

FCC REPORT

(UNII)

Applicant: Sun Cupid Technology (HK) Ltd.

Address of Applicant: 16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.

Equipment Under Test (EUT)

Product Name: LTE mobile phone

Model No.: N5501L, A5L

Trade mark: NUU

FCC ID: 2ADINN5501L

Applicable standards: FCC CFR Title 47 Part 15 Subpart E Section 15.407

Date of sample receipt: 20 Jun., 2018

Date of Test: 20 Jun., to 16 Jul., 2018

Date of report issued: 25 Jul., 2018

Test Result: PASS*

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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2 Version

Version No.	Date	Description
00	25 Jul., 2018	Original

Tested by:


Test Engineer

Date:

25 Jul., 2018

Reviewed by:


Project Engineer

Date:

25 Jul., 2018

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4 Test Summary

Test Item	Section in CFR 47	Test Result
Antenna requirement	15.203 & 15.407 (a)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.407 (a) (1) (iv)	Pass
26dB Occupied Bandwidth	15.407 (a) (5)	Pass
Power Spectral Density	15.407 (a) (1) (iv)	Pass
Band Edge	15.407(b)	Pass
Spurious Emission	15.205 & 15.209	Pass
Frequency Stability	15.407(g)	Pass
<i>Pass: The EUT complies with the essential requirements in the standard.</i>		
<i>N/A: Not Applicable.</i>		

5 General Information

5.1 Client Information

Applicant:	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Manufacturer	Sun Cupid Technology (HK) Ltd.
Address:	16/F, CEO Tower, 77 Wing Hong Street, Cheung Sha Wan, Kowloon, Hong Kong.
Factory:	SUNCUPID (ShenZhen) Electronic Ltd
Address:	Baolong Industrial City, Longgang District, Shenzhen Hi-Tech Road, Building 1, A 7, China.

5.2 General Description of E.U.T.

Product Name:	LTE mobile phone
Model No.:	N5501L, A5L
Operation Frequency:	Band 1: 5150MHz-5250MHz
Channel numbers:	Band 1: 802.11a/802.11n20: 4, 802.11n40: 2,
Channel separation:	802.11a/802.11n20: 20MHz, 802.11n40: 40MHz
Modulation technology (IEEE 802.11a):	BPSK, QPSK, 16-QAM, 64-QAM
Modulation technology (IEEE 802.11n):	BPSK, QPSK, 16-QAM, 64-QAM
Data speed (IEEE 802.11a):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps, 54Mbps
Data speed (IEEE 802.11n20):	MCS0: 6.5Mbps, MCS1:13Mbps, MCS2:19.5Mbps, MCS3:26Mbps, MCS4:39Mbps, MCS5:52Mbps, MCS6:58.5Mbps, MCS7:65Mbps
Data speed (IEEE 802.11n40):	MCS0:15Mbps, MCS1:30Mbps, MCS2:45Mbps, MCS3:60Mbps, MCS4:90Mbps, MCS5:120Mbps, MCS6:135Mbps, MCS7:150Mbps
Antenna Type:	Internal Antenna
Antenna gain:	-0.57 dBi
Power supply:	Rechargeable Li-ion Battery DC3.8V-2650mAh
AC adapter:	Adapter(1) Model: HNBL050100UX Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter(2) Model: HJ-0501000E1-US Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A Adapter(3) Model: HJ-0501000B3-EU Input: AC100-240V, 50/60Hz, 0.2A Output: DC 5.0V, 1.0A
Remark:	1. The No.: N5501L, A5L were identical inside, the electrical circuit design, layout, components used and internal wiring, with only

	difference being model name and trademark. 2. adapter (1) have different pins and the internal structure is the same, so there is no need to do the difference test.
--	--

Operation Frequency each of channel			
Band 1			
802.11a/802.11n20		802.11n40	
Channel	Frequency	Channel	Frequency
36	5180MHz	38	5190MHz
40	5200MHz	46	5230MHz
44	5220MHz		
48	5240MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Band 1			
802.11a/802.11n20		802.11n40	
Channel	Frequency	Channel	Frequency
Lowest channel	5180MHz	Lowest channel	5190MHz
Middle channel	5200MHz	Highest channel	5230MHz
Highest channel	5240MHz		

5.3 Test environment and test mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Continuously transmitting mode	Keep the EUT in 100% duty cycle transmitting with modulation.
We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate, and found the follow list were the worst case.	
Mode	Data rate
802.11a	6 Mbps
802.11n20	6.5 Mbps
802.11n40	13 Mbps

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC ID/DoC
DELL	PC	OPTIPLEX745	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC
FLY POWER	Switching Adapter	PS24A120K2000UD	N/A	N/A

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Emission (9kHz ~ 30MHz)	± 2.22 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	± 2.76 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	± 4.28 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	± 5.72 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	± 2.88 dB (k=2)

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Registration No.: 727551**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The Registration No. is 727551.

- **IC - Registration No.: 10106A-1**

The 3m Semi-anechoic chamber of Shenzhen Zhongjian Nanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

- **CNAS - Registration No.: CNAS L6048**

Shenzhen Zhongjian Nanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

- **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

5.8 Laboratory Location

Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.9 Test Instruments list

Radiated Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
Loop Antenna	SCHWARZBECK	FMZB1519B	00044	03-16-2018	03-15-2019
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-16-2018	03-15-2019
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-16-2018	03-15-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A
Pre-amplifier	HP	8447D	2944A09358	03-07-2018	03-06-2019
Pre-amplifier	CD	PAP-1G18	11804	03-07-2018	03-06-2019
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-07-2018	03-06-2019
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-07-2018	03-06-2019
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-07-2018	03-06-2019
Cable	MICRO-COAX	MFR64639	K10742-5	03-07-2018	03-06-2019
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-07-2018	03-06-2019

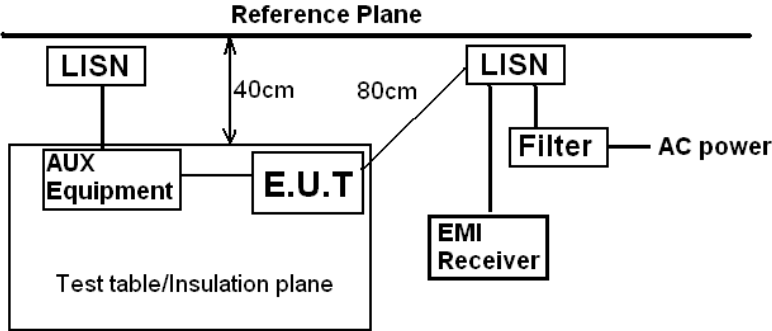
Conducted Emission:					
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (mm-dd-yy)	Cal. Due date (mm-dd-yy)
EMI Test Receiver	Rohde & Schwarz	ESCI	101189	03-07-2018	03-06-2019
Pulse Limiter	SCHWARZBECK	OSRAM 2306	9731	03-07-2018	03-06-2019
LISN	CHASE	MN2050D	1447	03-19-2018	03-18-2019
LISN	Rohde & Schwarz	ESH3-Z5	8438621/010	07-21-2018	07-20-2019
Cable	HP	10503A	N/A	03-07-2018	03-06-2019
EMI Test Software	AUDIX	E3	6.110919b	N/A	N/A

6 Test results and Measurement Data

6.1 Antenna requirement

Standard requirement:	FCC Part15 E Section 15.203 /407(a)
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.	
E.U.T Antenna:	
The WiFi antenna is an Internal antenna which cannot replace by end-user, the best case gain of the antenna is -0.57 dBi.	
	

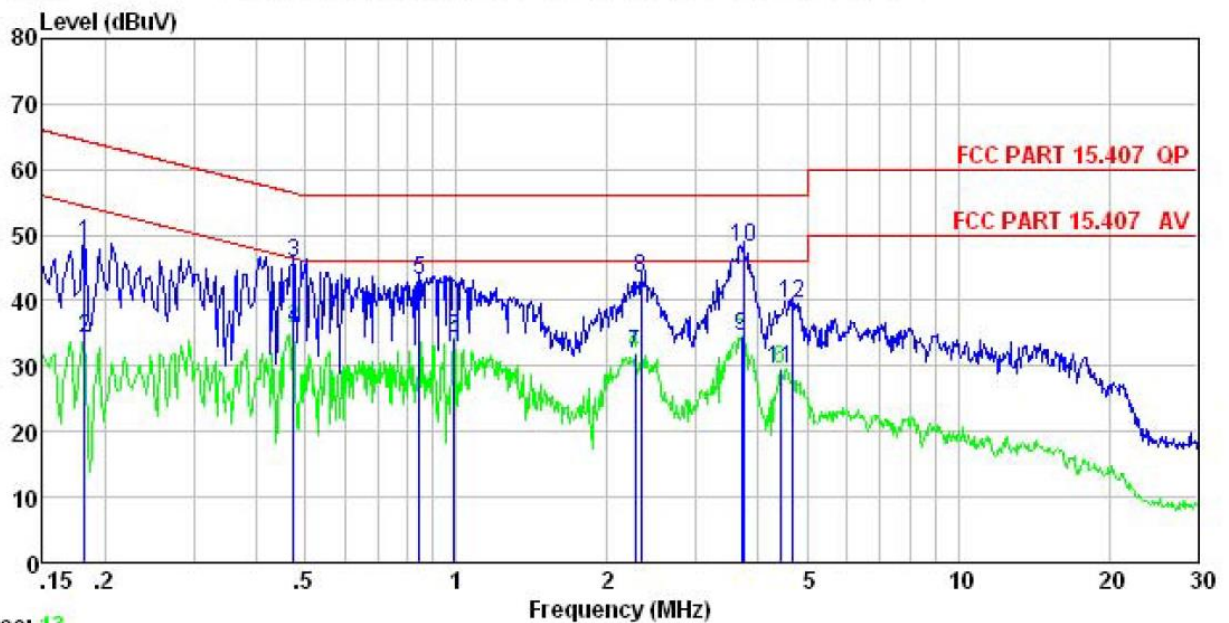
6.2 Conducted Emission

Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Class / Severity:	Class B		
Receiver setup:	RBW=9kHz, VBW=30kHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	
	0.15-0.5	66 to 56*	0.15-0.5
	0.5-5	56	0.5-5
	5-30	60	5-30
* Decreases with the logarithm of the frequency.			
Test procedure	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). It provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		
Test setup:	 Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m		
Test Instruments:	Refer to section 5.9 for details		
Test mode:	Refer to section 5.3 for details.		
Test results:	Passed		

Adapter (1)

Measurement Data:

Test Phase: Line



Trace: 13

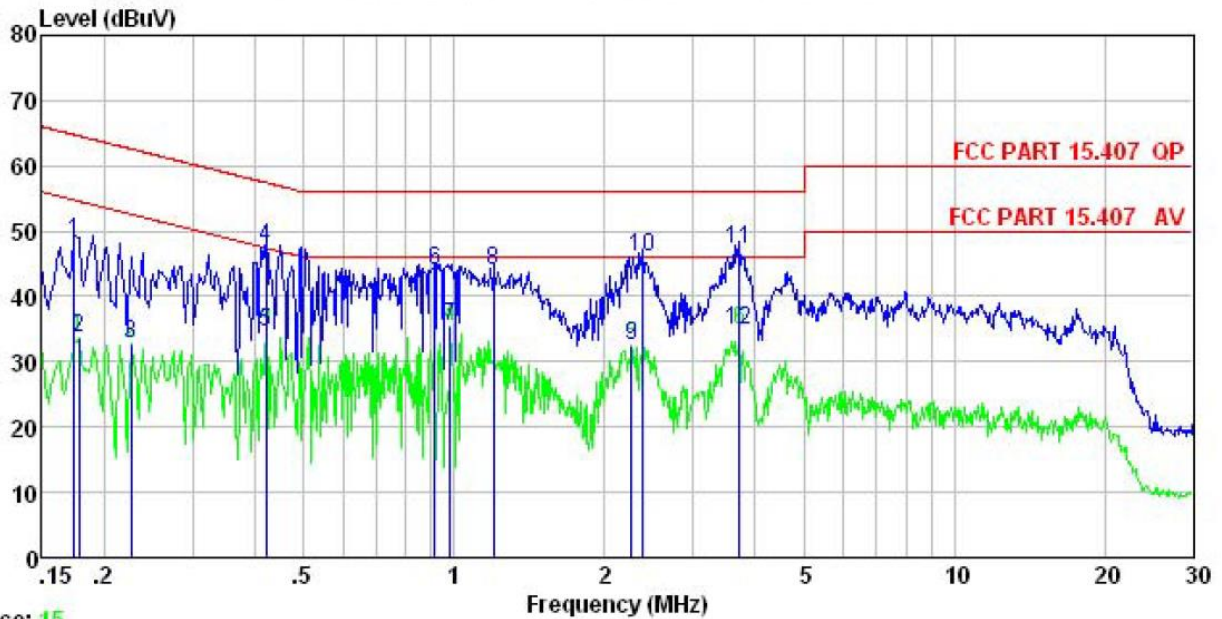
Site : CCIS Shielding Room
 Condition : FCC PART 15.407 QP LISN LINE
 EUT : LTE mobile phone
 Model : N5501L
 Test Mode : 5GWIFI mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: YT
 Remark :

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.182	37.68	0.16	10.77	48.61	64.42	-15.81	QP
2	0.182	23.20	0.16	10.77	34.13	64.42	-30.29	Average
3	0.474	34.95	0.12	10.75	45.82	56.45	-10.63	QP
4	0.474	24.72	0.12	10.75	35.59	56.45	-20.86	Average
5	0.844	32.06	0.13	10.82	43.01	56.00	-12.99	QP
6	0.989	23.15	0.13	10.87	34.15	56.00	-21.85	Average
7	2.273	20.71	0.15	10.95	31.81	56.00	-24.19	Average
8	2.334	32.42	0.15	10.94	43.51	56.00	-12.49	QP
9	3.700	23.37	0.18	10.90	34.45	56.00	-21.55	Average
10	3.740	36.96	0.18	10.90	48.04	56.00	-7.96	QP
11	4.430	18.40	0.19	10.87	29.46	56.00	-26.54	Average
12	4.672	28.41	0.20	10.86	39.47	56.00	-16.53	QP

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Test Phase: Neutral



Trace: 15

Site : CCIS Shielding Room
Condition : FCC PART 15.407 QP LISN NEUTRAL
EUT : LTE mobile phone
Model : N5501L
Test Mode : 5GWIFI mode
Power Rating : AC 120V/60Hz
Environment : Temp: 23 °C Humi:56% Atmos:101KPa
Test Engineer: YT
Remark :

	Read	LISN	Cable	Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Remark
-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dB	dBuV	dBuV	dB
1	0.174	36.66	0.95	10.77	48.38	64.77 -16.39 QP
2	0.178	21.88	0.95	10.77	33.60	64.59 -30.99 Average
3	0.226	21.11	0.94	10.75	32.80	62.61 -29.81 Average
4	0.421	35.74	0.97	10.73	47.44	57.42 -9.98 QP
5	0.421	22.86	0.97	10.73	34.56	57.42 -22.86 Average
6	0.914	32.23	0.97	10.84	44.04	56.00 -11.96 QP
7	0.984	23.71	0.97	10.87	35.55	56.00 -20.45 Average
8	1.197	32.03	0.97	10.89	43.89	56.00 -12.11 QP
9	2.261	20.48	0.98	10.95	32.41	56.00 -23.59 Average
10	2.371	34.20	0.98	10.94	46.12	56.00 -9.88 QP
11	3.720	35.44	1.00	10.90	47.34	56.00 -8.66 QP
12	3.720	22.84	1.00	10.90	34.74	56.00 -21.26 Average

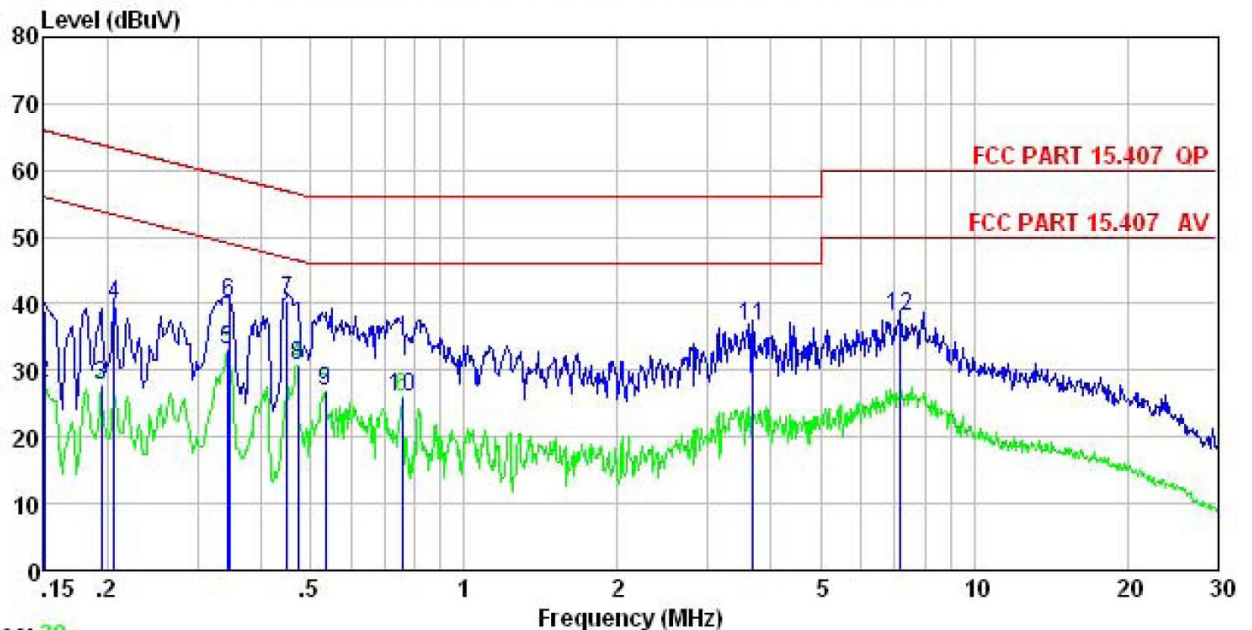
Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Adapter (2)

Measurement Data:

Test Phase: Line



Trace: 39

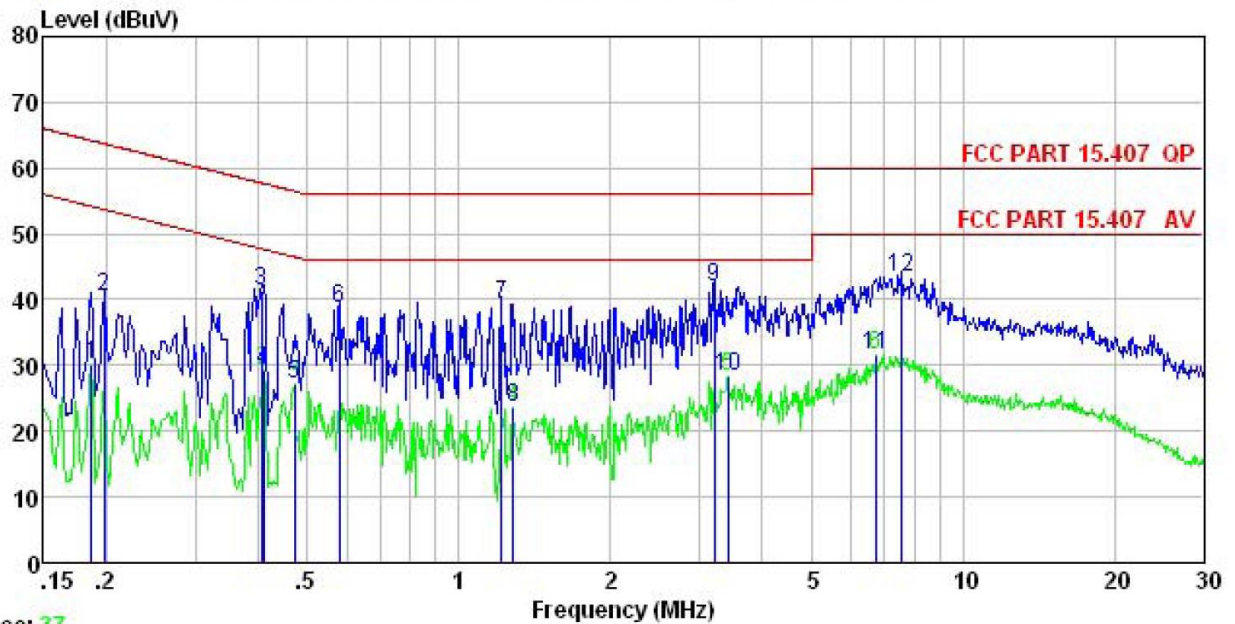
Site : CCIS Shielding Room
 Condition : FCC PART 15.407 QP LISN LINE
 EUT : LTE mobile phone
 Model : N5501L
 Test Mode : 5.2GWIFI mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: YT
 Remark : HJ-0501000E1-US

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	28.14	0.18	10.78	39.10	66.00	-26.90	QP
2	0.150	16.95	0.18	10.78	27.91	56.00	-28.09	Average
3	0.194	16.92	0.15	10.76	27.83	53.84	-26.01	Average
4	0.206	28.83	0.15	10.76	39.74	63.36	-23.62	QP
5	0.343	22.33	0.13	10.73	33.19	49.13	-15.94	Average
6	0.346	29.17	0.12	10.73	40.02	59.05	-19.03	QP
7	0.449	29.63	0.12	10.74	40.49	56.89	-16.40	QP
8	0.471	19.81	0.12	10.75	30.68	46.49	-15.81	Average
9	0.535	15.97	0.12	10.76	26.85	46.00	-19.15	Average
10	0.755	15.03	0.13	10.79	25.95	46.00	-20.05	Average
11	3.681	25.42	0.17	10.90	36.49	56.00	-19.51	QP
12	7.175	26.95	0.25	10.81	38.01	60.00	-21.99	QP

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Test Phase: Neutral



Site : CCIS Shielding Room
 Condition : FCC PART 15.407 QP LISN NEUTRAL
 EUT : LTE mobile phone
 Model : N5501L
 Test Mode : 5.2GWIFI mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: YT
 Remark : HJ-0501000E1-US

	Read	LISN	Cable	Limit	Over	
Freq	Level	Factor	Loss	Line	Limit	Remark
MHz	dBuV	dB	dB	dBuV	dB	
1	0.186	18.29	0.94	10.76	29.99	54.20 -24.21 Average
2	0.198	28.80	0.92	10.76	40.48	63.71 -23.23 QP
3	0.406	29.51	0.97	10.72	41.20	57.73 -16.53 QP
4	0.410	17.67	0.97	10.72	29.36	47.64 -18.28 Average
5	0.471	15.41	0.97	10.75	27.13	46.49 -19.36 Average
6	0.579	26.87	0.97	10.76	38.60	56.00 -17.40 QP
7	1.216	27.49	0.97	10.90	39.36	56.00 -16.64 QP
8	1.282	11.78	0.97	10.90	23.65	46.00 -22.35 Average
9	3.207	30.02	0.99	10.91	41.92	56.00 -14.08 QP
10	3.417	16.47	1.00	10.91	28.38	46.00 -17.62 Average
11	6.698	19.73	1.02	10.81	31.56	50.00 -18.44 Average
12	7.526	31.49	1.02	10.83	43.34	60.00 -16.66 QP

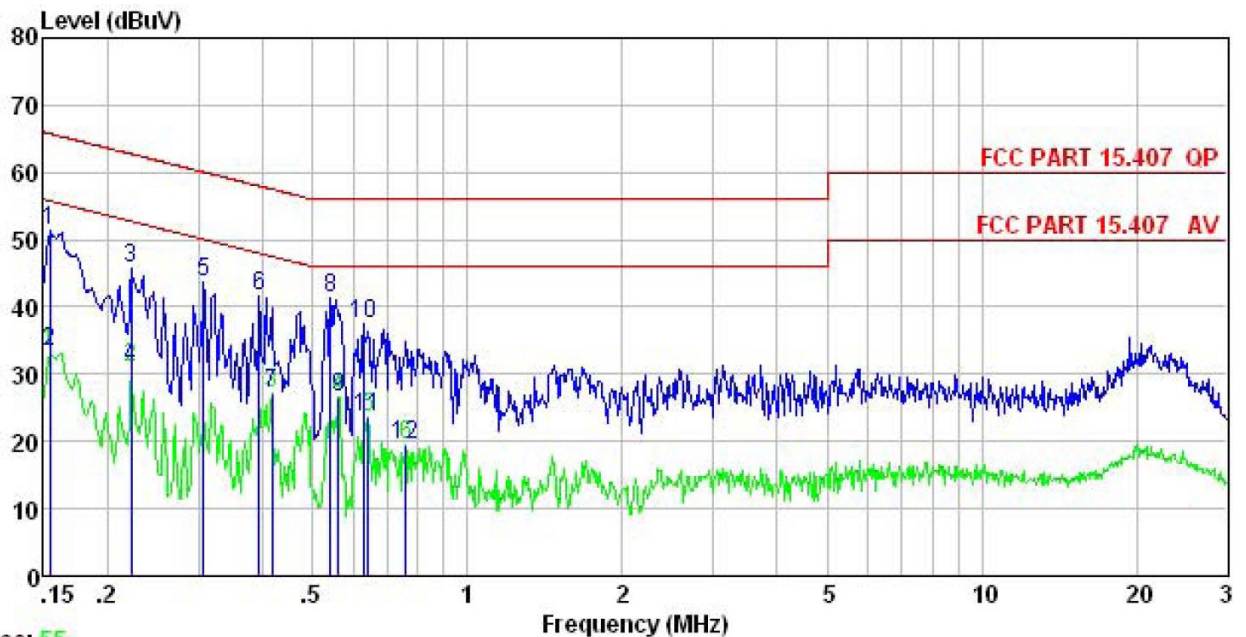
Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Adapter (3)

Measurement Data:

Test Phase: Line



Trace: 55

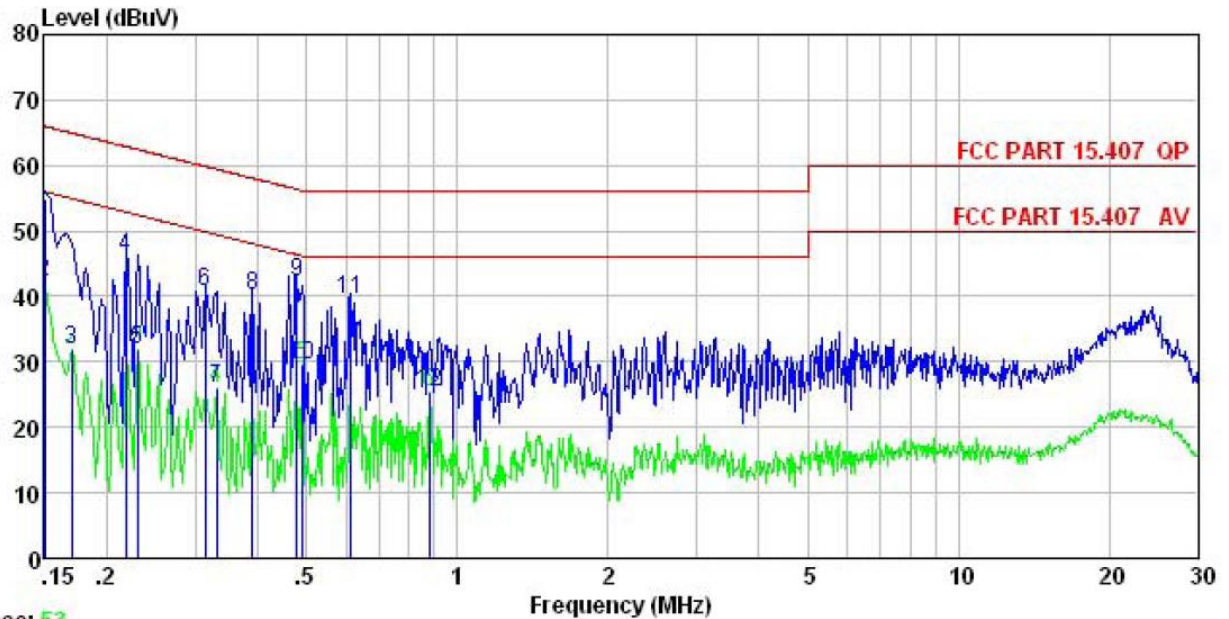
Site : CCIS Shielding Room
 Condition : FCC PART 15.407 QP LISN LINE
 EUT : LTE mobile phone
 Model : N5501L
 Test Mode : 5.2GWIFI mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: YT
 Remark : HJ-0501000B3-EU

	Freq	Read	LISN	Cable	Level	Limit	Over	
	MHz	Level	Factor	Loss	Line	Limit	Limit	Remark
		dBuV	dB	dB	dBuV	dBuV	dB	
1	0.154	40.37	0.18	10.78	51.33	65.78	-14.45	QP
2	0.154	22.32	0.18	10.78	33.28	55.78	-22.50	Average
3	0.222	34.99	0.14	10.76	45.89	62.74	-16.85	QP
4	0.222	19.96	0.14	10.76	30.86	52.74	-21.88	Average
5	0.307	32.96	0.13	10.74	43.83	60.06	-16.23	QP
6	0.393	30.82	0.12	10.72	41.66	57.99	-16.33	QP
7	0.417	16.30	0.12	10.73	27.15	47.51	-20.36	Average
8	0.541	30.55	0.12	10.76	41.43	56.00	-14.57	QP
9	0.561	15.74	0.12	10.76	26.62	46.00	-19.38	Average
10	0.627	26.51	0.13	10.77	37.41	56.00	-18.59	QP
11	0.641	12.62	0.13	10.77	23.52	46.00	-22.48	Average
12	0.759	8.56	0.13	10.80	19.49	46.00	-26.51	Average

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

Test Phase: Neutral



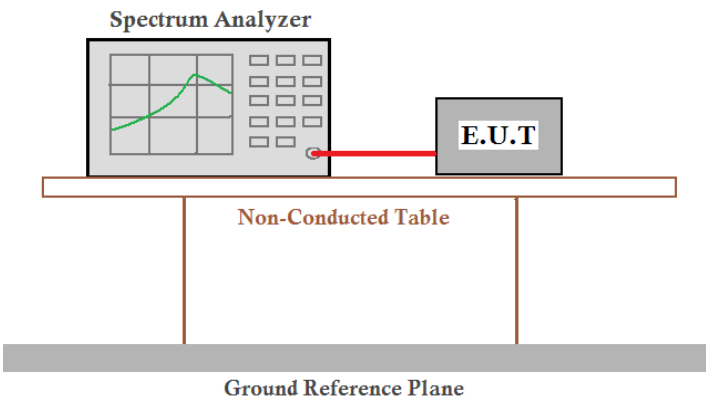
Site : CCIS Shielding Room
 Condition : FCC PART 15.407 QP LISN NEUTRAL
 EUT : LTE mobile phone
 Model : N5501L
 Test Mode : 5.2GWIFI mode
 Power Rating : AC 120V/60Hz
 Environment : Temp: 23 °C Humi:56% Atmos:101KPa
 Test Engineer: YT
 Remark : HJ-0501000B3-EU

	Read	LISN	Cable		Limit	Over	
Freq	Level	Factor	Loss	Level	Line	Limit	Remark
-----	-----	-----	-----	-----	-----	-----	-----
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.150	43.24	0.99	10.78	55.01	66.00	-10.99 QP
2	0.150	30.53	0.99	10.78	42.30	56.00	-13.70 Average
3	0.170	20.13	0.96	10.77	31.86	54.94	-23.08 Average
4	0.219	34.33	0.93	10.76	46.02	62.88	-16.86 QP
5	0.230	20.15	0.94	10.75	31.84	52.44	-20.60 Average
6	0.313	28.94	0.97	10.74	40.65	59.88	-19.23 QP
7	0.330	14.34	0.97	10.73	26.04	49.44	-23.40 Average
8	0.389	28.42	0.97	10.72	40.11	58.08	-17.97 QP
9	0.479	30.44	0.97	10.75	42.16	56.36	-14.20 QP
10	0.489	17.73	0.97	10.76	29.46	46.19	-16.73 Average
11	0.611	27.83	0.97	10.77	39.57	56.00	-16.43 QP
12	0.880	13.54	0.97	10.83	25.34	46.00	-20.66 Average

Notes:

1. An initial pre-scan was performed on the live and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss.

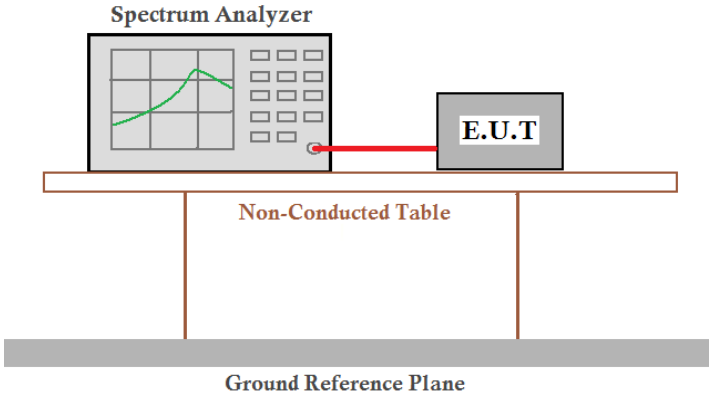
6.3 Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv)
Test Method:	ANSI C63.10: 2013, KDB789033
Limit:	Band 1: 24dBm
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by two vertical legs. Below the table is a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Band 1				
Mode	Test CH	Conducted Output power (dBm)	Limit (dBm)	Result
802.11a	Lowest	0.61	24.00	Pass
	Middle	0.93		
	Highest	0.35		
802.11n20	Lowest	0.04	24.00	Pass
	Middle	0.23		
	Highest	0.32		
802.11n40	Lowest	0.43	24.00	Pass
	Highest	0.56		

6.4 Occupy Bandwidth

Test Requirement:	FCC Part15 E Section 15.407 (a) (5)
Test Method:	ANSI C63.10:2013 and KDB 789033
Limit:	Band 1: N/A (26dB Emission Bandwidth and 99% Occupy Bandwidth)
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

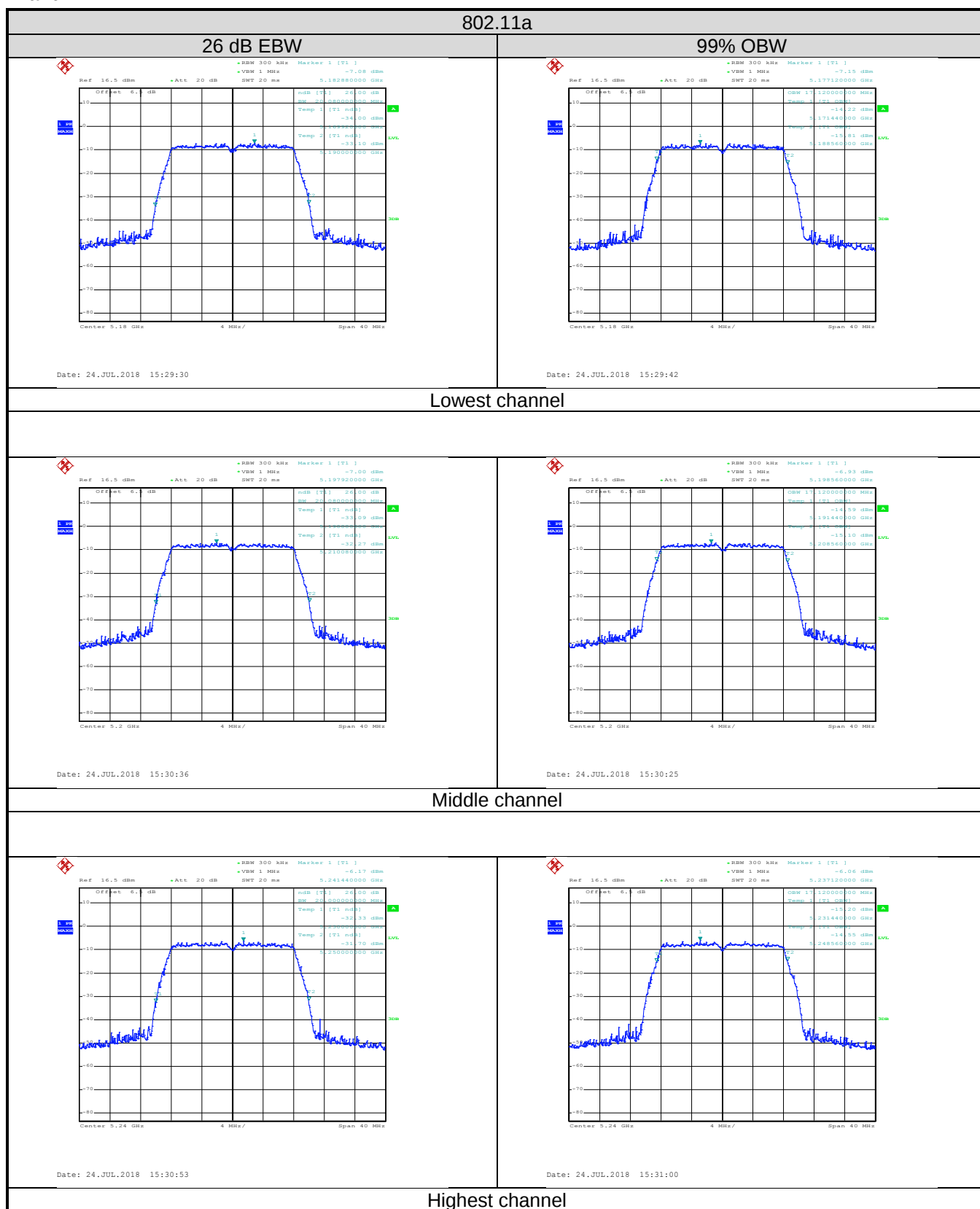
Measurement Data:

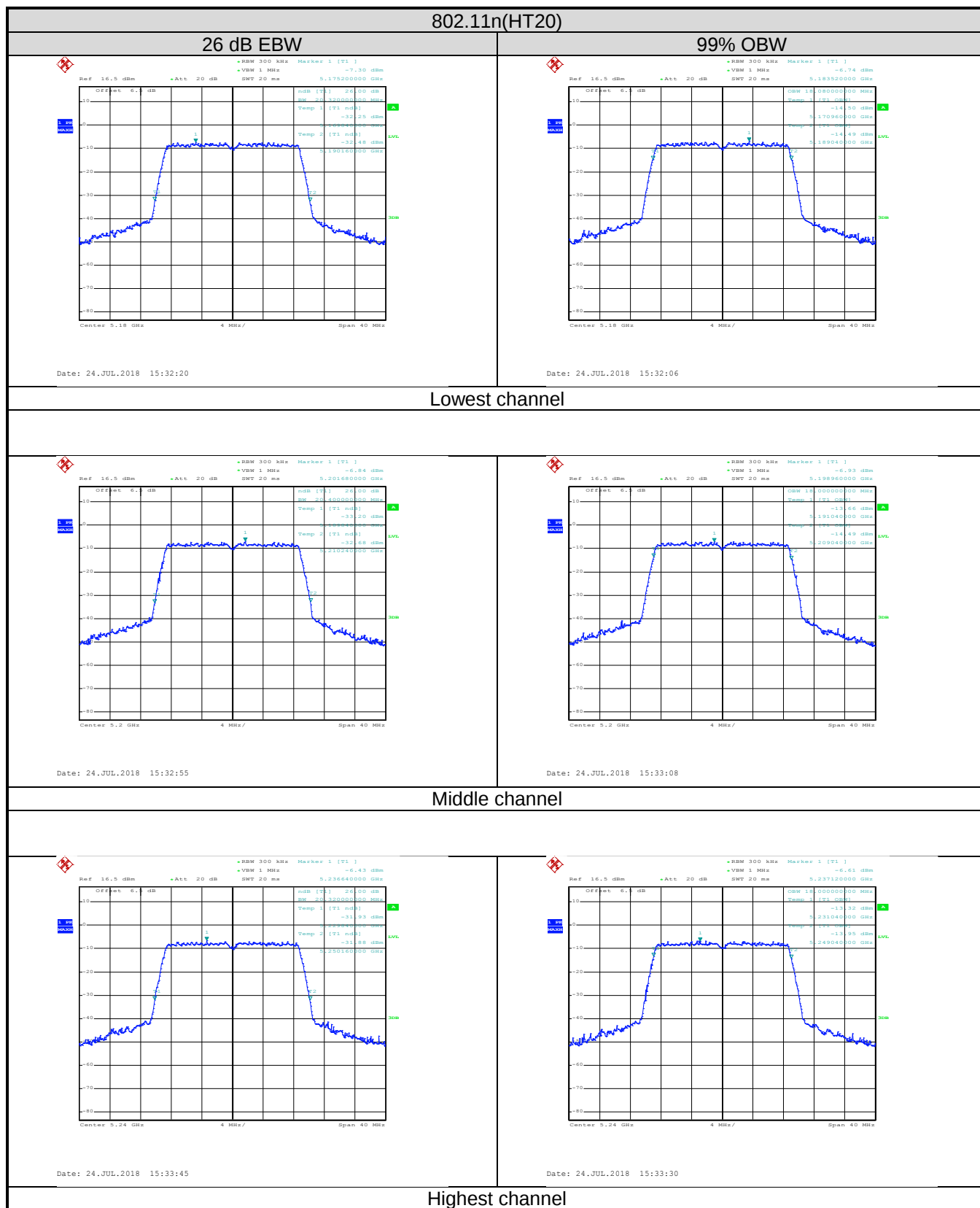
Band 1:

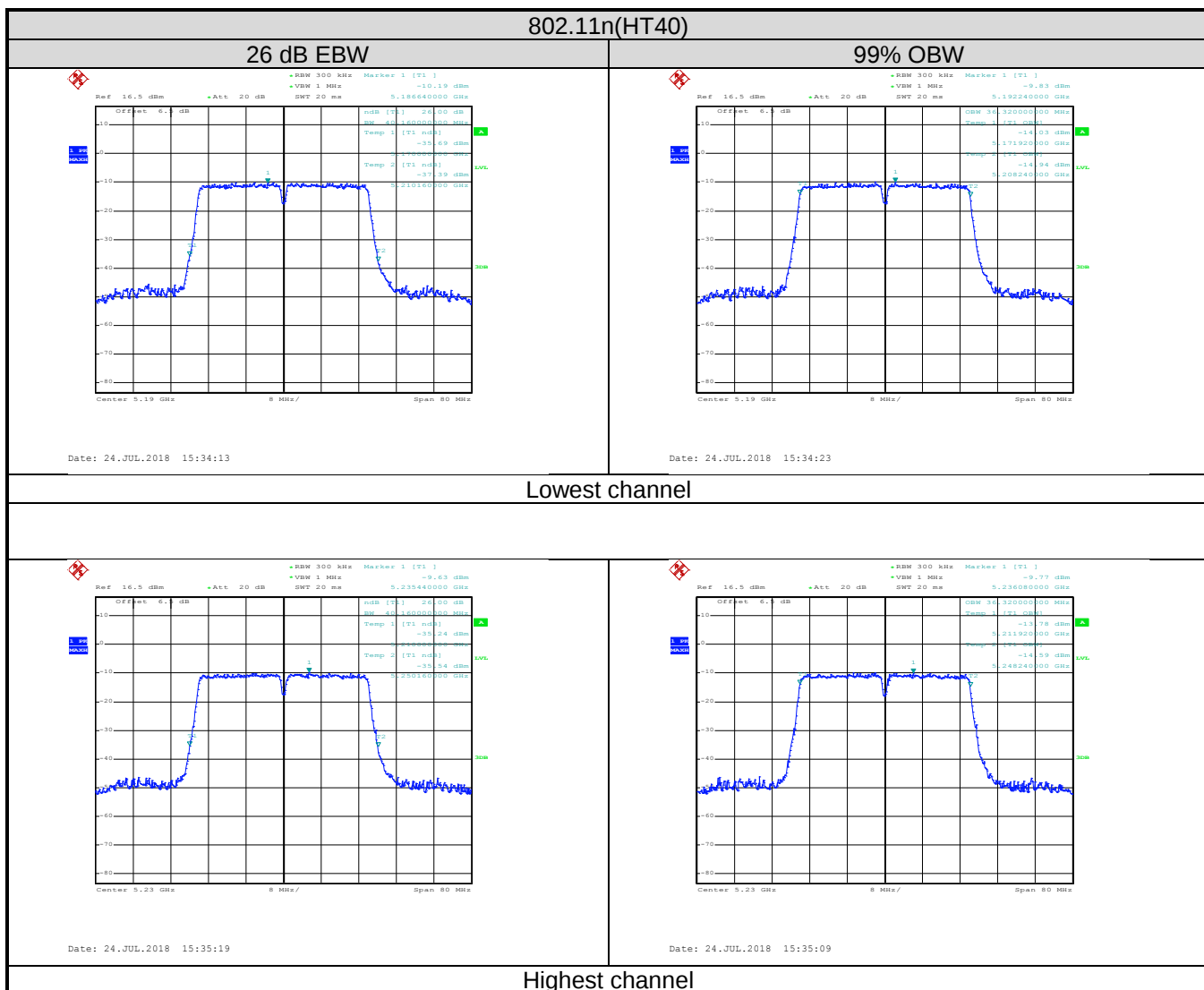
Test Channel	26dB Emission Bandwidth (MHz)			Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)		
Lowest	20.08	20.32	40.16	N/A	PASS
Middle	20.08	20.40	---		
Highest	20.00	20.32	40.16		
Test Channel	99% Occupy Bandwidth (MHz)			Limit	Result
	802.11a	802.11n (HT20)	802.11n (HT40)		
Lowest	17.12	18.08	36.32	N/A	PASS
Middle	17.12	18.00	---		
Highest	17.12	18.00	36.32		

Test plot as follows:

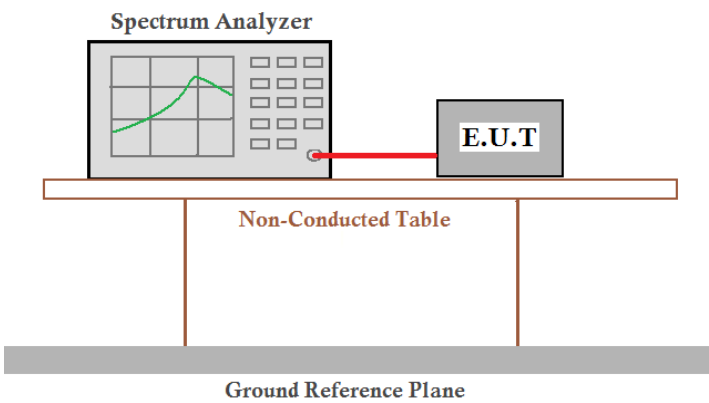
Band 1:







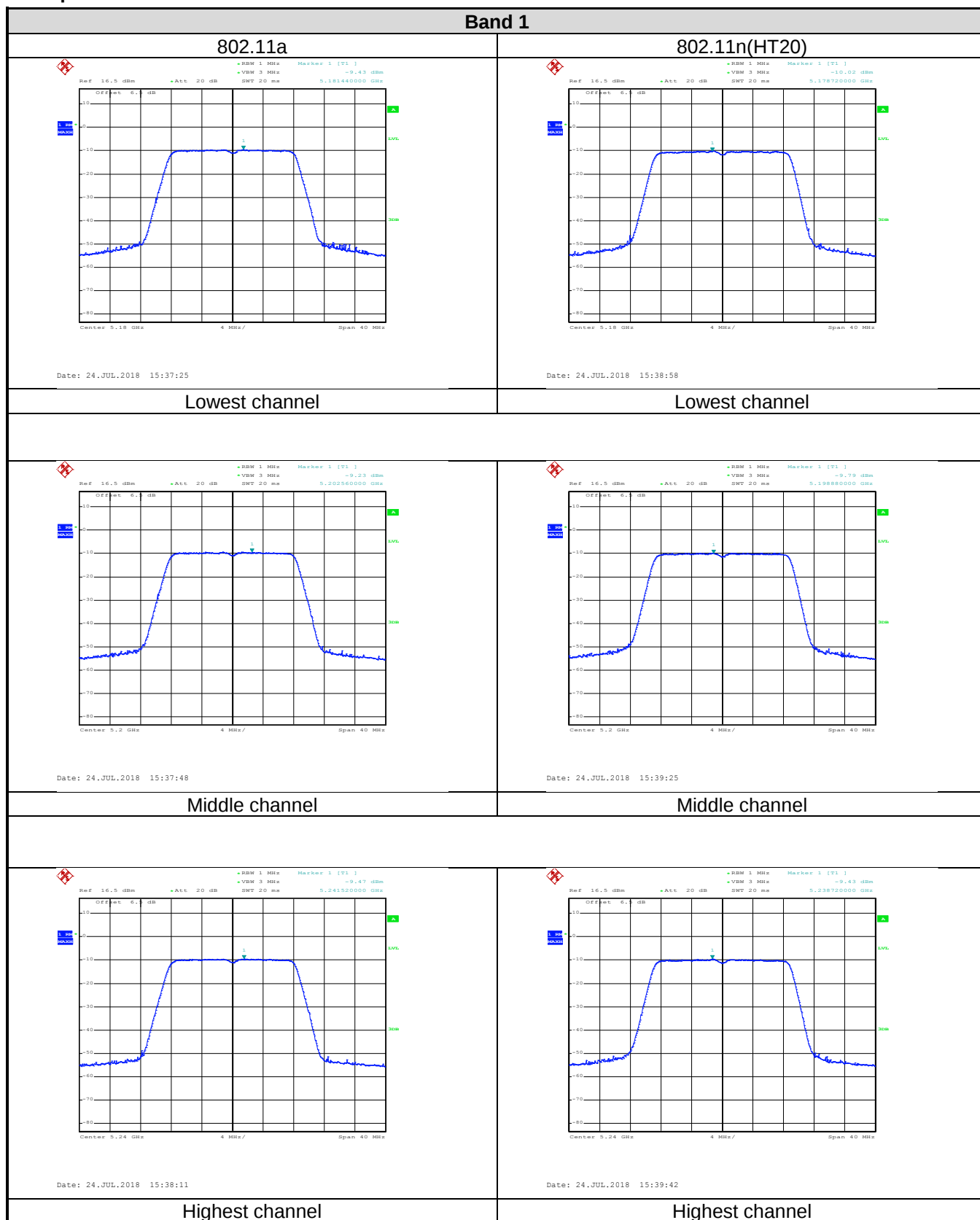
6.5 Power Spectral Density

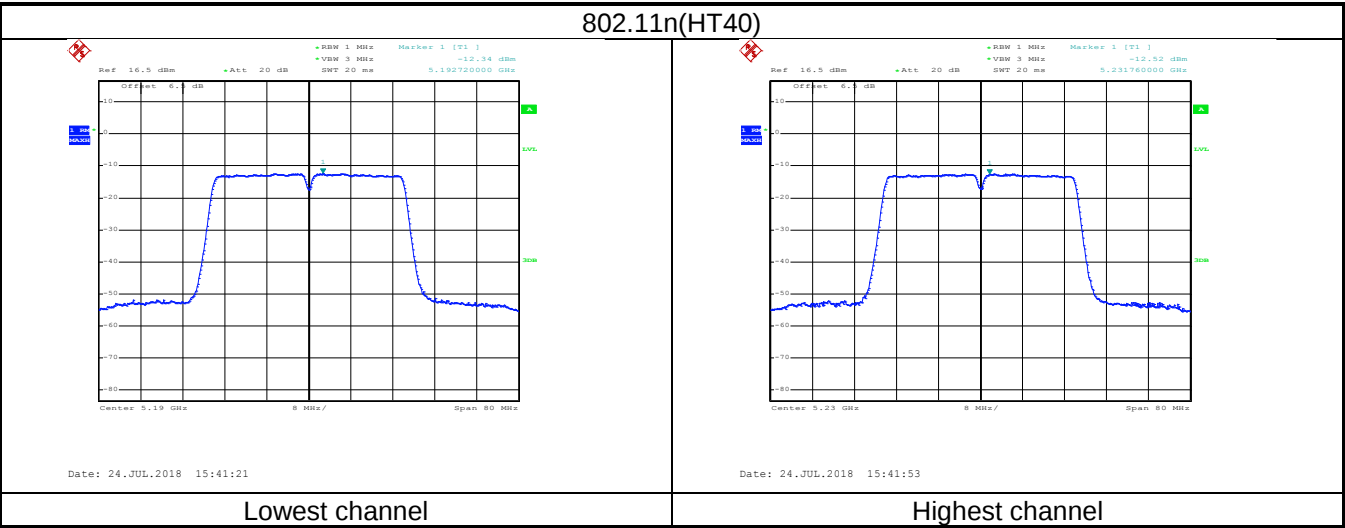
Test Requirement:	FCC Part15 E Section 15.407 (a) (1) (iv)
Test Method:	ANSI C63.10:2013, KDB 789033
Limit:	Band 1: 11 dBm/MHz
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer, shown with a green trace on its screen, is connected to an E.U.T (Equipment Under Test) by a red cable. Both the Spectrum Analyzer and the E.U.T are placed on a table labeled 'Non-Conducted Table'. Below this table is a thick grey bar representing the 'Ground Reference Plane'.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

Band 1				
Mode	Test CH	PSD (dBm)	Limit (dBm)	Result
802.11a	Lowest	-9.43	11.00	Pass
	Middle	-9.23		
	Highest	-9.47		
802.11n(HT20)	Lowest	-10.02	11.00	Pass
	Middle	-9.79		
	Highest	-9.43		
802.11n(HT40)	Lowest	-12.34	11.00	Pass
	Highest	-12.52		

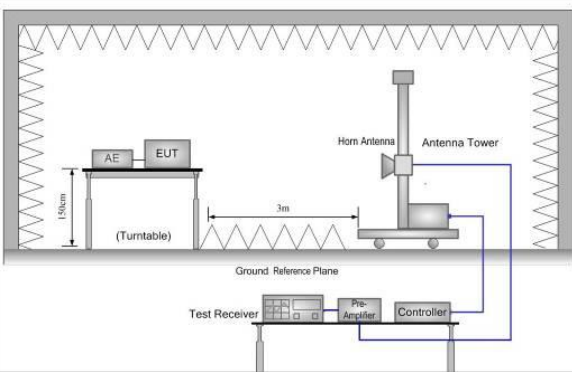
Test plot as follows:





6.6 Band Edge

Test Requirement:	FCC Part 15 E Section 15.407 (b)			
Test Method:	ANSI C63.10:2013 , KDB 789033			
Receiver setup:	Detector	RBW	VBW	Remark
	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	RMS	1MHz	3MHz	Average Value
Limit:	Band		Limit (dBuV/m @3m)	Remark
	Band 1/2/3		68.20	Peak Value
			54.00	Average Value
	Band 4		78.20	Peak Value
			54.00	Average Value
	Band 4 limit: For transmitters operating in the 5.725-5.85 GHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			
	Remark: 1. Band 1/2/3 limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm.			
	2. Band 4 limit: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm. E[dBμV/m] = EIRP[dBm] + 95.2=105.2 dBuV/m, for EIPR[dBm]=10dBm. E[dBμV/m] = EIRP[dBm] + 95.2=110.8 dBuV/m, for EIPR[dBm]=15.6dBm. E[dBμV/m] = EIRP[dBm] + 95.2=122.2 dBuV/m, for EIPR[dBm]=27dBm.			
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.			

Test setup:		
Test Instruments:	Refer to section 5.9 for details	
Test mode:	Refer to section 5.3 for details	
Test results:	Passed	

Measurement Data (worst case):

Band 1:

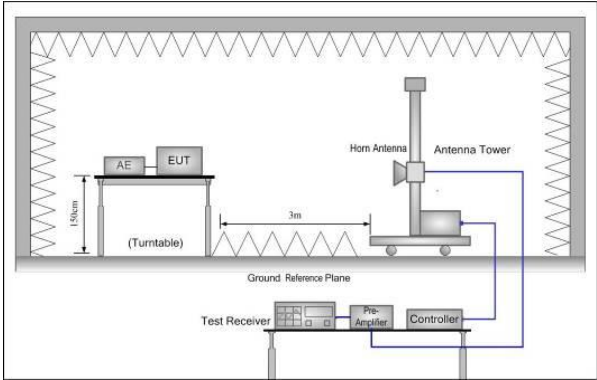
Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	41.23	36.23	7.05	41.93	42.58	68.20	-25.62	Horizontal
5150.00	39.62	36.23	7.05	41.93	40.97	68.20	-27.23	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	31.32	36.23	7.05	41.93	32.67	54.00	-21.33	Horizontal
5150.00	32.44	36.23	7.05	41.93	33.79	54.00	-20.21	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	42.20	35.37	7.11	41.89	42.79	68.20	-25.41	Horizontal
5350.00	41.77	35.37	7.11	41.89	42.36	68.20	-25.84	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	32.02	35.37	7.11	41.89	32.61	54.00	-21.39	Horizontal
5350.00	31.46	35.37	7.11	41.89	32.05	54.00	-21.95	Vertical
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	42.11	36.23	7.05	41.93	43.46	68.20	-24.74	Horizontal
5150.00	42.02	36.23	7.05	41.93	43.37	68.20	-24.83	Vertical
Detector: Average								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	31.34	36.23	7.05	41.93	32.69	54.00	-21.31	Horizontal
5150.00	32.23	36.23	7.05	41.93	33.58	54.00	-20.42	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	41.77	35.37	7.11	41.89	42.36	68.20	-25.84	Horizontal
5350.00	39.62	35.37	7.11	41.89	40.21	68.20	-27.99	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	31.20	35.37	7.11	41.89	31.79	54.00	-22.21	Horizontal
5350.00	29.49	35.37	7.11	41.89	30.08	54.00	-23.92	Vertical
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	43.20	36.23	7.05	41.93	44.55	68.20	-23.65	Horizontal
5150.00	41.77	36.23	7.05	41.93	43.12	68.20	-25.08	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5150.00	31.42	36.23	7.05	41.93	32.77	54.00	-21.23	Horizontal
5150.00	32.22	36.23	7.05	41.93	33.57	54.00	-20.43	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	43.52	35.37	35.37	7.11	41.89	68.20	-26.31	Horizontal
5350.00	42.11	35.37	35.37	7.11	41.89	68.20	-26.31	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5350.00	31.24	35.37	7.11	41.89	31.83	54.00	-22.17	Horizontal
5350.00	32.46	35.37	7.11	41.89	33.05	54.00	-20.95	Vertical
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

6.7 Spurious Emission

6.7.1 Restricted Band

Test Requirement:	FCC Part15 E Section 15.407(b)				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency	Limit (dBuV/m @3m)		Remark	
	Above 1GHz	74.00		Peak Value	
		54.00		Average Value	
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				
Test setup:					
Test Instruments:	Refer to section 5.9 for details				
Test mode:	Refer to section 5.3 for details				
Test results:	Passed				

Measurement Data (worst case):

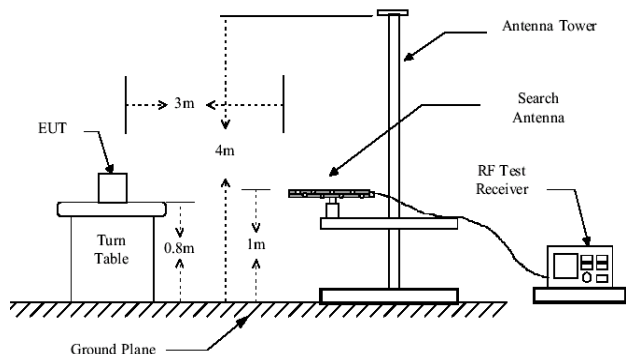
Band 1:

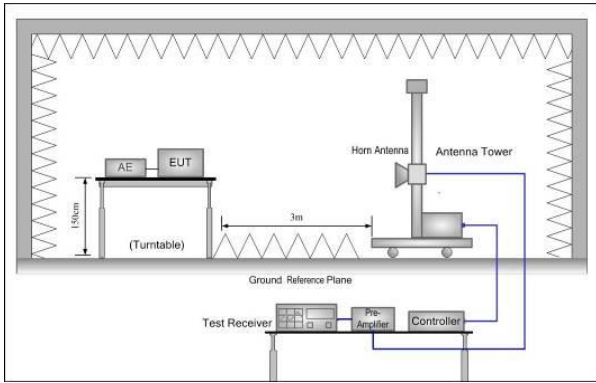
Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	42.52	34.50	6.80	42.05	41.77	74.00	-32.23	Horizontal
4500.00	41.43	34.50	6.80	42.05	40.68	74.00	-33.32	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	31.40	34.50	6.80	42.05	30.65	54.00	-23.35	Horizontal
4500.00	32.23	34.50	6.80	42.05	31.48	54.00	-22.52	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	42.22	34.90	7.18	41.85	42.45	74.00	-31.55	Horizontal
5460.00	41.76	34.90	7.18	41.85	41.99	74.00	-32.01	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	32.23	34.90	7.18	41.85	32.46	54.00	-21.54	Horizontal
5460.00	31.44	34.90	7.18	41.85	31.67	54.00	-22.33	Vertical
Remark: 1. <i>Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.</i> 2. <i>The emission levels of other frequencies are very lower than the limit and not show in test report.</i>								

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	42.21	34.50	6.80	42.05	41.46	74.00	-32.54	Horizontal
4500.00	41.13	34.50	6.80	42.05	40.38	74.00	-33.62	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	31.23	34.50	6.80	42.05	30.48	54.00	-23.52	Horizontal
4500.00	32.03	34.50	6.80	42.05	31.28	54.00	-22.72	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	41.77	34.90	7.18	41.85	42.00	74.00	-32.00	Horizontal
5460.00	41.42	34.90	7.18	41.85	41.65	74.00	-32.35	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	32.02	34.90	7.18	41.85	32.25	54.00	-21.75	Horizontal
5460.00	32.41	34.90	7.18	41.85	32.64	54.00	-21.36	Vertical
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	41.25	34.50	6.80	42.05	40.50	74.00	-33.50	Horizontal
4500.00	41.77	34.50	6.80	42.05	41.02	74.00	-32.98	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4500.00	31.52	34.50	6.80	42.05	30.77	54.00	-23.23	Horizontal
4500.00	32.29	34.50	6.80	42.05	31.54	54.00	-22.46	Vertical
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	42.25	34.90	7.18	41.85	42.48	74.00	-31.52	Horizontal
5460.00	41.77	34.90	7.18	41.85	42.00	74.00	-32.00	Vertical
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV/m)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
5460.00	30.23	34.90	7.18	41.85	30.46	54.00	-23.54	Horizontal
5460.00	32.49	34.90	7.18	41.85	32.72	54.00	-21.28	Vertical
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

6.7.2 Unwanted Emissions out of the Restricted Bands

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	30MHz to 40GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	30MHz-88MHz		40.0		Quasi-peak Value
	88MHz-216MHz		43.5		Quasi-peak Value
	216MHz-960MHz		46.0		Quasi-peak Value
	960MHz-1GHz		54.0		Quasi-peak Value
	Above 1GHz		68.20		Peak Value
			54.00		Average Value
	Remark: Above 1GHz limit: $E[dB\mu V/m] = EIRP[dBm] + 95.2 = 68.2 \text{ dBuV/m}$, for $EIPR[dBm] = -27dBm$.				
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				
Test setup:	Below 1GHz 				

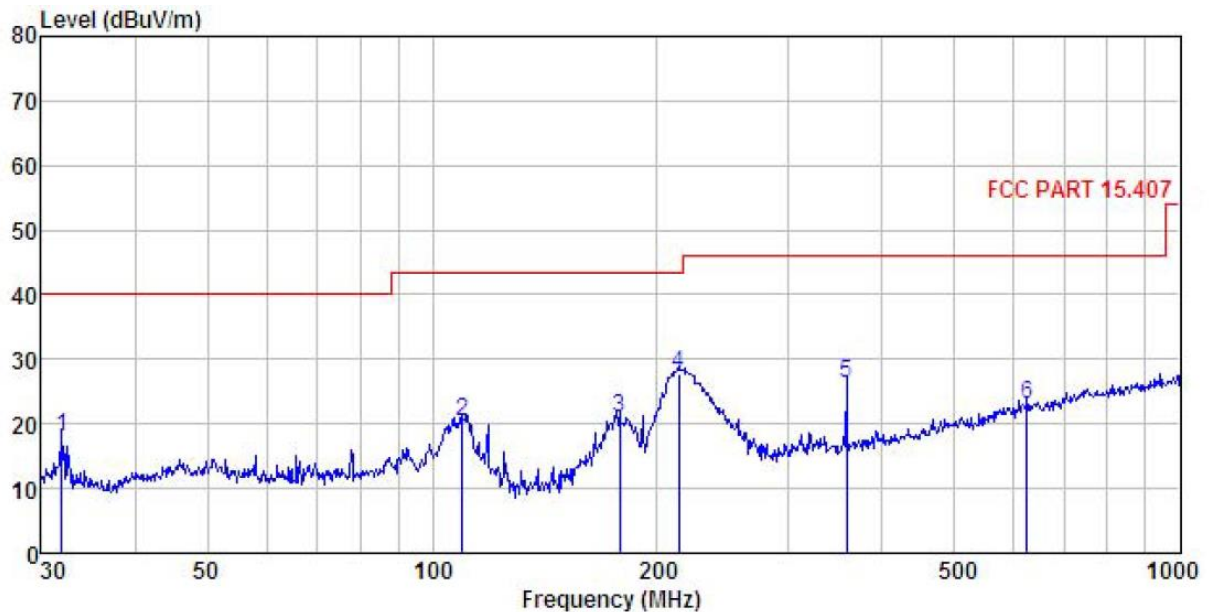
	Above 1GHz 
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Adapter (1)

Measurement Data (worst case):

Below 1GHz

Test Polarization: Horizontal



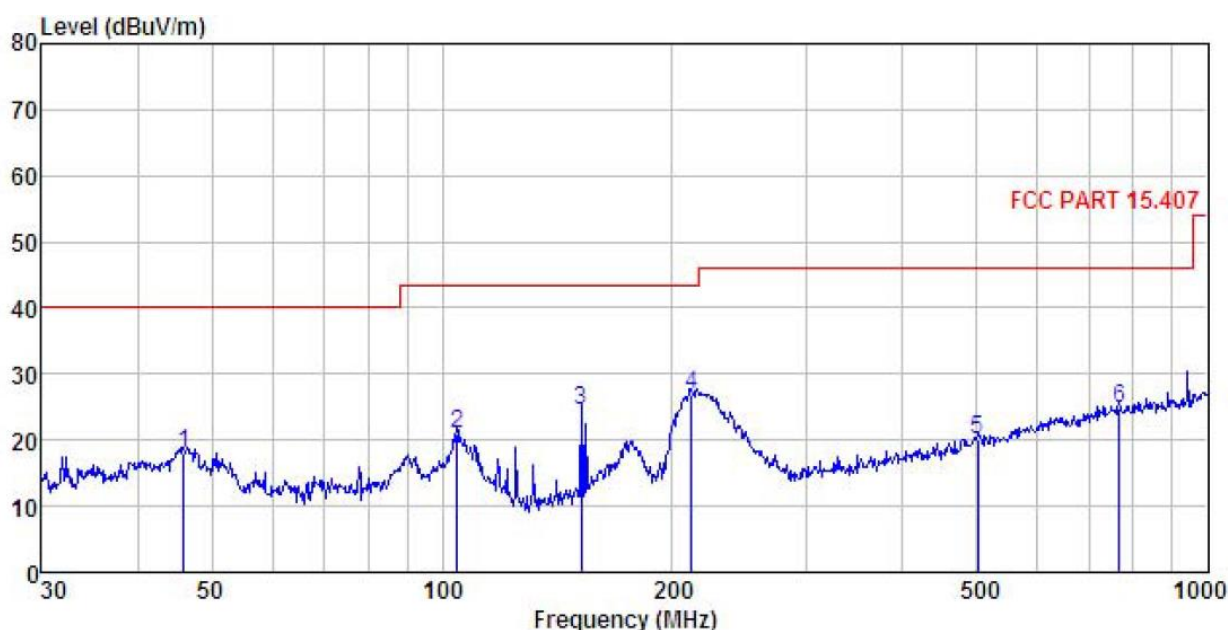
Site : 3m chamber
 Condition : FCC PART 15.407 3m VULB9163(30M2G) HORIZONTAL
 EUT : LTE mobile phone
 Model : N5501L
 Test mode : 5GWIFI Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 REMARK :

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	31.955	36.18	11.05	0.85	29.97	18.11	40.00	-21.89	QP
2	109.796	35.50	12.29	2.05	29.46	20.38	43.50	-23.12	QP
3	178.133	37.54	9.73	2.71	28.99	20.99	43.50	-22.51	QP
4	213.763	41.69	12.04	2.85	28.74	27.84	43.50	-15.66	QP
5	357.929	37.05	14.75	3.10	28.59	26.31	46.00	-19.69	QP
6	625.078	28.51	19.51	3.90	28.86	23.06	46.00	-22.94	QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test Polarization: Vertical



Site : 3m chamber
 Condition : FCC PART 15.407 3m VULB9163(30M2G) VERTICAL
 EUT : LTE mobile phone
 Model : N5501L
 Test mode : 5GWIFI Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 REMARK :

	Freq	ReadAntenna	Cable	Preamp		Limit	Over	
		Level	Factor	Loss	Factor	Level	Line	Limit
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	46.016	32.72	13.78	1.28	29.85	17.93	40.00	-22.07 QP
2	104.536	36.55	11.98	1.99	29.50	21.02	43.50	-22.48 QP
3	152.130	42.51	8.71	2.53	29.20	24.55	43.50	-18.95 QP
4	211.527	40.68	11.95	2.86	28.76	26.73	43.50	-16.77 QP
5	501.179	27.93	17.51	3.63	28.96	20.11	46.00	-25.89 QP
6	766.057	27.89	21.00	4.36	28.39	24.86	46.00	-21.14 QP

Remark:

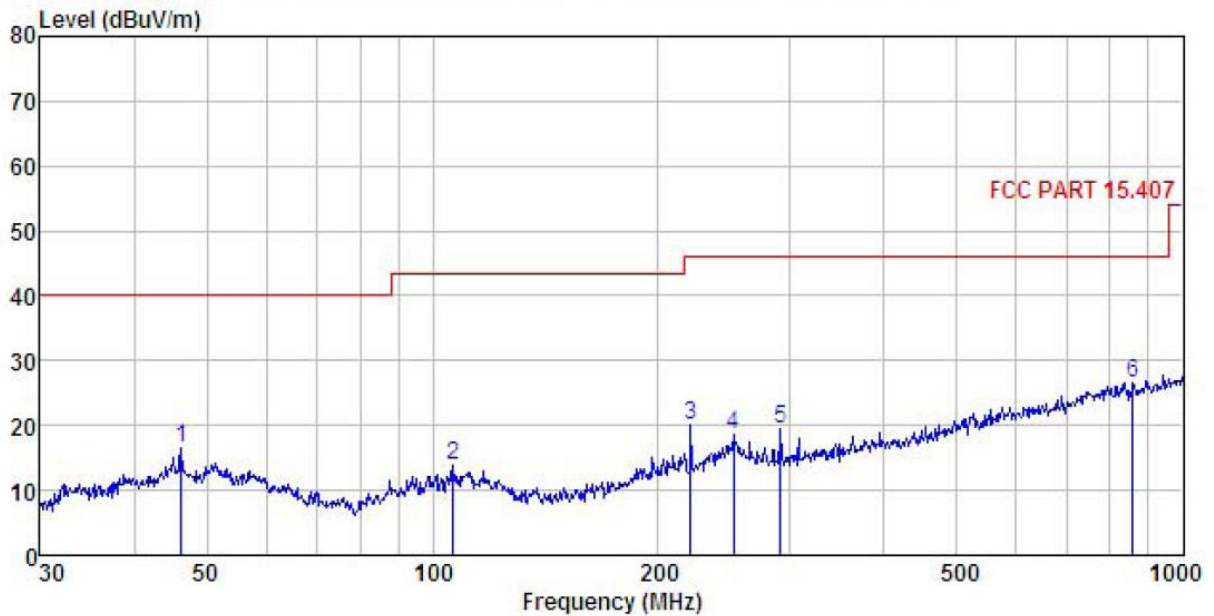
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Adapter (2)

Measurement Data (worst case):

Below 1GHz

Test Polarization: Horizontal



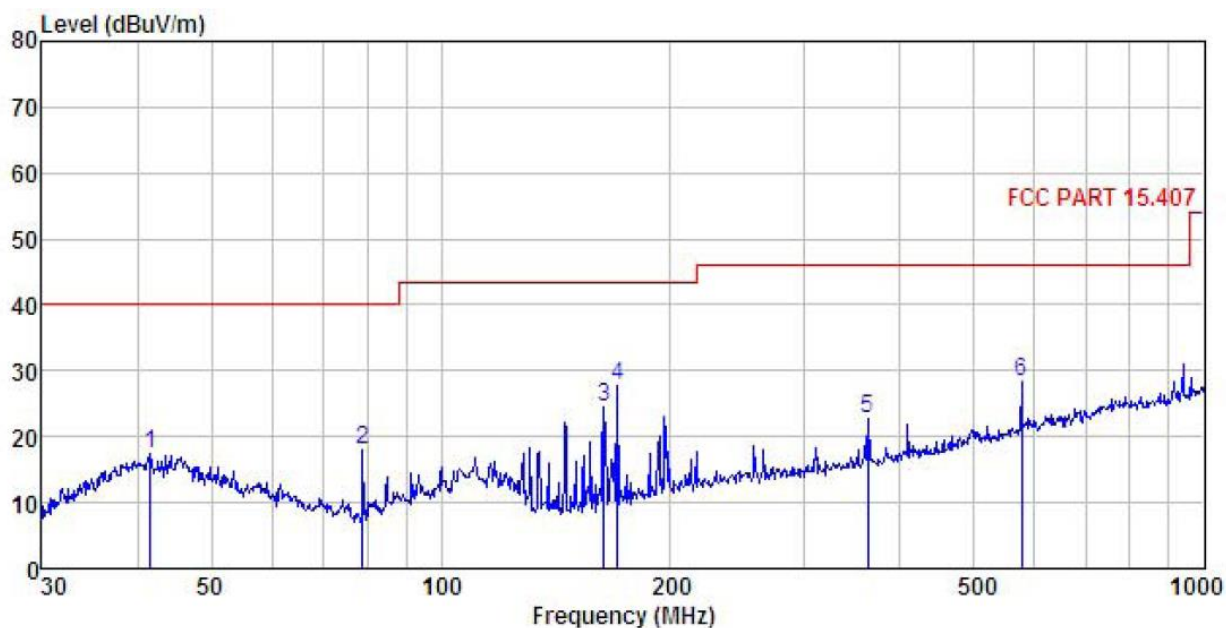
Site : 3m chamber
 Condition : FCC PART 15.407 3m VULB9163(30M2G) HORIZONTAL
 EUT : LTE mobile phone
 Model : N5501L
 Test mode : 5GWIFI Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 REMARK : HJ-0501000E1-US

	ReadAntenna	Cable	Preamp		Limit	Over	
Freq	Level	Factor	Loss	Factor	Level	Line	Limit
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	46.178	31.22	13.80	1.28	29.85	16.45	40.00
2	106.385	29.31	12.09	2.01	29.48	13.93	43.50
3	220.617	33.50	12.29	2.85	28.70	19.94	46.00
4	252.063	30.94	13.31	2.82	28.54	18.53	46.00
5	291.036	31.54	13.55	2.92	28.47	19.54	46.00
6	857.025	29.12	21.44	4.12	27.99	26.69	46.00

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test Polarization: Vertical



Site : 3m chamber
 Condition : FCC PART 15.407 3m VULB9163(30M2G) VERTICAL
 EUT : LTE mobile phone
 Model : N5501L
 Test mode : 5GWIFI Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 REMARK : HJ-0501000E1-US

	Freq	Read	Antenna	Cable	Preamp	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
		dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	41.567	32.86	13.09	1.24	29.89	17.30	40.00	-22.70 QP
2	78.965	37.85	8.20	1.65	29.65	18.05	40.00	-21.95 QP
3	163.755	41.69	9.21	2.62	29.10	24.42	43.50	-19.08 QP
4	170.195	44.72	9.41	2.66	29.05	27.74	43.50	-15.76 QP
5	362.985	33.36	14.85	3.09	28.62	22.68	46.00	-23.32 QP
6	576.644	34.78	18.65	3.92	29.01	28.34	46.00	-17.66 QP

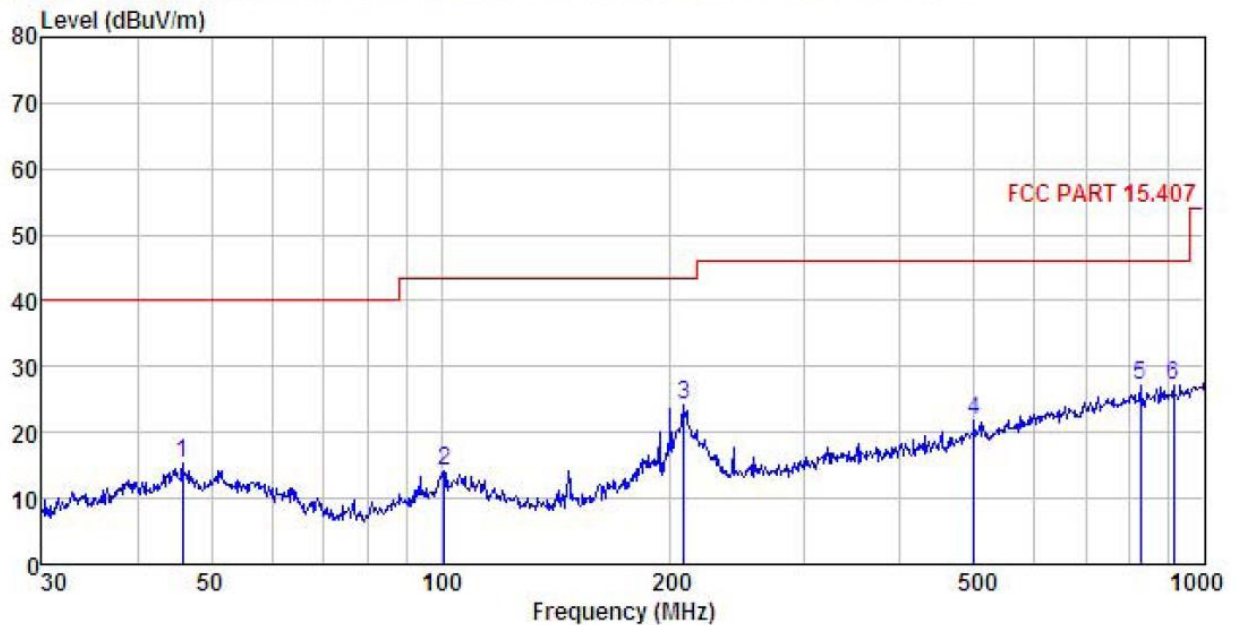
Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Adapter (3)

Measurement Data (worst case):
Below 1GHz

Test Polarization: Horizontal



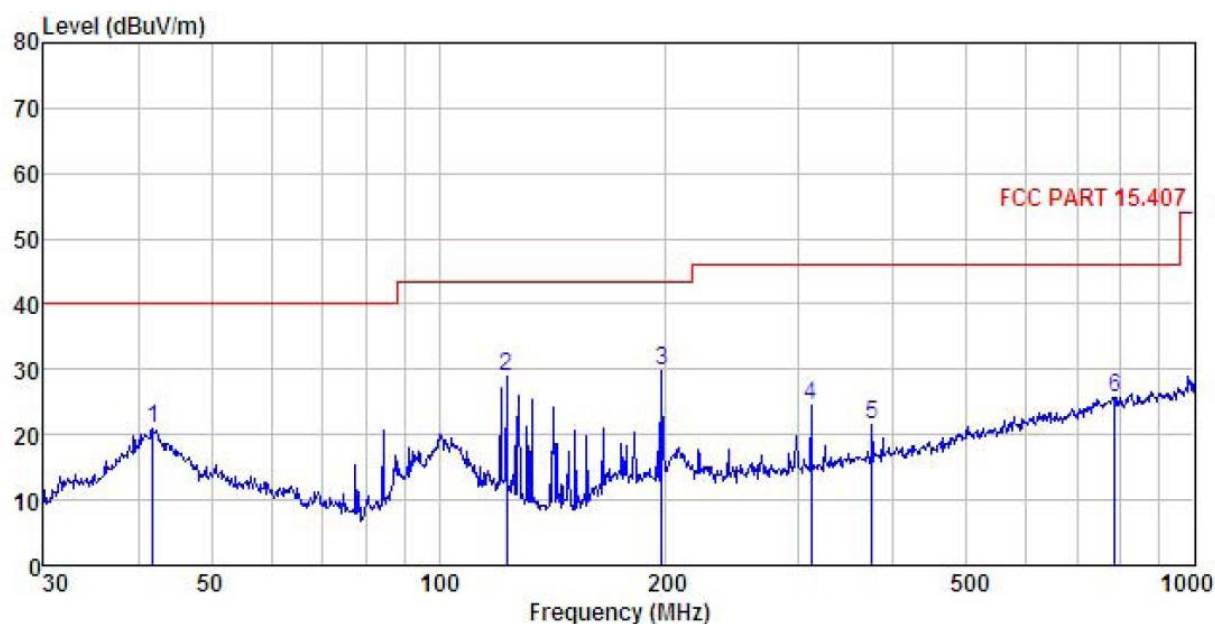
Site : 3m chamber
Condition : FCC PART 15.407 3m VULB9163(30M2G) HORIZONTAL
EUT : LTE mobile phone
Model : N5501L
Test mode : 5GWIFI Mode
Power Rating : AC 120V/60Hz
Environment : Temp:25.5°C Humi:55%
Test Engineer: YT
REMARK : HJ-0501000B3-EU

	Freq	Read	Antenna	Cable	Preamp	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	45.855	30.03	13.77	1.29	29.85	15.24	40.00	-24.76 QP
2	100.934	29.85	11.76	1.95	29.52	14.04	43.50	-29.46 QP
3	207.850	38.28	11.81	2.86	28.78	24.17	43.50	-19.33 QP
4	499.425	29.62	17.48	3.61	28.95	21.76	46.00	-24.24 QP
5	824.597	29.69	21.15	4.27	28.10	27.01	46.00	-18.99 QP
6	912.862	28.74	22.33	3.84	27.84	27.07	46.00	-18.93 QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Test Polarization: Vertical



Site : 3m chamber
 Condition : FCC PART 15.407 3m VULB9163(30M2G) VERTICAL
 EUT : LTE mobile phone
 Model : N5501L
 Test mode : 5GWIFI Mode
 Power Rating : AC 120V/60Hz
 Environment : Temp:25.5°C Humi:55%
 Test Engineer: YT
 REMARK : HJ-0501000B3-EU

	Freq	Read	Antenna	Cable	Preamp	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	41.860	36.58	13.15	1.24	29.88	21.09	40.00	-18.91 QP
2	122.834	46.21	9.76	2.20	29.37	28.80	43.50	-14.70 QP
3	197.200	44.42	11.42	2.85	28.85	29.84	43.50	-13.66 QP
4	311.087	36.06	13.84	2.97	28.48	24.39	46.00	-21.61 QP
5	374.623	32.05	15.06	3.09	28.67	21.53	46.00	-24.47 QP
6	785.093	28.73	21.00	4.35	28.28	25.80	46.00	-20.20 QP

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

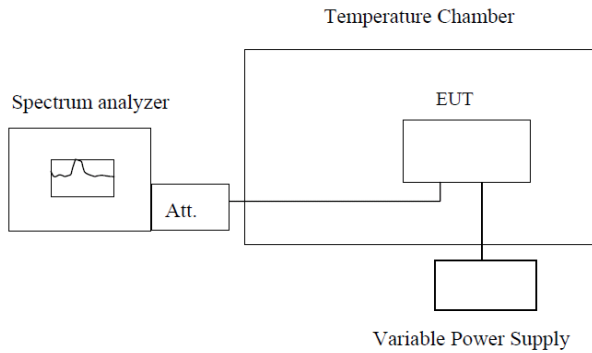
Above 1GHz:
Band 1:

Band 1 – 802.11a								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	48.25	40.10	9.82	41.97	56.20	68.20	-12.00	Vertical
10360.00	47.61	40.10	9.82	41.97	55.56	68.20	-12.64	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	39.62	40.10	9.82	41.97	47.57	54.00	-6.43	Vertical
10360.00	40.72	40.10	9.82	41.97	48.67	54.00	-5.33	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	49.25	40.00	9.85	41.95	57.15	68.20	-11.05	Vertical
10400.00	48.11	40.00	9.85	41.95	56.01	68.20	-12.19	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	39.27	40.00	9.85	41.95	47.17	54.00	-6.83	Vertical
10400.00	40.11	40.00	9.85	41.95	48.01	54.00	-5.99	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	48.57	39.70	9.96	41.88	56.35	68.20	-11.85	Vertical
10480.00	47.91	39.70	9.96	41.88	55.69	68.20	-12.51	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	39.52	39.70	9.96	41.88	47.30	54.00	-6.70	Vertical
10480.00	38.19	39.70	9.96	41.88	45.97	54.00	-8.03	Horizontal
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT20)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	48.25	40.10	9.82	41.97	56.20	68.20	-12.00	Vertical
10360.00	49.31	40.10	9.82	41.97	57.26	68.20	-10.94	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10360.00	39.67	40.10	9.82	41.97	47.62	54.00	-6.38	Vertical
10360.00	38.14	40.10	9.82	41.97	46.09	54.00	-7.91	Horizontal
Test channel: Middle channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	49.37	40.00	9.85	41.95	57.27	68.20	-10.93	Vertical
10400.00	48.91	40.00	9.85	41.95	56.81	68.20	-11.39	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10400.00	41.45	40.00	9.85	41.95	49.35	54.00	-4.65	Vertical
10400.00	37.19	40.00	9.85	41.95	45.09	54.00	-8.91	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	49.85	39.70	9.96	41.88	57.63	68.20	-10.57	Vertical
10480.00	48.75	39.70	9.96	41.88	56.53	68.20	-11.67	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10480.00	38.61	39.70	9.96	41.88	46.39	54.00	-7.61	Vertical
10480.00	39.77	39.70	9.96	41.88	47.55	54.00	-6.45	Horizontal
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

Band 1 – 802.11n(HT40)								
Test channel: Lowest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	48.52	40.00	9.85	41.95	56.42	68.20	-11.78	Vertical
10380.00	47.64	40.00	9.85	41.95	55.54	68.20	-12.66	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10380.00	39.62	40.00	9.85	41.95	47.52	54.00	-6.48	Vertical
10380.00	38.54	40.00	9.85	41.95	46.44	54.00	-7.56	Horizontal
Test channel: Highest channel								
Detector: Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	48.54	39.80	9.92	41.90	56.36	68.20	-11.84	Vertical
10460.00	47.15	39.80	9.92	41.90	54.97	68.20	-13.23	Horizontal
Detector: Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10460.00	39.64	39.80	9.92	41.90	47.46	54.00	-6.54	Vertical
10460.00	38.45	39.80	9.92	41.90	46.27	54.00	-7.73	Horizontal
Remark: 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor. 2. The emission levels of other frequencies are very lower than the limit and not show in test report.								

6.8 Frequency stability

Test Requirement:	FCC Part15 E Section 15.407 (g)
Limit:	Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.
Test setup:	 Note : Measurement setup for testing on Antenna connector
Test procedure:	1. The EUT is installed in an environment test chamber with external power source. 2. Set the chamber to operate at 50 centigrade and external power source to output at nominal voltage of EUT. 3. A sufficient stabilization period at each temperature is used prior to each frequency measurement. 4. When temperature is stabled, measure the frequency stability. 5. The test shall be performed under -30 to 50 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.
Test Instruments:	Refer to section 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (the worst channel):

Band 1:

Voltage vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Temp(℃)	Voltage(ac)		
20	102V	5179.997643	0.45
	120V	5179.974779	4.87
	138V	5179.963951	6.96

Temperature vs. Frequency Stability (Lowest channel=5180MHz)

Test conditions		Frequency(MHz)	Max. Deviation (ppm)
Voltage(ac)	Temp(℃)		
120V	-20	5179.987033	2.50
	-10	5179.995377	0.89
	0	5179.968421	6.10
	10	5179.987556	2.40
	20	5179.996681	0.64
	30	5179.974290	4.96
	40	5179.963775	6.99
	50	5179.974929	4.84