Certification Application Report
FCC Part 15.407 & ISED RSS-247

Test Lab:		Applicant:	
Rhein Tech Laboratories, Inc. Phone:703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com		Honeywell International Inc. 9680 Old Bailes Road Fort Mill, SC 29707	
FCC ID/ IC	HD5-TAP1000-01/ 1693B-TAP100001	**Test Report Date**	June 15, 2018
Platform	N/A	**RTL Work Order #**	2018064
Model Model #/HVINs	A700x TAP1010-01, TAP1020-01, TAP1030-01	**RTL Quote #**	QRTL18-064A
American National Standard Institute	ANSI C63.10-2013 American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices		
FCC Classification:	NII-Unlicensed National Information Infrastructure TX		
FCC Rule Part(s)	FCC Rules Part 15.407: Unlicensed National Information Infrastructure Devices - General Technical Requirements		
ISED Standards	RSS-247 Issue 2: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus		
Digital Interface Information	Digital Interface was found to be compliant		

Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
5180 – 5240	0.027	N/A	91M8F1D
5260 – 5320	0.020	N/A	89M5F1D
5500 – 5700	0.022	N/A	97M4F1D
5745 – 5825	0.022	N/A	91M7F1D

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, ANSI C63.10, and ISED RSS-247 and RSS-Gen.

Signature:  Date: June 15, 2018

Typed/Printed Name: Desmond A. Fraser Position: President

These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANAB. Refer to certificate and scope of accreditation AT-1445.

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1 General Information

1.1 Scope

Applicable Standards:

FCC Rules Part 15.407: Unlicensed National Information Infrastructure Devices - General Technical Requirements

ISED RSS-247: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and License-Exempt Local Area Network (LE-LAN) Devices

ISED RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus

1.2 Description of EUT

Equipment Under Test	Body-worn transmitter
Model	A700x
Power Supply	Internal rechargeable 3.7VDC Li-Ion Battery
Modulation Type	OFDM
Frequency Range	5180-5240 MHz, 5260-5320 MHz, 5500-5700 MHz, 5745-5825 MHz
Antenna Connector	Internal 5.3 dBi

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.10-2013).

1.4 Related Submittal(s)/Grant(s)

This is an original certification application for Honeywell International Inc. Model A700x, FCC ID: HD5-TAP1000-01, IC: 1693B-TAP100001. The ISED application includes a family certification for three HVINS: TAP1010-01, TAP1020-01, and TAP1030-01. These 3 HVINs are electrically identical.

1.5 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested.

Table 2-1: Test Modes

802.11a (20 MHz)	5180
802.11n (20 MHz)	5180
802.11n (40 MHz)	5190
802.11a (20 MHz)	5200
802.11n (20 MHz)	5200
802.11n (40 MHz)	5230
802.11a (20 MHz)	5240
802.11n (20 MHz)	5240
802.11ac (80 MHz)	5210
802.11a (20 MHz)	5260
802.11n (20 MHz)	5260
802.11n (40 MHz)	5270
802.11a (20 MHz)	5280
802.11n (20 MHz)	5280
802.11n (40 MHz BW)	5310
802.11a (20 MHz)	5320
802.11n (20 MHz)	5320
802.11ac (80 MHz)	5290
802.11a (20 MHz)	5260
802.11n (20 MHz)	5260
802.11n (40 MHz BW)	5270
802.11a (20 MHz)	5280
802.11n (20 MHz)	5280
802.11n (40 MHz BW)	5310
802.11a (20 MHz)	5320
802.11n (20 MHz)	5320
802.11a (20 MHz BW)	5500
802.11n (20 MHz)	5550
802.11a (20 MHz)	5600
802.11n (20 MHz)	5650
802.11a (20 MHz)	5700
802.11n (20 MHz)	5750
802.11ac (80 MHz)	5530
802.11ac (80 MHz)	5610
802.11ac (80 MHz)	5690
802.11a (20 MHz)	5745
802.11n (20 MHz)	5745
802.11n (40 MHz BW)	5755
802.11a (20 MHz)	5785
802.11n (20 MHz)	5785

802.11n (40 MHz BW)	5795
802.11a (20 MHz)	5825
802.11n (20 MHz)	5825
802.11ac (80 MHz)	5775

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted, and all modes were investigated and the worst-case mode was used for final testing. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-2: Test Result Summary – FCC Part 15, Subpart C (Section 15.407); ISED RSS-247, RSS-Gen

Test	FCC Reference	ISED Reference	Result
Maximum Conducted Output Power	FCC 15.407(a/1/2/3)	RSS-247 6.2 RSS-Gen 6.12	Pass
Peak Power Spectral Density Measurement	FCC 15.407(a/1/2/3)	RSS-247 6.2	Pass
Frequency Stability Measurement	FCC 15.407(g)	RSS-Gen 6.11	Pass
Compliance With the Band Edge	FCC 15.407(7), 15.205	RSS-247 6.2	Pass
Antenna Conducted Spurious Emissions	FCC 15.407(6)	RSS-247 6.2	Pass
26 dB and 6dB Bandwidth	FCC 15.407(a) and (e)	RSS-247 6.2	Pass
Radiated Emissions	FCC 15.209	RSS-247 6.2 RSS-Gen 6.13/7.1	Pass
99% Bandwidth	N/A	RSS-Gen 6.7/ TRC-43	N/A

2.4 Test System Details

The test samples were received on June 5, 2018. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables. The BT transceiver models are electrically identical.

Table 2-3: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
BT Transceiver (conducted)	Honeywell International Inc.	TAP1020-01	7518200122	HD5-TAP1000-01	N/A	22944
BT Transceiver	Honeywell International Inc.	TAP1020-01	7518200106	HD5-TAP1000-01	N/A	22942
BT Transceiver	Honeywell International Inc.	TAP1010-01	7418200070	HD5-TAP1000-01	N/A	22940
3.7V Lithium Ion Battery	Honeywell International Inc.	BT-901	351747034705	N/A	N/A	22950
3.7V Lithium Ion Battery	Honeywell International Inc.	TBA901-01	351747030105	N/A	N/A	22955
3.7V Lithium Ion Battery	Honeywell International Inc.	BT-902	351741029405	N/A	N/A	22952

Table 2-4: Support Equipment

Part	Manufacturer	Model #	Serial Number	FCC ID	Cable Description	RTL Bar Code
Laptop	Samsung	NP300E5A-A01UB	HJVF93EB903201D	N/A	N/A	901550

2.5 Configuration of Tested System

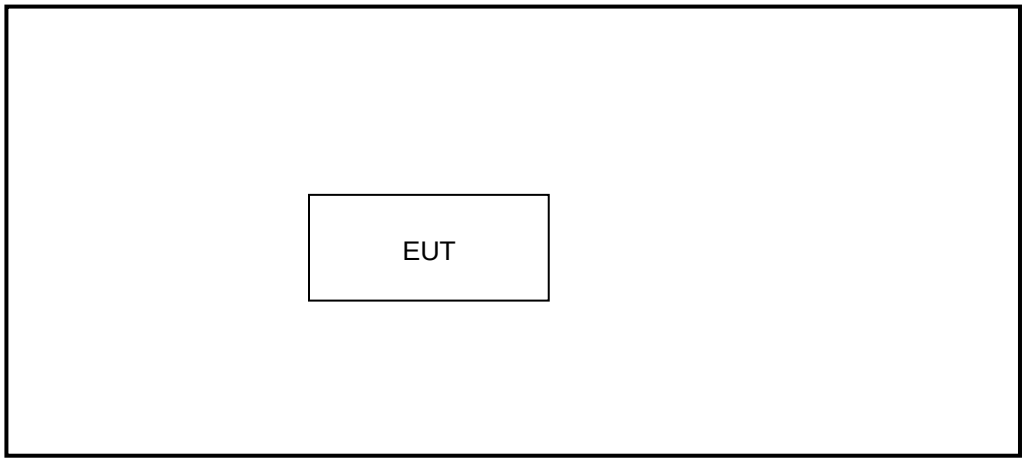


Figure 2-1: Configuration of System Under Test

3 Peak Output Power – FCC 15.407(a)(1) (2)(3); ISED RSS-247 6.2, RSS-Gen 6.12

3.1 Power Output Test Procedure

A conducted power measurement of the EUT was taken using an analyzer with a 50 ohm attenuator.

3.2 Power Output Test Data

Table 3-1: Power Output Test Data – 5180-5240 MHz, 802.11a

Designation	Frequency (MHz)	RMS Power Conducted Output (dBm)	Limit (dBm)	Pass/Fail
802.11a (20 MHz BW)	5180	11.0	30.0	Pass
802.11n (20 MHz BW)	5180	11.5	30.0	Pass
802.11n (40 MHz BW)	5180	14.3	30.0	Pass
802.11a (20 MHz BW)	5200	11.1	30.0	Pass
802.11n (20 MHz BW)	5200	11.3	30.0	Pass
802.11n (40 MHz BW)	5180	14.3	30.0	Pass
802.11ac (80MHz BW)	5210	11.4	30.0	Pass
802.11a (20 MHz BW)	5220	11.2	30.0	Pass
802.11n (20 MHz BW)	5220	11.3	30.0	Pass
802.11n (40 MHz BW)	5220	11.7	30.0	Pass
802.11a (20 MHz BW)	5240	11.5	30.0	Pass
802.11n (20 MHz BW)	5240	11.2	30.0	Pass
802.11n (40 MHz BW)	5240	11.7	30.0	Pass

Table 3-2: Power Output Test Data – 5260-5320 MHz and 5500-5700 MHz

Designation	Frequency (MHz)	RMS Power Conducted Output (dBm)	Limit (dBm)	Pass/Fail
802.11a (20 MHz BW)	5260	11.0	24.0	Pass
802.11n (20 MHz BW)	5260	13.0	24.0	Pass
802.11n (40 MHz BW)	5260	11.9	24.0	Pass
802.11a (20 MHz BW)	5280	11.0	24.0	Pass
802.11n (20 MHz BW)	5280	11.5	24.0	Pass
802.11n (40 MHz BW)	5280	11.5	24.0	Pass
802.11ac (80 MHz BW)	5290	11.7	24.0	Pass
802.11a (20 MHz BW)	5320	11.5	24.0	Pass
802.11n (20 MHz BW)	5320	11.3	24.0	Pass
802.11n (40 MHz BW)	5320	11.3	24.0	Pass
802.11a (20 MHz BW)	5500	12.7	24.0	Pass
802.11n (20 MHz BW)	5500	12.9	24.0	Pass
802.11n (40 MHz BW)	5500	13.0	24.0	Pass
802.11ac (80 MHz BW)	5530	13.4	24.0	Pass
802.11a (20 MHz BW)	5600	11.8	24.0	Pass
802.11n (20 MHz BW)	5600	11.8	24.0	Pass
802.11n (40 MHz BW)	5600	12.1	24.0	Pass
802.11ac (80 MHz BW)	5610	12.2	24.0	Pass
802.11 ac (80 MHz BW)	5690	11.2	24.0	Pass
802.11a (20 MHz BW)	5700	11.4	24.0	Pass
802.11n (20 MHz BW)	5700	11.6	24.0	Pass
802.11n (40 MHz BW)	5700	11.4	24.0	Pass

Table 3-3: Power Output Test Data – 5745–5825 MHz

Designation	Frequency (MHz)	RMS Power Conducted Output (dBm)	Limit (dBm)	Pass/Fail
802.11a (20 MHz BW)	5745	12.9	30.0	Pass
802.11n (20 MHz BW)	5745	13.5	30.0	Pass
802.11n (40 MHz BW)	5745	10.9	30.0	Pass
802.11ac (80 MHz BW)	5775	10.8	30.0	Pass
802.11a (20 MHz BW)	5785	10.3	30.0	Pass
802.11n (20 MHz BW)	5785	10.9	30.0	Pass
802.11n (40 MHz BW)	5785	10.6	30.0	Pass
802.11a (20 MHz BW)	5825	10.4	30.0	Pass
802.11n (20 MHz BW)	5825	10.3	30.0	Pass

Result: PASS

Measurement uncertainties shown for these tests are expanded Gaussian uncertainties expressed at 95% confidence level using a coverage factor k = 1.96. Measurement uncertainty = ±0.5 dB.

Table 3-4: Power Output Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Khue Do		June 6, 2018
Test Engineer	Signature	Date of Test

4 Compliance with the Band Edge – FCC 15.407(7) 15.205; ISED RSS-247 6.2

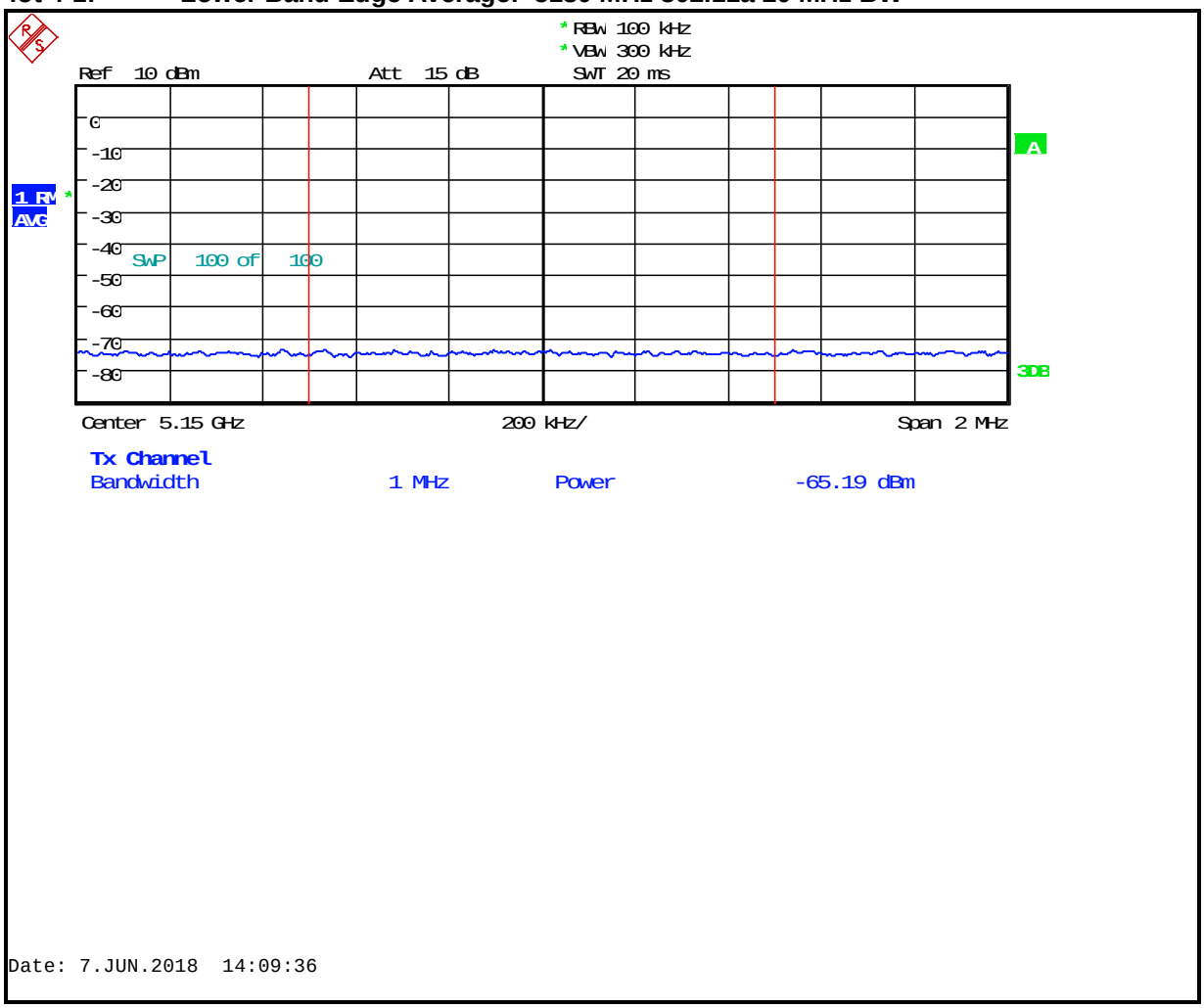
4.1 Band Edge Test Procedure

The transmitter output was connected to its appropriate antenna. 1 MHz integrated peak (100 kHz RBW/1 MHz VBW) and 1 MHz integrated average (100 MHz RBW/1 MHz VBW) corrected measurements were taken within the restricted band to show compliance.

4.2 Restricted Band Edge Test Results

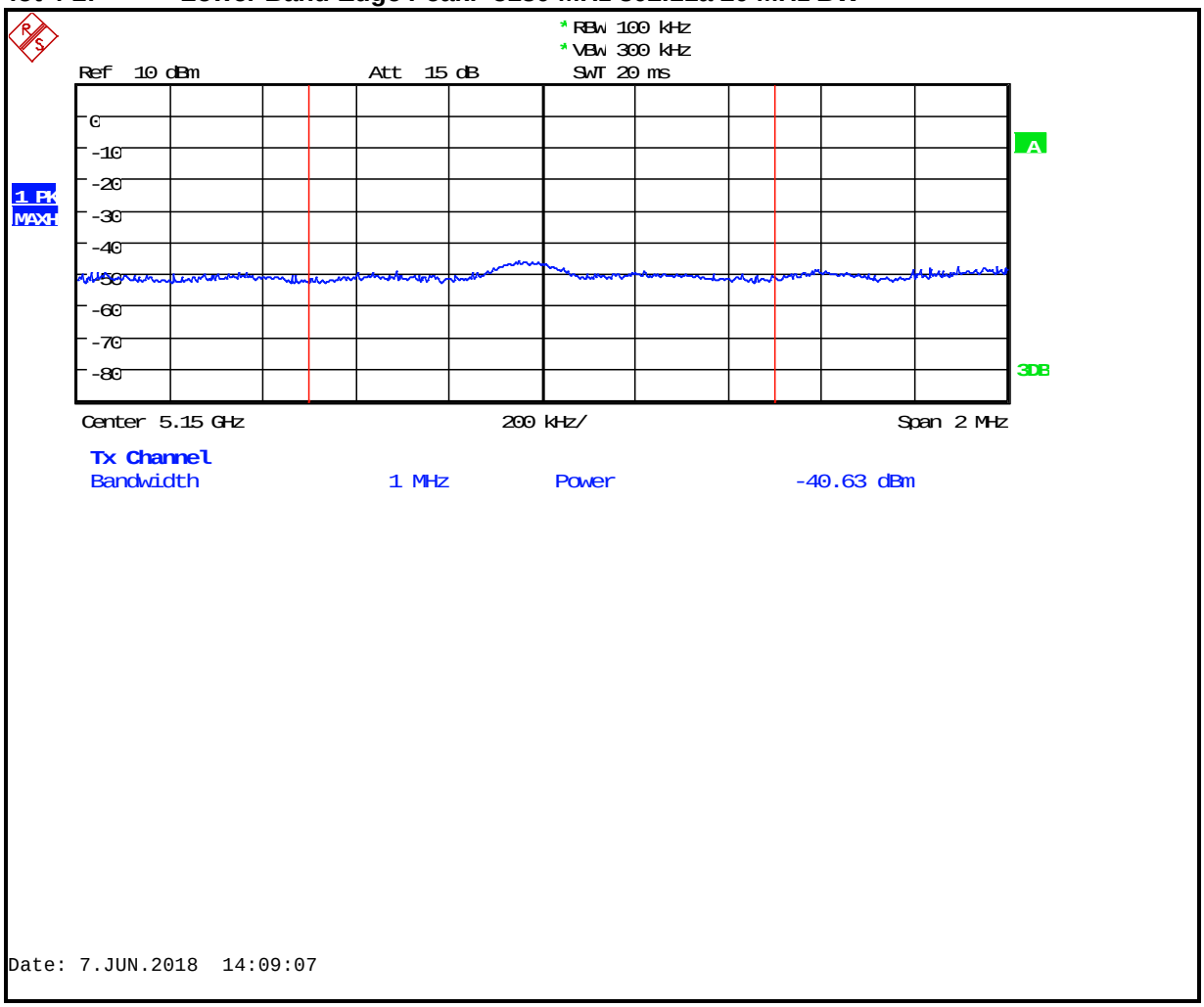
4.2.1 Lower Band Edge

Plot 4-1: Lower Band Edge Average: 5180 MHz 802.11a 20 MHz BW



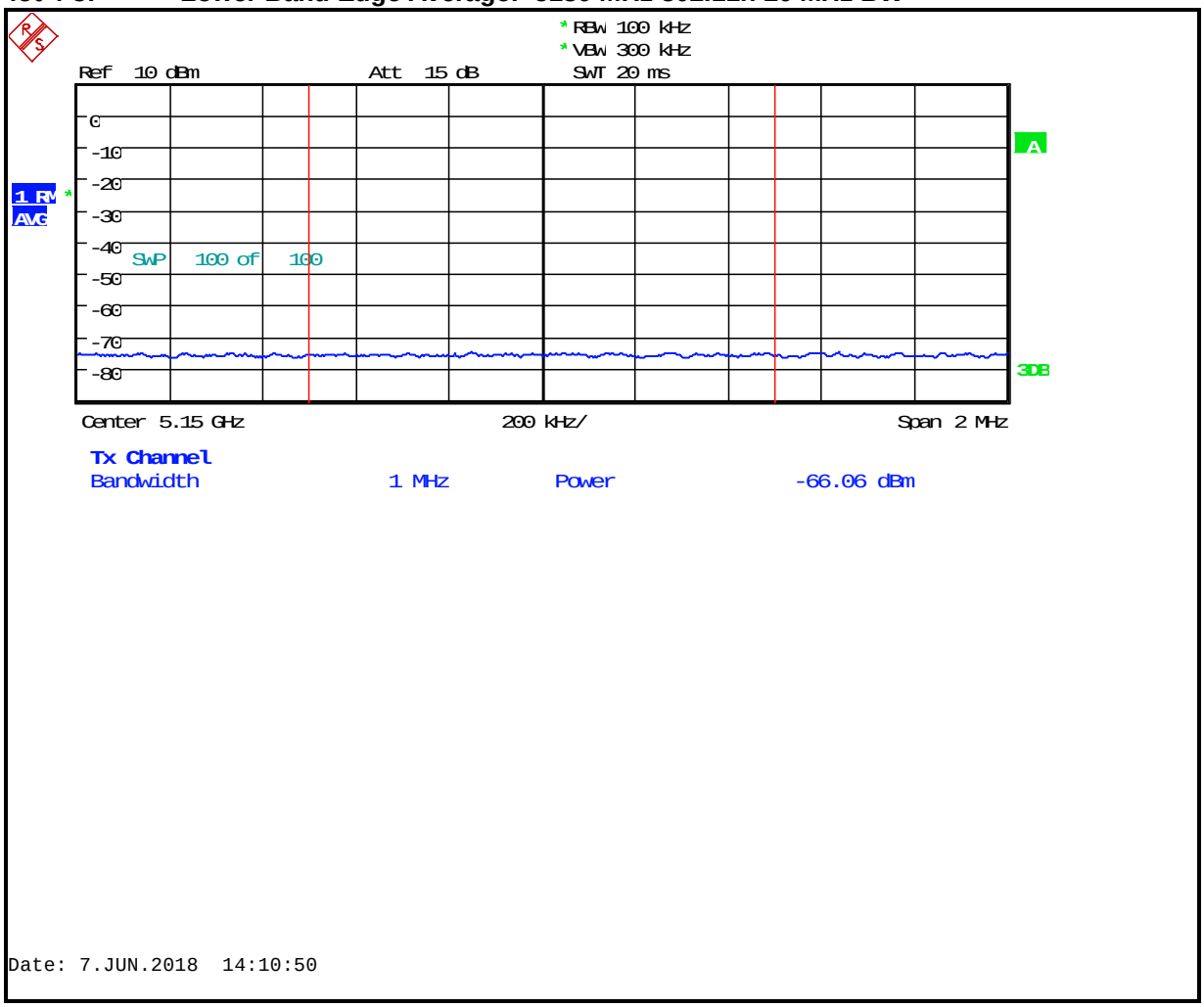
-65.2+ 95.2 = 30 dBµV/m – 54 dBµV/m (limit) = -24 dB margin

Plot 4-2: Lower Band Edge Peak: 5180 MHz 802.11a 20 MHz BW



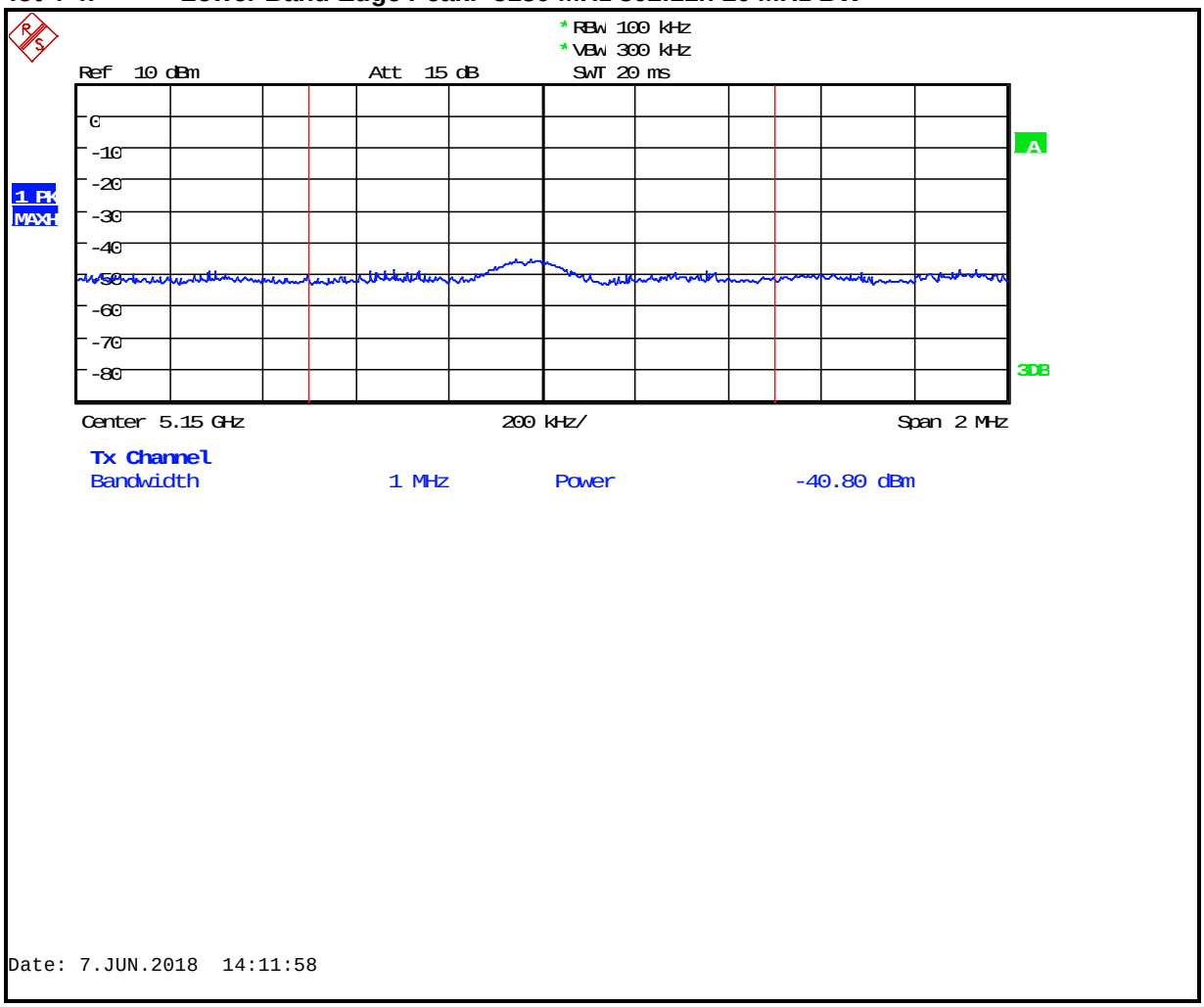
-40.6 + 95.2 = 54.6 dBµV/m – 74 dBµV/m (limit) = -19.4 dB margin

Plot 4-3: Lower Band Edge Average: 5180 MHz 802.11n 20 MHz BW



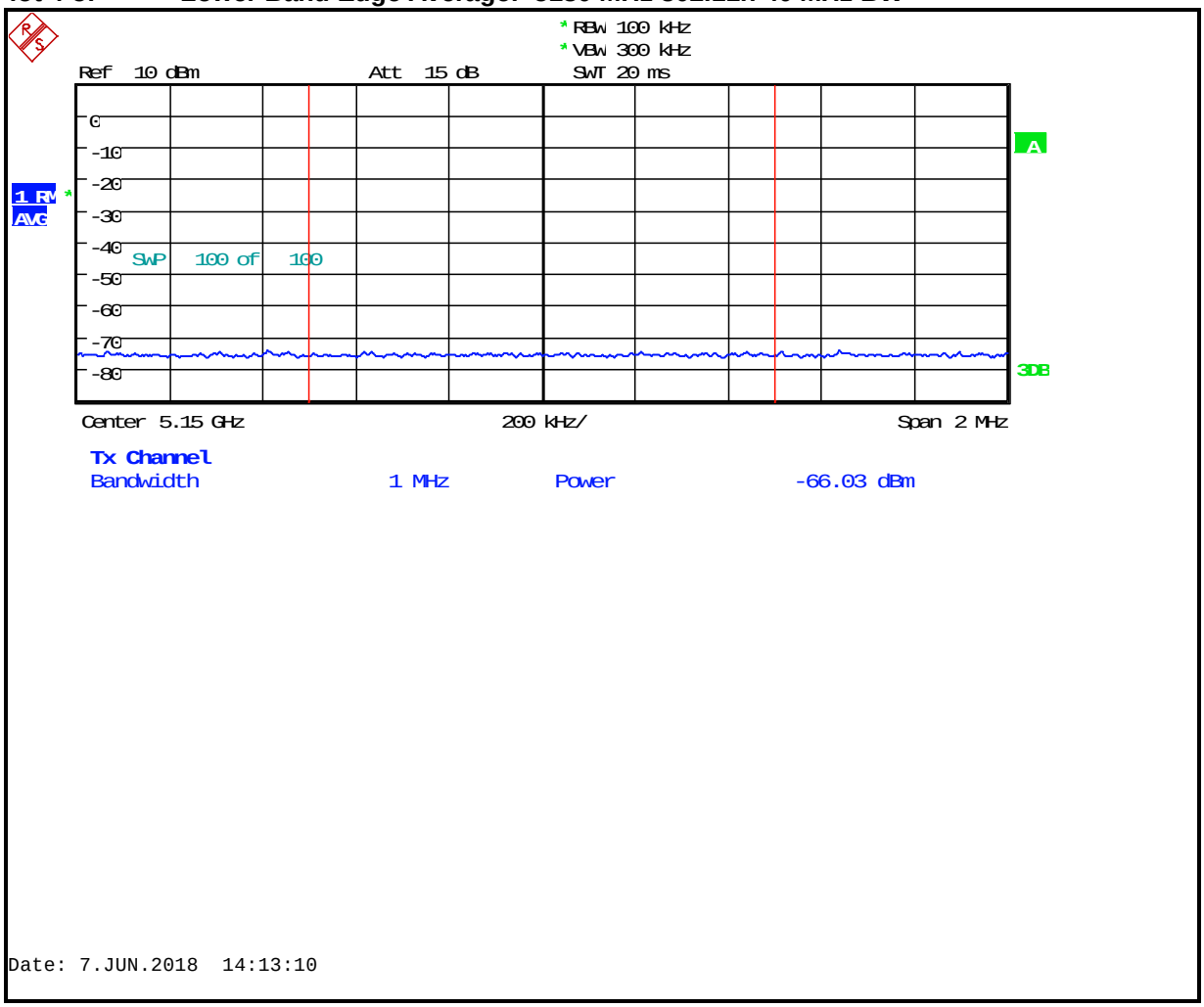
-66.1 + 95.2 = 29.1 dBµV/m – 54 dBµV/m (limit) = -24.9 dB margin

Plot 4-4: Lower Band Edge Peak: 5180 MHz 802.11n 20 MHz BW



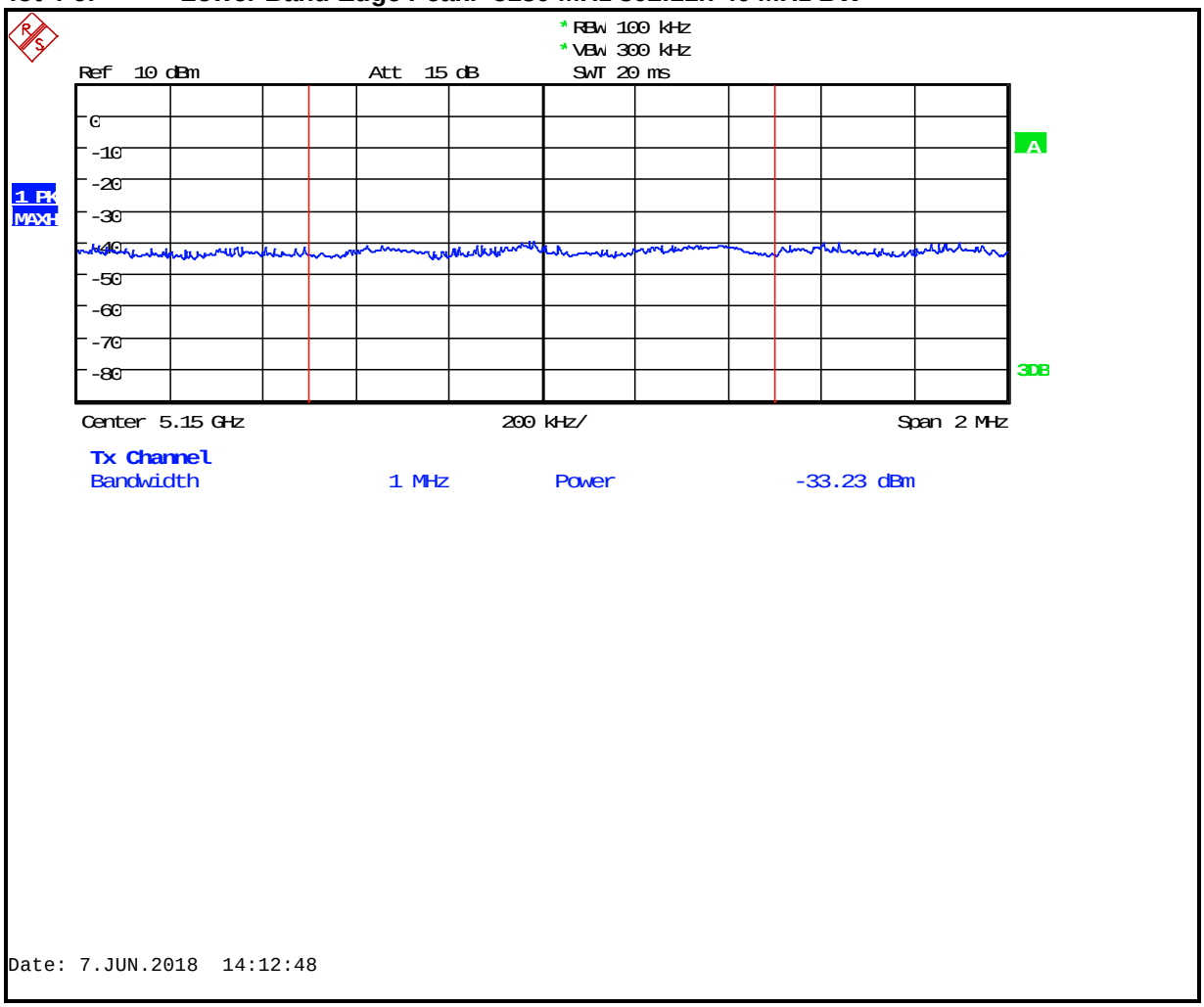
-40.8 + 95.2 = 54.4 dBµV/m – 74 dBµV/m (limit) = -19.6 dB margin

Plot 4-5: Lower Band Edge Average: 5180 MHz 802.11n 40 MHz BW



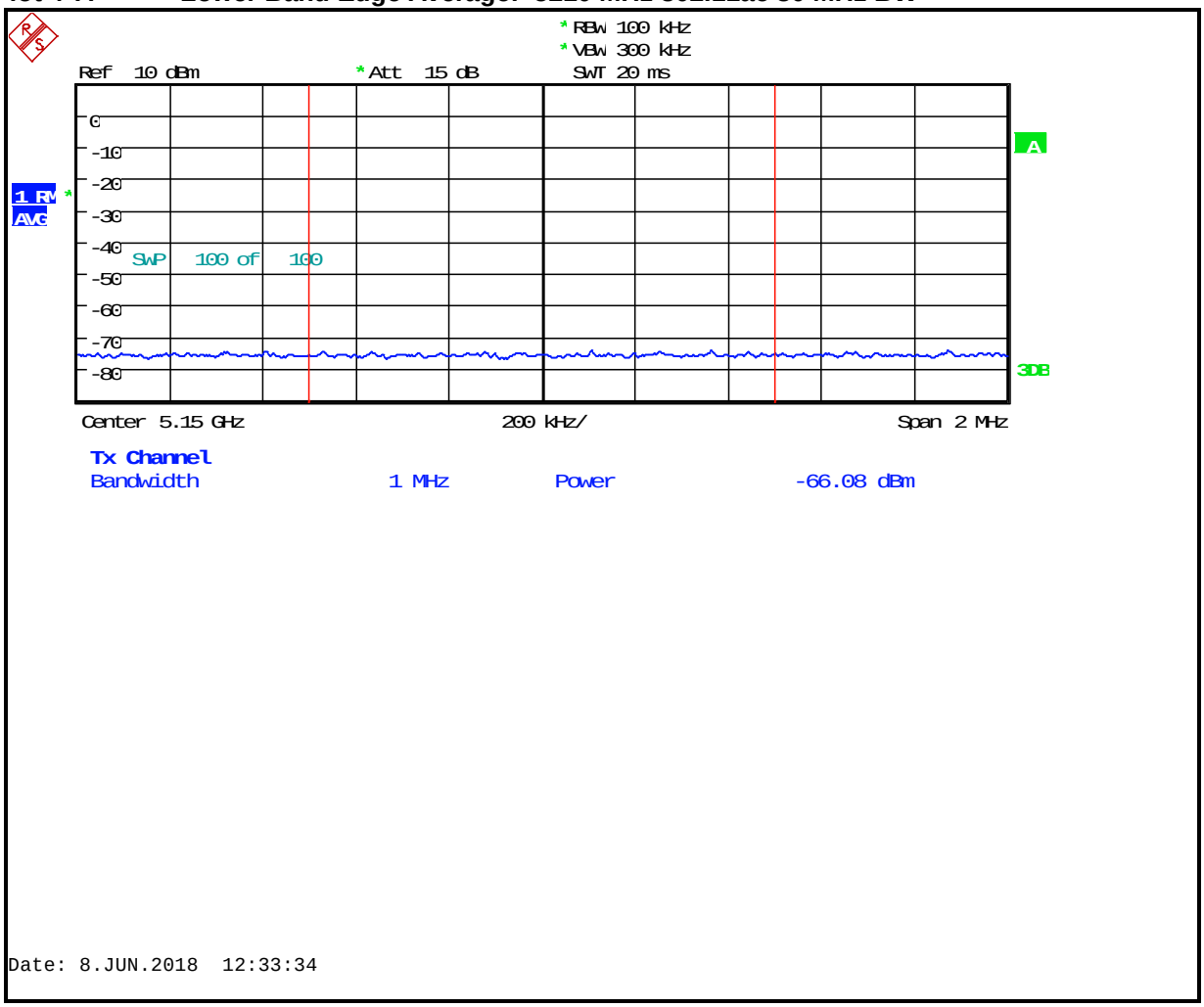
-66 + 95.2 = 29.2 dBµV/m – 54 dBµV/m (limit) = -24.8 dB margin

Plot 4-6: Lower Band Edge Peak: 5180 MHz 802.11n 40 MHz BW



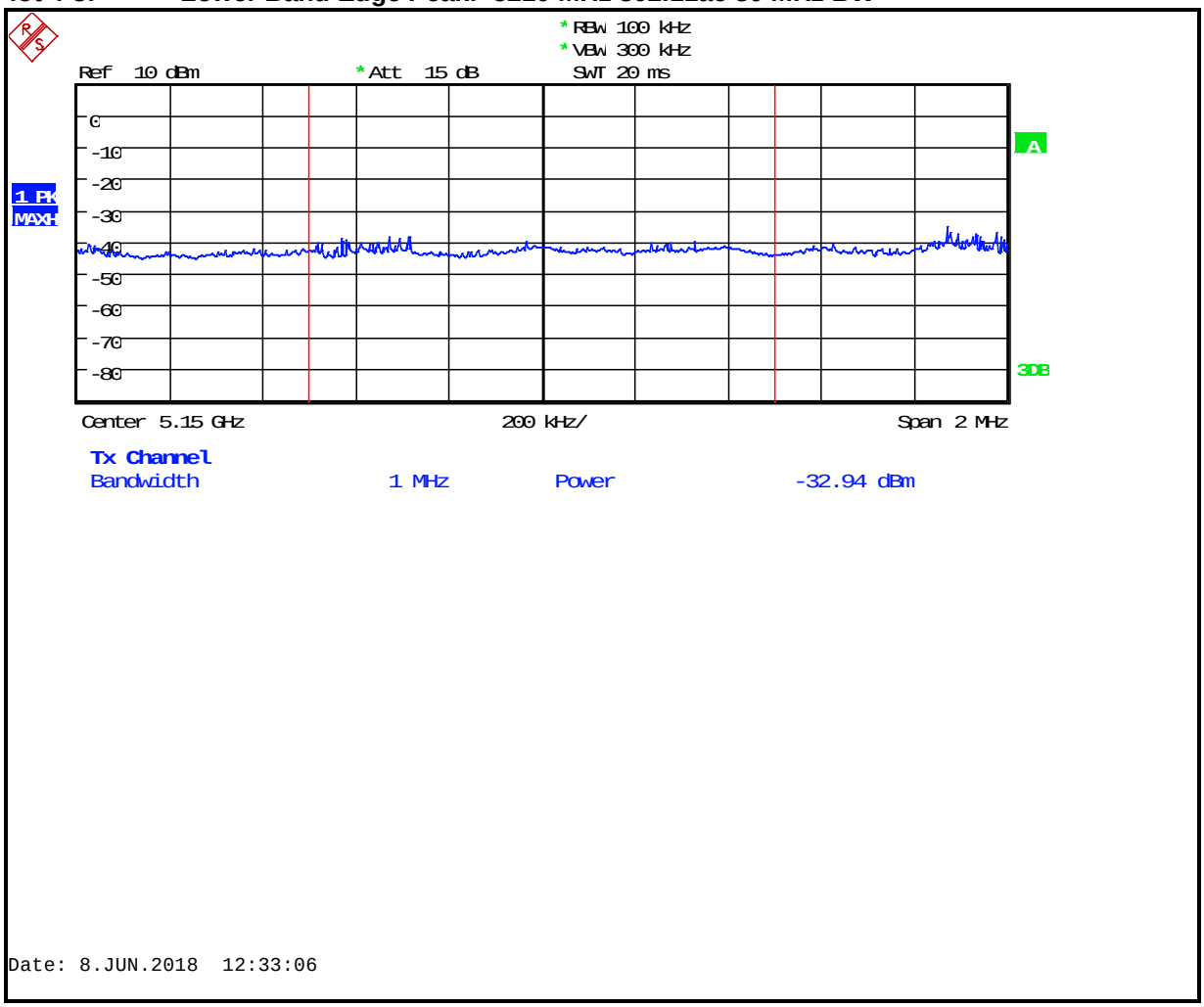
-33.2 + 95.2 = 62 dBµV/m – 74 dBµV/m (limit) = -12 dB margin

Plot 4-7: Lower Band Edge Average: 5210 MHz 802.11ac 80 MHz BW



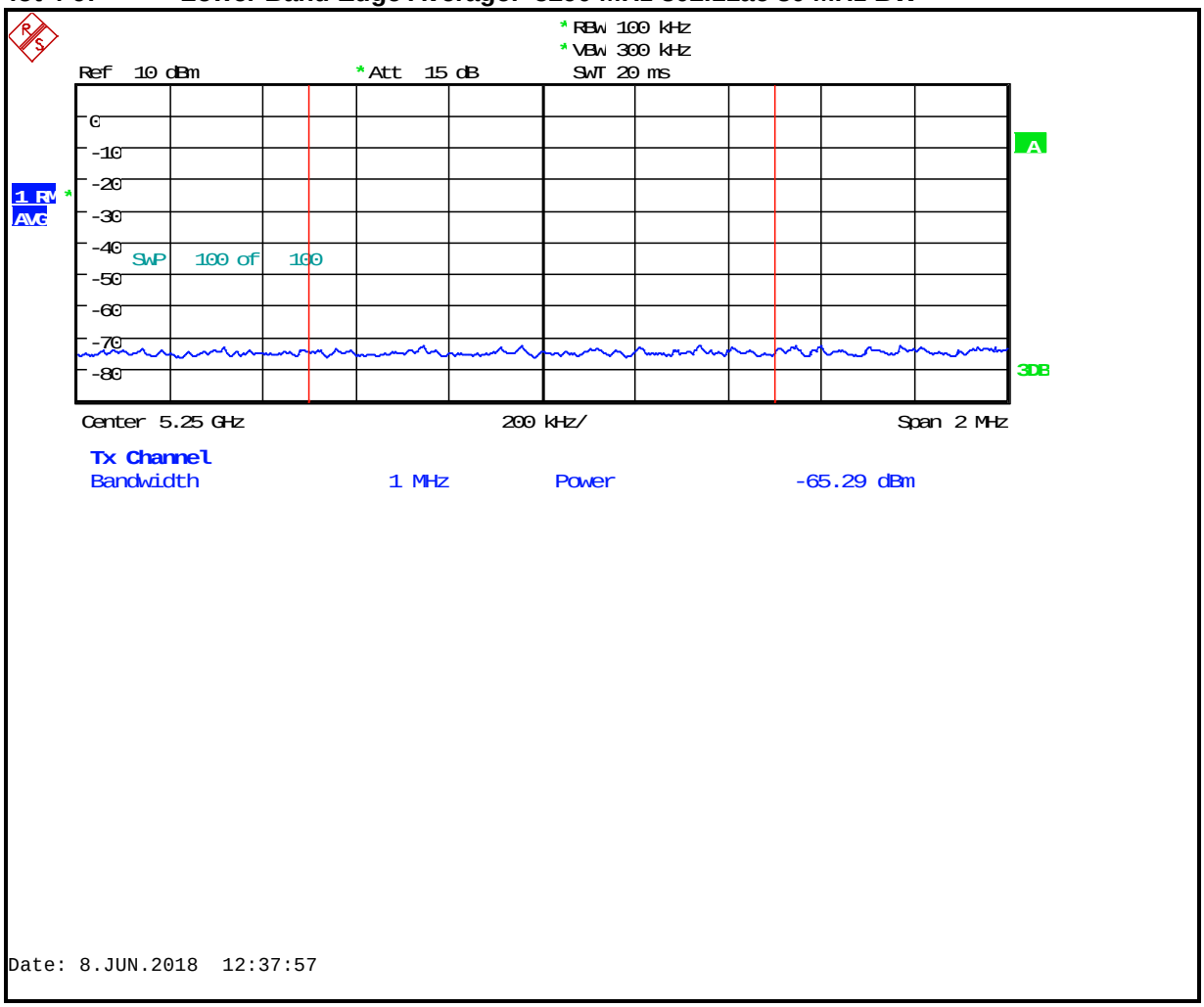
-66.1 + 95.2 = 29.1 dBµV/m – 54 dBµV/m (limit) = -24.9 dB margin

Plot 4-8: Lower Band Edge Peak: 5210 MHz 802.11ac 80 MHz BW



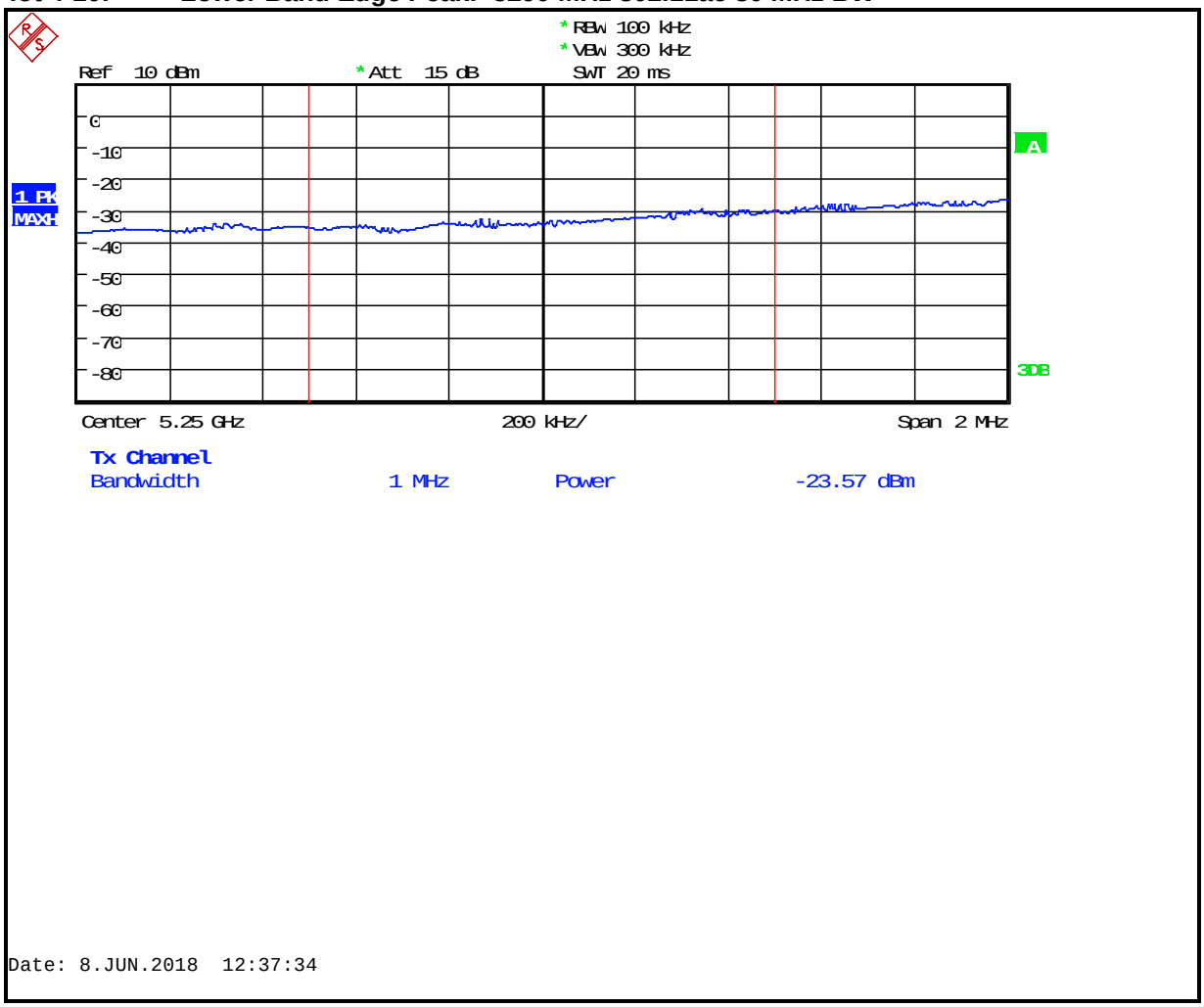
-32.9 + 95.2 = 62.3 dBµV/m – 74 dBµV/m (limit) = -11.7 dB margin

Plot 4-9: Lower Band Edge Average: 5290 MHz 802.11ac 80 MHz BW



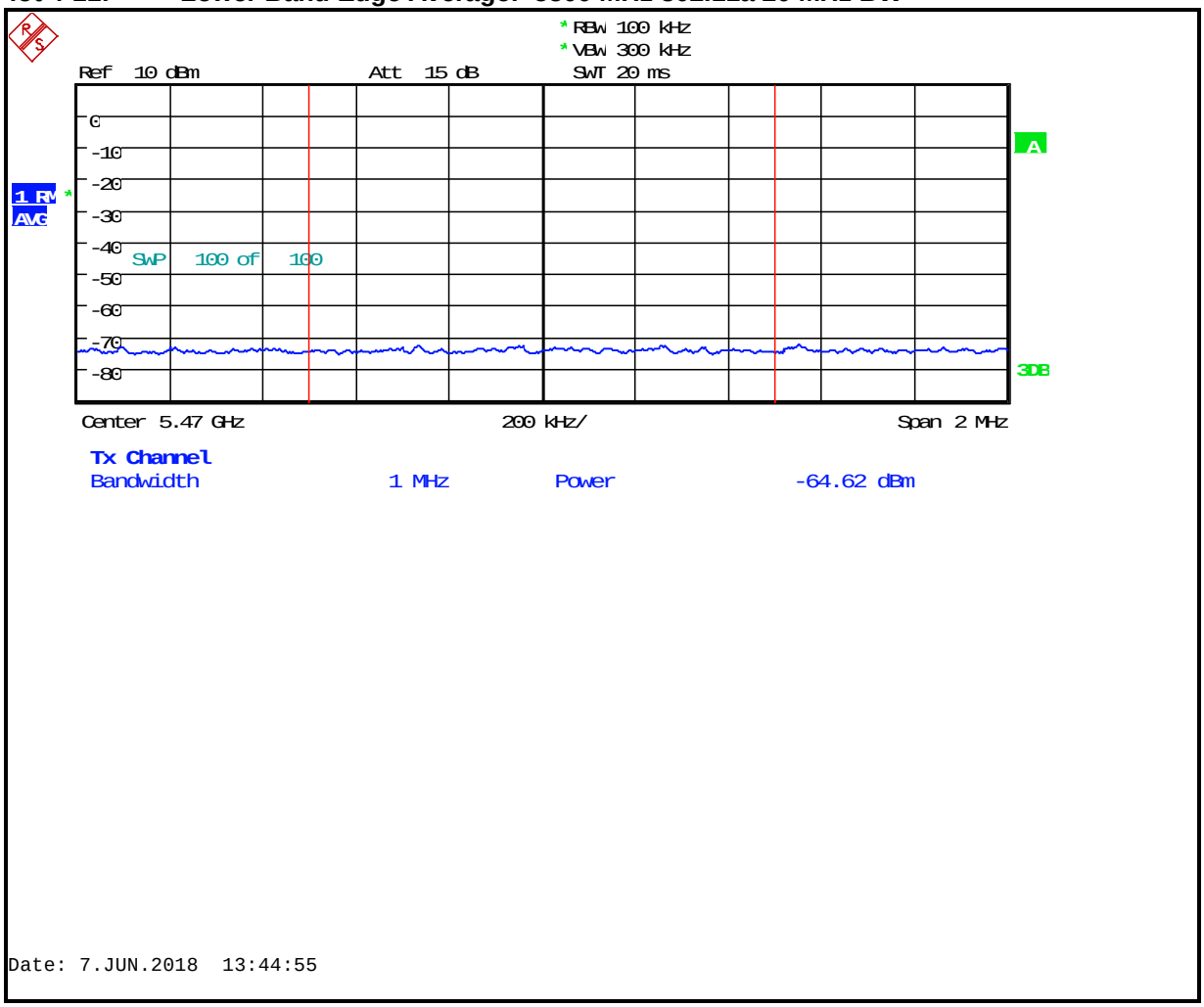
-65.3 + 95.2 = 29.9 dBµV/m – 54 dBµV/m (limit) = -24.1 dB margin

Plot 4-10: Lower Band Edge Peak: 5290 MHz 802.11ac 80 MHz BW



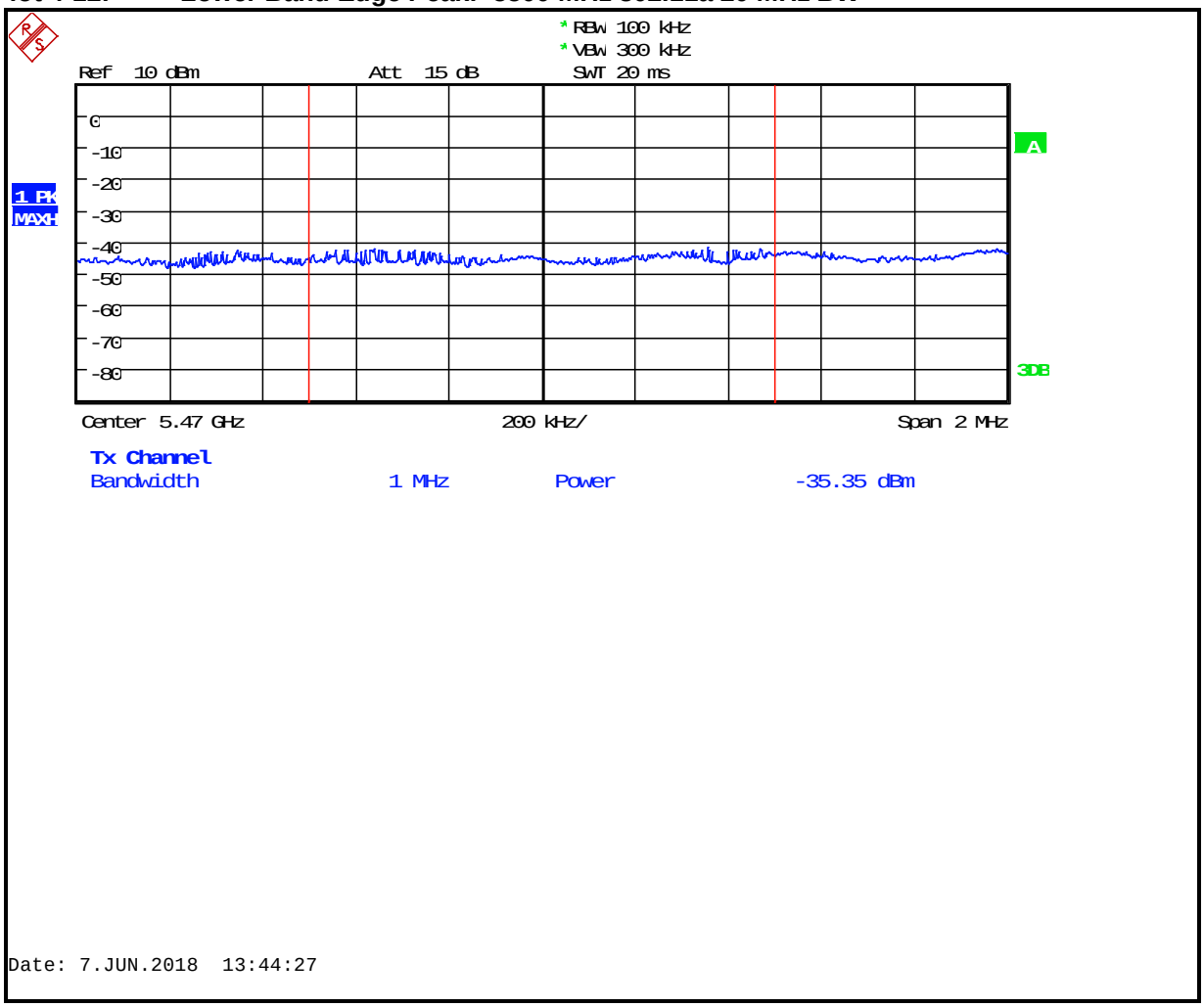
-23.6 + 95.2 = 71.6 dBµV/m – 74 dBµV/m (limit) = -2.4 dB margin

Plot 4-11: Lower Band Edge Average: 5500 MHz 802.11a 20 MHz BW



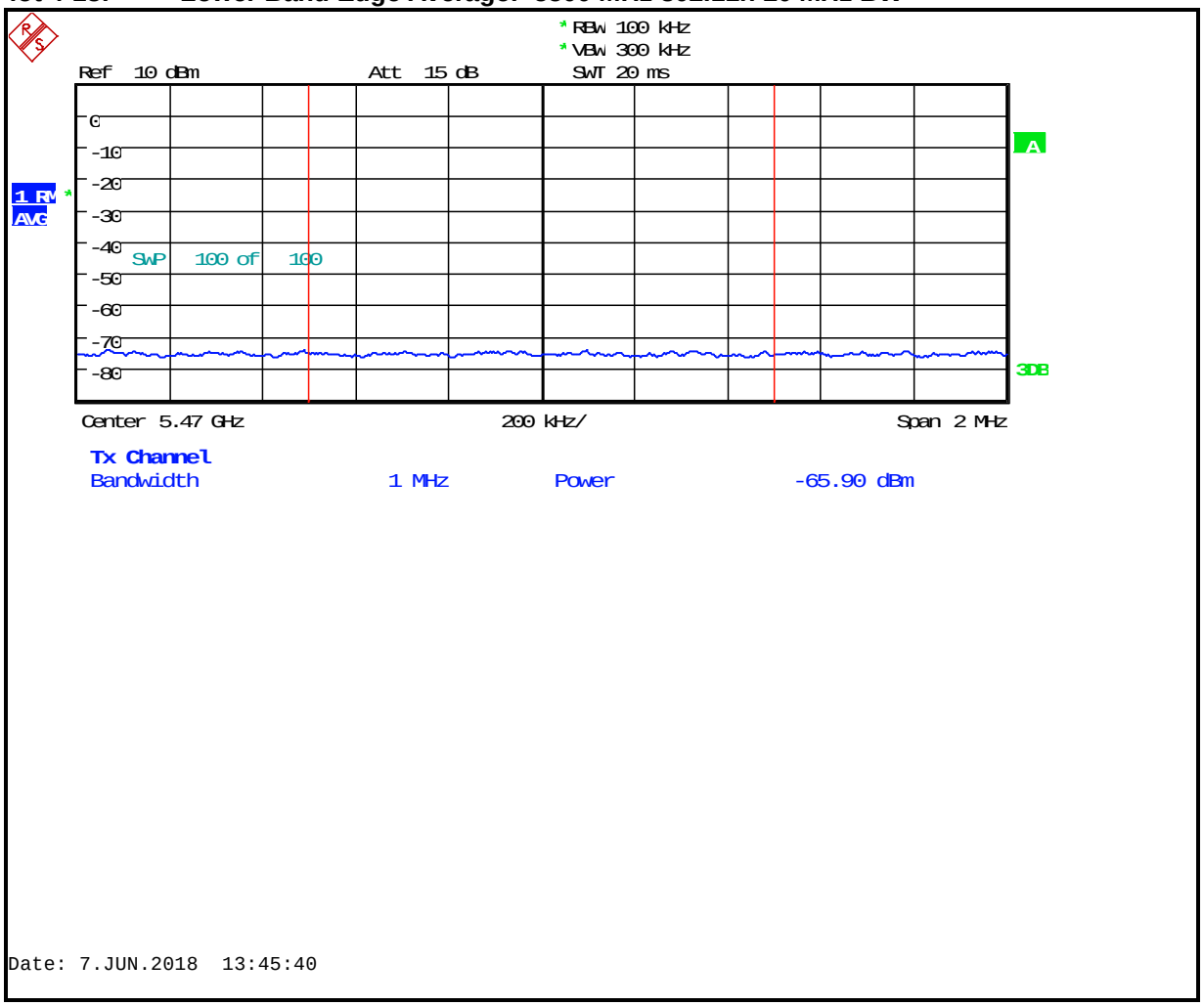
-64.6 + 95.2 = 30.6 dBµV/m – 54 dBµV/m (limit) = -23.4 dB margin

Plot 4-12: Lower Band Edge Peak: 5500 MHz 802.11a 20 MHz BW



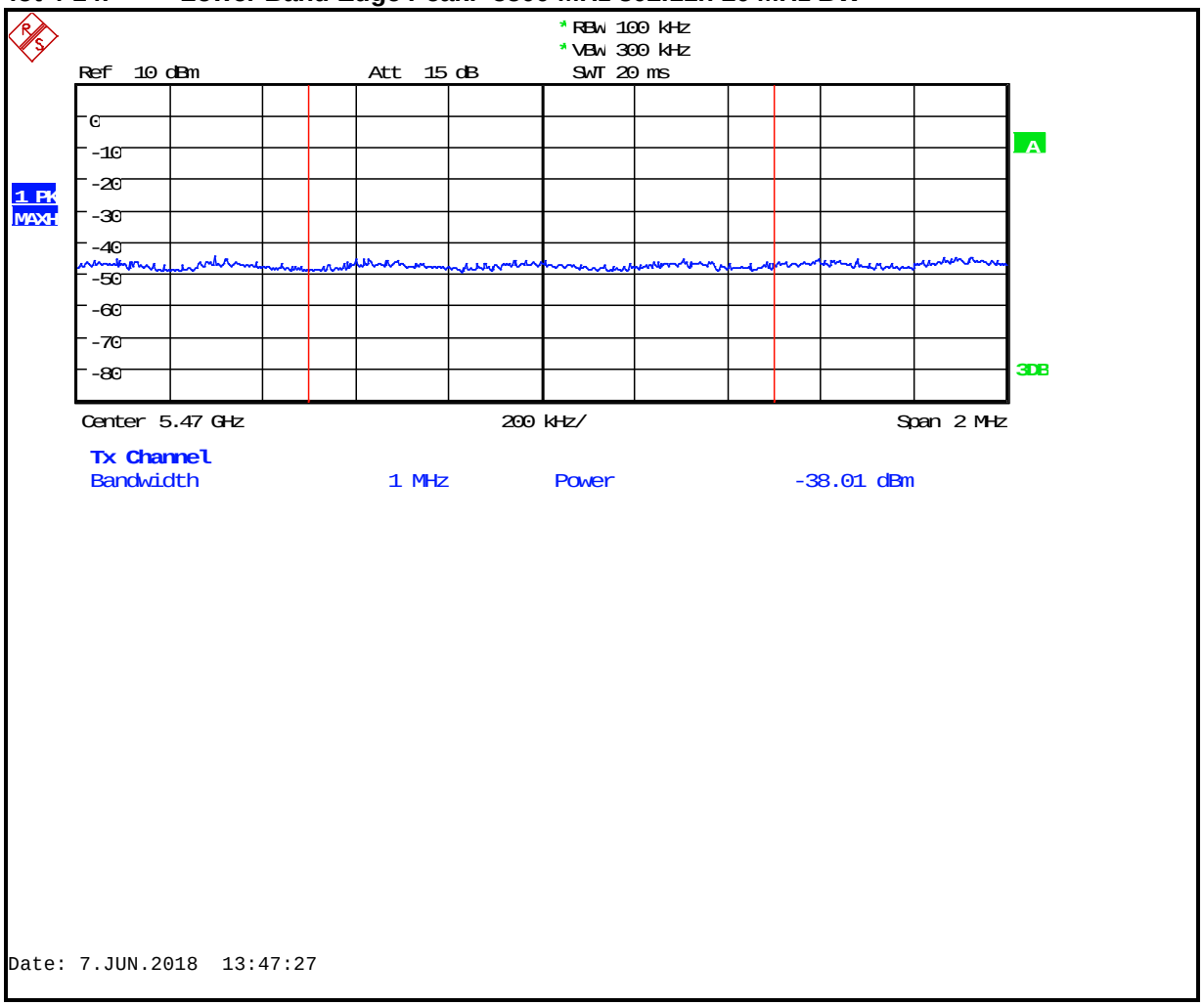
-35.4 + 95.2 = 59.8 dBµV/m – 74 dBµV/m (limit) = -14.2 dB margin

Plot 4-13: Lower Band Edge Average: 5500 MHz 802.11n 20 MHz BW



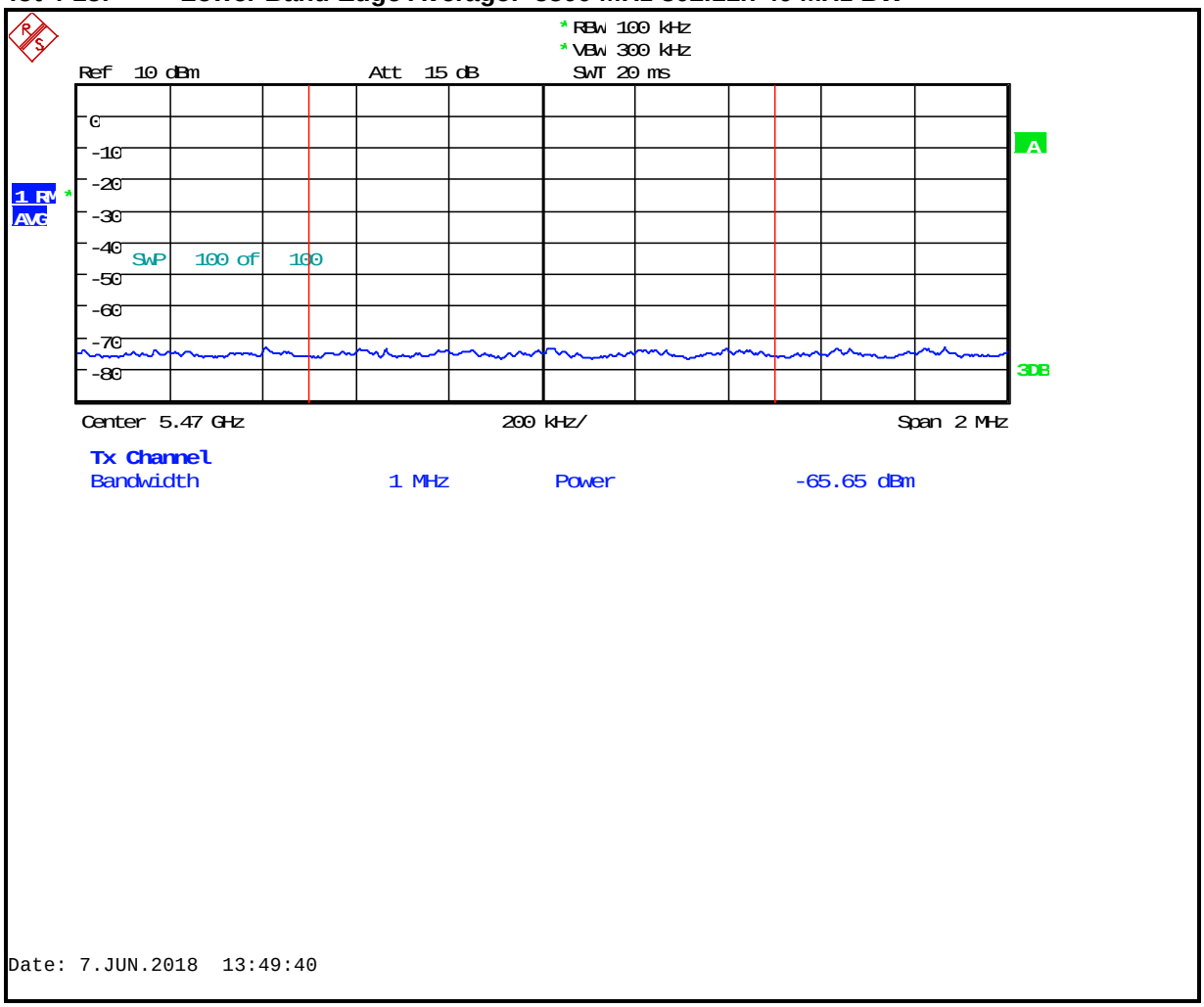
-65.9 + 95.2 = 29.3 dBµV/m – 54 dBµV/m (limit) = -24.7dB margin

Plot 4-14: Lower Band Edge Peak: 5500 MHz 802.11n 20 MHz BW



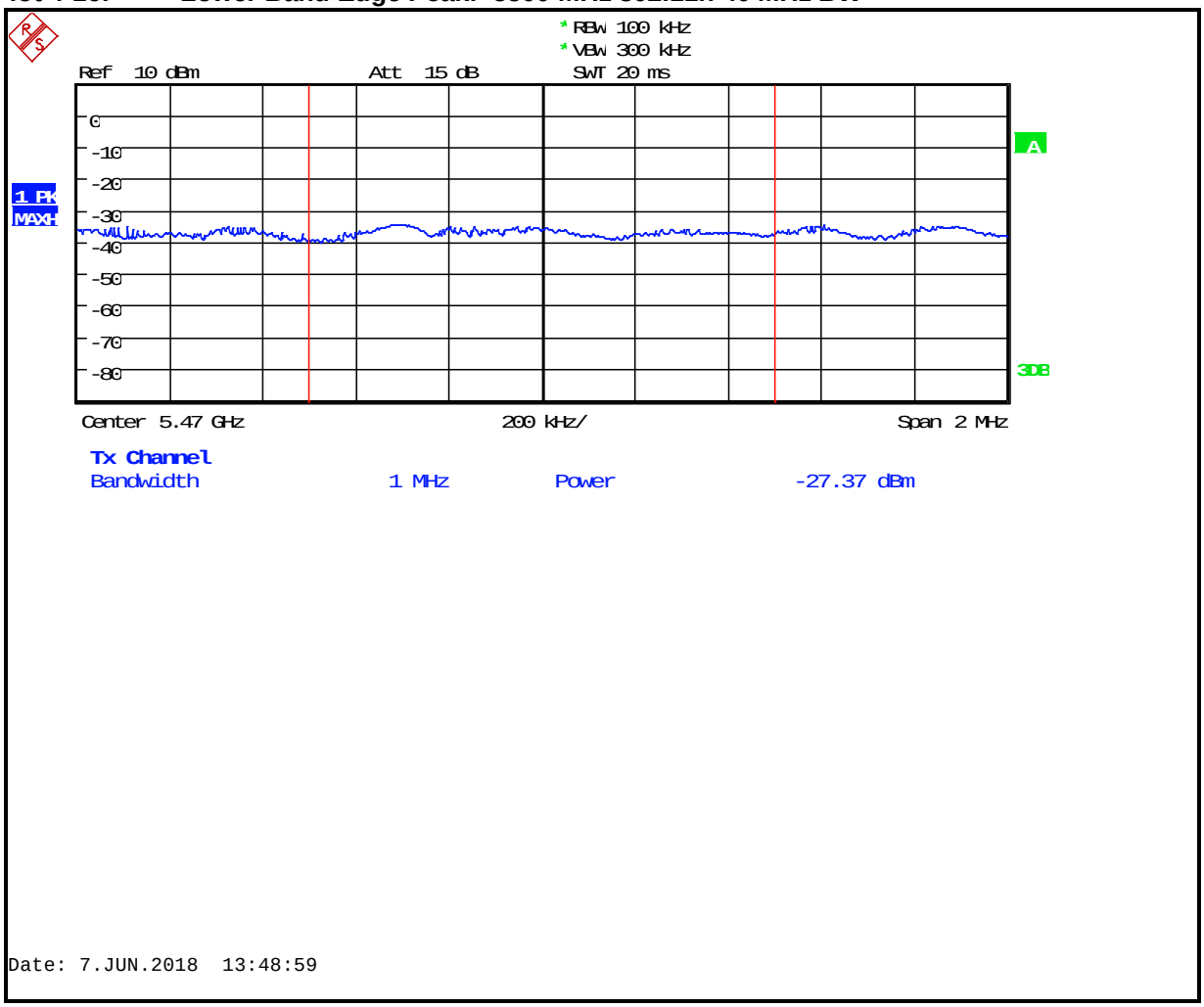
-38.1 + 95.2 = 57.1 dBµV/m – 74 dBµV/m (limit) = -16.9 dB margin

Plot 4-15: Lower Band Edge Average: 5500 MHz 802.11n 40 MHz BW



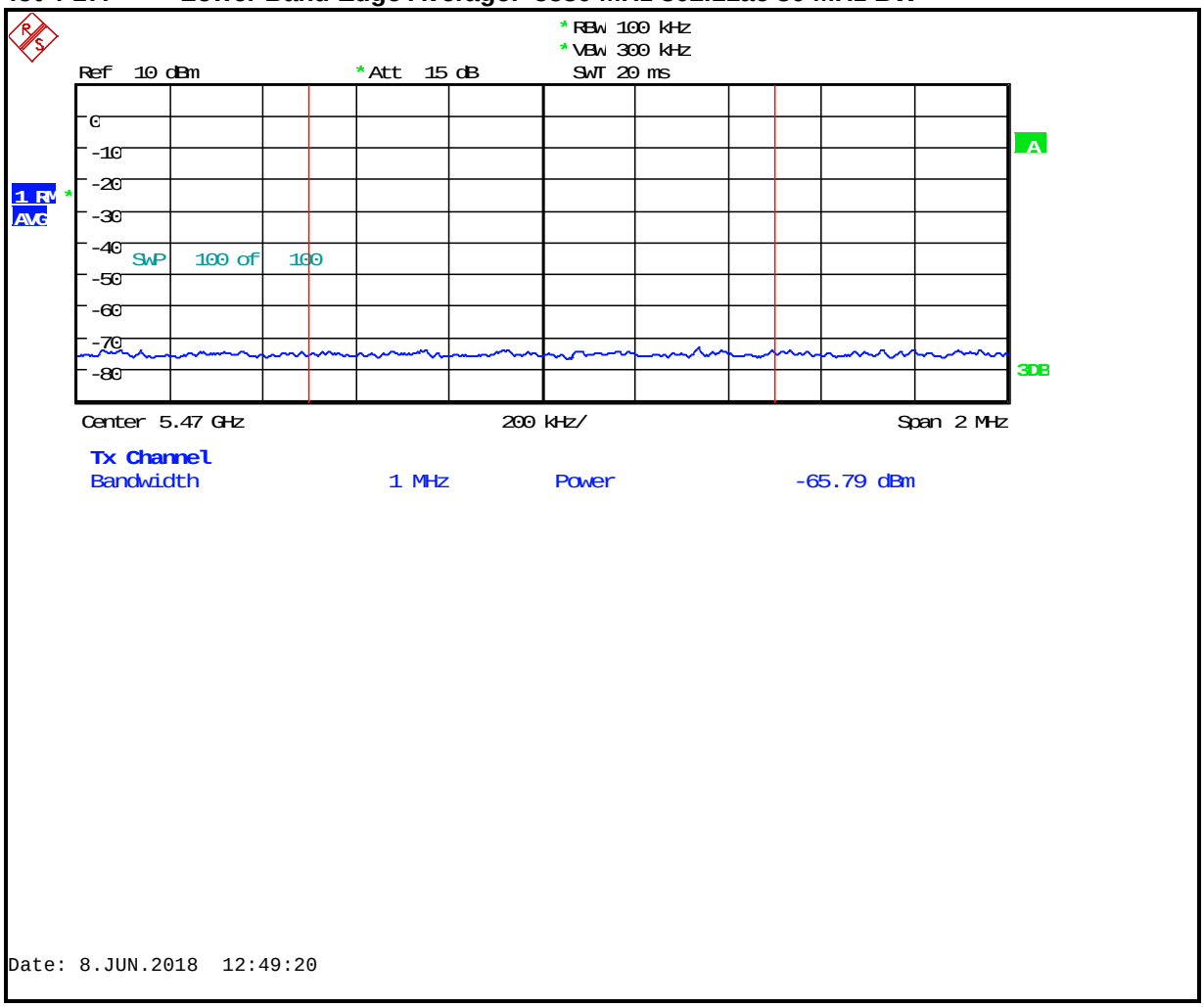
-65.7 + 95.2 = 29.5 dBµV/m – 54 dBµV/m (limit) = -24.5 dB margin

Plot 4-16: Lower Band Edge Peak: 5500 MHz 802.11n 40 MHz BW



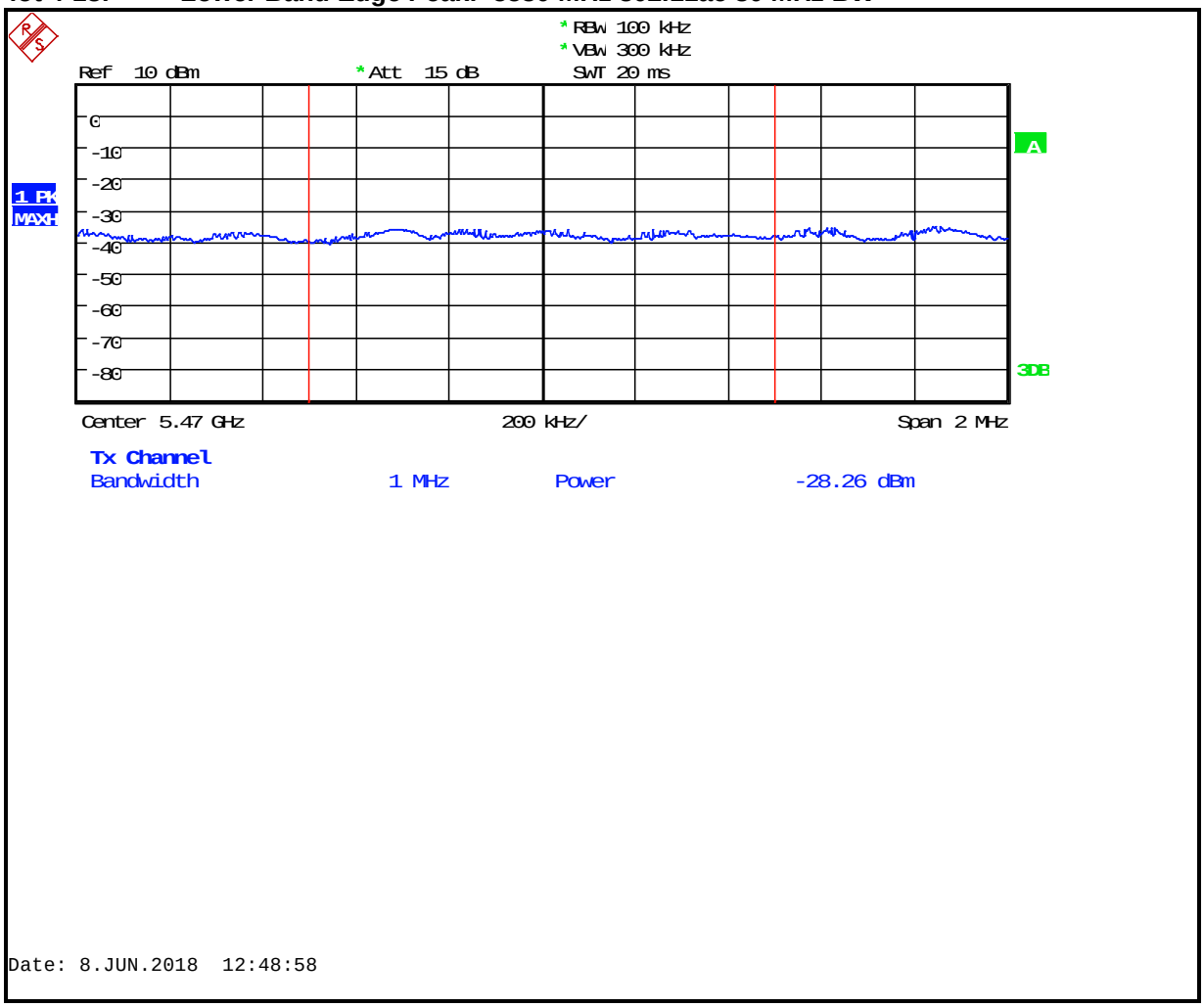
-27.4 + 95.2 = 67.8 dBµV/m – 74 dBµV/m (limit) = -6.2 dB margin

Plot 4-17: Lower Band Edge Average: 5530 MHz 802.11ac 80 MHz BW



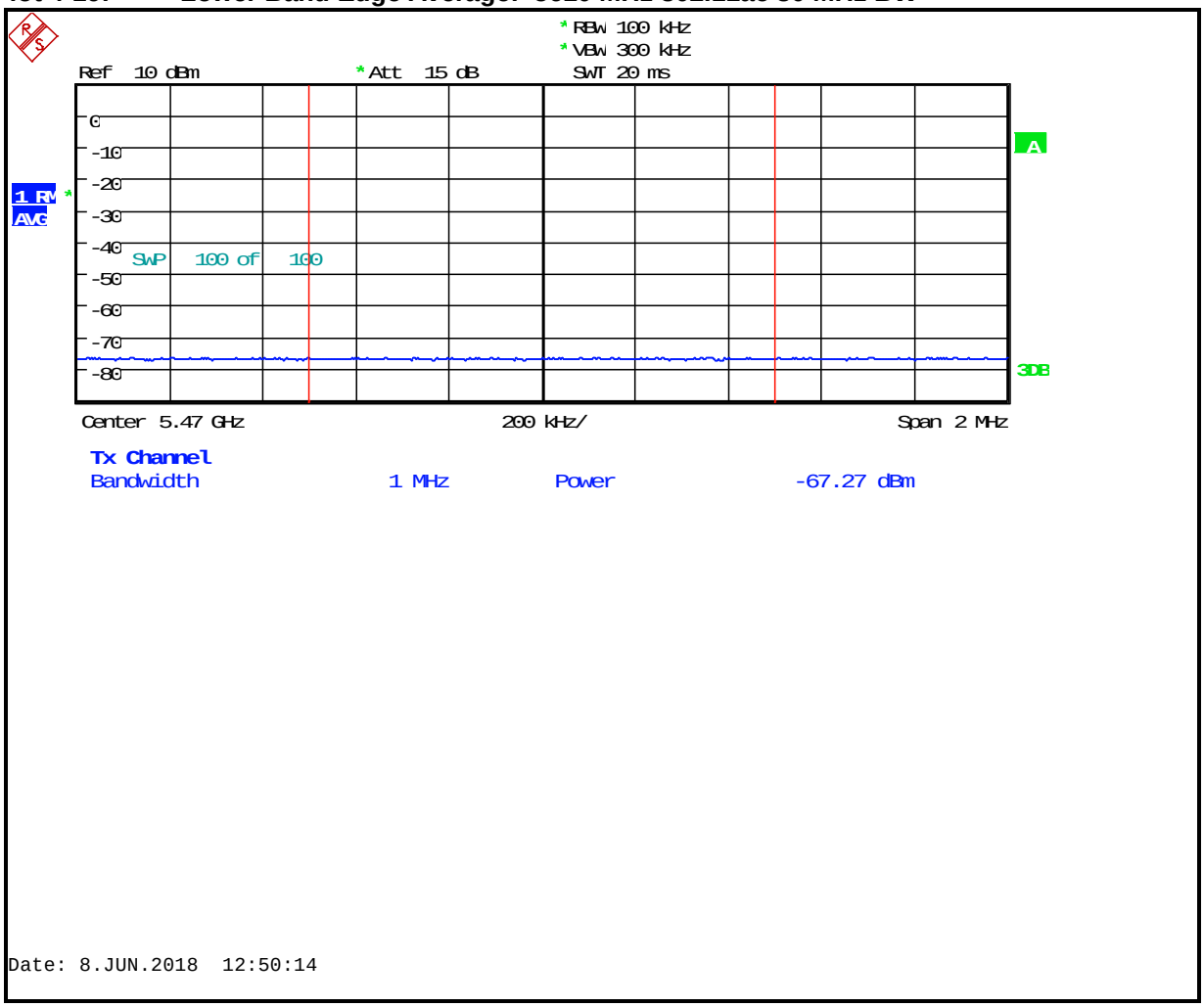
-65.8 + 95.2 = 29.4 dBµV/m – 54 dBµV/m (limit) = -24.6 dB margin

Plot 4-18: Lower Band Edge Peak: 5530 MHz 802.11ac 80 MHz BW



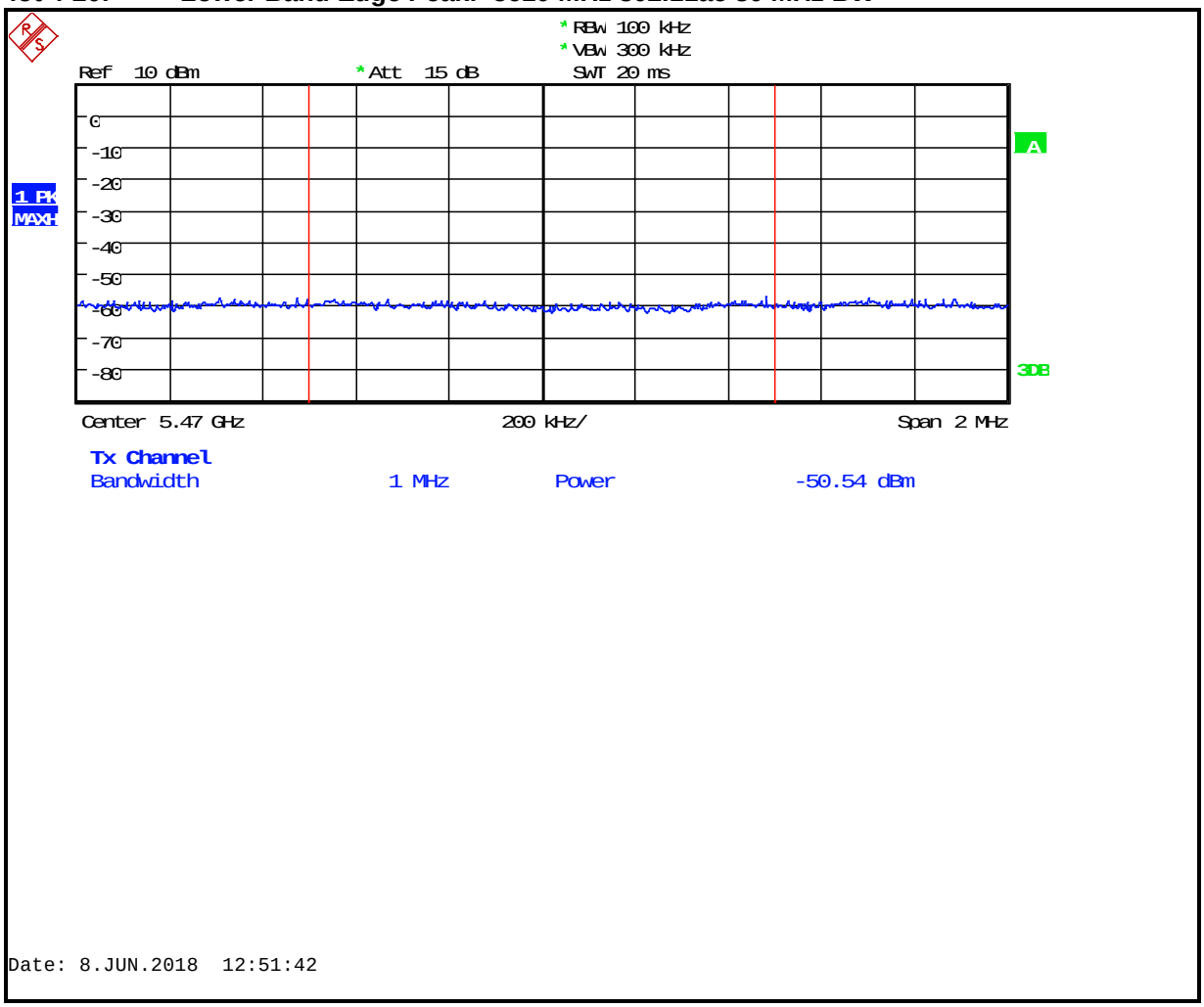
-28.3 + 95.2 = 66.9 dBµV/m – 74 dBµV/m (limit) = -7.1 dB margin

Plot 4-19: Lower Band Edge Average: 5610 MHz 802.11ac 80 MHz BW



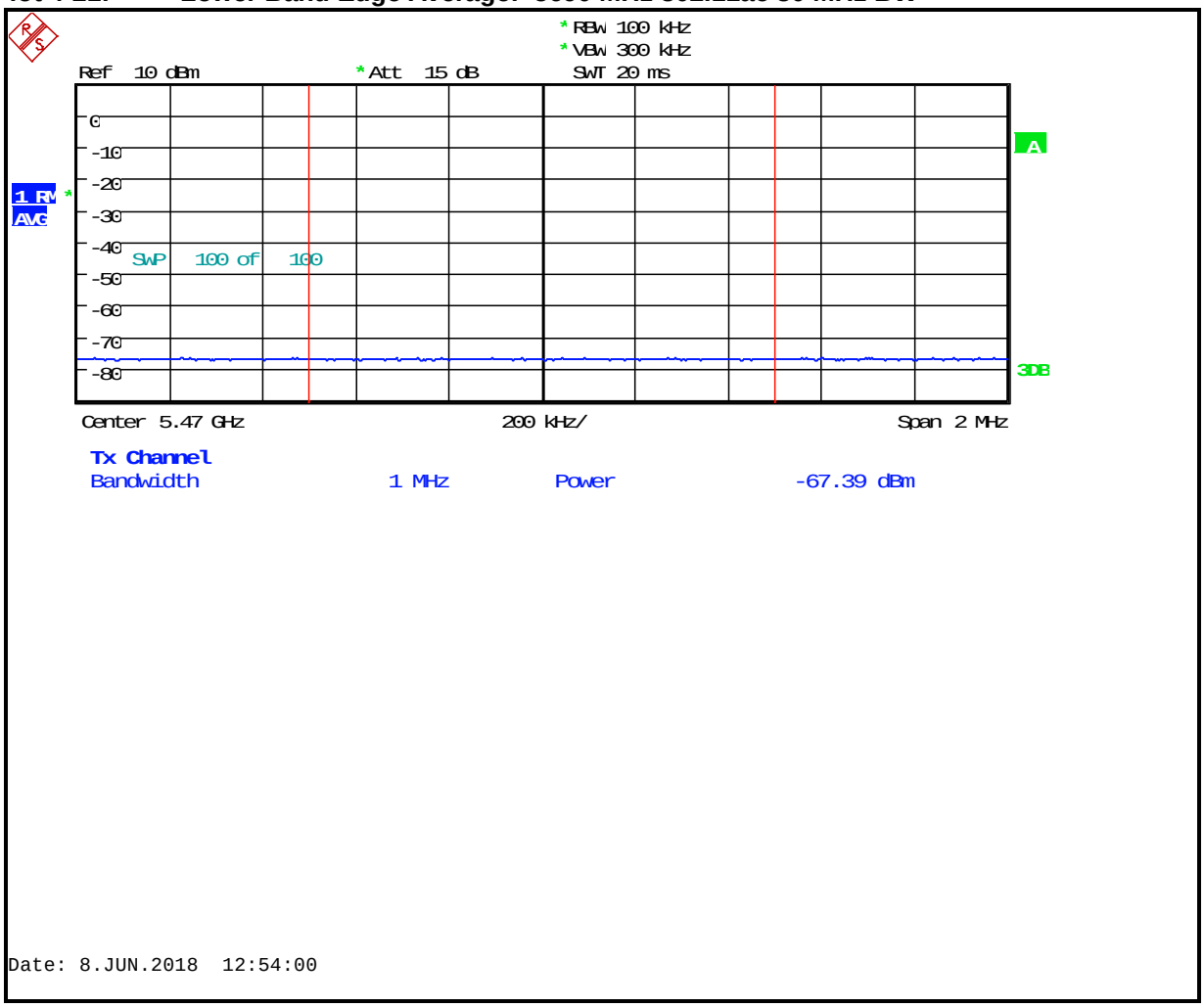
-67.3 + 95.2 = 27.9 dBµV/m – 54 dBµV/m (limit) = -26.1 dB margin

Plot 4-20: Lower Band Edge Peak: 5610 MHz 802.11ac 80 MHz BW



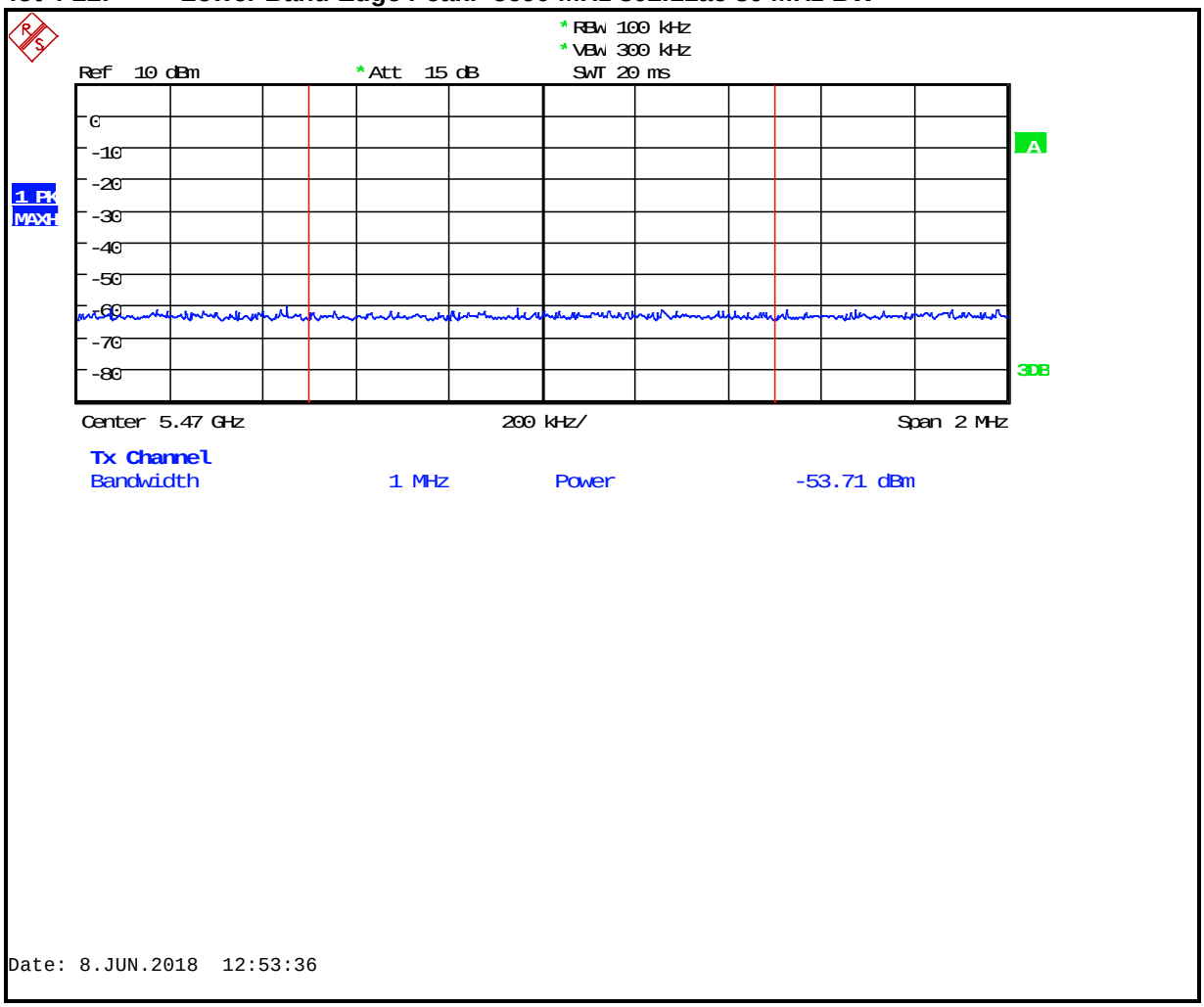
-50.5 + 95.2 = 44.7 dBµV/m – 74 dBµV/m (limit) = -29.3dB margin

Plot 4-21: Lower Band Edge Average: 5690 MHz 802.11ac 80 MHz BW



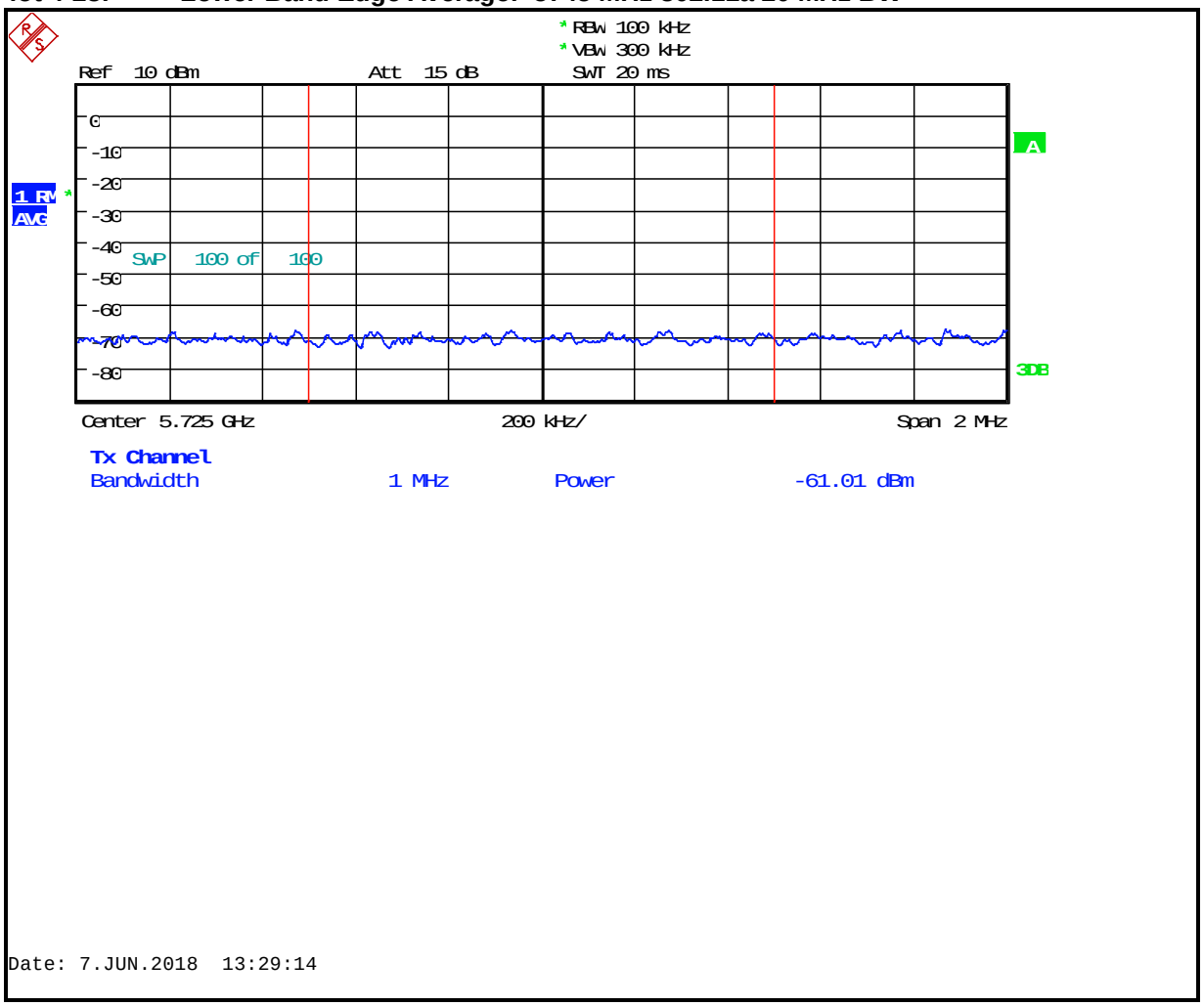
-67.4 + 95.2 = 27.8 dBµV/m – 54 dBµV/m (limit) = -26.2 dB margin

Plot 4-22: Lower Band Edge Peak: 5690 MHz 802.11ac 80 MHz BW



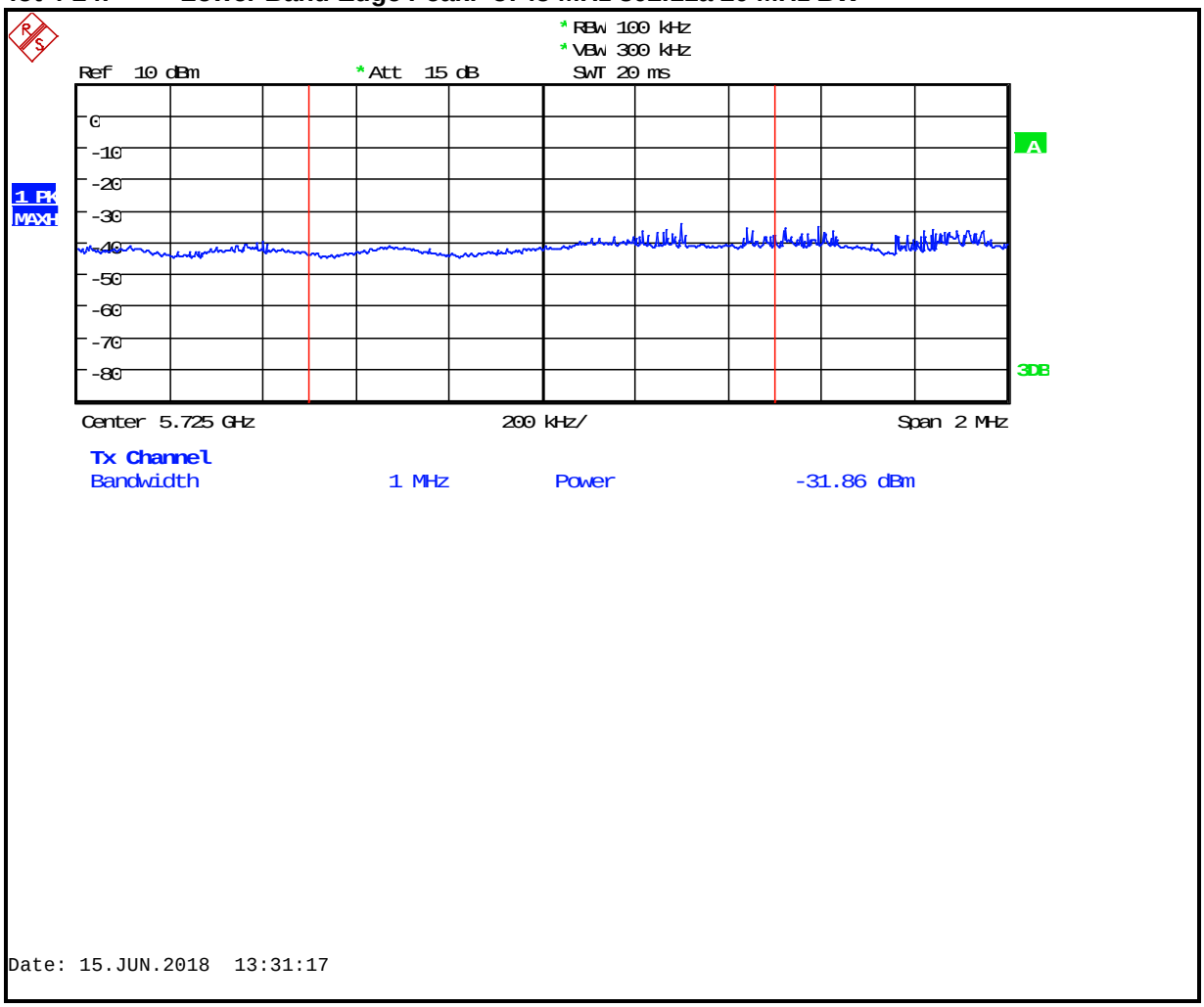
-53.7 + 95.2 = 41.5 dBµV/m – 74 dBµV/m (limit) = -32.5 dB margin

Plot 4-23: Lower Band Edge Average: 5745 MHz 802.11a 20 MHz BW



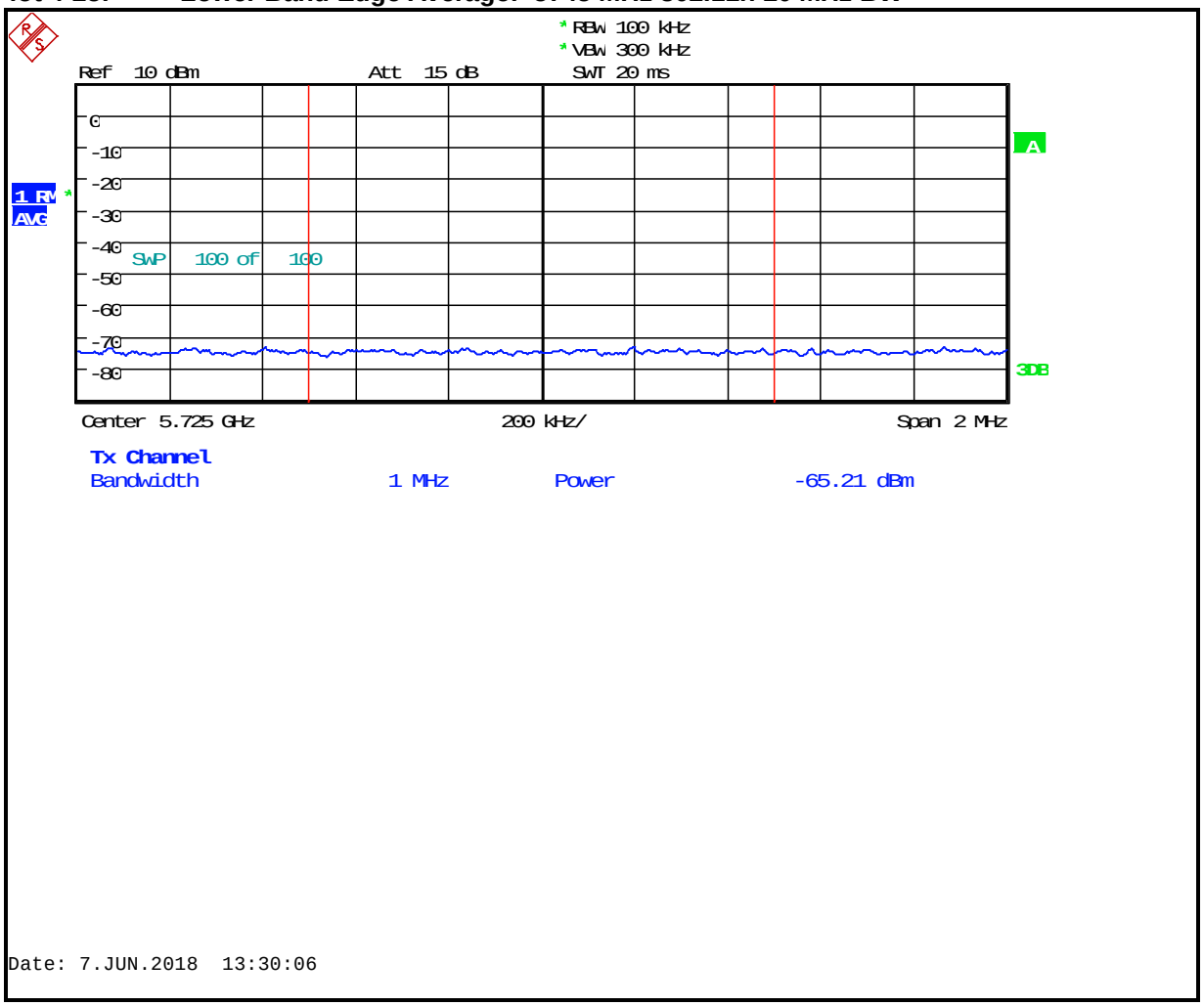
-61+ 95.2 = 34.2 dBµV/m – 54 dBµV/m (limit) = -19.8 dB margin

Plot 4-24: Lower Band Edge Peak: 5745 MHz 802.11a 20 MHz BW



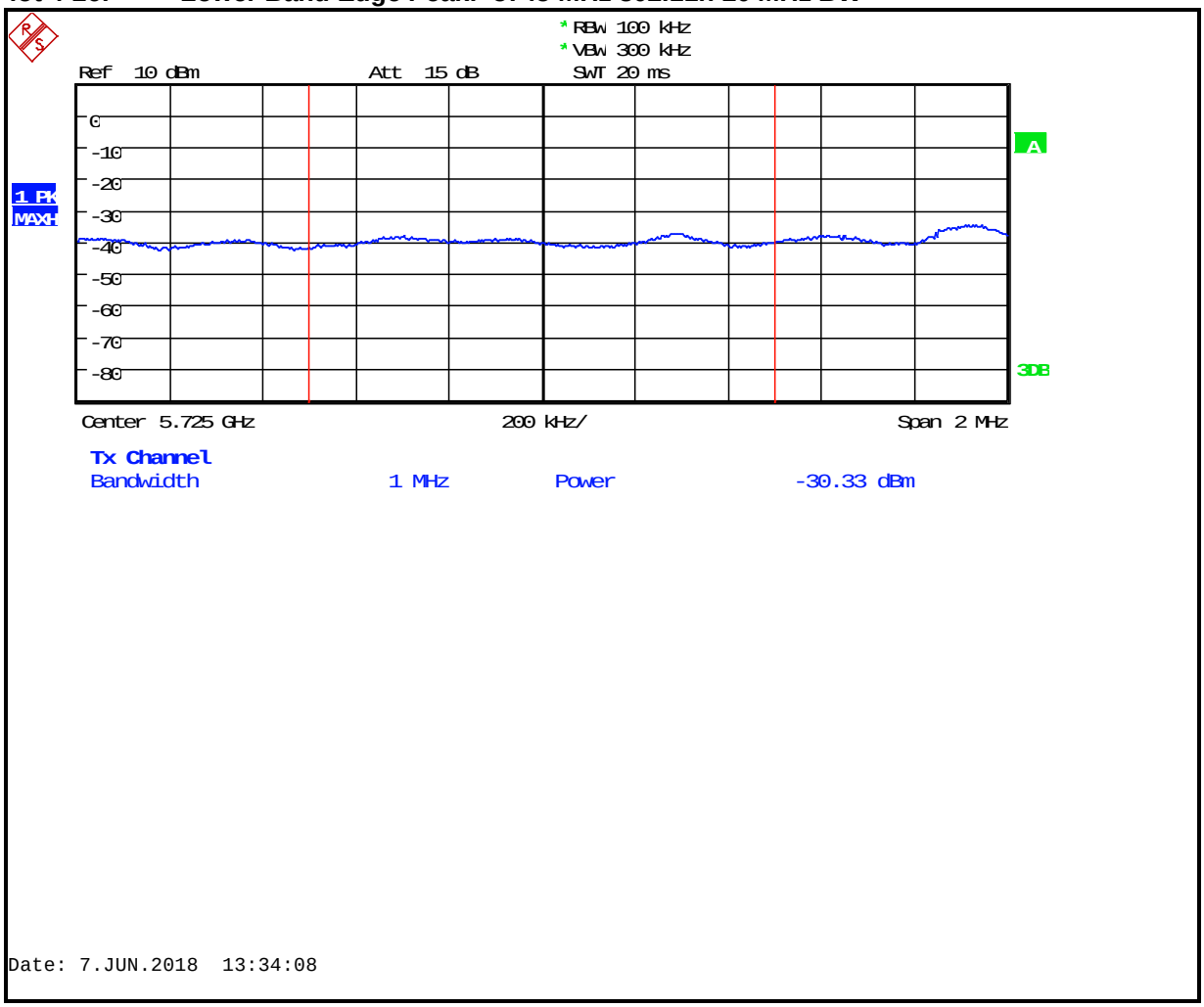
-31.9 + 95.2 = 63.3 dBµV/m – 74 dBµV/m (limit) = -10.7 dB margin

Plot 4-25: Lower Band Edge Average: 5745 MHz 802.11n 20 MHz BW



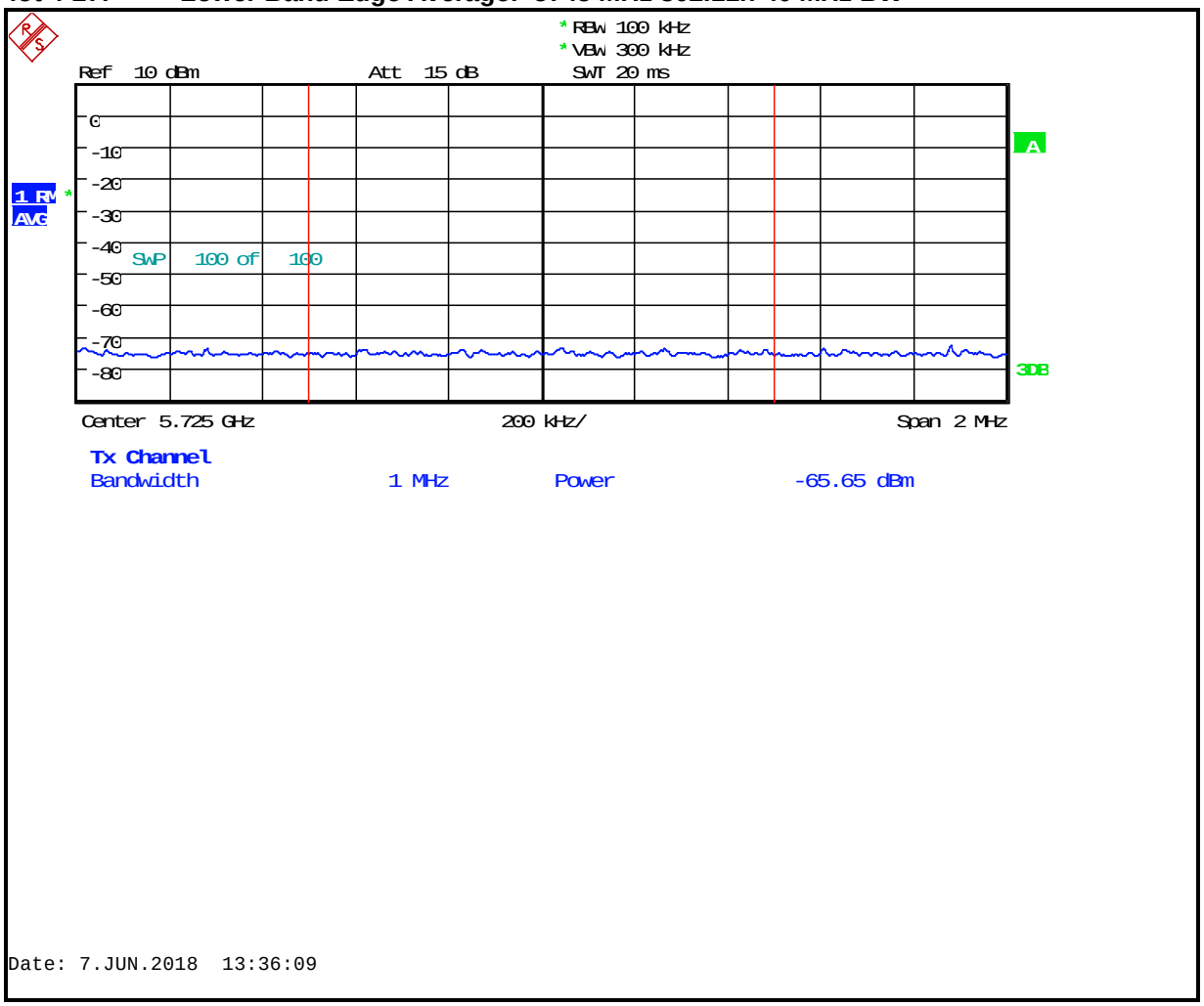
-65.2 + 95.2 = 30 dBµV/m – 54 dBµV/m (limit) = -24 dB margin

Plot 4-26: Lower Band Edge Peak: 5745 MHz 802.11n 20 MHz BW



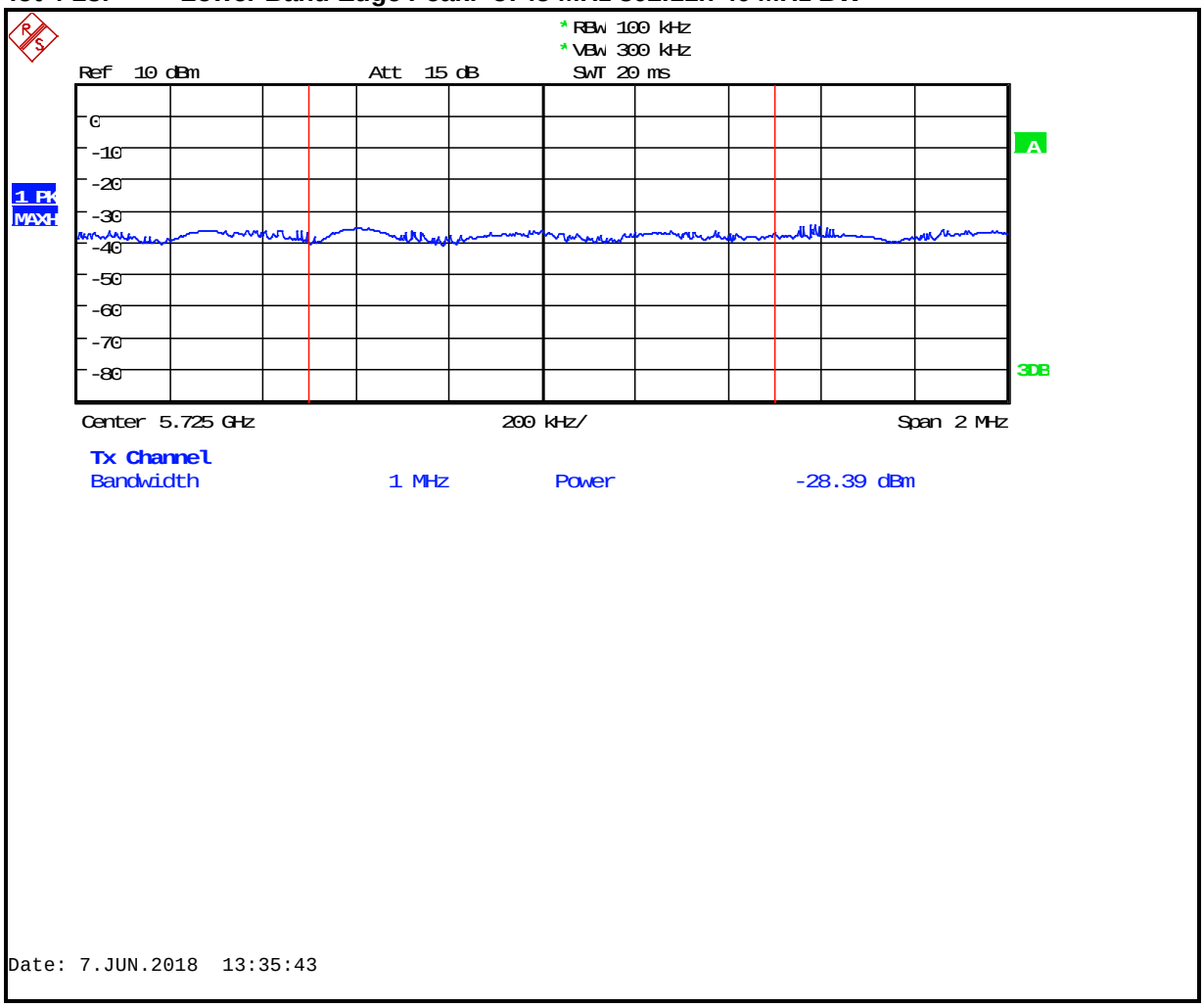
-30.3 + 95.2 = 64.9 dBµV/m – 74 dBµV/m (limit) = -9.1 dB margin

Plot 4-27: Lower Band Edge Average: 5745 MHz 802.11n 40 MHz BW



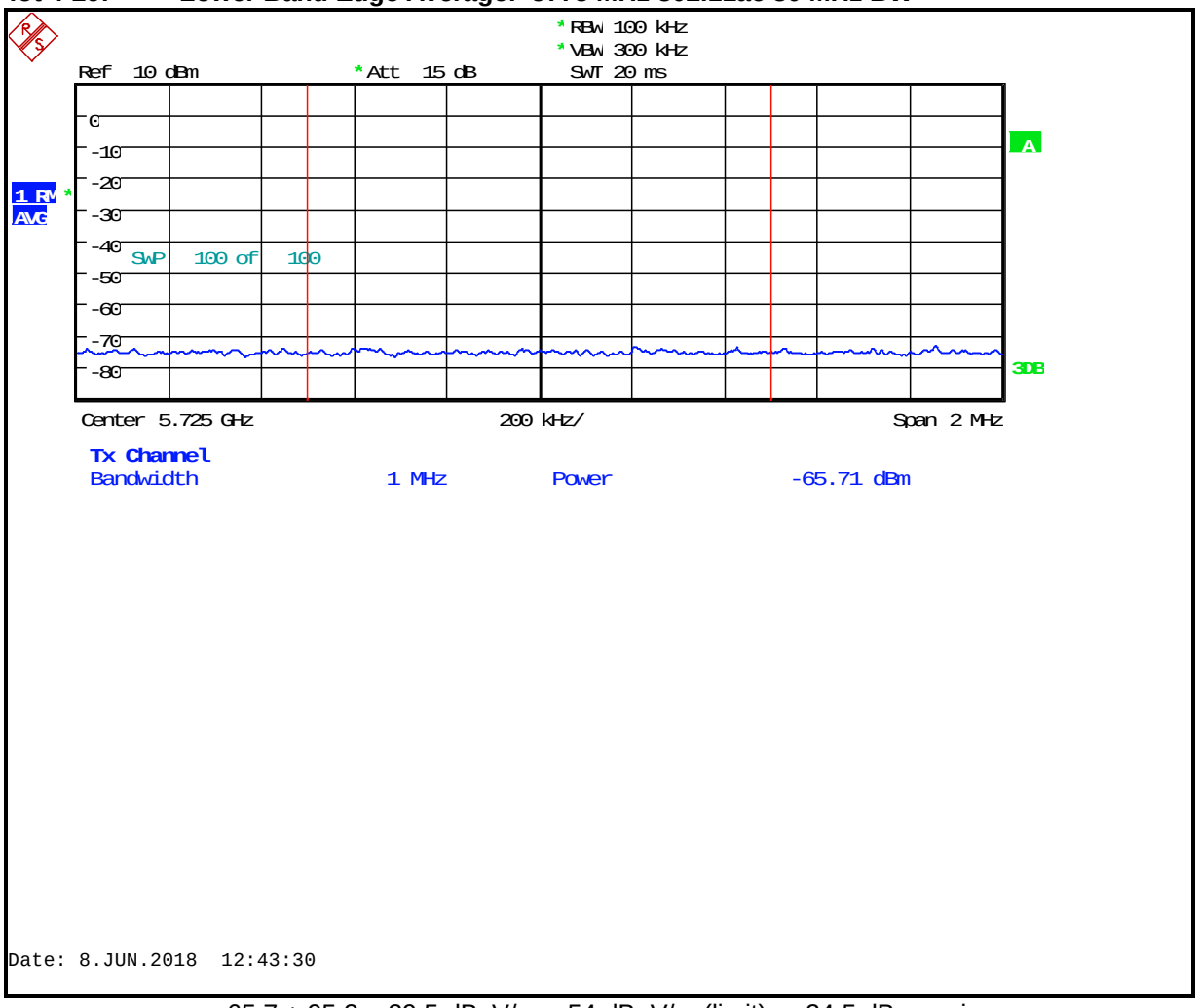
-65.7 + 95.2 = 29.5 dBµV/m – 54 dBµV/m (limit) = -24.5 dB margin

Plot 4-28: Lower Band Edge Peak: 5745 MHz 802.11n 40 MHz BW



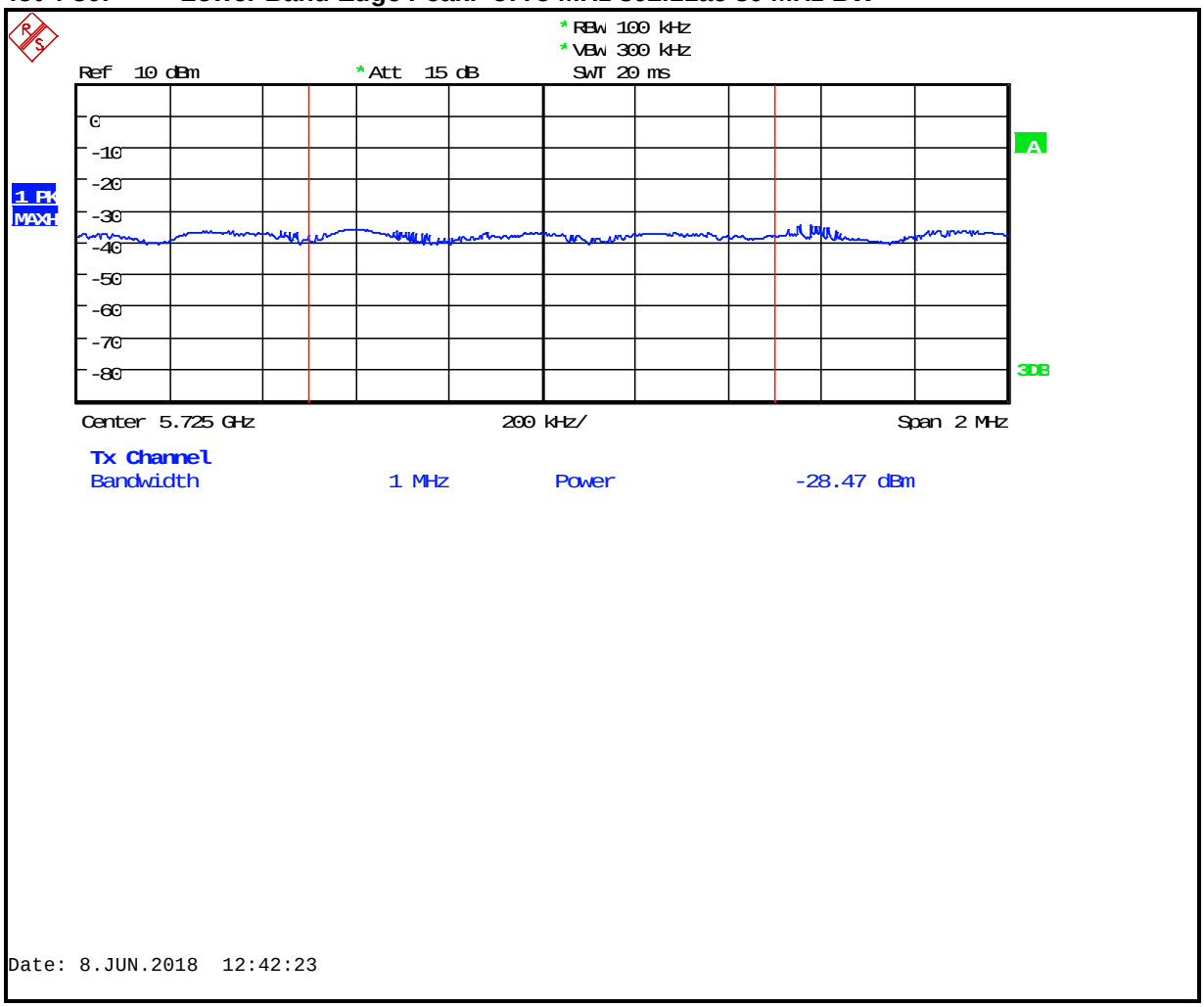
-28.4 + 95.2 = 66.8 dBµV/m – 74 dBµV/m (limit) = -7.2 dB margin

Plot 4-29: Lower Band Edge Average: 5775 MHz 802.11ac 80 MHz BW



-65.7 + 95.2 = 29.5 dBµV/m – 54 dBµV/m (limit) = -24.5 dB margin

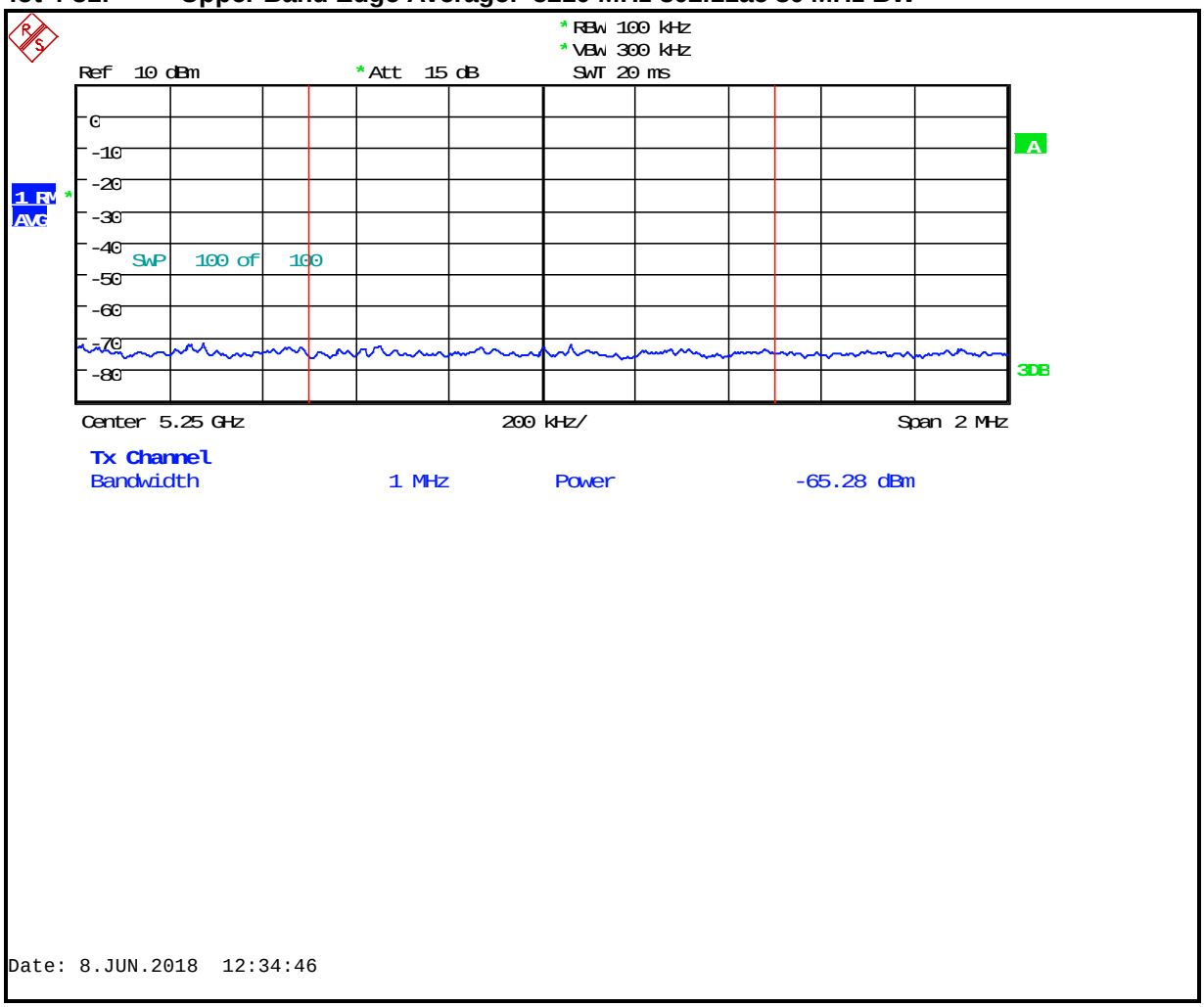
Plot 4-30: Lower Band Edge Peak: 5775 MHz 802.11ac 80 MHz BW



-28.5 + 95.2 = 66.7 dBµV/m – 74 dBµV/m (limit) = -7.3 dB margin

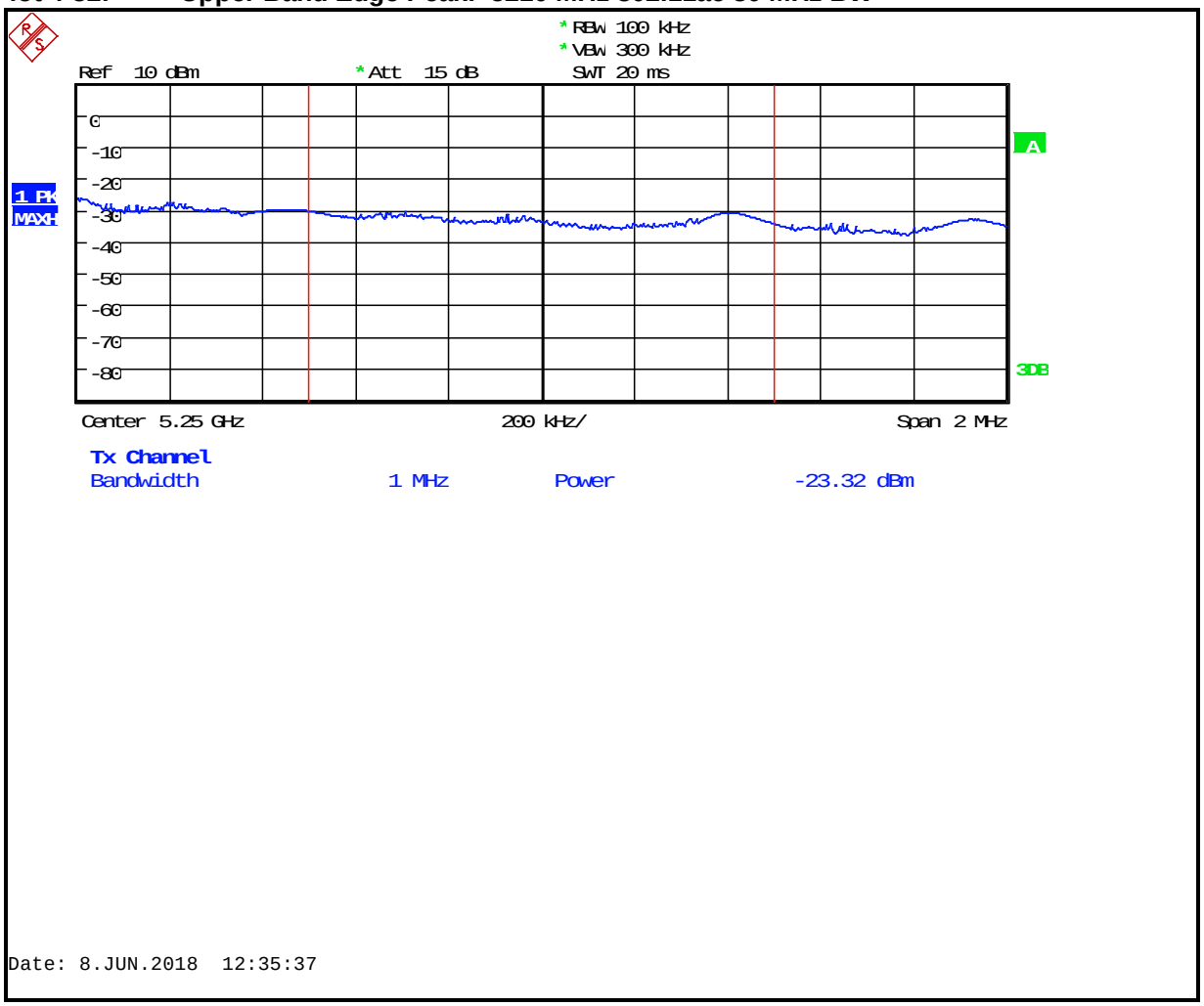
4.2.2 Upper Band Edge

Plot 4-31: Upper Band Edge Average: 5210 MHz 802.11ac 80 MHz BW



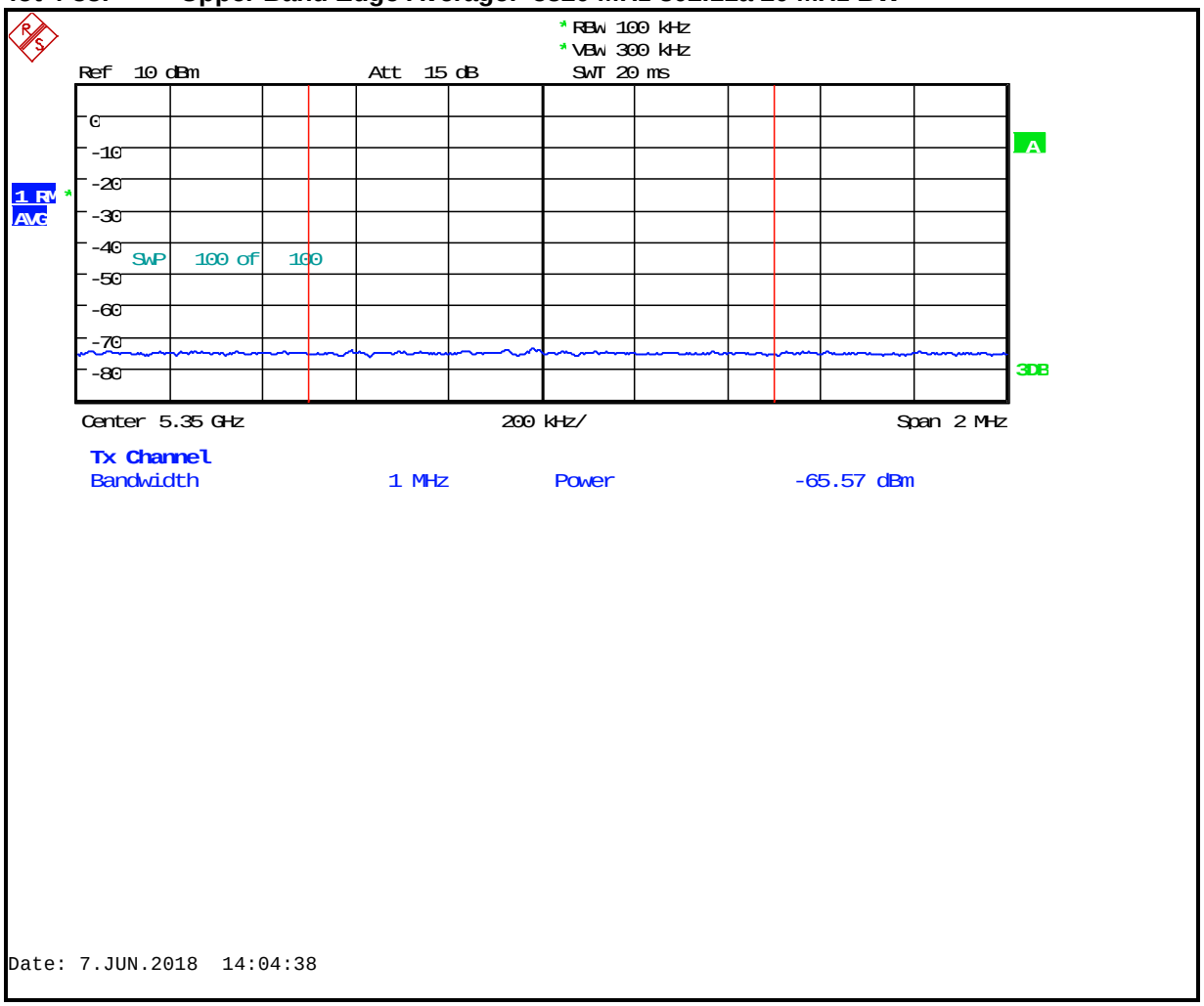
-65.3 + 95.2 = 29.9 dBµV/m – 54 dBµV/m (limit) = -24.1 dB margin

Plot 4-32: Upper Band Edge Peak: 5210 MHz 802.11ac 80 MHz BW



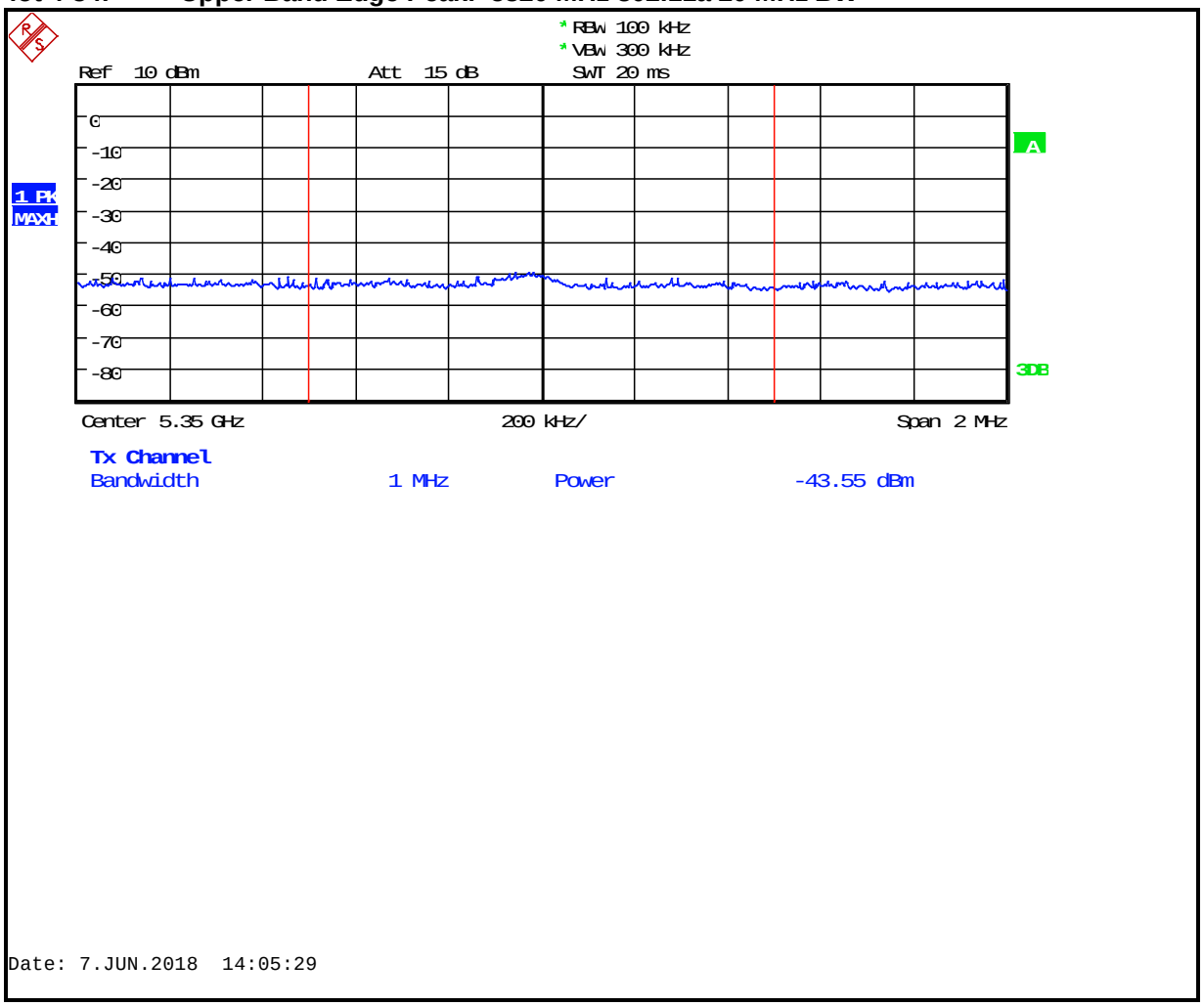
-23.3 + 95.2 = 71.9 dBµV/m – 74 dBµV/m (limit) = -2.1dB margin

Plot 4-33: Upper Band Edge Average: 5320 MHz 802.11a 20 MHz BW



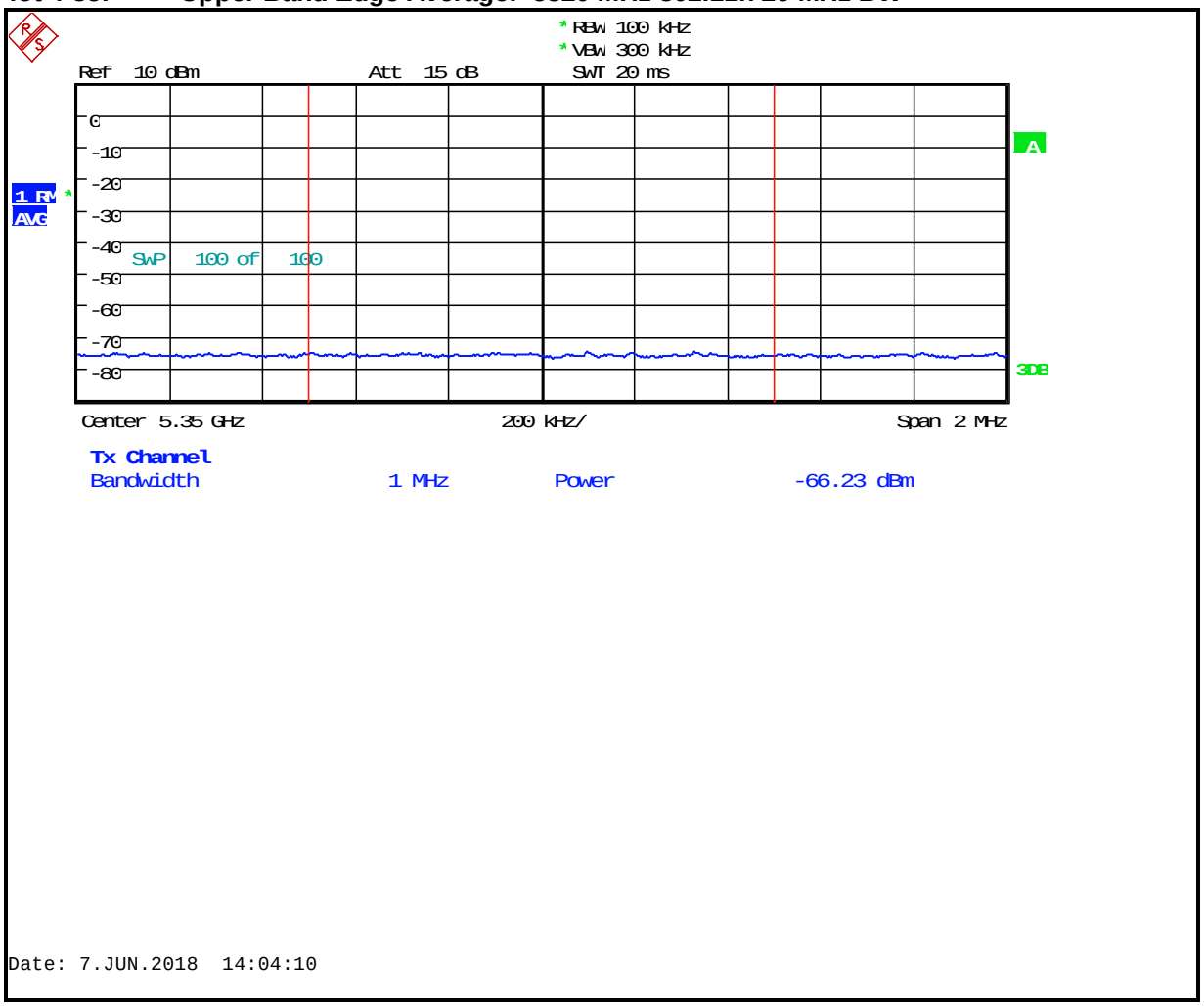
-65.6 + 95.2 = 29.6dBµV/m – 54 dBµV/m (limit) = -24.4dB margin

Plot 4-34: Upper Band Edge Peak: 5320 MHz 802.11a 20 MHz BW



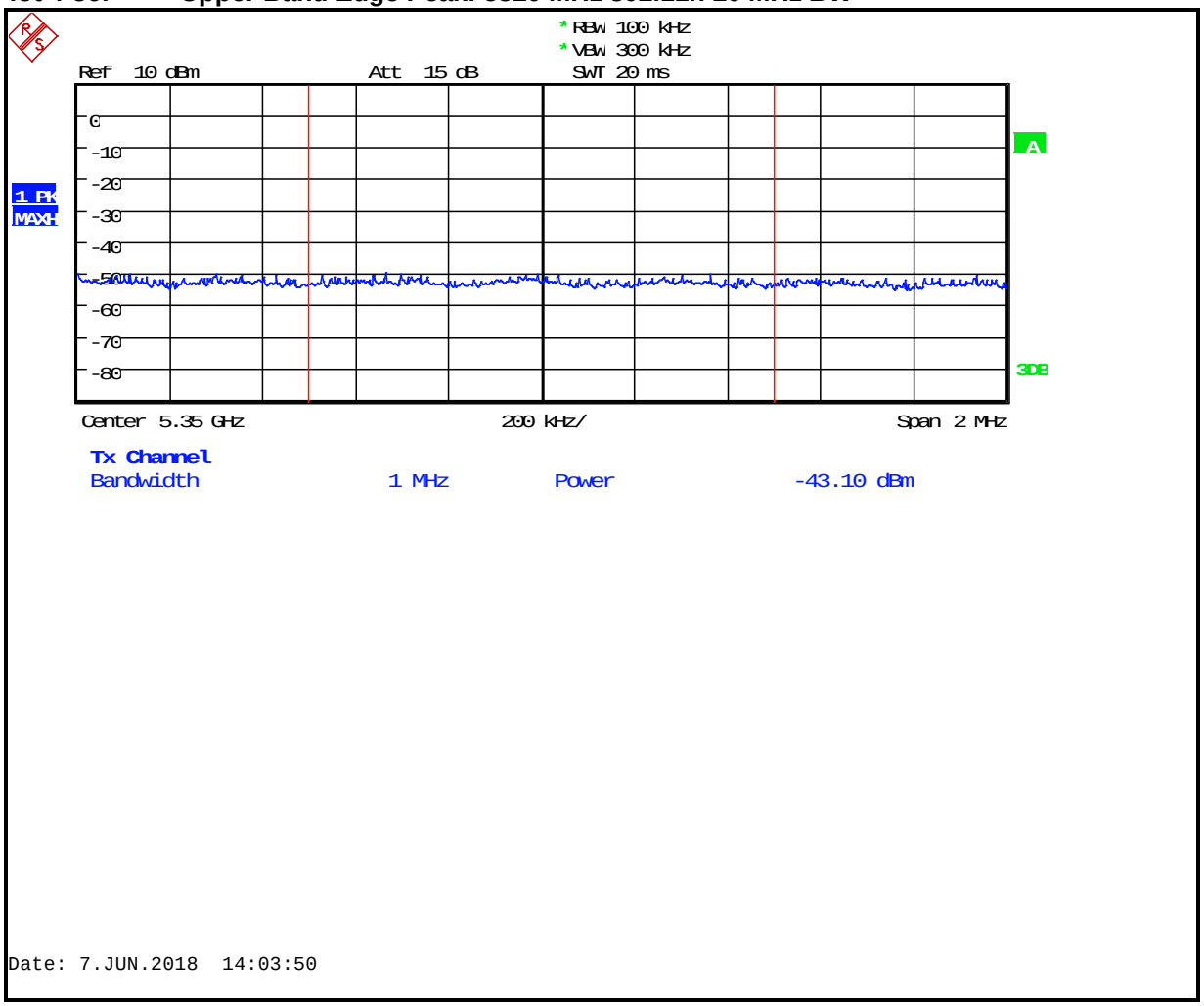
-43.6 + 95.2 = 51.6 dBµV/m – 74 dBµV/m (limit) = -22.4 dB margin

Plot 4-35: Upper Band Edge Average: 5320 MHz 802.11n 20 MHz BW



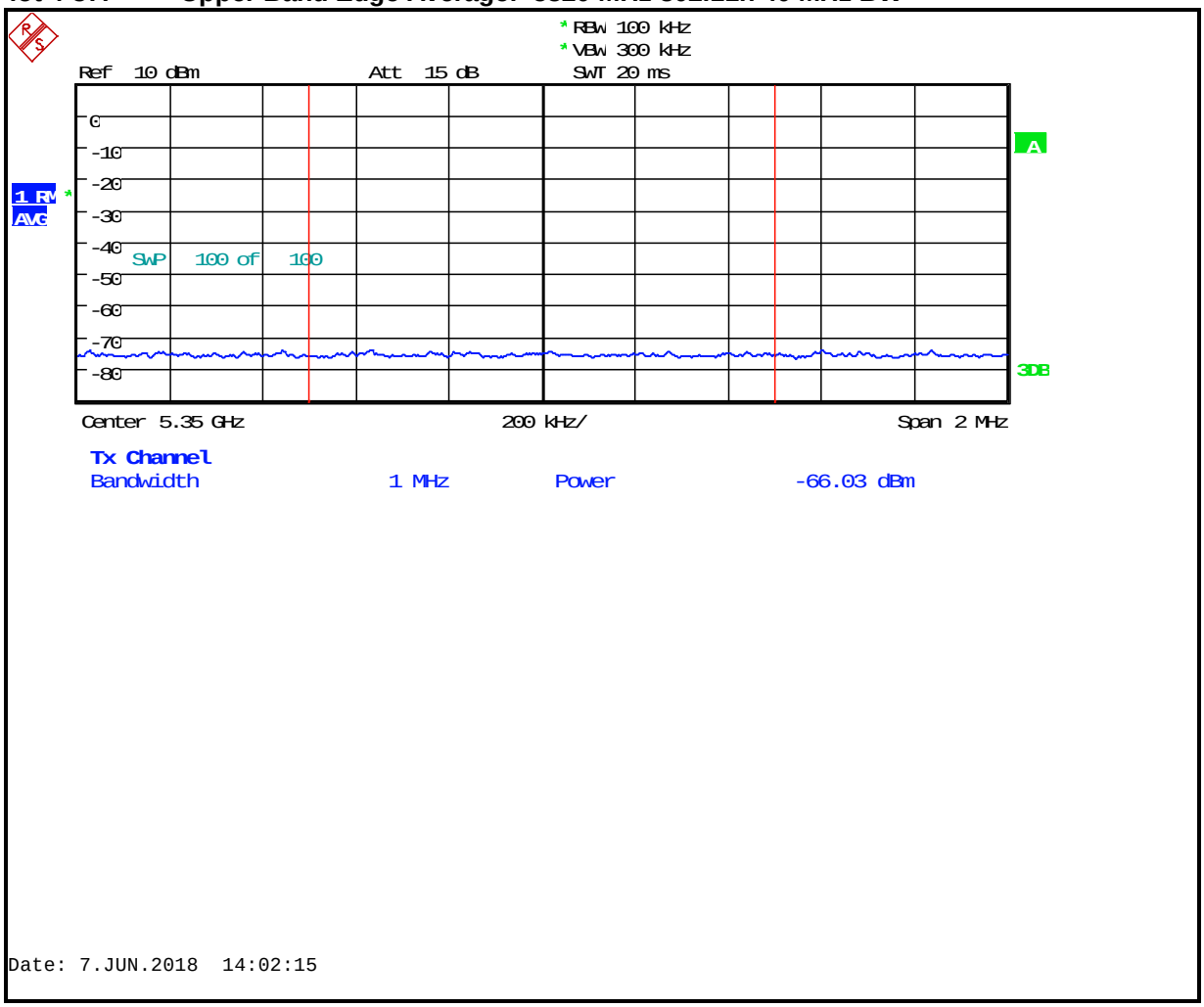
-66.2 + 95.2 = 29 dBµV/m – 54 dBµV/m (limit) = -25 dB margin

Plot 4-36: Upper Band Edge Peak: 5320 MHz 802.11n 20 MHz BW



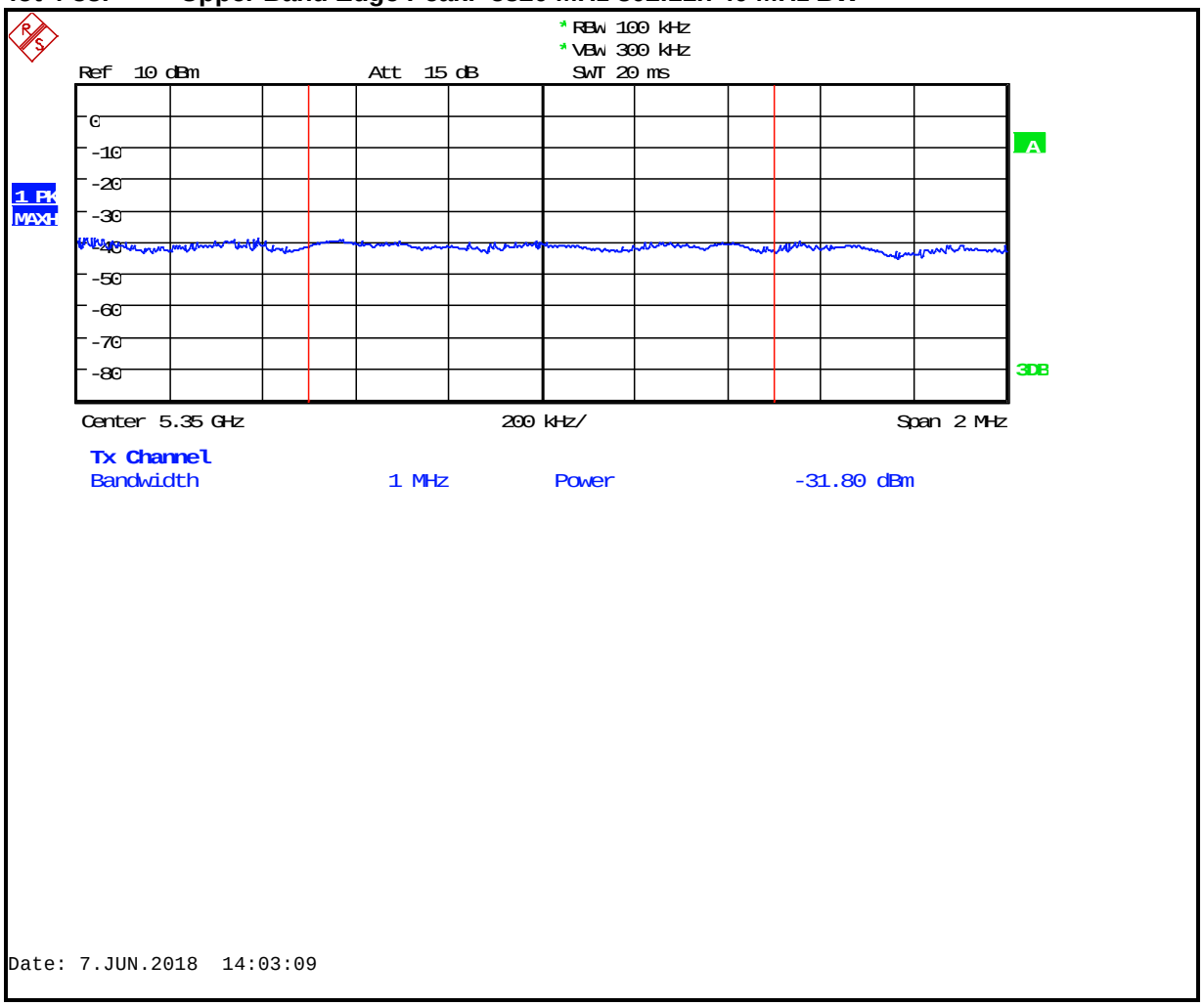
-43.1 + 95.2 = 52.1 dBµV/m – 74 dBµV/m (limit) = -21.9 dB margin

Plot 4-37: Upper Band Edge Average: 5320 MHz 802.11n 40 MHz BW



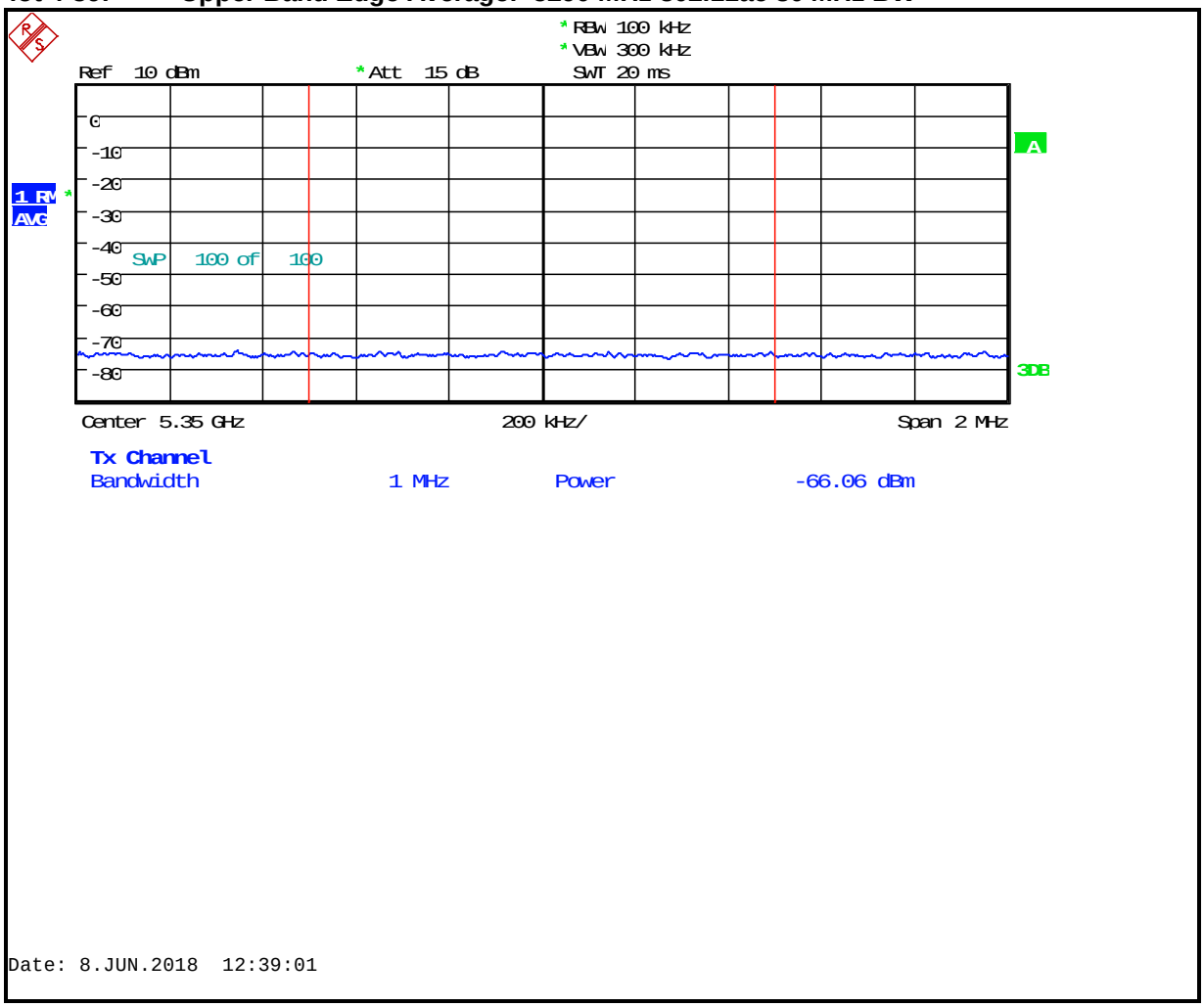
-66 + 95.2 = 29.2 dBµV/m – 54 dBµV/m (limit) = -24.8 dB margin

Plot 4-38: Upper Band Edge Peak: 5320 MHz 802.11n 40 MHz BW



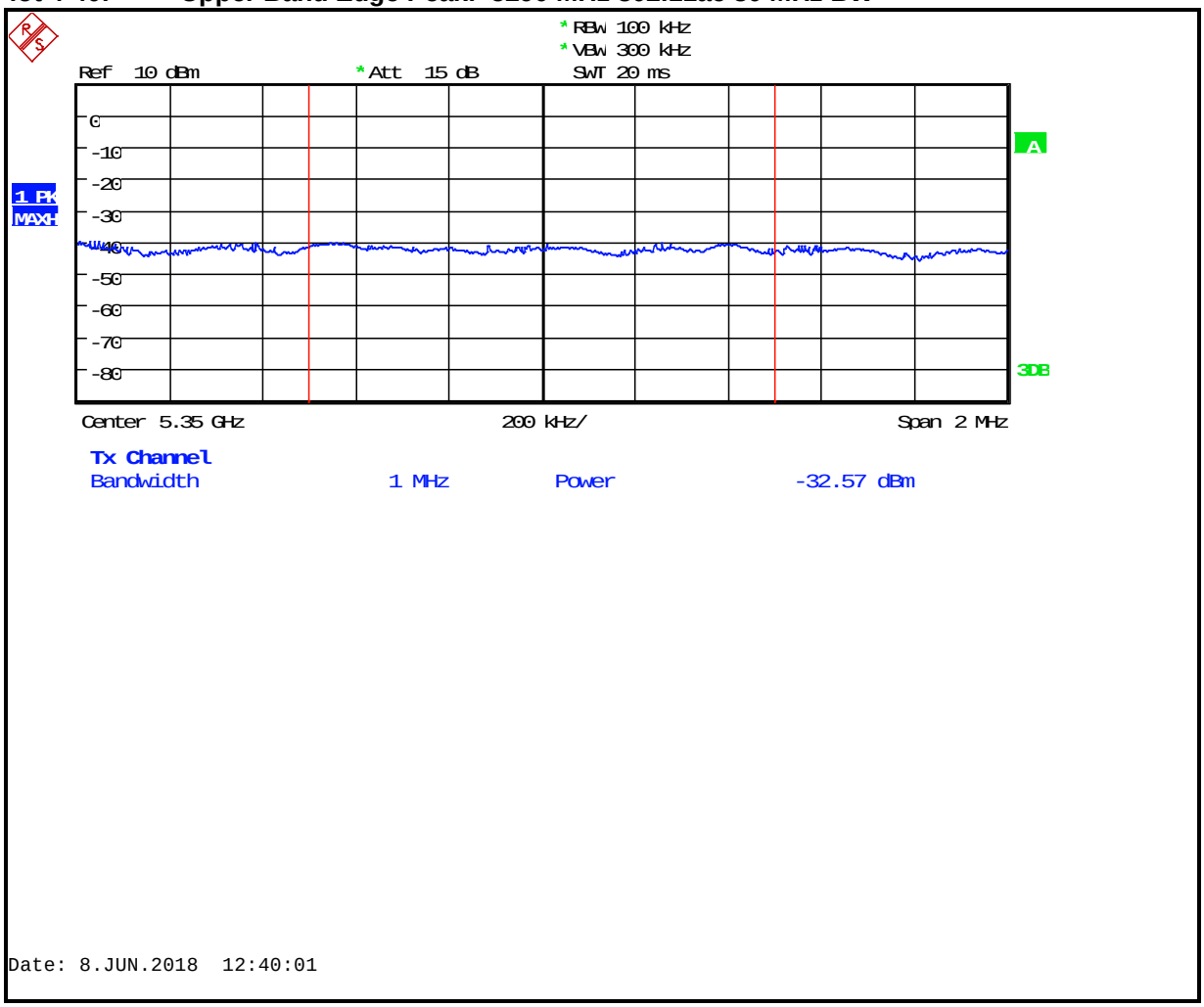
-31.8 + 95.2 = 63.4 dBµV/m – 74 dBµV/m (limit) = -10.6 dB margin

Plot 4-39: Upper Band Edge Average: 5290 MHz 802.11ac 80 MHz BW



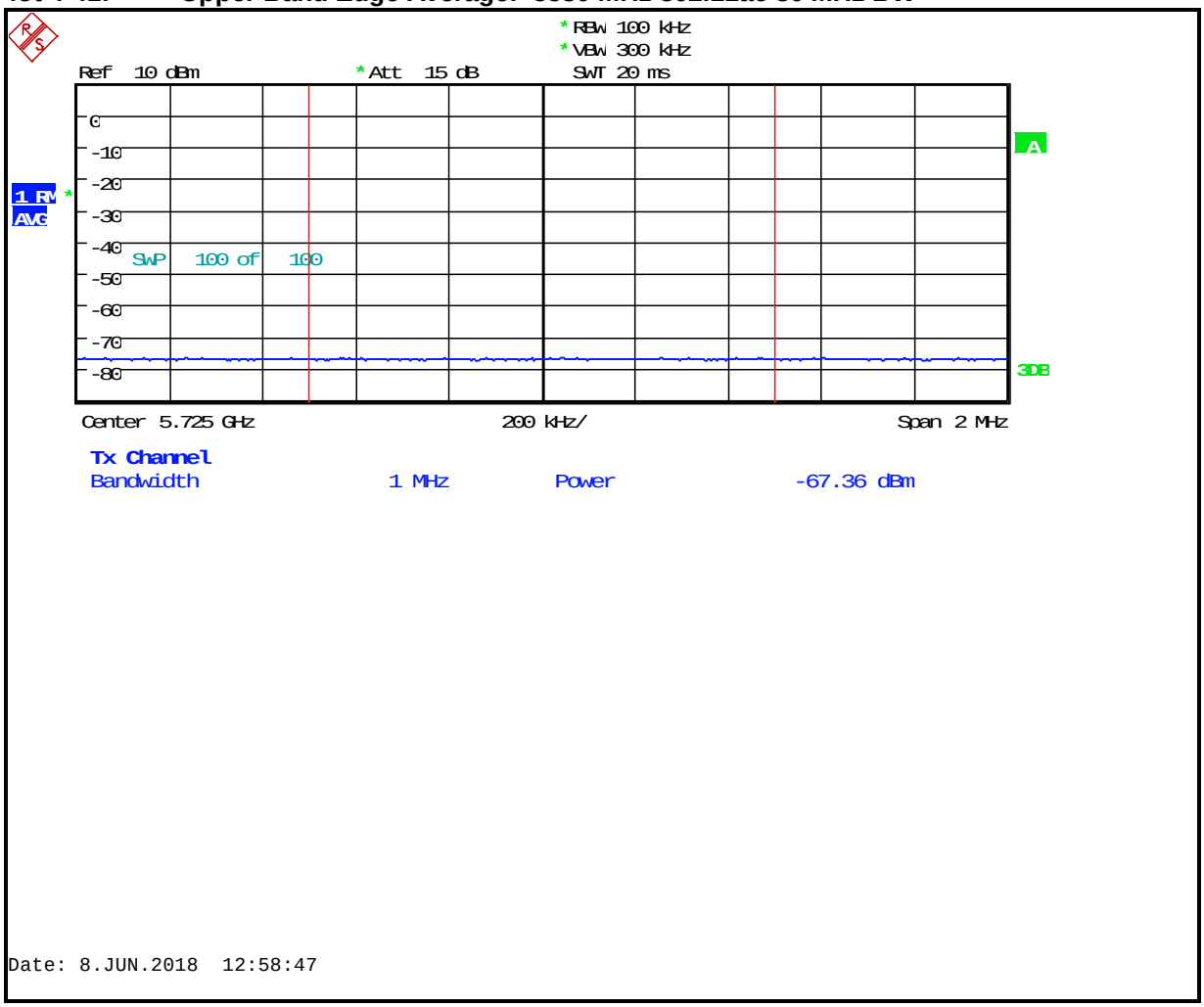
-66.1 + 95.2 = 29.1 dBµV/m – 54 dBµV/m (limit) = -24.9 dB margin

Plot 4-40: Upper Band Edge Peak: 5290 MHz 802.11ac 80 MHz BW



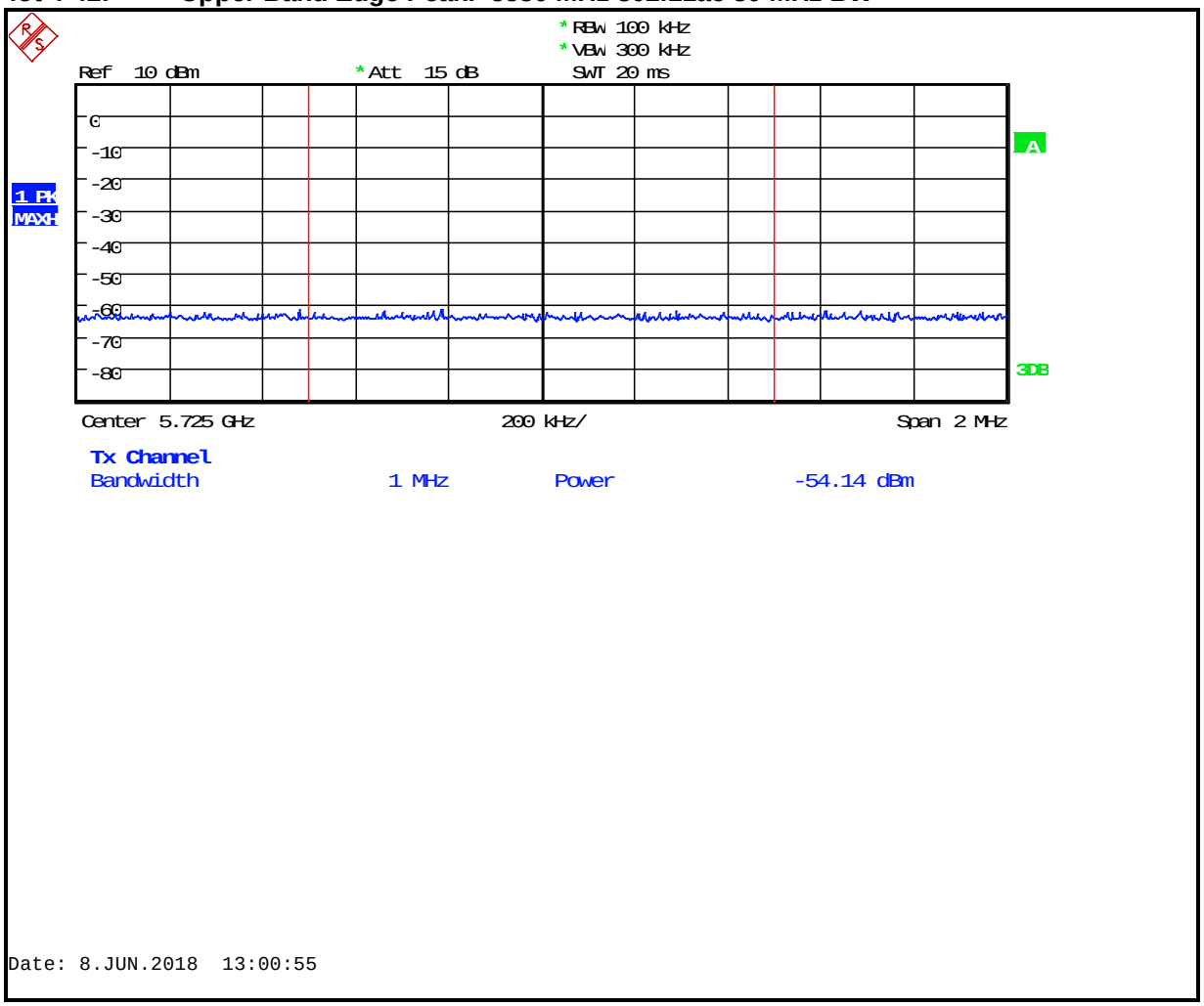
-32.6 + 95.2 = 62.6 dBµV/m – 74 dBµV/m (limit) = -11.4 dB margin

Plot 4-41: Upper Band Edge Average: 5530 MHz 802.11ac 80 MHz BW



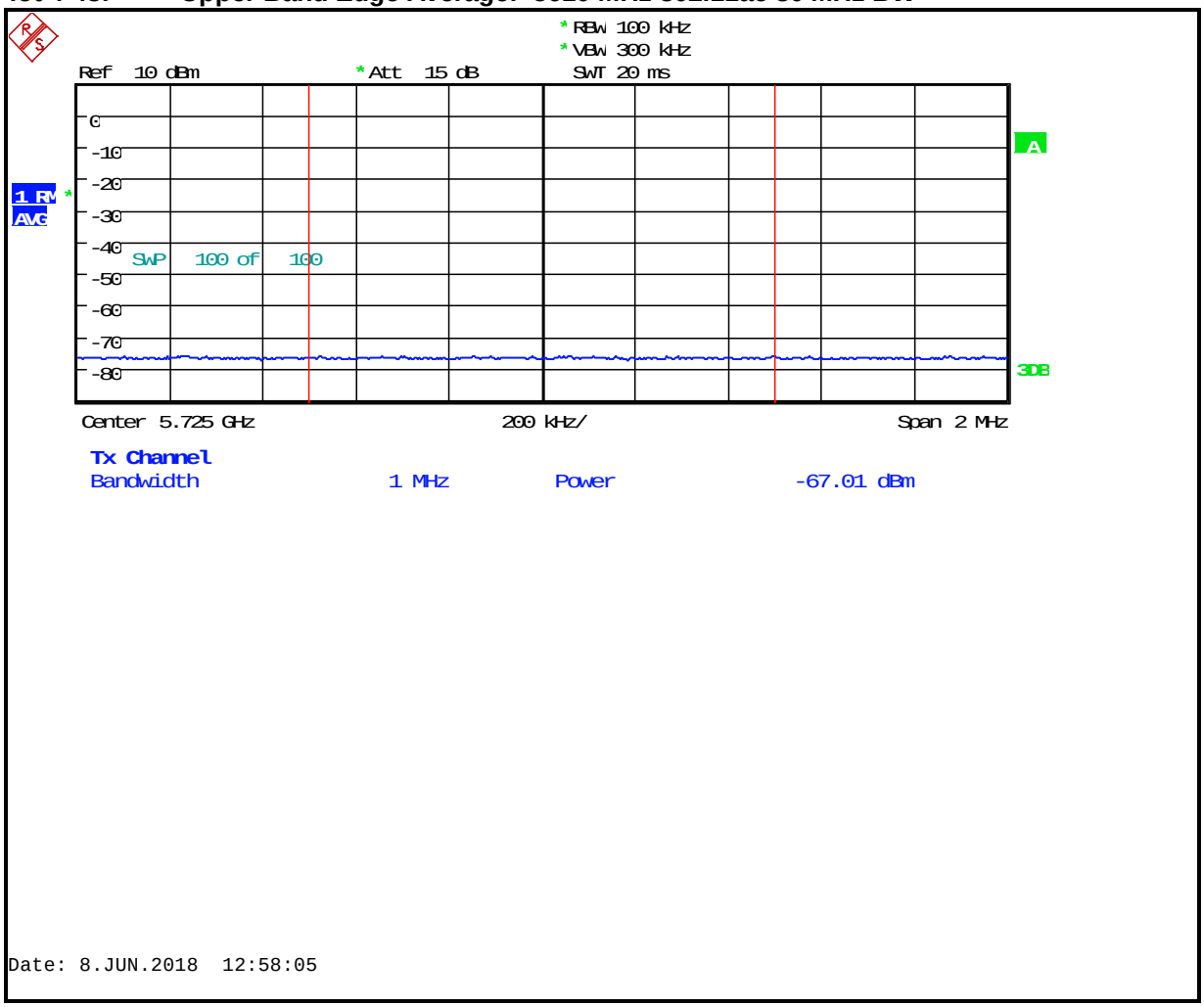
-67.4 + 95.2 = 27.8 dBµV/m – 54 dBµV/m (limit) = -26.2 dB margin

Plot 4-42: Upper Band Edge Peak: 5530 MHz 802.11ac 80 MHz BW



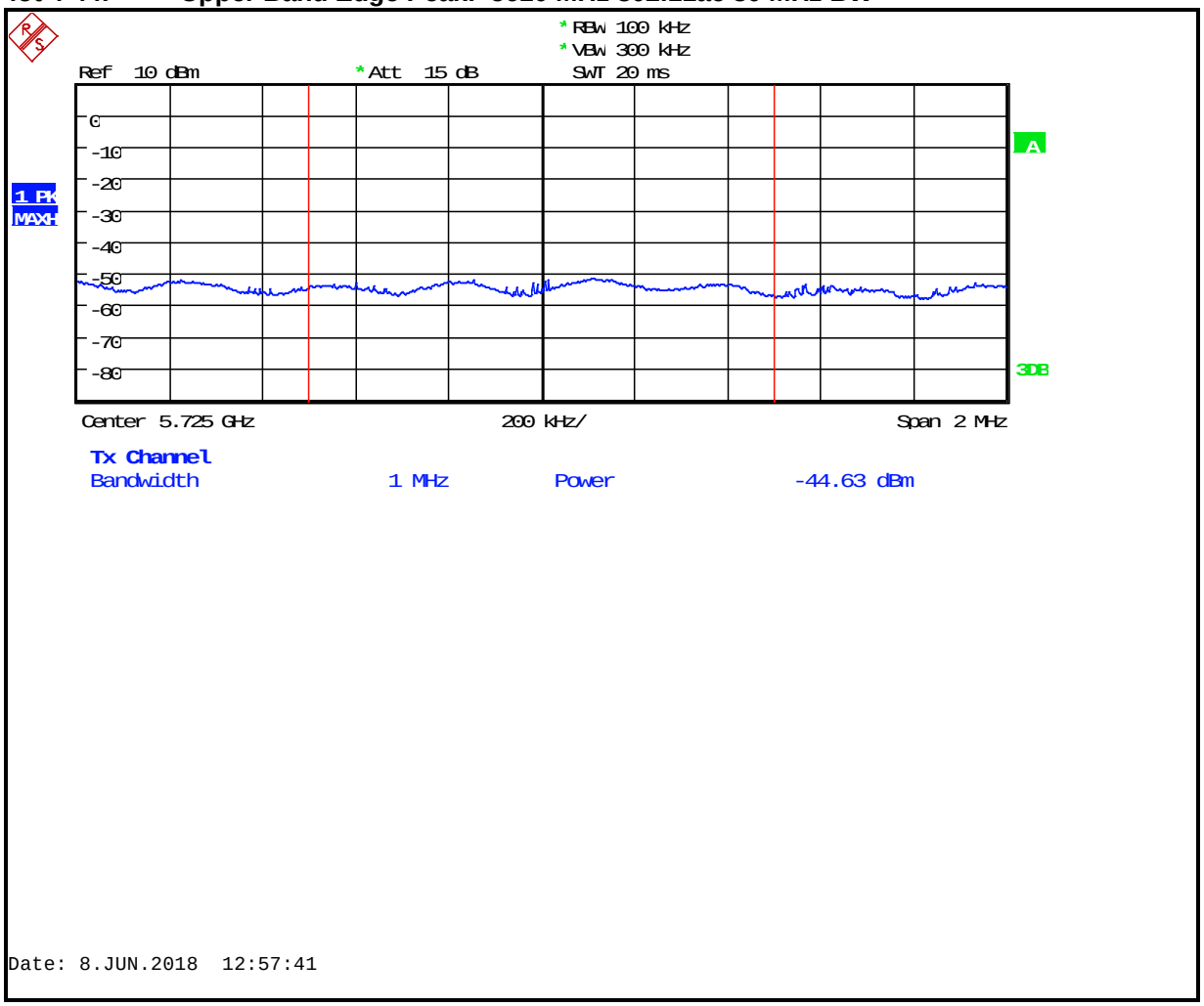
-54.1 + 95.2 = 41.1 dBµV/m – 74 dBµV/m (limit) = -32.9 dB margin

Plot 4-43: Upper Band Edge Average: 5610 MHz 802.11ac 80 MHz BW



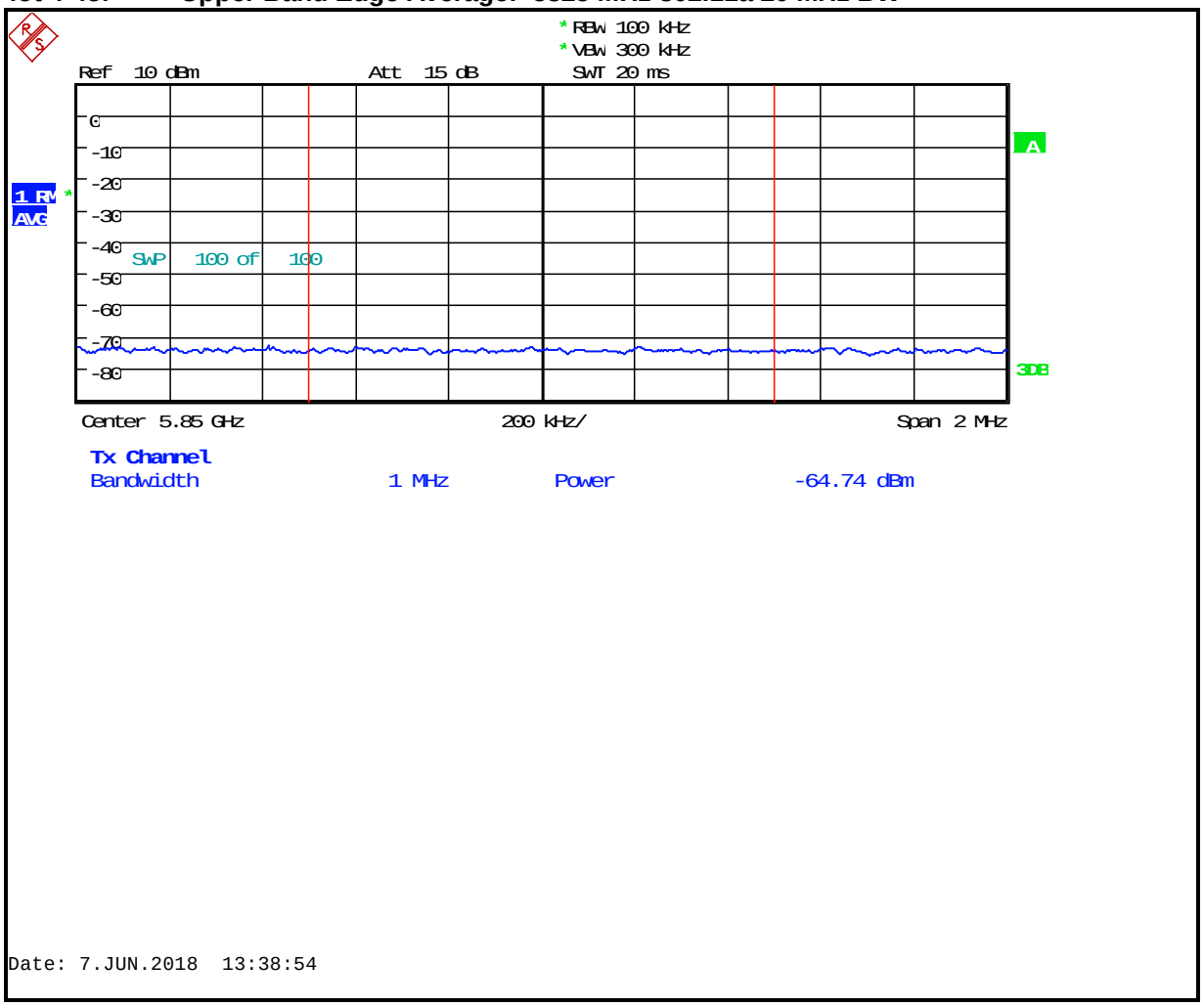
-67 + 95.2 = 28.2 dBµV/m – 54 dBµV/m (limit) = -25.8 dB margin

Plot 4-44: Upper Band Edge Peak: 5610 MHz 802.11ac 80 MHz BW



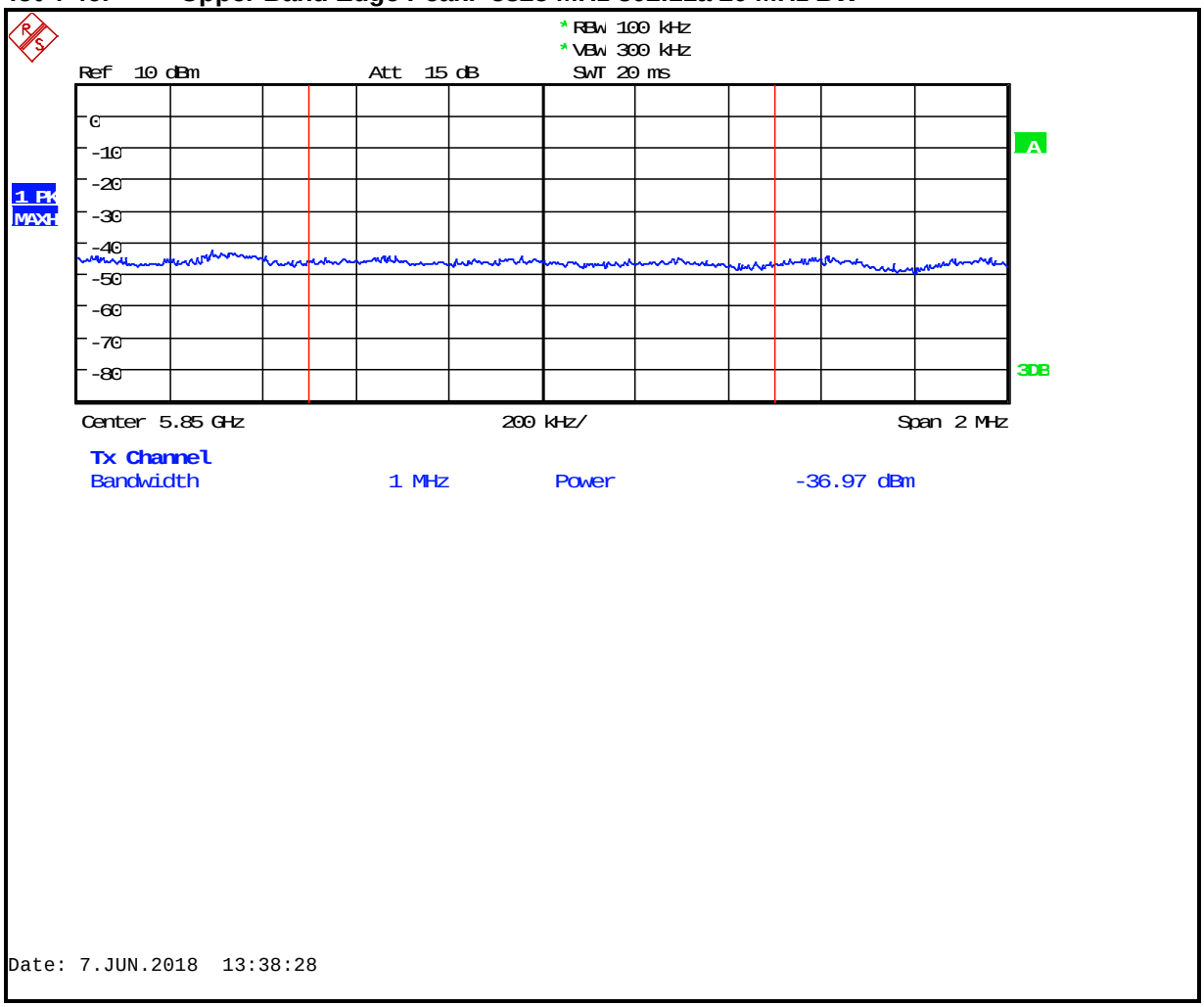
-44.6 + 95.2 = 50.6 dBµV/m – 74 dBµV/m (limit) = -23.4 dB margin

Plot 4-45: Upper Band Edge Average: 5825 MHz 802.11a 20 MHz BW



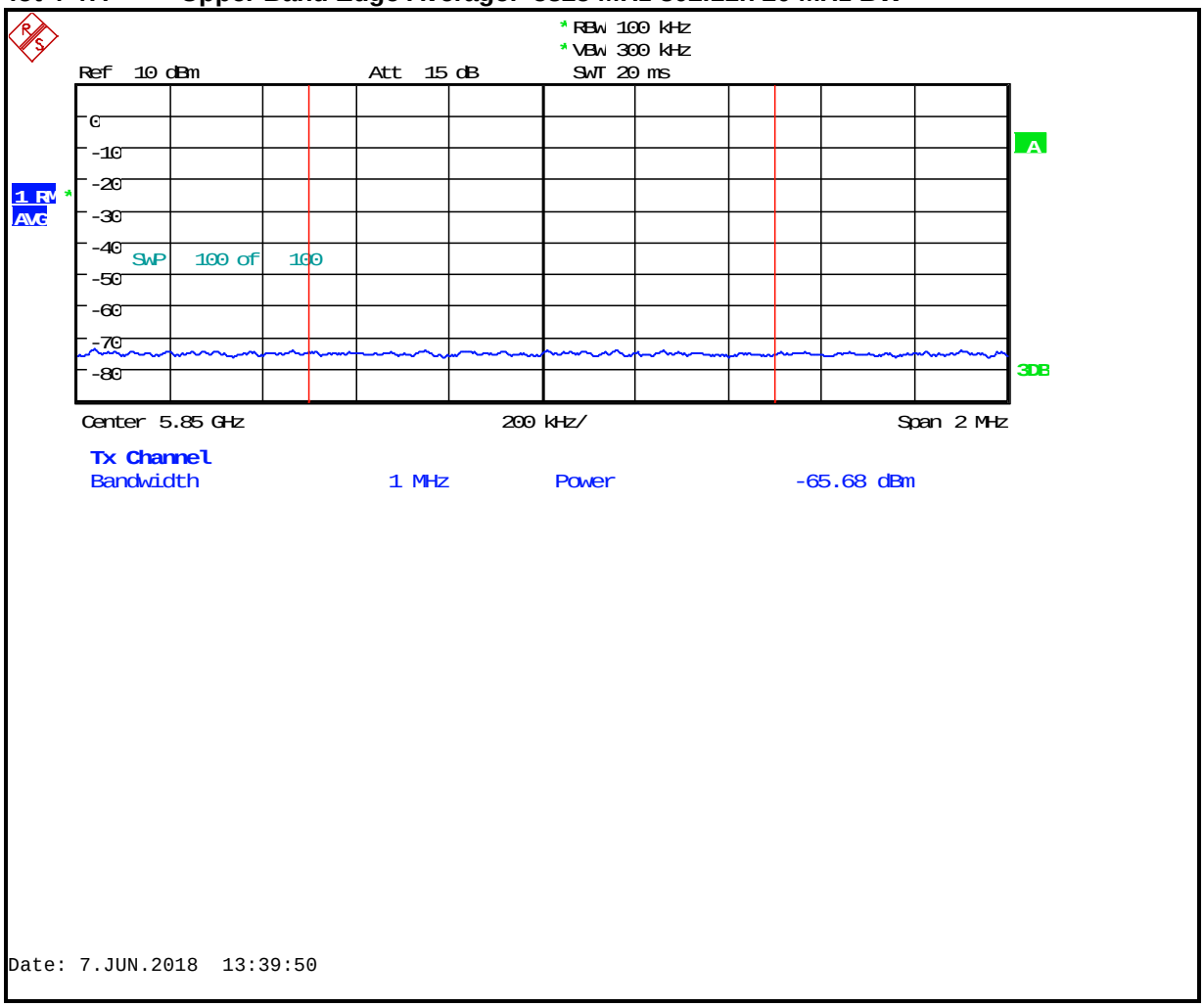
-64.7+ 95.2 = 30.5 dBµV/m – 54 dBµV/m (limit) = -23.5 dB margin

Plot 4-46: Upper Band Edge Peak: 5825 MHz 802.11a 20 MHz BW



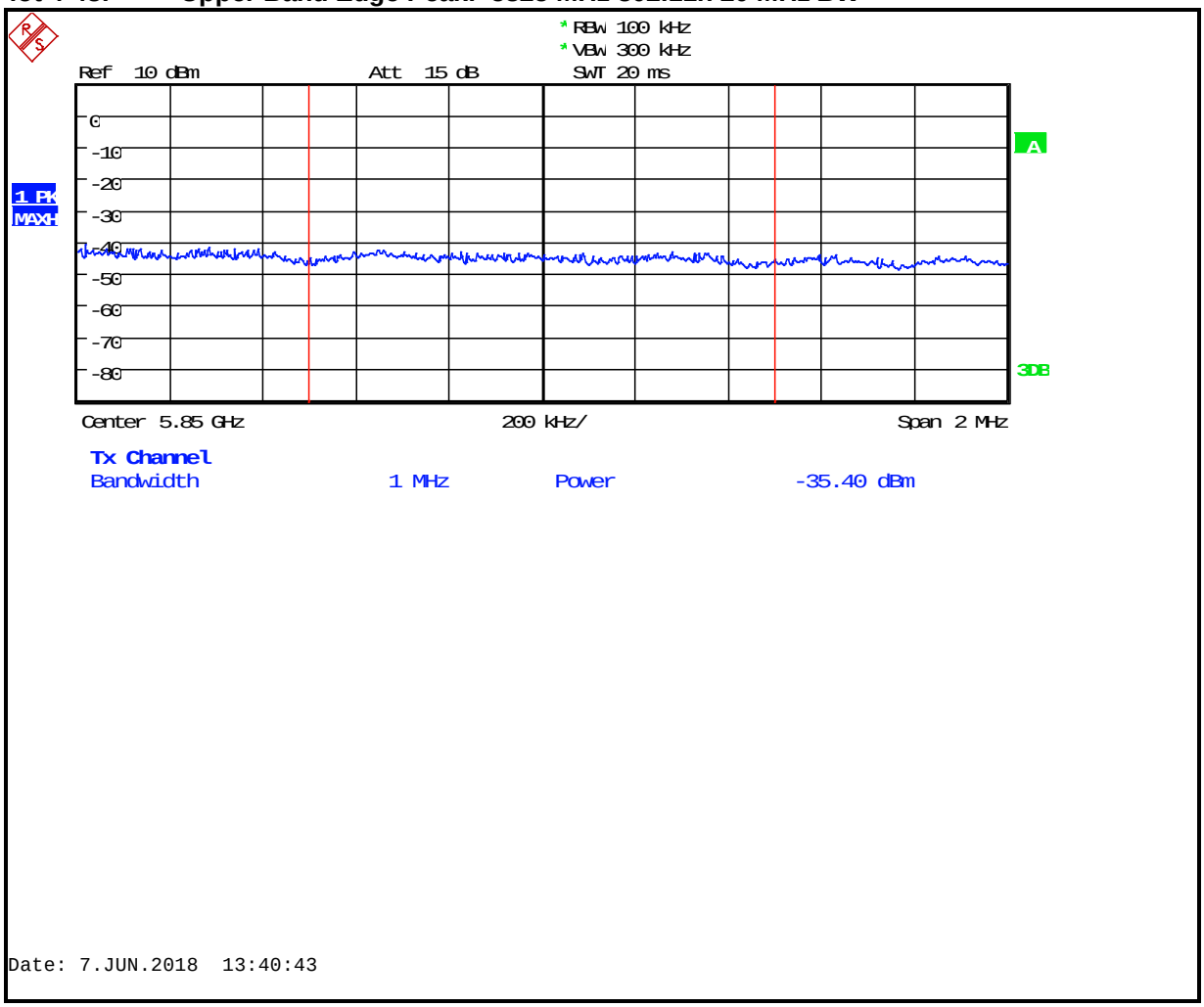
-37 + 95.2 = 58.2 dBµV/m – 74 dBµV/m (limit) = -15.8 dB margin

Plot 4-47: Upper Band Edge Average: 5825 MHz 802.11n 20 MHz BW



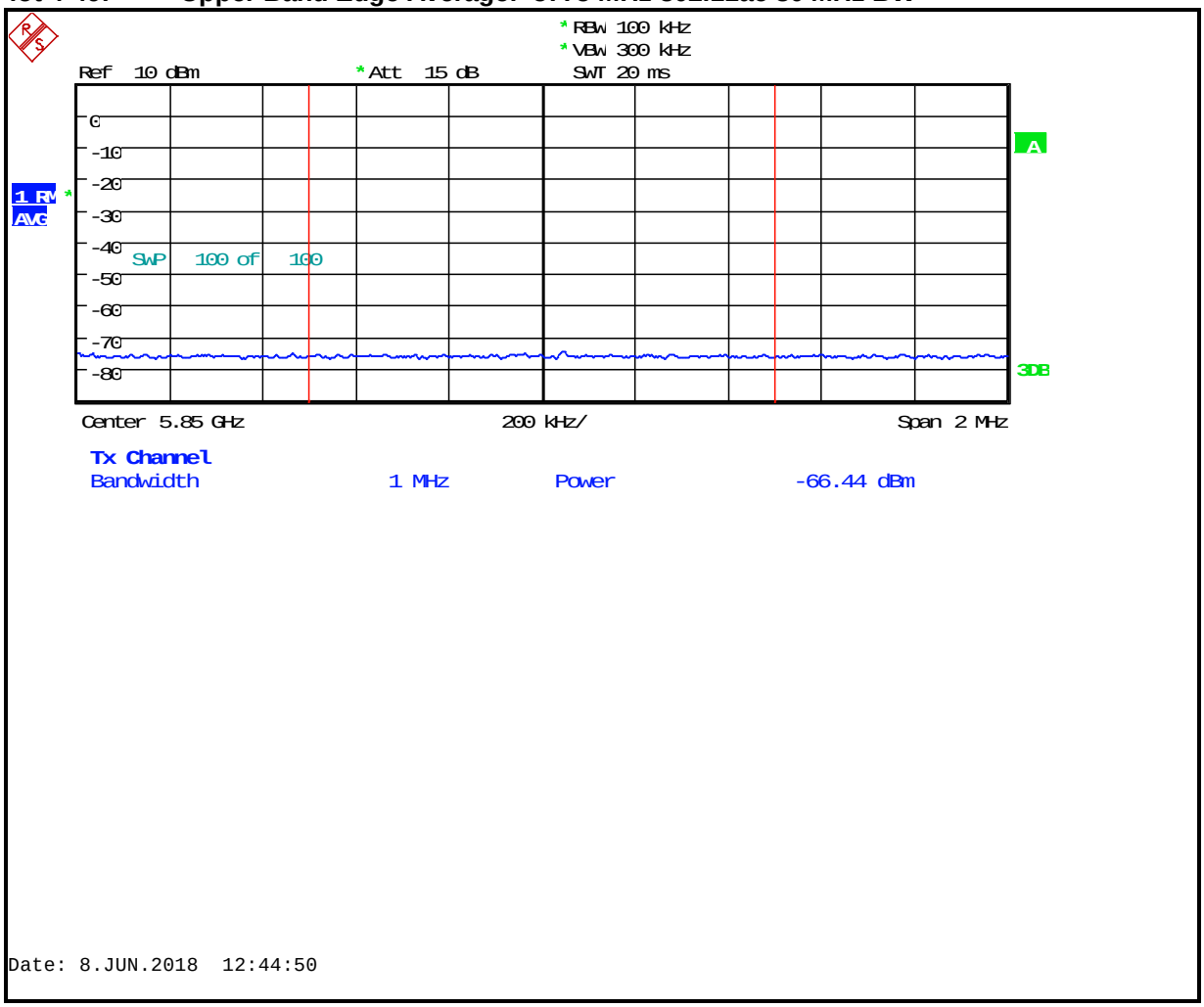
-65.7+ 95.2 = 29.5 dBµV/m – 54 dBµV/m (limit) = -24.5 dB margin

Plot 4-48: Upper Band Edge Peak: 5825 MHz 802.11n 20 MHz BW



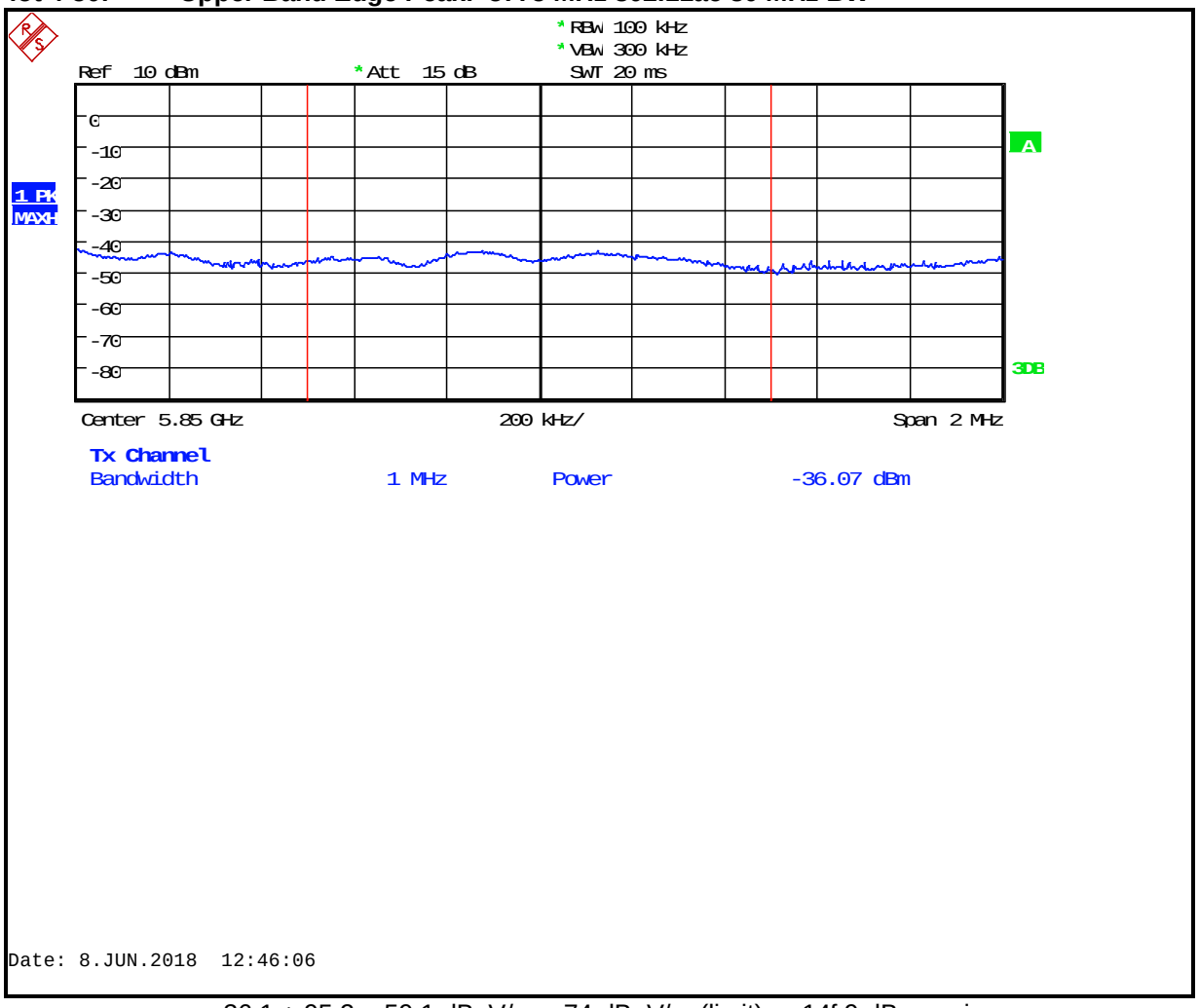
-35.4 + 95.2 = 59.8 dBµV/m – 74 dBµV/m (limit) = -14.2 dB margin

Plot 4-49: Upper Band Edge Average: 5775 MHz 802.11ac 80 MHz BW



-66.4 + 95.2 = 28.8 dBµV/m – 54 dBµV/m (limit) = -25.2 dB margin

Plot 4-50: Upper Band Edge Peak: 5775 MHz 802.11ac 80 MHz BW



-36.1 + 95.2 = 59.1 dBµV/m – 74 dBµV/m (limit) = -14f.9 dB margin

Result: PASS

Measurement uncertainty: Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty = ±2.0 dB

Table 4-1: Band Edge Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Khue Do		June 7-8, 2018
Test Engineer	Signature	Dates of Test

5 Antenna Conducted Spurious Emissions – FCC 15.407(6); ISED RSS-247 6.2

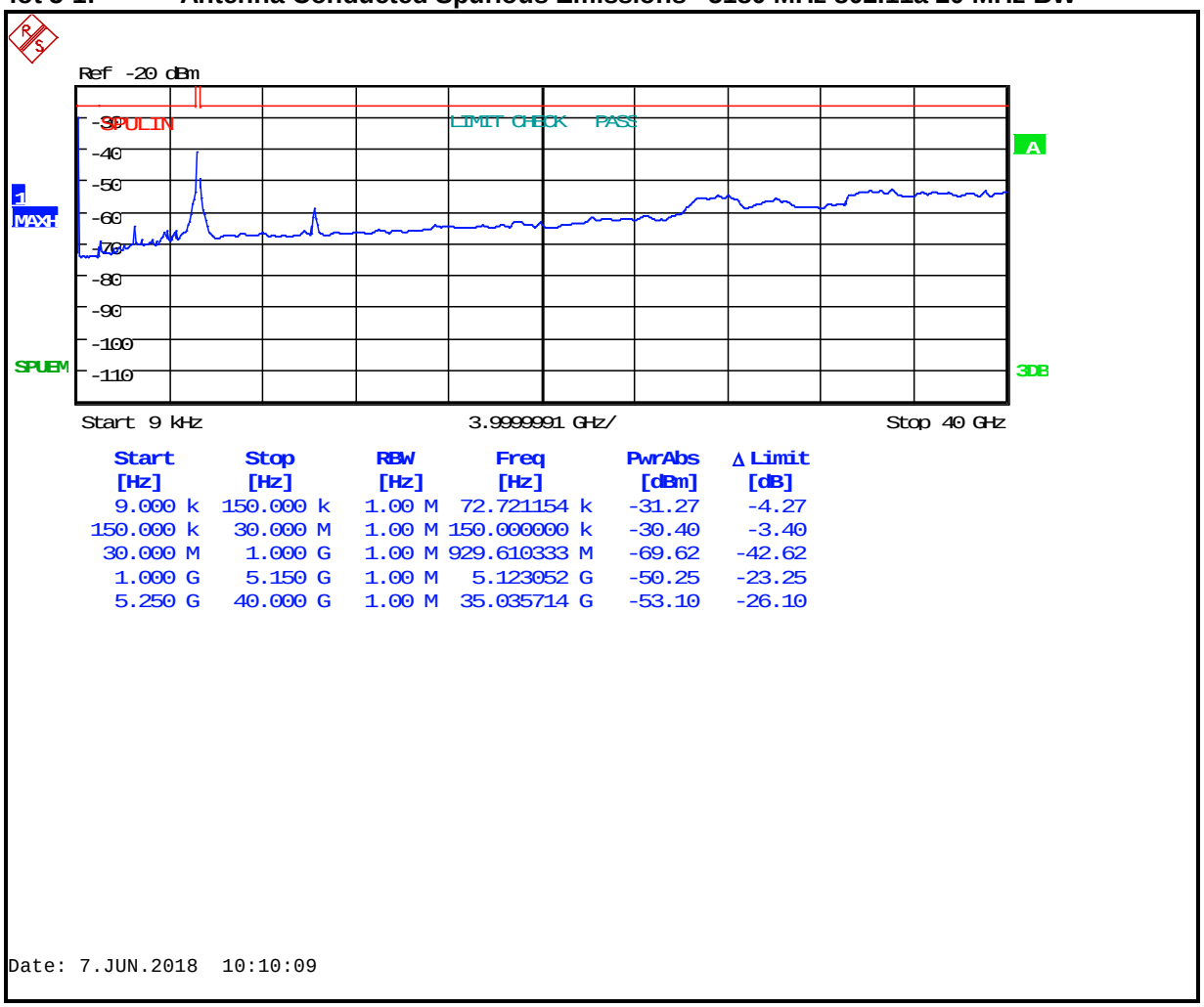
5.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna conducted spurious emissions per FCC 15.407(6) were measured from the EUT antenna port using a 50-ohm spectrum analyzer with the resolution bandwidth set at 1 MHz, and the video bandwidth set at >3 x RBW.

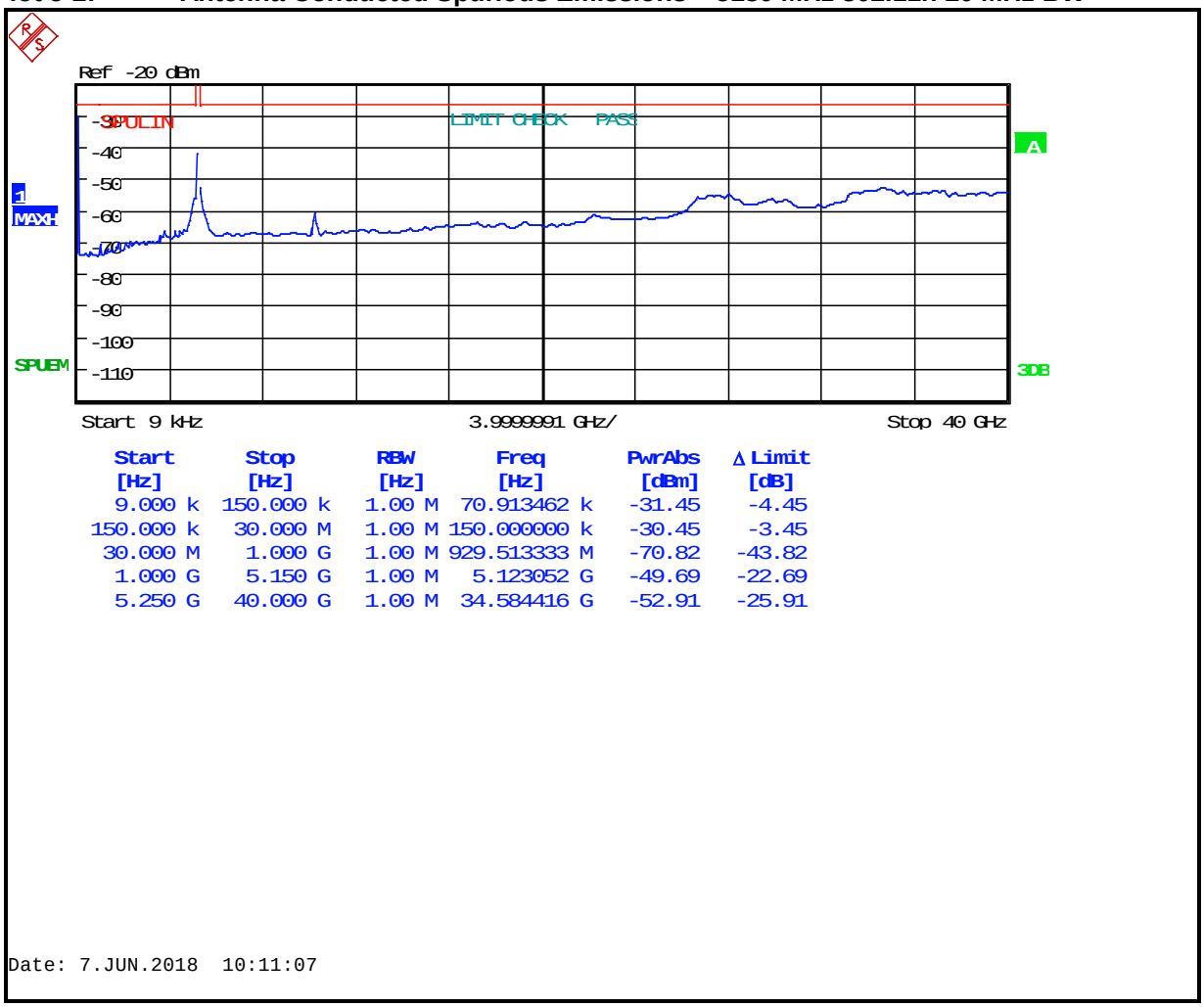
5.2 Antenna Conducted Spurious Emissions Test Results

No harmonics or spurs were found within 20 dB (note that we are reporting power as peak) of the carrier level from the carrier to the 10th harmonic of the carrier frequency. The plots below are presented to show compliance.

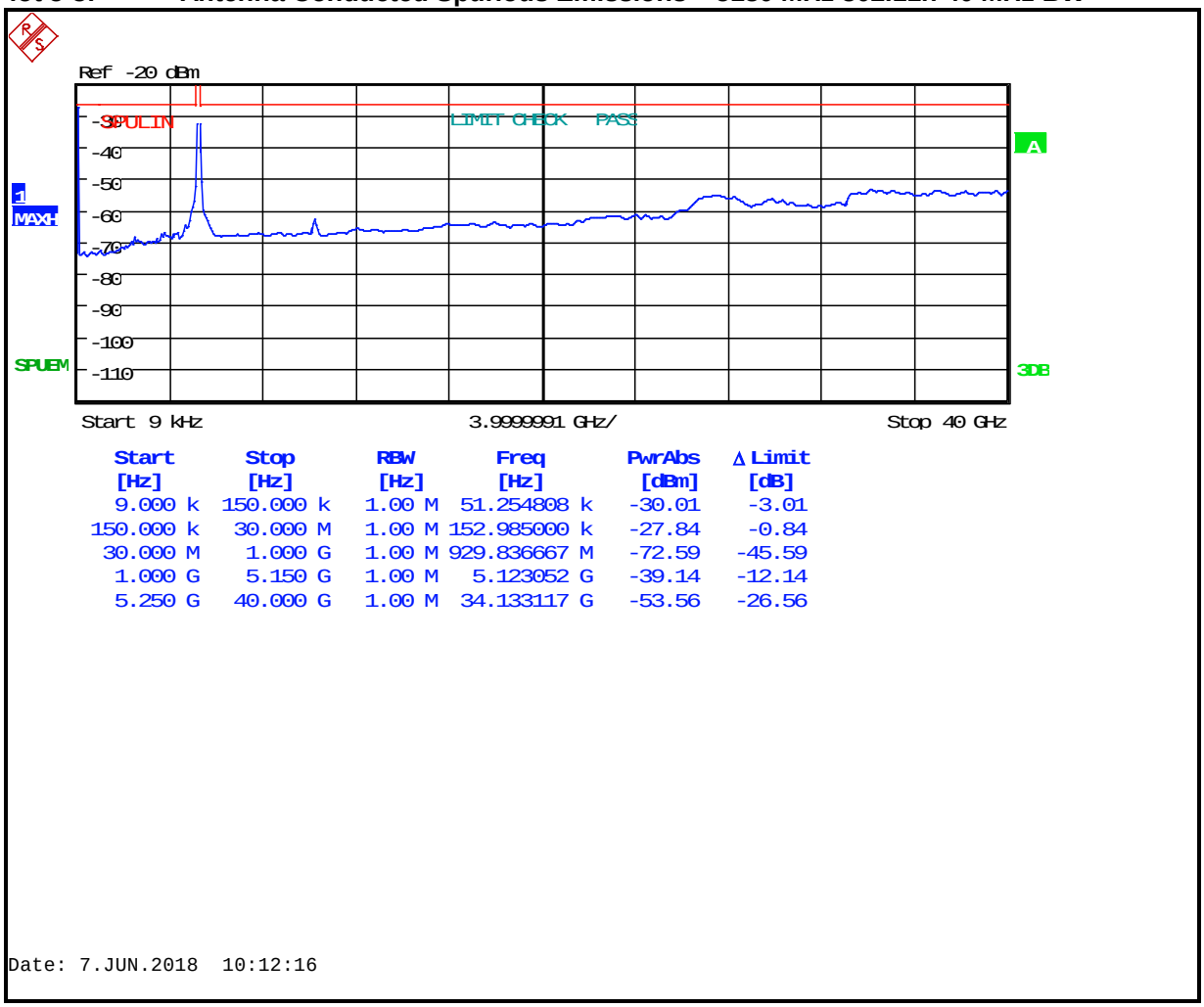
Plot 5-1: Antenna Conducted Spurious Emissions– 5180 MHz 802.11a 20 MHz BW



Plot 5-2: Antenna Conducted Spurious Emissions – 5180 MHz 802.11n 20 MHz BW



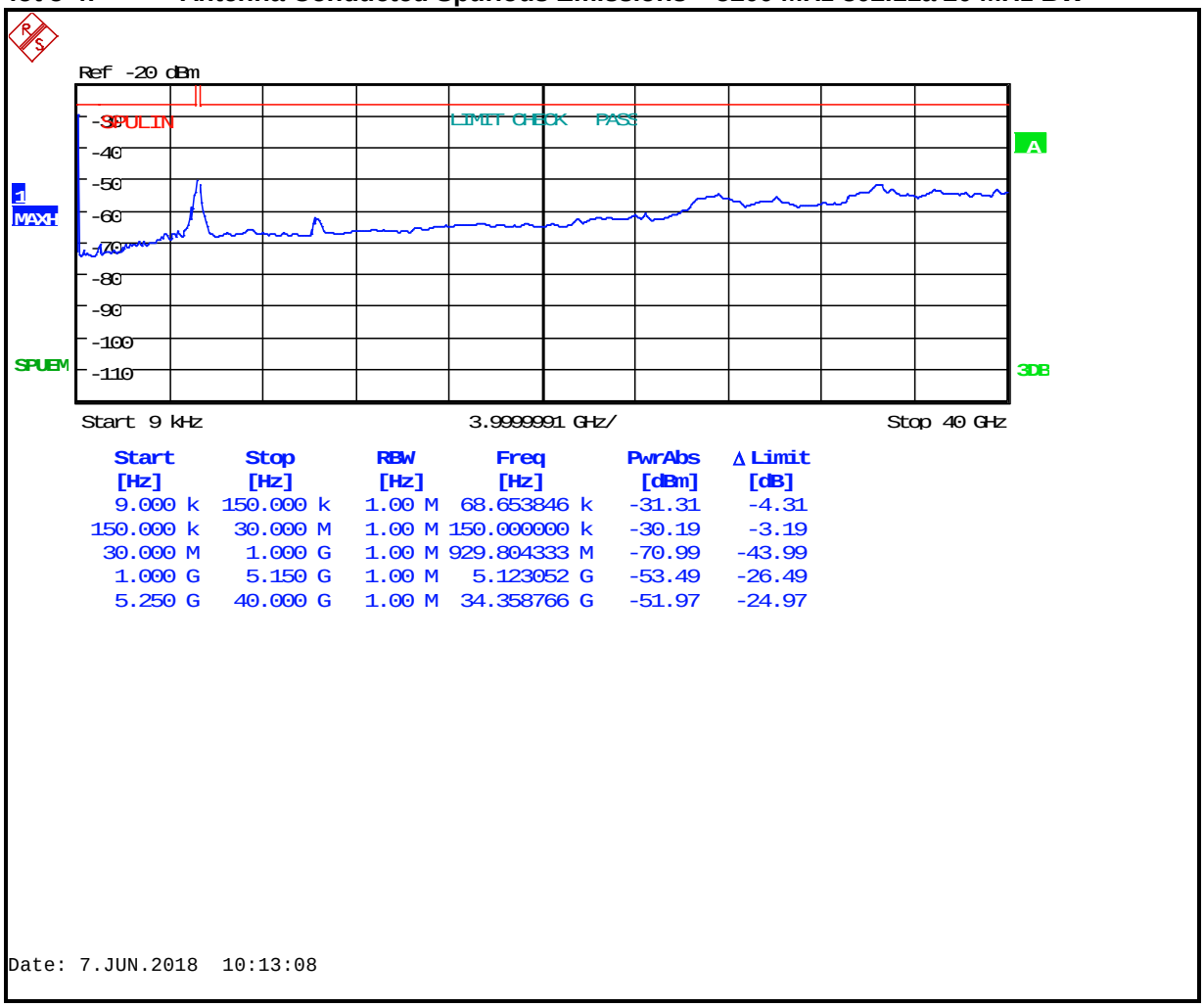
Plot 5-3: Antenna Conducted Spurious Emissions – 5180 MHz 802.11n 40 MHz BW



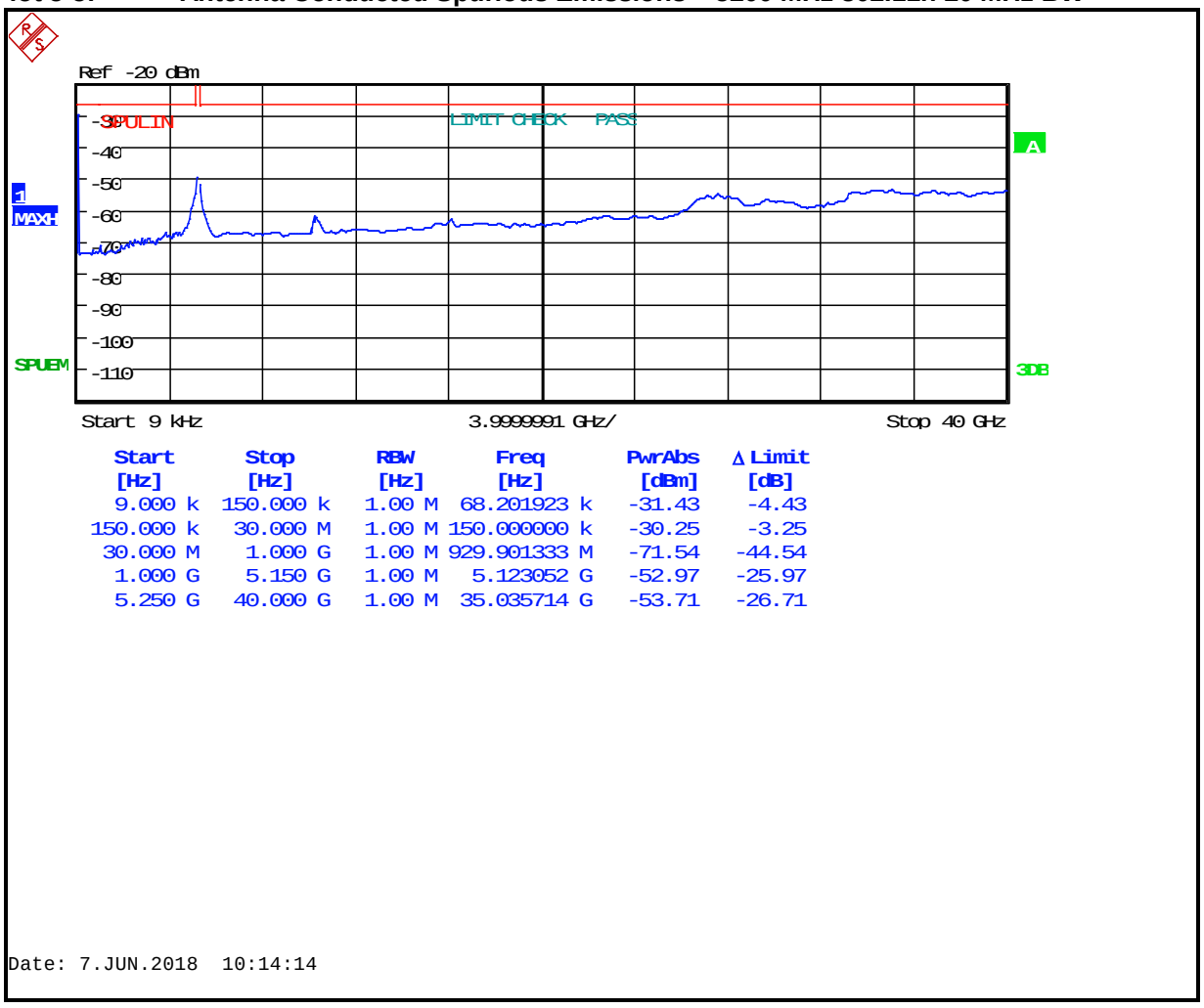
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	51.254808 k	-30.01	-3.01
150.000 k	30.000 M	1.00 M	152.985000 k	-27.84	-0.84
30.000 M	1.000 G	1.00 M	929.836667 M	-72.59	-45.59
1.000 G	5.150 G	1.00 M	5.123052 G	-39.14	-12.14
5.250 G	40.000 G	1.00 M	34.133117 G	-53.56	-26.56

Date: 7.JUN.2018 10:12:16

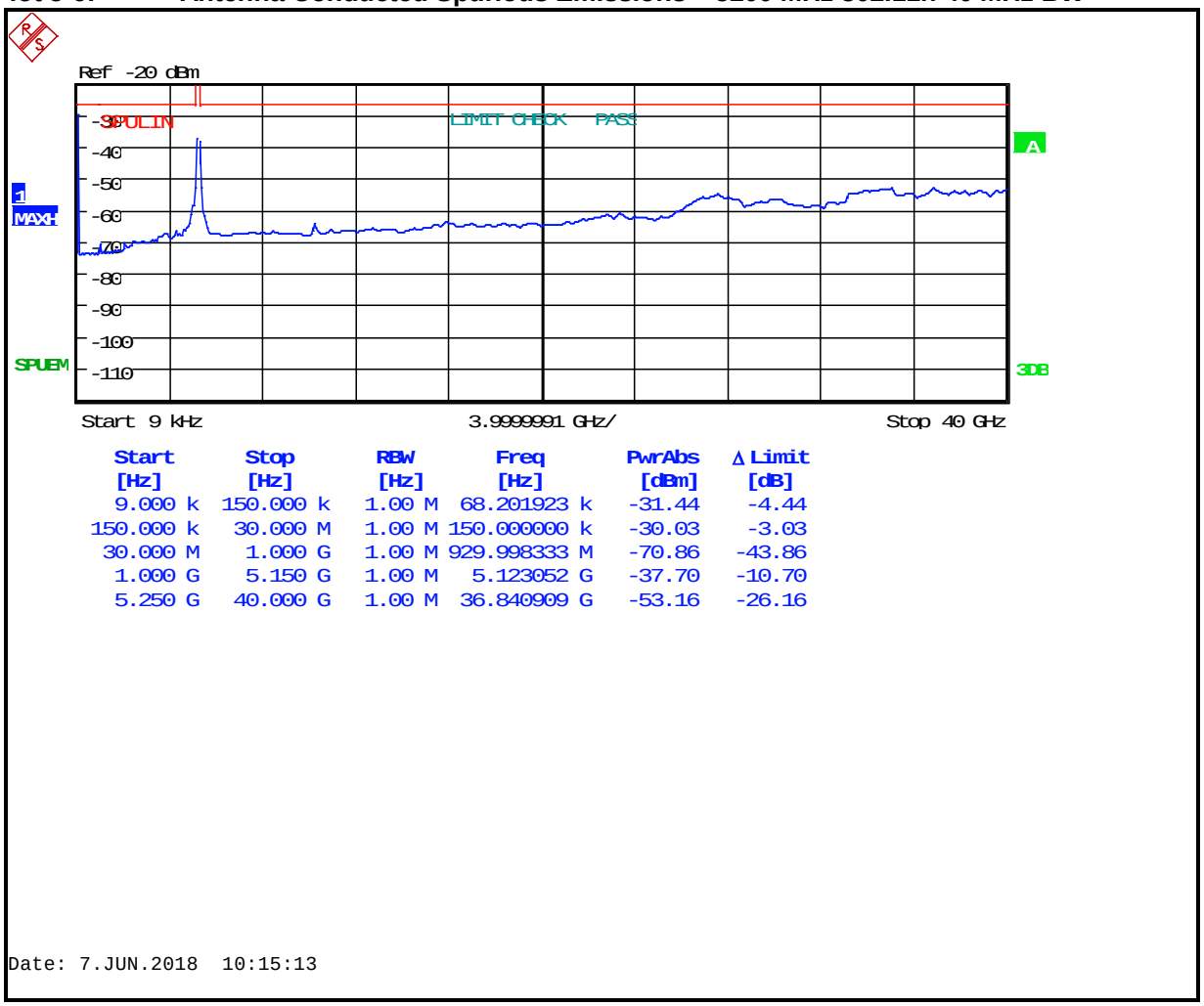
Plot 5-4: Antenna Conducted Spurious Emissions – 5200 MHz 802.11a 20 MHz BW



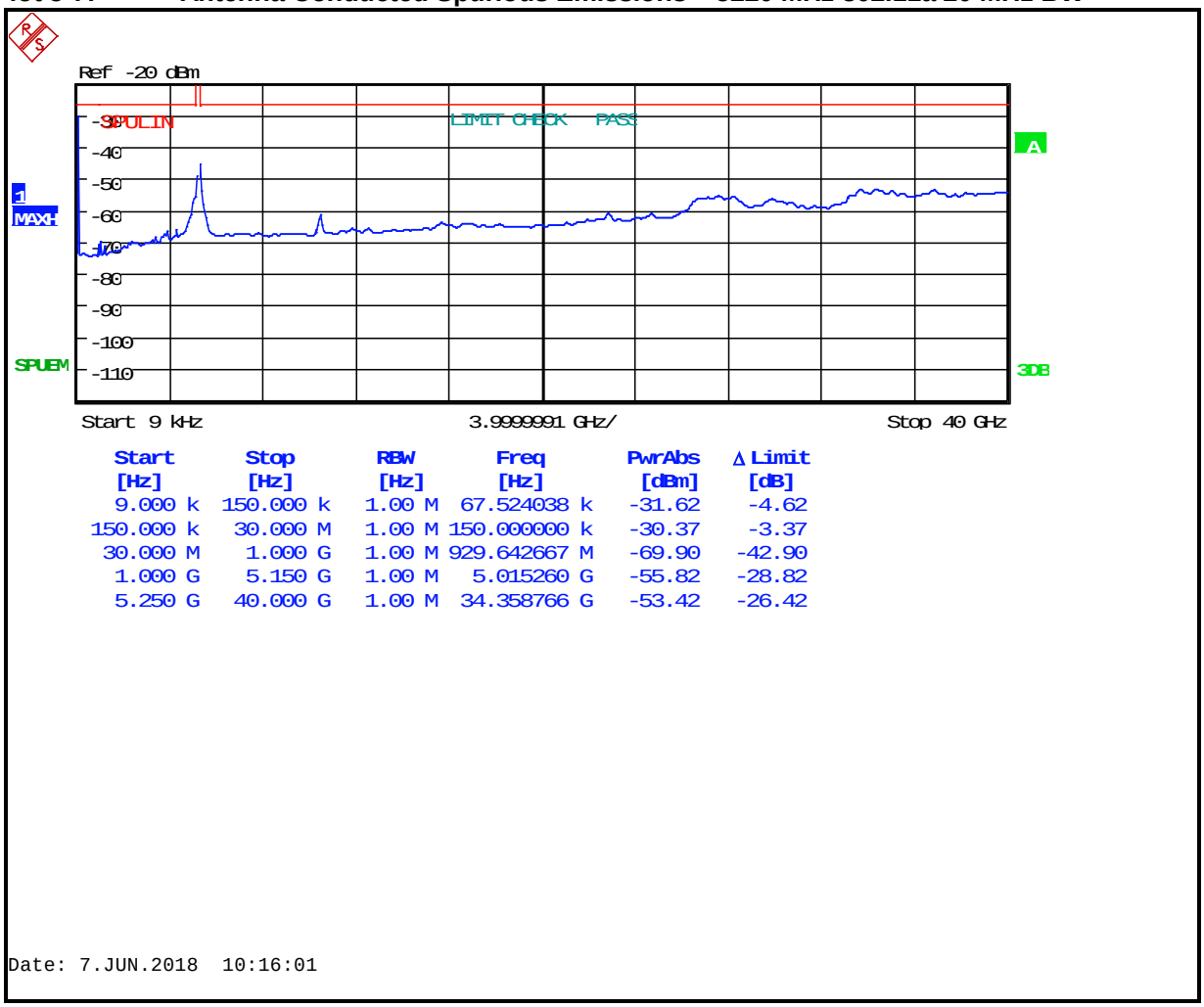
Plot 5-5: Antenna Conducted Spurious Emissions – 5200 MHz 802.11n 20 MHz BW



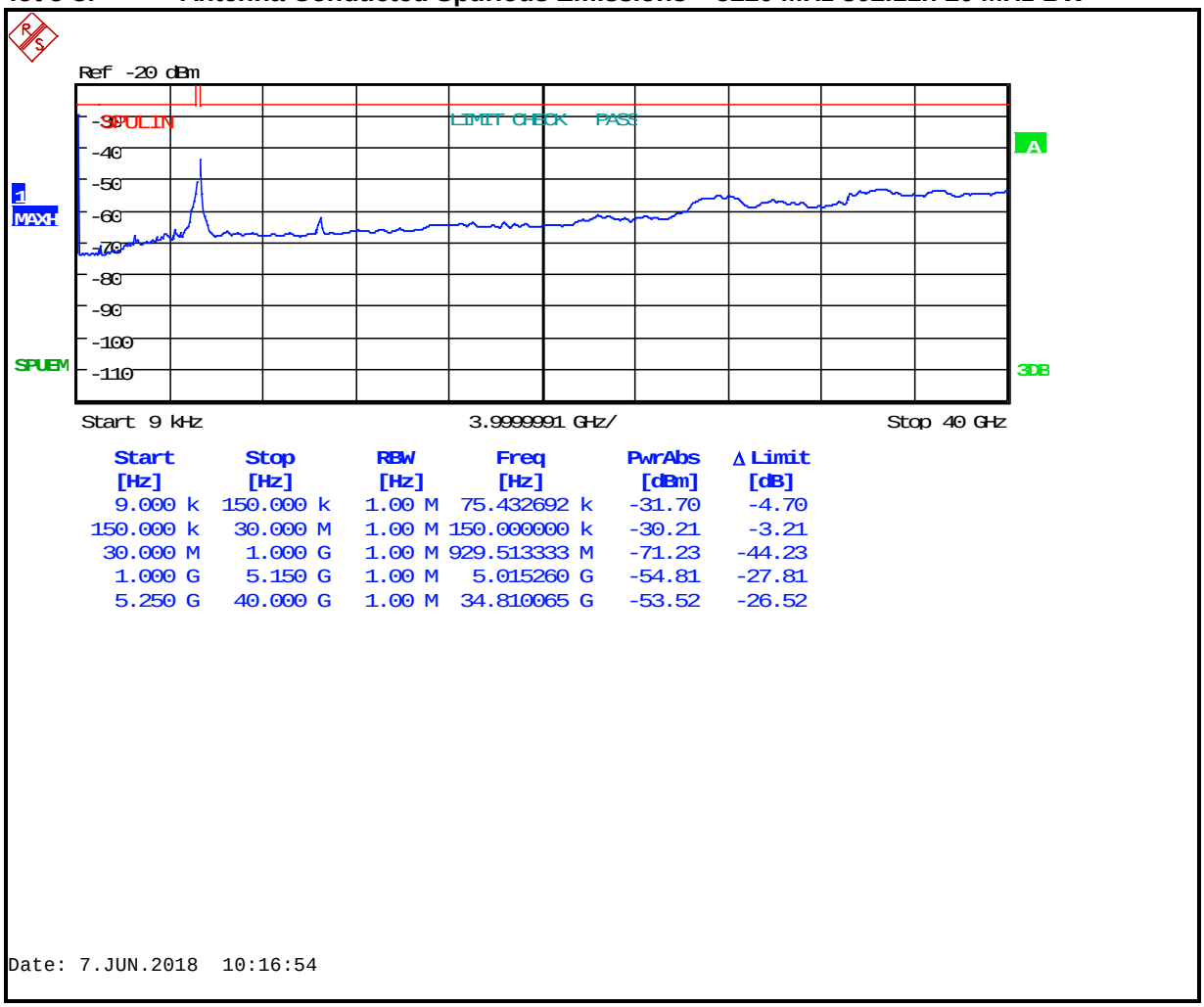
Plot 5-6: Antenna Conducted Spurious Emissions – 5200 MHz 802.11n 40 MHz BW



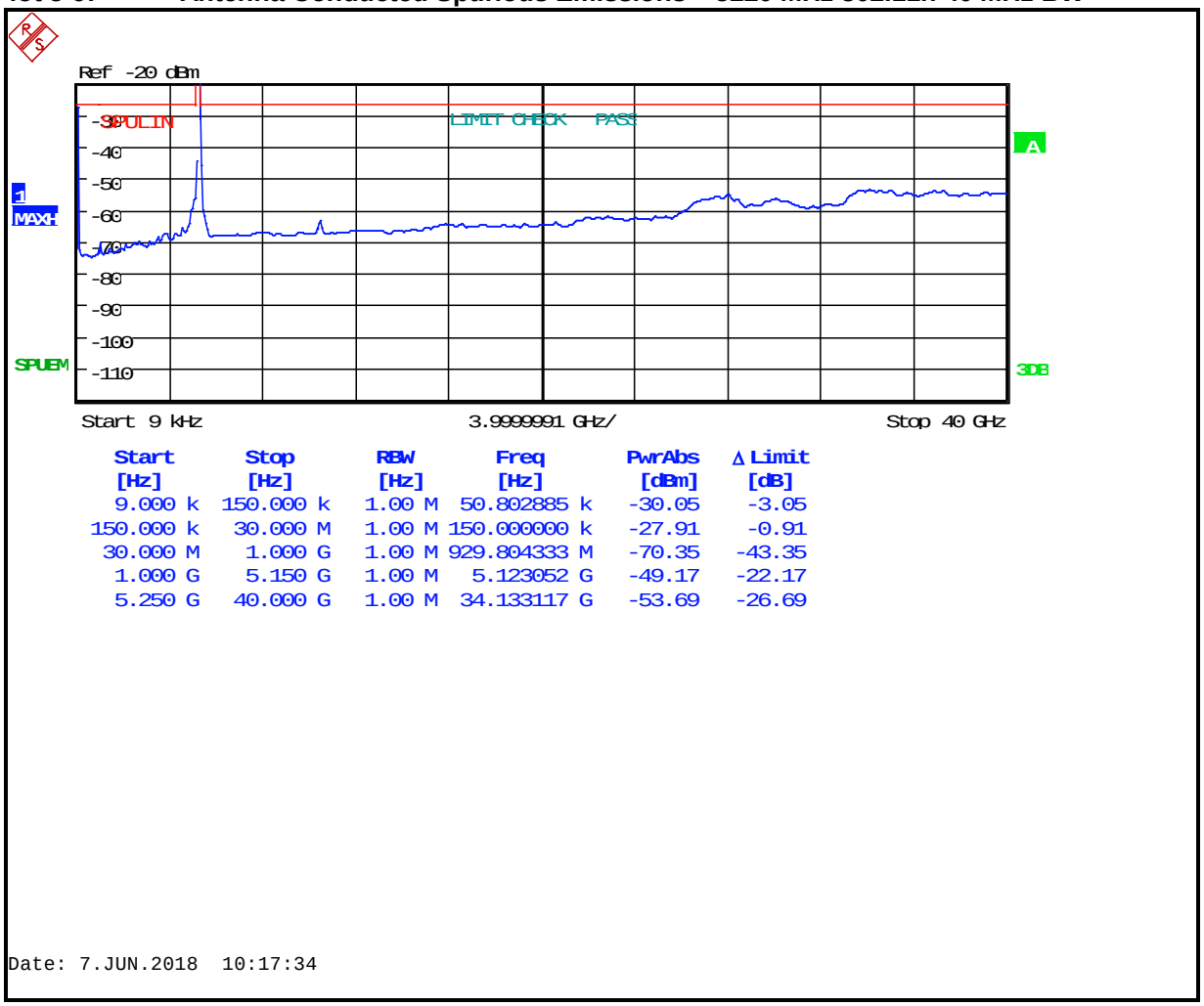
Plot 5-7: Antenna Conducted Spurious Emissions – 5220 MHz 802.11a 20 MHz BW



Plot 5-8: Antenna Conducted Spurious Emissions – 5220 MHz 802.11n 20 MHz BW



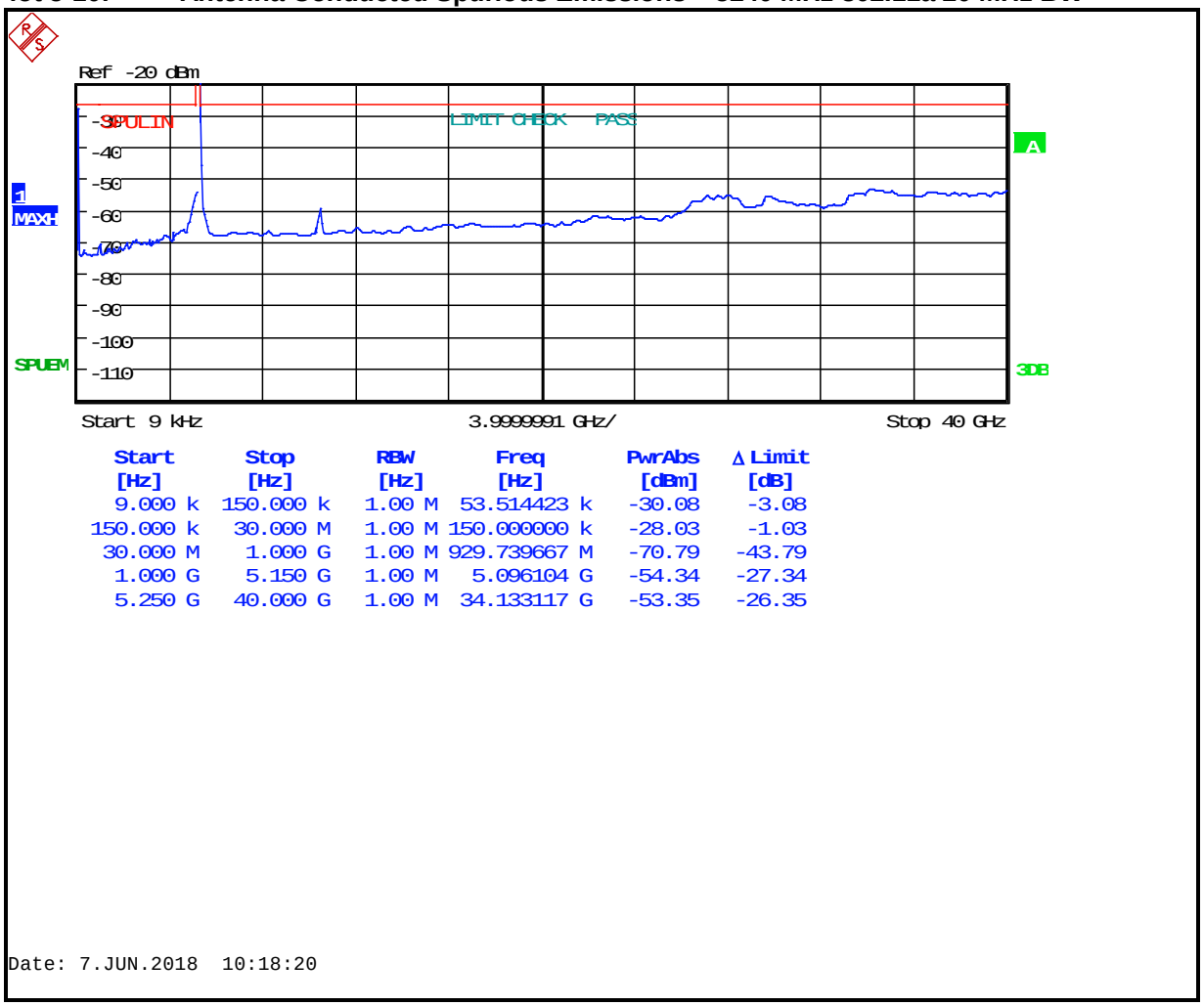
Plot 5-9: Antenna Conducted Spurious Emissions – 5220 MHz 802.11n 40 MHz BW



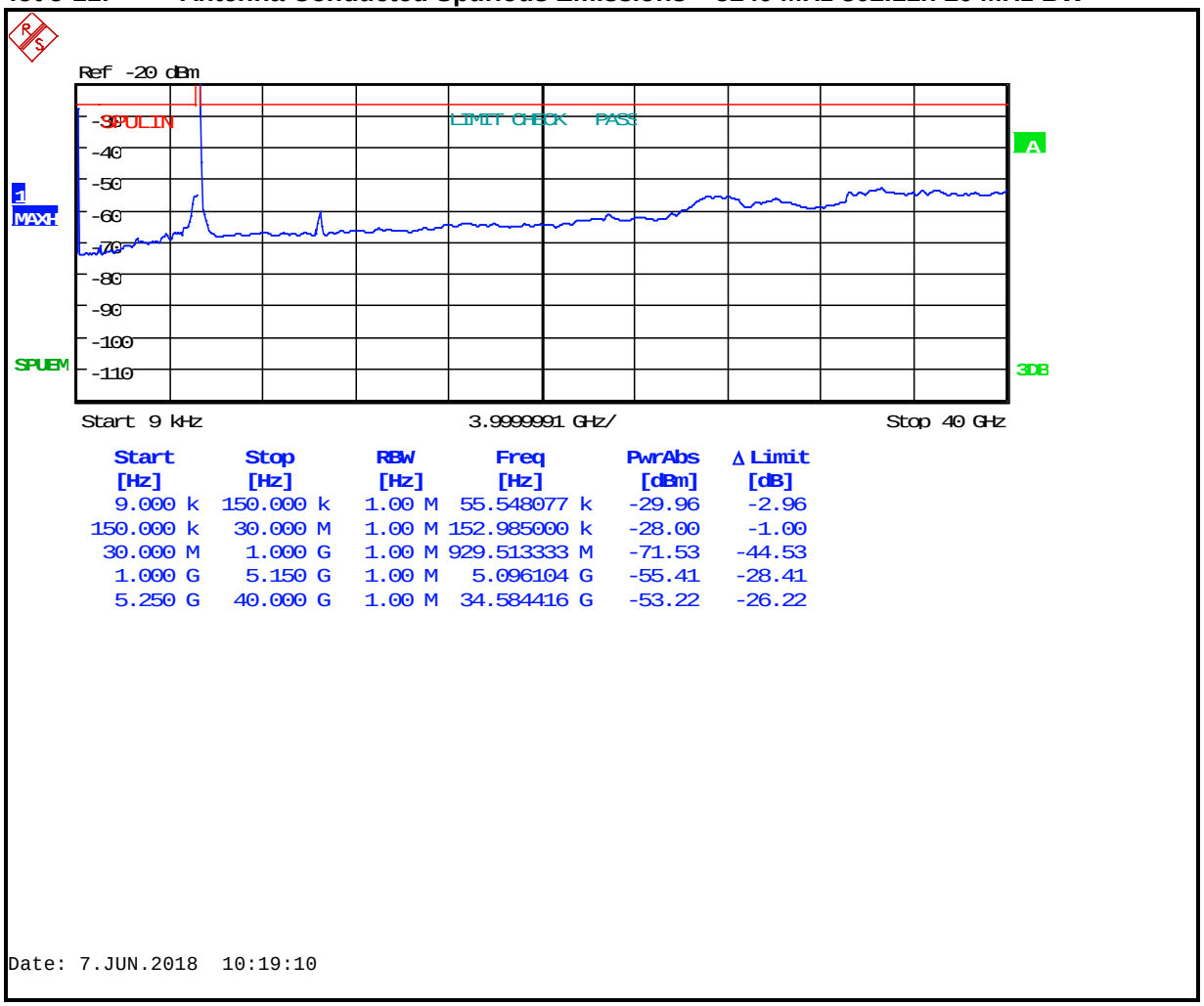
Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	50.802885 k	-30.05	-3.05
150.000 k	30.000 M	1.00 M	150.000000 k	-27.91	-0.91
30.000 M	1.000 G	1.00 M	929.804333 M	-70.35	-43.35
1.000 G	5.150 G	1.00 M	5.123052 G	-49.17	-22.17
5.250 G	40.000 G	1.00 M	34.133117 G	-53.69	-26.69

Date: 7.JUN.2018 10:17:34

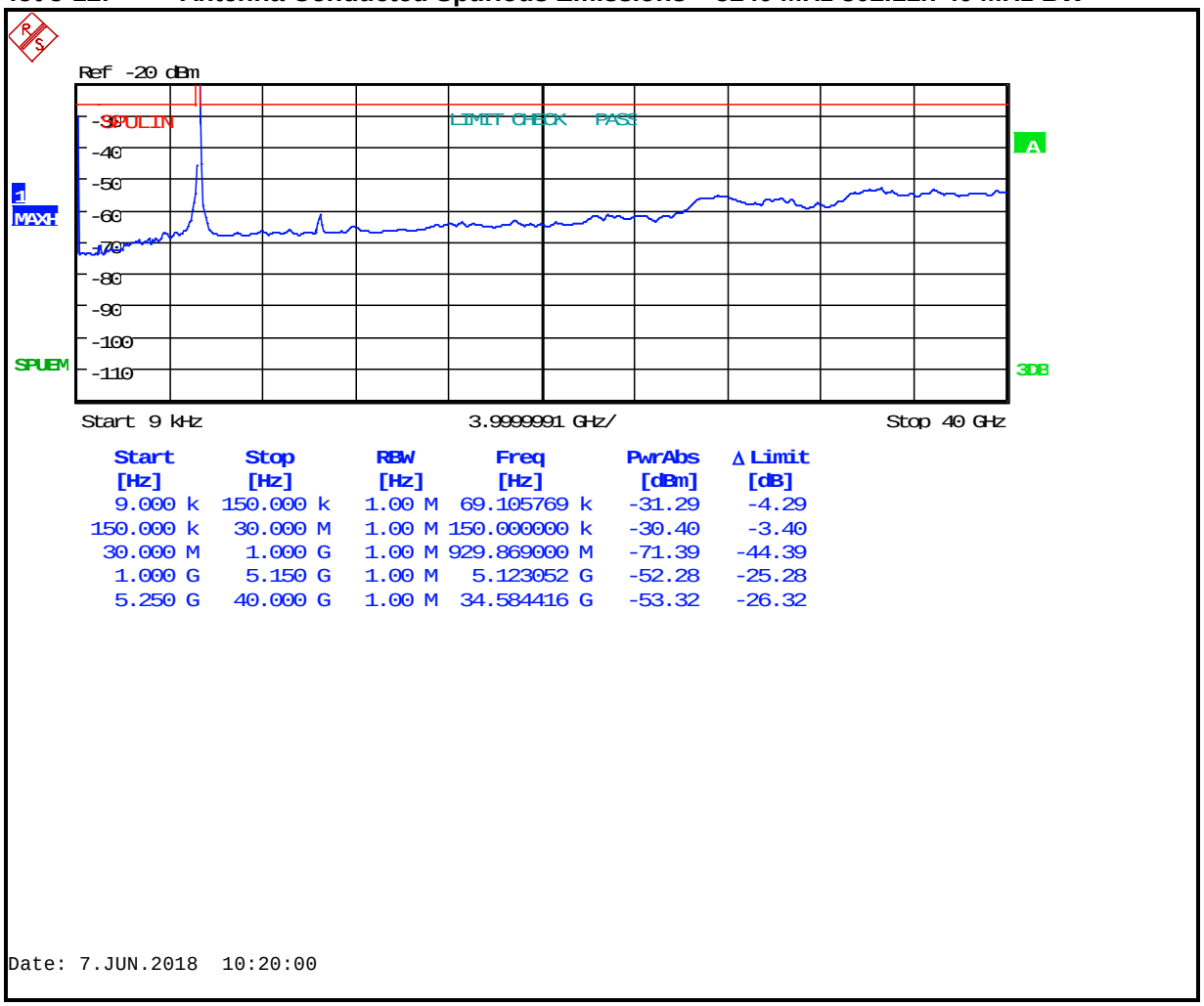
Plot 5-10: Antenna Conducted Spurious Emissions – 5240 MHz 802.11a 20 MHz BW



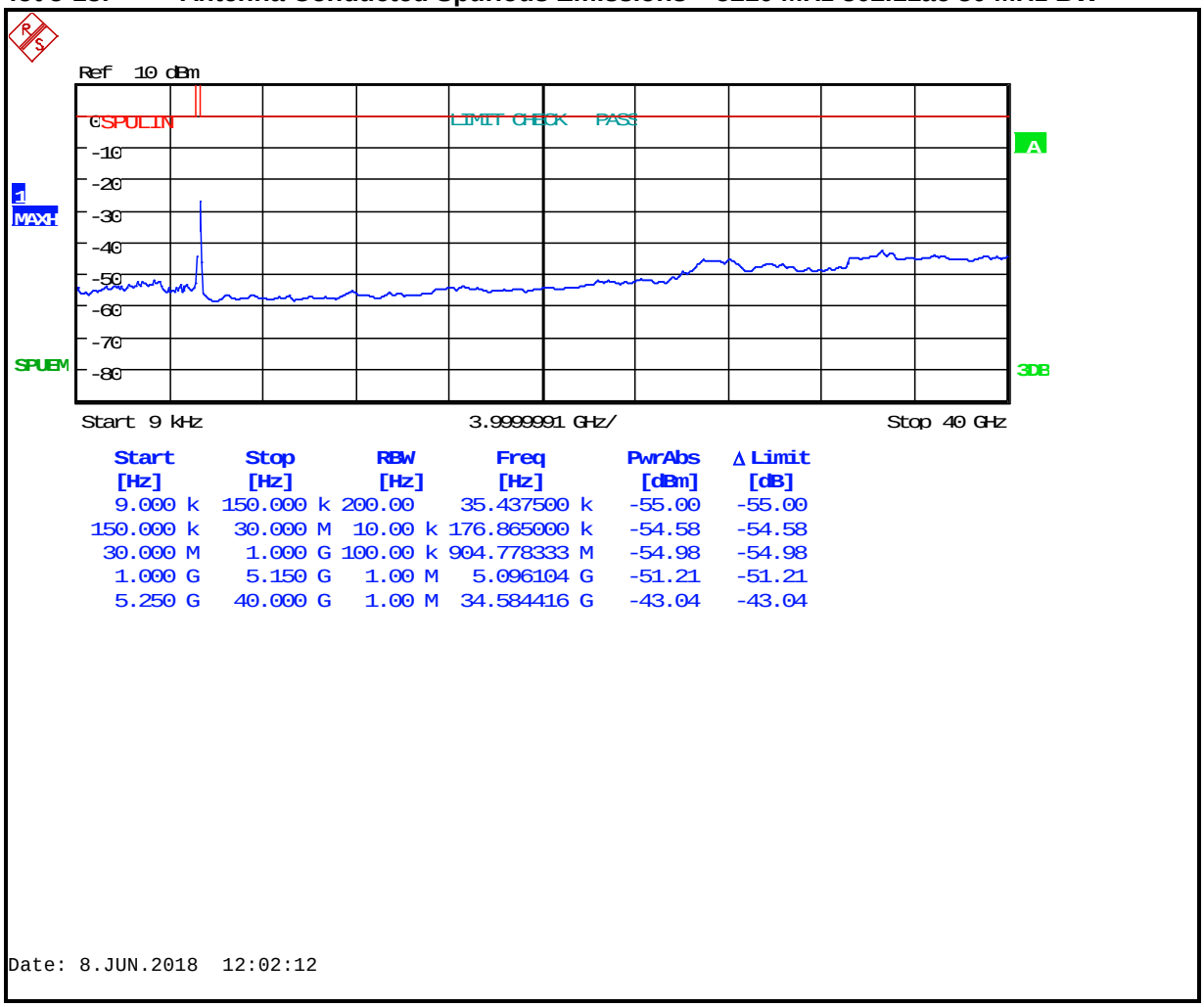
Plot 5-11: Antenna Conducted Spurious Emissions – 5240 MHz 802.11n 20 MHz BW



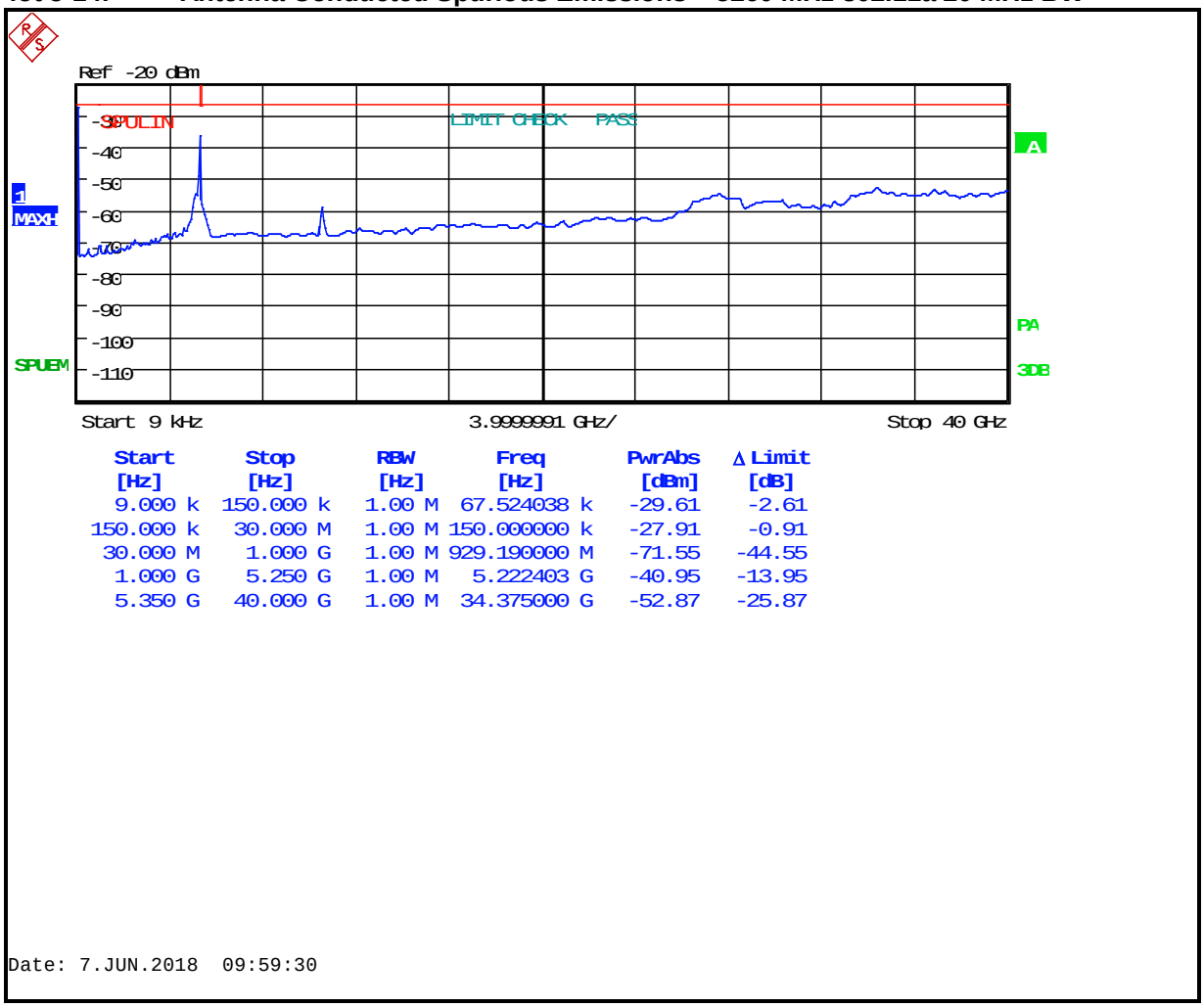
Plot 5-12: Antenna Conducted Spurious Emissions – 5240 MHz 802.11n 40 MHz BW



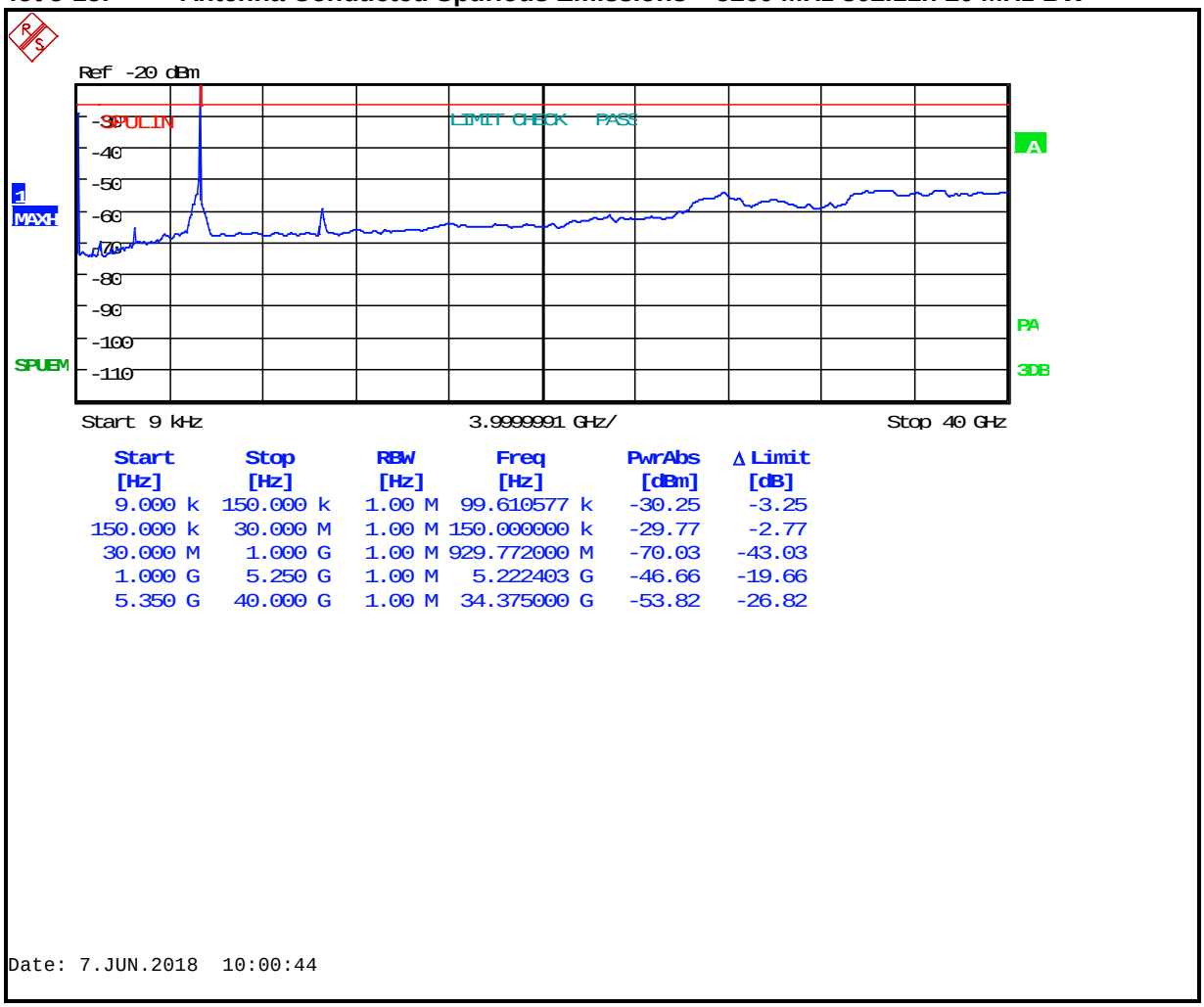
Plot 5-13: Antenna Conducted Spurious Emissions – 5210 MHz 802.11ac 80 MHz BW



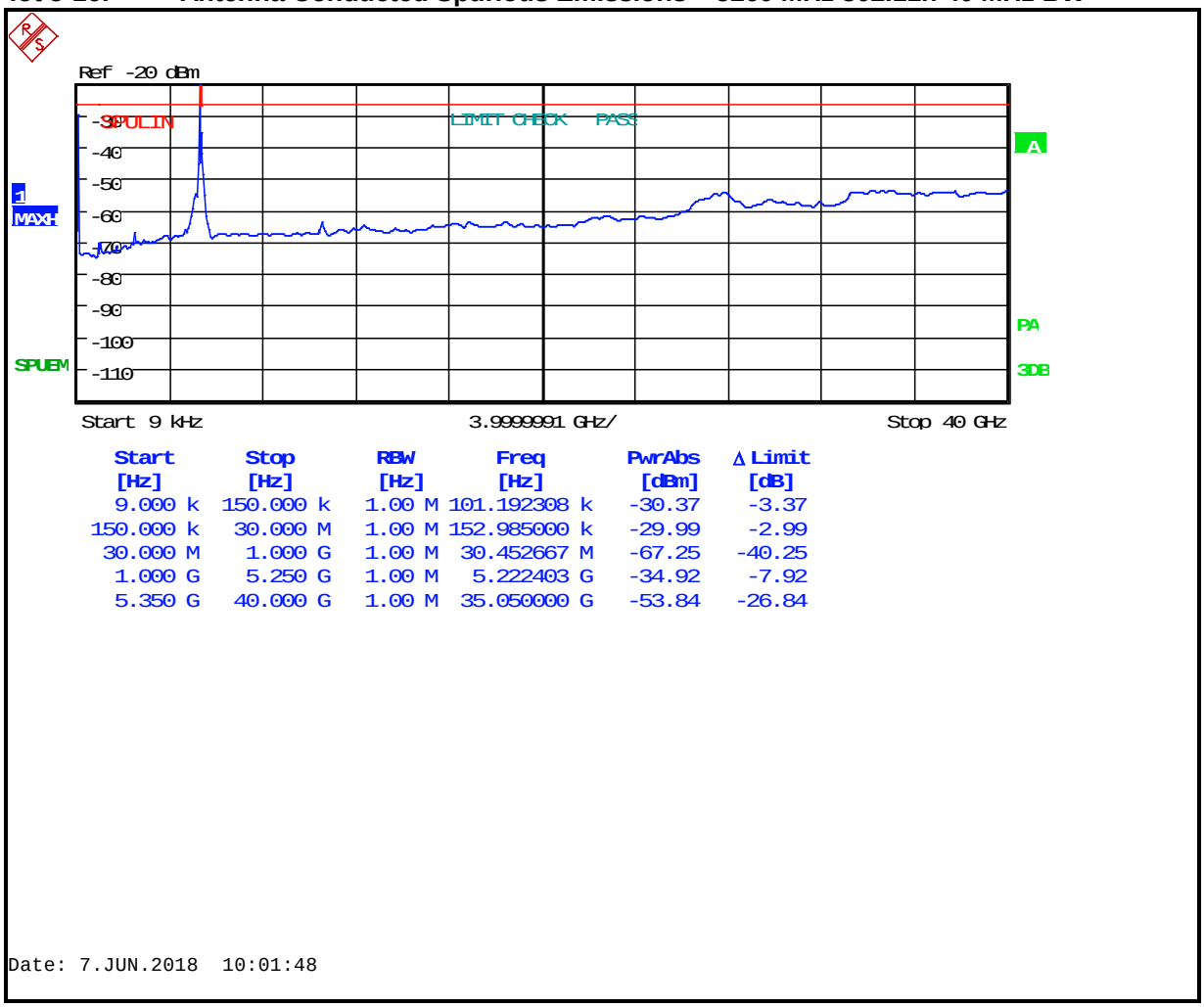
Plot 5-14: Antenna Conducted Spurious Emissions – 5260 MHz 802.11a 20 MHz BW



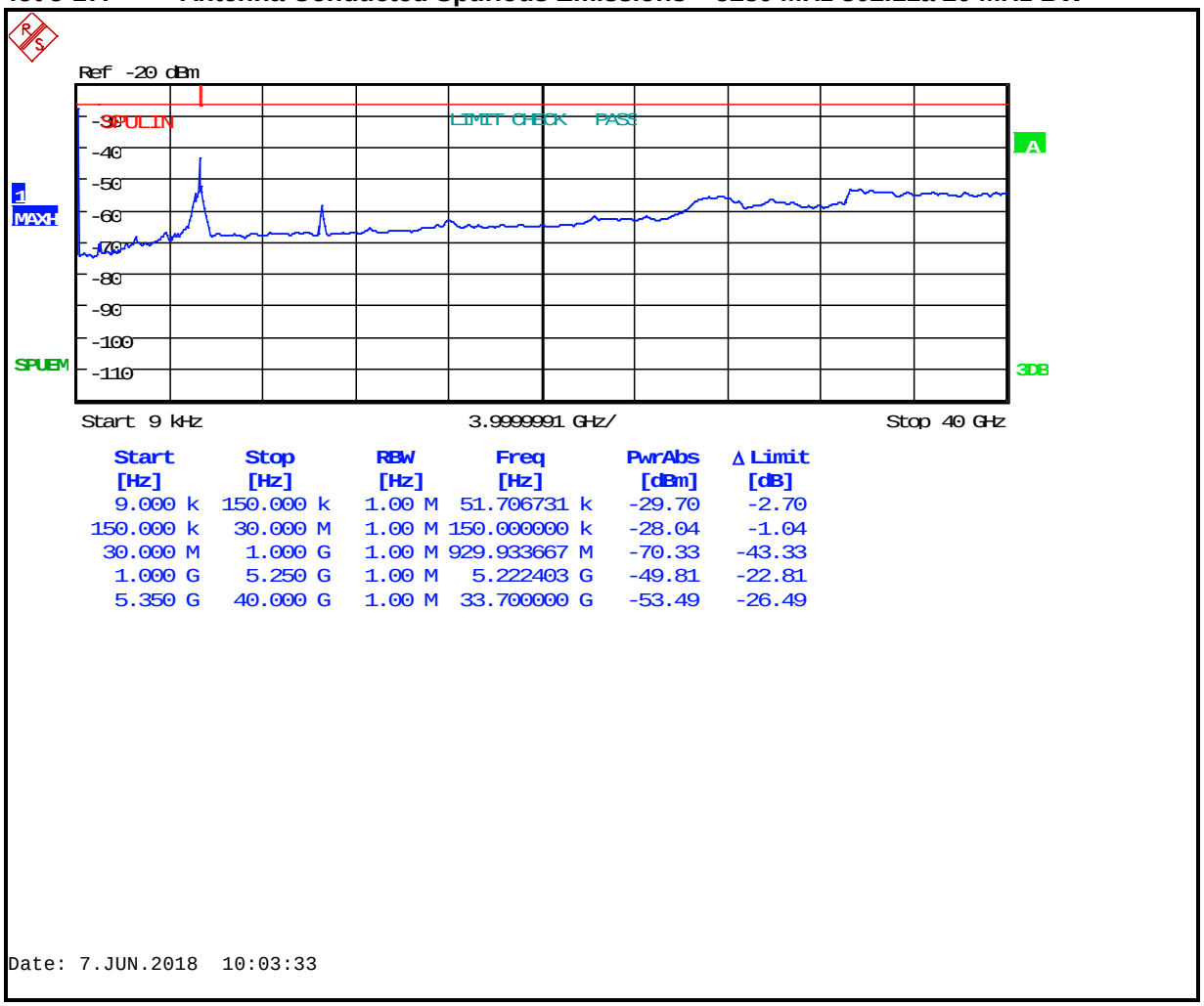
Plot 5-15: Antenna Conducted Spurious Emissions – 5260 MHz 802.11n 20 MHz BW



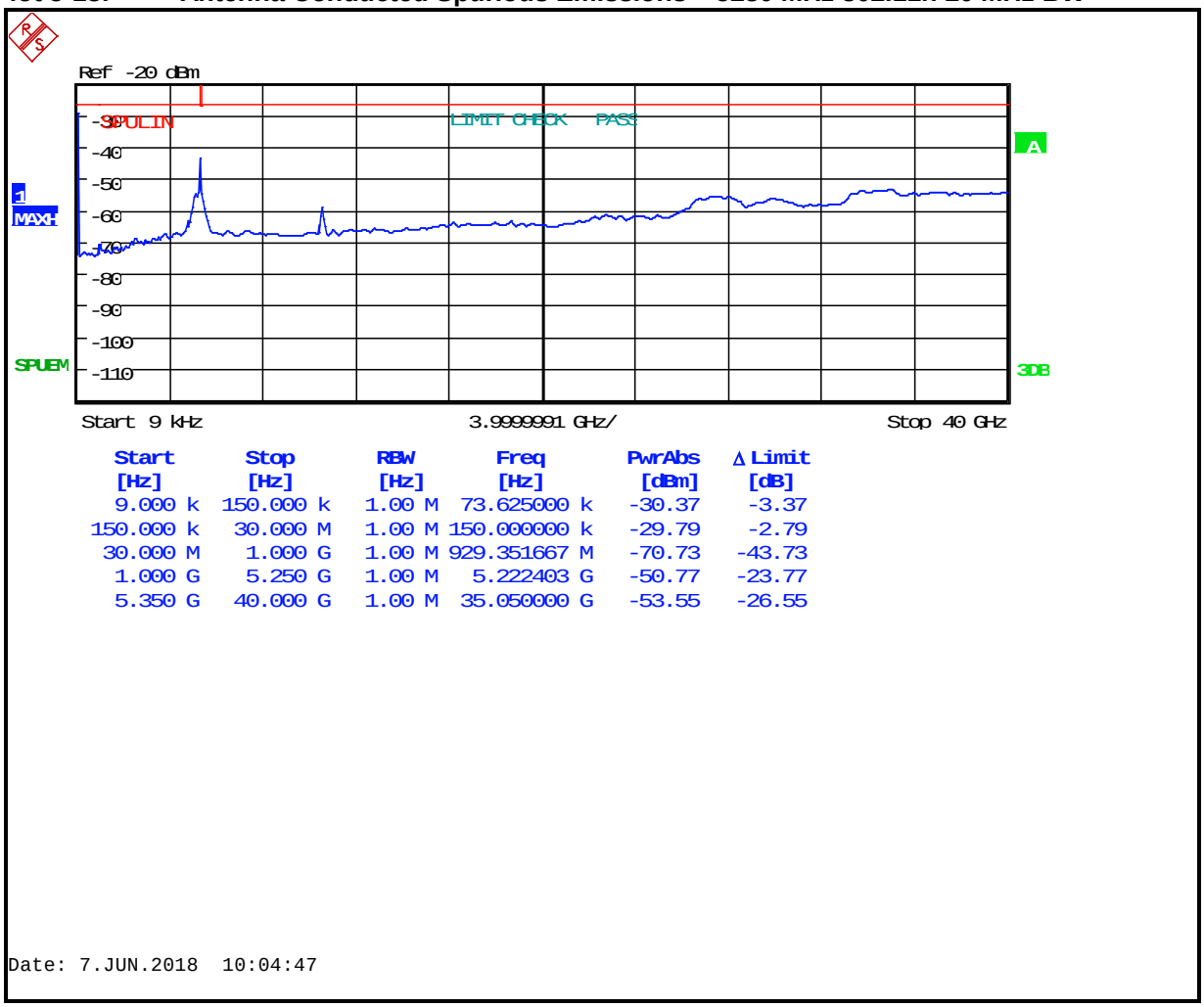
Plot 5-16: Antenna Conducted Spurious Emissions – 5260 MHz 802.11n 40 MHz BW



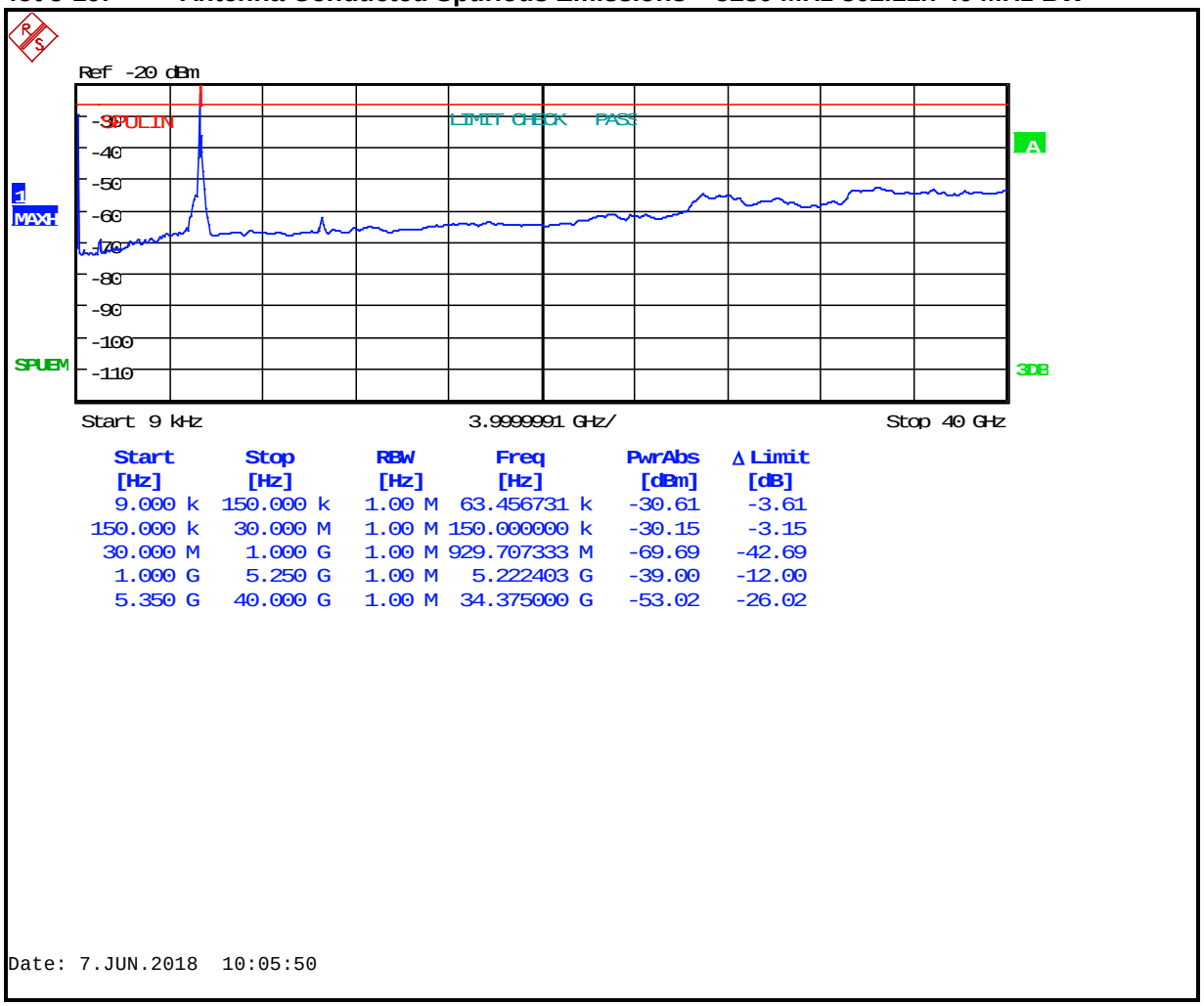
Plot 5-17: Antenna Conducted Spurious Emissions – 5280 MHz 802.11a 20 MHz BW



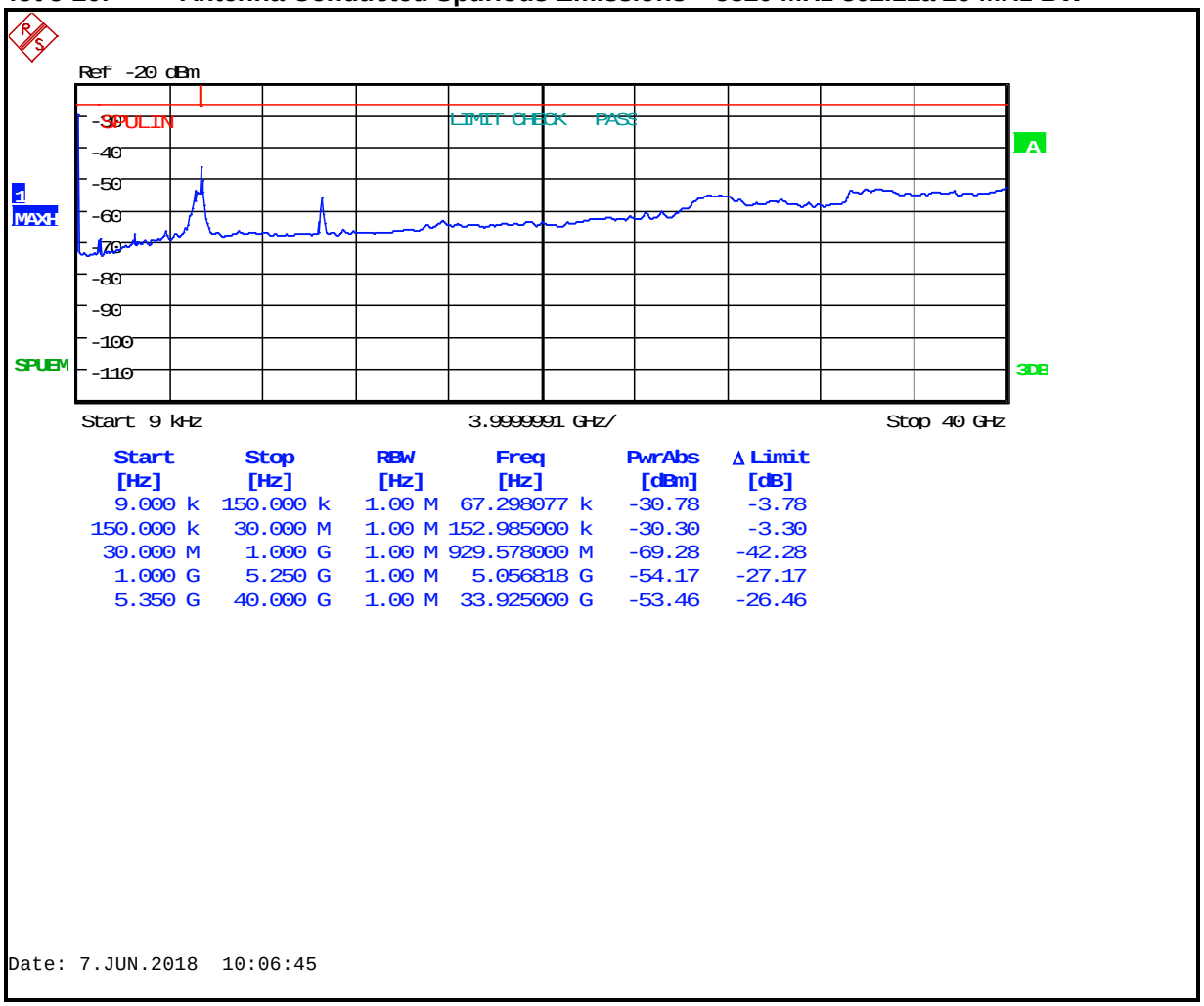
Plot 5-18: Antenna Conducted Spurious Emissions – 5280 MHz 802.11n 20 MHz BW



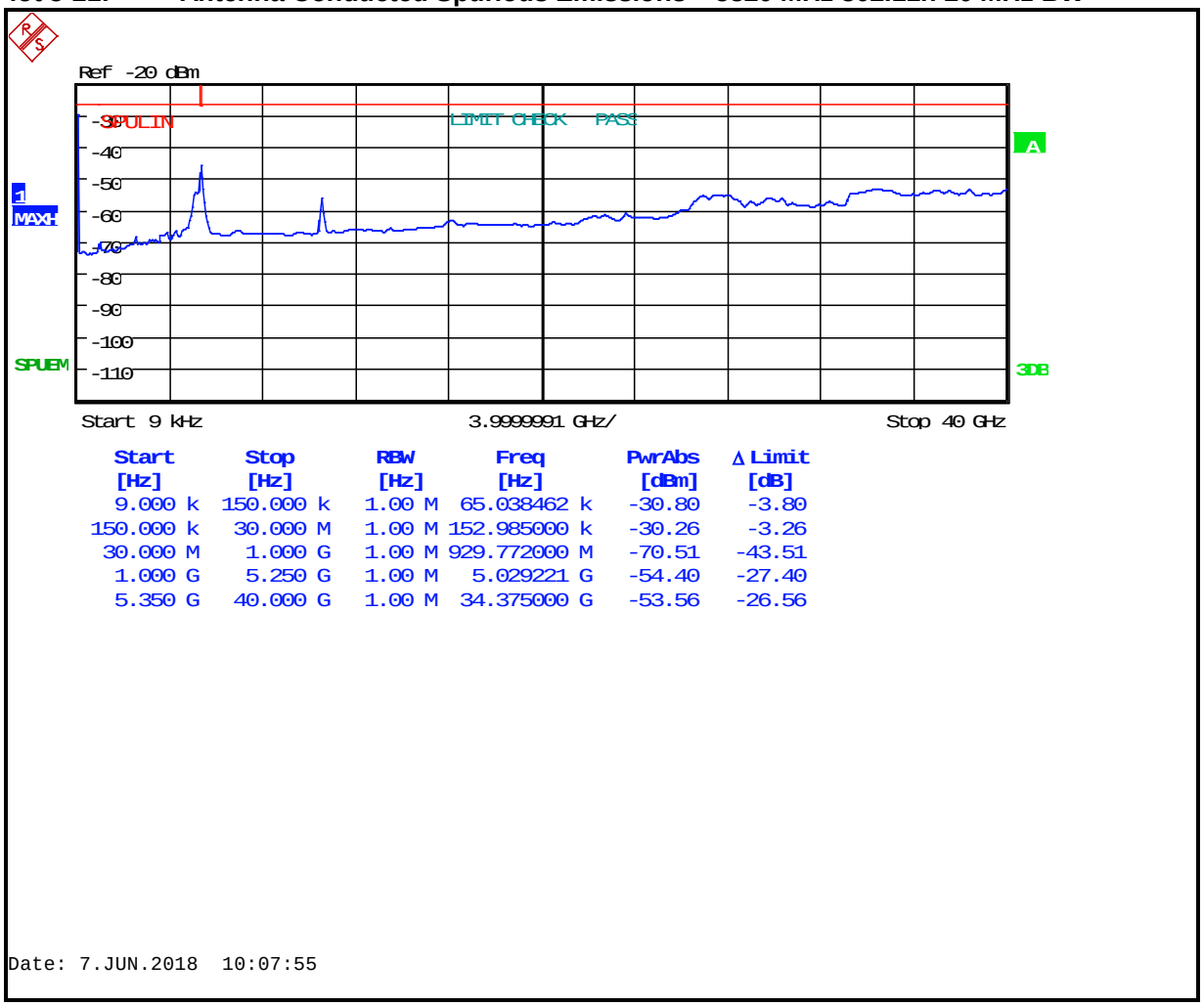
Plot 5-19: Antenna Conducted Spurious Emissions – 5280 MHz 802.11n 40 MHz BW



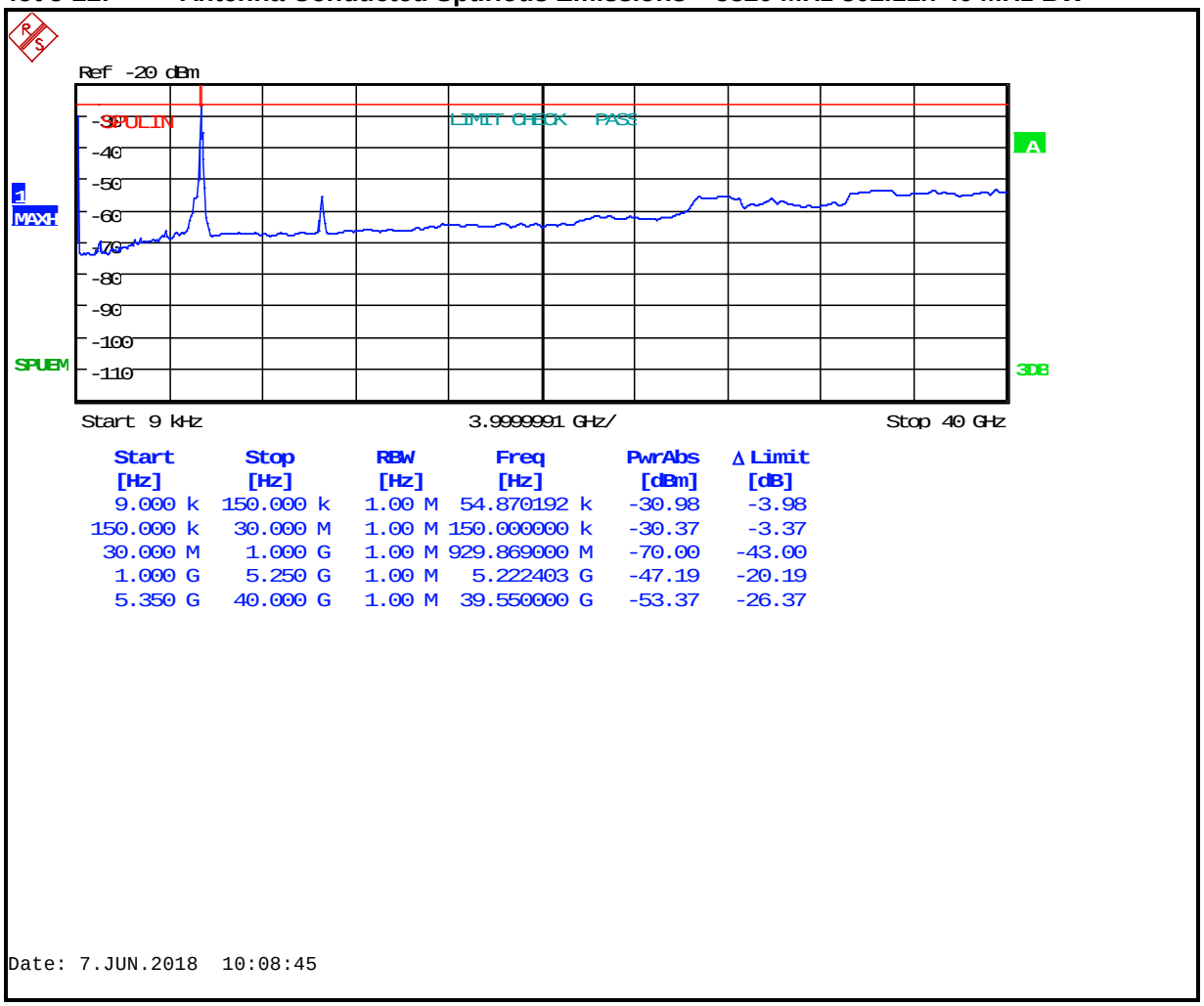
Plot 5-20: Antenna Conducted Spurious Emissions – 5320 MHz 802.11a 20 MHz BW



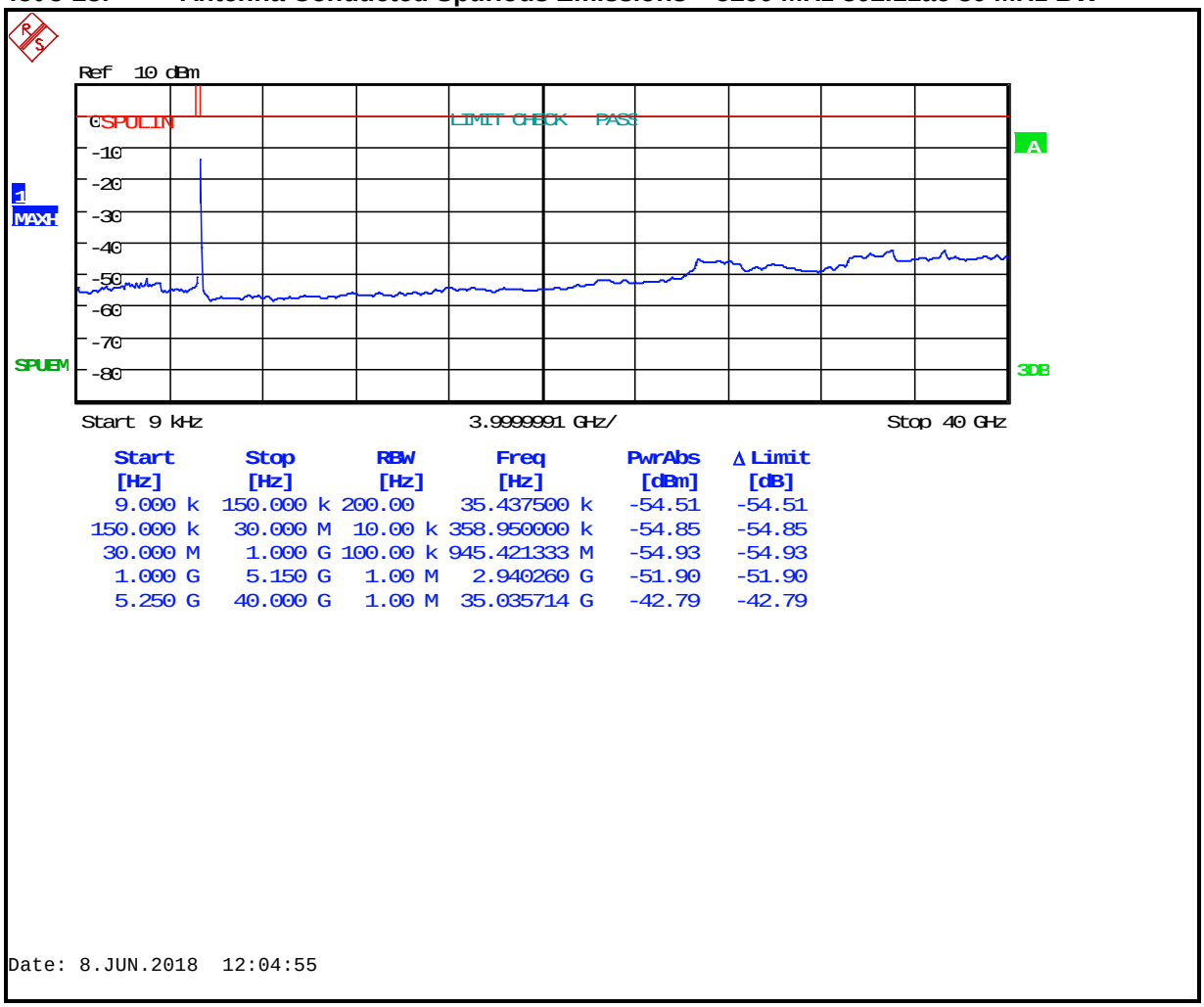
Plot 5-21: Antenna Conducted Spurious Emissions – 5320 MHz 802.11n 20 MHz BW



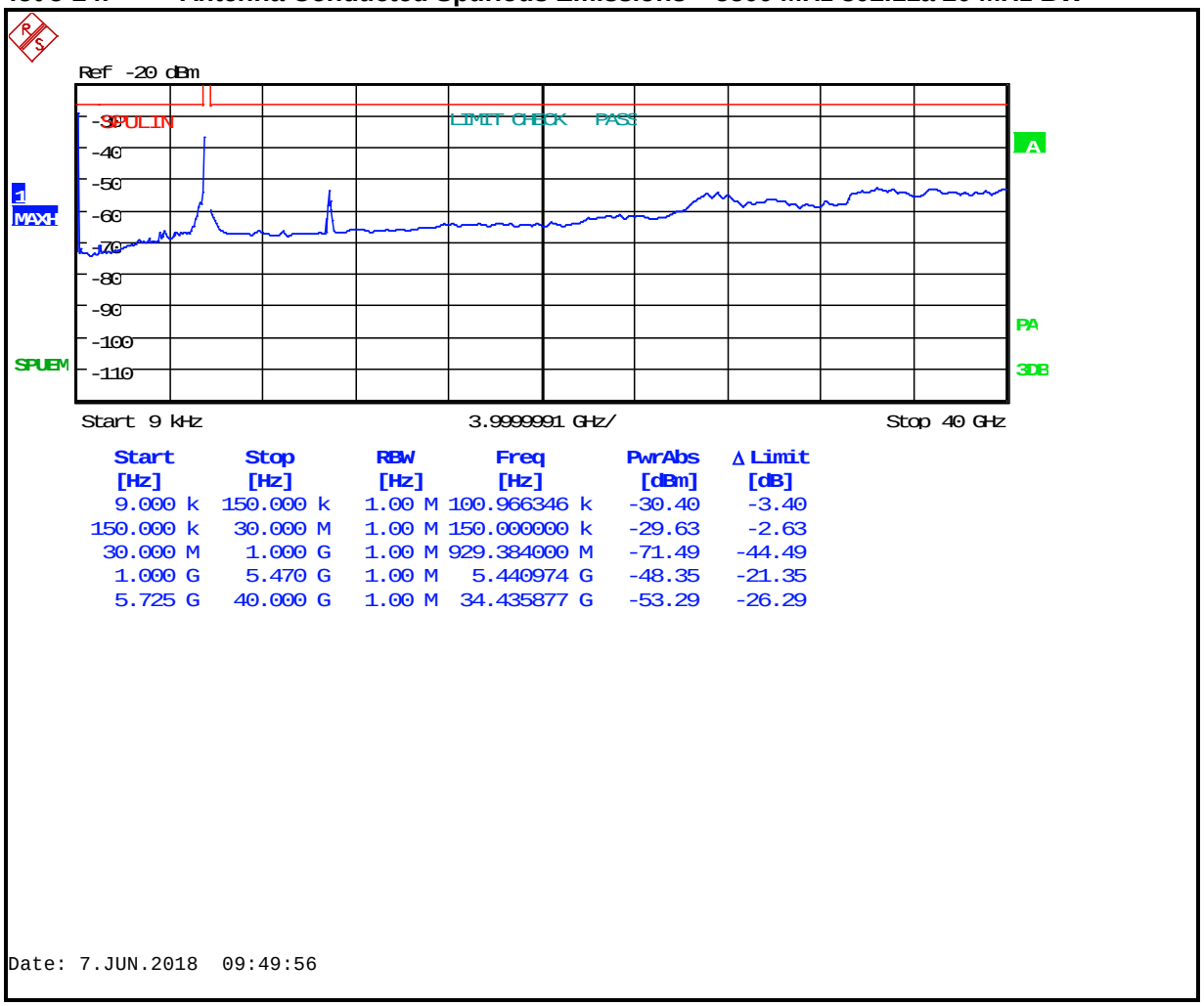
Plot 5-22: Antenna Conducted Spurious Emissions – 5320 MHz 802.11n 40 MHz BW



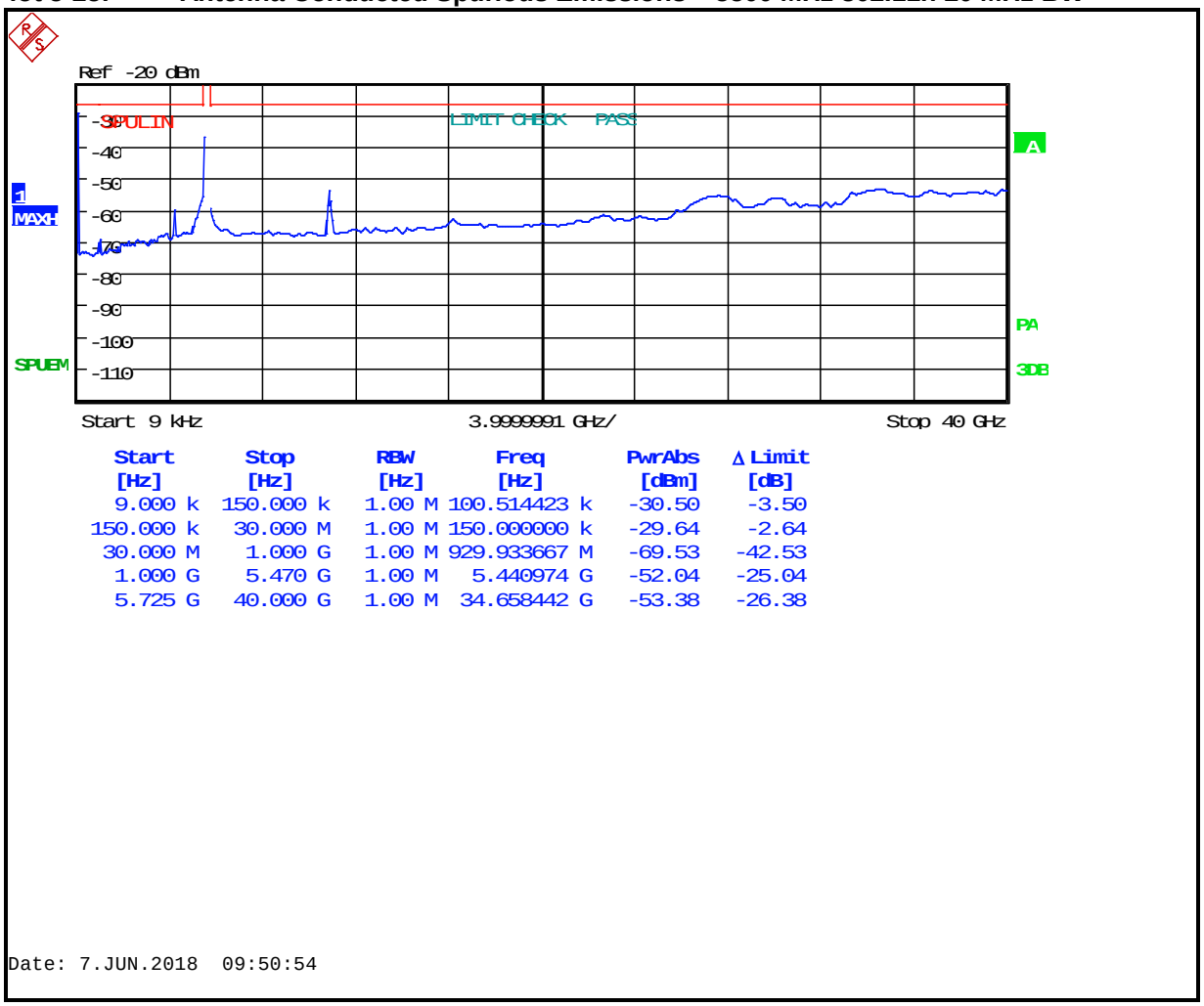
Plot 5-23: Antenna Conducted Spurious Emissions – 5290 MHz 802.11ac 80 MHz BW



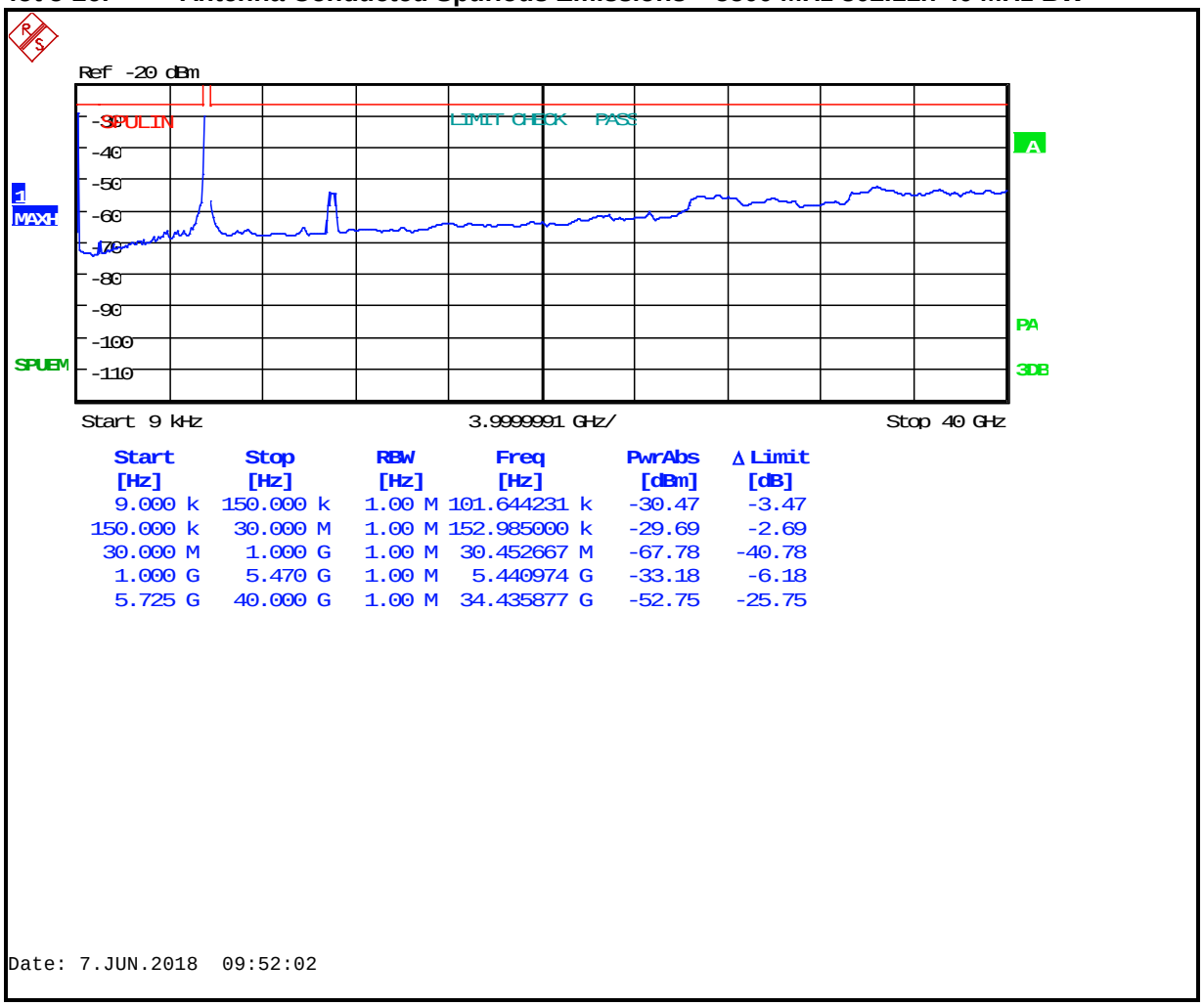
Plot 5-24: Antenna Conducted Spurious Emissions – 5500 MHz 802.11a 20 MHz BW



Plot 5-25: Antenna Conducted Spurious Emissions – 5500 MHz 802.11n 20 MHz BW



Plot 5-26: Antenna Conducted Spurious Emissions – 5500 MHz 802.11n 40 MHz BW



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	101.644231 k	-30.47	-3.47
150.000 k	30.000 M	1.00 M	152.985000 k	-29.69	-2.69
30.000 M	1.000 G	1.00 M	30.452667 M	-67.78	-40.78
1.000 G	5.470 G	1.00 M	5.440974 G	-33.18	-6.18
5.725 G	40.000 G	1.00 M	34.435877 G	-52.75	-25.75

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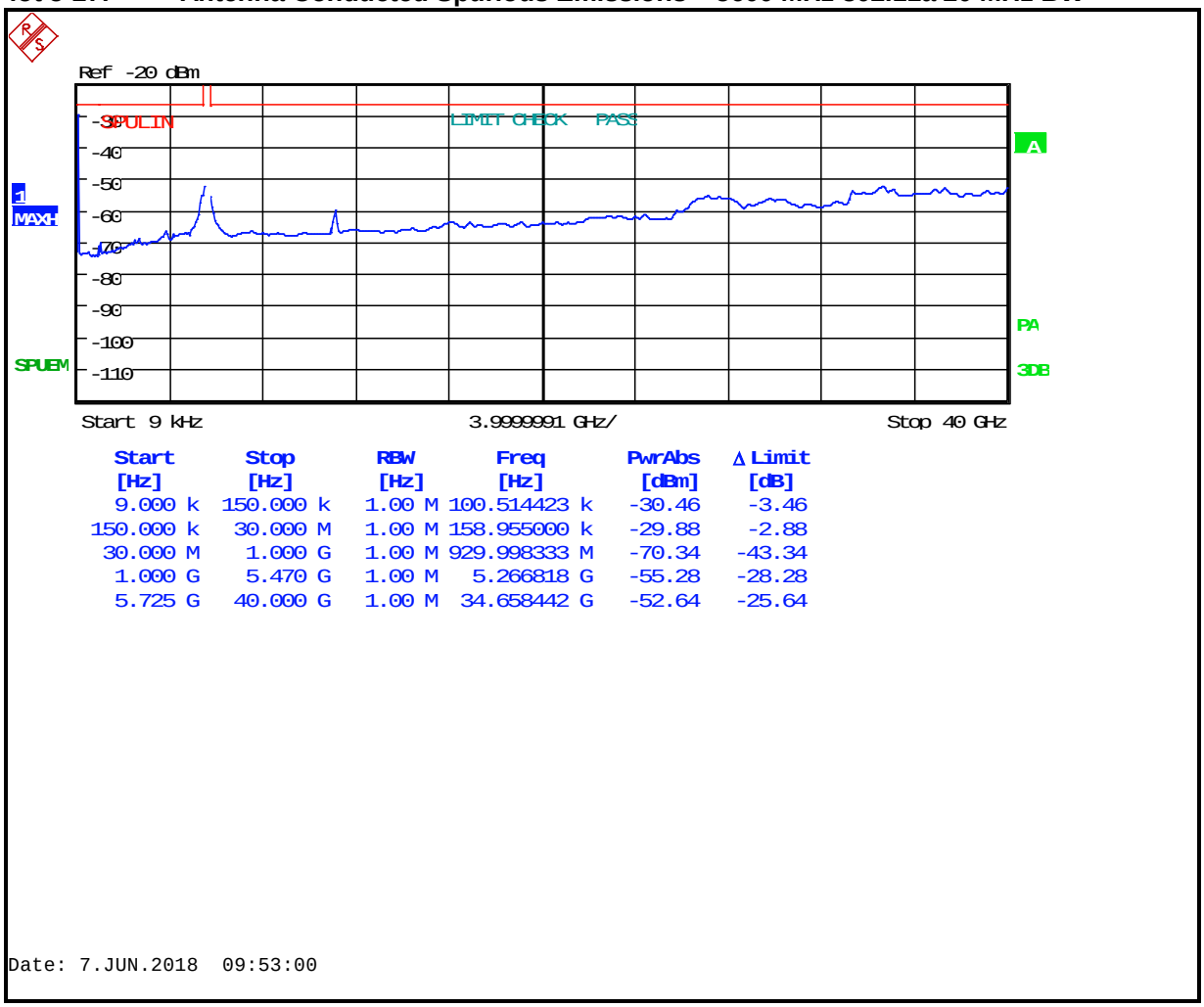
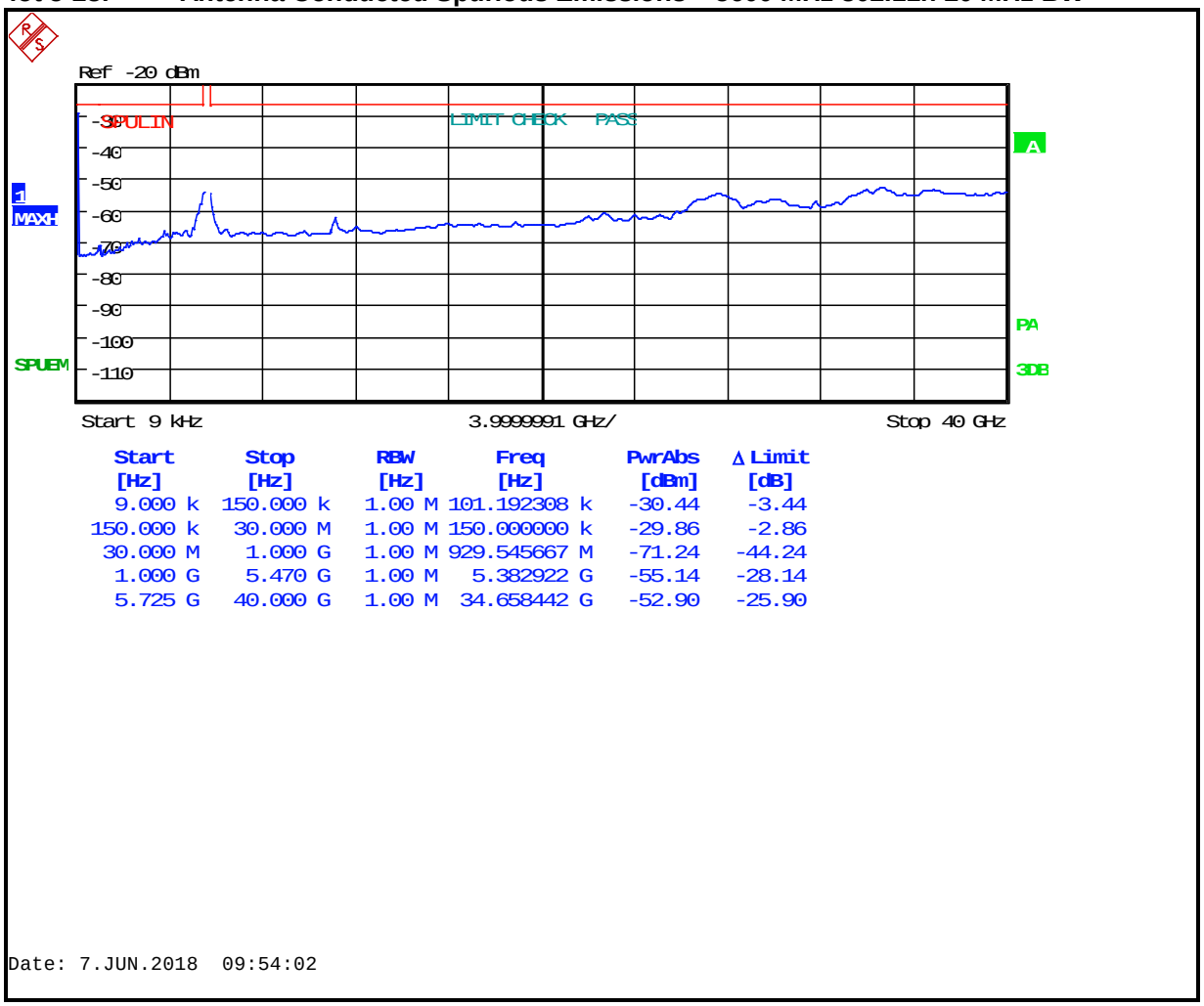
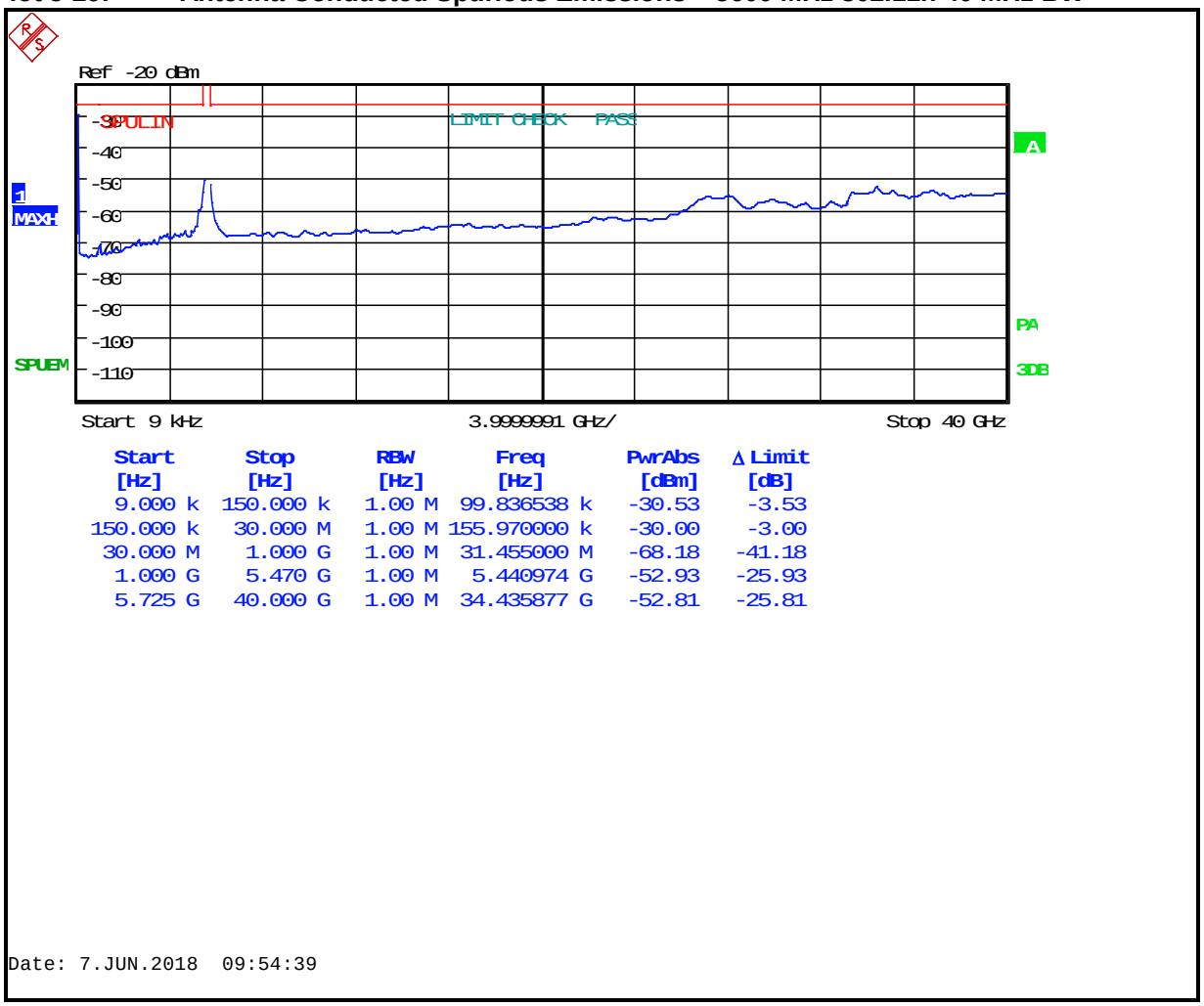
Plot 5-27: Antenna Conducted Spurious Emissions – 5600 MHz 802.11a 20 MHz BW



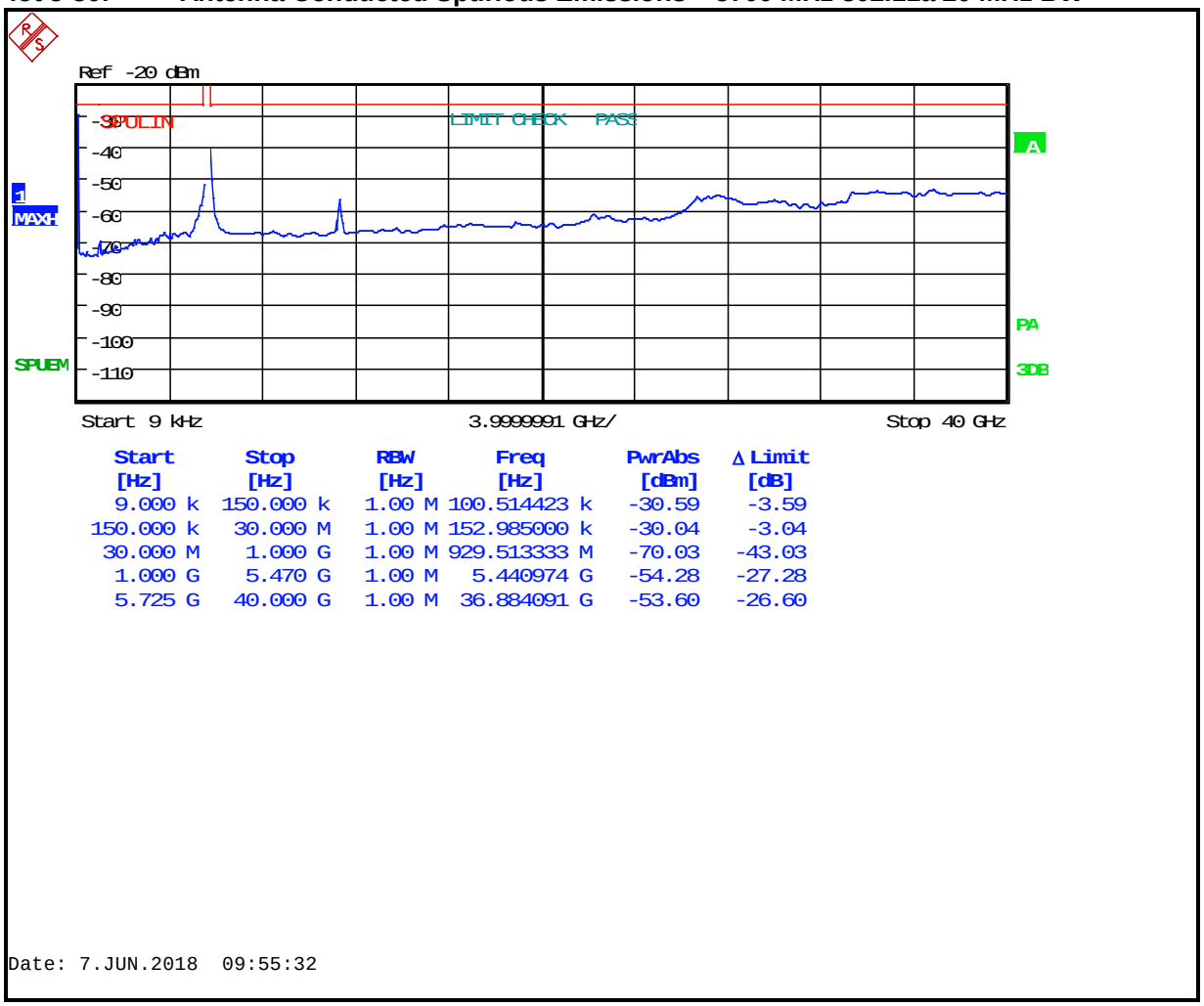
Plot 5-28: Antenna Conducted Spurious Emissions – 5600 MHz 802.11n 20 MHz BW



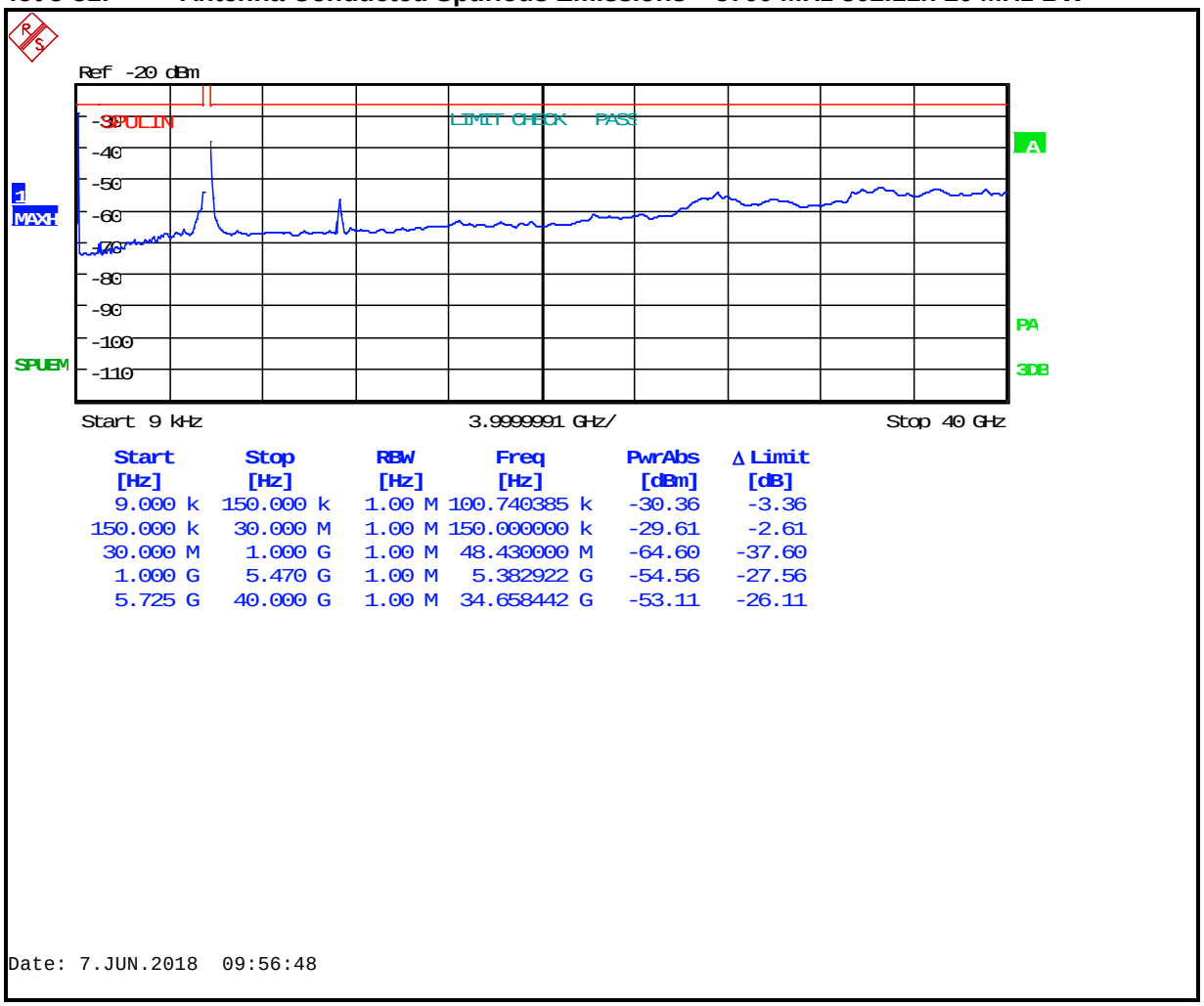
Plot 5-29: Antenna Conducted Spurious Emissions – 5600 MHz 802.11n 40 MHz BW



Plot 5-30: Antenna Conducted Spurious Emissions – 5700 MHz 802.11a 20 MHz BW



Plot 5-31: Antenna Conducted Spurious Emissions – 5700 MHz 802.11n 20 MHz BW



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	100.740385 k	-30.36	-3.36
150.000 k	30.000 M	1.00 M	150.000000 k	-29.61	-2.61
30.000 M	1.000 G	1.00 M	48.430000 M	-64.60	-37.60
1.000 G	5.470 G	1.00 M	5.382922 G	-54.56	-27.56
5.725 G	40.000 G	1.00 M	34.658442 G	-53.11	-26.11

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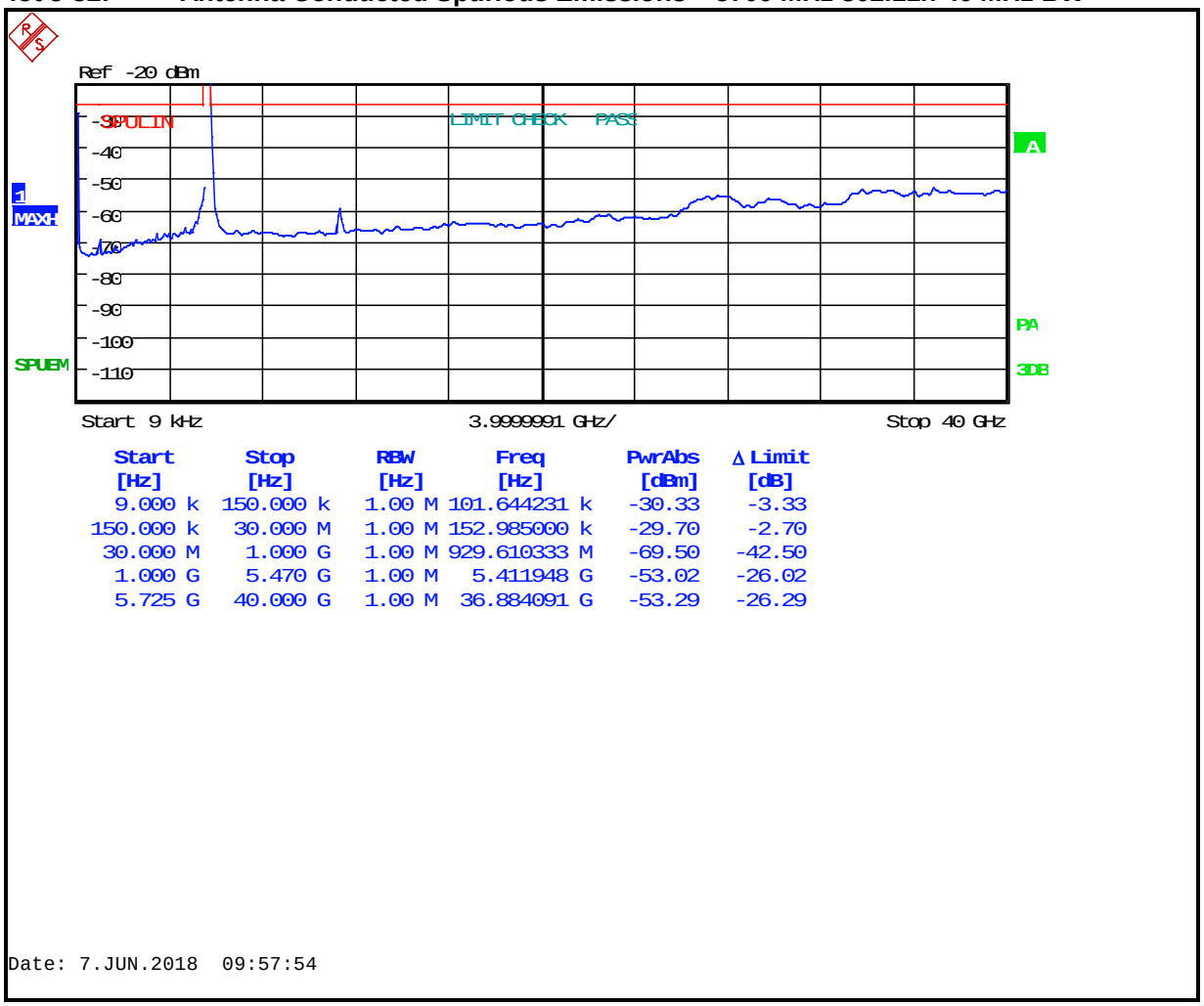
Plot 5-32: Antenna Conducted Spurious Emissions – 5700 MHz 802.11n 40 MHz BW



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	101.644231 k	-30.33	-3.33
150.000 k	30.000 M	1.00 M	152.985000 k	-29.70	-2.70
30.000 M	1.000 G	1.00 M	929.610333 M	-69.50	-42.50
1.000 G	5.470 G	1.00 M	5.411948 G	-53.02	-26.02
5.725 G	40.000 G	1.00 M	36.884091 G	-53.29	-26.29

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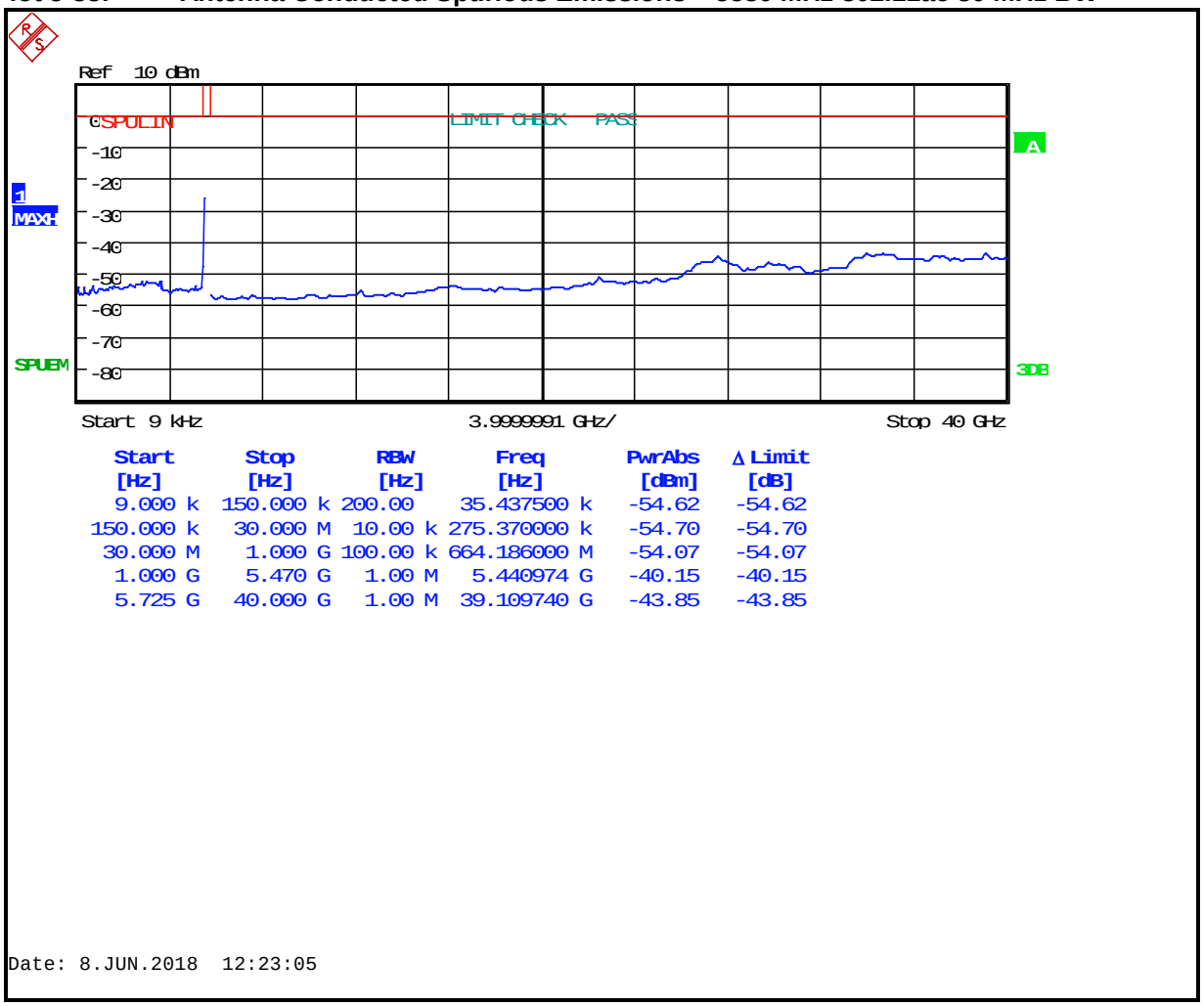
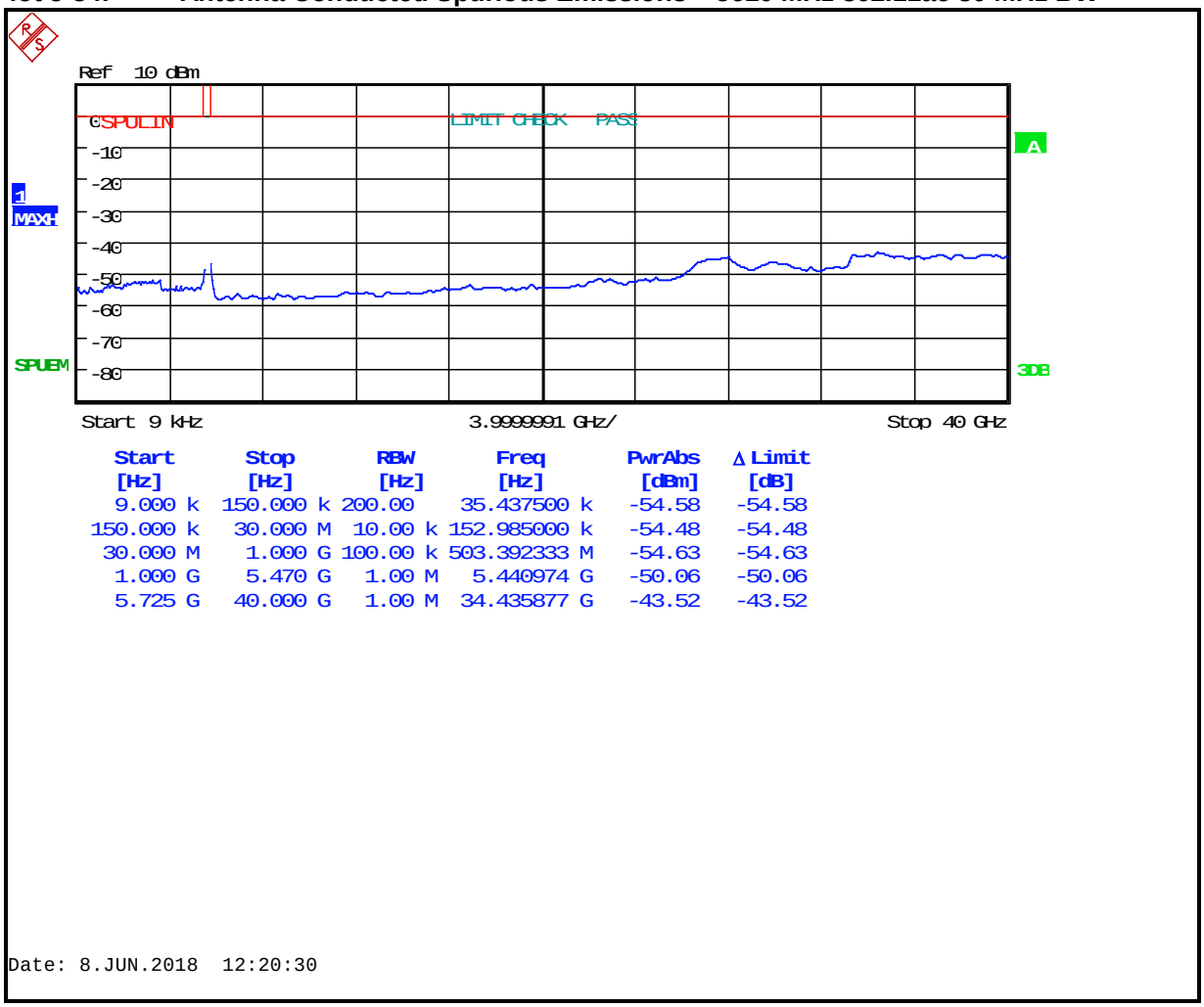
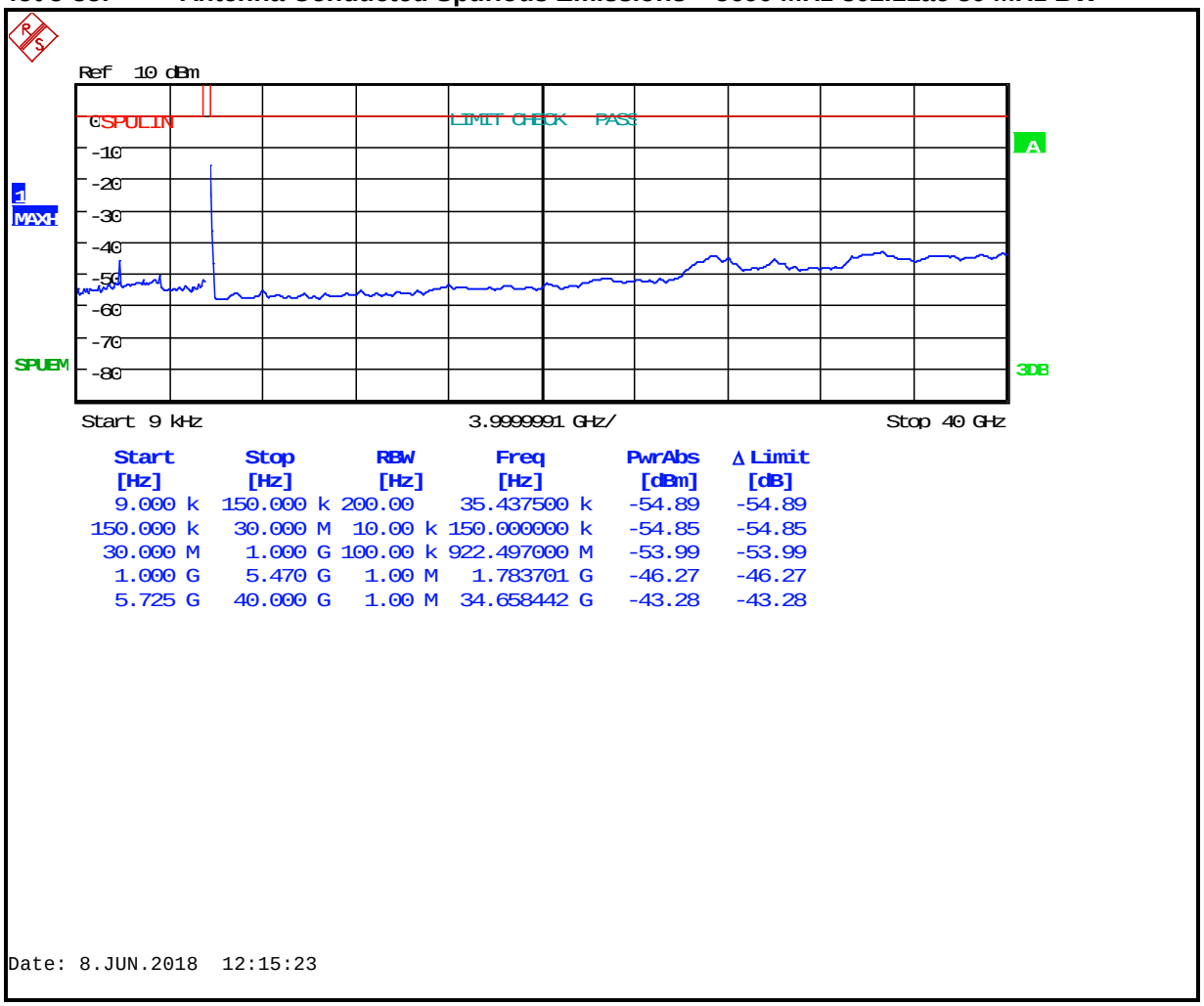
Plot 5-33: Antenna Conducted Spurious Emissions – 5530 MHz 802.11ac 80 MHz BW



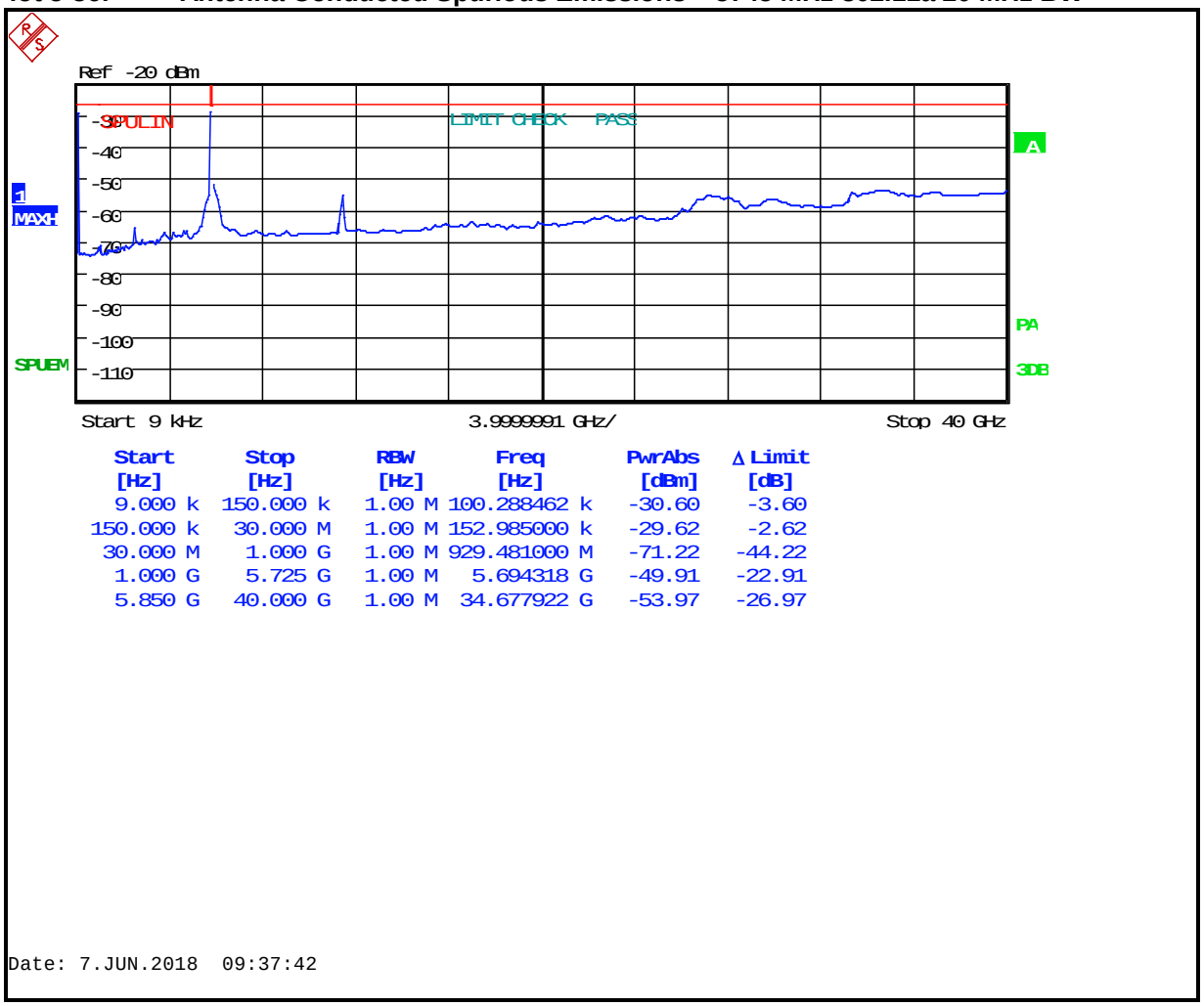
Plot 5-34: Antenna Conducted Spurious Emissions – 5610 MHz 802.11ac 80 MHz BW



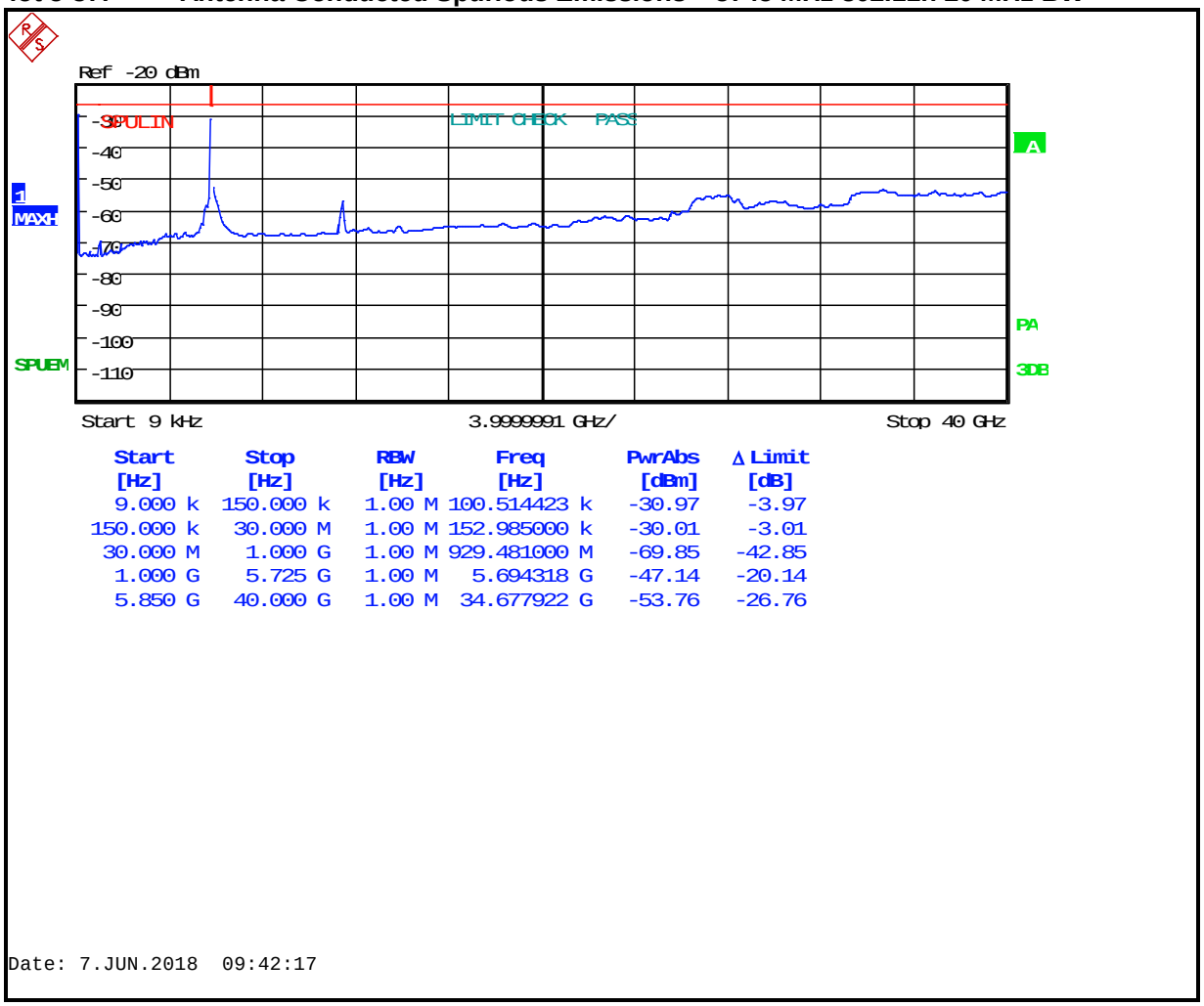
Plot 5-35: Antenna Conducted Spurious Emissions – 5690 MHz 802.11ac 80 MHz BW



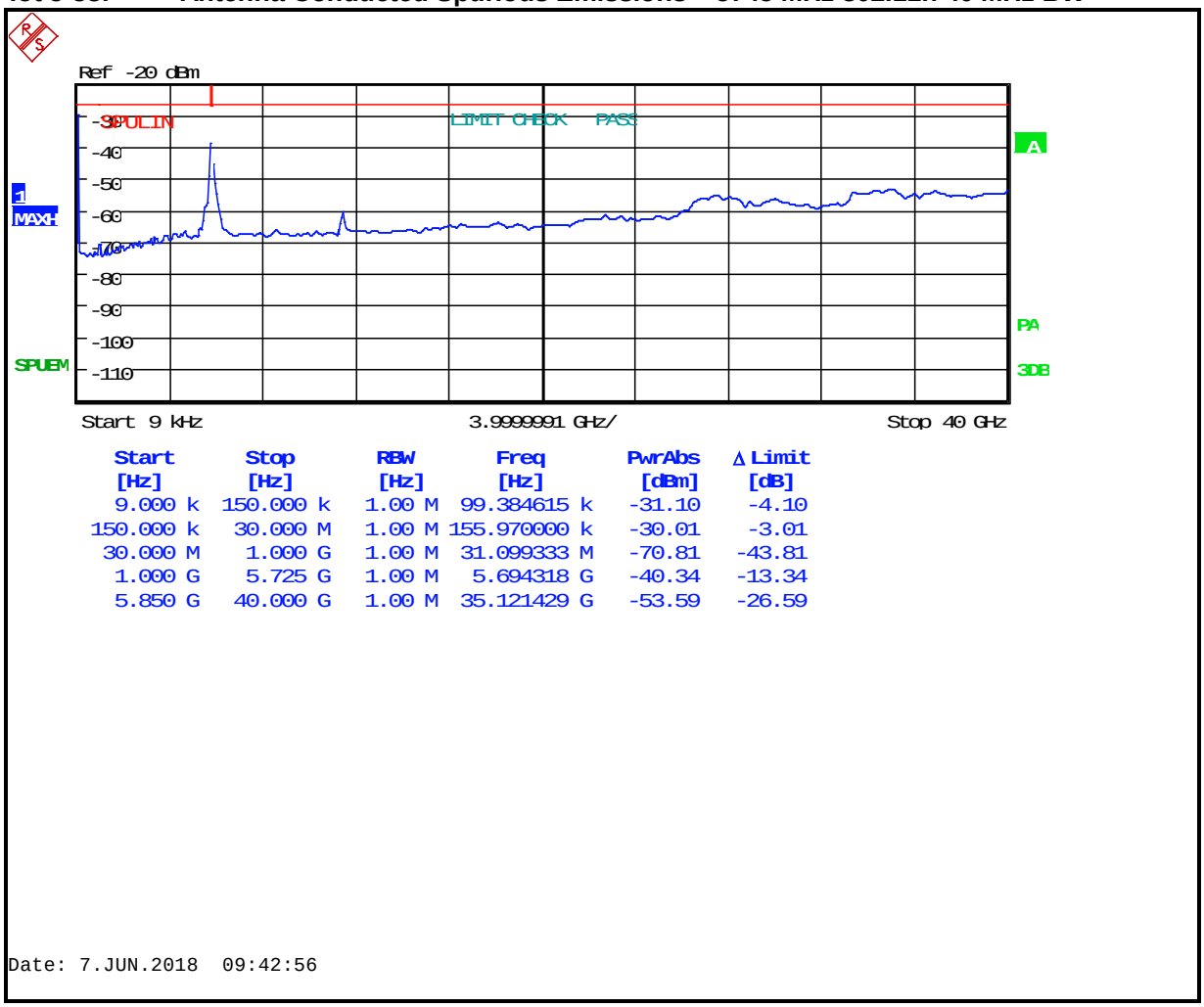
Plot 5-36: Antenna Conducted Spurious Emissions – 5745 MHz 802.11a 20 MHz BW



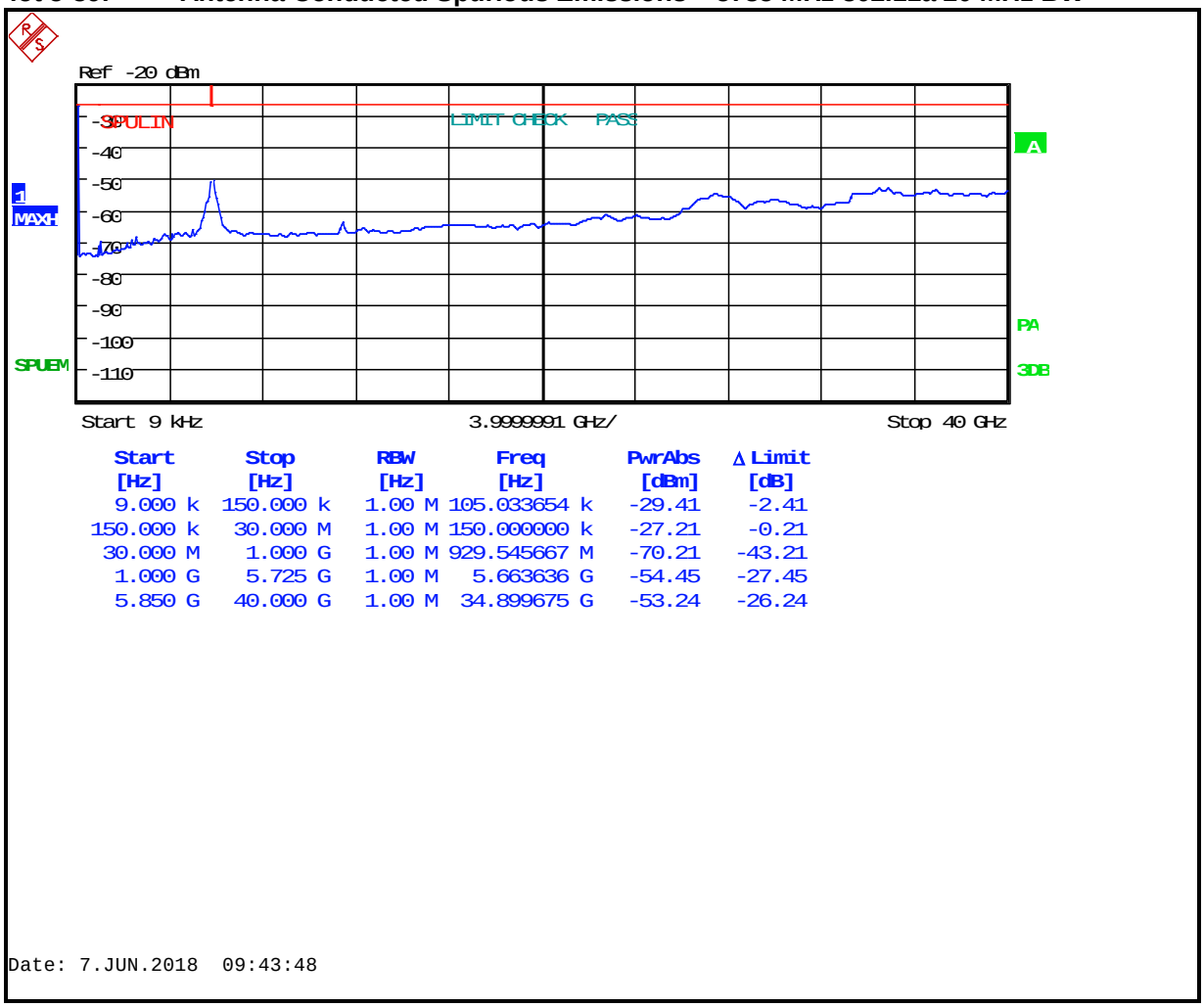
Plot 5-37: Antenna Conducted Spurious Emissions – 5745 MHz 802.11n 20 MHz BW



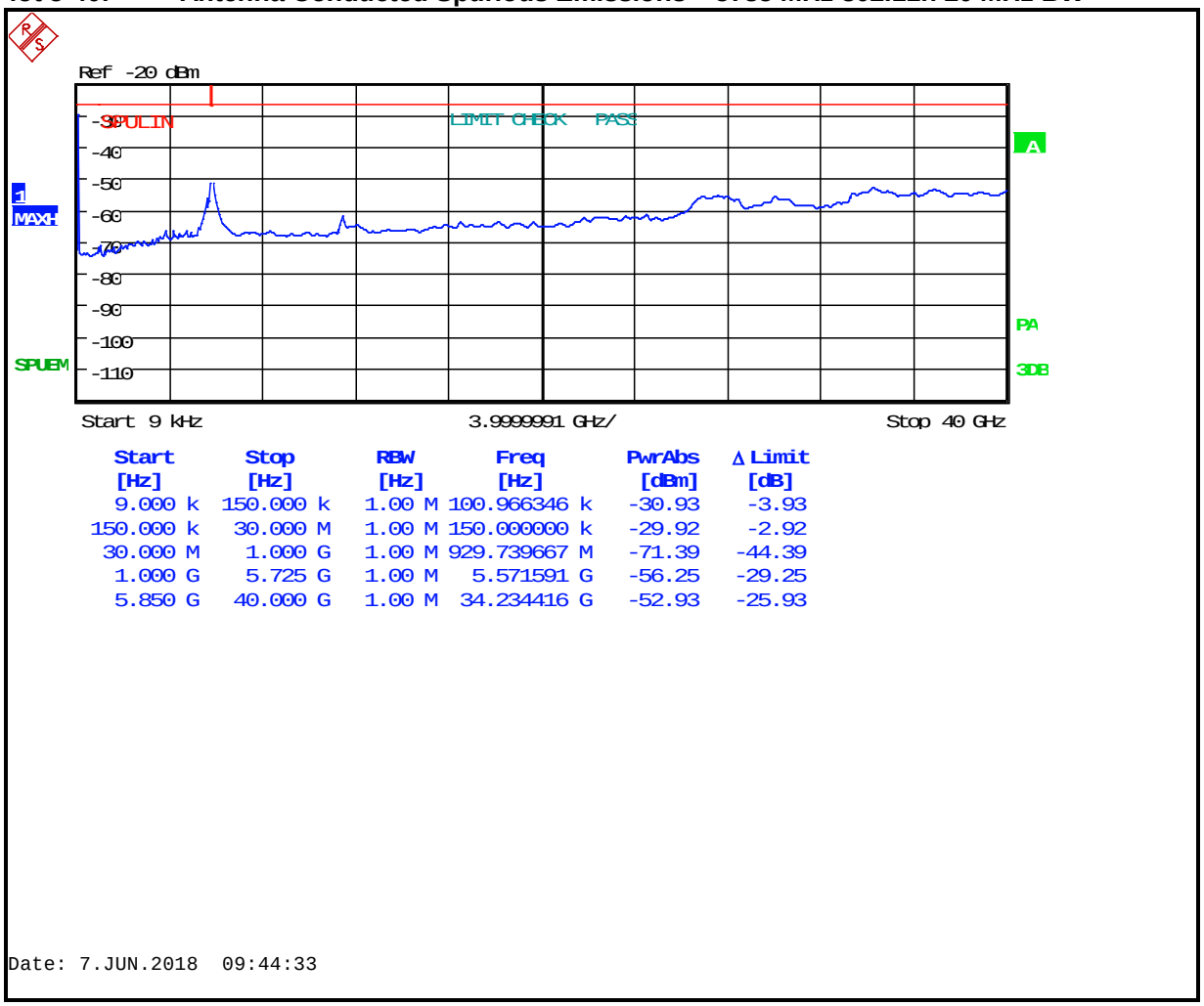
Plot 5-38: Antenna Conducted Spurious Emissions – 5745 MHz 802.11n 40 MHz BW



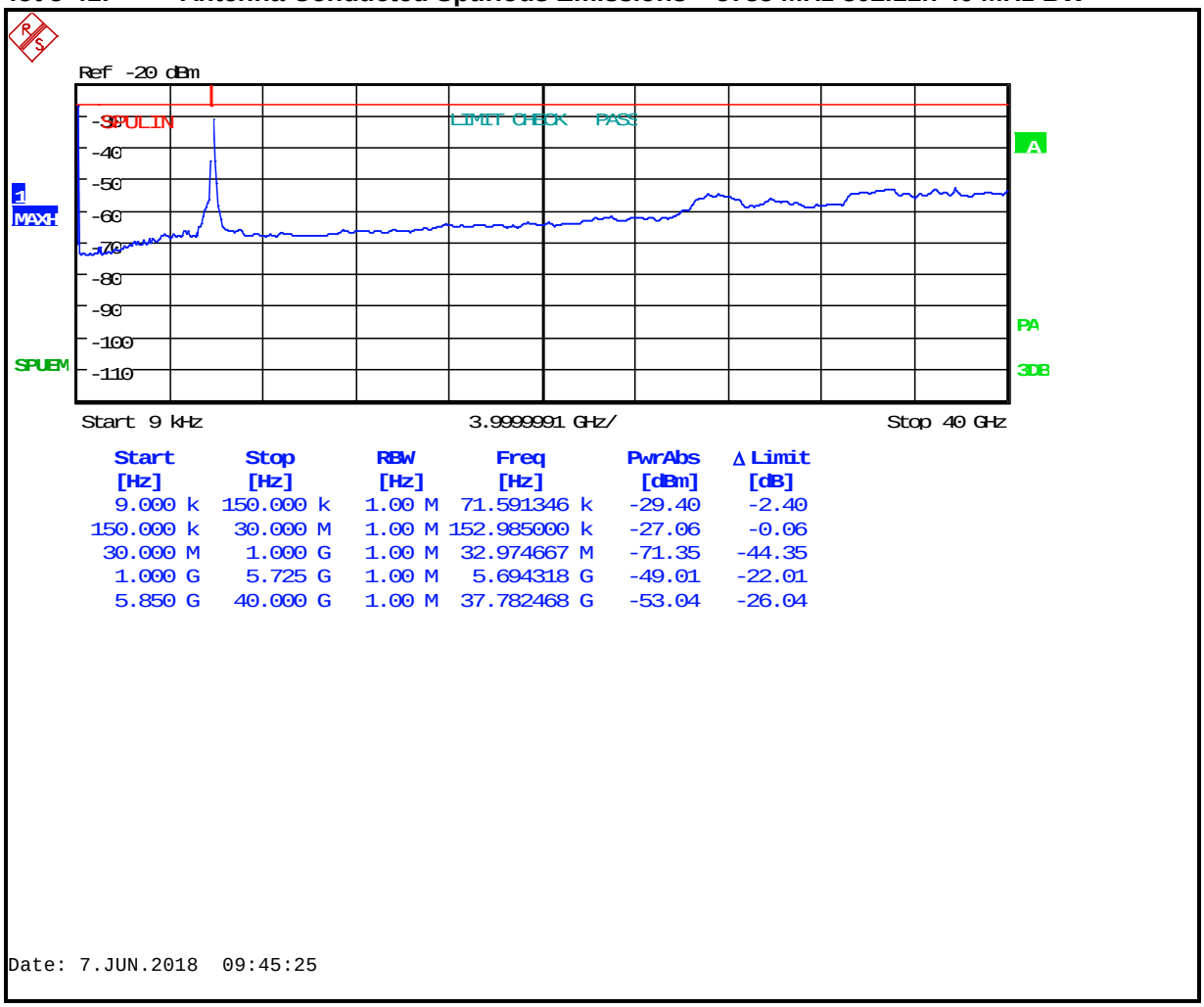
Plot 5-39: Antenna Conducted Spurious Emissions – 5785 MHz 802.11a 20 MHz BW



Plot 5-40: Antenna Conducted Spurious Emissions – 5785 MHz 802.11n 20 MHz BW



Plot 5-41: Antenna Conducted Spurious Emissions – 5785 MHz 802.11n 40 MHz BW



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	71.591346 k	-29.40	-2.40
150.000 k	30.000 M	1.00 M	152.985000 k	-27.06	-0.06
30.000 M	1.000 G	1.00 M	32.974667 M	-71.35	-44.35
1.000 G	5.725 G	1.00 M	5.694318 G	-49.01	-22.01
5.850 G	40.000 G	1.00 M	37.782468 G	-53.04	-26.04

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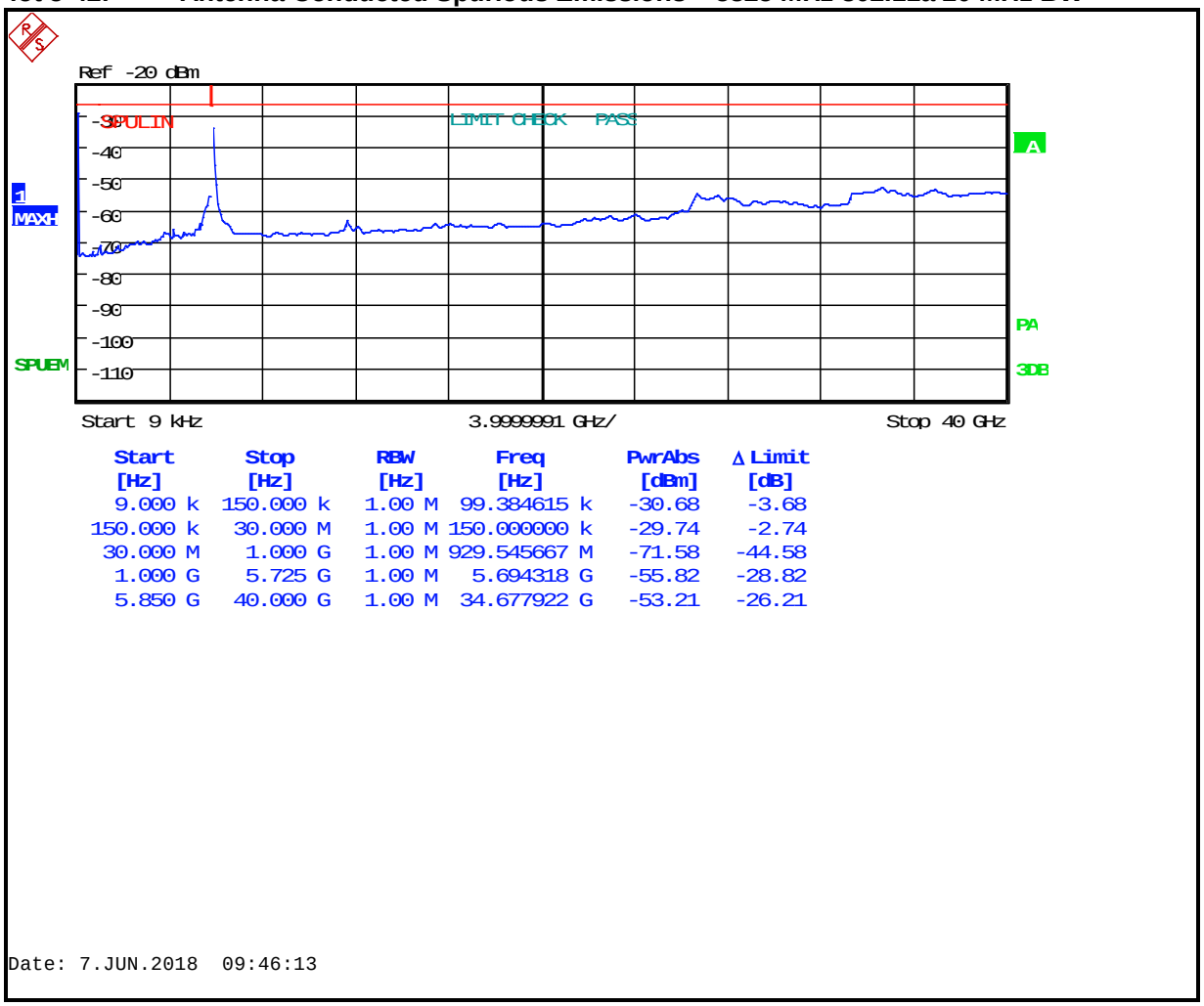
Plot 5-42: Antenna Conducted Spurious Emissions – 5825 MHz 802.11a 20 MHz BW



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
9.000 k	150.000 k	1.00 M	99.384615 k	-30.68	-3.68
150.000 k	30.000 M	1.00 M	150.000000 k	-29.74	-2.74
30.000 M	1.000 G	1.00 M	929.545667 M	-71.58	-44.58
1.000 G	5.725 G	1.00 M	5.694318 G	-55.82	-28.82
5.850 G	40.000 G	1.00 M	34.677922 G	-53.21	-26.21

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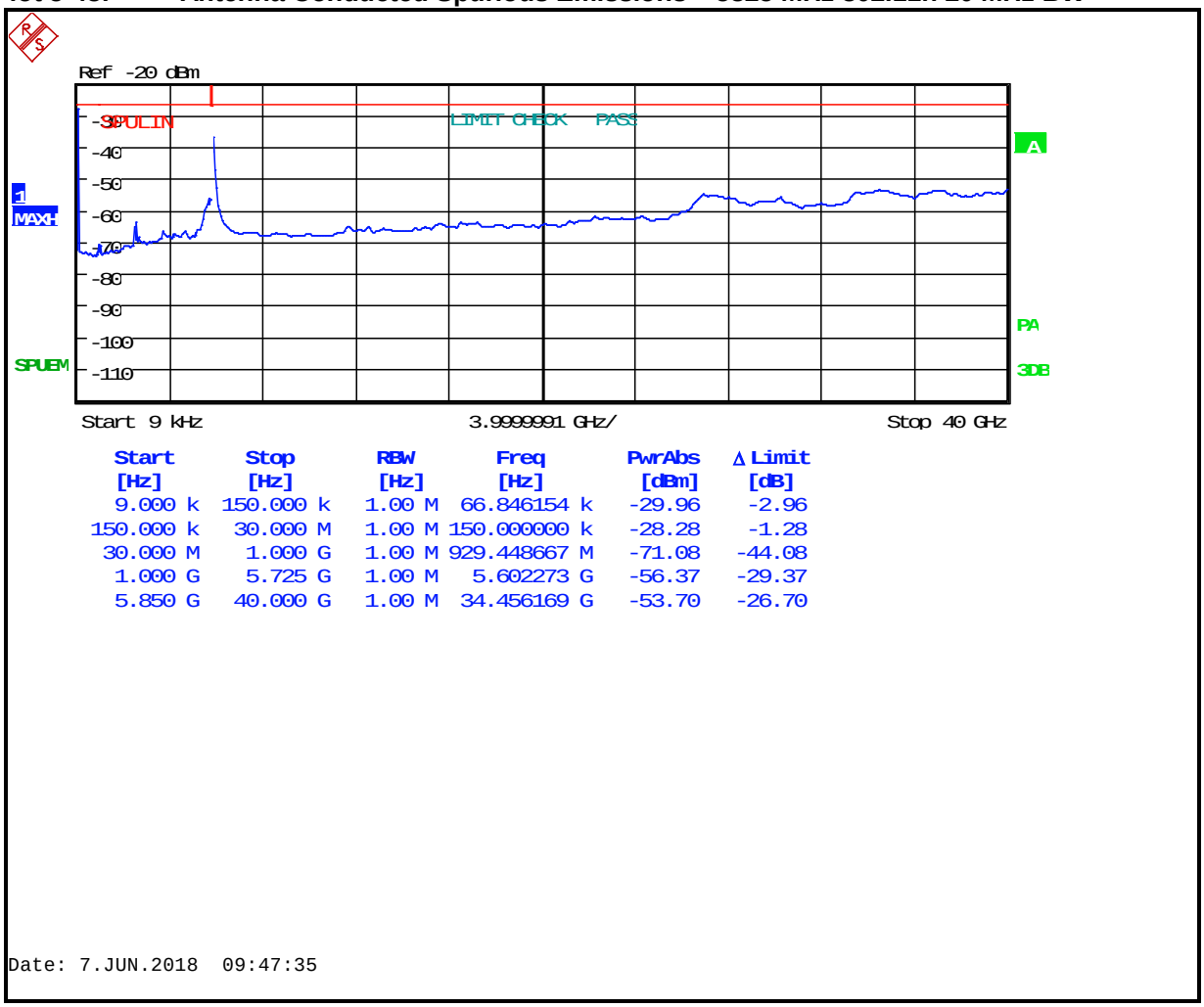
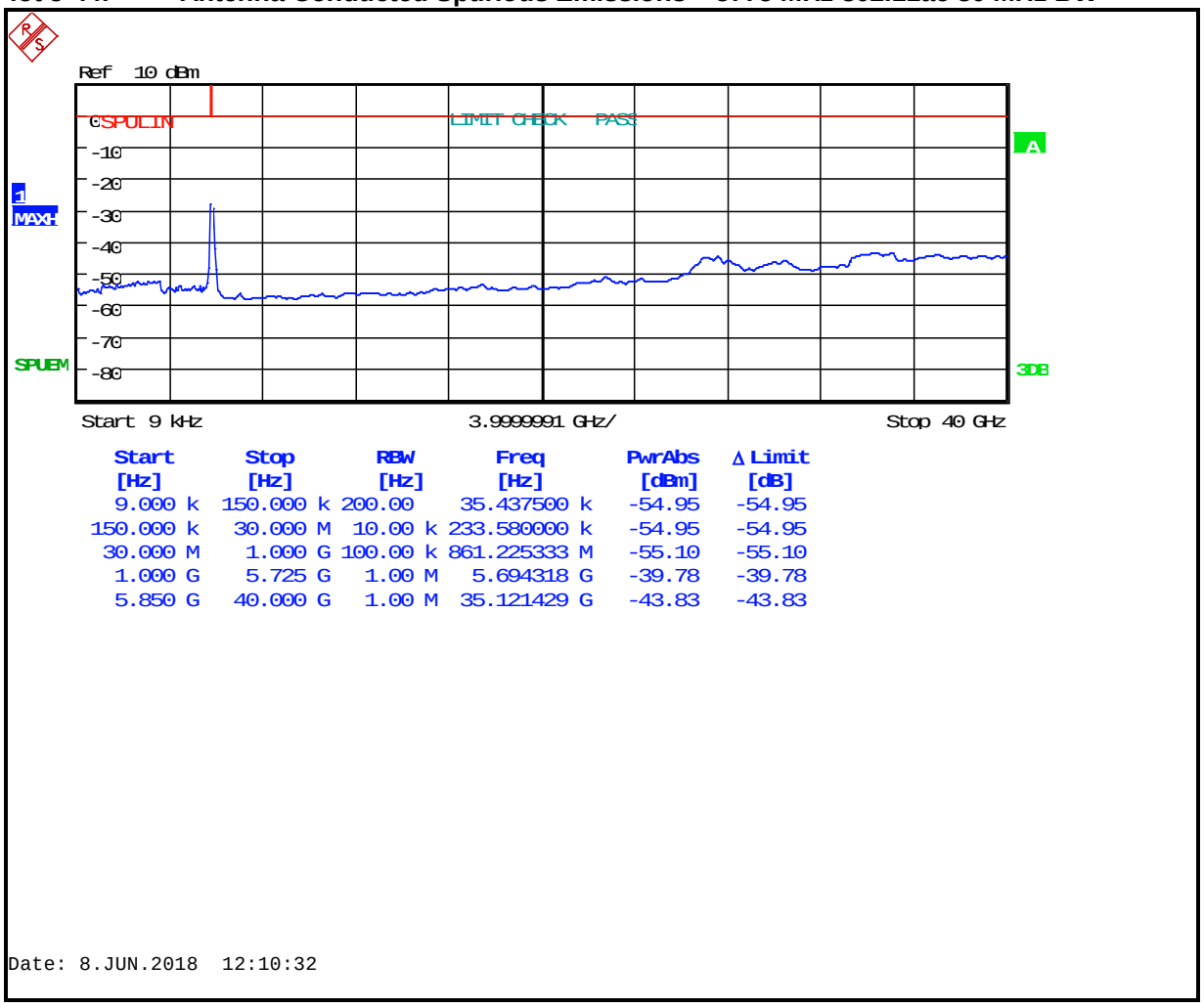
Plot 5-43: Antenna Conducted Spurious Emissions – 5825 MHz 802.11n 20 MHz BW



Plot 5-44: Antenna Conducted Spurious Emissions – 5775 MHz 802.11ac 80 MHz BW



Result: PASS

Measurement uncertainty: Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty = ±2.0 dB

Table 5-1: Antenna Conducted Spurious Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Khue Do		June 7-8, 2018
Test Engineer	Signature	Dates of Test

6 6 dB Bandwidth – FCC 15.407(a)(e); ISED RSS-247 6.2

6.1 6 dB Bandwidth Test Procedure

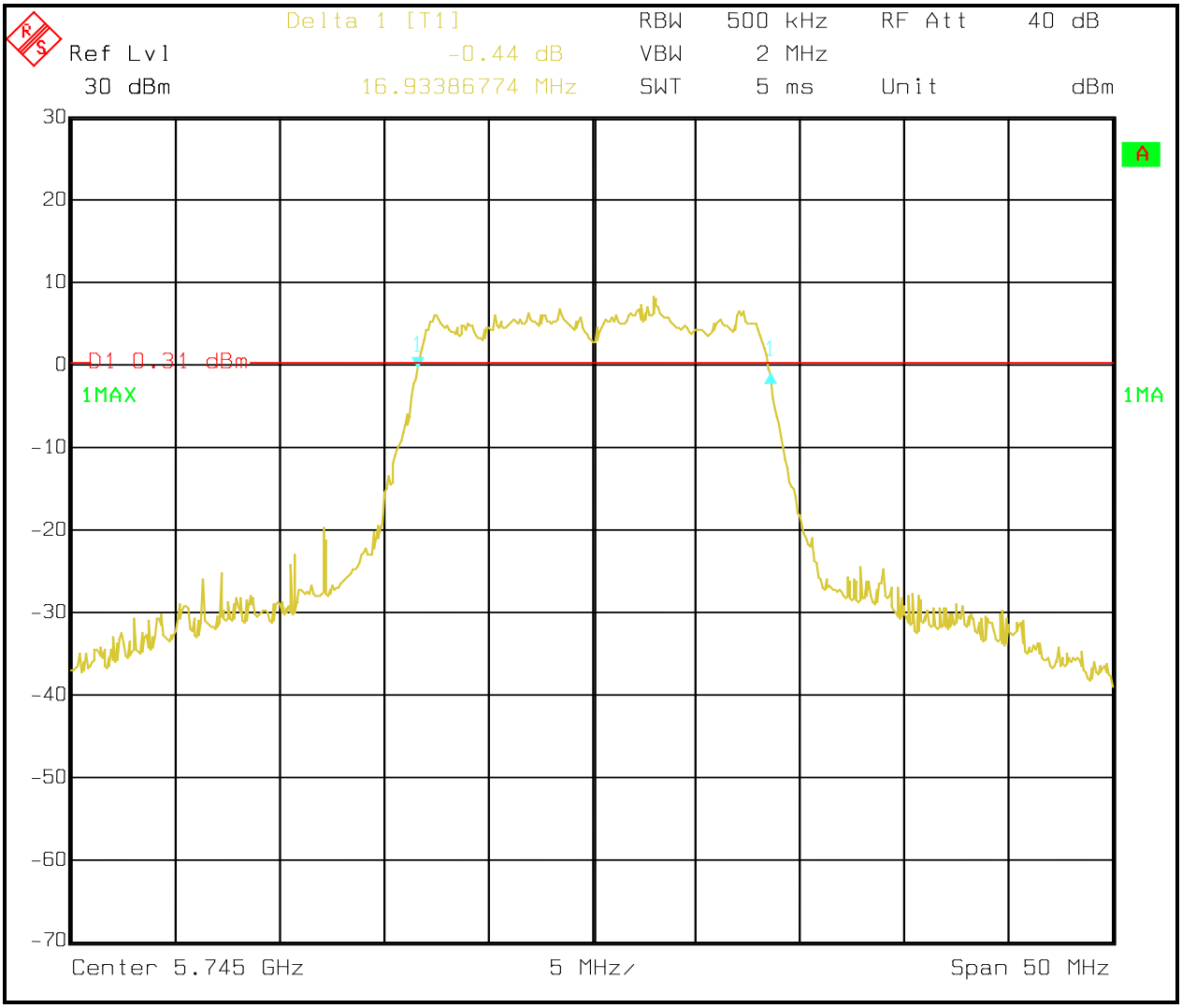
The minimum 6 dB bandwidths per FCC 15.407(a)(3) were measured using a 50-ohm spectrum analyzer with the resolution bandwidth set at 1% of the span, and the video bandwidth set at ≥3xRBW. The device was modulated. The minimum 6 dB bandwidths are presented below.

6.2 6 dB Bandwidth Test Data

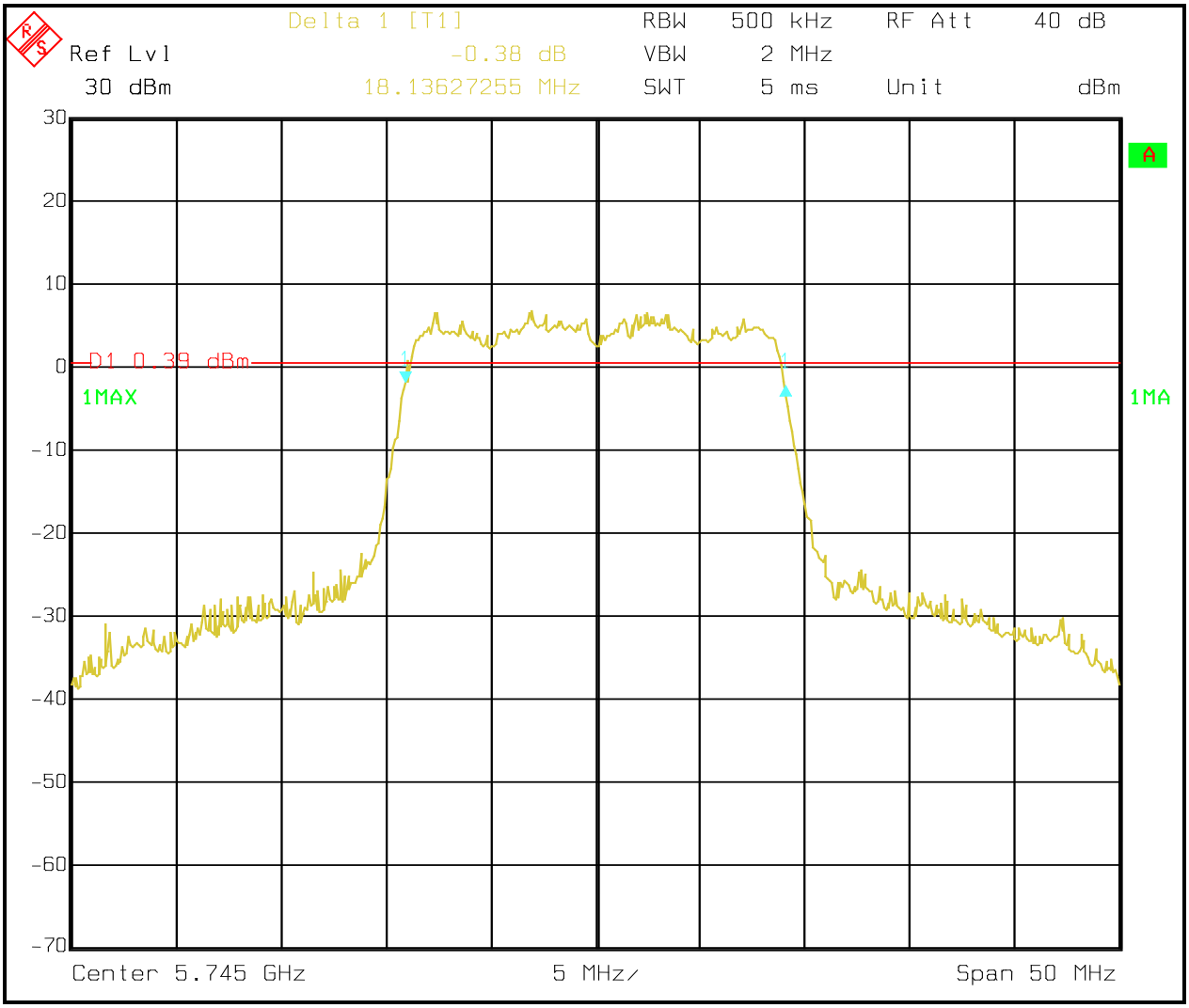
Table 6-1: 6 dB Bandwidth Test Data

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)
149	5745 (20 MHz) 802.11a	16.9
149	5745 (20 MHz) 802.11n	18.1
151	5755 (40 MHz) 802.11n	37.1
155	5775 (80 MHz) 802.11ac	77.4
157	5785 (20 MHz) 802.11a	16.9
157	5785 (20 MHz) 802.11n	18.0
159	5795 (40 MHz) 802.11n	36.7
165	5825 (20 MHz) 802.11a	16.7
165	5825 (20 MHz) 802.11n	17.9

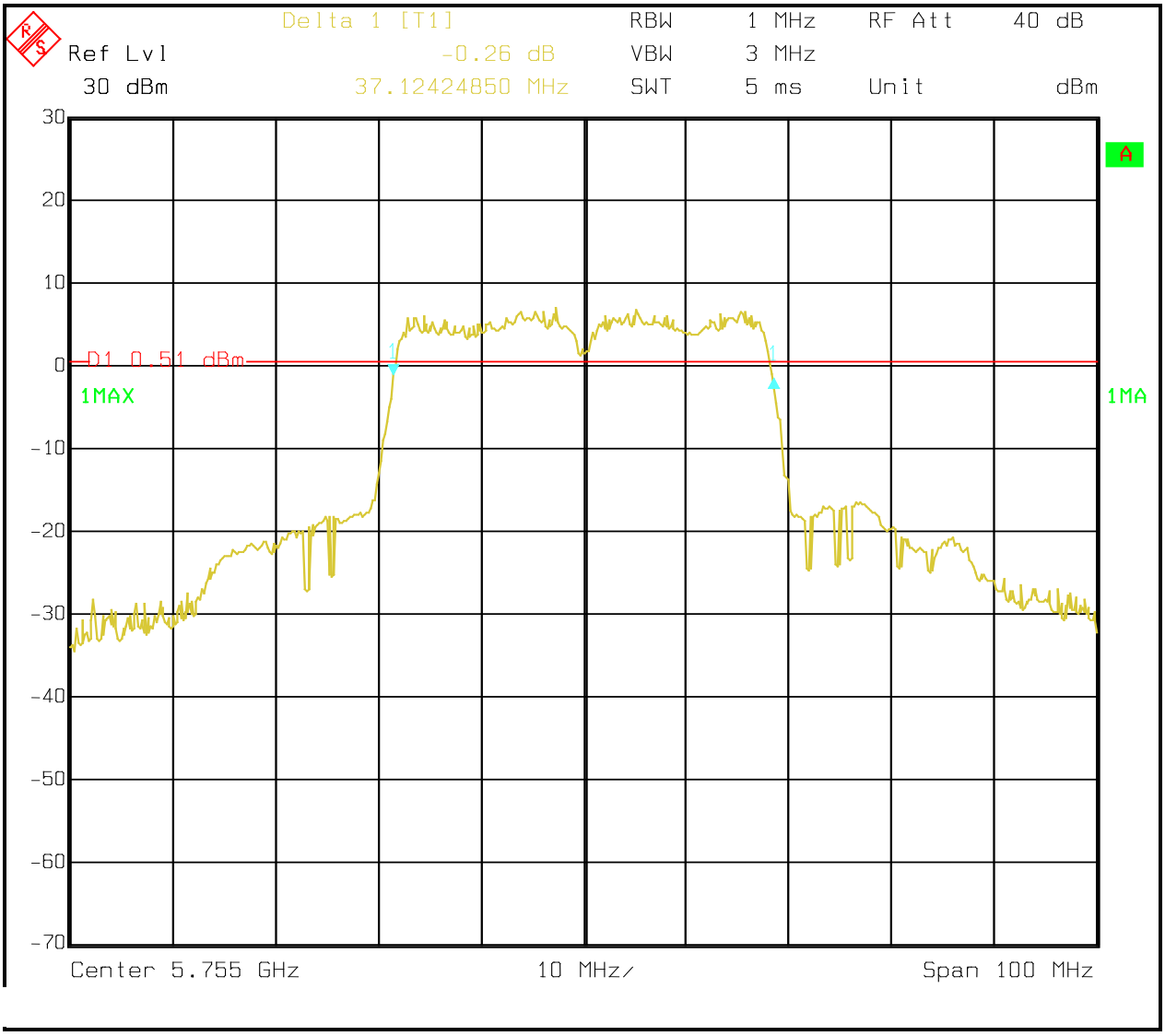
Plot 6-1: 6 dB Bandwidth – 5745 MHz 802.11a 20 MHz BW



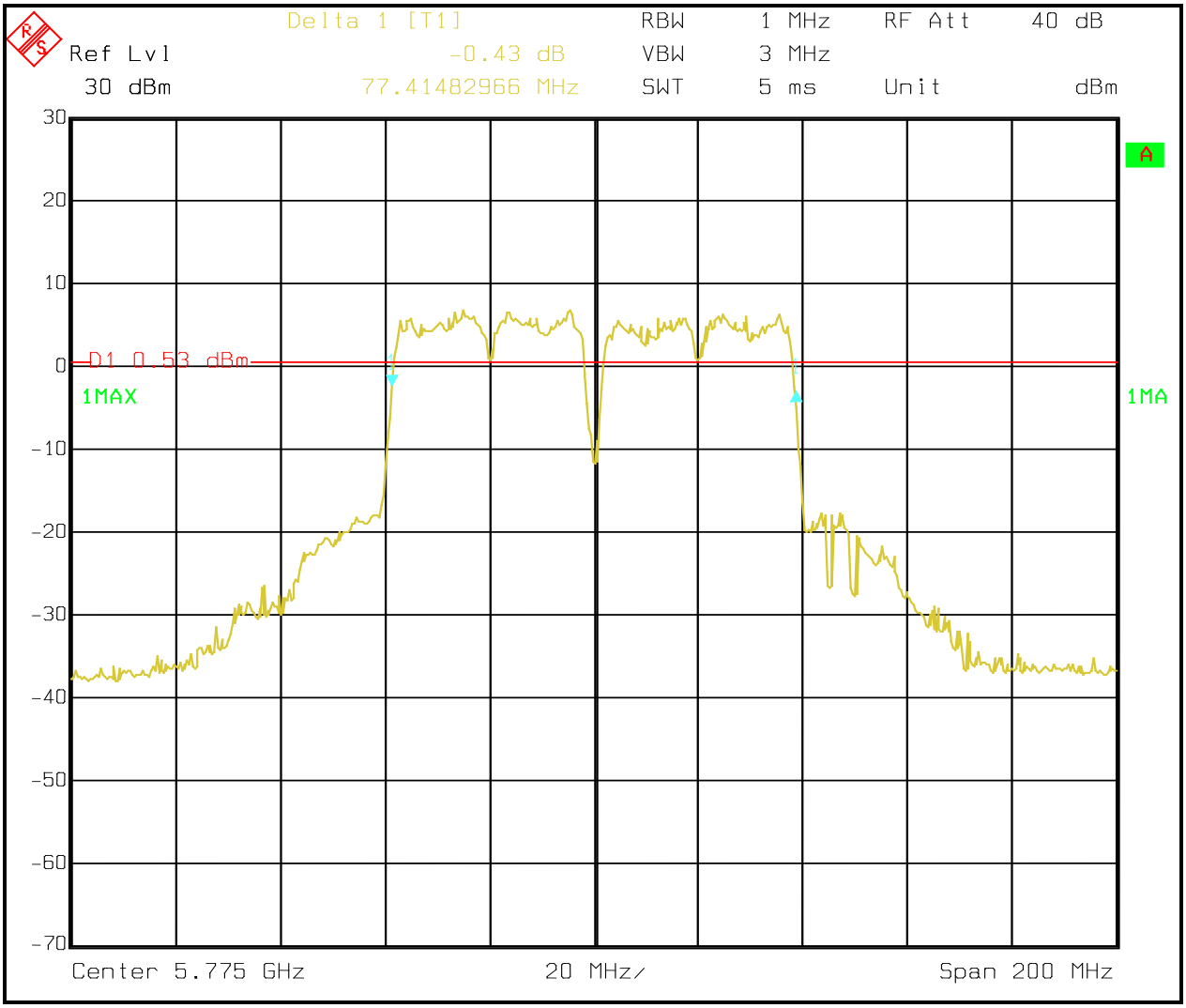
Plot 6-2: 6 dB Bandwidth – 5745 MHz 802.11n 20 MHz BW



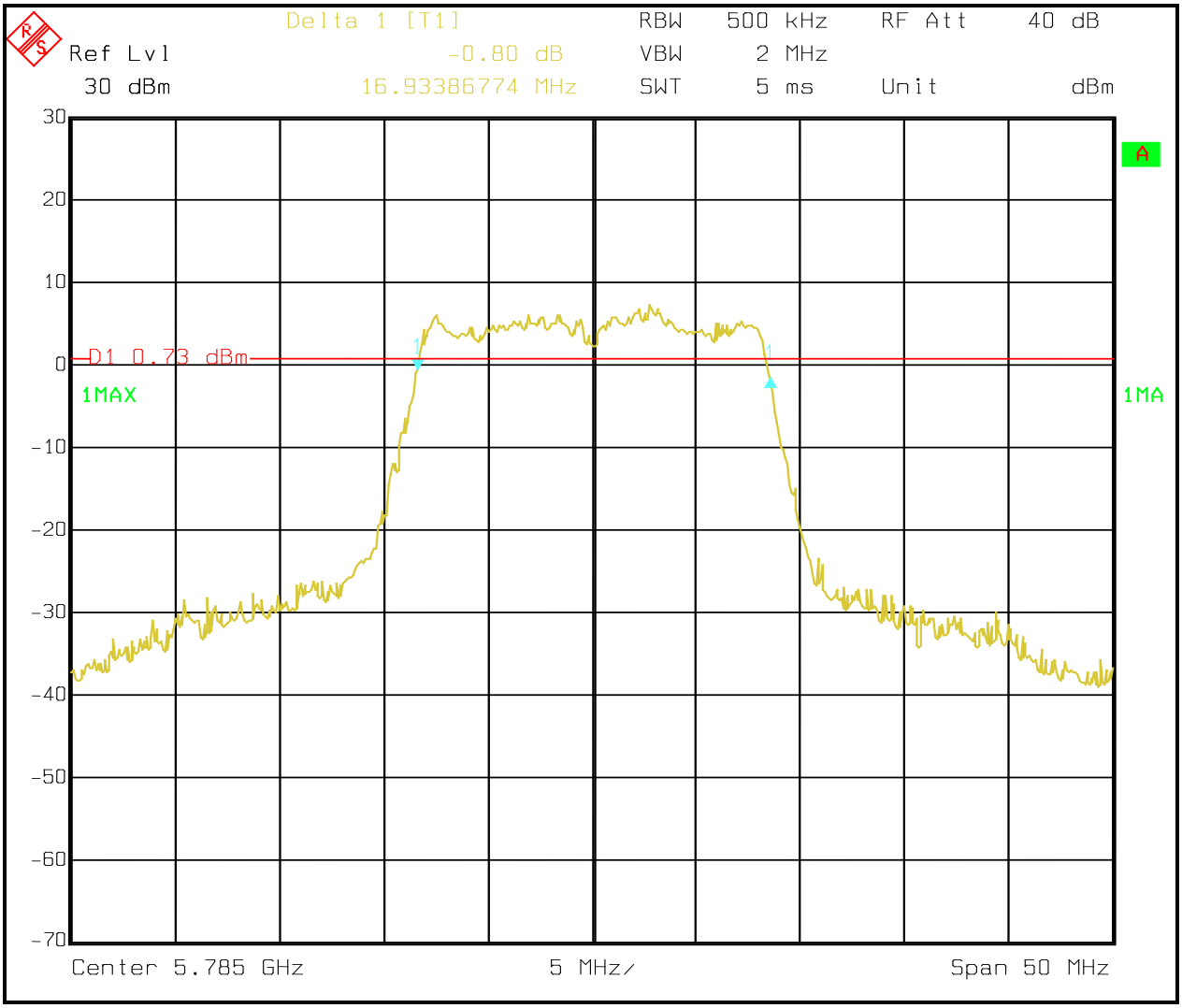
Plot 6-3: 6 dB Bandwidth – 5755 MHz 802.11n 40 MHz BW



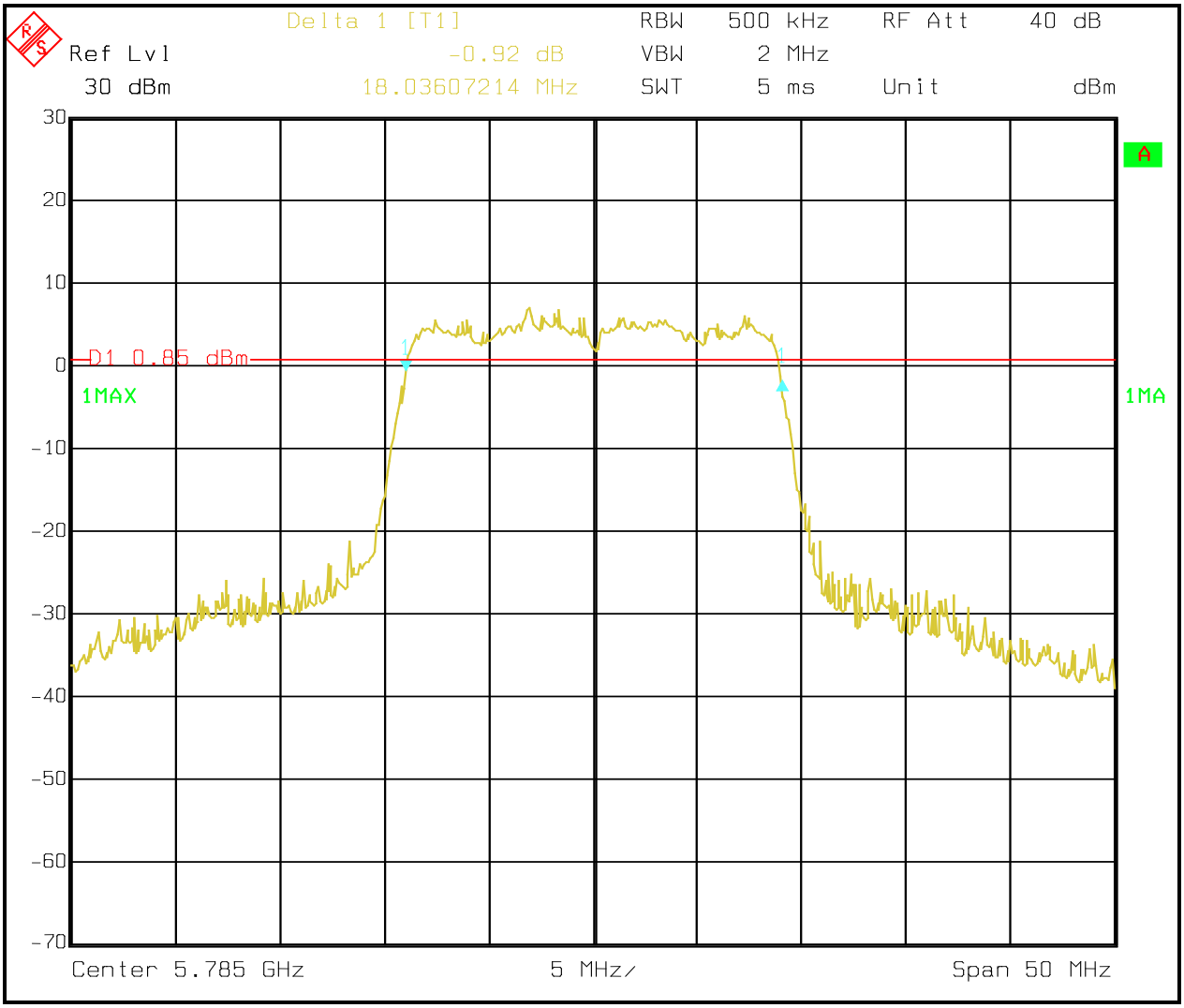
Plot 6-4: 6 dB Bandwidth – 5775 MHz 802.11ac 80 MHz BW



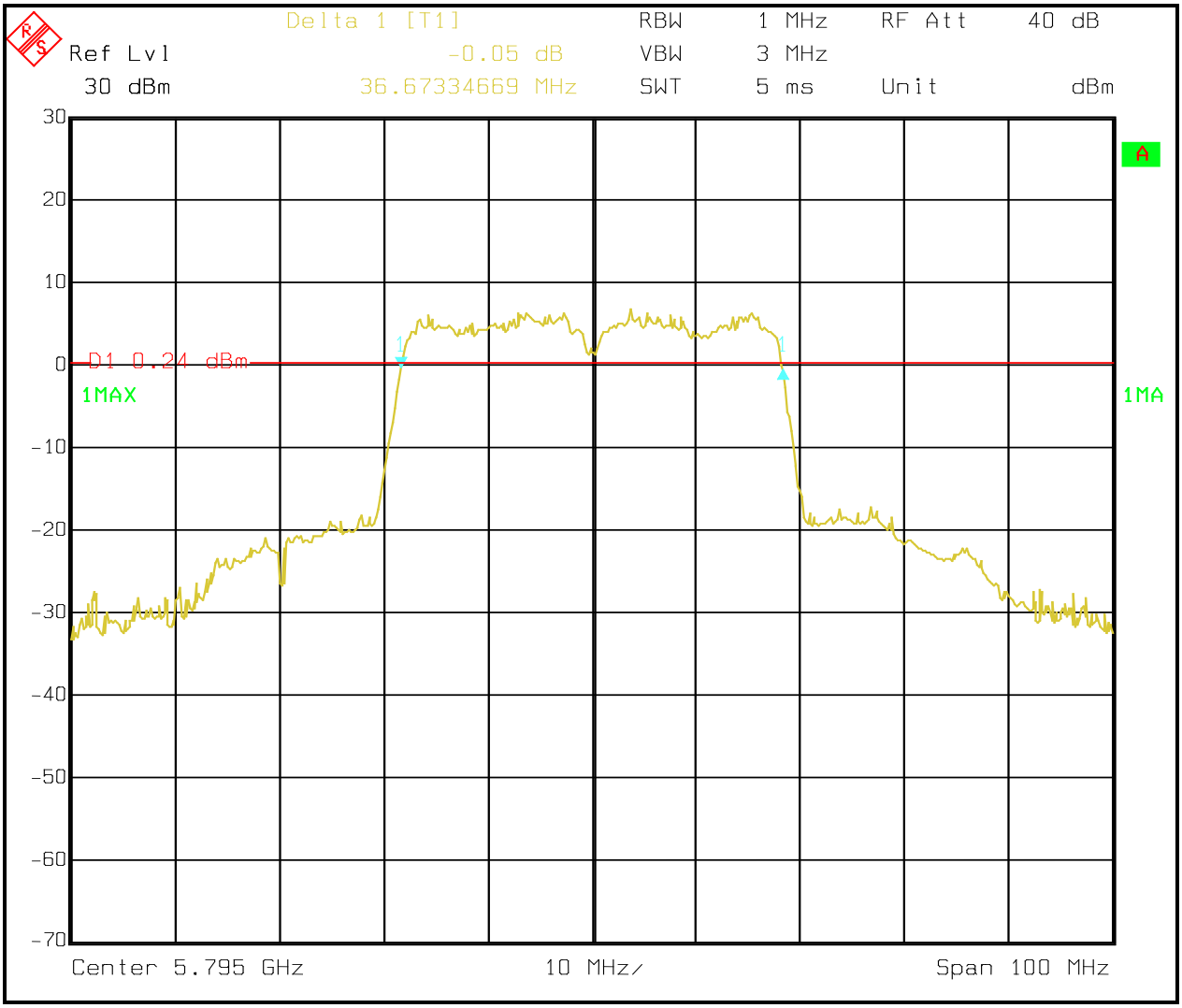
Plot 6-5: 6 dB Bandwidth – 5785 MHz 802.11a 20 MHz BW



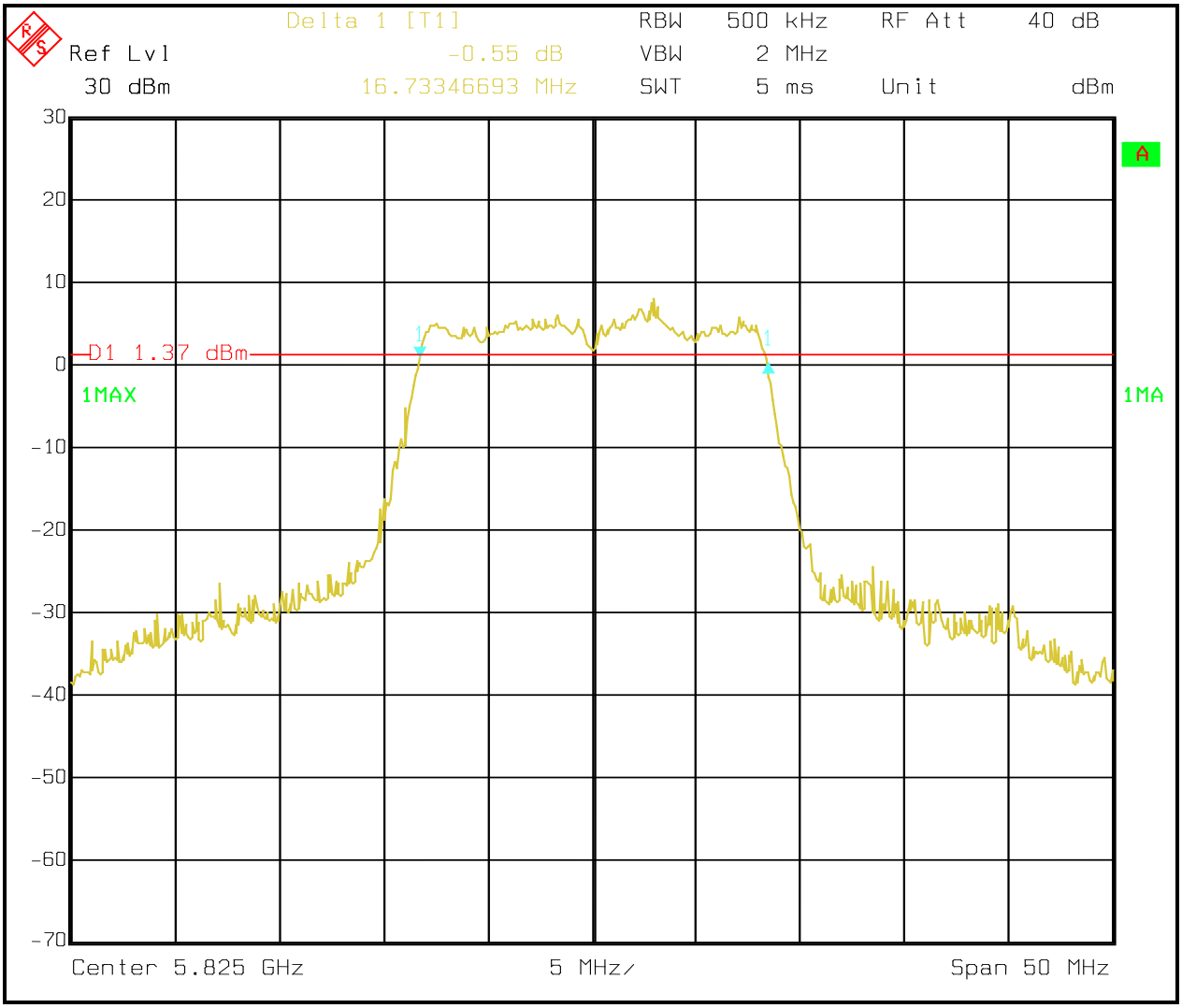
Plot 6-6: 6 dB Bandwidth – 5785 MHz 802.11n 20 MHz BW



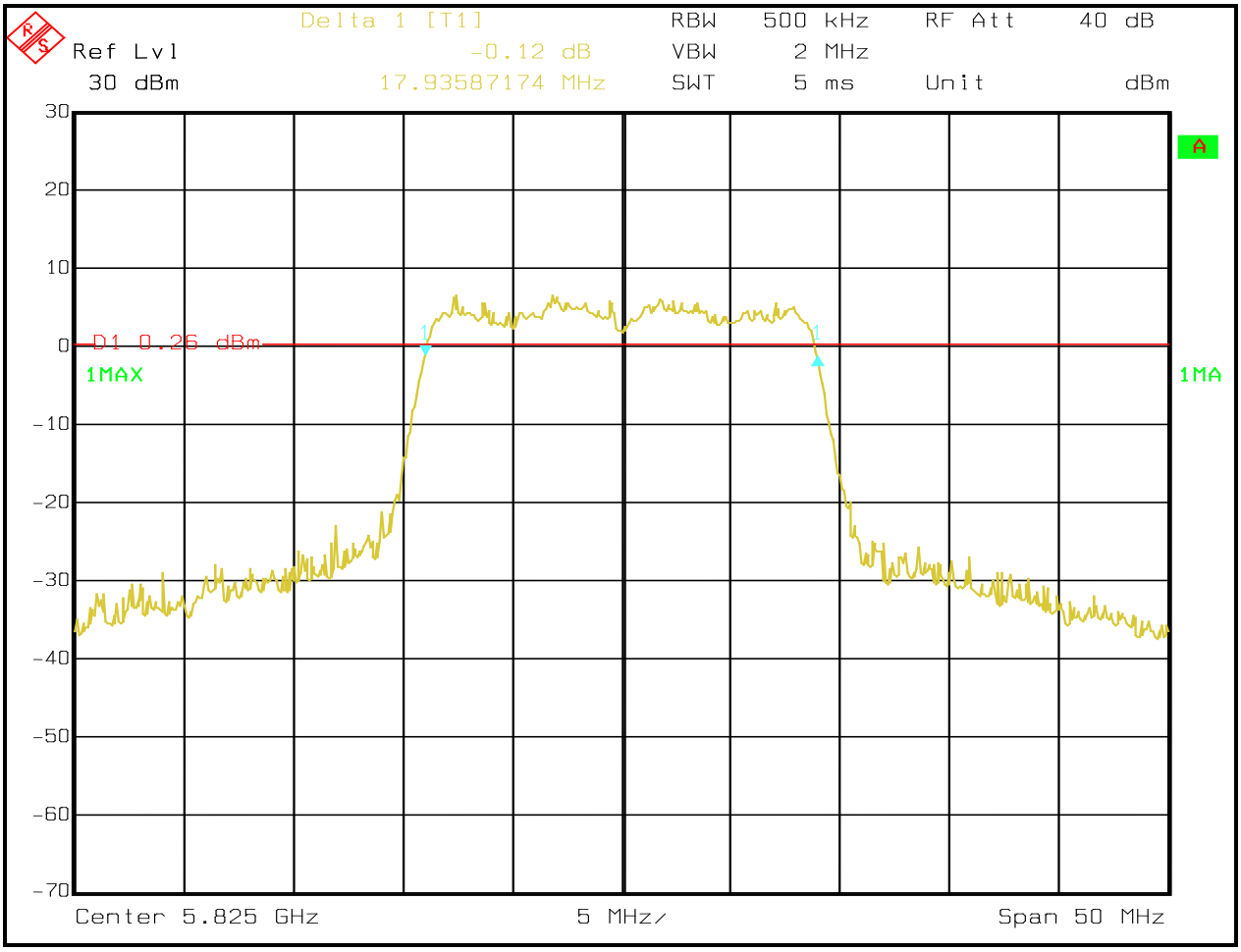
Plot 6-7: 6 dB Bandwidth – 5795 MHz 802.11n 40 MHz BW



Plot 6-8: 6 dB Bandwidth – 5825 MHz 802.11a 20 MHz BW



Plot 6-9: 6 dB Bandwidth – 5825 MHz 802.11n 20 MHz BW



Result: PASS

Measurement uncertainty: Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty= ±2.0 dB

Table 6-2: 6 dB Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	June 14, 2018
Test Engineer	Signature	Date of Test

7 Occupied Bandwidth – ISED RSS-Gen 6.7

7.1 99% Bandwidth Test Procedure

The following conditions shall be observed for measuring the occupied bandwidth and x dB bandwidth:

• The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

• The span of the spectrum analyzer shall be set large enough to capture all products of the modulation process, including the emission skirts, around the carrier frequency, but small enough to avoid having other emissions (e.g. on adjacent channels) within the span.

• The detector of the spectrum analyzer shall be set to "Sample". However, a peak, or peak hold, may be used in place of the sampling detector since this usually produces a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold (or "Max Hold") may be necessary to determine the occupied / x dB bandwidth if the device is not transmitting continuously.

• The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the actual occupied / x dB bandwidth and the video bandwidth (VBW) shall not be smaller than three times the RBW value. Video averaging is not permitted.

Note: It may be necessary to repeat the measurement a few times until the RBW and VBW are in compliance with the above requirement.

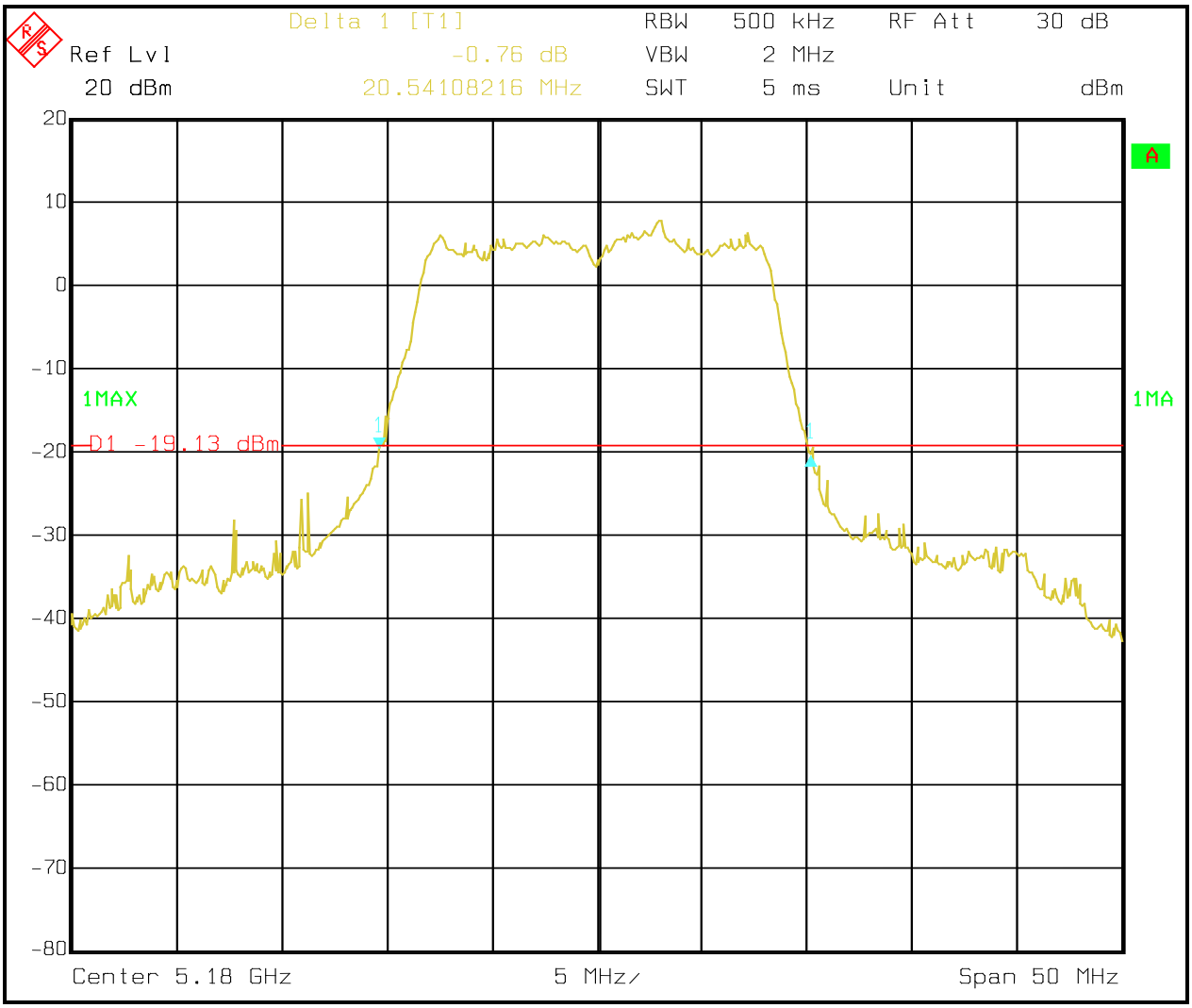
7.2 99% Bandwidth Test Data

Table 7-1: 99% Bandwidth Test Data

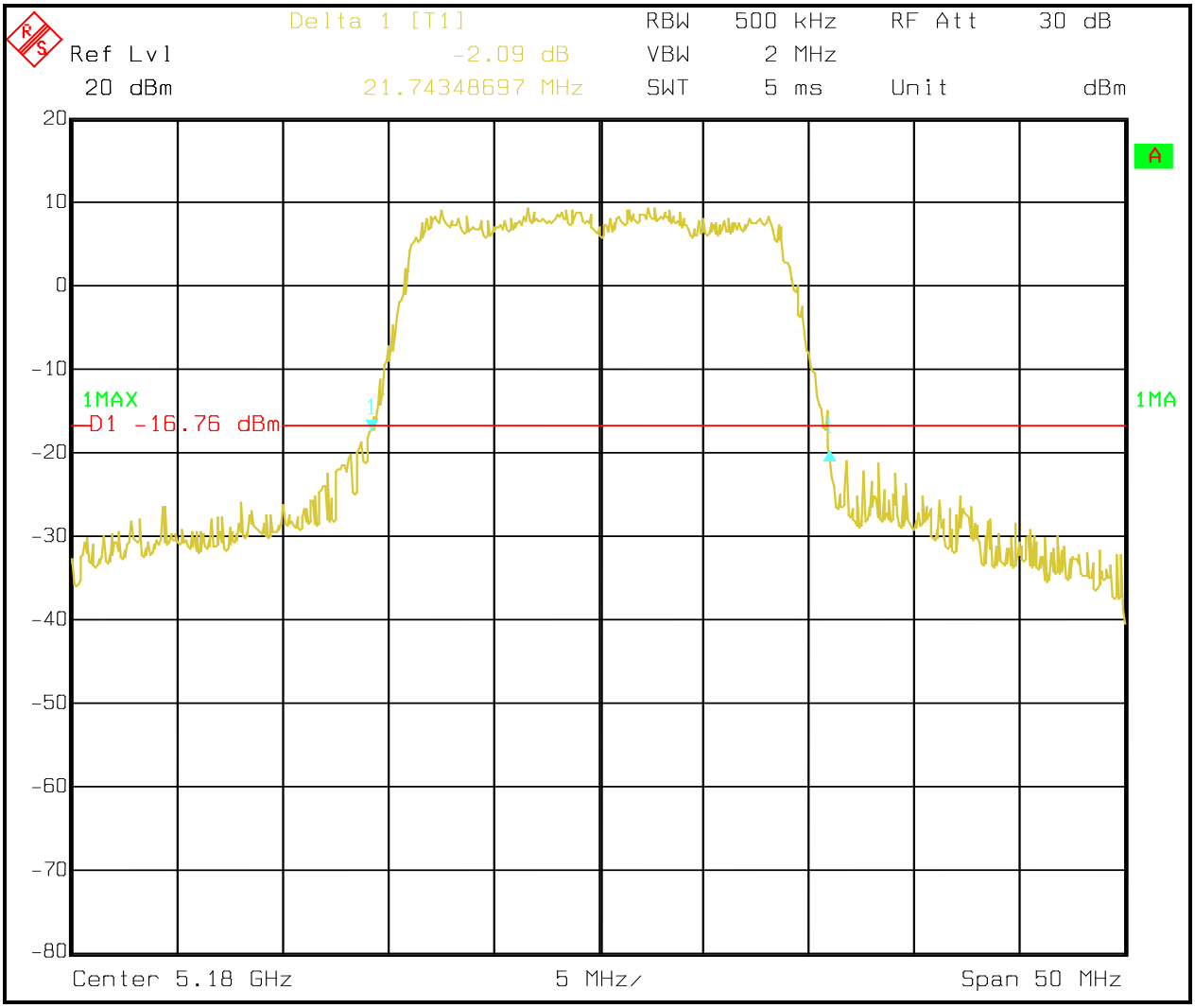
Designation	Frequency (MHz)	99% Bandwidth (MHz)
802.11a (20 MHz)	5180	20.5
802.11n (20 MHz)	5180	21.7
802.11n (40 MHz)	5190	49.7
802.11a (20 MHz)	5200	20.6
802.11n (20 MHz)	5200	20.8
802.11n (40 MHz)	5230	54.6
802.11a (20 MHz)	5240	20.2
802.11n (20 MHz)	5240	20.4
802.11ac (80 MHz)	5210	91.8
802.11a (20 MHz)	5260	20.5
802.11n (20 MHz)	5260	20.7
802.11n (40 MHz)	5270	54.7
802.11a (20 MHz)	5280	20.7
802.11n (20 MHz)	5280	20.9
802.11n (40 MHz BW)	5310	51.3
802.11a (20 MHz)	5320	20.4
802.11n (20 MHz)	5320	20.8
802.11ac (80 MHz)	5290	89.5
802.11a (20 MHz)	5260	20.5
802.11n (20 MHz)	5260	20.7
802.11n (40 MHz BW)	5270	54.7
802.11a (20 MHz)	5280	20.7
802.11n (20 MHz)	5280	20.9
802.11n (40 MHz BW)	5310	51.3
802.11a (20 MHz)	5320	20.4
802.11n (20 MHz)	5320	20.8
802.11a (20 MHz BW)	5500	20.5
802.11n (20 MHz)	5550	20.8
802.11a (20 MHz)	5600	19.9
802.11n (20 MHz)	5650	20.4
802.11a (20 MHz)	5700	20.3
802.11n (20 MHz)	5750	20.8
802.11ac (80 MHz)	5530	97.4
802.11ac (80 MHz)	5610	97.2
802.11ac (80 MHz)	5690	95.3
802.11a (20 MHz)	5745	20.3
802.11n (20 MHz)	5745	20.7
802.11n (40 MHz BW)	5755	53.6
802.11a (20 MHz)	5785	20.4
802.11n (20 MHz)	5785	20.9
802.11n (40 MHz BW)	5795	55.1
802.11a (20 MHz)	5825	20.3
802.11n (20 MHz)	5825	20.9
802.11ac (80 MHz)	5775	91.7

7.3 99% Bandwidth Plots

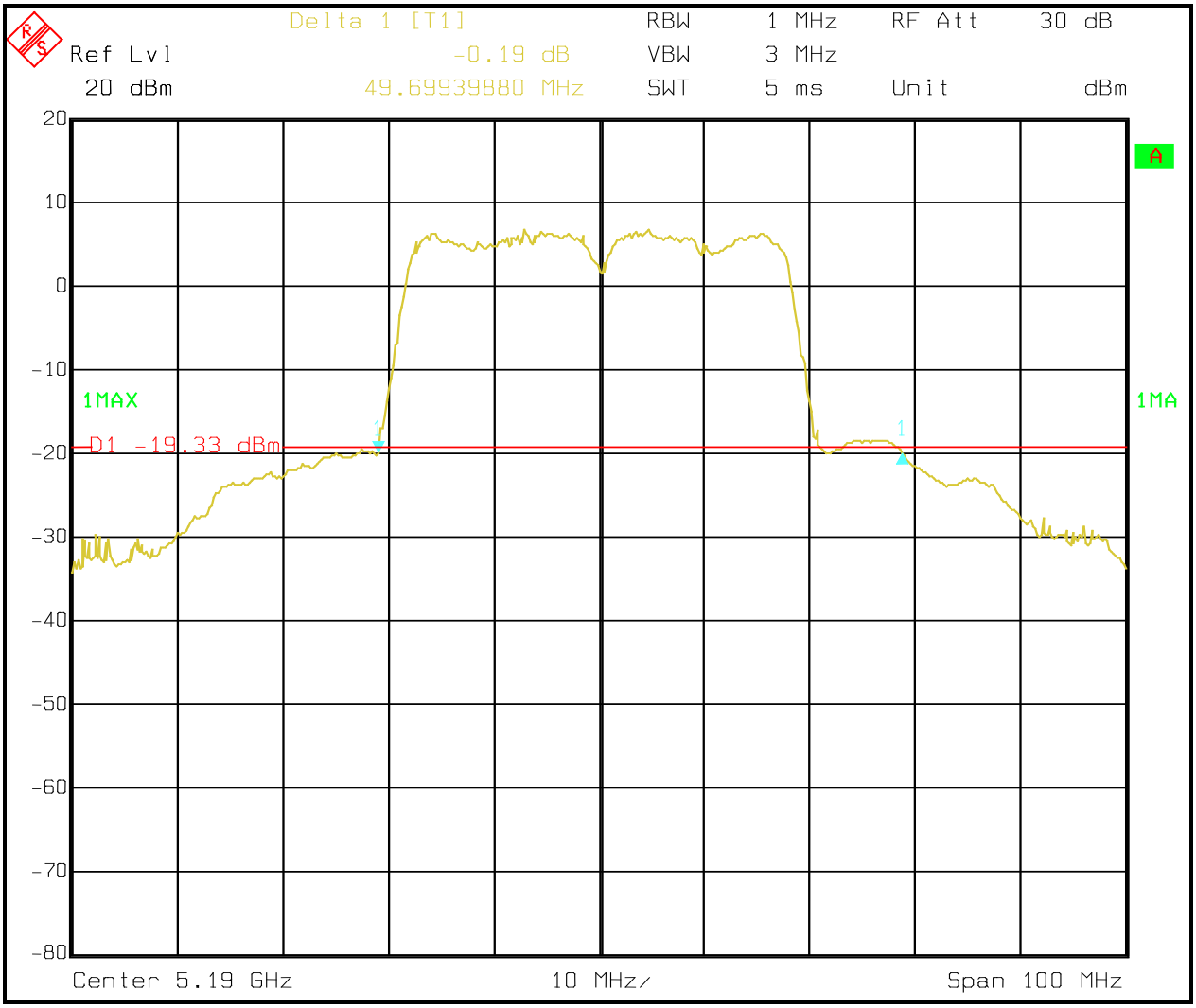
Plot 7-1: 99% Bandwidth – 5180 MHz 802.11a 20 MHz BW



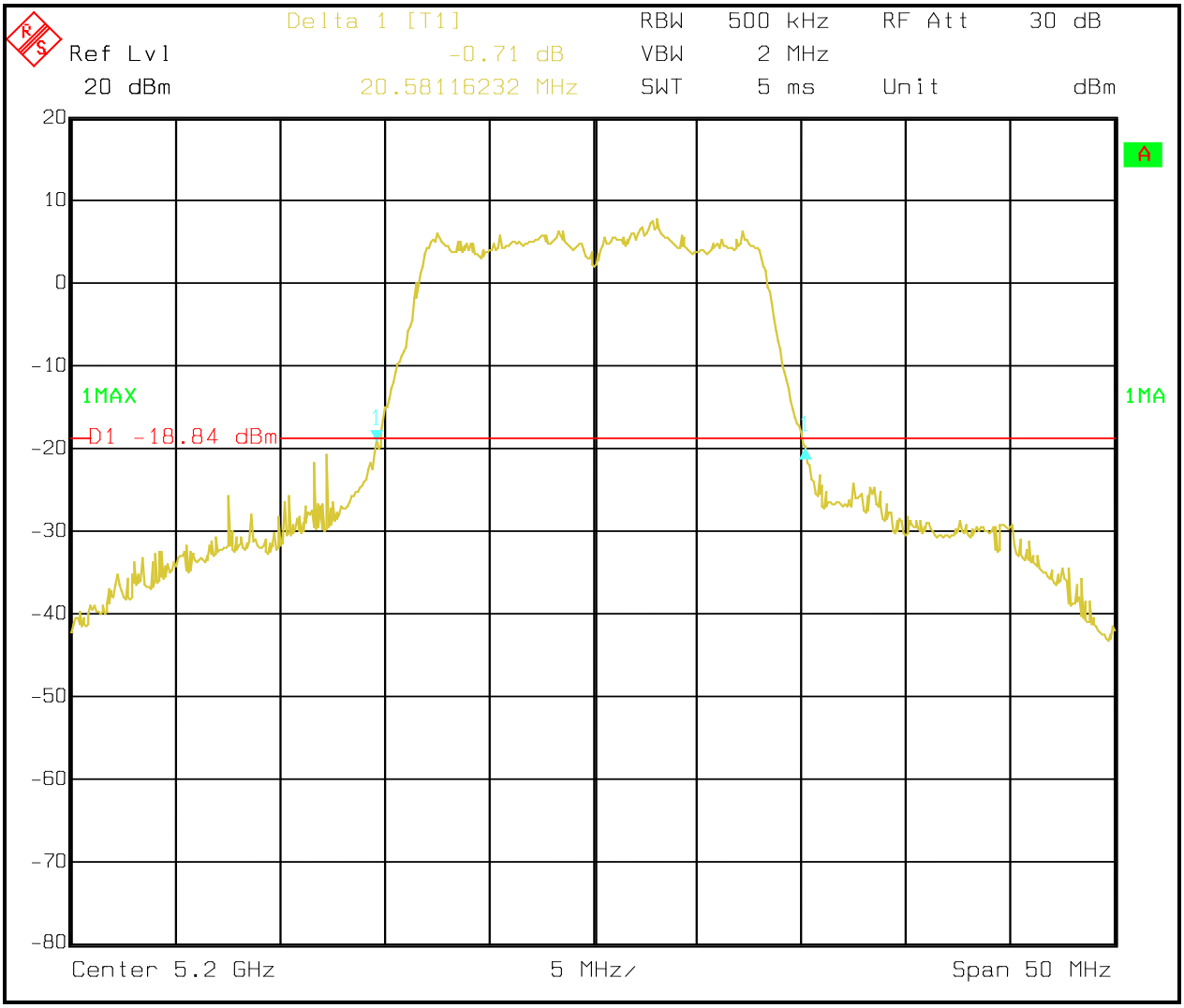
Plot 7-2: 99% OBW – 5180 MHz 802.11n 20 MHz BW



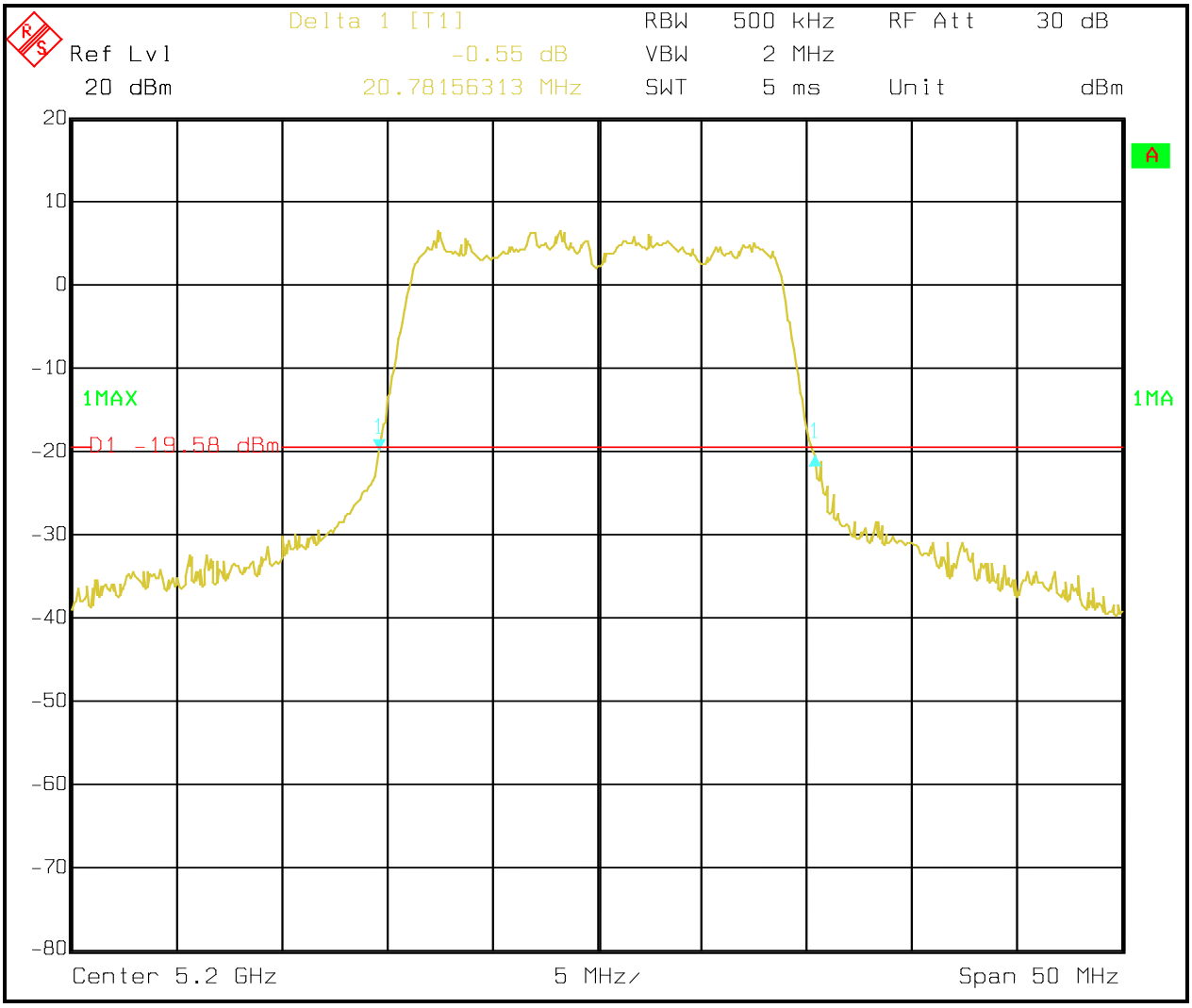
Plot 7-3: 99% OBW – 5190 MHz 802.11n 40 MHz BW



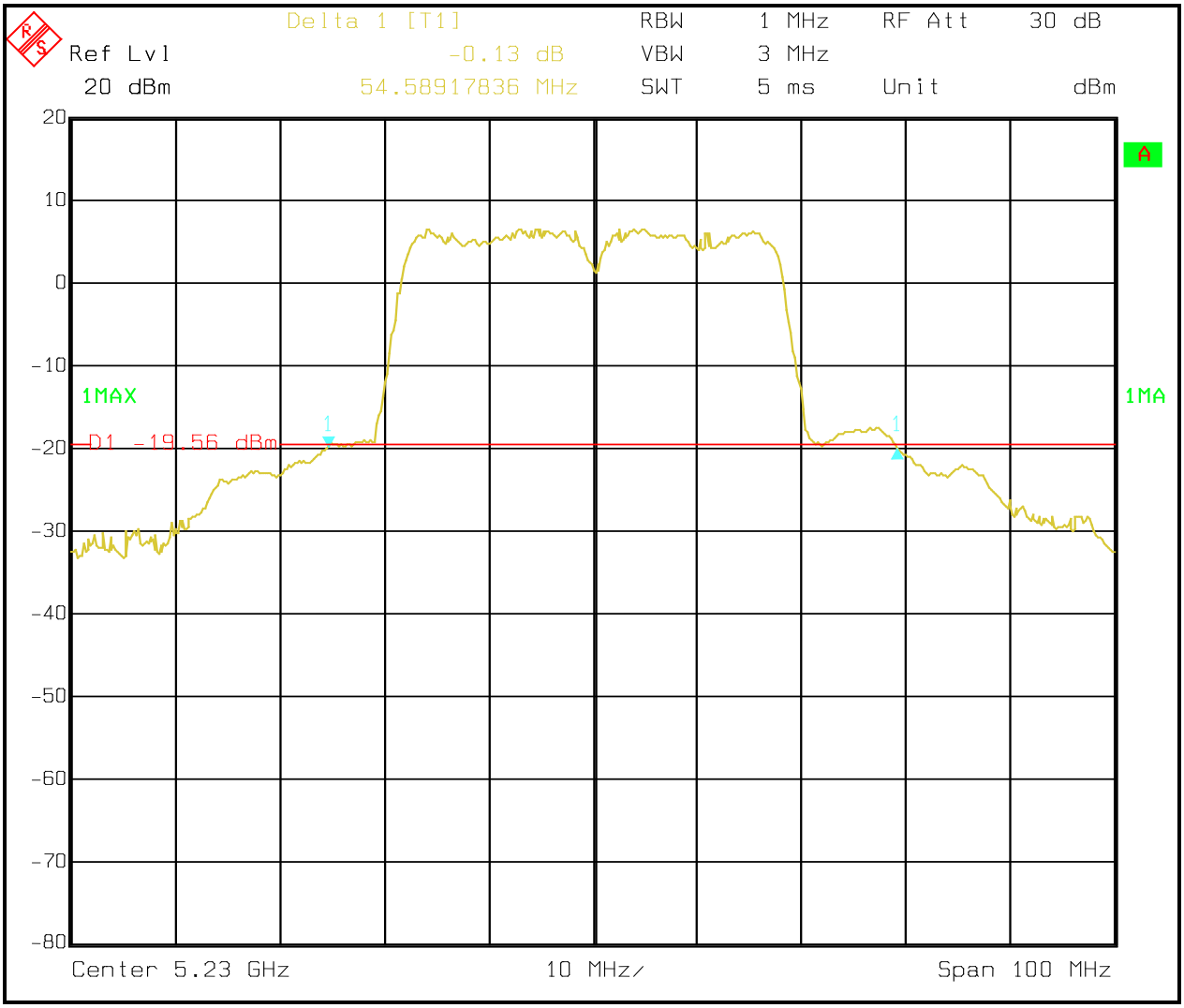
Plot 7-4: 99% OBW – 5200 MHz 802.11a 20 MHz BW



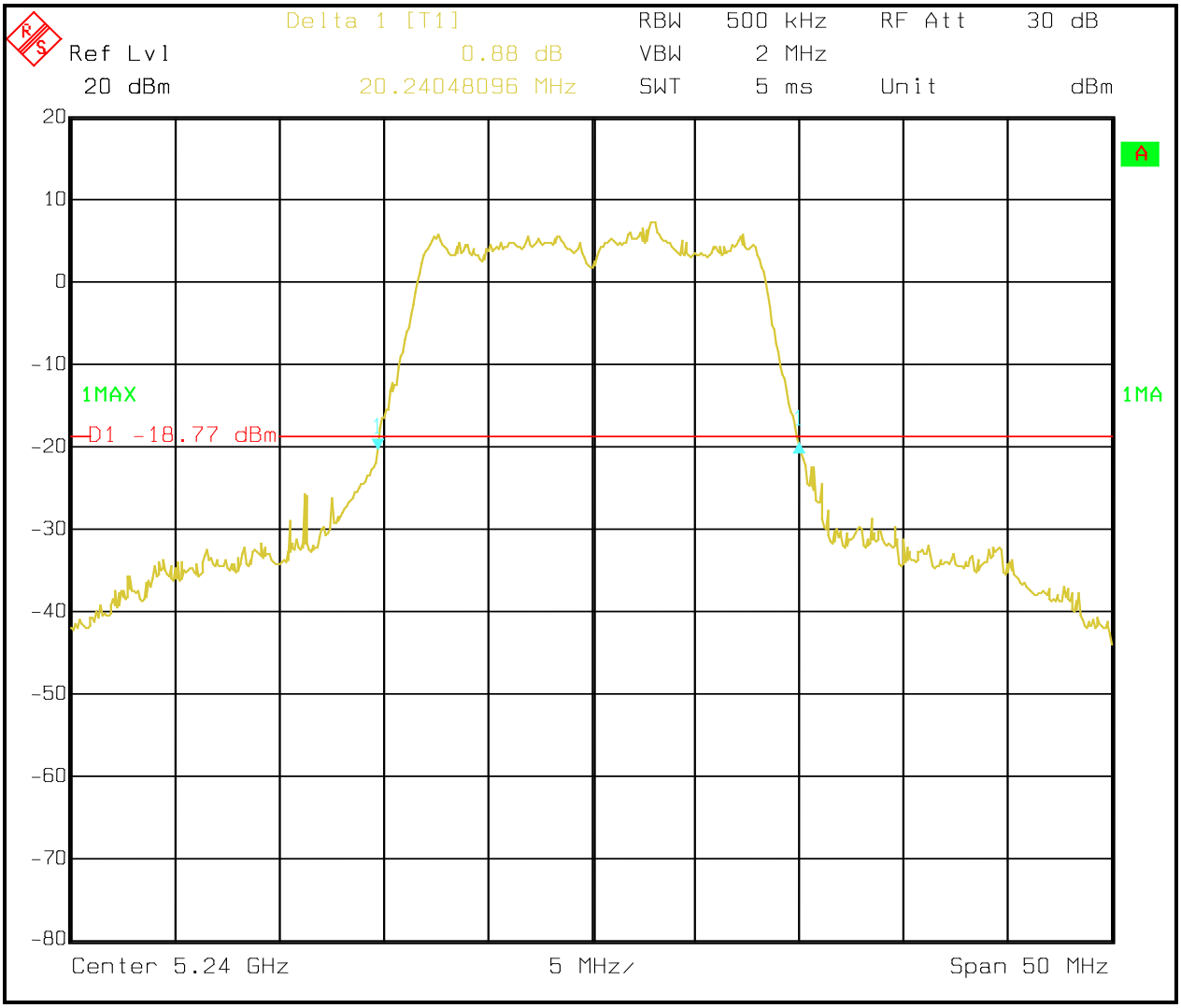
Plot 7-5: 99% OBW – 5200 MHz 802.11n 20 MHz BW



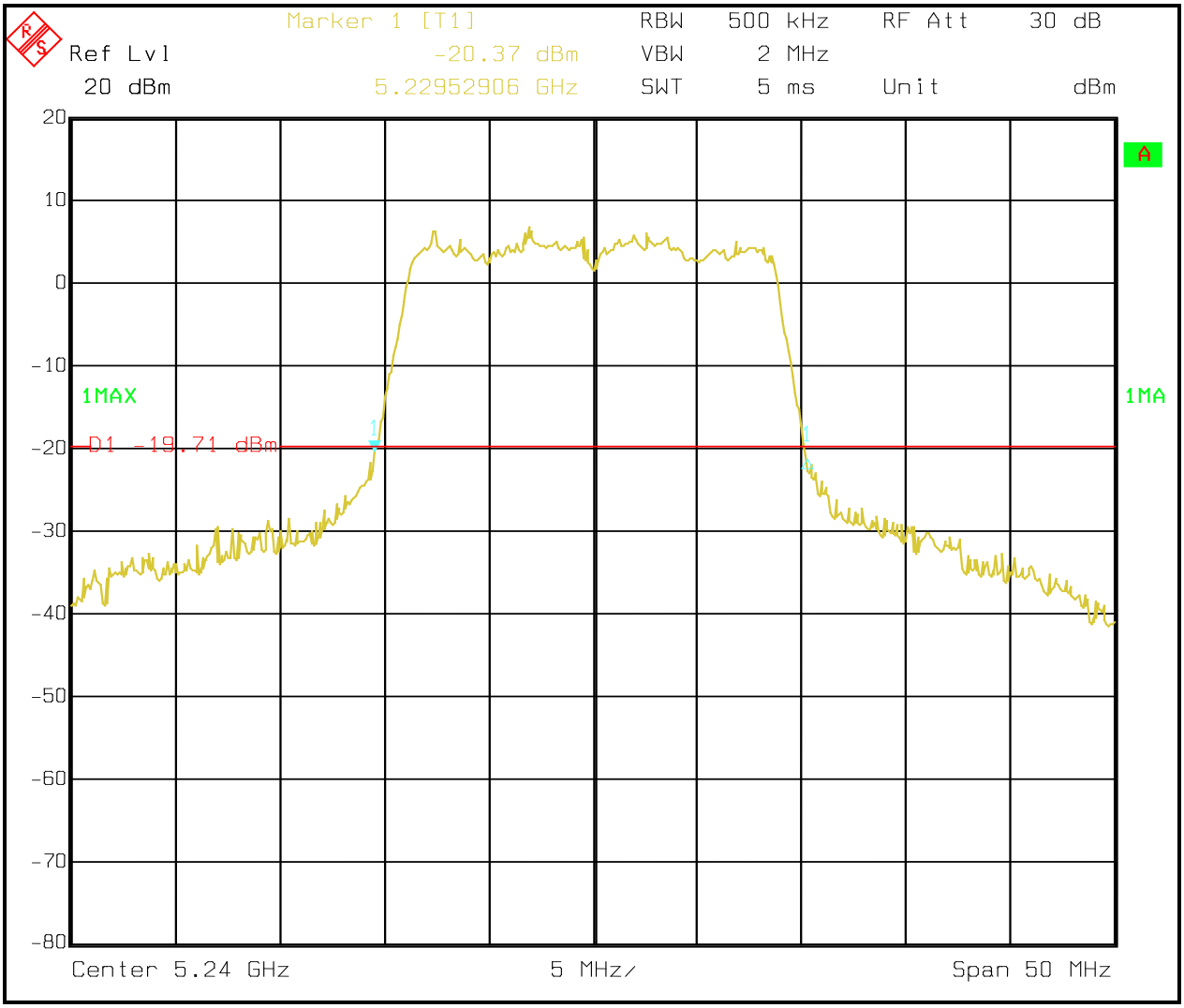
Plot 7-6: 99% OBW – 5230 MHz 802.11n 40 MHz BW



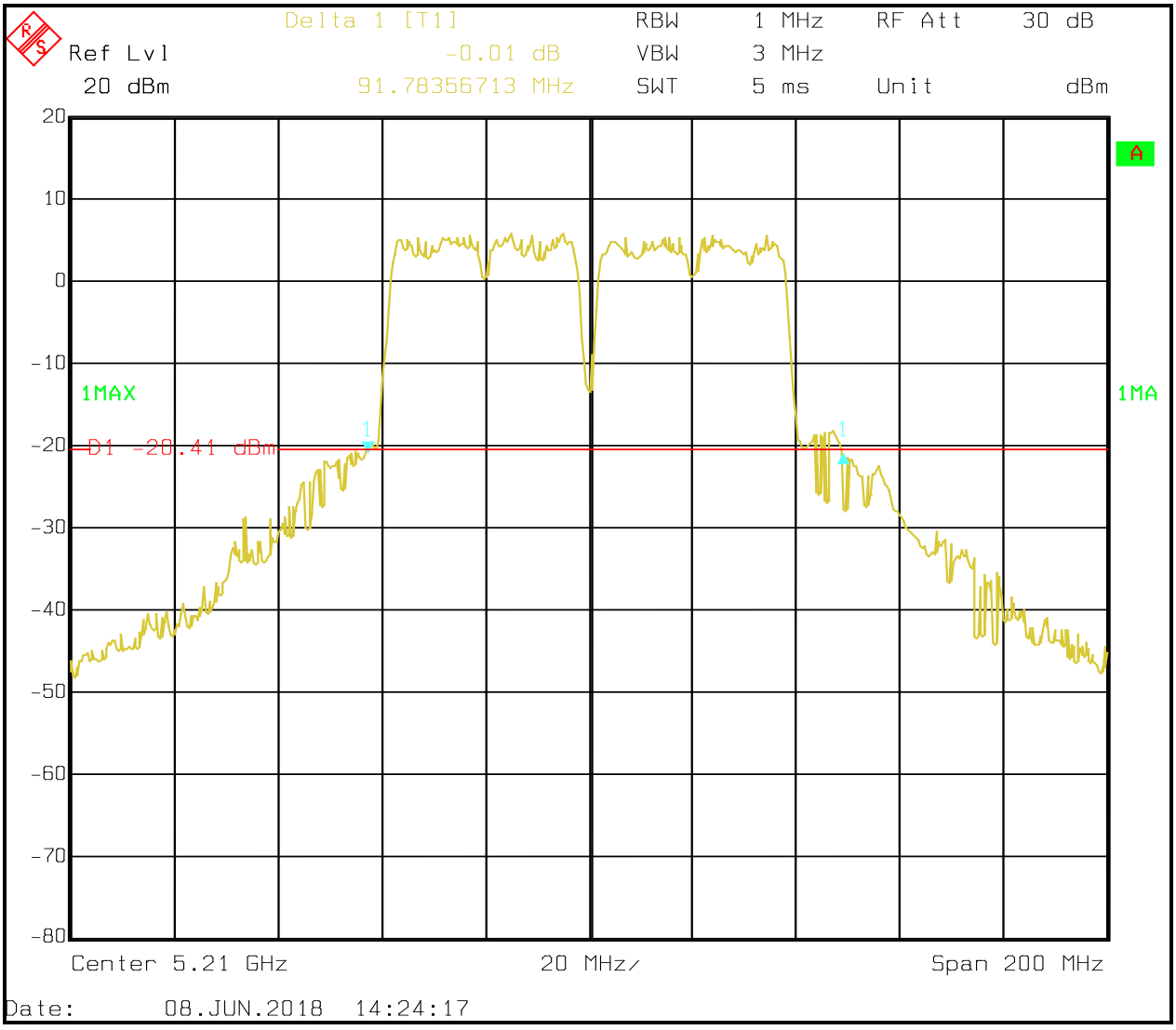
Plot 7-7: 99% OBW – 5240 MHz 802.11a 20 MHz BW



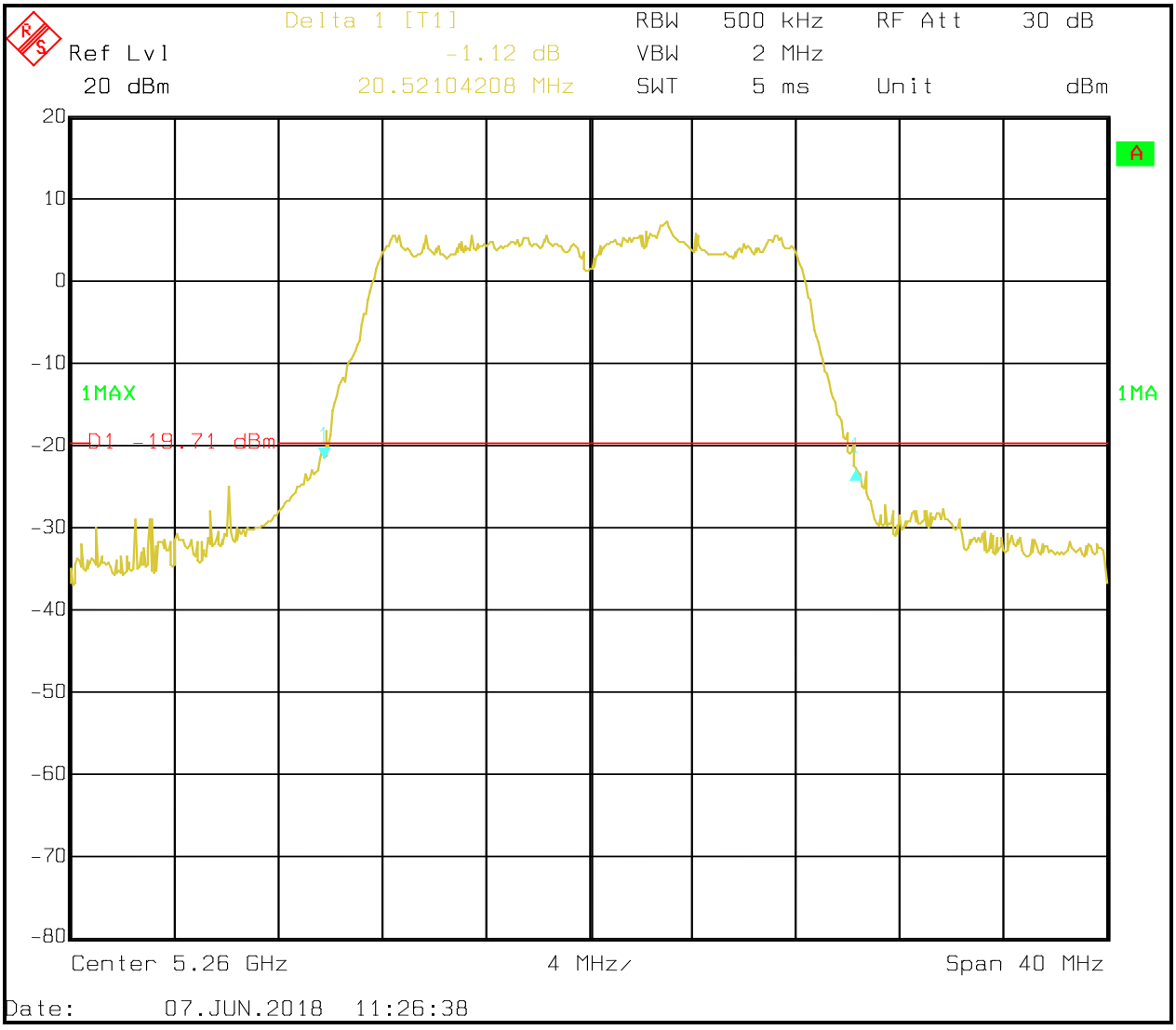
Plot 7-8: 99% OBW – 5240 MHz 802.11n 20 MHz BW



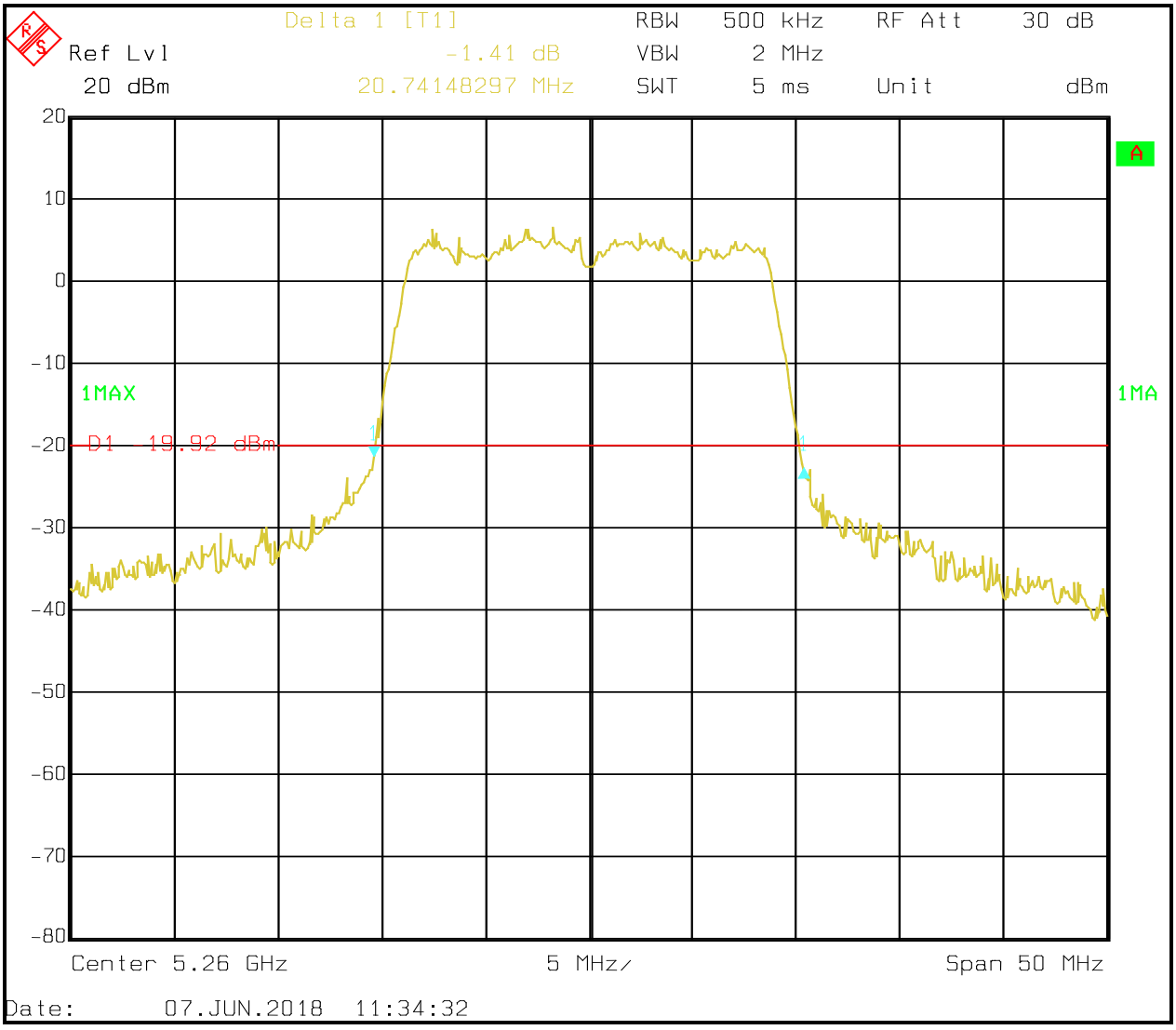
Plot 7-9: 99% OBW – 5210 MHz 802.11ac 80 MHz BW



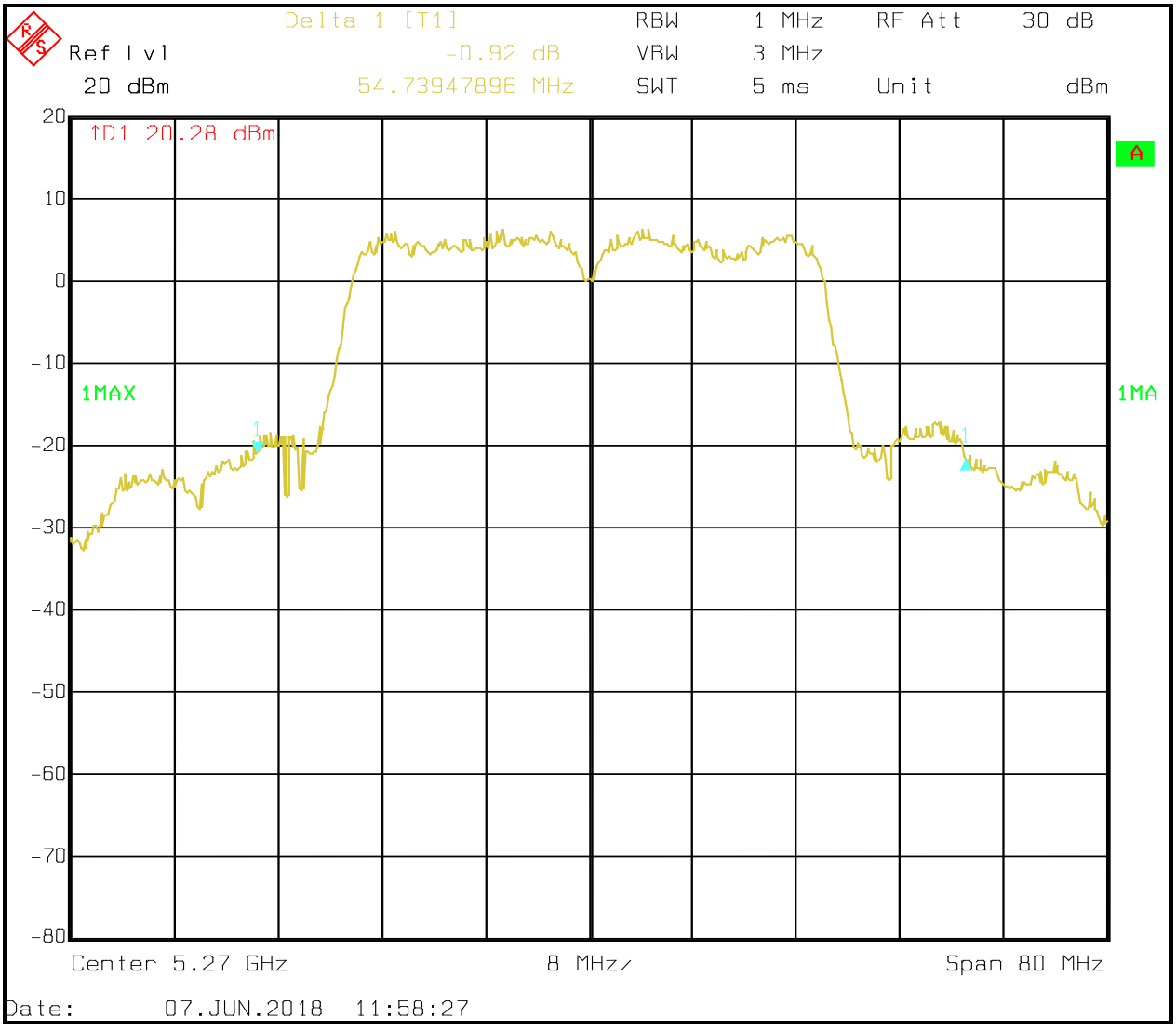
Plot 7-10: 99% OBW – 5260 MHz 802.11a 20 MHz BW



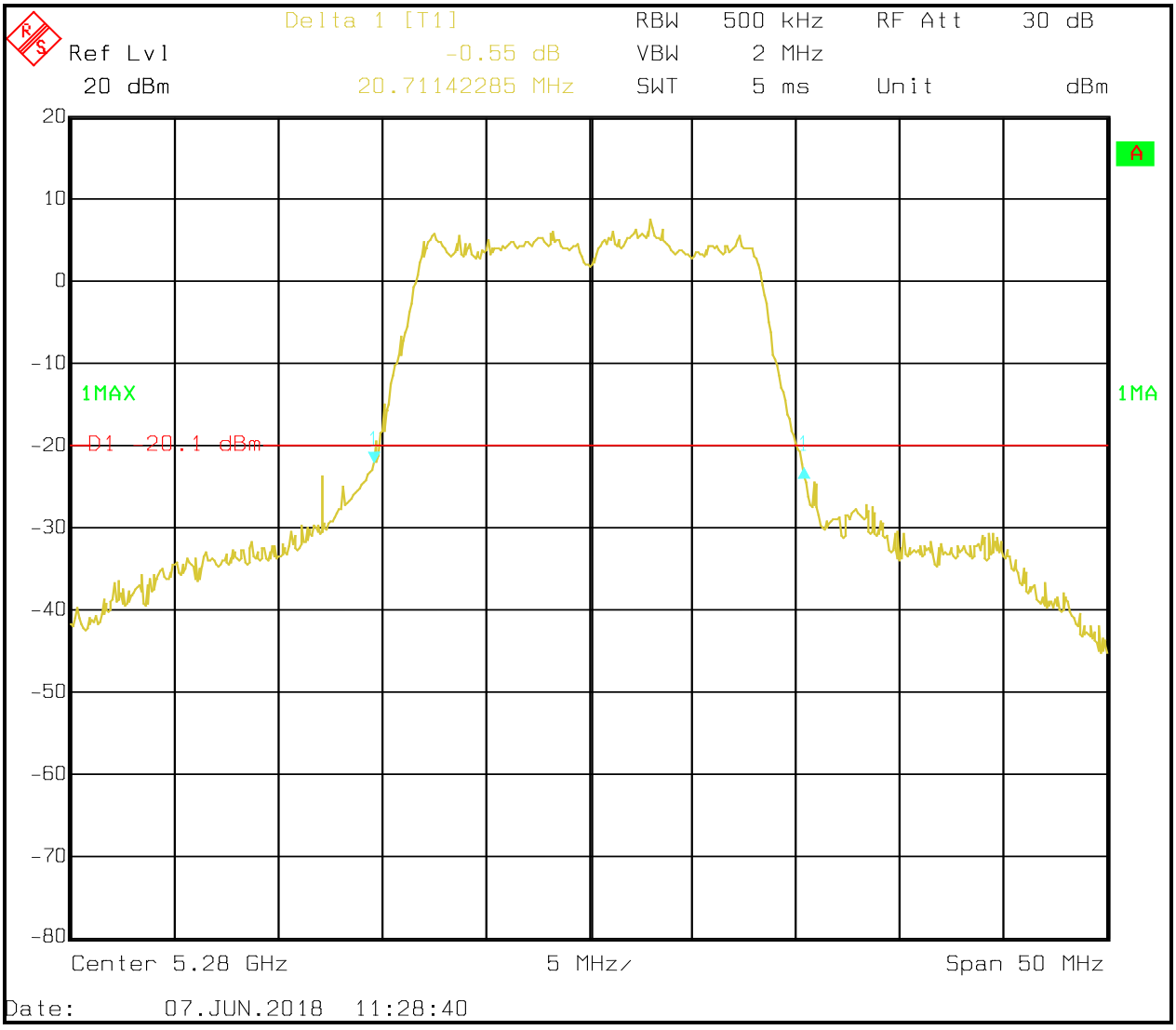
Plot 7-11: 99% OBW – 5260 MHz 802.11n 20 MHz BW



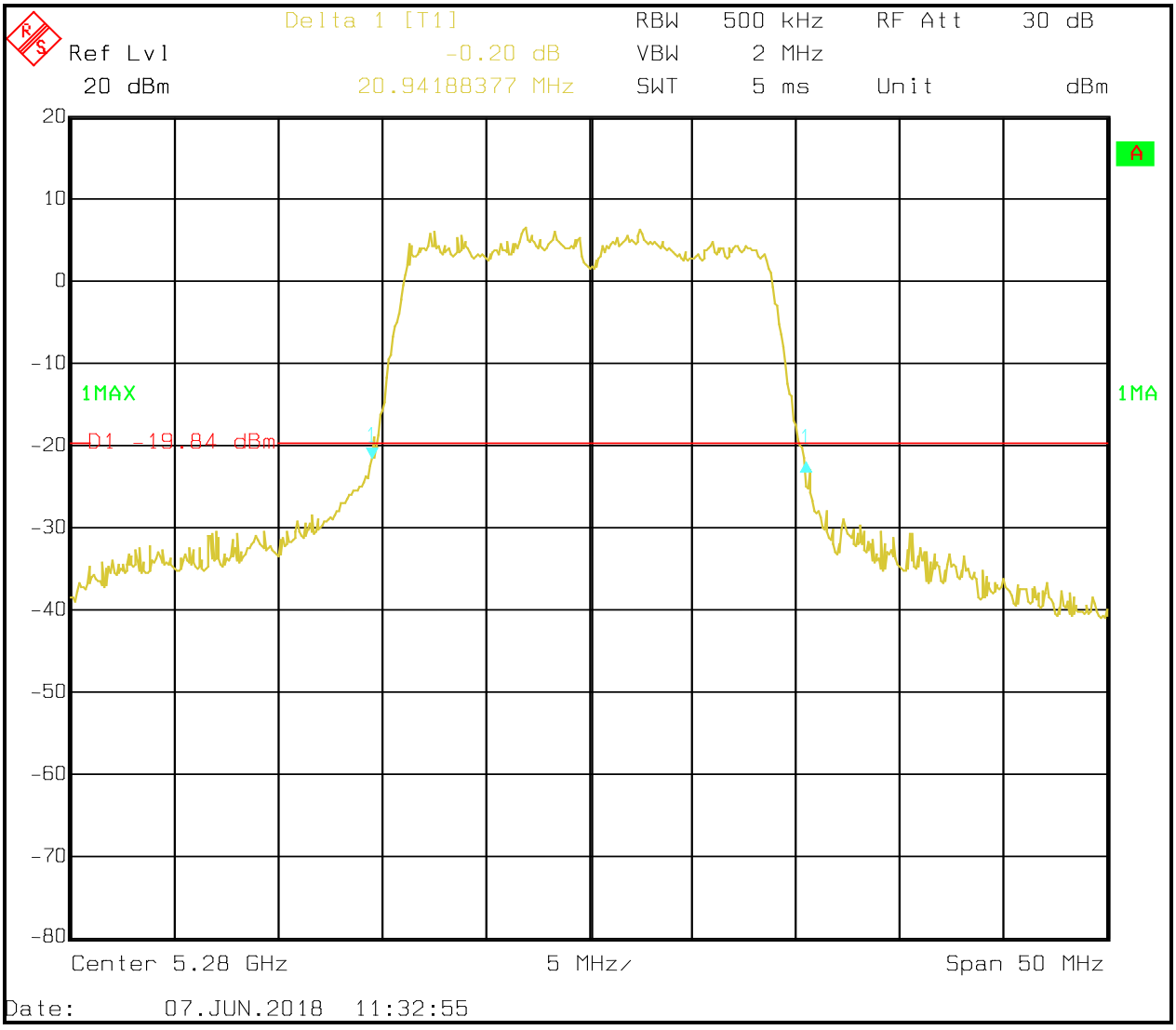
Plot 7-12: 99% OBW – 5270 MHz 802.11n 40 MHz BW



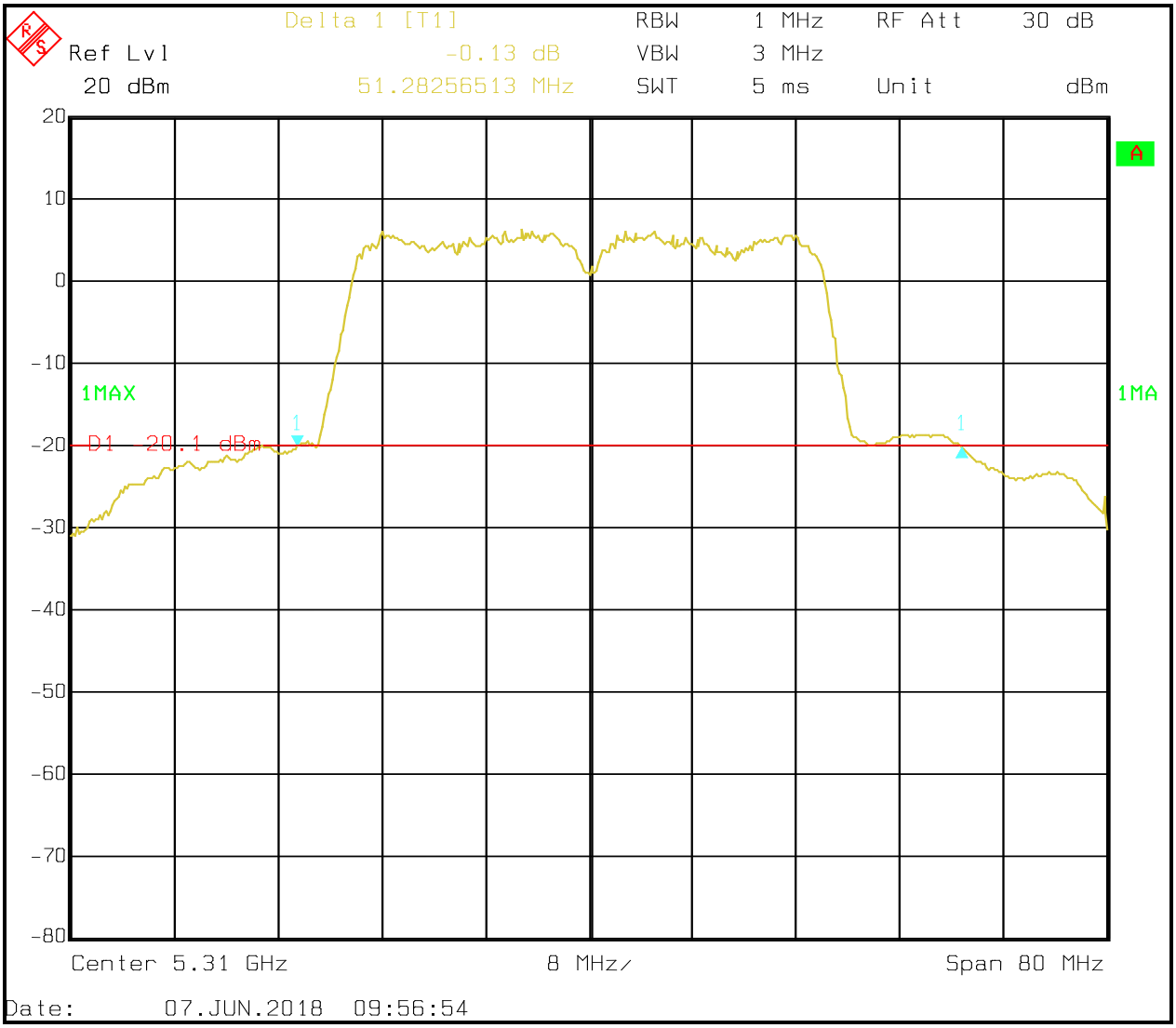
Plot 7-13: 99% OBW – 5280 MHz 802.11a 20 MHz BW



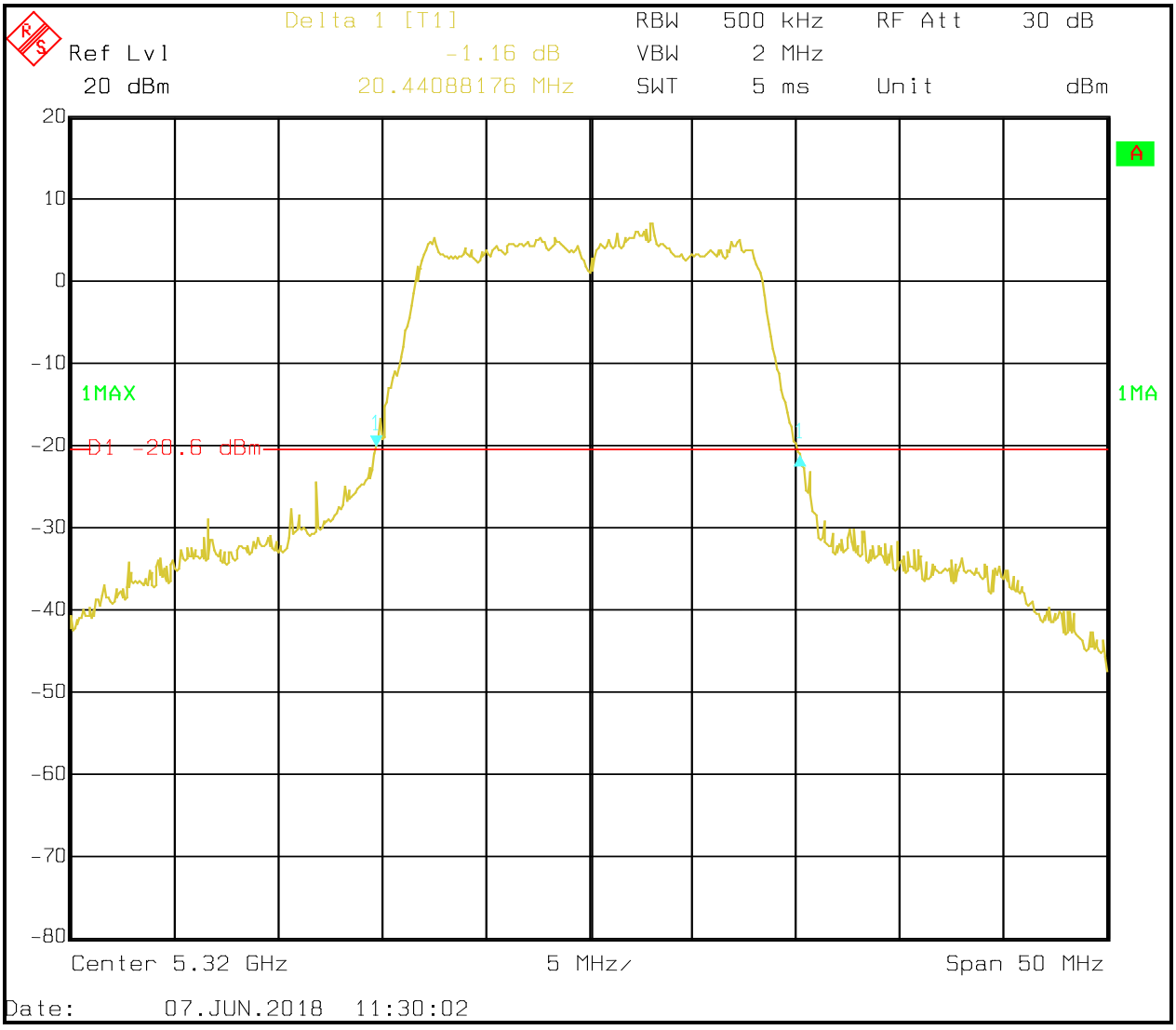
Plot 7-14: 99% OBW – 5280 MHz 802.11n 20 MHz BW



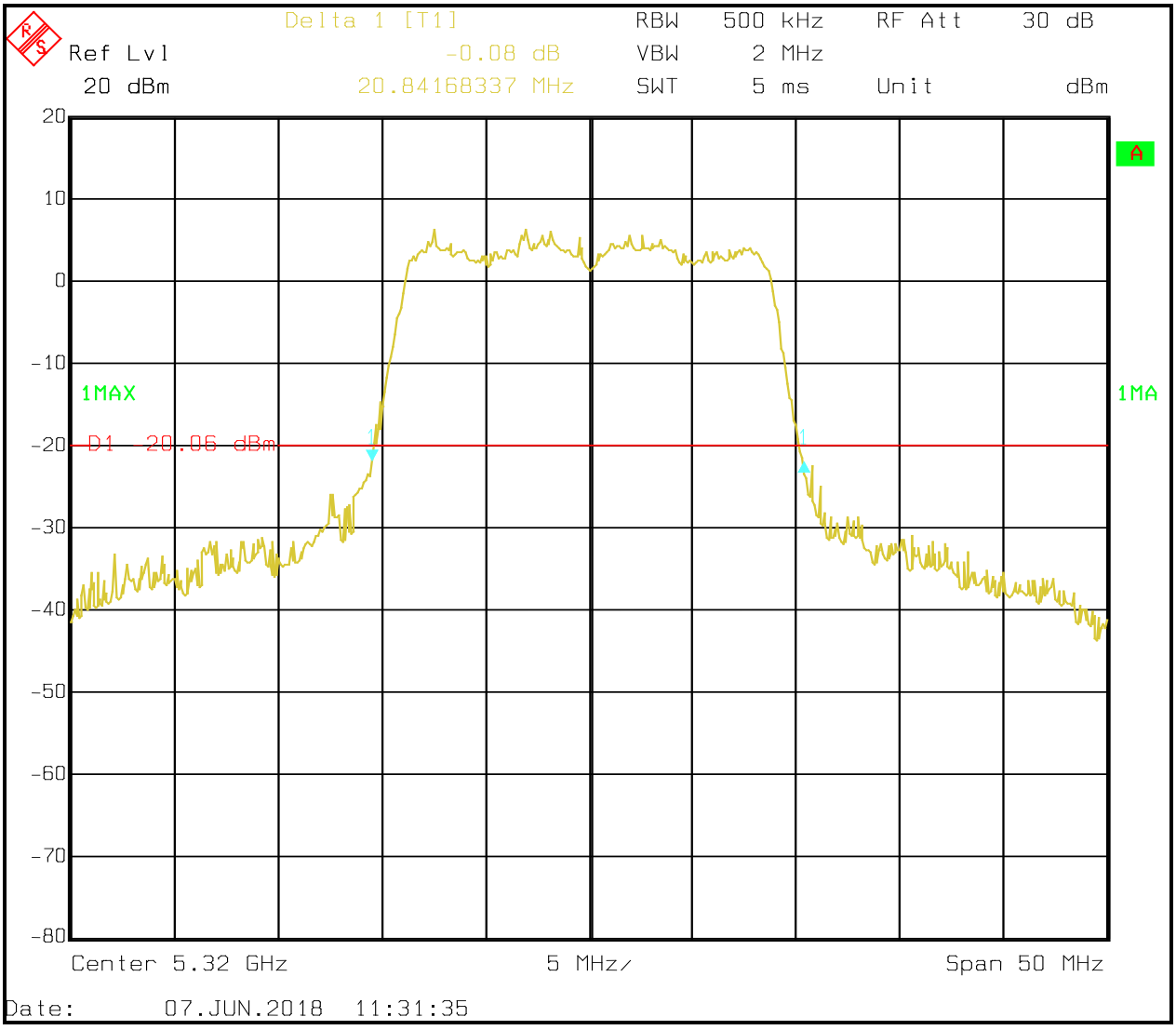
Plot 7-15: 99% OBW – 5310 MHz 802.11n 40 MHz BW



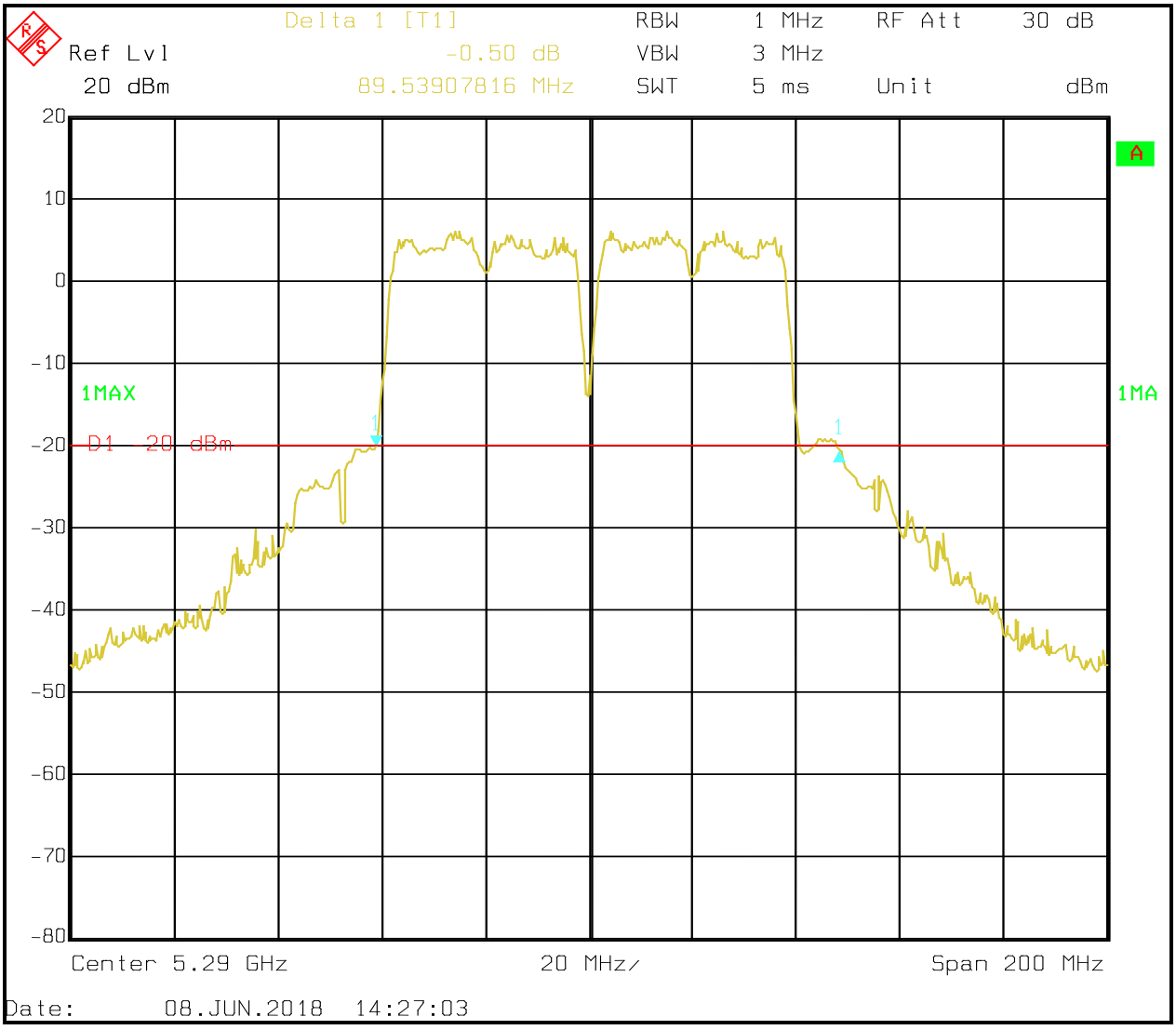
Plot 7-16: 99% OBW – 5320 MHz 802.11a 20 MHz BW



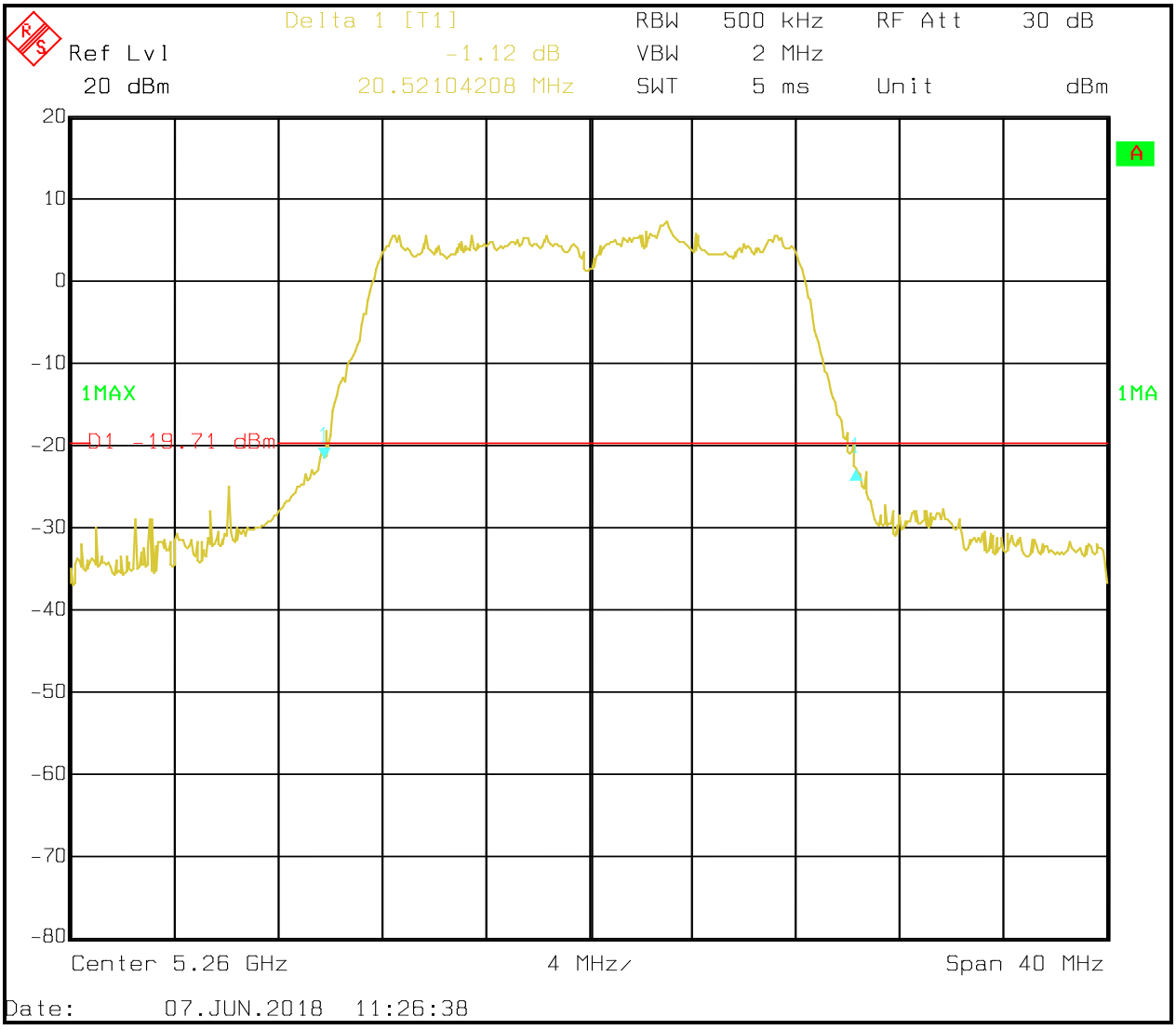
Plot 7-17: 99% OBW – 5320 MHz 802.11n 20 MHz BW



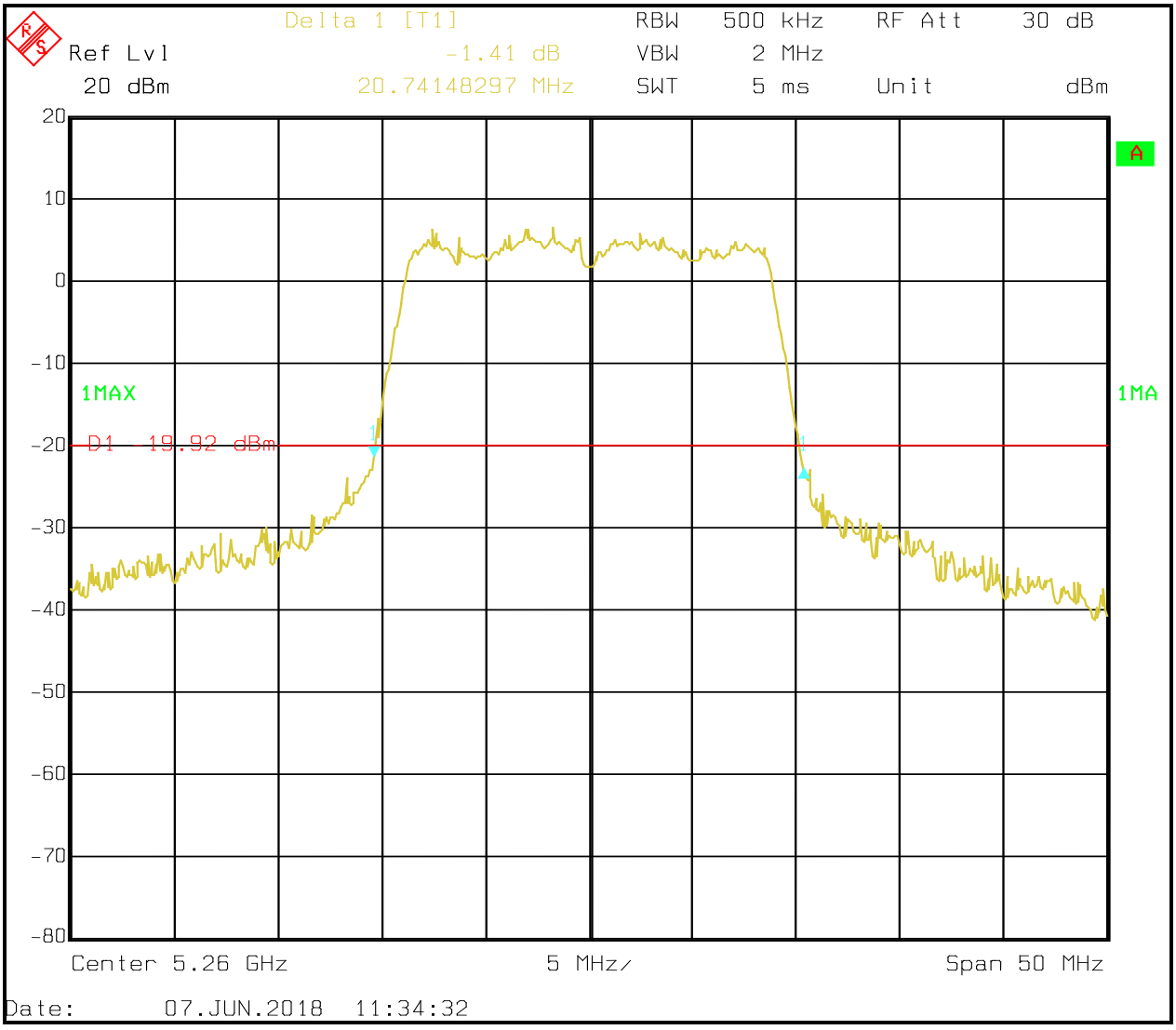
Plot 7-18: 99% OBW – 5290 MHz 802.11ac 80 MHz BW



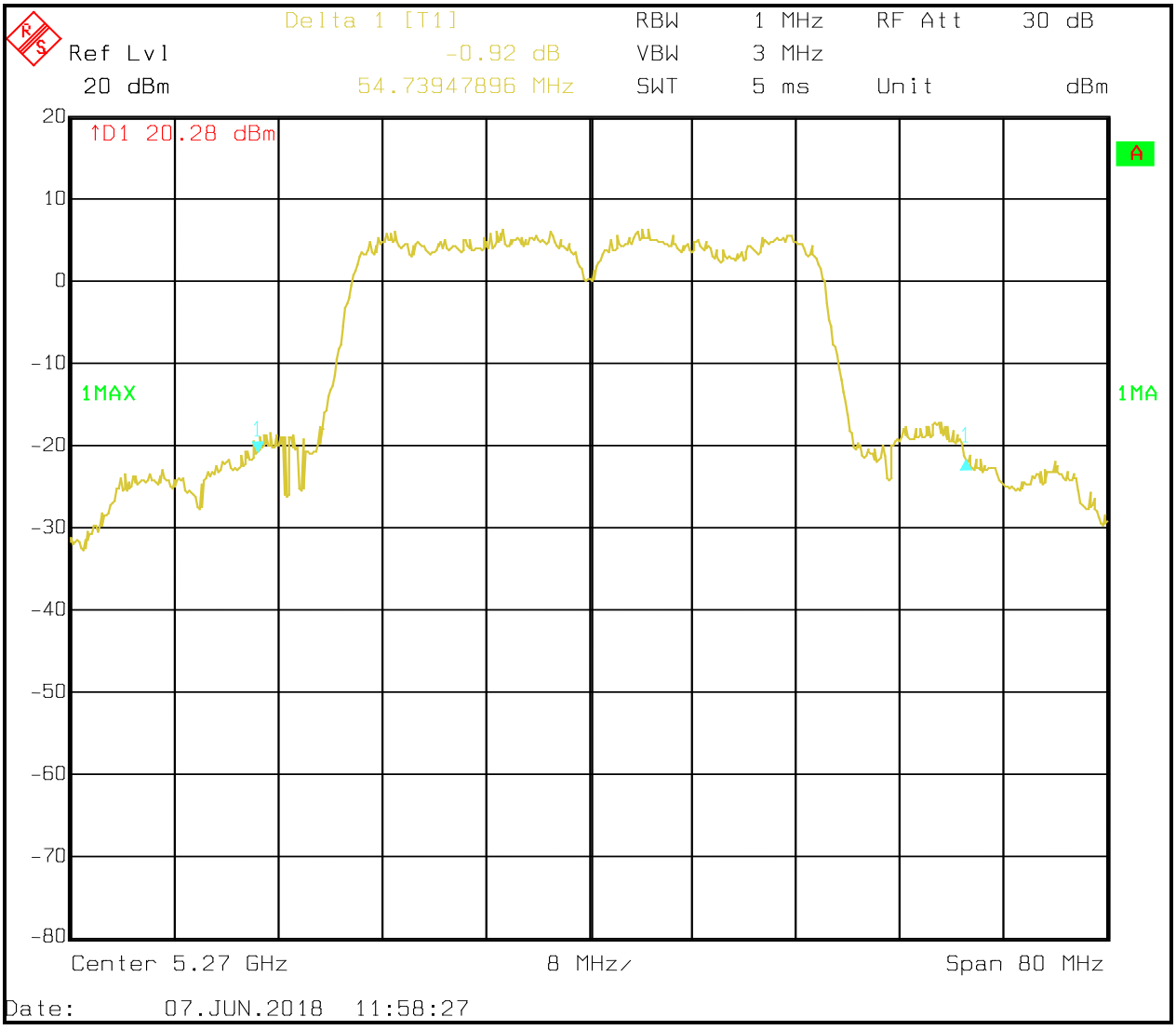
Plot 7-19: 99% OBW – 5260 MHz 802.11a 20 MHz BW



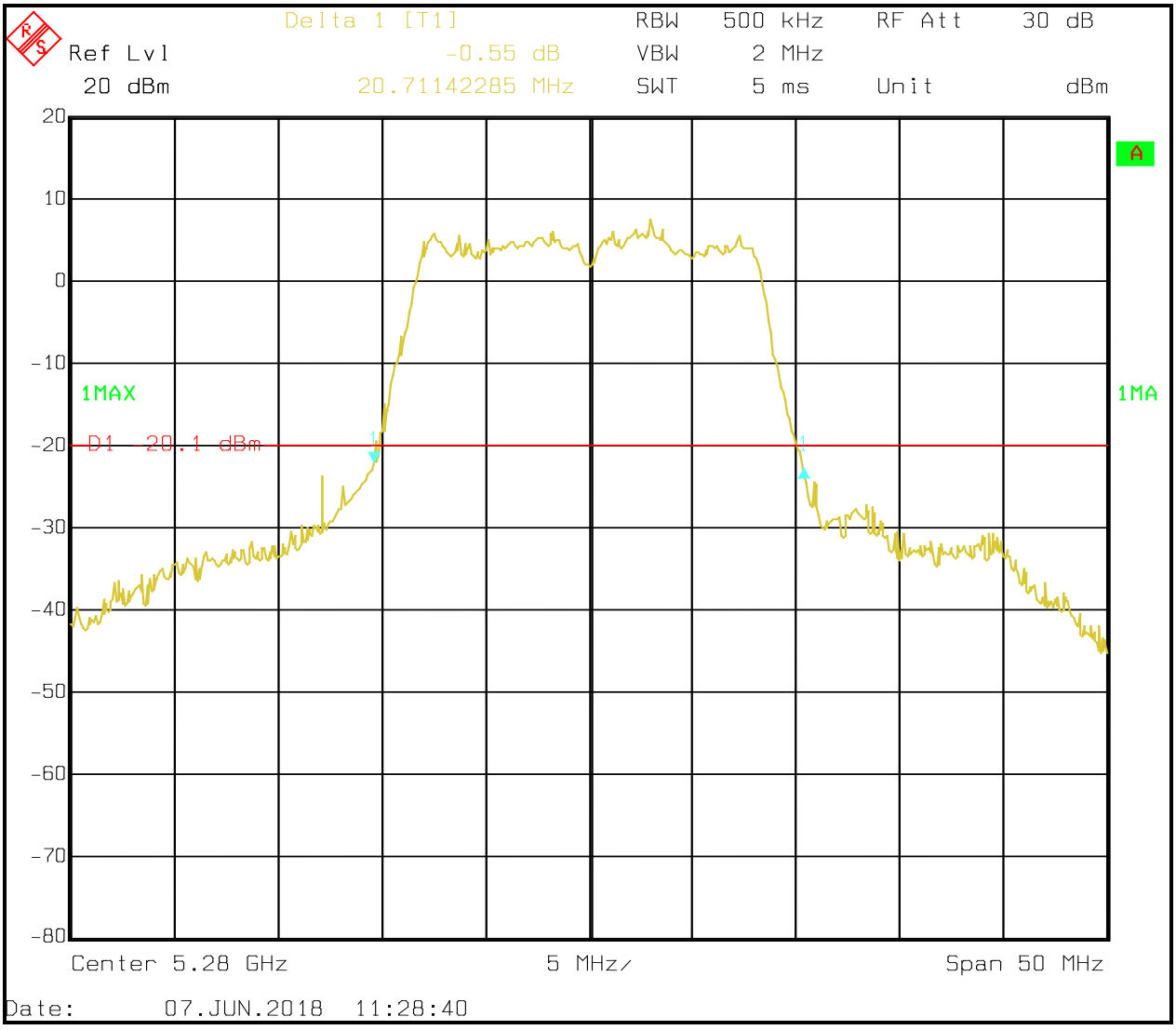
Plot 7-20: 99% OBW – 5260 MHz 802.11n 20 MHz BW



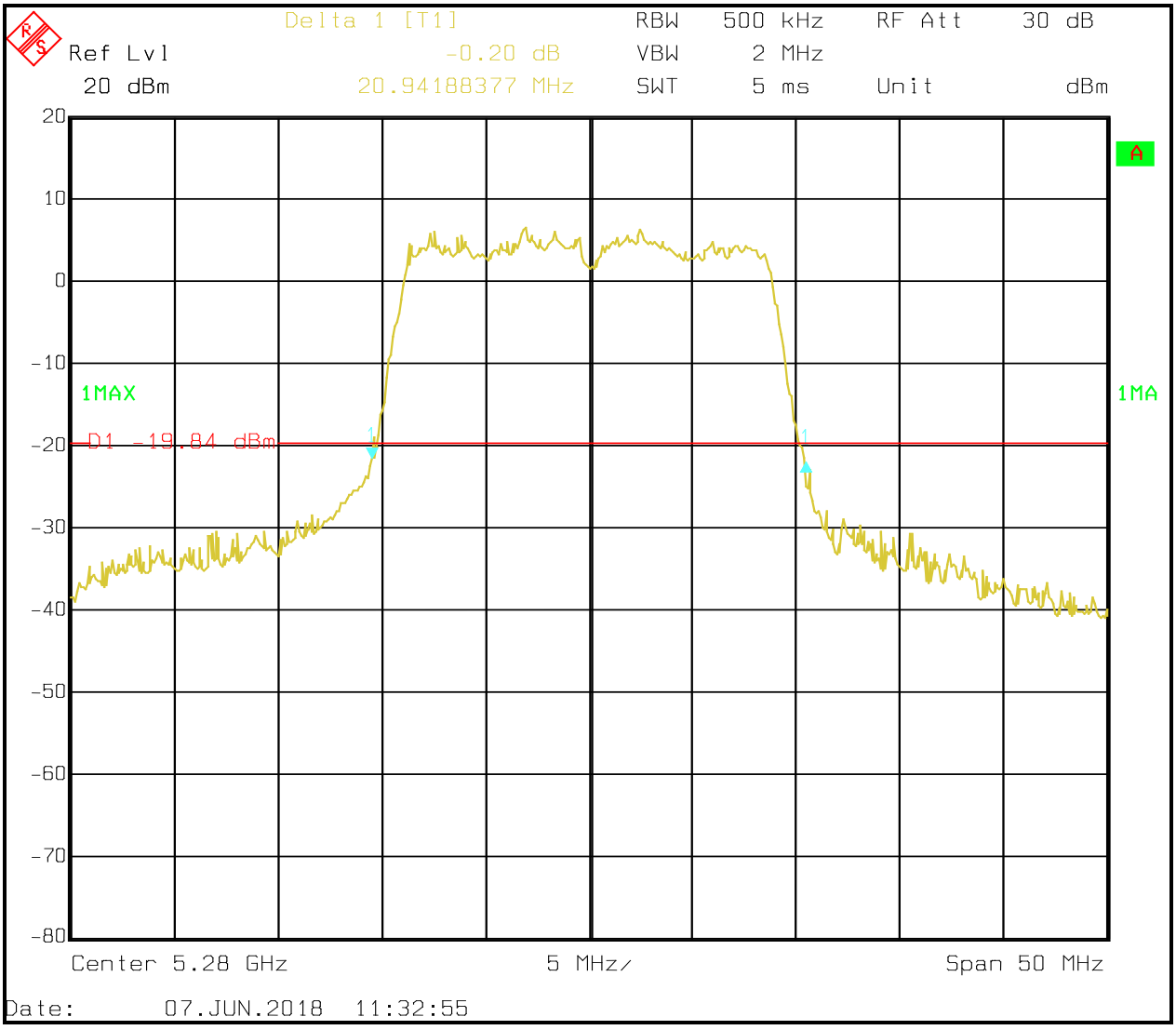
Plot 7-21: 99% OBW – 5270 MHz 802.11n 40 MHz BW



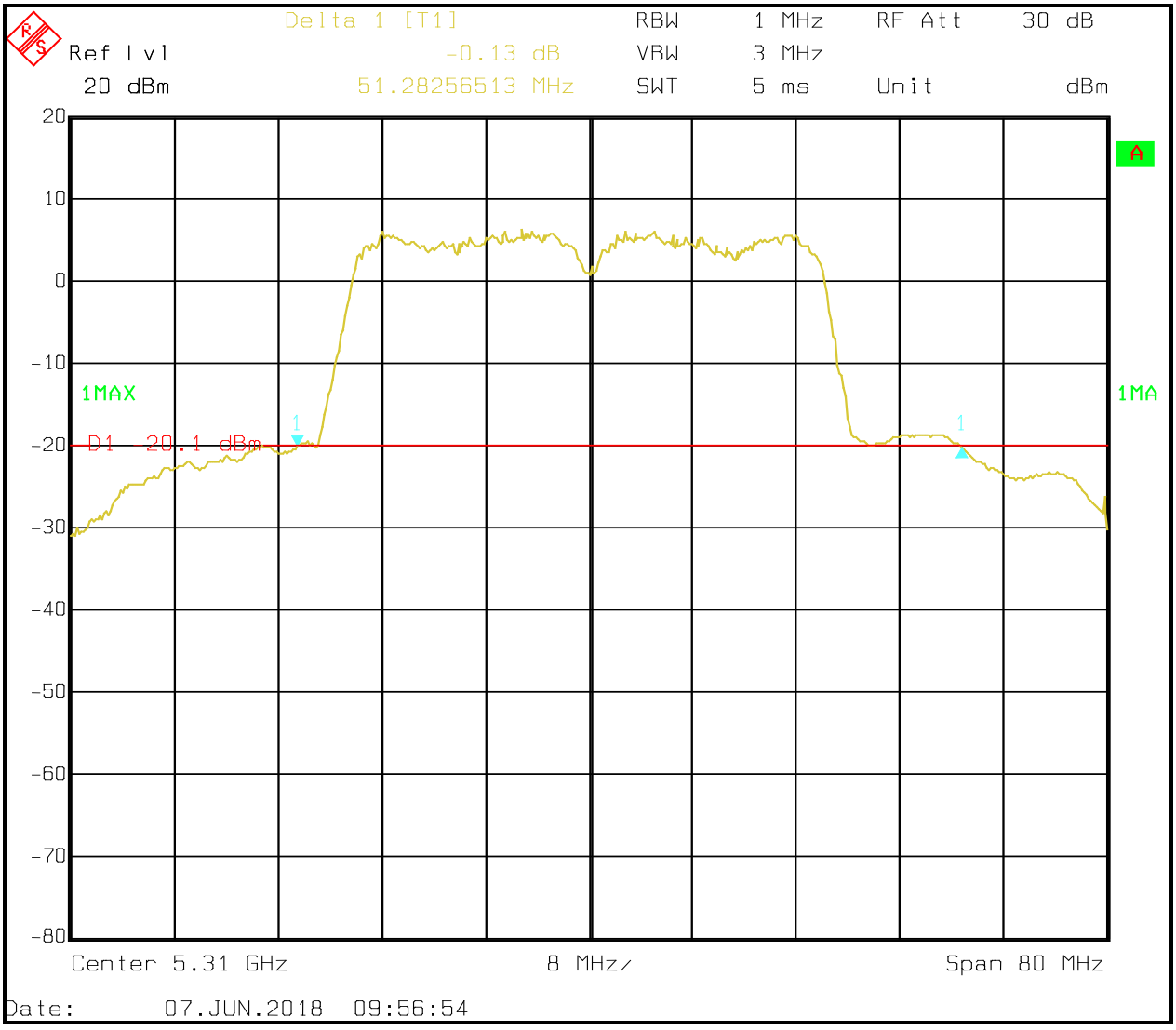
Plot 7-22: 99% OBW – 5280 MHz 802.11a 20 MHz BW



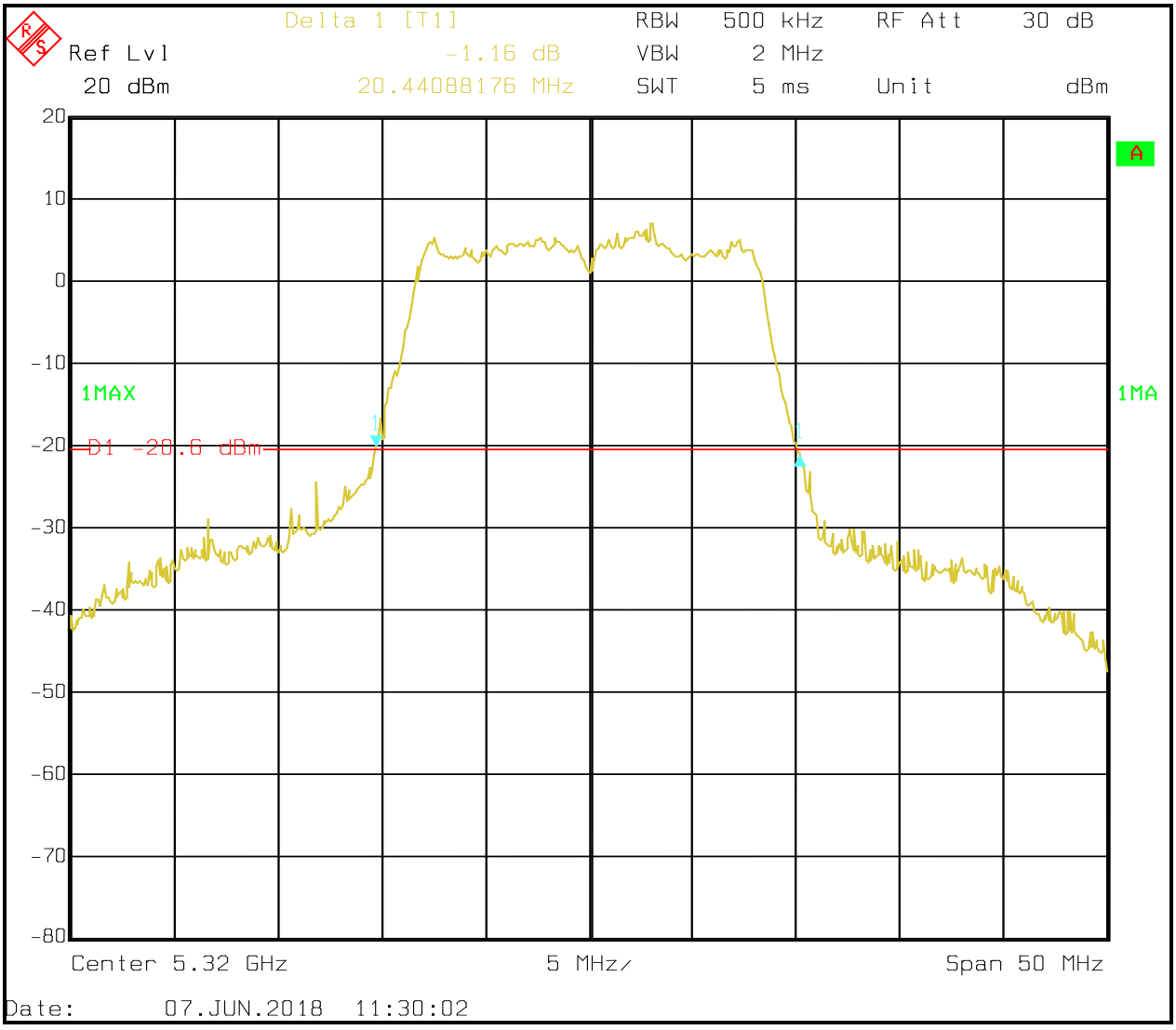
Plot 7-23: 99% OBW – 5280 MHz 802.11n 20 MHz BW



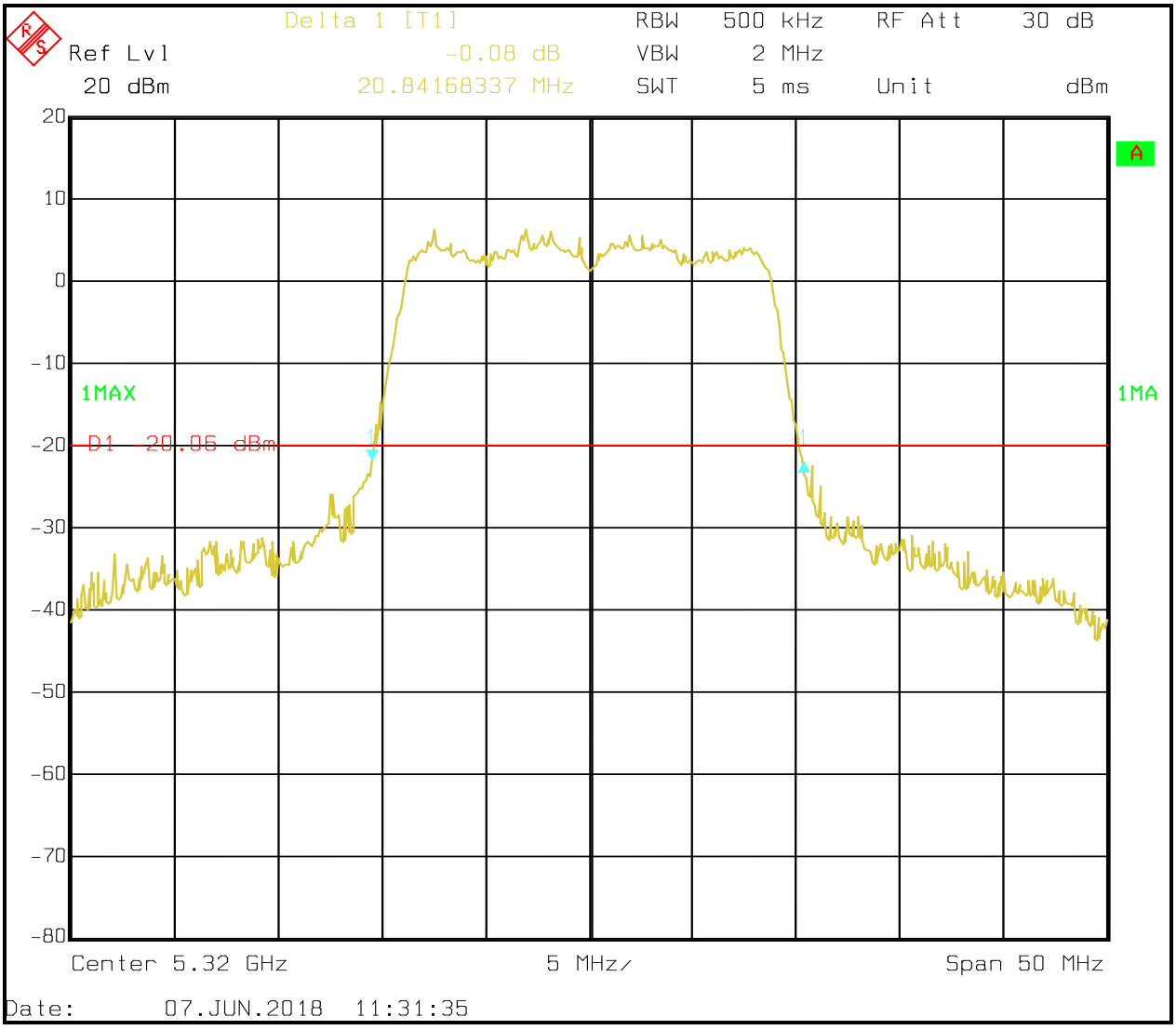
Plot 7-24: 99% OBW – 5310 MHz 802.11n 40 MHz BW



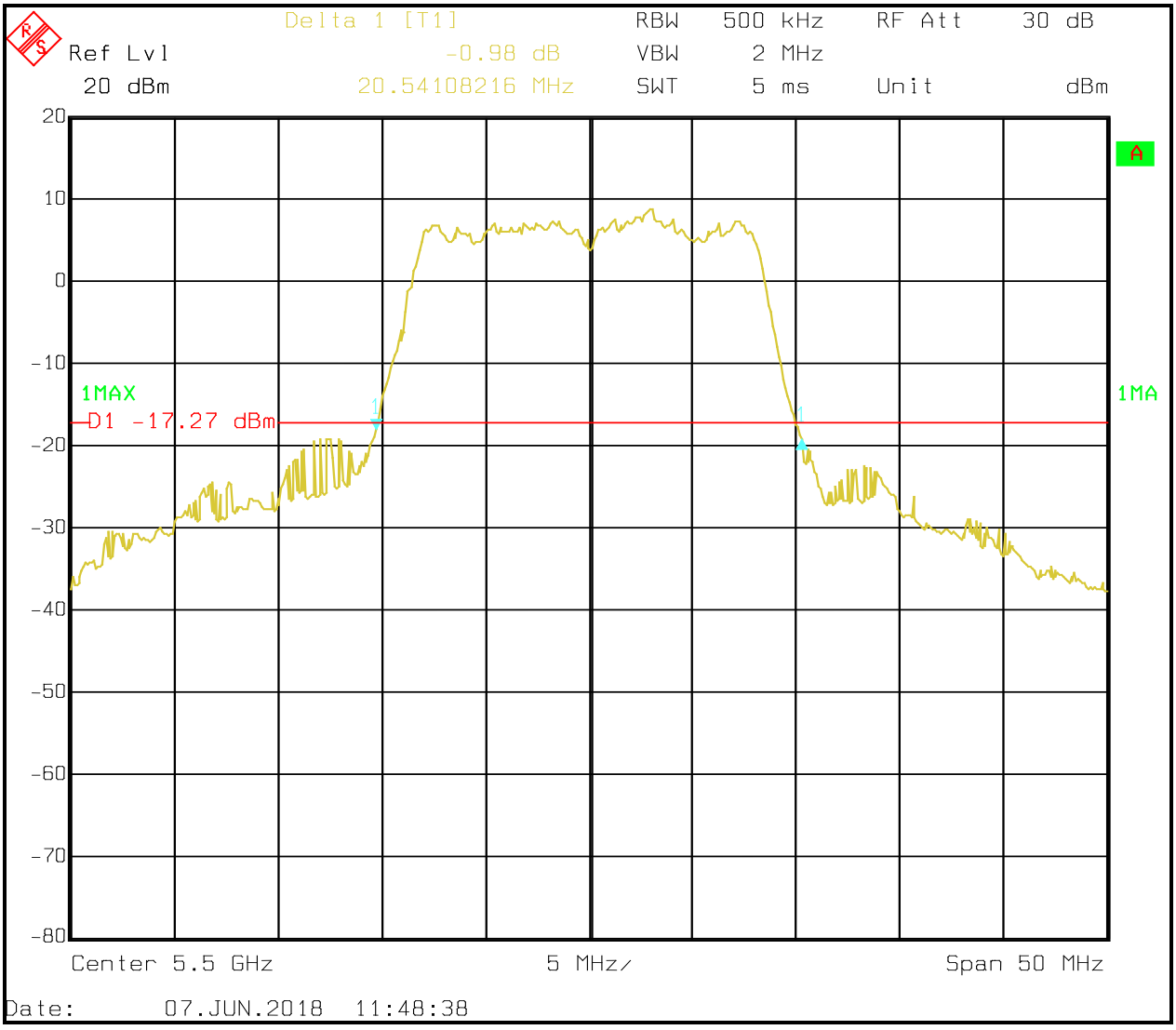
Plot 7-25: 99% OBW – 5320 MHz 802.11a 20 MHz BW



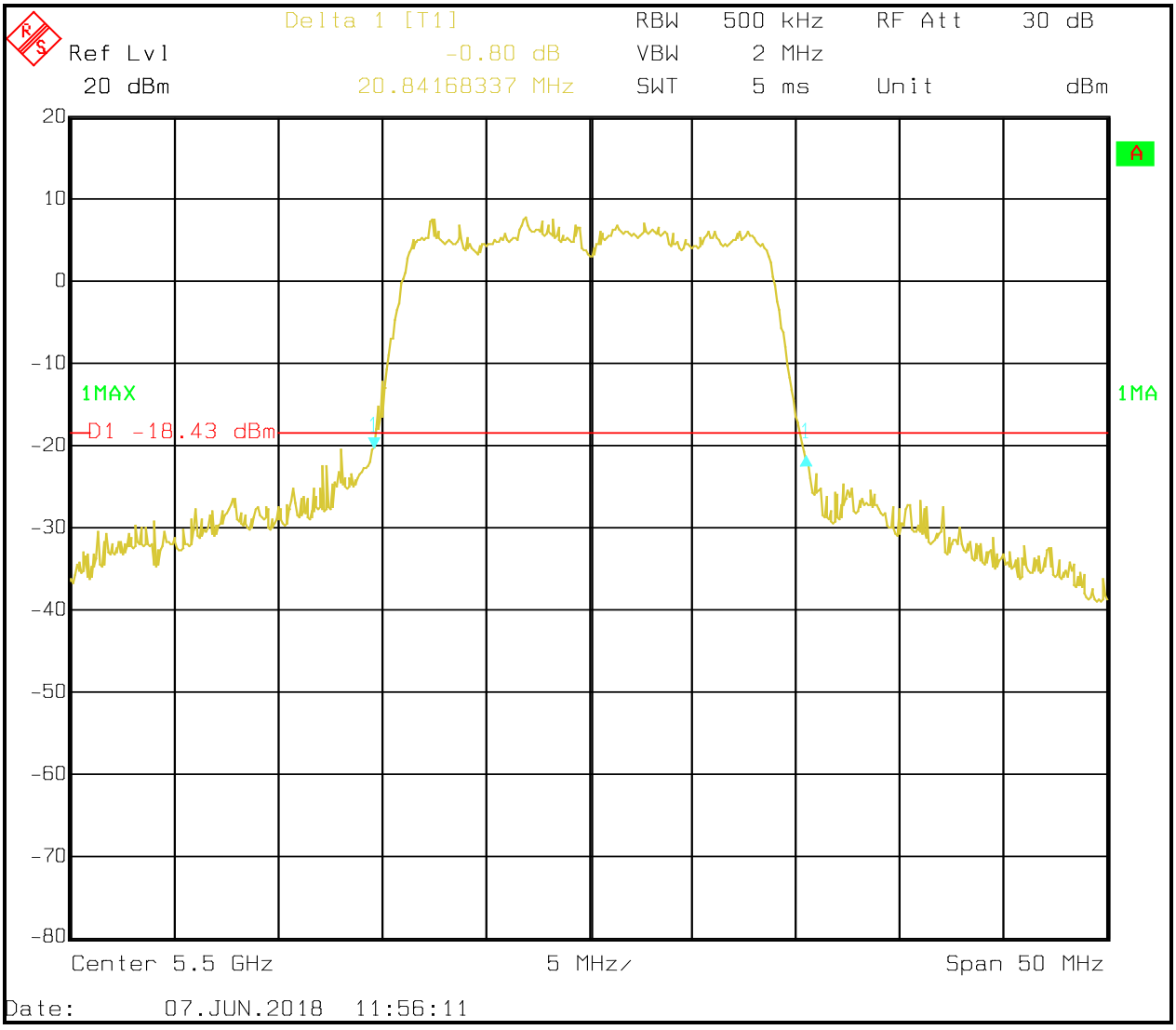
Plot 7-26: 99% OBW – 5320 MHz 802.11n 20 MHz BW



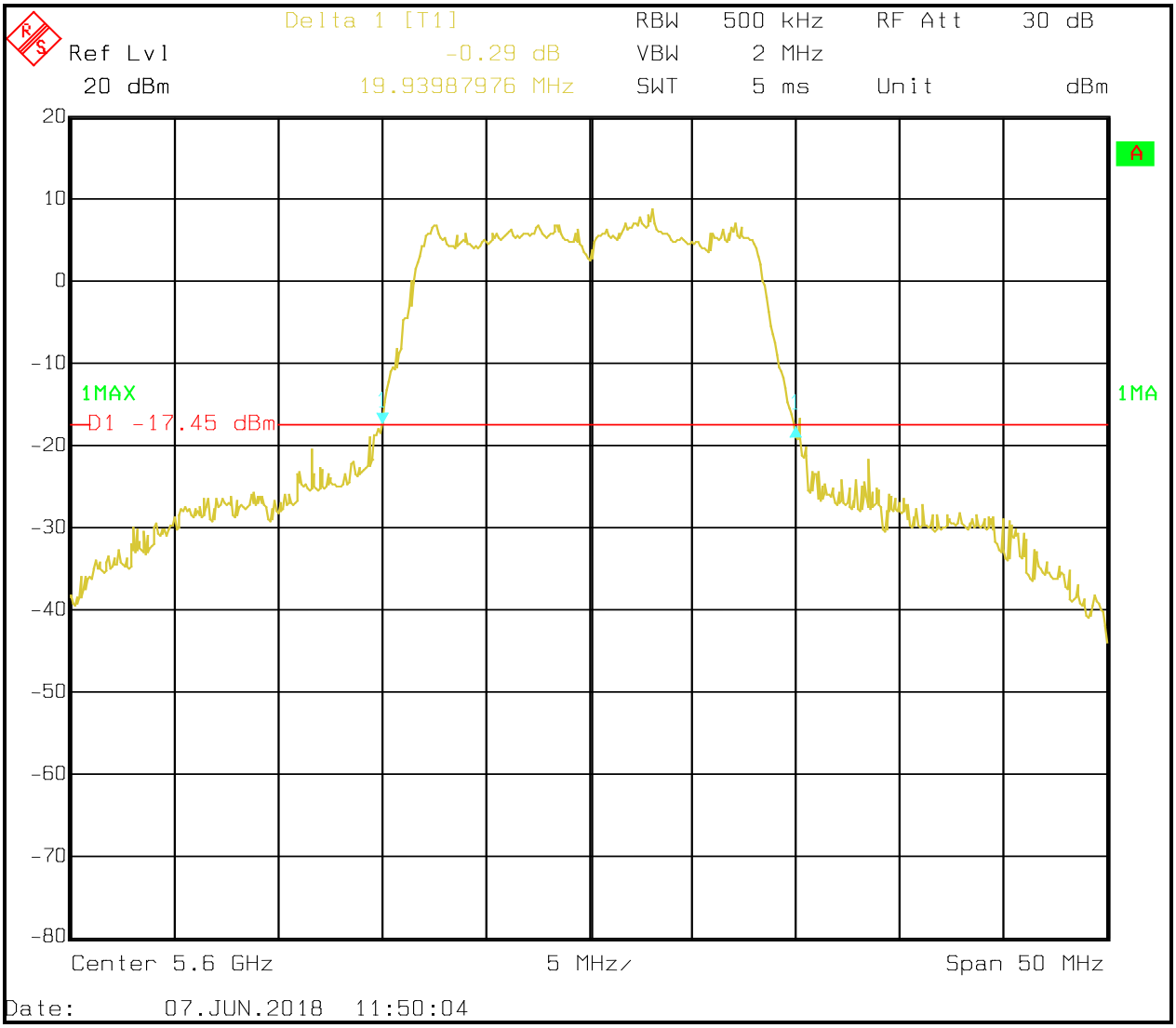
Plot 7-27: 99% OBW – 5500 MHz 802.11a 20 MHz BW



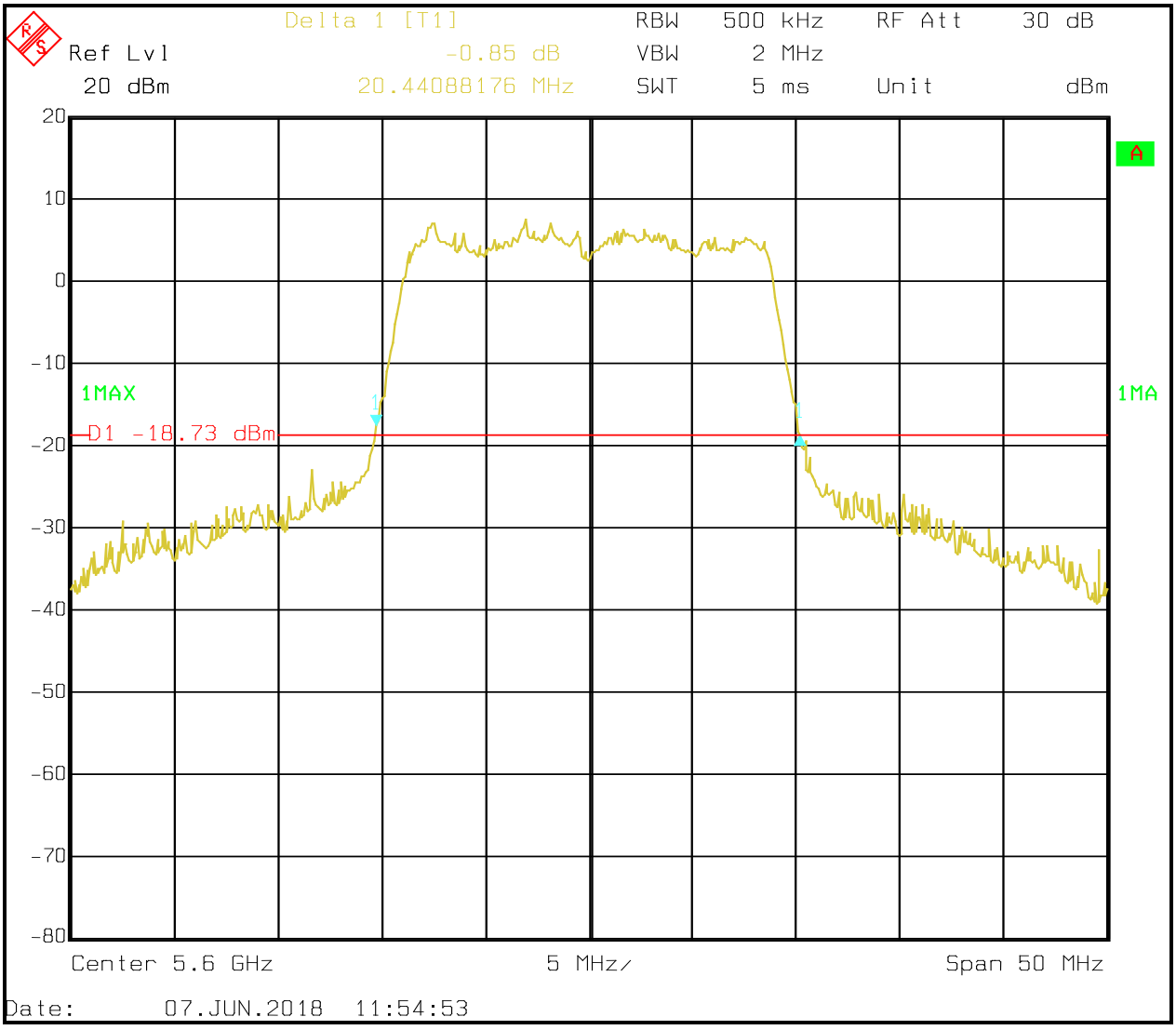
Plot 7-28: 99% OBW – 5550 MHz 802.11n 20 MHz BW



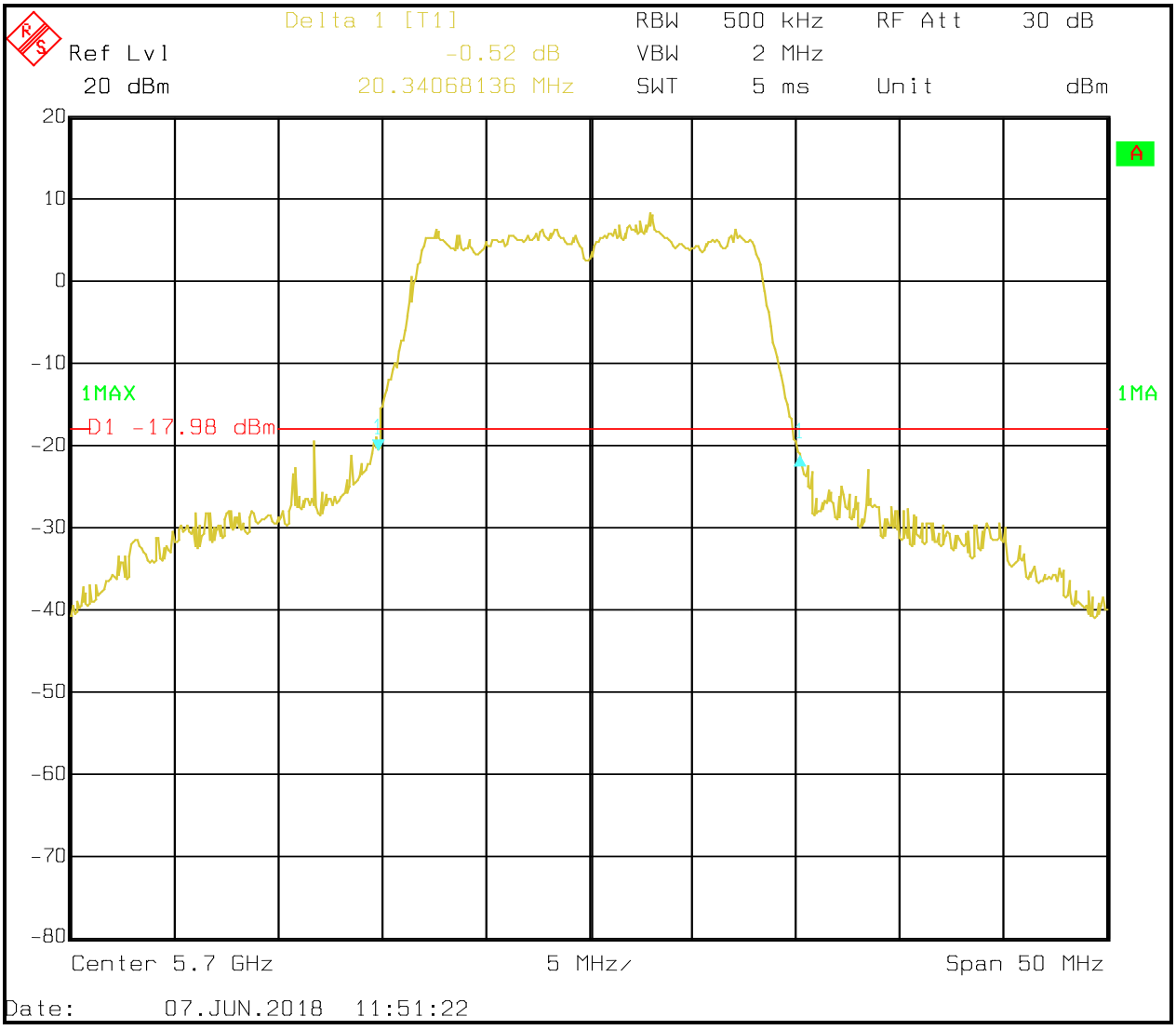
Plot 7-29: 99% OBW – 5600 MHz 802.11a 20 MHz BW



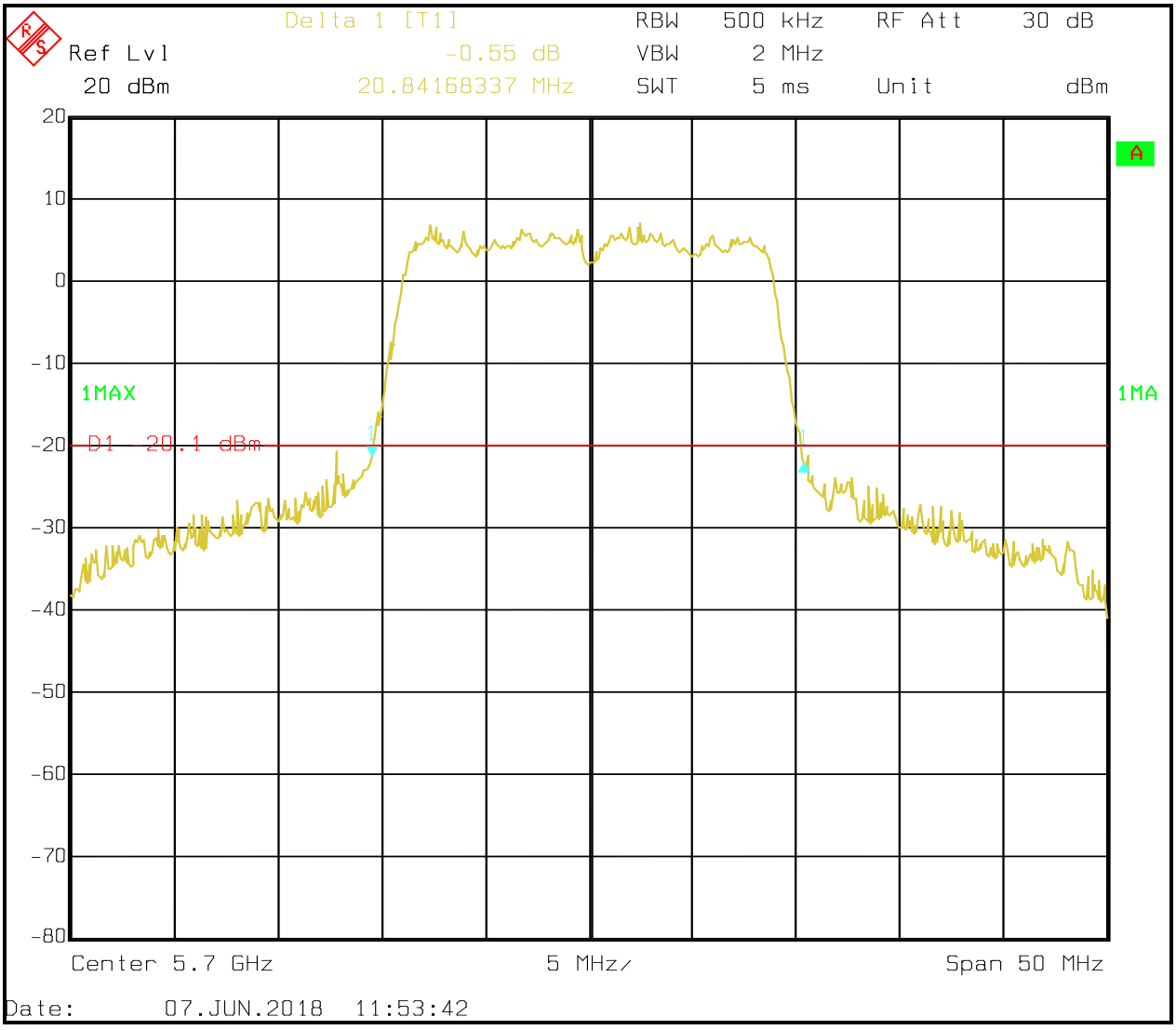
Plot 7-30: 99% OBW – 5650 MHz 802.11n 20 MHz BW



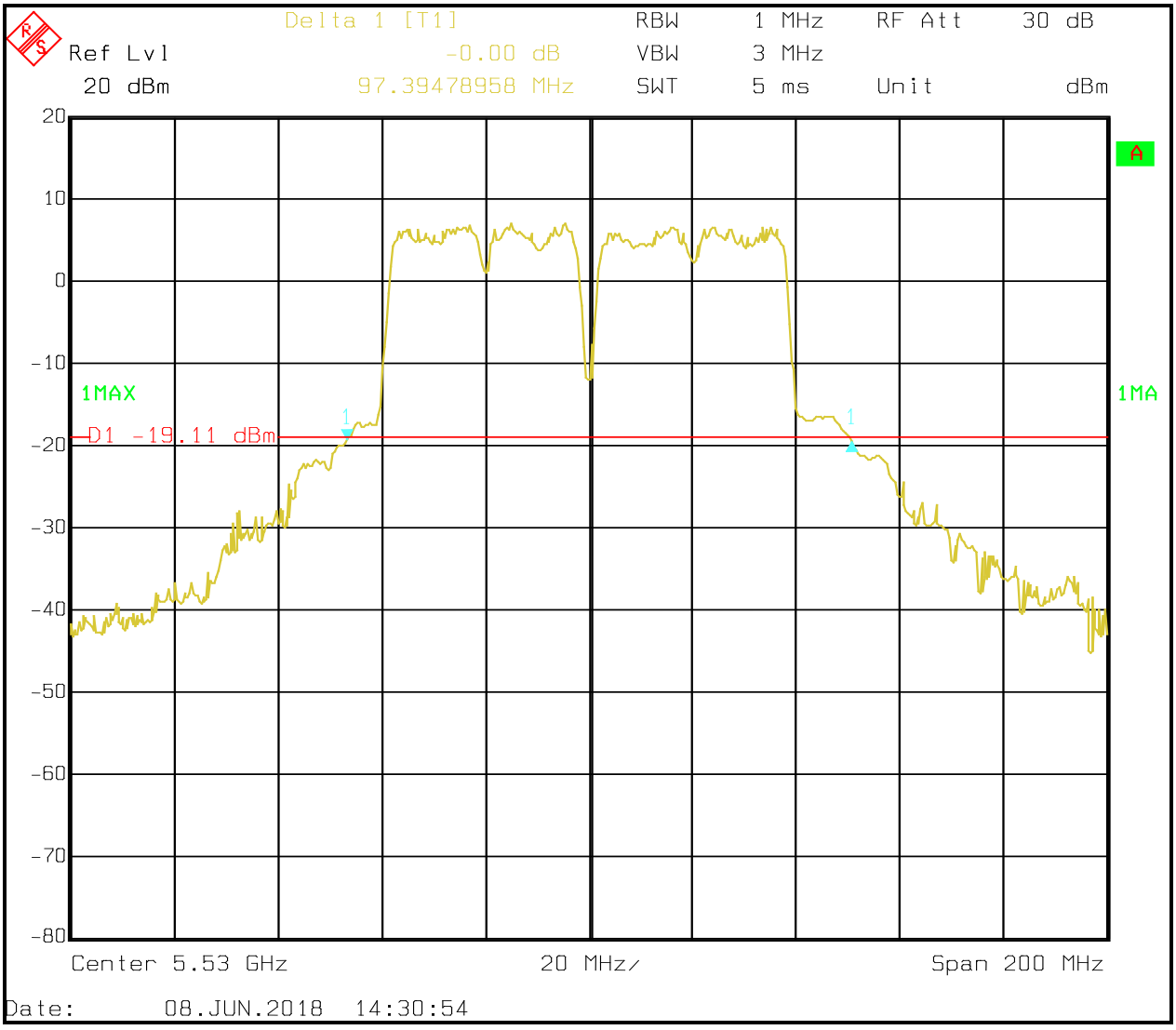
Plot 7-31: 99% OBW – 5700 MHz 802.11a 20 MHz BW



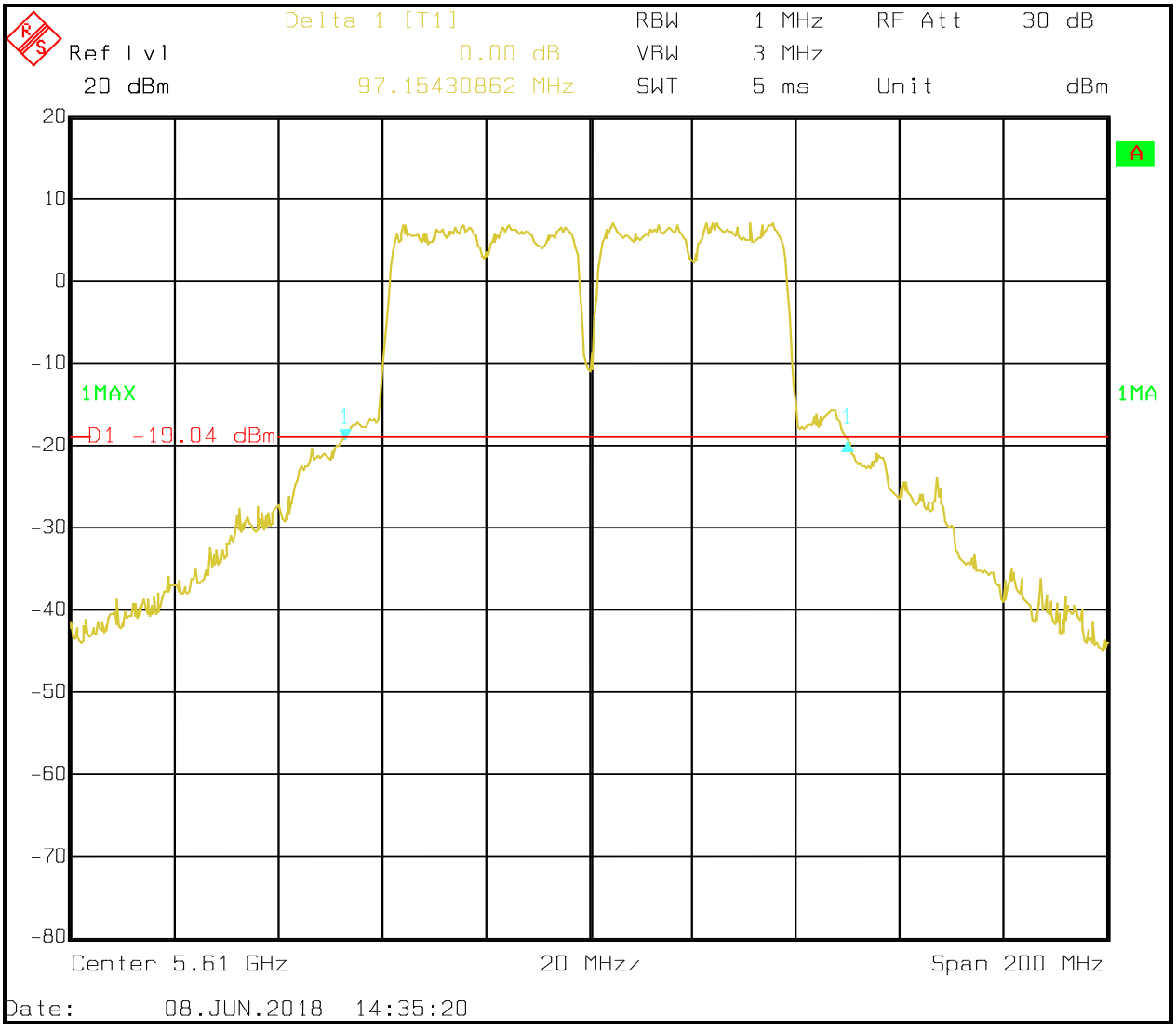
Plot 7-32: 99% OBW – 5750 MHz 802.11n 20 MHz BW



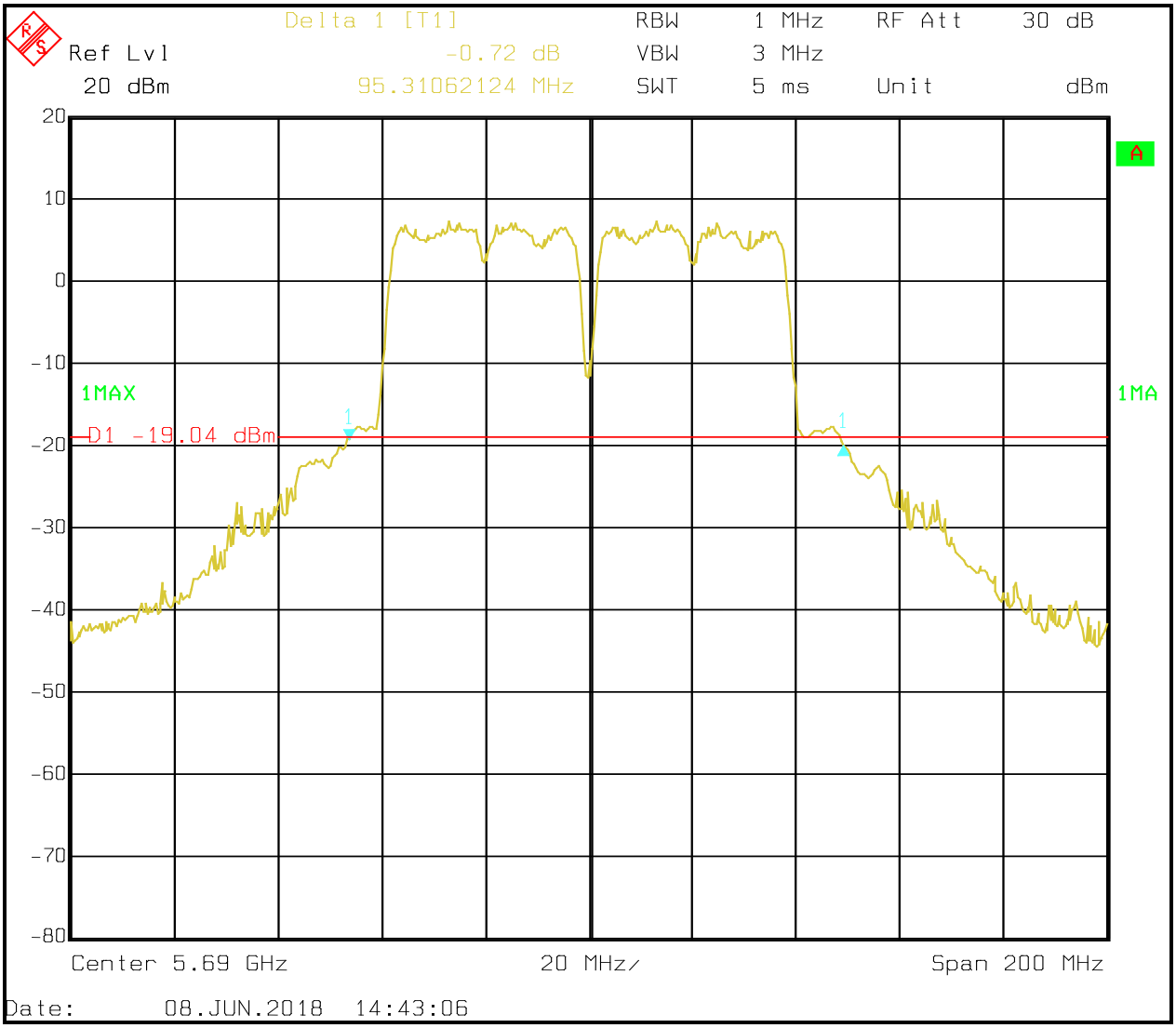
Plot 7-33: 99% OBW – 5530 MHz 802.11ac 80 MHz BW



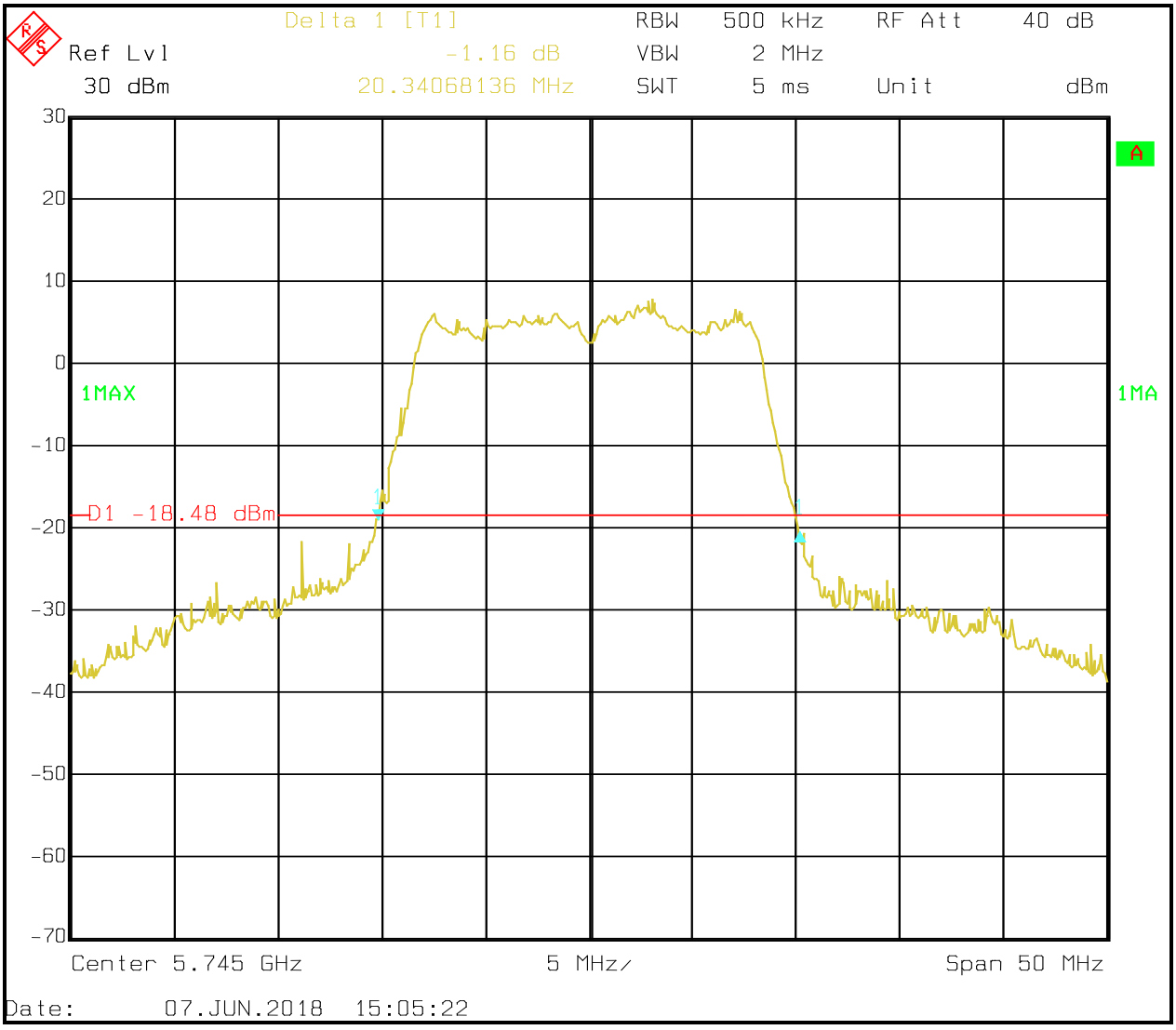
Plot 7-34: 99% OBW – 5610 MHz 802.11ac 80 MHz BW



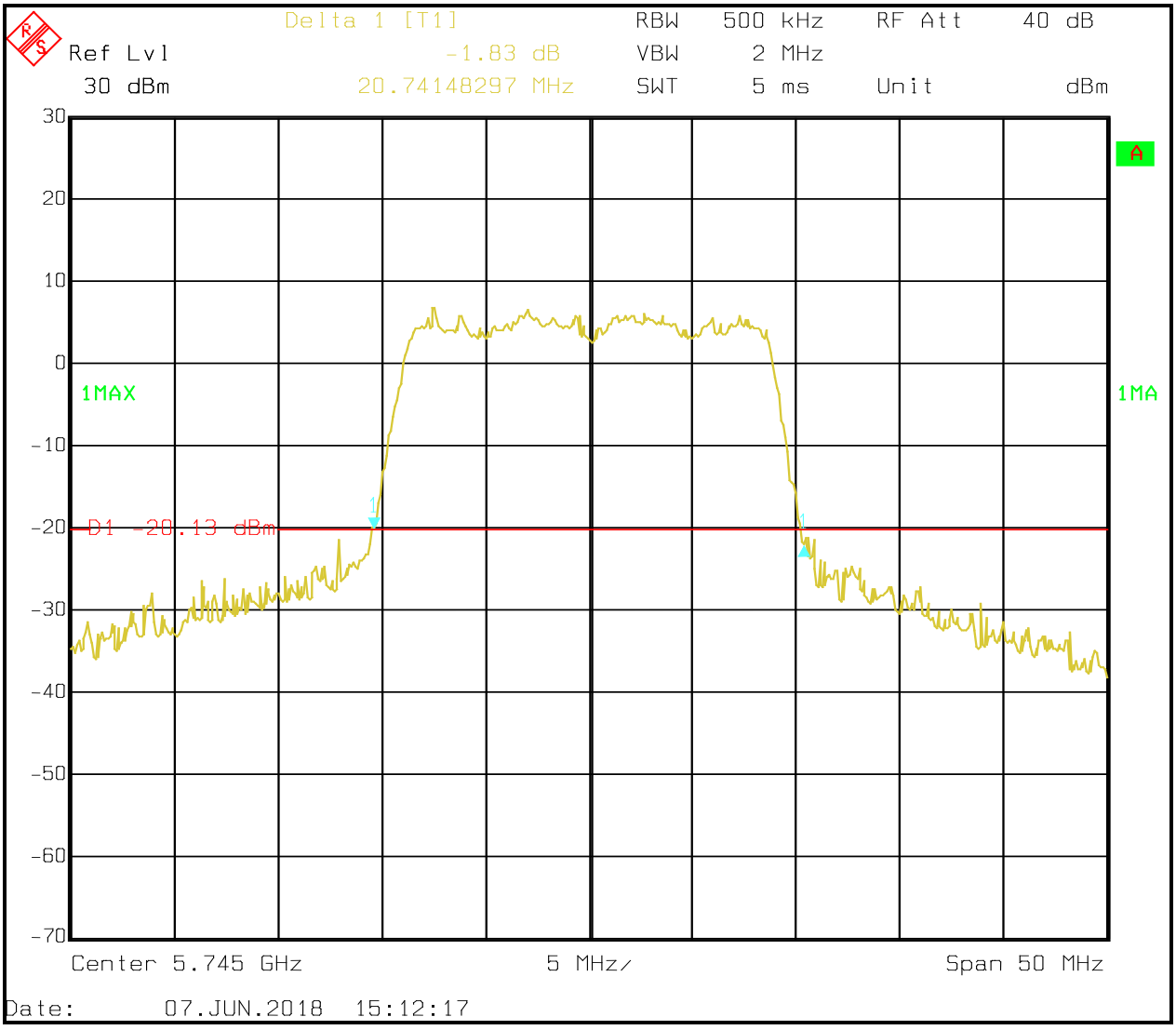
Plot 7-35: 99% OBW – 5690 MHz 802.11ac 80 MHz BW



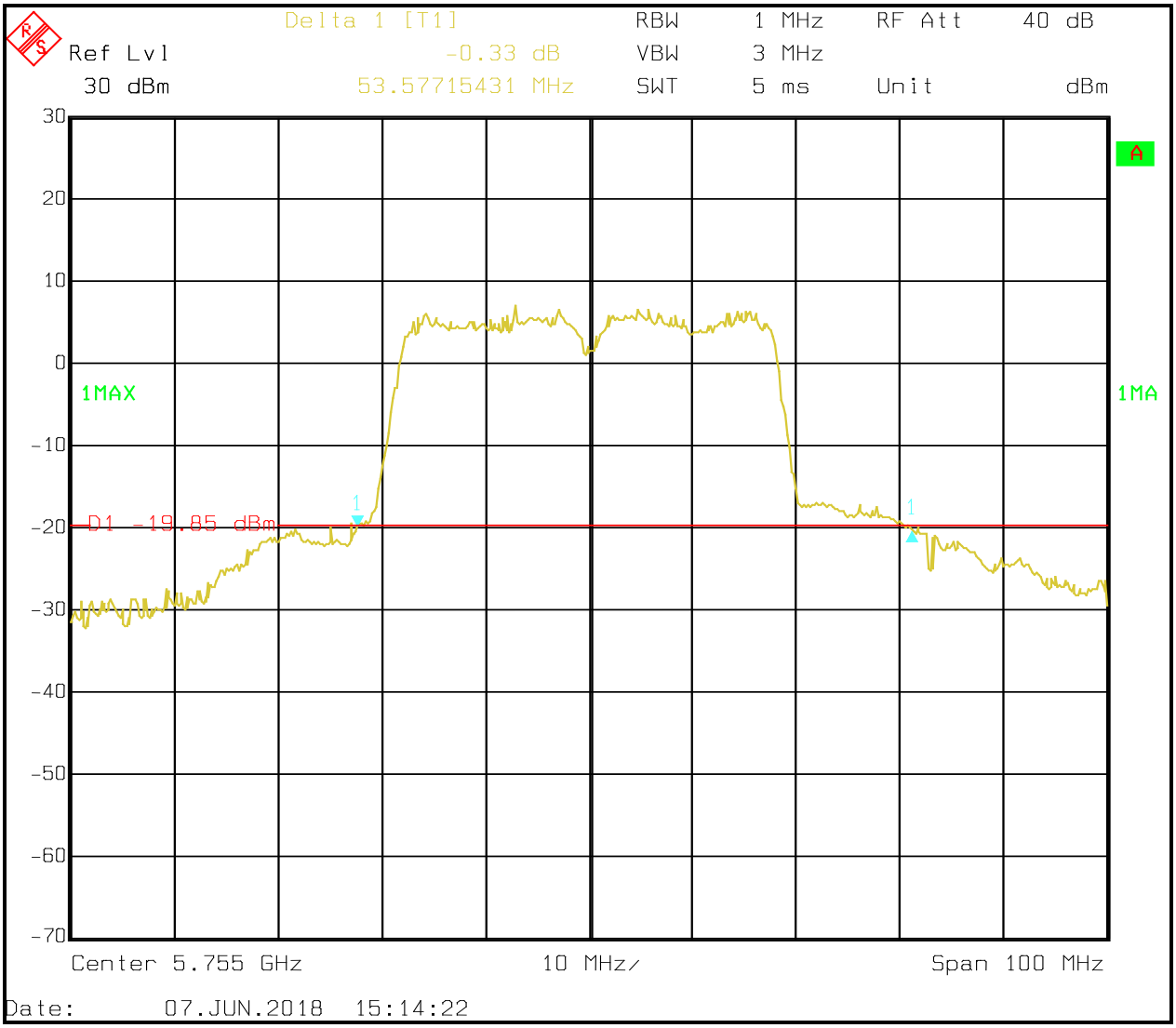
Plot 7-36: 99% OBW – 5745 MHz 802.11a 20 MHz BW



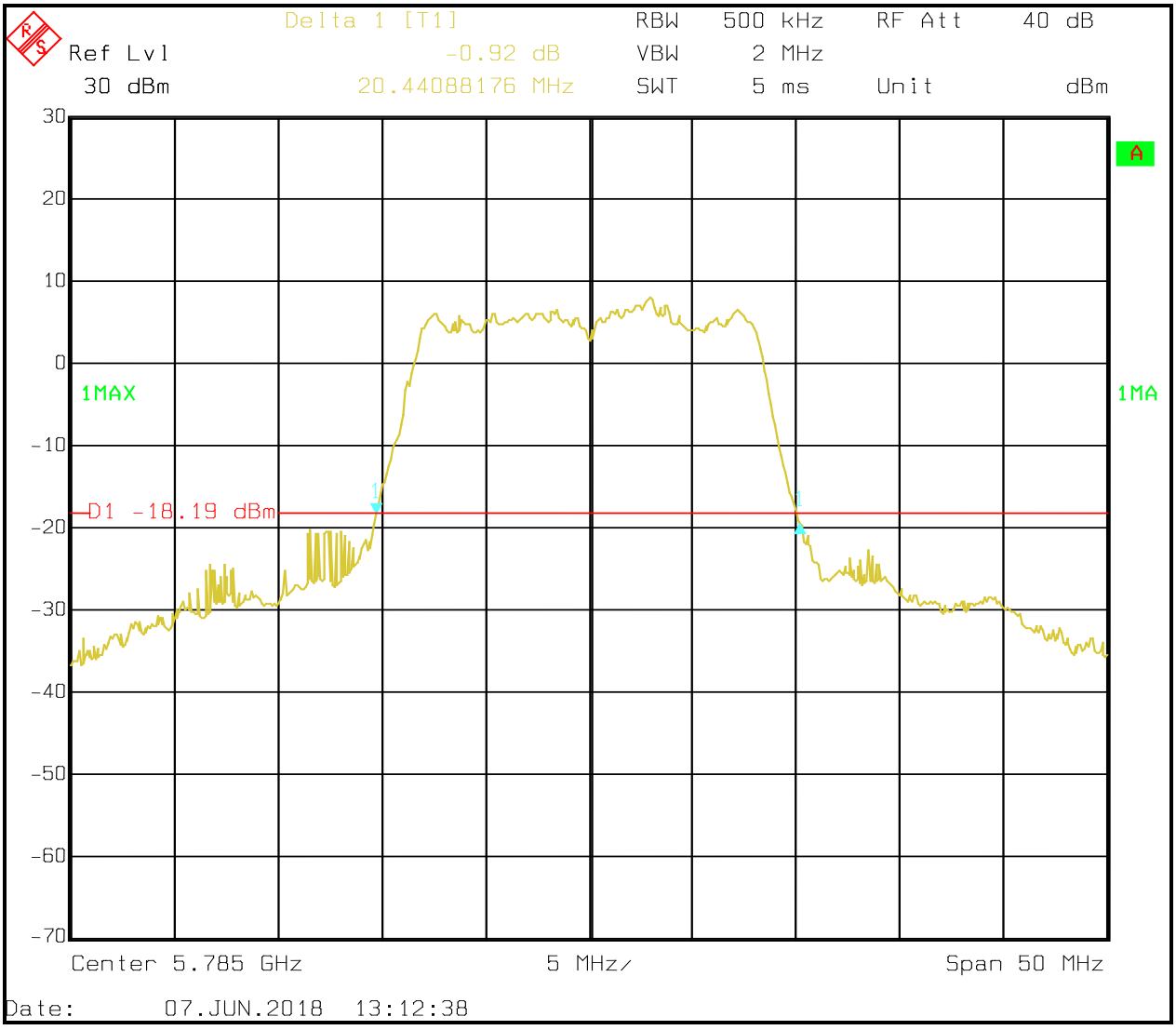
Plot 7-37: 99% OBW – 5745 MHz 802.11n 20 MHz BW



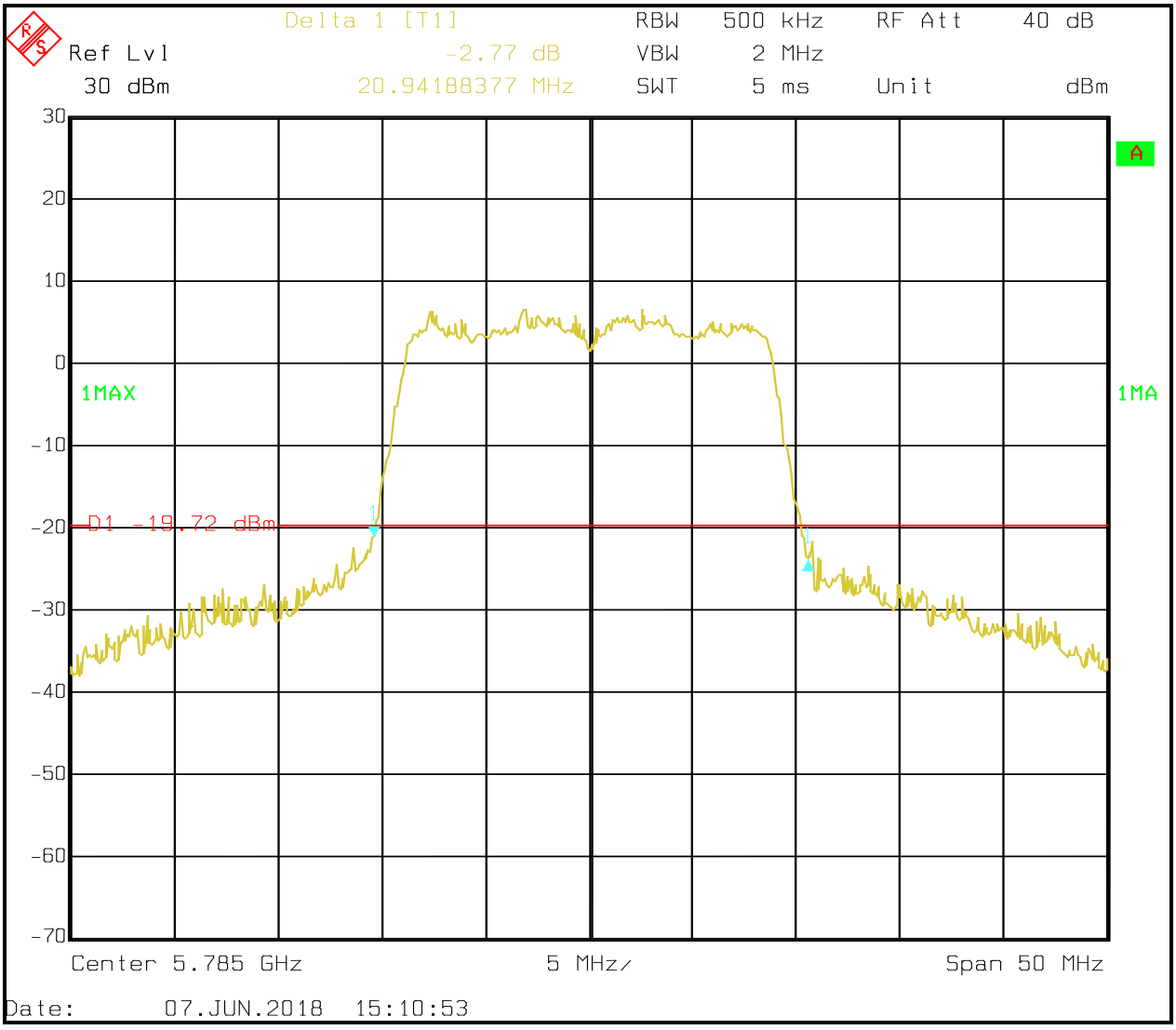
Plot 7-38: 99% OBW – 5755 MHz 802.11n 40 MHz BW



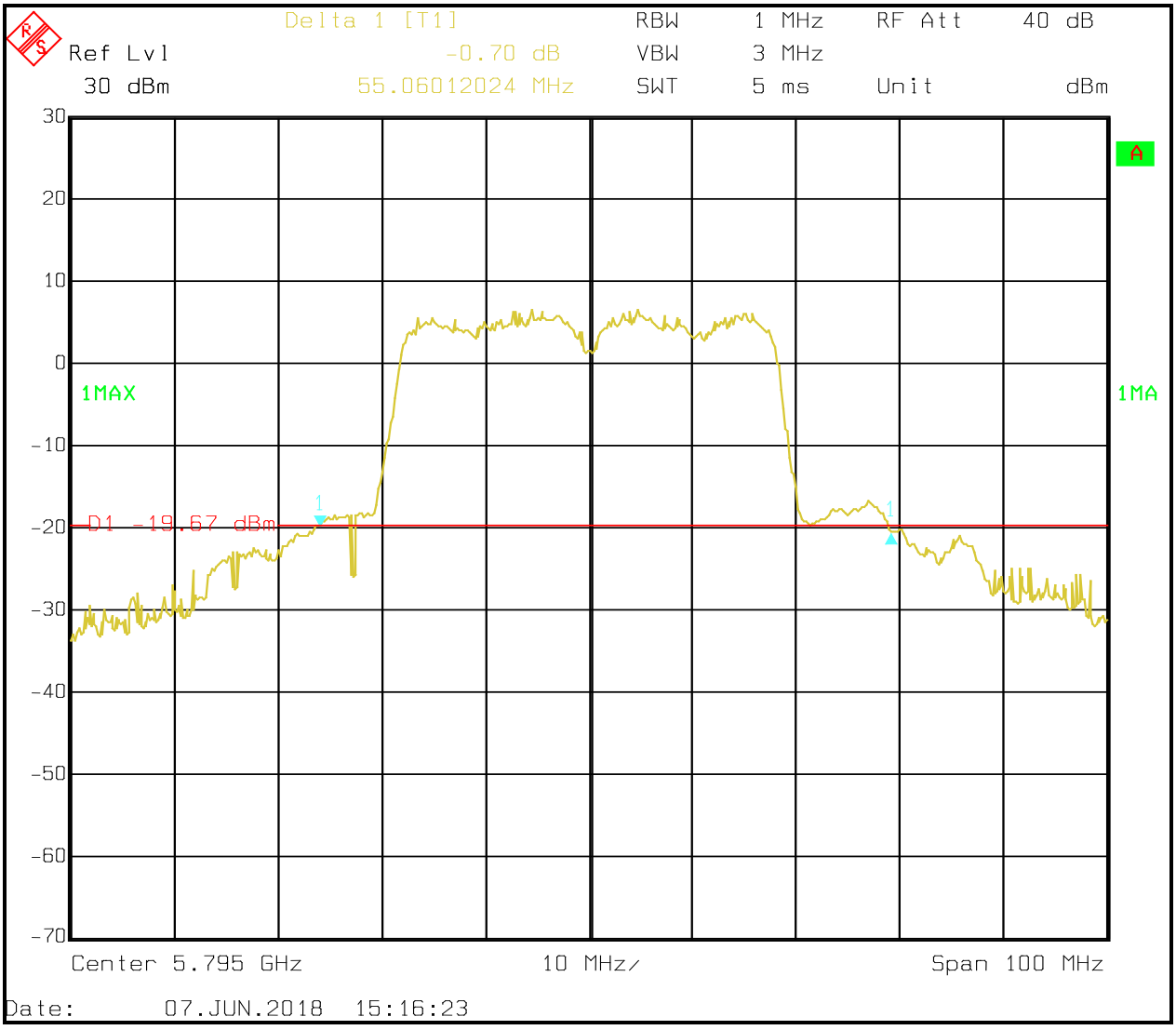
Plot 7-39: 99% OBW – 5785 MHz 802.11a 20 MHz BW



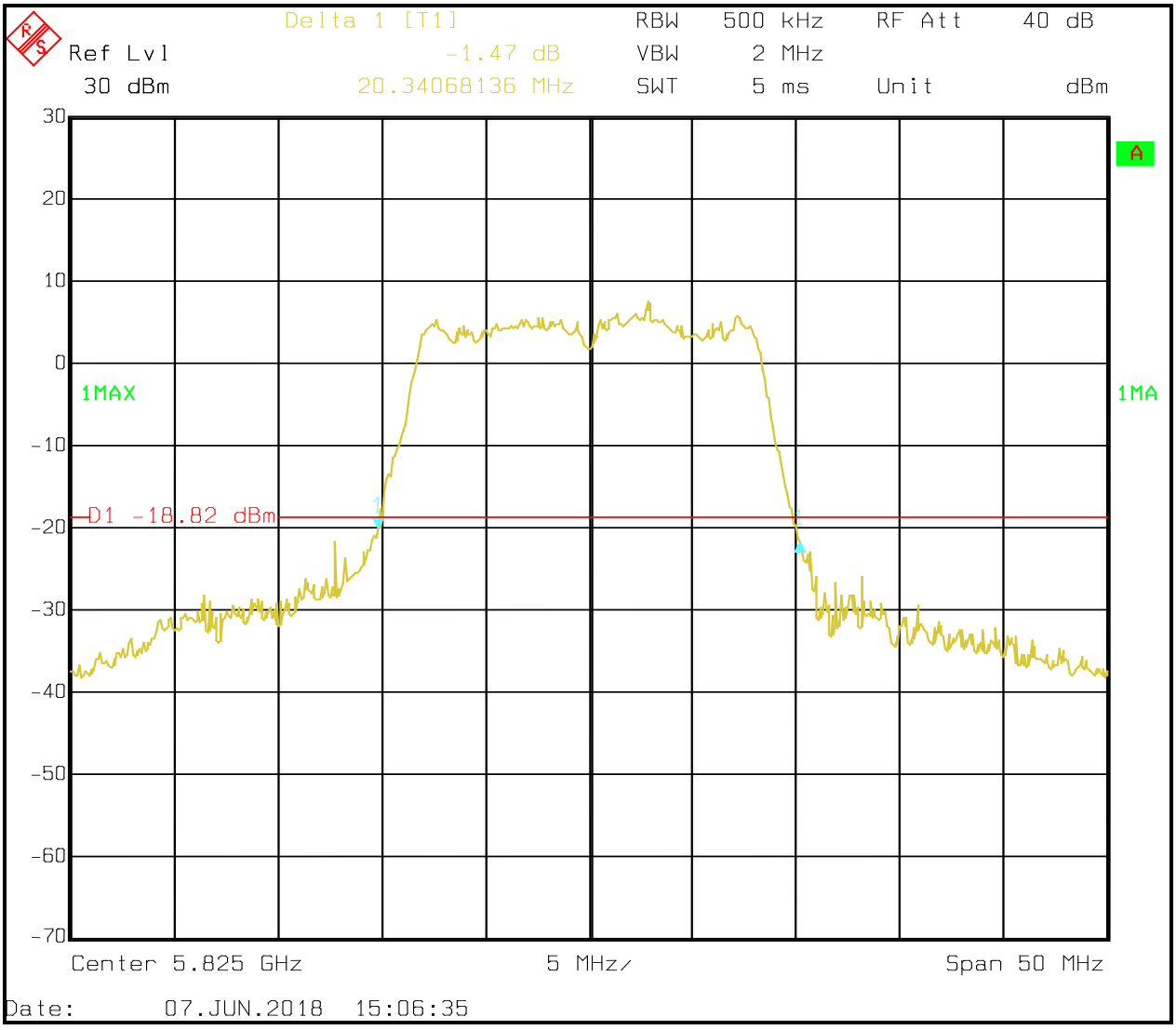
Plot 7-40: 99% OBW – 5785 MHz 802.11n 20 MHz BW



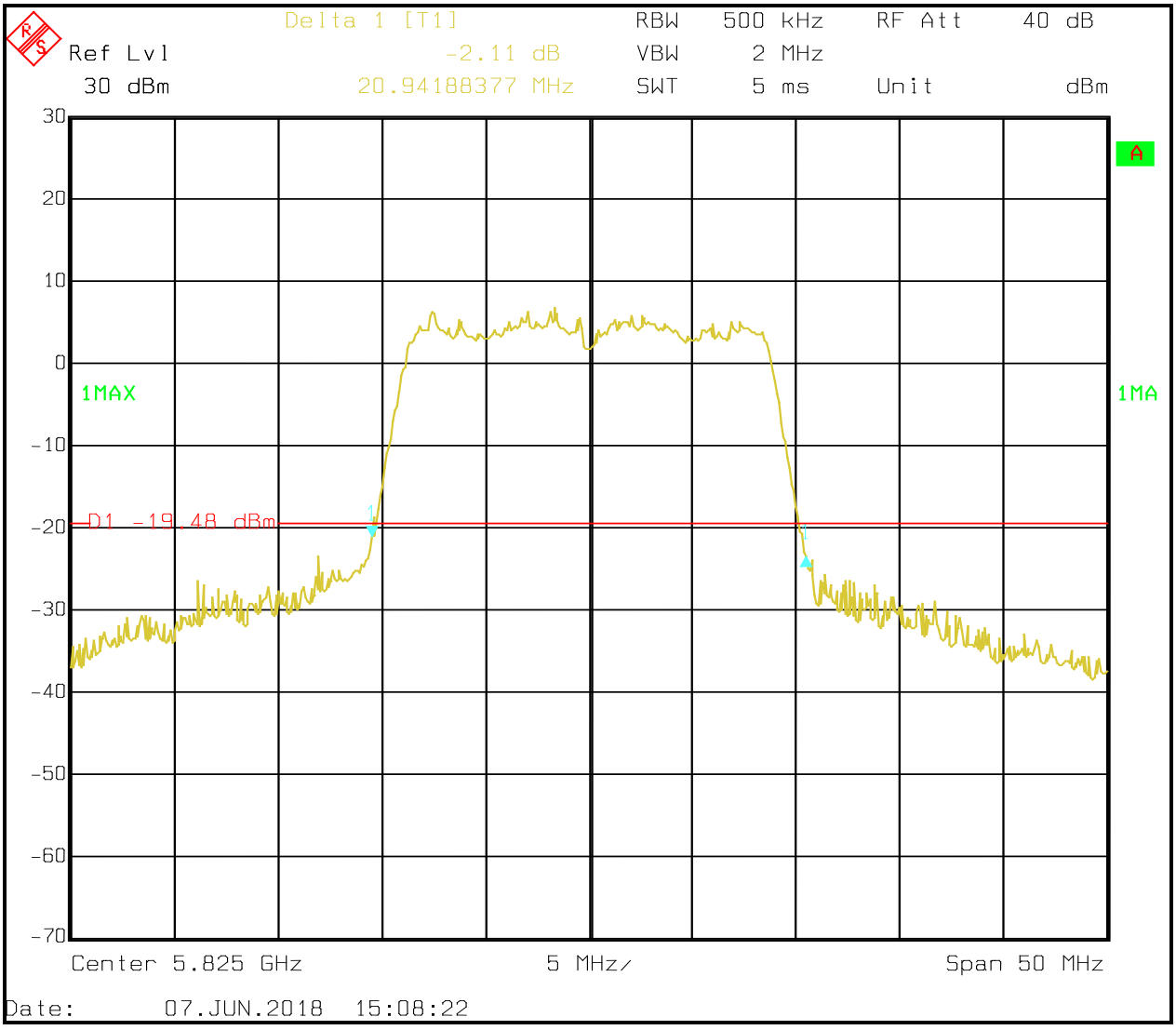
Plot 7-41: 99% OBW – 5795 MHz 802.11n 40 MHz BW



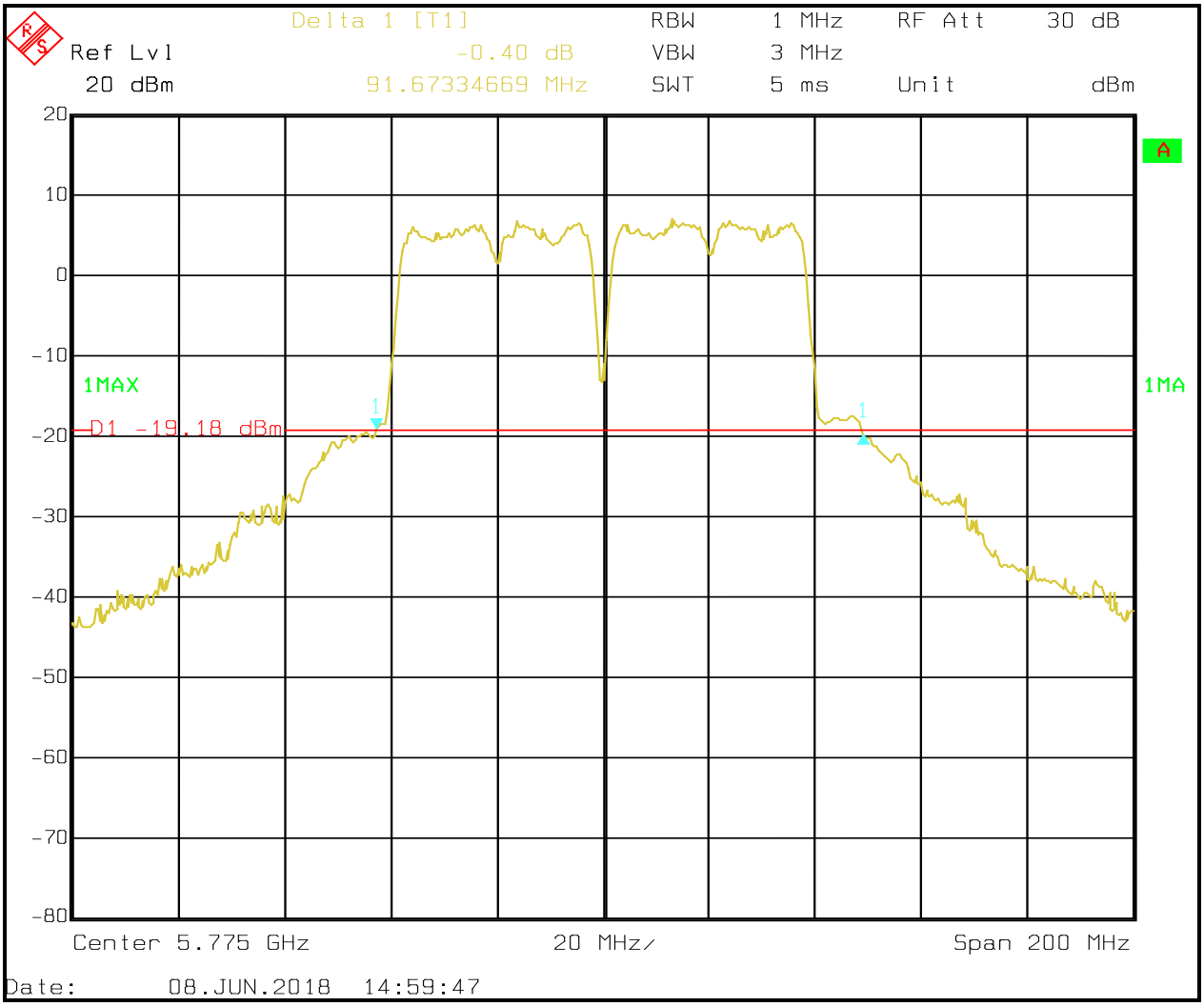
Plot 7-42: 99% OBW – 5825 MHz 802.11a 20 MHz BW



Plot 7-43: 99% OBW – 5825 MHz 802.11a 20 MHz BW



Plot 7-44: 99% OBW – 5775 MHz 802.11ac 80 MHz BW



Result: PASS

Measurement uncertainty: Measurement uncertainties shown for these tests are expanded uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty = ±2.0 dB

Table 7-2: 99% OBW Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Daniel W. Baltzell		June 7 & 8, 2018
Test Engineer	Signature	Dates of Test

8 Power Spectral Density – FCC 15.407(a)(1)(2)(3); ISED RSS-247 6.2

8.1 Power Spectral Density Test Procedure

The power spectral density per FCC 15.407(a)(1)(2)(3) was measured using a 50-ohm spectrum analyzer. The spectral lines were resolved for the modulated carriers. These levels are below the limits. See the power spectral density table and plots.

8.2 Power Spectral Density Test Data

Table 8-1: Power Spectral Density Test Data – 5180-5240 MHz

802.11 type	Frequency (MHz)	RF Power Level (dBm)	Limit (dBm)	Pass/Fail
a (20 MHz)	5180	7.0	17.0	Pass
n (20 MHz)	5180	6.0	17.0	Pass
n (40 MHz)	5180	3.3	17.0	Pass
a (20 MHz)	5200	7.0	17.0	Pass
n (20 MHz)	5200	6.2	17.0	Pass
n (40 MHz)	5200	3.0	17.0	Pass
ac (80 MHz)	5210	3.7	17.0	Pass
a (20 MHz)	5220	7.0	17.0	Pass
n (20 MHz)	5220	6.0	17.0	Pass
n (40 MHz)	5220	3.5	17.0	Pass
a (20 MHz)	5240	6.9	17.0	Pass
n (20 MHz)	5240	6.0	17.0	Pass
n (40 MHz)	5240	3.6	17.0	Pass

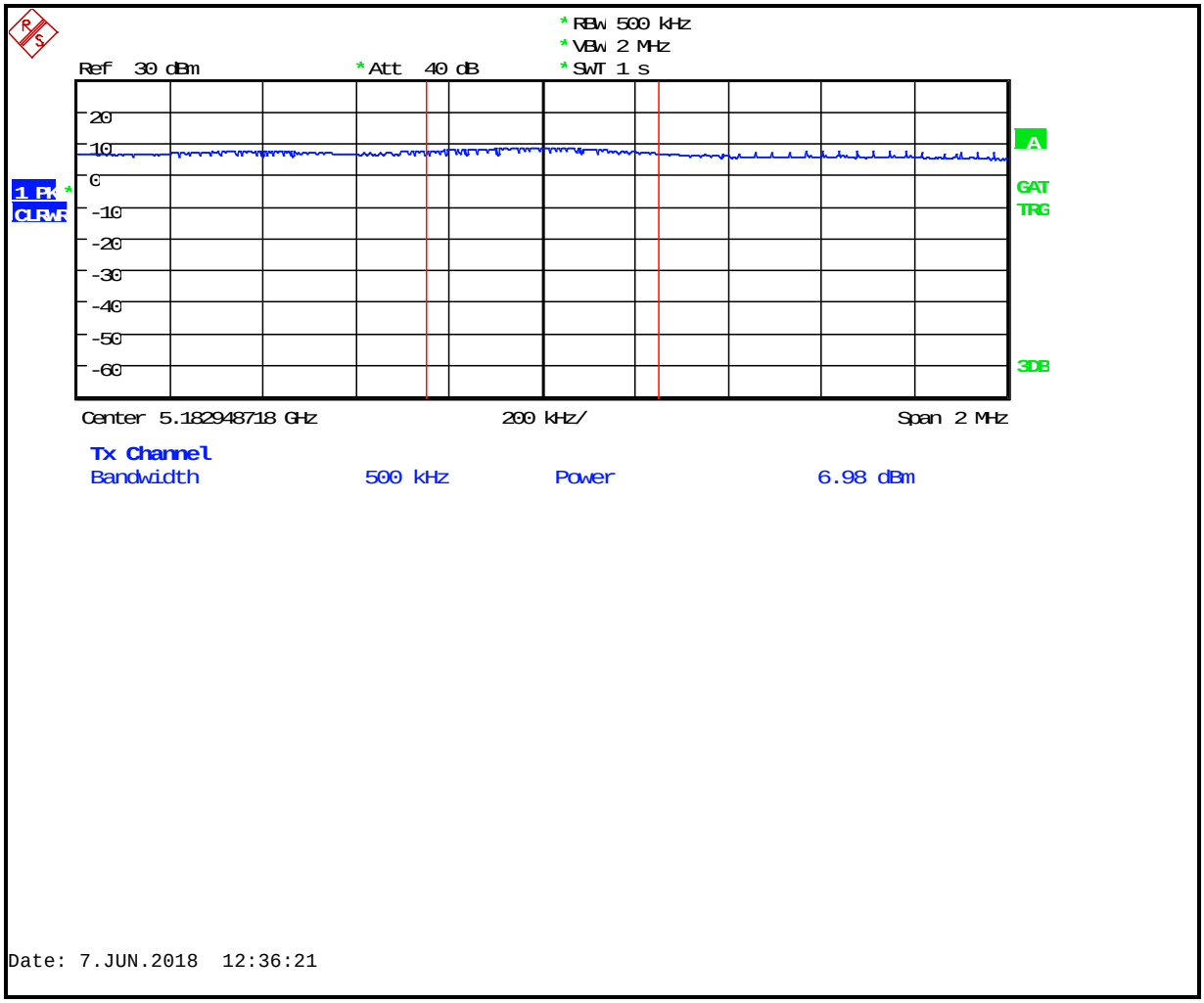
Table 8-2: Power Spectral Density Test Data – 5260-5320 MHz and 5500-5700 MHz

802.11 type	Frequency (MHz)	RF Power Level (dBm)	Limit (dBm)	Pass/Fail
a (20 MHz)	5260	6.6	11.0	Pass
n (20 MHz)	5260	6.0	11.0	Pass
n (40 MHz)	5260	2.6	11.0	Pass
a (20 MHz)	5280	7.2	11.0	Pass
n (20 MHz)	5280	6.1	11.0	Pass
n (40 MHz)	5280	2.3	11.0	Pass
a (20 MHz)	5320	6.9	11.0	Pass
n (20 MHz)	5320	5.9	11.0	Pass
n (40 MHz)	5320	3.5	11.0	Pass
ac (80 MHz)	5290	3.7	11.0	Pass
a (20 MHz)	5500	8.6	11.0	Pass
n (20 MHz)	5500	7.0	11.0	Pass
n (40 MHz)	5500	4.8	11.0	Pass
ac (80 MHz)	5530	4.9	11.0	Pass
a (20 MHz)	5600	7.8	11.0	Pass
n (20 MHz)	5600	6.3	11.0	Pass
n (40 MHz)	5600	4.0	11.0	Pass
ac (80 MHz)	5610	3.9	11.0	Pass
ac (80 MHz)	5690	2.4	11.0	Pass
a (20 MHz)	5700	7.0	11.0	Pass
n (20 MHz)	5700	6.3	11.0	Pass
n (40 MHz)	5700	3.5	11.0	Pass

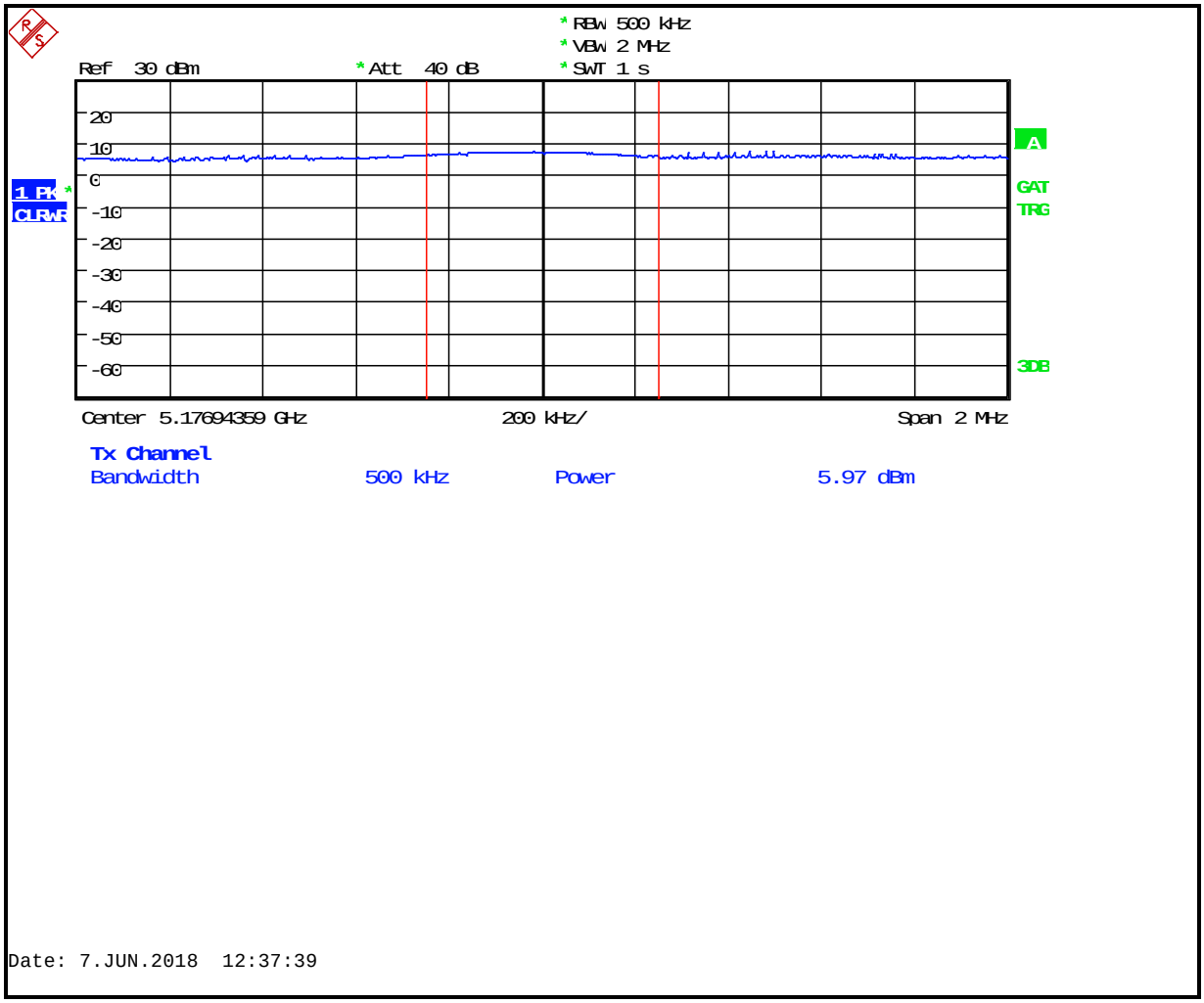
Table 8-3: Power Spectral Density Test Data – 5745-5825 MHz

802.11 type	Frequency (MHz)	RF Power Level (dBm)	Limit (dBm)	Pass/Fail
a (20 MHz)	5745	7.9	30.0	Pass
n (20 MHz)	5745	5.4	30.0	Pass
n (40 MHz)	5745	2.9	30.0	Pass
ac (80 MHz)	5775	4.0	30.0	Pass
a (20 MHz)	5785	7.1	30.0	Pass
n (20 MHz)	5785	6.2	30.0	Pass
n (40 MHz)	5785	3.1	30.0	Pass
a (20 MHz)	5825	7.4	30.0	Pass
n (20 MHz)	5825	6.6	30.0	Pass

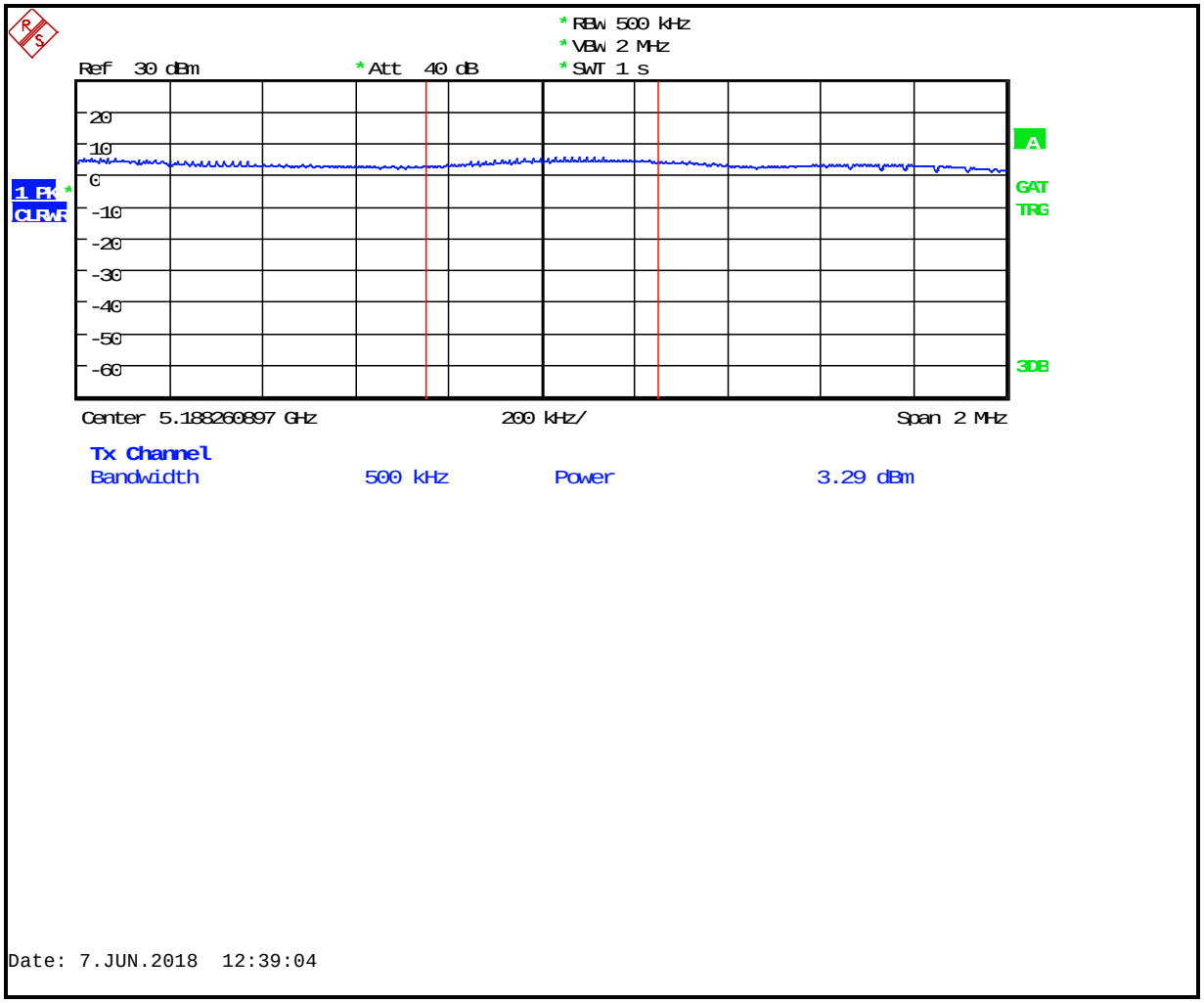
Plot 8-1: PSD – 5180 MHz 802.11a 20 MHz



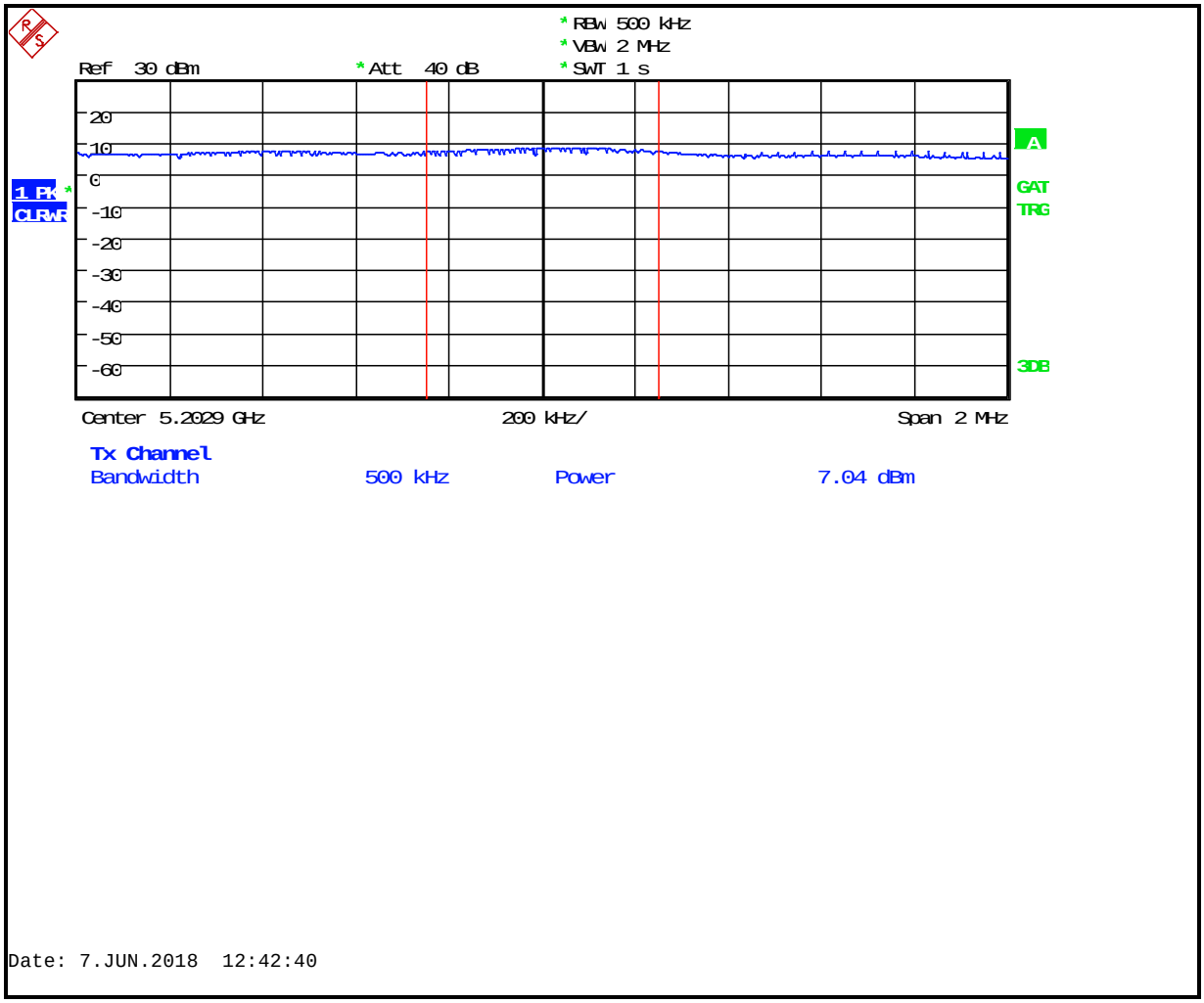
Plot 8-2: PSD – 5180 MHz 802.11n 20 MHz



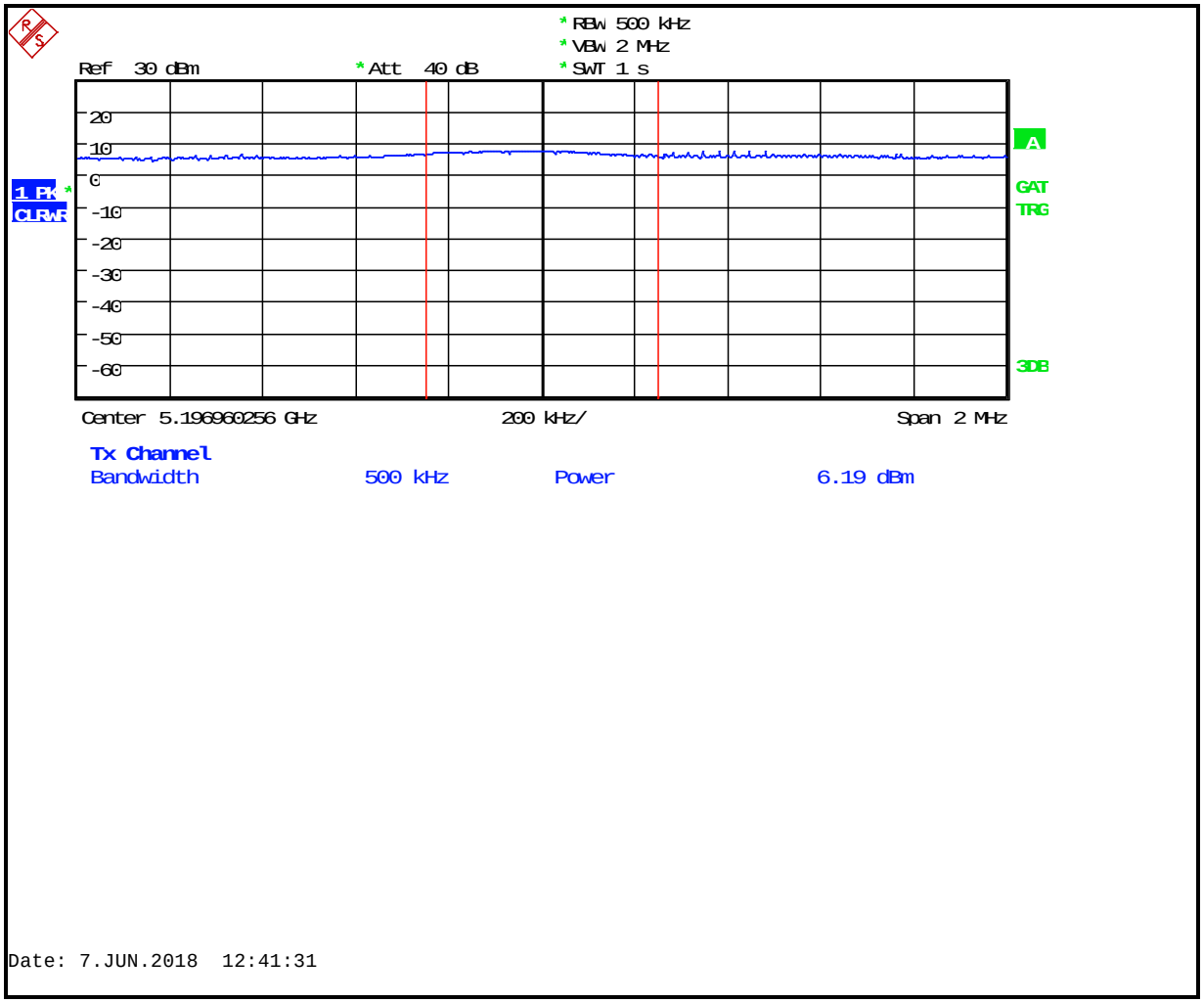
Plot 8-3: PSD – 5180 MHz 802.11n 40 MHz



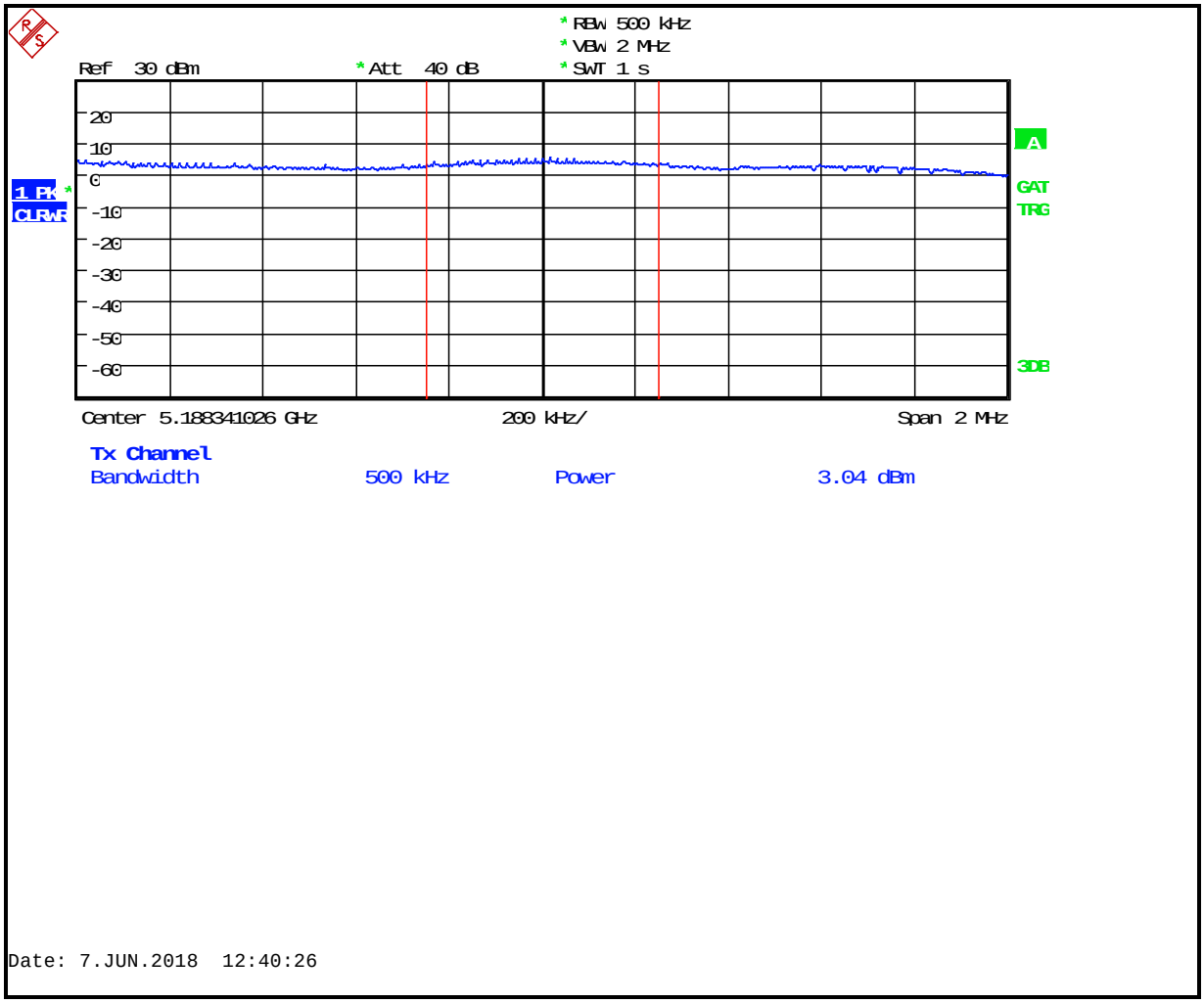
Plot 8-4: PSD – 5200 MHz 802.11a 20 MHz



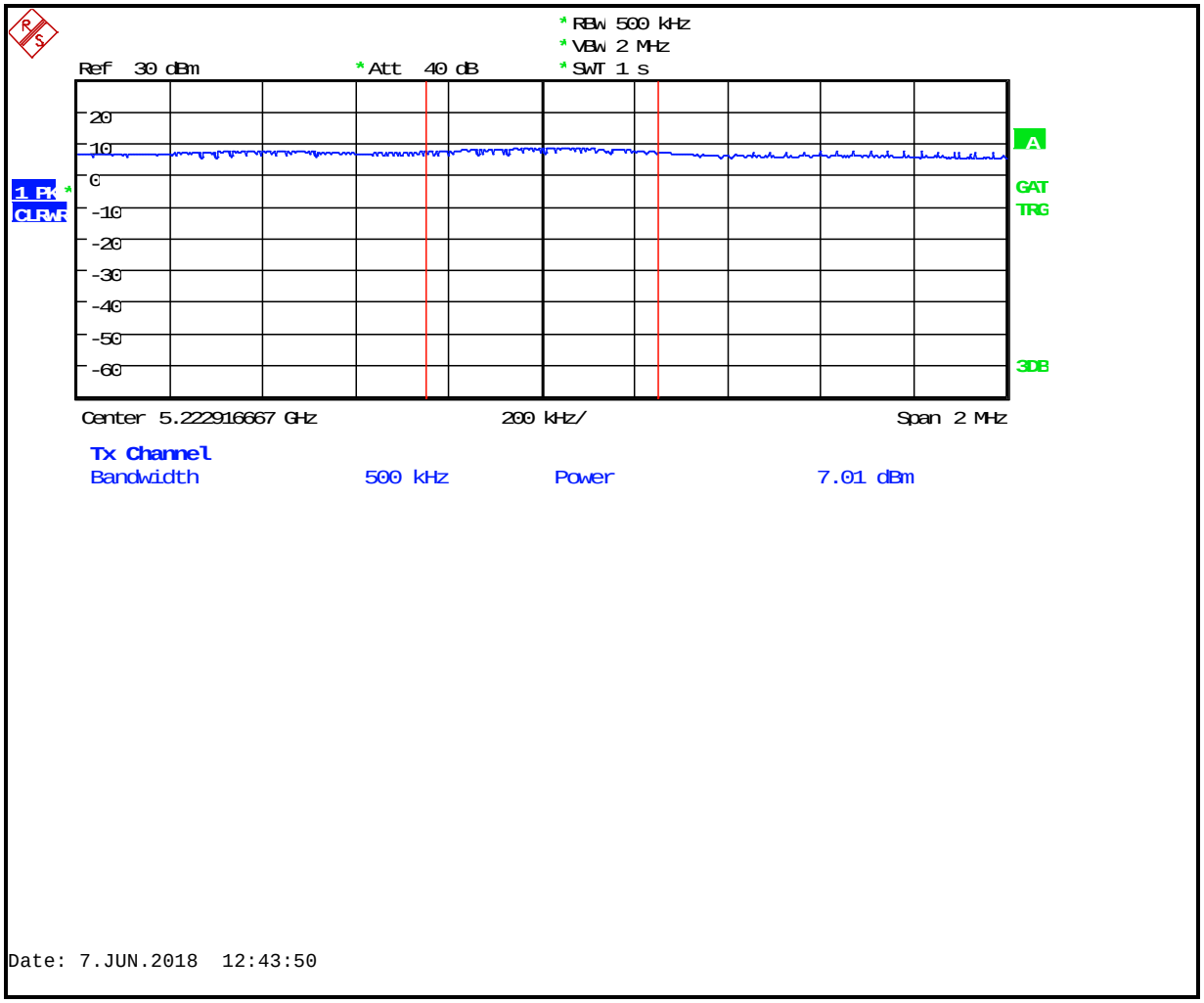
Plot 8-5: PSD – 5200 MHz 802.11n 20 MHz



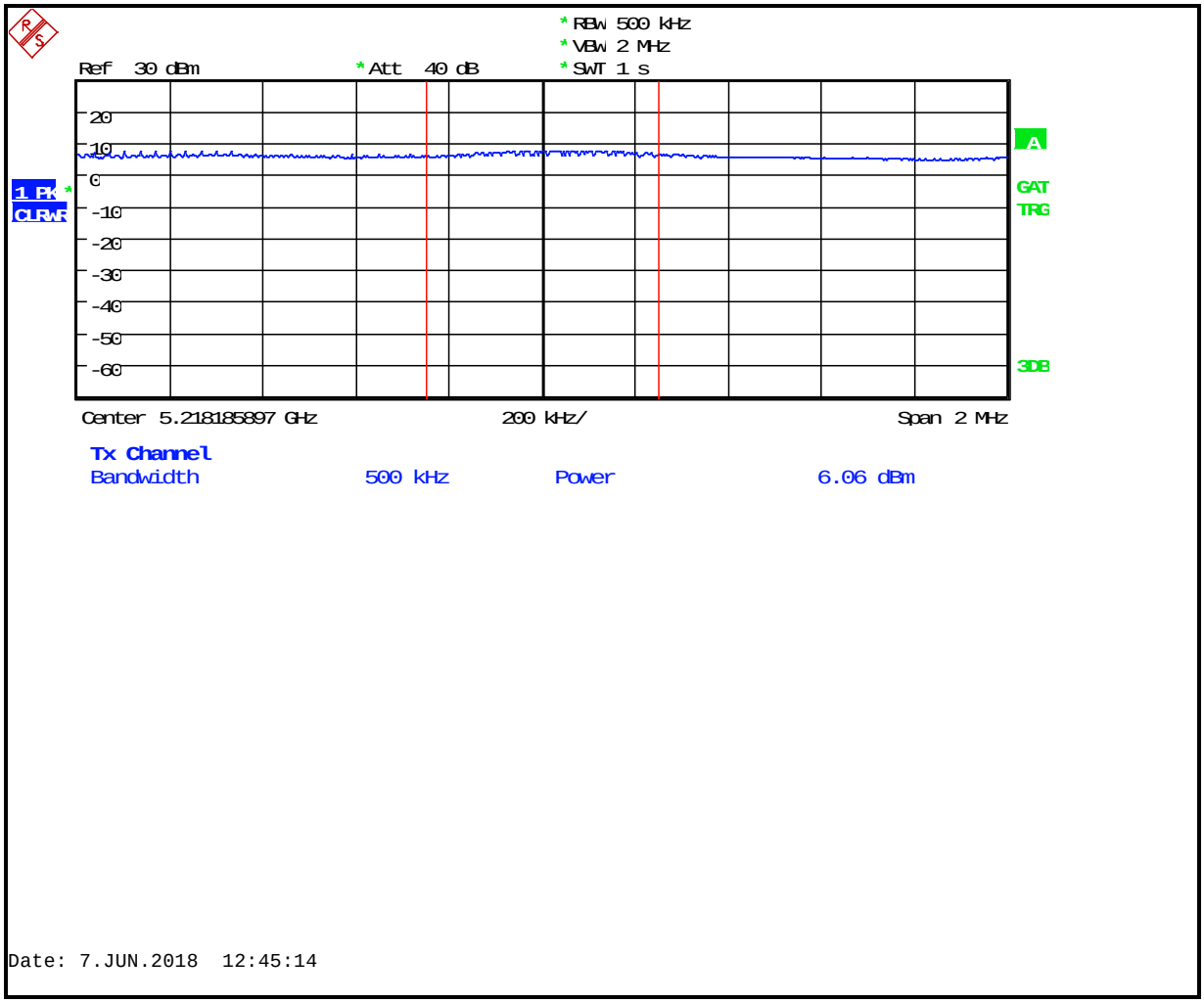
Plot 8-6: PSD – 5200 MHz 802.11n 40 MHz



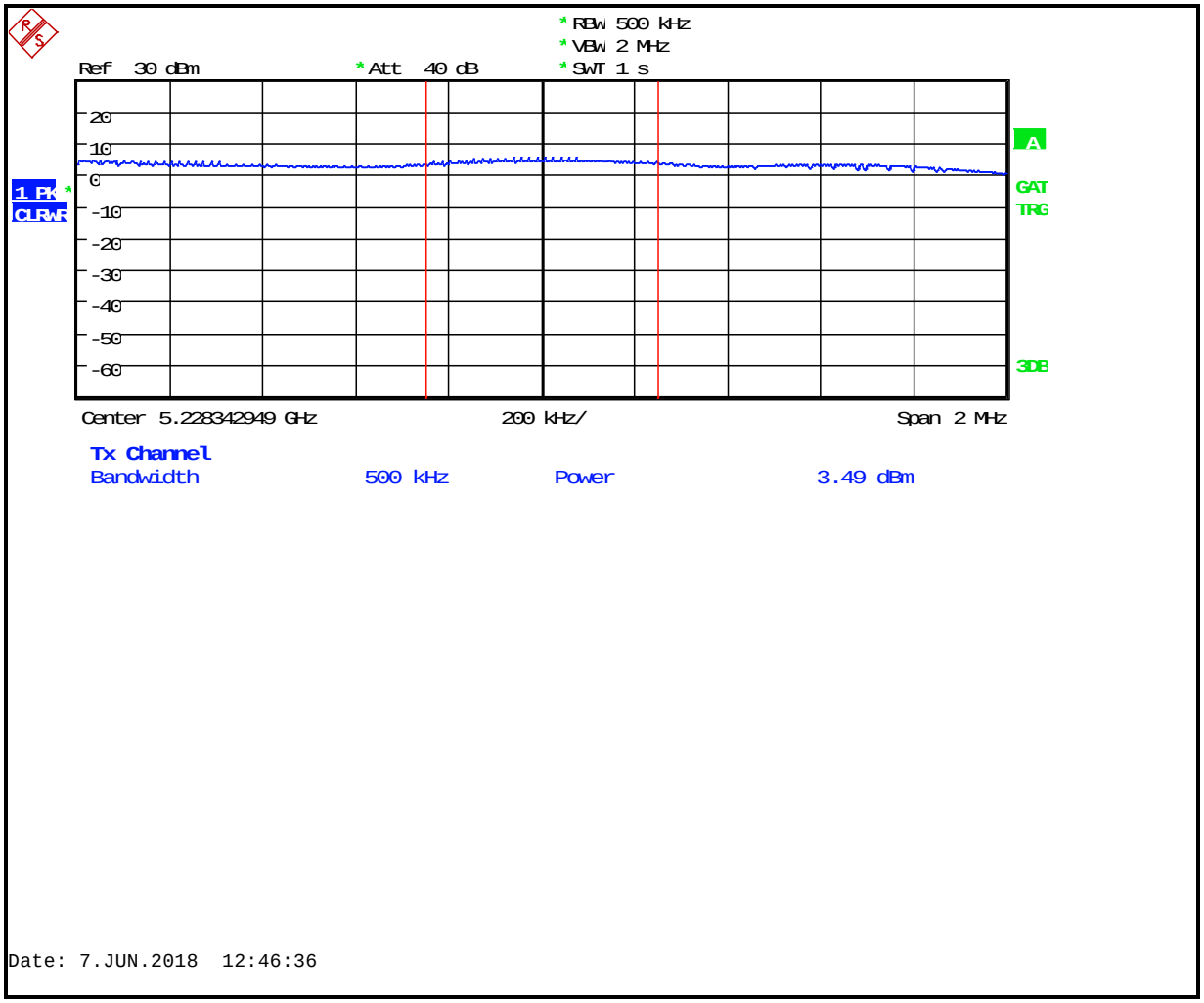
Plot 8-7: PSD – 5220 MHz 802.11a 20 MHz



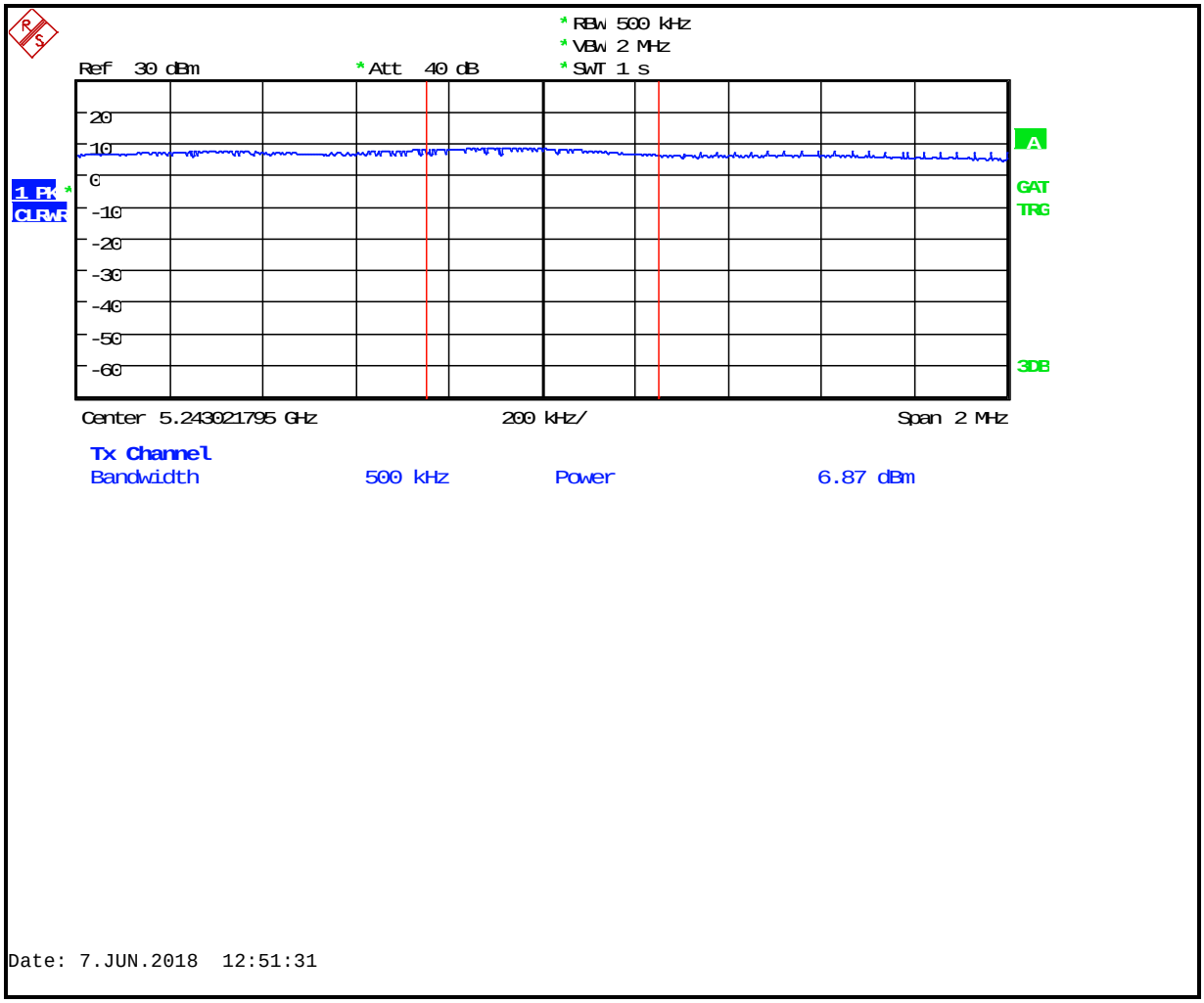
Plot 8-8: PSD – 5220 MHz 802.11n 20 MHz



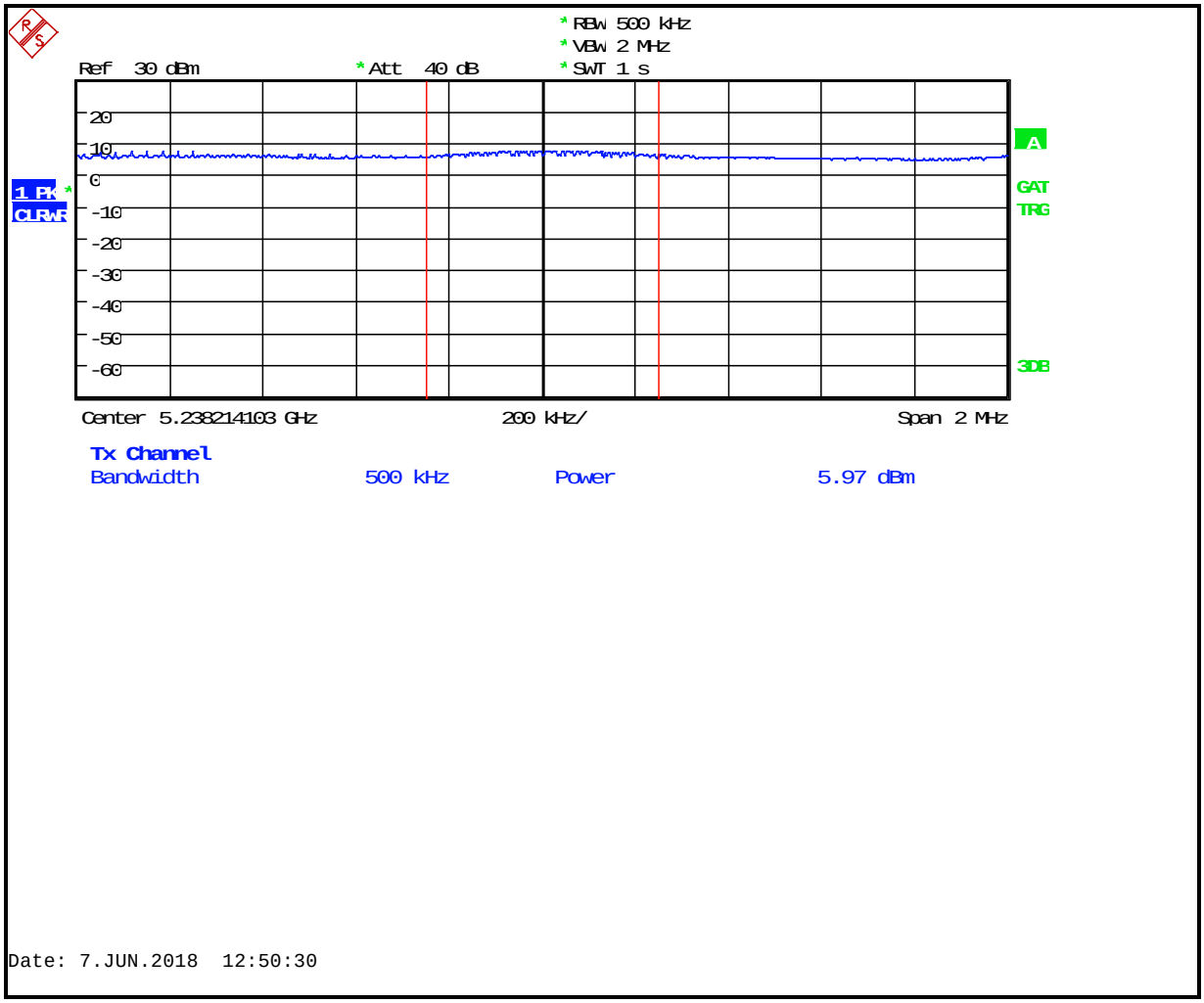
Plot 8-9: PSD – 5220 MHz 802.11n 40 MHz



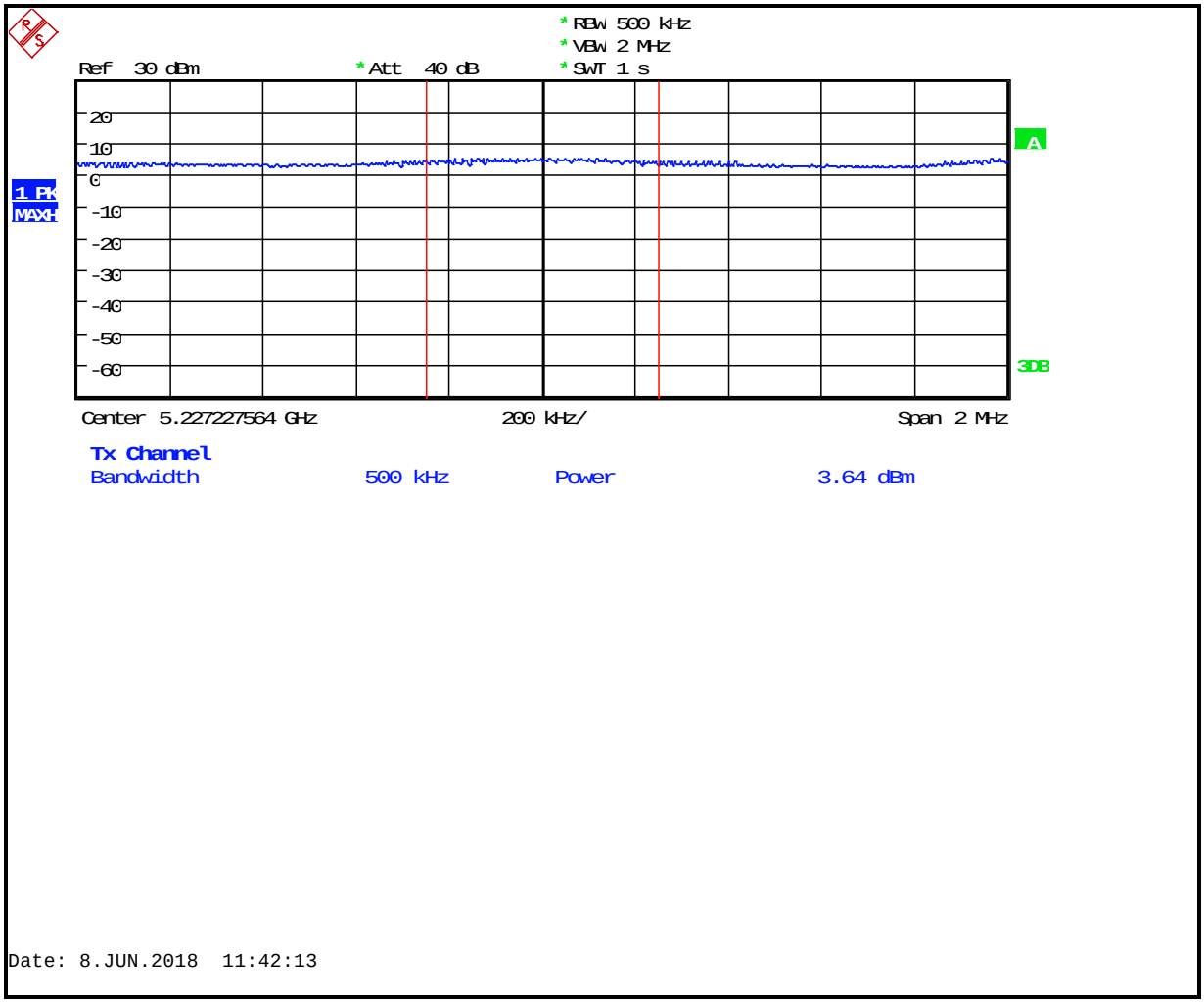
Plot 8-10: PSD – 5240 MHz 802.11a 20 MHz



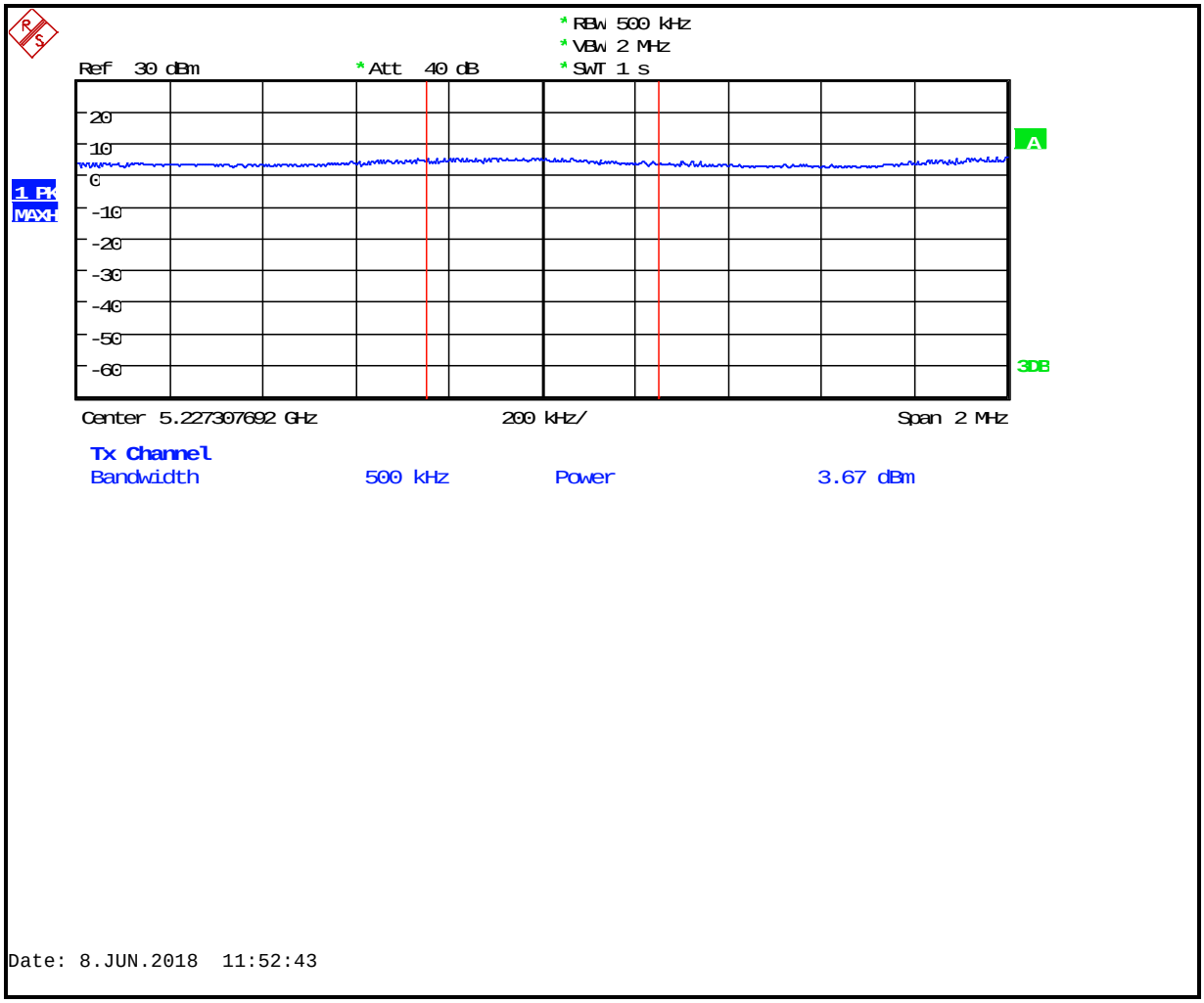
Plot 8-11: PSD – 5240 MHz 802.11n 20 MHz



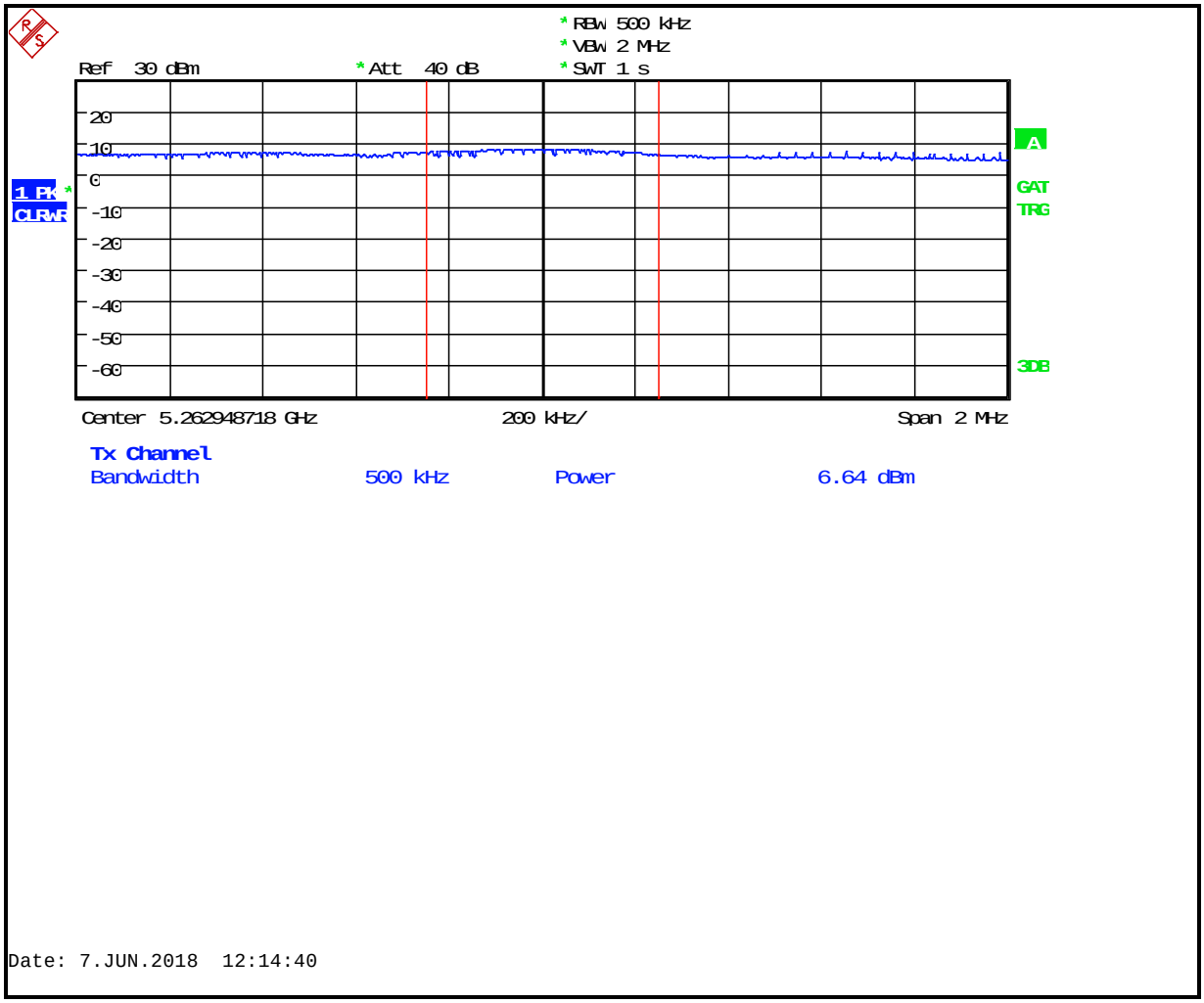
Plot 8-12: PSD – 5240 MHz 802.11n 40 MHz



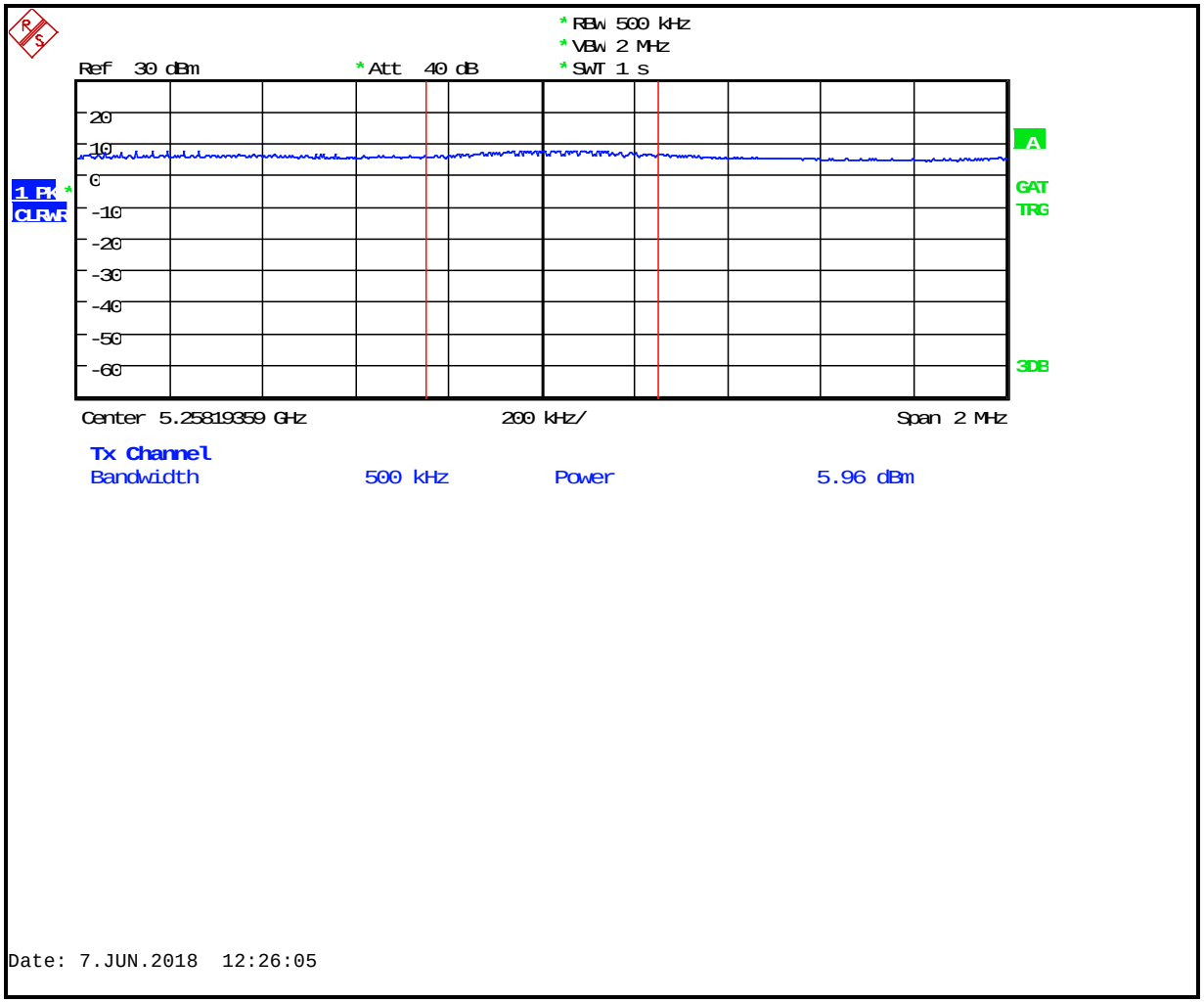
Plot 8-13: PSD – 5210 MHz 802.11ac 80 MHz



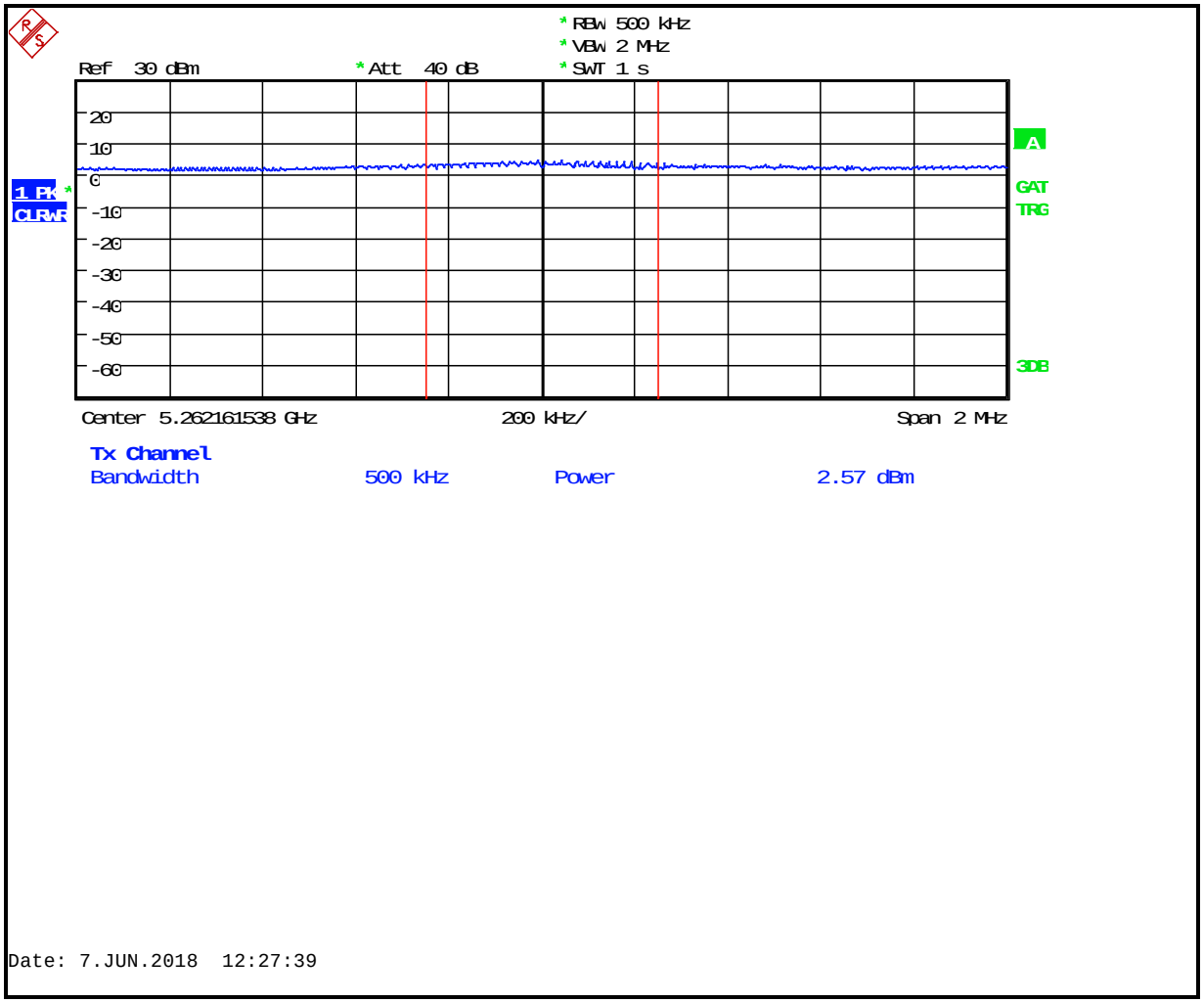
Plot 8-14: PSD – 5260 MHz 802.11a 20 MHz



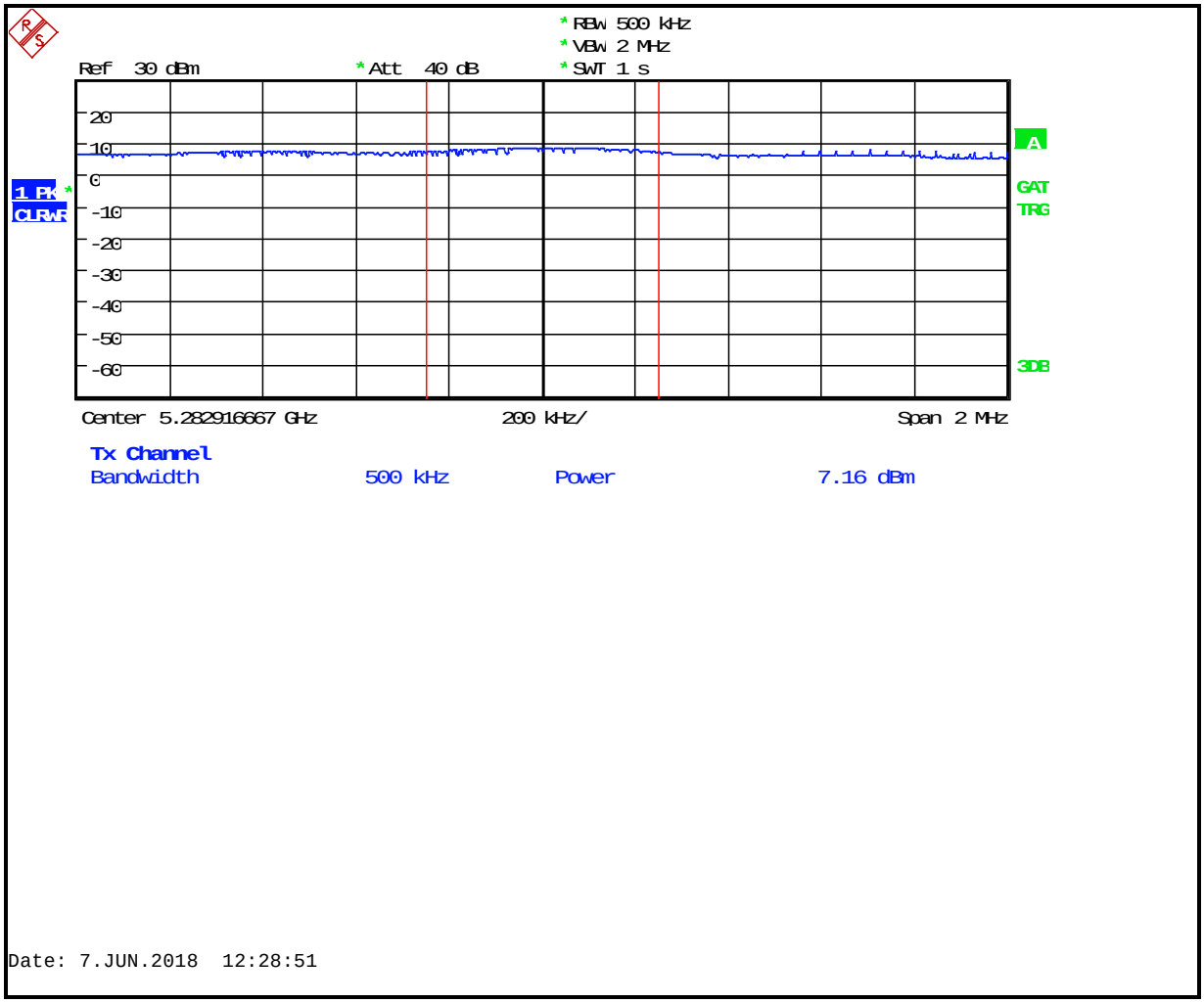
Plot 8-15: PSD – 5260 MHz 802.11n 20 MHz



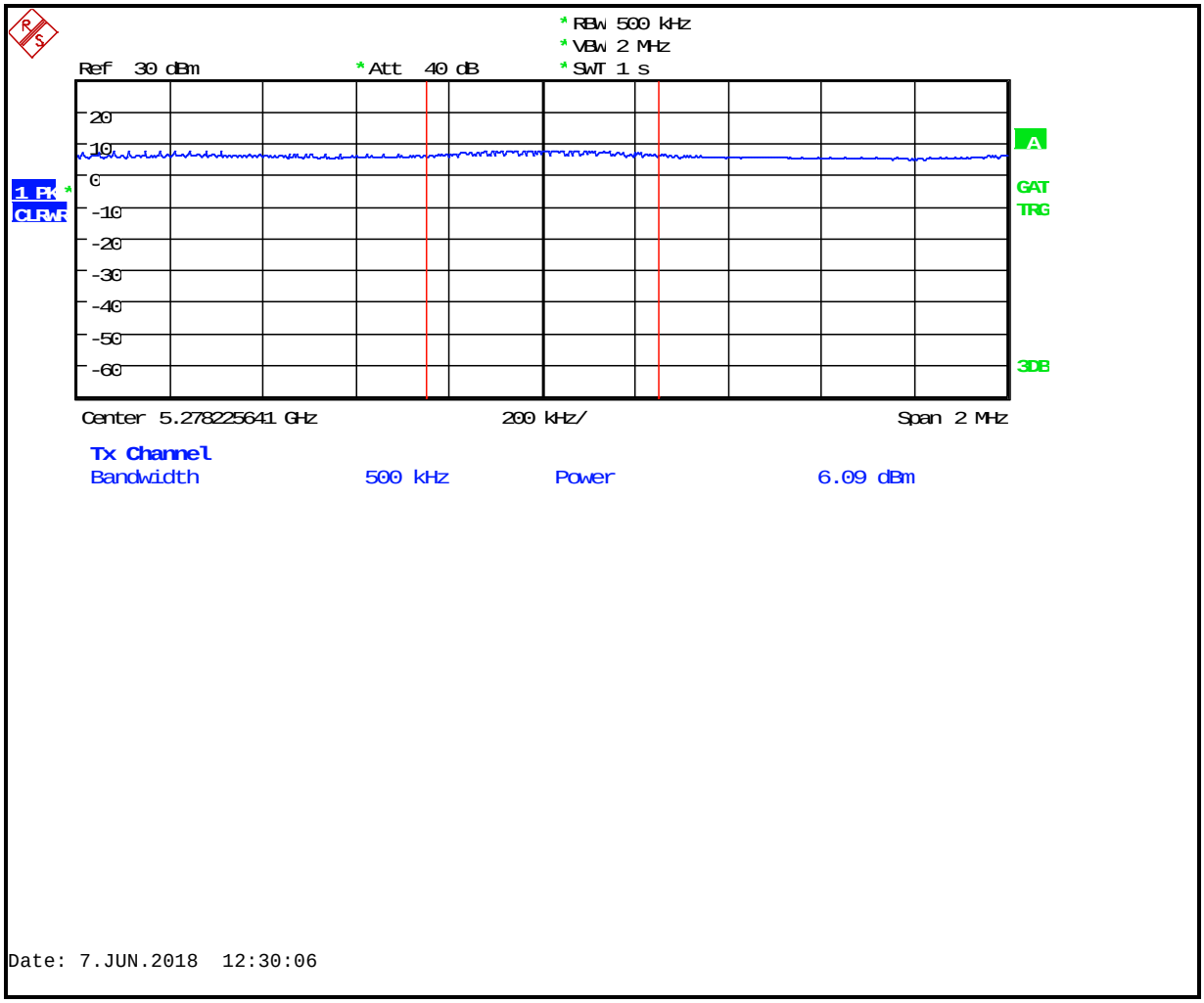
Plot 8-16: PSD – 5260 MHz 802.11n 40 MHz



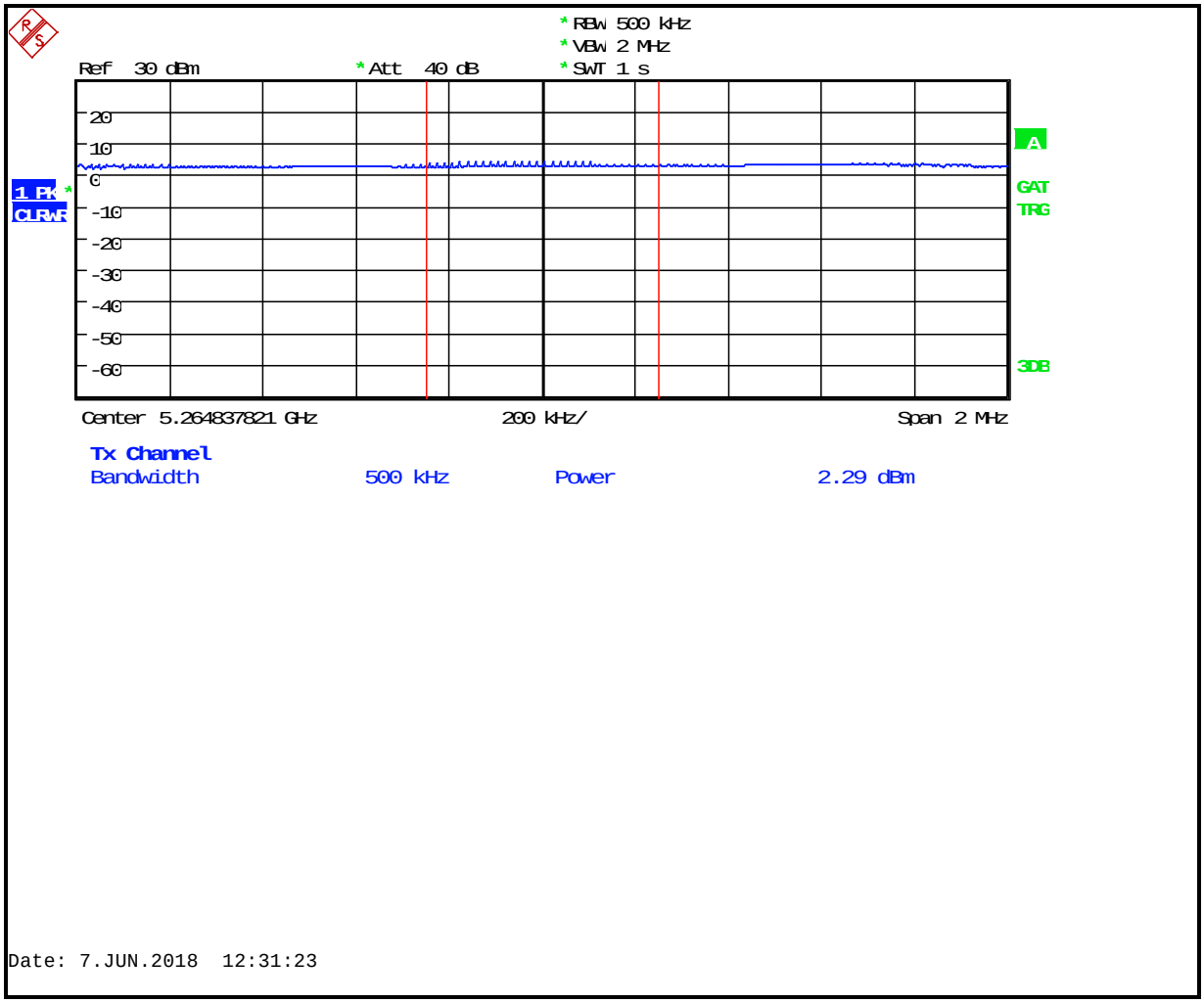
Plot 8-17: PSD – 5280 MHz 802.11a 20 MHz



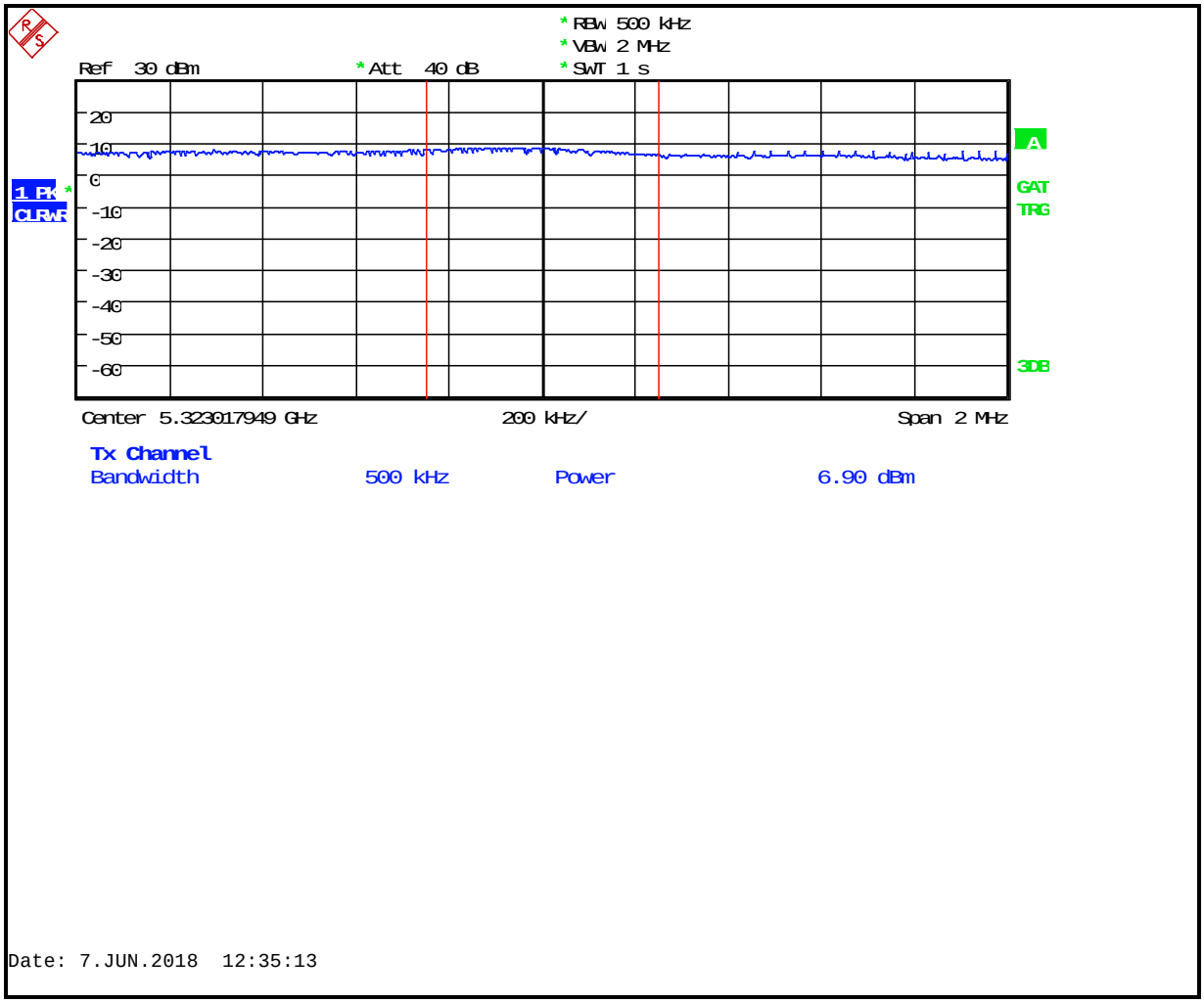
Plot 8-18: PSD – 5280 MHz 802.11n 20 MHz



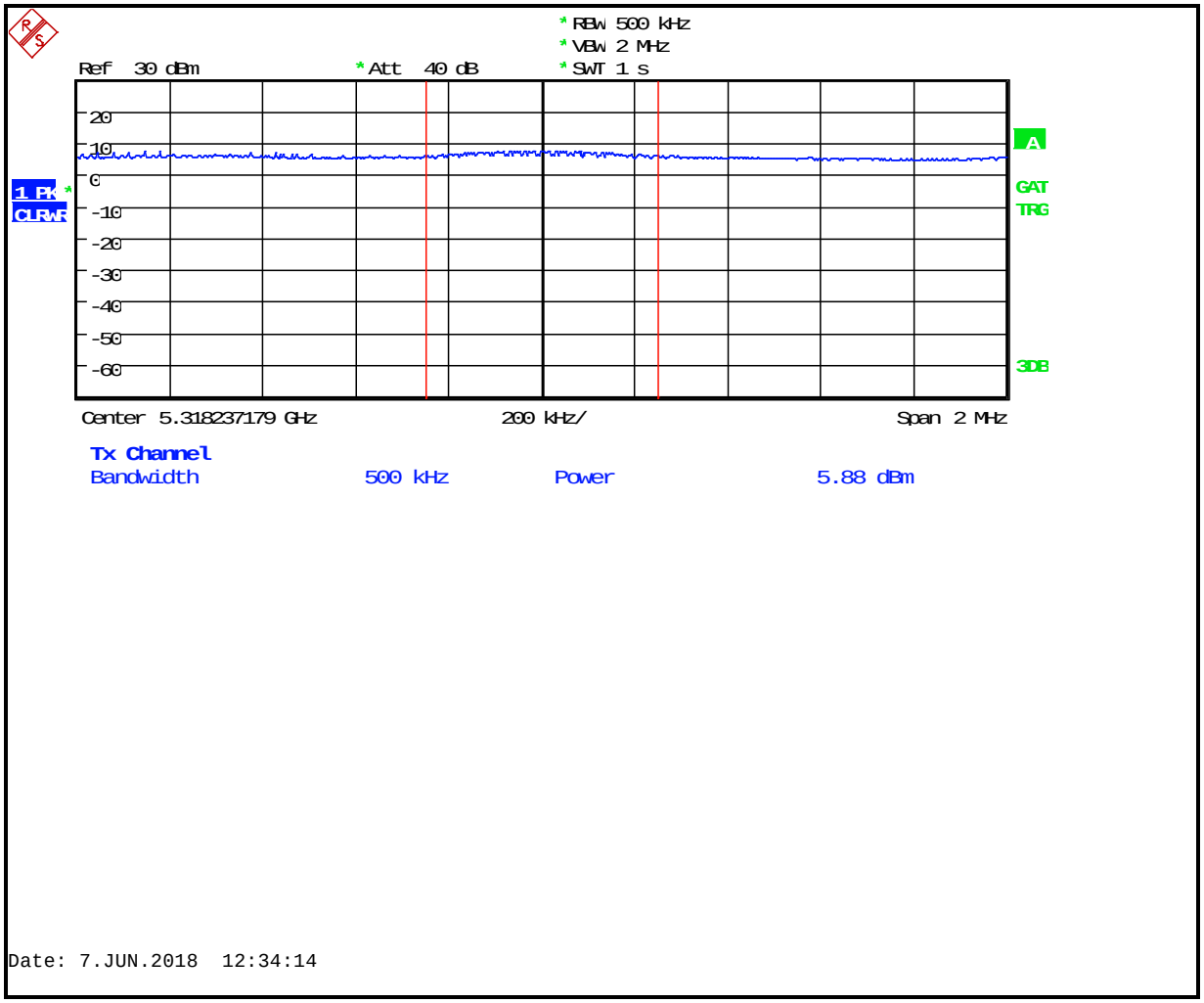
Plot 8-19: PSD – 5280 MHz 802.11n 40 MHz



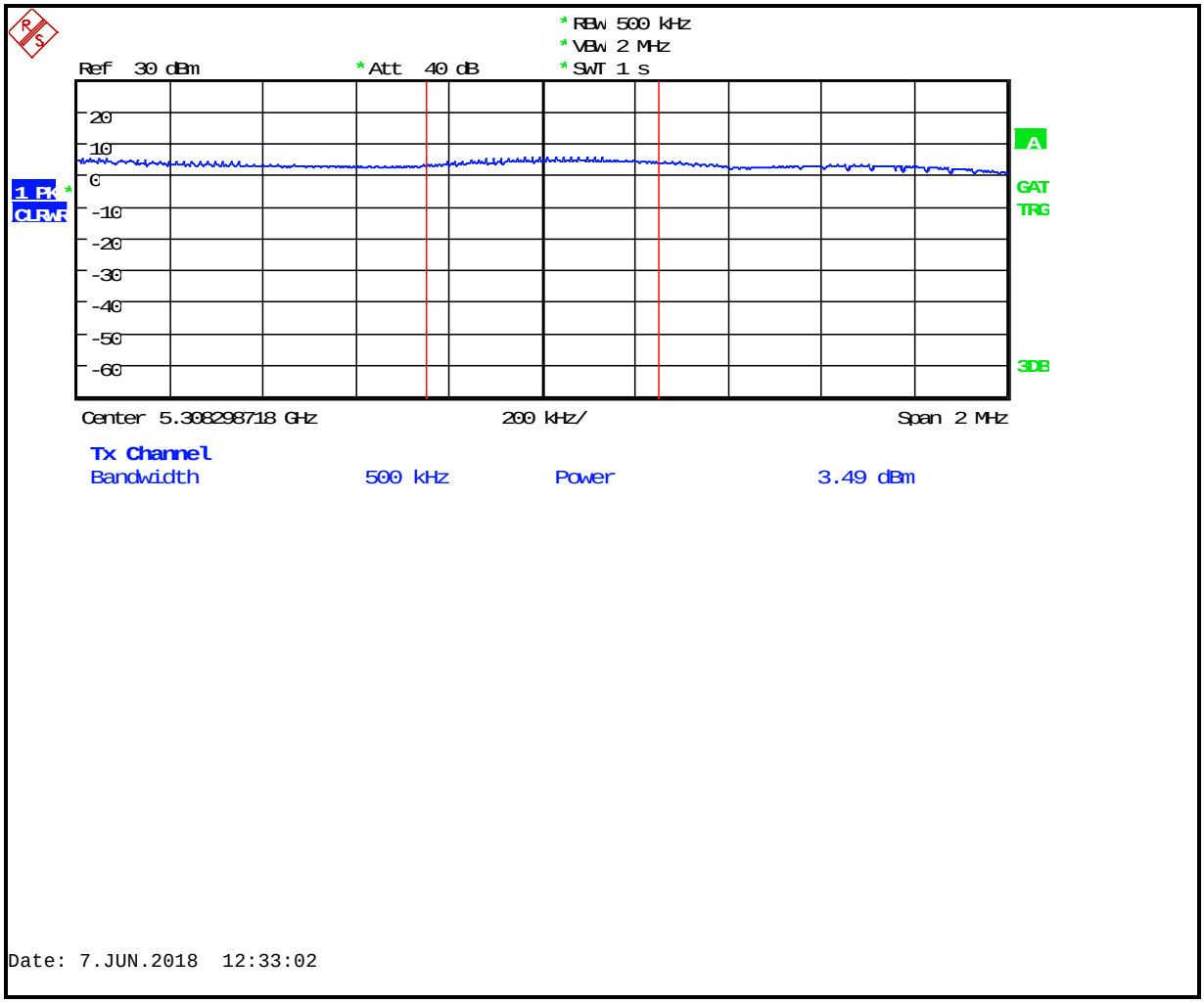
Plot 8-20: PSD – 5320 MHz 802.11a 20 MHz



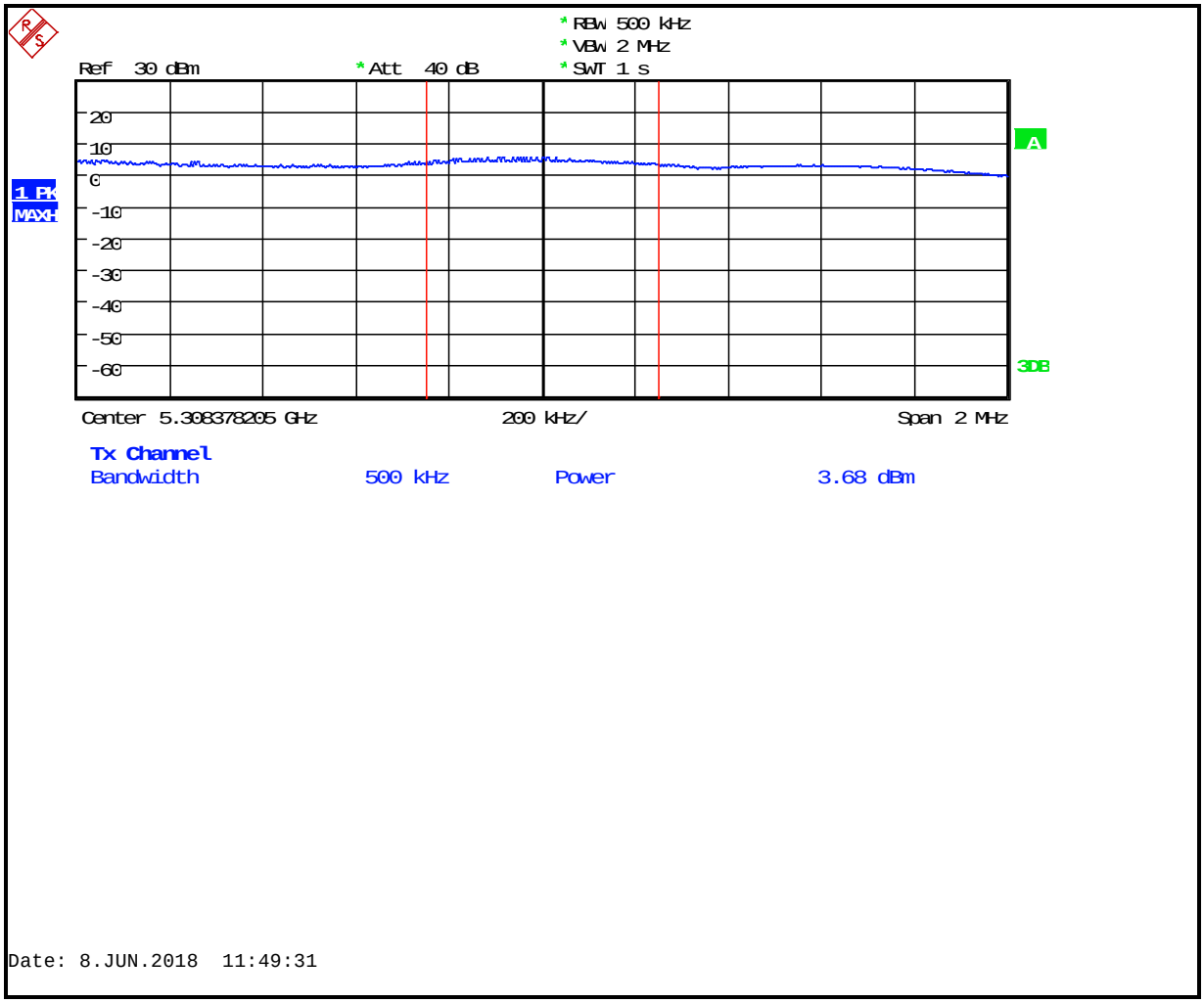
Plot 8-21: PSD – 5320 MHz 802.11n 20 MHz



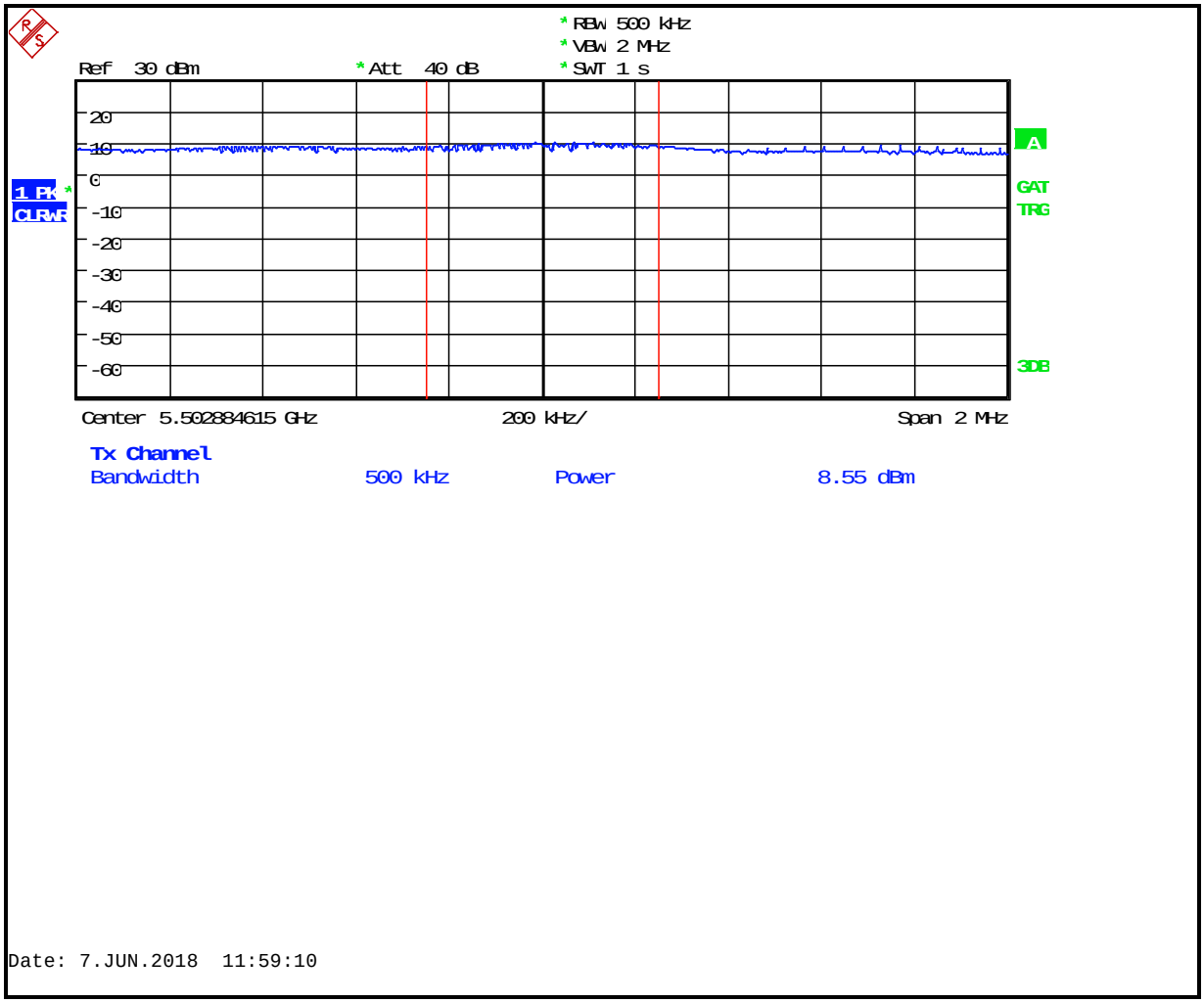
Plot 8-22: PSD – 5320 MHz 802.11n 40 MHz



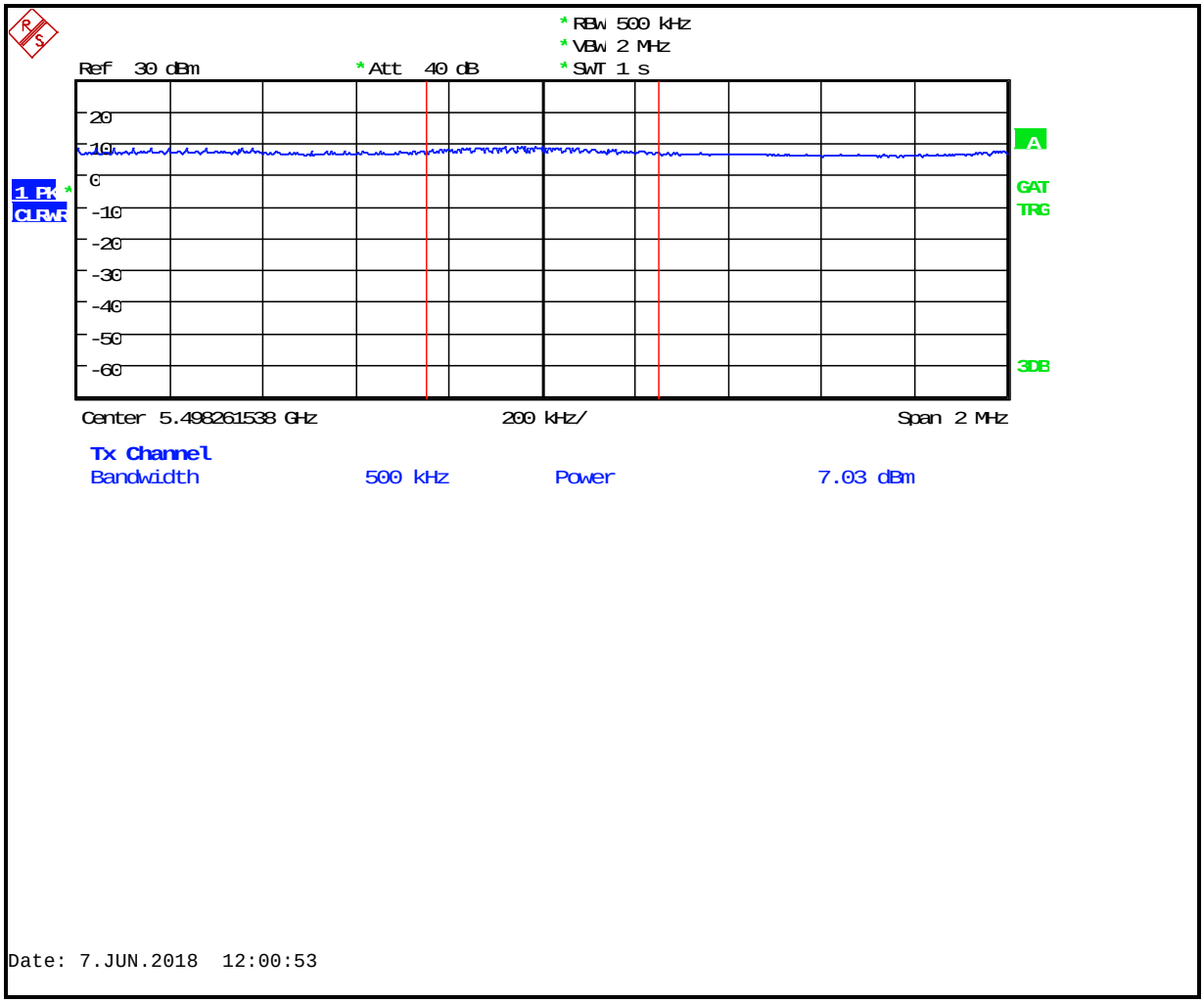
Plot 8-23: PSD – 5290 MHz 802.11ac 80 MHz



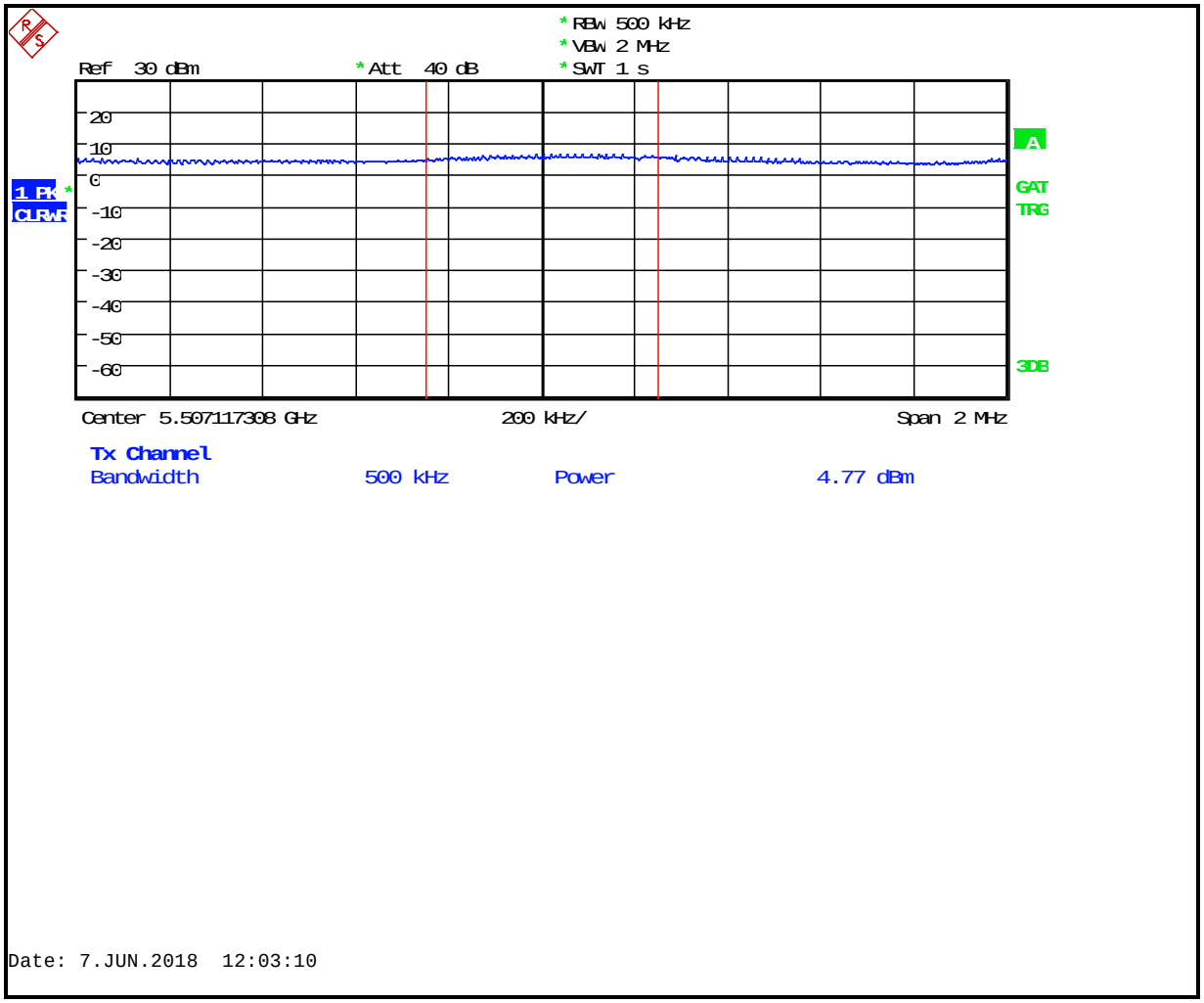
Plot 8-24: PSD – 5500 MHz 802.11a 20 MHz



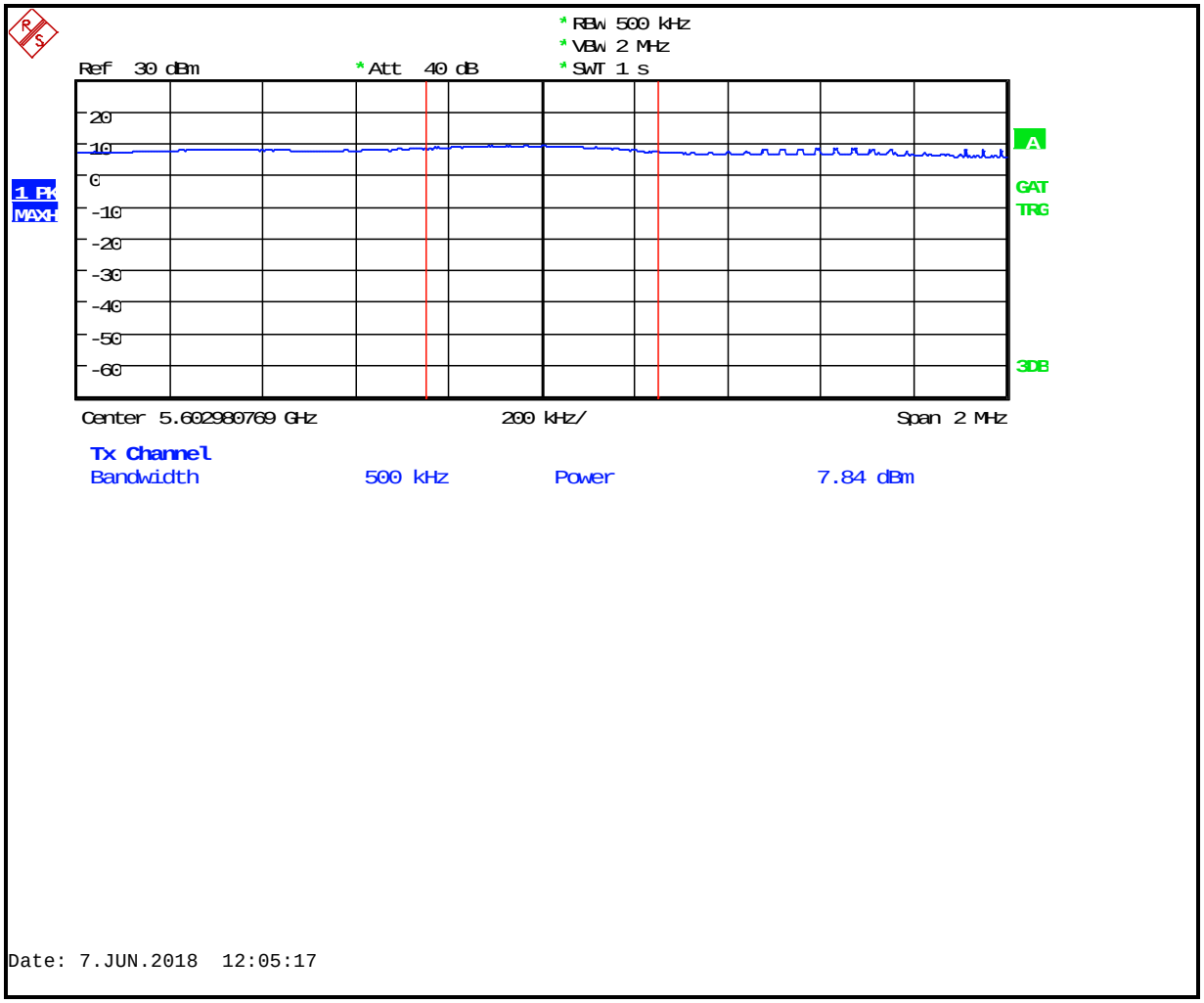
Plot 8-25: PSD – 5500 MHz 802.11n 20 MHz



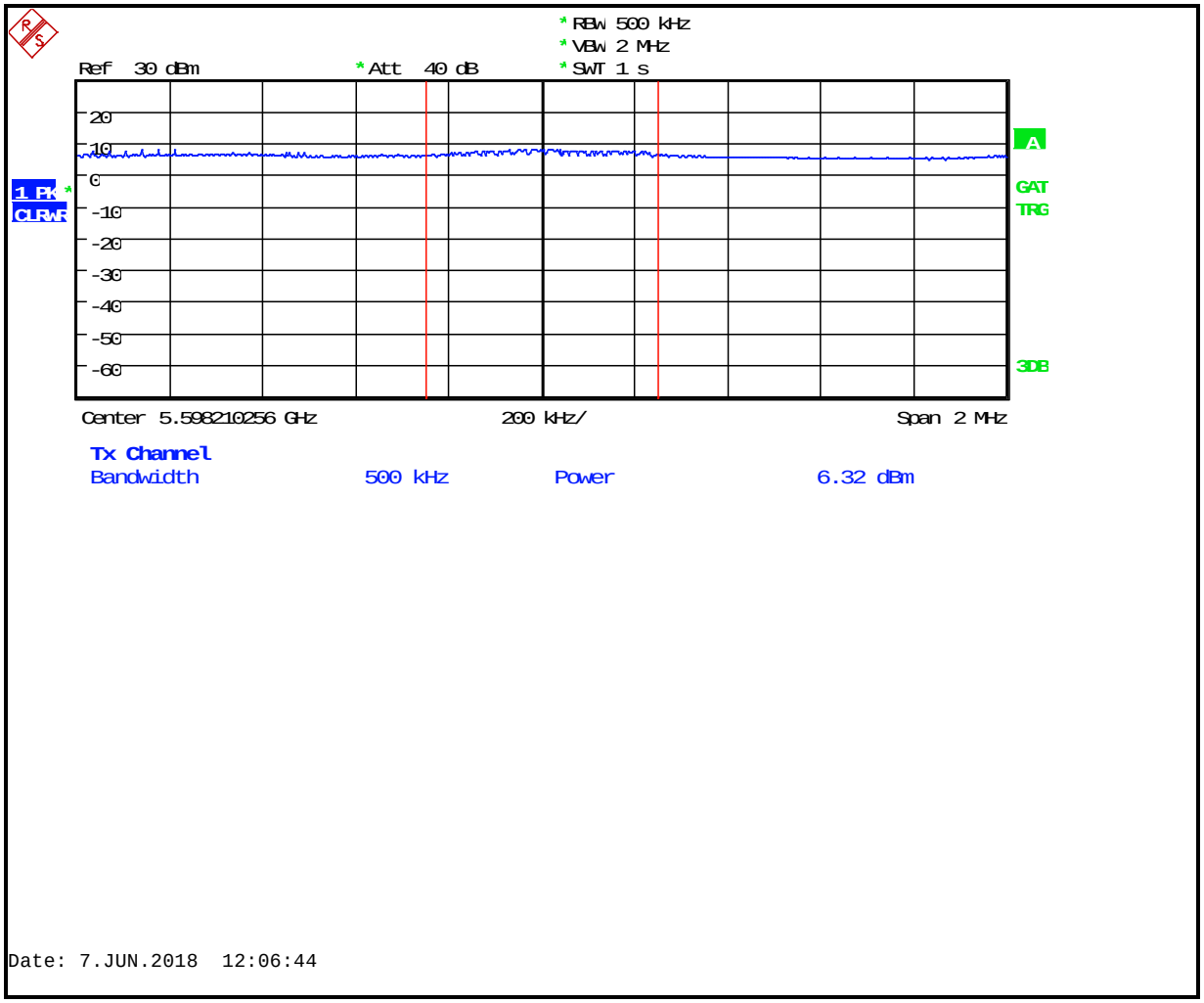
Plot 8-26: PSD – 5500 MHz 802.11n 40 MHz



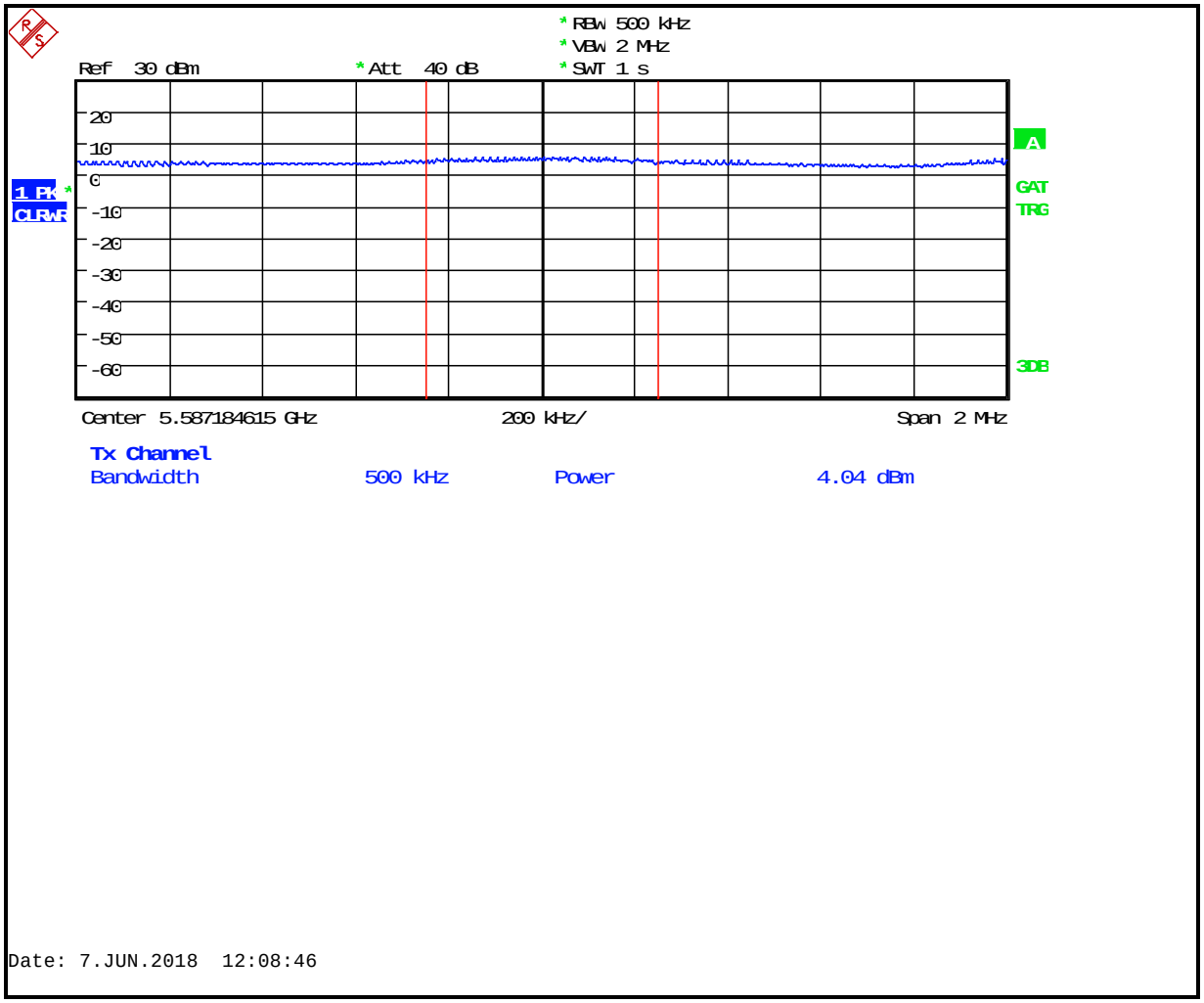
Plot 8-27: PSD – 5600 MHz 802.11a 20 MHz



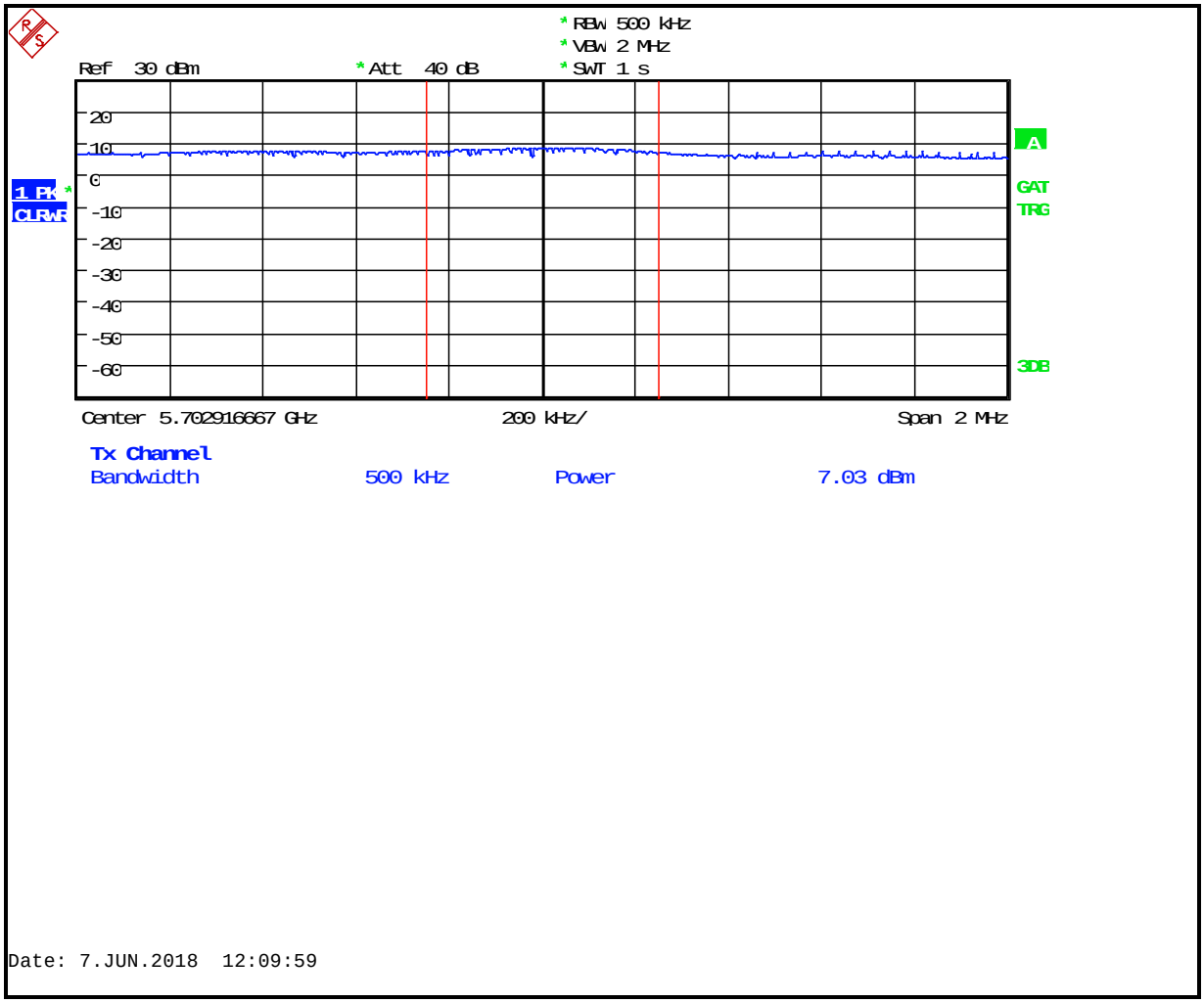
Plot 8-28: PSD – 5600 MHz 802.11n 20 MHz



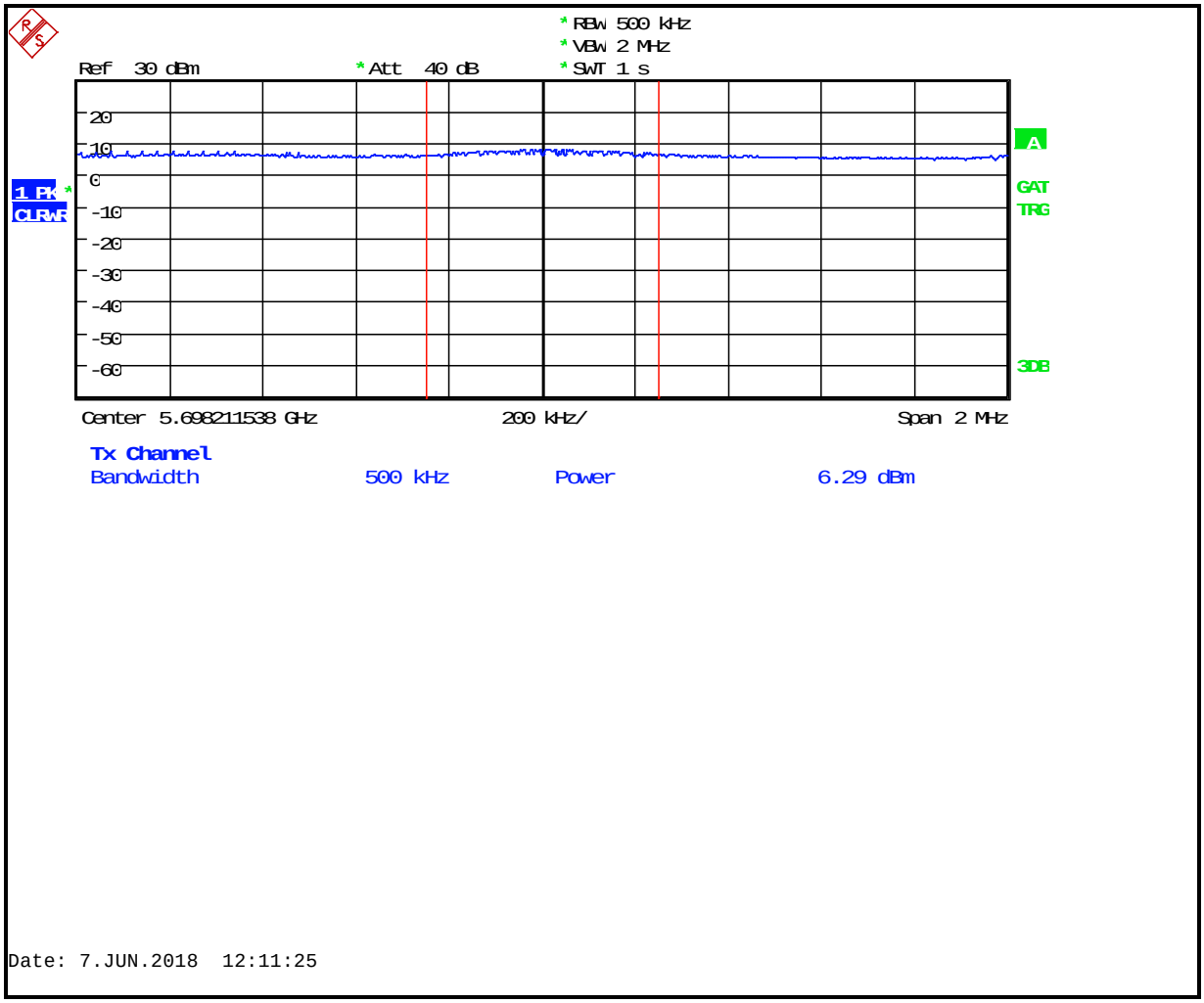
Plot 8-29: PSD – 5600 MHz 802.11n 40 MHz



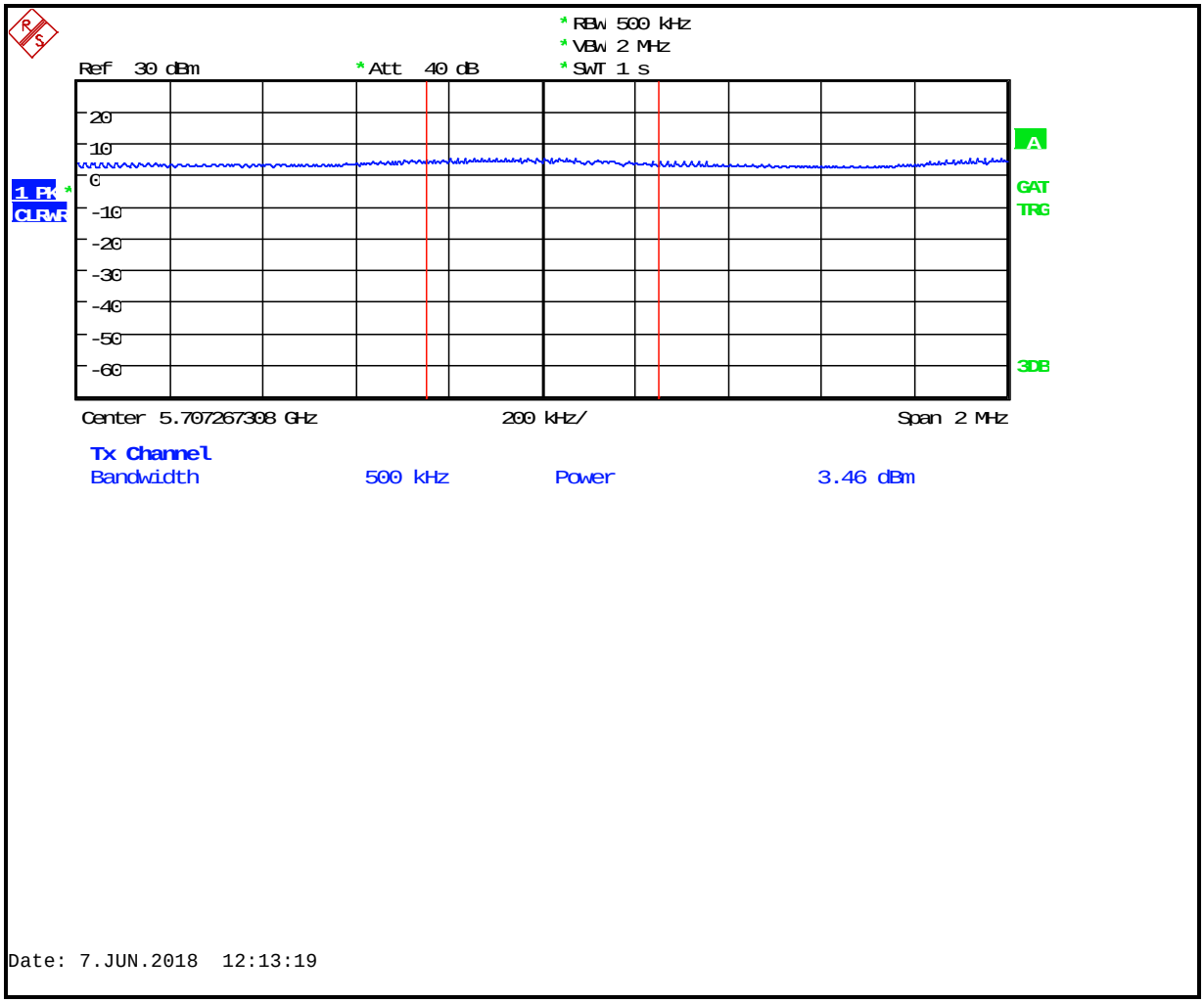
Plot 8-30: PSD – 5700 MHz 802.11a 20 MHz



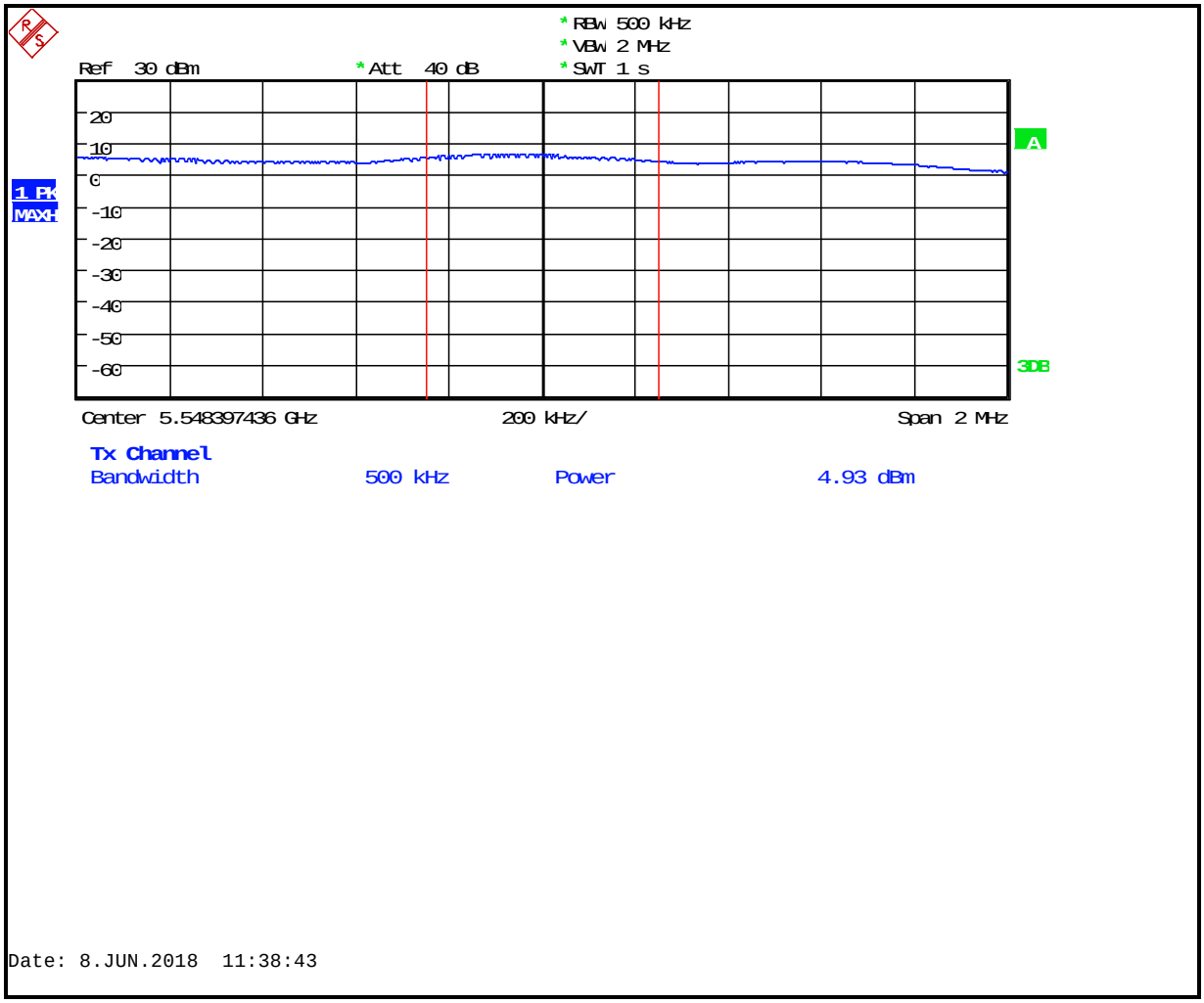
Plot 8-31: PSD – 5700 MHz 802.11n 20 MHz



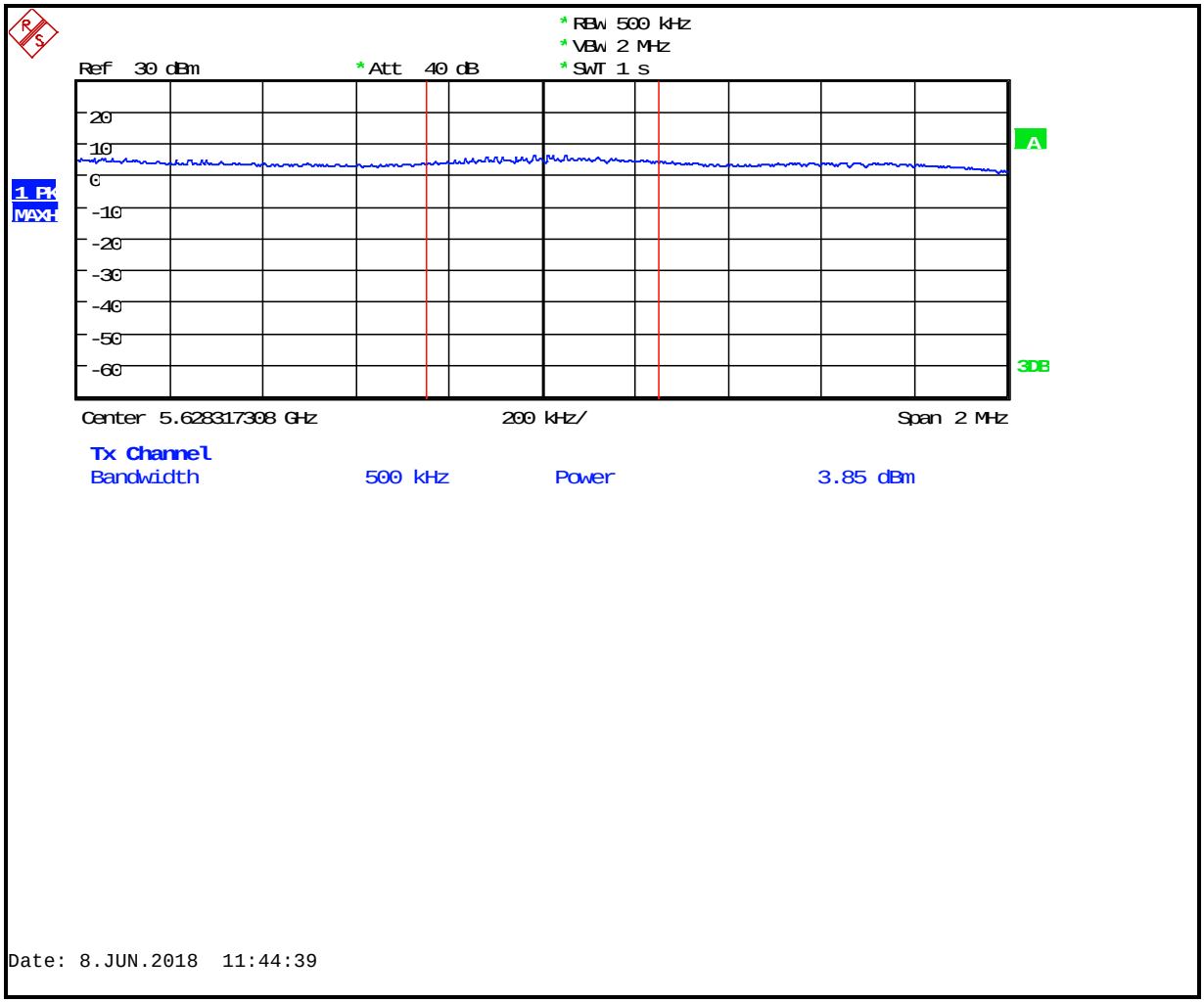
Plot 8-32: PSD – 5700 MHz 802.11n 40 MHz



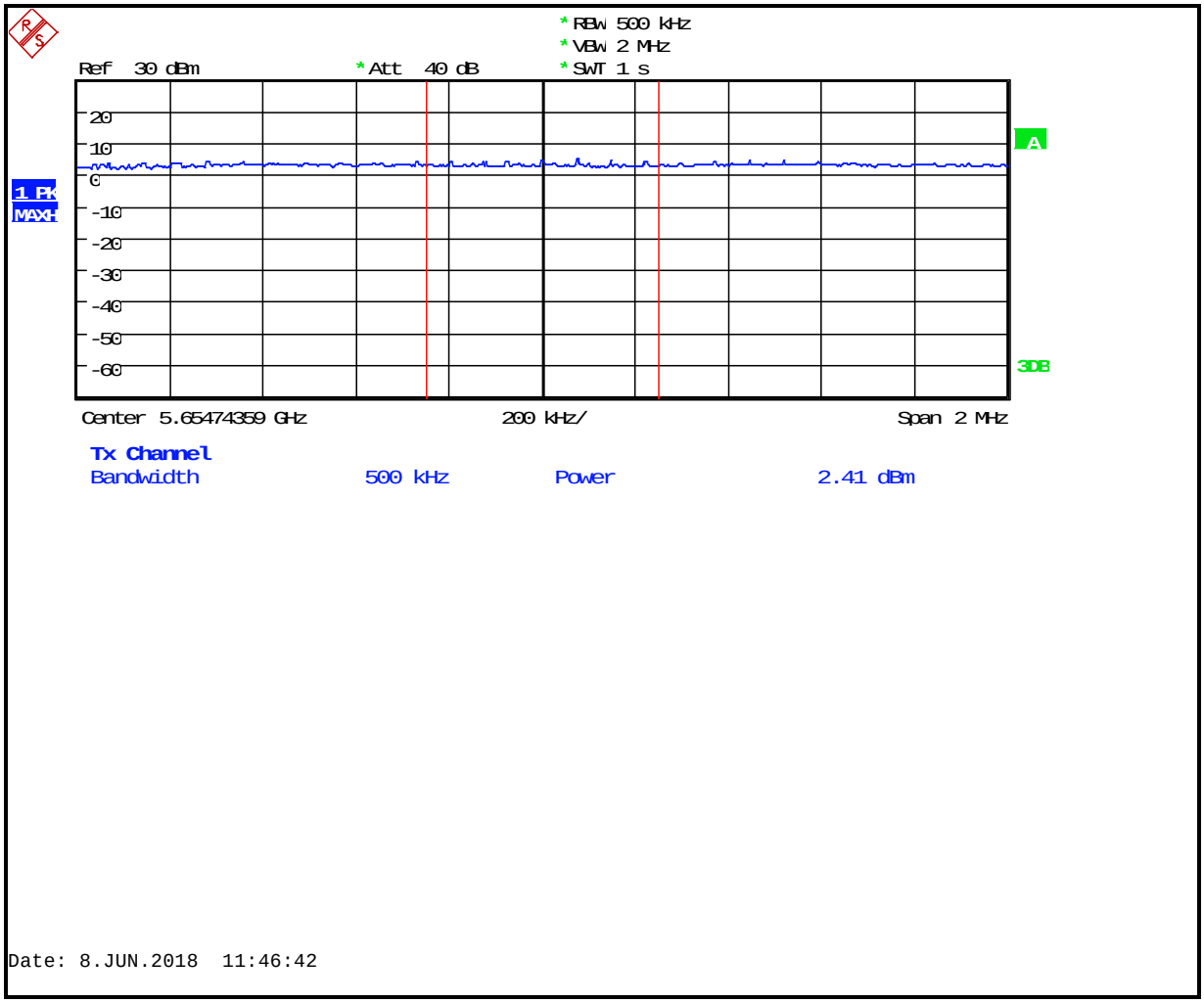
Plot 8-33: PSD – 5530 MHz 802.11ac 80 MHz



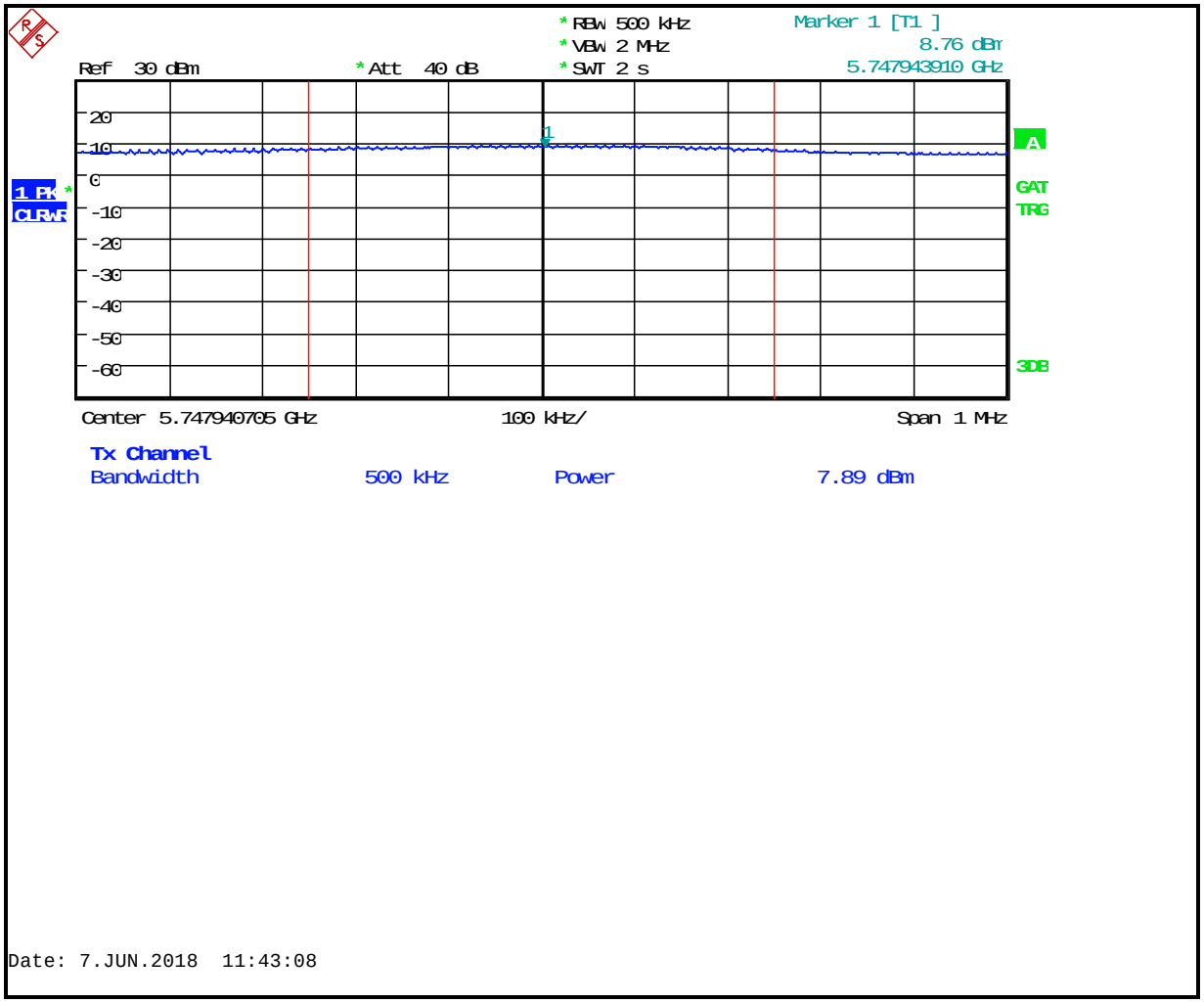
Plot 8-34: PSD – 5610 MHz 802.11ac 80 MHz



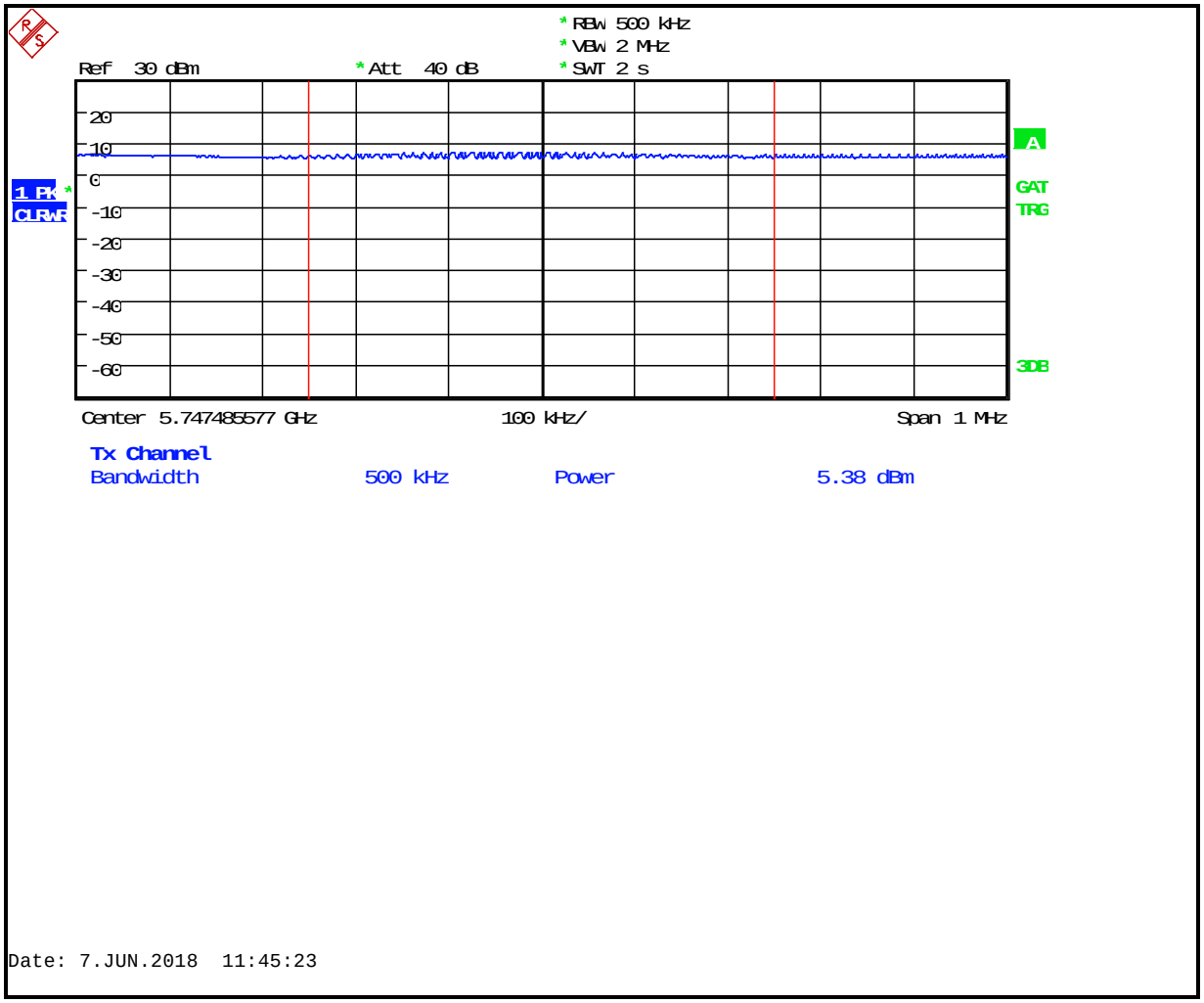
Plot 8-35: PSD – 5690 MHz 802.11ac 80 MHz



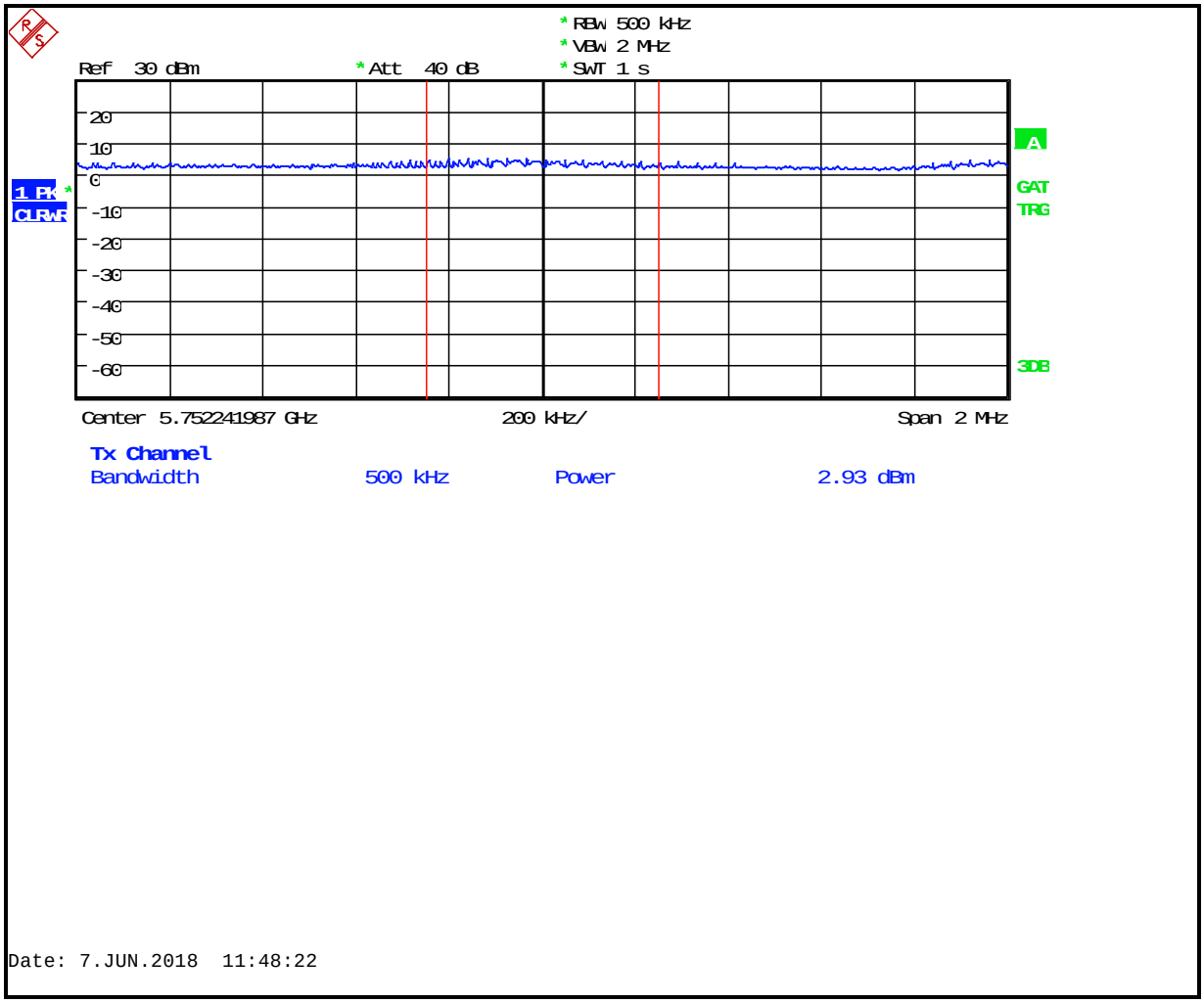
Plot 8-36: PSD – 5745 MHz 802.11a 20 MHz



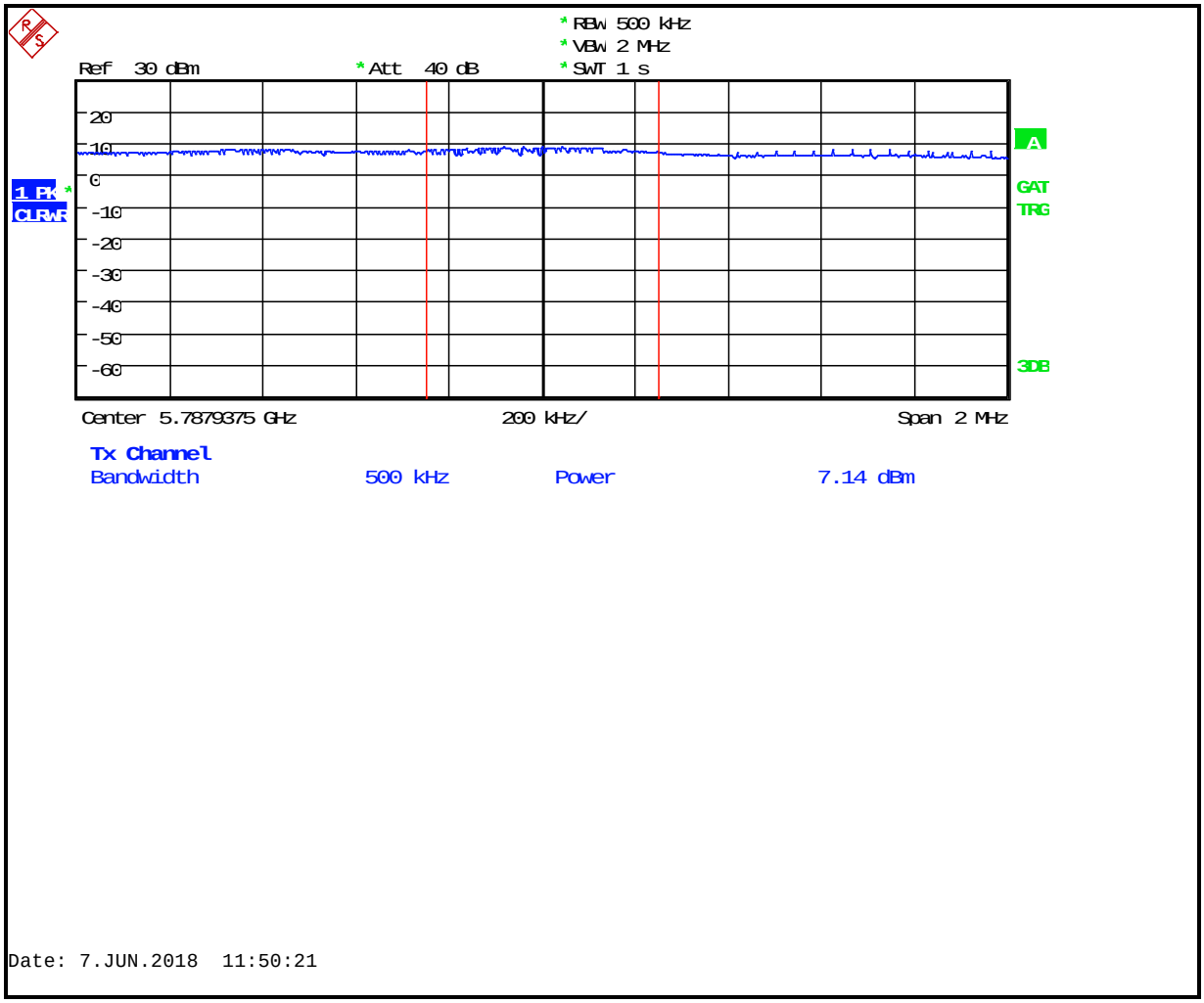
Plot 8-37: PSD – 5745 MHz 802.11n 20 MHz



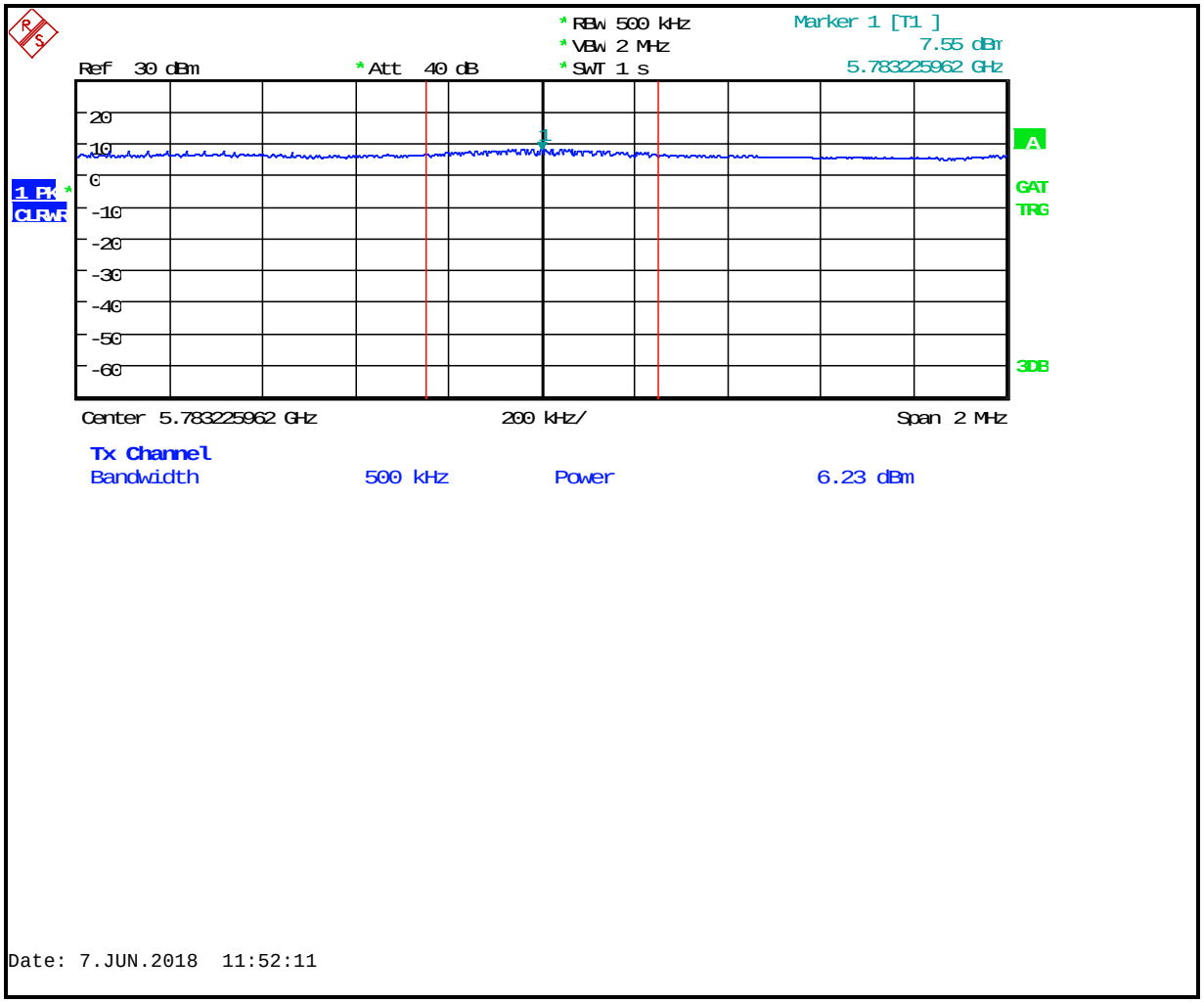
Plot 8-38: PSD – 5745 MHz 802.11n 40 MHz



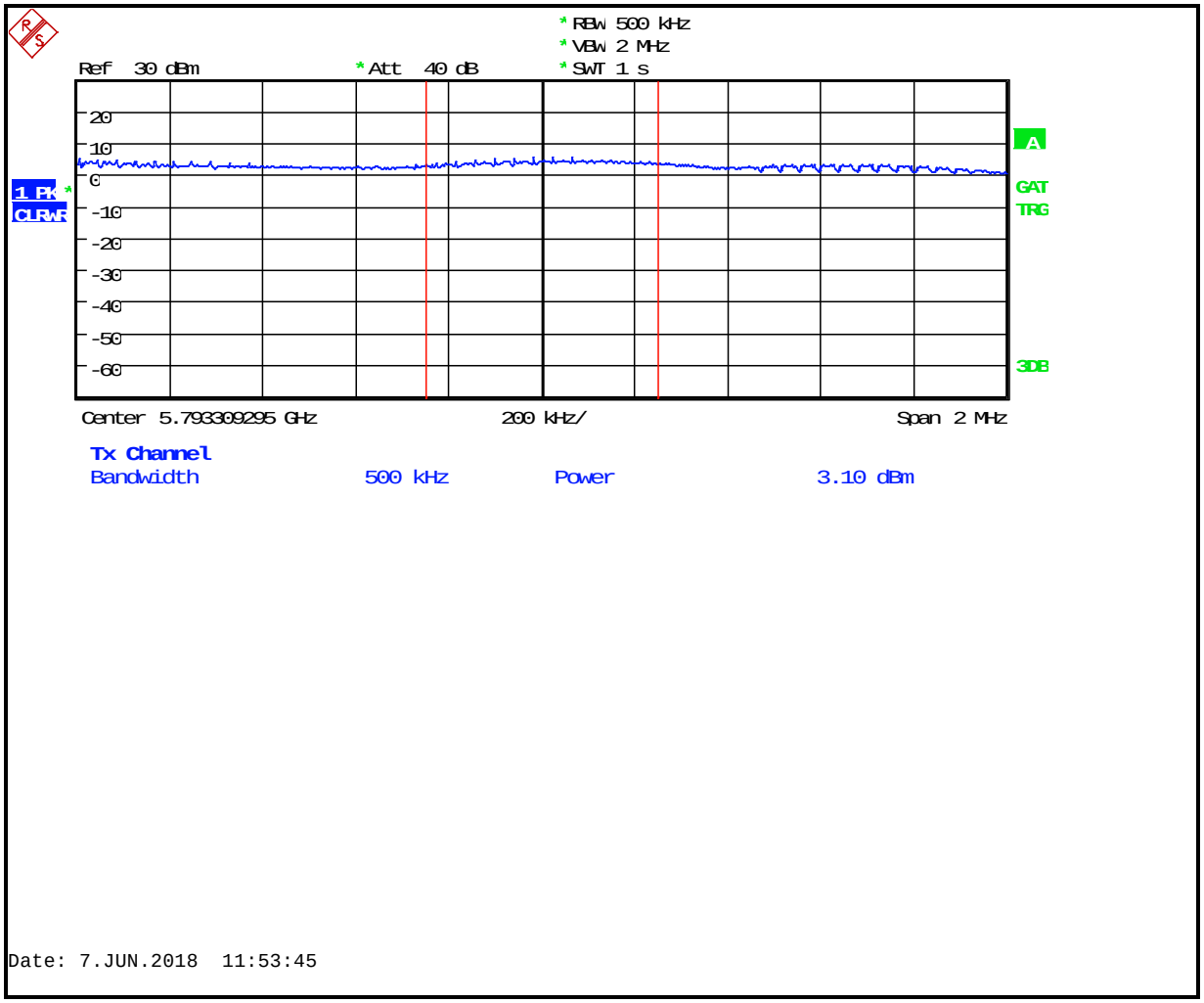
Plot 8-39: PSD – 5785 MHz 802.11a 20 MHz



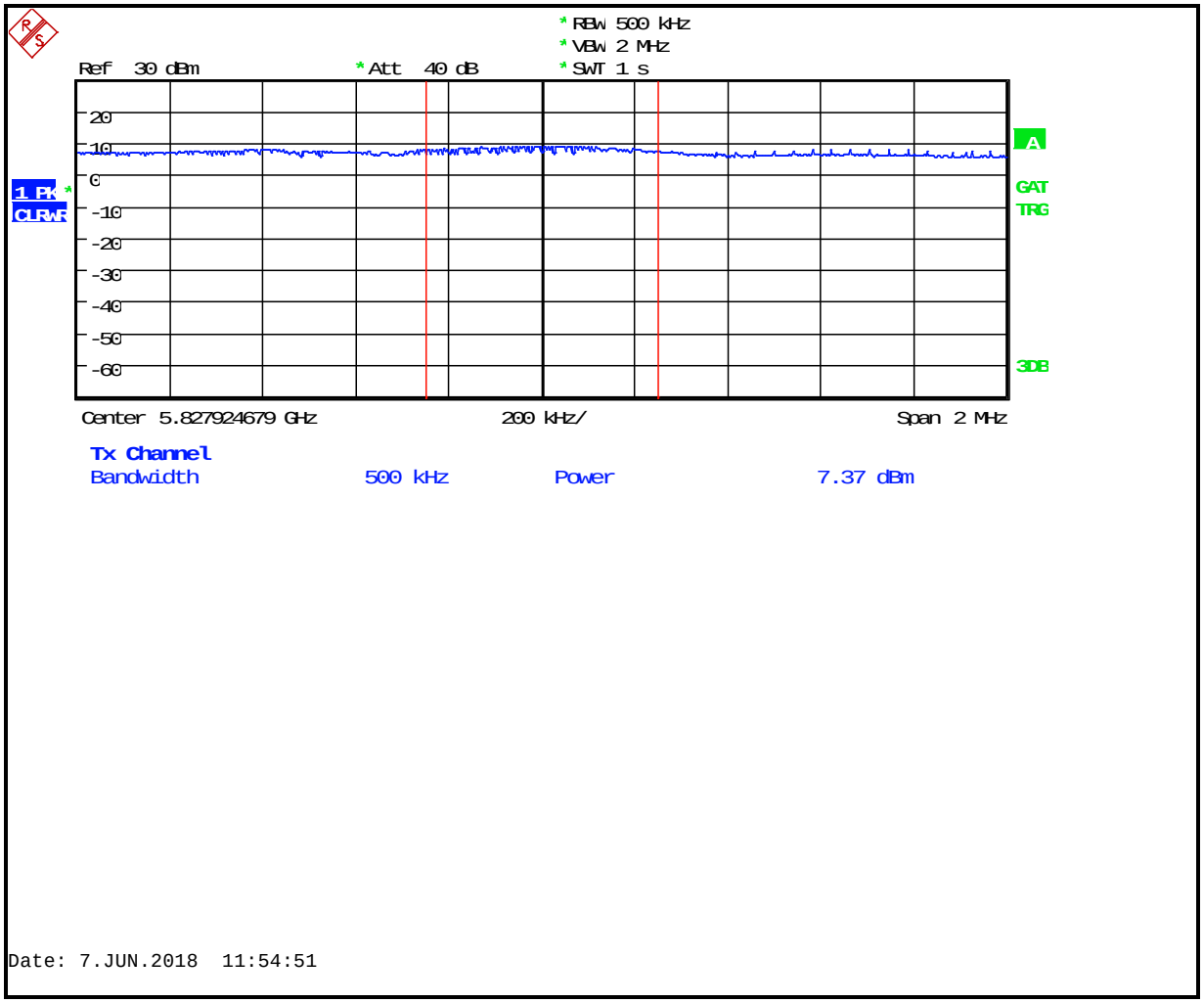
Plot 8-40: PSD – 5785 MHz 802.11n 20 MHz



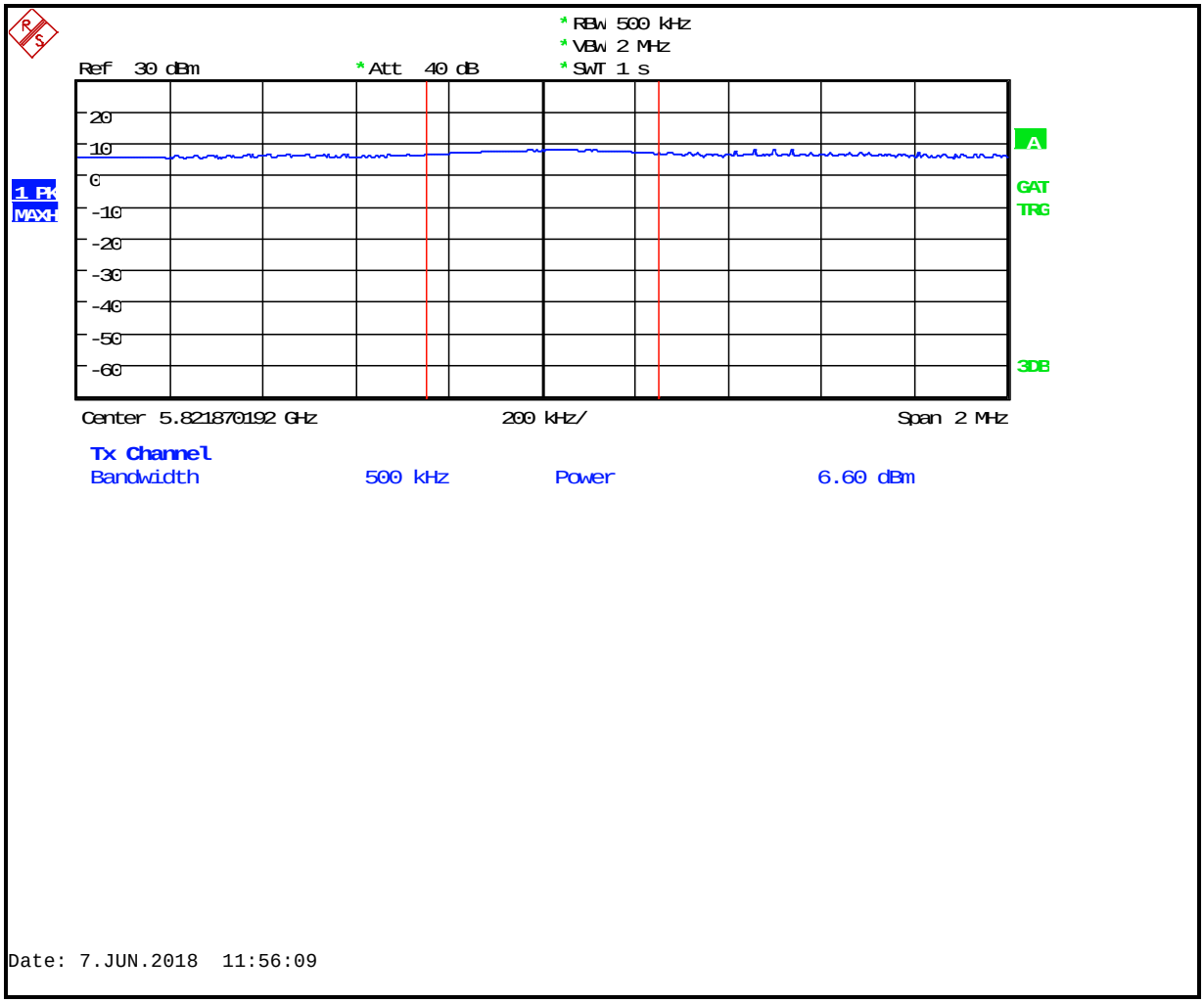
Plot 8-41: PSD – 5785 MHz 802.11n 40 MHz



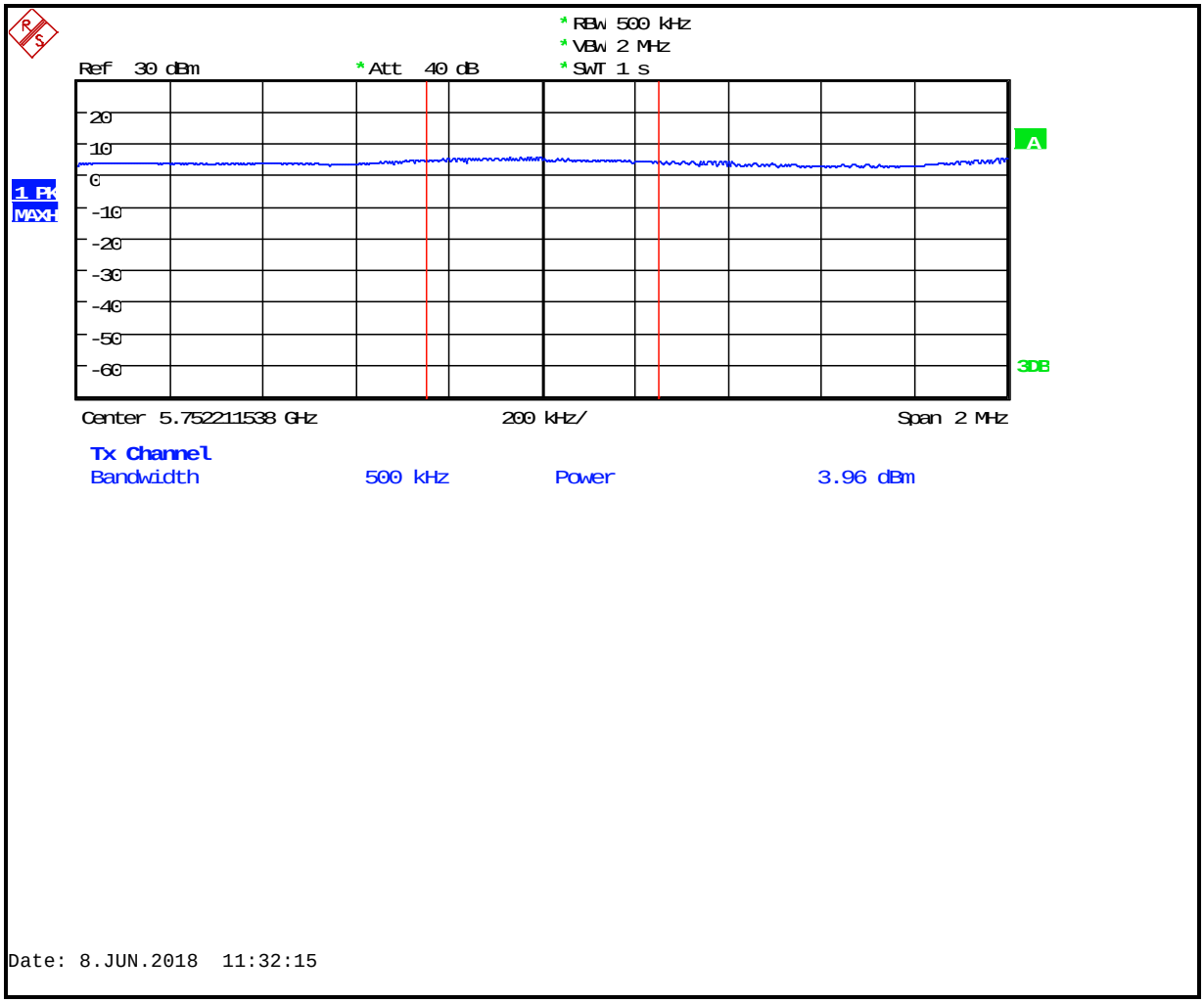
Plot 8-42: PSD – 5825 MHz 802.11a 20 MHz



Plot 8-43: PSD – 5825 MHz 802.11n 20 MHz



Plot 8-44: PSD – 5775 MHz 802.11ac 80 MHz



Result: PASS

Measurement uncertainties shown for these tests are expanded Gaussian uncertainties expressed at 95% confidence level using a coverage factor k = 1.96. Measurement uncertainty = ±0.5 dB.

Table 8-4: Power Spectral Density Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19

Test Personnel:

Khue Do		June 7-8 & 14, 2018
Test Engineer	Signature	Dates of Test

9 Radiated Emissions – FCC 15.209; ISED RSS-247 6.2 and RSS-Gen

9.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

9.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10th harmonic of the highest fundamental transmitter frequency (24.8 GHz) for the 2.4 GHz band.

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

9.3 Radiated Emissions Test Results

Table 9-1: Radiated Emissions Harmonics/Spurious – 5180 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15540	3.9	48.7	52.6	74.0	-21.4
20720	1.3	53.3	54.6	74.0	-19.4

Table 9-2: Radiated Emissions Harmonics/Spurious – 5180 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15540	-6.0	48.7	42.7	54.0	-11.3
20720	-9.2	53.3	44.1	54.0	-9.9

Table 9-3: Radiated Emissions Harmonics/Spurious – 5200 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15600	4.5	48.7	53.2	74.0	-20.8
20800	0.5	53.3	53.9	74.0	-20.2
31200	3.1	44.6	47.7	74.0	-26.3

Table 9-4: Radiated Emissions Harmonics/Spurious – 5200 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15600	-7.5	48.7	41.2	54.0	-12.8
20800	-9.2	53.3	44.1	54.0	-9.9
31200	-5.7	44.6	38.9	54.0	-15.1

Table 9-5: Radiated Emissions Harmonics/Spurious – 5220 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15660	3.1	48.6	51.7	74.0	-22.4
20880	0.7	53.3	54.0	74.0	-20.0
31320	3.9	44.6	48.5	74.0	-25.5

Table 9-6: Radiated Emissions Harmonics/Spurious – 5220 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15660	-6.3	48.6	42.3	54.0	-11.7
20880	-8.9	53.3	44.4	54.0	-9.6
31320	-6.5	44.6	38.1	54.0	-15.9

Table 9-7: Radiated Emissions Harmonics/Spurious – 5240 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15720	5.4	48.7	54.1	74.0	-19.9
20960	-0.1	53.4	53.3	74.0	-20.7
31440	1.4	44.6	46.0	74.0	-28.1

Table 9-8: Radiated Emissions Harmonics/Spurious – 5240 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15720	-6.8	48.7	41.9	54.0	-12.1
20960	-8.8	53.4	44.7	54.0	-9.3
31440	-7.9	44.6	36.7	54.0	-17.3

Table 9-9: Radiated Emissions Harmonics/Spurious – 5260 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15780	3.6	48.7	52.3	74.0	-21.7
21040	0.6	53.4	54.0	74.0	-20.0
31560	4.4	44.3	48.7	74.0	-25.3

Table 9-10: Radiated Emissions Harmonics/Spurious – 5260 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15780	-6.0	48.7	42.7	54.0	-11.3
21040	-8.9	53.4	44.5	54.0	-9.5
31560	-5.0	44.3	39.3	54.0	-14.7

Table 9-11: Radiated Emissions Harmonics/Spurious – 5280 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
15840	5.0	48.7	53.7	74.0	-20.4
21120	0.4	53.3	53.7	74.0	-20.3
31680	4.0	44.3	48.3	74.0	-25.7

Table 9-12: Radiated Emissions Harmonics/Spurious – 5280 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
15840	-6.5	48.7	42.2	54.0	-11.8
21120	-8.3	53.3	45.0	54.0	-9.0
31680	-6.4	44.3	37.9	54.0	-16.1

Table 9-13: Radiated Emissions Harmonics/Spurious – 5320 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
10640	4.8	42.7	47.5	74.0	-26.5
15960	3.4	48.7	52.1	74.0	-21.9
21280	-0.1	53.5	53.4	74.0	-20.6

Table 9-14: Radiated Emissions Harmonics/Spurious – 5320 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
10640	-4.3	42.7	38.4	54.0	-15.6
15960	-7.3	48.7	41.4	54.0	-12.6
21280	-9.2	53.5	44.4	54.0	-9.7

Table 9-15: Radiated Emissions Harmonics/Spurious – 5500 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11000	0.3	42.9	43.2	74.0	-30.8

Table 9-16: Radiated Emissions Harmonics/Spurious – 5500 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11000	-10.1	42.9	32.8	54.0	-21.2

Table 9-17: Radiated Emissions Harmonics/Spurious – 5600 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11200	0.4	43.0	43.4	74.0	-30.6
22400	-0.4	54.5	54.1	74.0	-19.9

Table 9-18: Radiated Emissions Harmonics/Spurious – 5600 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11200	-9.8	43.0	33.2	54.0	-20.8
22400	-7.9	54.5	46.6	54.0	-7.4

Table 9-19: Radiated Emissions Harmonics/Spurious – 5700 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11400	0.0	43.1	43.1	74.0	-30.9
22800	1.9	54.3	56.2	74.0	-17.8

Table 9-20: Radiated Emissions Harmonics/Spurious – 5700 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11400	-10.4	43.1	32.7	54.0	-21.3
22800	-9.6	54.3	44.7	54.0	-9.3

Table 9-21: Radiated Emissions Harmonics/Spurious – 5745 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11490	1.7	43.1	44.8	74.0	-29.2
22980	-0.8	54.3	53.5	74.0	-20.5

Table 9-22: Radiated Emissions Harmonics/Spurious – 5745 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11490	-9.5	43.1	33.6	54.0	-20.4
22980	-7.6	54.3	46.7	54.0	-7.3

Table 9-23: Radiated Emissions Harmonics/Spurious – 5785 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11570	1.7	43.3	45.0	74.0	-29.0

Table 9-24: Radiated Emissions Harmonics/Spurious – 5785 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11570	-9.0	43.3	34.3	54.0	-19.7

Table 9-25: Radiated Emissions Harmonics/Spurious – 5825 MHz Peak Detector

Frequency (MHz)	Peak Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Peak Corrected (dBµV/m)	Peak Limit (dBµV/m)	Peak Margin (dB)
11650	0.5	43.4	43.9	74.0	-30.1

Table 9-26: Radiated Emissions Harmonics/Spurious – 5825 MHz Average Detector

Frequency (MHz)	Average Analyzer (dBµV/m)	Site Correction Factor (dB/m)	Average Corrected (dBµV/m)	Average Limit (dBµV/m)	Average Margin (dB)
11650	-10.0	43.4	33.4	54.0	-20.6

Table 9-27: Unintentional Emissions Test Data

Temperature: 72.4°F Humidity: 55%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (°)**	**Antenna Height (m)**	**Analyzer Reading (dBµV)**	**Site Correction Factor (dB/m)**	**Emission Level (dBµV/m)**	**Limit (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
51.04	QP	H	90	1.0	11.8	9.0	20.8	40.0	-19.2	PASS
150.50	QP	H	90	1.0	3.1	11.5	14.6	43.5	-28.9	PASS
192.39	QP	H	90	1.0	-0.4	10.3	9.9	43.5	-33.6	PASS
207.42	QP	H	90	1.0	16.9	10.5	27.4	43.5	-16.1	PASS
556.91	QP	H	90	1.0	4.3	21.0	25.3	46.0	-20.7	PASS
767.94	QP	H	90	1.0	3.8	22.5	26.3	46.0	-19.7	PASS

Result: PASS

Measurement uncertainties shown for these tests are expanded Gaussian uncertainties expressed at 95% confidence level using a coverage factor k = 2. Measurement uncertainty = ±4.7 dB.

Table 9-28: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901663	Rohde and Schwarz	HFH2-Z2	Loop Antenna (9 kHz-30 MHz)	827525/019	5/1/19
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1-26.5 GHz)	3008A00505	8/18/18
900905	Rhein Tech Laboratories	PR-1040	OATS 1 Preamplifier 40dB (30 MHz–2 GHz)	1006	8/18/18
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter Antenna mast, polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/21/18
901593	Insulated Wire Inc.	KPS-1503-360-KPR	SMK RF Cables 36"	NA	8/18/18
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 kHz–6.5 GHz)	3325A00159	4/4/19
900914	Hewlett Packard	8546OA	RF Filter Section (100 kHz-6.5 GHz)	3330A00107	4/4/19
900772	EMCO	3161-02	Horn Antenna (2-4 GHz)	9804-1044	4/9/19
900321	EMCO	3161-03	Horn Antenna (4.0-8.2 GHz)	9508-1020	4/9/19
900323	EMCO	3160-07	Horn Antenna (8.2-12.4 GHz)	9605-1054	4/9/19
900356	EMCO	3160-08	Horn Antenna (12.4-18 GHz)	9607-1044	4/9/19
901218	EMCO	3160-09	Horn Antenna (18-26.5 GHz)	960281-003	4/9/19
901303	EMCO	3160-10	Horn Antenna (26.5-40.0 GHz)	960452-007	4/15/21
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	4/26/19
900791	Antenna Research Associates, Inc.	LPB-2520	Bilog Antenna (25-1000 MHz)	1037	10/4/20

Test Personnel:

Khue N. Do		June 11-12, 2018
Test Engineer	Signature	Dates of Test

10 Conclusion

The data in this measurement report shows that the EUT as tested, Honeywell International Inc. Model A700x, FCC ID: HD5-TAP1000-01, IC: 1693B-TAP100001, complies with the applicable requirements of FCC Parts 2 and 15 and ISED RSS-247 and RSS-Gen.