



# FCC PART 15C TEST REPORT No.I20Z60681-IOT06

for

**Client name: TCL Communication Ltd.**

**Product name: GSM/UMTS/LTE Mobile phone**

**Model name: 5004S**

**With**

**FCC ID: 2ACCJH127**

**Hardware Version: 08**

**Software Version: 5H6EUFEO**

**Issued Date: 2020-06-29**

**Note:**

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The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I20Z60681-IOT06	Rev.0	1st edition	2020-06-29

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## 1. TEST LABORATORY

### 1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2005 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0, and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

### 1.2. Testing Location

Conducted testing Location: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
P. R. China100191

Radiated testing Location: CTTL(BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology  
Development Area, Beijing, P. R. China 100176

### 1.3. Testing Environment

Normal Temperature: 15-35°C

Extreme Temperature: -20/+55°C

Relative Humidity: 20-75%

### 1.4. Project date

Testing Start Date: 2020-06-02

Testing End Date: 2020-06-29

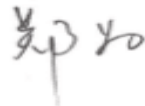
### 1.5. Signature



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Jiang Xue

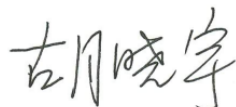
(Prepared this test report)



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Zheng Wei

(Reviewed this test report)



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Hu Xiaoyu

(Approved this test report)



## **2. CLIENT INFORMATION**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science  
Park, Shatin, NT, Hong Kong  
City: Hong Kong  
Postal Code: /  
Country: China  
Telephone: 0086-755-36611722  
Fax: 0086-755-36612000-81722

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science  
Park, Shatin, NT, Hong Kong  
City: Hong Kong  
Postal Code: /  
Country: China  
Telephone: 0086-755-36611722  
Fax: 0086-755-36612000-81722

### **3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY**

#### **EQUIPMENT(AE)**

##### **3.1. About EUT**

Description	GSM/UMTS/LTE Mobile phone
Model name	5004S
FCC ID	2ACCJH127
WLAN Frequency Range	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Voltage	3.8V

##### **3.2. Internal Identification of EUT used during the test**

<b>EUT ID*</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
EUT2	355952110203802	08	5H6EUFEO
EUT1	355952110203810	08	5H6EUFEO

\*EUT ID: is used to identify the test sample in the lab internally.

##### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>
AE1	Battery	/

\*AE ID: is used to identify the test sample in the lab internally.

##### **3.4. General Description**

Equipment Under Test (EUT) is a model of GSM/UMTS/LTE Mobile phone with integrated antenna. It consists of normal options: Battery and Charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

## **4. REFERENCE DOCUMENTS**

### **4.1. Documents supplied by applicant**

EUT feature information is supplied by the applicant or manufacturer, which is the basis of testing.

### **4.2. Reference Documents for testing**

The following documents listed in this section are referred for testing.

FCC Part15	FCC CFR 47, Part 15, Subpart C and E: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.407 General technical requirements	2018
ANSI C63.10	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2013
UNII: KDB 789033 D02	General U-NII Test Procedures New Rules v02r01	2017-12
KDB 558074 D01	Federal Communications Commission Office of Engineering and Technology Laboratory Division GUIDANCE FOR COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEM, FREQUENCY HOPPING SPREAD SPECTRUM SYSTEM, AND HYBRID SYSTEM DEVICES OPERATING UNDER SECTION 15.247 OF THE FCC RULES	2019

## **5. LABORATORY ENVIRONMENT**

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.



## 6. SUMMARY OF TEST RESULTS

### 6.1. Summary of Test Results

SUMMARY OF MEASUREMENT RESULTS	Sub-clause of Part15C	Sub-clause of IC	Verdict
Maximum Peak Output Power	15.407 (a)	/	<b>P</b>
Peak Power Spectral Density	15.407 (a)	/	<b>P</b>
Occupied 6dB Bandwidth	15.407 (e)	/	<b>P</b>
Band Edges Compliance - Conducted& Radiated	15.407 (b)	/	<b>P</b>
Transmitter Spurious Emission - Conducted	15.407	/	<b>P</b>
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	<b>P</b>
AC Powerline Conducted Emission	15.107, 15.207	/	<b>P</b>

Please refer to **ANNEX A** for detail.

Terms used in Verdict column

P	Pass, The EUT complies with the essential requirements in the standard.
NM	Not measured, The test was not measured by CTTL
NA	Not Applicable, The test was not applicable
F	Fail, The EUT does not comply with the essential requirements in the standard

### 6.2. Statements

CTTL has evaluated the test cases requested by the client/manufacturer as listed in section 6.1 of this report for the EUT specified in section 3 according to the standards or reference documents listed in section 4.1.

This report only deals with the WLAN function among the features described in section 3.

### 6.3. Test Conditions

For this report, all the test cases are tested under normal temperature and normal voltage, and also under norm humidity, the specific condition is shown as follows:

Temperature	26°C
Voltage	3.8V
Humidity	44%

## 7. TEST EQUIPMENTS UTILIZED

### Conducted test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Vector Signal Analyzer	FSQ40	200089	Rohde & Schwarz	1 year	2021-05-06
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2021-05-17
3	Test Receiver	ESCI 7	100344	Rohde & Schwarz	1 year	2021-02-26
4	Shielding Room	S81	/	ETS-Lindgren	/	/

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESU26	100235	Rohde & Schwarz	1 year	2021-03-03
2	BiLog Antenna	VULB9163	483	Schwarzbeck	1 years	2020-09-17
3	Dual-Ridge Waveguide Horn Antenna	3115	6914	ETS-Lindgren	1 years	2021-01-14

## 8. Measurement Uncertainty

### 8.1. Transmitter Output Power

Measurement Uncertainty: 0.387dB,k=1.96

### 8.2. Peak Power Spectral Density

Measurement Uncertainty: 0.705dB,k=1.96

### 8.3. Occupied 6dB Bandwidth

Measurement Uncertainty: 60.80Hz,k=1.96

### 8.4. Band Edges Compliance

Measurement Uncertainty : 0.62dB,k=1.96

### 8.5. Spurious Emissions

#### Conducted (k=1.96)

Frequency Range	Uncertainty(dB)
$30\text{MHz} \leq f \leq 2\text{GHz}$	1.22
$2\text{GHz} \leq f \leq 3.6\text{GHz}$	1.22
$3.6\text{GHz} \leq f \leq 8\text{GHz}$	1.22
$8\text{GHz} \leq f \leq 12.75\text{GHz}$	1.51
$12.75\text{GHz} \leq f \leq 26\text{GHz}$	1.51
$26\text{GHz} \leq f \leq 40\text{GHz}$	1.59

#### Radiated (k=2)

Frequency Range	Uncertainty(dB)
9kHz-30MHz	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.40
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.32
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

### 8.6. AC Power-line Conducted Emission

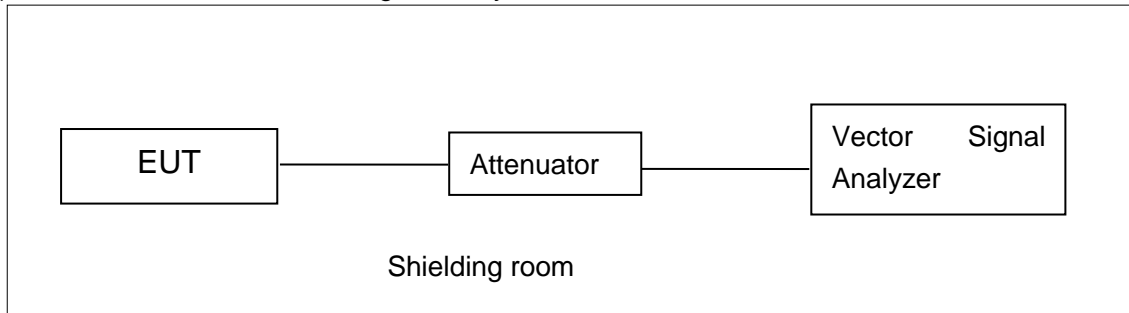
Measurement Uncertainty : 3.08dB,k=2

## ANNEX A: MEASUREMENT RESULTS

### A.1. Measurement Method

#### A.1.1. Conducted Measurements

- 1). Connect the EUT to the test system correctly.
- 2). Set the EUT to the required work mode.
- 3). Set the EUT to the required channel.
- 4). Set the spectrum analyzer to start measurement.
- 5). Record the values. Vector Signal Analyzer

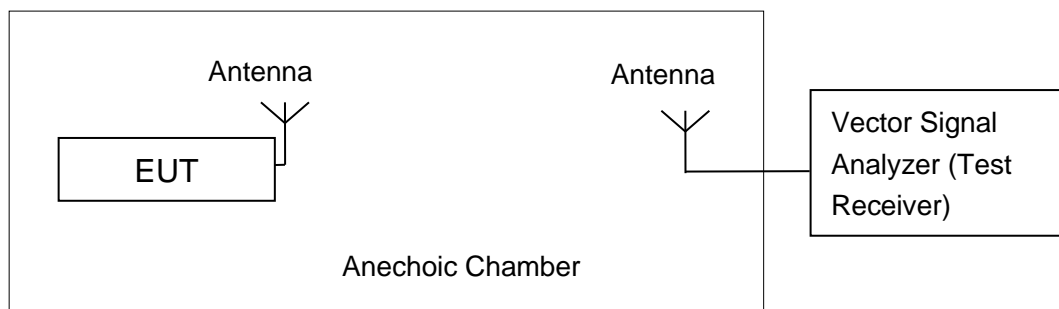


#### A.1.2. Radiated Emission Measurements

In the case of radiated emission, the used settings are as follows,

Sweep frequency from 30 MHz to 1GHz, RBW = 100 kHz, VBW = 300 kHz;

Sweep frequency from 1 GHz to 26GHz, RBW = 1MHz, VBW = 10Hz;



The measurement is made according to ANSI C63.10.

The radiated emission test is performed in semi-anechoic chamber. The distance from the EUT to the reference point of measurement antenna is 3m. The test is carried out on both vertical and horizontal polarization and only maximization result of both polarizations is kept. During the test, the turntable is rotated 360° and the measurement antenna is moved from 1m to 4m to get the maximization result.

## A.2. Maximum Peak Output Power

### Measurement Limit and Method:

Standard	Limit (dBm)
FCC CRF Part 15.407(a)	< 30

### A.2.1 Antenna Gain

Antenna gain is -2.8dBi and the value is supplied by the applicant or manufacturer.

### A.2.2. Maximum Average Output Power-Conducted

Method of Measurement: See ANSI C63.10-clause 12.3.2.2 Method SA-1

### Duty Cycle:

11a	6Mbps
Duty Cycle	100%
11n-20	MCS0
Duty Cycle	100%
11n-40	MCS0
Duty Cycle	98%
11ac-20	MCS0
Duty Cycle	98%
11ac-40	MCS0
Duty Cycle	98%
11ac-80	MCS0
Duty Cycle	96%

### 802.11a mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	13.67	13.84	13.39

### 802.11n-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11n(20MHz)	12.53	12.80	12.94

### 802.11ac-HT20 mode

Mode	Test Result (dBm)		
	5745MHz (Ch149)	5785MHz (Ch157)	5825MHz(Ch165)
802.11ac(20MHz)	12.71	12.77	12.95

**802.11n-HT40 mode**

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11n(40MHz)	12.48	11.93

**802.11ac-HT40 mode**

Mode	Test Result (dBm)	
	5755MHz (Ch151)	5795MHz(Ch159)
802.11ac(40MHz)	12.61	11.84

**802.11ac-HT80 mode**

Mode	Test Result (dBm)
	5775MHz (Ch155)
802.11ac(80MHz)	10.67

**Conclusion: PASS**

### A.3. Peak Power Spectral Density

#### Measurement Limit:

Standard	Limit
FCC 47 CFR Part 15.407(a)	< 30 dBm/500 kHz

The measurement is made according to ANSI C63.10 and KDB789033 D02

#### Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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#### Measurement Results:

Mode	Channel	Power Spectral Density ( dBm/500kHz )	Conclusion
802.11a	149	1.41	P
	157	1.57	P
	165	1.92	P
802.11n HT20	149	0.14	P
	157	0.35	P
	165	0.65	P
802.11ac HT20	149	0.85	P
	157	0.73	P
	165	0.94	P
802.11n HT40	151	-2.13	P
	159	-2.77	P
802.11ac HT40	151	-1.79	P
	159	-2.39	P
802.11ac HT80	155	-6.35	P

**Conclusion: PASS**

#### A.4. Occupied 6dB Bandwidth

##### Measurement Limit:

Standard	Limit (kHz)
FCC 47 CFR Part 15.407 (e)	≥ 500

The measurement is made according to KDB789033 D02 .

##### Measurement Uncertainty:

Measurement Uncertainty	60.80Hz
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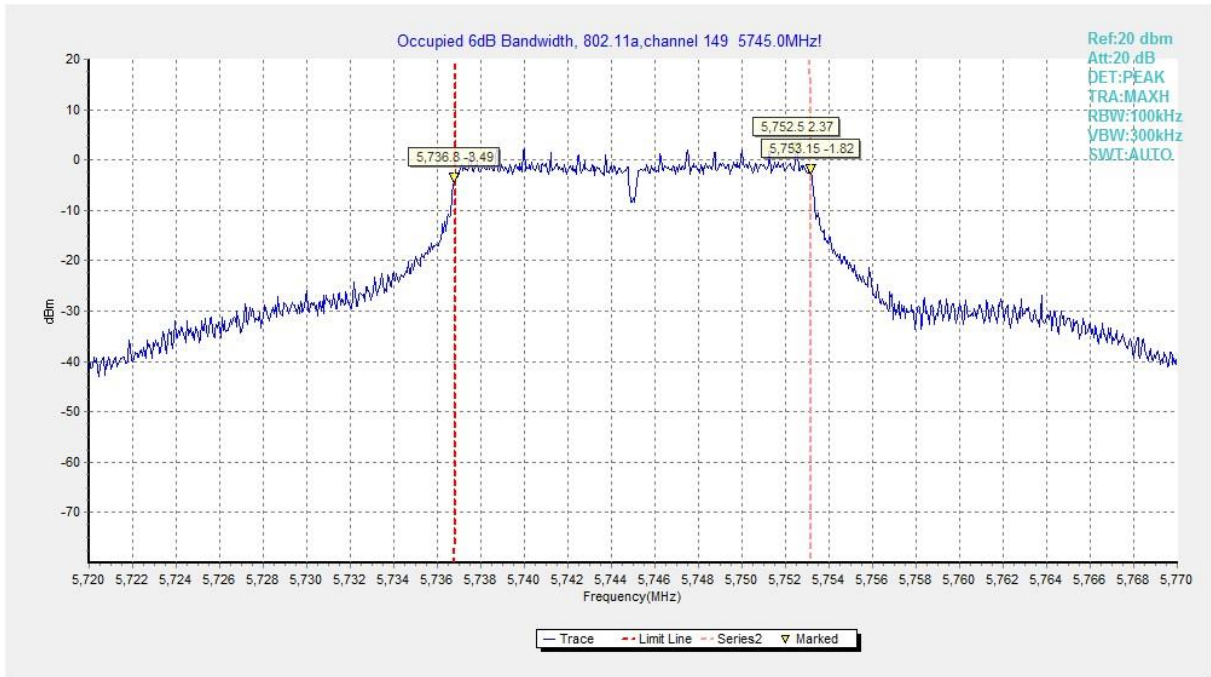
##### Measurement Result:

Mode	Channel	Occupied 6dB Bandwidth ( MHz)		conclusion
		Fig.	Value	
802.11a	149	Fig.1	16.35	P
	157	Fig.2	16.35	P
	165	Fig.3	16.40	P
802.11n HT20	149	Fig.4	17.55	P
	157	Fig.5	17.55	P
	165	Fig.6	17.60	P
802.11ac HT20	149	Fig.7	17.55	P
	157	Fig.8	17.55	P
	165	Fig.9	17.60	P
802.11n HT40	151	Fig.10	35.60	P
	159	Fig.11	35.12	P
802.11ac HT40	151	Fig.12	35.20	P
	159	Fig.13	35.20	P
802.11ac HT80	155	Fig.14	75.20	P

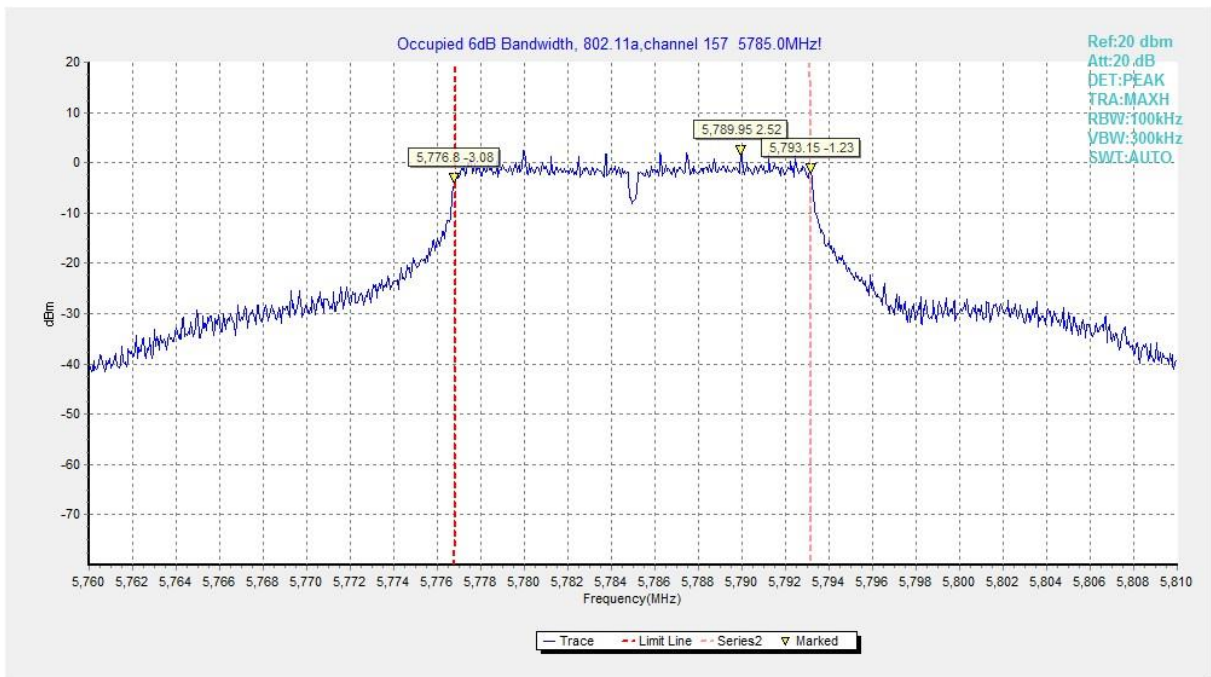
**Conclusion: PASS**

Test graphs as below:

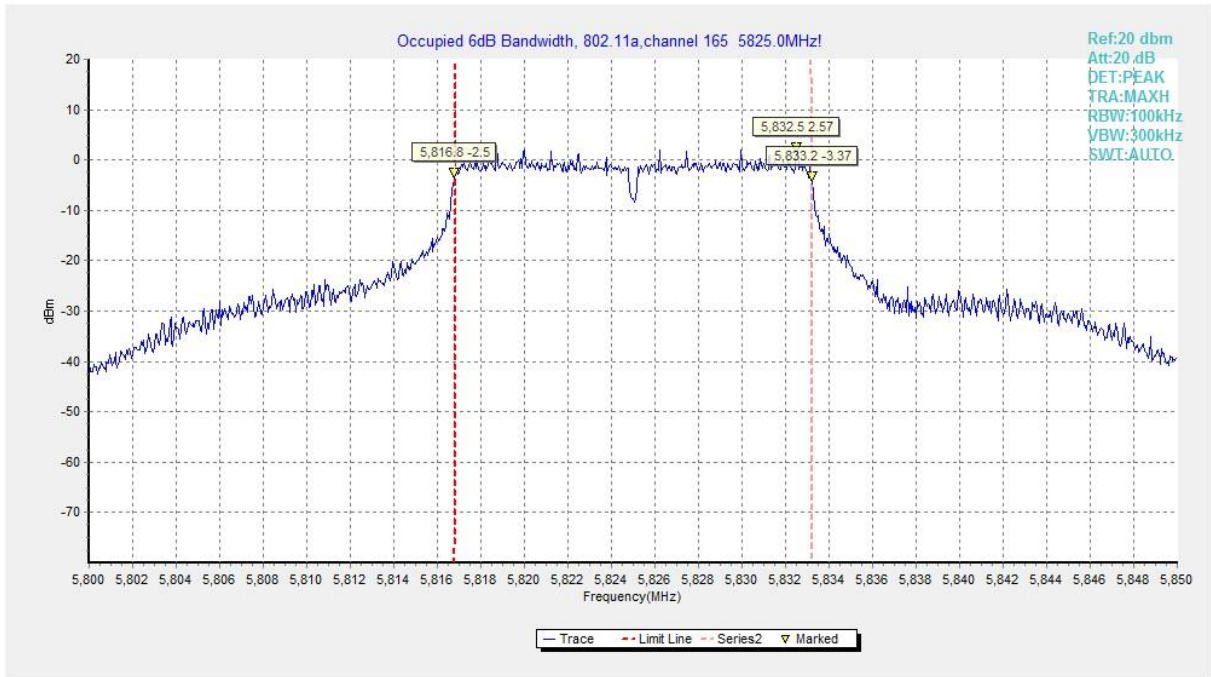




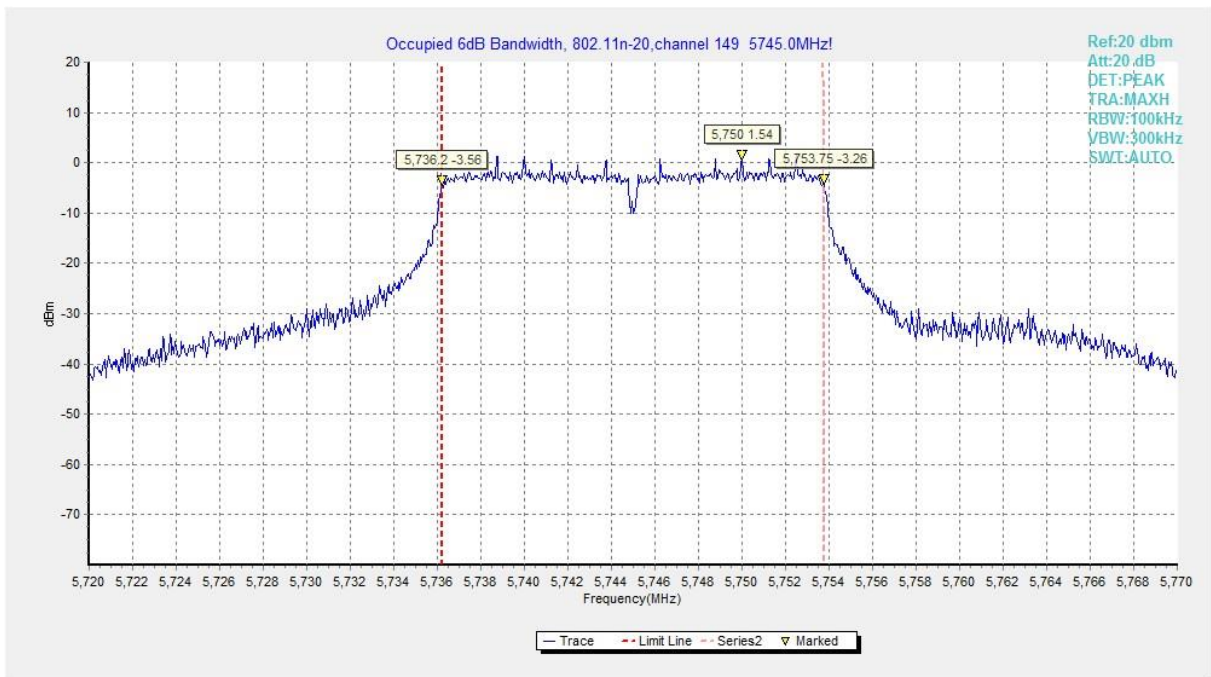
**Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)**



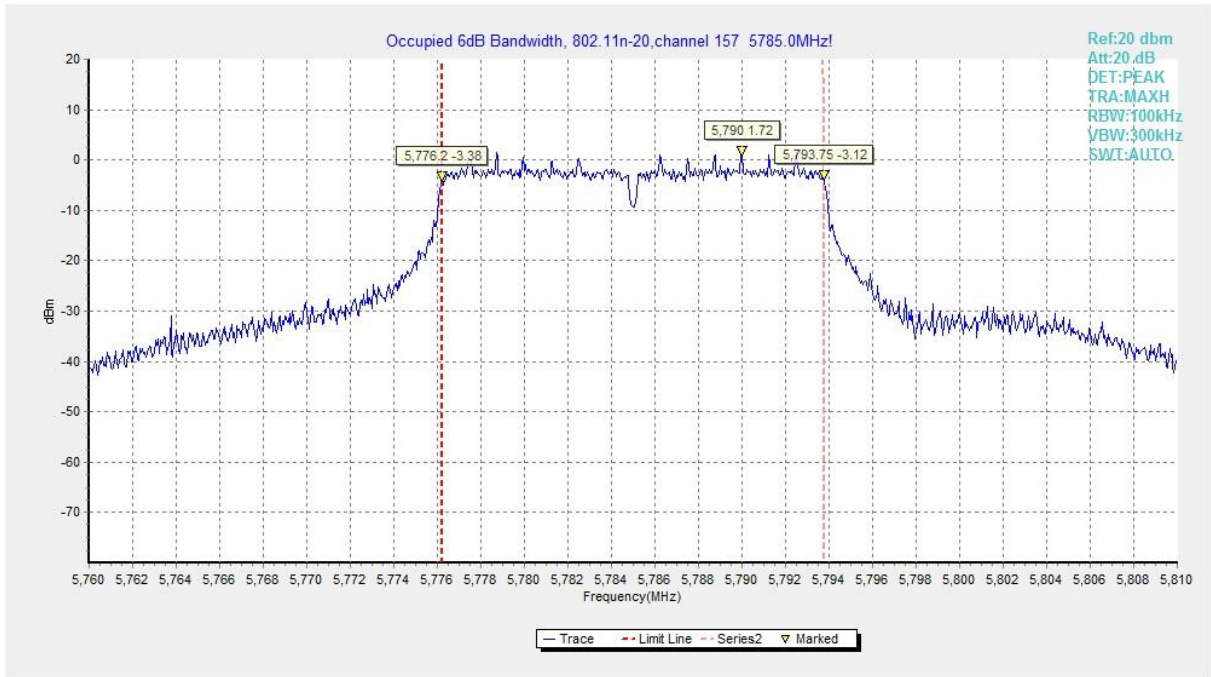
**Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)**



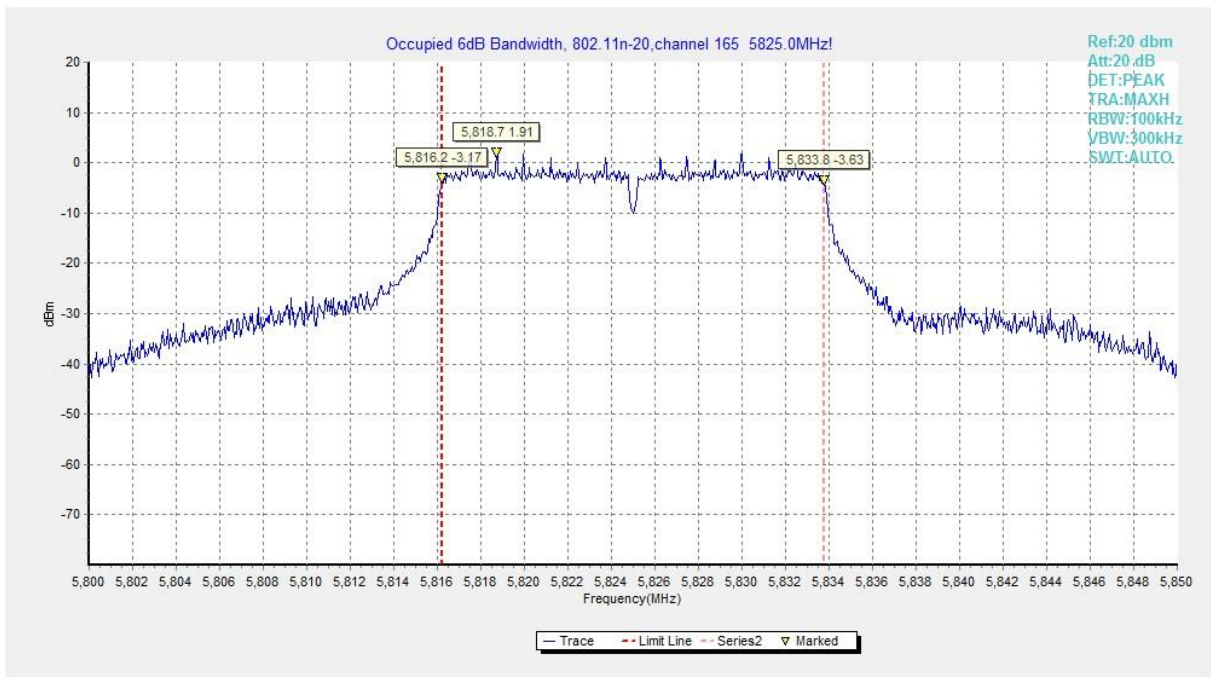
**Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)**



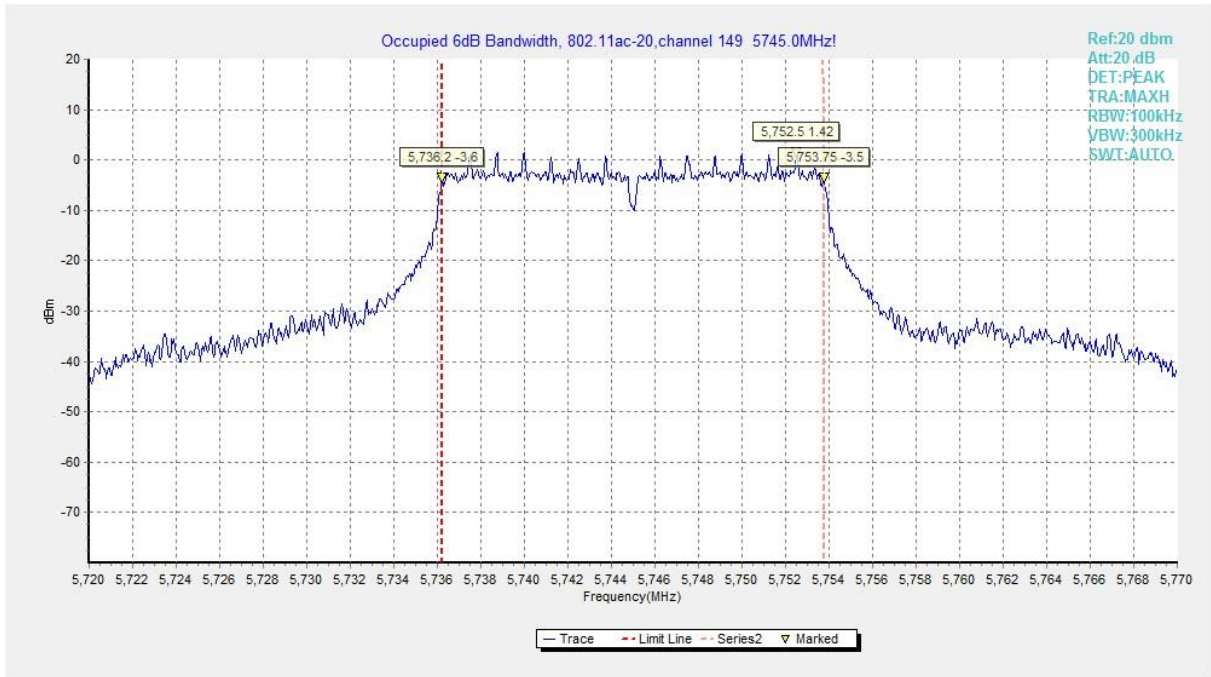
**Fig. 4 Occupied 6dB Bandwidth (802.11n20, Ch 149)**



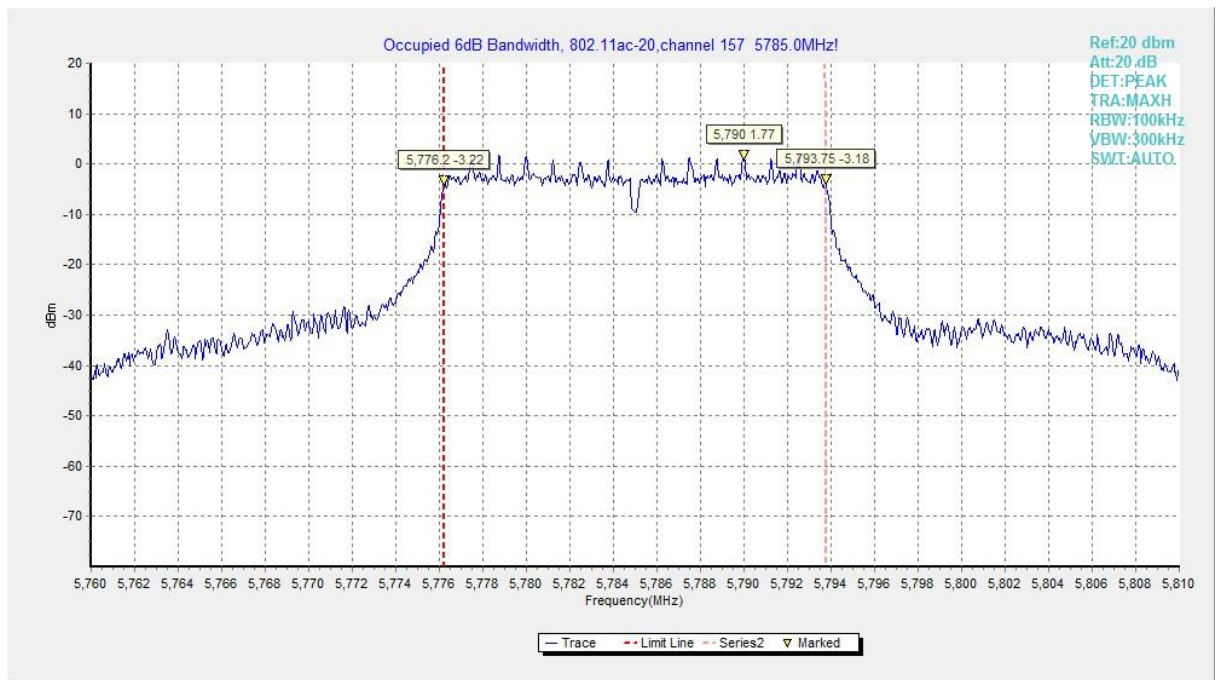
**Fig. 5 Occupied 6dB Bandwidth (802.11n20, Ch 157)**



**Fig. 6 Occupied 6dB Bandwidth (802.11n20, Ch 165)**



**Fig. 7      Occupied 6dB Bandwidth (802.11ac20, Ch 149)**



**Fig. 8      Occupied 6dB Bandwidth (802.11ac20, Ch 157)**

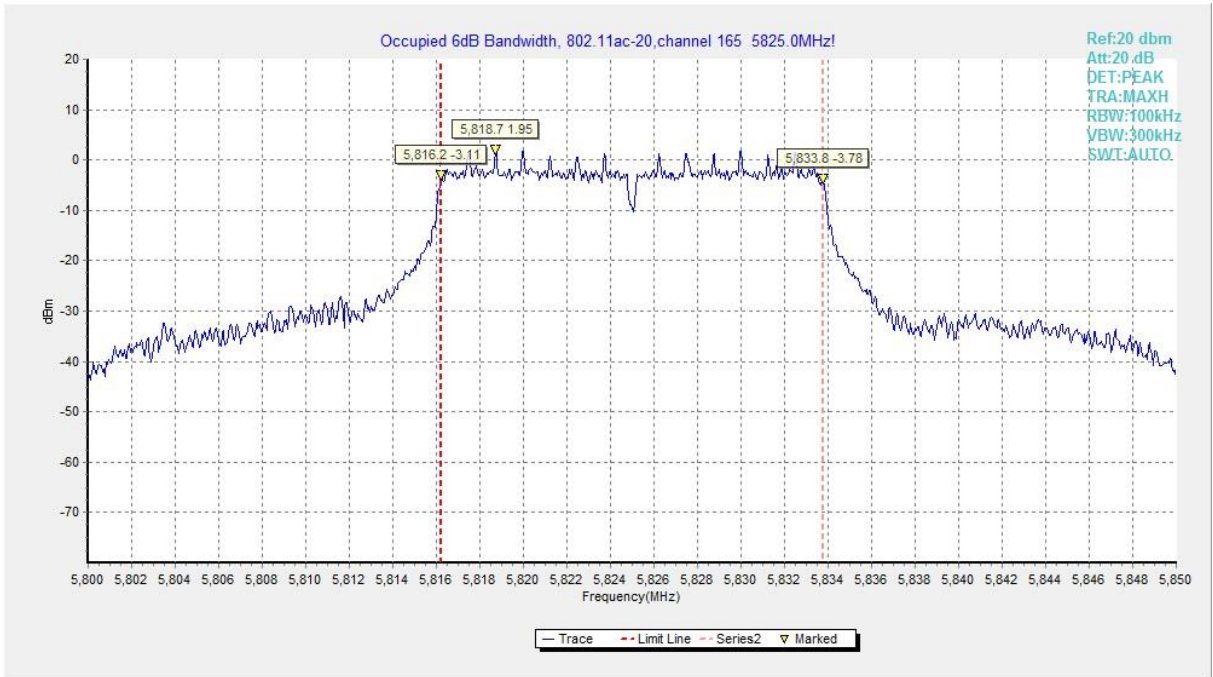


Fig. 9 Occupied 6dB Bandwidth (802.11ac20, Ch 165)

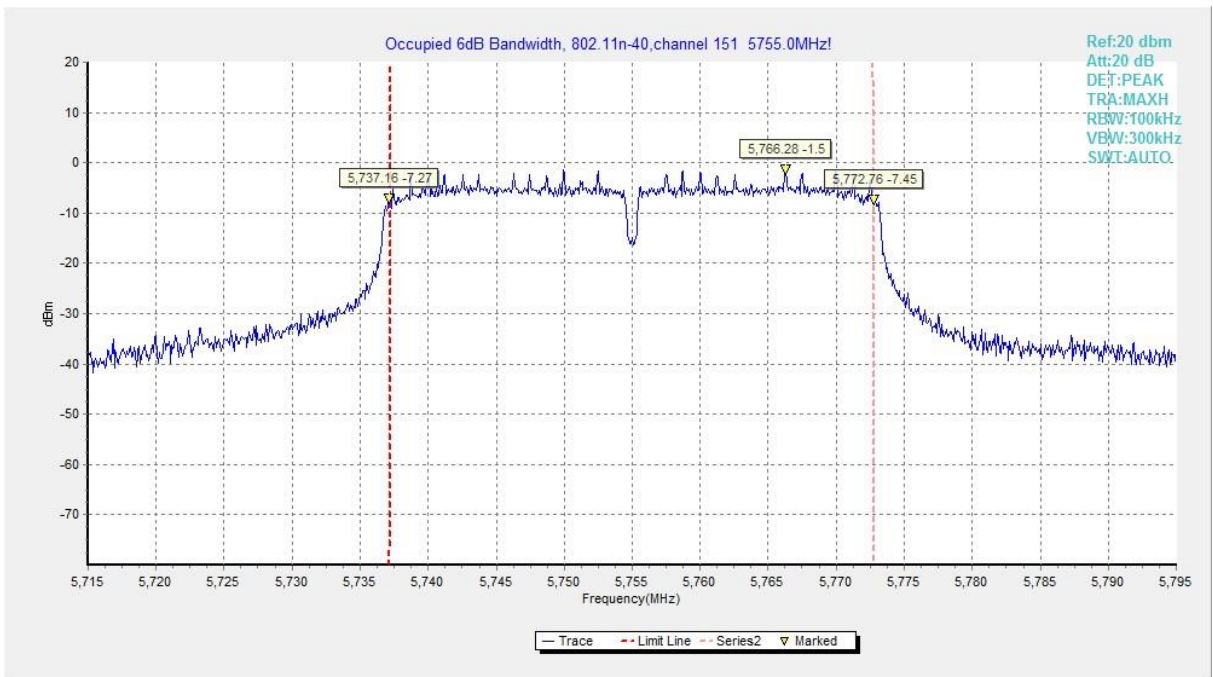
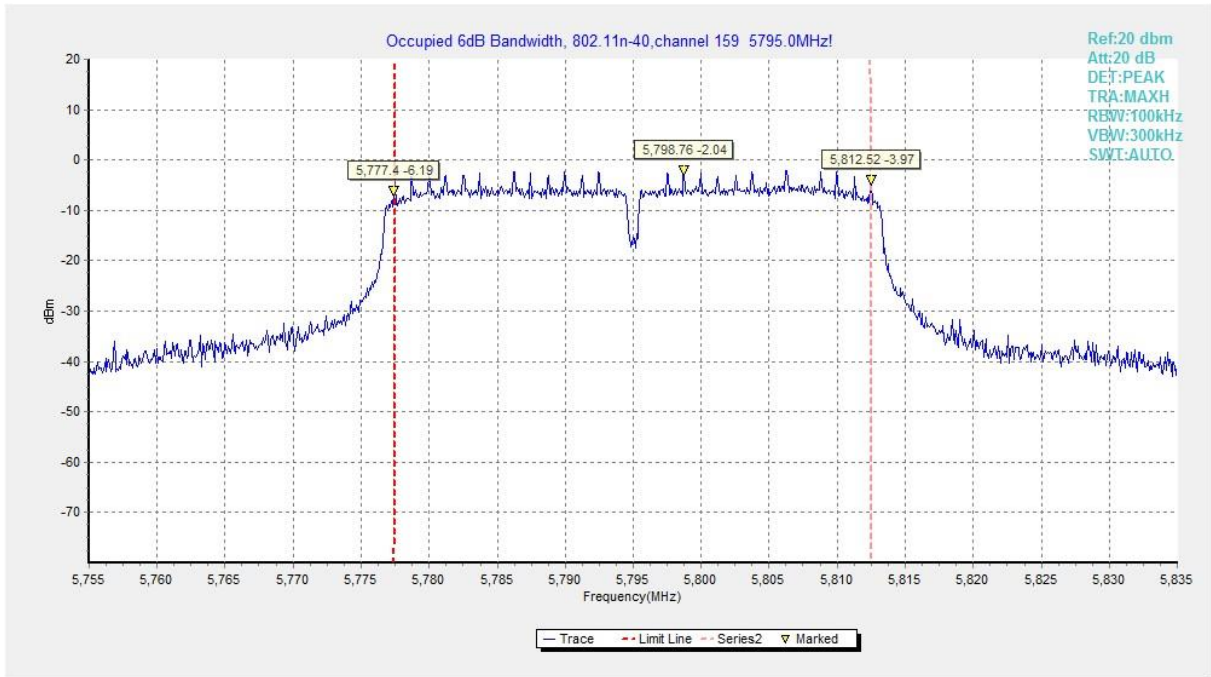
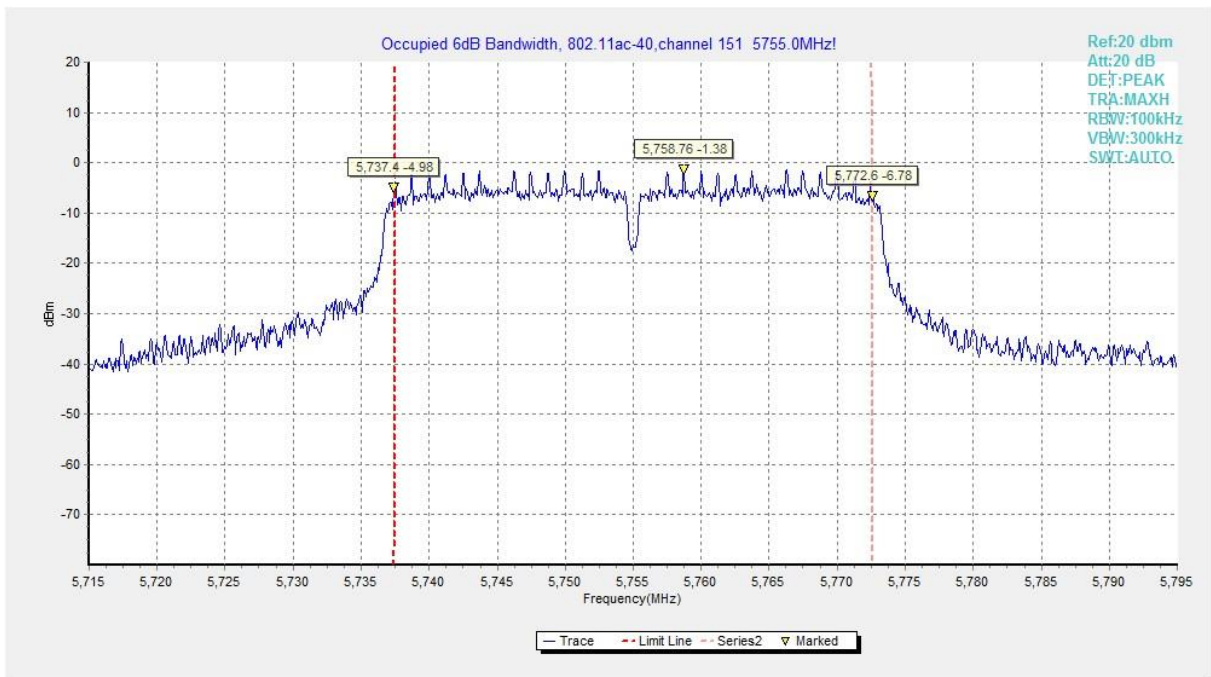


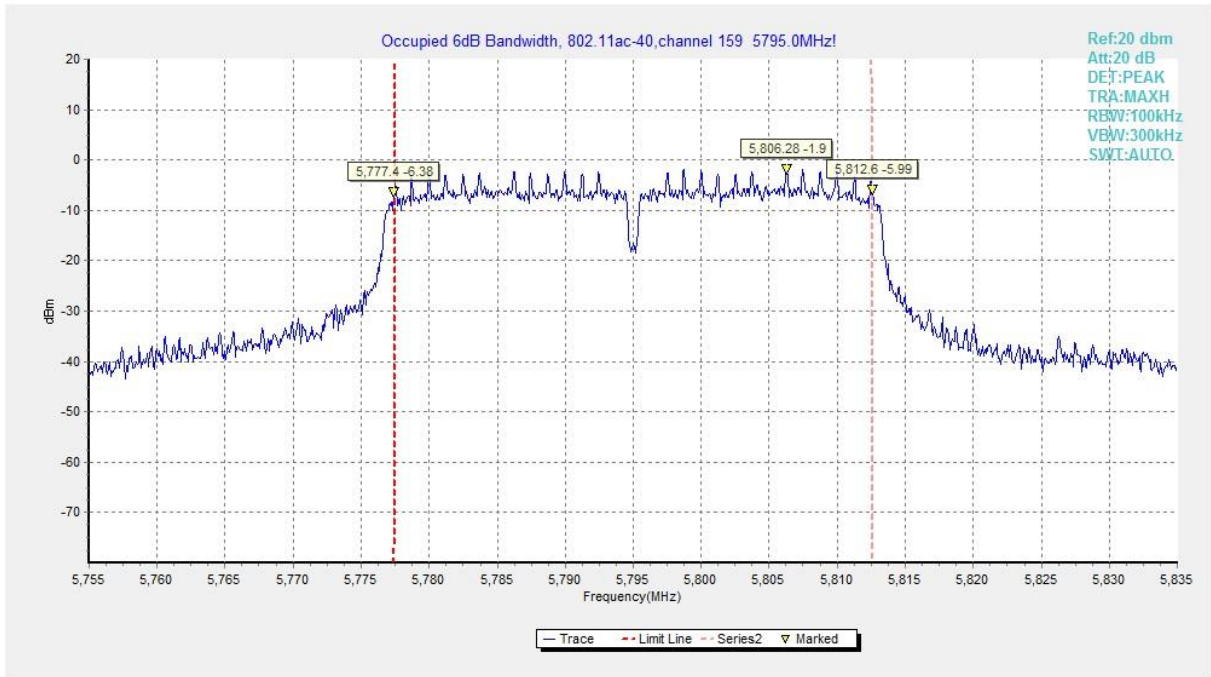
Fig. 10 Occupied 6dB Bandwidth (802.11n40, Ch 151)



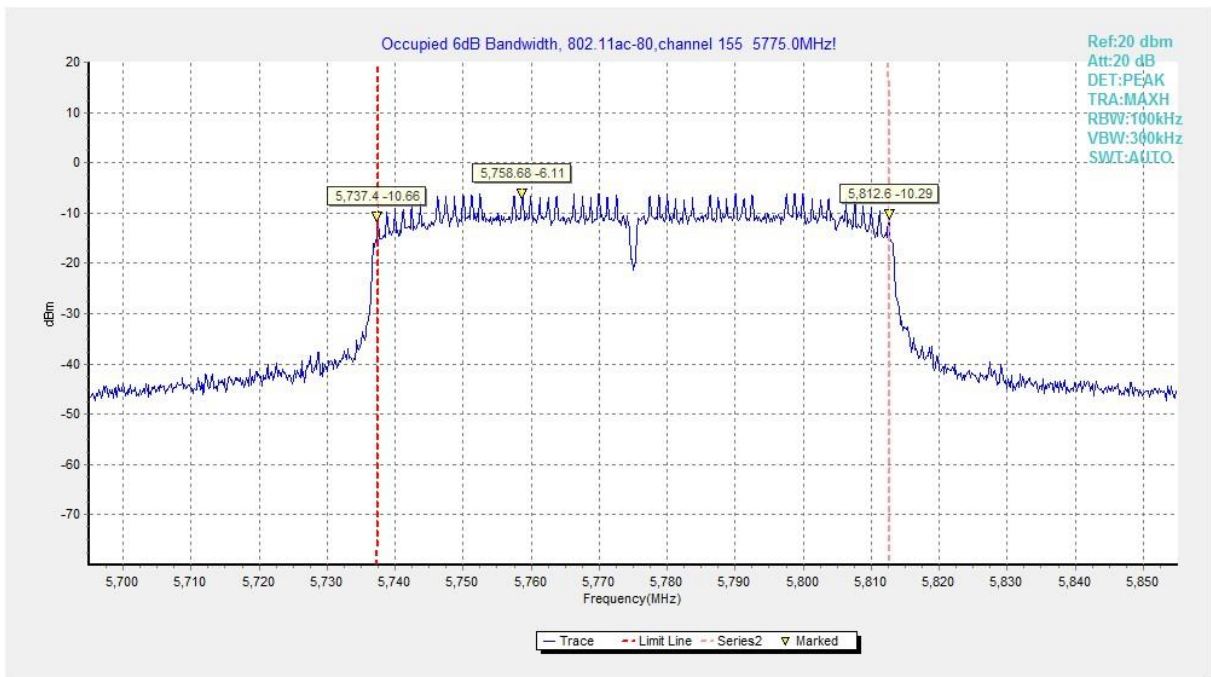
**Fig. 11 Occupied 6dB Bandwidth (802.11n40, Ch 159)**



**Fig. 12 Occupied 6dB Bandwidth (802.11ac40, Ch 151)**



**Fig. 13 Occupied 6dB Bandwidth (802.11ac40, Ch 159)**



**Fig. 14 Occupied 6dB Bandwidth (802.11ac80, Ch 155)**

## A.5. Transmitter Spurious Emission

### Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	5725MHz~5850MHz	< -27

The measurement is made according to ANSI C63.10 .

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

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

### Measurement Uncertainty:

Frequency Range	Uncertainty(dB)
30MHz ≤ f ≤ 2GHz	0.63
2GHz ≤ f ≤ 3.6GHz	0.82
3.6GHz ≤ f ≤ 8GHz	1.55
8GHz ≤ f ≤ 20GHz	1.86
20GHz ≤ f ≤ 22GHz	1.90
22GHz ≤ f ≤ 26GHz	2.20

### A.5.1 Transmitter Spurious Emission - Radiated

#### Measurement Limit:

Standard	Frequency (MHz)	Limit (dBm/MHz)
FCC 47 CFR Part 15.407	5725MHz~5850MHz	< -27

The measurement is made according to ANSI C63.10 .

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

#### Limit in restricted band:

Frequency of emission (MHz)	Field strength (uV/m)	Field strength (dBμV/m)	Measurement distance(m)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

#### Measurement Results:

#### Note:

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss", and



including the gain of receive antenna, the gain of the preamplifier, the cable loss.

$P_{Mea}$  is the field strength recorded from the instrument.

**Average Results:**

**802.11a**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11a Channel 149							
17943.9	45	-25.5	46.7	23.8	V	54	9
17960.4	45	-25.5	46.7	23.8	V	54	9
17975.8	45	-25.5	46.7	23.8	H	54	9
17981.3	45	-25.5	46.7	23.8	H	54	9
17948.3	44.9	-25.5	46.7	23.7	H	54	9.1
17950.5	44.9	-25.5	46.7	23.7	H	54	9.1
802.11a Channel 157							
17948.3	45	-25.5	46.7	23.8	V	54	9
17984.6	45	-25.5	46.7	23.8	H	54	9
17993.4	45	-25.5	46.7	23.8	V	54	9
17997.8	45	-25.5	46.7	23.8	H	54	9
17954.9	44.9	-25.5	46.7	23.7	V	54	9.1
17967	44.9	-25.5	46.7	23.7	H	54	9.1
802.11a Channel 165							
17997.8	45.1	-25.5	46.7	23.9	H	54	8.9
17949.4	45	-25.5	46.7	23.8	V	54	9
17953.8	45	-25.5	46.7	23.8	V	54	9
17985.7	45	-25.5	46.7	23.8	H	54	9
17990.1	45	-25.5	46.7	23.8	H	54	9
17950.5	44.9	-25.5	46.7	23.7	H	54	9.1

**802.11n-HT20**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11n Channel 149</b>							
17957.1	45.1	-25.5	46.7	23.9	V	54	8.9
17961.5	45.1	-25.5	46.7	23.9	V	54	8.9
17996.7	45.1	-25.5	46.7	23.9	H	54	8.9
17952.7	45	-25.5	46.7	23.8	H	54	9
17991.2	45	-25.5	46.7	23.8	V	54	9
17943.9	44.9	-25.5	46.7	23.7	V	54	9.1
<b>802.11n Channel 157</b>							
17946.1	45.1	-25.5	46.7	23.9	H	54	8.9
17953.8	45.1	-25.5	46.7	23.9	H	54	8.9
17995.6	45.1	-25.5	46.7	23.9	V	54	8.9
17949.4	45	-25.5	46.7	23.8	V	54	9
17951.6	45	-25.5	46.7	23.8	H	54	9
17979.1	45	-25.5	46.7	23.8	H	54	9
<b>802.11n Channel 165</b>							
17984.6	45.1	-25.5	46.7	23.9	V	54	8.9
17941.7	45	-25.5	46.7	23.8	V	54	9
17953.8	45	-25.5	46.7	23.8	V	54	9
17964.8	45	-25.5	46.7	23.8	H	54	9
17978	45	-25.5	46.7	23.8	H	54	9
17979.1	45	-25.5	46.7	23.8	H	54	9

**802.11n-HT40**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11n-HT40 Channel 151</b>							
17990.1	45.2	-25.5	46.7	24	H	54	8.8
17961.5	45.1	-25.5	46.7	23.9	H	54	8.9
17951.6	45	-25.5	46.7	23.8	V	54	9
17953.8	45	-25.5	46.7	23.8	V	54	9
17958.2	45	-25.5	46.7	23.8	V	54	9
17960.4	45	-25.5	46.7	23.8	H	54	9
<b>802.11n-HT40 Channel 159</b>							
17952.7	45.4	-25.5	46.7	24.2	H	54	8.6
17954.9	45.1	-25.5	46.7	23.9	V	54	8.9
17995.6	45.1	-25.5	46.7	23.9	V	54	8.9
17996.7	45.1	-25.5	46.7	23.9	H	54	8.9
17975.8	45	-25.5	46.7	23.8	V	54	9
17946.1	44.9	-25.5	46.7	23.7	V	54	9.1

**802.11ac-VHT20**

Frequency (MHz)	Result (dBUV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBUV/m)	Polarization	Limit (dBUV/m)	Margin (dBUV/m)
<b>802.11ac-VHT20 Channel 149</b>							
17962.6	45	-25.5	46.7	23.8	H	54	9
17963.7	45	-25.5	46.7	23.8	V	54	9
17994.5	45	-25.5	46.7	23.8	H	54	9
17954.9	44.9	-25.5	46.7	23.7	V	54	9.1
17957.1	44.9	-25.5	46.7	23.7	H	54	9.1
17984.6	44.9	-25.5	46.7	23.7	H	54	9.1
<b>802.11ac-VHT20 Channel 157</b>							
17958.2	45.2	-25.5	46.7	24	H	54	8.8
17987.9	45.2	-25.5	46.7	24	H	54	8.8
17991.2	45.1	-25.5	46.7	23.9	H	54	8.9
17942.8	45	-25.5	46.7	23.8	H	54	9
17960.4	45	-25.5	46.7	23.8	H	54	9
17964.8	45	-25.5	46.7	23.8	V	54	9
<b>802.11ac-VHT20 Channel 165</b>							
17989	45.2	-25.5	46.7	24	H	54	8.8
17957.1	45.1	-25.5	46.7	23.9	V	54	8.9
17963.7	45.1	-25.5	46.7	23.9	V	54	8.9
17980.2	45.1	-25.5	46.7	23.9	H	54	8.9
17995.6	45.1	-25.5	46.7	23.9	V	54	8.9
17940.6	45	-25.5	46.7	23.8	V	54	9

**802.11ac-VHT40**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11ac-VHT40 Channel 151</b>							
17982.4	45.3	-25.5	46.7	24.1	V	54	8.7
17963.7	45	-25.5	46.7	23.8	V	54	9
17983.5	45	-25.5	46.7	23.8	H	54	9
17994.5	45	-25.5	46.7	23.8	V	54	9
17948.3	44.9	-25.5	46.7	23.7	H	54	9.1
17957.1	44.9	-25.5	46.7	23.7	V	54	9.1
<b>802.11ac-VHT40 Channel 159</b>							
17975.8	45.2	-25.5	46.7	24	H	54	8.8
17982.4	45.1	-25.5	46.7	23.9	H	54	8.9
17948.3	44.9	-25.5	46.7	23.7	V	54	9.1
17954.9	44.9	-25.5	46.7	23.7	H	54	9.1
17974.7	44.9	-25.5	46.7	23.7	V	54	9.1
17976.9	44.9	-25.5	46.7	23.7	V	54	9.1

**802.11ac-VHT80**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11ac-VHT80 Channel 155</b>							
17943.9	45.2	-25.5	46.7	24	V	54	8.8
17981.3	45	-25.5	46.7	23.8	V	54	9
17957.1	44.9	-25.5	46.7	23.7	H	54	9.1
17994.5	44.9	-25.5	46.7	23.7	H	54	9.1
17995.6	44.9	-25.5	46.7	23.7	V	54	9.1
17952.7	44.8	-25.5	46.7	23.6	V	54	9.2

**Peak Results:**
**802.11a**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
802.11a Channel 149							
17994.5	57.1	-25.5	46.7	35.9	H	74	16.9
17946.1	57	-25.5	46.7	35.8	H	74	17
17873.5	56.5	-25.5	46.7	35.3	V	74	17.5
17993.4	56.5	-25.5	46.7	35.3	V	74	17.5
17928.5	56.2	-25.5	46.7	35	H	74	17.8
5724.2	75.8	-16.3	34.3	57.8	H	120	44.2
802.11a Channel 157							
17953.8	57.1	-25.5	46.7	35.9	H	74	16.9
17986.8	56.8	-25.5	46.7	35.6	H	74	17.2
17952.7	56.7	-25.5	46.7	35.5	H	74	17.3
17958.2	56.7	-25.5	46.7	35.5	H	74	17.3
17971.4	56.6	-25.5	46.7	35.4	V	74	17.4
17979.1	56.6	-25.5	46.7	35.4	V	74	17.4
802.11a Channel 165							
17969.2	56.8	-25.5	46.7	35.6	V	74	17.2
17957.1	56.5	-25.5	46.7	35.3	H	74	17.5
17972.5	56.5	-25.5	46.7	35.3	H	74	17.5
17986.8	56.5	-25.5	46.7	35.3	H	74	17.5
17995.6	56.5	-25.5	46.7	35.3	V	74	17.5
5850.5	68.7	-16.2	34.4	50.6	H	122	53.3

**802.11n-HT20**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
<b>802.11n Channel 149</b>							
17959.3	57	-25.5	46.7	35.8	H	74	17
17945	56.6	-25.5	46.7	35.4	H	74	17.4
17935.1	56.5	-25.5	46.7	35.3	V	74	17.5
17956	56.5	-25.5	46.7	35.3	H	74	17.5
17930.7	56.4	-25.5	46.7	35.2	V	74	17.6
5724.9	71.8	-16.3	34.3	53.8	H	121	49.2
<b>802.11n Channel 157</b>							
17947.2	56.8	-25.5	46.7	35.6	H	74	17.2
17762.4	56.6	-25.5	46.7	35.4	H	74	17.4
17969.2	56.6	-25.5	46.7	35.4	H	74	17.4
17960.4	56.5	-25.5	46.7	35.3	H	74	17.5
17974.7	56.5	-25.5	46.7	35.3	H	74	17.5
17997.8	56.5	-25.5	46.7	35.3	H	74	17.5
<b>802.11n Channel 165</b>							
17926.3	57.5	-25.5	46.7	36.3	H	74	16.5
17958.2	56.9	-25.5	46.7	35.7	V	74	17.1
17947.2	56.7	-25.5	46.7	35.5	V	74	17.3
17954.9	56.7	-25.5	46.7	35.5	H	74	17.3
17984.6	56.6	-25.5	46.7	35.4	V	74	17.4
5850.6	65.3	-16.2	34.4	47.2	H	122	56.7

**802.11n-HT40**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11n-HT40 Channel 151</b>							
17949.4	57.3	-25.5	46.7	36.1	H	74	16.7
17996.7	57.3	-25.5	46.7	36.1	H	74	16.7
17976.9	56.6	-25.5	46.7	35.4	H	74	17.4
17970.3	56.5	-25.5	46.7	35.3	H	74	17.5
17995.6	56.5	-25.5	46.7	35.3	H	74	17.5
5724.2	69.2	-16.3	34.3	51.2	H	120	50.8
<b>802.11n-HT40 Channel 159</b>							
17965.9	57.2	-25.5	46.7	36	H	74	16.8
17896.6	57	-25.5	46.7	35.8	V	74	17
17817.4	56.9	-25.5	46.7	35.7	H	74	17.1
17919.7	56.9	-25.5	46.7	35.7	V	74	17.1
17992.3	56.8	-25.5	46.7	35.6	H	74	17.2
5850	56.9	-16.2	34.4	38.8	H	122	65.1



**802.11ac-HT20**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Margin (dBuV/m)
<b>802.11ac-VHT20 Channel 149</b>							
17948.3	57.7	-25.5	46.7	36.5	V	74	16.3
17971.4	56.8	-25.5	46.7	35.6	V	74	17.2
17897.7	56.5	-25.5	46.7	35.3	H	74	17.5
17975.8	56.5	-25.5	46.7	35.3	V	74	17.5
17987.9	56.5	-25.5	46.7	35.3	H	74	17.5
5723.5	68.8	-16.3	34.3	50.8	H	119	50.2
<b>802.11ac-VHT20 Channel 157</b>							
17974.7	57.4	-25.5	46.7	36.2	H	74	16.6
17978	57.4	-25.5	46.7	36.2	H	74	16.6
17903.2	56.8	-25.5	46.7	35.6	V	74	17.2
17637	56.7	-25.7	46	36.5	H	74	17.3
17984.6	56.7	-25.5	46.7	35.5	V	74	17.3
17965.9	56.6	-25.5	46.7	35.4	V	74	17.4
<b>802.11ac-VHT20 Channel 165</b>							
17996.7	57.1	-25.5	46.7	35.9	H	74	16.9
17995.6	56.6	-25.5	46.7	35.4	V	74	17.4
17990.1	56.4	-25.5	46.7	35.2	V	74	17.6
17993.4	56.3	-25.5	46.7	35.1	V	74	17.7
17754.7	56.2	-25.5	46.7	35	V	74	17.8
5850	68.4	-16.2	34.4	50.3	H	122	53.6

**802.11ac-HT40**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
<b>802.11ac-VHT40 Channel 151</b>							
17890	57.2	-25.5	46.7	36	H	74	16.8
17952.7	57.2	-25.5	46.7	36	H	74	16.8
17950.5	56.8	-25.5	46.7	35.6	H	74	17.2
17954.9	56.7	-25.5	46.7	35.5	V	74	17.3
17946.1	56.5	-25.5	46.7	35.3	V	74	17.5
5720.3	64.5	-16.3	34.3	46.5	H	112	47.5
<b>802.11ac-VHT40 Channel 159</b>							
17987.9	56.8	-25.5	46.7	35.6	H	74	17.2
17945	56.7	-25.5	46.7	35.5	H	74	17.3
17996.7	56.6	-25.5	46.7	35.4	H	74	17.4
17962.6	56	-25.5	46.7	34.8	V	74	18
17980.2	56	-25.5	46.7	34.8	V	74	18
5853.1	56.1	-16.2	34.4	38	H	115	58.9

**802.11ac-HT80**

Frequency (MHz)	Result (dBuV/m)	Cable Loss (dB)	Antenna Factor	PMea (dBuV/m)	Polarization	Limit (dBuV/m)	Magin (dBuV/m)
<b>802.11ac-VHT80 Channel 155</b>							
17971.4	57.3	-25.5	46.7	36.1	H	74	16.7
17868	56.4	-25.5	46.7	35.2	V	74	17.6
17993.4	56.4	-25.5	46.7	35.2	H	74	17.6
17905.4	56.2	-25.5	46.7	35	H	74	17.8
17975.8	56.2	-25.5	46.7	35	H	74	17.8
17983.5	56.2	-25.5	46.7	35	H	74	17.8

**Conclusion: PASS**

## A.6. Band Edges Compliance

### A6.1 Band Edges - Radiated

#### Measurement Limit:

Standard	Limit (dBm/MHz)	
FCC 47 CFR Part 15.407	at the band edge	27
	at 5 MHz above or below the band edge	15.6
	at 25 MHz above or below the band edge	10
	at 75 MHz or more above or below the band edge	-27
	Note: increasing linearly from point to point.	

The measurement is made according to KDB 789033 D02

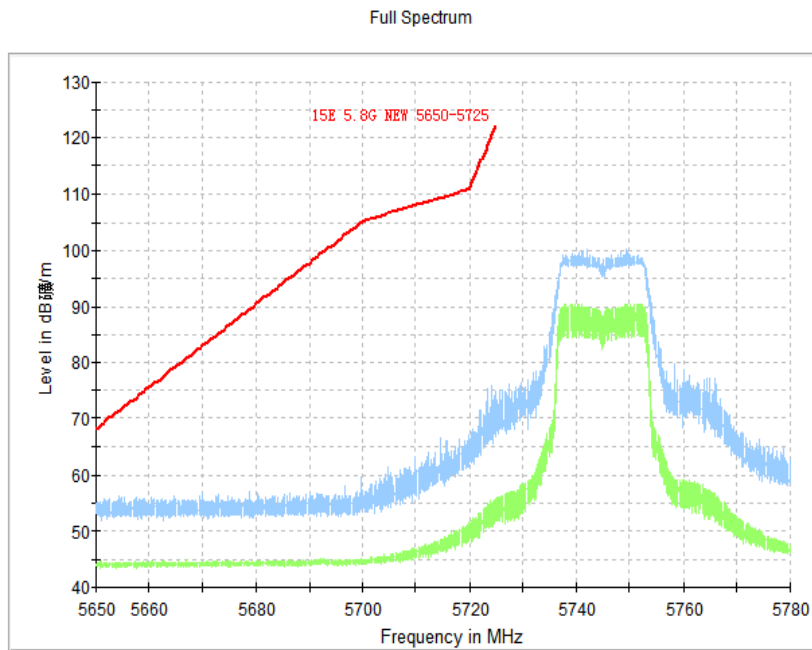
In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

#### Measurement Result:

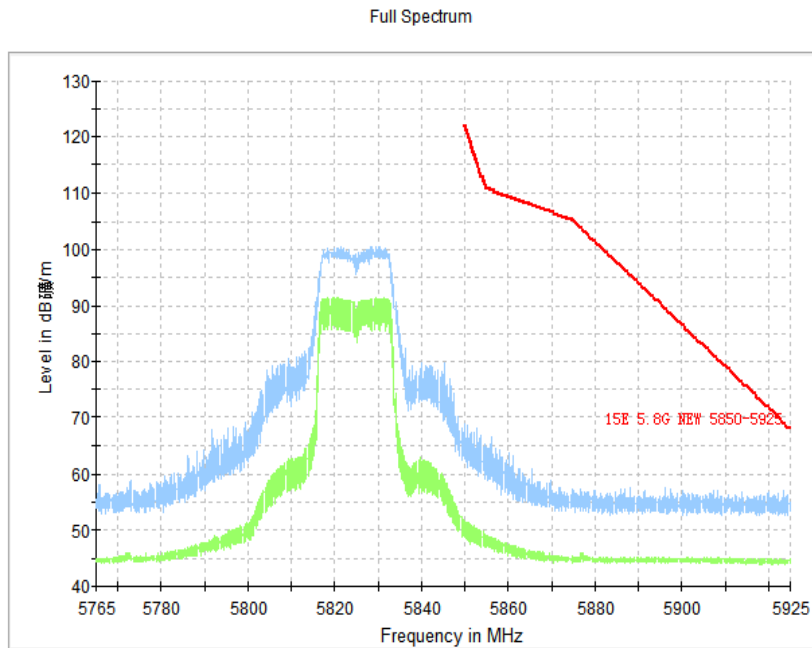
Mode	Channel	Test Results	Conclusion
802.11a	5745 MHz	Fig.15	P
	5825 MHz	Fig.16	P
802.11n HT20	5745 MHz	Fig.17	P
	5825 MHz	Fig.18	P
802.11ac HT20	5745 MHz	Fig.19	P
	5825 MHz	Fig.20	P
802.11n HT40	5755 MHz	Fig.21	P
	5795 MHz	Fig.22	P
802.11ac HT40	5755 MHz	Fig.23	P
	5795 MHz	Fig.24	P
802.11ac HT80	5775 MHz	Fig.25	P
	5775 MHz	Fig.26	P

**Conclusion: PASS**

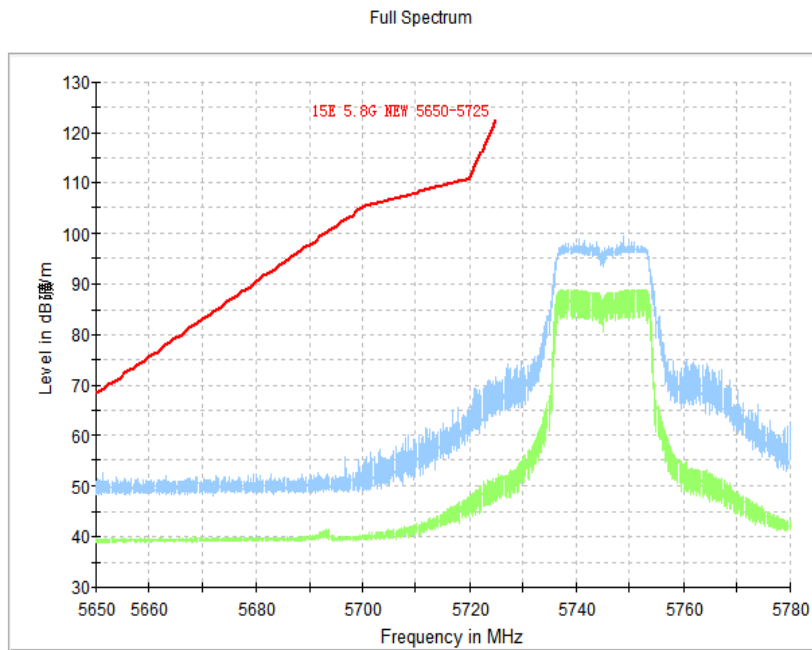
Test graphs as below:



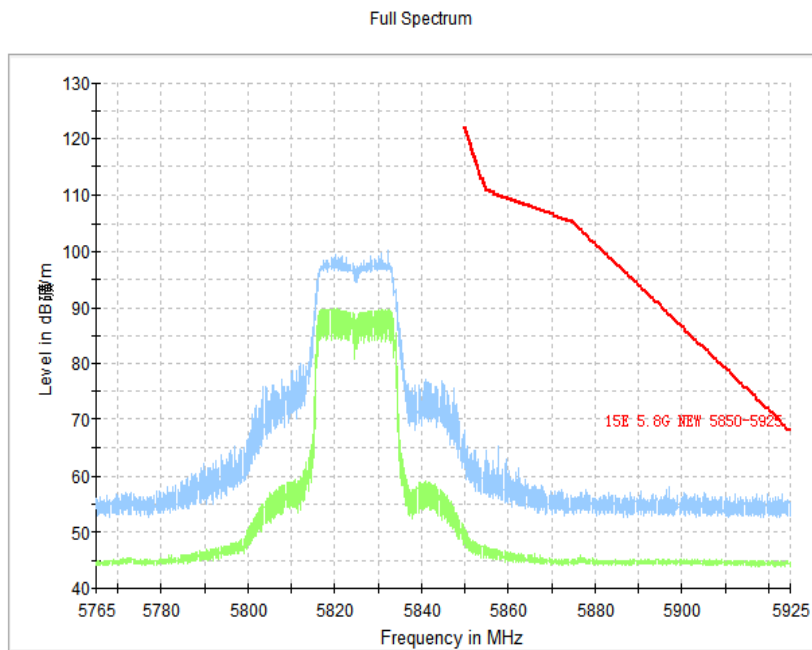
**Fig. 15 Band Edges (802.11a, 5745MHz)**



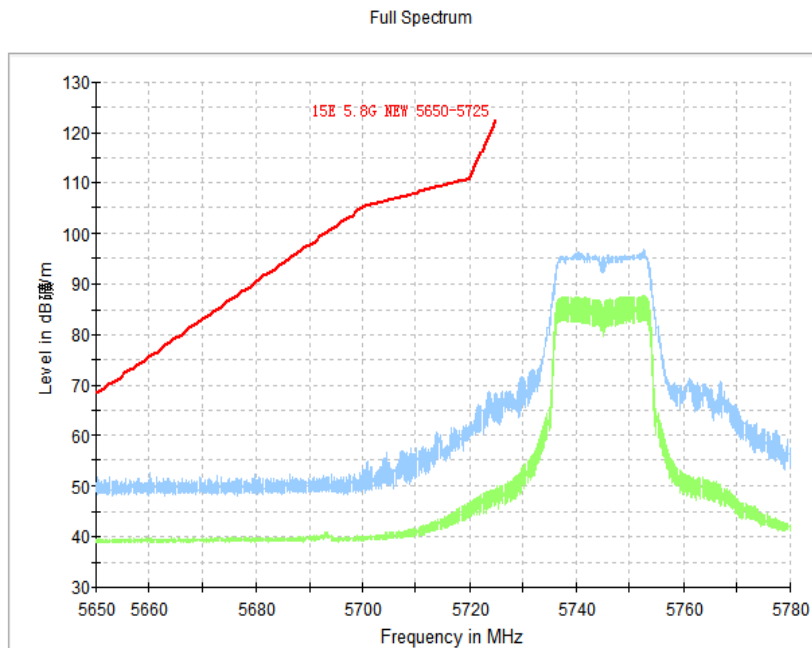
**Fig. 16 Band Edges (802.11a, 5825MHz)**



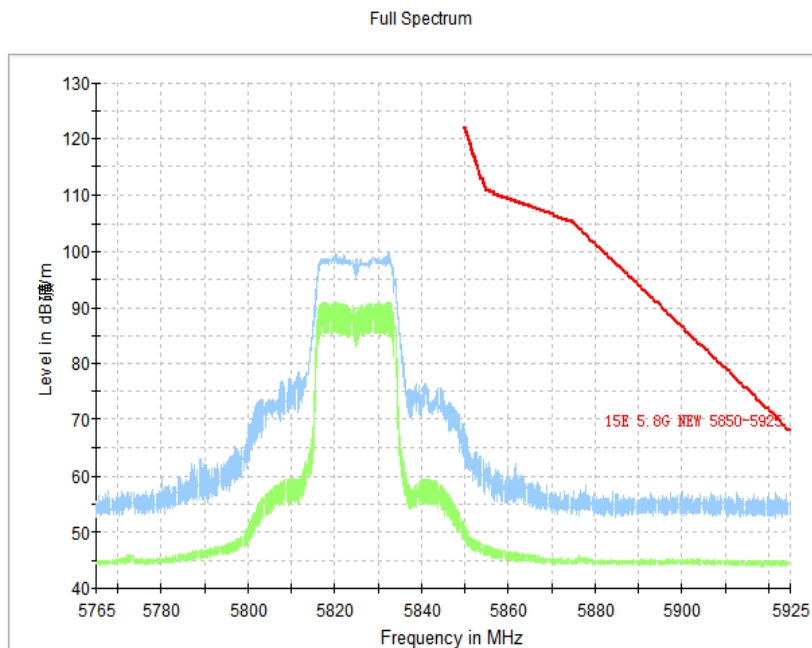
**Fig. 17 Band Edges (802.11n-HT20, 5745MHz)**



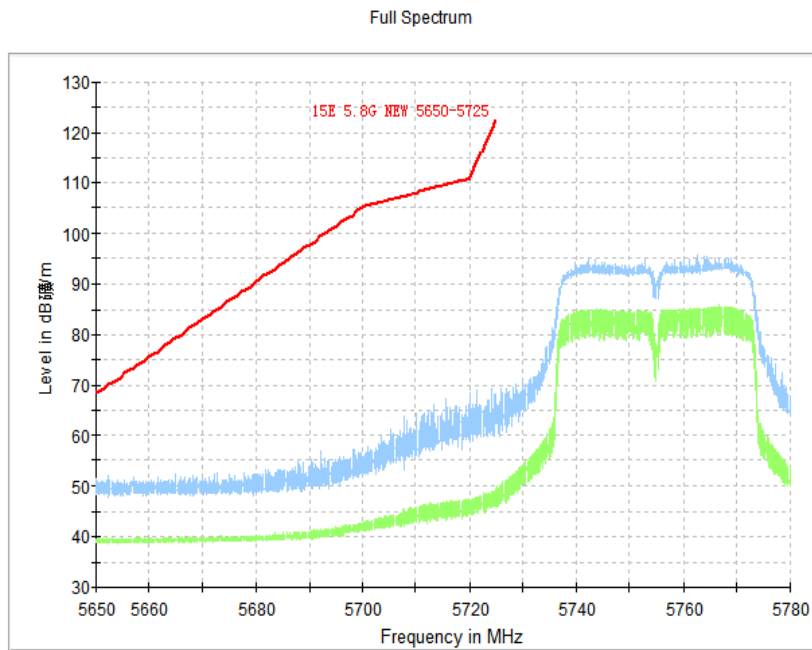
**Fig. 18 Band Edges (802.11n-HT20, 5825MHz)**



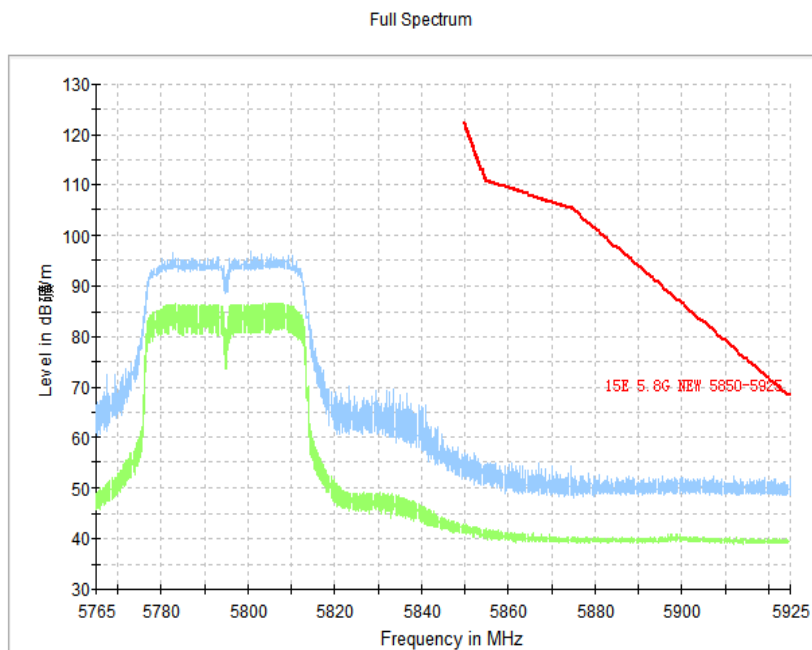
**Fig. 19 Band Edges (802.11ac-HT20, 5745MHz)**



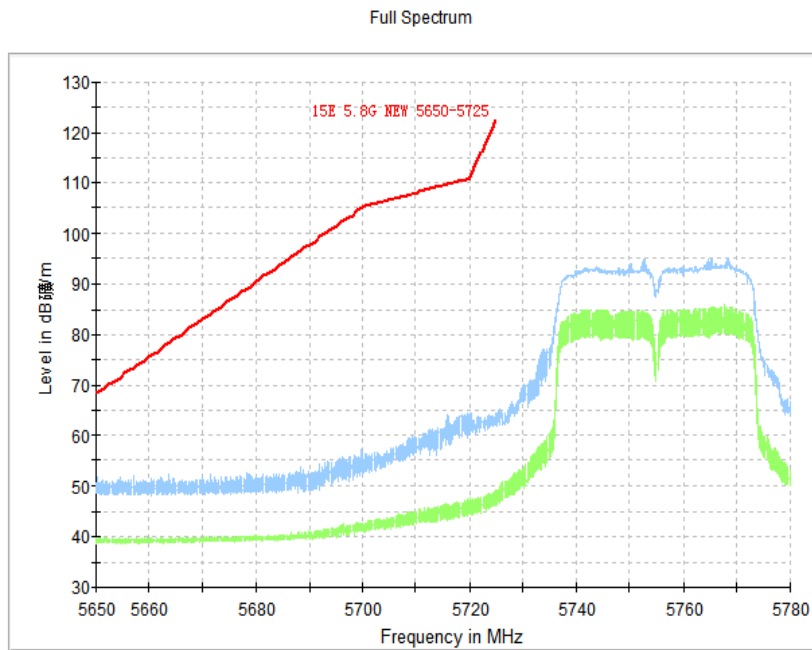
**Fig. 20 Band Edges (802.11ac-HT20, 5825MHz)**



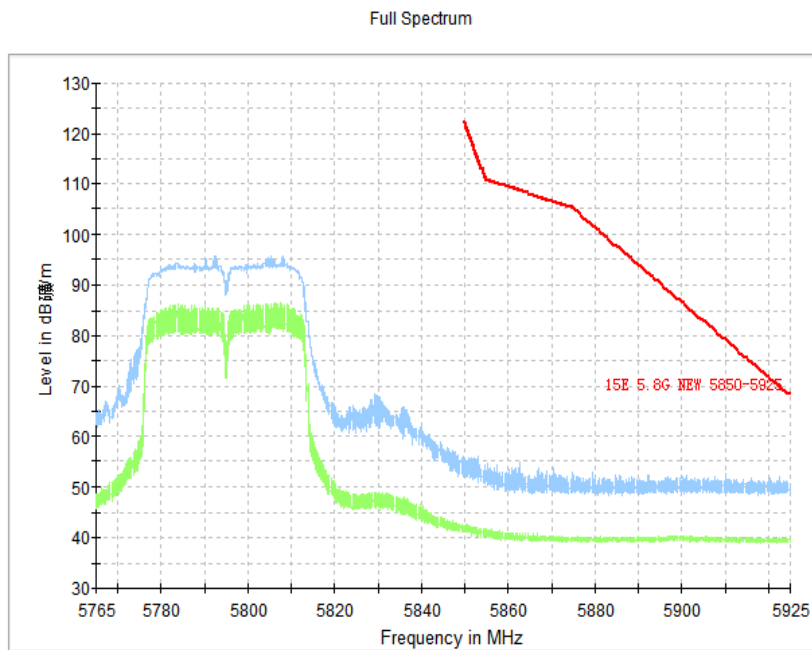
**Fig. 21 Band Edges (802.11n-HT40, 5755MHz)**



**Fig. 22 Band Edges (802.11n-HT40, 5795MHz)**

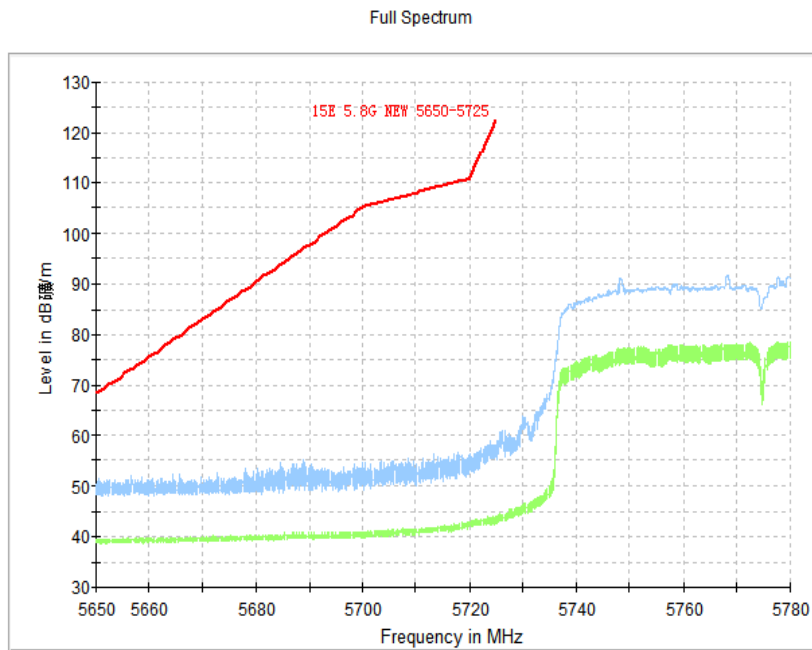


**Fig. 23 Band Edges (802.11ac-HT40, 5755MHz)**

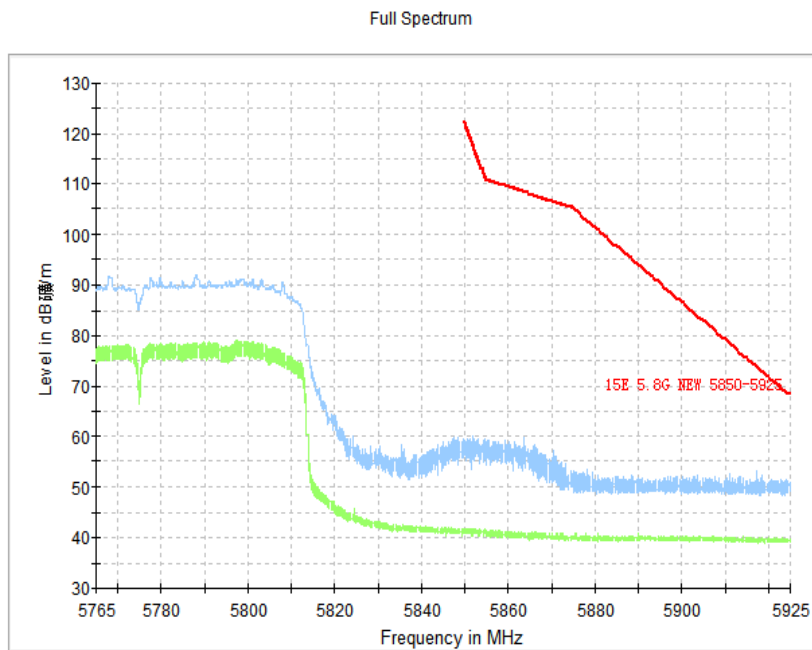


**Fig. 24 Band Edges (802.11ac-HT40, 5795MHz)**





**Fig. 25 Band Edges (802.11ac-HT80, 5775MHz)**



**Fig. 26 Band Edges (802.11ac-HT80, 5775MHz)**

### A.7. AC Powerline Conducted Emission

Test Condition:

Voltage (V)	Frequency (Hz)
110	60

Measurement Result and limit:

WLAN (Quasi-peak Limit)

Frequency range (MHz)	Quasi-peak Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
		With charger	802.11a	
0.15 to 0.5	66 to 56	Fig. 27		<b>P</b>
0.5 to 5	56			
5 to 30	60			

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
		With charger	802.11a	
0.15 to 0.5	56 to 46	Fig.27		<b>P</b>
0.5 to 5	46			
5 to 30	50			

The measurement is made according to ANSI C63.10 .

Conclusion: **PASS**

Test graphs as below:

Result for traffic:

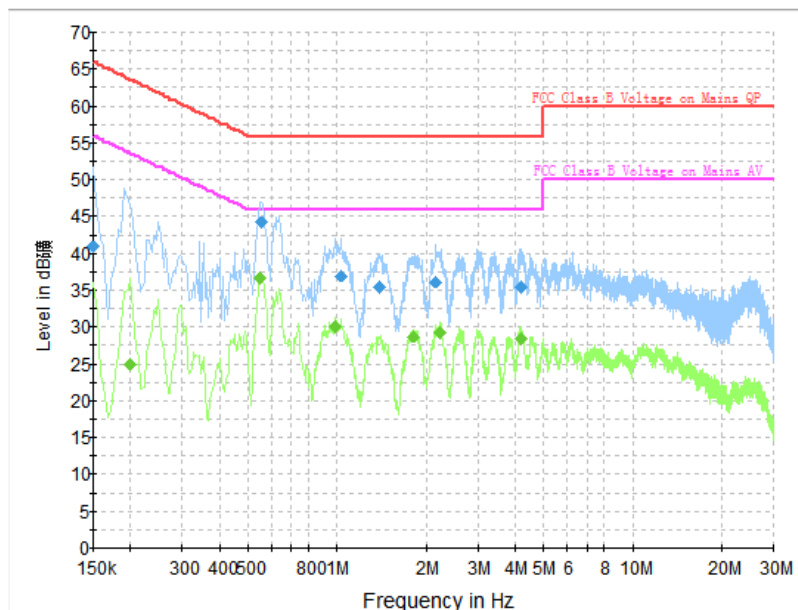


Fig. 27 AC Powerline Conducted Emission-802.11a

### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	40.9	L1	20.4	25.1	66.0
0.555000	44.3	L1	20.1	11.7	56.0
1.032000	36.9	L1	19.8	19.1	56.0
1.387500	35.5	L1	19.9	20.5	56.0
2.170500	36.2	L1	20.1	19.8	56.0
4.195500	35.5	N	20.4	20.5	56.0

### Final Result 2

Frequency (MHz)	Average (dB $\mu$ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.199500	25.0	N	19.8	28.7	53.6
0.550500	36.7	N	20.0	9.3	46.0
0.987000	30.1	L1	19.8	15.9	46.0
1.815000	28.7	N	19.9	17.3	46.0
2.224500	29.3	N	19.9	16.7	46.0
4.177500	28.4	N	20.4	17.6	46.0

## ANNEX B: Accreditation Certificate

<p>United States Department of Commerce National Institute of Standards and Technology</p> 	
<hr/> <p><b>Certificate of Accreditation to ISO/IEC 17025:2005</b></p> <hr/>	
<p>NVLAP LAB CODE: 600118-0</p>	
<p><b>Telecommunication Technology Labs, CAICT</b> Beijing China</p>	
<p><i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i></p>	
<p><b>Electromagnetic Compatibility &amp; Telecommunications</b></p>	
<p><i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).</i></p>	
<hr/> <p>2019-09-26 through 2020-09-30 <i>Effective Dates</i></p>	 <hr/> <p><i>[Signature]</i> For the National Voluntary Laboratory Accreditation Program</p>

\*\*\* END OF REPORT BODY \*\*\*