

# TEST REPORT

**Product Name** : Tablet PC  
**Model Number** : SJM2102  
**FCC ID** : 2A2SP-SJMB

**Prepared for** : Smart Communications Holding, Inc.  
**Address** : 10491 72nd Street, Seminole, FL 33777, USA

**Prepared by** : EMTEK (SHENZHEN) CO., LTD.  
**Address** : Bldg 69, Majialong Industry Zone, Nanshan District,  
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**Report Number** : ENS2307100147W00204R  
**Date(s) of Tests** : July 13, 2023 to August 8, 2023  
**Date of issue** : August 9, 2023

## TABLE OF CONTENTS

<b>1 TEST RESULT CERTIFICATION.....</b>	<b>4</b>
<b>2 EUT TECHNICAL DESCRIPTION.....</b>	<b>5</b>
<b>3 SUMMARY OF TEST RESULT.....</b>	<b>7</b>
<b>4 TEST METHODOLOGY.....</b>	<b>8</b>
4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	8
4.2 MEASUREMENT EQUIPMENT USED.....	8
4.3 DESCRIPTION OF TEST MODES.....	9
<b>5 FACILITIES AND ACCREDITATIONS.....</b>	<b>13</b>
5.1 FACILITIES.....	13
5.2 LABORATORY ACCREDITATIONS AND LISTINGS.....	13
<b>6 TEST SYSTEM UNCERTAINTY.....</b>	<b>14</b>
<b>7 SETUP OF EQUIPMENT UNDER TEST.....</b>	<b>15</b>
7.1 RADIO FREQUENCY TEST SETUP.....	15
7.2 RADIO FREQUENCY TEST SETUP.....	15
7.3 CONDUCTED EMISSION TEST SETUP.....	17
7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM.....	18
7.5 SUPPORT EQUIPMENT.....	18
<b>8 TEST REQUIREMENTS.....</b>	<b>19</b>
8.1 BANDWIDTH MEASUREMENT.....	19
8.2 MAXIMUM CONDUCTED OUTPUT POWER.....	158
8.3 MAXIMUM PEAK POWER DENSITY.....	254
8.4 UNDESIRABLE RADIATED SPURIOUS EMISSION.....	318
8.5 POWER LINE CONDUCTED EMISSIONS.....	355
8.6 ANTENNA APPLICATION.....	358

## Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2307100147W00204R	/	Original Report

# 1 TEST RESULT CERTIFICATION

Applicant : Smart Communications Holding, Inc.  
 Address : 10491 72nd Street, Seminole, FL 33777, USA  
 Manufacturer : Estone Technology LTD  
 Address : 2F,Building No.1, Jia'an Industrial Park,No.2 Long Chang Road, Bao'an, Shenzhen 518101, China.  
 EUT : Tablet PC  
 Model Name : SJM2102  
 Trademark : Smart Communications

**Measurement Procedure Used:**

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	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 and Part 15.407.


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

Date of Test : July 13, 2023 to August 8, 2023

Prepared by : *Una Yu*  
Una Yu/Editor

Reviewer : *Joe Xia*  
Joe Xia/Supervisor

Approved & Authorized Signer : *Lisa Wang*  
Lisa Wang/Manager



## 2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product	Tablet PC
Model Number	SJM2102
Wifi Type	UNII-1: 5150MHz-5250MHz Band UNII-2A: with 5250MHz-5350MHz Band UNII-2C: with 5470MHz-5725MHz Band UNII-3: with 5725MHz-5850MHz Band
WLAN Supported	802.11a 802.11n(20MHz channel bandwidth) 802.11n(40MHz channel bandwidth) 802.11ac(20MHz channel bandwidth) 802.11ac(40MHz channel bandwidth) 802.11ac(80MHz channel bandwidth) 802.11ax(20MHz channel bandwidth) 802.11ax(40MHz channel bandwidth) 802.11ax(80MHz channel bandwidth)
Data Rate	802.11a:54/48/36/24/18/12/9/6Mbps 802.11n:up to 600 Mbps 802.11ac/ax:up to 1.733Gbps
Modulation	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM/1024QAM for 802.11ac/ax
Frequency Range	UNII-1: 5150MHz-5250MHz Band
	5180-5240MHz for 802.11a 5180-5240MHz for 802.11n(HT20) 5180-5240MHz for 802.11ac(HT20)/ax(HT20) 5190-5230MHz for 802.11n(HT40) 5190-5230MHz for 802.11ac(HT40)/ ax(HT40) 5210MHz for 802.11ac(HT80)/ ax(HT80)
	UNII-2A: with 5250MHz-5350MHz Band
	5260-5320MHz for 802.11a 5260-5320MHz for 802.11n(HT20) 5260-5320MHz for 802.11ac(HT20) /ax(HT20) 5270-5310MHz for 802.11n(HT40) 5270-5310MHz for 802.11ac(HT40) /ax(HT40) 5290MHz for 802.11ac(HT80)/ ax(HT80)
	UNII-2C: with 5470MHz-5725MHz Band
	5500-5700MHz for 802.11a 5500-5700MHz for 802.11n(HT20) 5500-5700MHz for 802.11ac(HT20)/ ax(HT20) 5510-5670MHz for 802.11n(HT40) 5510-5670MHz for 802.11ac(HT40)/ /ax(HT40) 5530-5610MHz for 802.11ac(HT80)/ ax(HT80)
	UNII-3 with 5725MHz-5850MHz Band

	5745-5825MHz for 802.11a 5745-5825MHz for 802.11n(HT20) 5745-5825MHz for 802.11ac(HT20)/ ax(HT20) 5755-5795MHz for 802.11n(HT40) 5755-5795MHz for 802.11ac(HT40)/ ax(HT40) 5775MHz for 802.11ac(HT80)/ ax(HT80)
<b>TPC Function</b>	Applicable
<b>Antenna Type</b>	Integrated Antenna
<b>Antenna Gain</b>	ANT1: 3.32dBi, ANT2: 3.32dBi
<b>Power Supply</b>	Battery 3.7V, 3940mAh, 14.58Wh DC 5V by USB Port
<b>Temperature Range</b>	0°C ~ 45°C

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



### 3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	Maximum Conducted Output Power	PASS	
15.407 (a)	Peak Power Spectral Density	PASS	
15.407 (b)	Radiated Spurious Emission	PASS	
15.407 (b)(6) 15.207	Power Line Conducted Emission	PASS	
15.407(a) 15.203	Antenna Application	PASS	

NOTE1: N/A (Not Applicable).

NOTE2: According to FCC OET KDB 789033 D2 General UNII Test Procedures New Rules v02r01, 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: 2A2SP-SJMB** filing to comply with Section 15.247 of the FCC Part 15, Subpart E 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

FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

### 4.2 MEASUREMENT EQUIPMENT USED

#### For Conducted Emission Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2023/5/13	1Year
AMN	Rohde & Schwarz	ENV216	101161	2023/5/13	1Year

#### For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Pre-Amplifier	Bonn	BLMA 011001N	2213967A	2022/10/31	1Year
EMI Test Receiver	Rohde & Schwarz	ESR7	102551	2022/10/31	1Year
Bilog Antenna	Schwarzbeck	VULB9163	9163142	2022/7/24	2Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	2023/6/2	2Year
Pre-Amplifier	Bonn	BLMA 0118-5G	2213967B-01	2022/10/31	1Year
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101290	2022/10/31	1Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2023/5/12	2Year
Pre-Amplifier	Lunar EM	LNA18G26-40	J1012131010001	2023/5/10	1Year
Pre-Amplifier	Lunar EM	LNA26G40-40	J1013131028001	2023/5/10	1Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2023/5/12	2Year

#### For Other Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Wideband Radio Communication Tester	R&S	CMW500	171168	2022/11/2	1Year
Frequency Extender	R&S	CMW-Z800A	100430	2022/11/2	1Year
Spectrum Analyzer	R&S	FSV3044	MY60242456	2022/11/2	1Year
Analog Signal Generator	R&S	SMB100A	MY61252625	2022/11/2	1Year
Vector Signal Generator	R&S	SMM100A	MY61252674	2022/11/2	1Year
RF Control Unit	Tonscend	JS0806-2	22C8060567	2022/11/2	1Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2023/5/10	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.

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 5150-5250MHz

Frequency and Channels list for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

Frequency and Channels list for 802.11n (40)/802.11ac(40)/802.11ax(40):

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

Frequency and Channel list for 802.11ac(80)/802.11ax(80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

**Test Frequency and Channels** for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

**Test Frequency and channels** for 802.11n (40)/802.11ac(40)/802.11ax(40):

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 channels** for 802.11ac(80)/802.11ax(80):

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 5250-5350MHz**

Frequency and Channels list for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

Frequency and Channels list for 802.11n (40)/802.11ac(40)/802.11ax(40):

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

Frequency and Channels list for 802.11ac(80)/802.11ax(80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

**Test Frequency and Channels** for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

**Test Frequency and channels** for 802.11n (40)/802.11ac(40)/802.11ax(40):

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 channels** for 802.11ac(80)/802.11ax(80):

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

**Wifi 5G with 5470-5725MHz**

Frequency and Channels list for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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 Channels list for 802.11n (40)/802.11ac(40)/802.11ax(40):

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

Frequency and Channels list for 802.11ac(80)/802.11ax(80):

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

**Test Frequency and Channels** for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	140	5700

**Test Frequency and channels** for 802.11n (40)/802.11ac(40)/802.11ax(40):

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

**Test Frequency and channels** for 802.11ac(80)/802.11ax(80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610		

**Wifi 5G with 5725MHz-5850MHz**

Frequency and Channels list for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

Frequency and Channels list for 802.11n (40)/802.11ac(40)/802.11ax(40):

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

Frequency and Channels list for 802.11ac(80)/802.11ax(80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

**Test Frequency and Channels** for 802.11a/n(20)/802.11ac(20)/802.11ax(20):

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

**Test Frequency and channels** for 802.11n (40)/802.11ac(40)/802.11ax(40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755			159	5795

**Test Frequency and channels** for 802.11ac(80)/802.11ax(80):

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

Multi-antenna correlation:

<input checked="" type="checkbox"/>	Transmit Signals are Correlated
	Directional gain = $10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2 / N_{ANT}]$ dBi
<input type="checkbox"/>	All Transmit Signals are Completely Uncorrelated
	Directional gain = $10 \log[(10^{G^1/10} + 10^{G^2/10} + \dots + 10^{G^N/10}) / N_{ANT}]$ dBi

ANT1: 3.32dBi, ANT2: 3.32dBi

 ANT1+ANT2: Directional gain =  $10 \log [(10^{3.32/20} + 10^{3.32/20})^2 / 2]$  dBi=6.33dBi

## 5 FACILITIES AND ACCREDITATIONS

### 5.1 FACILITIES

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

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

: **Accredited by CNAS**

The Certificate Registration Number is L2291

The Laboratory has been assessed and proved to be in compliance with CNAS-CL01 (identical to ISO/IEC 17025:2017)

**Accredited by FCC**

Designation Number: CN1204

Test Firm Registration Number: 882943

**Accredited by A2LA**

The Certificate Number is 4321.01

**Accredited by Industry Canada**

The Conformity Assessment Body Identifier is CN0008

Name of Firm

: EMTEK (SHENZHEN) CO., LTD.

Site Location

: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China

## 6 TEST SYSTEM UNCERTAINTY

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

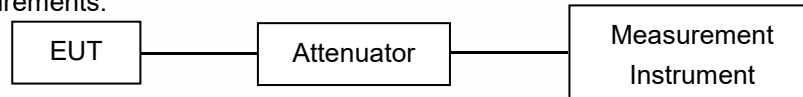
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\text{dB}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Power Density	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
Band Edge Test	$\pm 3\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 0.5^\circ\text{C}$
Humidity	$\pm 3\%$

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 C63.10-2013 and 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:

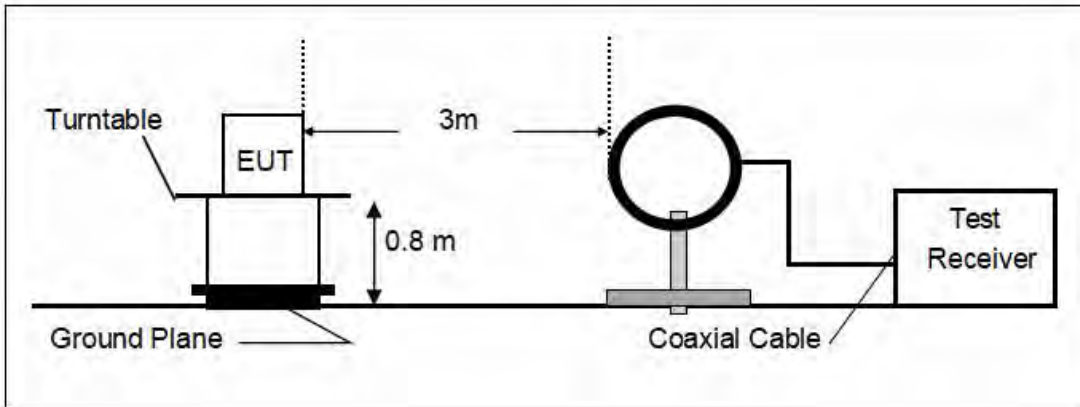
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is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

Above 1GHz:

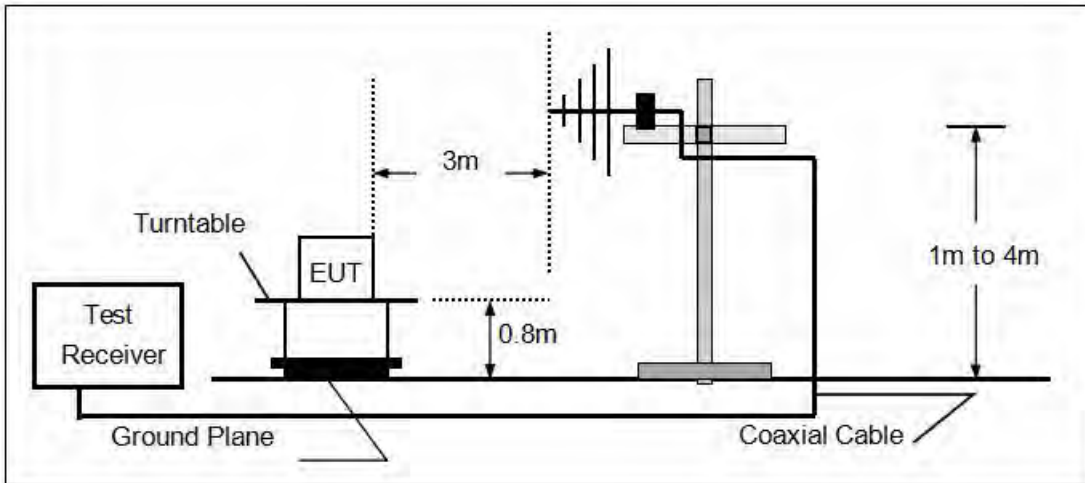
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

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).

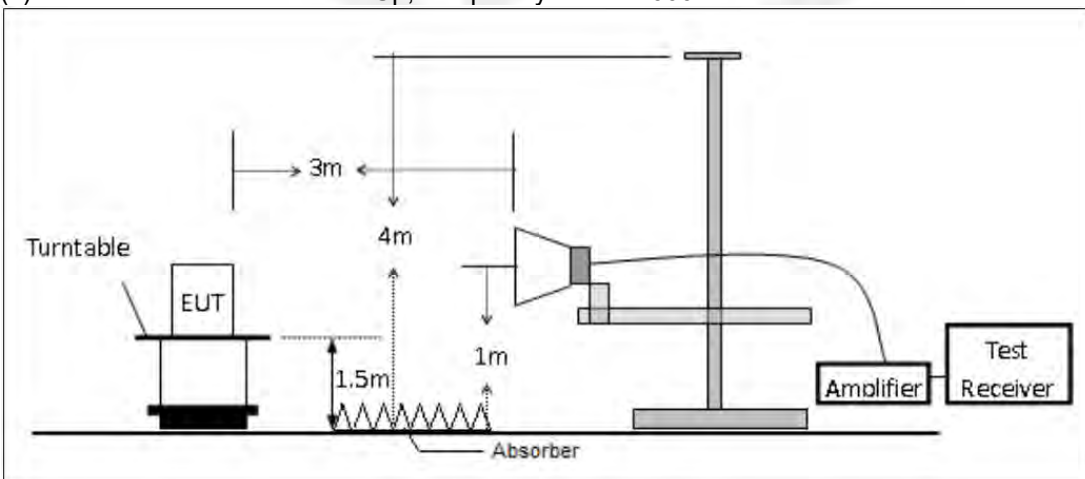
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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



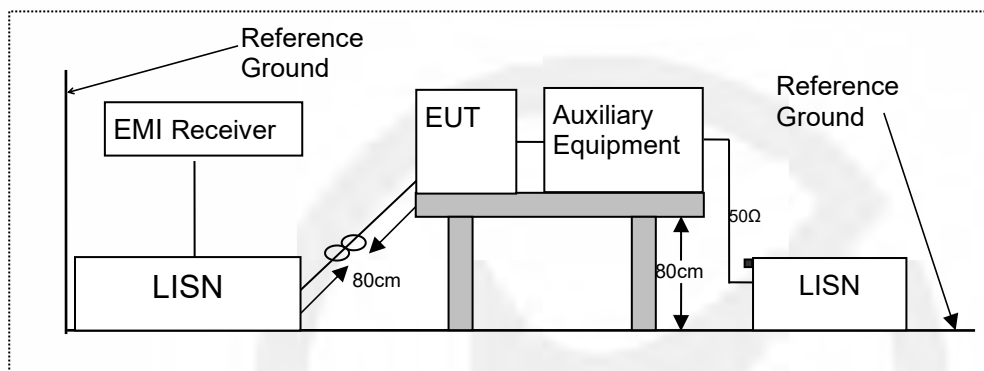


### 7.3 CONDUCTED EMISSION TEST SETUP

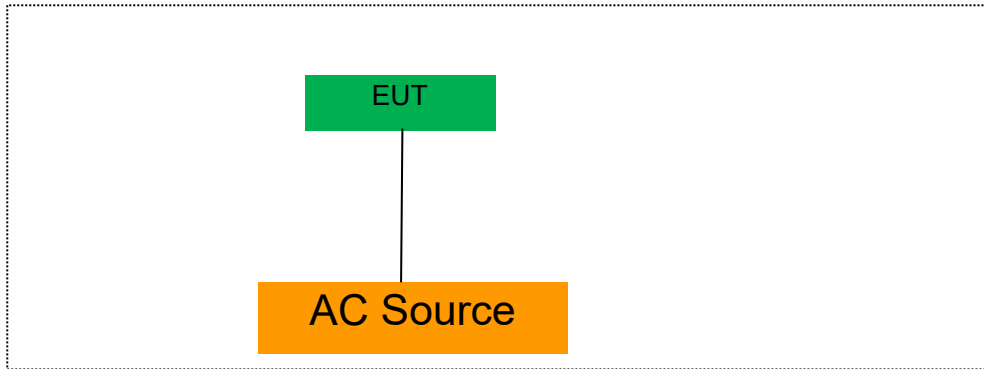
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All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

N/A

## 8 TEST REQUIREMENTS

### 8.1 BANDWIDTH MEASUREMENT

#### 8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I  
According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C  
According to FCC Part 15.407(a)(3) for UNII Band III  
According to FCC Part 15.407(e) for UNII Band III  
According to 789033 D02 Section II(C)  
According to 789033 D02 Section II(D)

#### 8.1.2 Conformance Limit

(1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) 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 6.1 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)  $\geq 3 \times$  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  $\geq 3 \times$  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

**Emission Bandwidth (26dB)**

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	21.520	5169.280	5190.800	---	---
	Ant2	5180	21.040	5169.320	5190.360	---	---
	Ant1	5200	22.360	5188.280	5210.640	---	---
	Ant2	5200	21.200	5189.320	5210.520	---	---
	Ant1	5240	21.200	5229.360	5250.560	---	---
	Ant2	5240	20.760	5229.520	5250.280	---	---
	Ant1	5260	20.840	5249.520	5270.360	---	---
	Ant2	5260	20.920	5249.440	5270.360	---	---
	Ant1	5280	20.920	5269.520	5290.440	---	---
	Ant2	5280	21.080	5269.560	5290.640	---	---
	Ant1	5320	21.000	5309.400	5330.400	---	---
	Ant2	5320	21.200	5309.400	5330.600	---	---
	Ant1	5500	21.360	5489.280	5510.640	---	---
	Ant2	5500	21.240	5489.240	5510.480	---	---
	Ant1	5580	21.160	5569.320	5590.480	---	---
	Ant2	5580	21.040	5569.480	5590.520	---	---
	Ant1	5700	20.960	5689.560	5710.520	---	---
	Ant2	5700	20.960	5689.520	5710.480	---	---
	Ant1	5745	21.320	5734.280	5755.600	---	---
	Ant2	5745	21.280	5734.280	5755.560	---	---
	Ant1	5785	20.800	5774.520	5795.320	---	---
	Ant2	5785	21.640	5774.200	5795.840	---	---
	Ant1	5825	21.040	5814.400	5835.440	---	---
	Ant2	5825	20.840	5814.560	5835.400	---	---
11N20MIMO	Ant1	5180	21.040	5169.480	5190.520	---	---
	Ant2	5180	21.240	5169.360	5190.600	---	---
	Ant1	5200	21.640	5189.440	5211.080	---	---
	Ant2	5200	21.480	5189.160	5210.640	---	---
	Ant1	5240	21.480	5229.200	5250.680	---	---
	Ant2	5240	21.280	5229.400	5250.680	---	---
	Ant1	5260	21.160	5249.360	5270.520	---	---
	Ant2	5260	21.280	5249.280	5270.560	---	---
	Ant1	5280	21.360	5269.280	5290.640	---	---
	Ant2	5280	21.240	5269.280	5290.520	---	---
	Ant1	5320	21.240	5309.280	5330.520	---	---
	Ant2	5320	21.280	5309.280	5330.560	---	---
	Ant1	5500	21.440	5489.160	5510.600	---	---
	Ant2	5500	21.440	5489.360	5510.800	---	---
	Ant1	5580	21.480	5569.240	5590.720	---	---
	Ant2	5580	21.200	5569.400	5590.600	---	---
	Ant1	5700	21.360	5689.240	5710.600	---	---
	Ant2	5700	21.280	5689.400	5710.680	---	---
	Ant1	5745	21.680	5734.120	5755.800	---	---
	Ant2	5745	21.320	5734.280	5755.600	---	---
	Ant1	5785	21.120	5774.360	5795.480	---	---
	Ant2	5785	21.240	5774.440	5795.680	---	---
	Ant1	5825	21.600	5814.120	5835.720	---	---
	Ant2	5825	21.240	5814.320	5835.560	---	---
11N40MIMO	Ant1	5190	39.840	5170.000	5209.840	---	---

	Ant2	5190	39.760	5170.080	5209.840	---	---
	Ant1	5230	40.080	5209.920	5250.000	---	---
	Ant2	5230	39.760	5210.240	5250.000	---	---
	Ant1	5270	40.160	5249.920	5290.080	---	---
	Ant2	5270	39.920	5249.920	5289.840	---	---
	Ant1	5310	39.760	5290.160	5329.920	---	---
	Ant2	5310	39.760	5290.160	5329.920	---	---
	Ant1	5510	39.760	5490.080	5529.840	---	---
	Ant2	5510	39.840	5490.080	5529.920	---	---
	Ant1	5550	39.840	5530.080	5569.920	---	---
	Ant2	5550	39.840	5530.080	5569.920	---	---
	Ant1	5670	39.920	5650.000	5689.920	---	---
	Ant2	5670	40.000	5650.080	5690.080	---	---
	Ant1	5755	39.920	5735.160	5775.080	---	---
	Ant2	5755	40.080	5735.000	5775.080	---	---
	Ant1	5795	39.680	5775.160	5814.840	---	---
	Ant2	5795	40.080	5774.920	5815.000	---	---
	11AC20MIMO	Ant1	5180	21.600	5169.320	5190.920	---
Ant2		5180	21.400	5169.240	5190.640	---	---
Ant1		5200	21.640	5189.160	5210.800	---	---
Ant2		5200	21.320	5189.320	5210.640	---	---
Ant1		5240	21.400	5229.320	5250.720	---	---
Ant2		5240	21.200	5229.200	5250.400	---	---
Ant1		5260	21.160	5249.280	5270.440	---	---
Ant2		5260	21.440	5249.400	5270.840	---	---
Ant1		5280	21.600	5269.080	5290.680	---	---
Ant2		5280	21.160	5269.400	5290.560	---	---
Ant1		5320	21.160	5309.480	5330.640	---	---
Ant2		5320	21.680	5309.120	5330.800	---	---
Ant1		5500	21.320	5489.320	5510.640	---	---
Ant2		5500	21.440	5489.120	5510.560	---	---
Ant1		5580	21.400	5569.120	5590.520	---	---
Ant2		5580	21.360	5569.360	5590.720	---	---
Ant1		5700	21.320	5689.240	5710.560	---	---
Ant2		5700	21.440	5689.240	5710.680	---	---
Ant1		5745	21.560	5734.080	5755.640	---	---
Ant2		5745	21.320	5734.320	5755.640	---	---
Ant1		5785	21.280	5774.400	5795.680	---	---
Ant2		5785	21.320	5774.280	5795.600	---	---
Ant1		5825	21.160	5814.360	5835.520	---	---
Ant2		5825	21.360	5814.160	5835.520	---	---
11AC40MIMO	Ant1	5190	40.080	5169.920	5210.000	---	---
	Ant2	5190	40.160	5170.000	5210.160	---	---
	Ant1	5230	40.160	5209.760	5249.920	---	---
	Ant2	5230	39.680	5210.160	5249.840	---	---
	Ant1	5270	40.080	5249.840	5289.920	---	---
	Ant2	5270	40.000	5249.840	5289.840	---	---
	Ant1	5310	40.240	5289.840	5330.080	---	---
	Ant2	5310	40.080	5289.920	5330.000	---	---
	Ant1	5510	40.080	5490.080	5530.160	---	---
	Ant2	5510	40.160	5489.920	5530.080	---	---
	Ant1	5550	39.920	5530.160	5570.080	---	---
	Ant2	5550	39.920	5530.080	5570.000	---	---
	Ant1	5670	40.240	5650.000	5690.240	---	---
	Ant2	5670	39.840	5650.080	5689.920	---	---

	Ant1	5755	39.920	5735.080	5775.000	---	---	
	Ant2	5755	40.160	5735.000	5775.160	---	---	
	Ant1	5795	40.480	5774.840	5815.320	---	---	
	Ant2	5795	39.840	5775.080	5814.920	---	---	
11AC80MIMO	Ant1	5210	82.080	5169.200	5251.280	---	---	
	Ant2	5210	82.720	5168.560	5251.280	---	---	
	Ant1	5290	81.920	5249.360	5331.280	---	---	
	Ant2	5290	81.920	5249.040	5330.960	---	---	
	Ant1	5530	81.600	5489.520	5571.120	---	---	
	Ant2	5530	81.280	5489.360	5570.640	---	---	
	Ant1	5610	81.600	5569.520	5651.120	---	---	
	Ant2	5610	81.440	5569.200	5650.640	---	---	
	Ant1	5775	81.920	5734.200	5816.120	---	---	
	Ant2	5775	81.600	5734.200	5815.800	---	---	
11AX20MIMO	Ant1	5180	21.360	5169.200	5190.560	---	---	
	Ant2	5180	21.240	5169.440	5190.680	---	---	
	Ant1	5200	21.520	5189.200	5210.720	---	---	
	Ant2	5200	21.160	5189.320	5210.480	---	---	
	Ant1	5240	21.160	5229.400	5250.560	---	---	
	Ant2	5240	21.440	5229.280	5250.720	---	---	
	Ant1	5260	21.200	5249.480	5270.680	---	---	
	Ant2	5260	21.280	5249.320	5270.600	---	---	
	Ant1	5280	21.520	5269.160	5290.680	---	---	
	Ant2	5280	21.400	5269.320	5290.720	---	---	
	Ant1	5320	21.480	5309.200	5330.680	---	---	
	Ant2	5320	21.240	5309.320	5330.560	---	---	
	Ant1	5500	21.680	5489.160	5510.840	---	---	
	Ant2	5500	21.280	5489.240	5510.520	---	---	
	Ant1	5580	21.120	5569.280	5590.400	---	---	
	Ant2	5580	21.080	5569.520	5590.600	---	---	
	Ant1	5700	21.240	5689.240	5710.480	---	---	
	Ant2	5700	21.200	5689.480	5710.680	---	---	
	Ant1	5745	21.240	5734.400	5755.640	---	---	
	Ant2	5745	21.000	5734.520	5755.520	---	---	
	Ant1	5785	21.040	5774.480	5795.520	---	---	
	Ant2	5785	21.200	5774.320	5795.520	---	---	
	Ant1	5825	21.080	5814.360	5835.440	---	---	
	Ant2	5825	21.520	5814.240	5835.760	---	---	
	11AX40MIMO	Ant1	5190	40.080	5169.840	5209.920	---	---
		Ant2	5190	39.760	5170.160	5209.920	---	---
		Ant1	5230	40.480	5209.760	5250.240	---	---
		Ant2	5230	40.080	5210.000	5250.080	---	---
Ant1		5270	40.080	5250.160	5290.240	---	---	
Ant2		5270	39.920	5249.920	5289.840	---	---	
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Ant2		5310	39.920	5289.920	5329.840	---	---	
Ant1		5510	40.000	5490.080	5530.080	---	---	
Ant2		5510	40.240	5489.680	5529.920	---	---	
Ant1		5550	40.080	5530.080	5570.160	---	---	
Ant2		5550	40.080	5530.080	5570.160	---	---	
Ant1		5670	40.000	5650.000	5690.000	---	---	
Ant2		5670	39.920	5650.080	5690.000	---	---	
Ant1		5755	39.920	5734.920	5774.840	---	---	
Ant2		5755	40.080	5735.000	5775.080	---	---	
Ant1		5795	40.400	5774.840	5815.240	---	---	

	Ant2	5795	40.080	5775.000	5815.080	---	---
11AX80MIMO	Ant1	5210	81.280	5169.360	5250.640	---	---
	Ant2	5210	81.120	5169.520	5250.640	---	---
	Ant1	5290	81.120	5249.840	5330.960	---	---
	Ant2	5290	80.960	5249.840	5330.800	---	---
	Ant1	5530	81.440	5489.680	5571.120	---	---
	Ant2	5530	81.440	5489.200	5570.640	---	---
	Ant1	5610	80.800	5569.520	5650.320	---	---
	Ant2	5610	81.120	5569.520	5650.640	---	---
	Ant1	5775	80.960	5734.520	5815.480	---	---
	Ant2	5775	81.280	5734.520	5815.800	---	---





## 11A\_Ant1\_5180



## 11A\_Ant2\_5180



## 11A\_Ant1\_5200



## 11A\_Ant2\_5200



## 11A\_Ant1\_5240



## 11A\_Ant2\_5240



## 11A\_Ant1\_5260



## 11A\_Ant2\_5260



## 11A\_Ant1\_5280



## 11A\_Ant2\_5280



## 11A\_Ant1\_5320



## 11A\_Ant2\_5320



## 11A\_Ant1\_5500



## 11A\_Ant2\_5500



## 11A\_Ant1\_5580



## 11A\_Ant2\_5580



## 11A\_Ant1\_5700



## 11A\_Ant2\_5700



## 11A\_Ant1\_5745



## 11A\_Ant2\_5745



## 11A\_Ant1\_5785



## 11A\_Ant2\_5785



## 11A\_Ant1\_5825



## 11A\_Ant2\_5825





## 11N20MIMO Ant1 5180



## 11N20MIMO Ant2 5180



## 11N20MIMO Ant1 5200



## 11N20MIMO\_Ant2\_5200



## 11N20MIMO\_Ant1\_5240



## 11N20MIMO\_Ant2\_5240



## 11N20MIMO Ant1 5260



## 11N20MIMO Ant2 5260



## 11N20MIMO Ant1 5280



## 11N20MIMO\_Ant2\_5280



## 11N20MIMO\_Ant1\_5320



## 11N20MIMO\_Ant2\_5320



## 11N20MIMO Ant1 5500



## 11N20MIMO Ant2 5500



## 11N20MIMO Ant1 5580



## 11N20MIMO\_Ant2\_5580



## 11N20MIMO\_Ant1\_5700



## 11N20MIMO\_Ant2\_5700



## 11N20MIMO Ant1 5745



## 11N20MIMO Ant2 5745



## 11N20MIMO Ant1 5785



## 11N20MIMO\_Ant2\_5785



## 11N20MIMO\_Ant1\_5825



## 11N20MIMO\_Ant2\_5825





## 11N40MIMO Ant1 5190



## 11N40MIMO Ant2 5190



## 11N40MIMO Ant1 5230



## 11N40MIMO\_Ant2\_5230



## 11N40MIMO\_Ant1\_5270



## 11N40MIMO\_Ant2\_5270



## 11N40MIMO Ant1 5310



## 11N40MIMO Ant2 5310



## 11N40MIMO Ant1 5510



## 11N40MIMO\_Ant2\_5510



## 11N40MIMO\_Ant1\_5550



## 11N40MIMO\_Ant2\_5550



## 11N40MIMO Ant1 5670



## 11N40MIMO Ant2 5670



## 11N40MIMO Ant1 5755



## 11N40MIMO\_Ant2\_5755



## 11N40MIMO\_Ant1\_5795



## 11N40MIMO\_Ant2\_5795



## 11AC20MIMO\_Ant1\_5180



## 11AC20MIMO\_Ant2\_5180



## 11AC20MIMO\_Ant1\_5200



## 11AC20MIMO\_Ant2\_5200



## 11AC20MIMO\_Ant1\_5240



## 11AC20MIMO\_Ant2\_5240





## 11AC20MIMO\_Ant1\_5260



## 11AC20MIMO\_Ant2\_5260



## 11AC20MIMO\_Ant1\_5280



## 11AC20MIMO\_Ant2\_5280



## 11AC20MIMO\_Ant1\_5320



## 11AC20MIMO\_Ant2\_5320



## 11AC20MIMO\_Ant1\_5500



## 11AC20MIMO\_Ant2\_5500



## 11AC20MIMO\_Ant1\_5580



## 11AC20MIMO\_Ant2\_5580



## 11AC20MIMO\_Ant1\_5700



## 11AC20MIMO\_Ant2\_5700



11AC20MIMO\_Ant1\_5745



11AC20MIMO\_Ant2\_5745



11AC20MIMO\_Ant1\_5785



11AC20MIMO\_Ant2\_5785



11AC20MIMO Ant1 5825



11AC20MIMO Ant2 5825



## 11AC40MIMO\_Ant1\_5190



## 11AC40MIMO\_Ant2\_5190



## 11AC40MIMO\_Ant1\_5230



## 11AC40MIMO\_Ant2\_5230



## 11AC40MIMO\_Ant1\_5270



## 11AC40MIMO\_Ant2\_5270





## 11AC40MIMO\_Ant1\_5310



## 11AC40MIMO\_Ant2\_5310



## 11AC40MIMO\_Ant1\_5510



## 11AC40MIMO\_Ant2\_5510



## 11AC40MIMO\_Ant1\_5550



## 11AC40MIMO\_Ant2\_5550



## 11AC40MIMO\_Ant1\_5670



## 11AC40MIMO\_Ant2\_5670



## 11AC40MIMO\_Ant1\_5755



11AC40MIMO\_Ant2\_5755



11AC40MIMO\_Ant1\_5795



11AC40MIMO\_Ant2\_5795



## 11AC80MIMO\_Ant1\_5210



## 11AC80MIMO\_Ant2\_5210



## 11AC80MIMO\_Ant1\_5290



## 11AC80MIMO\_Ant2\_5290



## 11AC80MIMO\_Ant1\_5530



## 11AC80MIMO\_Ant2\_5530



## 11AC80MIMO\_Ant1\_5610



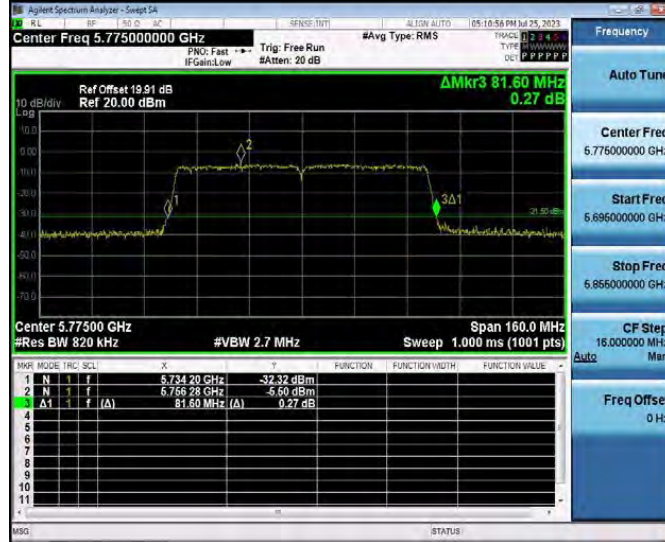
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### 11AC80MIMO\_Ant2\_5775



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### 11AX20MIMO\_Ant2\_5180





## 11AX20MIMO\_Ant1\_5200



## 11AX20MIMO\_Ant2\_5200



## 11AX20MIMO\_Ant1\_5240



## 11AX20MIMO\_Ant2\_5240



## 11AX20MIMO\_Ant1\_5260



## 11AX20MIMO\_Ant2\_5260



## 11AX20MIMO\_Ant1\_5280



## 11AX20MIMO\_Ant2\_5280



## 11AX20MIMO\_Ant1\_5320



## 11AX20MIMO\_Ant2\_5320



## 11AX20MIMO\_Ant1\_5500



## 11AX20MIMO\_Ant2\_5500



## 11AX20MIMO\_Ant1\_5580



## 11AX20MIMO\_Ant2\_5580



## 11AX20MIMO\_Ant1\_5700



## 11AX20MIMO\_Ant2\_5700



## 11AX20MIMO\_Ant1\_5745



## 11AX20MIMO\_Ant2\_5745



## 11AX20MIMO\_Ant1\_5785



## 11AX20MIMO\_Ant2\_5785



## 11AX20MIMO\_Ant1\_5825



## 11AX20MIMO\_Ant2\_5825



## 11AX40MIMO\_Ant1\_5190



## 11AX40MIMO\_Ant2\_5190





## 11AX40MIMO\_Ant1\_5230



## 11AX40MIMO\_Ant2\_5230



## 11AX40MIMO\_Ant1\_5270



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## 11AX40MIMO\_Ant2\_5310



## 11AX40MIMO\_Ant1\_5510



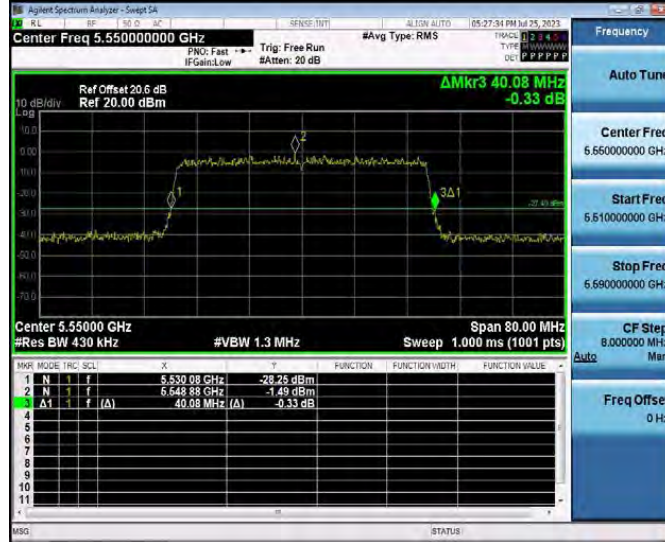
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## 11AX40MIMO\_Ant2\_5550



## 11AX40MIMO\_Ant1\_5670



## 11AX40MIMO\_Ant2\_5670



## 11AX40MIMO\_Ant1\_5755



## 11AX40MIMO\_Ant2\_5755



## 11AX40MIMO\_Ant1\_5795



## 11AX40MIMO\_Ant2\_5795



## 11AX80MIMO\_Ant1\_5210



## 11AX80MIMO\_Ant2\_5210



## 11AX80MIMO\_Ant1\_5290



## 11AX80MIMO\_Ant2\_5290



## 11AX80MIMO\_Ant1\_5530



## 11AX80MIMO\_Ant2\_5530



## 11AX80MIMO\_Ant1\_5610



## 11AX80MIMO\_Ant2\_5610

