



FCC Part 15.407

TEST REPORT

For

IEI Integration Corp.

No. 29, Zhongxing Rd, Xizhi Dist., New Taipei City 221, Taiwan(R.O.C.)

FCC ID: RFHMODAT-550A

Report Type:
Original Report

Product Type:
PDA

Report Producer : Jane Lee

Jane Lee

Report Number : RLK181207001-00E

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Revision History

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1 General Information

1.1 Product Description for Equipment under Test (EUT)

Applicant	IEI Integration Corp..
	No. 29, Zhongxing Rd, Xizhi Dist., New Taipei City 221, Taiwan(R.O.C.)
Manufacturer	IEI Integration Corp..
	No. 29, Zhongxing Rd, Xizhi Dist., New Taipei City 221, Taiwan(R.O.C.)
Brand(Trade) Name	
Product (Equipment)	PDA
Main Model Name	MODAT-550A-OA53
Series Model Name	MODAT-550A-OA53-ET
Model Discrepancy	MODAT-550A-OA53 with Barcode Reader MODAT-550A-OA53-ET without Barcode Reader
Frequency Range	5150 MHz ~ 5250 MHz, 5250 MHz ~ 5350 MHz, 5470 MHz ~ 5725 MHz, 5725 MHz ~ 5850 MHz
Transmit Power	IEEE 802.11a Mode: 14.49dBm (0.028W) IEEE802.11ac VHT20 Mode: 13.80dBm (0.024W) IEEE 802.11ac VHT40 Mode: 13.62dBm (0.023W)
Modulation Technique	IEEE 802.11a Mode: OFDM IEEE 802.11ac VHT20 Mode: OFDM IEEE 802.11ac VHT40 Mode: OFDM
Transmit Data Rate	IEEE 802.11a Mode: 54-6 Mbps IEEE 802.11ac VHT20 Mode: MCS 0-9 IEEE 802.11ac VHT40 Mode: MCS 0-9
Number of Channels	For UNII-1 Band I: IEEE 802.11a / IEEE802.11ac VHT20 Mode: 4 Channels IEEE 802.11ac VHT40 Mode: 2 Channels For UNII-2A Band II: IEEE 802.11a / IEEE802.11ac VHT20 Mode: 4 Channels IEEE 802.11ac VHT40 Mode: 2 Channels For UNII-2C Band III: IEEE 802.11a / IEEE802.11ac VHT20 Mode: 11 Channels IEEE 802.11ac VHT40 Mode: 5 Channels For UNII-3 Band IV: IEEE 802.11a / IEEE802.11ac VHT20 Mode: 5 Channels IEEE 802.11ac VHT40 Mode: 2 Channels

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

Antenna Specification	FPC Antenna / 0 dBi
-----------------------	---------------------

Power Operation (Voltage Range)	☒ AC 120V/60Hz ☒ Adapter: <i>Brand Name: Asian Power Devices Inc</i> <i>Model: WA15IO5R</i> <i>I/P: 100-240V 50~60Hz 0.5A</i> <i>O/P: 5Vdc, 3A</i> ☐ By AC Power Cord ☐ PoE
	☐ DC Type ☒ Battery: <i>Rechargeable Li-polymer Battery</i> <i>Brand Name: QIAO XIN TECHNOLOGY CO., LTD</i> <i>Model: IE-01S02A0</i> <i>3.7V = 4000mAh, 14.8W</i> ☐ DC Power Supply ☐ External from USB Cable ☐ External DC Adapter
	☐ Host System
Received Date	Dec 07, 2018
Date of Test	Dec 07, 2018 ~ Feb 19, 2019

*All measurement and test data in this report was gathered from production sample serial number: 181207001
(Assigned by BACL, Taiwan).

1.2 Objective

This report is prepared on behalf of *IEI Integration Corp.* 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 15.225 DXX submission with FCC ID: RFHMODAT-550A

FCC Part 15.247 DSS submission with FCC ID: RFHMODAT-550A

FCC Part 15.247 DTS submission with FCC ID: RFHMODAT-550A

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 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.

The system support 802.11a/n ht20/n ht40/ac vht20/ac vht40, the 802.11n ht20/n 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

For 5250 ~ 5350MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

For 5470 ~ 5725MHz

11 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600		

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590		

For 5725 ~ 5850MHz:

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

2.2 Equipment Modifications

No modification was made to the EUT.

2.3 Test Mode

Mode: Full System (Model: MODAT-550A-QA53) tested all measure item.

2.4 EUT Exercise Software

Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

The software was used “MP-Tool RTL819 x3.0”.

UNII Band	Mode	Channel	Frequency (MHz)	Power setting
UNII-1	802.11a	36	5180	19.5
		40	5200	19.5
		48	5240	19.5
UNII-2A		52	5260	19.5
		60	5300	19.5
		64	5320	19.5
UNII-2C		100	5500	18.5
		116	5580	18.5
		140	5700	18.5
UNII-3		149	5745	19
		157	5785	19
		165	5825	19
UNII-1	802.11n 20 / ac 20	36	5180	18.5
		40	5200	18.5
		48	5240	18.5
UNII-2A		52	5260	18.5
		60	5300	18.5
		64	5320	18.5
UNII-2C		100	5500	18
		116	5580	18
		140	5700	18
UNII-3		149	5745	18
		157	5785	18
		165	5825	18
UNII-1	802.11n 40 / ac 40	38	5190	16
		46	5230	16
		UNII-2A	54	5270
62			5310	17
UNII-2C		102	5510	17.5
		118	5590	17.5
		134	5670	17.5
UNII-3		151	5755	18
		159	5795	18

2.5 Support Equipment List and Details

Description	Manufacturer	Model Number	BSMI	FCC ID	S/N
Adapter	APD	WA-15I05R	R43017	N/A	N/A
Base	iEi	iEi	N/A	N/A	N/A

2.6 External Cable List and Details

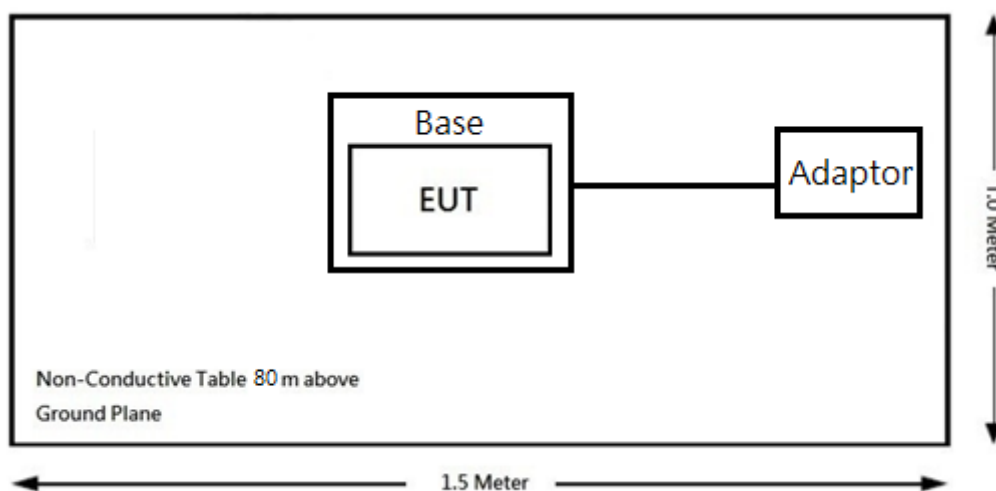
Cable Description	Length (m)	From	To
Micro USB Cable	1.5	Adapter	Base

2.7 Block Diagram of Test Setup

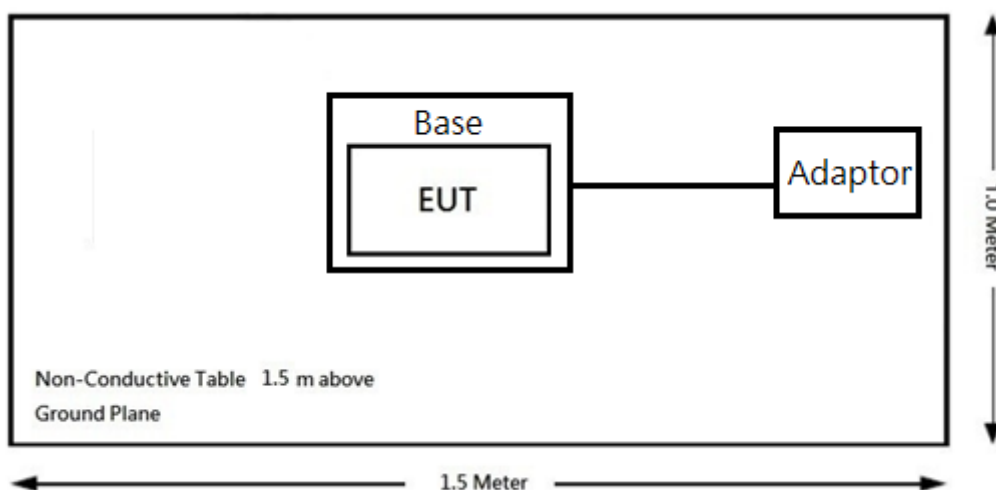
See test photographs attached in setup photos for the actual connections between EUT and support equipment.

Radiation:

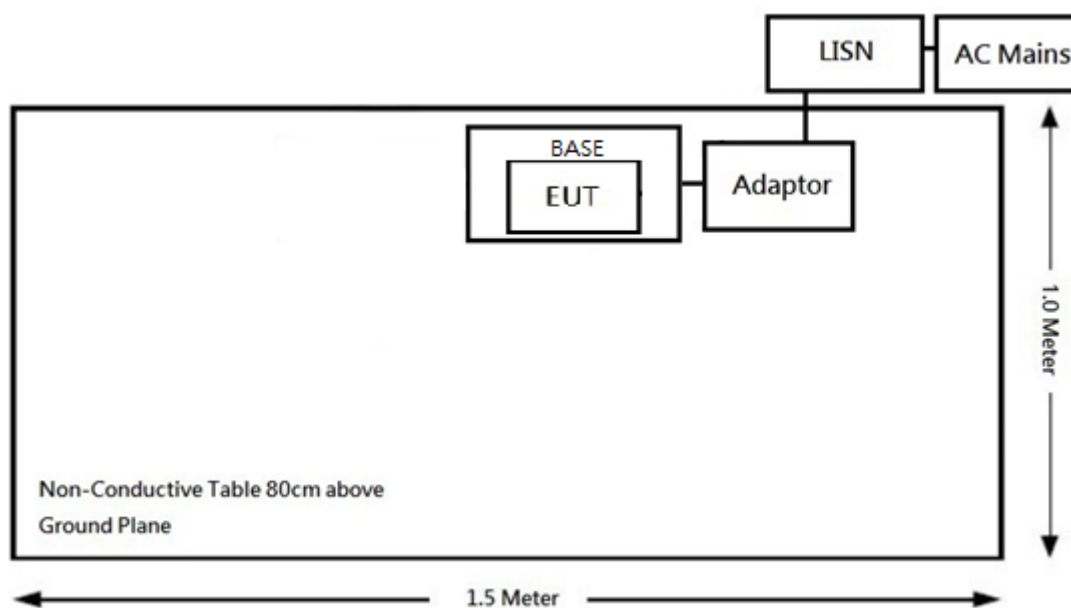
Below 1GHz:



Above 1GHz:



Conduction:



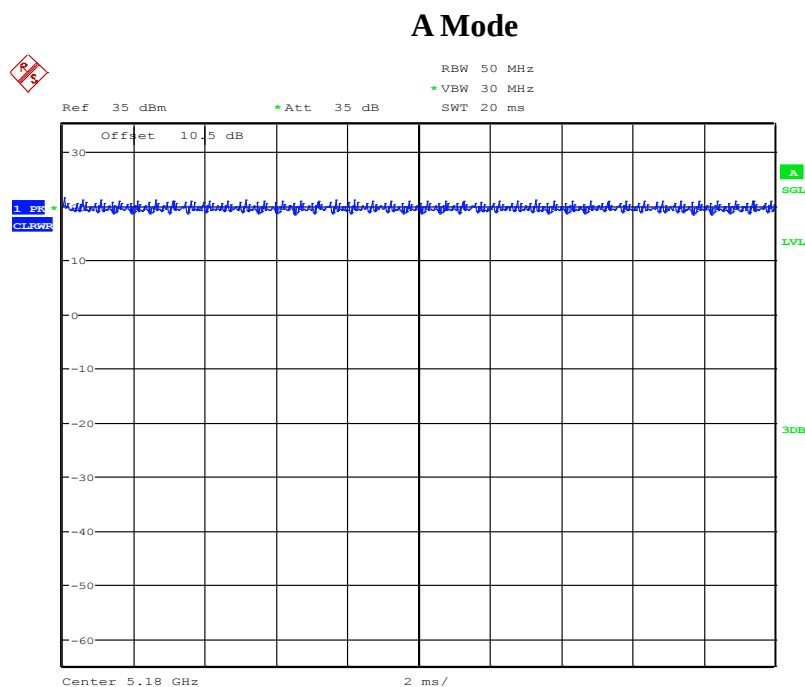
2.8 Duty Cycle

According to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section B: 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	20	20	100	0
802.11ac20	20	20	100	0
802.11ac40	20	20	100	0

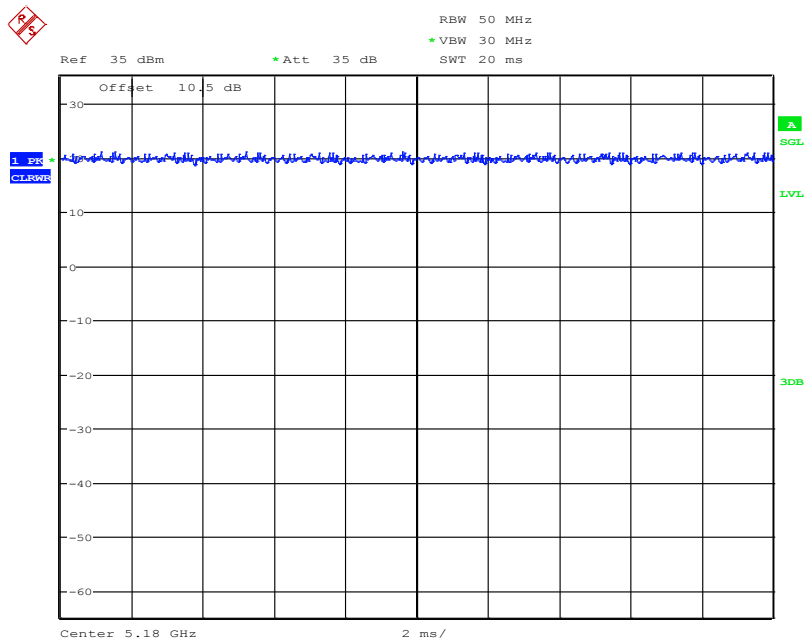
Note: Duty Cycle Correction Factor = $10 \cdot \log(1/\text{duty cycle})$

Please refer to the following plots.



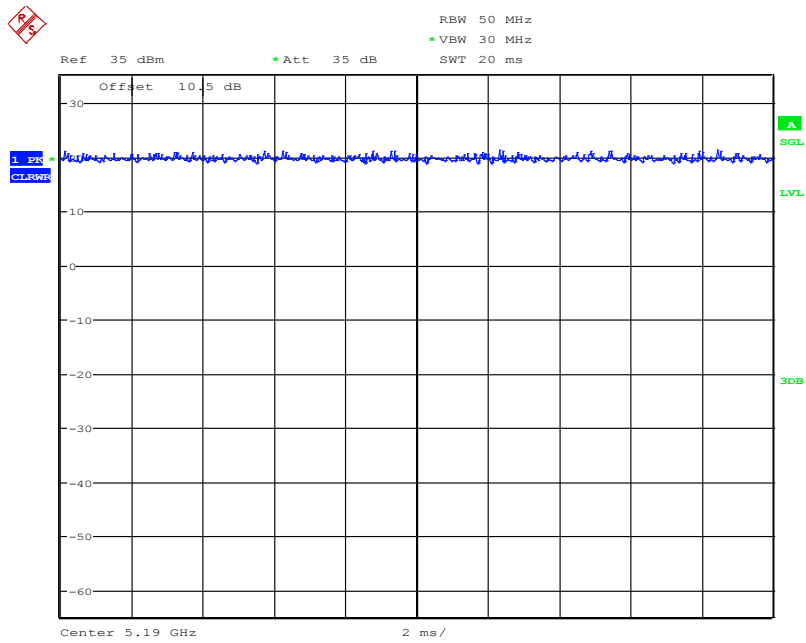
Date: 9.JAN.2019 17:07:52

AC20 Mode



Date: 9.JAN.2019 17:08:25

AC40 Mode



Date: 9.JAN.2019 17:08:58

3 Summary of Test Results

FCC Rules	Description of Test	Results
FCC §15.407(f), § 2.1093	RF Exposure	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)(1),(2),(3),(4),(7)	Unwanted Emission	Compliance
§15.407(a),(e)	Emission Bandwidth	Compliance
§15.407(a)(1),(2),(3)	Conducted Transmitter Output Power	Compliance
§15.407(a)(1),(2),(3)	Power Spectral Density	Compliance

4 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
AC Line Conduction Room (CON-A)					
LISN	Rohde & Schwarz	ENV216	101612	2018/02/22	2019/02/21
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2018/10/23	2019/10/22
Pulse Limiter	Rohde & Schwarz	ESH3Z2	TXZEM104	2018/08/03	2019/08/02
RF Cable	EMEC	EM-CB5D	001	2018/07/02	2019/07/01
Software	AUDIX	E3	V9.150826k	N.C.R	N.C.R
Radiated Room (966-A)					
Active Loop Antenna	ETS-Lindgren	6502	00035796	2018/03/13	2019/03/12
Bilog Antenna with 6 dB Attenuator	SUNOL SCIENCES & MINI-CIRCUITS	JB6/UNAT-6+	A050115/1554 2_01	2018/12/11	2019/12/10
Horn Antenna	EMCO	3115	9311-4158	2018/04/20	2019/04/19
Horn Antenna	ETS-Lindgren	3116	62638	2018/08/29	2019/08/28
Preamplifier	Sonoma	310N	130602	2018/07/04	2019/07/03
Preamplifier	EM Electronics Corp.	EM01G18G	060657	2018/12/07	2019/12/06
Microwave Preamplifier	EM Electronics Corporation	EM18G40G	060656	2019/01/11	2020/01/10
EMI Test Receiver	Rohde & Schwarz	ESR7	101419	2018/10/23	2019/10/22
Spectrum Analyzer	Rohde & Schwarz	FSV40	101435	2018/02/13	2019/02/12
Micro flex Cable	UTIFLEX	FSCM 64639 / (2M)	93D0127	2018/07/31	2019/07/30
Micro flex Cable	UTIFLEX	UFA210A-1-3149-300300	MFR64639 226389-001	2018/11/16	2019/11/15
Micro flex Cable	ROSNOL	K1K50-UP0264-K1K50-450CM	160309-1	2018/03/05	2019/03/04
Micro flex Cable	ROSNOL	K1K50-UP0264-K1K50-80CM	160309-2	2019/01/16	2020/01/15
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
NSA	BACL	966-A	N/A	2018/07/09	2019/07/08
VSWR	BACL	966-A	N/A	2018/07/16	2019/07/15

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

Description	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Room					
Spectrum Analyzer	Rohde & Schwarz	FSU26	200268	2018/05/04	2019/05/03
Cable	WOKEN	SFL402	S02-160323-07	2018/02/11	2019/02/10
Attenuator	MINI-CIRCUITS	BW-S10W5+	N/A	2018/03/08	2019/03/07
Power Sensor	KEYSIGHT	U2021XA	MY54080018	2018/03/07	2019/03/06

***Statement of Traceability:** *BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to the SI System of Units via the R.O.C. Center for Measurement Standards of the Electronics Testing Center, Taiwan (ETC) or to another internationally recognized National Metrology Institute (NMI), and were compliant with the current Taiwan Accreditation Foundation (TAF) requirements*

5 FCC §15.407(f), § 2.1093 - RF Exposure

5.1 Applicable Standard

According to FCC §2.1093 and §1.1307(b) (1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance v06

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot$$

$$[\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

5.2 RF Exposure Evaluation Result

For Wi-Fi:

Please refer to the SAR report, report No.: RLK181207001-23A

6 FCC §15.203 – Antenna Requirements

6.1 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 user of a standard antenna jack or electrical connector is prohibited.

And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna does not exceed 6dBi. 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.

6.2 Antenna List and Details

Manufacturer	Model	Antenna Type	Antenna Gain
ICP Electronics Inc.	MODAT 531	FPC Antenna	0 dBi

The EUT has one integral antenna arrangement, which was permanently attached; fulfill the requirement of this section.

Result: Compliance

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

7.1 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 μ H/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

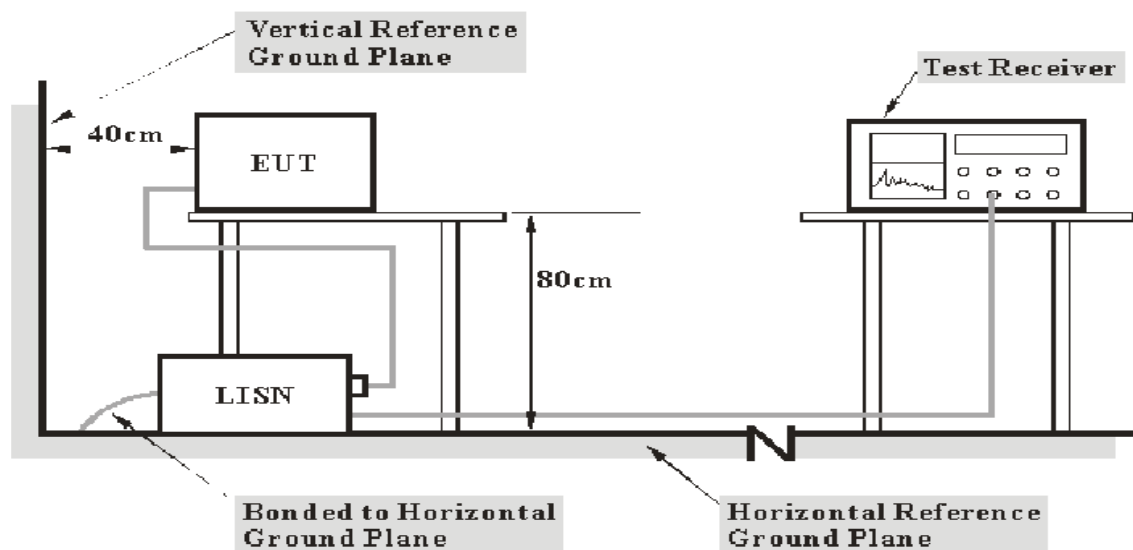
7.2 Measurement Uncertainty

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	2.71 dB (k=2, 95% level of confidence)

7.3 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.

7.4 EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations

Frequency Range	IF B/W
150kHz – 30MHz	9kHz

7.5 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.

7.6 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:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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:

$$\text{Over Limit} = \text{Level} - \text{Limit Line}$$

7.7 Environmental Conditions

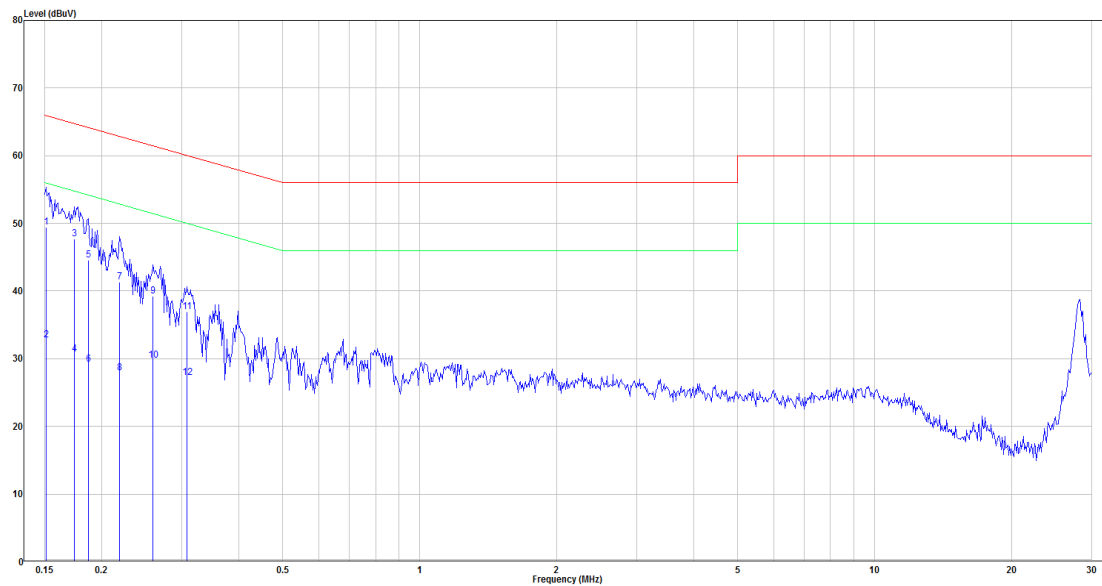
Temperature:	27.7 °C
Relative Humidity:	68 %
ATM Pressure:	1009 hPa

The testing was performed by Tom Hsu on 2019-01-31.

7.8 Test Results

Test Mode: Transmitting

Main: AC120 V, 60 Hz, Line



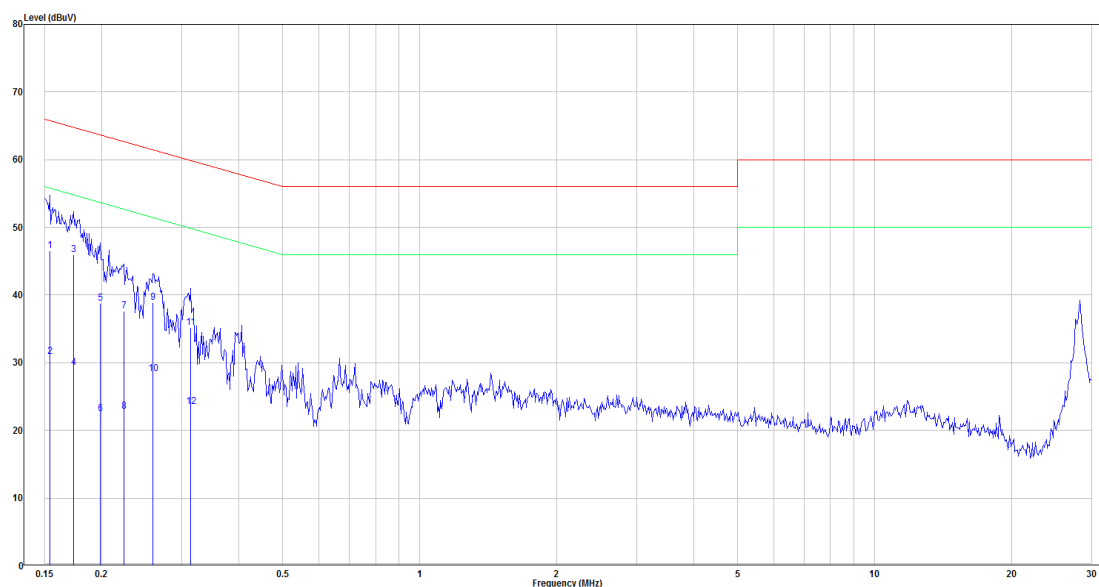
No.	Frequency (MHz)	Reading (dBμV)	Correct Factor(dB)	Result (dBμV)	Limit (dBμV)	Over limit (dB)	Remark
1	0.151	29.97	19.45	49.42	65.96	-16.54	QP
2	0.151	13.28	19.45	32.73	55.96	-23.23	Average
3	0.174	28.21	19.46	47.67	64.76	-17.09	QP
4	0.174	11.26	19.46	30.72	54.76	-24.04	Average
5	0.187	25.07	19.46	44.53	64.18	-19.65	QP
6	0.187	9.77	19.46	29.23	54.18	-24.95	Average
7	0.219	21.88	19.46	41.34	62.85	-21.51	QP
8	0.219	8.42	19.46	27.88	52.85	-24.97	Average
9	0.260	19.73	19.46	39.19	61.45	-22.26	QP
10	0.260	10.25	19.46	29.71	51.45	-21.74	Average
11	0.307	17.44	19.47	36.91	60.04	-23.13	QP
12	0.307	7.73	19.47	27.20	50.04	-22.84	Average

Note:

Level = Read Level + Factor

Over Limit = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

Main: AC120 V, 60 Hz, Neutral

No.	Frequency (MHz)	Reading (dBμV)	Correct Factor(dB)	Result (dBμV)	Limit (dBμV)	Over limit (dB)	Remark
1	0.154	27.09	19.44	46.53	65.79	-19.26	QP
2	0.154	11.49	19.44	30.93	55.79	-24.86	Average
3	0.173	26.50	19.45	45.95	64.80	-18.85	QP
4	0.173	9.78	19.45	29.23	54.80	-25.57	Average
5	0.198	19.36	19.46	38.82	63.68	-24.86	QP
6	0.198	2.99	19.46	22.45	53.68	-31.23	Average
7	0.223	18.18	19.46	37.64	62.69	-25.05	QP
8	0.223	3.37	19.46	22.83	52.69	-29.86	Average
9	0.260	19.49	19.46	38.95	61.45	-22.50	QP
10	0.260	8.89	19.46	28.35	51.45	-23.10	Average
11	0.314	15.75	19.46	35.21	59.87	-24.66	QP
12	0.314	4.06	19.46	23.52	49.87	-26.35	Average

Note:

Level = Read Level + Factor

Over Limit = Level – Limit Line

Factor = (LISN, ISN, PLC or current probe) Factor + Cable Loss + Attenuator

8 FCC §15.209, §15.205 , §15.407(b) (1),(2),(3),(4),(6),(7) – Spurious Emissions

8.1 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	16.42 – 16.423	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC §15.209(a): Except as provided elsewhere in this Subpart, 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**	3
88 - 216	150**	3
216 - 960	200**	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 470-806MHz. 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 5.25-5.35 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: 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 not exceed an e.i.r.p. of -27 dBm/MHz.
- (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.

8.2 Measurement Uncertainty

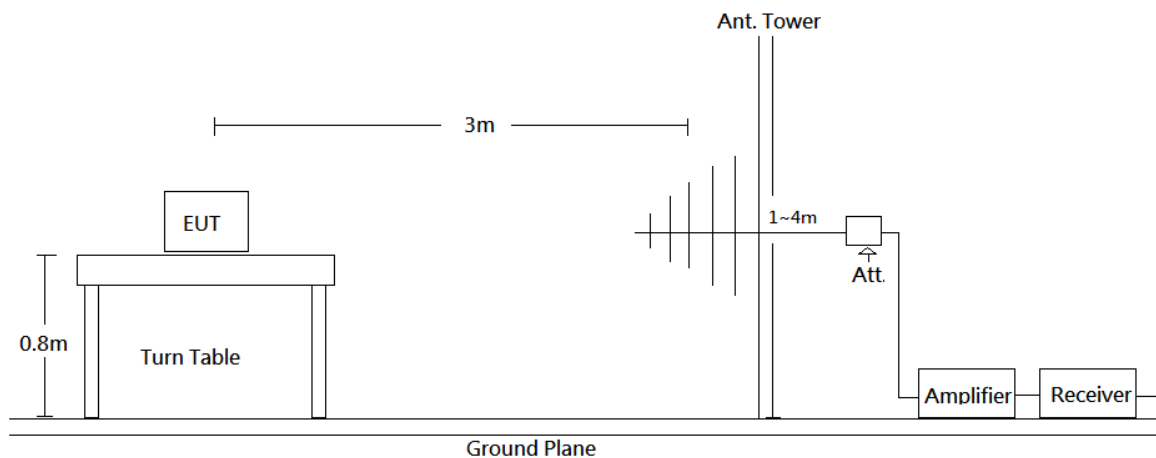
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency 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.

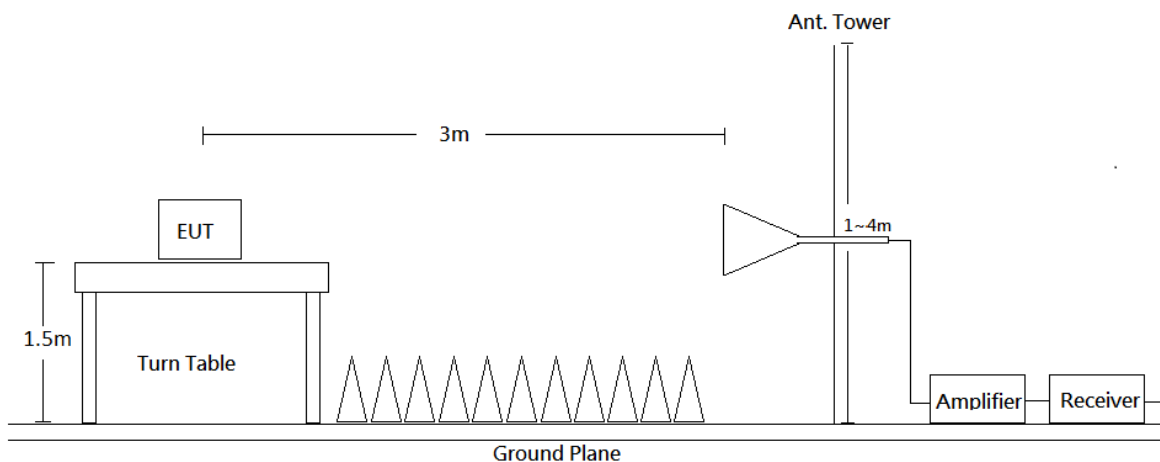
Frequency	Measurement uncertainty
30 MHz~200 MHz	3.75 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	4.21 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	4.83 dB (k=2, 95% level of confidence)
6 GHz~18 GHz	5.18 dB (k=2, 95% level of confidence)
18 GHz~26 GHz	4.55 dB (k=2, 95% level of confidence)
26 GHz~40 GHz	4.67 dB (k=2, 95% level of confidence)

8.3 EUT Setup

Below 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.

8.4 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 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

8.5 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: $E [dB\mu V/m] = EIRP[dBm] + 95.2$, for $d = 3$ meters.

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

Equivalent Field Strength at 3m is 68.23 dB μ V/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 dB μ V/m at 75 MHz or more above or below the band edge increasing linearly to 105.2 dB μ V/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 dB μ V/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 dB μ V/m at the band edge.

8.6 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:

$$\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

$$\text{Margin} = \text{Result} - \text{Limit}$$

8.7 Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.407 Limit.

8.8 Environmental Conditions

Radiation		Conducted	
Temperature:	25 °C	Temperature:	24 °C
Relative Humidity:	55 %	Relative Humidity:	54 %
ATM Pressure:	1010 hPa	ATM Pressure:	1010 hPa

The Radiation Spurious Emissions testing was performed by Tom Hsu on 2019-01-19 ~ 2019-01-21.

The Conducted Spurious Emissions testing was performed by Tom Hsu on 2019-01-18.

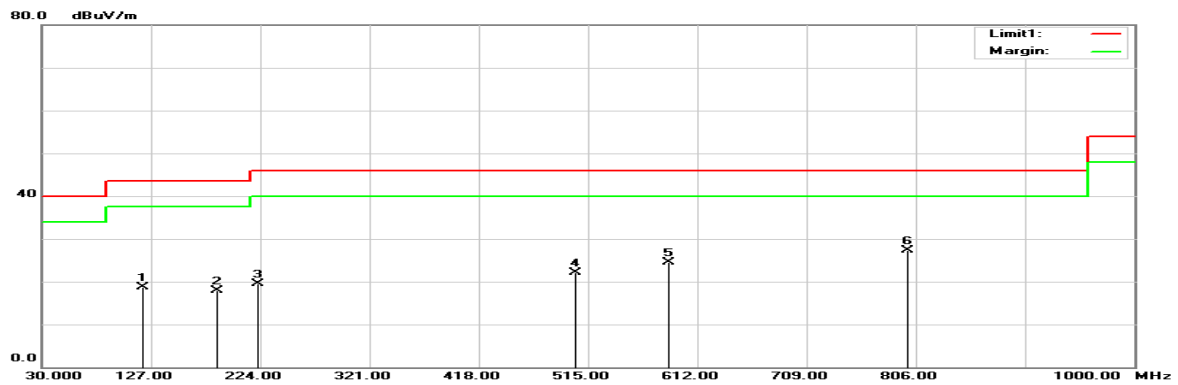
8.9 Test Results

Test Mode: Transmitting

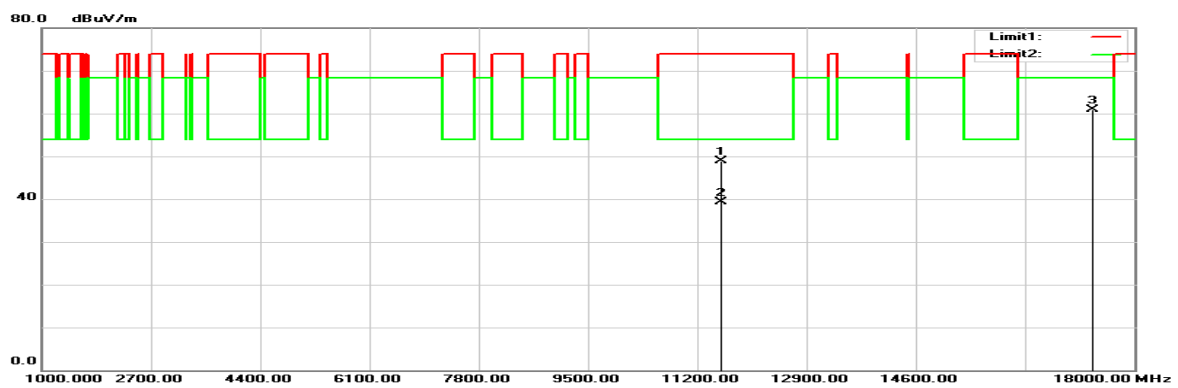
(Pre-scan with three orthogonal axis, and worse case as Y axis.)

Horizontal (worst case is Wi-Fi a mode 5785MHz)

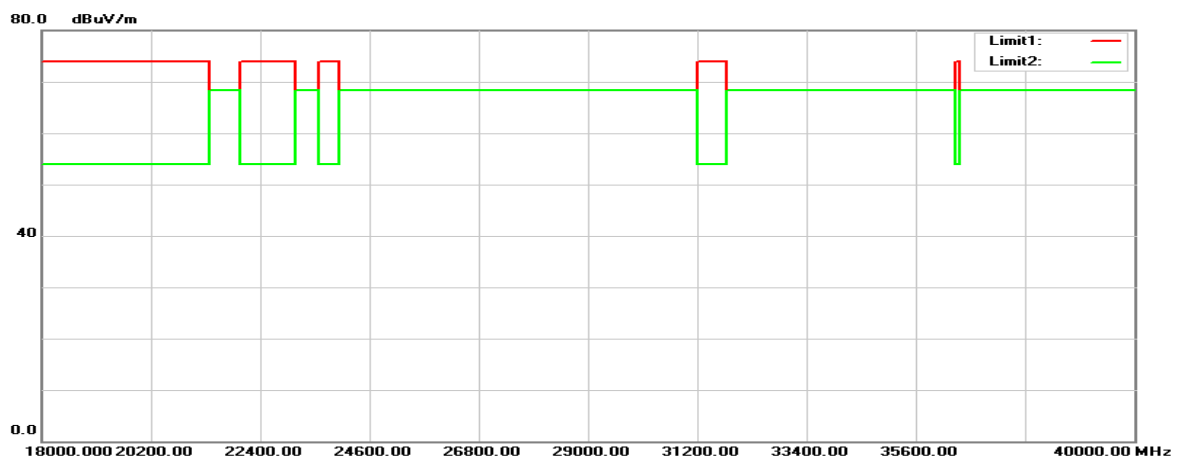
30MHz-1GHz:



1GHz-18GHz:

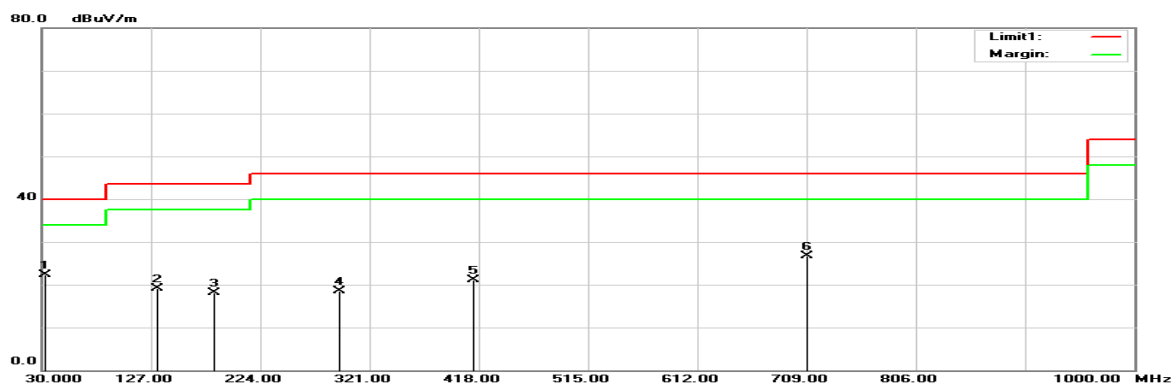


18GHz-40GHz:

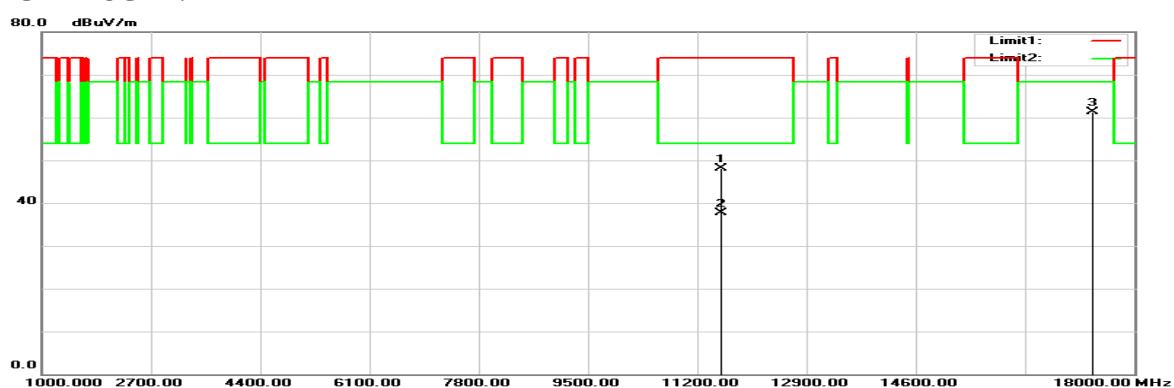


Vertical (worst case is Wi-Fi a mode 5785MHz)

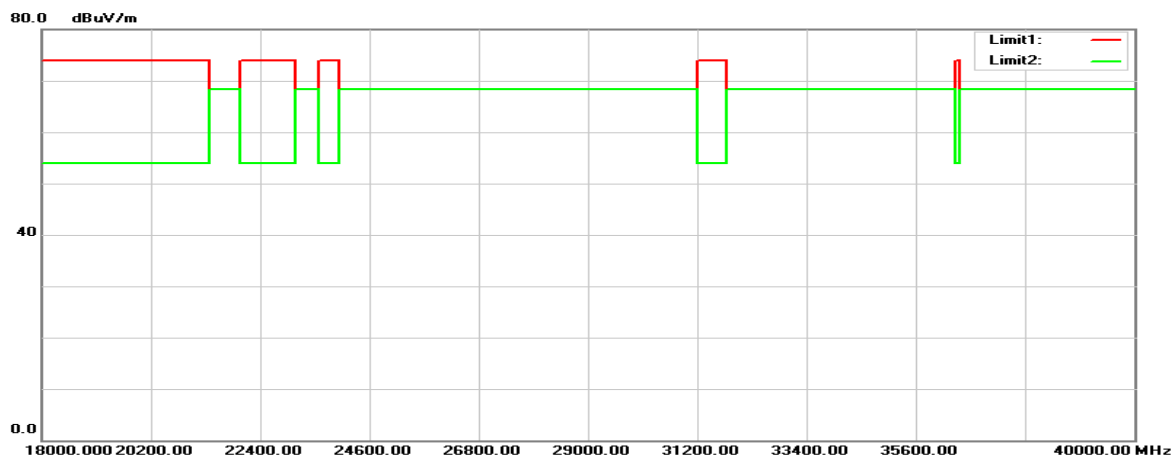
30MHz-1GHz:



1GHz-18GHz:



18GHz-40GHz:



Below 1GHz**Horizontal**

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
120.2100	29.55	-10.80	18.75	43.50	-24.75	100	145	QP
185.2000	30.76	-12.91	17.85	43.50	-25.65	100	75	QP
222.0600	32.18	-12.66	19.52	46.00	-26.48	100	2	QP
503.3600	27.70	-5.67	22.03	46.00	-23.97	100	13	QP
586.7800	28.83	-4.23	24.60	46.00	-21.40	100	171	QP
798.2400	27.86	-0.61	27.25	46.00	-18.75	100	143	QP

Vertical

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
32.9100	27.84	-5.60	22.24	40.00	-17.76	100	291	QP
132.8200	29.74	-10.63	19.11	43.50	-24.39	100	11	QP
183.2600	31.16	-12.98	18.18	43.50	-25.32	100	62	QP
293.8400	28.36	-9.85	18.51	46.00	-27.49	100	70	QP
413.1500	28.48	-7.42	21.06	46.00	-24.94	100	233	QP
709.0000	29.35	-2.64	26.71	46.00	-19.29	100	30	QP

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

For UNII-1 Band I:**Above 1GHz****Horizontal**

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5150.000	60.81	2.91	63.72	74.00	-10.28	100	84	peak
5150.000	47.53	2.91	50.44	54.00	-3.56	100	84	AVG
5180.000	103.53	2.92	106.45	N/A	N/A	100	87	peak
5180.000	95.82	2.92	98.74	N/A	N/A	100	87	AVG
10360.000	33.06	13.62	46.68	68.23	-21.55	100	134	peak
15540.000	43.92	12.45	56.37	74.00	-17.63	100	36	peak
15540.000	33.93	12.45	46.38	54.00	-7.62	100	36	AVG
a Mode, Middle channel								
5200.000	103.76	2.94	106.70	N/A	N/A	100	89	peak
5200.000	94.76	2.94	97.70	N/A	N/A	100	89	AVG
10400.000	34.12	13.57	47.69	68.23	-20.54	100	112	peak
15600.000	42.49	12.32	54.81	74.00	-19.19	100	36	peak
15600.000	32.27	12.32	44.59	54.00	-9.41	100	36	AVG
a Mode, High channel								
5240.000	103.33	2.89	106.22	N/A	N/A	100	89	peak
5240.000	94.54	2.89	97.43	N/A	N/A	100	89	AVG
5350.000	51.99	2.94	54.93	74.00	-19.07	100	56	peak
5350.000	38.99	2.94	41.93	54.00	-12.07	100	56	AVG
10480.000	34.20	13.71	47.91	68.23	-20.32	100	184	peak
15720.000	44.30	12.51	56.81	74.00	-17.19	100	131	peak
15720.000	33.59	12.51	46.10	54.00	-7.90	100	131	AVG

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5150.000	57.77	2.91	60.68	74.00	-13.32	100	45	peak
5150.000	45.45	2.91	48.36	54.00	-5.64	100	45	AVG
5180.000	100.50	2.92	103.42	N/A	N/A	100	29	peak
5180.000	92.60	2.92	95.52	N/A	N/A	100	29	AVG
10360.000	32.20	13.62	45.82	68.23	-22.41	100	185	peak
14345.000	43.72	16.01	59.73	68.23	-8.50	100	23	peak
15540.000	43.24	12.45	55.69	74.00	-18.31	100	38	peak
15540.000	32.84	12.45	45.29	54.00	-8.71	100	38	AVG
a Mode, Middle channel								
5200.000	100.78	2.94	103.72	N/A	N/A	100	28	peak
5200.000	91.38	2.94	94.32	N/A	N/A	100	28	AVG
10400.000	33.86	13.57	47.43	68.23	-20.80	100	159	peak
14396.000	44.33	15.83	60.16	68.23	-8.07	100	14	peak
15600.000	43.37	12.32	55.69	74.00	-18.31	100	202	peak
15600.000	31.71	12.32	44.03	54.00	-9.97	100	202	AVG
a Mode, High channel								
5240.000	100.01	2.89	102.90	N/A	N/A	100	31	peak
5240.000	92.28	2.89	95.17	N/A	N/A	100	31	AVG
5350.000	52.24	2.94	55.18	74.00	-18.82	100	98	peak
5350.000	38.77	2.94	41.71	54.00	-12.29	100	98	AVG
10480.000	35.48	13.71	49.19	68.23	-19.04	100	231	peak
14396.000	43.04	15.83	58.87	68.23	-9.36	100	23	peak
15720.000	47.67	12.51	60.18	74.00	-13.82	100	35	peak
15720.000	37.19	12.51	49.70	54.00	-4.30	100	35	AVG

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

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
ac20 Mode, Low channel								
5150.000	59.15	2.91	62.06	74.00	-11.94	100	90	peak
5150.000	45.31	2.91	48.22	54.00	-5.78	100	90	AVG
5180.000	102.86	2.92	105.78	N/A	N/A	100	89	peak
5180.000	93.81	2.92	96.73	N/A	N/A	100	89	AVG
10360.000	33.64	13.62	47.26	68.23	-20.97	100	209	peak
15540.000	45.78	12.45	58.23	74.00	-15.77	100	34	peak
15540.000	35.58	12.45	48.03	54.00	-5.97	100	34	AVG
ac20 Mode, Middle channel								
5200.000	103.24	2.94	106.18	N/A	N/A	100	89	peak
5200.000	94.65	2.94	97.59	N/A	N/A	100	89	AVG
10400.000	34.67	13.57	48.24	68.23	-19.99	100	57	peak
15600.000	44.71	12.32	57.03	74.00	-16.97	100	36	peak
15600.000	34.35	12.32	46.67	54.00	-7.33	100	36	AVG
ac20 Mode, High channel								
5240.000	101.89	2.89	104.78	N/A	N/A	100	90	peak
5240.000	92.53	2.89	95.42	N/A	N/A	100	90	AVG
5350.000	51.74	2.94	54.68	74.00	-19.32	100	161	peak
5350.000	38.94	2.94	41.88	54.00	-12.12	100	161	AVG
10480.000	33.82	13.71	47.53	68.23	-20.70	100	70	peak
15720.000	44.00	12.51	56.51	74.00	-17.49	100	39	peak
15720.000	33.64	12.51	46.15	54.00	-7.85	100	39	AVG

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5150.000	55.70	2.91	58.61	74.00	-15.39	100	31	peak
5150.000	44.33	2.91	47.24	54.00	-6.76	100	31	AVG
5180.000	99.56	2.92	102.48	N/A	N/A	100	29	peak
5180.000	91.12	2.92	94.04	N/A	N/A	100	29	AVG
10360.000	33.89	13.62	47.51	68.23	-20.72	100	107	peak
14362.000	48.78	15.94	64.72	68.23	-3.51	100	14	peak
15540.000	46.30	12.45	58.75	74.00	-15.25	100	38	peak
15540.000	35.98	12.45	48.43	54.00	-5.57	100	38	AVG
ac20 Mode, Middle channel								
5200.000	99.29	2.94	102.23	N/A	N/A	100	29	peak
5200.000	90.01	2.94	92.95	N/A	N/A	100	29	AVG
10400.000	33.80	13.57	47.37	68.23	-20.86	100	295	peak
14345.000	43.90	16.01	59.91	68.23	-8.32	100	22	peak
15600.000	46.38	12.32	58.70	74.00	-15.30	100	189	peak
15600.000	33.70	12.32	46.02	54.00	-7.98	100	189	AVG
ac20 Mode, High channel								
5240.000	98.86	2.89	101.75	N/A	N/A	100	31	peak
5240.000	89.63	2.89	92.52	N/A	N/A	100	31	AVG
5350.000	52.27	2.94	55.21	74.00	-18.79	100	317	peak
5350.000	38.76	2.94	41.70	54.00	-12.30	100	317	AVG
10480.000	35.01	13.71	48.72	68.23	-19.51	100	12	peak
14362.000	46.17	15.94	62.11	68.23	-6.12	100	12	peak
15720.000	48.29	12.51	60.80	74.00	-13.20	100	35	peak
15720.000	36.69	12.51	49.20	54.00	-4.80	100	35	AVG

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5150.000	61.74	2.91	64.65	74.00	-9.35	100	83	peak
5150.000	48.60	2.91	51.51	54.00	-2.49	100	83	AVG
5190.000	97.02	2.93	99.95	N/A	N/A	100	92	peak
5190.000	87.16	2.93	90.09	N/A	N/A	100	92	AVG
10380.000	33.75	13.60	47.35	68.23	-20.88	100	331	peak
ac40 Mode, High channel								
5230.000	96.59	2.90	99.49	N/A	N/A	100	89	peak
5230.000	88.18	2.90	91.08	N/A	N/A	100	89	AVG
5350.000	51.66	2.94	54.60	74.00	-19.40	100	203	peak
5350.000	38.80	2.94	41.74	54.00	-12.26	100	203	AVG
10460.000	33.87	13.68	47.55	68.23	-20.68	100	167	peak

Vertical

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5150.000	59.89	2.91	62.80	74.00	-11.20	100	27	peak
5150.000	46.64	2.91	49.55	54.00	-4.45	100	27	AVG
5190.000	94.73	2.93	97.66	N/A	N/A	100	29	peak
5190.000	84.92	2.93	87.85	N/A	N/A	100	29	AVG
10380.000	33.38	13.60	46.98	68.23	-21.25	100	359	peak
14379.000	44.04	15.88	59.92	68.23	-8.31	100	23	peak
ac40 Mode, High channel								
5230.000	93.46	2.90	96.36	N/A	N/A	100	31	peak
5230.000	84.91	2.90	87.81	N/A	N/A	100	31	AVG
5350.000	51.20	2.94	54.14	74.00	-19.86	100	63	peak
5350.000	38.59	2.94	41.53	54.00	-12.47	100	63	AVG
10460.000	34.10	13.68	47.78	68.23	-20.45	100	143	peak
14396.000	42.60	15.83	58.43	68.23	-9.80	100	19	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

For UNII-2A Band II:**Above 1GHz****Horizontal**

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5150.000	52.09	2.91	55.00	74.00	-19.00	100	79	peak
5150.000	39.56	2.91	42.47	54.00	-11.53	100	79	AVG
5260.000	103.08	2.86	105.94	N/A	N/A	100	87	peak
5260.000	95.05	2.86	97.91	N/A	N/A	100	87	AVG
10520.000	35.41	13.75	49.16	68.23	-19.07	100	84	peak
15780.000	39.43	12.25	51.68	74.00	-22.32	100	134	peak
15780.000	29.50	12.25	41.75	54.00	-12.25	100	134	AVG
a Mode, Middle channel								
5300.000	102.70	2.81	105.51	N/A	N/A	100	89	peak
5300.000	94.79	2.81	97.60	N/A	N/A	100	89	AVG
10600.000	34.58	13.78	48.36	68.23	-19.87	100	269	peak
15900.000	47.49	12.24	59.73	74.00	-14.27	100	9	peak
15900.000	34.60	12.24	46.84	54.00	-7.16	100	9	AVG
a Mode, High channel								
5319.040	103.25	2.86	106.11	N/A	N/A	100	89	peak
5319.040	95.20	2.86	98.06	N/A	N/A	100	89	AVG
5350.000	56.19	2.94	59.13	74.00	-14.87	100	94	peak
5350.000	44.87	2.94	47.81	54.00	-6.19	100	94	AVG
10640.000	34.78	13.88	48.66	74.00	-25.34	100	357	peak
10640.000	24.13	13.88	38.01	54.00	-15.99	100	357	AVG
15960.000	45.86	12.35	58.21	74.00	-15.79	100	129	peak
15960.000	35.83	12.35	48.18	54.00	-5.82	100	129	AVG

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5150.000	51.39	2.91	54.30	74.00	-19.70	100	172	peak
5150.000	39.34	2.91	42.25	54.00	-11.75	100	172	AVG
5260.000	99.80	2.86	102.66	N/A	N/A	100	31	peak
5260.000	91.92	2.86	94.78	N/A	N/A	100	31	AVG
10520.000	34.70	13.75	48.45	68.23	-19.78	100	268	peak
14362.000	47.85	15.94	63.79	68.23	-4.44	100	47	peak
15780.000	40.40	12.25	52.65	74.00	-21.35	100	35	peak
15780.000	31.38	12.25	43.63	54.00	-10.37	100	35	AVG
a Mode, Middle channel								
5300.000	99.33	2.81	102.14	N/A	N/A	100	31	peak
5300.000	91.08	2.81	93.89	N/A	N/A	100	31	AVG
10600.000	35.07	13.78	48.85	68.23	-19.38	100	126	peak
14396.000	44.52	15.83	60.35	68.23	-7.88	100	16	peak
15900.000	48.88	12.24	61.12	74.00	-12.88	100	38	peak
15900.000	38.22	12.24	50.46	54.00	-3.54	100	38	AVG
a Mode, High channel								
5319.040	99.34	2.86	102.20	N/A	N/A	100	32	peak
5319.040	91.41	2.86	94.27	N/A	N/A	100	32	AVG
5350.000	55.14	2.94	58.08	74.00	-15.92	100	36	peak
5350.000	42.90	2.94	45.84	54.00	-8.16	100	36	AVG
10640.000	34.95	13.88	48.83	74.00	-25.17	100	9	peak
10640.000	24.10	13.88	37.98	54.00	-16.02	100	9	AVG
14362.000	43.88	15.94	59.82	68.23	-8.41	100	16	peak
15960.000	50.34	12.35	62.69	74.00	-11.31	100	40	peak
15960.000	38.83	12.35	51.18	54.00	-2.82	100	40	AVG

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5150.000	52.17	2.91	55.08	74.00	-18.92	100	160	peak
5150.000	39.21	2.91	42.12	54.00	-11.88	100	160	AVG
5260.000	101.82	2.86	104.68	N/A	N/A	100	89	peak
5260.000	93.32	2.86	96.18	N/A	N/A	100	89	AVG
10520.000	34.54	13.75	48.29	68.23	-19.94	100	46	peak
ac20 Mode, Middle channel								
5300.000	101.62	2.81	104.43	N/A	N/A	100	89	peak
5300.000	92.93	2.81	95.74	N/A	N/A	100	89	AVG
10600.000	35.40	13.78	49.18	68.23	-19.05	100	332	peak
15900.000	46.24	12.24	58.48	74.00	-15.52	100	129	peak
15900.000	30.89	12.24	43.13	54.00	-10.87	100	129	AVG
ac20 Mode, High channel								
5320.000	102.09	2.87	104.96	N/A	N/A	100	89	peak
5320.000	93.69	2.87	96.56	N/A	N/A	100	89	AVG
5350.000	57.40	2.94	60.34	74.00	-13.66	100	92	peak
5350.000	45.55	2.94	48.49	54.00	-5.51	100	92	AVG
10640.000	35.81	13.88	49.69	74.00	-24.31	100	87	peak
10640.000	24.06	13.88	37.94	54.00	-16.06	100	87	AVG
15960.000	45.38	12.35	57.73	74.00	-16.27	100	0	peak
15960.000	33.11	12.35	45.46	54.00	-8.54	100	0	AVG

Vertical

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5150.000	51.51	2.91	54.42	74.00	-19.58	100	317	peak
5150.000	39.32	2.91	42.23	54.00	-11.77	100	317	AVG
5260.000	98.51	2.86	101.37	N/A	N/A	100	31	peak
5260.000	90.09	2.86	92.95	N/A	N/A	100	31	AVG
10520.000	34.86	13.75	48.61	68.23	-19.62	100	88	peak
14362.000	43.51	15.94	59.45	68.23	-8.78	100	12	peak
ac20 Mode, Middle channel								
5300.000	98.24	2.81	101.05	N/A	N/A	100	126	peak
5300.000	89.50	2.81	92.31	N/A	N/A	100	126	AVG
10600.000	35.48	13.78	49.26	68.23	-18.97	100	50	peak
14362.000	44.13	15.94	60.07	68.23	-8.16	100	16	peak
15900.000	48.10	12.24	60.34	74.00	-13.66	100	40	peak
15900.000	34.84	12.24	47.08	54.00	-6.92	100	40	AVG
ac20 Mode, High channel								
5320.000	98.29	2.87	101.16	N/A	N/A	100	32	peak
5320.000	89.95	2.87	92.82	N/A	N/A	100	32	AVG
5350.000	54.58	2.94	57.52	74.00	-16.48	100	124	peak
5350.000	42.40	2.94	45.34	54.00	-8.66	100	124	AVG
10640.000	35.45	13.88	49.33	74.00	-24.67	100	129	peak
10640.000	24.72	13.88	38.60	54.00	-15.40	100	129	AVG
14362.000	44.09	15.94	60.03	68.23	-8.20	100	3	peak
15960.000	48.65	12.35	61.00	74.00	-13.00	100	178	peak
15960.000	33.52	12.35	45.87	54.00	-8.13	100	178	AVG

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5150.000	52.48	2.91	55.39	74.00	-18.61	100	294	peak
5150.000	40.11	2.91	43.02	54.00	-10.98	100	294	AVG
5270.000	99.11	2.85	101.96	N/A	N/A	100	87	peak
5270.000	90.63	2.85	93.48	N/A	N/A	100	87	AVG
10540.000	34.99	13.75	48.74	68.23	-19.49	100	306	peak
ac40 Mode, High channel								
5310.000	97.64	2.84	100.48	N/A	N/A	100	91	peak
5310.000	89.80	2.84	92.64	N/A	N/A	100	91	AVG
5350.000	61.27	2.94	64.21	74.00	-9.79	100	94	peak
5350.000	48.44	2.94	51.38	54.00	-2.62	100	94	AVG
10620.000	34.63	13.83	48.46	74.00	-25.54	100	16	peak
10620.000	23.69	13.83	37.52	54.00	-16.48	100	16	AVG
15930.000	41.12	12.29	53.41	74.00	-20.59	100	9	peak
15930.000	28.13	12.29	40.42	54.00	-13.58	100	9	AVG

Vertical

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5150.000	52.86	2.91	55.77	74.00	-18.23	100	27	peak
5150.000	40.22	2.91	43.13	54.00	-10.87	100	27	AVG
5270.000	95.16	2.85	98.01	N/A	N/A	100	31	peak
5270.000	87.22	2.85	90.07	N/A	N/A	100	31	AVG
10540.000	34.53	13.75	48.28	68.23	-19.95	100	201	peak
14362.000	43.87	15.94	59.81	68.23	-8.42	100	23	peak
ac40 Mode, High channel								
5310.000	93.62	2.84	96.46	N/A	N/A	100	126	peak
5310.000	84.81	2.84	87.65	N/A	N/A	100	126	AVG
5350.000	58.58	2.94	61.52	74.00	-12.48	100	32	peak
5350.000	45.89	2.94	48.83	54.00	-5.17	100	32	AVG
10620.000	35.12	13.83	48.95	74.00	-25.05	100	117	peak
10620.000	23.62	13.83	37.45	54.00	-16.55	100	117	AVG
14362.000	42.85	15.94	58.79	68.23	-9.44	100	13	peak
15930.000	41.16	12.29	53.45	74.00	-20.55	100	38	peak
15930.000	30.40	12.29	42.69	54.00	-11.31	100	38	AVG

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

For UNII-2C Band III:**Above 1GHz****Horizontal**

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5460.000	51.99	3.53	55.52	74.00	-18.48	100	60	peak
5460.000	39.34	3.53	42.87	54.00	-11.13	100	60	AVG
5500.000	98.54	3.55	102.09	N/A	N/A	100	89	peak
5500.000	90.93	3.55	94.48	N/A	N/A	100	89	AVG
11000.000	34.34	14.05	48.39	74.00	-25.61	100	202	peak
11000.000	24.57	14.05	38.62	54.00	-15.38	100	202	AVG
16500.000	43.77	14.51	58.28	68.23	-9.95	100	22	peak
a Mode, Middle channel								
5580.000	98.91	3.57	102.48	N/A	N/A	100	143	peak
5580.000	90.73	3.57	94.30	N/A	N/A	100	143	AVG
11160.000	35.18	14.15	49.33	74.00	-24.67	100	160	peak
11160.000	23.77	14.15	37.92	54.00	-16.08	100	160	AVG
16740.000	43.32	15.85	59.17	68.23	-9.06	100	25	peak
a Mode, High channel								
5700.000	98.83	3.70	102.53	N/A	N/A	100	159	peak
5700.000	91.05	3.70	94.75	N/A	N/A	100	159	AVG
5725.000	56.75	3.73	60.48	68.23	-7.75	100	152	peak
11400.000	36.88	14.21	51.09	74.00	-22.91	100	1	peak
11400.000	24.07	14.21	38.28	54.00	-15.72	100	1	AVG
17116.000	45.37	18.20	63.57	68.23	-4.66	100	150	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5460.000	53.14	3.53	56.67	74.00	-17.33	100	69	peak
5460.000	41.26	3.53	44.79	54.00	-9.21	100	69	AVG
5500.000	99.40	3.55	102.95	N/A	N/A	100	109	peak
5500.000	91.72	3.55	95.27	N/A	N/A	100	109	AVG
11000.000	33.73	14.05	47.78	74.00	-26.22	100	228	peak
11000.000	23.78	14.05	37.83	54.00	-16.17	100	228	AVG
14362.000	43.24	15.94	59.18	68.23	-9.05	100	15	peak
16500.000	44.45	14.51	58.96	68.23	-9.27	100	36	peak
a Mode, Middle channel								
5580.000	100.48	3.57	104.05	N/A	N/A	100	107	peak
5580.000	92.73	3.57	96.30	N/A	N/A	100	107	AVG
11160.000	34.33	14.15	48.48	74.00	-25.52	100	123	peak
11160.000	22.78	14.15	36.93	54.00	-17.07	100	123	AVG
14379.000	42.90	15.88	58.78	68.23	-9.45	100	41	peak
16740.000	42.93	15.85	58.78	68.23	-9.45	100	36	peak
a Mode, High channel								
5698.470	101.71	3.69	105.40	N/A	N/A	100	109	peak
5698.470	92.81	3.69	96.50	N/A	N/A	100	109	AVG
5725.000	57.71	3.73	61.44	68.23	-6.79	100	100	peak
11400.000	35.92	14.21	50.13	74.00	-23.87	100	128	peak
11400.000	24.43	14.21	38.64	54.00	-15.36	100	128	AVG
14362.000	42.46	15.94	58.40	68.23	-9.83	100	16	peak
17100.000	43.69	18.09	61.78	68.23	-6.45	100	38	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5460.000	52.31	3.53	55.84	74.00	-18.16	100	150	peak
5460.000	40.62	3.53	44.15	54.00	-9.85	100	150	AVG
5500.000	98.76	3.55	102.31	N/A	N/A	100	89	peak
5500.000	90.14	3.55	93.69	N/A	N/A	100	89	AVG
11000.000	34.44	14.05	48.49	74.00	-25.51	100	289	peak
11000.000	22.94	14.05	36.99	54.00	-17.01	100	289	AVG
16500.000	45.54	14.51	60.05	68.23	-8.18	100	10	peak
ac20 Mode, Middle channel								
5580.000	98.89	3.57	102.46	N/A	N/A	100	161	peak
5580.000	90.60	3.57	94.17	N/A	N/A	100	161	AVG
11160.000	34.59	14.15	48.74	74.00	-25.26	100	200	peak
11160.000	23.84	14.15	37.99	54.00	-16.01	100	200	AVG
16740.000	44.57	15.85	60.42	68.23	-7.81	100	113	peak
ac20 Mode, High channel								
5700.000	98.86	3.70	102.56	N/A	N/A	100	143	peak
5700.000	90.15	3.70	93.85	N/A	N/A	100	143	AVG
5725.000	59.10	3.73	62.83	68.23	-5.40	100	159	peak
11400.000	35.09	14.21	49.30	74.00	-24.70	100	6	peak
11400.000	25.24	14.21	39.45	54.00	-14.55	100	6	AVG
17100.000	44.07	18.09	62.16	68.23	-6.07	100	145	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5460.000	52.47	3.53	56.00	74.00	-18.00	100	98	peak
5460.000	40.22	3.53	43.75	54.00	-10.25	100	98	AVG
5500.000	99.50	3.55	103.05	N/A	N/A	100	108	peak
5500.000	90.96	3.55	94.51	N/A	N/A	100	108	AVG
11000.000	33.64	14.05	47.69	74.00	-26.31	100	278	peak
11000.000	23.26	14.05	37.31	54.00	-16.69	100	278	AVG
14396.000	43.32	15.83	59.15	68.23	-9.08	100	51	peak
16500.000	41.70	14.51	56.21	68.23	-12.02	100	33	peak
ac20 Mode, Middle channel								
5580.000	100.53	3.57	104.10	N/A	N/A	100	108	peak
5580.000	92.33	3.57	95.90	N/A	N/A	100	108	AVG
11160.000	33.88	14.15	48.03	74.00	-25.97	100	236	peak
11160.000	22.55	14.15	36.70	54.00	-17.30	100	236	AVG
14396.000	42.50	15.83	58.33	68.23	-9.90	100	21	peak
16740.000	41.32	15.85	57.17	68.23	-11.06	100	33	peak
ac20 Mode, High channel								
5700.000	101.57	3.70	105.27	N/A	N/A	100	107	peak
5700.000	93.11	3.70	96.81	N/A	N/A	100	107	AVG
5725.000	61.42	3.73	65.15	68.23	-3.08	100	65	peak
11400.000	35.15	14.21	49.36	74.00	-24.64	100	205	peak
11400.000	24.62	14.21	38.83	54.00	-15.17	100	205	AVG
14379.000	45.40	15.88	61.28	68.23	-6.95	100	22	peak
17100.000	44.76	18.09	62.85	68.23	-5.38	100	27	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5460.000	56.68	3.53	60.21	74.00	-13.79	100	92	peak
5460.000	43.92	3.53	47.45	54.00	-6.55	100	92	AVG
5510.000	95.29	3.57	98.86	N/A	N/A	100	123	peak
5510.000	86.82	3.57	90.39	N/A	N/A	100	123	AVG
11020.000	34.45	14.06	48.51	74.00	-25.49	100	13	peak
11020.000	22.68	14.06	36.74	54.00	-17.26	100	13	AVG
16530.000	39.54	14.68	54.22	68.23	-14.01	100	25	peak
ac40 Mode, Middle channel								
5590.000	94.75	3.55	98.30	N/A	N/A	100	164	peak
5590.000	85.96	3.55	89.51	N/A	N/A	100	164	AVG
11180.000	35.00	14.17	49.17	74.00	-24.83	100	109	peak
11180.000	22.75	14.17	36.92	54.00	-17.08	100	109	AVG
16770.000	39.29	15.99	55.28	68.23	-12.95	100	77	peak
ac40 Mode, High channel								
5670.000	96.32	3.64	99.96	N/A	N/A	100	144	peak
5670.000	86.64	3.64	90.28	N/A	N/A	100	144	AVG
5725.000	54.54	3.73	58.27	68.23	-9.96	100	139	peak
11340.000	34.42	14.17	48.59	74.00	-25.41	100	297	peak
11340.000	23.40	14.17	37.57	54.00	-16.43	100	297	AVG
17014.000	39.98	17.22	57.20	68.23	-11.03	100	9	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5460.000	56.00	3.53	59.53	74.00	-14.47	100	108	peak
5460.000	43.66	3.53	47.19	54.00	-6.81	100	108	AVG
5510.000	95.63	3.57	99.20	N/A	N/A	100	108	peak
5510.000	87.10	3.57	90.67	N/A	N/A	100	108	AVG
11020.000	33.46	14.06	47.52	74.00	-26.48	100	72	peak
11020.000	22.78	14.06	36.84	54.00	-17.16	100	72	AVG
14379.000	44.00	15.88	59.88	68.23	-8.35	100	49	peak
16530.000	38.91	14.68	53.59	68.23	-14.64	100	44	peak
ac40 Mode, Middle channel								
5590.000	96.86	3.55	100.41	N/A	N/A	100	108	peak
5590.000	88.42	3.55	91.97	N/A	N/A	100	108	AVG
11180.000	35.03	14.17	49.20	74.00	-24.80	100	359	peak
11180.000	22.61	14.17	36.78	54.00	-17.22	100	359	AVG
14379.000	42.43	15.88	58.31	68.23	-9.92	100	16	peak
16770.000	39.17	15.99	55.16	68.23	-13.07	100	35	peak
ac40 Mode, High channel								
5670.000	98.48	3.64	102.12	N/A	N/A	100	108	peak
5670.000	89.58	3.64	93.22	N/A	N/A	100	108	AVG
5725.000	56.69	3.73	60.42	68.23	-7.81	100	108	peak
11340.000	34.67	14.17	48.84	74.00	-25.16	100	92	peak
11340.000	23.70	14.17	37.87	54.00	-16.13	100	92	AVG
14396.000	43.08	15.83	58.91	68.23	-9.32	100	21	peak
17010.000	38.52	17.18	55.70	68.23	-12.53	100	79	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

For UNII-3 Band IV:**Above 1GHz****Horizontal**

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5630.100	53.84	3.57	57.41	68.20	-10.79	100	32	peak
5658.450	54.46	3.62	58.08	74.45	-16.37	100	227	peak
5719.700	55.65	3.73	59.38	110.72	-51.34	100	158	peak
5724.950	61.21	3.73	64.94	122.09	-57.15	100	165	peak
5745.000	97.76	3.77	101.53	N/A	N/A	100	143	peak
5745.000	90.03	3.77	93.80	N/A	N/A	100	143	AVG
5850.600	53.45	3.95	57.40	120.83	-63.43	100	80	peak
5873.350	53.92	4.04	57.96	105.66	-47.70	100	320	peak
5902.400	54.22	4.14	58.36	84.92	-26.56	100	4	peak
5943.000	54.11	4.21	58.32	68.20	-9.88	100	219	peak
11490.000	33.79	14.36	48.15	74.00	-25.85	100	301	peak
11490.000	23.68	14.36	38.04	54.00	-15.96	100	301	AVG
17235.000	44.26	19.12	63.38	68.23	-4.85	100	235	peak
a Mode, Middle channel								
5615.400	54.33	3.54	57.87	68.20	-10.33	100	194	peak
5690.650	53.66	3.68	57.34	98.28	-40.94	100	30	peak
5707.100	53.91	3.70	57.61	107.19	-49.58	100	198	peak
5722.500	54.50	3.73	58.23	116.50	-58.27	100	170	peak
5785.000	98.47	3.91	102.38	N/A	N/A	100	159	peak
5785.000	89.22	3.91	93.13	N/A	N/A	100	159	AVG
5853.400	54.33	3.97	58.30	114.45	-56.15	100	137	peak
5868.450	54.16	4.03	58.19	107.03	-48.84	100	221	peak
5886.650	54.83	4.09	58.92	96.58	-37.66	100	27	peak
5944.400	53.96	4.21	58.17	68.20	-10.03	100	1	peak
11570.000	34.63	14.33	48.96	74.00	-25.04	100	261	peak
11570.000	24.89	14.33	39.22	54.00	-14.78	100	261	AVG
17355.000	40.89	20.05	60.94	68.23	-7.29	100	182	peak
a Mode, High channel								
5621.000	53.29	3.56	56.85	68.20	-11.35	100	213	peak
5673.150	54.19	3.65	57.84	85.33	-27.49	100	283	peak
5719.700	53.92	3.73	57.65	110.72	-53.07	100	188	peak
5723.900	53.24	3.73	56.97	119.69	-62.72	100	31	peak
5825.000	97.10	3.96	101.06	N/A	N/A	100	31	peak
5825.000	88.24	3.96	92.20	N/A	N/A	100	31	AVG
5850.250	58.15	3.95	62.10	121.63	-59.53	100	155	peak
5858.300	55.65	3.99	59.64	109.88	-50.24	100	34	peak
5878.600	54.37	4.06	58.43	102.54	-44.11	100	183	peak
5927.250	54.01	4.18	58.19	68.20	-10.01	100	128	peak
11650.000	34.24	14.43	48.67	74.00	-25.33	100	190	peak
11650.000	24.72	14.43	39.15	54.00	-14.85	100	190	AVG
17475.000	41.77	21.23	63.00	68.23	-5.23	100	170	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
a Mode, Low channel								
5622.050	52.89	3.56	56.45	68.20	-11.75	100	98	peak
5692.400	53.49	3.68	57.17	99.58	-42.41	100	75	peak
5719.700	57.08	3.73	60.81	110.72	-49.91	100	108	peak
5724.950	62.84	3.73	66.57	122.09	-55.52	100	105	peak
5745.000	99.97	3.77	103.74	N/A	N/A	100	107	peak
5745.000	92.51	3.77	96.28	N/A	N/A	100	107	AVG
5854.100	54.05	3.97	58.02	112.85	-54.83	100	236	peak
5867.750	54.43	4.03	58.46	107.23	-48.77	100	20	peak
5911.850	54.09	4.15	58.24	77.93	-19.69	100	126	peak
5945.100	54.18	4.21	58.39	68.20	-9.81	100	108	peak
11490.000	33.09	14.36	47.45	74.00	-26.55	100	0	peak
11490.000	23.42	14.36	37.78	54.00	-16.22	100	0	AVG
17235.000	43.08	19.12	62.20	68.23	-6.03	100	135	peak
a Mode, Middle channel								
5621.700	53.78	3.56	57.34	68.20	-10.86	100	110	peak
5667.900	54.48	3.64	58.12	81.45	-23.33	100	273	peak
5702.550	53.98	3.70	57.68	105.91	-48.23	100	110	peak
5724.250	53.68	3.73	57.41	120.49	-63.08	100	103	peak
5785.000	101.77	3.91	105.68	N/A	N/A	100	106	peak
5785.000	93.51	3.91	97.42	N/A	N/A	100	106	AVG
5853.050	54.47	3.97	58.44	115.25	-56.81	100	129	peak
5864.600	54.83	4.00	58.83	108.11	-49.28	100	97	peak
5917.800	55.06	4.17	59.23	73.53	-14.30	100	302	peak
5938.100	53.90	4.20	58.10	68.20	-10.10	100	106	peak
11570.000	33.84	14.33	48.17	74.00	-25.83	100	276	peak
11570.000	23.47	14.33	37.80	54.00	-16.20	100	276	AVG
17355.000	41.19	20.05	61.24	68.23	-6.99	100	134	peak
a Mode, High channel								
5615.050	53.44	3.54	56.98	68.20	-11.22	100	0	peak
5695.200	53.41	3.68	57.09	101.65	-44.56	100	64	peak
5707.100	53.72	3.70	57.42	107.19	-49.77	100	77	peak
5723.200	54.81	3.73	58.54	118.10	-59.56	100	356	peak
5825.000	101.89	3.96	105.85	N/A	N/A	100	129	peak
5825.000	92.90	3.96	96.86	N/A	N/A	100	129	AVG
5850.250	61.35	3.95	65.30	121.63	-56.33	100	129	peak
5858.300	57.66	3.99	61.65	109.88	-48.23	100	134	peak
5895.750	56.08	4.12	60.20	89.84	-29.64	100	162	peak
5925.150	54.21	4.18	58.39	68.20	-9.81	100	123	peak
11650.000	34.24	14.43	48.67	74.00	-25.33	100	190	peak
11650.000	24.18	14.43	38.61	54.00	-15.39	100	215	AVG
17475.000	38.08	21.23	59.31	68.23	-8.92	100	289	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5636.050	53.38	3.59	56.97	68.20	-11.23	100	237	peak
5688.200	53.81	3.67	57.48	96.47	-38.99	100	159	peak
5719.700	57.14	3.73	60.87	110.72	-49.85	100	174	peak
5724.600	64.11	3.73	67.84	121.29	-53.45	100	158	peak
5745.000	97.77	3.77	101.54	N/A	N/A	100	156	peak
5745.000	88.34	3.77	92.11	N/A	N/A	100	156	AVG
5854.800	53.94	3.97	57.91	111.26	-53.35	100	20	peak
5870.550	54.69	4.03	58.72	106.45	-47.73	100	287	peak
5906.950	54.98	4.15	59.13	81.56	-22.43	100	102	peak
5950.000	54.05	4.23	58.28	68.20	-9.92	100	194	peak
11490.000	33.65	14.36	48.01	74.00	-25.99	100	6	peak
11490.000	23.85	14.36	38.21	54.00	-15.79	100	6	AVG
17235.000	41.59	19.12	60.71	68.23	-7.52	100	169	peak
ac20 Mode, Middle channel								
5619.600	53.38	3.56	56.94	68.20	-11.26	100	1	peak
5652.150	53.52	3.61	57.13	69.79	-12.66	100	5	peak
5716.200	53.80	3.72	57.52	109.74	-52.22	100	169	peak
5723.550	52.99	3.73	56.72	118.89	-62.17	100	347	peak
5785.000	96.90	3.91	100.81	N/A	N/A	100	159	peak
5785.000	87.50	3.91	91.41	N/A	N/A	100	159	AVG
5852.700	53.97	3.97	57.94	116.04	-58.10	100	71	peak
5868.100	54.70	4.03	58.73	107.13	-48.40	100	251	peak
5916.750	54.44	4.17	58.61	74.31	-15.70	100	79	peak
5934.250	53.71	4.20	57.91	68.20	-10.29	100	1	peak
11570.000	34.80	14.33	49.13	74.00	-24.87	100	53	peak
11570.000	24.77	14.33	39.10	54.00	-14.90	100	53	AVG
ac20 Mode, High channel								
5625.550	52.86	3.57	56.43	68.20	-11.77	100	357	peak
5694.850	53.43	3.68	57.11	101.39	-44.28	100	5	peak
5709.200	53.94	3.71	57.65	107.78	-50.13	100	191	peak
5722.850	53.06	3.73	56.79	117.30	-60.51	100	136	peak
5825.000	95.93	3.96	99.89	N/A	N/A	100	180	peak
5825.000	86.79	3.96	90.75	N/A	N/A	100	180	AVG
5850.250	57.67	3.95	61.62	121.63	-60.01	100	160	peak
5858.300	56.06	3.99	60.05	109.88	-49.83	100	28	peak
5897.500	54.58	4.12	58.70	88.55	-29.85	100	212	peak
5944.050	53.94	4.21	58.15	68.20	-10.05	100	108	peak
11650.000	34.65	14.43	49.08	74.00	-24.92	100	190	peak
11650.000	24.96	14.43	39.39	54.00	-14.61	100	190	AVG
17475.000	39.31	21.23	60.54	68.23	-7.69	100	168	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac20 Mode, Low channel								
5641.300	53.24	3.59	56.83	68.20	-11.37	100	212	peak
5699.750	54.07	3.70	57.77	105.02	-47.25	100	107	peak
5719.700	59.54	3.73	63.27	110.72	-47.45	100	105	peak
5724.600	66.76	3.73	70.49	121.29	-50.80	100	107	peak
5745.000	100.26	3.77	104.03	N/A	N/A	100	108	peak
5745.000	90.74	3.77	94.51	N/A	N/A	100	108	AVG
5853.400	54.35	3.97	58.32	114.45	-56.13	100	113	peak
5869.150	53.97	4.03	58.00	106.84	-48.84	100	152	peak
5911.850	54.32	4.15	58.47	77.93	-19.46	100	145	peak
5925.850	54.90	4.18	59.08	68.20	-9.12	100	119	peak
11490.000	34.69	14.36	49.05	74.00	-24.95	100	322	peak
11490.000	24.93	14.36	39.29	54.00	-14.71	100	322	AVG
17235.000	39.61	19.12	58.73	68.23	-9.50	100	131	peak
ac20 Mode, Middle channel								
5630.100	53.56	3.57	57.13	68.20	-11.07	100	218	peak
5696.250	54.02	3.69	57.71	102.42	-44.71	100	203	peak
5709.900	53.67	3.71	57.38	107.97	-50.59	100	7	peak
5724.600	53.06	3.73	56.79	121.29	-64.50	100	64	peak
5785.000	100.61	3.91	104.52	N/A	N/A	100	107	peak
5785.000	91.30	3.91	95.21	N/A	N/A	100	107	AVG
5850.950	54.49	3.95	58.44	120.03	-61.59	100	131	peak
5856.200	54.70	3.97	58.67	110.46	-51.79	100	107	peak
5889.450	54.02	4.10	58.12	94.51	-36.39	100	87	peak
5934.950	54.00	4.20	58.20	68.20	-10.00	100	82	peak
11570.000	34.25	14.33	48.58	74.00	-25.42	100	251	peak
11570.000	24.63	14.33	38.96	54.00	-15.04	100	251	AVG
ac20 Mode, High channel								
5649.000	53.29	3.61	56.90	68.20	-11.30	100	283	peak
5685.400	53.47	3.67	57.14	94.40	-37.26	100	51	peak
5715.500	53.46	3.72	57.18	109.54	-52.36	100	268	peak
5724.250	52.94	3.73	56.67	120.49	-63.82	100	339	peak
5825.000	100.64	3.96	104.60	N/A	N/A	100	129	peak
5825.000	91.46	3.96	95.42	N/A	N/A	100	129	AVG
5850.250	60.05	3.95	64.00	121.63	-57.63	100	129	peak
5857.950	57.95	3.99	61.94	109.97	-48.03	100	106	peak
5897.500	55.23	4.12	59.35	88.55	-29.20	100	67	peak
5937.050	53.78	4.20	57.98	68.20	-10.22	100	5	peak
11650.000	33.50	14.43	47.93	74.00	-26.07	100	261	peak
11650.000	23.74	14.43	38.17	54.00	-15.83	100	261	AVG
17475.000	37.42	21.23	58.65	68.23	-9.58	100	118	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

Horizontal

Frequency (MHz)	Reading (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5623.800	53.66	3.56	57.22	68.20	-10.98	100	168	peak
5695.550	54.56	3.69	58.25	101.91	-43.66	100	144	peak
5719.000	62.77	3.73	66.50	110.52	-44.02	100	157	peak
5721.450	66.00	3.73	69.73	114.11	-44.38	100	158	peak
5755.000	95.08	3.80	98.88	N/A	N/A	100	157	peak
5755.000	89.05	3.80	92.85	N/A	N/A	100	157	AVG
5850.250	53.66	3.95	57.61	121.63	-64.02	100	95	peak
5865.300	53.88	4.00	57.88	107.92	-50.04	100	256	peak
5898.900	54.43	4.14	58.57	87.51	-28.94	100	0	peak
5935.650	53.93	4.20	58.13	68.20	-10.07	100	358	peak
11510.000	34.11	14.36	48.47	74.00	-25.53	100	30	peak
11510.000	24.42	14.36	38.78	54.00	-15.22	100	30	AVG
17265.000	37.82	19.40	57.22	68.23	-11.01	100	161	peak
ac40 Mode, High channel								
5605.250	53.78	3.53	57.31	68.20	-10.89	100	277	peak
5679.800	53.68	3.66	57.34	90.25	-32.91	100	4	peak
5715.500	53.38	3.72	57.10	109.54	-52.44	100	169	peak
5720.400	53.32	3.73	57.05	111.71	-54.66	100	146	peak
5795.000	95.36	3.95	99.31	N/A	N/A	100	155	peak
5795.000	86.32	3.95	90.27	N/A	N/A	100	155	AVG
5852.000	54.69	3.96	58.65	117.64	-58.99	100	30	peak
5857.600	55.19	3.99	59.18	110.07	-50.89	100	40	peak
5880.350	54.51	4.06	58.57	101.24	-42.67	100	198	peak
5931.800	54.29	4.20	58.49	68.20	-9.71	100	319	peak
11590.000	34.06	14.32	48.38	74.00	-25.62	100	16	peak
11590.000	24.11	14.32	38.43	54.00	-15.57	100	16	AVG
17385.000	37.13	20.23	57.36	68.23	-10.87	100	190	peak

Result = Reading + Correct 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 (dBμV)	Correct Factor(dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
ac40 Mode, Low channel								
5629.750	53.25	3.57	56.82	68.20	-11.38	100	148	peak
5698.700	56.13	3.69	59.82	104.24	-44.42	100	105	peak
5718.300	64.28	3.73	68.01	110.32	-42.31	100	64	peak
5723.550	67.06	3.73	70.79	118.89	-48.10	100	63	peak
5755.000	97.49	3.80	101.29	N/A	N/A	100	107	peak
5755.000	88.90	3.80	92.70	N/A	N/A	100	107	AVG
5853.400	54.01	3.97	57.98	114.45	-56.47	100	292	peak
5866.350	54.42	4.01	58.43	107.62	-49.19	100	357	peak
5911.500	54.57	4.15	58.72	78.19	-19.47	100	329	peak
5940.550	53.74	4.21	57.95	68.20	-10.25	100	222	peak
11510.000	33.78	14.36	48.14	74.00	-25.86	100	85	peak
11510.000	24.05	14.36	38.41	54.00	-15.59	100	85	AVG
17265.000	37.22	19.40	56.62	68.23	-11.61	100	282	peak
ac40 Mode, High channel								
5615.400	53.48	3.54	57.02	68.20	-11.18	100	125	peak
5680.850	53.67	3.67	57.34	91.03	-33.69	100	331	peak
5712.700	54.00	3.72	57.72	108.76	-51.04	100	103	peak
5723.900	54.33	3.73	58.06	119.69	-61.63	100	128	peak
5795.000	97.85	3.95	101.80	N/A	N/A	100	107	peak
5795.000	88.92	3.95	92.87	N/A	N/A	100	107	AVG
5854.100	57.04	3.97	61.01	112.85	-51.84	100	126	peak
5871.950	56.28	4.03	60.31	106.05	-45.74	100	117	peak
5887.000	54.38	4.09	58.47	96.32	-37.85	100	120	peak
5930.750	53.78	4.20	57.98	68.20	-10.22	100	10	peak
11590.000	33.99	14.32	48.31	74.00	-25.69	100	85	peak
11590.000	24.07	14.32	38.39	54.00	-15.61	100	85	AVG
17385.000	37.11	20.23	57.34	68.23	-10.89	100	127	peak

Result = Reading + Correct Factor

Margin = Result – Limit

Correct Factor = Antenna Factor + Cable Loss – Amplifier Gain

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

9 FCC §15.407(a)(e) – Emission Bandwidth And Occupied Bandwidth

9.1 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.

9.2 Test Procedure

As per 789033 D02 General U-NII 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 $\geq 3 \cdot$ 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.

9.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by Tom Hsu on 2019-01-18~2019-01-19.

9.4 Test Results

Test mode: Transmitting

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-1	802.11a	36	5180	25.9	16.86
		40	5200	28.91	16.99
		48	5240	26.67	17.18
	802.11ac20	36	5180	28.85	17.88
		40	5200	30.13	17.88
		48	5240	26.03	17.76
	802.11ac40	38	5190	69.49	36.54
		46	5230	69.87	36.67

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-2A Band II	802.11a	52	5260	29.87	16.99
		60	5300	29.49	17.18
		64	5320	29.94	17.24
	802.11ac20	52	5260	28.14	17.82
		60	5300	28.78	17.88
		64	5320	26.86	17.76
	802.11ac40	54	5270	69.36	36.41
		62	5310	69.74	36.54

UNII Band	Mode	Channel	Frequency (MHz)	26dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-2C Band III	802.11a	100	5500	29.55	16.99
		118	5580	28.46	16.99
		140	5700	27.88	16.99
	802.11ac20	100	5500	26.35	17.76
		118	5580	24.94	17.76
		140	5700	22.88	17.69
	802.11ac40	102	5510	69.62	36.28
		118	5590	60.9	36.41
		134	5670	57.31	36.54

UNII Band	Mode	Channel	Frequency (MHz)	6dB Emission Bandwidth (MHz)	99% Emission Bandwidth (MHz)
UNII-3 Band IV	802.11a	149	5745	16.35	16.99
		157	5785	16.41	17.05
		165	5825	16.35	17.05
	802.11ac20	149	5745	17.56	17.69
		157	5785	17.63	17.76
		165	5825	17.56	17.69
	802.11ac40	151	5755	36.41	36.41
		159	5795	36.41	36.28

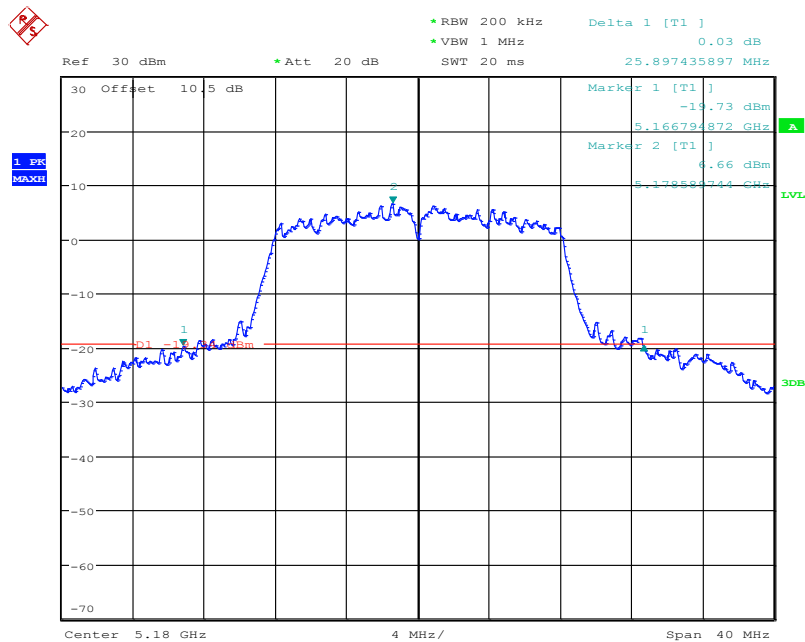
Please refer to the following plots

Transmitting Mode:

UNII-1 Band I / BW 26dBc

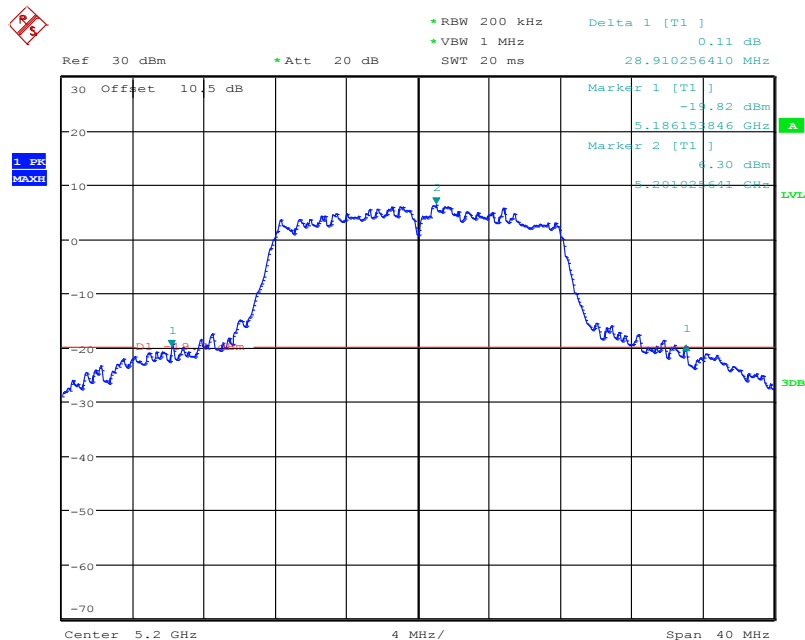
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



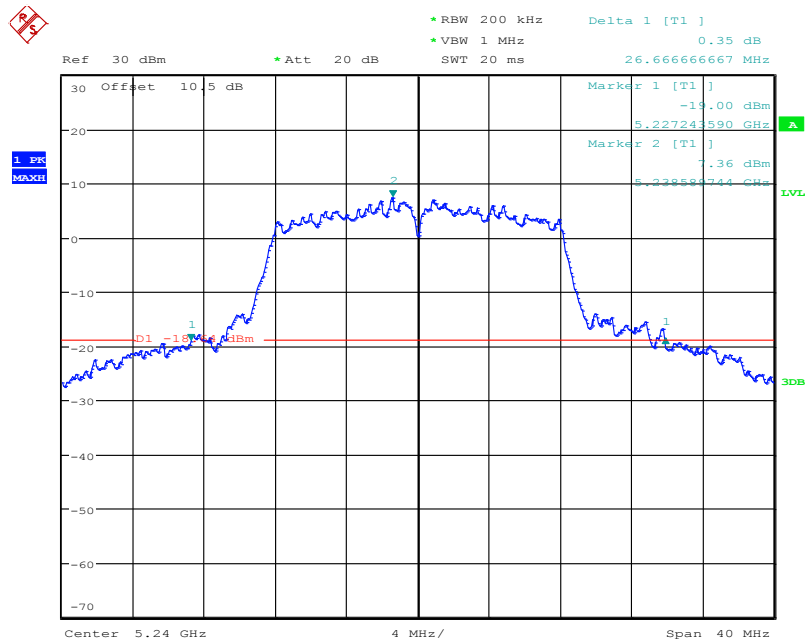
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5200MHz



Date: 18.JAN.2019 15:25:50

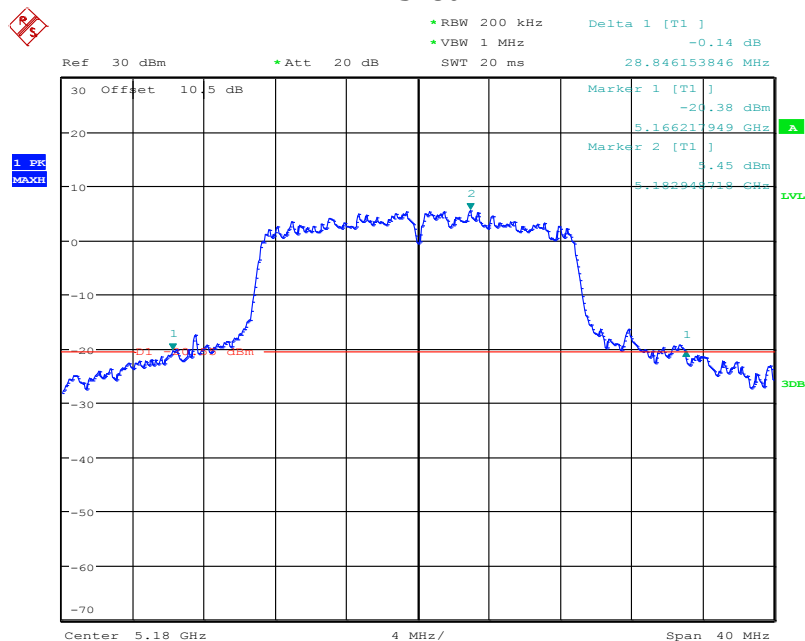
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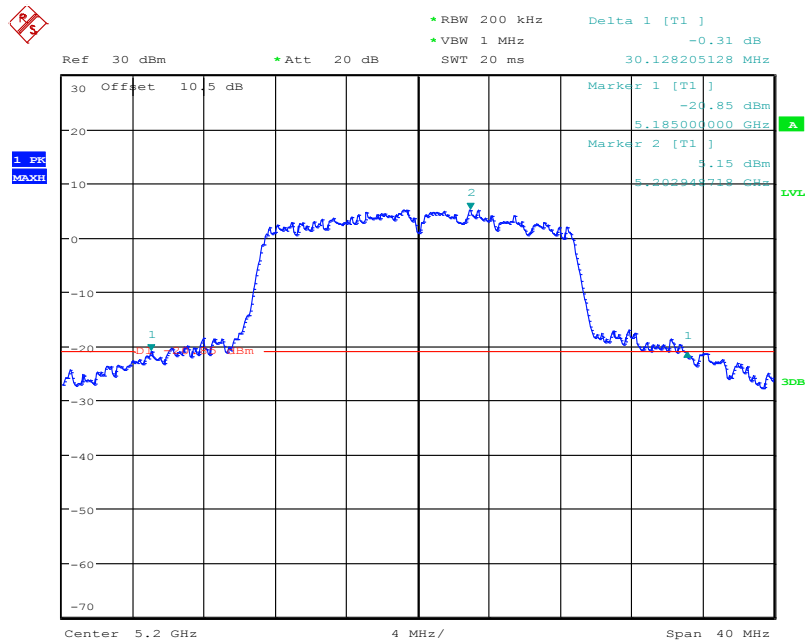
IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz

5180MHz



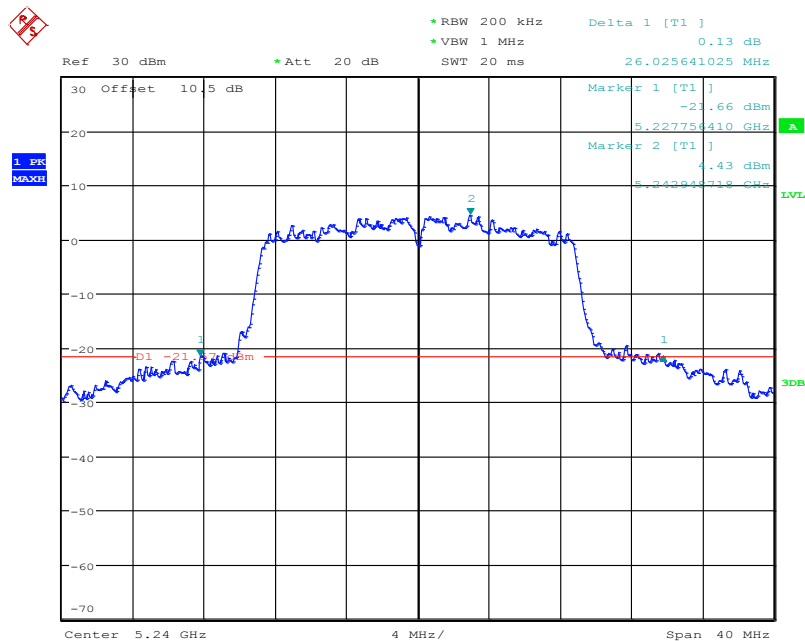
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5200MHz

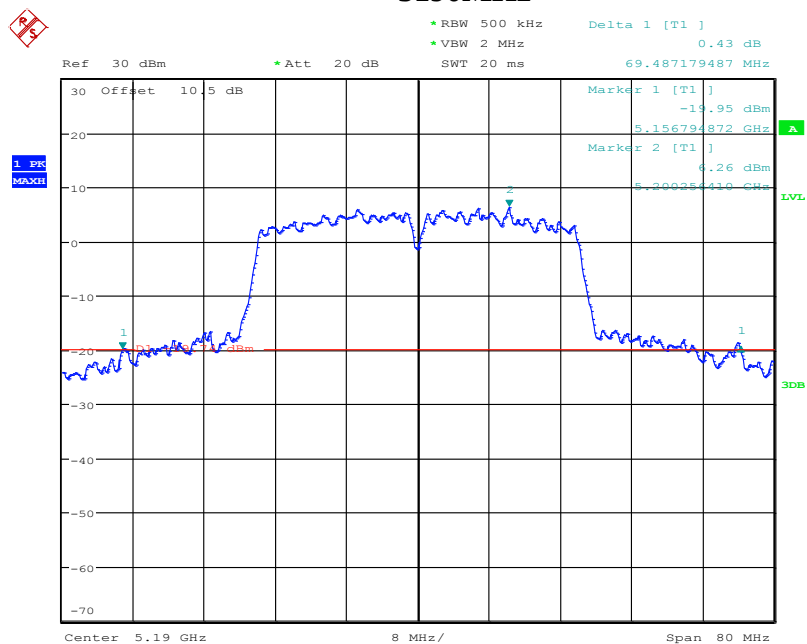


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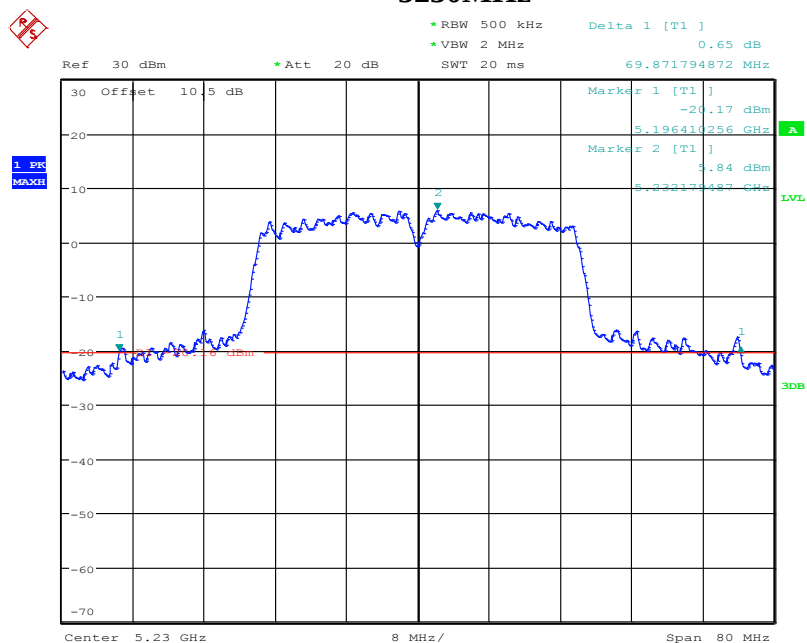
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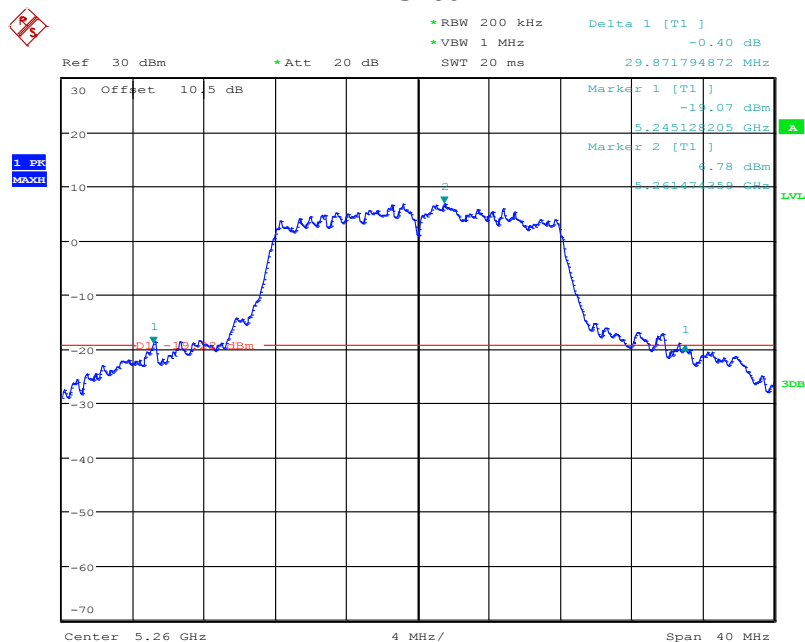
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IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz
5190MHz

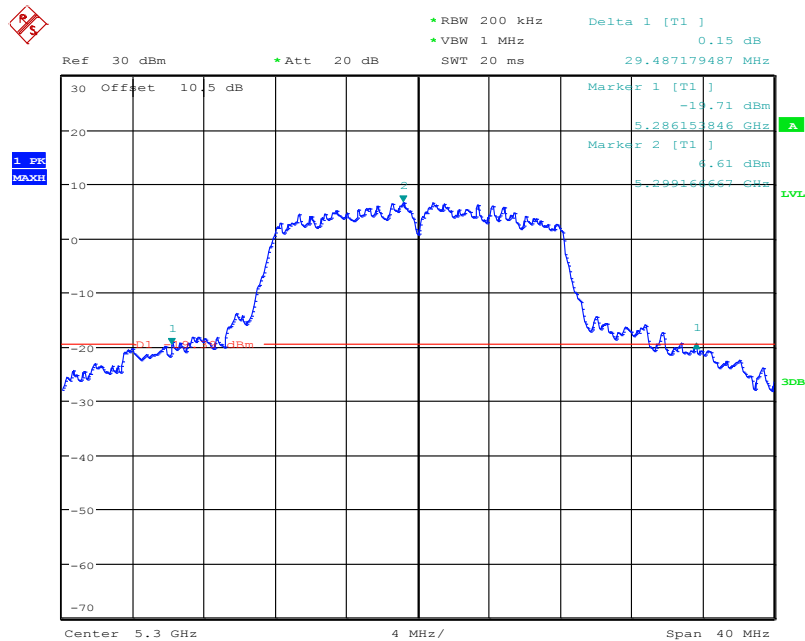
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5230MHz

Date: 19.JAN.2019 09:47:52

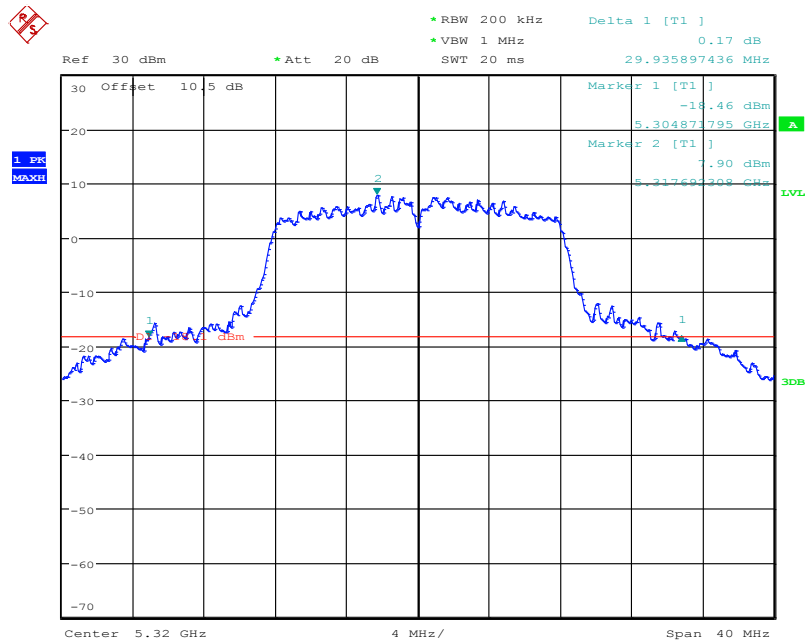
UNII-2A Band II / BW 26dBc
IEEE 802.11a Mode / 5250 ~ 5350MHz**5260MHz**

Date: 18.JAN.2019 15:47:48

5300MHz

Date: 18.JAN.2019 16:02:28

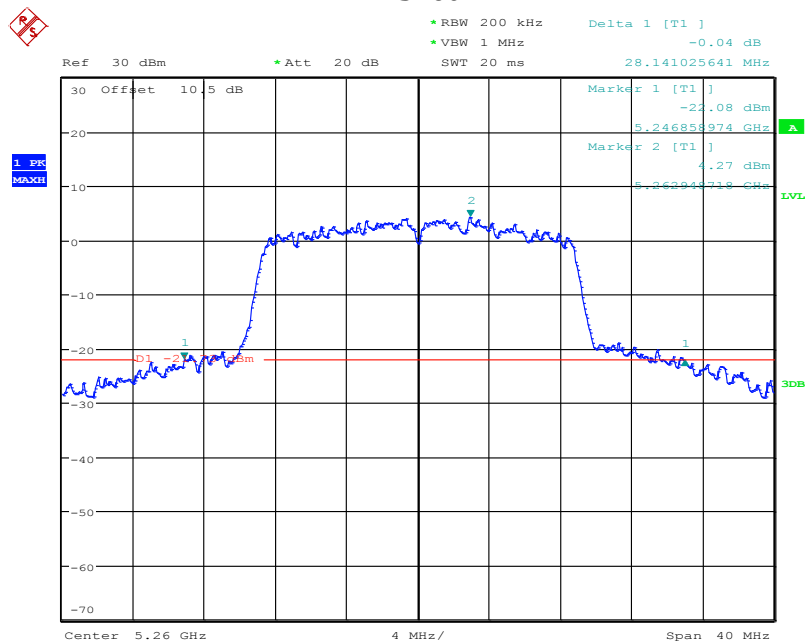
5320MHz



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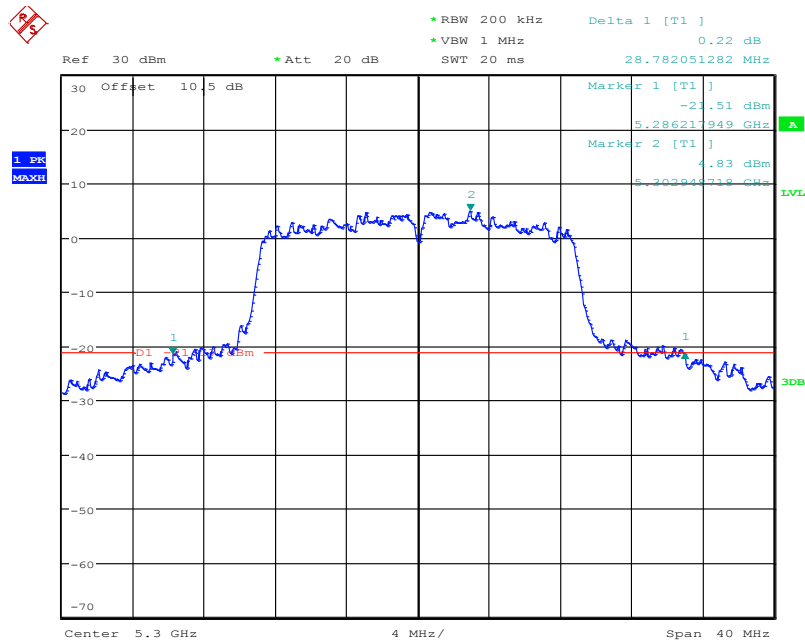
IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz

5260MHz



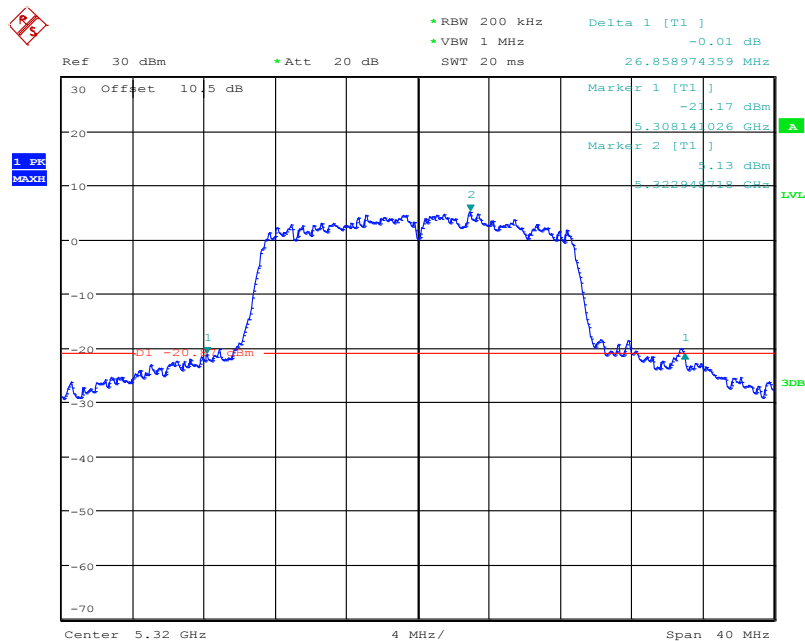
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5300MHz



Date: 19.JAN.2019 09:12:00

5320MHz



Date: 19.JAN.2019 09:14:49

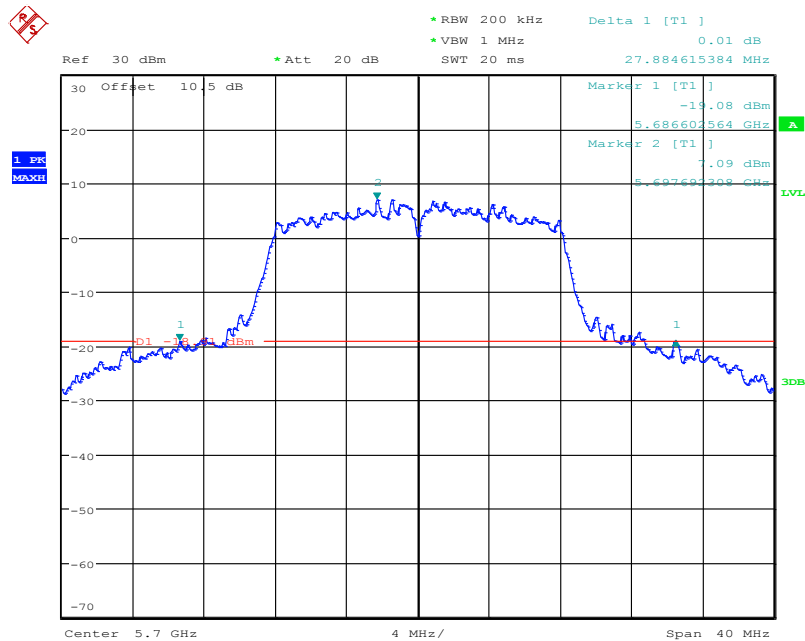


Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Taiwan)

5500MHz



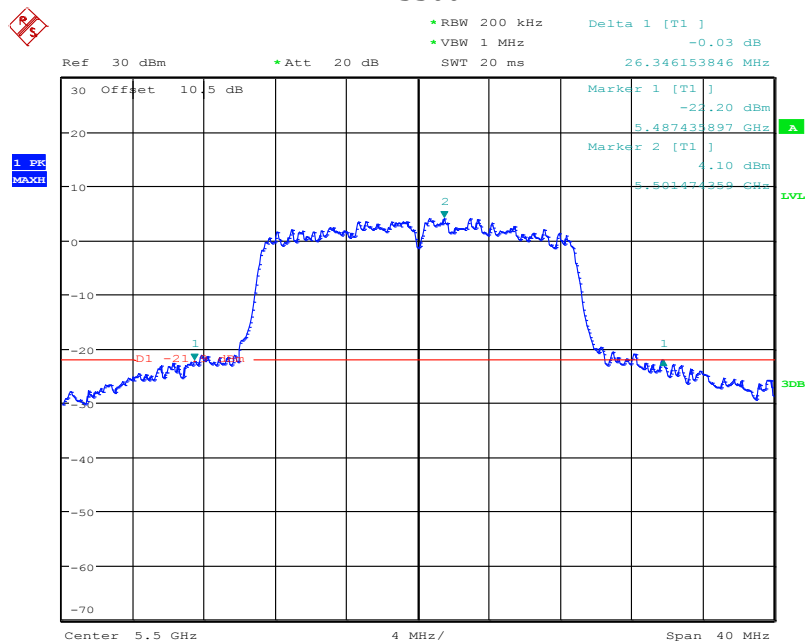
5700MHz



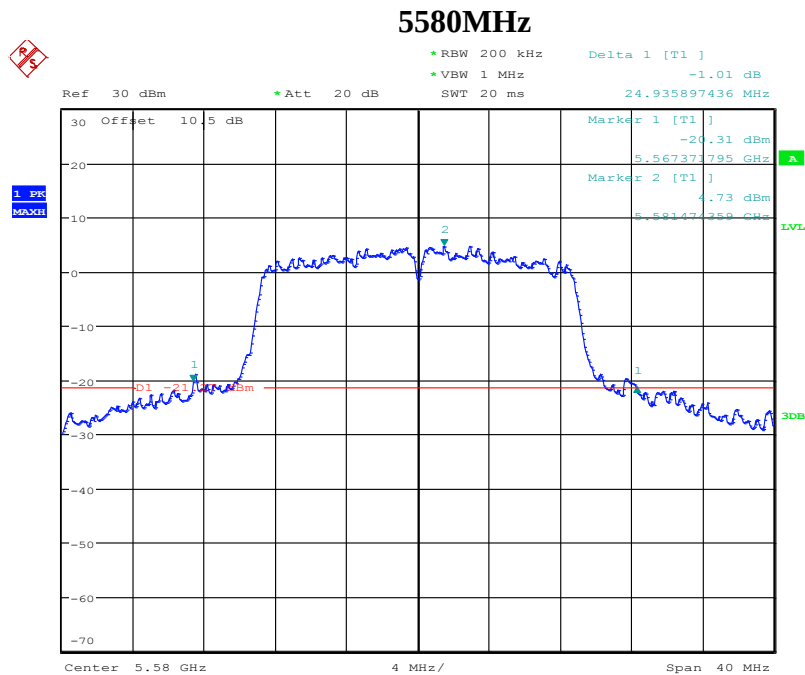
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IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz

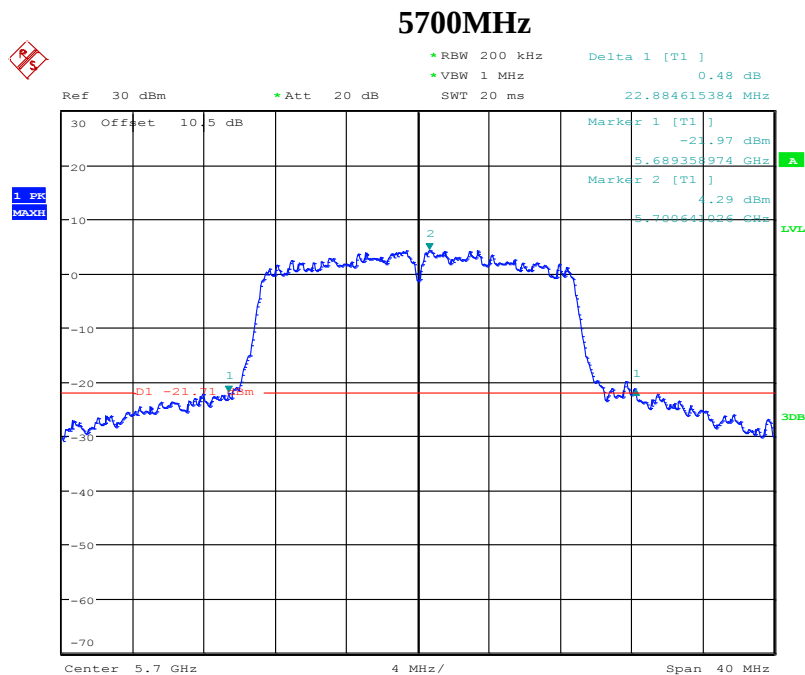
5500MHz



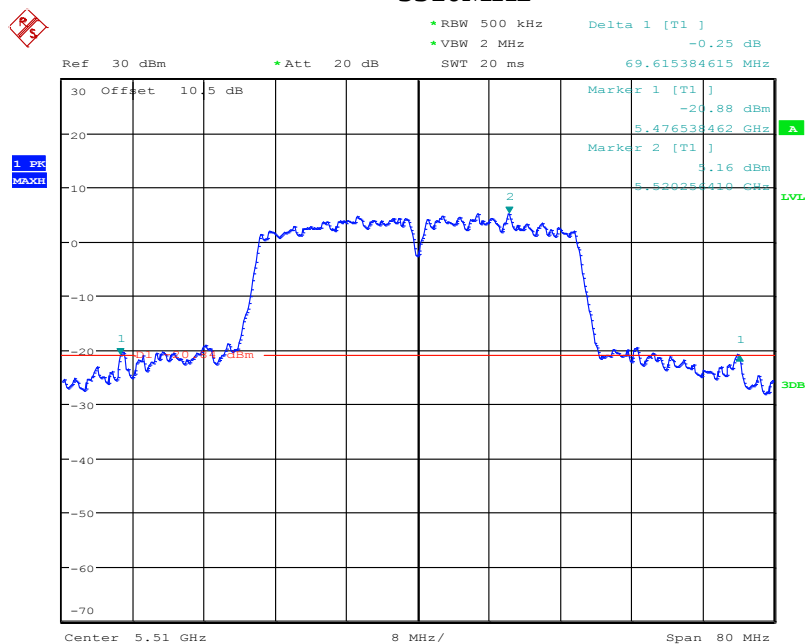
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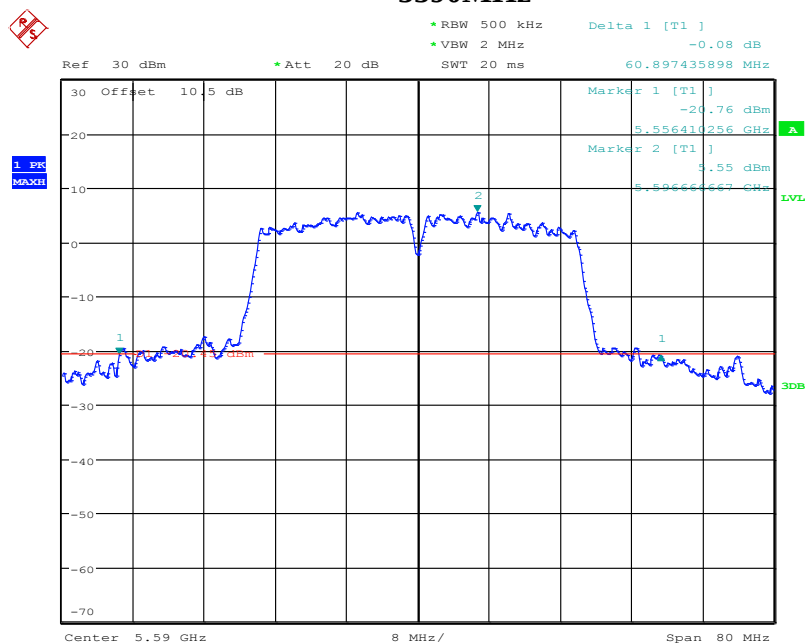
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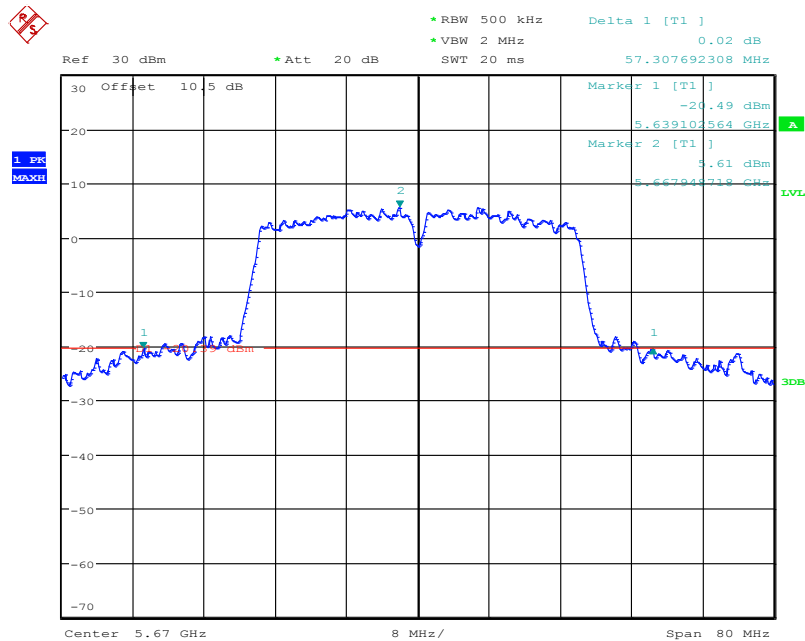
IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz
5510MHz

Date: 19.JAN.2019 09:59:06

5590MHz

Date: 19.JAN.2019 10:02:28

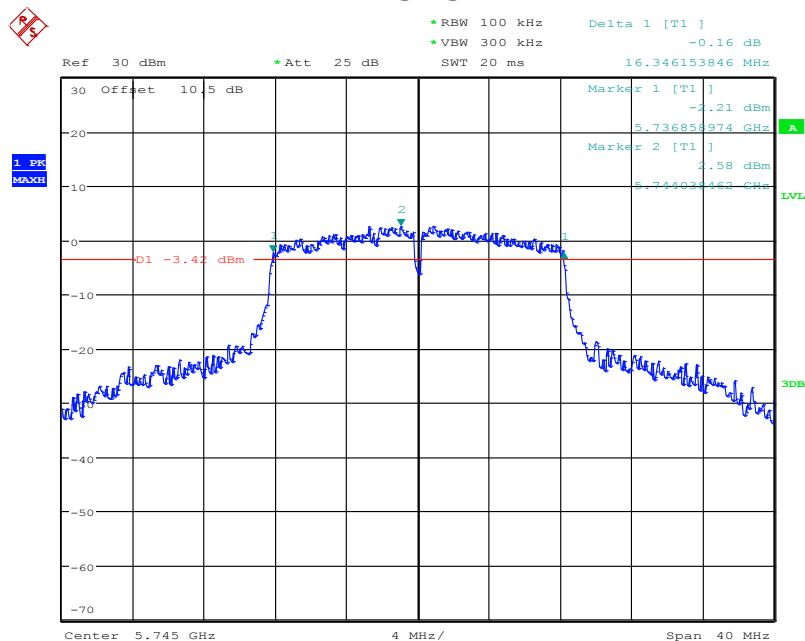
5670MHz



Date: 19.JAN.2019 10:04:50

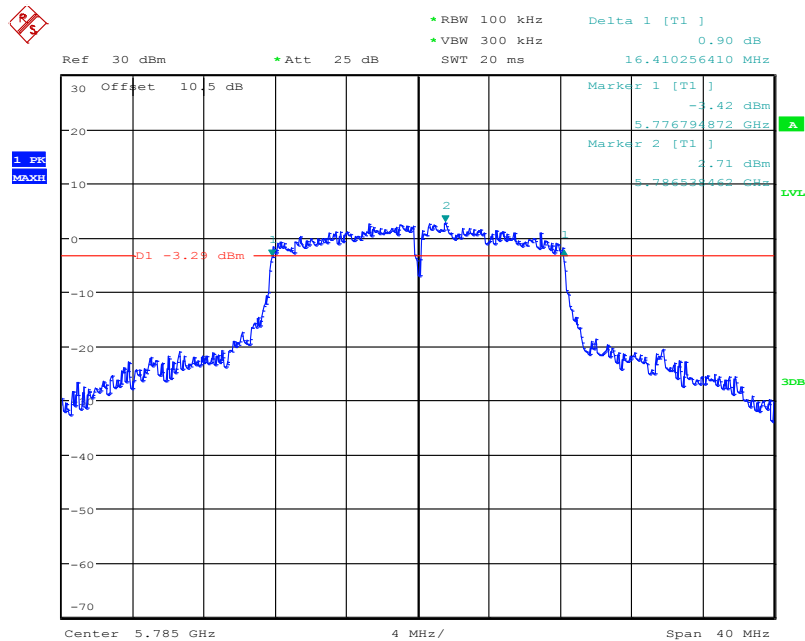
UNII-3 Band IV / BW 6dBc
IEEE 802.11a Mode / 5725 ~ 5850MHz

5745MHz



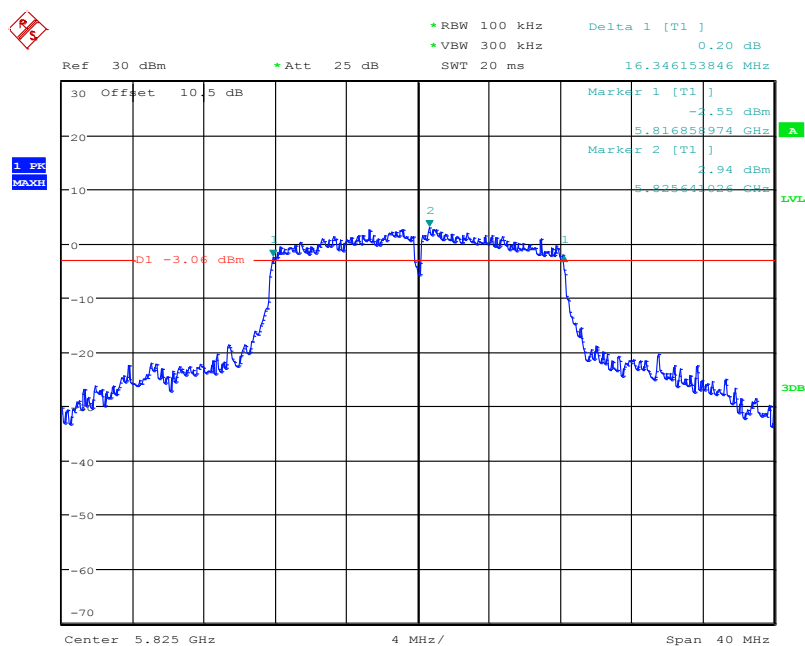
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5785MHz

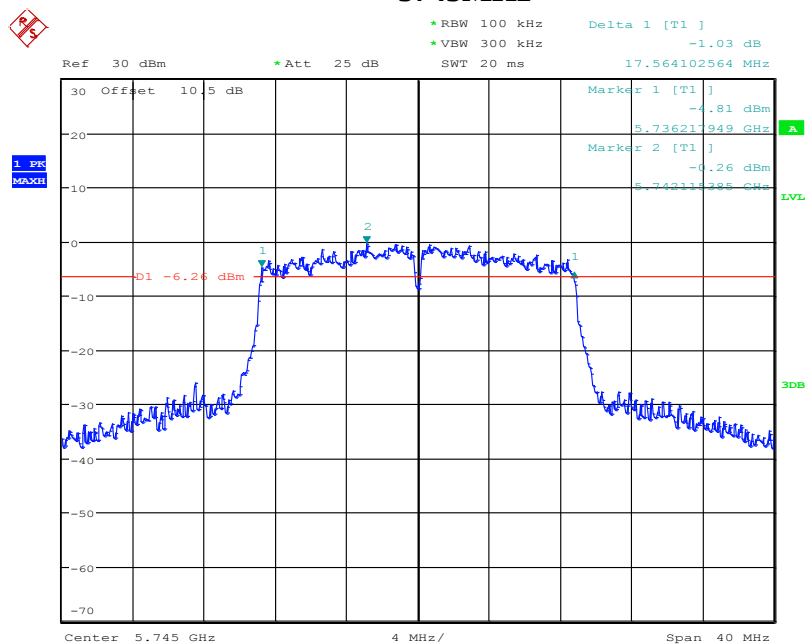


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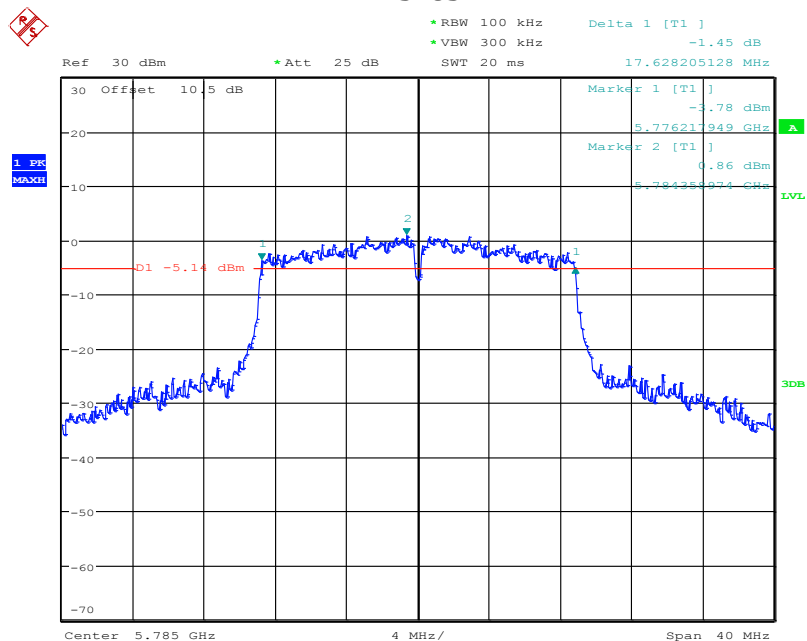
5825MHz



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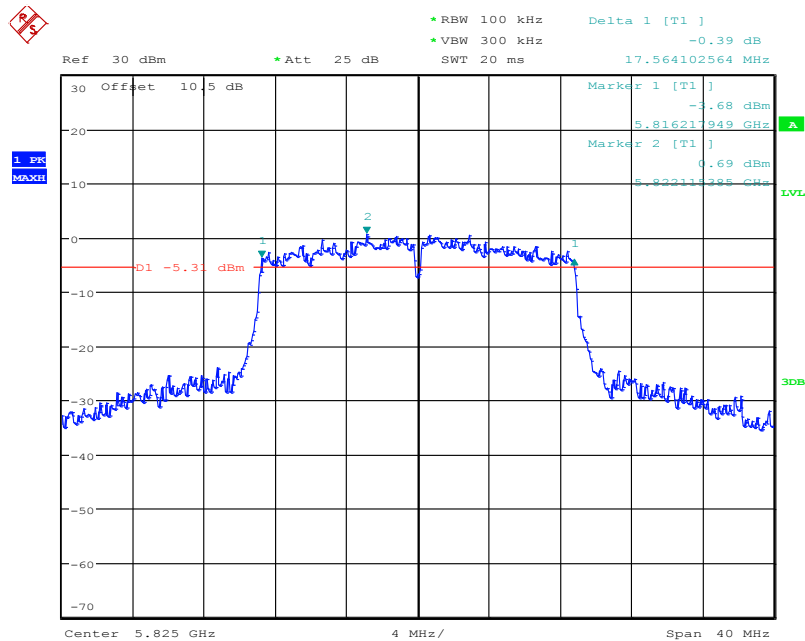
IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz
5745MHz

Date: 19.JAN.2019 09:26:31

5785MHz

Date: 19.JAN.2019 09:33:37

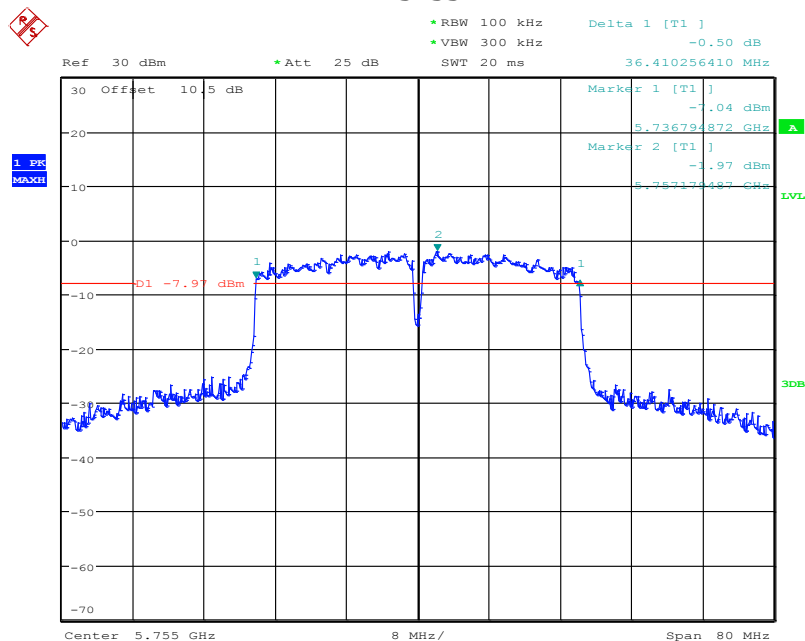
5825MHz



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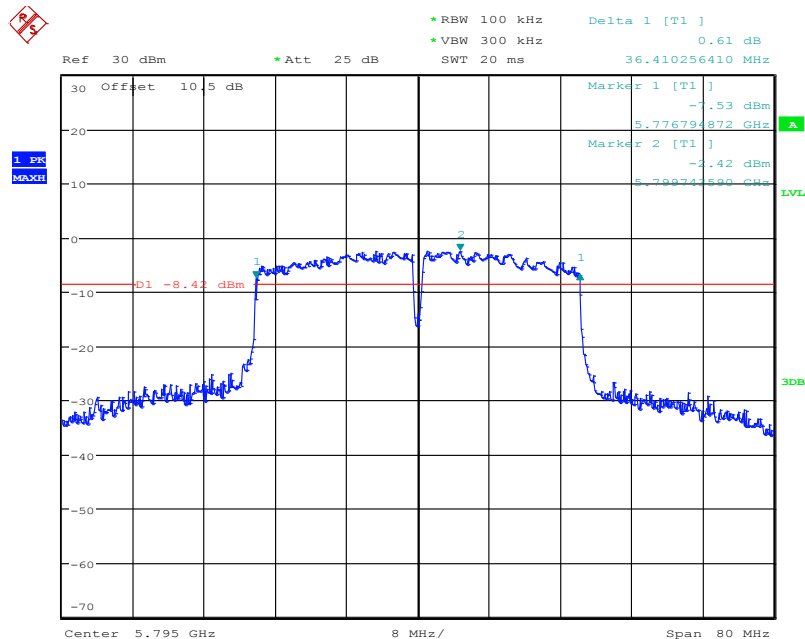
IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz

5755MHz



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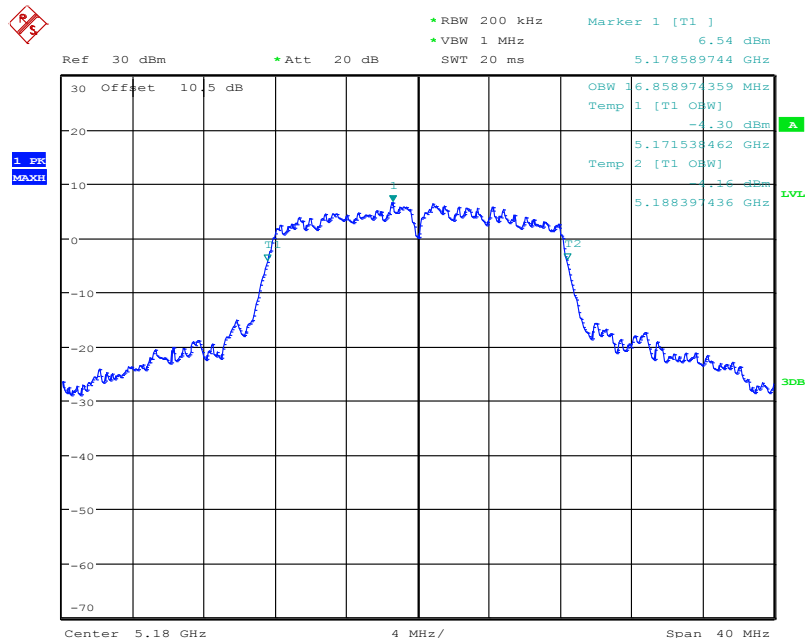
5795MHz



Date: 19.JAN.2019 10:09:58

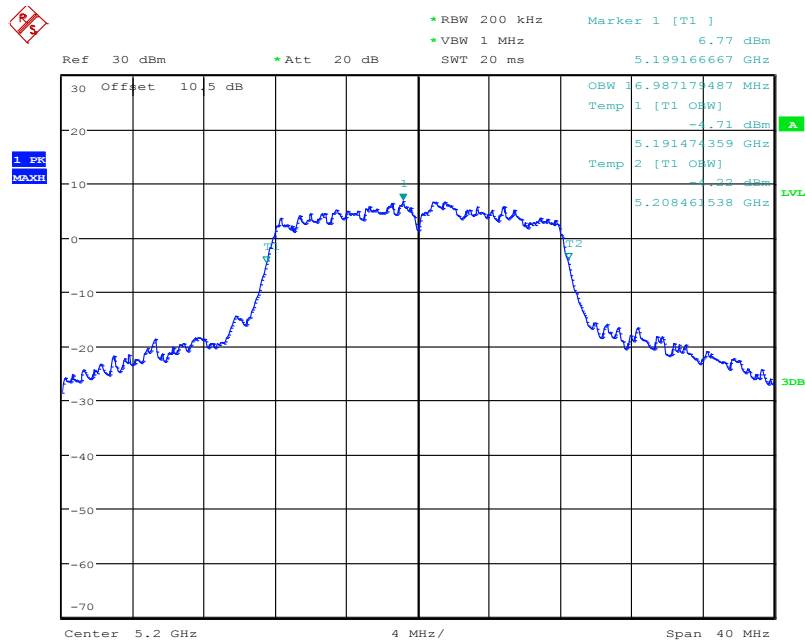
UNII-1 Band I / OBW 99%
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



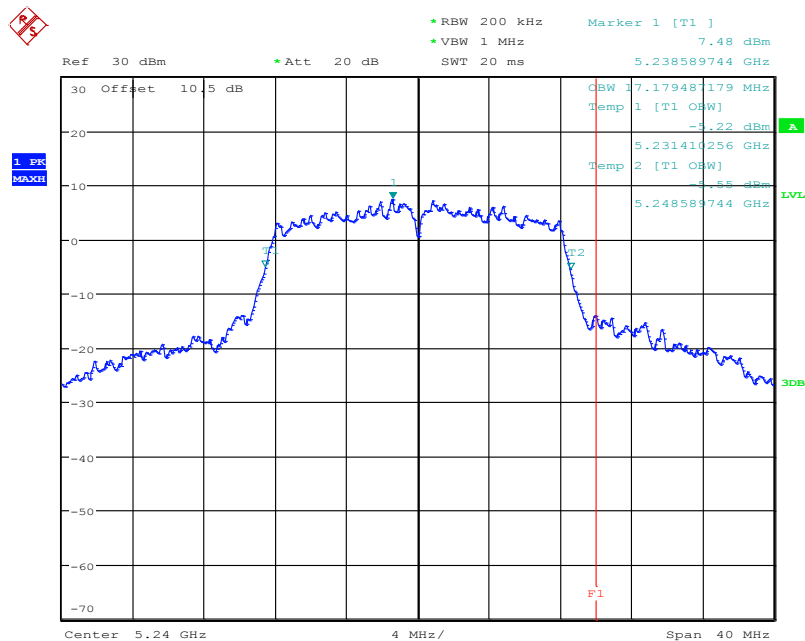
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5200MHz

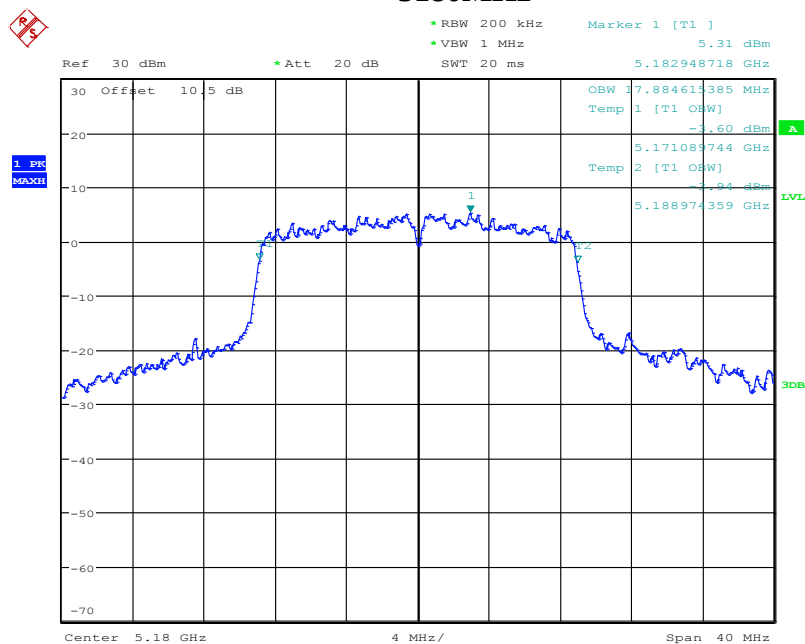


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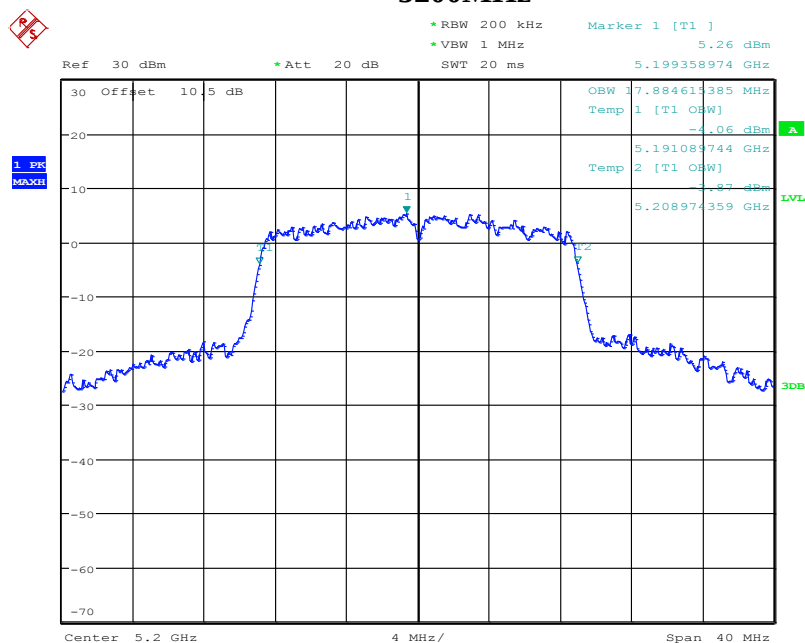
5240MHz



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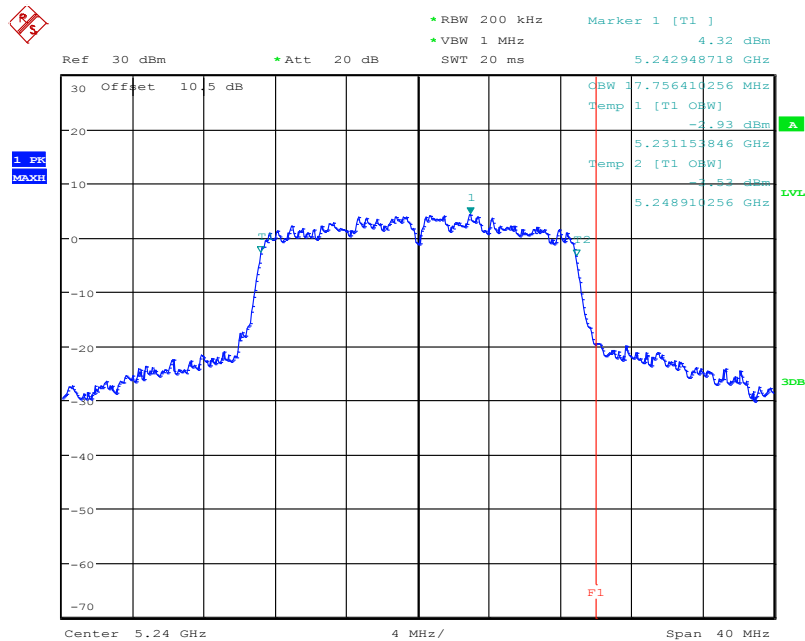
IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz
5180MHz

Date: 18.JAN.2019 16:58:13

5200MHz

Date: 18.JAN.2019 17:04:55

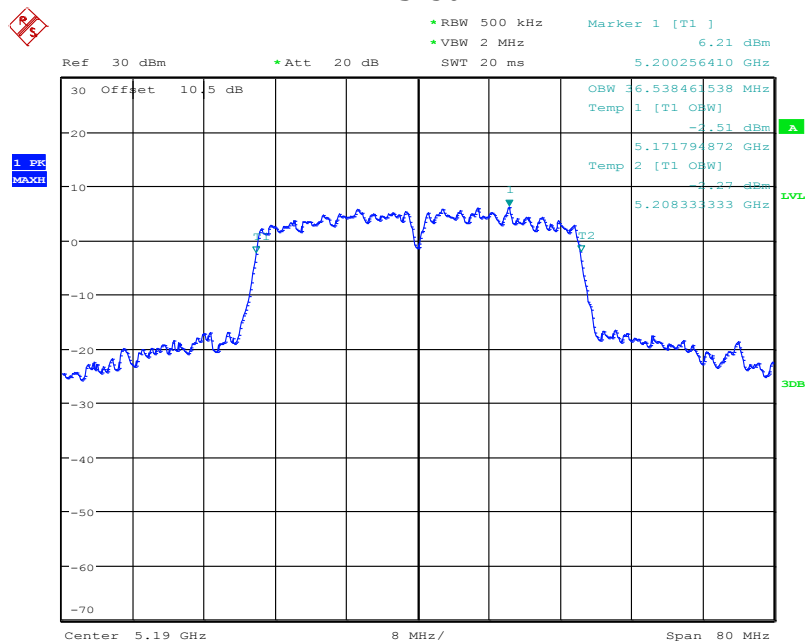
5240MHz



Date: 18.JAN.2019 17:53:25

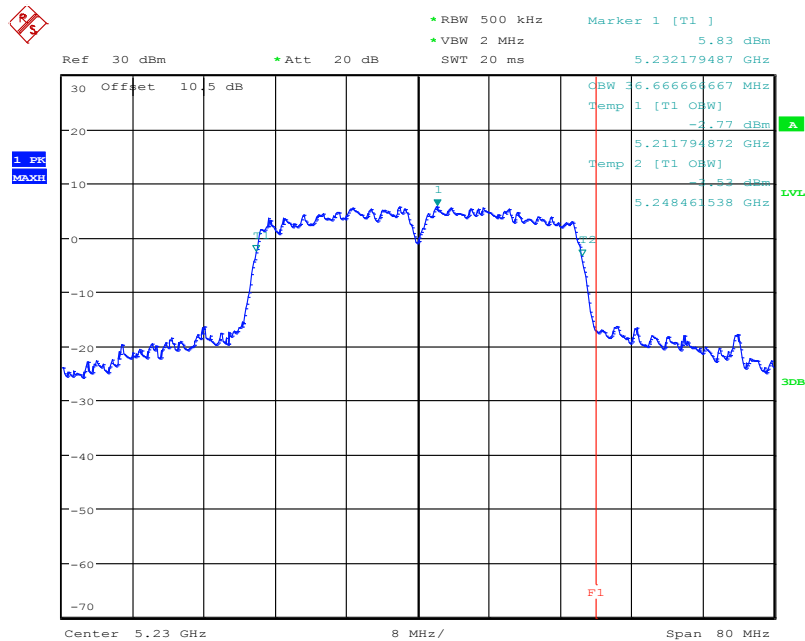
IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

5190MHz



Date: 19.JAN.2019 09:39:50

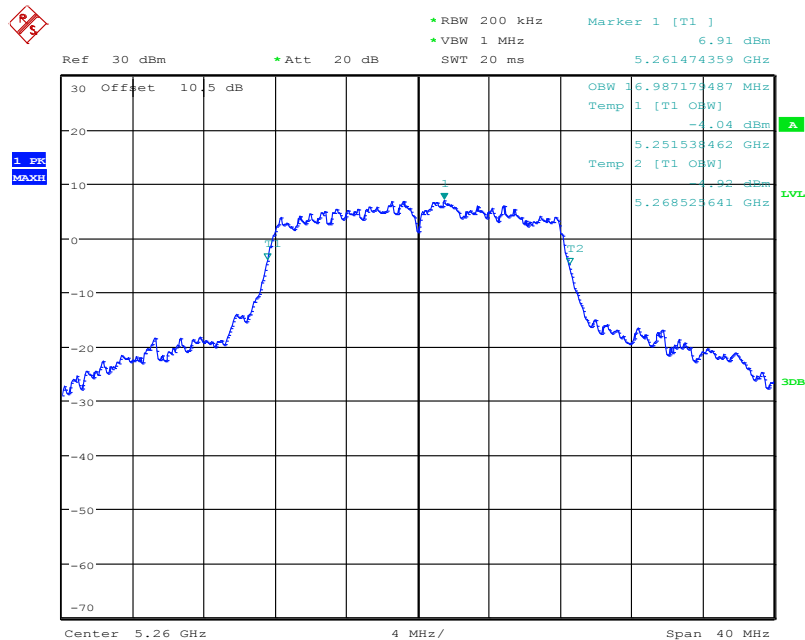
5230MHz



Date: 19.JAN.2019 09:48:39

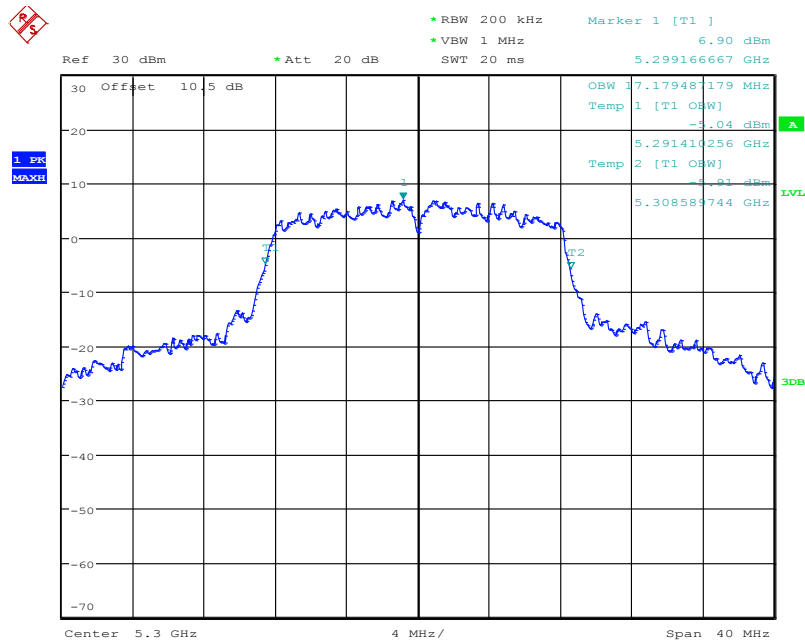
UNII-2A Band II / OBW 99%
IEEE 802.11a Mode / 5250 ~ 5350MHz

5260MHz



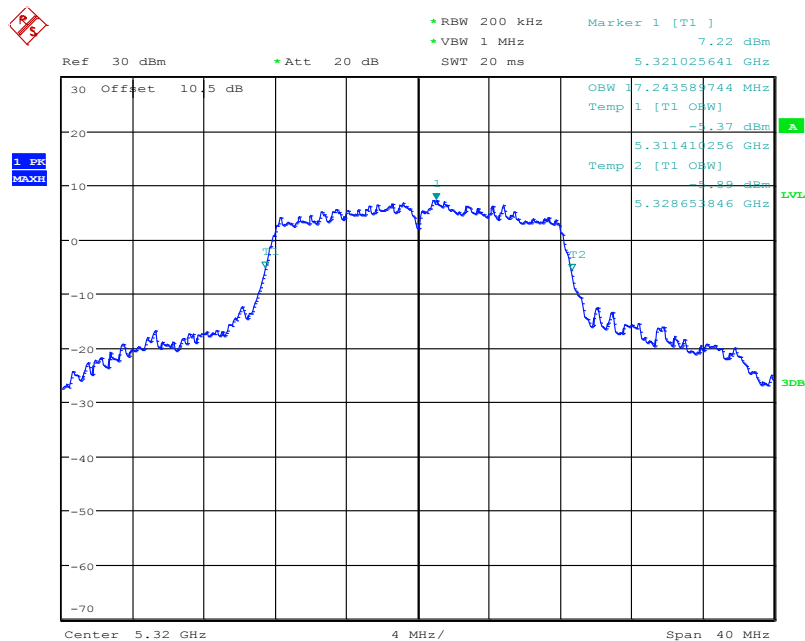
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5300MHz

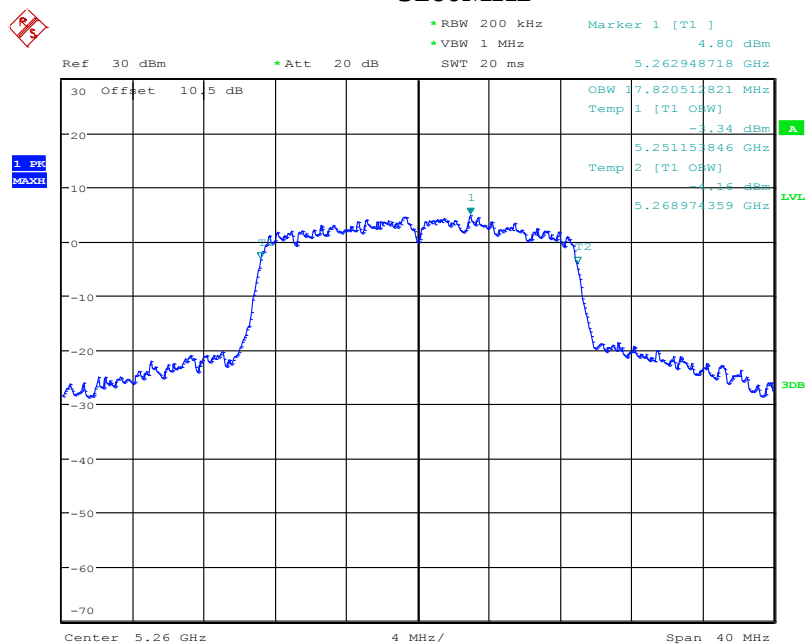


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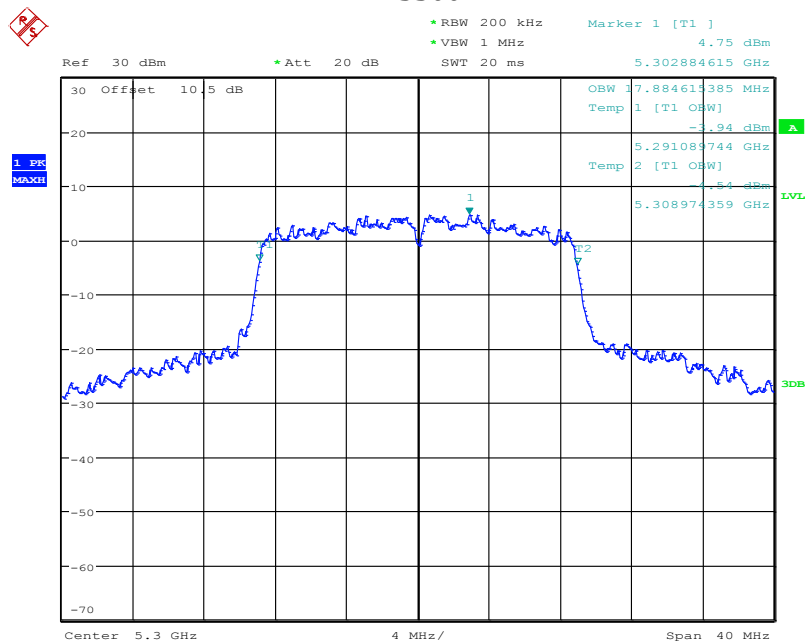
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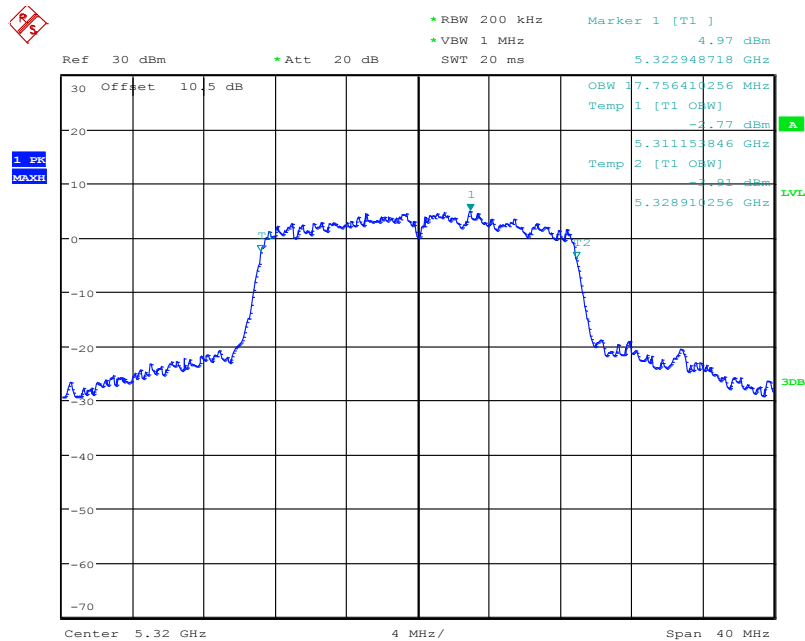
IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz
5260MHz

Date: 19.JAN.2019 09:09:45

5300MHz

Date: 19.JAN.2019 09:12:47

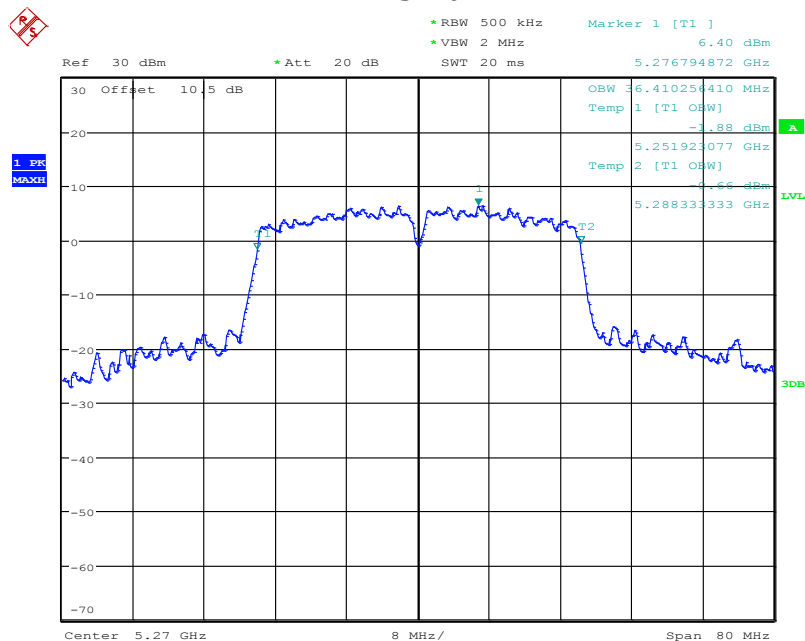
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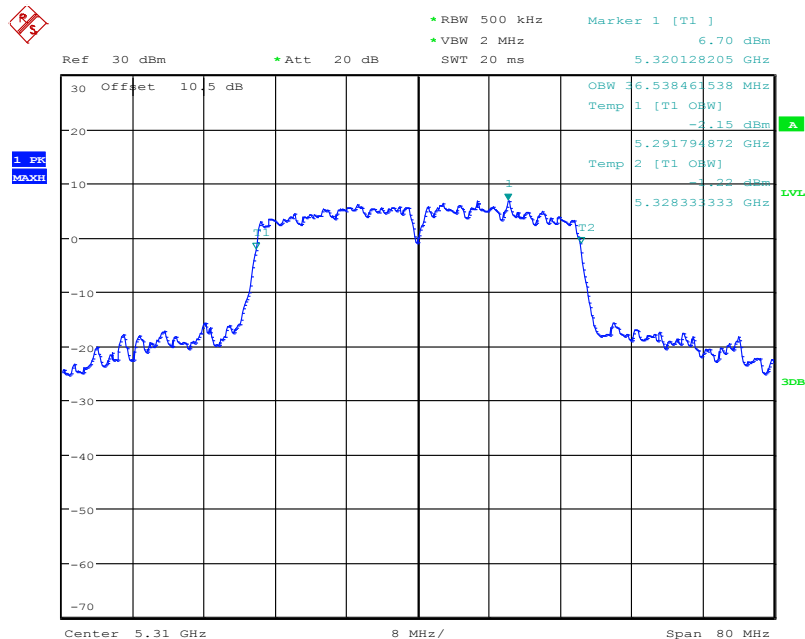
IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz

5270MHz



Date: 19.JAN.2019 09:50:39

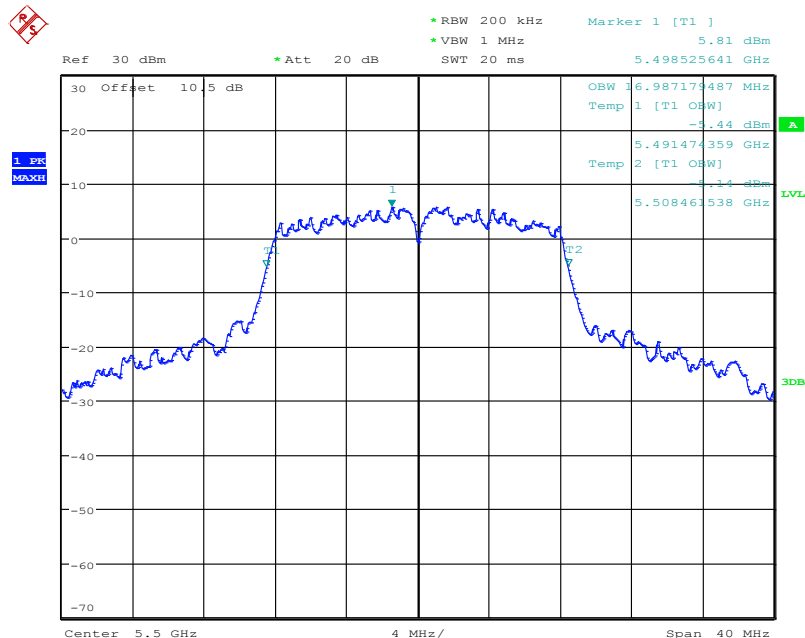
5310MHz



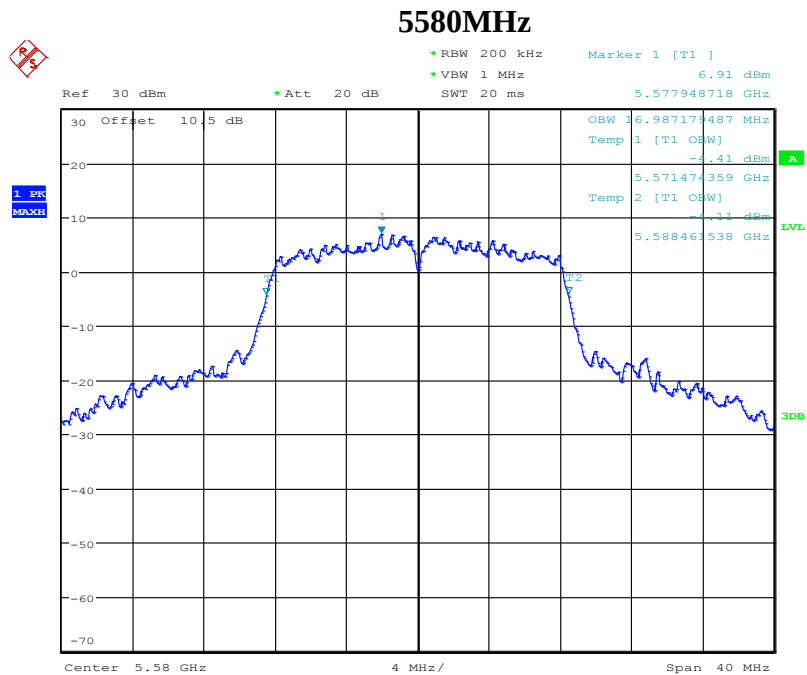
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UNII-2C Band III / OBW 99%
IEEE 802.11a Mode / 5470 ~ 5725MHz

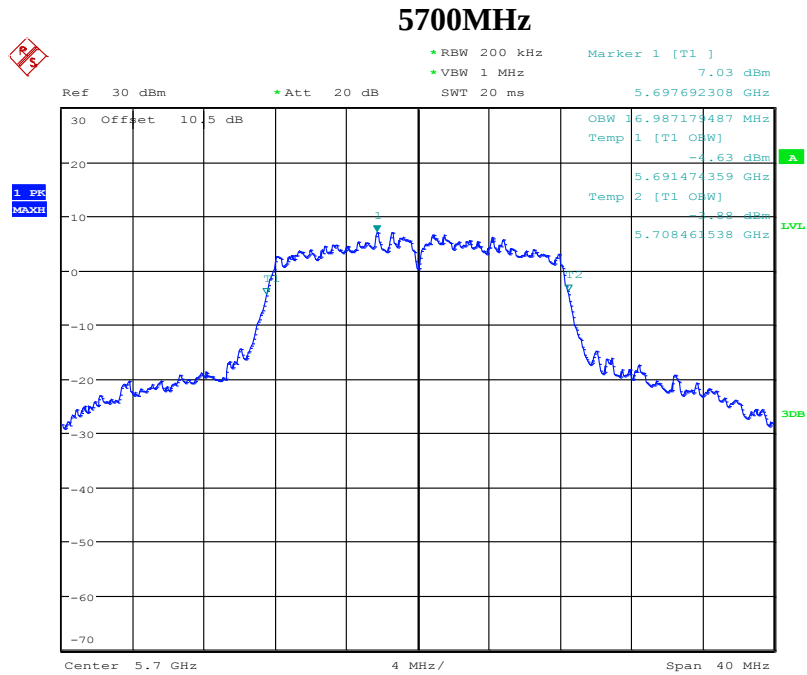
5500MHz



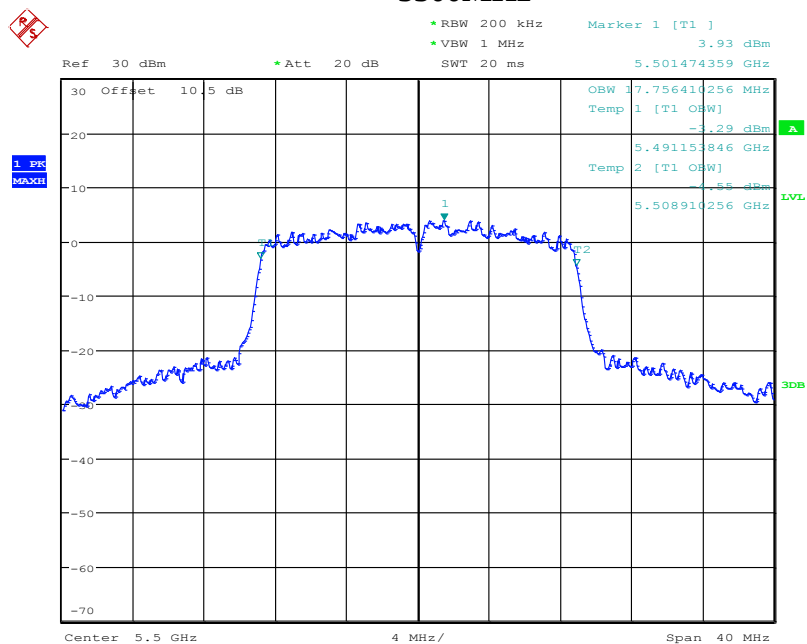
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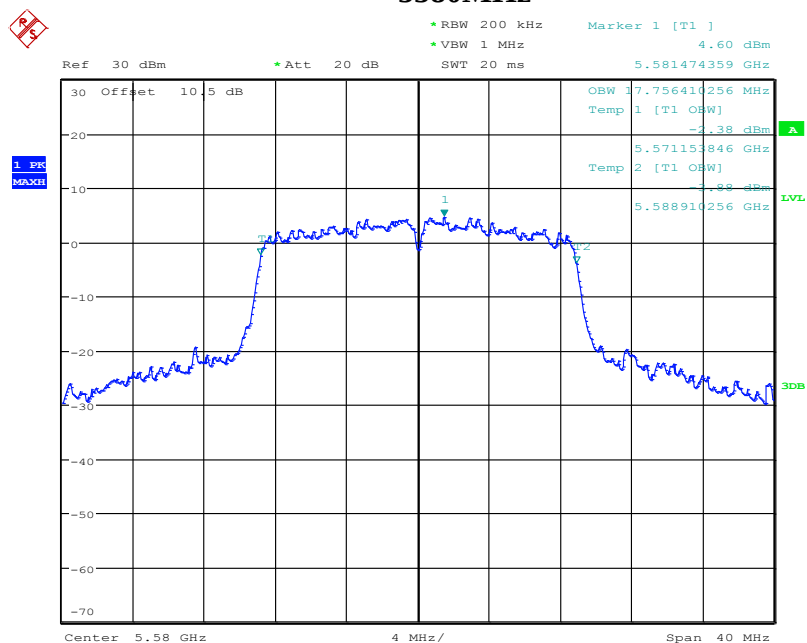
Date: 18.JAN.2019 16:25:39



Date: 18.JAN.2019 16:33:26

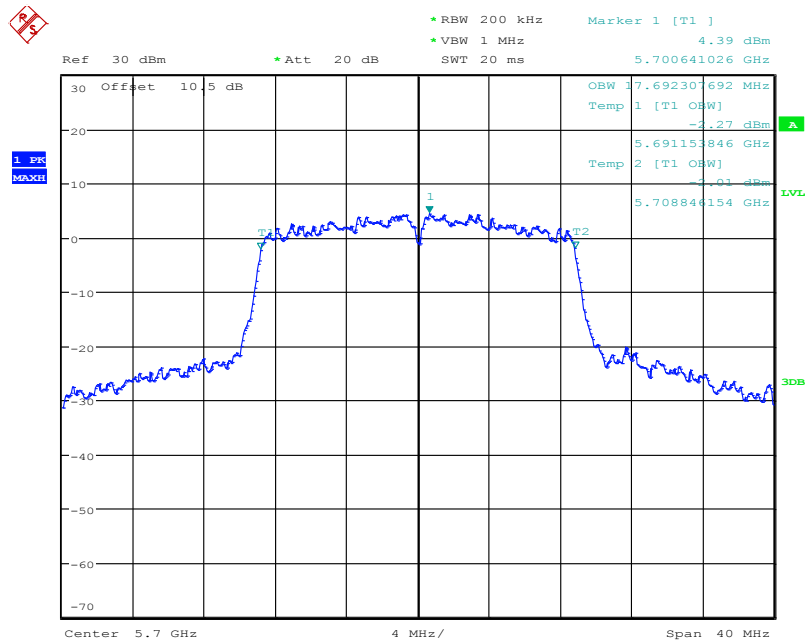
IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz
5500MHz

Date: 19.JAN.2019 09:17:41

5580MHz

Date: 19.JAN.2019 09:20:36

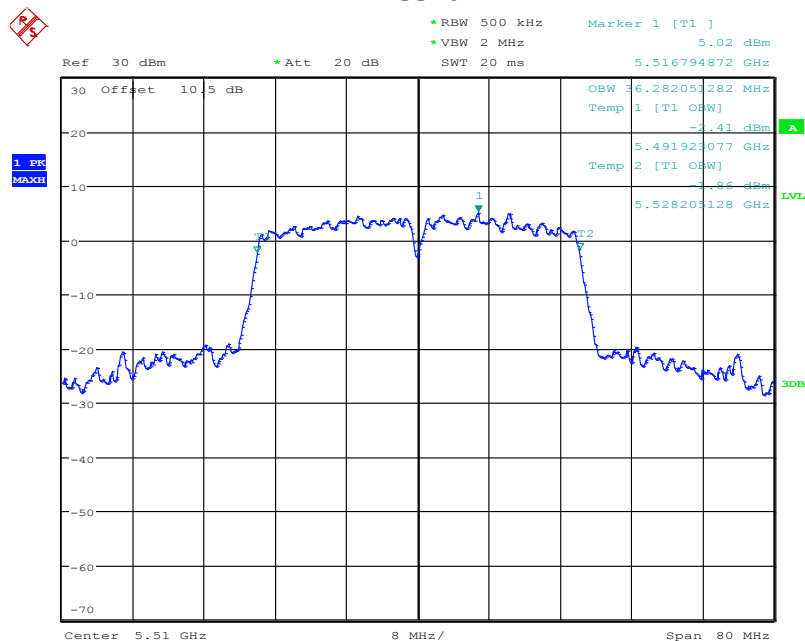
5700MHz



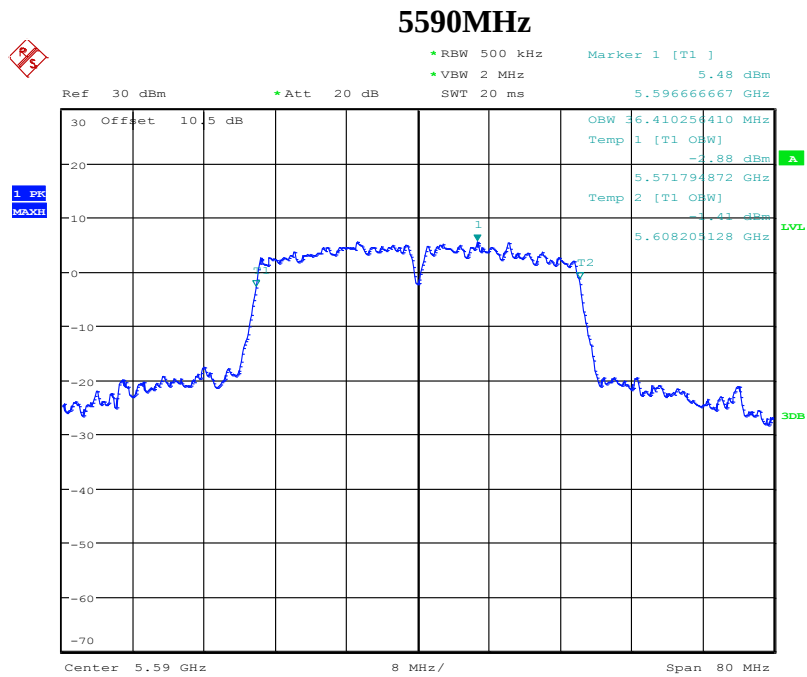
Date: 19.JAN.2019 09:24:52

IEEE 802.11ac VHT40 Mode / 5470 ~ 5725MHz

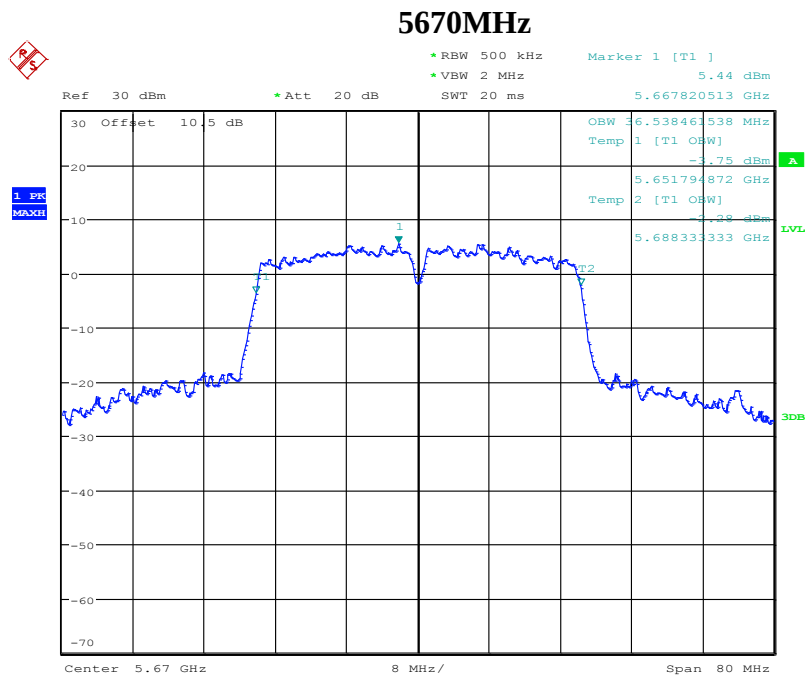
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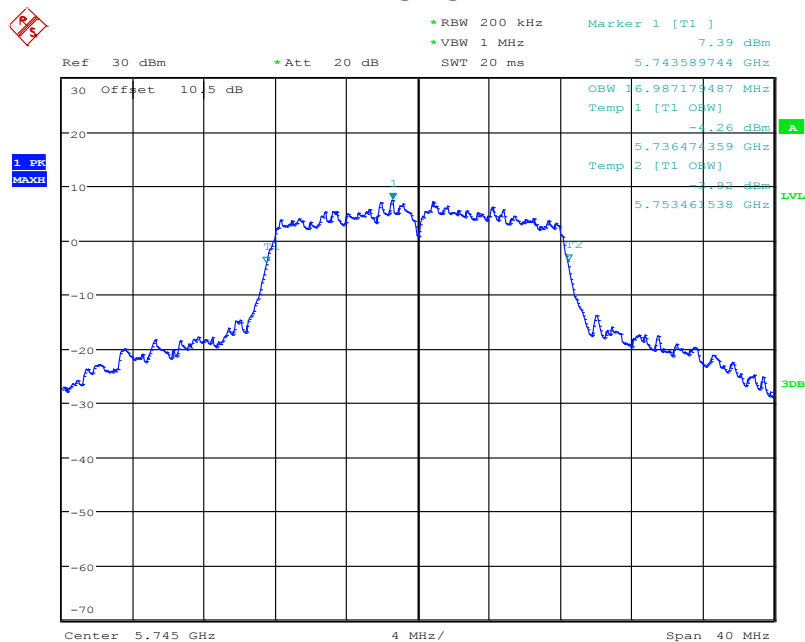
Date: 19.JAN.2019 09:59:53



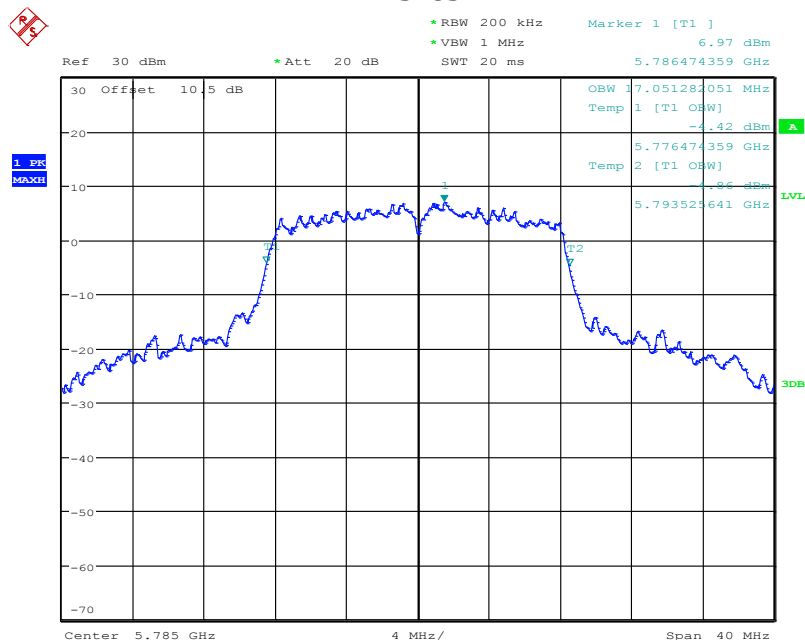
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Date: 19.JAN.2019 10:05:38

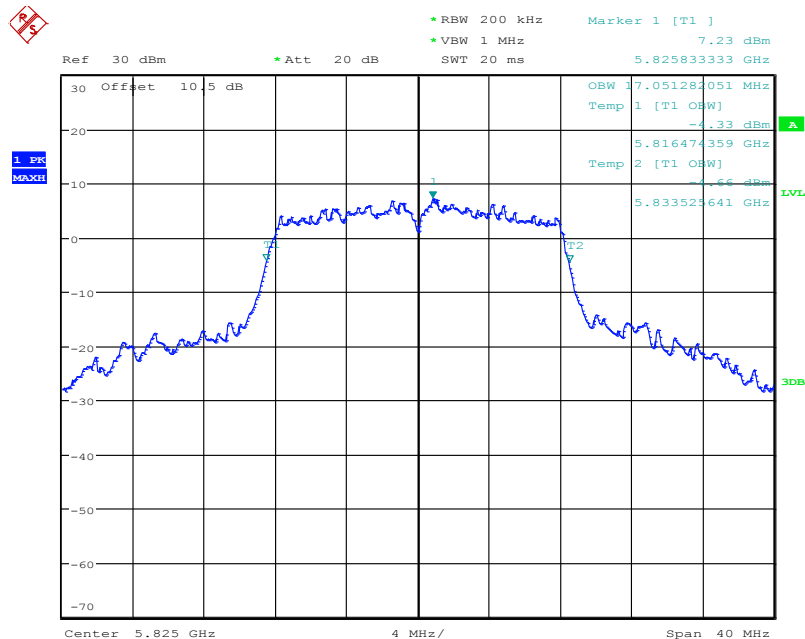
UNII-3 Band IV / OBW 99%
IEEE 802.11a Mode / 5725 ~ 5850MHz**5745MHz**

Date: 18.JAN.2019 16:36:06

5785MHz

Date: 18.JAN.2019 16:40:26

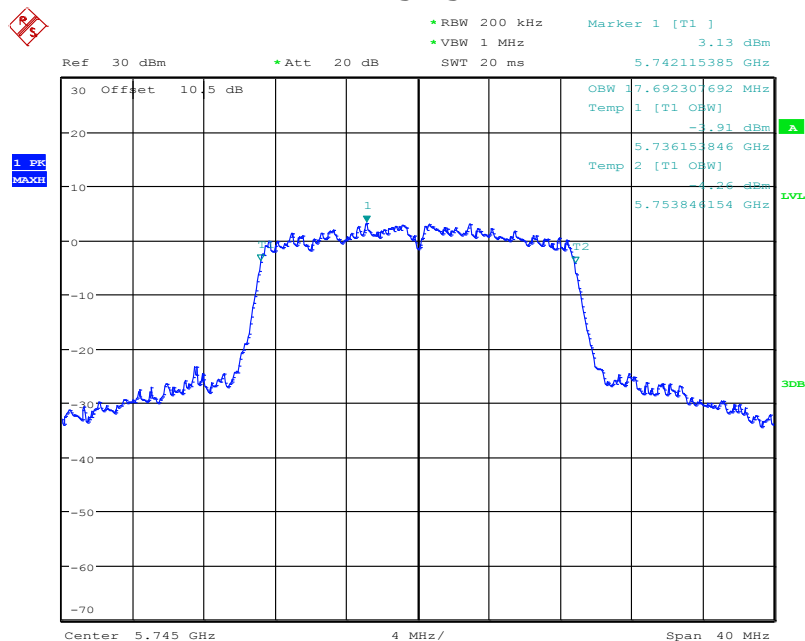
5825MHz



Date: 18.JAN.2019 16:53:51

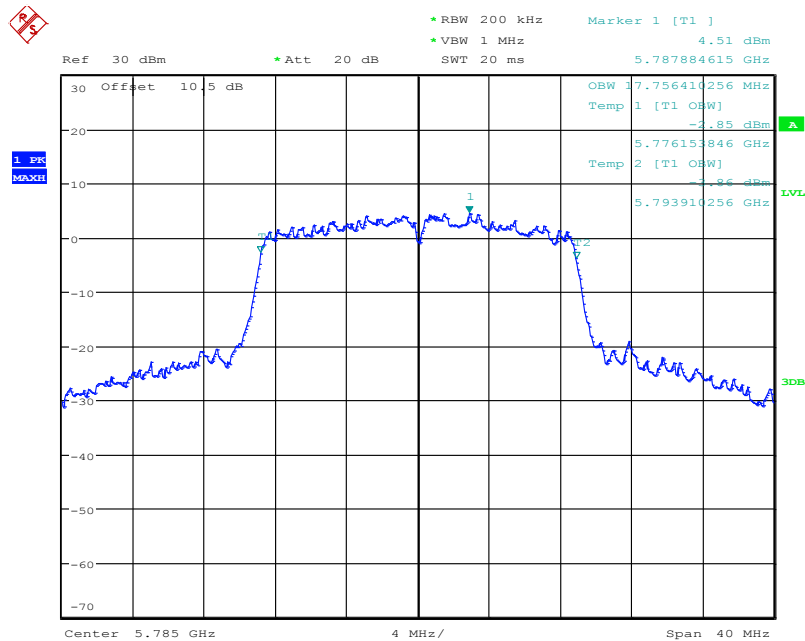
IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz

5745MHz



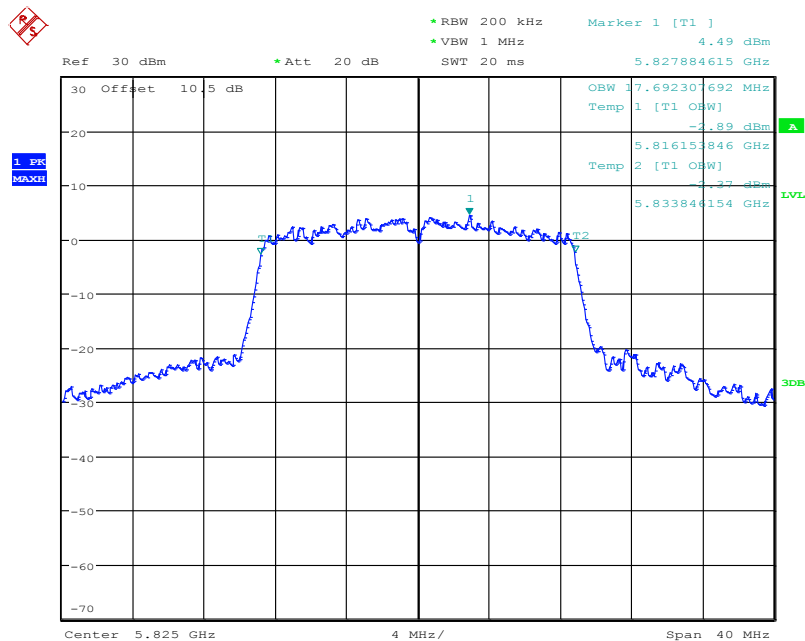
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5785MHz

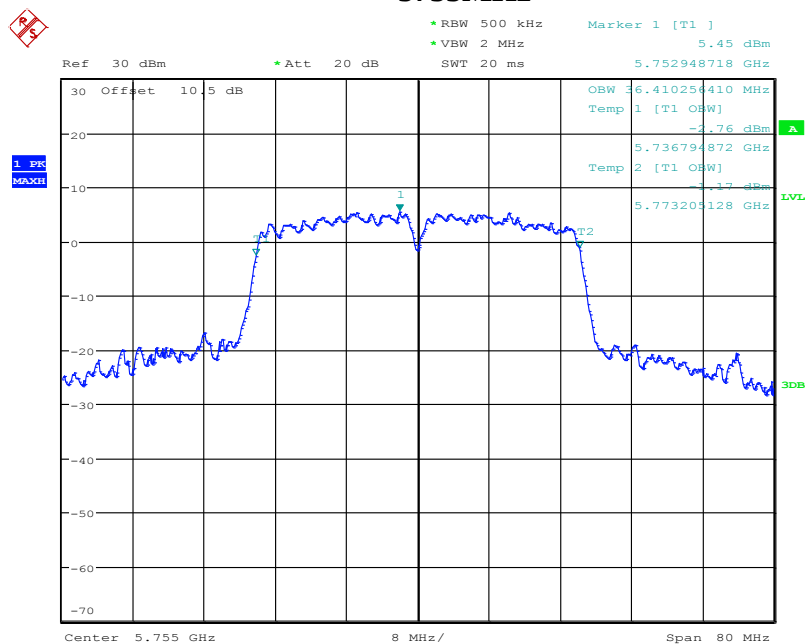


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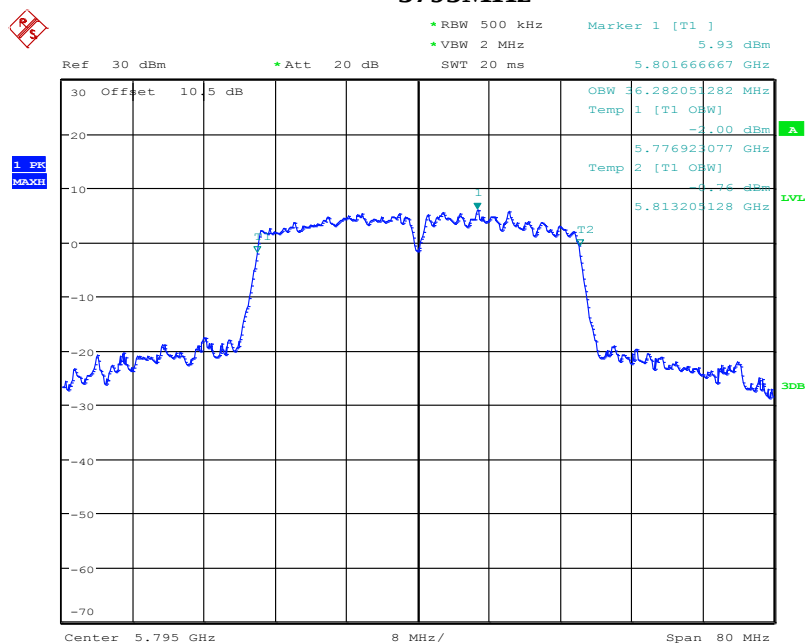
5825MHz



Date: 19.JAN.2019 09:37:30

IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz
5755MHz

Date: 19.JAN.2019 10:09:08

5795MHz

Date: 19.JAN.2019 10:11:17

10 FCC §15.407(a)(1),(2),(3) – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.407(a):

For 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.

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 $11 \text{ dBm} + 10 \log B$, 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.

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 789033 D02 General U-NII 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.

10.3 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	1010 hPa

The testing was performed by Tom Hsu on 2019-01-19.

10.4 Test Results

Test Mode: Transmitting

UNII Band	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)
UNII-1	802.11a	36	5180	14.24	0	14.24	24
		40	5200	14.15	0	14.15	24
		48	5240	14.01	0	14.01	24
UNII-2A		52	5260	14.27	0	14.27	24
		60	5300	14.41	0	14.41	24
		64	5320	14.09	0	14.09	24
UNII-2C		100	5500	14.04	0	14.04	24
		116	5580	14.19	0	14.19	24
		140	5700	14.07	0	14.07	24
UNII-3		149	5745	14.34	0	14.34	30
		157	5785	14.49	0	14.49	30
		165	5825	14.39	0	14.39	30
UNII-1	802.11 ac20	36	5180	13.45	0	13.45	24
		40	5200	13.59	0	13.59	24
		48	5240	13.37	0	13.37	24
UNII-2A		52	5260	13.47	0	13.47	24
		60	5300	13.29	0	13.29	24
		64	5320	13.31	0	13.31	24
UNII-2C		100	5500	13.66	0	13.66	24
		116	5580	13.60	0	13.6	24
		140	5700	13.80	0	13.8	24
UNII-3		149	5745	13.34	0	13.34	30
		157	5785	13.28	0	13.28	30
		165	5825	13.35	0	13.35	30

UNII Band	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)
UNII-1	802.11 ac40	38	5190	11.67	0	11.67	24
		46	5230	11.85	0	11.85	24
UNII-2A		54	5270	13.62	0	13.62	24
		62	5310	12.32	0	12.32	24
UNII-2C		102	5510	13.34	0	13.34	24
		118	5590	13.27	0	13.27	24
		134	5670	13.40	0	13.4	24
UNII-3		151	5755	13.47	0	13.47	30
		159	5795	13.55	0	13.55	30

11 FCC § 15.407(a)(1),(2),(3) – Power Spectral Density

11.1 Applicable Standard

According to FCC §15.407(a):

For 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.

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 $11 \text{ dBm} + 10 \log B$, 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.

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 30dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6dBi 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 6dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6dBi 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.

11.2 Test Procedure

According to 789033 D02 General U-NII 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 $RBW \geq 1/T$, where T is defined in II.B.1.a).
- b) Set $VBW \geq 3$ RBW.
- c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/RBW)$ 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 $10 \log (1\text{MHz}/RBW)$ 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.

11.3 Environmental Conditions

Temperature:	26 °C
Relative Humidity:	57 %
ATM Pressure:	1010 hPa

The testing was performed by Tom Hsu on 2019-01-18~2019-07-23.

11.4 Test Results*Test Mode: Transmitting*

UNII Band	Mode	Channel	Frequency (MHz)	Maximum Power Spectral Density(dBm/MHz)	Duty Factor (dB)	Total Maximum Power Spectral DensityV with duty factor (dBm/MHz)	Limit (dBm/MHz)
UNII-1	802.11a	36	5180	4.26	0	4.26	11
		40	5200	4.42	0	4.42	11
		48	5240	4.46	0	4.46	11
	802.11 ac20	36	5180	3.74	0	3.74	11
		40	5200	3.34	0	3.34	11
		48	5240	3.66	0	3.66	11
	802.11 ac40	38	5190	1.66	0	1.66	11
		46	5230	1.54	0	1.54	11
UNII-2A	802.11a	52	5260	4.02	0	4.02	11
		60	5300	4.46	0	4.46	11
		64	5320	4.35	0	4.35	11
	802.11 ac20	52	5260	3.4	0	3.4	11
		60	5300	3.32	0	3.32	11
		64	5320	3.15	0	3.15	11
	802.11 ac40	54	5270	2.05	0	2.05	11
		62	5310	2.13	0	2.13	11

UNII Band	Mode	Channel	Frequency (MHz)	Maximum Power Spectral Density(dBm/MHz)	Duty Factor (dB)	Total Maximum Power Spectral DensityV with duty factor (dBm/MHz)	Limit (dBm/MHz)
UNII-2C	802.11a	100	5500	3.68	0	3.68	11
		116	5580	3.99	0	3.99	11
		140	5700	3.55	0	3.55	11
	802.11 ac20	100	5500	3.61	0	3.61	11
		116	5580	3.82	0	3.82	11
		140	5700	3.63	0	3.63	11
	802.11 ac40	102	5510	0.56	0	0.56	11
		118	5590	1.18	0	1.18	11
		134	5670	1.08	0	1.08	11
UNII Band	Mode	Channel	Frequency (MHz)	Maximum Power Spectral Density(dBm/500kHz)	Duty Factor (dB)	Total Maximum Power Spectral DensityV with duty factor (dBm/500kHz)	Limit (dBm/500kHz)
UNII-3	802.11a	149	5745	3.88	0	3.88	30
		157	5785	3.87	0	3.87	30
		165	5825	3.9	0	3.90	30
	802.11 ac20	149	5745	0.72	0	0.72	30
		157	5785	1.92	0	1.92	30
		165	5825	1.97	0	1.97	30
	802.11 ac40	151	5755	-1.2	0	-1.20	30
		159	5795	-1.37	0	-1.37	30

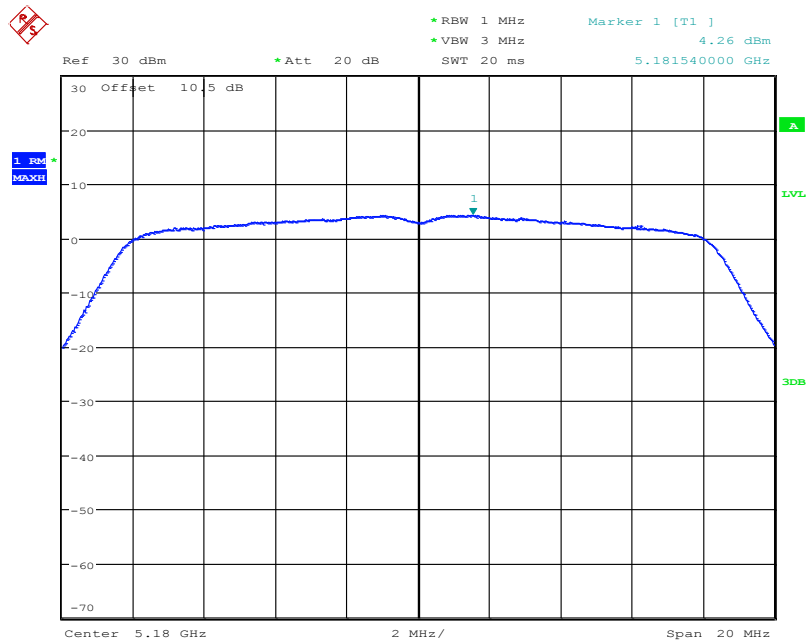
Please refer to the following plots

Test Mode: Transmitting

UNII-1 Band I PSD

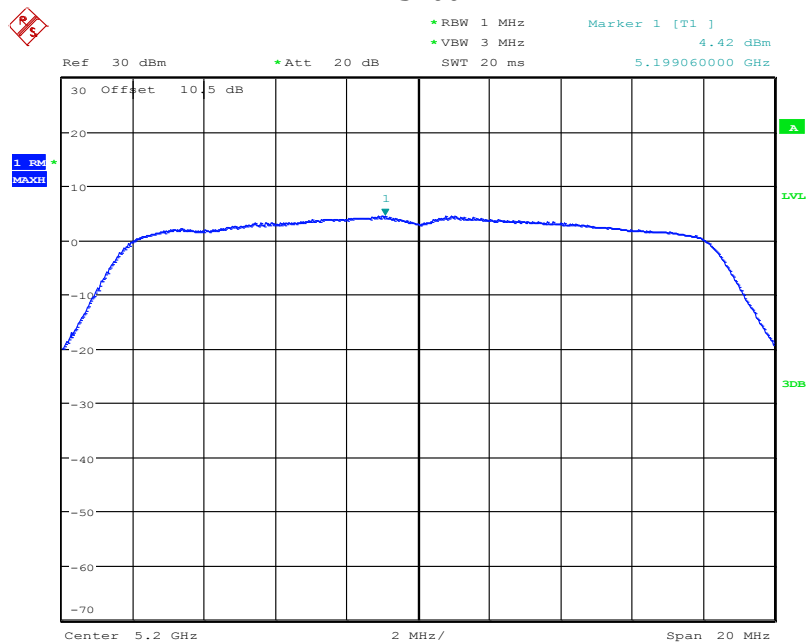
IEEE 802.11a Mode / 5150 ~ 5250MHz

5180MHz



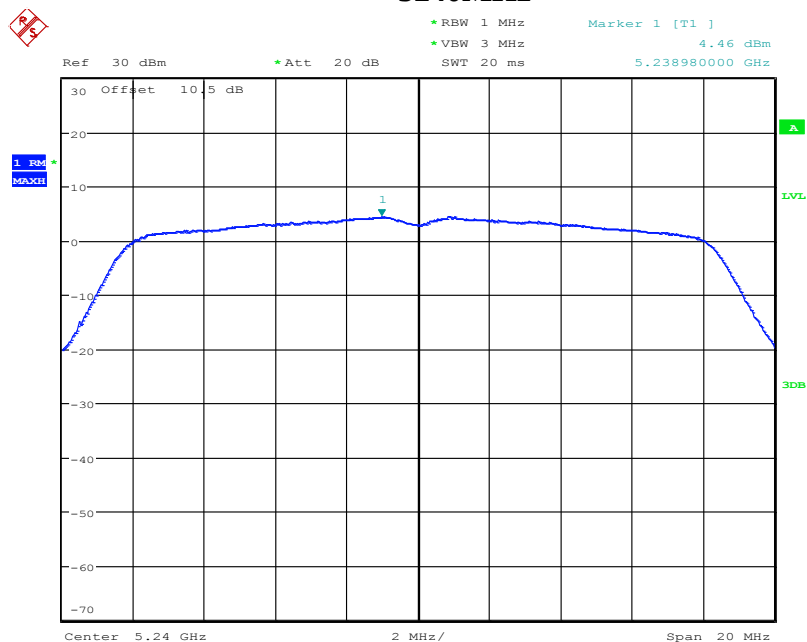
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5200MHz



Date: 23.JUL.2019 15:46:35

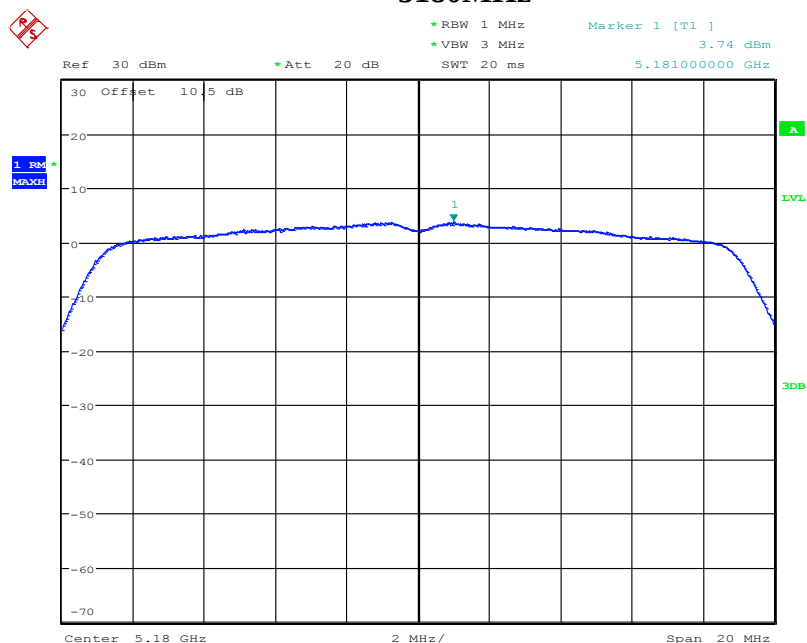
5240MHz



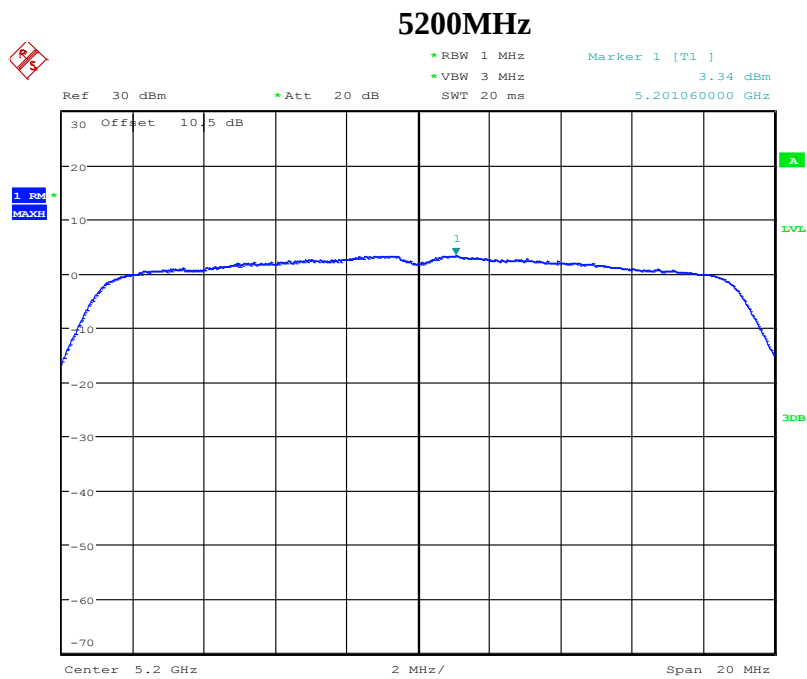
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IEEE 802.11ac VHT20 Mode / 5150 ~ 5250MHz

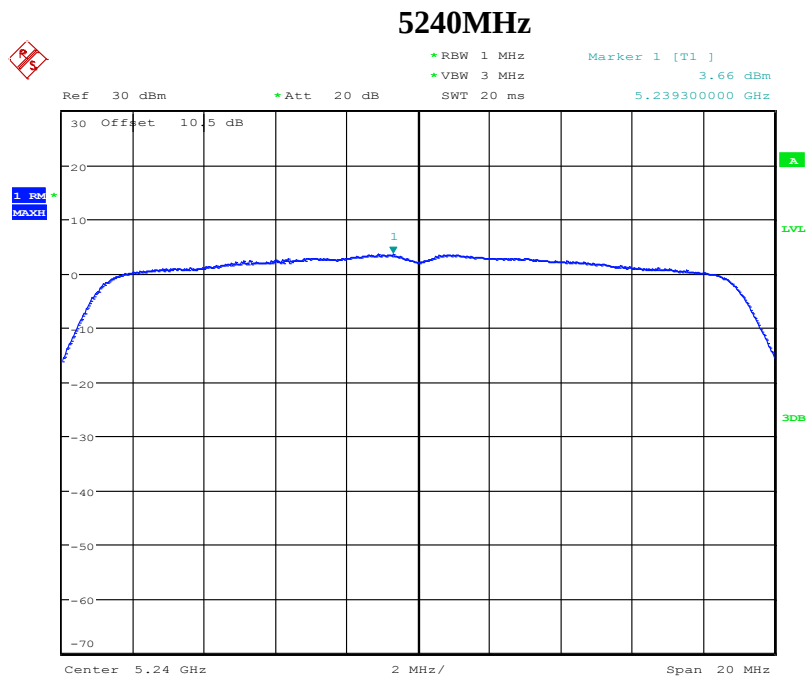
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Date: 23.JUL.2019 16:03:07



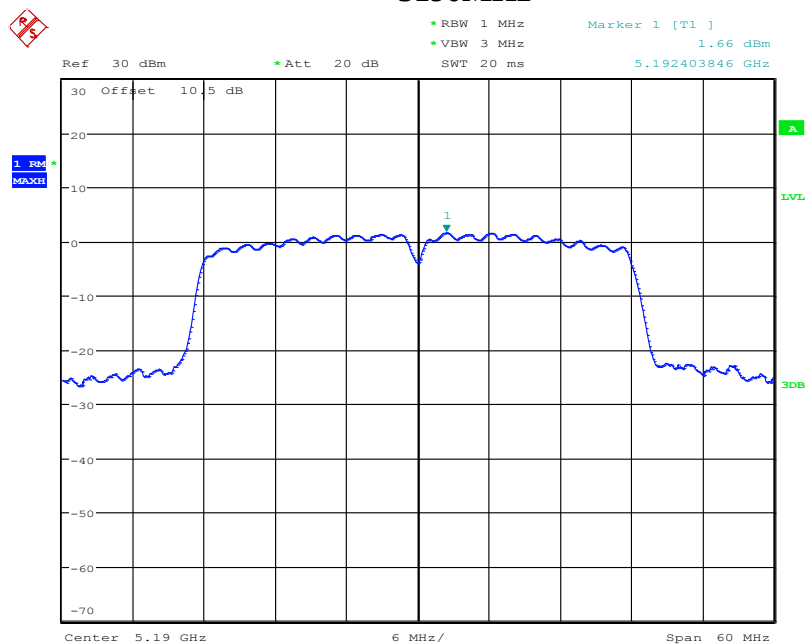
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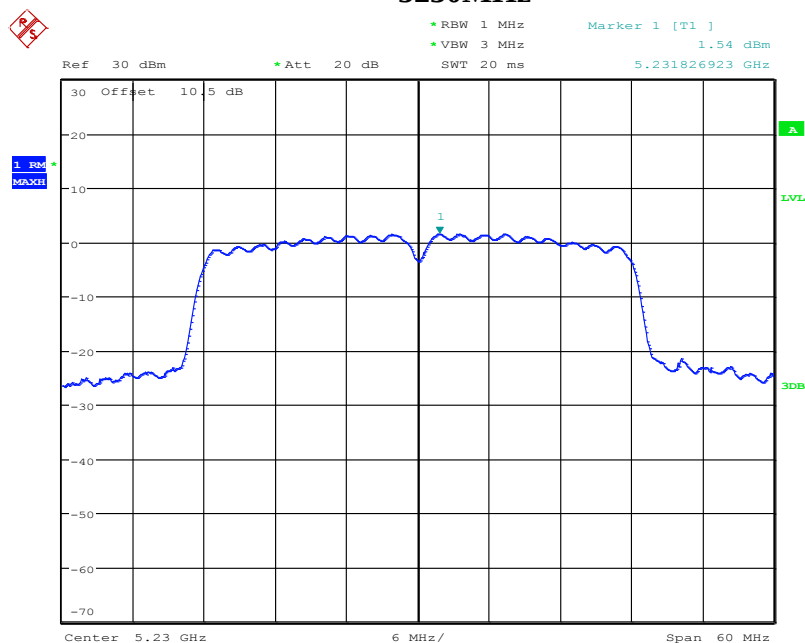
IEEE 802.11ac VHT40 Mode / 5150 ~ 5250MHz

5190MHz

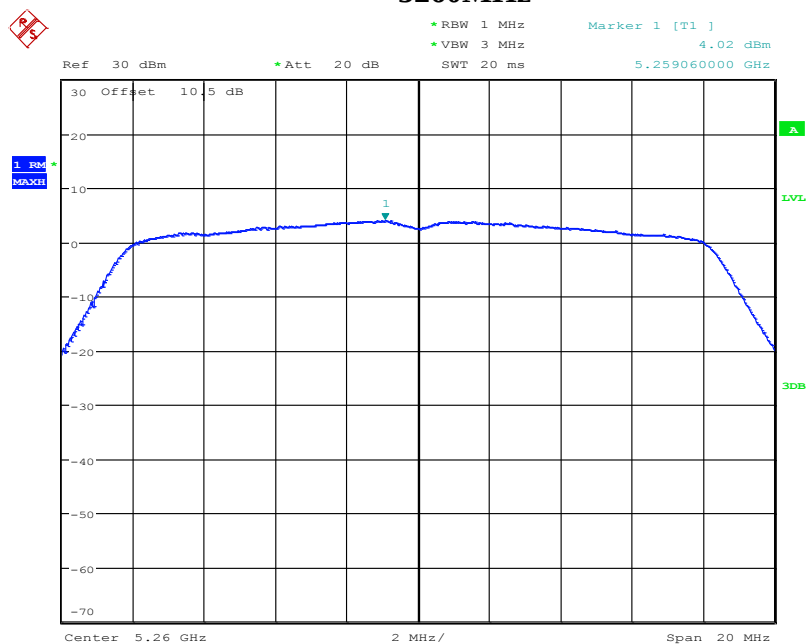


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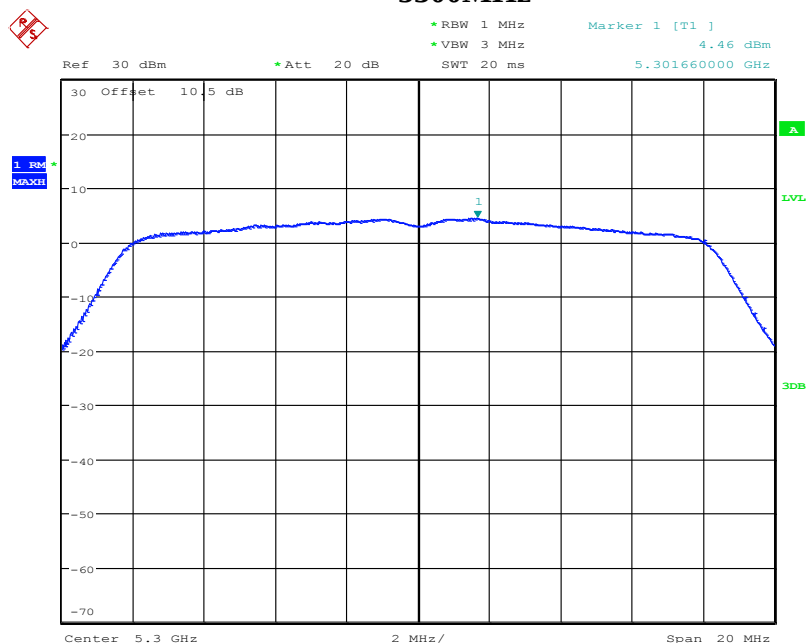
5230MHz



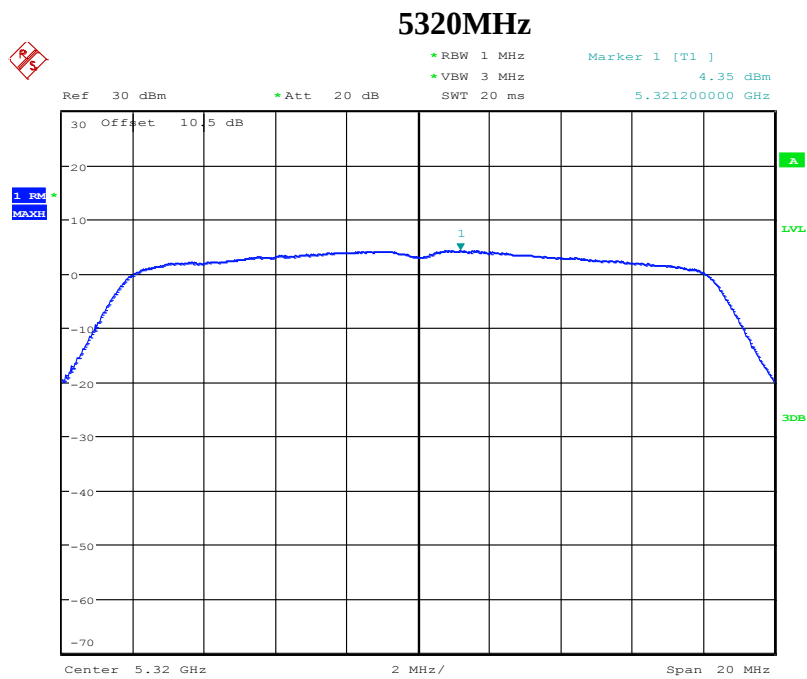
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UNII-2A Band I PSD
IEEE 802.11a Mode / 5250 ~ 5350MHz**5260MHz**

Date: 23.JUL.2019 15:50:36

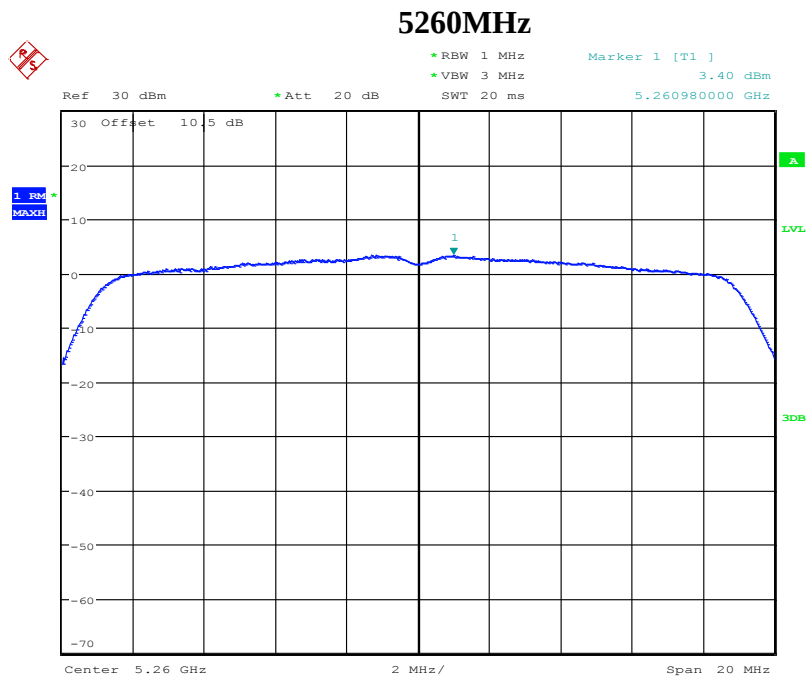
5300MHz

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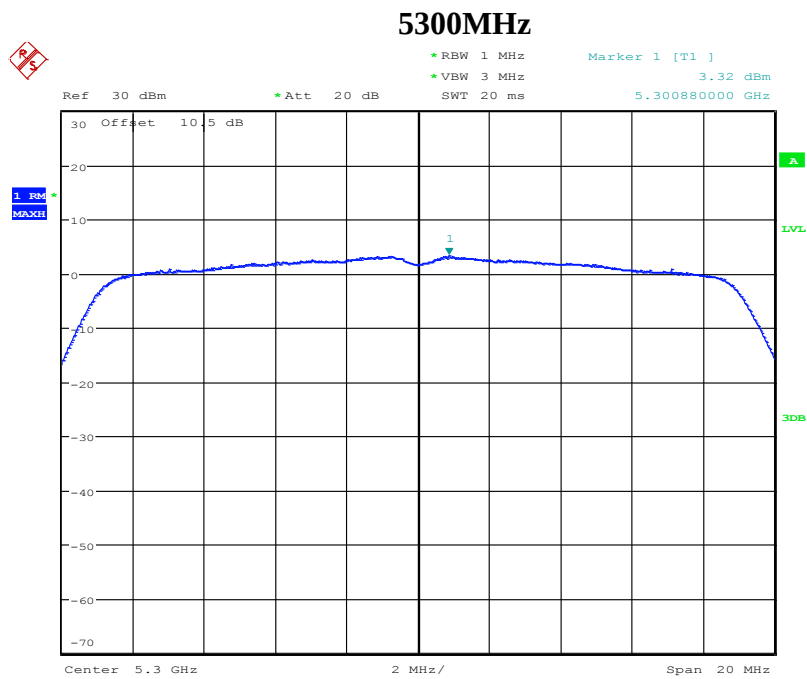


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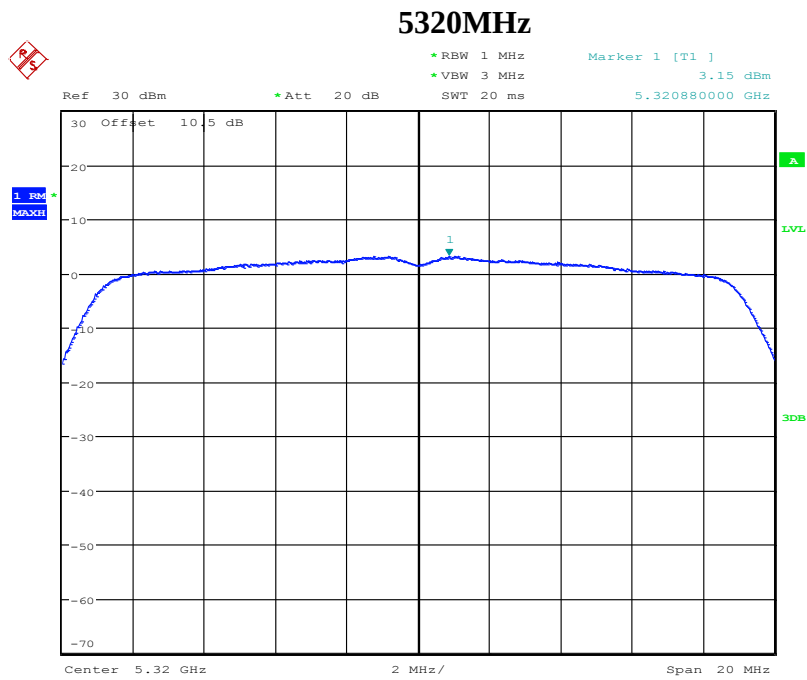
IEEE 802.11ac VHT20 Mode / 5250 ~ 5350MHz



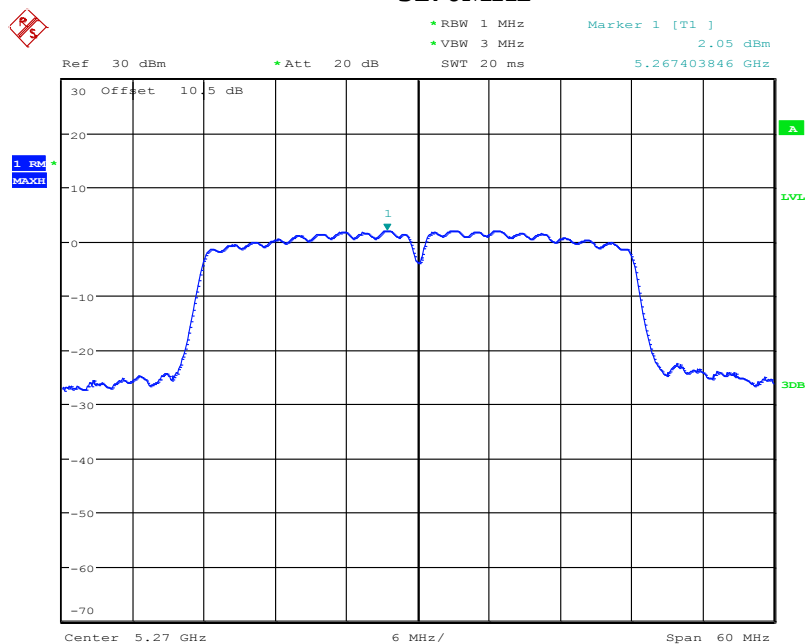
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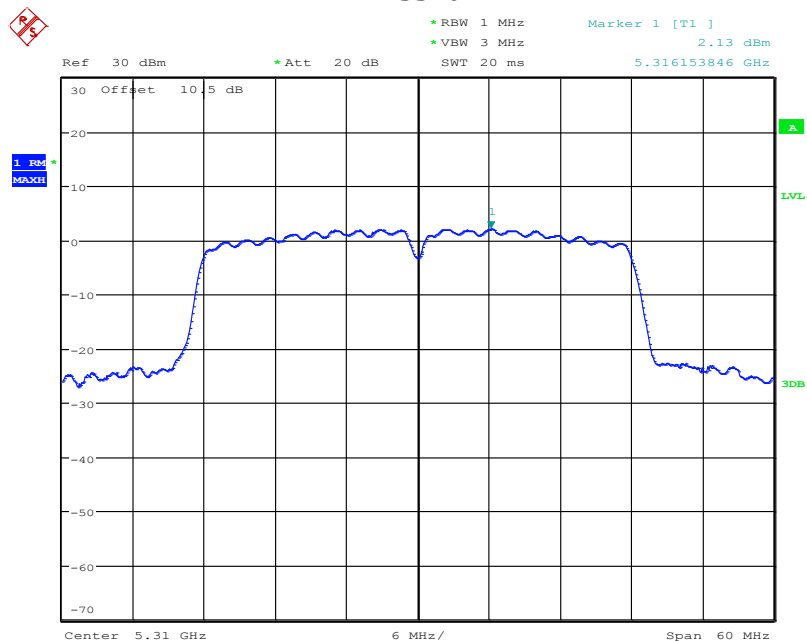
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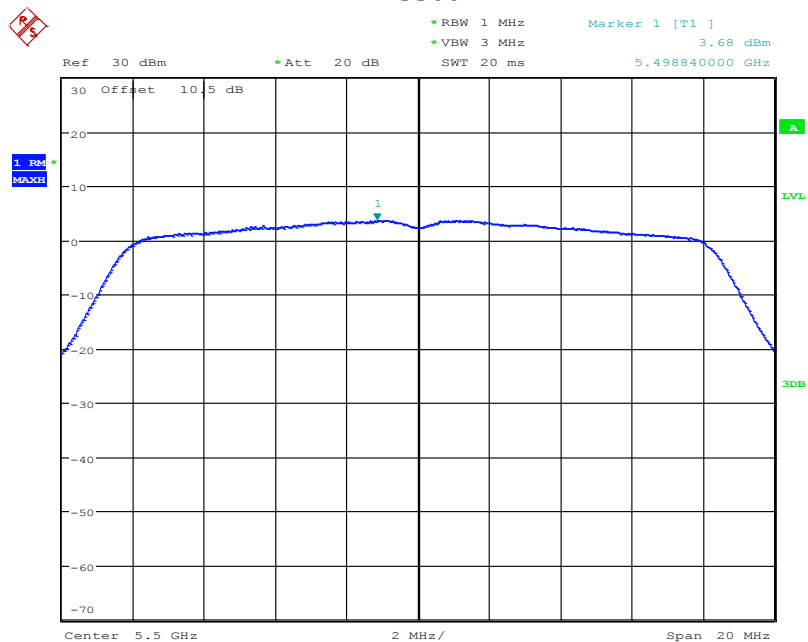
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IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz
5270MHz

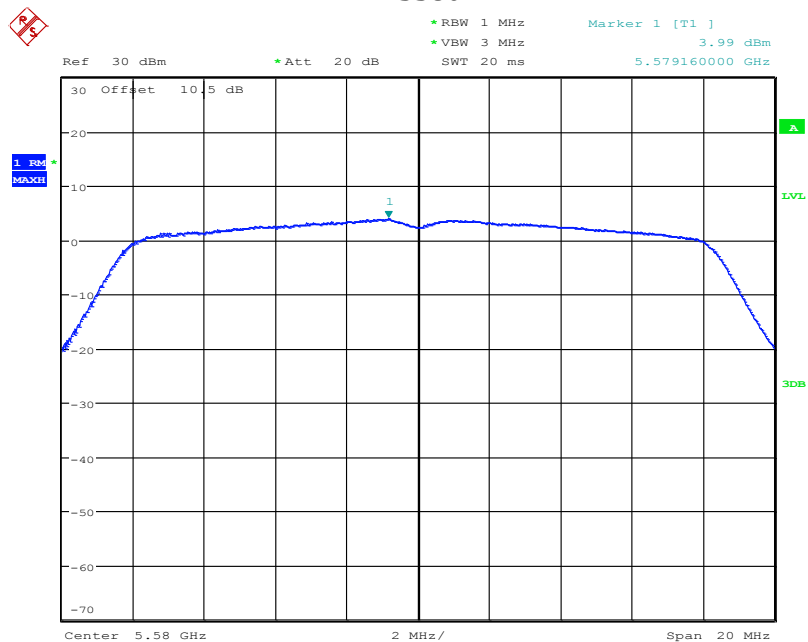
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5310MHz

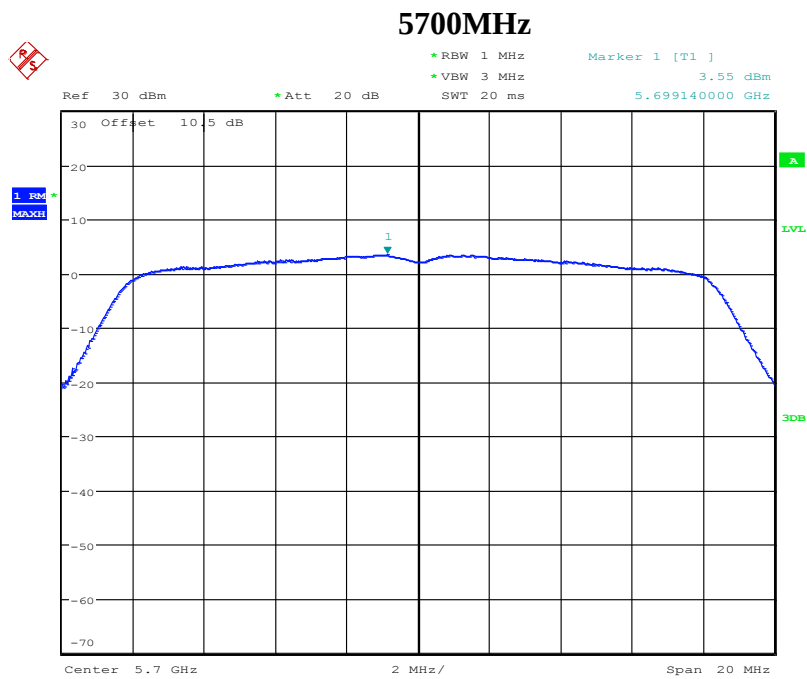
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UNII-2C Band I PSD
IEEE 802.11a Mode / 5470 ~ 5725MHz**5500MHz**

Date: 23.JUL.2019 15:57:01

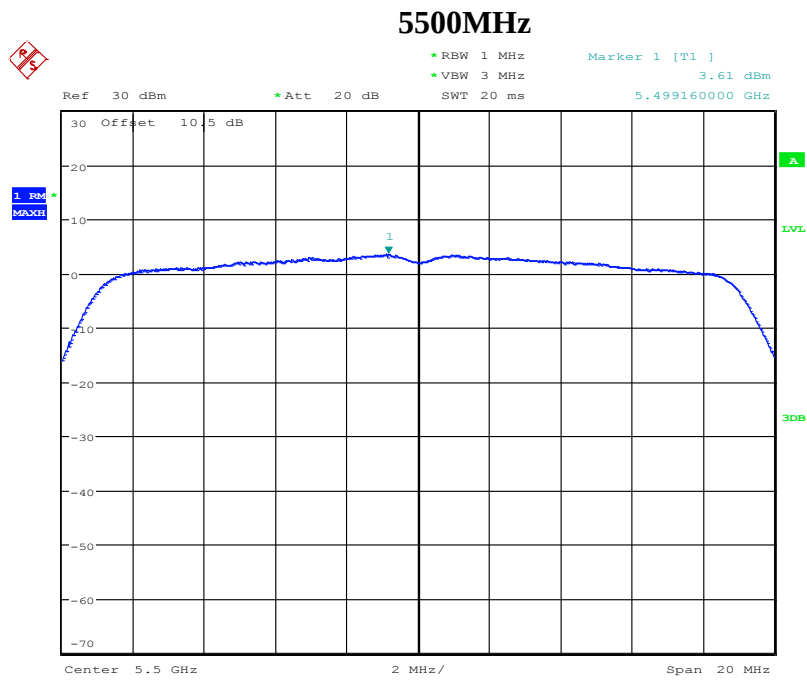
5580MHz

Date: 23.JUL.2019 15:58:52

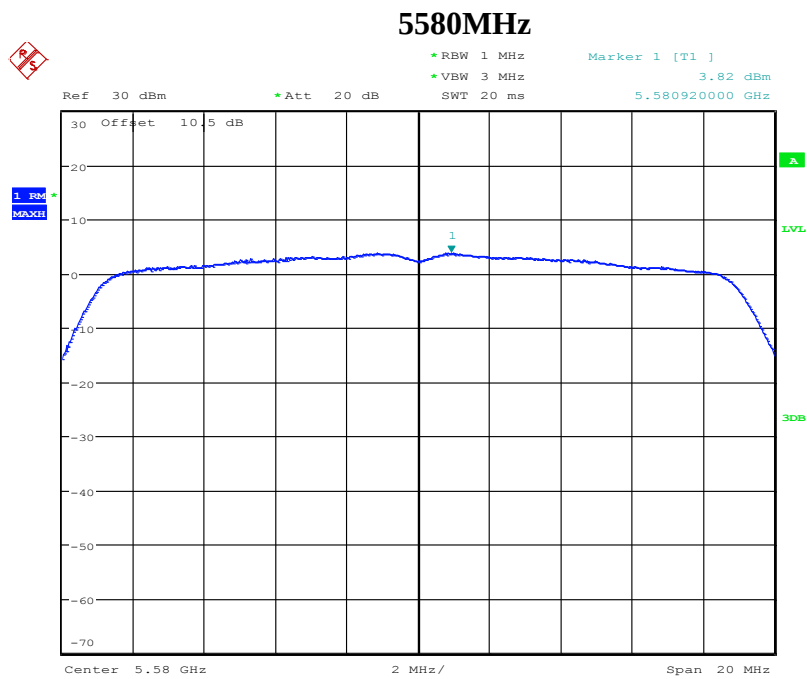


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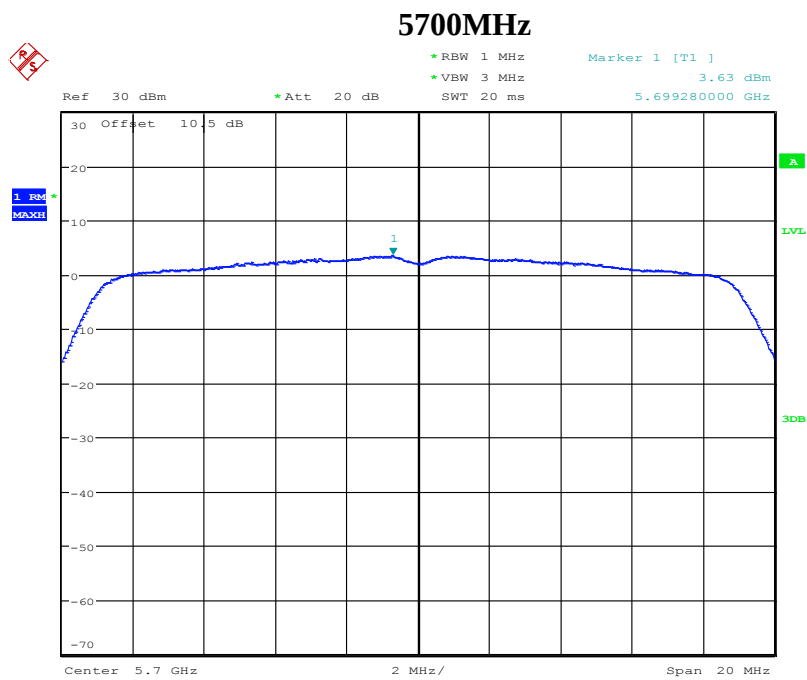
IEEE 802.11ac VHT20 Mode / 5470 ~ 5725MHz



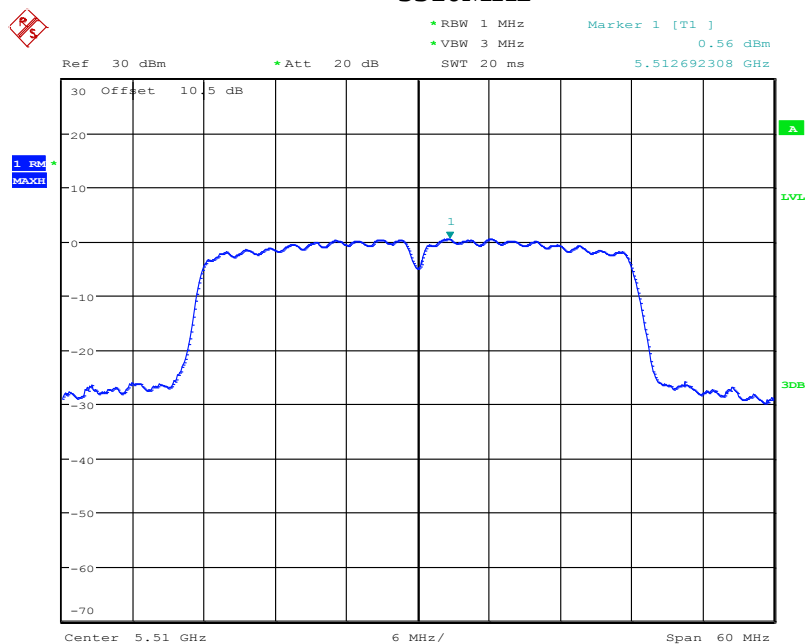
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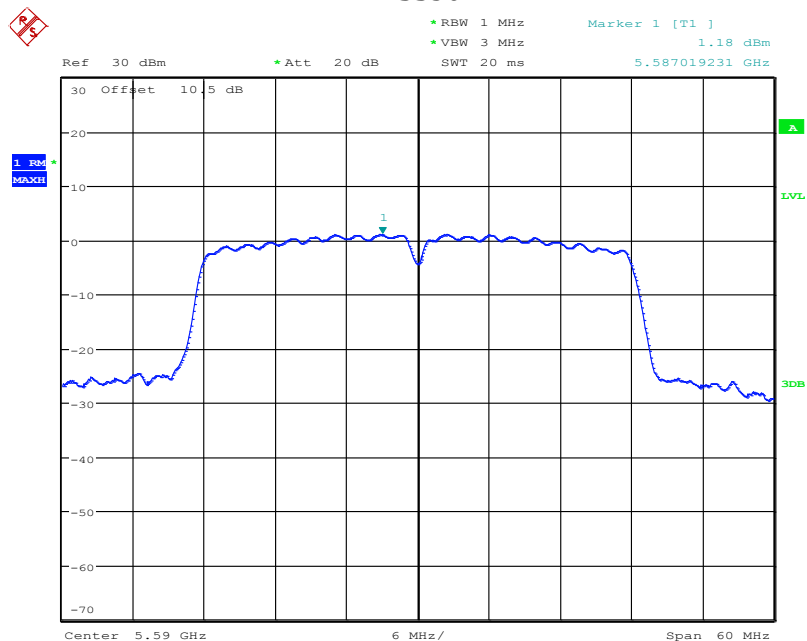
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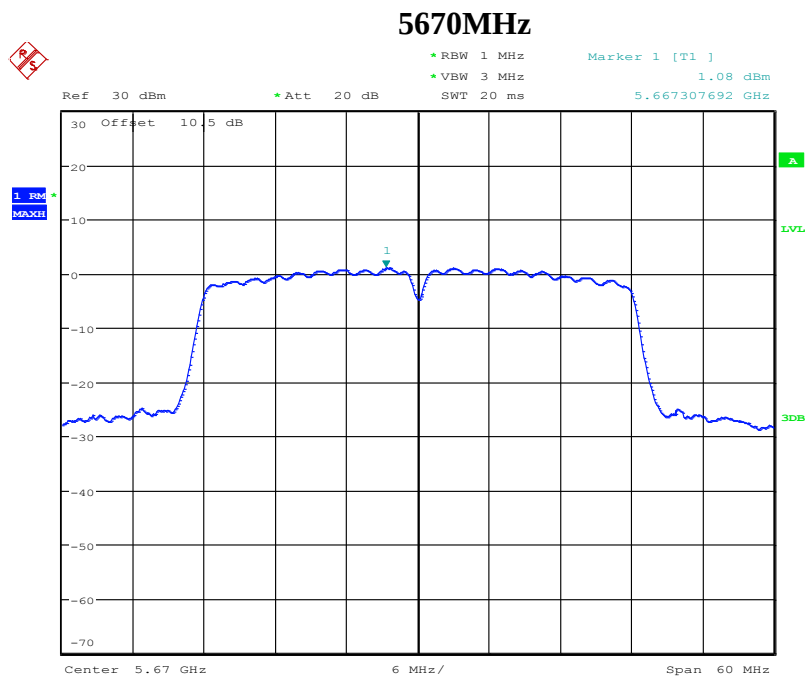
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IEEE 802.11ac VHT40 Mode / 5250 ~ 5350MHz
5510MHz

Date: 19.JAN.2019 09:59:24

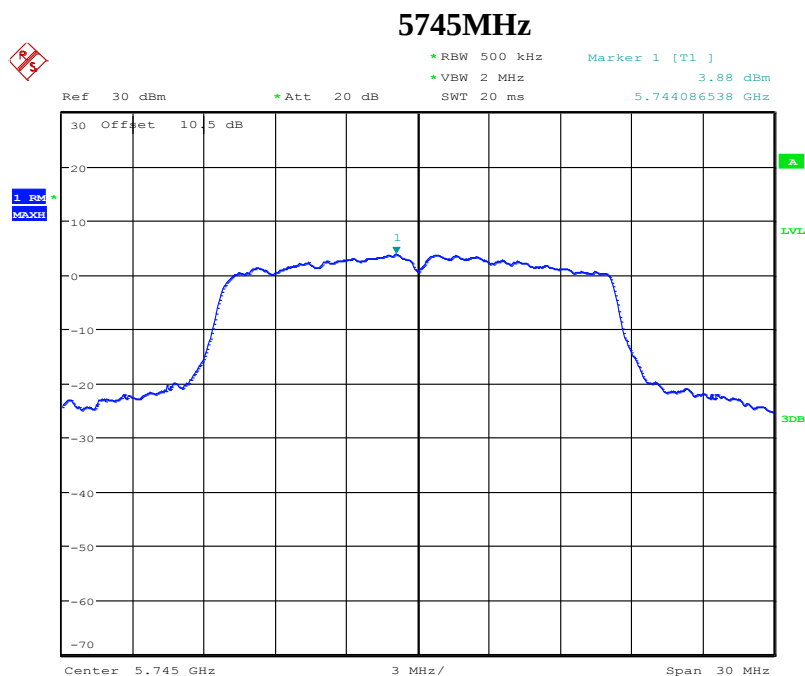
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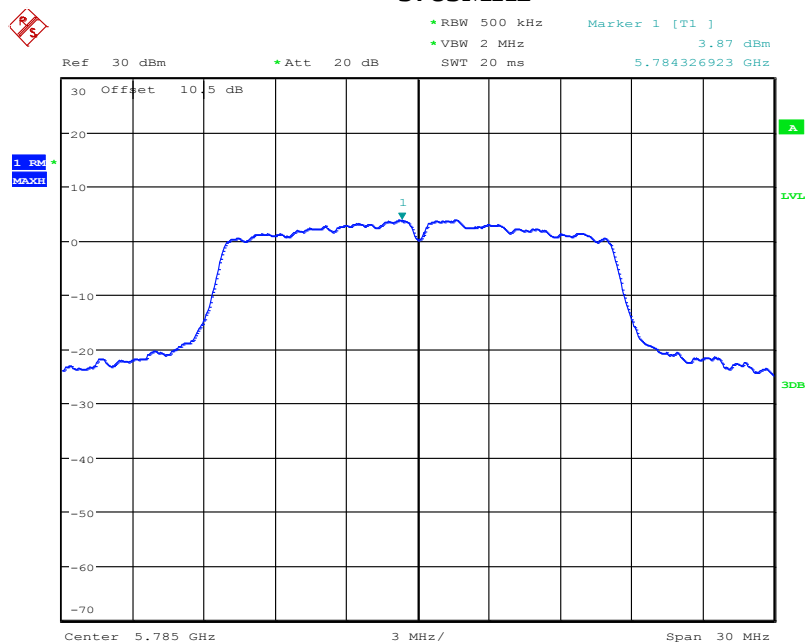
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UNII-3 Band IV PSD
IEEE 802.11a mode / 5725 ~ 5850MHz



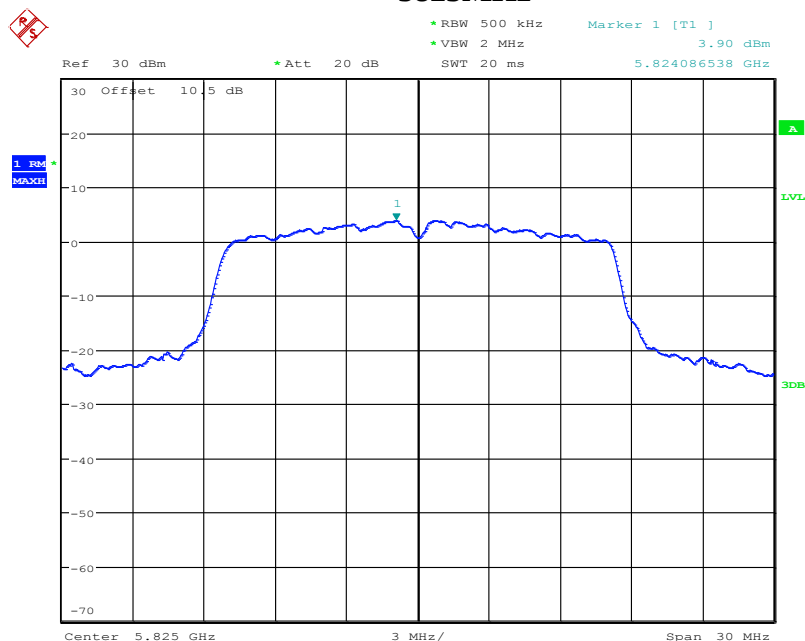
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5785MHz

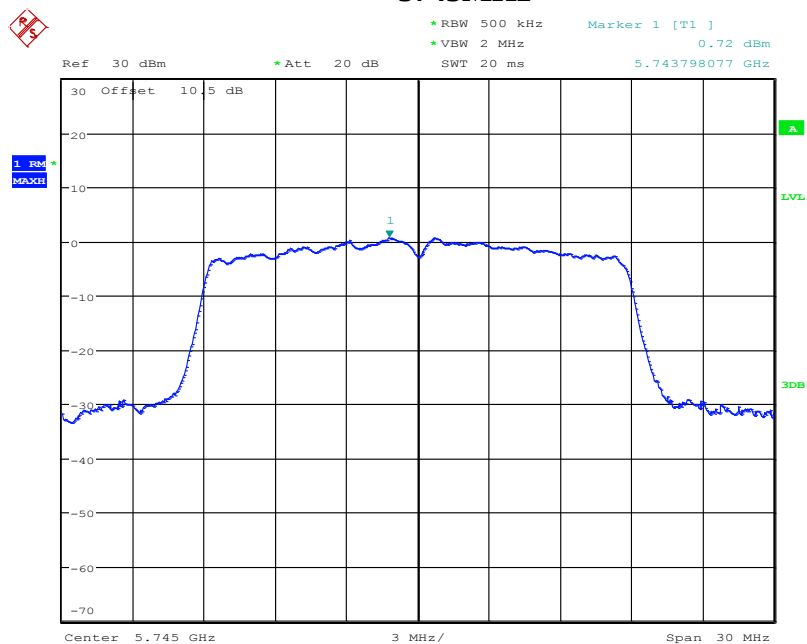


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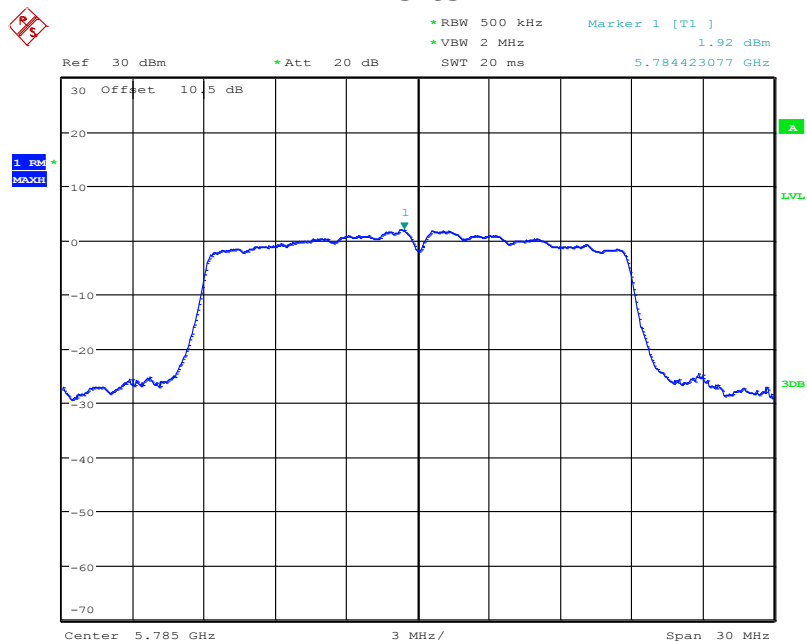
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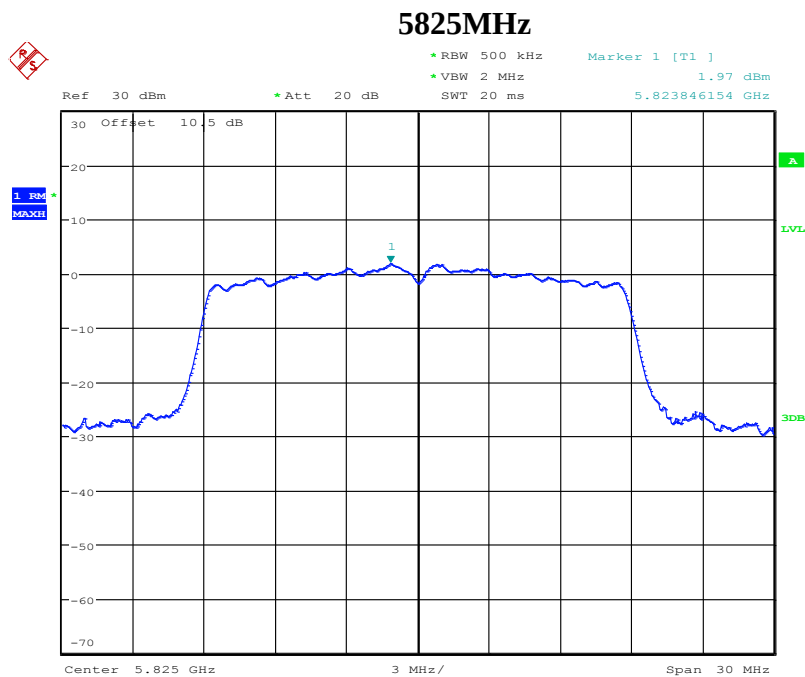
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IEEE 802.11ac VHT20 Mode / 5725 ~ 5850MHz
5745MHz

Date: 19.JAN.2019 09:27:19

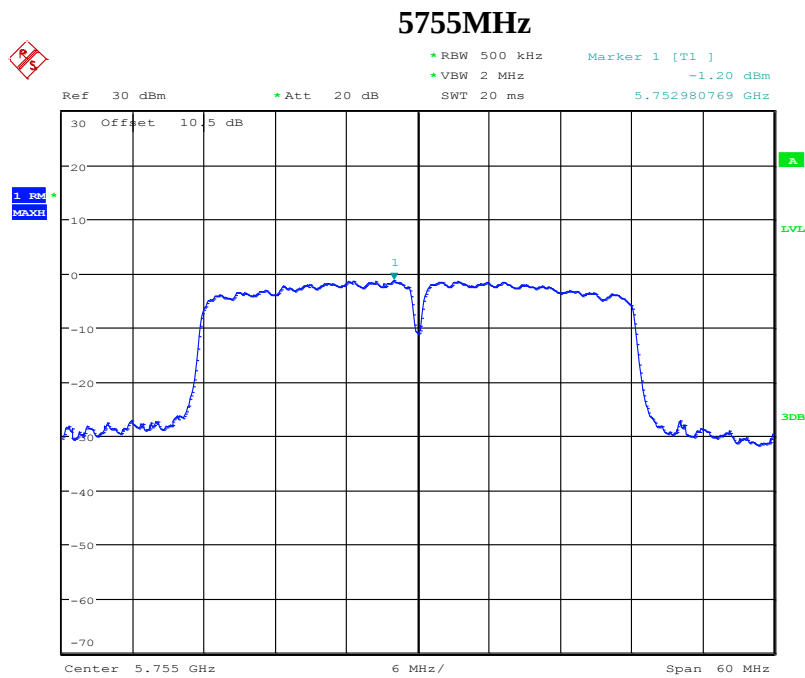
5785MHz

Date: 19.JAN.2019 09:34:25



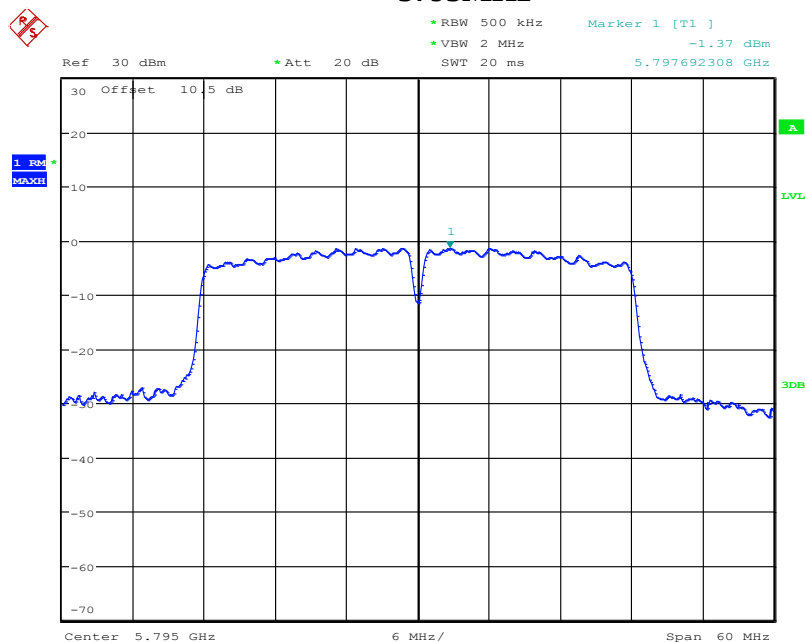
Date: 19.JAN.2019 09:36:59

IEEE 802.11ac VHT40 Mode / 5725 ~ 5850MHz



Date: 19.JAN.2019 10:08:38

5795MHz



Date: 19.JAN.2019 10:10:45

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