



FCC LISTED,
REGISTRATION NUMBER:
720267
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REGISTRATION NUMBER
4621A-2

Informe de ensayo nº:
Test report No:

NIE: 54022RRF.008A1

Test report (Modification 1)

USA FCC Part 15.407 (U-NII), 15.209

CANADA RSS-247, RSS-Gen

Unlicensed National Information Infrastructure Devices. General technical requirements.

Radiated emission limits; general requirements.

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.

Identificación del objeto ensayado.....: Identification of item tested	Automotive infotainment System
Marca Trademark	Mercedes-Benz
Modelo y/o referencia tipo Model and /or type reference	NTG6 HIGH
Other identification of the product	FCC ID: T8GNTG6H / IC: 6434A-NTG6H
Final HW version	D5
Final SW version	E22.4.2
Características Features	FM, AM, DAB, USB, HDD, Bluetooth, WLAN, GNSS.
Solicitante Applicant	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH BECKER-GOERING-STR. 16; 76307 KARLSBAD GERMANY
Método de ensayo solicitado, norma.....: Test method requested, standard	USA FCC Part 15.407 10-1-16 Edition: Unlicensed National Information Infrastructure Devices. General technical requirements. Band U-NII-3 (5725 MHz – 5850 MHz). USA FCC Part 15.209 10-1-16 Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 4 (November 2014). Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General UNII Test Procedures New Rules v01r04 dated 02/05/2017. Guidance for IEEE Std 802.11ac Device Emission Testing 644545 D03 Guidance for IEEE 802.11ac v01 dated 08/14/2014. Guidance for Emissions Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v02r01 dated 10/31/2013. ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Resultado Summary	IN COMPLIANCE
Aprobado por (nombre / cargo y firma) Approved by (name / position & signature)	Rafael López Martín LAB EMC Manager
Fecha de realización Date of issue	2017-12-27
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Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

DEKRA Testing and Certification is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

DEKRA Testing and Certification is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: ISED 4621A-2.

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DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

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The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
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4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Testing and Certification internal document PODT000.

Usage of samples

Samples undergoing test have been selected by: **the client**

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
54022/020	Automotive infotainment System	NTG6 HIGH	A 167 900 04 03	2017-09-26
54022/049	CAN Box	NTG6 HMI-CAN	H0034755	2017-09-26
54022/053	Harness	---	---	2017-09-26
54022/050	Double Ethernet cable	---	---	2017-09-26
54022/043	Tel/GPS/VIP antenna	---	---	2017-09-26
54022/021	Dual BT/WLAN antenna	---	---	2017-09-26
54022/022	BT/WLAN antenna	---	---	2017-09-26
54022/038	BT/WLAN antenna	---	---	2017-09-26

- Sample S/01 has undergone following test(s).
All radiated tests indicated in appendix A.

Sample S/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
54022/020	Automotive infotainment System	NTG6 HIGH	A 167 900 04 03	2017-09-26
54022/049	CAN Box	NTG6 HMI-CAN	H0034755	2017-09-26
54022/053	Harness	---	---	2017-09-26
54022/050	Double Ethernet cable	---	---	2017-09-26

- Sample S/02 has undergone following test(s).
All conducted tests indicated in appendix A.

Test sample description

The test sample (AIO) consists of an automotive head unit to be installed in cars with the following features: FM, AM, DAB, TX, USB, HDD, Bluetooth, WLAN and GNSS.

Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
BECKER-GOERING-STR. 16; 76307 KARLSBAD GERMANY

Testing period

The performed test started on 2017-10-20 and finished on 2017-11-27.

The tests have been performed at DEKRA Testing and Certification.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

In the semianechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 1 Ω

Modifications to the reference test report

It was introduced the following modifications in respect to the test report number 54022RRF.008 related with the same samples, in the next clauses and sub-clauses:

Clauses / Sub-clauses	Modification	Justification
Appendix A/ 15.407 (a) (3) - RSS 247 Clause 6.2.4.1 Test.	Added the conducted output power in MiMo mode.	TCB request
Appendix A/ 15.407 Subclause (b) (4) - RSS 247 Clause 6.2.4.2 Test.	Added the sentence with the chips that can be working at the same time.	TCB request
Appendix A/ 15.407 Subclause (b) (4) - RSS 247 Clause 6.2.4.2 Test.	Modified the sentence to the modes used to verify the impact of the co-location interfaces radios.	TCB request

This modification test report cancels and replaces the test report 54022RRF.008.

Remarks and comments

- 1; The tests have been performed by the technical personnel: Pedro Parada, Carlos Alberto Contreras, José Carlos Luque.
- 2: The compliance is checked through a description of how this requirement is met that is provided by the applicant.
- 3: Used instrumentation:

Conducted Measurements

	Last Cal. date	Cal. due date
1. Signal Analyzer R&S FSQ 8	2016/06	2018/06
2. DC power supply R&S NGPE 40/40	2014/11	2017/11

Radiated Measurements

	Last Cal. date	Cal. due date
1. Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2. BiconicalLog antenna ETS LINDGREN 3142E	2017/07	2020/04
3. Multi Device Controller EMCO 2090	N.A.	N.A.
4. Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2016/11	2019/11
5. Broadband Horn antenna 18-40 GHz SCHWARZBECK BBHA 9170	2017/03	2020/03
6. EMI Test Receiver R&S ESU 40	2016/03	2018/03
7. Spectrum analyser Rohde & Schwarz FSW50	2015/12	2017/12
8. RF pre-amplifier 20 MHz- 6 GHz BLNA 0360-01N BONN ELEKTRONIK	2017/07	2018/07
9. RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-1M	2016/02	2018/02
10. RF pre-amplifier 18-40 GHz BONN ELEKTRONIK BLMA 1840-1M	2015/12	2017/12

Testing verdicts

Not applicable	N/A
Pass	P
Fail	F
Not measured	N/M

1. 5.725 GHz – 5.85 GHz Band

FCC PART 15 PARAGRAPH		VERDICT			
		NA	P	F	NM
15.407 (a) (3) / RSS 247 Clause 6.2.4.1	Power limits. Maximum output power		P		
15.407 (a) (3) / RSS 247 Clause 6.2.4.1	Maximum power spectral density		P		
15.407 (b) (4), (7) / RSS 247 Clause 6.2.4.2	Radiated Band-edge emissions compliance (Transmitter).		P		
15.407 (e) / RSS 247 Clause 6.2.4.1	6 dB bandwidth.		P		
15.407 (b) (4), (6), (7) / RSS 247 Clause 6.2.4.2	Undesirable radiated emissions (Transmitter)		P		
15.407 (g)	Frequency stability				NM ²

2: See remarks and comments.

2. Common requirements for all bands

FCC PART 15 PARAGRAPH		VERDICT			
		NA	P	F	NM
15.407 (c)	Transmission in case of absence of information to transmit, or operational failure.				NM ²

2: See remarks and comments.

Appendix A – Test result for 5.725 GHz – 5.85 GHz band

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TEST CONDITIONS

Power supply (V):
 $V_{\text{nominal}} = 12.6 \text{ Vdc}$

Type of power supply = External power supply (Battery).
Type of antenna: External antenna.
Declared Gain for antenna RF port 1/2 (maximum) = +3.2 dBi. (Antenna gain plus antenna cable loss)
Declared Gain for antenna RF port 3 (maximum) = +0.9 dBi. (Antenna gain plus antenna cable loss)
Declared Gain for antenna RF port 4 (maximum) = +2.3 dBi. (Antenna gain plus antenna cable loss)

Operating frequencies in the sub-band 5.725-5.85 GHz.

-For IEEE 802.11a, the equipment uses channels 149, 157, 165.

-For IEEE 802.11n, there are two bandwidths:

For 20 MHz bandwidth the equipment uses channels 149, 157, 165.
For 40 MHz bandwidth the equipment uses channels 151, 159.

-For IEEE 802.11ac, there are three bandwidths:

For 20 MHz bandwidth the equipment uses channels 149, 157, 165.
For 40 MHz bandwidth the equipment uses channels 151, 159.
For 80 MHz bandwidth the equipment uses channel 155.

TEST FREQUENCIES:

For WiFi a/n20/ac20:

Lowest channel (149): 5745 MHz

Middle channel (157): 5785 MHz

Highest channel (165): 5825 MHz

For WiFi n40/ac40:

Lowest channel (151): 5755 MHz

Highest channel (159): 5795 MHz

For WiFi ac80:

Middle channel (155): 5775 MHz

The test set-up was made in accordance to the general provisions of ANSI C63.10: 2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04 dated 02/05/2017 and FCC KDB 662911 D01 Multiple Transmitter Output v02r01 dated 10/31/2013.

For radio testing purposes the card was installed in a test fixture. The test fixture is connected to a laptop computer and dc power supplied. The laptop computer was used to configure the EUT to continuously transmit at a specified output power with different modes and modulation schemes.

The data rates of 6Mb/s for 802.11a, HT0 (SISO) for 802.11n20/ac20 and n40/ac40, and VHT0 (SISO) for 802.11ac80 were selected based on preliminary testing that identified those rates corresponding to the worst cases for output power and spurious levels at the band edges.

The field strength at the band edges was evaluated for each mode and on each chain individually on the lowest and highest channels at the rated power for the channel under test. Where the power at the edge channels was lower than the power at the center channels additional measurements were made at the adjacent channels.

It was necessary to change between WLAN 0-CORE 0 with antenna 3, WLAN1-CORE 0 with antenna 1 or 2, WLAN1-CORE 1 with antenna 4 and WLAN 0-CORE 2 (CORE 0+CORE 1) with antenna 1 and 4 (MiMo Configuration).

WIFI FCC:

```
tx_test.sh -a wlan0 stop
```

WLAN 0:

a20 - Core0

```
tx_test.sh -a wlan0 149 0 -d x -r 6 20
```

```
tx_test.sh -a wlan0 157 0 -d x -r 6 20
```

```
tx_test.sh -a wlan0 165 0 -d x -r 6 20
```

n20 - Core0

```
tx_test.sh -a wlan0 149 0 -d x -h 0 20
```

```
tx_test.sh -a wlan0 157 0 -d x -h 0 20
```

```
tx_test.sh -a wlan0 165 0 -d x -h 0 20
```

n40 - Core0

```
tx_test.sh -a wlan0 153 0 -d x -h 0 40
```

```
tx_test.sh -a wlan0 161 0 -d x -h 0 40
```

ac80 - Core0

```
tx_test.sh -a wlan0 161 0 -d x -v 0 80
```

WLAN 1:

```
tx_test.sh -a wlan1 stop
```

a20 - Core0

```
tx_test.sh -a wlan1 149 0 -d x -r 6 20
```

```
tx_test.sh -a wlan1 157 0 -d x -r 6 20
```

```
tx_test.sh -a wlan1 165 0 -d x -r 6 20
```

n20 - Core0

```
tx_test.sh -a wlan1 149 0 -d x -h 0 20
```

```
tx_test.sh -a wlan1 157 0 -d x -h 0 20
```

```
tx_test.sh -a wlan1 165 0 -d x -h 0 20
```

n40 - Core0

```
tx_test.sh -a wlan1 153 0 -d x -h 0 40
```

```
tx_test.sh -a wlan1 161 0 -d x -h 0 40
```

ac80 - Core0

```
tx_test.sh -a wlan1 161 0 -d x -v 0 80
```

a20 - Core1

```
tx_test.sh -a wlan1 149 0 -d x -r 6 20
```

```
tx_test.sh -a wlan1 157 0 -d x -r 6 20
```

```
tx_test.sh -a wlan1 165 0 -d x -r 6 20
```

n20 - Core1

```
tx_test.sh -a wlan1 149 1 -d x -h 0 20
```

```
tx_test.sh -a wlan1 157 1 -d x -h 0 20
```

```
tx_test.sh -a wlan1 165 1 -d x -h 0 20
```

n40 - Core1

```
tx_test.sh -a wlan1 153 1 -d x -h 0 40
```

```
tx_test.sh -a wlan1 161 1 -d x -h 0 40
```

ac80 - Core1

```
tx_test.sh -a wlan1 161 1 -d x -v 0 80
```

a20 – Core2

```
tx_test.sh -a wlan1 149 2 -d x -r 6 20
```

```
tx_test.sh -a wlan1 157 2 -d x -r 6 20
```

```
tx_test.sh -a wlan1 165 2 -d x -r 6 20
```

n20 – Core2

```
tx_test.sh -a wlan1 149 2 -d x -h 0 20
```

```
tx_test.sh -a wlan1 157 2 -d x -h 0 20
```

```
tx_test.sh -a wlan1 165 2 -d x -h 0 20
```

n40 – Core2

```
tx_test.sh -a wlan1 153 2 -d x -h 0 40
```

```
tx_test.sh -a wlan1 161 2 -d x -h 0 40
```

ac80 – Core2

```
tx_test.sh -a wlan1 161 2 -d x -v 0 80
```

CONDUCTED MEASUREMENTS

The equipment under test was set up in a shielded room and it is connected to the spectrum analyzer using low loss RF cables with sma type connectors. The reading in the spectrum analyzer is corrected taking into account the cable loss.



RADIATED MEASUREMENTS

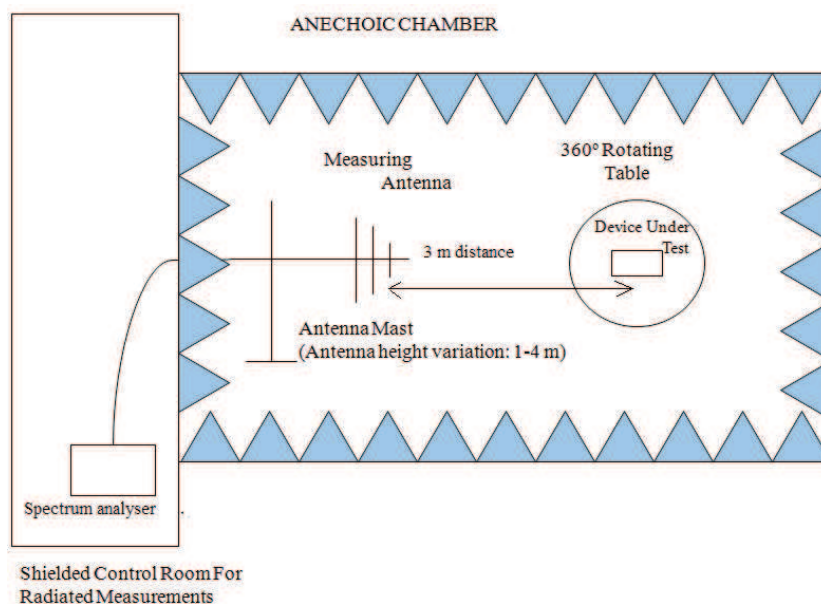
All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 1m for the frequency range 1 GHz-40 GHz (1 GHz-18 GHz Double ridge horn antenna and 18 GHz-40 GHz horn antenna).

For radiated emissions in the range 1 GHz-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

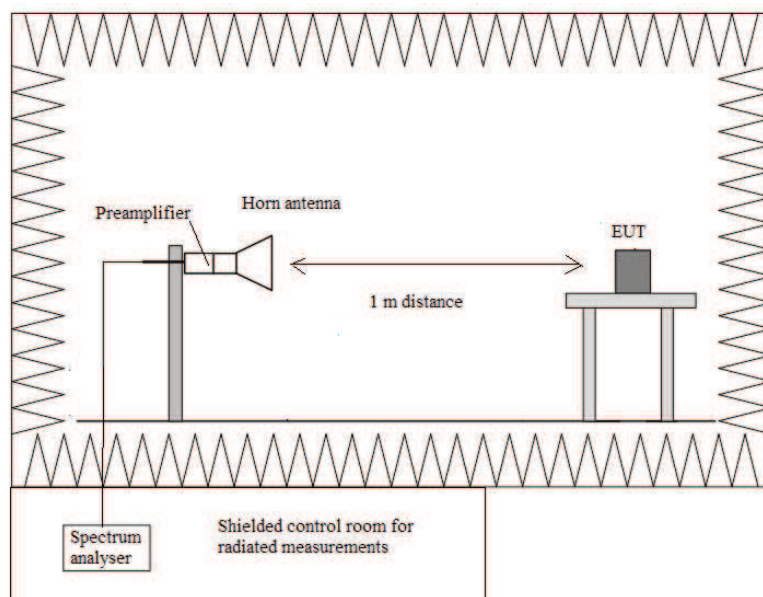
The equipment under test was set up on a non-conductive (wooden) platform one meter above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360°.

Measurements were made in both horizontal and vertical planes of polarization.

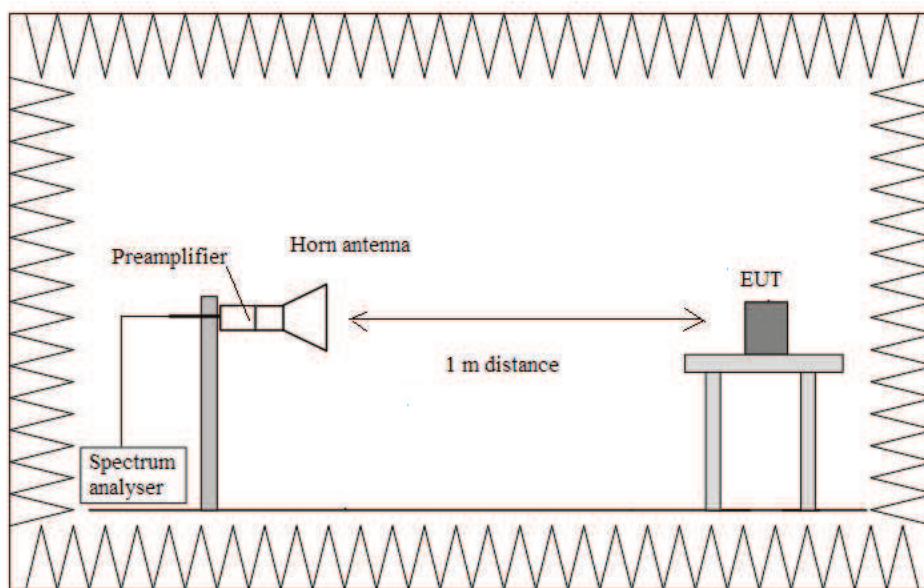
Radiated measurements setup $f < 1$ GHz.



Radiated measurements setup $f > 1$ GHz up to 18 GHz.



Radiated measurements setup $f > 18$ GHz up to 40 GHz.



99 % and 26 dB Bandwidth

RESULTS

WLAN1-CORE 0 – Antenna RF port 3:

SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.320	17.200	17.240
26 dB bandwidth (MHz)	21.730	21.474	21.681
Measurement uncertainty (kHz)	<±230		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	18.480	18.280	18.240
26 dB bandwidth (MHz)	22.179	21.794	21.923
Measurement uncertainty (kHz)	<±230		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
99% bandwidth (MHz)	36.500	36.500
26 dB bandwidth (MHz)	40.481	40.513
Measurement uncertainty (kHz)	<±530	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
99% bandwidth (MHz)	75.200
26 dB bandwidth (MHz)	82.980
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 0 – Antenna RF External port 2:
SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.160	17.120	17.160
26 dB bandwidth (MHz)	21.629	21.538	21.602
Measurement uncertainty (kHz)	<±230		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	18.320	18.400	18.400
26 dB bandwidth (MHz)	21.987	22.115	22.179
Measurement uncertainty (kHz)	<±230		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
99% bandwidth (MHz)	36.300	36.400
26 dB bandwidth (MHz)	40.353	40.288
Measurement uncertainty (kHz)	<±530	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
99% bandwidth (MHz)	75.840
26 dB bandwidth (MHz)	82.212
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 1 – Antenna RF port 4:
SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.080	17.080	17.080
26 dB bandwidth (MHz)	21.498	21.667	21.602
Measurement uncertainty (kHz)	<±230		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	18.440	18.240	18.280
26 dB bandwidth (MHz)	22.170	21.987	22.180
Measurement uncertainty (kHz)	<±230		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
99% bandwidth (MHz)	36.400	36.400
26 dB bandwidth (MHz)	40.224	35.449
Measurement uncertainty (kHz)	<±530	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
99% bandwidth (MHz)	75.840
26 dB bandwidth (MHz)	82.278
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 2 (CORE 0+CORE 1) – Antenna RF port 1 and 4:

MIMO mode:

1. 802.11a mode (see next plots).

Port 1:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.120	17.200	17.200
26 dB bandwidth (MHz)	21.595	21.666	21.666
Measurement uncertainty (kHz)	<±230		

Port 4:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.000	17.040	17.040
26 dB bandwidth (MHz)	21.666	21.859	21.923
Measurement uncertainty (kHz)	<±230		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Port 1:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	18.400	18.440	18.400
26 dB bandwidth (MHz)	22.115	22.243	22.298
Measurement uncertainty (kHz)	<±230		

Port 4:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
99% bandwidth (MHz)	17.920	17.880	17.880
26 dB bandwidth (MHz)	21.602	21.666	21.602
Measurement uncertainty (kHz)	<±230		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Port 1:

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
99% bandwidth (MHz)	36.400	36.400
26 dB bandwidth (MHz)	40.865	40.737
Measurement uncertainty (kHz)	<±530	

Port 4:

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
99% bandwidth (MHz)	36.200	36.200
26 dB bandwidth (MHz)	39.904	39.775
Measurement uncertainty (kHz)	<±530	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

Port 1:

	Frequency 5775 MHz
99% bandwidth (MHz)	75.960
26 dB bandwidth (MHz)	82.276
Measurement uncertainty (kHz)	<±630

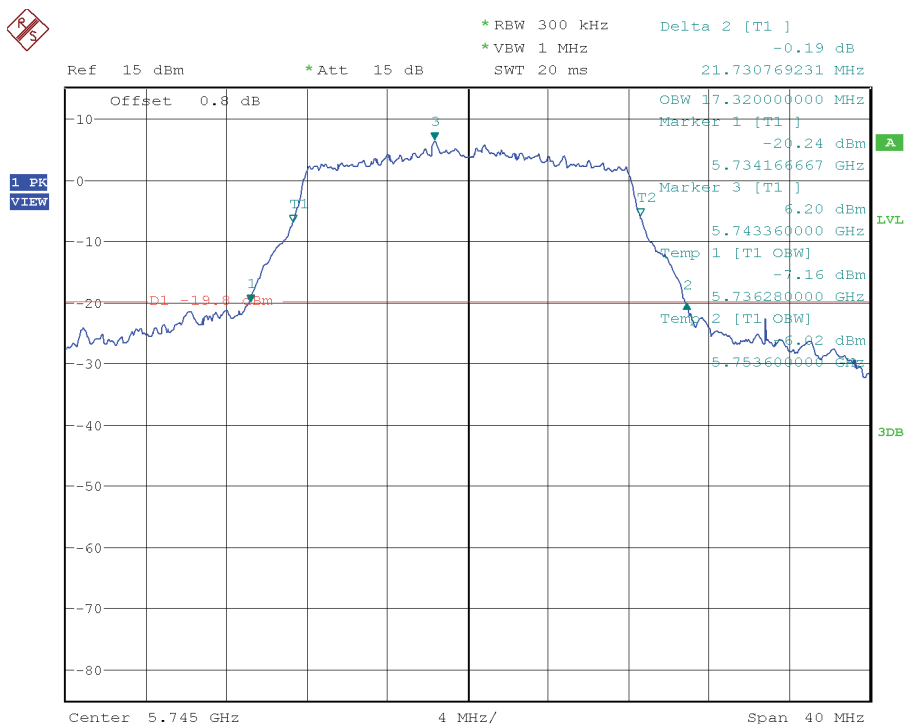
Port 4:

	Frequency 5775 MHz
99% bandwidth (MHz)	75.200
26 dB bandwidth (MHz)	81.891
Measurement uncertainty (kHz)	<±630

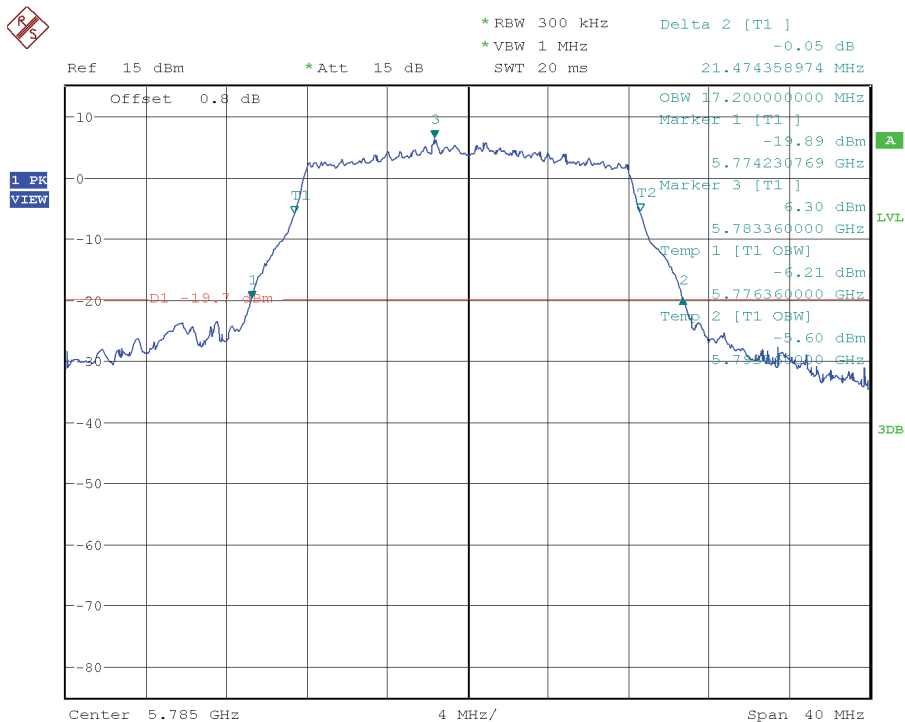
WLAN1-CORE 0 – Antenna RF port 3:

802.11a mode

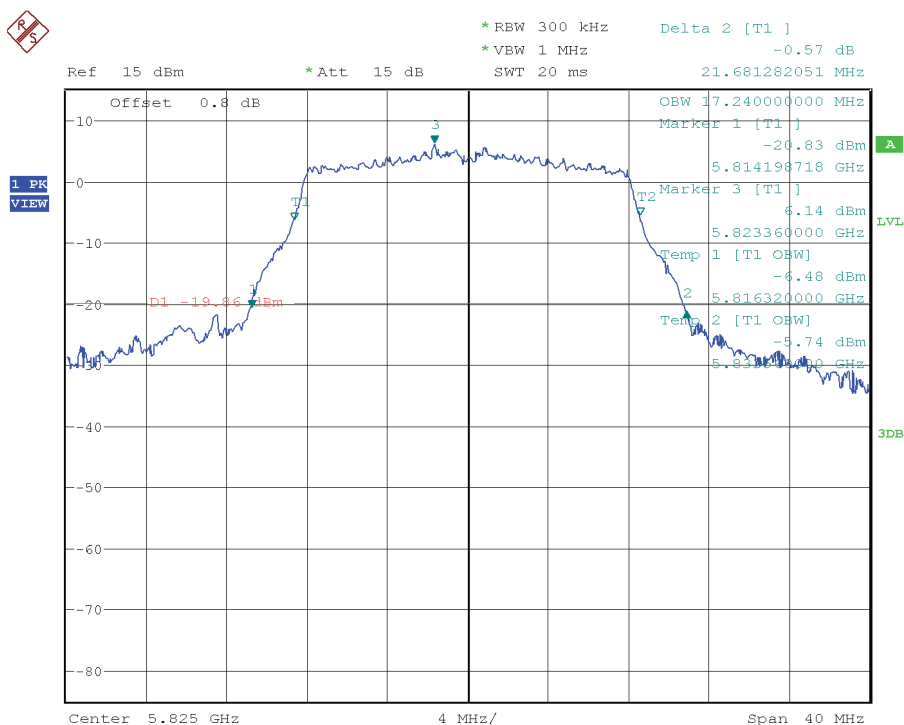
Lowest Channel



Middle Channel

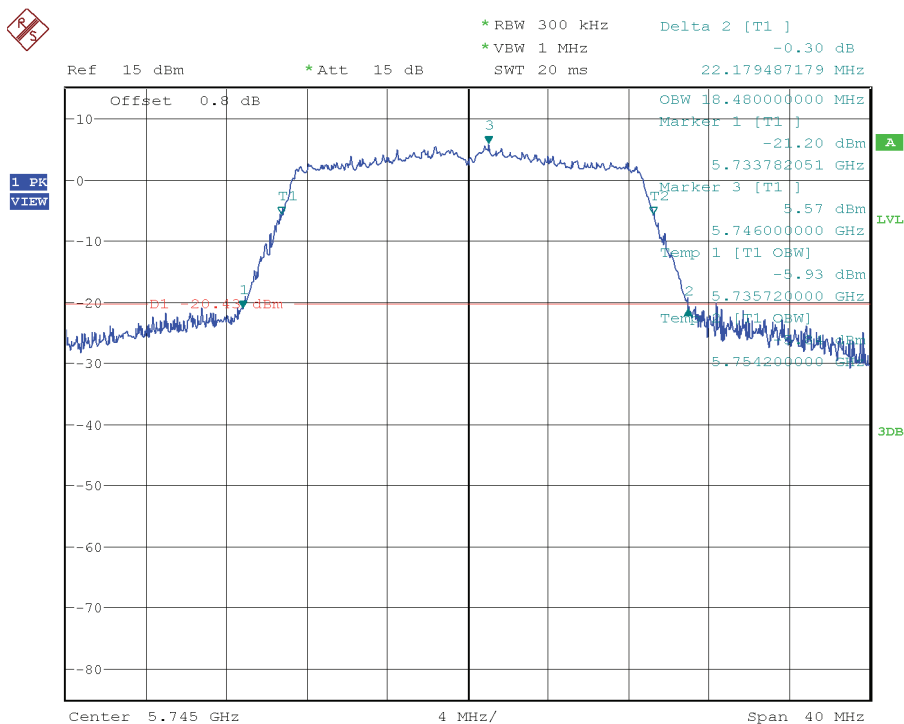


Highest Channel

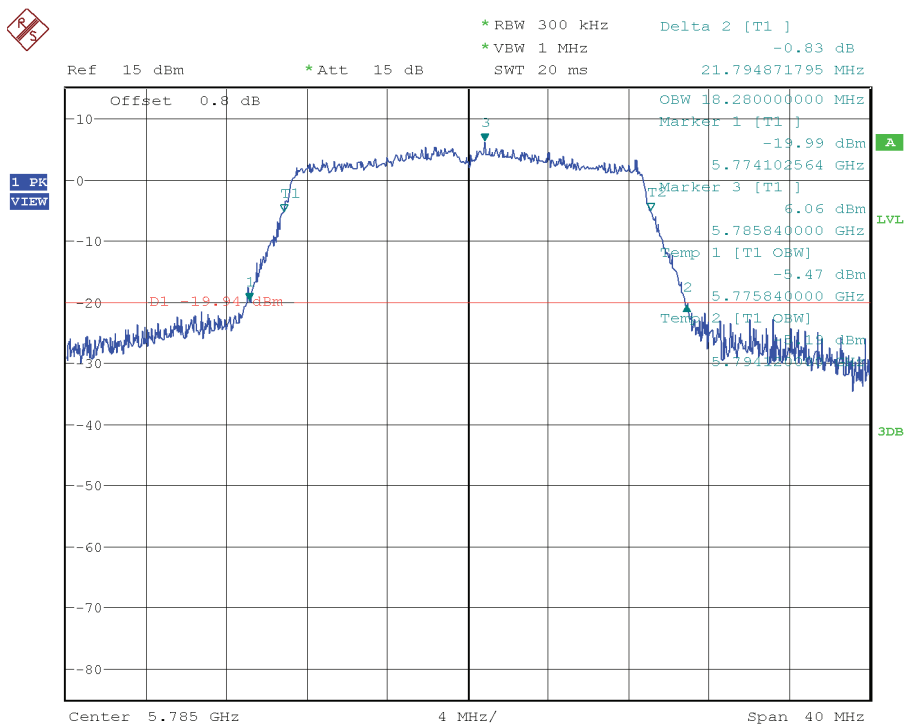


802.11 n20 MHz and 802.11 ac 20 MHz modes

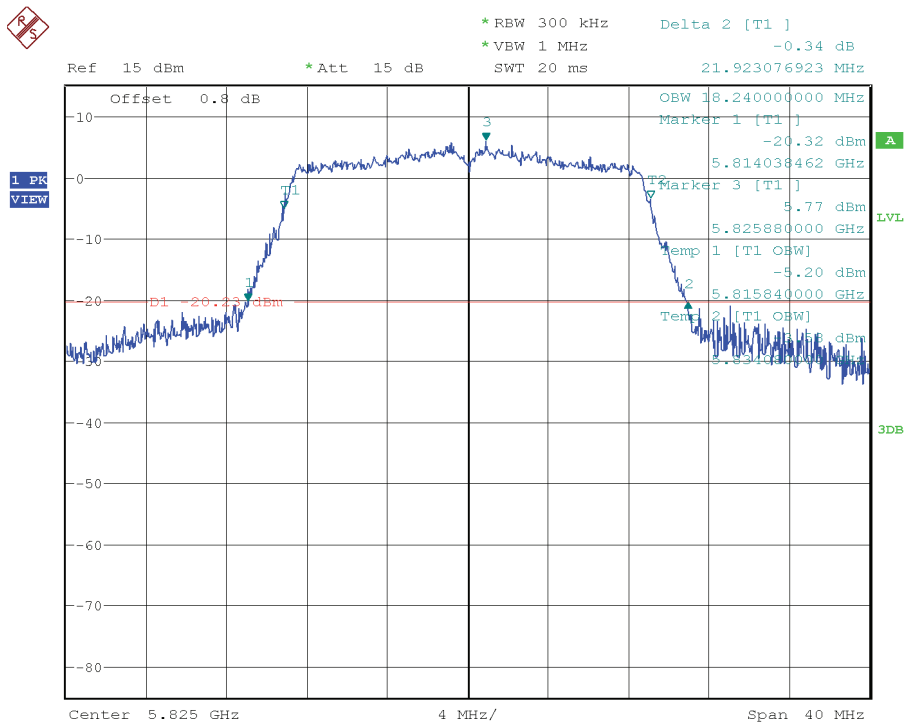
Lowest Channel



Middle Channel

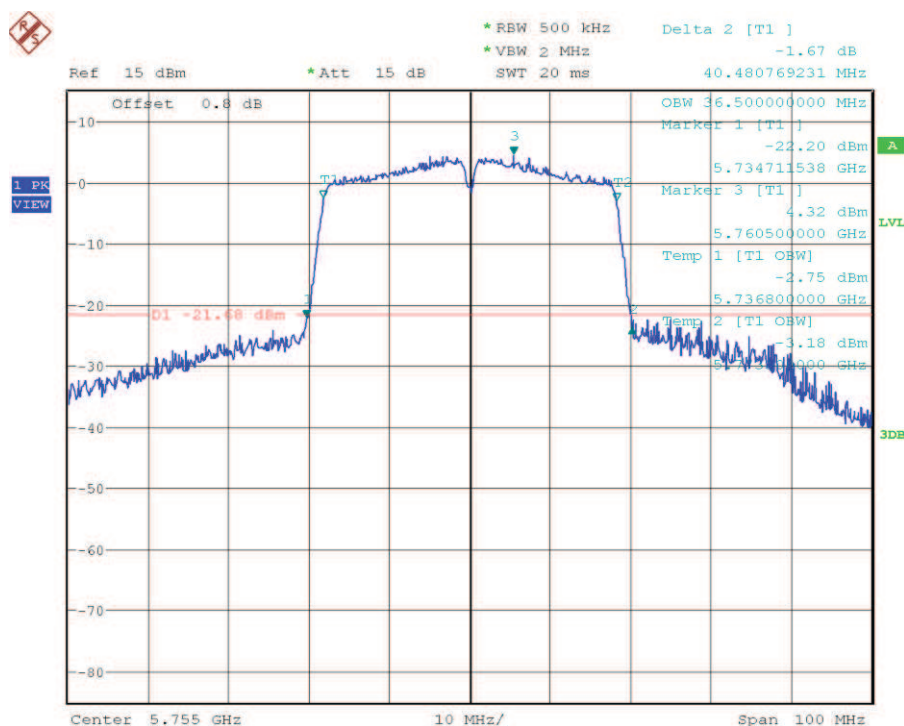


Highest Channel

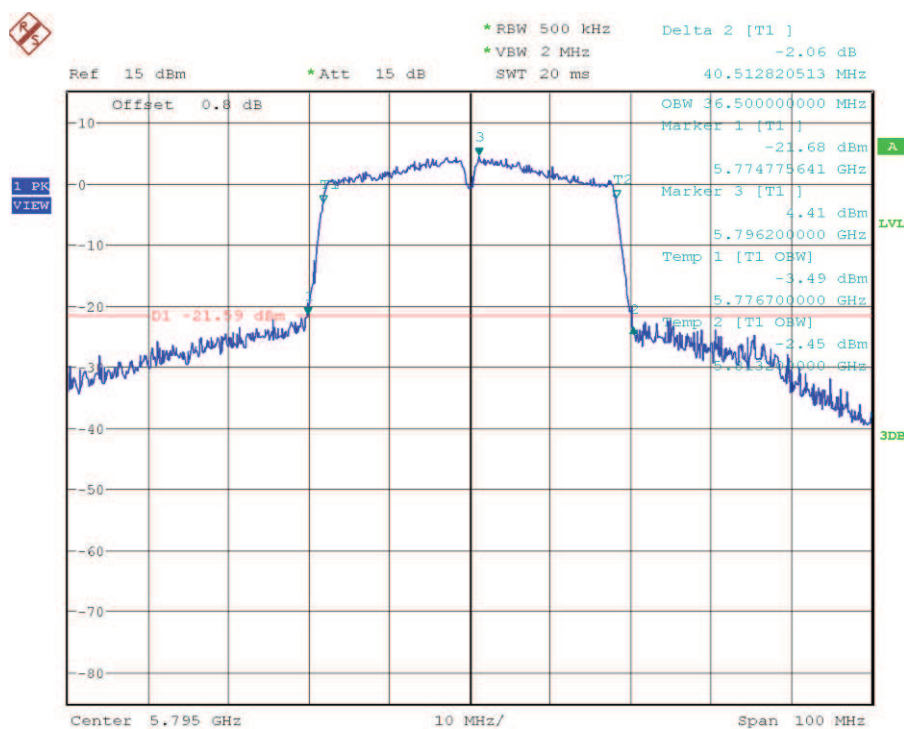


802.11 n40 MHz and 802.11 ac 40 MHz modes

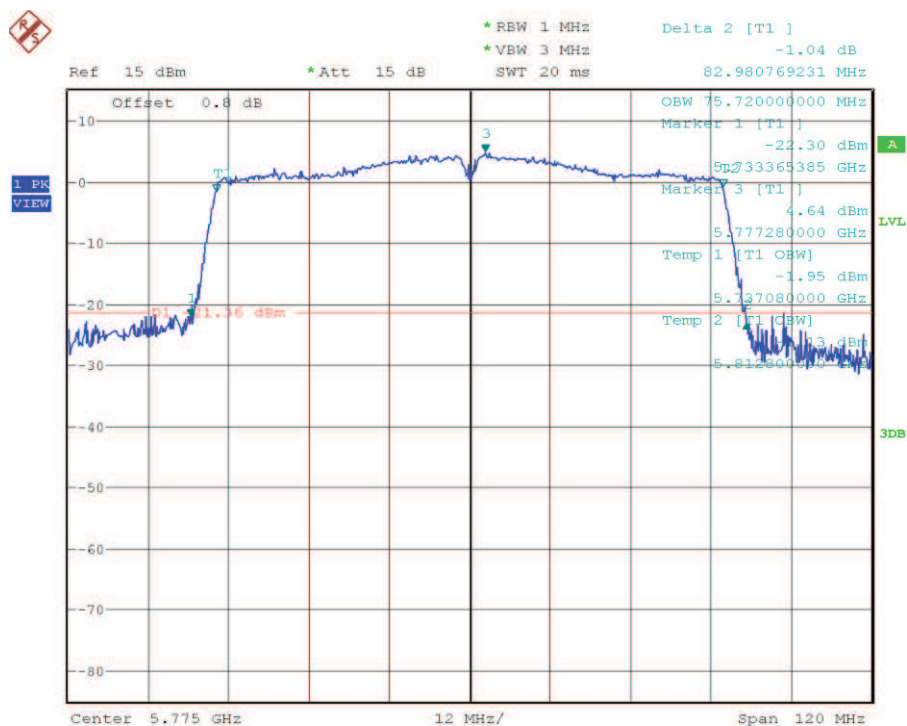
Lowest Channel



Highest Channel



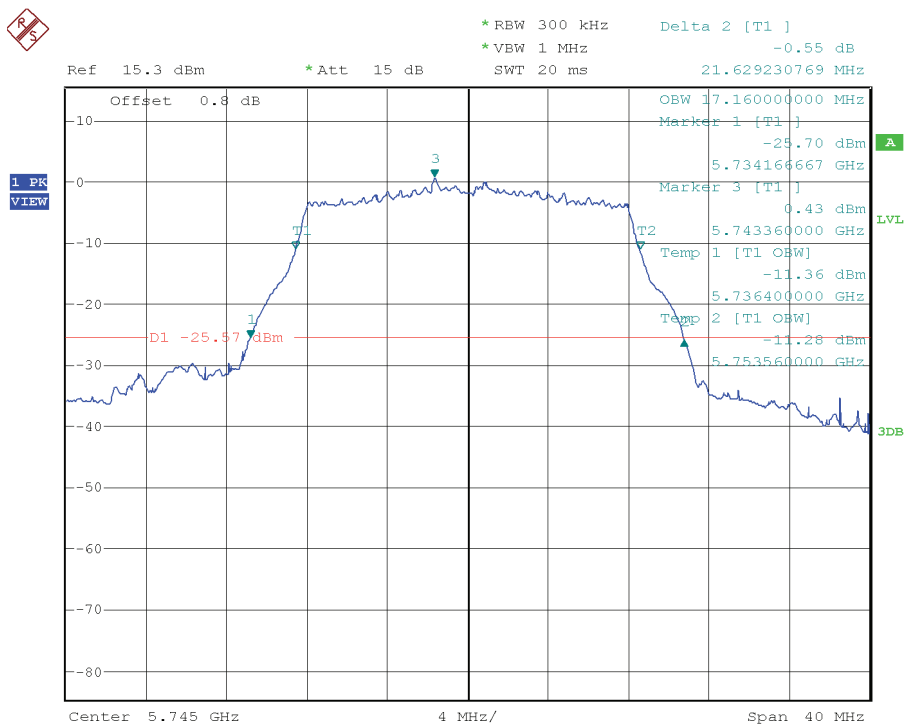
802.11 ac 80 MHz mode



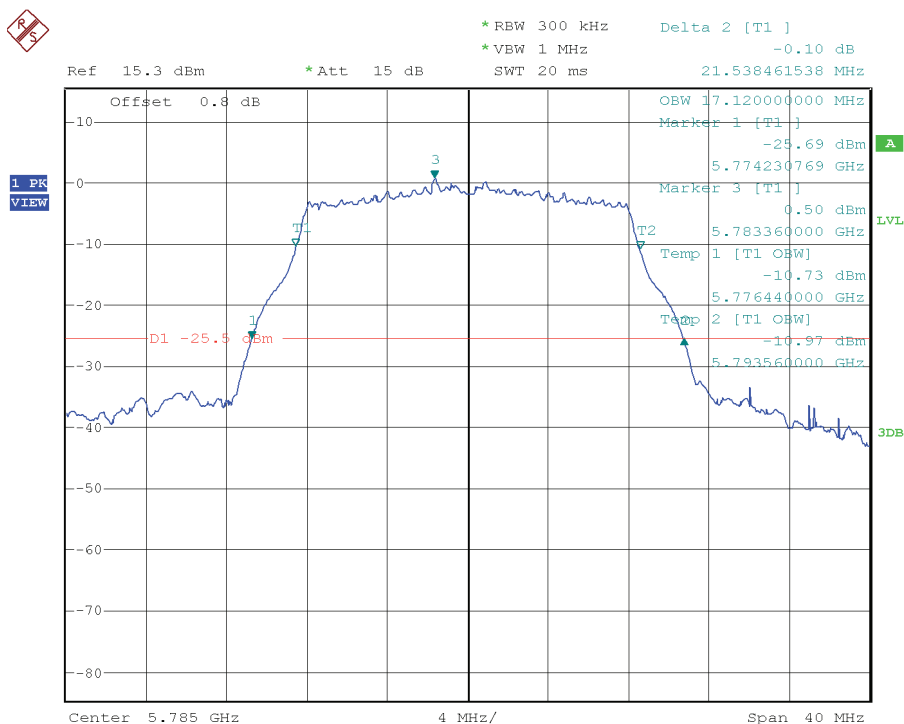
WLAN0-CORE 0 – Antenna RF External port 2:

802.11a mode

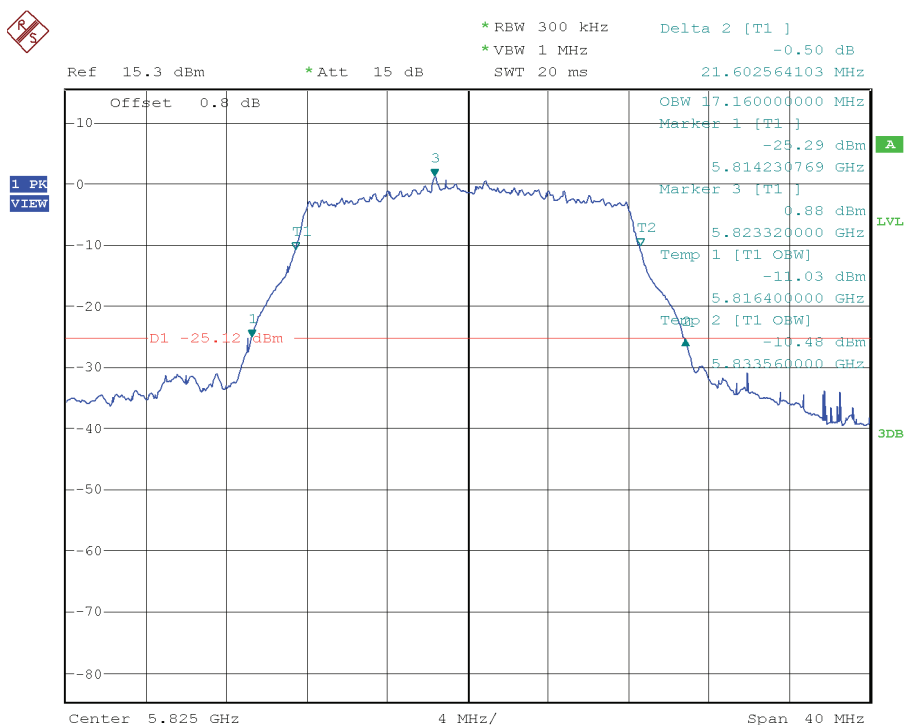
Lowest Channel



Middle Channel

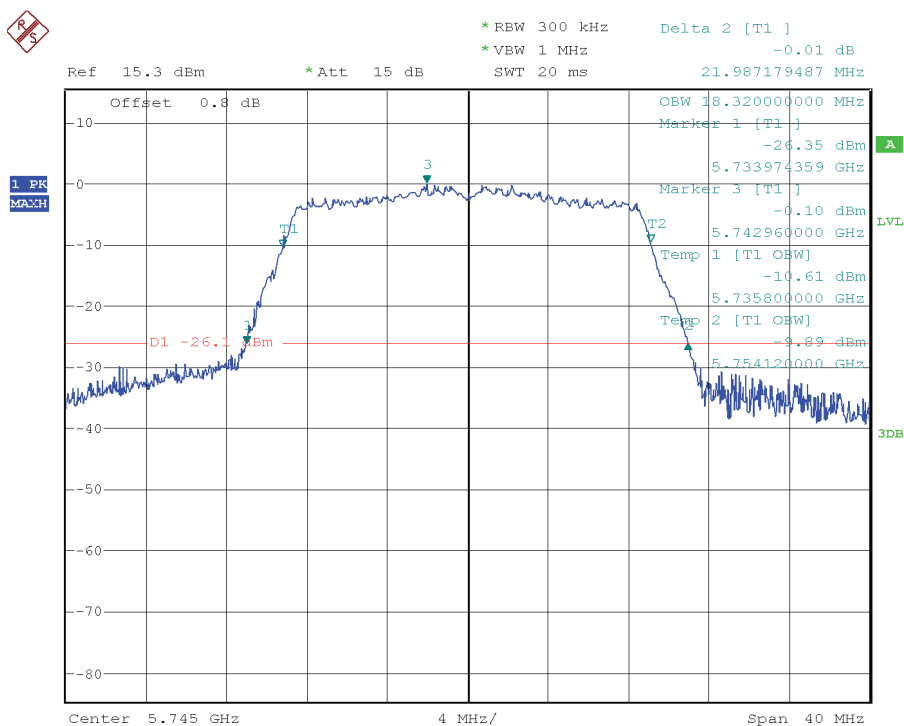


Highest Channel

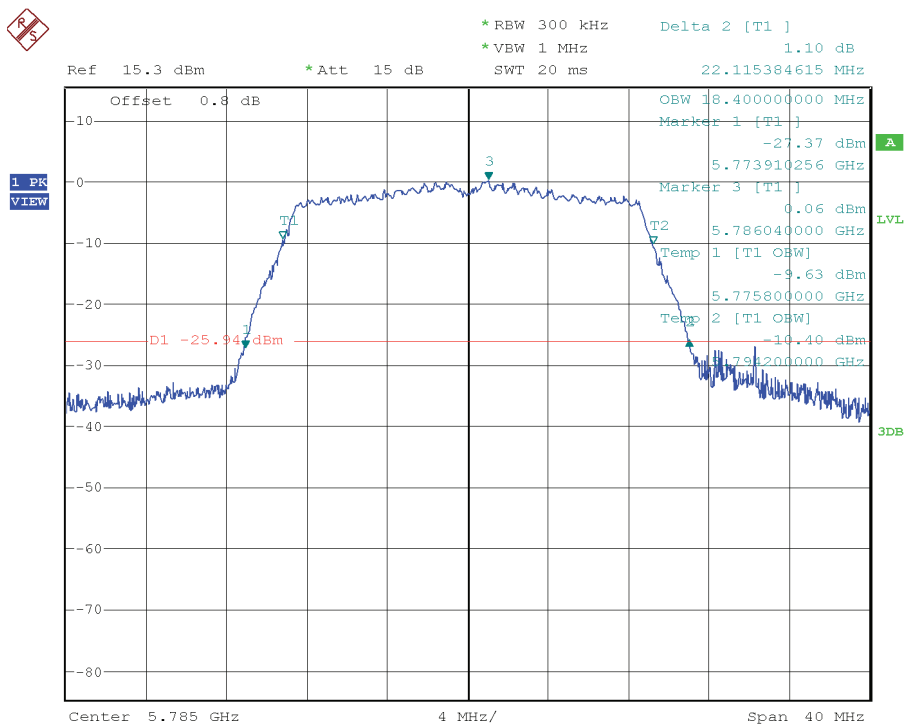


802.11 n20 MHz and 802.11 ac 20 MHz modes

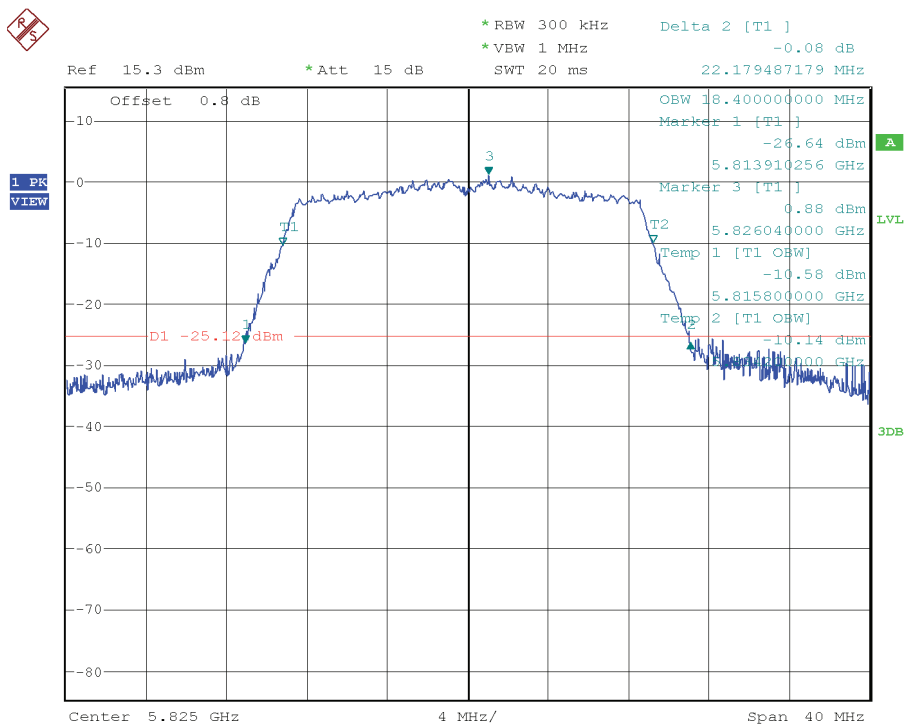
Lowest Channel



Middle Channel

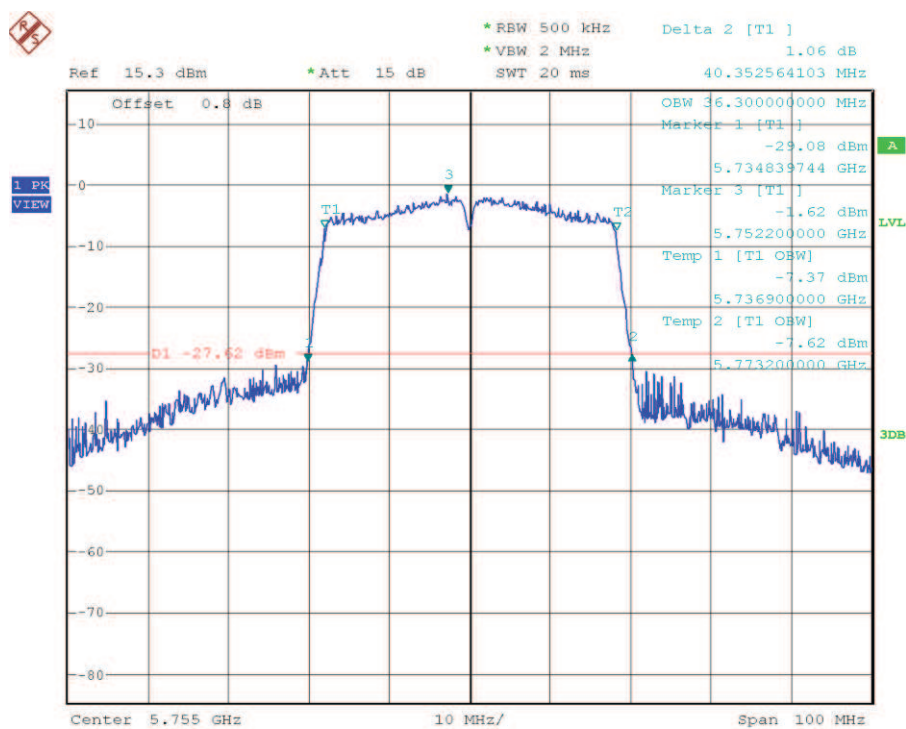


Highest Channel

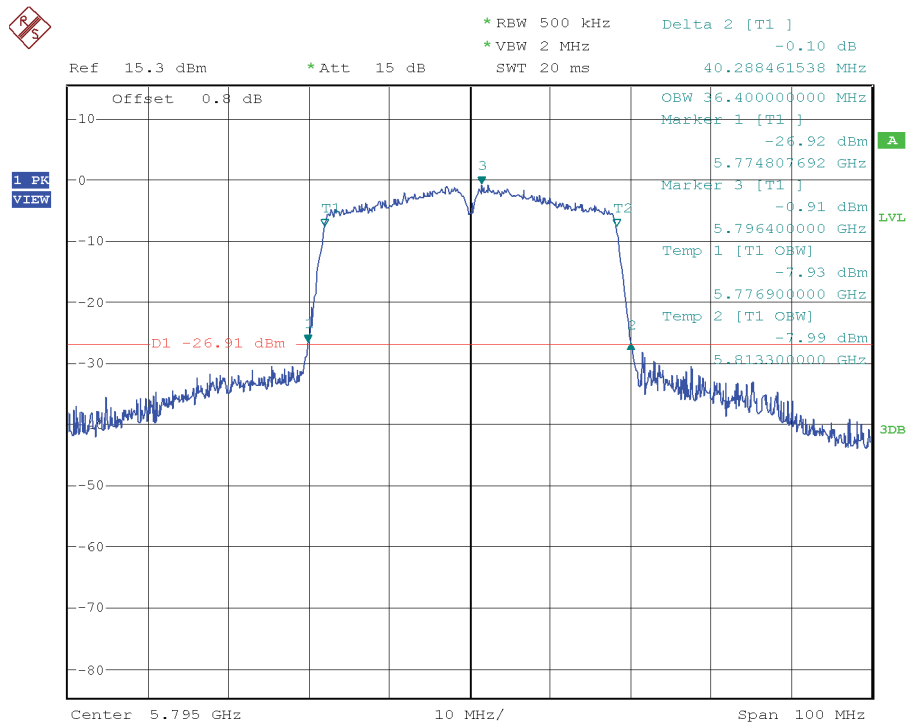


802.11 n40 MHz and 802.11 ac 40 MHz modes

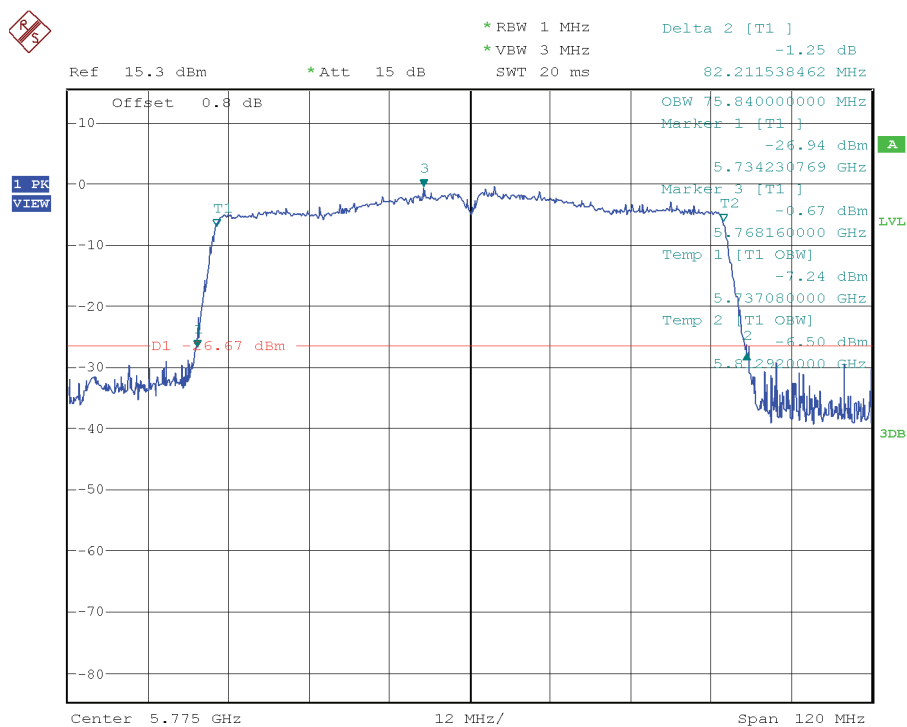
Lowest Channel



Highest Channel



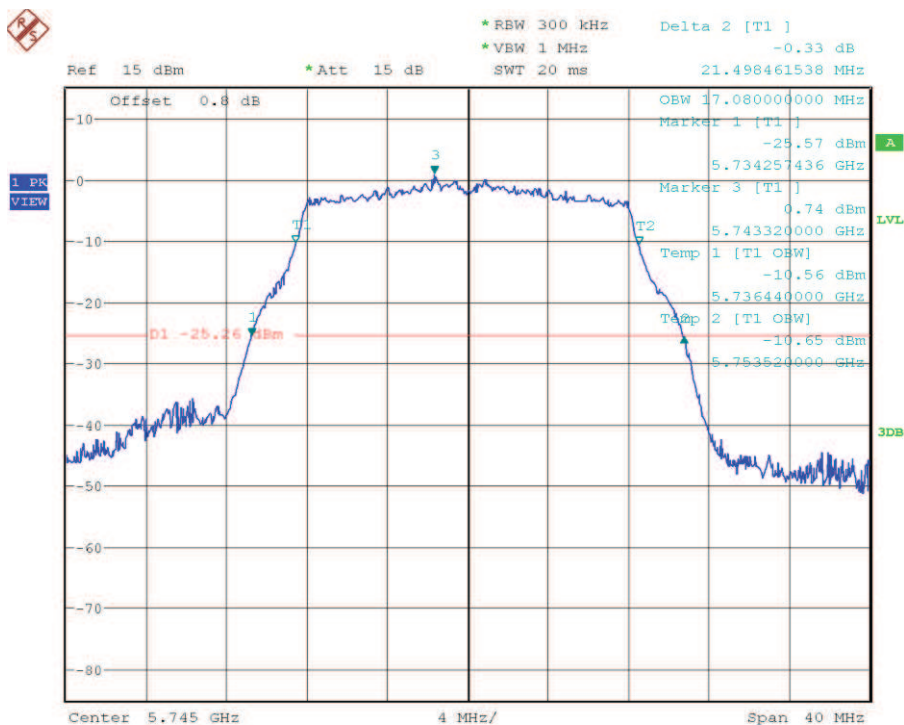
802.11 ac 80 MHz mode



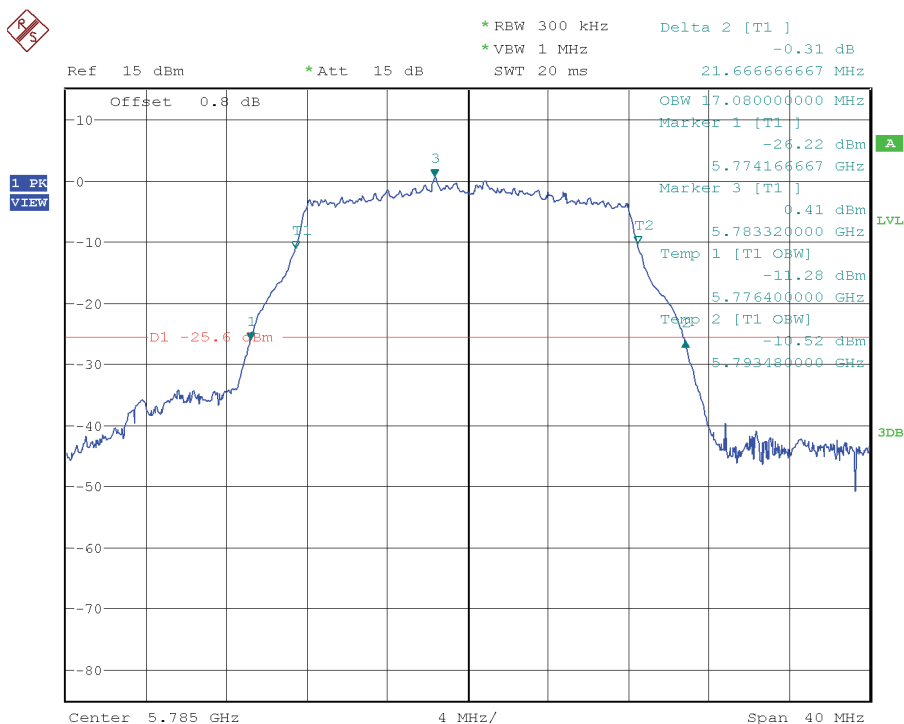
WLAN0-CORE 1 – Antenna RF port 4:

802.11a mode

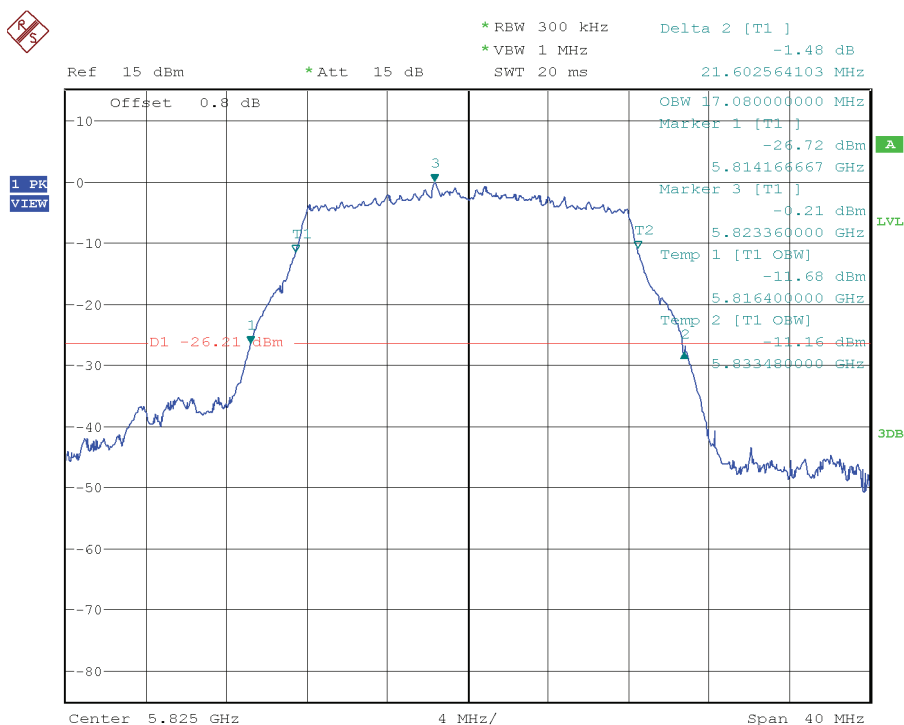
Lowest Channel



Middle Channel

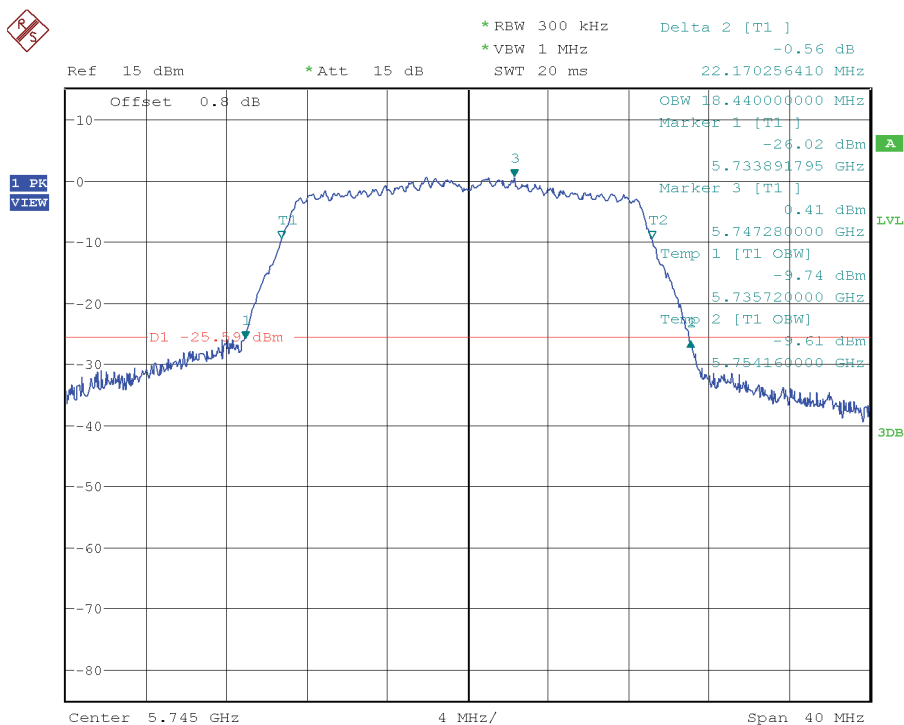


Highest Channel

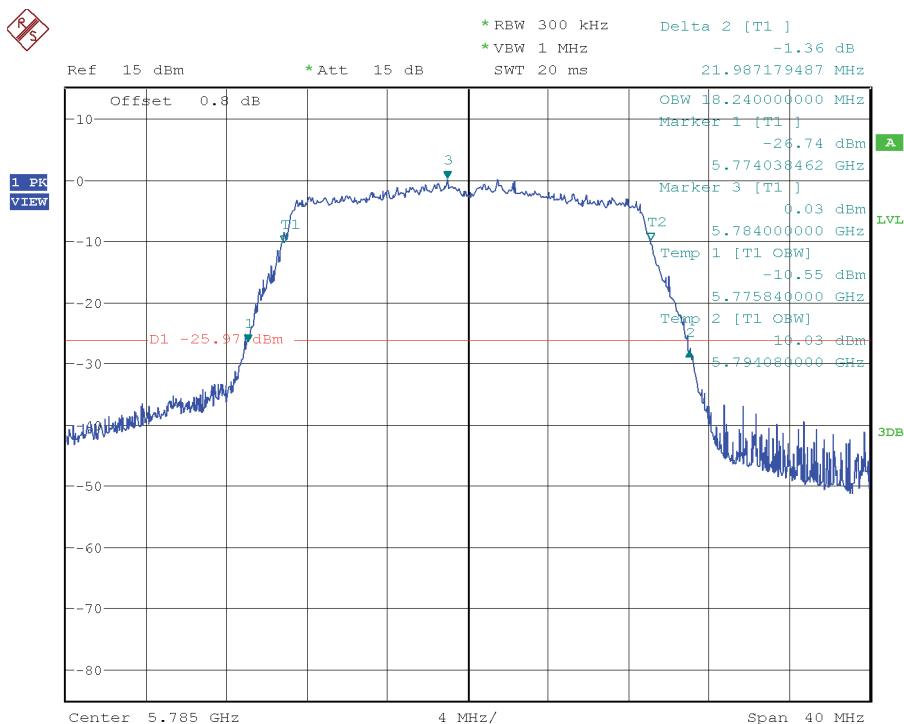


802.11 n20 MHz and 802.11 ac 20 MHz modes

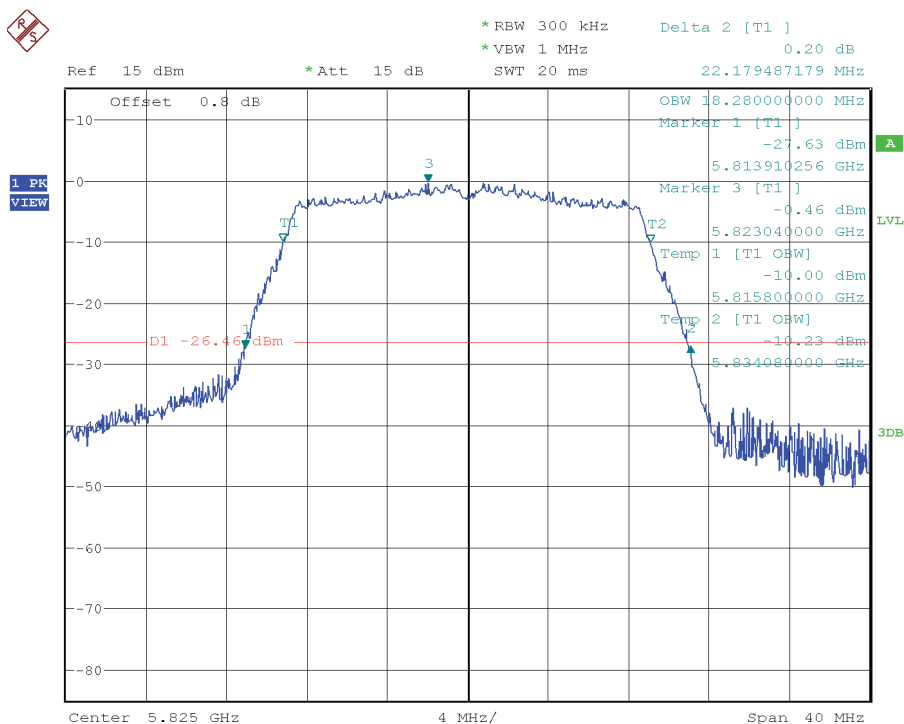
Lowest Channel



Middle Channel

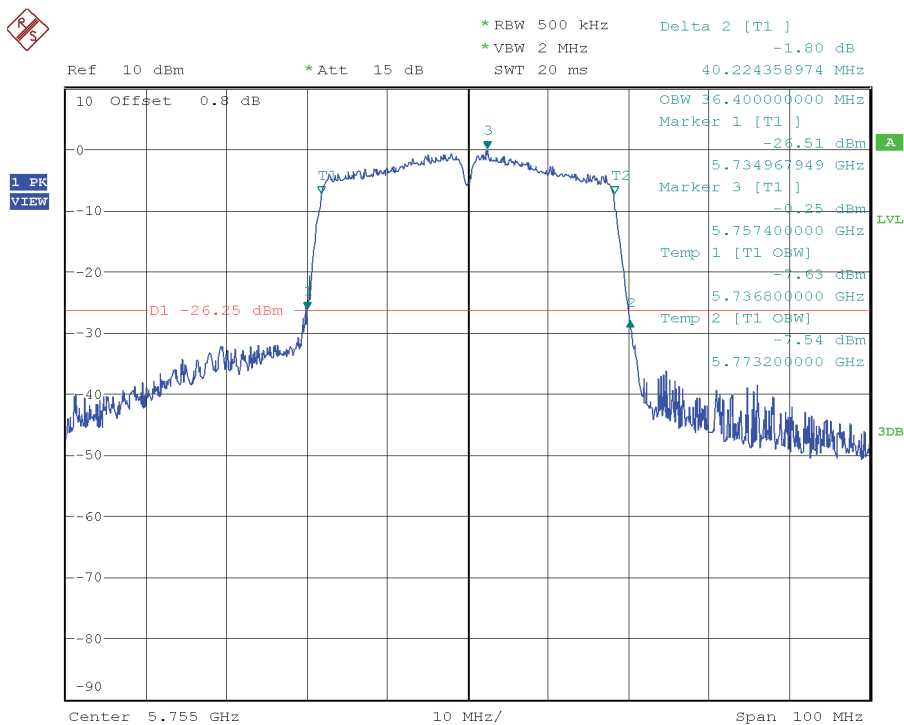


Highest Channel

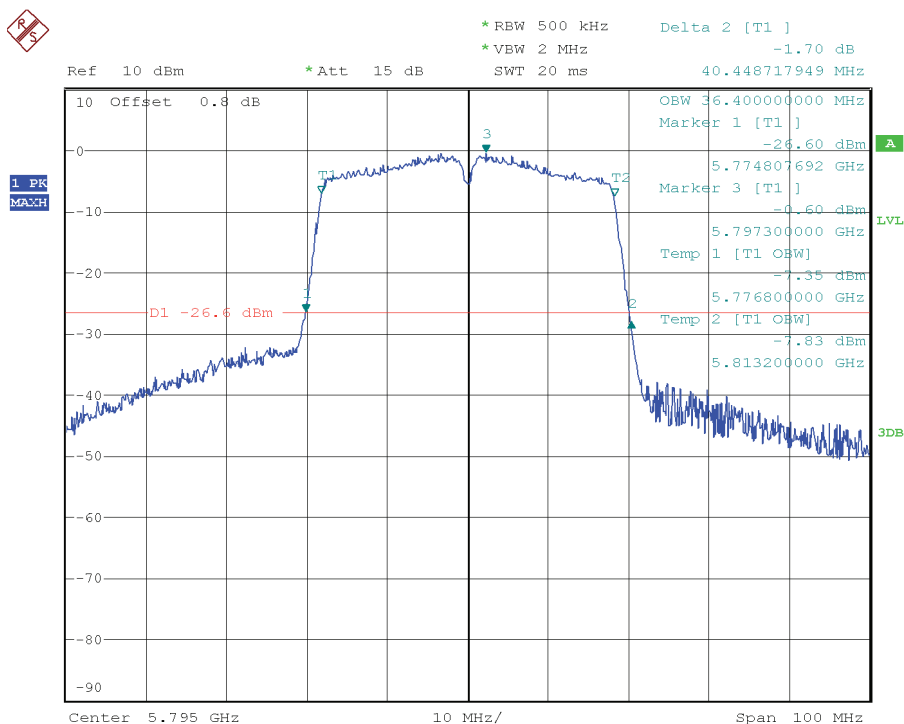


802.11 n40 MHz and 802.11 ac 40 MHz modes

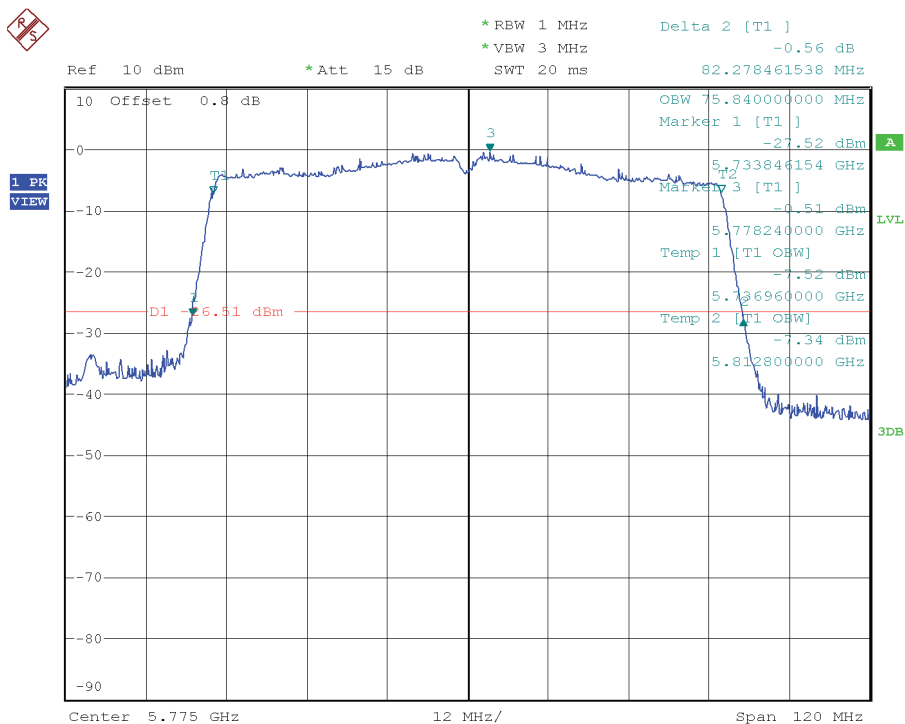
Lowest Channel



Highest Channel



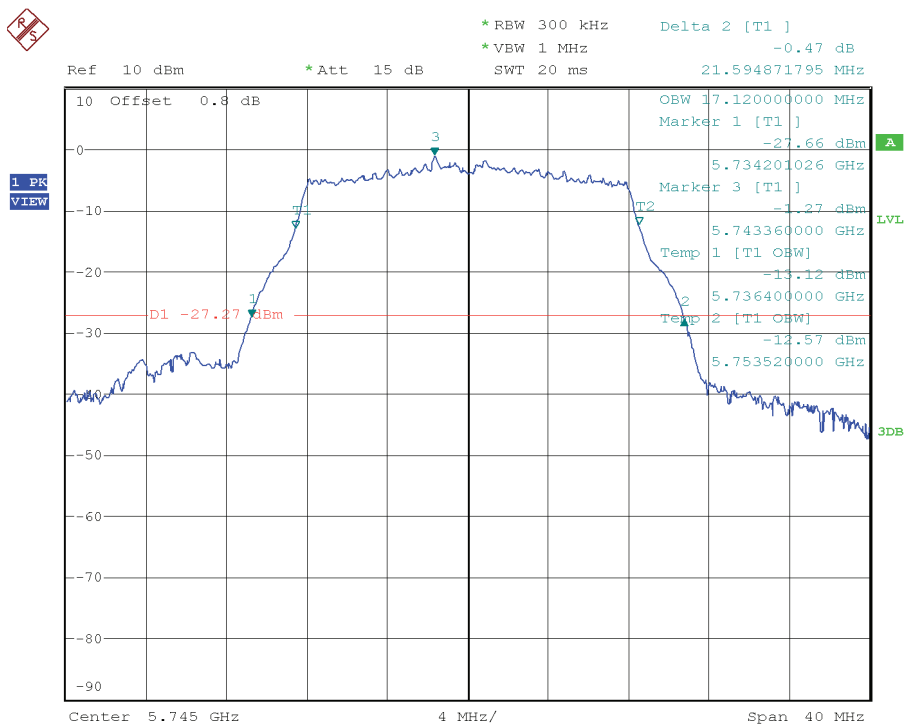
802.11 ac 80 MHz mode



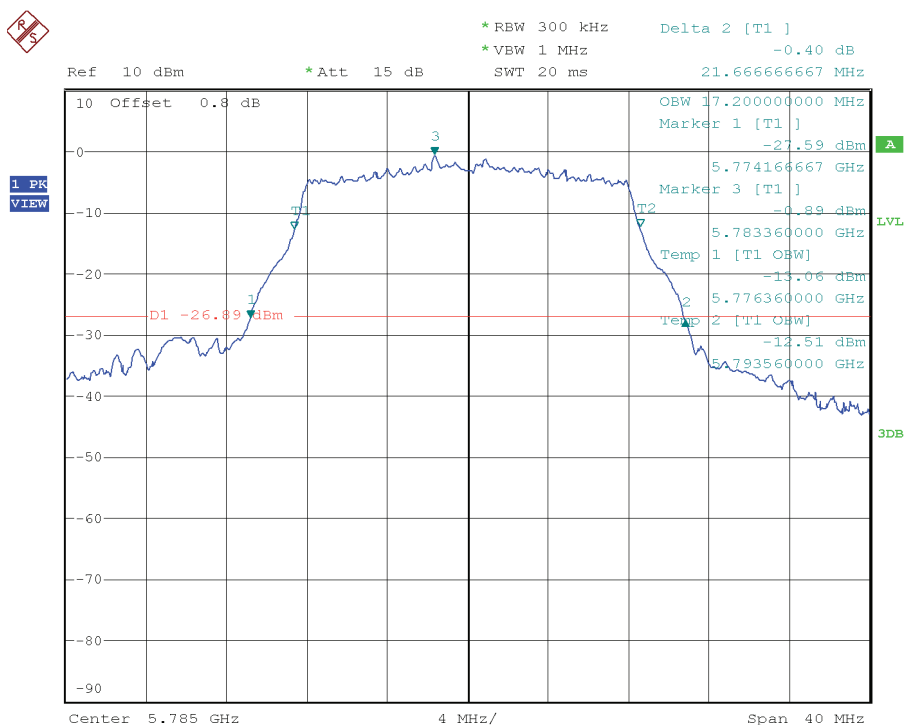
WLAN0-CORE 2 (CORE 0+CORE 1) – Antenna RF port 1 and 4:

802.11a mode Port 1

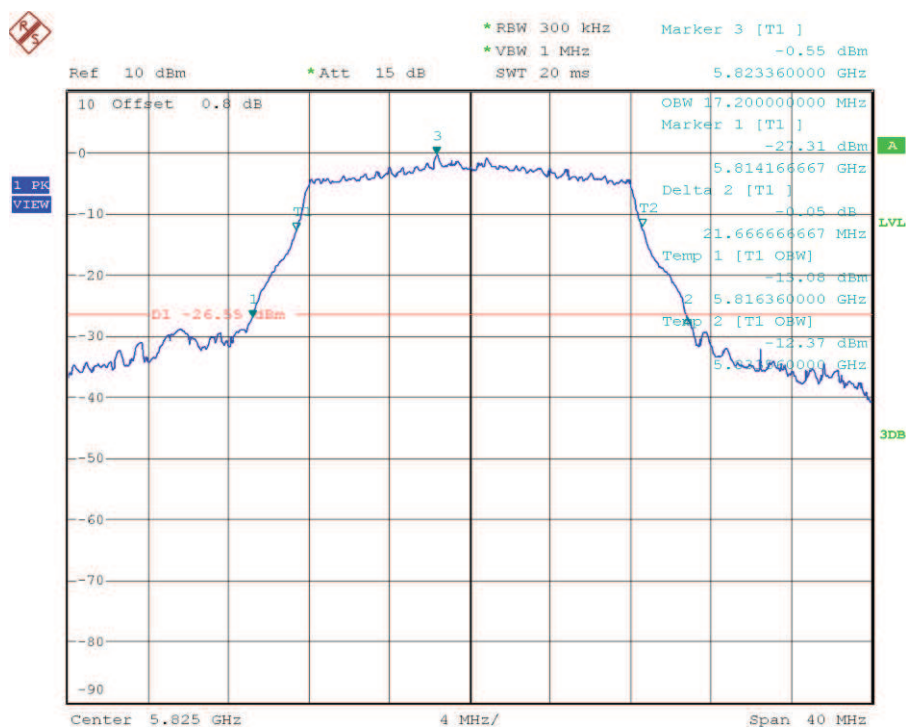
Lowest Channel



Middle Channel

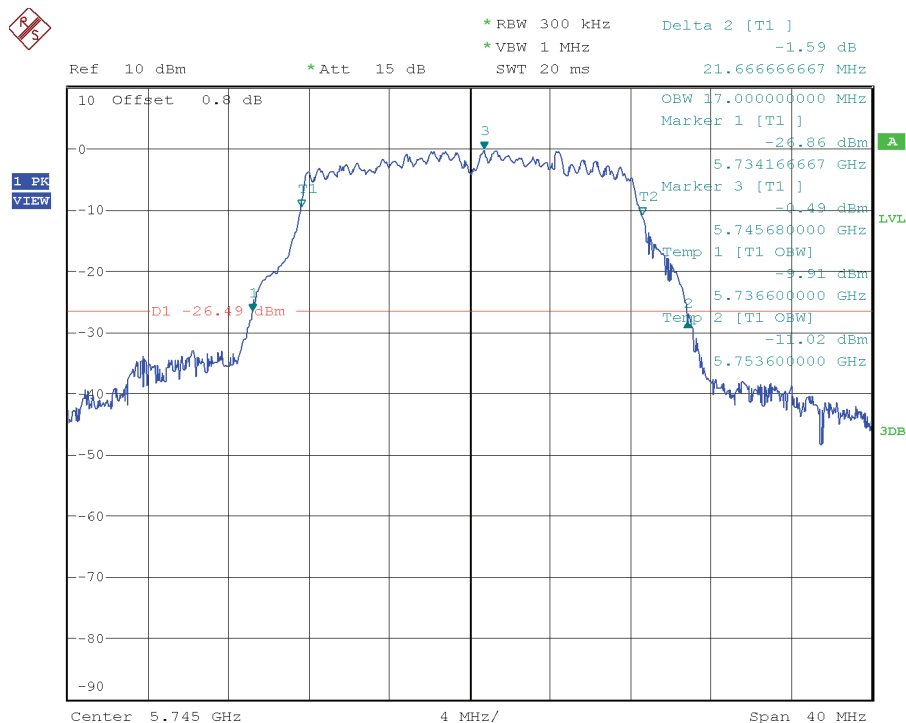


Highest Channel

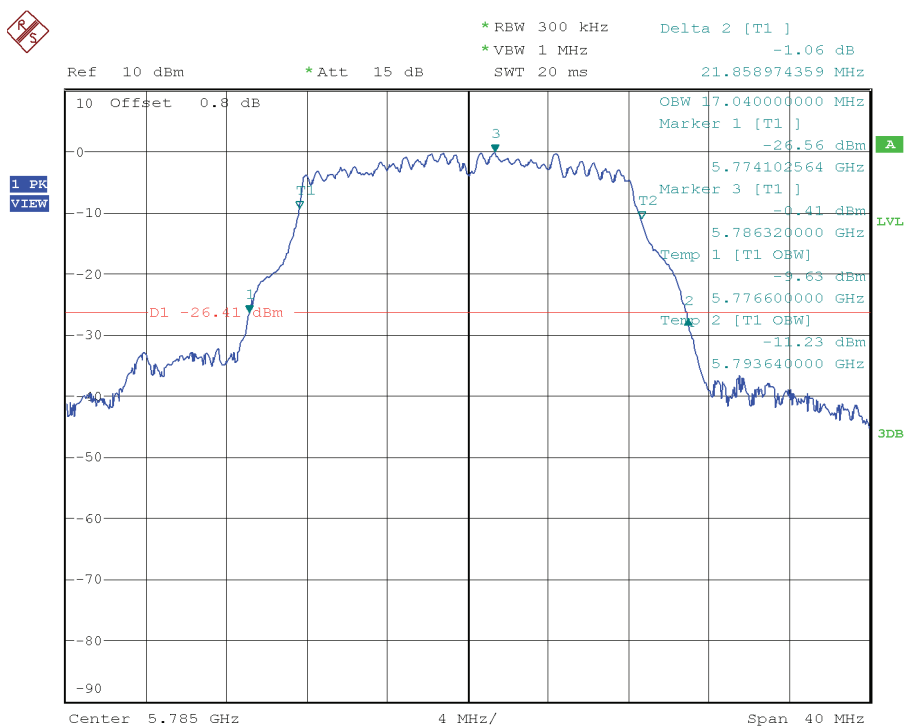


802.11a mode Port 4

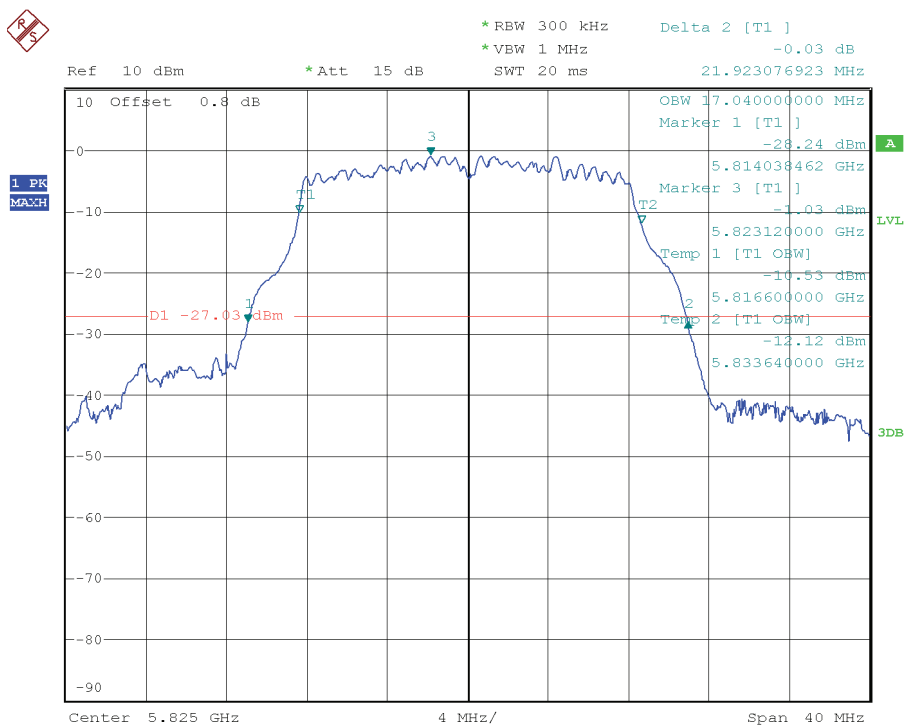
Lowest Channel



Middle Channel

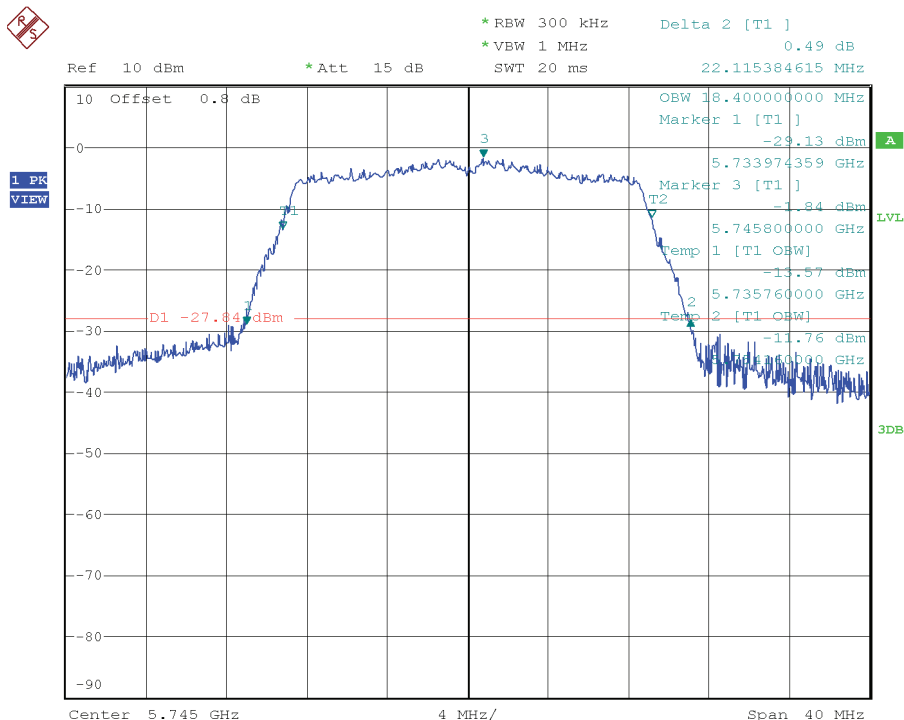


Highest Channel

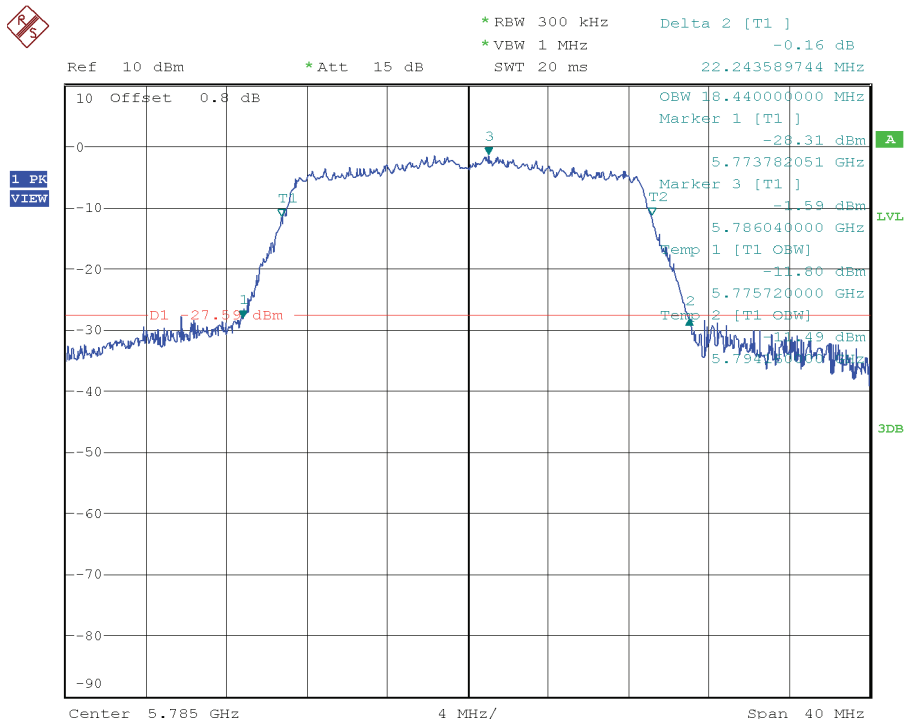


802.11 n20 MHz and 802.11 ac 20 MHz modes Port 1

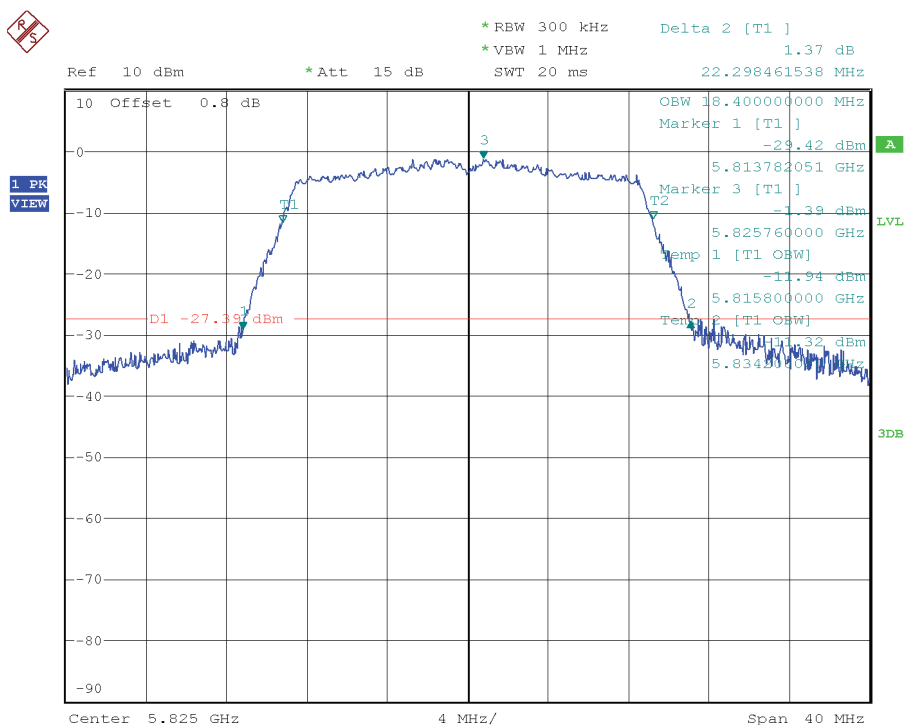
Lowest Channel



Middle Channel

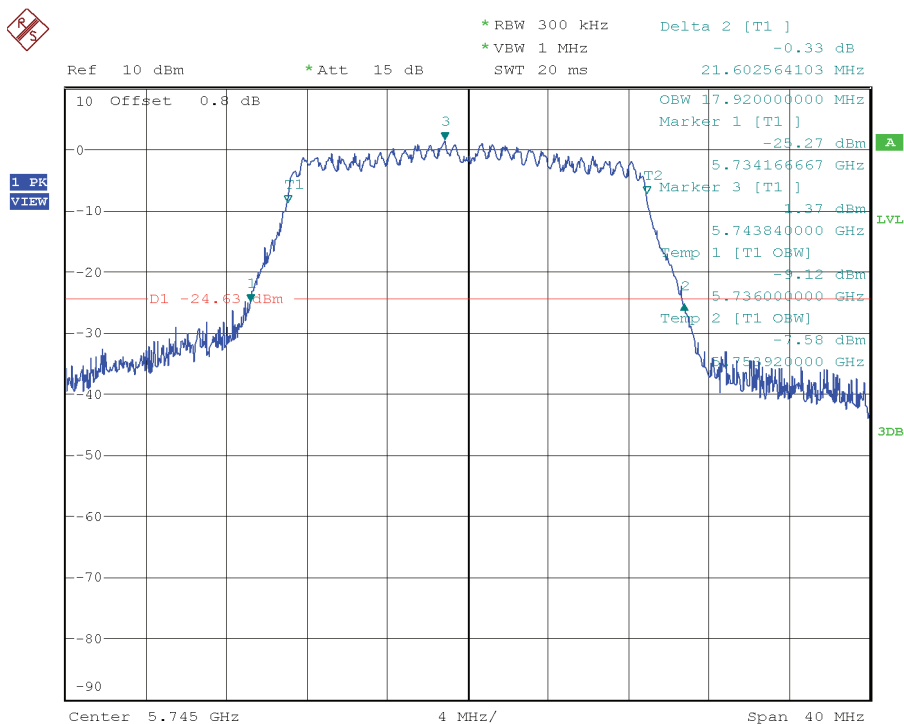


Highest Channel

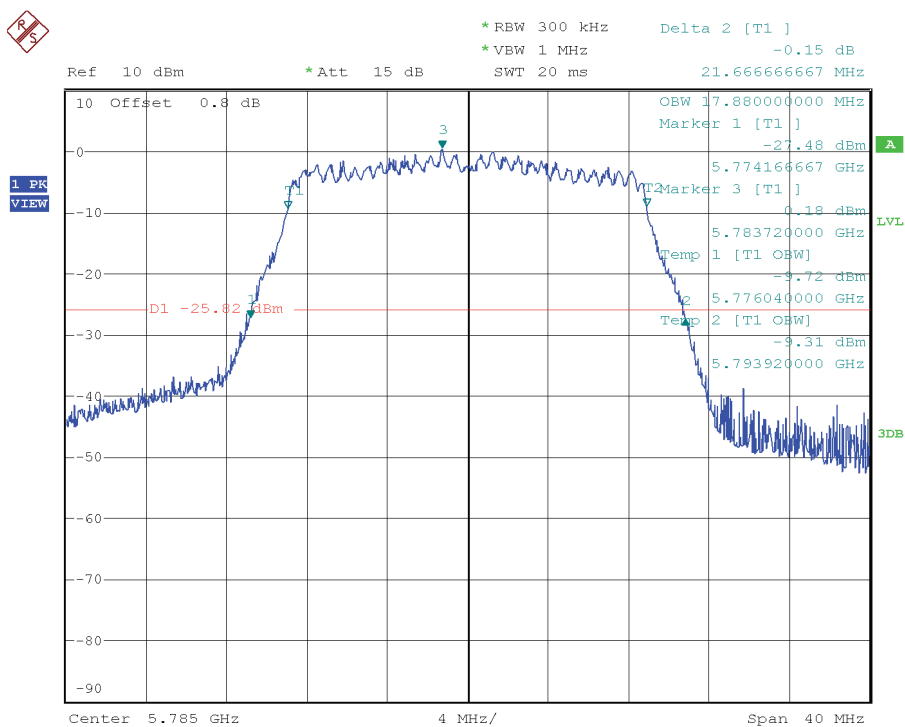


802.11 n20 MHz and 802.11 ac 20 MHz modes Port 4

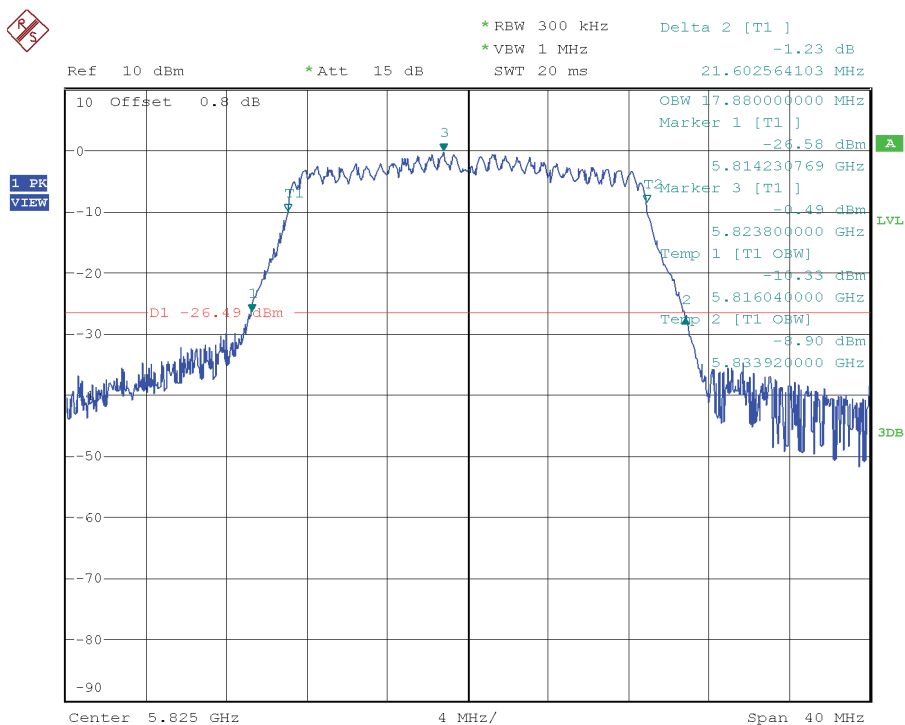
Lowest Channel



Middle Channel

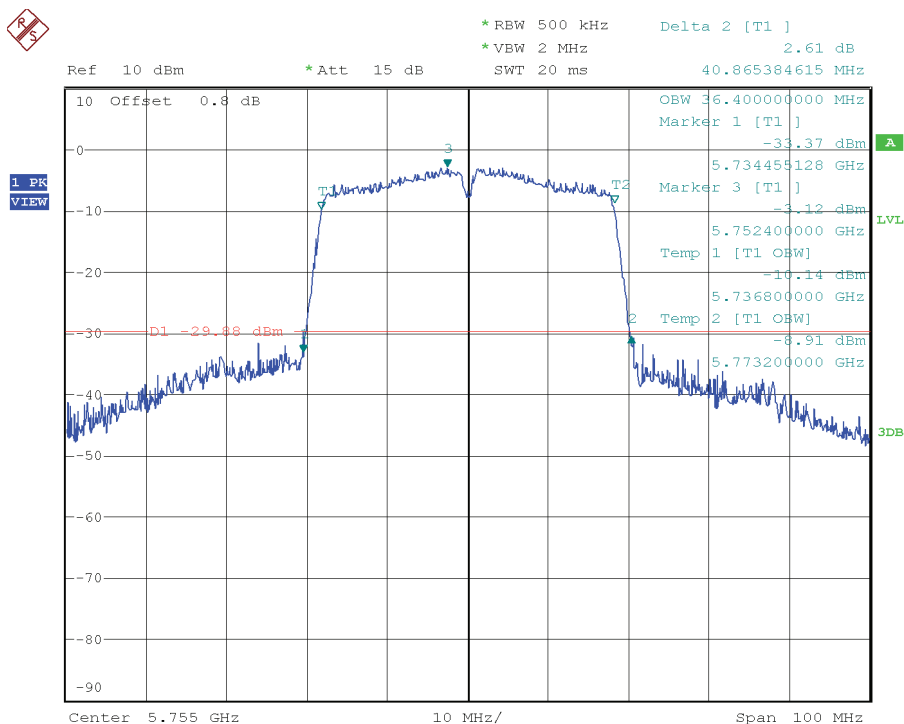


Highest Channel

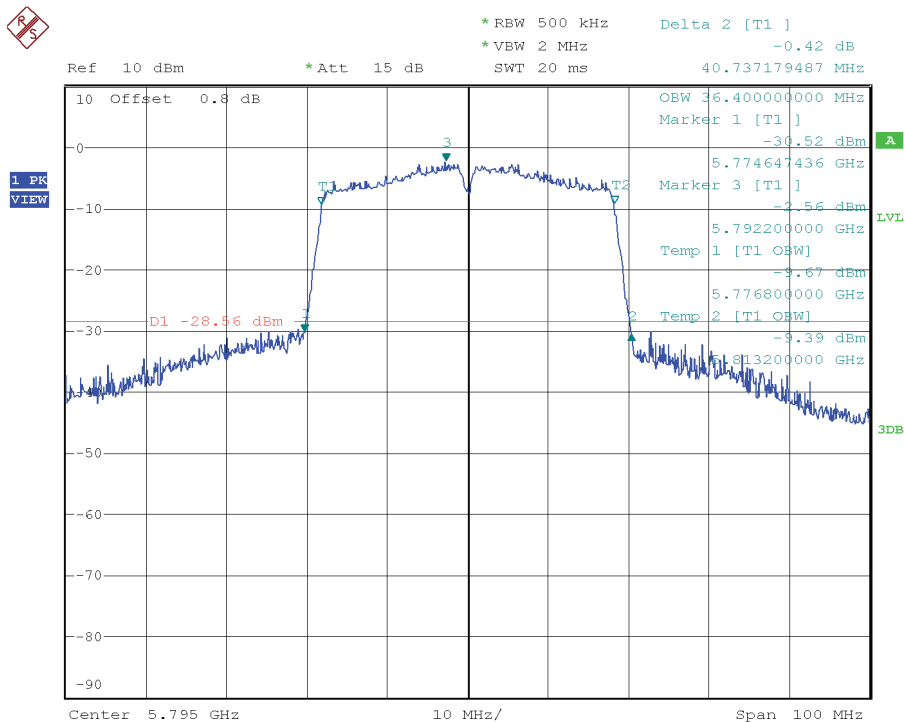


802.11 n40 MHz and 802.11 ac 40 MHz modes Port 1

Lowest Channel

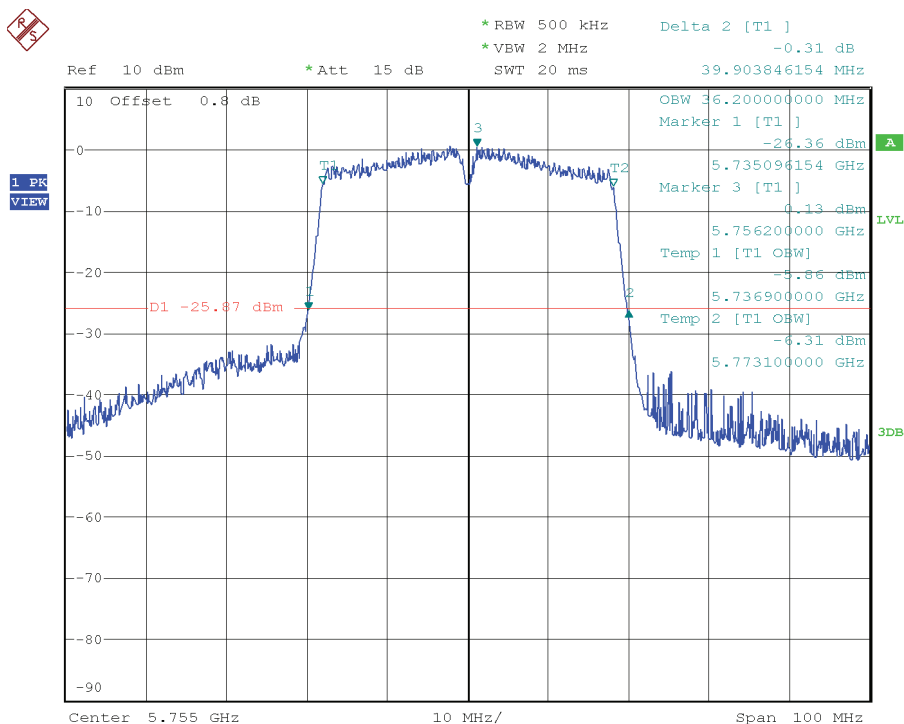


Highest Channel

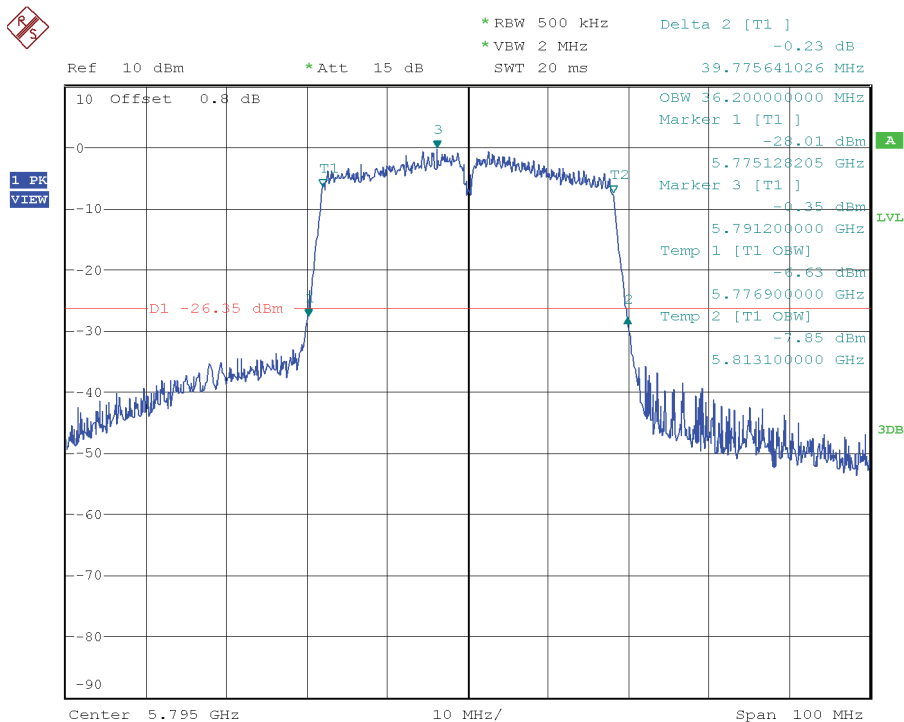


802.11 n40 MHz and 802.11 ac 40 MHz modes Port 4

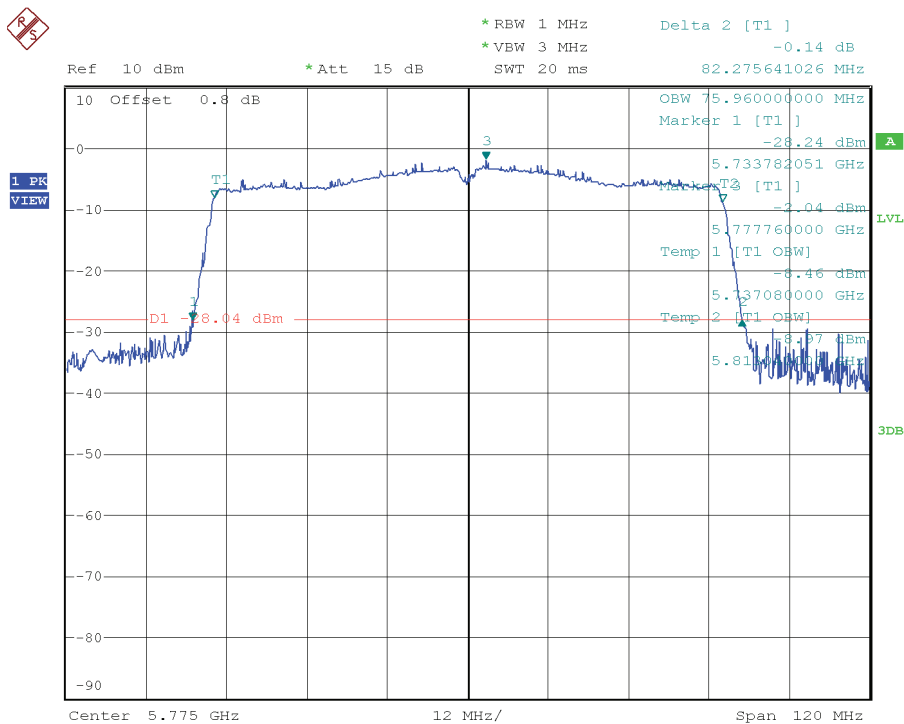
Lowest Channel



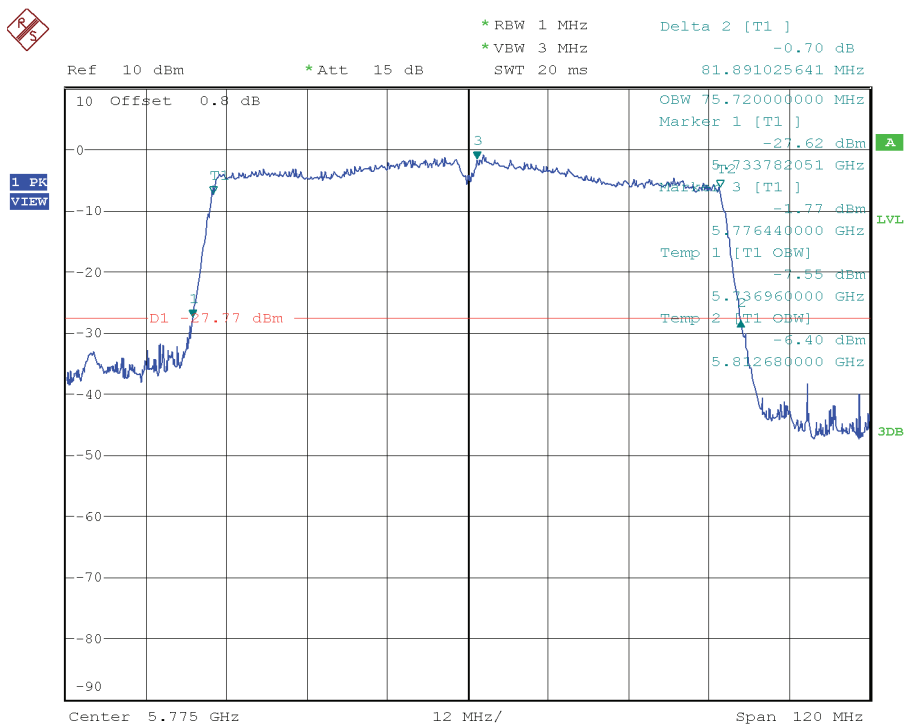
Highest Channel



802.11 ac 80 MHz mode Port 1



802.11 ac 80 MHz mode Port 4



Section 15.407 Subclause (e) / RSS 247 Clause 6.2.4.1. 6 dB bandwidth

SPECIFICATION

FCC 15.407/RSS247: Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

RESULTS

The maximum conducted output power was measured using the channel power integration method according to point C) 2) of Guidance 789033 D02 General UNII Test Procedures New Rules v01r04.

WLAN1-CORE 0 – Antenna RF port 3:

SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	16.443	16.378	16.400
Measurement uncertainty (kHz)	<±130		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	17.628	17.628	17.628
Measurement uncertainty (kHz)	<±130		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
6 dB bandwidth (MHz)	35.721	35.609
Measurement uncertainty (kHz)	<±280	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
6 dB bandwidth (MHz)	76.058
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 0 – Antenna RF External port 2:
SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	16.378	16.346	16.378
Measurement uncertainty (kHz)	<±130		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	17.628	17.628	17.628
Measurement uncertainty (kHz)	<±130		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
6 dB bandwidth (MHz)	36.121	35.609
Measurement uncertainty (kHz)	<±280	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
6 dB bandwidth (MHz)	75.801
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 1 – Antenna RF port 4:
SISO mode:

1. 802.11a mode (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	16.378	16.378	16.378
Measurement uncertainty (kHz)	<±130		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	17.610	17.628	17.628
Measurement uncertainty (kHz)	<±130		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
6 dB bandwidth (MHz)	35.801	35.449
Measurement uncertainty (kHz)	<±280	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

	Frequency 5775 MHz
6 dB bandwidth (MHz)	75.708
Measurement uncertainty (kHz)	<±630

WLAN0-CORE 2 (CORE 0+CORE 1) – Antenna RF port 1 and 4:

MIMO mode:

1. 802.11a mode (see next plots).

Port 1:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	16.346	16.410	16.378
Measurement uncertainty (kHz)	<±130		

Port 4:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	16.410	16.410	16.442
Measurement uncertainty (kHz)	<±130		

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Port 1:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	17.660	17.628	17.628
Measurement uncertainty (kHz)	<±130		

Port 4:

	Lowest frequency 5745 MHz	Middle frequency 5785 MHz	Highest frequency 5825 MHz
6 dB bandwidth (MHz)	17.628	17.628	17.628
Measurement uncertainty (kHz)	<±130		

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Port 1:

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
6 dB bandwidth (MHz)	36.218	35.657
Measurement uncertainty (kHz)	<±280	

Port 4:

	Lowest frequency 5755 MHz	Highest frequency 5795 MHz
6 dB bandwidth (MHz)	36.058	36.378
Measurement uncertainty (kHz)	<±280	

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

4. 802.11 ac 80 MHz mode. (see next plots).

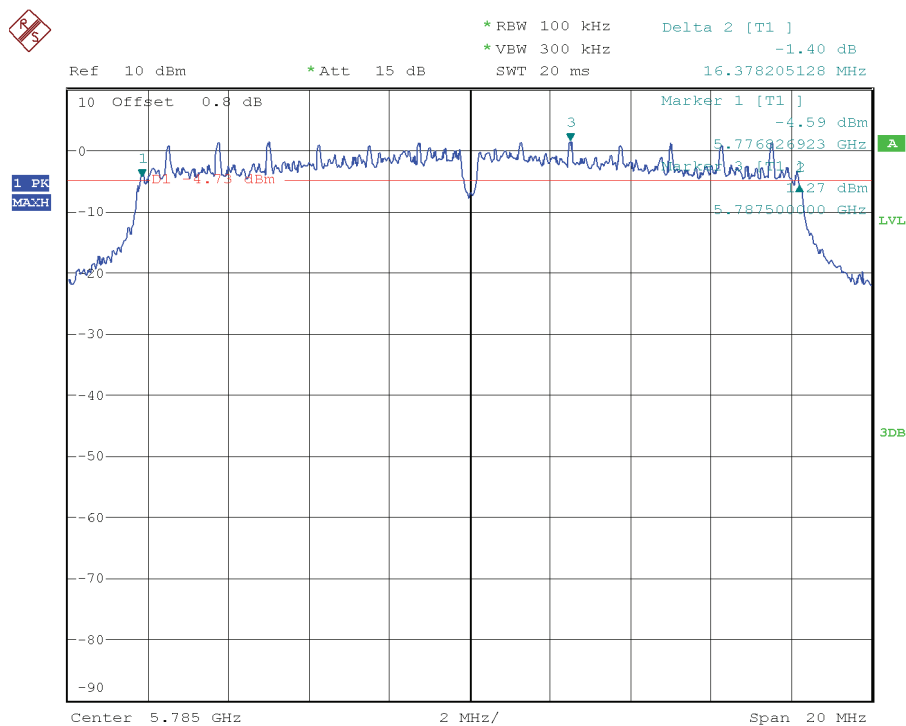
Port 1:

	Frequency 5775 MHz
6 dB bandwidth (MHz)	75.865
Measurement uncertainty (kHz)	<±630

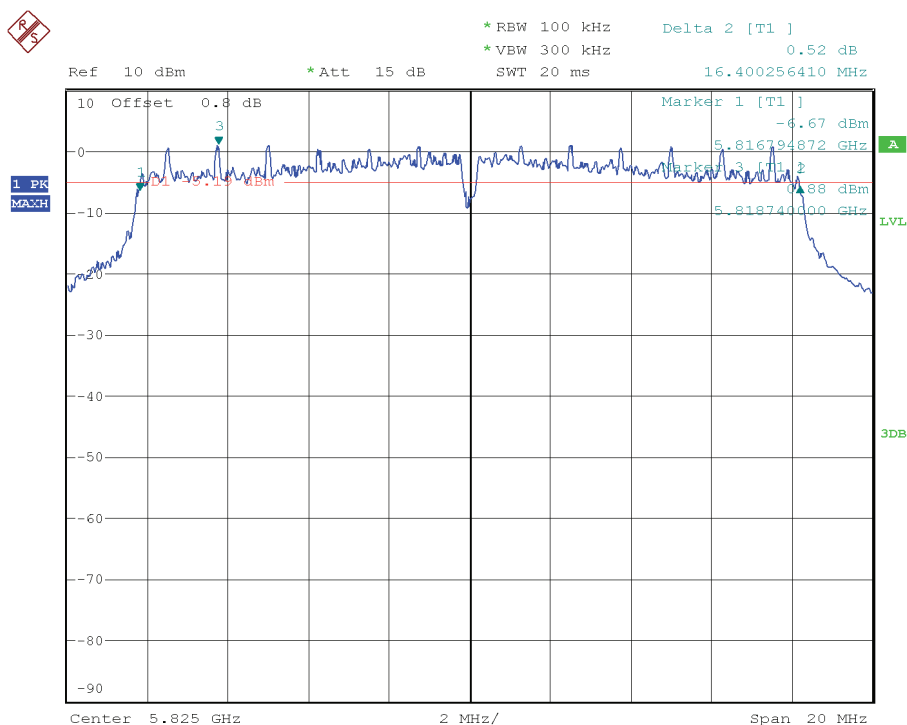
Port 4:

	Frequency 5775 MHz
6 dB bandwidth (MHz)	76.282
Measurement uncertainty (kHz)	<±630

Lowest Channel

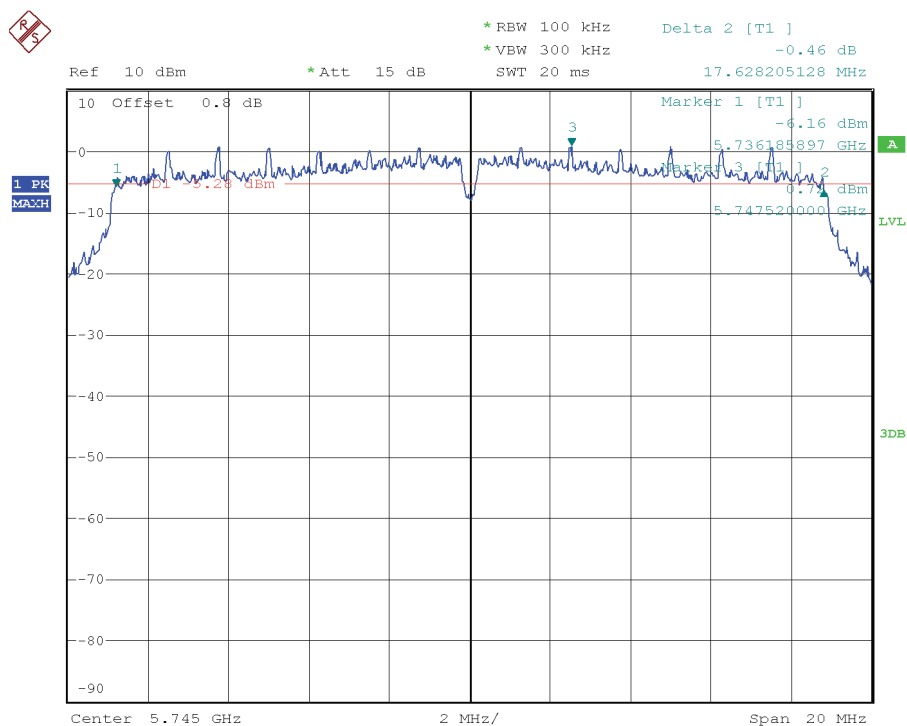


Highest Channel

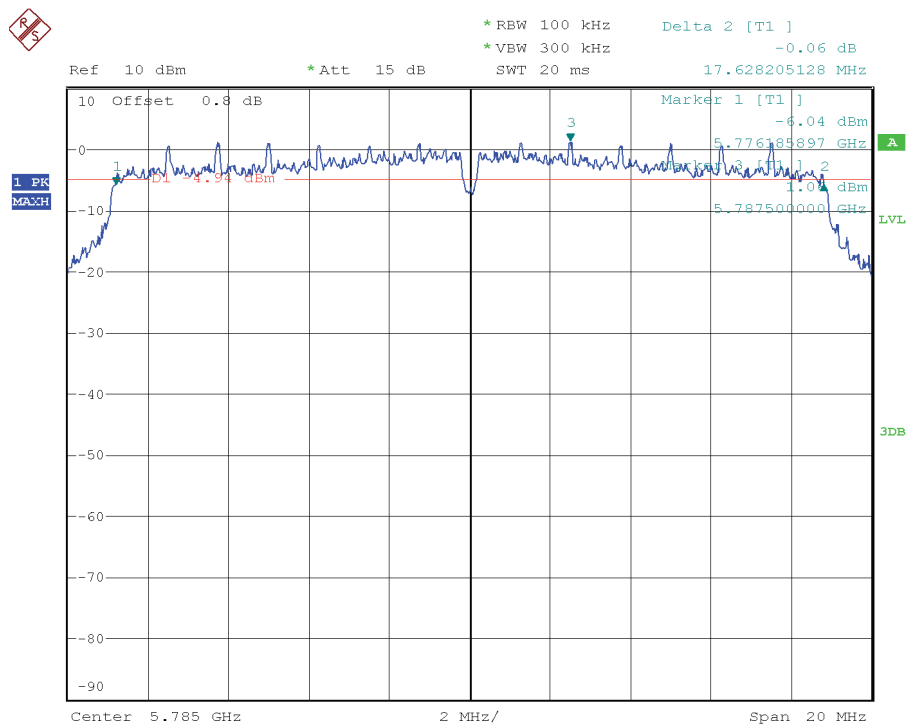


802.11 n20 MHz and 802.11 ac 20 MHz modes

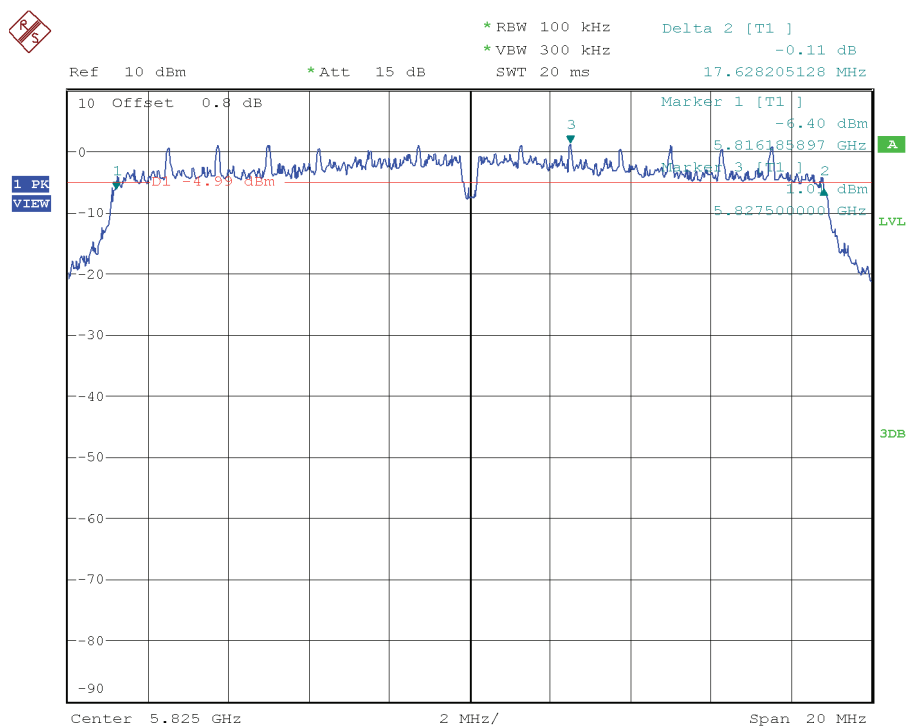
Lowest Channel



Middle Channel

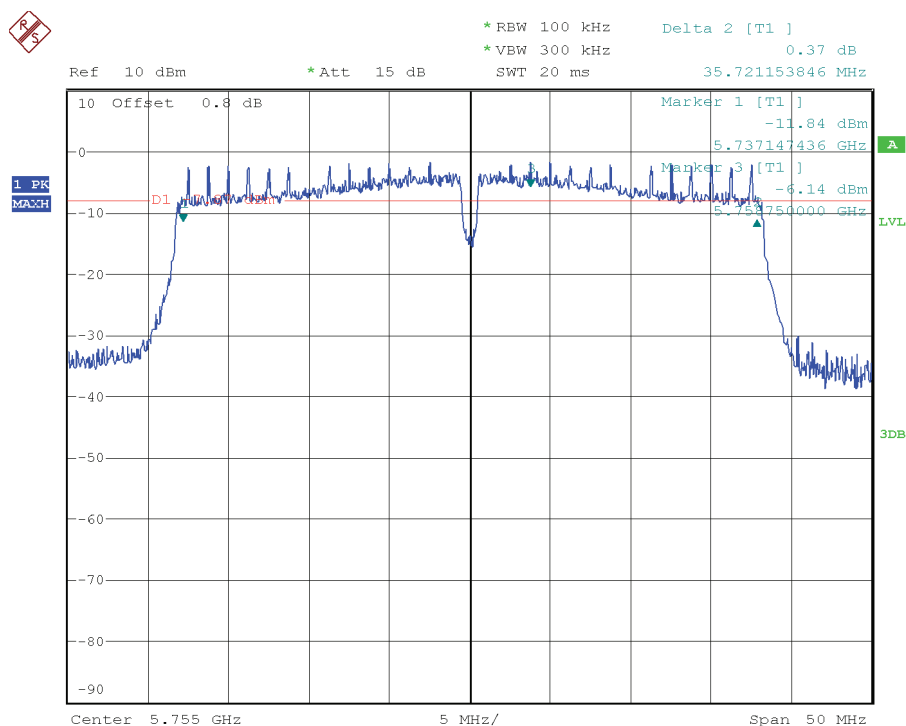


Highest Channel

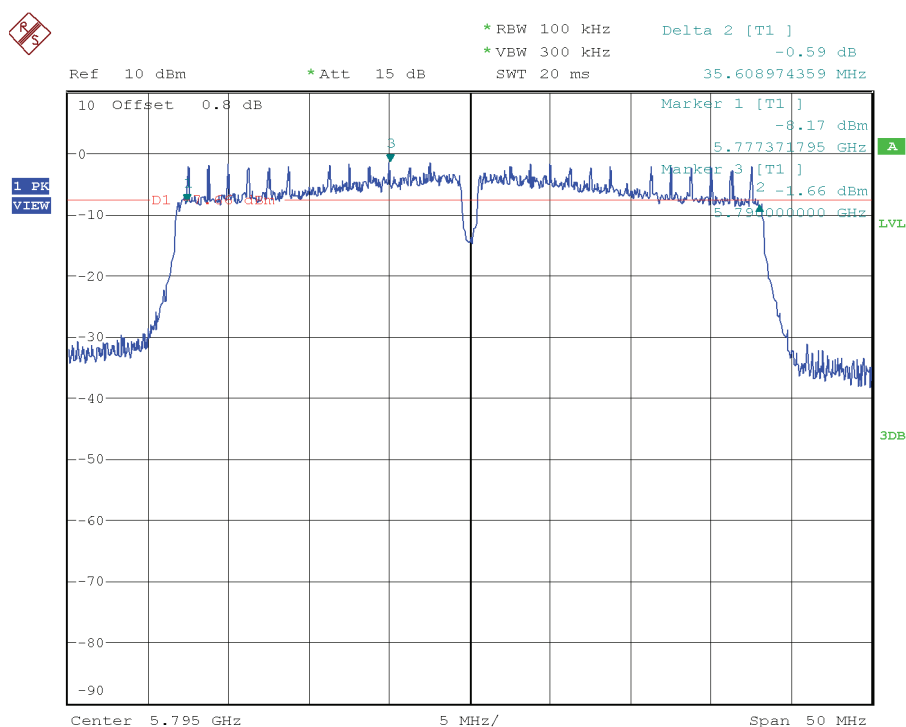


802.11 n40 MHz and 802.11 ac 40 MHz modes

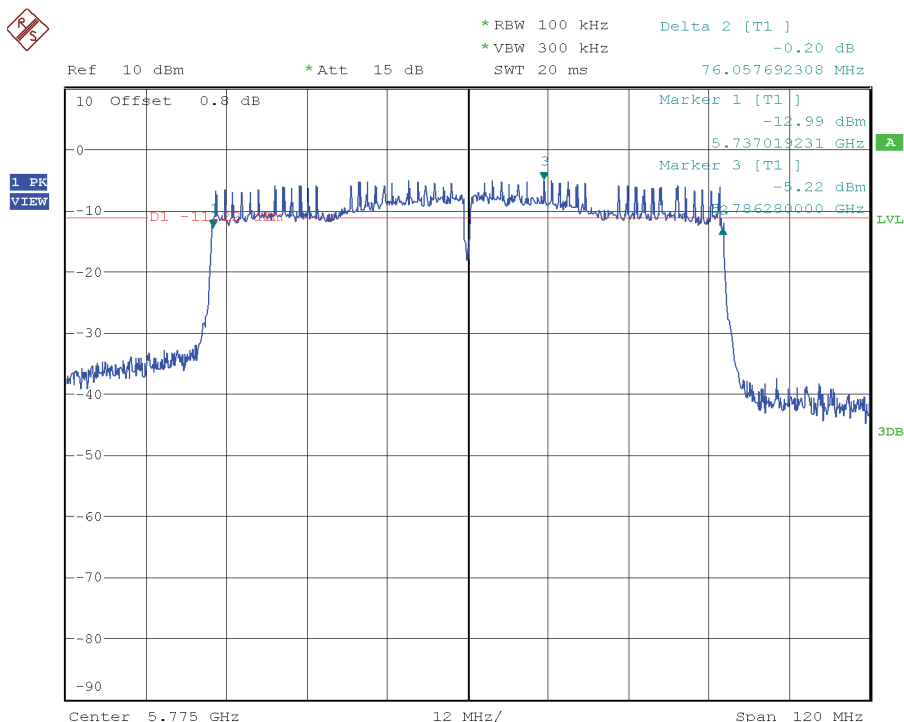
Lowest Channel



Highest Channel



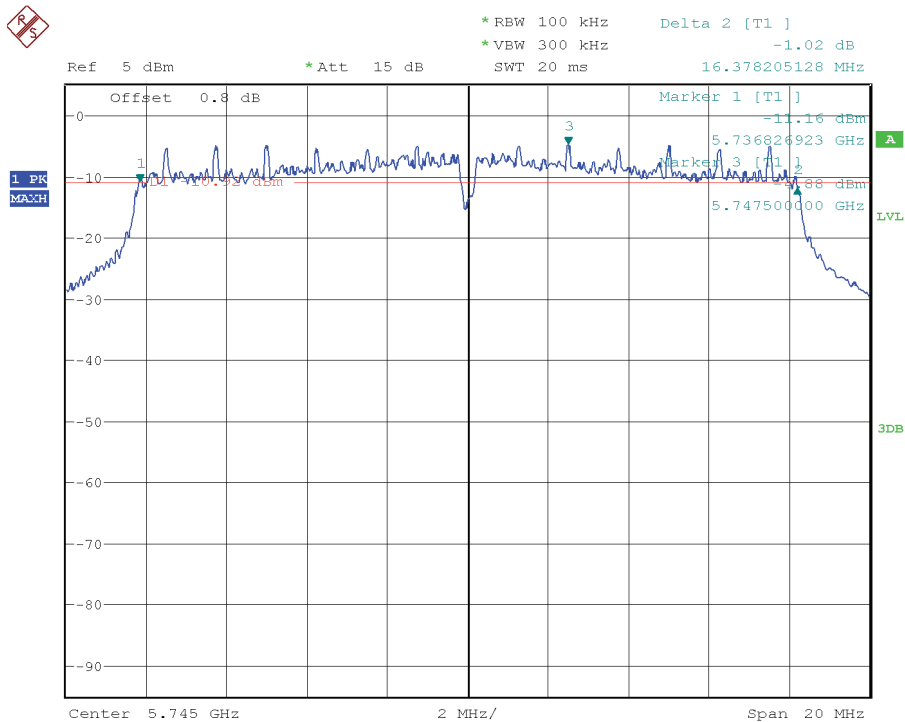
802.11 ac 80 MHz mode



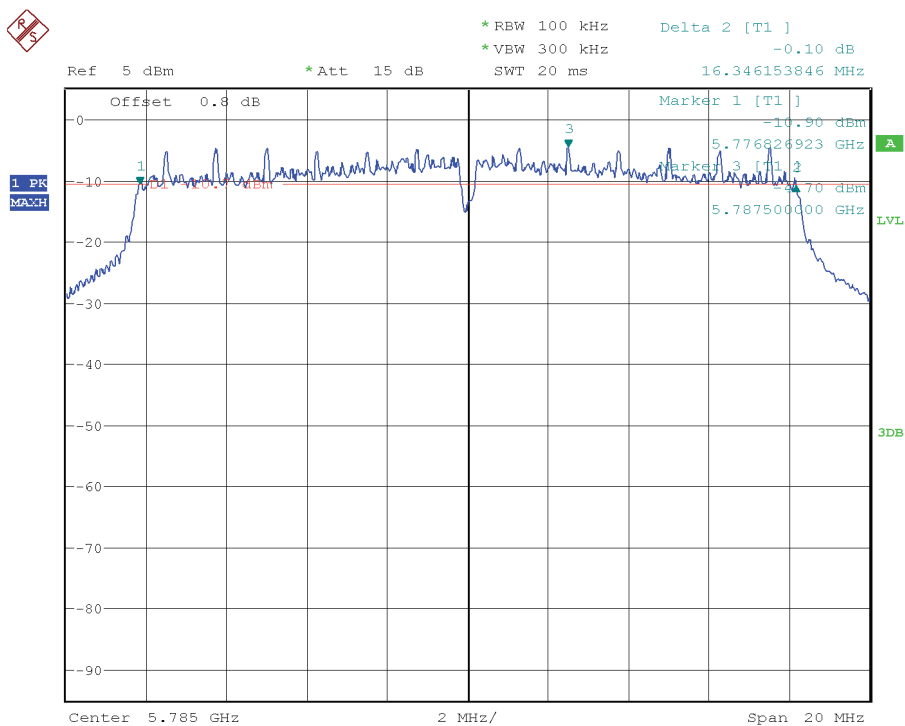
WLAN0-CORE 0 – Antenna RF External port 2:

802.11a mode

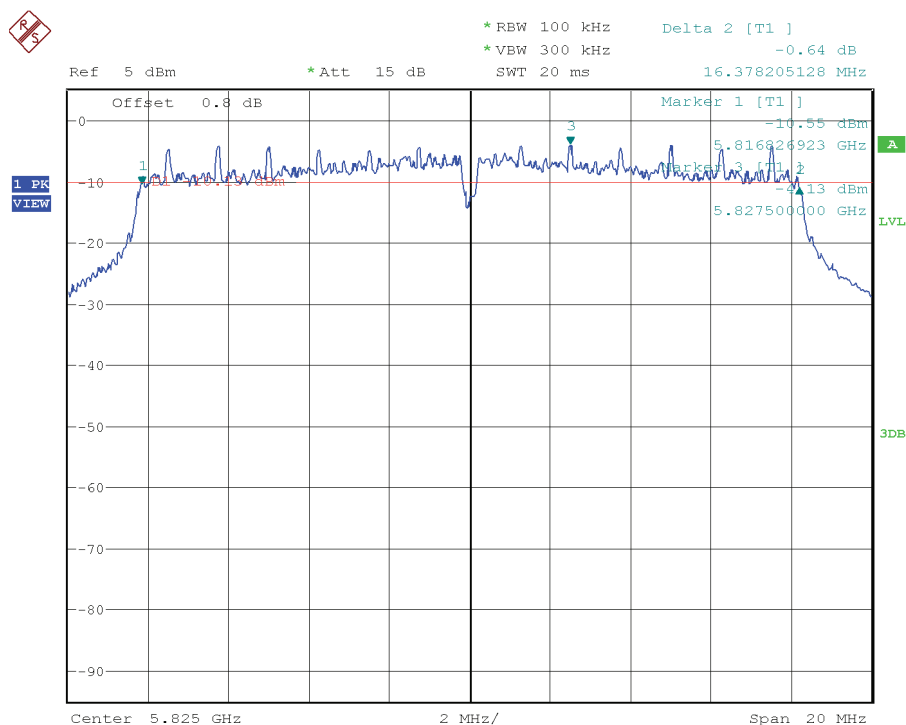
Lowest Channel



Middle Channel

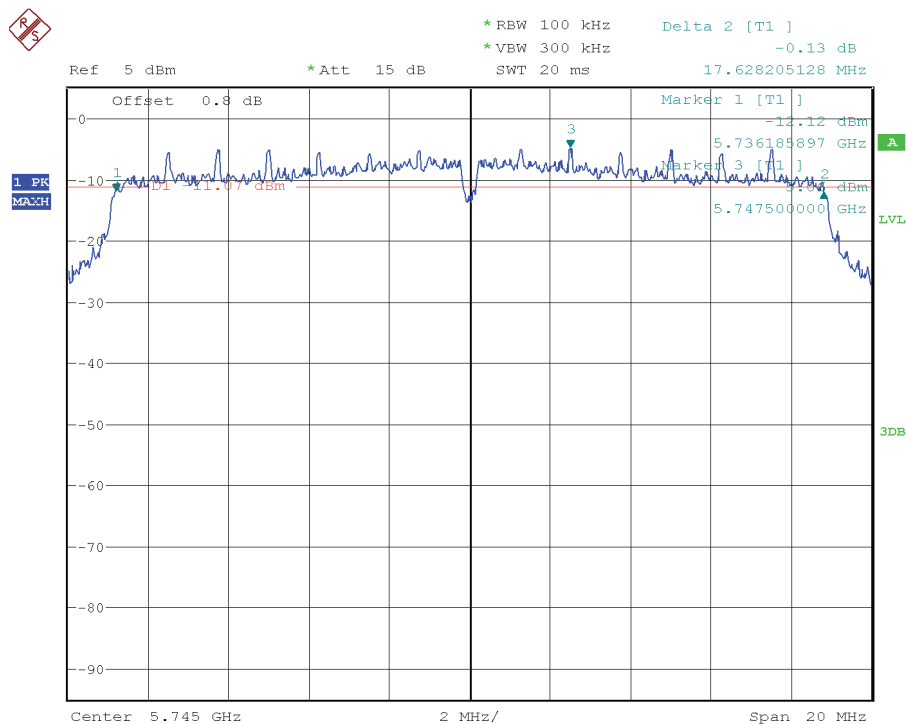


Highest Channel

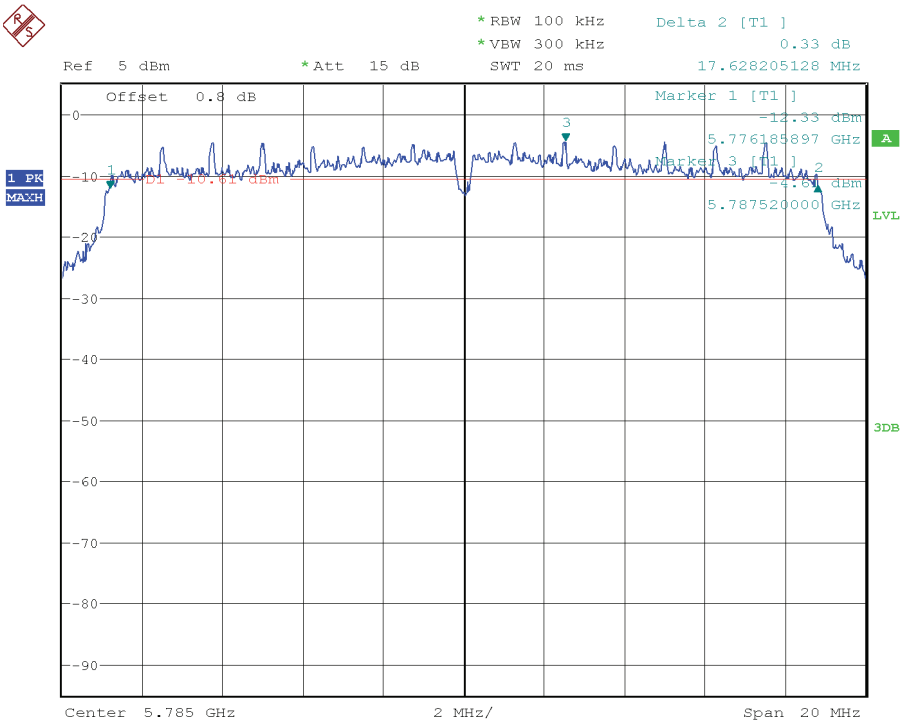


802.11 n20 MHz and 802.11 ac 20 MHz modes

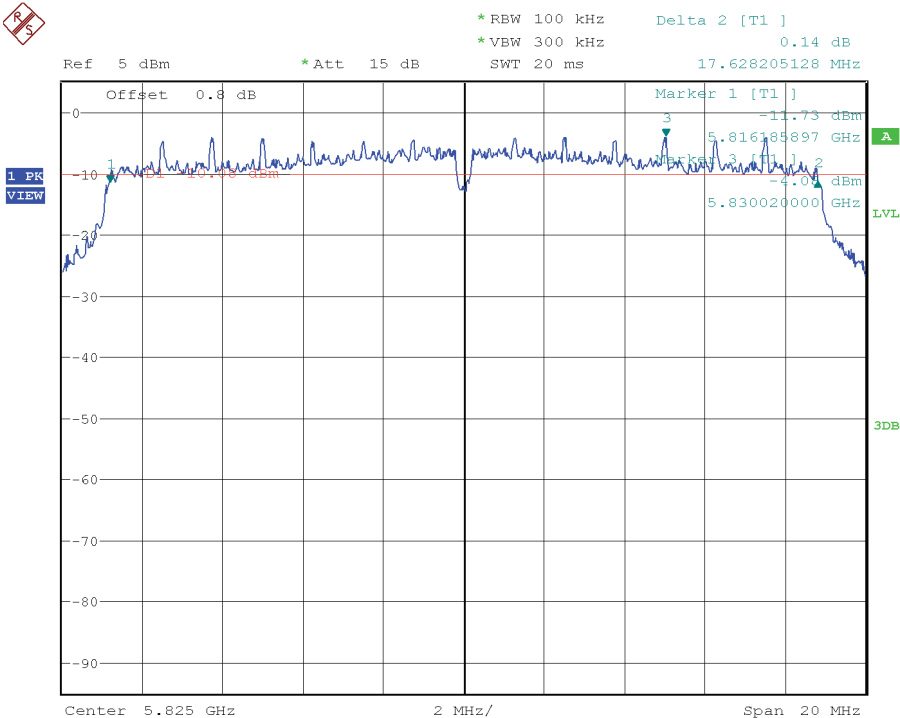
Lowest Channel



Middle Channel

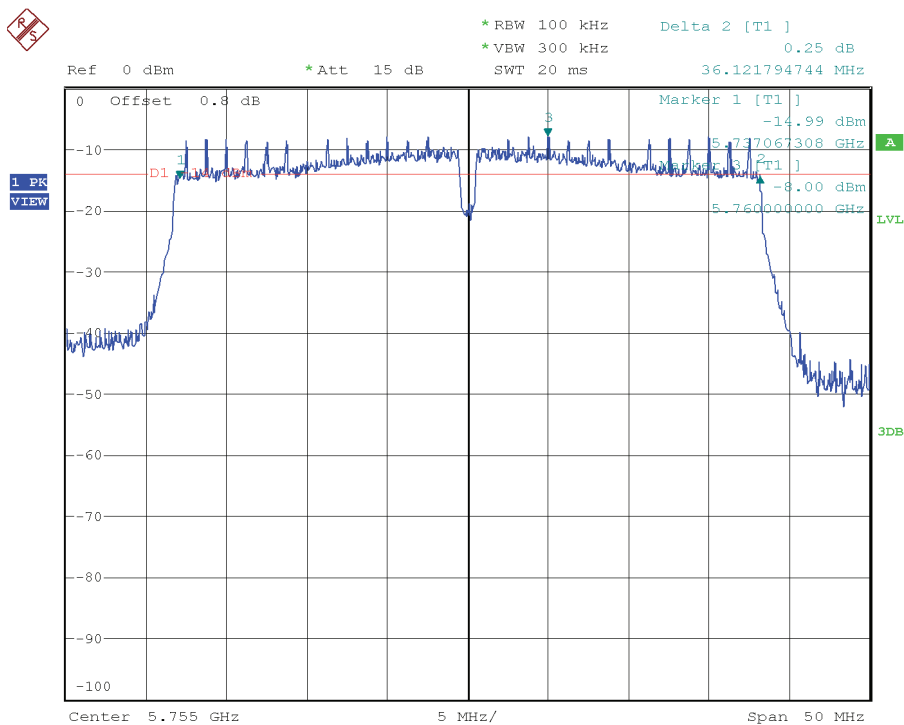


Highest Channel

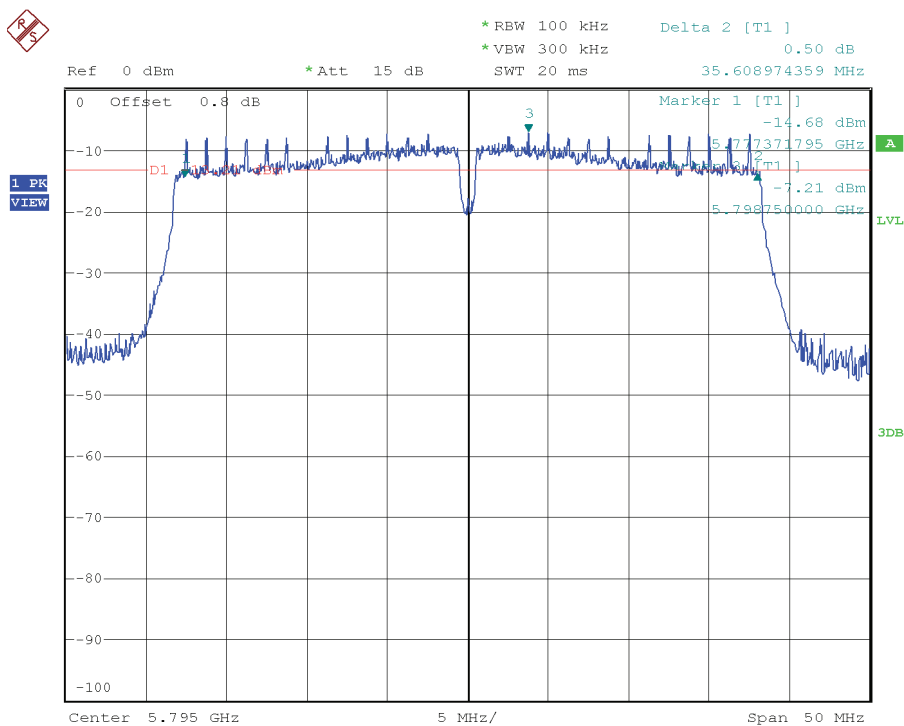


802.11 n40 MHz and 802.11 ac 40 MHz modes

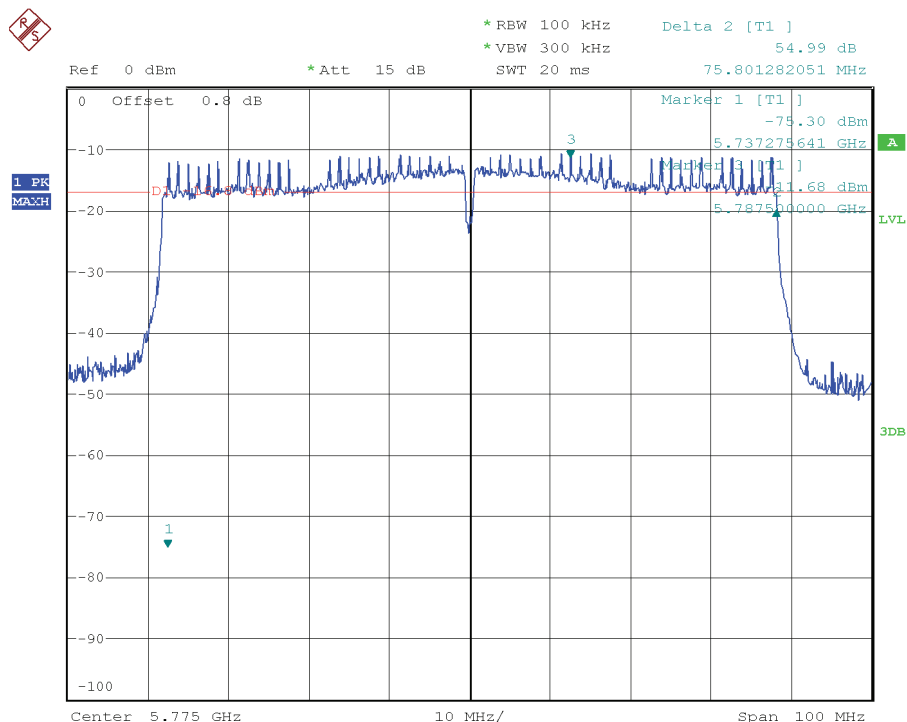
Lowest Channel



Highest Channel



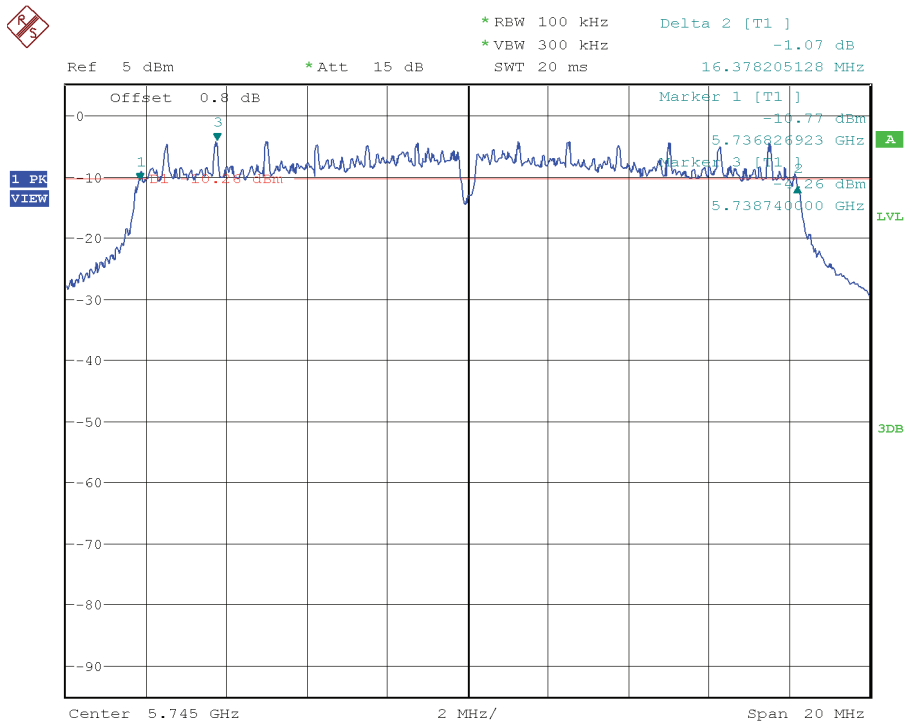
802.11 ac 80 MHz mode



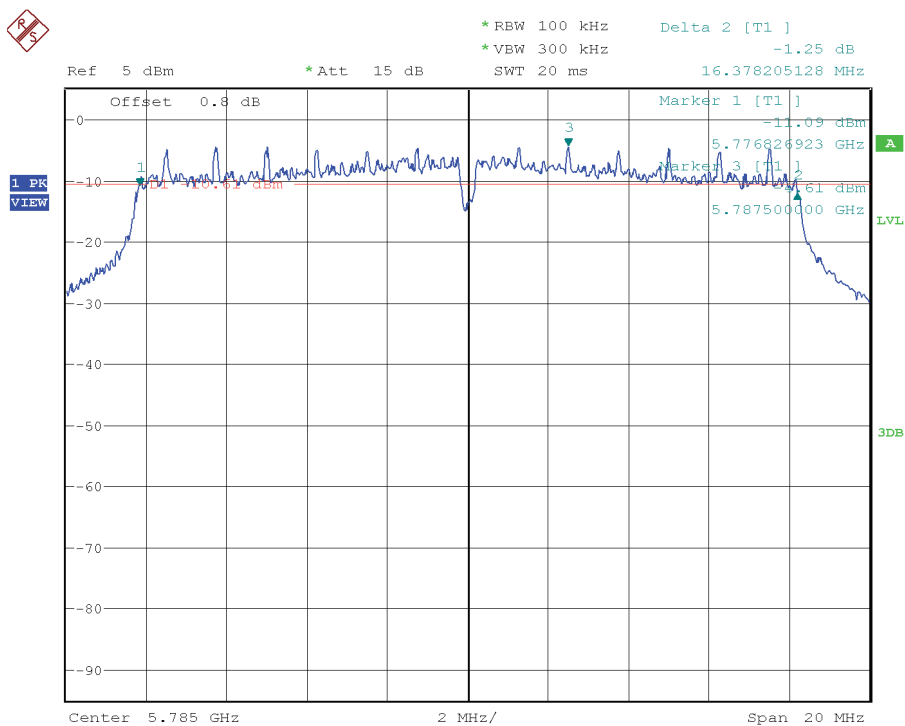
WLAN0-CORE 1 – Antenna RF port 4:

802.11a mode

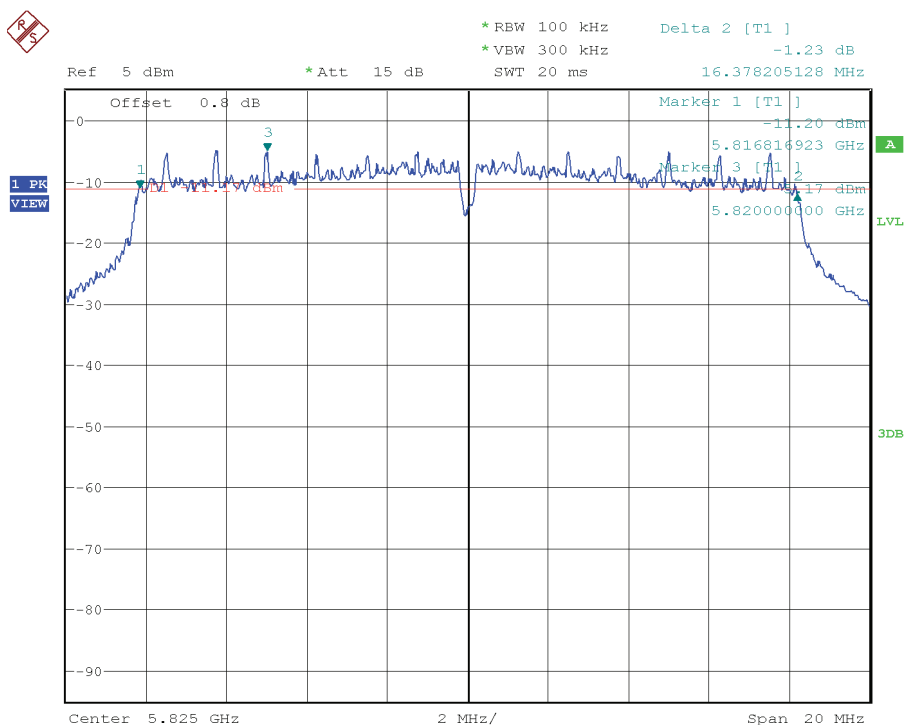
Lowest Channel



Middle Channel

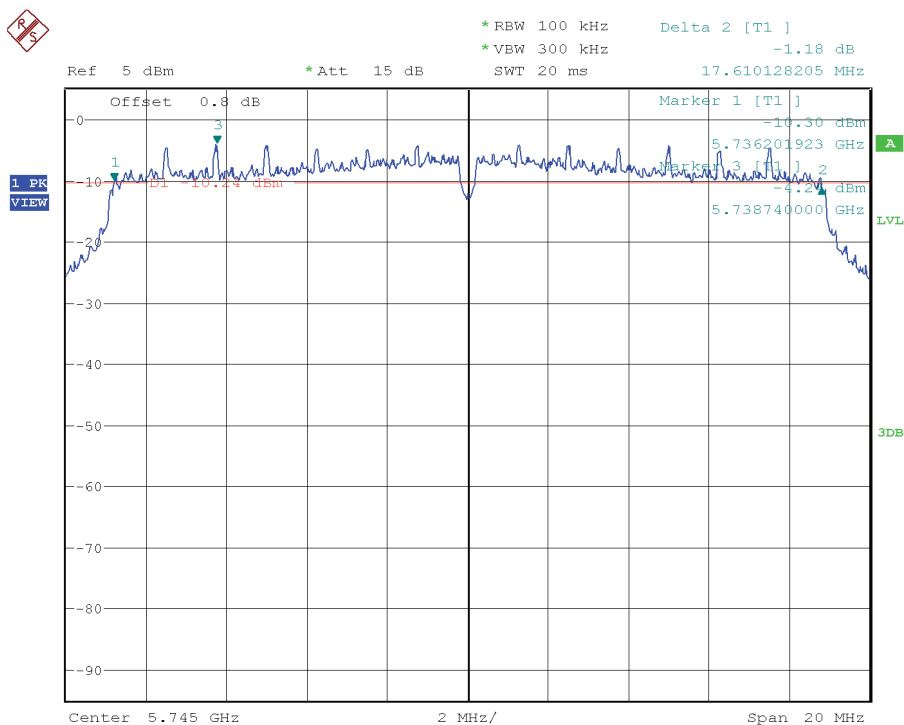


Highest Channel

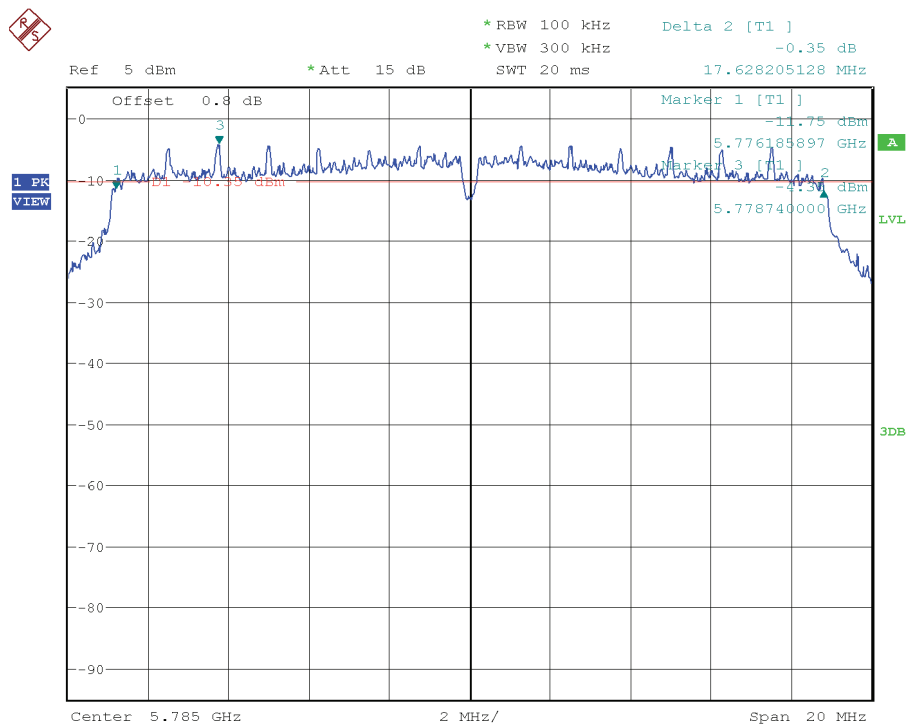


802.11 n20 MHz and 802.11 ac 20 MHz modes

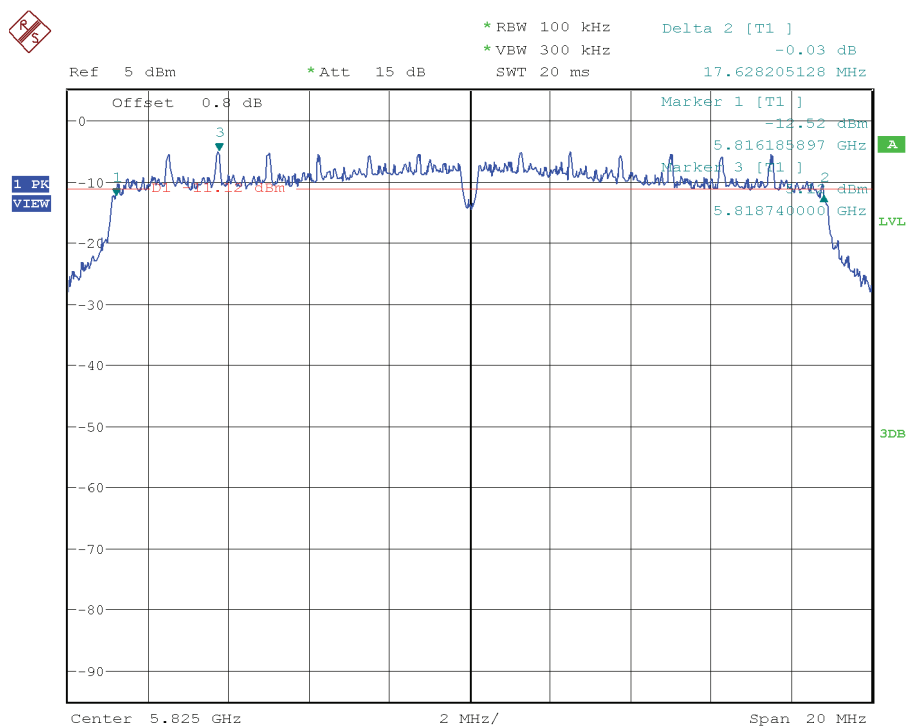
Lowest Channel



Middle Channel

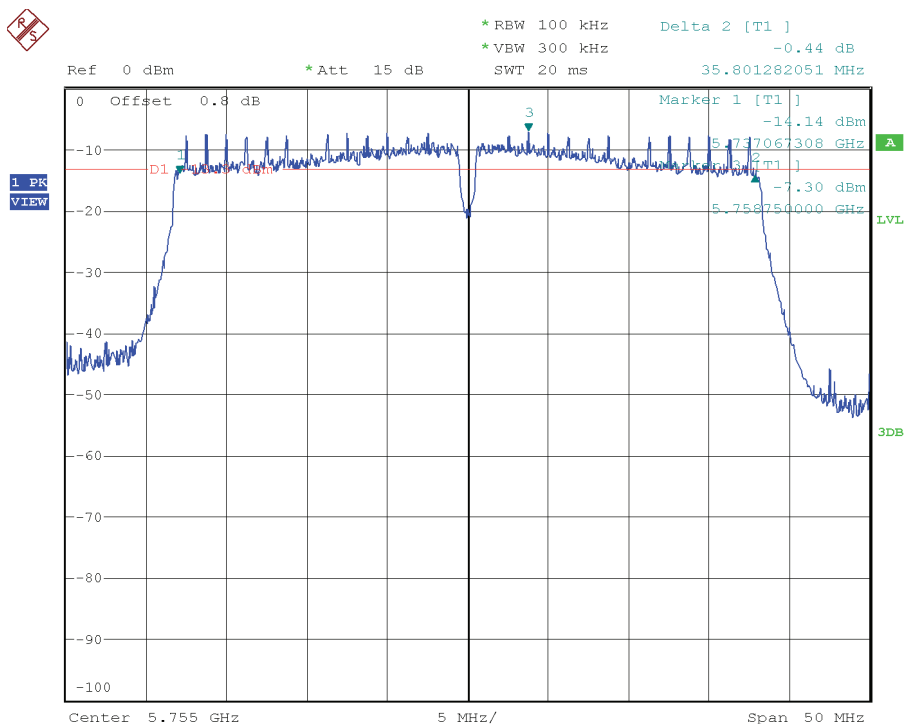


Highest Channel

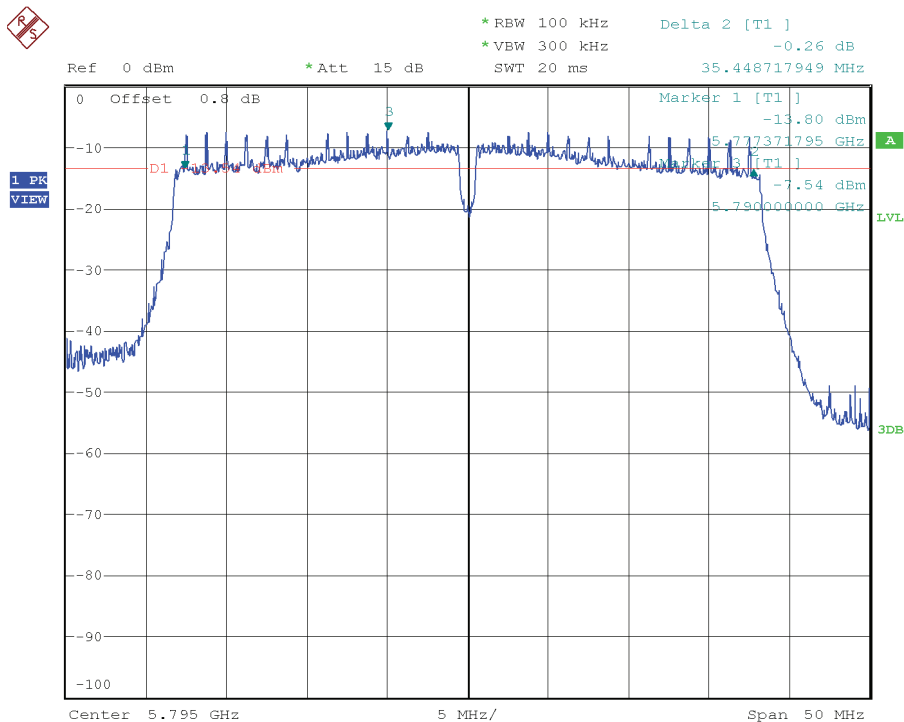


802.11 n40 MHz and 802.11 ac 40 MHz modes

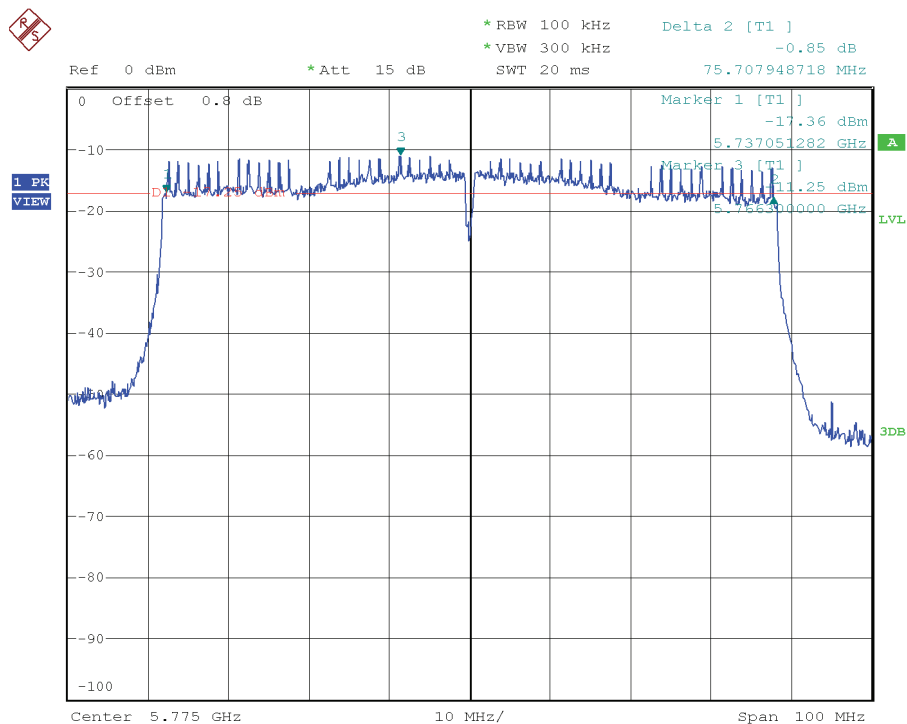
Lowest Channel



Highest Channel



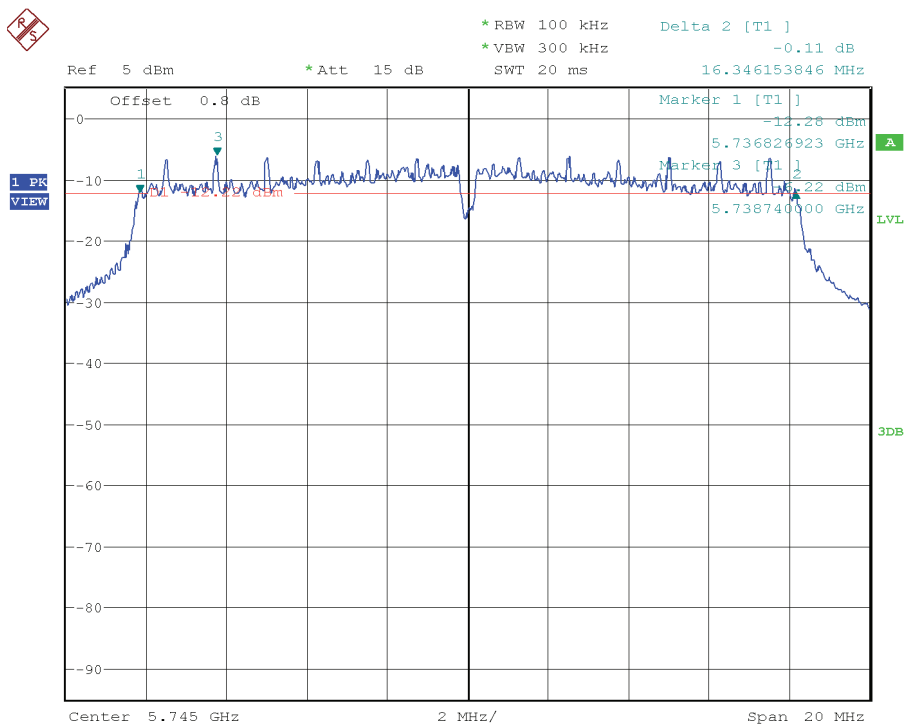
802.11 ac 80 MHz mode



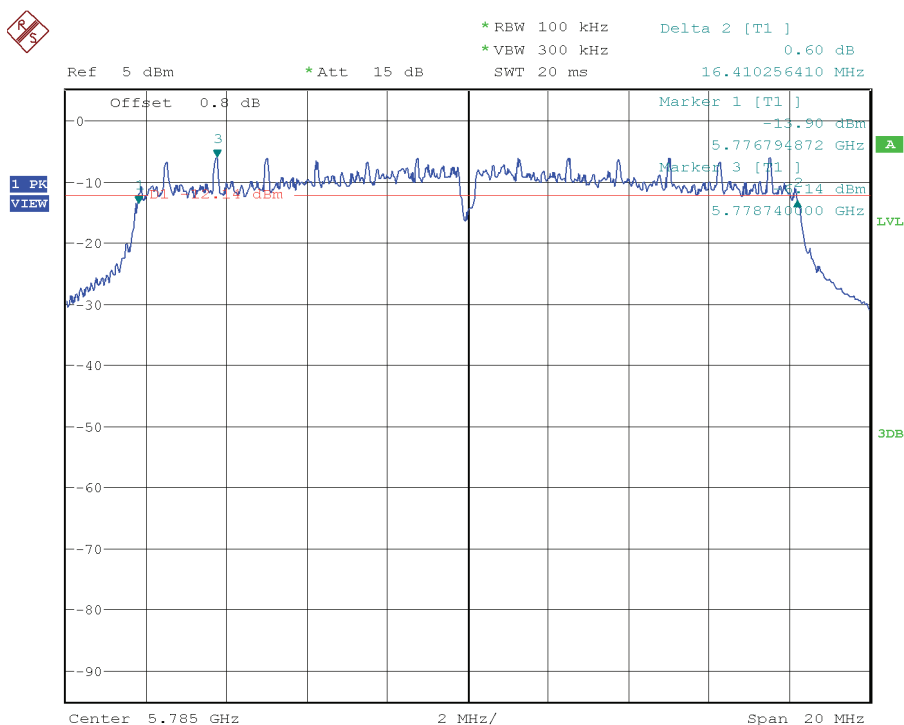
WLAN0-CORE 2 (CORE 0+CORE 1) – Antenna RF port 1 and 4:

802.11a mode Port 1

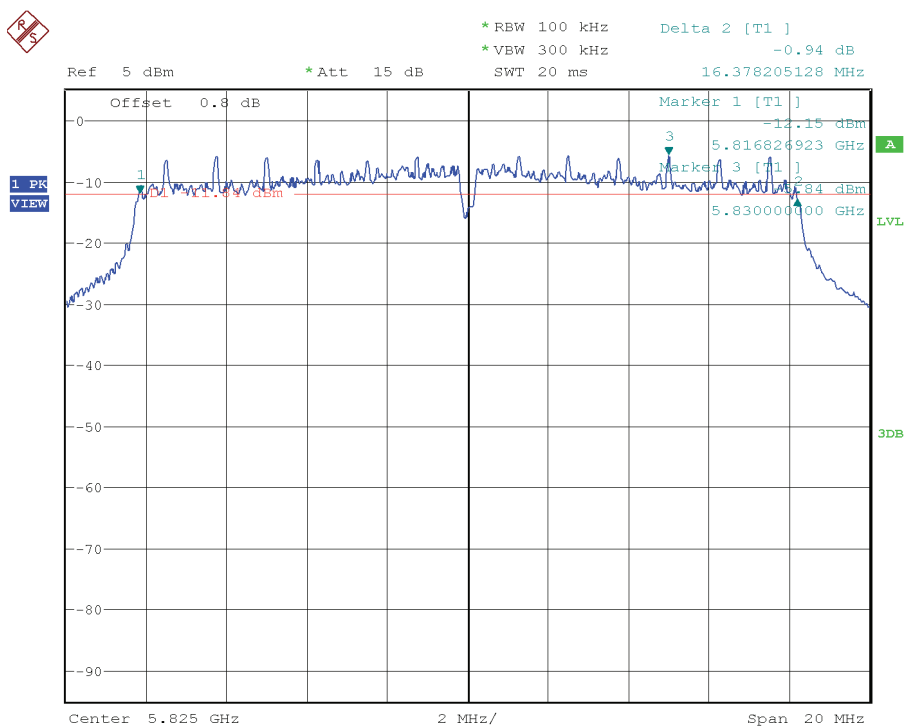
Lowest Channel



Middle Channel

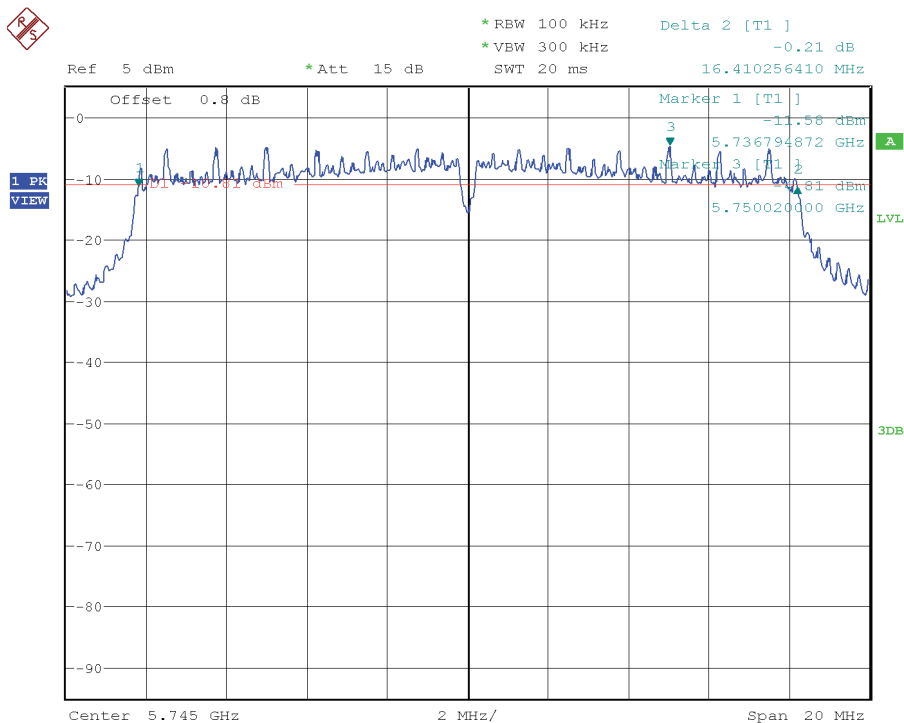


Highest Channel

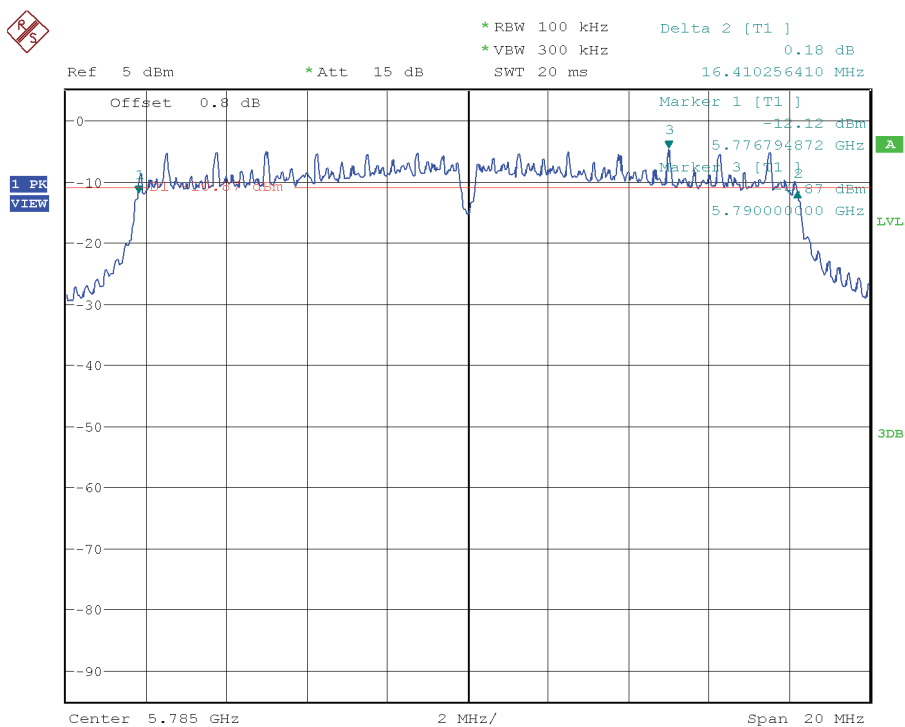


802.11a mode Port 4

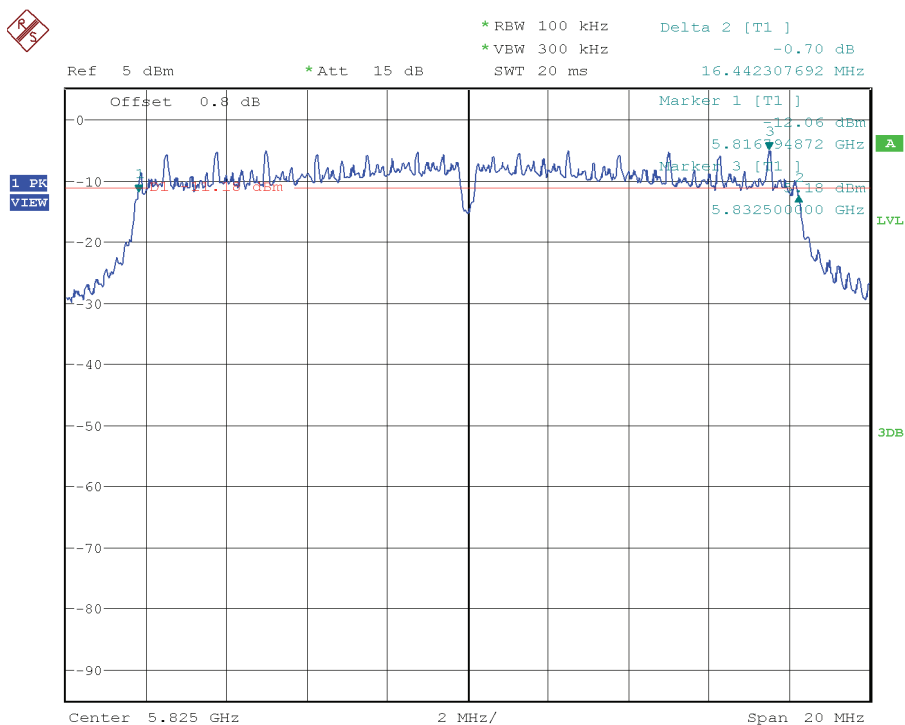
Lowest Channel



Middle Channel

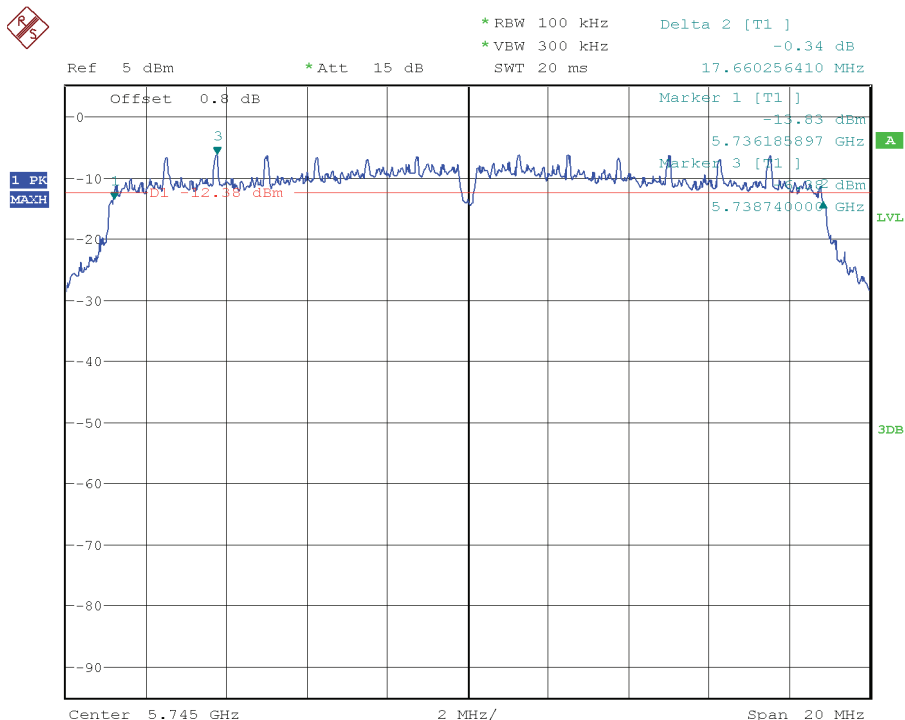


Highest Channel

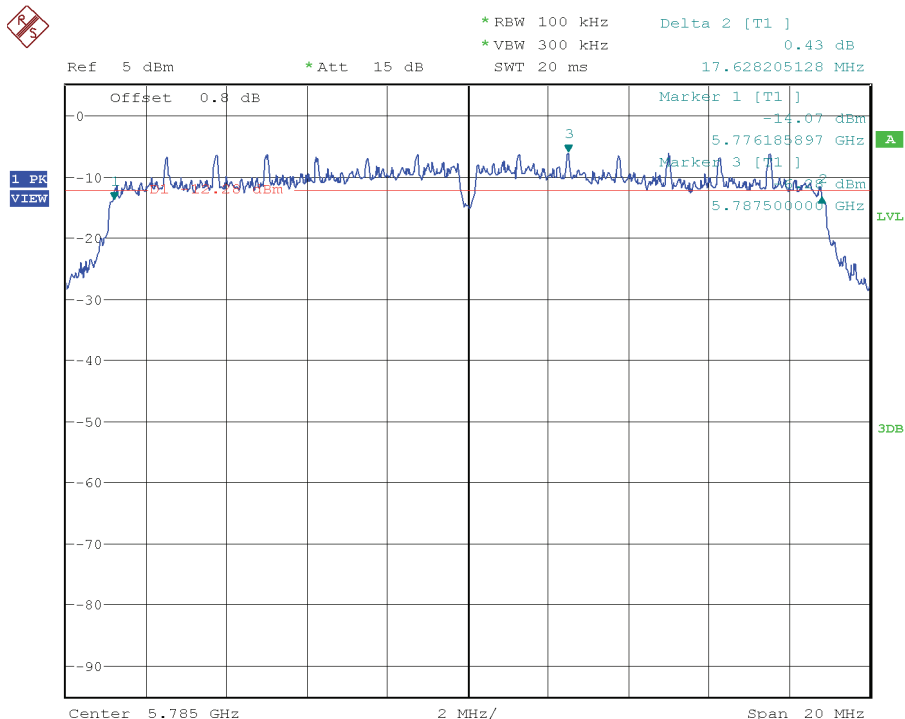


802.11 n20 MHz and 802.11 ac 20 MHz modes Port 1

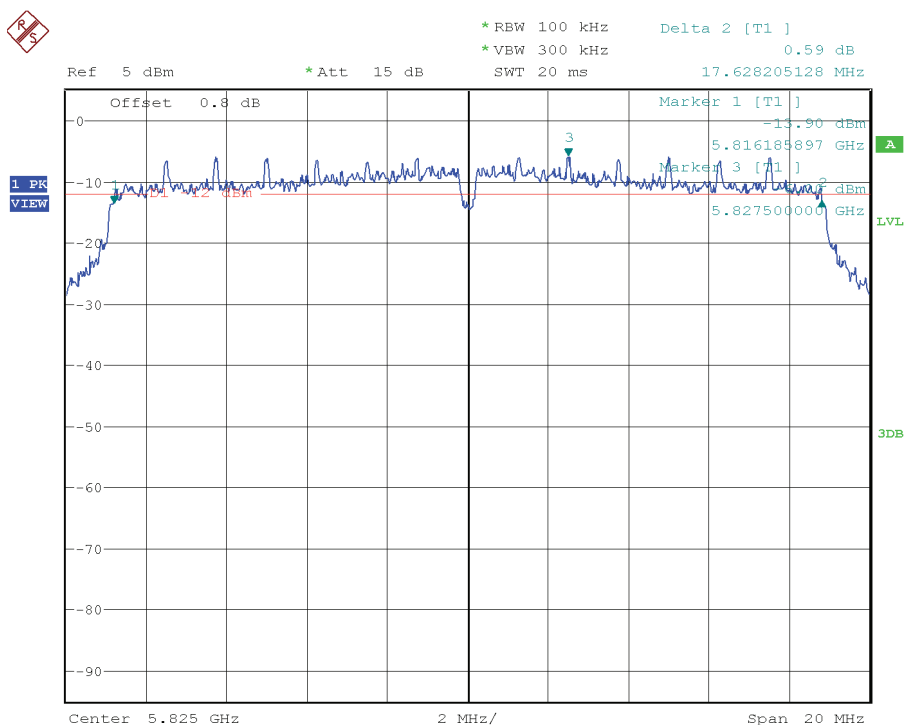
Lowest Channel



Middle Channel

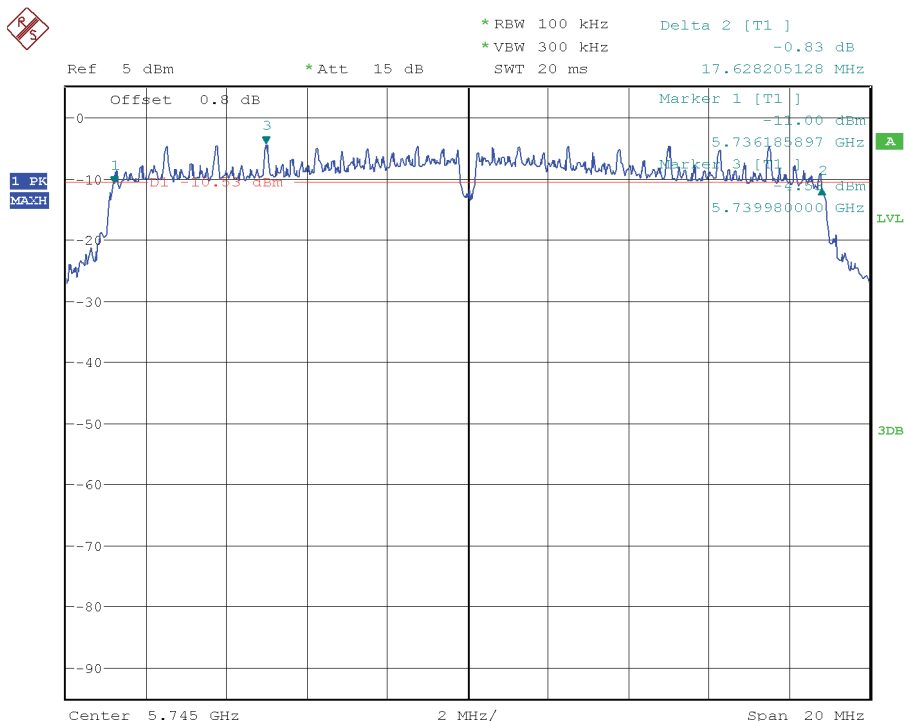


Highest Channel

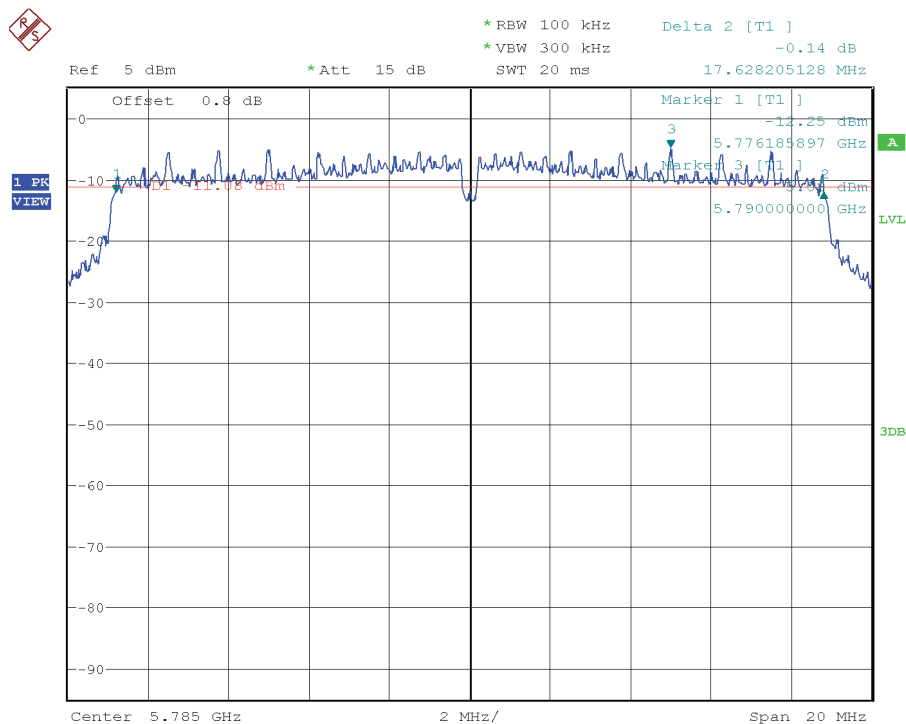


802.11 n20 MHz and 802.11 ac 20 MHz modes Port 4

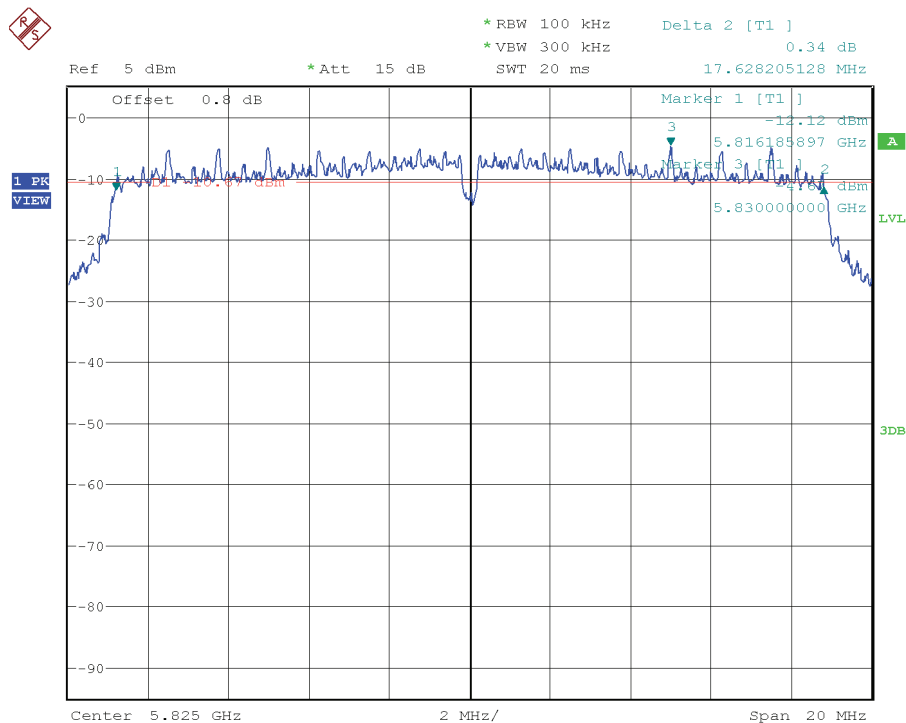
Lowest Channel



Middle Channel

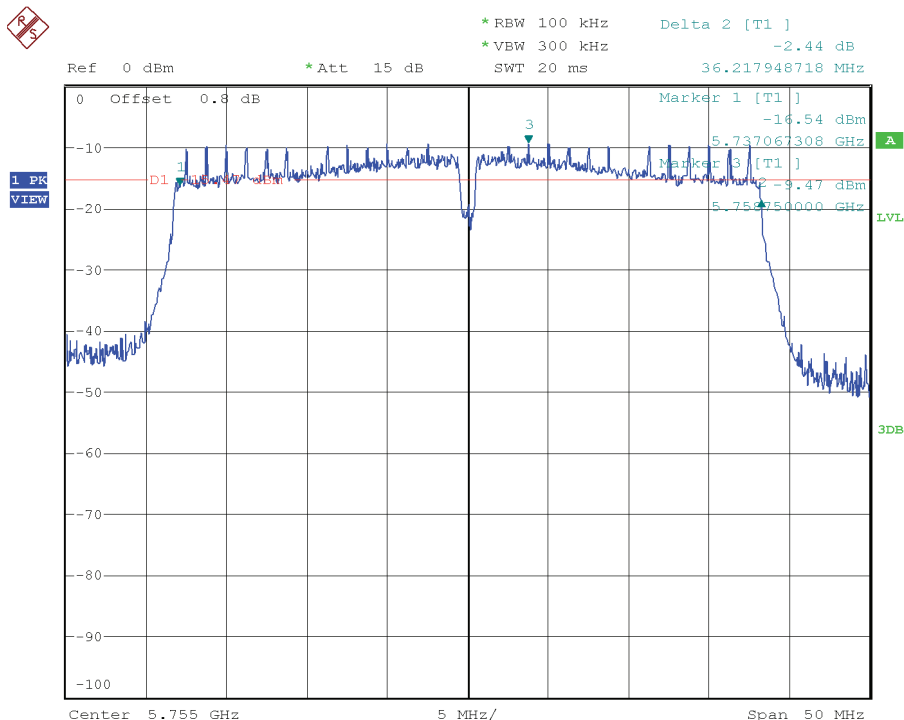


Highest Channel

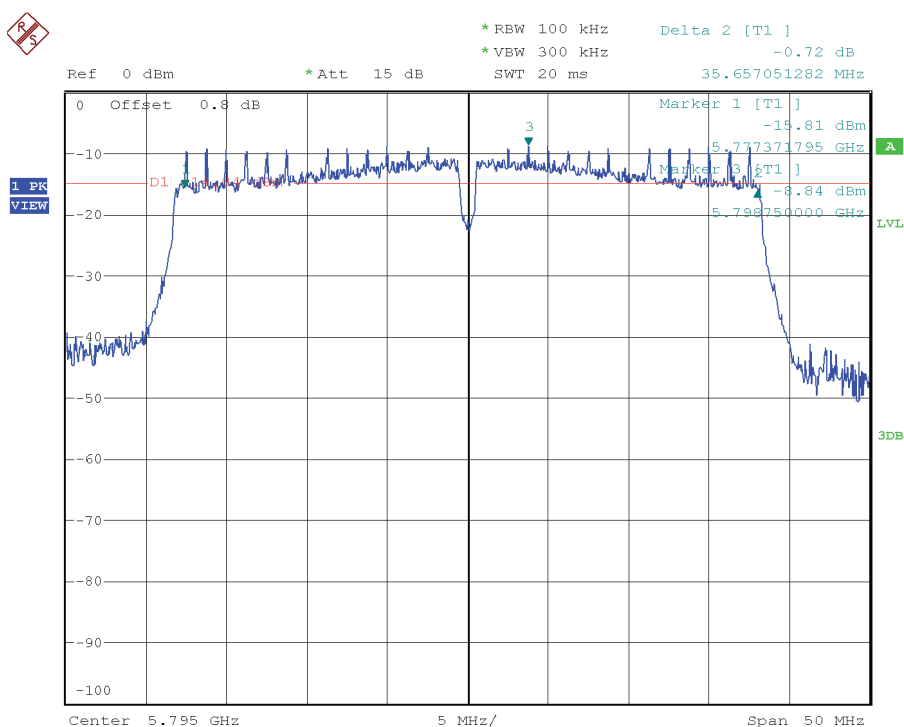


802.11 n40 MHz and 802.11 ac 40 MHz modes Port 1

Lowest Channel

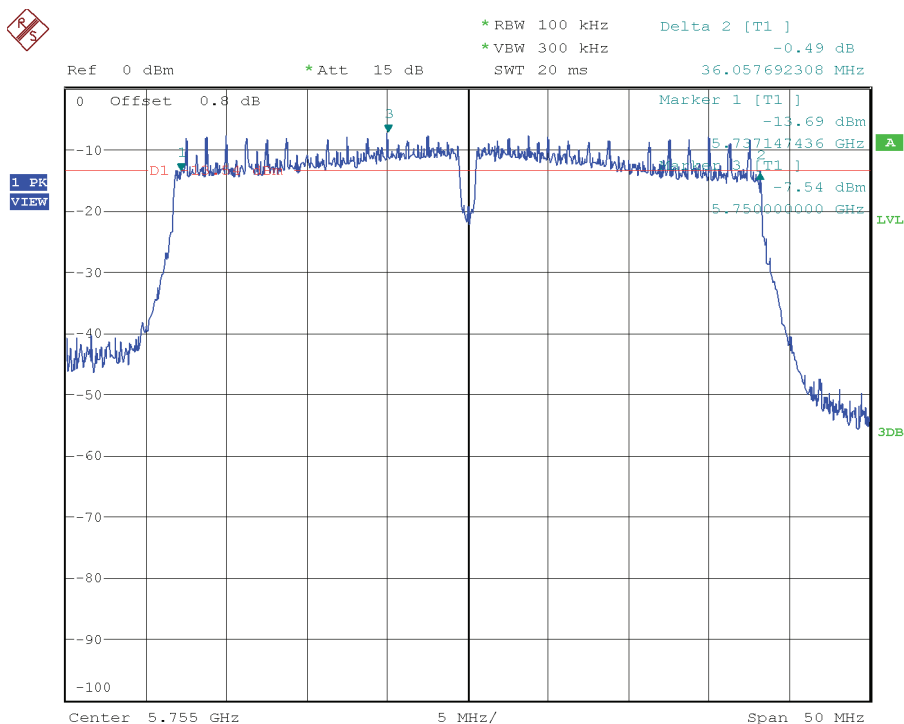


Highest Channel

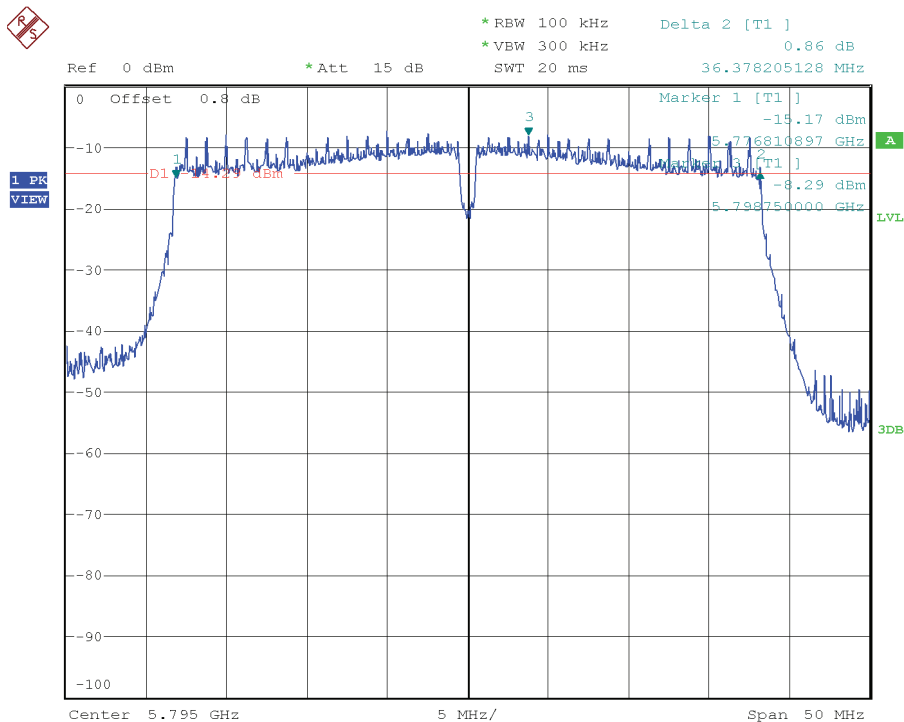


802.11 n40 MHz and 802.11 ac 40 MHz modes Port 4

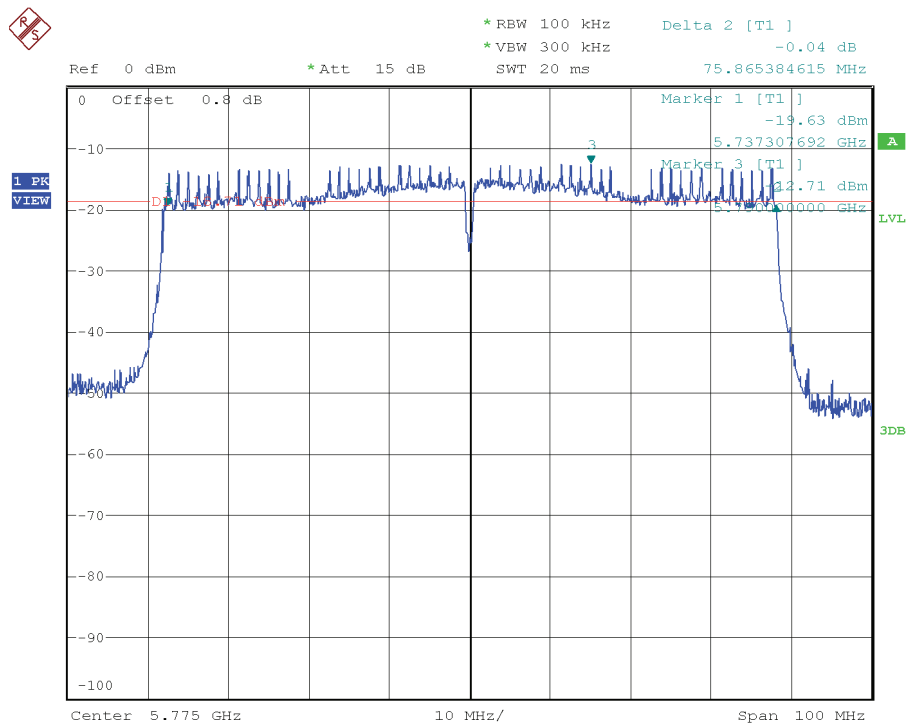
Lowest Channel



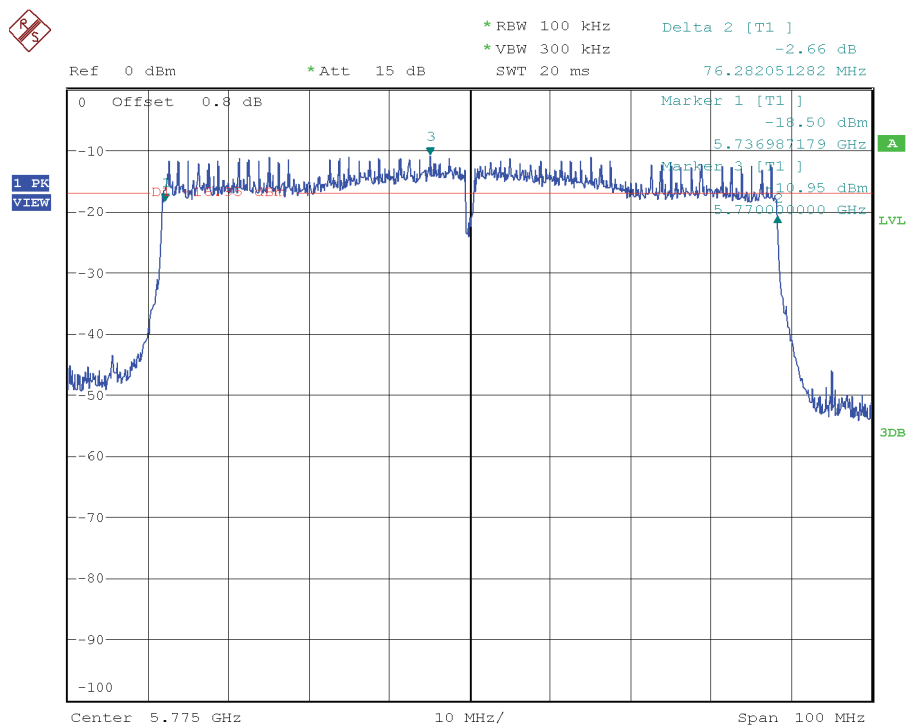
Highest Channel



802.11 ac 80 MHz mode Port 1



802.11 ac 80 MHz mode Port 4



Section 15.407 Subclause (a) (3) / RSS 247 Clause 6.4.2.1. Maximum output power, Maximum power spectral density and antenna gain

SPECIFICATION

FCC 15.407/RSS 247: For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30 dBm). In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

The maximum conducted output power was measured using the channel power integration method according to point E) 2) b) (Method SA-1) of Guidance 789033 D02 General UNII Test Procedures New Rules v01r04.

In the measure-and-sum approach for MIMO mode, the conducted emission level (*e.g.*, transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units (mW—not dBm).

The e.i.r.p. levels are calculated by adding the declared maximum antenna gain (dBi).

The maximum power spectral density (PSD) was measured over 500 kHz.

The e.i.r.p. levels are calculated by adding the declared maximum antenna gain (dBi).

For MIMO mode, the Measure and add $10 \log(\text{NANT})$ dB, (where NANT is the number of outputs) technique was used according to the Guidance for Emission Testing of Transmitters with Multiple Outputs in the Same Band 662911 D01 Multiple Transmitter Output v02r01 dated 10/31/2013.

With this technique, spectrum measurements are performed at each output of the device, and the quantity $10 \log(\text{NANT})$ dB is added to each spectrum value before comparing to the emission limit. Number of outputs = 2.

The number of transmit antennas (NANT) are 2 and the number of spatial streams (Nss) are 2 and therefore the Array Gain is 0 dB.

WLAN1-CORE 0 – Antenna RF port 3:

1. 802.11a mode (see next plots).

Maximum declared antenna gain = +0.9 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500 kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	12.17	13.07	0.34	1.24
5785 MHz	12.57	13.47	0.48	1.38
5825 MHz	12.49	13.39	0.37	1.27

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

Maximum declared antenna gain = +0.9 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	12.03	12.93	-1.17	-0.27
5785 MHz	12.53	13.43	-0.80	0.10
5825 MHz	12.40	13.30	-1.00	-0.10

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

Maximum declared antenna gain = +0.9 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5755 MHz	12.33	13.23	-3.73	-2.83
5795 MHz	12.34	13.24	-3.44	-2.54

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

4. 802.11 ac 80 MHz mode. (see next plots).

Maximum declared antenna gain = +0.9 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5775 MHz	11.65	12.55	-7.35	-6.45

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

WLAN0-CORE 0 – Antenna RF External port 2:

1. 802.11a mode (see next plots).

Maximum declared antenna gain = +3.2 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500 kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	6.64	9.84	-5.26	-2.06
5785 MHz	6.79	9.99	-5.38	-2.18
5825 MHz	7.32	10.52	-4.78	-1.58

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

Maximum declared antenna gain = +3.2 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	6.45	9.65	-6.76	-3.56
5785 MHz	6.78	9.98	-6.49	-3.29
5825 MHz	7.18	10.38	-5.88	-2.68

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

Maximum declared antenna gain = +3.2 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5755 MHz	6.13	9.33	-9.65	-6.45
5795 MHz	6.56	9.76	-9.36	-6.16

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

4. 802.11 ac 80 MHz mode. (see next plots).

Maximum declared antenna gain = +3.2 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5775 MHz	5.85	9.05	-13.18	-9.98

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

WLAN0-CORE 1 – Antenna RF port 4:

1. 802.11a mode (see next plots).

Maximum declared antenna gain = +2.3 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500 kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	6.92	9.22	-5.08	-2.78
5785 MHz	6.85	9.15	-5.16	-2.86
5825 MHz	5.96	8.26	-5.68	-3.38

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

Maximum declared antenna gain = +2.3 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5745 MHz	6.68	8.98	-6.30	-4.00
5785 MHz	6.54	8.84	-6.67	-4.37
5825 MHz	6.00	8.30	-7.32	-5.02

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

Maximum declared antenna gain = +2.3 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5755 MHz	6.68	8.98	-8.99	-6.69
5795 MHz	6.41	8.71	-9.35	-7.05

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

4. 802.11 ac 80 MHz mode. (see next plots).

Maximum declared antenna gain = +2.3 dBi

Frequency	Maximum conducted output power (dBm)	Maximum output power e.i.r.p. (dBm)	PSD/500kHz (dBm)	PSD/500kHz e.i.r.p. (dBm)
5775 MHz	5.97	8.27	-13.26	-10.96

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

WLAN0-CORE 2 (CORE0+CORE 1) – Antenna RF port 1 and 4:

1. 802.11a mode (see next plots).

MIMO Port 1+4. MAXIMUM OUTPUT POWER

Maximum declared antenna gain Port 1 = +3.2 dBi

Maximum declared antenna gain Port 4 = +2.3 dBi

Frequency	Maximum e.i.r.p. Port 1 (dBm)	Maximum e.i.r.p. Port 4 (dBm)	Maximum conducted output power. MiMo (dBm) Port 1+4	Maximum e.i.r.p. MiMo (dBm) Port 1+4
5745 MHz	8.33	8.78	8.87	11.57
5785 MHz	8.58	8.71	8.93	11.65
5825 MHz	9.04	8.62	9.10	11.84

MIMO Port 1+4. PSD/500kHz

Frequency	PSD/500kHz Port 1 (dBm)	PSD/500kHz Port 4 (dBm)	Total PSD/500kHz Port 1 (dBm) ¹	Total PSD/500kHz Port 4 (dBm) ¹	Total PSD/500kHz Port 1 e.i.r.p. (dBm)	Total PSD/500kHz Port 4 e.i.r.p. (dBm)
5745 MHz	-7.35	-6.04	-4.34	-3.03	-1.14	-0.73
5785 MHz	-6.58	-6.07	-3.57	-3.06	-0.37	-0.76
5825 MHz	-6.16	-6.08	-3.15	-3.07	0.05	-0.77

Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

2. 802.11 n20 MHz and 802.11 ac 20 MHz modes. (see next plots).

Note: the test was performed with 802.11 n20 MHz mode which is the same modulation scheme as 802.11 ac 20 MHz.

MIMO Port 1+4. MAXIMUM OUTPUT POWER

Maximum declared antenna gain Port 1 = +3.2 dBi

Maximum declared antenna gain Port 4 = +2.3 dBi

Frequency	Maximum e.i.r.p. Port 1 (dBm)	Maximum e.i.r.p. Port 4 (dBm)	Maximum conducted output power. MiMo (dBm) Port 1+4	Maximum e.i.r.p. MiMo (dBm) Port 1+4
5745 MHz	8.11	8.60	8.67	11.37
5785 MHz	8.33	8.41	8.66	11.38
5825 MHz	8.78	8.46	8.89	11.63

MIMO Port 1+4. PSD/500kHz

Frequency	PSD/500kHz Port 1 (dBm)	PSD/500kHz Port 4 (dBm)	Total PSD/500kHz Port 1 (dBm) ¹	Total PSD/500kHz Port 4 (dBm) ¹	Total PSD/500kHz Port 1 e.i.r.p. (dBm)	Total PSD/500kHz Port 4 e.i.r.p. (dBm)
5745 MHz	-8.36	-7.14	-5.35	-4.13	-2.15	-1.83
5785 MHz	-8.21	-7.49	-5.20	-4.48	-2.00	-2.18
5825 MHz	-7.89	-7.60	-4.88	-4.59	-1.68	-2.29

Note 1: The quantity $10 \cdot \log 2$ (two antennas) is added to the spectrum peak value according to document 662911 D01.

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

3. 802.11 n40 MHz and 802.11 ac 40 MHz modes. (see next plots).

Note: the test was performed with 802.11 n40 MHz mode which is the same modulation scheme as 802.11 ac 40 MHz.

Maximum declared antenna gain Port 1 = +3.2 dBi

Maximum declared antenna gain Port 4 = +2.3 dBi

MIMO Port 1+4. MAXIMUM OUTPUT POWER

Frequency	Maximum e.i.r.p. Port 1 (dBm)	Maximum e.i.r.p. Port 4 (dBm)	Maximum conducted output power. MiMo (dBm) Port 1+4	Maximum e.i.r.p. MiMo (dBm) Port 1+4
5755 MHz	7.79	8.37	8.40	11.10
5795 MHz	8.08	8.27	8.47	11.18

MIMO Port 1+4. PSD/500kHz

Frequency	PSD/500kHz Port 1 (dBm)	PSD/500kHz Port 4 (dBm)	Total PSD/500kHz Port 1 (dBm) ¹	Total PSD/500kHz Port 4 (dBm) ¹	Total PSD/500kHz Port 1 e.i.r.p. (dBm)	Total PSD/500kHz Port 4 e.i.r.p. (dBm)
5755 MHz	-11.58	-10.20	-8.57	-7.19	-5.37	-4.89
5795 MHz	-11.38	-10.34	-8.37	-7.33	-5.17	-5.03

Measurement uncertainty = $\leq \pm 0.66$ dB

Verdict: PASS

4. 802.11 ac 80 MHz mode. (see next plots).

Maximum declared antenna gain Port 1 = +3.2 dBi

Maximum declared antenna gain Port 4 = +2.3 dBi

MIMO CHAIN A+B. MAXIMUM OUTPUT POWER

Frequency	Maximum e.i.r.p. Port 1 (dBm)	Maximum e.i.r.p. Port 4 (dBm)	Maximum conducted output power. MiMo (dBm) Port 1+4	Maximum e.i.r.p. MiMo (dBm) Port 1+4
5775 MHz	7.40	7.76	7.88	10.59

MIMO Port 1+4. PSD/500kHz

Frequency	PSD/500kHz Chain A (dBm)	PSD/500kHz Chain B (dBm)	Total PSD/500kHz Chain A (dBm) ¹	Total PSD/500kHz Chain B (dBm) ¹	Total PSD/500kHz Chain A e.i.r.p. (dBm)	Total PSD/500kHz Chain B e.i.r.p. (dBm)
5775 MHz	-14.92	-14.03	-11.91	-11.02	-8.71	-8.72

Measurement uncertainty = $\leq \pm 0.66$ dB

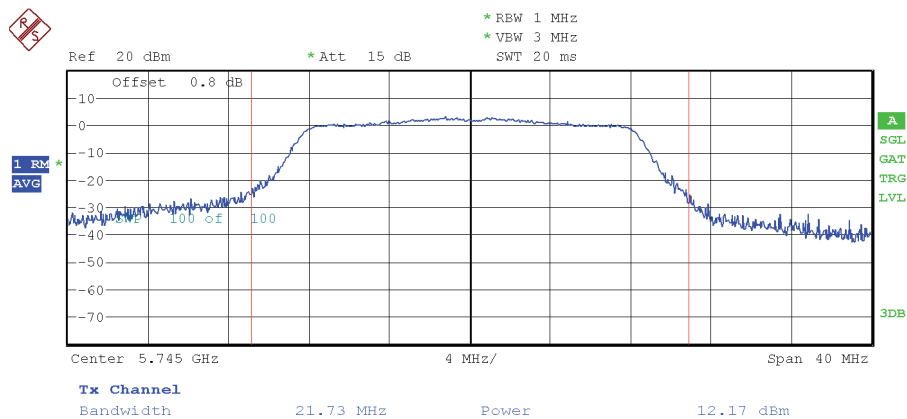
Verdict: PASS

MAXIMUM OUTPUT POWER

WLAN1-CORE 0 – Antenna RF port 3:

802.11a mode

Lowest Channel



Middle Channel

