



FCC PART 15C TEST REPORT No. I22Z61676-IOT03

for

TCL Communication Ltd.

GSM/UMTS/LTE mobile phone

T430W

With

FCC ID: 2ACCJH167

Hardware Version: 03

Software Version: UGS4

Issued Date: 2022-10-06

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.

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REPORT HISTORY

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1. TEST LABORATORY

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 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 (ISED#: 24849). 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(huayuan North Road)

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

1.3. TestingEnvironment

Normal Temperature: 15-35°C

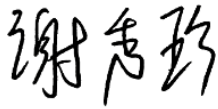
Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2022-08-31

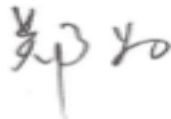
Testing End Date: 2022-10-06

1.5. Signature



Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Pang Shuai

(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: TCL Communication Ltd.
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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
Contact: Annie Jiang
Country: China
Email: nianxiang.jiang@tcl.com
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	GSM/UMTS/LTE mobile phone
Model name	T430W
FCC ID	2ACCJH167
WLAN Frequency Band	ISM Band: 5725MHz~5850MHz
Type of modulation	OFDM
Voltage	3.85V

3.2. Internal Identification of EUT used during the test

EUT ID*	IMEI	HW Version	SW Version
UT28a	01629800000812	03	UGS4
UT42a	016298000001760	03	UGS4

*EUT ID: is used to identify the test sample in the lab internally.
 UT28a is used for Conduction test, UT42a is used for Radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Type	SN
AE1	Battery	/	/
AE2	Dummy battery	/	/
AE3	Battery	/	/
AE4	USB Cable	/	/
AE5	USB Cable	/	/
AE6	Charger1	/	/

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

AE1

Model	TLi028C7
Manufacturer	NINGBO VEKEN BATTERY CO., LTD.
Capacity	min2880mAh/type 3000mAh
Nominal Voltage	3.85V

AE2

Model	/
Manufacturer	/
Capacity	/
Nominal Voltage	/

AE3

Model	TLi028C1
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Manufacturer	Shenzhen BYD Lithium Battery Company Limited
Capacity	min2880mAh/type 3000mAh
Nominal Voltage	3.85V
AE4	
Model	CDA0000123C1
Manufacturer	Juwei
Length of cable	/
AE5	
Model	CDA0000123C2
Manufacturer	Shenghua
Length of cable	/
AE6	
Model	UC13US
Manufacturer	PUAN
Length of cable	/

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 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	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

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)	/	P
Peak Power Spectral Density	15.407 (a)	/	P
Occupied 6dB Bandwidth	15.407 (e)	/	P
Band Edges Compliance - Conducted& Radiated	15.407 (b)	/	P
Transmitter Spurious Emission - Conducted	15.407	/	P
Transmitter Spurious Emission - Radiated	15.407, 15.205, 15.209	/	P
AC Powerline Conducted Emission	15.107, 15.207	/	P

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/matrixer 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	3.85V
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	2023-05-15
2	LISN	ENV216	101200	Rohde & Schwarz	1 year	2023-06-29
3	Test Receiver	ESCI	100344	Rohde & Schwarz	1 year	2023-03-21
4	Shielding Room	S81	/	ETS-Lindgren	/	/

Radiated emission test system

No	Equipment	Model	Serial Number	Manufacturer	Calibration Period	Calibration Due date
1	Test Receiver	ESW44	103023	R&S	1 year	2022-10-28
2	BiLog Antenna	VULB 9163	1223	SCHWARZBECK	1 year	2023-07-25
3	Dual-Ridge Waveguide Horn Antenna	3115	00167250	ETS-Lindgren	1 year	2023-06-20
4	Dual-Ridge Waveguide Horn Antenna	3116	2663	ETS-Lindgren	1 year	2023-02-08

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	4.92
$30\text{MHz} \leq f \leq 1\text{GHz}$	5.15
$1\text{GHz} \leq f \leq 18\text{GHz}$	5.54
$18\text{GHz} \leq f \leq 40\text{GHz}$	5.26

8.6. AC Power-line Conducted Emission

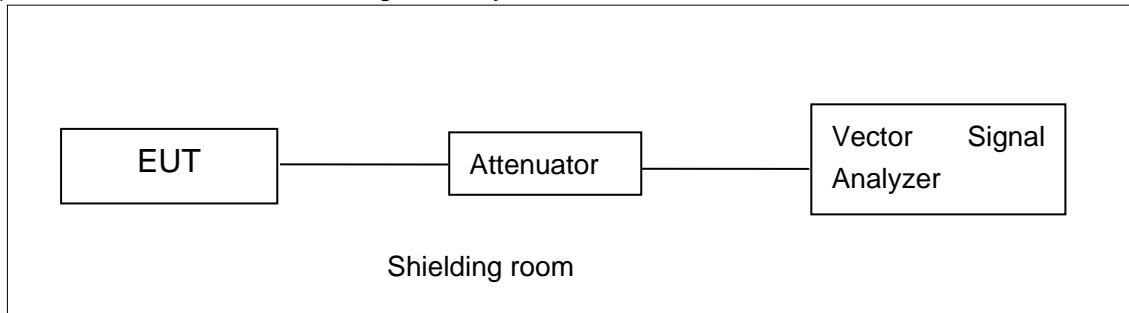
Measurement Uncertainty : 3.08dB,k=2

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

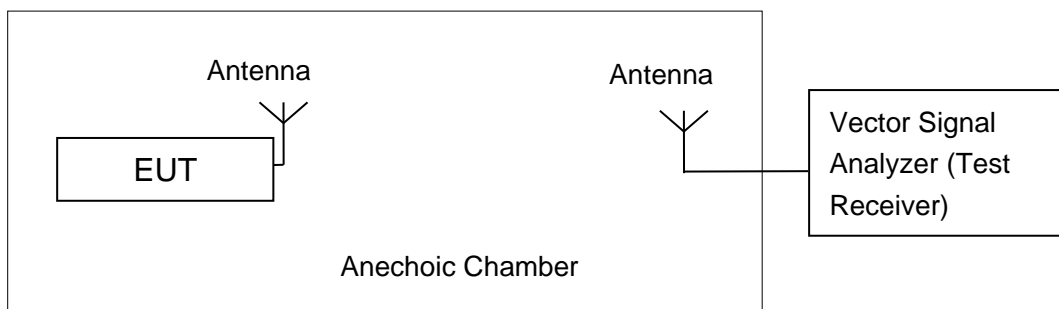


A.1.2. Radiated Emission Measurements

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 -2.2 dBi and the value is supplied by the applicant or manufacturer.

A.2.2. Maximum Average Output Power-Conducted

Measurement Results:

802.11a mode

Mode	Data Rate (Mbps)	Test Result (dBm)		
		5745MHz (Ch149)	5785MHz (Ch157)	5825MHz (Ch165)
802.11a	6	17.58	17.65	18.27

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	17.30	17.32	17.76

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	16.38	16.41	17.54

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	16.29	16.38

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	15.37	15.48

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	14.47

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%

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	3.39	P
	157	4.57	P
	165	5.76	P
802.11n HT20	149	2.71	P
	157	4.26	P
	165	5.44	P
802.11n HT40	151	-0.24	P
	159	0.51	P
802.11ac HT80	155	-5.09	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
802.11a	149	Fig.1	16.35	P
	157	Fig.2	16.35	P
	165	Fig.3	16.35	P
802.11n HT20	149	Fig.4	17.55	P
	157	Fig.5	17.55	P
	165	Fig.6	17.55	P
802.11n HT40	151	Fig.7	36.08	P
	159	Fig.8	36.08	P
802.11ac HT80	155	Fig.9	76.00	P

Conclusion: PASS

Test graphs as below:

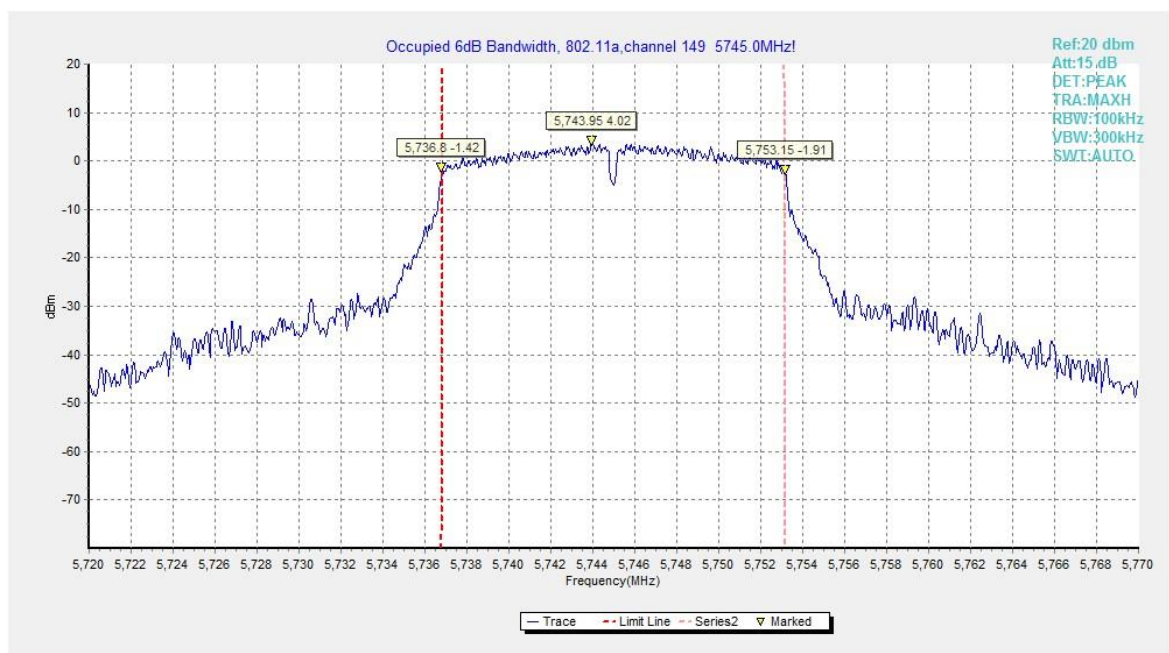


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

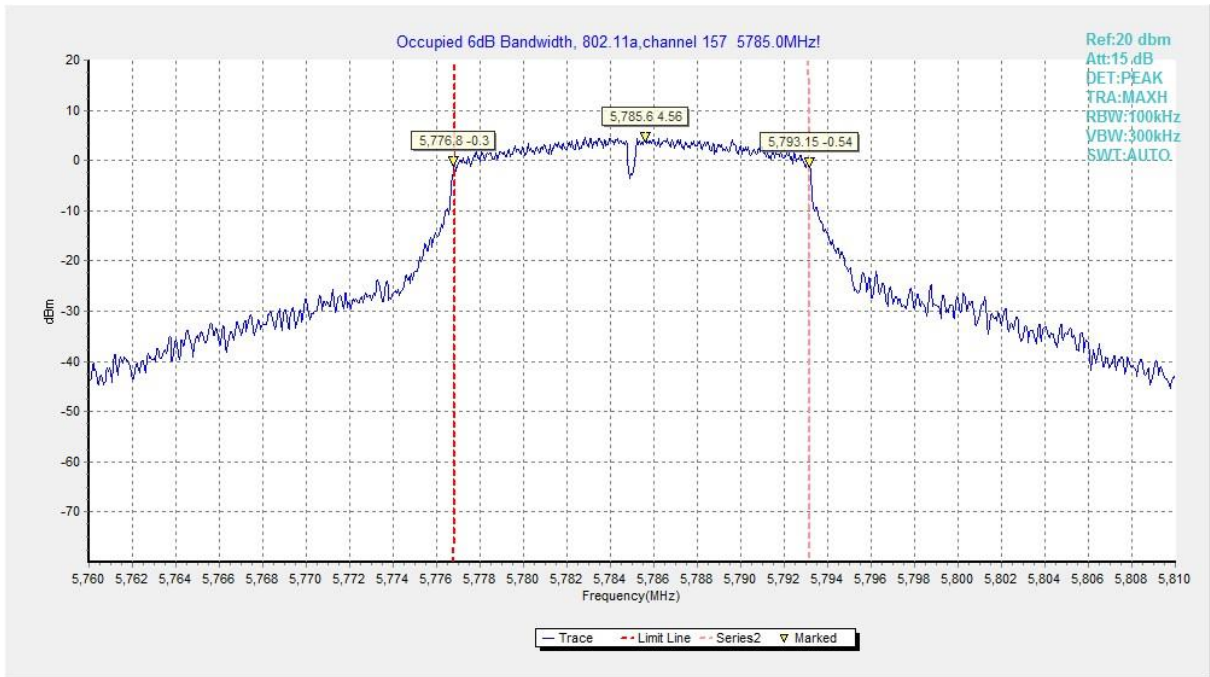


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

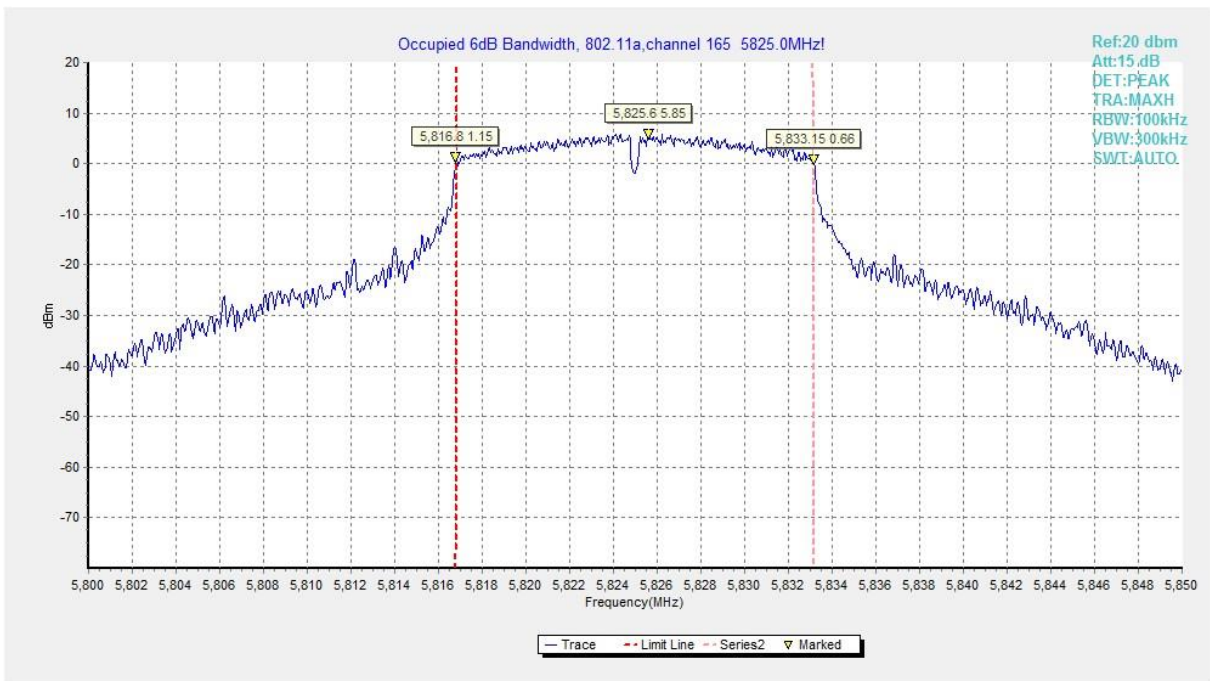


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

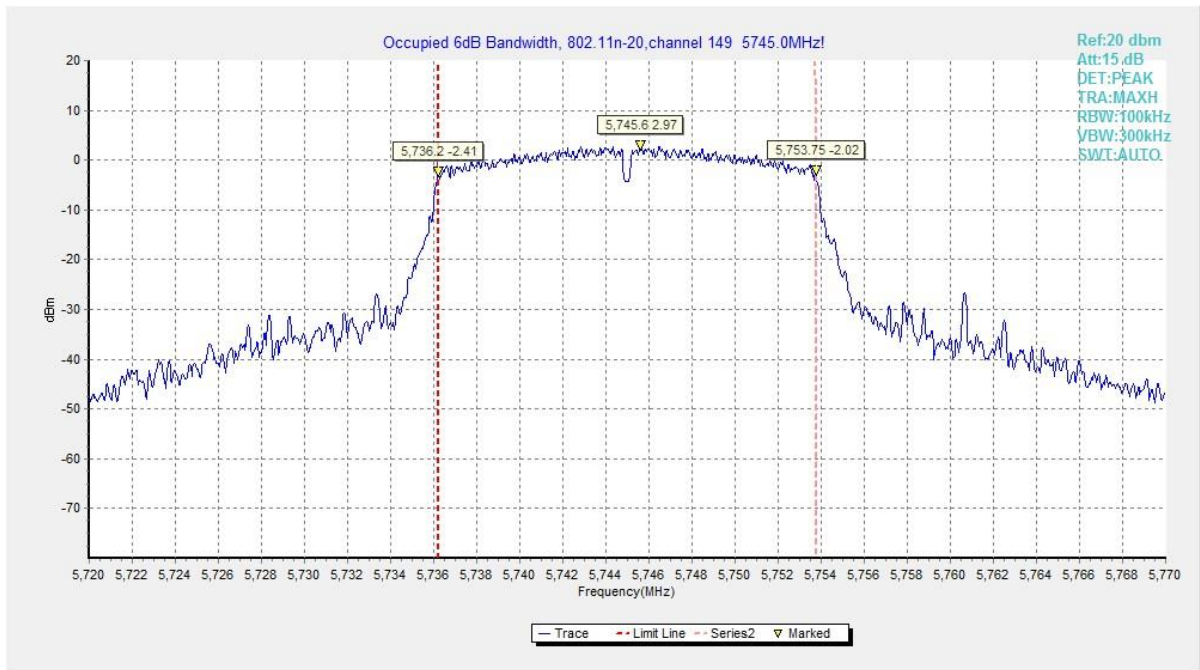


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

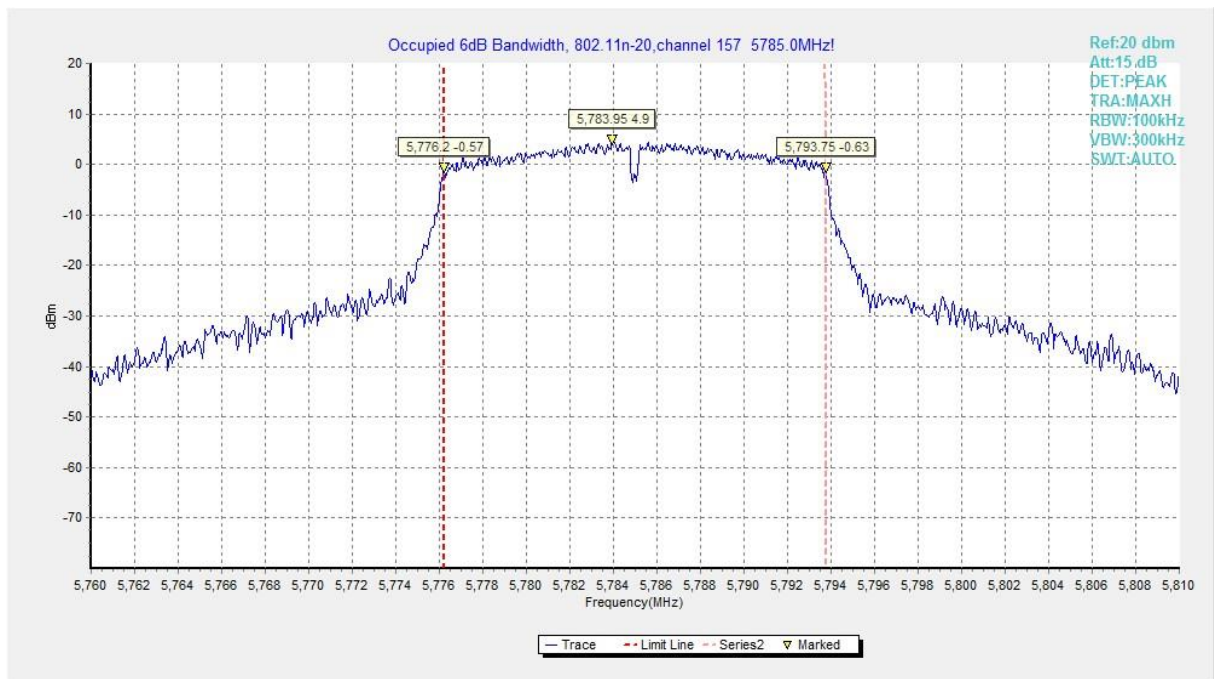


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

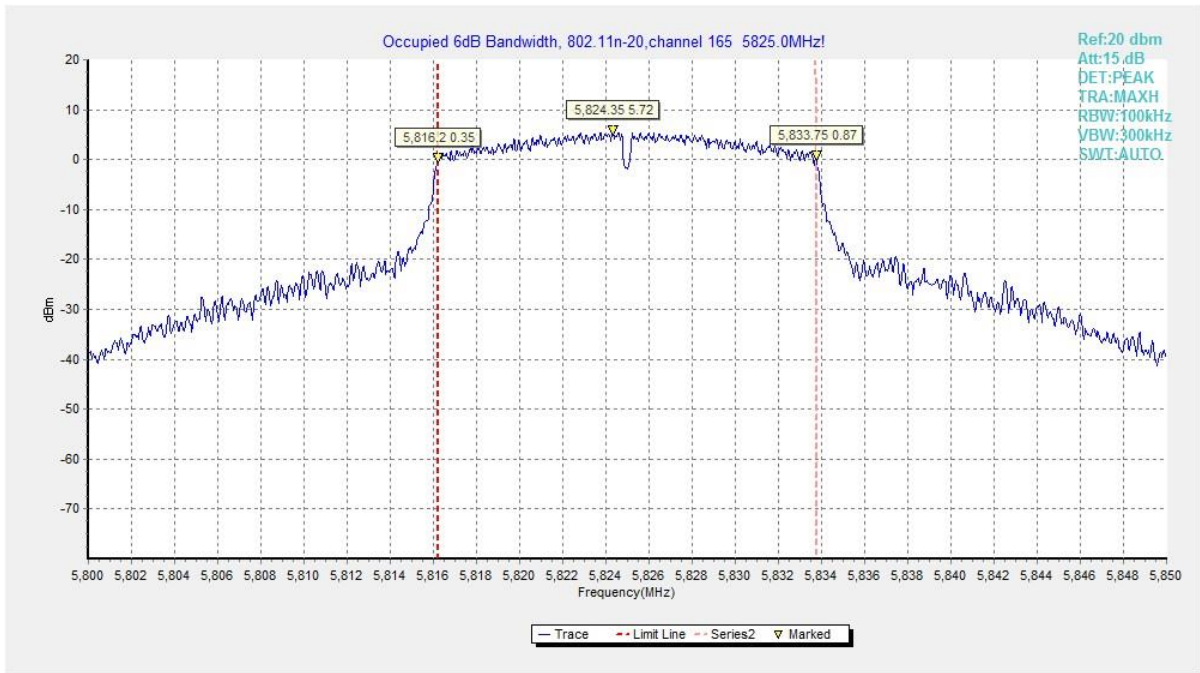


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

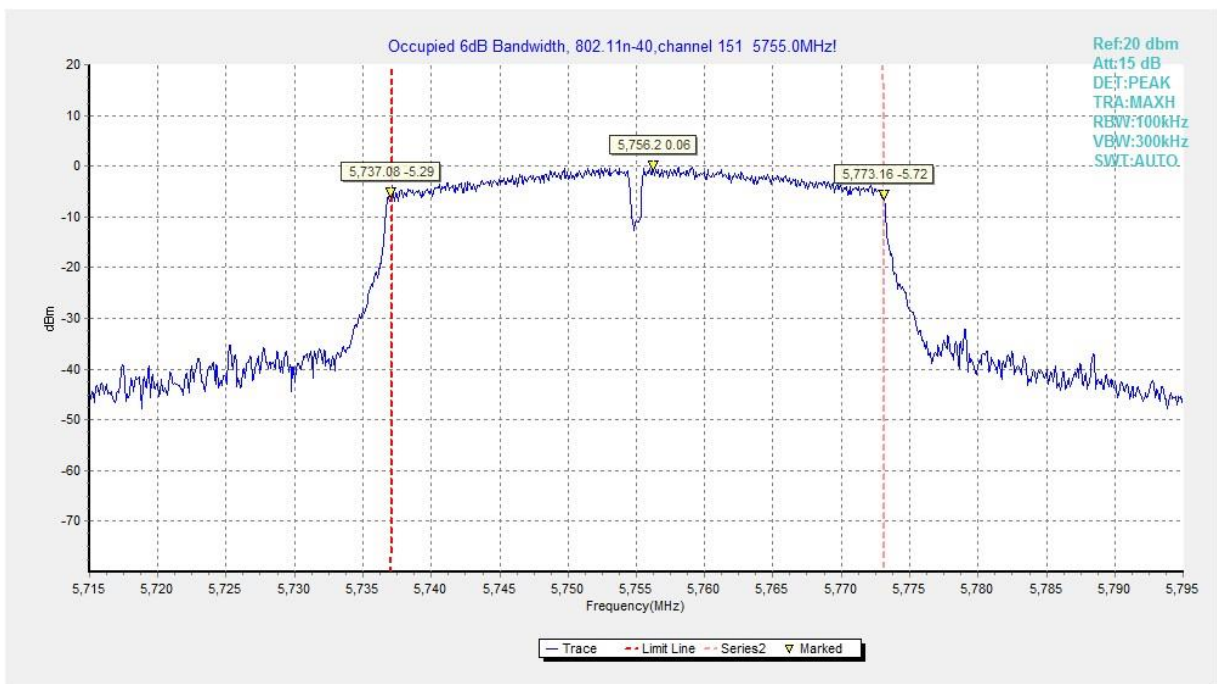


Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

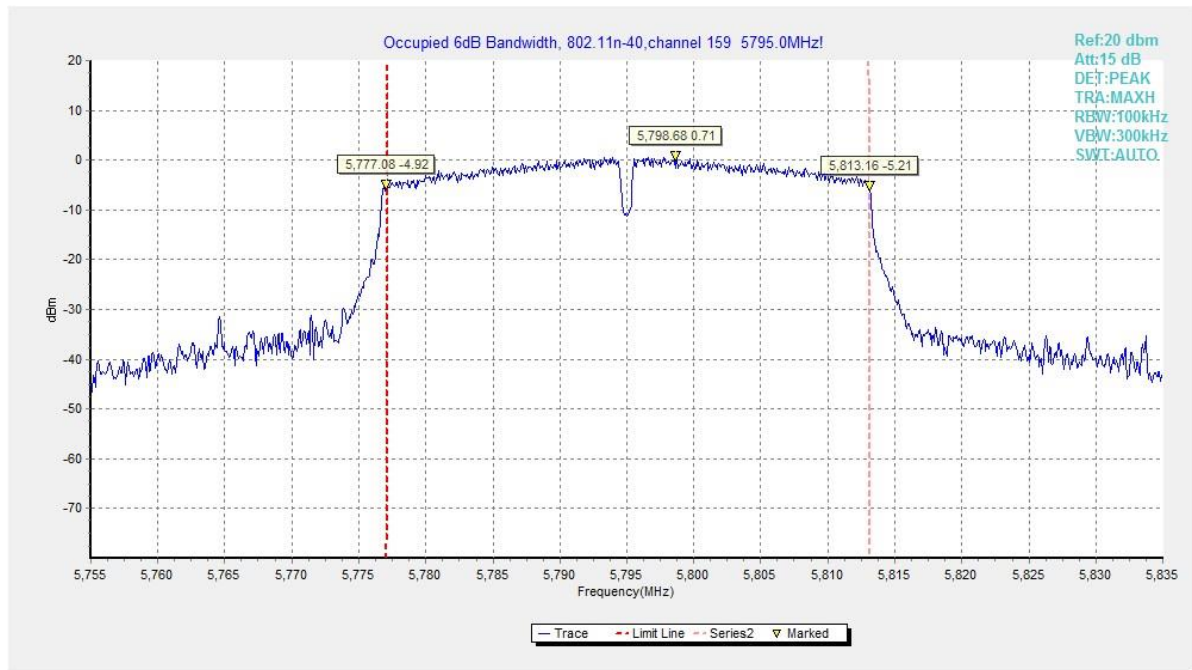


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

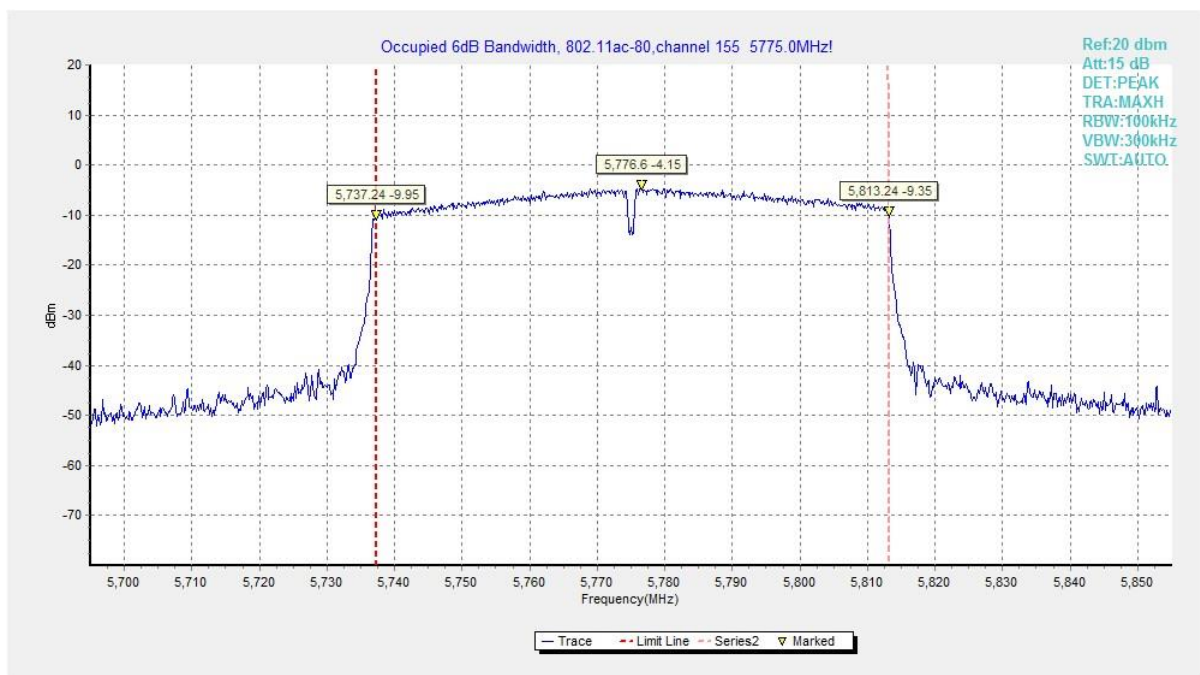


Fig. 9 Occupied 6dB Bandwidth (802.11ac-HT80, Ch 155)

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.

Average Results:

802.11a

Ch149

Frequency (MHz)	Meas. Result (dBµV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBµV)	Limit (dBµV/m)	Margin (dB)	Antenna Pol. (H/V)
17960.95	40.86	-25.50	46.66	19.70	54.00	13.14	H
17986.80	40.64	-25.50	46.66	19.48	54.00	13.36	V
15976.00	37.86	-27.35	38.54	26.67	54.00	16.14	V
13262.85	37.64	-29.67	39.55	27.76	54.00	16.36	V
11864.75	36.74	-31.85	39.05	29.54	54.00	17.26	H
11788.30	36.60	-31.99	38.98	29.61	54.00	17.40	V

Ch157

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17966.45	40.93	-25.50	46.66	19.77	54.00	13.07	V
17974.70	40.90	-25.50	46.66	19.74	54.00	13.10	H
15980.40	37.76	-27.35	38.54	26.57	54.00	16.24	V
16073.90	37.61	-26.77	38.93	25.45	54.00	16.39	V
10860.45	36.45	-32.33	38.59	30.19	54.00	17.55	V
11804.80	36.35	-31.85	39.05	29.15	54.00	17.65	H

Ch165

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17953.80	40.79	-25.50	46.66	19.63	54.00	13.21	H
17916.40	40.78	-25.50	46.66	19.62	54.00	13.22	V
16072.80	38.26	-26.77	38.93	26.10	54.00	15.74	H
15961.15	37.94	-27.35	38.54	26.75	54.00	16.06	V
11869.15	36.73	-31.85	39.05	29.53	54.00	17.27	V
10860.45	36.47	-32.33	38.59	30.21	54.00	17.53	H

802.11n-HT20

Ch149

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17938.40	40.52	-25.50	46.66	19.36	54.00	13.48	H
17995.60	40.51	-25.50	46.66	19.35	54.00	13.49	V
15970.50	37.74	-27.35	38.54	26.55	54.00	16.26	V
15979.85	37.54	-27.35	38.54	26.35	54.00	16.46	V
11863.65	36.45	-31.85	39.05	29.25	54.00	17.55	V
11869.70	36.26	-31.85	39.05	29.06	54.00	17.74	H

Ch157

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17956.00	40.99	-25.50	46.66	19.83	54.00	13.01	H
17994.50	40.94	-25.50	46.66	19.78	54.00	13.06	H
16083.25	38.05	-26.77	38.93	25.89	54.00	15.95	H
15961.15	38.03	-27.35	38.54	26.84	54.00	15.97	V
11869.15	36.56	-31.85	39.05	29.36	54.00	17.44	V
11787.20	36.48	-31.99	38.98	29.49	54.00	17.52	H

Ch165

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17894.40	40.72	-25.50	46.66	19.56	54.00	13.28	V
17998.90	40.70	-25.50	46.66	19.54	54.00	13.30	H
16024.40	37.75	-27.35	38.54	26.56	54.00	16.25	H
14481.10	37.71	-28.59	42.46	23.84	54.00	16.29	H
11787.75	36.37	-31.99	38.98	29.38	54.00	17.63	H
11789.40	36.36	-31.99	38.98	29.37	54.00	17.64	V

802.11n-HT40

Ch151

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17979.65	40.69	-25.50	46.66	19.53	54.00	13.31	H
17997.80	40.65	-25.50	46.66	19.49	54.00	13.35	V
16068.40	37.91	-26.77	38.93	25.75	54.00	16.09	V
13294.20	37.89	-29.49	39.71	27.67	54.00	16.11	H
11809.20	36.61	-31.85	39.05	29.41	54.00	17.39	H
11849.90	36.28	-31.85	39.05	29.08	54.00	17.72	H

Ch159

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17959.30	40.66	-25.50	46.66	19.50	54.00	13.34	H
17974.70	40.66	-25.50	46.66	19.50	54.00	13.34	H
16127.80	37.98	-26.77	38.93	25.82	54.00	16.02	H
16135.50	37.96	-26.77	38.93	25.80	54.00	16.04	H
11798.20	36.51	-31.85	39.05	29.31	54.00	17.49	V
11902.70	36.48	-31.85	39.05	29.28	54.00	17.52	V

802.11ac-HT20

Ch149

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17929.05	41.12	-25.50	46.66	19.96	54.00	12.88	V
17924.65	40.99	-25.50	46.66	19.83	54.00	13.01	H
16068.95	37.97	-26.77	38.93	25.81	54.00	16.03	H
16060.15	37.92	-26.77	38.93	25.76	54.00	16.08	V
11877.40	36.64	-31.85	39.05	29.44	54.00	17.36	V
11865.85	36.57	-31.85	39.05	29.37	54.00	17.43	H

Ch157

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17952.70	41.10	-25.50	46.66	19.94	54.00	12.90	H
17940.05	40.90	-25.50	46.66	19.74	54.00	13.10	H
15965.00	38.14	-27.35	38.54	26.95	54.00	15.86	V
15982.05	38.08	-27.35	38.54	26.89	54.00	15.92	H
11778.95	36.25	-31.99	38.98	29.26	54.00	17.75	V
11871.90	36.24	-31.85	39.05	29.04	54.00	17.76	V

Ch165

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17990.65	40.88	-25.50	46.66	19.72	54.00	13.12	H
17953.80	40.82	-25.50	46.66	19.66	54.00	13.18	V
16155.30	38.34	-26.77	38.93	26.18	54.00	15.66	V
13261.75	38.23	-29.67	39.55	28.35	54.00	15.77	H
11851.55	36.49	-31.85	39.05	29.29	54.00	17.51	H
11871.90	36.42	-31.85	39.05	29.22	54.00	17.58	V

802.11ac-HT40

Ch151

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17957.10	41.37	-25.50	46.66	20.21	54.00	12.63	V
17940.60	41.04	-25.50	46.66	19.88	54.00	12.96	H
13250.20	38.01	-29.67	39.55	28.13	54.00	15.99	V
16050.80	38.01	-27.35	38.54	26.82	54.00	15.99	V
11378.00	36.42	-32.42	38.79	30.05	54.00	17.58	V
11821.85	36.32	-31.85	39.05	29.12	54.00	17.68	H

Ch159

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17867.45	40.68	-25.50	46.66	19.52	54.00	13.32	V
17920.25	40.64	-25.50	46.66	19.48	54.00	13.36	H
16061.80	38.07	-26.77	38.93	25.91	54.00	15.93	V
16049.70	37.94	-27.35	38.54	26.75	54.00	16.06	V
11853.20	36.52	-31.85	39.05	29.32	54.00	17.48	H
11874.10	36.48	-31.85	39.05	29.28	54.00	17.52	V

802.11ac-HT80

Ch155

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17948.85	40.88	-25.50	46.66	19.72	54.00	13.12	V
17990.10	40.68	-25.50	46.66	19.52	54.00	13.32	H
14484.40	38.12	-28.59	42.46	24.25	54.00	15.88	H
14499.80	37.97	-28.59	42.46	24.10	54.00	16.03	V
11790.50	36.46	-31.99	38.98	29.47	54.00	17.54	H
11869.70	36.46	-31.85	39.05	29.26	54.00	17.54	V

Peak Results:
802.11a

Ch149

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17243.20	52.27	-25.95	44.35	33.86	68.20	15.93	V
17517.10	51.87	-26.85	45.25	33.47	68.20	16.33	H
16977.00	50.68	-26.32	42.36	34.63	68.20	17.52	V
16840.60	50.57	-26.62	41.49	35.70	68.20	17.63	V
11055.70	47.23	-32.49	38.72	40.99	74.00	26.77	H
10757.05	46.86	-32.77	38.49	41.14	74.00	27.14	V

Ch157

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17243.75	51.71	-25.95	44.35	33.30	68.20	16.49	H
17060.05	51.60	-26.60	43.36	34.84	68.20	16.60	H
16954.45	50.98	-26.32	42.36	34.93	68.20	17.22	V
16955.00	50.84	-26.32	42.36	34.79	68.20	17.36	H
10843.95	47.87	-32.33	38.59	41.61	74.00	26.13	H
11329.05	47.54	-32.36	38.77	41.14	74.00	26.46	H

Ch165

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17298.20	51.88	-25.95	44.35	33.47	68.20	16.32	H
17223.40	51.78	-25.95	44.35	33.37	68.20	16.42	V
16913.20	51.30	-26.32	42.36	35.25	68.20	16.90	H
16579.35	51.25	-26.87	40.65	37.47	68.20	16.95	H
11392.85	46.89	-32.42	38.79	40.52	74.00	27.11	V
11833.95	46.88	-31.85	39.05	39.68	74.00	27.12	H

802.11n-HT20

Ch149

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17552.30	51.99	-26.85	45.25	33.59	68.20	16.21	H
17595.20	51.42	-25.74	45.95	31.21	68.20	16.78	H
16873.05	51.09	-26.62	41.49	36.22	68.20	17.11	V
16850.50	50.53	-26.62	41.49	35.66	68.20	17.67	V
11750.35	47.27	-31.99	38.98	40.28	74.00	26.73	H
11375.80	47.23	-32.42	38.79	40.86	74.00	26.77	H

Ch157

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17460.45	52.50	-26.85	45.25	34.10	68.20	15.70	H
17973.60	51.55	-25.50	46.66	30.39	74.00	22.45	V
16892.30	51.21	-26.32	42.36	35.16	68.20	16.99	H
16967.65	51.08	-26.32	42.36	35.03	68.20	17.12	H
11876.85	47.51	-31.85	39.05	40.31	74.00	26.49	H
11136.00	47.31	-32.60	38.75	41.17	74.00	26.69	V

Ch165

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17257.50	52.23	-25.95	44.35	33.82	68.20	15.97	V
17808.60	52.22	-25.50	46.66	31.06	74.00	21.78	V
16880.20	51.76	-26.32	42.36	35.71	68.20	16.44	H
16750.95	51.06	-26.62	41.49	36.19	68.20	17.14	V
10738.35	47.04	-32.77	38.49	41.32	74.00	26.96	V
8558.15	46.95	-34.13	37.86	43.21	68.20	21.25	H

802.11n-HT40

Ch151

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17857.55	51.47	-25.50	46.66	30.31	74.00	22.53	H
16949.50	51.40	-26.32	42.36	35.35	68.20	16.80	V
17661.75	51.31	-25.74	45.95	31.10	68.20	16.89	V
16942.90	51.12	-26.32	42.36	35.07	68.20	17.08	H
11363.70	46.96	-32.42	38.79	40.59	74.00	27.04	V
11787.20	46.87	-31.99	38.98	39.88	74.00	27.13	H

Ch159

Frequency (MHz)	Meas. Result (dB μ V/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dB μ V)	Limit (dB μ V/m)	Margin (dB)	Antenna Pol. (H/V)
17572.65	52.11	-25.74	45.95	31.90	68.20	16.09	V
17450.55	51.70	-26.85	45.25	33.30	68.20	16.50	V
13766.10	51.01	-29.10	40.86	39.24	68.20	17.19	H
16957.20	50.83	-26.32	42.36	34.78	68.20	17.37	H
11819.10	47.25	-31.85	39.05	40.05	74.00	26.75	H
11805.90	47.00	-31.85	39.05	39.80	74.00	27.00	H

802.11ac-HT20

Ch149

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17221.75	51.64	-25.95	44.35	33.23	68.20	16.56	V
17567.15	51.58	-25.74	45.95	31.37	68.20	16.62	V
16757.00	51.50	-26.62	41.49	36.63	68.20	16.70	V
16952.80	50.90	-26.32	42.36	34.85	68.20	17.30	V
11888.40	47.28	-31.85	39.05	40.08	74.00	26.72	H
10761.45	46.94	-32.77	38.49	41.22	74.00	27.06	V

Ch157

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17596.85	52.25	-25.74	45.95	32.04	68.20	15.95	H
17592.45	51.79	-25.74	45.95	31.58	68.20	16.41	H
16853.80	51.75	-26.62	41.49	36.88	68.20	16.45	H
16860.40	51.61	-26.62	41.49	36.74	68.20	16.59	V
10818.10	47.72	-32.33	38.59	41.46	74.00	26.28	H
10746.60	46.95	-32.77	38.49	41.23	74.00	27.05	V

Ch165

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17568.25	52.12	-25.74	45.95	31.91	68.20	16.08	V
17998.35	51.99	-25.50	46.66	30.83	74.00	22.01	H
16959.40	51.68	-26.32	42.36	35.63	68.20	16.52	H
16894.50	51.06	-26.32	42.36	35.01	68.20	17.14	V
11367.55	47.57	-32.42	38.79	41.20	74.00	26.43	H
11259.20	47.47	-32.36	38.77	41.07	74.00	26.53	H

802.11ac-HT40

Ch151

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17458.25	52.18	-26.85	45.25	33.78	68.20	16.02	H
16687.15	51.89	-26.87	40.65	38.11	68.20	16.31	V
17333.40	51.64	-25.95	44.35	33.23	68.20	16.56	H
16858.20	51.16	-26.62	41.49	36.29	68.20	17.04	V
11411.55	47.25	-32.42	38.79	40.88	74.00	26.75	H
11874.10	47.12	-31.85	39.05	39.92	74.00	26.88	V

Ch159

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17132.10	52.46	-26.60	43.36	35.70	68.20	15.74	H
17329.00	51.60	-25.95	44.35	33.19	68.20	16.60	H
16959.40	50.84	-26.32	42.36	34.79	68.20	17.36	H
16953.90	50.71	-26.32	42.36	34.66	68.20	17.49	H
10718.00	47.81	-32.77	38.49	42.09	74.00	26.19	V
10736.15	47.12	-32.77	38.49	41.40	74.00	26.88	H

802.11ac-HT80

Ch155

Frequency (MHz)	Meas. Result (dBμV/m)	Cable loss (dB)	Antenna Factor (dB/m)	Receiver Reading (dBμV)	Limit (dBμV/m)	Margin (dB)	Antenna Pol. (H/V)
17663.95	51.89	-25.74	45.95	31.68	68.20	16.31	H
17561.65	51.81	-25.74	45.95	31.60	68.20	16.39	V
16840.60	51.71	-26.62	41.49	36.84	68.20	16.49	V
16741.60	51.10	-26.62	41.49	36.23	68.20	17.10	H
10666.85	47.41	-32.76	38.38	41.79	74.00	26.59	V
11415.95	47.21	-32.42	38.79	40.84	74.00	26.79	V

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
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.10	P
	5825 MHz	Fig.11	P
802.11n HT20	5745 MHz	Fig.12	P
802.11ac HT20	5745 MHz	Fig.13	P
	5825 MHz	Fig.14	P
	5825 MHz	Fig.15	P
802.11n HT40	5755 MHz	Fig.16	P
	5795 MHz	Fig.17	P
802.11ac HT40	5755 MHz	Fig.18	P
	5795 MHz	Fig.19	P
802.11ac HT80	5775 MHz	Fig.20	P
	5775 MHz	Fig.21	P

Conclusion: PASS

Test graphs as below:

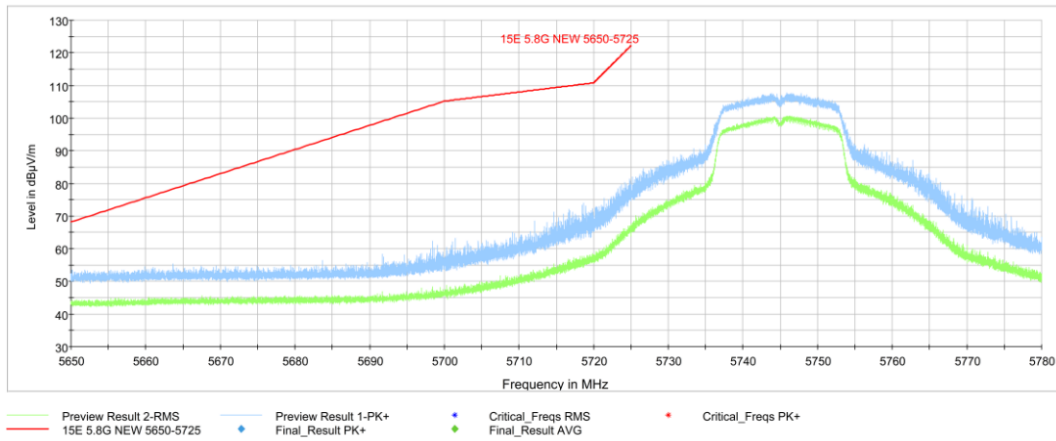


Fig. 10 Band Edges (802.11a, 5745MHz)

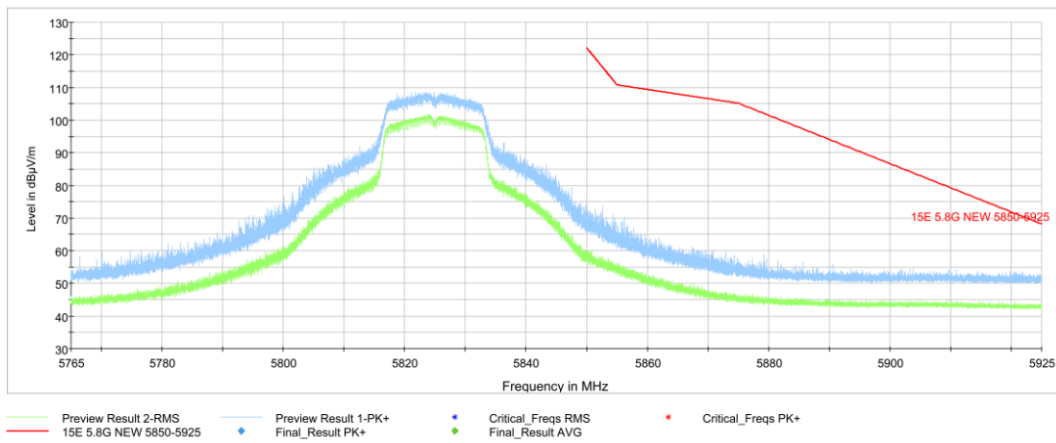


Fig. 11 Band Edges (802.11a, 5825MHz)

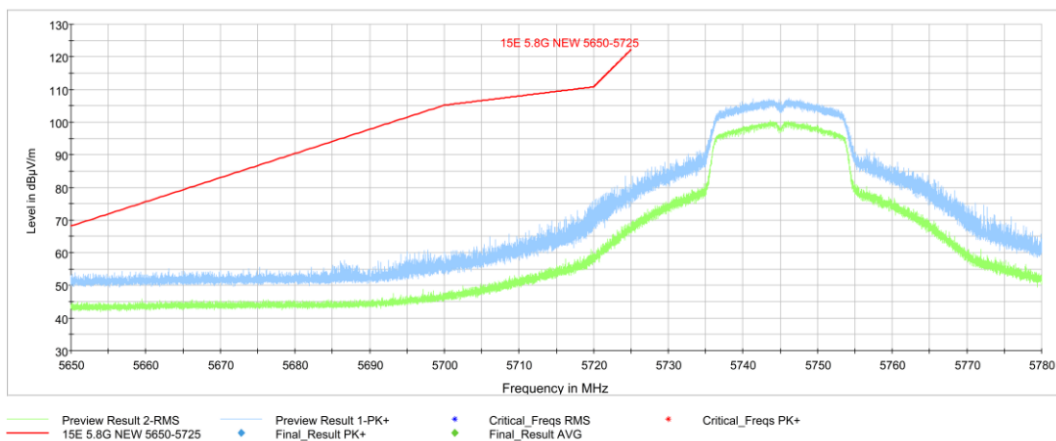


Fig. 12 Band Edges (802.11n-HT20, 5745MHz)

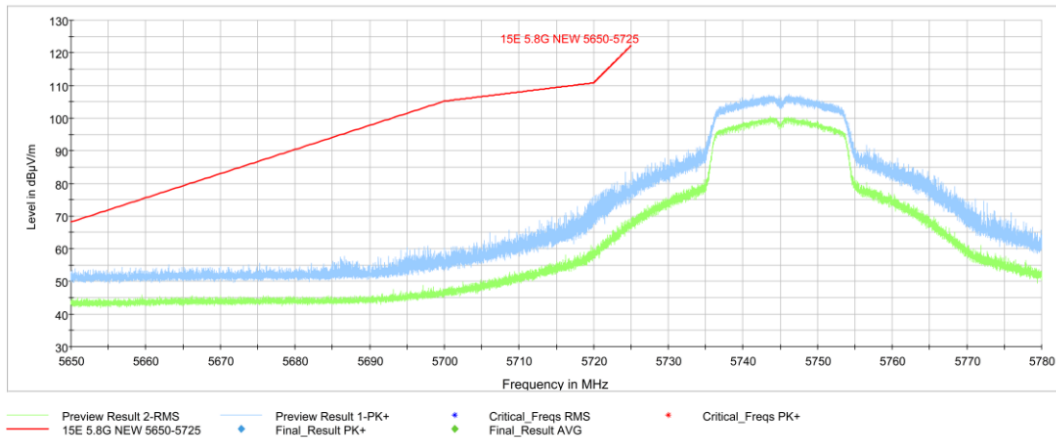


Fig. 13 Band Edges (802.11n-HT20, 5825MHz)

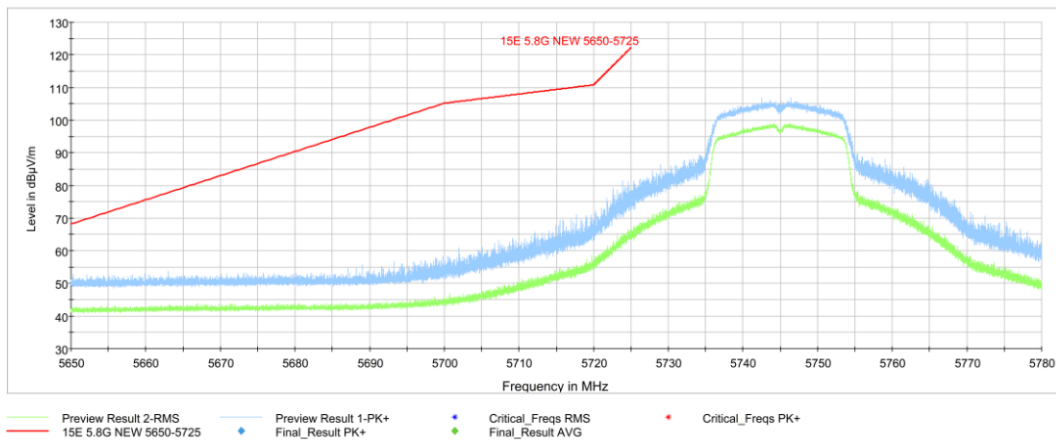


Fig. 14 Band Edges (802.11ac-HT20, 5745MHz)

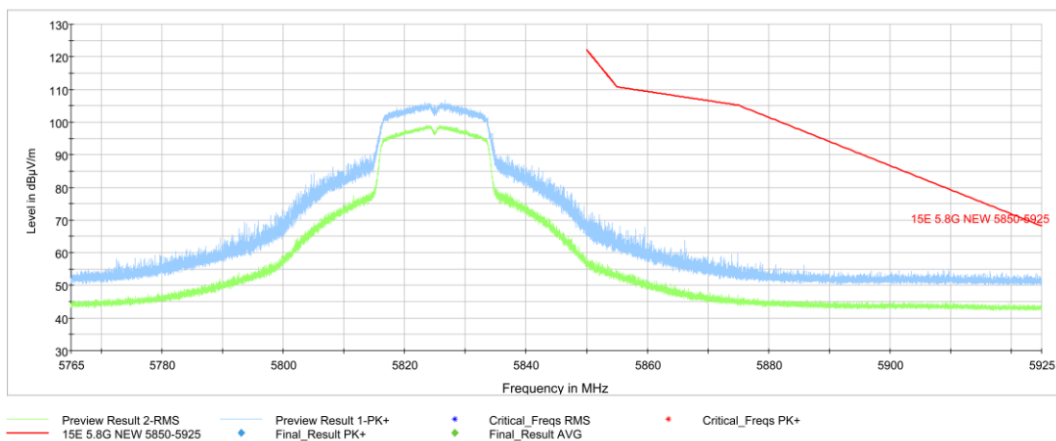


Fig. 15 Band Edges (802.11ac-HT20, 5825MHz)

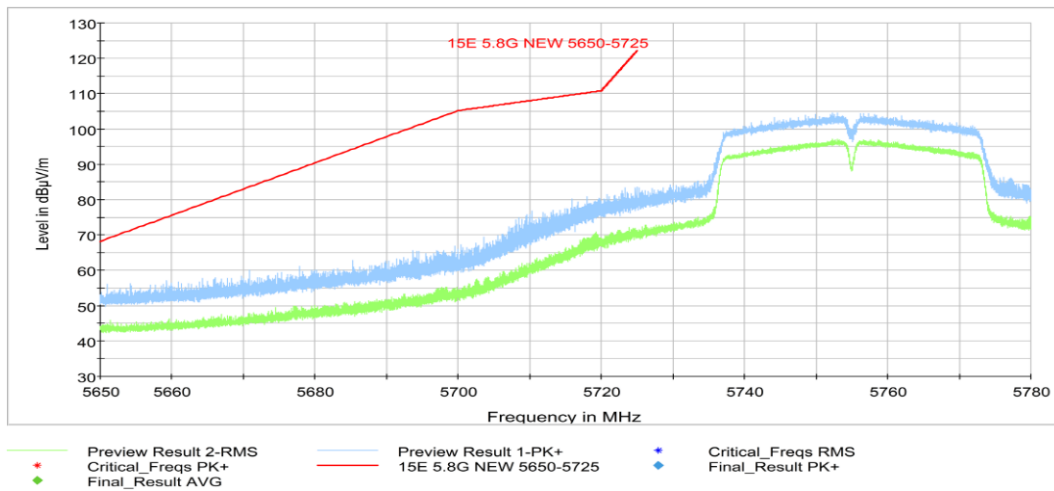


Fig. 16 Band Edges (802.11n-HT40, 5755MHz)

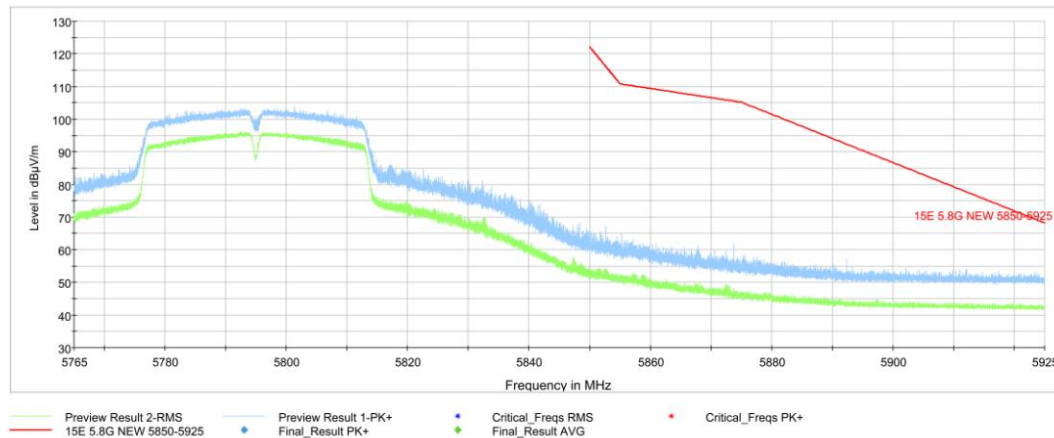


Fig. 17 Band Edges (802.11n-HT40, 5795MHz)

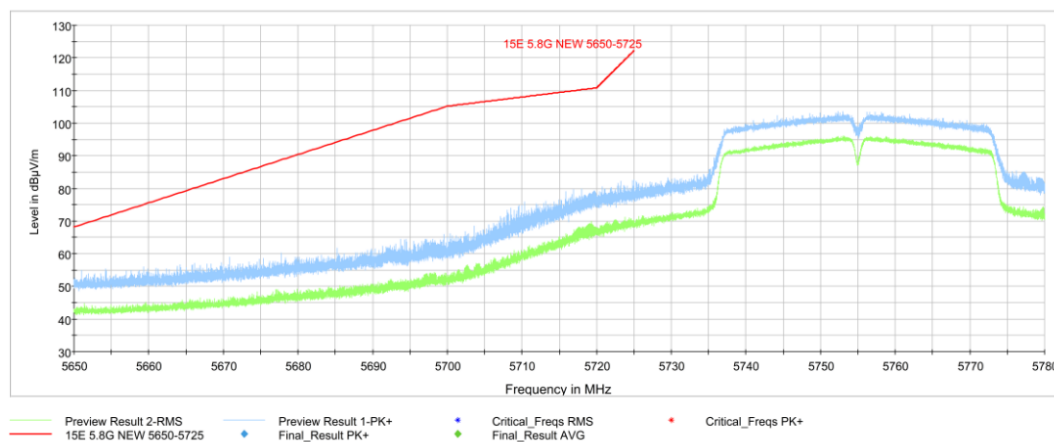


Fig. 18 Band Edges (802.11ac-HT40, 5755MHz)

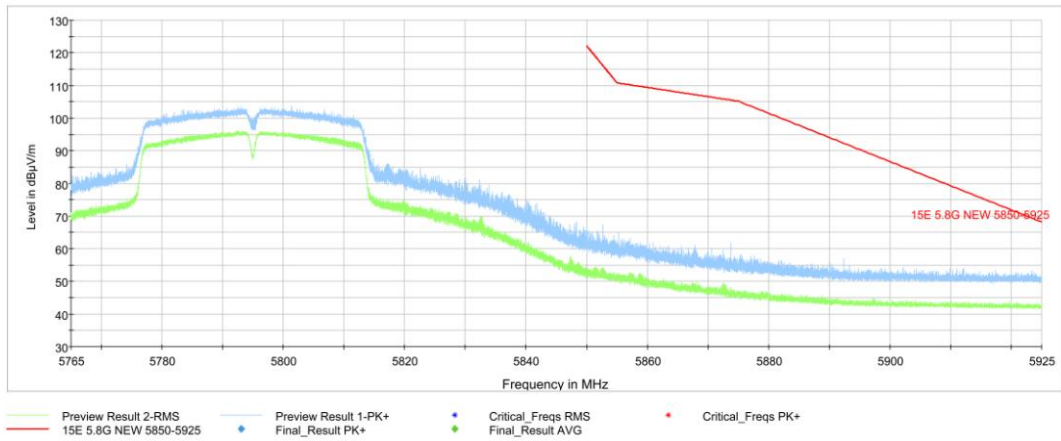


Fig. 19 Band Edges (802.11ac-HT40, 5795MHz)

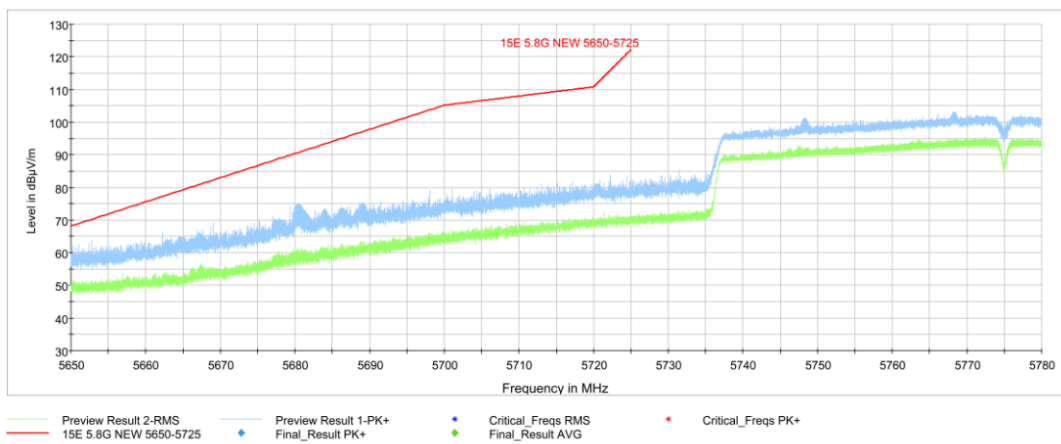


Fig. 20 Band Edges (802.11ac-HT80, 5775MHz)

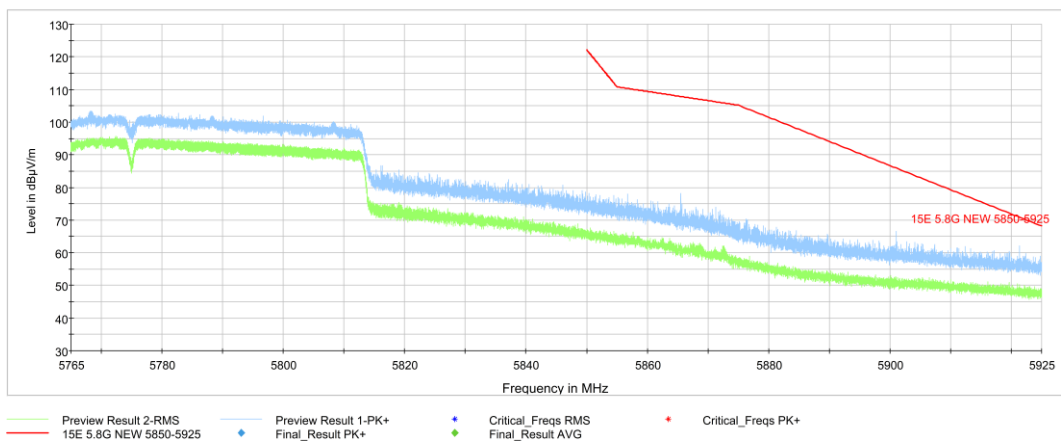


Fig. 21 Band Edges (802.11ac-HT80, 5775MHz)

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 μ V)	Result (dB μ 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 μ V)	Result (dB μ 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:

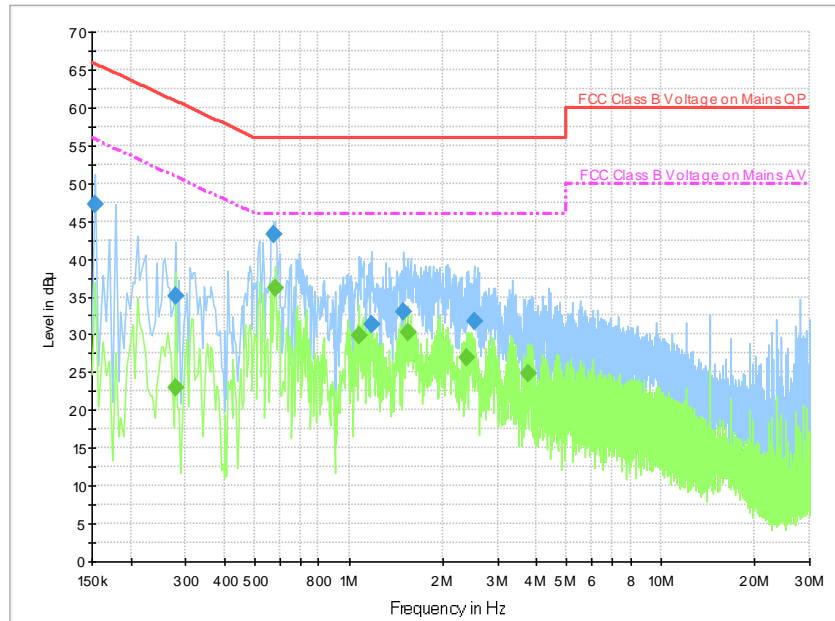


Fig. 22 AC Powerline Conducted Emission-802.11a

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154000	47.2	2000.0	9.000	On	N	19.9	18.5	65.8
0.278000	35.0	2000.0	9.000	On	L1	19.7	25.9	60.9
0.574000	43.2	2000.0	9.000	On	L1	19.7	12.8	56.0
1.182000	31.3	2000.0	9.000	On	N	19.6	24.7	56.0
1.502000	32.9	2000.0	9.000	On	N	19.6	23.1	56.0
2.514000	31.8	2000.0	9.000	On	N	19.6	24.2	56.0

Measurement Result 2:

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.278000	23.0	2000.0	9.000	On	L1	19.7	27.9	50.9
0.578000	36.1	2000.0	9.000	On	L1	19.7	9.9	46.0
1.078000	29.9	2000.0	9.000	On	L1	19.7	16.1	46.0
1.546000	30.3	2000.0	9.000	On	L1	19.6	15.7	46.0
2.394000	27.0	2000.0	9.000	On	L1	19.6	19.0	46.0
3.758000	24.8	2000.0	9.000	On	L1	19.6	21.2	46.0

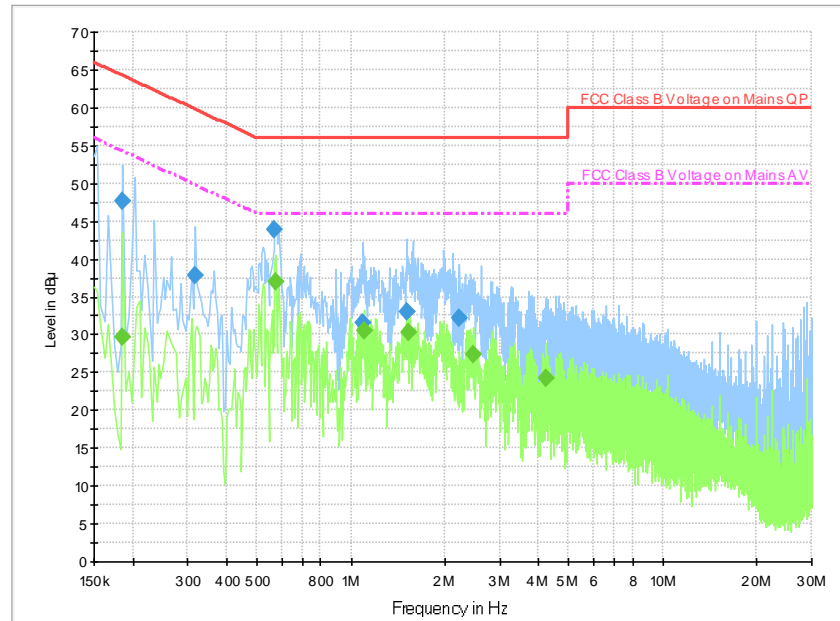


Fig. 23 AC Powerline Conducted Emission-Idle

Measurement Result 1:

Frequency (MHz)	QuasiPeak (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.186000	47.6	2000.0	9.000	On	L1	19.7	16.6	64.2
0.318000	37.8	2000.0	9.000	On	L1	19.7	21.9	59.8
0.570000	43.8	2000.0	9.000	On	L1	19.7	12.2	56.0
1.094000	31.6	2000.0	9.000	On	N	19.6	24.4	56.0
1.510000	32.9	2000.0	9.000	On	N	19.6	23.1	56.0
2.218000	32.2	2000.0	9.000	On	N	19.6	23.8	56.0

Measurement Result 2:

Frequency (MHz)	Average (dB μ V)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.186000	29.6	2000.0	9.000	On	L1	19.7	24.6	54.2
0.574000	37.1	2000.0	9.000	On	L1	19.7	8.9	46.0
1.102000	30.4	2000.0	9.000	On	L1	19.6	15.6	46.0
1.538000	30.3	2000.0	9.000	On	L1	19.6	15.7	46.0
2.474000	27.4	2000.0	9.000	On	L1	19.6	18.6	46.0
4.202000	24.2	2000.0	9.000	On	L1	19.6	21.8	46.0

ANNEX B: EUT parameters

Disclaimer: The worse case and antenna gain 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

<p>United States Department of Commerce National Institute of Standards and Technology</p> <div style="display: flex; justify-content: space-around; align-items: center;"><div style="font-size: 2em; font-weight: bold; letter-spacing: 0.5em;">NVLAP[®]</div><div style="text-align: center;"></div></div> <hr/> <p style="text-align: center;">Certificate of Accreditation to ISO/IEC 17025:2017</p> <hr/> <p style="text-align: center;">NVLAP LAB CODE: 600118-0</p> <p style="text-align: center;">Telecommunication Technology Labs, CAICT Beijing China</p> <p style="text-align: center;"><i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i></p> <p style="text-align: center;">Electromagnetic Compatibility & Telecommunications</p> <p style="text-align: center;"><i>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. 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> <div style="display: flex; justify-content: space-between; align-items: center;"><div style="text-align: center;"><hr/><p>2022-10-01 through 2023-09-30 <i>Effective Dates</i></p></div><div style="text-align: center;"></div><div style="text-align: center;"> <hr/><p><i>For the National Voluntary Laboratory Accreditation Program</i></p></div></div>	
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