FCC RF TEST REPORT

Report No.:	R201811006
Model No.:	JA32
Grant No.:	JOY
FCC ID:	JOYJA32
Date of Receipt:	Oct 10,2018
Date of Test:	Oct 10,2018~ Nov 24,2018
Date of Issue:	Nov 24,2018
Test Result:	PASS

Applicant:	KYOCERA CORPORATION
Manufacturer:	KYOCERA CORPORATION
Factory:	KYOCERA CORPORATION
Product Name	SMART PHONE
Trade Mark	KYOCERA
Address:	Yokohama Office 2-1-1 Kagahara,Tsuzuki-ku Yokohama-shi,Kanagawa,Japan
Issued By:	BYD Precise Manufacture Co., Ltd.
Lab Location:	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People's Republic of China

Table of Contents

1 REPORT ISSUED HISTORY

Version	Description	Issued Data
Rev. 01	Original issue	Nov 24,2018

2 CERTIFICATION

PRODUCT:	Smart Phone
MODEL:	JA32
BRAND:	KYOCERA
APPLICANT:	KYOCERA
TEST SAMPLE:	ENGINEERING SAMPLE
SN.:	JA32125479850089K0676
HW Version:	JA32
SW Version:	Sdm660_64-userdebug 9
TESTED:	Oct 10,2018~ Nov 24,2018
STANDARDS:	FCC 47 CFR Part15 Subpart E §15.407

The above equipment has been tested by **BYD Precise Manufacture Co., Ltd.,** and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

PREPARED BY : _____ **DATE:** 2018-11-24
(Yan Chen/ Engineer)

TECHNICAL ACCEPTANCE : _____ **DATE:** 2018-11-24
Responsible for EMS (Zhaohui Feng / Manager)

APPROVED BY : _____ **DATE:** 2018-11-24
(Jie Yan / Director)

3 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

FCC RULE	Description	RESULT	REMARK
§15.403(i)	26dB and 99% BandWidth	Pass	-
§15.407(a)	Maximum Conducted Output Power	Pass	≤ 24,30dBm(depend on band)
§15.407(a)	Power Spectral Density	Pass	≤ 11 (depend on band)
§15.407(g)	Frequency Stability	Pass	Within Operation Band

3.1 Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5%
RF output power, Conducted	±0.59dB
Power Spectral Density, Conducted	±0.59dB
Unwanted Emissions, Radiated	±1.6dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	±1%

4 GENERAL INFORMATION

4.1 Test Equipments List

Description & Manufacturer	MODEL NO.	SERIAL NO.	Next Calibration date
SIGNAL ANALYZER ROHDE & SCHWARZ	FSQ26	200393	2019/4/9
DC Power Supply Agilent	E3632A	MY40029031	2019/3/5
RADIO COMMUNICATION TESTER	CMW500	145022	2019/10/16
Temperature Chamber WEISS	Temperature Chamber	'58226087670060	2019/3/5
Power Divider r	-	C279810-01	-
RF cable	Huber Suhner SUCOFLEX 104PE	-	-
PC	-	30008979	-

NOTE: Calibration cycle 12 months.

4.2 Description of Test Modes

Test Items	Mode	Data Rate	Test Channel	Power level
26dB and 99% BW Power Spectral Density Output Power	802.11a	6Mbps	L/M/H	15
	802.11n HT20	MCS0	L/M/H	15
	802.11n HT40	MCS0	L/M/H	13
	802.11ac VHT20	MCS0	L/M/H	15
	802.11ac VHT40	MCS0	L/M/H	13
	802.11ac VHT80	MCS0	M	13
Frequency Stability	802.11a	6Mbps	L/M/H	15
	802.11n HT20	MCS0	L/M/H	15
	802.11n HT40	MCS0	L/M/H	13
	802.11ac VHT20	MCS0	L/M/H	15
	802.11ac VHT40	MCS0	L/M/H	13
	802.11ac VHT80	MCS0	M	13

4.3 Testing Location

Test Site	BYD Precise Manufacture Co., Ltd.
Test Site Location	No. 3001, Baohe Road, Baolong Longgang, Shenzhen, 518116, People' s Republic of China
Post Code	518116
Telephone	+86-755 8489 8888 55501
Fax	+86-755 8964 3771

4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 4886.01)**

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 4886.01.

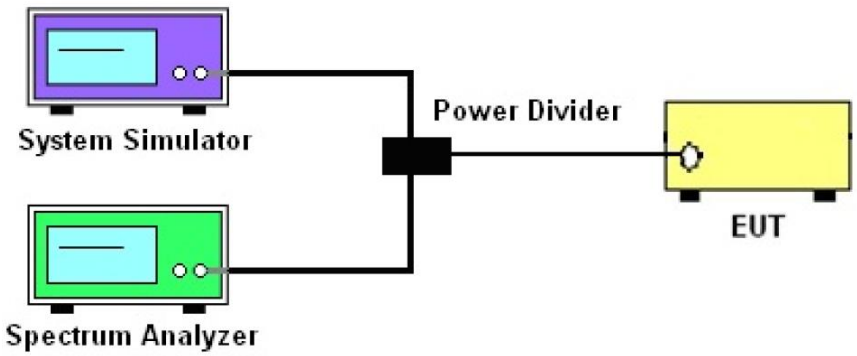
- **FCC –Designation Number: CN1232**

BYD Precise Manufacture Co., Ltd., Baolong Shenzhen Laboratory has been recognized as an accredited testing laboratory.
Designation Number: CN1232.

4.5 Test Environment and List of Software and Parts

Test Items	Software	Parts	Environment
26dB BandWidth	QRCT Version3.0	USB Cable、Fake battery	Temp.:25℃±3 Humi:30%~60% Volt.:3.8V
99% BandWidth	QRCT Version3.0	USB Cable、Fake battery	Temp.:25℃±3 Humi:30%~60% Volt.:3.8V
Output Power	QRCT Version3.0	USB Cable、Fake battery	Temp.:25℃±3 Humi:30%~60% Volt.:3.8V
Power Spectral Density	QRCT Version3.0	USB Cable、Fake battery	Temp.:25℃±3 Humi:30%~60% Volt.:3.8V
Frequency Stability	QRCT Version3.0	USB Cable、Fake battery	Temp.:-20℃~60℃ Humi:30%~60% Volt.:3.8、3.42、4.18V

4.6 CONFIGURATION of System Under Test



4.7 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part15 Subpart E
FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

5 TEST TYPES AND RESULTS

5.1 26dB and 99% Bandwidth

5.1.1 Description

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

5.1.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.1.3 Test Procedure

a. Set RBW = approximately 1% of the emission bandwidth.

b. Set the VBW > RBW

c. Detector = Peak

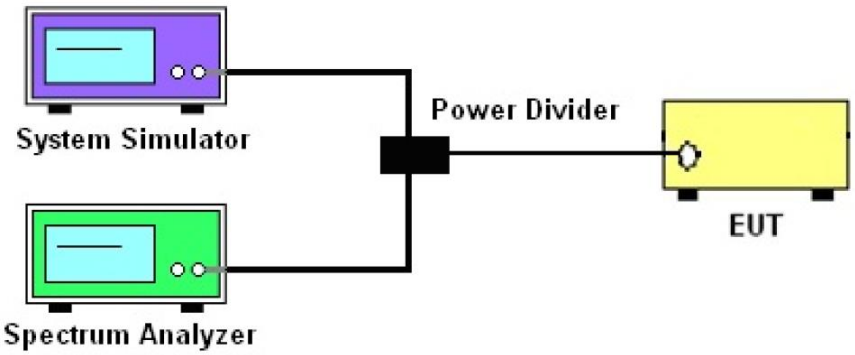
d. Trace mode = max hold.

e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

f. For 99% Bandwidth Measurement, the spectrum analyzers resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth(VBW) ≥ 3 * RBW.

g. Measure and record the results in the test report.

5.1.4 Test Setup



5.1.5 Test Results

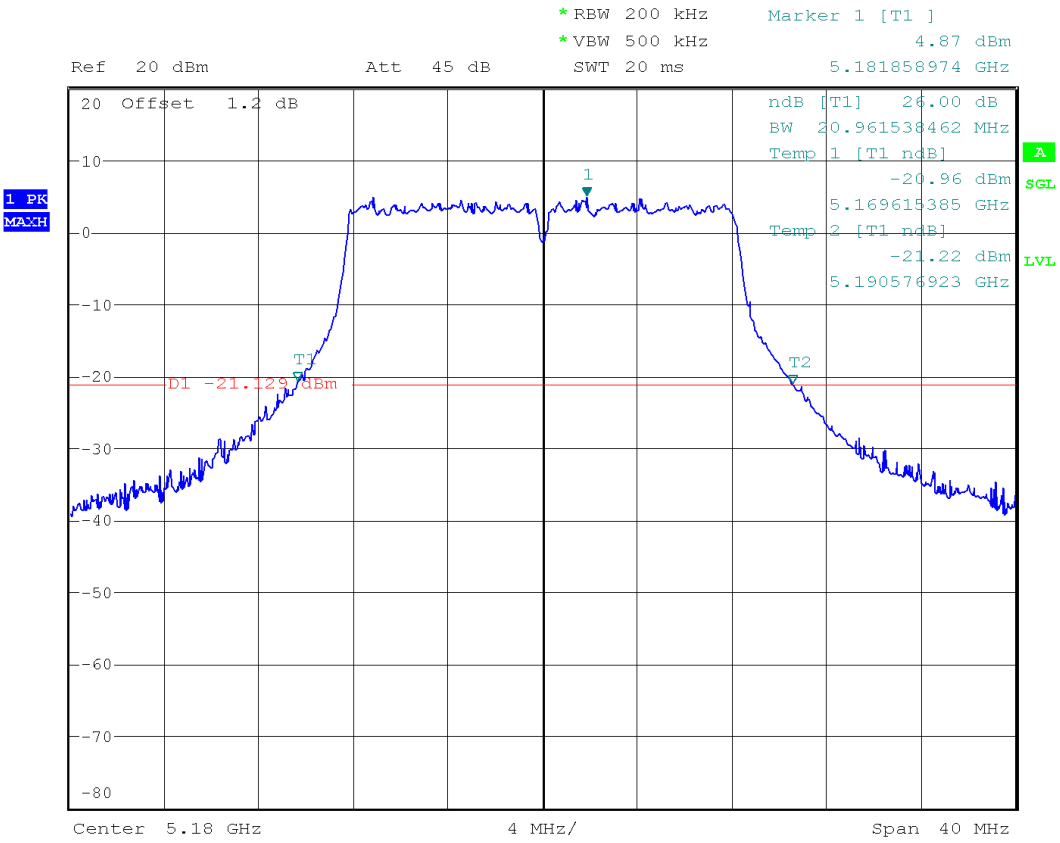
5G U-NII-1					
Mode	Data Rate	Channel	Frequency(MHz)	99% BW(MHz)	26dB BW(MHz)
11A	6Mbps	36	5180	17.280	20.962
11A	6Mbps	44	5220	17.296	21.090
11A	6Mbps	48	5240	17.296	20.962
11N 5G HT20	MCS0	36	5180	18.496	22.436
11N 5G HT20	MCS0	44	5220	18.448	22.436
11N 5G HT20	MCS0	48	5240	18.464	22.244
11N 5G HT40	MCS0	38	5190	37.504	44.359
11N 5G HT40	MCS0	46	5230	37.472	44.744
11AC HT20	MCS0	36	5180	18.432	21.923
11AC HT20	MCS0	44	5220	18.432	22.051
11AC HT20	MCS0	48	5240	18.464	22.372
11AC HT40	MCS0	38	5190	37.376	43.590
11AC HT40	MCS0	46	5230	37.408	43.718
11AC HT80	MCS0	42	5210	77.952	90.256

5G U-NII-2A					
Mode	Data Rate	Channel	Frequency(MHz)	99% BW(MHz)	26dB BW(MHz)
11A	6Mbps	52	5260	17.296	20.962
11A	6Mbps	60	5300	17.264	20.705
11A	6Mbps	64	5320	17.264	20.897
11N 5G HT20	MCS0	52	5260	18.464	22.180
11N 5G HT20	MCS0	60	5300	18.448	22.051
11N 5G HT20	MCS0	64	5320	18.464	22.564
11N 5G HT40	MCS0	54	5270	37.504	44.359
11N 5G HT40	MCS0	62	5310	37.472	44.359
11AC HT20	MCS0	52	5260	18.432	22.180
11AC HT20	MCS0	60	5300	18.448	22.051
11AC HT20	MCS0	64	5320	18.432	22.244
11AC HT40	MCS0	54	5270	37.344	43.462
11AC HT40	MCS0	62	5310	37.344	43.333
11AC HT80	MCS0	58	5290	77.696	90.769

5G U-NII-2C					
Mode	Data Rate	Channel	Frequency(MHz)	99% BW(MHz)	26dB BW(MHz)
11A	6Mbps	100	5500	17.280	21.218
11A	6Mbps	116	5580	17.280	21.218

11A	6Mbps	140	5700	17.264	21.026
11N 5G HT20	MCS0	100	5500	18.480	22.180
11N 5G HT20	MCS0	116	5580	18.480	22.244
11N 5G HT20	MCS0	140	5700	18.448	22.372
11N 5G HT40	MCS0	102	5510	37.504	44.103
11N 5G HT40	MCS0	110	5550	37.504	44.231
11N 5G HT40	MCS7	134	5670	37.440	44.487
11AC HT20	MCS0	100	5500	18.464	22.051
11AC HT20	MCS0	116	5580	18.432	21.987
11AC HT20	MCS0	140	5700	18.448	22.180
11AC HT40	MCS0	102	5510	37.312	43.590
11AC HT40	MCS0	110	5550	37.408	43.333
11AC HT40	MCS0	134	5670	37.376	43.718
11AC HT80	MCS0	106	5530	77.760	90.256

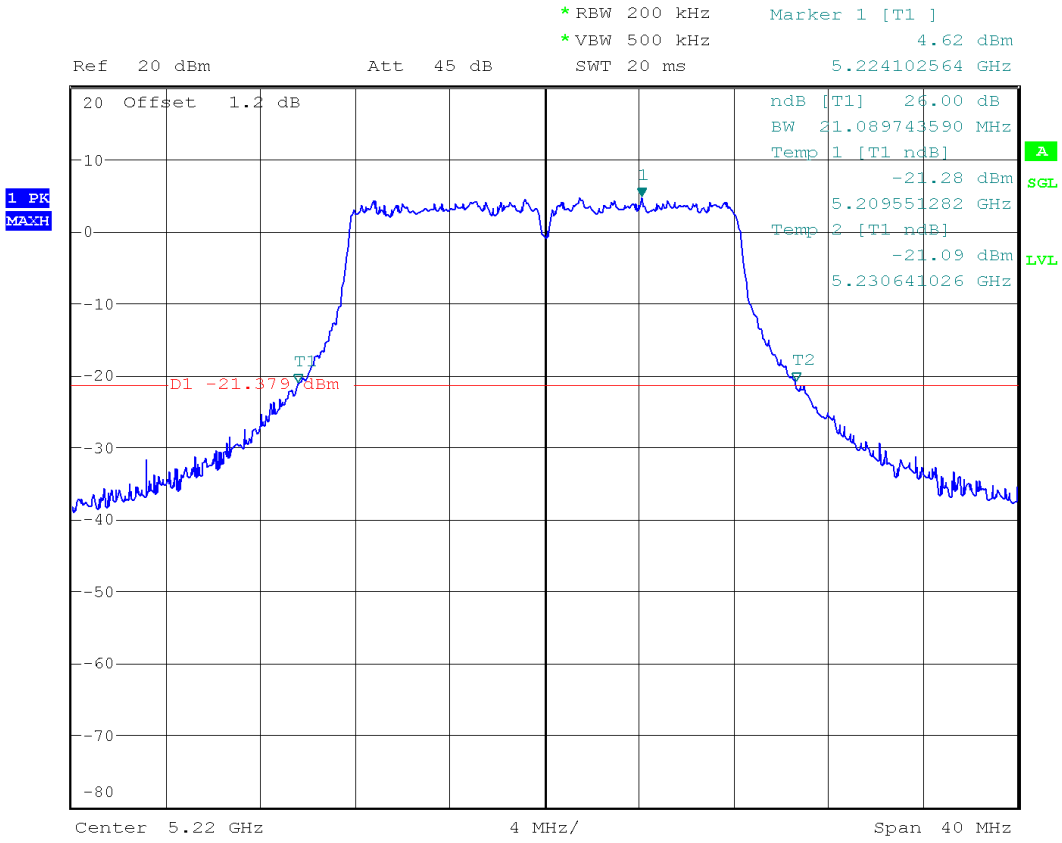
26dB bandwidth(U-NII-1):



BAND

Date: 22.OCT.2018 05:13:32

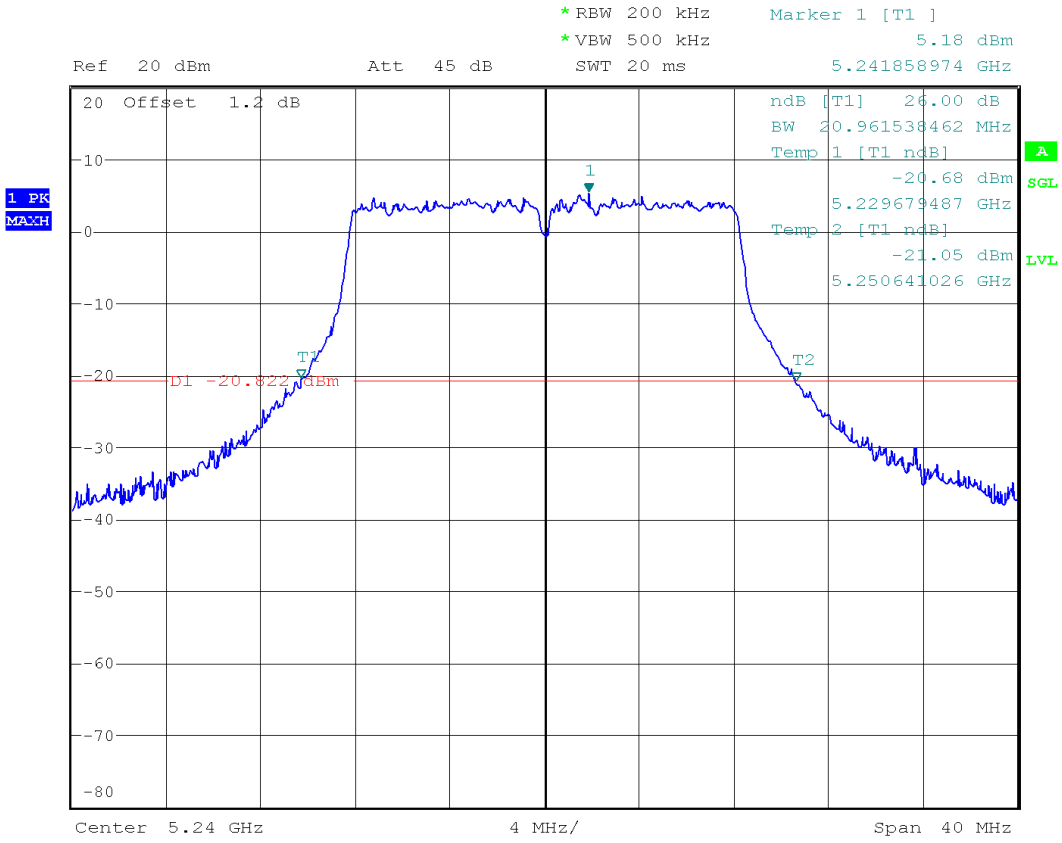
11A 6Mbps CH36 5180MHZ



BAND

Date: 22.OCT.2018 05:23:15

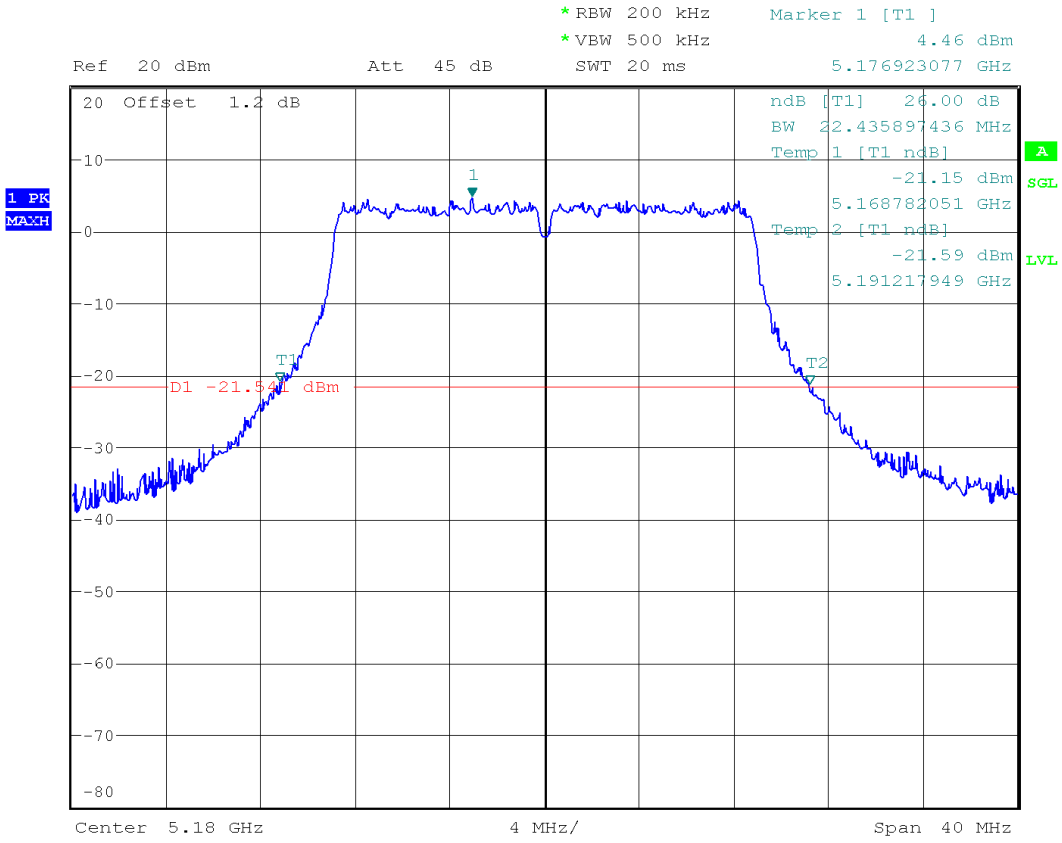
11A 6Mbps CH44 5220MHZ



BAND

Date: 22.OCT.2018 05:31:55

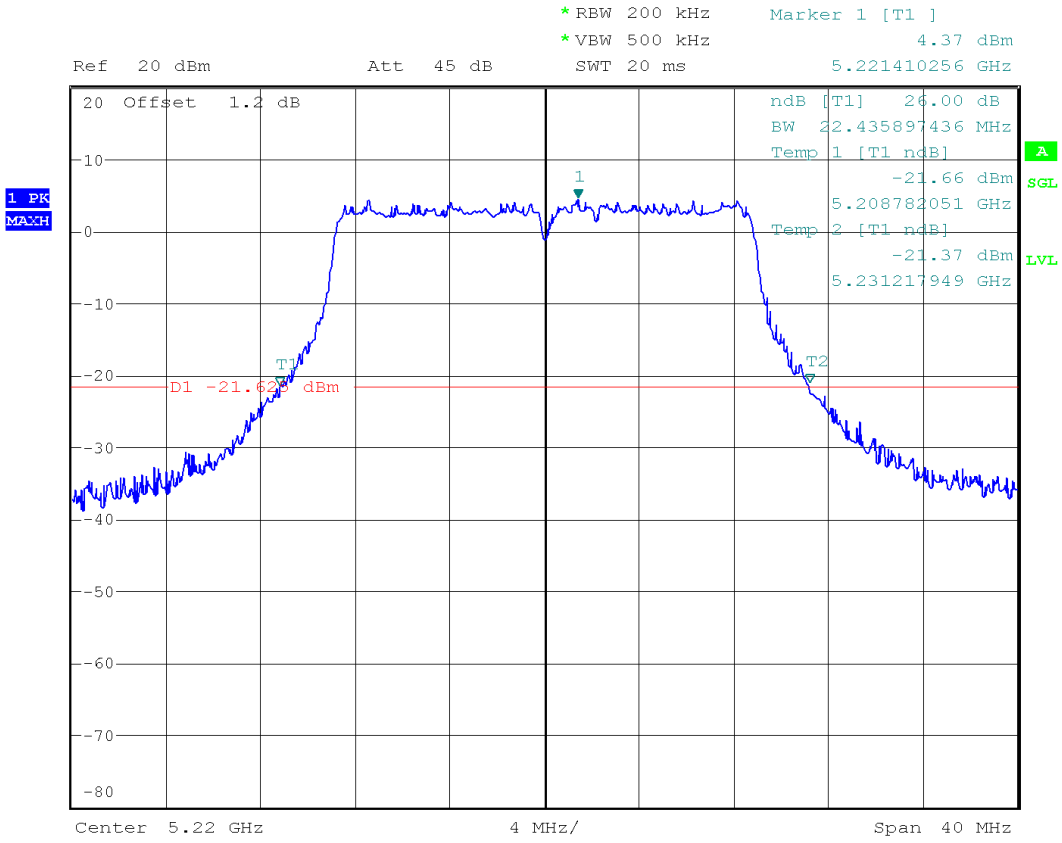
11A 6Mbps CH48 5240MHZ



BAND

Date: 22.OCT.2018 09:27:23

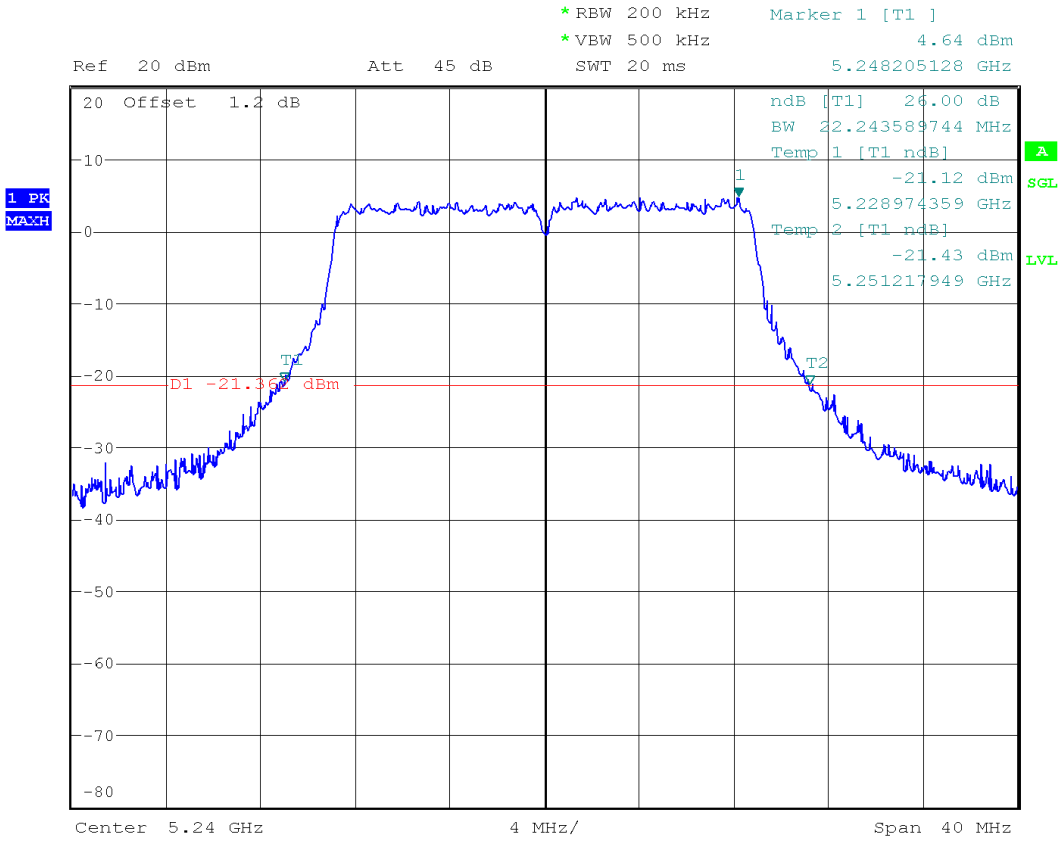
11N 5G HT20 MCS0 CH36 5180MHZ



BAND

Date: 22.OCT.2018 09:32:26

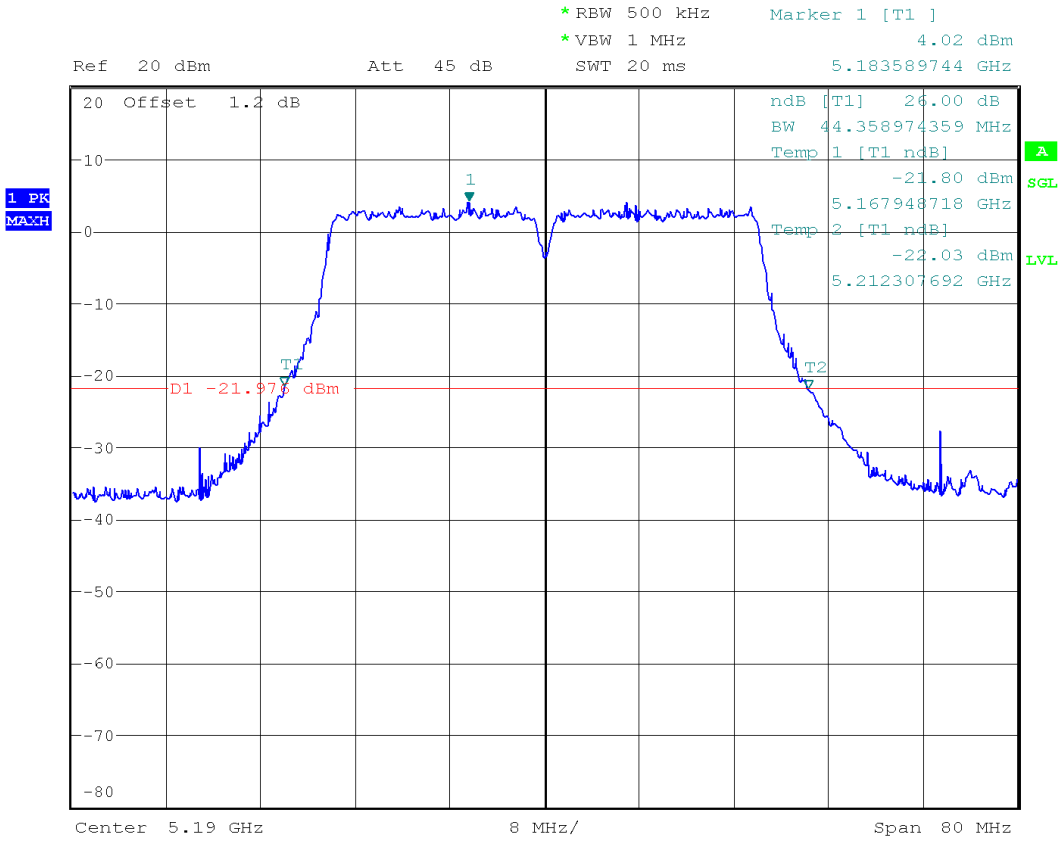
11N 5G HT20 MCS0 CH44 5220MHZ



BAND

Date: 22.OCT.2018 09:36:10

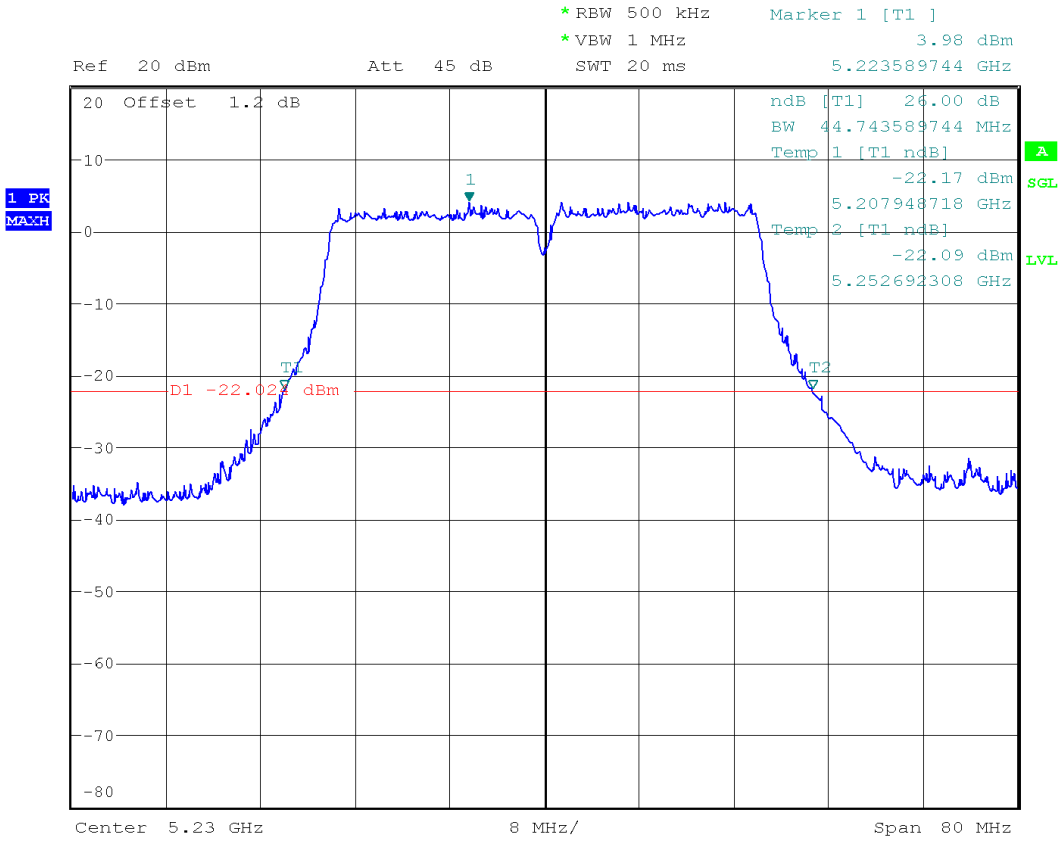
11N 5G HT20 MCS0 CH48 5240MHZ



BAND

Date: 22.OCT.2018 10:23:56

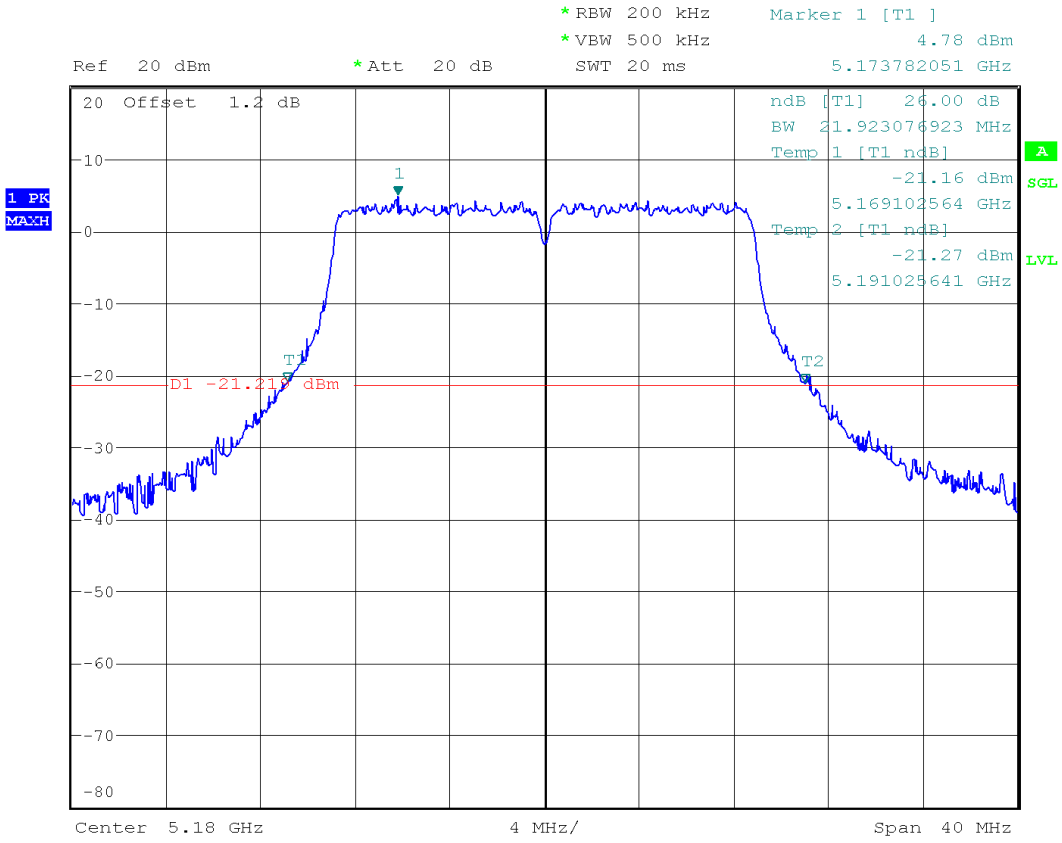
11N 5G HT40 MCS0 CH38 5190MHZ



BAND

Date: 22.OCT.2018 10:28:00

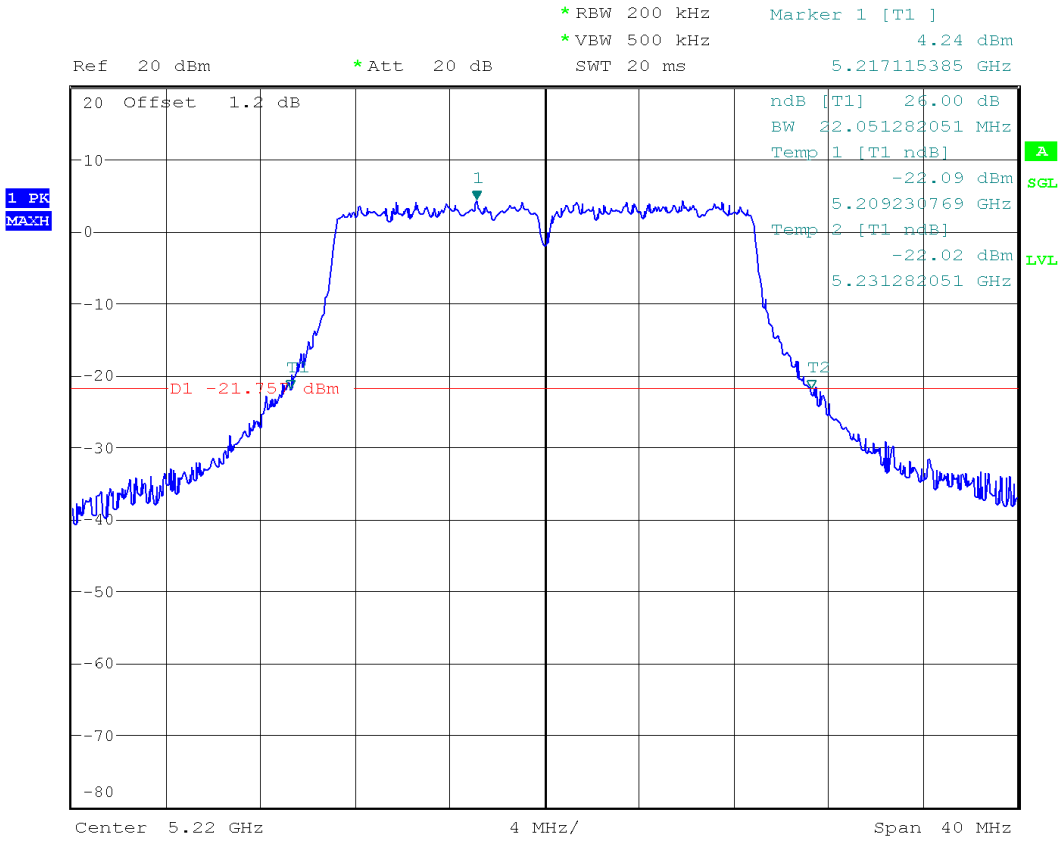
11N 5G HT40 MCS0 CH46 5230MHZ



BAND

Date: 23.OCT.2018 03:22:55

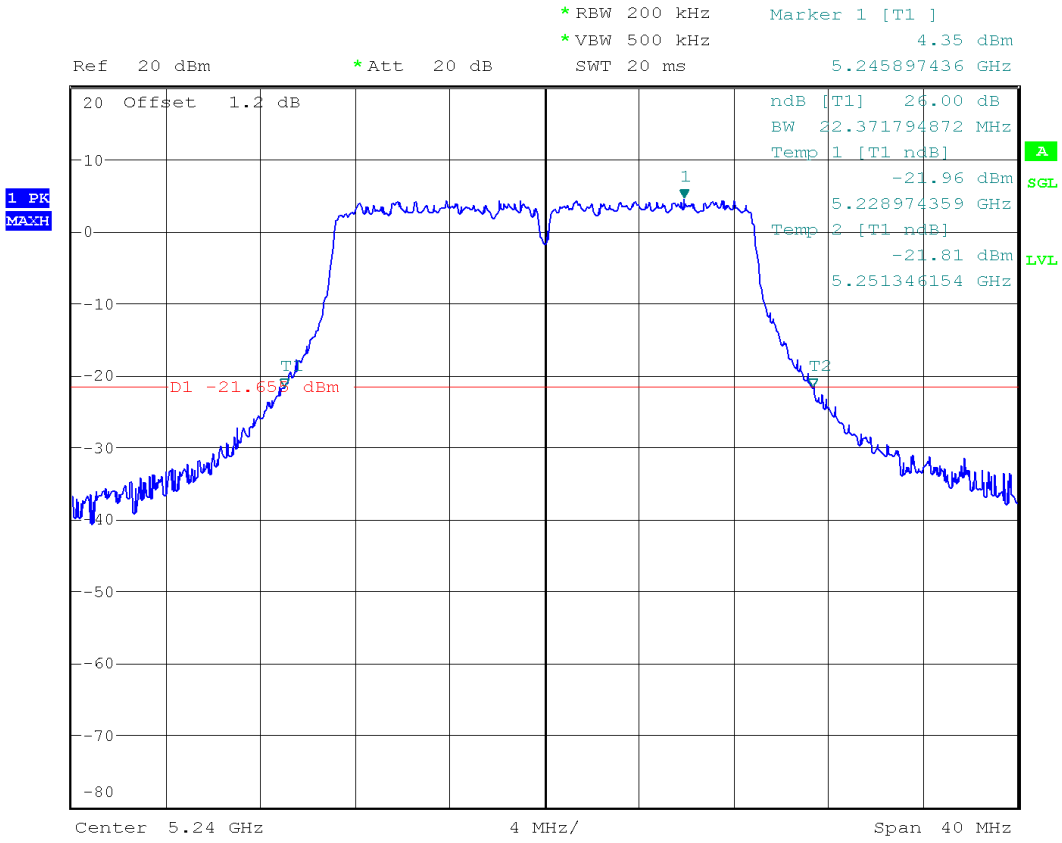
11AC HT20 MCS0 CH36 5180MHZ



BAND

Date: 23.OCT.2018 03:28:42

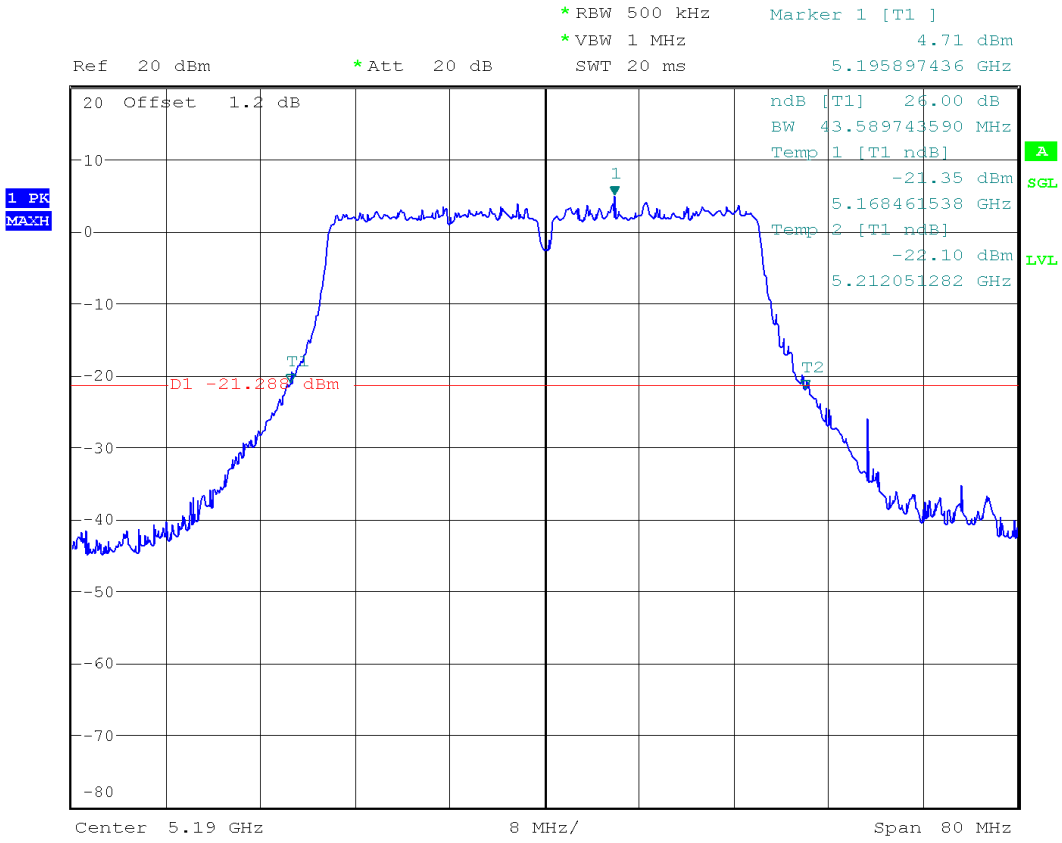
11AC HT20 MCS0 CH44 5220MHZ



BAND

Date: 23.OCT.2018 03:35:00

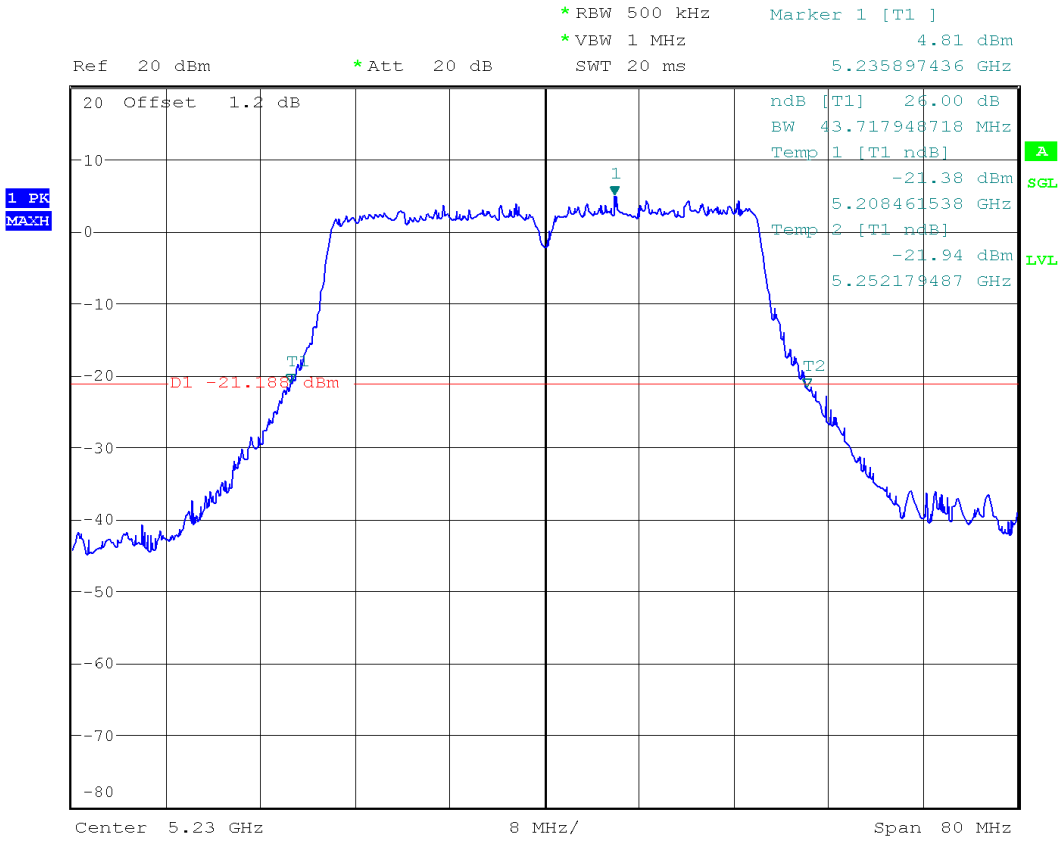
11AC HT20 MCS0 CH48 5240MHZ



BAND

Date: 23.OCT.2018 04:34:35

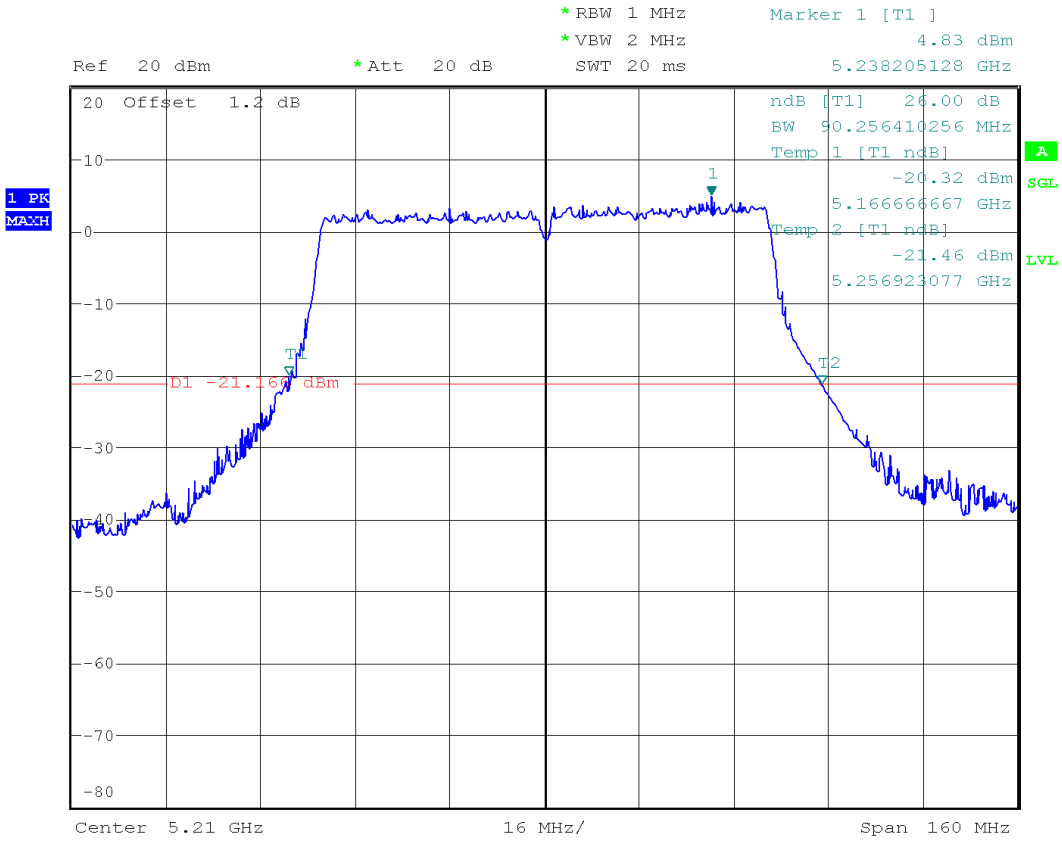
11AC HT40 MCS0 CH38 5190MHZ



BAND

Date: 23.OCT.2018 04:42:39

11AC HT40 MCS0 CH46 5230MHZ

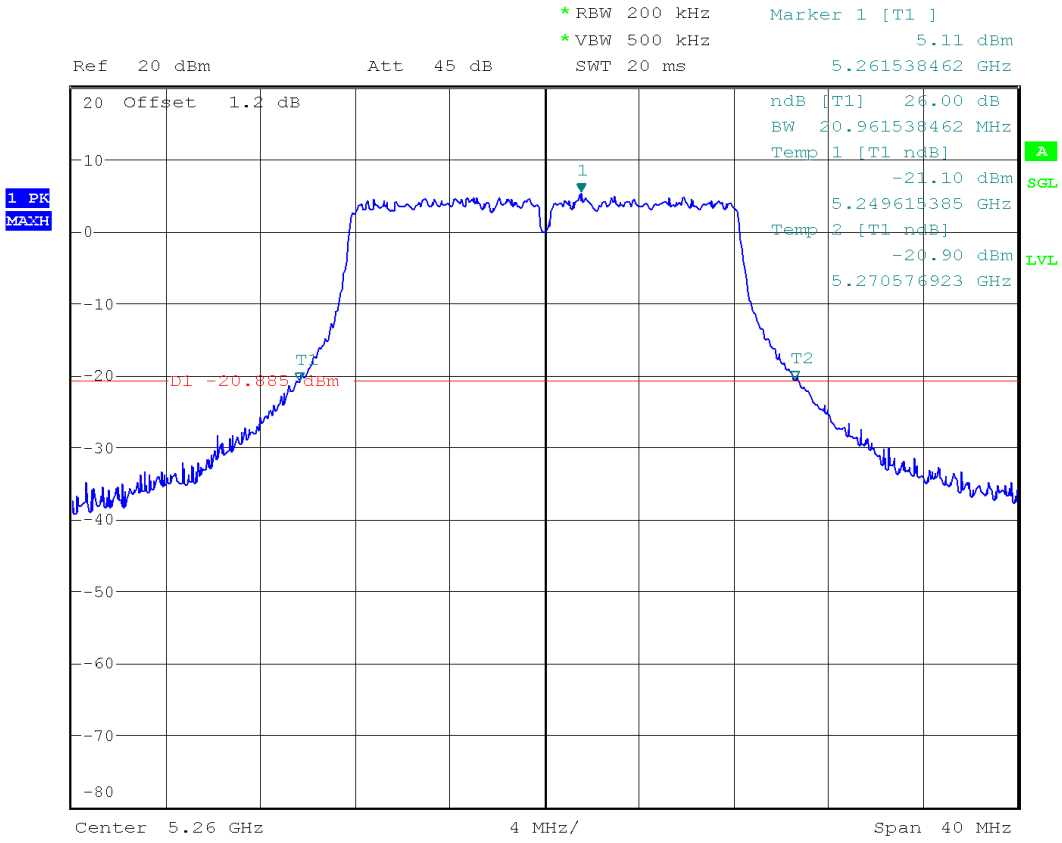


BAND

Date: 23.OCT.2018 05:24:14

11AC HT80 MCS0 CH42 5210MHZ

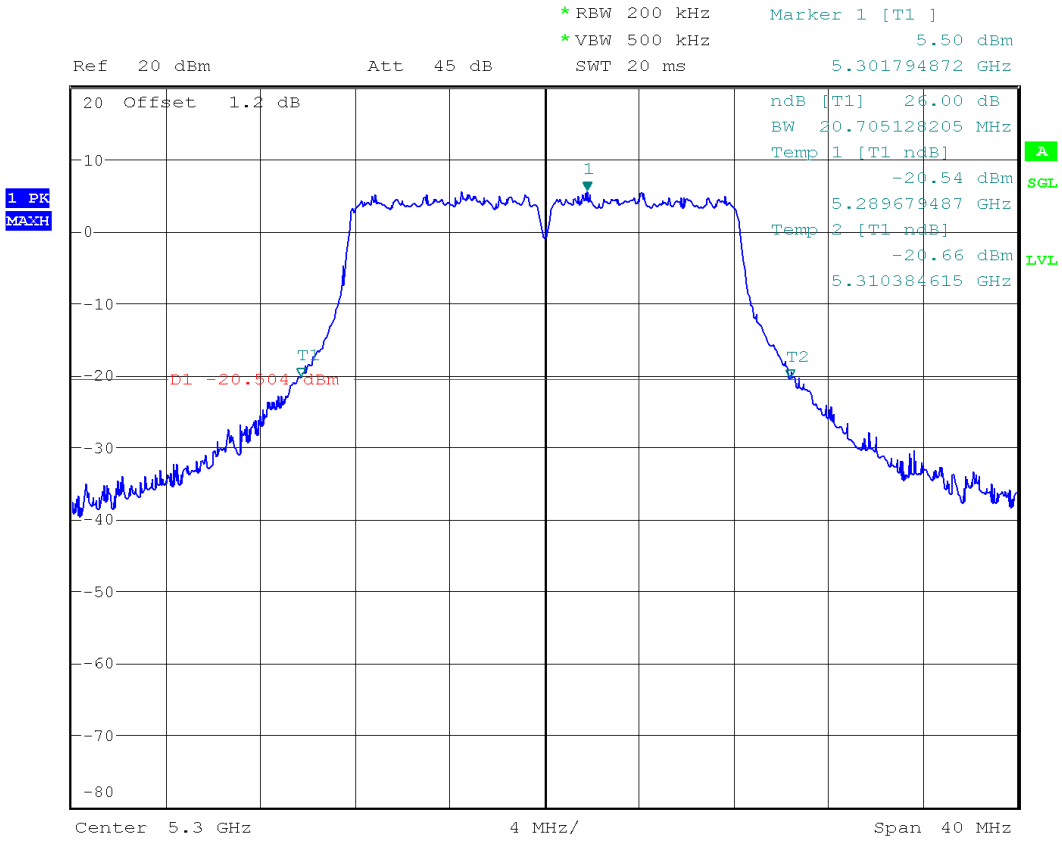
26dB bandwidth(U-NII-2A):



BAND

Date: 22.OCT.2018 05:37:35

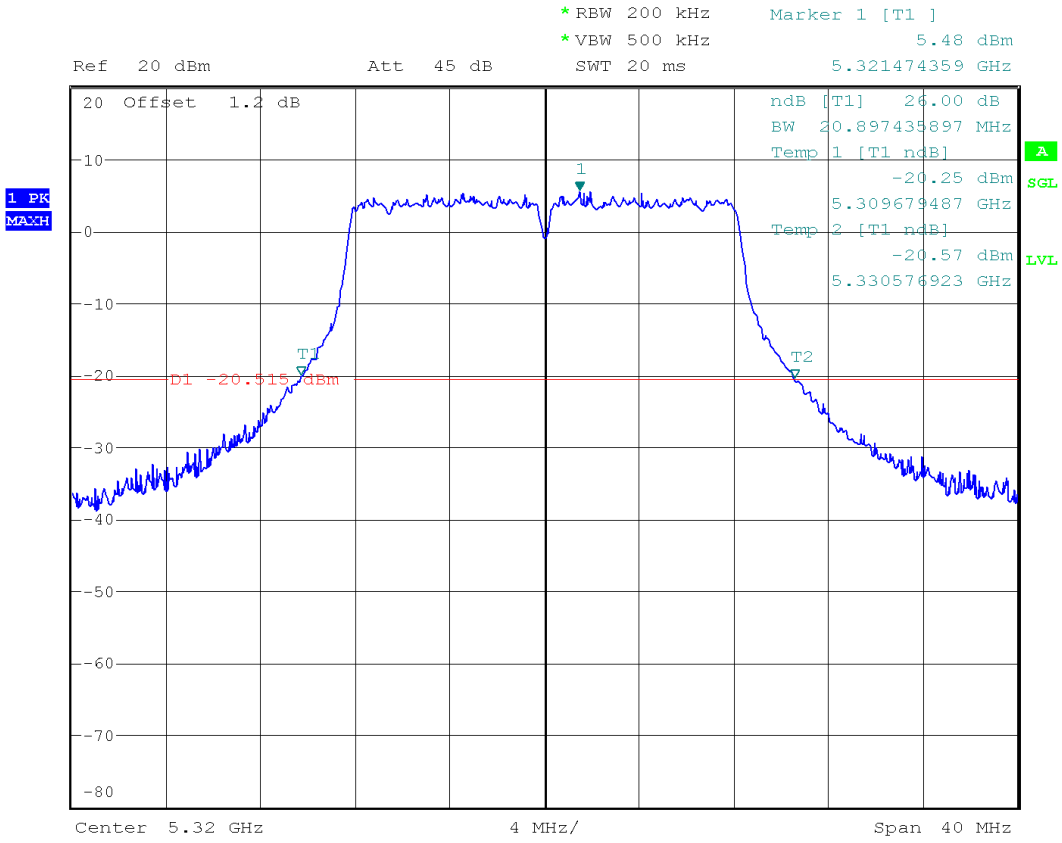
11A 6Mbps CH52 5260MHZ



BAND

Date: 22.OCT.2018 05:44:19

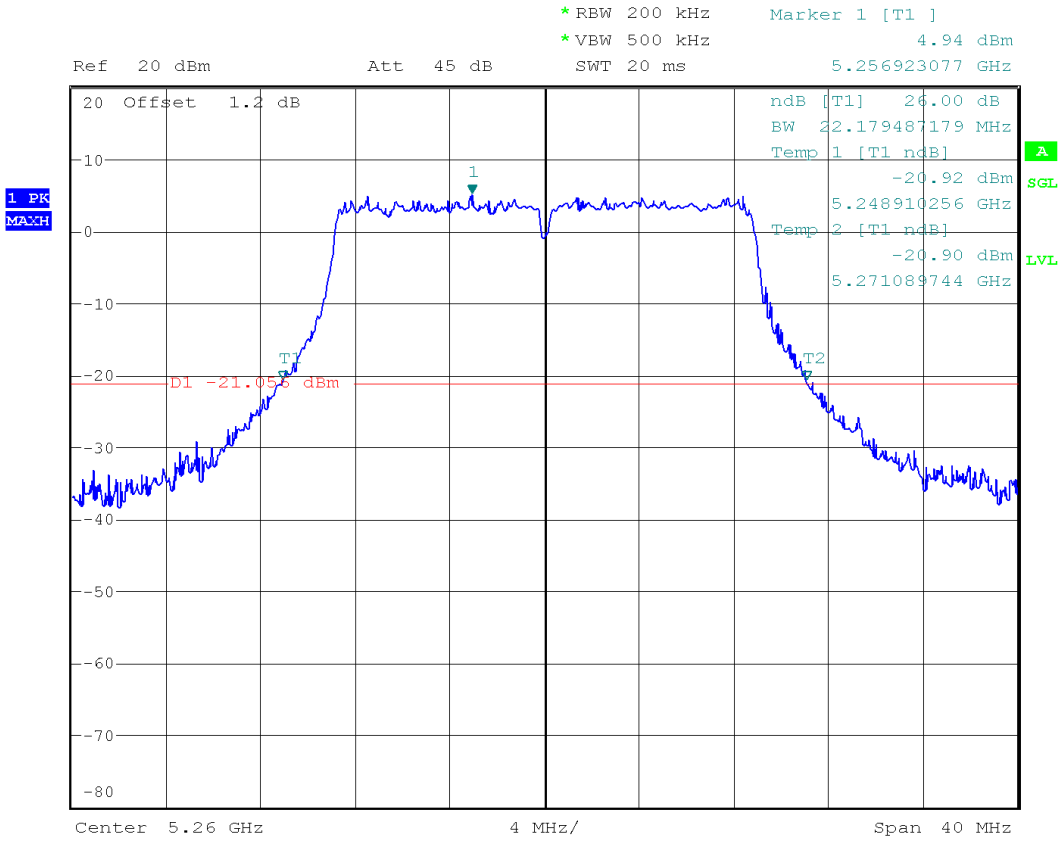
11A 6Mbps CH60 5300MHZ



BAND

Date: 22.OCT.2018 05:47:52

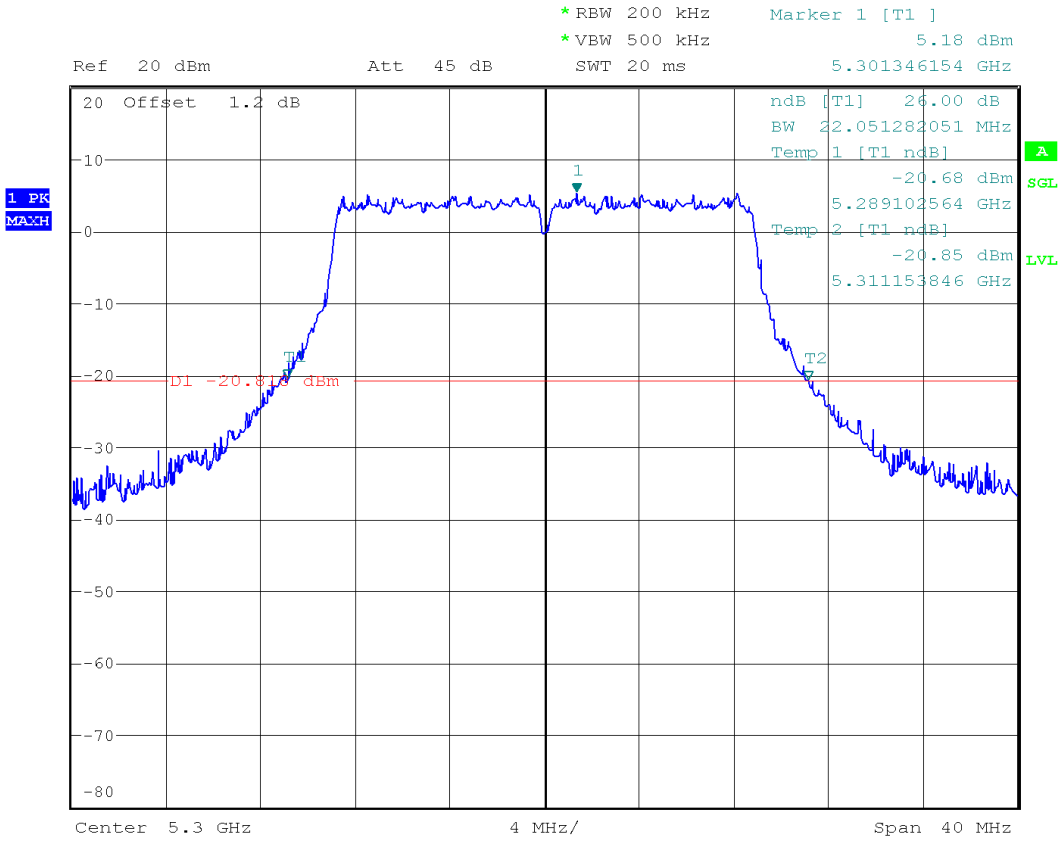
11A 6Mbps CH64 5320MHZ



BAND

Date: 22.OCT.2018 09:40:52

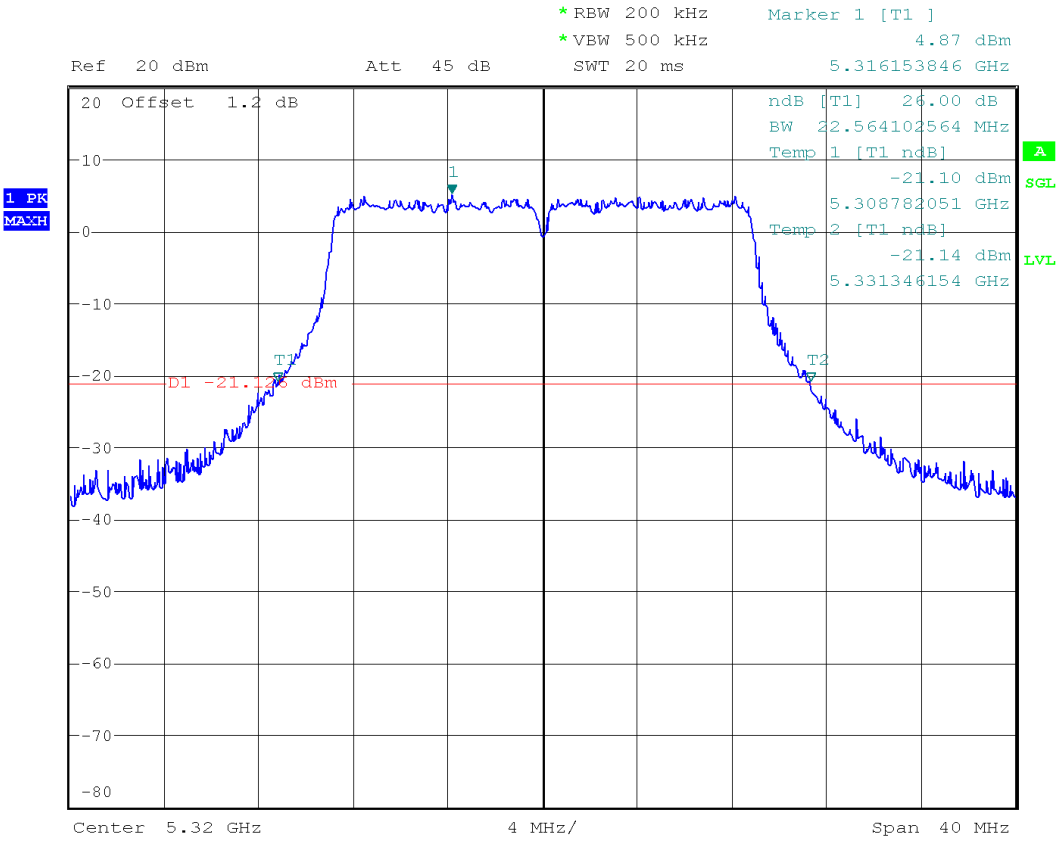
11N 5G HT20 MCS0 CH52 5260MHZ



BAND

Date: 22.OCT.2018 09:44:54

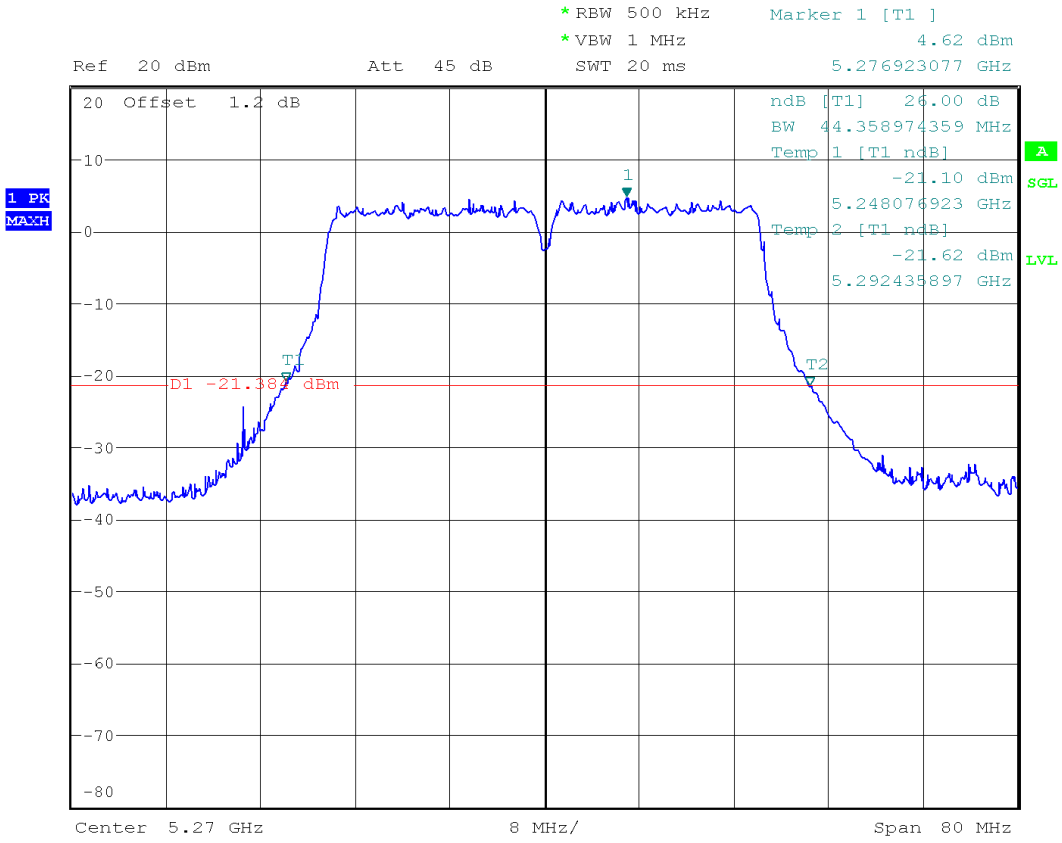
11N 5G HT20 MCS0 CH60 5300MHZ



BAND

Date: 22.OCT.2018 09:49:04

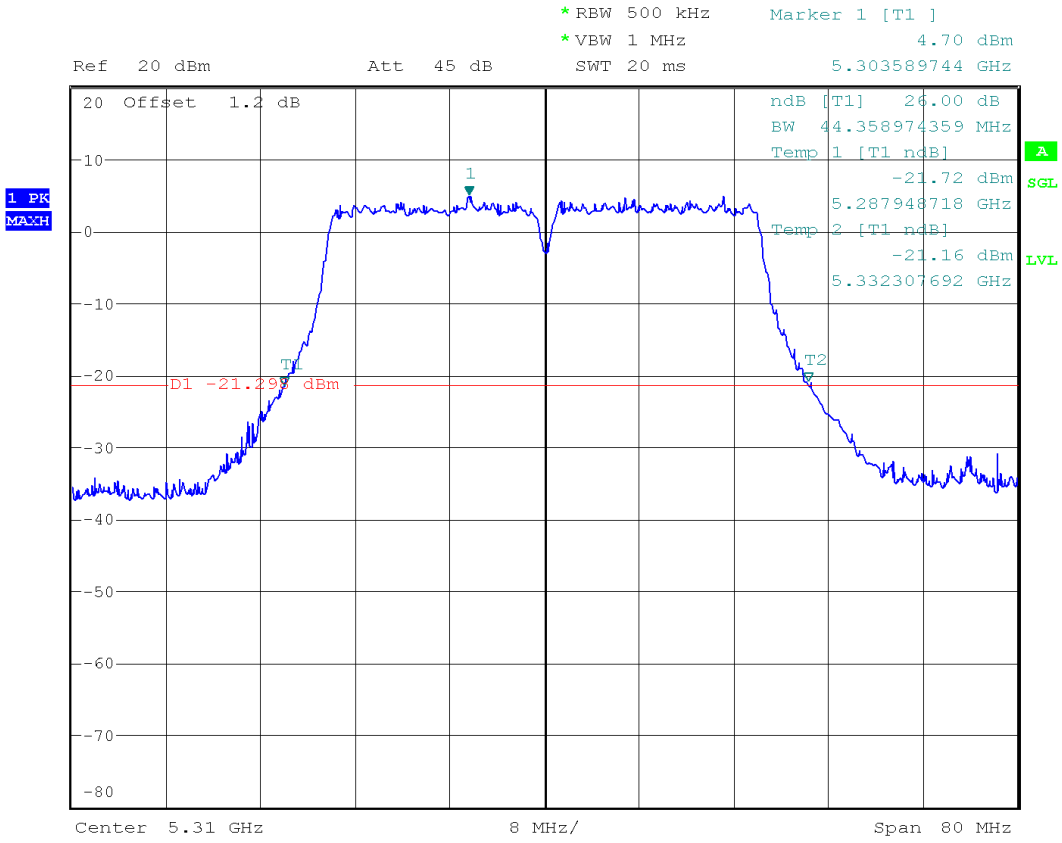
11N 5G HT20 MCS0 CH64 5320MHZ



BAND

Date: 22.OCT.2018 10:32:29

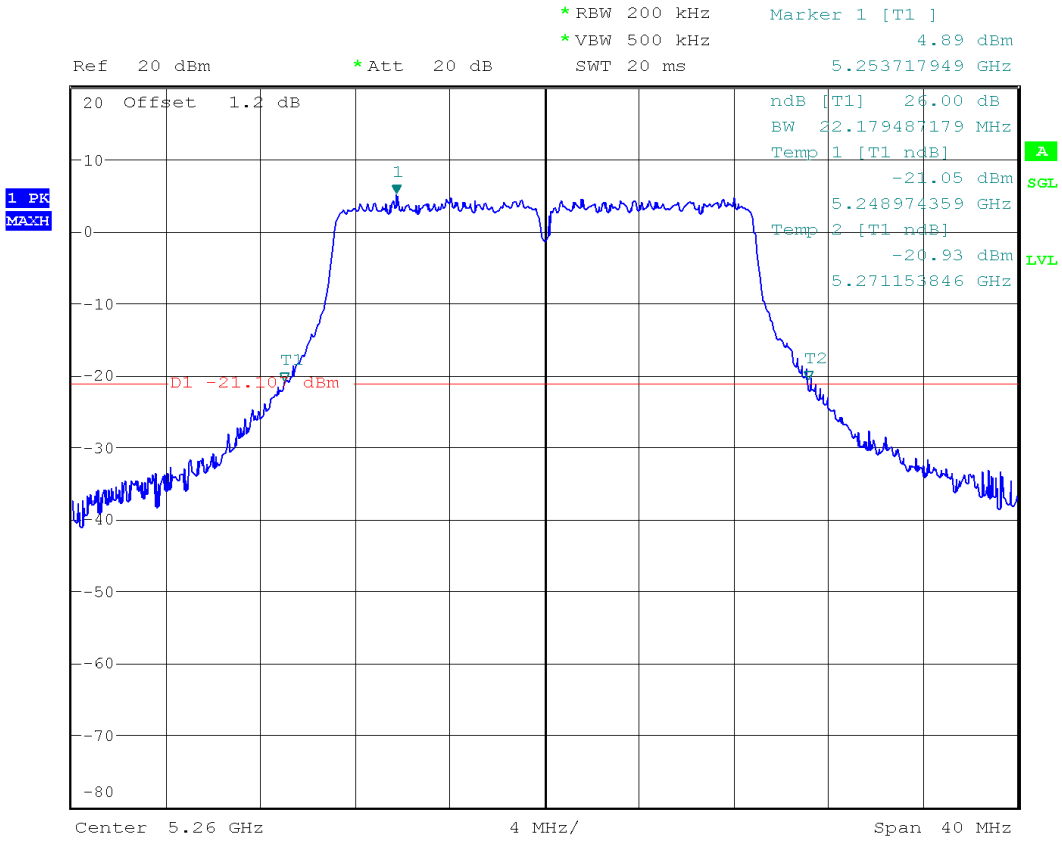
11N 5G HT40 MCS0 CH54 5270MHZ



BAND

Date: 22.OCT.2018 10:36:25

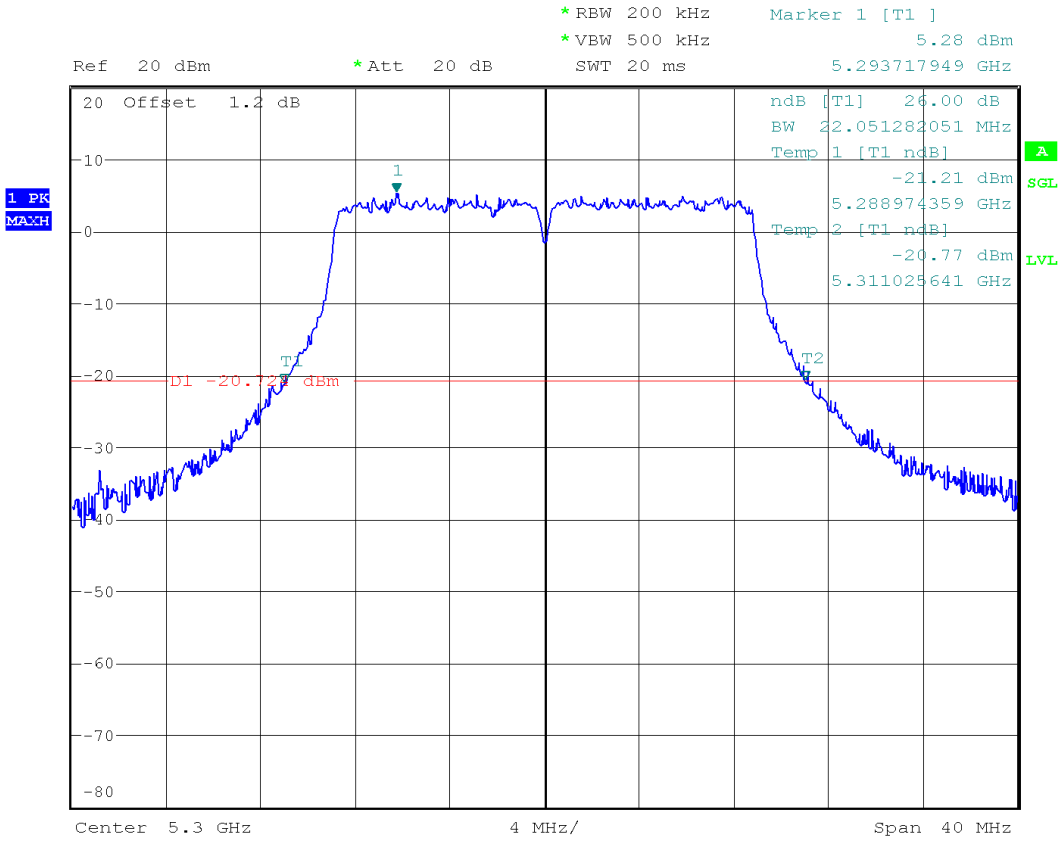
11N 5G HT40 MCS0 CH62 5310MHZ



BAND

Date: 23.OCT.2018 03:39:36

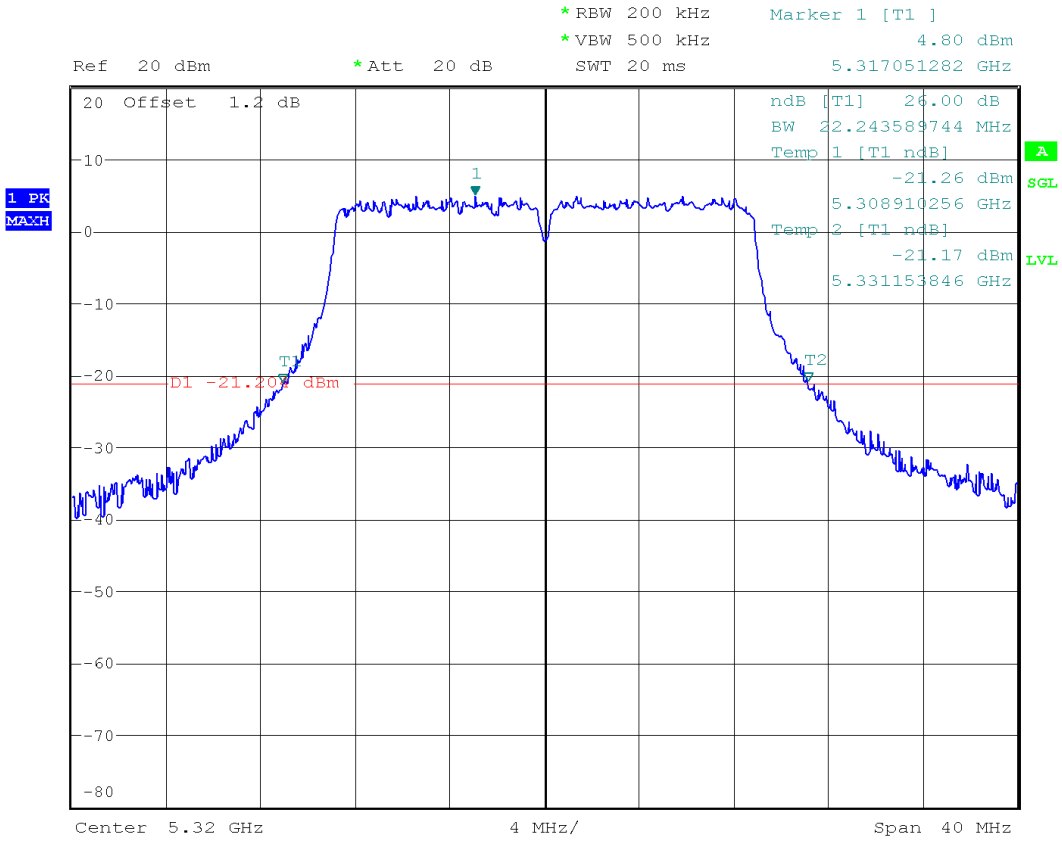
11AC HT20 MCS0 CH52 5260MHZ



BAND

Date: 23.OCT.2018 03:44:57

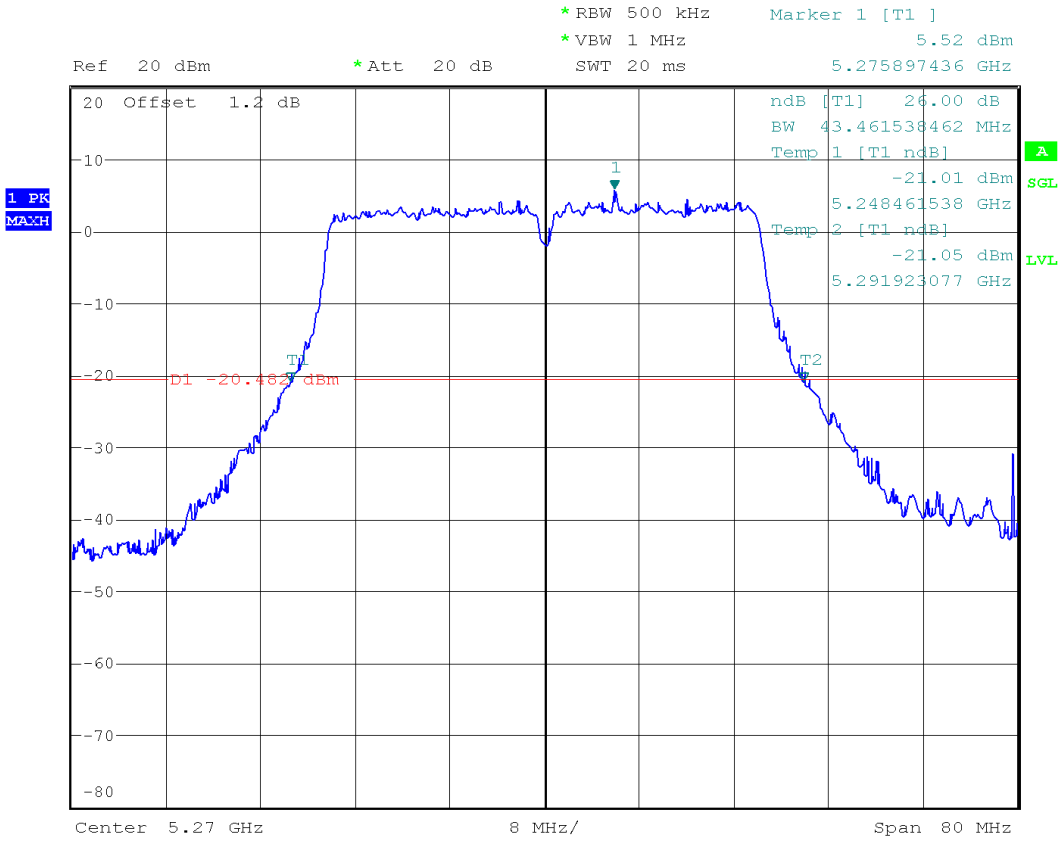
11AC HT20 MCS0 CH60 5300MHZ



BAND

Date: 23.OCT.2018 03:50:03

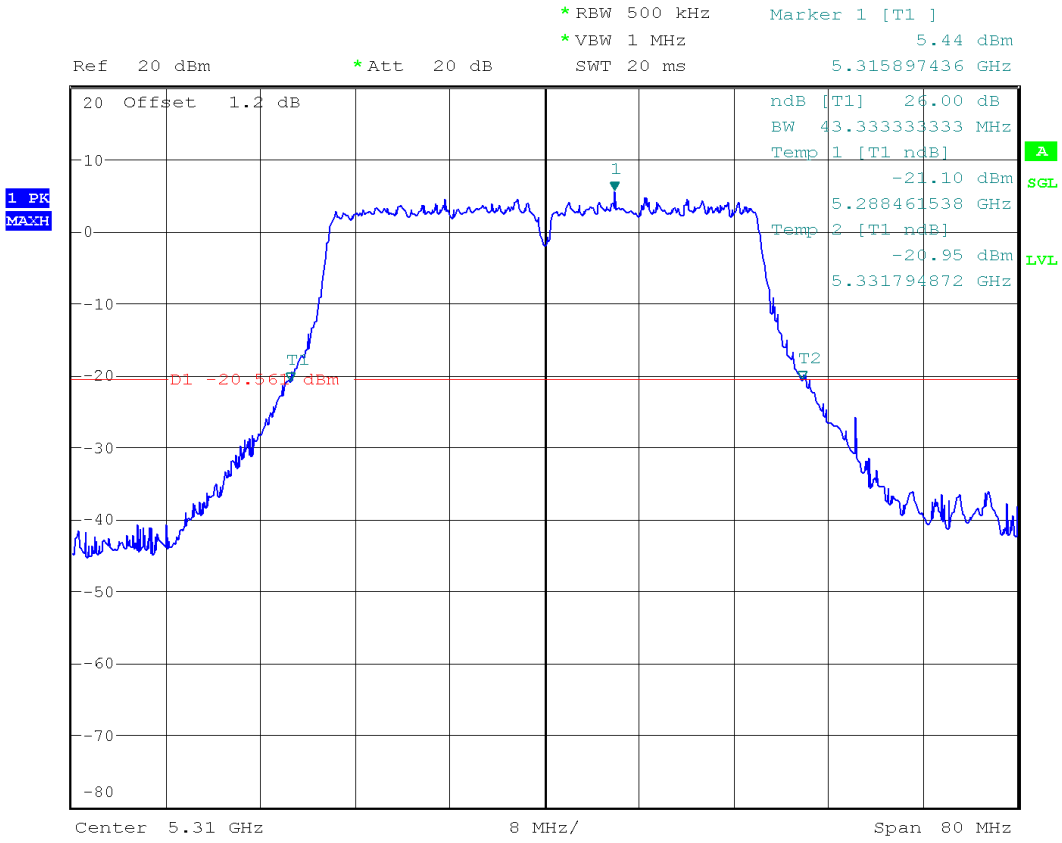
11AC HT20 MCS0 CH64 5320MHZ



BAND

Date: 23.OCT.2018 04:47:29

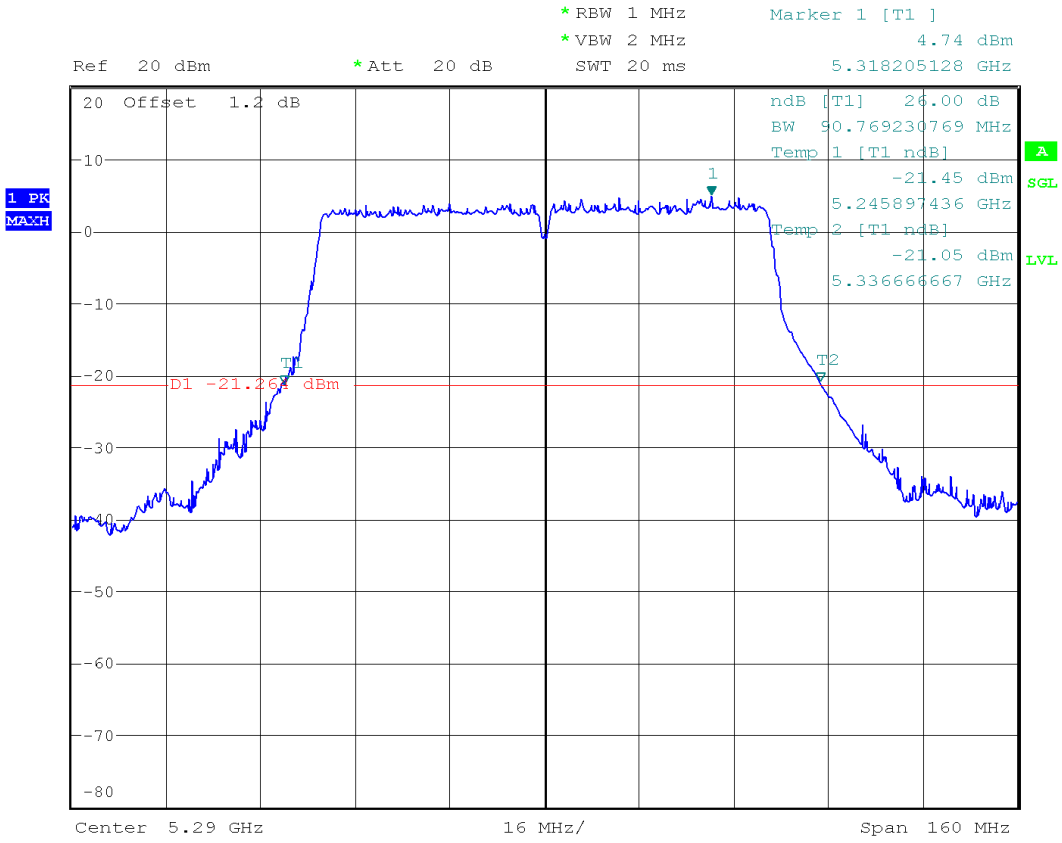
11AC HT40 MCS0 CH54 5270MHZ



BAND

Date: 23.OCT.2018 04:52:30

11AC HT40 MCS0 CH62 5310MHZ

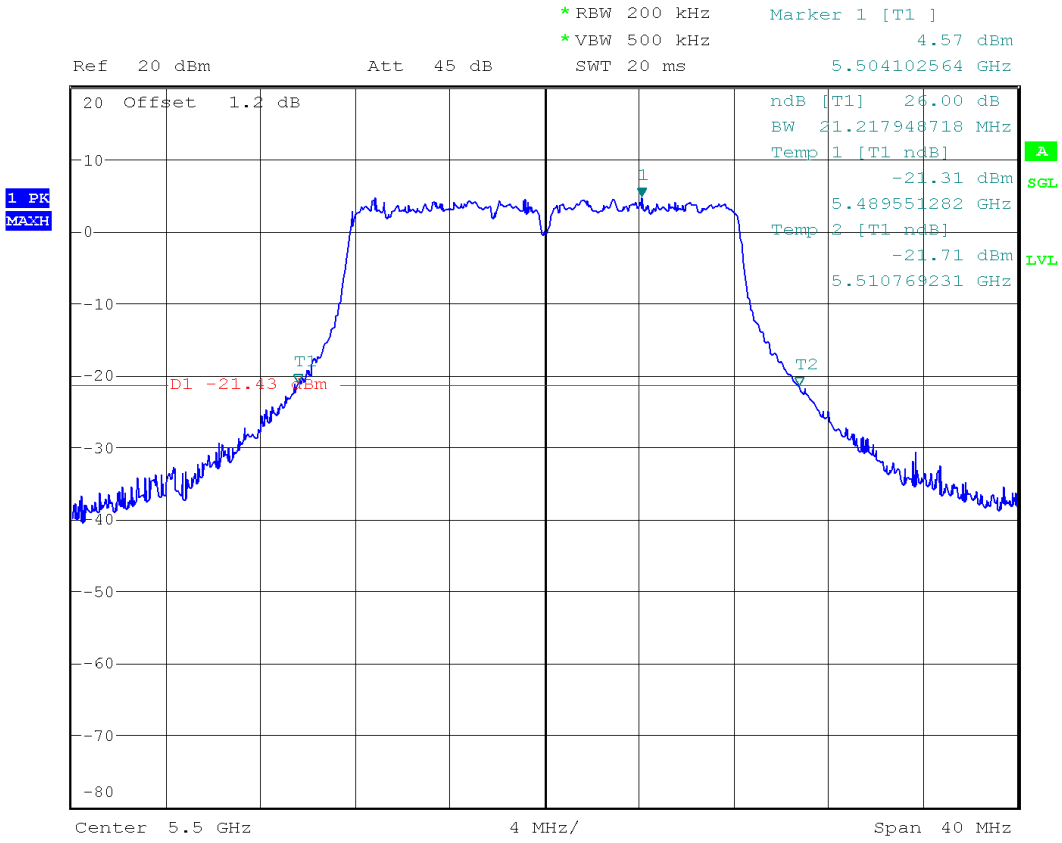


BAND

Date: 23.OCT.2018 05:28:08

11AC HT80 MCS0 CH58 5290MHZ

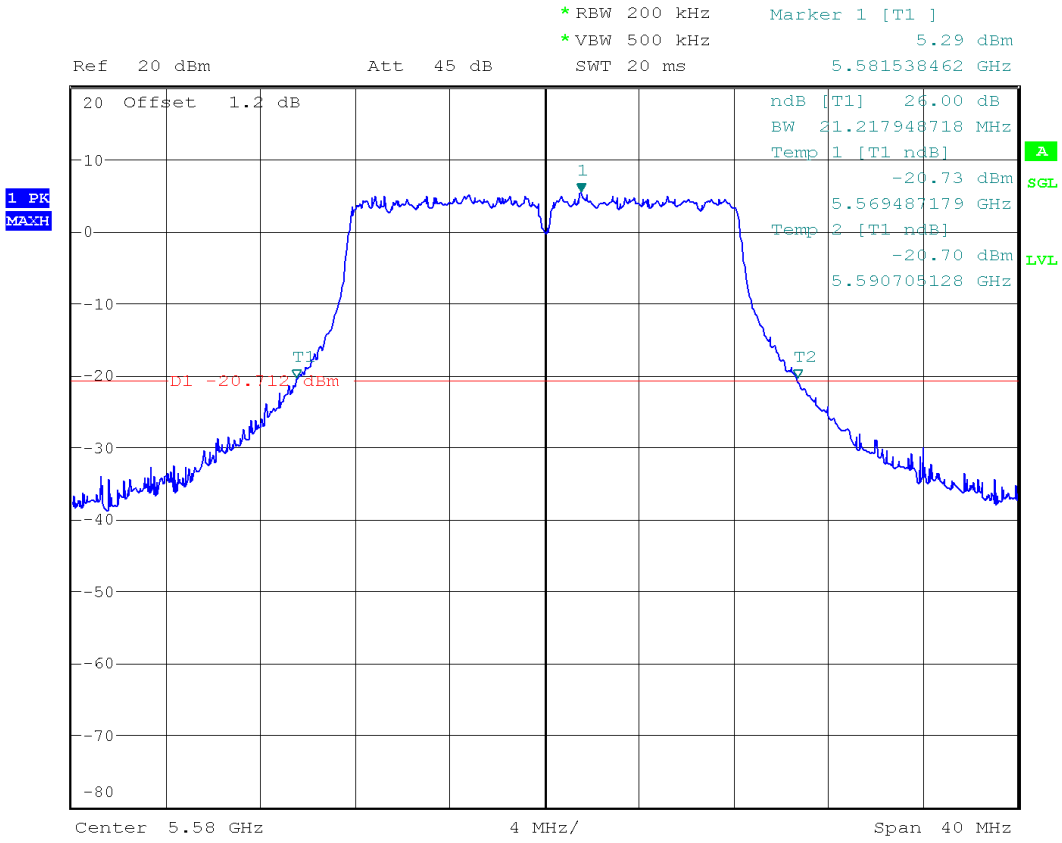
26dB bandwidth(U-NII-2C):



BAND

Date: 22.OCT.2018 05:52:27

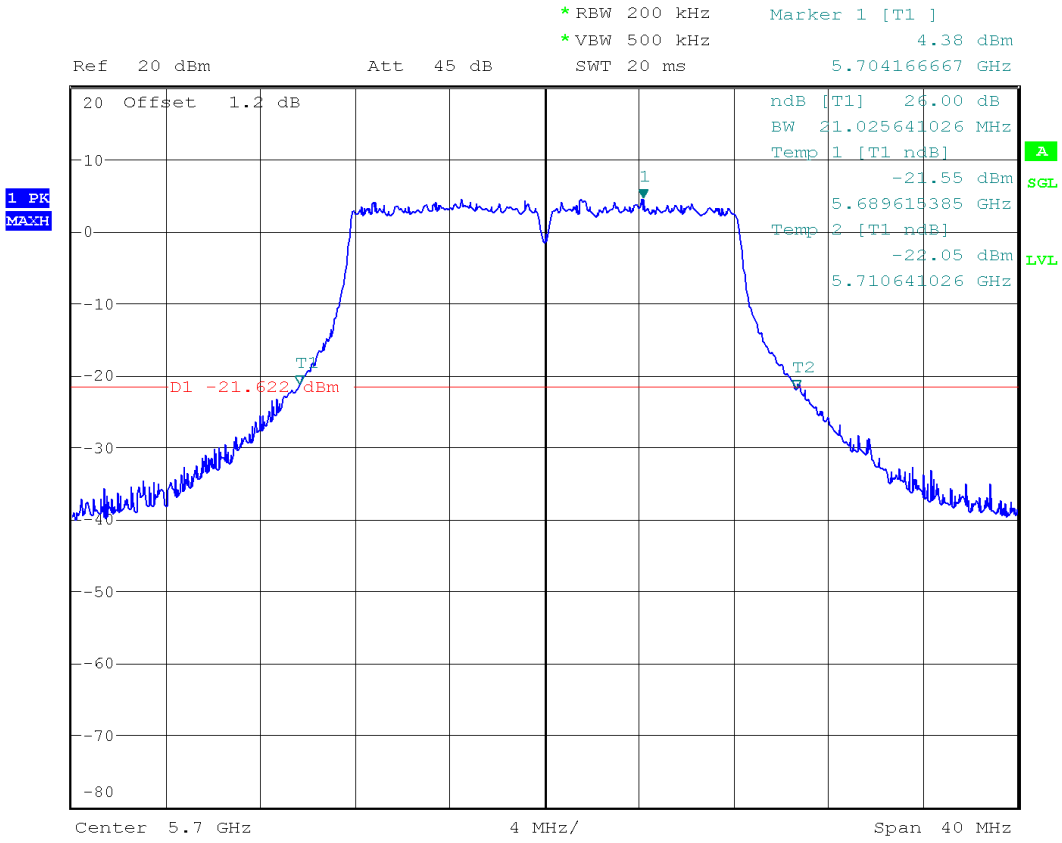
11A 6Mbps CH100 5500MHZ



BAND

Date: 22.OCT.2018 06:55:05

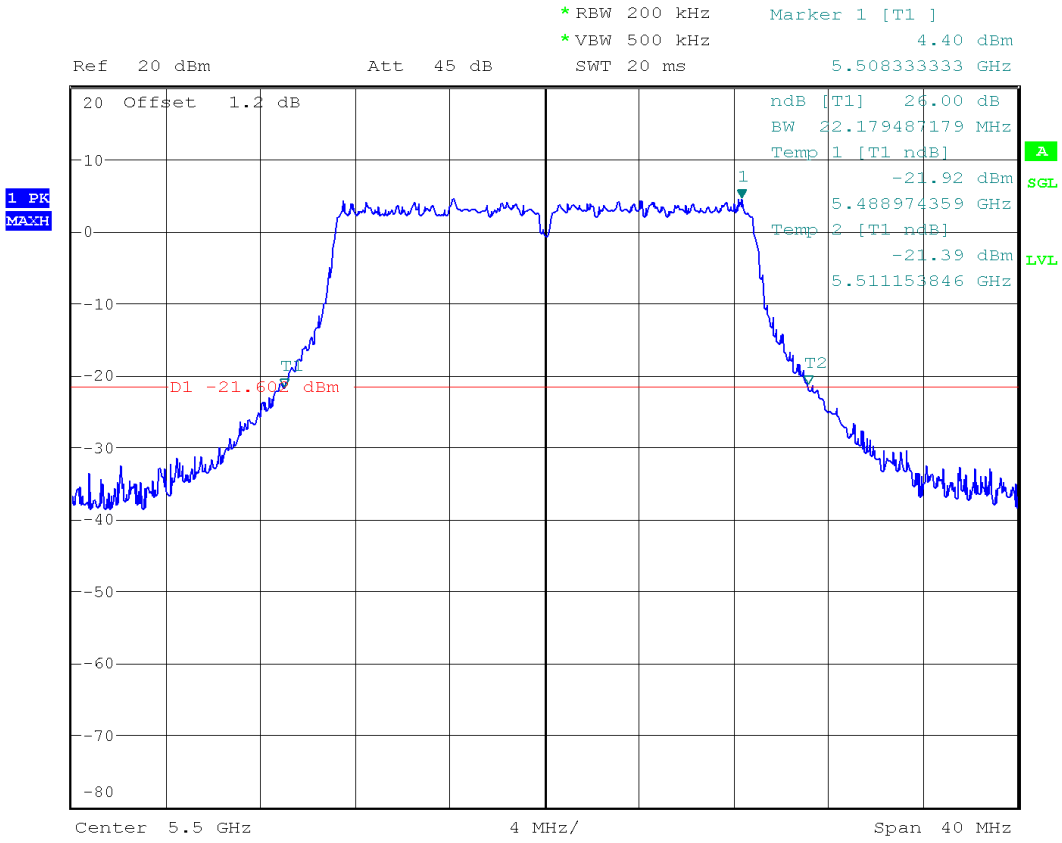
11A 6Mbps CH116 5580MHZ



BAND

Date: 22.OCT.2018 07:02:02

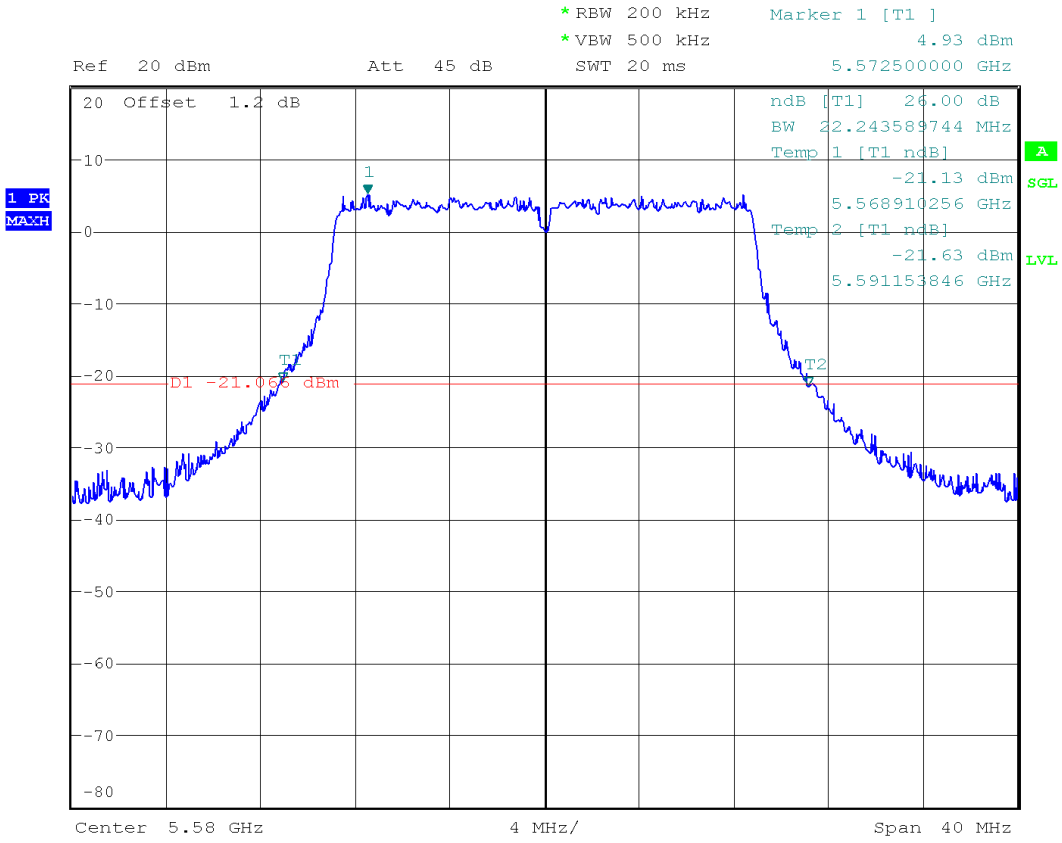
11A 6Mbps CH140 5700MHZ



BAND

Date: 22.OCT.2018 09:52:49

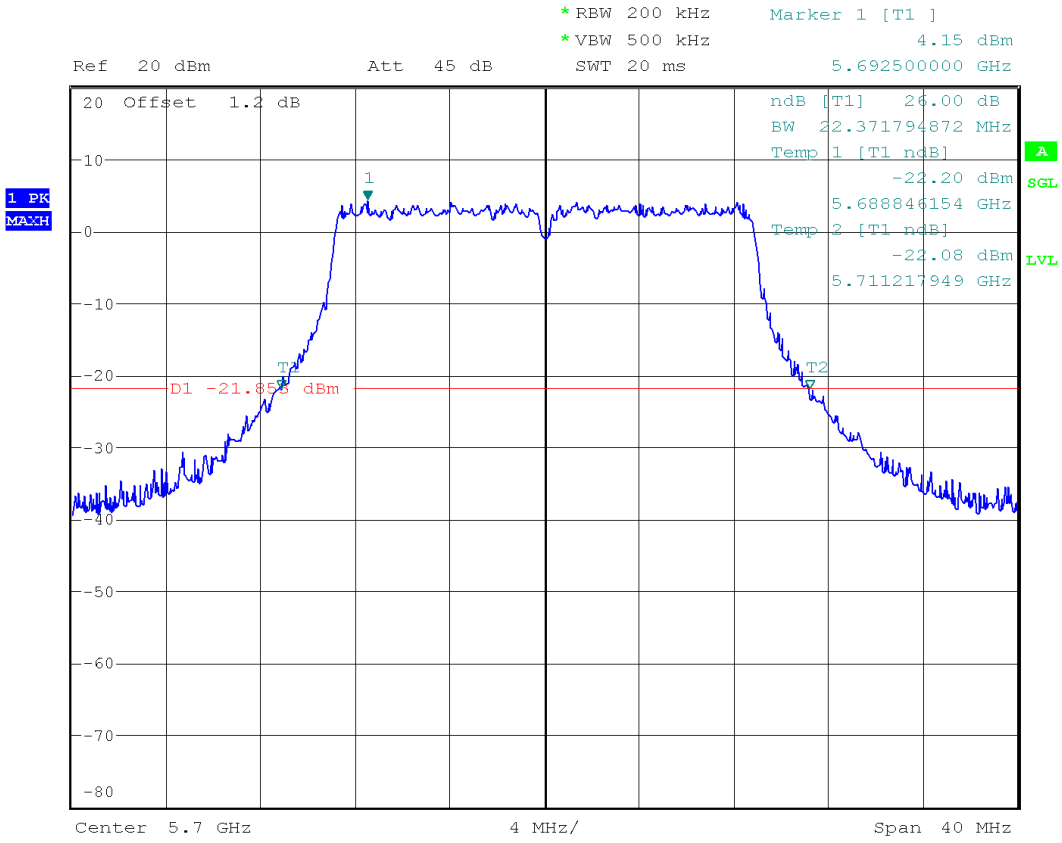
11N 5G HT20 MCS0 CH100 5500MHZ



BAND

Date: 22.OCT.2018 09:56:37

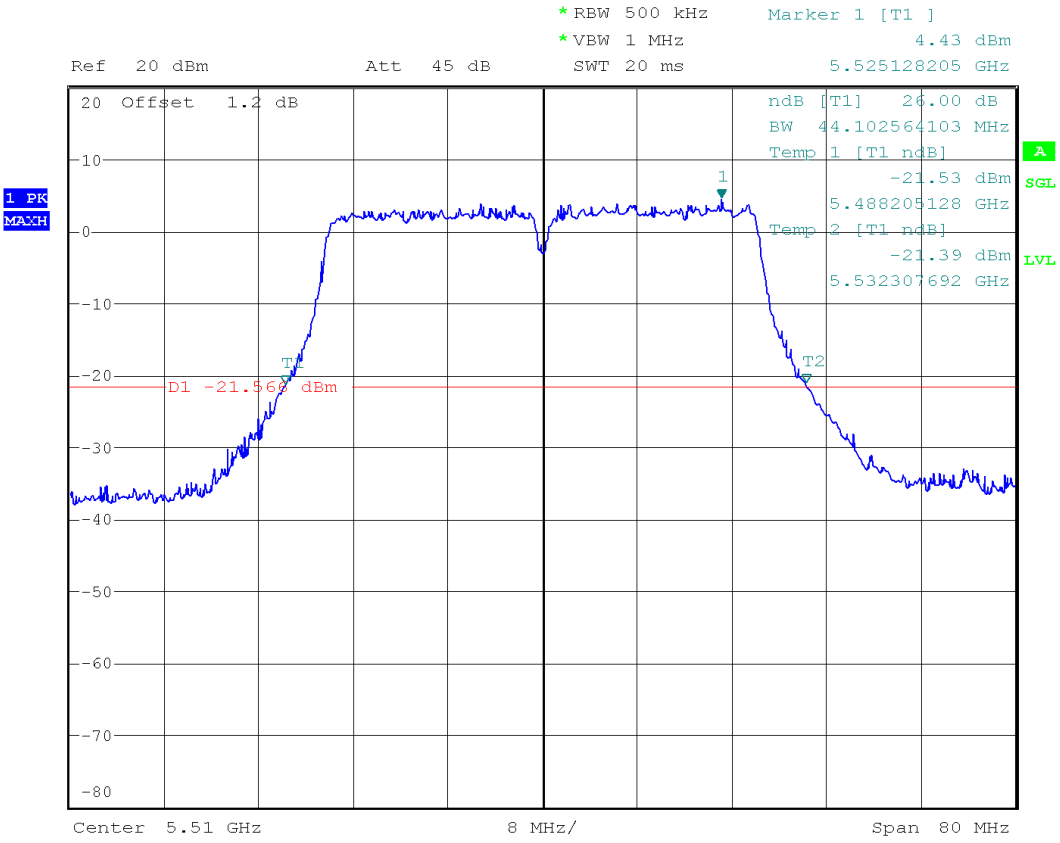
11N 5G HT20 MCS0 CH116 5580MHZ



BAND

Date: 22.OCT.2018 10:00:32

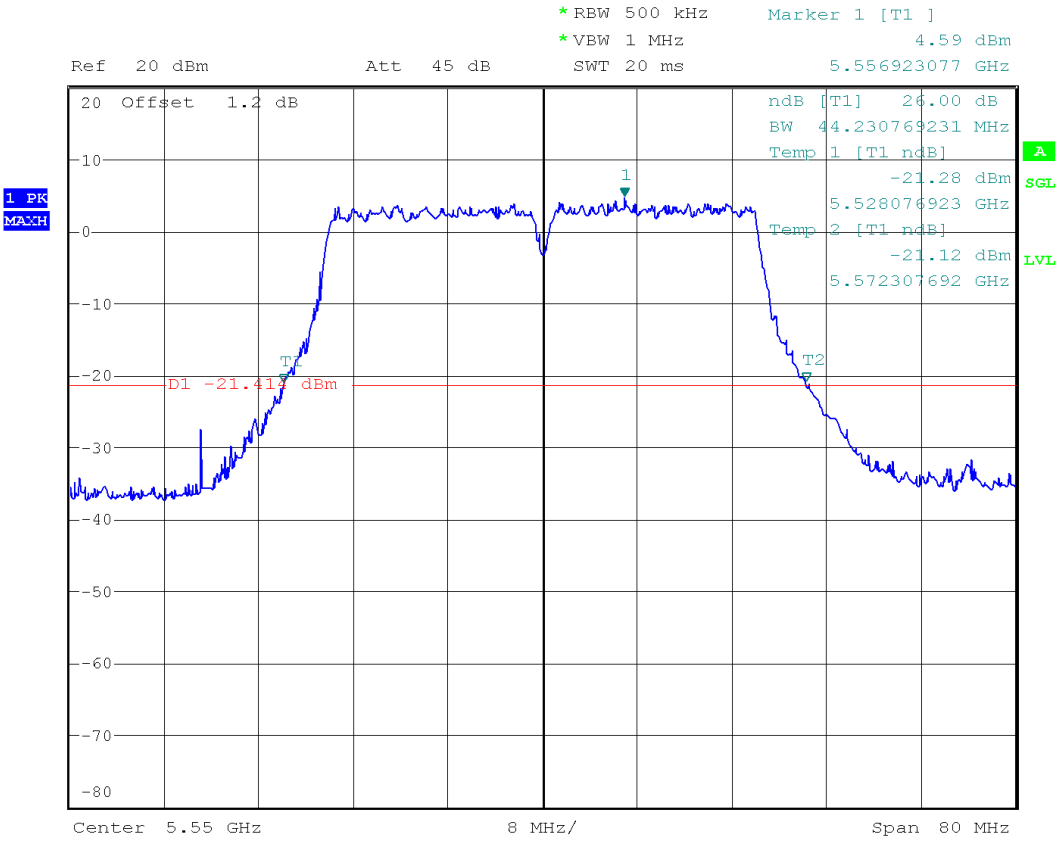
11N 5G HT20 MCS0 CH140 5700MHZ



BAND

Date: 22.OCT.2018 10:40:11

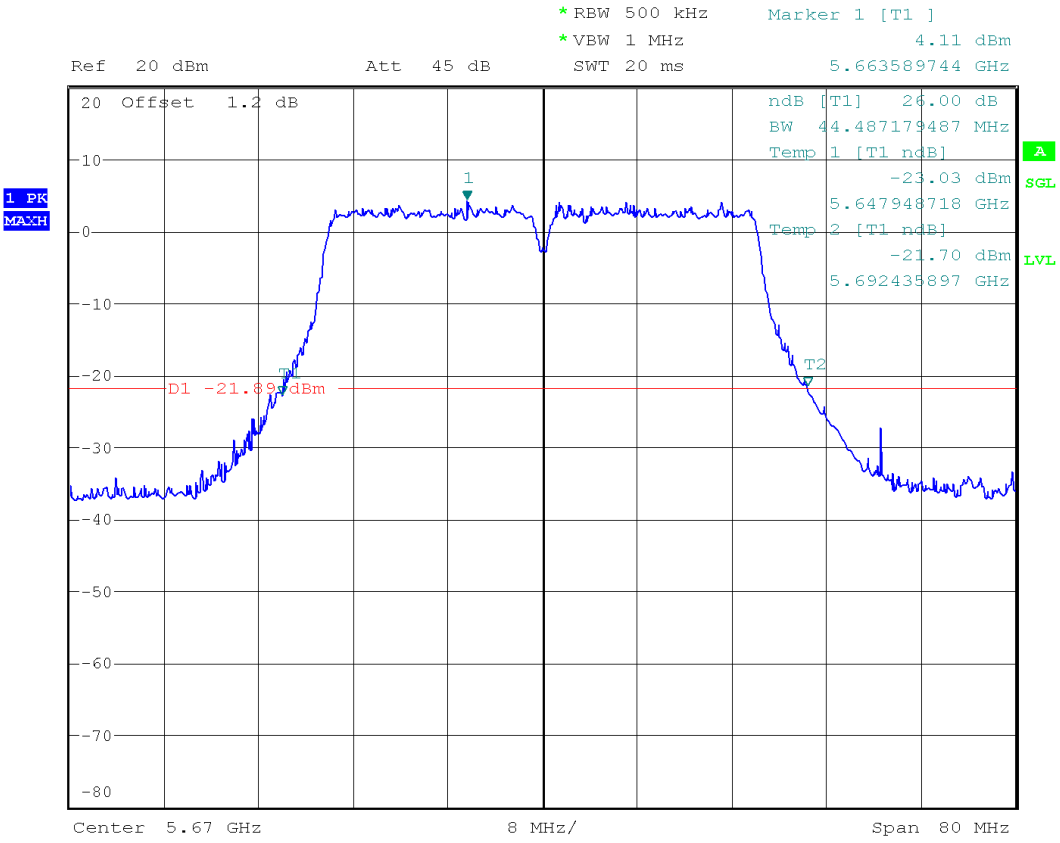
11N 5G HT40 MCS0 CH102 5510MHZ



BAND

Date: 22.OCT.2018 10:44:40

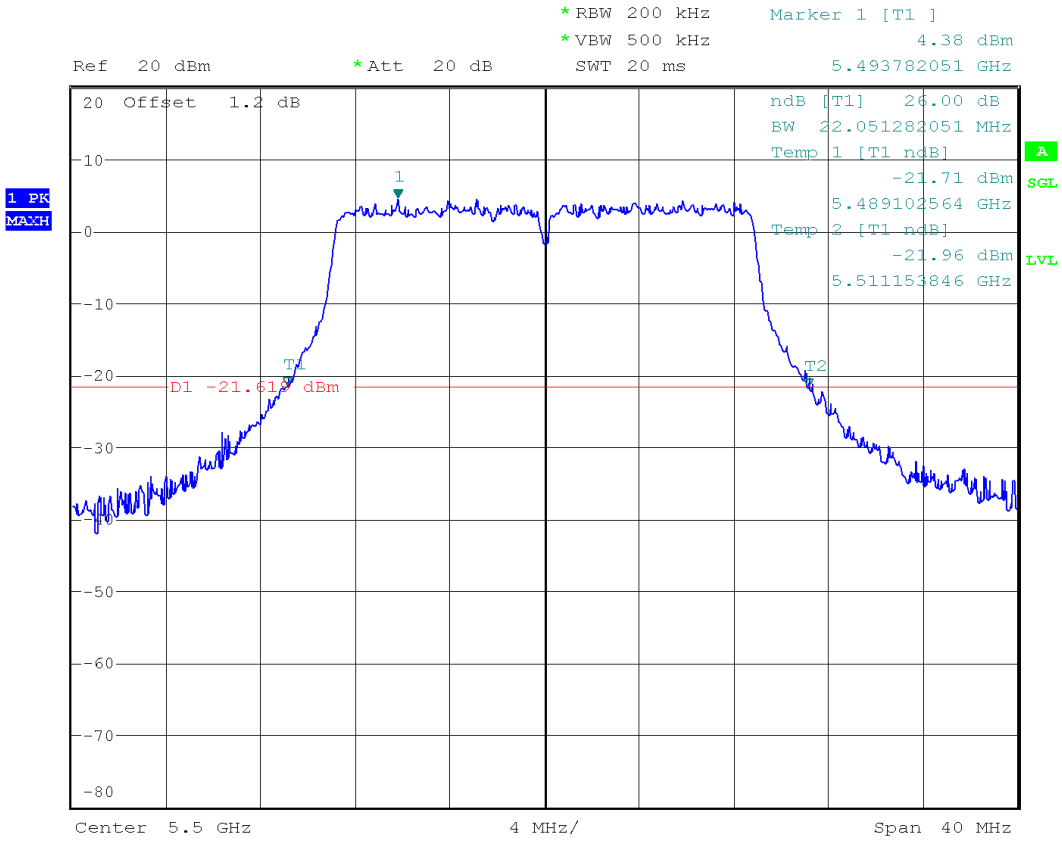
11N 5G HT40 MCS0 CH110 5550MHZ



BAND

Date: 22.OCT.2018 10:48:40

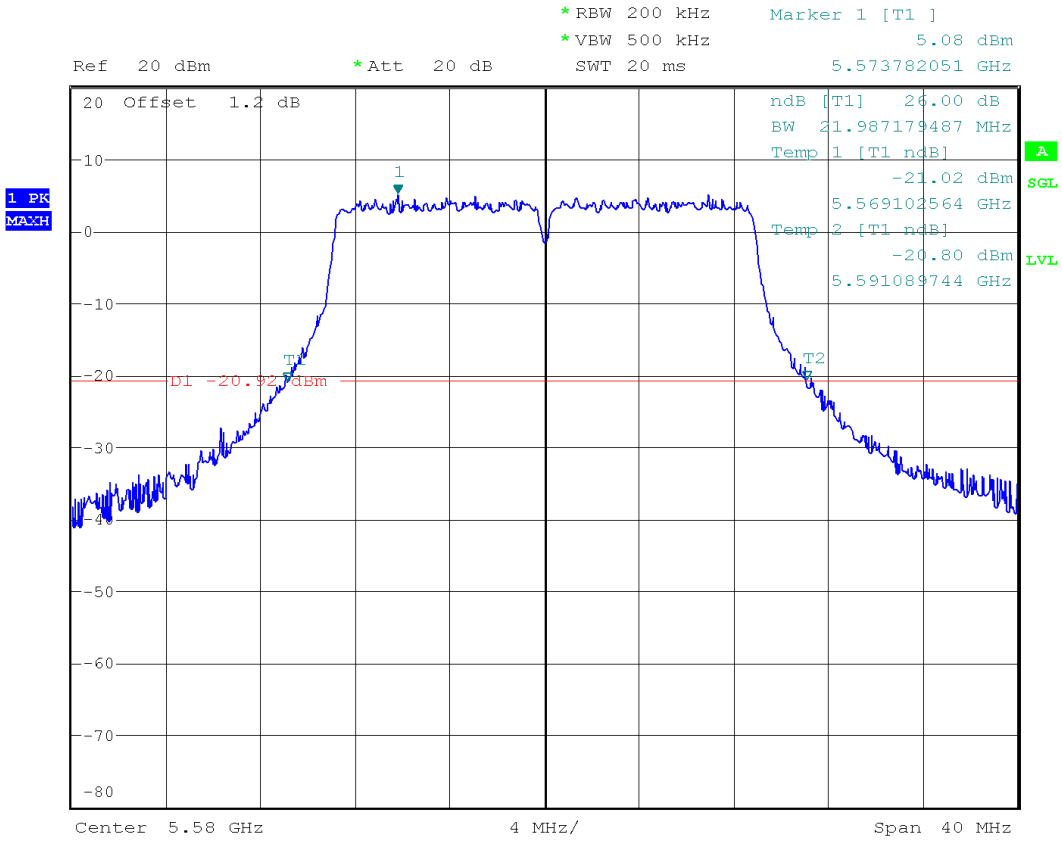
11N 5G HT40 MCS0 CH134 5670MHZ



BAND

Date: 23.OCT.2018 03:54:20

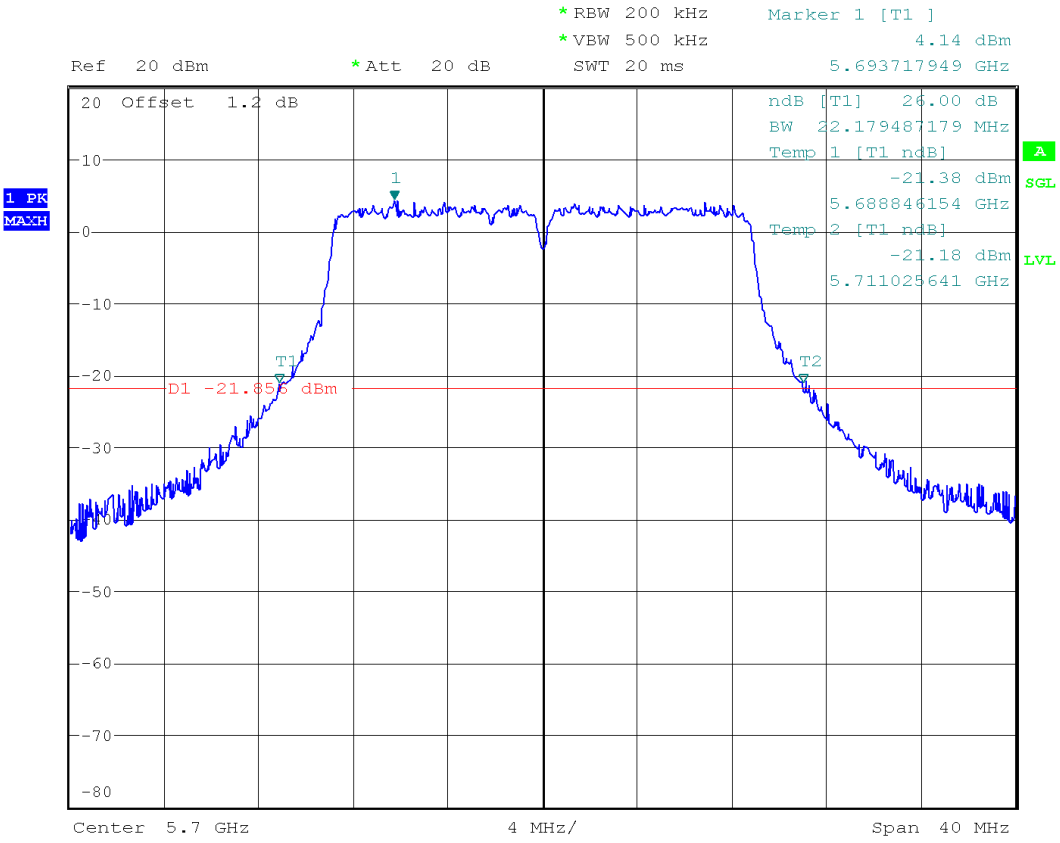
11AC HT20 MCS0 CH100 5500MHZ



BAND

Date: 23.OCT.2018 03:59:48

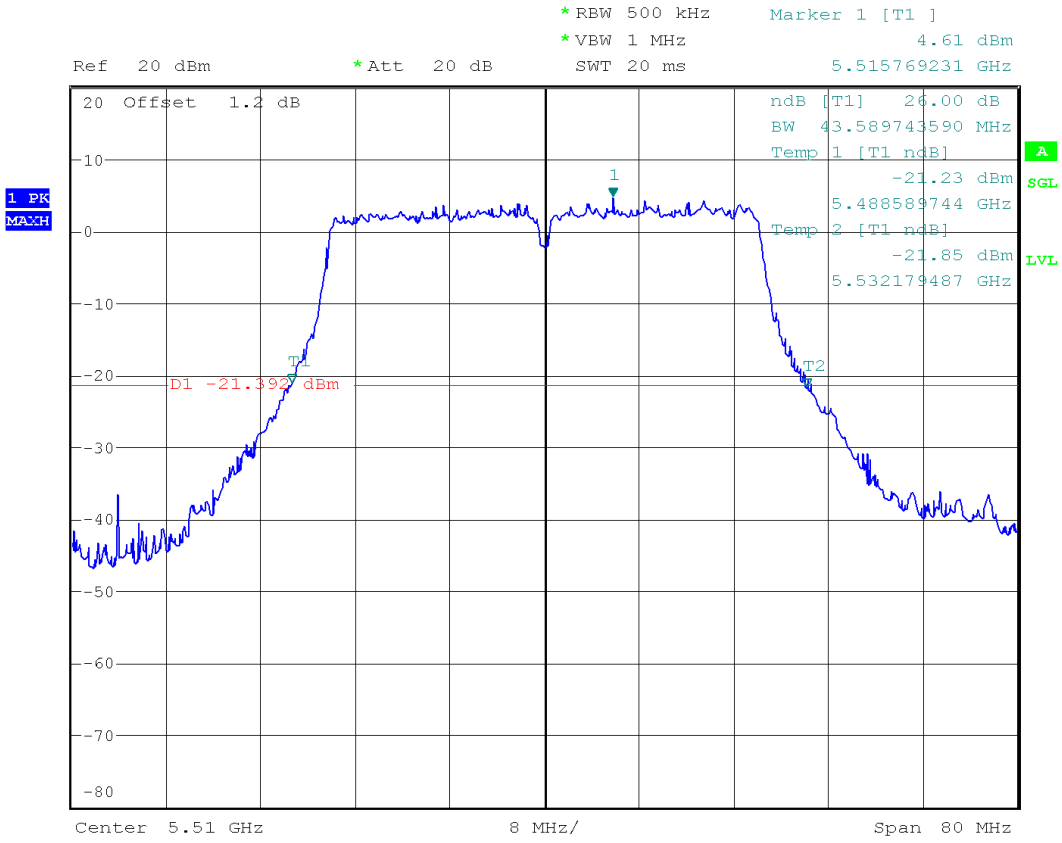
11AC HT20 MCS0 CH116 5580MHZ



BAND

Date: 23.OCT.2018 04:04:38

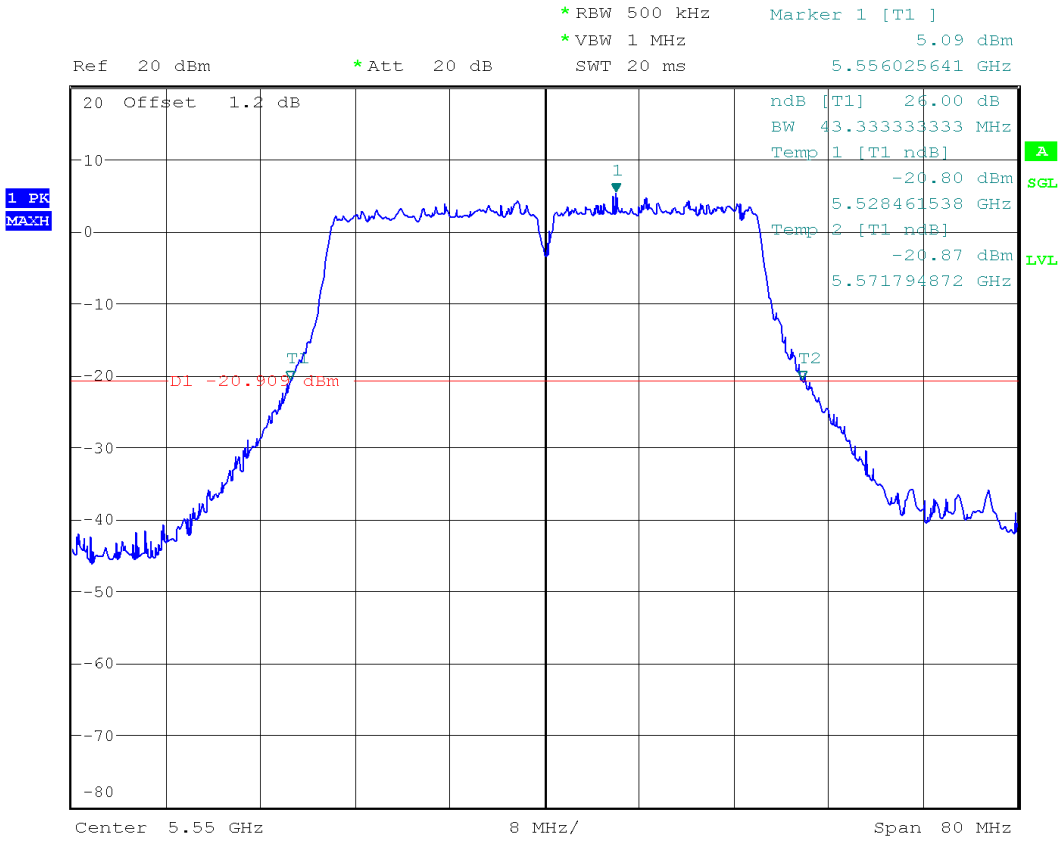
11AC HT20 MCS0 CH140 5700MHZ



BAND

Date: 23.OCT.2018 04:56:42

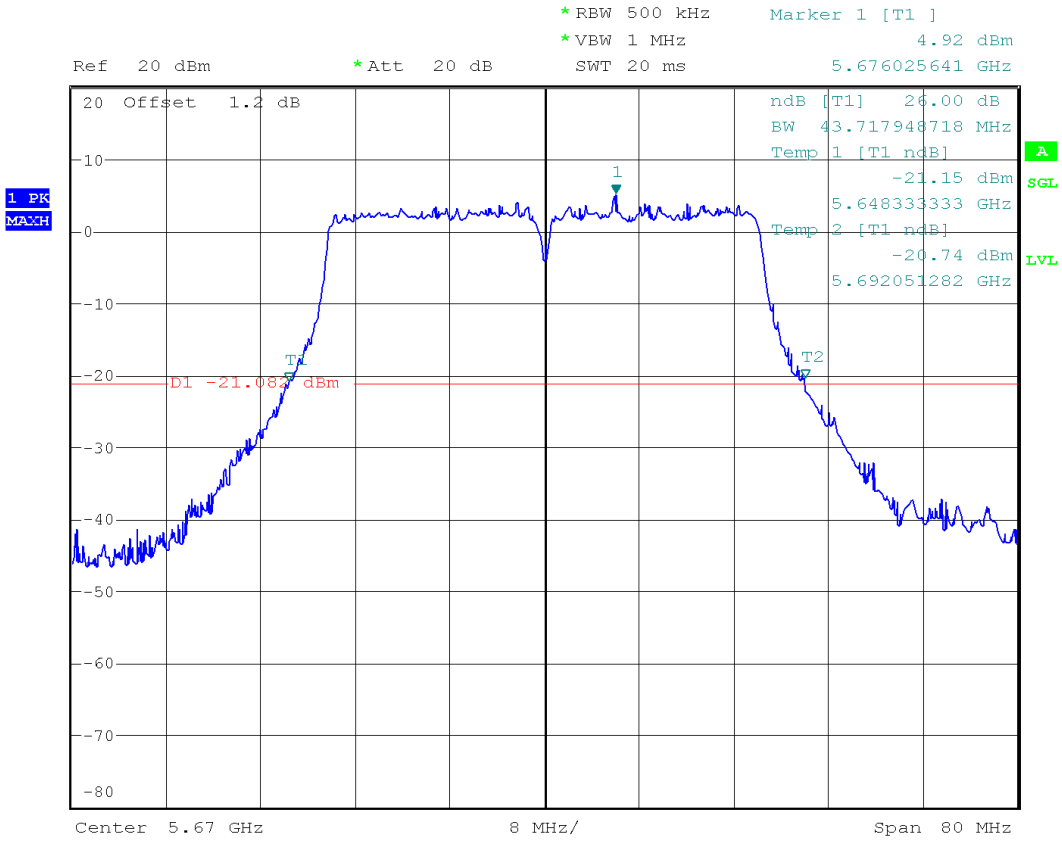
11AC HT40 MCS0 CH102 5510MHZ



BAND

Date: 23.OCT.2018 05:01:21

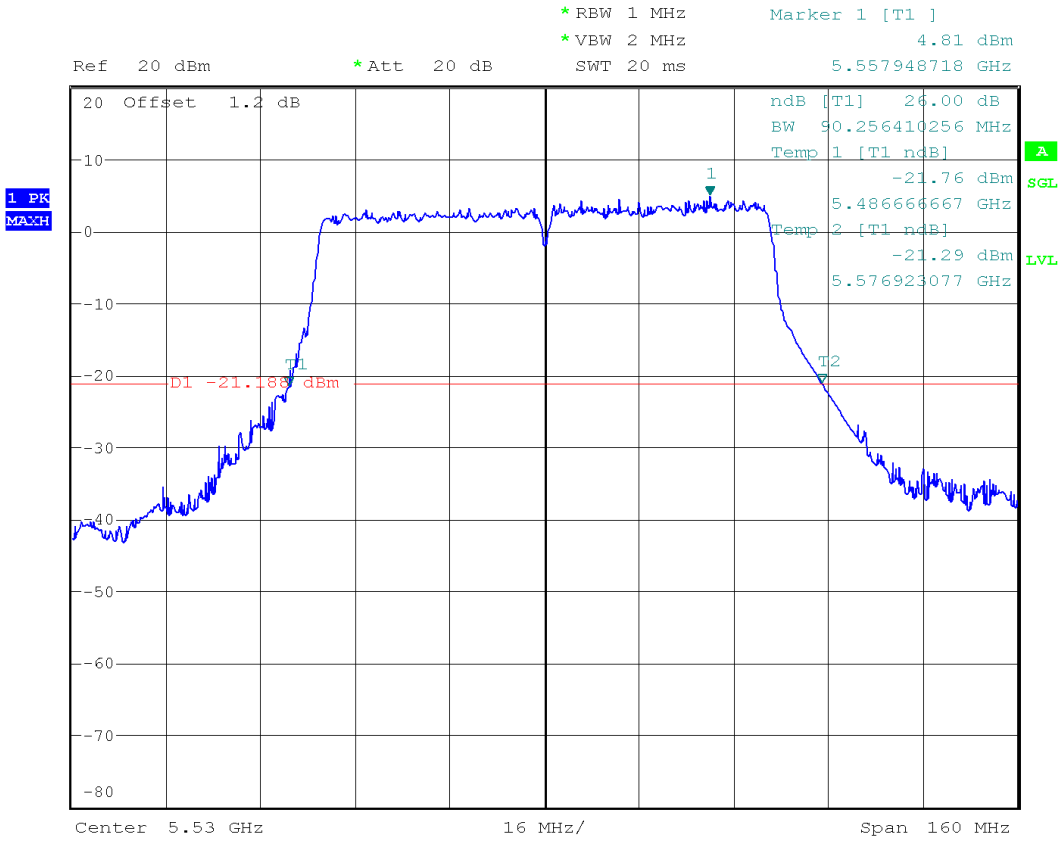
11AC HT40 MCS0 CH110 5550MHZ



BAND

Date: 23.OCT.2018 05:05:55

11AC HT40 MCS0 CH134 5670MHZ

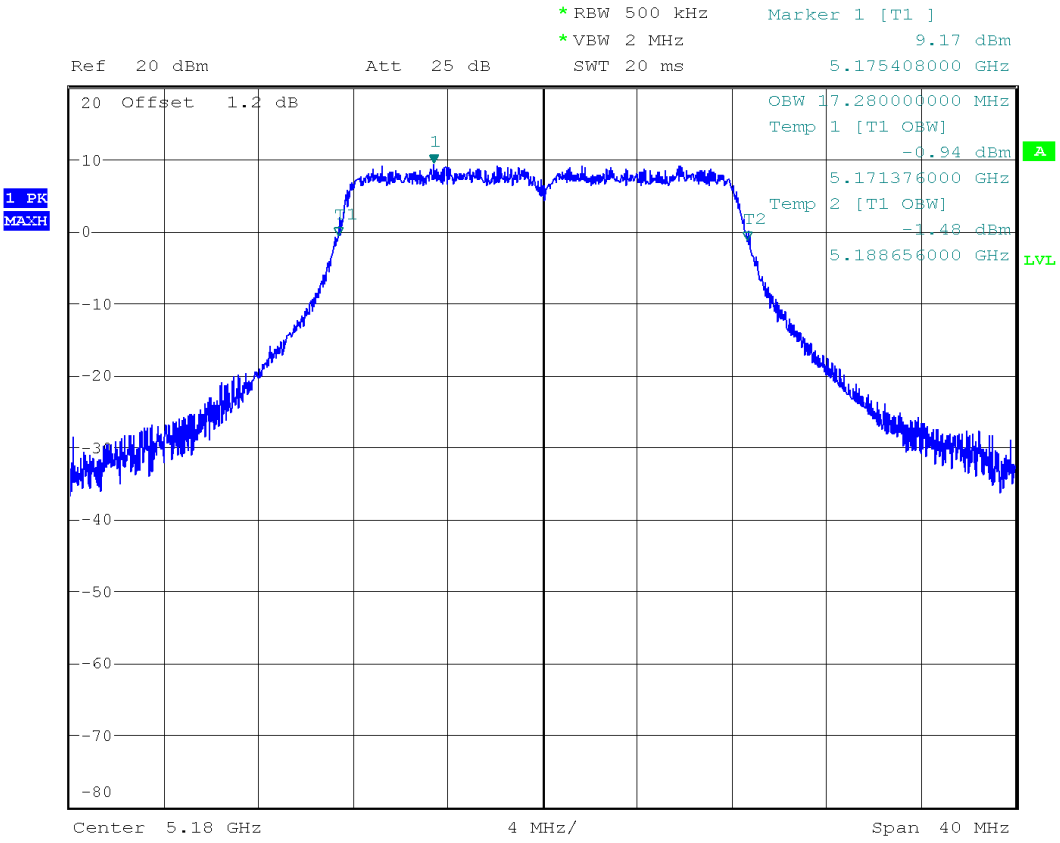


BAND

Date: 23.OCT.2018 05:48:59

11AC HT80 MCS0 CH106 5530MHZ

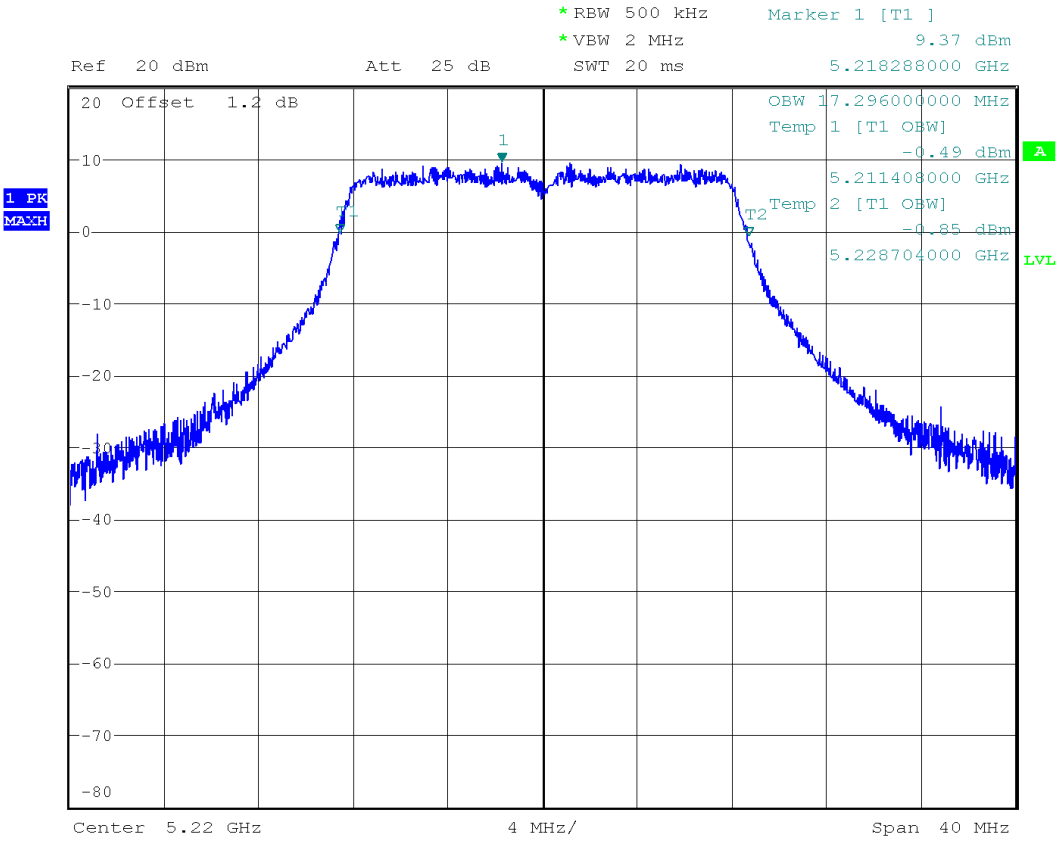
99% bandwidth(U-NII-1):



BAND

Date: 22.OCT.2018 05:03:08

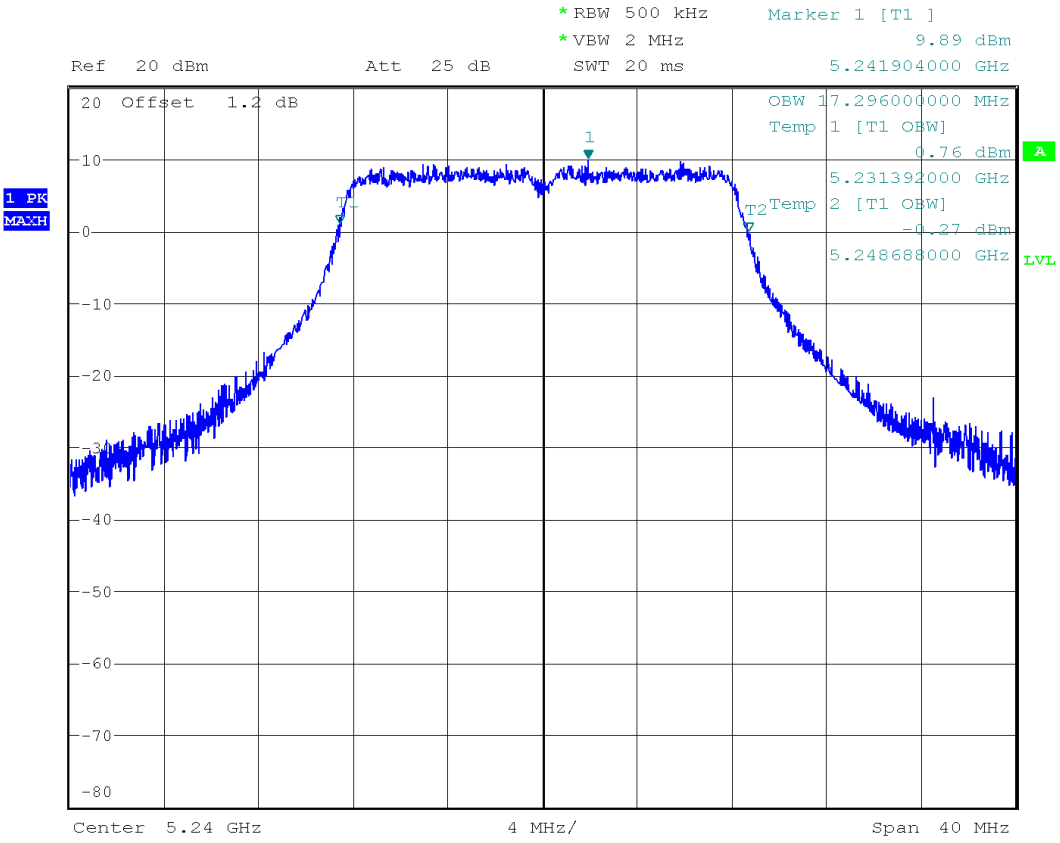
11A 6Mbps CH36 5180MHZ



BAND

Date: 22.OCT.2018 05:19:57

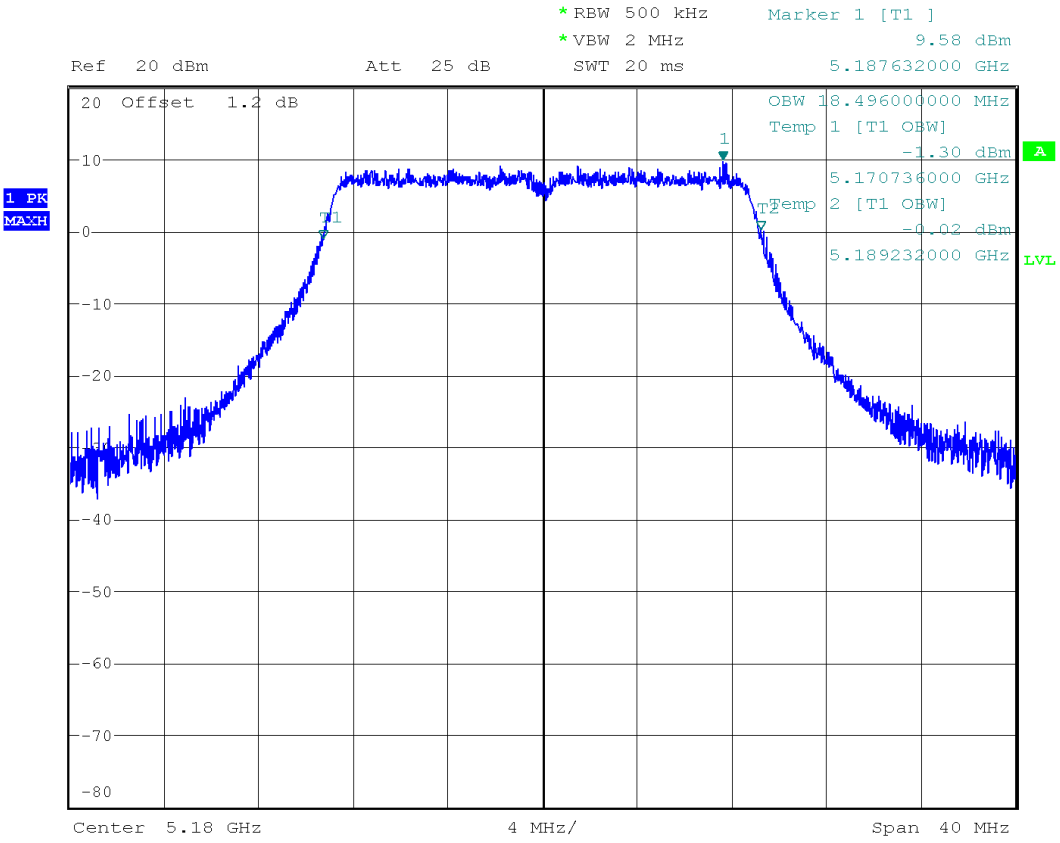
11A 6Mbps CH44 5220MHZ



BAND

Date: 22.OCT.2018 05:28:40

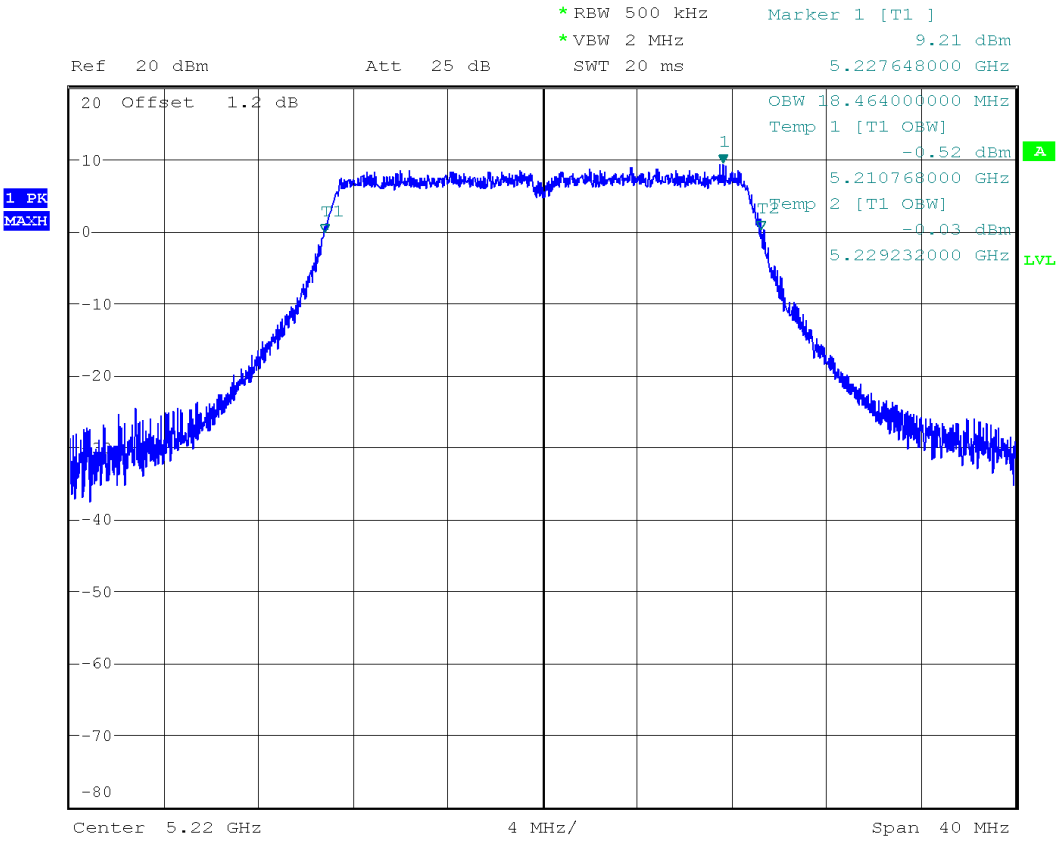
11A 6Mbps CH48 5240MHZ



BAND

Date: 22.OCT.2018 09:24:54

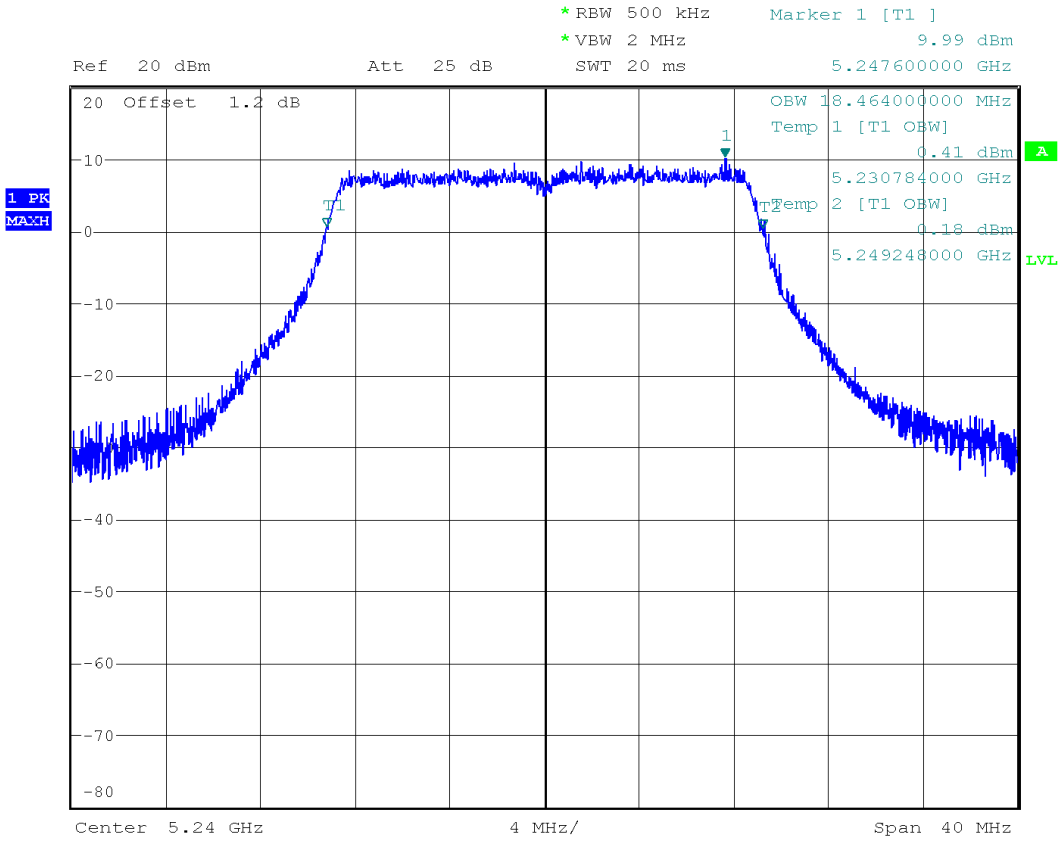
11N 5G HT20 MCS0 CH36 5180MHZ



BAND

Date: 22.OCT.2018 09:29:52

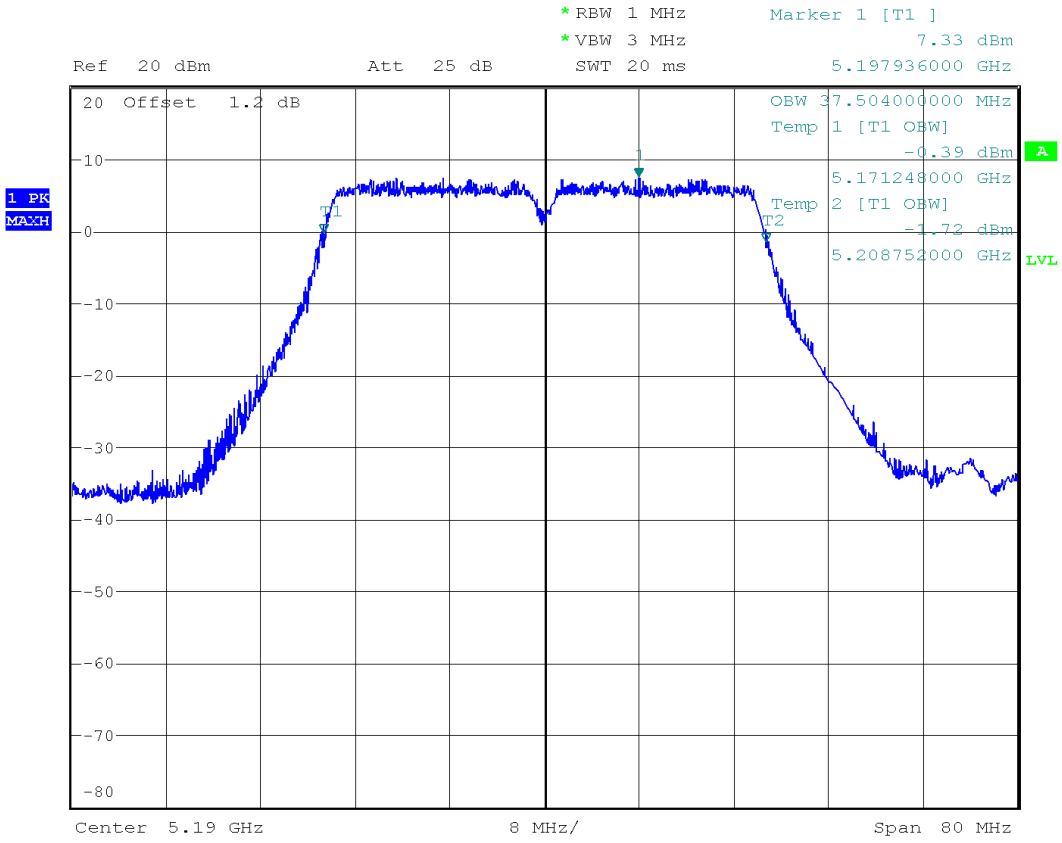
11N 5G HT20 MCS0 CH44 5220MHZ



BAND

Date: 22.OCT.2018 09:34:02

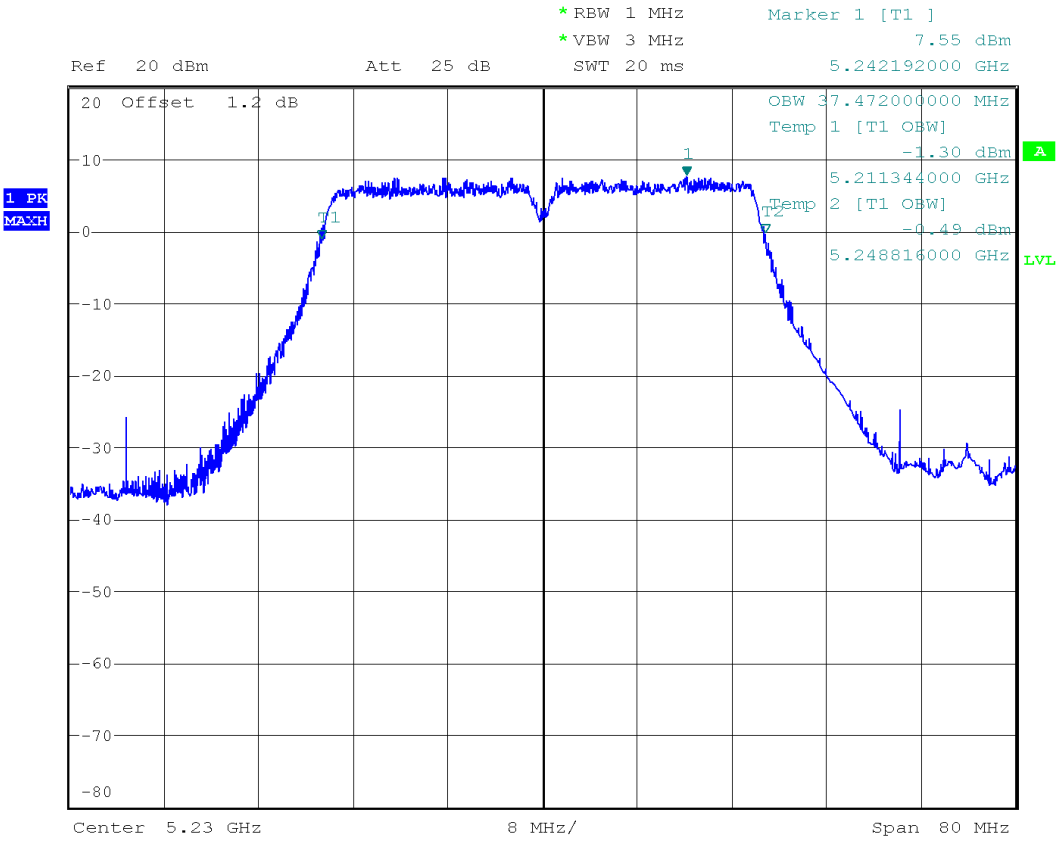
11N 5G HT20 MCS0 CH48 5240MHZ



BAND

Date: 22.OCT.2018 10:20:29

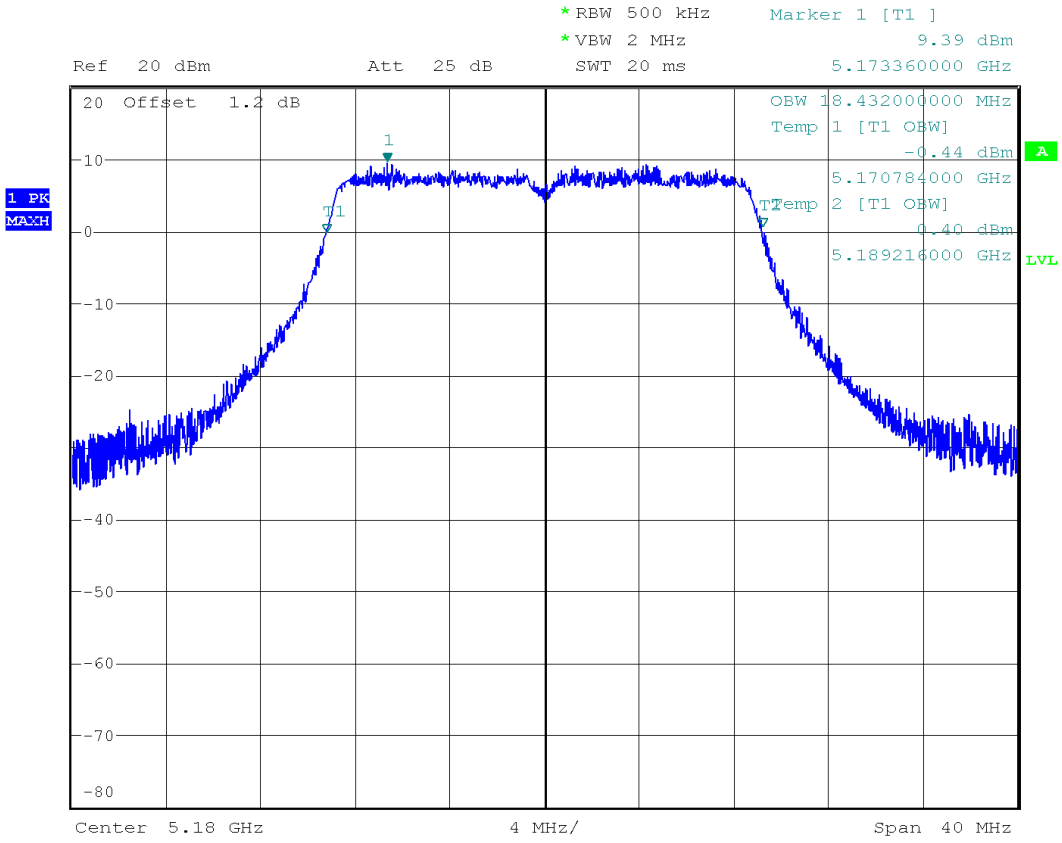
11N 5G HT40 MCS0 CH38 5190MHZ



BAND

Date: 22.OCT.2018 10:25:38

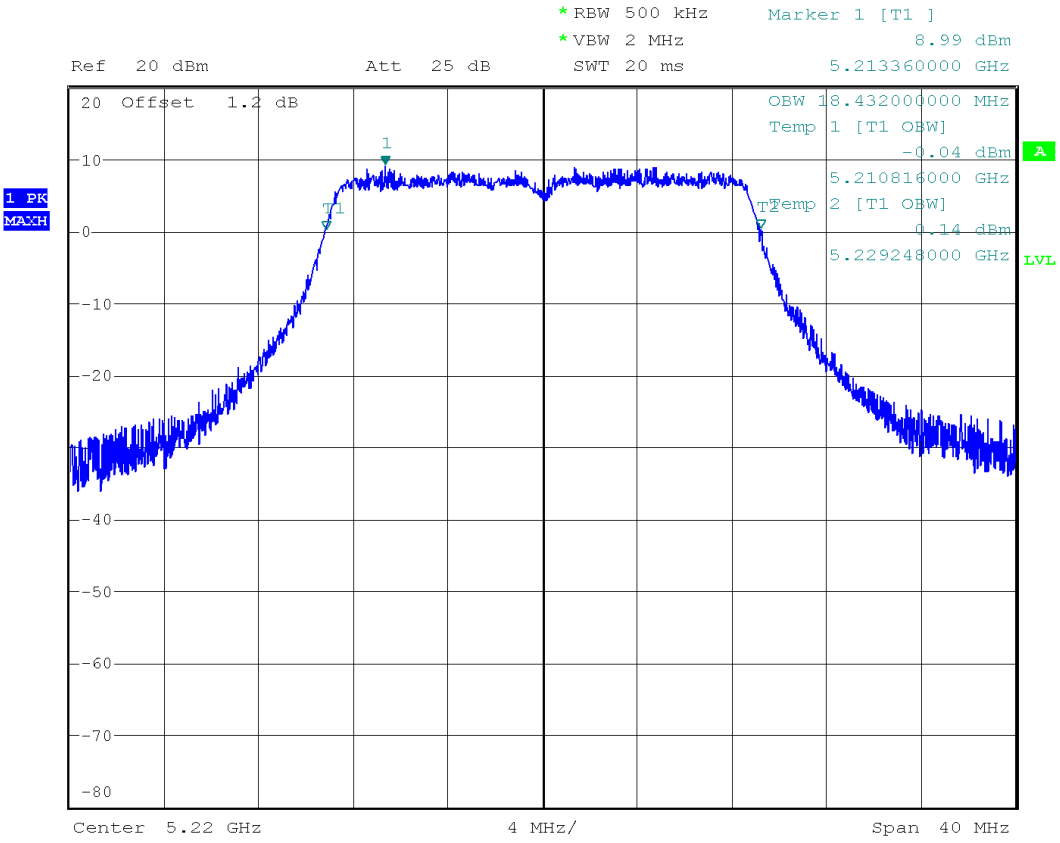
11N 5G HT40 MCS0 CH46 5230MHZ



BAND

Date: 23.OCT.2018 03:20:13

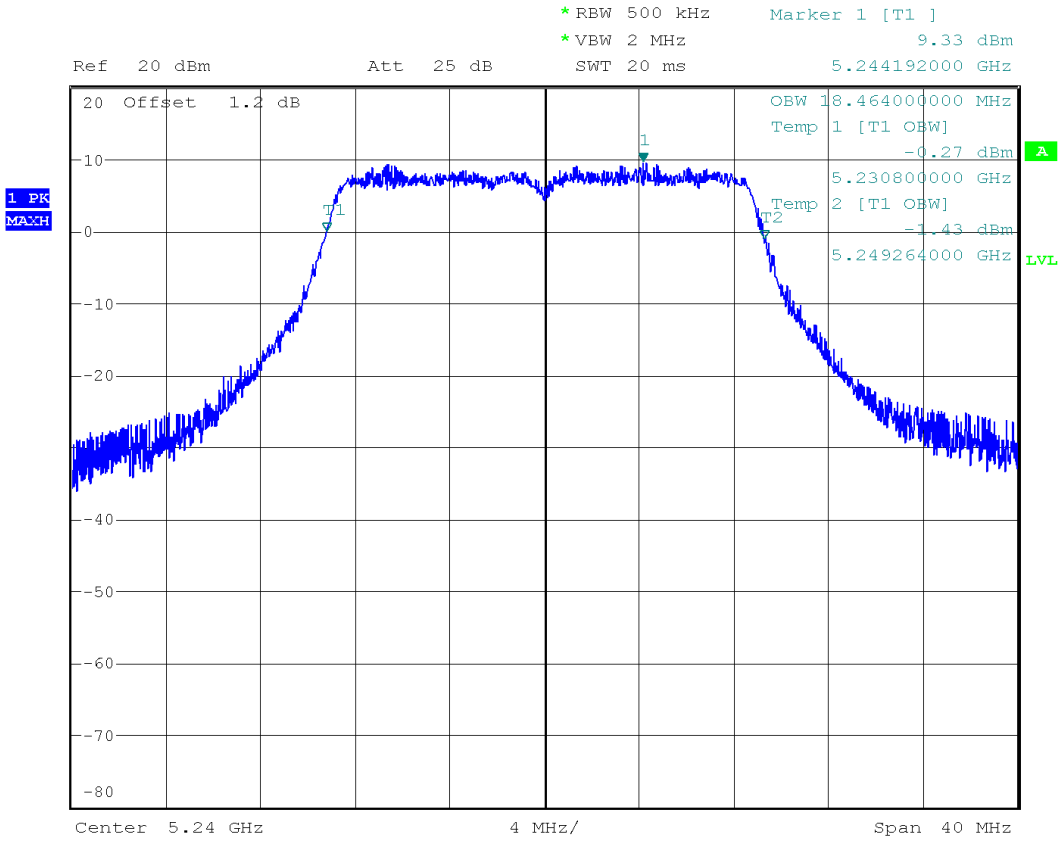
11AC HT20 MCS0 CH36 5180MHZ



BAND

Date: 23.OCT.2018 03:25:48

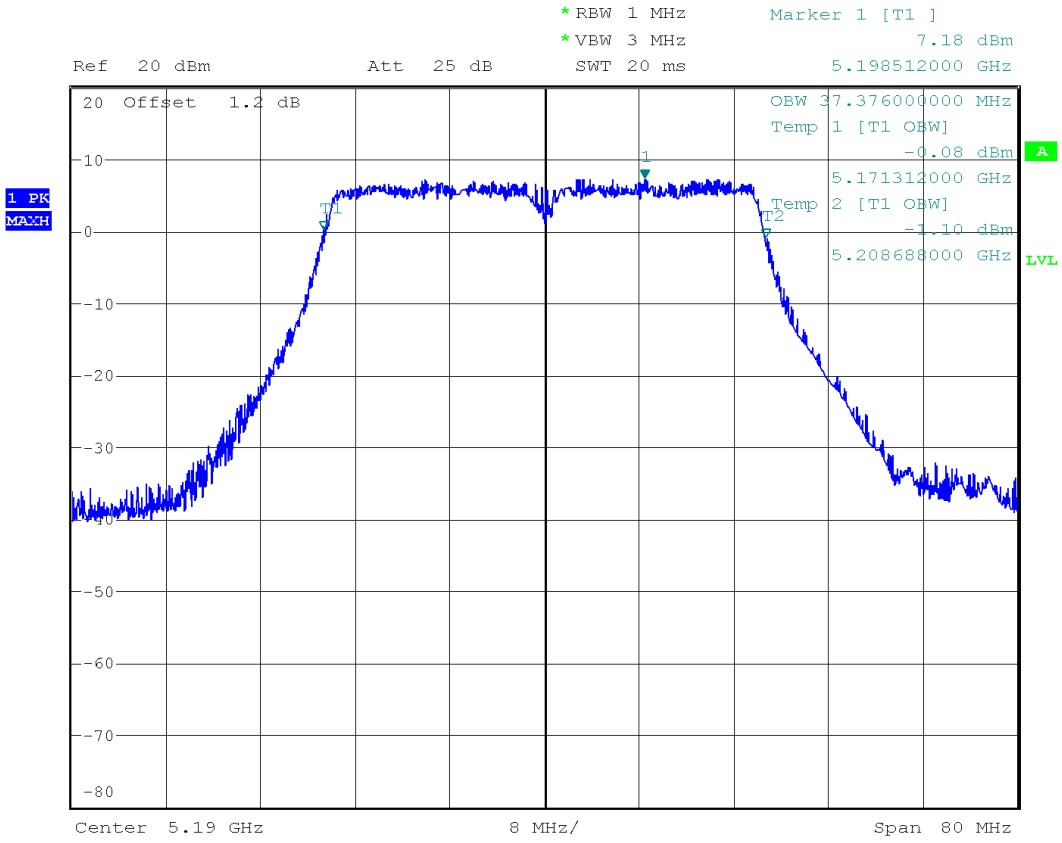
11AC HT20 MCS0 CH44 5220MHZ



BAND

Date: 23.OCT.2018 03:32:35

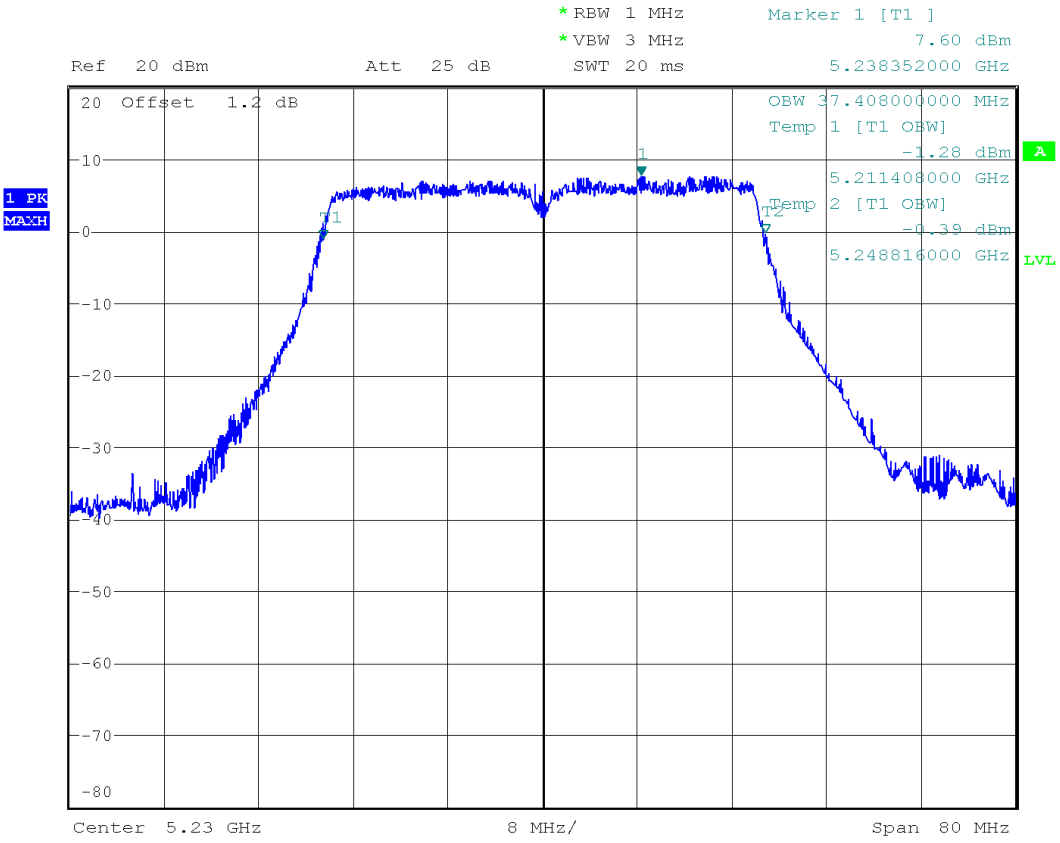
11AC HT20 MCS0 CH48 5240MHZ



BAND

Date: 23.OCT.2018 04:32:08

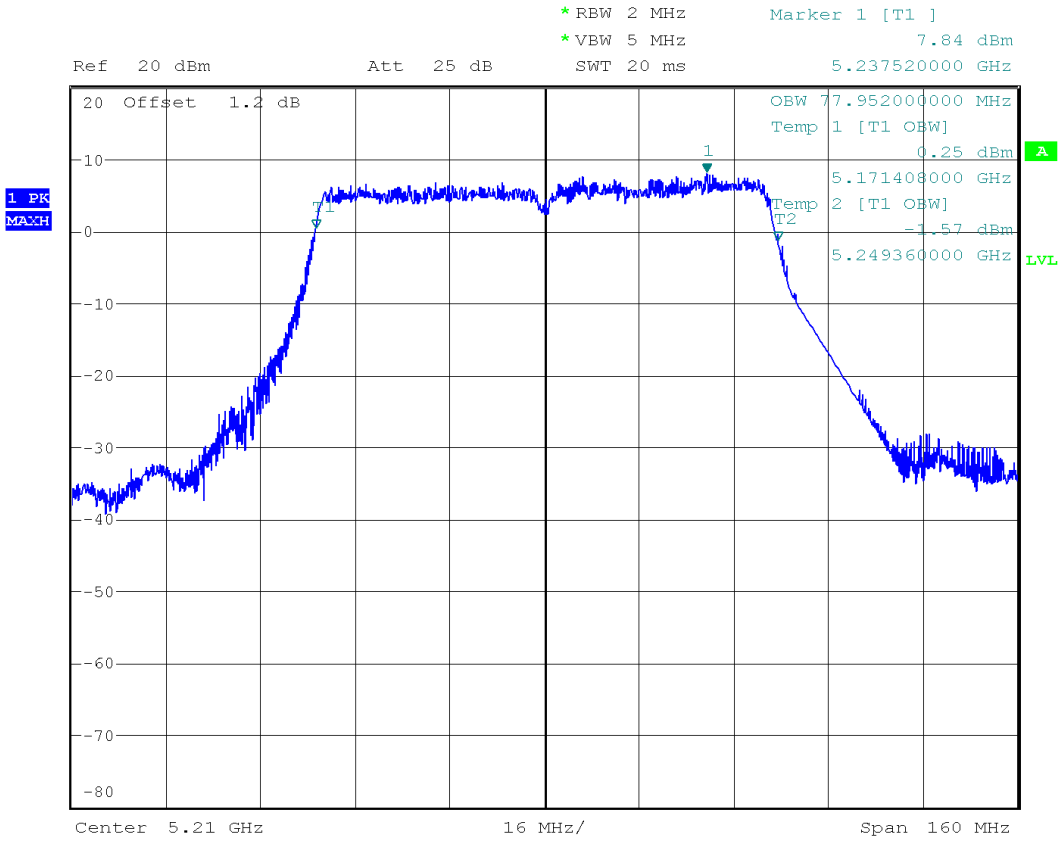
11AC HT40 MCS0 CH38 5190MHZ



BAND

Date: 23.OCT.2018 04:38:57

11AC HT40 MCS0 CH46 5230MHZ

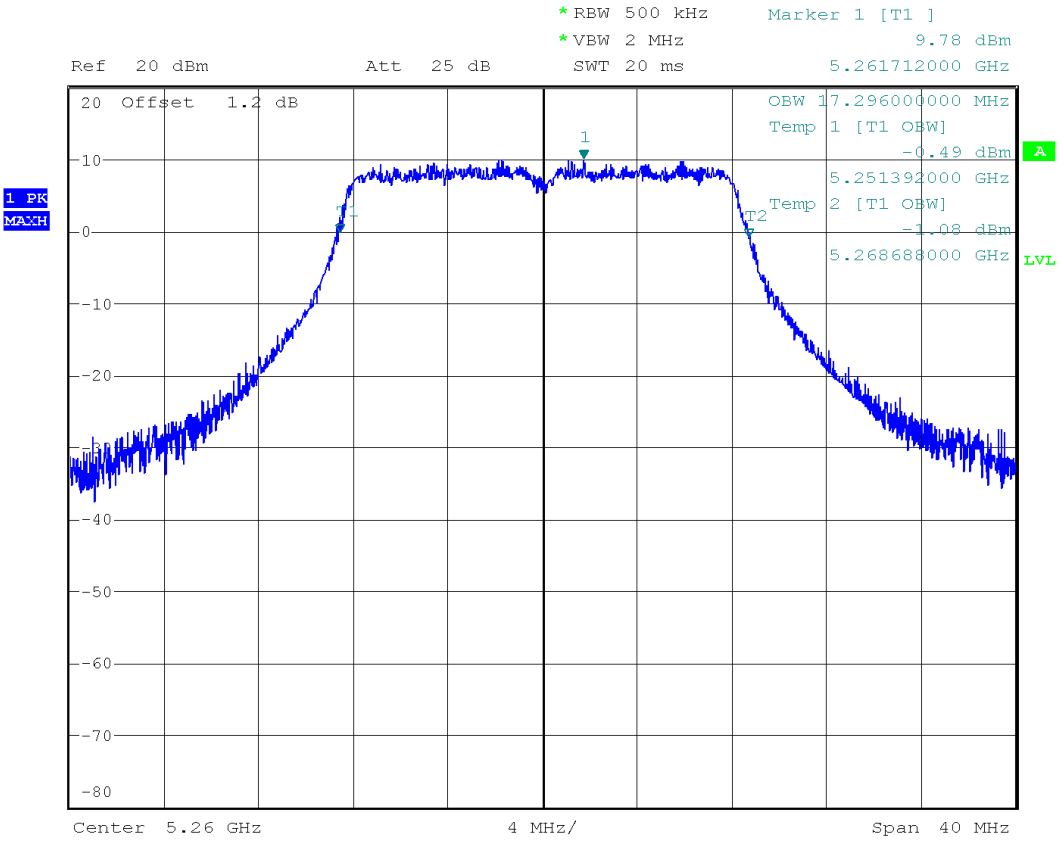


BAND

Date: 23.OCT.2018 05:21:57

11AC HT80 MCS0 CH42 5210MHZ

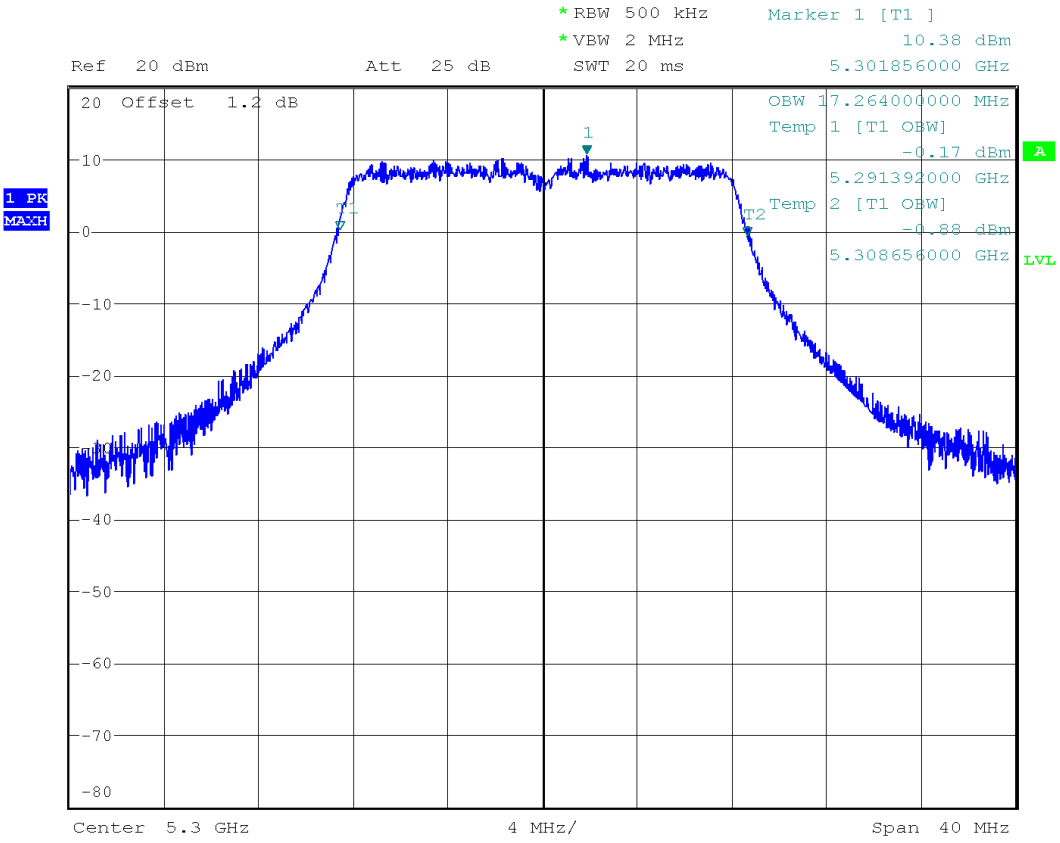
99% bandwidth(U-NII-2A):



BAND

Date: 22.OCT.2018 05:34:58

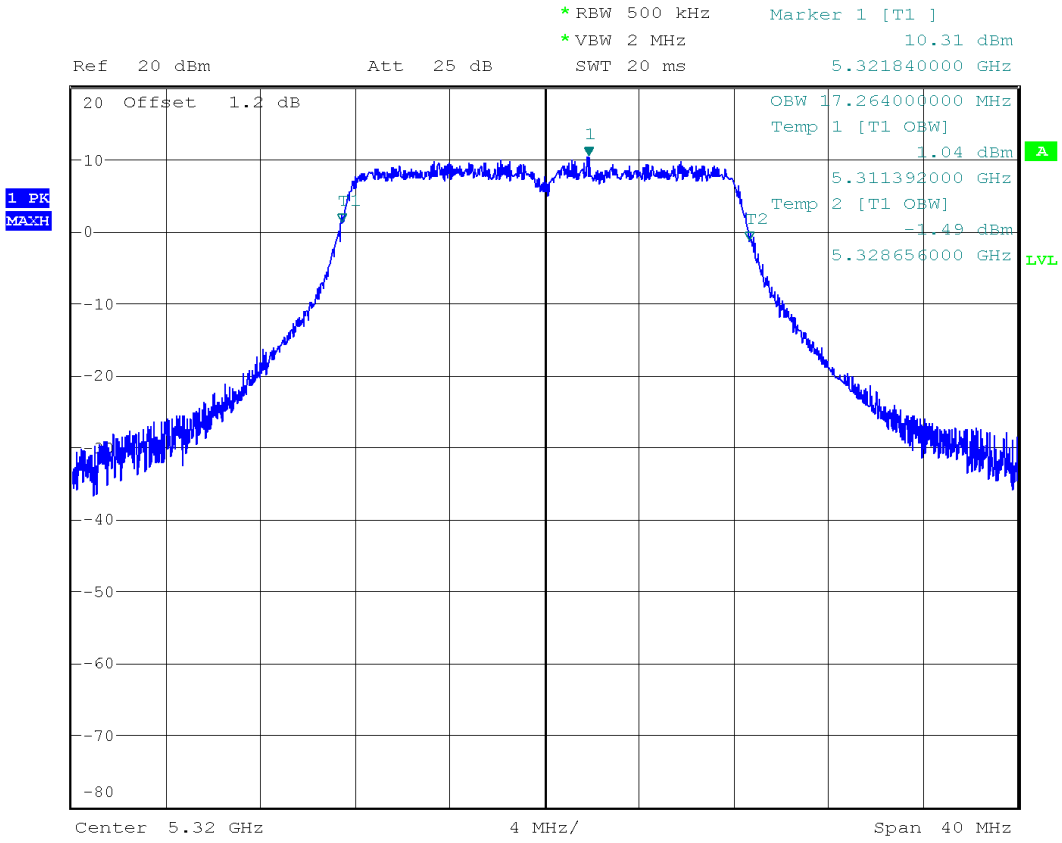
11A 6Mbps CH52 5260MHZ



BAND

Date: 22.OCT.2018 05:40:23

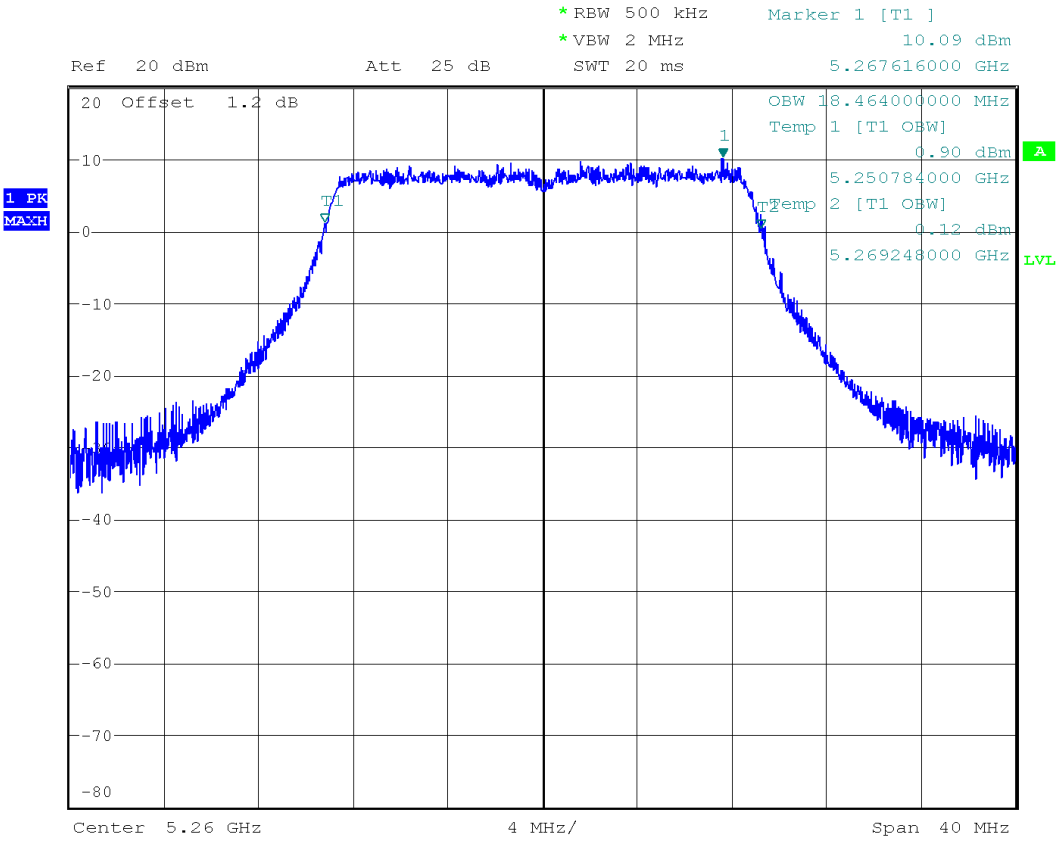
11A 6Mbps CH60 5300MHZ



BAND

Date: 22.OCT.2018 05:45:32

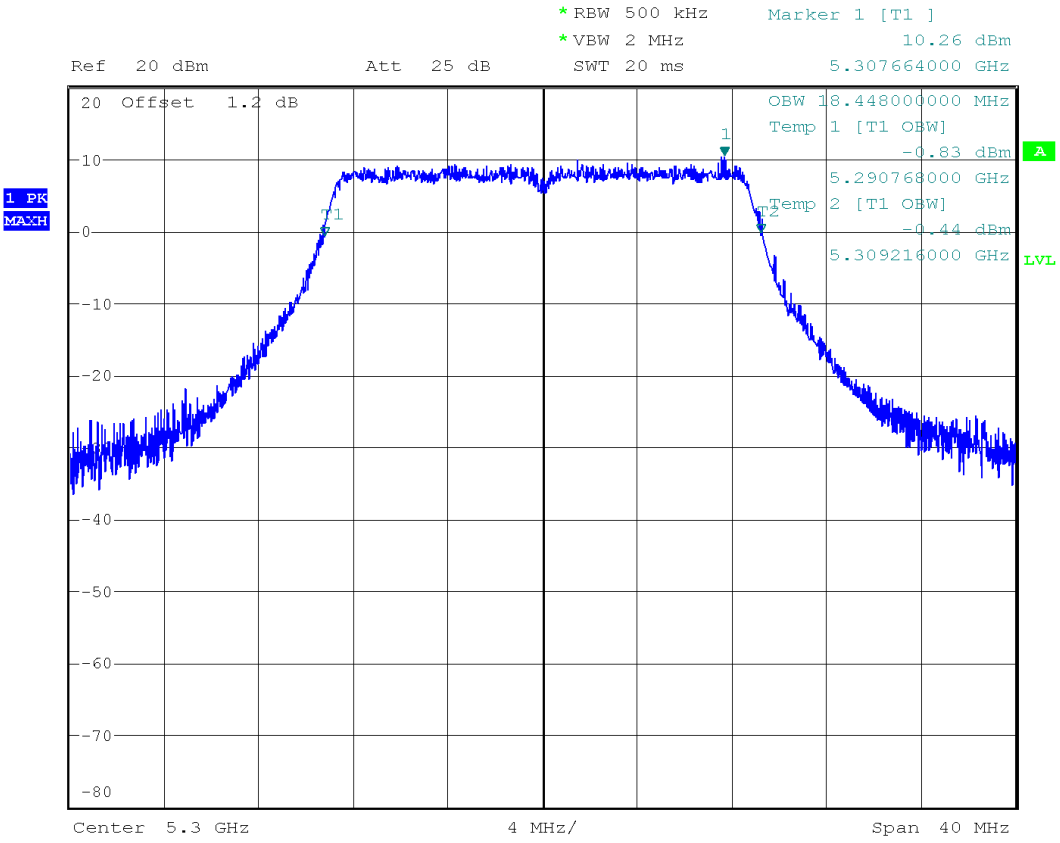
11A 6Mbps CH64 5320MHZ



BAND

Date: 22.OCT.2018 09:37:45

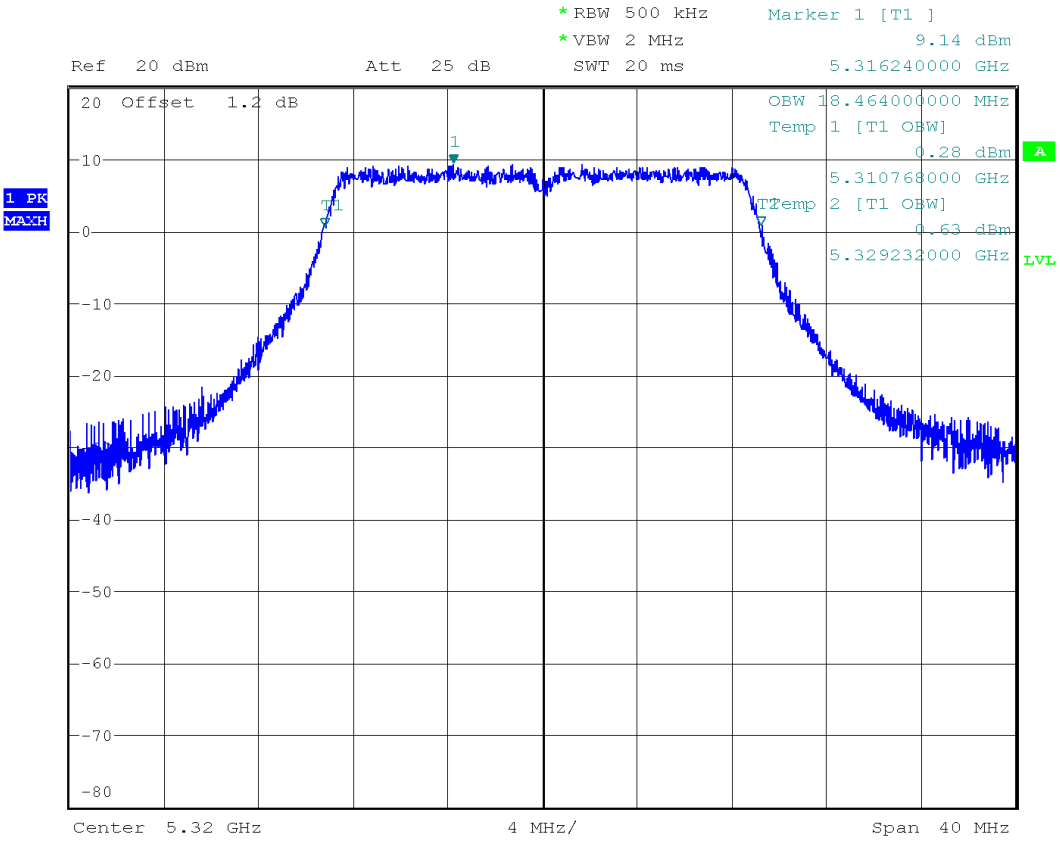
11N 5G HT20 MCS0 CH52 5260MHZ



BAND

Date: 22.OCT.2018 09:42:42

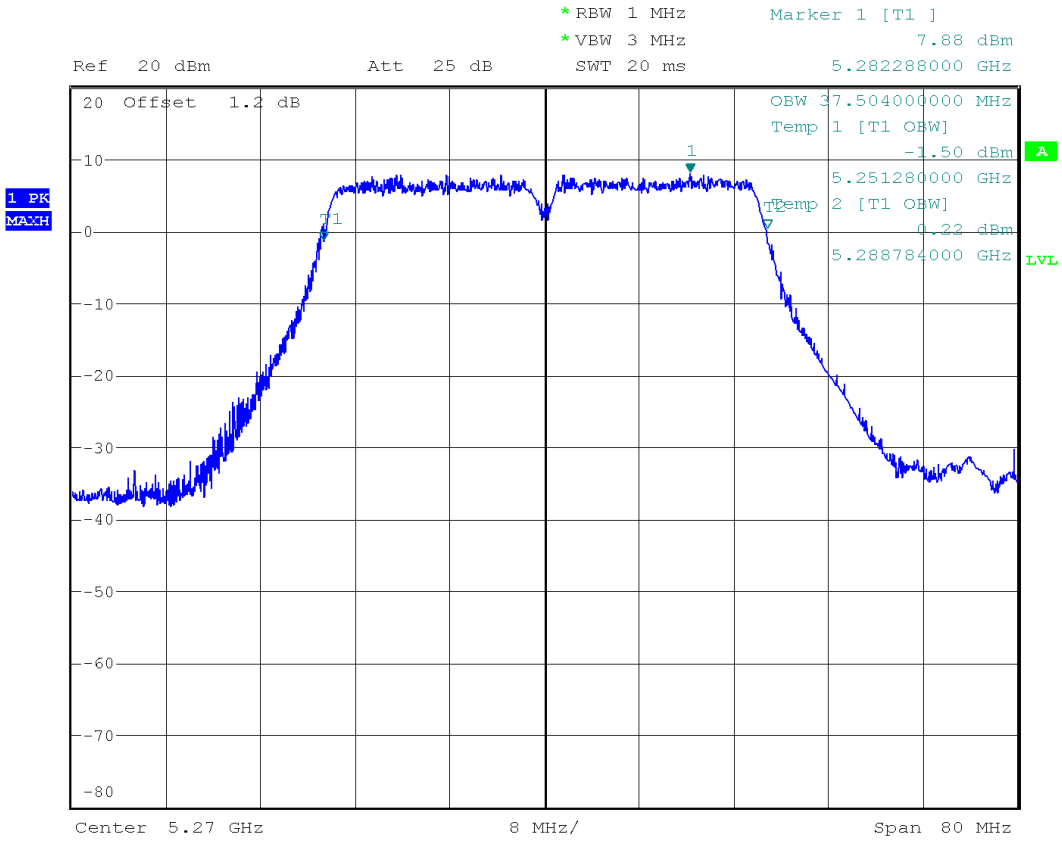
11N 5G HT20 MCS0 CH60 5300MHZ



BAND

Date: 22.OCT.2018 09:46:36

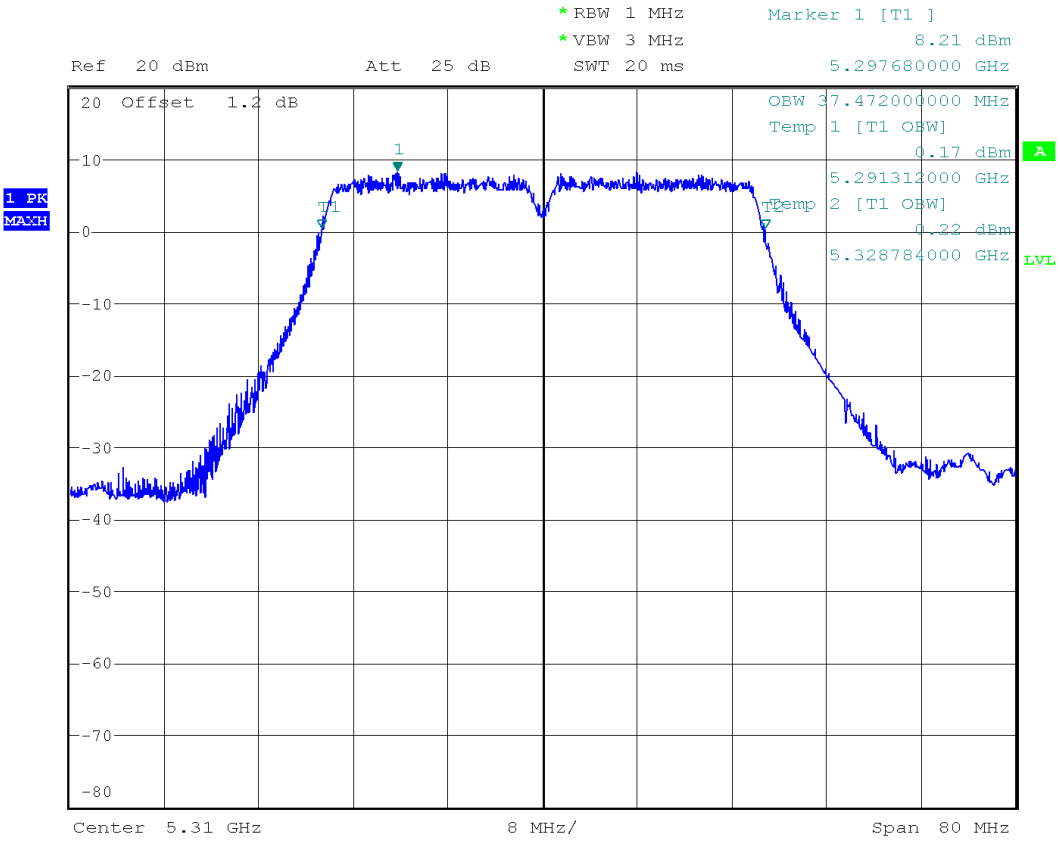
11N 5G HT20 MCS0 CH64 5320MHZ



BAND

Date: 22.OCT.2018 10:29:53

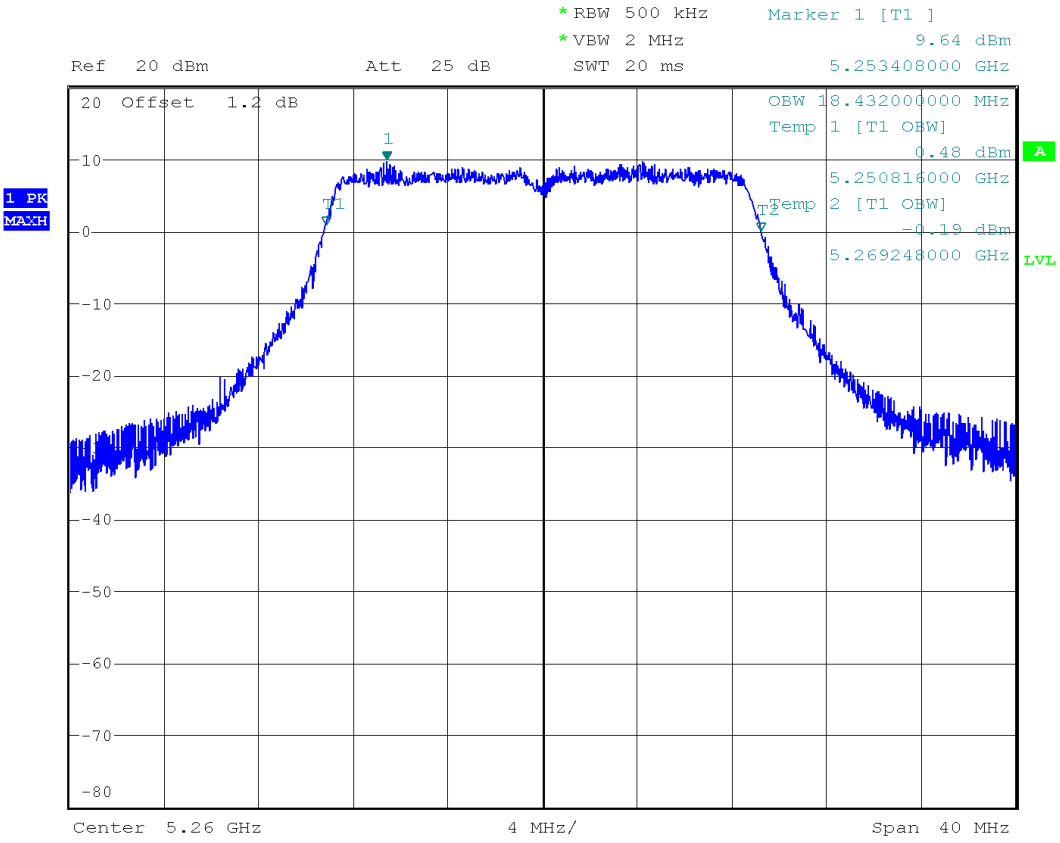
11N 5G HT40 MCS0 CH54 5270MHZ



BAND

Date: 22.OCT.2018 10:34:07

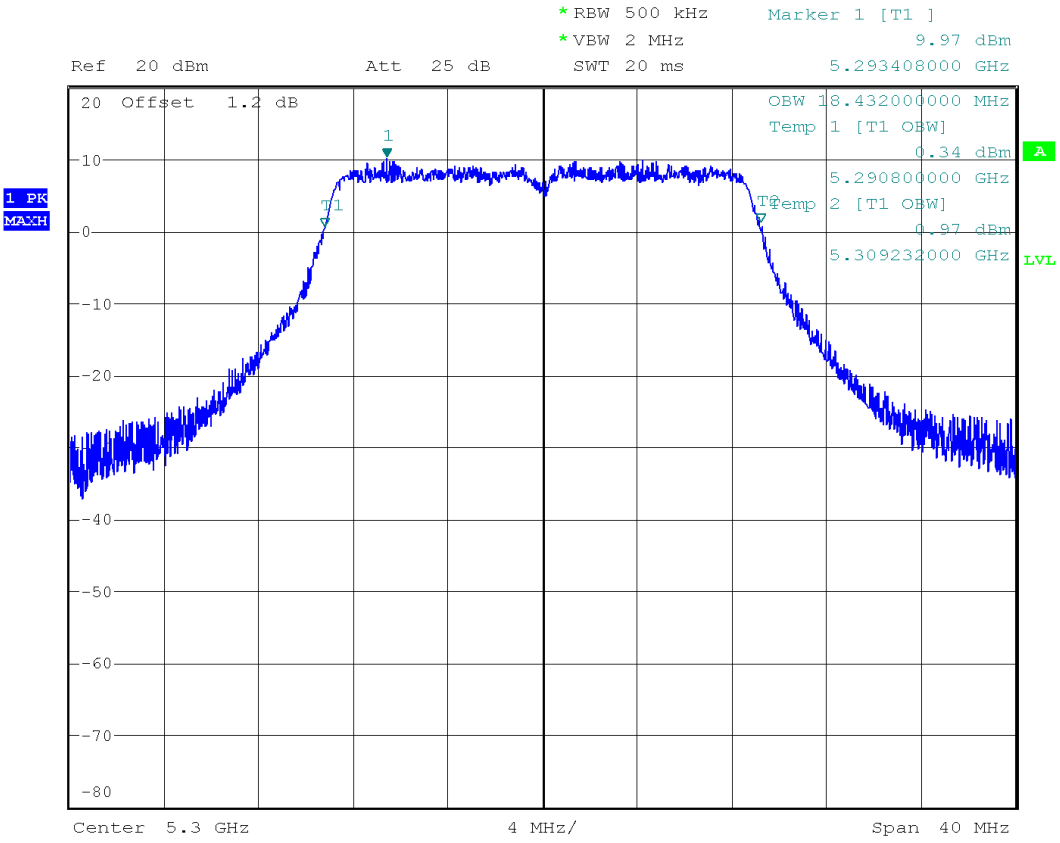
11N 5G HT40 MCS0 CH62 5310MHZ



BAND

Date: 23.OCT.2018 03:36:41

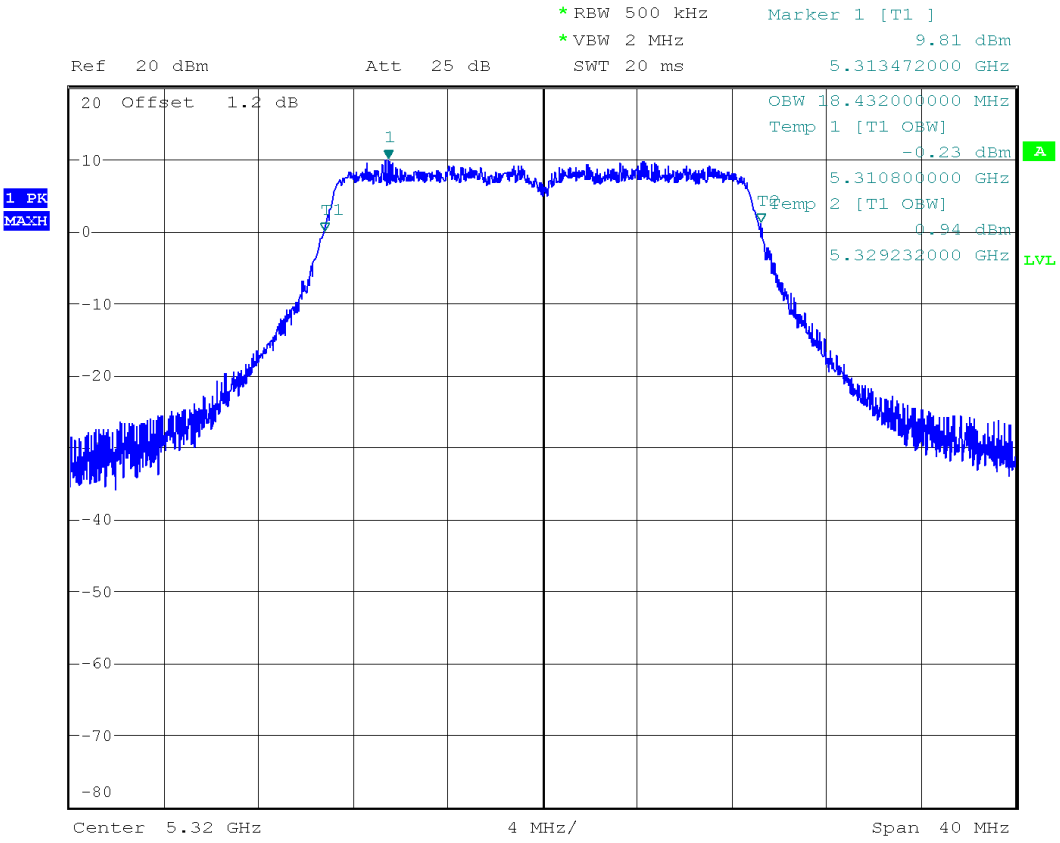
11AC HT20 MCS0 CH52 5260MHZ



BAND

Date: 23.OCT.2018 03:41:59

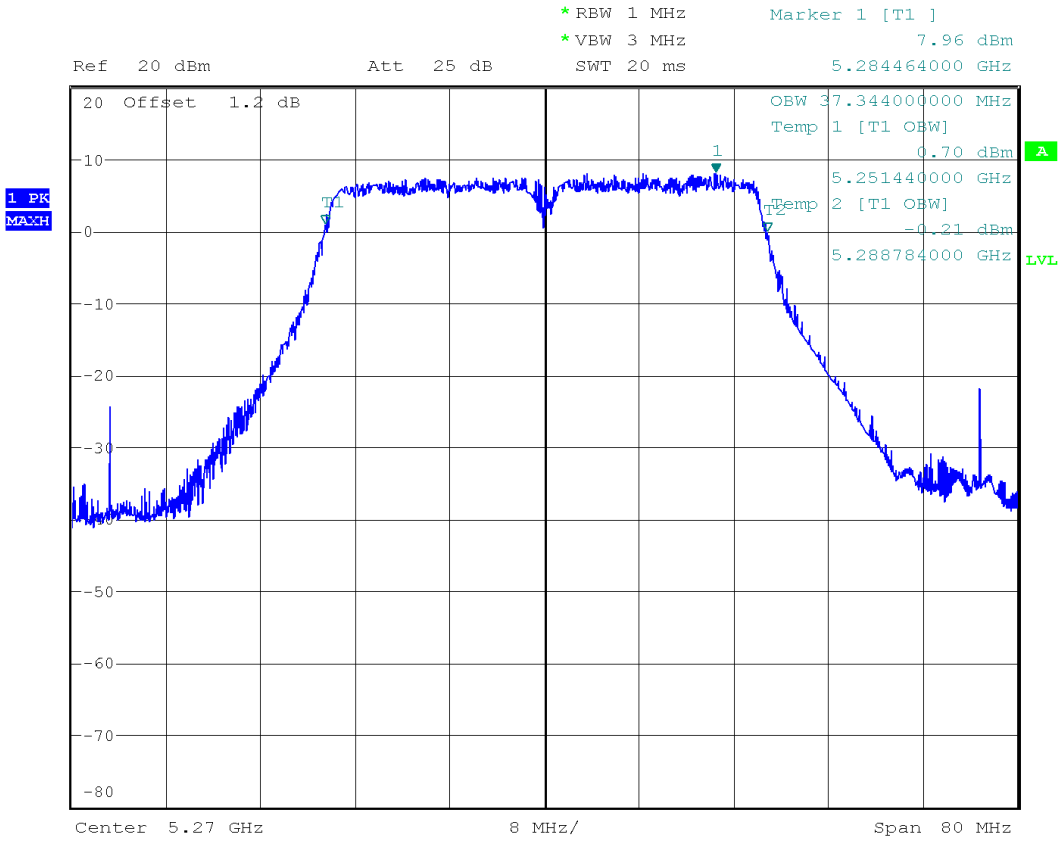
11AC HT20 MCS0 CH60 5300MHZ



BAND

Date: 23.OCT.2018 03:47:09

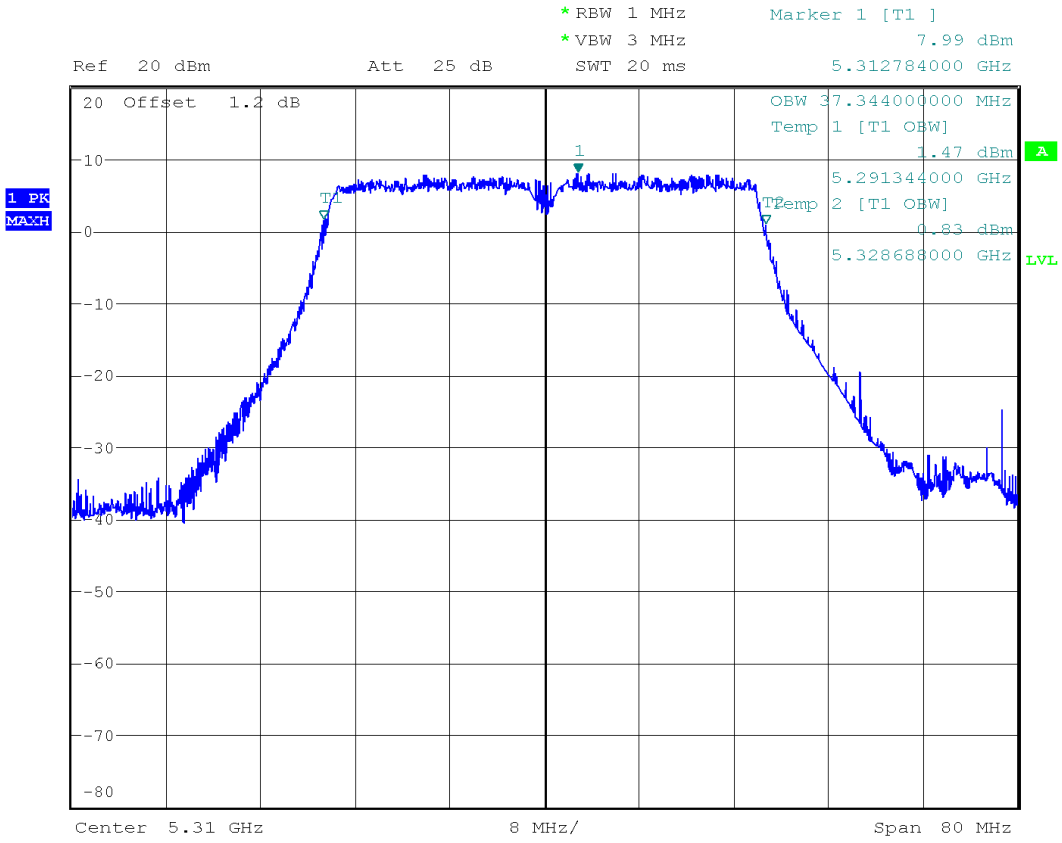
11AC HT20 MCS0 CH64 5320MHZ



BAND

Date: 23.OCT.2018 04:44:33

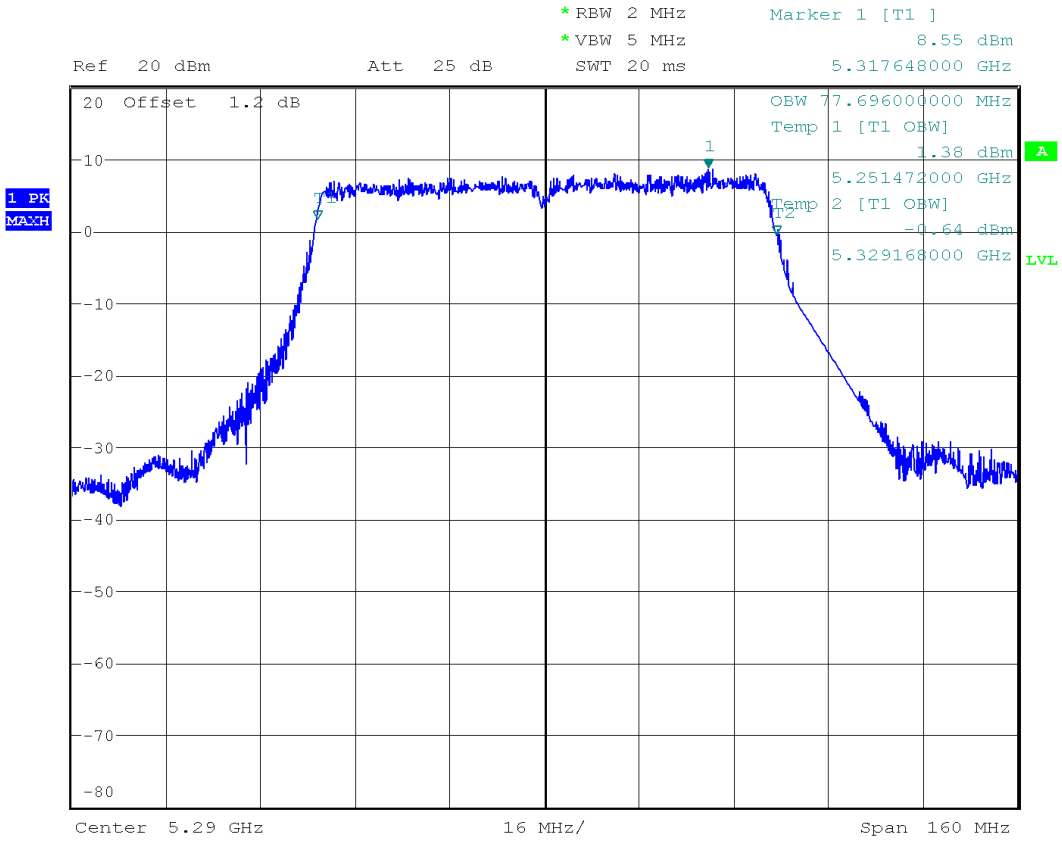
11AC HT40 MCS0 CH54 5270MHZ



BAND

Date: 23.OCT.2018 04:50:21

11AC HT40 MCS0 CH62 5310MHZ

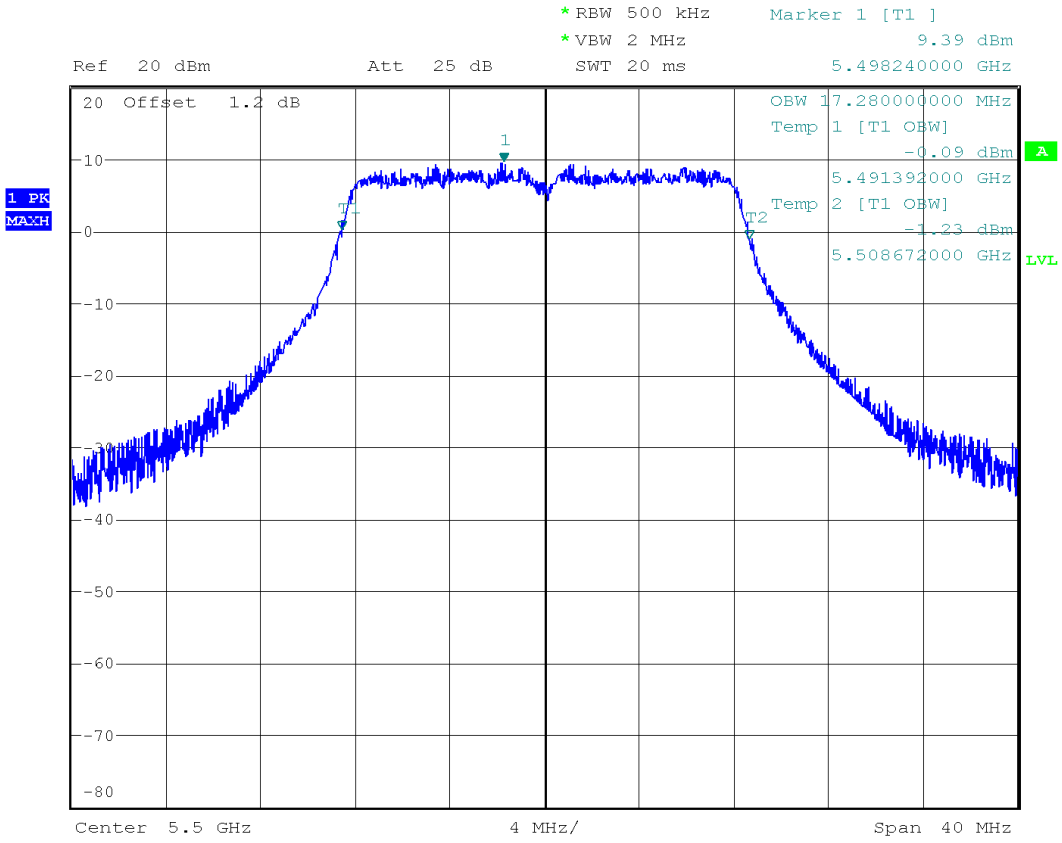


BAND

Date: 23.OCT.2018 05:25:52

11AC HT80 MCS0 CH58 5290MHZ

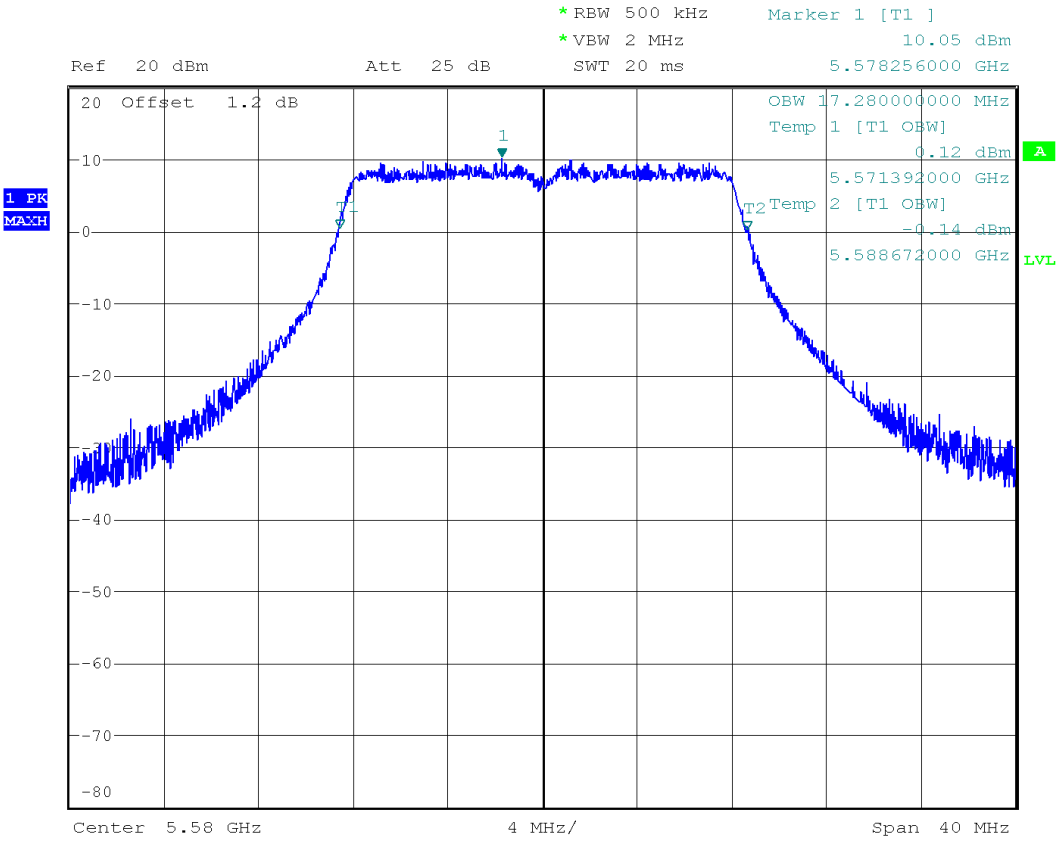
99% bandwidth(U-NII-2C):



BAND

Date: 22.OCT.2018 05:49:58

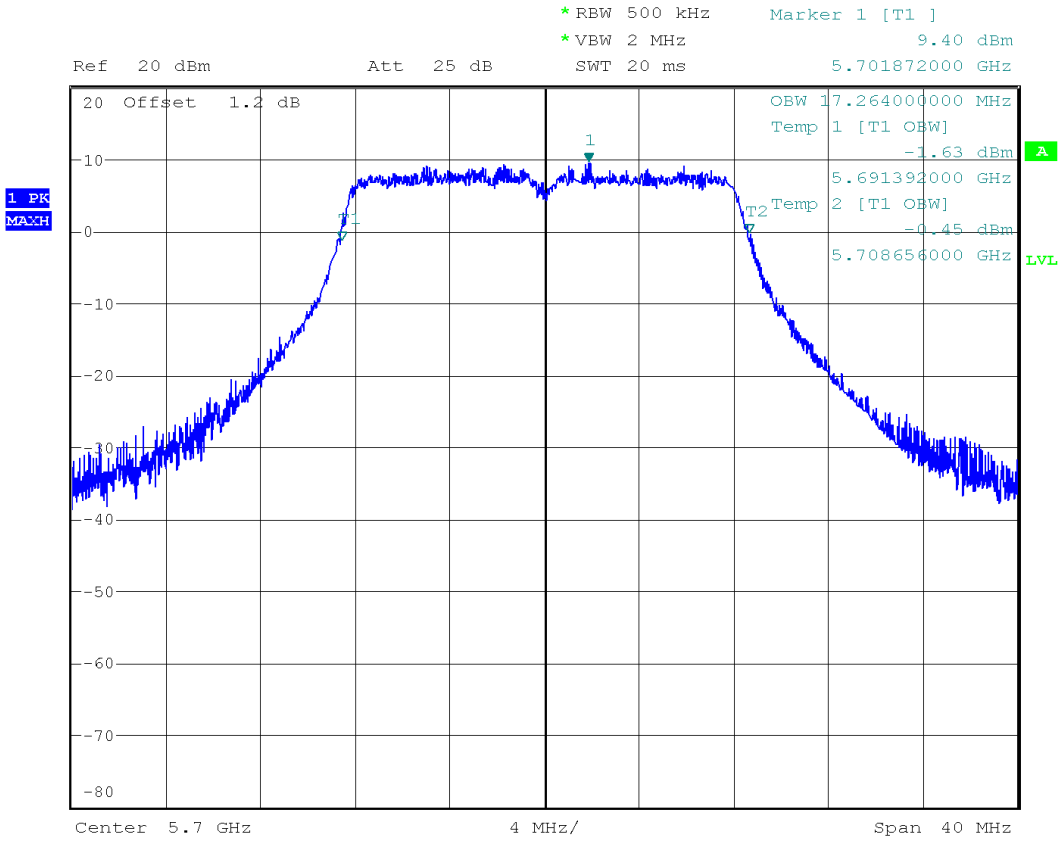
11A 6Mbps CH100 5500MHZ



BAND

Date: 22.OCT.2018 06:51:29

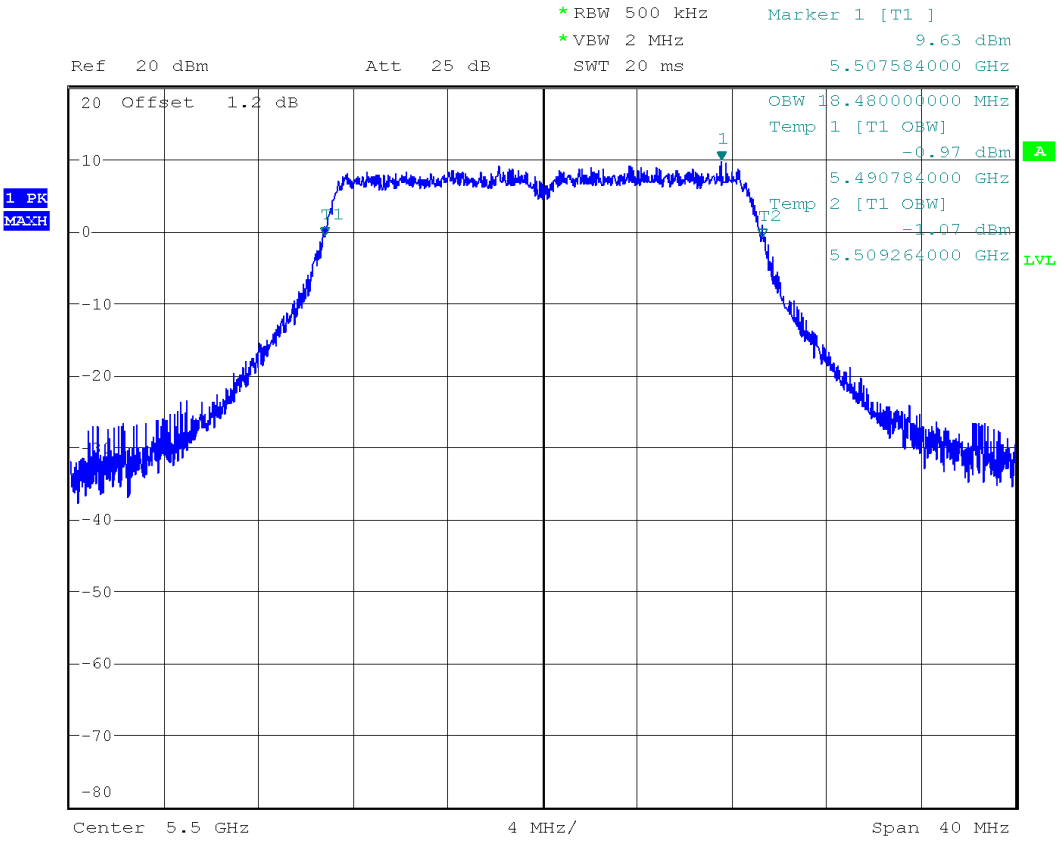
11A 6Mbps CH116 5580MHZ



BAND

Date: 22.OCT.2018 06:58:56

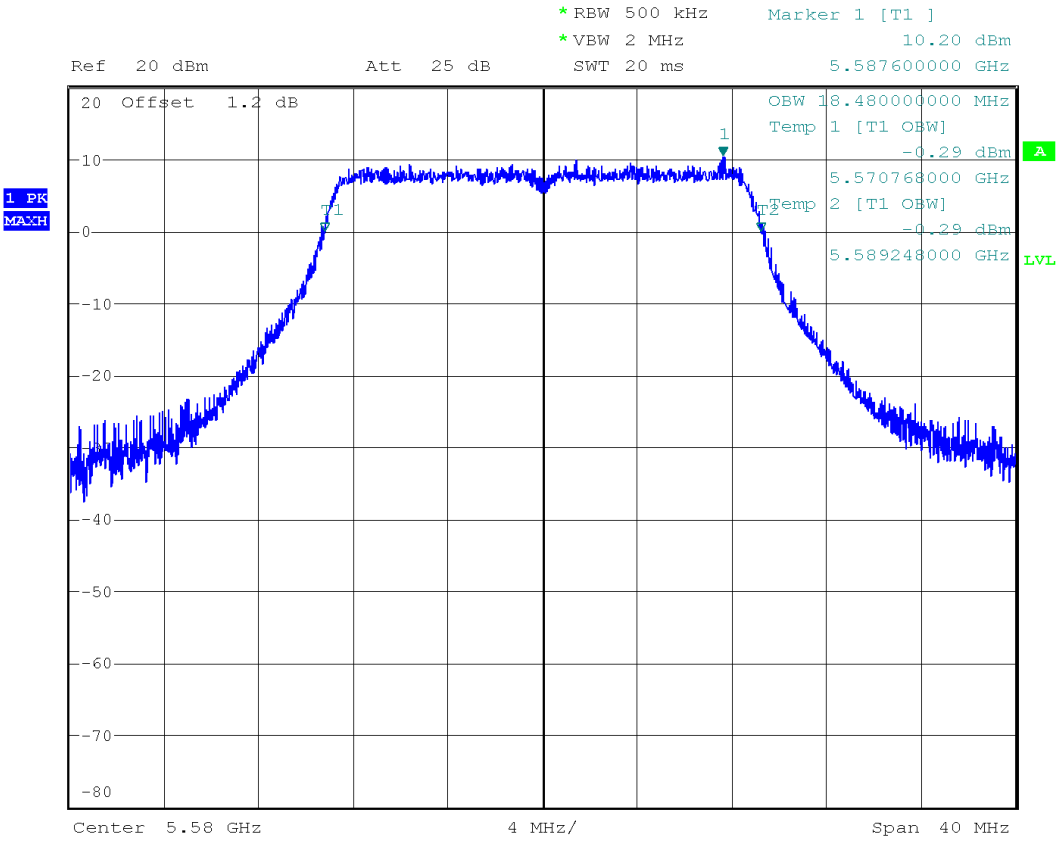
11A 6Mbps CH140 5700MHZ



BAND

Date: 22.OCT.2018 09:50:48

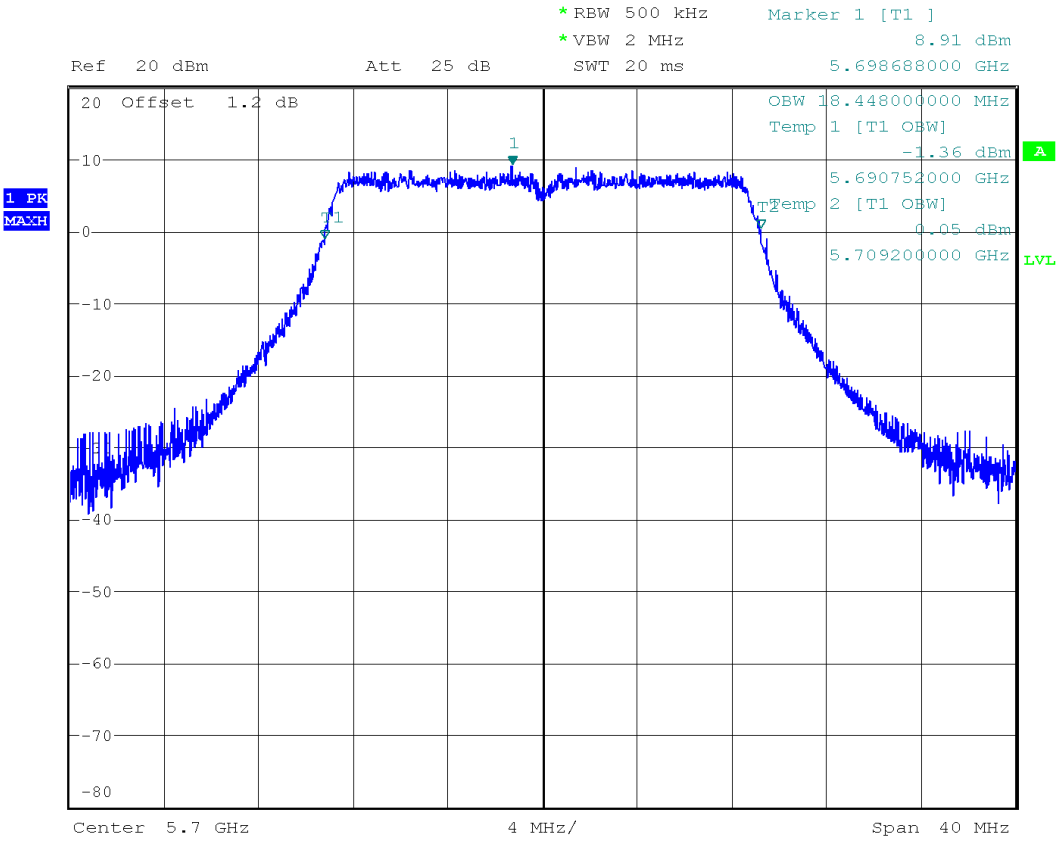
11N 5G HT20 MCS0 CH100 5500MHZ



BAND

Date: 22.OCT.2018 09:54:23

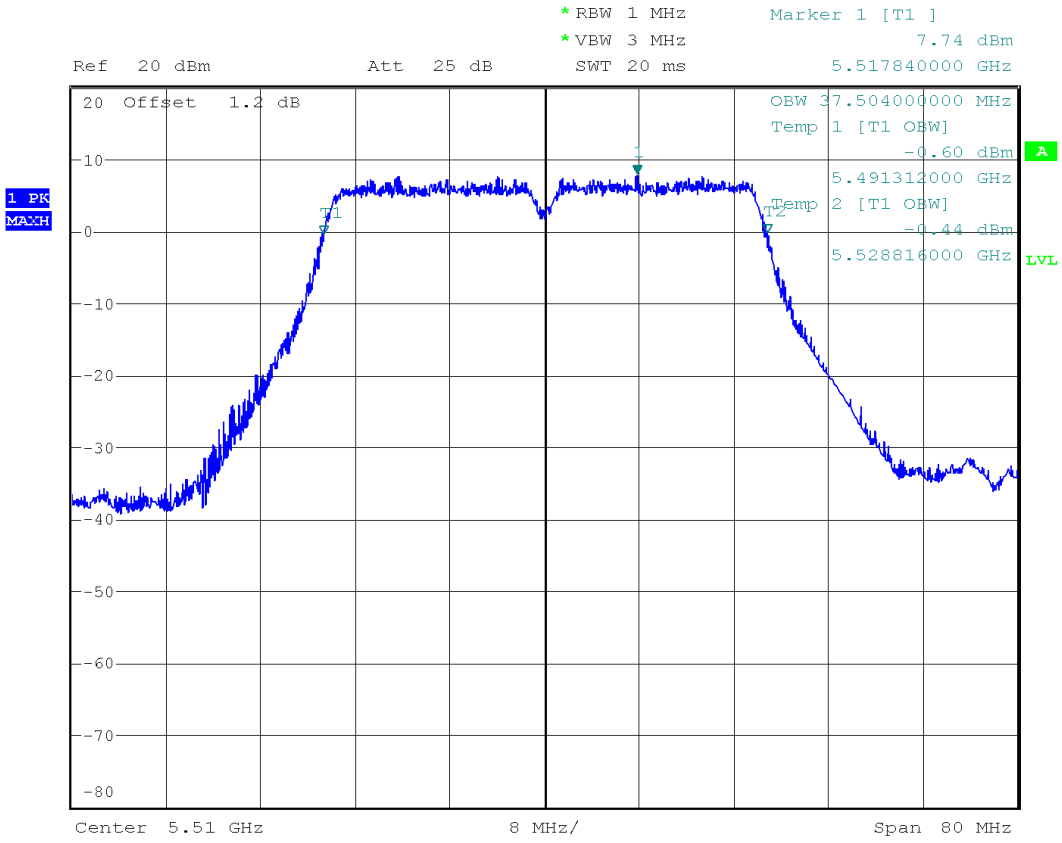
11N 5G HT20 MCS0 CH116 5580MHZ



BAND

Date: 22.OCT.2018 09:58:20

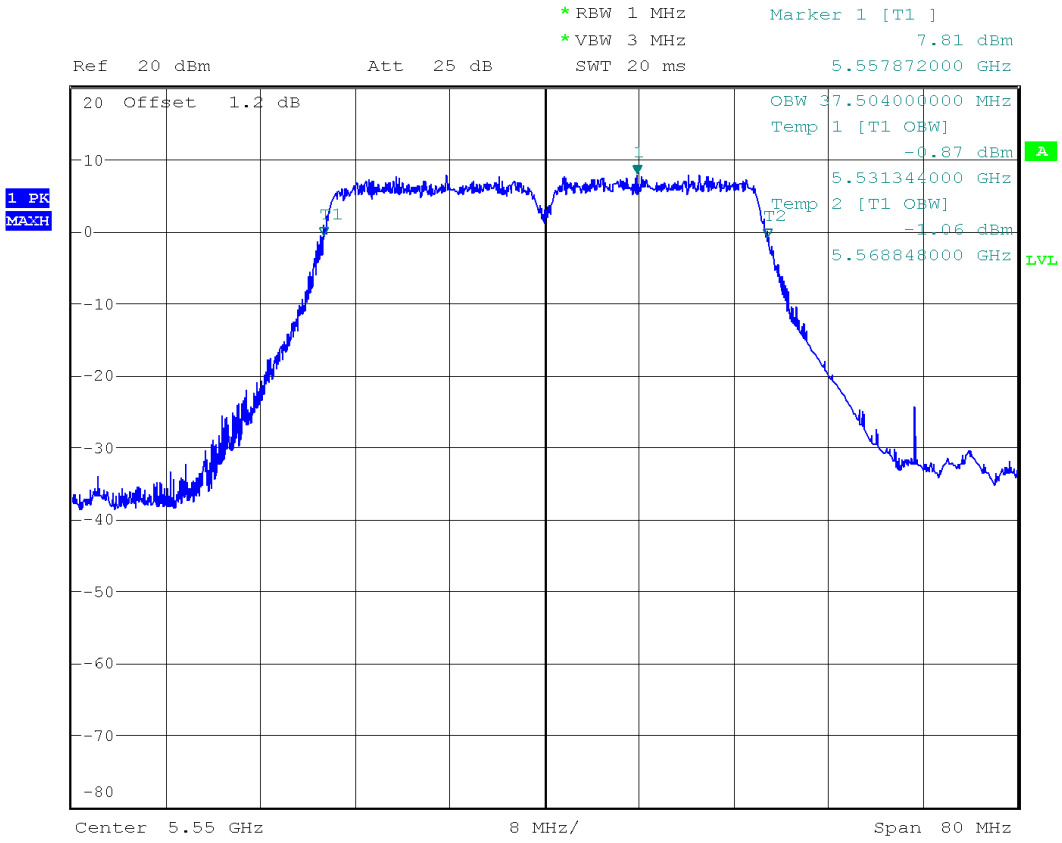
11N 5G HT20 MCS0 CH140 5700MHZ



BAND

Date: 22.OCT.2018 10:38:03

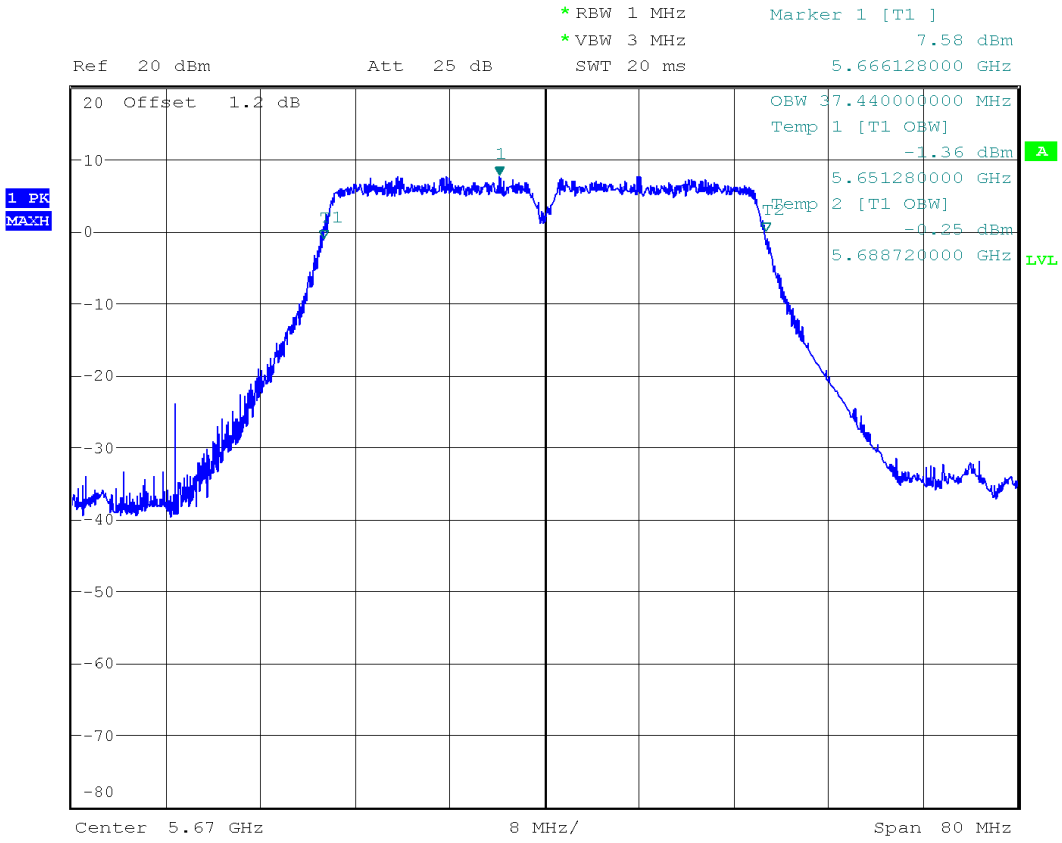
11N 5G HT40 MCS0 CH102 5510MHZ



BAND

Date: 22.OCT.2018 10:42:07

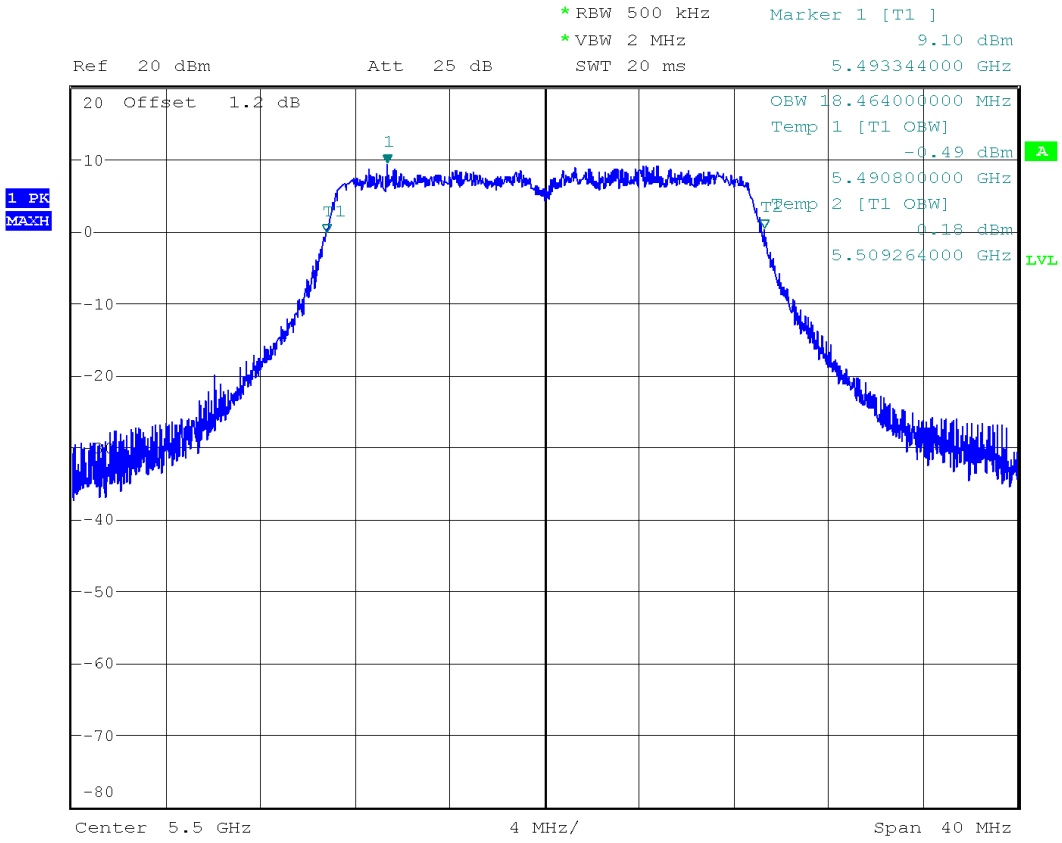
11N 5G HT40 MCS0 CH110 5550MHZ



BAND

Date: 22.OCT.2018 10:46:17

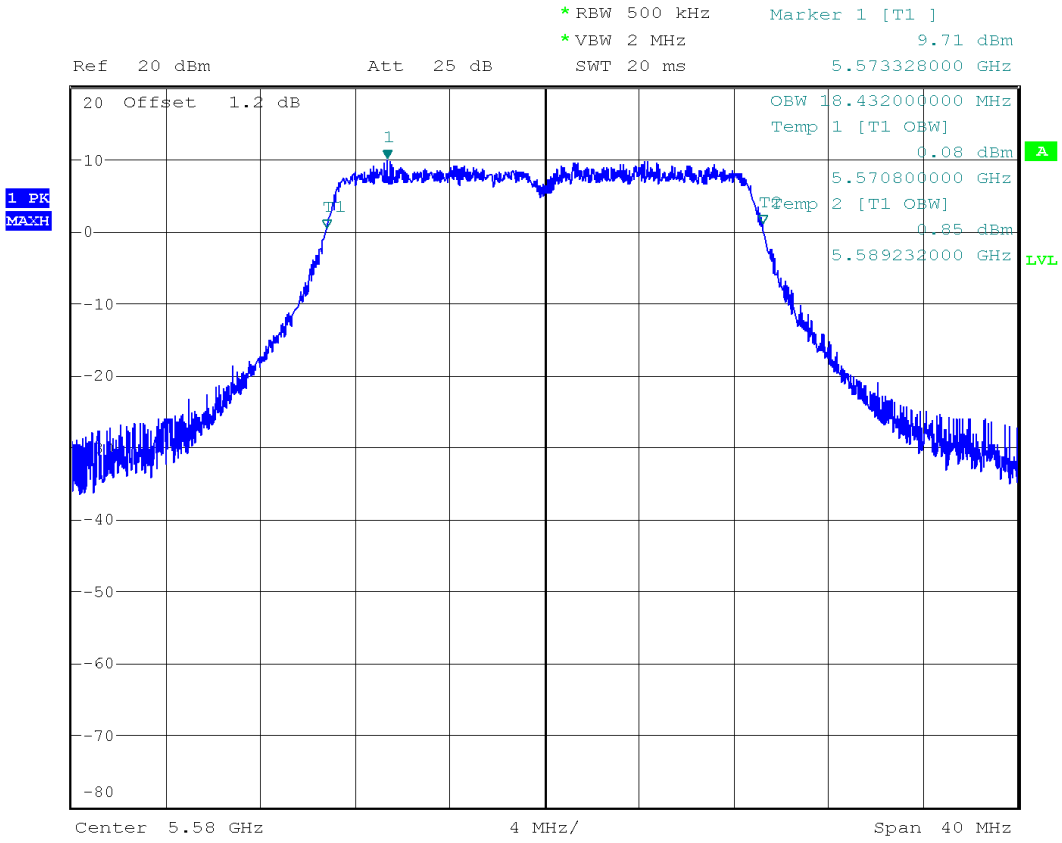
11N 5G HT40 MCS0 CH134 5670MHZ



BAND

Date: 23.OCT.2018 03:52:02

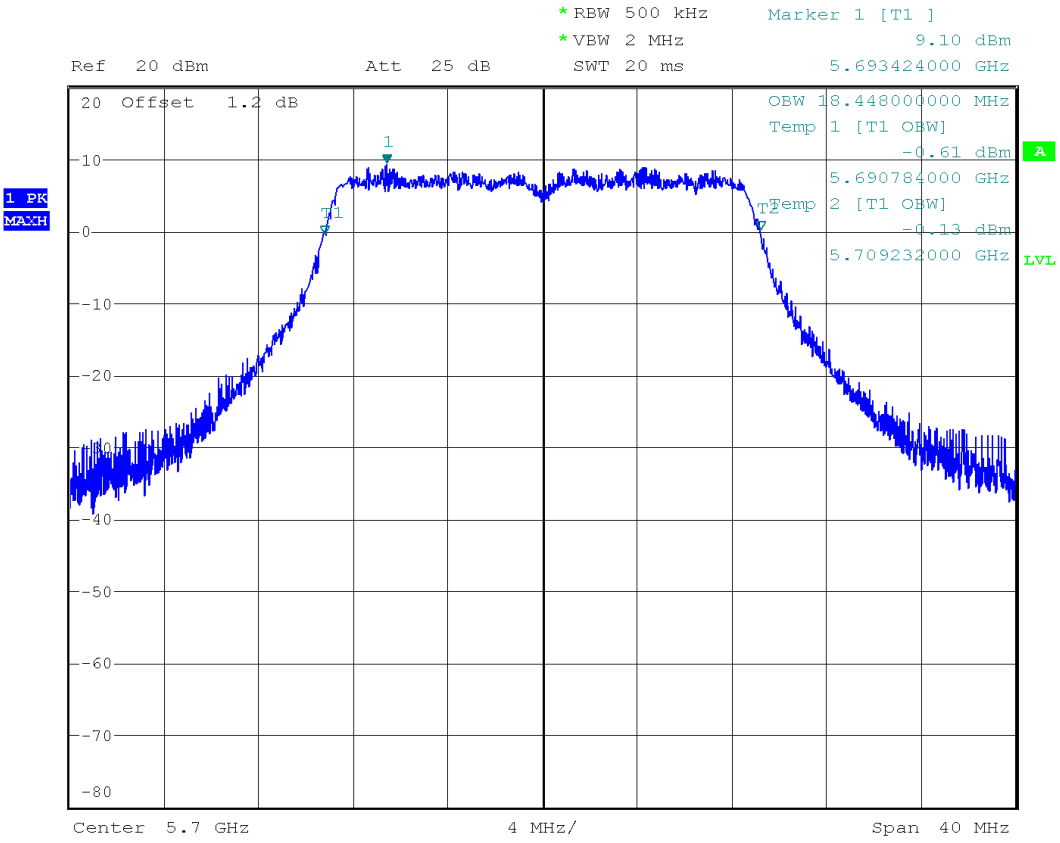
11AC HT20 MCS0 CH100 5500MHZ



BAND

Date: 23.OCT.2018 03:55:53

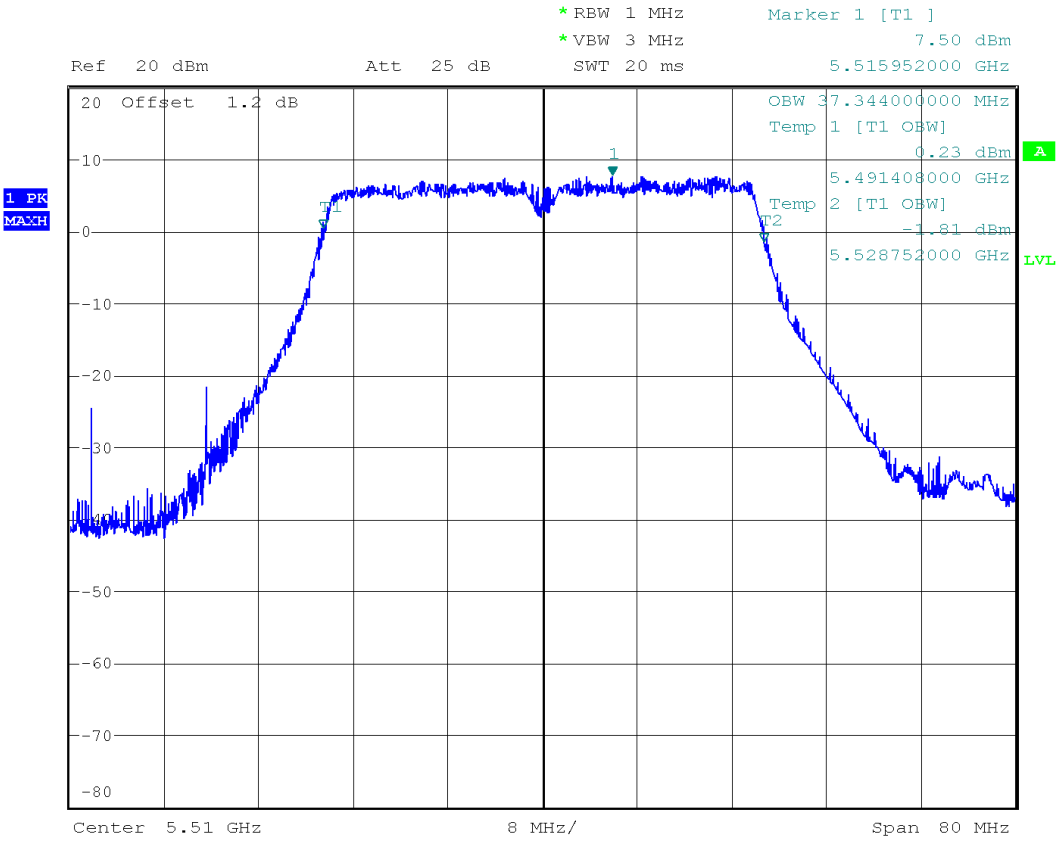
11AC HT20 MCS0 CH116 5580MHZ



BAND

Date: 23.OCT.2018 04:01:34

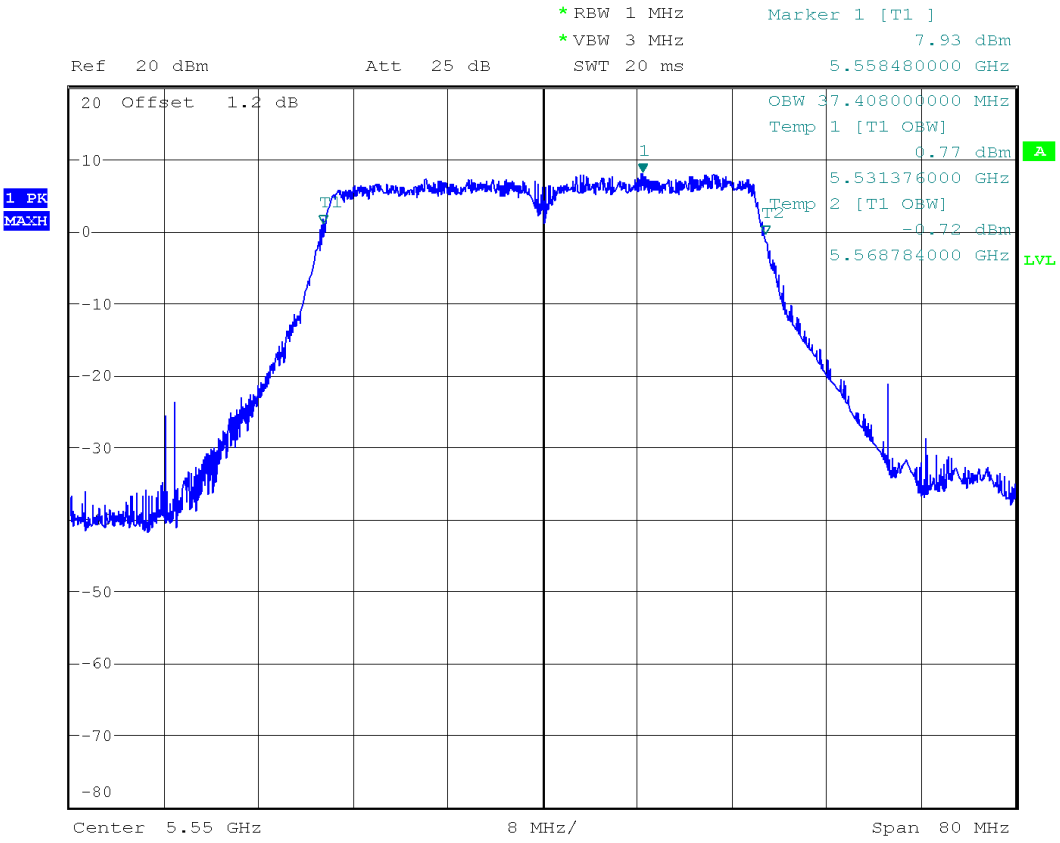
11AC HT20 MCS0 CH140 5700MHZ



BAND

Date: 23.OCT.2018 04:54:17

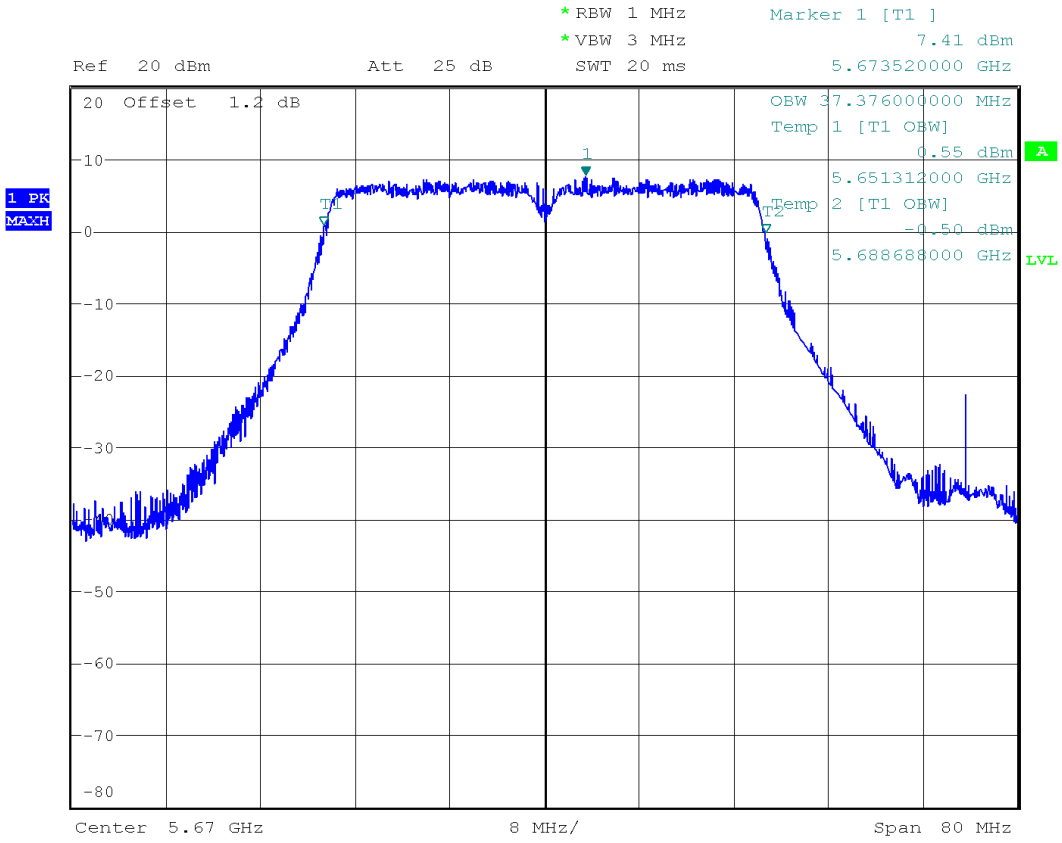
11AC HT40 MCS0 CH102 5510MHZ



BAND

Date: 23.OCT.2018 04:58:42

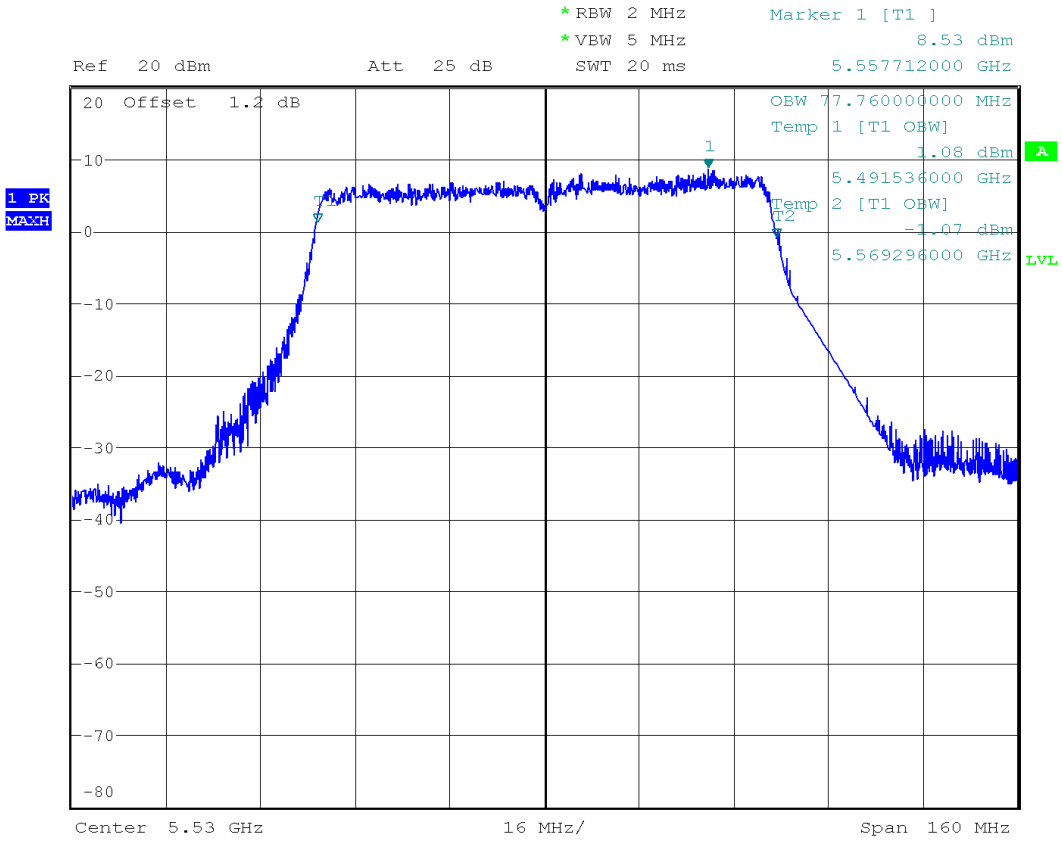
11AC HT40 MCS0 CH110 5550MHZ



BAND

Date: 23.OCT.2018 05:03:11

11AC HT40 MCS0 CH134 5670MHZ



BAND

Date: 23.OCT.2018 05:46:05

11AC HT80 MCS0 CH106 5530MHZ

5.2 Output Power

5.2.1 Description

For the band 5150-5250 MHz, the maximum conducted output power shall not exceed 250mW.

For the bands 5250-5350 MHz and 5470-5600 MHz and 5650-5725 MHz bands, the maximum conducted output power shall not exceed the lesser of 250mW(24dBm) or 11 dBm + 10log B, where B is the 26 dB emissions bandwidth in 1-MHz.

If transmitting antenna directional gain is greater than 6 dBi, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p of 1W.

5.2.2 Test Instruments

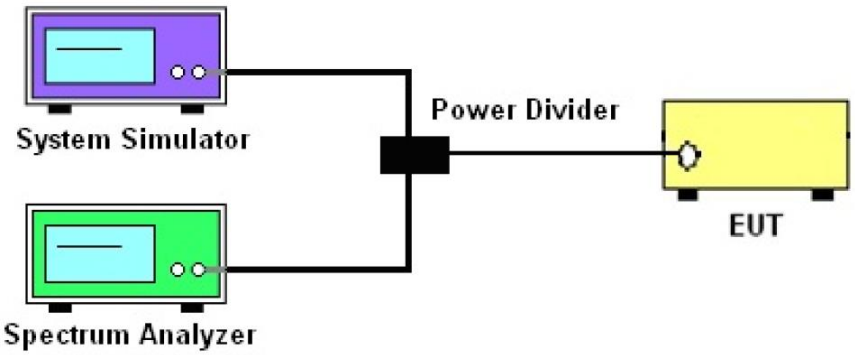
The measuring equipment is listed in the section 4.1 of this test report.

5.2.3 Test Procedure

a. The RF output of EUT was connected to the RADIO COMMUNICATION TESTER by RF cable and attenuator. The path loss was compensated to the results for each measurement.

b. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.

5.2.4 Test Setup



5.2.5 Test Result

Test Band:	5GHz U-NII-1

Mod.	Data Rata	Channel	Fre.(MHz)	Average Conducted Power(dBm)	Gain [dBi]	Limit(dBm)	Pass/Fail
11a	6Mbps	36	5180	12.28	-1.42	24	Pass
11a	6Mbps	44	5220	11.64	-1.42	24	Pass
11a	6Mbps	48	5240	11.59	-1.42	24	Pass
11n HT20	MCS0	36	5180	12.2	-1.42	24	Pass
11n HT20	MCS0	44	5220	11.51	-1.42	24	Pass
11n HT20	MCS0	48	5240	11.54	-1.42	24	Pass
11n HT40	MCS0	38	5190	10.32	-1.42	24	Pass
11n HT40	MCS0	46	5230	9.76	-1.42	24	Pass
11ac VHT20	MCS0	36	5180	12.09	-1.42	24	Pass
11ac VHT20	MCS0	44	5220	11.59	-1.42	24	Pass
11ac VHT20	MCS0	48	5240	11.69	-1.42	24	Pass
11ac VHT40	MCS0	38	5190	10.23	-1.42	24	Pass
11ac VHT40	MCS0	46	5230	9.85	-1.42	24	Pass
11ac VHT80	MCS0	42	5210	10.03	-1.42	24	Pass

Test Band:	5GHz U-NII-2A

Mod.	Data Rata	Channel	Fre.(MHz)	Average Conducted Power(dBm)	Gain [dBi]	Limit(dBm)	Pass/Fail
11a	6Mbps	52	5260	11.62	-2	24	Pass

11a	6Mbps	60	5300	12.05	-2	24	Pass
11a	6Mbps	64	5320	12.13	-2	24	Pass
11n HT20	MCS0	52	5260	11.54	-2	24	Pass
11n HT20	MCS0	60	5300	11.99	-2	24	Pass
11n HT20	MCS0	64	5320	12.08	-2	24	Pass
11n HT40	MCS0	54	5270	9.87	-2	24	Pass
11n HT40	MCS0	62	5310	10.11	-2	24	Pass
11ac VHT20	MCS0	52	5260	11.59	-2	24	Pass
11ac VHT20	MCS0	60	5300	12.08	-2	24	Pass
11ac VHT20	MCS0	64	5320	12.04	-2	24	Pass
11ac VHT40	MCS0	54	5270	9.9	-2	24	Pass
11ac VHT40	MCS0	62	5310	10.3	-2	24	Pass
11ac VHT80	MCS0	58	5290	9.98	-2	24	Pass

Test Band:	5GHz U-NII-2C

Mod.	Data Rata	Channel	Fre.(MHz)	Average Conducted Power(dBm)	Gain [dBi]	Limit(dBm)	Pass/Fail
11a	6Mbps	100	5500	11.07	-2.71	24	Pass
11a	6Mbps	116	5580	9.79	-2.71	24	Pass
11a	6Mbps	140	5700	9.4	-2.71	24	Pass
11n HT20	MCS0	100	5500	10.97	-2.71	24	Pass
11n HT20	MCS0	116	5580	9.69	-2.71	24	Pass
11n HT20	MCS0	140	5700	9.26	-2.71	24	Pass
11n HT40	MCS0	102	5510	9.04	-2.71	24	Pass

11n HT40	MCS0	110	5550	8.21	-2.71	24	Pass
11n HT40	MCS0	134	5670	7.73	-2.71	24	Pass
11ac VHT20	MCS0	100	5500	10.97	-2.71	24	Pass
11ac VHT20	MCS0	116	5580	9.83	-2.71	24	Pass
11ac VHT20	MCS0	140	5700	9.38	-2.71	24	Pass
11ac VHT40	MCS0	102	5510	9.19	-2.71	24	Pass
11ac VHT40	MCS0	110	5550	8.22	-2.71	24	Pass
11ac VHT40	MCS0	134	5670	7.78	-2.71	24	Pass
11ac VHT80	MCS0	106	5530	8.6	-2.71	24	Pass

5.3 Power Spectral Density

5.3.1 Description

For the band 5150-5250 MHz, the peak power spectral density shall not exceed 11dBm in any 1-MHz band.

For the bands 5250-5350 MHz and 5470-5600 and 5650-5725 MHz, the peak power spectral density shall not exceed 11 dBm in any 1-MHz band.

If transmitting antenna directional gain is greater than 6 dBi, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.3.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

5.3.3 Test Procedure

a. The testing follows FCC KDB 789033 D01 General UNII Test Procedures v01r03.

Section F) Peak power spectral density (PPSD).

Note: Though the rule refers to " peak power spectral density" , the intent is to measure the maximum value of the time average of the power spectral density measured during a period of continuous transmission.

#Method SA-2#

(Trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

b. The testing follows Method SA-2 of FCC KDB 789033 D01 General UNII Test Procedures v01r03.

(1) Measure the duty cycle.

(2) Set span to encompass the entire emission bandwidth (EBW) of the signal.

(3) Set RBW = 1 MHz.

(4) Set VBW ≥ 3 MHz.

(5) Number of points in sweep ≥ 2 Span / RBW.

(6) Sweep time = auto.

(7) Detector = RMS.

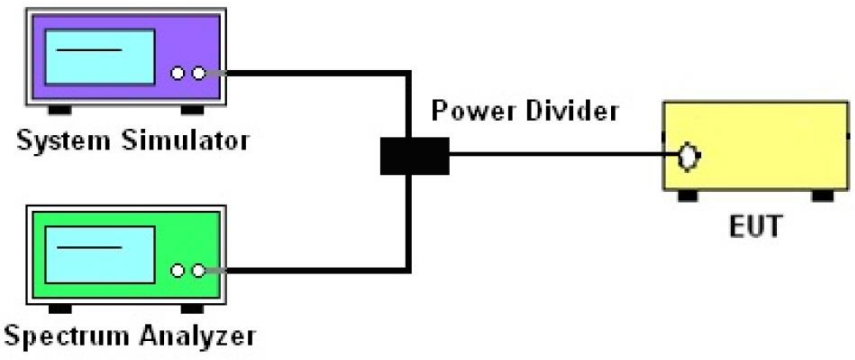
(8) Trace average at least 100 traces in power averaging mode.

Add 10log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10log(1/0.25)=6 dB if the duty cycle is 25 percent.

c. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

d. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

5.3.4 Test Setup



5.3.5 Test Result

5G U-NII-1								
Mode	Data Rate	Channel	Frequency(MHz)	Duty Factor(dB)	Power Spectral Density(dBm/1MHz)	Gain [dBi]	Limit(dBm/1MHz)	P/F
11A	6Mbps	36	5180	0.08	4.95	-1.42	11	PASS
11A	6Mbps	44	5220	0.08	5.03	-1.42	11	PASS
11A	6Mbps	48	5240	0.08	4.88	-1.42	11	PASS
11N 5G HT20	MCS0	36	5180	0.09	4.76	-1.42	11	PASS
11N 5G HT20	MCS0	44	5220	0.09	4.68	-1.42	11	PASS
11N 5G HT20	MCS0	48	5240	0.09	4.84	-1.42	11	PASS
11N 5G HT40	MCS0	38	5190	0.22	-0.57	-1.42	11	PASS
11N 5G HT40	MCS0	46	5230	0.22	-0.72	-1.42	11	PASS
11AC HT20	MCS0	36	5180	0.07	4.50	-1.42	11	PASS
11AC HT20	MCS0	44	5220	0.07	4.62	-1.42	11	PASS
11AC HT20	MCS0	48	5240	0.07	5.18	-1.42	11	PASS
11AC HT40	MCS0	38	5190	0.18	-0.97	-1.42	11	PASS
11AC HT40	MCS0	46	5230	0.18	-0.56	-1.42	11	PASS
11AC HT80	MCS0	42	5210	0.38	-3.07	-1.42	11	PASS

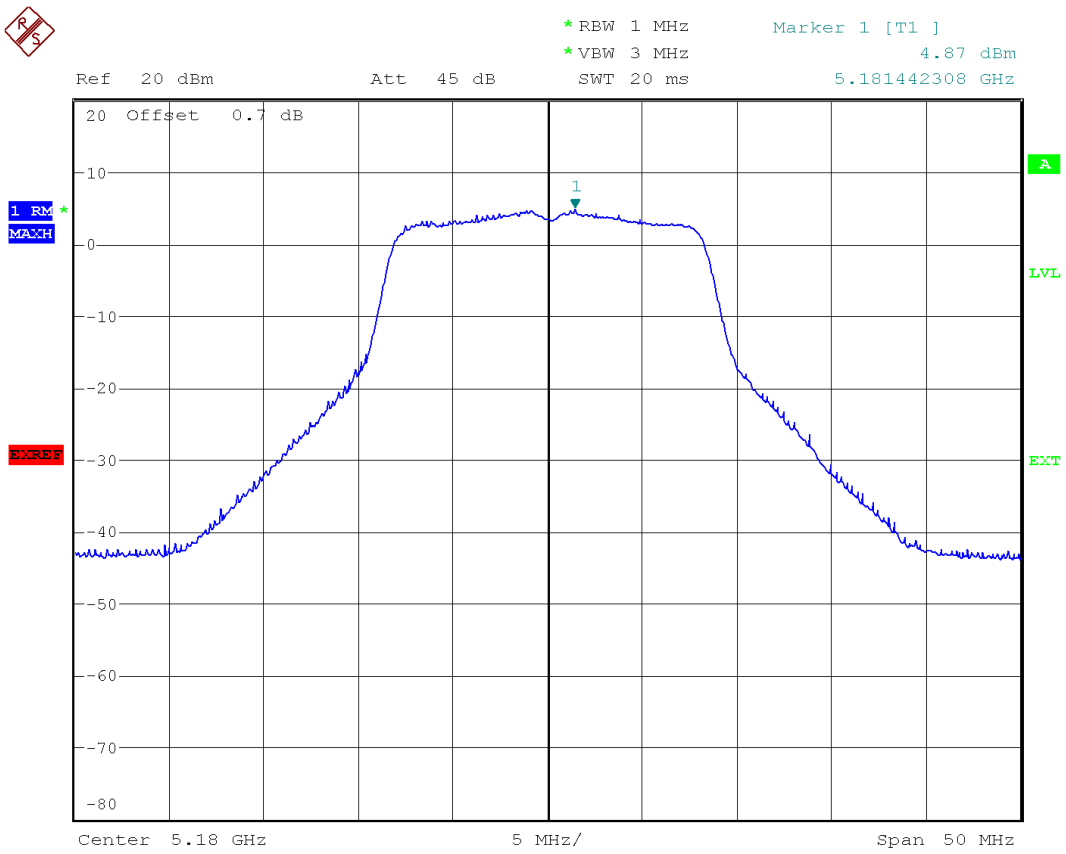
5G U-NII-2A								
Mode	Data Rate	Channel	Frequency(MHz)	Duty Factor(dB)	Power Spectral Density(dBm/1MHz)	Gain [dBi]	Limit(dBm/1MHz)	P/F
11A	6Mbps	52	5260	0.10	4.74	-2.00	11	PASS
11A	6Mbps	60	5300	0.10	4.62	-2.00	11	PASS
11A	6Mbps	64	5320	0.10	4.72	-2.00	11	PASS

11N 5G HT20	MCS0	52	5260	0.12	5.04	-2.00	11	PASS
11N 5G HT20	MCS0	60	5300	0.12	4.71	-2.00	11	PASS
11N 5G HT20	MCS0	64	5320	0.12	4.83	-2.00	11	PASS
11N 5G HT40	MCS0	54	5270	0.18	-0.65	-2.00	11	PASS
11N 5G HT40	MCS0	62	5310	0.18	-0.83	-2.00	11	PASS
11AC HT20	MCS0	52	5260	0.10	5.19	-2.00	11	PASS
11AC HT20	MCS0	60	5300	0.10	5.11	-2.00	11	PASS
11AC HT20	MCS0	64	5320	0.10	4.74	-2.00	11	PASS
11AC HT40	MCS0	54	5270	0.22	-0.47	-2.00	11	PASS
11AC HT40	MCS0	62	5310	0.22	-0.93	-2.00	11	PASS
11AC HT80	MCS0	58	5290	0.45	-2.37	-2.00	11	PASS

5G U-NII-2C								
Mode	Data Rate	Channel	Frequency(MHz)	Duty Factor(dB)	Power Spectral Density(dBm/1MHz)	Gain [dBi]	Limit(dBm/1MHz)	P/F
11A	6Mbps	100	5500	0.10	4.71	-2.71	11	PASS
11A	6Mbps	116	5580	0.10	5.12	-2.71	11	PASS
11A	6Mbps	140	5700	0.10	4.70	-2.71	11	PASS
11N 5G HT20	MCS0	100	5500	0.14	4.63	-2.71	11	PASS
11N 5G HT20	MCS0	116	5580	0.14	4.78	-2.71	11	PASS
11N 5G HT20	MCS0	140	5700	0.14	4.33	-2.71	11	PASS
11N 5G HT40	MCS0	102	5510	0.20	-1.07	-2.71	11	PASS
11N 5G HT40	MCS0	110	5550	0.20	-0.58	-2.71	11	PASS
11N 5G HT40	MCS0	134	5670	0.20	-1.07	-2.71	11	PASS

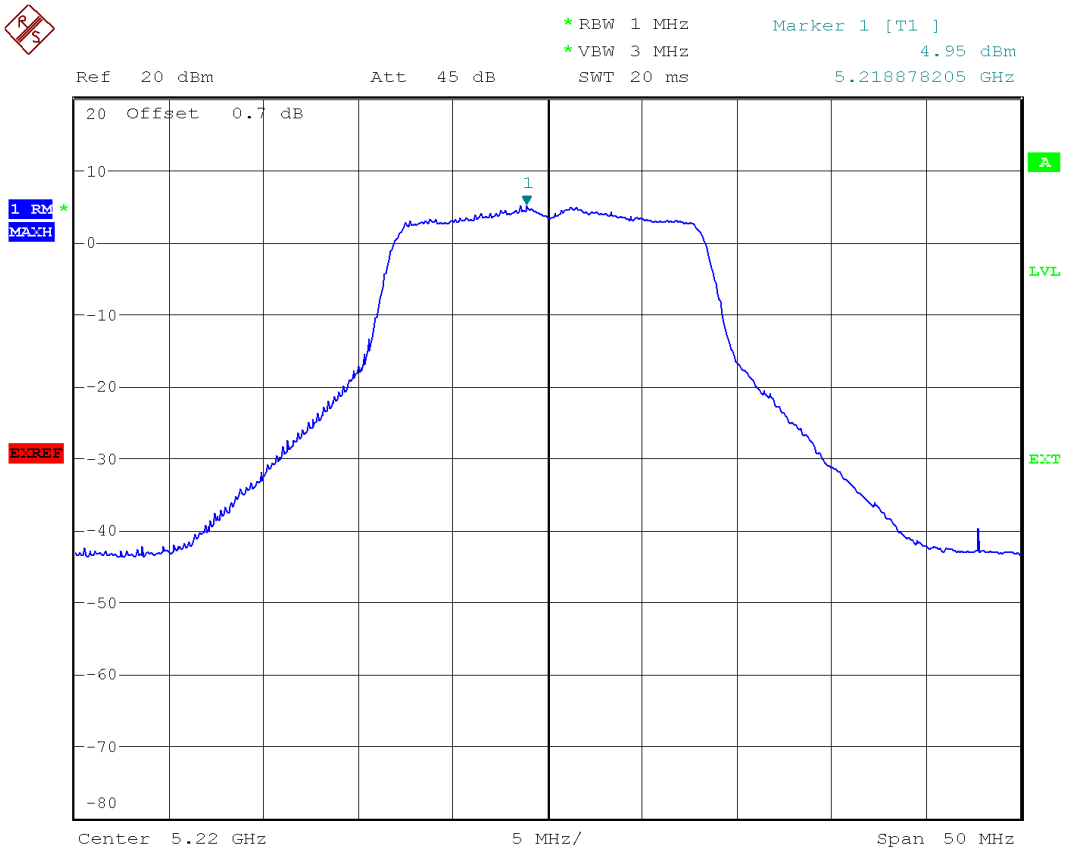
11AC HT20	MCS0	100	5500	0.10	4.71	-2.71	11	PASS
11AC HT20	MCS0	116	5580	0.10	4.82	-2.71	11	PASS
11AC HT20	MCS0	140	5700	0.10	5.00	-2.71	11	PASS
11AC HT40	MCS0	102	5510	0.20	-0.98	-2.71	11	PASS
11AC HT40	MCS0	110	5550	0.20	-0.93	-2.71	11	PASS
11AC HT40	MCS0	134	5670	0.20	-1.32	-2.71	11	PASS
11AC HT80	MCS0	106	5530	0.44	-2.96	-2.71	11	PASS

5G U-NII-1



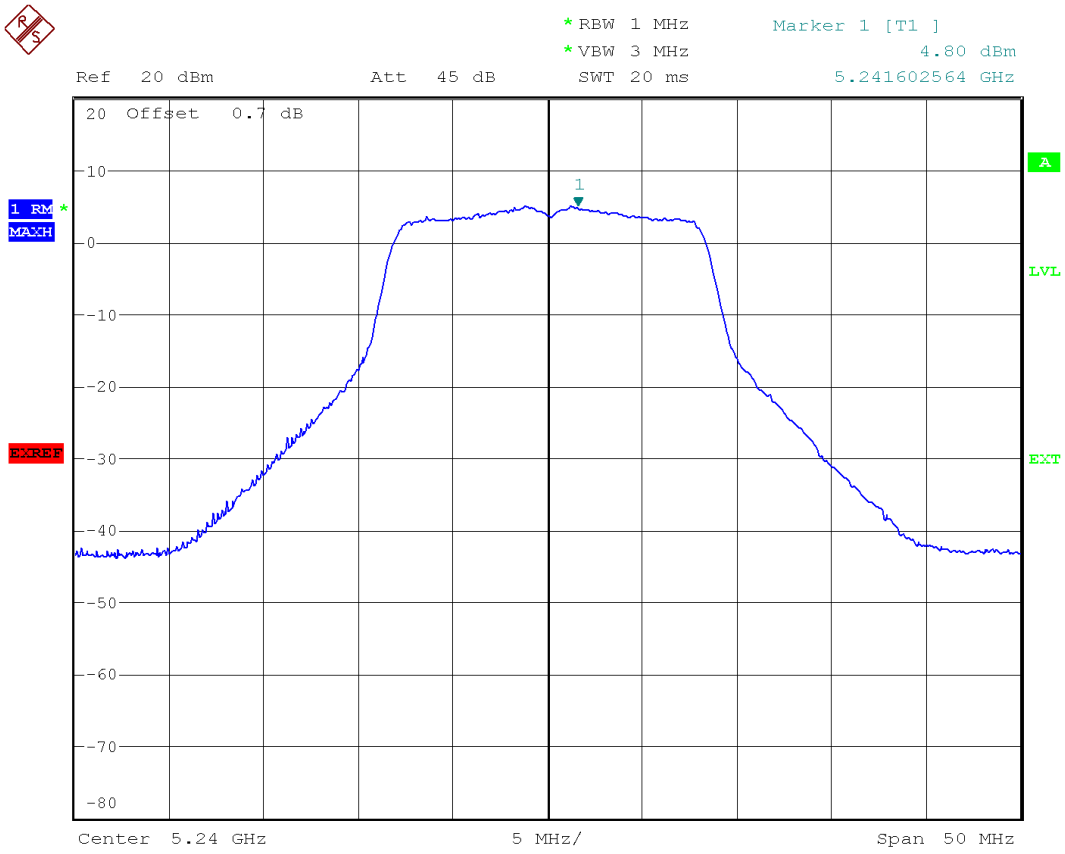
Date: 15.NOV.2018 04:13:16

11A 6Mbps CH36 5180MHZ

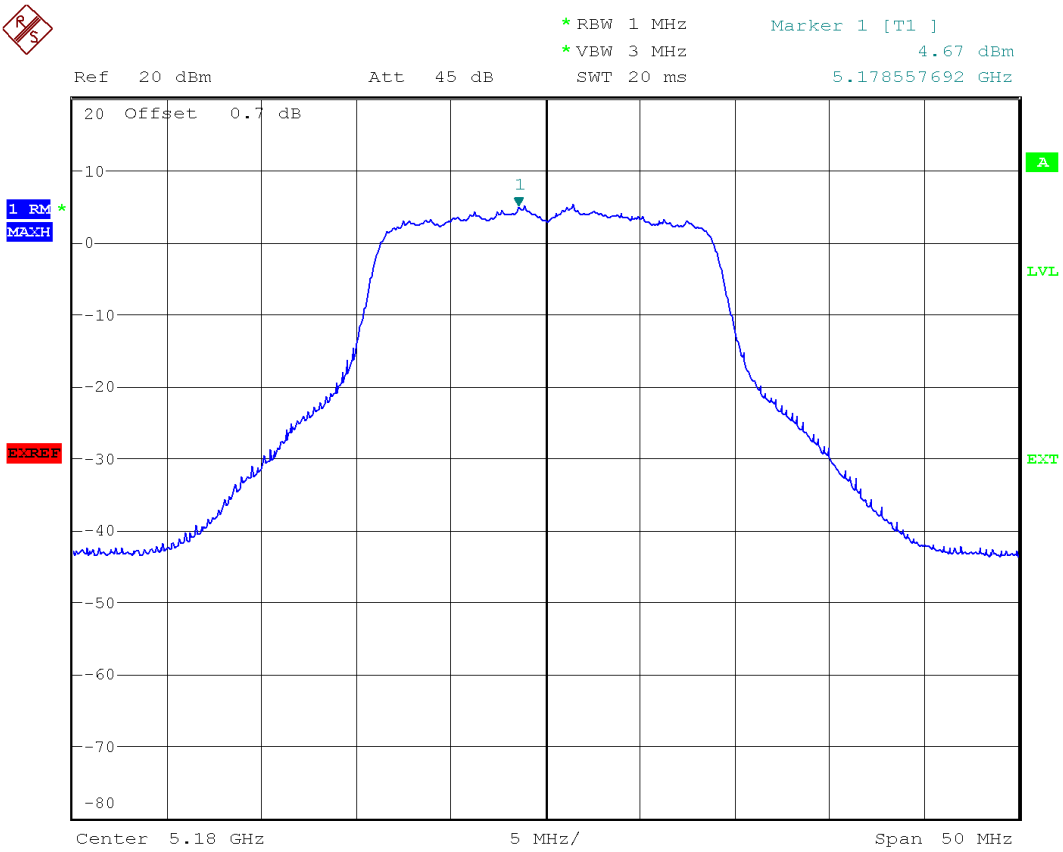


Date: 13.NOV.2018 11:05:20

11A 6Mbps CH44 5220MHZ

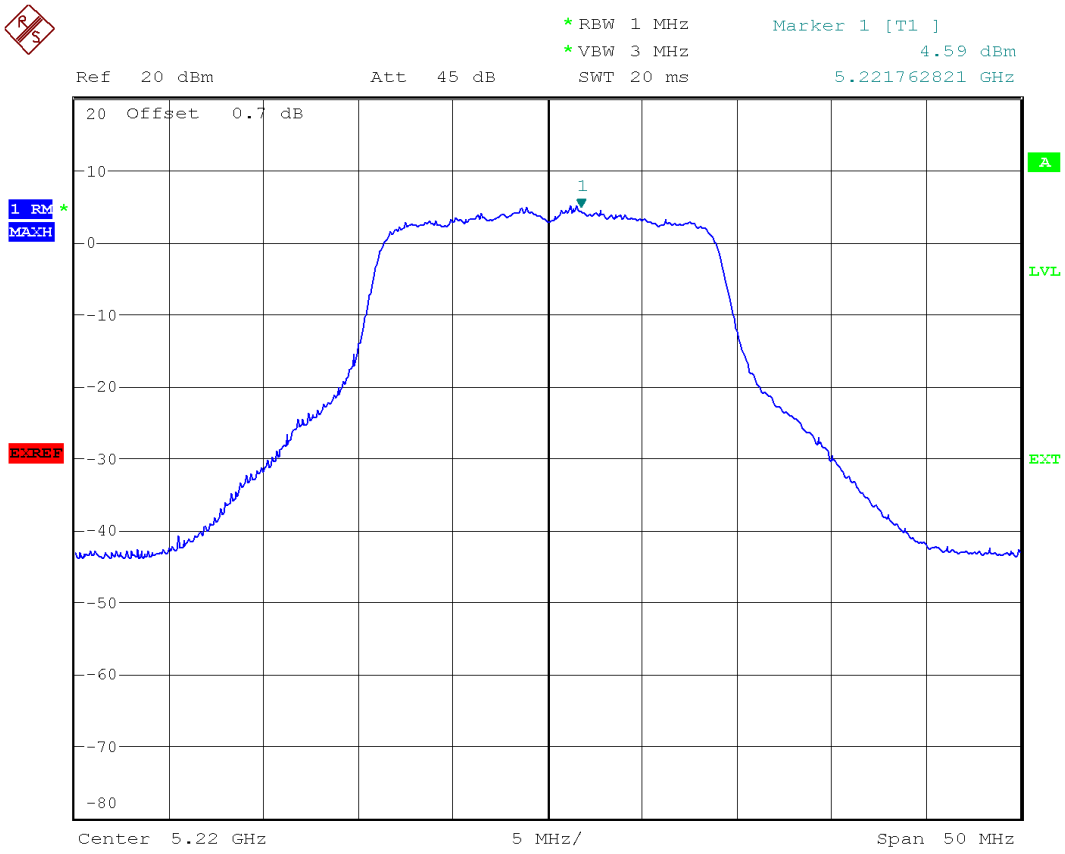


11A 6Mbps CH48 5240MHZ



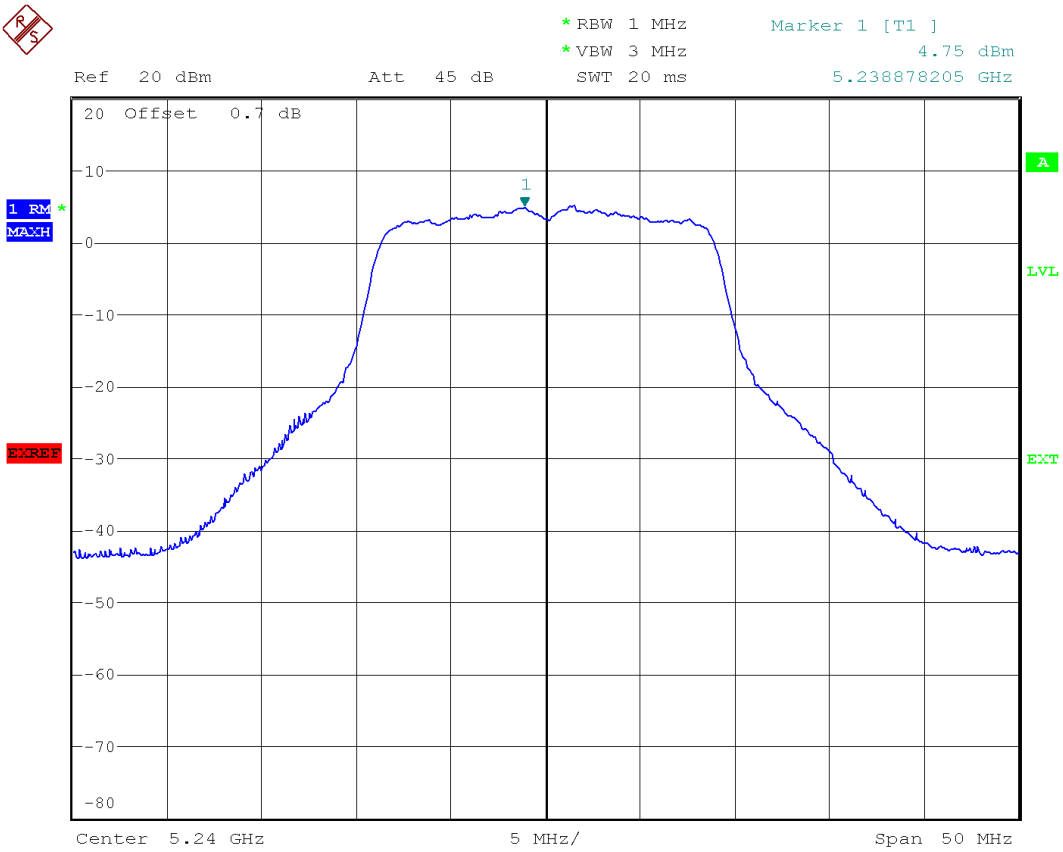
Date: 13.NOV.2018 09:59:06

11N 5G HT20 MCS0 CH36 5180MHZ



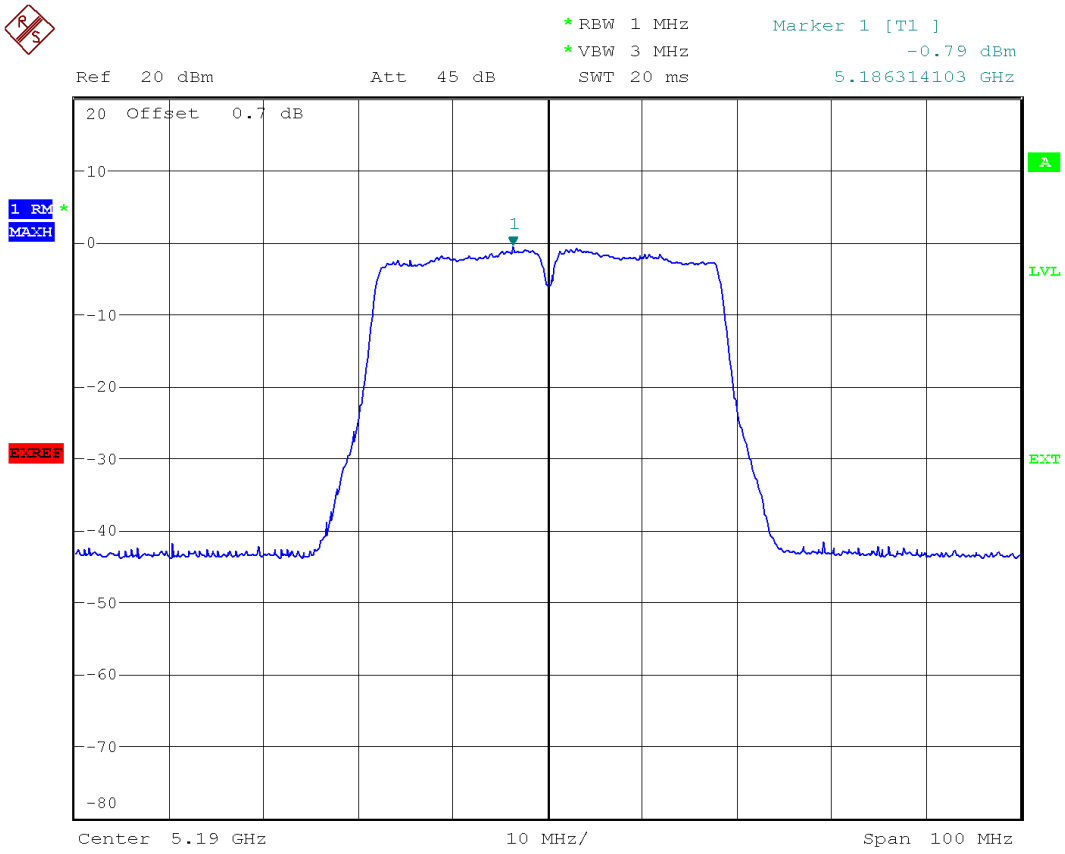
Date: 13.NOV.2018 09:59:43

11N 5G HT20 MCS0 CH44 5220MHZ



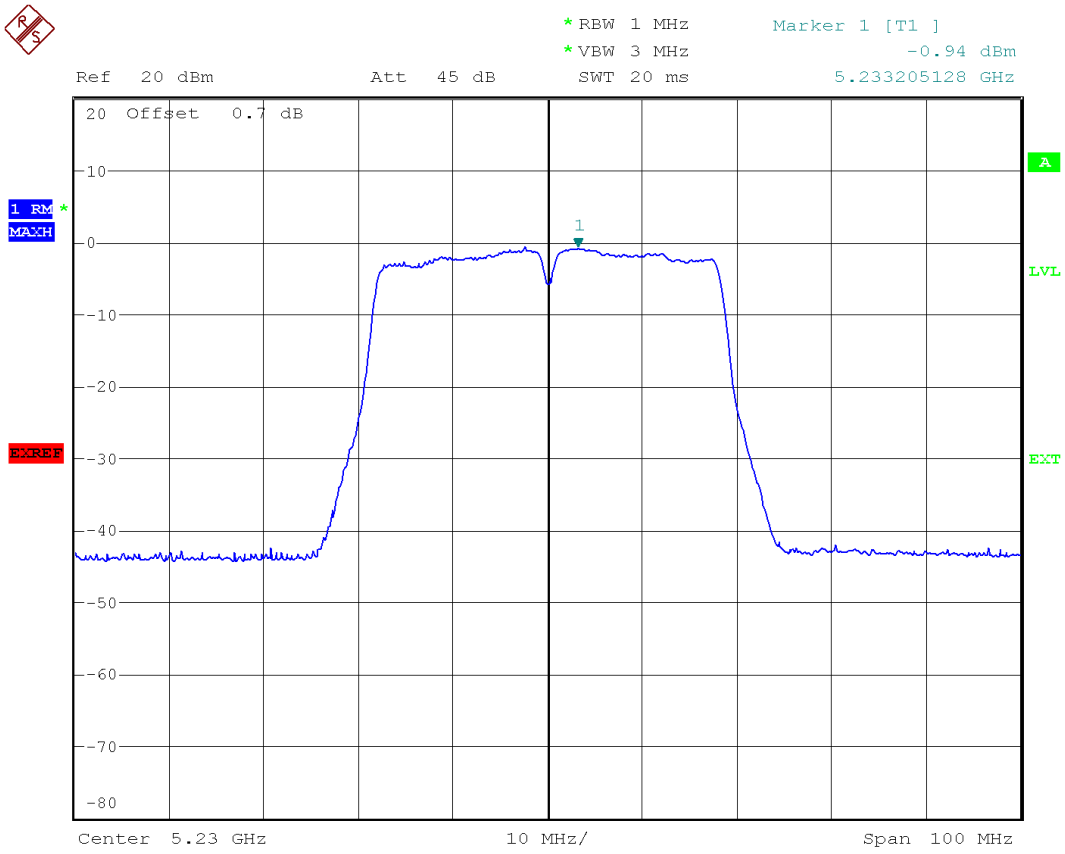
Date: 13.NOV.2018 10:00:30

11N 5G HT20 MCS0 CH48 5240MHZ



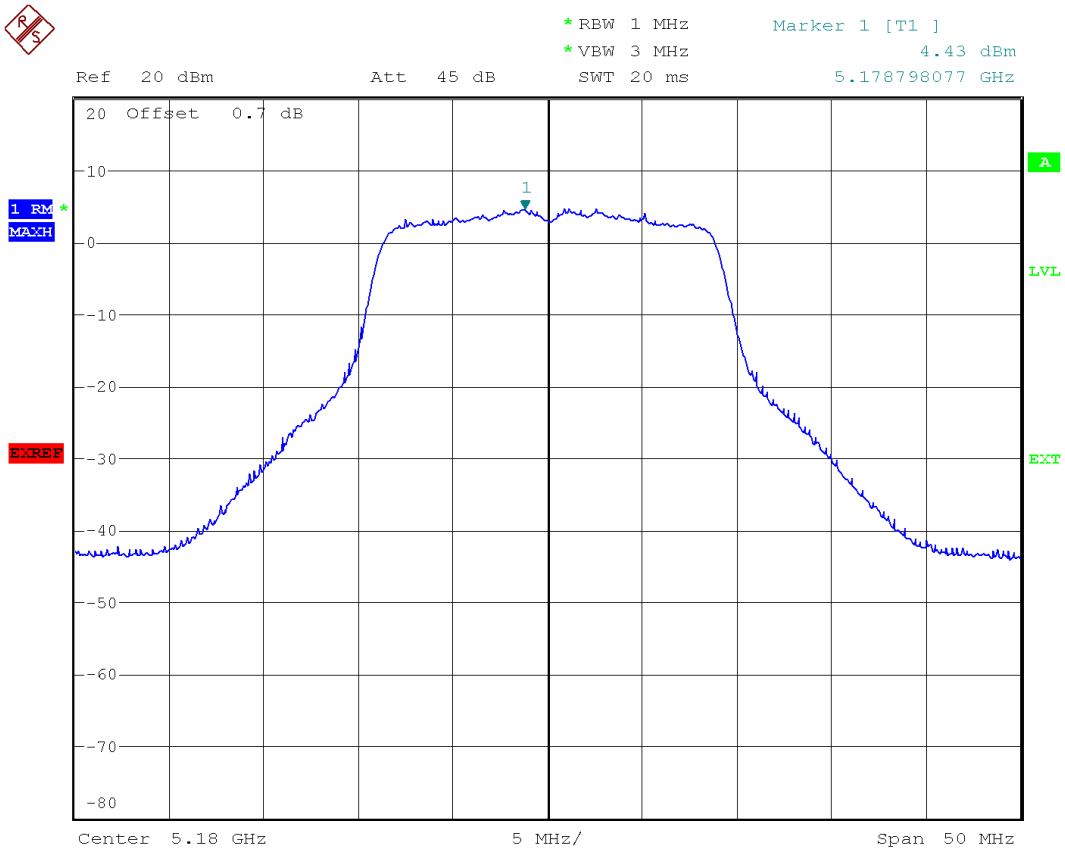
Date: 13.NOV.2018 10:21:00

11N 5G HT40 MCS0 CH38 5190MHZ



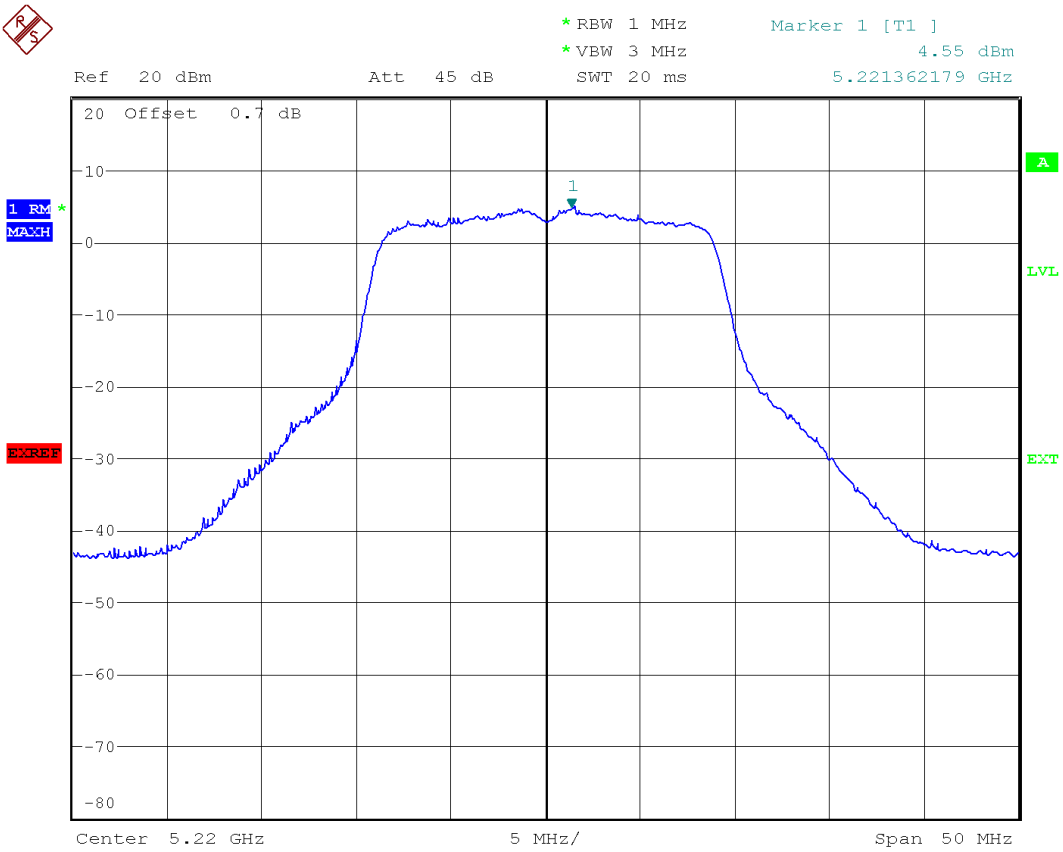
Date: 13.NOV.2018 10:22:09

11N 5G HT40 MCS0 CH46 5230MHZ



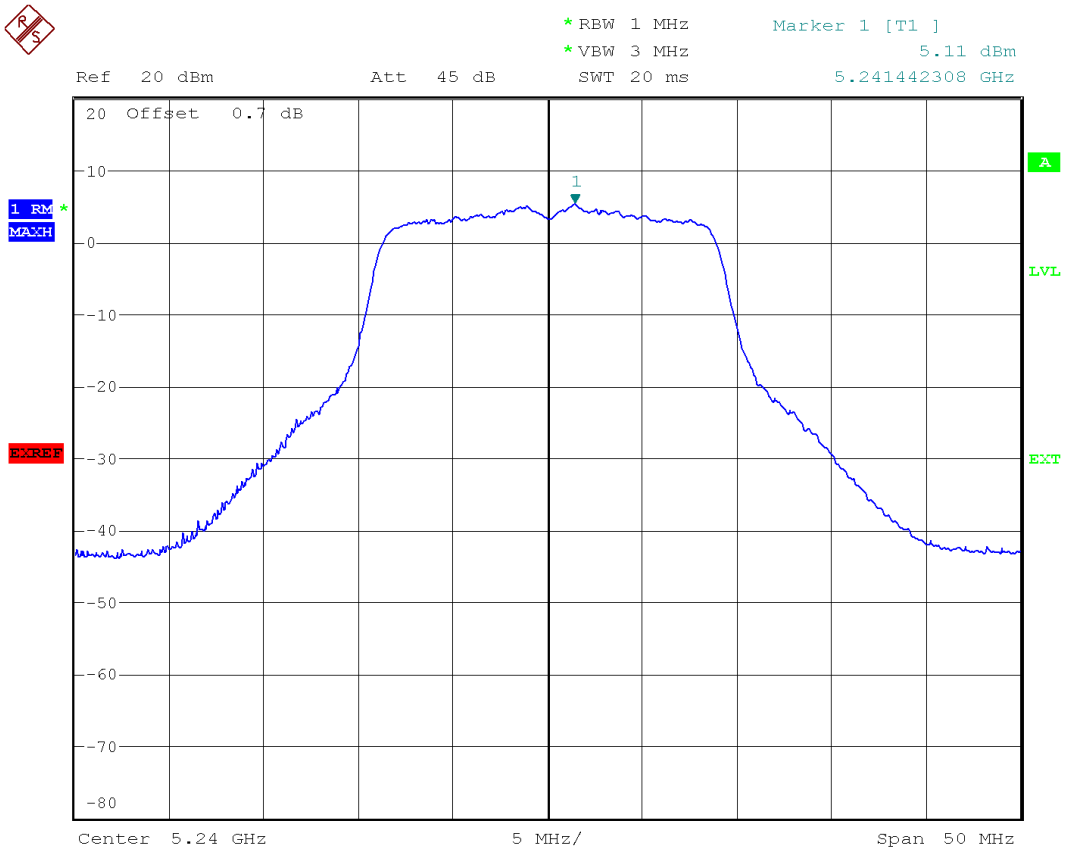
Date: 13.NOV.2018 10:29:41

11AC HT20 MCS0 CH36 5180MHZ



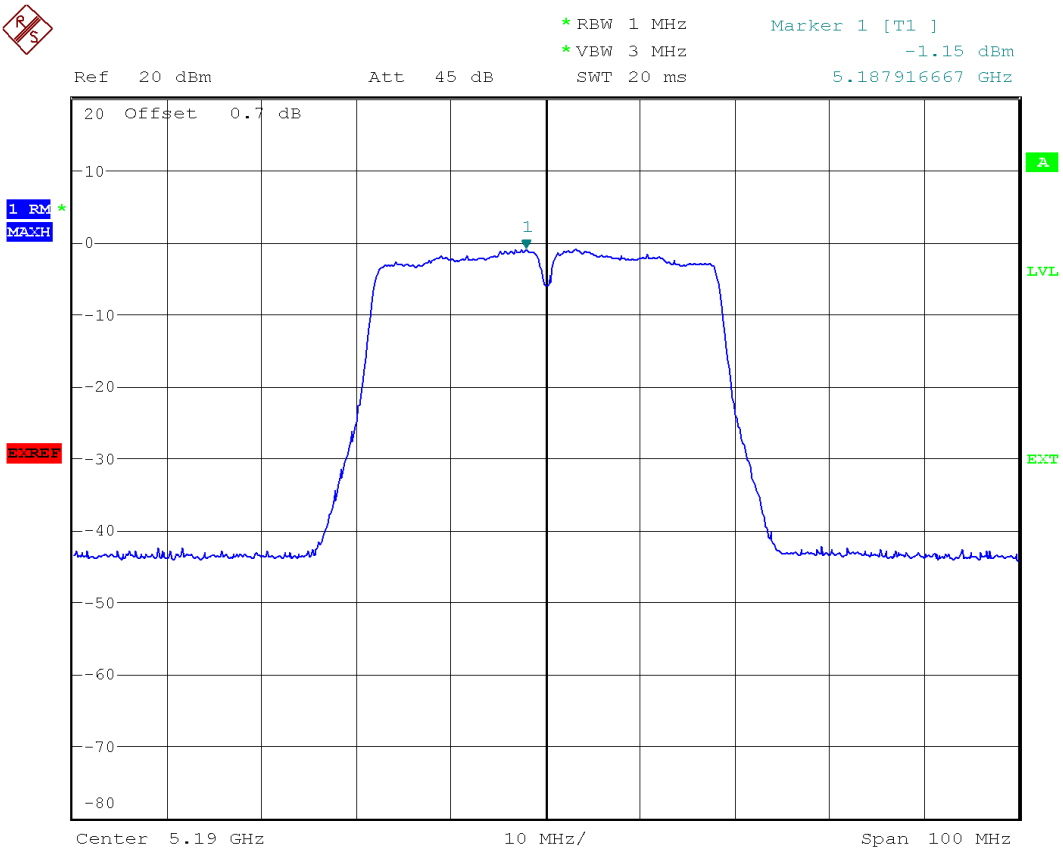
Date: 13.NOV.2018 10:30:29

11AC HT20 MCS0 CH44 5220MHZ



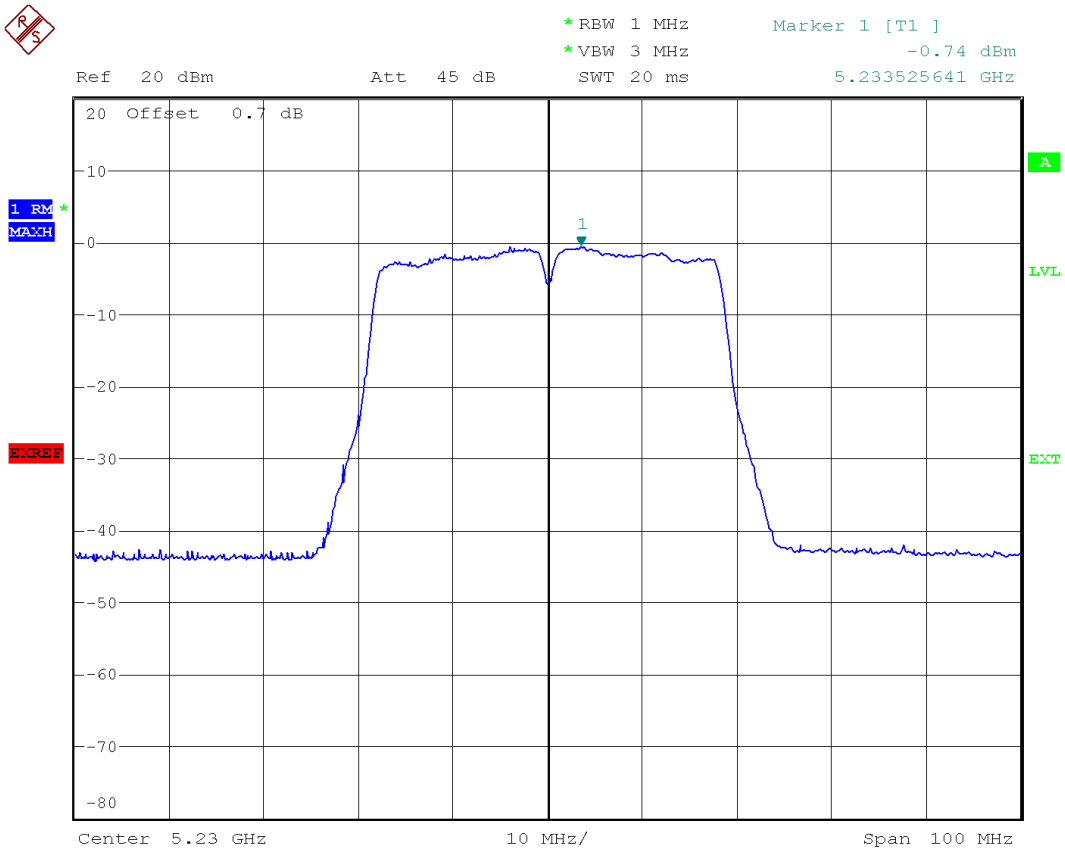
Date: 13.NOV.2018 10:31:17

11AC HT20 MCS0 CH48 5240MHZ



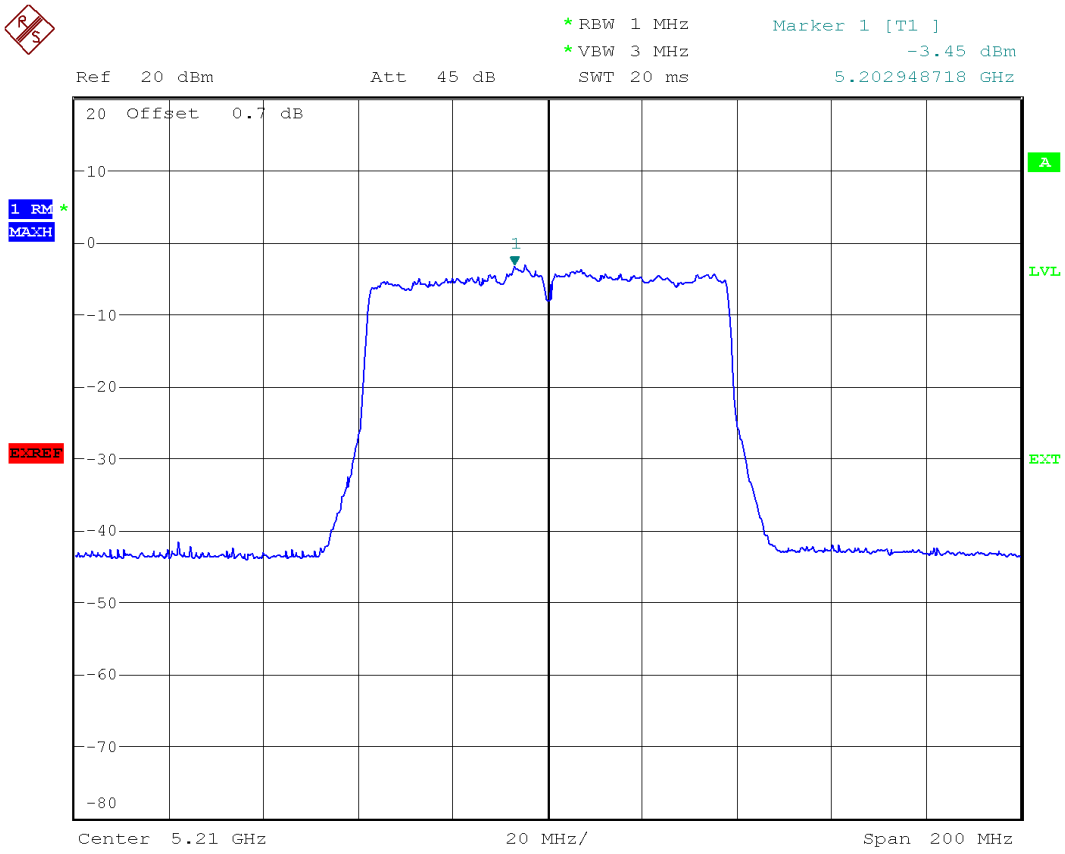
Date: 13.NOV.2018 10:38:01

11AC HT40 MCS0 CH38 5190MHZ



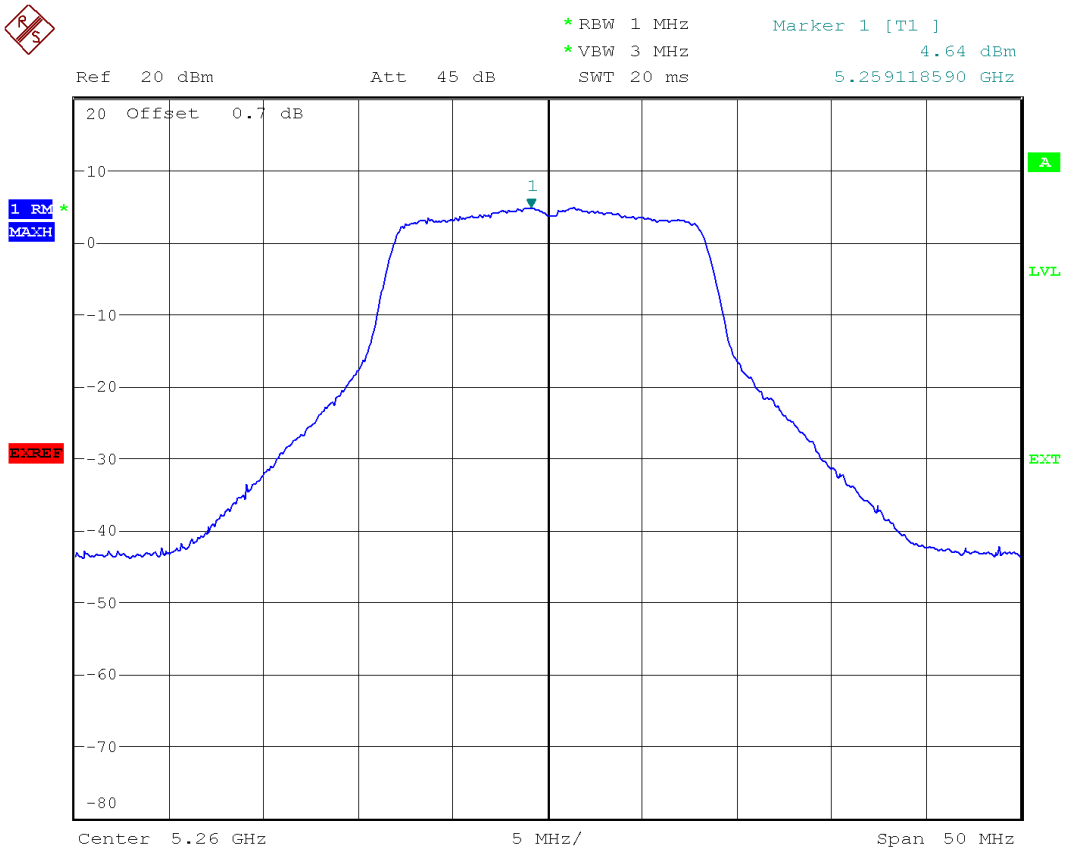
Date: 13.NOV.2018 10:38:44

11AC HT40 MCS0 CH46 5230MHZ

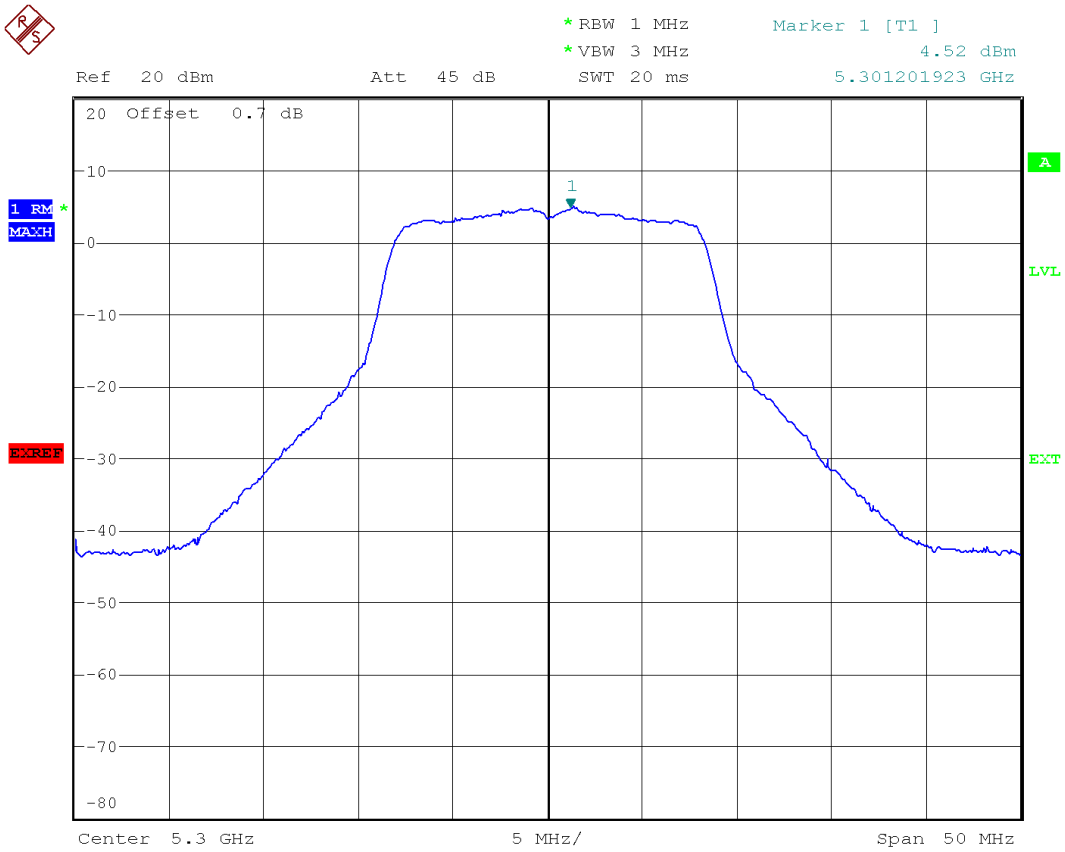


11AC HT80 MCS0 CH42 5210MHZ

5G U-NII-2A

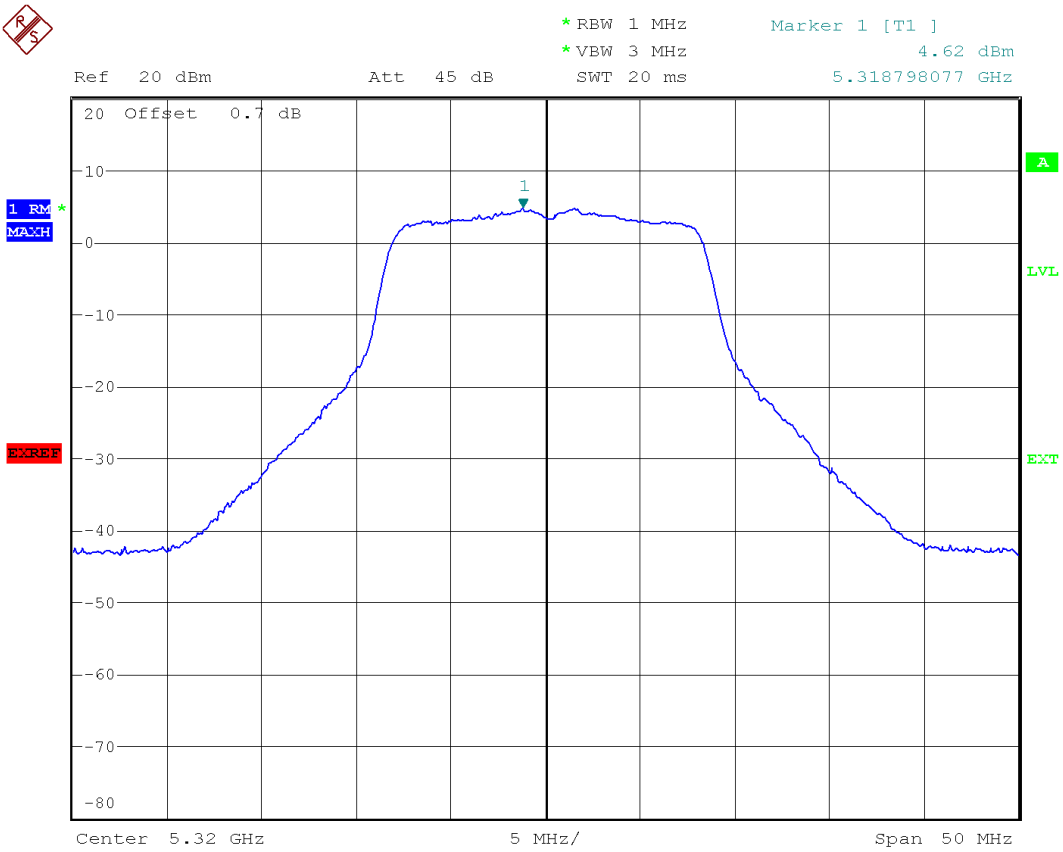


11A 6Mbps CH52 5260MHZ



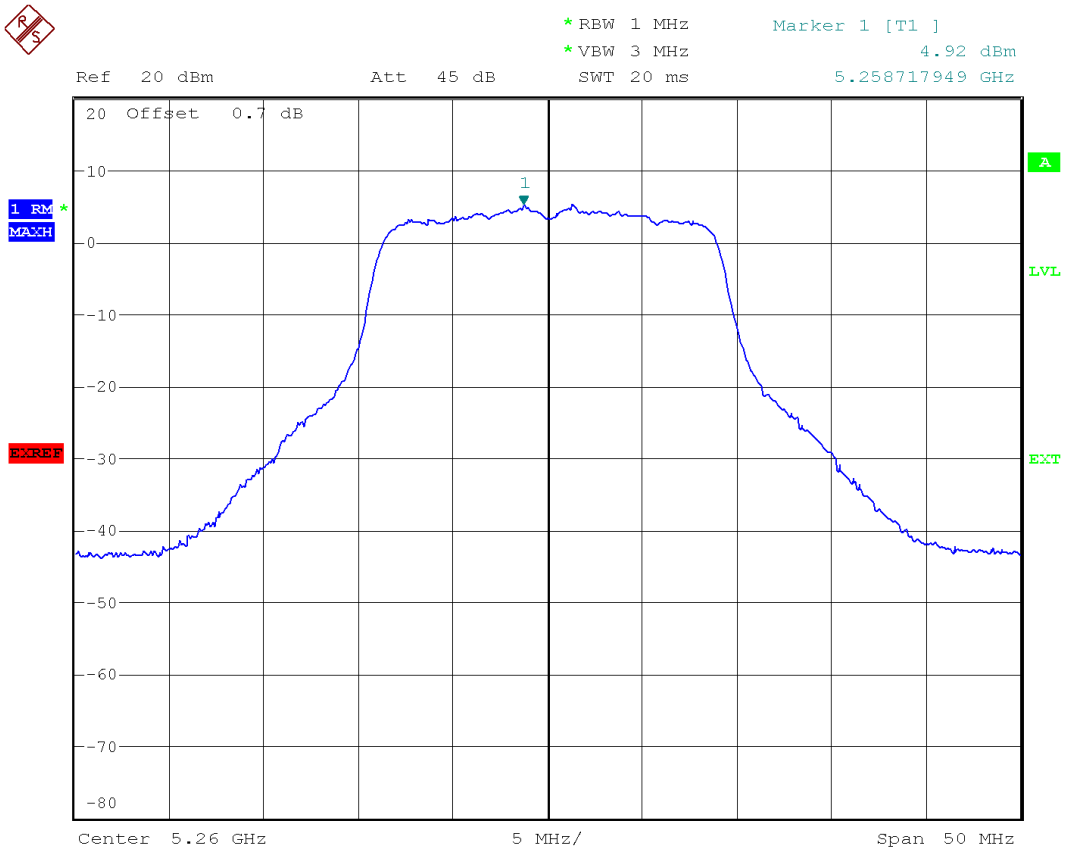
Date: 13.NOV.2018 09:53:46

11A 6Mbps CH60 5300MHZ



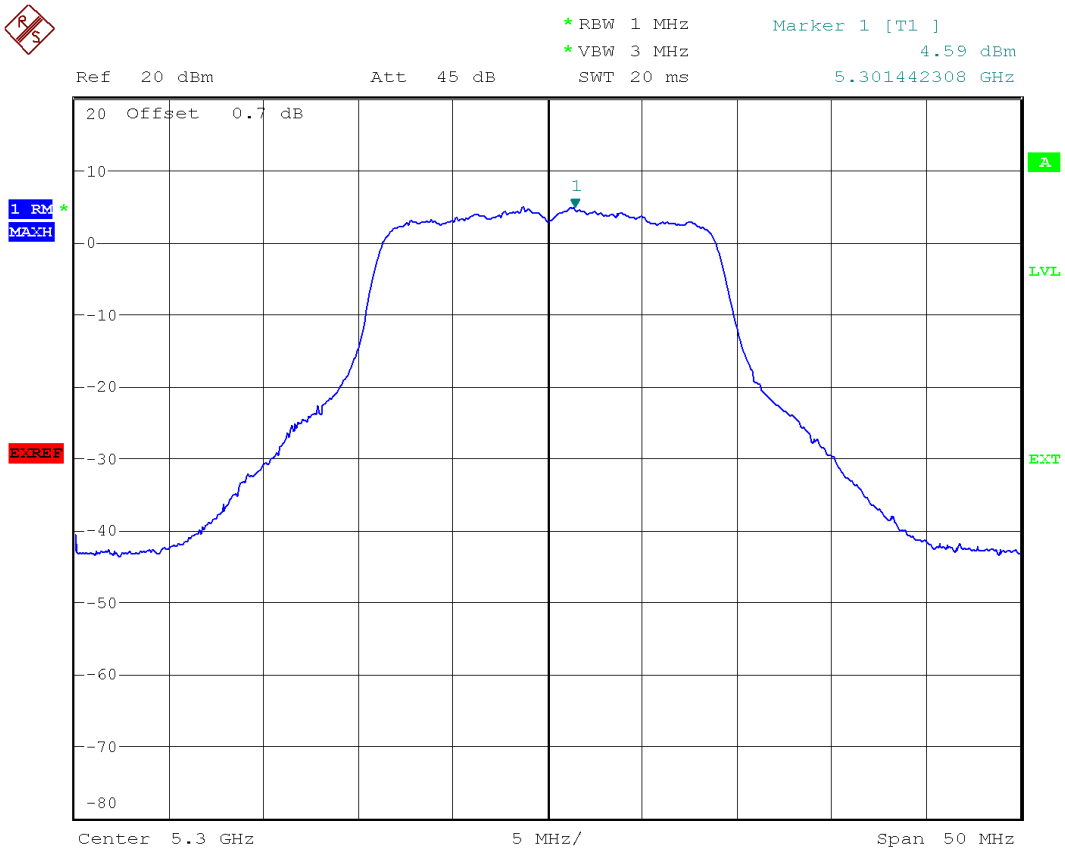
Date: 13.NOV.2018 09:54:36

11A 6Mbps CH64 5320MHZ



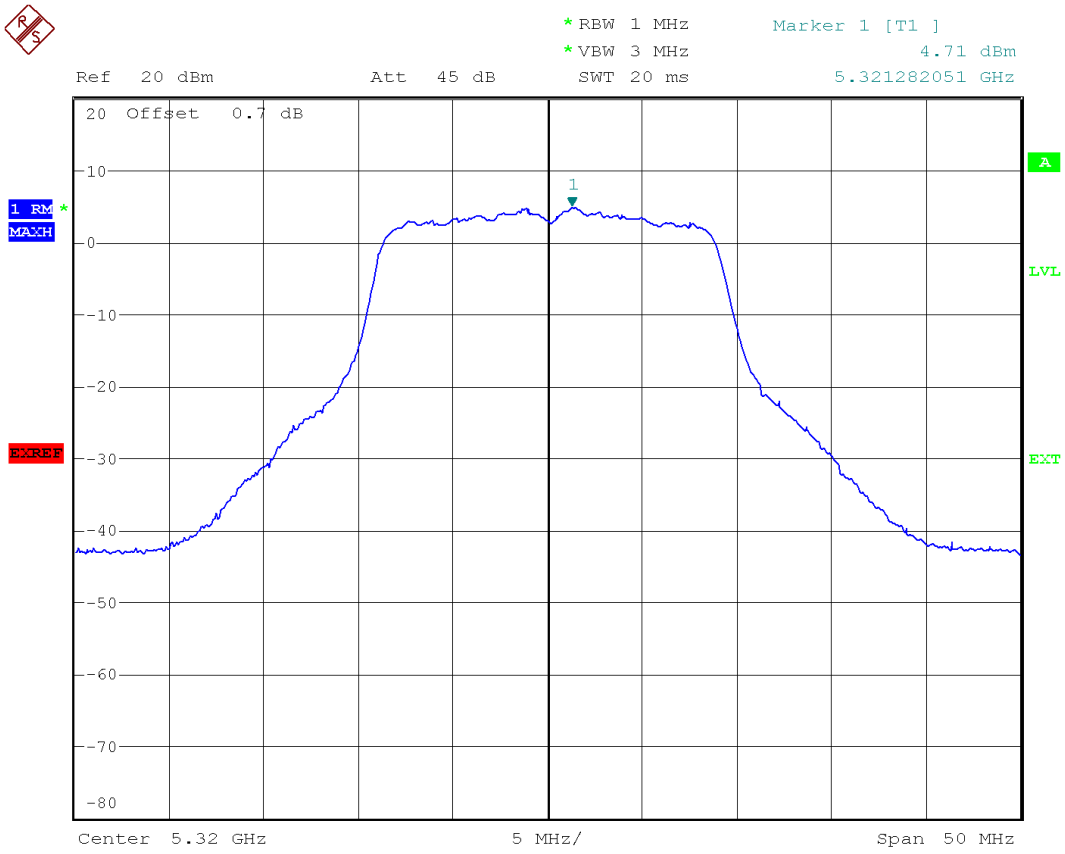
Date: 13.NOV.2018 10:01:27

11N 5G HT20 MCS0 CH52 5260MHZ



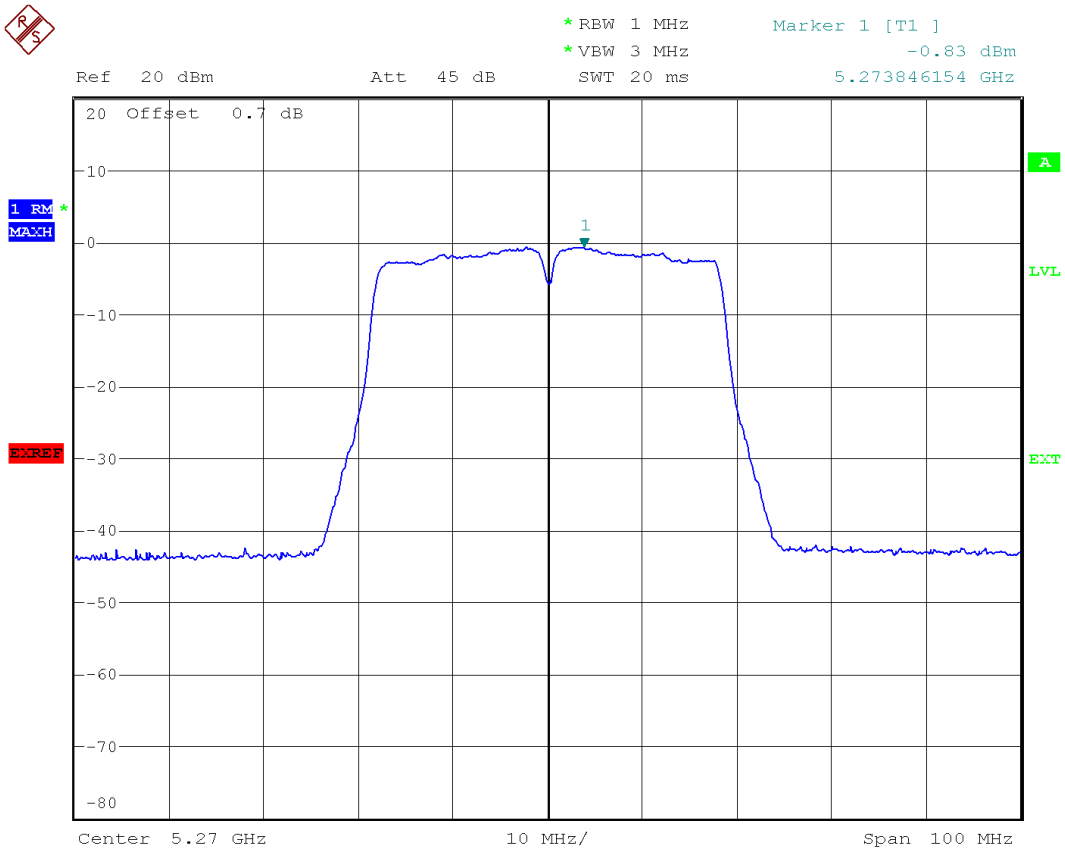
Date: 13.NOV.2018 10:02:12

11N 5G HT20 MCS0 CH60 5300MHZ



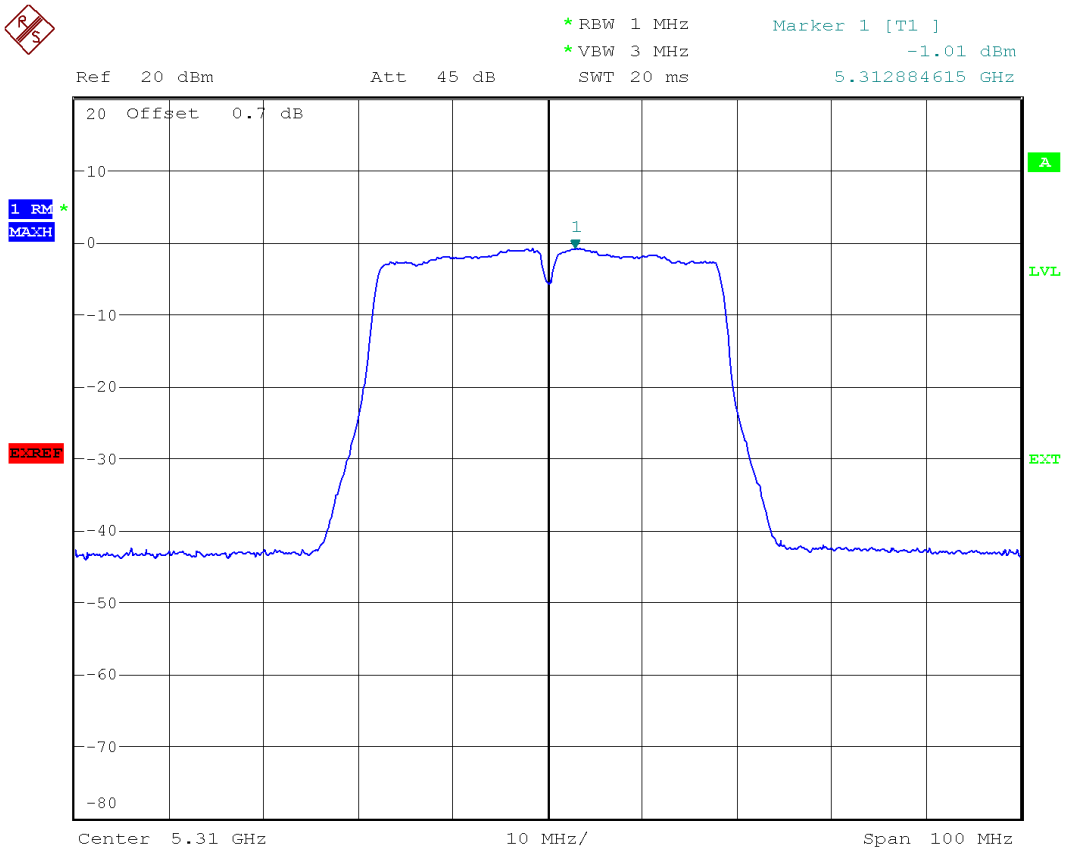
Date: 13.NOV.2018 10:03:12

11N 5G HT20 MCS0 CH64 5320MHZ



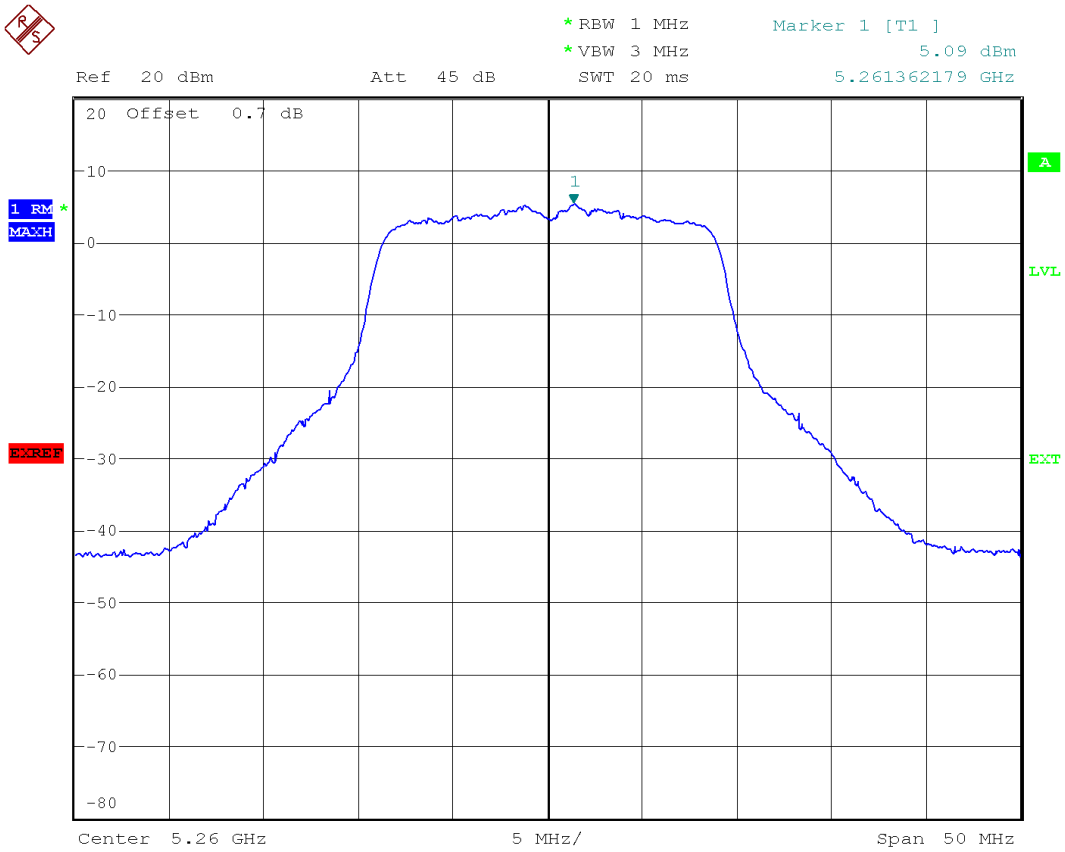
Date: 13.NOV.2018 10:23:06

11N 5G HT40 MCS0 CH54 5270MHZ



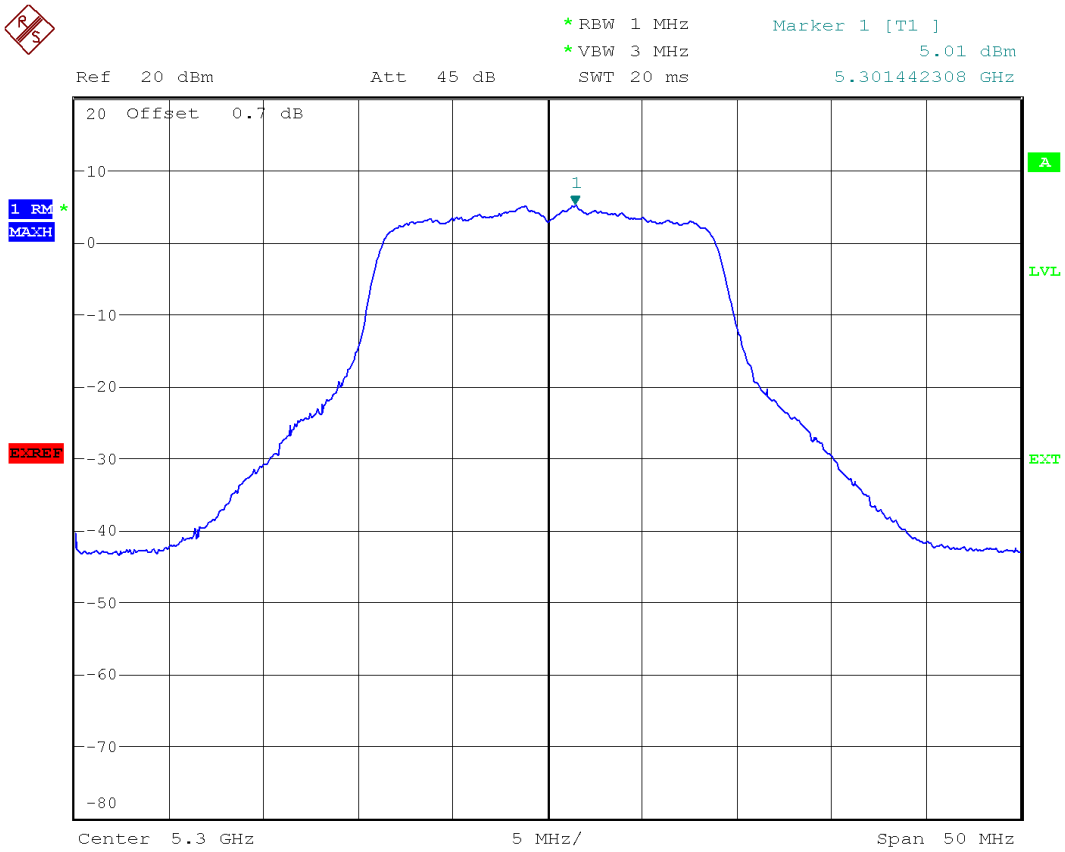
Date: 13.NOV.2018 10:24:11

11N 5G HT40 MCS0 CH62 5310MHZ



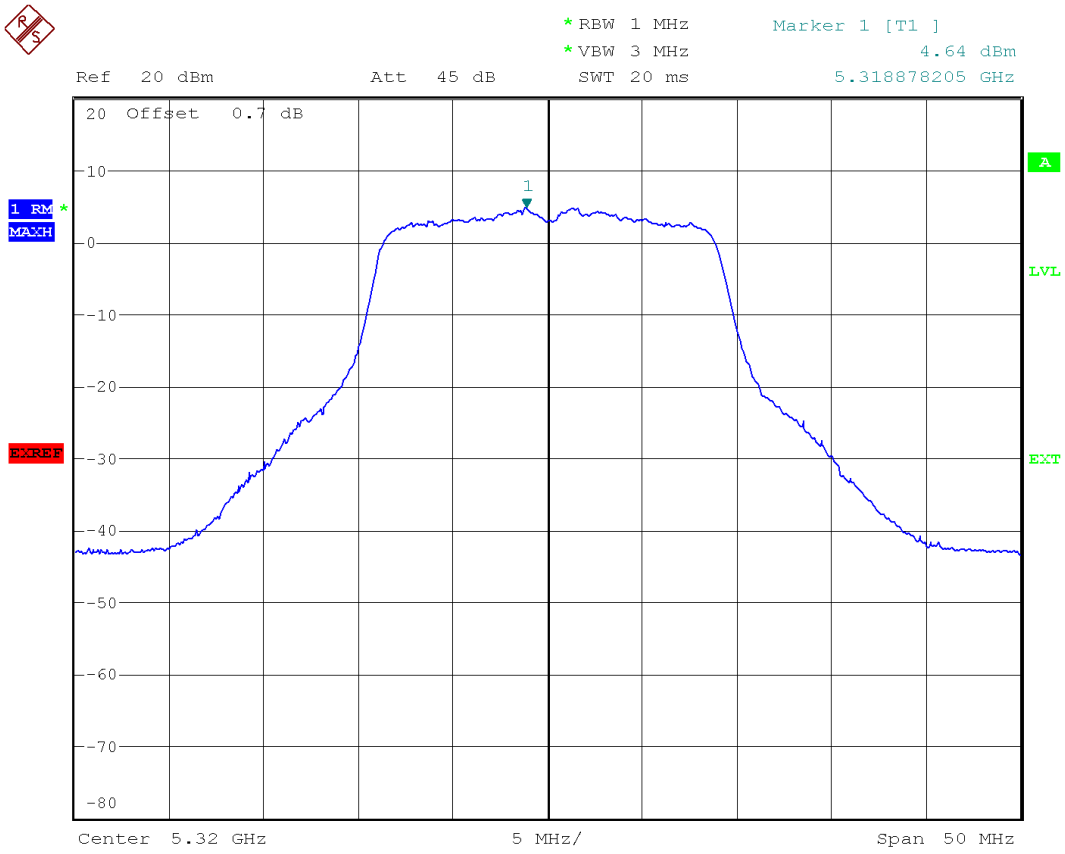
Date: 13.NOV.2018 10:32:15

11AC HT20 MCS0 CH52 5260MHZ



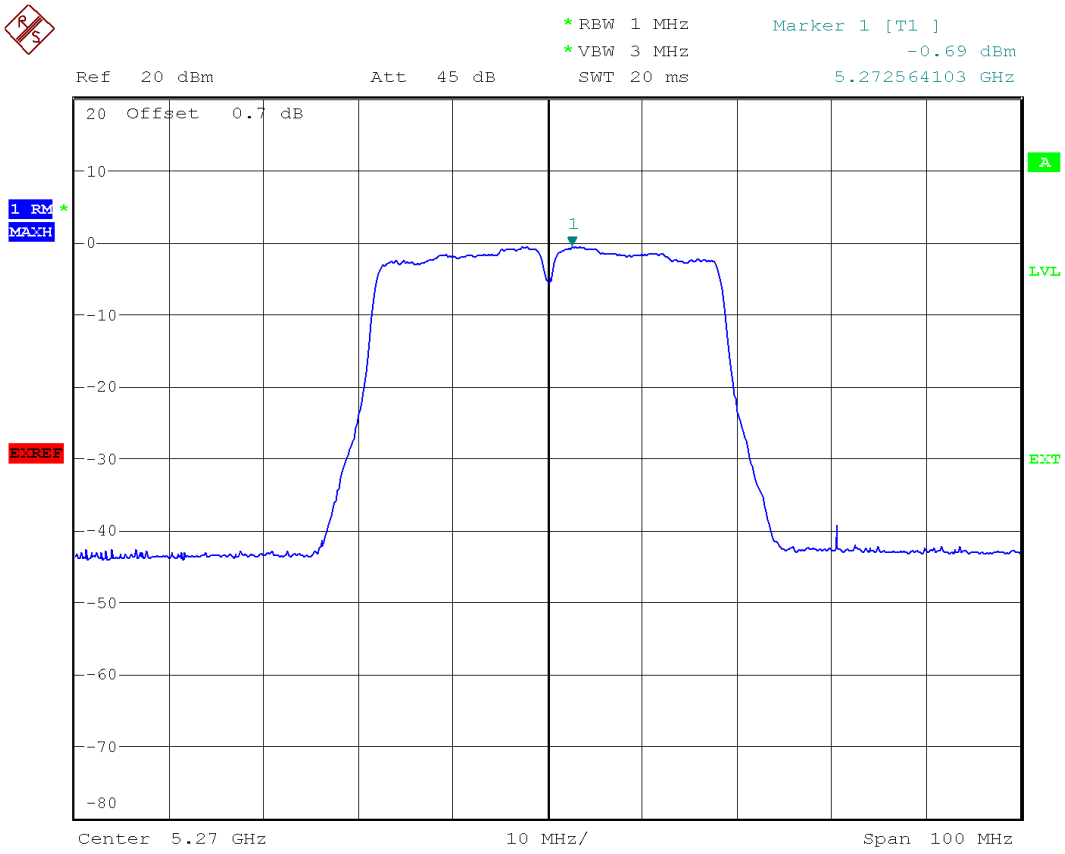
Date: 13.NOV.2018 10:33:14

11AC HT20 MCS0 CH60 5300MHZ

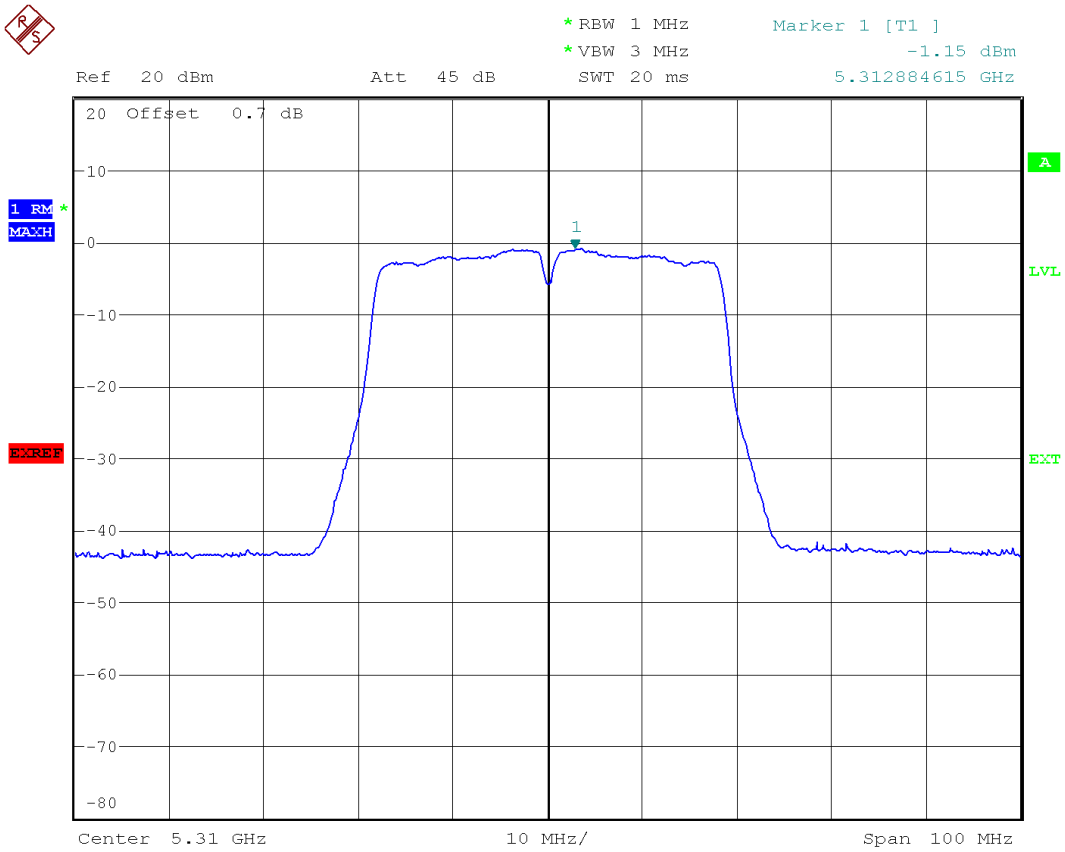


Date: 13.NOV.2018 10:34:00

11AC HT20 MCS0 CH64 5320MHZ

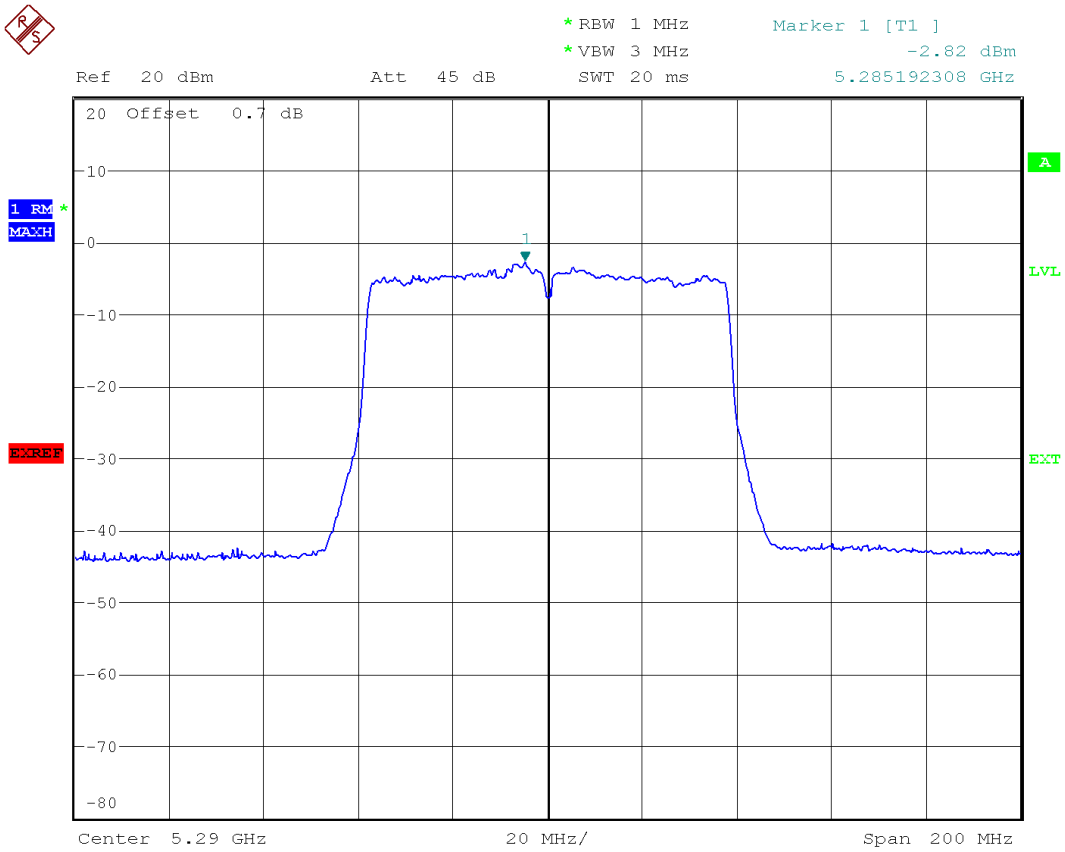


11AC HT40 MCS0 CH54 5270MHZ



Date: 13.NOV.2018 10:40:38

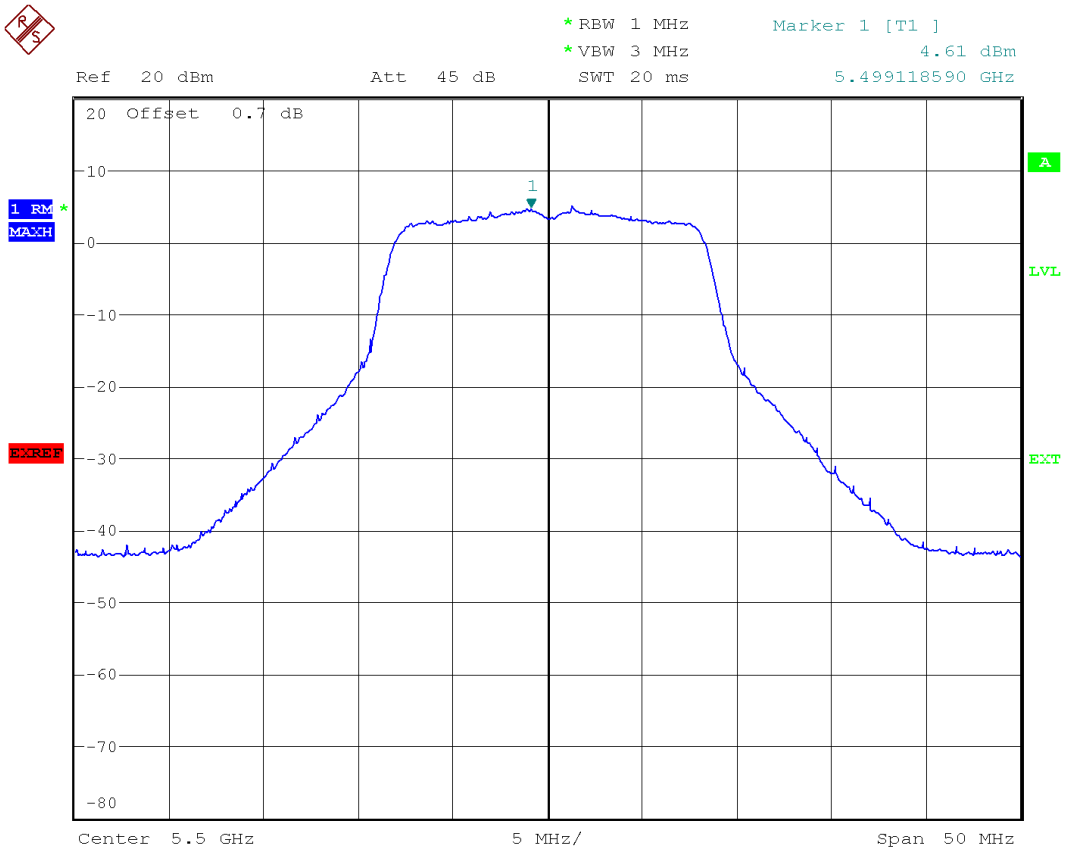
11AC HT40 MCS0 CH62 5310MHZ



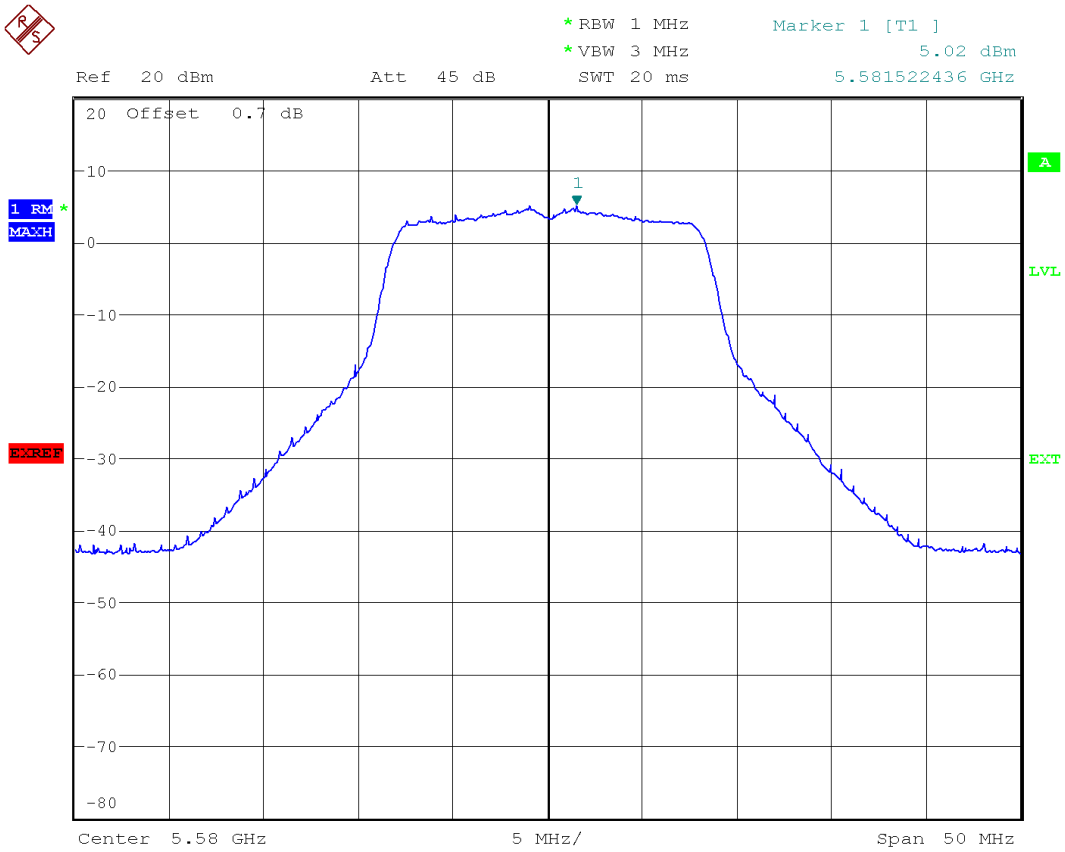
Date: 13.NOV.2018 10:45:33

11AC HT80 MCS0 CH58 5290MHZ

5G U-NII-2C

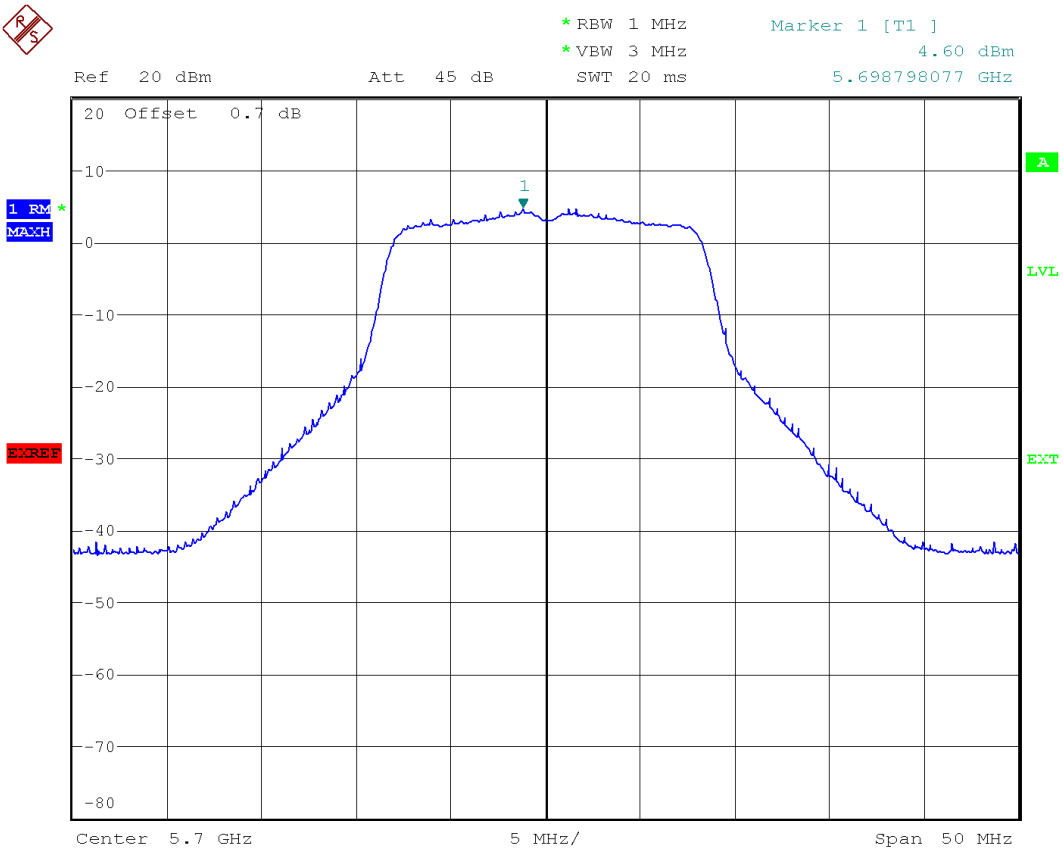


11A 6Mbps CH100 5500MHZ



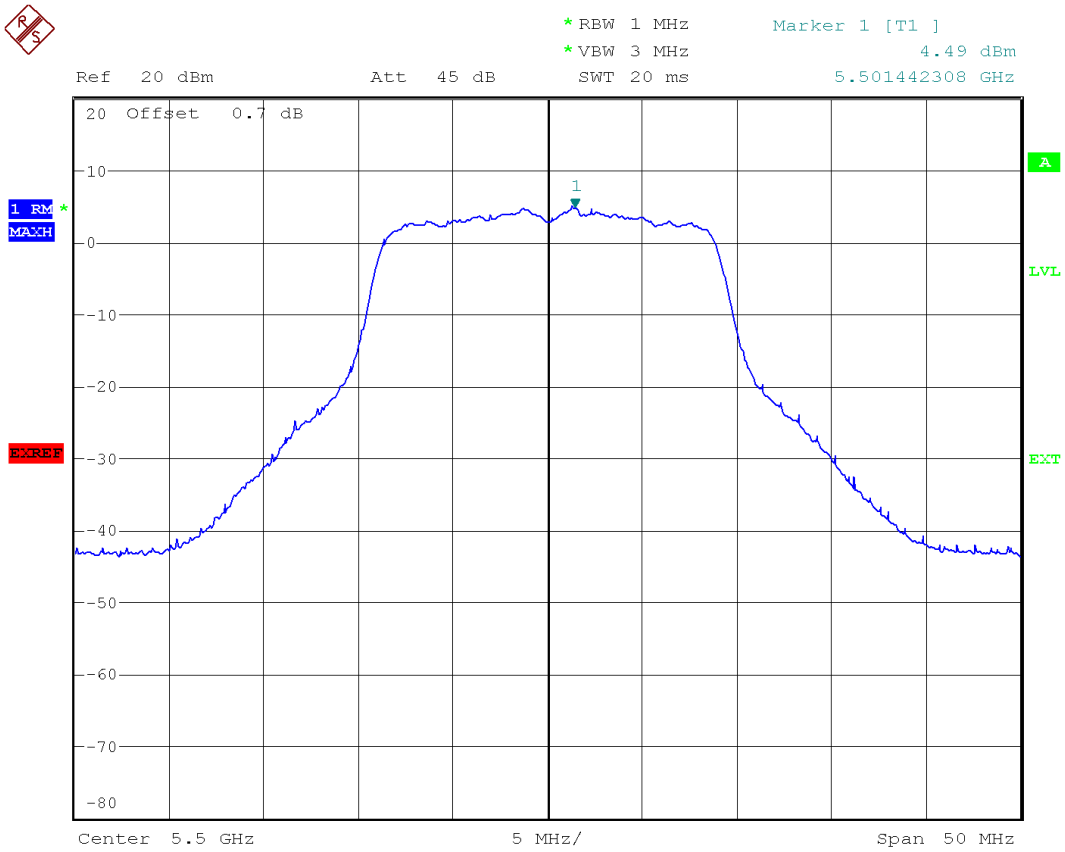
Date: 13.NOV.2018 09:56:35

11A 6Mbps CH116 5580MHZ



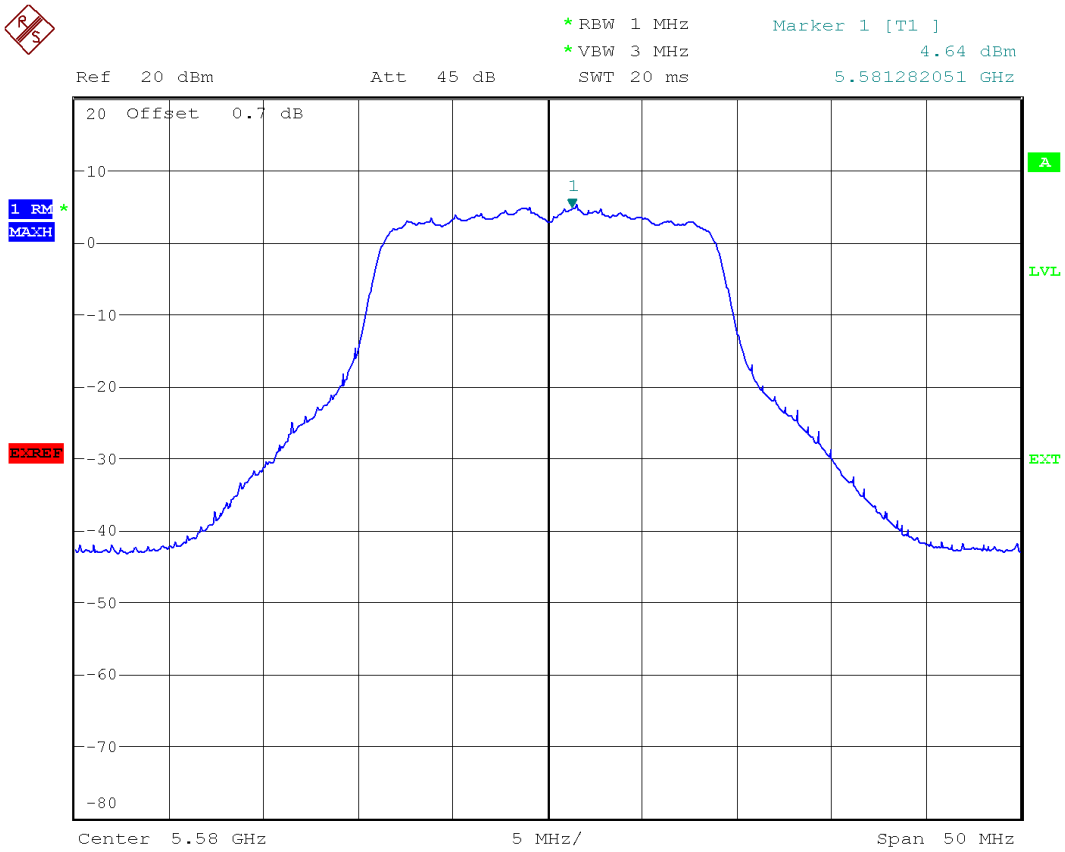
Date: 13.NOV.2018 09:57:33

11A 6Mbps CH140 5700MHZ



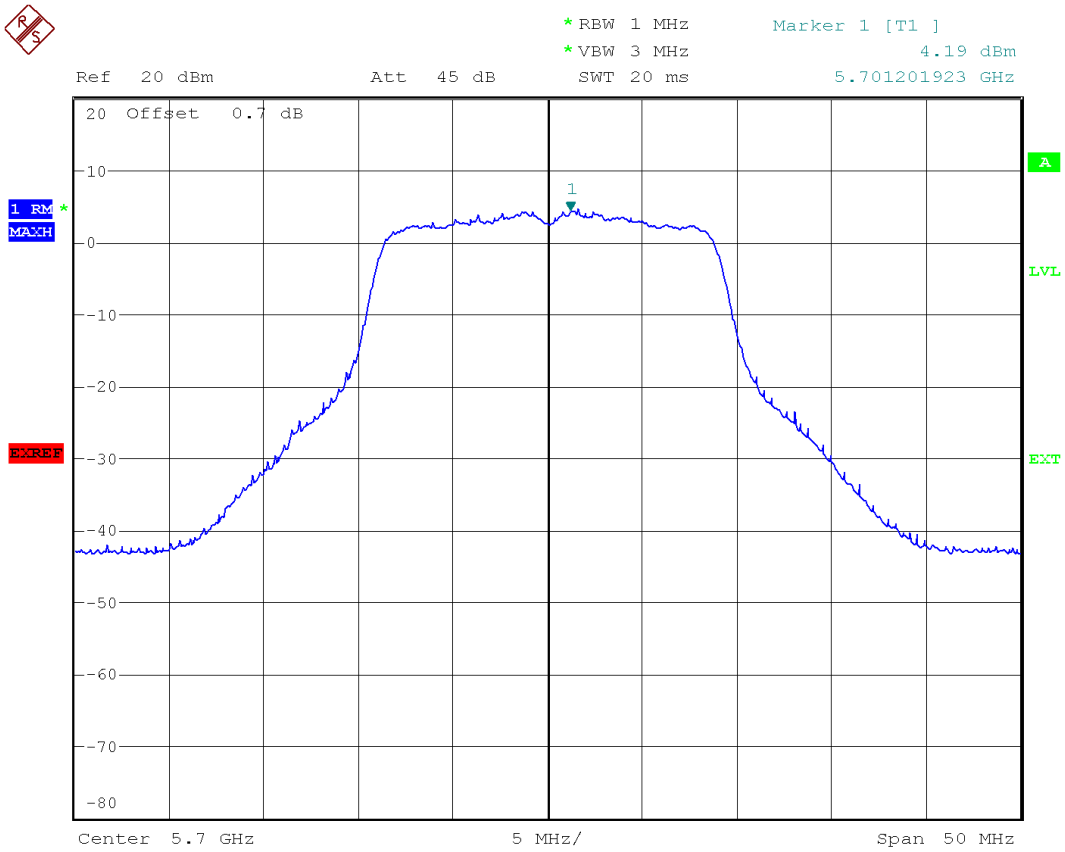
Date: 13.NOV.2018 10:04:09

11N 5G HT20 MCS0 CH100 5500MHZ



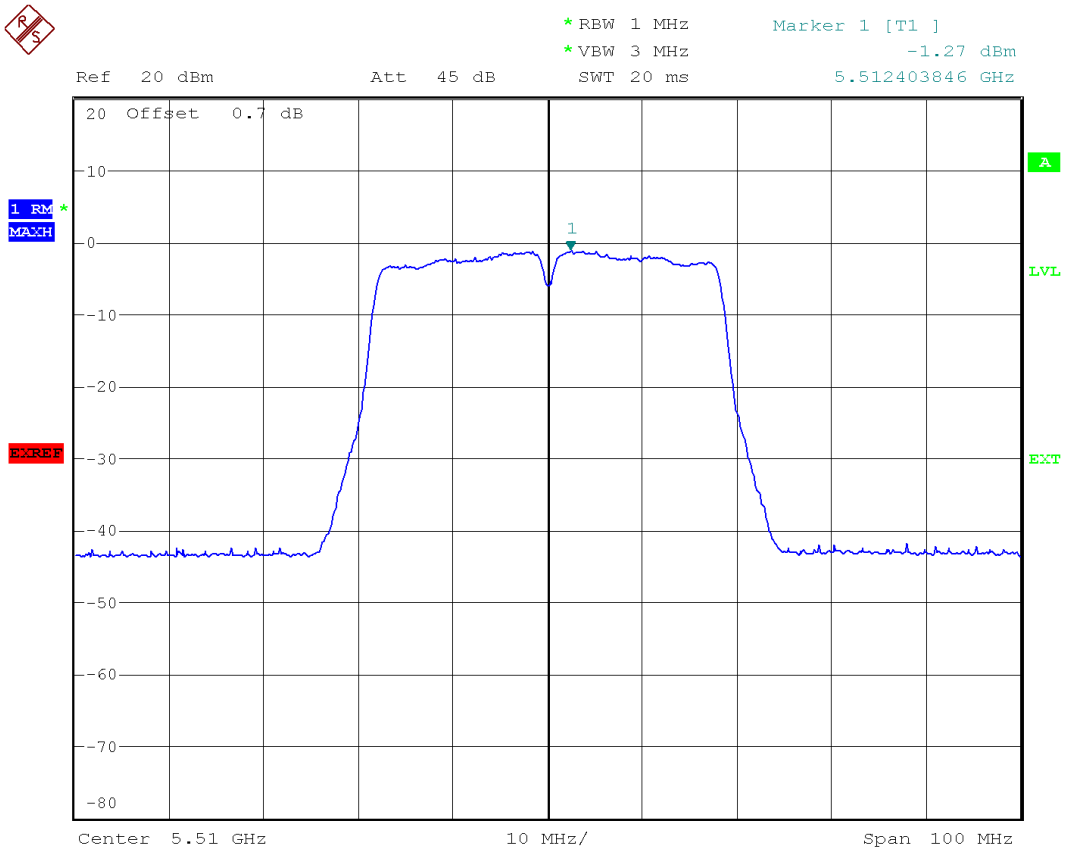
Date: 13.NOV.2018 10:09:16

11N 5G HT20 MCS0 CH116 5580MHZ



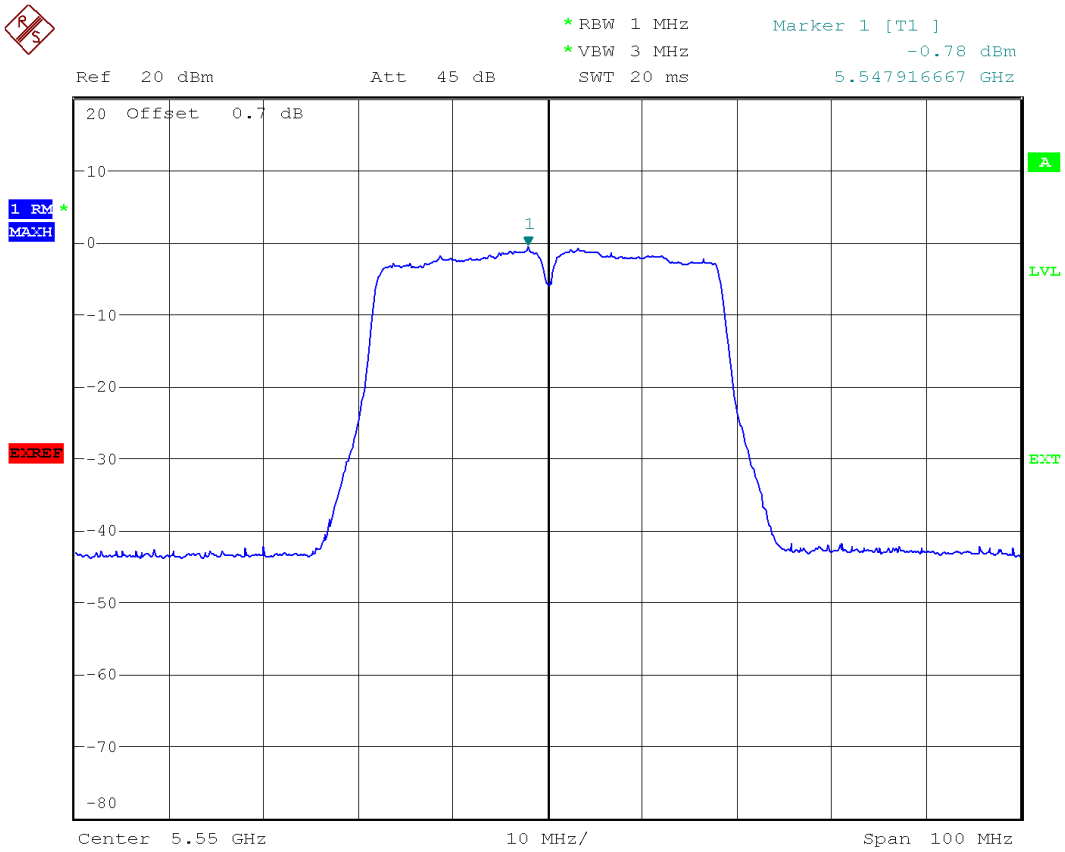
Date: 13.NOV.2018 10:10:26

11N 5G HT20 MCS0 CH140 5700MHZ



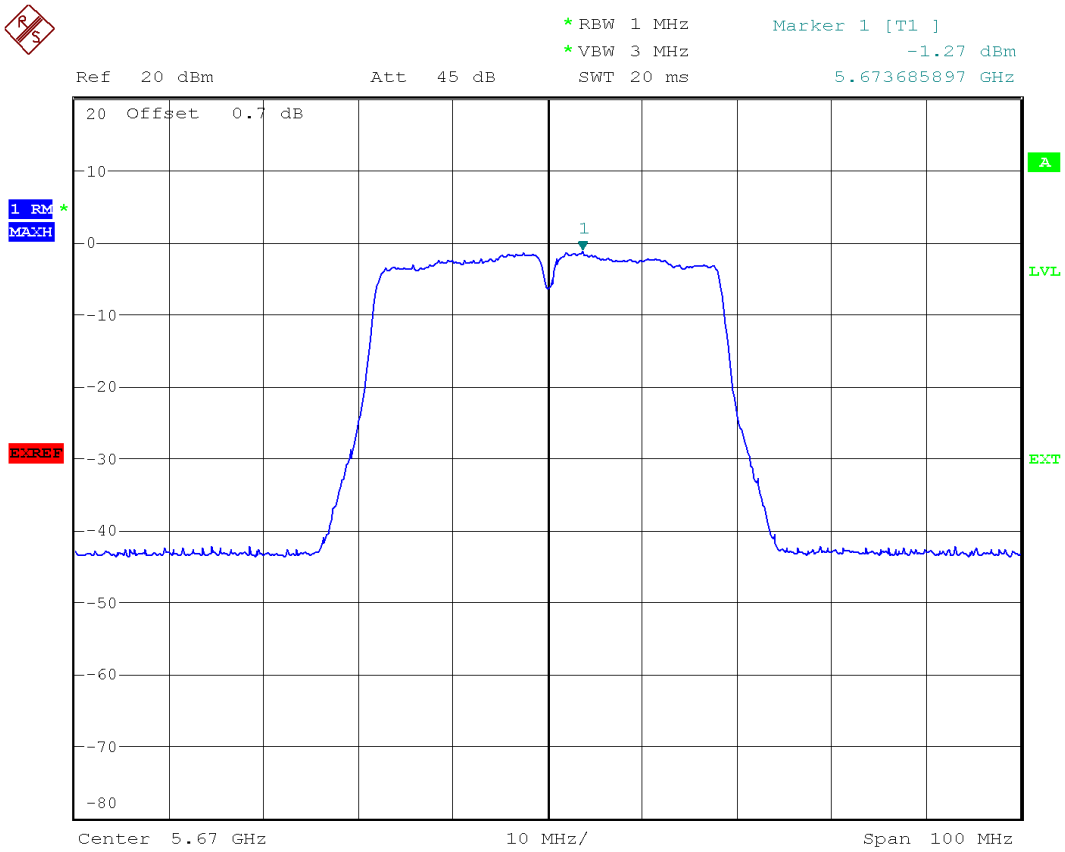
Date: 15.NOV.2018 04:08:50

11N 5G HT40 MCS0 CH102 5510MHZ



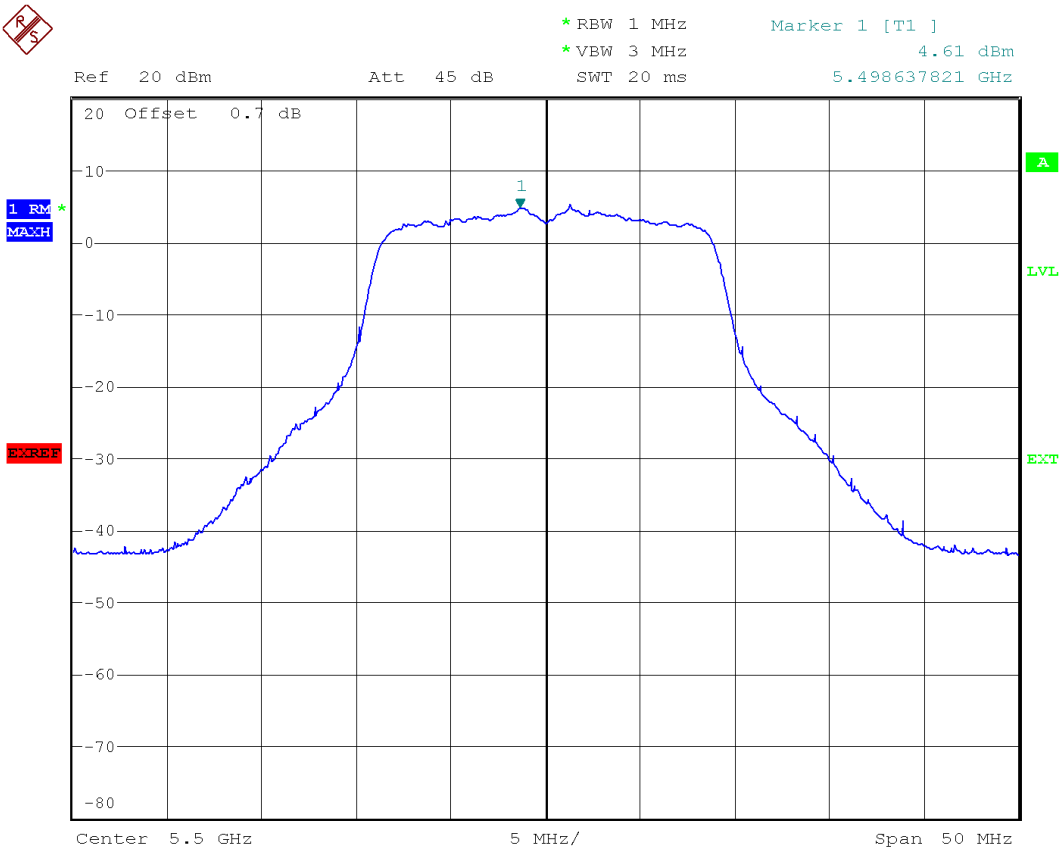
Date: 13.NOV.2018 10:26:44

11N 5G HT40 MCS0 CH110 5550MHZ



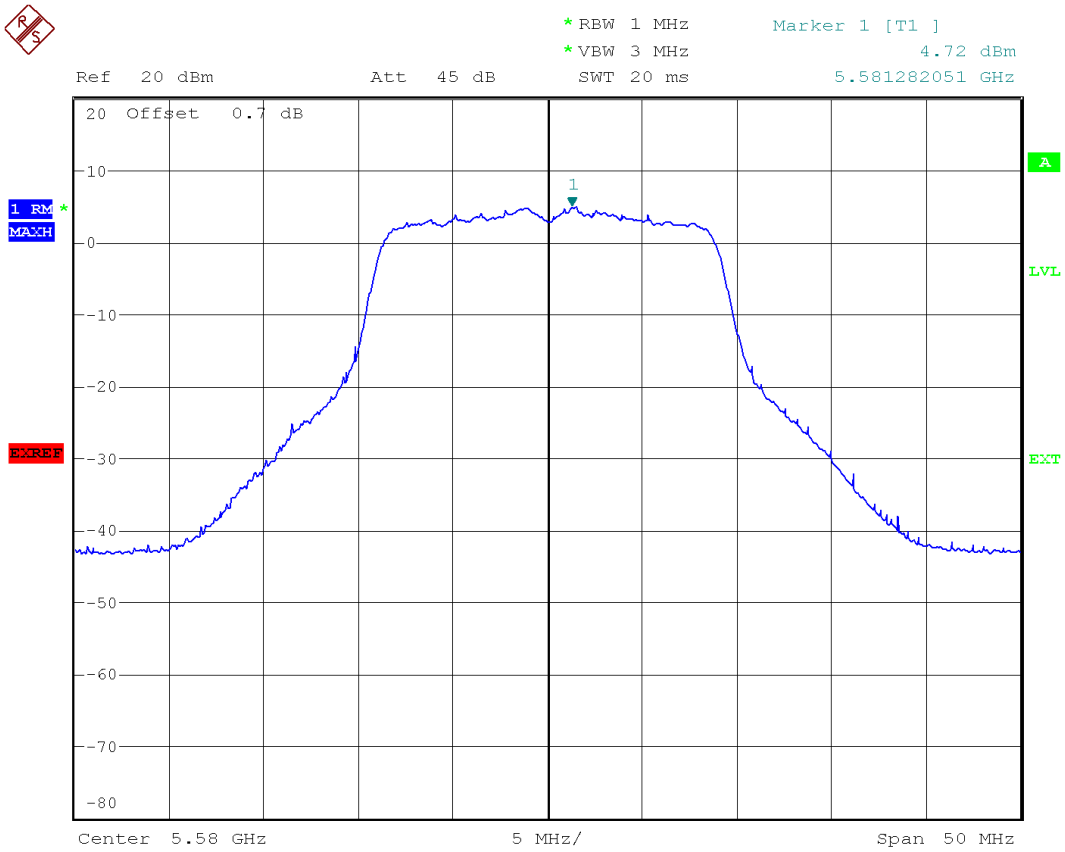
Date: 13.NOV.2018 10:28:05

11N 5G HT40 MCS0 CH134 5670MHZ



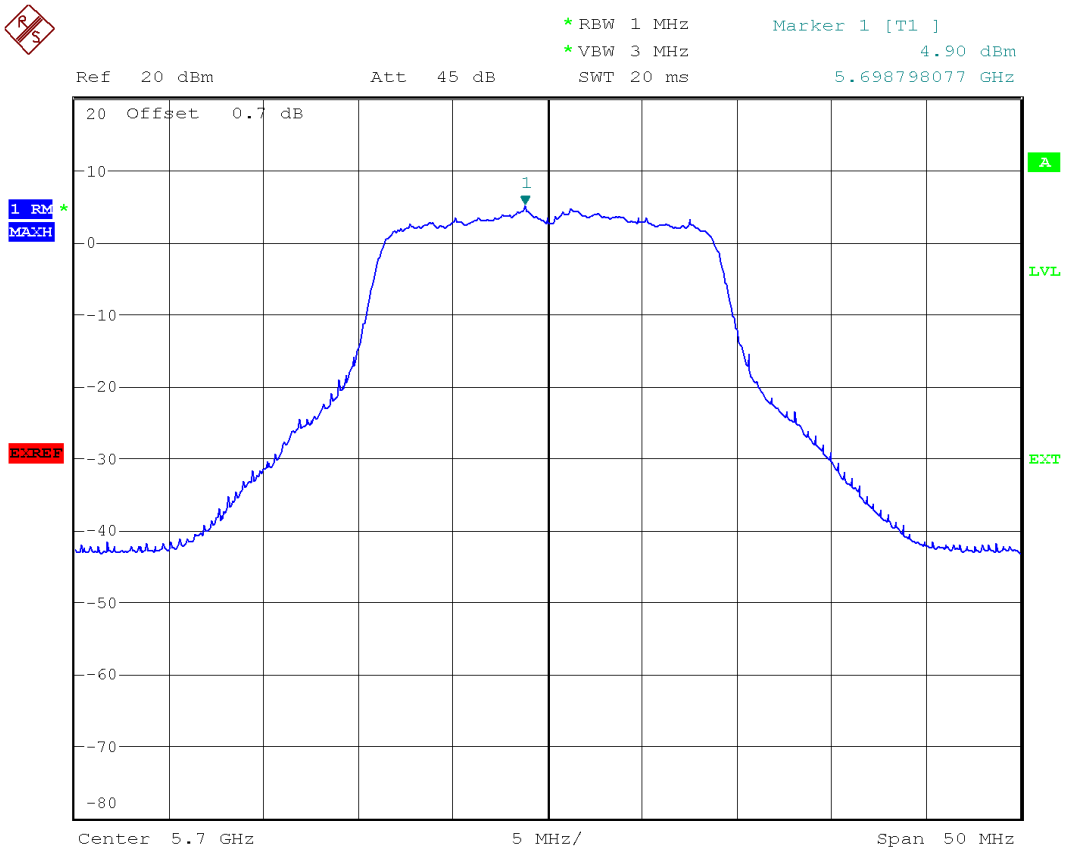
Date: 13.NOV.2018 10:34:58

11AC HT20 MCS0 CH100 5500MHZ



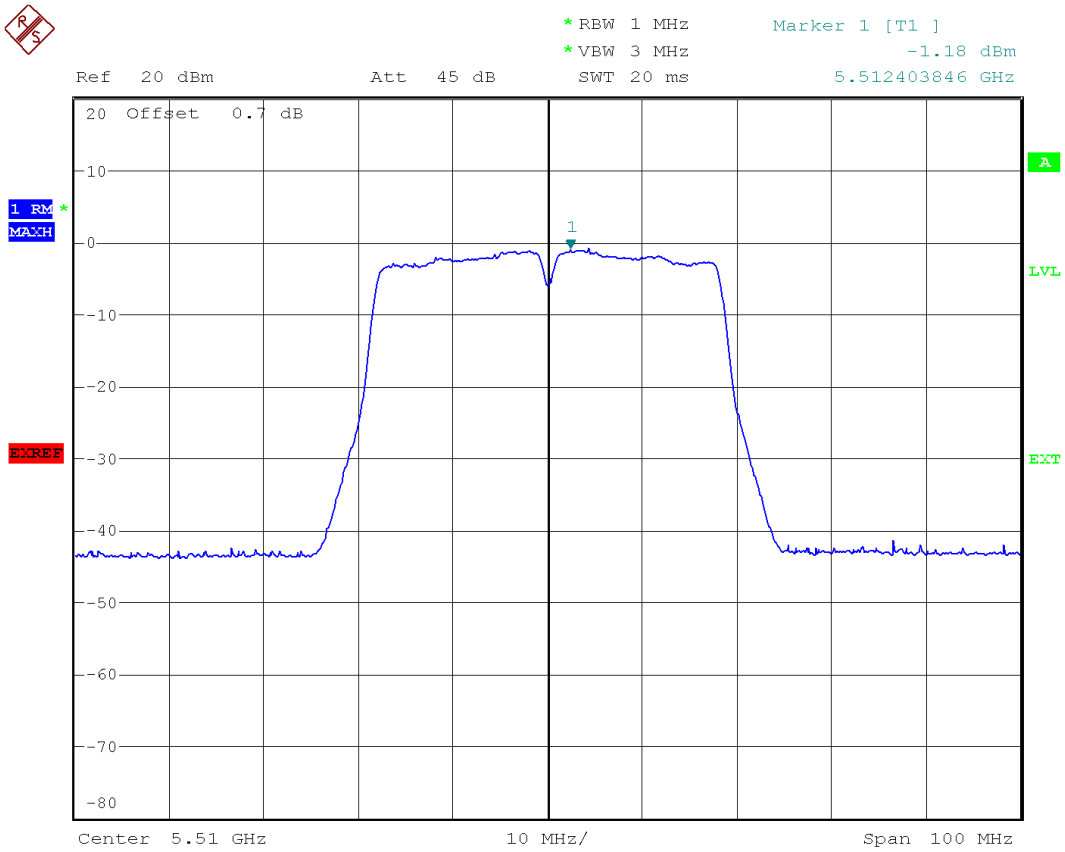
Date: 13.NOV.2018 10:35:32

11AC HT20 MCS0 CH116 5580MHZ



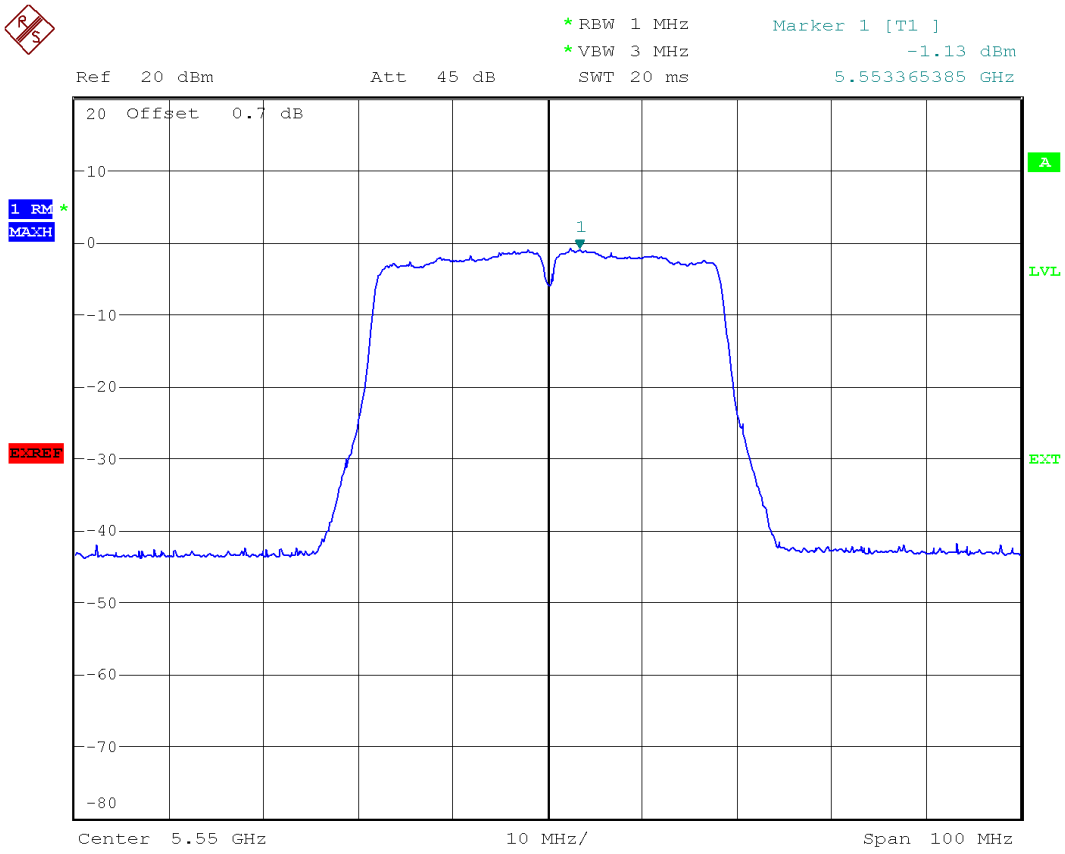
Date: 13.NOV.2018 10:36:44

11AC HT20 MCS0 CH140 5700MHZ



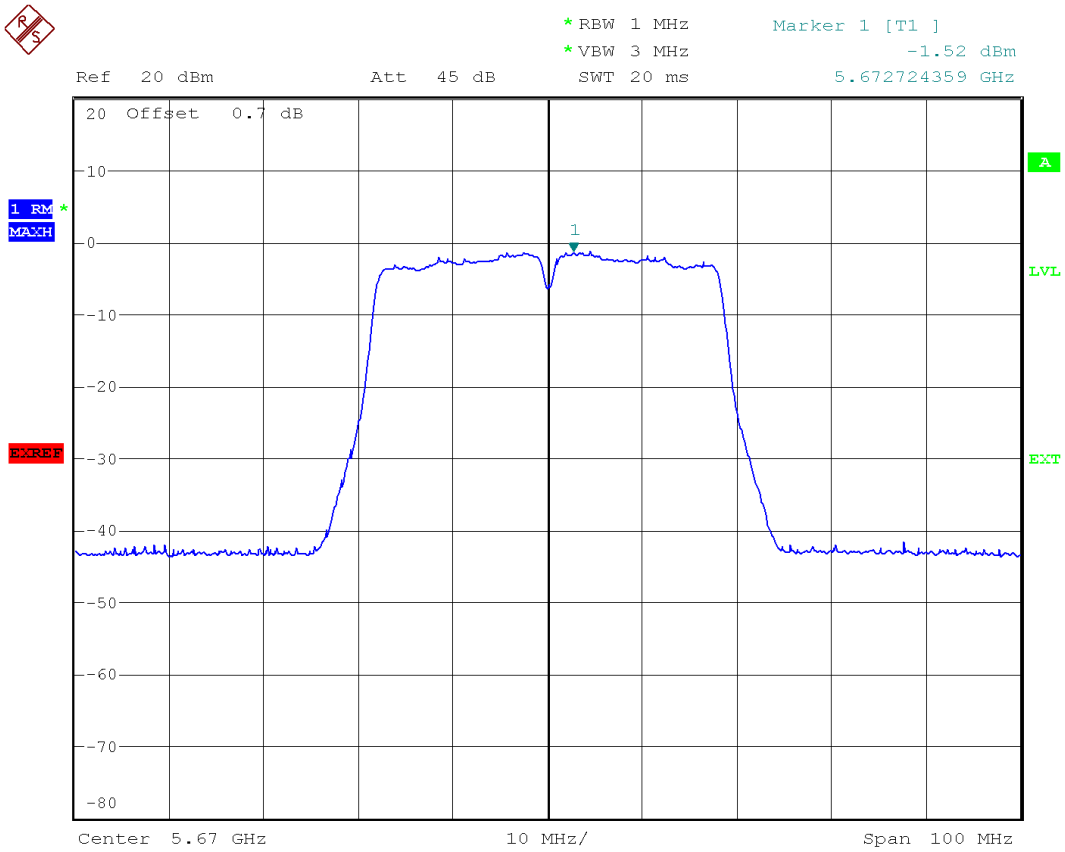
Date: 13.NOV.2018 10:41:33

11AC HT40 MCS0 CH102 5510MHZ



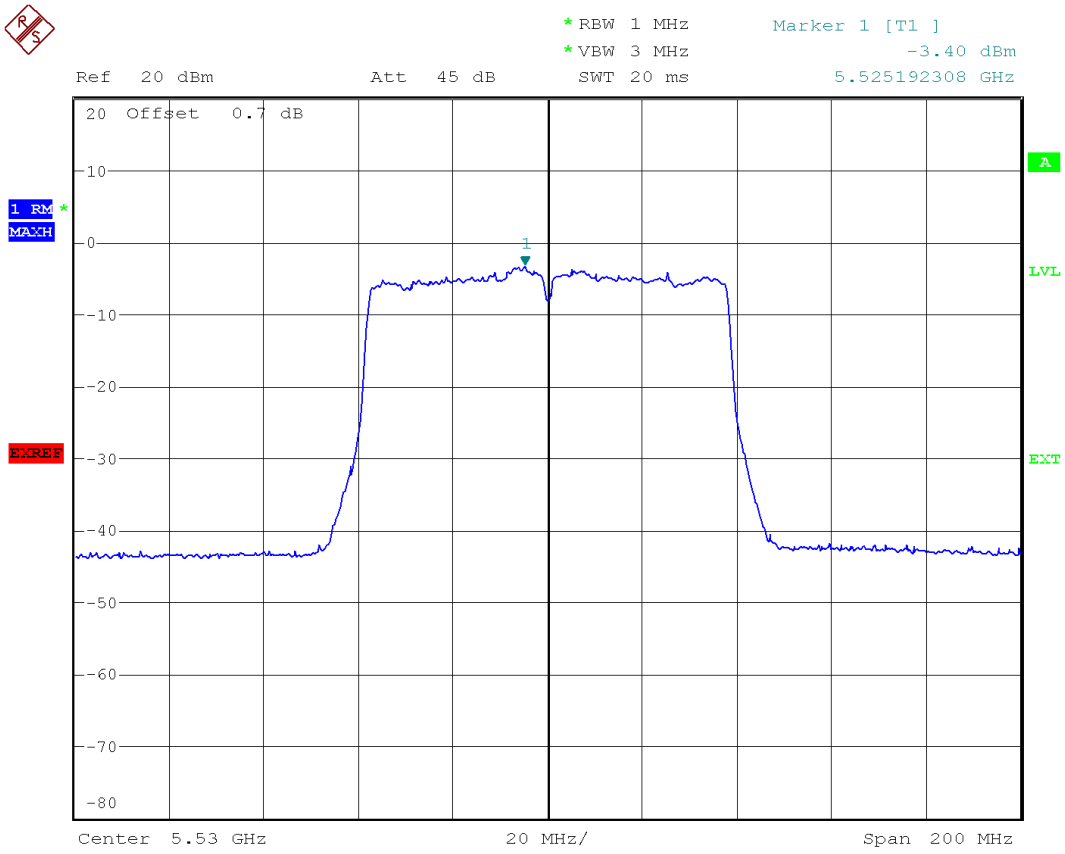
Date: 13.NOV.2018 10:42:13

11AC HT40 MCS0 CH110 5550MHZ



Date: 13.NOV.2018 10:43:03

11AC HT40 MCS0 CH134 5670MHZ



Date: 13.NOV.2018 10:46:31

11AC HT80 MCS0 CH106 5530MHZ

5.4 Frequency Stability

5.4.1 Description

Manufactures of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

5.4.2 Test Instruments

The measuring equipment is listed in the section 4.1 of this test report.

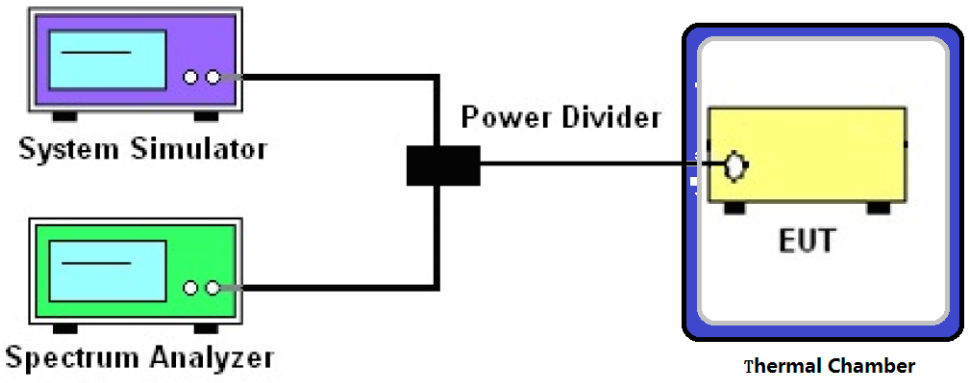
5.4.3 Test Procedure

a. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.

b. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.

c. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

5.4.4 Test Setup



5.4.5 Test Result

5G U-NII-1							
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)			P/F
				25℃			
				3.8V	3.4V	4.2V	
11A	6Mbps	36	5180	0.82	0.43	0.31	PASS
11A	6Mbps	44	5220	0.8	0.43	0.3	PASS
11A	6Mbps	48	5240	0.79	0.43	0.29	PASS
11N 5G HT20	MCS0	36	5180	0.76	0.42	0.28	PASS
11N 5G HT20	MCS0	44	5220	0.74	0.41	0.27	PASS
11N 5G HT20	MCS0	48	5240	0.72	0.41	0.27	PASS
11N 5G HT40	MCS0	38	5190	0.7	0.4	0.26	PASS
11N 5G HT40	MCS0	46	5230	0.69	0.4	0.25	PASS
11AC HT20	MCS0	36	5180	0.68	0.4	0.25	PASS
11AC HT20	MCS0	44	5220	0.67	0.41	0.25	PASS
11AC HT20	MCS0	48	5240	0.66	0.41	0.26	PASS
11AC HT40	MCS0	38	5190	0.66	0.41	0.25	PASS
11AC HT40	MCS0	46	5230	0.66	0.41	0.26	PASS
11AC HT80	MCS0	42	5210	0.63	0.4	0.22	PASS

5G U-NII-2A							
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)			P/F
				25℃			
				3.8V	3.4V	4.2V	
11A	6Mbps	52	5260	0.64	0.41	0.26	PASS
11A	6Mbps	60	5300	0.64	0.42	0.26	PASS
11A	6Mbps	64	5320	0.63	0.41	0.26	PASS
11N 5G HT20	MCS0	52	5260	0.61	0.4	0.24	PASS

11N 5G HT20	MCS0	60	5300	0.6	0.4	0.23	PASS
11N 5G HT20	MCS0	64	5320	0.6	0.39	0.23	PASS
11N 5G HT40	MCS0	54	5270	0.58	0.38	0.22	PASS
11N 5G HT40	MCS0	62	5310	0.56	0.39	0.21	PASS
11AC HT20	MCS0	52	5260	0.56	0.39	0.22	PASS
11AC HT20	MCS0	60	5300	0.55	0.39	0.22	PASS
11AC HT20	MCS0	64	5320	0.55	0.39	0.22	PASS
11AC HT40	MCS0	54	5270	0.56	0.39	0.23	PASS
11AC HT40	MCS0	62	5310	0.55	0.39	0.22	PASS
11AC HT80	MCS0	58	5290	0.54	0.35	0.22	PASS

5G U-NII-2C							
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)			P/F
				25℃			
				3.8V	3.4V	4.2V	
11A	6Mbps	100	5500	0.55	0.4	0.23	PASS
11A	6Mbps	116	5580	0.55	0.4	0.23	PASS
11A	6Mbps	140	5700	0.54	0.4	0.22	PASS
11N 5G HT20	MCS0	100	5500	0.53	0.4	0.21	PASS
11N 5G HT20	MCS0	116	5580	0.52	0.39	0.2	PASS
11N 5G HT20	MCS0	140	5700	0.51	0.39	0.2	PASS
11N 5G HT40	MCS0	102	5510	0.5	0.38	0.19	PASS
11N 5G HT40	MCS0	110	5550	0.5	0.38	0.19	PASS
11N 5G HT40	MCS0	134	5670	0.5	0.38	0.19	PASS
11AC HT20	MCS0	100	5500	0.49	0.39	0.19	PASS

11AC HT20	MCS0	116	5580	0.5	0.39	0.2	PASS
11AC HT20	MCS0	140	5700	0.5	0.38	0.19	PASS
11AC HT40	MCS0	102	5510	0.49	0.39	0.19	PASS
11AC HT40	MCS0	110	5550	0.5	0.4	0.2	PASS
11AC HT40	MCS0	134	5670	0.49	0.4	0.2	PASS
11AC HT80	MCS0	106	5530	0.49	0.4	0.22	PASS

5G U-NII-1											
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)							P/F
				3.8V							
				-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	
11A	54Mbps	36	5180	7.57	8.18	6.94	3.73	1.47	-0.15	-2.85	-4.52	-4.92	PASS
11A	54Mbps	44	5220	7.58	8.18	6.94	3.74	1.47	-0.16	-2.86	-4.53	-4.91	PASS
11A	54Mbps	48	5240	7.58	8.19	6.94	3.74	1.46	-0.19	-2.87	-4.54	-4.91	PASS
11N 5G HT20	MCS7	36	5180	7.59	8.18	6.93	3.73	1.44	-0.22	-2.9	-4.55	-4.91	PASS
11N 5G HT20	MCS7	44	5220	7.59	8.18	6.93	3.73	1.43	-0.24	-2.92	-4.56	-4.9	PASS
11N 5G HT20	MCS7	48	5240	7.6	8.18	6.93	3.73	1.41	-0.27	-2.94	-4.57	-4.89	PASS
11N 5G HT40	MCS7	38	5190	8	8.18	6.92	3.72	1.4	-0.3	-2.96	-4.59	-4.89	PASS
11N 5G HT40	MCS7	46	5230	7.99	8.18	6.92	3.73	1.4	-0.31	-2.97	-4.59	-4.88	PASS
11AC HT20	MCS8	36	5180	7.99	8.18	6.91	3.73	1.39	-0.33	-2.99	-4.6	-4.88	PASS
11AC HT20	MCS8	44	5220	7.98	8.19	6.92	3.75	1.39	-0.35	-3	-4.6	-4.88	PASS
11AC HT20	MCS8	48	5240	7.98	8.19	6.92	3.76	1.39	-0.36	-3.01	-4.61	-4.87	PASS
11AC HT40	MCS9	38	5190	7.96	8.18	6.92	3.77	1.37	-0.38	-3.02	-4.62	-4.88	PASS
11AC HT40	MCS9	46	5230	7.95	8.19	6.91	3.77	1.38	-0.39	-3.03	-4.62	-4.86	PASS
11AC HT80	MCS9	42	5210	7.86	8.12	6.85	3.75	1.35	-0.39	-3.04	-4.61	-4.88	PASS

5G U-NII-2A												
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)								P/F
				3.8V								
				-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	
11A	54Mbps	52	5260	7.94	8.19	6.91	3.8	1.37	-0.43	-3.06	-4.64	-4.86	PASS
11A	54Mbps	60	5300	7.93	8.19	6.92	3.81	1.38	-0.44	-3.07	-4.64	-4.85	PASS
11A	54Mbps	64	5320	7.93	8.19	6.91	3.82	1.37	-0.46	-3.08	-4.65	-4.85	PASS
11N 5G HT20	MCS7	52	5260	7.92	8.19	6.9	3.82	1.36	-0.49	-3.11	-4.66	-4.84	PASS
11N 5G HT20	MCS7	60	5300	7.92	8.19	6.9	3.83	1.35	-0.51	-3.12	-4.67	-4.83	PASS
11N 5G HT20	MCS7	64	5320	7.91	8.19	6.9	3.83	1.34	-0.53	-3.14	-4.67	-4.83	PASS
11N 5G HT40	MCS7	54	5270	7.9	8.19	6.89	3.81	1.33	-0.56	-3.16	-4.69	-4.82	PASS
11N 5G HT40	MCS7	62	5310	7.89	8.19	6.89	3.81	1.33	-0.57	-3.17	-4.69	-4.82	PASS
11AC HT20	MCS8	52	5260	7.88	8.19	6.89	3.83	1.33	-0.58	-3.18	-4.69	-4.82	PASS
11AC HT20	MCS8	60	5300	7.87	8.19	6.89	3.85	1.33	-0.59	-3.19	-4.7	-4.81	PASS
11AC HT20	MCS8	64	5320	7.86	8.19	6.9	3.87	1.33	-0.61	-3.19	-4.7	-4.81	PASS
11AC HT40	MCS9	54	5270	7.85	8.19	6.89	3.88	1.33	-0.62	-3.2	-4.71	-4.81	PASS
11AC HT40	MCS9	62	5310	7.83	8.19	6.89	3.9	1.34	-0.64	-3.21	-4.71	-4.8	PASS
11AC HT80	MCS9	58	5290	7.77	8.16	6.84	3.89	1.33	-0.64	-3.24	-4.73	-4.77	PASS

5G U-NII-2C												
Mode	Data Rate	Channel	Frequency(MHz)	Frequency Stability(PPM)								P/F
				3.8V								
				-20℃	-10℃	0℃	10℃	20℃	30℃	40℃	50℃	60℃	
11A	54Mbps	100	5500	7.81	8.2	6.9	3.93	1.35	-0.65	-3.23	-4.72	-4.79	PASS
11A	54Mbps	116	5580	7.8	8.2	6.9	3.94	1.36	-0.67	-3.24	-4.73	-4.78	PASS
11A	54Mbps	140	5700	7.79	8.2	6.9	3.95	1.36	-0.68	-3.25	-4.74	-4.78	PASS
11N 5G HT20	MCS7	100	5500	7.79	8.2	6.9	3.95	1.36	-0.7	-3.26	-4.74	-4.77	PASS
11N 5G HT20	MCS7	116	5580	7.78	8.2	6.89	3.94	1.36	-0.72	-3.28	-4.75	-4.76	PASS
11N 5G HT20	MCS7	140	5700	7.77	8.2	6.89	3.95	1.35	-0.74	-3.3	-4.76	-4.76	PASS
11N 5G HT40	MCS7	102	5510	7.76	8.2	6.88	3.96	1.36	-0.76	-3.31	-4.76	-4.75	PASS
11N 5G HT40	MCS7	110	5550	7.74	8.2	6.89	3.97	1.37	-0.77	-3.32	-4.77	-4.75	PASS
11N 5G HT40	MCS7	134	5670	7.74	8.2	6.89	3.99	1.38	-0.78	-3.32	-4.77	-4.75	PASS
11AC HT20	MCS8	100	5500	7.72	8.2	6.89	4.02	1.39	-0.79	-3.32	-4.78	-4.74	PASS
11AC HT20	MCS8	116	5580	7.71	8.2	6.89	4.03	1.4	-0.8	-3.34	-4.78	-4.74	PASS

11AC HT20	MCS8	140	5700	7.7	8.2	6.89	4.04	1.4	-0.81	-3.34	-4.78	-4.73	PASS
11AC HT40	MCS9	102	5510	7.7	8.19	6.89	4.06	1.41	-0.83	-3.35	-4.79	-4.72	PASS
11AC HT40	MCS9	110	5550	7.67	8.21	6.89	4.06	1.42	-0.83	-3.36	-4.79	-4.73	PASS
11AC HT40	MCS9	134	5670	7.66	8.2	6.91	4.09	1.43	-0.83	-3.36	-4.79	-4.73	PASS
11AC HT80	MCS9	106	5530	7.61	8.16	6.88	4.05	1.42	-0.85	-3.37	-4.8	-4.71	PASS

6 SAMPLE PICTURE

Reference attachment : Test Setup Photos_2

7 APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, BYD Precise Manufacture Co., Ltd., were founded in 2007 to provide our best service in RF, Radio consultation. Our laboratories are accredited by the following accreditation bodies according to ISO/IEC 17025 (2005) .

USA	A2LA Certificate No.: 4886.01

Copies of accreditation certificates could be inquired from our office. If you have any comments, please feel free to contact us at the following:

EMC / RF / Lab:
Tel: +86-755 8489 8888 55501
Fax: +86-755 8964 3771

--- END ---