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Certificate: 1152.01

Date: 22 August 2022

I.T.L. (PRODUCT TESTING) LTD.
FCC/IC Radio Test Report

for

Amimon Ltd.

Equipment under test:

Wireless Video Transmission Module

AMNPTTX01

Tested by: _____
M. Zohar

Approved by: _____
I. Mansky

I. Cohen: pp _____

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Measurement/Technical Report for

Amimon Ltd.

Wireless Video Transmission Module

AMNPTTX01

FCC ID: VQSAMNPTTX01

IC: 7680A-AMNPTTX01

This report concerns: Class II Permissive Change

Equipment type: FCC: Unlicensed National Information (UNII)
Infrastructure: TX
ISED: WLAN

Limits used: 47CFR15, Part 15, Subpart E, Section 15.407
RSS-247, Issue 2, February 2017, Section 5
RSS-Gen, Issue 5, April 2018, AMD1:2019, AMD2:2021

Measurement procedure used: KDB 789033 D02 v02, ANSI C63.10:2013
RSS-Gen, Issue 5, April 2018.

Certification application prepared by:
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Table of Contents

1 General Information

1.1 Administrative Information

Manufacturer:	Amimon Ltd.
Manufacturer's Address:	26 Zarhin St., Ra'anana 4366250, Israel
Manufacturer's Representative	Gabi Nocham
Equipment Under Test (E.U.T):	Wireless Video Transmission Module
Equipment PMN:	AMNPTTX01
Equipment Serial No.:	Not designated
Equipment HVIN:	AMN7.5.11
Equipment FVIN:	N/A
Date of Receipt of E.U.T:	August 23, 2021
Start of Test:	August 23, 2021
End of Test:	May 04, 2022
Test Laboratory and Location:	I.T.L. (Product Testing) Ltd. 1 Bat Sheva St., Lod 7110603, Israel

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), FCC Designation No. IL1005.
3. Department of Innovation, Science and Economic Development (ISED) Canada, CAB identifier: IL1002

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 Product Description

The E.U.T. provides high-end, high performance, wireless HD video transmission that operates in challenging unmanned environment.

The AMNPTTX01 is the video source unit, which is connected to a camera to capture video signals and to transmit these signals to its companion device, like the AMN42012 thus creating a wireless video link at the 5GHz band.

Supply Voltage Range	$5V_{DC}$ ± 10%
Mode of operation	Transceiver, two ports
Modulations	OFDM
Assigned Frequency Range	5150-5250 MHz, 5250-5350 MHz, 5470-5725 MHz, 5725-5850 MHz
Operating Frequency Range	5150-5250 MHz, 5250-5350 MHz, 5470-5725 MHz, 5725-5850 MHz
Total transmit power (conducted)	~22.0dBm
Antenna Gain	2.0dBi (dipole)
Modulation BW	20/40 MHz

1.4 Test Methodology

Both conducted and radiated emissions testing were performed according to the procedures in KDB 789033 D02 v02, ANSI C63.10: 2013, RSS-247, Issue 2, February 2017, Section 5, and RSS-Gen, Issue 5, April 2018, AMD1:2019, AMD2:2021.

Radiated emissions testing was performed at an antenna-to-EUT distance of three meters.

1.5 Test Facility

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by the A2LA, certificate No. 1152.01. Its FCC Designation Number is IL1005.

1.6 Measurement Uncertainty

Conducted Emission
Conducted Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4)

0.15 – 30 MHz:
Expanded Uncertainty (95% Confidence, K=2): ± 3.44 dB

Radiated Emission
Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site:

30-1000MHz:
Expanded Uncertainty (95% Confidence, K=2): ± 4.96 dB

1 GHz to 6 GHz
Expanded Uncertainty (95% Confidence, K=2): ±5.19 dB

>6 GHz
Expanded Uncertainty (95% Confidence, K=2): ±5.51 dB

2 System Test Configuration

2.1 Justification

1. The E.U.T. is an approved UNII 1,2 3 transceiver module (FCC ID: VQSAMNPTTX01; IC: 7680A-AMNPTTX01) using 20 MHz or 40 MHz BWs.
2. This report's purpose is to check C2PC compliance. The rational for C2PC is as follows:

   a. Adding the usage of UNII2 C frequencies at 5710 MHz for the 40 MHz BW, and 5720 MHz for 20 MHz BW.

   b. Re-arranging the channels at UNII3 for 40MHz and 20 MHz BW. Full tests were done on the band's lowest and highest frequencies. As the middle frequency was covered in the original grant, only power and radiated emissions were tested for verification purpose.

   c. Update the test reports to RSS-247 Issue 2: 2017 for UNII2 and UNII3, regarding power and emissions - output power is generally lower than what appears in the original reports. Radiated emissions were repeated on the edges to confirm compliance with the tested power.

   d. Adding variants under the same Grant with identical RF sections.
3. The following is our suggested test procedure:
   - UNII2:
     - Full tests at frequencies 5710MHz/40MHz BW and 5720MHz/20MHz BW
     - Power measurements at the test frequencies of:
       - 40MHz: 5270MHz, 5310MHz, 5510MHz, 5670MHz
       - 20MHz: 5260MHz, 5280MHz, 5320MHz, 5500MHz, 5580MHz
     - Radiated emissions and Band edge - at the worst-case antenna test frequencies:
       - 40MHz: 5310MHz, 5510MHz, 5670MHz
       - 20MHz: 5260MHz, 5500MHz, 5580MHz
   - UNII3:
     - Full tests at 5740, 5840, 5750, 5830 MHz, with both antenna types.
     - Power and emissions will be tested in the middle channel (5790MHz, 5780MHz) with the worst-case antenna.

2.2 EUT Exercise Software

No special exercise software was used.

2.3 Special Accessories

No special accessories were used

2.4 Equipment Modifications

No modifications were necessary in order to achieve compliance.

2.5 Configuration of Tested System

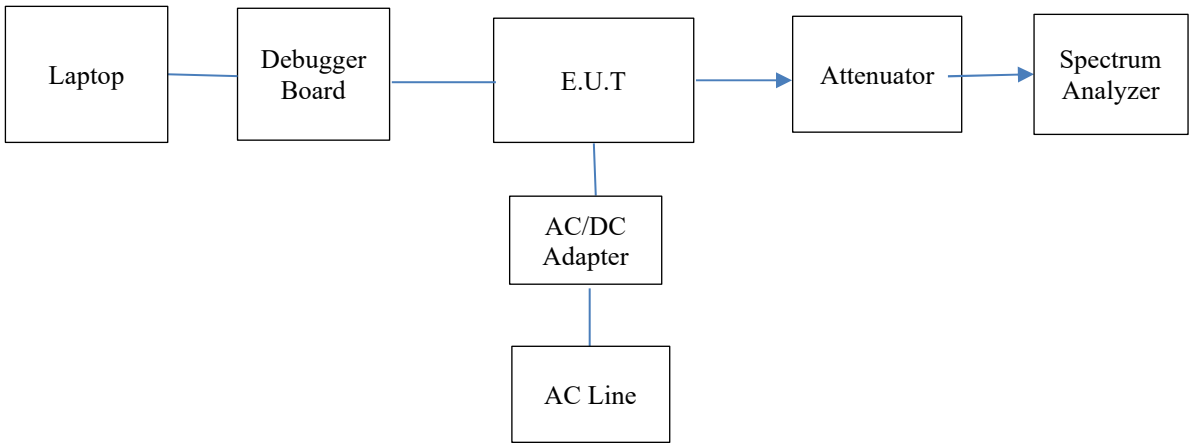


Figure 1. Configuration of Tested System - Conducted

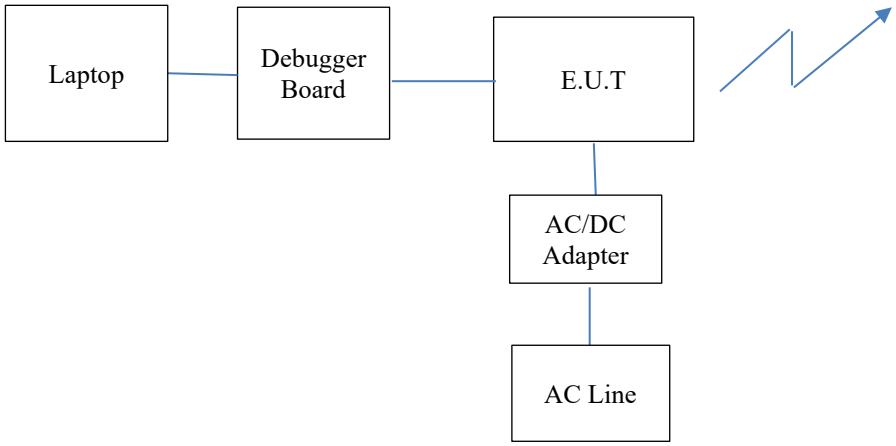


Figure 2. Configuration of Tested System - Radiated

3 Conducted and Radiated Measurement Test Setup Photos

See a separate file.

4 Conducted Emission from AC Mains

4.1 Test Specification

FCC Part 15, Subpart C, Section 15.207
RSS-Gen, Issue 5: 2018, Clause 8.8

4.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))

The E.U.T operation mode and test setup are as described in Section 2 of this report. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on a 0.8 meter high wooden table, 0.4 meter from the room's vertical wall. In the case of a floor-standing E.U.T., it was placed on the horizontal ground plane.

The E.U.T was powered from 115 V AC / 60 Hz via 50 Ohm / 50 µHn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T.

The center of the E.U.T.'s AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver and are displayed on the receiver's spectrum display.

The E.U.T was evaluated in TX operation mode.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

4.3 Test Limit

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

** Decreases with the logarithm of the frequency.*

4.4 Test Results

JUDGEMENT: Passed by -9.00 dB

The margin between the emission levels and the specification limit is, in the worst case, -16.99 dB for the phase line at 18.70 MHz, and -9.00 dB at 24.022 MHz for the neutral line.

The EUT met the FCC Part 15, Subpart C and RSS-Gen specifications requirements.

The details of the highest emissions are given in *Figure 3* to *Figure 6*.

Conducted Emission

E.U.T Description	Wireless Video Transmission Module
Type	AMNPTTX01
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C
	RSS-Gen, Issue 5, Clause 8.8
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC Adapter

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

	TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1	Quasi Peak	162 kHz	36.02	-29.33
1	Quasi Peak	214 kHz	32.80	-30.24
1	Quasi Peak	578 kHz	33.29	-22.70
2	Average	578 kHz	28.47	-17.52
1	Quasi Peak	734 kHz	30.63	-25.37
2	Average	734 kHz	25.13	-20.86
1	Quasi Peak	1.122 MHz	30.77	-25.22
2	Average	17.822 MHz	21.32	-28.67
2	Average	18.366 MHz	25.31	-24.68
2	Average	18.702 MHz	26.75	-23.24
1	Quasi Peak	18.918 MHz	31.22	-28.77
1	Quasi Peak	20.258 MHz	33.50	-26.50
2	Average	20.258 MHz	28.07	-21.93
1	Quasi Peak	20.81 MHz	30.33	-29.66
2	Average	20.81 MHz	25.02	-24.97
1	Quasi Peak	20.994 MHz	29.96	-30.03
2	Average	20.994 MHz	24.37	-25.62
2	Average	21.666 MHz	24.76	-25.24
1	Quasi Peak	24.022 MHz	35.27	-24.72
2	Average	24.022 MHz	35.66	-14.33

Date: 23.AUG.2021 17:06:42

Figure 3. Detectors: Peak, Quasi-peak, Average

Note: Delta Limit refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Wireless Video Transmission Module
Type	AMNPTTX01
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C; RSS-Gen, Issue 5, Clause 8.8
Lead:	Phase
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC Adapter

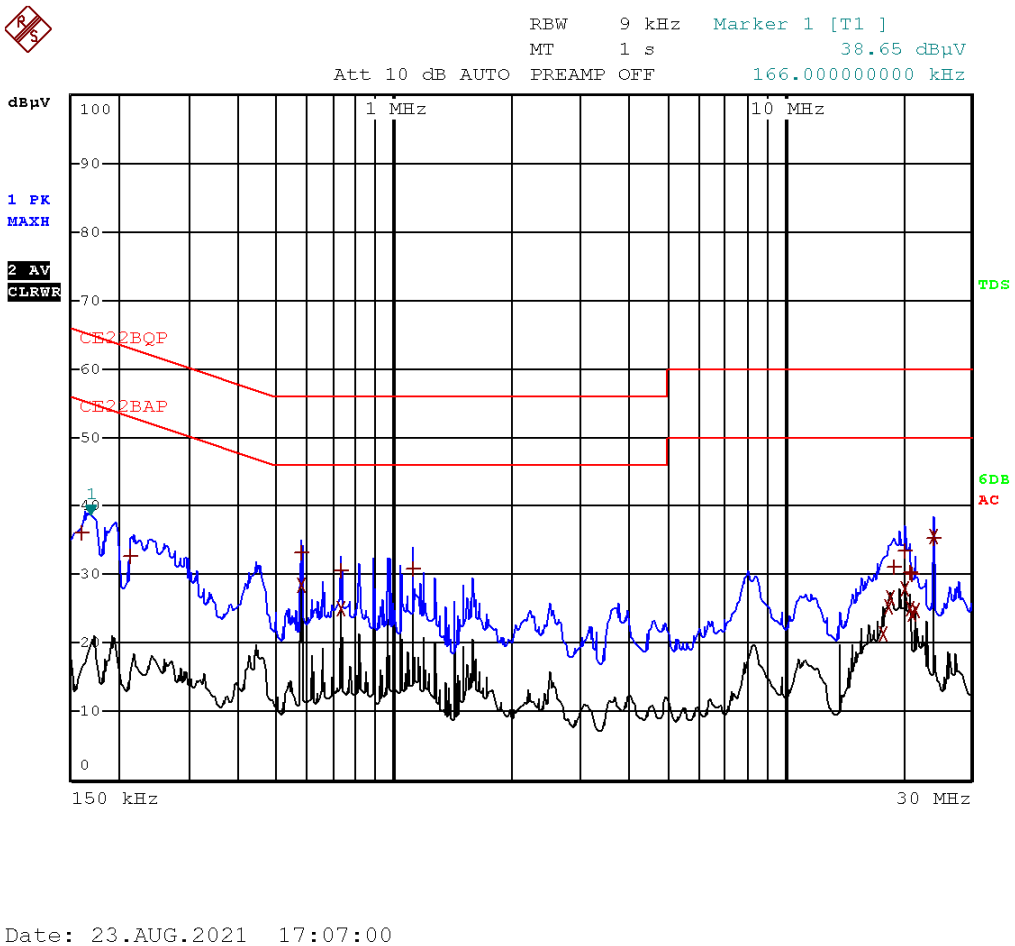


Figure 4. Detectors: Peak, Quasi-peak, Average

Conducted Emission

E.U.T Description	Wireless Video Transmission Module
Type	AMNPTTX01
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C; RSS-Gen, Issue 5, Clause 8.8
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC Adapter

EDIT PEAK LIST (Final Measurement Results)

Trace1: CE22BQP
Trace2: CE22BAP
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2	Average	13.942 MHz	29.82	-20.17
1	Quasi Peak	15.998 MHz	25.78	-34.21
1	Quasi Peak	16.674 MHz	26.35	-33.64
1	Quasi Peak	16.898 MHz	26.98	-33.01
1	Quasi Peak	16.922 MHz	25.67	-34.32
2	Average	17.894 MHz	30.85	-19.14
2	Average	18.022 MHz	31.49	-18.51
2	Average	18.246 MHz	29.95	-20.04
1	Quasi Peak	18.506 MHz	31.55	-28.44
2	Average	18.702 MHz	33.00	-16.99
1	Quasi Peak	18.71 MHz	33.90	-26.09
1	Quasi Peak	18.73 MHz	32.75	-27.24
1	Quasi Peak	18.958 MHz	33.24	-26.75
2	Average	19.382 MHz	31.16	-18.83
1	Quasi Peak	19.614 MHz	28.32	-31.67
1	Quasi Peak	19.634 MHz	28.51	-31.49
2	Average	19.71 MHz	32.21	-17.78
2	Average	20.382 MHz	30.17	-19.82
2	Average	20.81 MHz	28.57	-21.42
2	Average	24.022 MHz	40.99	-9.00

Date: 23.AUG.2021 17:14:50

Figure 5. Detectors: Peak, Quasi-peak, Average

Note: Delta Limit refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Conducted Emission

E.U.T Description	Wireless Video Transmission Module
Type	AMNPTTX01
Serial Number:	Not designated

Specification:	FCC Part 15, Subpart C; RSS-Gen, Issue 5, Clause 8.8
Lead:	Neutral
Detectors:	Peak, Quasi-peak, Average
Power Operation	AC/DC Adapter

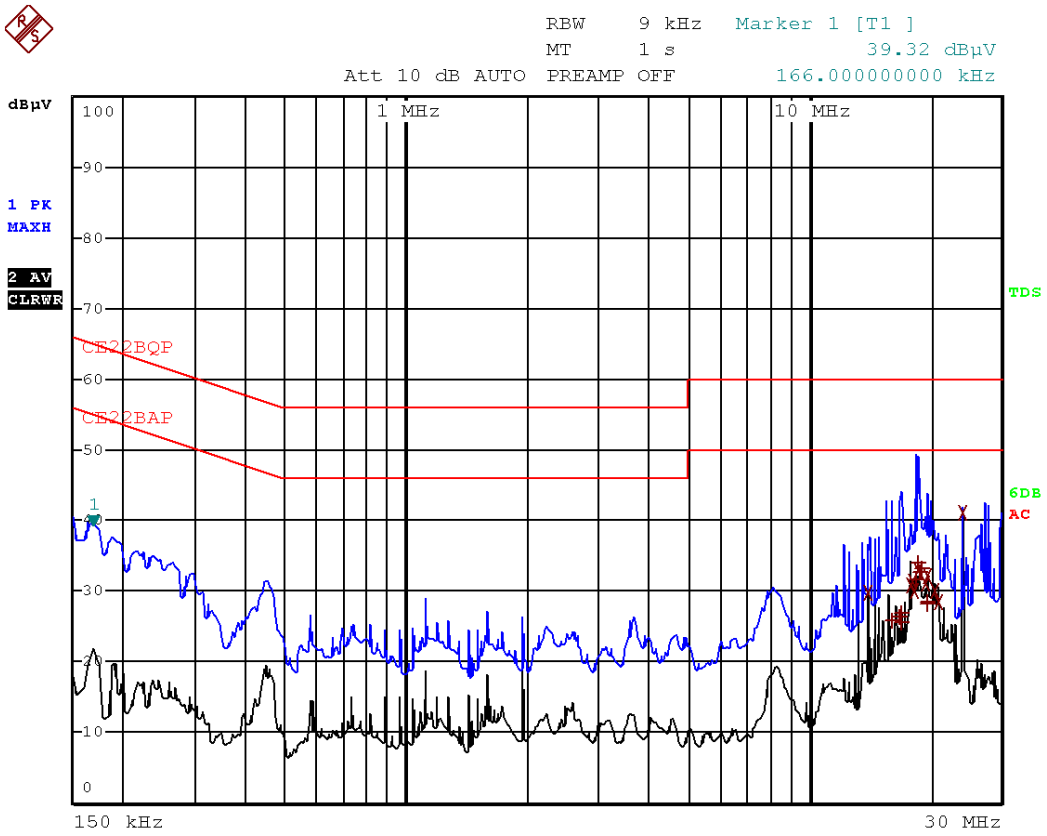


Figure 6 Detectors: Peak, Quasi-peak, Average

4.5 Test Equipment Used; Conducted Emission

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
LISN	Fischer	FCC-LISN-25A	128	28/10/2020	18/01/2023
Transient Limiter	HP	11947A	3107A03042	13/04/2021	20/01/2023
EMI Receiver	Rohde & Schwarz	ESCI7	100724	23/02/2021	23/02/2023
Cable CE Chamber 5M	Telrad	RJ214	-	25/4/2021	25/4/2022

Figure 7 Test Equipment Used

5 Occupied Bandwidth

5.1 Test Specification

FCC, Part 2, Subpart J, Section 2.1049

RSS-Gen, Issue 5: 2018, Section 6.7; RSS-247: 2017, Section 6

5.2 Test Procedure

(Temperature (20°C)/ Humidity (48%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss= 31.5dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

The RBW set to the range of 1% -5% of the OBW. The span was set to 1.5-5 times of the OBW 99% occupied bandwidth function was set on.

5.3 Test Limit

N/A

5.4 Test Results

Declared EBW	Operation Frequency	Reading
(MHz)	(MHz)	(MHz)
40.0	5710	38.0
20.0	5720	19.5

Figure 8. Bandwidth Test Results, UNII2 band

Declared EBW	Operation Frequency	Reading
(MHz)	(MHz)	(MHz)
40.0	5750	37.9
40.0	5830	37.9
20.0	5740	19.1
20.0	5840	18.8

Figure 9. Bandwidth Test Results, UNII3 band

See additional information in Figure 10 to Figure 15.

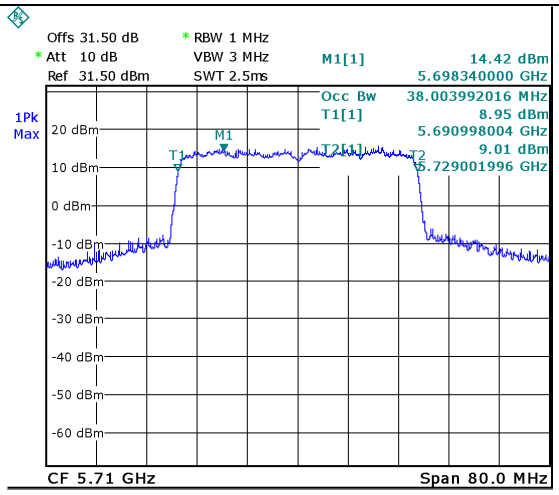


Figure 10. 5710.0MHz, 40MHz BW

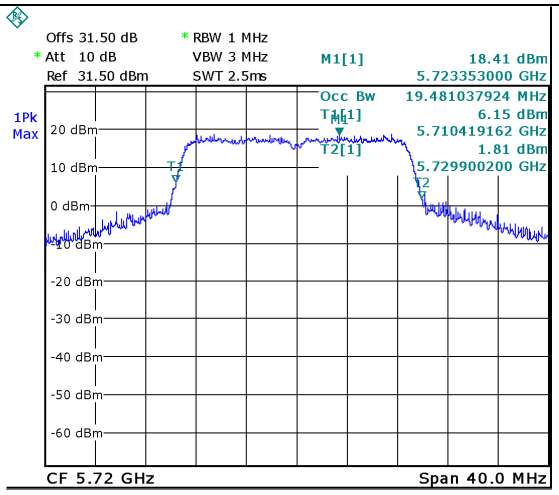


Figure 11. 5720.0MHz, 20MHz BW

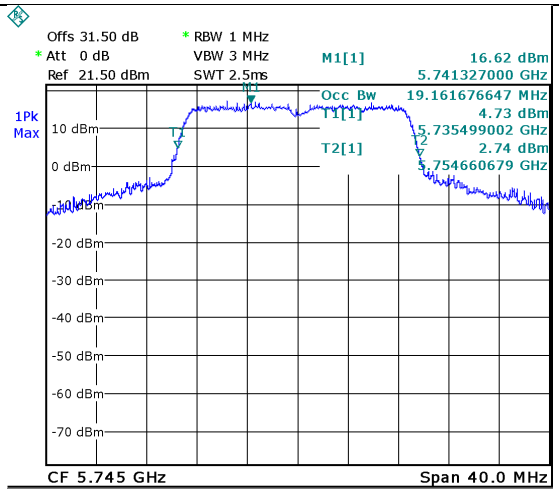


Figure 12. 5740.0MHz, 20MHz BW

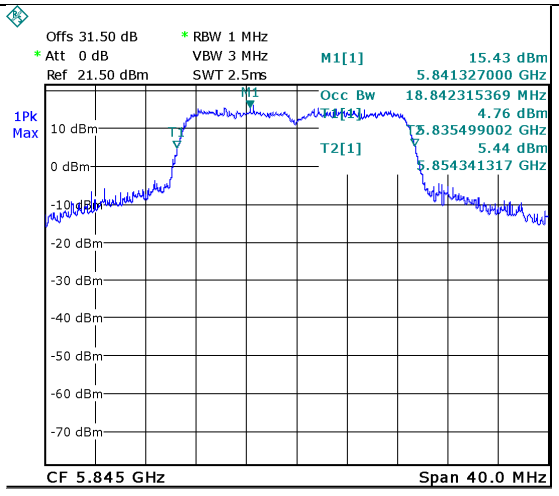


Figure 13. 5840.0MHz, 20MHz BW

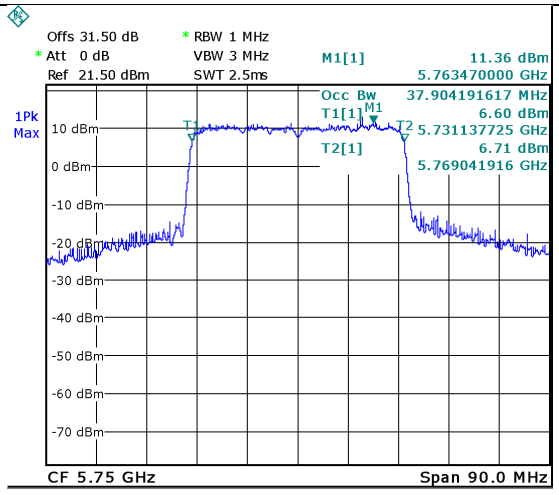


Figure 14. 5750.0MHz, 40MHz BW

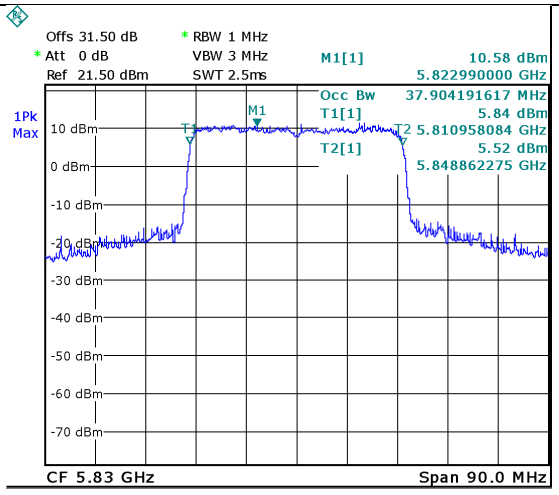


Figure 15. 5830.0MHz, 40MHz BW

5.5 Test Equipment Used; Occupied Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Rohde & Schwarz	FSL6	100194	20/02/2021	20/02/2023
Low Loss cable	Huber Shunner	Sucofelex	27504/4PEA	23/05/2021	23/05/2022
30 dB attenuator	MCL	BW-S30W5	533	23/05/2020	23/05/2022

Figure 16 Test Equipment Used

6 26dB Bandwidth

6.1 Test Specification

FCC, Part 2, Sub part J, Section 2.1049

RSS-Gen, Issue 5: 2018, Section 6.7

6.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))
The E.U.T. operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss= 31.5dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.

The RBW is set to the range of 1% of the EBW.

6.3 Test Limit

N/A

6.4 Test Results

Declared EBW	Operation Frequency	Reading
(MHz)	(MHz)	(MHz)
40.0	5710	39.6
20.0	5720	19.8

Figure 17. Bandwidth Test Results, UNII2 band

Declared EBW	Operation Frequency	Reading
(MHz)	(MHz)	(MHz)
40.0	5750	39.6
40.0	5830	39.9
20.0	5740	19.5
20.0	5840	19.5

Figure 18. Bandwidth Test Results, UNII3 band

See additional information in Figure 19 to Figure 24.

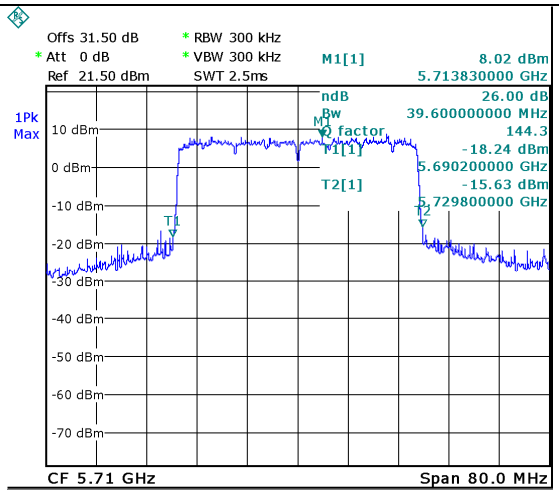


Figure 19. 5710.0MHz, 40MHz BW

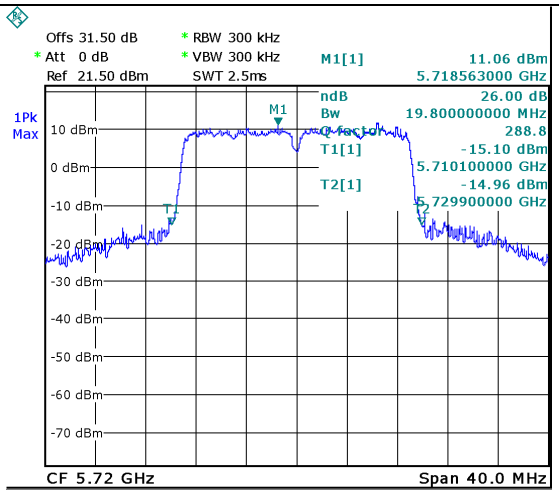


Figure 20. 5720.0MHz, 20MHz BW

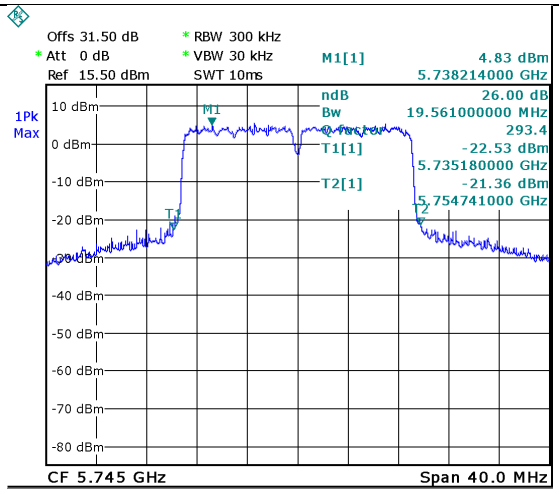


Figure 21. 5740.0MHz, 20MHz BW

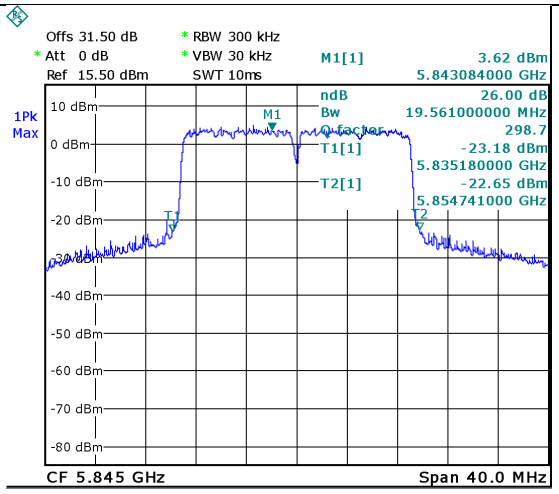


Figure 22. 5840.0MHz, 20MHz BW

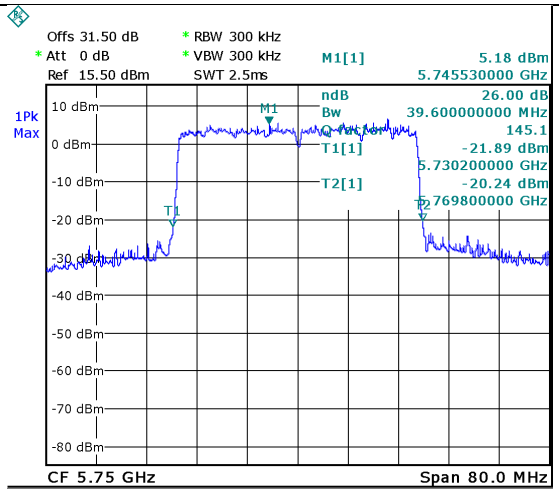


Figure 23. 5750.0MHz, 40MHz BW

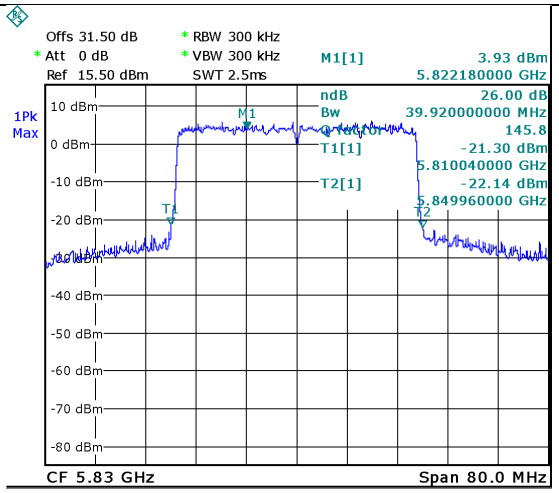


Figure 24. 5830.0MHz, 40MHz BW

6.5 Test Equipment Used; Occupied Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Rohde & Schwarz	FSL6	100194	23/02/2021	20/02/2023
Low Loss cable	Huber Shunner	Sucofelex	27504/4PEA	23/05/2021	23/05/2022
30 dB attenuator	MCL	BW-S30W5	533	23/05/2021	23/05/2022

Figure 25 Test Equipment Used

7 6 dB Minimum Bandwidth

7.1 Test Specification

FCC Part 15, Subpart E, Section 407(e)

RSS-247, Issue 2: 2017, Section 6.2.4; RSS-Gen, Issue 5: 2018, Section 6.7

7.2 Test Procedure

(Temperature (22°C)/ Humidity (61%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss=31.5 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.
The spectrum bandwidth of the E.U.T. at the point of 6 dB below maximum peak power was measured and recorded. The RBW was set to 100 kHz.

7.3 Test Limit

For systems using digital modulation techniques that operate in the 5725-5850 MHz band. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.4 Test Results

Declared EBW (MHz)	Operation Frequency (MHz)	Reading (MHz)
40.0	5750	38.0
40.0	5830	37.7
20.0	5740	17.8
20.0	5840	17.9

Figure 26. 6dB Bandwidth Test Results, UNII3 band

JUDGEMENT: Passed

For additional information see Figure 27 to Figure 30.

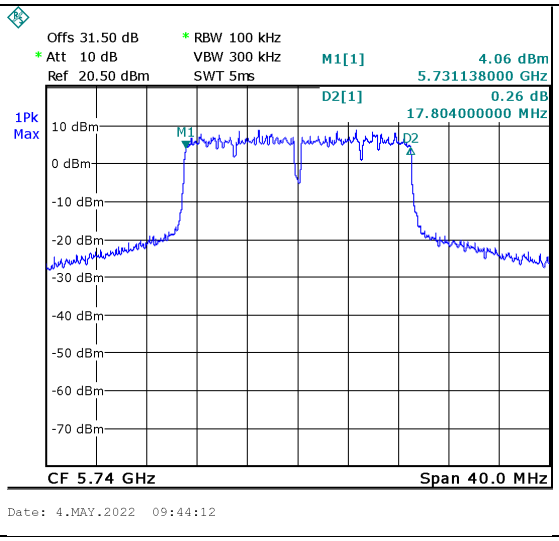


Figure 27. 5740.0MHz, 20MHz BW

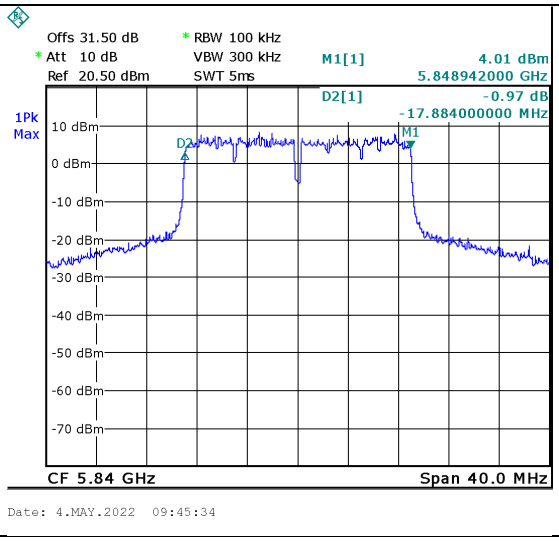


Figure 28. 5840.0MHz, 20MHz BW

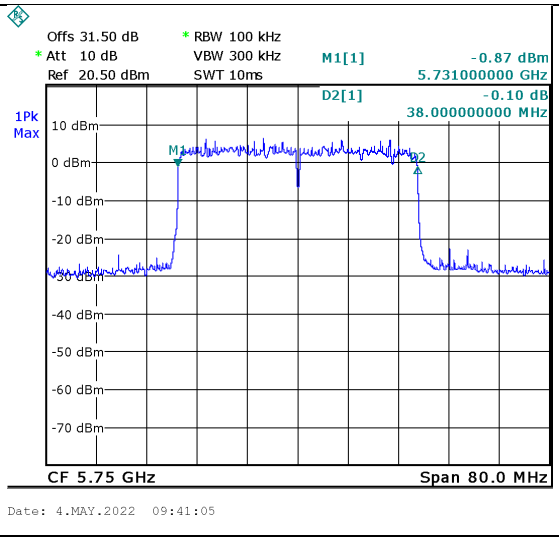


Figure 29. 5750.0MHz, 40MHz BW

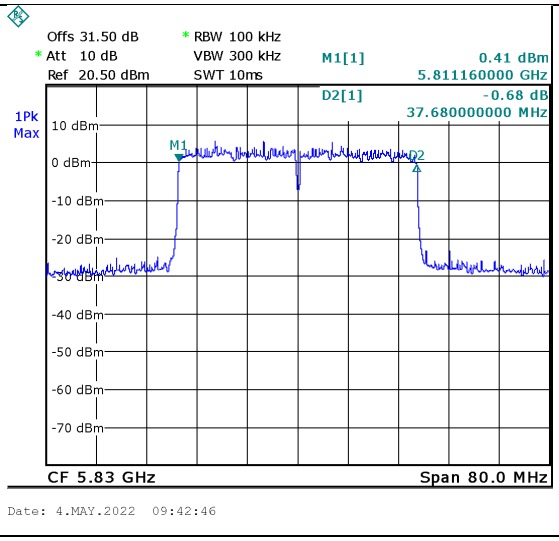


Figure 30. 5830.0MHz, 40MHz BW

7.5 Test Equipment Used; 6dB Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Rohde & Schwarz	FSL6	100194	23/02/2021	20/02/2023
Low Loss cable	Huber Shunner	Sucofelex	27504/4PEA	23/05/2021	23/05/2022
30 dB attenuator	MCL	BW-S30W5	533	23/05/2021	23/05/2022

Figure 31 Test Equipment Used

8 Maximum Conducted Output Power

8.1 Test Specification

FCC, Part 15, Subpart E, Section 407

RSS-247, Issue 2: 2017, Section 6.2

8.2 Test Procedure

(Temperature (22°C)/ Humidity (57%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report.
The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss=31.5 dB). Special attention was taken to prevent Spectrum Analyzer RF input overload.
Spectrum setting done according KDB 789033 d02 v01, method SA-1 instructions (section 2.b).

8.3 FCC Test Limits

Operational Band U-NII 2A, 2C:
15.407(a) (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.

Operational Band U-NII 3:
15.407(a) (3) (i) For the 5.725-5.850 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. the maximum conducted power spectral density shall not exceed 30 dBm in any 500-kHz band

8.4 ISED Test Limit

Operational Band U-NII 2A:

- The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less. assuming antenna gain does not exceed 6dBi.
- Devices, other than outdoor fixed devices, having an E.I.R.P. greater than 200 mW shall comply with E.I.R.P. elevation mask or implement a method to permanently reduce their E.I.R.P. via a firmware feature in case the Department requires it.

Operational Band U-NII 2C:
The maximum conducted output power shall not exceed 250 mW or 11 + 10 log10B, dBm, whichever is less, assuming antenna gain does not exceed 6dBi.

Operational Band U-NII 3:
The maximum conducted output power shall not exceed 1W. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

8.5 Test Results

Band U-NII 2A, 5250MHz-5350MHz								
BW	Operation Frequency	Port 1 Reading	Port 2 Reading	Total Power*	Antenna Gain	EIRP	Limit**	Margin
(MHz)	(MHz)	(dBm)	(dBm)	(dBm)	(dBi)	(dBm)	(dBm)	(dB)
20.0	5260.0	17.97	17.52	20.8	2.0	22.8	23.0	-0.2
	5280.0	17.49	18.12	20.8	2.0	22.8	23.0	-0.2
	5320.0	17.35	18.14	20.8	2.0	22.8	23.0	-0.2
40.0	5270.0	17.48	18.23	20.9	2.0	22.9	23.0	-0.1
	5310.0	17.58	17.67	20.6	2.0	22.6	23.0	-0.4

**Note 1: total power (dBm)= 10 log [port1(W)+port2(W)]*
***Note 2: Limit determinates by ISED requirements to meet elevation angles examinations*

Figure 32 Test Results 2TX mode, U-NII 2A

Band U-NII 2C, 5470MHz-5725MHz						
BW	Operation Frequency	Port 1 Reading	Port 2 Reading	Total Power*	**Limit	Margin
(MHz)	(MHz)	(dBm)	(dBm)	(dBm)	(dBm)	(dB)
20.0	5500.0	17.21	18.7	21.0	23.6	-2.6
	5580.0	18.52	18.39	21.5	23.6	-2.1
	5720.0	18.68	18.37	21.5	23.6	-2.1
40.0	5510.0	18.87	19.09	22.0	24.0	-2.0
	5670.0	18.57	19.10	21.9	24.0	-2.1
	5710.0	18.02	17.86	21.0	24.0	-3.0

*Note 1: total power (dBm)= 10 log [port1(W)+port2(W)]
**Note 2: Limit determinates by ISED/FCC requirements and calculated by following: 11+10log (BW_{26dB}) Since A.G<6dBi, the limits relates to conducted power measurements with no relation to EIRP.

Figure 33 Test Results 2TX mode, U-NII 2C

Band U-NII 3, 5725MHz-5850MHz						
BW	**Operation Frequency**	**Port 1 Reading**	**Port 2 Reading**	**Total Power***	**Limit Conducted****	**Margin**
(MHz)	**(MHz)**	**(dBm)**	**(dBm)**	**(dBm)**	**(dBm)**	**(dB)**
20.0	5740.0	17.57	17.77	20.7	30.0	-9.3
	5800.0	17.48	17.84	20.7	30.0	-9.3
	5840.0	17.51	17.8	20.7	30.0	-9.3
40.0	5750.0	19.01	19.04	22.0	30.0	-8.0
	5790.0	17.27	18.12	20.7	30.0	-9.3
	5830.0	18.76	18.95	21.9	30.0	-8.1

*Note 1: total power (dBm)= 10 log [port1(W)+port2(W)]

**Note2: Since A.G<6dBi, the limits relate to conducted power measurements with no relation to EIRP.

Figure 34 Test Results 2TX mode, U-NII 3

JUDGMENT:

- FCC: Passed by -2.0 dB
- ISED: Passed by -0.1 dB

For additional information see Figure 35 to Figure 68.

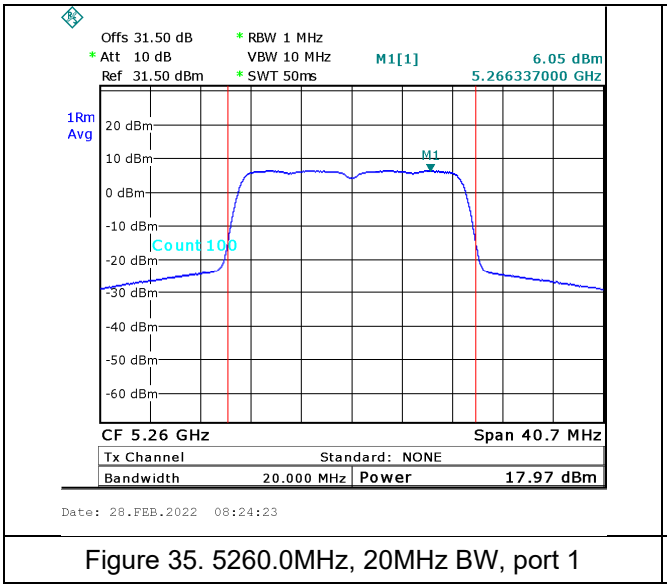


Figure 35. 5260.0MHz, 20MHz BW, port 1

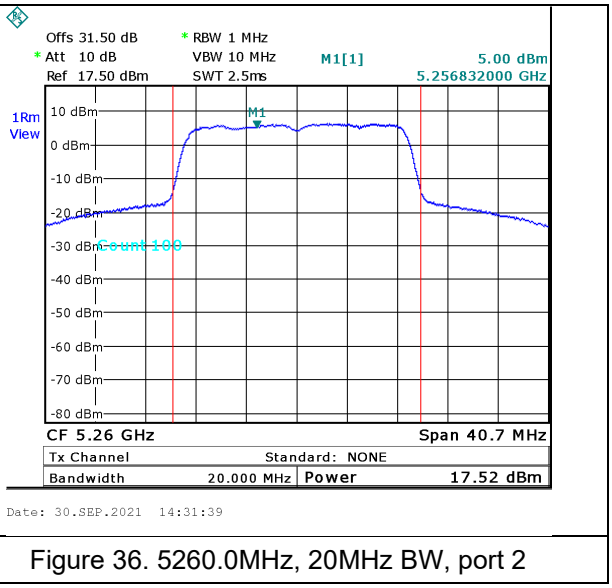


Figure 36. 5260.0MHz, 20MHz BW, port 2

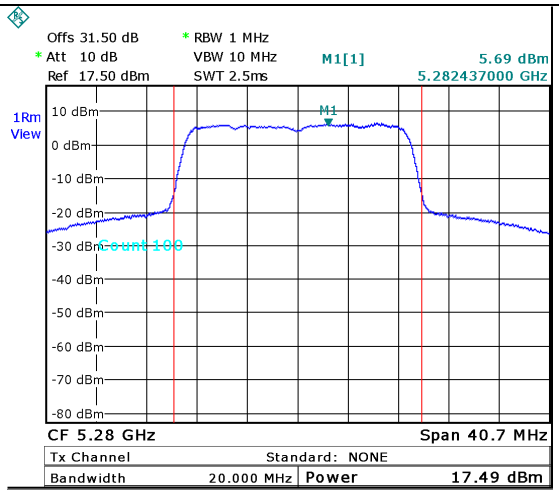


Figure 37. 5280.0MHz, 20MHz BW, port 1

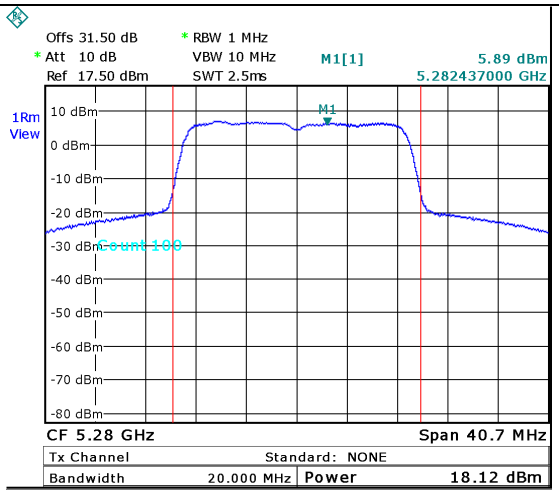


Figure 38. 5280.0MHz, 20MHz BW, port 2

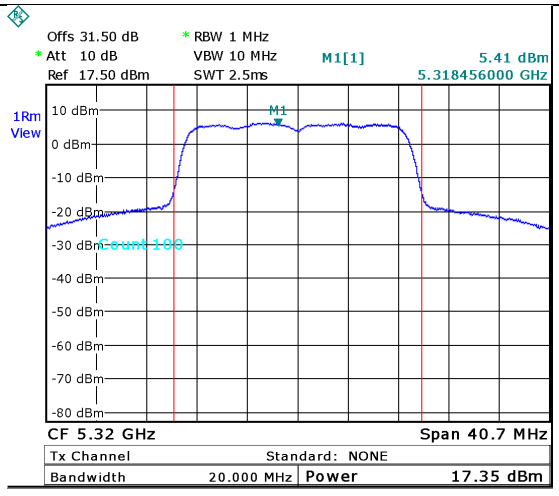


Figure 39. 5320.0MHz, 20MHz BW, port 1

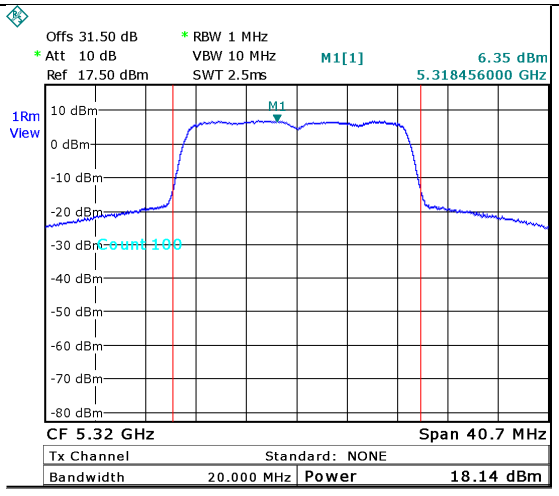


Figure 40. 5320.0MHz, 20MHz BW, port 2

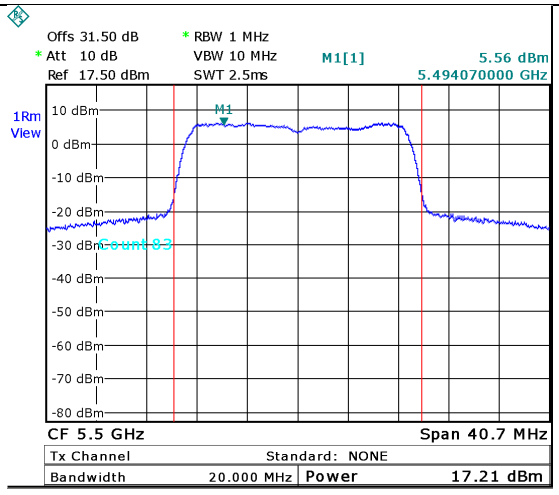


Figure 41. 5500.0MHz, 20MHz BW, port 1

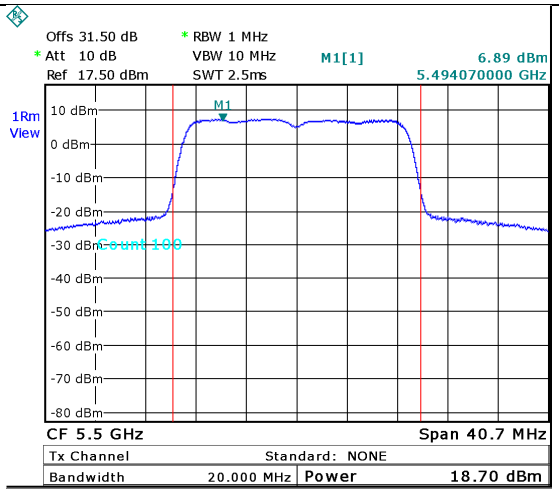


Figure 42. 5500.0MHz, 20MHz BW, port 2

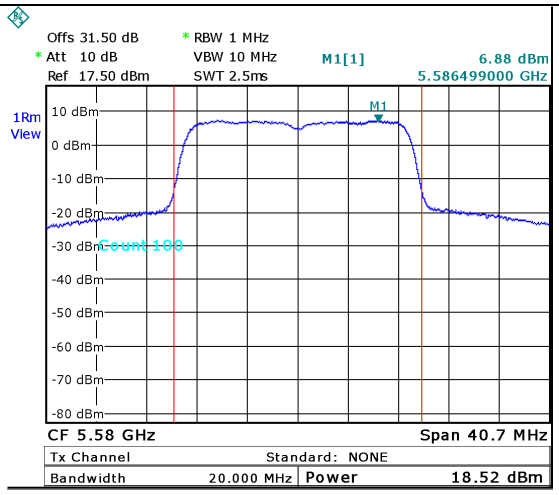


Figure 43. 5580.0MHz, 20MHz BW, port 1

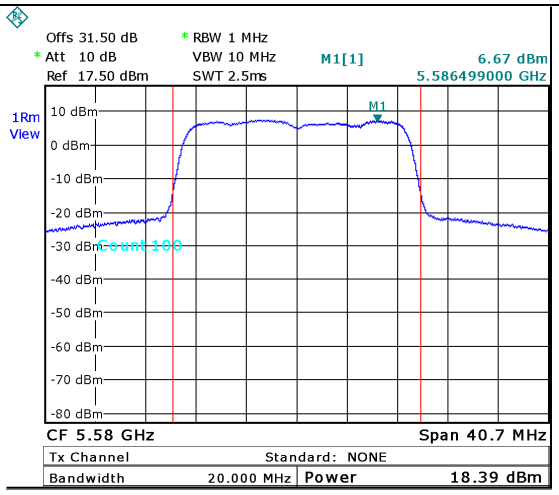


Figure 44. 5580.0MHz, 20MHz BW, port 2

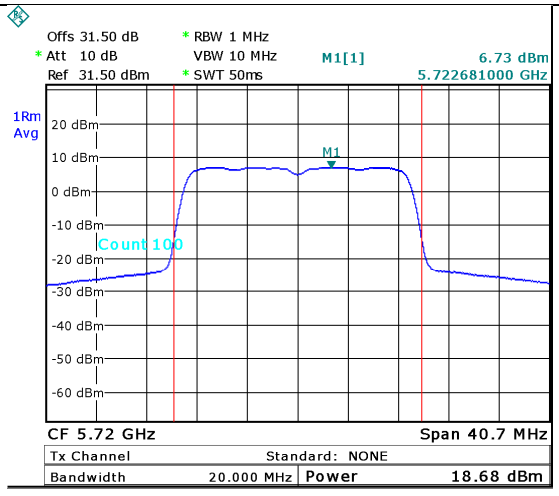


Figure 45. 5720.0MHz, 20MHz BW, port 1

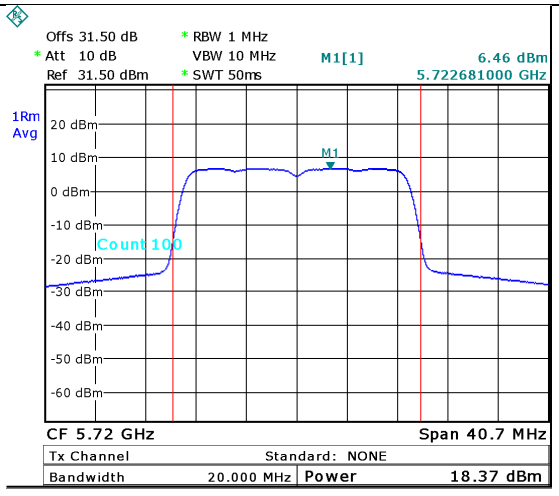


Figure 46. 5720.0MHz, 20MHz BW, port 2

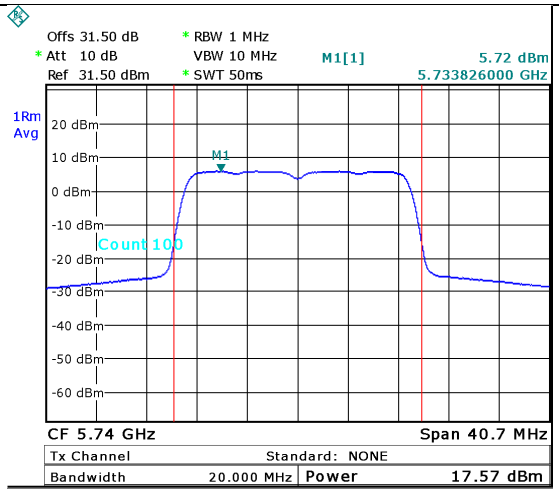


Figure 47. 5740.0MHz, 20MHz BW, port 1

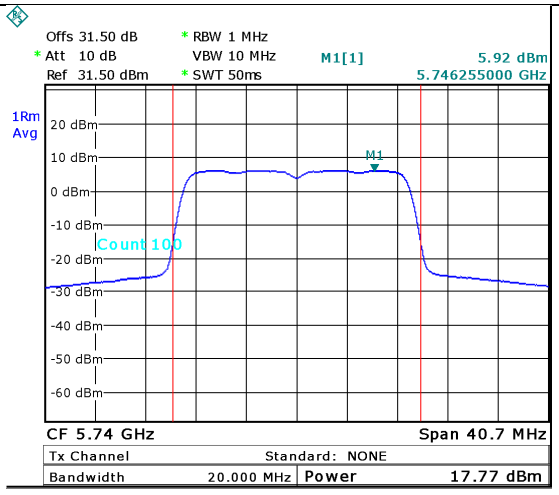


Figure 48. 5740.0MHz, 20MHz BW, port 2

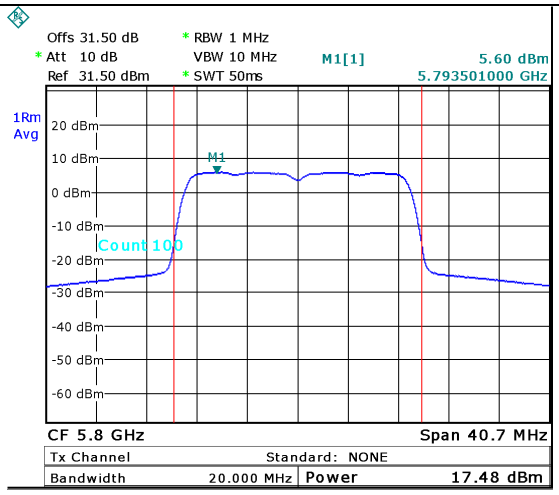


Figure 49. 5800.0MHz, 20MHz BW, port 1

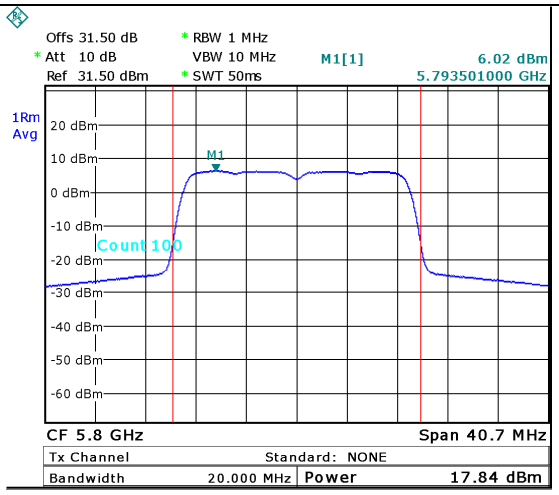


Figure 50. 5800.0MHz, 20MHz BW, port 2

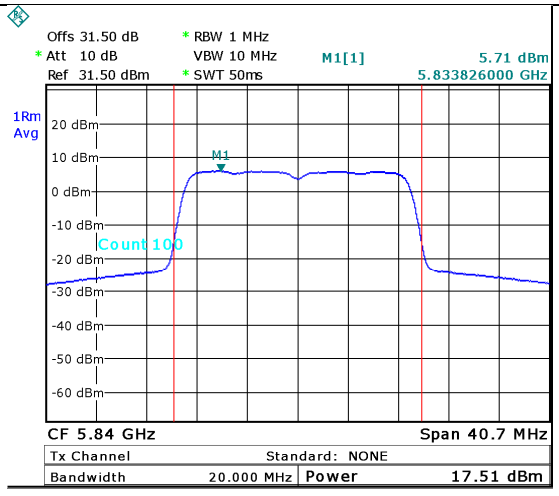


Figure 51. 5840.0MHz, 20MHz BW, port 1

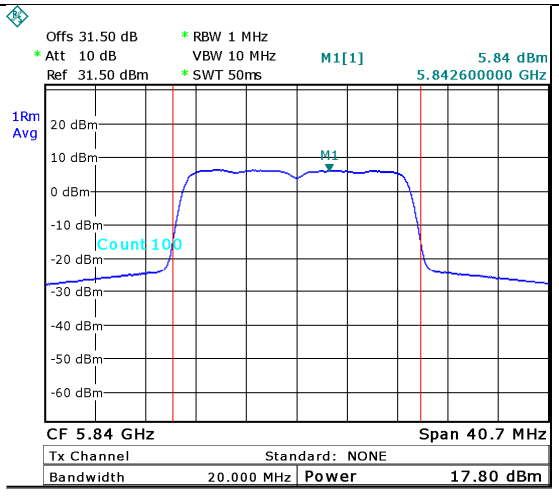


Figure 52. 5840.0MHz, 20MHz BW, port 2

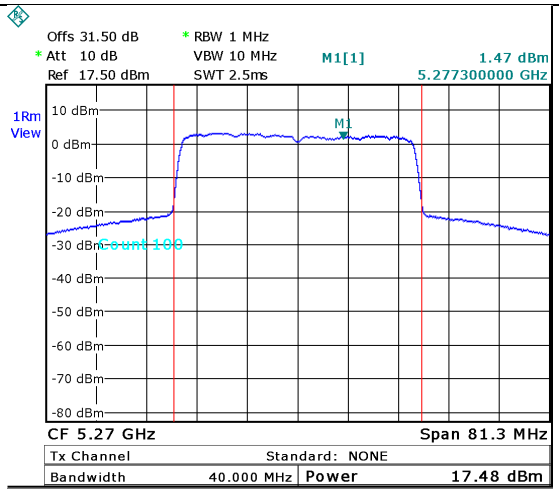


Figure 53. 5270.0MHz, 40MHz BW, port 1

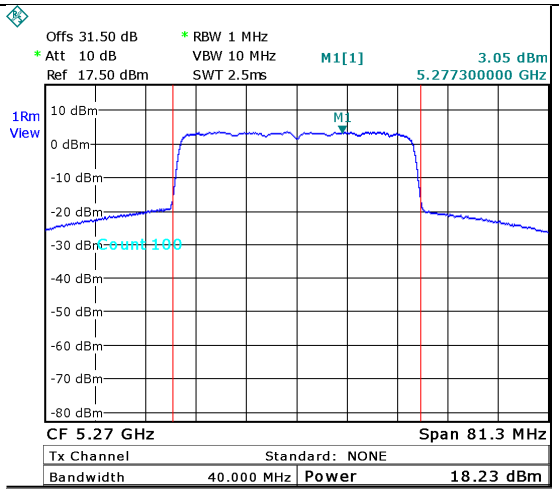


Figure 54. 5270.0MHz, 40MHz BW, port 2

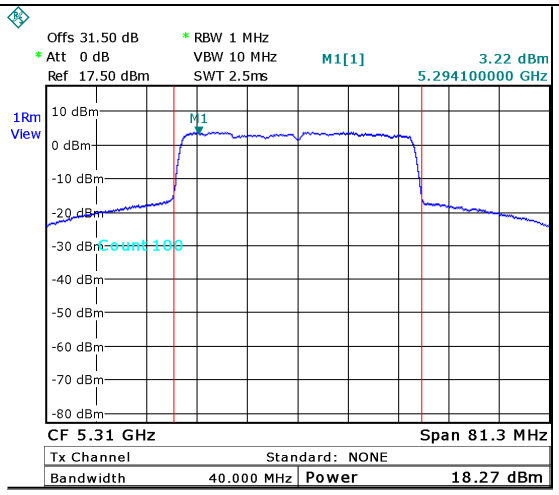


Figure 55. 5310.0MHz, 40MHz BW, port 1

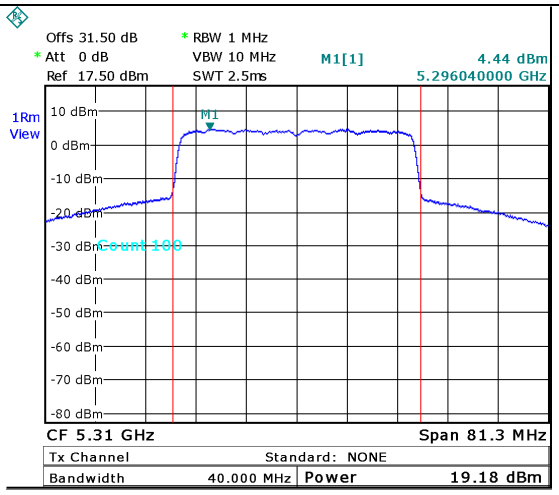


Figure 56. 5310.0MHz, 40MHz BW, port 2

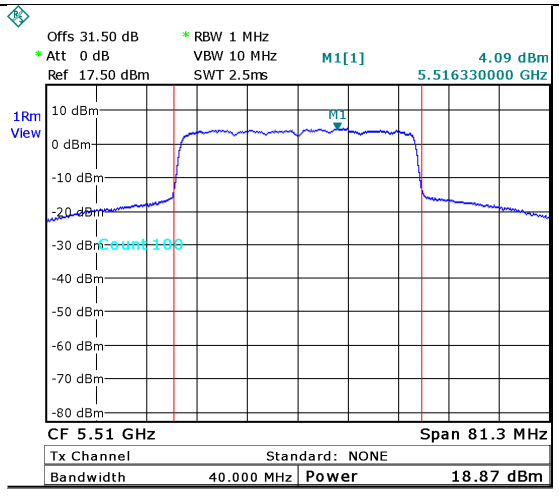


Figure 57. 5510.0MHz, 40MHz BW, port 1

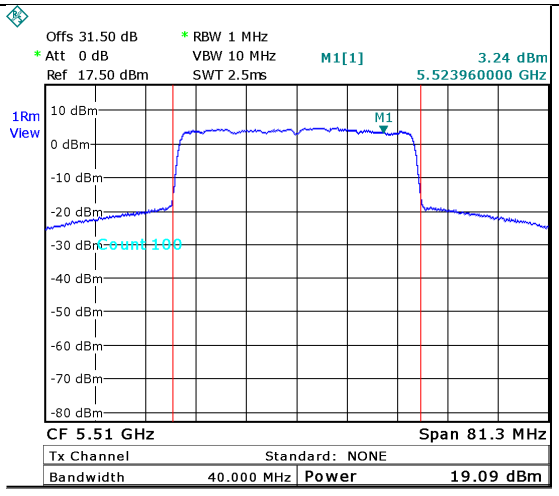


Figure 58. 5510.0MHz, 40MHz BW, port 2

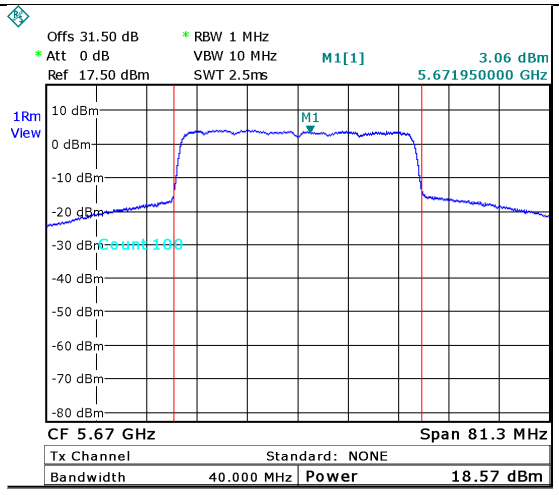


Figure 59. 5670.0MHz, 40MHz BW, port 1

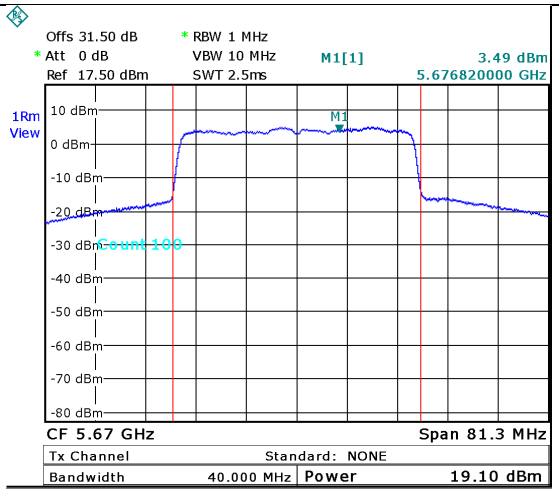


Figure 60. 5670.0MHz, 40MHz BW, port 2

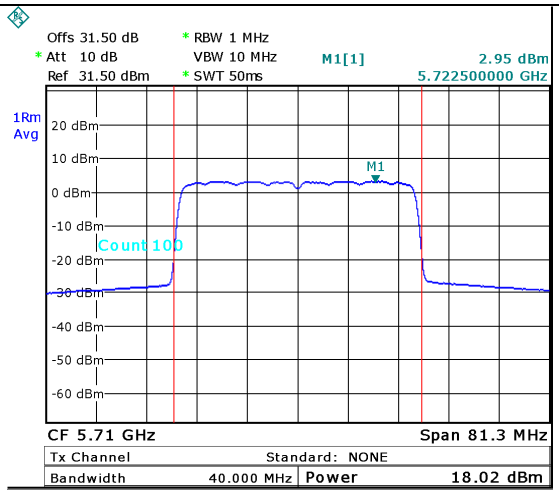


Figure 61. 5710.0MHz, 40MHz BW, port 1

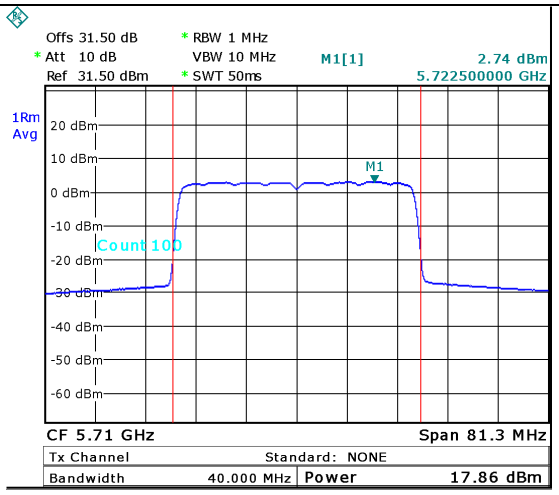


Figure 62. 5710.0MHz, 40MHz BW, port 2

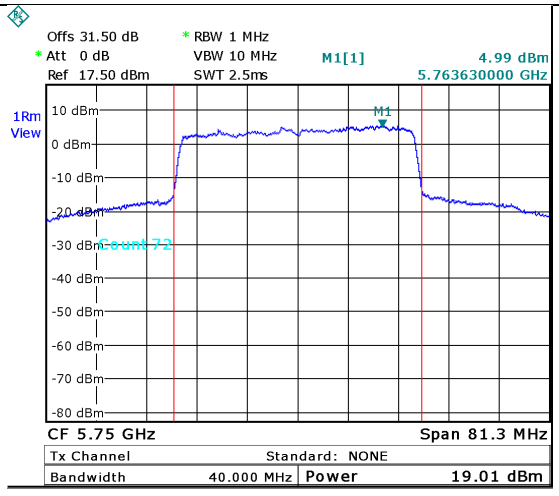


Figure 63. 5750.0MHz, 40MHz BW, port 1

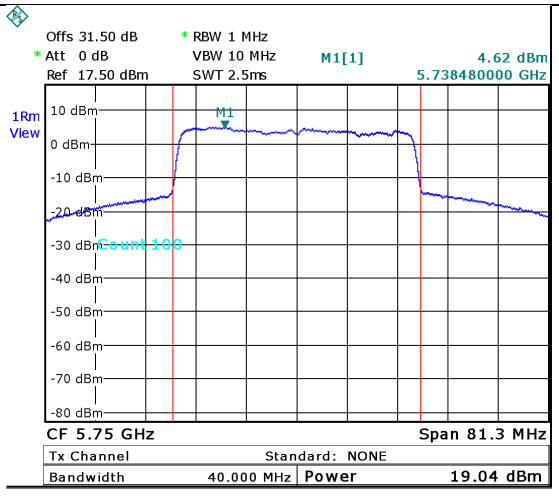


Figure 64. 5750.0MHz, 40MHz BW, port 2

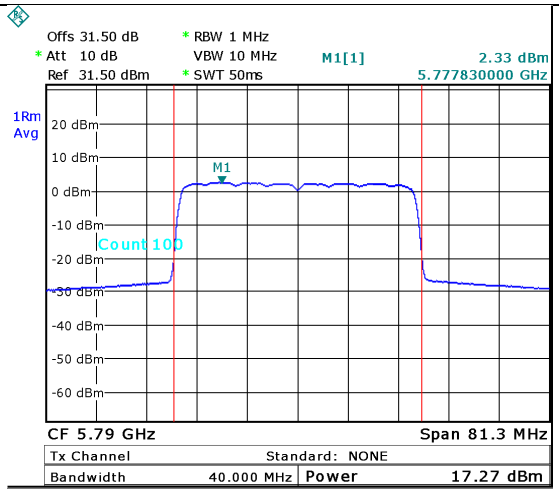


Figure 65. 5790.0MHz, 40MHz BW, port 1

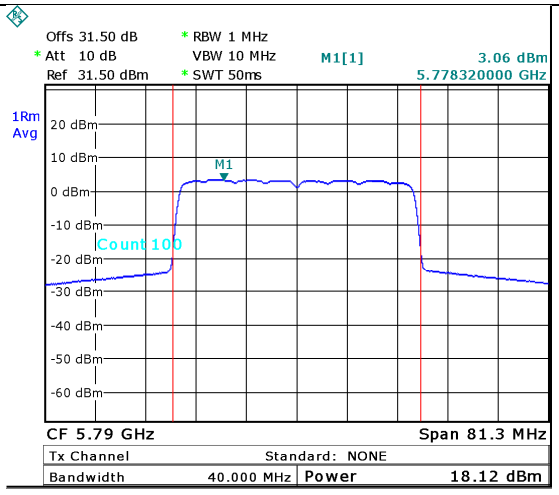


Figure 66. 5790.0MHz, 40MHz BW, port 2

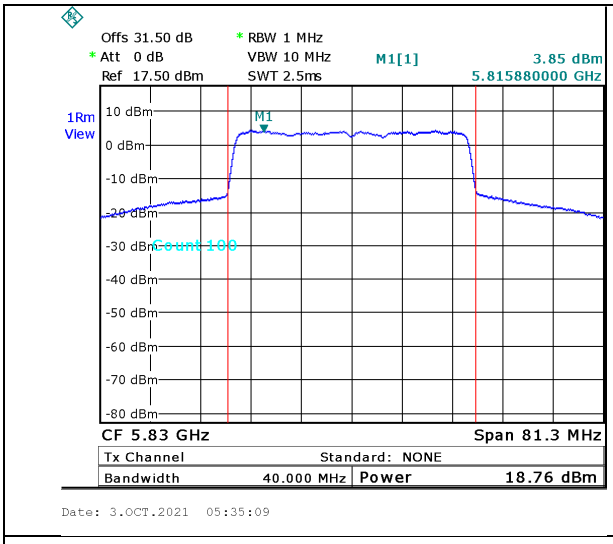


Figure 67. 5830.0MHz, 40MHz BW, port 1

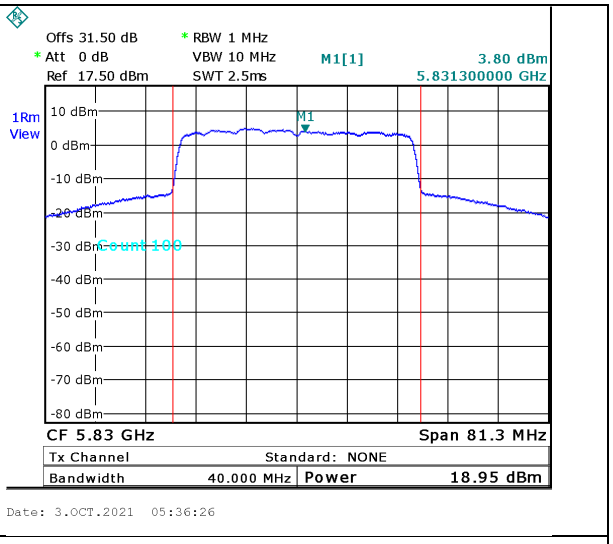


Figure 68. 5830.0MHz, 40MHz BW, port 2

8.6 Test Equipment Used; Maximum Peak Power Output

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Rohde & Schwarz	FSL6	100194	23/02/2021	20/02/2023
Low Loss cable	Huber Shunner	Sucofelex	27504/4PEA	23/05/2021	23/05/2022
30 dB attenuator	MCL	BW-S30W5	533	23/05/2021	23/05/2022

Figure 69 Test Equipment Used

9 Maximum Power Spectral Density (PSD)

9.1 Test Specification

FCC, Part 15, Subpart E, Section 407

RSS-247, Issue 2: 2017, Section 6.2

9.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))

The E.U.T operation mode and test set-up are as described in Section 2 of this report. The E.U.T. antenna terminal was connected to the Spectrum Analyzer through an external attenuator and an appropriate coaxial cable (total loss= 31.5dB). Special attention was taken to prevent Spectrum Analyzer RF input overload. Spectrum setting done according KDB 789033 d02 v01instructions (section F).

9.3 FCC Test Limits

Operational Band U-NII 2A, 2C:

For devices in the 5.25-5.35 GHz and 5.47-5.725GHz bands the maximum power spectral density shall not exceed 11 dBm in any 1-megahertz band, provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Operational Band U-NII 3:

For devices in the 5.725-5.85 GHz band, the maximum power spectral density shall not exceed 30dBm in any 500KHz band provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note: Special requirements provided for fixed, point-to-point U-NII devices

9.4 ISED Test Limit

Operational Band U-NII 2A, 2C:

For devices in the 5.25-5.725 GHz band, the maximum conducted spectral density shall not exceed 11 dBm in any 1.0 MHz band.

Operational Band U-NII 3:

For devices in the 5.725-5.85 GHz band the maximum conducted spectral density shall not exceed 30 dBm in any 500 kHz band.

9.5 Test Results

Band U-NII 2A, 5250MHz-5350MHz						
BW	Operation Frequency	PSD@RBW=1MHz		Total PSD*	Limit	Margin
		Port 1 Reading	Port 2 Reading			
(MHz)	(MHz)	(dBm/MHz)		(dBm/MHz)	(dBm/MHz)	(dB)
20.0	5260.0	6.69	5.00	8.9	11.0	-2.1
	5280.0	5.69	5.89	8.8		-2.2
	5320.0	5.41	6.35	8.9		-2.1
40.0	5270.0	1.47	3.05	5.3		-5.7
	5310.0	2.53	2.6	5.6		-5.4

*Note: total power (dBm)= 10 log [port1(W)+port2(W)]

Figure 70 Test Results 2TX mode, U-NII 2A

Band U-NII 2C, 5470MHz-5725MHz						
BW	Operation Frequency	PSD@RBW=1MHz		Total PSD*	Limit	Margin
		Port 1 Reading	Port 2 Reading			
(MHz)	(MHz)	(dBm/MHz)		(dBm/MHz)	(dBm/MHz)	(dB)
20.0	5500.0	5.56	6.89	9.2	11.0	-1.8
	5580.0	6.88	6.67	9.8		-1.2
	5720.0	6.73	6.46	9.6		-1.4
40.0	5510.0	4.09	3.24	6.7		-4.3
	5670.0	3.06	3.49	6.3		-4.7
	5710.0	2.95	2.74	5.9		-5.1

*Note: total power (dBm)= 10 log [port1(W)+port2(W)

Figure 71 Test Results 2TX mode, U-NII 2C

Band U-NII 3, 5725MHz-5850MHz							
BW	Operation Frequency	PSD@RBW=1MHz*		Total PSD	Total PSD*	Limit	Margin
		Port 1 Reading	Port 2 Reading				
(MHz)	(MHz)	(dBm/MHz)		(dBm/MHz)	(dBm/500kHz)	(dBm/500kHz)	(dB)
20.0	5740.0	5.72	5.92	8.83	5.8	30.0	-24.2
	5800.0	5.6	6.02	8.83	5.8		-24.2
	5840.0	5.71	5.84	8.79	5.8		-24.2
40.0	5750.0	4.99	4.62	7.82	4.8		-25.2
	5790.0	2.33	3.06	5.72	2.7		-27.2
	5830.0	3.85	3.8	6.84	3.8		-26.2

*Note: total power (dBm)= 10 log [port1(W)+port2(W)], total power includes factor of conversion RBW 1MHz to 500kHz which is 3dB

**Note: RBW Conversion factor was calculated as the following equation: 10log(500kHz/1MHz) =-3dB

Figure 72 Test Results 2TX mode, U-NII 3

JUDGEMENT:

- FCC: Passed by -0.05 dB
- ISED: Passed by -0.05 dB

For additional information see Figure 73 to Figure 106.

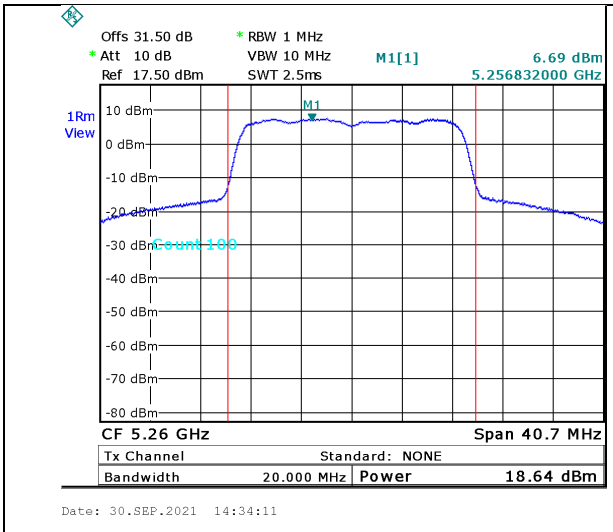


Figure 73. 5260.0MHz, 20MHz BW, port 1

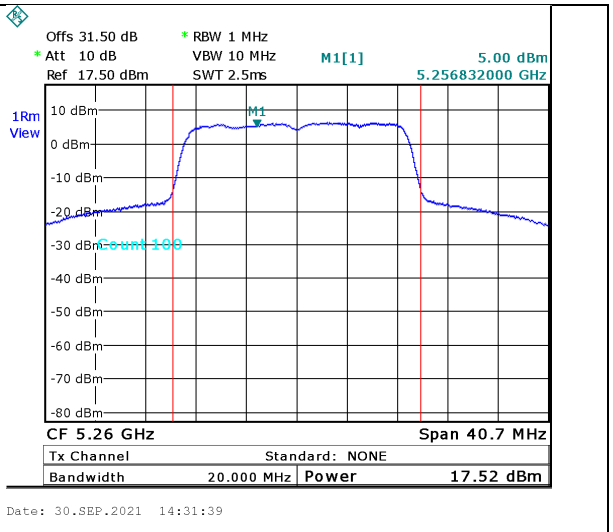


Figure 74. 5260.0MHz, 20MHz BW, port 2

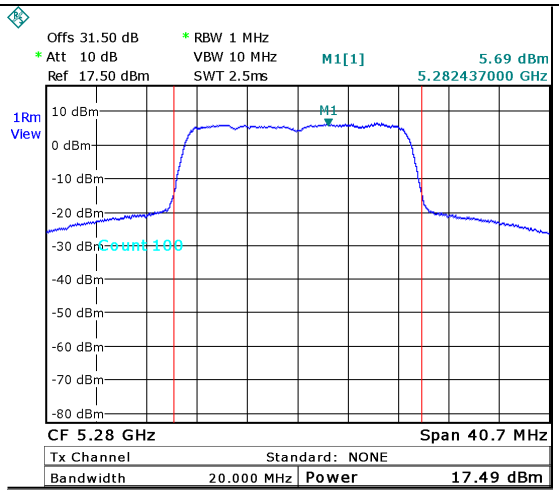


Figure 75. 5280.0MHz, 20MHz BW, port 1

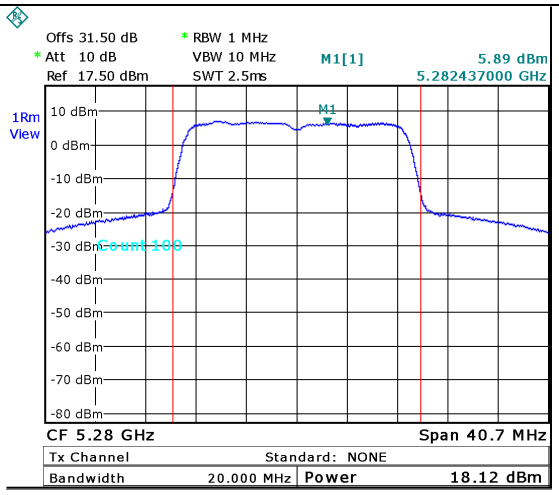


Figure 76. 5280.0MHz, 20MHz BW, port 2

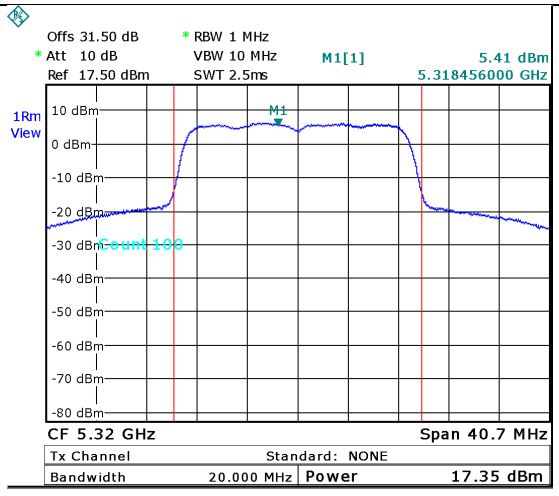


Figure 77. 5320.0MHz, 20MHz BW, port 1

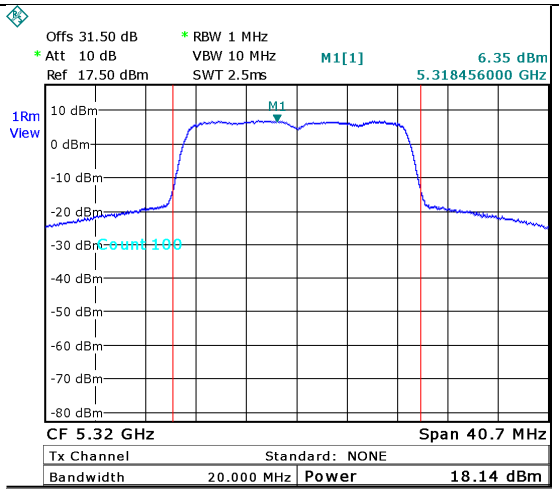


Figure 78. 5320.0MHz, 20MHz BW, port 2

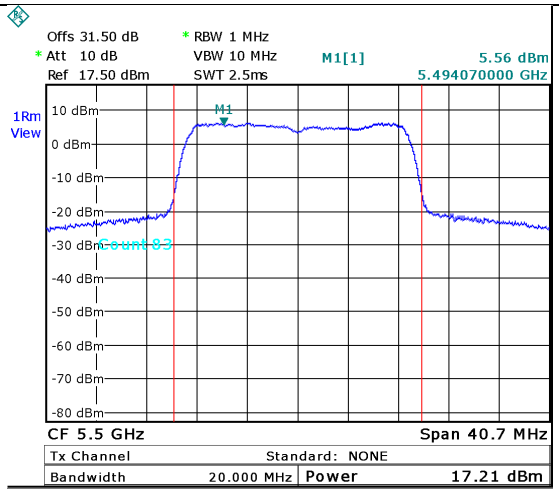


Figure 79. 5500.0MHz, 20MHz BW, port 1

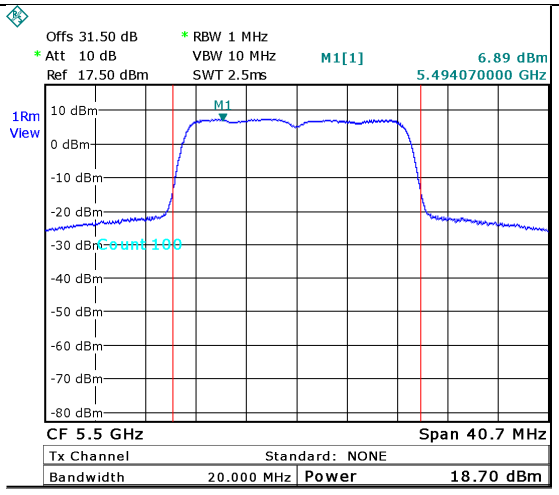


Figure 80. 5500.0MHz, 20MHz BW, port 2

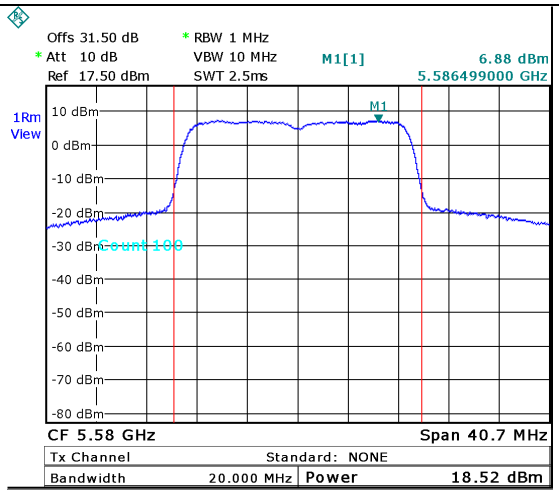


Figure 81. 5580.0MHz, 20MHz BW, port 1

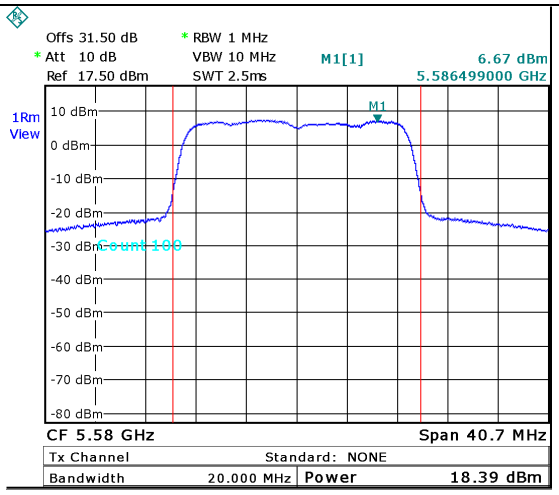


Figure 82. 5580.0MHz, 20MHz BW, port 2

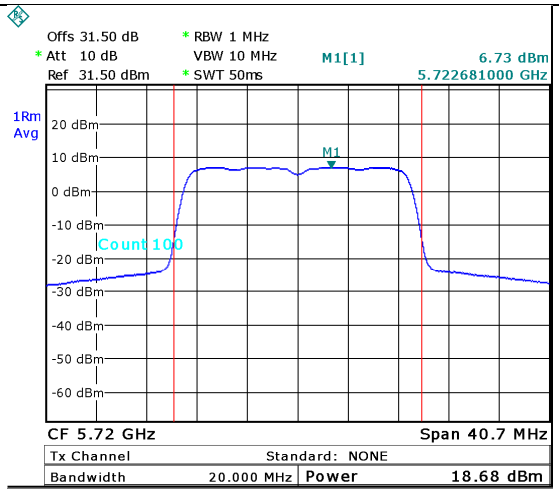


Figure 83. 5720.0MHz, 20MHz BW, port 1

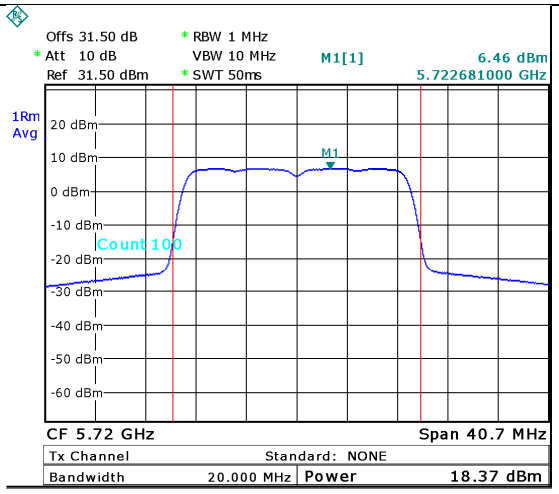


Figure 84. 5720.0MHz, 20MHz BW, port 2

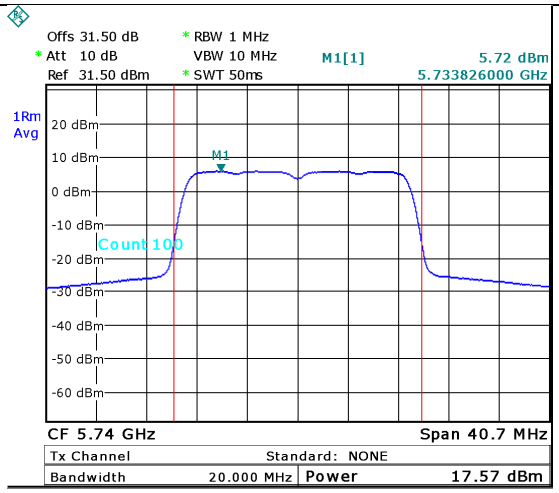


Figure 85. 5740.0MHz, 20MHz BW, port 1

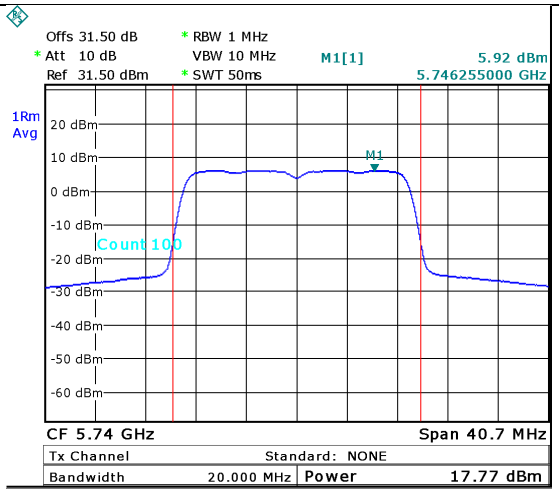


Figure 86. 5740.0MHz, 20MHz BW, port 2

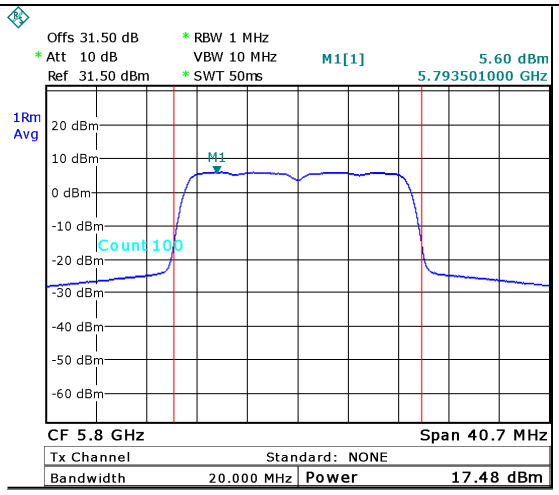


Figure 87. 5800.0MHz, 20MHz BW, port 1

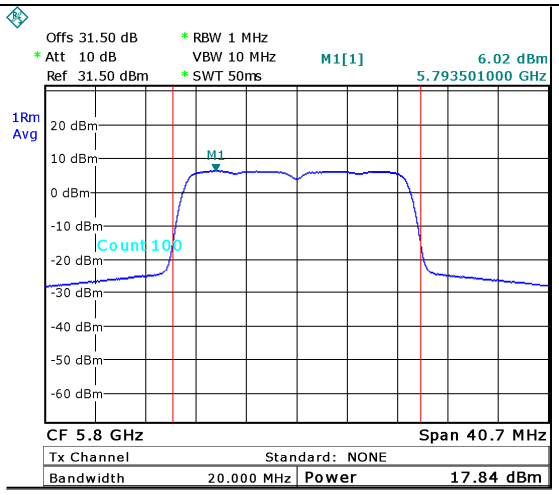


Figure 88. 5800.0MHz, 20MHz BW, port 2

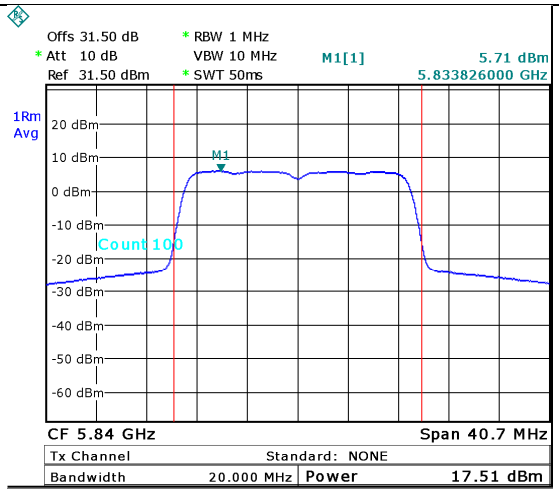


Figure 89. 5840.0MHz, 20MHz BW, port 1

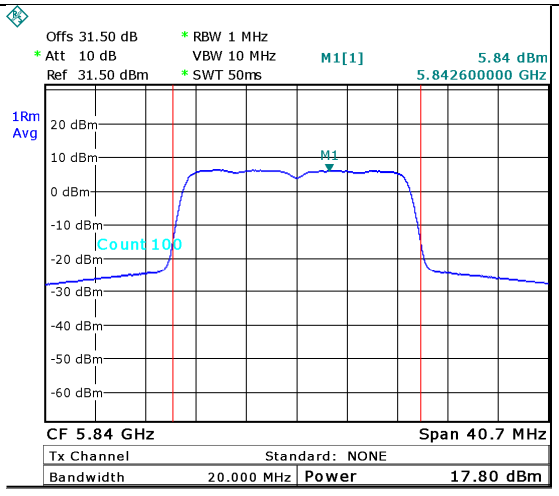


Figure 90. 5840.0MHz, 20MHz BW, port 2

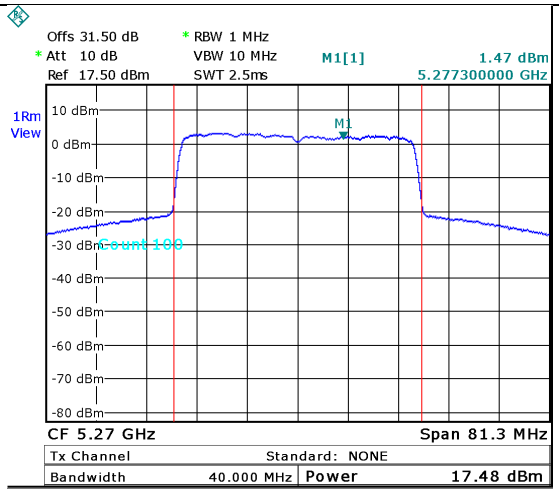


Figure 91. 5270.0MHz, 40MHz BW, port 1

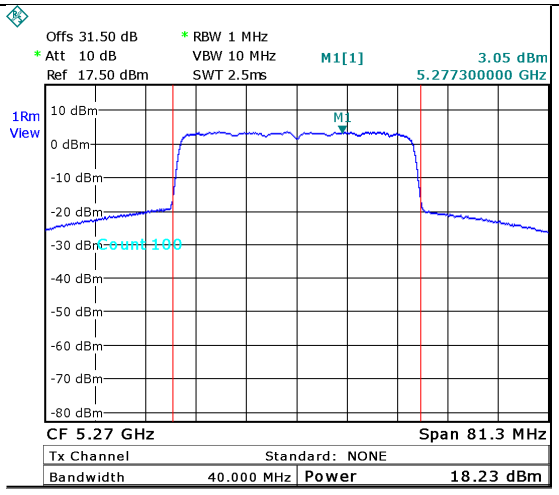


Figure 92. 5270.0MHz, 40MHz BW, port 2

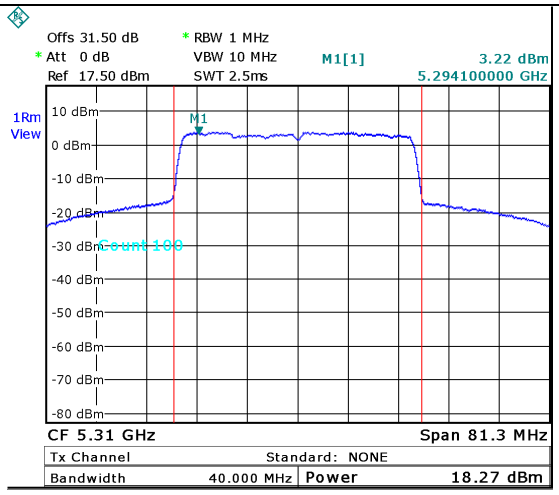


Figure 93. 5310.0MHz, 40MHz BW, port 1

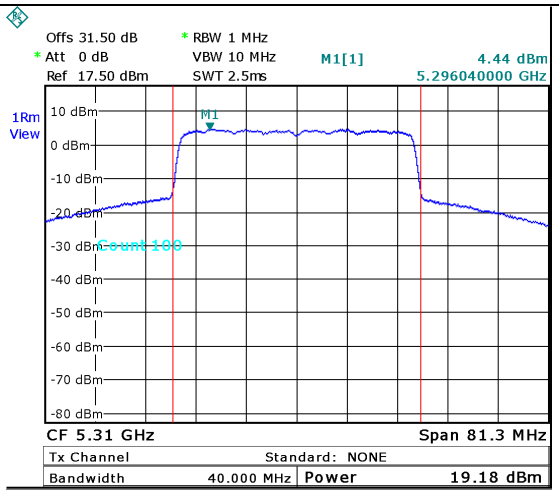


Figure 94. 5310.0MHz, 40MHz BW, port 2

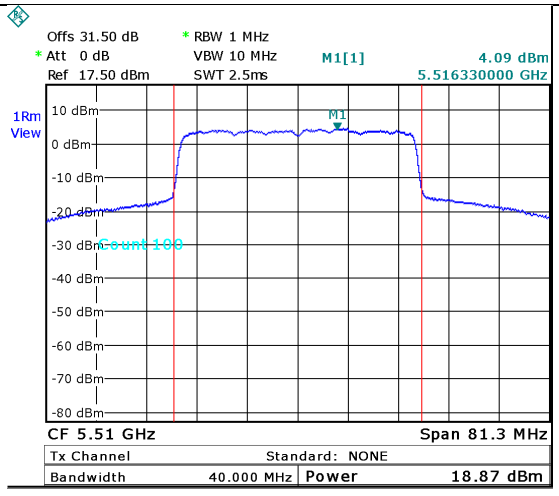


Figure 95. 5510.0MHz, 40MHz BW, port 1

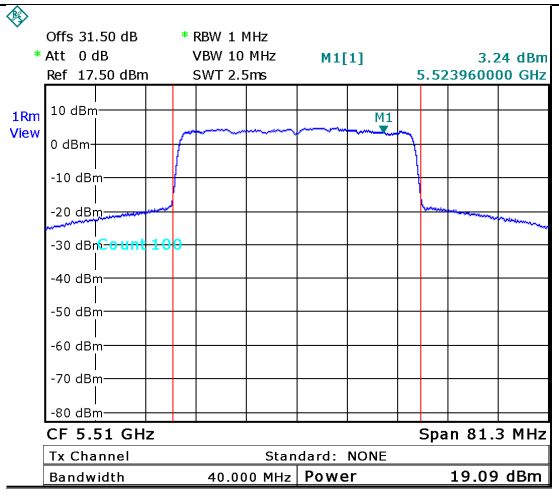


Figure 96. 5510.0MHz, 40MHz BW, port 2

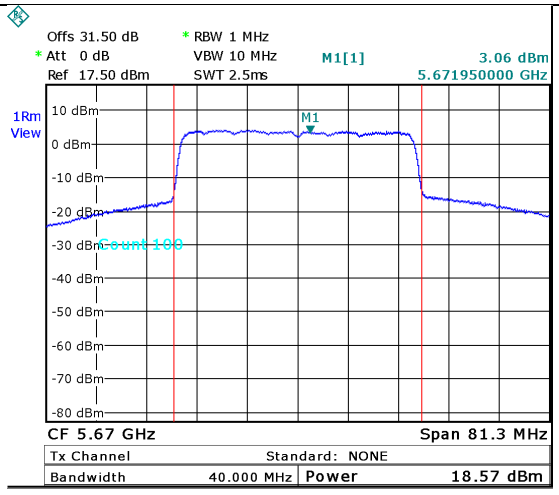


Figure 97. 5670.0MHz, 40MHz BW, port 1

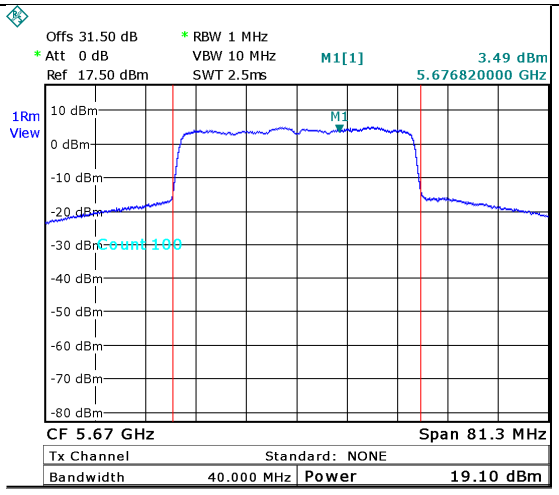


Figure 98. 5670.0MHz, 40MHz BW, port 2

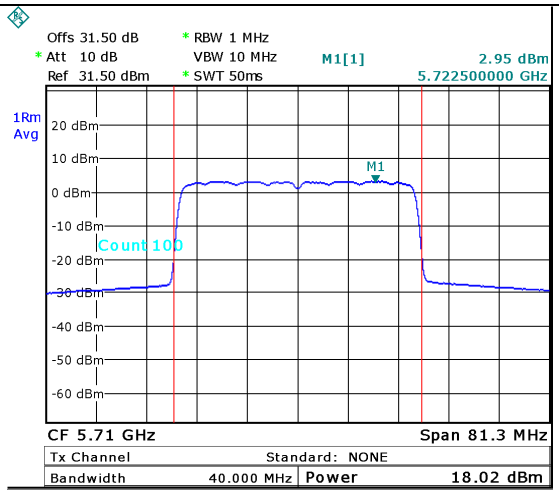


Figure 99. 5710.0MHz, 40MHz BW, port 1

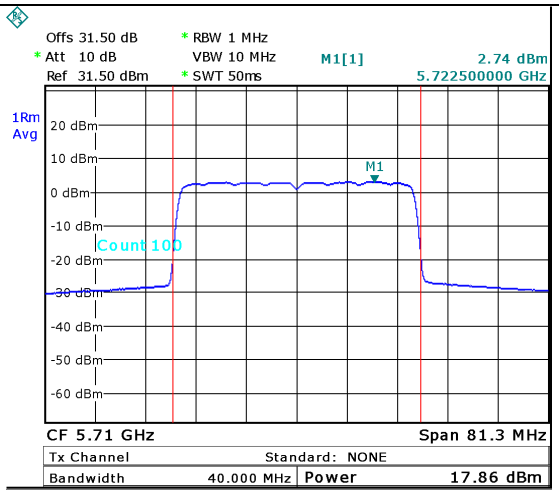


Figure 100. 5710.0MHz, 40MHz BW, port 2

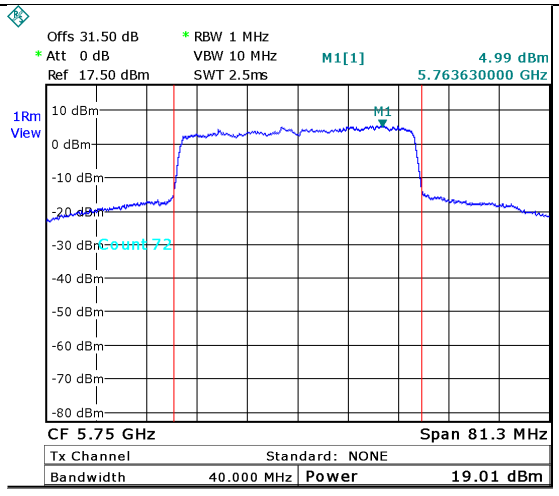


Figure 101. 5750.0MHz, 40MHz BW, port 1

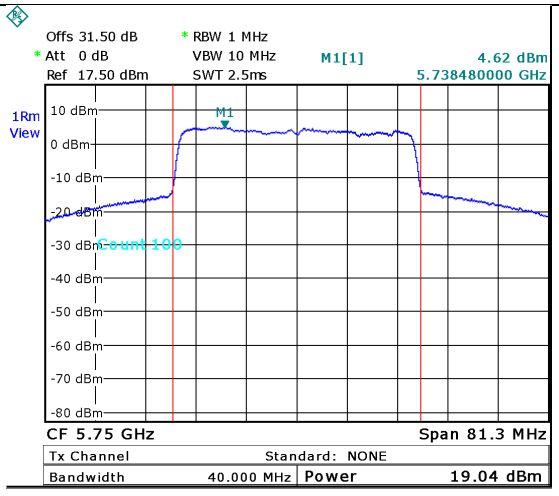


Figure 102. 5750.0MHz, 40MHz BW, port 2

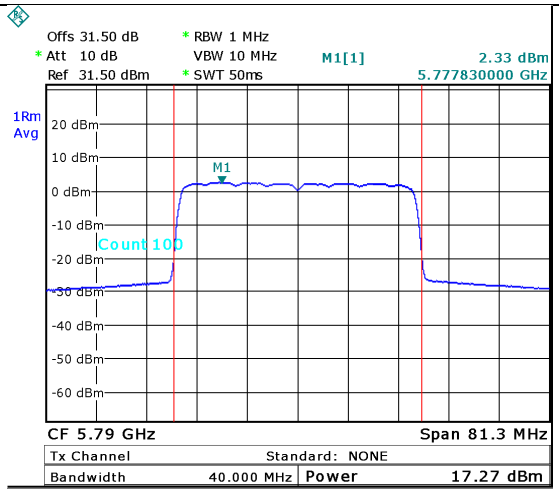


Figure 103. 5790.0MHz, 40MHz BW, port 1

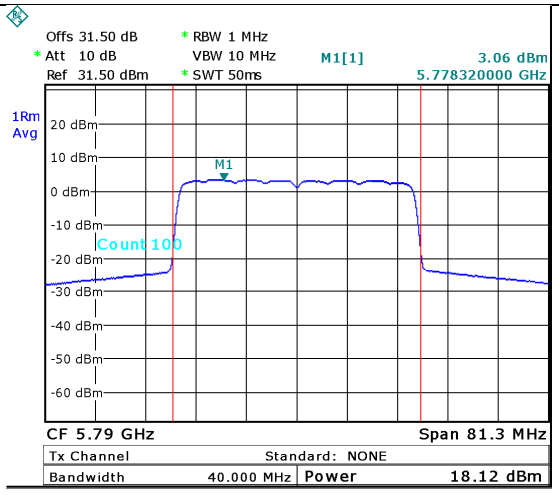


Figure 104. 5790.0MHz, 40MHz BW, port 2

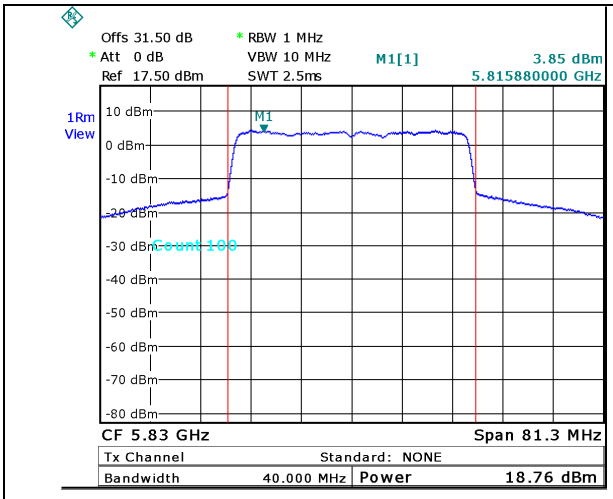


Figure 105. 5830.0MHz, 40MHz BW, port 1

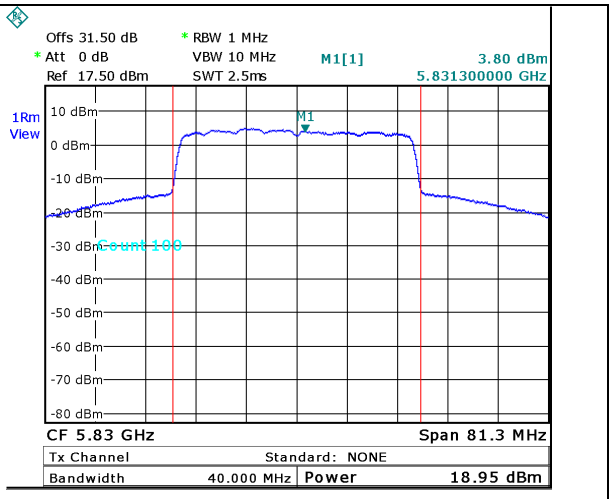


Figure 106. 5830.0MHz, 40MHz BW, port 2

9.6 Test Equipment Used, Transmitted Power Density

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	Rohde & Schwarz	FSL6	100194	23/02/2021	20/02/2023
Low Loss cable	Huber Shunner	Sucofelex	27504/4PEA	23/05/2021	23/05/2022
30 dB attenuator	MCL	BW-S30W5	533	23/05/2020	23/05/2022

Figure 107 Test Equipment Used

10 Band Edge

10.1 Test Specification

FCC Part 15, Subpart E, Section 15.407(b)(1-8)
RSS-247, Issue 2: 2017, Sections 6.2.1.2; RSS-Gen, Issue 5: 2018, Section 6.2

10.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))
Testing was performed for both Radiated Emission for Emissions in the Non-Restricted Bands and in the Restricted Bands:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.

- For band edge emissions that falls near the restricted band section II.G.1c applied with measuring methods as described in section II.G.5 (b) and II.G.6 (Method AD) of KDB 789033 D02
- For band edge emissions that falls outside the restricted band section II.G.2c and 2diii were applied with measuring methods as described in section II.G.5 (b) of KDB 789033 D02

The highest radiations are described in the plots below.

10.3 Test Limits FCC/ISED

Operating Band	Up band edge (restricted band)	Low Band edge (non-restricted band)
(MHz)	(dBm)	(dBm)
5250-5350	Peak: 74dBuV/m@3m Avg: 54dBuV/m@3m	NA
5470-5725	NA	e.i.r.p. of −27 dBm/MHz(68.2dBuV/m@3m)

Operating Band	Frequency ranges from band edge	EIRP limit	EIRP limit
(MHz)	(MHz)	(dBm/MHz)	(dBµV/m/MHz@3m)
5725-5850	±5.0	27.0 decreasing linearly to 15.6	122.2 decreasing linearly to 110.8
	±5.0±25.0	15.6 decreasing linearly to 10.0	110.0 decreasing linearly to 105.2
	±25.0±75.0	10.0 decreasing linearly to -27.0	105.2 decreasing linearly to 68.2
	±75.0	-27.0.0	68.2

*The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

In addition to the IC standard, any unwanted emission that falls into the band 5250-5350 MHz shall be attenuated below the channel power by at least 26 dB, when measured using a resolution bandwidth between 1 and 5% of the occupied bandwidth (i.e. 99% bandwidth), above 5250 MHz

10.4 Test Results

JUDGEMENT: Passed
The EUT met the requirements of the FCC Part 15, Subpart E, Section 15.407(b)(1-8), RSS-Gen: 2018, Section 6.2, and RSS-247, Issue 2: 2017, Sections 6.2.1(2), 6.2.2(2), 6.2.3(2), 6.2.4(2) specifications.
For details see Figure 108 to Figure 141.

Band Edge Emissions with 2-Port Transmission Configuration

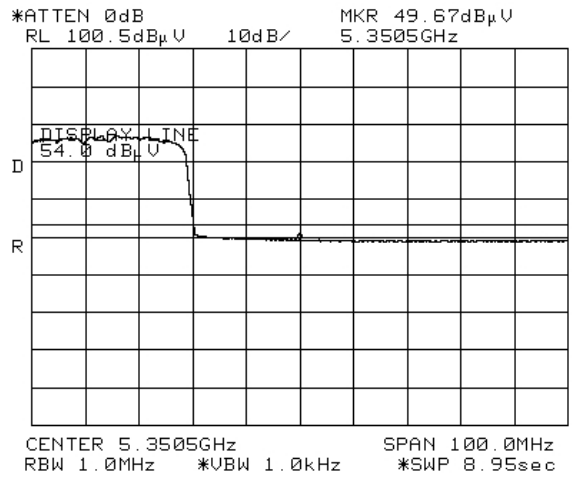


Figure 108: 5310M, Horizontal Avg

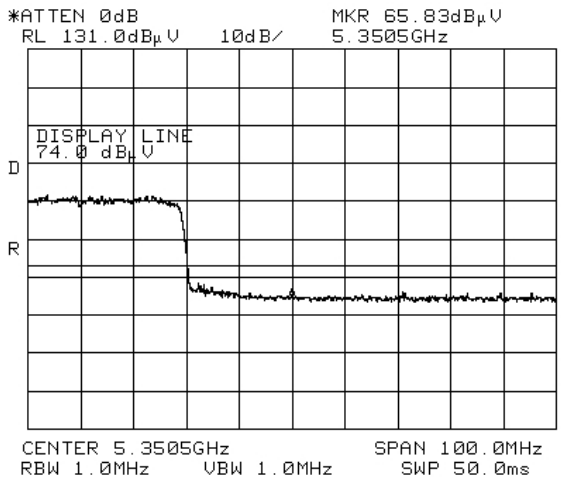


Figure 109: 5310M, Horizontal Peak

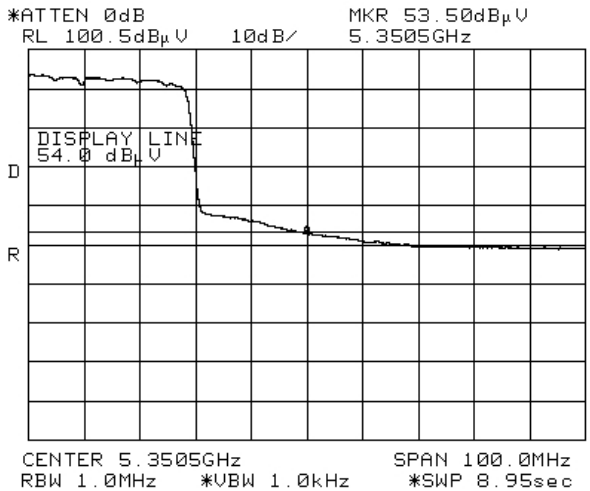


Figure 110: 5310M, Vertical Avg

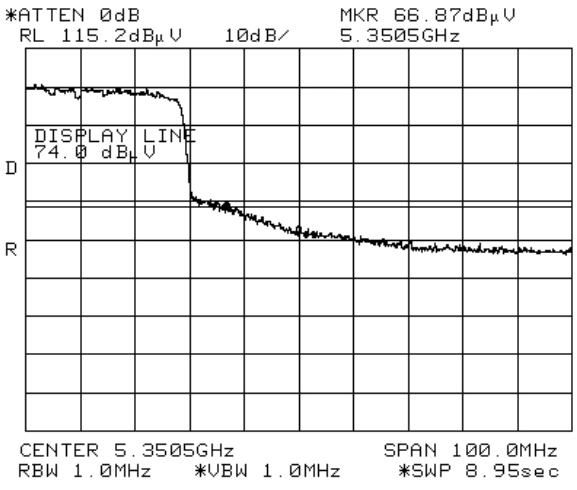


Figure 111: 5310M, Vertical Peak

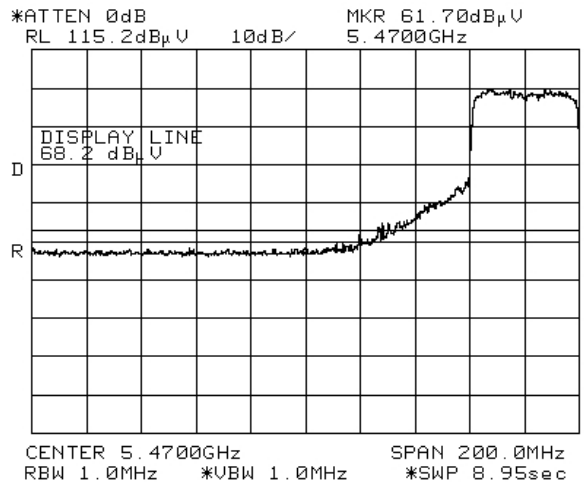


Figure 112: 5550M, Vertical Peak

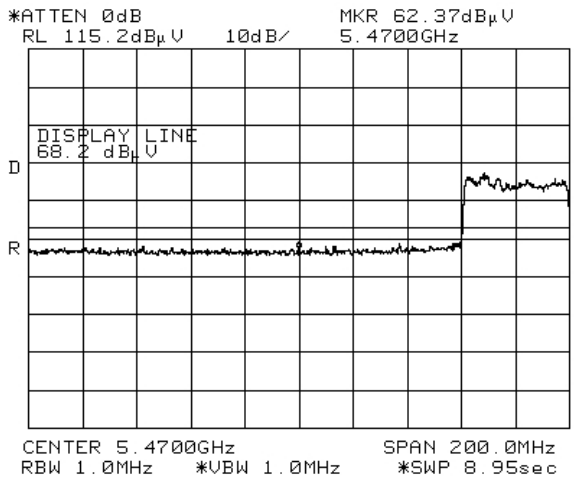


Figure 113: 5550M, Horizontal Peak

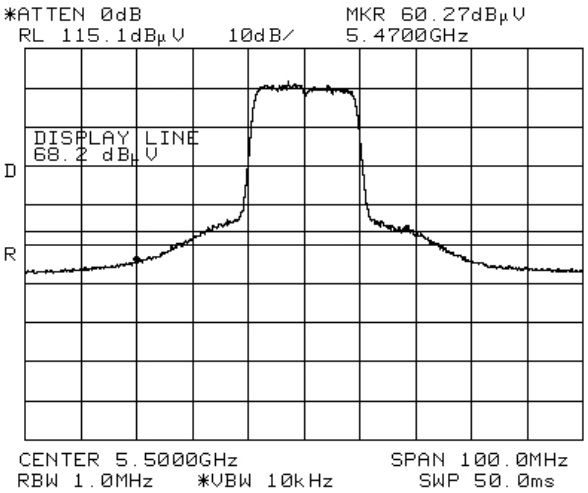


Figure 114: 5500M, VERTICAL PEAK

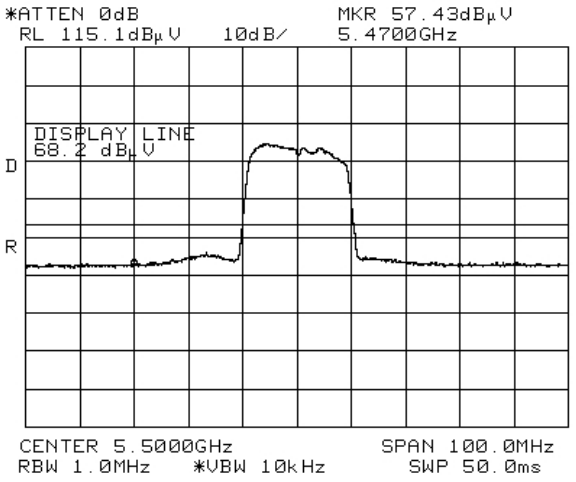


Figure 115: 5500M, HORIZONTAL PEAK

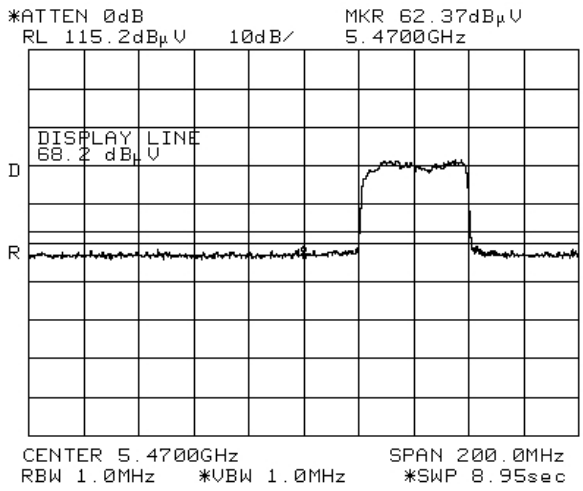


Figure 116: 5510M, Horizontal Peak

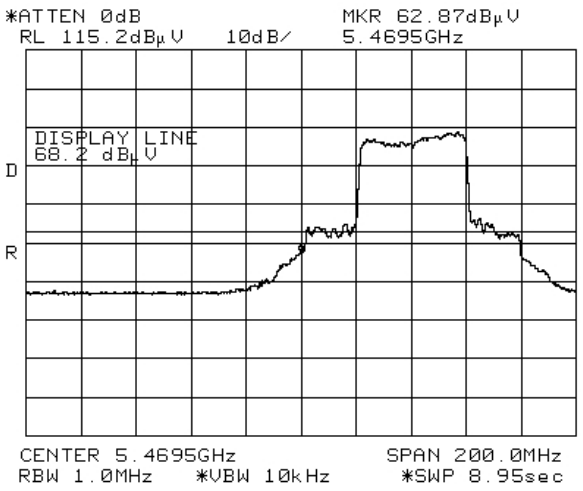


Figure 117: 5510M, Vertical Peak

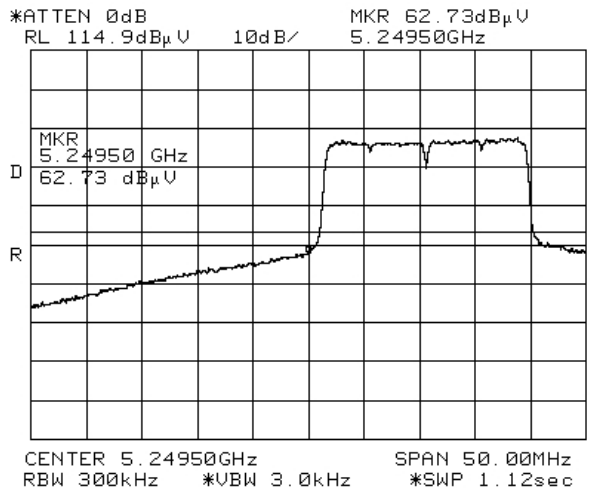


Figure 118: 5260M, Vertical Avg

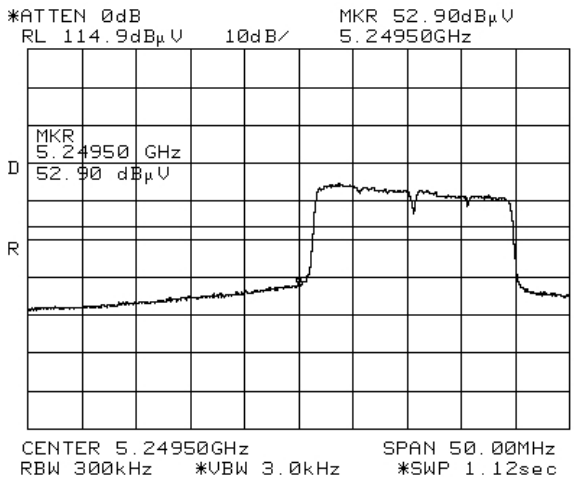


Figure 119: 5260M, Horizontal Avg

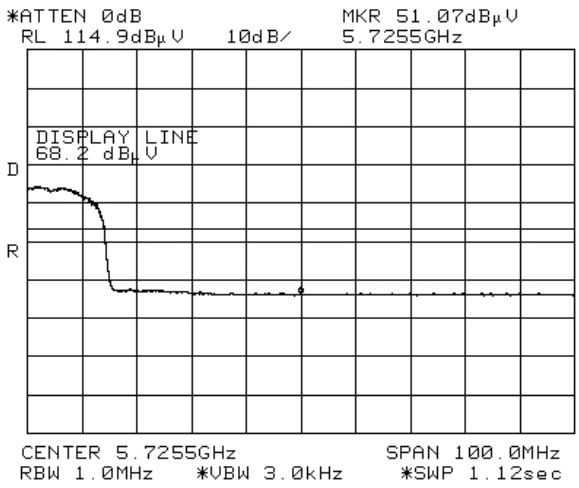


Figure 120: 5670M, Horizontal Avg

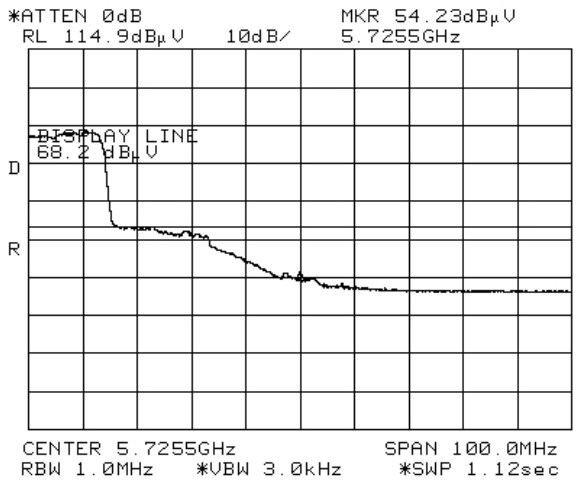


Figure 121: 5670M, Vertical Avg

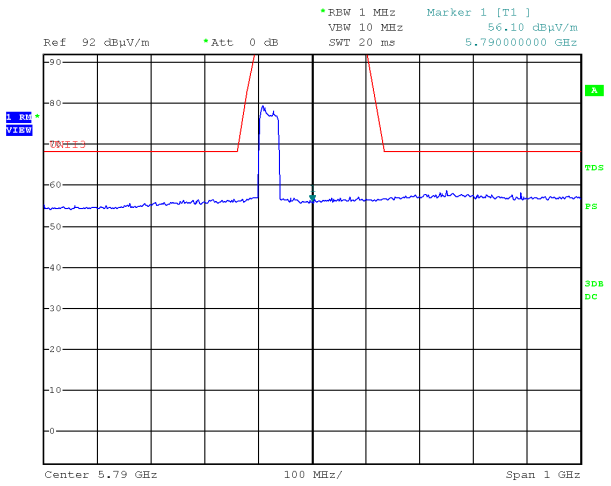


Figure 122: Emission performance, up to 40MHz from band edge, 5710M, Horizontal 1

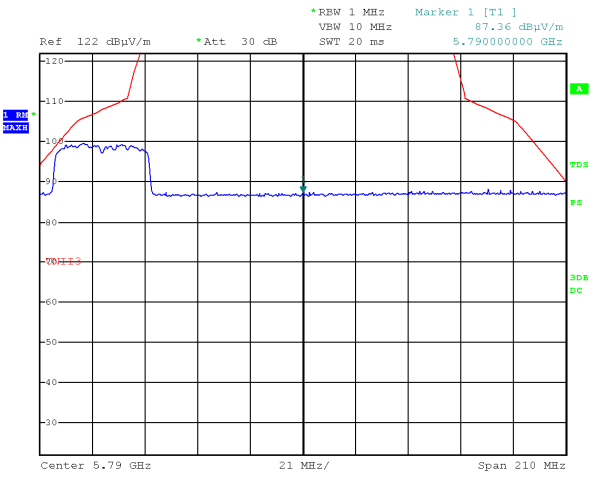


Figure 123: Emission performance, up to 500MHz from band edge, 5710M, Horizontal 2

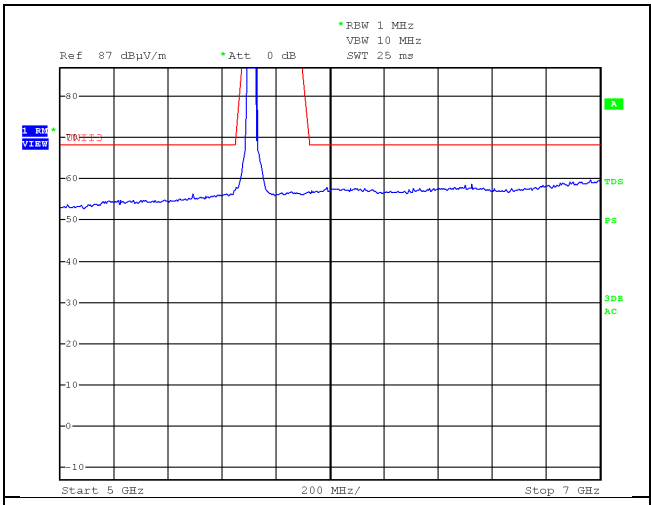


Figure 124: Emission performance, up to 40MHz from band edge, 5710M, Vertical 1

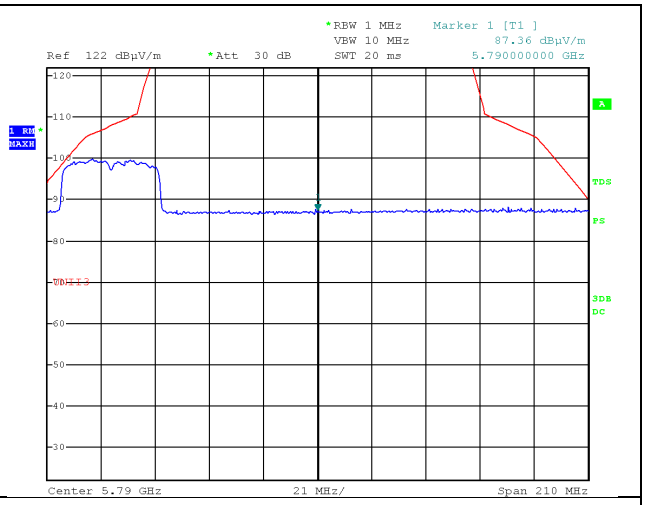


Figure 125: Emission performance, up to 500MHz from band edge, 5710M, Vertical 2

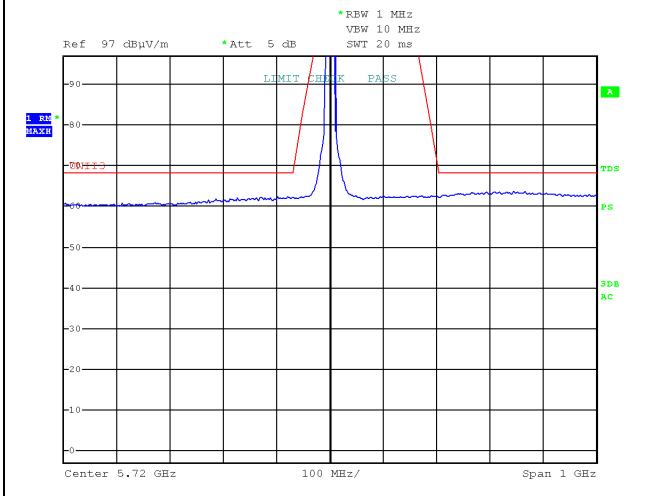


Figure 126: Emission performance, up to 40MHz from band edge, 5720M, Horizontal 1

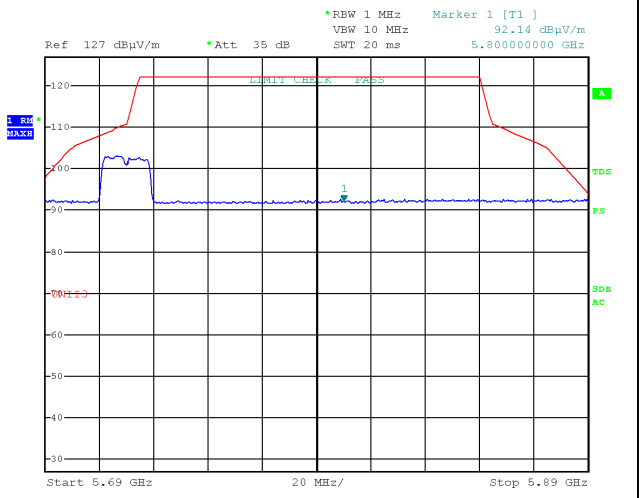


Figure 127: Emission performance, up to 500MHz from band edge, 5720M, Horizontal 2

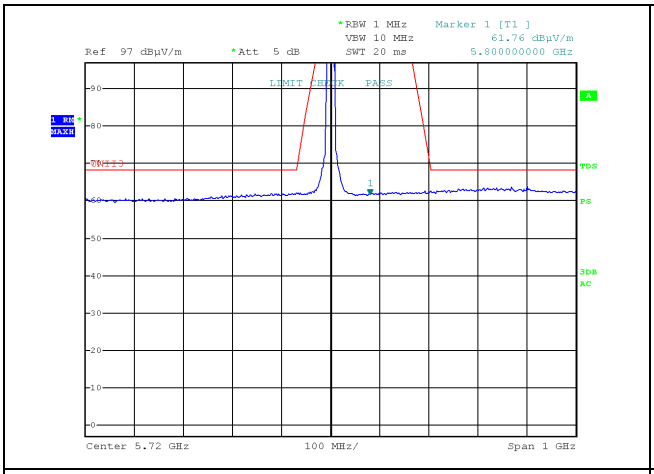


Figure 128: Emission performance, up to 40MHz from band edge, 5720M, Vertical 1

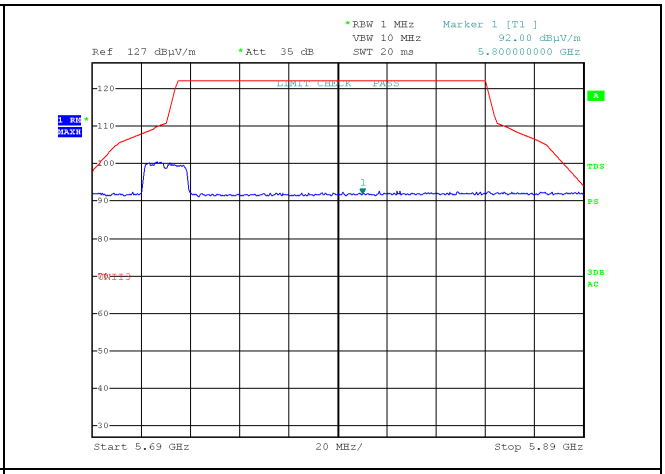


Figure 129: Emission performance, up to 500MHz from band edge, 5720M, Vertical 2

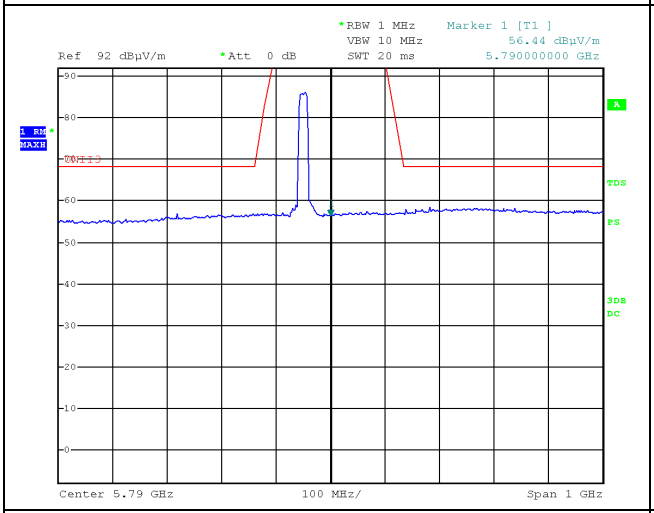


Figure 130: Emission performance, up to 40MHz from band edge, 5740M, Horizontal

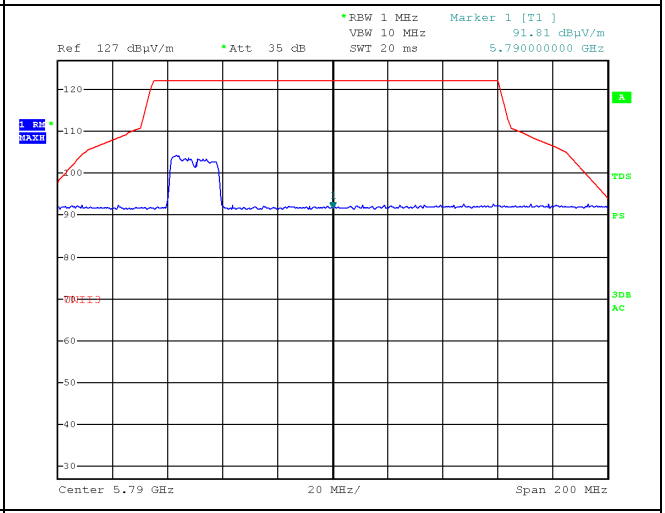


Figure 131: Emission performance, up to 500MHz from band edge, 5740M, Vertical 1

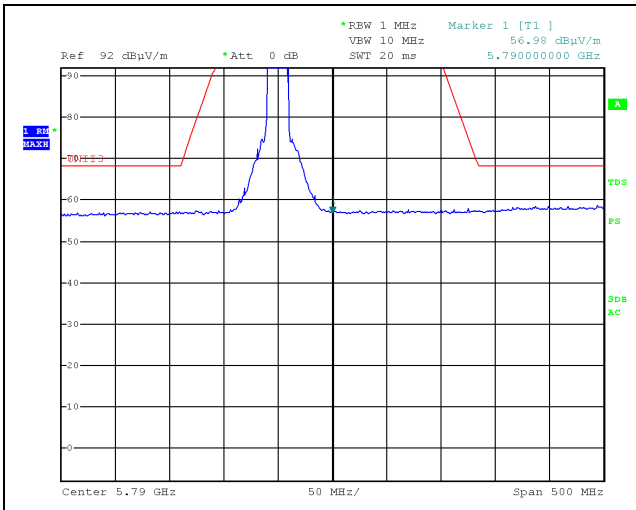


Figure 132: Emission performance, up to 40MHz from band edge, 5740M, Vertical 2

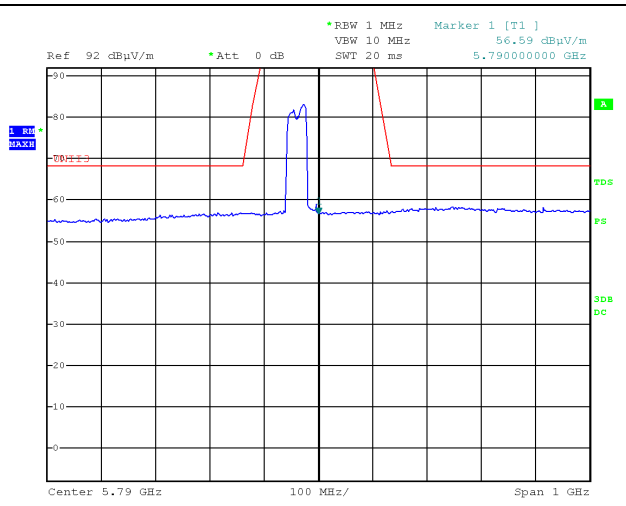


Figure 133: Emission performance, up to 500MHz from band edge, 5750M, Horizontal

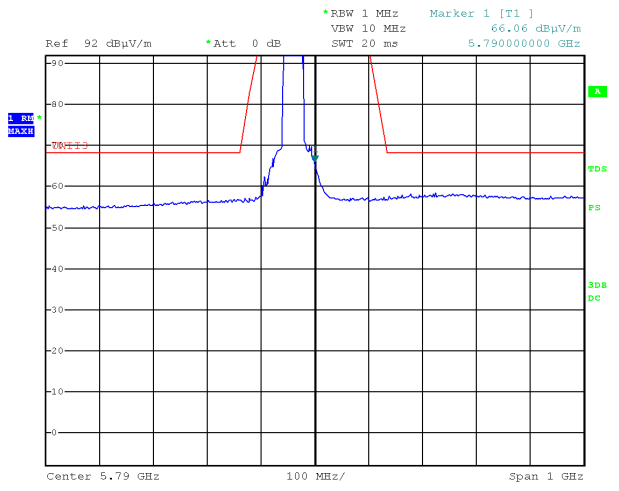


Figure 134: Emission performance, up to 40MHz from band edge, 5750M, Vertical 1

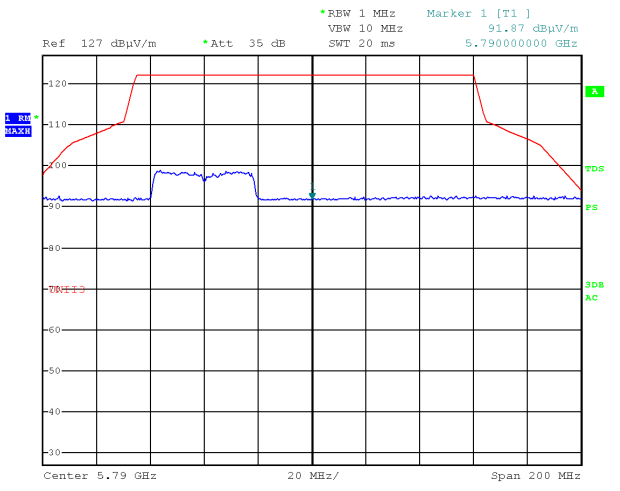


Figure 135: Emission performance, up to 500MHz from band edge, 5750M, Vertical 2

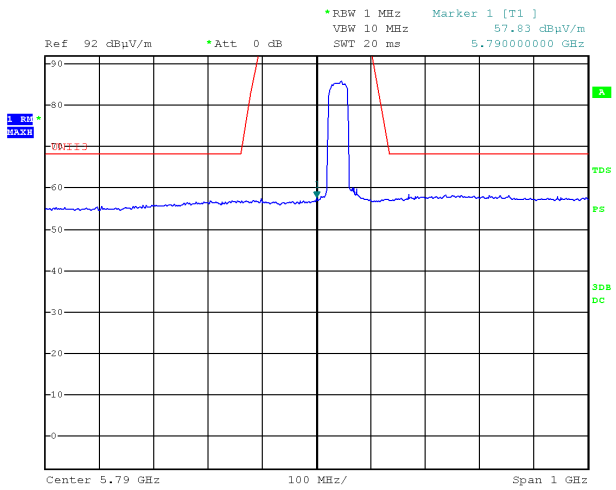


Figure 136: Emission performance, up to 40MHz from band edge, 5830M, Horizontal

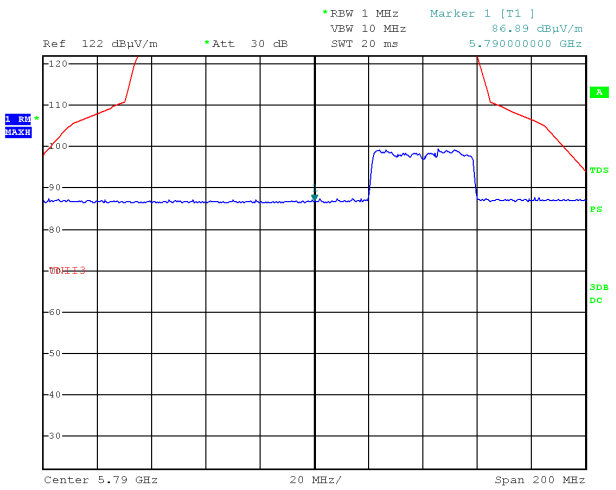


Figure 137: Emission performance, up to 500MHz from band edge, 5830M, Vertical 1

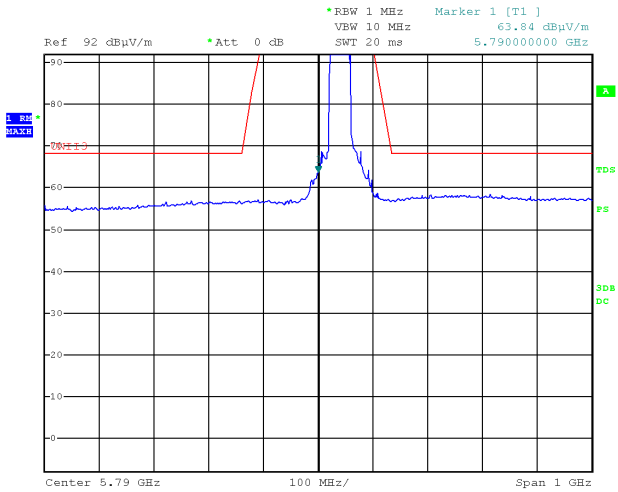


Figure 138: Emission performance, up to 40MHz from band edge, 5830M, Vertical 2

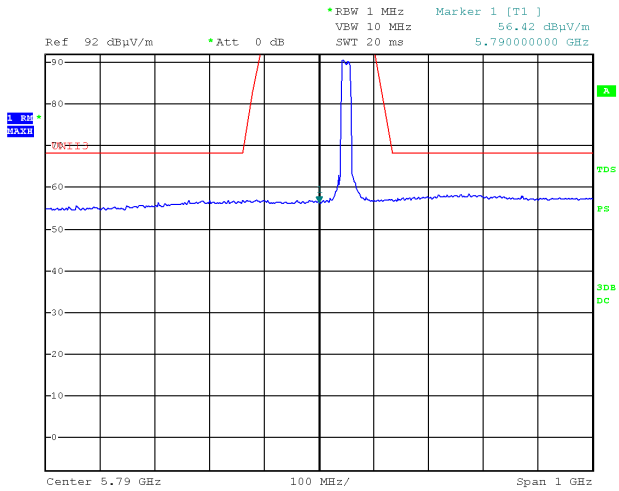


Figure 139: Emission performance, up to 500MHz from band edge, 5840M, Horizontal

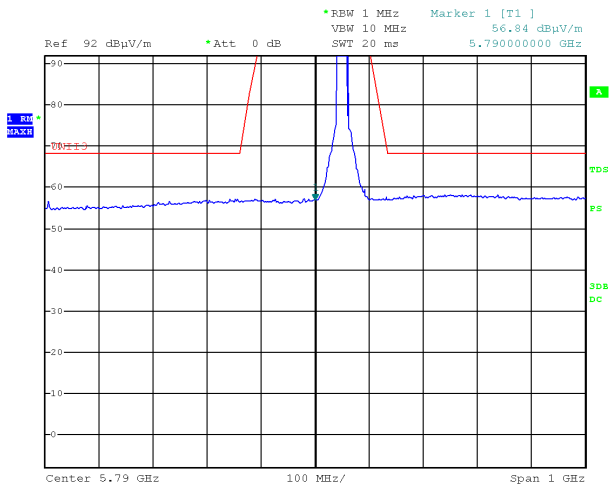


Figure 140: Emission performance, up to 40MHz from band edge, 5840M, Vertical 1

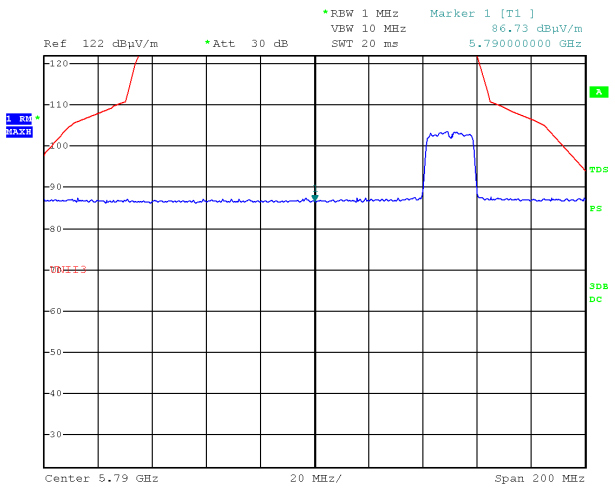


Figure 141: Emission performance, up to 500MHz from band edge, 5840M, Vertical 2

10.5 Test Instrumentation Used, Band Edge

Instrument	Manufacturer	Model	Serial No.	Last Calibration	Next Calibration
Spectrum Analyzer	HP	8564E	3442A00275	28/02/2021	28/02/2023
Horn Antenna	ETS	3115	29845	25/05/2021	25/05/2024
EMI Test Receiver	Rohde & Schwarz	ESCI7	100724	23/02/2021	23/02/2023
Cable for KA Band Antenna	OSR Electronics	37297C KPS\KPS (KPS-1503-590-KPS	1503-590 (05032006)	23/05/2021	23/05/2022
10 m RF cable	Commscope ORS	0623 WBC-400	G020132	25/05/2021	25/05/2022

Figure 142 Test Equipment Used

11 Undesirable/Unwanted Emissions

11.1 Test Specification

Part 15, Subpart E, 15.407(b)
RSS-247, Issue 2: 2017, Section 6.2.4.2; RSS-Gen, Issue 5: 2018, Section 8.9

11.2 Test Procedure

(Temperature (22°C)/ Humidity (56%RH))
Testing was performed for both Radiated Emission for Emissions in the Non-Restricted Bands & in the Restricted Bands:

For measurements between 0.009-30MHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 0.009-30MHz was scanned.

For measurements between 30-1000MHz:
A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 30-1000MHz was scanned and the list of the highest emissions was verified and updated accordingly.

For measurements between 1-40GHz:

The E.U.T was tested inside the shielded room and placed on a non-metallic table, 1.5 meters above the ground. The emissions were measured at a distance of 3 meters. The readings were maximized by the turntable azimuth between 0-360°, and the antenna polarization.
The frequency range 1.0-40.0 GHz was scanned.

Evaluation was performed for 20.0 and 40.0 MHz BW transmissions, and at all operations frequencies. The highest radiations are described in the tables below.

11.3 FCC and ISED Test Limits

Operation frequency band	Frequency ranges from band edge	EIRP limit	EIRP limit
	(MHz)	(dBm/MHz)	(dBµV/m/MHz@3m)
UNII2A	N/A	-27.0.0	68.2
UNII2C	N/A	-27.0.0	68.2
UNII3	±5.0	27.0 decreasing linearly to 15.6	122.2 decreasing linearly to 110.8
	±5.0±25.0	15.6 decreasing linearly to 10.0	110.0 decreasing linearly to 105.2
	±25.0±75.0	10.0 decreasing linearly to -27.0	105.2 decreasing linearly to 68.2
	±75.0	-27.0.0	68.2

Figure 143 FCC and IC Non-Restricted Band Limits

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength (dBµV/m)	Field strength* (dBµV/m) @ 3m
0.009-0.490	2400/F(kHz)	300	48.5-13.8	128.5-73.8
0.490-1.705	24000/F(kHz)	30	33.8-23.0	73.8-63.0
1.705-30.0	30	30	29.5	69.5
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

Figure 144 FCC Restricted Band Limits

Frequency (MHz)	Magnetic Field strength (microampere/meter)	Measurement distance (meters)	Magnetic Field strength (dBµA/m)	Magnetic Field strength* (dBµA/m) @ 3m
0.009-0.490	6.37/F(kHz)	300	-3.0-(-37.7)	77.0-42.2
0.490-1.705	63.7/F(kHz)	30	-17.7-(-28.5)	22.3-11.4
1.705-30.0	0.08	30	-21.9	18.0
Frequency (MHz)	**Field strength (microvolts/meter)**	**Measurement distance (meters)**	**Field strength (dBµV/m)**	**Field strength* (dBµV/m) @ 3m**
30-88	100	3	40.0	40.0
88-216	150	3	43.5	43.5
216-960	200	3	46.0	46.0
Above 960	500	3	54.0	54.0

*The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz Radiated emission limits in these three bands are based on measurements employing an average detector. For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

Figure 145 IC Restricted Band Limits

11.4 Test Results

JUDGEMENT: Passed

The EUT met the requirements of the FCC Part 15, Subpart E, Section 15.407(b) and RSS-247, Issue 2: 2018, Sections 6.2.1(2), 6.2.2(2), 6.2.3(2), 6.2.4(2) specification.

Radiated Emission

E.U.T Description	Wireless Video Transmission Module
Type	AMNPTTX01
Serial Number:	Not designated

Specifications: FCC, Part 15, Subpart E, Section 15.407(b) and RSS-247, Issue 2: 2018, Sections 6.2.1(2), 6.2.2(2), 6.2.3(2), 6.2.4(2)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 40.0 GHz

Operation BW: 40MHz Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
5310.0	21,240.0	V	53.1.	74.0	-20.9	50.6	54.0	-3.4
	21,240.0	H	47.8	74.0	-26.2	43.8	54.0	-10.2
5510.0	22,040.0	V	52.1	74.0	-21.9	49.1	54.0	-4.9
	22,040.0	H	47.2	74.0	-6.8	44.2	54.0	-9.8
5670.0	22,680.0	V	49.4	74.0	-24.6	47.1	54.0	-6.9
	22,680.0	H	45.2	74.0	-28.8	43.5	54.0	-10.5
5710.0	No emissions detected above the spectrum analyzer noise level which have at least 10dB margin below the limits							
5750.0								
5790.0								
5830.0								

Figure 146. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

Specifications: FCC, Part 15, Subpart E, Section 15.407(b)(1-7) and RSS-247, Issue 2: 2017, Sections 6.2.1(2), 6.2.2(2), 6.2.3(2), 6.2.4(2)

Antenna Polarization: Horizontal/Vertical Frequency Range: 9kHz to 40.0 GHz

Operation BW: 20MHz Detector: Peak, Average

Operation Frequency	Freq.	Pol	Peak Reading	Peak Limit	Peak Margin	Average Reading	Average Limit	Average Margin
(MHz)	(MHz)	(H/V)	(dBµV/m)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV/m)	(dB)
5260.0	21,040	V	54.8	74.0	-19.2	50.8	54.0	-3.2
	21,040	H	47.7	74.0	-26.3	42.6	54.0	-11.4
5500.0	22,000	V	50.1	74.0	-23.9	48.3	54.0	-5.7
	22,000	H	48.7	74.0	-25.3	43.2	54.0	-10.8
5580.0	No emissions detected above the spectrum analyzer noise level which have at least 10dB margin below the limits							
5720.0								
5740.0								
5780.0								
5800.0								
5840.0								

Figure 147. Radiated Emission Results

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Plots for the restricted band 5.35-5.46MHz

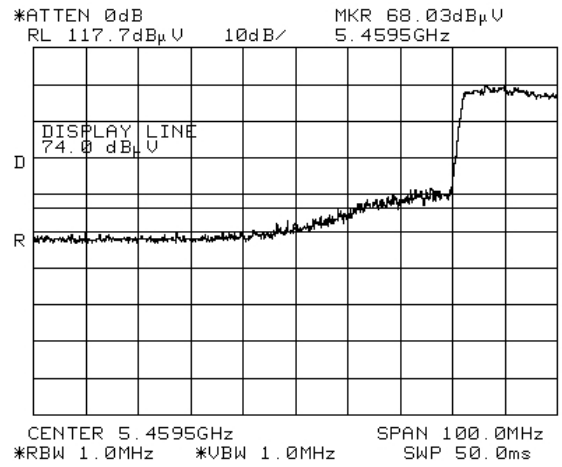


Figure 148: 5510M, horizontal, Peak

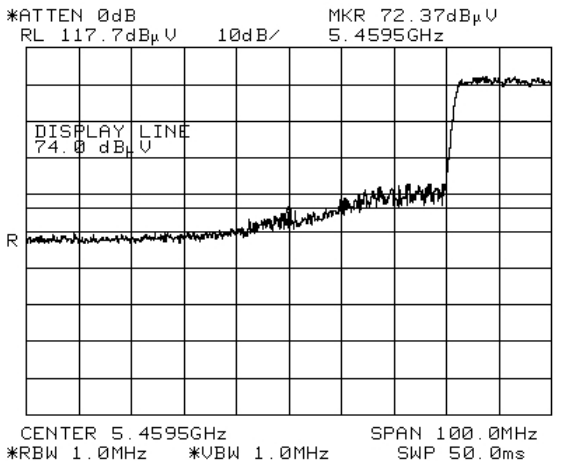


Figure 149: 5510M, vertical, Peak

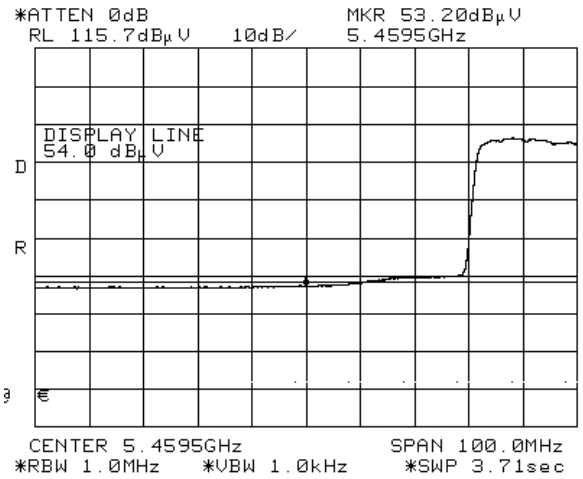


Figure 150: 5510M, horizontal, Avg

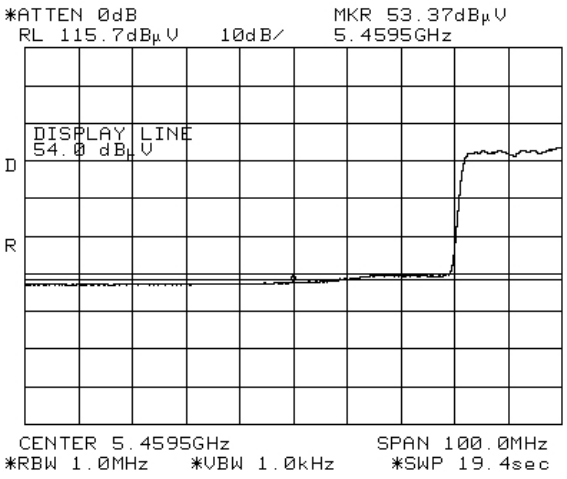


Figure 151: 5510M, vertical, Avg

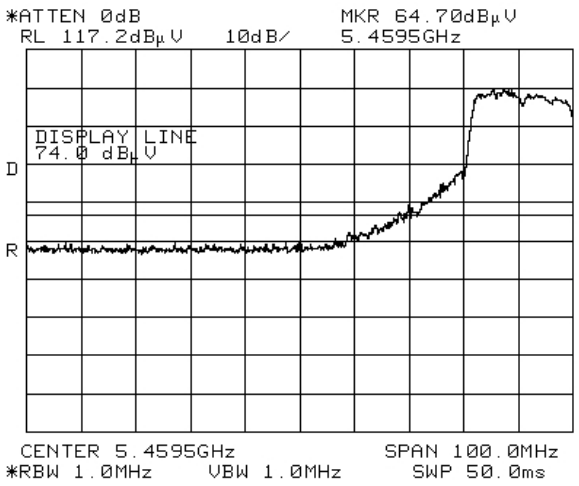


Figure 152: 5500M, horizontal, Peak

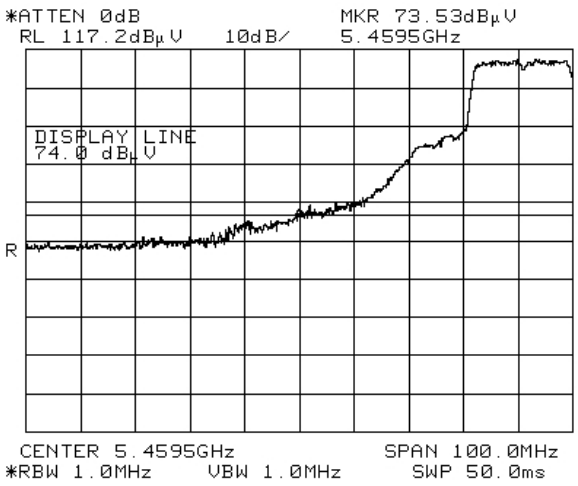


Figure 153: 5500M, vertical, Peak

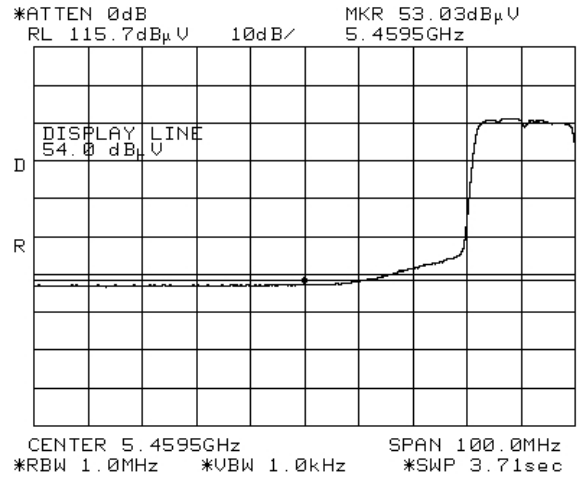


Figure 154: 5500M, horizontal, Avg

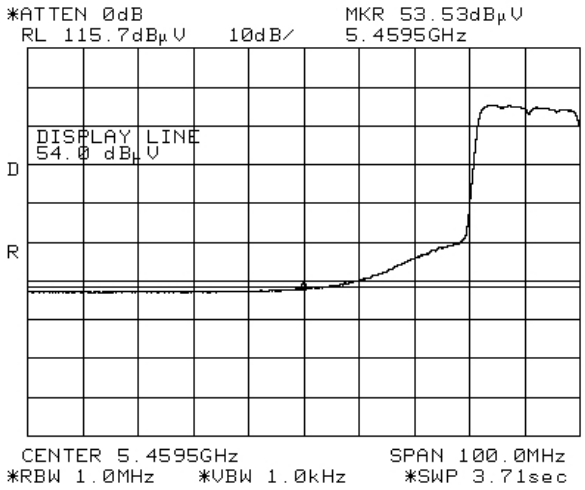


Figure 155: 5500M, vertical, Avg

11.5 Test Instrumentation Used, Emissions in Non-Restricted Frequency Bands

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
EMI Receiver	R&S	ESCI7	100724	23/2/2021	23/2/2023
EMI Receiver	HP	8542E	3906A00276	24/2/2021	24/2/2023
RF Filter Section	HP	85420E	3705A00248	24/2/2021	24/2/2023
EMC Analyzer	HP	8593 EM	3826A00265	22/2/2021	22/2/2023
Active Loop Antenna	EMCO	6502	2950	3/5/2021	3/5/2023

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Next Calibration Due
Biconical Antenna	EMCO	3110B	9912-3337	3/5/2020	3/5/2022
Log Periodic Antenna	EMCO	3146	9505-4081	27/4/2020	27/4/2024
Horn Antenna	ETS	3115	29845	25/5/2021	25/5/2024
Horn Antenna	ARA	SWH-28	1007	2/11/2021	2/11/2024
Log-periodic Antenna	EMCO	3146	9107-3158	27/4/2021	27/4/2024
RF Cable Chamber	Commscope ORS	0623 WBC-400	G020132	25/5/2020	25/5/2022
RF Cable Oats	EIM	RG214-11N(X2)	-	4/8/2020	20/05/2022
Filter Band Pass 4-20 GHz	Meuro	MFL040120H50	902252	24/5/2020	24/5/2022
Full Anechoic Civil Chamber	ETS	S81	SL 11643	NCR	NCR
Antenna Mast	ETS	2070-2	9608-1497	NCR	NCR
Turntable	ETS	2087	-	NCR	NCR
Mast & Table Controller	ETS/EMCO	2090	9608-1456	NCR	NCR

Figure 156 Test Equipment Used

11.6 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors", using the following equation:

FS = RA + AF + CF

FS: Field Strength [dBµv/m]
RA: Receiver Amplitude [dBµv]
AF: Receiving Antenna Correction Factor [dB/m]
CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dBµV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBµV

No external pre-amplifiers are used.

12 Antenna Gain/Information

12.1 Test Specification

FCC, Part 15, Subpart B. section 212 (a)(iv)

12.2 Test Limit

The modular transmitter must comply with the antenna and transmission system requirements of §§15.203, 15.204(b) and 15.204(c). The antenna must either be permanently attached or employ a “unique” antenna coupler (at all connections between the module and the antenna, including the cable).

12.3 Test Results

Model	Type	Antenna Gain	Impedance
AMN_ANT_1010	Dipole	2 dBi	50Ω
AMN_ANT_1012-0	Dipole	0 dBi	50Ω

Figure 157 Antenna Gain Results

Judgment: Passed

2dBi antenna with RP-SMA/UFL connector type.

13 RF Exposure/Safety

See a separate file.

14 APPENDIX A - CORRECTION FACTORS

14.1 For ITL #1911 OATS RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1.0	0.5		450.00	5.83
10.00	1.0		500.00	6.33
20.00	1.34		550.00	6.67
30.00	1.5		600.00	6.83
50.00	1.83		650.00	7.17
100.00	2.67		700.00	7.66
150.00	3.17		750.00	7.83
200.00	3.83		800.00	8.16
250.00	4.17		850.00	8.5
300.00	4.5		900.00	8.83
350.00	5.17		950.00	8.84
400.00	5.5		1000.00	9.0

14.2 For ITL #1840 Anechoic Chamber RF Cable

Frequency (MHz)	Cable Loss (dB)		Frequency (MHz)	Cable Loss (dB)
1000.0	-1.4		10000.0	-6.0
1500.0	-1.7		10500.0	-6.2
2000.0	-2.0		11000.0	-6.2
2500.0	-2.3		11500.0	-6.0
3000.0	-2.6		12000.0	-6.0
3500.0	-2.8		12500.0	-6.1
4000.0	-3.1		13000.0	-6.3
4500.0	-3.3		13500.0	-6.5
5000.0	-3.6		14000.0	-6.7
5500.0	-3.7		14500.0	-7.0
6000.0	-4.0		15000.0	-7.3
6500.0	-4.4		15500.0	-7.5
7000.0	-4.7		16000.0	-7.6
7500.0	-4.8		16500.0	-8.0
8000.0	-5.0		17000.0	-8.0
8500.0	-5.1		17500.0	-8.1
9000.0	-5.6		18000.0	-8.2
9500.0	-5.8			

14.3 For ITL # 1075 Active Loop Antenna

Frequency (MHz)	MAF (dBs/m)	AF (dB/m)
0.01	-33.1	18.4
0.02	-37.2	14.3
0.03	-38.2	13.3
0.05	-39.8	11.7
0.1	-40.1	11.4
0.2	-40.3	11.2
0.3	-40.3	11.2
0.5	-40.3	11.2
0.7	-40.3	11.2
1	-40.1	11.4
2	-40.0	11.5
3	-40.0	11.5
4	-40.1	11.4
5	-40.2	11.3
6	-40.4	11.1
7	-40.4	11.1
8	-40.4	11.1
9	-40.5	11.0
10	-40.5	11.0
20	-41.5	10.0
30	-43.5	8.0

14.4 For ITL #1356 Biconical Antenna

Frequency (MHz)	AF (dB/m)
30	14.94
35	13.79
40	12.66
45	11.68
50	10.96
60	9.92
70	9.36
80	8.78
90	8.74
100	9.93
120	11.02
140	11.63
160	12.38
180	13.24
200	14.25

14.5 For ITL # 1853 Log Periodic Antenna

Frequency (MHz)	AF (dB/m)
200	10.71
250	11.69
300	14.45
400	15.64
500	18.21
600	19.07
700	21.23
800	21.04
900	22.58
1000	23.96

14.6 For ITL # 1352 1-18 Horn Antenna

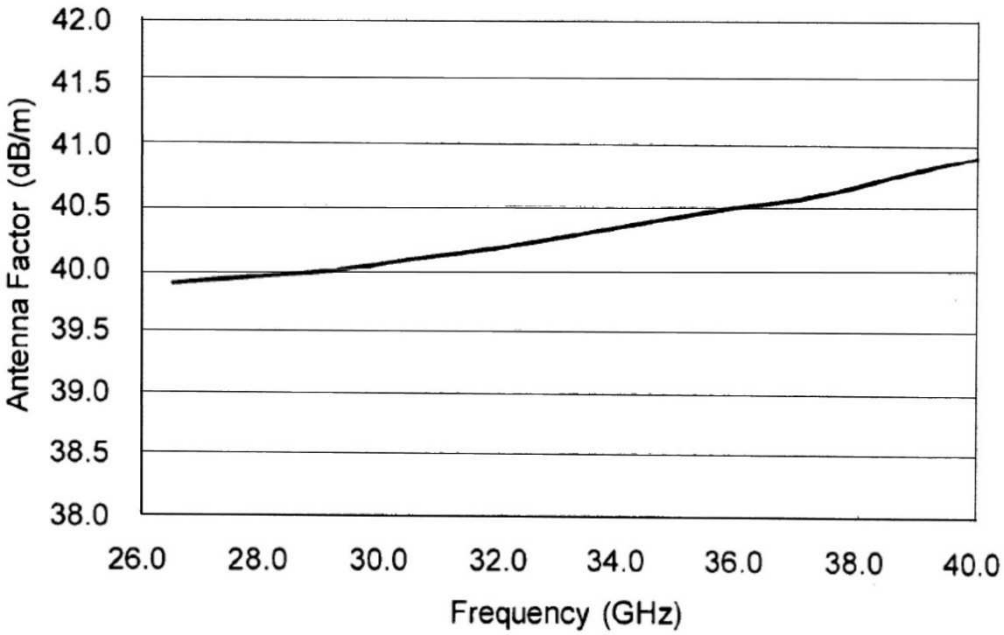
Frequency (GHz)	AF (dB/m)		Frequency (GHz)	AF (dB/m)
0.75	25		9.5	38
1.0	23.5		10.0	38.5
1.5	26.0		10.5	38.5
2.0	29.0		11.0	38.5
2.5	27.5		11.5	38.5
3.0	30.0		12.0	38.0
3.5	31.5		12.5	38.5
4.0	32.5		13.0	40.0
4.5	32.5		13.5	41.0
5.0	33.0		14.0	40.0
5.5	35.0		14.5	39.0
6.0	36.5		15.0	38.0
6.5	36.5		15.5	37.5
7.0	37.5		16.0	37.5
7.5	37.5		16.5	39.0
8.0	37.5		17.0	40.0
8.5	38.0		17.5	42.0
9.0	37.5		18.0	42.5

14.7 For ITL # 1353 18-26.5 GHz Horn Antenna

Frequency (MHz)	Measured antenna factor (dB/m)[1]
18000	32.4
18500	32.0
19000	32.3
19500	32.4
20000	32.3
20500	32.8
21000	32.8
21500	32.7
22000	33.1
22500	33.0
23000	33.1
23500	33.8
24000	33.5
24500	33.5
25000	33.8
25500	33.9
26000	34.2
26500	34.7

[1] The antenna factor shall be added to the receiver reading in dBµV to obtain field strength in dBµV/m.

14.8 For ITL # 1777 26.5-40 GHz Horn Antenna



14.9 For Horn Antenna Model: SWH-28

Measuring distance: 3 meters.

Frequency (MHz)	Measured antenna factor (dB/m)[2]
18,000	32.4
18,500	32.0
19,000	32.3
19,500	32.4
20,000	32.3
20,500	32.8
21,000	32.8
21,500	32.7
22,000	33.1
22,500	33.0
23,000	33.1
23,500	33.8
24,000	33.5
24,500	33.5

[2] The antenna factor shall be added to the receiver reading in dBµV, to obtain field strength in dBµV/m.

Frequency (MHz)	Measured antenna factor $(dB/m)^2$
25,000	33.8
25,500	33.9
26,000	34.2
26,500	34.7

End of Test report