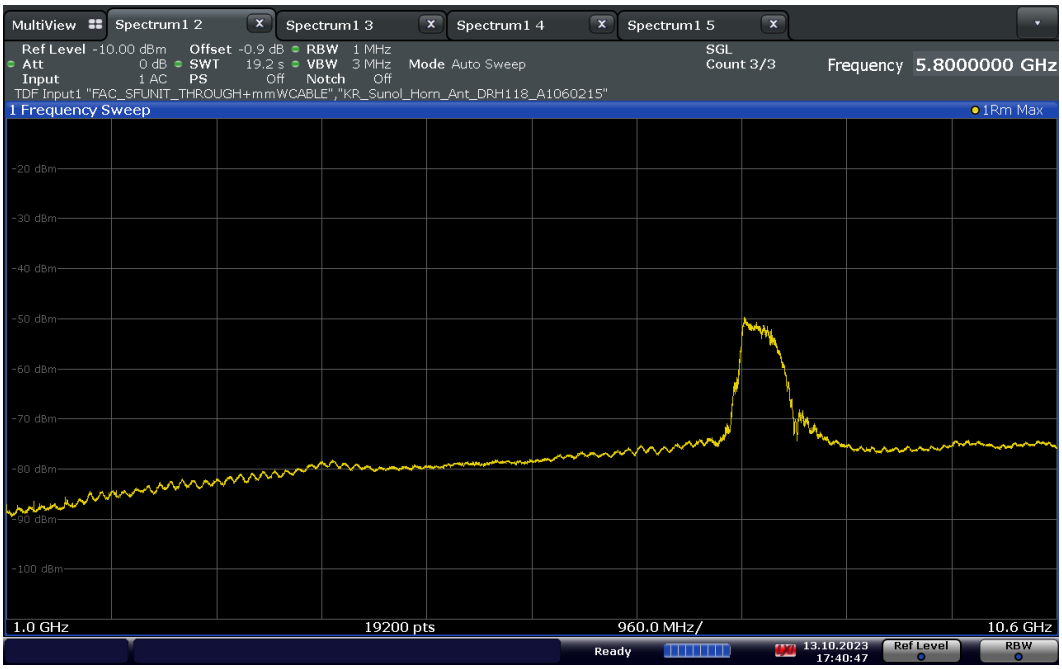
**Table 7-10. Radiated Spurious Emissions CH. 5**

| | |
|---|---|
| **Channel:** | 5 |
| **Frequency (MHz):** | 6489.6 |
| **Preamble ID** | 10 |
| **Config** | SP3 |

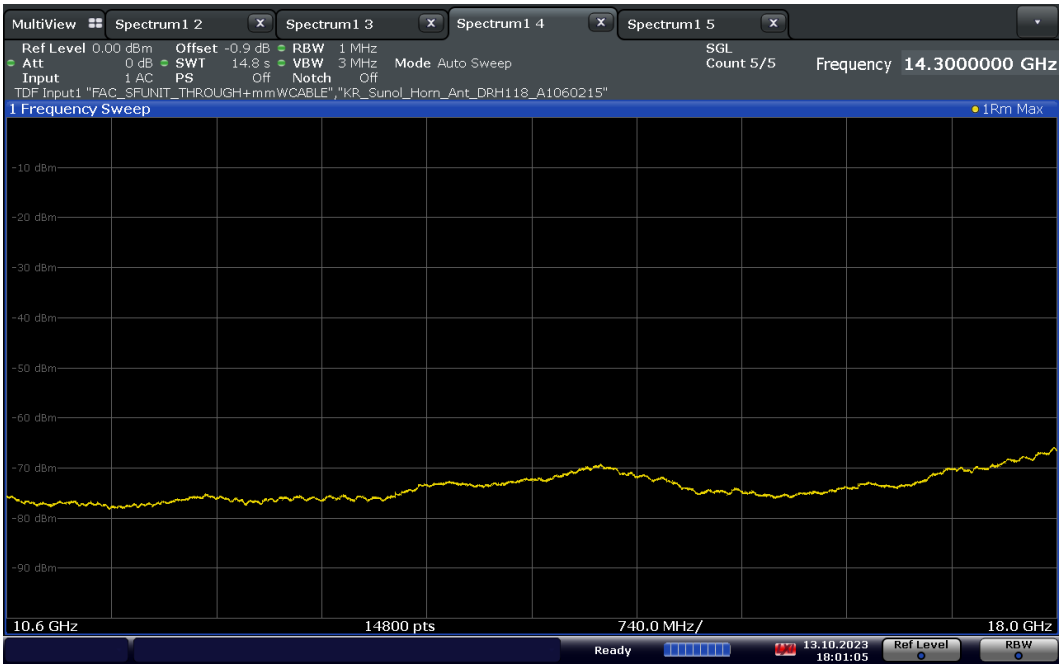
| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Spurious Emission Level[dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|---|
| 1204 | RMS | H | - | - | -101.47 | -85.30 | -16.17 |
| 1564 | RMS | H | - | - | -100.06 | -85.30 | -14.76 |

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

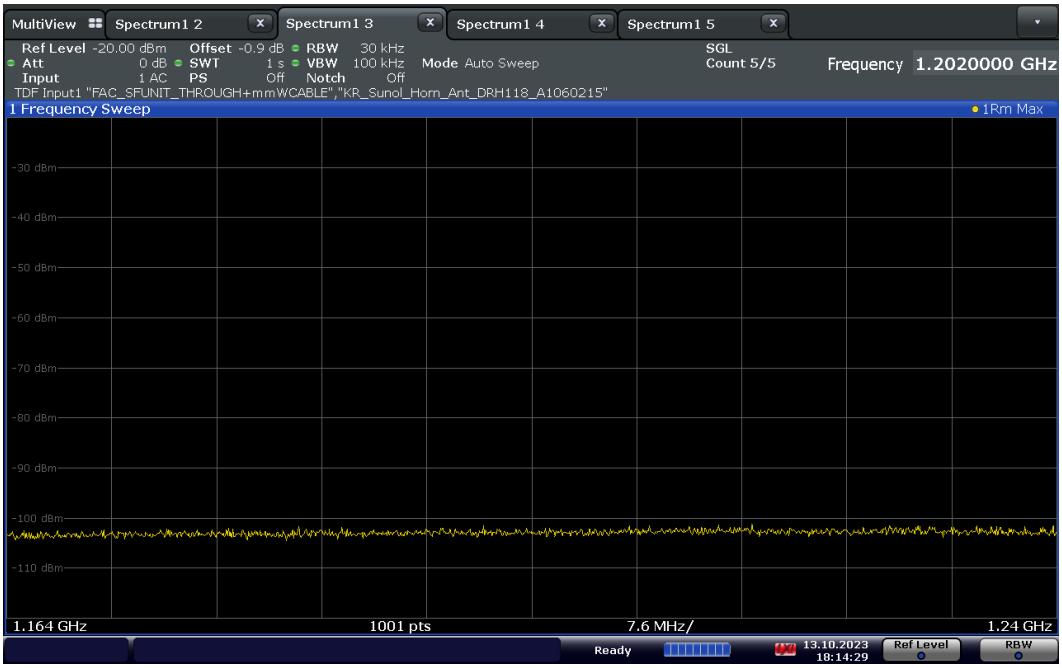
## Channel 9



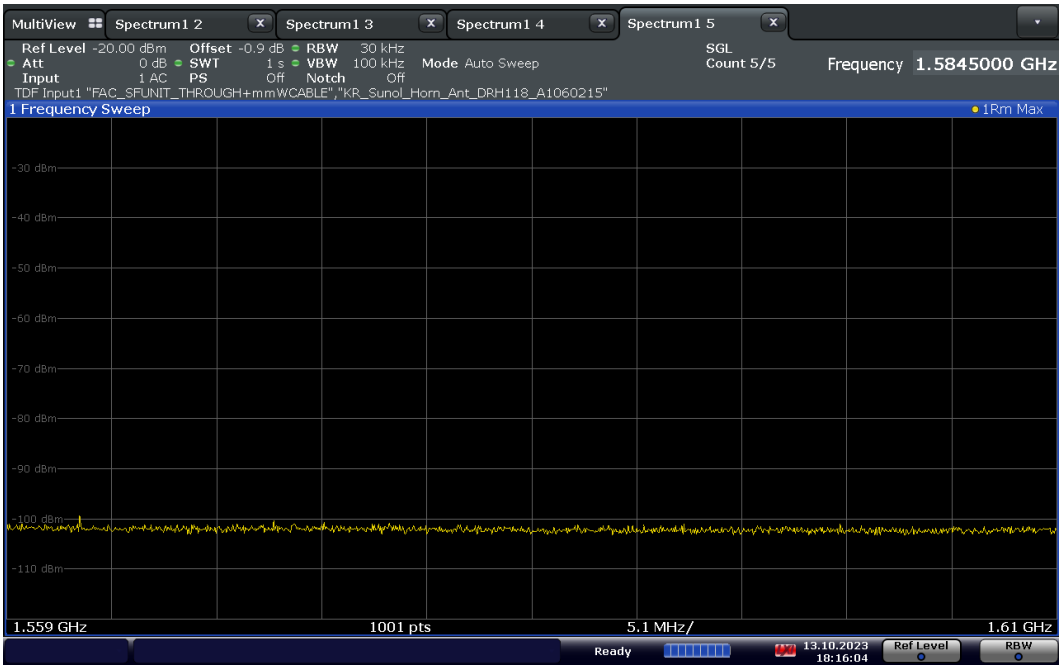

**Plot 7-45. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9**



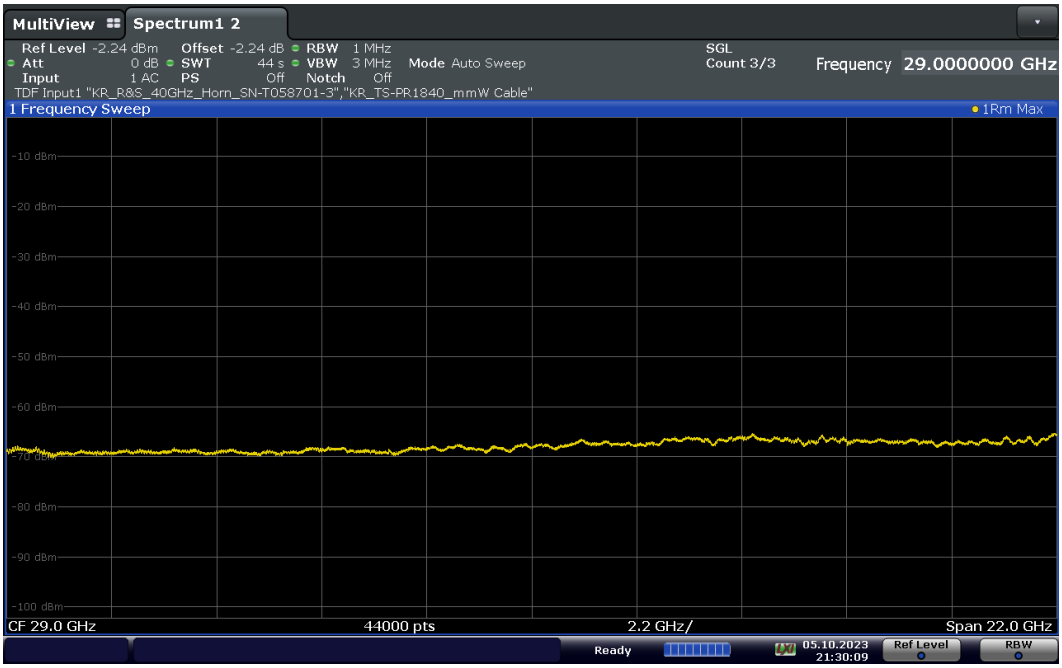

**Plot 7-46. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.9**




**Plot 7-47. Radiated Spurious Pre-Scan 1164 - 1240 MHz - CH.9 – GPS band**




**Plot 7-48. Radiated Spurious Pre-Scan 1559 - 1610 MHz - CH.9 – GPS band**




**Plot 7-49. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.9**

| | |
|---|---|
| **Channel:** | 9 |
| **Frequency (MHz):** | 7987.2 |
| **Preamble ID** | 10 |
| **Config** | SP3 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Spurious Emission Level[dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|---|
| 1587 | RMS | H | - | - | -87.05 | -75.30 | -11.75 |
| 1973 | RMS | H | - | - | -84.63 | -63.30 | -21.33 |
| 3056 | RMS | H | - | - | -82.58 | -61.30 | -21.28 |
| 10358 | RMS | H | - | - | -75.04 | -41.30 | -33.74 |
| 17819 | RMS | H | - | - | -66.80 | -61.30 | -5.50 |
| 39950 | RMS | H | - | - | -65.23 | -61.30 | -3.93 |

**Table 7-12. Radiated Spurious Emissions CH. 9**

| | |
|---|---|
| **Channel:** | 9 |
| **Frequency (MHz):** | 7987.2 |
| **Preamble ID** | 10 |
| **Config** | SP3 |

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Spurious Emission Level[dBm] | Limit [dBm] | Margin [dB] |
|---|---|---|---|---|---|---|---|
| 1188 | RMS | H | - | - | -101.63 | -85.30 | -16.33 |
| 1571 | RMS | H | - | - | -99.32 | -85.30 | -14.02 |

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

## 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 7-19 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 7-14. 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

## Test Setup

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

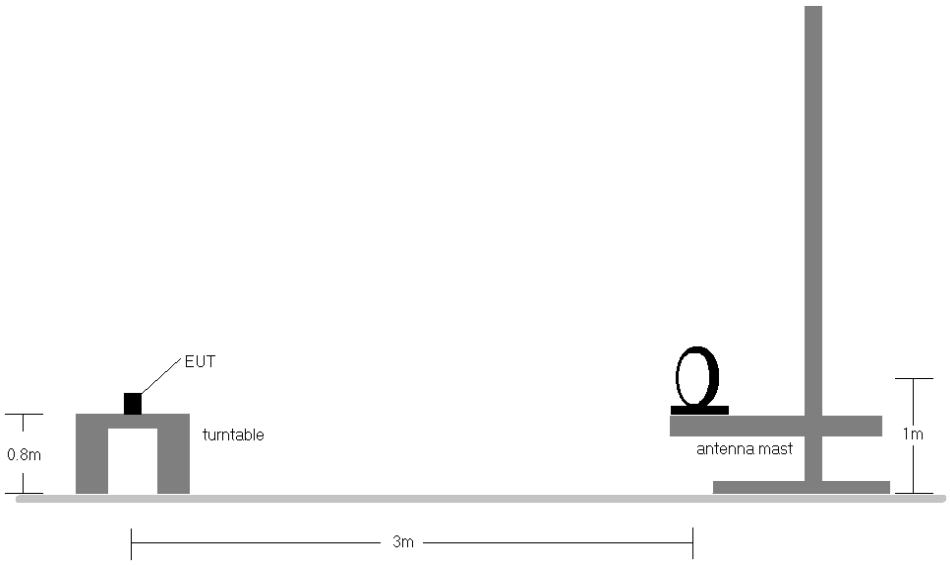



**Figure 7-4. Radiated Test Setup < 30Mhz**

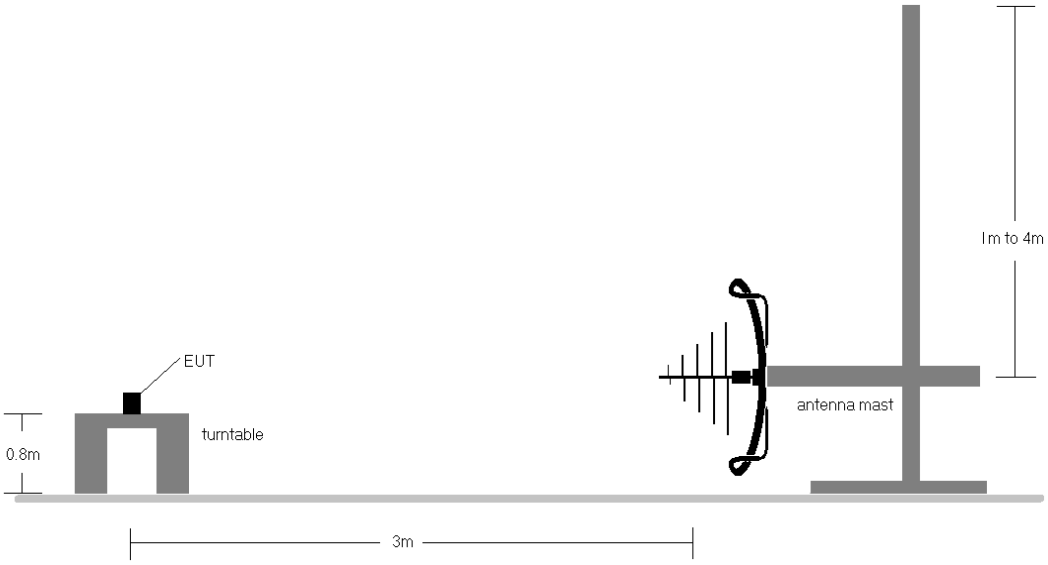
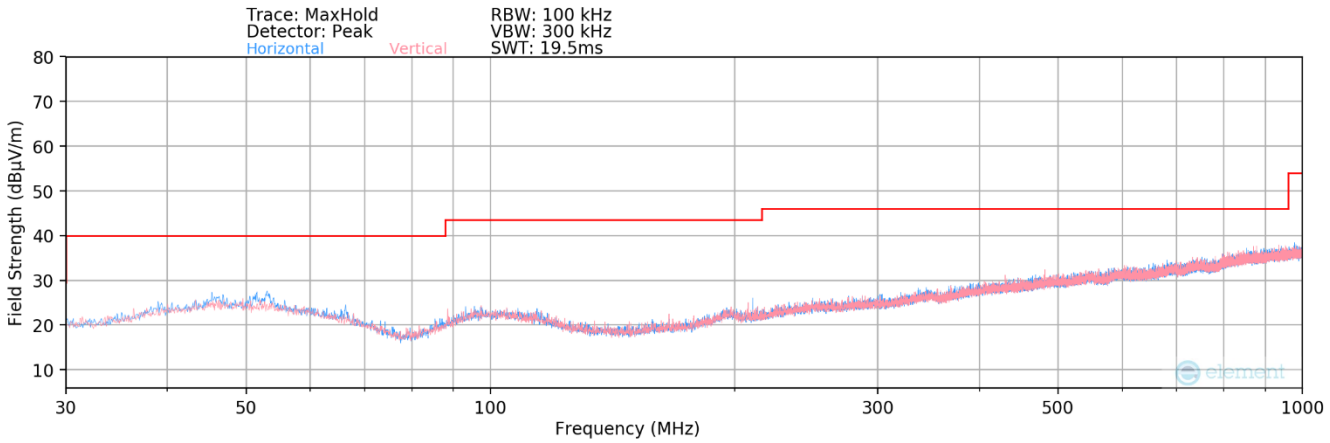



**Figure 7-5. Radiated Test Setup < 1GHz**

## Test Notes

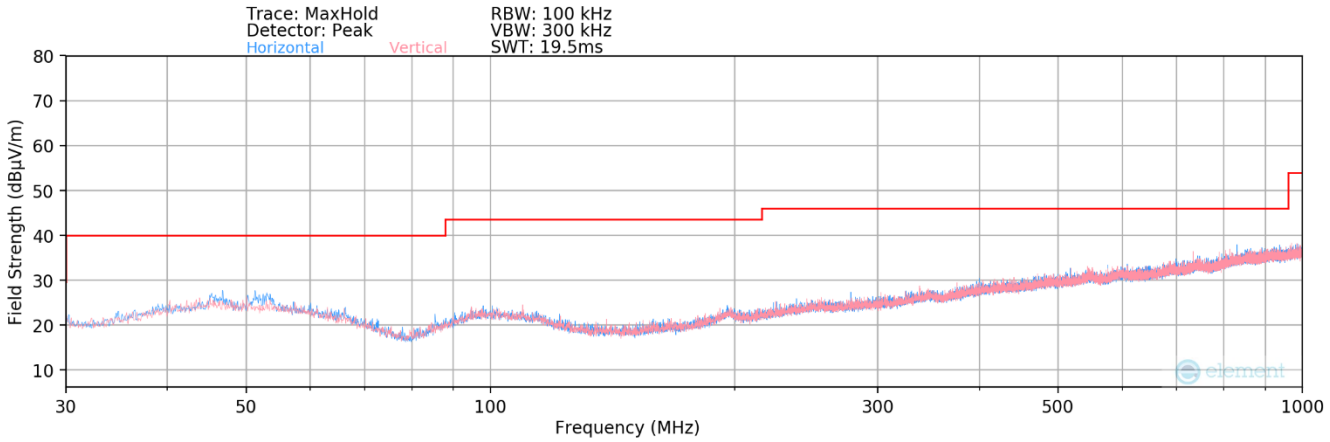
1. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
2. The spectrum is investigated using a peak detector and final measurements are recorded using CISPR quasi peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
3. Emissions were measured at a 3 meter test distance.
4. 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.
5. No spurious emissions were detected within 20dB of the limit below 30MHz.
6. 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.
7. 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.




**Plot 7-50. 30MHz - 1 GHz Pre-Scan Plots – CH 5**

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBuV/m] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|
| 52.39 | Quasi-Peak | H | - | - | 1.52 | 20.37 | 21.89 | 40.00 | -18.11 |
| 953.89 | Quasi-Peak | H | - | - | 2.35 | 30.65 | 33.00 | 46.02 | -13.02 |
| 957.27 | Quasi-Peak | V | - | - | 2.41 | 30.67 | 33.08 | 46.02 | -12.94 |

**Table 7-15. Radiated Spurious Emissions Below 1GHz – CH5**




**Plot 7-51. 30MHz - 1 GHz Pre-Scan Plots – CH 9**

| Frequency [MHz] | Detector | Ant. Pol. [H/V] | Antenna Height [cm] | Turntable Azimuth [degree] | Analyzer Level [dBuV/m] | AFCL [dB/m] | Field Strength [dBµV/m] | Limit [dBµV/m] | Margin [dB] |
|---|---|---|---|---|---|---|---|---|---|
| 52.88 | Quasi-Peak | H | - | - | 1.49 | 20.32 | 21.81 | 40.00 | -18.19 |
| 957.41 | Quasi-Peak | H | - | - | 2.28 | 30.67 | 32.95 | 46.02 | -13.07 |
| 959.27 | Quasi-Peak | V | - | - | 2.35 | 30.67 | 33.02 | 46.02 | -13.00 |

**Table 7-16. Radiated Spurious Emissions Below 1GHz – CH9**

## 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 7-20 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 7-17. 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

## Test Setup

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

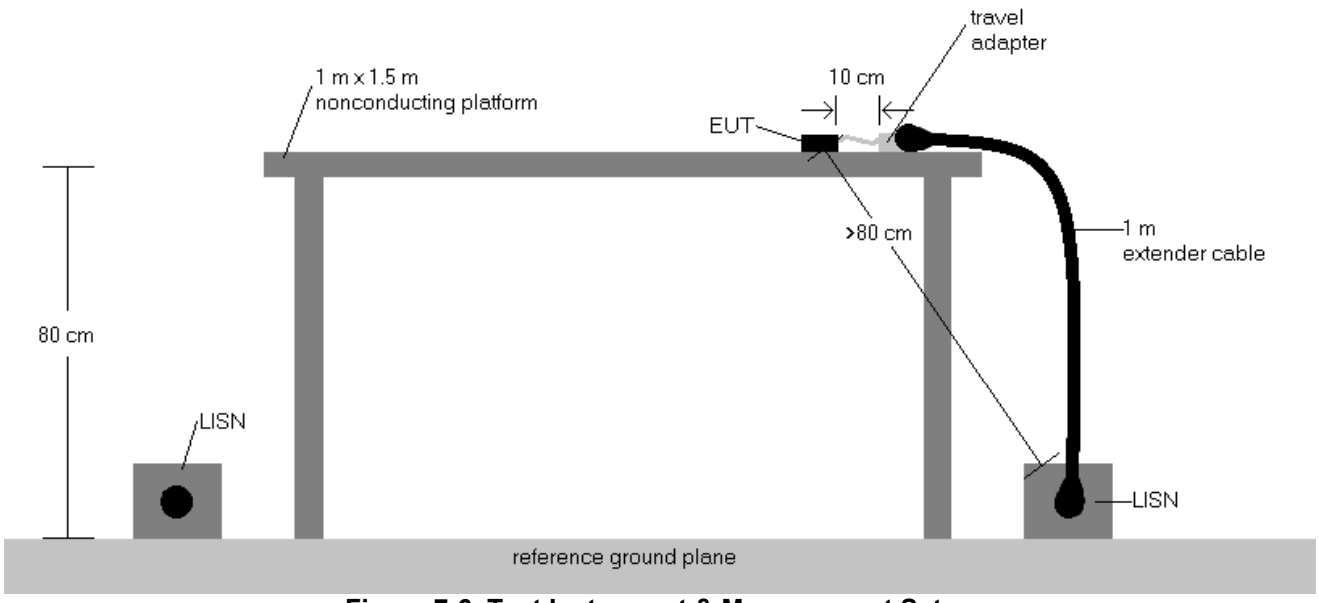
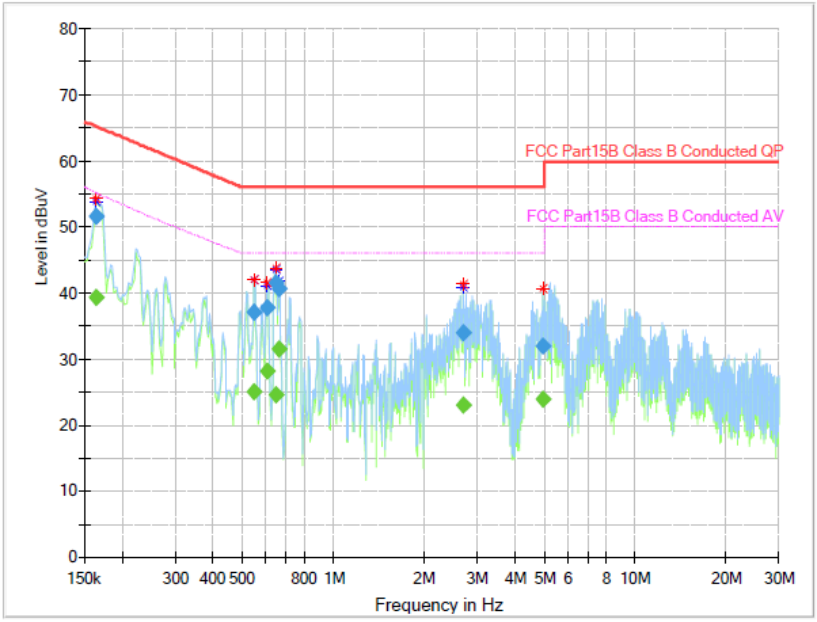



**Figure 7-6. Test Instrument & Measurement Setup**

## Test Notes

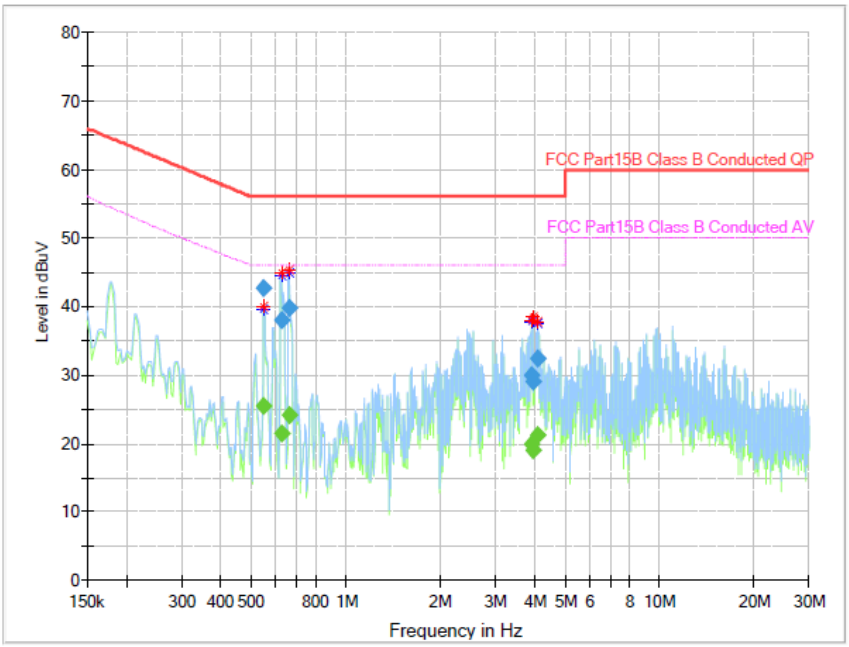
1. All Modes of operation were investigated and the worst-case emissions are reported.
2. The limit for Class B device(s) from 150kHz to 30MHz are specified in Section 15.207 and RSS-Gen.
3. L1 = Phase; N = Neutral
4. Corr. (dB) = Cable loss (dB) + LISN insertion factor (dB)
5. QP/AV Level (dBµV) = QP/AV Reading (dBµV) + Factor (dB)
6. Margin (dB) = QP/AV Limit (dBµV) – QP/AV Level (dBµV)
7. Traces shown in plot are made using a peak detector.
8. Deviations to the Specifications: None.




## Final_Result

| Frequency (MHz) | Quasi Peak (dBuV) | Average (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.164925 | --- | 39.31 | 55.14 | 15.83 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.164925 | 51.65 | --- | 65.21 | 13.56 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.549990 | --- | 25.11 | 46.00 | 20.89 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.549990 | 37.17 | --- | 56.00 | 18.83 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.606705 | --- | 28.19 | 46.00 | 17.81 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.606705 | 37.80 | --- | 56.00 | 18.20 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.645510 | --- | 24.48 | 46.00 | 21.52 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.645510 | 41.58 | --- | 56.00 | 14.42 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.663420 | --- | 31.50 | 46.00 | 14.50 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.663420 | 40.72 | --- | 56.00 | 15.28 | 1000.0 | 9.000 | L1 | 9.9 |
| 2.699190 | --- | 22.91 | 46.00 | 23.09 | 1000.0 | 9.000 | L1 | 9.8 |
| 2.699190 | 33.95 | --- | 56.00 | 22.05 | 1000.0 | 9.000 | L1 | 9.8 |
| 4.982715 | --- | 23.84 | 46.00 | 22.16 | 1000.0 | 9.000 | L1 | 9.9 |
| 4.982715 | 31.99 | --- | 56.00 | 24.01 | 1000.0 | 9.000 | L1 | 9.9 |

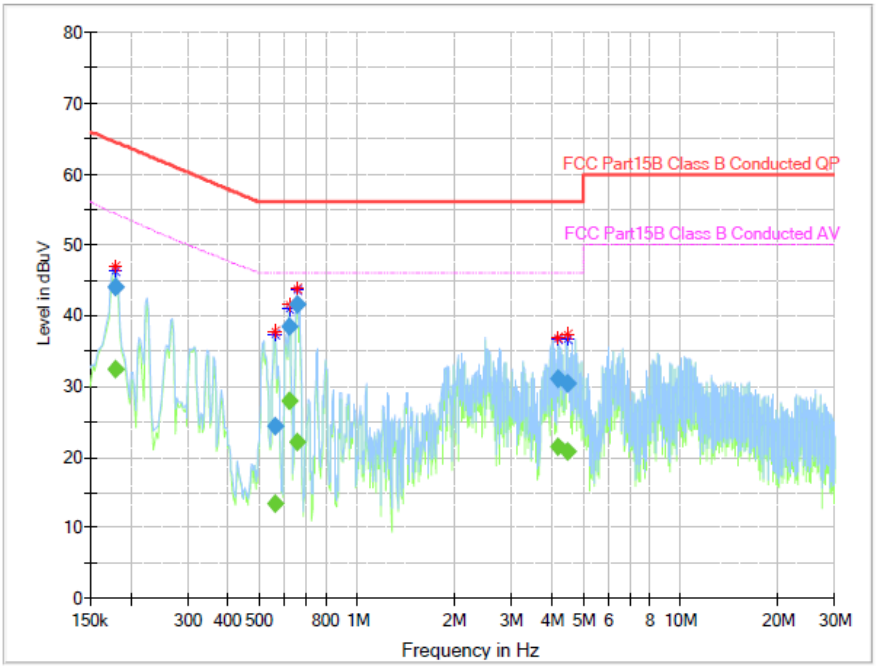
**Plot 7-52. Line Conducted Plot (L1) – CH 5**




## Final_Result

| Frequency (MHz) | Quasi Peak (dBuV) | Average (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.549990 | --- | 25.45 | 46.00 | 20.55 | 1000.0 | 9.000 | N | 9.9 |
| 0.549990 | 42.75 | --- | 56.00 | 13.25 | 1000.0 | 9.000 | N | 9.9 |
| 0.624615 | --- | 21.48 | 46.00 | 24.52 | 1000.0 | 9.000 | N | 9.9 |
| 0.624615 | 38.04 | --- | 56.00 | 17.96 | 1000.0 | 9.000 | N | 9.9 |
| 0.660435 | --- | 24.18 | 46.00 | 21.82 | 1000.0 | 9.000 | N | 9.9 |
| 0.660435 | 39.80 | --- | 56.00 | 16.20 | 1000.0 | 9.000 | N | 9.9 |
| 3.905130 | --- | 19.83 | 46.00 | 26.17 | 1000.0 | 9.000 | N | 9.9 |
| 3.905130 | 29.87 | --- | 56.00 | 26.13 | 1000.0 | 9.000 | N | 9.9 |
| 3.943935 | --- | 18.89 | 46.00 | 27.11 | 1000.0 | 9.000 | N | 9.9 |
| 3.943935 | 28.98 | --- | 56.00 | 27.02 | 1000.0 | 9.000 | N | 9.9 |
| 4.090200 | --- | 21.25 | 46.00 | 24.75 | 1000.0 | 9.000 | N | 9.9 |
| 4.090200 | 32.30 | --- | 56.00 | 23.70 | 1000.0 | 9.000 | N | 9.9 |

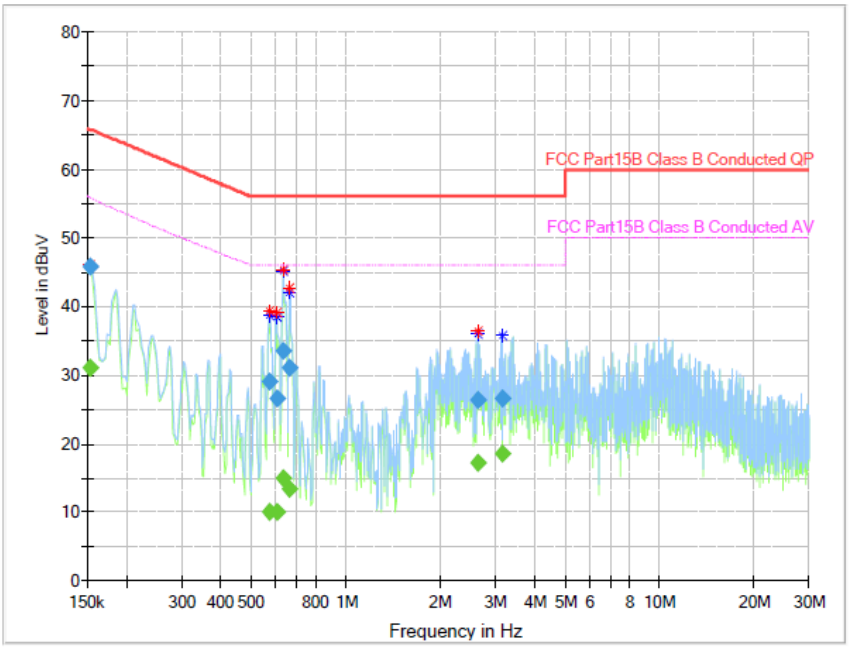
**Plot 7-53. Line Conducted Plot (N) – CH 5**




## Final_Result

| Frequency (MHz) | Quasi Peak (dBuV) | Average (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.179850 | --- | 32.48 | 54.36 | 21.89 | 1000.0 | 9.000 | L1 | 10.0 |
| 0.179850 | 44.02 | --- | 64.49 | 20.47 | 1000.0 | 9.000 | L1 | 10.0 |
| 0.558945 | --- | 13.37 | 46.00 | 32.63 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.558945 | 24.45 | --- | 56.00 | 31.55 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.618645 | --- | 27.98 | 46.00 | 18.02 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.618645 | 38.37 | --- | 56.00 | 17.63 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.654465 | --- | 22.18 | 46.00 | 23.82 | 1000.0 | 9.000 | L1 | 9.9 |
| 0.654465 | 41.50 | --- | 56.00 | 14.50 | 1000.0 | 9.000 | L1 | 9.9 |
| 4.206615 | --- | 21.43 | 46.00 | 24.57 | 1000.0 | 9.000 | L1 | 9.9 |
| 4.206615 | 31.12 | --- | 56.00 | 24.88 | 1000.0 | 9.000 | L1 | 9.9 |
| 4.469295 | --- | 20.70 | 46.00 | 25.30 | 1000.0 | 9.000 | L1 | 9.9 |
| 4.469295 | 30.44 | --- | 56.00 | 25.56 | 1000.0 | 9.000 | L1 | 9.9 |

**Plot 7-54. Line Conducted Plot (L1) – CH 9**




## Final_Result

| Frequency (MHz) | Quasi Peak (dBuV) | Average (dBuV) | Limit (dBuV) | Margin (dB) | Meas. Time (ms) | Bandwidth (kHz) | Line | Corr. (dB) |
|---|---|---|---|---|---|---|---|---|
| 0.152985 | --- | 31.16 | 55.82 | 24.66 | 1000.0 | 9.000 | N | 9.8 |
| 0.152985 | 45.74 | --- | 65.84 | 20.10 | 1000.0 | 9.000 | N | 9.8 |
| 0.573870 | --- | 10.05 | 46.00 | 35.95 | 1000.0 | 9.000 | N | 9.9 |
| 0.573870 | 29.03 | --- | 56.00 | 26.97 | 1000.0 | 9.000 | N | 9.9 |
| 0.603720 | --- | 10.05 | 46.00 | 35.95 | 1000.0 | 9.000 | N | 9.9 |
| 0.603720 | 26.64 | --- | 56.00 | 29.36 | 1000.0 | 9.000 | N | 9.9 |
| 0.633570 | --- | 14.91 | 46.00 | 31.09 | 1000.0 | 9.000 | N | 9.9 |
| 0.633570 | 33.54 | --- | 56.00 | 22.46 | 1000.0 | 9.000 | N | 9.9 |
| 0.663420 | --- | 13.48 | 46.00 | 32.52 | 1000.0 | 9.000 | N | 9.9 |
| 0.663420 | 31.09 | --- | 56.00 | 24.91 | 1000.0 | 9.000 | N | 9.9 |
| 2.645460 | --- | 17.22 | 46.00 | 28.78 | 1000.0 | 9.000 | N | 9.8 |
| 2.645460 | 26.34 | --- | 56.00 | 29.66 | 1000.0 | 9.000 | N | 9.8 |
| 3.146940 | --- | 18.59 | 46.00 | 27.41 | 1000.0 | 9.000 | N | 9.8 |
| 3.146940 | 26.55 | --- | 56.00 | 29.45 | 1000.0 | 9.000 | N | 9.8 |

**Plot 7-55. Line Conducted Plot (N) – CH 9**

# 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMS928U** has been tested to comply with the requirements specified in §15.519 and §15.521 of the FCC rules.