# TEST REPORT

**Product Name : Pos Terminal**
**Model Number : C1, C1A, C1B, C1P, C1Q, C1 Pro**
**FCC ID : 2AJ2B-C1**

| | | |
|---|---|---|
| Prepared for | : | Telepower Communication Co., Ltd. |
| Address | : | 5 Bld, Zone A, Hantian Technology Town No.17 ShenHai RD, Nanhai District, Foshan, China |
| Prepared by | : | EMTEK (SHENZHEN) CO., LTD. |
| Address | : | Building 69, Majialong Industry Zone,Nanshan District, Shenzhen, Guangdong, China<br>Tel: (0755) 26954280<br>Fax: (0755) 26954282 |
| Report Number | : | ENS2204290166W00204R |
| Date(s) of Tests | : | April 29, 2022 to July 1, 2022 |
| Date of issue | : | July 1, 2022 |

# 1 TEST RESULT CERTIFICATION

| | | |
|---|---|---|
| Applicant | : | Telepower Communication Co., Ltd. |
| Address | : | 5 Bld, Zone A, Hantian Technology Town No.17 ShenHai RD, Nanhai District, Foshan, China |
| Manufacturer | : | Telepower Communication Co., Ltd. |
| Address | : | 5 Bld, Zone A, Hantian Technology Town No.17 ShenHai RD, Nanhai District, Foshan, China |
| EUT | : | Pos Terminal |
| Model Name | : | C1, C1A, C1B, C1P, C1Q, C1 Pro |
| Trademark | : | Telpo |

Measurement Procedure Used:

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULT** |
| FCC 47 CFR Part 2, Subpart J<br>FCC 47 CFR Part 15, Subpart E | **PASS** |
| IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)<br>IC RSS-247 Issue 2(02-2017) | **PASS** |

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.407, IC RSS-247 Issue 2 and IC RSS-GEN, Issue 5.

The test results of this report relate only to the tested sample identified in this report.

Date of Test : April 29, 2022 to July 1, 2022

Prepared by : Luo peiye /Editor

Reviewer : Joe Xia/Supervisor

Approve & Authorized Signer : Lisa Wang/Manager

# Modified History

| Version | Report No. | Revision Date | Summary |
|---|---|---|---|
| V1.0 | ENS2204290166W00204R | / | Original Report |
| | | | |
| | | | |

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# 2 EUT TECHNICAL DESCRIPTION

| Characteristics | Description |
|---|---|
| **Product:** | Pos Terminal |
| **Model Number:** | C1, C1A, C1B, C1P, C1Q, C1 Pro<br>(These models are identical in circuitry and electrical, mechanical and physical construction; Only indicates for different market purposes; We chose C1 as the final test prototype) |
| **Sample Number:** | 2# |
| **Wifi Type:** | Wifi 5G with 5150MHz-5250MHz Band<br>Wifi 5G with 5250MHz-5350MHz Band<br>Wifi 5G with 5470MHz-5725MHz Band<br>Wifi 5G with 5725MHz-5850MHz Band |
| **WLAN Supported:** | 802.11a/n/ac |
| **Data Rate :** | 802.11a: 54/48/36/24/18/12/9/6Mbps<br>802.11n: MCS0-MCS15<br>802.11ac: MCS0-MCS9 |
| **Modulation:** | OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n<br>OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac |
| **Frequency Range:** | UNII-1: 5150MHz-5250MHz Band<br>5180-5240MHz for 802.11a/n(HT20)/ac(VHT20);<br>5190-5230MHz for 802.11n(HT40)/ac(VHT40);<br>5210MHz for 802.11ac(VHT80); |
| | UNII-2A: 5250MHz-5350MHz Band<br>5260-5320MHz for 802.11a/n(HT20)/ac(VHT20);<br>5270-5310MHz for 802.11n(HT40)/ac(VHT40);<br>5290MHz for 802.11ac(VHT80); |
| | UNII-2C: 5470MHz-5725MHz Band<br>5500-5700MHz for 802.11a/n(HT20)/ac(VHT20);<br>5510-5670MHz for 802.11n(HT40)/ac(VHT40);<br>5530MHz for 802.11ac(VHT80); |
| | UNII-3 with 5725MHz-5850MHz Band<br>5745-5825MHz for 802.11a/n(HT20)/ac(VHT20);<br>5755-5795MHz for 802.11n(HT40)/ac(VHT40);<br>5775MHz for 802.11ac(VHT80); |
| **TPC Function:** | Not Applicable |
| **Antenna Type:** | FPC Antenna |
| **Antenna Gain:** | 6.7 dBi |

| | |
|---|---|
| **Transmit Power:** | UNII-1 Band: 14.13 dBm<br>UNII-2A Band: 13.87 dBm<br>UNII-2C Band: 13.65 dBm<br>UNII-3 Band: 11.91 dBm |
| **Power Supply:** | DC 24V from adapter |
| **Adapter:** | Model:ADS-65HI-19A-3 24060E<br>Input: AC100-240, 50Hz/60Hz,1.5A<br>Output: DC24V,2.5A,64.0W |
| **Test Voltage:** | AC 120V/60Hz |
| **Date of Received:** | April 29, 2022 |
| **Temperature Range:** | -5°C ~ +45°C |

***Note:*** *For more details, please refer to the User's manual of the EUT.*

# 3 SUMMARY OF TEST RESULT

| FCC PartClause | IC Part Clause | Test Parameter | Verdict | Remark |
|---|---|---|---|---|
| 15.407 (a)<br>15.407 (e)<br>2.1049 | RSS-247, 6.2<br>RSS-Gen 6.7 | 99% , 6dB and 26dB Bandwidth | PASS | |
| 15.407 (a) | RSS-247, 6.2 | Maximum Conducted Output Power | PASS | |
| 15.407 (a) | RSS-247, 6.2 | PeakPower Spectral Density | PASS | |
| 15.407 (b)<br>15.209<br>15.205 | RSS-247, 6.2<br>RSS-Gen 8.9<br>RSS-Gen 8.10<br>RSS-Gen 6.13 | RadiatedSpurious Emission | PASS | |
| 15.207 | RSS-Gen 8.8 | Power Line Conducted Emission | PASS | |
| 15.407(a)<br>15.203 | RSS-Gen 6.8 | Antenna Application | PASS | |
| NOTE1:N/A (Not Applicable)<br>NOTE2:According to FCC OET KDB 789033, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits. | | | | |

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **FCC ID: 2AJ2B-C1** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

# 4 TEST METHODOLOGY

## 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart E
IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)
IC RSS-247 Issue 2(02-2017)
FCC KDB 662911 D01 Multiple Transmitter Output v02r01
FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

## 4.2 MEASUREMENT EQUIPMENT USED

**Conducted Emission Test Equipment**

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101384 | 2022/5/14 | 1Year |
| AMN | Rohde & Schwarz | ENV216 | 101161 | 2022/5/14 | 1Year |
| AMN | Kyoritsu | KNW-407 | 8-1492-9 | 2022/5/15 | 1Year |

**For Spurious Emissions Test**

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Pre-Amplifier | HP | 8447F | 2944A07999 | 2022/5/14 | 1Year |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 101414 | 2022/5/14 | 1Year |
| Bilog Antenna | Schwarzbeck | VULB9163 | 712 | 2021/7/5 | 2 Year |
| Horn antenna | Schwarzbeck | BBHA9120D | 9120D-1178 | 2020/7/4 | 2 Year |
| Pre-Amplifie | Lunar EM | LNA1G18-48 | J101113101000 1 | 2022/5/15 | 1Year |
| Spectrum Analyzer | Rohde & Schwarz | FSV40 | 100967 | 2022/5/14 | 1Year |
| Horn antenna | Schwarzbeck | BBHA9170 | 9170-399 | 2021/6/12 | 2 Year |
| Cable | H+B | NmSm-05-C15052 | N/A | 2022/5/15 | 1 Year |
| Cable | H+B | NmSm-2-C15201 | N/A | 2022/5/15 | 1 Year |
| Cable | H+B | NmNm-7-C15702 | N/A | 2022/5/15 | 1 Year |
| Cable | H+B | SAC-40G-1 | 414 | 2022/5/15 | 1 Year |
| Cable | H+B | SUCOFLEX104 | MY14871/4 | 2022/5/15 | 1 Year |
| Cable | H+B | BLU18A-NmSm-650 0 | D8501 | 2022/5/15 | 1 Year |
| Band reject Filter(50dB) | WI/DE | WRCGV-2400(2400-2485MHz) | 2 | 2022/5/15 | 1 Year |

**For other test items:**

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|---|---|---|---|---|---|
| Signal Analyzer | Agilent | N9010A | MY53470879 | 2022/5/14 | 1Year |
| Vector Signal Generater | Agilent | N5182B | MY53050878 | 2022/5/14 | 1Year |
| Analog Signal Generator | Agilent | N5171B | MY53050553 | 2022/5/14 | 1Year |
| Power Meter | Agilent | PS-X10-100 | \ | 2022/5/15 | 1Year |

| | | | | | |
|---|---|---|---|---|---|
| Blocking Box | THEDA | AD211 | TW5451140 | 2022/5/14 | 1Year |
| Switchgroup | THEDA | ETF-025(VASC6) | TW5451008 | N/A | N/A |
| MIMO Matrix Switch | THEDA | 4P5TM18 | TW5451009 | N/A | N/A |
| Temperature&Humidity Chamber | ESPEC | EL-02KA | 12107166 | 2021/7/3 | 1 Year |

## 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.
The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.
The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.
Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.
Those data rates (802.11a: 54 Mbps; 802.11n(HT20): MCS0; 802.11ac(VHT20): MCS0; 802.11n(HT40): MCS0; 802.11ac(VHT40): MCS0; 802.11ac(VHT80): MCS0;) were used for all test.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

**Wifi 5G with U-NII - 1**

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 36 | 5180 | 44 | 5220 | | |
| 40 | 5200 | 48 | 5240 | | |

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 38 | 5190 | 46 | 5230 | | |
| | | | | | |

Frequency and Channel list for 802.11ac (VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 42 | 5210 | | | | |
| | | | | | |

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 36 | 5180 | 40 | 5200 | 48 | 5240 |

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 38 | 5190 | N/A | N/A | 46 | 5230 |

Test Frequency and channel for 802.11ac (VHT80) :

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 42 | 5210 | N/A | N/A | N/A | N/A |

**Wifi 5G with U-NII -2A**

Frequency and Channel list 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 52 | 5260 | 60 | 5300 | | |
| 56 | 5280 | 64 | 5320 | | |

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 54 | 5270 | | | | |
| 62 | 5310 | | | | |

Frequency and Channel list for 802.11ac (VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 58 | 5290 | | | | |

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 52 | 5260 | 56 | 5280 | 64 | 5320 |

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 54 | 5270 | N/A | N/A | 62 | 5310 |

Test Frequency and channel for 802.11ac (VHT80):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 58 | 5290 | | | | |

**Wifi 5G with U-NII -2C**

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 100 | 5500 | 116 | 5580 | 132 | 5660 |
| 104 | 5520 | 120 | 5600 | 136 | 5680 |
| 108 | 5540 | 124 | 5620 | 140 | 5700 |
| 112 | 5560 | 128 | 5640 | | |

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 102 | 5510 | 118 | 5590 | 134 | 5670 |
| 110 | 5550 | 126 | 5630 | | |

Frequency and Channel list for 802.11ac (VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 106 | 5530 | 122 | 5610 | | |
| | | | | | |

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 100 | 5500 | 120 | 5600 | 140 | 5700 |

Test Frequency and channel for802.11n (HT40), 802.11ac (VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 102 | 5510 | | | 134 | 5670 |

Test Frequency and channel for 802.11ac (VHT80):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 106 | 5530 | | | | |

**Wifi 5G with U-NII -3**

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 149 | 5745 | 157 | 5785 | 165 | 5825 |
| 153 | 5765 | 161 | 5805 | | |

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 151 | 5755 | 159 | 5795 | | |

Frequency and Channel list for 802.11ac (VHT80):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|---|---|
| 155 | 5775 | | | | |

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 149 | 5745 | 157 | 5785 | 165 | 5825 |

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 151 | 5755 | N/A | N/A | 159 | 5795 |

Test Frequency and channel for 802.11ac (VHT80):

| Lowest Frequency | | Middle Frequency | | Highest Frequency | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 155 | 5775 | | | | |

# 5 FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (Shenzhen) Co., Ltd.
Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## 5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

## 5.3 LABORATORY ACCREDITATIONS AND LISTINGS

| Site Description | | |
|---|---|---|
| EMC Lab. | : | **Accredited by CNAS**<br>The Certificate Registration Number is L2291.<br>The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)<br><br>**Accredited by FCC**<br>Designation Number: CN1204<br>Test Firm Registration Number: 882943<br><br>**Accredited by A2LA**<br>The Certificate Number is 4321.01.<br><br>Accredited by Industry Canada<br>The Conformity Assessment Body Identifier is CN0008 |
| Name of Firm | : | EMTEK (SHENZHEN) CO., LTD. |
| Site Location | : | Building 69, Majialong Industry Zone,<br>Nanshan District, Shenzhen, Guangdong, China |

# 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

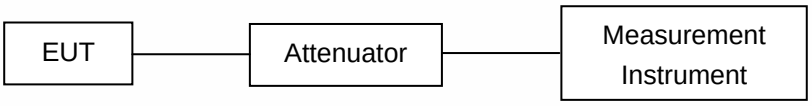
| Test Parameter | Measurement Uncertainty |
|---|---|
| Radio Frequency | ±1x10^-5 |
| Maximum Peak Output Power Test | ±1.0dB |
| Conducted Emissions Test | ±2.0dB |
| Radiated Emission Test | ±2.0dB |
| Power Density | ±2.0dB |
| Occupied Bandwidth Test | ±1.0dB |
| Band Edge Test | ±3dB |
| All emission, radiated | ±3dB |
| Antenna Port Emission | ±3dB |
| Temperature | ±0.5℃ |
| Humidity | ±3% |

Measurement Uncertainty for a level of Confidence of 95%

# 7 SETUP OF EQUIPMENT UNDER TEST

## 7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.




## 7.2 RADIO FREQUENCY TEST SETUP

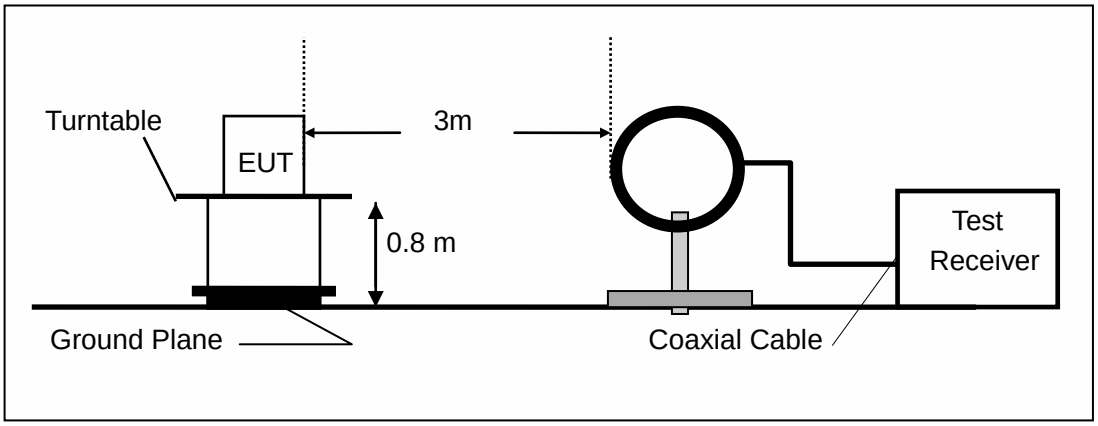
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

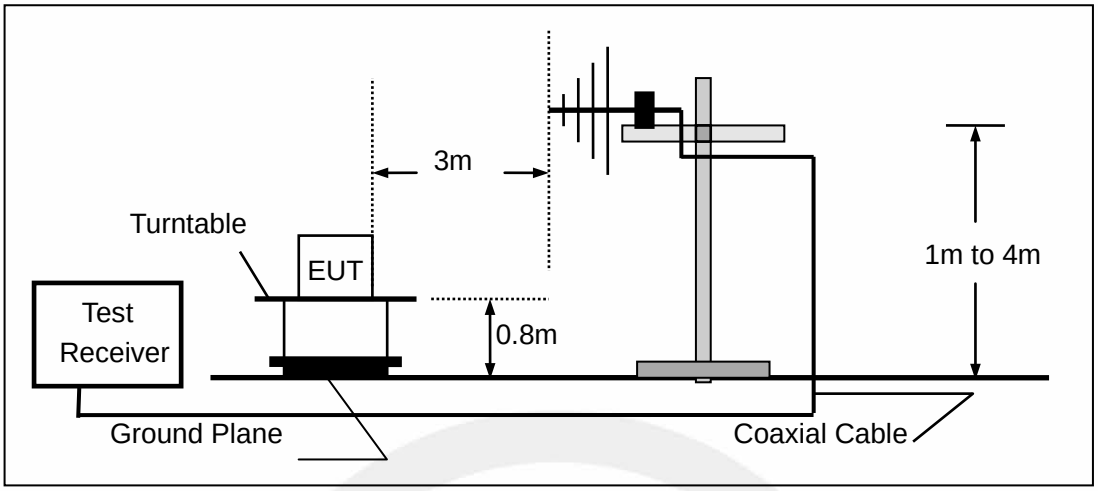
Above 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz：
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

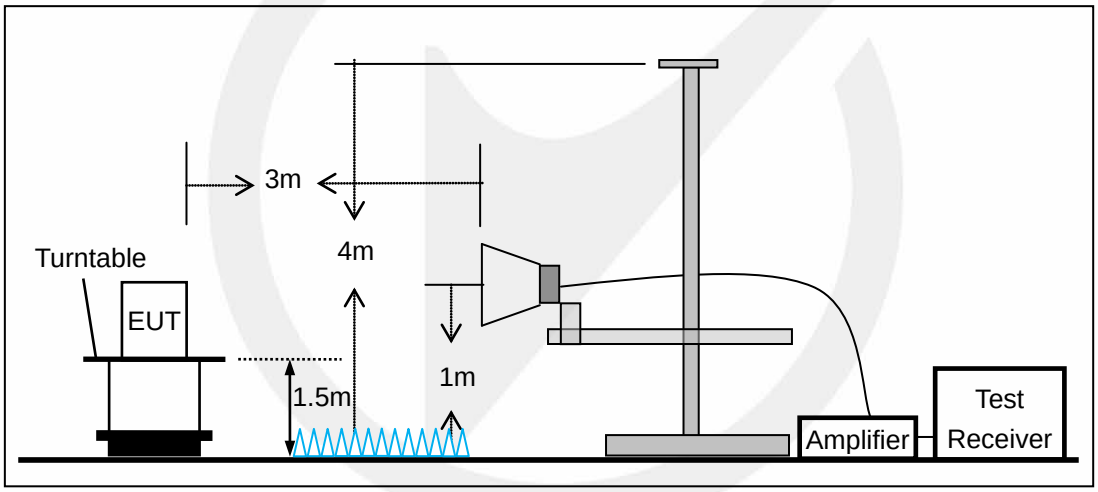
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b)Radiated Emission Test Set-Up, Frequency Below 1000MHz




(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

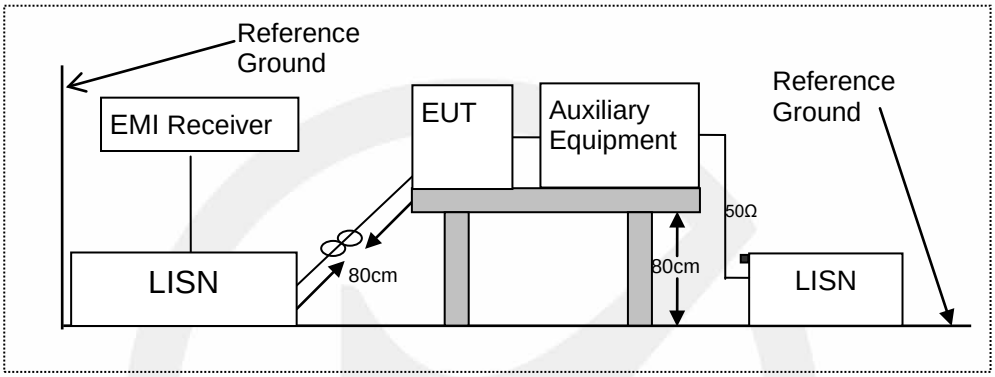


## 7.3 CONDUCTED EMISSION TEST SETUP

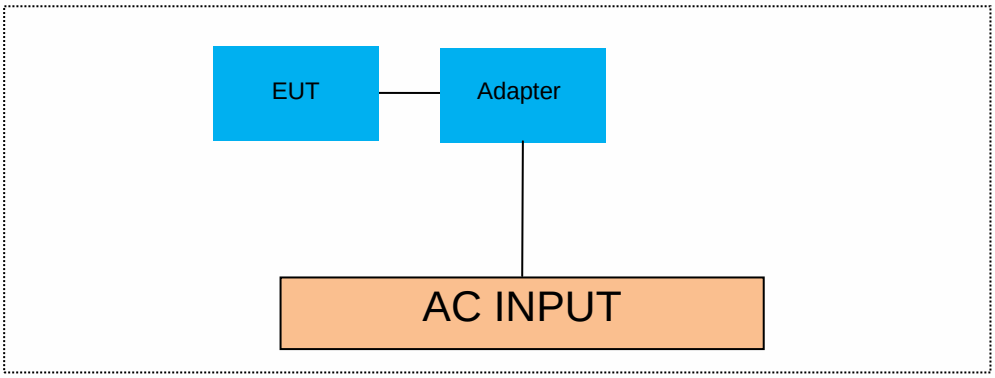
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



## 7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM




## 7.5 SUPPORT EQUIPMENT

| EUT Cable List and Details | | | |
|---|---|---|---|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| / | / | / | / |

| Auxiliary Cable List and Details | | | |
|---|---|---|---|
| Cable Description | Length (m) | Shielded/Unshielded | With / Without Ferrite |
| / | / | / | / |

| Auxiliary Equipment List and Details | | | |
|---|---|---|---|
| Description | Manufacturer | Model | Serial Number |
| / | / | / | / |

**Notes:**

*1.* All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

*2.* Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

# 8 TEST REQUIREMENTS

## 8.1 BANDWIDTHMEASUREMENT

### 8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNIIBand I
According to FCC Part 15.407(a)(2) for UNIIBand II-A and UNIIBand II-C
According to FCC Part 15.407(a)(3) for UNIIBand III
According toFCC Part 15.407(e) for UNIIBand III
According to 789033 D02 SectionII(C)
According to 789033 D02 SectionII(D)
According to RSS-Gen6.6, RSS 247, 6.2

### 8.1.2 Conformance Limit

The 26dB bandwidth is used to determine the conducted power limits.
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

### 8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

### 8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) $\geqslant$ 3 $\times$ RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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.
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth
The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E.

However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ≥ 3 • RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

8.1.5 Test Results

| | |
|---|---|
| Temperature: | 25°C |
| Relative Humidity: | 45% |
| ATM Pressure: | 1011 mbar |

Note: N/A

| TestMode | Antenna | Frequency[MHz] | 26db EBW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| 11A | Ant1 | 5180 | 22.320 | 5168.640 | 5190.960 | --- | --- |
| | | 5220 | 24.400 | 5208.080 | 5232.480 | --- | --- |
| | | 5240 | 24.040 | 5228.240 | 5252.280 | --- | --- |
| | | 5260 | 24.800 | 5247.160 | 5271.960 | --- | --- |
| | | 5300 | 22.560 | 5288.720 | 5311.280 | --- | --- |
| | | 5320 | 24.000 | 5308.360 | 5332.360 | --- | --- |
| | | 5500 | 24.560 | 5488.040 | 5512.600 | --- | --- |
| | | 5580 | 24.040 | 5568.160 | 5592.200 | --- | --- |
| | | 5700 | 24.440 | 5688.080 | 5712.520 | --- | --- |
| | | 5745 | 23.520 | 5733.040 | 5756.560 | --- | --- |
| | | 5785 | 22.040 | 5773.640 | 5795.680 | --- | --- |
| | | 5825 | 23.600 | 5813.720 | 5837.320 | --- | --- |
| 11N20SISO | Ant1 | 5180 | 27.840 | 5165.880 | 5193.720 | --- | --- |
| | | 5220 | 24.000 | 5207.800 | 5231.800 | --- | --- |
| | | 5240 | 24.240 | 5227.760 | 5252.000 | --- | --- |
| | | 5260 | 24.320 | 5247.440 | 5271.760 | --- | --- |
| | | 5300 | 25.160 | 5287.160 | 5312.320 | --- | --- |
| | | 5320 | 22.560 | 5308.680 | 5331.240 | --- | --- |
| | | 5500 | 23.800 | 5487.960 | 5511.760 | --- | --- |
| | | 5580 | 22.520 | 5568.520 | 5591.040 | --- | --- |
| | | 5700 | 23.680 | 5688.160 | 5711.840 | --- | --- |
| | | 5745 | 22.720 | 5733.560 | 5756.280 | --- | --- |
| | | 5785 | 23.640 | 5772.200 | 5795.840 | --- | --- |
| | | 5825 | 23.800 | 5814.000 | 5837.800 | --- | --- |
| 11N40SISO | Ant1 | 5190 | 55.600 | 5162.480 | 5218.080 | --- | --- |
| | | 5230 | 42.400 | 5208.800 | 5251.200 | --- | --- |
| | | 5270 | 41.760 | 5248.880 | 5290.640 | --- | --- |
| | | 5310 | 41.760 | 5288.960 | 5330.720 | --- | --- |
| | | 5510 | 42.080 | 5488.880 | 5530.960 | --- | --- |
| | | 5550 | 41.440 | 5529.520 | 5570.960 | --- | --- |
| | | 5670 | 58.400 | 5632.560 | 5690.960 | --- | --- |
| | | 5755 | 41.200 | 5734.680 | 5775.880 | --- | --- |
| | | 5795 | 49.120 | 5766.360 | 5815.480 | --- | --- |
| 11AC20SISO | Ant1 | 5180 | 27.800 | 5166.240 | 5194.040 | --- | --- |
| | | 5220 | 24.320 | 5207.880 | 5232.200 | --- | --- |
| | | 5240 | 24.800 | 5227.480 | 5252.280 | --- | --- |

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|---|---|---|---|---|---|---|---|
| | | 5260 | 25.600 | 5247.480 | 5273.080 | --- | --- |
| | | 5300 | 24.240 | 5287.400 | 5311.640 | --- | --- |
| | | 5320 | 25.000 | 5307.280 | 5332.280 | --- | --- |
| | | 5500 | 26.200 | 5486.680 | 5512.880 | --- | --- |
| | | 5580 | 23.120 | 5567.720 | 5590.840 | --- | --- |
| | | 5700 | 22.560 | 5688.960 | 5711.520 | --- | --- |
| | | 5745 | 26.040 | 5731.880 | 5757.920 | --- | --- |
| | | 5785 | 23.040 | 5773.720 | 5796.760 | --- | --- |
| | | 5825 | 22.520 | 5813.920 | 5836.440 | --- | --- |
| 11AC40SISO | Ant1 | 5190 | 50.080 | 5165.840 | 5215.920 | --- | --- |
| | | 5230 | 42.400 | 5208.720 | 5251.120 | --- | --- |
| | | 5270 | 42.320 | 5248.720 | 5291.040 | --- | --- |
| | | 5310 | 41.920 | 5288.880 | 5330.800 | --- | --- |
| | | 5510 | 41.520 | 5489.040 | 5530.560 | --- | --- |
| | | 5550 | 40.960 | 5529.600 | 5570.560 | --- | --- |
| | | 5670 | 68.160 | 5638.800 | 5706.960 | --- | --- |
| | | 5755 | 41.840 | 5734.360 | 5776.200 | --- | --- |
| | | 5795 | 45.920 | 5769.960 | 5815.880 | --- | --- |
| 11AC80SISO | Ant1 | 5210 | 118.560 | 5145.200 | 5263.760 | --- | --- |
| | | 5290 | 90.560 | 5242.320 | 5332.880 | --- | --- |
| | | 5530 | 117.760 | 5455.920 | 5573.680 | --- | --- |
| | | 5610 | 115.520 | 5541.200 | 5656.720 | --- | --- |
| | | 5775 | 101.760 | 5715.000 | 5816.760 | --- | --- |

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| 11A_Ant1_5240 |
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| 11A_Ant1_5785 |
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| 11A_Ant1_5825 |
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| 11N20SISO_Ant1_5220 |
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| 11N20SISO_Ant1_5240 |
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| 11N20SISO_Ant1_5260 |
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| 11N20SISO_Ant1_5300 |
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| 11N20SISO_Ant1_5320 |
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| 11N20SISO_Ant1_5500 |
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| 11N20SISO_Ant1_5580 |
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| 11N20SISO_Ant1_5700 |
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| 11N20SISO_Ant1_5745 |
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| 11N20SISO_Ant1_5785 |
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| 11N20SISO_Ant1_5825 |
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| 11N40SISO_Ant1_5190 |
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| 11N40SISO_Ant1_5230 |
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| 11N40SISO_Ant1_5270 |
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| 11N40SISO_Ant1_5310 |
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| 11N40SISO_Ant1_5510 |
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| 11N40SISO_Ant1_5550 |
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| 11N40SISO_Ant1_5670 |
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| 11N40SISO_Ant1_5755 |
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| 11N40SISO_Ant1_5795 |
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| 11AC20SISO_Ant1_5180 |
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| 11AC20SISO_Ant1_5220 |
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| 11AC20SISO_Ant1_5240 |
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| 11AC20SISO_Ant1_5260 |
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| 11AC20SISO_Ant1_5500 |
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| 11AC20SISO_Ant1_5580 |
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| 11AC20SISO_Ant1_5700 |
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| 11AC20SISO_Ant1_5745 |
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| 11AC20SISO_Ant1_5785 |
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| 11AC20SISO_Ant1_5825 |
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| 11AC40SISO_Ant1_5190 |
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| 11AC40SISO_Ant1_5230 |
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| 11AC40SISO_Ant1_5270 |
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| 11AC40SISO_Ant1_5310 |
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| 11AC40SISO_Ant1_5510 |
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| 11AC40SISO_Ant1_5550 |
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| 11AC40SISO_Ant1_5670 |
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| 11AC40SISO_Ant1_5755 |
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| 11AC40SISO_Ant1_5795 |
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| 11AC80SISO_Ant1_5210 |
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| 11AC80SISO_Ant1_5290 |
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| 11AC80SISO_Ant1_5530 |
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| 11AC80SISO_Ant1_5610 |
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| 11AC80SISO_Ant1_5775 |
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| TestMode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| 11A | Ant1 | 5180 | 17.005 | 5171.451 | 5188.456 | --- | --- |
| | | 5220 | 17.011 | 5211.491 | 5228.502 | --- | --- |
| | | 5240 | 16.910 | 5231.541 | 5248.451 | --- | --- |
| | | 5260 | 16.938 | 5251.508 | 5268.446 | --- | --- |
| | | 5300 | 16.891 | 5291.534 | 5308.425 | --- | --- |
| | | 5320 | 16.941 | 5311.481 | 5328.422 | --- | --- |
| | | 5500 | 16.916 | 5491.505 | 5508.421 | --- | --- |
| | | 5580 | 16.887 | 5571.479 | 5588.366 | --- | --- |
| | | 5700 | 16.907 | 5691.594 | 5708.501 | --- | --- |
| | | 5745 | 16.945 | 5736.512 | 5753.457 | --- | --- |
| | | 5785 | 16.891 | 5776.504 | 5793.395 | --- | --- |
| | | 5825 | 16.875 | 5816.537 | 5833.412 | --- | --- |
| 11N20SISO | Ant1 | 5180 | 18.322 | 5170.812 | 5189.134 | --- | --- |
| | | 5220 | 18.159 | 5210.896 | 5229.055 | --- | --- |
| | | 5240 | 18.152 | 5230.897 | 5249.049 | --- | --- |
| | | 5260 | 18.119 | 5250.935 | 5269.054 | --- | --- |
| | | 5300 | 18.102 | 5290.917 | 5309.019 | --- | --- |
| | | 5320 | 18.064 | 5310.894 | 5328.958 | --- | --- |
| | | 5500 | 18.108 | 5490.908 | 5509.016 | --- | --- |
| | | 5580 | 18.070 | 5570.921 | 5588.991 | --- | --- |
| | | 5700 | 18.171 | 5690.963 | 5709.134 | --- | --- |
| | | 5745 | 18.084 | 5735.959 | 5754.043 | --- | --- |
| | | 5785 | 18.103 | 5775.857 | 5793.960 | --- | --- |
| | | 5825 | 18.046 | 5815.941 | 5833.987 | --- | --- |
| 11N40SISO | Ant1 | 5190 | 36.651 | 5171.647 | 5208.298 | --- | --- |
| | | 5230 | 36.509 | 5211.746 | 5248.255 | --- | --- |
| | | 5270 | 36.459 | 5251.722 | 5288.181 | --- | --- |
| | | 5310 | 36.468 | 5291.675 | 5328.143 | --- | --- |
| | | 5510 | 36.483 | 5491.761 | 5528.244 | --- | --- |
| | | 5550 | 36.416 | 5531.752 | 5568.168 | --- | --- |
| | | 5670 | 36.529 | 5651.725 | 5688.254 | --- | --- |
| | | 5755 | 36.542 | 5736.747 | 5773.289 | --- | --- |
| | | 5795 | 36.492 | 5776.690 | 5813.182 | --- | --- |
| 11AC20SISO | Ant1 | 5180 | 18.215 | 5170.890 | 5189.105 | --- | --- |
| | | 5220 | 18.129 | 5210.911 | 5229.040 | --- | --- |
| | | 5240 | 18.093 | 5230.935 | 5249.028 | --- | --- |
| | | 5260 | 18.136 | 5250.911 | 5269.047 | --- | --- |
| | | 5300 | 18.109 | 5290.879 | 5308.988 | --- | --- |
| | | 5320 | 18.100 | 5310.902 | 5329.002 | --- | --- |
| | | 5500 | 18.052 | 5490.921 | 5508.973 | --- | --- |
| | | 5580 | 18.063 | 5570.899 | 5588.962 | --- | --- |
| | | 5700 | 18.113 | 5690.953 | 5709.066 | --- | --- |
| | | 5745 | 18.014 | 5735.987 | 5754.001 | --- | --- |

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|---|---|---|---|---|---|---|---|
| | | 5785 | 18.069 | 5775.939 | 5794.008 | --- | --- |
| | | 5825 | 18.078 | 5815.934 | 5834.012 | --- | --- |
| 11AC40SISO | Ant1 | 5190 | 36.487 | 5171.698 | 5208.185 | --- | --- |
| | | 5230 | 36.424 | 5211.796 | 5248.220 | --- | --- |
| | | 5270 | 36.477 | 5251.706 | 5288.183 | --- | --- |
| | | 5310 | 36.434 | 5291.724 | 5328.158 | --- | --- |
| | | 5510 | 36.375 | 5491.794 | 5528.169 | --- | --- |
| | | 5550 | 36.447 | 5531.743 | 5568.190 | --- | --- |
| | | 5670 | 36.565 | 5651.694 | 5688.259 | --- | --- |
| | | 5755 | 36.390 | 5736.795 | 5773.185 | --- | --- |
| | | 5795 | 36.503 | 5776.686 | 5813.189 | --- | --- |
| 11AC80SISO | Ant1 | 5210 | 76.456 | 5171.678 | 5248.134 | --- | --- |
| | | 5290 | 76.159 | 5251.710 | 5327.869 | --- | --- |
| | | 5530 | 76.248 | 5491.743 | 5567.991 | --- | --- |
| | | 5610 | 76.193 | 5571.493 | 5647.686 | --- | --- |
| | | 5775 | 76.186 | 5736.774 | 5812.960 | --- | --- |

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