



FCC PART 15C TEST REPORT No.I21Z60772-IOT05

for

Shenzhen Tinno Mobile Technology Corp.

Smart Phone

U319AA

With

FCC ID: XD6U319AA

Hardware Version: V1.0

Software Version: U319AAV01.02.10

Issued Date: 2021-06-21

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

| Report Number | Revision | Description | Issue Date |
|----------------------|-----------------|---|-------------------|
| I21Z60772-IOT05 | Rev.0 | 1st edition | 2021-06-11 |
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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. Testing Environment

Normal Temperature: 15-35°C

Relative Humidity: 20-75%

1.4. Project date

Testing Start Date: 2021-04-25

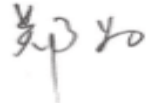
Testing End Date: 2021-06-06

1.5. Signature

谢秀珍


Xie Xiuzhen

(Prepared this test report)



Zheng Wei

(Reviewed this test report)



Hu Xiaoyu

(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Shenzhen Tinno Mobile Technology Corp.
Address: 4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District,Shenzhen, P.R.China
City: Shenzhen
Postal Code: /
Country: China
Telephone: 0755-86095550
Fax: /

2.2. Manufacturer Information

Company Name: Shenzhen Tinno Mobile Technology Corp.
Address: 4/F, H-3 Building,OCT Eastern Industrial Park. NO.1 XiangShan East Road, Nan Shan District,Shenzhen, P.R.China
City: Shenzhen
Postal Code: /
Country: China
Telephone: 0755-86095550
Fax: /

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY

EQUIPMENT(AE)

3.1. About EUT

| | |
|---------------------|---------------------------|
| Description | Smart Phone |
| Model name | U319AA |
| FCC ID | XD6U319AA |
| 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 |
|---------|-----------------|------------|-----------------|
| EUT1 | 860999050012816 | V1.0 | U319AAV01.02.10 |
| EUT2 | 860999050009929 | V1.0 | U319AAV01.02.10 |

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

3.3. Internal Identification of AE used during the test

| AE ID* | Description | Type | SN |
|--------|---------------|------|----|
| AE1 | Battery | / | / |
| AE2 | Dummy battery | / | / |
| AE2 | Charger | / | / |
| AE3 | USB Cable | / | / |

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

AE1

| | |
|-----------------|--------------------------------------|
| Model | LT25H426271W |
| Manufacturer | Ningbo Veken Battery Company Limited |
| Capacity | 2500 mAh |
| Nominal Voltage | 3.85V |

AE2

| | |
|-----------------|---------------|
| Model | Dummy battery |
| Manufacturer | / |
| Capacity | / |
| Nominal Voltage | / |

AE3

| | |
|-----------------|-------------|
| Model | TN-050120U8 |
| Manufacturer | / |
| Length of cable | / |

AE4

Model /
Manufacturer /
Length of cable /

3.4. General Description

Equipment Under Test (EUT) is a model of Smart 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 |

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/matrix 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 | 2021-06-06 |
| 2 | LISN | ESH3-Z5 | 825562/028 | R&S | 1 year | 2021-10-15 |
| 3 | Test Receiver | ESCI | 100344 | Rohde & Schwarz | 1 year | 2022-02-23 |
| 4 | Shielding Room | S81 | / | ETS-Lindgren | / | / |

Radiated emission test system

| No. | Equipment | Model | Serial Number | Manufacturer | Calibration Period | Calibration Due date |
|-----|---------------|-----------|---------------|--------------|--------------------|----------------------|
| 1 | Test Receiver | ESU 26 | 100235 | R&S | 1 year | 2022-02-23 |
| 2 | EMI Antenna | VULB 9163 | 483 | SCHWARZBECK | 1 year | 2021-08-27 |
| 3 | EMI Antenna | 3115 | 6914 | ETS-Lindgren | 1 year | 2022-02-03 |

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 | / |
| $30\text{MHz} \leq f \leq 1\text{GHz}$ | 5.16 |
| $1\text{GHz} \leq f \leq 18\text{GHz}$ | 5.44 |
| $18\text{GHz} \leq f \leq 40\text{GHz}$ | 5.28 |

8.6. AC Power-line Conducted Emission

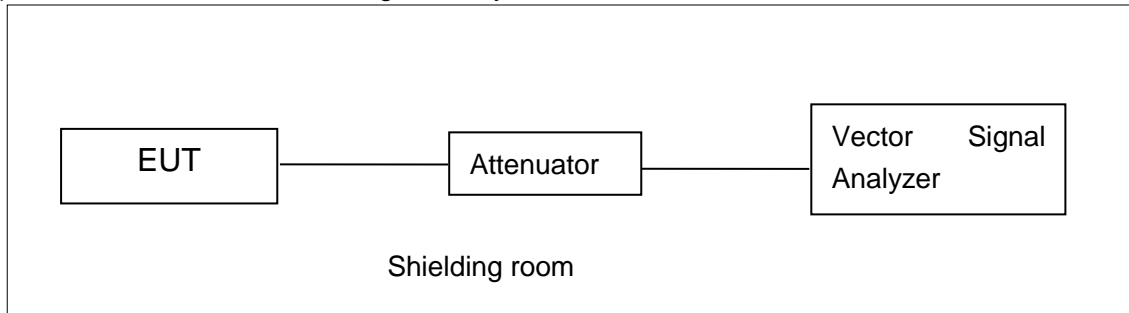
Measurement Uncertainty : 3.08dB,k=2

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

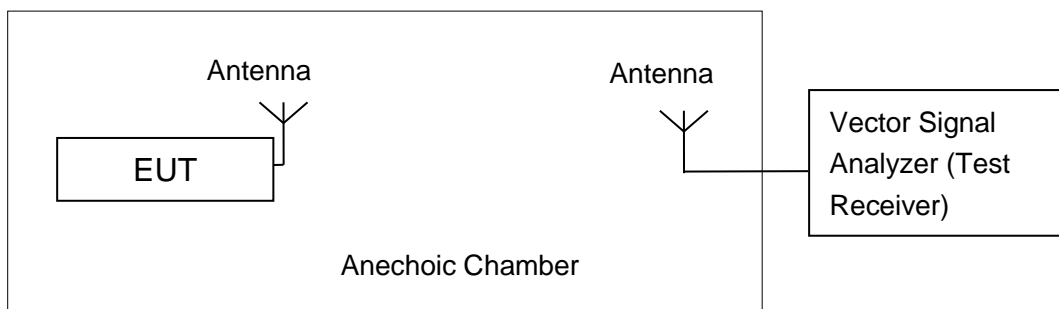


A.1.2. Radiated Emission Measurements

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 0.3dBi 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

802.11a mode

| Mode | Test Result (dBm) | | |
|---------|-------------------|-----------------|-----------------|
| | 5745MHz (Ch149) | 5785MHz (Ch157) | 5825MHz (Ch165) |
| 802.11a | 13.31 | 12.90 | 12.63 |

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

802.11n-HT20 mode

| Mode | Test Result (dBm) | | |
|----------------|-------------------|-----------------|----------------|
| | 5745MHz (Ch149) | 5785MHz (Ch157) | 5825MHz(Ch165) |
| 802.11n(20MHz) | 13.24 | 12.85 | 12.66 |

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

802.11n-HT40 mode

| Mode | Test Result (dBm) | |
|----------------|-------------------|----------------|
| | 5755MHz (Ch151) | 5795MHz(Ch159) |
| 802.11n(40MHz) | 13.67 | 13.79 |

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

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 |
|-------------------------|--------|

Measurement Results:

| Mode | Channel | Power Spectral Density (dBm/500kHz) | Conclusion |
|-----------------|---------|--|------------|
| 802.11a | 149 | -2.44 | P |
| | 157 | -2.73 | P |
| | 165 | -3.08 | P |
| 802.11n HT20 | 149 | -2.70 | P |
| | 157 | -3.07 | P |
| | 165 | -3.42 | P |
| 802.11n HT40 | 151 | -5.87 | P |
| | 159 | -6.12 | 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 |
|-------------------------|---------|

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 | 36.00 | P |
| | 159 | Fig.8 | 36.00 | P |

Conclusion: PASS

Test graphs as below:

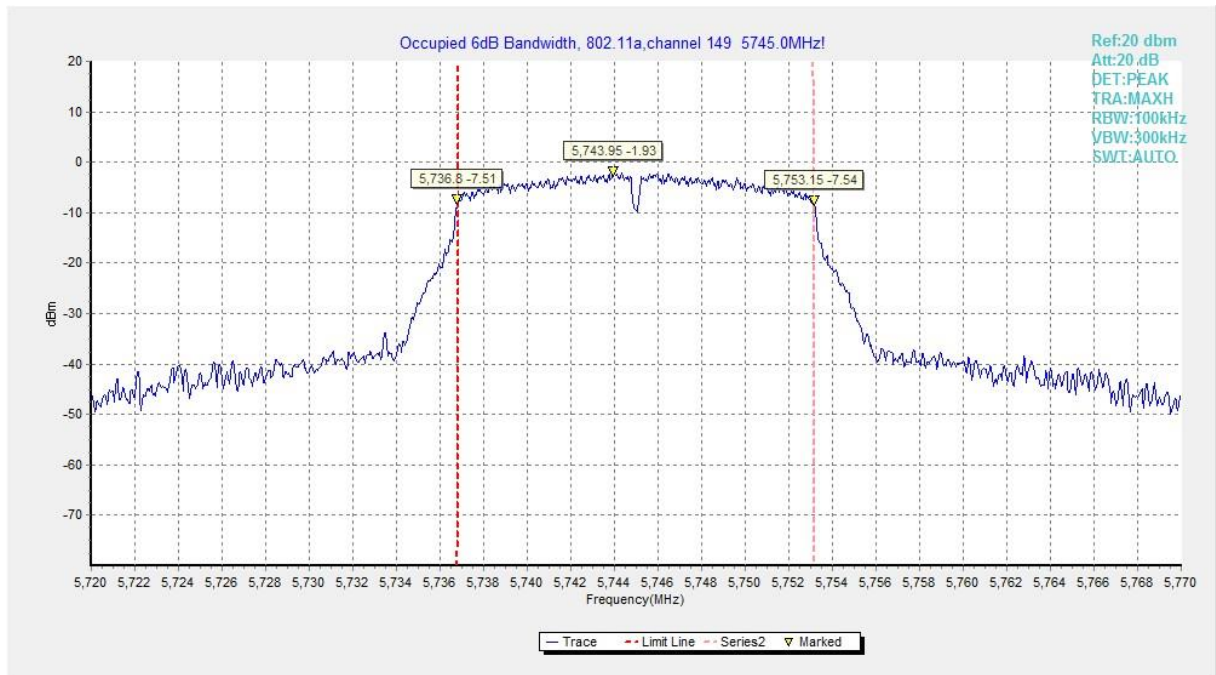


Fig. 1 Occupied 6dB Bandwidth (802.11a, Ch 149)

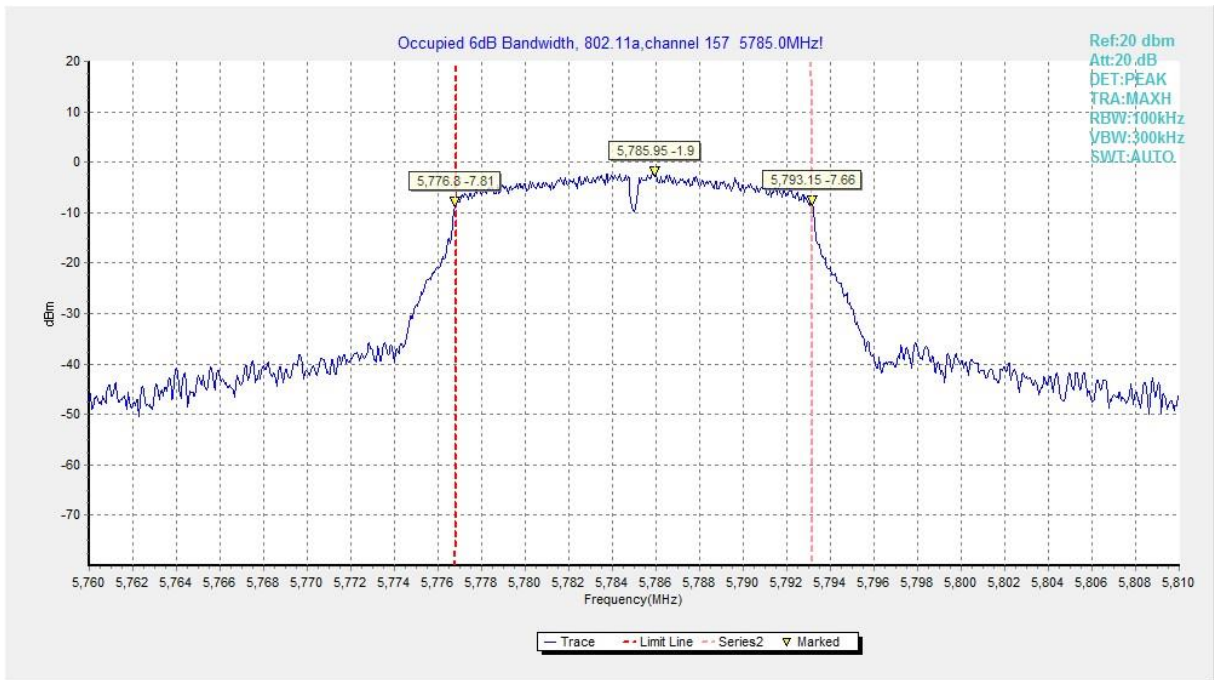


Fig. 2 Occupied 6dB Bandwidth (802.11a, Ch 157)

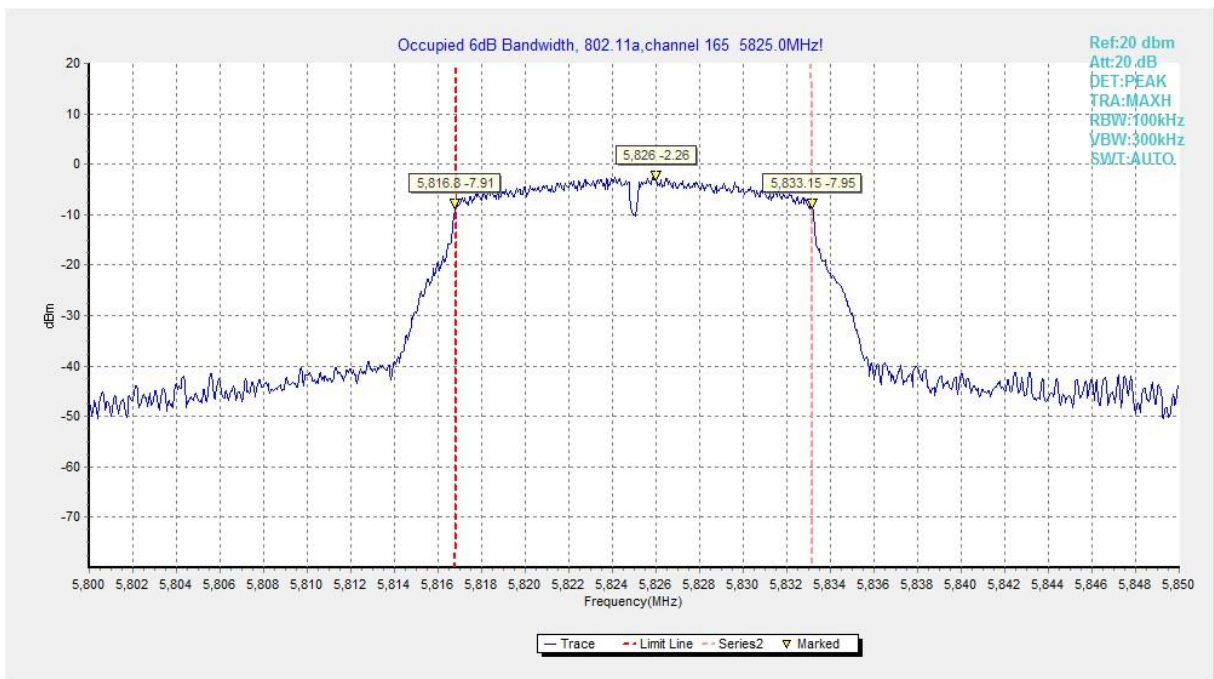


Fig. 3 Occupied 6dB Bandwidth (802.11a, Ch 165)

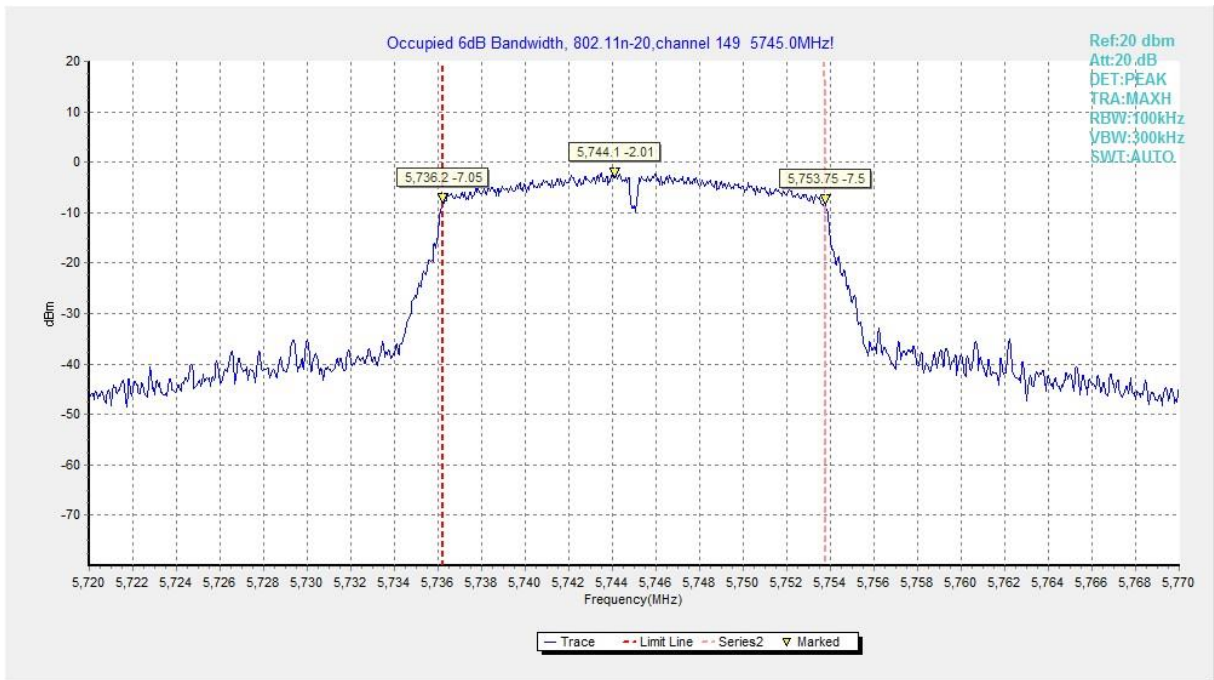


Fig. 4 Occupied 6dB Bandwidth (802.11n-HT20, Ch 149)

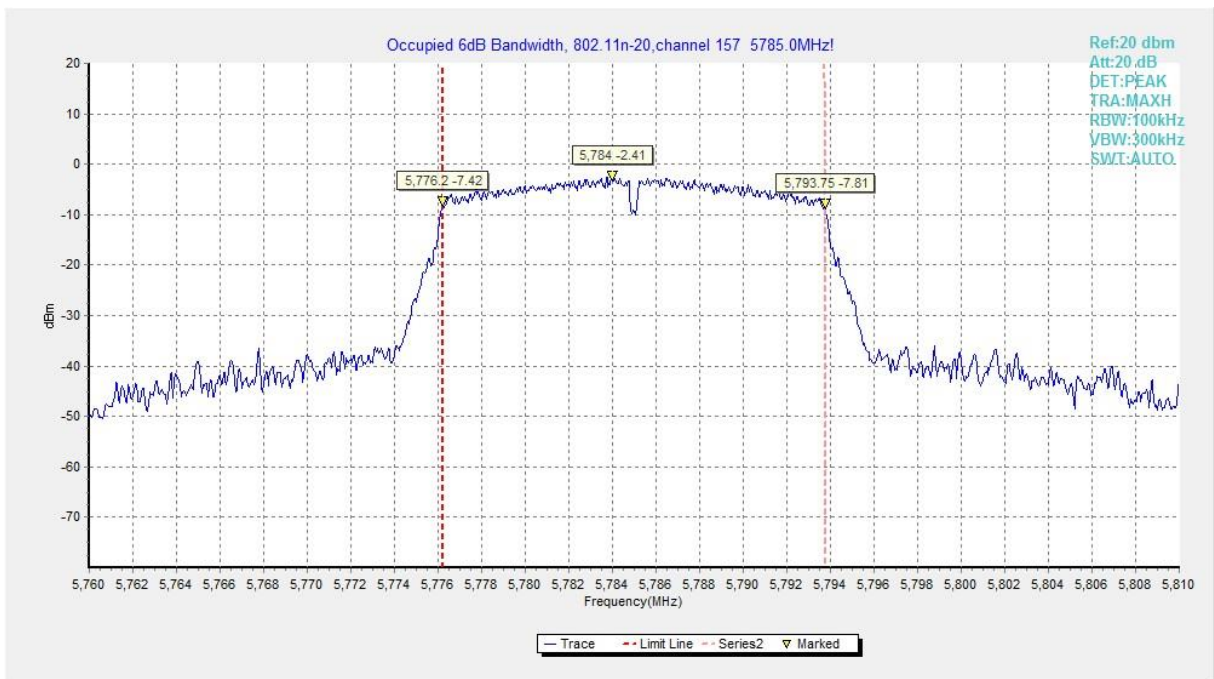


Fig. 5 Occupied 6dB Bandwidth (802.11n-HT20, Ch 157)

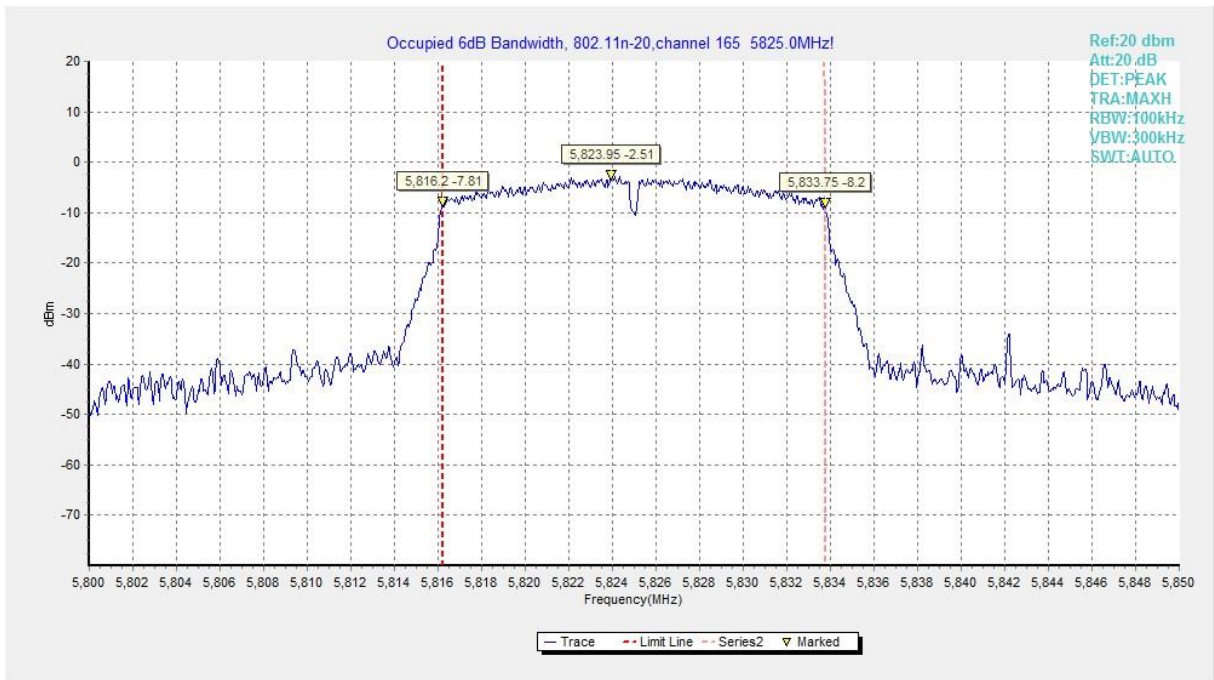


Fig. 6 Occupied 6dB Bandwidth (802.11n-HT20, Ch 165)

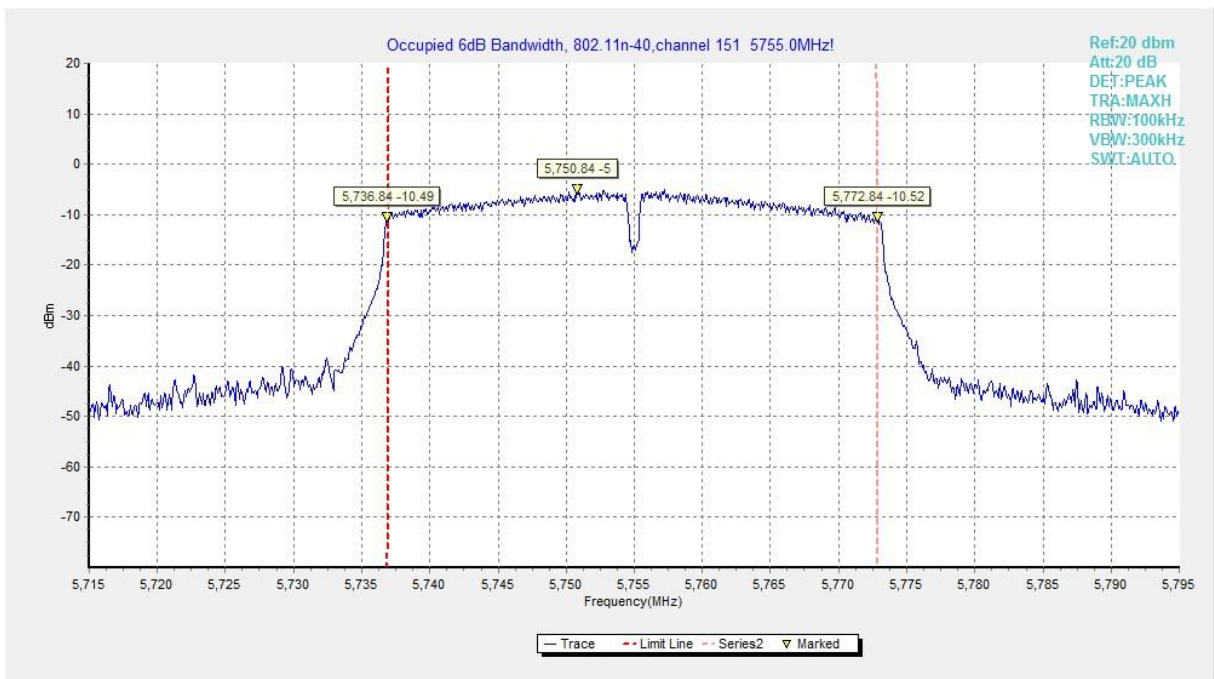


Fig. 7 Occupied 6dB Bandwidth (802.11n-HT40, Ch 151)

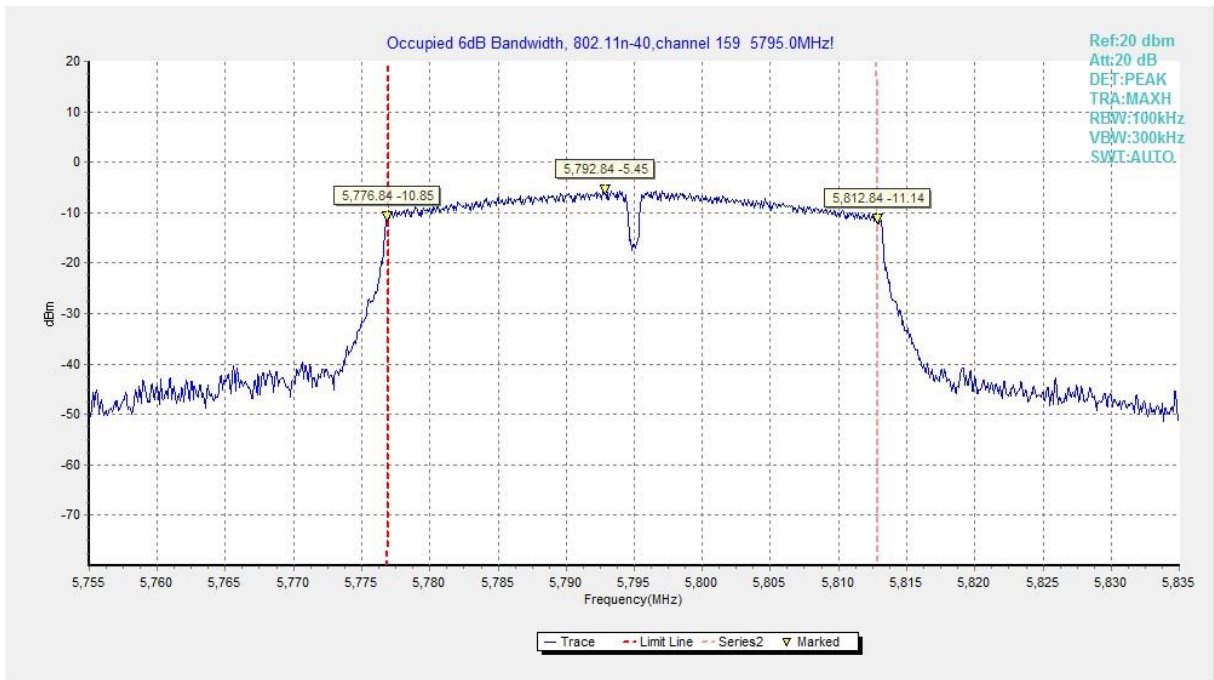


Fig. 8 Occupied 6dB Bandwidth (802.11n-HT40, Ch 159)

A.5. Transmitter Spurious Emission

A.5.1 Transmitter Spurious Emission - 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

Measurement Results:

802.11a mode

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|---------|---------|-------------------|--------------|------------|
| 802.11a | 149 | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |
| | 157 | 30 MHz ~1 GHz | --- | P |
| | | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |
| | | 18 GHz ~ 26.5 GHz | --- | P |
| | 165 | 26.5 GHz~ 40 GHz | --- | P |
| | | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |

802.11n-HT20 mode

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|-------------------|---------|-------------------|--------------|------------|
| 802.11n (HT20) | 149 | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |
| | 157 | 30 MHz ~1 GHz | --- | P |
| | | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |
| | | 18 GHz ~ 26.5 GHz | --- | P |
| | 165 | 26.5 GHz~ 40 GHz | --- | P |
| | | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |

802.11n-HT40 mode

| Mode | Channel | Frequency Range | Test Results | Conclusion |
|-------------------|---------|-------------------|--------------|------------|
| 802.11n (HT40) | 151 | 30 MHz ~1 GHz | --- | P |
| | | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |
| | | 18 GHz ~ 26.5 GHz | --- | P |
| | | 26.5 GHz~ 40 GHz | --- | P |
| | 159 | 1 GHz ~ 3 GHz | --- | P |
| | | 3 GHz ~ 7 GHz | --- | P |
| | | 7 GHz ~ 18 GHz | --- | P |

Conclusion: PASS

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

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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17998.300 | 46.83 | -25.50 | 46.66 | 25.67 | 54.00 | 7.17 | V |
| 17997.200 | 46.56 | -25.50 | 46.66 | 25.40 | 54.00 | 7.44 | H |
| 14497.600 | 39.44 | -28.59 | 42.46 | 25.57 | 54.00 | 14.56 | H |
| 14482.200 | 39.36 | -28.59 | 42.46 | 25.49 | 54.00 | 14.64 | V |
| 11958.800 | 34.99 | -31.48 | 39.09 | 27.38 | 54.00 | 19.01 | V |
| 11819.600 | 34.96 | -31.85 | 39.05 | 27.76 | 54.00 | 19.04 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17998.300 | 46.36 | -25.50 | 46.66 | 25.20 | 54.00 | 7.64 | V |
| 17988.500 | 46.35 | -25.50 | 46.66 | 25.19 | 54.00 | 7.65 | H |
| 14497.000 | 39.43 | -28.59 | 42.46 | 25.56 | 54.00 | 14.57 | H |
| 14493.800 | 39.24 | -28.59 | 42.46 | 25.37 | 54.00 | 14.76 | H |
| 11812.500 | 34.80 | -31.85 | 39.05 | 27.60 | 54.00 | 19.20 | V |
| 11844.400 | 34.75 | -31.85 | 39.05 | 27.55 | 54.00 | 19.25 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17991.200 | 46.20 | -25.50 | 46.66 | 25.04 | 54.00 | 7.80 | V |
| 17984.600 | 46.02 | -25.50 | 46.66 | 24.86 | 54.00 | 7.98 | H |
| 14496.000 | 39.48 | -28.59 | 42.46 | 25.61 | 54.00 | 14.52 | H |
| 14498.100 | 39.37 | -28.59 | 42.46 | 25.50 | 54.00 | 14.63 | V |
| 11823.000 | 34.73 | -31.85 | 39.05 | 27.53 | 54.00 | 19.27 | V |
| 11994.000 | 34.57 | -31.48 | 39.09 | 26.96 | 54.00 | 19.43 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17987.900 | 46.42 | -25.50 | 46.66 | 25.26 | 54.00 | 7.58 | H |
| 17995.600 | 46.36 | -25.50 | 46.66 | 25.20 | 54.00 | 7.64 | H |
| 14482.800 | 39.18 | -28.59 | 42.46 | 25.31 | 54.00 | 14.82 | H |
| 14493.800 | 39.18 | -28.59 | 42.46 | 25.31 | 54.00 | 14.82 | V |
| 11808.100 | 35.01 | -31.85 | 39.05 | 27.81 | 54.00 | 18.99 | H |
| 11829.500 | 34.76 | -31.85 | 39.05 | 27.56 | 54.00 | 19.24 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17985.700 | 46.28 | -25.50 | 46.66 | 25.12 | 54.00 | 7.72 | H |
| 17993.400 | 46.21 | -25.50 | 46.66 | 25.05 | 54.00 | 7.79 | V |
| 14481.600 | 39.20 | -28.59 | 42.46 | 25.33 | 54.00 | 14.80 | H |
| 14477.800 | 39.06 | -28.59 | 42.46 | 25.19 | 54.00 | 14.94 | H |
| 11841.100 | 34.72 | -31.85 | 39.05 | 27.52 | 54.00 | 19.28 | V |
| 11999.500 | 34.72 | -31.48 | 39.09 | 27.11 | 54.00 | 19.28 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17986.200 | 46.31 | -25.50 | 46.66 | 25.15 | 54.00 | 7.69 | V |
| 17993.400 | 46.23 | -25.50 | 46.66 | 25.07 | 54.00 | 7.77 | H |
| 14475.600 | 39.22 | -28.59 | 42.46 | 25.35 | 54.00 | 14.78 | V |
| 14482.200 | 39.22 | -28.59 | 42.46 | 25.35 | 54.00 | 14.78 | H |
| 11822.400 | 34.73 | -31.85 | 39.05 | 27.53 | 54.00 | 19.27 | H |
| 11821.900 | 34.64 | -31.85 | 39.05 | 27.44 | 54.00 | 19.36 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17991.200 | 46.22 | -25.50 | 46.66 | 25.06 | 54.00 | 7.78 | H |
| 17997.200 | 46.14 | -25.50 | 46.66 | 24.98 | 54.00 | 7.86 | V |
| 14478.900 | 39.26 | -28.59 | 42.46 | 25.39 | 54.00 | 14.74 | V |
| 14482.800 | 39.20 | -28.59 | 42.46 | 25.33 | 54.00 | 14.80 | V |
| 11917.000 | 34.70 | -31.48 | 39.09 | 27.09 | 54.00 | 19.30 | V |
| 11915.400 | 34.62 | -31.48 | 39.09 | 27.01 | 54.00 | 19.38 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17998.900 | 46.43 | -25.50 | 46.66 | 25.27 | 54.00 | 7.57 | V |
| 17985.700 | 46.04 | -25.50 | 46.66 | 24.88 | 54.00 | 7.96 | H |
| 14498.100 | 39.27 | -28.59 | 42.46 | 25.40 | 54.00 | 14.73 | H |
| 14499.200 | 39.23 | -28.59 | 42.46 | 25.36 | 54.00 | 14.77 | V |
| 11811.400 | 34.66 | -31.85 | 39.05 | 27.46 | 54.00 | 19.34 | V |
| 11904.400 | 34.65 | -31.85 | 39.05 | 27.45 | 54.00 | 19.35 | H |

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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17997.200 | 58.41 | -25.50 | 46.66 | 37.25 | 74.00 | 15.59 | H |
| 17987.900 | 57.82 | -25.50 | 46.66 | 36.66 | 74.00 | 16.18 | H |
| 14369.500 | 51.63 | -28.42 | 42.34 | 37.71 | 68.30 | 16.67 | H |
| 14113.100 | 51.58 | -28.99 | 42.00 | 38.56 | 68.30 | 16.72 | H |
| 11819.600 | 47.57 | -31.85 | 39.05 | 40.37 | 74.00 | 26.43 | V |
| 11965.400 | 46.74 | -31.48 | 39.09 | 39.13 | 74.00 | 27.26 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17947.800 | 57.55 | -25.50 | 46.66 | 36.39 | 74.00 | 16.45 | V |
| 17973.600 | 57.48 | -25.50 | 46.66 | 36.32 | 74.00 | 16.52 | V |
| 14322.100 | 51.31 | -28.42 | 42.34 | 37.39 | 68.30 | 16.99 | H |
| 14691.200 | 51.30 | -28.32 | 41.35 | 38.28 | 68.30 | 17.00 | H |
| 11847.100 | 47.09 | -31.85 | 39.05 | 39.89 | 74.00 | 26.91 | H |
| 10960.000 | 47.01 | -32.82 | 38.70 | 41.13 | 74.00 | 26.99 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17990.100 | 57.78 | -25.50 | 46.66 | 36.62 | 74.00 | 16.22 | H |
| 17984.600 | 57.49 | -25.50 | 46.66 | 36.33 | 74.00 | 16.51 | H |
| 14398.000 | 50.90 | -28.59 | 42.46 | 37.03 | 68.30 | 17.40 | V |
| 14551.000 | 50.75 | -27.29 | 41.90 | 36.14 | 68.30 | 17.55 | V |
| 11651.400 | 46.80 | -32.31 | 38.91 | 40.21 | 74.00 | 27.20 | V |
| 11585.400 | 46.63 | -32.31 | 38.91 | 40.04 | 74.00 | 27.37 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17991.800 | 58.46 | -25.50 | 46.66 | 37.30 | 74.00 | 15.54 | V |
| 17963.700 | 57.57 | -25.50 | 46.66 | 36.41 | 74.00 | 16.43 | H |
| 14478.400 | 51.42 | -28.59 | 42.46 | 37.55 | 74.00 | 22.58 | V |
| 14358.500 | 50.92 | -28.42 | 42.34 | 37.00 | 68.30 | 17.38 | V |
| 11848.800 | 46.63 | -31.85 | 39.05 | 39.43 | 74.00 | 27.37 | H |
| 11128.900 | 46.53 | -32.60 | 38.75 | 40.39 | 74.00 | 27.47 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17975.200 | 57.39 | -25.50 | 46.66 | 36.23 | 74.00 | 16.61 | H |
| 17972.000 | 57.20 | -25.50 | 46.66 | 36.04 | 74.00 | 16.80 | V |
| 14730.800 | 52.10 | -28.32 | 41.35 | 39.08 | 68.30 | 16.20 | H |
| 14421.100 | 51.09 | -28.59 | 42.46 | 37.22 | 68.30 | 17.21 | V |
| 11652.500 | 46.80 | -32.31 | 38.91 | 40.21 | 74.00 | 27.20 | V |
| 10958.900 | 46.26 | -32.82 | 38.70 | 40.38 | 74.00 | 27.74 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17984.000 | 57.76 | -25.50 | 46.66 | 36.60 | 74.00 | 16.24 | H |
| 17979.700 | 57.22 | -25.50 | 46.66 | 36.06 | 74.00 | 16.78 | V |
| 14229.200 | 51.50 | -28.99 | 42.00 | 38.48 | 68.30 | 16.80 | H |
| 14395.900 | 51.31 | -28.59 | 42.46 | 37.44 | 68.30 | 16.99 | V |
| 11912.600 | 46.86 | -31.85 | 39.05 | 39.66 | 74.00 | 27.14 | H |
| 11621.600 | 46.65 | -32.31 | 38.91 | 40.06 | 74.00 | 27.35 | V |

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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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17996.700 | 57.55 | -25.50 | 46.66 | 36.39 | 74.00 | 16.45 | V |
| 17972.500 | 57.50 | -25.50 | 46.66 | 36.34 | 74.00 | 16.50 | V |
| 14327.100 | 51.33 | -28.42 | 42.34 | 37.41 | 68.30 | 16.97 | H |
| 14631.200 | 51.26 | -27.29 | 41.90 | 36.65 | 68.30 | 17.04 | V |
| 11529.800 | 46.93 | -32.26 | 38.84 | 40.36 | 74.00 | 27.07 | H |
| 11968.700 | 46.54 | -31.48 | 39.09 | 38.93 | 74.00 | 27.46 | 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) |
|-----------------|-----------------------------|-----------------|-----------------------|-------------------------|----------------|-------------|--------------------|
| 17967.500 | 57.41 | -25.50 | 46.66 | 36.25 | 74.00 | 16.59 | V |
| 17962.600 | 57.32 | -25.50 | 46.66 | 36.16 | 74.00 | 16.68 | H |
| 14690.100 | 51.13 | -28.32 | 41.35 | 38.11 | 68.30 | 17.17 | V |
| 14349.600 | 51.06 | -28.42 | 42.34 | 37.14 | 68.30 | 17.24 | V |
| 11841.100 | 46.25 | -31.85 | 39.05 | 39.05 | 74.00 | 27.75 | V |
| 11826.200 | 46.24 | -31.85 | 39.05 | 39.04 | 74.00 | 27.76 | H |

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. | |

Measurement Result:

| Mode | Channel | Test Results | Conclusion |
|-----------------|----------|--------------|------------|
| 802.11a | 5745 MHz | Fig.9 | P |
| | 5825 MHz | Fig.10 | P |
| 802.11n HT20 | 5745 MHz | Fig.11 | P |
| | 5825 MHz | Fig.12 | P |
| 802.11n HT40 | 5755 MHz | Fig.13 | P |
| | 5795 MHz | Fig.14 | P |

Conclusion: PASS

Test graphs as below:

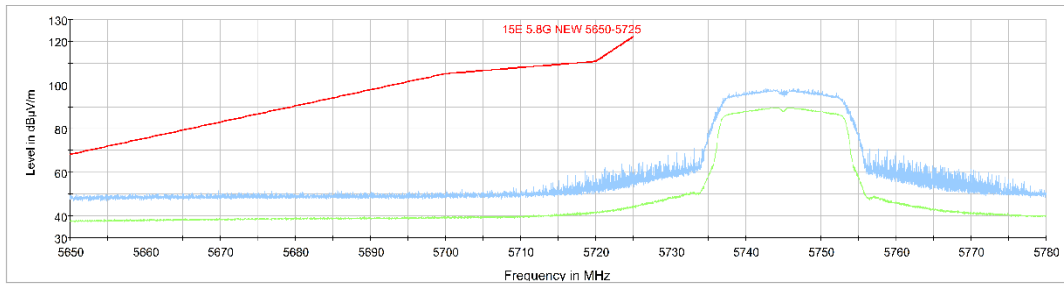


Fig. 9 Band Edges (802.11a Ch149,5745MHz)

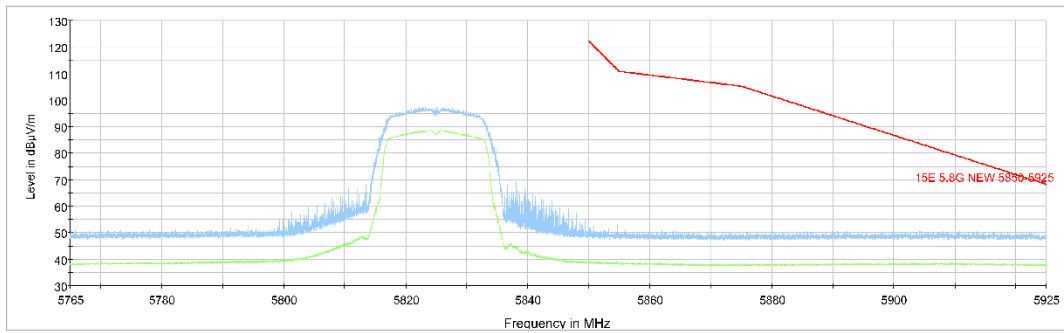


Fig. 10 Band Edges (802.11a Ch165, 5825MHz)

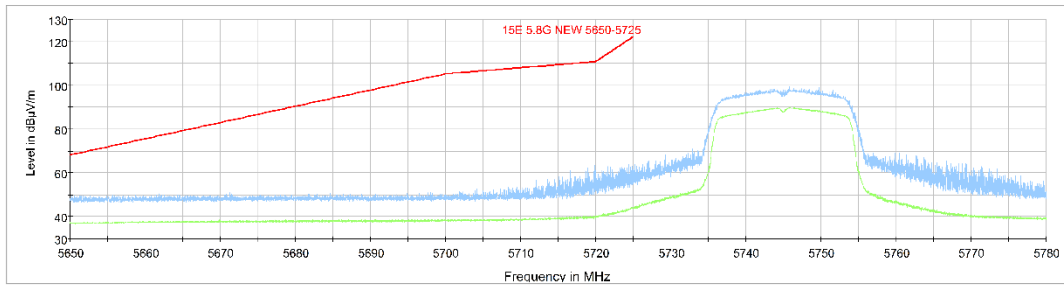


Fig. 11 Band Edges (802.11n-HT20 Ch149, 5745MHz)

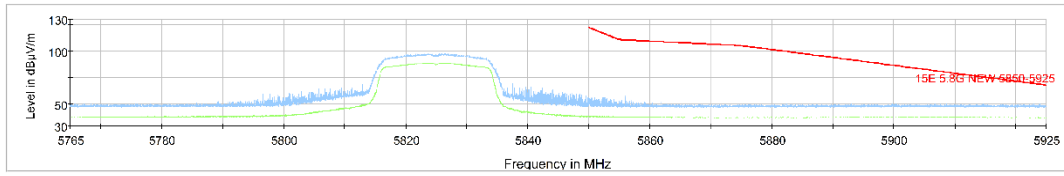


Fig. 12 Band Edges (802.11n-HT20 Ch165, 5825MHz)

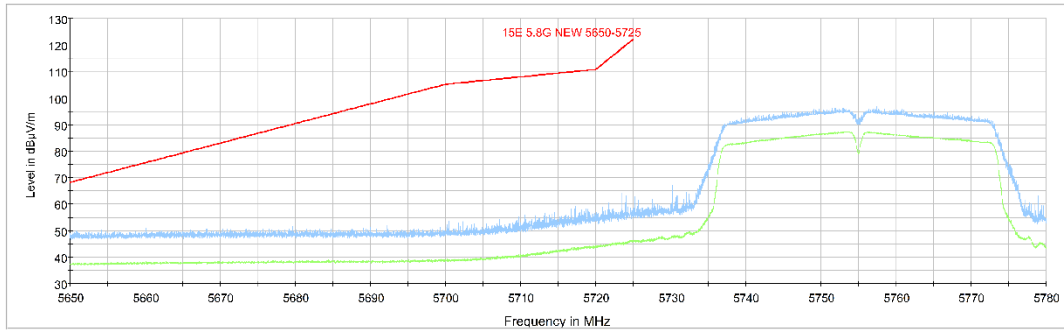


Fig. 13 Band Edges (802.11n-HT40 Ch151, 5755MHz)

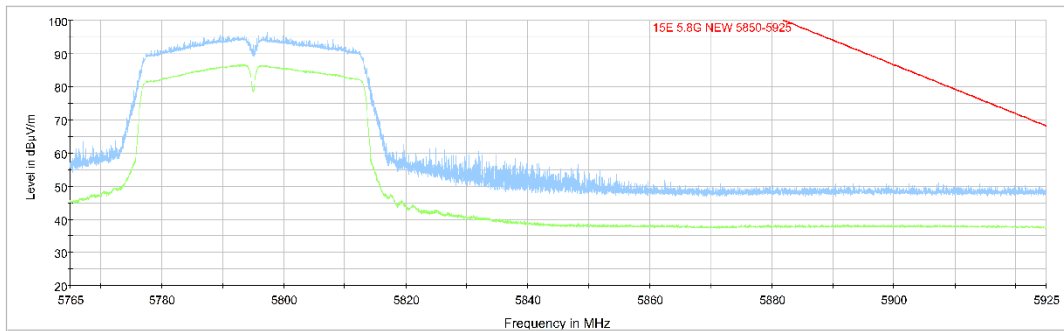


Fig. 14 Band Edges (802.11n-HT40 Ch159, 5795MHz)

A.7. AC Powerline Conducted Emission

Test Condition:

| Voltage (V) | Frequency (Hz) |
|-------------|----------------|
| 120 | 60 |

Measurement uncertainty:

Expanded measurement uncertainty for this test item is $U = 3.08\text{dB}$, $k=2$.

Measurement Result and limit:

WLAN (Quasi-peak Limit)

| Frequency range (MHz) | Quasi-peak Limit (dB μ V) | Result (dB μ V) | | Conclusion |
|-----------------------|-------------------------------|---------------------|--------|------------|
| | | With charger AE2 | | |
| | | 802.11a | Idle | |
| 0.15 to 0.5 | 66 to 56 | Fig.15 | Fig.16 | 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 AE2 | | |
| | | 802.11a | Idle | |
| 0.15 to 0.5 | 56 to 46 | Fig.15 | Fig.16 | 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:

Traffic:

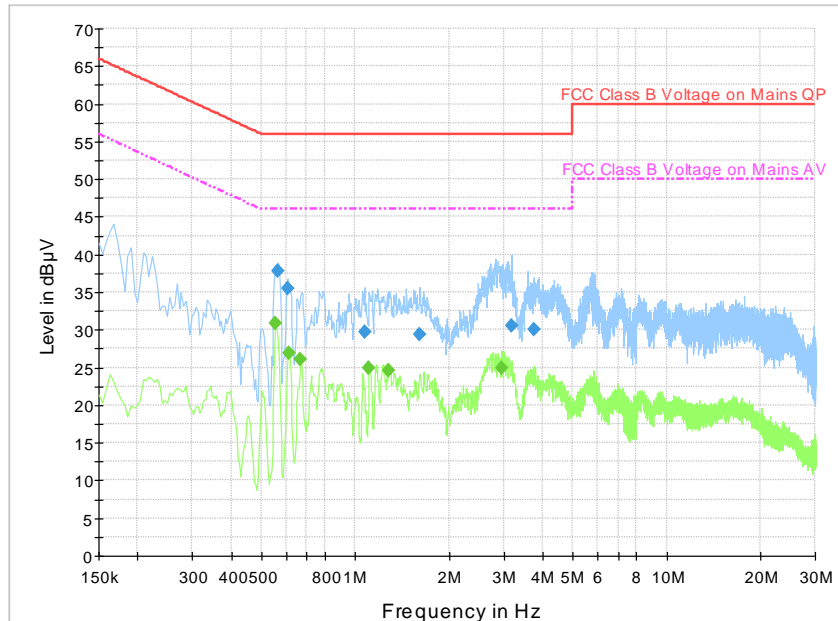


Fig. 15 AC Power line Conducted Emission-802.11a

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.564000 | 37.8 | GND | N | 10.0 | 18.2 | 56.0 |
| 0.604500 | 35.6 | GND | L1 | 9.9 | 20.5 | 56.0 |
| 1.072500 | 29.8 | GND | L1 | 10.0 | 26.2 | 56.0 |
| 1.612500 | 29.5 | GND | L1 | 10.0 | 26.5 | 56.0 |
| 3.174000 | 30.6 | GND | L1 | 10.1 | 25.4 | 56.0 |
| 3.754500 | 30.1 | GND | L1 | 10.1 | 25.9 | 56.0 |

Final Result 2

| Frequency (MHz) | CAverage (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|-----------------|-----|------|------------|-------------|--------------|
| 0.555000 | 30.9 | GND | L1 | 10.0 | 15.1 | 46.0 |
| 0.613500 | 26.9 | GND | L1 | 9.9 | 19.1 | 46.0 |
| 0.667500 | 26.0 | GND | L1 | 9.9 | 20.0 | 46.0 |
| 1.108500 | 24.9 | GND | L1 | 10.0 | 21.1 | 46.0 |
| 1.279500 | 24.6 | GND | L1 | 10.0 | 21.4 | 46.0 |
| 2.949000 | 24.9 | GND | L1 | 10.0 | 21.1 | 46.0 |

Idle:

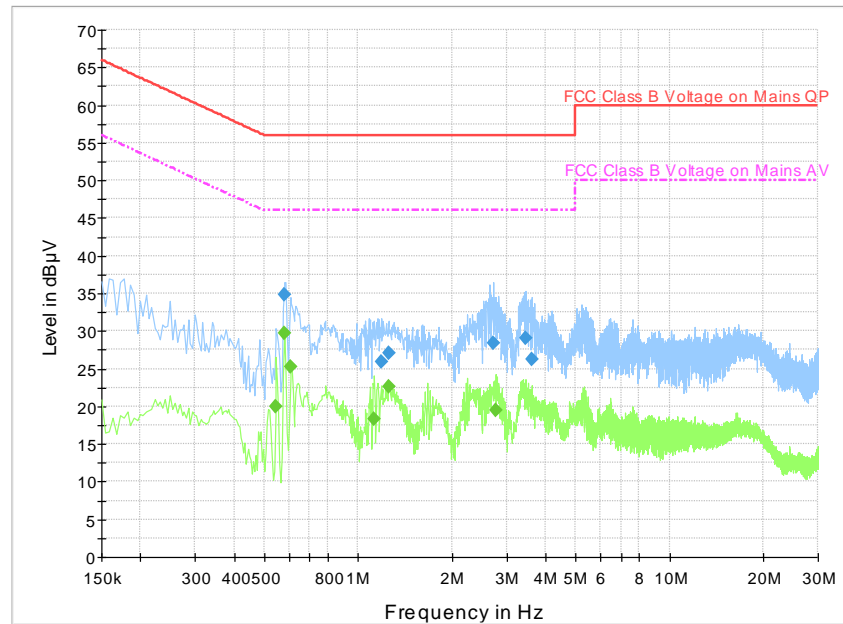


Fig. 16 AC Power line Conducted Emission-Idle

Note1: The graphic result above is the maximum of the measurements for both phase line and neutral line.

Final Result 1

| Frequency (MHz) | QuasiPeak (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|------------------|-----|------|------------|-------------|--------------|
| 0.582000 | 34.9 | GND | L1 | 9.9 | 21.1 | 56.0 |
| 1.185000 | 25.9 | GND | L1 | 10.0 | 30.1 | 56.0 |
| 1.252500 | 27.0 | GND | L1 | 10.0 | 29.0 | 56.0 |
| 2.724000 | 28.3 | GND | L1 | 10.0 | 27.7 | 56.0 |
| 3.439500 | 29.0 | GND | L1 | 10.1 | 27.0 | 56.0 |
| 3.615000 | 26.2 | GND | L1 | 10.1 | 29.8 | 56.0 |




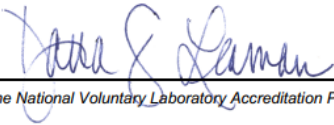
Final Result 2

| Frequency (MHz) | CAverage (dBµV) | PE | Line | Corr. (dB) | Margin (dB) | Limit (dBµV) |
|-----------------|-----------------|-----|------|------------|-------------|--------------|
| 0.546000 | 20.0 | GND | L1 | 10.0 | 26.0 | 46.0 |
| 0.582000 | 29.8 | GND | N | 9.9 | 16.2 | 46.0 |
| 0.609000 | 25.3 | GND | N | 9.9 | 20.7 | 46.0 |
| 1.126500 | 18.3 | GND | N | 10.0 | 27.7 | 46.0 |
| 1.261500 | 22.6 | GND | L1 | 10.0 | 23.4 | 46.0 |
| 2.764500 | 19.5 | GND | L1 | 10.0 | 26.5 | 46.0 |

ANNEX B: EUT parameters

Disclaimer: The 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

| | |
|---|---|
| <p>United States Department of Commerce National Institute of Standards and Technology</p>   | |
| <hr/> Certificate of Accreditation to ISO/IEC 17025:2017 <hr/> | |
| NVLAP LAB CODE: 600118-0 | |
| Telecommunication Technology Labs, CAICT Beijing China | |
| <i>is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:</i> | |
| Electromagnetic Compatibility & Telecommunications | |
| <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> | |
| 2020-09-29 through 2021-09-30 <i>Effective Dates</i> |   <i>For the National Voluntary Laboratory Accreditation Program</i> |

*** END OF REPORT BODY ***