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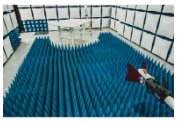

MEASUREMENT REPORT
FCC Part 15F ULTRA WIDEBAND

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

Date of Testing:
6/21 – 7/1/2021
Test Site/Location:
PCTEST Lab. Yongin-Si, Gyeonggi-do, South Korea
Test Report Serial No.:
1M2106280075-07.A3L

FCC ID:	**A3LSMF926B**
APPLICANT:	**Samsung Electronics Co., Ltd.**

Application Type:	Class II Permissive Change
Model:	SM-F926B
Additional Models:	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
Class II Permissive Change:	Please see FCC change document
Original Grant Date:	7/15/2021

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

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Prepared by

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 PCTEST Test Location

These measurement tests were conducted at the PCTEST facility located at 13, Heungdeok 1-ro, Giheung-gu, Yongin-si, Gyeonggi-do, 16954, South Korea. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST located in Yongin-si, Gyeonggi-do, 16954, South Korea.

- PCTEST is an ISO 17025-2017 accredited test facility under the National Voluntary Laboratory Accreditation Program (NVLAP) with Certificate number 600143-0 for Specific Absorption Rate (SAR), where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (26168) test laboratory with the site description on file with ISED.

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.: 1368M

2.2 Device Capabilities

This device contains the following capabilities:

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

2.3 Test Configuration

The EUT was tested per the guidance of Section 10 of ANSI C63.10-2013. The EUT setup procedures of ANSI C63.10-203 were used to reference the appropriate EUT setup for radiated spurious emissions testing and AC line conducted testing. See Section 3.2 for AC line conducted emissions test setups, 3.3 for radiated emissions test setups.

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

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

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

2.4 EMI Suppression Device(s)/Modifications

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

2.5 Antenna Description

Following antenna was used for the testing.

Frequency [GHz]	Antenna 1 Gain [dBi]	Antenna 2 Gain [dBi]
6.5	-5.45	-6.62
8.0	-3.55	-3.84

Table 2-1. Maximum Peak Antenna Gain

2.6 Software and Firmware

The test was conducted with firmware version F926USQU0AUCE 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 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2014. A raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. . An 80cm tall test table made of Styrodur is placed on top of the turn table. For measurements above 1GHz, an additional Styrodur pedestal is placed on top of the test table to bring the total table height to 1.5m.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

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

3.3 Environmental Conditions

The temperature is controlled within range of 15ºC to 35ºC. 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)
Radiated Disturbance (<1GHz)	3.01
Radiated Disturbance (>1GHz)	5.56
Radiated Disturbance (>18GHz)	3.16

6.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Huber+Suhner	SF102/11SK/11SK/1500	RF Cable	N/A			SN 804225/2
Huber+Suhner	SF102/11SK/11SK/2000	RF Cable	N/A			SN 804223/2
Mini-Circuits	BW-N10W5+	Attenuator	6/29/2020	Annual	6/28/2021	1607
Mini-Circuits	BW-N10W5+	Attenuator	6/29/2020	Annual	6/28/2021	1607
NARDA	180-442A-KF	Horn Antenna (Small)	11/20/2020	Biennial	11/19/2020	T058701-03
Rohde & Schwarz	TS-PR1840	Preamplifier	6/29/2020	Annual	6/28/2021	100049
Rohde & Schwarz	FSW43	Signal & Spectrum Analyzer	9/17/2020	Annual	9/16/2021	101250
Rohde & Schwarz	TS-SFUNIT-Rx	Shielded Filter Unit	2/19/2021	Annual	2/18/2022	102131
Schwarzbeck	VULB9162	Broadband TRILOG Antenna	7/9/2019	Biennial	7/8/2021	9162-217
Sunol Sciences	DRH-118	Horn Antenna	8/9/2019	Biennial	8/8/2021	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: A3LSMF926B

FCC Classification: Ultra-Wideband (UWB)

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

Table 7-1. Summary of Test Results

7.2 Peak Power and Maximum Average Emissions

§15.519(e), §15.519(c)

Test Overview and Limit

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

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

Frequency in MHz	EIRP in dBm
3100 - 10600	-41.3

Test Procedures Used

ANSI C63.10-2013

Test Settings

Peak:

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

Average:

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

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	6.7410	-2.99	0	-2.99
	9	SP0	9	V	7.9867	-1.73	0	-1.73
2	5	SP0	9	H	6.5026	-3.71	0	-3.71
	9	SP0	10	V	7.9942	-1.59	0	-1.59

Table 7-2. BPRF Highest Peak Power Results

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

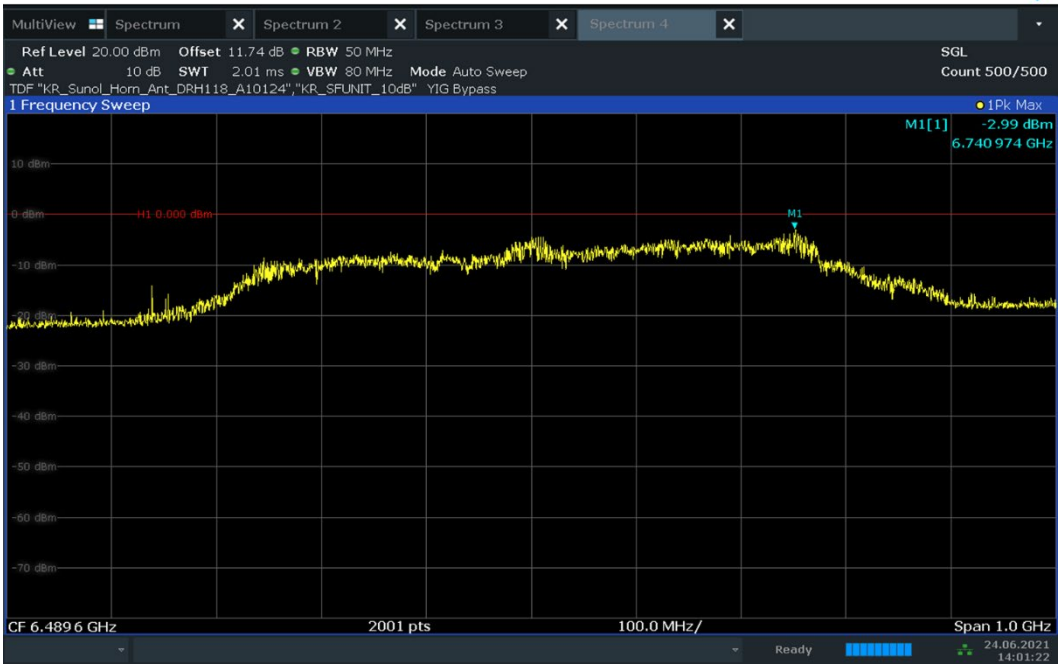
Table 7-3. BPRF Highest Average Power Results

Sample Calculation:

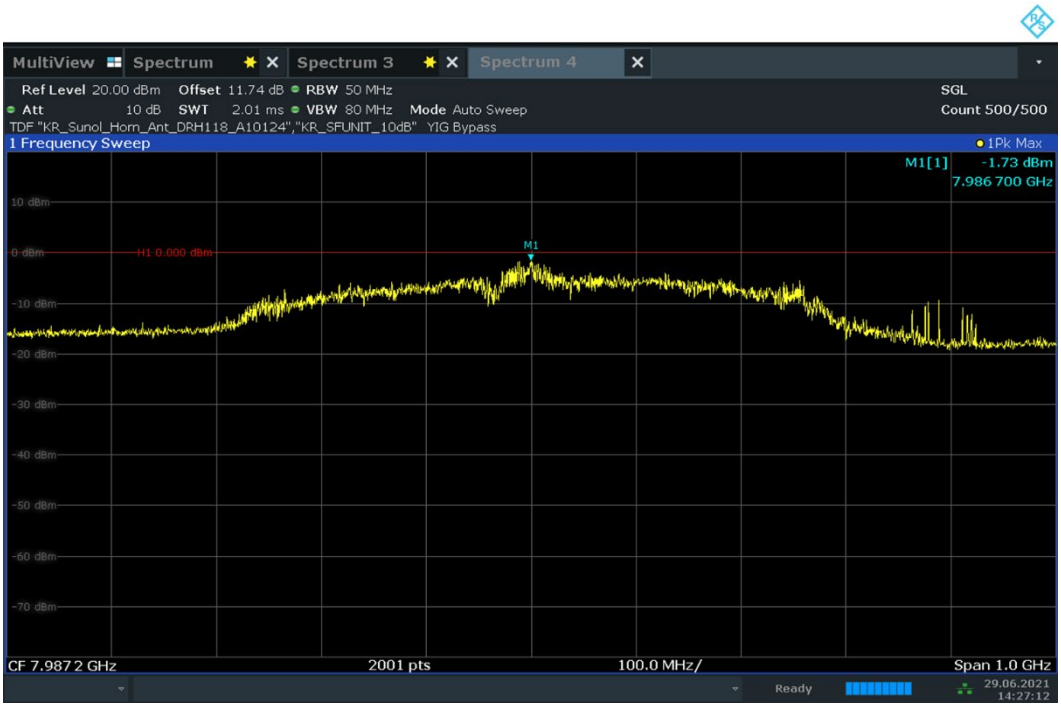
The raw radiated spurious level is converted to field strength in dBuV/m. Then, the EIRP level is calculated by applying the additional factors shown below for a test distance of 3 meter

.

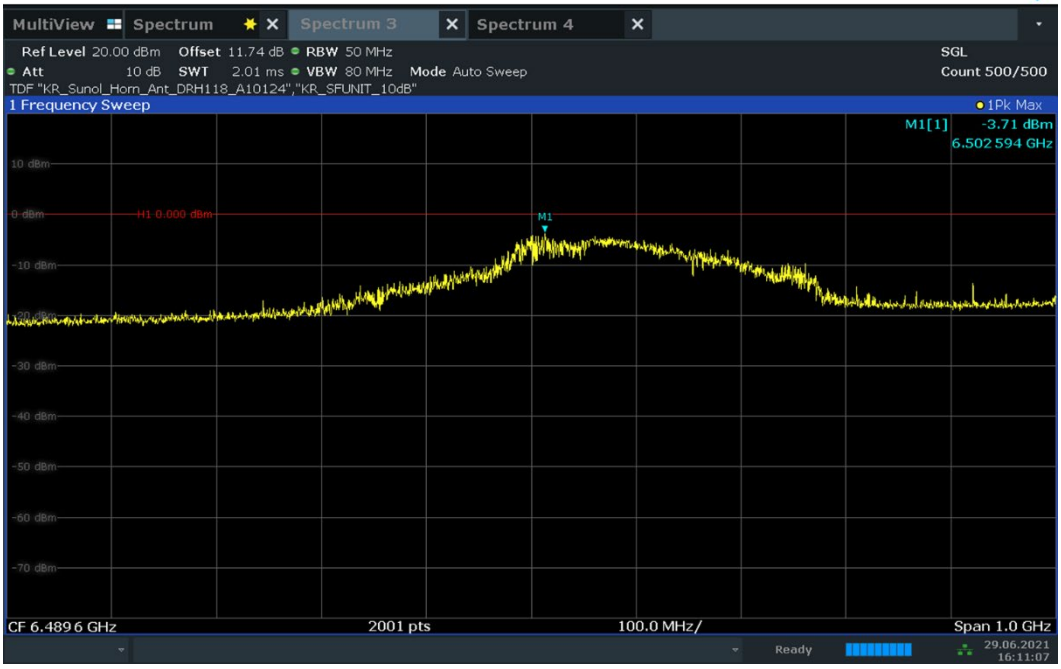
RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8



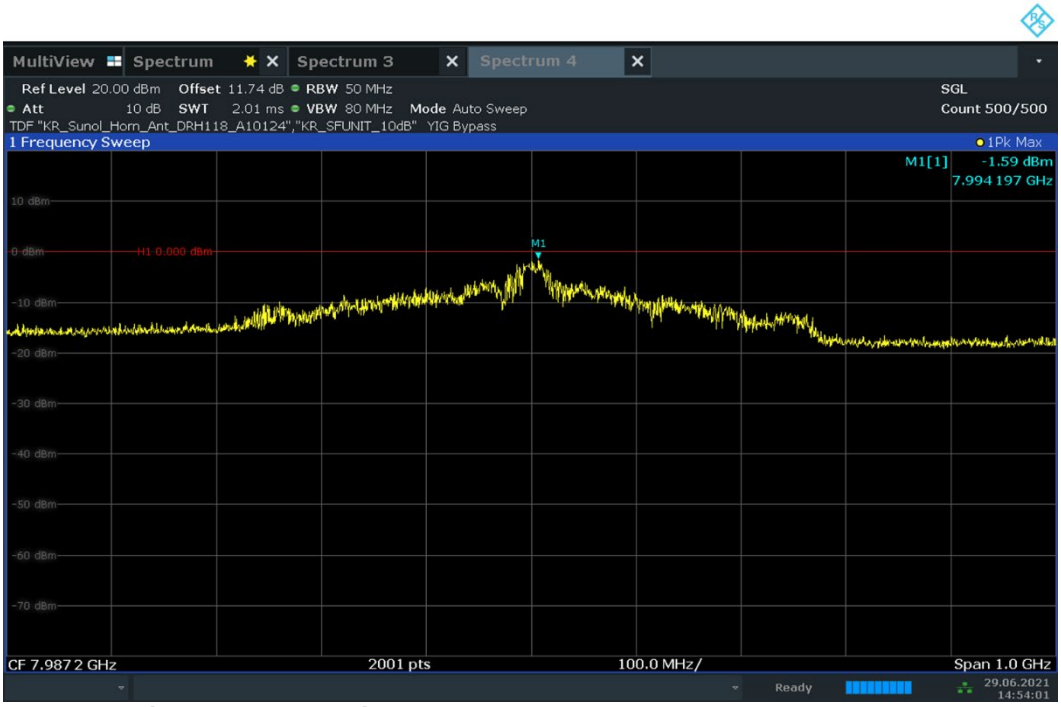
Plot 7-1. UWB Peak Power Measurement - ANT 1 - CH.5 – BPRF



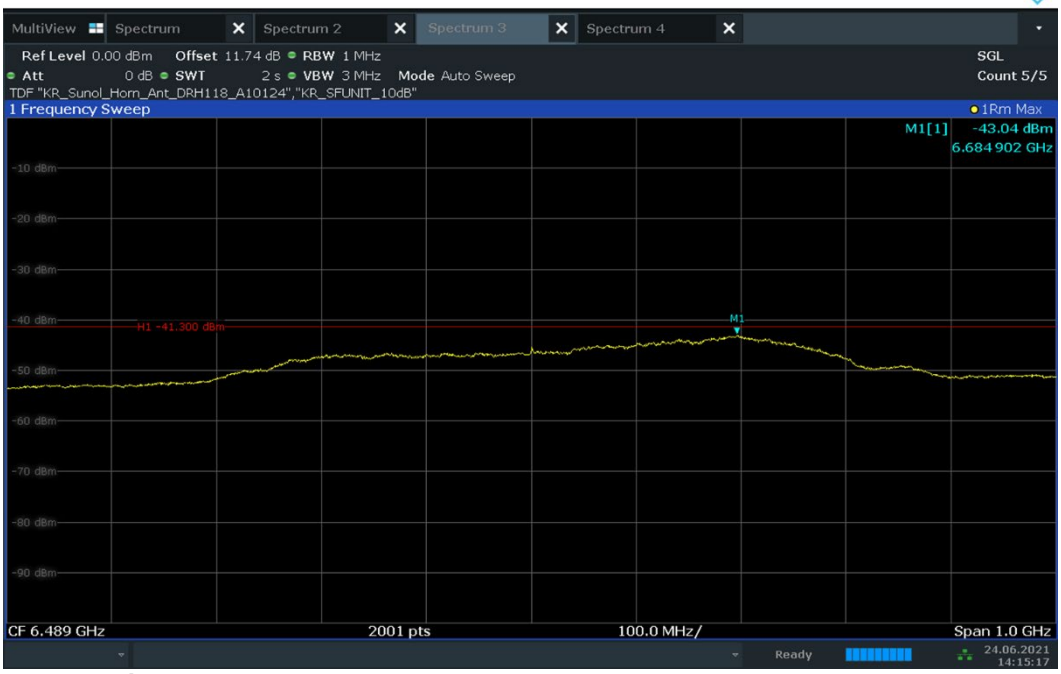
Plot 7-2. UWB Peak Power Measurement - ANT 1 - CH.9 – BPRF



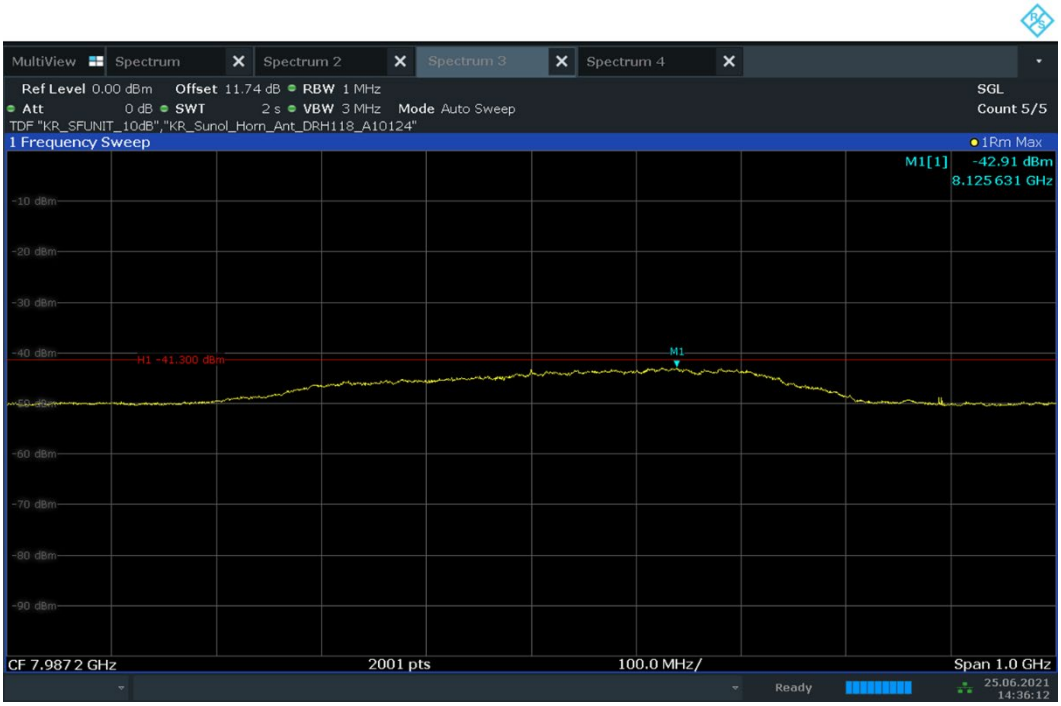
Plot 7-3. UWB Peak Power Measurement - ANT 2 - CH.5 – BPRF



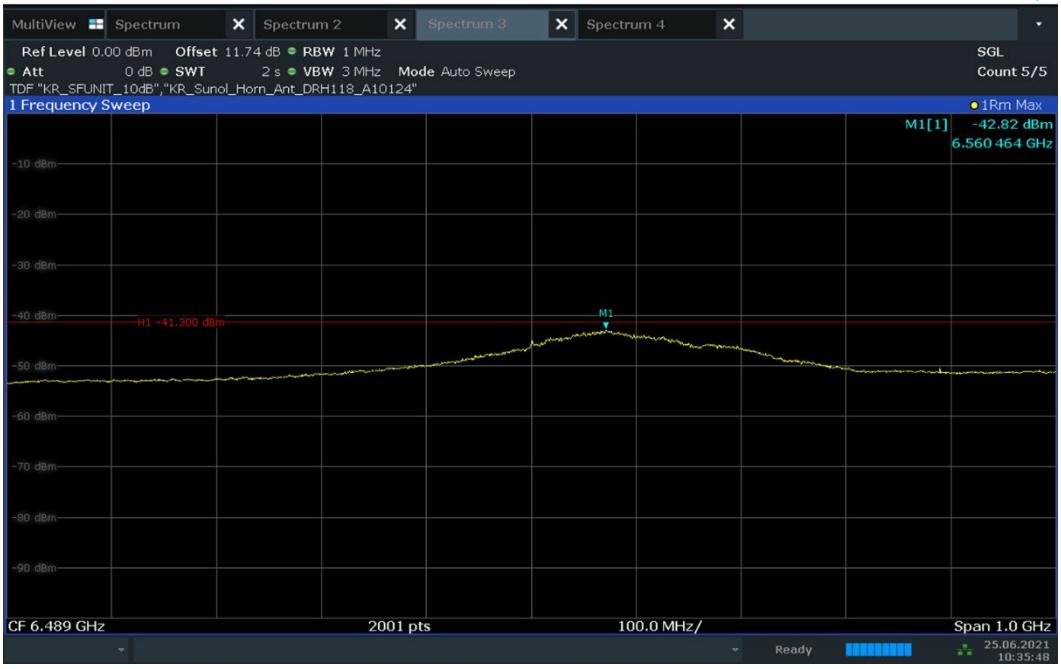
Plot 7-4. UWB Peak Power Measurement - ANT 2 - CH.9 – BPRF



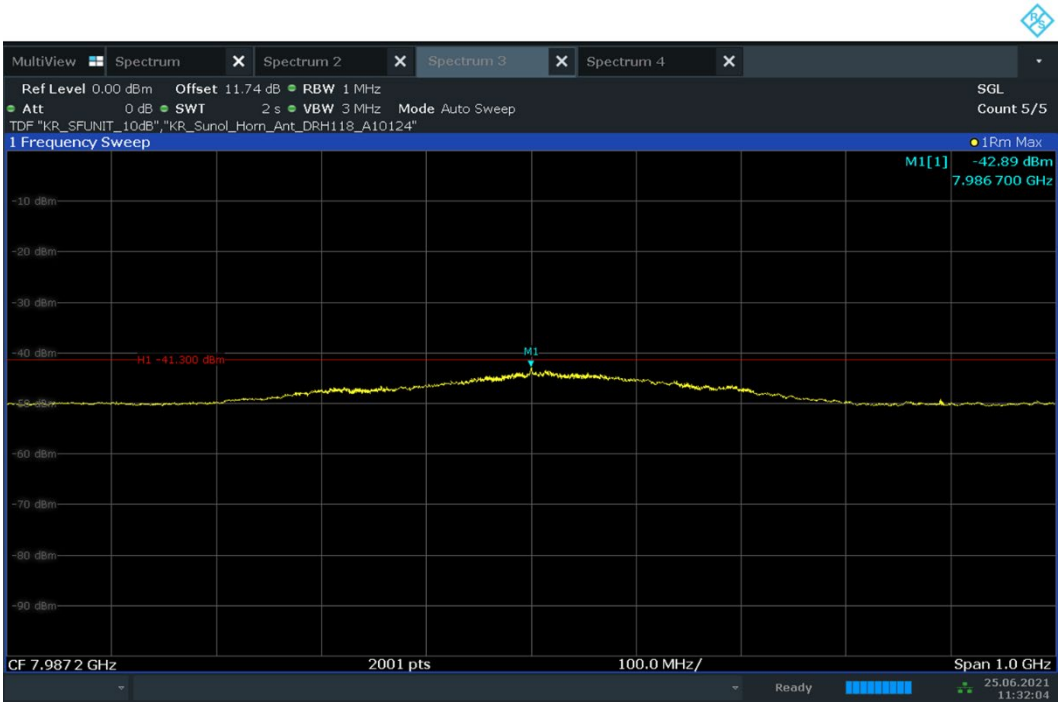
Plot 7-5. UWB Average Power Measurement - ANT 1 - CH.5 – BPRF



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



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



Plot 7-8. UWB Average Power Measurement - ANT 2 - CH.9 – BPRF

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	6.6130	-7.11	0	-7.11
	9	SP0	27	V	7.9857	-5.64	0	-5.64
2	5	SP0	27	H	6.6080	-7.28	0	-7.28
	9	SP0	27	H	7.9870	-5.47	0	-5.47

Table 7-4. 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	6.6484	-43.26	-41.3	-1.96
	9	SP3	27	H	8.1671	-43.24	-41.3	-1.94
2	5	SP3	27	H	6.5595	-43.09	-41.3	-1.79
	9	SP0	27	H	7.9872	-43.16	-41.3	-1.86

Table 7-5. HPRF Highest Average Power Results

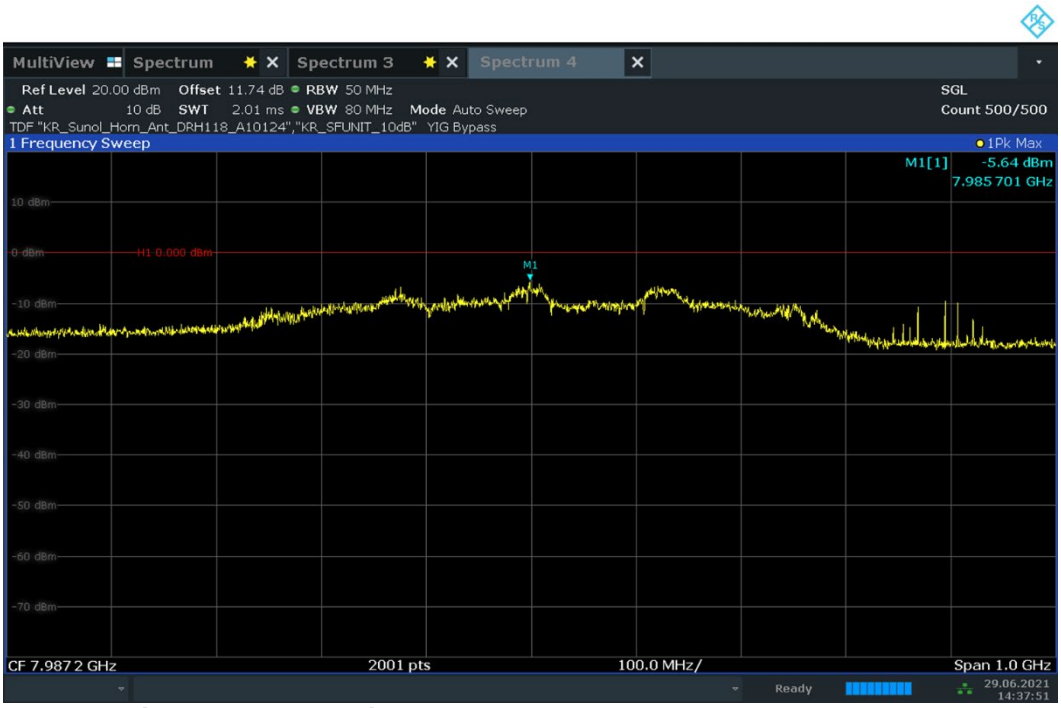
Sample Calculation

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

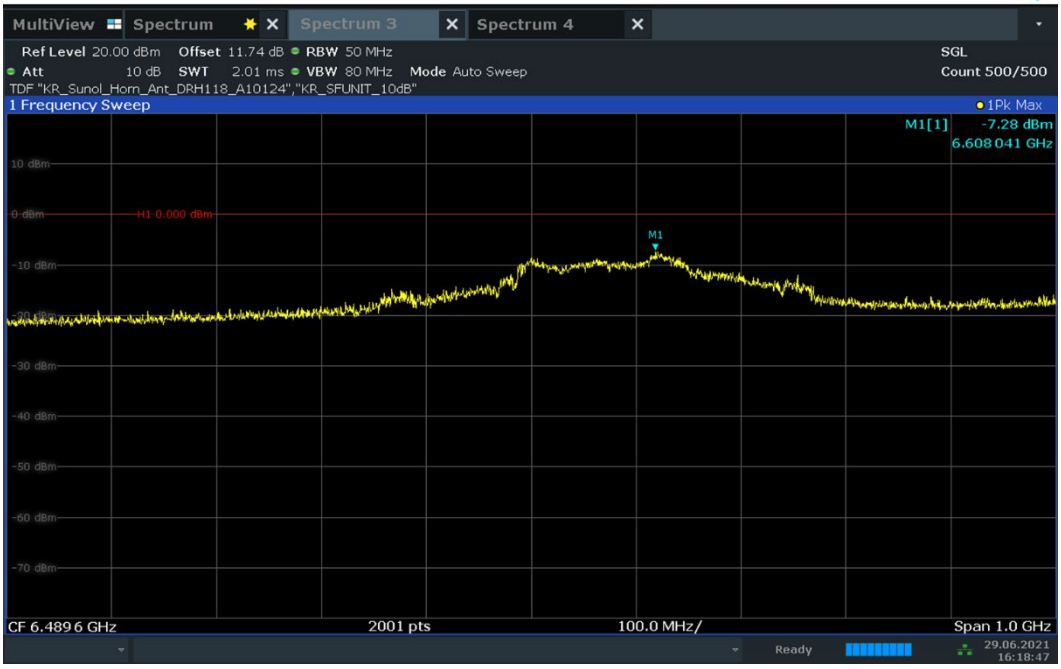
.

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

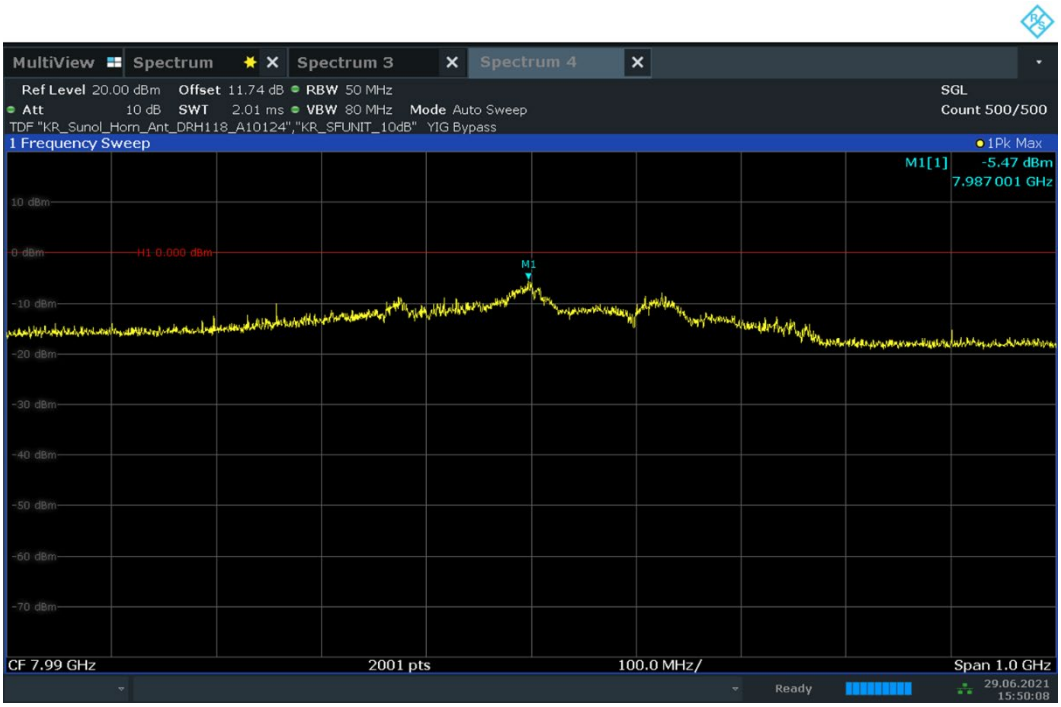
Plot 7-9. UWB Peak Power Measurement - ANT 1 - CH.5 – HPRF



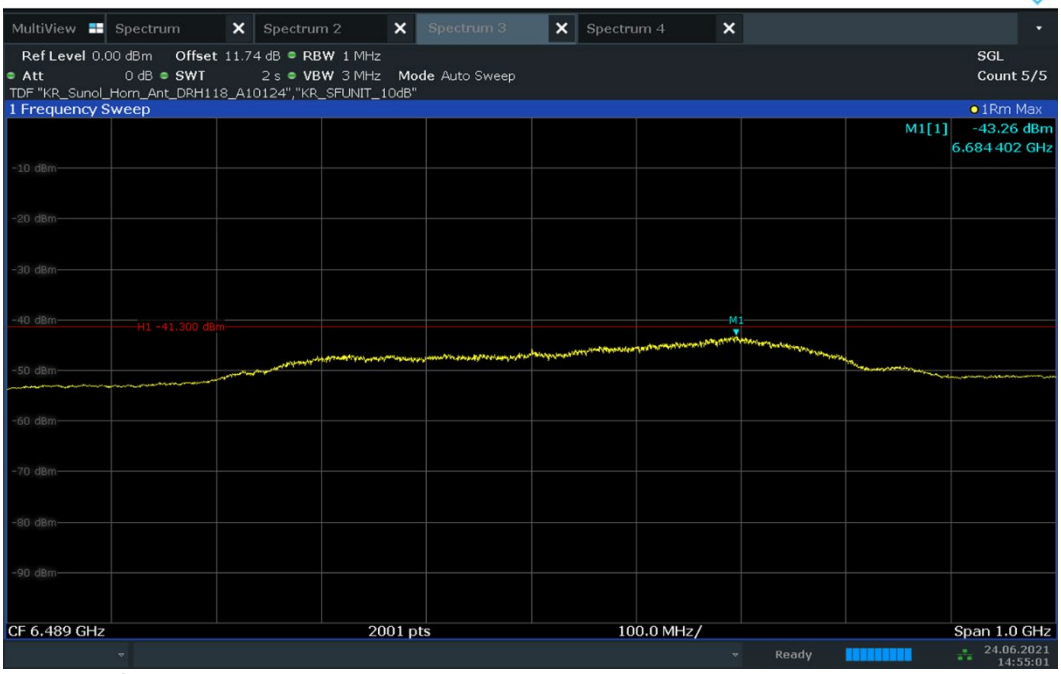
Plot 7-10. UWB Peak Power Measurement - ANT 1 - CH.9 – HPRF



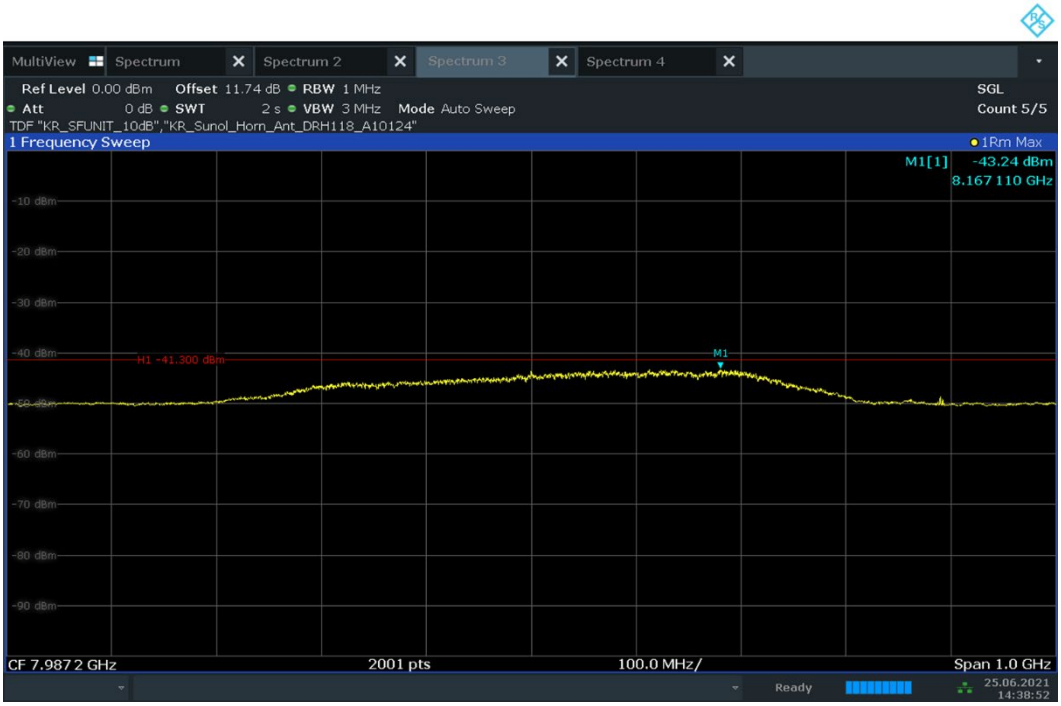
Plot 7-11. UWB Peak Power Measurement - ANT 2 - CH.5 – HPRF



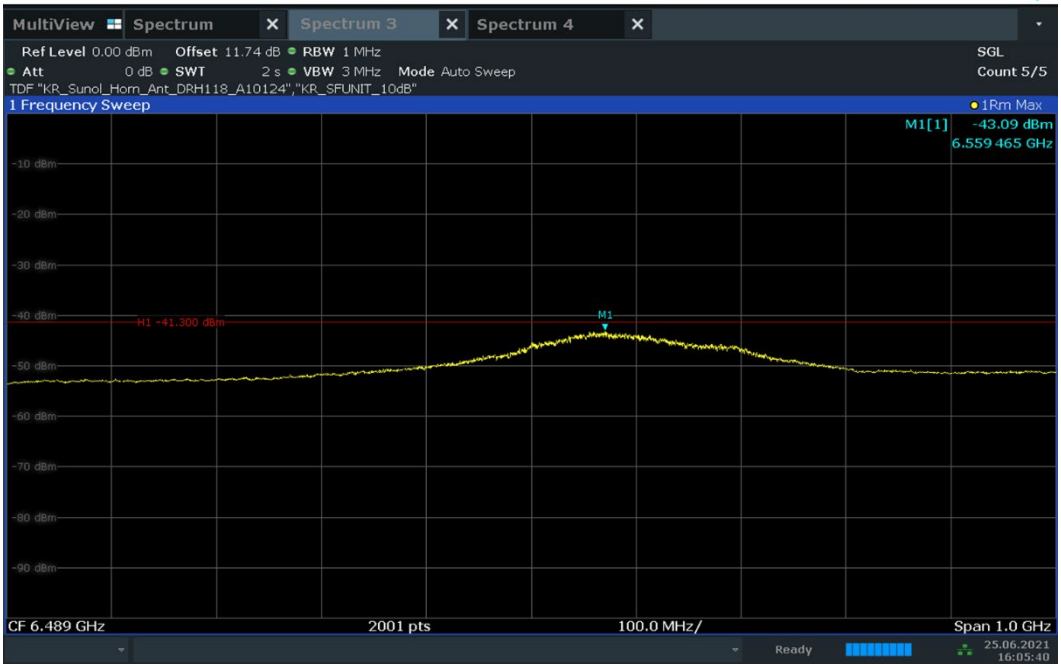
Plot 7-12. UWB Peak Power Measurement - ANT 2 - CH.9 – HPRF



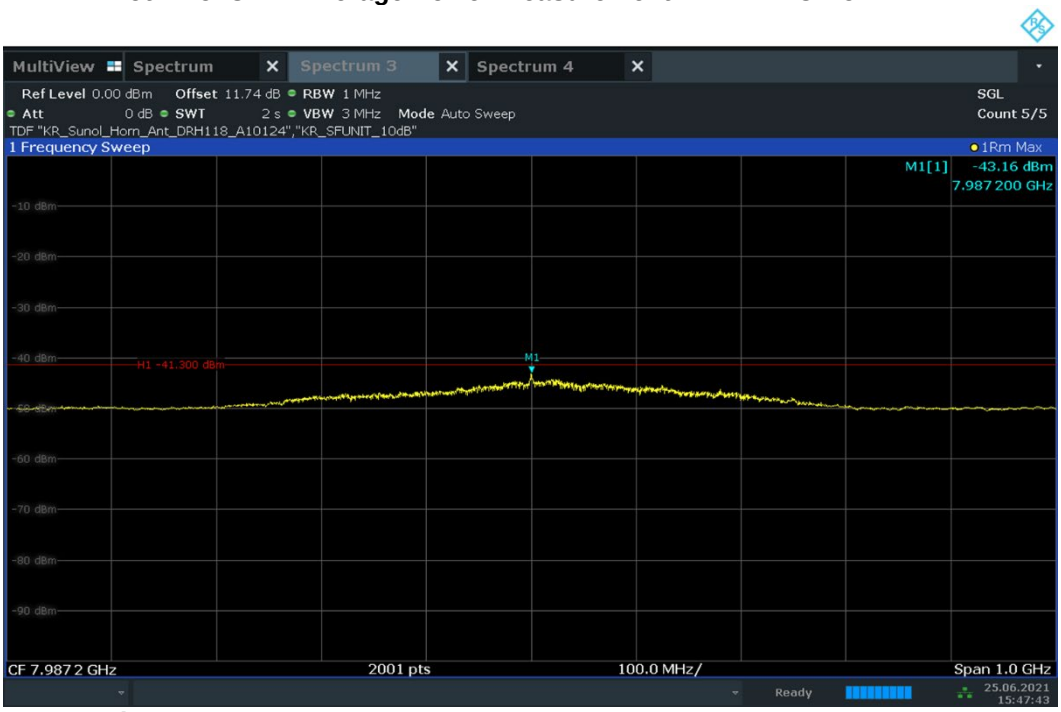
Plot 7-13. UWB Average Power Measurement - ANT 1 - CH.5 – HPRF



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



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



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

7.3 Radiated Measurement Data above 960MHz

§15.519 (c), §15.519(d), §15.209(a)

Test Overview and Limit

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

§15.519(c)

Frequency in MHz	EIRP in dBm
960-1610	-75.3
1610-1990	-63.3
1990-3100	-61.3
3100-10600	-41.3
Above 10600	-61.3

Table 7-6. Above 960MHz Average Limits

§15.519(d)

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

Table 7-7. Above 960MHz Average Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Average EIRP Measurements

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

Test Setup

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

Test Notes

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

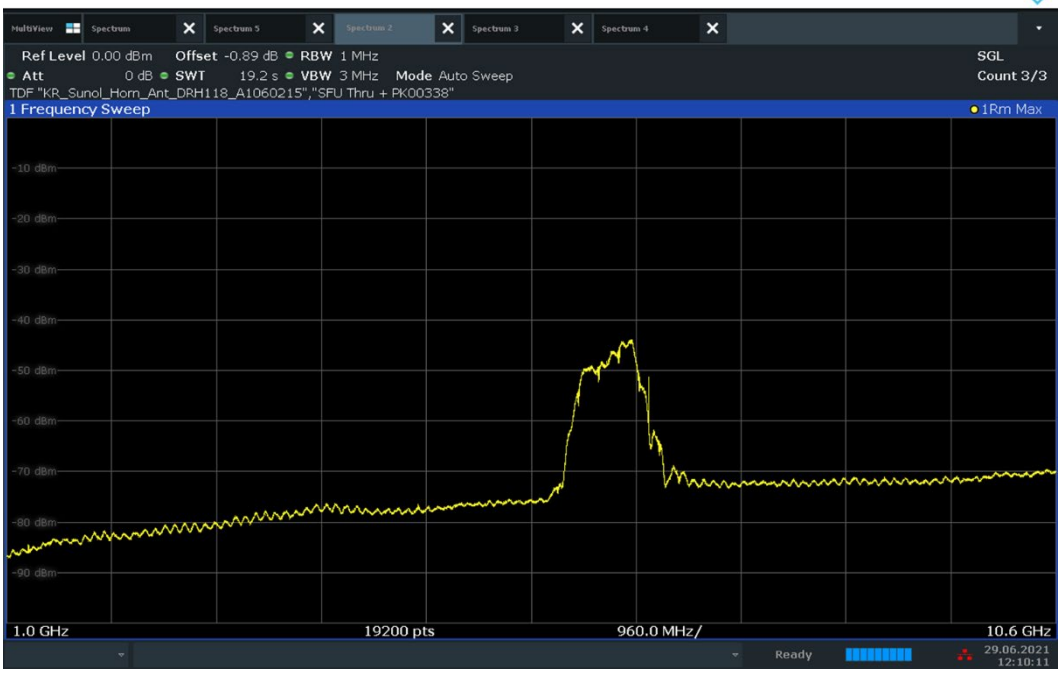
Sample Calculation

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

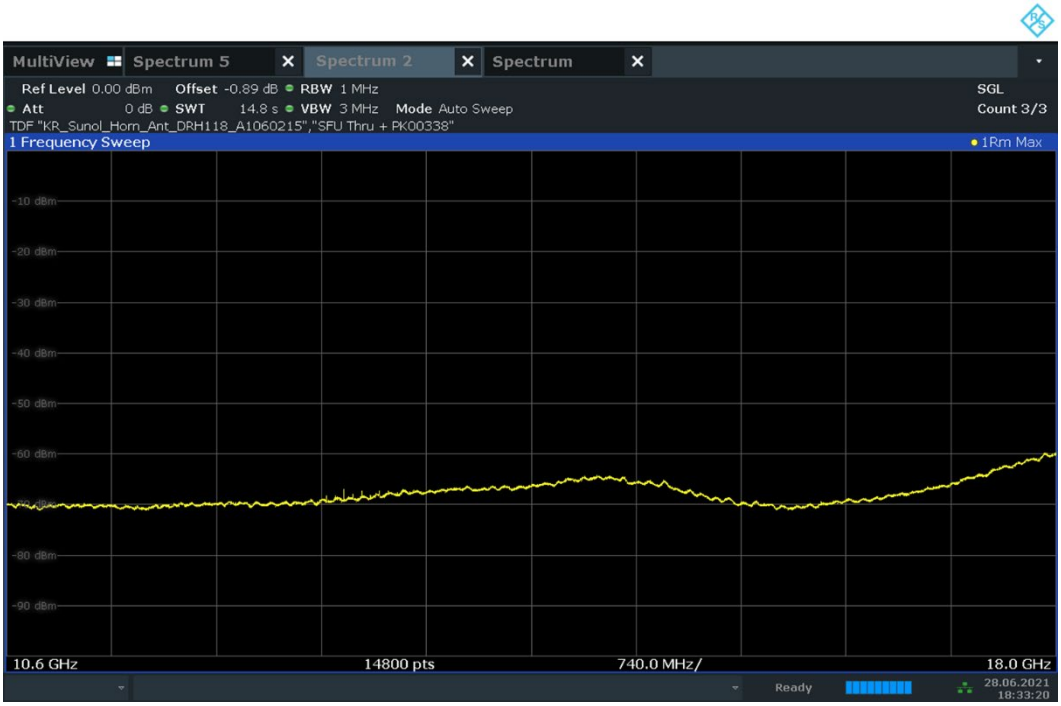
.

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

Channel 5 ANTENNA 1:



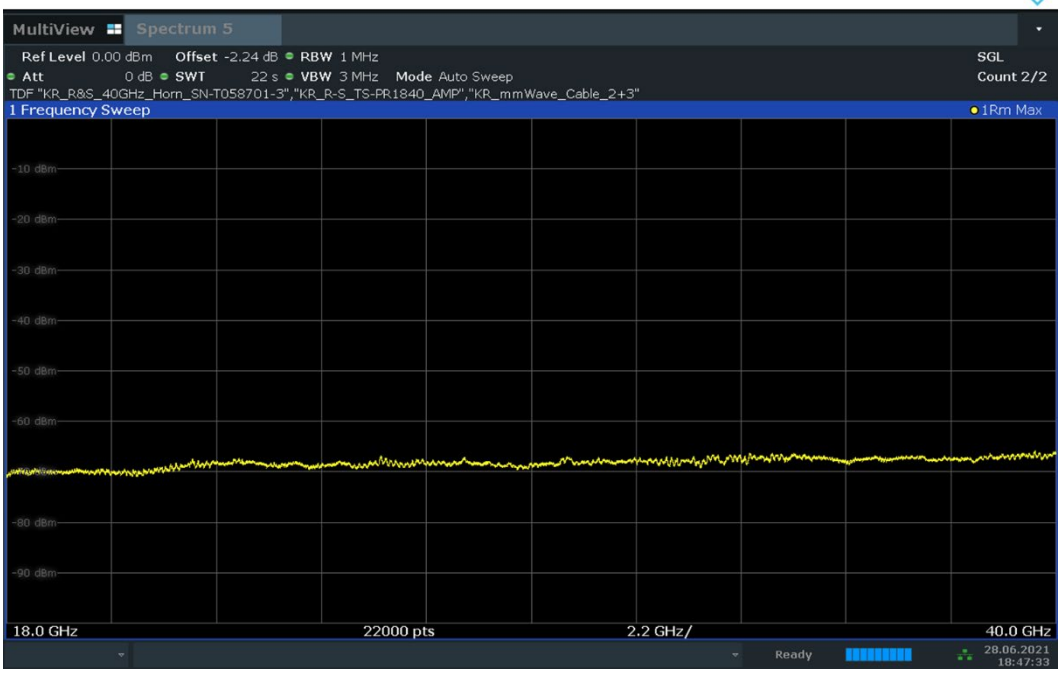
Plot 7-17. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.5 - ANT 1



Plot 7-18. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5 - ANT 1

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

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



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

Channel:	5
Frequency (MHz):	6500
Preamble	11
Config	SP1

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

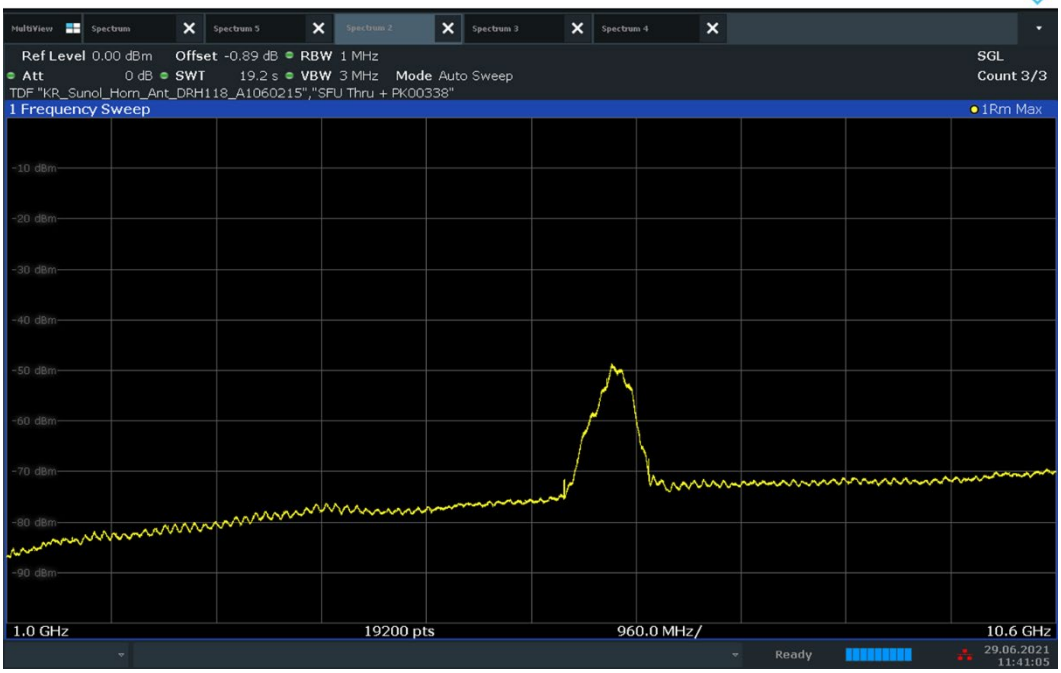
Table 7-8. Radiated Spurious Emissions CH. 5 – ANT1

Channel:	5
Frequency (MHz):	6500
Preamble	11
Config	SP1

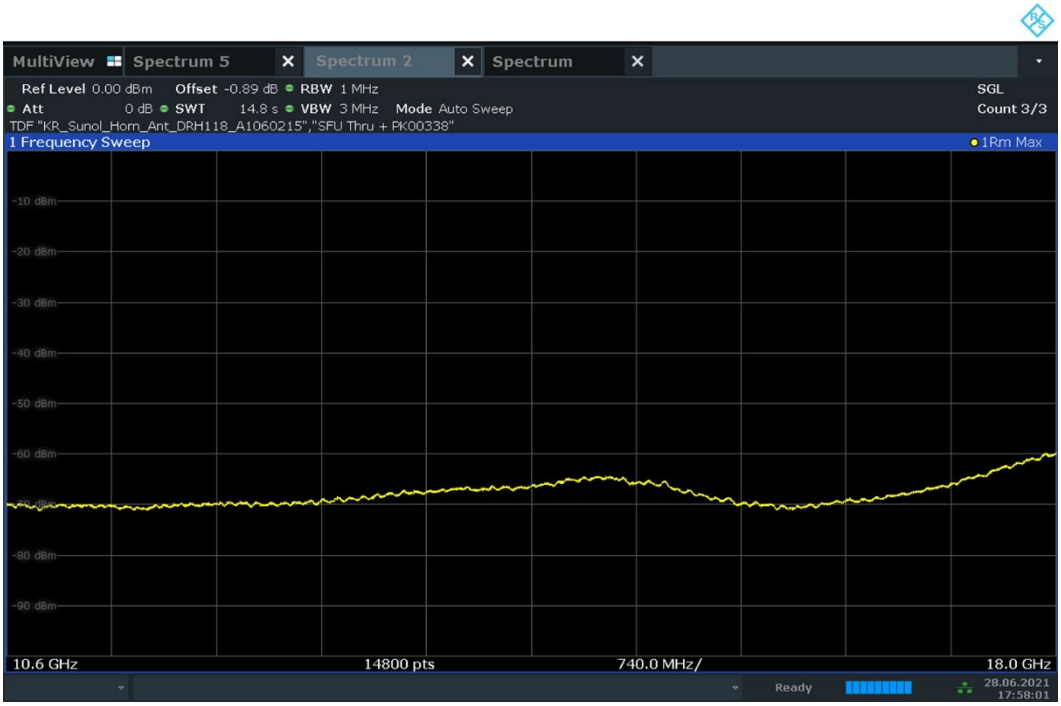
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	307	-80.45	-11.59	-12.64	-92.94	-85.30	-7.64
1226	RMS	V	-	-	-86.44	-11.46	-12.64	-98.80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

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

Channel 5 ANTENNA 2:

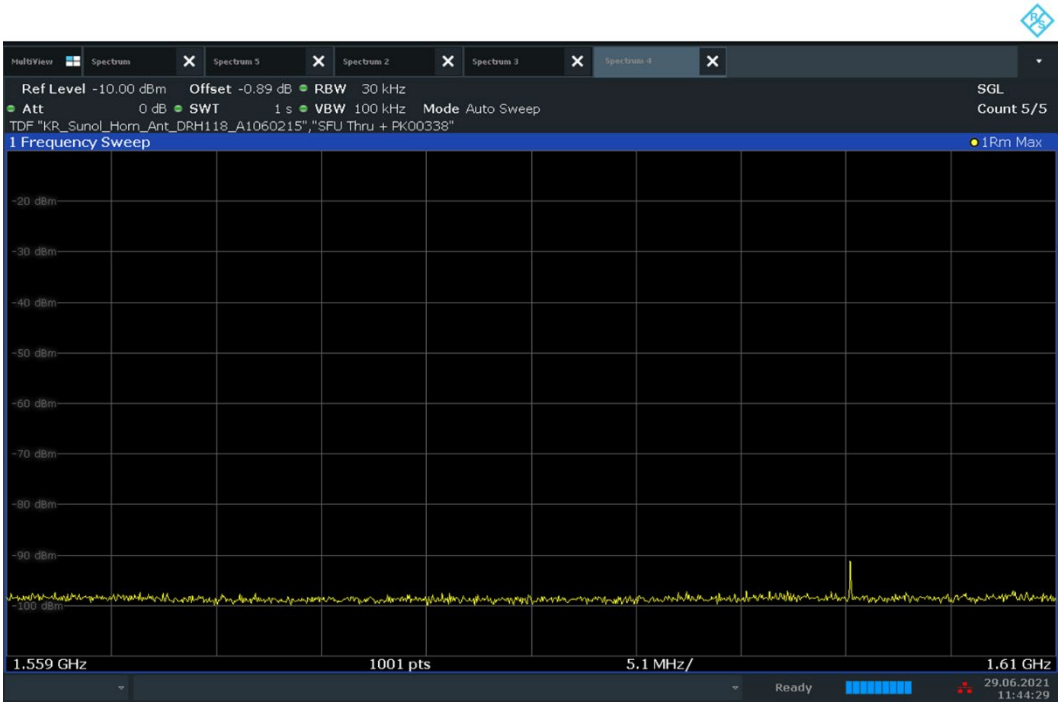


Plot 7-22. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.5 - ANT 2

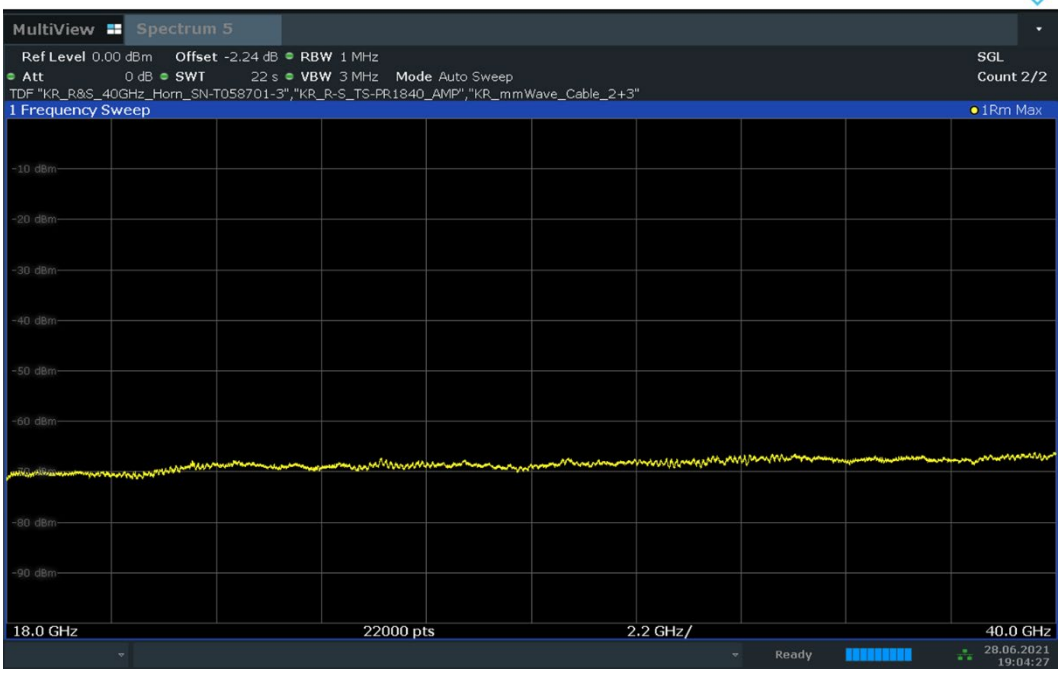


Plot 7-23. Radiated Spurious Pre-Scan 10600 - 18000 MHz - CH.5 - ANT 2

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



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



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

Channel:	5
Frequency (MHz):	6500
Preamble	9
Config	SP3

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1519	RMS	H	-	-	-72.81	-9.51	-12.64	-83.22	-75.30	-7.92
1893	RMS	H	-	-	-72.73	-8.14	-12.64	-81.77	-63.30	-18.47
3095	RMS	H	-	-	-72.95	-5.07	-12.64	-78.92	-61.30	-17.62
10600	RMS	H	-	-	-76.40	7.28	-12.64	-70.02	-41.30	-28.72
12979	RMS	H	-	-	-77.10	8.67	-12.64	-69.33	-61.30	-8.03
39564	RMS	H	-	-	-65.53	1.66	-13.98	-66.10	-61.30	-4.80

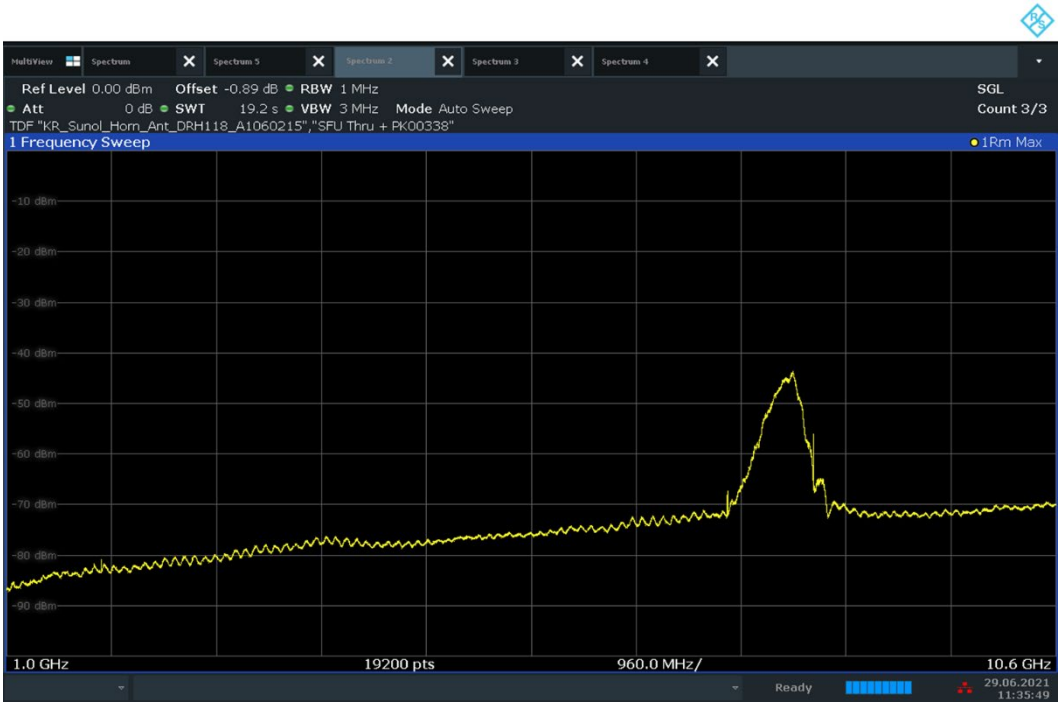
Table 7-10. Radiated Spurious Emissions CH. 5 – ANT2

Channel:	5
Frequency (MHz):	6500
Preamble	9
Config	SP3

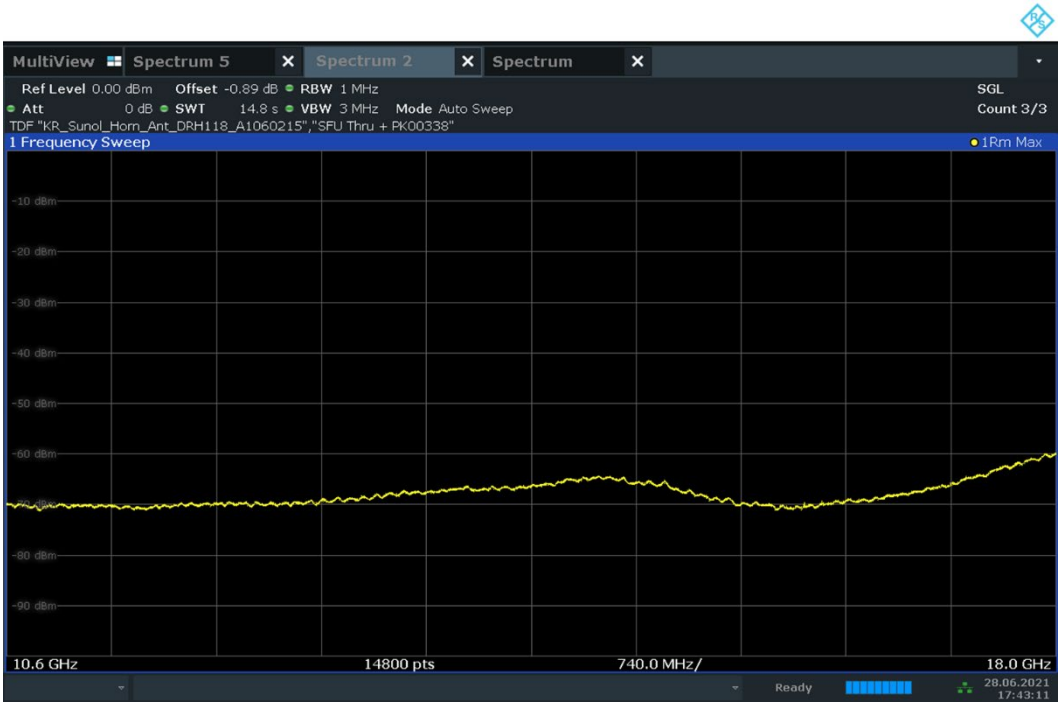
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	16	-82.28	-11.59	-12.64	-94.77	-85.30	-9.47
1237	RMS	V	-	-	-86.26	-11.40	-12.64	-98.56	-85.30	-13.26
1239	RMS	V	-	-	-86.30	-11.38	-12.64	-98.58	-85.30	-13.28
1594	RMS	H	-	-	-86.75	-9.40	-12.64	-97.05	-85.30	-11.75
1600	RMS	H	150	16	-80.91	-9.42	-12.64	-91.23	-85.30	-5.93
1608	RMS	H	-	-	-86.69	-9.48	-12.64	-97.07	-85.30	-11.77

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

Channel 9 ANTENNA 1:



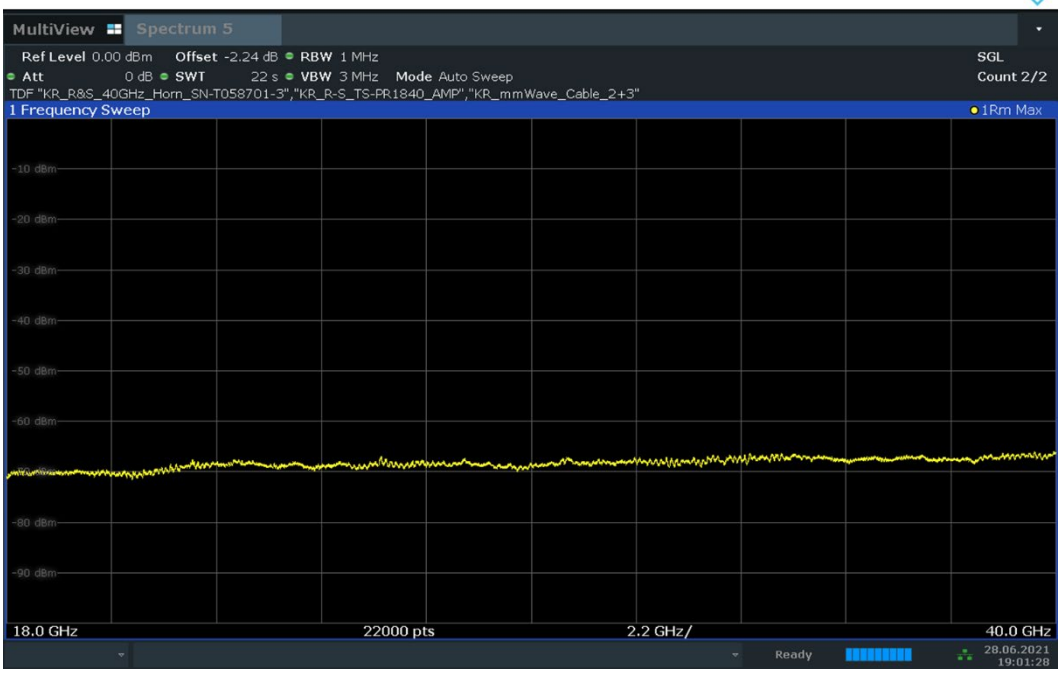
Plot 7-27. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 1



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

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

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



Plot 7-31. Radiated Spurious Pre-Scan 18 – 40 GHz - CH.9 - ANT 1

Channel:	9
Frequency (MHz):	8000
Preamble	12
Config	SP1

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1556	RMS	H	-	-	-73.05	-9.27	-12.64	-83.21	-75.30	-7.91
1867	RMS	H	-	-	-71.75	-8.17	-12.64	-80.82	-63.30	-17.52
3096	RMS	H	-	-	-72.99	-5.06	-12.64	-78.95	-61.30	-17.65
10600	RMS	H	-	-	-76.39	7.28	-12.64	-70.01	-41.30	-28.71
15974	RMS	H	-	-	-75.57	6.74	-12.64	-69.73	-61.30	-8.43
39957	RMS	H	-	-	-65.76	2.03	-13.98	-65.97	-61.30	-4.67

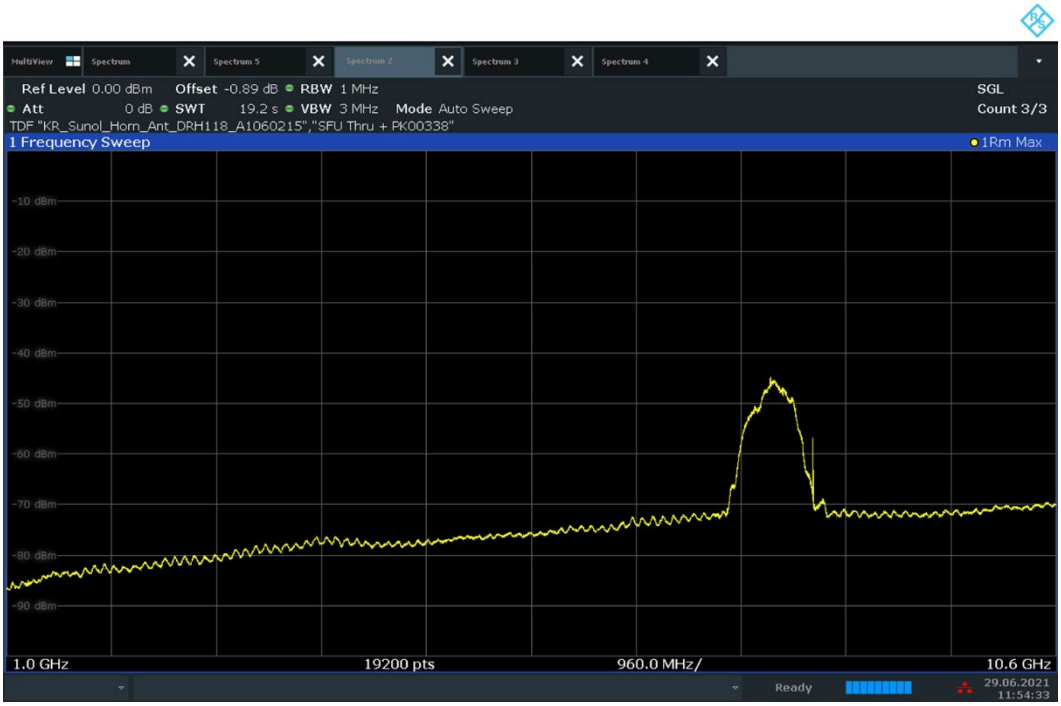
Table 7-12. Radiated Spurious Emissions CH. 9 – ANT1

Channel:	9
Frequency (MHz):	8000
Preamble	12
Config	SP1

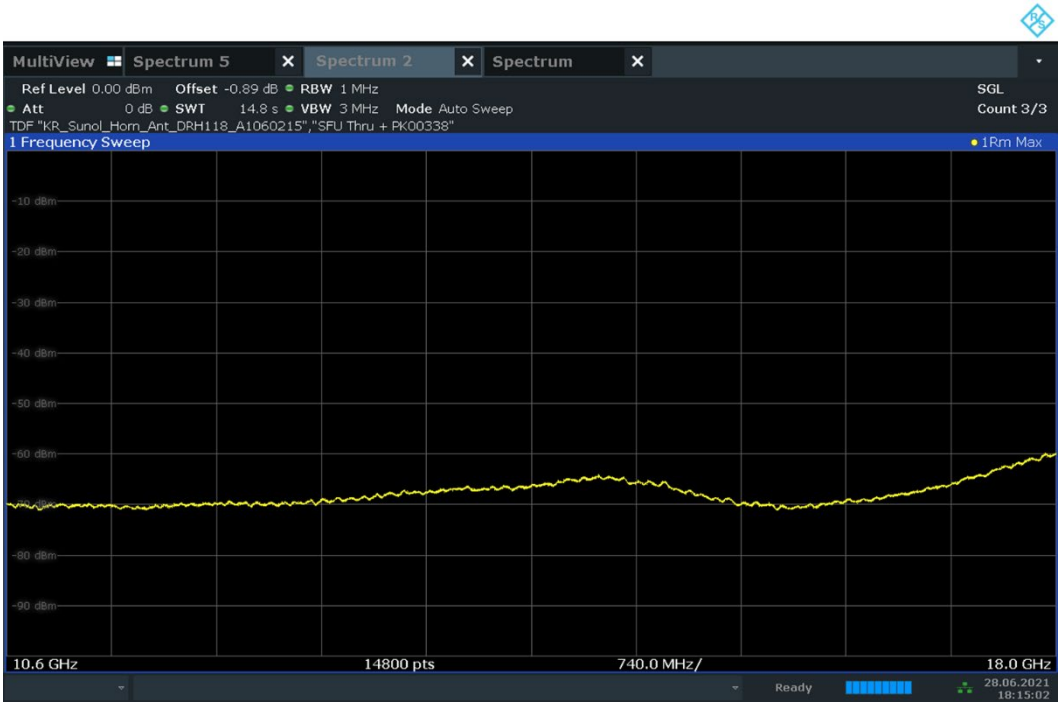
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	62	-82.42	-11.59	-12.64	-94.91	-85.30	-9.61
1229	RMS	V	-	-	-86.54	-11.44	-12.64	-98.88	-85.30	-13.58
1236	RMS	V	-	-	-86.69	-11.40	-12.64	-98.98	-85.30	-13.68
1592	RMS	H	-	-	-86.92	-9.39	-12.64	-97.21	-85.30	-11.91
1600	RMS	H	150	62	-85.12	-9.42	-12.64	-95.44	-85.30	-10.14
1605	RMS	H	-	-	-86.82	-9.46	-12.64	-97.18	-85.30	-11.88

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

Channel 9 ANTENNA 2:



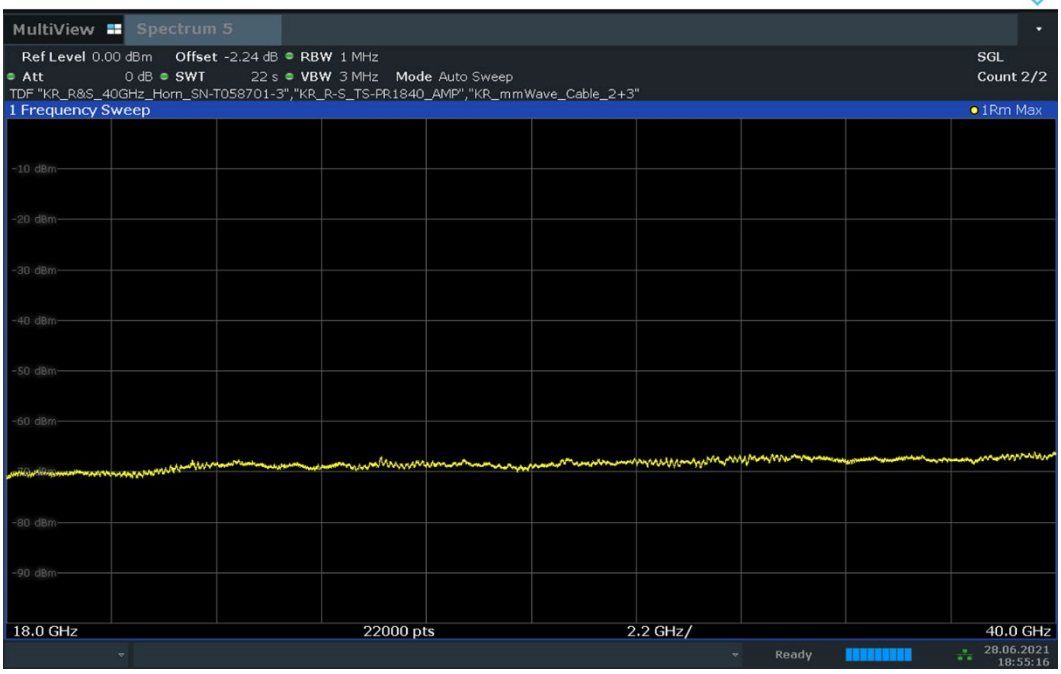
Plot 7-32. Radiated Spurious Pre-Scan 1000 - 10600 MHz - CH.9 - ANT 2



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

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

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



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

Channel:	5
Frequency (MHz):	8000
Preamble	9
Config	SP3

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1556	RMS	V	-	-	-73.02	-9.27	-12.64	-83.19	-75.30	-7.89
1895	RMS	V	-	-	-72.63	-8.13	-12.64	-81.66	-63.30	-18.36
3098	RMS	V	-	-	-72.94	-5.03	-12.64	-78.87	-61.30	-17.57
10600	RMS	V	-	-	-76.39	7.28	-12.64	-70.01	-41.30	-28.71
15974	RMS	V	-	-	-75.50	6.74	-12.64	-69.66	-61.30	-8.36
39959	RMS	V	-	-	-65.82	2.01	-13.98	-66.05	-61.30	-4.75

Table 7-14. Radiated Spurious Emissions CH. 9 – ANT2

Channel:	5
Frequency (MHz):	8000
Preamble	9
Config	SP3

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Dist. Corr. Factor [dB]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1200	RMS	V	150	1	-81.17	-11.59	-12.64	-93.66	-85.30	-8.36
1227	RMS	V	-	-	-86.45	-11.45	-12.64	-98.80	-85.30	-13.50
1238	RMS	V	-	-	-85.68	-11.39	-12.64	-97.97	-85.30	-12.67
1561	RMS	V	-	-	-86.60	-9.27	-12.64	-96.77	-85.30	-11.47
1567	RMS	V	-	-	-87.27	-9.29	-12.64	-97.46	-85.30	-12.16
1600	RMS	V	150	1	-84.12	-9.42	-12.64	-94.44	-85.30	-9.14

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

7.4 Radiated Spurious Emissions Measurements – Below 1GHz

§15.209(a), §15.519(c); RSS-Gen [8.9]

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates and modes were investigated for radiated spurious emissions. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

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

Frequency	Field Strength [μV/m]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 7-16. Radiated Limits

Test Procedures Used

ANSI C63.10-2013

Test Settings

Quasi-Peak Field Strength Measurements

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

Test Setup

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

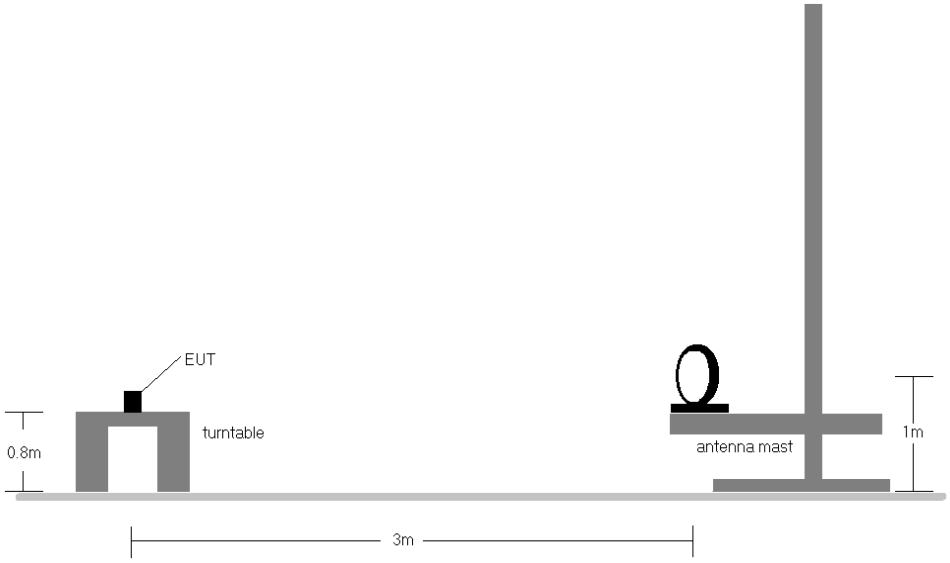


Figure 7-1. Radiated Test Setup < 30Mhz

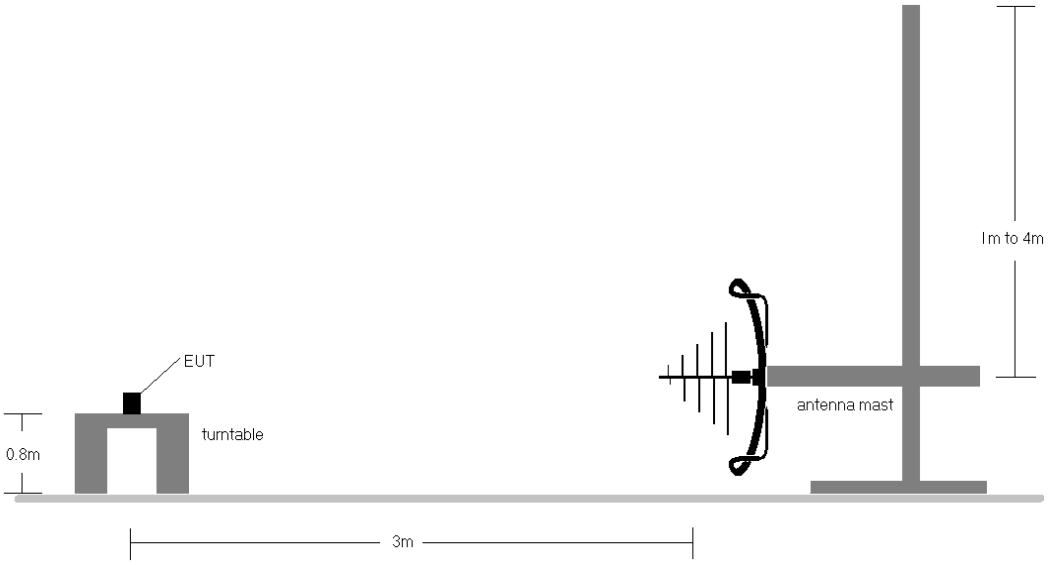
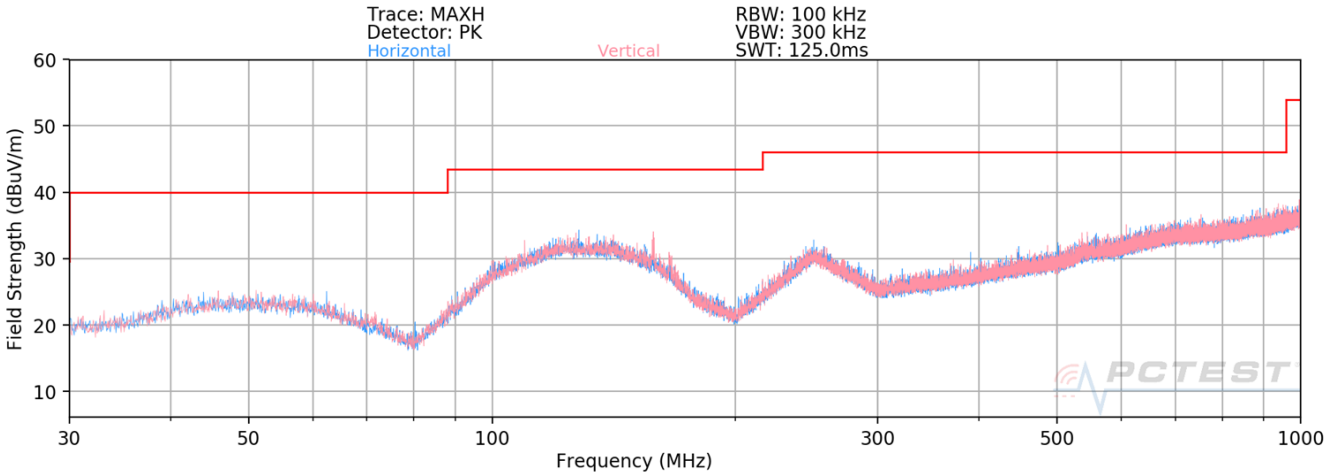


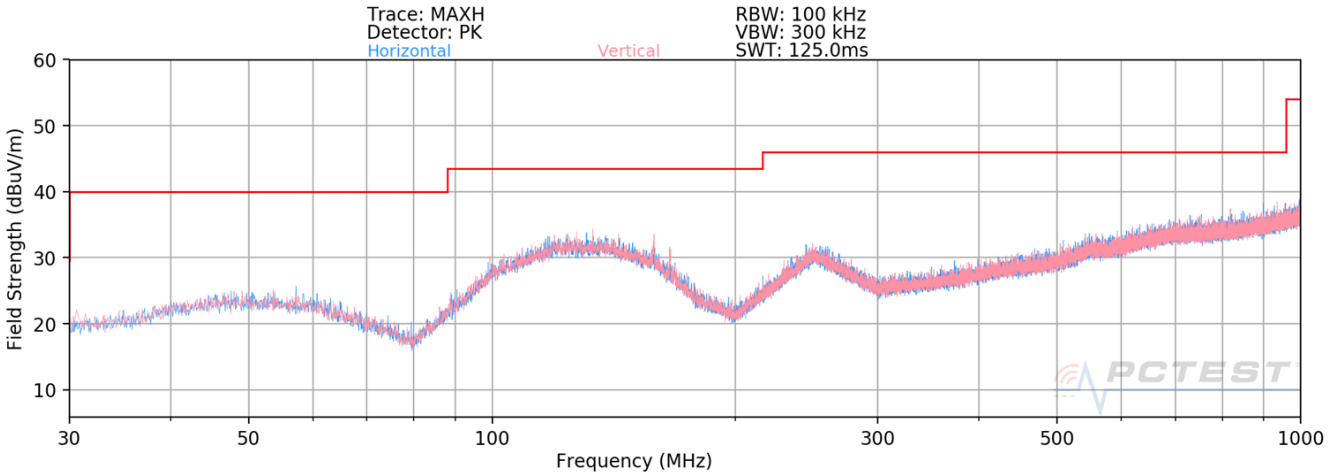
Figure 7-2. Radiated Test Setup < 1GHz

Test Notes

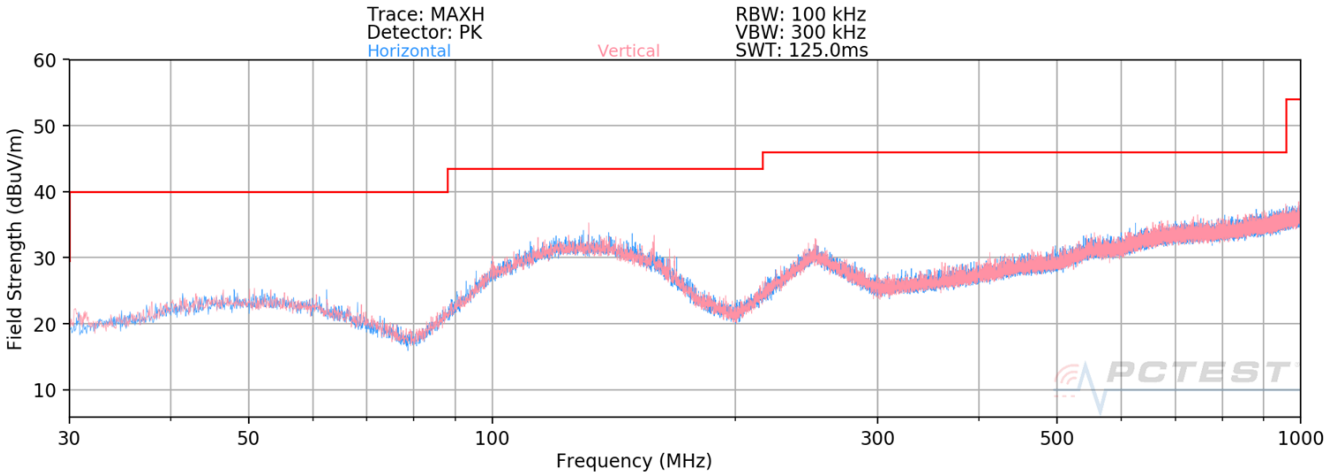
1. All emissions lying in restricted bands specified in §15.205 and RSS-Gen(8.10) are below the limit shown in Table 7-15.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. The spectrum 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.



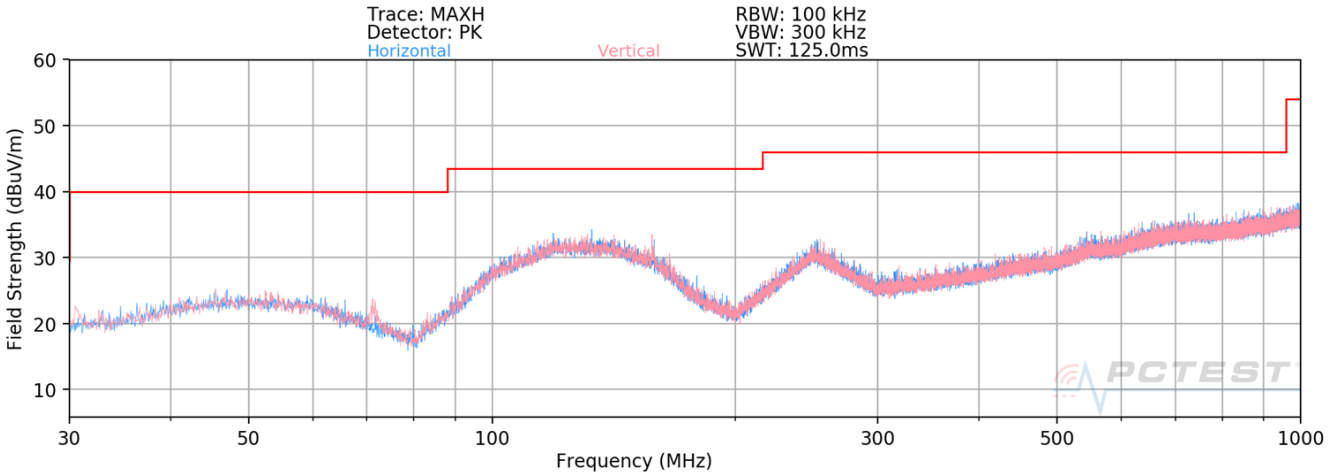
Plot 7-37. 30MHz - 1 GHz Pre-Scan Plots ANT1 – CH 5



Plot 7-38. 30MHz - 1 GHz Pre-Scan Plots ANT1 – CH 9



Plot 7-39. 30MHz - 1 GHz Pre-Scan Plots ANT2 – CH 5



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

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.