



# FCC PART 15C TEST REPORT No.23T04Z80001-18

for

**TCL Communication Ltd.**

**Tablet PC**

**9136R,9136K**

**FCC ID: 2ACCJB210**

with

**Hardware Version: 05**

**Software Version: 7WS2**

**Issued Date: 2023-11-06**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
23T04Z80001-18	Rev.0	1st edition	2023-11-06

Note: the latest revision of the test report supersedes all previous version.

## **CONTENTS**

<b>CONTENTS .....</b>	<b>3</b>
<b>1. TEST LABORATORY .....</b>	<b>5</b>
1.1. INTRODUCTION & ACCREDITATION .....	5
1.2. TESTING LOCATION .....	5
1.3. TESTING ENVIRONMENT .....	5
1.4. PROJECT DATE .....	5
1.5. SIGNATURE .....	5
<b>2. CLIENT INFORMATION .....</b>	<b>6</b>
2.1. APPLICANT INFORMATION .....	6
2.2. MANUFACTURER INFORMATION .....	6
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>7</b>
3.1. ABOUT EUT .....	7
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....	7
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST .....	7
3.4. GENERAL DESCRIPTION .....	7
<b>4. REFERENCE DOCUMENTS .....</b>	<b>8</b>
4.1. DOCUMENTS SUPPLIED BY APPLICANT .....	8
4.2. REFERENCE DOCUMENTS FOR TESTING .....	8
<b>5. LABORATORY ENVIRONMENT .....</b>	<b>8</b>
<b>6. TEST RESULTS .....</b>	<b>9</b>
6.1. SUMMARY OF TEST RESULTS .....	9
6.2. STATEMENTS .....	9
6.3. TEST CONDITIONS .....	9
<b>7. TEST FACILITIES UTILIZED .....</b>	<b>10</b>
<b>8. MEASUREMENT UNCERTAINTY .....</b>	<b>11</b>
8.1. TRANSMITTER OUTPUT POWER .....	11
8.2. PEAK POWER SPECTRAL DENSITY .....	11
8.3. 6dB EMISSION BANDWIDTH .....	11
8.4. BAND EDGES COMPLIANCE .....	11
8.5. SPURIOUS EMISSIONS .....	11
8.6. AC POWER-LINE CONDUCTED EMISSION .....	11
<b>ANNEX A: MEASUREMENT RESULTS .....</b>	<b>12</b>
A.1. MEASUREMENT METHOD .....	12
A.2. MAXIMUM PEAK OUTPUT POWER .....	13
A.2.1 ANTENNA GAIN .....	13
A.2.2. MAXIMUM AVERAGE OUTPUT POWER-CONDUCTED .....	13



A.3. PEAK POWER SPECTRAL DENSITY ..... 17

A.4. 6dB EMISSION BANDWIDTH ..... 19

A.5. TRANSMITTER SPURIOUS EMISSION ..... 25

A.5.1 TRANSMITTER SPURIOUS EMISSION - RADIATED ..... 25

A.6. BAND EDGES COMPLIANCE ..... 36

A.6.1 BAND EDGES - RADIATED ..... 36

A.7. AC POWERLINE CONDUCTED EMISSION ..... 41

**ANNEX B: EUT PARAMETERS..... 44**

**ANNEX C: ACCREDITATION CERTIFICATE ..... 44**

## 1. Test Laboratory

### 1.1. Introduction & Accreditation

**Telecommunication Technology Labs, CAICT** is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA 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(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,  
100191, P. R. China

### 1.3. TestingEnvironment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

### 1.4. Project date

Testing Start Date: 2023-09-05

Testing End Date: 2023-11-06

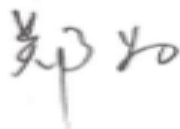
### 1.5. Signature



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Yao Xingyu

(Prepared this test report)



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Zheng Wei

(Reviewed this test report)



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Pang Shuai

(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: +86 755 3661 1621  
Fax: +86 755 3661 2000-81722

### **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: +86 755 3661 1621  
Fax: +86 755 3661 2000-81722

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

Description	Tablet PC
Model name	9136R,9136K
FCC ID	2ACCJB210
WLAN Frequency Band	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Nominal Voltage	3.85V
Extreme High Voltage	4.35V
Extreme Low Voltage	3.50V

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

EUT ID*	IMEI	HW Version	SW Version	Date of receipt
EUT1	016486000002009	05	7WS2	2023-10-07
EUT2	016486000001043	05	7WS2	2023-09-05

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

EUT2 is used for Conduction test, EUT1 is used for Radiation test.

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

AE ID*	Description
AE1	Battery
AE2	Charger
AE3	Data Cable
AE1	
Model	TLp040M7
Manufacturer	Veken
Capacity(mAh)	4080mAh
AE2	
Model	CBA005AAGNC5
Manufacturer	PUAN
Length of cable	/
AE3	
Model	CDA0000124C1
Manufacturer	JUWEI
Length of cable	/

\*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 Tablet PC 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 CFR 47, Part 15, Subpart C and E:	
FCC Part15	15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.407 General technical requirements	2021
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

## **5. Laboratory Environment**

Conducted RF performance testing is performed in shielding room.

EMC performance testing is performed in Semi-anechoic chamber.



## 6. 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 - 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 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.

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	3.85V
Humidity	44%

## 7. Test Facilities 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	2024-07-04
2	Vector Signal Analyzer	FSW67	104051	Rohde & Schwarz	1 year	2024-03-06
3	LISN	ENV216	101200	Rohde & Schwarz	1 year	2024-06-05
4	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2024-02-28
5	Attenuator	10dB/2W	/	Rosenberger	/	/
6	Shielding Room	S81	/	ETS-Lindgren	/	/

### Radiated emission test system

No.	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103144	Rohde & Schwarz	1 year	2023-10-25
2	EMI Antenna	VULB9163	01222	Schwarzbeck	1 year	2024-02-28
3	EMI Antenna	3115	6914	ETS-Lindgren	1 year	2024-04-25
4	EMI Antenna	3116	2661	ETS-Lindgren	1 year	2024-01-30

※ NOTE: The Test Receiver with series number of 103144 did not exceed the CAL.DUE.DATE when used.

## 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. 6dB Emission 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	/
$30\text{MHz} \leq f \leq 1\text{GHz}$	4.72
$1\text{GHz} \leq f \leq 18\text{GHz}$	4.84
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.12

### 8.6. AC Power-line Conducted Emission

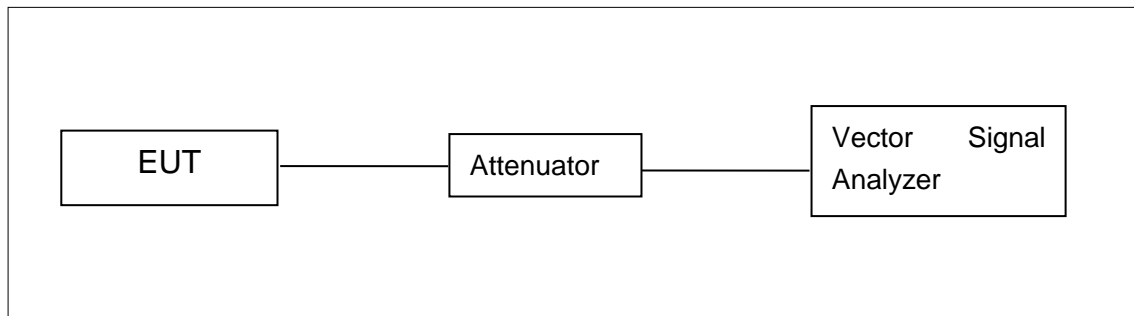
Measurement Uncertainty : 3.08dB,k=2

## **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

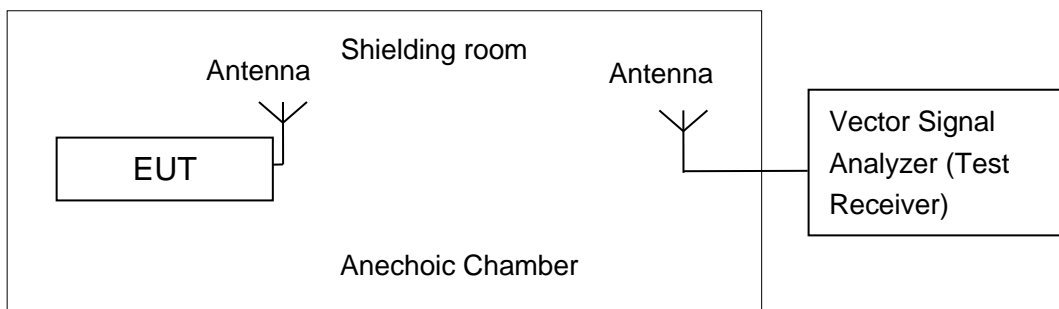


#### **A.1.2. Radiated Emission Measurements**

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 = 3MHz;



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:**

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

Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

Set RBW = 1 MHz.

Set VBW ≥ 3 MHz.

Number of points in sweep ≥ 2 × span / RBW.

Sweep time = auto.

Detector = power averaging (rms)

Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter.

Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal. Add 10 log (1/x), where x is the duty cycle

### **A.2.1 Antenna Gain**

Antenna gain is 0.75dBi and the value is supplied by the applicant or manufacturer.

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

**EUT ID: EUT2**

### **Measurement Results:**

#### **802.11a mode**

<b>Mode</b>	<b>Data Rate (Mbps)</b>	<b>Test Result (dBm)</b>		
		<b>5745MHz (Ch149)</b>	<b>5785MHz (Ch157)</b>	<b>5825MHz (Ch165)</b>
802.11a	6	16.61	16.95	16.91
	9	/	/	/
	12	/	/	/
	18	/	/	/
	24	/	/	/
	36	/	/	/
	48	/	/	/
	54	/	/	/

The data rate 6Mbps is selected as worst condition, and the following cases are performed with this condition.

**802.11n-HT20 mode**

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11n (20MHz)	MCS0	17.23	17.59	18.18
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

**802.11ac-HT20 mode**

Mode	Data Rate (Index)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11ac (20MHz)	MCS0	16.70	16.38	16.35
	MCS1	/	/	/
	MCS2	/	/	/
	MCS3	/	/	/
	MCS4	/	/	/
	MCS5	/	/	/
	MCS6	/	/	/
	MCS7	/	/	/
	MCS8	/	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

**802.11n-HT40 mode**

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11n (40MHz)	MCS0	12.21	12.13
	MCS1	/	/
	MCS2	/	/
	MCS3	/	/
	MCS4	/	/
	MCS5	/	/
	MCS6	/	/
	MCS7	/	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

**802.11ac-HT40 mode**

Mode	Data Rate (Index)	Test Result (dBm)	
		5755MHz (Ch151)	5795MHz (Ch159)
802.11ac (40MHz)	MCS0	13.06	13.08
	MCS1	/	/
	MCS2	/	/
	MCS3	/	/
	MCS4	/	/
	MCS5	/	/
	MCS6	/	/
	MCS7	/	/
	MCS8	/	/
	MCS9	/	/

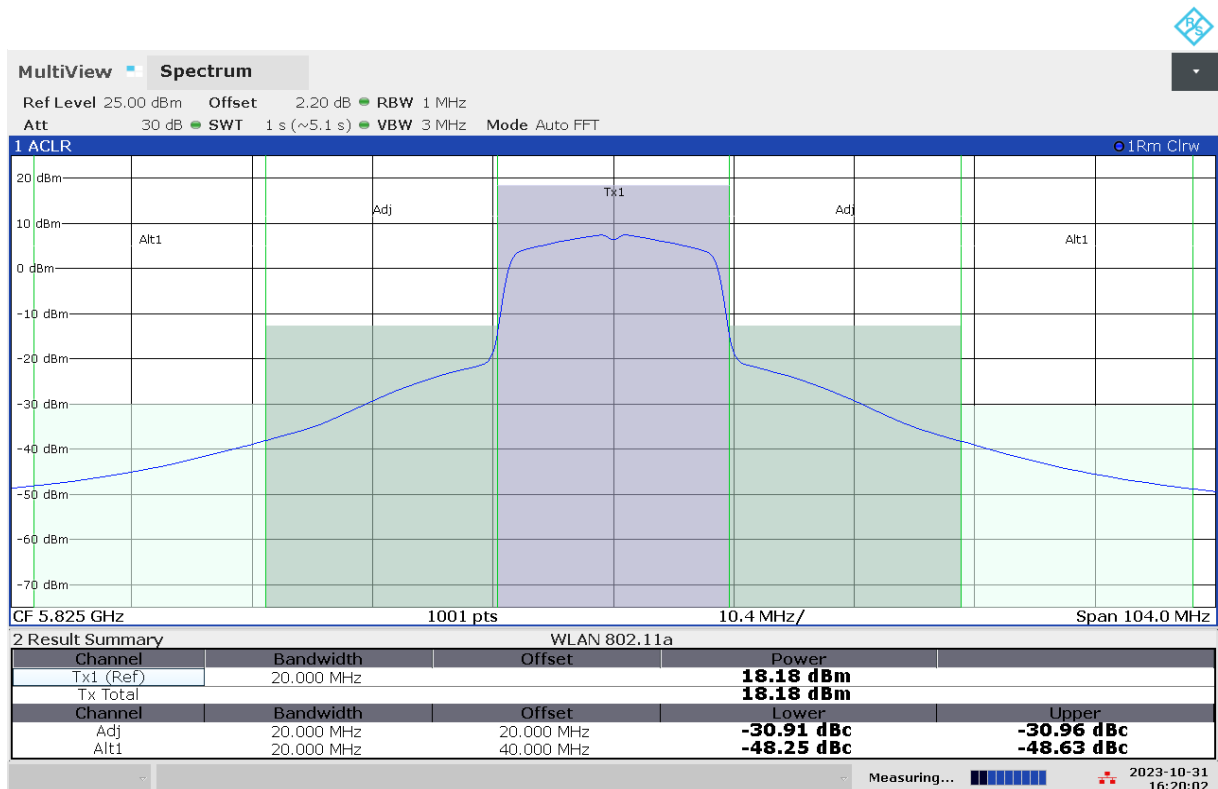
The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

### 802.11ac-HT80 mode

Mode	Data Rate (Index)	Test Result (dBm)
		5775MHz (Ch155)
802.11ac (80MHz)	MCS0	13.23
	MCS1	/
	MCS2	/
	MCS3	/
	MCS4	/
	MCS5	/
	MCS6	/
	MCS7	/
	MCS8	/
	MCS9	/

The data rate MCS0 is selected as worst condition, and the following cases are performed with this condition.

The duty cycle of all mode are 100%



Date: 31.OCT.2023 16:20:02

**Maximum output Power: 11n20 CH165**

**Conclusion: PASS**



### A.3. Peak Power Spectral Density

#### Measurement Limit:

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

Set span to encompass the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

Set RBW = 500 kHz.

Set VBW ≥ 3 MHz.

Number of points in sweep ≥ 2 × span / RBW.

Sweep time = auto.

Detector = power averaging (rms)

Trace average at least 100 traces in power averaging (rms) mode; however, the number of traces to be averaged shall be increased above 100 as needed to ensure that the average accurately represents the true average over the on and off periods of the transmitter. Use the peak search function on the instrument to find the peak of the spectrum and record its value. Add 10 log (1/x), where x is the duty cycle.

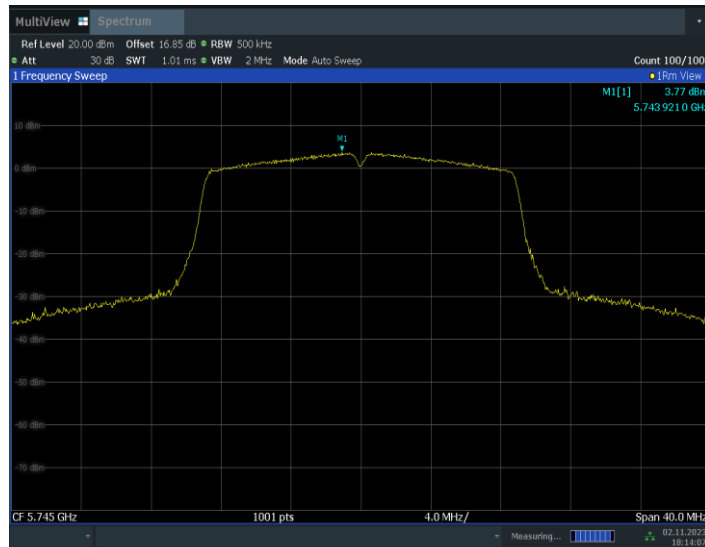
#### Measurement Uncertainty:

Measurement Uncertainty	0.75dB
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EUT ID: EUT2

#### Measurement Results:

Mode	Channel	Power Spectral Density ( dBm/500kHz )	Conclusion
802.11a	149	3.52	P
	157	3.24	P
	165	3.07	P
802.11n HT20	149	3.77	P
	157	3.14	P
	165	3.39	P
802.11ac HT40	151	-3.02	P
	159	-3.32	P
802.11ac HT80	155	-7.03	P



**Peak Power Spectral Density:11n20 CH149**

**Conclusion: PASS**

#### **A.4. 6dB Emission Bandwidth**

##### **Measurement Limit:**

<b>Standard</b>	<b>Limit (kHz)</b>
FCC 47 CFR Part 15.407 (e)	≥ 500

Set RBW = 100 kHz.

Set the video bandwidth (VBW) ≥ 3 × RBW.

Detector = Peak.

Trace mode = max hold.

Sweep = auto couple.

Allow the trace to stabilize.

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

##### **Measurement Uncertainty:**

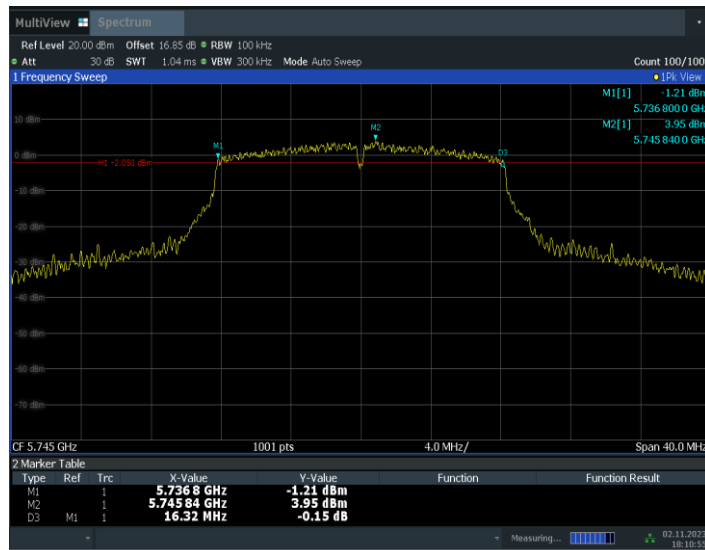
Measurement Uncertainty	60.80Hz
-------------------------	---------

**EUT ID: EUT2**

##### **Measurement Result:**

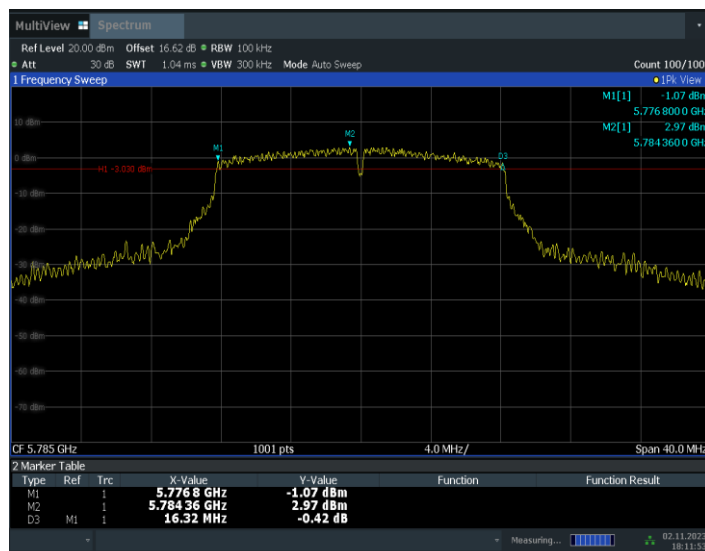
<b>Mode</b>	<b>Channel</b>	<b>6dB Emission Bandwidth ( MHz)</b>		<b>conclusion</b>
802.11a	149	Fig.1	16.32	P
	157	Fig.2	16.32	P
	165	Fig.3	16.32	P
802.11n HT20	149	Fig.4	17.60	P
	157	Fig.5	17.60	P
	165	Fig.6	17.60	P
802.11ac (VHT40)	151	Fig.7	36.24	P
	159	Fig.8	36.00	P
802.11ac (VHT80)	155	Fig.9	76.00	P

**Test graphs as below:**



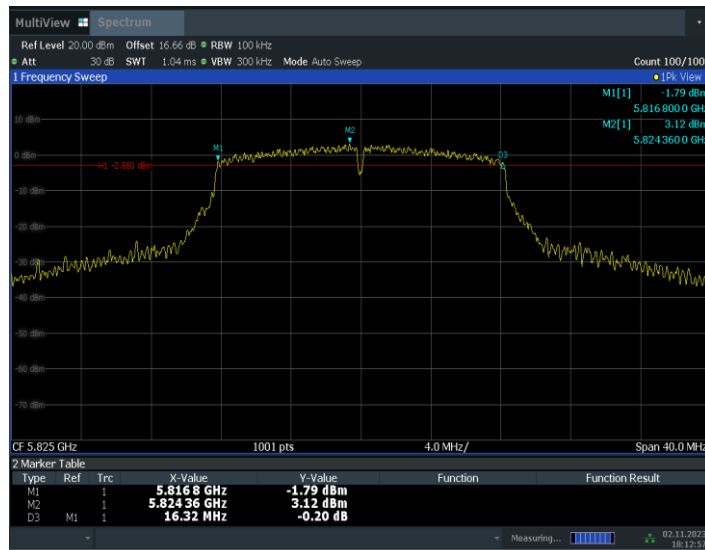
18:10:56 02.11.2023

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



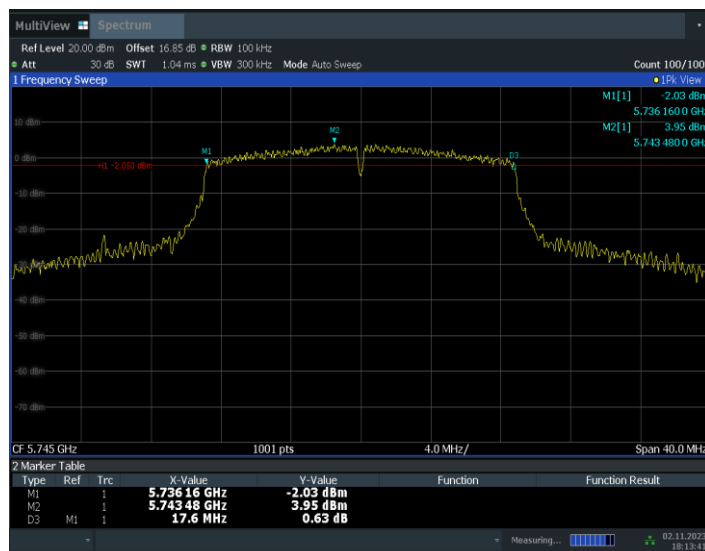
18:11:54 02.11.2023

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



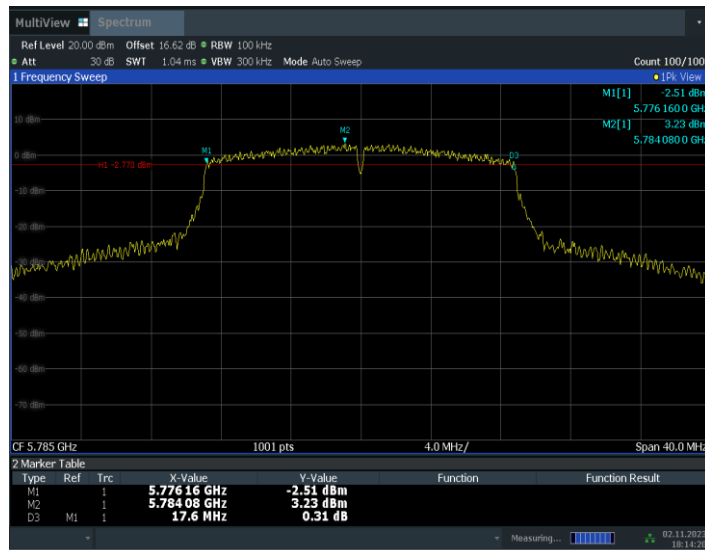
18:12:58 02.11.2023

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



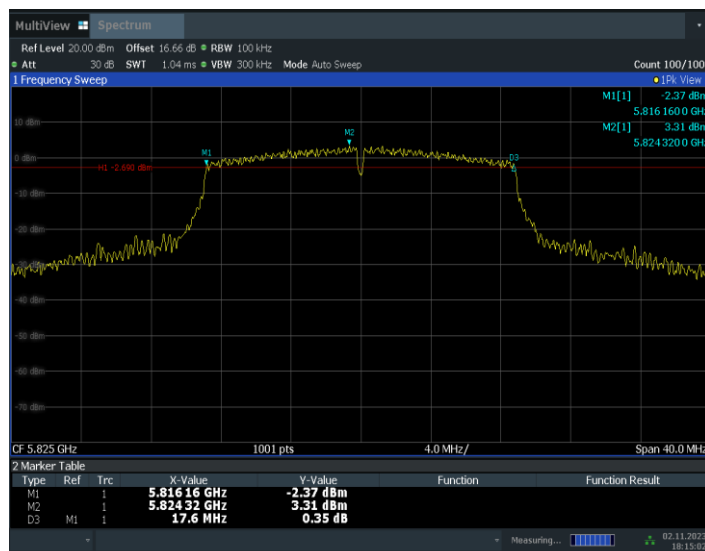
18:13:41 02.11.2023

**Fig. 4 6dB Emission Bandwidth (802.11n-HT20, Ch 149)**



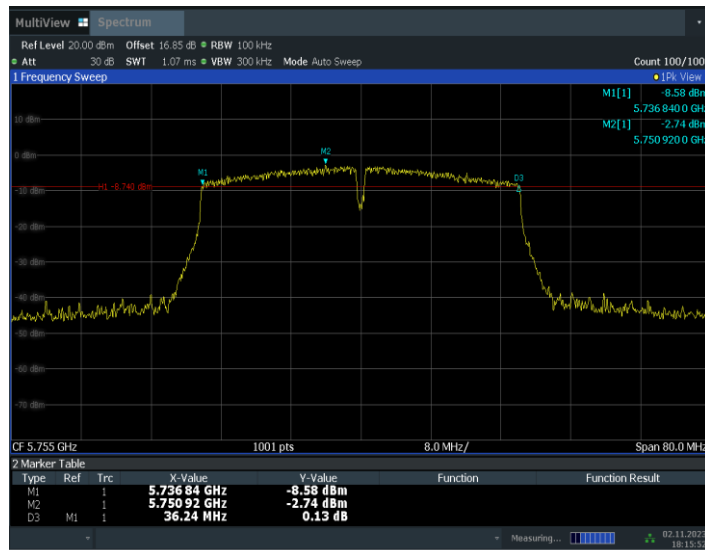
18:14:21 02.11.2023

Fig. 5 6dB Emission Bandwidth (802.11n-HT20, Ch 157)



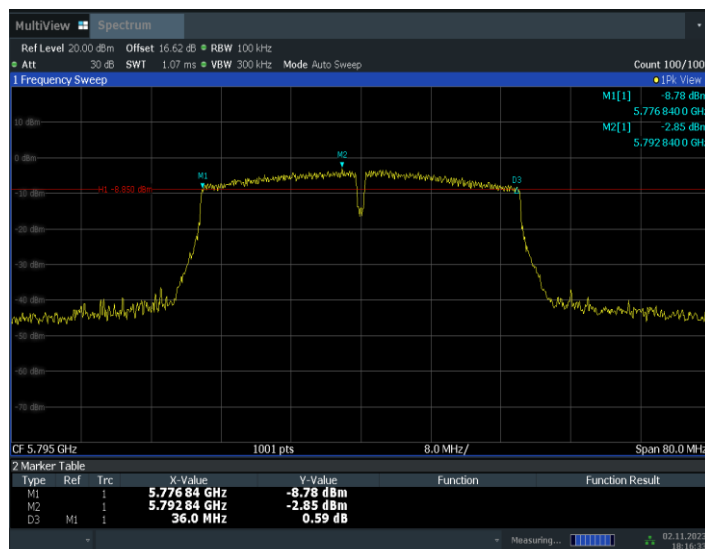
18:15:02 02.11.2023

Fig. 6 6dB Emission Bandwidth (802.11n-HT20, Ch 165)



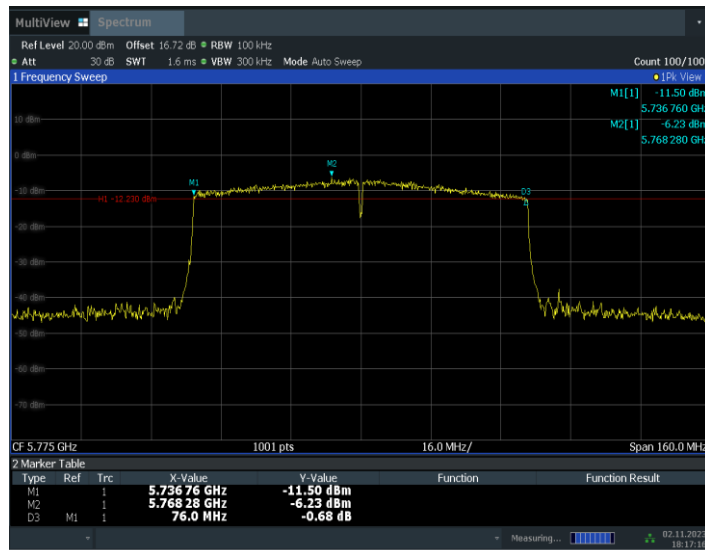
18:15:52 02.11.2023

Fig. 7 6dB Emission Bandwidth (802.11ac-VHT40, Ch 151)



18:16:33 02.11.2023

Fig. 8 6dB Emission Bandwidth (802.11ac-VHT40, Ch 159)



**Fig. 9 6dB Emission Bandwidth (802.11ac-VHT80, Ch 155)**

**Conclusion: PASS**



## **A.5. Transmitter Spurious Emission**

### **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.

**Conclusion: PASS**

**Average Results:**
**802.11a**

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17986.250	42.43	-29.59	45.95	26.07	54.00	11.57	V
17969.750	42.35	-29.59	45.95	25.99	54.00	11.65	V
14497.050	36.88	-29.56	41.90	24.54	54.00	17.12	V
14490.450	36.87	-29.56	41.90	24.53	54.00	17.13	H
11876.850	34.36	-32.73	39.15	27.94	54.00	19.64	V
11860.350	34.01	-32.73	39.15	27.59	54.00	19.99	V

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17957.650	42.65	-29.59	45.95	26.29	54.00	11.35	H
17995.600	42.49	-29.59	45.95	26.13	54.00	11.51	V
14498.150	36.91	-29.56	41.90	24.57	54.00	17.09	V
14497.600	36.79	-29.56	41.90	24.45	54.00	17.21	V
11776.200	34.00	-32.71	39.20	27.51	54.00	20.00	V
11770.700	33.99	-32.71	39.20	27.50	54.00	20.01	V

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17992.850	42.45	-29.59	45.95	26.09	54.00	11.55	V
17998.900	42.33	-29.59	45.95	25.97	54.00	11.67	V
14490.450	37.11	-29.56	41.90	24.77	54.00	16.89	V
14499.800	37.06	-29.56	41.90	24.72	54.00	16.94	V
11893.900	33.86	-32.53	39.10	27.29	54.00	20.14	V
11890.600	33.85	-32.53	39.10	27.28	54.00	20.15	V

**802.11n-HT20**

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17974.700	42.35	-29.59	45.95	25.99	54.00	11.65	H
17992.850	42.24	-29.59	45.95	25.88	54.00	11.76	H
14490.450	37.08	-29.56	41.90	24.74	54.00	16.92	V
14474.500	36.94	-29.56	41.90	24.60	54.00	17.06	V
11866.950	33.95	-32.73	39.15	27.53	54.00	20.05	V
11779.500	33.93	-32.71	39.20	27.44	54.00	20.07	V

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17958.200	42.43	-29.59	45.95	26.07	54.00	11.57	V
17976.900	42.43	-29.59	45.95	26.07	54.00	11.57	V
14499.250	36.96	-29.56	41.90	24.62	54.00	17.04	V
14479.450	36.80	-29.56	41.90	24.46	54.00	17.20	V
11871.350	34.03	-32.73	39.15	27.61	54.00	19.97	V
11895.000	33.97	-32.53	39.10	27.40	54.00	20.03	V

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17995.050	42.22	-29.59	45.95	25.86	54.00	11.78	V
17941.150	42.15	-29.59	45.95	25.79	54.00	11.85	H
14498.700	37.13	-29.56	41.90	24.79	54.00	16.87	V
14497.050	36.78	-29.56	41.90	24.44	54.00	17.22	V
11891.700	34.37	-32.53	39.10	27.80	54.00	19.63	V
11864.750	34.17	-32.73	39.15	27.75	54.00	19.83	V

**802.11n-HT40**

## Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17990.100	42.20	-29.59	45.95	25.84	54.00	11.80	V
17998.900	42.19	-29.59	45.95	25.83	54.00	11.81	V
14497.600	36.92	-29.56	41.90	24.58	54.00	17.08	V
14488.800	36.88	-29.56	41.90	24.54	54.00	17.12	V
11775.650	33.97	-32.71	39.20	27.48	54.00	20.03	V
11868.600	33.94	-32.73	39.15	27.52	54.00	20.06	V

## Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17946.650	42.43	-29.59	45.95	26.07	54.00	11.57	V
17963.700	42.34	-29.59	45.95	25.98	54.00	11.66	H
14493.750	36.86	-29.56	41.90	24.52	54.00	17.14	V
14499.800	36.86	-29.56	41.90	24.52	54.00	17.14	V
11898.300	34.13	-32.53	39.10	27.56	54.00	19.87	V
11862.550	34.03	-32.73	39.15	27.61	54.00	19.97	V

**802.11ac-HT20**

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17985.150	42.39	-29.59	45.95	26.03	54.00	11.61	V
17960.400	42.26	-29.59	45.95	25.90	54.00	11.74	V
14493.750	37.12	-29.56	41.90	24.78	54.00	16.88	V
14483.300	36.71	-29.56	41.90	24.37	54.00	17.29	V
11888.400	33.93	-32.53	39.10	27.36	54.00	20.07	H
11776.750	33.90	-32.71	39.20	27.41	54.00	20.10	V

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17995.050	42.23	-29.59	45.95	25.87	54.00	11.77	V
17956.000	42.15	-29.59	45.95	25.79	54.00	11.85	H
14495.950	36.90	-29.56	41.90	24.56	54.00	17.10	V
14493.750	36.86	-29.56	41.90	24.52	54.00	17.14	V
11777.850	33.81	-32.71	39.20	27.32	54.00	20.19	V
11781.150	33.81	-32.71	39.20	27.32	54.00	20.19	V

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17976.900	42.28	-29.59	45.95	25.92	54.00	11.72	V
17962.600	42.23	-29.59	45.95	25.87	54.00	11.77	H
14490.450	36.88	-29.56	41.90	24.54	54.00	17.12	V
14478.900	36.77	-29.56	41.90	24.43	54.00	17.23	V
11786.100	33.79	-32.09	39.20	26.68	54.00	20.21	V
11763.000	33.74	-32.71	39.20	27.25	54.00	20.26	V

**802.11ac-HT40**

## Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17977.450	42.20	-29.59	45.95	25.84	54.00	11.80	H
17945.550	42.15	-29.59	45.95	25.79	54.00	11.85	V
14490.450	36.95	-29.56	41.90	24.61	54.00	17.05	V
14486.050	36.90	-29.56	41.90	24.56	54.00	17.10	V
11885.650	34.31	-32.53	39.10	27.74	54.00	19.69	V
11881.800	34.12	-32.53	39.10	27.55	54.00	19.88	V

## Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17986.250	42.37	-29.59	45.95	26.01	54.00	11.63	V
17942.250	42.25	-29.59	45.95	25.89	54.00	11.75	V
14495.950	37.08	-29.56	41.90	24.74	54.00	16.92	V
14497.050	36.98	-29.56	41.90	24.64	54.00	17.02	V
11857.050	33.64	-32.73	39.15	27.22	54.00	20.36	V
11871.900	33.60	-32.73	39.15	27.18	54.00	20.40	V

**802.11ac-HT80**

## Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17986.250	42.39	-29.59	45.95	26.03	54.00	11.61	H
17996.700	42.36	-29.59	45.95	26.00	54.00	11.64	V
14497.050	37.08	-29.56	41.90	24.74	54.00	16.92	V
14491.000	36.96	-29.56	41.90	24.62	54.00	17.04	V
11868.600	34.31	-32.73	39.15	27.89	54.00	19.69	V
11880.700	34.24	-32.73	39.15	27.82	54.00	19.76	V

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

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17977.450	54.34	-29.59	45.95	37.98	74.00	19.66	V
17940.600	53.65	-29.59	45.95	37.29	74.00	20.35	V
14104.900	49.45	-30.20	41.70	37.95	68.20	18.75	V
14585.600	49.22	-29.14	41.90	36.46	68.20	18.98	V
11853.200	44.95	-32.73	39.15	38.53	74.00	29.05	V
11909.300	44.58	-32.53	39.10	38.01	74.00	29.42	V

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17987.900	53.59	-29.59	45.95	37.23	74.00	20.41	V
17993.400	53.08	-29.59	45.95	36.72	74.00	20.92	V
14570.200	48.97	-29.14	41.90	36.21	68.20	19.23	H
14574.050	48.85	-29.14	41.90	36.09	68.20	19.35	V
11879.050	45.43	-32.73	39.15	39.01	74.00	28.57	H
11895.000	45.13	-32.53	39.10	38.56	74.00	28.87	H

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17987.350	53.00	-29.59	45.95	36.64	74.00	21.00	V
17985.150	52.90	-29.59	45.95	36.54	74.00	21.10	V
14599.350	48.96	-29.14	41.90	36.20	68.20	19.24	V
14607.050	48.83	-30.67	41.70	37.80	68.20	19.37	V
11896.100	45.26	-32.53	39.10	38.69	74.00	28.74	V
11874.100	44.87	-32.73	39.15	38.45	74.00	29.13	V

**802.11n-HT20**

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17991.200	53.95	-29.59	45.95	37.59	74.00	20.05	V
17990.100	53.42	-29.59	45.95	37.06	74.00	20.58	H
14579.550	48.86	-29.14	41.90	36.10	68.20	19.34	H
14566.350	48.79	-29.14	41.90	36.03	68.20	19.41	V
11883.450	45.55	-32.53	39.10	38.98	74.00	28.45	V
11866.400	44.91	-32.73	39.15	38.49	74.00	29.09	H

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17947.750	53.15	-29.59	45.95	36.79	74.00	20.85	V
17934.550	52.98	-29.59	45.95	36.62	74.00	21.02	V
14554.250	49.26	-30.55	41.90	37.91	68.20	18.94	V
14585.600	49.14	-29.14	41.90	36.38	68.20	19.06	V
11778.400	45.43	-32.71	39.20	38.94	74.00	28.57	H
11839.450	45.07	-32.73	39.15	38.65	74.00	28.93	V

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17960.950	53.77	-29.59	45.95	37.41	74.00	20.23	H
17997.250	53.36	-29.59	45.95	37.00	74.00	20.64	H
14598.800	49.42	-29.14	41.90	36.66	68.20	18.78	V
14555.350	49.16	-29.14	41.90	36.40	68.20	19.04	V
11888.400	45.40	-32.53	39.10	38.83	74.00	28.60	V
11923.050	44.98	-32.53	39.10	38.41	74.00	29.02	V



**802.11n-HT40**

## Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17957.100	53.45	-29.59	45.95	37.09	74.00	20.55	V
17981.850	53.25	-29.59	45.95	36.89	74.00	20.75	V
14607.050	49.24	-30.67	41.70	38.21	68.20	18.96	V
14588.350	48.82	-29.14	41.90	36.06	68.20	19.38	V
11785.000	45.20	-32.09	39.20	38.09	74.00	28.80	V
11743.750	45.11	-32.71	39.20	38.62	74.00	28.89	H

## Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17989.550	54.26	-29.59	45.95	37.90	74.00	19.74	V
17990.100	52.87	-29.59	45.95	36.51	74.00	21.13	V
14600.450	49.30	-29.14	41.90	36.54	68.20	18.90	V
14184.650	49.12	-30.42	41.70	37.84	68.20	19.08	V
11761.350	44.79	-32.71	39.20	38.30	74.00	29.21	V
11791.050	44.67	-32.09	39.20	37.56	74.00	29.33	V

**802.11ac-HT20**

## Channel 149

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17967.000	53.33	-29.59	45.95	36.97	74.00	20.67	H
17947.750	53.24	-29.59	45.95	36.88	74.00	20.76	V
14588.900	49.27	-29.14	41.90	36.51	68.20	18.93	H
14187.400	48.96	-30.42	41.70	37.68	68.20	19.24	V
11895.000	45.08	-32.53	39.10	38.51	74.00	28.92	V
11788.300	45.07	-32.09	39.20	37.96	74.00	28.93	V

## Channel 157

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17993.950	53.06	-29.59	45.95	36.70	74.00	20.94	V
17980.200	53.04	-29.59	45.95	36.68	74.00	20.96	V
14181.900	48.73	-30.42	41.70	37.45	68.20	19.47	V
14690.650	48.72	-30.04	41.50	37.26	68.20	19.48	V
11832.850	45.05	-32.73	39.15	38.63	74.00	28.95	V
11858.700	44.57	-32.73	39.15	38.15	74.00	29.43	V

## Channel 165

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17949.950	53.16	-29.59	45.95	36.80	74.00	20.84	H
17990.100	52.81	-29.59	45.95	36.45	74.00	21.19	H
14578.450	49.34	-29.14	41.90	36.58	68.20	18.86	V
14573.500	49.16	-29.14	41.90	36.40	68.20	19.04	V
11782.800	44.62	-32.09	39.20	37.51	74.00	29.38	H
11799.850	44.45	-32.09	39.20	37.34	74.00	29.55	H

**802.11ac-HT40**

## Channel 151

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17977.450	54.01	-29.59	45.95	37.65	74.00	19.99	H
17991.200	53.17	-29.59	45.95	36.81	74.00	20.83	V
14102.150	49.24	-30.20	41.70	37.74	68.20	18.96	H
14696.700	48.93	-30.04	41.50	37.47	68.20	19.27	H
11882.350	45.14	-32.53	39.10	38.57	74.00	28.86	H
11870.250	45.08	-32.73	39.15	38.66	74.00	28.92	V

## Channel 159

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17925.200	53.62	-29.59	45.95	37.26	74.00	20.38	V
17952.150	53.31	-29.59	45.95	36.95	74.00	20.69	V
14569.100	48.70	-29.14	41.90	35.94	68.20	19.50	V
14687.900	48.55	-30.04	41.50	37.09	68.20	19.65	V
11764.650	44.60	-32.71	39.20	38.11	74.00	29.40	V
11758.600	44.52	-32.71	39.20	38.03	74.00	29.48	V

**802.11ac-HT80**

## Channel 155

Frequency (MHz)	Measurement Result (dBuV/m)	Cable Loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Pol. (H/V)
17926.300	52.94	-29.59	45.95	36.58	74.00	21.06	V
17972.500	52.92	-29.59	45.95	36.56	74.00	21.08	V
14175.850	49.14	-30.42	41.70	37.86	68.20	19.06	V
14608.700	49.14	-30.67	41.70	38.11	68.20	19.06	V
11859.250	45.15	-32.73	39.15	38.73	74.00	28.85	V
11871.350	44.83	-32.73	39.15	38.41	74.00	29.17	V

## **A.6. Band Edges Compliance**

### **A6.1 Band Edges - Radiated**

#### **Measurement Limit:**

<b>Standard</b>	<b>Limit (dBm/MHz)</b>	
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

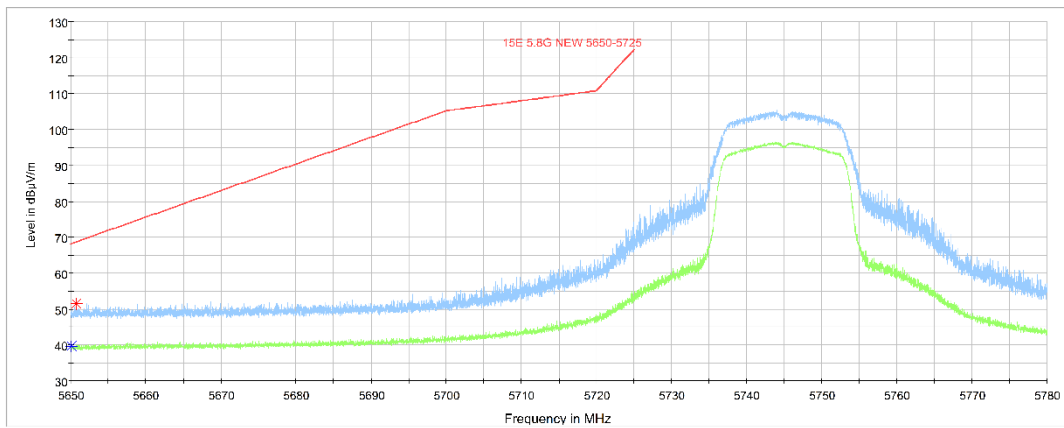
In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

#### **Measurement Result:**

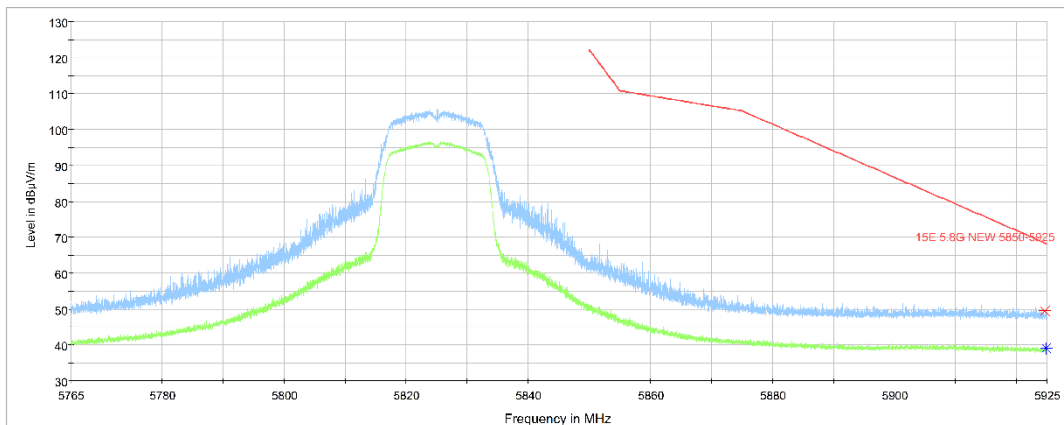
<b>Mode</b>	<b>Channel</b>	<b>Test Results</b>	<b>Conclusion</b>
802.11a	5745 MHz	Fig.10	P
	5825 MHz	Fig.11	P
802.11n HT20	5745 MHz	Fig.12	P
	5825 MHz	Fig.13	P
802.11n HT40	5755 MHz	Fig.14	P
	5795 MHz	Fig.15	P
802.11ac HT20	5745 MHz	Fig.16	P
	5825 MHz	Fig.17	P
802.11ac HT40	5755 MHz	Fig.18	P
	5795 MHz	Fig.19	P
802.11ac HT80	5775 MHz	Fig.20 Fig.21	P

**Conclusion: PASS**

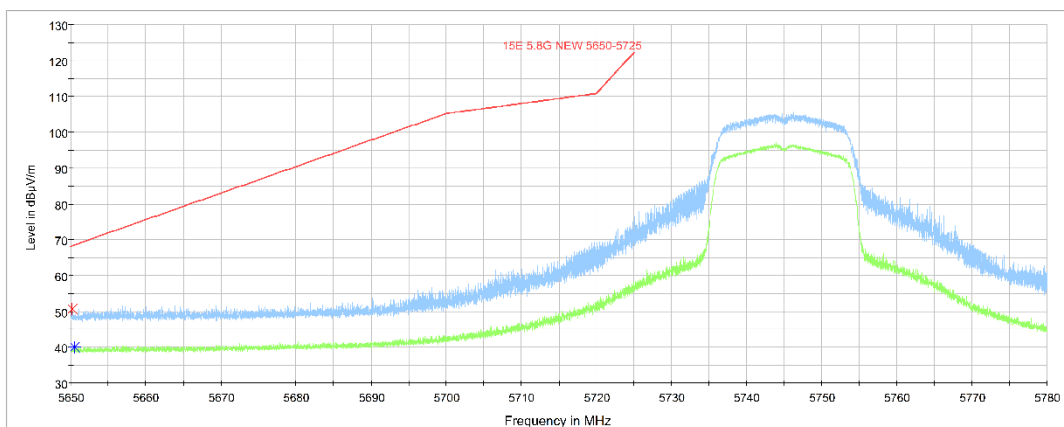
**Test graphs as below:**



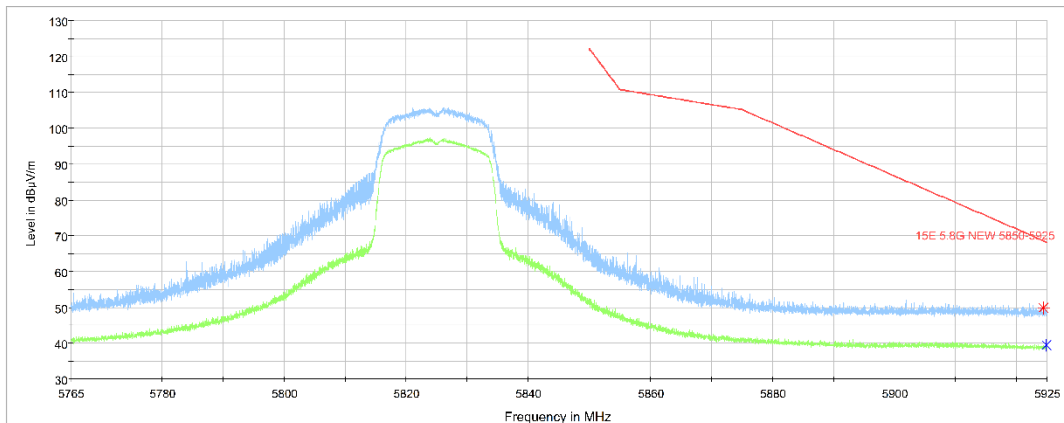
**Fig. 10 Band Edges (802.11a Ch149,5745MHz)**



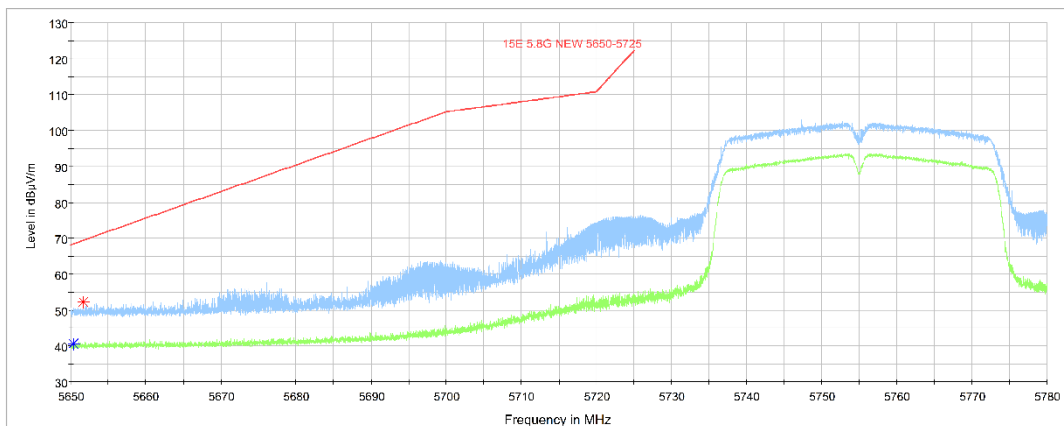
**Fig. 11 Band Edges (802.11a Ch165, 5825MHz)**



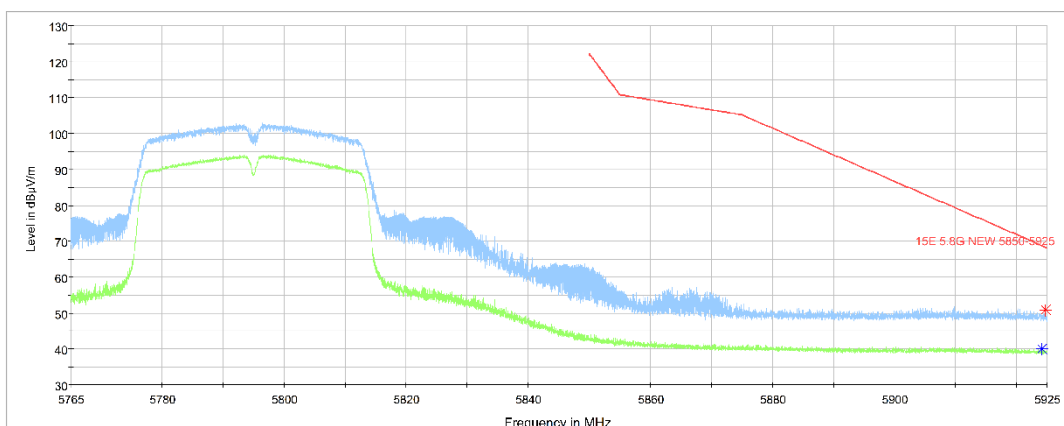
**Fig. 12 Band Edges (802.11n-HT20 Ch149, 5745MHz)**



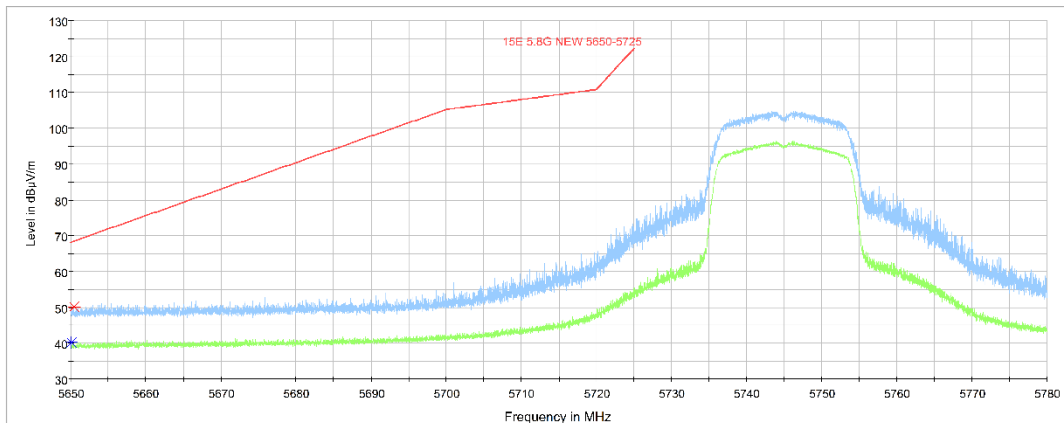
**Fig. 13 Band Edges (802.11n-HT20 Ch165, 5825MHz)**



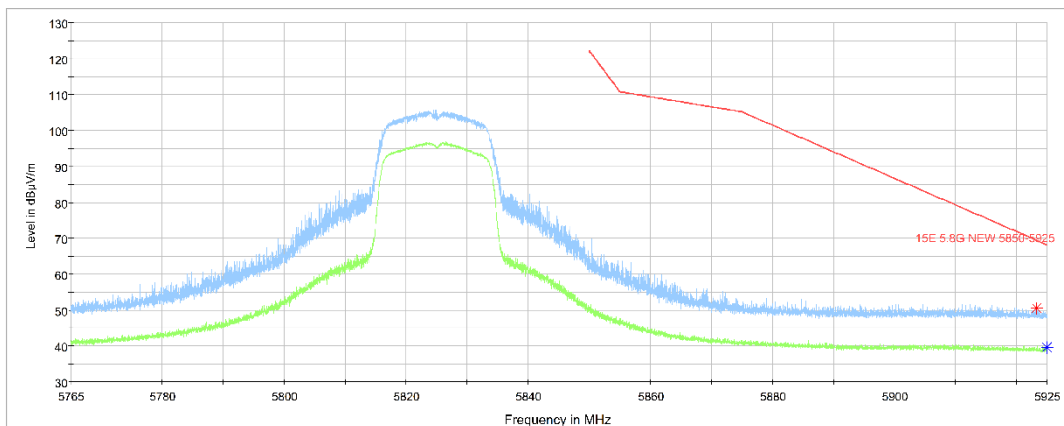
**Fig. 14 Band Edges (802.11n-HT40 Ch151, 5755MHz)**



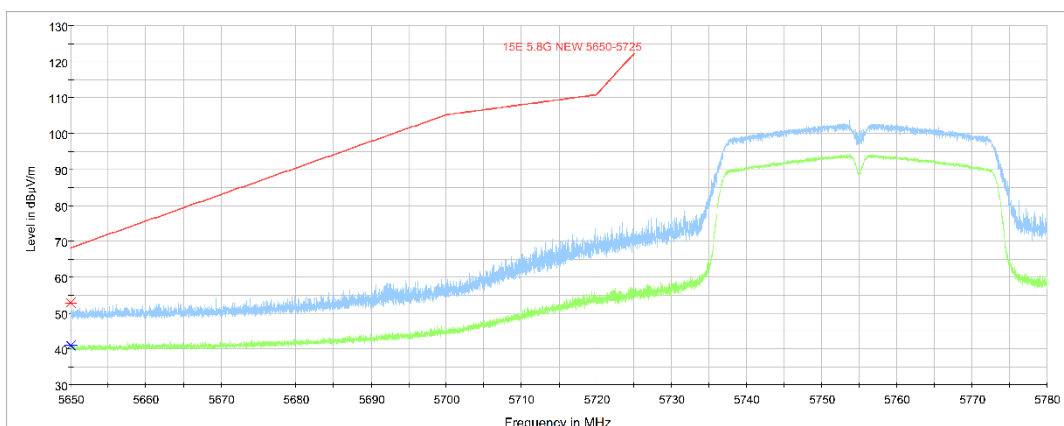
**Fig. 15 Band Edges (802.11n-HT40 Ch159, 5795MHz)**



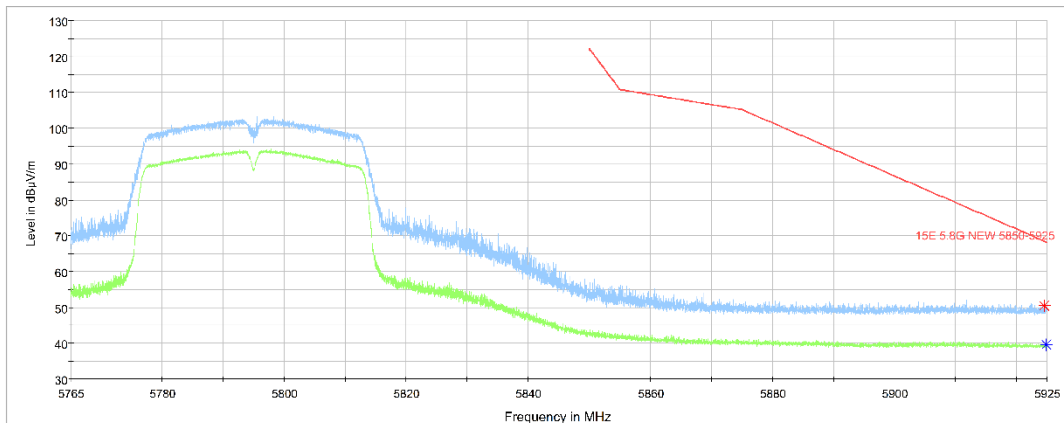
**Fig. 16 Band Edges (802.11ac-HT20 Ch149, 5745MHz)**



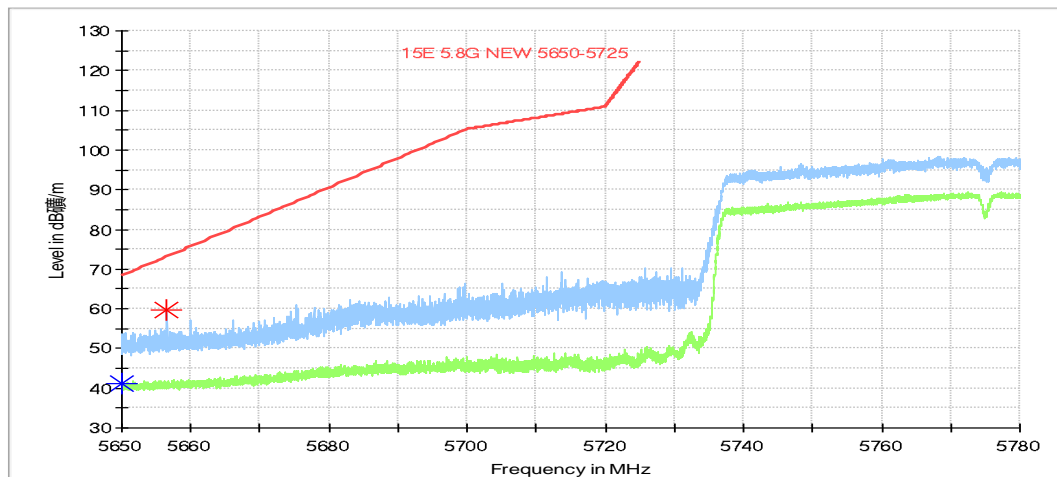
**Fig. 17 Band Edges (802.11ac-HT20 Ch165, 5825MHz)**



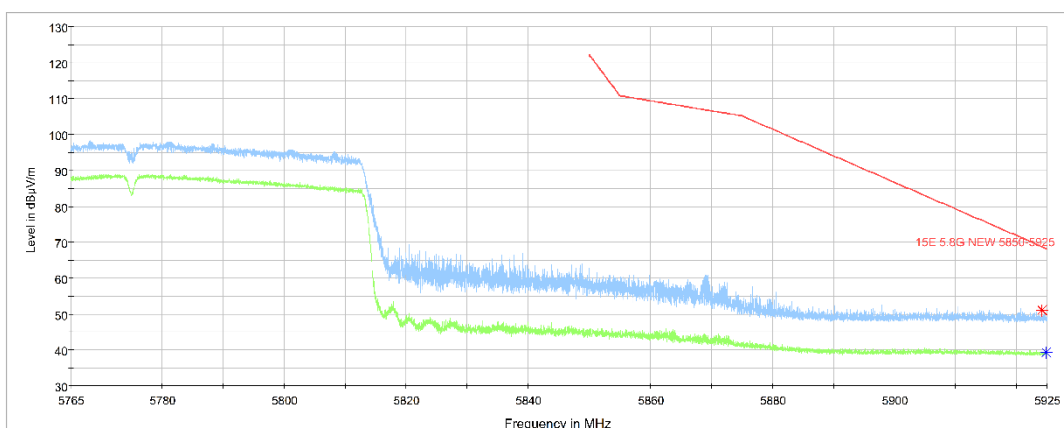
**Fig. 18 Band Edges (802.11ac-HT40 Ch151, 5755MHz)**



**Fig. 19 Band Edges (802.11ac-HT40 Ch159, 5795MHz)**  
Full Spectrum



**Fig. 20 Band Edges (802.11ac-HT80 Ch155, 5775MHz)**



**Fig. 21 Band Edges (802.11ac-HT80, 5775MHz)**



### A.7. AC Powerline Conducted Emission

**Test Condition:**

Voltage (V)	Frequency (Hz)
110	60

**Measurement uncertainty:**

Expanded measurement uncertainty for this test item is  $U = 3.2\text{dB}$ ,  $k=2$ .

**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	Idle	
0.15 to 0.5	66 to 56	Fig.22	Fig.23	P
0.5 to 5	56			
5 to 30	60			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

WLAN (Average Limit)

Frequency range (MHz)	Average Limit (dB $\mu$ V)	Result (dB $\mu$ V)		Conclusion
		With charger		
		802.11a	Idle	
0.15 to 0.5	56 to 46	Fig.22	Fig.23	P
0.5 to 5	46			
5 to 30	50			

NOTE: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

The measurement is made according to ANSI C63.10 .

**Conclusion: PASS**

**Test graphs as below:**

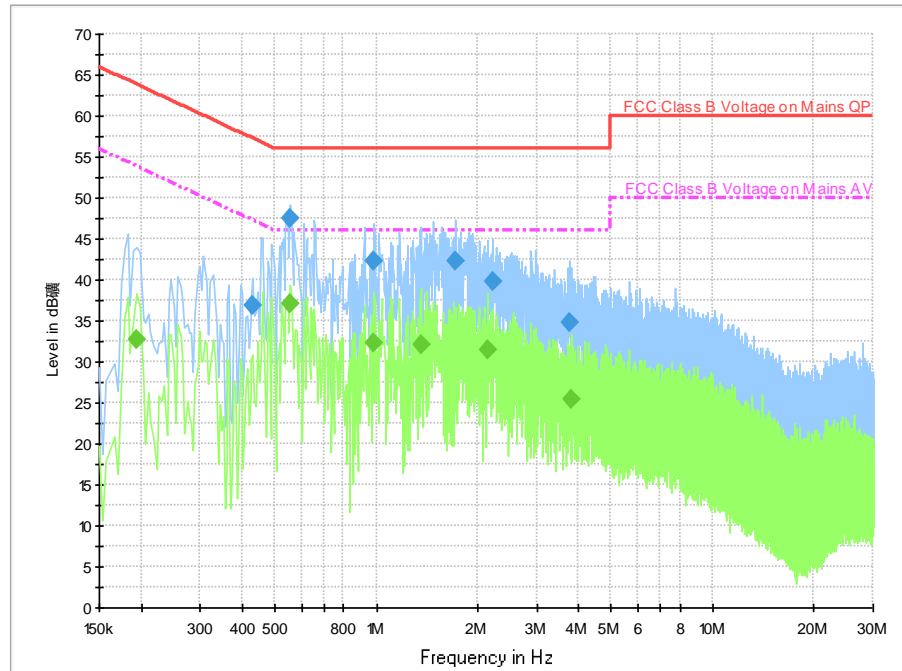


Fig. 22 AC Powerline Conducted Emission-802.11a

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.430000	36.8	2000.0	9.000	On	L1	19.7	20.4	57.3	
0.554000	47.5	2000.0	9.000	On	N	19.7	8.5	56.0	
0.986000	42.3	2000.0	9.000	On	N	19.6	13.7	56.0	
1.718000	42.3	2000.0	9.000	On	L1	19.6	13.7	56.0	
2.210000	39.7	2000.0	9.000	On	L1	19.6	16.3	56.0	
3.758000	34.9	2000.0	9.000	On	L1	19.6	21.1	56.0	

**Final Result 2**

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.194000	32.7	2000.0	9.000	On	N	19.7	21.1	53.9	
0.554000	37.1	2000.0	9.000	On	N	19.7	8.9	46.0	
0.986000	32.4	2000.0	9.000	On	N	19.6	13.6	46.0	
1.354000	32.2	2000.0	9.000	On	L1	19.6	13.8	46.0	
2.150000	31.4	2000.0	9.000	On	L1	19.6	14.6	46.0	
3.790000	25.4	2000.0	9.000	On	L1	19.6	20.6	46.0	

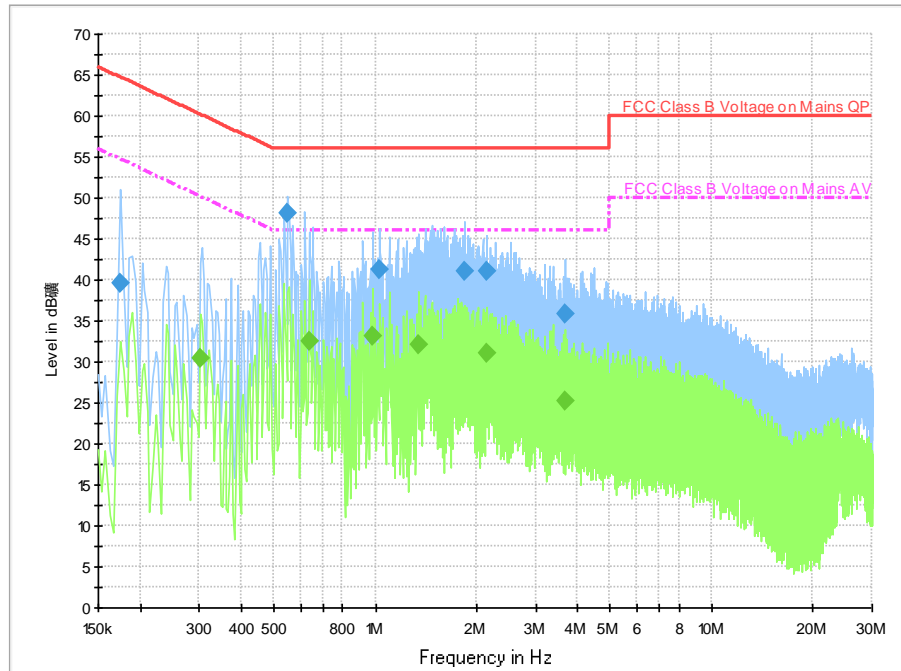


Fig. 23 AC Powerline Conducted Emission-Idle

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.174000	39.5	2000.0	9.000	On	N	19.7	25.3	64.8	
0.550000	48.1	2000.0	9.000	On	L1	19.7	7.9	56.0	
1.030000	41.3	2000.0	9.000	On	N	19.6	14.7	56.0	
1.842000	41.1	2000.0	9.000	On	L1	19.6	14.9	56.0	
2.146000	41.0	2000.0	9.000	On	N	19.6	15.0	56.0	
3.682000	35.9	2000.0	9.000	On	N	19.6	20.1	56.0	

**Final Result 2**

Frequency (MHz)	CAverage (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)	Comment
0.302000	30.5	2000.0	9.000	On	L1	19.7	19.7	50.2	
0.634000	32.4	2000.0	9.000	On	N	19.6	13.6	46.0	
0.982000	33.2	2000.0	9.000	On	N	19.6	12.8	46.0	
1.346000	32.1	2000.0	9.000	On	L1	19.6	13.9	46.0	
2.158000	31.1	2000.0	9.000	On	L1	19.6	14.9	46.0	
3.650000	25.2	2000.0	9.000	On	L1	19.6	20.8	46.0	

## **ANNEX B: EUT parameters**

Disclaimer: The antenna gain and worse case provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

## **ANNEX C: Accreditation Certificate**



**Accredited Laboratory**

A2LA has accredited

**TELECOMMUNICATION TECHNOLOGY LABS, CAICT**  
*Beijing, People's Republic of China*

for technical competence in the field of  
**Electrical Testing**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 26<sup>th</sup> day of June 2023.



Mr. Trace McInturff, Vice President, Accreditation Services  
For the Accreditation Council  
Certificate Number 7049.01  
Valid to July 31, 2024

*For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.*

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