FCC Part 15.407

TEST REPORT

For

Draytek Corporation

No. 26, Fu shing Rd., Hukou County, Hsinchu Industrial Park Hsinchu, 303, Taiwan

FCC ID: VGYAP920

Report Type:	**Product Type:**
Original Report	Outdoor Extreme Power Wireless AP

Report Producer: Kaylee Chiang

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REVISION HISTORY

Revision	No.	Report Number	Issue Date	Description	Author/ Revised by
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TABLE OF CONTENTS

1 GENERAL INFORMATION 5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) 5
1.2 OBJECTIVE 7
1.3 RELATED SUBMITTAL(S)/GRANT(S) 7
1.4 TEST METHODOLOGY 7
1.5 TEST FACILITY 8
2 SYSTEM TEST CONFIGURATION 9
2.1 DESCRIPTION OF TEST CONFIGURATION 9
2.2 EQUIPMENT MODIFICATIONS 10
2.3 EUT EXERCISE SOFTWARE 10
2.4 TEST MODE 10
2.5 SUPPORT EQUIPMENT LIST AND DETAILS 11
2.6 EXTERNAL CABLE LIST AND DETAILS 11
2.7 BLOCK DIAGRAM OF TEST SETUP 11
2.8 DUTY CYCLE 13
3 SUMMARY OF TEST RESULTS 16
4 FCC §15.407(F), §1.1310, §2.1091 - MAXIMUM PERMISSIBLE EXPOSURE (MPE) 17
4.1 APPLICABLE STANDARD 17
4.2 RF EXPOSURE EVALUATION RESULT 17
5 FCC §15.203 – ANTENNA REQUIREMENTS 18
5.1 APPLICABLE STANDARD 18
5.2 ANTENNA LIST AND DETAILS 18
6 FCC §15.407 (B) (6) & §15.207(A)-AC LINE CONDUCTED EMISSIONS 19
6.1 APPLICABLE STANDARD 19
6.2 MEASUREMENT UNCERTAINTY 19
6.3 EUT SETUP 20
6.4 EMI TEST RECEIVER SETUP 20
6.5 TEST PROCEDURE 20
6.6 CORRECTED FACTOR & MARGIN CALCULATION 21
6.7 TEST EQUIPMENT LIST AND DETAILS 21
6.8 TEST ENVIRONMENTAL CONDITIONS 21
6.9 TEST RESULTS 21
7 FCC §15.209, §15.205 & §15.407(B) – UNWANTED EMISSION 24
7.1 APPLICABLE STANDARD 24
7.2 MEASUREMENT UNCERTAINTY 25
7.3 EUT SETUP 26
7.4 EMI TEST RECEIVER & SPECTRUM ANALYZER SETUP 27
7.5 TEST PROCEDURE 27
7.6 CORRECTED FACTOR & MARGIN CALCULATION 27
7.7 TEST RESULTS SUMMARY 28
7.8 TEST EQUIPMENT LIST AND DETAILS 29
7.9 TEST ENVIRONMENTAL CONDITIONS 29
7.10 TEST RESULTS 30
8 FCC §15.407(A)(E) –EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH 66
8.1 APPLICABLE STANDARD 66
8.2 TEST PROCEDURE 66
8.3 TEST EQUIPMENT LIST AND DETAILS 67
8.4 TEST ENVIRONMENTAL CONDITIONS 67
8.5 TEST RESULTS 68

9 FCC §15.407(A)(1) – MAXIMUM OUTPUT POWER 115
9.1 APPLICABLE STANDARD 115
9.2 TEST PROCEDURE 115
9.3 TEST EQUIPMENT LIST AND DETAILS 115
9.4 TEST ENVIRONMENTAL CONDITIONS 115
9.5 TEST RESULTS 116
10 FCC §15.407(A) – POWER SPECTRAL DENSITY 117
10.1 APPLICABLE STANDARD 117
10.2 TEST PROCEDURE 117
10.3 TEST EQUIPMENT LIST AND DETAILS 118
10.4 TEST ENVIRONMENTAL CONDITIONS 118
10.5 TEST RESULTS 119

1 General Information

1.1 Product Description for Equipment Under Test (EUT)

Applicant	:	Draytek Corporation No. 26, Fu shing Rd., Hukou County, Hsinchu Industrial Park Hsinchu, 303, Taiwan
Manufacturer	:	Draytek Corporation No. 26, Fu shing Rd., Hukou County, Hsinchu Industrial Park Hsinchu, 303, Taiwan
Product	:	Outdoor Extreme Power Wireless AP
Model	:	VigorAP 920RPD
Series Model	:	VigorAP 920R, VigorAP 920RP, VigorAP 920RD
Trade Name	:	DrayTek
Frequency Range	:	5150 MHz ~ 5250 MHz, 5725 MHz ~ 5850 MHz
Transmit Power	:	CDD Mode IEEE 802.11a Mode: 19.59dBm IEEE 802.11ac VHT20 Mode: 21.55dBm IEEE 802.11ac VHT40 Mode: 21.79dBm IEEE 802.11ac VHT80 Mode: 22.01dBm
Modulation Technique	:	IEEE 802.11a: OFDM IEEE 802.11ac VHT 20 Mode: OFDM IEEE 802.11ac VHT 40 Mode: OFDM IEEE 802.11ac VHT 80 Mode: OFDM
Number of Channels	:	IEEE 802.11a / IEEE802.11n HT20 Mode: 9 Channels IEEE 802.11ac VHT40 Mode: 4 Channels IEEE 802.11ac VHT80 Mode: 2 Channels
Antenna Specification	:	Patch Antenna / Gain: 13.21 dBi Dipole Antenna / Gain: 5.97 dBi
Voltage Range	:	56Vdc, 800mA
Date of Test	:	Nov 27, 2017 ~ Jun 11, 2018

**All measurement and test data in this report was gathered from production sample serial number: 171117001 (Assigned by BACL, Taiwan). The EUT supplied by the applicant was received on 2017-11-17.*

PoE Information:

Model: GRT-560080A

Input: 100-240Vac, 50/60Hz

Output: 56Vdc, 800mA

Model Difference: The major electrical and mechanical constructions of series models are identical to the basic model, except different Market segmentation. Please refer to the Declaration of similarity letter for more detail.

1.2 Objective

This report is prepared on behalf of *Draytek Corporation* in accordance with Part 2, Subpart J, Part 15, Subparts A, C and E of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart E, and section 15.203, 15.205, 15.207, 15.209 and 15.407 rules.

1.3 Related Submittal(s)/Grant(s)

FCC Part 15.247 DTS submission with FCC ID: VGYAP920

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

KDB 662911 D01 Multiple Transmitter Output v02r01

KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

1.5 Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Taiwan) to collect test data is located on
☒70, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.
☐68-3, Lane 169, Sec. 2, Datong Road, Xizhi Dist., New Taipei City 22183, Taiwan, R.O.C.

Bay Area Compliance Laboratories Corp. (Taiwan) Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 3180) and the FCC designation No. TW3180 under the FCC 2.948 (e) by Mutual Recognition Agreement (MRA) in FCC Test. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 974454. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

2 System Test Configuration

2.1 Description of Test Configuration

The system was configured for testing in an engineering mode, which is provided by manufacture.

There are two modes of EUT for 802.11n/ac in 5GHz. One is patch antenna mode, and the other is dipole antenna mode. Both modes have been tested and recorded in this test report. And the patch antenna gain is greater than the dipole antenna, so the patch antenna is the worst mode.

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40/ac vht80, the ht20/ht40 were reduced since the identical parameters with 802.11ac vht20 and vht40.

For 5150 ~ 5250MHz
4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
40	5200	48	5240

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

For 802.11a, 802.11ac vht20, Channel 36, 40 and 48 was tested, for 802.11ac vht40, Channel 38, 46 were tested, for 802.11ac 80, channel 42 was tested.

For 5745 ~ 5825MHz:
5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	161	5805
153	5765	165	5825
157	5785		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
155	5775

For 802.11a, 802.11ac vht20, Channel 149, 157 and 165 was tested, for 802.11ac vht40, Channel 151, 159 was tested, for 802.11ac 80, channel 155 was tested.

The device supports SISO at all modes and MIMO at 802.11n/ac modes.
SISO mode and MIMO mode have the same power level setting and base on output power testing, MIMO mode power than SISO mode large, MIMO mode was selected for full testing.

2.2 Equipment Modifications

No modification was made to the EUT

2.3 EUT Exercise Software

The software was used "QCA Radio Control Toolkit".

UNII Band	Mode	Channel	Frequency (MHz)	Power setting	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	16	16
		40	5200	16	16
		48	5240	15.5	15.5
UNII-3		149	5745	17.5	17.5
		157	5785	17.5	17.5
		165	5825	17	17
UNII-1	802.11n 20 / ac20	36	5180	16	16
		40	5200	16	16
		48	5240	16	16
UNII-3		149	5745	19.5	19.5
		157	5785	19	19
		165	5825	18.5	18.5
UNII-1	802.11n 40 / ac 40	38	5190	16	16
		46	5230	16	16
UNII-3		151	5755	19	19
		159	5795	18.5	18.5
UNII-1	802.11 ac 80	42	5210	14.5	14.5
UNII-3		155	5775	18.5	18.5

The EUT was configured for testing in an engineering mode which was provided by the manufacturer.
The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all data rates bandwidths, and modulations.

802.11a MIMO Mode: 6Mbps
802.11ac vht20 MIMO Mode: MCS0
802.11ac vht40 MIMO Mode: MCS0
802.11ac vht80 MIMO Mode: MCS0 Nss =1

2.4 Test Mode

Pre-Scan
Mode 1: Full System (model: VigorAP 920RPD) for all test item.
Mode 2: Full System (model: VigorAP 920RD) for AC Line Conducted Emissions and Radiated Spurious Emissions.
Mode 3: Full System (model: VigorAP 920RP) for AC Line Conducted Emissions and Radiated Spurious Emissions.
Mode 4: Full System (model: VigorAP 920R) for AC Line Conducted Emissions and Radiated Spurious Emissions.

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available.

Final Test
Mode 1: Full System (model: VigorAP 920RPD) + patch antenna tested all measure item.
Mode 2: Full System (model: VigorAP 920RP) + dipole antenna tested Radiated Emission.

2.5 Support Equipment List and Details

Description	Manufacturer	Model Number	S/N
NB	Dell	E6410	10912240367
NB	ASUS	N81V	N/A

2.6 External Cable List and Details

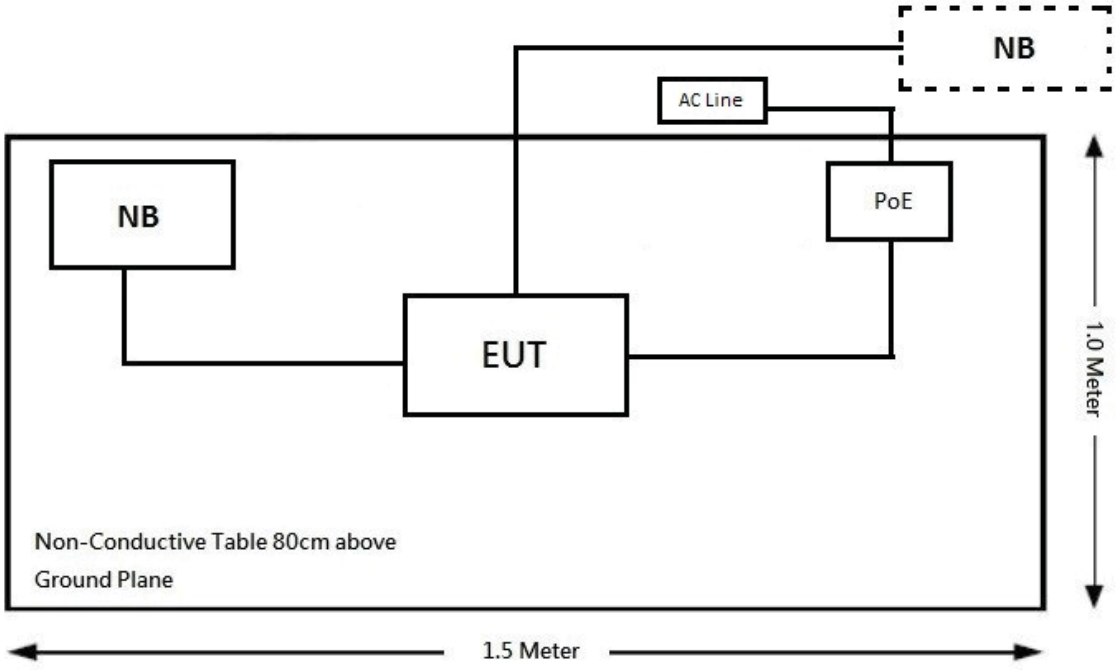
Cable Description	Length (m)	From	To
RJ45 Cable	2M	NB	EUT
RJ45 Cable	2M	NB	EUT

2.7 Block Diagram of Test Setup

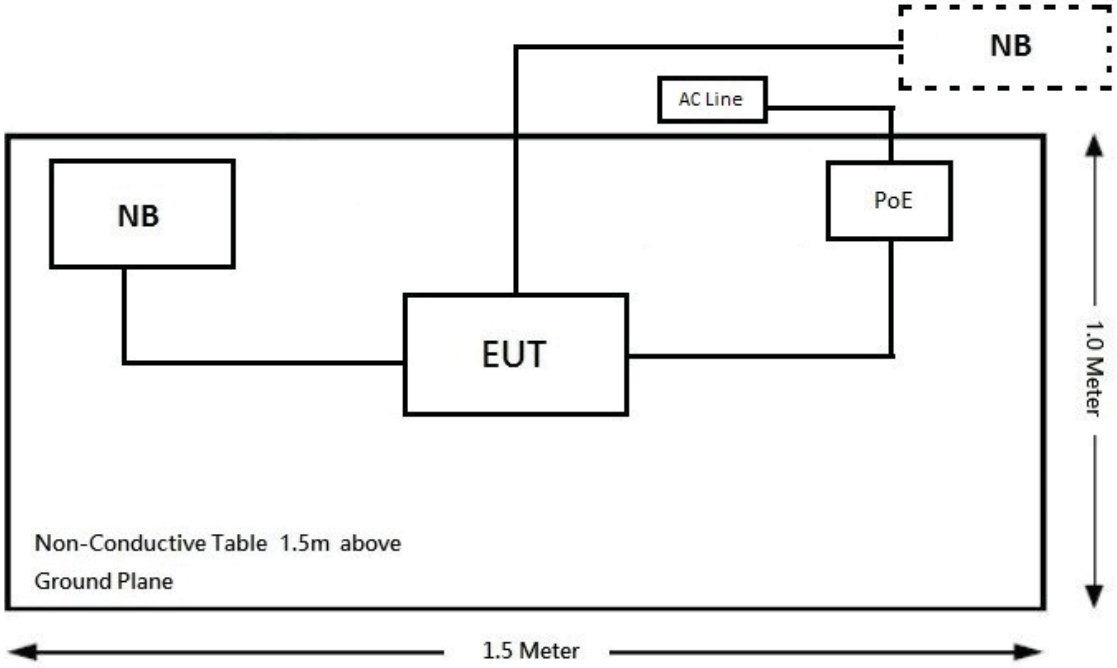
See test photographs attached in Exhibit A for the actual connections between EUT and support equipment.

Radiation:

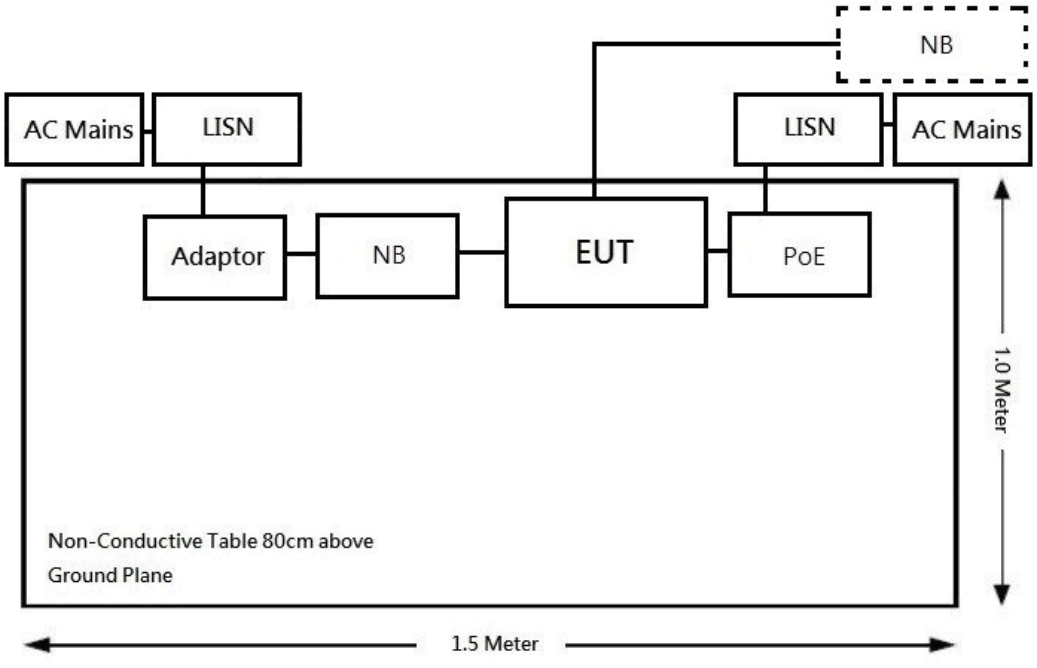
Below 1GHz:



Above 1GHz:



Conduction:



2.8 Duty Cycle

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 section B:

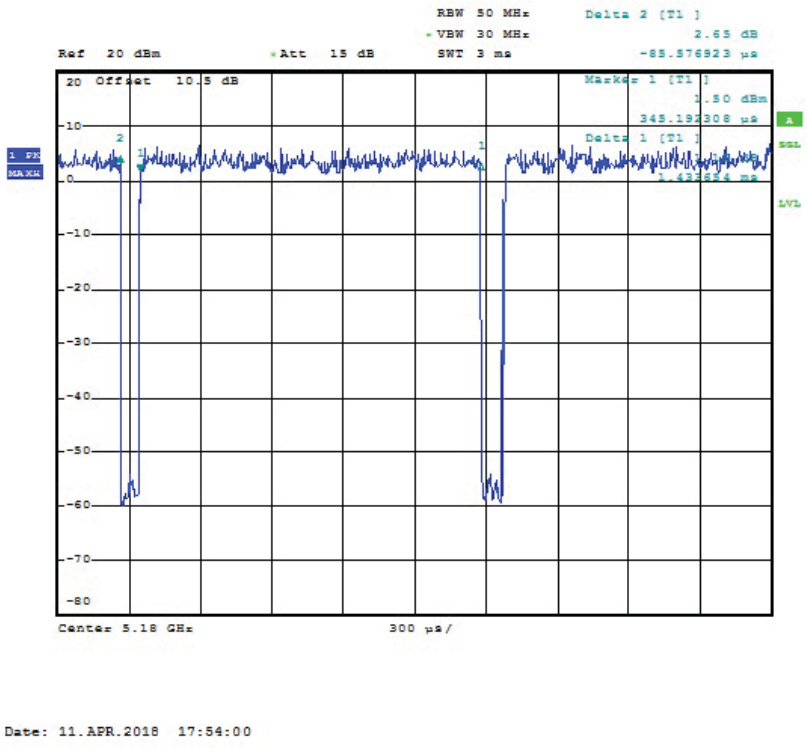
All measurements are to be performed with the EUT transmitting at 100% duty cycle at its maximum power control level; however, if 100% duty cycle cannot be achieved, measurements of duty cycle, x, and maximum power transmission duration, T, are required for each tested mode of operation.

Radio Mode	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
802.11a	1.433	1.518	94	0.27
802.11ac20	1.337	1.417	94	0.27
802.11ac40	0.625	0.753	83	0.81
802.11ac80	0.295	0.431	68	1.67

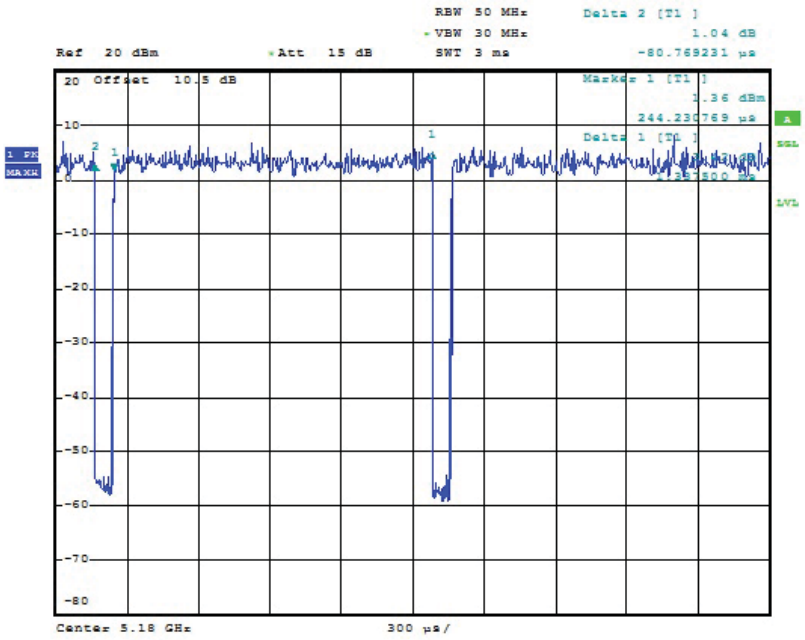
Note: Duty Cycle Correction Factor = 10*log(1/duty cycle)

Please refer to the following plots.

A Mode

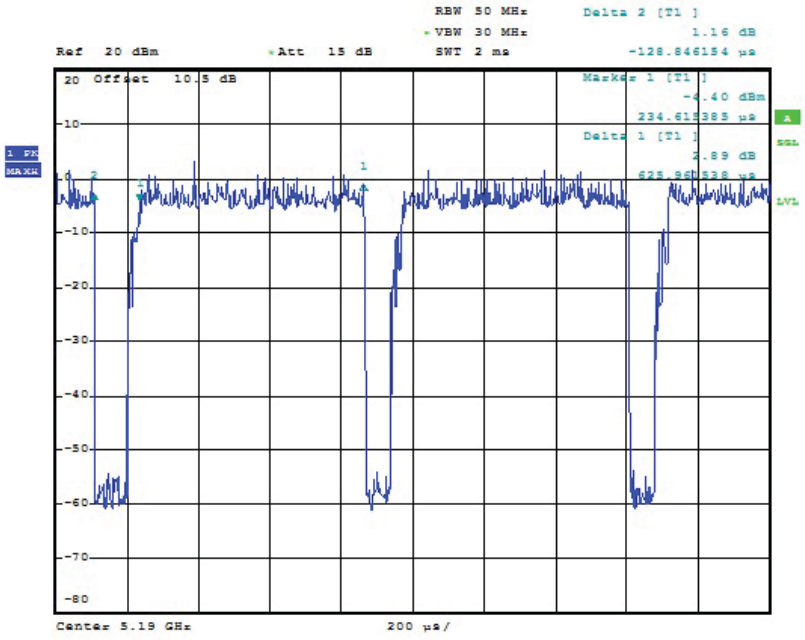


AC20 Mode



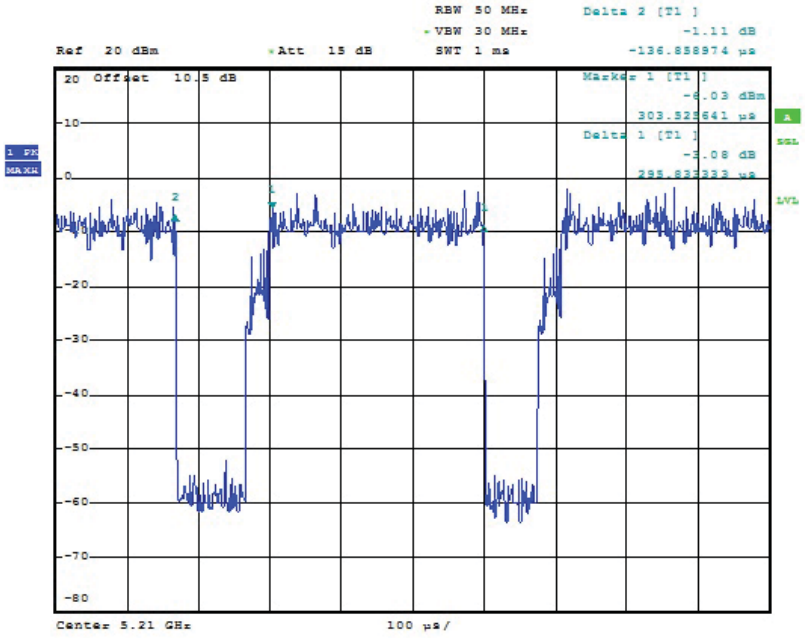
Date: 11.APR.2018 17:55:02

AC40 Mode



Date: 11.APR.2018 17:58:34

AC80 Mode



Date: 11.APR.2018 18:00:04

3 Summary of Test Results

FCC Rules	Description of Test	Result
§15.407 (f) & §1.1310 &§2.1091	Maximum Permissible Exposure (MPE)	Compliance
§15.203	Antenna Requirement	Compliance
§15.407(b)(6)& §15.207(a)	AC Line Conducted Emissions	Compliance
§15.205& §15.209 &§15.407(b)	Unwanted Emission	Compliance
§15.407(a) (e)	Emission Bandwidth	Compliance
§15.407(a) (1)	Conducted Transmitter Output Power	Compliance
§15.407 (a) (1)(5)	Power Spectral Density	Compliance

4 FCC §15.407(f), §1.1310, §2.1091 - Maximum Permissible Exposure (MPE)

4.1 Applicable Standard

According to§15.407(f) and §1.1310, U-NII devices are subject to the radio frequency radiation exposure requirements specified in §§ 1.1307(b), and 2.1091 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request

4.2 RF Exposure Evaluation Result

MPE evaluation for single transmission:

Mode	Frequency Range (MHz)	Antenna Gain		Target Power		Evaluation Distance (cm)	Power Density (mW/cm^2)	MPE Limit (mW/cm^2)
		(dBi)	(numeric)	(dBm)	(mW)			
2.4G WIFI	2412-2462	3.12	2.05	27.5	562.34	20	0.23	1.0
5G WIFI B1	5180-5240	10.97	12.50	18.0	63.09	20	0.16	1.0
5G WIFI B4	5725-5825	13.21	20.94	22.5	177.83	20	0.74	1.0

Note: the maximum antenna gain was used for evaluation.

MPE evaluation for simultaneous transmission:

2.4G WIFI and 5G WIFI can transmit at the same time, MPE evaluation is as below formula:

PD1/Limit1+PD2/Limit2+……＜1, PD (Power Density)

MPE evaluation=
MPE of 2.4G WIFI/1 + MPE of 5G WIFI/1
= 0.23/1+0.74/1=0.97＜1.0

Result: MPE evaluation of single and simultaneous transmission meet 20cm the requirement of standard.

5 FCC §15.203 – Antenna Requirements

5.1 Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
And according to FCC 47 CFR section 15.407 (a)(3),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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.2 Antenna List and Details

No.	Manufacturer	Model	Antenna Type	Antenna Gain	
				UNII-1 Band	UNII-3 Band
Patch Antenna					
1	DrayTek	ALA110-093110	Patch Antenna	10.97 dBi	13.21 dBi
2	DrayTek	ALA110-093110	Patch Antenna	10.33 dBi	12.25 dBi
Dipole Antenna					
1	DrayTek	600-1092000-00G	Dipole Antenna	5.78 dBi	5.97 dBi
2	DrayTek	600-1092000-00G	Dipole Antenna	5.78 dBi	5.97 dBi

VigorAP 920RD and VigorAP 920RPD are operate 2.4G and 5G WIFI using Dipole antenna and Patch antenna individually. VigorAP 920R and VigorAP 920RP operate 2.4G and 5G WIFI using Dipole antenna in common, and no Patch antenna inside the EUT. Please refer to photos.

This product is a professional installation, detailed installation process reference user manual.

Result: Compliance

6 FCC §15.407 (b) (6) & §15.207(a)-AC Line Conducted Emissions

6.1 Applicable Standard

As per FCC §15.407(b) (6)

Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207

As per FCC §15.207

For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequencies ranges.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 2
0.5-5	56	46
5-30	60	50

Note 1: Decreases with the logarithm of the frequency.
Note 2: A linear average detector is required

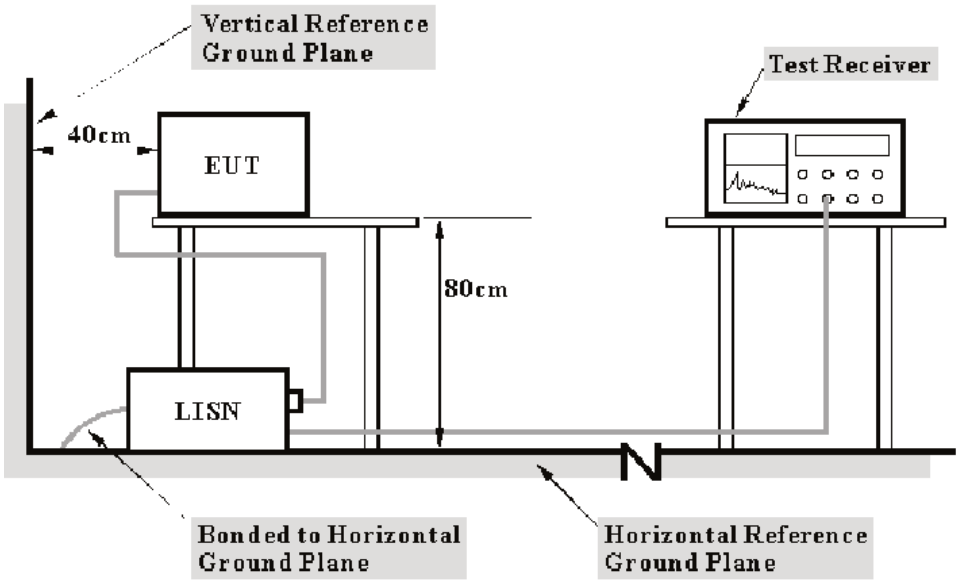
6.2 Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Taiwan) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report

Port	Expanded Measurement uncertainty
AC Mains	4.64 dB (k=2, 95% level of confidence)

6.3 EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

6.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz. During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	Receiver RBW
150 kHz - 30 MHz	9 kHz

6.5 Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the LISN. Maximizing procedure was performed on the six (6) highest emissions of the EUT. All data was recorded in the Quasi-peak and average detection mode.

6.6 Corrected Factor & Margin Calculation

The factor is calculated by adding LISN/ISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

Factor = LISN VDF + Cable Loss + Transient Limiter Attenuation

The "Over Limit" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an over limit of -7 dB means the emission is 7 dB below the limit. The equation for Over Limit calculation is as follows:

Over Limit = Level – Limit Line

6.7 Test Equipment List and Details

Manufacturers	Descriptions	Models	Serial Numbers	Calibration Date	Calibration Due Date
LISN	Rohde & Schwarz	ENV216	101248	2017/07/20	2018/07/19
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2017/11/06	2018/11/05
Pulse Limiter	Rohde & Schwarz	ESH3Z2	TXZEM025	2017/08/10	2018/08/09
RF Cable	EMEC	EM-CB5D	001	2017/07/10	2018/07/09
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R

**** Statement of Traceability:*** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

6.8 Test Environmental Conditions

Temperature:	25 ℃
Relative Humidity:	58 %
ATM Pressure:	1020 hPa

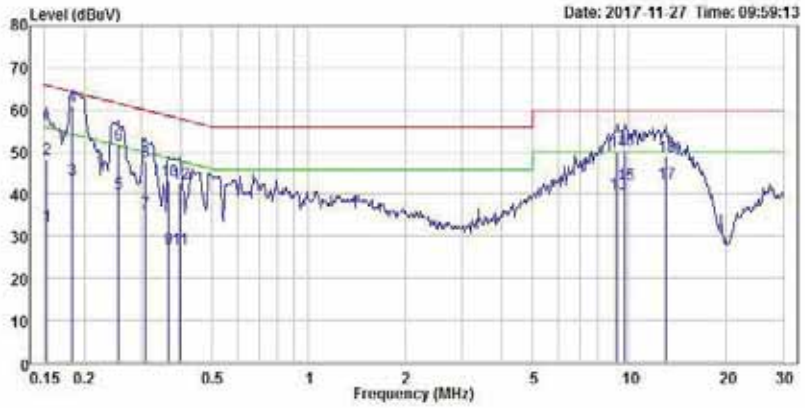
The testing was performed by Andy Shih on 2017-11-27.

6.9 Test Results

Test Mode: Transmitting mode

Please refer to the following plots and tables.

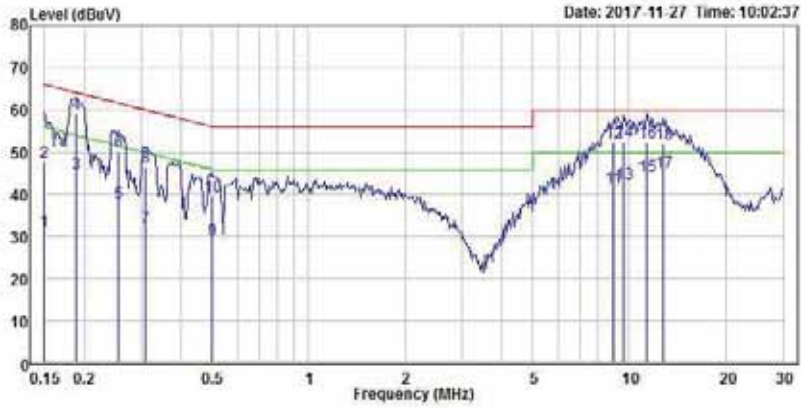
Main: AC 120V/60 Hz, Line



Condition: Line
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.152	32.64	55.87	-23.23	19.50	13.14	Average	Line
2	0.152	48.38	65.87	-17.49	19.50	28.88	QP	Line
3	0.183	43.50	54.35	-10.85	19.50	24.00	Average	Line
4	0.183	60.69	64.35	-3.66	19.50	41.19	QP	Line
5	0.256	40.00	51.57	-11.57	19.50	20.50	Average	Line
6	0.256	51.59	61.57	-9.98	19.50	32.09	QP	Line
7	0.310	35.69	49.98	-14.29	19.50	16.19	Average	Line
8	0.310	47.83	59.98	-12.15	19.50	28.33	QP	Line
9	0.366	27.03	48.59	-21.56	19.51	7.52	Average	Line
10	0.366	43.23	58.59	-15.36	19.51	23.72	QP	Line
11	0.396	26.96	47.93	-20.97	19.51	7.45	Average	Line
12	0.396	42.73	57.93	-15.20	19.51	23.22	QP	Line
13	9.153	40.26	50.00	-9.74	19.76	20.50	Average	Line
14	9.153	50.21	60.00	-9.79	19.76	30.45	QP	Line
15	9.678	42.23	50.00	-7.77	19.76	22.47	Average	Line
16	9.678	50.52	60.00	-9.48	19.76	30.76	QP	Line
17	12.893	42.67	50.00	-7.33	19.79	22.88	Average	Line
18	12.893	48.95	60.00	-11.05	19.79	29.16	QP	Line

Main: AC 120V/60 Hz, Neutral



Condition: Neutral
EUT :
Mode :
Note : 120V/60Hz

	Freq	Level	Limit Line	Over Limit	Factor	Read Level	Remark	Pol/Phase
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.150	31.38	56.00	-24.62	19.63	11.75	Average	Neutral
2	0.150	47.73	66.00	-18.27	19.63	28.10	QP	Neutral
3	0.187	44.90	54.15	-9.25	19.63	25.27	Average	Neutral
4	0.187	58.86	64.15	-5.29	19.63	39.23	QP	Neutral
5	0.254	38.11	51.63	-13.52	19.63	18.48	Average	Neutral
6	0.254	50.24	61.63	-11.39	19.63	30.61	QP	Neutral
7	0.310	32.34	49.98	-17.64	19.63	12.71	Average	Neutral
8	0.310	46.51	59.98	-13.47	19.63	26.88	QP	Neutral
9	0.500	29.15	46.01	-16.86	19.64	9.51	Average	Neutral
10	0.500	39.63	56.01	-16.38	19.64	19.99	QP	Neutral
11	8.937	41.78	50.00	-8.22	19.89	21.89	Average	Neutral
12	8.937	52.34	60.00	-7.66	19.89	32.45	QP	Neutral
13	9.601	42.50	50.00	-7.50	19.91	22.59	Average	Neutral
14	9.601	52.53	60.00	-7.47	19.91	32.62	QP	Neutral
15	11.259	44.44	50.00	-5.56	19.93	24.51	Average	Neutral
16	11.259	52.43	60.00	-7.57	19.93	32.50	QP	Neutral
17	12.689	45.32	50.00	-4.68	19.95	25.37	Average	Neutral

7 FCC §15.209, §15.205 & §15.407(b) – UNWANTED EMISSION

7.1 Applicable Standard

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110 0.495 – 0.505 2.1735 – 2.1905 4.125 – 4.128 4.17725 – 4.17775 4.20725 – 4.20775 6.215 – 6.218 6.26775 – 6.26825 6.31175 – 6.31225 8.291 – 8.294 8.362 – 8.366 8.37625 – 8.38675 8.41425 – 8.41475 12.29 – 12.293 12.51975 – 12.52025 12.57675 – 12.57725 13.36 – 13.41	16.42 – 16.423 16.69475 – 16.69525 25.5 – 25.67 37.5 – 38.25 73 – 74.6 74.8 – 75.2 108 – 121.94 123 – 138 149.9 – 150.05 156.52475 – 156.52525 156.7 – 156.9 162.0125 –167.17 167.72 – 173.2 240 – 285 322 – 335.4 399.9 – 410 608 – 614	960 – 1240 1300 – 1427 1435 – 1626.5 1645.5 – 1646.5 1660 – 1710 1718.8 – 1722.2 2200 – 2300 2310 – 2390 2483.5 – 2500 2690 – 2900 3260 – 3267 3.332 – 3.339 3 3458 – 3 358 3.600 – 4.400	4. 5 – 5. 15 5. 35 – 5. 46 7.25 – 7.75 8.025 – 8.5 9.0 – 9.2 9.3 – 9.5 10.6 – 12.7 13.25 – 13.4 14.47 – 14.5 15.35 – 16.2 17.7 – 21.4 22.01 – 23.12 23.6 – 24.0 31.2 – 31.8 36.43 – 36.5 Above 38.6

As per FCC §15.209: The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 Note 1	3
88 - 216	150 Note 1	3
216 - 960	200 Note 1	3
Above 960	500	3

Note 1: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As per FCC Part 15.407 (b)

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall noet exceed an e.i.r.p. of -27 dBm/MHz.

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

(4) Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in §15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

(5) The provisions of §15.205 apply to intentional radiators operating under this section.

7.2 Measurement Uncertainty

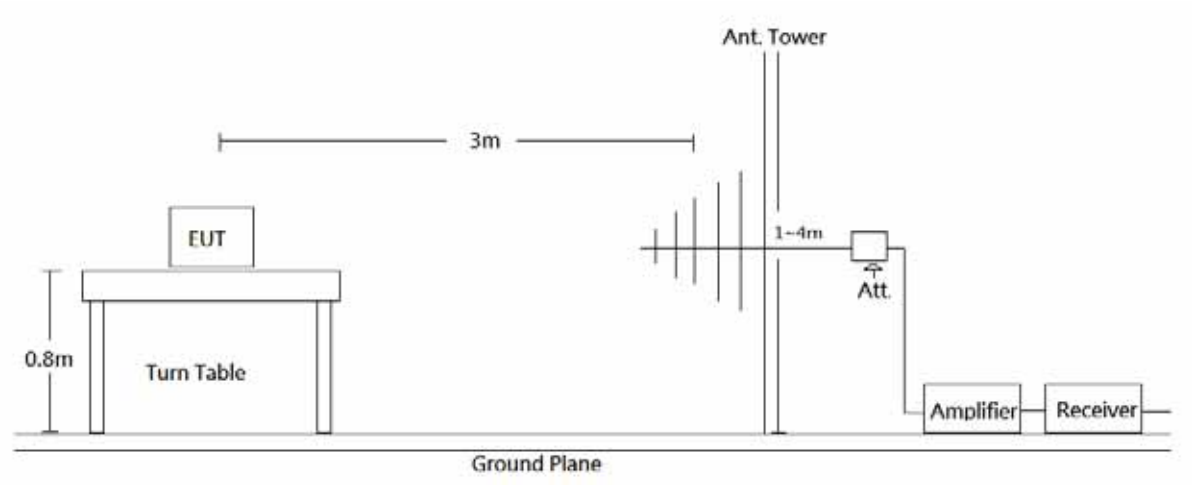
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Taiwan) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report.

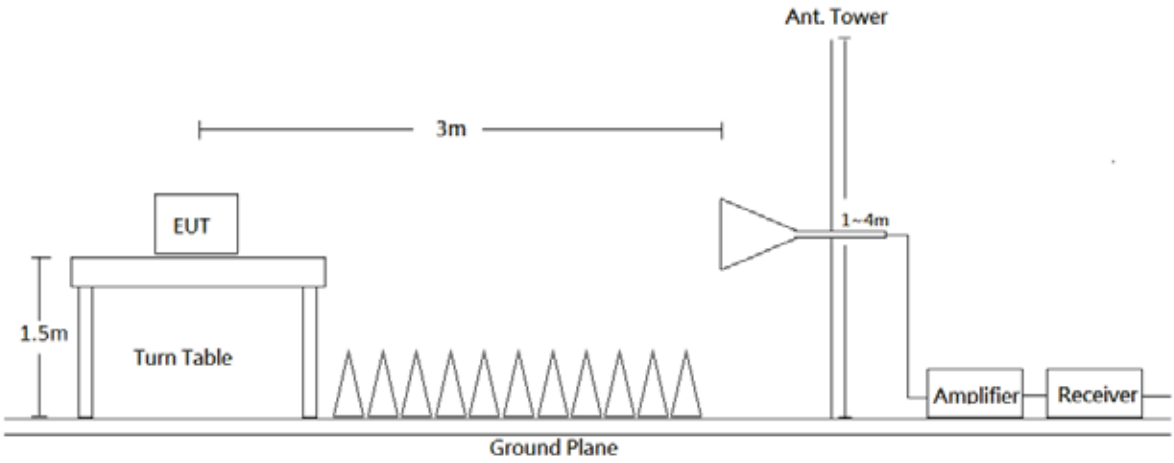
Frequency	Measurement uncertainty
30 MHz~200 MHz	4.21 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	4.41 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	4.51 dB (k=2, 95% level of confidence)
6 GHz~18 GHz	4.88 dB (k=2, 95% level of confidence)
18 GHz~26 GHz	4.30 dB (k=2, 95% level of confidence)
26 GHz~40 GHz	4.30 dB (k=2, 95% level of confidence)

7.3 EUT Setup

Blow 1 GHz:



Above 1 GHz:



Radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part 15.209 and FCC 15.407 Limits.

7.4 EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 40 GHz. During the radiated emission test, the EMI test receiver for below 1GHz and spectrum analyzer for above 1GHz was set with the following configurations measurement method 6.3 in ANSI C63.10.

Frequency Range	RBW	VBW	Detector	Duty cycle	Measurement method
30-1000 MHz	120 kHz	/	QP		QP
Above 1 GHz	1 MHz	3 MHz	PK		PK
	1 MHz	3 MHz	RMS	>98%	Ave
	1 MHz	1/T	PK	<98%	Ave

7.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

According to C63.10-2013, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

Frequency Band 5150~5250 MHz, EIRP Limit -27(dBm/MHz)

Equivalent Field Strength at 3m is 68.23 dBμV/m

Frequency Band 5725~5850 MHz, EIRP is all emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Equivalent Field Strength at 3m is all emissions shall be limited to a level of 68.2 dBμV/m at 75 MHz or more above or below the band edge increasing linearly to 105.2 dBμV/m at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 110.8 dBμV/m at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 122.2 dBμV/m at the band edge.

7.6 Corrected Factor & Margin Calculation

The Correct Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain + Attenuator

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

Margin = Result –Limit

7.7 Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.209 Limit. Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$Lm + U(Lm) \leq Llim + Ucispr$

In BACL, U(Lm) is less than Ucispr, if Lm is less than Llim, it implies that the EUT complies with the limit.

7.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/15542_01	2017/12/20	2018/12/19
Horn Antenna	EMCO	3115	9311-4158	2017/05/24	2018/05/23
Horn Antenna	ETS-Lindgren	3116	62638	2017/09/13	2018/09/12
Preamplifier	Sonoma	310N	130602	2017/07/03	2018/07/02
Preamplifier	EM Electronics Corp.	EM01G18G	060657	2017/12/14	2018/12/13
Microware Preamplifier	EM Electronics Corporatino	EM18G40G	060656	2018/01/15	2019/01/14
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2017/11/06	2018/11/05
Spectrum Analyzer	Rohde & Schwarz	FSV40	101203	2017/07/13	2018/07/12
Microflex Cable	UTIFLEX	UFB311A-Q-1440-300300	220490-006	2017/10/31	2018/10/30
Microflex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2017/11/10	2018/11/09
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2018/03/05	2019/03/04
Microflex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2018/01/17	2019/01/16
Turn Table	Champro	TT-2000	060772-T	N.C.R	N.C.R
Antenna Tower	Champro	AM-BS-4500-B	060772-A	N.C.R	N.C.R
Controller	Champro	EM1000	60772	N.C.R	N.C.R
Software	Farad	EZ_EMC	BACL-03A1	N.C.R	N.C.R

**** Statement of Traceability:*** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

7.9 Test Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	57 %
ATM Pressure:	1020 hPa

The testing was performed by Andy Shih on 2018-03-23.

7.10 Test Results

Test Mode: Transmitting Mode

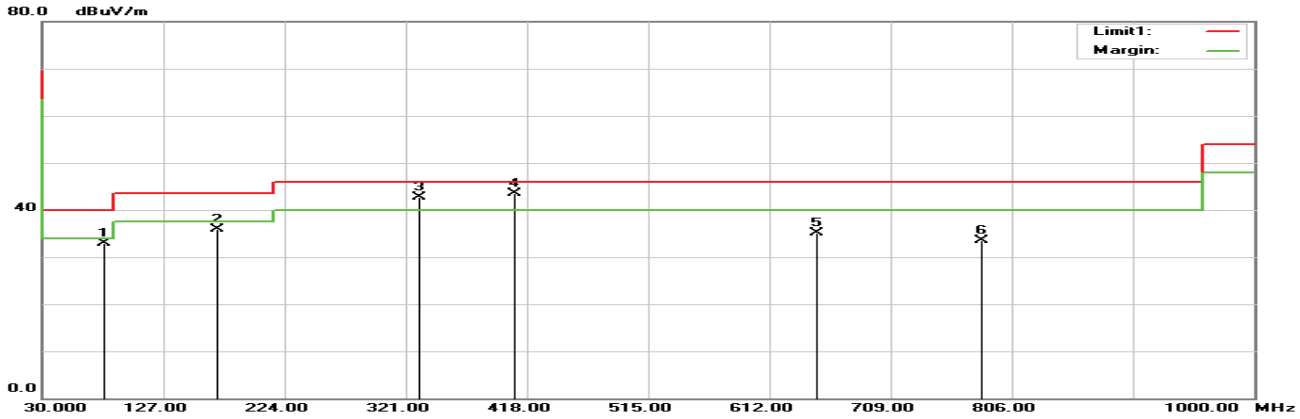
Mode 1 (Patch Antenna)

(Pre-scan with three orthogonal axis, and worse case as Y axis.)

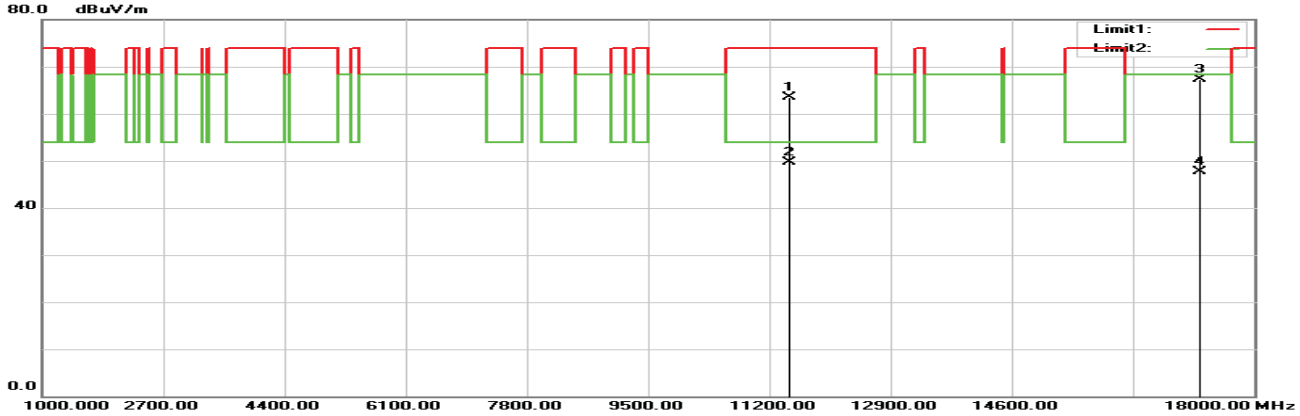
Horizontal

A mode: Worst case is 5745MHz.

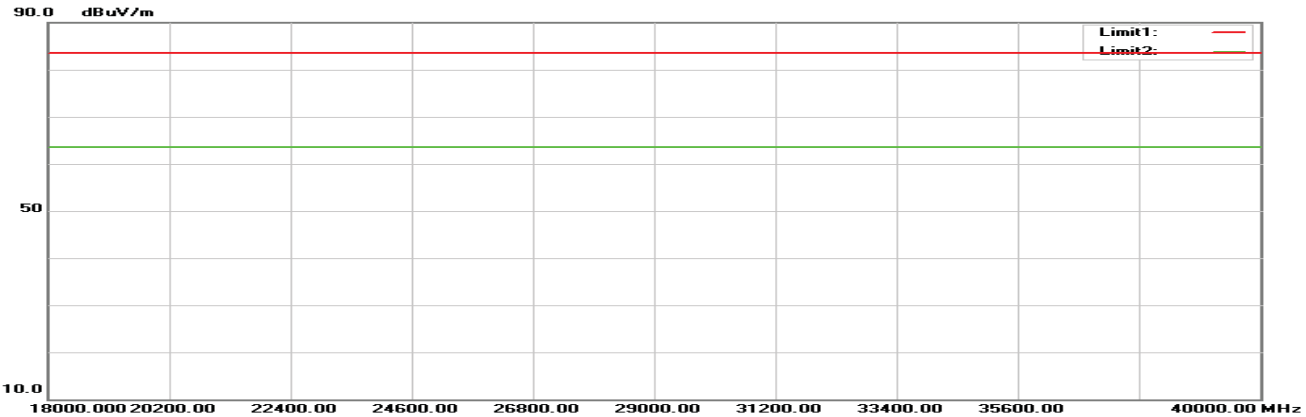
30MHz-1GHz



1GHz-18GHz



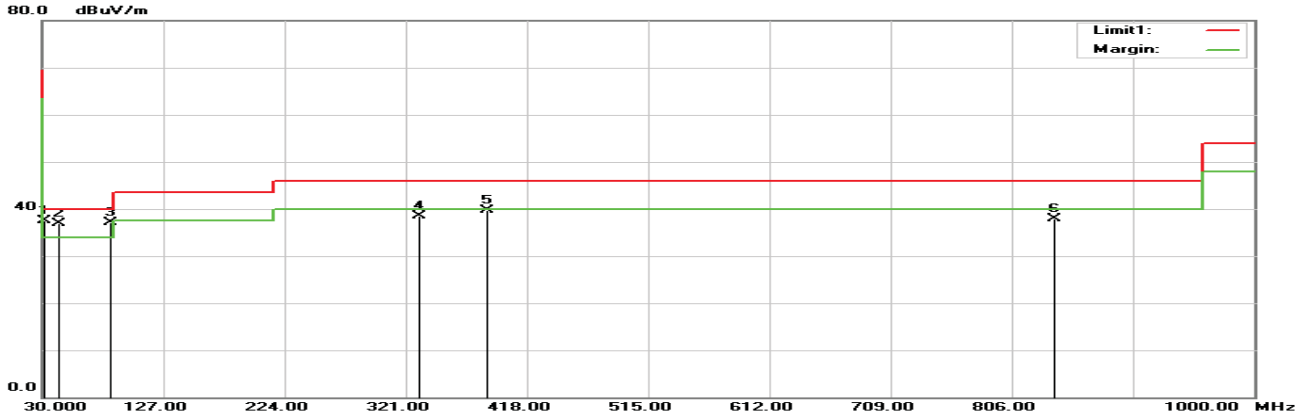
18GHz-40GHz



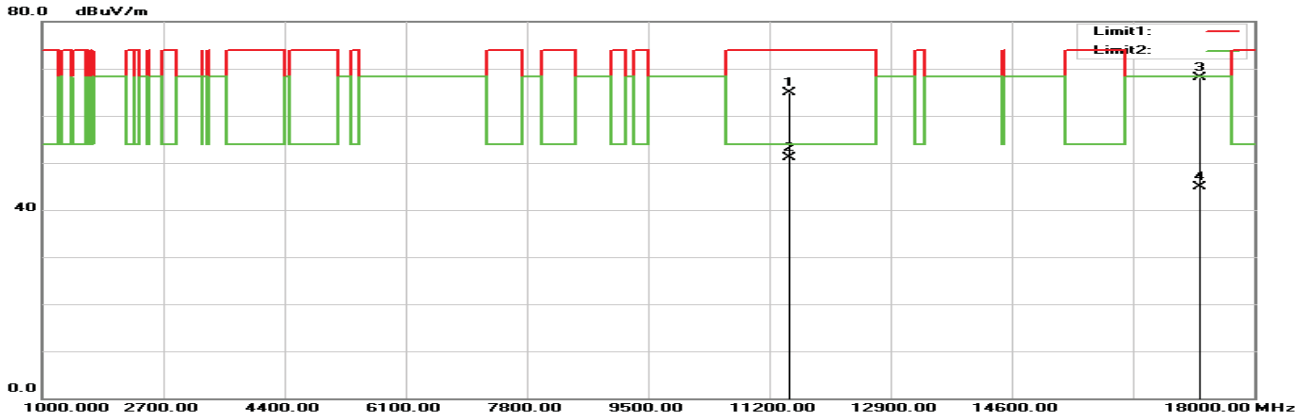
Vertical

A mode: Worst case is 5745MHz.

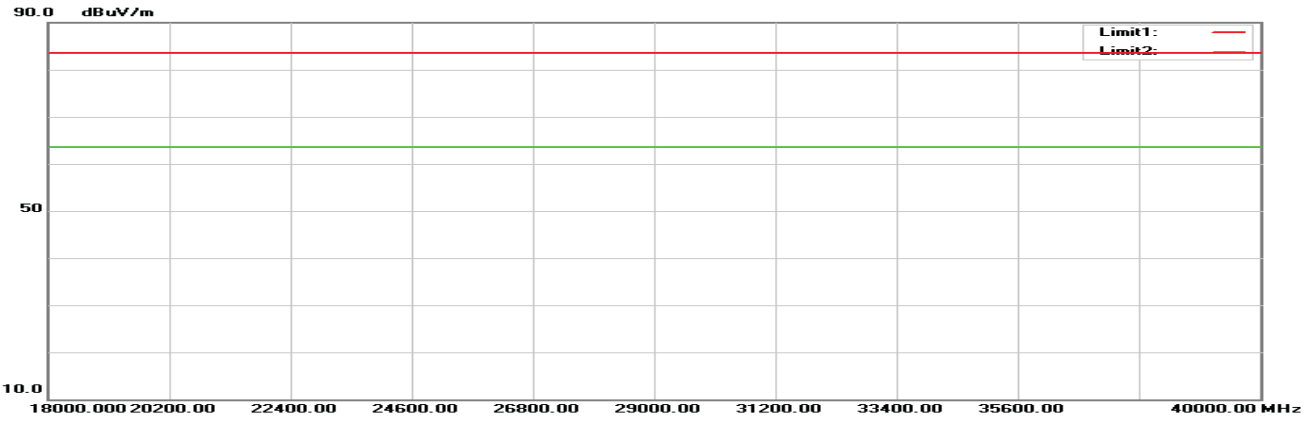
30MHz-1GHz



1GHz-18GHz



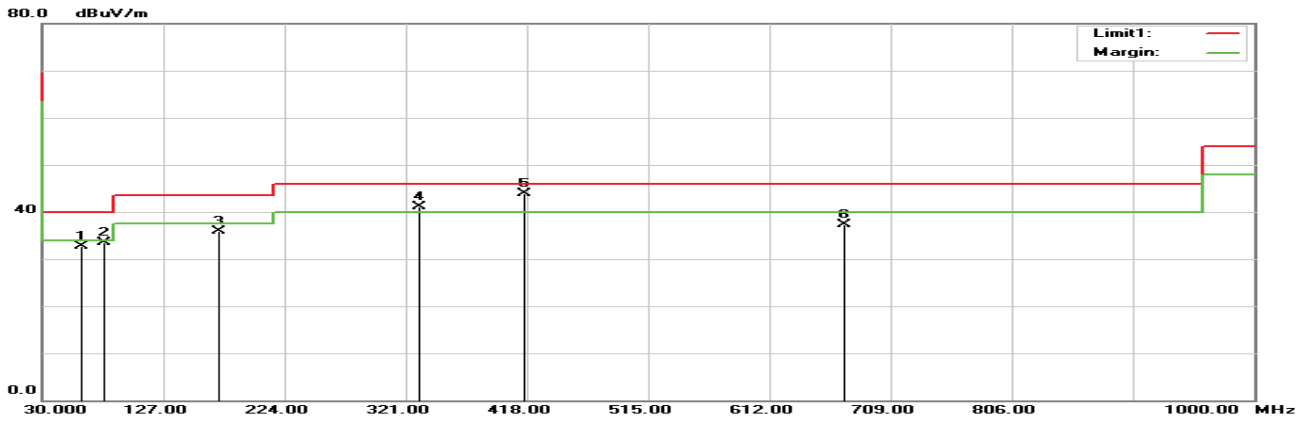
18GHz-40GHz



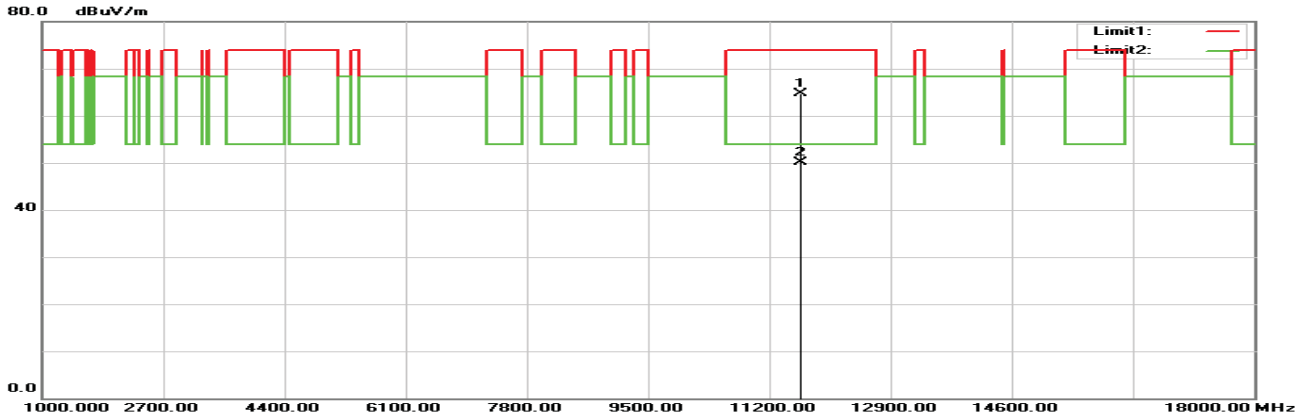
Horizontal

AC20 mode: Worst case is 5825MHz.

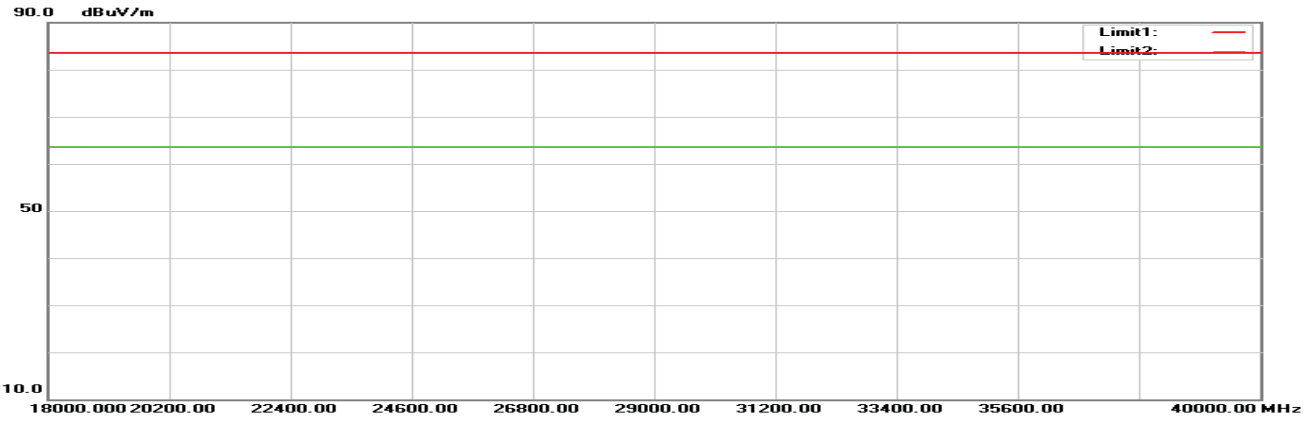
30MHz-1GHz



1GHz-18GHz



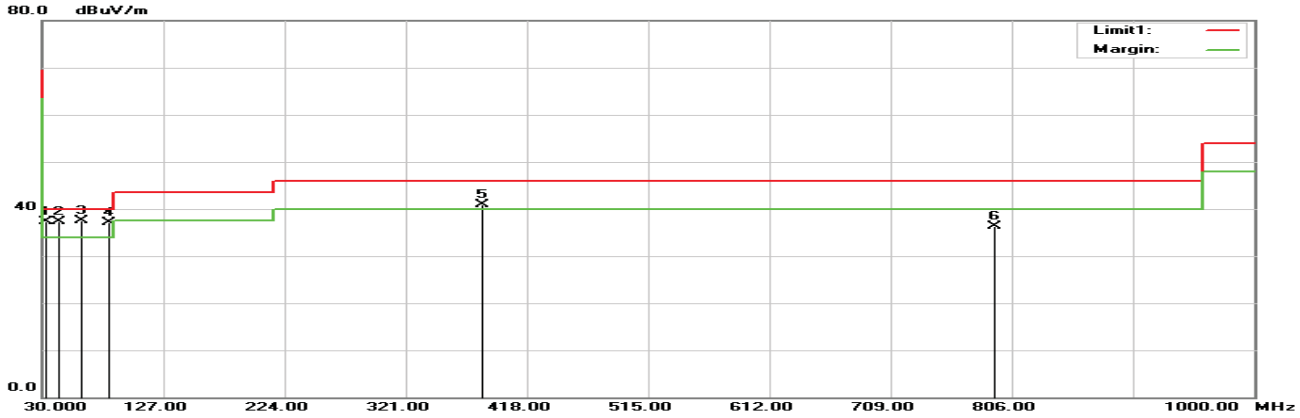
18GHz-40GHz



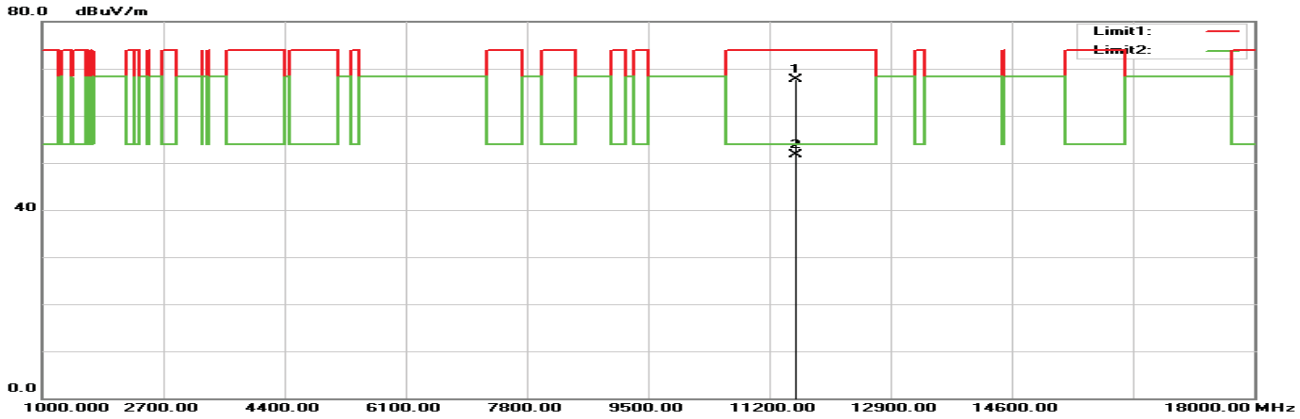
Vertical

AC20 mode: Worst case is 5785MHz.

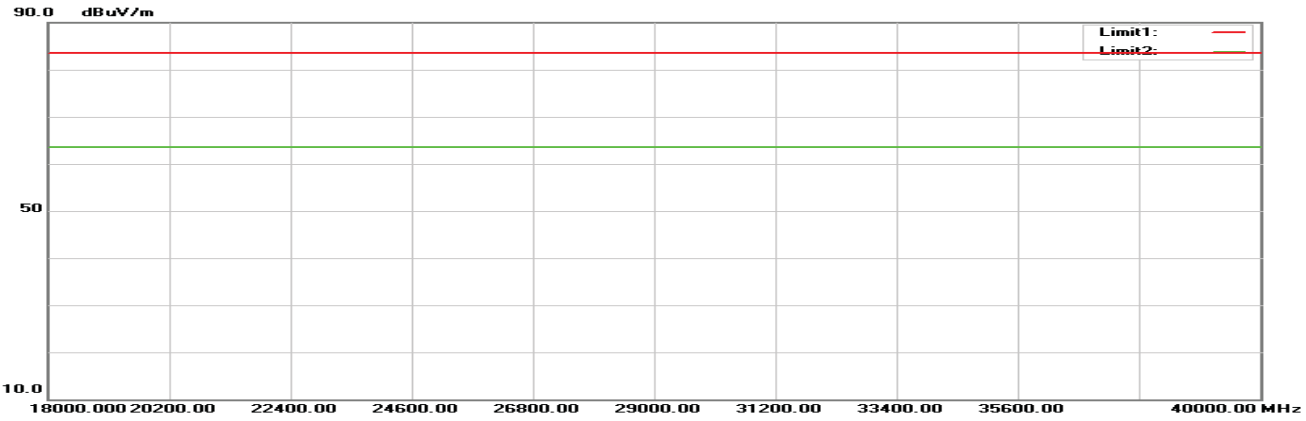
30MHz-1GHz



1GHz-18GHz



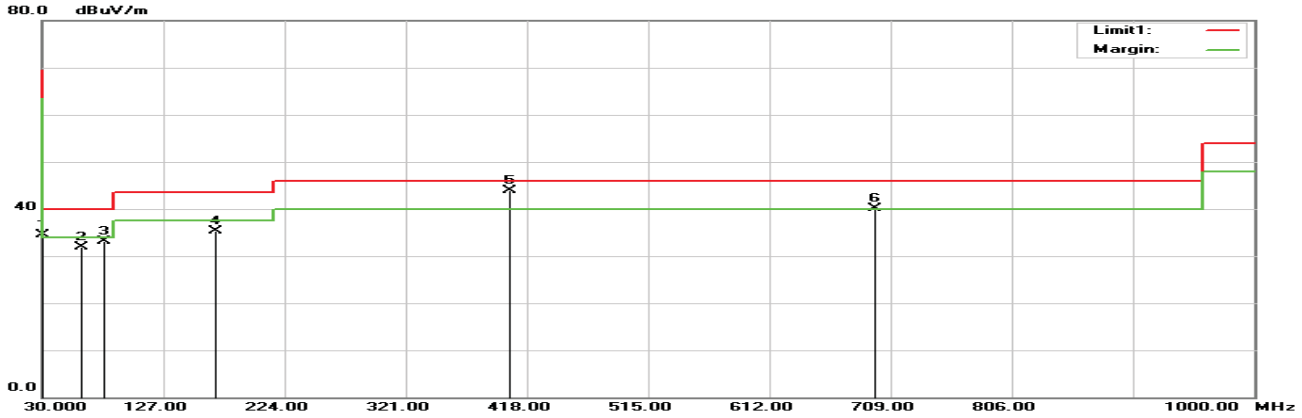
18GHz-40GHz



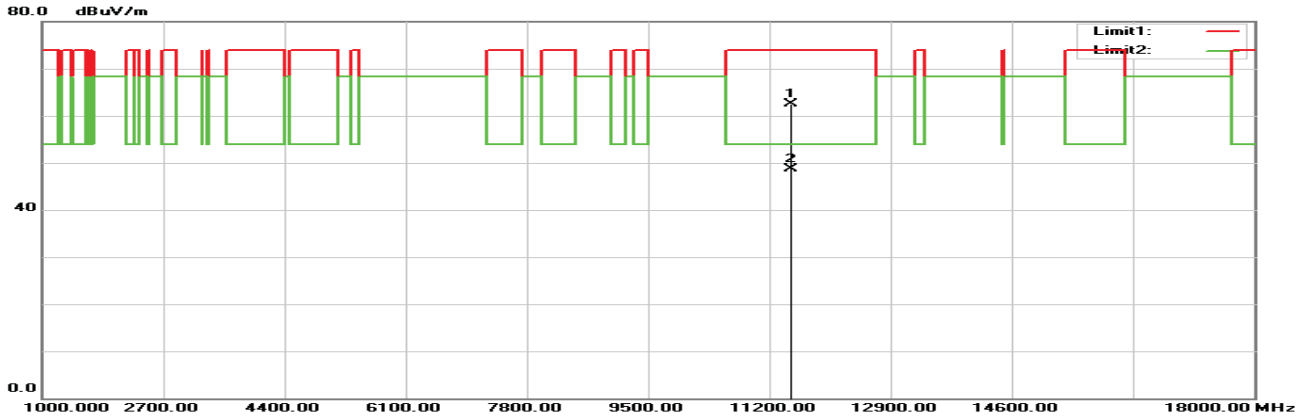
Horizontal

AC40 mode: Worst case is 5775MHz.

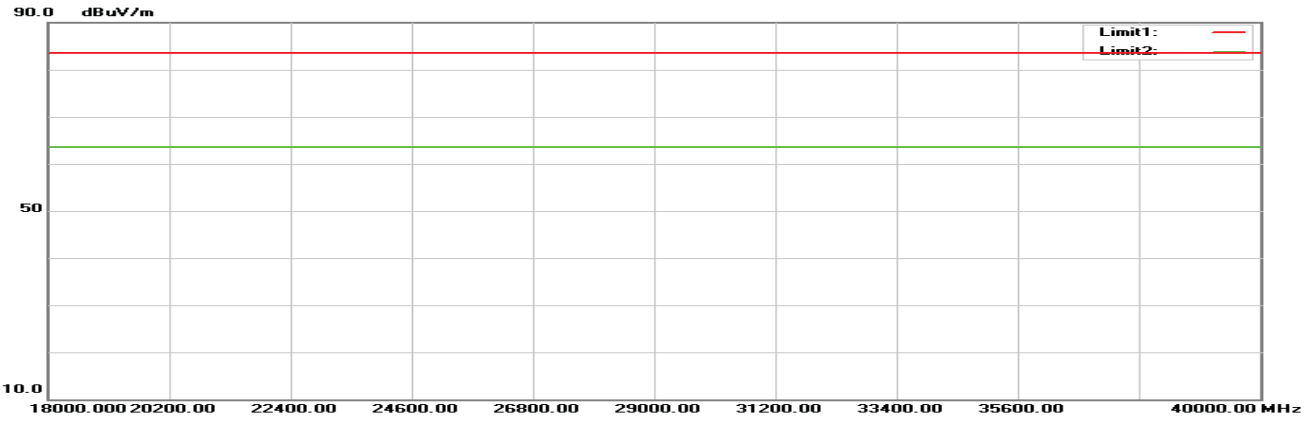
30MHz-1GHz



1GHz-18GHz



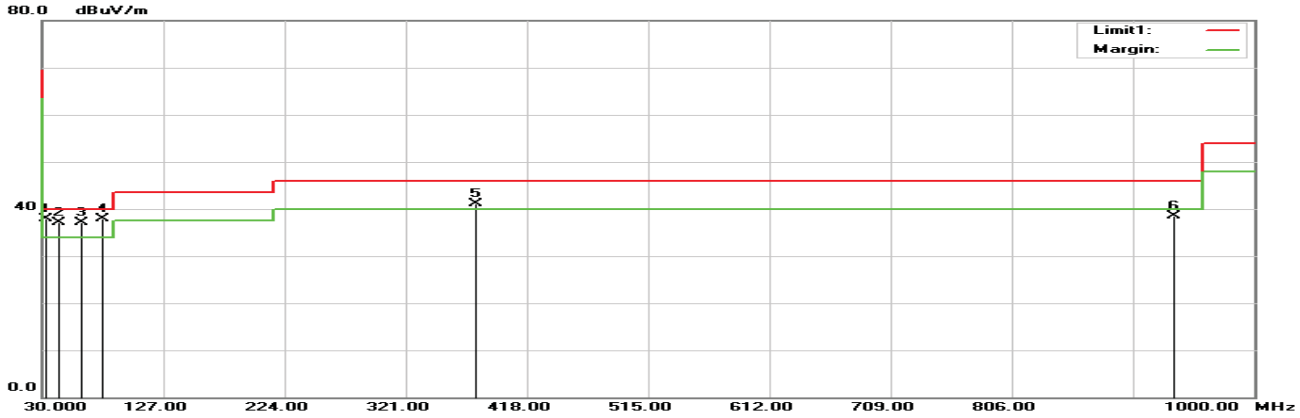
18GHz-40GHz



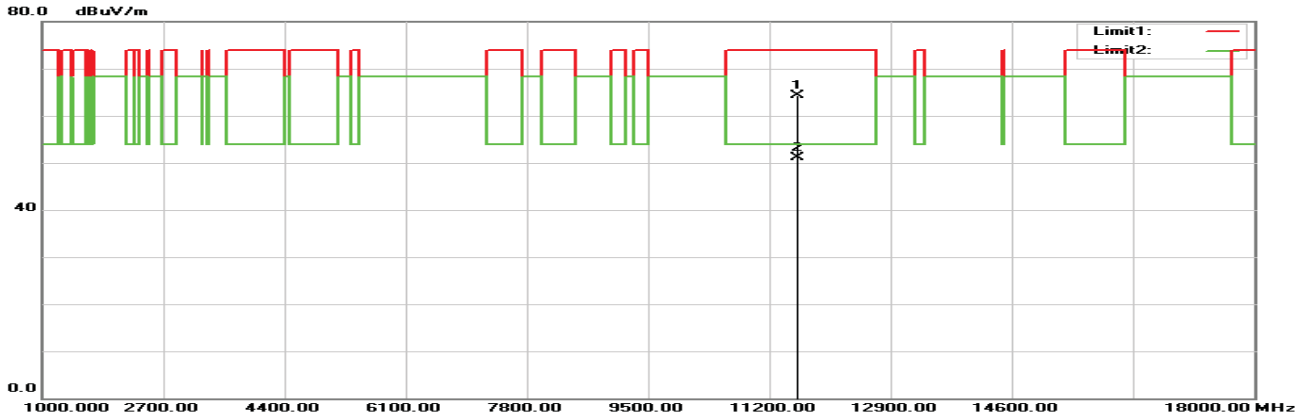
Vertical

AC40 mode: Worst case is 5745MHz.

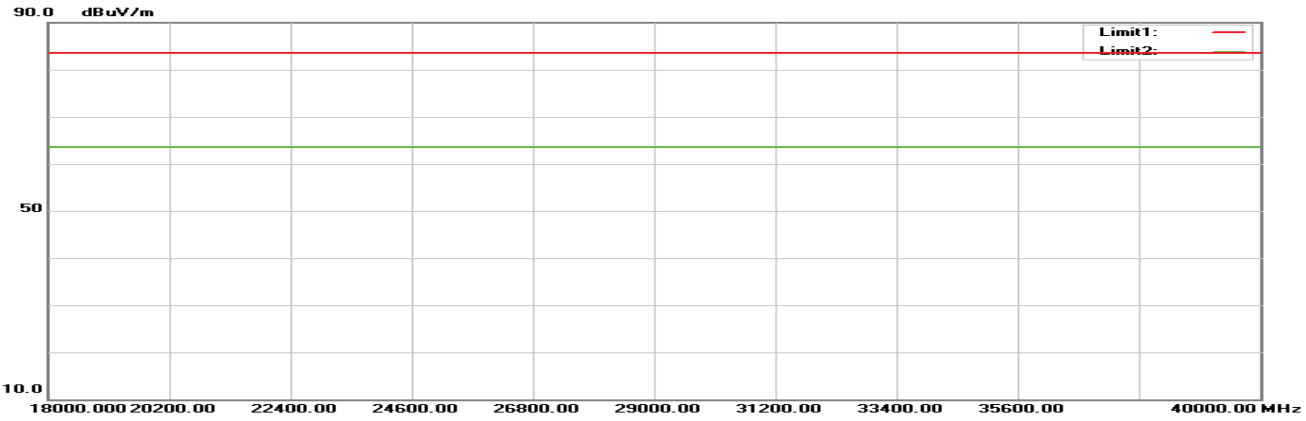
30MHz-1GHz



1GHz-18GHz



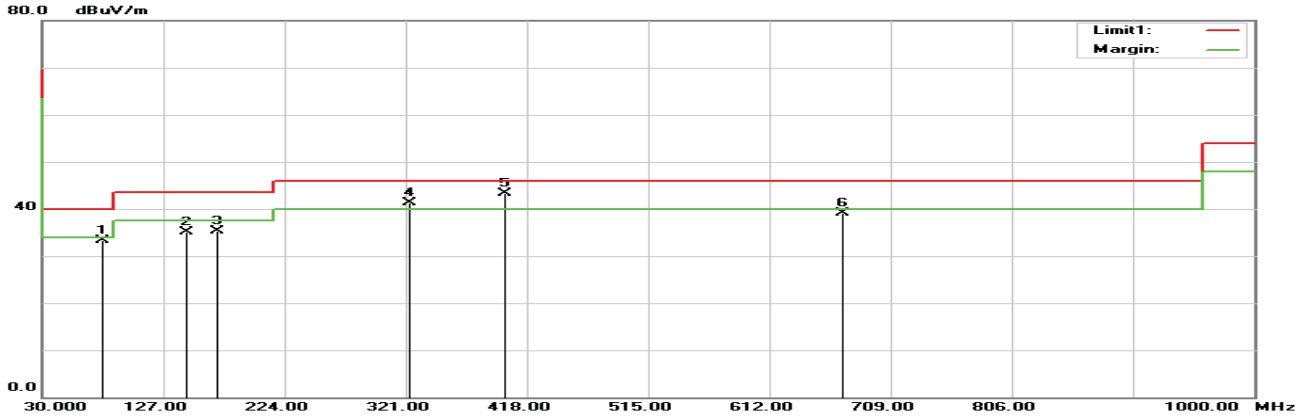
18GHz-40GHz



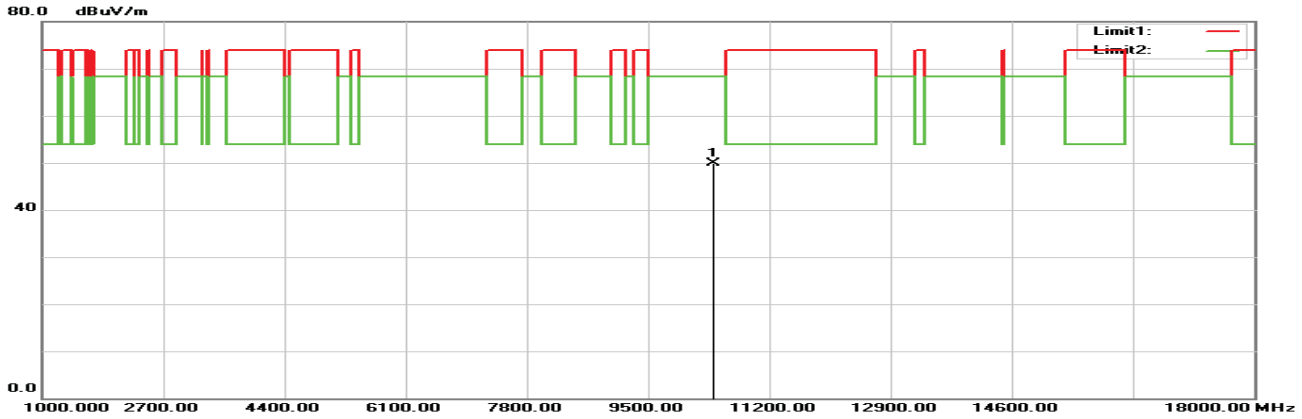
Horizontal

AC80 mode: Worst case is 5210MHz.

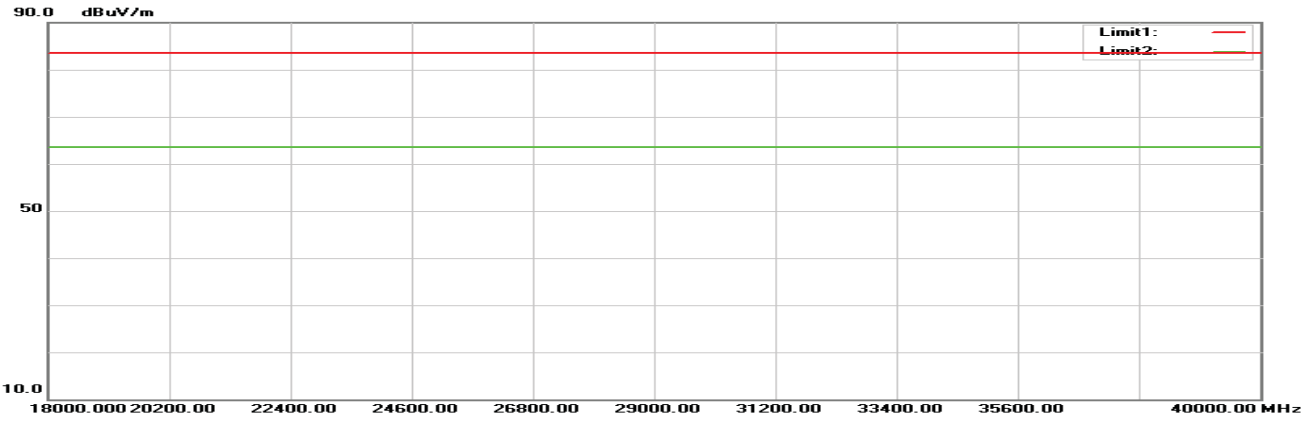
30MHz-1GHz



1GHz-18GHz



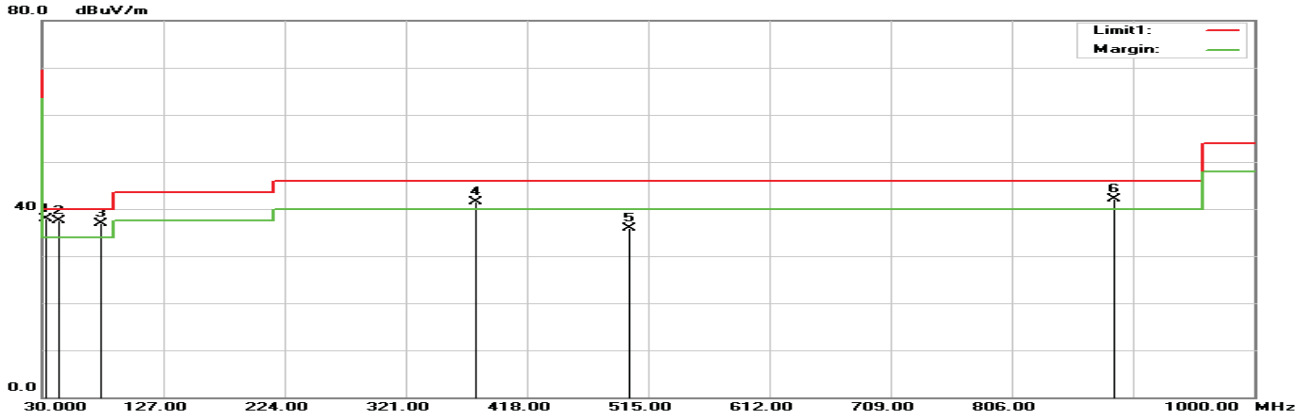
18GHz-40GHz



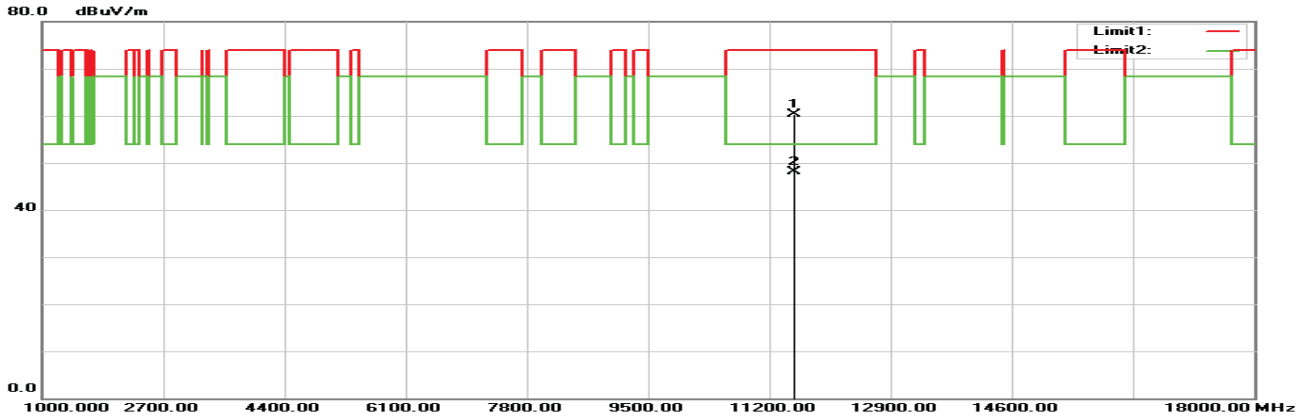
Vertical

AC80 mode: Worst case is 5775MHz.

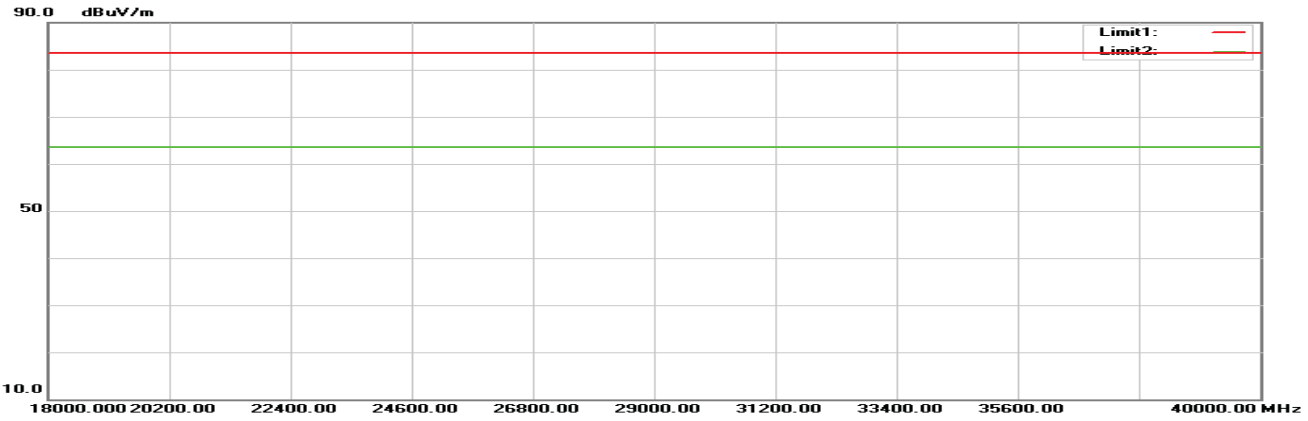
30MHz-1GHz



1GHz-18GHz



18GHz-40GHz



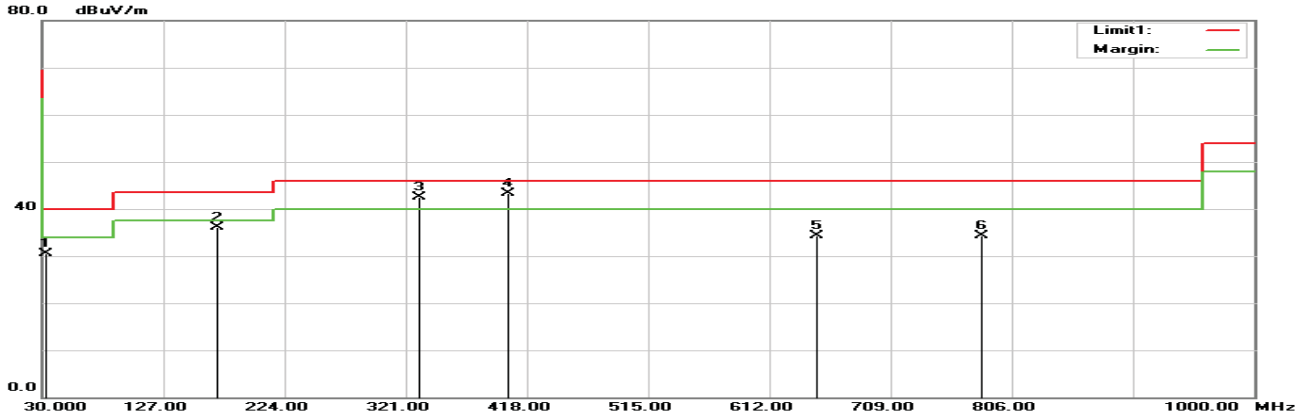
Mode 2 (Dipole Antenna)

(Pre-scan with three orthogonal axis, and worse case as Y axis.)

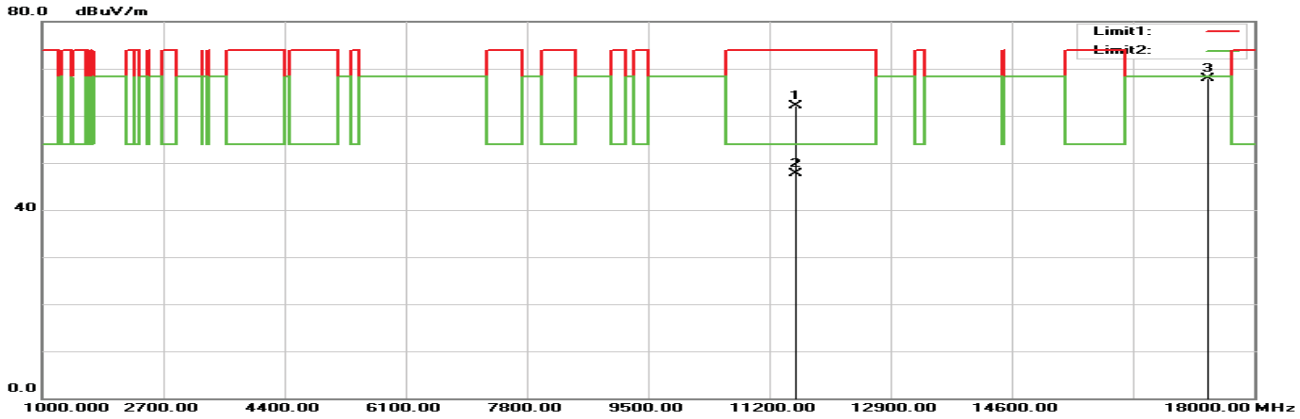
Horizontal

A mode: Worst case is 5785MHz.

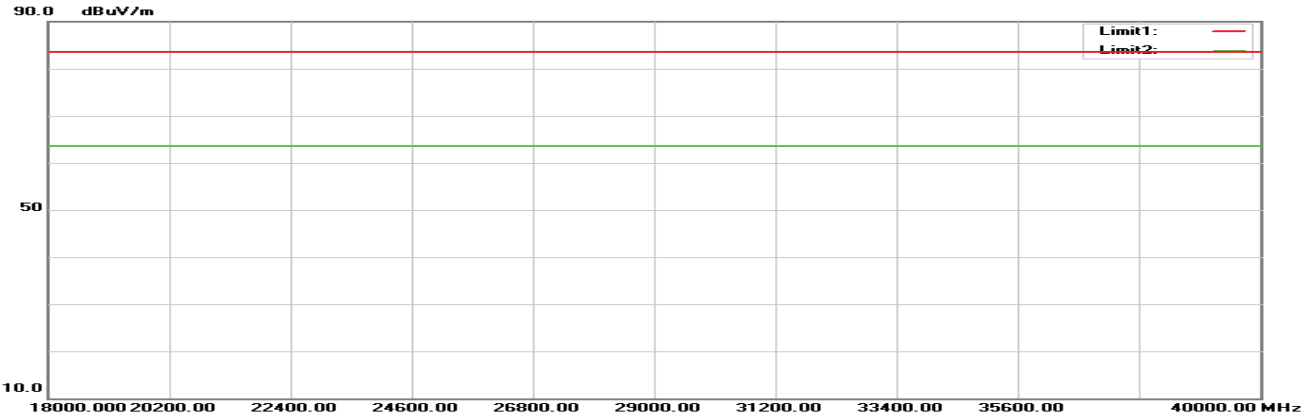
30MHz-1GHz



1GHz-18GHz



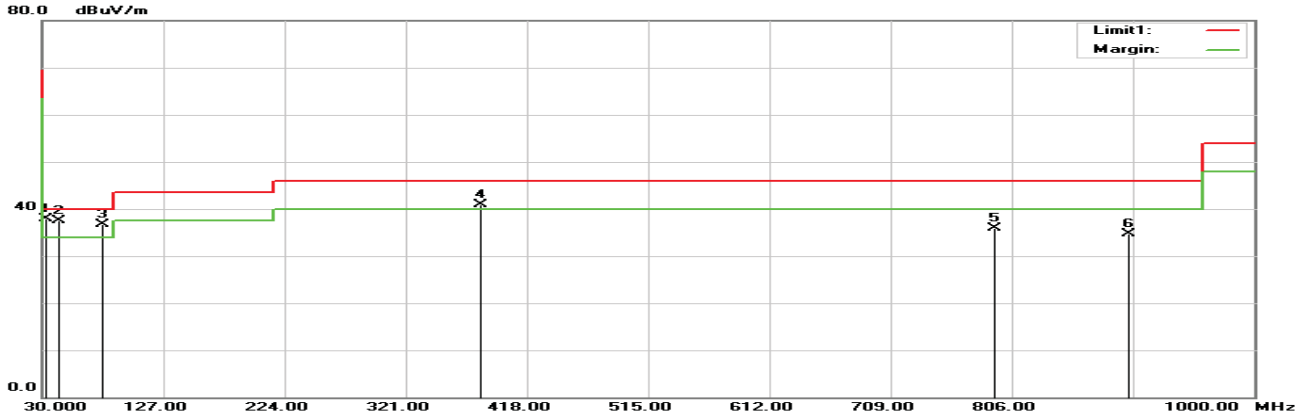
18GHz-40GHz



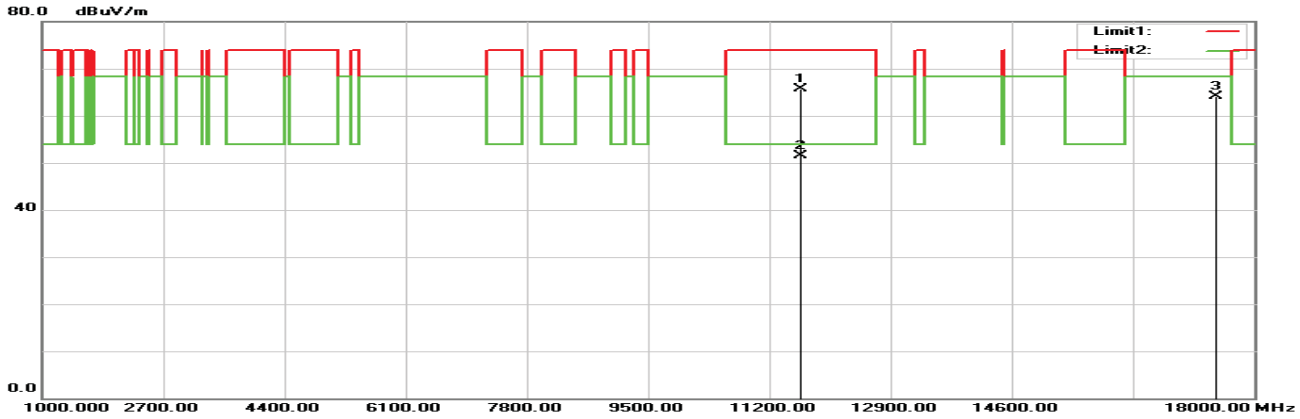
Vertical

A mode: Worst case is 5825MHz.

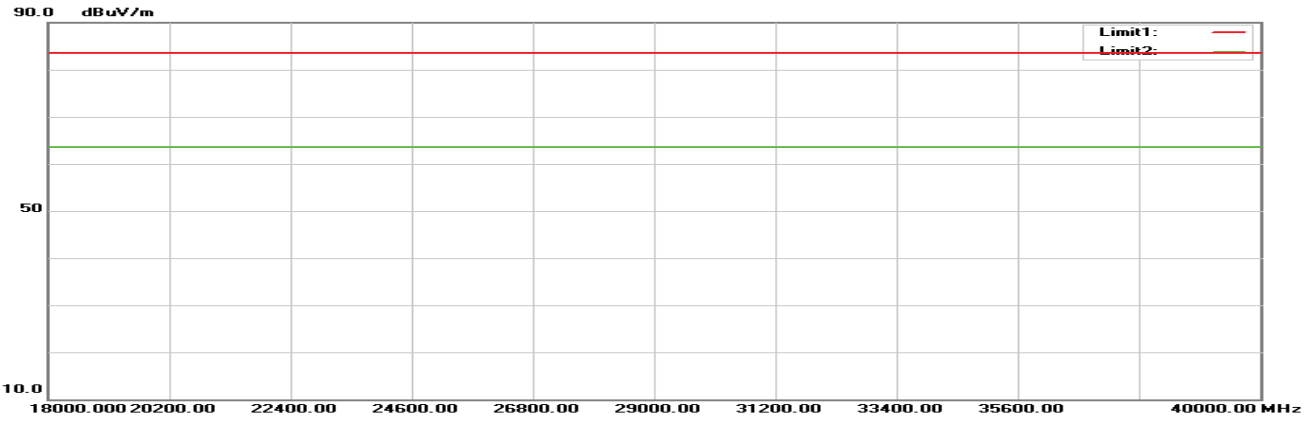
30MHz-1GHz



1GHz-18GHz



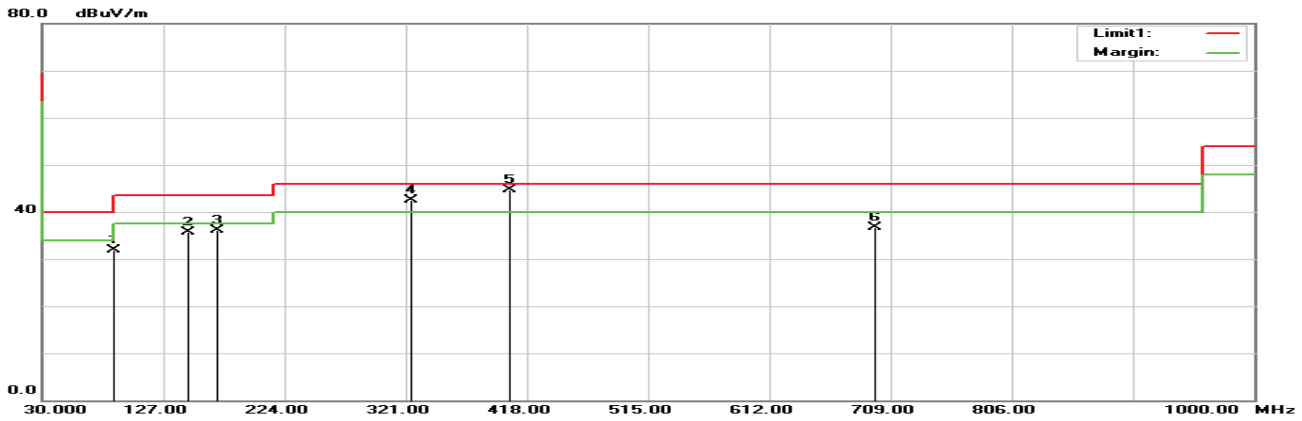
18GHz-40GHz



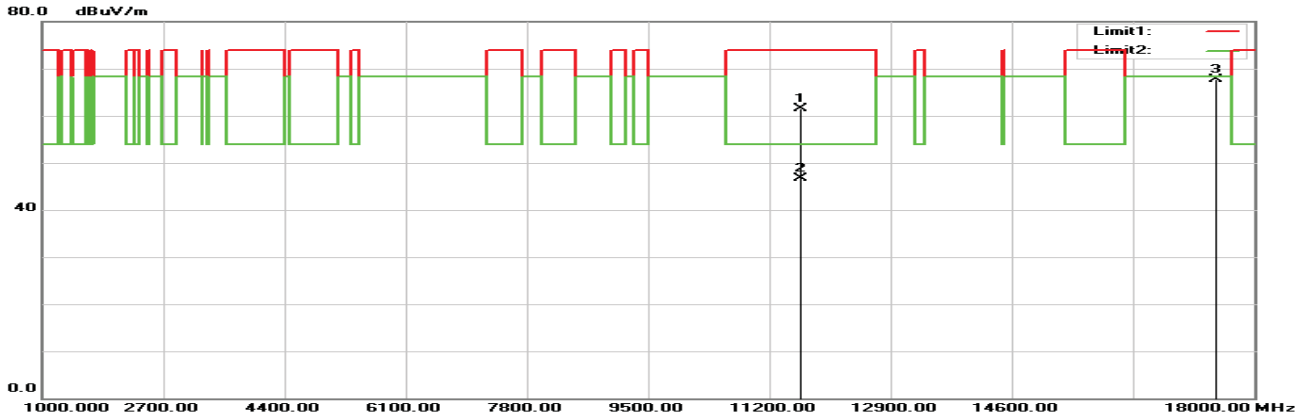
Horizontal

AC20 mode: Worst case is 5825MHz.

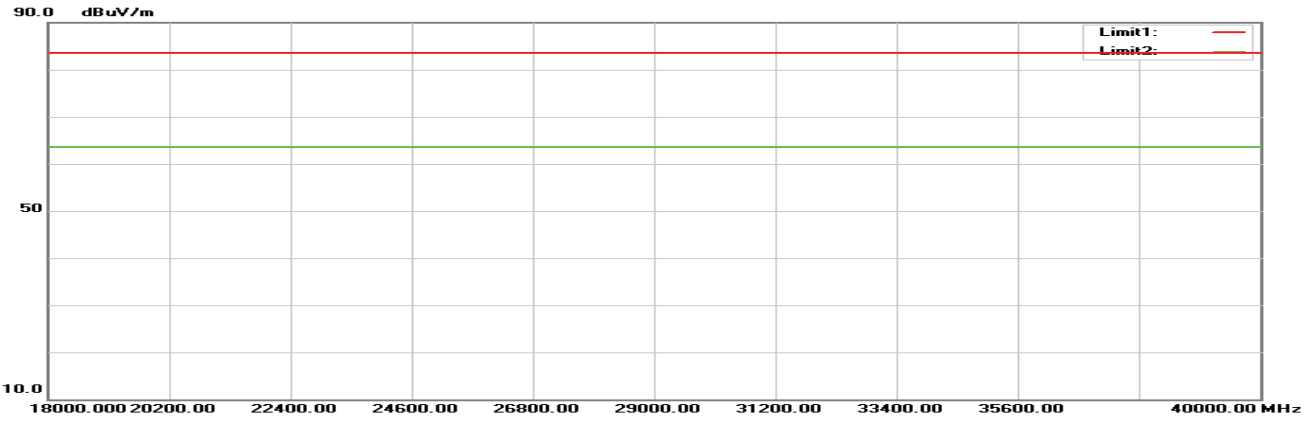
30MHz-1GHz



1GHz-18GHz



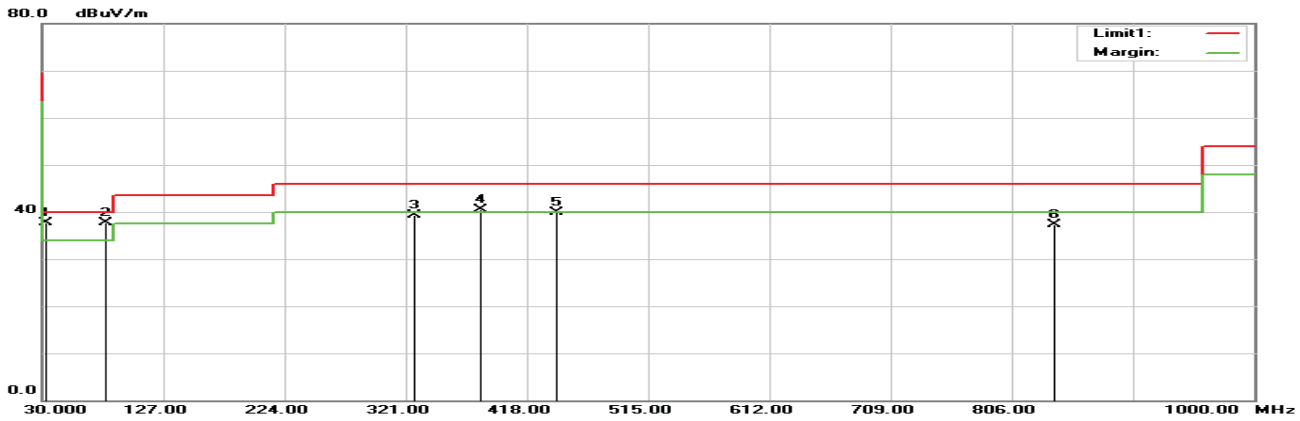
18GHz-40GHz



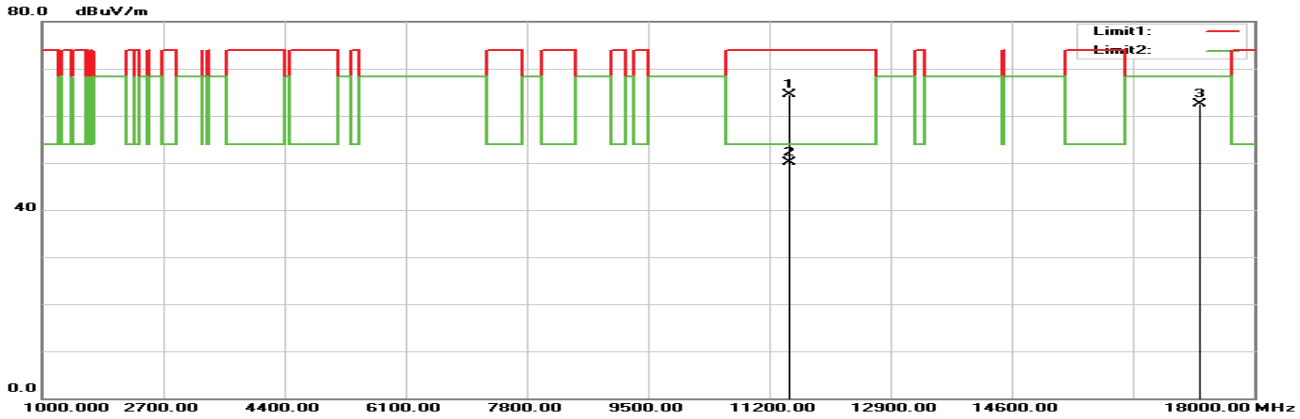
Vertical

AC20 mode: Worst case is 5745MHz.

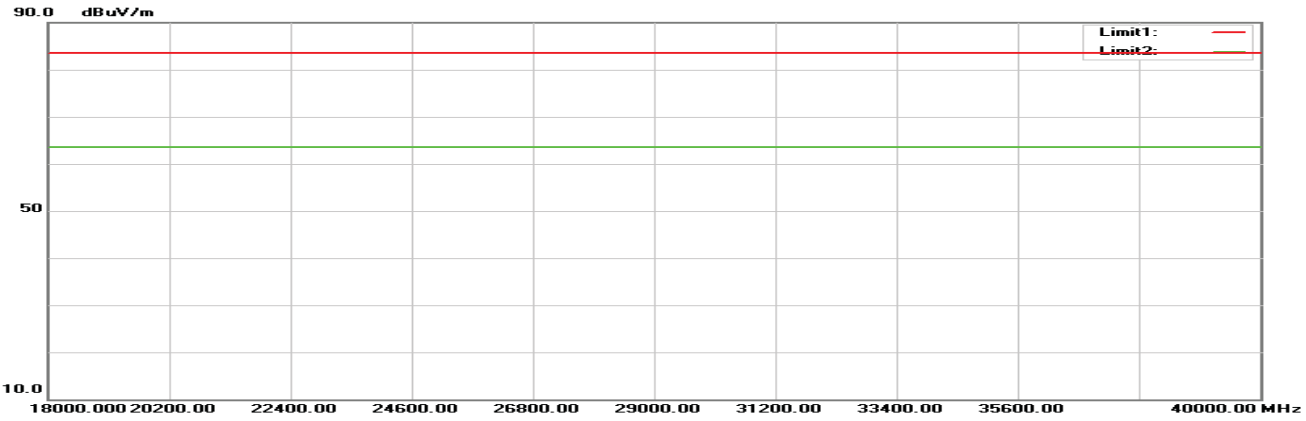
30MHz-1GHz



1GHz-18GHz



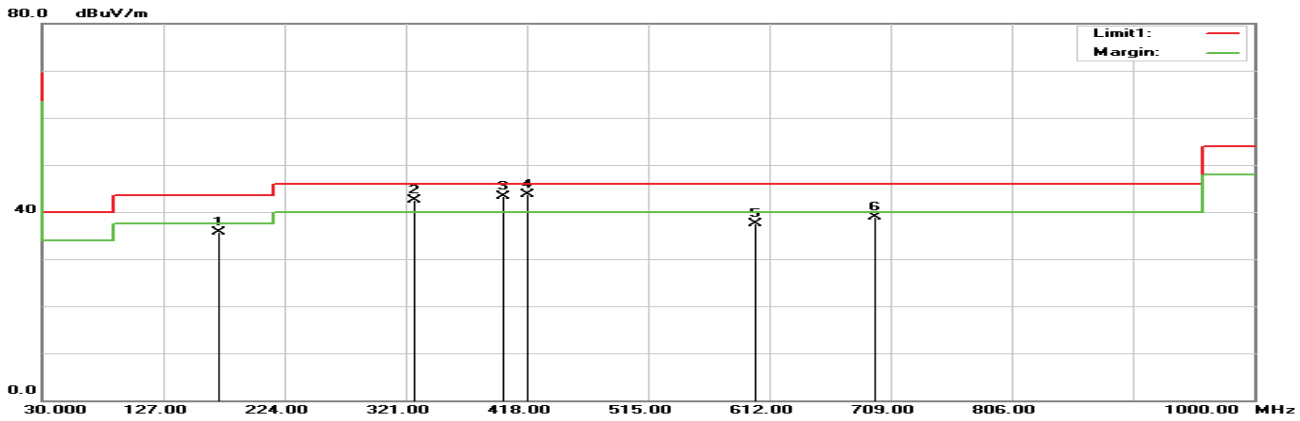
18GHz-40GHz



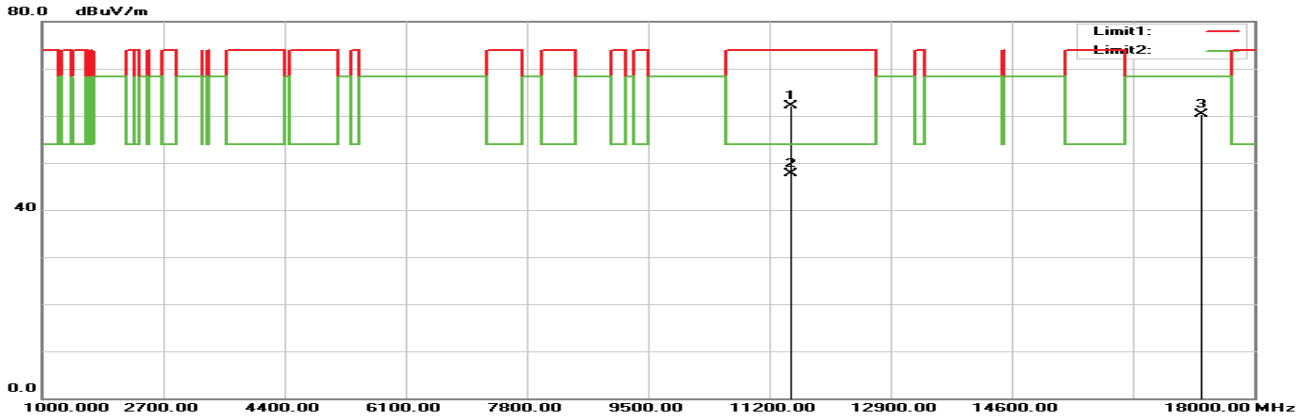
Horizontal

AC40 mode: Worst case is 5775MHz.

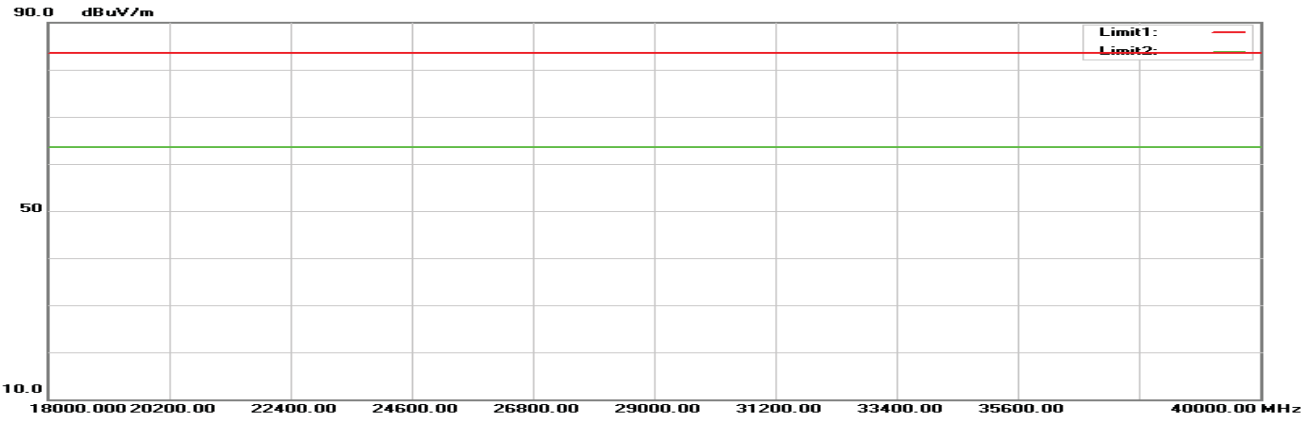
30MHz-1GHz



1GHz-18GHz



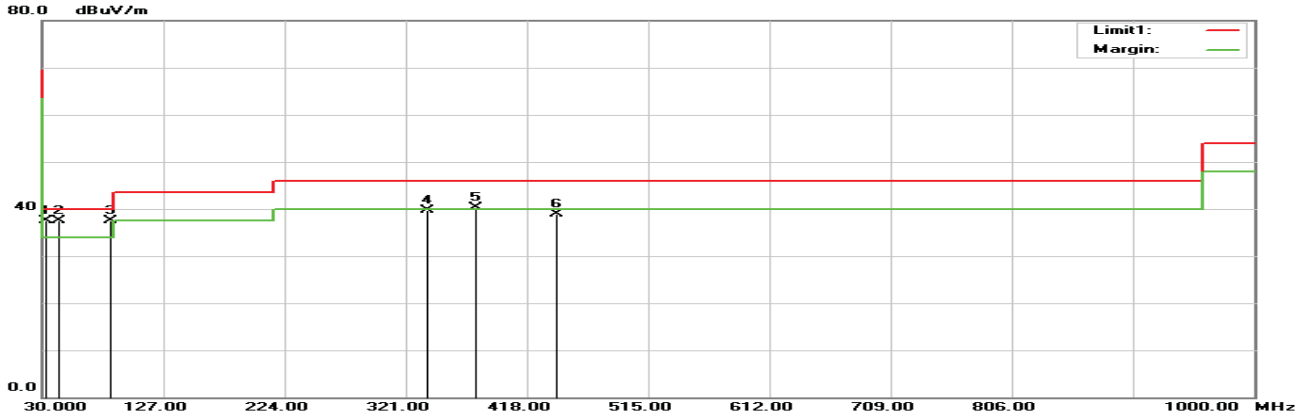
18GHz-40GHz



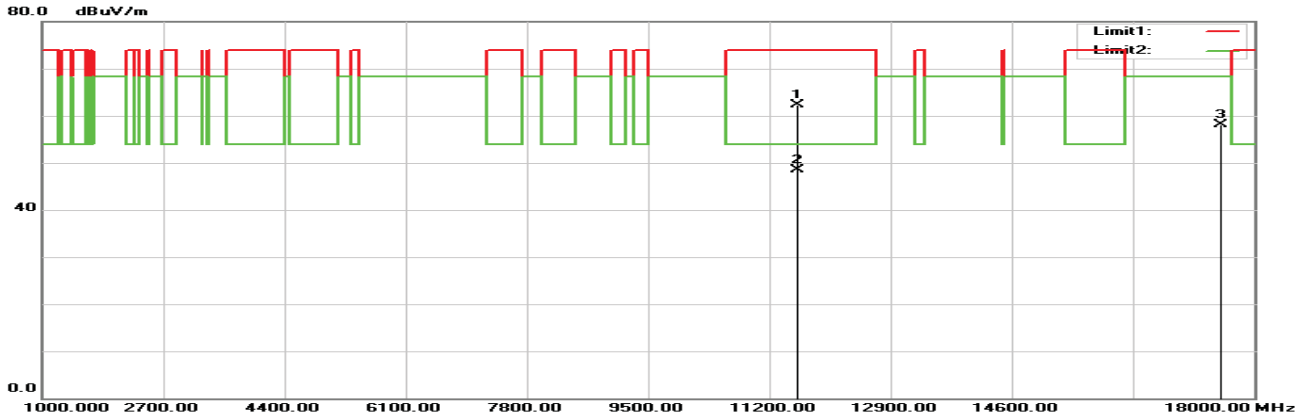
Vertical

AC40 mode: Worst case is 5745MHz.

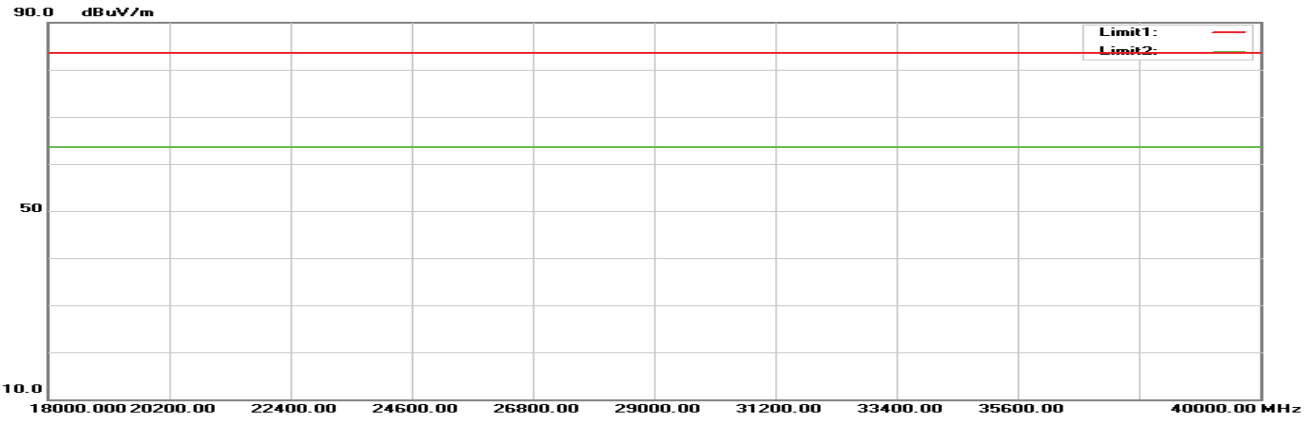
30MHz-1GHz



1GHz-18GHz



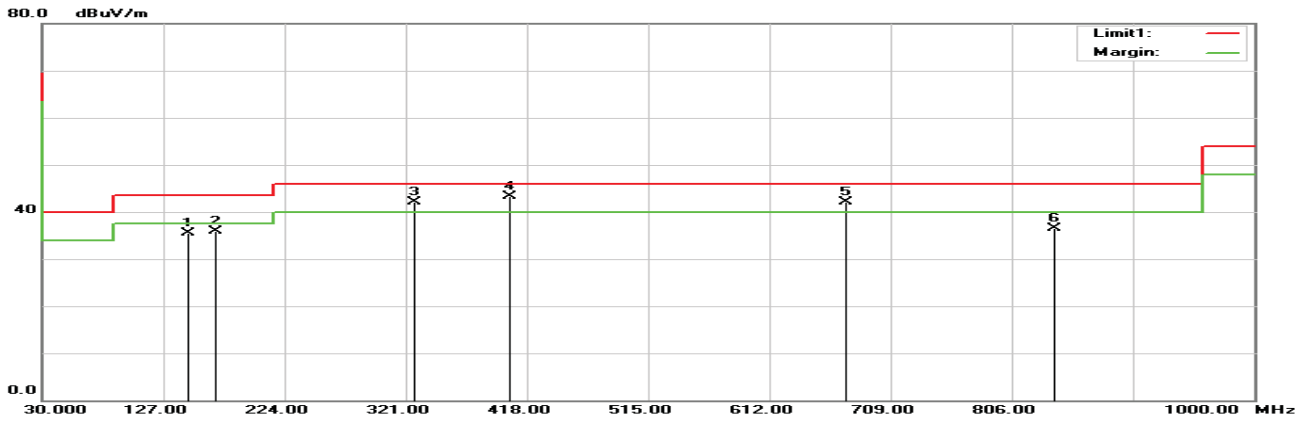
18GHz-40GHz



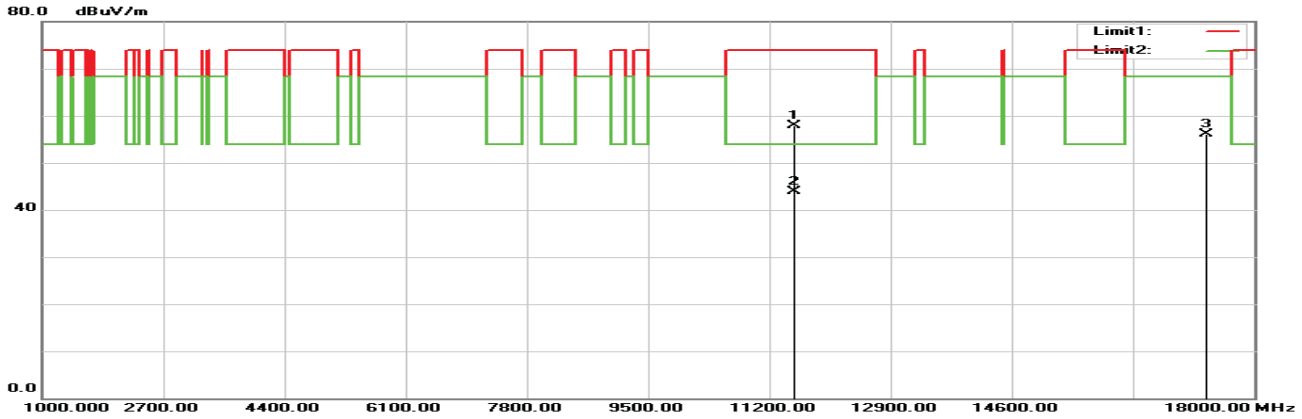
Horizontal

AC80 mode: Worst case is 5775MHz.

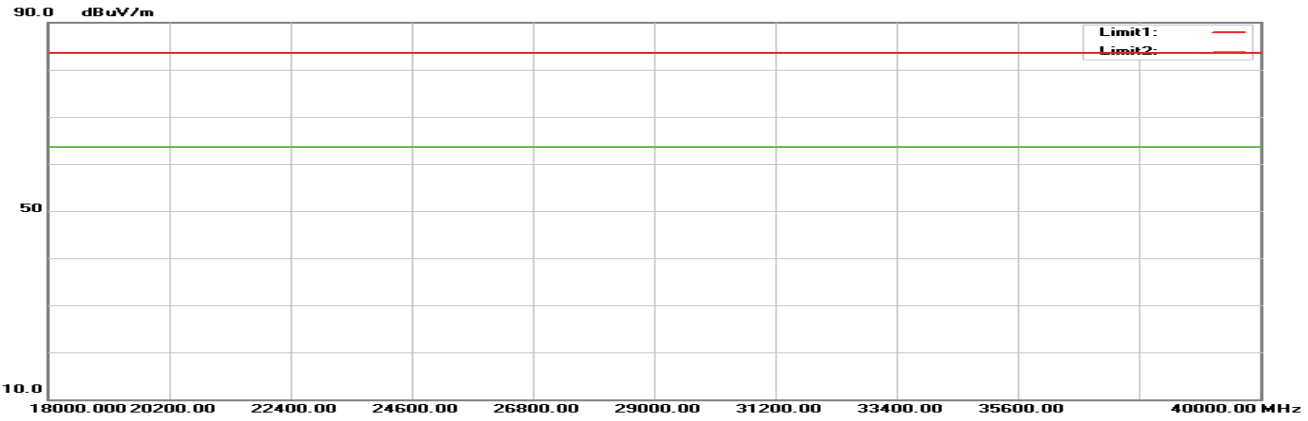
30MHz-1GHz



1GHz-18GHz



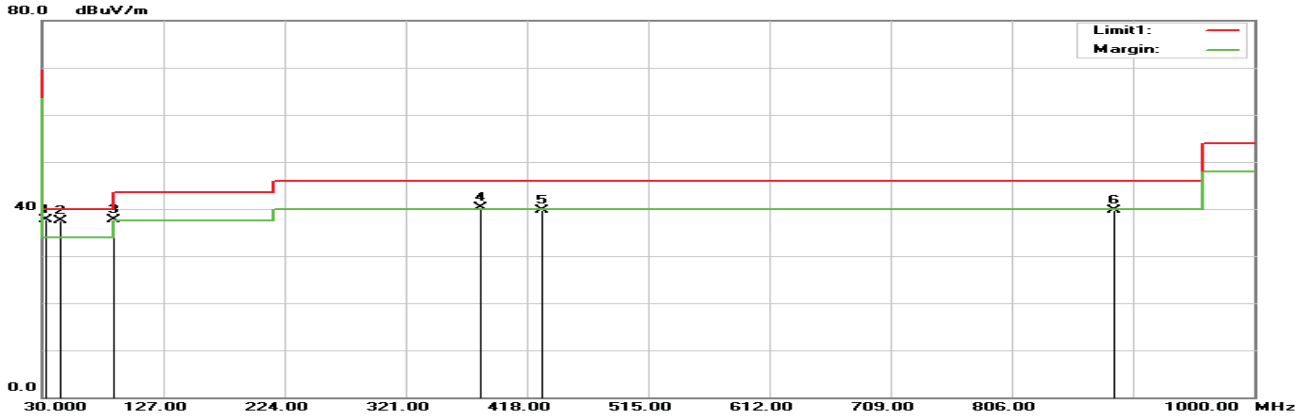
18GHz-40GHz



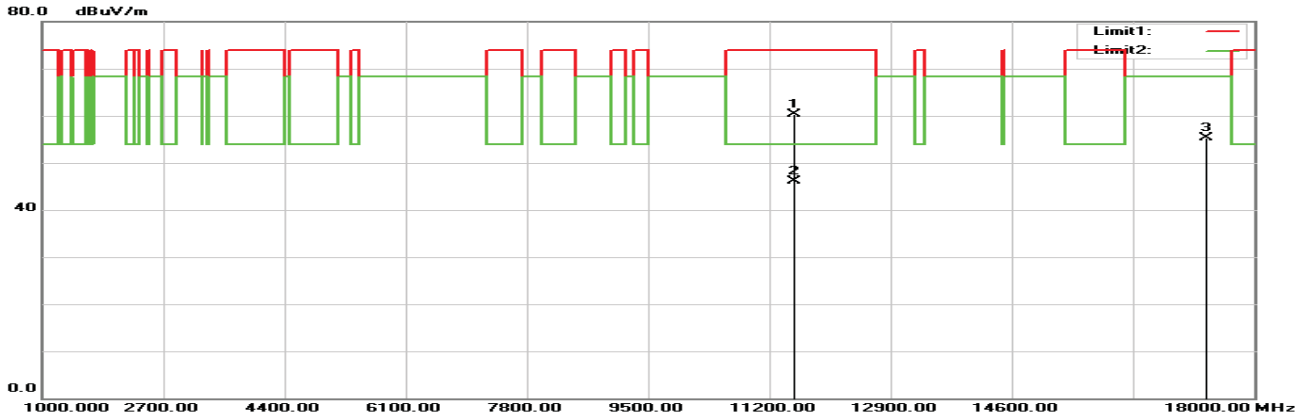
Vertical

AC80 mode: Worst case is 5775MHz.

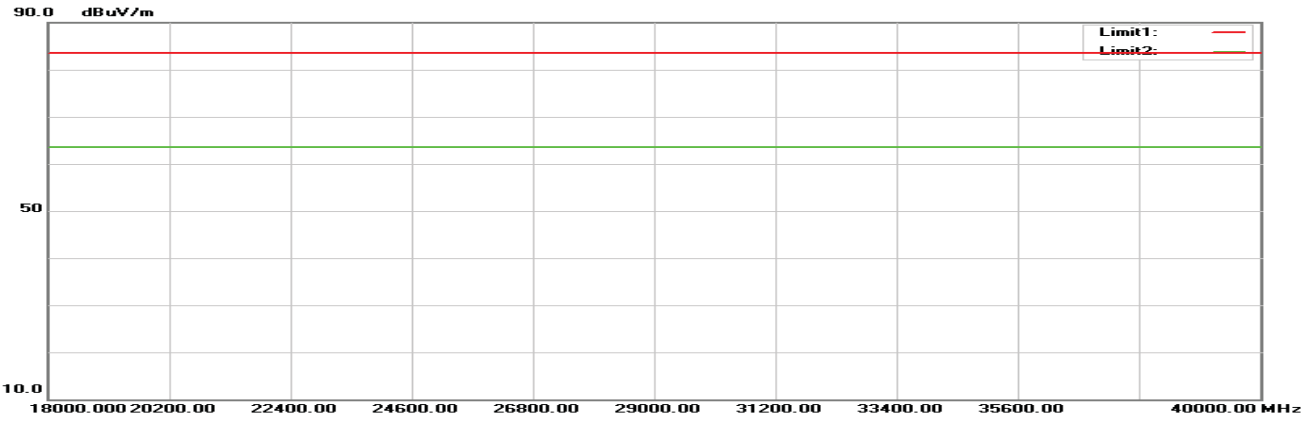
30MHz-1GHz



1GHz-18GHz



18GHz-40GHz



Mode 1 (Patch Antenna)

Horizontal

Frequency (MHz)	Reading (dB μ V)	Correct Factor(dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
A Mode								
79.4700	49.35	-16.49	32.86	40.00	-7.14	100	3	QP
169.6800	47.96	-12.14	35.82	43.50	-7.68	100	50	QP
331.6700	51.77	-9.04	42.73	46.00	-3.27	100	2	QP
408.3000	50.97	-7.41	43.56	46.00	-2.44	100	28	QP
649.8300	38.53	-3.46	35.07	46.00	-10.93	100	60	QP
781.7500	34.66	-1.14	33.52	46.00	-12.48	100	35	QP
AC20 Mode								
62.0100	49.90	-17.25	32.65	40.00	-7.35	100	360	QP
79.4700	50.02	-16.49	33.53	40.00	-6.47	100	335	QP
171.6200	48.23	-12.31	35.92	43.50	-7.58	100	67	QP
331.6700	50.06	-9.04	41.02	46.00	-4.98	100	12	QP
416.0600	51.13	-7.26	43.87	46.00	-2.13	100	29	QP
672.1400	40.47	-3.14	37.33	46.00	-8.67	100	98	QP
AC40 Mode								
30.0000	37.78	-3.26	34.52	40.00	-5.48	100	229	QP
62.0100	49.16	-17.25	31.91	40.00	-8.09	100	135	QP
79.4700	49.51	-16.49	33.02	40.00	-6.98	100	359	QP
168.7100	47.38	-12.05	35.33	43.50	-8.17	100	62	QP
404.4200	51.39	-7.49	43.90	46.00	-2.10	100	45	QP
696.3900	42.84	-2.79	40.05	46.00	-5.95	100	106	QP
AC80 Mode								
78.5000	49.73	-16.50	33.23	40.00	-6.77	100	358	QP
145.4300	46.09	-11.00	35.09	43.50	-8.41	100	79	QP
170.6500	47.58	-12.23	35.35	43.50	-8.15	100	84	QP
323.9100	50.55	-9.22	41.33	46.00	-4.67	100	23	QP
400.5400	50.85	-7.57	43.28	46.00	-2.72	100	28	QP
671.1700	42.23	-3.16	39.07	46.00	-6.93	100	60	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
A Mode								
31.9400	42.15	-4.60	37.55	40.00	-2.45	100	288	QP
43.5800	49.98	-13.04	36.94	40.00	-3.06	100	179	QP
84.3200	53.60	-16.55	37.05	40.00	-2.95	100	99	QP
331.6700	47.51	-9.04	38.47	46.00	-7.53	100	307	QP
385.9900	47.61	-7.87	39.74	46.00	-6.26	100	62	QP
839.9500	37.94	0.03	37.97	46.00	-8.03	100	68	QP
AC20 Mode								
32.9100	42.54	-5.27	37.27	40.00	-2.73	100	343	QP
43.5800	50.27	-13.04	37.23	40.00	-2.77	100	141	QP
62.0100	54.74	-17.25	37.49	40.00	-2.51	100	39	QP
83.3500	53.62	-16.54	37.08	40.00	-2.92	100	13	QP
382.1100	48.79	-7.95	40.84	46.00	-5.16	100	70	QP
792.4200	37.03	-0.81	36.22	46.00	-9.78	100	77	QP
AC40 Mode								
32.9100	43.25	-5.27	37.98	40.00	-2.02	100	73	QP
43.5800	50.05	-13.04	37.01	40.00	-2.99	100	338	QP
62.0100	54.36	-17.25	37.11	40.00	-2.89	100	30	QP
78.5000	54.46	-16.50	37.96	40.00	-2.04	100	43	QP
377.2600	49.12	-8.05	41.07	46.00	-4.93	100	70	QP
935.9800	36.35	2.07	38.42	46.00	-7.58	100	94	QP
AC80 Mode								
32.9100	43.12	-5.27	37.85	40.00	-2.15	100	107	QP
43.5800	50.64	-13.04	37.60	40.00	-2.40	100	116	QP
77.5300	53.49	-16.50	36.99	40.00	-3.01	100	94	QP
377.2600	49.61	-8.05	41.56	46.00	-4.44	100	75	QP
499.4800	41.53	-5.65	35.88	46.00	-10.12	100	7	QP
888.4500	41.32	0.83	42.15	46.00	-3.85	100	89	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Mode 2 (Dipole Antenna)

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
A Mode								
32.9100	35.80	-5.27	30.53	40.00	-9.47	100	305	QP
170.6500	48.40	-12.23	36.17	43.50	-7.33	100	62	QP
331.6700	51.59	-9.04	42.55	46.00	-3.45	100	16	QP
403.4500	50.73	-7.51	43.22	46.00	-2.78	100	24	QP
649.8300	37.81	-3.46	34.35	46.00	-11.65	100	55	QP
781.7500	35.50	-1.14	34.36	46.00	-11.64	100	43	QP
AC20 Mode								
87.2300	48.46	-16.59	31.87	40.00	-8.13	100	227	QP
146.4000	46.72	-11.01	35.71	43.50	-7.79	100	67	QP
169.6800	48.17	-12.14	36.03	43.50	-7.47	100	62	QP
324.8800	51.80	-9.20	42.60	46.00	-3.40	100	20	QP
404.4200	52.14	-7.49	44.65	46.00	-1.35	100	37	QP
696.3900	39.41	-2.79	36.62	46.00	-9.38	100	23	QP
AC40 Mode								
171.6200	48.06	-12.31	35.75	43.50	-7.75	100	75	QP
327.7900	51.55	-9.14	42.41	46.00	-3.59	100	0	QP
399.5700	50.84	-7.59	43.25	46.00	-2.75	100	23	QP
418.9700	50.84	-7.20	43.64	46.00	-2.36	100	23	QP
600.3600	41.62	-4.18	37.44	46.00	-8.56	100	91	QP
696.3900	41.64	-2.79	38.85	46.00	-7.15	100	80	QP
AC80 Mode								
147.3700	46.54	-11.03	35.51	43.50	-7.99	100	70	QP
168.7100	47.89	-12.05	35.84	43.50	-7.66	100	67	QP
327.7900	51.27	-9.14	42.13	46.00	-3.87	100	14	QP
404.4200	50.77	-7.49	43.28	46.00	-2.72	100	14	QP
673.1100	45.32	-3.12	42.20	46.00	-3.80	100	14	QP
839.9500	36.43	0.03	36.46	46.00	-9.54	100	38	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
A Mode								
32.9100	43.09	-5.27	37.82	40.00	-2.18	100	360	QP
43.5800	50.45	-13.04	37.41	40.00	-2.59	100	190	QP
78.5000	53.29	-16.50	36.79	40.00	-3.21	100	287	QP
381.1400	48.95	-7.98	40.97	46.00	-5.03	100	65	QP
792.4200	36.77	-0.81	35.96	46.00	-10.04	100	64	QP
900.0900	33.67	1.03	34.70	46.00	-11.30	100	106	QP
AC20 Mode								
32.9100	43.01	-5.27	37.74	40.00	-2.26	100	73	QP
81.4100	54.14	-16.51	37.63	40.00	-2.37	100	315	QP
327.7900	48.51	-9.14	39.37	46.00	-6.63	100	328	QP
381.1400	48.41	-7.98	40.43	46.00	-5.57	100	62	QP
442.2500	46.57	-6.73	39.84	46.00	-6.16	100	356	QP
839.9500	37.31	0.03	37.34	46.00	-8.66	100	51	QP
AC40 Mode								
32.9100	42.82	-5.27	37.55	40.00	-2.45	100	6	QP
43.5800	50.61	-13.04	37.57	40.00	-2.43	100	171	QP
84.3200	54.00	-16.55	37.45	40.00	-2.55	100	85	QP
338.4600	48.55	-8.88	39.67	46.00	-6.33	100	316	QP
377.2600	48.43	-8.05	40.38	46.00	-5.62	100	62	QP
441.2800	45.61	-6.74	38.87	46.00	-7.13	100	1	QP
AC80 Mode								
32.9100	42.90	-5.27	37.63	40.00	-2.37	100	5	QP
44.5500	51.17	-13.70	37.47	40.00	-2.53	100	199	QP
87.2300	54.26	-16.59	37.67	40.00	-2.33	100	73	QP
381.1400	48.33	-7.98	40.35	46.00	-5.65	100	66	QP
430.6100	46.64	-6.96	39.68	46.00	-6.32	100	359	QP
888.4500	38.78	0.83	39.61	46.00	-6.39	100	128	QP

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Above 1 GHz (Mode 1 - Patch Antenna)

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11a / 5180MHz								
5150.000	63.56	1.89	65.45	74.00	-8.55	100	93	peak
5150.000	45.71	1.89	47.60	54.00	-6.40	202	93	AVG
5180.000	115.11	1.95	117.06	N/A	N/A	202	93	peak
5180.000	102.85	1.95	104.80	N/A	N/A	202	93	AVG
10360.000	37.74	12.40	50.14	68.23	-18.09	190	95	peak
802.11a / 5200MHz								
5200.000	114.47	1.97	116.44	N/A	N/A	203	93	peak
5200.000	102.07	1.97	104.04	N/A	N/A	203	93	AVG
10400.000	38.57	12.43	51.00	68.23	-17.23	186	95	peak
802.11a / 5240MHz								
5240.000	112.51	2.03	114.54	N/A	N/A	204	85	peak
5240.000	100.29	2.03	102.32	N/A	N/A	204	85	AVG
5350.000	58.44	2.21	60.65	74.00	-13.35	204	85	peak
5350.000	47.06	2.21	49.27	54.00	-4.73	204	85	AVG
10480.000	37.37	12.49	49.86	68.23	-18.37	100	148	peak
802.11a / 5745MHz								
5614.700	54.85	2.74	57.59	68.23	-10.64	100	285	peak
5699.750	61.54	2.96	64.50	105.02	-40.52	100	83	peak
5717.600	77.01	3.00	80.01	110.13	-30.12	100	291	peak
5724.250	84.33	3.01	87.34	120.49	-33.15	100	283	peak
5745.000	118.26	3.07	121.33	N/A	N/A	198	277	peak
5745.000	106.67	3.07	109.74	N/A	N/A	198	277	AVG
5851.650	54.65	3.33	57.98	118.44	-60.46	100	80	peak
5866.350	54.99	3.37	58.36	107.62	-49.26	100	285	peak
5918.150	55.21	3.50	58.71	73.27	-14.56	100	218	peak
5945.800	54.73	3.59	58.32	68.23	-9.91	100	359	peak
11490.000	50.40	13.17	63.57	74.00	-10.43	121	96	peak
11490.000	36.57	13.17	49.74	54.00	-4.26	121	96	AVG
17235.000	49.01	18.26	67.27	68.23	-0.96	145	108	peak
802.11a / 5785MHz								
5629.050	54.33	2.76	57.09	68.23	-11.14	100	94	peak
5666.500	55.07	2.87	57.94	80.41	-22.47	100	81	peak
5711.650	55.10	2.98	58.08	108.46	-50.38	100	281	peak
5723.900	54.80	3.01	57.81	119.69	-61.88	100	279	peak
5785.000	117.30	3.18	120.48	N/A	N/A	209	281	peak
5785.000	105.67	3.18	108.85	N/A	N/A	209	281	AVG
5853.750	54.72	3.35	58.07	113.65	-55.58	100	288	peak
5865.650	55.51	3.37	58.88	107.82	-48.94	100	288	peak
5893.300	55.59	3.44	59.03	91.66	-32.63	100	23	peak
5947.900	55.10	3.59	58.69	68.23	-9.54	100	281	peak
11570.000	51.26	13.21	64.47	74.00	-9.53	220	97	peak
11570.000	37.54	13.21	50.75	54.00	-3.25	220	97	AVG
17355.000	42.97	19.23	62.20	68.23	-6.03	139	111	peak
802.11a / 5825MHz								
5632.200	53.94	2.79	56.73	68.23	-11.50	100	287	peak
5685.750	55.16	2.92	58.08	94.66	-36.58	100	272	peak
5702.550	54.87	2.96	57.83	105.91	-48.08	100	281	peak
5723.550	54.57	3.01	57.58	118.89	-61.31	100	160	peak
5825.000	116.11	3.27	119.38	N/A	N/A	146	288	peak
5825.000	104.38	3.27	107.65	N/A	N/A	146	288	AVG
5853.400	66.30	3.34	69.64	114.45	-44.81	100	287	peak
5855.850	61.76	3.35	65.11	110.56	-45.45	100	84	peak
5883.150	55.30	3.42	58.72	99.17	-40.45	100	280	peak
5925.850	54.79	3.53	58.32	68.23	-9.91	100	271	peak
11650.000	51.48	13.26	64.74	74.00	-9.26	100	126	peak
11650.000	37.04	13.26	50.30	54.00	-3.70	100	126	AVG
17475.000	35.73	20.20	55.93	68.23	-12.30	100	28	peak

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11a / 5180MHz								
5150.000	55.58	1.89	57.47	74.00	-16.53	130	53	peak
5150.000	41.58	1.89	43.47	54.00	-10.53	130	53	AVG
5180.000	106.88	1.95	108.83	N/A	N/A	130	53	peak
5180.000	94.90	1.95	96.85	N/A	N/A	130	53	AVG
10360.000	38.93	12.40	51.33	68.23	-16.90	100	88	peak
802.11a / 5200MHz								
5200.000	105.61	1.97	107.58	N/A	N/A	207	31	peak
5200.000	93.40	1.97	95.37	N/A	N/A	207	31	AVG
10400.000	40.76	12.43	53.19	68.23	-15.04	100	86	peak
802.11a / 5240MHz								
5240.000	104.91	2.03	106.94	N/A	N/A	100	34	peak
5240.000	92.84	2.03	94.87	N/A	N/A	100	34	AVG
5350.000	54.87	2.21	57.08	74.00	-16.92	100	34	peak
5350.000	41.00	2.21	43.21	54.00	-10.79	100	34	AVG
10480.000	40.04	12.49	52.53	68.23	-15.70	100	104	peak
802.11a / 5745MHz								
5610.150	53.97	2.72	56.69	68.23	-11.54	100	63	peak
5699.400	54.84	2.96	57.80	104.76	-46.96	100	300	peak
5717.600	66.15	3.00	69.15	110.13	-40.98	100	292	peak
5724.600	75.04	3.02	78.06	121.29	-43.23	100	287	peak
5745.000	107.15	3.07	110.22	N/A	N/A	100	300	peak
5745.000	95.41	3.07	98.48	N/A	N/A	100	300	AVG
5851.300	53.88	3.33	57.21	119.24	-62.03	100	223	peak
5867.400	54.67	3.37	58.04	107.33	-49.29	100	238	peak
5919.200	54.62	3.51	58.13	72.49	-14.36	100	77	peak
5944.750	54.77	3.58	58.35	68.23	-9.88	100	222	peak
11490.000	51.72	13.17	64.89	74.00	-9.11	100	106	peak
11490.000	37.95	13.17	51.12	54.00	-2.88	100	106	AVG
17235.000	49.86	18.26	68.12	68.23	-0.11	163	91	peak
802.11a / 5785MHz								
5646.550	53.66	2.81	56.47	68.23	-11.76	100	235	peak
5654.950	54.49	2.83	57.32	71.86	-14.54	100	120	peak
5719.700	54.55	3.01	57.56	110.72	-53.16	100	341	peak
5723.200	53.99	3.01	57.00	118.10	-61.10	100	326	peak
5785.000	107.94	3.18	111.12	N/A	N/A	125	290	peak
5785.000	96.05	3.18	99.23	N/A	N/A	125	290	AVG
5853.750	54.10	3.35	57.45	113.65	-56.20	100	349	peak
5872.650	55.20	3.40	58.60	105.86	-47.26	100	107	peak
5878.950	54.77	3.41	58.18	102.28	-44.10	100	238	peak
5941.600	54.57	3.57	58.14	68.23	-10.09	100	196	peak
11570.000	54.78	13.21	67.99	74.00	-6.01	201	117	peak
11570.000	40.17	13.21	53.38	54.00	-0.62	201	117	AVG
17355.000	43.68	19.23	62.91	68.23	-5.32	100	133	peak
802.11a / 5825MHz								
5645.150	54.16	2.81	56.97	68.23	-11.26	100	136	peak
5699.050	54.03	2.95	56.98	104.50	-47.52	100	177	peak
5710.600	53.79	2.98	56.77	108.17	-51.40	100	300	peak
5721.450	53.76	3.01	56.77	114.11	-57.34	100	360	peak
5825.000	106.41	3.27	109.68	N/A	N/A	154	290	peak
5825.000	94.61	3.27	97.88	N/A	N/A	154	290	AVG
5850.250	58.57	3.33	61.90	121.63	-59.73	100	293	peak
5858.650	56.09	3.36	59.45	109.78	-50.33	100	288	peak
5882.100	54.90	3.42	58.32	99.95	-41.63	100	266	peak
5944.750	54.55	3.58	58.13	68.23	-10.10	100	52	peak
11650.000	54.10	13.26	67.36	74.00	-6.64	100	115	peak
11650.000	39.52	13.26	52.78	54.00	-1.22	100	115	AVG
17475.000	35.98	20.20	56.18	68.23	-12.05	100	81	peak

Horizontal

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT20 / 5180MHz								
5150.000	59.05	1.89	60.94	74.00	-13.06	137	94	peak
5150.000	43.48	1.89	45.37	54.00	-8.63	137	94	AVG
5180.000	113.76	1.95	115.71	N/A	N/A	137	94	peak
5180.000	100.65	1.95	102.60	N/A	N/A	137	94	AVG
10360.000	37.23	12.40	49.63	68.23	-18.60	117	150	peak
802.11ac VHT20 / 5200MHz								
5200.000	113.47	1.97	115.44	N/A	N/A	190	94	peak
5200.000	100.73	1.97	102.70	N/A	N/A	190	94	AVG
10400.000	37.73	12.43	50.16	68.23	-18.07	105	148	peak
802.11ac VHT20 / 5240MHz								
5240.000	113.83	2.03	115.86	N/A	N/A	100	94	peak
5240.000	100.88	2.03	102.91	N/A	N/A	100	94	AVG
5350.000	58.42	2.21	60.63	74.00	-13.37	100	92	peak
5350.000	46.53	2.21	48.74	54.00	-5.26	100	92	AVG
10480.000	36.36	12.49	48.85	68.23	-19.38	191	97	peak
802.11ac VHT20 / 5745MHz								
5629.050	55.16	2.76	57.92	68.23	-10.31	100	282	peak
5699.750	60.87	2.96	63.83	105.02	-41.19	100	279	peak
5719.350	75.62	3.01	78.63	110.62	-31.99	100	277	peak
5724.600	86.11	3.02	89.13	121.29	-32.16	100	279	peak
5745.000	118.48	3.07	121.55	N/A	N/A	100	279	peak
5745.000	106.36	3.07	109.43	N/A	N/A	100	279	AVG
5853.750	54.60	3.35	57.95	113.65	-55.70	100	336	peak
5867.400	54.54	3.37	57.91	107.33	-49.42	100	73	peak
5893.650	55.36	3.44	58.80	91.40	-32.60	100	102	peak
5939.150	54.74	3.56	58.30	68.23	-9.93	100	290	peak
11490.000	50.66	13.17	63.83	74.00	-10.17	197	150	peak
11490.000	34.14	13.17	47.31	54.00	-6.69	197	150	AVG
802.11ac VHT20 / 5785MHz								
5632.550	54.46	2.79	57.25	68.23	-10.98	100	76	peak
5699.400	54.65	2.96	57.61	104.76	-47.15	100	77	peak
5719.700	55.69	3.01	58.70	110.72	-52.02	100	287	peak
5721.450	55.23	3.01	58.24	114.11	-55.87	100	280	peak
5785.000	118.53	3.18	121.71	N/A	N/A	172	280	peak
5785.000	106.30	3.18	109.48	N/A	N/A	172	280	AVG
5851.650	56.05	3.33	59.38	118.44	-59.06	100	282	peak
5867.400	55.46	3.37	58.83	107.33	-48.50	100	283	peak
5892.950	54.85	3.44	58.29	91.92	-33.63	100	194	peak
5939.150	54.69	3.56	58.25	68.23	-9.98	100	64	peak
11570.000	48.12	13.21	61.33	74.00	-12.67	100	130	peak
11570.000	35.50	13.21	48.71	54.00	-5.29	100	130	AVG
802.11ac VHT20 / 5825MHz								
5625.550	54.89	2.76	57.65	68.23	-10.58	100	295	peak
5693.800	54.67	2.94	57.61	100.61	-43.00	100	282	peak
5714.100	55.25	2.98	58.23	109.15	-50.92	100	85	peak
5720.750	54.78	3.01	57.79	112.51	-54.72	100	282	peak
5825.000	117.91	3.27	121.18	N/A	N/A	185	282	peak
5825.000	105.16	3.27	108.43	N/A	N/A	185	282	AVG
5852.700	72.94	3.34	76.28	116.04	-39.76	100	287	peak
5855.850	66.75	3.35	70.10	110.56	-40.46	100	288	peak
5875.450	59.17	3.40	62.57	104.87	-42.30	100	82	peak
5928.650	55.07	3.54	58.61	68.23	-9.62	100	282	peak
11650.000	51.37	13.26	64.63	74.00	-9.37	214	100	peak
11650.000	36.76	13.26	50.02	54.00	-3.98	214	100	AVG

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT20 / 5180MHz								
5150.000	55.87	1.89	57.76	74.00	-16.24	100	55	peak
5150.000	41.52	1.89	43.41	54.00	-10.59	100	55	AVG
5180.000	106.26	1.95	108.21	N/A	N/A	100	53	peak
5180.000	93.92	1.95	95.87	N/A	N/A	100	53	AVG
10360.000	36.96	12.40	49.36	68.23	-18.87	170	90	peak
802.11ac VHT20 / 5200MHz								
5200.000	107.19	1.97	109.16	N/A	N/A	121	55	peak
5200.000	93.69	1.97	95.66	N/A	N/A	121	55	AVG
10400.000	37.61	12.43	50.04	68.23	-18.19	198	92	peak
802.11ac VHT20 / 5240MHz								
5240.000	107.26	2.03	109.29	N/A	N/A	160	27	peak
5240.000	94.05	2.03	96.08	N/A	N/A	160	27	AVG
5350.000	55.76	2.21	57.97	74.00	-16.03	100	32	peak
5350.000	41.12	2.21	43.33	54.00	-10.67	100	32	AVG
10480.000	39.12	12.49	51.61	68.23	-16.62	100	84	peak
802.11ac VHT20 / 5745MHz								
5647.950	54.27	2.82	57.09	68.23	-11.14	100	283	peak
5692.750	54.99	2.93	57.92	99.84	-41.92	100	82	peak
5714.450	68.25	2.98	71.23	109.25	-38.02	100	285	peak
5724.950	75.30	3.02	78.32	122.09	-43.77	100	297	peak
5745.000	108.91	3.07	111.98	N/A	N/A	230	288	peak
5745.000	96.71	3.07	99.78	N/A	N/A	230	288	AVG
5853.750	53.83	3.35	57.18	113.65	-56.47	100	2	peak
5858.300	54.77	3.36	58.13	109.88	-51.75	100	303	peak
5915.700	55.30	3.50	58.80	75.08	-16.28	100	180	peak
5947.200	54.27	3.59	57.86	68.23	-10.37	100	102	peak
11490.000	51.19	13.17	64.36	74.00	-9.64	100	107	peak
11490.000	36.73	13.17	49.90	54.00	-4.10	100	107	AVG
802.11ac VHT20 / 5785MHz								
5635.700	53.81	2.79	56.60	68.23	-11.63	100	193	peak
5662.650	53.93	2.85	56.78	77.56	-20.78	100	295	peak
5712.000	54.82	2.98	57.80	108.56	-50.76	100	134	peak
5722.150	53.83	3.01	56.84	115.70	-58.86	100	11	peak
5785.000	109.61	3.18	112.79	N/A	N/A	228	288	peak
5785.000	96.49	3.18	99.67	N/A	N/A	228	288	AVG
5851.300	53.88	3.33	57.21	119.24	-62.03	100	53	peak
5855.850	54.73	3.35	58.08	110.56	-52.48	100	313	peak
5905.900	55.00	3.48	58.48	82.33	-23.85	100	76	peak
5941.950	54.86	3.57	58.43	68.23	-9.80	100	253	peak
11570.000	54.58	13.21	67.79	74.00	-6.21	198	109	peak
11570.000	38.58	13.21	51.79	54.00	-2.21	198	109	AVG
802.11ac VHT20 / 5825MHz								
5627.650	54.50	2.76	57.26	68.23	-10.97	100	120	peak
5654.950	54.61	2.83	57.44	71.86	-14.42	100	175	peak
5714.100	53.66	2.98	56.64	109.15	-52.51	100	8	peak
5720.050	53.98	3.01	56.99	110.91	-53.92	100	295	peak
5825.000	106.62	3.27	109.89	N/A	N/A	137	299	peak
5825.000	93.85	3.27	97.12	N/A	N/A	137	299	AVG
5850.250	63.21	3.33	66.54	121.63	-55.09	100	290	peak
5855.850	60.79	3.35	64.14	110.56	-46.42	100	290	peak
5880.700	55.49	3.41	58.90	100.98	-42.08	100	60	peak
5928.300	54.66	3.54	58.20	68.23	-10.03	100	240	peak
11650.000	51.37	13.26	64.63	74.00	-9.37	215	100	peak
11650.000	36.76	13.26	50.02	54.00	-3.98	215	100	AVG

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT40 / 5190MHz								
5150.000	68.50	1.89	70.39	74.00	-3.61	219	94	peak
5150.000	50.32	1.89	52.21	54.00	-1.79	219	94	AVG
5190.000	110.43	1.95	112.38	N/A	N/A	219	94	peak
5190.000	98.92	1.95	100.87	N/A	N/A	219	94	AVG
10380.000	37.60	12.41	50.01	68.23	-18.22	116	148	peak
802.11ac VHT40 / 5230MHz								
5230.000	109.23	2.02	111.25	N/A	N/A	100	94	peak
5230.000	98.31	2.02	100.33	N/A	N/A	100	94	AVG
5350.000	58.89	2.21	61.10	74.00	-12.90	100	89	peak
5350.000	46.46	2.21	48.67	54.00	-5.33	100	89	AVG
10460.000	35.78	12.48	48.26	68.23	-19.97	142	149	peak
802.11ac VHT40 / 5775MHz								
5649.350	57.76	2.83	60.59	68.23	-7.64	100	285	peak
5697.300	72.53	2.94	75.47	103.20	-27.73	100	285	peak
5718.300	82.07	3.00	85.07	110.32	-25.25	100	84	peak
5724.950	85.98	3.02	89.00	122.09	-33.09	100	87	peak
5755.000	115.53	3.09	118.62	N/A	N/A	200	280	peak
5755.000	103.68	3.09	106.77	N/A	N/A	200	280	AVG
5850.600	57.95	3.33	61.28	120.83	-59.55	100	292	peak
5857.950	56.55	3.36	59.91	109.97	-50.06	100	84	peak
5885.950	55.27	3.43	58.70	97.10	-38.40	100	288	peak
5948.950	54.97	3.59	58.56	68.23	-9.67	100	271	peak
11510.000	49.29	13.17	62.46	74.00	-11.54	201	149	peak
11510.000	35.62	13.17	48.79	54.00	-5.21	201	149	AVG
802.11ac VHT40 / 5795MHz								
5647.950	54.38	2.82	57.20	68.23	-11.03	100	89	peak
5690.650	56.70	2.92	59.62	98.28	-38.66	100	282	peak
5711.650	61.11	2.98	64.09	108.46	-44.37	100	84	peak
5723.200	63.79	3.01	66.80	118.10	-51.30	100	290	peak
5795.000	114.70	3.20	117.90	N/A	N/A	100	282	peak
5795.000	103.25	3.20	106.45	N/A	N/A	100	282	AVG
5852.700	69.27	3.34	72.61	116.04	-43.43	100	281	peak
5856.550	64.32	3.36	67.68	110.37	-42.69	100	289	peak
5878.950	59.18	3.41	62.59	102.28	-39.69	100	86	peak
5945.100	54.93	3.59	58.52	68.23	-9.71	100	61	peak
11590.000	48.51	13.22	61.73	74.00	-12.27	224	98	peak
11590.000	34.52	13.22	47.74	54.00	-6.26	224	98	AVG

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT40 / 5190MHz								
5150.000	58.30	1.89	60.19	74.00	-13.81	126	53	peak
5150.000	43.23	1.89	45.12	54.00	-8.88	126	53	AVG
5190.000	103.62	1.95	105.57	N/A	N/A	126	53	peak
5190.000	91.48	1.95	93.43	N/A	N/A	126	53	AVG
10380.000	37.35	12.41	49.76	68.23	-18.47	105	359	peak
802.11ac VHT40 / 5230MHz								
5230.000	103.21	2.02	105.23	N/A	N/A	149	56	peak
5230.000	90.17	2.02	92.19	N/A	N/A	149	56	AVG
5350.000	55.06	2.21	57.27	74.00	-16.73	100	56	peak
5350.000	41.31	2.21	43.52	54.00	-10.48	100	56	AVG
10460.000	34.46	12.48	46.94	68.23	-21.29	100	82	peak
802.11ac VHT40 / 5775MHz								
5611.900	54.50	2.72	57.22	68.23	-11.01	100	15	peak
5695.550	61.62	2.94	64.56	101.91	-37.35	100	68	peak
5714.100	73.11	2.98	76.09	109.15	-33.06	100	290	peak
5720.050	73.37	3.01	76.38	110.91	-34.53	100	287	peak
5755.000	106.17	3.09	109.26	N/A	N/A	235	288	peak
5755.000	94.37	3.09	97.46	N/A	N/A	235	288	AVG
5852.350	54.29	3.34	57.63	116.84	-59.21	100	293	peak
5859.700	54.40	3.36	57.76	109.48	-51.72	100	264	peak
5902.400	54.96	3.46	58.42	84.92	-26.50	100	328	peak
5928.300	54.33	3.54	57.87	68.23	-10.36	100	314	peak
11510.000	49.29	13.17	62.46	74.00	-11.54	200	109	peak
11510.000	36.09	13.17	49.26	54.00	-4.74	200	109	AVG
802.11ac VHT40 / 5795MHz								
5637.100	53.86	2.79	56.65	68.23	-11.58	100	126	peak
5690.650	54.27	2.92	57.19	98.28	-41.09	100	53	peak
5717.600	54.94	3.00	57.94	110.13	-52.19	100	82	peak
5722.150	58.92	3.01	61.93	115.70	-53.77	100	288	peak
5795.000	105.33	3.20	108.53	N/A	N/A	157	288	peak
5795.000	93.96	3.20	97.16	N/A	N/A	157	288	AVG
5850.950	60.50	3.33	63.83	120.03	-56.20	100	301	peak
5857.950	59.06	3.36	62.42	109.97	-47.55	100	292	peak
5888.750	55.21	3.44	58.65	95.03	-36.38	100	345	peak
5947.900	54.56	3.59	58.15	68.23	-10.08	100	37	peak
11590.000	51.14	13.22	64.36	74.00	-9.64	195	114	peak
11590.000	37.79	13.22	51.01	54.00	-2.99	195	114	AVG

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT80 / 5210MHz								
5150.000	65.17	1.89	67.06	74.00	-6.94	197	92	peak
5150.000	51.81	1.89	53.70	54.00	-0.30	197	92	AVG
5210.000	104.91	1.99	106.90	N/A	N/A	197	92	peak
5210.000	94.23	1.99	96.22	N/A	N/A	197	92	AVG
5350.000	60.24	2.21	62.45	74.00	-11.55	197	92	peak
5350.000	48.03	2.21	50.24	54.00	-3.76	197	92	AVG
10420.000	37.54	12.44	49.98	68.23	-18.25	100	323	peak
802.11ac VHT80 / 5775MHz								
5646.900	62.03	2.82	64.85	68.23	-3.38	100	87	peak
5699.050	71.70	2.95	74.65	104.50	-29.85	100	84	peak
5707.100	73.70	2.97	76.67	107.19	-30.52	100	279	peak
5723.550	74.74	3.01	77.75	118.89	-41.14	100	280	peak
5775.000	111.50	3.14	114.64	N/A	N/A	216	283	peak
5775.000	100.24	3.14	103.38	N/A	N/A	216	283	AVG
5852.000	68.66	3.34	72.00	117.64	-45.64	100	280	peak
5862.150	67.94	3.37	71.31	108.80	-37.49	100	280	peak
5875.100	65.33	3.40	68.73	105.13	-36.40	100	280	peak
5926.550	56.38	3.53	59.91	68.23	-8.32	100	85	peak
11550.000	47.31	13.19	60.50	74.00	-13.50	198	153	peak
11550.000	32.63	13.19	45.82	54.00	-8.18	198	153	AVG

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT80 / 5210MHz								
5150.000	55.39	1.89	57.28	74.00	-16.72	100	116	peak
5150.000	42.63	1.89	44.52	54.00	-9.48	100	116	AVG
5210.000	97.87	1.99	99.86	N/A	N/A	100	29	peak
5210.000	86.59	1.99	88.58	N/A	N/A	100	29	AVG
5350.000	54.91	2.21	57.12	74.00	-16.88	100	327	peak
5350.000	42.36	2.21	44.57	54.00	-9.43	100	327	AVG
10420.000	36.73	12.44	49.17	68.23	-19.06	100	84	peak
802.11ac VHT80 / 5775MHz								
5640.250	54.33	2.80	57.13	68.23	-11.10	100	301	peak
5698.700	60.47	2.95	63.42	104.24	-40.82	100	285	peak
5717.600	63.19	3.00	66.19	110.13	-43.94	100	292	peak
5724.250	62.67	3.01	65.68	120.49	-54.81	100	288	peak
5775.000	101.40	3.14	104.54	N/A	N/A	145	290	peak
5775.000	90.63	3.14	93.77	N/A	N/A	100	290	AVG
5850.950	57.35	3.33	60.68	120.03	-59.35	100	303	peak
5858.650	56.90	3.36	60.26	109.78	-49.52	100	290	peak
5877.550	55.72	3.41	59.13	103.31	-44.18	100	56	peak
5940.900	55.46	3.57	59.03	68.23	-9.20	100	345	peak
11550.000	47.19	13.19	60.38	74.00	-13.62	203	113	peak
11550.000	34.94	13.19	48.13	54.00	-5.87	203	113	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Above 1 GHz (Mode 2 - Dipole Antenna)

Vertical

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11a / 5180MHz								
5150.000	58.34	1.89	60.23	74.00	-13.77	100	278	peak
5150.000	43.99	1.89	45.88	54.00	-8.12	100	278	AVG
5180.000	113.86	1.95	115.81	N/A	N/A	156	83	peak
5180.000	103.33	1.95	105.28	N/A	N/A	156	83	AVG
10360.000	39.28	12.40	51.68	68.23	-16.55	100	101	peak
802.11a / 5200MHz								
5200.000	114.43	1.97	116.40	N/A	N/A	183	86	peak
5200.000	103.07	1.97	105.04	N/A	N/A	183	86	AVG
10400.000	37.55	12.43	49.98	68.23	-18.25	170	138	peak
802.11a / 5240MHz								
5240.000	112.93	2.03	114.96	N/A	N/A	100	82	peak
5240.000	101.94	2.03	103.97	N/A	N/A	100	82	AVG
5350.000	55.68	2.21	57.89	74.00	-16.11	100	281	peak
5350.000	45.83	2.21	48.04	54.00	-5.96	100	281	AVG
10480.000	37.68	12.49	50.17	68.23	-18.06	161	328	peak
802.11a / 5745MHz								
5638.850	55.43	2.79	58.22	68.23	-10.01	100	80	peak
5699.400	57.81	2.96	60.77	104.76	-43.99	100	87	peak
5717.950	70.94	3.00	73.94	110.23	-36.29	100	292	peak
5724.950	77.36	3.02	80.38	122.09	-41.71	100	89	peak
5745.000	117.67	3.07	120.74	N/A	N/A	227	87	peak
5745.000	106.45	3.07	109.52	N/A	N/A	227	87	AVG
5852.700	55.16	3.34	58.50	116.04	-57.54	100	84	peak
5863.200	55.21	3.37	58.58	108.50	-49.92	100	281	peak
5902.750	55.05	3.47	58.52	84.67	-26.15	100	213	peak
5945.800	55.12	3.59	58.71	68.23	-9.52	100	120	peak
11490.000	45.85	13.17	59.02	74.00	-14.98	100	102	peak
11490.000	31.54	13.17	44.71	54.00	-9.29	100	102	AVG
17235.000	48.87	18.26	67.13	68.23	-1.10	100	102	peak
802.11a / 5785MHz								
5626.250	55.49	2.76	58.25	68.23	-9.98	100	88	peak
5699.050	56.20	2.95	59.15	104.50	-45.35	100	286	peak
5716.200	55.86	3.00	58.86	109.74	-50.88	100	275	peak
5723.550	56.43	3.01	59.44	118.89	-59.45	100	286	peak
5785.000	117.95	3.18	121.13	N/A	N/A	175	89	peak
5785.000	106.70	3.18	109.88	N/A	N/A	175	89	AVG
5851.300	55.19	3.33	58.52	119.24	-60.72	100	18	peak
5863.550	56.33	3.37	59.70	108.41	-48.71	100	289	peak
5909.400	55.40	3.49	58.89	79.74	-20.85	100	286	peak
5947.550	55.35	3.59	58.94	68.23	-9.29	100	338	peak
11570.000	48.97	13.21	62.18	74.00	-11.82	100	101	peak
11570.000	34.42	13.21	47.63	54.00	-6.37	100	101	AVG
17355.000	48.63	19.23	67.86	68.23	-0.37	100	103	peak
802.11a / 5825MHz								
5645.850	55.74	2.81	58.55	68.23	-9.68	100	87	peak
5689.600	54.86	2.92	57.78	97.50	-39.72	100	94	peak
5712.700	55.33	2.98	58.31	108.76	-50.45	100	6	peak
5723.550	54.90	3.01	57.91	118.89	-60.98	100	79	peak
5825.000	116.54	3.27	119.81	N/A	N/A	176	87	peak
5825.000	105.48	3.27	108.75	N/A	N/A	176	87	AVG
5852.000	65.69	3.34	69.03	117.64	-48.61	100	278	peak
5856.200	63.62	3.35	66.97	110.46	-43.49	100	83	peak
5878.250	55.31	3.41	58.72	102.80	-44.08	100	291	peak
5930.400	55.67	3.54	59.21	68.23	-9.02	100	299	peak
11650.000	51.70	13.26	64.96	74.00	-9.04	196	106	peak
11650.000	37.12	13.26	50.38	54.00	-3.62	196	106	AVG
17475.000	42.15	20.20	62.35	68.23	-5.88	100	103	peak

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11a / 5180MHz								
5150.000	55.31	1.89	57.20	74.00	-16.80	100	1	peak
5150.000	41.96	1.89	43.85	54.00	-10.15	100	1	AVG
5180.000	103.52	1.95	105.47	N/A	N/A	173	85	peak
5180.000	92.33	1.95	94.28	N/A	N/A	173	85	AVG
10360.000	40.96	12.40	53.36	68.23	-14.87	100	92	peak
802.11a / 5200MHz								
5200.000	114.43	1.97	116.40	N/A	N/A	183	86	peak
5200.000	103.07	1.97	105.04	N/A	N/A	183	86	AVG
10400.000	37.55	12.43	49.98	68.23	-18.25	170	138	peak
802.11a / 5240MHz								
5240.000	102.54	2.03	104.57	N/A	N/A	100	85	peak
5240.000	91.04	2.03	93.07	N/A	N/A	100	85	AVG
5350.000	54.48	2.21	56.69	74.00	-17.31	100	70	peak
5350.000	41.24	2.21	43.45	54.00	-10.55	100	70	AVG
10480.000	38.49	12.49	50.98	68.23	-17.25	100	167	peak
802.11a / 5745MHz								
5649.700	54.29	2.83	57.12	68.23	-11.11	100	25	peak
5656.000	54.82	2.83	57.65	72.64	-14.99	100	76	peak
5719.700	59.43	3.01	62.44	110.72	-48.28	100	84	peak
5723.200	64.07	3.01	67.08	118.10	-51.02	100	283	peak
5745.000	107.27	3.07	110.34	N/A	N/A	148	82	peak
5745.000	95.52	3.07	98.59	N/A	N/A	148	82	AVG
5852.350	55.07	3.34	58.41	116.84	-58.43	100	103	peak
5863.200	55.24	3.37	58.61	108.50	-49.89	100	102	peak
5896.100	55.00	3.46	58.46	89.59	-31.13	100	359	peak
5927.950	55.67	3.53	59.20	68.23	-9.03	100	250	peak
11490.000	50.43	13.17	63.60	74.00	-10.40	100	111	peak
11490.000	35.34	13.17	48.51	54.00	-5.49	100	111	AVG
17235.000	45.09	18.26	63.35	68.23	-4.88	157	111	peak
802.11a / 5785MHz								
5625.900	53.85	2.76	56.61	68.23	-11.62	100	13	peak
5698.350	54.34	2.95	57.29	103.98	-46.69	100	208	peak
5712.000	55.14	2.98	58.12	108.56	-50.44	100	87	peak
5721.800	53.96	3.01	56.97	114.90	-57.93	100	39	peak
5785.000	108.37	3.18	111.55	N/A	N/A	150	83	peak
5785.000	96.62	3.18	99.80	N/A	N/A	150	83	AVG
5853.400	54.56	3.34	57.90	114.45	-56.55	100	221	peak
5866.700	55.08	3.37	58.45	107.52	-49.07	100	354	peak
5878.600	55.37	3.41	58.78	102.54	-43.76	100	238	peak
5927.600	54.90	3.53	58.43	68.23	-9.80	100	359	peak
11570.000	52.80	13.21	66.01	74.00	-7.99	100	119	peak
11570.000	38.27	13.21	51.48	54.00	-2.52	100	119	AVG
17355.000	43.25	19.23	62.48	68.23	-5.75	170	119	peak
802.11a / 5825MHz								
5631.850	54.20	2.79	56.99	68.23	-11.24	100	72	peak
5687.500	54.46	2.92	57.38	95.95	-38.57	100	127	peak
5718.300	54.40	3.00	57.40	110.32	-52.92	100	139	peak
5721.800	54.21	3.01	57.22	114.90	-57.68	100	47	peak
5825.000	107.21	3.27	110.48	N/A	N/A	138	83	peak
5825.000	95.76	3.27	99.03	N/A	N/A	138	83	AVG
5850.600	56.69	3.33	60.02	120.83	-60.81	100	293	peak
5855.150	55.77	3.35	59.12	110.76	-51.64	100	292	peak
5916.050	55.40	3.50	58.90	74.82	-15.92	100	275	peak
5939.500	54.73	3.56	58.29	68.23	-9.94	100	161	peak
11650.000	52.52	13.26	65.78	74.00	-8.22	100	126	peak
11650.000	38.27	13.26	51.53	54.00	-2.47	100	126	AVG
17475.000	43.97	20.20	64.17	68.23	-4.06	147	124	peak

Vertical

Frequency (MHz)	Reading (dBµV)	Correct Factor(dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT20 / 5180MHz								
5150.000	59.04	1.89	60.93	74.00	-13.07	100	80	peak
5150.000	44.44	1.89	46.33	54.00	-7.67	100	80	AVG
5180.000	114.37	1.95	116.32	N/A	N/A	179	80	peak
5180.000	102.11	1.95	104.06	N/A	N/A	179	80	AVG
10360.000	37.32	12.40	49.72	68.23	-18.51	100	342	peak
802.11ac VHT20 / 5200MHz								
5200.000	113.55	1.97	115.52	N/A	N/A	100	287	peak
5200.000	100.73	1.97	102.70	N/A	N/A	100	287	AVG
10400.000	37.98	12.43	50.41	68.23	-17.82	100	124	peak
802.11ac VHT20 / 5240MHz								
5240.000	114.99	2.03	117.02	N/A	N/A	211	84	peak
5240.000	102.47	2.03	104.50	N/A	N/A	211	84	AVG
5350.000	56.07	2.21	58.28	74.00	-15.72	100	91	peak
5350.000	42.79	2.21	45.00	54.00	-9.00	100	91	AVG
10480.000	37.77	12.49	50.26	68.23	-17.97	167	320	peak
802.11ac VHT20 / 5745MHz								
5644.100	55.64	2.81	58.45	68.23	-9.78	100	94	peak
5691.000	55.22	2.93	58.15	98.54	-40.39	100	84	peak
5719.700	62.29	3.01	65.30	110.72	-45.42	100	85	peak
5724.600	69.87	3.02	72.89	121.29	-48.40	100	84	peak
5745.000	119.19	3.07	122.26	N/A	N/A	187	89	peak
5745.000	106.92	3.07	109.99	N/A	N/A	187	89	AVG
5852.350	54.71	3.34	58.05	116.84	-58.79	100	211	peak
5868.450	54.84	3.37	58.21	107.03	-48.82	100	78	peak
5906.600	55.11	3.49	58.60	81.82	-23.22	100	235	peak
5927.600	54.93	3.53	58.46	68.23	-9.77	100	288	peak
11490.000	48.92	13.17	62.09	74.00	-11.91	194	152	peak
11490.000	35.26	13.17	48.43	54.00	-5.57	194	152	AVG
17235.000	49.43	18.26	67.69	68.23	-0.54	221	135	peak
802.11ac VHT20 / 5785MHz								
5624.500	54.87	2.76	57.63	68.23	-10.60	100	275	peak
5688.200	54.83	2.92	57.75	96.47	-38.72	100	286	peak
5713.000	55.51	2.98	58.49	108.84	-50.35	100	78	peak
5720.050	55.57	3.01	58.58	110.91	-52.33	100	84	peak
5785.000	117.96	3.18	121.14	N/A	N/A	100	278	peak
5785.000	106.16	3.18	109.34	N/A	N/A	100	278	AVG
5853.400	55.38	3.34	58.72	114.45	-55.73	100	289	peak
5857.250	55.14	3.36	58.50	110.17	-51.67	100	281	peak
5895.750	55.09	3.46	58.55	89.84	-31.29	100	58	peak
5941.250	54.82	3.57	58.39	68.23	-9.84	100	224	peak
11570.000	47.50	13.21	60.71	74.00	-13.29	100	104	peak
11570.000	31.68	13.21	44.89	54.00	-9.11	100	104	AVG
17355.000	46.36	19.23	65.59	68.23	-2.64	100	119	peak
802.11ac VHT20 / 5825MHz								
5624.850	54.71	2.76	57.47	68.23	-10.76	100	81	peak
5686.800	54.67	2.92	57.59	95.43	-37.84	100	282	peak
5714.450	54.79	2.98	57.77	109.25	-51.48	100	91	peak
5721.450	54.58	3.01	57.59	114.11	-56.52	100	84	peak
5825.000	118.21	3.27	121.48	N/A	N/A	191	280	peak
5825.000	106.11	3.27	109.38	N/A	N/A	191	280	AVG
5851.300	71.20	3.33	74.53	119.24	-44.71	100	284	peak
5855.150	67.62	3.35	70.97	110.76	-39.79	100	81	peak
5875.100	58.65	3.40	62.05	105.13	-43.08	100	91	peak
5944.050	54.72	3.58	58.30	68.23	-9.93	100	34	peak
11650.000	48.31	13.26	61.57	74.00	-12.43	108	123	peak
11650.000	33.50	13.26	46.76	54.00	-7.24	108	123	AVG
17475.000	47.53	20.20	67.73	68.23	-0.50	228	105	peak

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT20 / 5180MHz								
5150.000	54.78	1.89	56.67	74.00	-17.33	100	278	peak
5150.000	41.11	1.89	43.00	54.00	-11.00	100	278	AVG
5180.000	104.61	1.95	106.56	N/A	N/A	110	89	peak
5180.000	91.74	1.95	93.69	N/A	N/A	110	89	AVG
10360.000	37.99	12.40	50.39	68.23	-17.84	100	201	peak
802.11ac VHT20 / 5200MHz								
5200.000	103.86	1.97	105.83	N/A	N/A	129	87	peak
5200.000	91.17	1.97	93.14	N/A	N/A	129	87	AVG
10400.000	37.75	12.43	50.18	68.23	-18.05	156	245	peak
802.11ac VHT20 / 5240MHz								
5240.000	104.20	2.03	106.23	N/A	N/A	138	85	peak
5240.000	91.24	2.03	93.27	N/A	N/A	138	85	AVG
5350.000	55.20	2.21	57.41	74.00	-16.59	100	276	peak
5350.000	40.85	2.21	43.06	54.00	-10.94	100	276	AVG
10480.000	38.38	12.49	50.87	68.23	-17.36	100	120	peak
802.11ac VHT20 / 5745MHz								
5646.200	53.74	2.81	56.55	68.23	-11.68	100	200	peak
5699.400	53.96	2.96	56.92	104.76	-47.84	100	315	peak
5707.100	54.98	2.97	57.95	107.19	-49.24	100	291	peak
5724.250	54.16	3.01	57.17	120.49	-63.32	100	18	peak
5745.000	108.25	3.07	111.32	N/A	N/A	100	85	peak
5745.000	96.48	3.07	99.55	N/A	N/A	100	85	AVG
5852.000	54.50	3.34	57.84	117.64	-59.80	100	249	peak
5860.400	54.63	3.37	58.00	109.29	-51.29	100	328	peak
5889.100	55.02	3.44	58.46	94.77	-36.31	100	8	peak
5943.700	54.61	3.57	58.18	68.23	-10.05	100	8	peak
11490.000	51.32	13.17	64.49	74.00	-9.51	112	118	peak
11490.000	36.88	13.17	50.05	54.00	-3.95	112	118	AVG
17235.000	44.17	18.26	62.43	68.23	-5.80	191	72	peak
802.11ac VHT20 / 5785MHz								
5647.600	54.19	2.82	57.01	68.23	-11.22	100	129	peak
5671.050	54.30	2.88	57.18	83.78	-26.60	100	327	peak
5707.100	54.40	2.97	57.37	107.19	-49.82	100	287	peak
5721.100	53.85	3.01	56.86	113.31	-56.45	100	347	peak
5785.000	108.56	3.18	111.74	N/A	N/A	238	287	peak
5785.000	96.21	3.18	99.39	N/A	N/A	238	287	AVG
5852.350	54.32	3.34	57.66	116.84	-59.18	100	343	peak
5868.800	54.96	3.39	58.35	106.94	-48.59	100	178	peak
5911.150	55.07	3.50	58.57	78.45	-19.88	100	150	peak
5933.900	54.92	3.55	58.47	68.23	-9.76	100	359	peak
11570.000	53.67	13.21	66.88	74.00	-7.12	100	111	peak
11570.000	37.80	13.21	51.01	54.00	-2.99	100	111	AVG
17355.000	42.88	19.23	62.11	68.23	-6.12	100	133	peak
802.11ac VHT20 / 5825MHz								
5649.350	54.75	2.83	57.58	68.23	-10.65	100	268	peak
5696.250	54.23	2.94	57.17	102.42	-45.25	100	31	peak
5705.000	54.81	2.96	57.77	106.60	-48.83	100	170	peak
5720.750	53.76	3.01	56.77	112.51	-55.74	100	290	peak
5825.000	108.52	3.27	111.79	N/A	N/A	136	292	peak
5825.000	96.16	3.27	99.43	N/A	N/A	136	292	AVG
5850.250	60.63	3.33	63.96	121.63	-57.67	100	300	peak
5855.150	59.63	3.35	62.98	110.76	-47.78	100	299	peak
5909.050	55.61	3.49	59.10	80.00	-20.90	100	136	peak
5931.100	54.92	3.54	58.46	68.23	-9.77	100	156	peak
11650.000	53.30	13.26	66.56	74.00	-7.44	112	119	peak
11650.000	38.57	13.26	51.83	54.00	-2.17	112	119	AVG
17475.000	41.93	20.20	62.13	68.23	-6.10	100	133	peak

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT40 / 5190MHz								
5150.000	63.16	1.89	65.05	74.00	-8.95	100	283	peak
5150.000	47.36	1.89	49.25	54.00	-4.75	100	283	AVG
5190.000	111.38	1.95	113.33	N/A	N/A	178	82	peak
5190.000	100.62	1.95	102.57	N/A	N/A	178	82	AVG
10380.000	37.44	12.41	49.85	68.23	-18.38	100	344	peak
802.11ac VHT40 / 5230MHz								
5230.000	110.59	2.02	112.61	N/A	N/A	147	81	peak
5230.000	99.62	2.02	101.64	N/A	N/A	147	81	AVG
5350.000	54.27	2.21	56.48	74.00	-17.52	100	295	peak
5350.000	42.53	2.21	44.74	54.00	-9.26	100	295	AVG
10460.000	37.60	12.48	50.08	68.23	-18.15	100	33	peak
802.11ac VHT40 / 5775MHz								
5642.350	58.85	2.80	61.65	68.23	-6.58	100	277	peak
5696.950	74.48	2.94	77.42	102.94	-25.52	100	87	peak
5719.700	82.92	3.01	85.93	110.72	-24.79	100	86	peak
5722.850	87.11	3.01	90.12	117.30	-27.18	100	89	peak
5755.000	116.19	3.09	119.28	N/A	N/A	226	82	peak
5755.000	105.23	3.09	108.32	N/A	N/A	226	82	AVG
5850.250	58.10	3.33	61.43	121.63	-60.20	100	82	peak
5855.500	57.27	3.35	60.62	110.66	-50.04	100	87	peak
5884.550	55.80	3.42	59.22	98.13	-38.91	100	11	peak
5925.850	54.81	3.53	58.34	68.23	-9.89	100	4	peak
11510.000	45.35	13.17	58.52	74.00	-15.48	193	62	peak
11510.000	31.40	13.17	44.57	54.00	-9.43	193	62	AVG
17265.000	48.03	18.50	66.53	68.23	-1.70	227	103	peak
802.11ac VHT40 / 5795MHz								
5601.050	55.27	2.70	57.97	68.23	-10.26	100	280	peak
5689.600	57.72	2.92	60.64	97.50	-36.86	100	91	peak
5719.000	61.62	3.01	64.63	110.52	-45.89	100	83	peak
5723.900	64.69	3.01	67.70	119.69	-51.99	100	78	peak
5795.000	116.38	3.20	119.58	N/A	N/A	100	88	peak
5795.000	105.04	3.20	108.24	N/A	N/A	100	88	AVG
5852.700	70.91	3.34	74.25	116.04	-41.79	100	87	peak
5857.250	63.87	3.36	67.23	110.17	-42.94	100	87	peak
5875.100	60.44	3.40	63.84	105.13	-41.29	100	85	peak
5945.800	55.44	3.59	59.03	68.23	-9.20	100	333	peak
11590.000	46.95	13.22	60.17	74.00	-13.83	195	135	peak
11590.000	33.73	13.22	46.95	54.00	-7.05	195	135	AVG
17385.000	43.56	19.47	63.03	68.23	-5.20	100	102	peak

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT40 / 5190MHz								
5150.000	55.31	1.89	57.20	74.00	-16.80	100	308	peak
5150.000	41.71	1.89	43.60	54.00	-10.40	100	308	AVG
5190.000	100.75	1.95	102.70	N/A	N/A	162	87	peak
5190.000	89.37	1.95	91.32	N/A	N/A	162	87	AVG
10380.000	37.36	12.41	49.77	68.23	-18.46	164	308	peak
802.11ac VHT40 / 5230MHz								
5230.000	99.00	2.02	101.02	N/A	N/A	157	274	peak
5230.000	87.89	2.02	89.91	N/A	N/A	157	274	AVG
5350.000	55.86	2.21	58.07	74.00	-15.93	100	323	peak
5350.000	41.75	2.21	43.96	54.00	-10.04	100	323	AVG
10460.000	37.92	12.48	50.40	68.23	-17.83	139	189	peak
802.11ac VHT40 / 5775MHz								
5638.500	54.42	2.79	57.21	68.23	-11.02	100	161	peak
5696.600	63.34	2.94	66.28	102.68	-36.40	100	83	peak
5713.050	70.11	2.98	73.09	108.85	-35.76	100	82	peak
5720.050	71.97	3.01	74.98	110.91	-35.93	100	83	peak
5755.000	105.68	3.09	108.77	N/A	N/A	157	83	peak
5755.000	94.53	3.09	97.62	N/A	N/A	157	83	AVG
5852.350	54.38	3.34	57.72	116.84	-59.12	100	325	peak
5859.350	54.93	3.36	58.29	109.58	-51.29	100	230	peak
5912.200	54.75	3.50	58.25	77.67	-19.42	100	301	peak
5950.000	54.89	3.59	58.48	68.23	-9.75	100	41	peak
11510.000	48.97	13.17	62.14	74.00	-11.86	100	126	peak
11510.000	34.50	13.17	47.67	54.00	-6.33	100	126	AVG
17260.000	41.77	18.46	60.23	68.23	-8.00	169	116	peak
802.11ac VHT40 / 5795MHz								
5639.550	54.17	2.79	56.96	68.23	-11.27	100	325	peak
5676.300	54.63	2.89	57.52	87.66	-30.14	100	177	peak
5707.100	55.09	2.97	58.06	107.19	-49.13	100	236	peak
5724.600	54.67	3.02	57.69	121.29	-63.60	100	70	peak
5795.000	105.35	3.20	108.55	N/A	N/A	157	293	peak
5795.000	93.67	3.20	96.87	N/A	N/A	157	293	AVG
5851.300	60.78	3.33	64.11	119.24	-55.13	100	291	peak
5856.200	59.22	3.35	62.57	110.46	-47.89	100	301	peak
5875.800	54.99	3.40	58.39	104.61	-46.22	100	307	peak
5927.950	55.02	3.53	58.55	68.23	-9.68	100	254	peak
11591.000	49.01	13.22	62.23	74.00	-11.77	100	127	peak
11591.000	35.31	13.22	48.53	54.00	-5.47	100	127	AVG
17524.000	37.64	20.56	58.20	68.23	-10.03	100	358	peak

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT80 / 5210MHz								
5150.000	59.79	1.89	61.68	74.00	-12.32	100	86	peak
5150.000	47.24	1.89	49.13	54.00	-4.87	100	86	AVG
5210.000	105.55	1.99	107.54	N/A	N/A	164	82	peak
5210.000	94.08	1.99	96.07	N/A	N/A	164	82	AVG
10420.000	37.80	12.44	50.24	68.23	-17.99	155	189	peak
802.11ac VHT80 / 5775MHz								
5642.350	62.31	2.80	65.11	68.23	-3.12	100	89	peak
5684.350	72.76	2.92	75.68	93.62	-17.94	100	89	peak
5702.200	75.73	2.96	78.69	105.82	-27.13	100	87	peak
5722.850	77.31	3.01	80.32	117.30	-36.98	100	89	peak
5775.000	111.93	3.14	115.07	N/A	N/A	100	87	peak
5775.000	101.58	3.14	104.72	N/A	N/A	100	87	AVG
5852.350	71.48	3.34	74.82	116.84	-42.02	100	87	peak
5864.250	69.27	3.37	72.64	108.21	-35.57	100	89	peak
5875.800	64.12	3.40	67.52	104.61	-37.09	100	280	peak
5932.150	57.09	3.55	60.64	68.23	-7.59	100	288	peak
11550.000	44.75	13.19	57.94	74.00	-16.06	206	63	peak
11550.000	30.75	13.19	43.94	54.00	-10.06	206	63	AVG
17325.000	37.16	18.99	56.15	68.23	-12.08	100	118	peak

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
802.11ac VHT80 / 5210MHz								
5150.000	54.62	1.89	56.51	74.00	-17.49	100	120	peak
5150.000	41.69	1.89	43.58	54.00	-10.42	100	120	AVG
5210.000	94.32	1.99	96.31	N/A	N/A	161	86	peak
5210.000	83.43	1.99	85.42	N/A	N/A	161	86	AVG
10420.000	38.01	12.44	50.45	68.23	-17.78	100	232	peak
802.11ac VHT80 / 5775MHz								
5634.650	54.24	2.79	57.03	68.23	-11.20	100	276	peak
5679.800	57.49	2.89	60.38	90.25	-29.87	100	287	peak
5701.150	61.32	2.96	64.28	105.52	-41.24	100	84	peak
5721.100	61.16	3.01	64.17	113.31	-49.14	100	287	peak
5775.000	102.32	3.14	105.46	N/A	N/A	149	84	peak
5775.000	91.00	3.14	94.14	N/A	N/A	149	84	AVG
5854.450	56.45	3.35	59.80	112.05	-52.25	100	83	peak
5861.800	56.25	3.37	59.62	108.90	-49.28	100	281	peak
5885.600	55.80	3.43	59.23	97.36	-38.13	100	302	peak
5930.050	55.12	3.54	58.66	68.23	-9.57	100	1	peak
11550.000	47.17	13.19	60.36	74.00	-13.64	114	119	peak
11550.000	33.00	13.19	46.19	54.00	-7.81	114	119	AVG
17325.000	36.37	18.99	55.36	68.23	-12.87	121	53	peak

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Test Mode: simultaneous transmissions (2.4G WIFI+5G WIFI)

Mode 1 (Patch Antenna)

Horizontal

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
85.2900	47.62	-16.57	31.05	40.00	-8.95	100	225	QP
145.4300	44.15	-11.00	33.15	43.50	-10.35	100	48	QP
171.6200	45.51	-12.31	33.20	43.50	-10.30	100	53	QP
327.7900	49.06	-9.14	39.92	46.00	-6.08	100	19	QP
407.3300	49.72	-7.43	42.29	46.00	-3.71	100	7	QP
672.1400	39.06	-3.14	35.92	46.00	-10.08	100	17	QP
4824.000	46.46	1.05	47.51	74.00	-26.49	144	329	peak
4824.000	39.14	1.05	40.19	54.00	-13.81	144	329	AVG
11490.000	49.94	13.17	63.11	74.00	-10.89	100	218	peak
11490.000	36.23	13.17	49.40	54.00	-4.60	100	218	AVG

Vertical

Frequency (MHz)	Reading (dB μV)	Correct Factor(dB/m)	Result (dB μV/m)	Limit (dB μV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
32.9100	43.00	-5.27	37.73	40.00	-2.27	100	302	QP
61.0400	54.61	-17.33	37.28	40.00	-2.72	100	48	QP
84.3200	51.89	-16.55	35.34	40.00	-4.66	100	103	QP
373.3800	48.69	-8.13	40.56	46.00	-5.44	100	70	QP
442.2500	46.58	-6.73	39.85	46.00	-6.15	100	341	QP
935.9800	31.36	2.07	33.43	46.00	-12.57	100	39	QP
4824.000	50.65	1.05	51.70	74.00	-22.30	121	324	peak
4824.000	43.03	1.05	44.08	54.00	-9.92	100	324	AVG
11490.000	51.24	13.17	64.41	74.00	-9.59	100	58	peak
11490.000	37.56	13.17	50.73	54.00	-3.27	100	58	AVG

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

Mode 2 (Dipole Antenna)

Horizontal

Frequency (MHz)	Reading (dB μ V)	Correct Factor(dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
62.9800	45.99	-17.16	28.83	40.00	-11.17	100	90	QP
158.0400	44.51	-11.19	33.32	43.50	-10.18	100	270	QP
263.7700	38.78	-10.88	27.90	46.00	-18.10	100	75	QP
398.6000	44.32	-7.61	36.71	46.00	-9.29	100	111	QP
600.3600	38.15	-4.18	33.97	46.00	-12.03	100	121	QP
696.3900	36.52	-2.79	33.73	46.00	-12.27	100	66	QP
4824.000	49.55	1.05	50.60	74.00	-23.40	195	155	peak
4824.000	44.95	1.05	46.00	54.00	-8.00	195	155	AVG
10420.000	35.23	12.44	47.67	68.23	-20.56	100	145	peak

Vertical

Frequency (MHz)	Reading (dB μ V)	Correct Factor(dB/m)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Degree (˚)	Remark
30.9700	41.58	-3.93	37.65	40.00	-2.35	100	352	QP
81.4100	54.99	-16.51	38.48	40.00	-1.52	100	348	QP
439.3400	40.73	-6.78	33.95	46.00	-12.05	100	154	QP
551.8600	35.96	-4.98	30.98	46.00	-15.02	100	137	QP
838.0100	31.44	-0.01	31.43	46.00	-14.57	100	145	QP
900.0900	31.09	1.03	32.12	46.00	-13.88	100	93	QP
4824.000	52.79	1.05	53.84	74.00	-20.16	210	311	peak
4824.000	49.74	1.05	50.79	54.00	-3.21	210	311	AVG
10420.000	35.44	12.44	47.88	68.23	-20.35	100	152	peak

Note: Result = Reading + Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

Spurious emissions more than 20 dB below the limit were not reported.

8 FCC §15.407(a)(e) –EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

8.1 Applicable Standard

As per FCC §15.407(a): The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.
As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

8.2 Test Procedure

As per KDB 789033 D02 General UNII Test Procedures New Rules v02r01

Emission Bandwidth (EBW)

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 maximum 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%.

99% Occupied Bandwidth

The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is *required* only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).
The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW ≥ 3 · RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used.

Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

8.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSU26	200268	2017/05/08	2018/05/07
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Attenuator	MINI-CIRCUITS	BW-S10W5+	N/A	2018/03/08	2019/03/07

**** Statement of Traceability:*** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

8.4 Test Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	57 %
ATM Pressure:	1020 hPa

The testing was performed by Andy Shih on 2018-03-30 ~ 2018-04-11.

8.5 Test Results

Test mode: Transmitting

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	
				Chain 0	Chain 1
UNII-1	802.11a	36	5180	19.20	18.88
		40	5200	19.20	19.01
		48	5240	19.13	18.88
UNII-3		149	5745	19.65	19.07
		157	5785	20.03	18.82
		165	5825	19.39	18.94
UNII-1	802.11ac20	36	5180	20.03	19.97
		40	5200	20.10	20.16
		48	5240	20.10	19.90
UNII-3		149	5745	20.35	20.16
		157	5785	19.96	20.10
		165	5825	21.82	19.97
UNII-1	802.11ac 40	38	5190	39.68	39.42
		46	5230	39.55	39.30
UNII-3		151	5755	42.31	39.30
		159	5795	40.26	39.81
UNII-1	802.11ac 80	42	5210	85.50	83.20
UNII-3		155	5775	84.99	83.71

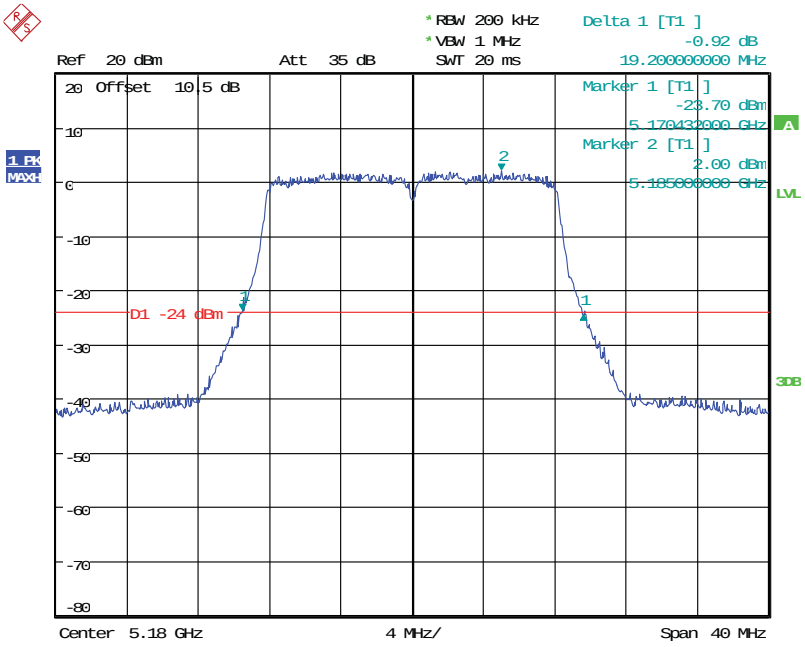
UNII Band	Mode	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)		Remark
				Chain 0	Chain 1	
UNII-1	802.11a	36	5180	16.40	16.44	No transmitted signal in the 99% bandwidth extends into the U-NII-2 band
		40	5200	16.40	16.40	
		48	5240	16.41	16.41	
UNII-3		149	5745	16.44	16.44	
		157	5785	16.48	16.40	
		165	5825	16.44	16.40	
UNII-1	802.11ac20	36	5180	17.60	17.60	
		40	5200	17.60	17.60	
		48	5240	17.63	17.63	
UNII-3		149	5745	17.72	17.64	
		157	5785	17.72	17.60	
		165	5825	17.72	17.60	
UNII-1	802.11ac 40	38	5190	36.08	36.00	
		46	5230	36.03	36.03	
UNII-3		151	5755	36.32	35.92	
		159	5795	36.32	35.92	
UNII-1	802.11ac 80	42	5210	75.90	75.90	
UNII-3		155	5775	76.00	75.68	

UNII Band	Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)		Limit (MHz)
				Chain 0	Chain 1	
UNII-3	802.11a	149	5745	16.12	16.38	>0.5
		157	5785	16.27	16.06	>0.5
		165	5825	16.26	16.00	>0.5
	802.11ac20	149	5745	17.54	17.54	>0.5
		157	5785	17.54	17.47	>0.5
		165	5825	17.60	16.83	>0.5
	802.11ac 40	151	5755	35.46	35.20	>0.5
		159	5795	35.46	35.71	>0.5
	802.11ac 80	155	5775	75.77	75.26	>0.5

Please refer to the following plots

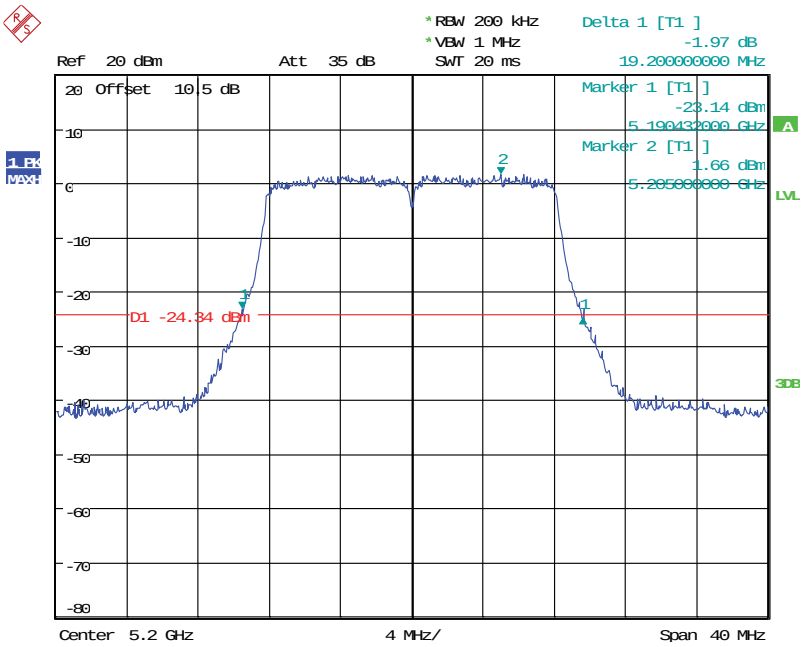
Transmitting Mode:

UNII BW 26dBc
IEEE 802.11a mode / 5150 ~ 5250MHz(chain 0)
5180MHz



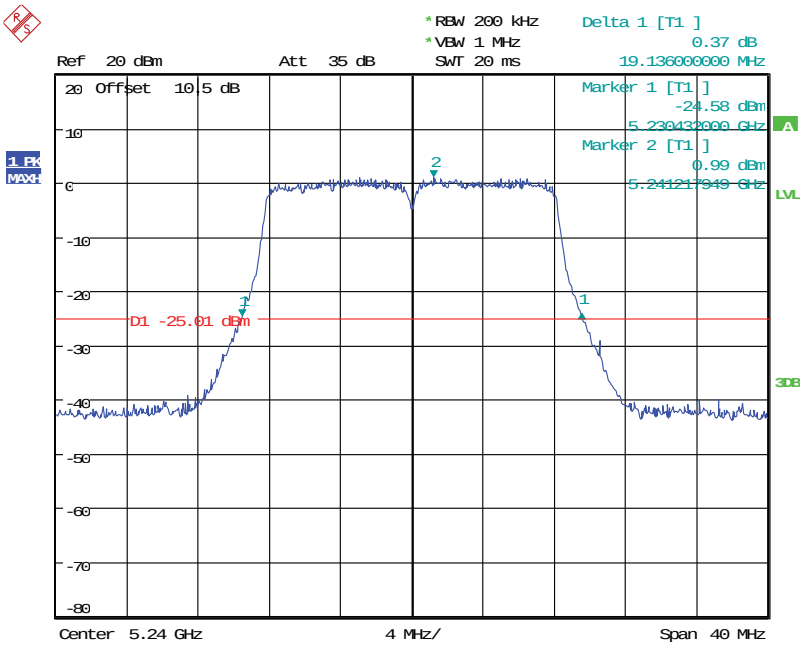
Date: 30.MAR.2018 17:15:07

5200MHz



Date: 30.MAR.2018 17:16:41

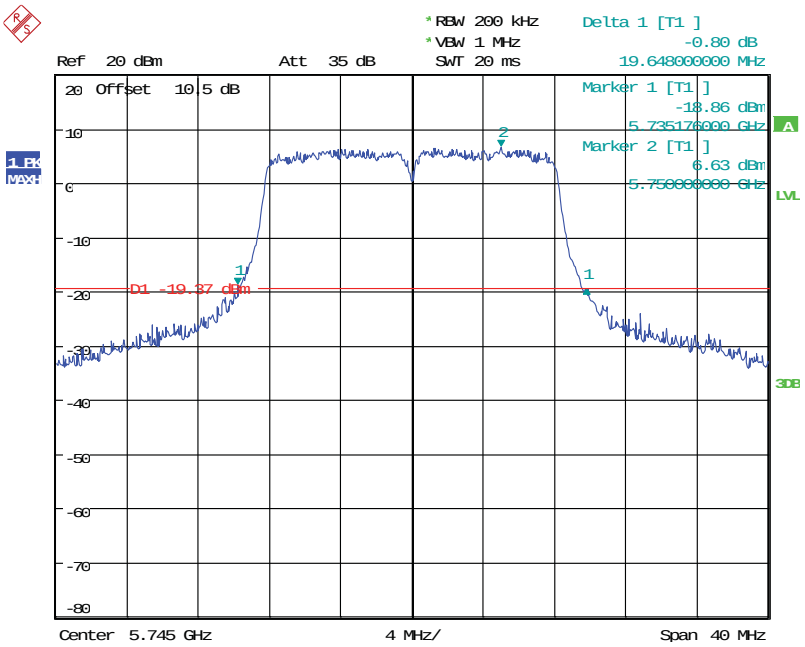
5240MHz



Date: 30.MAR.2018 17:18:21

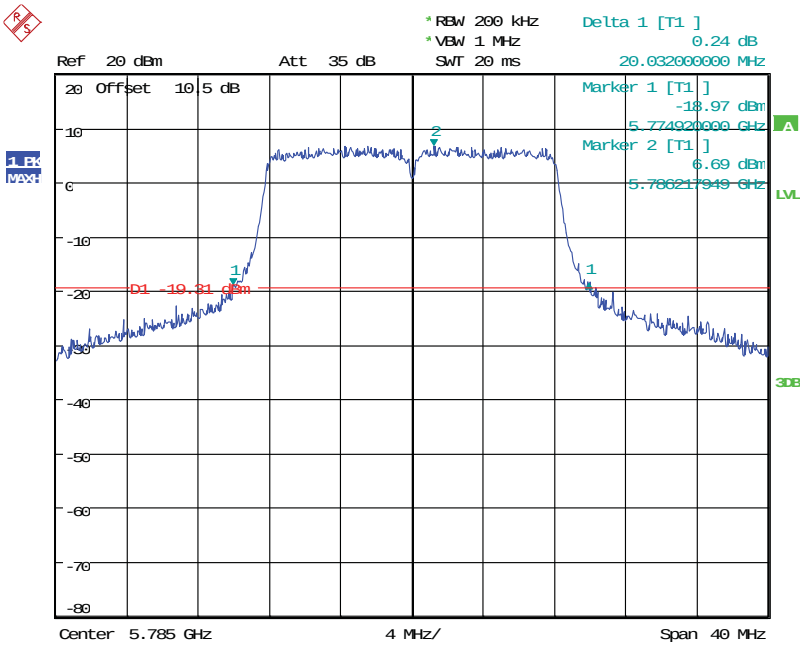
IEEE 802.11a mode / 5725 ~ 5850MHz (chain 0)

5745MHz



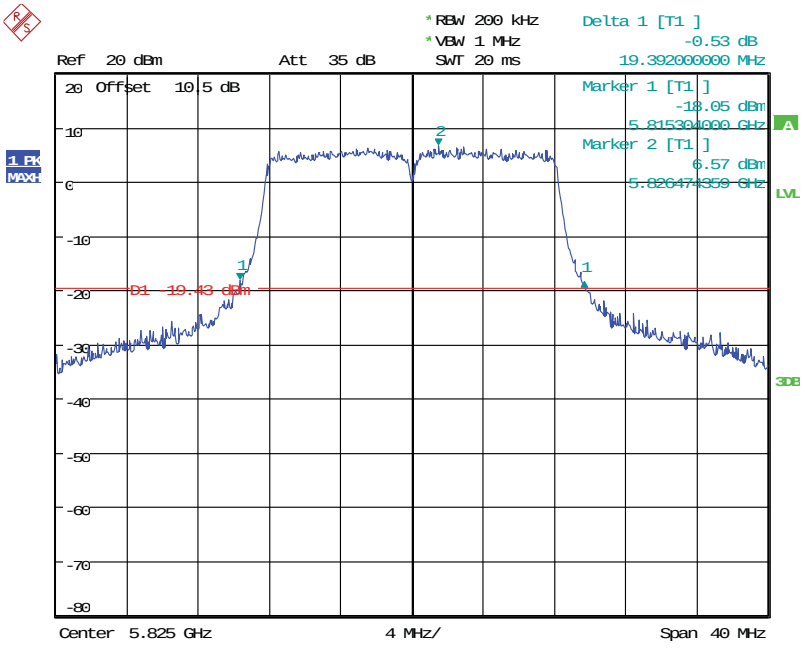
Date: 30.MAR.2018 17:20:16

5785MHz



Date: 30.MAR.2018 17:22:14

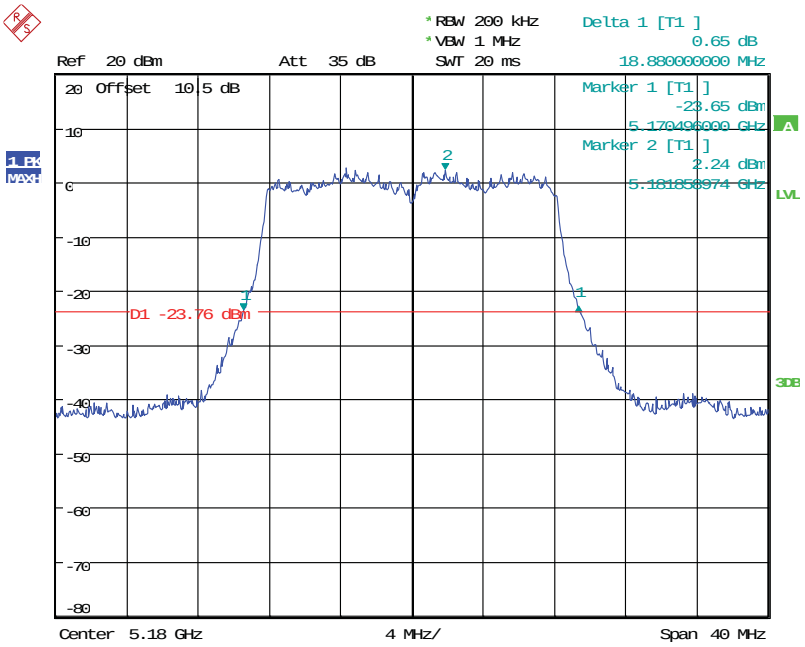
5825MHz



Date: 30.MAR.2018 17:24:03

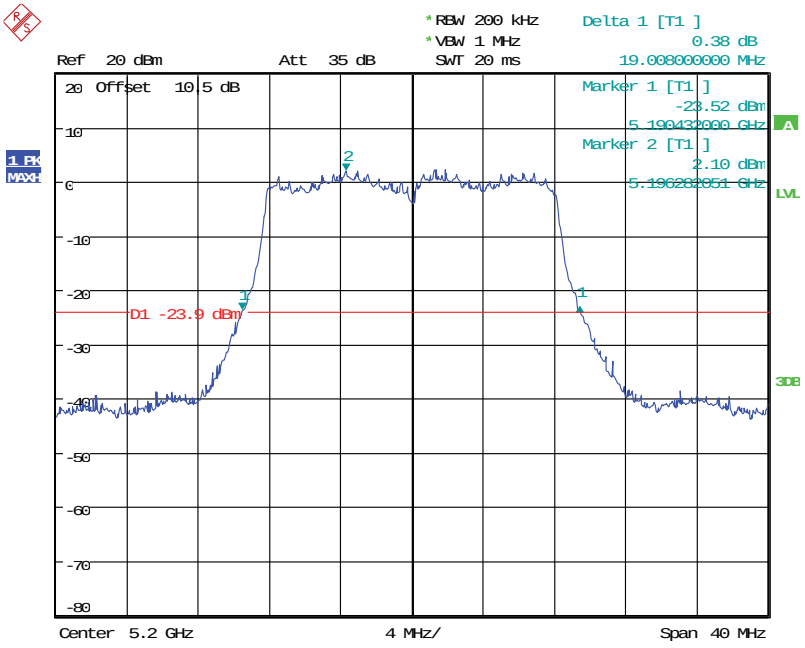
IEEE 802.11a mode / 5150 ~ 5250MHz(chain 1)

5180MHz



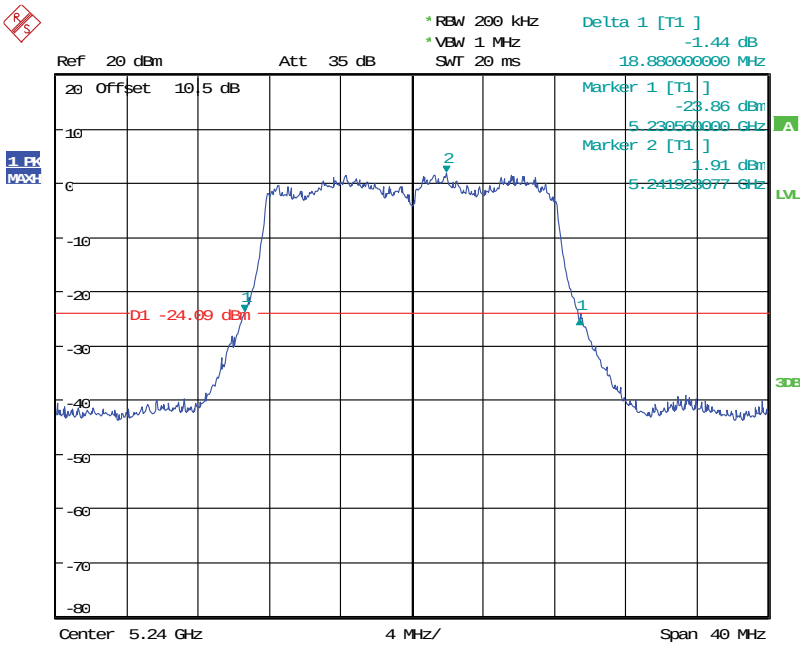
Date: 30.MAR.2018 18:21:44

5200MHz



Date: 30.MAR.2018 18:23:12

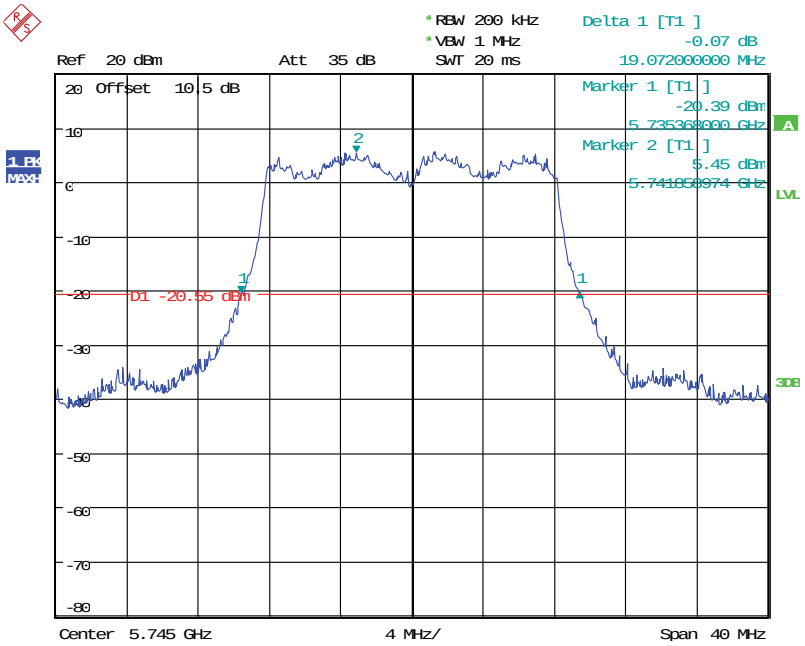
5240MHz



Date: 30.MAR.2018 18:24:42

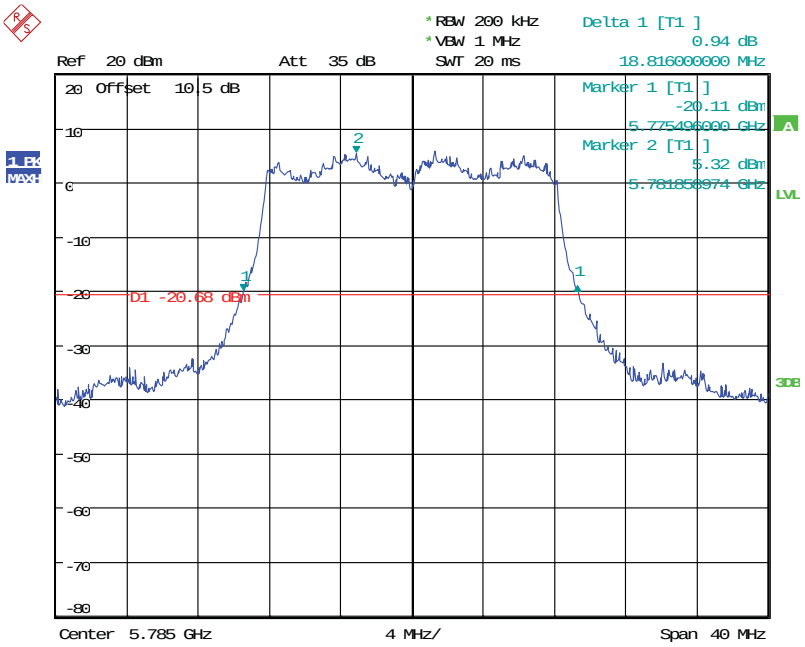
IEEE 802.11a mode / 5725 ~ 5850MHz (chain 1)

5745MHz



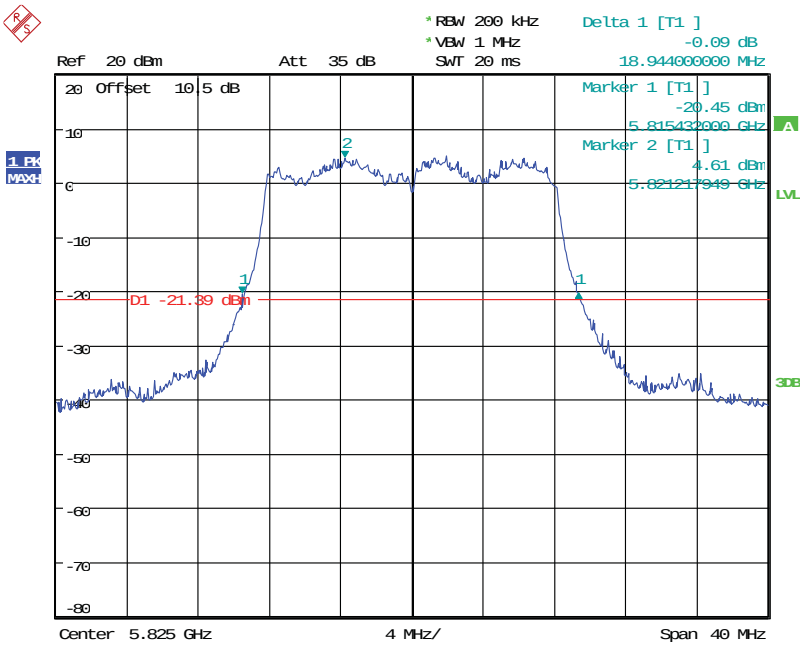
Date: 30.MAR.2018 18:26:30

5785MHz



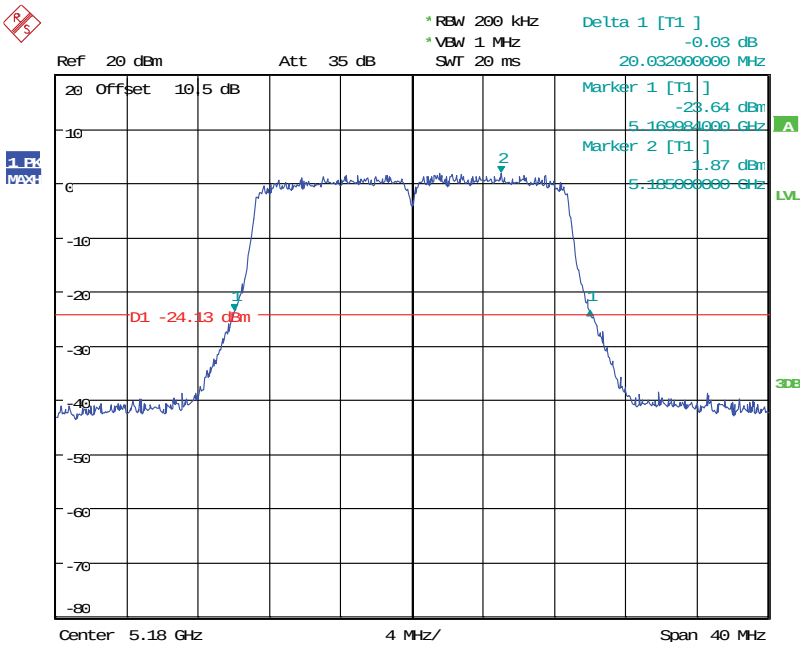
Date: 30.MAR.2018 18:28:40

5825MHz



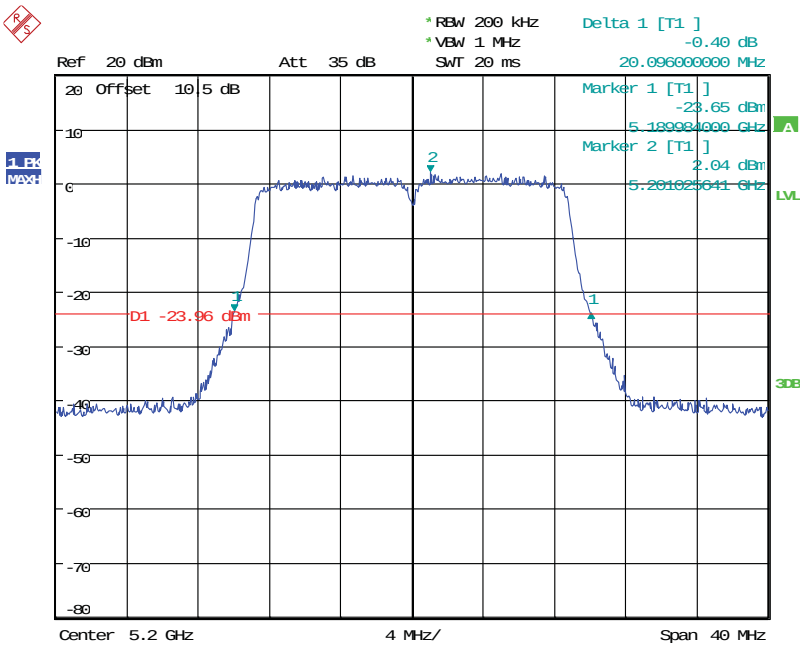
Date: 30.MAR.2018 18:30:40

IEEE 802.11ac VHT20 mode / 5150 ~ 5250MHz(chain 0)
5180MHz



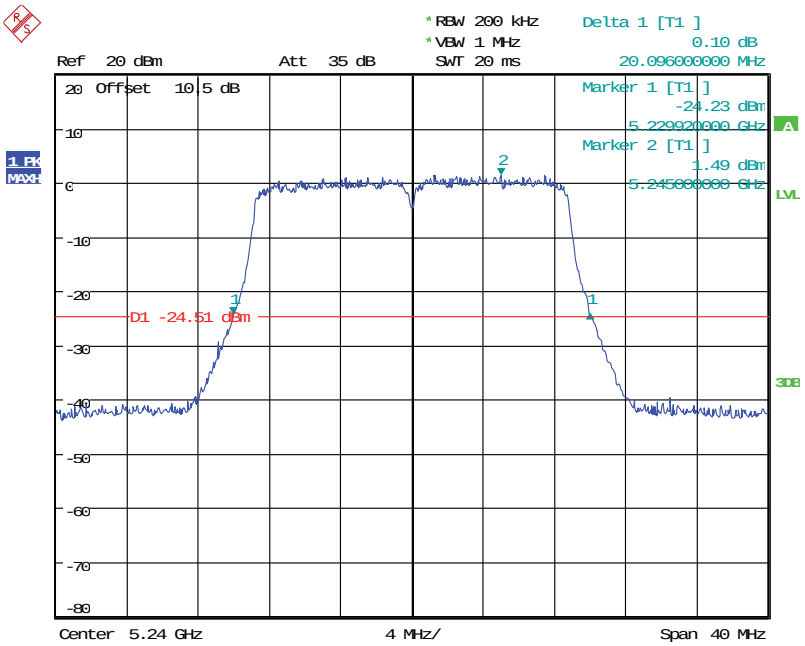
Date: 30.MAR.2018 17:26:10

5200MHz



Date: 30.MAR.2018 17:27:33

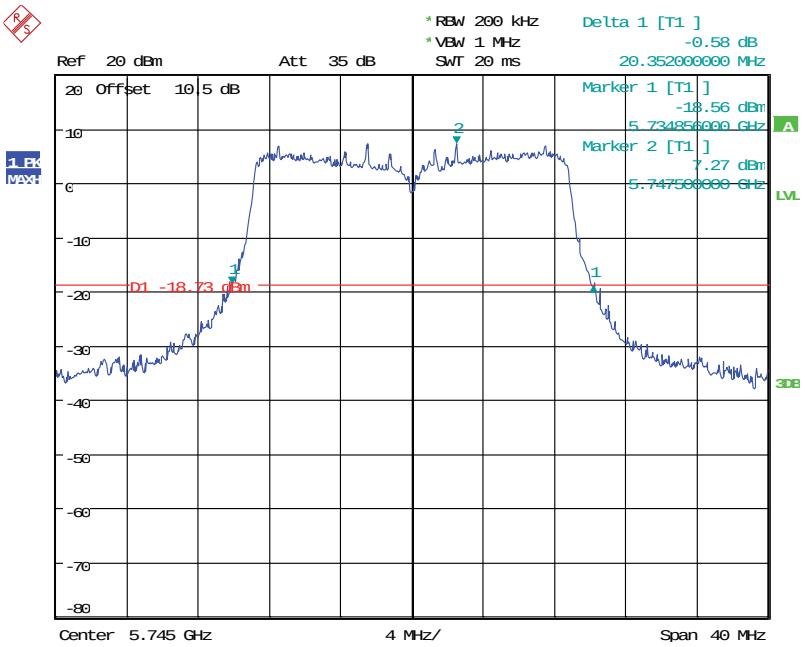
5240MHz



Date: 30.MAR.2018 17:28:50

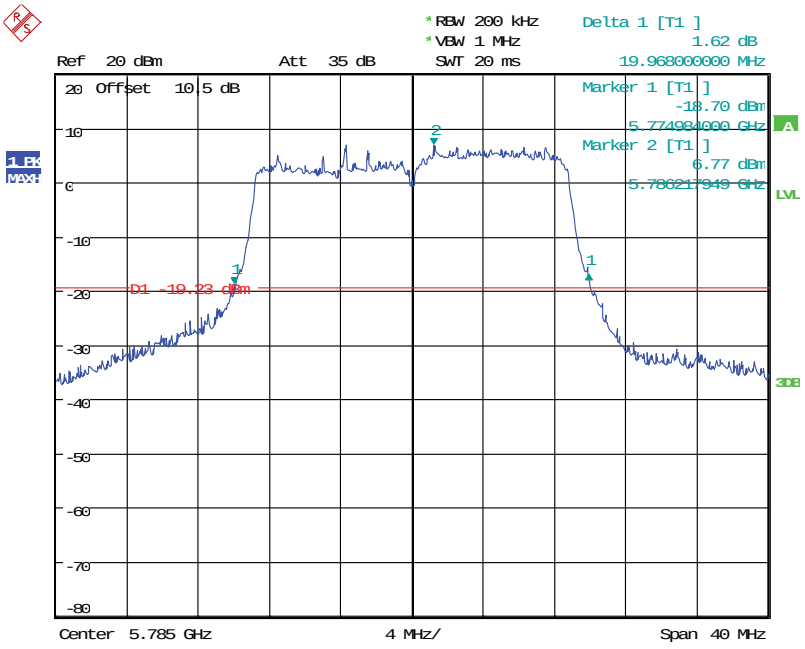
IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 0)

5745MHz



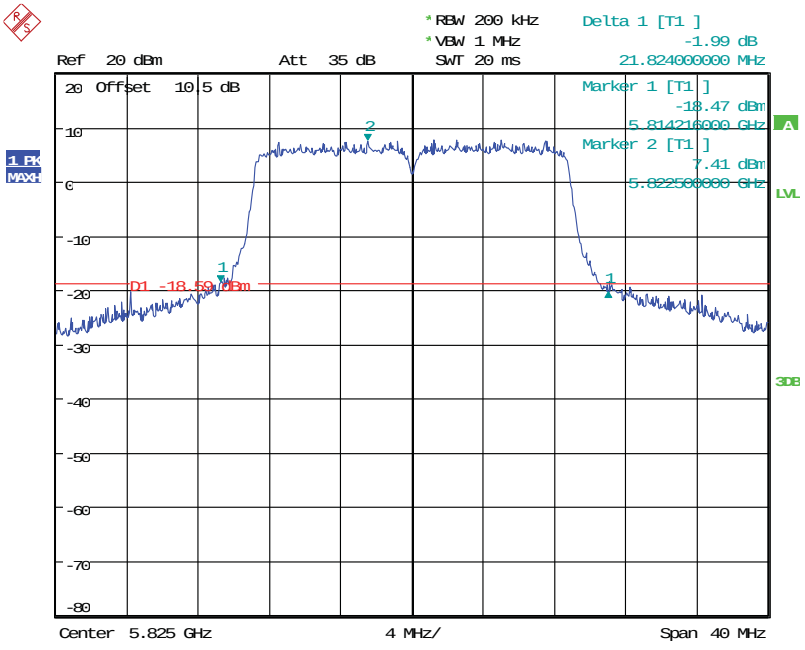
Date: 30.MAR.2018 19:27:18

5785MHz



Date: 30.MAR.2018 19:29:33

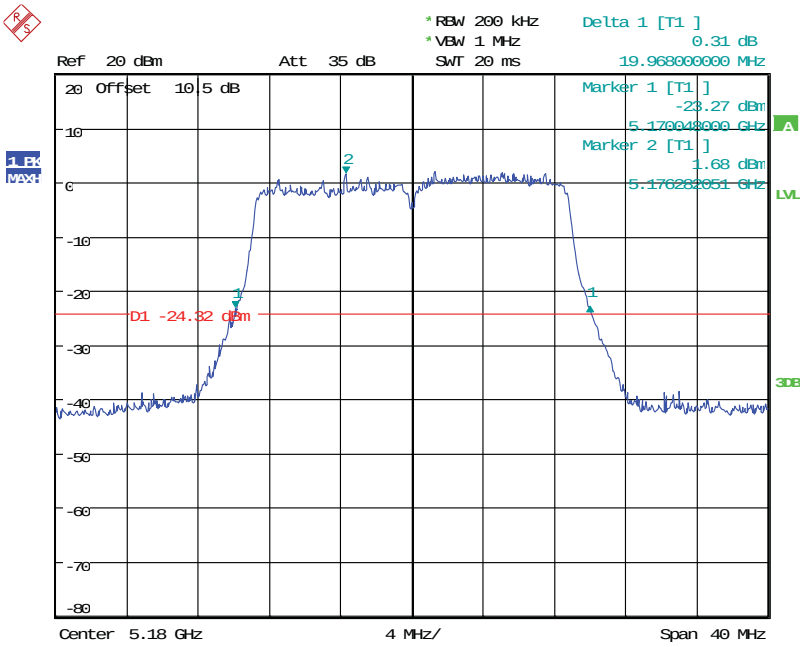
5825MHz



Date: 30.MAR.2018 19:31:32

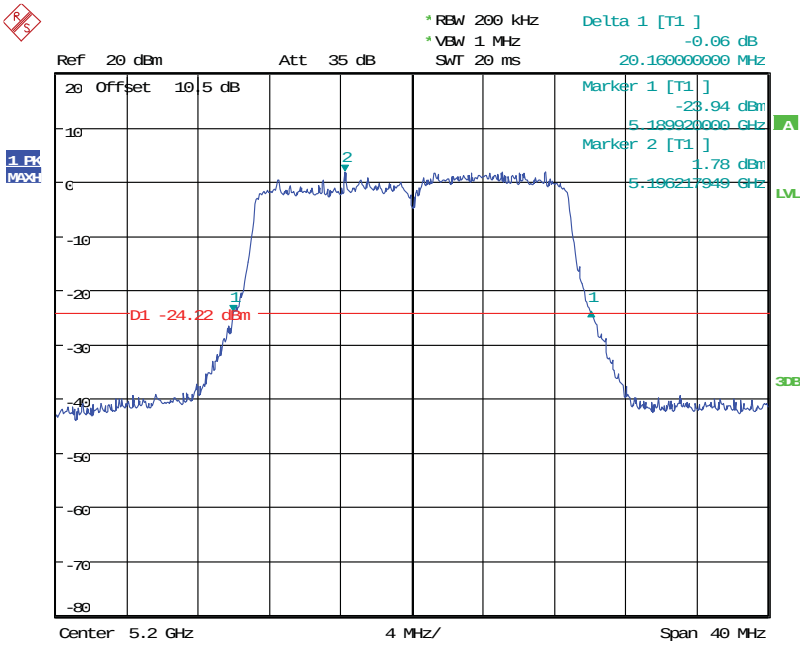
IEEE 802.11 ac VHT20 mode / 5150 ~ 5250MHz(chain 1)

5180MHz



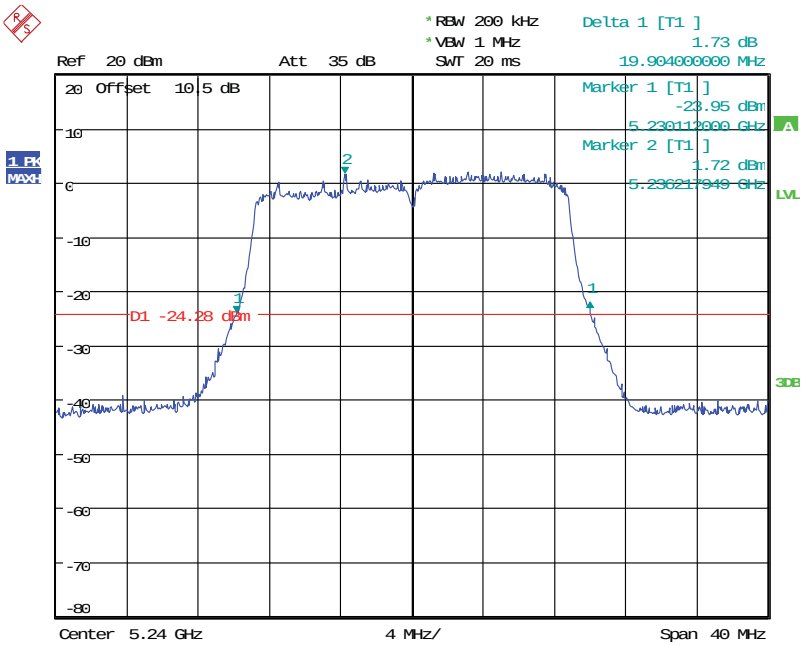
Date: 30.MAR.2018 18:32:52

5200MHz



Date: 30.MAR.2018 18:34:35

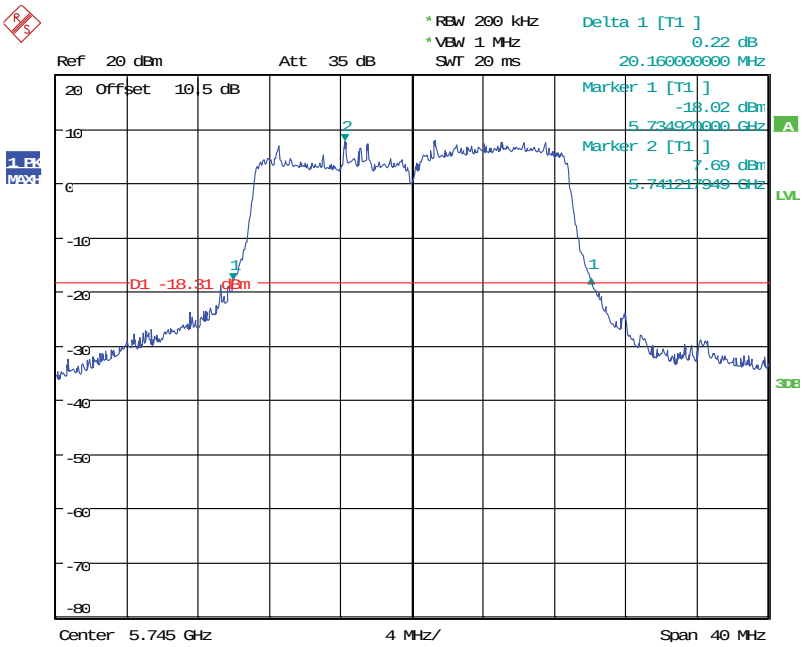
5240MHz



Date: 30.MAR.2018 18:36:07

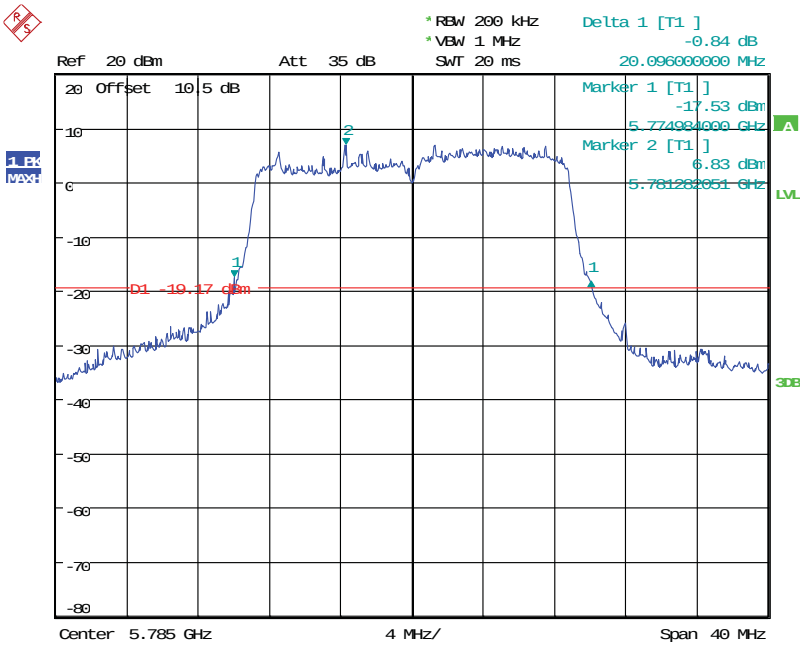
IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 1)

5745MHz



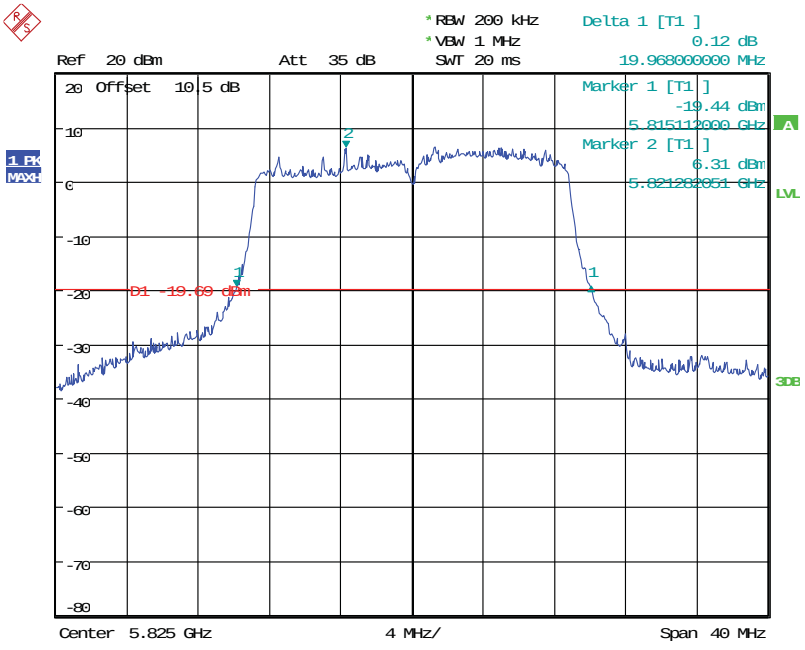
Date: 30.MAR.2018 18:37:59

5785MHz



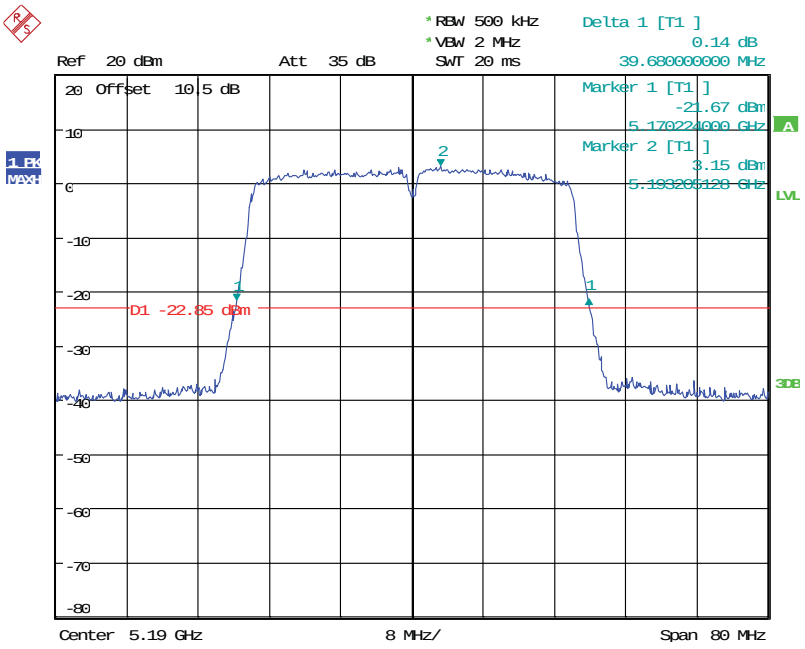
Date: 30.MAR.2018 18:42:03

5825MHz



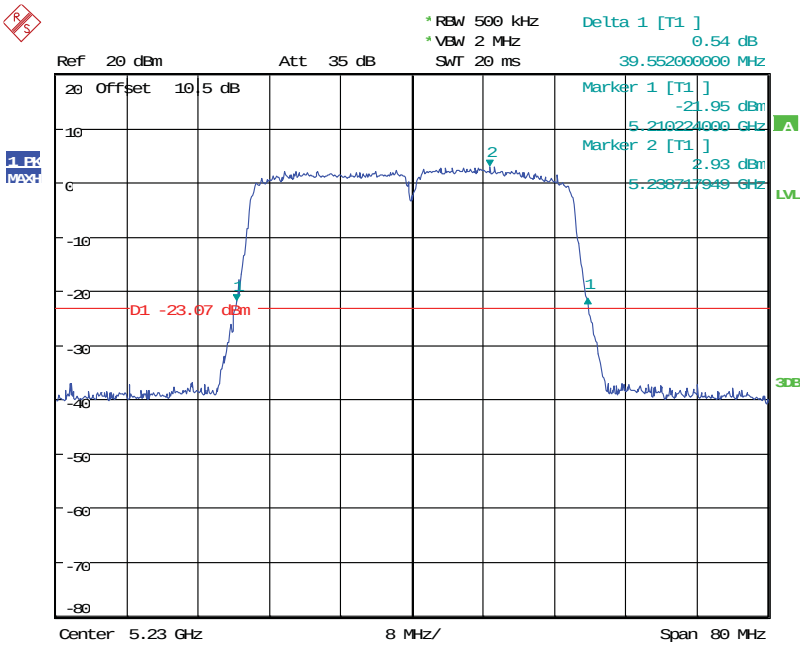
Date: 30.MAR.2018 18:43:55

IEEE 802.11ac VHT40 mode / 5150 ~ 5250MHz(chain 0)
5190MHz



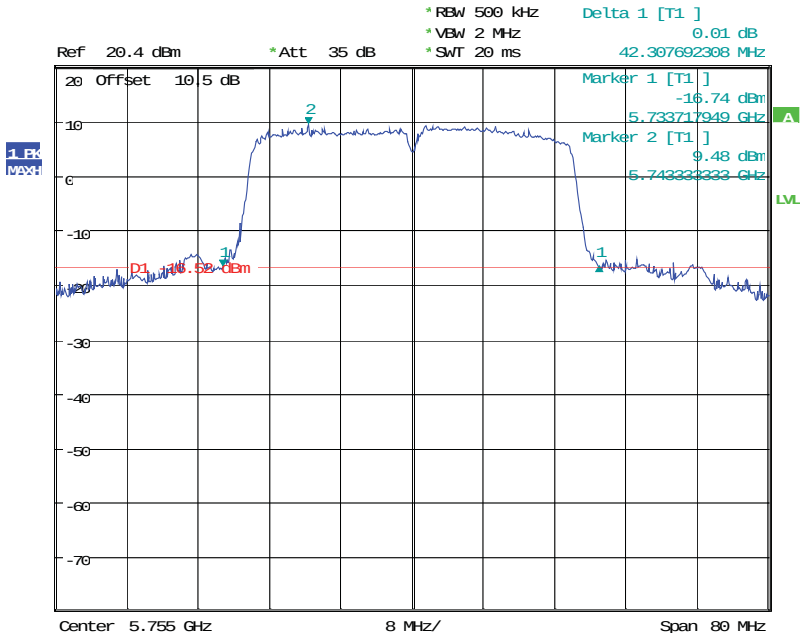
Date: 30.MAR.2018 17:35:02

5230MHz



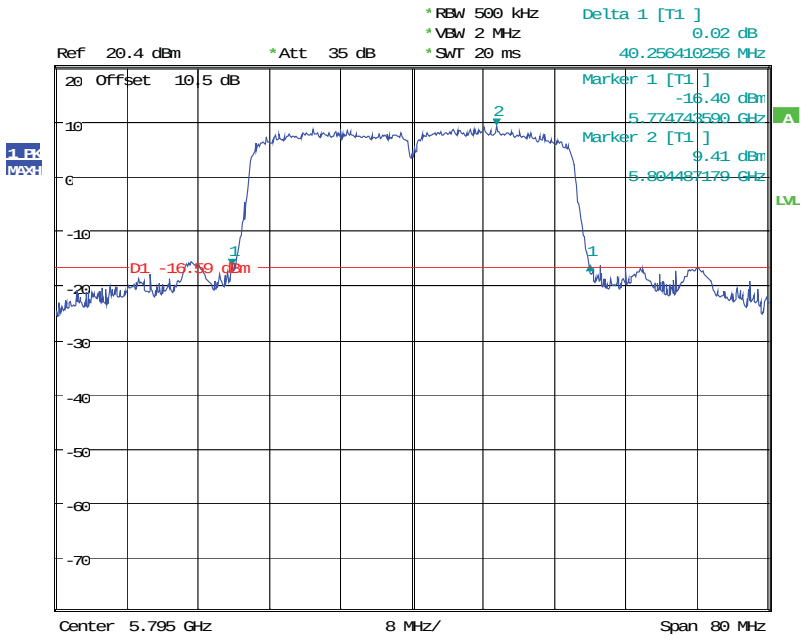
Date: 30.MAR.2018 17:36:19

IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 0)
5755MHz



Date: 17.APR.2018 14:49:04

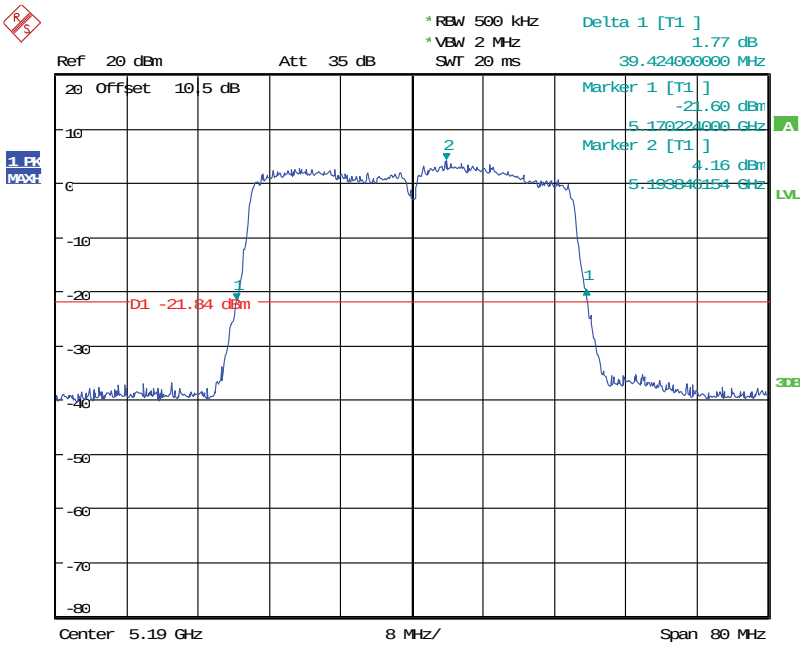
5795MHz



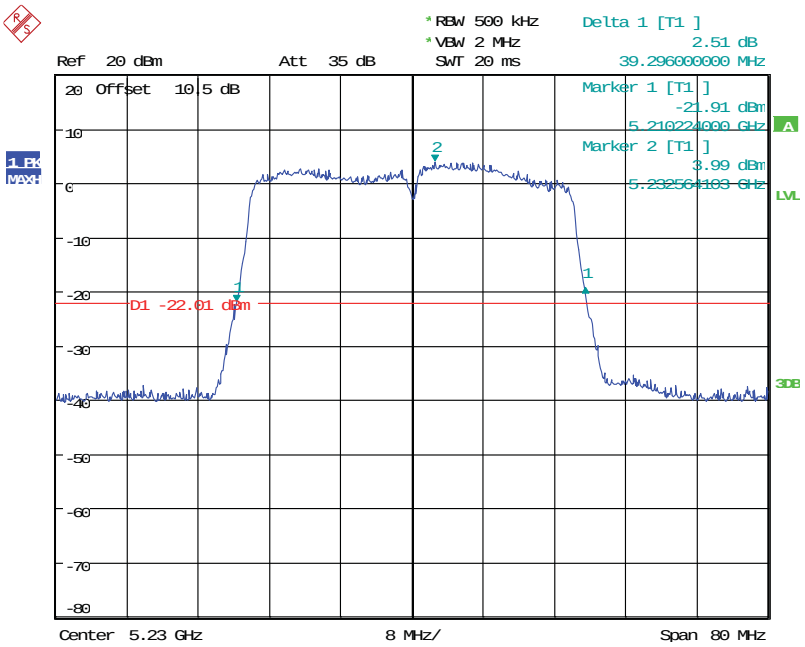
Date: 17.APR.2018 14:51:26

IEEE 802.11 ac VHT40 mode / 5150 ~ 5250MHz(chain 1)

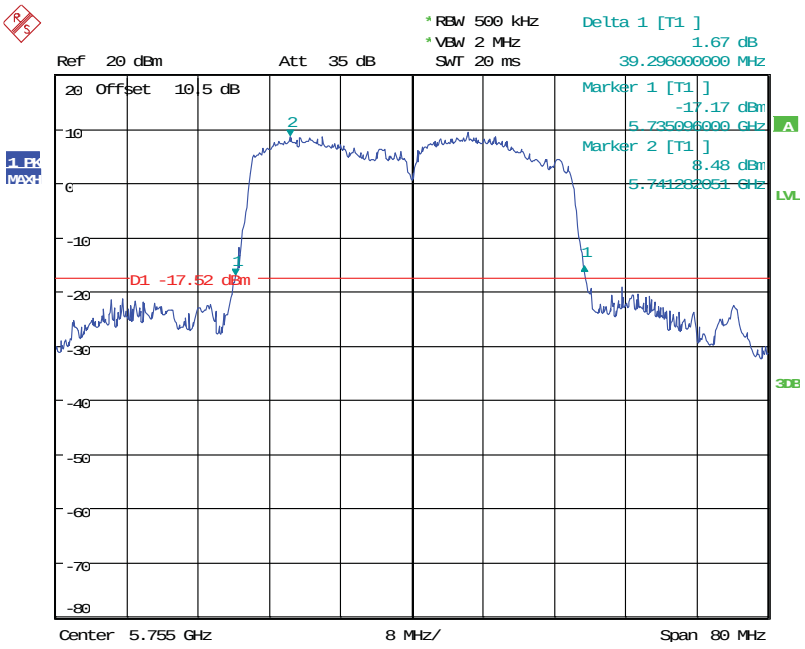
5190MHz



5230MHz

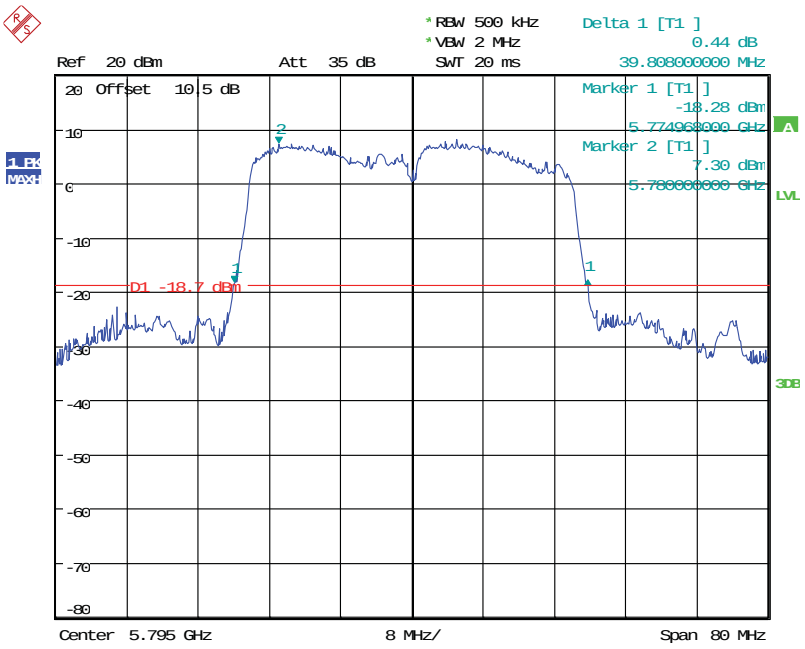


IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 1)
5755MHz



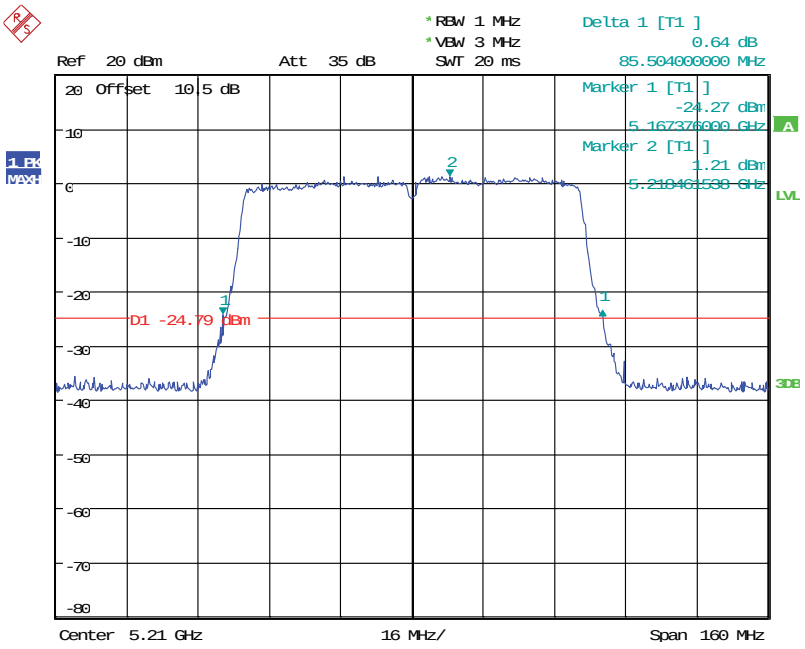
Date: 30.MAR.2018 18:49:28

5795MHz



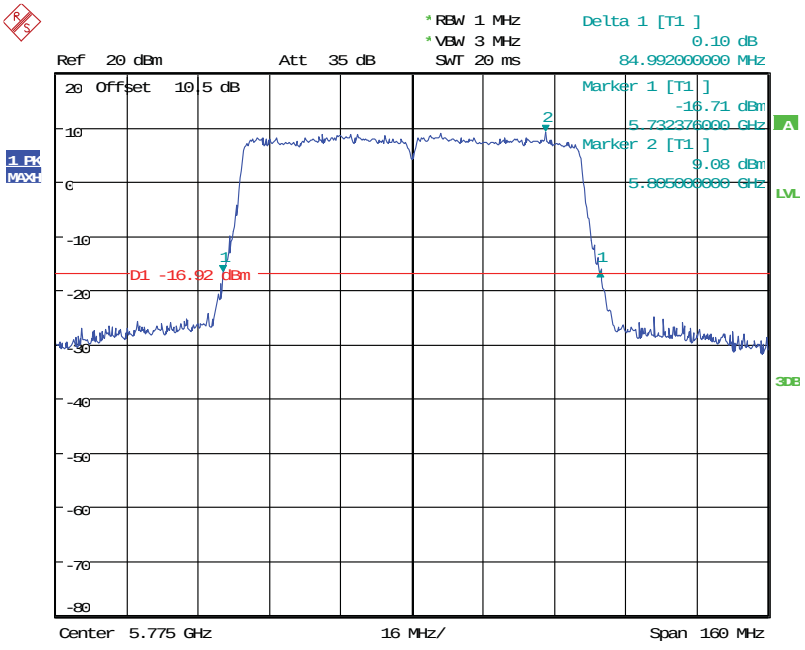
Date: 30.MAR.2018 18:51:13

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 0)
5210MHz



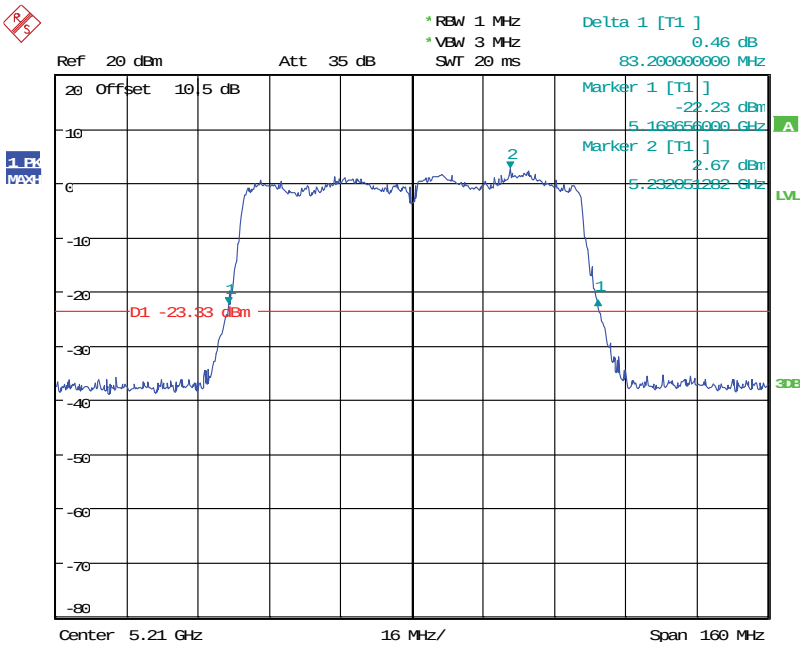
Date: 30.MAR.2018 17:41:24

IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 0)
5775MHz



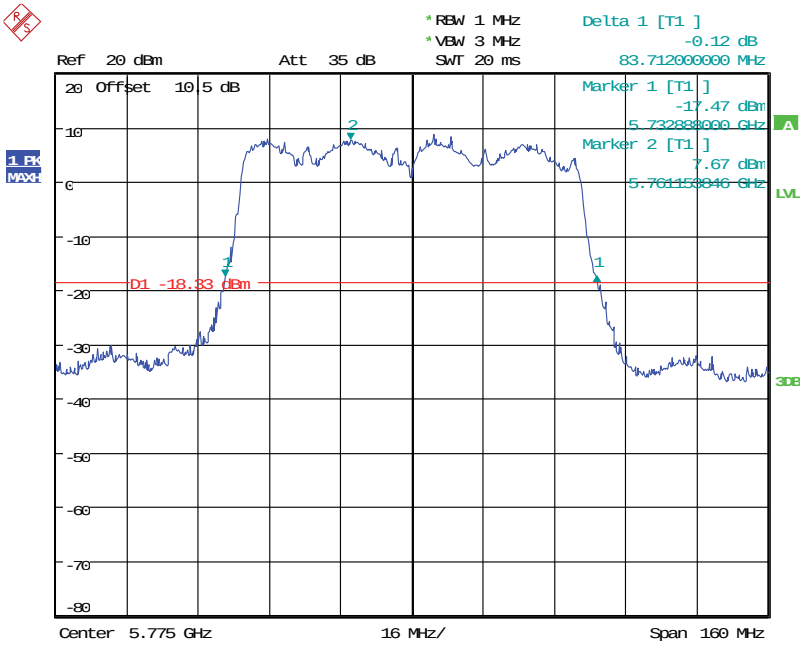
Date: 30.MAR.2018 17:43:00

IEEE 802.11 ac VHT80 mode / 5150 ~ 5250MHz(chain 1)
5210MHz



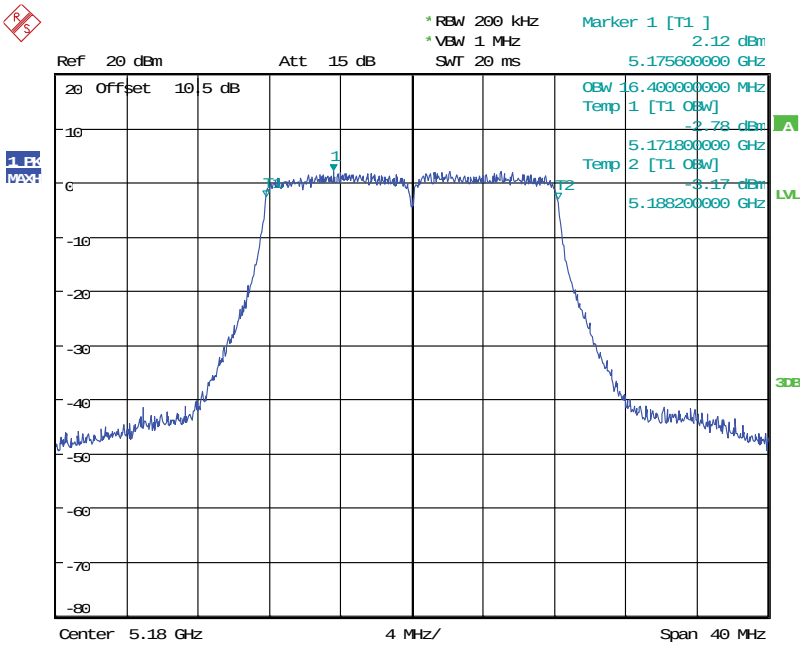
Date: 30.MAR.2018 18:52:59

IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 1)
5775MHz



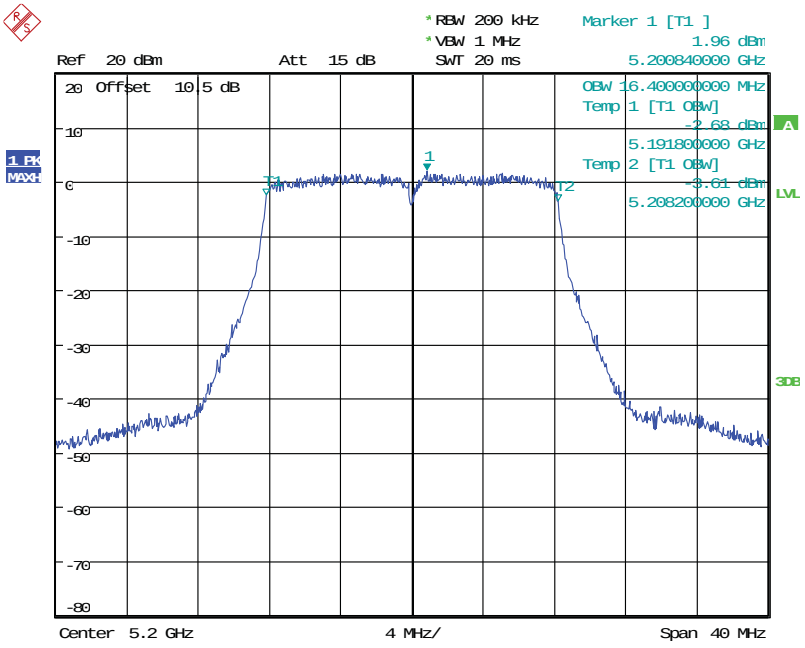
Date: 30.MAR.2018 18:54:38

OBW99%
IEEE 802.11a mode / 5150 ~ 5250MHz (chain 0)
5180MHz



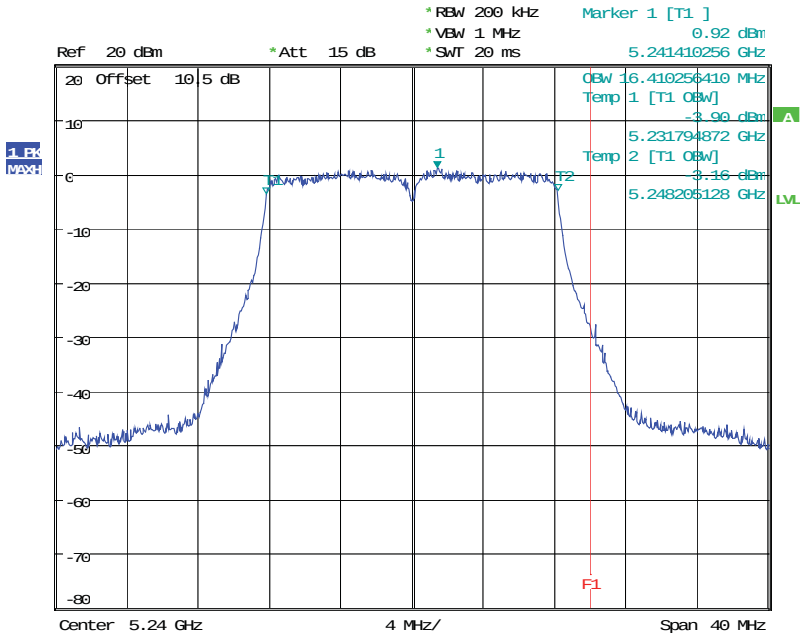
Date: 30.MAR.2018 17:15:25

5200MHz



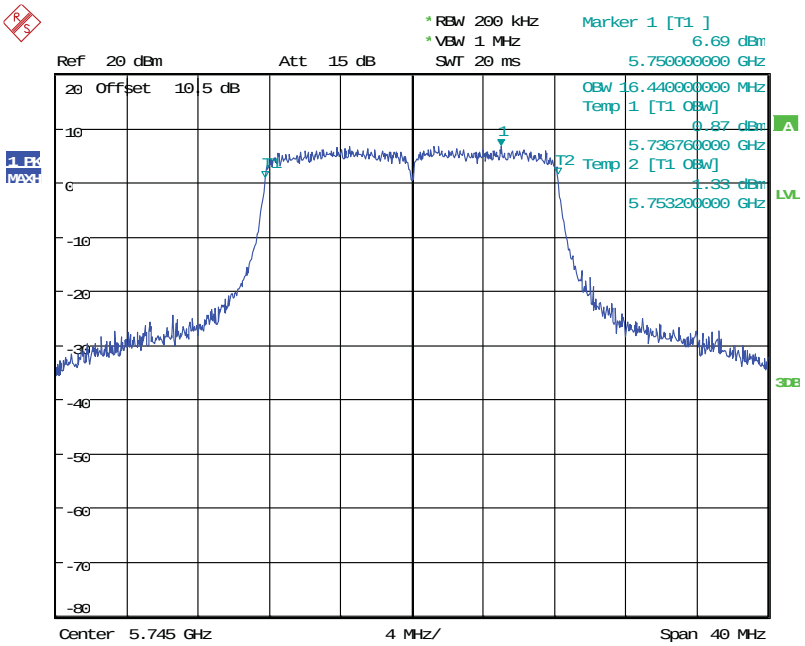
Date: 30.MAR.2018 17:17:00

5240MHz



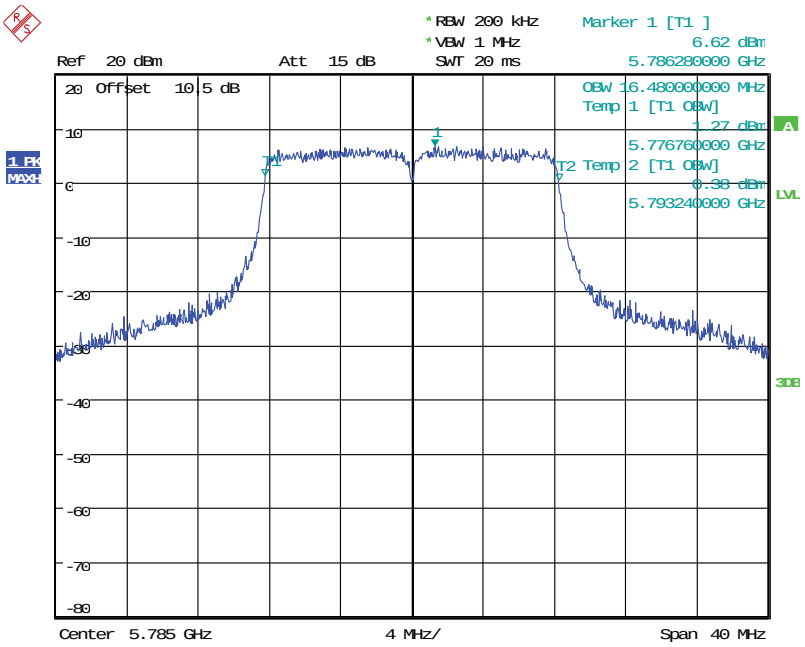
Date: 11.APR.2018 16:47:10

IEEE 802.11a mode / 5725 ~ 5850MHz (chain 0)
5745MHz



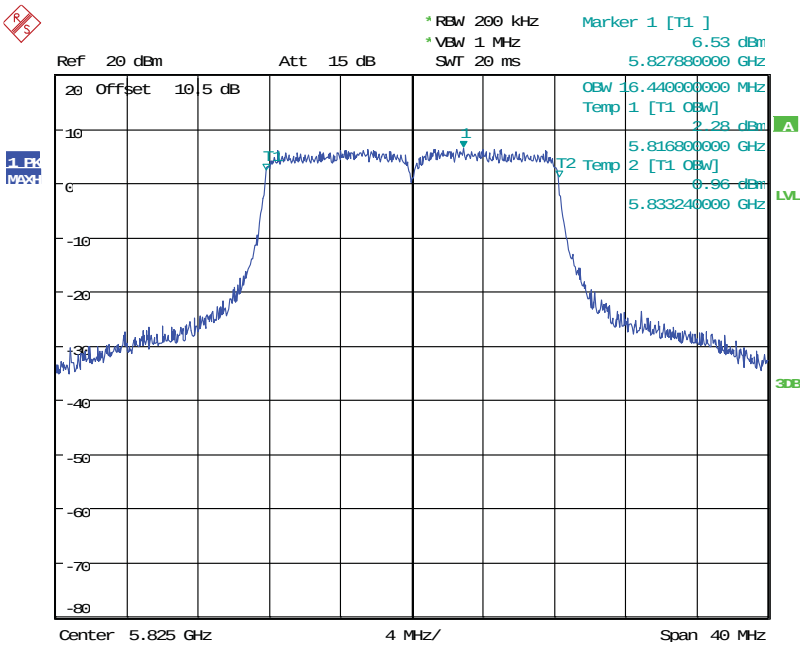
Date: 30.MAR.2018 17:20:35

5785MHz



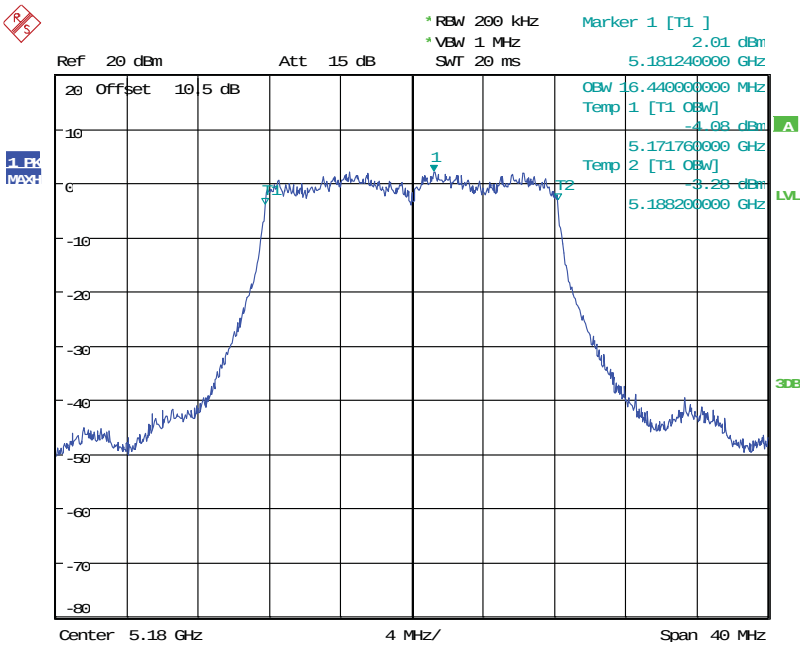
Date: 30.MAR.2018 17:22:33

5825MHz



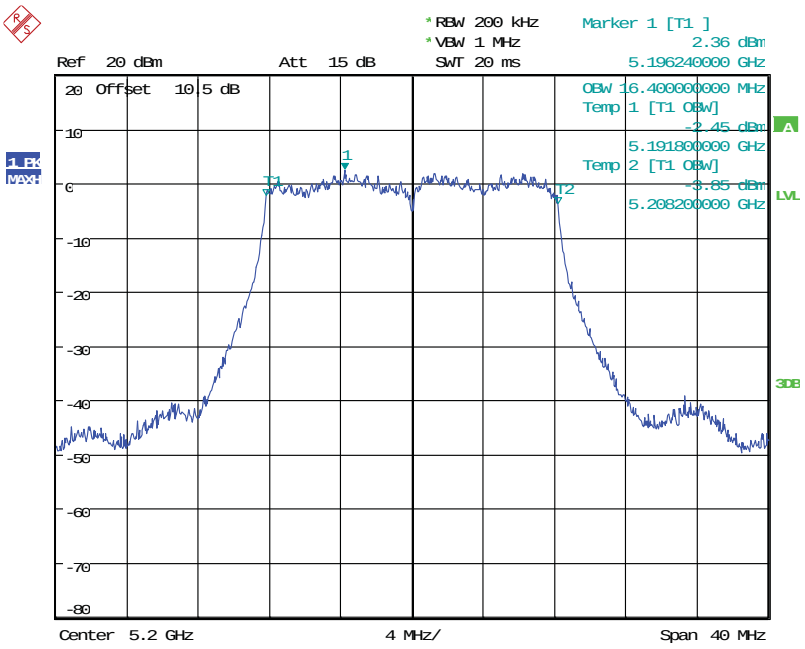
Date: 30.MAR.2018 17:24:22

IEEE 802.11a mode / 5150 ~ 5250MHz (chain 1)
5180MHz



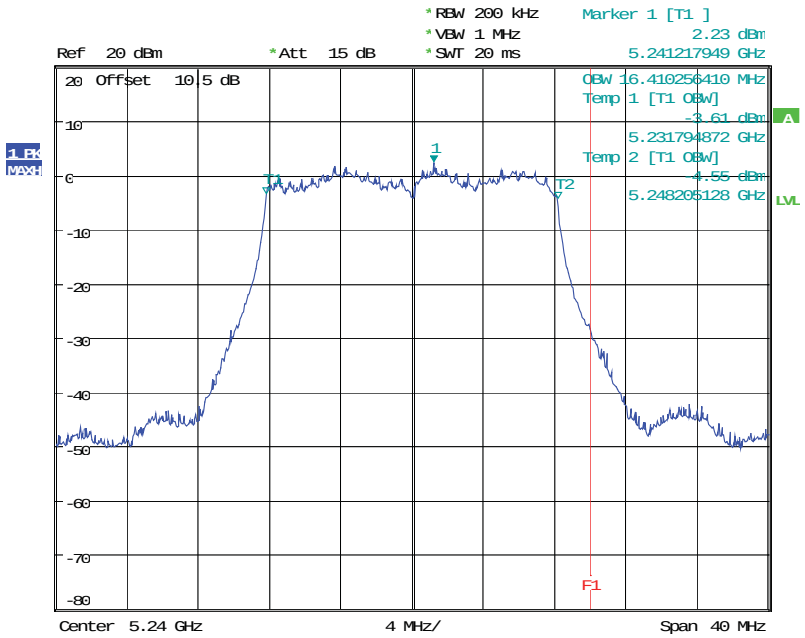
Date: 30.MAR.2018 18:22:04

5200MHz



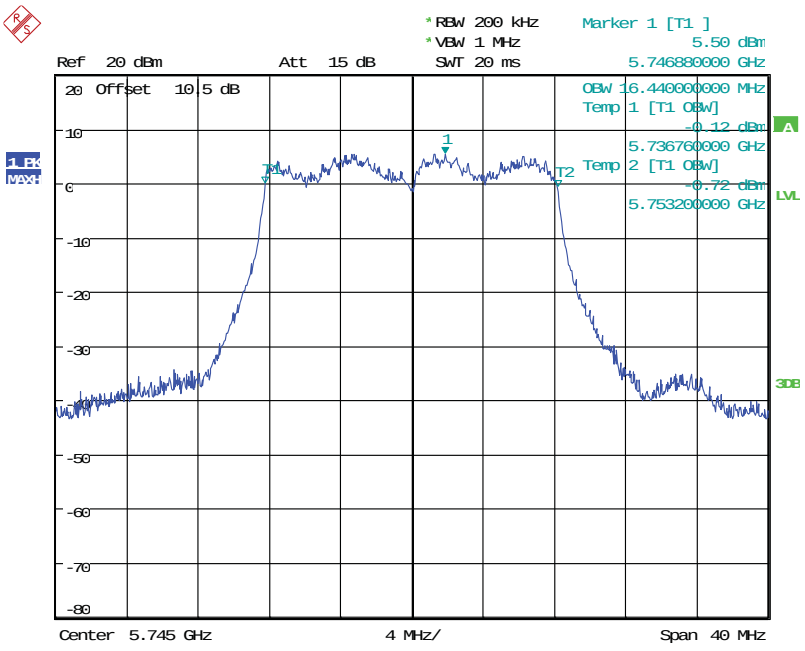
Date: 30.MAR.2018 18:23:31

5240MHz



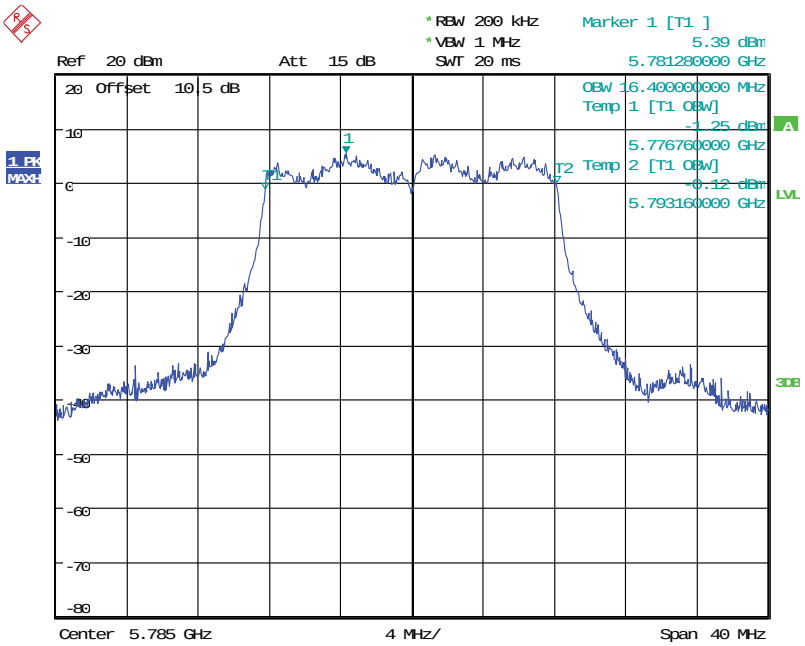
Date: 11.APR.2018 16:49:00

IEEE 802.11a mode / 5725 ~ 5850MHz (chain 1)
5745MHz



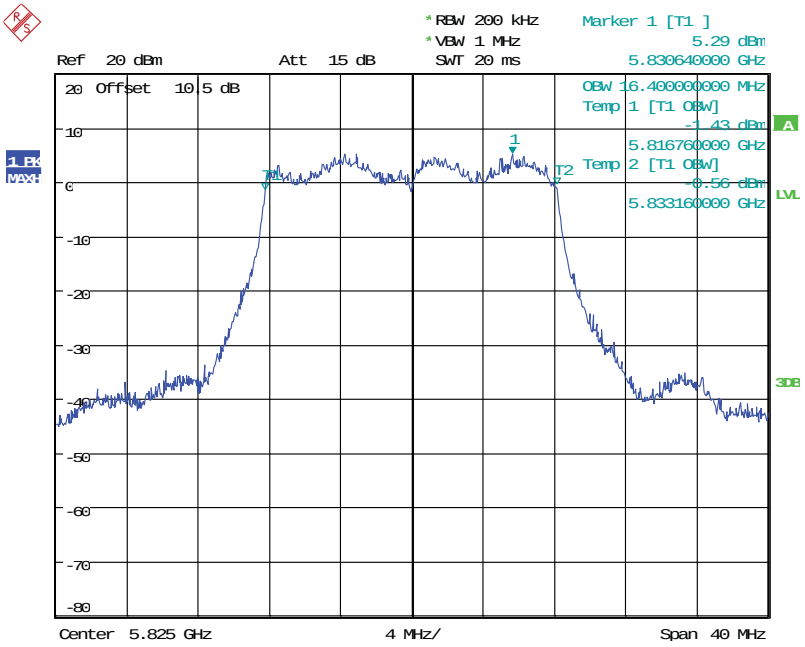
Date: 30.MAR.2018 18:26:48

5785MHz



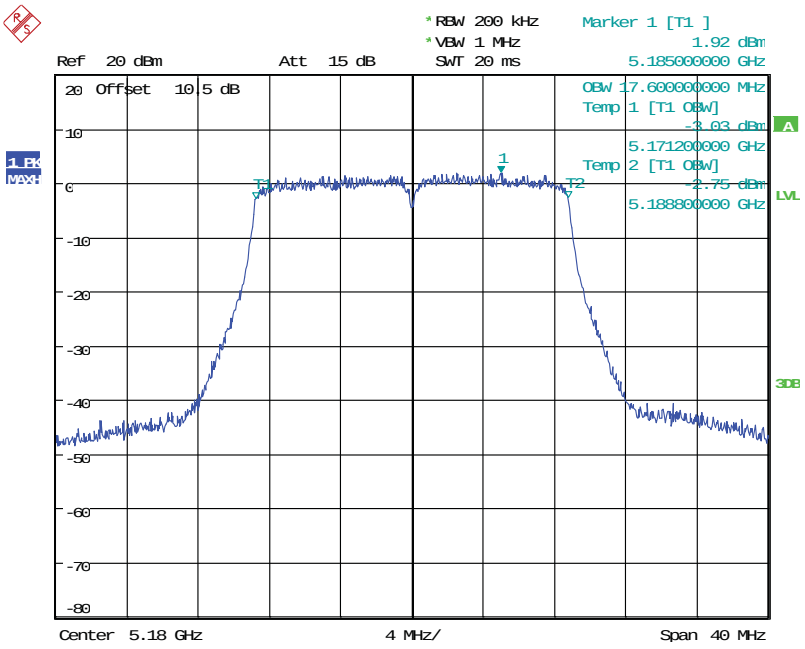
Date: 30.MAR.2018 18:28:58

5825MHz



Date: 30.MAR.2018 18:30:59

IEEE 802.11ac VHT20 mode / 5150 ~ 5250MHz (chain 0)
5180MHz



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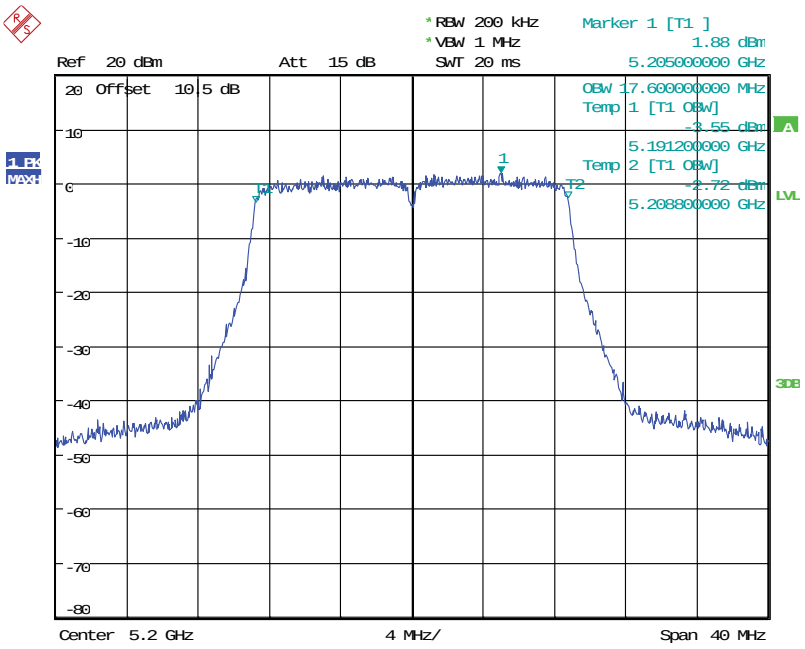
5200MHz



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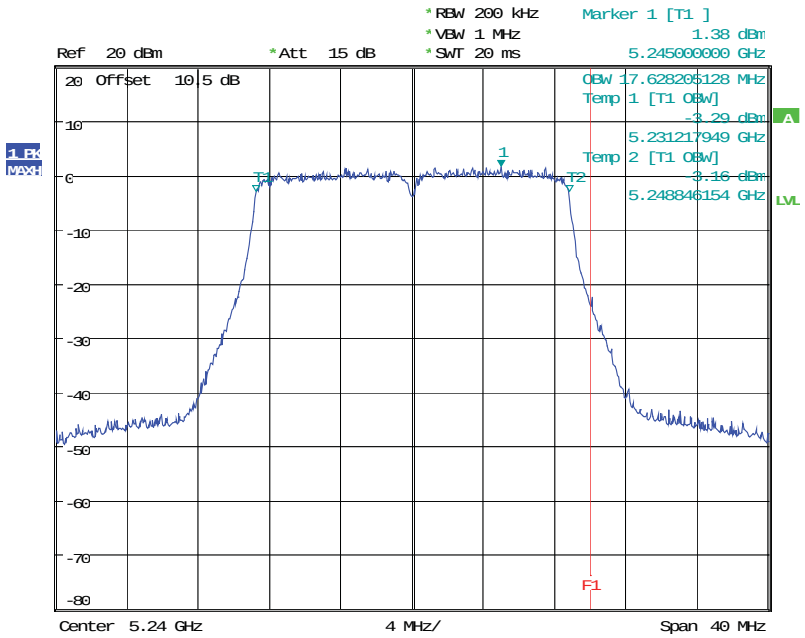
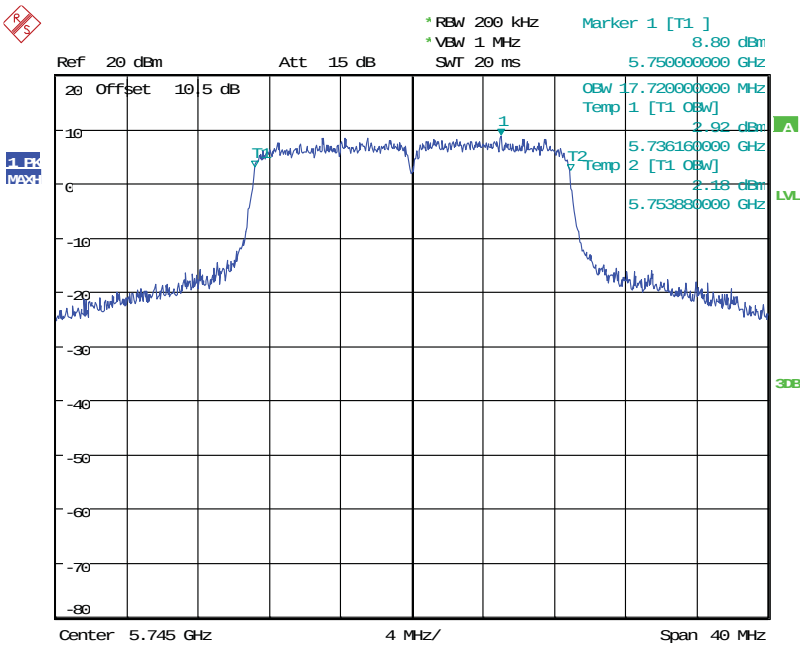
5240MHz



Date: 11.APR.2018 16:51:01

IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 0)
5745MHz



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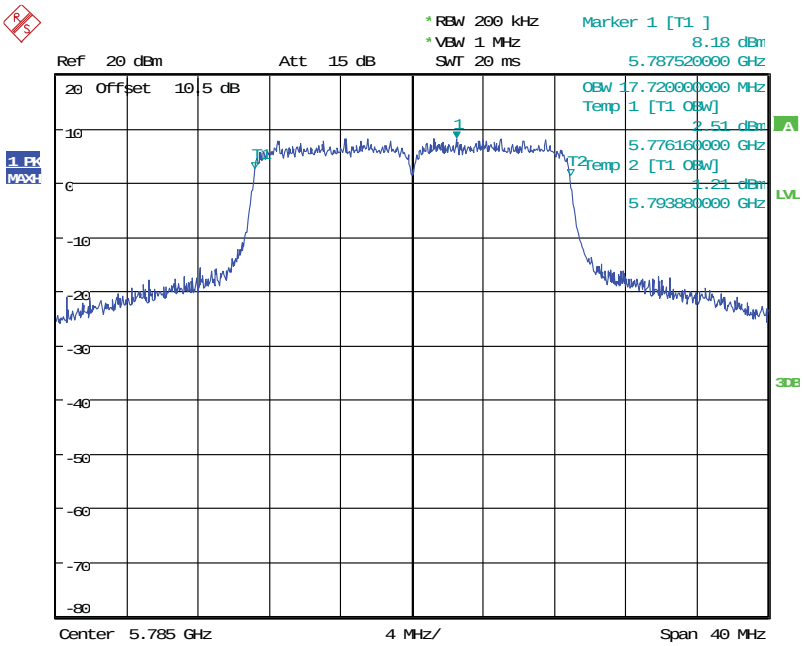
5785MHz



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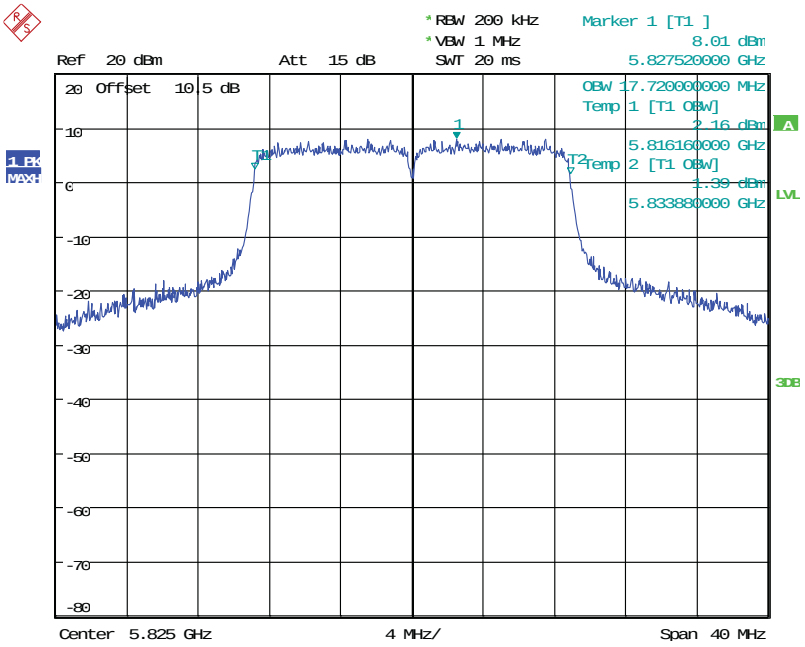
5825MHz



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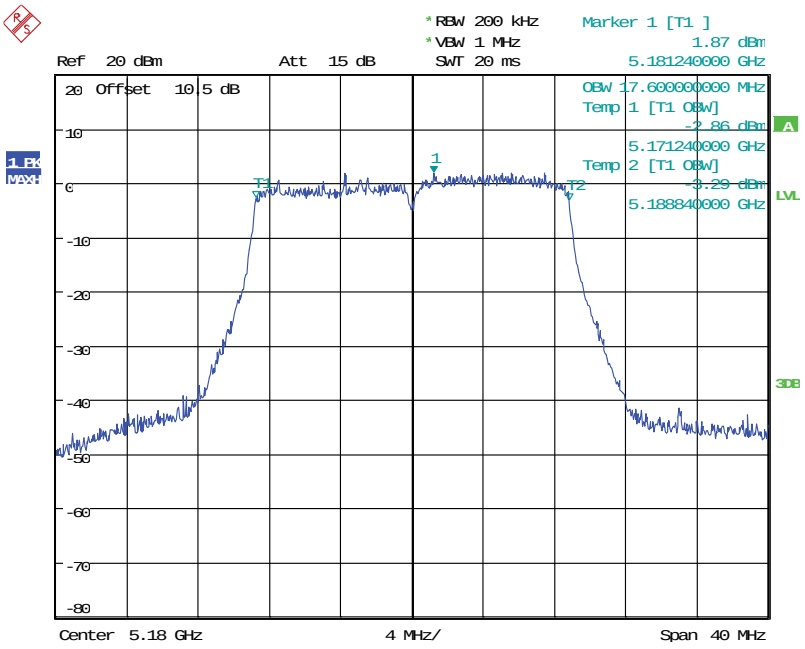
IEEE 802.11ac VHT20 mode / 5150 ~ 5250MHz(chain 1)
5180MHz



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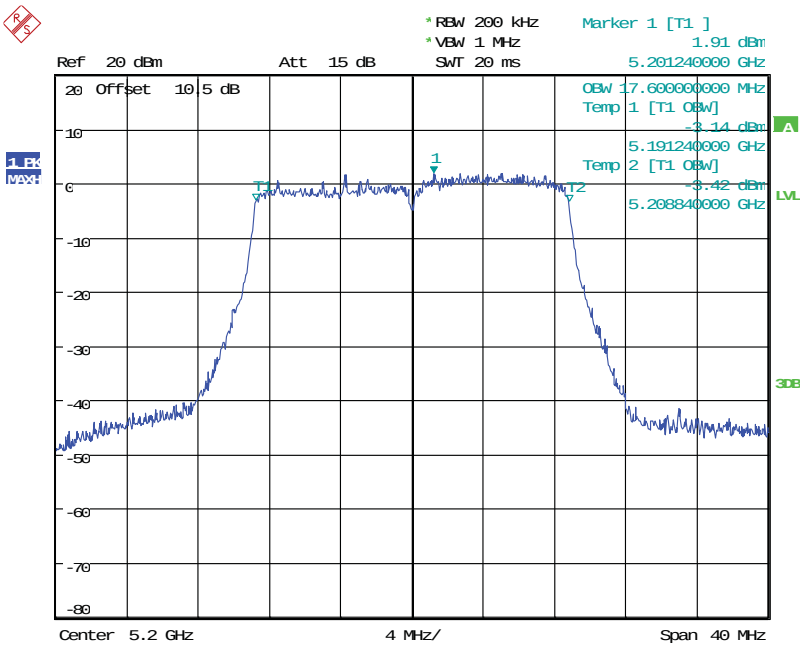
5200MHz



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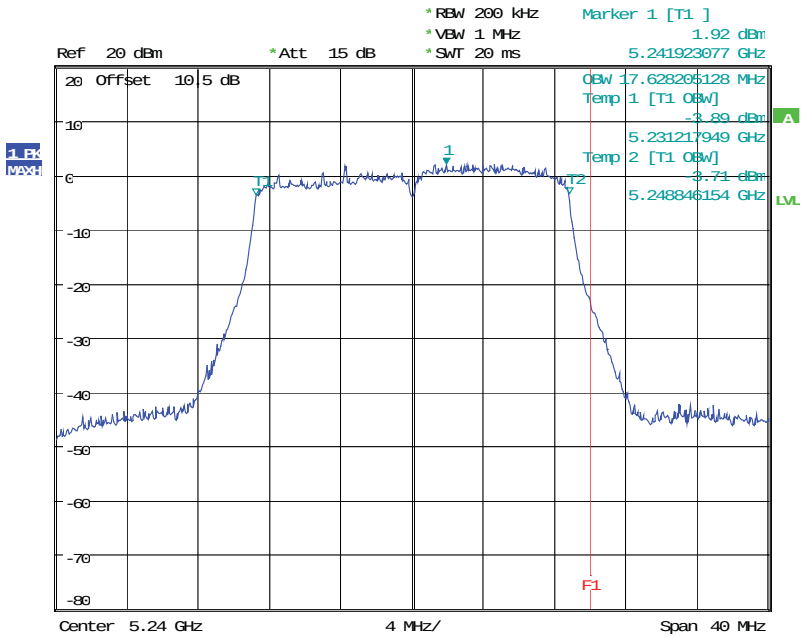
5240MHz



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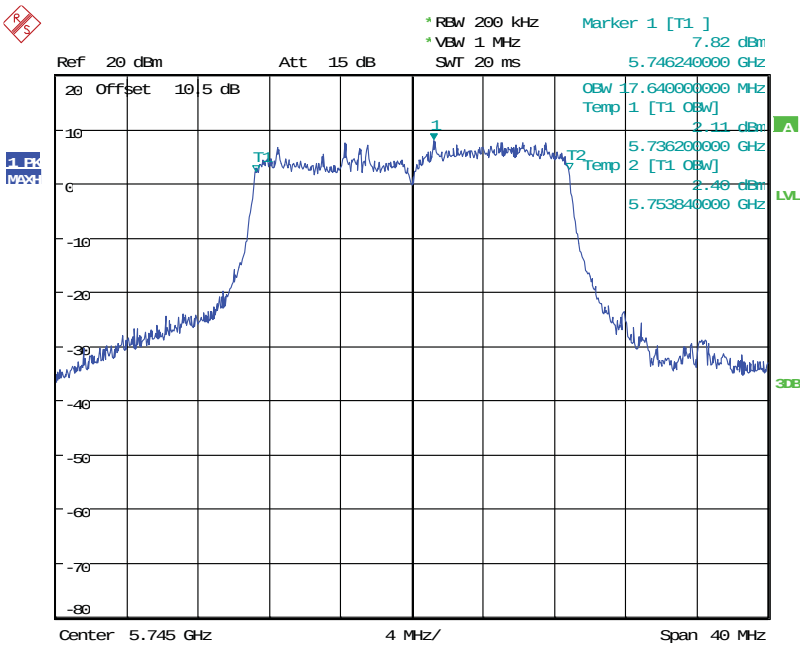
IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 1)
5745MHz



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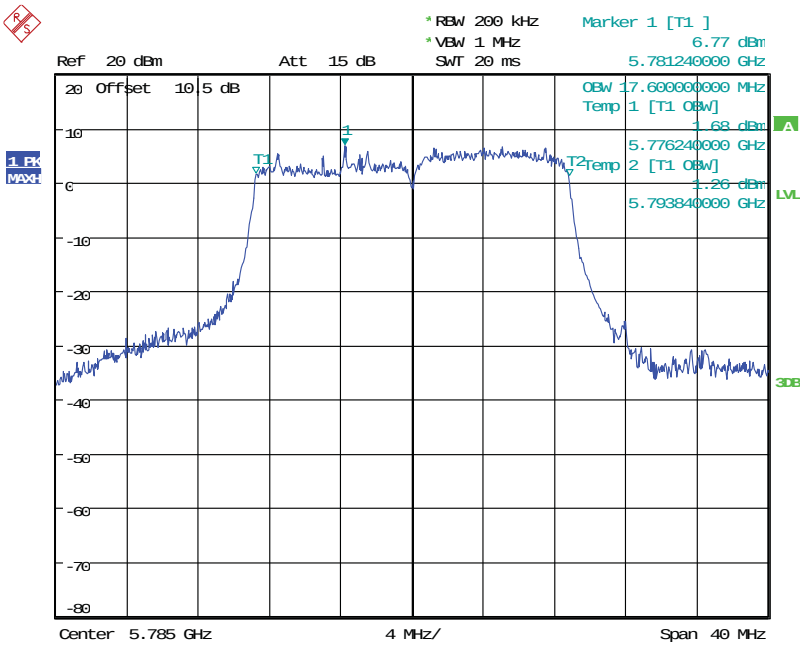
5785MHz



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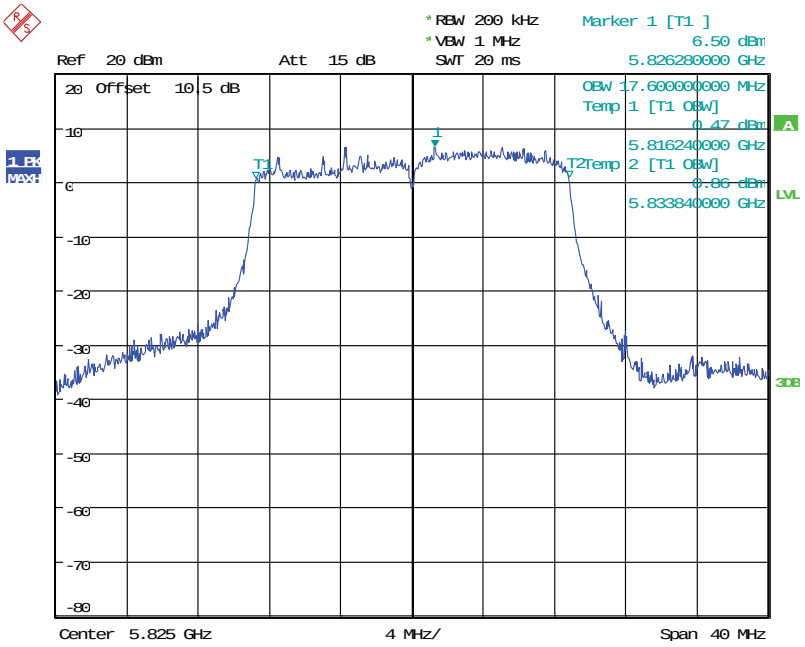
5825MHz



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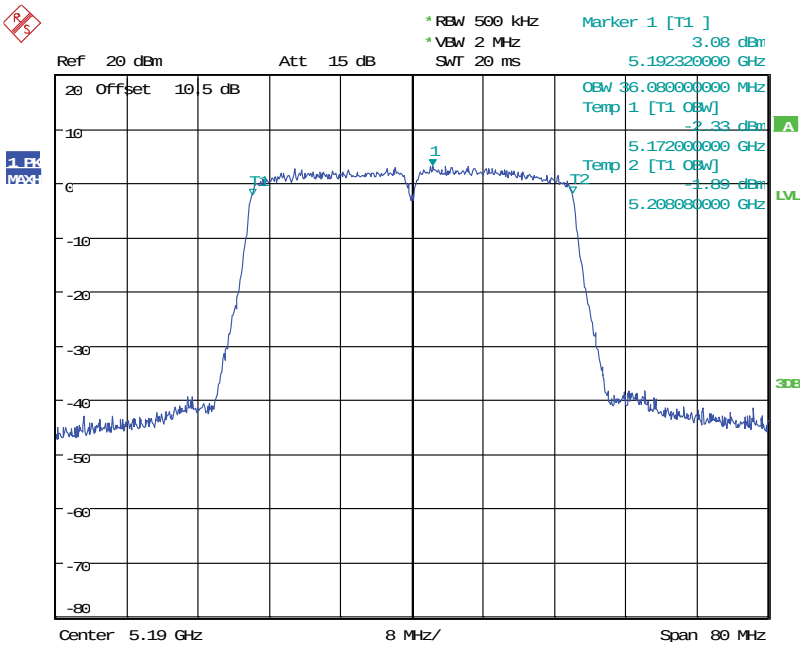
IEEE 802.11ac VHT40 mode / 5150 ~ 5250MHz (chain 0)
5190MHz



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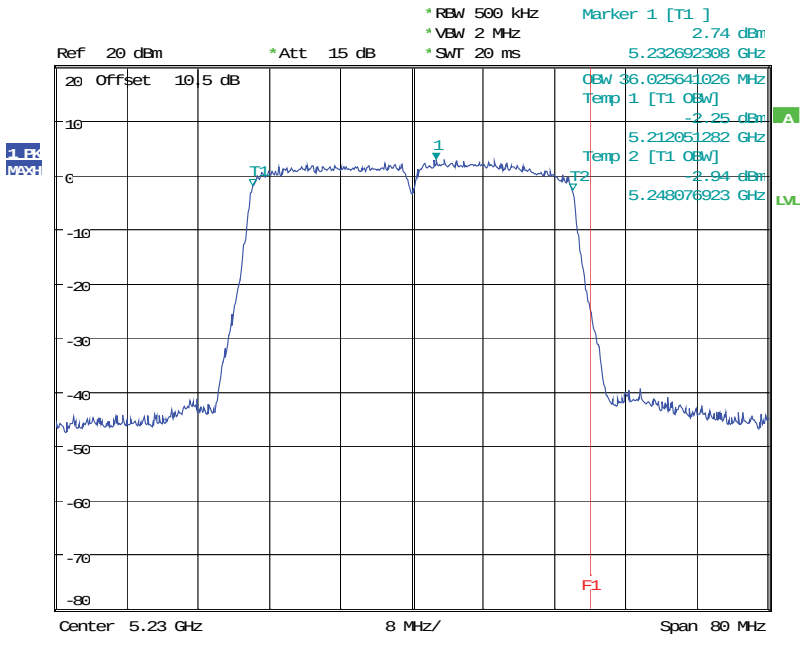
5230MHz



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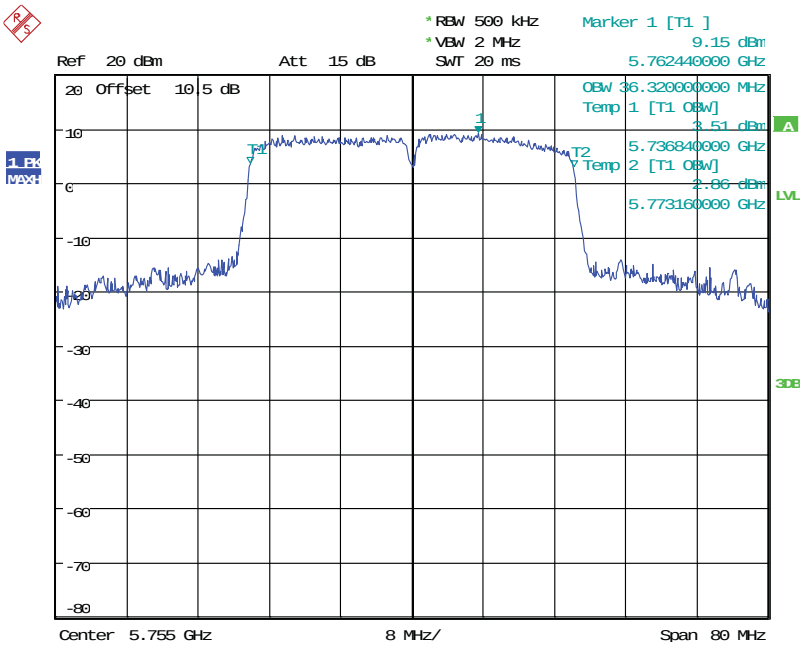
IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 0)
5755MHz



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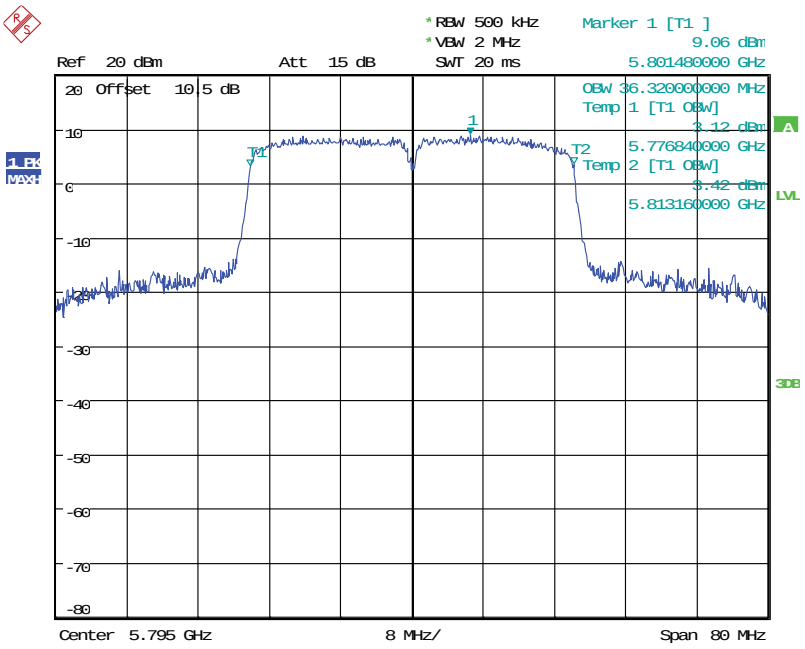
5795MHz



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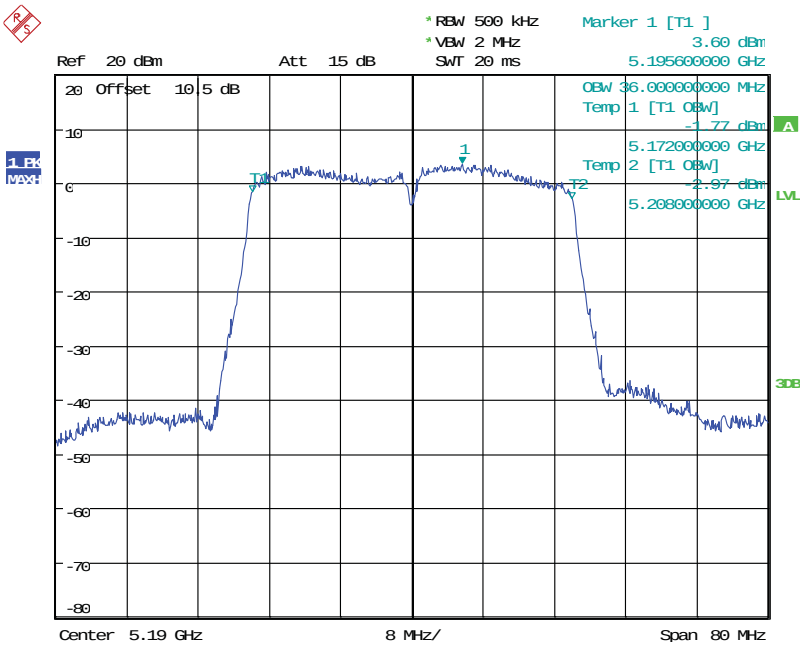
IEEE 802.11ac VHT40 mode / 5150 ~ 5250MHz (chain 1)
5190MHz



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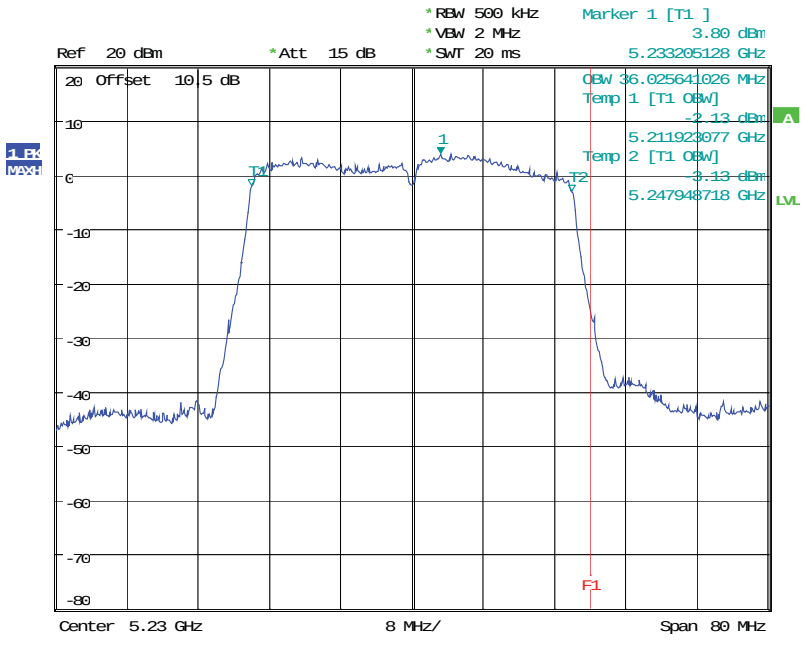
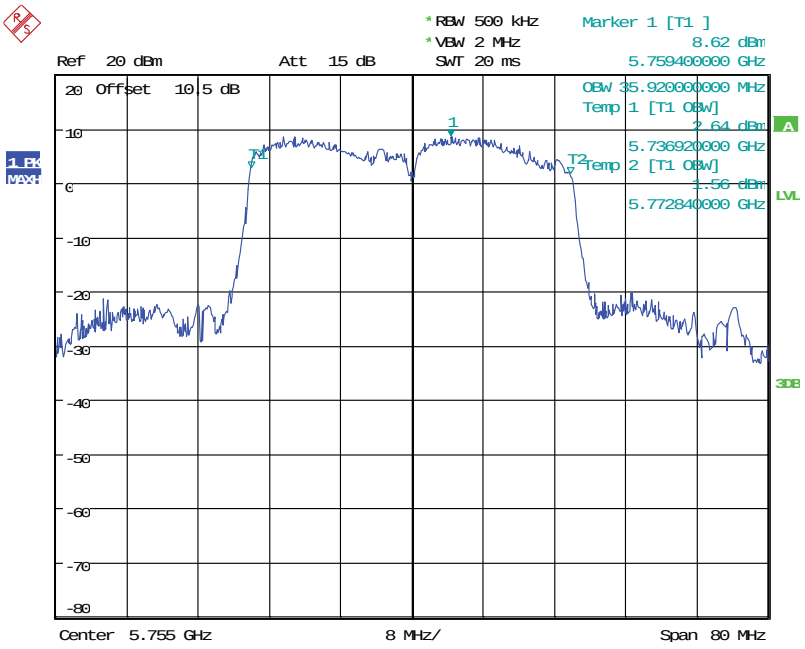
5230MHz



Date: 11.APR.2018 16:54:31

IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 1)
5755MHz



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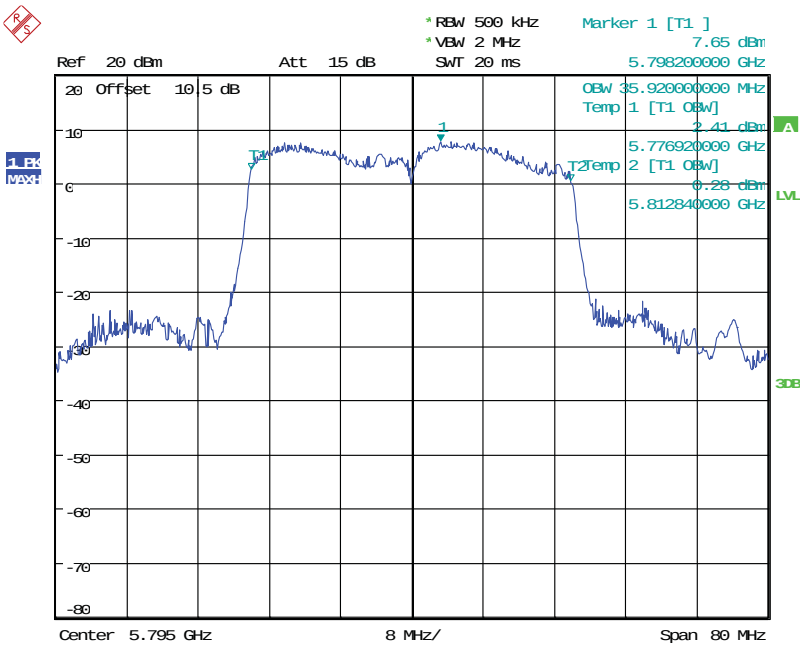
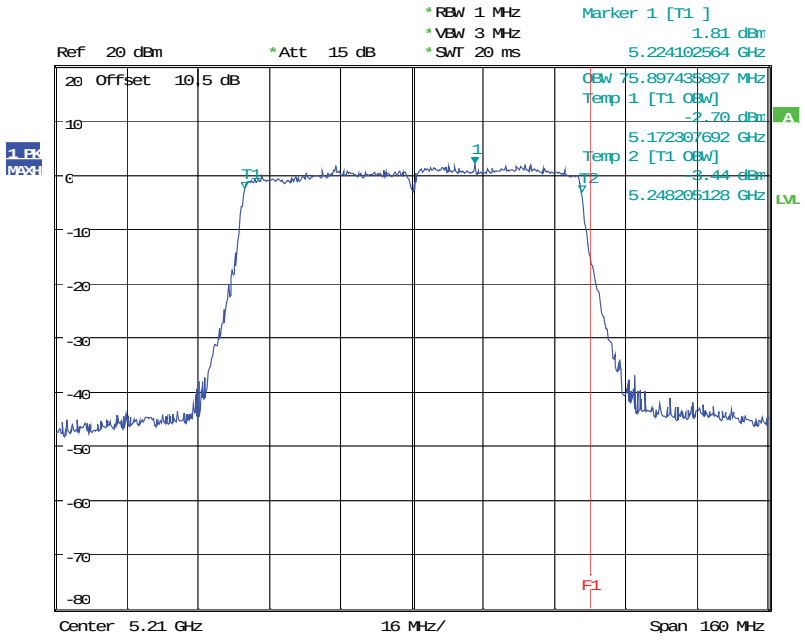
5795MHz



Date: 30.MAR.2018 18:51:31

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz (chain 0)
5210MHz



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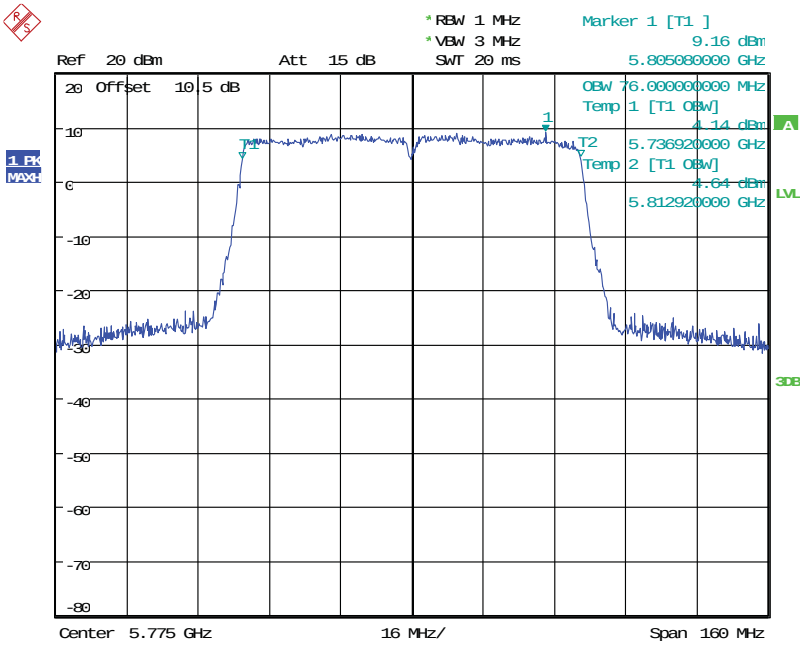
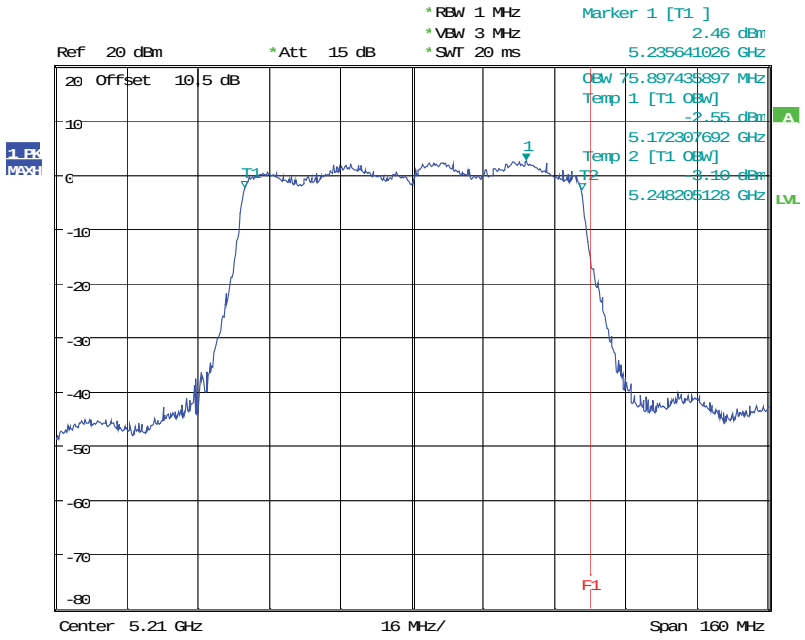
IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 0)
5775MHz



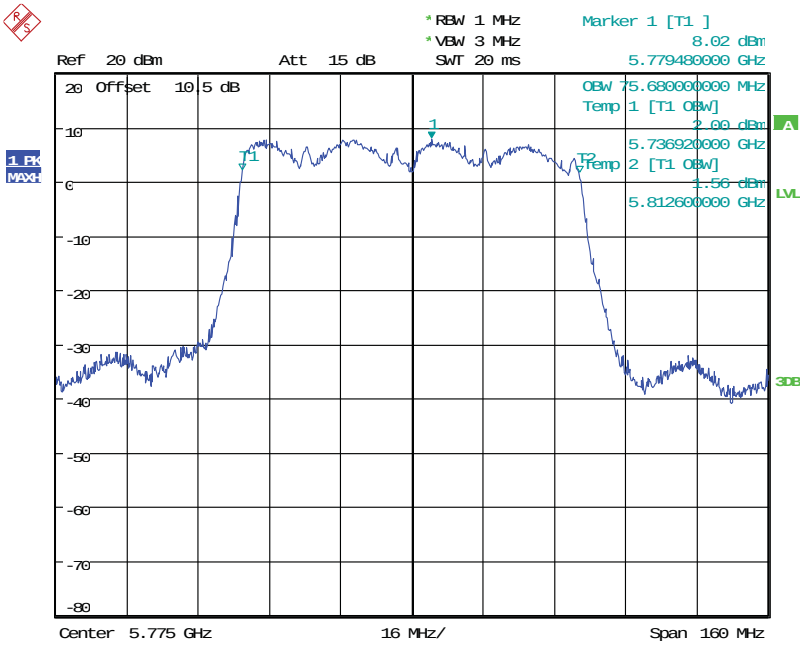
Date: 30.MAR.2018 17:43:19

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz(chain 1)
5210MHz



Date: 11.APR.2018 16:56:20

IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 1)
5775MHz

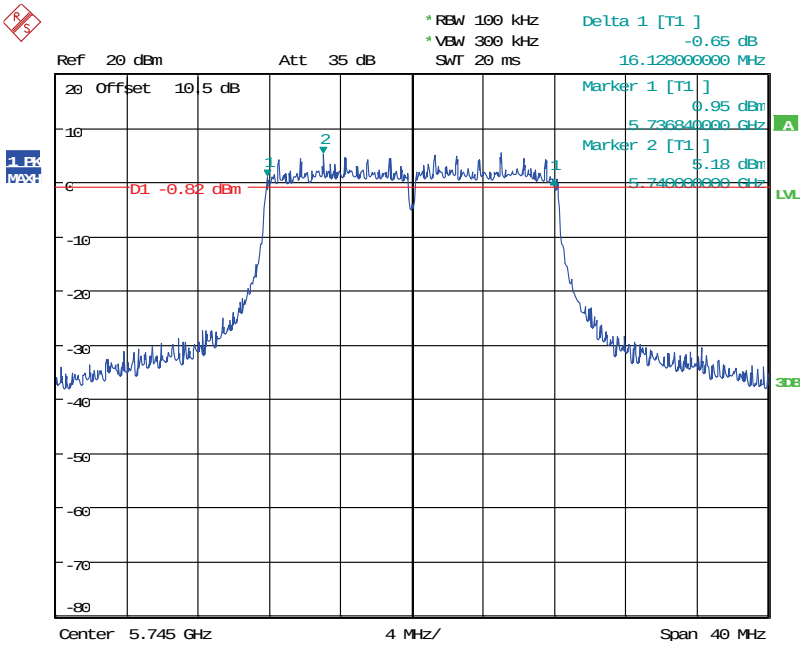


Date: 30.MAR.2018 18:54:56

BW 6dBc

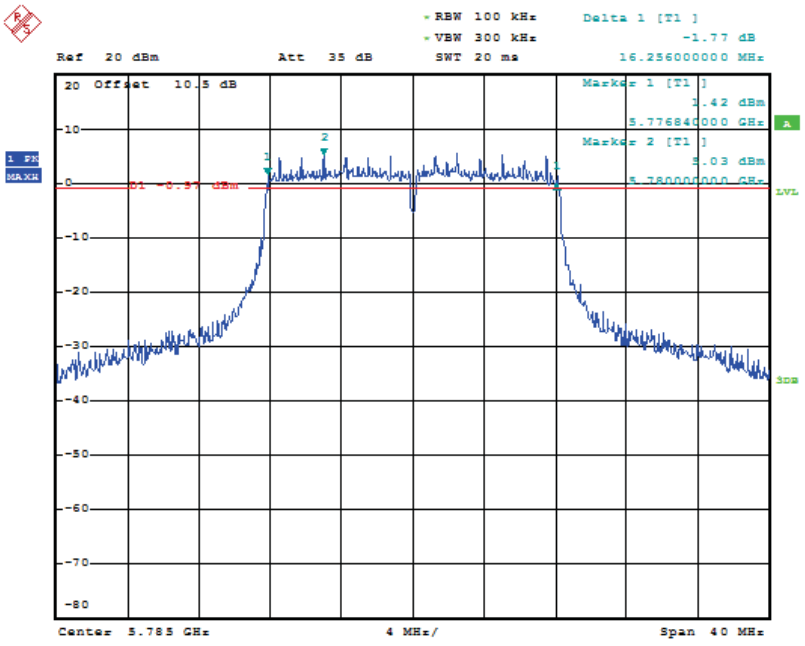
IEEE 802.11a mode / 5725 ~ 5850MHz (chain 0)

5745MHz



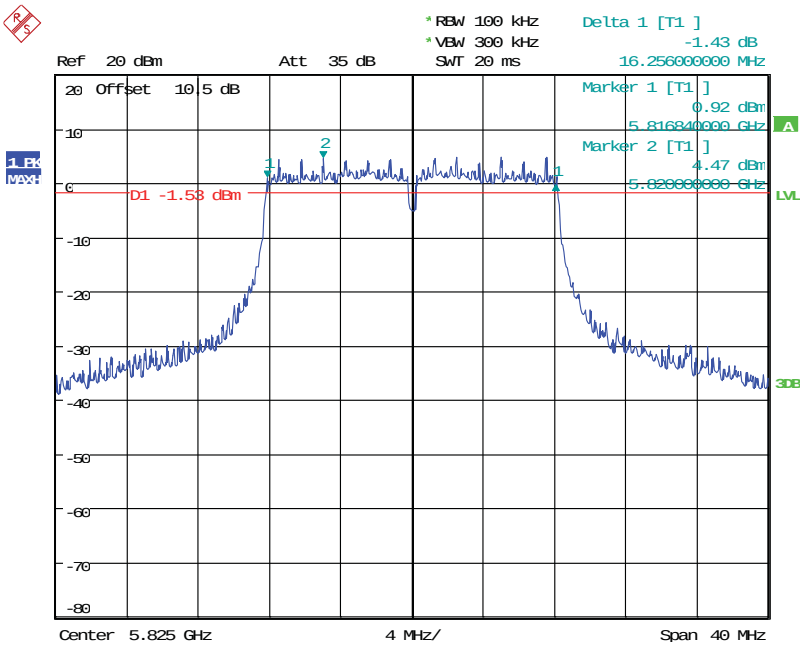
Date: 30.MAR.2018 17:21:28

5785MHz



Date: 30.MAR.2018 17:23:27

5825MHz



Date: 30.MAR.2018 17:25:15

IEEE 802.11a mode / 5725 ~ 5850MHz (chain 1)
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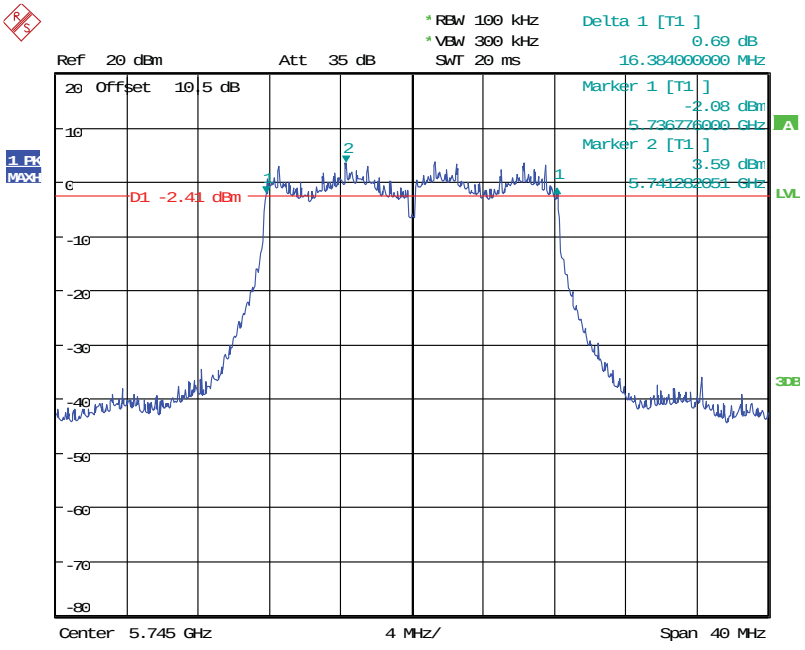
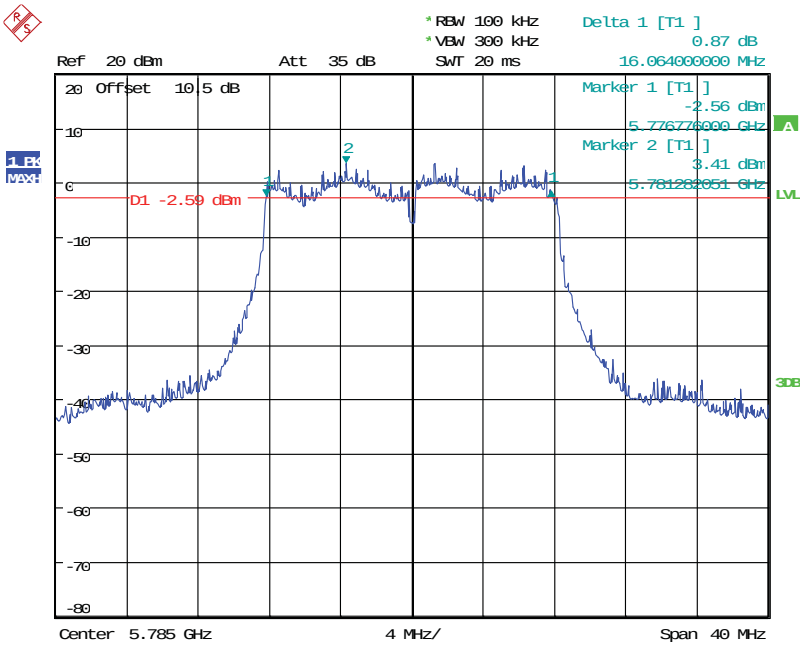


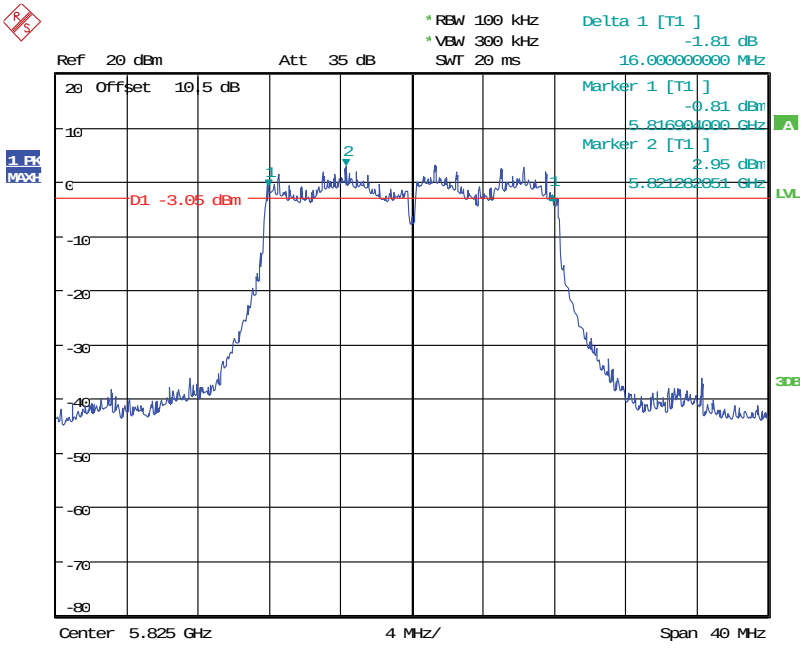
Date: 30.MAR.2018 18:27:41

5785MHz



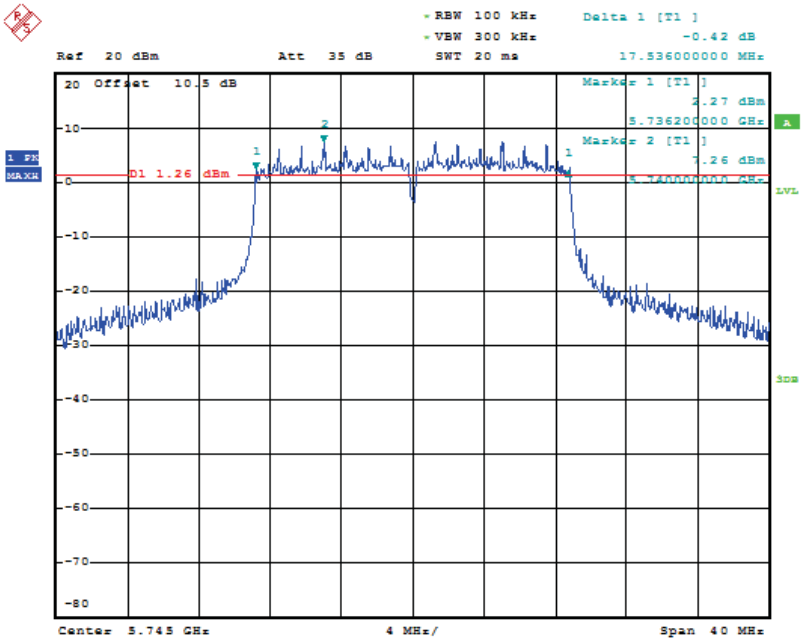
Date: 30.MAR.2018 18:29:52

5825MHz



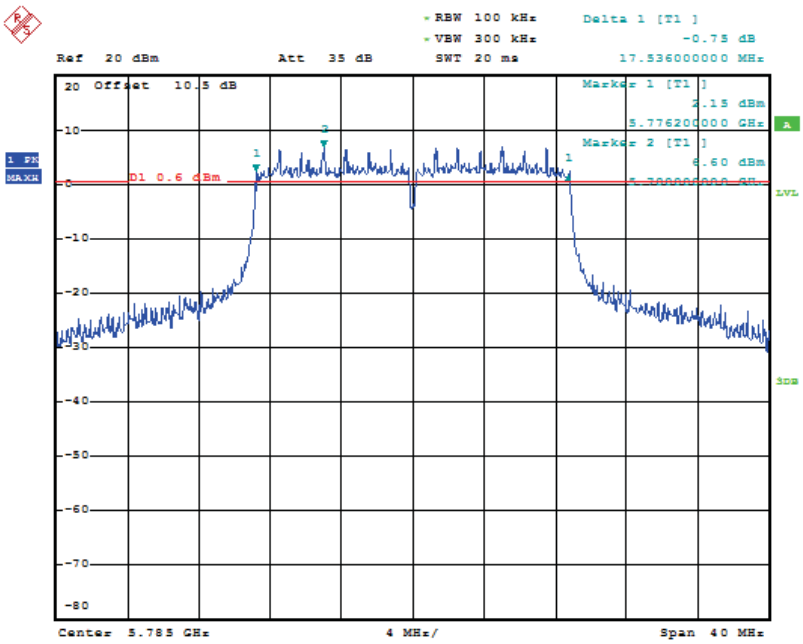
Date: 30.MAR.2018 18:31:52

IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 0)
5745MHz



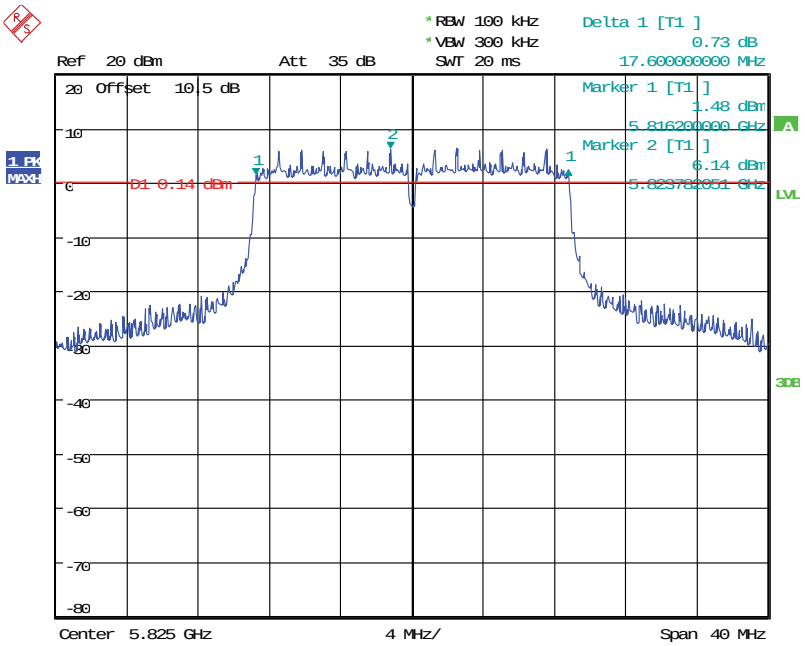
Date: 30.MAR.2018 17:31:19

5785MHz



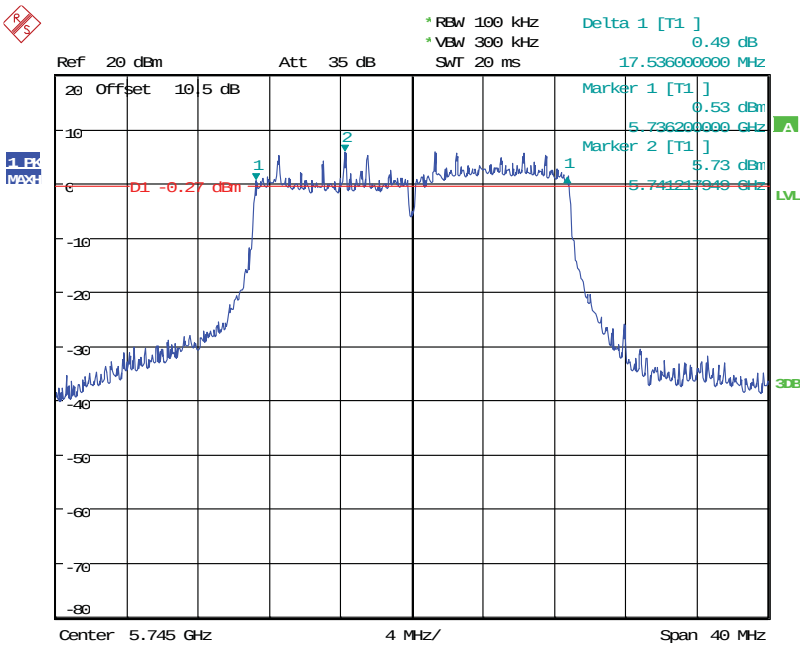
Date: 30.MAR.2018 17:32:52

5825MHz



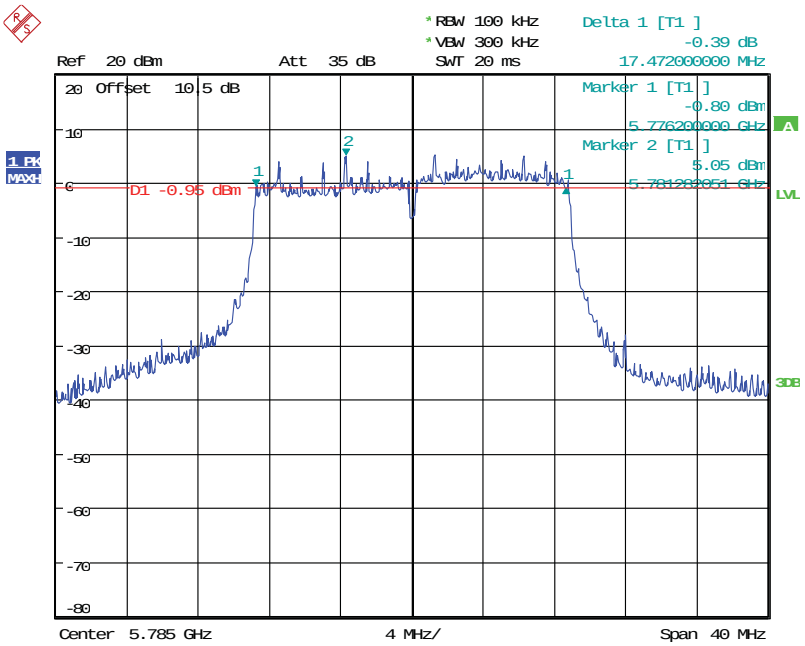
Date: 30.MAR.2018 17:34:25

IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 1)
5745MHz



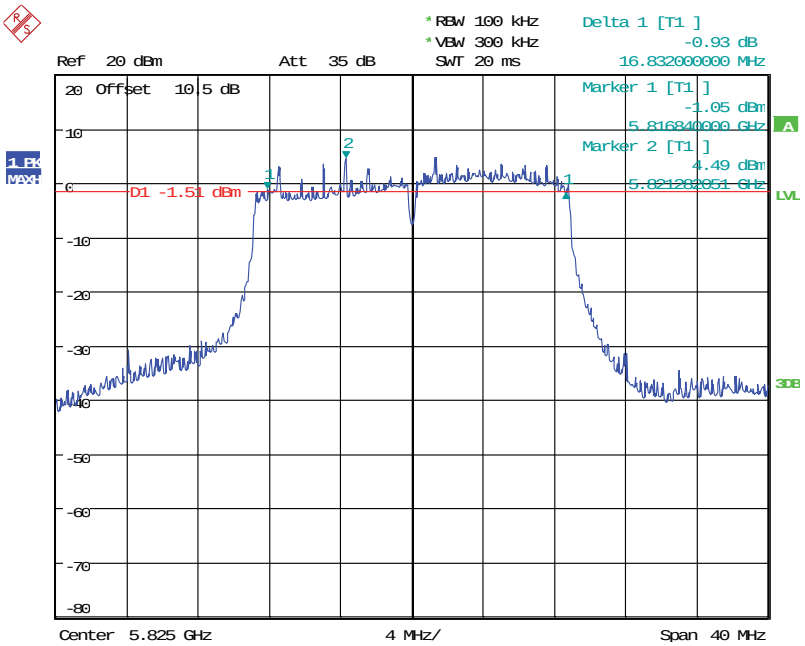
Date: 30.MAR.2018 18:39:10

5785MHz



Date: 30.MAR.2018 18:43:14

5825MHz



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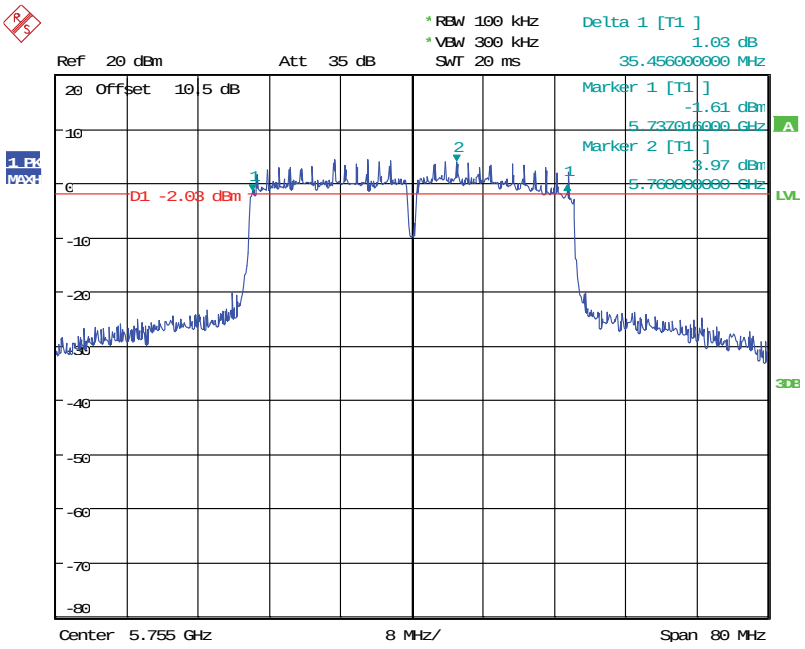
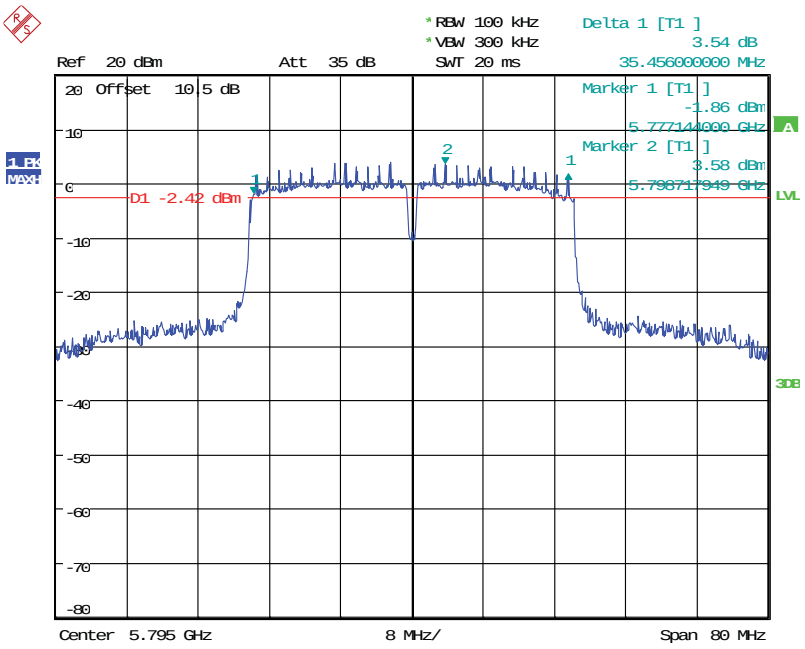
IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz(chain 0)
5755MHz



Date: 30.MAR.2018 17:38:50

5795MHz



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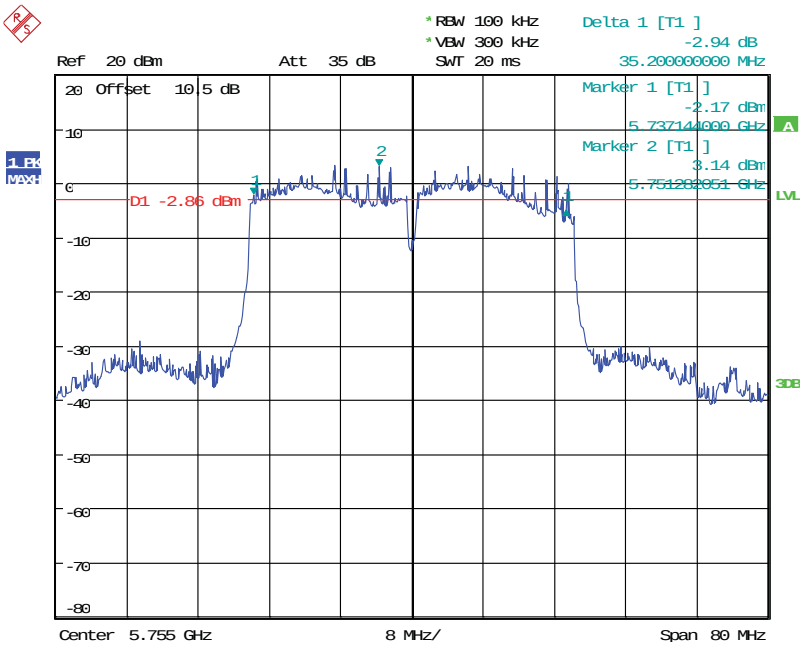
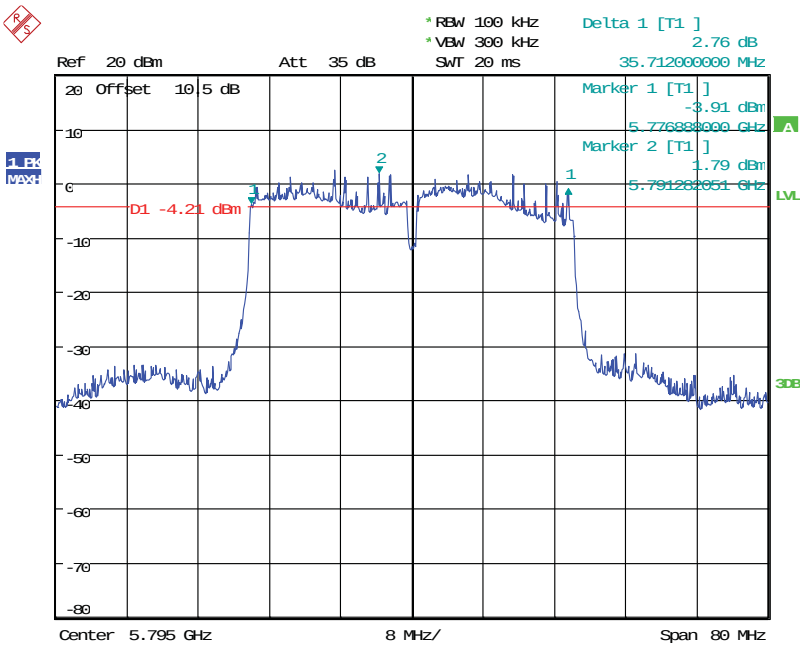
IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz(chain 1)
5755MHz



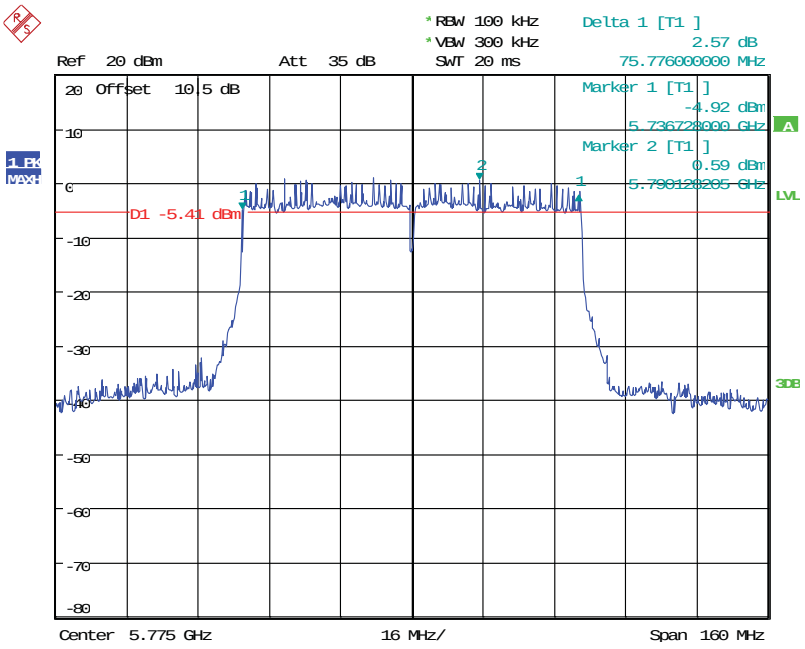
Date: 30.MAR.2018 18:50:40

5795MHz



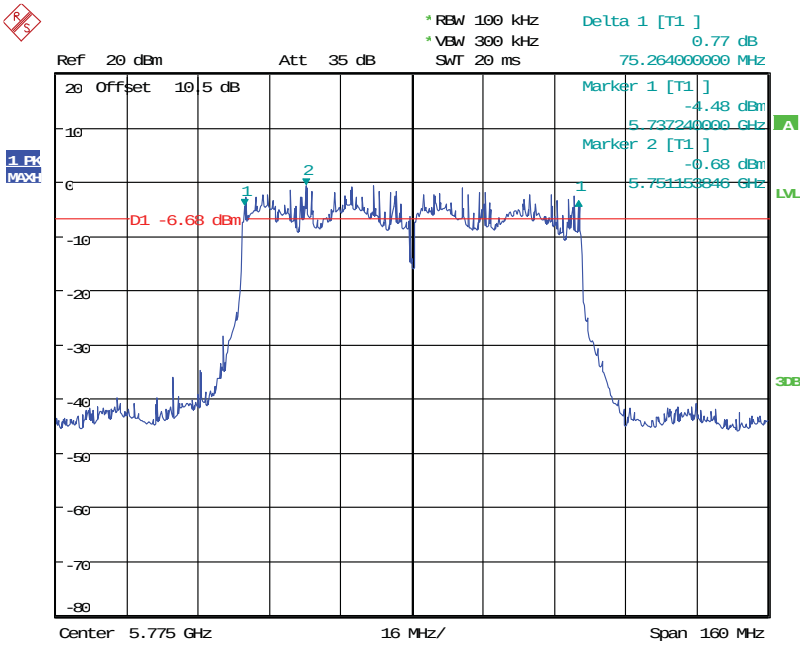
Date: 30.MAR.2018 18:52:22

IEEE 802.11 ac VHT80 mode / 5725 ~ 5850MHz(chain 0)
5775MHz



Date: 30.MAR.2018 17:44:12

IEEE 802.11 ac VHT80 mode / 5725 ~ 5850MHz(chain 1)
5775MHz



Date: 30.MAR.2018 18:55:49

9 FCC §15.407(a)(1) – Maximum Output Power

9.1 Applicable Standard

According to FCC §15.407(a):
For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm)..

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

9.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01
The use Power Meter
1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

9.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Power Sensor	KEYSIGHT	U2021XA	MY54080018	2018/03/07	2019/03/06
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Attenuator	MINI-CIRCUITS	BW-S10W5+	N/A	2018/03/08	2019/03/07

**** Statement of Traceability:*** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

9.4 Test Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	57 %
ATM Pressure:	1020 hPa

The testing was performed by Andy Shih on 2018-03-30.

9.5 Test Results

Test Mode: Transmitting

Mode	Channel	Frequency (MHz)	Maximum Conducted Average Output Power(dBm)			Duty Factor (dB)	Total Maximum Conducted Average Output Power With Duty Factor (dBm)	Limit (dBm)	Gain (above 30 degrees from the horizin) (dBi)	EIRP (dBm)	EIRP Limit (dBm)
			Chain 0	Chain 1	Total						
802.11 a	36	5180	14.59	14.43	17.52	0.27	17.79	25.03	2.75	20.54	21
	40	5200	14.68	14.37	17.54	0.27	17.81	25.03	2.75	20.56	21
	48	5240	14.26	14.15	17.22	0.27	17.49	25.03	2.75	20.24	21
	149	5745	17.09	15.25	19.28	0.27	19.55	22.79	N/A	N/A	N/A
	157	5785	17.32	14.98	19.32	0.27	19.59	22.79	N/A	N/A	N/A
	165	5825	17.18	14.78	19.15	0.27	19.42	22.79	N/A	N/A	N/A
802.11 ac20	36	5180	14.43	14.28	17.37	0.27	17.64	25.03	2.75	20.39	21
	40	5200	14.56	14.25	17.42	0.27	17.69	25.03	2.75	20.44	21
	48	5240	14.66	14.61	17.65	0.27	17.92	25.03	2.75	20.67	21
	149	5745	18.95	17.47	21.28	0.27	21.55	22.79	N/A	N/A	N/A
	157	5785	18.62	16.62	20.74	0.27	21.01	22.79	N/A	N/A	N/A
	165	5825	18.54	16.36	20.6	0.27	20.87	22.79	N/A	N/A	N/A
802.11 ac 40	38	5190	13.97	13.73	16.86	0.81	17.67	25.03	2.75	20.42	21
	46	5230	14.12	13.67	16.91	0.81	17.72	25.03	2.75	20.47	21
	151	5755	18.67	17.14	20.98	0.81	21.79	22.79	N/A	N/A	N/A
	159	5795	18.41	16.26	20.48	0.81	21.29	22.79	N/A	N/A	N/A
802.11 ac 80	42	5210	12.79	12.45	15.63	1.67	17.30	25.03	2.75	20.05	21
	155	5775	18.23	16.18	20.34	1.67	22.01	22.79	N/A	N/A	N/A

Note:

According to FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For power measurements on IEEE 802.11 devices, Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

The device have two antenna, so array gain is 0 dB.

The maximum antenna gain was used for evaluation the limits(10.97dBi for 5150-5250MHz, 13.21 dBi for 5725-5850MHz).

10 FCC §15.407(a) – Power Spectral Density

10.1 Applicable Standard

According to FCC §15.407(a):

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz 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. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

10.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/*T*, where *T* is defined in II.B.l.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

10.3 Test Equipment List and Details

Descriptions	Manufacturers	Models	Serial Numbers	Calibration Date	Calibration Due Date
Spectrum Analyzer	Rohde & Schwarz	FSU26	200268	2017/05/08	2018/05/07
				2018/05/04	2019/05/03
Cable	WOKEN	SFL402	S02-160323-07	2018/02/12	2019/02/11
Attenuator	MINI-CIRCUITS	BW-S10W5+	N/A	2018/03/08	2019/03/07

**** Statement of Traceability:*** BACL Corp. attests that all calibrations have been performed according to TAF requirements, traceable to the ETC.

10.4 Test Environmental Conditions

Temperature:	24° C
Relative Humidity:	58 %
ATM Pressure:	1010 hPa

The testing was performed by Andy Shih on 2018-03-30 ~ 2018-06-11.

10.5 Test Results

Test Mode: Transmitting

UNII Band	Mode	Channel	Frequency (MHz)	Maximum Power Spectral Density (dBm/MHz)			Duty Factor (dB)	Total Maximum Power Spectral Density with duty factor (dBm/MHz)	Limit (dBm/MHz)
				Chain 0	Chain 1	Total			
UNII-1	802.11a	36	5180	2.28	2.91	5.62	0.27	5.89	9.02
		40	5200	1.95	2.42	5.2	0.27	5.47	9.02
		48	5240	1.34	2.08	4.74	0.27	5.01	9.02
UNII-1	802.11 ac20	36	5180	1.93	2.04	5.00	0.27	5.27	9.02
		40	5200	1.79	2.17	4.99	0.27	5.26	9.02
		48	5240	1.60	2.32	4.99	0.27	5.26	9.02
UNII-1	802.11 ac 40	38	5190	2.19	2.6	5.41	0.81	6.22	9.02
		46	5230	2.00	2.43	5.23	0.81	6.04	9.02
UNII-1	802.11 ac 80	42	5210	-6.19	-5.73	-2.94	1.67	-1.27	9.02
UNII Band	**Mode**	**Channel**	**Frequency (MHz)**	**Maximum Power Spectral Density (dBm/500kHz)**			**Duty Factor (dB)**	**Total Maximum Power Spectral Density with duty factor (dBm/500kHz)**	**Limit (dBm/500kHz)**
				Chain 0	**Chain 1**	**Total**			
UNII-3	802.11a	149	5745	4.87	4.39	7.65	0.27	7.92	19.78
		157	5785	4.67	3.70	7.22	0.27	7.49	19.78
		165	5825	4.72	3.17	7.02	0.27	7.29	19.78
UNII-3	802.11 ac20	149	5745	7.01	6.74	9.89	0.27	10.16	19.78
		157	5785	7.31	5.78	9.62	0.27	9.89	19.78
		165	5825	6.86	5.23	9.13	0.27	9.40	19.78
UNII-3	802.11 ac 40	151	5755	3.36	2.53	5.98	0.81	6.79	19.78
		159	5795	2.76	1.81	5.32	0.81	6.13	19.78
UNII-3	802.11 ac 80	155	5775	1.22	-0.65	3.40	1.67	5.07	19.78

Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for

Power spectral density (PSD) measurements on the devices:

Array Gain = 10 log(NANT/NSS) dB.

So:

For UNII-1 Band max antenna gain is 10.97 dBi

Directional gain = GANT + Array Gain = 10.97+10*log(2) =13.98 dBi

The Power density Limits was reduce 7.98 dB

For UNII-3 Band max antenna gain is 13.21 dBi

Directional gain = GANT + Array Gain = 13.21+10*log(2) =16.22 dBi

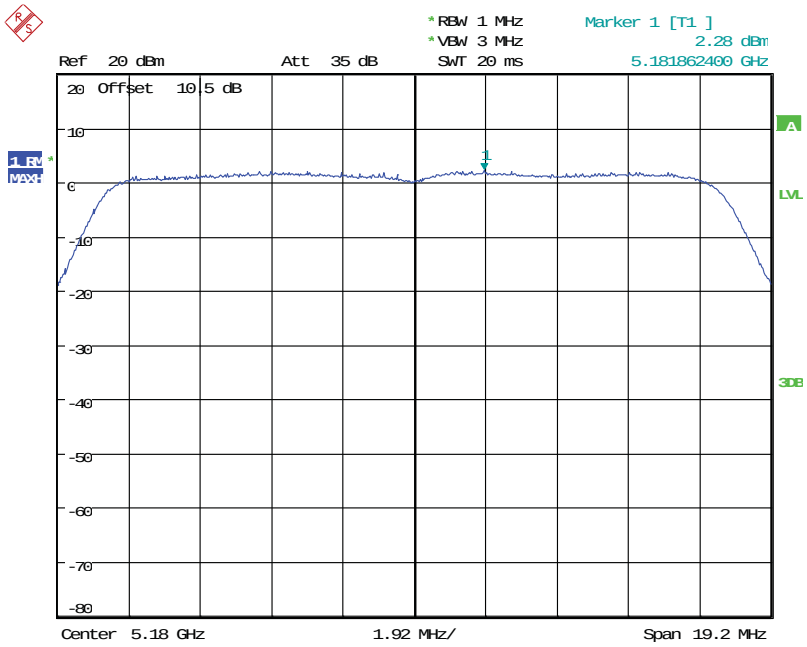
The Power density Limits was reduce 10.22 dB

Please refer to the following plots

Test Mode: Transmitting

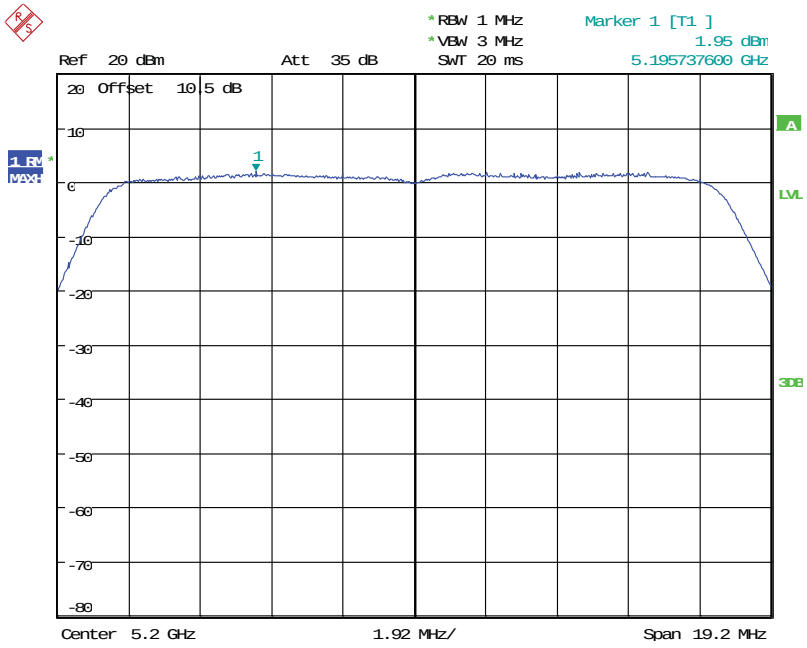
IEEE 802.11a mode / 5150 ~ 5250MHz (chain 0)

5180MHz



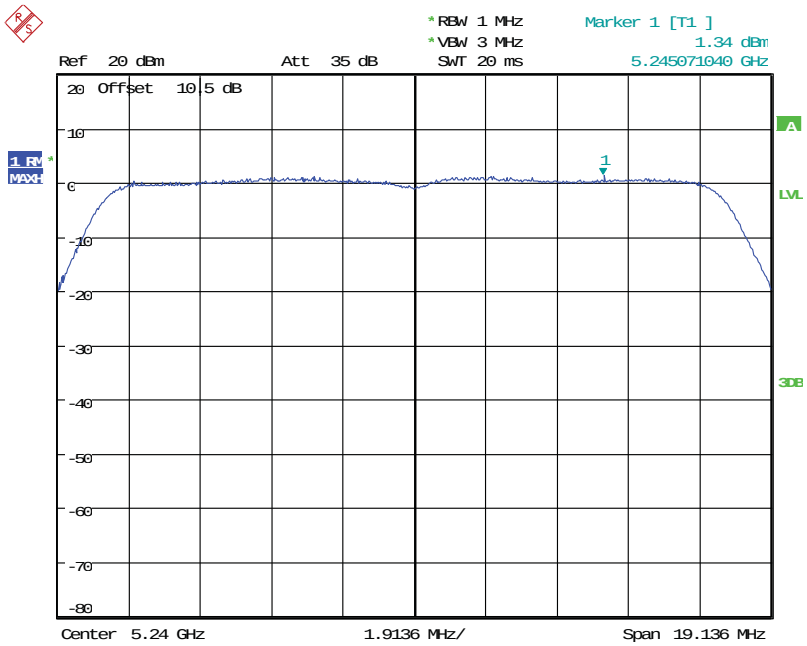
Date: 30.MAR.2018 17:15:42

5200MHz



Date: 30.MAR.2018 17:17:17

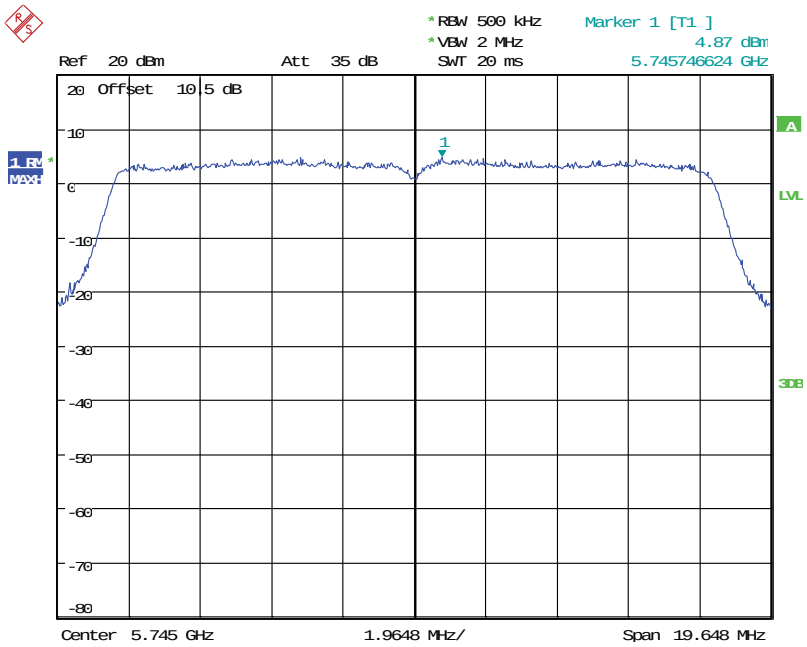
5240MHz



Date: 30.MAR.2018 17:18:58

IEEE 802.11a mode / 5725 ~ 5850MHz (chain 0)

5745MHz



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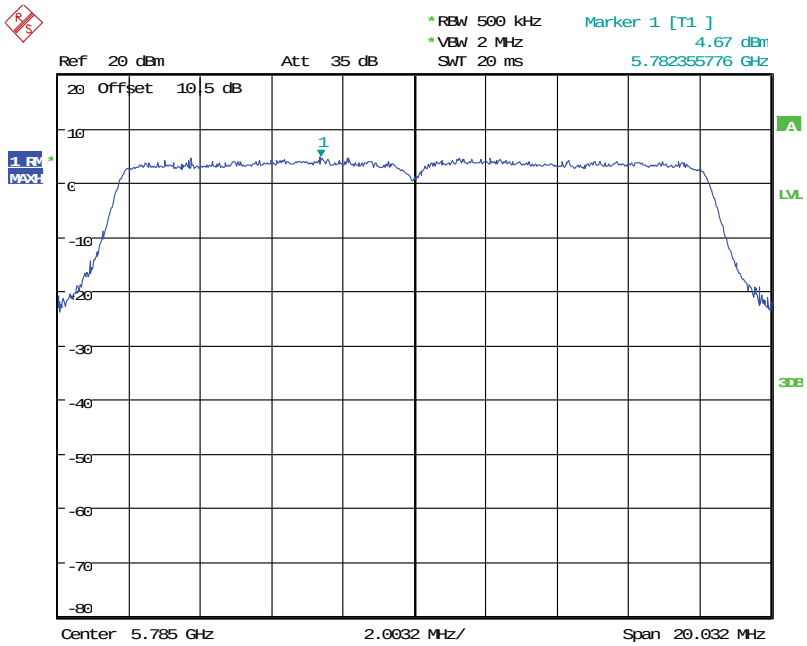
5785MHz



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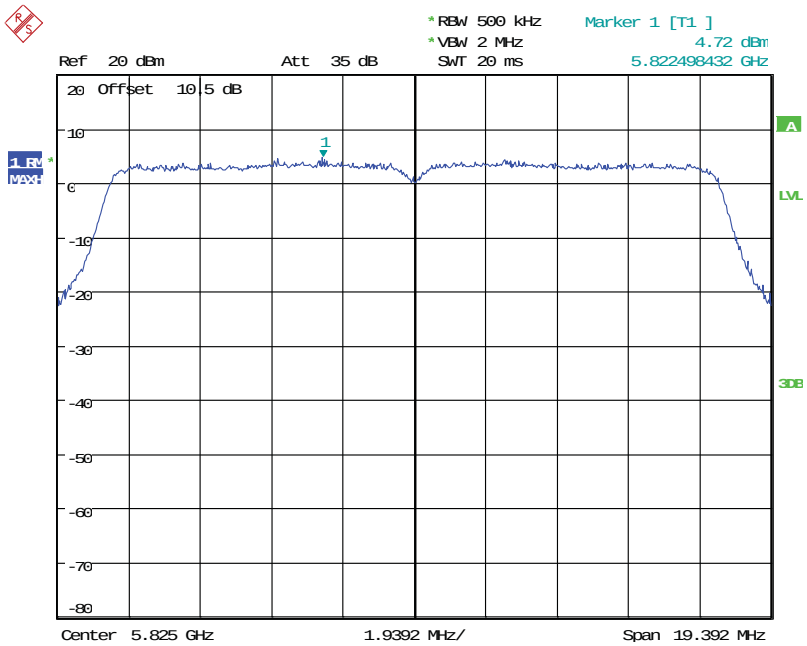
5825MHz



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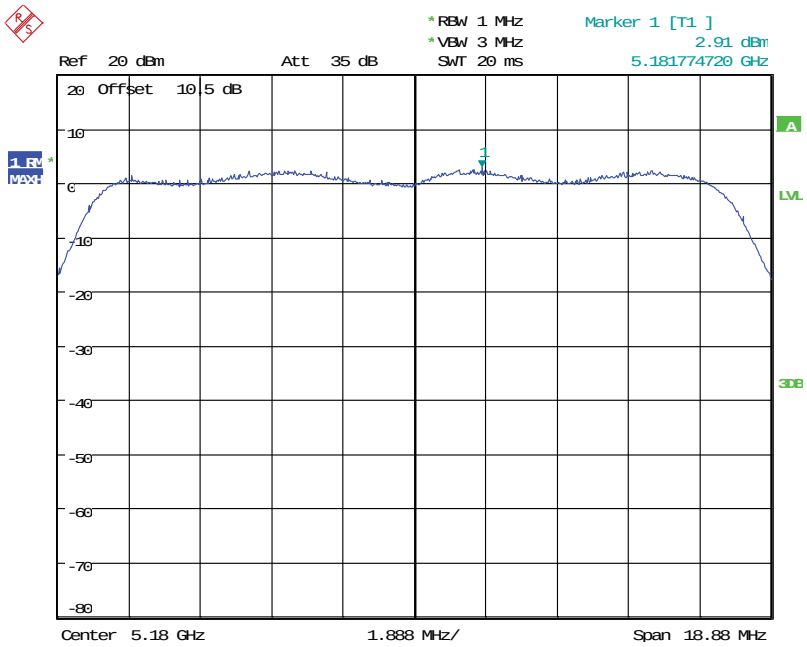
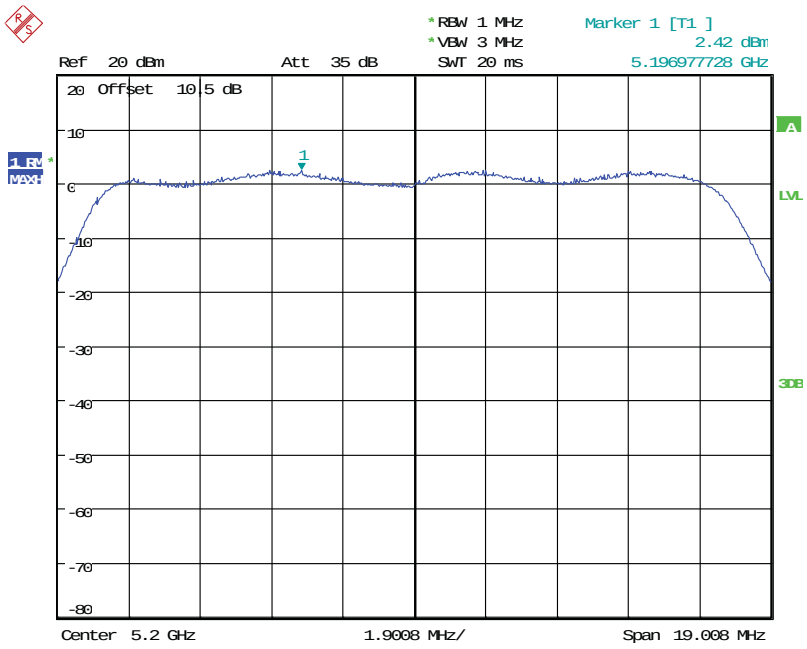
IEEE 802.11a mode / 5150 ~ 5250MHz (chain 1)
5180MHz



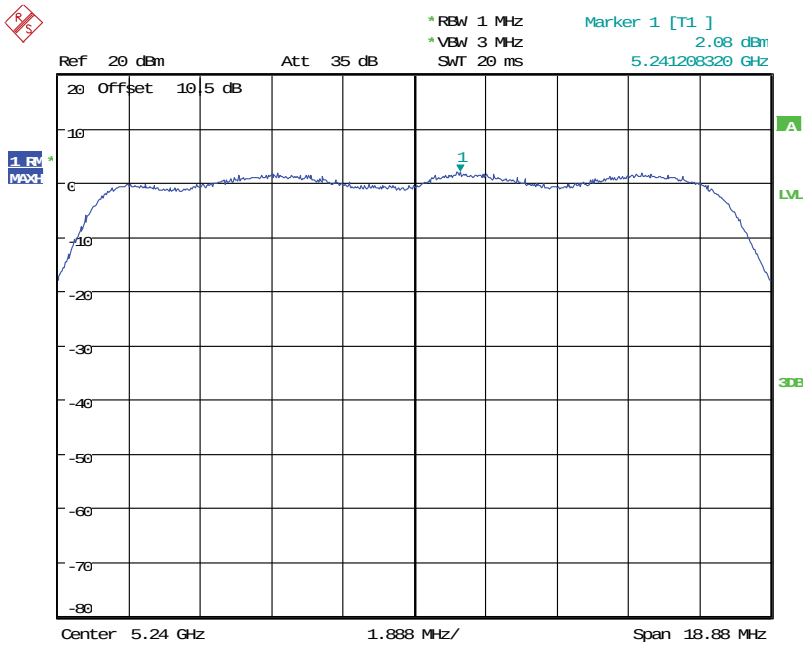
Date: 30.MAR.2018 18:22:21

5200MHz

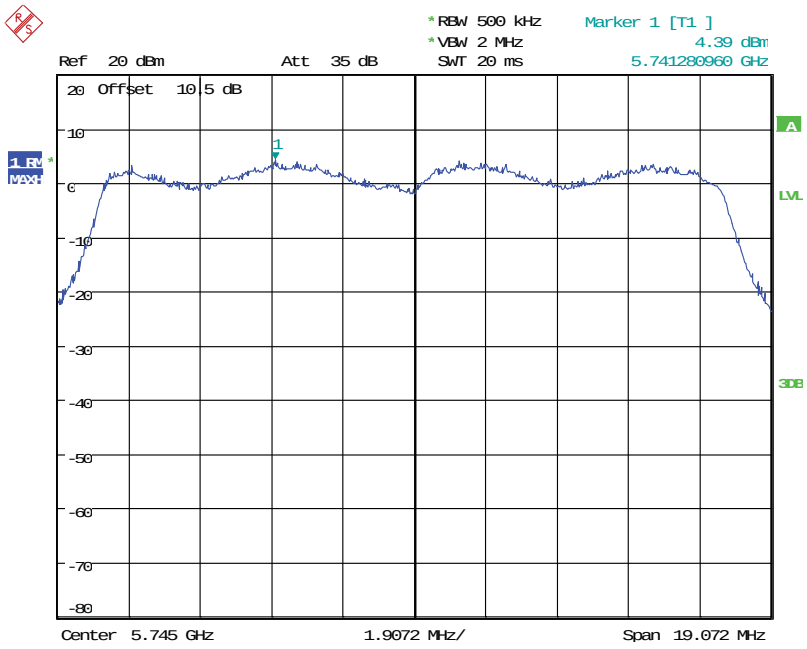


Date: 30.MAR.2018 18:23:48

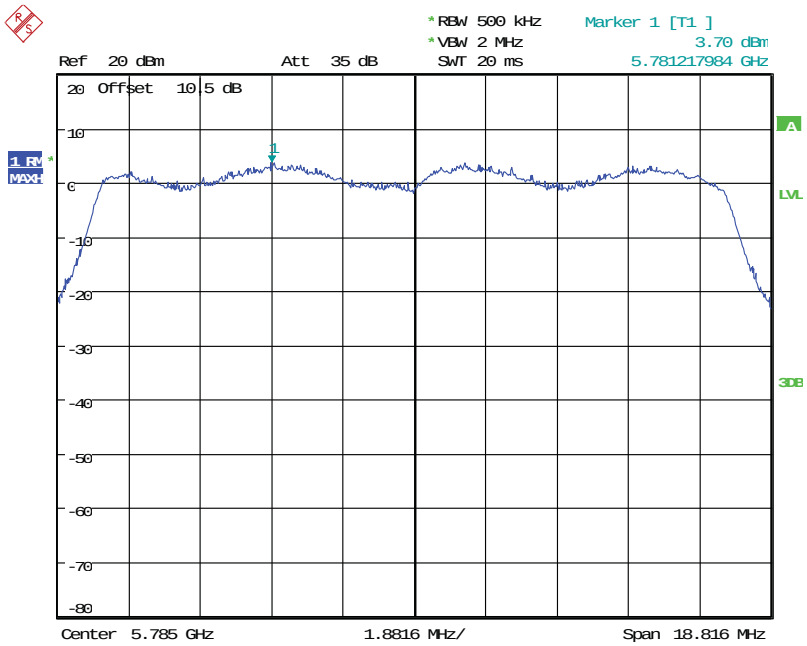
5240MHz



IEEE 802.11a mode / 5725 ~ 5850MHz (chain 1)
5745MHz

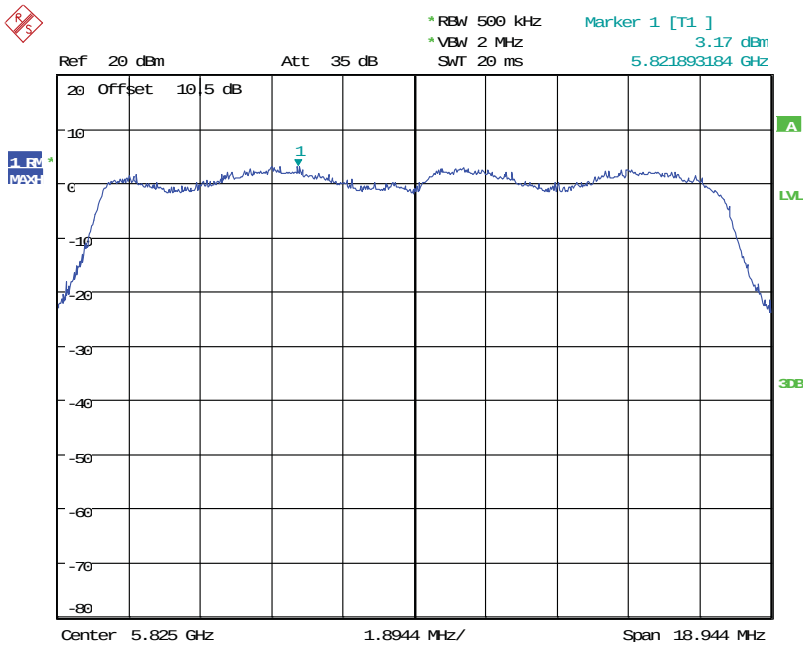


5785MHz



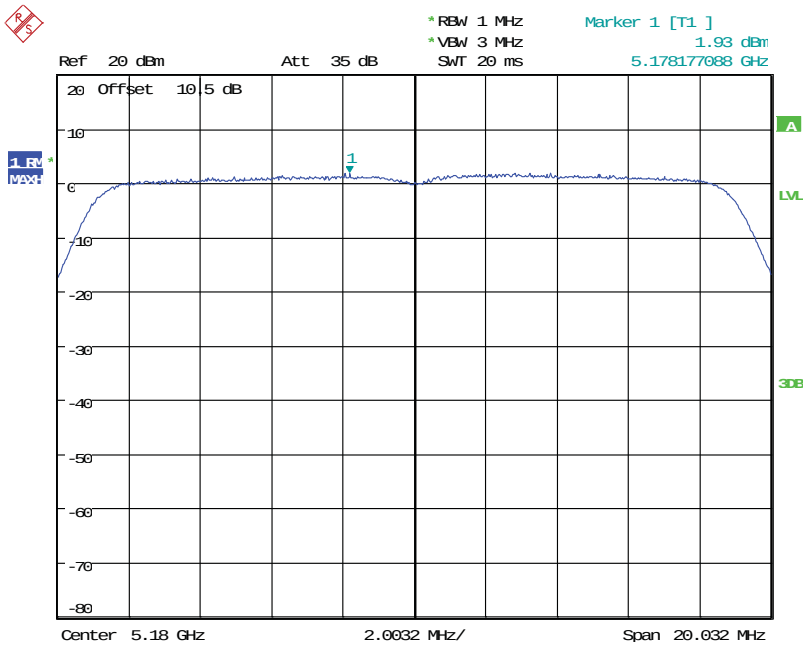
Date: 30.MAR.2018 18:29:15

5825MHz



Date: 30.MAR.2018 18:31:15

IEEE 802.11ac VHT20 mode / 5150 ~ 5250MHz (chain 0)
5180MHz



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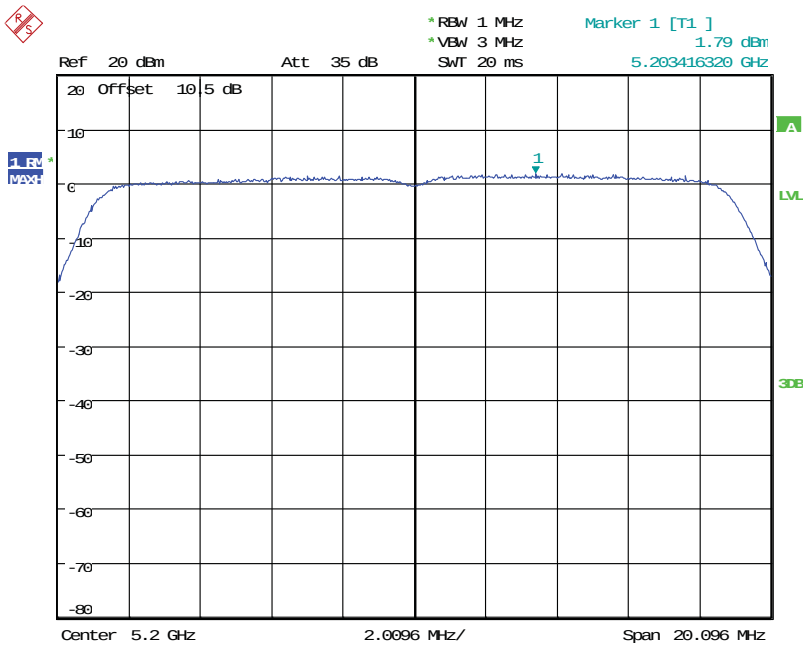
5200MHz



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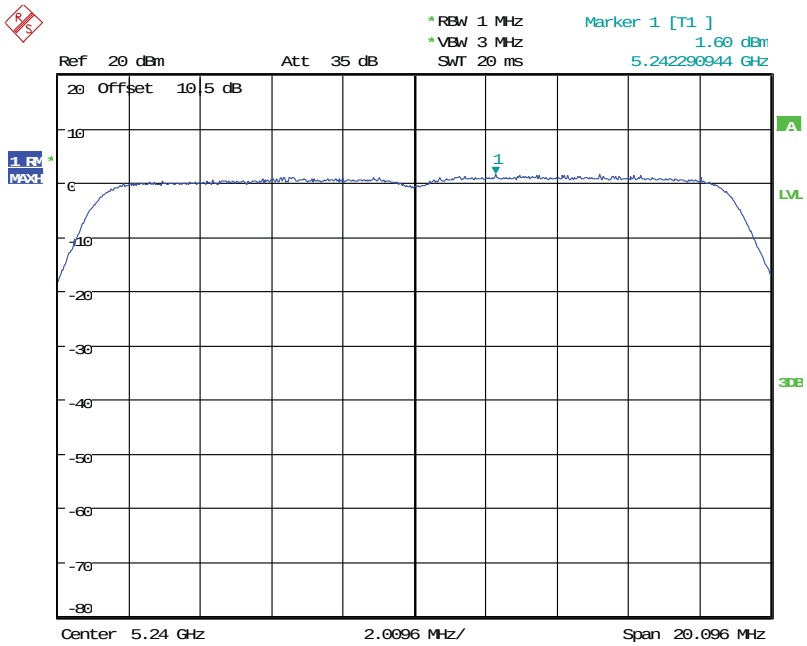
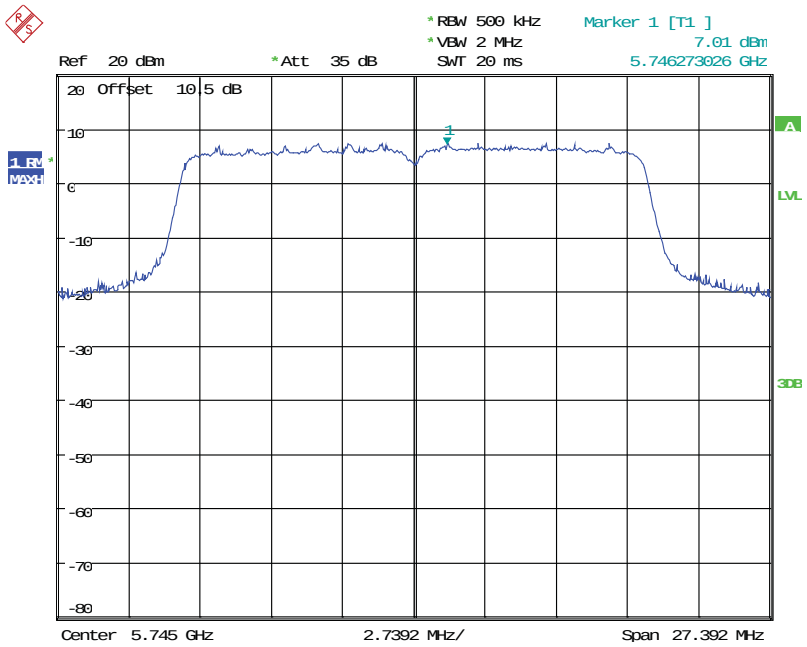
5240MHz



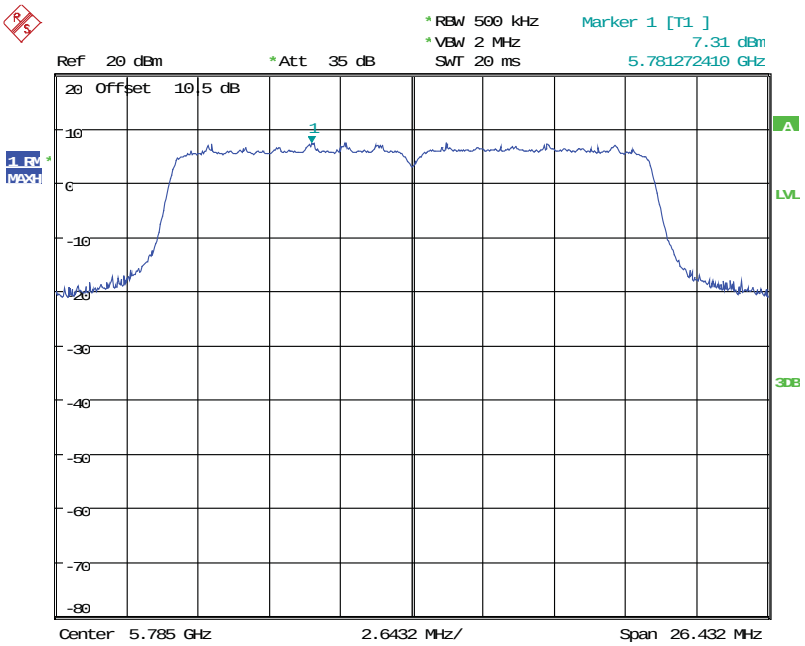
Date: 30.MAR.2018 17:29:27

IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 0)
5745MHz



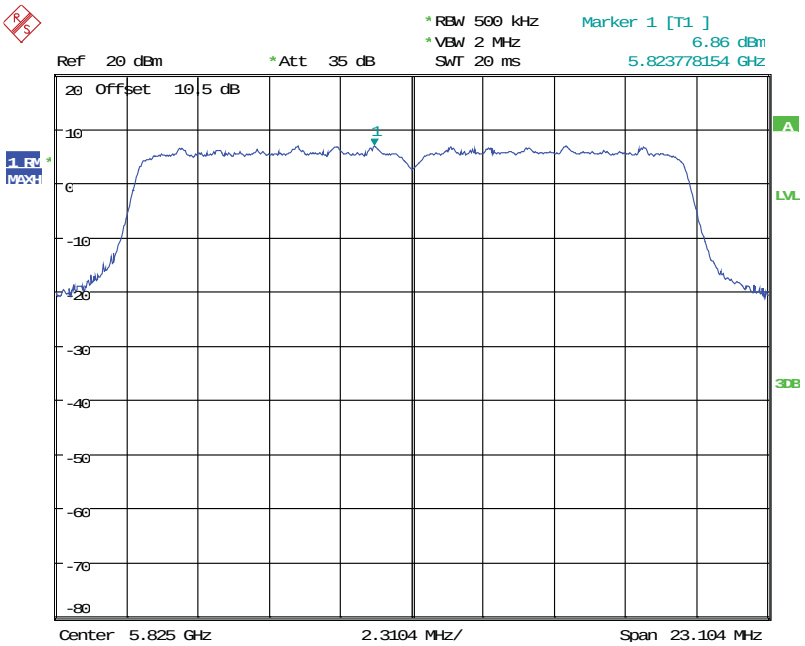
Date: 11.JUN.2018 10:25:45

5785MHz



Date: 11.JUN.2018 10:30:18

5825MHz



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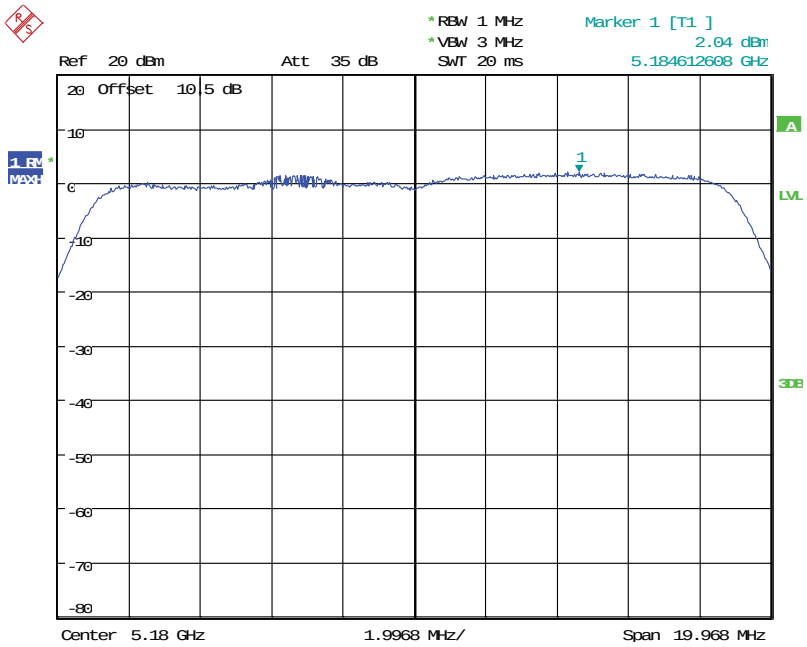
IEEE 802.11ac VHT20 mode / 5150 ~ 5250MHz (chain 1)
5180MHz



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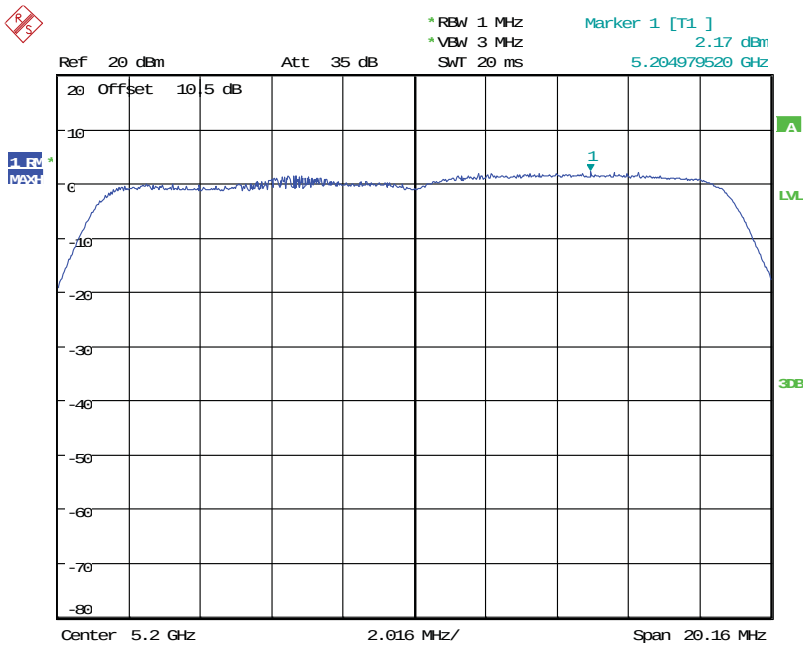
5200MHz



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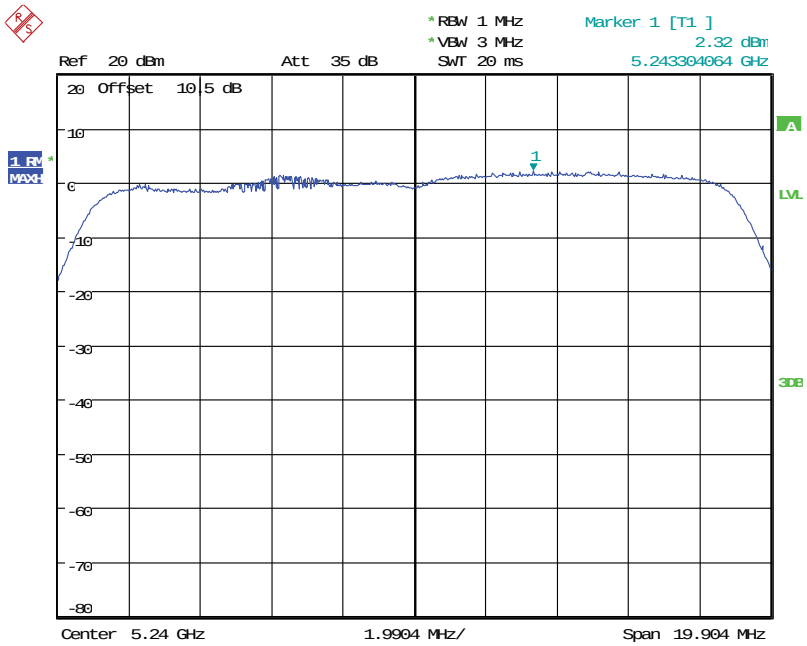
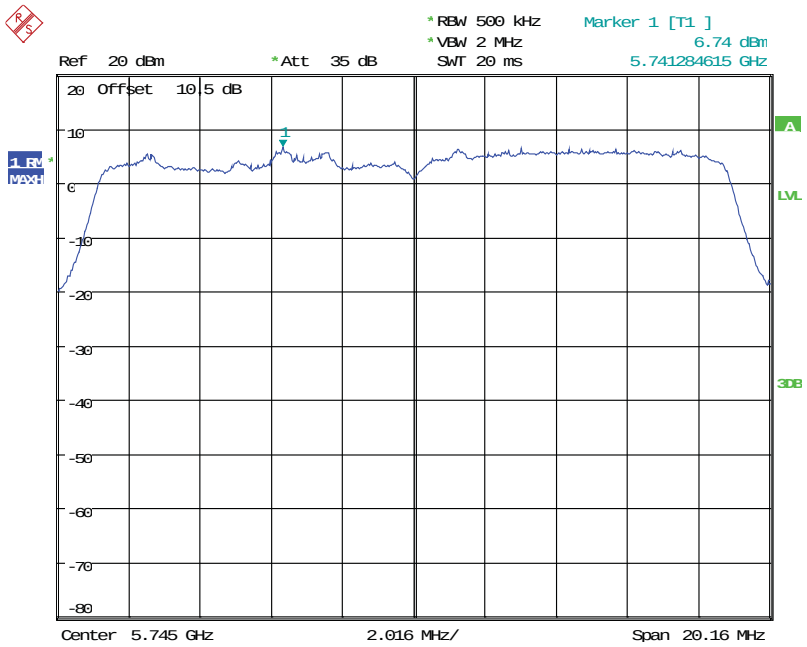
5240MHz



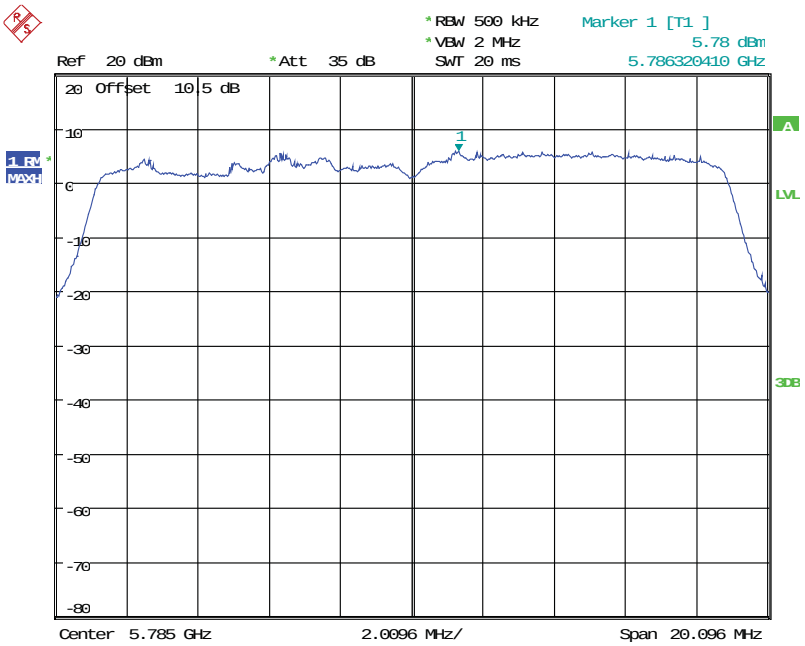
Date: 30.MAR.2018 18:36:43

IEEE 802.11ac VHT20 mode / 5725 ~ 5850MHz (chain 1)
5745MHz



Date: 11.JUN.2018 10:27:27

5785MHz



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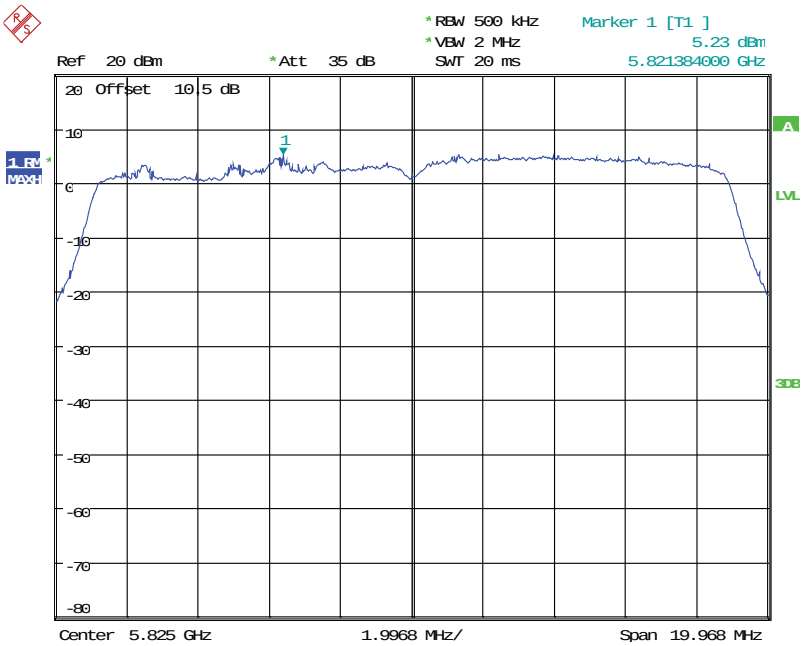
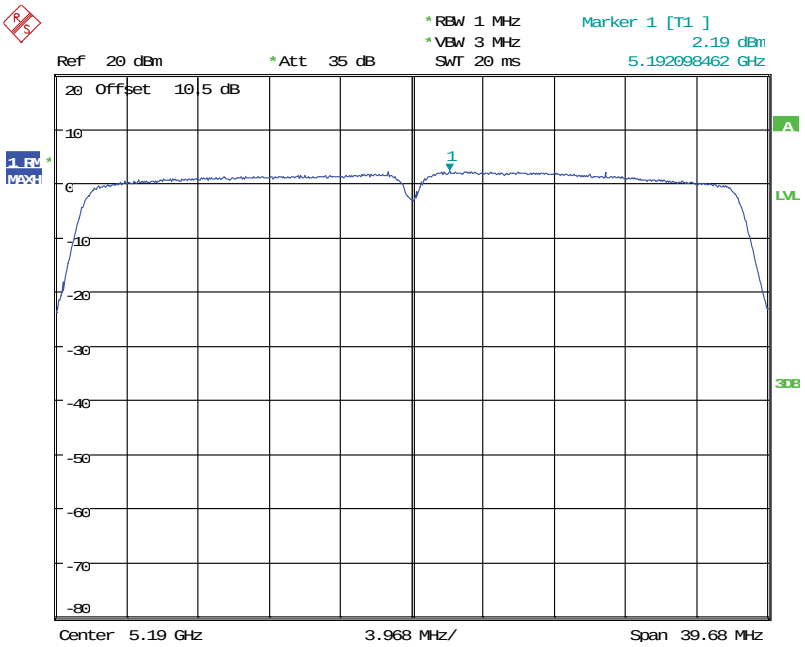
5825MHz



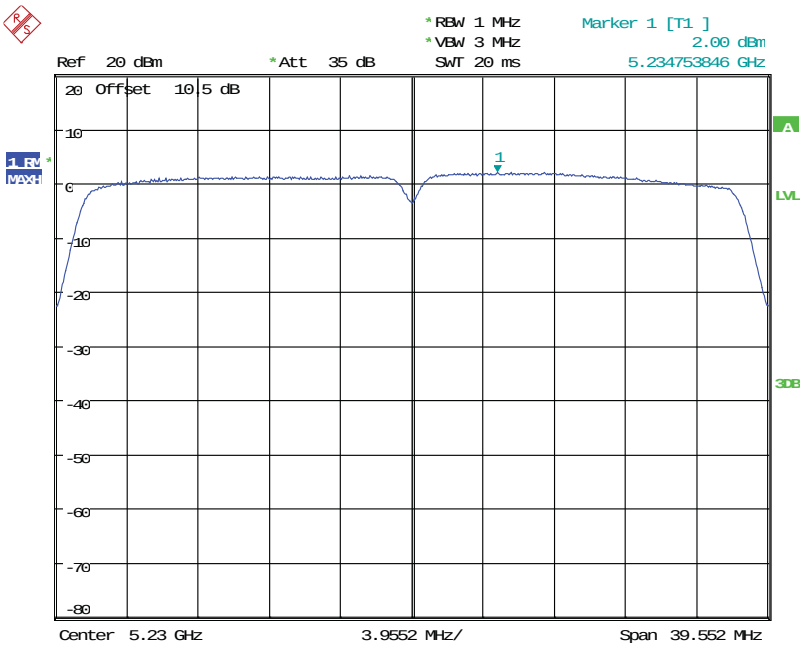
Date: 11.JUN.2018 10:31:52

IEEE 802.11ac VHT40 mode / 5150 ~ 5250MHz (chain 0)
5190MHz



Date: 11.JUN.2018 10:14:49

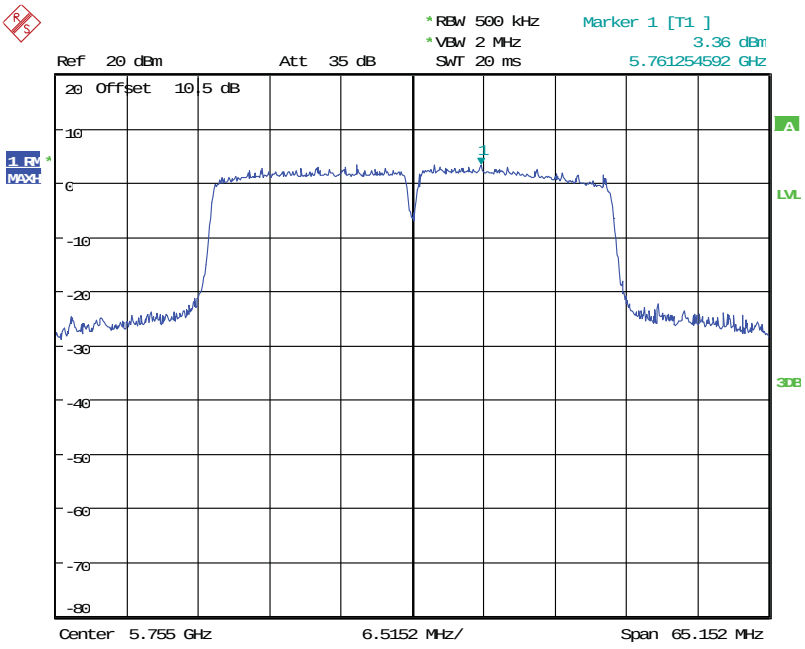
5230MHz



Date: 11.JUN.2018 10:18:15

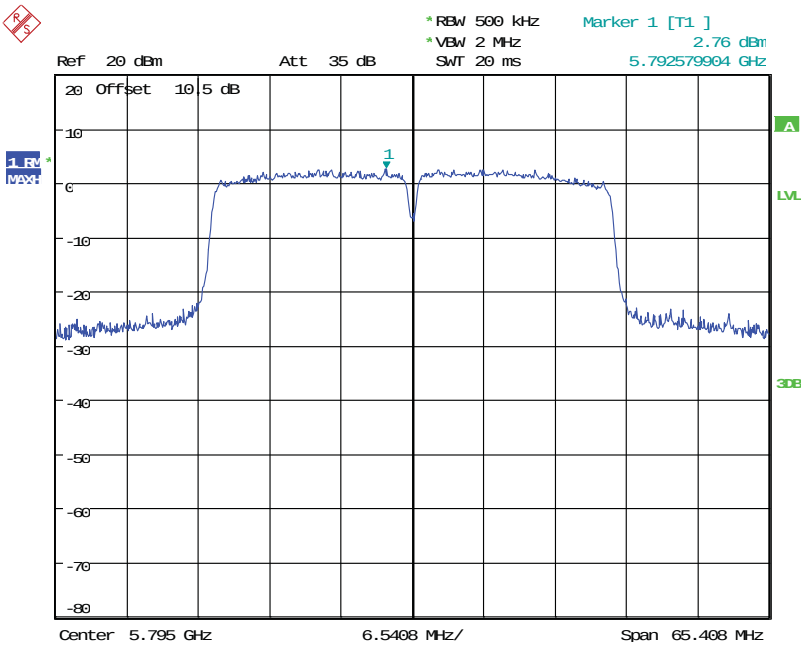
IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 0)

5755MHz



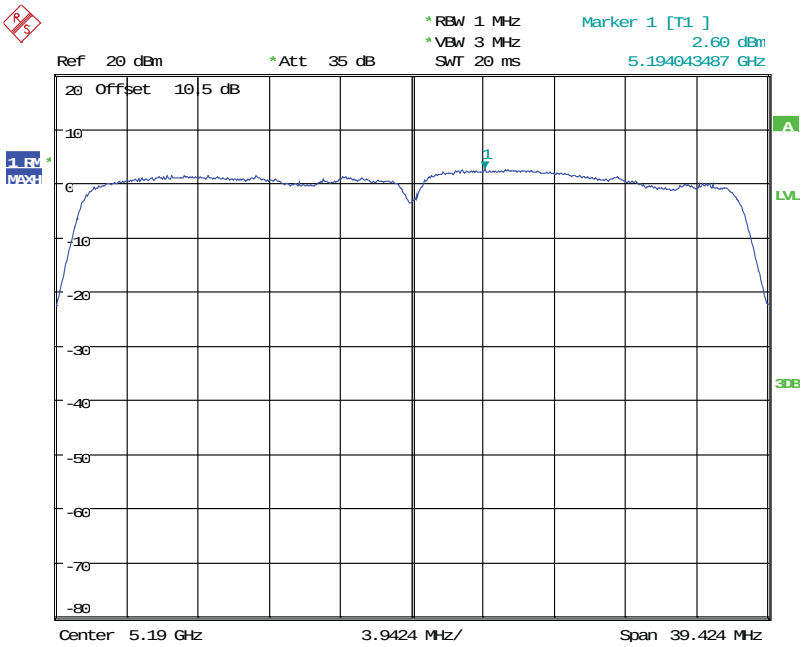
Date: 30.MAR.2018 17:38:14

5795MHz



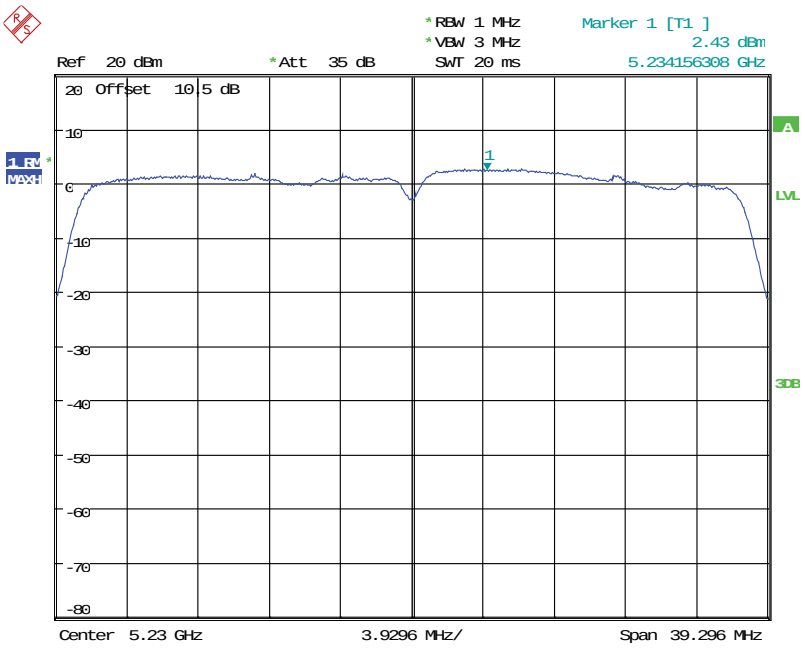
Date: 30.MAR.2018 17:39:52

IEEE 802.11ac VHT40 mode / 5150 ~ 5250MHz (chain 1)
5190MHz



Date: 11.JUN.2018 10:15:45

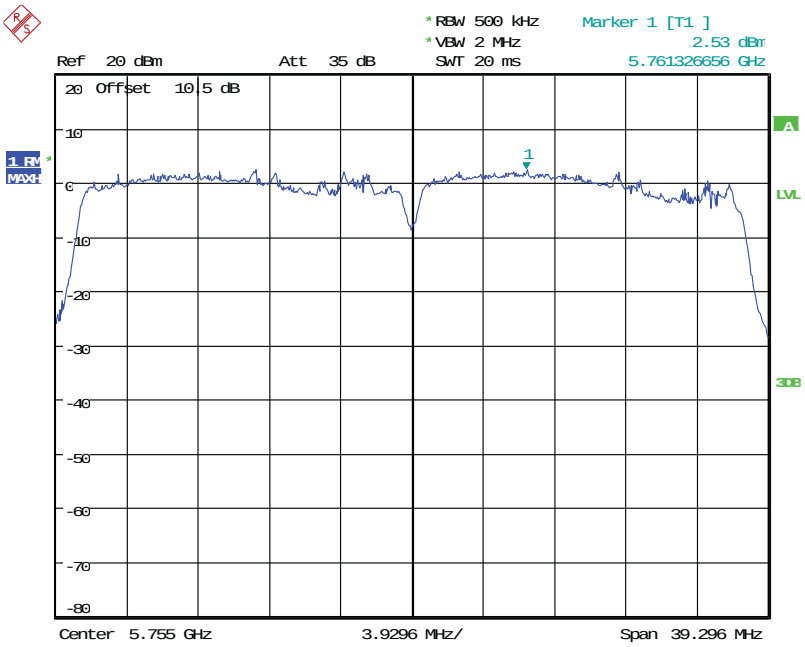
5230MHz



Date: 11.JUN.2018 10:17:35

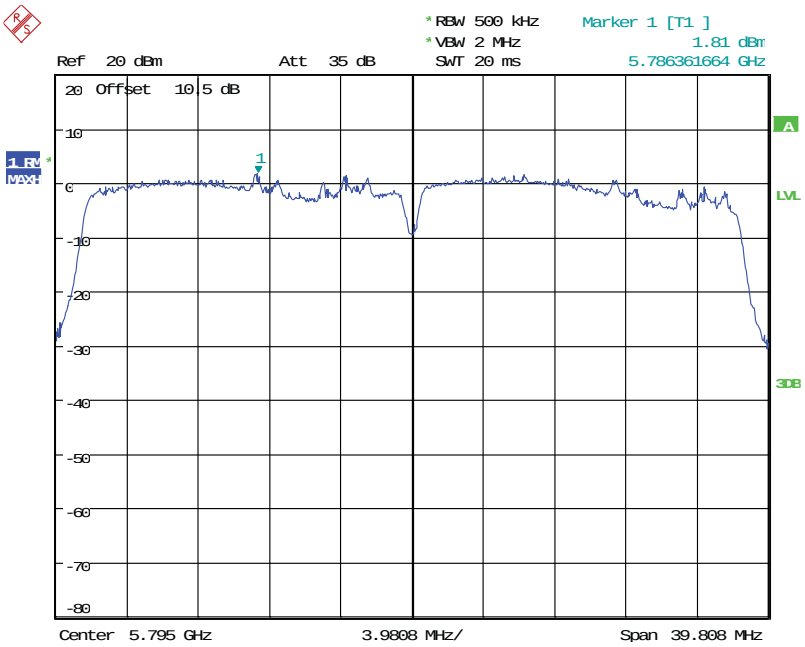
IEEE 802.11ac VHT40 mode / 5725 ~ 5850MHz (chain 1)

5755MHz



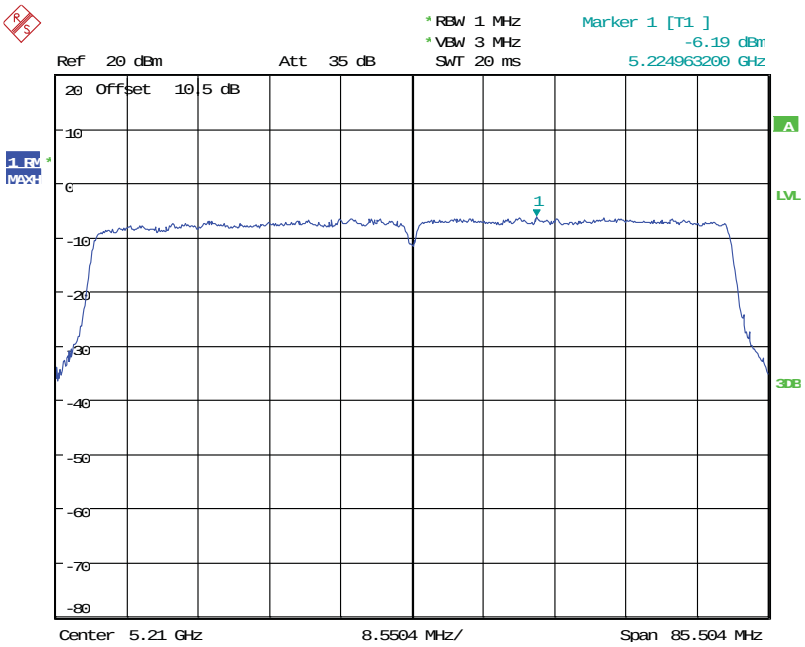
Date: 30.MAR.2018 18:50:03

5795MHz



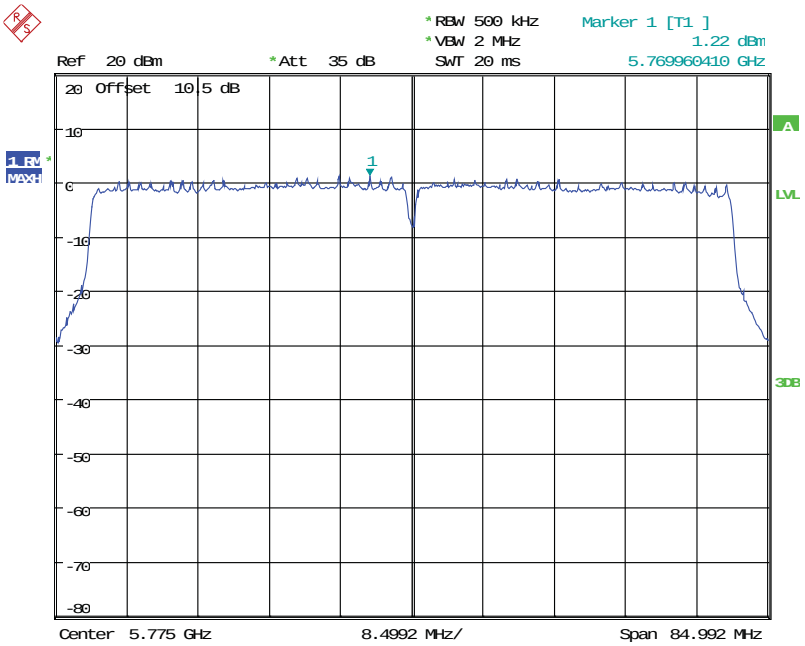
Date: 30.MAR.2018 18:51:47

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz (chain 0)
5210MHz



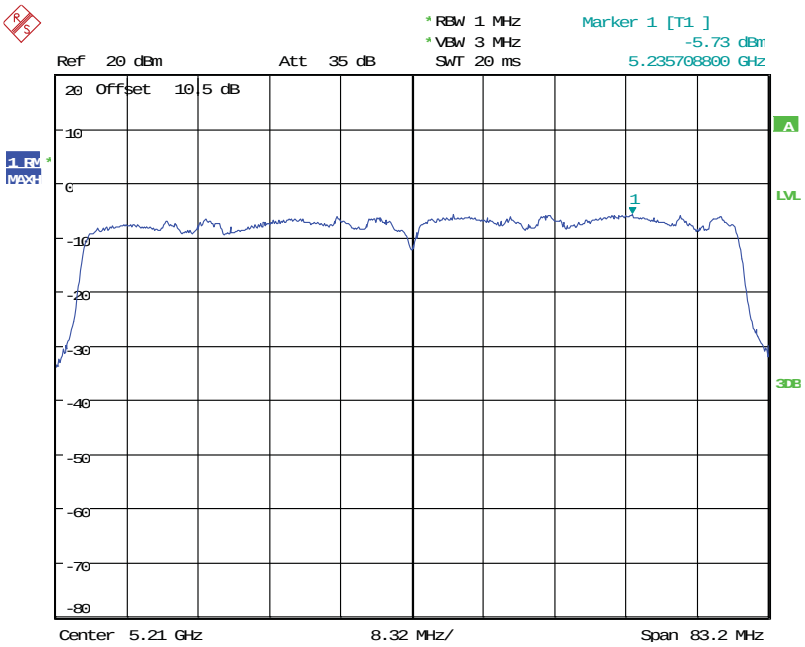
Date: 30.MAR.2018 17:42:01

IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 0)
5775MHz



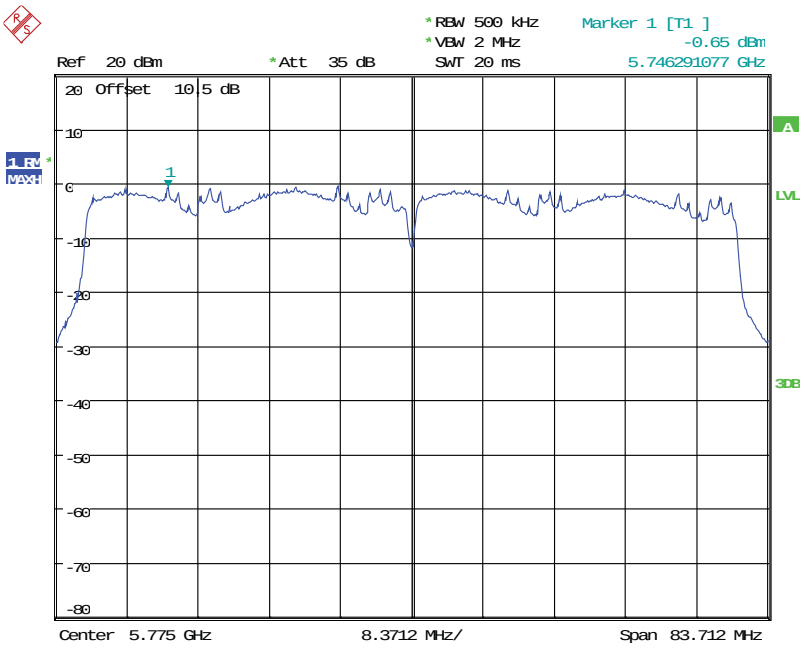
Date: 11.JUN.2018 10:21:36

IEEE 802.11ac VHT80 mode / 5150 ~ 5250MHz (chain 1)
5210MHz



Date: 30.MAR.2018 18:53:35

IEEE 802.11ac VHT80 mode / 5725 ~ 5850MHz (chain 1)
5775MHz



Date: 11.JUN.2018 10:23:05

******* END OF REPORT *******