

Radio Testing of the

Fortem Technologies, Inc.
Radar Model: R30

In accordance with FCC Title 47 Chapter I Subchapter D Part 90

Fortem Technologies, Inc.
1064 S N County Blvd 6th Floor
Pleasant Grove, UT 84062
USA



America

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Inspire trust.**

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Date: January 2022

Document Number: 72173712B Issue 01 | Version Number: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Authorized Signatory	Xiaoying Zhang	January 03, 2022	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

EXECUTIVE SUMMARY

A sample of this product was tested and found to be in compliance with FCC Title 47 Chapter I Subchapter D Part 90



A2LA Cert. No. 2955.13

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ACCREDITATION

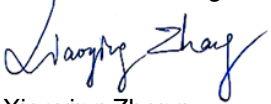
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REPORT ON	Radio Testing of the Fortem Technologies, Inc. Model R30 Radar
TEST REPORT NUMBER	72173712B
TEST REPORT DATE	January 2022
PREPARED FOR	Fortem Technologies, Inc. 1064 S N County Blvd 6th Floor Pleasant Grove, UT 84062 USA
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APPROVED BY	 Xiaoying Zhang Name Authorized Signatory Title: Senior RF Wireless Test Engineer
DATED	January 03, 2022



Revision History

72173712B Fortem Technologies, Inc. Model R30 Radar					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
01/03/2022	—	Initial Release			Xiaoying Zhang



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SECTION 1

REPORT SUMMARY

Radio Testing of the
Fortem Technologies, Inc.
TrueView R30 Radar



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Fortem Technologies, Inc. TrueView R30 Radar to the requirements of FCC Title 47 Chapter I Subchapter D Part 90.

Objective	To perform Radio testing to determine the Equipment Under Test's (EUT's) compliance with the test specification, for the series of tests carried out. This report is an update to Report No. 72153658B. Prior to certification, the manufacturer updated the power level necessitating re-evaluation of power measurements and associated spurious emissions. In addition to measurements not affected by the change, this test report covers the test results resulting from the updates.
Manufacturer	Fortem Technologies, Inc.
EUT	Radar
Trade Name	TrueView R30 Radar
Model Name	R30
FCC ID	2APIM-FTR30V002
IC Number	N/A
Serial Number(s)	X00330153
Number of Samples Tested	1
Test Specification/Issue/Date	FCC Title 47 Chapter I Subchapter D Part 90 Private Land Mobile Radio Services (October 1, 2020).
Start of Test	November 22, 2021
Finish of Test	November 30, 2021
Name of Engineer(s)	Alex Chang Ferdinand Custodio Omar Castillo Ivan Retana
Related Document(s)	• ANSI C63.26-2015. American National Standard for Compliance Testing of Transmitters Used in Licensed radio Services. • Test Report 72153658B Fortem R30 FCC Part 90 Test Report Issue 3. Issued by TÜV SÜD America, 10040 Mesa Rim Rd, San Diego, CA 92121 on March 18, 2020. • Supporting documents for EUT certification are separate exhibits.



1.2 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC Title 47 Chapter I Subchapter D Part 90 are shown below:

Part 2	Part 90	Test Description	Result	Comments/ Base Standard
§2.1046	§90.205(r) and (s)	RF Power Output	Compliant	
§2.1051	§90.210(n)	Unwanted Emissions (Emission Mask)	Compliant	
§2.1053	§90.210(n)(3)	Field Strength of Radiated Spurious Emissions	Compliant	
§2.1049		Occupied Bandwidth	Compliant	
§2.1047		Audio Low Pass Filter (Voice Input)	N/A	
§2.10479		Audio Frequency Response	N/A	
§2.1047		Modulation Limiting	N/A	
§2.1055	§90.213	Frequency Stability (Temperature Variation)	Compliant	
§2.1055	§90.213	Frequency Stability (Voltage Variation)	Compliant	

N/A

The EUT does not employ an audio input



1.3 Product Information

1.3.1 Technical Description

The Equipment Under Test (EUT) is a Fortem Technologies, Inc. TrueView R30 Radar. The EUT is a small, compact, powerful radar detection system providing tracking capabilities that monitor a marked or defined airspace and reports all airborne activity within that space.

1.3.2 EUT General Description

EUT Description	Radar
Model Name	TrueView R30 Radar
Model Number	R30
Serial Number	X00330153
Software Version	3.0
Input Voltage	24VDC (AC/DC Adapter, Traco Power TIB 480-124)
Operating Voltage Range	18VDC to 36VDC
Output RF Power	54.6 dBm EIRP (rated)
Mode Verified	16.2GHz to 16.7GHz (radio location)
Capability	15.4GHz to 15.7GHz (radio navigation) and 16.2GHz to 16.7GHz (radio location)
Operating Temperature	-40°C to 60°C
Primary Unit (EUT)	☒ Production ☐ Pre-Production ☐ Engineering
Emission Designator	170MQXN
Antenna Type	Internal Array
Antenna Model	N/A
Antenna gain	15 dBi
Modulation	FMCW



1.4 EUT Test configuration

1.4.1 Test Configuration Description

Test Configuration	Description
Default	EUT is configured by the support laptop through the ethernet port. The EUT was configured to transmit in either full radar swept mode or in single CW mode, depending on the test. The EUT was also configured to transmit in the frequencies at the extreme low, mid-range, and high ends of the allotted band through Python scripts and with the GUI using a web browser. Alternative configuration via remote setup is using the support laptop connected to the internet while both the EUT and the laptop connected to a common router. Using this setup, Fortem Engineer could remotely configure the EUT on the fly.

1.4.2 EUT Exercise Software

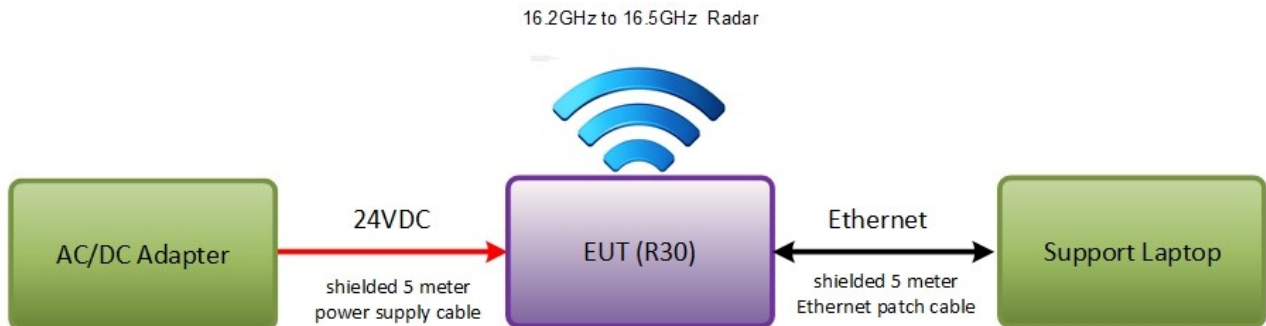
Web browser GUI (integrated with the EUT) and Python 3.7.

1.4.3 Support Equipment and I/O cables

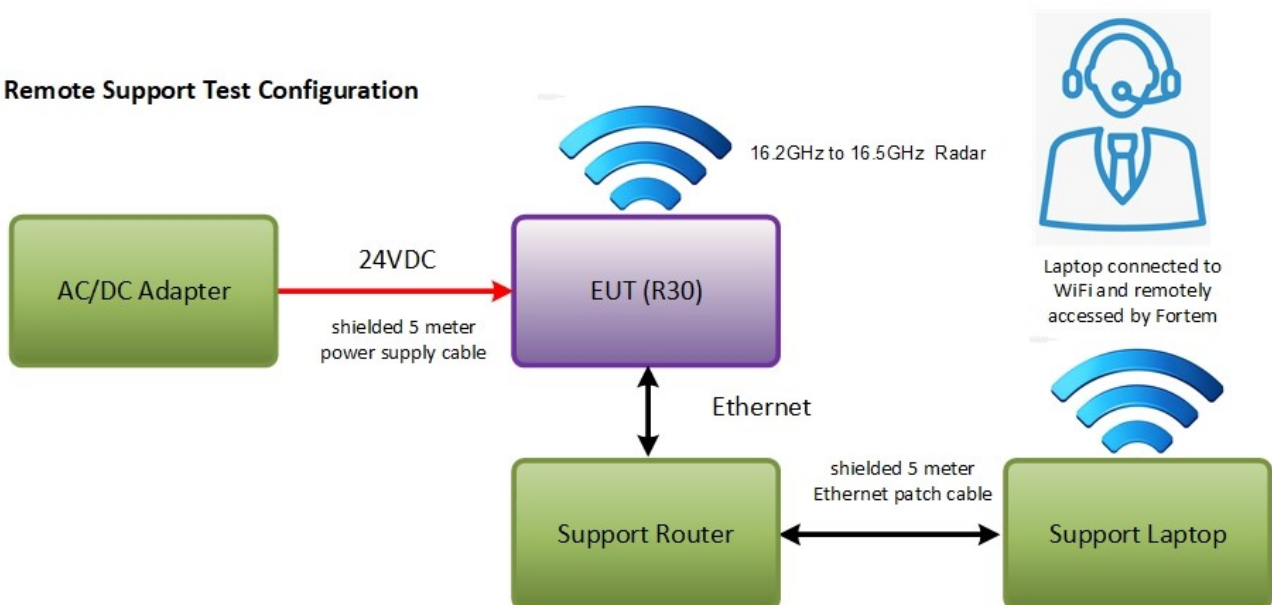
Manufacturer	Equipment/Cable	Description
Dell	Support Laptop	Model: XPS 15 9570
HP	Support Laptop	Model: HSTNN-C87C
Asus	Dual Band Gigabit Router	Model: RT-AC68U
Traco Power	EUT AC/DC Adapter	Part No. TIB 480-124 24VDC 480W
-	Ethernet Patch Cable	FPN: 220-0057. Shielded, 5m, RJ-45 to 26-pin ODU AMC
-	DC power supply end cable*	FPN: 220-0061. Shielded, 305mm, 5-pin ODU AMC to 3-pin DH-20 Series
-	DC power supply long cable*	FPN: 220-0084. Shielded, 12AWG, 2C, 5m. 3-pin DH-20 Series to 3-wire pigtail

* Note: Above "long" and "end" power cables connect to each other in series.

1.4.4 Simplified Test Configuration Diagram



Remote Support Test Configuration





1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number: X00330153		
None	—	—

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.26-2015. American National Standard for Compliance Testing of Transmitters Used in Licensed radio Services.

For conducted and radiated emissions, the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.26-2015. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.8 TEST FACILITY LOCATION

1.8.1 TÜV SÜD America Inc. (Mira Mesa)

10040 Mesa Rim Road, San Diego, CA 92121-2912 (32.901268,-117.177681). Phone: 858 678 1400
FAX: 858 546 0364

1.8.2 TÜV SÜD America Inc. (Rancho Bernardo)

16936 Via Del Campo, San Diego, CA 92127-1708 (33.018644,-117.092409). Phone: 858 678 1400
Fax: 858 546 0364.

1.9 TEST FACILITY REGISTRATION

1.9.1 FCC – Designation No.: US1146

TÜV SÜD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Designation is US1146.



1.9.2 Innovation, Science and Economic Development Canada (IC) Registration No.: 3067A-1 & 22806-1

The 10m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Rancho Bernardo) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 3067A-1.

The 3m Semi-anechoic chamber of TÜV SÜD America Inc. (San Diego Mira Mesa) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 22806-1.

1.9.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TÜV Product Service Inc. (San Diego) is a recognized EMC testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

1.9.4 NCC (National Communications Commission - US0102)

TÜV SÜD America Inc. (San Diego) is listed as a Foreign Recognized Telecommunication Equipment Testing Laboratory and is accredited to ISO/IEC 17025 (A2LA Certificate No.2955.13) which under APEC TEL MRA Phase 1 was designated as a Conformity Assessment Body competent to perform testing of equipment subject to the Technical Regulations covered under its scope of accreditation including RTTE01, PLMN01 and PLMN08 for TTE type of testing and LP002 for Low-Power RF Device type of testing.

1.9.5 VCCI – Registration No. A-0280 and A-0281

TÜV SÜD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

1.9.6 RRA – Identification No. US0102

TÜV SÜD America Inc. (San Diego) is National Radio Research Agency (RRA) recognized laboratory under Phase I of the APEC Tel MRA.

1.9.7 OFCA – U.S. Identification No. US0102

TÜV SÜD America Inc. (San Diego) is recognized by Office of the Communications Authority (OFCA) under Appendix B, Phase I of the APEC Tel MRA.



SECTION 2

TEST DETAILS

Radio Testing of the
Fortem Technologies, Inc.
R30 Radar



2.1 RF POWER OUTPUT

2.1.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.205 (r) and (s)

2.1.2 Standard Applicable

(r) All other frequency bands. Requested transmitter power will be considered and authorized on a case by case basis.

(s) The output power shall not exceed by more than 20 percent either the output power shown in the Radio Equipment List [available in accordance with §90.203(a)(1)] for transmitters included in this list or when not so listed, the manufacturer's rated output power for the particular transmitter specifically listed on the authorization.

2.1.3 Equipment Under Test and Modification State

Serial No: X00330153 / Default Test Configuration

2.1.4 Date of Test/Initial of test personnel who performed the test

April 14, 2021 / FSC

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Mira Mesa facility

Ambient Temperature	23.5 °C
Relative Humidity	37.6 %
ATM Pressure	100.5 kPa

2.1.7 Additional Observations

- This is a radiated test utilizing a spectrum analyzer.
- Test guidance is per Section 5.2.7 of ANSI C63.26-2015. The formula (d) was used to convert the measured field strength level to an equivalent power level for reporting:

$$EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$$

where D is the measurement distance (in the far field region) in meter

- The EUT was switched to CW mode for this test.
- EUT verified on both X and Y axis, only the worst axis presented.
- The actual limit for this test is not to exceed by more than 20% of the manufacturer's rated output power. The limit used during verifications will be ignored (greyed out on the test plots presented).

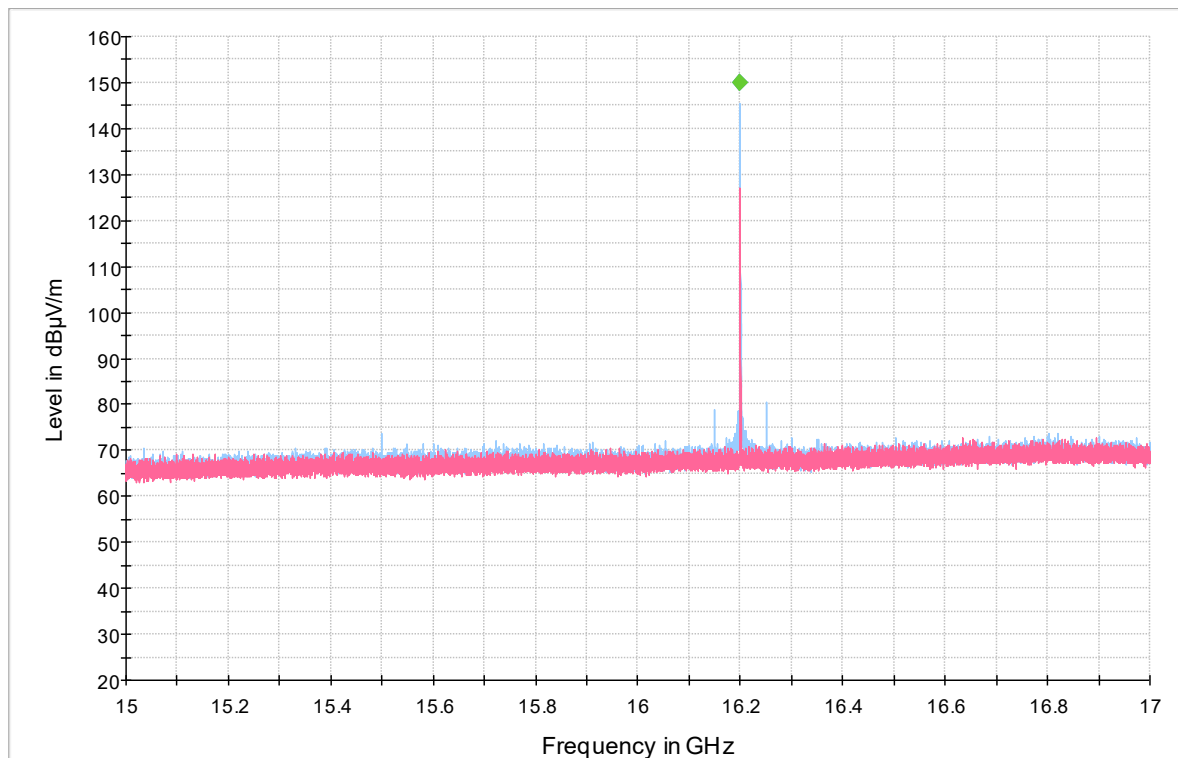


2.1.8 Summary of Test Results

Frequency (MHz)	Peak (dBμV/m @ 3 meters)	Average (dBμV/m @ 3 meters)	Peak EIRP (dBm)	Average EIRP (dBm)
16200.00	149.91	149.84	54.68	54.61
16450.00	149.28	149.21	54.05	53.98
16700.00	149.77	149.71	54.54	54.48
Manufacturer's rated output power = 53.8 dBm EIRP (EUT complies, max measured did not exceed by more than 20% of the manufacturer's rated output power)				

2.1.9 Low Channel Test Results

Full Spectrum



◆ Preview Result 1H-PK+ [Preview Result 1H.Result:2]
Final_Result PK+ [Final_Result.Result:4]
◆ Preview Result 1V-PK+ [Preview Result 1V.Result:2]
Final_Result AVG [Final_Result.Result:5]

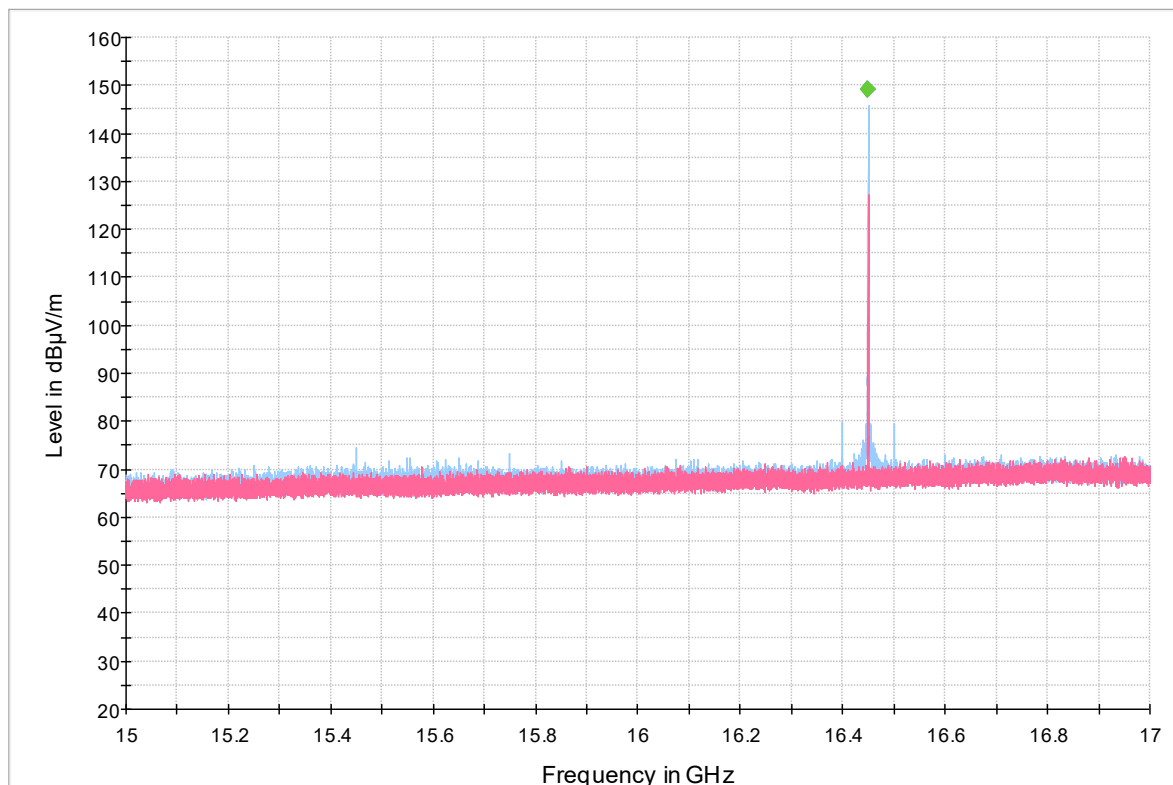
Peak (Field Strength @ 3 meters)

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16199.800000	149.91	73.90	-76.01	1000.0	1000.000	160.0	H	28.0	51

Average (Field Strength @ 3 meters)

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16199.800000	149.84	53.90	-95.94	1000.0	1000.000	160.0	H	28.0	51

2.1.10 Mid Channel Test Results



◆ Preview Result 1H-PK+ [Preview Result 1H.Result:2]
 Final_Result PK+ [Final_Result.Result:4]
 ◆ Preview Result 1V-PK+ [Preview Result 1V.Result:2]
 Final_Result AVG [Final_Result.Result:5]

Peak (Field Strength @ 3 meters)

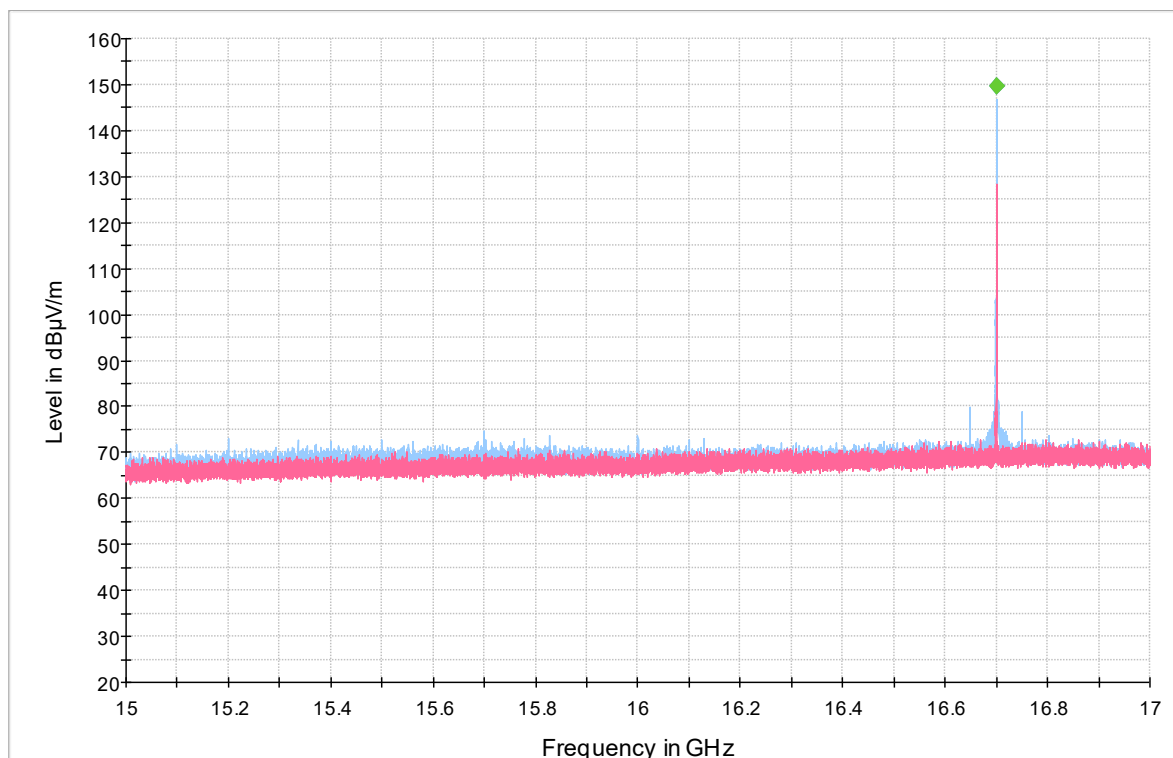
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16449.866667	149.28	73.90	-75.38	1000.0	1000.000	138.0	H	28.0	51

Average (Field Strength @ 3 meters)

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16449.866667	149.21	53.90	-95.31	1000.0	1000.000	138.0	H	28.0	51

2.1.11 High Channel Test Results

Full Spectrum



◆ Preview Result 1H-PK+ [Preview Result 1H.Result:2]
Final_Result PK+ [Final_Result.Result:4]
◆ Preview Result 1V-PK+ [Preview Result 1V.Result:2]
Final_Result AVG [Final_Result.Result:5]

Peak (Field Strength @ 3 meters)

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16699.866667	149.77	73.90	-75.87	1000.0	1000.000	149.0	H	27.0	52

Average (Field Strength @ 3 meters)

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
16699.866667	149.71	53.90	-95.81	1000.0	1000.000	149.0	H	27.0	52



2.2 UNWANTED EMISSIONS (EMISSION MASK)

2.2.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.210 (n)

2.2.2 Standard Applicable

(n) *Other frequency bands.* Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards.

(b) Emission Mask B. For transmitters that are equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the assigned frequency by more than 50 percent, but not more than 100 percent of the authorized bandwidth: At least 25 dB.

(2) On any frequency removed from the assigned frequency by more than 100 percent, but not more than 250 percent of the authorized bandwidth: At least 35 dB.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

2.2.3 Equipment Under Test and Modification State

Serial No: X00330153 / Test Configuration A

2.2.4 Date of Test/Initial of test personnel who performed the test

November 07, 2019 / AC

2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.6 Environmental Conditions

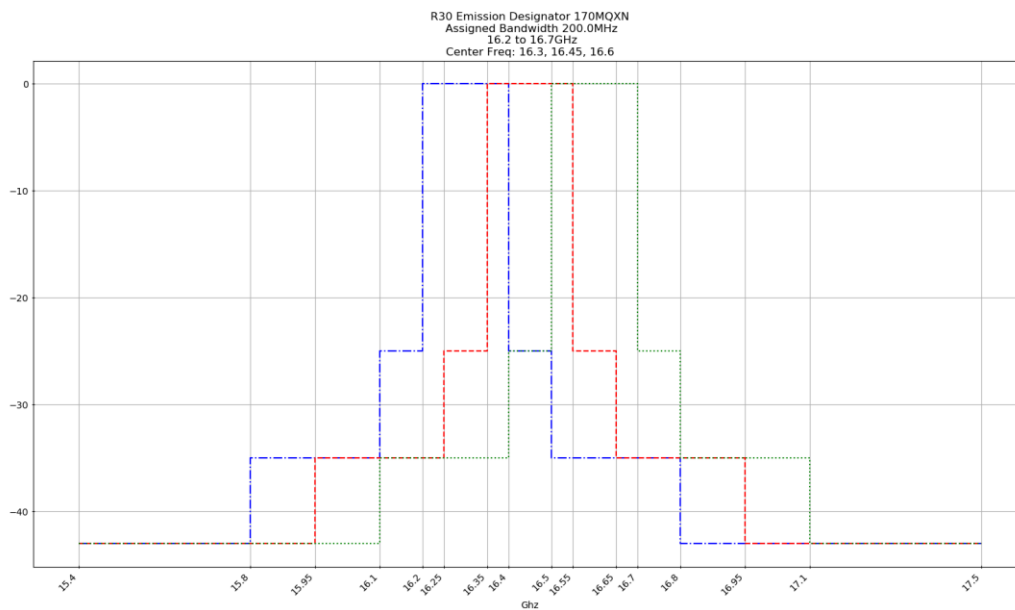
Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	25.0 °C
Relative Humidity	49.4 %
ATM Pressure	99.0 kPa

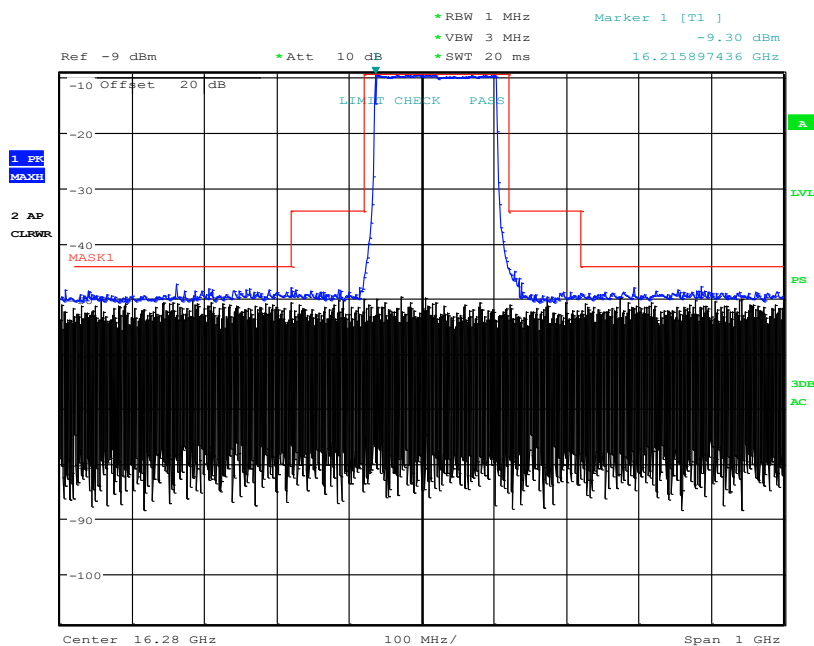
2.2.7 Additional Observations

- This is a relative radiated measurement.
- EUT is on full radar swept mode for this test.
- The emission mask was applied per Section 5.7.3 of ANSI C63.26-2015.
- §90.210(n)(3) is covered under Section 2.3 of this test report.

2.2.8 Channel Emission Masks

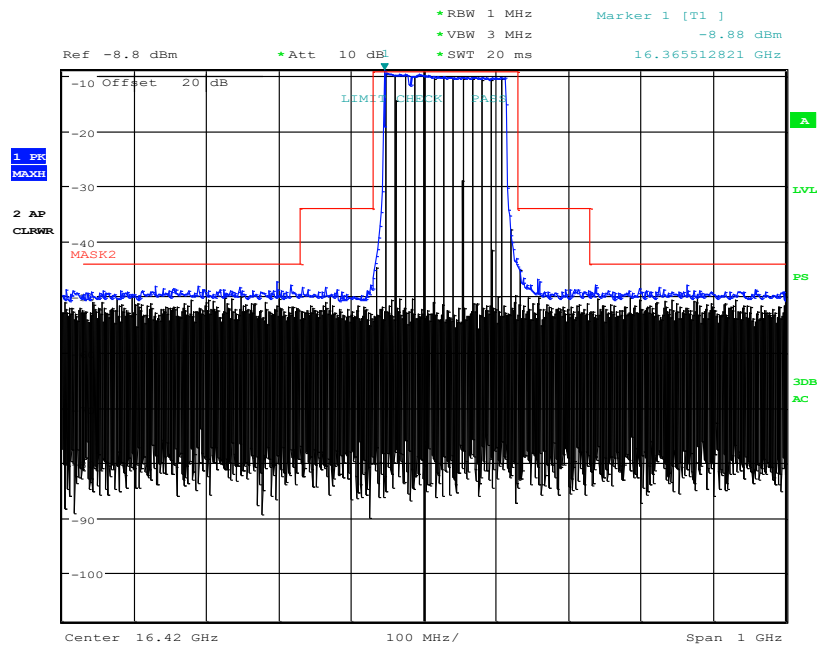


2.2.9 Test Result Plots



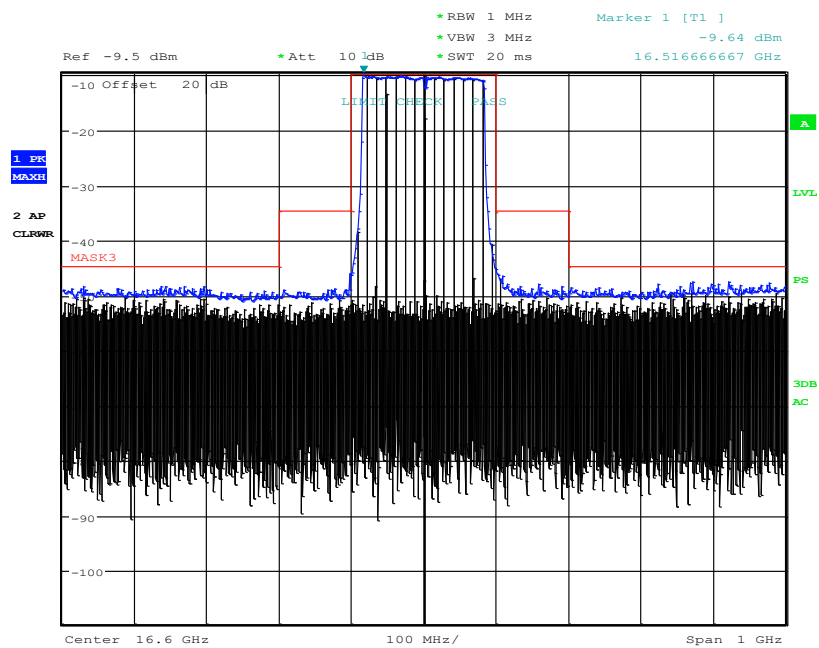
Date: 7.NOV.2019 16:37:05

Low Channel



Date: 7.NOV.2019 16:40:19

Mid Channel



Date: 7.NOV.2019 16:43:42

High Channel



2.3 FIELD STRENGTH OF RADIATED SPURIOUS EMISSIONS

2.3.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1053(a) and (b)

2.3.2 Standard Applicable

(a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate.

(b) The measurements specified in paragraph (a) of this section shall be made for the following equipment:

Those in which the spurious emissions are required to be 60 dB or more below the mean power of the transmitter.

All equipment operating on frequencies higher than 25 MHz.

All equipment where the antenna is an integral part of, and attached directly to the transmitter.

Other types of equipment as required, when deemed necessary by the Commission.

FCC 47 CFR Part 90, Clause 90.210 (n) and (b)(3)

(n) *Other frequency bands.* Transmitters designed for operation under this part on frequencies other than listed in this section must meet the emission mask requirements of Emission Mask B. Equipment operating under this part on frequencies allocated to but shared with the Federal Government, must meet the applicable Federal Government technical standards.

(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least $43 + 10 \log (P)$ dB.

2.3.3 Equipment Under Test and Modification State

Serial No: X00330153 / Default Test Configuration

2.3.4 Date of Test/Initial of test personnel who performed the test

November 23, 24 and 30, 2021 / Oc and IR

2.3.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.



2.3.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Mira Mesa facility

Ambient Temperature	23.5 °C	22.7 °C	25.8 °C
Relative Humidity	37.6 %	43.2 %	44.8 %
ATM Pressure	100.5 kPa	100.6 kPa	100.5 kPa

2.3.7 Additional Observations

- This is a radiated test. The spectrum was searched from 30MHz to 100GHz.
- Only the worst-case transmit mode presented.
- EUT verified on both X and Y axis, only the worst axis presented.
- In-band measurements are covered under Section 2.2 of this test report.
- Measurements below 40GHz were done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.3.8 for sample computation.
- Attenuation limit of $43 + 10 \log (P)$ is based from mean output power of the EUT. Therefore Average results takes precedence over Peak results.
- Measurement above 40GHz are done using harmonic mixers. Corresponding TDF (Transducer Factor) are programmed for each range.
- For measurements between 1GHz and 40GHz, only average detector is relevant for this frequency range.
- Tests distance and frequency ranges performed are summarized below:

Frequency Range	Test Distance
30 MHz to 1GHz	3 meters
1 GHz to 18 GHz	3 meters
18 GHz to 26.5 GHz	3 meters
26 GHz to 40 GHz	3 meters
40 GHz to 60 GHz	3 meters
60 GHz to 75 GHz	1 meter
75 GHz to 100 GHz	1 meter

2.3.8 Sample Computation (Radiated Emission)

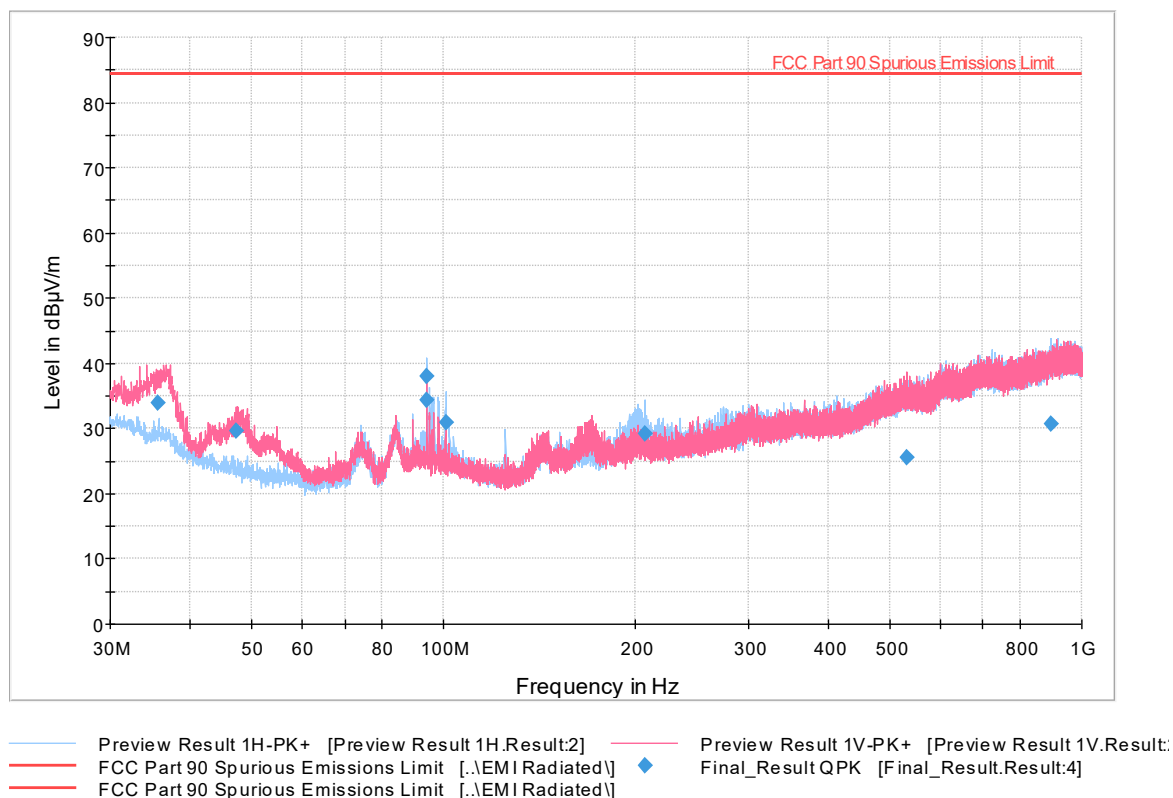
Measuring equipment raw measurement (dbμV) @ 30 MHz			24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3	-12.6
	Asset# 1172 (cable)	0.3	
	Asset# 1016 (preamplifier)	-30.7	
	Asset# 1175(cable)	0.3	
	Asset# 1002 (antenna)	17.2	
Reported QuasiPeak Final Measurement (dbμV/m) @ 30MHz			11.8

2.3.9 Test Results

Compliant. See attached plots.

2.3.10 Worst Case Channel Below 1GHz Radiated Emission Test

Full Spectrum



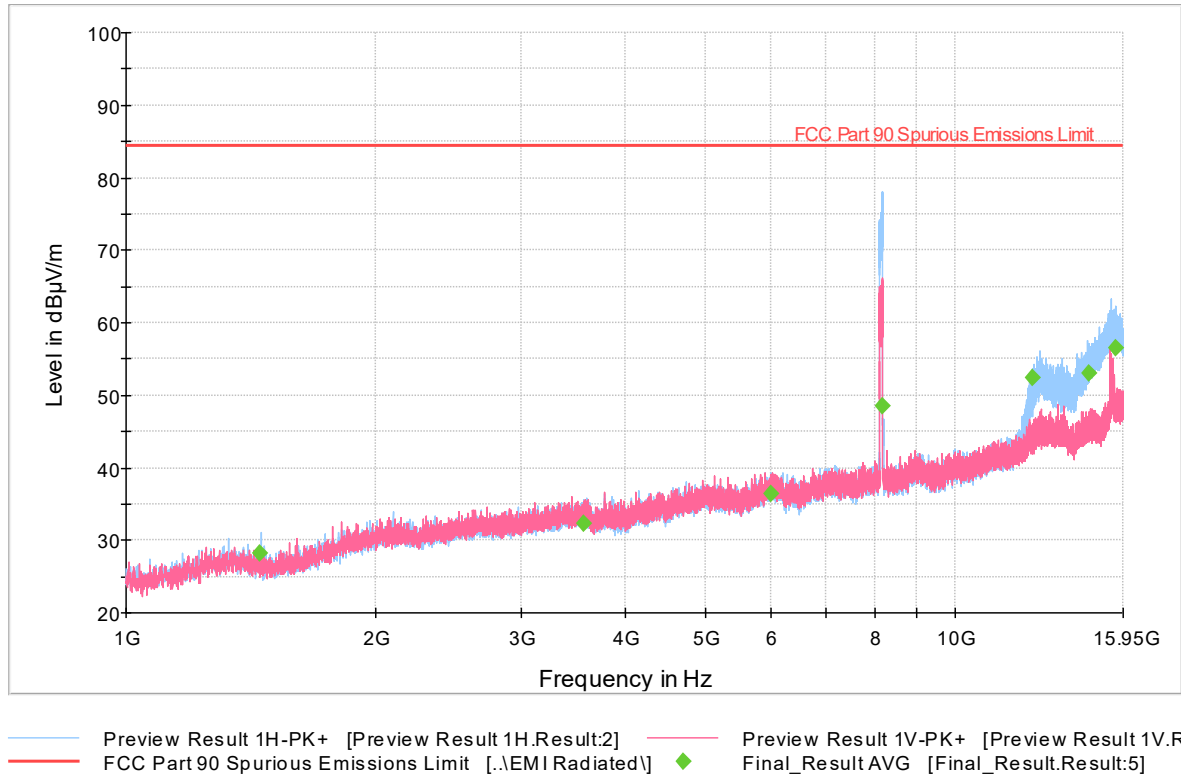
Quasi-Peak Data

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.555667	34.01	84.40	50.39	1000.0	120.000	100.0	V	114.0	19
47.340000	29.74	84.40	54.66	1000.0	120.000	107.0	V	330.0	15
94.124667	34.35	84.40	50.05	1000.0	120.000	325.0	H	287.0	15
94.140667	38.02	84.40	46.38	1000.0	120.000	200.0	H	120.0	15
100.720667	30.98	84.40	53.42	1000.0	120.000	189.0	H	302.0	16
206.355333	29.31	84.40	55.09	1000.0	120.000	121.0	H	288.0	17

Test Notes: Power supply and router connected to the EUT are placed outside the chamber causing some FM bands to couple with the setup. Margins are more than 20 dB from the limit, no additional actions were taken.

2.3.11 1GHz up to lower edge of the emission mask used (Low Channel)

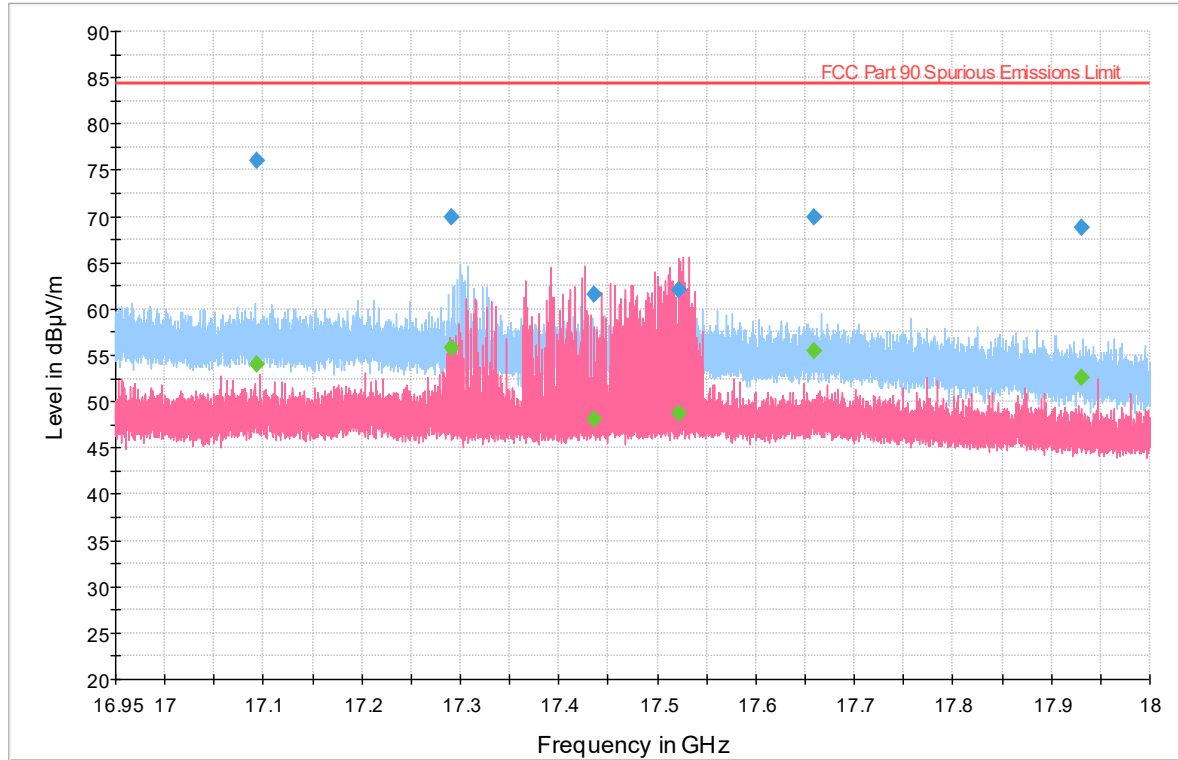
Full Spectrum



Average Data

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1451.978333	28.23	84.40	56.17	1000.0	1000.000	302.0	H	11.0	-4
3562.518333	32.34	84.40	52.06	1000.0	1000.000	227.0	H	306.0	4
5993.676667	36.31	84.40	48.09	1000.0	1000.000	365.0	H	20.0	5
8186.265000	48.54	84.40	35.86	1000.0	1000.000	175.0	H	354.0	10
12422.970000	52.31	84.40	32.09	1000.0	1000.000	229.0	H	63.0	14
14478.313333	53.01	84.40	31.39	1000.0	1000.000	342.0	H	22.0	13
15604.678333	56.45	84.40	27.95	1000.0	1000.000	238.0	H	11.0	14

2.3.12 Upper edge of the emission mask used up to 18GHz (High Channel)



— Preview Result 1H-PK+ [Preview Result 1H.Result:2] — Preview Result 1V-PK+ [Preview Result 1V.Result:2]
— FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] ◆ Final_Result PK+ [Final_Result.Result:4]
◆ Final_Result AVG [Final_Result.Result:5]

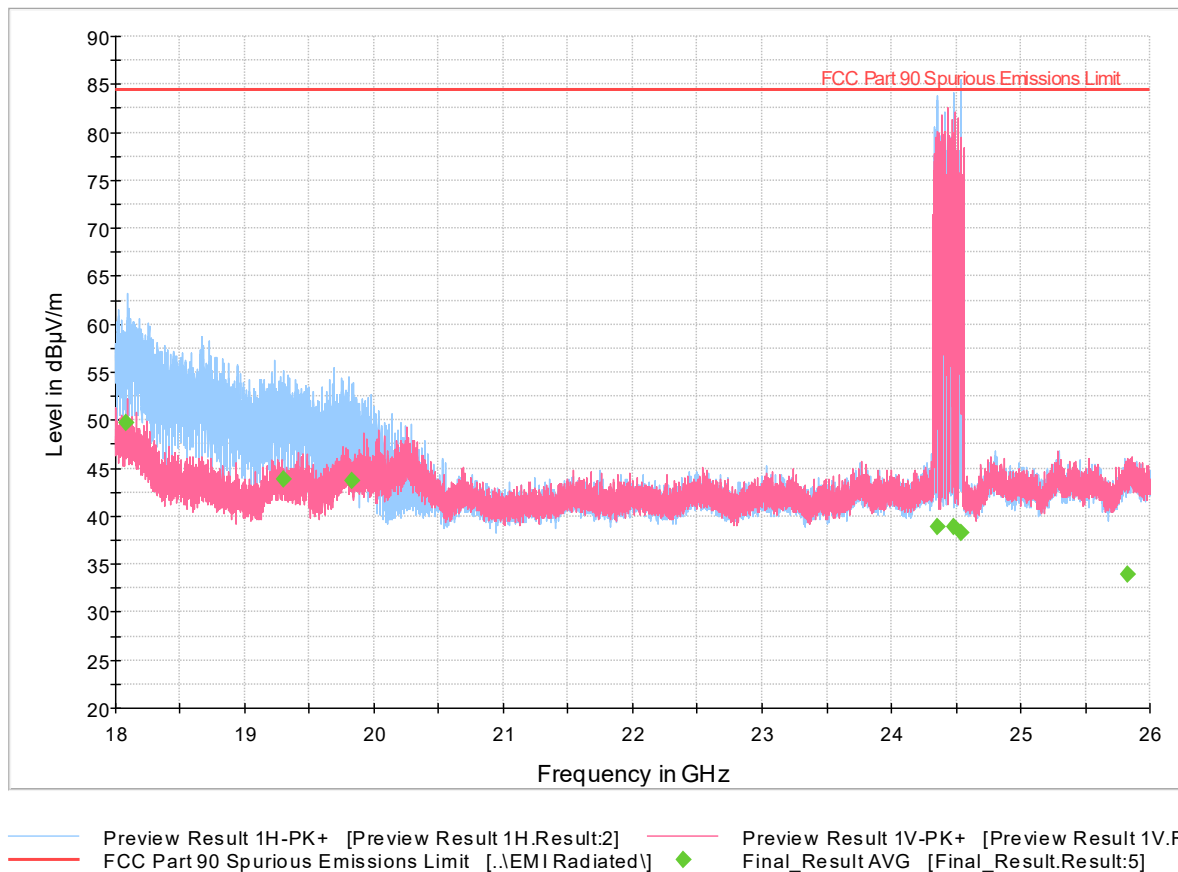
Peak Data

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
17093.970000	76.00	84.40	8.40	1000.0	1000.000	138.0	H	27.0	18
17291.480000	70.00	84.40	14.40	1000.0	1000.000	335.0	H	29.0	18
17435.095000	61.64	84.40	22.76	1000.0	1000.000	138.0	V	346.0	18
17521.525000	62.03	84.40	22.37	1000.0	1000.000	132.0	V	36.0	19
17658.305000	69.86	84.40	14.54	1000.0	1000.000	141.0	H	344.0	19
17930.000000	68.75	84.40	15.65	1000.0	1000.000	125.0	H	43.0	19

Average Data

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
17093.970000	54.10	84.40	30.30	1000.0	1000.000	138.0	H	27.0	18
17291.480000	55.79	84.40	28.61	1000.0	1000.000	335.0	H	29.0	18
17435.095000	48.14	84.40	36.26	1000.0	1000.000	138.0	V	346.0	18
17521.525000	48.68	84.40	35.72	1000.0	1000.000	132.0	V	36.0	19
17658.305000	55.46	84.40	28.94	1000.0	1000.000	141.0	H	344.0	19
17930.000000	52.59	84.40	31.81	1000.0	1000.000	125.0	H	43.0	19

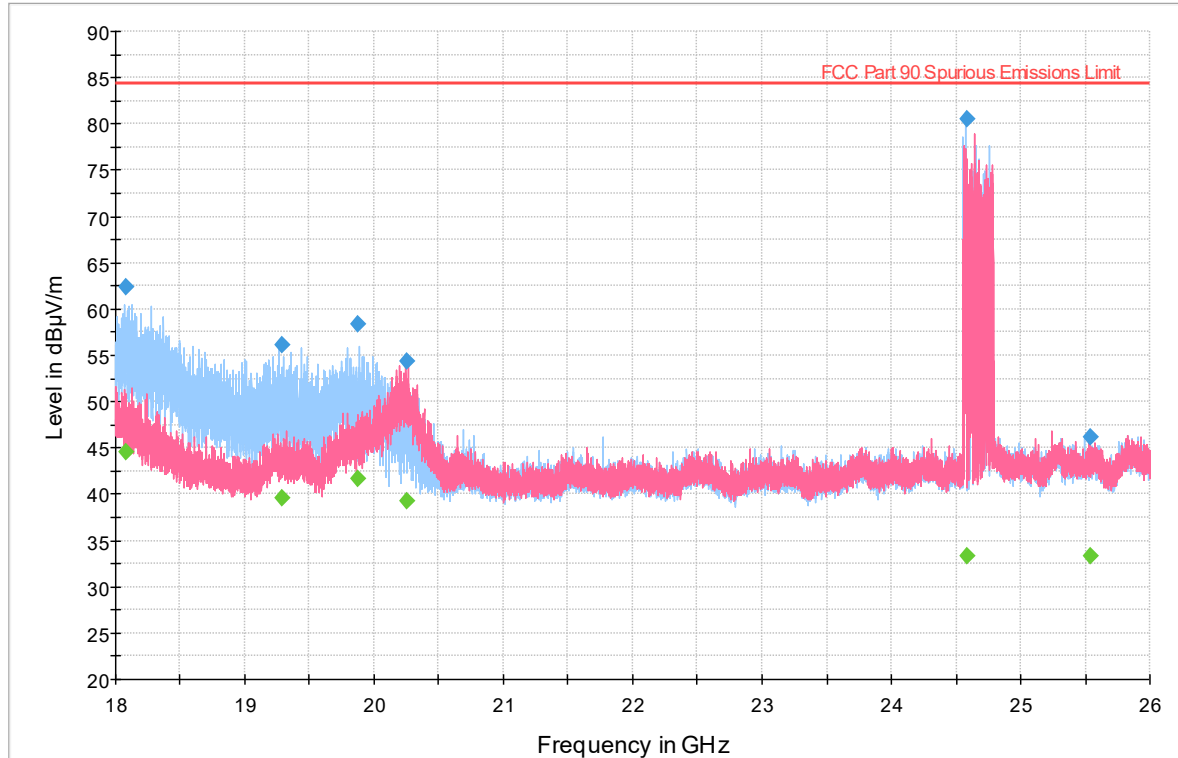
2.3.13 18GHz to 26GHz Radiated Emission Test (Low Channel)



Average Data

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18079.530500	49.70	84.40	34.70	1000.0	1000.000	153.0	H	61.0	-2
19301.553500	43.88	84.40	40.52	1000.0	1000.000	163.0	H	59.0	-2
19828.710000	43.64	84.40	40.76	1000.0	1000.000	140.0	H	60.0	-3
24353.557000	38.84	84.40	45.56	1000.0	1000.000	189.0	H	61.0	1
24485.979000	38.88	84.40	45.52	1000.0	1000.000	142.0	H	60.0	1
24536.236000	38.28	84.40	46.12	1000.0	1000.000	142.0	H	60.0	1

2.3.14 18GHz to 26GHz Radiated Emission Test (Mid Channel)



— Preview Result 1H-PK+ [Preview Result 1H.Result:2] — Preview Result 1V-PK+ [Preview Result 1V.Result:2]
— FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] ◆ Final_Result PK+ [Final_Result.Result:4]
◆ Final_Result AVG [Final_Result.Result:5]

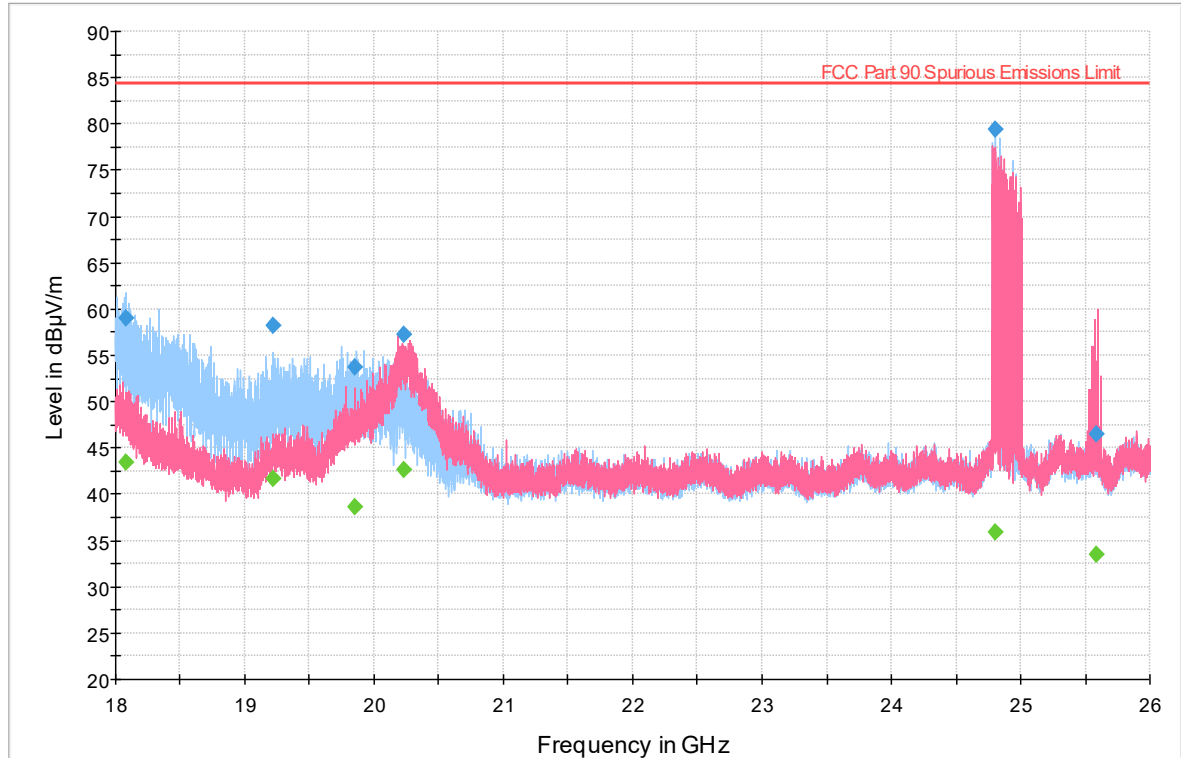
Peak Data

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18083.198500	62.38	84.40	22.02	1000.0	1000.000	201.0	H	355.0	-2
19289.291000	56.05	84.40	28.35	1000.0	1000.000	163.0	H	355.0	-2
19867.834500	58.33	84.40	26.07	1000.0	1000.000	163.0	H	356.0	-3
20250.996000	54.30	84.40	30.10	1000.0	1000.000	187.0	V	6.0	-2
24580.546500	80.54	84.40	3.86	1000.0	1000.000	138.0	H	60.0	1
25541.661000	46.10	84.40	38.30	1000.0	1000.000	163.0	V	190.0	2

Average Data

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18083.198500	44.60	84.40	39.80	1000.0	1000.000	201.0	H	355.0	-2
19289.291000	39.60	84.40	44.80	1000.0	1000.000	163.0	H	355.0	-2
19867.834500	41.72	84.40	42.68	1000.0	1000.000	163.0	H	356.0	-3
20250.996000	39.24	84.40	45.16	1000.0	1000.000	187.0	V	6.0	-2
24580.546500	33.33	84.40	51.07	1000.0	1000.000	138.0	H	60.0	1
25541.661000	33.27	84.40	51.13	1000.0	1000.000	163.0	V	190.0	2

2.3.15 18GHz to 26GHz Radiated Emission Test (High Channel)



— Preview Result 1H-PK+ [Preview Result 1H.Result:2] — Preview Result 1V-PK+ [Preview Result 1V.Result:2]
— FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] ◆ Final_Result PK+ [Final_Result.Result:4]
◆ Final_Result AVG [Final_Result.Result:5]

Peak Data

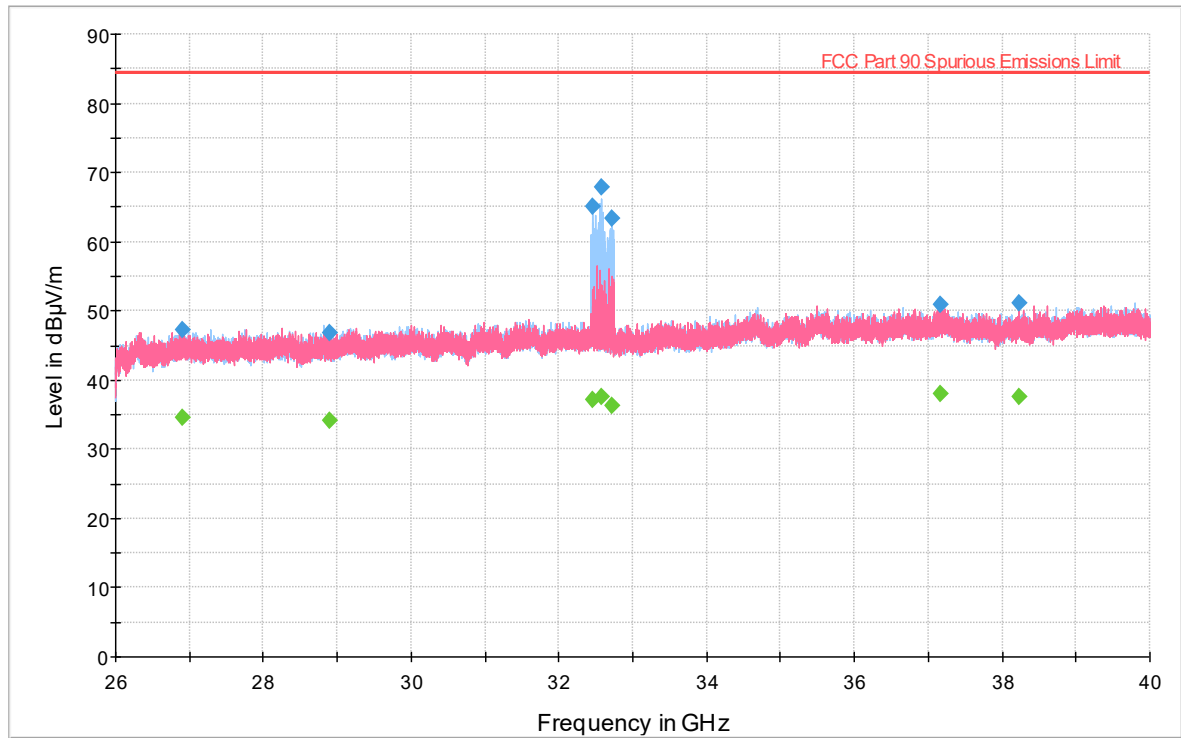
Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18077.026500	58.96	84.40	25.44	1000.0	1000.000	212.0	H	60.0	-3
19220.373500	58.27	84.40	26.13	1000.0	1000.000	163.0	H	356.0	-2
19856.315000	53.66	84.40	30.74	1000.0	1000.000	190.0	H	58.0	-3
20225.211000	57.26	84.40	27.14	1000.0	1000.000	163.0	V	0.0	-3
24808.380500	79.36	84.40	5.04	1000.0	1000.000	140.0	V	40.0	2
25587.830500	46.50	84.40	37.90	1000.0	1000.000	153.0	V	73.0	2

Average Data

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18077.026500	43.51	84.40	40.89	1000.0	1000.000	212.0	H	60.0	-3
19220.373500	41.70	84.40	42.70	1000.0	1000.000	163.0	H	356.0	-2
19856.315000	38.62	84.40	45.78	1000.0	1000.000	190.0	H	58.0	-3
20225.211000	42.66	84.40	41.74	1000.0	1000.000	163.0	V	0.0	-3
24808.380500	35.96	84.40	48.44	1000.0	1000.000	140.0	V	40.0	2
25587.830500	33.51	84.40	50.89	1000.0	1000.000	153.0	V	73.0	2

2.3.16 26GHz to 40GHz Radiated Emission Test (Low Channel)

Full Spectrum



— Preview Result 1H-PK+ [Preview Result 1H.Result:2] — Preview Result 1V-PK+ [Preview Result 1V.Result:
 — FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] — FCC Part 90 Spurious Emissions Limit [.\EMI Radi:
 ◆ Final_Result PK+ [Final_Result.Result:4] ◆ Final_Result AVG [Final_Result.Result:5]

Peak Data

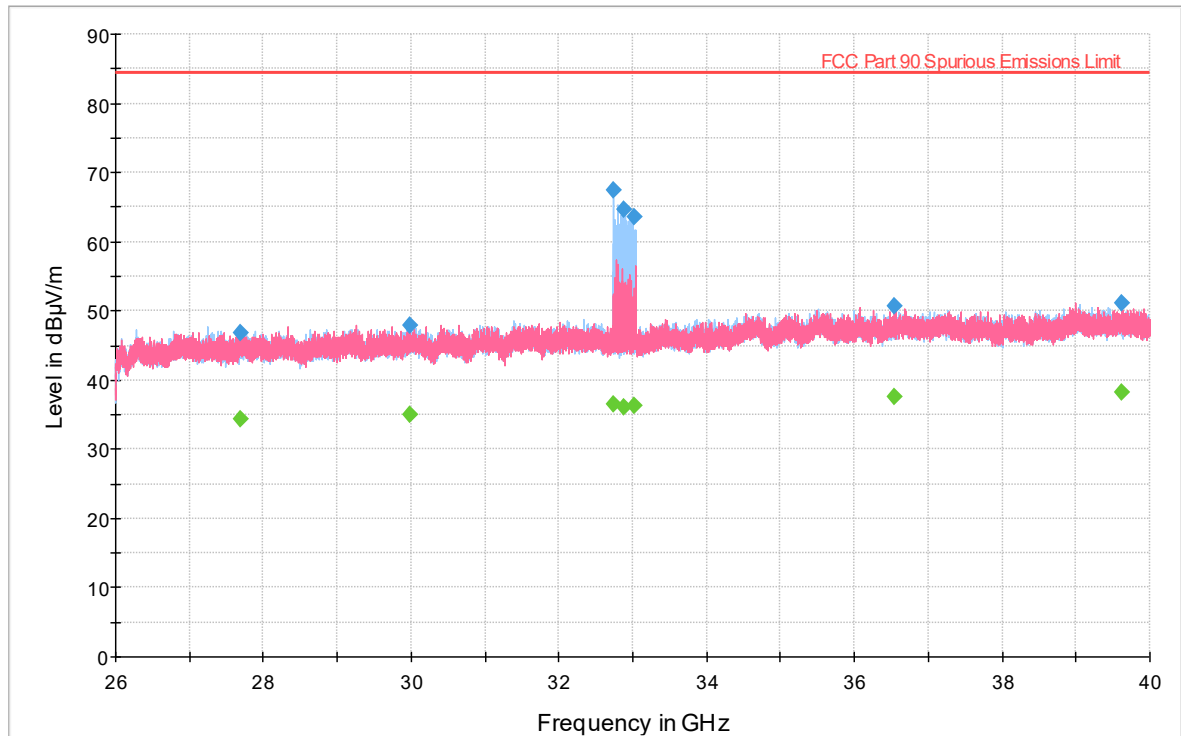
Frequency (MHz)	Max Peak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26914.661923	47.19	84.40	37.21	1000.0	1000.000	212.0	V	223.0	3
28890.883077	46.84	84.40	37.56	1000.0	1000.000	189.0	H	13.0	2
32466.255769	65.17	84.40	19.23	1000.0	1000.000	175.0	H	42.0	6
32572.701539	67.79	84.40	16.61	1000.0	1000.000	210.0	H	45.0	6
32721.639231	63.40	84.40	21.00	1000.0	1000.000	179.0	H	50.0	5
37170.043461	50.89	84.40	33.51	1000.0	1000.000	225.0	V	156.0	8

Average Data

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26914.661923	34.65	84.40	49.75	1000.0	1000.000	212.0	V	223.0	3
28890.883077	34.16	84.40	50.24	1000.0	1000.000	189.0	H	13.0	2
32466.255769	37.20	84.40	47.2	1000.0	1000.000	175.0	H	42.0	6
32572.701539	37.56	84.40	46.84	1000.0	1000.000	210.0	H	45.0	6
32721.639231	36.29	84.40	48.11	1000.0	1000.000	179.0	H	50.0	5
37170.043461	37.95	84.40	46.45	1000.0	1000.000	225.0	V	156.0	8
38231.944231	37.53	84.40-	46.87	1000.0	1000.000	145.0	V	344.0	8

2.3.17 26GHz to 40GHz Radiated Emission Test (Mid Channel)

Full Spectrum



Preview Result 1H-PK+ [Preview Result 1H.Result:2] Preview Result 1V-PK+ [Preview Result 1V.Result:
 FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] Final_Result PK+ [Final_Result.Result:4]
 Final_Result AVG [Final_Result.Result:5]

Peak Data

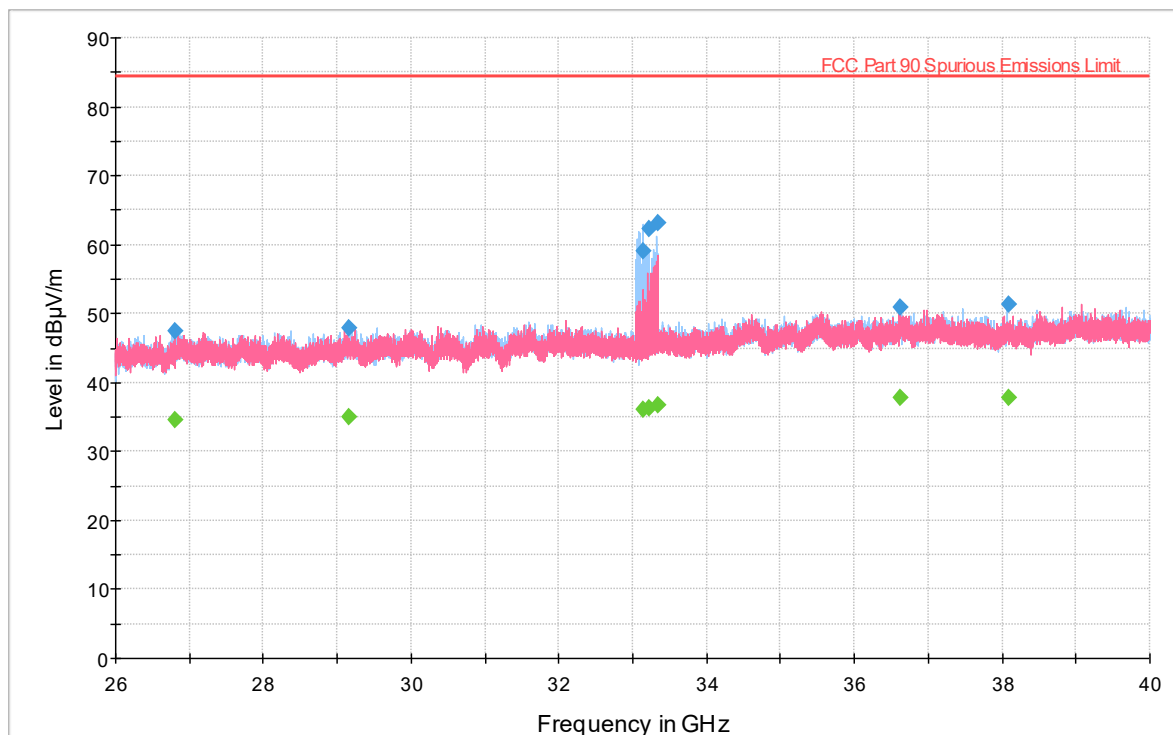
Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
27690.776538	46.74	84.40	37.66	1000.0	1000.000	125.0	V	327.0	3
29979.704615	47.90	84.40	36.50	1000.0	1000.000	225.0	V	55.0	3
32748.434230	67.51	84.40	16.89	1000.0	1000.000	194.0	H	44.0	5
32875.208462	64.58	84.40	19.82	1000.0	1000.000	138.0	H	6.0	6
33011.155000	63.63	84.40	20.77	1000.0	1000.000	130.0	H	1.0	6
36538.943846	50.79	84.40	33.61	1000.0	1000.000	225.0	H	4.0	7
39616.387307	51.17	84.40	33.23	1000.0	1000.000	162.0	H	282.0	8

Average Data

Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
27690.776538	34.39	84.40	50.01	1000.0	1000.000	125.0	V	327.0	3
29979.704615	35.07	84.40	49.33	1000.0	1000.000	225.0	V	55.0	3
32748.434230	36.53	84.40	47.87	1000.0	1000.000	194.0	H	44.0	5
32875.208462	36.14	84.40	48.26	1000.0	1000.000	138.0	H	6.0	6
33011.155000	36.37	84.40	48.03	1000.0	1000.000	130.0	H	1.0	6
36538.943846	37.63	84.40	46.77	1000.0	1000.000	225.0	H	4.0	7
39616.387307	38.27	84.40	46.13	1000.0	1000.000	162.0	H	282.0	8

2.3.18 26GHz to 40GHz Radiated Emission Test (High Channel)

Full Spectrum



— Preview Result 1H-PK+ [Preview Result 1H.Result:2] — Preview Result 1V-PK+ [Preview Result 1V.Result:
 — FCC Part 90 Spurious Emissions Limit [.\EMI Radiated\] ◆ Final_Result PK+ [Final_Result.Result:4]
 ◆ Final_Result AVG [Final_Result.Result:5]

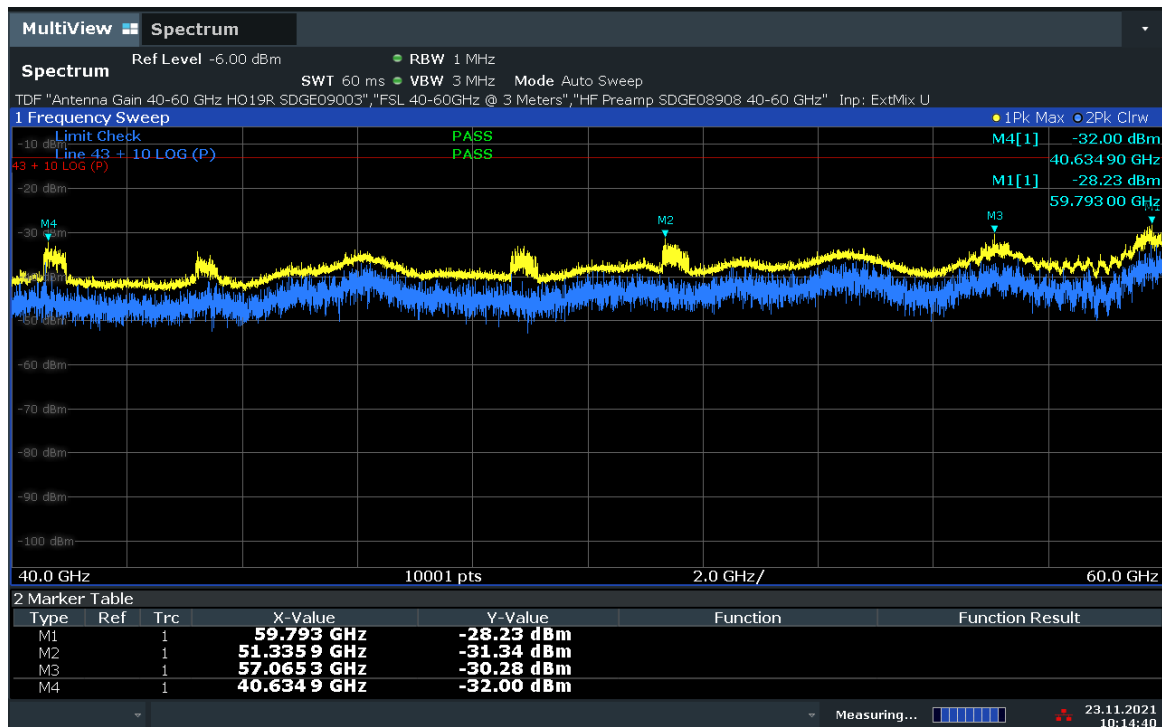
Peak Data

Frequency (MHz)	Max Peak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26802.794999	47.53	84.40	36.87	1000.0	1000.000	214.0	V	60.0	3
29161.938845	47.88	84.40	36.52	1000.0	1000.000	175.0	H	232.0	3
33140.539615	58.98	84.40	25.42	1000.0	1000.000	132.0	H	0.0	6
33215.556538	62.34	84.40	22.06	1000.0	1000.000	175.0	H	48.0	6
33334.948847	63.21	84.40	21.19	1000.0	1000.000	138.0	H	42.0	7
36611.168077	50.85	84.40	33.55	1000.0	1000.000	125.0	V	130.0	8
38082.802308	51.40	84.40	33.00	1000.0	1000.000	221.0	H	116.0	8

Average Data

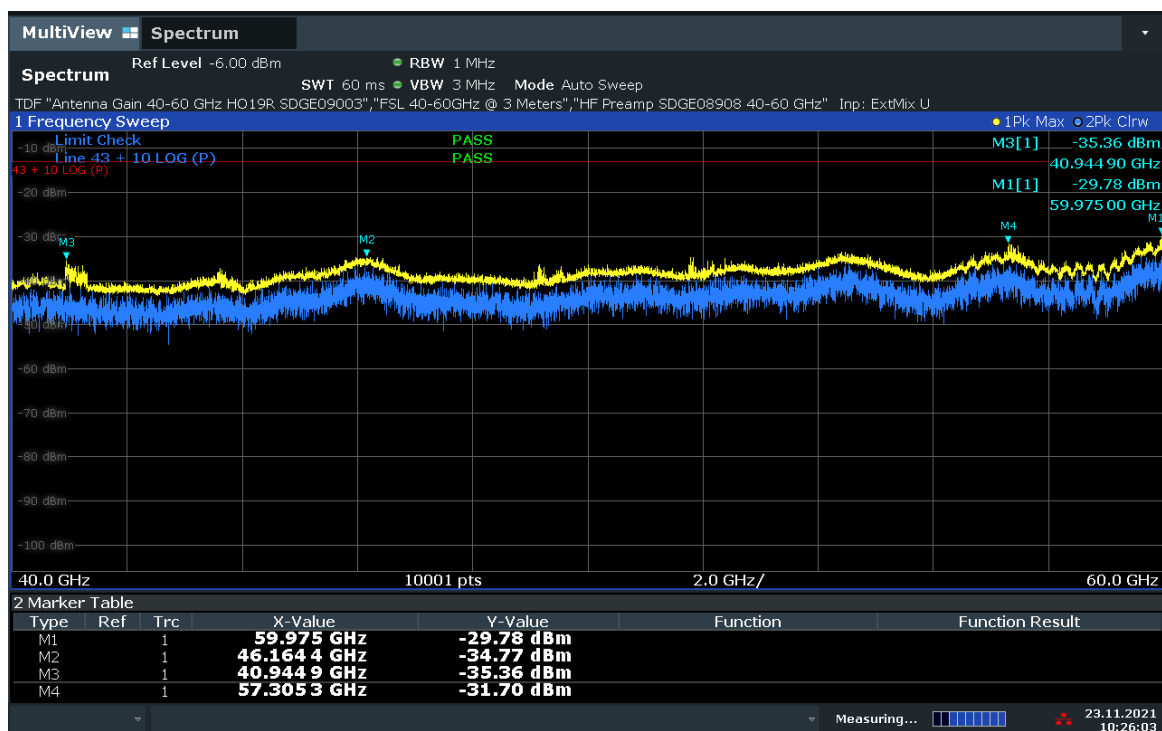
Frequency (MHz)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26802.794999	34.51	84.40	49.89	1000.0	1000.000	214.0	V	60.0	3
29161.938845	34.97	84.40	49.43	1000.0	1000.000	175.0	H	232.0	3
33140.539615	36.17	84.40	48.23	1000.0	1000.000	132.0	H	0.0	6
33215.556538	36.20	84.40	48.2	1000.0	1000.000	175.0	H	48.0	6
33334.948847	36.77	84.40	47.63	1000.0	1000.000	138.0	H	42.0	7
36611.168077	37.89	84.40	46.51	1000.0	1000.000	125.0	V	130.0	8
38082.802308	37.70	84.40	46.7	1000.0	1000.000	221.0	H	116.0	8

2.3.19 40GHz to 100GHz Maximized Plots



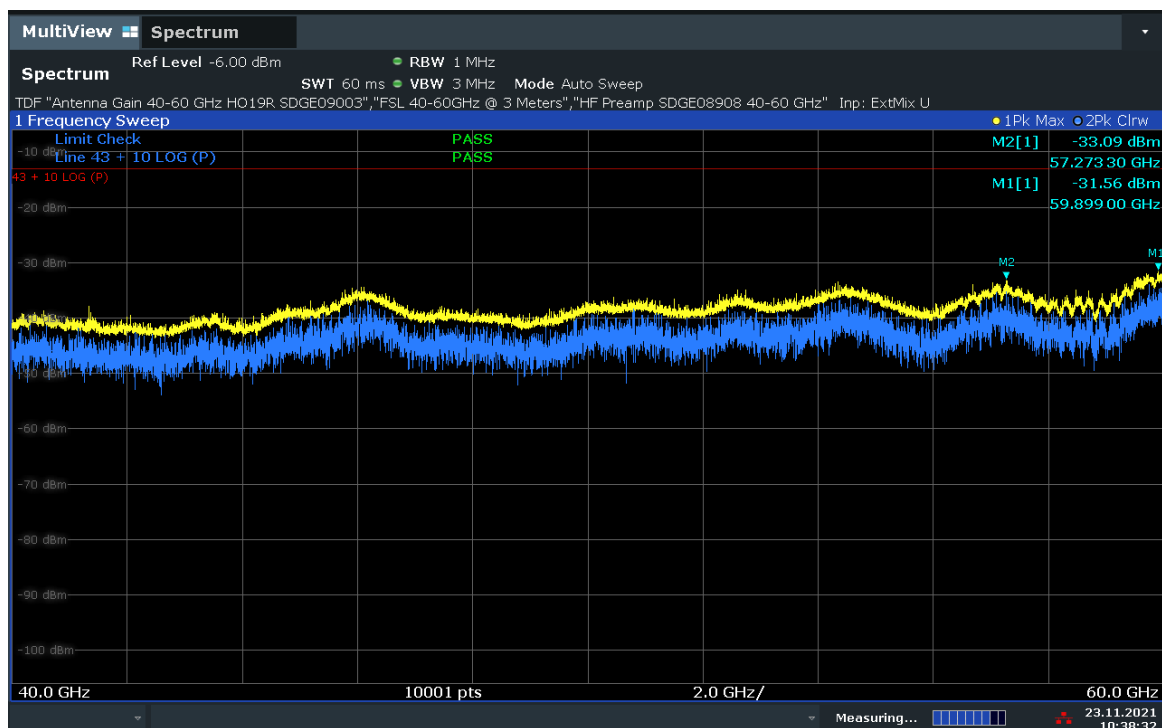
10:14:41 23.11.2021

40GHz to 60GHz Plot (Low Channel)



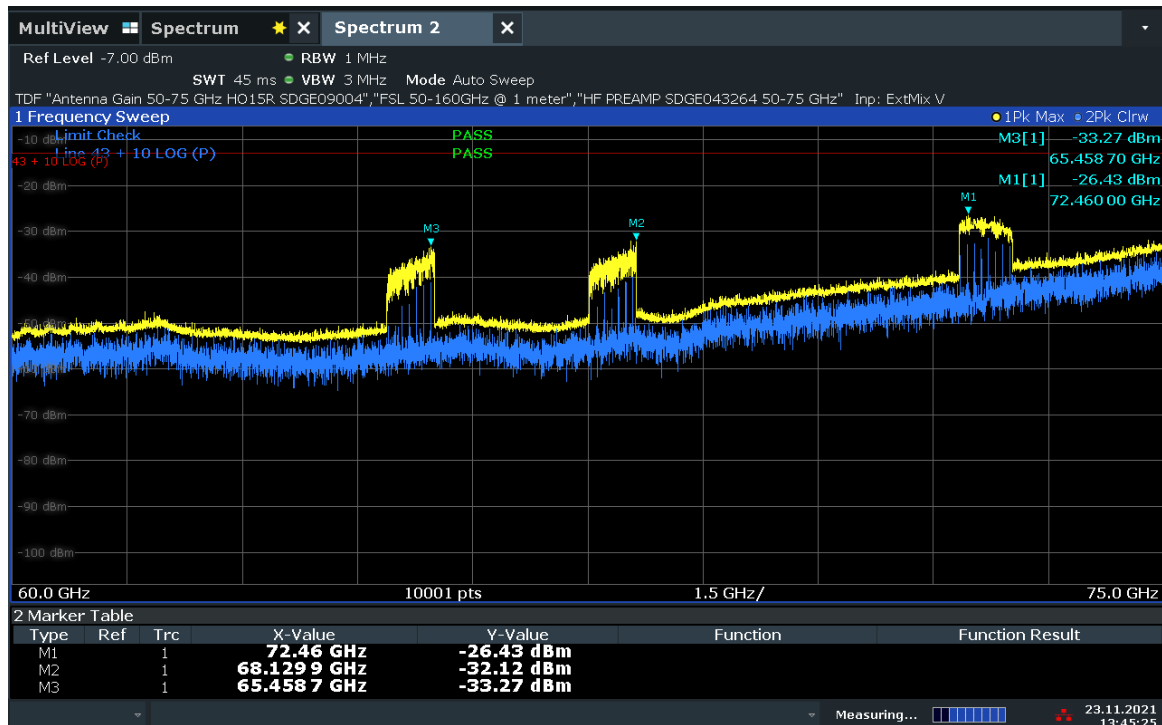
10:26:03 23.11.2021

40GHz to 60GHz Plot (Middle Channel)



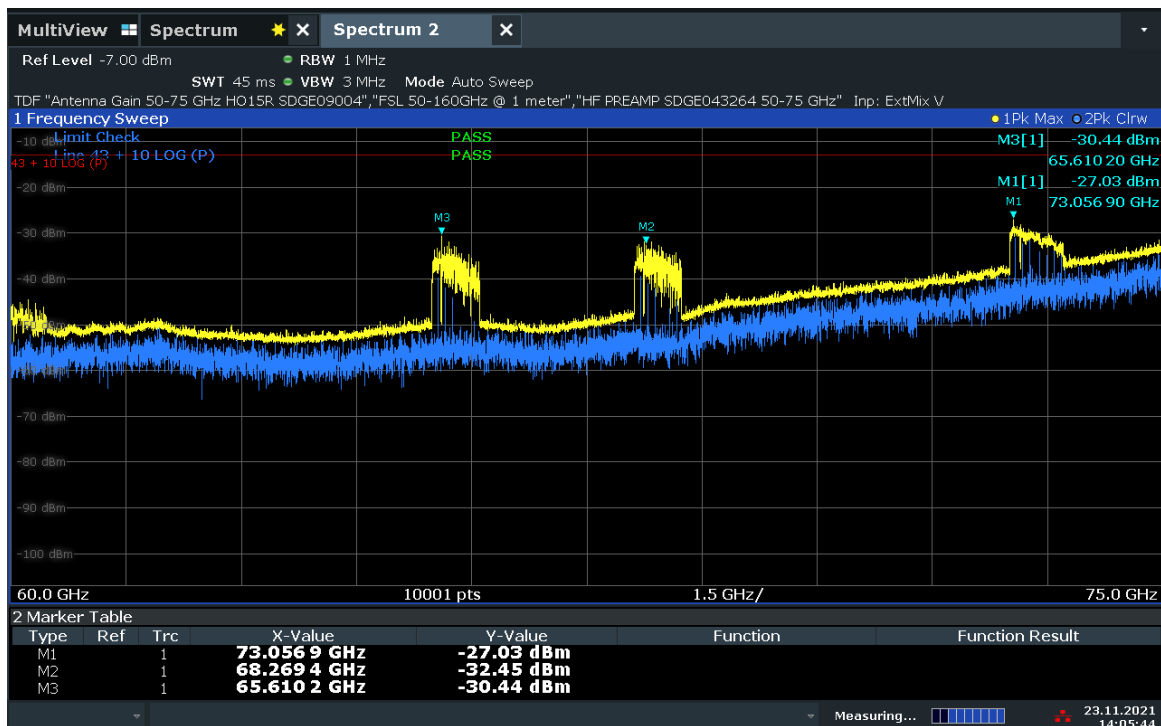
10:38:33 23.11.2021

40GHz to 60GHz Plot (High Channel)



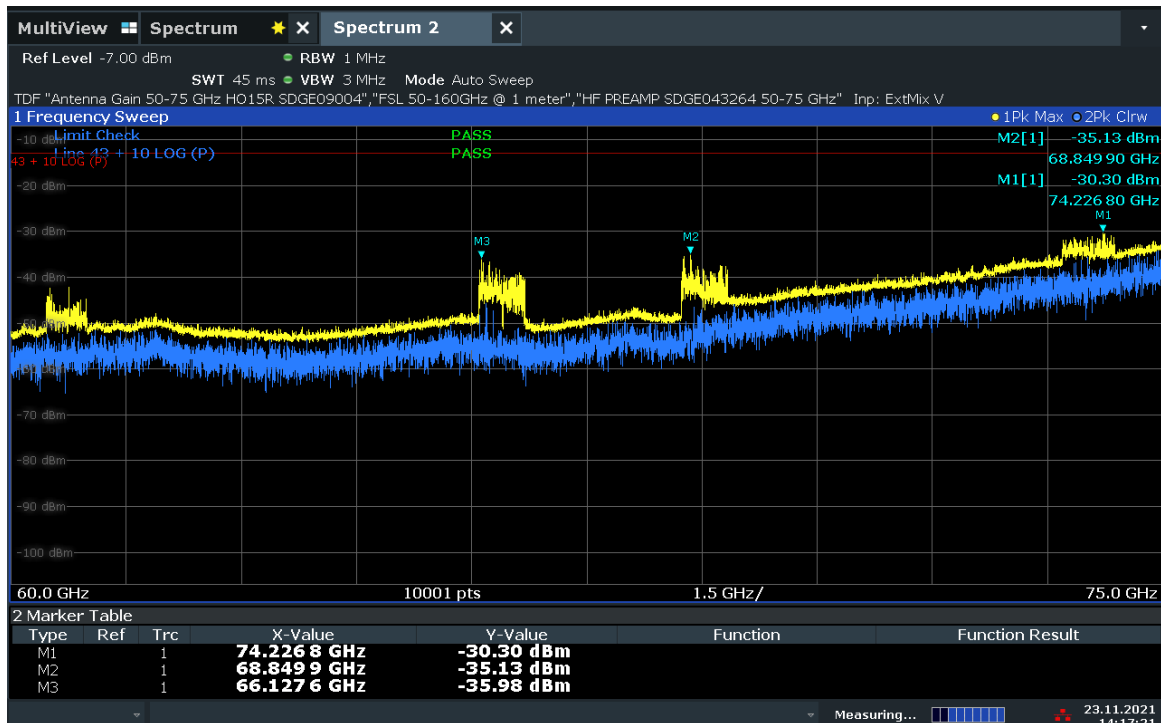
13:45:26 23.11.2021

60GHz to 75GHz Plot (Low Channel)



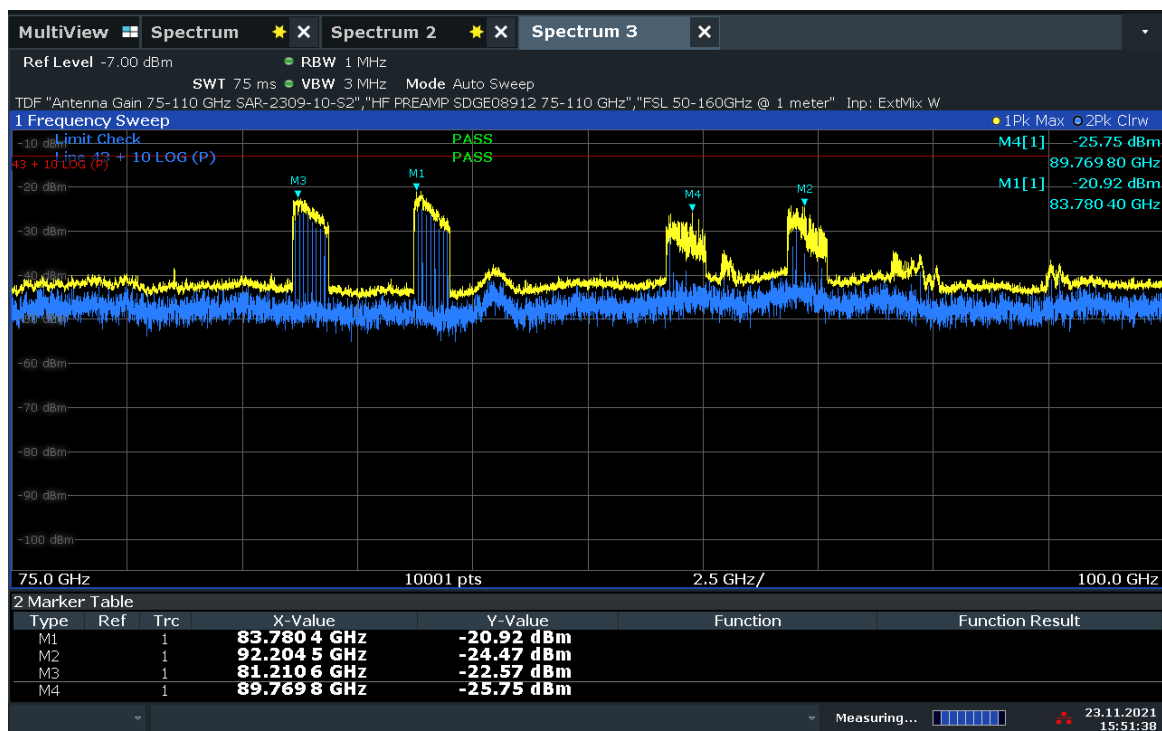
14:05:45 23.11.2021

60GHz to 75GHz Plot (Middle Channel)



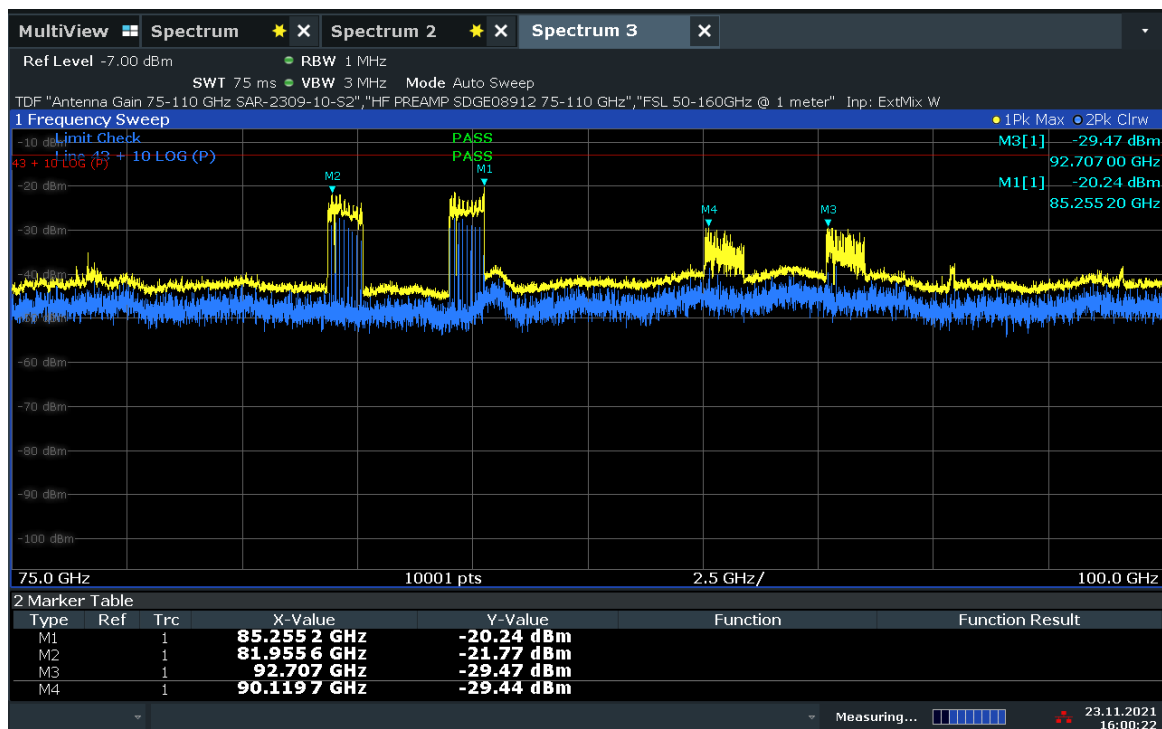
14:17:22 23.11.2021

60GHz to 75GHz Plot (High Channel)



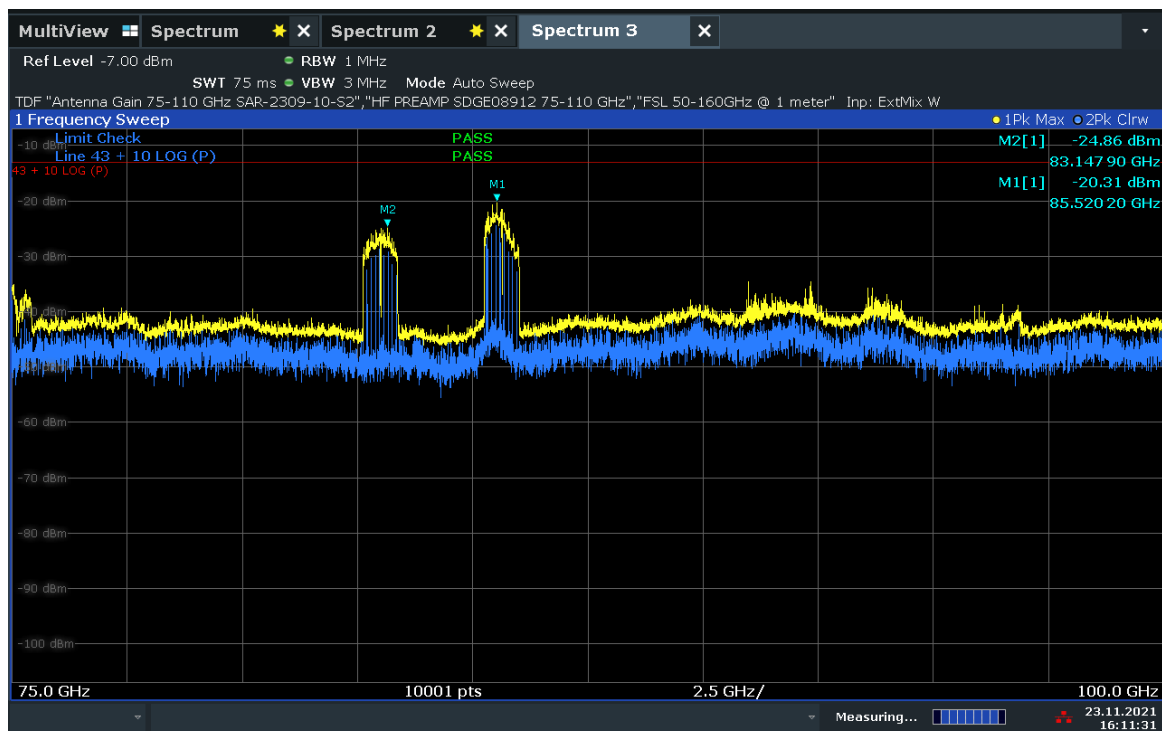
15:51:39 23.11.2021

75GHz to 100GHz Plot (Low Channel)



16:00:22 23.11.2021

75GHz to 100GHz Plot (Middle Channel)



16:11:32 23.11.2021

75GHz to 100GHz Plot (High Channel)



2.4 OCCUPIED BANDWIDTH

2.4.1 Specification Reference

FCC 47 CFR Part 2, Clause 2.1049

2.4.2 Standard Applicable

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

2.4.3 Equipment Under Test and Modification State

Serial No: X00330153 / Default Test Configuration

2.4.4 Date of Test/Initial of test personnel who performed the test

November 21, 2019 / FSC

2.4.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Mira Mesa facility

Ambient Temperature	25.4 °C
Relative Humidity	44.7 %
ATM Pressure	99.6 kPa

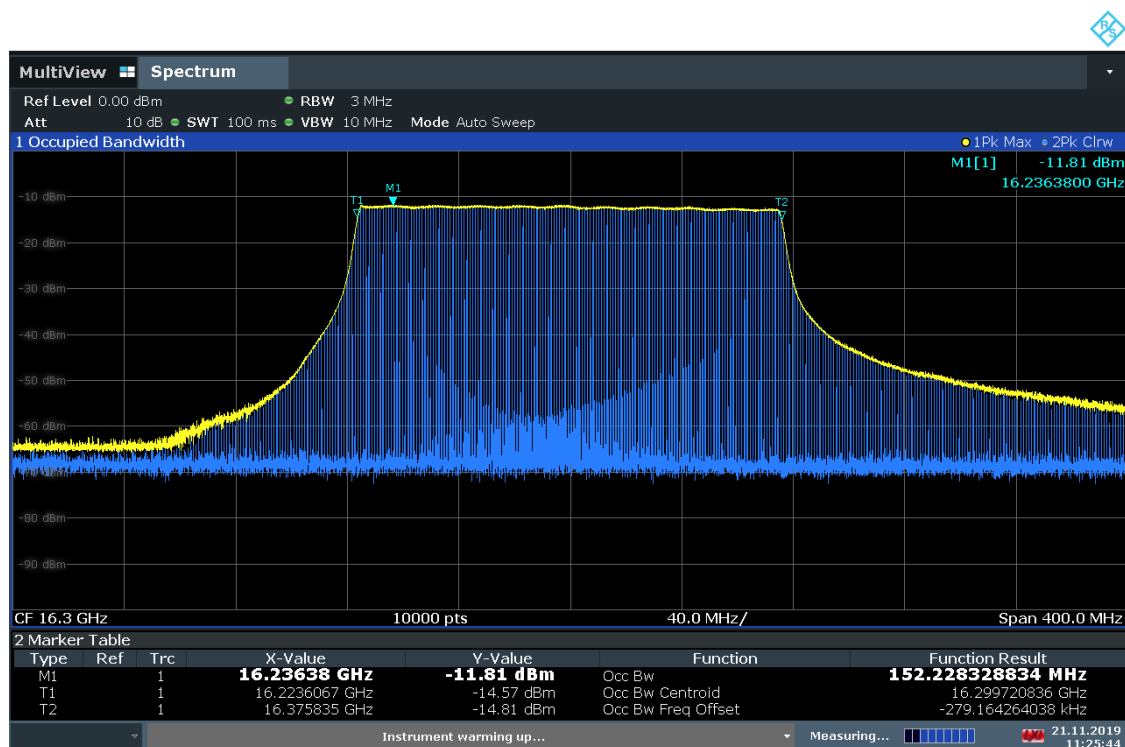
2.4.7 Additional Observations

- This is a radiated test.
- This is a radiated test utilizing a spectrum analyser.
- The attenuation for the external attenuator, adapter and cable is measured and entered as a Transducer factor (TDF).
- Occupied bandwidth measurement function of the spectrum analyser was utilized for this test.
- Span is wide enough to capture the channel transmission.
- RBW is 1% to 5% of the occupied bandwidth.
- VBW is >3 X RBW.
- Sweep is auto.
- Detector is peak.
- Trace is max hold.

2.4.8 Test Results Table (for reference only)

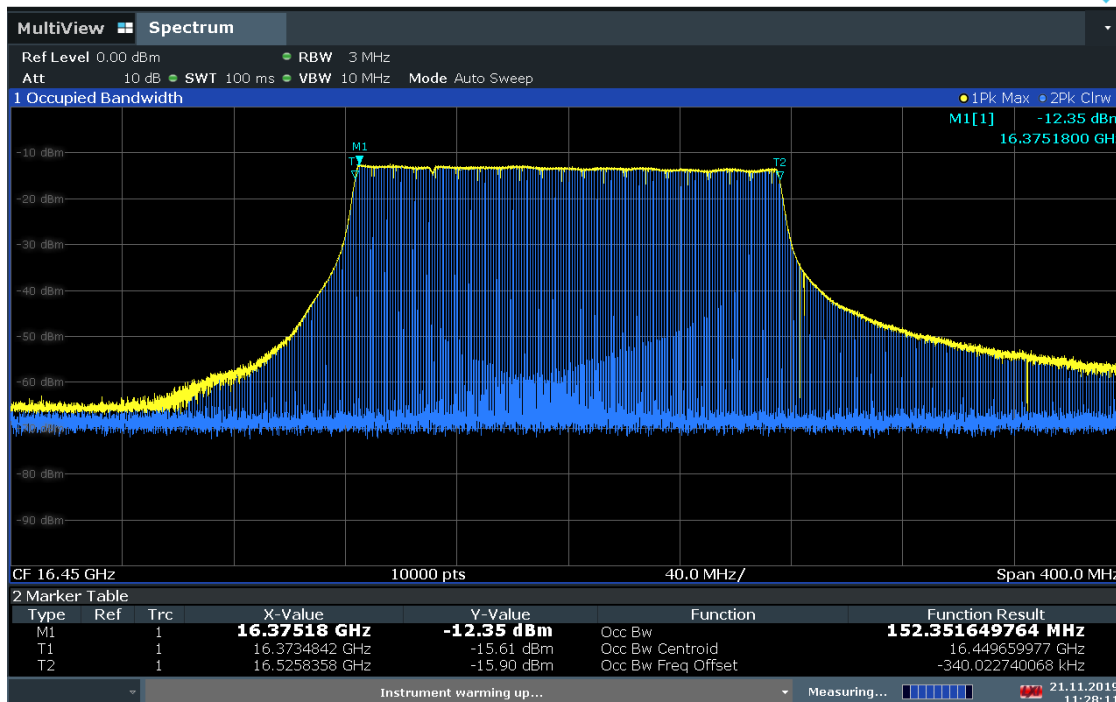
Channel	Center Frequency (GHz)	99% OBW (MHz)
Low	16.30	152.23
Mid	16.45	152.35
High	16.60	152.42

2.4.9 Test Result Plots



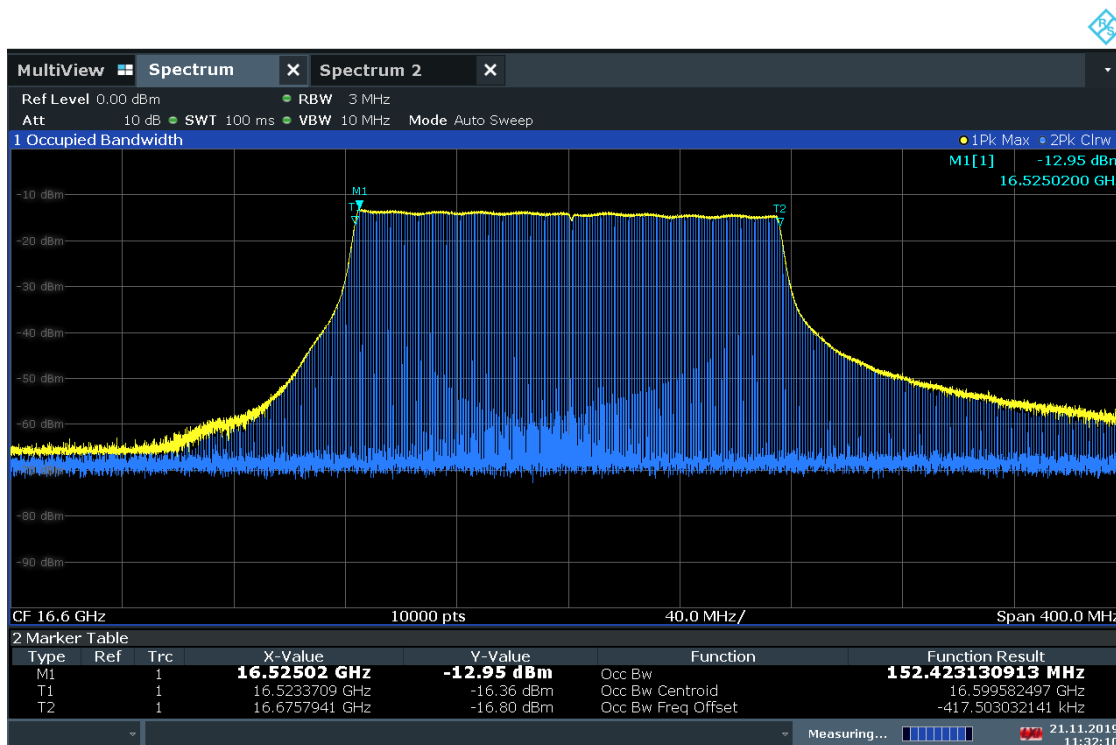
11:25:45 21.11.2019

Center Frequency @ 16.30GHz



11:28:13 21.11.2019

Center Frequency @ 16.45GHz



11:32:10 21.11.2019

Center Frequency @ 16.60GHz

2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC 47 CFR Part 90, Clause 90.213

2.5.2 Standard Applicable

(a) Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as specified in the following table:

Frequency Range (MHz)	Fixed and base station	Mobile Stations	
		>2 watts output power	<2 watts output power
Above 2450 ¹⁰	-	-	-

¹⁰Except for DSRCS equipment in the 5850-5925 MHz band, frequency stability is to be specified in the station authorization. Frequency stability for DSRCS equipment in the 5850-5925 MHz band is specified in subpart M of this part.

2.5.3 Equipment Under Test and Modification State

Serial No: X00330153 / Default Test Configuration

2.5.4 Date of Test/Initial of test personnel who performed the test

November 20 and 21, 2019 / FSC

2.5.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature	24.4 – 25.6 °C
Relative Humidity	43.1 – 44.7 %
ATM Pressure	97.9 – 98.9 kPa

2.5.7 Additional Observations

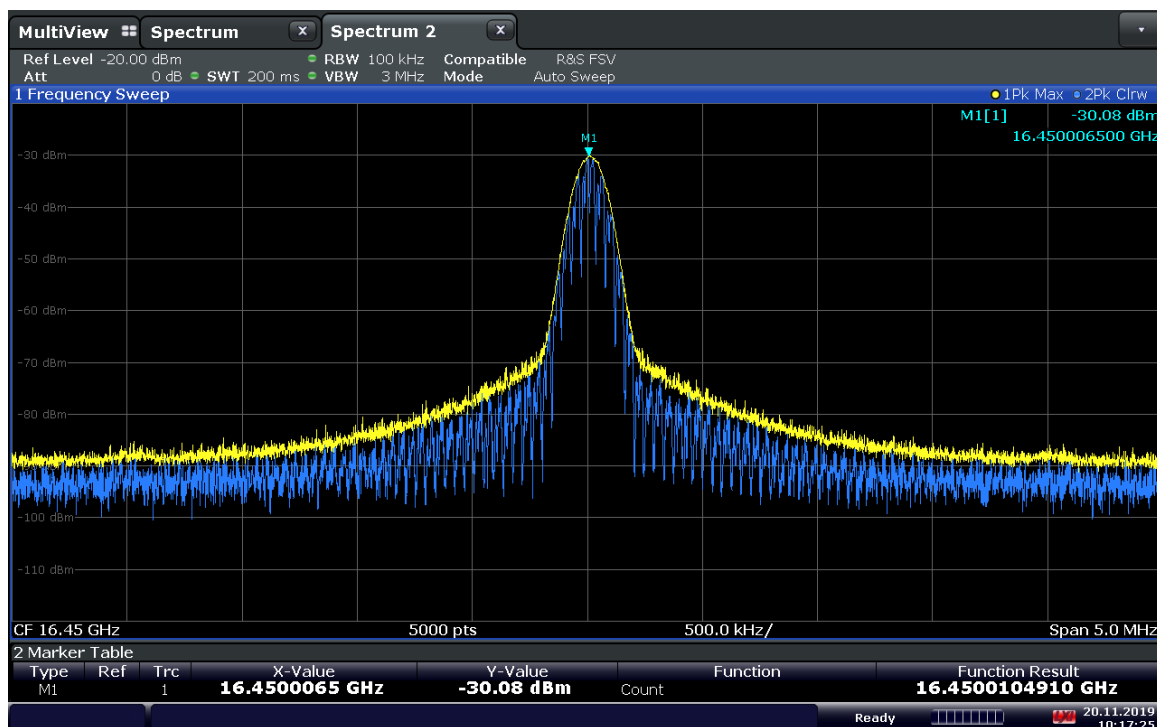
- This is a radiated test utilizing the spectrum analyser marker signal count function.
- Test Methodology is per Section 5.6 and Annex A A.2.9.7 of ANSI C63.26-2015.
- The EUT is in CW mode for this test.
- Nominal voltage was declared at 24VDC.

2.5.8 Test Result Table

Temperature (°C)	Frequency (MHz)	ppm
50°C	16,450,006.50	-0.24
40°C	16,450,005.50	-0.18
30°C	16,450,014.50	-0.73
20°C	16,450,002.50	0.00
10°C	16,450,017.50	-0.91
0°C	16,449,997.50	0.30
-10°C	16,449,995.50	0.43
-20°C	16,450,004.50	-0.12
-30°C	16,450,002.50	0.00
85% of Nominal Voltage	16,450,007.50	-0.30
115% of Nominal Voltage	16,449,998.50	0.24
Nominal Voltage	16,450,002.50	0.00

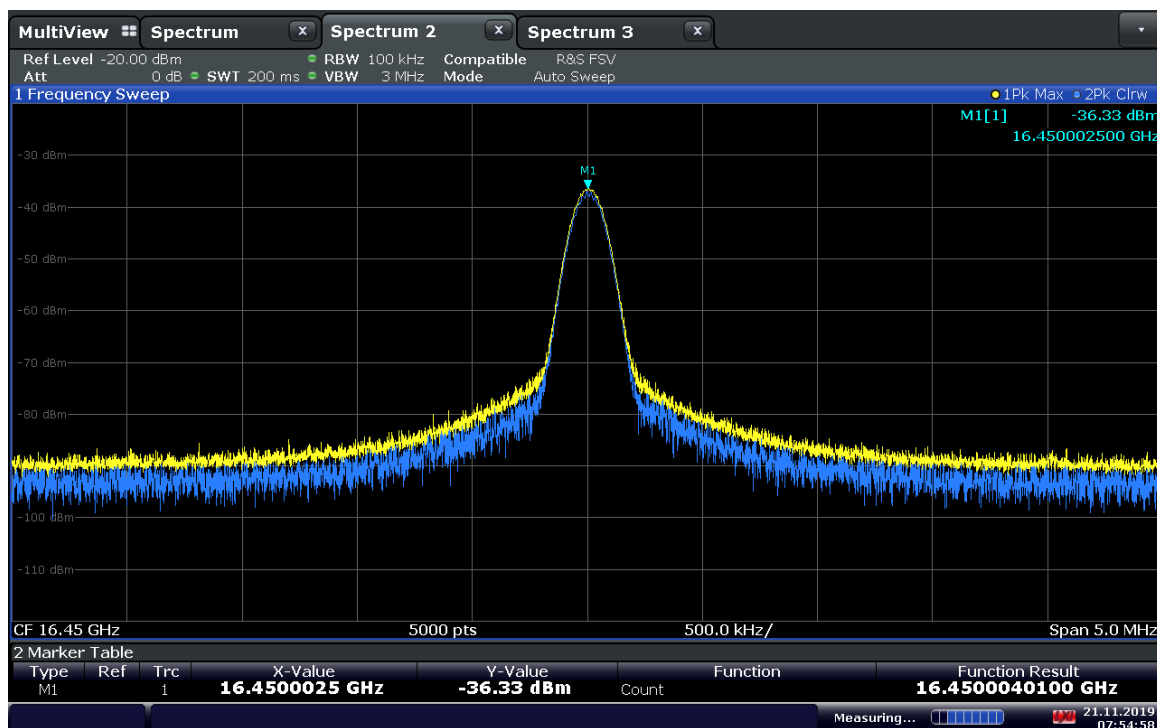
NOTE—Parts per million (ppm) is obtained as the difference from the reference frequency (in Hz) divided by the reference frequency (in MHz).

2.5.9 Sample Test Plots



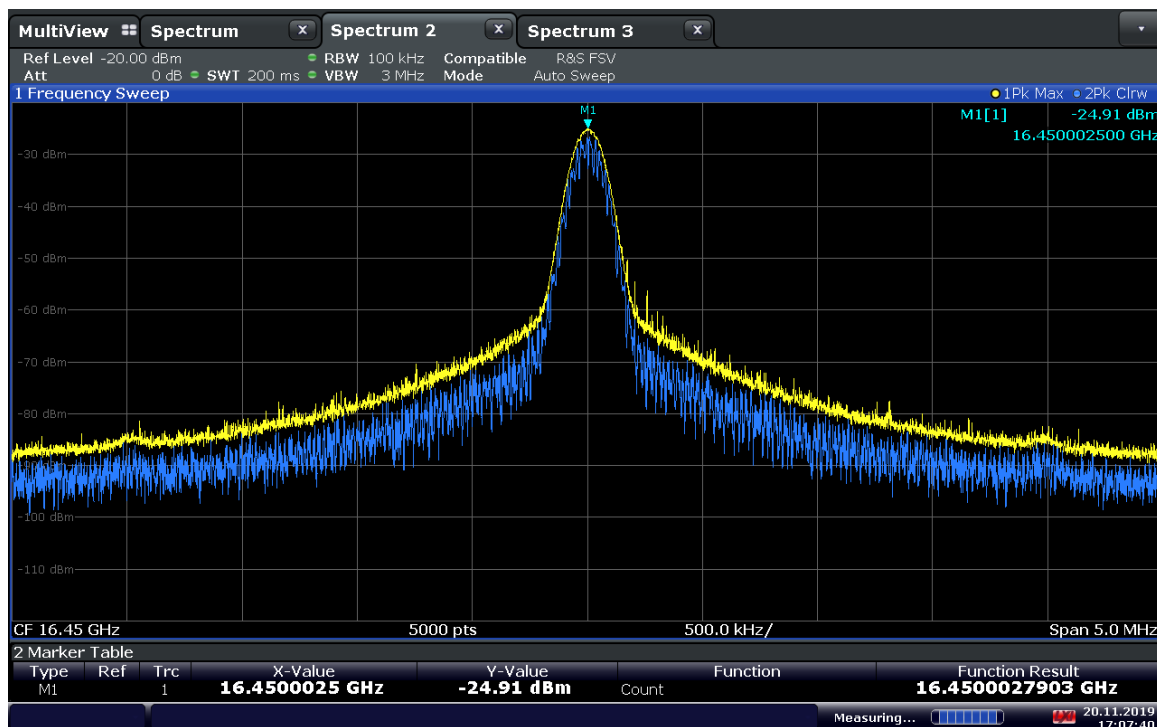
10:17:26 20.11.2019

Frequency Stability @ 50°C



07:54:58 21.11.2019

Frequency Stability @ 20°C (Nominal Voltage)



17:07:40 20.11.2019

Frequency Stability @ -30°C



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Radiated Emission						
1049	EMI Test Receiver	ESU40	100133	Rohde & Schwarz	10/01/21	10/01/22
7611	Signal/Spectrum Analyzer	FSW26	102017	Rohde & Schwarz	02/02/21	02/02/22
1002	Bilog Antenna	3142C	0058717	EMCO	10/21/21	10//21/23
1003	Signal Generator	SMR-40	1104.0002.40	Rhode & Schwarz	11/17/21	11/17/22
7631	Double-ridged waveguide horn	3117	00205418	ETS-Lindgren	09/16/20	09/16/22
46797	Preamplifier	PA-122	181925	Com Power	10//11/21	10/11/22
9001	Horn antenna (18-26.5GHz)	HO42S	101	Custom Microwave	09/23/21	09/23/23
9002	Horn antenna (26-40 GHz)	HO28S	102	Custom Microwaves	09/23/21	09/23/23
40815	Pre-amplifier (18-40 GHz)	19D18	15G27	Spacek Labs	10/11/21	10/11/22
7637	Harmonics mixer (40-60 GHz)	FS-Z60	100009	Rhode & Schwarz	07/29/20	07/29/23
7636	Harmonics mixer (60-90 GHz)	FS-Z90	100092	Rhode & Schwarz	07/29/20	07/29/23
7633	Harmonics mixer (75-110 GHz)	HM-110-7	101000	Radiometer Physics	02/22/21	07/29/23
9003	Horn antenna (40-60 GHz)	HO19R	103	Custom Microwaves	10/14/19	07/29/23
9004	Horn antenna (50-75 GHz)	HO15R	104	Custom Microwaves	10/10/19	07/29/23
7628	Horn antenna (75-110 GHz)	SAR-2309-10-S2	13481-01	Sage Millimeter, Inc.	Verified by 8861 and 8915	
8872	Direct Reading Attenuator (40-60)	STA-60-19-D1	11875-01	Sage Millimeter, Inc.	Verified by 7611 and corresponding antenna/mixer combination	
8860	Direct Reading Attenuator (50-75)	STA-60-15-D1	11466-01	Sage Millimeter, Inc.		
8861	Direct Reading Attenuator (75-110)	STA-60-10-D1	11466-01	Sage Millimeter, Inc.		
8919	Direct Reading Attenuator (90-140)	STA-60-08-D1	12605-01	Sage Millimeter, Inc.		
8873	Active Multiplier (40-60 GHz)	AMC-19-RFH00	124	Millitech, Inc.		
8914	Active Multiplier (50-75 GHz)	AMC-15-RFH00	283	Millitech, Inc.		
8915	Active Multiplier (75-110 GHz)	AMC-10-RFH00	606	Millitech, Inc.		
8920	Active Multiplier (90-140 GHz)	AMC-08-RFH00	58	Millitech, Inc.		



ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Miscellaneous						
43003	True RMS Multimeter	85 III	69880143	Fluke	10/23/20	10/23/21
7579	Temperature Chamber	115	151617	TestQuity	09/09/19	09/09/20
11312	Mini Environmental Quality Meter	850027	CF099-56010-340	11312	05/22/20	05/22/21
6726	Temp/Humidity Sensor	RTRH	16248370	Dickson	06/18/20	06/18/21
-	Test Software	EMC32	V10.50.40	Rhode & Schwarz	N/A	

Note: Test equipment listed in this table were verified within its calibration cycle when used.

3.2 Measurement Uncertainty

Calculation of Measurement Uncertainty per CISPR 16-4-2:2011 with Corr. 1

3.2.1 Radiated Measurements (Below 1GHz)

	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.20 dB	Normal, k=2	2.000	0.10	0.01
3	Antenna factor AF	0.58 dB	Normal, k=2	2.000	0.38	0.08
4	Receiver sinewave accuracy	0.15 dB	Normal, k=2	2.000	0.23	0.01
5	Receiver pulse amplitude	1.50 dB	Rectangular	1.732	0.87	0.75
6	Receiver pulse repetition rate	1.50 dB	Rectangular	1.732	0.87	0.75
7	Noise floor proximity	0.50 dB	Rectangular	1.732	0.29	0.08
8	Mismatch: antenna-receiver	0.95 dB	U-shaped	1.414	0.67	0.45
9	AF frequency interpolation	0.30 dB	Rectangular	1.732	0.17	0.03
10	AF height deviations	0.10 dB	Rectangular	1.732	0.06	0.00
11	Directivity difference at 3 m	3.12 dB	Rectangular	1.732	1.80	3.24
12	Phase center location at 3 m	1.00 dB	Rectangular	1.732	0.58	0.33
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	0.00 dB	Rectangular	1.732	0.00	0.00
15	Site imperfections	3.99 dB	Triangular	2.449	1.54	2.65
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.57 dB	Rectangular	1.732	0.44	0.11
18	Table height at 3 m	0.10 dB	Normal, k=2	2.000	0.05	0.00
19	Near-field effects	0.00 dB	Triangular	2.449	0.00	0.00
20	Effect of ambient noise on OATS	0.00 dB				0.00
Combined standard uncertainty			Normal	2.97 dB		
Expanded uncertainty			Normal, k=2	5.94 dB		



3.2.2 Radiated Emission Measurements (Above 1GHz)

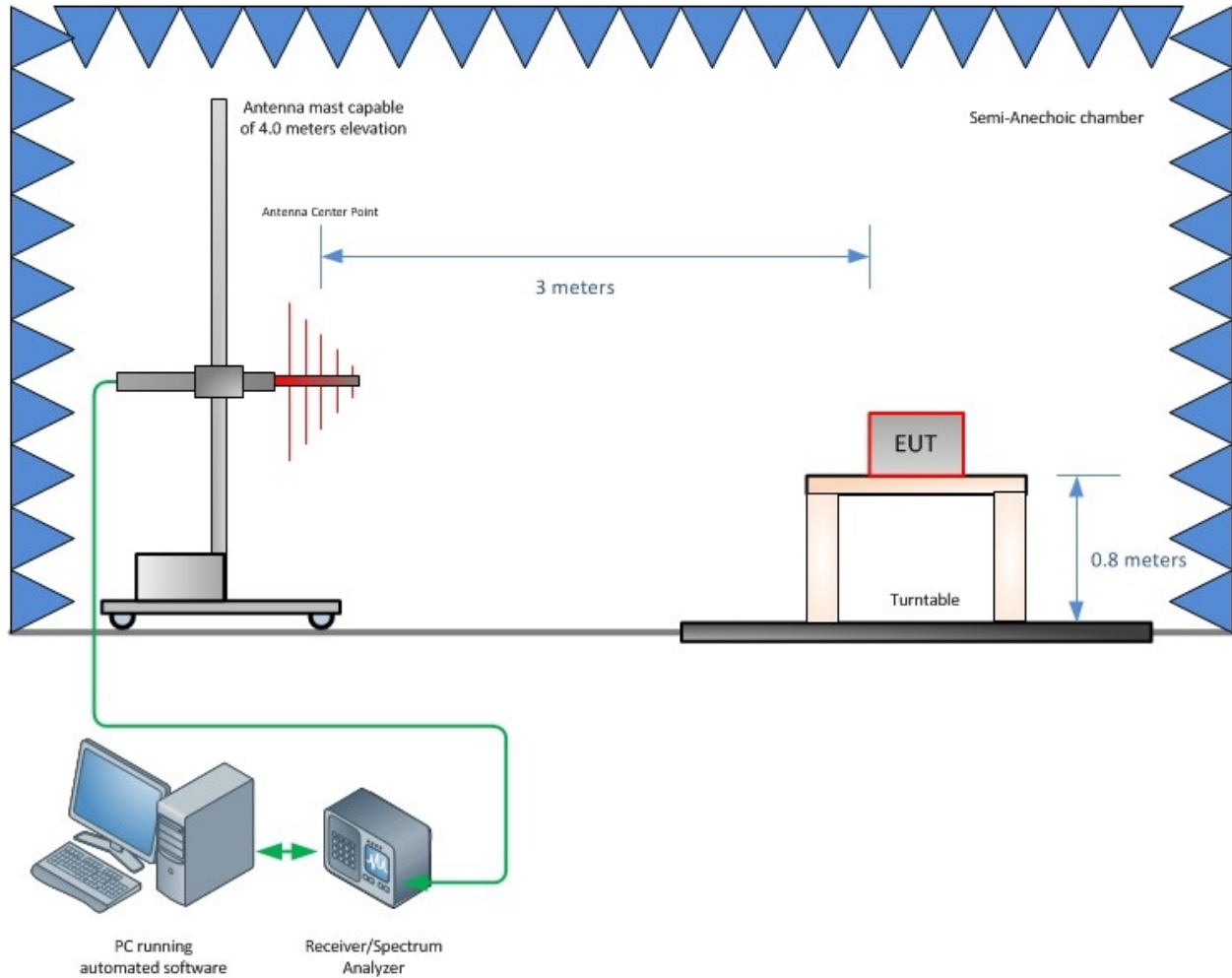
	Input Quantity (Contribution) X_i	Value	Prob. Dist.	Divisor	$u_i(x)$	$u_i(x)^2$
1	Receiver reading	0.10 dB	Normal, k=1	1.000	0.10	0.01
2	Attenuation: antenna-receiver	0.30 dB	Normal, k=2	2.000	0.10	0.02
3	Antenna factor AF	0.20 dB	Normal, k=2	2.000	0.38	0.01
4	Receiver sinewave accuracy	0.47 dB	Normal, k=2	2.000	0.23	0.06
5	Receiver pulse amplitude	0.15 dB	Rectangular	1.732	0.87	0.01
6	Receiver pulse repetition rate	1.21 dB	Rectangular	1.732	0.87	0.49
7	Noise floor proximity	0.70 dB	Rectangular	1.732	0.29	0.16
8	Mismatch: antenna-receiver	1.41 dB	U-shaped	1.414	0.67	0.99
9	AF frequency interpolation	1.30 dB	Rectangular	1.732	0.17	0.85
10	AF height deviations	0.30 dB	Rectangular	1.732	0.06	0.03
11	Directivity difference at 3 m	1.50 dB	Rectangular	1.732	1.80	0.75
12	Phase center location at 3 m	0.30 dB	Rectangular	1.732	0.58	0.03
13	Cross-polarisation	0.90 dB	Rectangular	1.732	0.52	0.27
14	Balance	5.91 dB	Rectangular	1.732	0.00	1.21
15	Site imperfections	1.57 dB	Triangular	2.449	1.33	0.82
16	Separation distance at 3 m	0.30 dB	Rectangular	1.732	0.17	0.03
17	Effect of setup table material	0.00 dB	Rectangular	1.732	0.44	0.00
18	Table height at 3 m	0.10 dB	Normal, k=2	2.000	0.05	0.01
19	Near-field effects	0.30 dB	Triangular	2.449	0.00	0.02
20	Effect of ambient noise on OATS	0.20 dB				0.01
Combined standard uncertainty			Normal	2.39	dB	
Expanded uncertainty			Normal, k=2	4.79	dB	



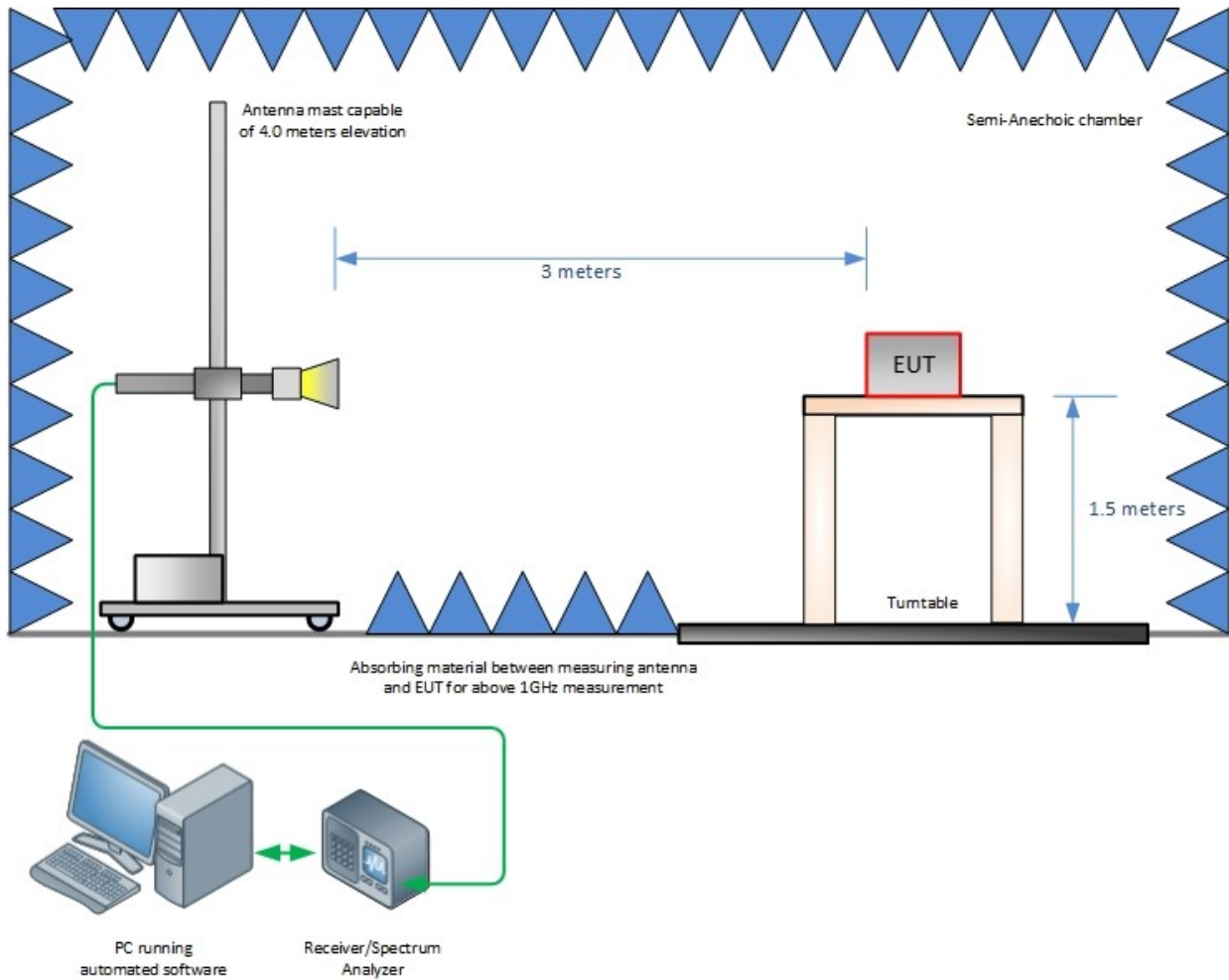
SECTION 4

Diagram of Test Setup

4.1 TEST SETUP DIAGRAM

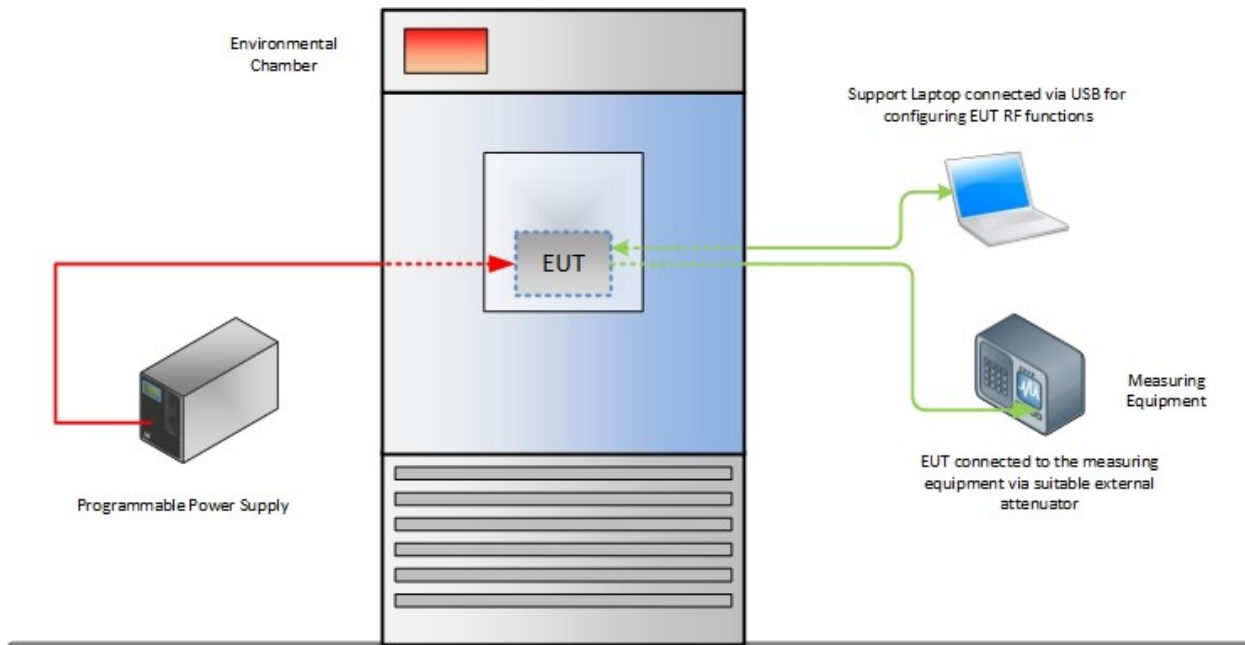


Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)

Refer to Section 2.3.7 for frequencies above 40GHz



Frequency Stability Test Configuration



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 Accreditation, Disclaimers and Copyright

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