TEST REPORT

Product Name : SIGMA-ONE
Model Number : MT-SIG1Y24-001
FCC ID : 2BLJ3-SIGMA-01

Prepared for	:	Meritech Co., Ltd
Address	:	5F, 2-28-1, Shinkawa, Chuo-ku Tokyo JAPAN
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Bldg 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282
Report Number	:	ENS2403270179W00502R
Date(s) of Tests	:	May 28, 2024 to September 3, 2024
Date of Issue	:	September 6, 2024

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Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2403270179W00502R	/	Original Report

1 TEST RESULT CERTIFICATION

Applicant	:	Meritech Co., Ltd
Address：		5F, 2-28-1, Shinkawa, Chuo-ku Tokyo JAPAN
Manufacturer	:	Sevenus Technology Co., Ltd
Address：		No.3, Hua'an Road, No.32 Zhongkai High-tech Zone, Huizhou, Guangdong, P.R. China
EUT	:	SIGMA-ONE
Model Name	:	MT-SIG1Y24-001
Trademark	:	Meritech Your efficiency, Our passion

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 above table standards requirement.
The test results of this report relate only to the tested sample identified in this report.

Date of Test	:	May 28, 2024 to September 3, 2024
Prepared by	:	Una Yu/Editor
Reviewer	:	Joe Xia/Supervisor
Approved & Authorized Signer	:	Lisa Wang/Manager

EMTEK (SHENZHEN) CO., LTD. TESTING

2 EUT TECHNICAL DESCRIPTION

Product Name:	SIGMA-ONE
Model Number:	MT-SIG1Y24-001
WIFI Type:	UNII-1: 5150MHz-5250MHz Band UNII-2A: 5250MHz-5350MHz Band UNII-2C: 5470MHz-5725MHz Band UNII-3: 5725MHz-5850MHz Band
WLAN Supported:	IEEE 802.11a IEEE 802.11n(20MHz channel bandwidth) IEEE 802.11n(40MHz channel bandwidth) IEEE 802.11ac(20MHz channel bandwidth) IEEE 802.11ac(40MHz channel bandwidth) IEEE 802.11ac(80MHz channel bandwidth) IEEE 802.11ax(20MHz channel bandwidth) IEEE 802.11ax(40MHz channel bandwidth) IEEE 802.11ax(80MHz channel bandwidth)
Frequency Range:	5150MHz-5250MHz Band: 5180-5240MHz for 802.11a 5180-5240MHz for 802.11n(20) 5190-5230MHz for 802.11n(40) 5180-5240MHz for 802.11ac(20) 5190-5230MHz for 802.11ac(40) 5210MHz for 802.11ac(80) 5180-5240MHz for 802.11ax(20) 5190-5230MHz for 802.11ax(40) 5210MHz for 802.11ax(80)
	5250MHz-5350MHz Band: 5260-5320MHz for 802.11a 5260-5320MHz for 802.11n(20) 5270-5310MHz for 802.11n(40) 5260-5320MHz for 802.11ac(20) 5270-5310MHz for 802.11ac(40) 5290MHz for 802.11ac(80) 5260-5320MHz for 802.11ax(20) 5270-5310MHz for 802.11ax(40) 5290MHz for 802.11ax(80)
	5470MHz-5725MHz Band: 5500-5700MHz for 802.11a 5500-5700MHz for 802.11n(20) 5510-5670MHz for 802.11n(40) 5500-5700MHz for 802.11ac(20) 5510-5670MHz for 802.11ac(40) 5530-5610MHz for 802.11ac(80) 5500-5700MHz for 802.11ax(20) 5510-5670MHz for 802.11ax(40) 5530-5610MHz for 802.11ax(80)

	5725MHz-5850MHz Band: 5745-5825MHz for 802.11a 5745-5825MHz for 802.11n(20) 5755-5795MHz for 802.11n(40) 5745-5825MHz for 802.11ac(20) 5755-5795MHz for 802.11ac(40) 5775MHz for 802.11ac(80) 5745-5825MHz for 802.11ax(20) 5755-5795MHz for 802.11ax(40) 5775MHz for 802.11ax(80)
Modulation:	OFDM/OFDMA
TPC Function:	Support
Beamforming:	Not Support
DFS Function:	Slave
Antenna Type:	Integrated Antenna
Antenna Gain:	Ant1: 3.27dBi, Ant2: 3.27dBi (Note: The antenna information is provided by the customers, which will have a certain impact on the test results.)
Smart System:	MIMO
Power Supply:	AC 120V/60Hz by Adapter Adapter: Model: SOY-1200300EU-056 Input: 100-240V~50/60Hz, 1.2A Max Output: 12V, 3A, 36W
Temperature Range:	-40℃~70℃

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: The results of this report do not take into account the uncertainty. 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 filing to comply with the above table standards requirement.

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	2024/5/11	1Year
AMN	Rohde & Schwarz	ENV216	101161	2024/5/10	1Year

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Pre-Amplifier	Bonn	BLMA 011001N	2213967A	2023/10/23	1Year
EMI Test Receiver	Rohde & Schwarz	ESR7	102551	2023/10/23	1Year
Bilog Antenna	Schwarzbeck	VULB9163	9163142	2022/7/9 2024/7/8	2Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	2023/6/2	2Year
Pre-Amplifier	Bonn	BLMA 0118-5G	2213967B-01	2023/10/23	1Year
Spectrum Analyzer	Rohde & Schwarz	FSV3044	101290	2023/10/23	1Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2023/5/12	2Year
Pre-Amplifier	Lunar EM	LNA18G26-40	J1012131010 001	2024/5/11	1Year
Pre-Amplifier	Lunar EM	LNA26G40-40	J1013131028 001	2024/5/11	1Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2023/5/12	2Year
Wideband Radio Communication Tester	R&S	CMW500	147366	2024/5/10	1Year

For Other Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Wideband Radio Communication Tester	R&S	CMW500	147366	2024/5/10	1Year
Frequency Extender	R&S	CMW-Z800A	100430	2023/9/14	1Year
Spectrum Analyzer	R&S	FSV3044	101289	2023/9/14	1Year
Analog Signal Generator	R&S	SMB100A	183237	2023/9/16	1Year
Vector Signal Generator	R&S	SMM100A	101808	2023/9/16	1Year
RF Control Unit(Power Meter)	Tonscend	JS0806-2	22C8060567	2023/9/14	1Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2024/5/10	1 Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2024/5/10	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)/ac(20)/ax(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)/ac(40)/ax(40):

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

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

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

Test Frequency and Channels for 802.11a/n(20)/ac(20)/ax(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)/ac(40)/ax(40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	-	-	46	5230

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

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	-	-	-	-

WIFI 5G with 5250-5350MHz

Frequency and Channels list for 802.11a/n(20)/ac(20)/ax(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)/ac(40)/ax(40):

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

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

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

Test Frequency and Channels for 802.11a/n(20)/ac(20)/ax(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)/ac(40)/ax(40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	-	-	62	5310

Test Frequency and channels for 802.11ac(80)/ax(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)/ac(20)/ax(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)/ac(40)/ax(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)/ax(80):

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

Test Frequency and Channels for 802.11a/n(20)/ac(20)/ax(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)/ac(40)/ax(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)/ax(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)/ax(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)/ac(40)/ax(40):

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

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

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

Test Frequency and Channels for 802.11a/n(20)/ac(20)/ax(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)/ac(40)/ax(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)/ax(80):

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

Multi-antenna correlation:

☑	Transmit Signals are Correlated
	Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2 / N_{ANT}$] dBi
☐	All Transmit Signals are Completely Uncorrelated
	Directional gain = 10 log[$(10^{G1/10} + 10^{G2/10} + \ldots + 10^{GN/10})$)/NANT] dBi

Ant1: 3.27dBi, Ant2: 3.27dBi

Directional gain = 6.28 dBi

5 FACILITIES AND ACCREDITATIONS

5.1 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 wave guide, 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 wide band 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”.

5.2 DESCRIPTION OF TEST FACILITY

Site Description
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:

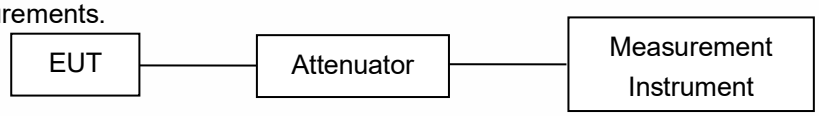
Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5℃
Humidity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

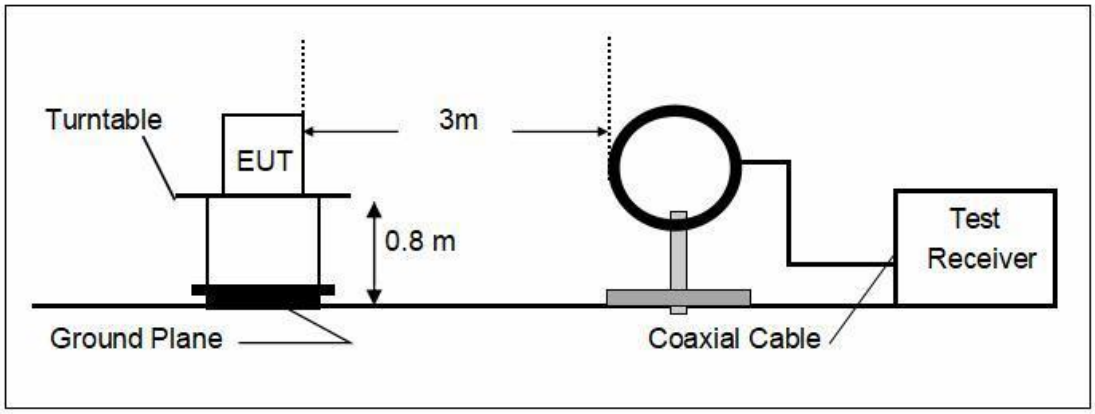
The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

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.

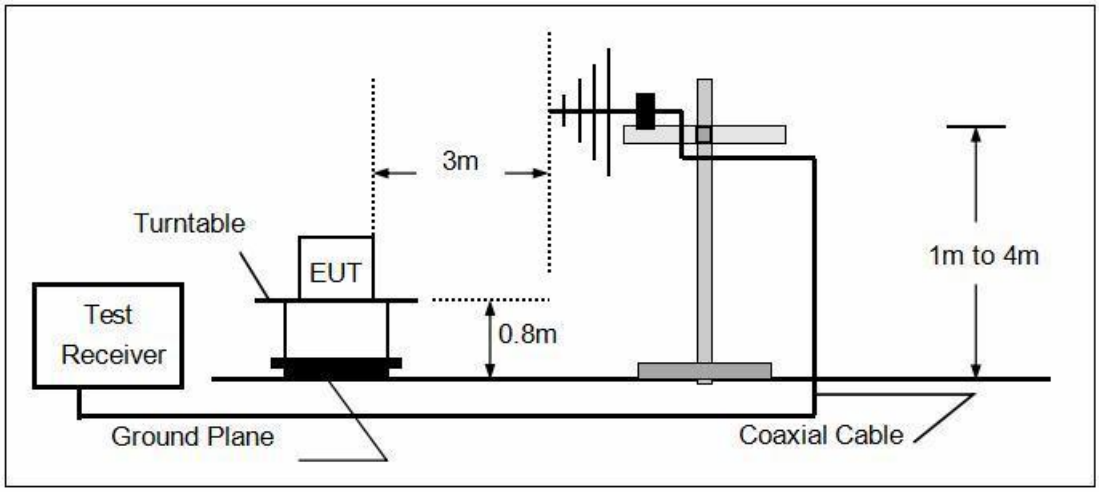
Above 30MHz：
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of 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).

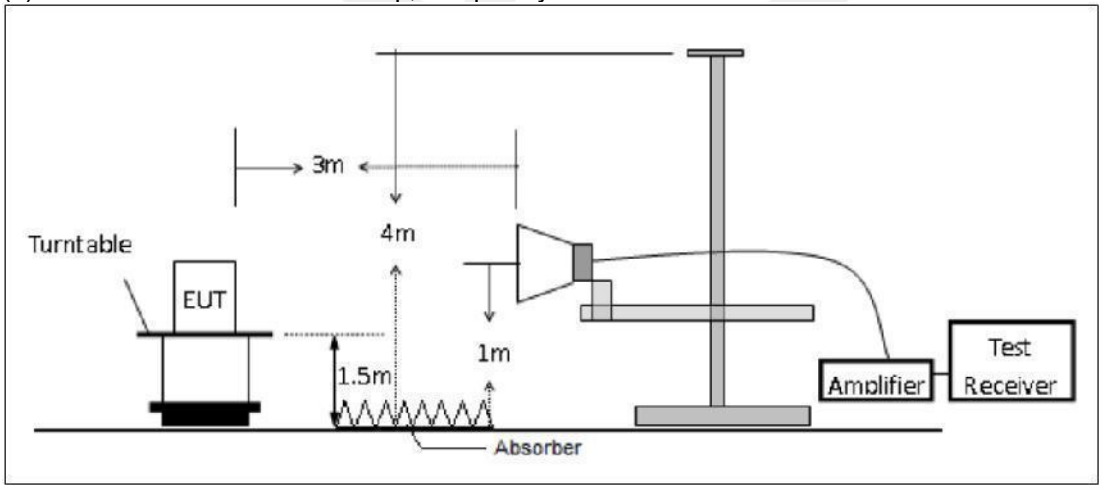
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



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



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

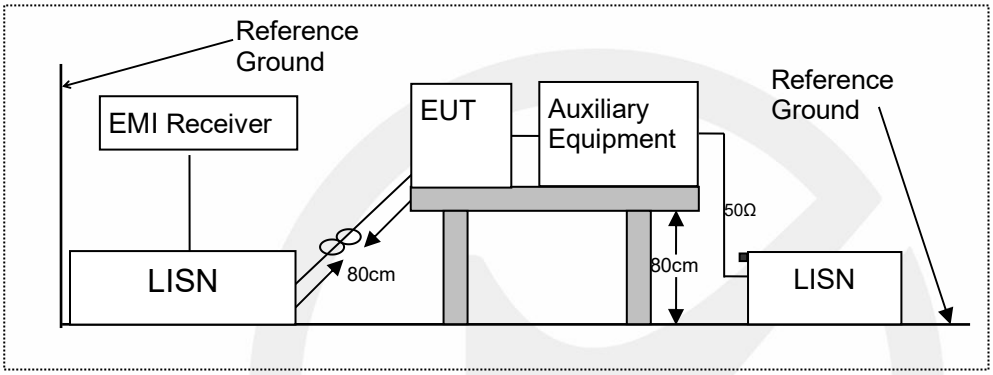


7.3 CONDUCTED EMISSION TEST SETUP

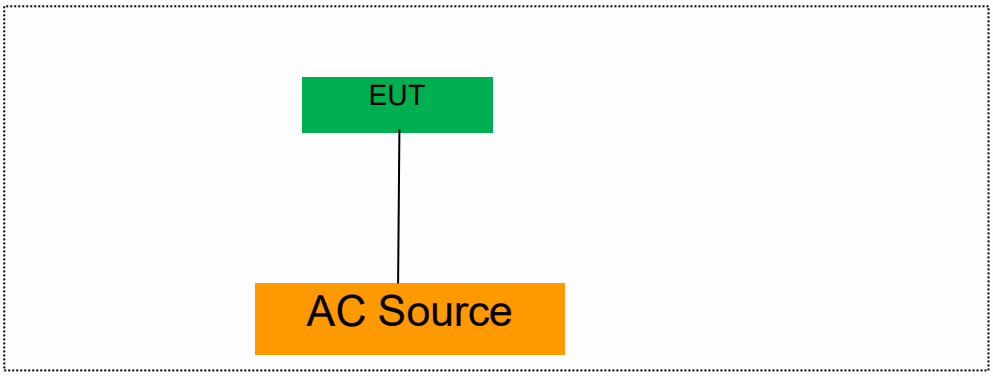
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All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

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 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 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) ≥ 3 × 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℃	ATM Pressure::	1011 mbar
Humidity :	45 %	Test Engineer:	GJ

Emission Bandwidth (26dB)

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	20.280	5169.800	5190.080	---	---
	Ant2	5180	20.720	5169.640	5190.360	---	---
	Ant1	5200	21.120	5189.520	5210.640	---	---
	Ant2	5200	20.800	5189.840	5210.640	---	---
	Ant1	5240	20.600	5229.880	5250.480	---	---
	Ant2	5240	20.720	5229.880	5250.600	---	---
	Ant1	5260	20.840	5249.800	5270.640	---	---
	Ant2	5260	20.520	5249.760	5270.280	---	---
	Ant1	5280	20.440	5270.000	5290.440	---	---
	Ant2	5280	20.440	5269.920	5290.360	---	---
	Ant1	5320	20.680	5309.800	5330.480	---	---
	Ant2	5320	20.840	5309.720	5330.560	---	---
	Ant1	5500	20.520	5489.720	5510.240	---	---
	Ant2	5500	20.600	5489.760	5510.360	---	---
	Ant1	5580	21.240	5569.600	5590.840	---	---
	Ant2	5580	20.640	5569.840	5590.480	---	---
	Ant1	5700	21.040	5689.480	5710.520	---	---
	Ant2	5700	20.560	5689.920	5710.480	---	---
	Ant1	5745	20.680	5734.880	5755.560	---	---
	Ant2	5745	20.680	5734.840	5755.520	---	---
	Ant1	5785	20.640	5774.680	5795.320	---	---
	Ant2	5785	21.120	5774.920	5796.040	---	---
	Ant1	5825	20.680	5814.720	5835.400	---	---
	Ant2	5825	20.880	5814.720	5835.600	---	---
11N20MIMO	Ant1	5180	21.000	5169.440	5190.440	---	---
	Ant2	5180	20.480	5169.760	5190.240	---	---
	Ant1	5200	20.960	5189.600	5210.560	---	---
	Ant2	5200	20.880	5189.520	5210.400	---	---
	Ant1	5240	21.080	5229.560	5250.640	---	---
	Ant2	5240	20.840	5229.440	5250.280	---	---
	Ant1	5260	20.960	5249.720	5270.680	---	---
	Ant2	5260	20.760	5249.720	5270.480	---	---
	Ant1	5280	21.280	5269.440	5290.720	---	---
	Ant2	5280	20.840	5269.600	5290.440	---	---
	Ant1	5320	20.720	5309.800	5330.520	---	---
	Ant2	5320	20.720	5309.640	5330.360	---	---
	Ant1	5500	20.920	5489.600	5510.520	---	---
	Ant2	5500	21.480	5489.080	5510.560	---	---
	Ant1	5580	21.200	5569.520	5590.720	---	---
	Ant2	5580	20.960	5569.560	5590.520	---	---
	Ant1	5700	20.800	5689.720	5710.520	---	---
	Ant2	5700	20.920	5689.720	5710.640	---	---
	Ant1	5745	20.960	5734.560	5755.520	---	---
	Ant2	5745	20.880	5734.680	5755.560	---	---
	Ant1	5785	20.840	5774.720	5795.560	---	---

	Ant2	5785	21.800	5774.840	5796.640	---	---
	Ant1	5825	21.360	5814.600	5835.960	---	---
	Ant2	5825	21.000	5814.760	5835.760	---	---
11N40MIMO	Ant1	5190	39.520	5170.160	5209.680	---	---
	Ant2	5190	38.720	5170.880	5209.600	---	---
	Ant1	5230	39.680	5210.480	5250.160	---	---
	Ant2	5230	39.040	5210.560	5249.600	---	---
	Ant1	5270	39.200	5250.320	5289.520	---	---
	Ant2	5270	38.560	5250.880	5289.440	---	---
	Ant1	5310	39.440	5290.480	5329.920	---	---
	Ant2	5310	38.800	5290.720	5329.520	---	---
	Ant1	5510	39.440	5490.320	5529.760	---	---
	Ant2	5510	38.800	5490.640	5529.440	---	---
	Ant1	5550	39.120	5530.480	5569.600	---	---
	Ant2	5550	38.720	5530.720	5569.440	---	---
	Ant1	5670	39.680	5650.080	5689.760	---	---
	Ant2	5670	39.120	5650.560	5689.680	---	---
	Ant1	5755	39.280	5735.560	5774.840	---	---
	Ant2	5755	39.040	5735.720	5774.760	---	---
	Ant1	5795	38.720	5775.720	5814.440	---	---
	Ant2	5795	38.960	5775.560	5814.520	---	---
11AC20MIMO	Ant1	5180	20.800	5169.600	5190.400	---	---
	Ant2	5180	21.280	5169.440	5190.720	---	---
	Ant1	5200	21.280	5189.280	5210.560	---	---
	Ant2	5200	20.880	5189.600	5210.480	---	---
	Ant1	5240	21.160	5229.440	5250.600	---	---
	Ant2	5240	20.960	5229.520	5250.480	---	---
	Ant1	5260	21.000	5249.520	5270.520	---	---
	Ant2	5260	20.840	5249.680	5270.520	---	---
	Ant1	5280	20.960	5269.480	5290.440	---	---
	Ant2	5280	20.680	5269.720	5290.400	---	---
	Ant1	5320	21.760	5309.560	5331.320	---	---
	Ant2	5320	20.600	5309.760	5330.360	---	---
	Ant1	5500	21.560	5489.240	5510.800	---	---
	Ant2	5500	20.560	5489.920	5510.480	---	---
	Ant1	5580	20.720	5569.840	5590.560	---	---
	Ant2	5580	20.760	5569.720	5590.480	---	---
	Ant1	5700	21.120	5689.600	5710.720	---	---
	Ant2	5700	21.080	5689.640	5710.720	---	---
	Ant1	5745	21.240	5734.280	5755.520	---	---
	Ant2	5745	20.720	5734.720	5755.440	---	---
	Ant1	5785	21.000	5774.560	5795.560	---	---
	Ant2	5785	21.000	5774.520	5795.520	---	---
	Ant1	5825	21.200	5814.480	5835.680	---	---
	Ant2	5825	20.480	5814.920	5835.400	---	---
11AC40MIMO	Ant1	5190	39.600	5170.400	5210.000	---	---
	Ant2	5190	39.200	5170.640	5209.840	---	---
	Ant1	5230	39.600	5210.320	5249.920	---	---
	Ant2	5230	38.720	5210.720	5249.440	---	---
	Ant1	5270	39.280	5250.560	5289.840	---	---
	Ant2	5270	38.640	5250.800	5289.440	---	---
	Ant1	5310	39.520	5290.240	5329.760	---	---
	Ant2	5310	38.880	5290.560	5329.440	---	---
	Ant1	5510	39.200	5490.480	5529.680	---	---
	Ant2	5510	38.880	5490.800	5529.680	---	---

	Ant1	5550	39.520	5530.480	5570.000	---	---
	Ant2	5550	38.720	5530.640	5569.360	---	---
	Ant1	5670	39.760	5650.320	5690.080	---	---
	Ant2	5670	38.720	5650.800	5689.520	---	---
	Ant1	5755	39.120	5735.720	5774.840	---	---
	Ant2	5755	38.560	5735.800	5774.360	---	---
	Ant1	5795	38.960	5775.640	5814.600	---	---
	Ant2	5795	38.480	5775.880	5814.360	---	---
11AC80MIMO	Ant1	5210	80.800	5169.840	5250.640	---	---
	Ant2	5210	79.680	5170.320	5250.000	---	---
	Ant1	5290	80.960	5249.680	5330.640	---	---
	Ant2	5290	80.320	5249.680	5330.000	---	---
	Ant1	5530	81.280	5489.680	5570.960	---	---
	Ant2	5530	80.160	5490.000	5570.160	---	---
	Ant1	5610	80.320	5570.000	5650.320	---	---
	Ant2	5610	79.520	5570.640	5650.160	---	---
	Ant1	5775	80.480	5735.160	5815.640	---	---
	Ant2	5775	80.320	5734.840	5815.160	---	---
11AX20MIMO	Ant1	5180	21.280	5169.480	5190.760	---	---
	Ant2	5180	21.200	5169.280	5190.480	---	---
	Ant1	5200	21.160	5189.520	5210.680	---	---
	Ant2	5200	20.800	5189.640	5210.440	---	---
	Ant1	5240	21.520	5229.280	5250.800	---	---
	Ant2	5240	20.960	5229.840	5250.800	---	---
	Ant1	5260	21.120	5249.440	5270.560	---	---
	Ant2	5260	20.920	5249.600	5270.520	---	---
	Ant1	5280	20.840	5269.600	5290.440	---	---
	Ant2	5280	21.000	5269.640	5290.640	---	---
	Ant1	5320	21.040	5309.440	5330.480	---	---
	Ant2	5320	20.760	5309.720	5330.480	---	---
	Ant1	5500	21.040	5489.440	5510.480	---	---
	Ant2	5500	20.640	5489.880	5510.520	---	---
	Ant1	5580	21.040	5569.640	5590.680	---	---
	Ant2	5580	20.760	5569.760	5590.520	---	---
	Ant1	5700	20.960	5689.600	5710.560	---	---
	Ant2	5700	20.720	5689.680	5710.400	---	---
	Ant1	5745	20.920	5734.680	5755.600	---	---
	Ant2	5745	21.720	5734.680	5756.400	---	---
	Ant1	5785	21.160	5774.440	5795.600	---	---
	Ant2	5785	20.800	5774.760	5795.560	---	---
	Ant1	5825	21.440	5814.600	5836.040	---	---
	Ant2	5825	21.720	5814.600	5836.320	---	---
11AX40MIMO	Ant1	5190	39.200	5170.400	5209.600	---	---
	Ant2	5190	38.800	5170.720	5209.520	---	---
	Ant1	5230	39.600	5210.400	5250.000	---	---
	Ant2	5230	39.200	5210.400	5249.600	---	---
	Ant1	5270	39.440	5250.320	5289.760	---	---
	Ant2	5270	39.040	5250.480	5289.520	---	---
	Ant1	5310	39.520	5290.320	5329.840	---	---
	Ant2	5310	38.640	5290.800	5329.440	---	---
	Ant1	5510	39.440	5490.400	5529.840	---	---
	Ant2	5510	38.720	5490.720	5529.440	---	---
	Ant1	5550	39.680	5530.080	5569.760	---	---
	Ant2	5550	38.880	5530.640	5569.520	---	---
	Ant1	5670	39.920	5650.160	5690.080	---	---

	Ant2	5670	38.720	5650.720	5689.440	---	---
	Ant1	5755	39.360	5735.560	5774.920	---	---
	Ant2	5755	38.720	5735.800	5774.520	---	---
	Ant1	5795	39.360	5775.400	5814.760	---	---
	Ant2	5795	38.880	5775.880	5814.760	---	---
11AX80MIMO	Ant1	5210	80.320	5170.000	5250.320	---	---
	Ant2	5210	80.000	5170.160	5250.160	---	---
	Ant1	5290	80.960	5250.000	5330.960	---	---
	Ant2	5290	80.640	5249.520	5330.160	---	---
	Ant1	5530	81.440	5488.880	5570.320	---	---
	Ant2	5530	80.160	5490.160	5570.320	---	---
	Ant1	5610	81.280	5570.160	5651.440	---	---
	Ant2	5610	80.000	5570.000	5650.000	---	---
	Ant1	5775	80.640	5735.000	5815.640	---	---
	Ant2	5775	80.320	5735.000	5815.320	---	---

Emission Bandwidth (26dB) Test Graphs

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