

Prüfbericht-Nr.: <i>Test report no.:</i>	60369886 001	Auftrags-Nr.: <i>Order no.:</i>	238485609	Seite 1 von 40 <i>Page 1 of 40</i>	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	23-Apr-2020		
Auftraggeber: <i>Client:</i>	Corsair Memory Inc. 47100 Bayside Parkway 94538 Fremont, CA United States				
Prüfgegenstand: <i>Test item:</i>	Ring Light				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	20LAC9901				
Auftrags-Inhalt: <i>Order content:</i>	FCC Part 15E Test report (WiFi 5GHz)				
Prüfgrundlage: <i>Test specification:</i>	FCC 47CFR Part 15: Subpart E Section 15.407				
Wareneingangsdatum: <i>Date of sample receipt:</i>	06-May-2020				
Prüfmuster-Nr.: <i>Test sample no:</i>	A002819929-002 A002819929-004				
Prüfzeitraum: <i>Testing period:</i>	08-May-2020 – 24-Jun-2020				
Ort der Prüfung: <i>Place of testing:</i>	EMC/RF Laboratory Taipei				
Prüflaboratorium: <i>Testing laboratory:</i>	Taipei Testing Laboratories				
Prüfergebnis*: <i>Test result*:</i>	Pass				
überprüft von: <i>reviewed by:</i>			genehmigt von: <i>authorized by:</i>		
Datum: 08-Sep-2020 <i>Date:</i>	Mars Y.J. Lin		Datum: 08-Sep-2020 <i>Date:</i>	Ryan W.T. Chen	
Stellung / Position:	Project Engineer		Stellung / Position:	Project Manager	
Sonstiges / Other:					
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

V05

TEST SUMMARY

Report Section	FCC Clause	Test Item	Result
5.1.1	15.407(a) & 15.203	Antenna Requirement	Pass
5.1.2	15.407(a)	Maximum Conducted Output Power	Pass
5.1.3	15.407(a)	26 dB Bandwidth	Pass
5.1.3	2.1049	99% Occupied Bandwidth	Pass
5.1.4	15.407(e)	6 dB Bandwidth (U-NII-3 Band only)	Pass
5.1.5	15.407(g)	Frequency Stability	Pass
5.1.6	15.407(a)	Power Spectral Density	Pass
5.1.7	15.407(b) & 15.205 & 15.209	Radiated Spurious Emissions and Band Edges	Pass
5.1.8	15.407(h) & KDB 905462 D02	Dynamic Frequency Selection	Pass
5.2.1	15.207	Mains Conducted Emission	Pass
6.1	2.1091	RF Exposure Compliance	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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APPENDIX A - TEST RESULT OF CONDUCTED

**APPENDIX B - TEST RESULT OF RADIATED SPURIOUS EMISSIONS & MAINS CONDUCTED
EMISSION**

APPENDIX SP - PHOTO DOCUMENTATION_TEST SETUP PHOTO

APPENDIX EP - PHOTO DOCUMENTATION_EUT PHOTO

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*Test Report No.***Seite 5 von 40**
*Page 5 of 40***HISTORY OF THIS TEST REPORT**

Report No.	Description	Date Issued
60369886 001	Original Release	08-Sep-2020

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A - Test Result of Conducted

Appendix B - Test Result of Radiated Spurious Emissions & Mains Conducted Emission

Appendix SP - Photo Documentation_Test Setup Photo

Appendix EP - Photo Documentation_EUT Photo

Applied Standard and Test Levels

Radio
FCC CFR47 Part 15: Subpart E Section 15.407
FCC CFR47 Part 2: Subpart J Section 2.1091
ANSI C63.10:2013
KDB 789033 D02 General UNII Test Procedures New Rules v02r01
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
KDB447498 D01 General RF Exposure Guidance v06
KDB905462 D03 UNII Clients Without Radar Detection New Rules v01r02

1.2 Decision Rule of Conformity

The decision rule of conformity of this test report is following the requirements of the requested standard in the quotation, and agreed among testing laboratory and manufacturer (applicant) to exclude the consideration of Measurement Uncertainty, unless it is required by the specific standard.

2. Test Sites

2.1 Test Laboratory

Taipei Testing Laboratories

11F. No.758, Sec. 4, Bade Rd., Songshan Dist.
Taipei City 105
Taiwan (R.O.C.)

2.2 Test Facility

Taipei Testing Laboratories

No.458-18, Sec. 2, Fenliao Rd., Linkou Dist.,
New Taipei City 244
Taiwan (R.O.C.)
(Conducted Test & Radiated Spurious Emissions)
FCC Registration No.: 226631
ISED Registration No.: 25563



2.3 Traceability

All measurement equipment calibrations are traceable to NML(Taiwan)/NIST(USA) or where calibration is performed outside Taiwan, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically in a suitably accredited Calibration Lab. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements are:

Emission Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-7}$
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Radiated emission of transmitter, valid up to 40 GHz	± 6 dB
Radiated emission of receiver, valid up to 40 GHz	± 6 dB
Temperature	± 2 °C
Humidity	± 10 %

3. General Product Information

3.1 Product Function and Intended Use

The EUT is a Ring Light. It contains a WLAN compatible module enabling the user to communicate data through a Wireless interface.

For details refer to the User Guide, Data Sheet and Circuit Diagram.

3.2 System Details and Ratings

Basic Information of EUT

Item	EUT information
Kind of Equipment/Test Item	Ring Light
Type Identification	20LAC9901
FCC ID	2AAFM-20LAC9901

Technical Specification of EUT

Item	EUT information
Operating Frequency	Band 1: 5180 MHz ~ 5240 MHz Band 2: 5260 MHz ~ 5320 MHz Band 3: 5500 MHz ~ 5700 MHz Band 4: 5745 MHz ~ 5825 MHz
Channel Spacing	10 MHz
Channel number	Band 1: 4 for 802.11a, 802.11n HT20 Band 2: 4 for 802.11a, 802.11n HT20 Band 3: 11 for 802.11a, 802.11n HT20 Band 4: 5 for 802.11a, 802.11n HT20
Data Rate	802.11a: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to MCS7
Operation Voltage	120Vac
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Maximum Output Power (mW)	5180 ~ 5240 MHz: 15.19 5260 ~ 5320 MHz: 15.25 5500 ~ 5700 MHz: 17.24 5745 ~ 5825 MHz: 17.74
Antenna Information	Refer to 5.1.1
Accessory Device	Refer to 4.4
DFS Mode	Slave without radar detection

3.3 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.4 Submitted Documents

- Circuit Diagram
- Instruction Manual
- Rating Label
- Technical Description

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The test modes were adapted accordingly in reference to the instructions for use.

During testing, Channel and Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output expected by the customer and is going to be fixed on the firmware of the final end product.

Table for Parameters of Test Software Setting

802.11a		802.11n HT20	
Channel	Power Setting	Channel	Power Setting
36	112	36	113
40	112	40	113
48	112	48	113
52	107	52	108
60	107	60	108
64	107	64	108
100	96	100	93
116	97	116	98
140	97	140	98
149	108	149	108
157	108	157	108
165	108	165	108

4.2 Carrier Frequency and Channel

Band	Channel	Frequency (MHz)	802.11a 802.11n HT20
U-NII-1 (Band 1)	36	5180	V
	38	5190	
	40	5200	V
	42	5210	
	44	5220	V
	46	5230	
	48	5240	V
U-NII-2A (Band 2)	52	5260	V
	54	5270	
	56	5280	V
	58	5290	
	60	5300	V
	62	5310	
	64	5320	V
U-NII-2C (Band 3)	100	5500	V
	102	5510	
	104	5520	V
	106	5530	
	108	5540	V
	110	5550	
	112	5560	V
	116	5580	V
	118	5590	
	120	5600	V
	122	5610	
	124	5620	V
	126	5630	
	128	5640	V
	132	5660	V
	134	5670	
	136	5680	V
U-NII-3 (Band 4)	140	5700	V
	149	5745	V
	151	5755	
	153	5765	V
	155	5775	
	157	5785	V
	159	5795	
	161	5805	V
	165	5825	V

4.3 Test Operation and Test Software

Setup for testing: Test samples are provided with a USB interface which makes it possible to control them through a test software installed on a notebook computer.

This software was running on the laptop computer connected to the EUT. It was used to enable the operation modes listed as below.

Test Software	Mptool.exe
---------------	------------

The samples were used as follows:

A002819929-002 for conducted

A002819929-004 for radiated

Full test was applied on all test modes, but only worst case was shown.

Modulation Mode	Tx Function
802.11a	1TX (SISO)
802.11n HT20	1TX (SISO)

EUT Configure Mode	Applicable To				Description
	Antenna Port Conducted Measurement	Radiated Spurious Emissions above 1 GHz	Radiated Spurious Emissions below 1 GHz	Mains Conducted Emission	
-	√	√	√	√	-

Note:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when position on **Z-plane**.
2. "-" means no effect.

Antenna Port Conducted Measurement

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	6.0
-		5260-5320	52 to 64	52, 60, 64	
-		5500-5700	100 to 140	100, 116, 140	
-		5745-5825	149 to 165	149, 157, 165	
-	802.11n HT20	5180-5240	36 to 48	36, 40, 48	6.5
-		5260-5320	52 to 64	52, 60, 64	
-		5500-5700	100 to 140	100, 116, 140	
-		5745-5825	149 to 165	149, 157, 165	

Radiated Spurious Emissions (Above 1 GHz)

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	6.0
-	802.11n HT20	5260-5320	52 to 64	52, 60, 64	6.5

Radiated Spurious Emissions (Below 1 GHz)

- ☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Produkte

Products

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EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11n HT20	5260-5320	52 to 64	64	6.5

Mains Conducted Emission Test☒ Pre-Scan full test was applied on all test modes, but only worst case was shown.☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Frequency (MHz)	Available Channel	Tested Channel	Date Rate (Mbps)
-	802.11n HT20	5180-5240	36 to 48	36	6.5

Test Condition

Test Item	Ambient Temperature	Relative Humidity	Tested by
Conducted Measurement	22-26 °C	50-65 %	Morrison Huang
Radiated Spurious Emissions above 1 GHz	22-26 °C	50-65 %	Simon Tsai
Radiated Spurious Emissions below 1 GHz	22-26 °C	50-65 %	Simon Tsai
Mains Conducted Emission	22-26 °C	50-65 %	Chun-Yi Wu

4.4 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

Accessory of EUT

Item No.	Description	Brand Name	Model No.	Serial No.	Length
3	Adapter	ULL Power	ICP65-130-4000	-	-
A	Adapter Cable	-	-	-	2.5

Support Unit

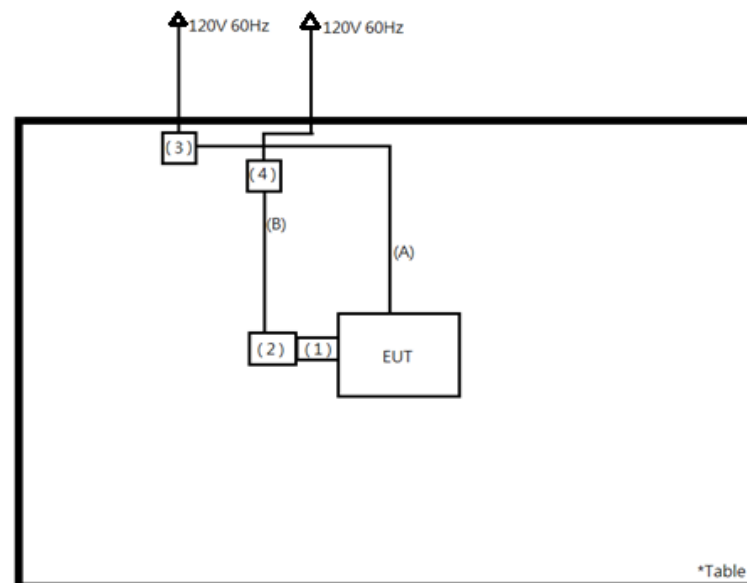
Item No.	Description	Brand Name	Model No.	Serial No.	Length
1	UART	-	CP2102	-	-
2	Notebook	Lenovo	81BL	MP1DCD6Y	-
4	Adapter	Lenovo	ADLX65NCC3A	-	-
B	Adapter Cable	-	-	-	1.5
-	AP	NETGEAR	R7800	4H75745800509	-

4.5 Countermeasures to Achieve EMC Compliance

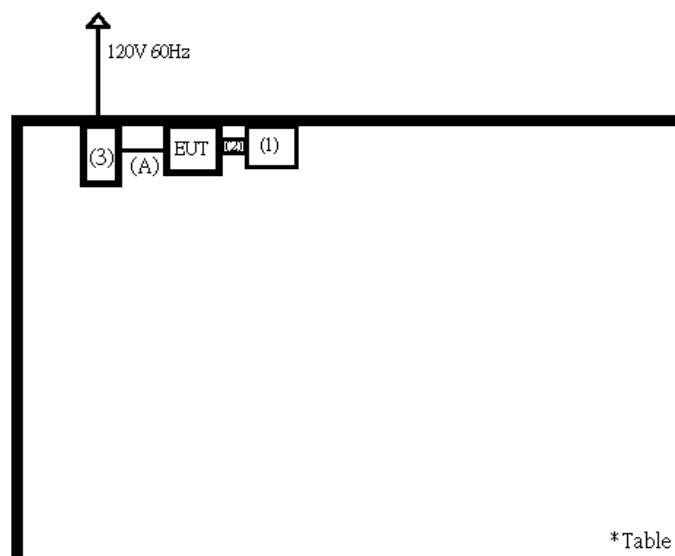
The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.6 Test Setup Diagram

<Radiated Spurious Emissions>

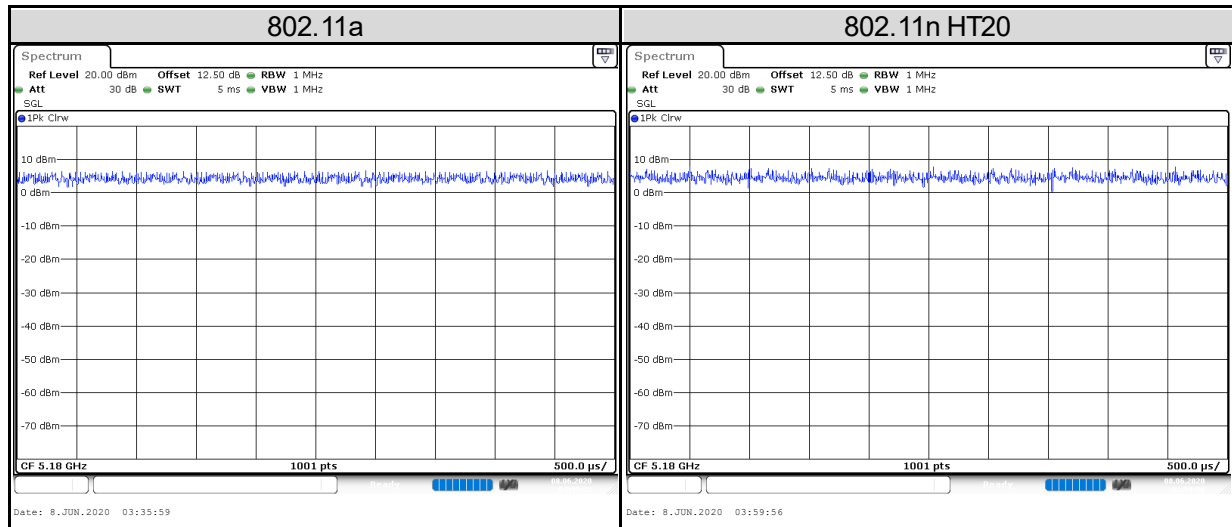


<Mains Conducted Emission mode>



4.7 Duty Cycle of Test Signal

Mode	On Time (ms)	On + Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)
802.11a	1	1	100	0.00
802.11n HT20	1	1	100	0.00



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

Requirement Use of approved antennas only

According to the manufacturer declaration, the EUT's antenna specifications are described as below.
The antenna is used with no possibility of replacement with a non-approved antenna by the end-user.
Therefore, the EUT is considered to comply with this provision.

Chip antenna with 3.2 dBi gain (5180 ~ 5240 MHz)
Chip antenna with 3.2 dBi gain (5260 ~ 5320 MHz)
Chip antenna with 3.2 dBi gain (5500 ~ 5700 MHz)
Chip antenna with 3.2 dBi gain (5745 ~ 5825 MHz)

Refer to EUT photo for details.

5.1.2 Maximum Conducted Output Power

Limit

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	✓	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	✓		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	✓		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	✓		1 Watt (30 dBm)

Note: B* is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

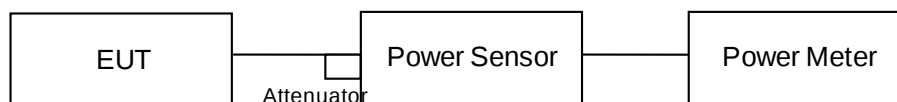
Array Gain = 0 dB (i.e., no array gain) for channel widths $\geq$ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20 MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Power Meter	Anritsu	ML2495A	1901008	2020/4/6	2021/4/5
Power Sensor	Anritsu	MA2411B	1725269	2020/4/7	2021/4/6

Test Procedures

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test Result
<802.11a>

Channel	Channel Frequency (MHz)	Average Output Power		Limit (dBm)
		(dBm)	(mW)	
36	5180	14.15	26.00	24.00
40	5200	14.32	27.04	24.00
48	5240	15.05	31.99	24.00
52	5260	13.95	24.83	24.00
60	5300	14.97	31.41	24.00
64	5320	14.89	30.83	24.00
100	5500	16.65	46.24	24.00
116	5580	17.24	52.97	24.00
140	5700	15.88	38.73	24.00
149	5745	17.74	59.43	30.00
157	5785	16.91	49.09	30.00
165	5825	16.13	41.02	30.00

Note:
For U-NII-2A, U-NII-2C Band:

1. $11 \text{ dBm} + 10\log(27.69) = 25.42 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(32.17) = 26.07 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(35.80) = 26.53 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(32.21) = 26.07 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(37.64) = 26.75 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(37.56) = 26.74 \text{ dBm} > 24 \text{ dBm}$.
7. $11 \text{ dBm} + 10\log(33.77) = 26.28 \text{ dBm} > 24 \text{ dBm}$.
8. $11 \text{ dBm} + 10\log(29.25) = 25.66 \text{ dBm} > 24 \text{ dBm}$.
9. $11 \text{ dBm} + 10\log(21.26) = 24.27 \text{ dBm} > 24 \text{ dBm}$.

<802.11n HT20>

Channel	Channel Frequency (MHz)	Average Output Power		Limit (dBm)
		(dBm)	(mW)	
36	5180	14.05	25.41	24.00
40	5200	14.61	28.91	24.00
48	5240	15.19	33.04	24.00
52	5260	14.23	26.49	24.00
60	5300	15.25	33.50	24.00
64	5320	15.05	31.99	24.00
100	5500	15.77	37.76	24.00
116	5580	17.22	52.72	24.00
140	5700	16.06	40.36	24.00
149	5745	17.54	56.75	30.00
157	5785	16.67	46.45	30.00
165	5825	15.96	39.45	30.00

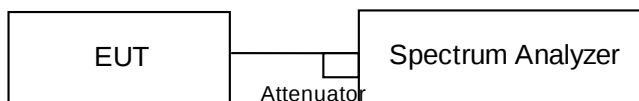
Note:
For U-NII-2A, U-NII-2C Band:

1. $11 \text{ dBm} + 10\log(27.97) = 25.46 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(32.49) = 26.11 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(36.40) = 26.61 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(32.17) = 26.07 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(36.48) = 26.62 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(37.22) = 26.70 \text{ dBm} > 24 \text{ dBm}$.
7. $11 \text{ dBm} + 10\log(31.73) = 26.01 \text{ dBm} > 24 \text{ dBm}$.
8. $11 \text{ dBm} + 10\log(30.25) = 25.80 \text{ dBm} > 24 \text{ dBm}$.
9. $11 \text{ dBm} + 10\log(21.85) = 24.39 \text{ dBm} > 24 \text{ dBm}$.

5.1.3 26dB Bandwidth and 99% Occupied Bandwidth

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101509	2020/5/5	2021/5/4

Test Procedure

- a. Set RBW = approximately 1% of the emission bandwidth.
- b. Set the VBW > RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
- f. For 99% Bandwidth Measurement, the transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to PEAK. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

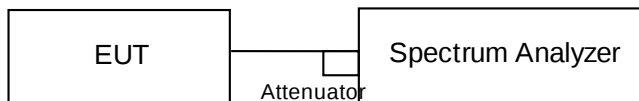
Test Results

Please refer to Appendix A

5.1.4 6dB Bandwidth (5725-5850MHz)

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101509	2020/5/5	2021/5/4

Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results

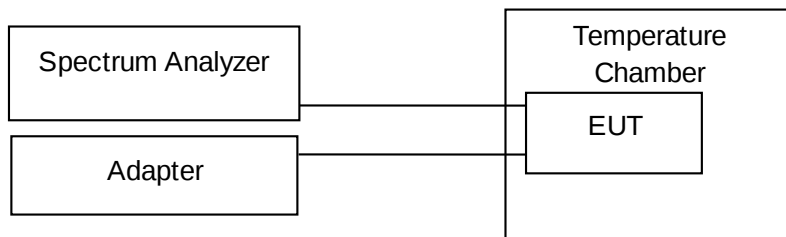
Please refer to Appendix A

5.1.5 Frequency Stability Measurement

Limit ± 20 ppm

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101509	2020/5/5	2021/5/4

Test Procedure

- To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
- The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

Test Results

Frequency (MHz)	5200			
Voltage (110Vac)	Measurement Frequency (MHz)			Deviation(ppm)
	5200.10072			19.369
	5200.09986			19.204
	5200.10072			19.369
Min Temp°C	0	2	5	10
50	5200.1068	5200.10897	5200.1042	5200.1081
40	5200.07467	5200.07771	5200.07858	5200.07858
30	5200.06512	5200.06599	5200.06556	5200.06512
20	5200.09986	5200.10029	5200.10029	5200.10072
10	5200.06686	5200.06556	5200.06599	5200.06686
0	5200.07511	5200.07554	5200.07685	5200.07728
-10	5200.0877	5200.09074	5200.0903	5200.09117
-20	5200.10376	5200.10376	5200.10376	5200.10376
Limit(ppm)	20			
Max. Deviation (ppm)	20.538	20.956	20.038	20.788

Frequency (MHz)	5300			
Voltage (110Vac)	Measurement Frequency (MHz)			Deviation(ppm)
	5300.09508			17.940
	5300.09551			18.021
	5300.09465			17.858
Min Temp°C	0	2	5	10
50	5300.10072	5300.10029	5300.10376	5300.10029
40	5300.06903	5300.07511	5300.07511	5300.07598
30	5300.06425	5300.06425	5300.06382	5300.06425
20	5300.09551	5300.09508	5300.09465	5300.09465
10	5300.07033	5300.0699	5300.0699	5300.0699
0	5300.08249	5300.08119	5300.08119	5300.08119
-10	5300.09725	5300.09508	5300.09421	5300.09465
-20	5300.10984	5300.10767	5300.1081	5300.10767
Limit(ppm)	20			
Max. Deviation (ppm)	20.725	20.315	20.396	20.315

Frequency (MHz)	5580			
Voltage (110Vac)	Measurement Frequency (MHz)			Deviation(ppm)
	5580.07685			13.772
	5580.07554			13.538
	5580.07858			14.082
Min Temp°C	0	2	5	10
50	5580.08509	5580.08162	5580.07945	5580.0875
40	5580.06946	5580.06773	5580.06686	5580.06729
30	5580.06556	5580.06512	5580.07554	5580.07554
20	5580.07554	5580.07164	5580.07033	5580.06946
10	5580.07554	5580.07554	5580.07554	5580.07554
0	5580.089	5580.0877	5580.0877	5580.0877
-10	5580.10463	5580.10159	5580.10203	5580.10159
-20	5580.11722	5580.11505	5580.11505	5580.11505
Limit(ppm)	20			
Max. Deviation (ppm)	22.542	22.125	22.125	22.125

Frequency (MHz)	5785			
Voltage (110Vac)	Measurement Frequency (MHz)			Deviation(ppm)
	5785.07164			12.384
	5785.07337			12.683
	5785.06903			11.933
Min Temp°C	0	2	5	10
50	5785.08683	5785.0903	5785.09161	5785.09074
40	5785.07337	5785.0725	5785.07337	5785.0725
30	5785.06773	5785.06773	5785.06773	5785.06773
20	5785.07337	5785.07815	5785.07945	5785.08032
10	5785.08292	5785.08292	5785.08292	5785.08336
0	5785.09768	5785.09725	5785.09725	5785.09725
-10	5785.11071	5785.11114	5785.11071	5785.11114
-20	5785.12373	5785.1233	5785.1233	5785.1233
Limit(ppm)	20			
Max. Deviation (ppm)	23.345	23.264	23.264	23.264

5.1.6 Power Spectral Density

Limit

For the 5.15~5.25GHz Bands:

For mobile and portable client devices in the 5.15~5.25GHz band, the Maximum Power spectral density shall not exceed 11dBm/MHz. For an indoor access point operating in the band 5.15~5.25GHz, the maximum power spectral density shall not exceed 17dBm/MHz.

For the 5.25~5.35GHz and 5.47~5.725GHz Bands:

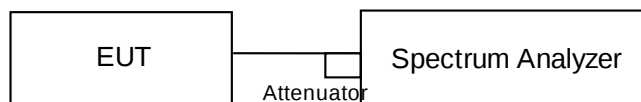
The maximum power spectral density shall not exceed 11dBm/MHz.

For the 5.725~5.85GHz Bands:

The maximum power spectral density shall not exceed 30dBm/500kHz.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101512	2020/2/18	2021/2/17

Test Procedure

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 500 kHz, Set VBW ≥ 3 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
4. Sweep time = auto, trigger set to "free run".
5. Trace average at least 100 traces in power averaging mode.
6. Record the max value

For MIMO mode, calculation method follows FCC KDB 662911 Method 2) a) of power density measurement using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

Test Results

Please refer to Appendix A

5.1.7 Radiated Spurious Emissions

Limit

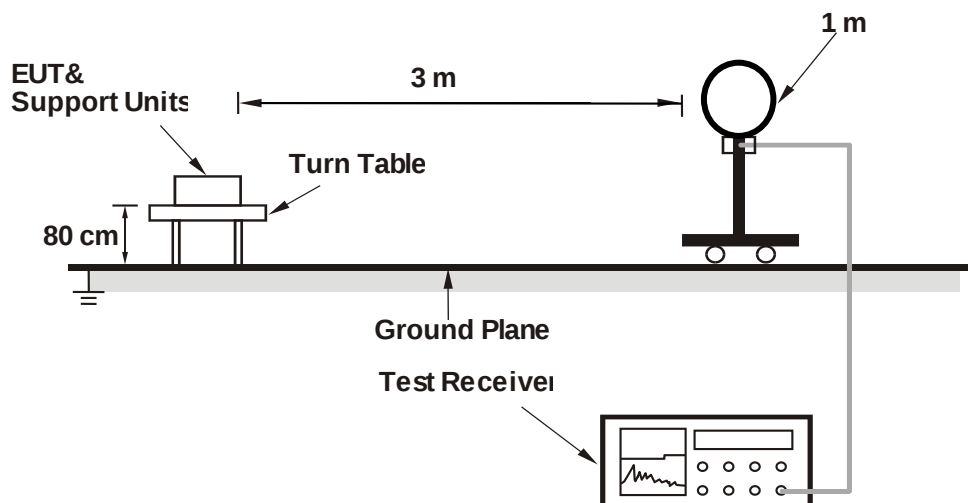
Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a).

Emissions radiated outside the restricted and authorized frequency bands must either comply with the radiated emission limits specified for the restricted bands or in §15.407(b).

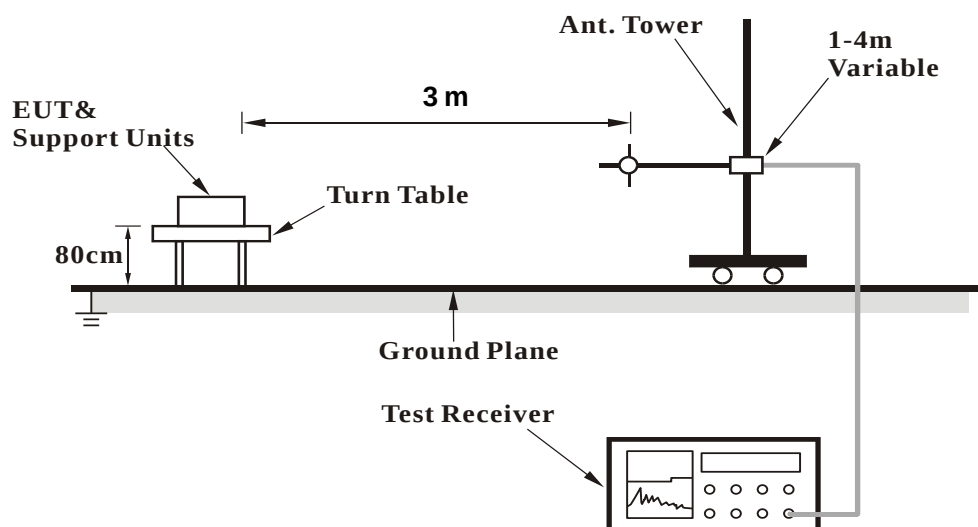
Kind of Test Site 3m Semi-Anechoic Chamber

Test Setup

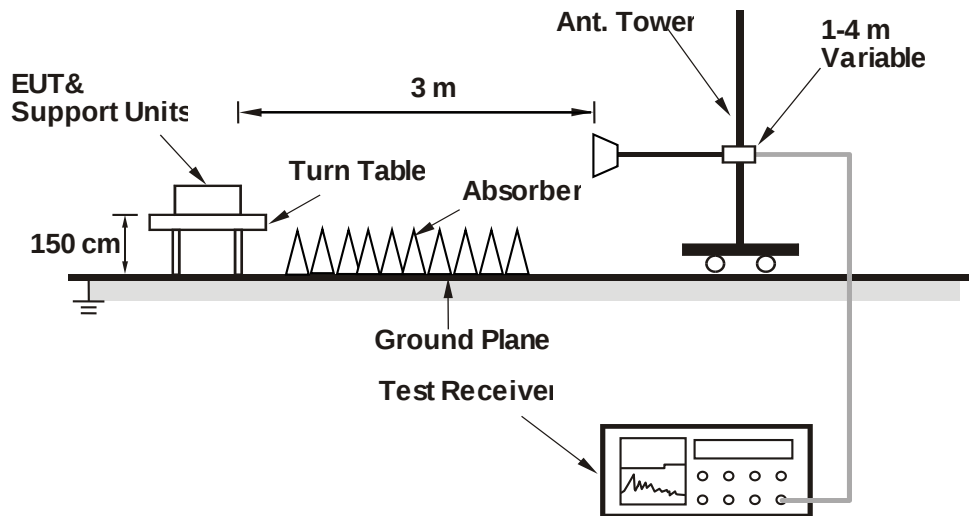
<Radiated Emissions below 30 MHz>



<Radiated Emissions 30 MHz to 1 GHz>



<Radiated Emissions above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV40	101509	2020/3/30	2021/3/29
Receiver	R&S	ESR7	102109	2020/3/30	2021/3/29
Bilog Antenna	SCHWARZBECK	VULB-9168	00950	2020/1/20	2021/1/18
Horn Antenna	ETS-Lindgren	3117	00218929	2019/11/27	2020/11/25
LF-AMP	Agilent	8447D	2727A05146	2020/2/17	2021/2/15
HF-AMP + AC source	EMCI	EMC051845SE	980635	2020/2/11	2021/2/9
HF-AMP + AC source	EMCI	EMC184045SE	980656	2020/2/11	2021/2/9
Horn Antenna	SCHWARZBECK	BBHA 9170	00890	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104EA	800057/4EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	802244/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 104	MY37203/4	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800897/2EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	800902/2EA	2020/3/25	2021/3/24
Microwave Cable	HUBER+SUHNER	SUCOFLEX 102EA	801026/2EA	2020/3/25	2021/3/24
Loop Antenna	Chance Most	EMCILPA600 +calibration	287	2020/1/9	2021/1/7

Test Procedures**For Radiated Emissions below 30 MHz**

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emissions above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.
5. The Radiated Emissions testing was performed in the X, Y and Z axis orientation. The worst-case Axis orientation is recorded in this test report.

Test Results

Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB)
Level (dBuV/m) = Reading (dBuV) + Factor (dB/m)

Please refer to Appendix B.

5.1.8 Dynamic Frequency Selection

Limit

<DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection>

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP $\geq$ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note 3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

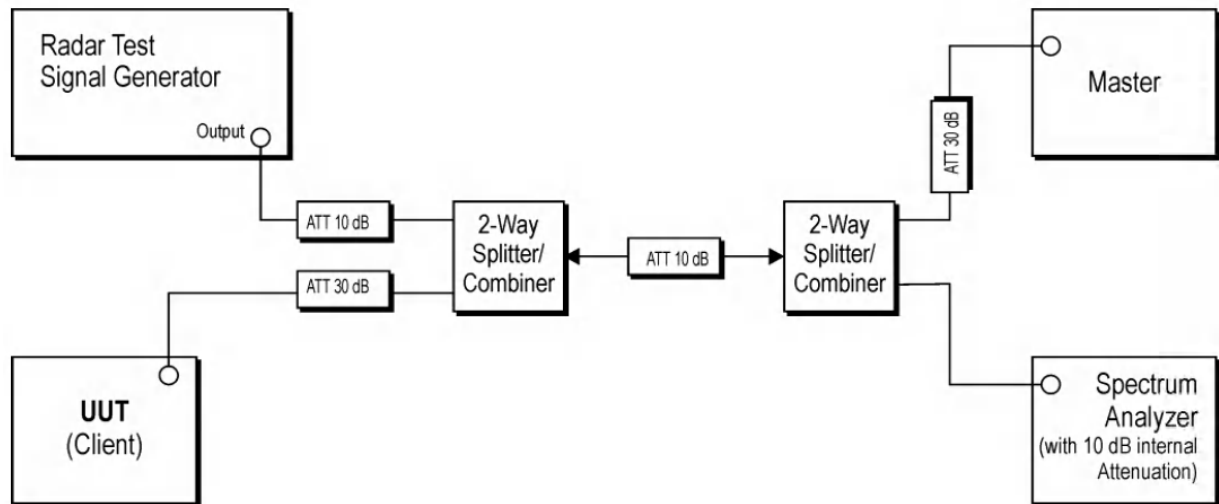
<DFS Response Requirement Values>

Parameter	Value
<i>Non-occupancy period</i>	Minimum 30 minutes
<i>Channel Availability Check Time</i>	60 seconds
<i>Channel Move Time</i>	10 seconds See Note 1.
<i>Channel Closing Transmission Time</i>	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
<i>U-NII Detection Bandwidth</i>	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: <i>Channel Move Time</i> and the <i>Channel Closing Transmission Time</i> should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The <i>Channel Closing Transmission Time</i> is comprised of 200 milliseconds starting at the beginning of the <i>Channel Move Time</i> plus any additional intermittent control signals required to facilitate a <i>Channel</i> move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the <i>U-NII Detection Bandwidth</i> detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

Kind of Test Site Shielded room

Test Setup

<Setup for Client with injection at the Master>



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV40	101509	2020/5/5	2021/5/4
MXG Vector Signal Generator	Agilent	N5182B	MY53050524	2020/4/7	2021/4/6

Requirement

Requirement	Operational Mode	
	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>DFS Detection Threshold</i>	Yes	Not required
<i>Channel Closing Transmission Time</i>	Yes	Yes
<i>Channel Move Time</i>	Yes	Yes
<i>U-NII Detection Bandwidth</i>	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
<i>U-NII Detection Bandwidth and Statistical Performance Check</i>	All BW modes must be tested	Not required
<i>Channel Move Time and Channel Closing Transmission Time</i>	Test using widest BW mode available	Test using the widest BW mode available for the link
<i>All other tests</i>	Any single BW mode	Not required

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.

Test Results
Non-occupancy period

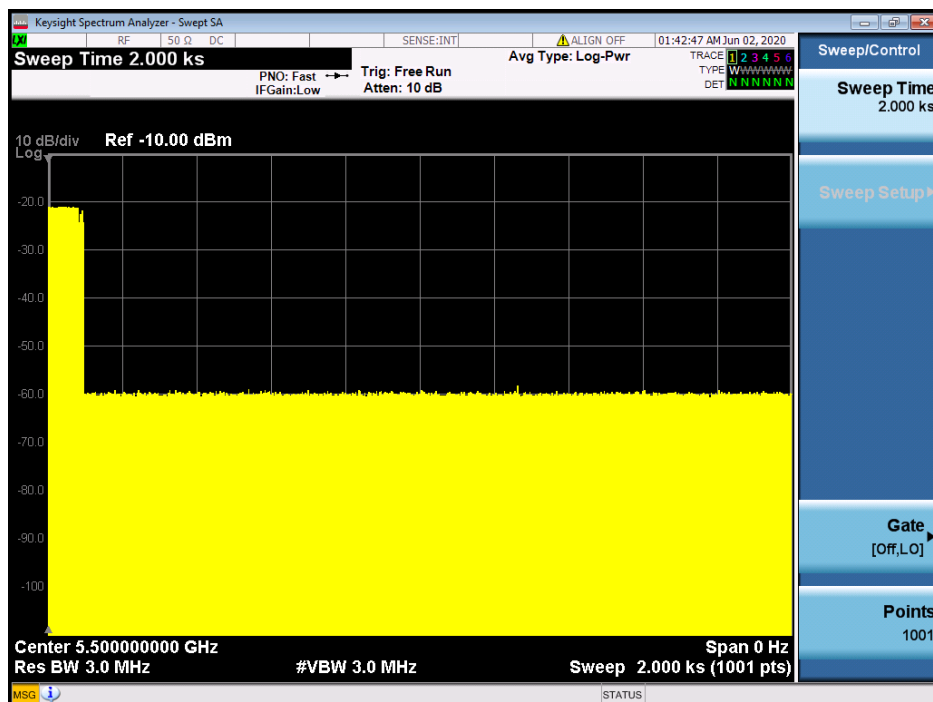
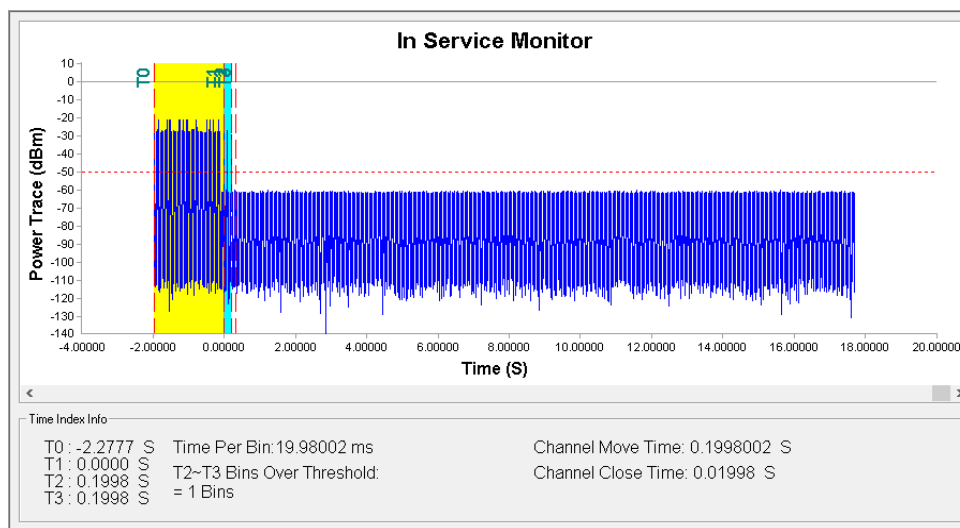
Channel (MHz)	Limit (minute)	Result
5500	≥30	Pass

Channel Moving Time

Channel (MHz)	Channel Move Time (s)	Limit (s)	Result
5500	0.199	<10	Pass

Channel Closing Transmission Time

Channel (MHz)	Channel Closing Transmission Time (ms)	Limit (ms)	Result
5500	0.019	<60	Pass



5.2 Mains Emission

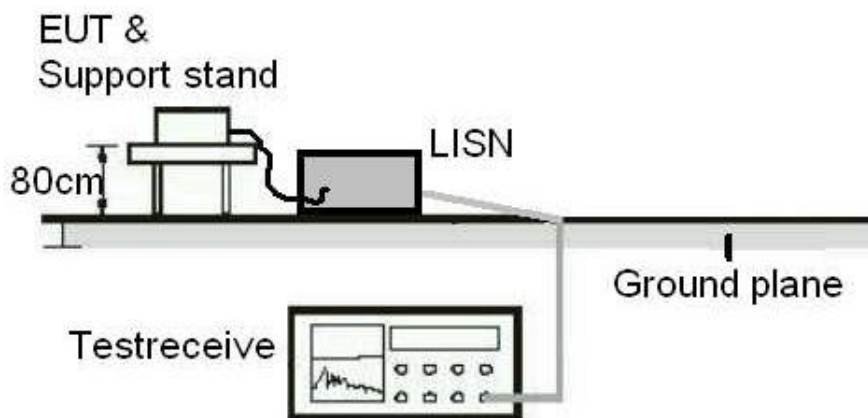
5.2.1 Mains Conducted Emission

Limit

Mains Conducted emissions as defined in §15.207 must comply with the mains conducted emission limits.

Kind of Test Site Shielded room

Test Setup



Test Instruments

Kind of Equipment	Manufacturer	Type	S/N	Calibration Date	Calibration Due Date
TWO-LINE V-NETWORK	SCHHWARZBECK	NSLK 8127	8127-00976	2019/10/2	2020/9/30
EMI Test Receiver	R&S	ESR7	102108	2020/4/22	2021/4/21
10dB attenuation	SCHHWARZBECK	VTSD 9561 F-N	660	2020/2/24	2021/2/23
Measurement Software	EZ	EZ EMC (Version NB-03A)	N/A	N/A	N/A

Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

Please refer to Appendix B.

6. Safety Human Exposure

6.1 RF Exposure Compliance

6.1.1 Power Density

Results

Separation distance is more than 20 cm, thus mobile device exposure limits can be applied.

Maximum Exposure:

Power to Antenna (mW)	59.43 mW
Power to Antenna (dBm)	17.7 dBm
Antenna Gain	3.2 dBi
Power+Ant Gain	124.2 mW
Distance	20 cm
S=	0.025 mW/cm ²

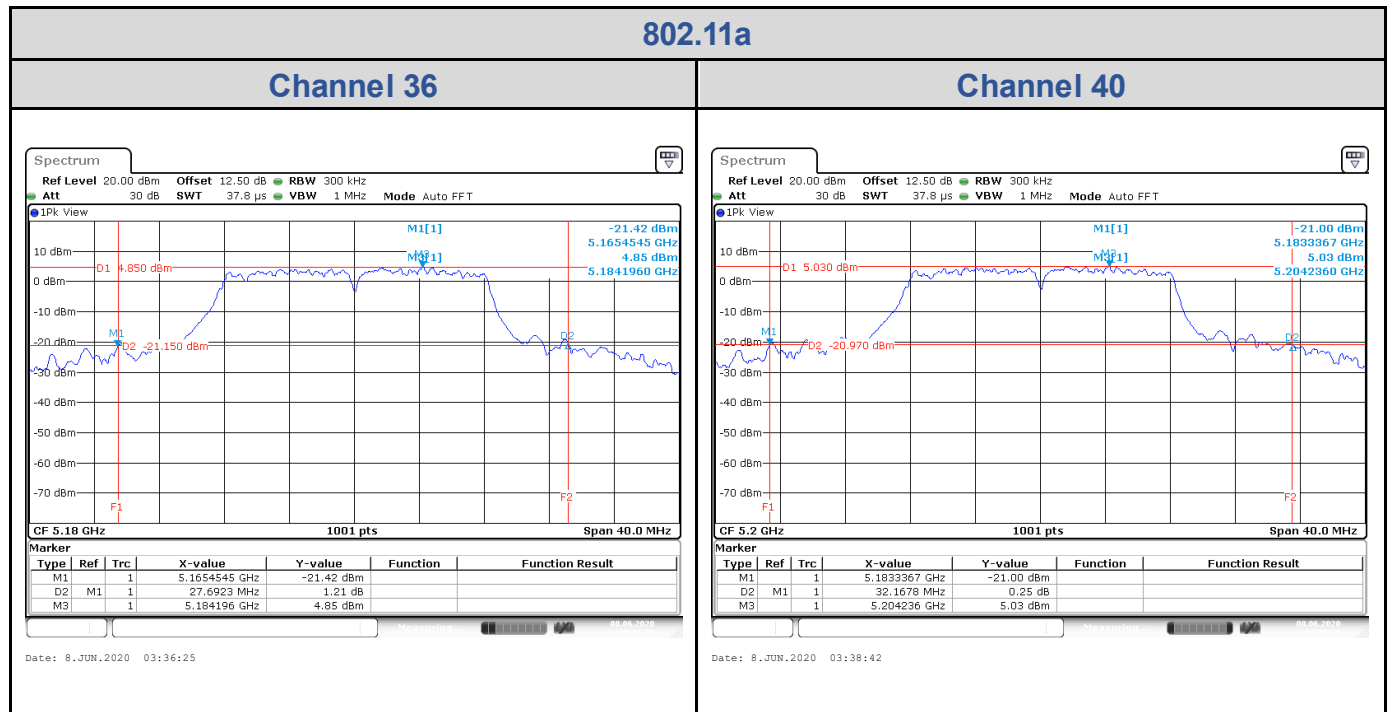
Limit FCC: 1500-100,000 MHz 1.0 mW/cm²

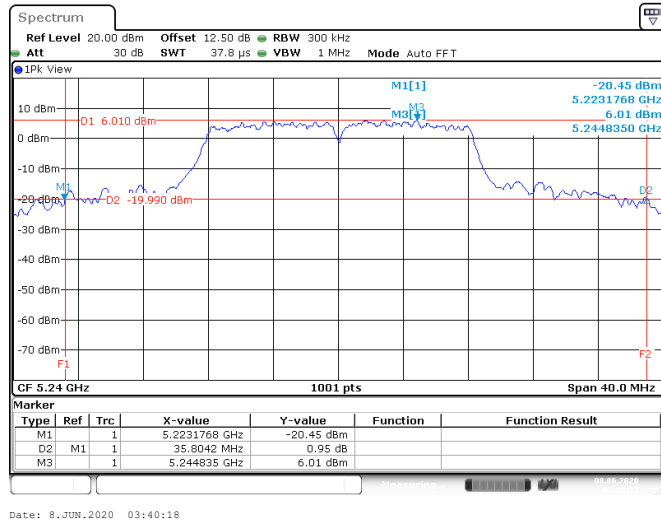
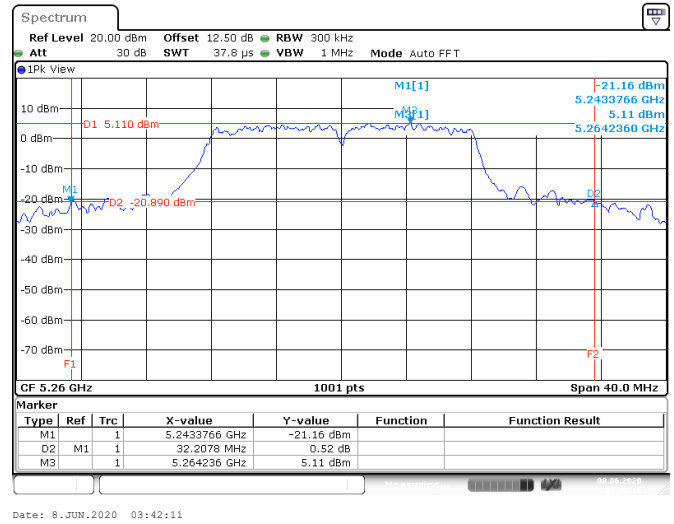
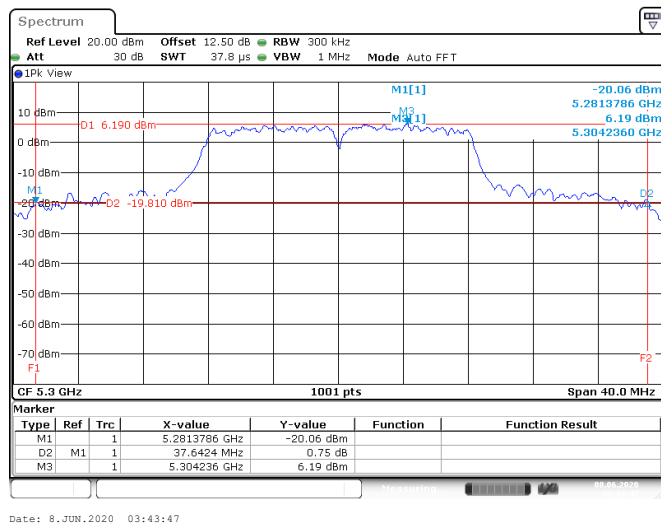
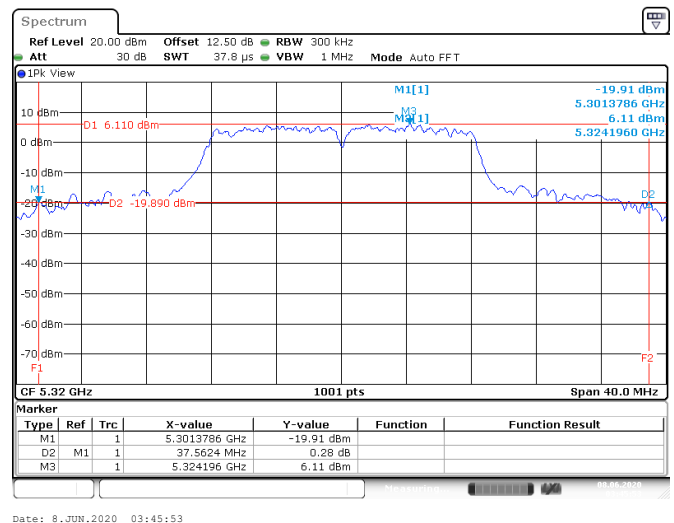
Appendix A: Test Results of Conducted Test

Test Result of 26 dB Bandwidth

802.11a

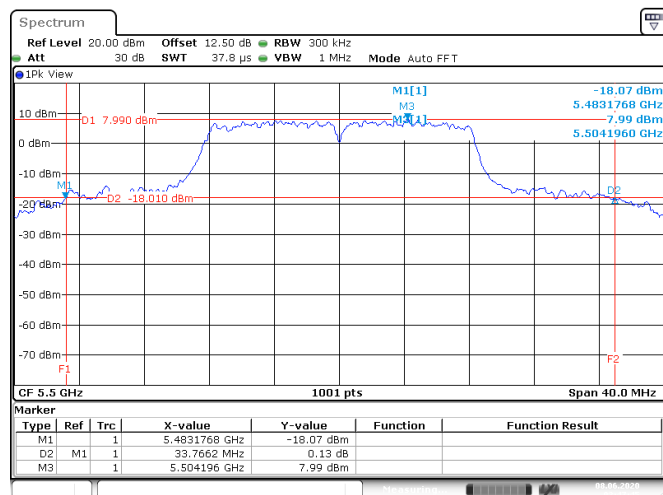
Band	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
U-NII-1	36	5180	27.69
	40	5200	32.17
	48	5240	35.80
U-NII-2A	52	5260	32.21
	60	5300	37.64
	64	5320	37.56
U-NII-2C	100	5500	33.77
	116	5580	29.25
	140	5700	21.26



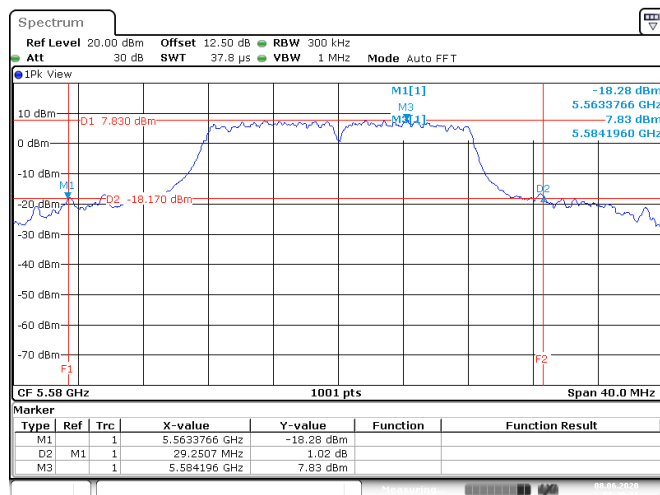
802.11a
Channel 48

Channel 52

Channel 60

Channel 64


802.11a

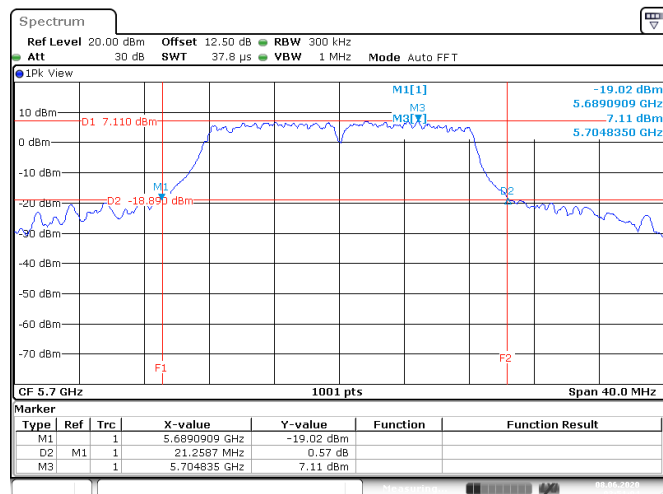
Channel 100



Channel 116

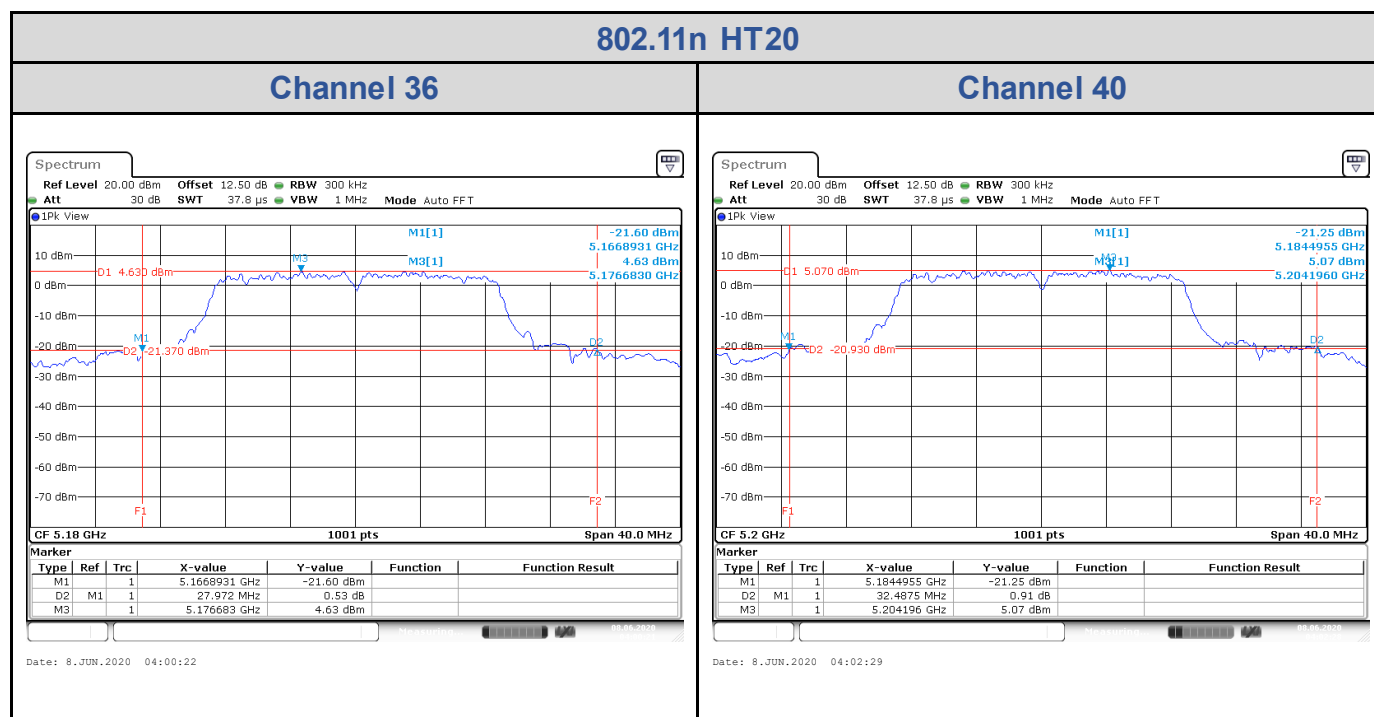


Channel 140



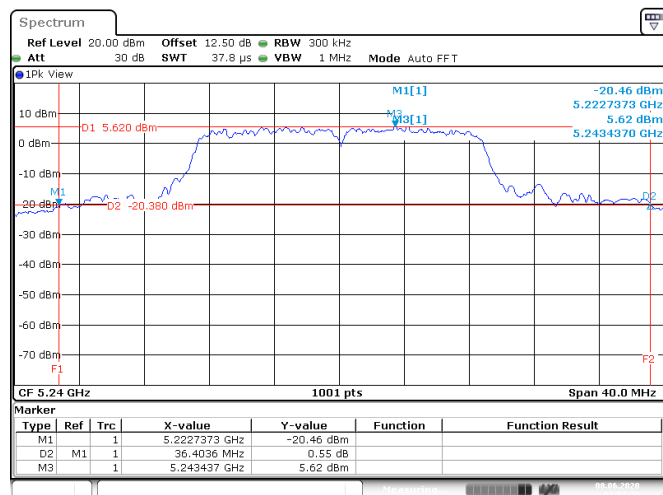
802.11n HT20

Band	Channel	Frequency (MHz)	26 dB Bandwidth (MHz)
U-NII-1	36	5180	27.97
	40	5200	32.49
	48	5240	36.40
U-NII-2A	52	5260	32.17
	60	5300	36.48
	64	5320	37.22
U-NII-2C	100	5500	31.73
	116	5580	30.25
	140	5700	21.82

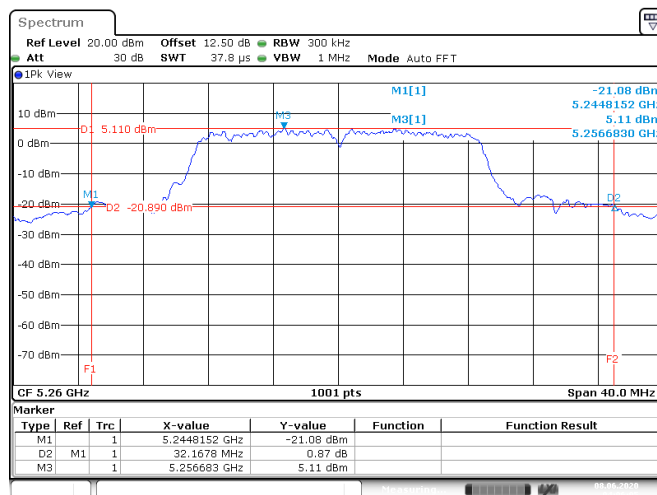


802.11n HT20

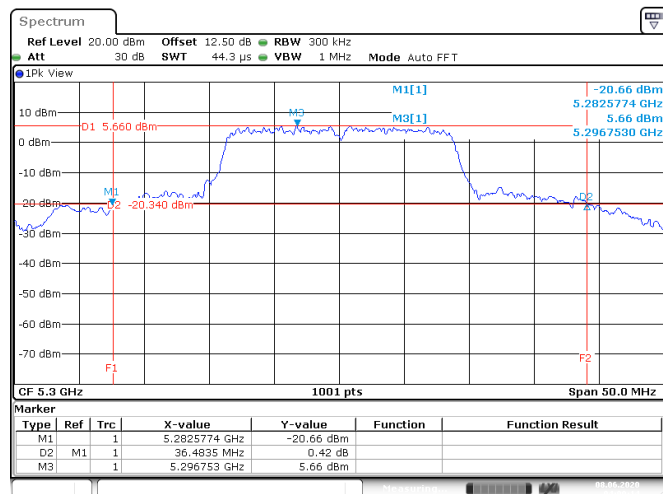
Channel 48



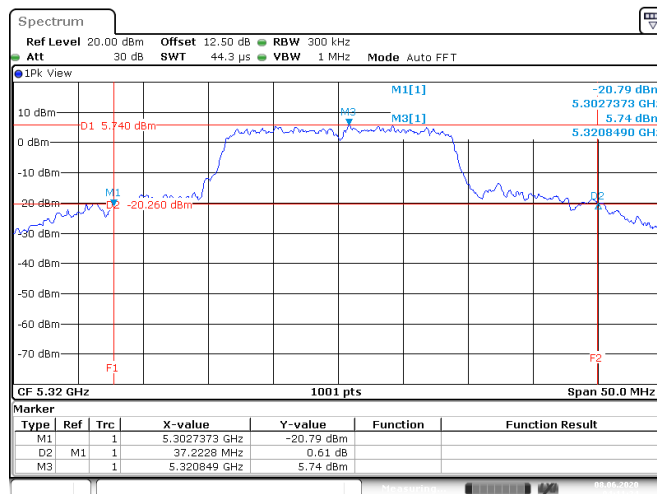
Channel 52

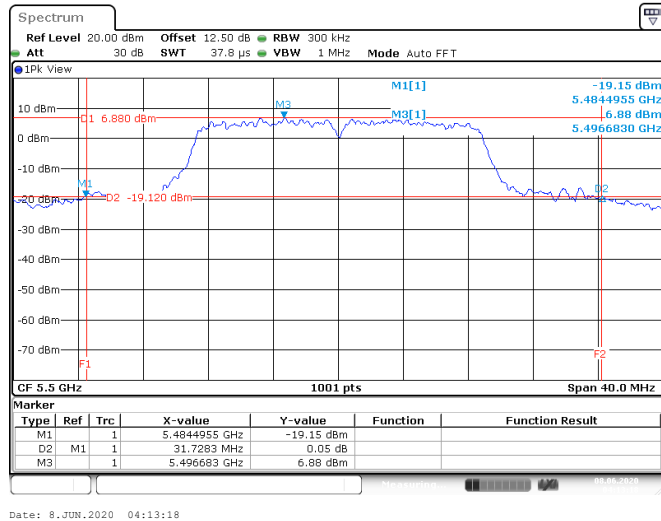
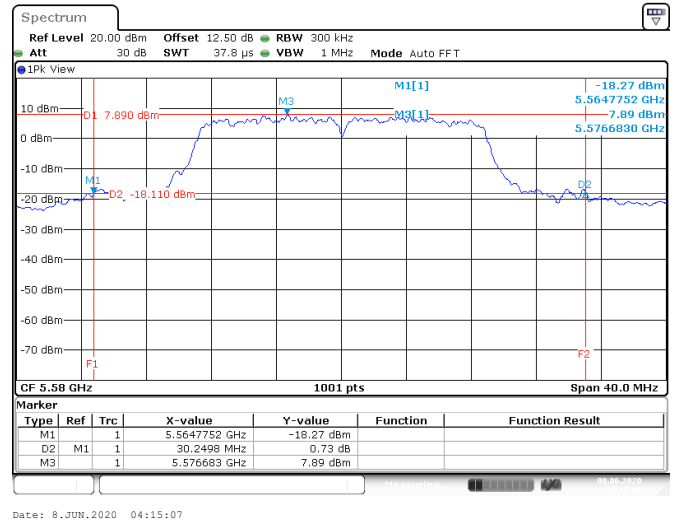
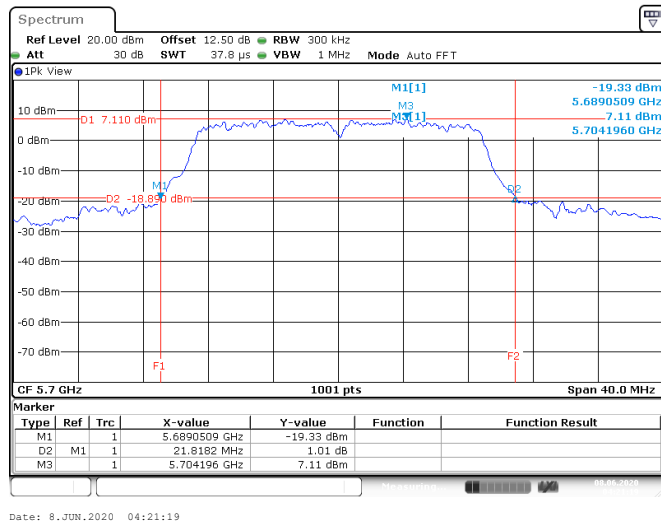


Channel 60



Channel 64

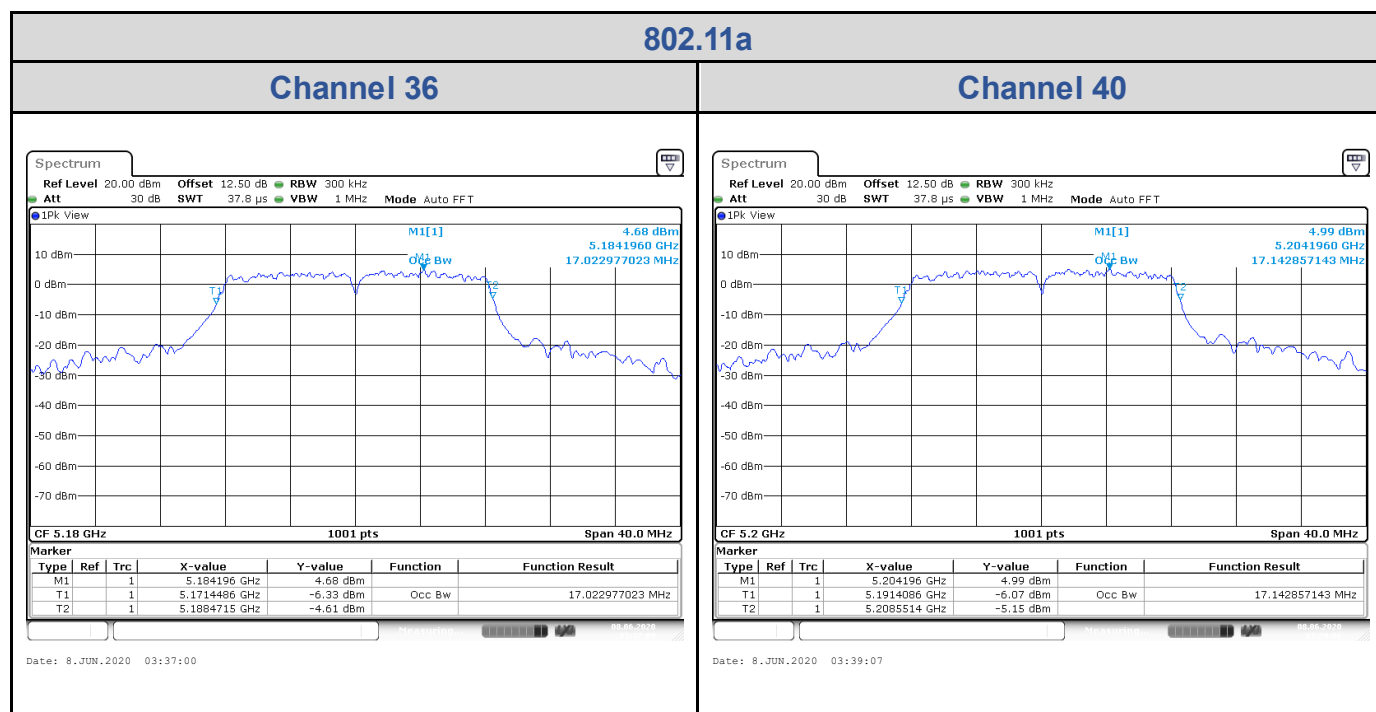


802.11n HT20
Channel 100

Channel 116

Channel 140


Test Result of 99% Occupied Bandwidth

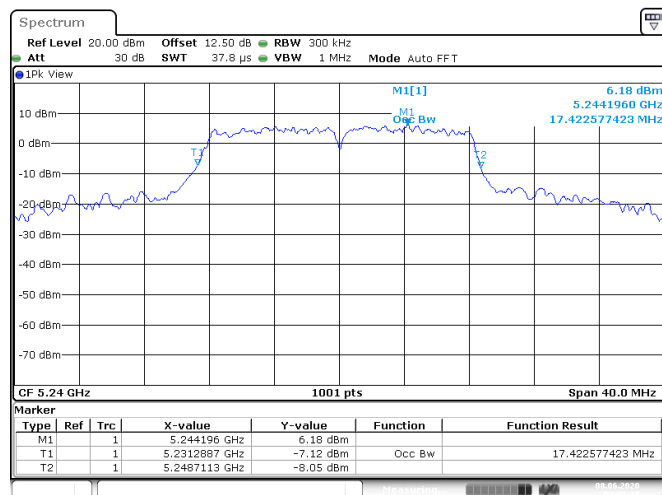
802.11a

Band	Channel	Frequency (MHz)	99% Bandwidth (MHz)
U-NII-1	36	5180	17.02
	40	5200	17.14
	48	5240	17.42
U-NII-2A	52	5260	17.14
	60	5300	17.62
	64	5320	17.54
U-NII-2C	100	5500	17.26
	116	5580	16.98
	140	5700	16.90
U-NII-3	149	5745	17.10
	157	5785	16.94
	165	5825	16.90

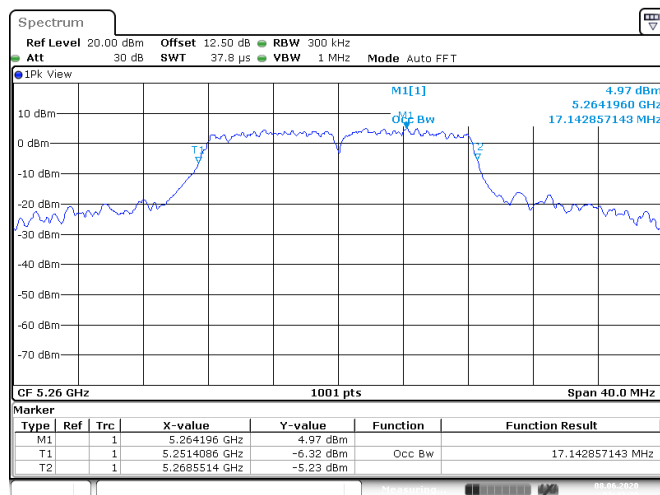


802.11a

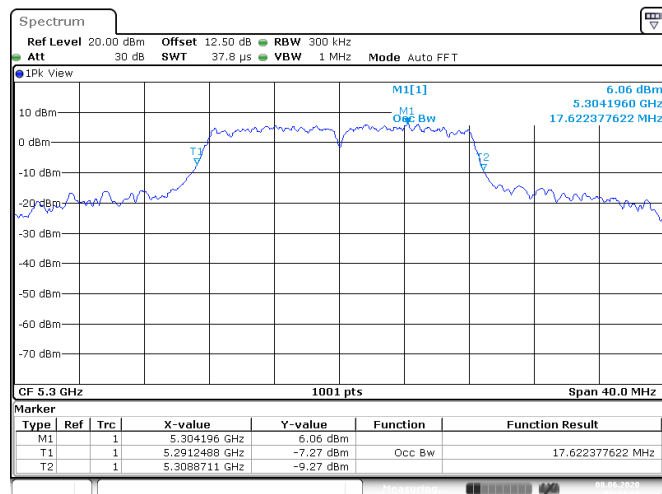
Channel 48



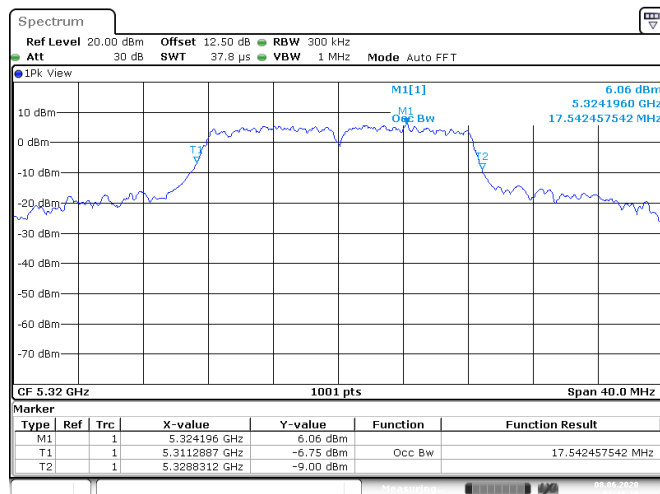
Channel 52



Channel 60

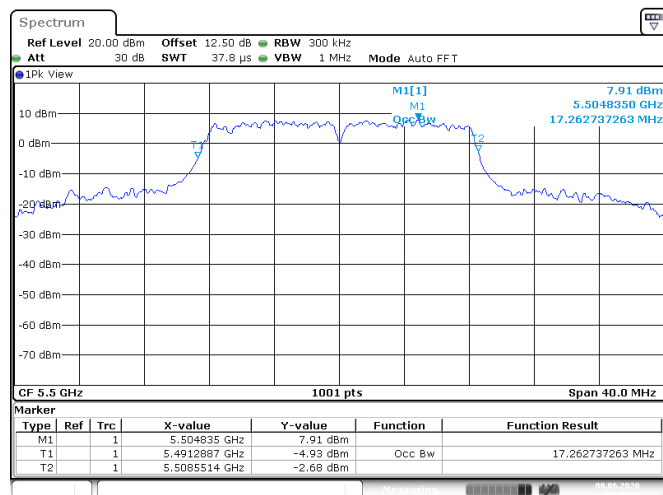


Channel 64

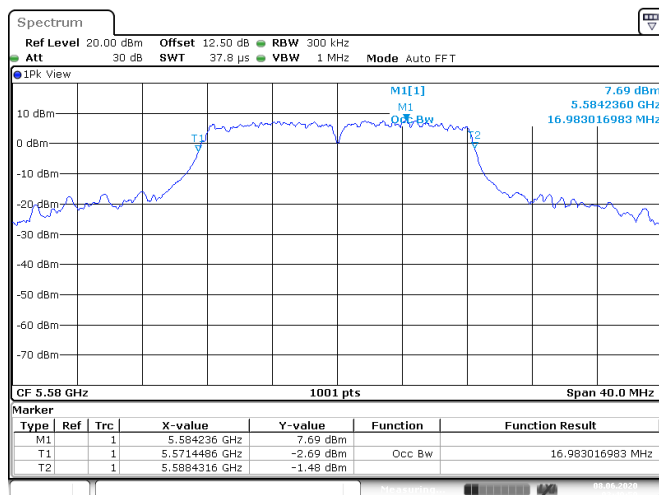


802.11a

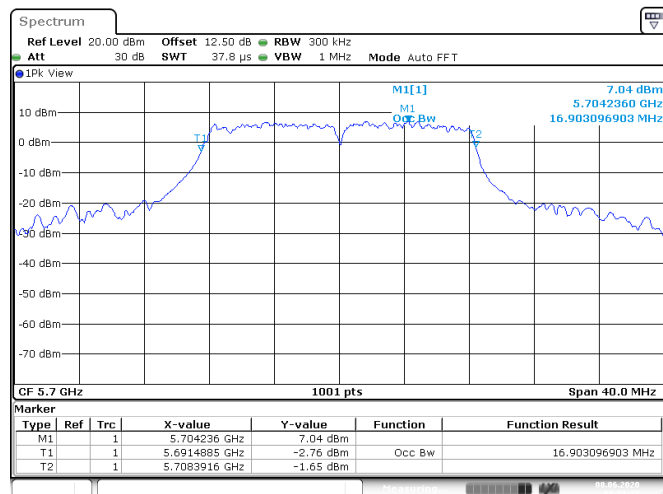
Channel 100



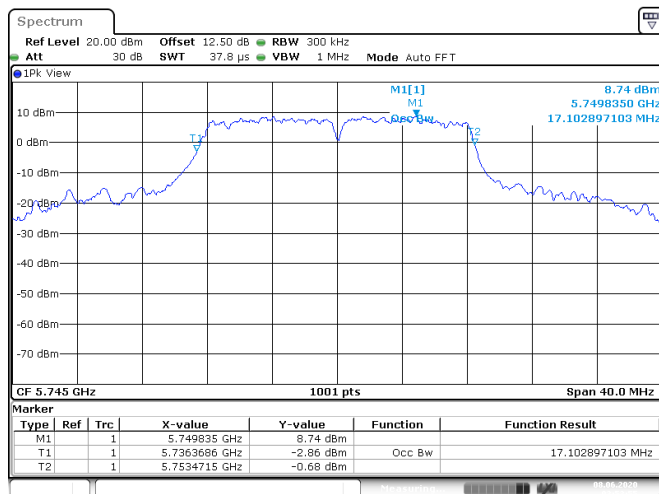
Channel 116

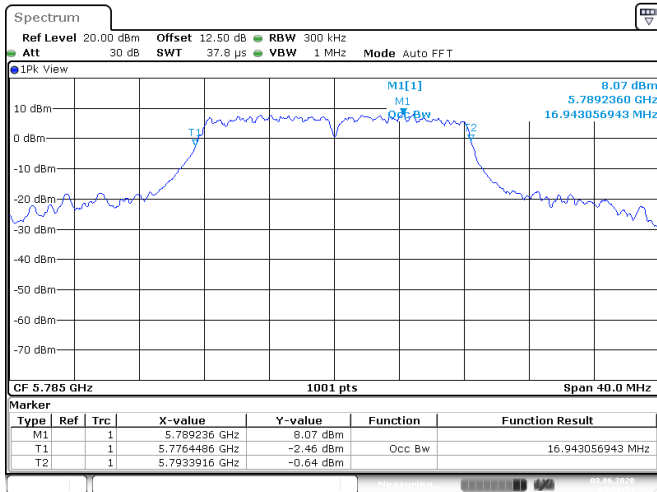


Channel 140

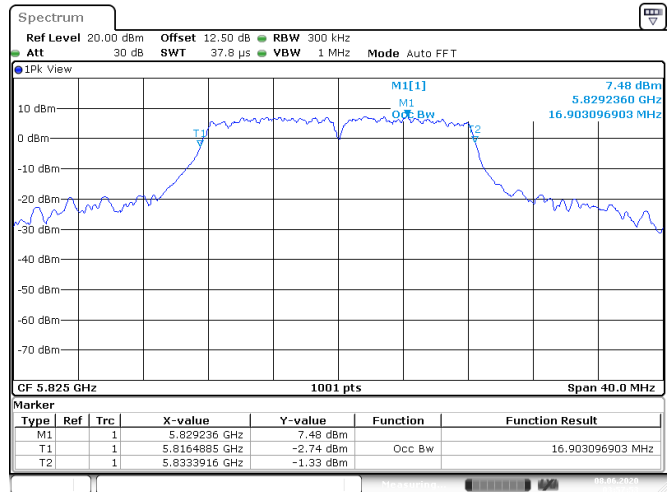


Channel 149



802.11a
Channel 157
Channel 165


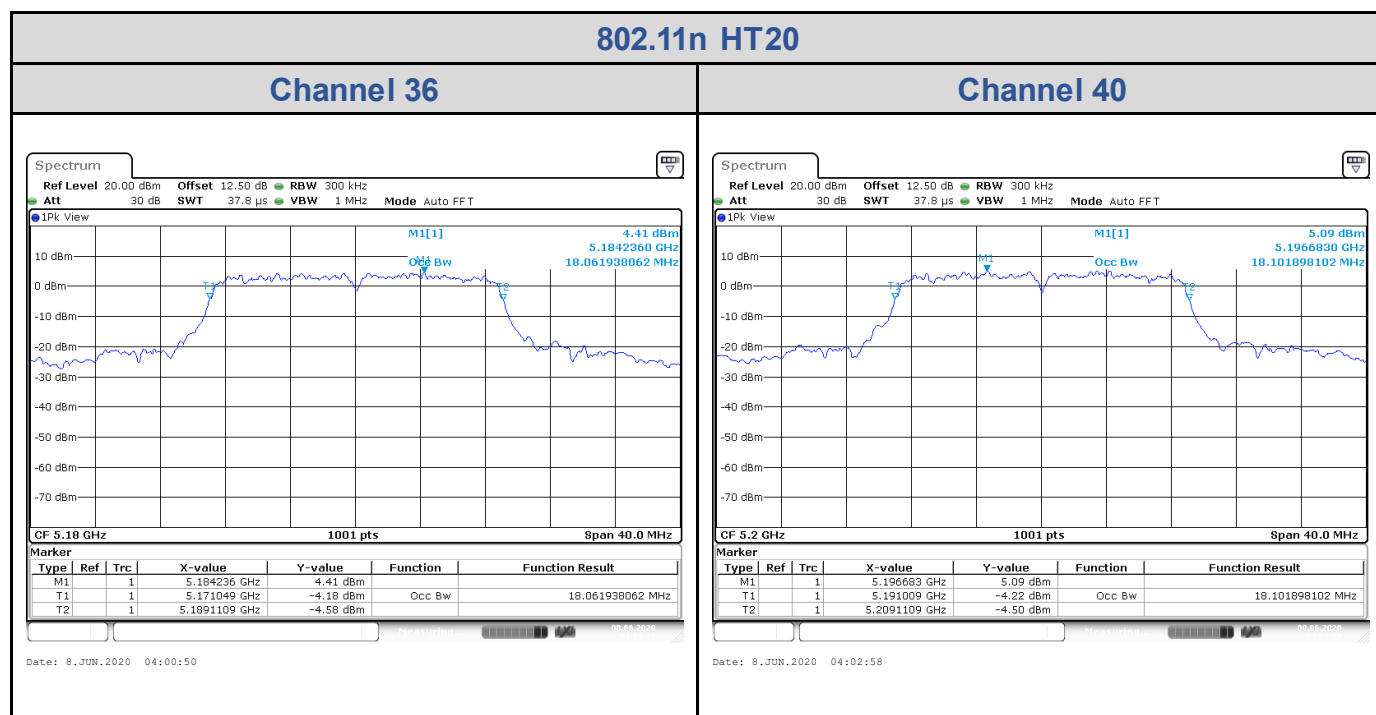
Date: 8.JUN.2020 03:56:15

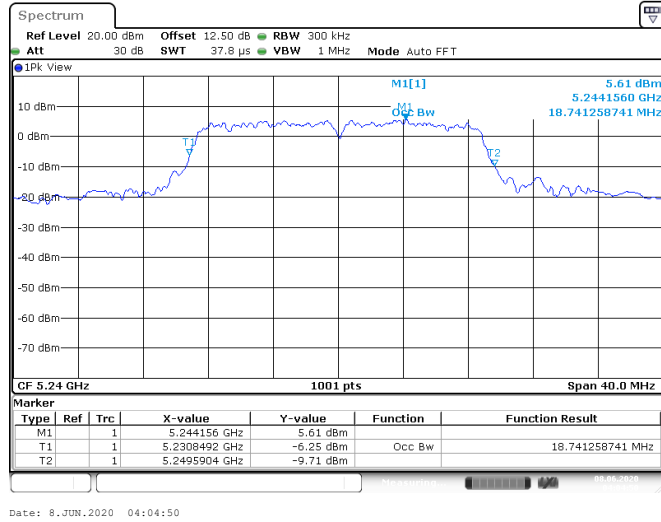
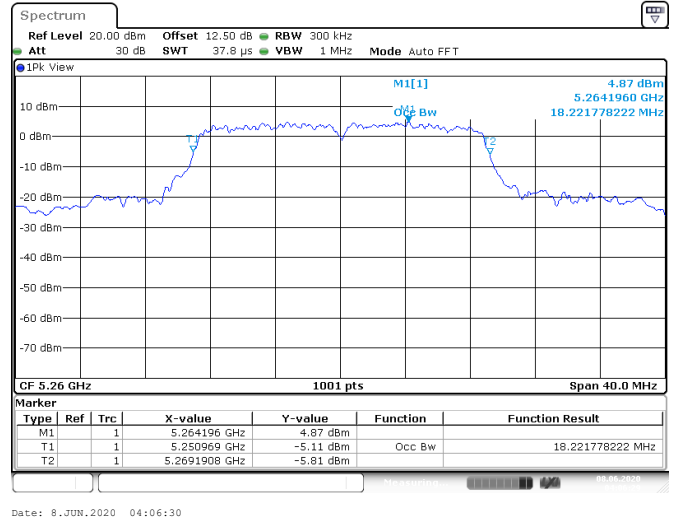
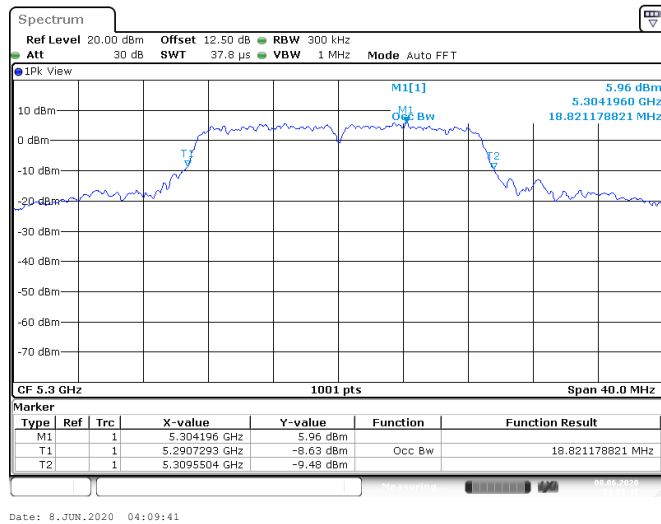
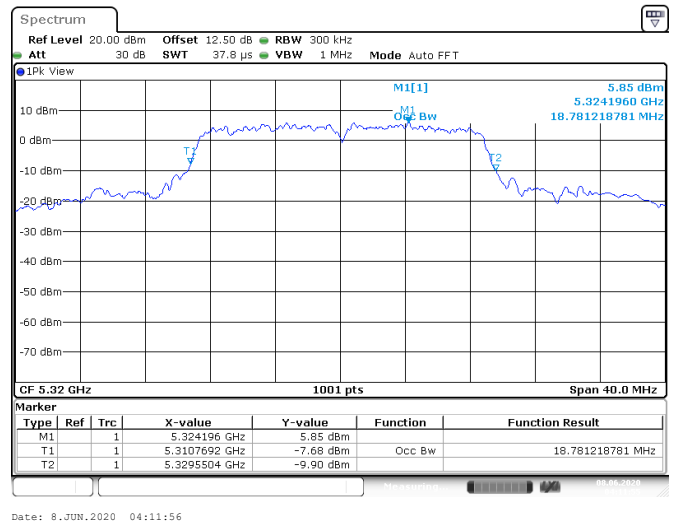


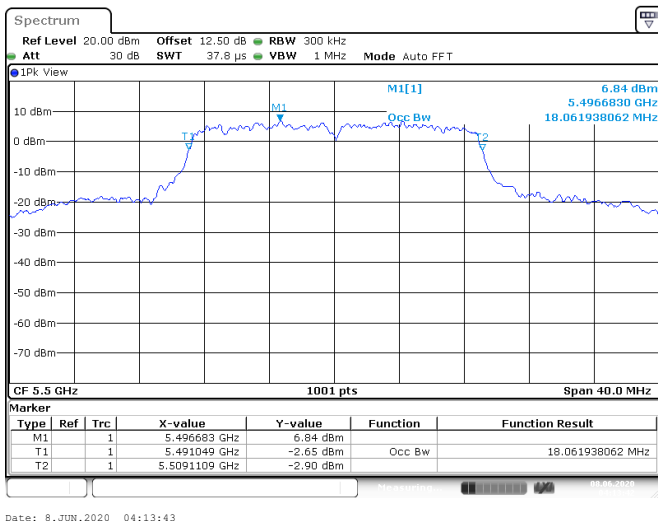
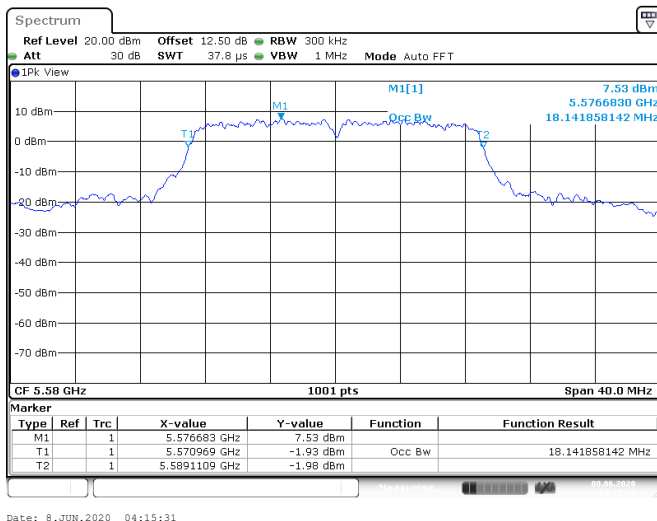
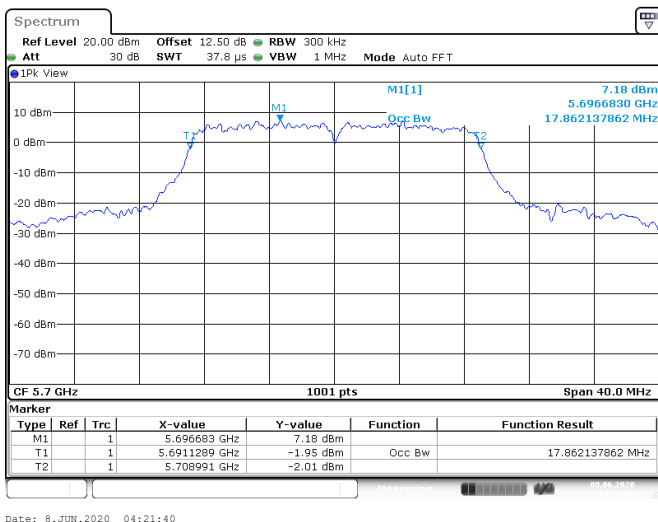
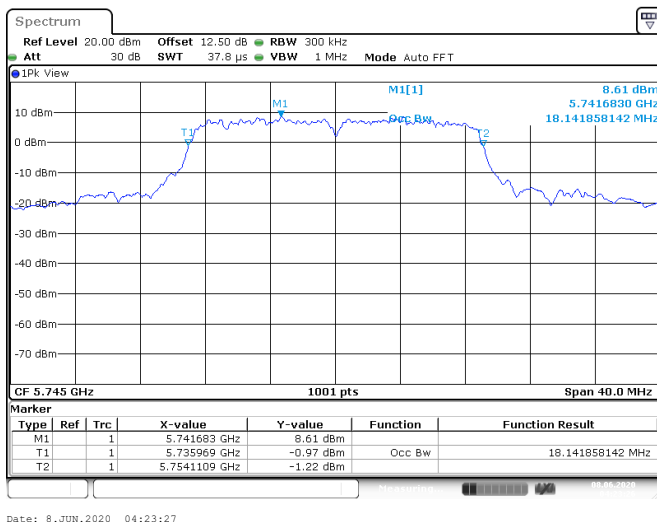
Date: 8.JUN.2020 03:57:53

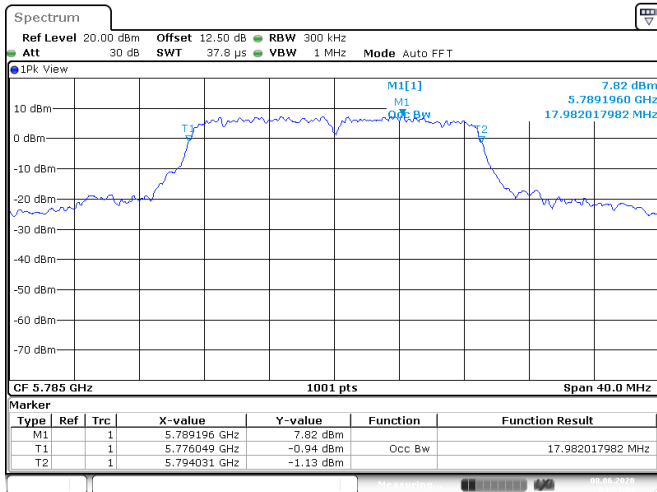
802.11n HT20

Band	Channel	Frequency (MHz)	99% Bandwidth (MHz)
U-NII-1	36	5180	18.06
	40	5200	18.10
	48	5240	18.74
U-NII-2A	52	5260	18.22
	60	5300	18.82
	64	5320	18.78
U-NII-2C	100	5500	18.06
	116	5580	18.14
	140	5700	17.86
U-NII-3	149	5745	18.14
	157	5785	17.98
	165	5825	17.94

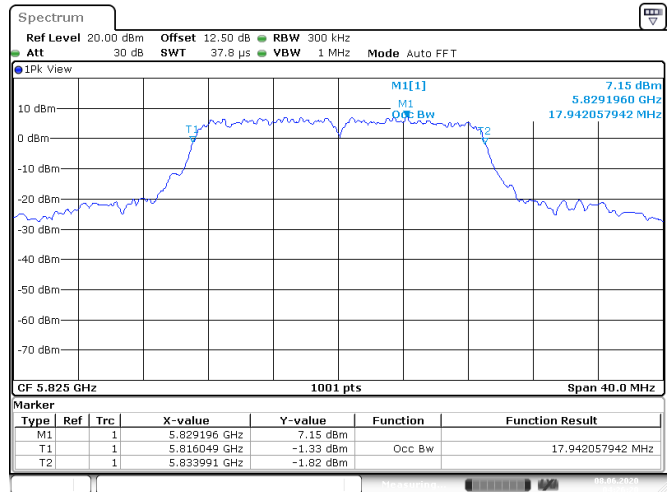


802.11n HT20
Channel 48

Channel 52

Channel 60

Channel 64


802.11n HT20
Channel 100

Channel 116

Channel 140

Channel 149


802.11n HT20
Channel 157
Channel 165


Date: 8.JUN.2020 04:24:55



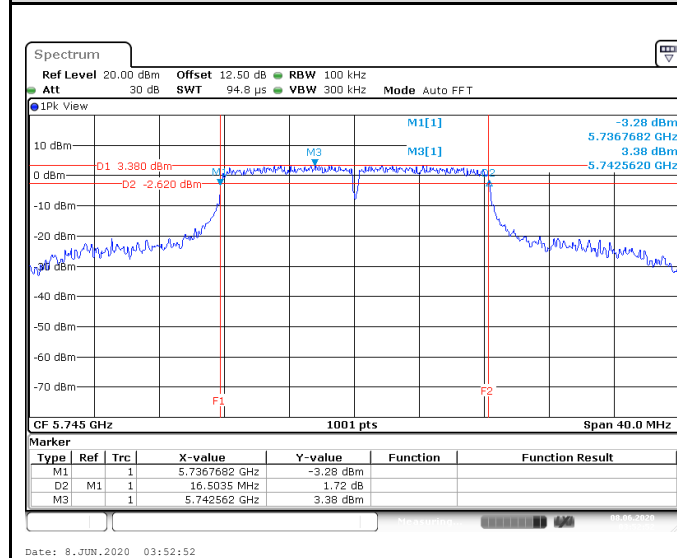
Date: 8.JUN.2020 04:26:20

Test Result of 6 dB Bandwidth

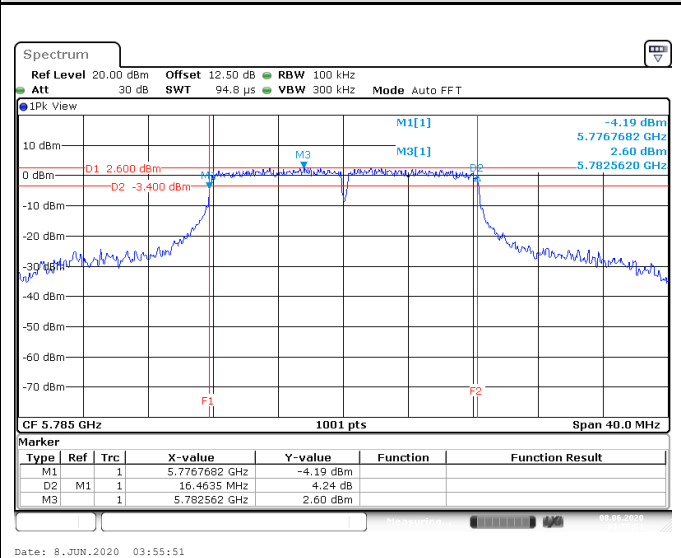
802.11a

Band	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)	Result
U-NII-3	149	5745	16.50	>500	Pass
	157	5785	16.46	>500	Pass
	165	5825	16.46	>500	Pass

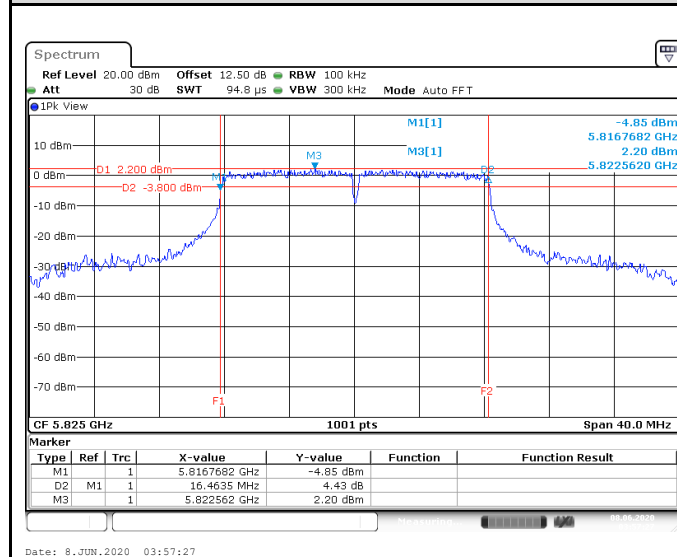
Channel 149



Channel 157

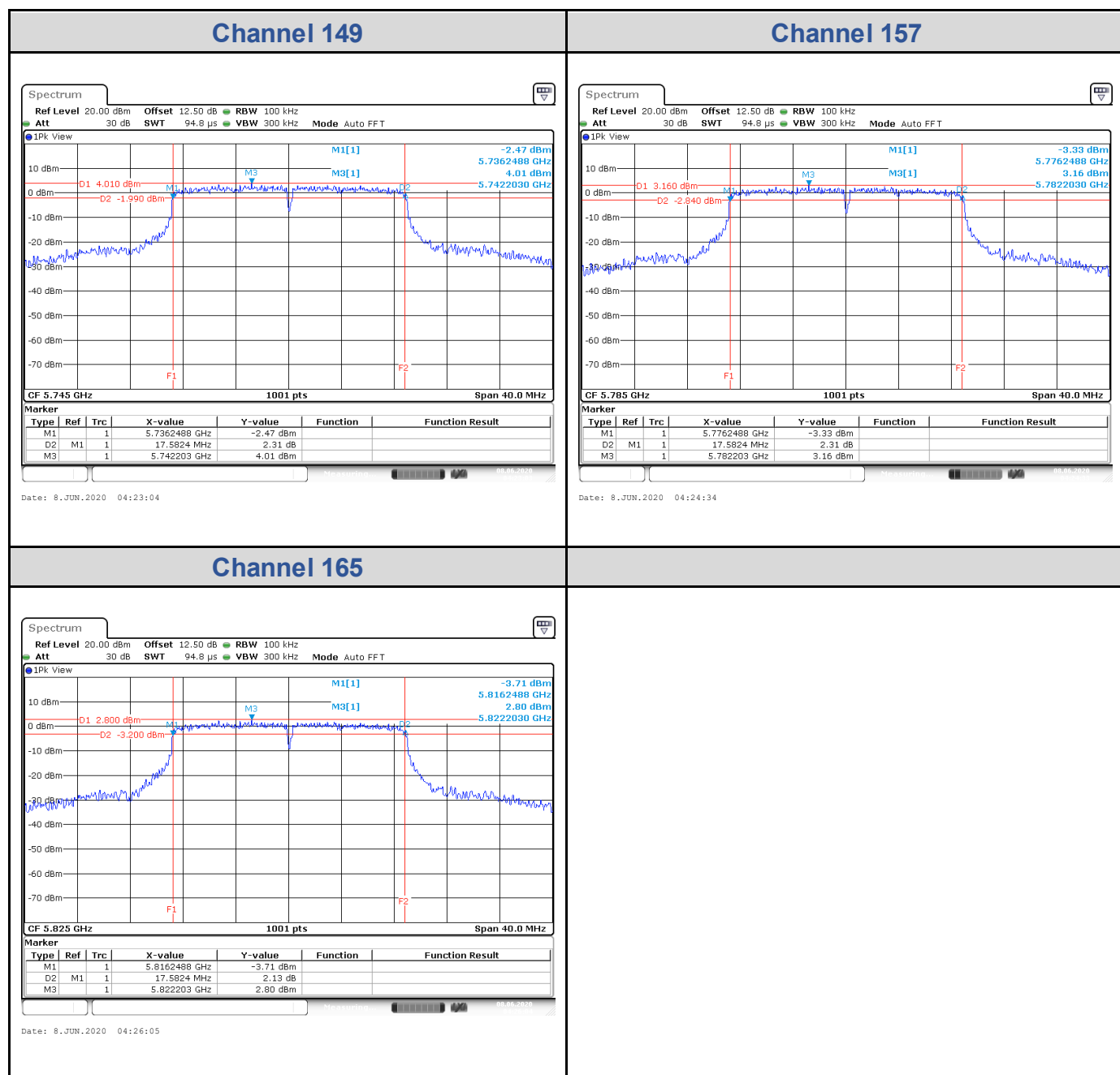


Channel 165



802.11n HT20

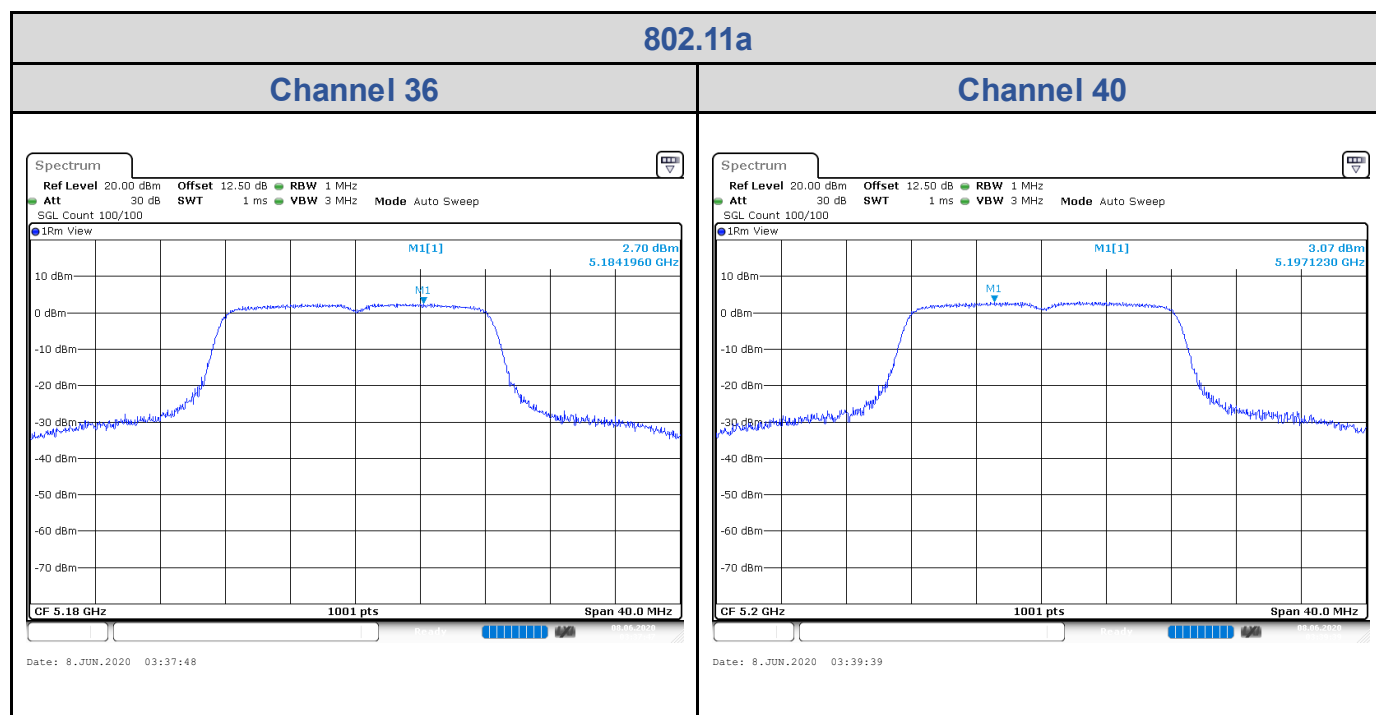
Band	Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)	Result
U-NII-3	149	5745	17.58	>500	Pass
	157	5785	17.58	>500	Pass
	165	5825	17.58	>500	Pass

Channel 149
Channel 157


Test Result of Power Spectral Density

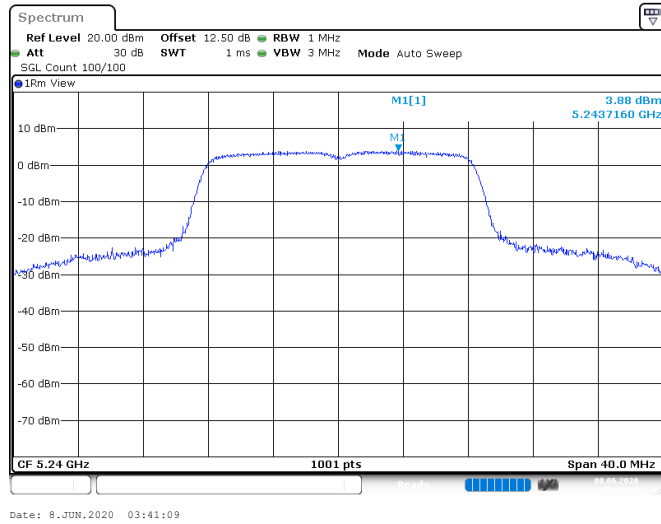
802.11a

Band	Channel	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Result
U-NII-1	36	5180	2.70	11	Pass
	40	5200	3.07	11	Pass
	48	5240	3.88	11	Pass
U-NII-2A	52	5260	3.09	11	Pass
	60	5300	4.14	11	Pass
	64	5320	3.87	11	Pass
U-NII-2C	100	5500	5.82	11	Pass
	116	5580	5.73	11	Pass
	140	5700	5.05	11	Pass

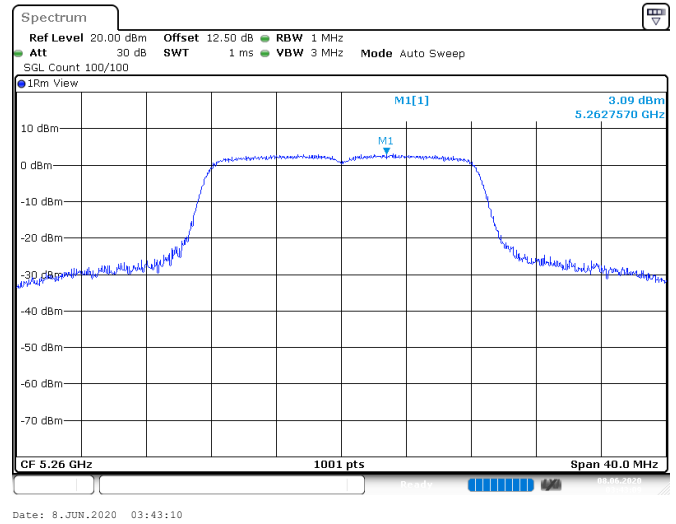


802.11a

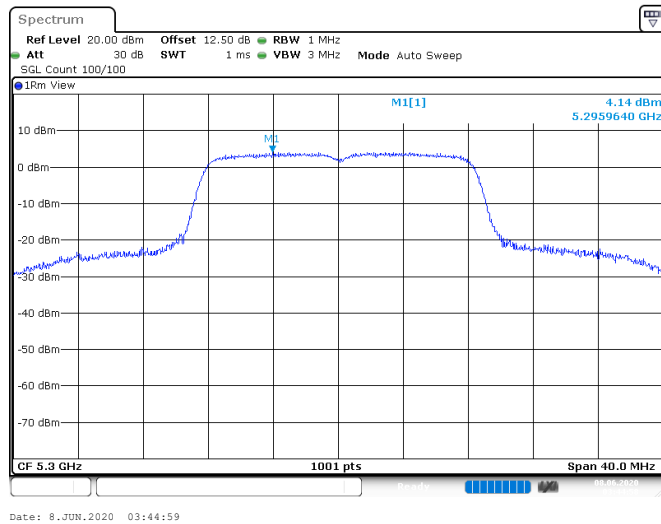
Channel 48



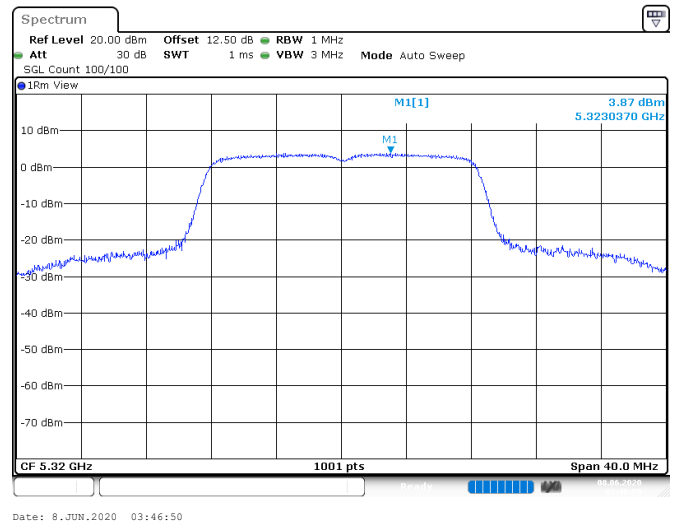
Channel 52



Channel 60

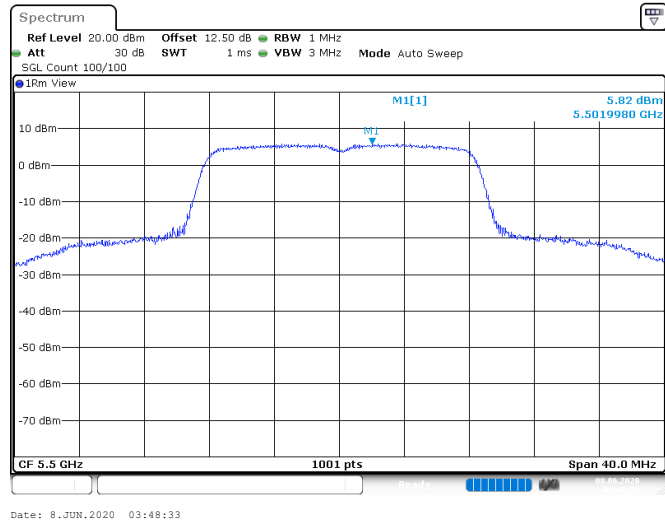


Channel 64

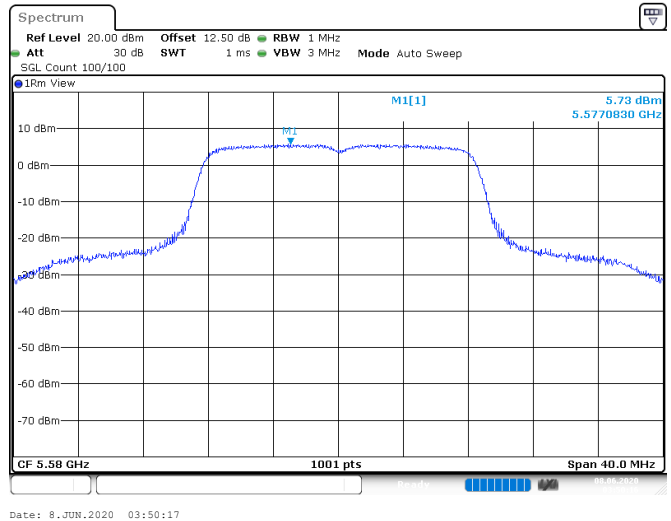


802.11a

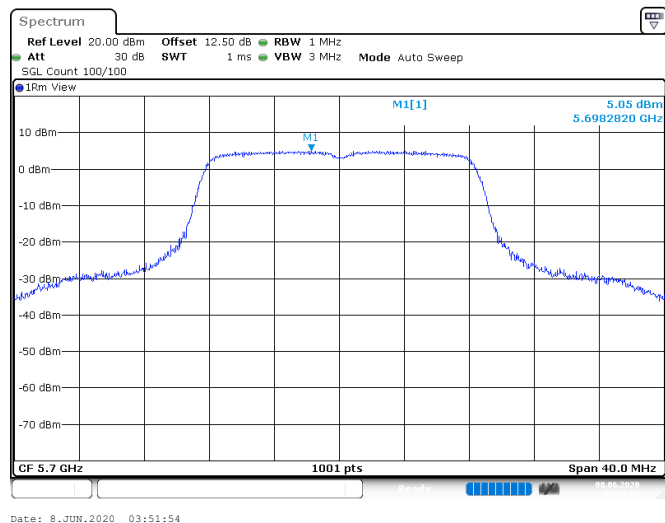
Channel 100



Channel 116

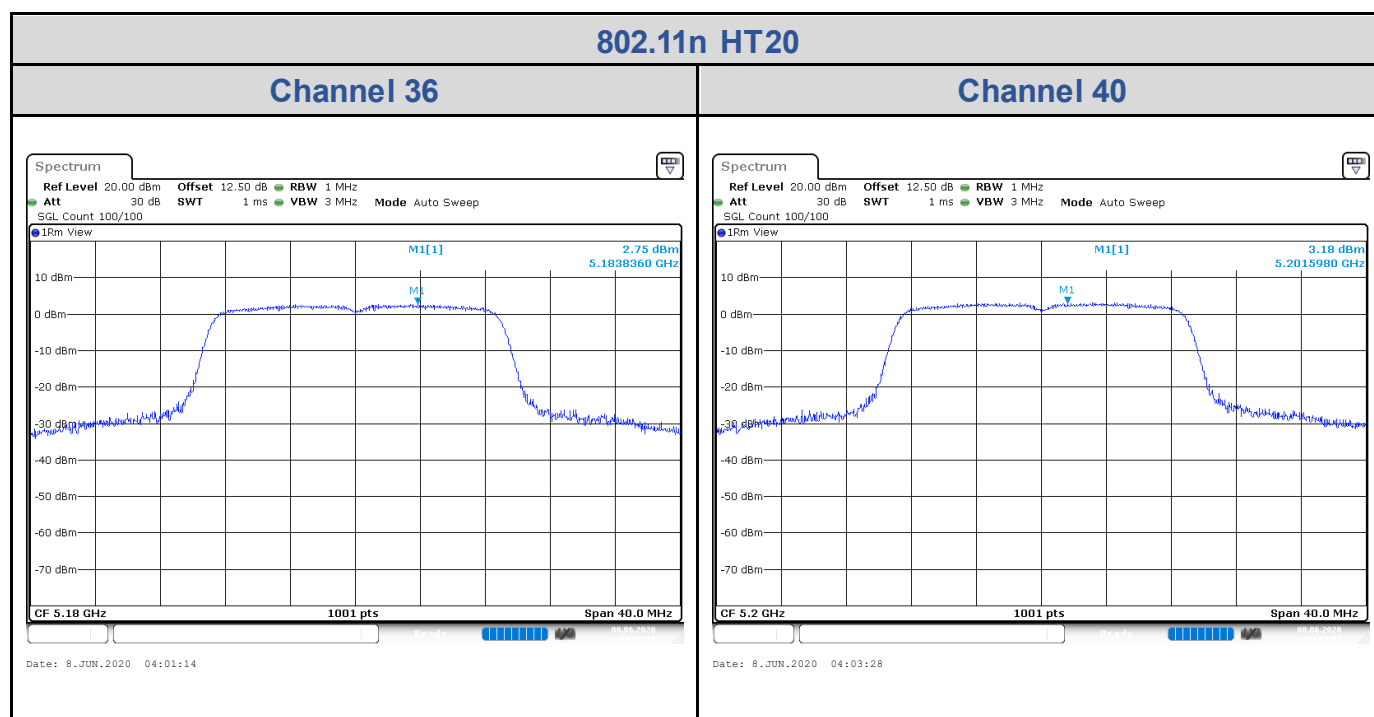


Channel 140



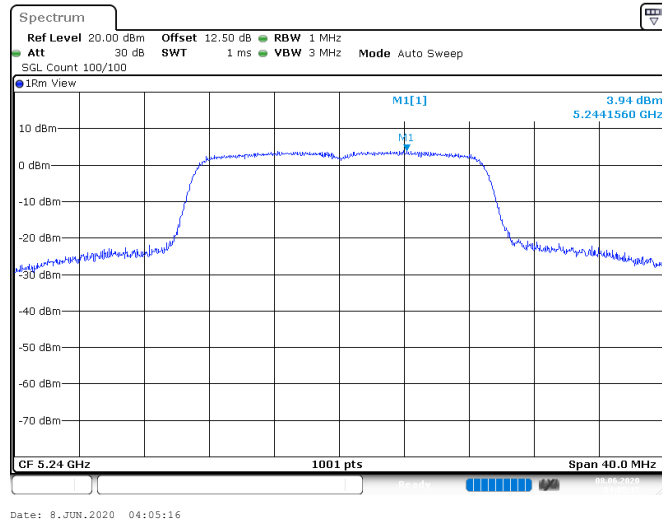
802.11n HT20

Band	Channel	Frequency (MHz)	PSD (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
U-NII-1	36	5180	2.75	11	Pass
	40	5200	3.18	11	Pass
	48	5240	3.94	11	Pass
U-NII-2A	52	5260	3.02	11	Pass
	60	5300	3.94	11	Pass
	64	5320	3.98	11	Pass
U-NII-2C	100	5500	4.67	11	Pass
	116	5580	5.79	11	Pass
	140	5700	5.05	11	Pass

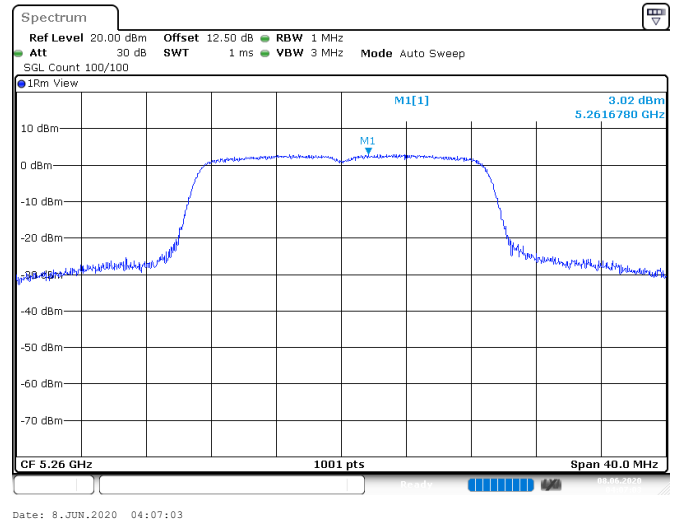


802.11n HT20

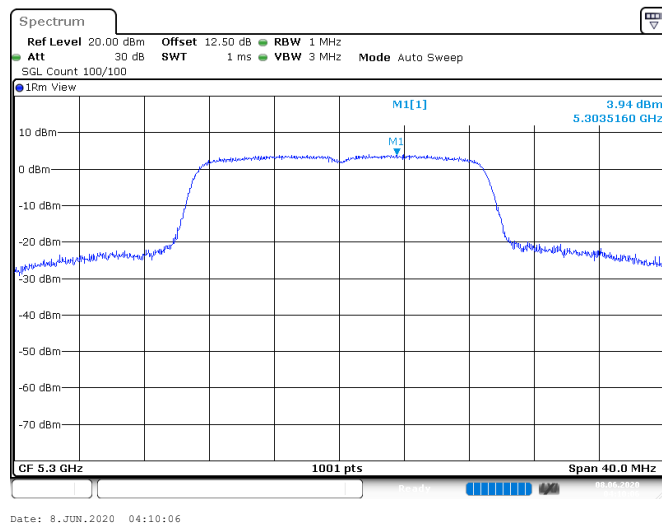
Channel 48



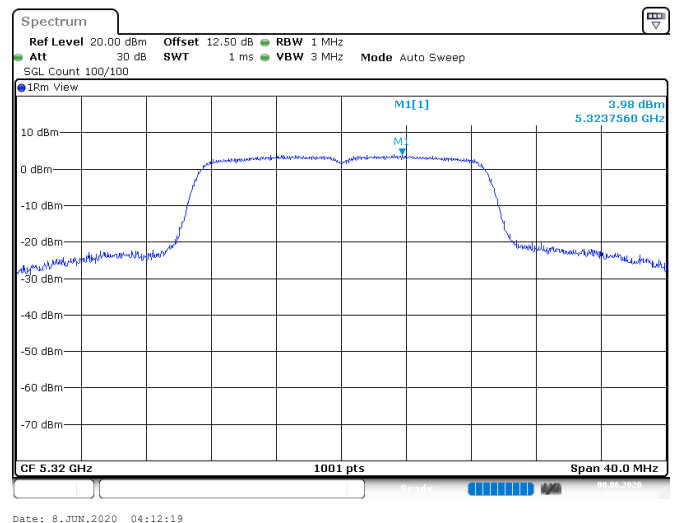
Channel 52



Channel 60

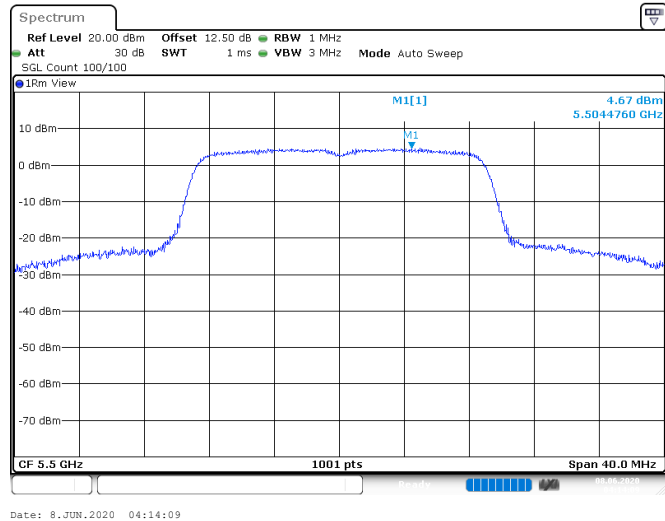


Channel 64

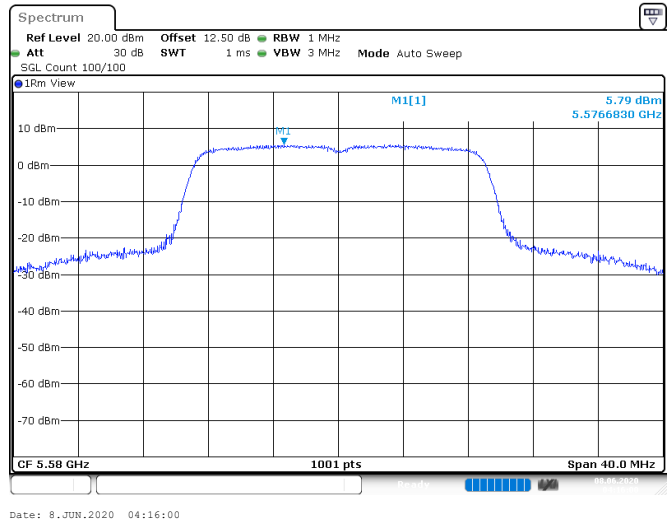


802.11n HT20

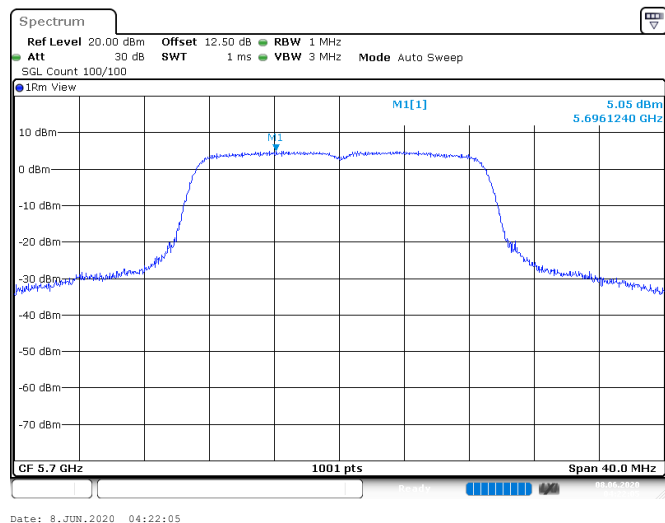
Channel 100



Channel 116



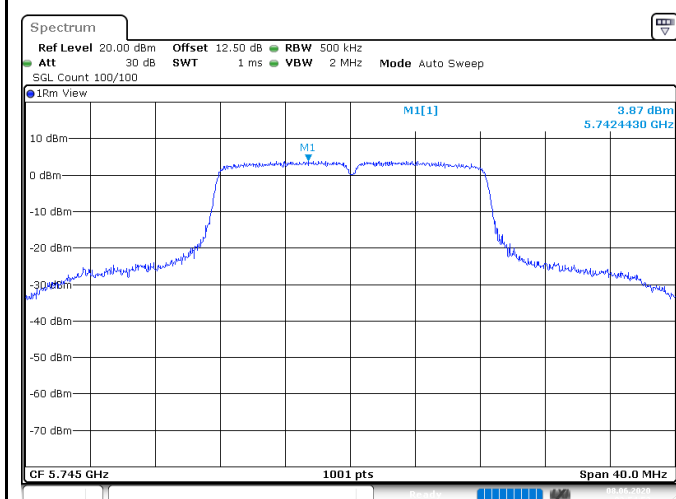
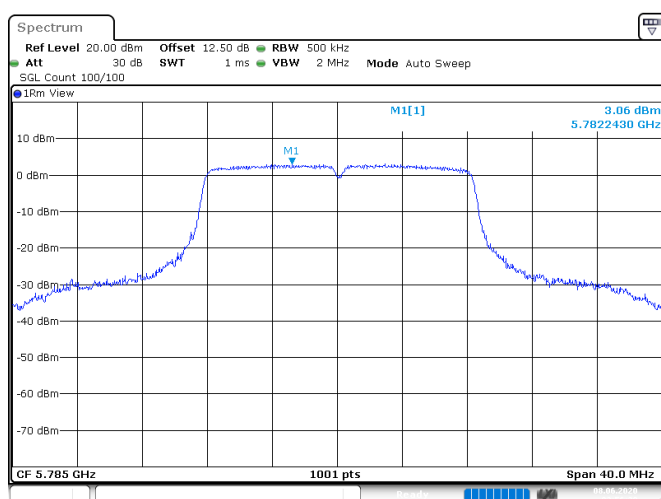
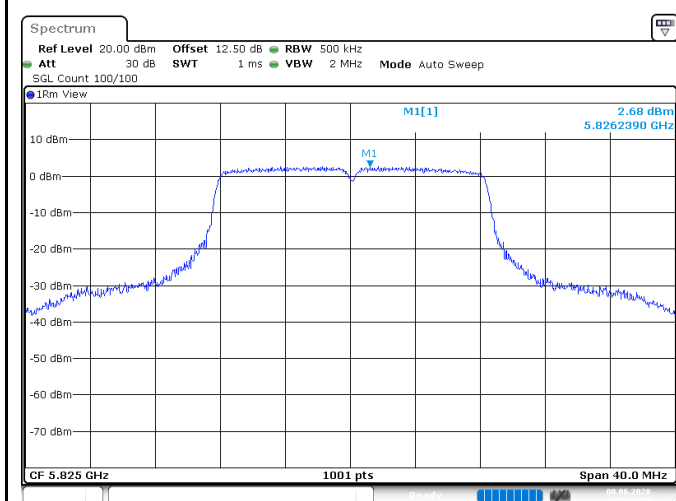
Channel 140



Test Result of Power Spectral Density

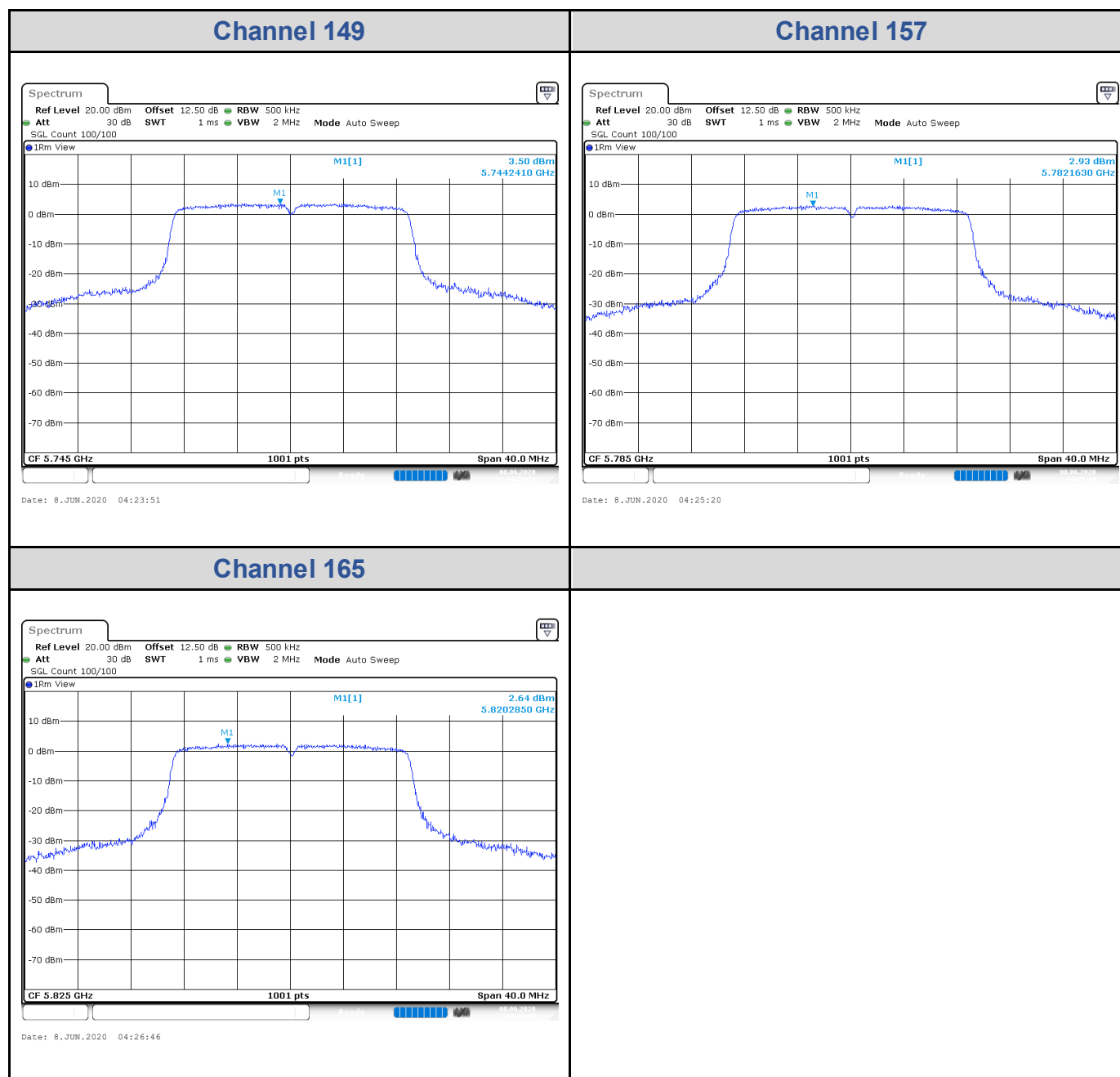
802.11a

Band	Channel	Frequency (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
U-NII-3	149	5745	3.87	30	Pass
	157	5785	3.06	30	Pass
	165	5825	2.68	30	Pass

Channel 149

Channel 157

Channel 165


802.11n HT20

Band	Channel	Frequency (MHz)	PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
U-NII-3	149	5745	3.5	30	Pass
	157	5785	2.93	30	Pass
	165	5825	2.64	30	Pass



Appendix B: Test Results of Radiation Spurious Emissions & Mains Conducted Emission

Band Edges, 4.5GHz ~ 7GHz

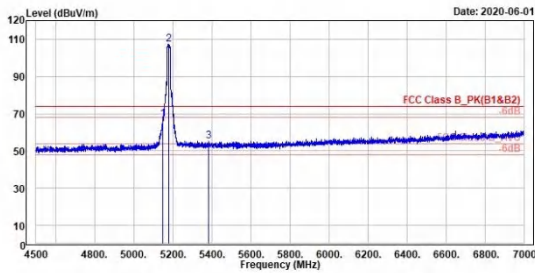
U-NII-1

802.11a

CH 36 (Horizontal) Peak



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No. 438-18, Sec. 2, Fenhua Rd., Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322

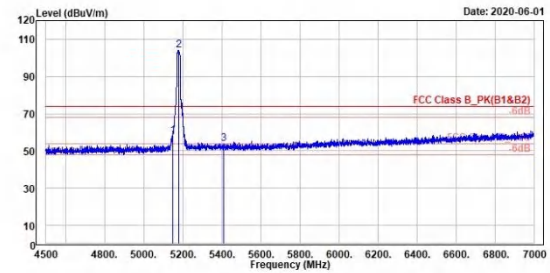


	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	5150.00	67.28	24.72	42.56	74.00	-6.72	331	317	Peak	Horizontal		
2 *	5180.00	107.34	64.64	42.70	74.00	33.34	334	294	Peak	Horizontal		
3	5383.00	55.05	11.84	43.21	74.00	-18.95	334	294	Peak	Horizontal		

CH 36 (Vertical) Peak



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Tel: +886-2172-1000 Fax: +886-2172-1322



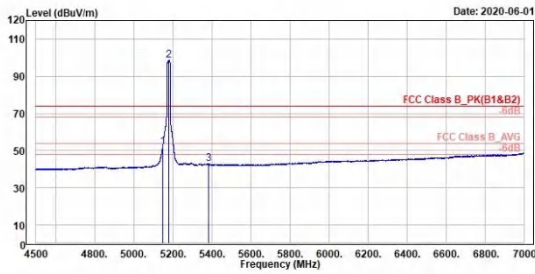
	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	5150.00	57.97	15.41	42.56	74.00	-16.03	388	265	Peak	Vertical		
2 *	5180.00	103.67	61.17	42.70	74.00	29.67	388	265	Peak	Vertical		
3	5412.50	54.01	10.80	43.21	74.00	-19.99	388	265	Peak	Vertical		

802.11a

CH 36 (Horizontal) Average



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Tel: +886-2172-1000 Fax: +886-2172-1322

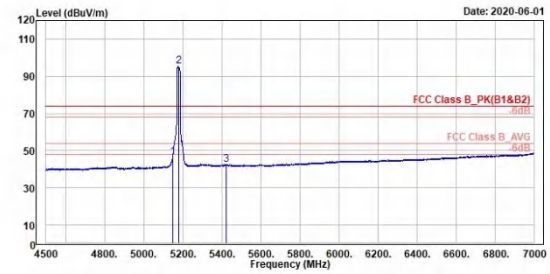


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5150.00	51.89	9.33	42.56	54.00	-2.11	331	317	Average	Horizontal	
2 *	5180.00	98.40	55.70	42.70	54.00	44.40	334	294	Average	Horizontal	
3	5386.00	42.86	-0.35	43.21	54.00	-11.14	334	294	Average	Horizontal	

CH 36 (Vertical) Average



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Tel: +886-2172-1000 Fax: +886-2172-1322



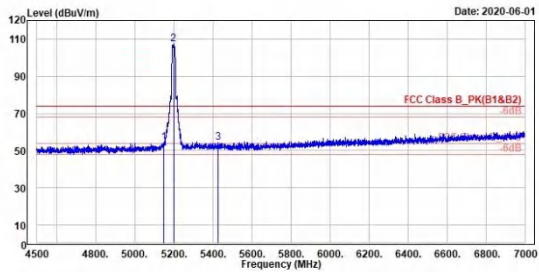
	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5150.00	46.52	3.96	42.56	54.00	-7.48	388	265	Average	Vertical	
2 *	5180.00	95.36	52.66	42.70	54.00	41.36	388	265	Average	Vertical	
3	5424.50	42.44	-0.73	43.17	54.00	-11.56	388	265	Average	Vertical	

802.11a

CH 40 (Horizontal) Peak



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Tel: +886-2172-1000 Fax: +886-2172-1322

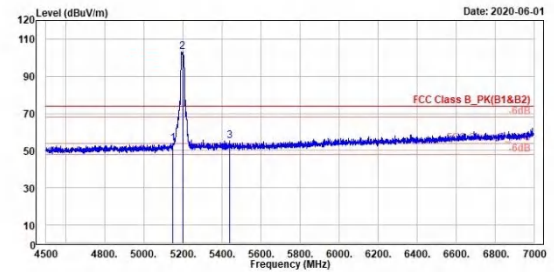


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.58	54.07	11.51	42.56	74.00	-19.93	334	295	Peak	Horizontal	
2 *	5200.00	107.20	64.40	42.80	74.00	33.20	334	295	Peak	Horizontal	
3	5429.00	54.16	11.01	43.15	74.00	-19.84	334	295	Peak	Horizontal	

CH 40 (Vertical) Peak



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Tel: +886-2172-1000 Fax: +886-2172-1322



	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.58	54.03	11.47	42.56	74.00	-19.97	330	265	Peak	Vertical	
2 *	5200.00	103.01	60.21	42.80	74.00	29.01	330	265	Peak	Vertical	
3	5442.00	55.35	12.24	43.11	74.00	-18.65	330	265	Peak	Vertical	

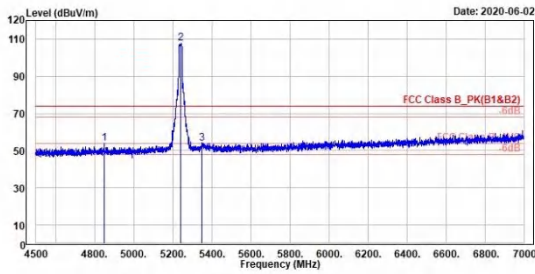
	Freq	Level	Read Line	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	Hz	dBu/m	dBu	dB/m	dBu/m	dB	cm	deg			
1	5149.00	42.81	0.25	42.56	54.00	-11.19	330	265	Average	Vertical	
2	5200.00	94.38	51.58	42.80	54.00	40.38	330	265	Average	Vertical	
3	5408.50	42.62	-0.61	43.23	54.00	-11.38	330	265	Average	Vertical	

802.11a

CH 48 (Horizontal) Peak



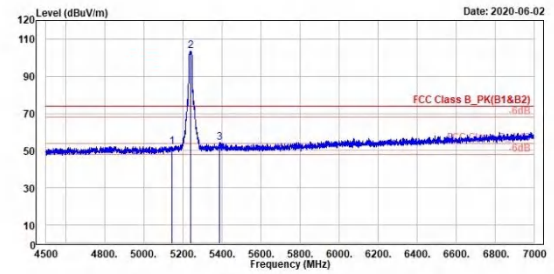
TÜV Rheinland Taiwan Ltd.
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Tel: +886-2172-1000 Fax: +886-2172-1322



CH 48 (Vertical) Peak



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Tel: +886-2172-1000 Fax: +886-2172-1322

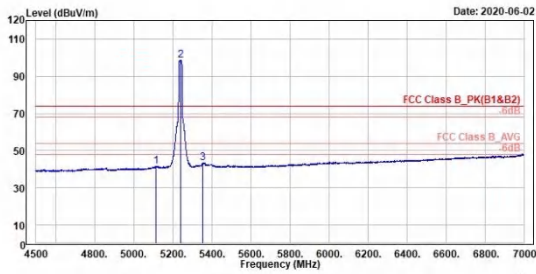


802.11a

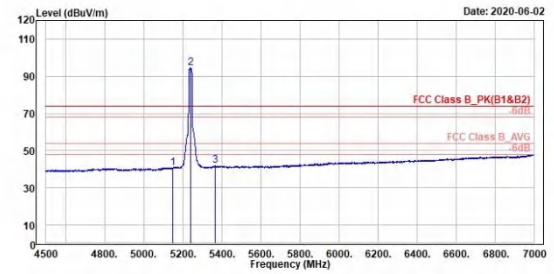
CH 48 (Horizontal) Average



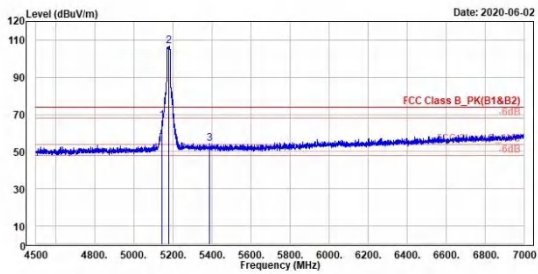
TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322

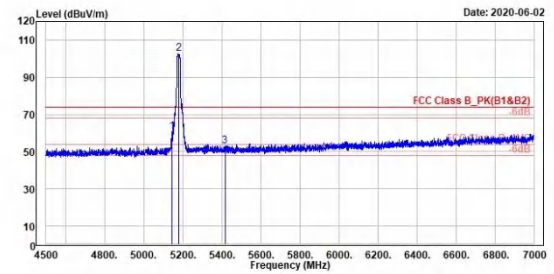


802.11n HT20
CH 36 (Horizontal) Peak

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 No. 458-18, Sec. 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5147.00	66.71	24.17	42.54	74.00	-7.29	335	295	Peak	Horizontal	
2 *	5180.00	106.62	63.92	42.70	74.00	32.62	335	295	Peak	Horizontal	
3	5390.00	54.12	10.90	43.22	74.00	-19.88	335	295	Peak	Horizontal	

CH 36 (Vertical) Peak

 TÜV Rheinland Taiwan Ltd.
 No. 458-18, Sec. 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
 Tel: +886-2172-1000 Fax: +886-2172-1322


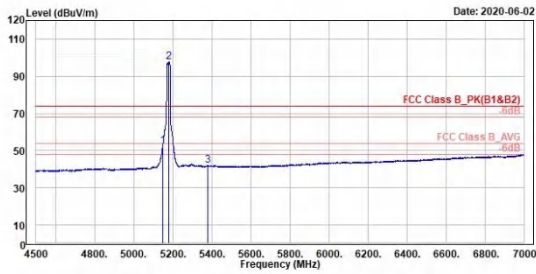
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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5147.00	60.67	18.13	42.54	74.00	-13.33	388	265	Peak	Vertical	
2 *	5180.00	102.88	60.18	42.70	74.00	28.88	388	265	Peak	Vertical	
3	5417.50	53.14	9.94	43.20	74.00	-20.86	388	265	Peak	Vertical	

802.11n HT20

CH 36 (Horizontal) Average



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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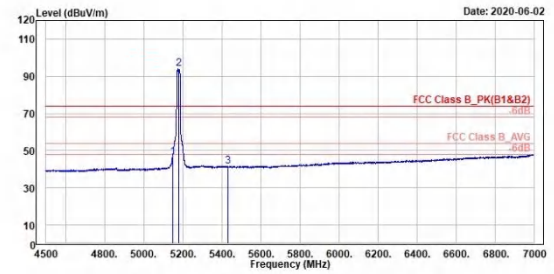


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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5150.00	52.32	9.76	42.56	54.00	-1.68	349	318	Average	Horizontal	
2 *	5180.00	97.53	54.63	42.70	54.00	43.53	349	318	Average	Horizontal	
3	5378.50	41.87	-1.33	43.20	54.00	-12.13	349	318	Average	Horizontal	

CH 36 (Vertical) Average



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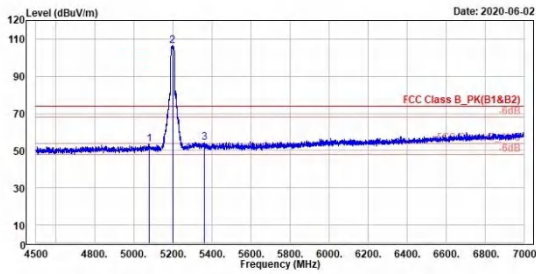
	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5150.00	46.71	4.15	42.56	54.00	-7.29	388	265	Average	Vertical	
2 *	5180.00	94.02	51.32	42.70	54.00	40.02	388	265	Average	Vertical	
3	5431.00	41.61	-1.55	43.16	54.00	-12.39	388	265	Average	Vertical	

802.11n HT20

CH 40 (Horizontal) Peak



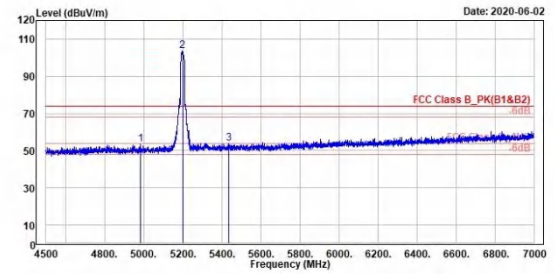
TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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CH 40 (Vertical) Peak



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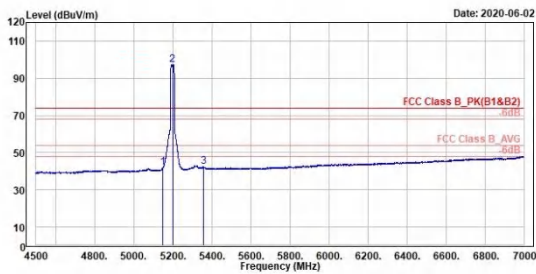


802.11n HT20

CH 40 (Horizontal) Average



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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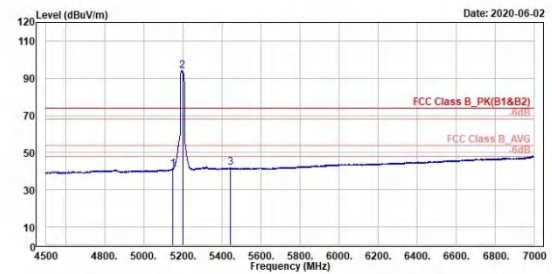


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5150.00	41.85	-0.71	42.56	54.00	-12.15	333	354	Average	Horizontal	
2 *	5200.00	97.52	56.52	42.00	54.00	43.52	333	354	Average	Horizontal	
3	5357.00	42.24	-0.89	43.13	54.00	-11.76	333	354	Average	Horizontal	

CH 40 (Vertical) Average



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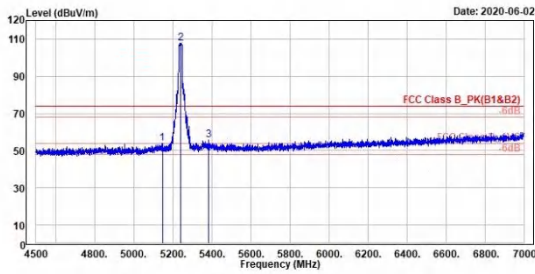
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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.00	41.22	-1.34	42.56	54.00	-12.78	337	236	Average	Vertical	
2 *	5200.00	94.21	51.41	42.80	54.00	40.21	337	236	Average	Vertical	
3	5447.00	41.83	-1.27	43.10	54.00	-12.17	337	236	Average	Vertical	

802.11n HT20

CH 48 (Horizontal) Peak



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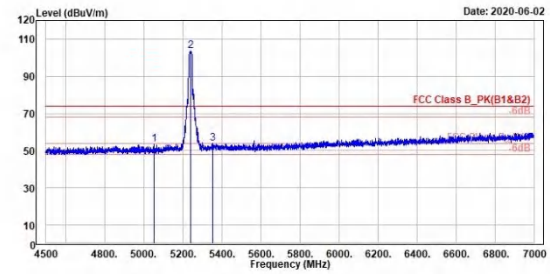


Peak	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5148.00	54.02	11.47	42.55	74.00	-19.98	328	346	Peak	Horizontal	
2 *	5240.00	107.67	64.68	42.99	74.00	33.67	328	346	Peak	Horizontal	
3	5386.50	55.79	12.58	43.21	74.00	-18.21	328	346	Peak	Horizontal	

CH 48 (Vertical) Peak



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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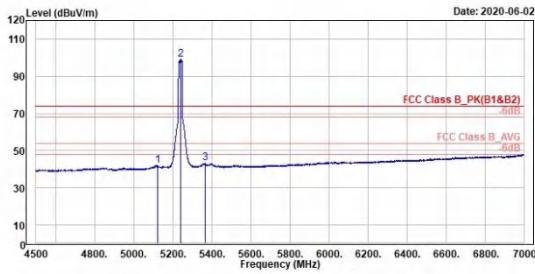
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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5052.50	53.53	11.44	42.09	74.00	-20.47	347	235	Peak	Vertical	
2 *	5240.00	103.52	60.53	42.99	74.00	29.52	347	235	Peak	Vertical	
3	5356.00	53.72	10.59	43.13	74.00	-20.28	347	235	Peak	Vertical	

802.11n HT20

CH 48 (Horizontal) Average



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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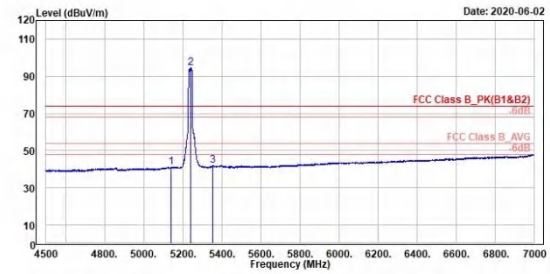


	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB		cm	deg			
1	5123.00	41.94	-0.49	42.43	54.00	-12.06		328	346	Average	Horizontal	
2 *	5240.00	98.89	55.90	42.99	54.00	44.89		328	346	Average	Horizontal	
3	5365.50	43.15	-0.01	43.16	54.00	-10.85		328	346	Average	Horizontal	

CH 48 (Vertical) Average



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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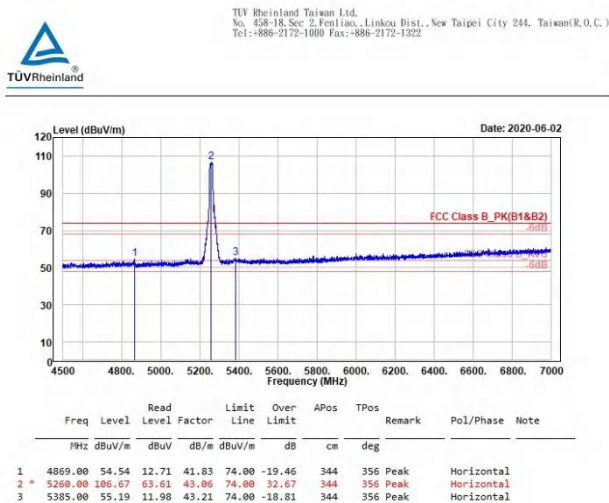
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	Hz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5142.00	40.95	-1.57	42.52	54.00	-13.05	347	235	Average	Vertical	
2	* 5240.00	91.58	51.59	42.99	54.00	40.58	347	235	Average	Vertical	
3	5355.00	44.89	-1.24	43.13	54.00	-12.11	347	235	Average	Vertical	

Band Edges, 4.5~7GHz

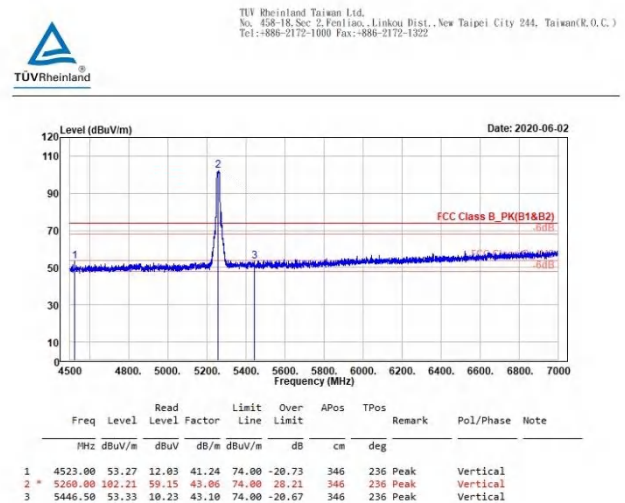
U-NII-2A

802.11a

CH 52 (Horizontal) Peak



CH 52 (Vertical) Peak



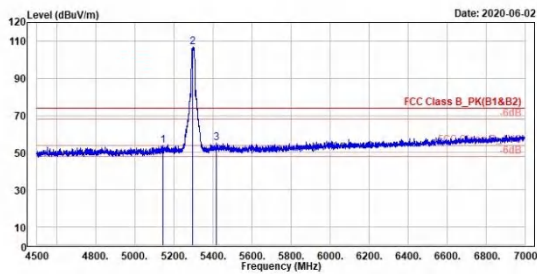
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	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5135.50	48.98	-1.51	42.49	54.00	-13.02	346	236	Average	Vertical	
2 *	5260.00	93.45	50.39	43.06	54.00	39.45	346	236	Average	Vertical	
3	5387.50	42.15	-1.06	43.21	54.00	-11.85	346	236	Average	Vertical	

802.11a

CH 60 (Horizontal) Peak



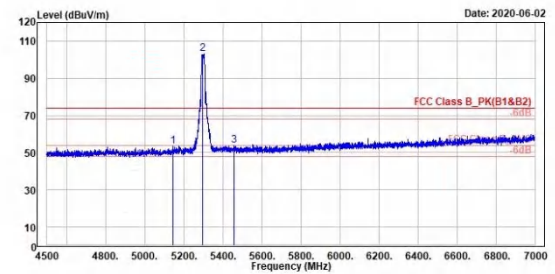
TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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CH 60 (Vertical) Peak



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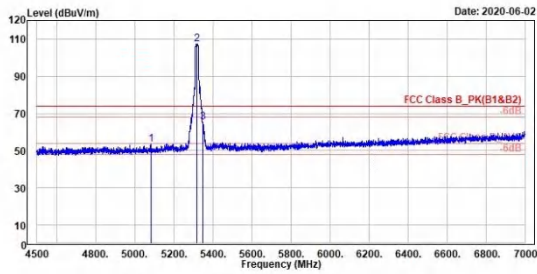
	Freq	Read Level	Line Limit	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	5145.50	40.84	-1.69	42.53	54.00	-13.16	353	257 Average	Vertical
2 *	5300.00	94.63	51.46	43.17	54.00	40.63	353	257 Average	Vertical
3	5383.00	42.23	-0.98	43.21	54.00	-11.77	353	257 Average	Vertical

802.11a

CH 64 (Horizontal) Peak



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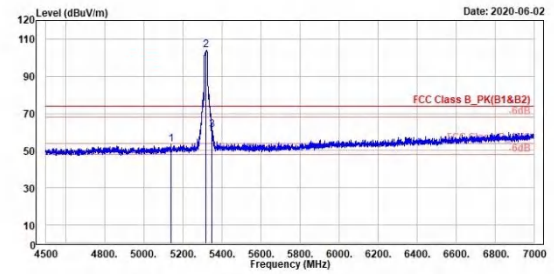


Peak	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5083.00	53.46	11.23	42.23	74.00	-20.54	320	340	Peak	Horizontal	
2 *	5320.00	107.13	63.90	43.15	74.00	33.13	320	340	Peak	Horizontal	
3	5350.00	65.12	22.01	43.11	74.00	-8.88	320	340	Peak	Horizontal	

CH 64 (Vertical) Peak



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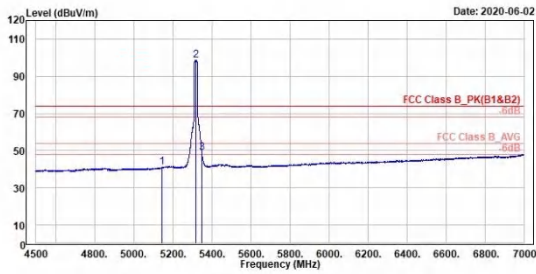
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1	5142.00	53.28	10.76	42.52	74.00	-20.72	356	240	Peak	Vertical	
2 *	5320.00	104.01	60.86	43.15	74.00	30.01	356	240	Peak	Vertical	
3	5350.00	61.21	18.10	43.11	74.00	-12.79	356	240	Peak	Vertical	

802.11a

CH 64 (Horizontal) Average



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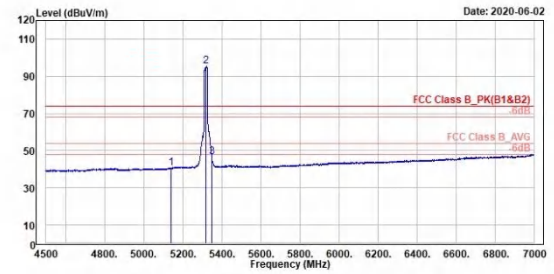


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5145.00	41.01	-1.52	42.53	54.00	-12.99	320	340	Average	Horizontal	
2 *	5320.00	98.76	55.41	43.35	54.00	44.76	320	340	Average	Horizontal	
3 !	5350.00	48.79	5.68	43.11	54.00	-5.21	320	340	Average	Horizontal	

CH 64 (Vertical) Average



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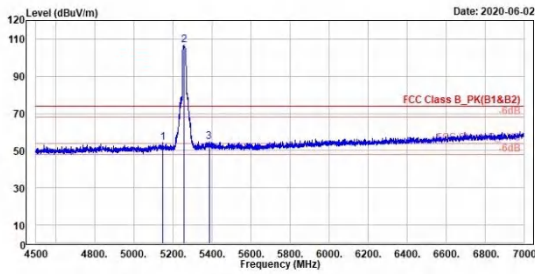
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1	5140.00	40.82	-1.69	42.51	54.00	-13.18	356	240	Average	Vertical	
2 *	5320.00	95.30	52.15	43.15	54.00	41.30	356	240	Average	Vertical	
3	5350.00	46.46	3.35	43.11	54.00	-7.54	356	240	Average	Vertical	

802.11n HT20

CH 52 (Horizontal) Peak



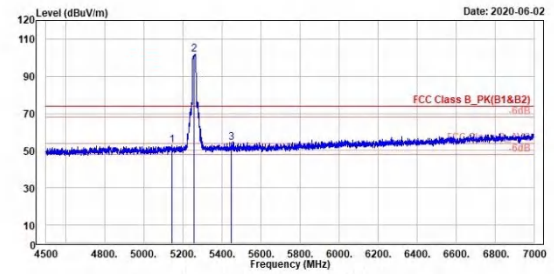
TÜV Rheinland Taiwan Ltd.
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CH 52 (Vertical) Peak



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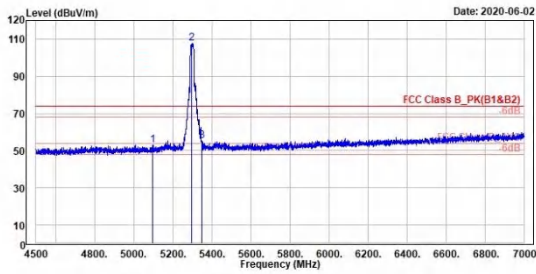
	Freq	Read Level	Line Limit	Over Limit	APos	TPos	Remark	Pol/Phase	Note	
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	5132.50	41.09	-1.38	42.47	54.00	-12.91	346	235	Average	Vertical
2 *	5260.00	93.29	50.23	43.06	54.00	39.29	346	235	Average	Vertical
3	5386.00	42.26	-0.95	43.21	54.00	-11.74	346	235	Average	Vertical

802.11n HT20

CH 60 (Horizontal) Peak



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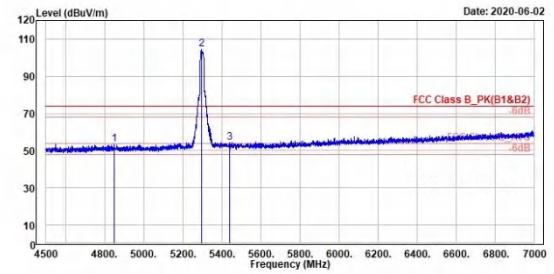


Peak	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5100.00	52.96	10.64	42.32	74.00	-21.04	337	349	Peak	Horizontal	
2 *	5300.00	107.60	64.43	43.17	74.00	33.60	337	349	Peak	Horizontal	
3	5352.00	55.01	11.90	43.11	74.00	-18.99	337	349	Peak	Horizontal	

CH 60 (Vertical) Peak



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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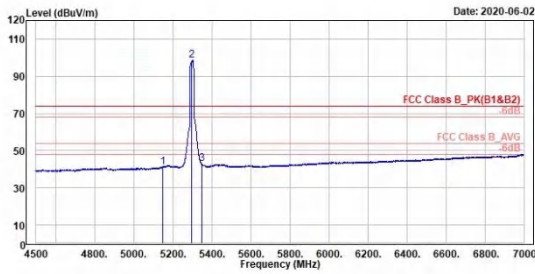
Peak	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	4849.00	53.44	11.62	41.82	74.00	-20.56	354	256	Peak	Vertical	
2 *	5300.00	104.35	61.18	43.17	74.00	30.35	354	256	Peak	Vertical	
3	5441.00	54.50	11.38	43.12	74.00	-19.50	354	256	Peak	Vertical	

802.11n HT20

CH 60 (Horizontal) Average



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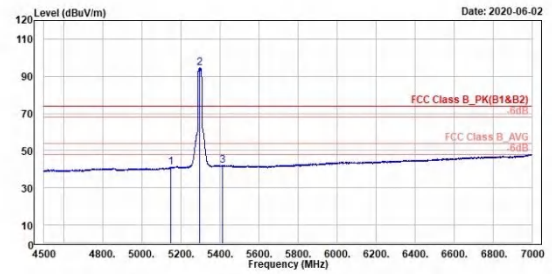


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.58	41.28	-1.28	42.56	54.00	-12.72	337	349	Average	Horizontal	
2 *	5349.00	98.59	55.42	43.17	54.00	44.59	337	349	Average	Horizontal	
3	5350.00	42.98	-0.13	43.11	54.00	-11.02	337	349	Average	Horizontal	

CH 60 (Vertical) Average



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No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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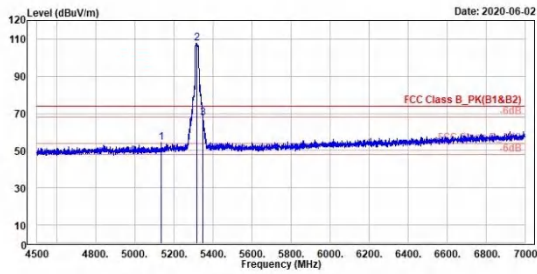
	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.00	41.04	-1.52	42.56	74.00	-32.96	354	256	Peak	Vertical	
2 *	5296.50	94.55	51.39	43.16	74.00	20.55	354	256	Peak	Vertical	
3	5414.50	42.09	-1.11	43.20	74.00	-31.91	354	256	Peak	Vertical	

802.11n HT20

CH 64 (Horizontal) Peak



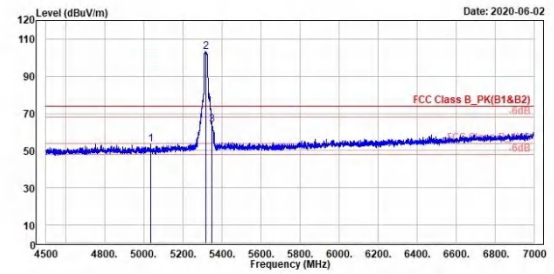
TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322



CH 64 (Vertical) Peak



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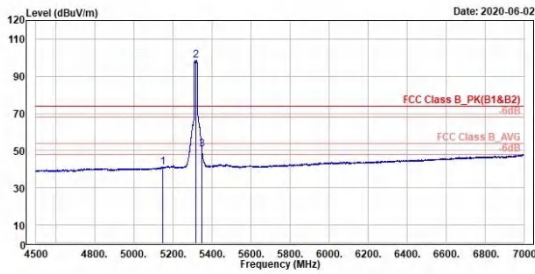


802.11n HT20

CH 64 (Horizontal) Average



TÜV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel: +886-2172-1000 Fax: +886-2172-1322

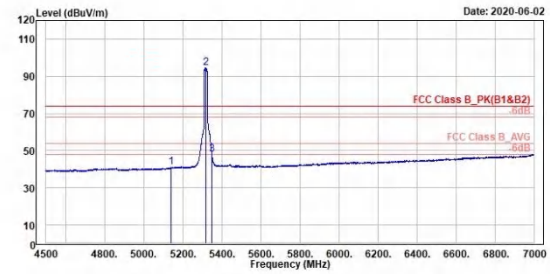


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.58	41.03	-1.53	42.56	54.00	-12.97	320	341	Average	Horizontal	
2 *	5328.00	98.44	55.29	43.15	54.00	44.44	320	341	Average	Horizontal	
3 !	5350.00	50.76	7.65	43.11	54.00	-3.24	320	341	Average	Horizontal	

CH 64 (Vertical) Average



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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5149.00	40.97	-1.54	42.51	54.00	-13.03	376	252	Average	Vertical	
2 *	5328.00	94.41	51.26	43.15	54.00	40.41	376	252	Average	Vertical	
3	5350.00	47.94	4.83	43.11	54.00	-6.06	376	252	Average	Vertical	

Band Edges, 5.3GHz ~ 5.47GHz, 5.725GHz
U-NII-2C

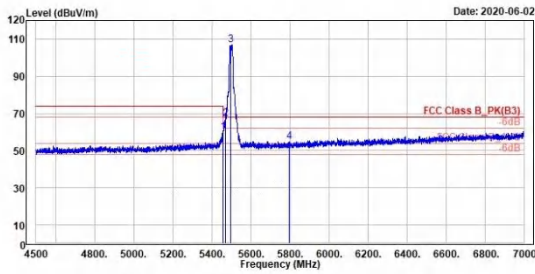
802.11a

CH 100 (Horizontal) Peak

CH 100 (Vertical) Peak



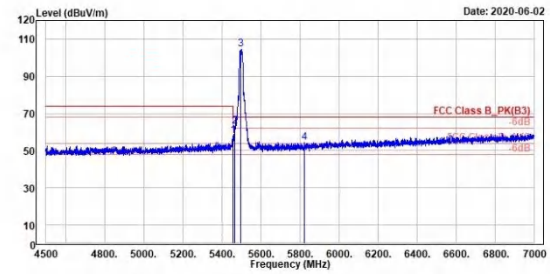
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	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	5458.00	59.92	16.89	43.12	74.00	-14.08		318		3 Peak	Horizontal	
2	5470.00	67.25	24.10	43.15	68.20	-0.95		318		3 Peak	Horizontal	
3 *	5500.00	106.96	63.73	43.23	68.20	38.76		298		5 Peak	Horizontal	
4	5797.50	54.59	11.14	43.45	68.20	-13.61		298		5 Peak	Horizontal	



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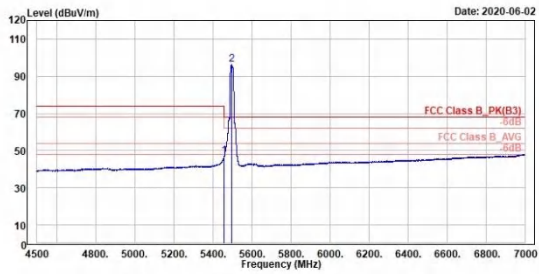
	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	dB	cm	deg			
1	5458.00	59.92	16.89	43.12	74.00	-14.08		289		261 Peak	Vertical	
2	5467.00	62.88	19.75	43.13	68.20	-5.32		289		261 Peak	Vertical	
3 *	5500.00	104.71	61.48	43.23	68.20	36.51		289		261 Peak	Vertical	
4	5826.00	54.43	10.95	43.48	68.20	-13.77		289		261 Peak	Vertical	

802.11a

CH 100 (Horizontal) Average



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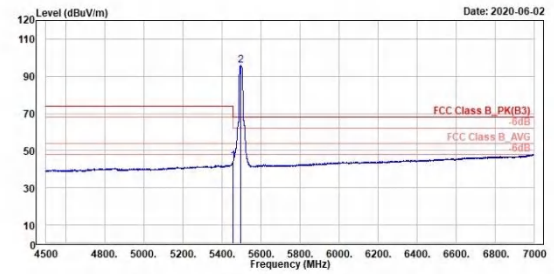


	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5460.00	46.78	3.66	43.12	54.00	-7.22	318	3	Average	Horizontal	
2 *	5500.00	96.13	52.90	43.23	54.00	42.13	298	5	Average	Horizontal	

CH 100 (Vertical) Average



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	Freq	Level	Read	Factor	Limit	Over	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	5459.58	44.35	1.23	43.12	54.00	-9.65	289	261	Average	Vertical	
2 *	5500.00	95.76	52.53	43.23	54.00	41.76	289	261	Average	Vertical	