TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 15.407

TEST REPORT

For

Samuelson Enterprises PLLC

16540 Scenic Drive, Barbeau, 49710, Michigan,USA

FCC ID: 2A2CO-FALCON-50

Report Type:	**Product Name:**
Original Report	4G POC Radio

Report Number:	SZ1210511-16362E-00D
Report Date:	2021-06-22
Reviewed By:	Ivan Cao Assistant Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		4G POC Radio
EUT Model:		Scorpion Falcon 50
Operation Frequency:		5180-5240 MHz (802.11a/n ht20/ac vht20) 5190-5230 MHz(802.11n ht40/ac vht40) 5745-5825 MHz (802.11a/n ht20/ac vht20) 5755-5795 MHz(802.11n ht40/ac vht40)
Maximum Output Power (Conducted):		5150-5250 MHz:9.09 dBm 5725-5850 MHz:9.08 dBm
Modulation Type:		OFDM
Antenna Gain▲:		0.69 dBi
Rated Input Voltage:		DC 3.8V from battery or DC 5V from adapter
Adapter Information	**Model:**	CPW050V2000
	Input:	100-240Vac 50/60Hz 0.35A
	Output:	5.0Vdc 2000mA
Serial Number:		SZ1210511-16362E-S1
EUT Received Date:		2021.05.11
EUT Received Status:		Good

Objective

This type approval report is prepared on behalf of ***Samuelson Enterprises PLLC*** in accordance with Part 2-Subpart J, Part 15-Subparts A, and E of the Federal Communications Commission's rules.

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

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

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Power Spectral Density, conducted	±0.61 dB
Unwanted Emissions, radiated	30M~200MHz: 4.55 dB,200M~1GHz: 5.92 dB,1G~6GHz: 4.98 dB, 6G~18GHz: 5.89 dB,18G~26.5G:5.47 dB,26.5G~40G:5.63 dB
Unwanted Emissions,conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%
AC Power Lines Conducted Emission	3.12 dB (150 kHz to 30 MHz)

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage fac vhtor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Description of Test Configuration

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

For 5150~5250 MHz band, 6 channels are provided:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220
38	5190	46	5230
40	5200	48	5240

For 802.11a, 802.11n ht20/ac vht20 channel 36, 40 and 48 was tested, for 802.11n ht40/ac vht40 channel 38, 46 were tested.

For 5725~5850MHz band, 7 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	159	5795
151	5755	161	5805
153	5765	165	5825
157	5785	/	/

For 802.11a, 802.11n ht20/ac vht20 channel 149, 157 and 165 was tested, for 802.11n ht40/ac vht40 channel 151, 159 were tested.

EUT Exercise Software

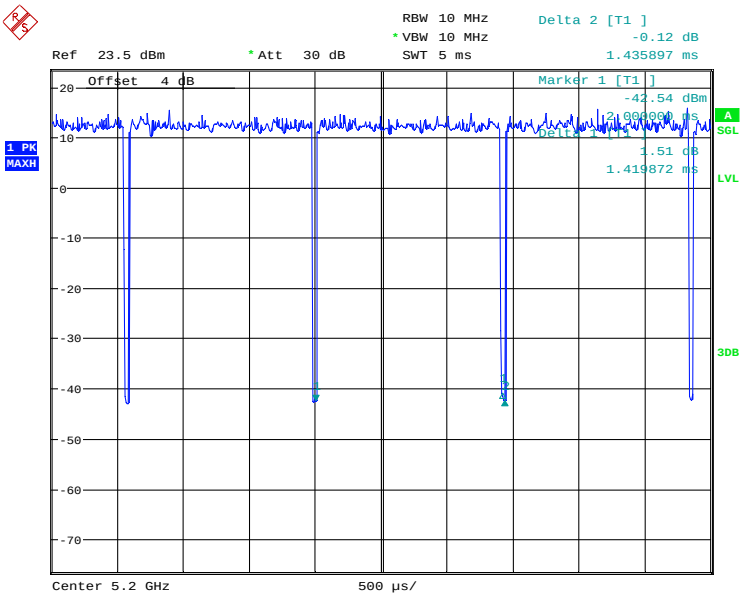
The software “Engineer Mode” was used for testing, which was provided by Manufacturer. The worst-case data rates are determined to be as follows for each mode based upon investigations by measuring the average power and PSD across all date rates, bandwidths, and modulations. The maximum power was configured as below table, that provided by the Manufacturer▲:

Band	Mode	Test Channel	Test Frequency (MHz)	Data Rate	Power level Setting
5150 - 5250 MHz	802.11a	Low	5180	6 Mbps	15
		Middle	5200	6 Mbps	15
		High	5240	6 Mbps	15
	802.11n ht20	Low	5180	MCS0	15
		Middle	5200	MCS0	15
		High	5240	MCS0	15
	802.11n ht40	Low	5190	MCS0	15
		High	5230	MCS0	15
5725 - 5850 MHz	802.11a	Low	5745	6 Mbps	15
		Middle	5785	6 Mbps	15
		High	5825	6 Mbps	15
	802.11n ht20	Low	5745	MCS0	16
		Middle	5785	MCS0	16
		High	5825	MCS0	16
	802.11n ht40	Low	5755	MCS0	16
		High	5795	MCS0	16

The duty cycle as below:

Mode	T_{on} (ms)	T_{on+off} (ms)	Duty Cycle (%)
802.11 a	1.420	1.436	98.89
802.11n ht20	1.311	1.335	98.20
802.11n ht40	0.657	0.681	96.48

802.11a



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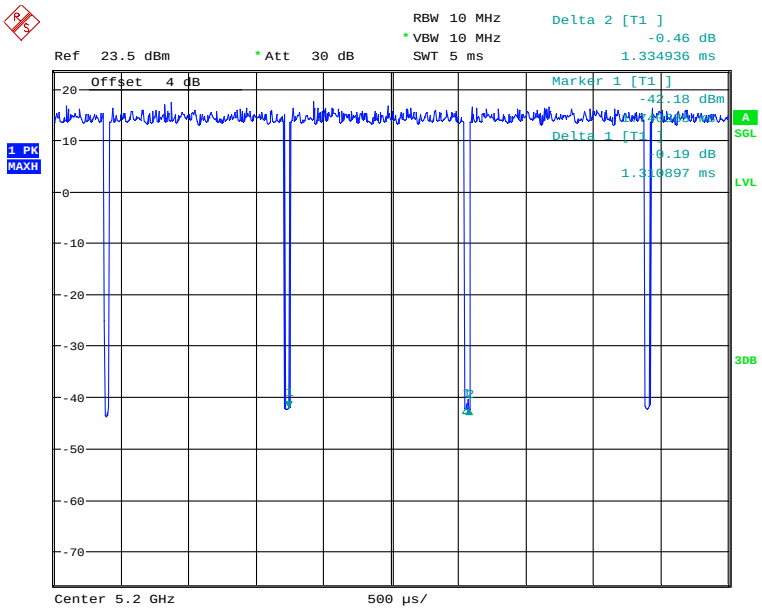
802.11n ht20



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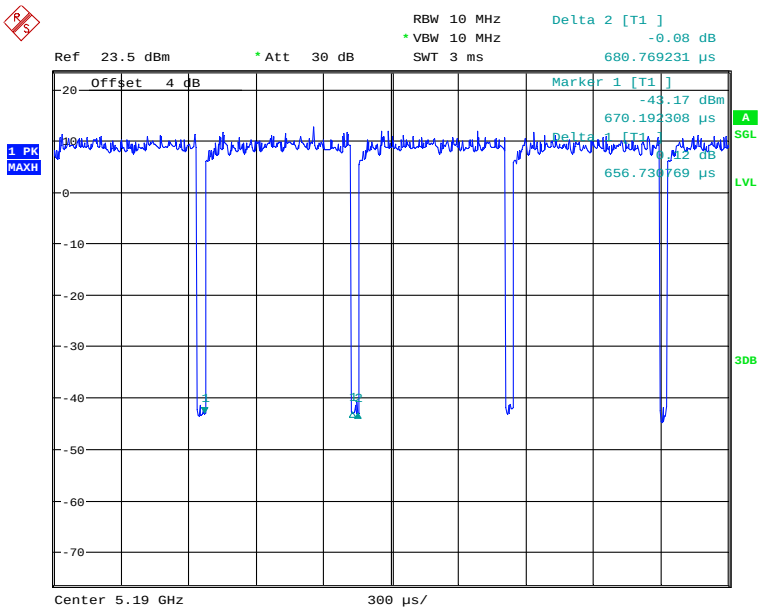
802.11n ht40



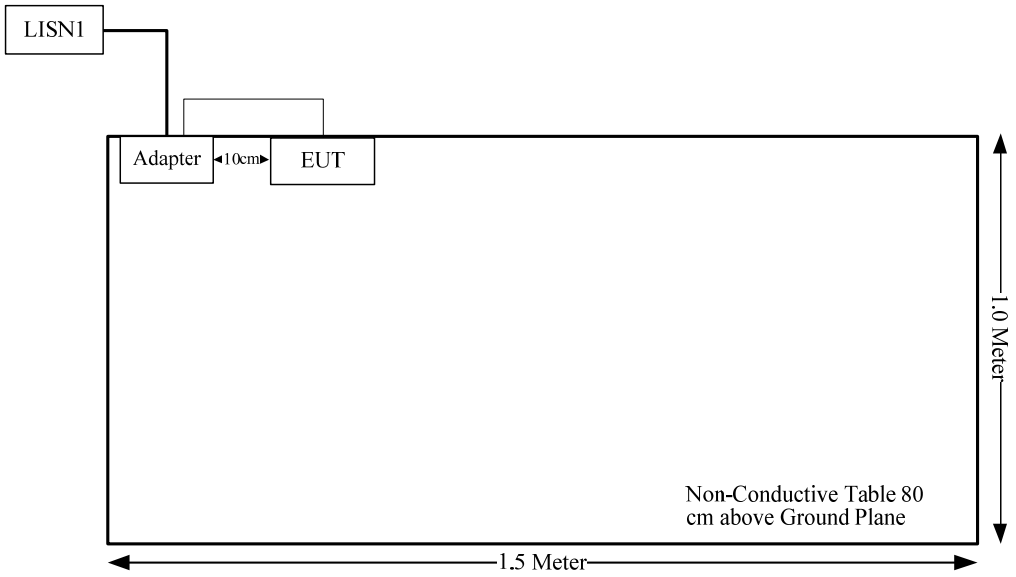
Equipment Modifications

No modification was made to the EUT.

Support Cable List and Details

Cable Description	Shielding Type	Ferrite Core	Length (m)	From Port	To
USB Cable	No	No	1.2	Adapter	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC §15.407 (f) & §1.1310 & §2.1093	RF Exposure	Compliance
FCC§15.203,	Antenna Requirement	Compliance
FCC§15.407(b)(6)& §15.207(a)	Conducted Emissions	Compliance
FCC§15.205& §15.209 &§15.407(b)	Undesirable Emission& Restricted Bands	Compliance
FCC§15.407(b)	Out Of Band Emissions	Compliance
FCC§15.407(a) (e)	Emission Bandwidth	Compliance
FCC§15.407(a) RSS-247 Clause 6.2	Conducted Transmitter Output Power	Compliance
FCC§15.407 (a),	Power Spectral Density	Compliance

FCC §15.407 (f) & §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

According to§15.407(f),§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: SZ1210511-16362E-20.

FCC §15.203- ANTENNA REQUIREMENT

Applicable Standard

According to FCC§ 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 user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.
c. Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types which can be used with the transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna type.

Antenna Connector Construction

The EUT has one internal FPC antenna arrangement for WLAN, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna Type	input impedance (Ohm)	Antenna Gain /Frequency Range
FPC	50	0.69 dBi/5.15~5.85GHz

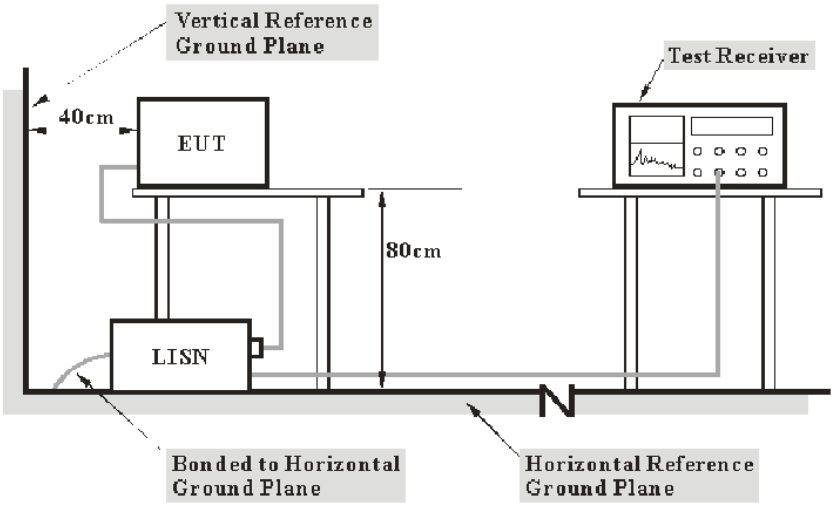
Result: Compliance.

FCC §15.207(a)– CONDUCTED EMISSIONS

Applicable Standard

FCC §15.207(a), §15.407(b) (6).

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.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main lisn with a 120 V/60 Hz AC power source.

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	IF B/W
150 kHz – 30 MHz	9 kHz

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

$V_C = V_R + A_C + VDF$
$C_f = A_C + VDF$

Herein,
V_C (cord. Reading): corrected voltage amplitude
V_R: reading voltage amplitude
A_c: attenuation caused by cable loss
VDF: voltage division fac vhtor of AMN
C_f: Correction Fac vhtor

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

Margin = Limit – Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

During the conducted emission test, the EUT was connected to the first 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.

Test Data

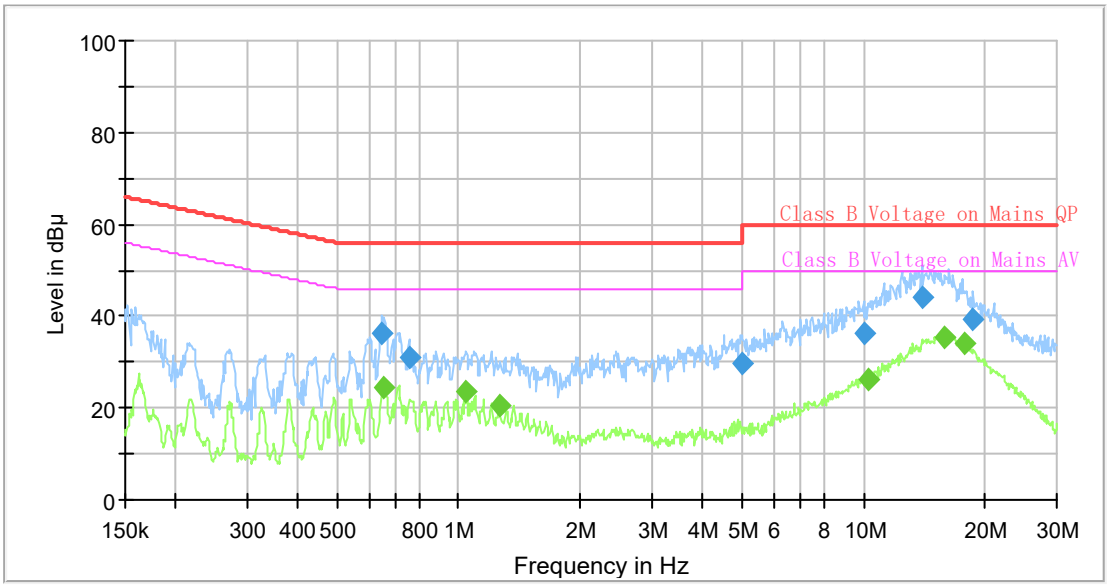
Environmental Conditions

Temperature:	24.3℃
Relative Humidity:	64%
ATM Pressure:	100.2kPa
Tester:	Walker Chen
Test Date:	2021-06-10

Test Result: Compliance

Test Mode: Transmitting

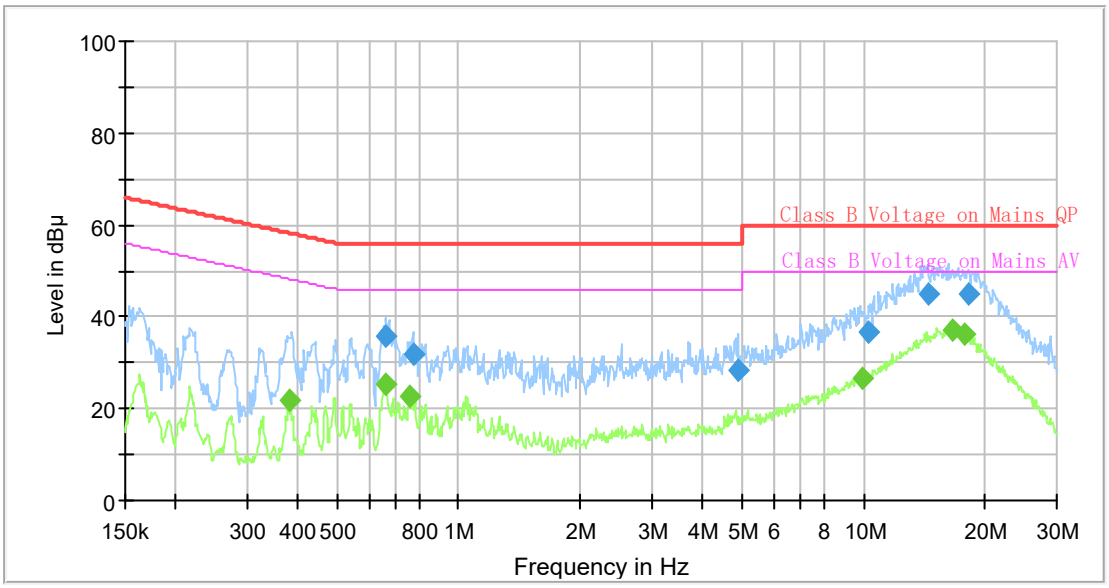
AC120 V, 60 Hz, Line:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.646766	36.38	---	56.00	19.62	9.000	L1	9.6
0.653250	---	24.66	46.00	21.34	9.000	L1	9.6
0.754910	30.79	---	56.00	25.21	9.000	L1	9.7
1.043973	---	23.49	46.00	22.51	9.000	L1	9.7
1.261826	---	20.66	46.00	25.34	9.000	L1	9.7
4.998419	29.49	---	56.00	26.51	9.000	L1	9.7
9.998049	36.44	---	60.00	23.56	9.000	L1	9.9
10.301765	---	26.35	50.00	23.65	9.000	L1	9.9
13.965015	44.09	---	60.00	15.91	9.000	L1	10.1
15.898604	---	35.19	50.00	14.81	9.000	L1	10.2
17.742400	---	33.94	50.00	16.06	9.000	L1	10.1
18.649748	39.13	---	60.00	20.87	9.000	L1	10.0

AC120 V, 60 Hz, Neutral:



Final_Result

Frequency (MHz)	QuasiPeak (dB µ V)	Average (dB µ V)	Limit (dB µ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.381193	---	21.66	48.25	26.59	9.000	N	9.6
0.659799	35.98	---	56.00	20.02	9.000	N	9.6
0.663098	---	25.44	46.00	20.56	9.000	N	9.6
0.758685	---	22.80	46.00	23.20	9.000	N	9.6
0.770122	31.69	---	56.00	24.31	9.000	N	9.6
4.899688	28.37	---	56.00	27.63	9.000	N	9.6
9.948307	---	26.77	50.00	23.23	9.000	N	9.7
10.301765	36.84	---	60.00	23.16	9.000	N	9.7
14.389237	45.05	---	60.00	14.95	9.000	N	9.9
16.545790	---	37.12	50.00	12.88	9.000	N	9.9
17.831112	---	36.14	50.00	13.86	9.000	N	9.9
18.099918	44.99	---	60.00	15.01	9.000	N	9.9

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

Applicable Standard

FCC §15.407; §15.209; §15.205;

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(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 5.25-5.35 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.

(3) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

(4) For transmitters operating in the 5.725-5.85 GHz band:

(i) 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.

(ii) Devices certified before March 2, 2017 with antenna gain greater than 10 dBi may demonstrate compliance with the emission limits in §15.247(d), but manufac vhturing, marketing and importing of devices certified under this alternative must cease by March 2, 2018. Devices certified before March 2, 2018 with antenna gain of 10 dBi or less may demonstrate compliance with the emission limits in §15.247(d), but manufac vhturing, marketing and importing of devices certified under this alternative must cease before March 2, 2020.

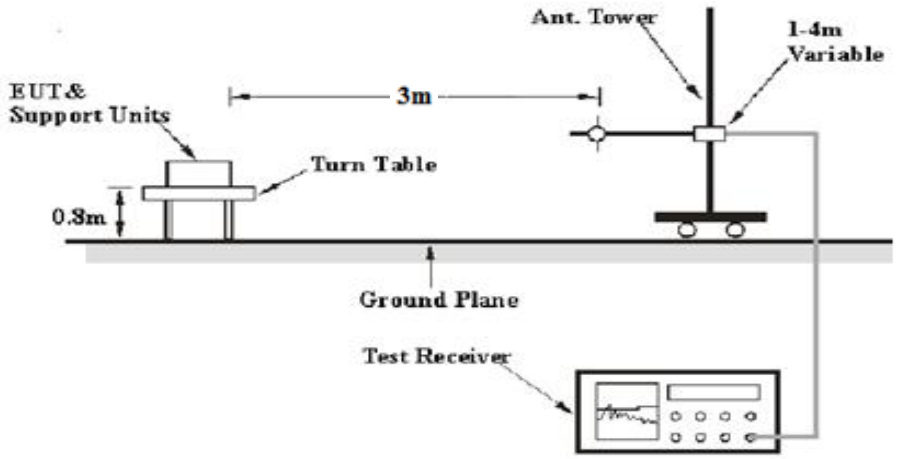
(5) The emission measurements shall be performed using a minimum resolution bandwidth of 1 MHz. A lower resolution bandwidth may be employed near the band edge, when necessary, provided the measured energy is integrated to show the total power over 1 MHz.

(6) 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.

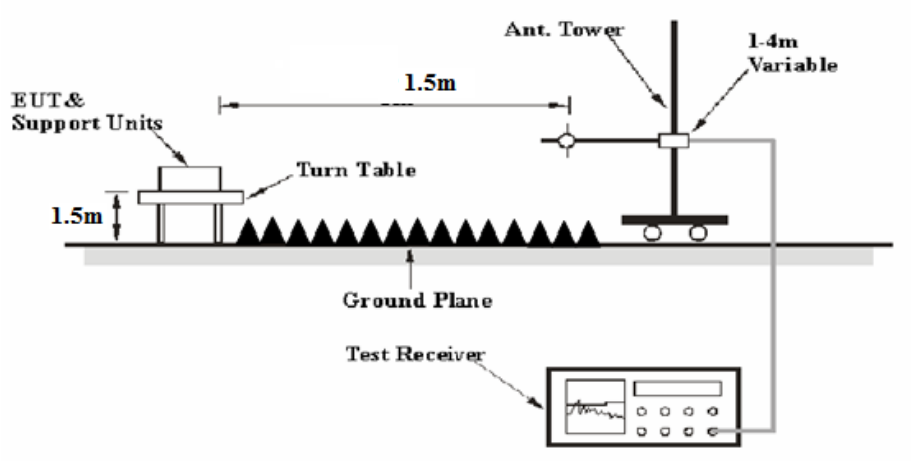
(7) The provisions of §15.205 apply to intentional radiators operating under this section.

EUT Setup

Below 1 GHz:



1-40 GHz:



The radiated emission Below 1GHz tests were performed in the 10 meters chamber test site, above 1GHz tests were performed in the 3 meters chamber test site B, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.407 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

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 & Spectrum Analyzer Setup were set with the following configurations:

30-1000MHz:

Measurement	RBW	Video B/W	IF B/W
QP	120 kHz	300 kHz	120kHz

1GHz- 40GHz:

Measurement	Duty cycle	RBW	Video B/W
PK	Any	1MHz	3 MHz
Ave.	>98%	1MHz	10 Hz
	<98%	1MHz	1/T

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

During the radiated emission test, the adapter was connected to the first AC floor outlet.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1GHz, peak and Average detection modes for frequencies above 1GHz.

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, emission shall be computed as: E [dBμV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

According to C63.10, the above 1G test result shall be extrapolated to the specified distance using an extrapolation fac vhtor of 20dB/decade from 3m to 1.5m or 1m
Distance extrapolation fac vhtor =20 log (specific distance [3m]/test distance [1.5m]) dB= 6.02 dB
or
Distance extrapolation fac vhtor =20 log (specific distance [3m]/test distance [1m]) dB= 9.54 dB

All emissions under the average limit and under the noise floor have not recorded in the report.

Corrected Amplitude & Margin Calculation

For the range 30MHz-1GHz, the Corrected Amplitude is calculated by adding the Antenna Fac vhtor and Cable Loss, and subtrac vhting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Corrected Amplitude = Meter Reading + Antenna Fac vhtor + Cable Loss - Amplifier Gain

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

Margin = Limit - Corrected Amplitude

For the range 1GHz-40GHz, Test performed at 1.5m or 1m, the Corrected Amplitude is calculated by adding the Antenna Fac vhtor and Cable Loss, and subtrac vhting the Amplifier Gain from the Meter Reading and the Distance extrapolation fac vhtor. The basic equation is as follows:

Corrected Amplitude
= Meter Reading + Antenna Fac vhtor + Cable Loss - Amplifier Gain-Distance extrapolation fac vhtor

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

Margin = Limit- Corrected Amplitude

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2020-12-05	2023-12-04
Ducommun Technolagies	Horn Antenna	ARH-2823-02	1007726-01 1302	2020-12-05	2023-12-04
R&S	Spectrum Analyzer	FSV40	101474	2020-07-07	2021-07-07
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
Sinoscite	Bandstop Filters	BSF5150-5850MN-0899-003	0899003	2020-05-06	2021-05-06
Mini Circuits	High Pass Filter	VHF-6010+	31118	2020-06-16	2021-06-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

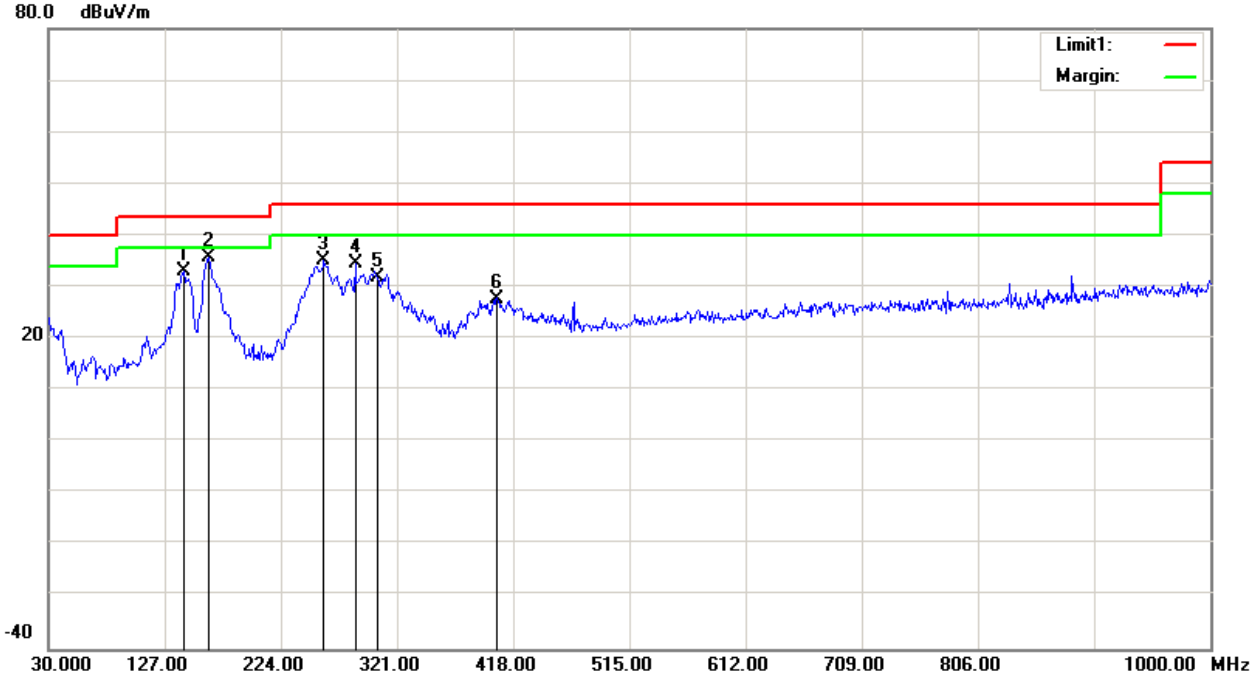
Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	21.4 °C	28.6 °C
Relative Humidity:	53%	50%
ATM Pressure:	100.1kPa	100.8 kPa
Tester:	Walker Yuan	Jeremy Liang
Test Date:	2021-06-12	2021-05-23

Test Mode: Transmitting

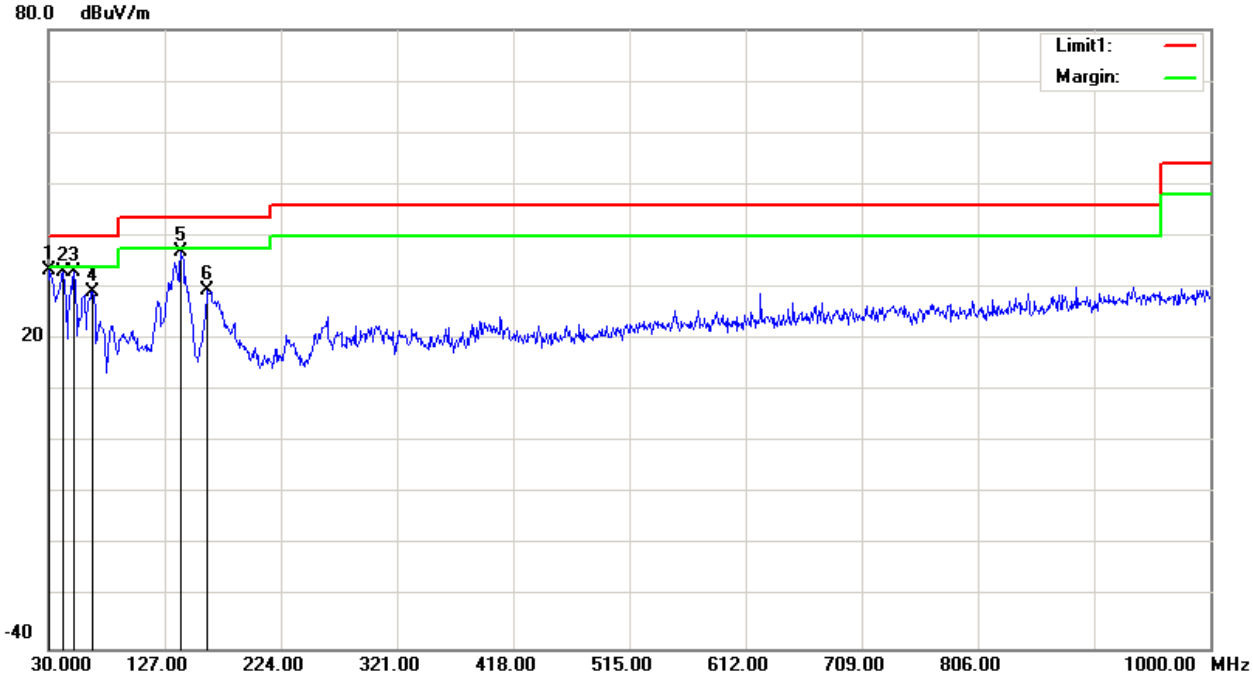
1) Below 1GHz(802.11a 5785 MHz was the worst):

Horizontal:



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Fac vhtor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
143.4900	42.13	peak	-9.02	33.11	43.50	10.39
163.8600	44.92	peak	-9.28	35.64	43.50	7.86
259.8900	44.48	peak	-9.32	35.16	46.00	10.84
286.0800	42.81	peak	-8.22	34.59	46.00	11.41
304.5100	39.06	peak	-7.20	31.86	46.00	14.14
404.4200	32.81	peak	-5.01	27.80	46.00	18.20

Vertical



Frequency (MHz)	Receiver Reading (dBµV)	Detector	Correction Fac vhtor (dB/m)	Cord. Amp. (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.9700	37.96	peak	-4.66	33.30	40.00	6.70
41.6400	43.46	peak	-10.37	33.09	40.00	6.91
51.3400	49.32	peak	-16.24	33.08	40.00	6.92
66.8600	45.70	peak	-16.41	29.29	40.00	10.71
140.5800	46.26	peak	-9.22	37.04	43.50	6.46
162.8900	38.76	peak	-9.39	29.37	43.50	14.13

2) 1GHz-40GHz:
5150-5250MHz
802.11a

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5180 MHz										
5180.00	66.31	PK	H	33.59	3.58	0.00	103.48	97.46	N/A	N/A
5180.00	57.48	AV	H	33.59	3.58	0.00	94.65	88.63	N/A	N/A
5180.00	65.19	PK	V	33.59	3.58	0.00	102.36	96.34	N/A	N/A
5180.00	57.08	AV	V	33.59	3.58	0.00	94.25	88.23	N/A	N/A
5150.00	32.51	PK	H	33.54	3.56	0.00	69.61	63.59	74.00	10.41
5150.00	19.76	AV	H	33.54	3.56	0.00	56.86	50.84	54.00	3.16
10360.00	45.85	PK	H	38.17	6.29	25.46	64.85	58.83	68.20	9.37
15540.00	36.24	PK	H	38.06	8.85	24.27	58.88	52.86	74.00	21.14
15540.00	24.75	AV	H	38.06	8.85	24.27	47.39	41.37	54.00	12.63
Middle Channel: 5200 MHz										
5200.00	65.98	PK	H	33.62	3.60	0.00	103.20	97.18	N/A	N/A
5200.00	56.87	AV	H	33.62	3.60	0.00	94.09	88.071	N/A	N/A
5200.00	65.14	PK	V	33.62	3.60	0.00	102.36	96.34	N/A	N/A
5200.00	56.87	AV	V	33.62	3.60	0.00	94.09	88.07	N/A	N/A
10400.00	41.41	PK	H	38.18	6.32	25.46	60.45	54.43	68.20	13.77
15600.00	36.24	PK	H	38.00	8.83	24.31	58.76	52.74	74.00	21.26
15600.00	24.11	AV	H	38.00	8.83	24.31	46.63	40.61	54.00	13.39
High Channel: 5240 MHz										
5240.00	65.62	PK	H	33.68	3.52	0.00	102.82	96.8	N/A	N/A
5240.00	56.81	AV	H	33.68	3.52	0.00	94.01	87.99	N/A	N/A
5240.00	65.13	PK	V	33.68	3.52	0.00	102.33	96.31	N/A	N/A
5240.00	56.89	AV	V	33.68	3.52	0.00	94.09	88.07	N/A	N/A
5350.00	30.67	PK	H	33.86	3.52	0.00	68.05	62.03	74.00	11.97
5350.00	19.43	AV	H	33.86	3.52	0.00	56.81	50.79	54.00	3.21
10480.00	39.22	PK	H	38.20	6.37	25.47	58.32	52.3	68.20	15.90
15720.00	37.42	PK	H	37.88	8.79	24.39	59.70	53.68	74.00	20.32
15720.00	25.34	AV	H	37.88	8.79	24.39	47.62	41.6	54.00	12.40

802.11n ht20

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5180 MHz										
5180.00	66.89	PK	H	33.59	3.58	0.00	104.06	98.04	N/A	N/A
5180.00	57.72	AV	H	33.59	3.58	0.00	94.89	88.87	N/A	N/A
5180.00	63.82	PK	V	33.59	3.58	0.00	100.99	94.97	N/A	N/A
5180.00	55.43	AV	V	33.59	3.58	0.00	92.60	86.58	N/A	N/A
5150.00	31.86	PK	H	33.54	3.56	0.00	68.96	62.94	74.00	11.06
5150.00	19.79	AV	H	33.54	3.56	0.00	56.89	50.87	54.00	3.13
10360.00	38.06	PK	H	38.17	6.29	25.46	57.06	51.04	68.20	17.16
15540.00	36.35	PK	H	38.06	8.85	24.27	58.99	52.97	74.00	21.03
15540.00	24.11	AV	H	38.06	8.85	24.27	46.75	40.73	54.00	13.27
Middle Channel: 5200 MHz										
5200.00	65.18	PK	H	33.62	3.60	0.00	102.40	96.38	N/A	N/A
5200.00	56.28	AV	H	33.62	3.60	0.00	93.50	87.48	N/A	N/A
5200.00	65.10	PK	V	33.62	3.60	0.00	102.32	96.3	N/A	N/A
5200.00	56.08	AV	V	33.62	3.60	0.00	93.30	87.28	N/A	N/A
10400.00	37.51	PK	H	38.18	6.32	25.46	56.55	50.53	68.20	17.67
15600.00	36.24	PK	H	38.00	8.83	24.31	58.76	52.74	74.00	21.26
15600.00	24.55	AV	H	38.00	8.83	24.31	47.07	41.05	54.00	12.95
High Channel: 5240 MHz										
5240.00	64.78	PK	H	33.68	3.52	0.00	101.98	95.96	N/A	N/A
5240.00	55.74	AV	H	33.68	3.52	0.00	92.94	86.92	N/A	N/A
5240.00	64.67	PK	V	33.68	3.52	0.00	101.87	95.85	N/A	N/A
5240.00	56.42	AV	V	33.68	3.52	0.00	93.62	87.6	N/A	N/A
5350.00	31.79	PK	H	33.86	3.52	0.00	69.17	63.15	74.00	10.85
5350.00	19.34	AV	H	33.86	3.52	0.00	56.72	50.7	54.00	3.30
10480.00	41.08	PK	H	38.20	6.37	25.47	60.18	54.16	68.20	14.04
15720.00	37.54	PK	H	37.88	8.79	24.39	59.82	53.8	74.00	20.20
15720.00	25.36	AV	H	37.88	8.79	24.39	47.64	41.62	54.00	12.38

802.11n ht40

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5190 MHz										
5190.00	62.45	PK	H	33.60	3.59	0.00	99.64	93.62	N/A	N/A
5190.00	53.13	AV	H	33.60	3.59	0.00	90.32	84.3	N/A	N/A
5190.00	62.45	PK	V	33.60	3.59	0.00	99.64	93.62	N/A	N/A
5190.00	53.03	AV	V	33.60	3.59	0.00	90.22	84.2	N/A	N/A
5150.00	34.17	PK	V	33.54	3.56	0.00	71.27	65.25	74.00	8.75
5150.00	22.36	AV	V	33.54	3.56	0.00	59.46	53.44	54.00	0.56
10380.00	35.69	PK	V	38.18	6.31	25.46	54.72	48.7	68.20	19.50
15570.00	35.63	PK	V	38.03	8.84	24.29	58.21	52.19	74.00	21.81
15570.00	23.34	AV	V	38.03	8.84	24.29	45.92	39.9	54.00	14.10
High Channel: 5230 MHz										
5230.00	62.94	PK	H	33.67	3.54	0.00	100.15	94.13	N/A	N/A
5230.00	52.33	AV	H	33.67	3.54	0.00	89.54	83.52	N/A	N/A
5230.00	60.68	PK	V	33.67	3.54	0.00	97.89	91.87	N/A	N/A
5230.00	51.16	AV	V	33.67	3.54	0.00	88.37	82.35	N/A	N/A
5350.00	31.16	PK	H	33.86	3.52	0.00	68.54	62.52	74.00	11.48
5350.00	19.43	AV	H	33.86	3.52	0.00	56.81	50.79	54.00	3.21
10460.00	37.62	PK	H	38.19	6.36	25.47	56.70	50.68	68.20	17.52
15690.00	36.24	PK	H	37.91	8.80	24.37	58.58	52.56	74.00	21.44
15690.00	24.15	AV	H	37.91	8.80	24.37	46.49	40.47	54.00	13.53

5725-5850MHz
802.11a

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5745 MHz										
5745.00	61.74	PK	H	34.20	3.69	0.00	99.63	93.61	N/A	N/A
5745.00	52.82	AV	H	34.20	3.69	0.00	90.71	84.69	N/A	N/A
5745.00	58.81	PK	V	34.20	3.69	0.00	96.70	90.68	N/A	N/A
5745.00	50.22	AV	V	34.20	3.69	0.00	88.11	82.09	N/A	N/A
5725.00	36.43	PK	H	34.19	3.69	0.00	74.31	68.29	122.20	53.91
5720.00	32.77	PK	H	34.19	3.69	0.00	70.65	64.63	110.80	46.17
5700.00	33.02	PK	H	34.18	3.68	0.00	70.88	64.86	105.20	40.34
5650.00	30.41	PK	H	34.16	3.63	0.00	68.20	62.18	68.20	6.02
11490.00	34.66	PK	H	38.99	6.59	25.51	54.73	48.71	74.00	25.29
11490.00	23.15	AV	H	38.99	6.59	25.51	43.22	37.2	54.00	16.80
17235.00	34.96	PK	H	41.56	8.78	23.72	61.58	55.56	68.20	12.64
Middle Channel: 5785 MHz										
5785.00	61.22	PK	H	34.21	3.71	0.00	99.14	93.12	N/A	N/A
5785.00	52.89	AV	H	34.21	3.71	0.00	90.81	84.79	N/A	N/A
5785.00	58.66	PK	V	34.21	3.71	0.00	96.58	90.56	N/A	N/A
5785.00	50.31	AV	V	34.21	3.71	0.00	88.23	82.21	N/A	N/A
11570.00	33.96	PK	H	39.00	6.61	25.46	54.11	48.09	74.00	25.91
11570.00	21.47	AV	H	39.00	6.61	25.46	41.62	35.6	54.00	18.40
17355.00	35.47	PK	H	42.26	8.81	23.60	62.94	56.92	68.20	11.28
High Channel: 5825 MHz										
5825.00	61.74	PK	H	34.23	3.73	0.00	99.70	93.68	N/A	N/A
5825.00	52.98	AV	H	34.23	3.73	0.00	90.94	84.92	N/A	N/A
5825.00	57.83	PK	V	34.23	3.73	0.00	95.79	89.77	N/A	N/A
5825.00	49.36	AV	V	34.23	3.73	0.00	87.32	81.3	N/A	N/A
5850.00	33.57	PK	H	34.24	3.75	0.00	71.56	65.54	122.20	56.66
5855.00	33.97	PK	H	34.24	3.75	0.00	71.96	65.94	110.80	44.86
5875.00	33.17	PK	H	34.25	3.77	0.00	71.19	65.17	105.20	40.03
5925.00	31.97	PK	H	34.27	3.80	0.00	70.04	64.02	68.20	4.18
11650.00	35.96	PK	H	39.00	6.64	25.41	56.19	50.17	74.00	23.83
11650.00	23.85	AV	H	39.00	6.64	25.41	44.08	38.06	54.00	15.94
17475.00	35.24	PK	H	42.96	8.84	23.48	63.56	57.54	68.20	10.66

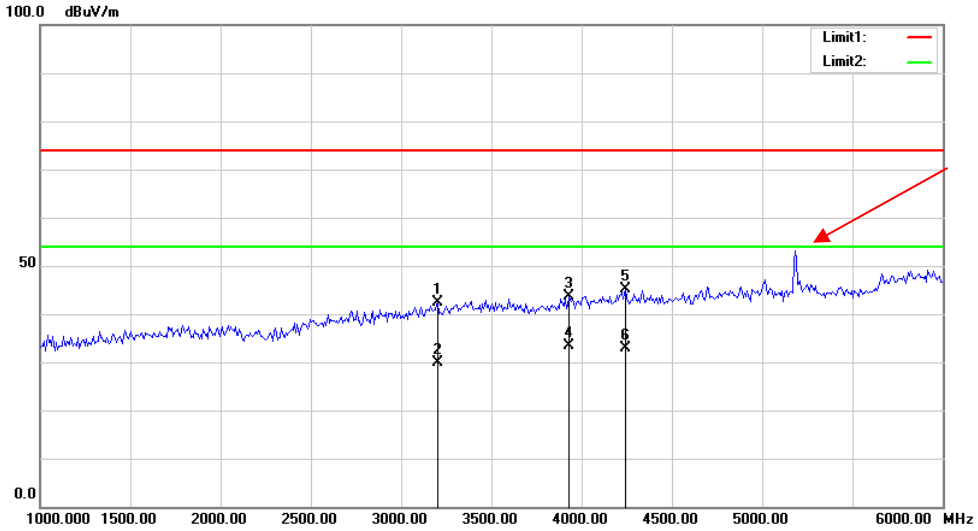
802.11n ht20

Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBμV/m)	Extrapolation result (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5745 MHz										
5745.00	63.36	PK	H	34.20	3.69	0.00	101.25	95.23	N/A	N/A
5745.00	54.37	AV	H	34.20	3.69	0.00	92.26	86.24	N/A	N/A
5745.00	57.48	PK	V	34.20	3.69	0.00	95.37	89.35	N/A	N/A
5745.00	48.72	AV	V	34.20	3.69	0.00	86.61	80.59	N/A	N/A
5725.00	38.26	PK	H	34.19	3.69	0.00	76.14	70.12	122.20	52.08
5720.00	32.52	PK	H	34.19	3.69	0.00	70.40	64.38	110.80	46.42
5700.00	32.45	PK	H	34.18	3.68	0.00	70.31	64.29	105.20	40.91
5650.00	32.11	PK	H	34.16	3.63	0.00	69.90	63.88	68.20	4.32
11490.00	35.91	PK	H	38.99	6.59	25.51	55.98	49.96	74.00	24.04
11490.00	23.85	AV	H	38.99	6.59	25.51	43.92	37.9	54.00	16.10
17235.00	35.96	PK	H	41.56	8.78	23.72	62.58	56.56	68.20	11.64
Middle Channel: 5785 MHz										
5785.00	62.54	PK	H	34.21	3.71	0.00	100.46	94.44	N/A	N/A
5785.00	54.12	AV	H	34.21	3.71	0.00	92.04	86.02	N/A	N/A
5785.00	56.88	PK	V	34.21	3.71	0.00	94.80	88.78	N/A	N/A
5785.00	47.43	AV	V	34.21	3.71	0.00	85.35	79.33	N/A	N/A
11570.00	35.96	PK	H	39.00	6.61	25.46	56.11	50.09	74.00	23.91
11570.00	23.74	AV	H	39.00	6.61	25.46	43.89	37.87	54.00	16.13
17355.00	36.02	PK	H	42.26	8.81	23.60	63.49	57.47	68.20	10.73
High Channel: 5825 MHz										
5825.00	62.40	PK	H	34.23	3.73	0.00	100.36	94.34	N/A	N/A
5825.00	53.86	AV	H	34.23	3.73	0.00	91.82	85.8	N/A	N/A
5825.00	56.74	PK	V	34.23	3.73	0.00	94.70	88.68	N/A	N/A
5825.00	47.29	AV	V	34.23	3.73	0.00	85.25	79.23	N/A	N/A
5850.00	35.61	PK	H	34.24	3.75	0.00	73.60	67.58	122.20	54.62
5855.00	33.29	PK	H	34.24	3.75	0.00	71.28	65.26	110.80	45.54
5875.00	33.01	PK	H	34.25	3.77	0.00	71.03	65.01	105.20	40.19
5925.00	32.56	PK	H	34.27	3.80	0.00	70.63	64.61	68.20	3.59
11650.00	35.86	PK	H	39.00	6.64	25.41	56.09	50.07	74.00	23.93
11650.00	23.85	AV	H	39.00	6.64	25.41	44.08	38.06	54.00	15.94
17475.00	35.68	PK	H	42.96	8.84	23.48	64.00	57.98	68.20	10.22

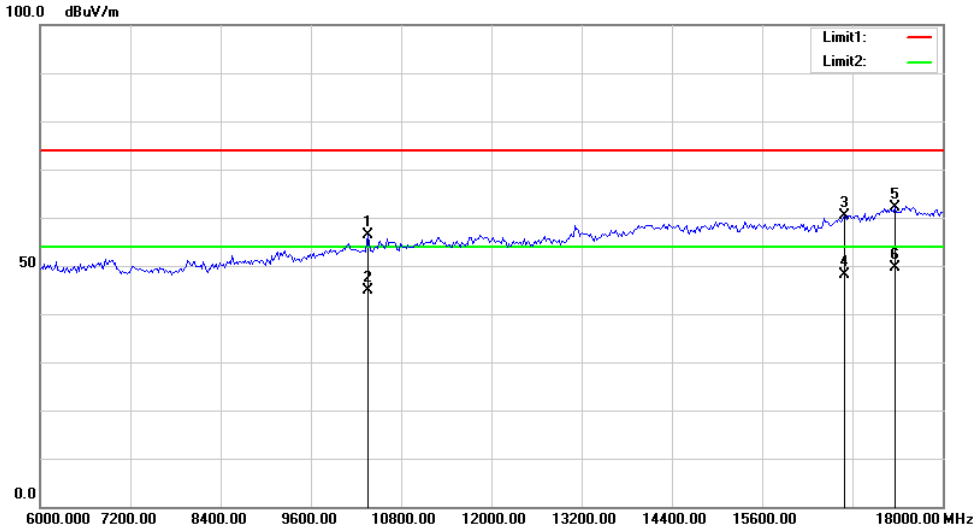
802.11n ht40

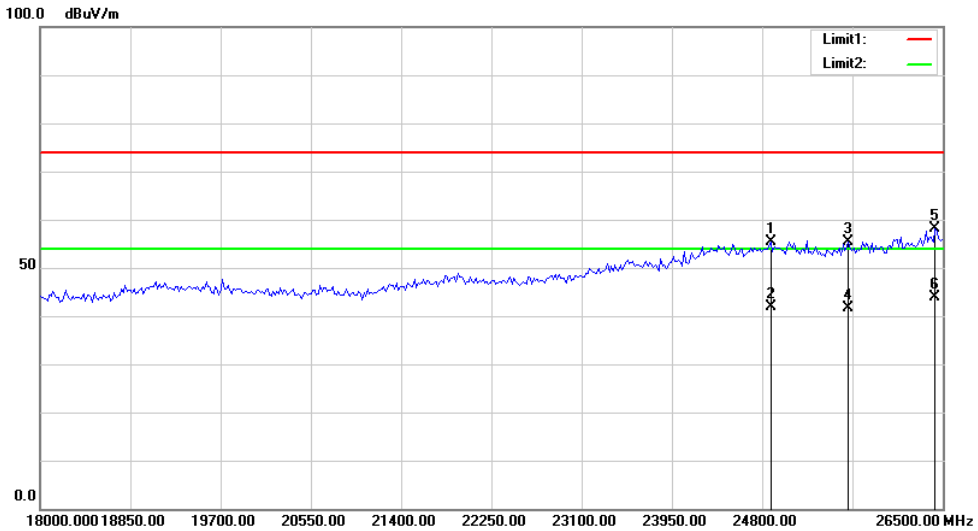
Frequency (MHz)	Receiver		Rx Antenna		Cable loss (dB)	Amplifier Gain (dB)	Corrected Amplitude (dBµV/m)	Extrapolation result (dBµV/m)	Limit (dBµV/m)	Margin (dB)
	Reading (dBµV)	Detector	Polar (H/V)	Fac vhtor (dB/m)						
Low Channel: 5755 MHz										
5755.00	59.36	PK	H	34.20	3.70	0.00	97.26	91.24	N/A	N/A
5755.00	50.56	AV	H	34.20	3.70	0.00	88.46	82.44	N/A	N/A
5755.00	55.41	PK	V	34.20	3.70	0.00	93.31	87.29	N/A	N/A
5755.00	46.96	AV	V	34.20	3.70	0.00	84.86	78.84	N/A	N/A
5725.00	37.30	PK	H	34.19	3.69	0.00	75.18	69.16	122.20	53.04
5720.00	36.08	PK	H	34.19	3.69	0.00	73.96	67.94	110.80	42.86
5700.00	32.65	PK	H	34.18	3.68	0.00	70.51	64.49	105.20	40.71
5650.00	31.29	PK	H	34.16	3.63	0.00	69.08	63.06	68.20	5.14
11510.00	35.92	PK	H	39.00	6.59	25.50	56.01	49.99	74.00	24.01
11510.00	23.81	AV	H	39.00	6.59	25.50	43.90	37.88	54.00	16.12
17265.00	36.34	PK	H	41.74	8.79	23.69	63.18	57.16	68.20	11.04
High Channel: 5795 MHz										
5795.00	59.37	PK	H	34.22	3.71	0.00	97.30	91.28	N/A	N/A
5795.00	49.95	AV	H	34.22	3.71	0.00	87.88	81.86	N/A	N/A
5795.00	55.08	PK	V	34.22	3.71	0.00	93.01	86.99	N/A	N/A
5795.00	45.25	AV	V	34.22	3.71	0.00	83.18	77.16	N/A	N/A
5850.00	33.62	PK	H	34.24	3.75	0.00	71.61	65.59	122.20	56.61
5855.00	32.92	PK	H	34.24	3.75	0.00	70.91	64.89	110.80	45.91
5875.00	32.42	PK	H	34.25	3.77	0.00	70.44	64.42	105.20	40.78
5925.00	31.59	PK	H	34.27	3.80	0.00	69.66	63.64	68.20	4.56
11590.00	36.04	PK	H	39.00	6.62	25.45	56.21	50.19	74.00	23.81
11590.00	24.09	AV	H	39.00	6.62	25.45	44.26	38.24	54.00	15.76
17385.00	36.46	PK	H	42.43	8.82	23.57	64.14	58.12	68.20	10.08

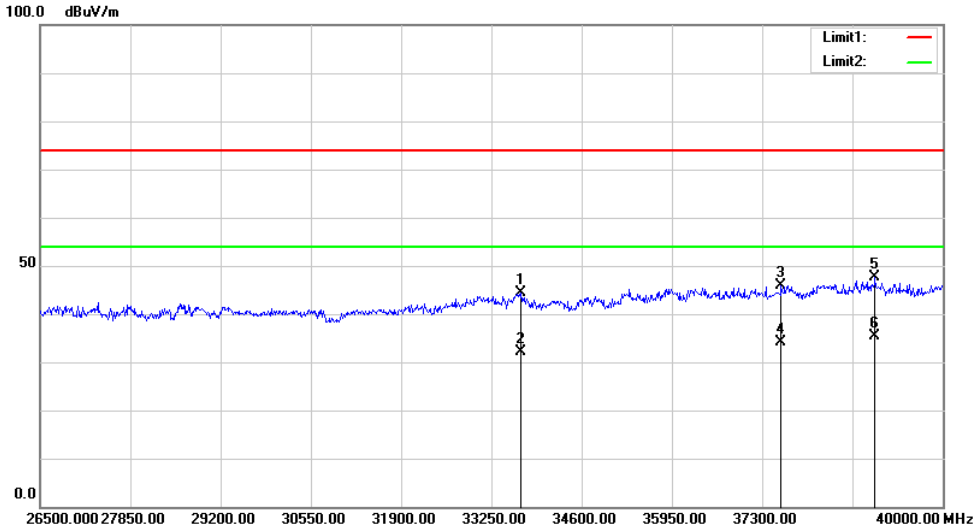
Test Plots(For worst mode 802.11a 5180MHz)
Horizontal



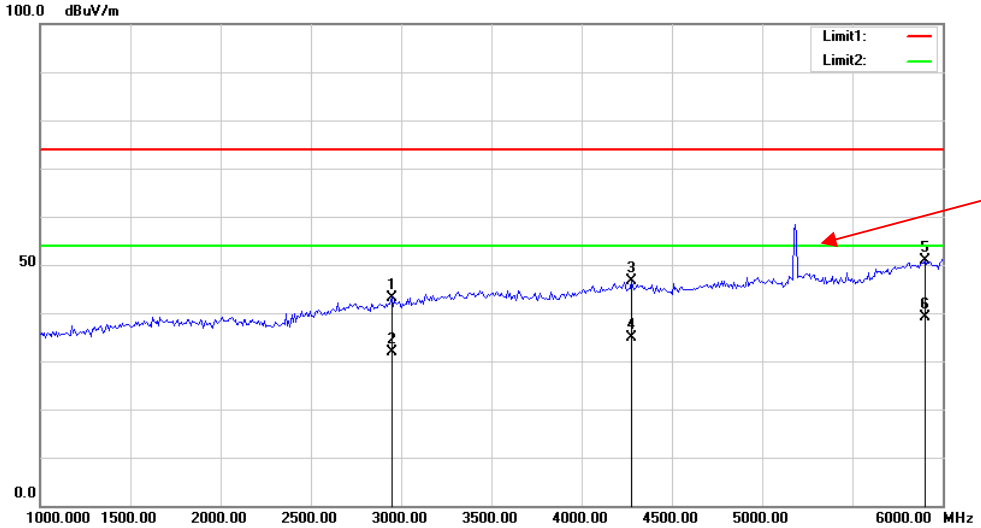
Fundamental Test with Band Rejection Filter



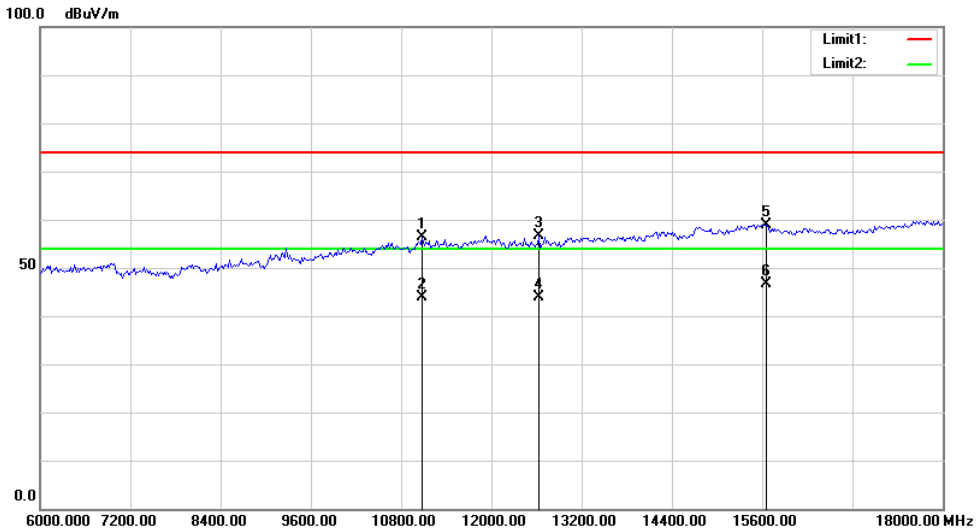


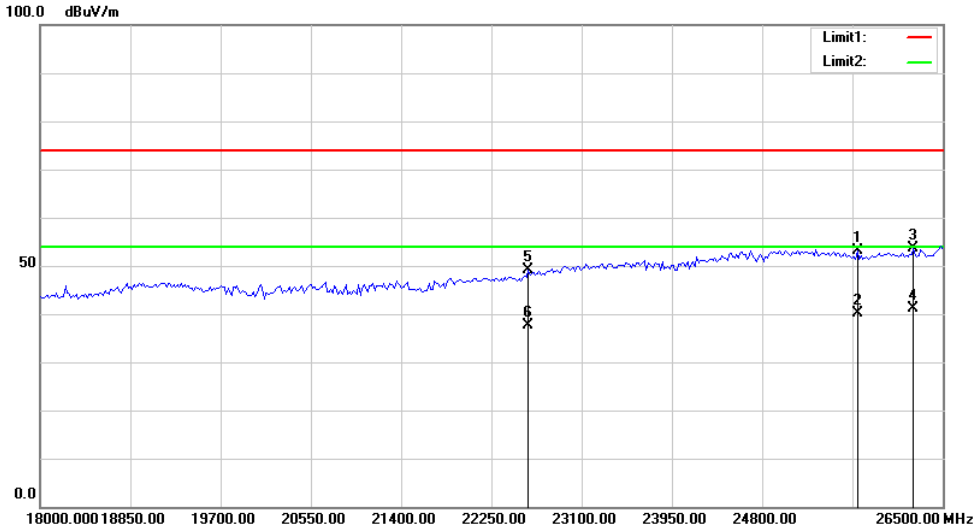


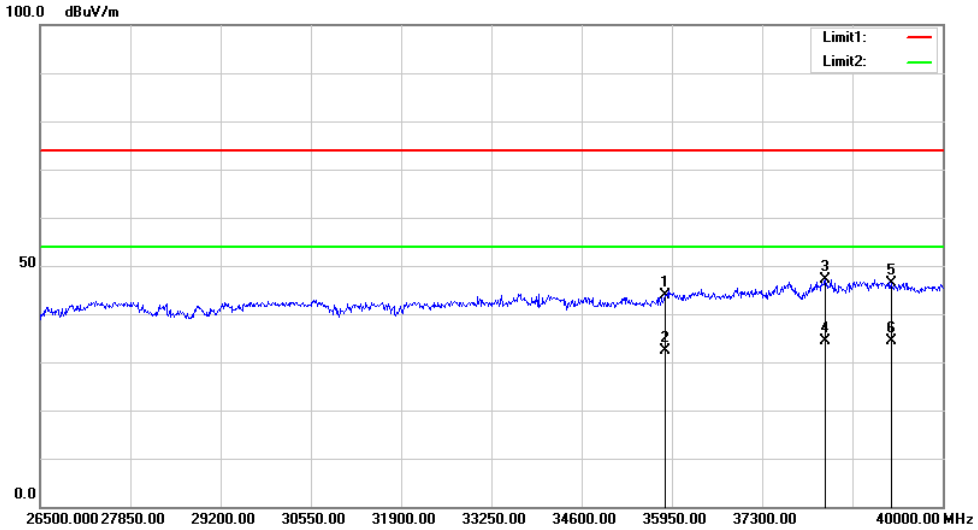
Vertical



Fundamental Test with Band Rejection Filter




100.0 dBuV/m
Limit1:
Limit2:
50
0.0
18000.000 18850.00 19700.00 20550.00 21400.00 22250.00 23100.00 23950.00 24800.00 26500.00 MHz


100.0 dBuV/m
Limit1:
Limit2:
50
0.0
26500.000 27850.00 29200.00 30550.00 31900.00 33250.00 34600.00 35950.00 37300.00 40000.00 MHz

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

Applicable Standard

15.407(a) (e).

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26.8°C
Relative Humidity:	48 %
ATM Pressure:	100.2 kPa
Tester:	Joe Qiao
Test Date:	2021.06.22

Test Result: Pass.

Please refer to the following tables and plots.

Test mode: Transmitting

5150-5250MHz:

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5180	19.910	16.987
	5200	20.064	16.859
	5240	19.897	17.051
802.11n ht20	5180	19.769	16.923
	5200	20.026	17.692
	5240	20.900	17.756
802.11n ht40	5190	40.000	36.154
	5230	39.872	36.154

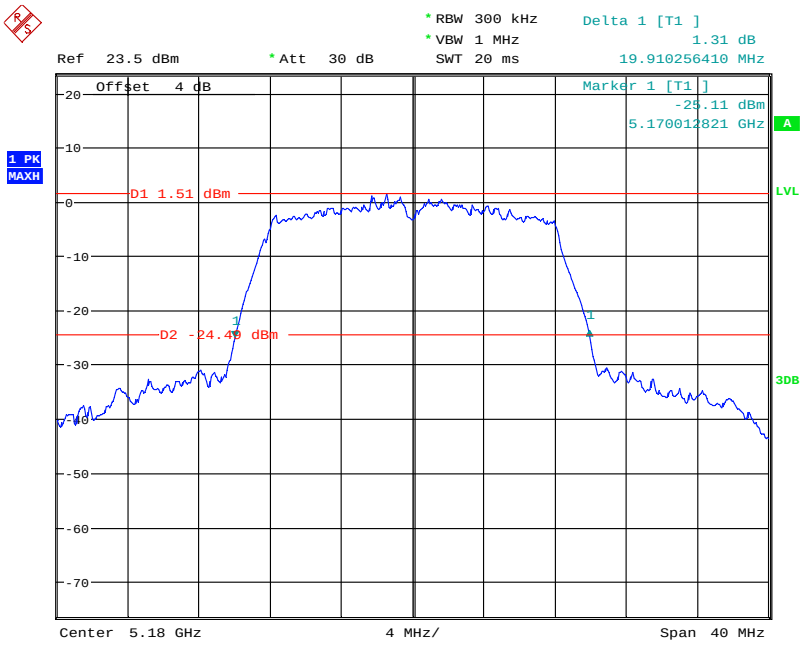
5725-5850MHz:

Mode	Frequency (MHz)	6 dB Emission Bandwidth (MHz)	6 dB Emission Bandwidth Limits (MHz)	99% Occupied Bandwidth (MHz)
802.11 a	5745	16.423	≥0.5	16.987
	5785	16.385	≥0.5	16.603
	5825	16.423	≥0.5	17.051
802.11n ht20	5745	17.692	≥0.5	17.756
	5785	17.667	≥0.5	17.756
	5825	17.667	≥0.5	17.821
802.11n ht40	5755	36.423	≥0.5	36.154
	5795	36.372	≥0.5	36.154

Note: the 99% Occupied Bandwidth have not fall into the band 5250-5350MHz or 5470-5725MHz, please refer to the test plots of 99% Occupied Bandwidth.

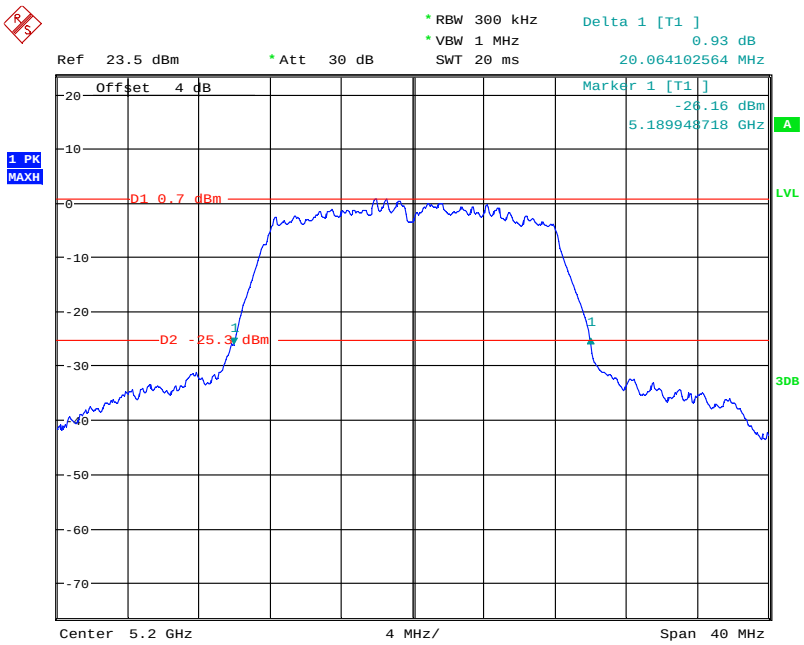
5150-5250MHz:
26dB Emission Bandwidth:

802.11a Low Channel



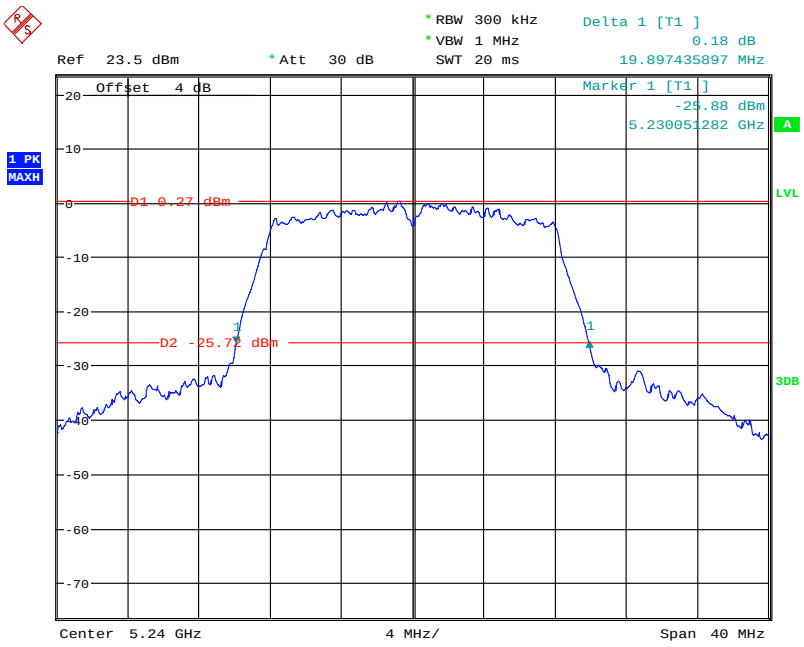
Date: 22.JUN.2021 11:16:32

802.11a Middle Channel



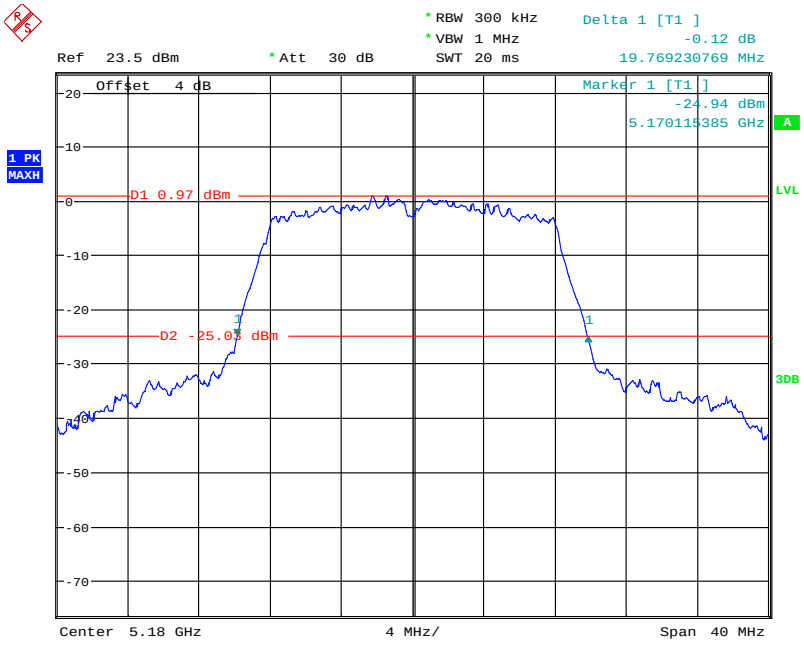
Date: 22.JUN.2021 11:14:22

802.11a High Channel



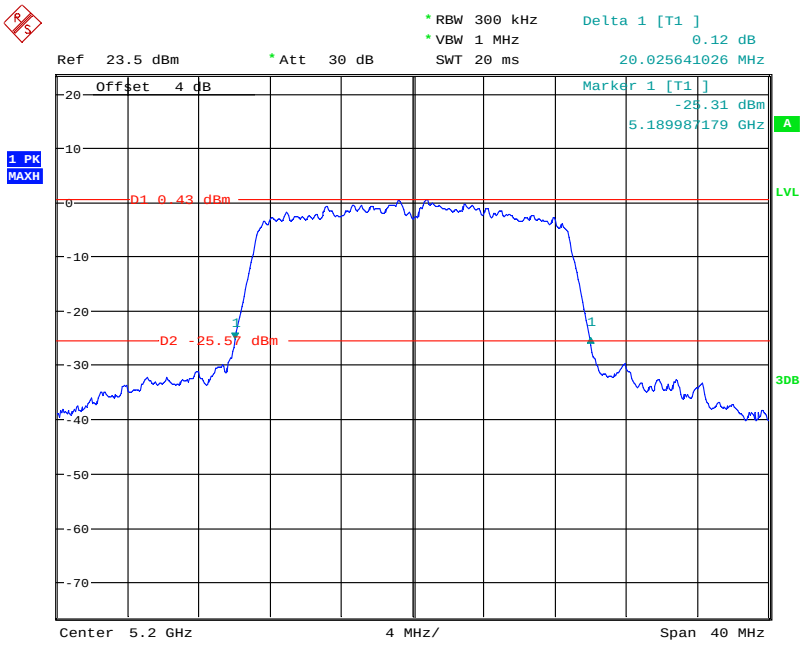
Date: 22.JUN.2021 11:11:32

802.11n ht20 Low Channel



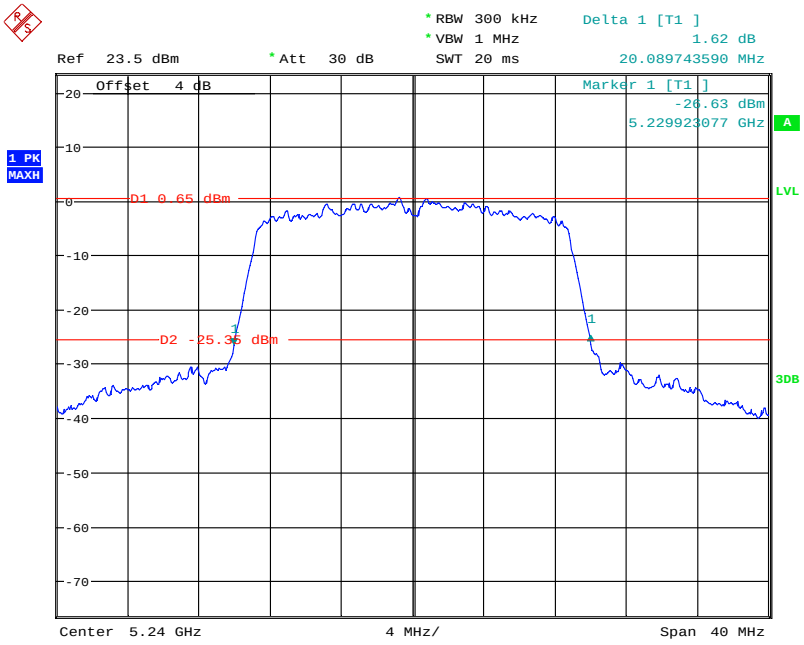
Date: 22.JUN.2021 11:21:13

802.11n ht20 Middle Channel



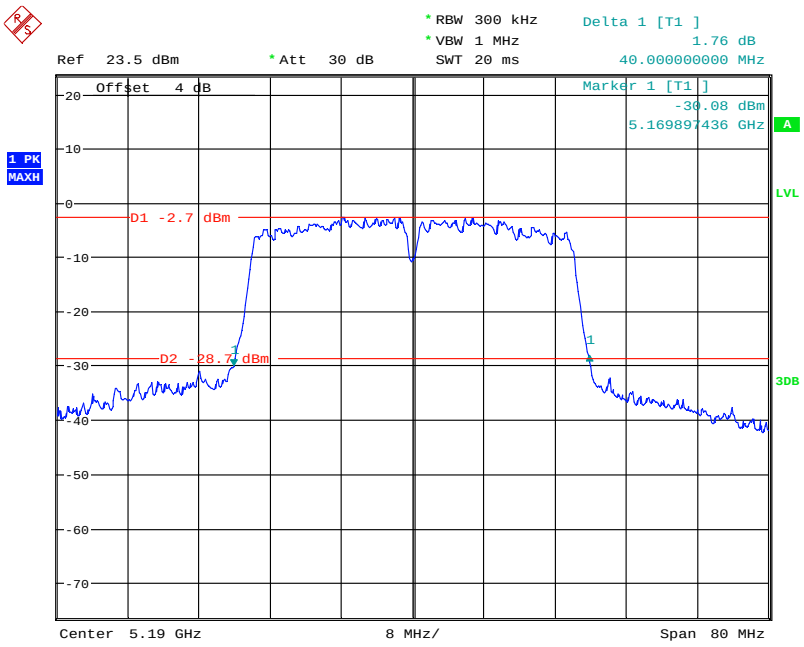
Date: 22.JUN.2021 11:23:41

802.11n ht20 High Channel



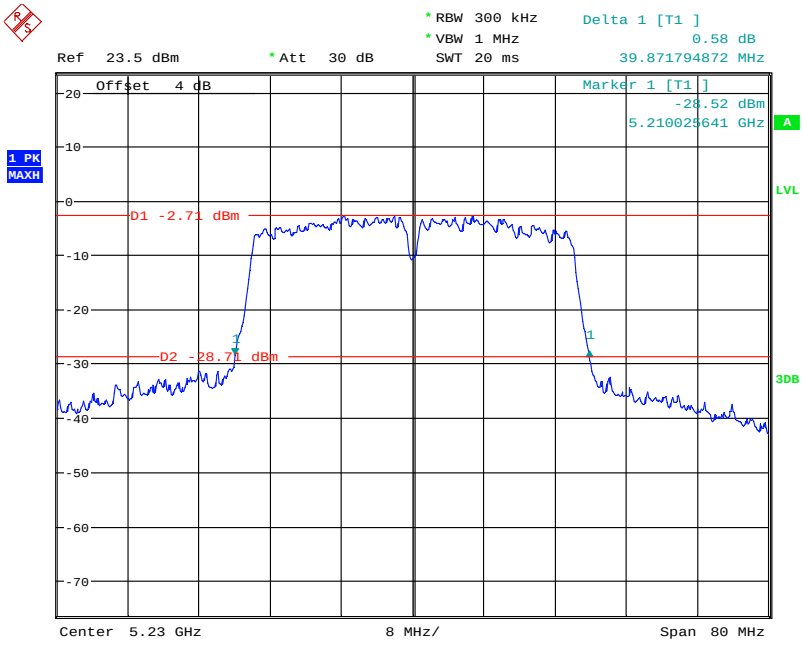
Date: 22.JUN.2021 11:26:15

802.11n ht40 Low Channel



Date: 22.JUN.2021 11:30:04

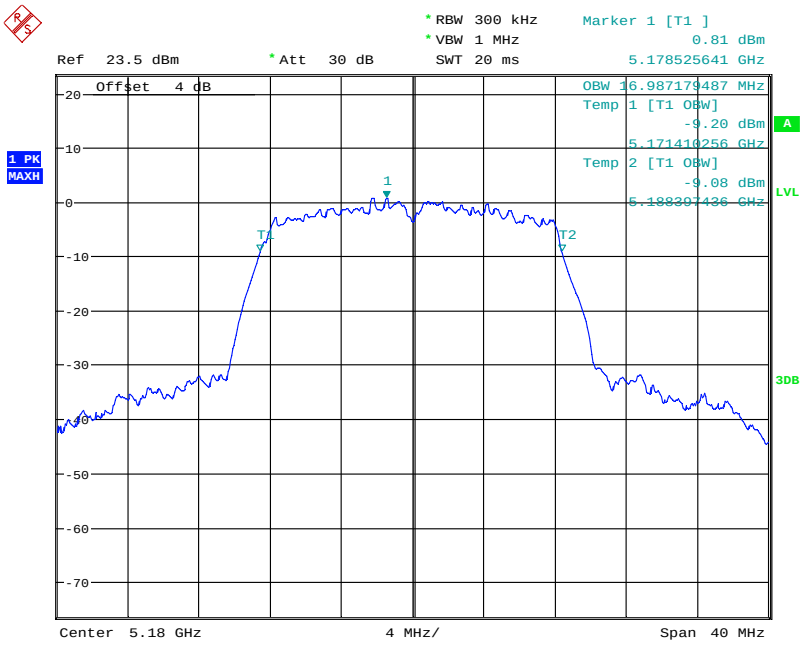
802.11n ht40 High Channel



Date: 22.JUN.2021 11:32:00

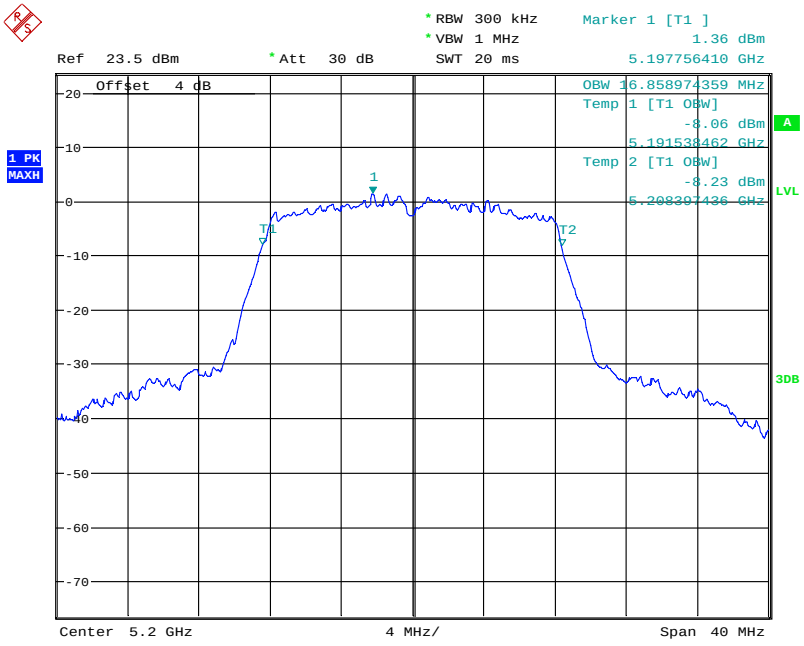
99% Occupied Bandwidth:

802.11a Low Channel



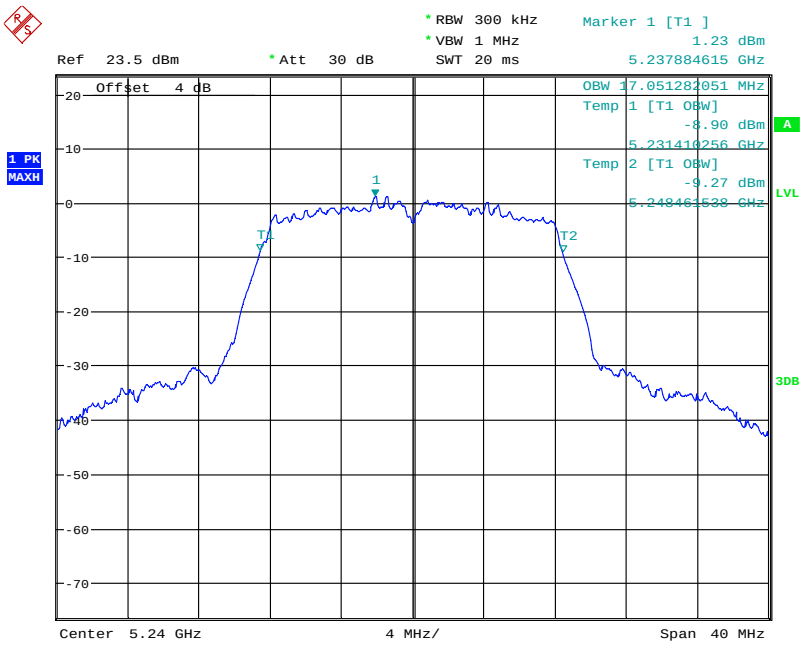
Date: 22.JUN.2021 12:24:31

802.11a Middle Channel



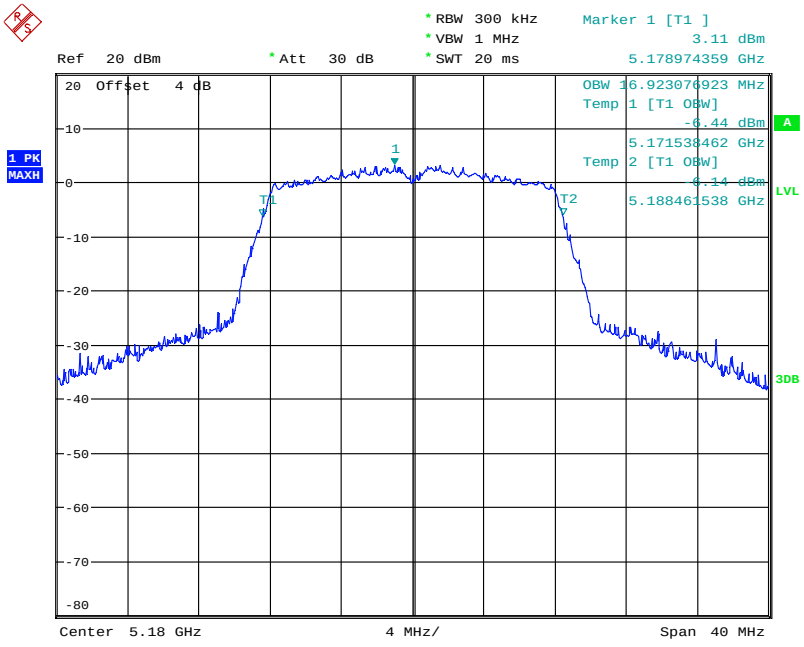
Date: 22.JUN.2021 12:26:24

802.11a High Channel



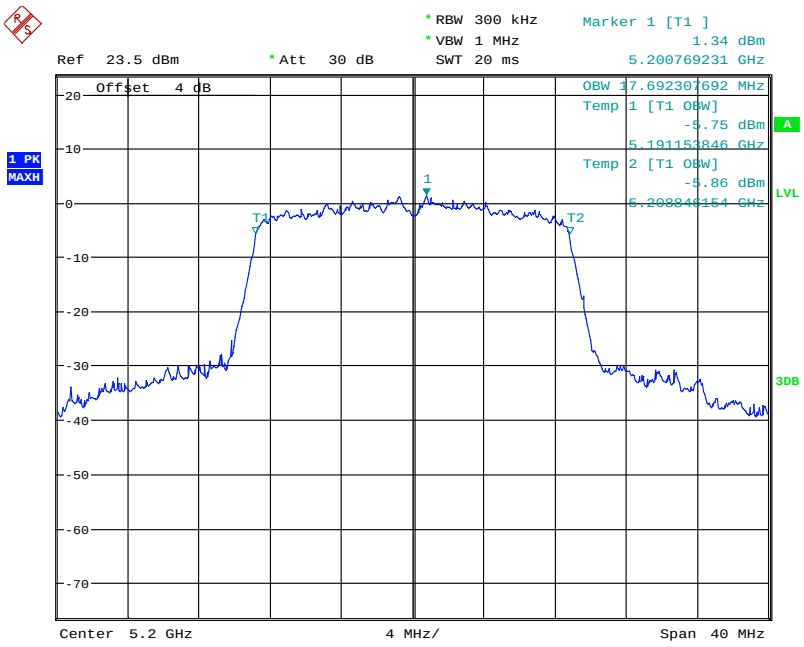
Date: 22.JUN.2021 12:27:42

802.11n ht20 Low Channel



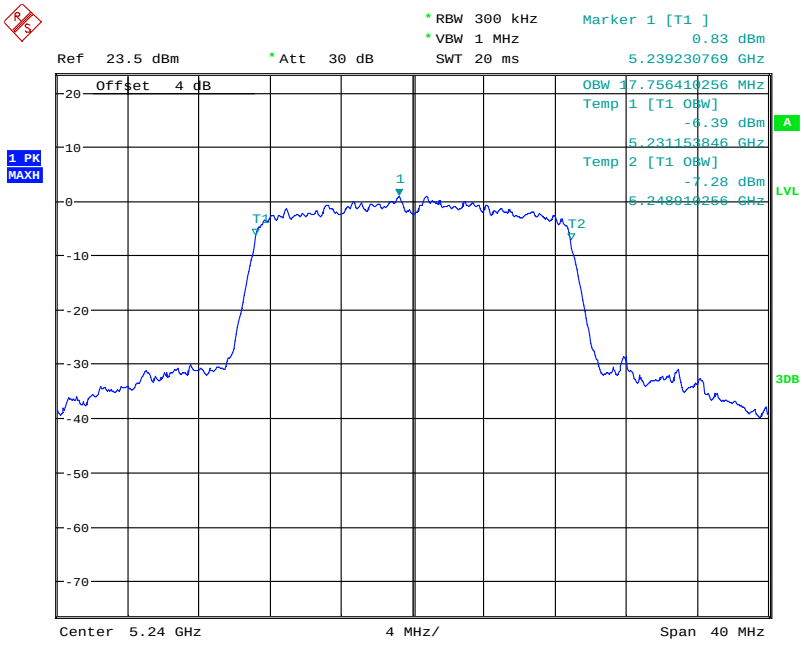
Date: 6.JUL.2021 20:47:30

802.11n ht20 Middle Channel



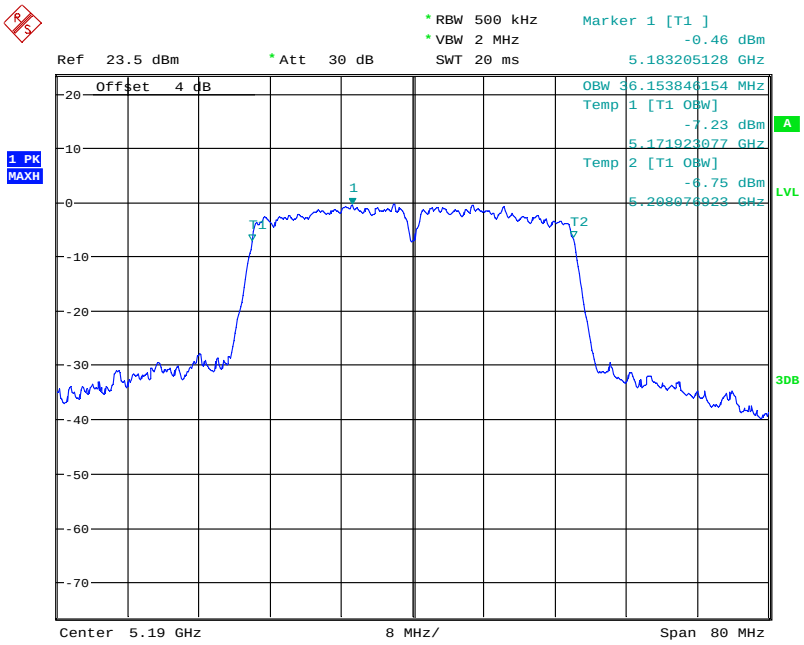
Date: 22.JUN.2021 12:30:41

802.11n ht20 High Channel



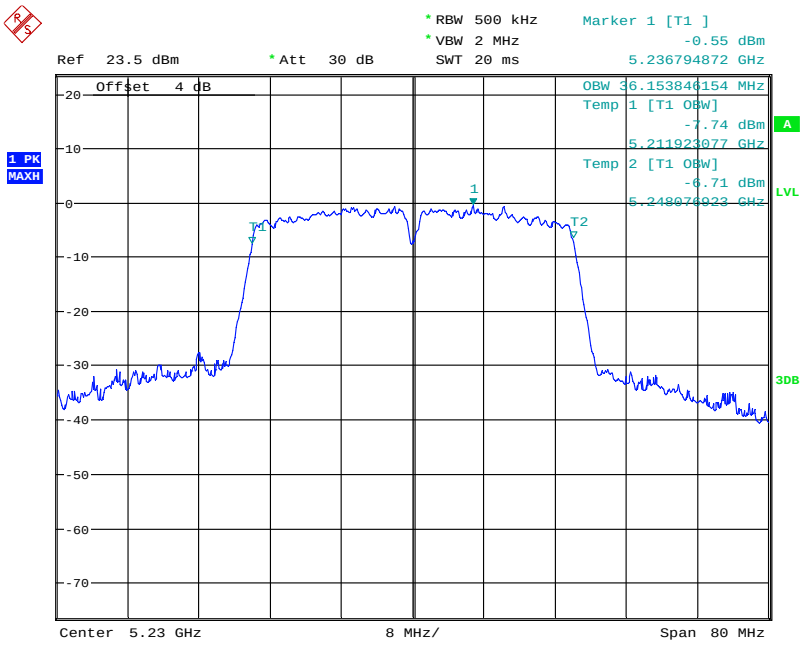
Date: 22.JUN.2021 12:29:46

802.11n ht40 Low Channel



Date: 22.JUN.2021 12:33:56

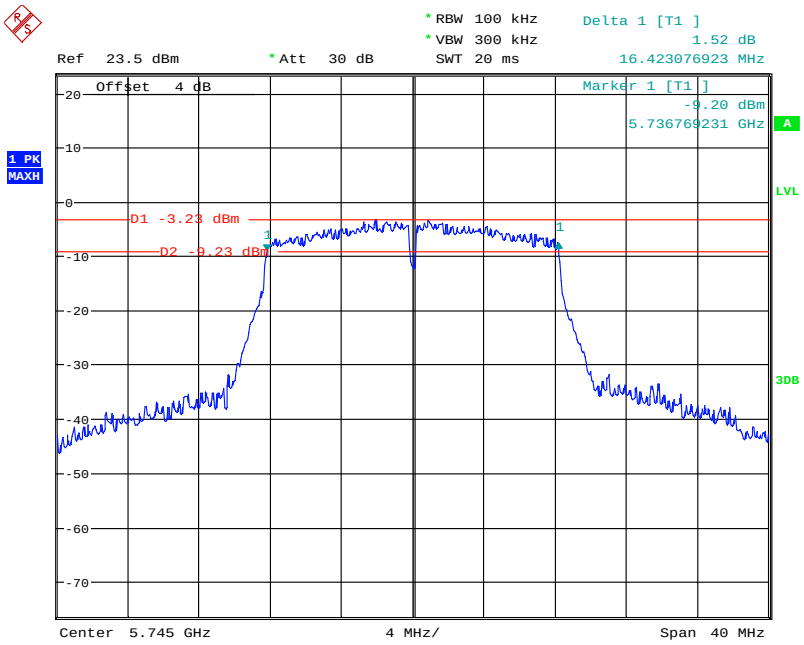
802.11n ht40 High Channel



Date: 22.JUN.2021 12:34:45

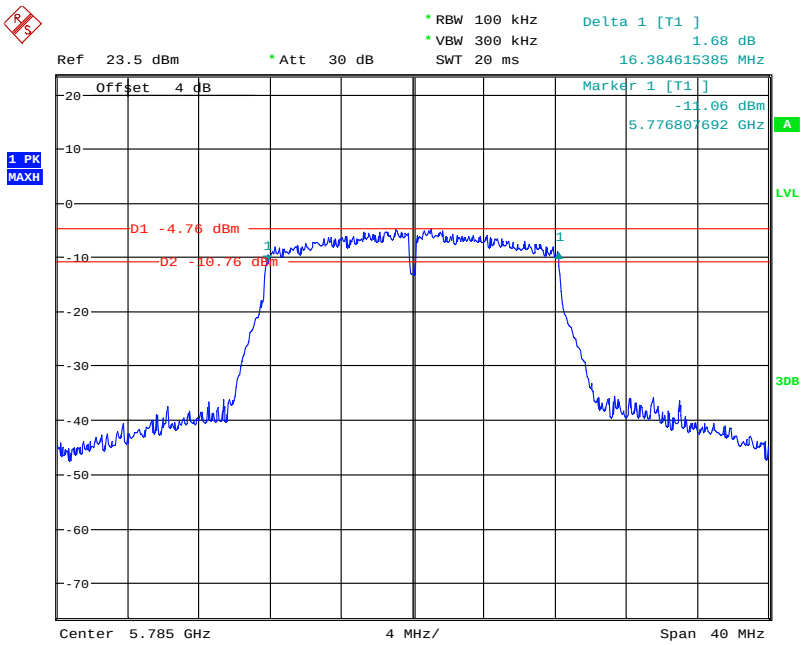
5725-5850MHz:
6dB Emission Bandwidth:

802.11a Low Channel



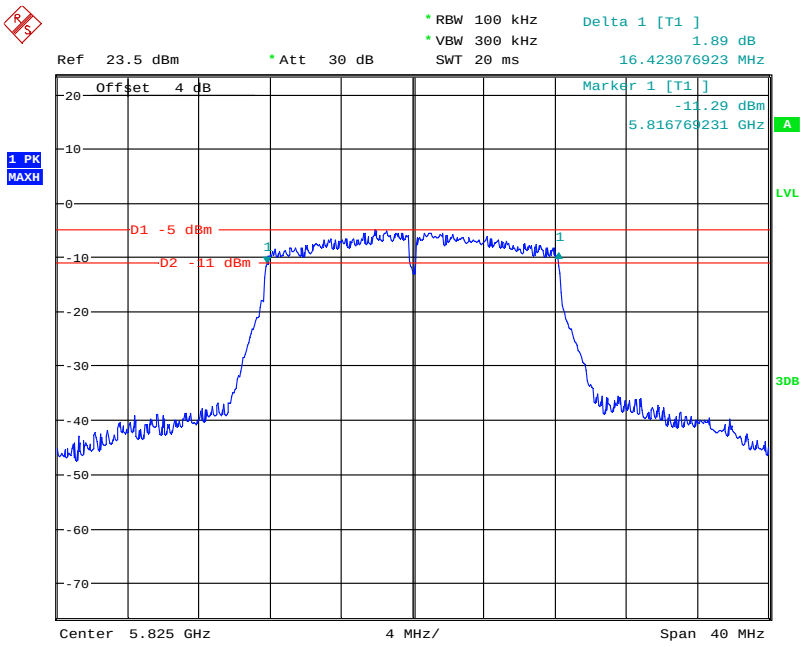
Date: 22.JUN.2021 11:36:16

802.11a Middle Channel



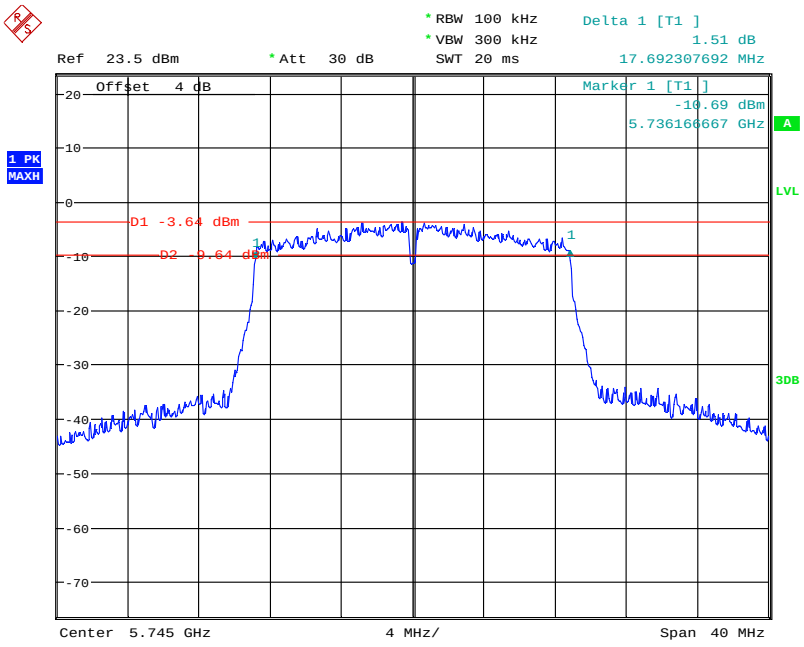
Date: 22.JUN.2021 11:38:22

802.11a High Channel



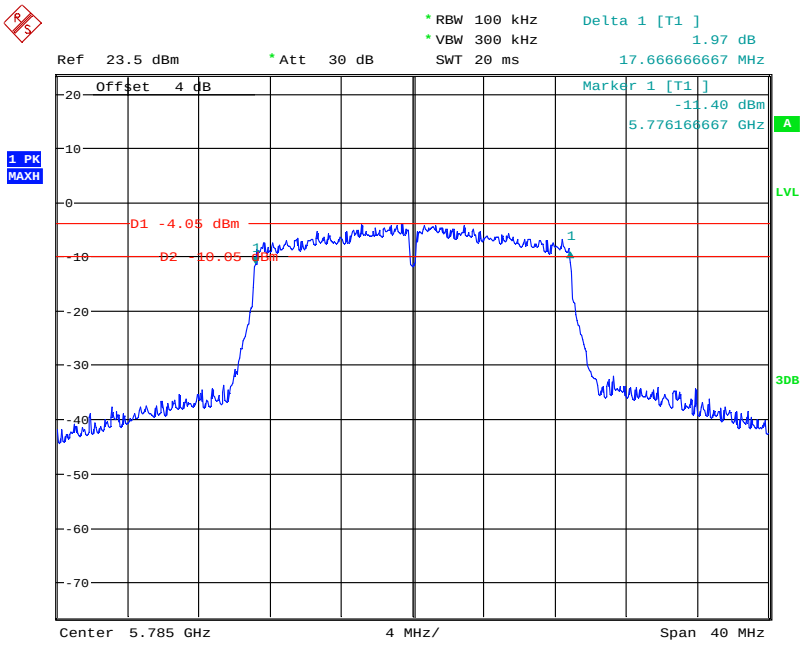
Date: 22.JUN.2021 11:40:07

802.11n ht20 Low Channel



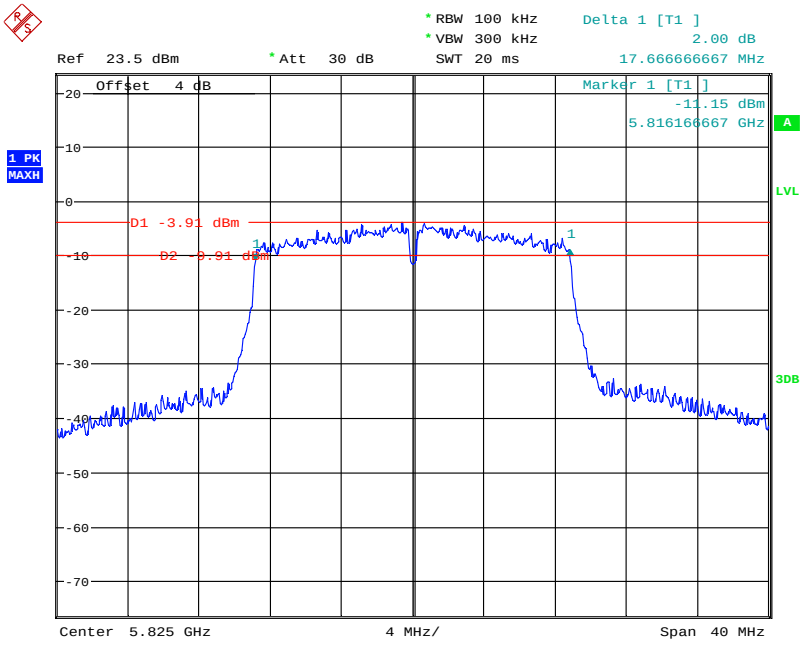
Date: 22.JUN.2021 11:51:28

802.11n ht20 Middle Channel



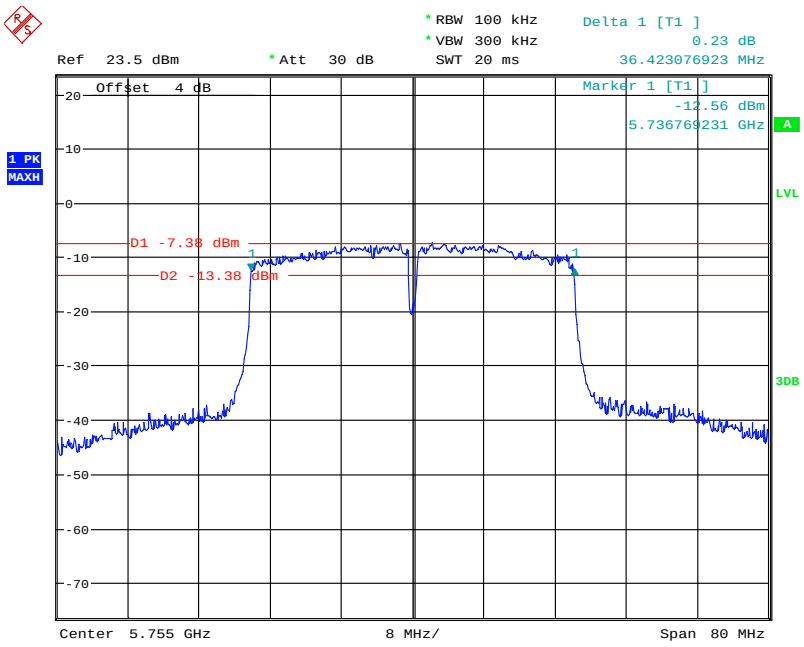
Date: 22.JUN.2021 11:49:45

802.11n ht20 High Channel



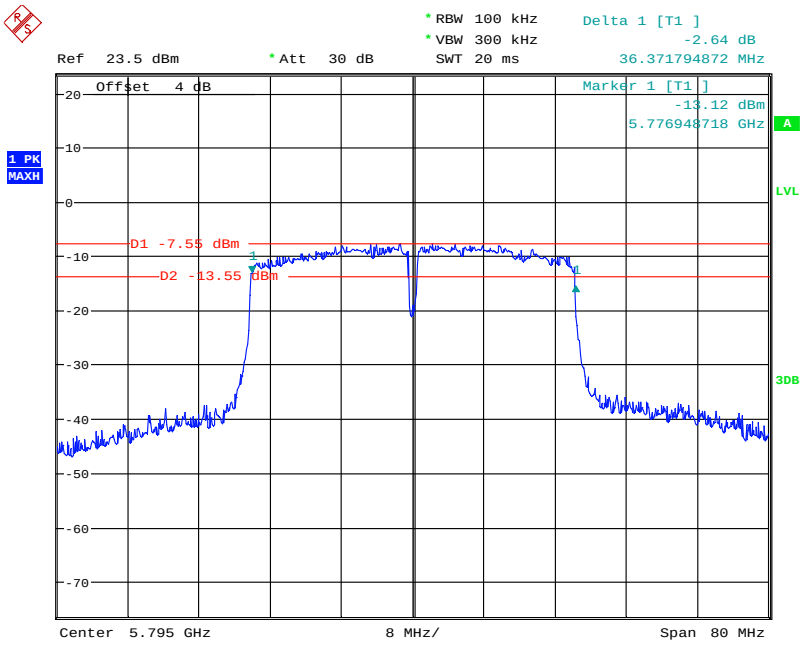
Date: 22.JUN.2021 11:47:19

802.11n ht40 Low Channel



Date: 22.JUN.2021 11:55:09

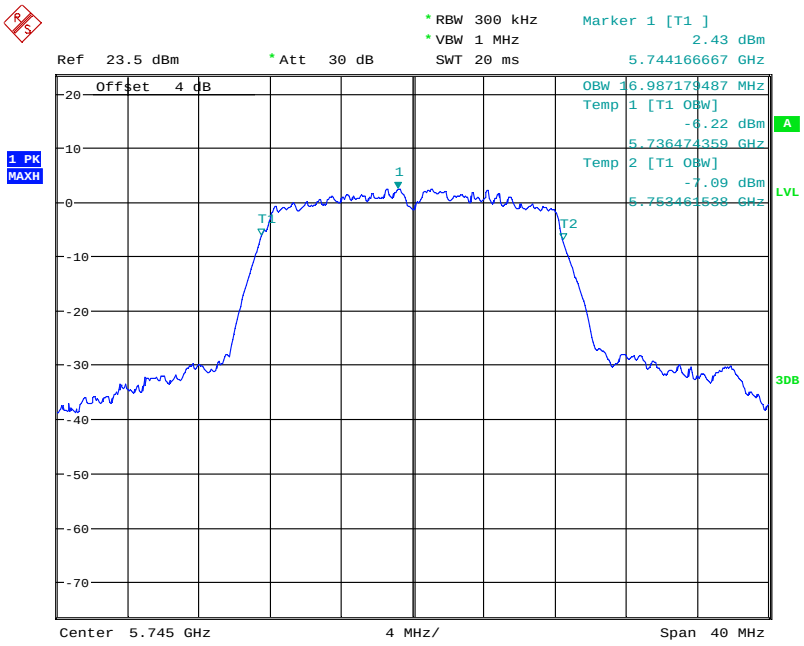
802.11n ht40 High Channel



Date: 22.JUN.2021 11:57:51

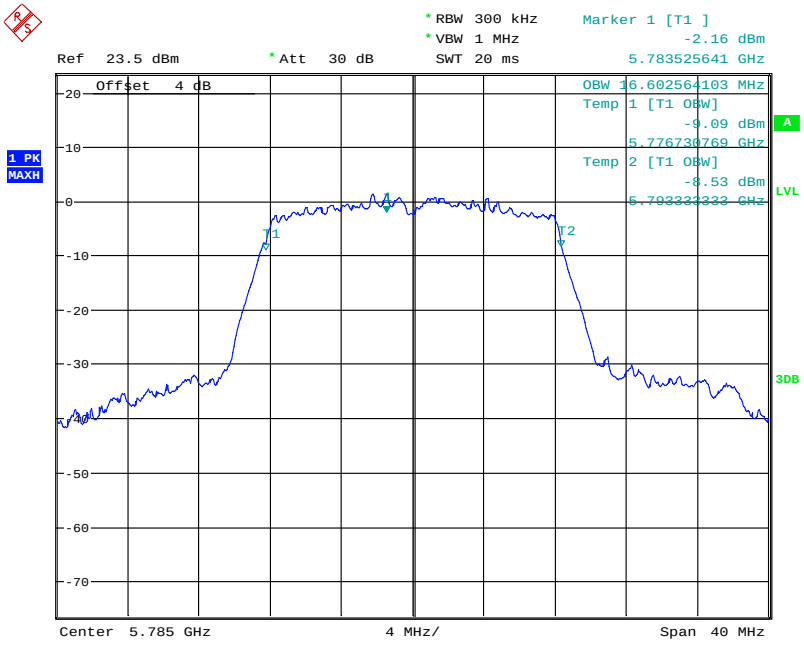
99% Occupied Bandwidth:

802.11a Low Channel



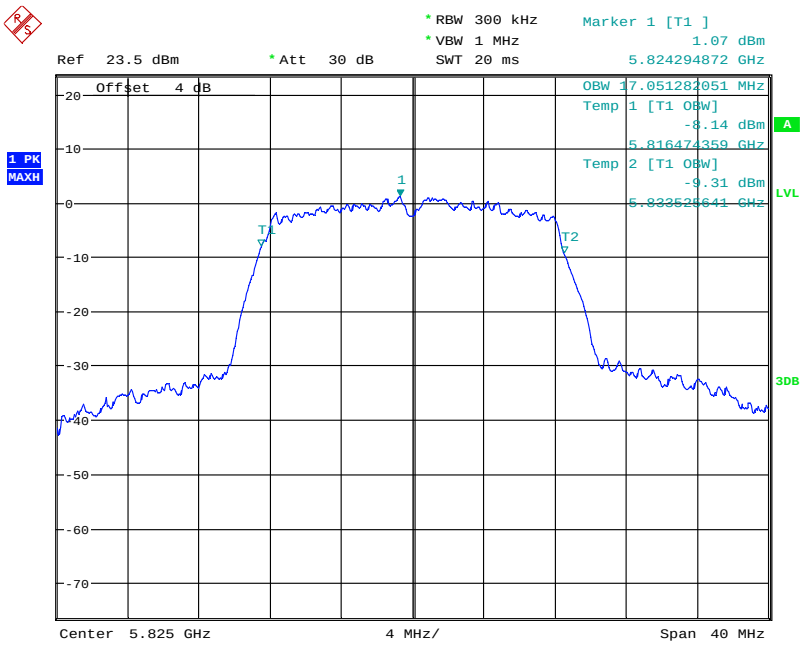
Date: 22.JUN.2021 12:36:31

802.11a Middle Channel



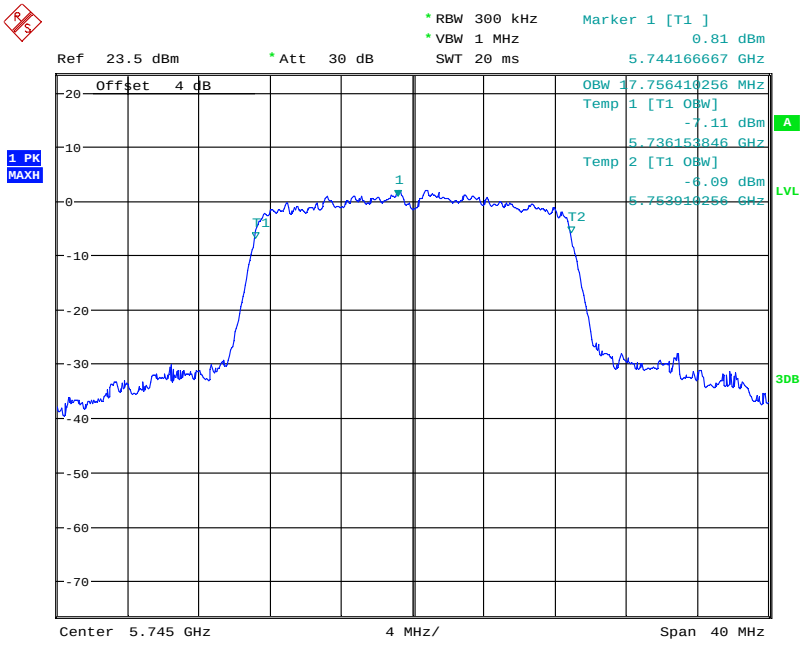
Date: 22.JUN.2021 12:37:21

802.11a High Channel



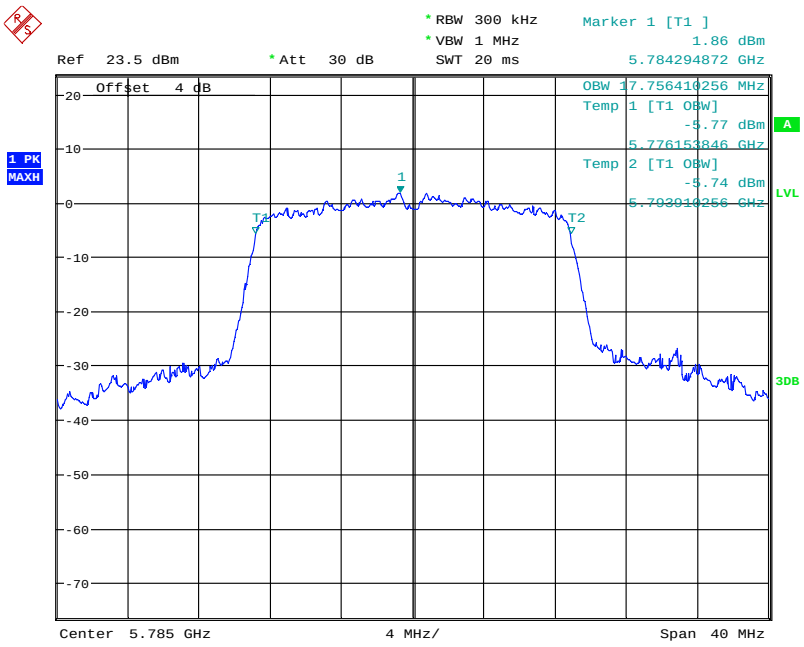
Date: 22.JUN.2021 12:38:05

802.11n ht20 Low Channel



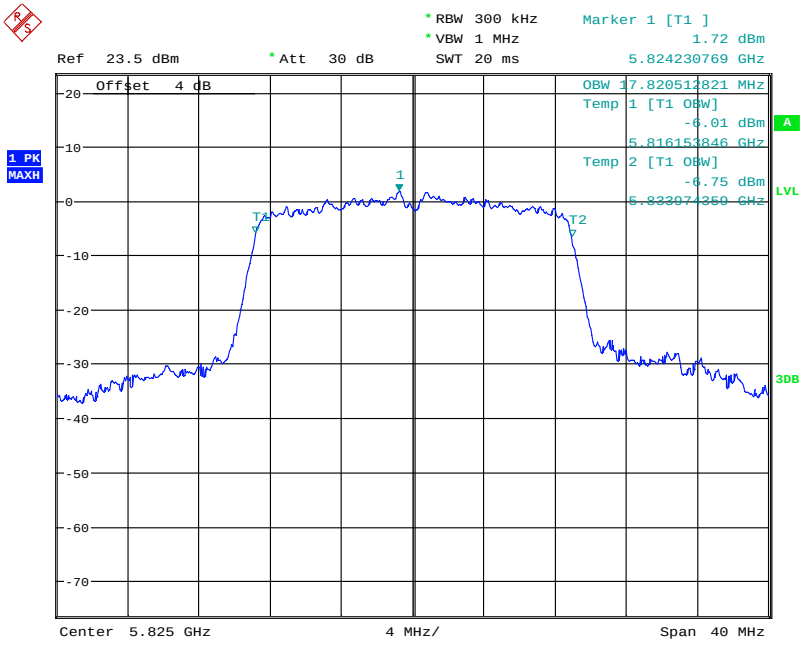
Date: 22.JUN.2021 12:40:32

802.11n ht20 Middle Channel



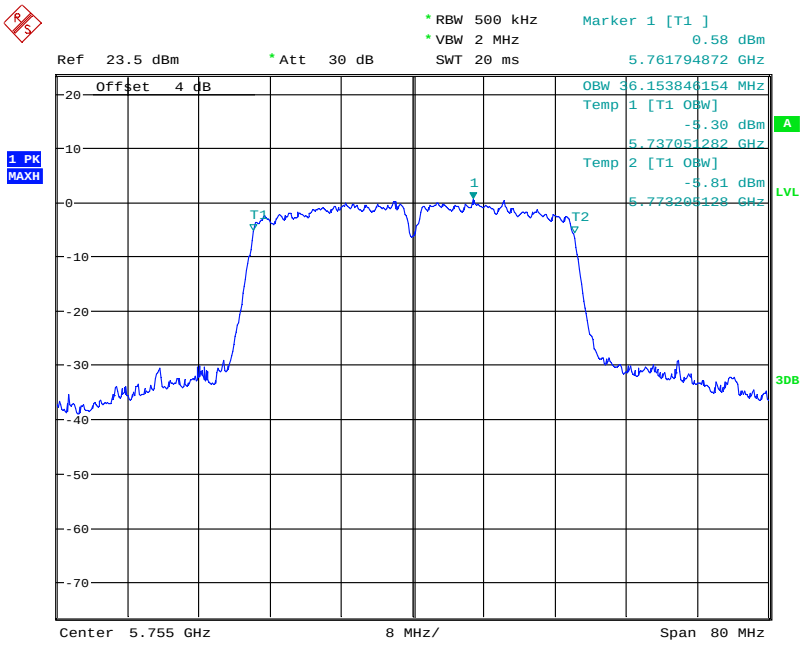
Date: 22.JUN.2021 12:39:56

802.11n ht20 High Channel



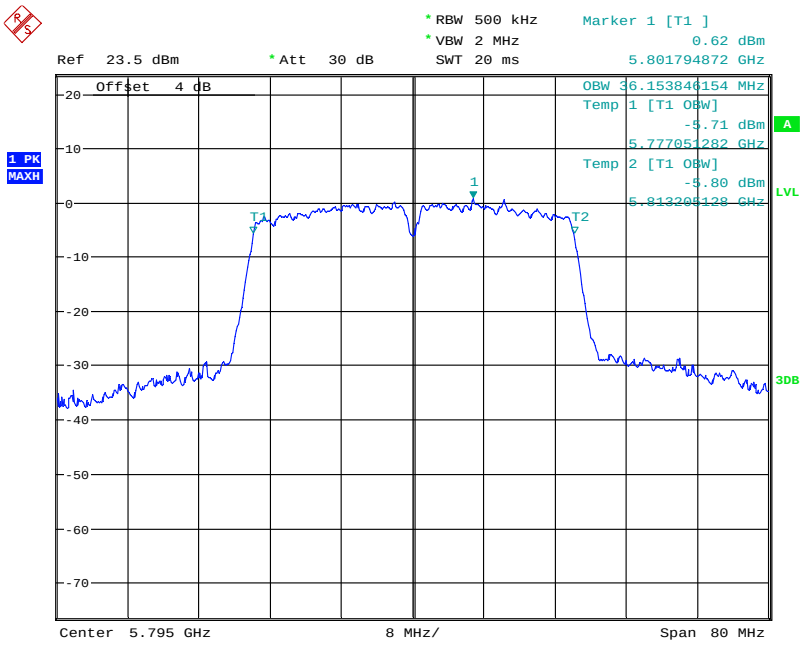
Date: 22.JUN.2021 12:39:03

802.11n ht40 Low Channel



Date: 22.JUN.2021 12:42:30

802.11n ht40 High Channel



Date: 22.JUN.2021 12:43:24

FCC §15.407(a) –MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.407(a)

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) 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).

(ii) For an indoor 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.

(iii) For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 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.

(3) 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.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
Agilent	USB Wideband Power Sensor	U2021XA	MY54080014	2021-05-09	2022-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Procedure

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

Test Data

Environmental Conditions

Temperature:	26.8°C
Relative Humidity:	48 %
ATM Pressure:	100.2 kPa
Tester:	Joe Qiao
Test Date:	2021.06.22

Test Mode: Transmitting

Band	Mode	Frequency (MHz)	Conducted Average Output Power (dBm)	Limit (dBm)
5150 - 5250 MHz	802.11 a	5180	8.65	24
		5200	7.86	24
		5240	8.99	24
	802.11n ht20	5180	8.74	24
		5200	8.80	24
		5240	9.03	24
	802.11n ht40	5190	8.78	24
		5230	9.09	24
5725 - 5850 MHz	802.11 a	5745	8.68	30
		5785	8.79	30
		5825	8.97	30
	802.11n ht20	5745	8.90	30
		5785	8.99	30
		5825	8.93	30
	802.11n ht40	5755	9.08	30
		5795	8.03	30

Note:
The device is a client device.
The duty cycle factor has been calculated into the test data.

FCC §15.407(a) - POWER SPECTRAL DENSITY

Applicable Standard

According to FCC §15.407(a)

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(i) 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).

(ii) For an indoor 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.

(iii) For fixed point-to-point access points 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. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 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.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 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.

(3) 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.

Test Procedure

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.8°C
Relative Humidity:	48 %
ATM Pressure:	100.2 kPa
Tester:	Joe Qiao
Test Date:	2021.06.22

Test Mode: Transmitting

Test Result:Compliance.Please refer to the following table and plot.

5150-5250MHz:

Mode	Frequency (MHz)	Maximum Power Spectral Density (dBm/MHz)	Limit (dBm/MHz)
802.11a	5180	-3.42	11
	5200	-1.63	11
	5240	-1.98	11
802.11n ht20	5180	-2.32	11
	5200	-1.93	11
	5240	-0.42	11
802.11n ht40	5190	-5.72	11
	5230	-5.77	11

5725-5850 MHz:

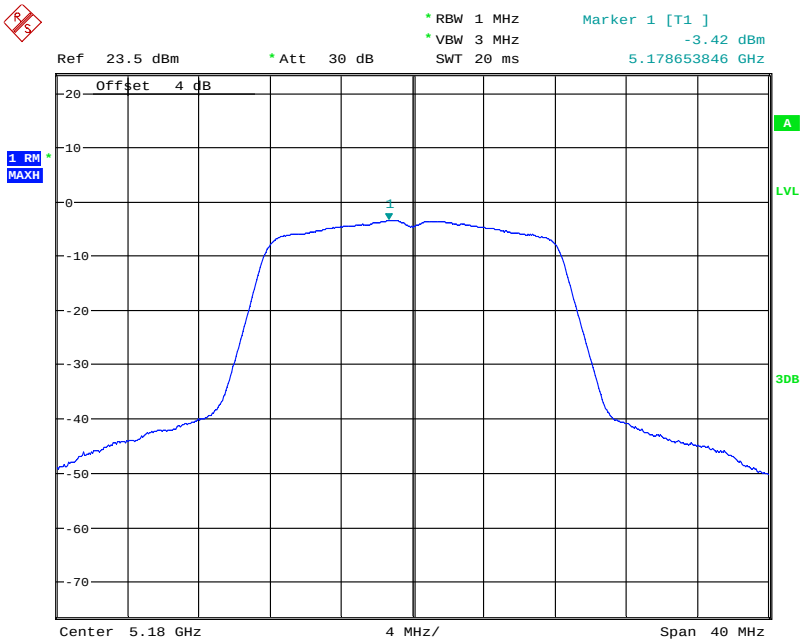
Mode	Frequency (MHz)	Reading (dBm/300kHz)	Maximum Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)
802.11a	5745	-3.68	-1.46	30
	5785	-5.24	-3.02	30
	5825	-5.24	-3.02	30
802.11n ht20	5745	-3.09	-0.87	30
	5785	-4.01	-1.79	30
	5825	-4.37	-2.15	30
802.11n ht40	5755	-8.16	-5.94	30
	5795	-7.58	-5.36	30

Note:
For 5.8GHz band, If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

Method SA-3 in KDB 789033 D02 General UNII Test Procedures New Rules v02r01was used for PSD test.

5150-5250MHz

802.11a Low Channel



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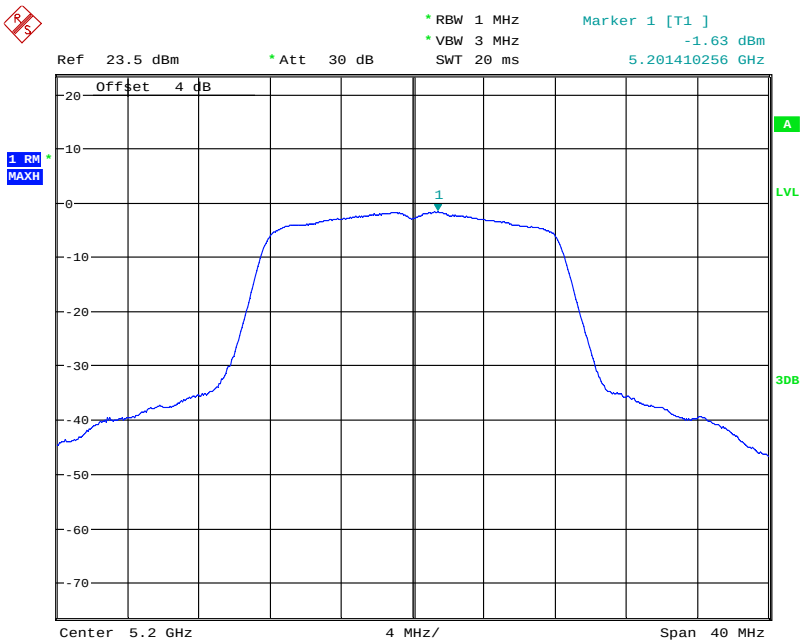
802.11a Middle Channel



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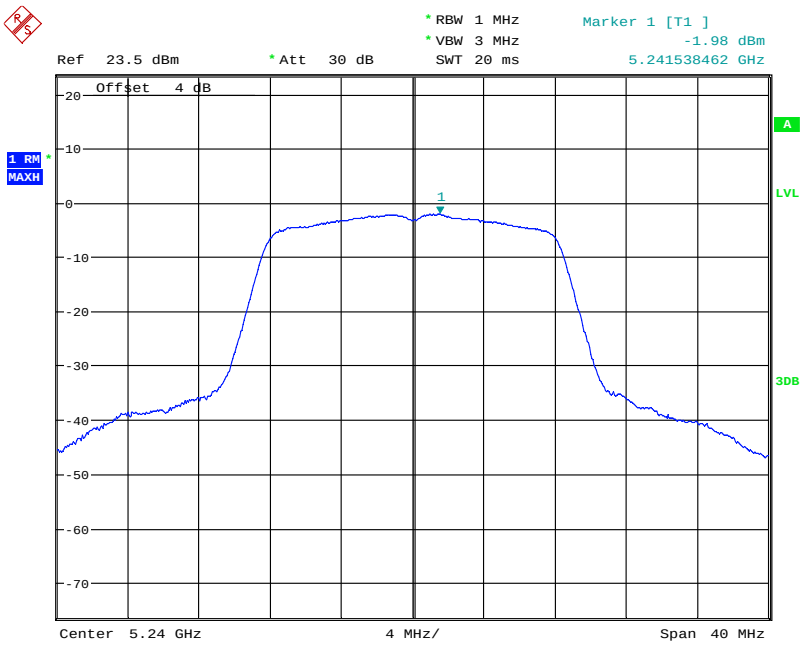

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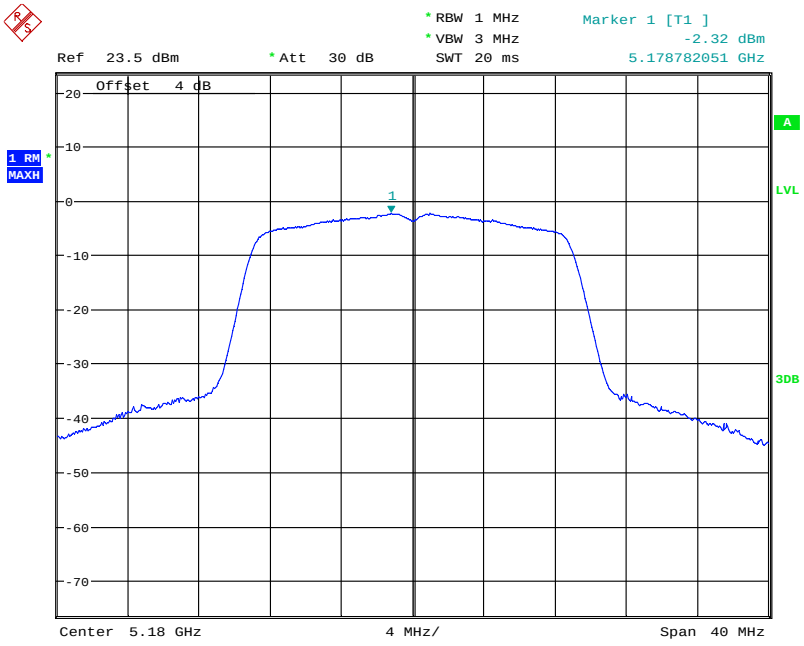

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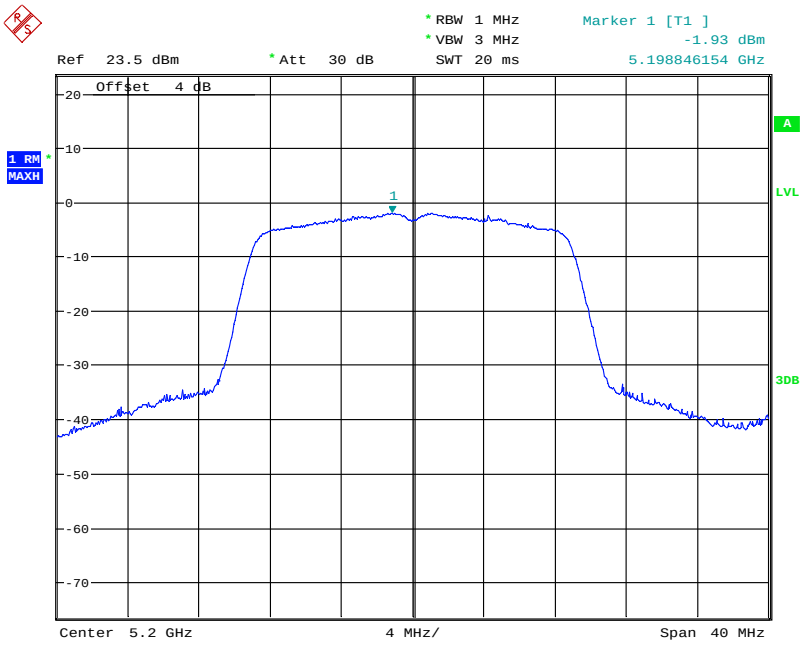

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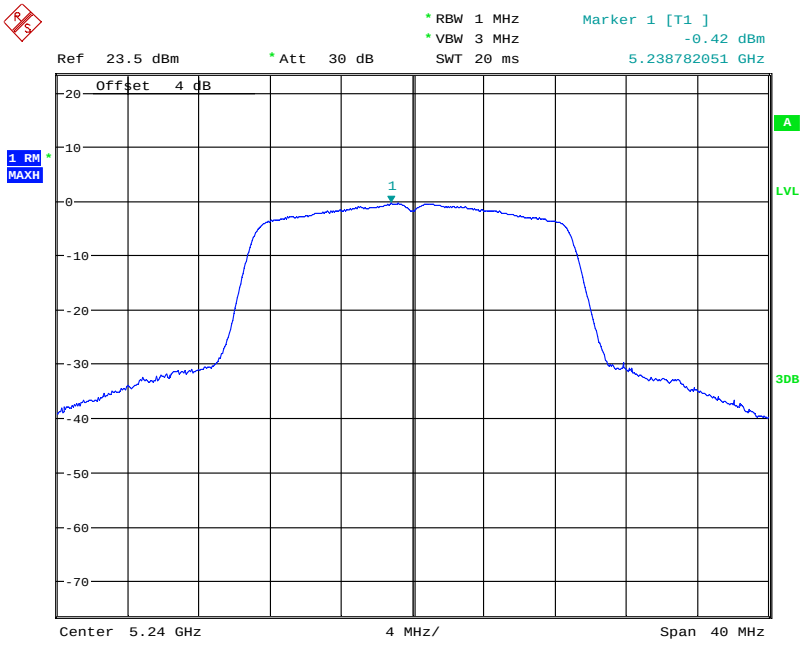

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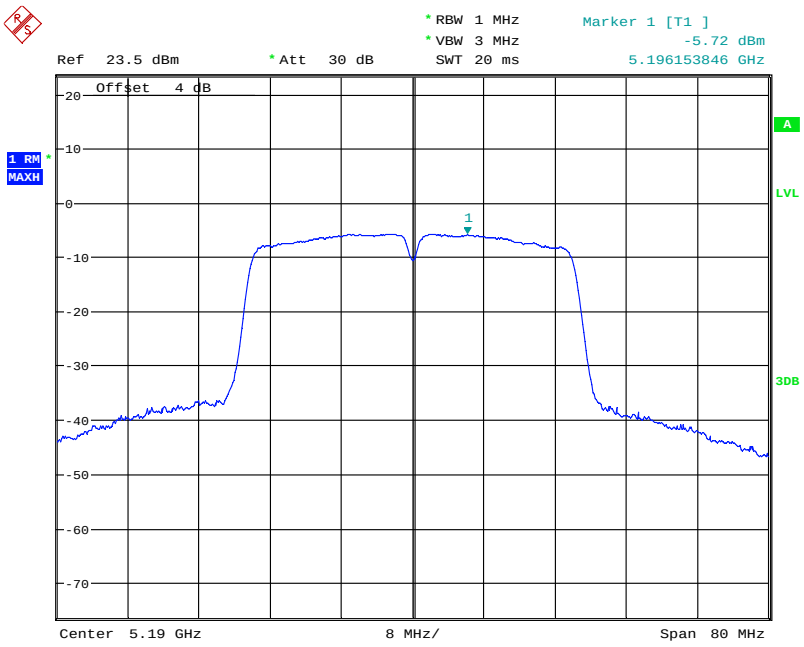

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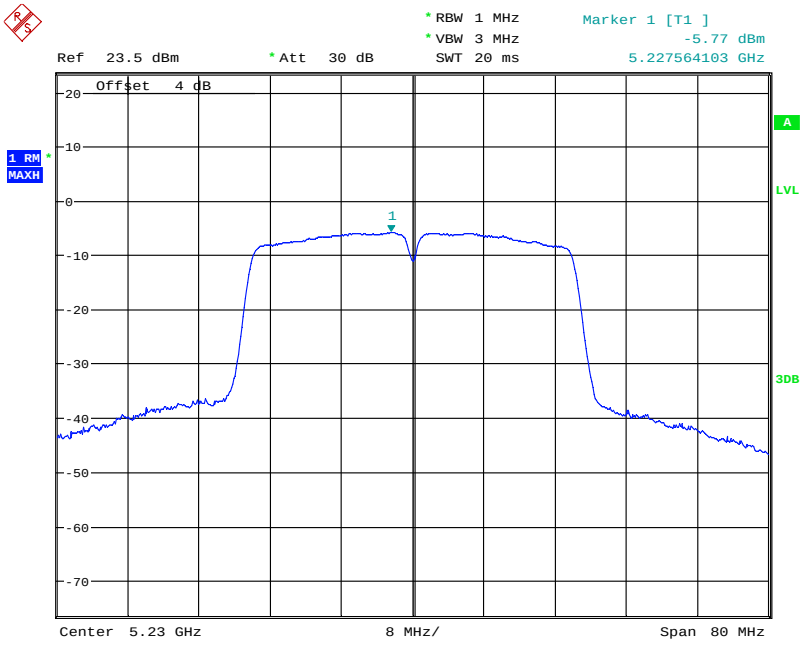

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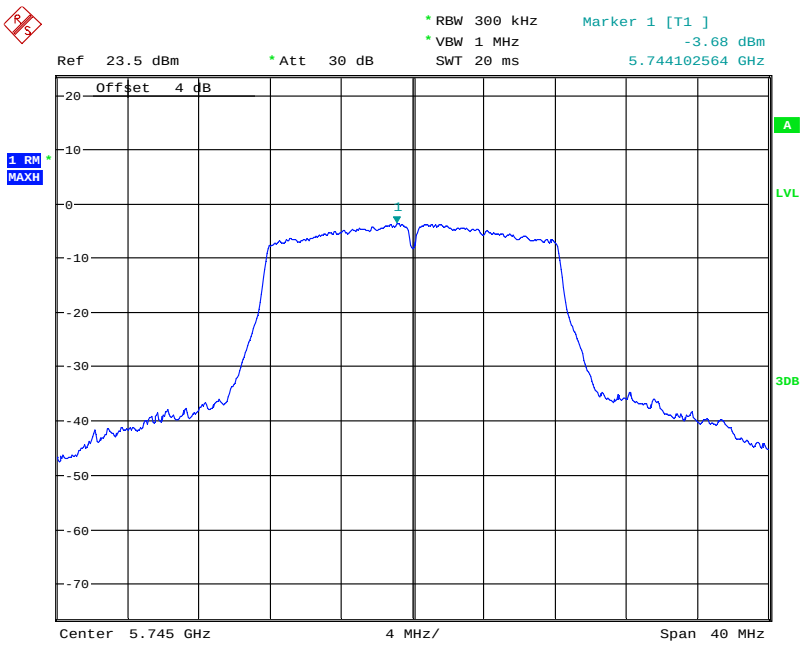
5725-5850MHz

802.11a Low Channel



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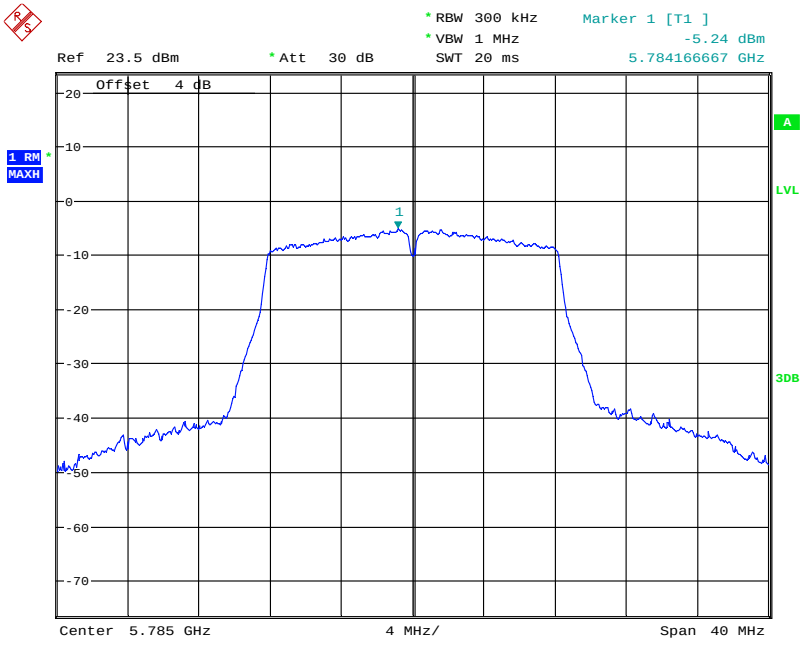

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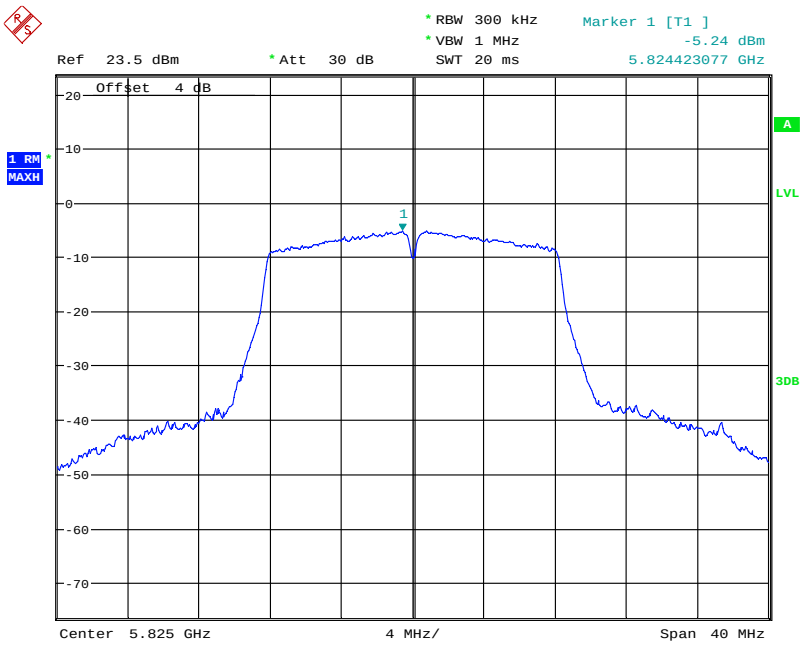
802.11a High Channel



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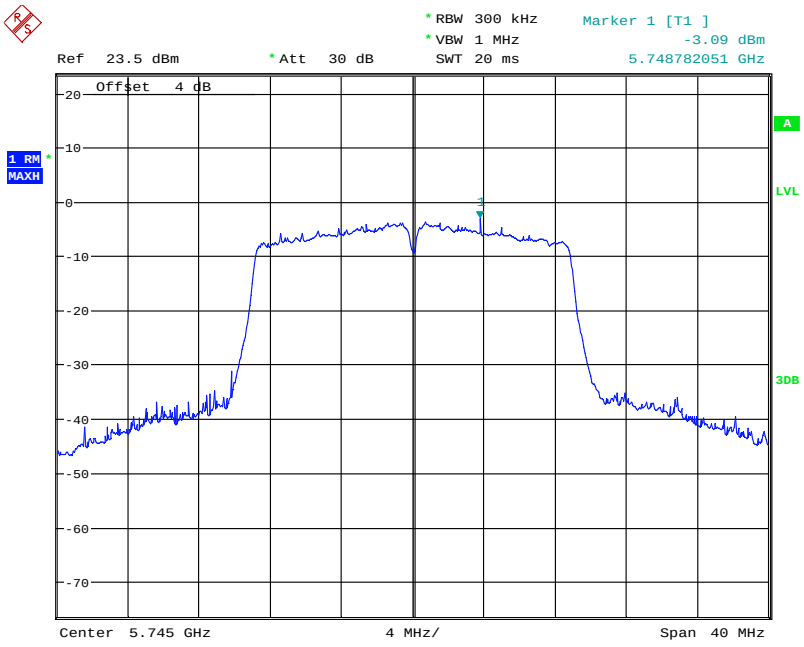

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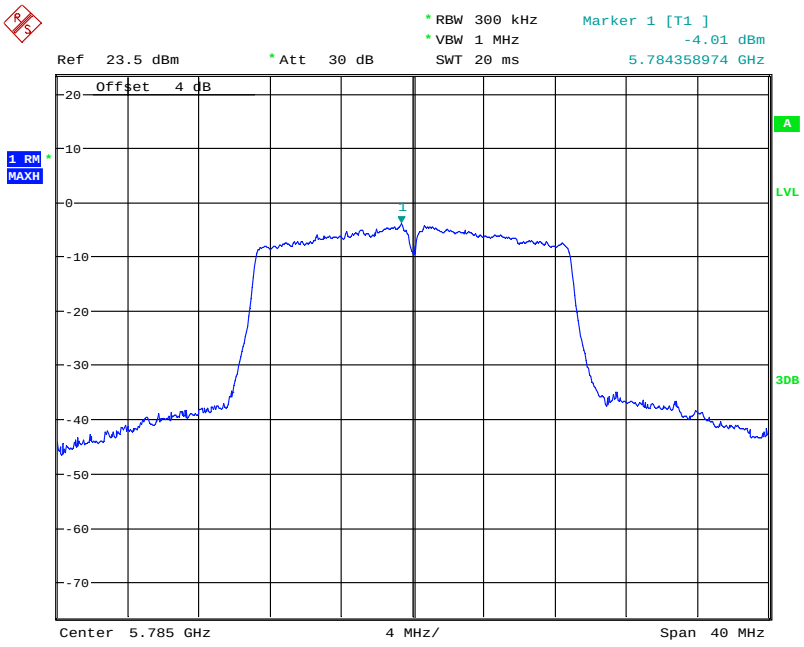

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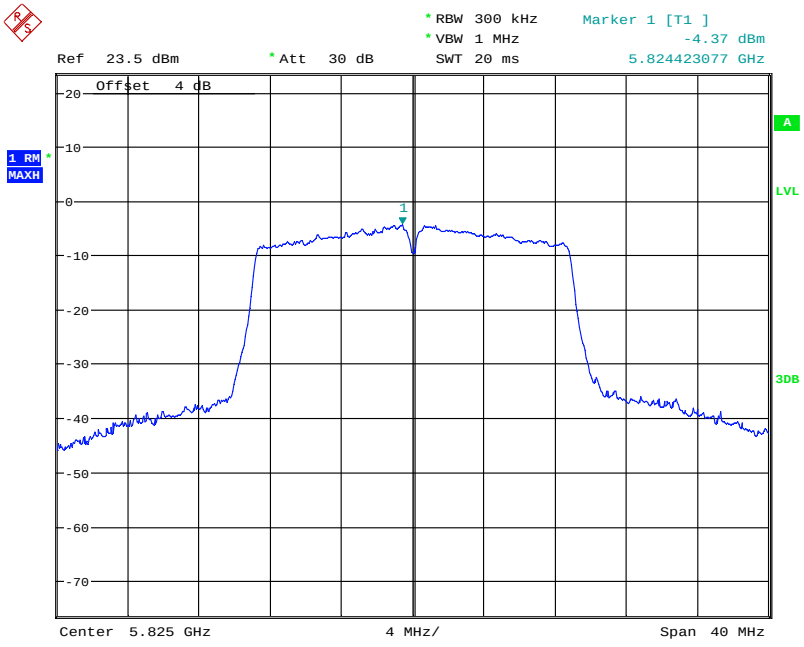

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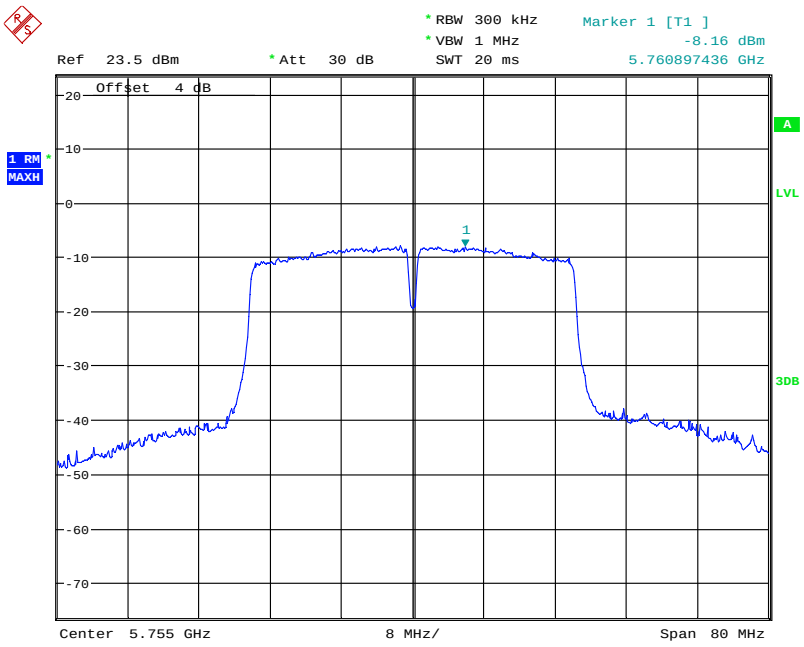

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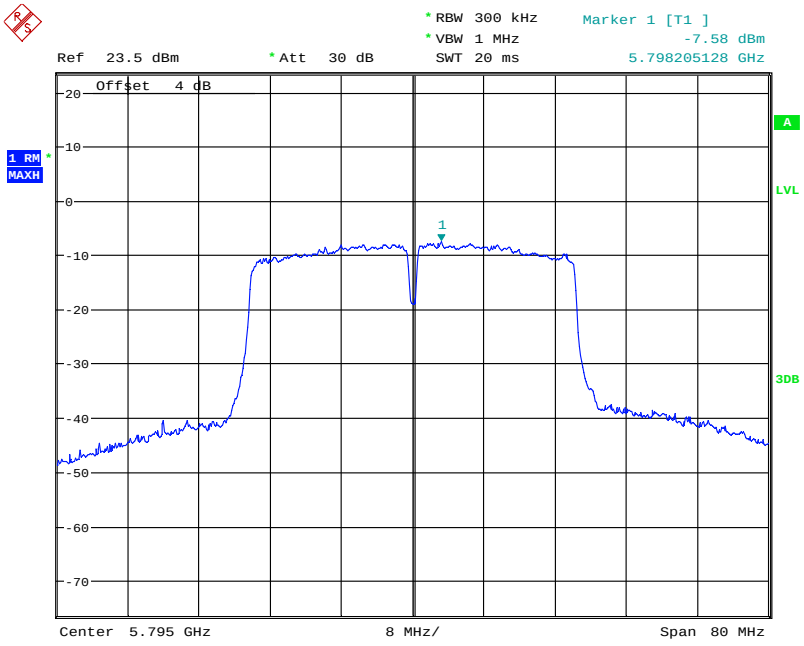

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