

# FCC TEST REPORT

**Product Name:** Phone  
**Trade Mark:** yumpingo  
**Model No.:** Yumpingo ONE  
**Report Number:** 190515008RFC-3  
**Test Standards:** FCC 47 CFR Part 15 Subpart C  
**FCC ID:** 2AIMEX1  
**Test Result:** PASS  
**Date of Issue:** September 3, 2019

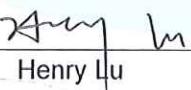
Prepared for:

**SMT TELECOMM HK LIMITED**  
**Unit C 8/F, CHARMHILL CTR 50 HILLWOOD RD TST KL HK**

Prepared by:

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**Version**

Version No.	Date	Description
V1.0	September 3, 2019	Original

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## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

<b>Applicant:</b>	SMT TELECOMM HK LIMITED
<b>Address of Applicant:</b>	Unit C 8/F, CHARMHILL CTR 50 HILLWOOD RD TST KL HK
<b>Manufacturer:</b>	Yumpingo Ltd
<b>Address of Manufacturer:</b>	22 Endell Street, London, UK

### 1.2 EUT INFORMATION

#### 1.2.1 General Description of EUT

<b>Product Name:</b>	Phone		
<b>Model No.:</b>	Yumpingo ONE		
<b>Trade Mark:</b>	yumpingo		
<b>DUT Stage:</b>	Identical Prototype		
<b>EUT Supports Function:</b>	GSM Bands:	GSM850/1900	
	UTRA Bands:	Band II/ Band IV/ Band V	
	E-UTRA Bands:	FDD Band 2/ Band 4/ Band 5/ Band 7/ Band 12/Band 17	
	2.4 GHz ISM Band:	IEEE 802.11b/g/n	
		Bluetooth 5.0	
	5 GHz U-NII Bands:	5 150 MHz to 5 250 MHz	IEEE 802.11a/n/ac
		5 470 MHz to 5 725 MHz	IEEE 802.11a/n/ac
		5 725 MHz to 5 850 MHz	IEEE 802.11a/n/ac
<b>Sample Received Date:</b>	May 15, 2019		
<b>Sample Tested Date:</b>	May 15, 2019 to June 30, 2019		
<b>Declaration of Differences:</b>	Sample 1: No holder Sample 2: With holder Note: Sample 1 without holder, Sample 2 with holder, the Holder does not contain metal, and all the other is the same. No effect on test results, all data is based on sample 1.		

#### 1.2.2 Description of Accessories

Battery	
<b>Model No.:</b>	BPX150
<b>Battery Type:</b>	Lithium-ion Polymer Rechargeable Battery
<b>Rated Voltage:</b>	3.85 Vdc
<b>Limited Charge Voltage:</b>	4.4 Vdc
<b>Rated Capacity:</b>	4900 mAh

Cable	
<b>Description:</b>	USB Type-C Plug Cable
<b>Cable Type:</b>	Unshielded without ferrite
<b>Length:</b>	1.0 Meter

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

<b>Frequency Band:</b>	2400 MHz to 2483.5 MHz
<b>Frequency Range:</b>	2412 MHz to 2462 MHz
<b>Support Standards:</b>	IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20, IEEE 802.11n-HT40
<b>Type of Modulation:</b>	IEEE 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE 802.11g: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT20: OFDM(64-QAM, 16-QAM, QPSK, BPSK) IEEE 802.11n-HT40: OFDM(64-QAM, 16-QAM, QPSK, BPSK)
<b>Data Rate:</b>	IEEE 802.11b: Up to 11 Mbps IEEE 802.11g: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS7(64 Mbps) IEEE 802.11n-HT40: Up to MCS7(135 Mbps)
<b>Number of Channels:</b>	IEEE 802.11b: 11 IEEE 802.11g: 11 IEEE 802.11n-HT20: 11 IEEE 802.11n-HT40: 7
<b>Channel Separation:</b>	5 MHz
<b>Antenna Type:</b>	Monopole
<b>Antenna Gain:</b>	1.58 dBi
<b>Maximum Peak Power:</b>	IEEE 802.11b: 18.47 dBm IEEE 802.11g: 22.06 dBm IEEE 802.11n-HT20: 21.87 dBm IEEE 802.11n-HT40: 20.38 dBm
<b>Normal Test Voltage:</b>	3.85 Vdc

### 1.4 OTHER INFORMATION

Operation Frequency Each of Channel	
IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20	$f = 2407 + 5k \text{ MHz}, k = 1, \dots, 11$
IEEE 802.11n-HT40	$f = 2407 + 5k \text{ MHz}, k = 3, \dots, 9$
Note: f is the operating frequency (MHz); k is the operating channel.	

### 1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

#### 1) Support Equipment

Description	Manufacturer	Model No.	Serial Number	Supplied by
Earphone	N/A	QTER01JY	N/A	UnionTrust

#### 2) Support Cable

Cable No.	Description	Connector	Length	Supplied by
1	Antenna Cable	SMA	0.30 Meter	UnionTrust

## 1.6 TEST LOCATION

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### **Shenzhen UnionTrust Quality and Technology Co., Ltd.**

Address: 16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China 518109  
Telephone: +86 (0) 755 2823 0888  
Fax: +86 (0) 755 2823 0886

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## 1.7 TEST FACILITY

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

### **CNAS-Lab Code: L9069**

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC/EN 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

### **A2LA-Lab Certificate No.: 4312.01**

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### **ISED Wireless Device Testing Laboratories**

CAB identifier: CN0032

### **FCC Accredited Lab.**

Designation Number: CN1194

Test Firm Registration Number: 259480

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## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

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## 1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Measurement Uncertainty
1	Conducted emission 9KHz-150KHz	±3.8 dB
2	Conducted emission 150KHz-30MHz	±3.4 dB
3	Radiated emission 9KHz-30MHz	±4.9 dB
4	Radiated emission 30MHz-1GHz	±4.7 dB
5	Radiated emission 1GHz-18GHz	±5.1 dB
6	Radiated emission 18GHz-26GHz	±5.2 dB
7	Radiated emission 26GHz-40GHz	±5.2 dB

## 2. TEST SUMMARY

FCC 47 CFR Part 15 Subpart C Test Cases			
Test Item	Test Requirement	Test Method	Result
<b>Antenna Requirement</b>	FCC 47 CFR Part 15 Subpart C Section 15.203/15.247 (c)	N/A	PASS
<b>AC Power Line Conducted Emission</b>	FCC 47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013 Clause 6.2	PASS
<b>Conducted Peak Output Power</b>	FCC 47 CFR Part 15 Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013 Clause 11.9.1.3	PASS
<b>6dB Bandwidth</b>	FCC 47 CFR Part 15 Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013 Clause 11.8.1	PASS
<b>Power Spectral Density</b>	FCC 47 CFR Part 15 Subpart C Section 15.247 (e)	ANSI C63.10-2013 Clause 11.10.2	PASS
<b>Conducted Out of Band Emission</b>	FCC 47 CFR Part 15 Subpart C Section 15.247(d)	ANSI C63.10-2013 Clause 11.11	PASS
<b>Radiated Spurious Emissions</b>	FCC 47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013 Clause 11.11 & Clause 11.12	PASS
<b>Band Edge Measurements (Radiated)</b>	FCC 47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013 Clause 11.13	PASS

**Note:**

- 1) N/A: In this whole report not applicable.

### 3. EQUIPMENT LIST

Radiated Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
<input checked="" type="checkbox"/>	3M Chamber & Accessory Equipment	ETS-LINDGREN	3M	N/A	Dec. 03, 2018	Dec. 03, 2021
<input checked="" type="checkbox"/>	Receiver	R&S	ESIB26	100114	Nov. 24, 2018	Nov. 24, 2019
<input checked="" type="checkbox"/>	Loop Antenna	ETS-LINDGREN	6502	00202525	Dec. 03, 2018	Dec. 03, 2019
<input checked="" type="checkbox"/>	Broadband Antenna	ETS-LINDGREN	3142E	00201566	Dec. 08, 2018	Dec. 08, 2019
<input type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103001	Dec. 08, 2018	Dec. 08, 2019
<input checked="" type="checkbox"/>	Preamplifier	HP	8447F	2805A02960	Nov. 24, 2018	Nov. 24, 2019
<input type="checkbox"/>	6dB Attenuator	Talent	RA6A5-N-18	18103002	Nov. 24, 2018	Nov. 24, 2019
<input type="checkbox"/>	Horn Antenna	ETS-LINDGREN	3117	00164202	Dec. 08, 2018	Dec. 08, 2019
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3117-PA	00201874	May 18, 2019	May 22, 2020
<input type="checkbox"/>	Horn Antenna	ETS-LINDGREN	3116C	00200180	May 20, 2019	May 20, 2020
<input checked="" type="checkbox"/>	Horn Antenna (Pre-amplifier)	ETS-LINDGREN	3116C-PA	00202652	Jan. 05, 2019	Jan. 05, 2020
<input checked="" type="checkbox"/>	Multi device Controller	ETS-LINDGREN	7006-001	00160105	N/A	N/A
<input checked="" type="checkbox"/>	Band Rejection Filter (2400MHz~2500MHz)	Micro-Tronics	BRM50702	G248	Jun. 06, 2019	Jun. 06, 2020
<input checked="" type="checkbox"/>	Test Software	Audix	e3	Software Version: 9.160333		

Conducted Emission Test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
<input checked="" type="checkbox"/>	Receiver	R&S	ESR7	1316.3003K07-101181-K3	Nov. 24, 2018	Nov. 24, 2019
<input checked="" type="checkbox"/>	Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	Nov. 24, 2018	Nov. 24, 2019
<input checked="" type="checkbox"/>	LISN	R&S	ESH2-Z5	860014/024	Nov. 24, 2018	Nov. 24, 2019
<input type="checkbox"/>	LISN	ETS-Lindgren	3816/2SH	00201088	Nov. 24, 2018	Nov. 24, 2019
<input checked="" type="checkbox"/>	Test Software	Audix	e3	Software Version: 9.160323		

Conducted RF test Equipment List						
Used	Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm dd, yyyy)	Cal. Due date (mm dd, yyyy)
<input checked="" type="checkbox"/>	EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY51440197	Nov. 24, 2018	Nov. 24, 2019
<input checked="" type="checkbox"/>	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430035	Nov. 24, 2018	Nov. 24, 2019
<input type="checkbox"/>	USB Wideband Power Sensor	KEYSIGHT	U2021XA	MY55430023	Nov. 24, 2018	Nov. 24, 2019

## 4. TEST CONFIGURATION

### 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

#### 4.1.1 Normal or Extreme Test Conditions

Environment Parameter	Selected Values During Tests		
Test Condition	Ambient		
	Temperature (°C)	Voltage (V)	Relative Humidity (%)
NT/NV	+15 to +35	3.85	20 to 75
<b>Remark:</b>			
1) NV: Normal Voltage; NT: Normal Temperature			

#### 4.1.2 Record of Normal Environment

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (kPa)	Tested by
AC Power Line Conducted Emission	24.8	50	99.80	Tom Guo
Conducted Peak Output Power	23.5	49	99.80	Hank Wu
6dB Bandwidth	23.5	49	99.80	Hank Wu
Power Spectral Density	23.5	49	99.80	Hank Wu
Conducted Out of Band Emission	23.5	49	99.80	Hank Wu
Radiated Spurious Emissions	25.2	52	100.02	Andy Lin
Band Edge Measurements (Radiated)	25.2	52	100.02	Andy Lin

## 4.2 TEST CHANNELS

Mode	Tx/Rx Frequency	Test RF Channel Lists		
		Lowest(L)	Middle(M)	Highest(H)
IEEE 802.11b	2412 MHz to 2462 MHz	Channel 1	Channel 7	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11g	2412 MHz to 2462 MHz	Channel 1	Channel 7	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT20	2412 MHz to 2462 MHz	Channel 1	Channel 7	Channel 11
		2412 MHz	2437 MHz	2462 MHz
IEEE 802.11n-HT40	2422 MHz to 2452 MHz	Channel 3	Channel 7	Channel 9
		2422 MHz	2437 MHz	2452 MHz

### 4.3 EUT TEST STATUS

Mode	Tx Function	Description
IEEE 802.11b		
IEEE 802.11g		
IEEE 802.11n-HT20	1Tx	1. Keep the EUT in continuously transmitting with modulation test single.
IEEE 802.11n-HT40		

Power Setting	
Mode	Channel 1 -11
IEEE 802.11b	20
IEEE 802.11g	17
IEEE 802.11n-HT20	16
IEEE 802.11n-HT40	12

Test Software	
Test software name:	Engineering mode *#*#3646633#*#*

### 4.4 PRE-SCAN

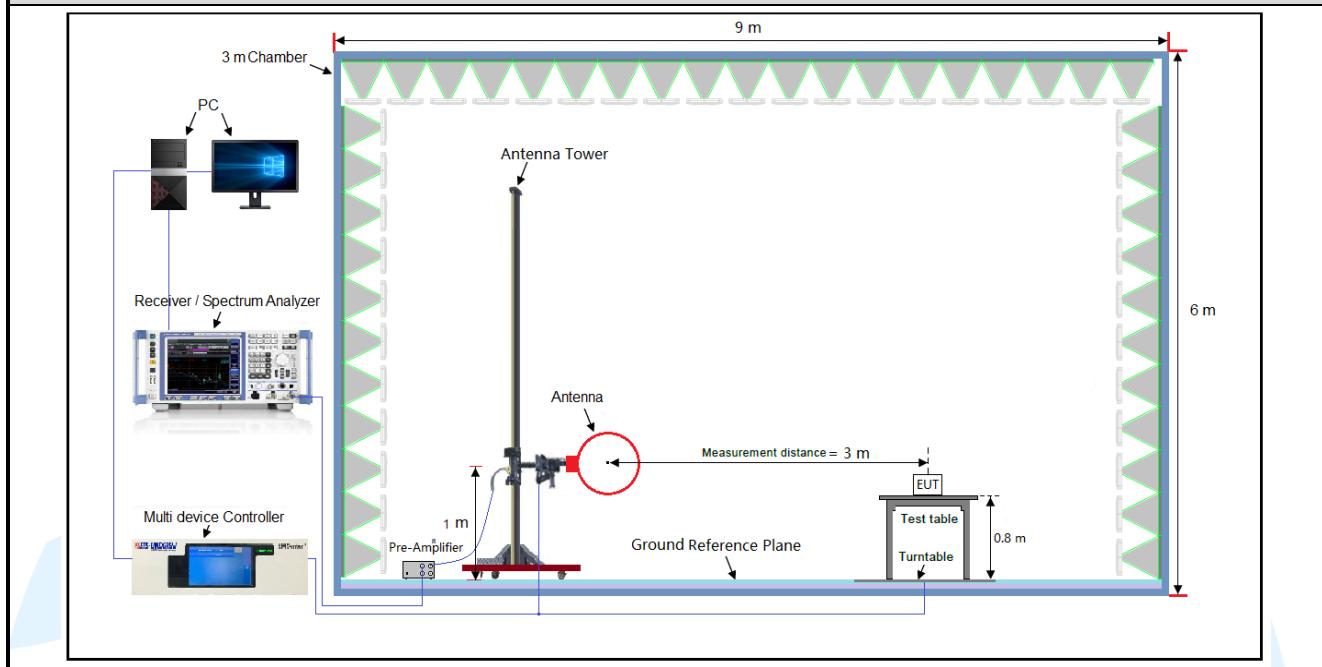
Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and data rate. Following data rate was (were) selected for the final test as listed below

Mode	Worst-case data rates
IEEE 802.11b	1 Mbps
IEEE 802.11g	6 Mbps
IEEE 802.11n-HT20	MCS0
IEEE 802.11n-HT40	MCS0

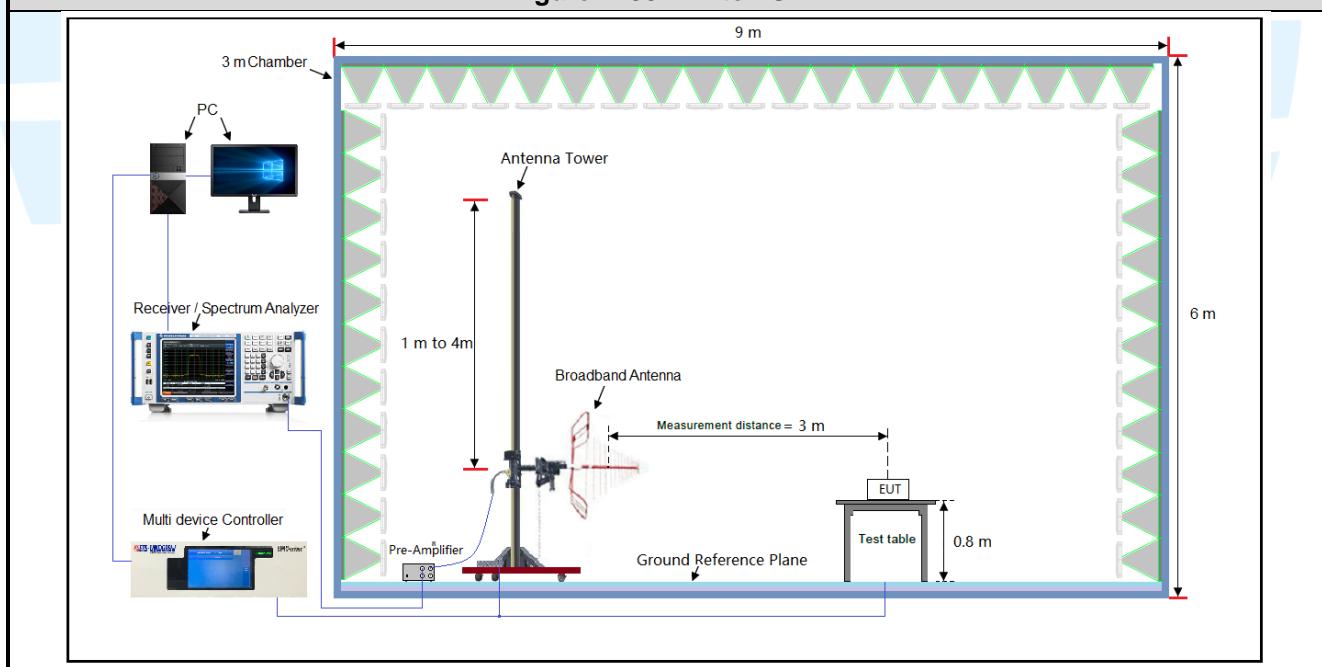
## 4.5 TEST SETUP

### 4.5.1 For Radiated Emissions test setup

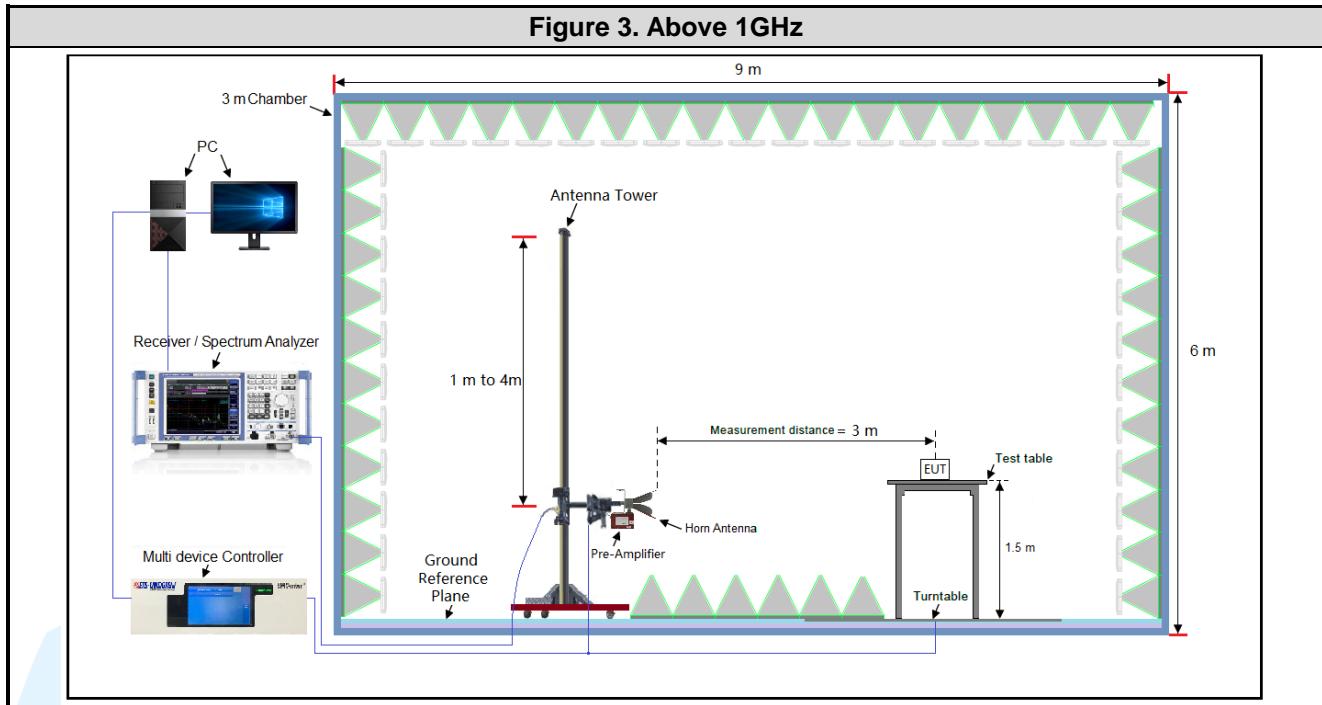
**Figure 1. Below 30MHz**



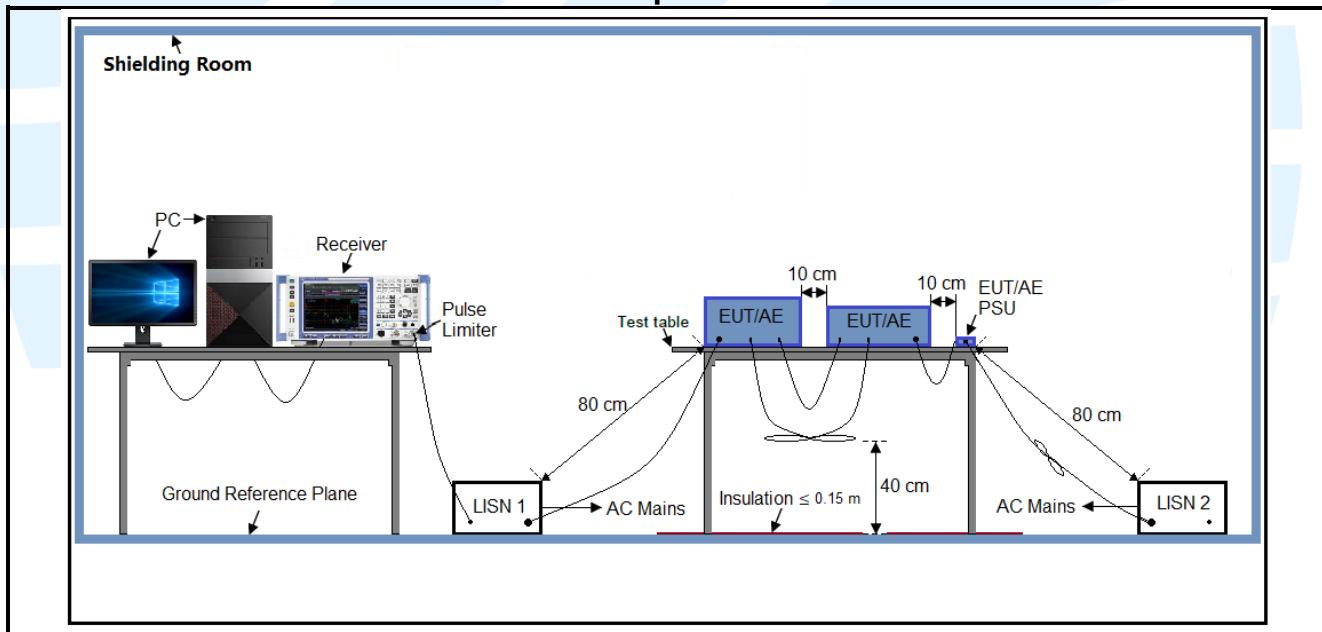
**Figure 2. 30MHz to 1GHz**



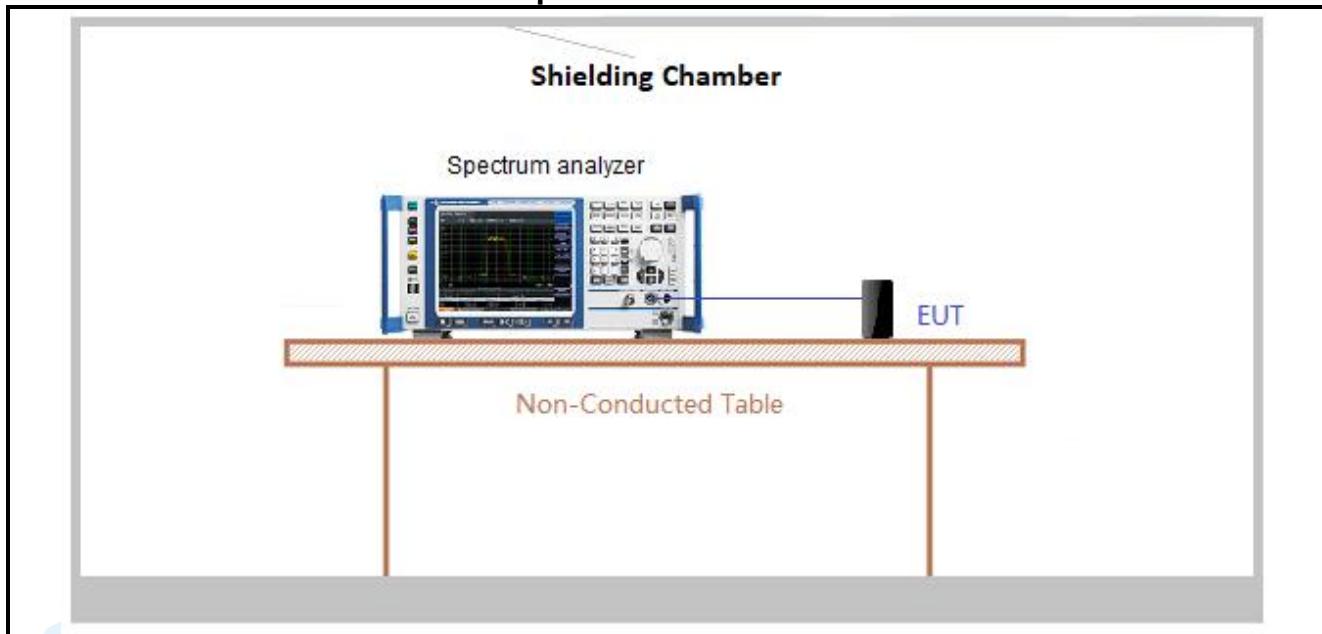
**Figure 3. Above 1GHz**



#### 4.5.2 For Conducted Emissions test setup



#### 4.5.3 For Conducted RF test setup



### 4.6 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.85V battery. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in (see table below) orientation.

Frequency	Mode	Antenna Port	Worst-case axis positioning
Above 1GHz	1TX	Chain 0	Y axis

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 4.7 DUTY CYCLE

**Test Procedure:** ANSI C63.10-2013 Clause 11.6.

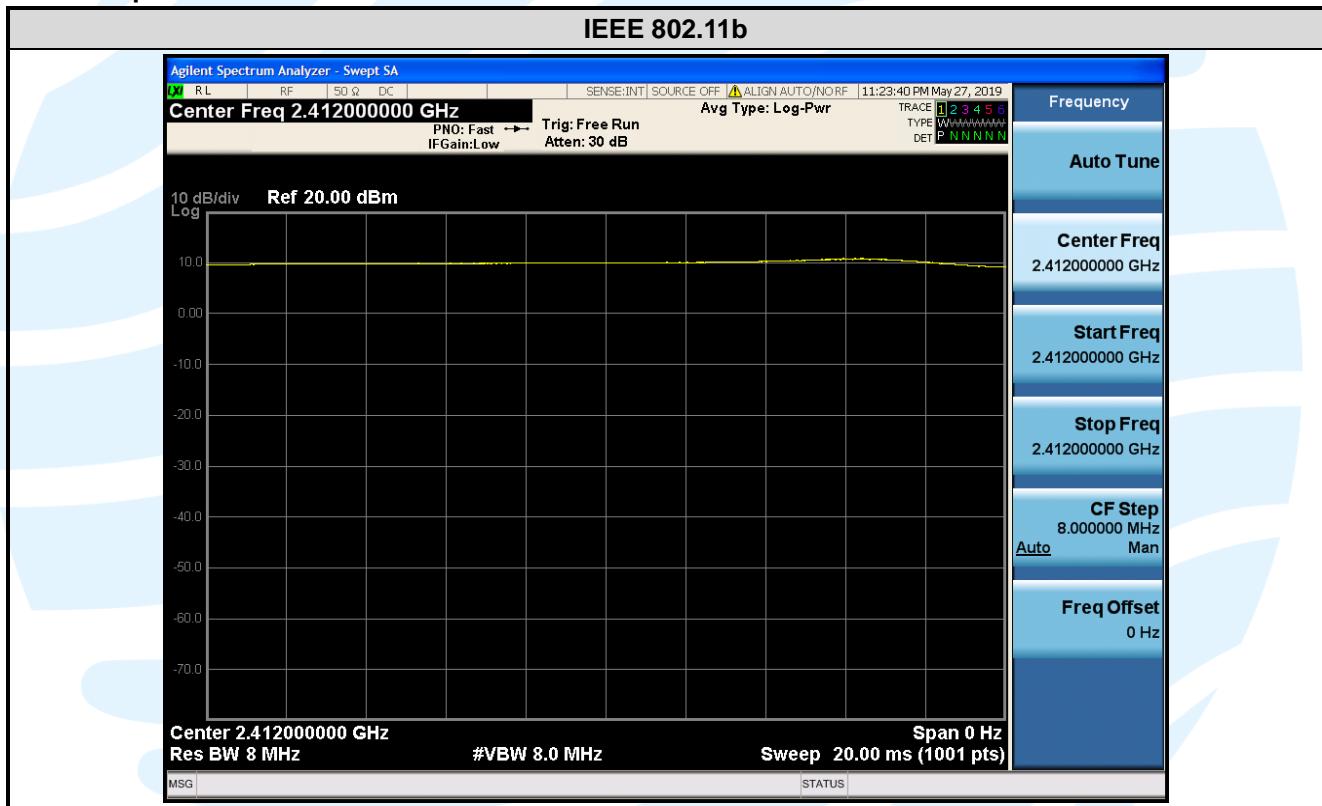
### Test Results

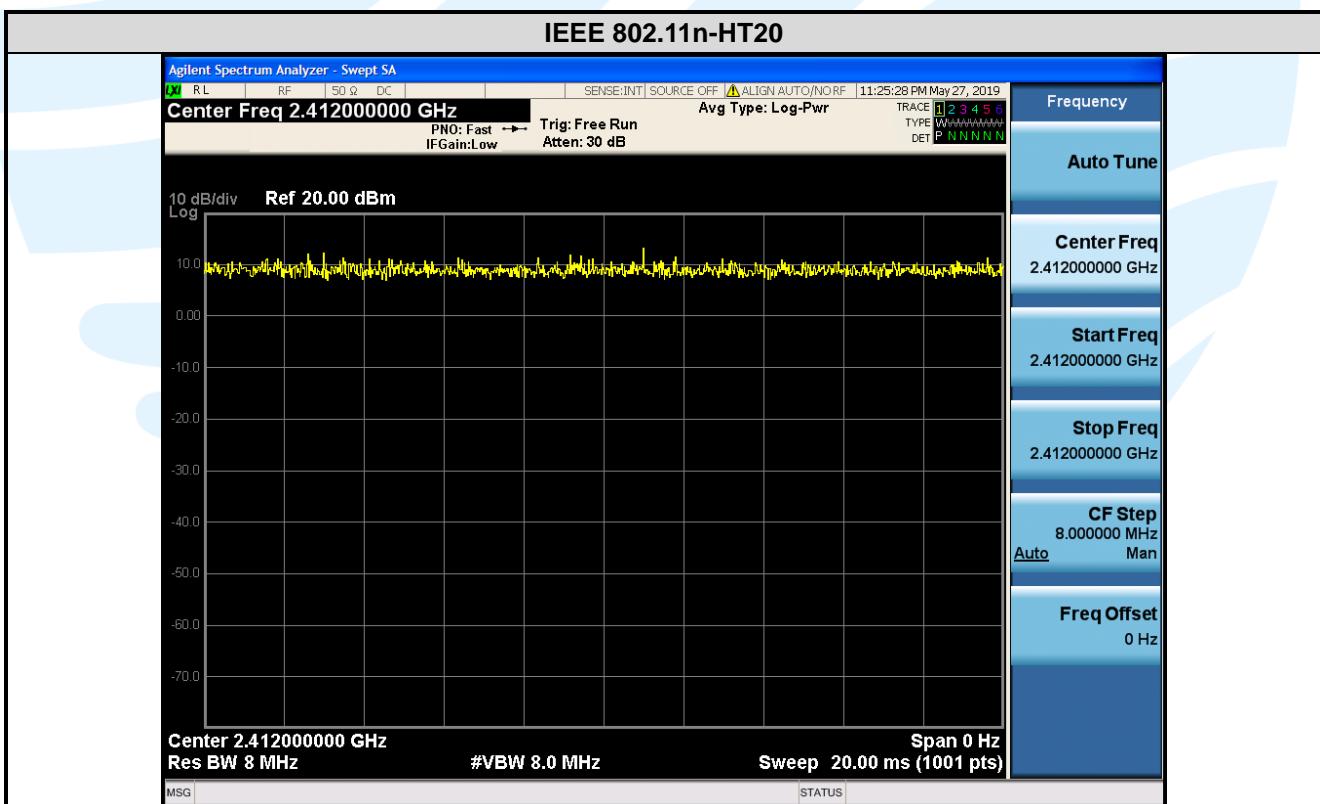
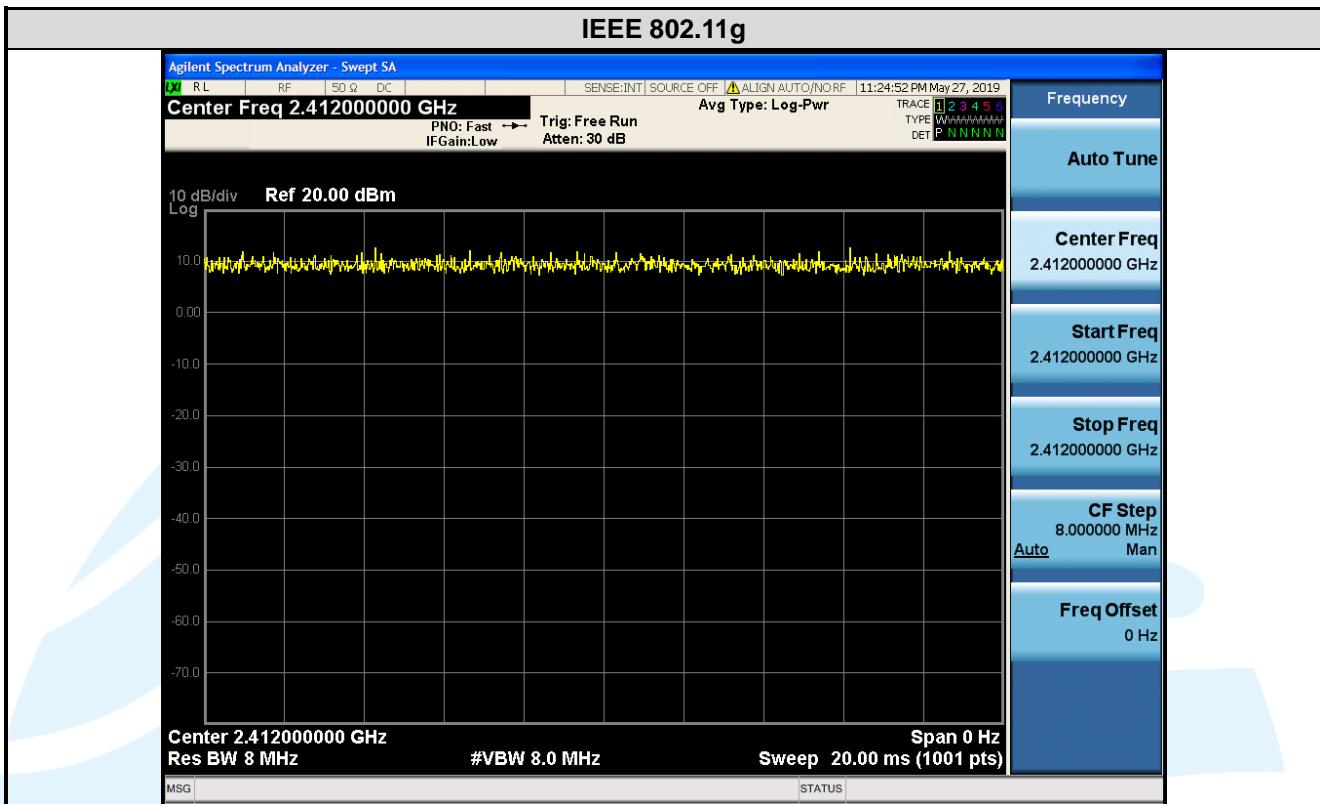
Mode	Data rates (Mbps)	On Time (msec)	Period (msec)	Duty Cycle (linear)	Duty Cycle (%)	Duty Cycle Factor (dB)	1/T Minimum VBW (kHz)	Average Factor (dB)
IEEE 802.11b	1	1	1	1.00	100.00	0.00	0.01	0.00
IEEE 802.11g	6	1	1	1.00	100.00	0.00	0.01	0.00
IEEE 802.11n-HT20	MCS0	1	1	1.00	100.00	0.00	0.01	0.00
IEEE 802.11n-HT40	MCS0	1	1	1.00	100.00	0.00	0.01	0.00

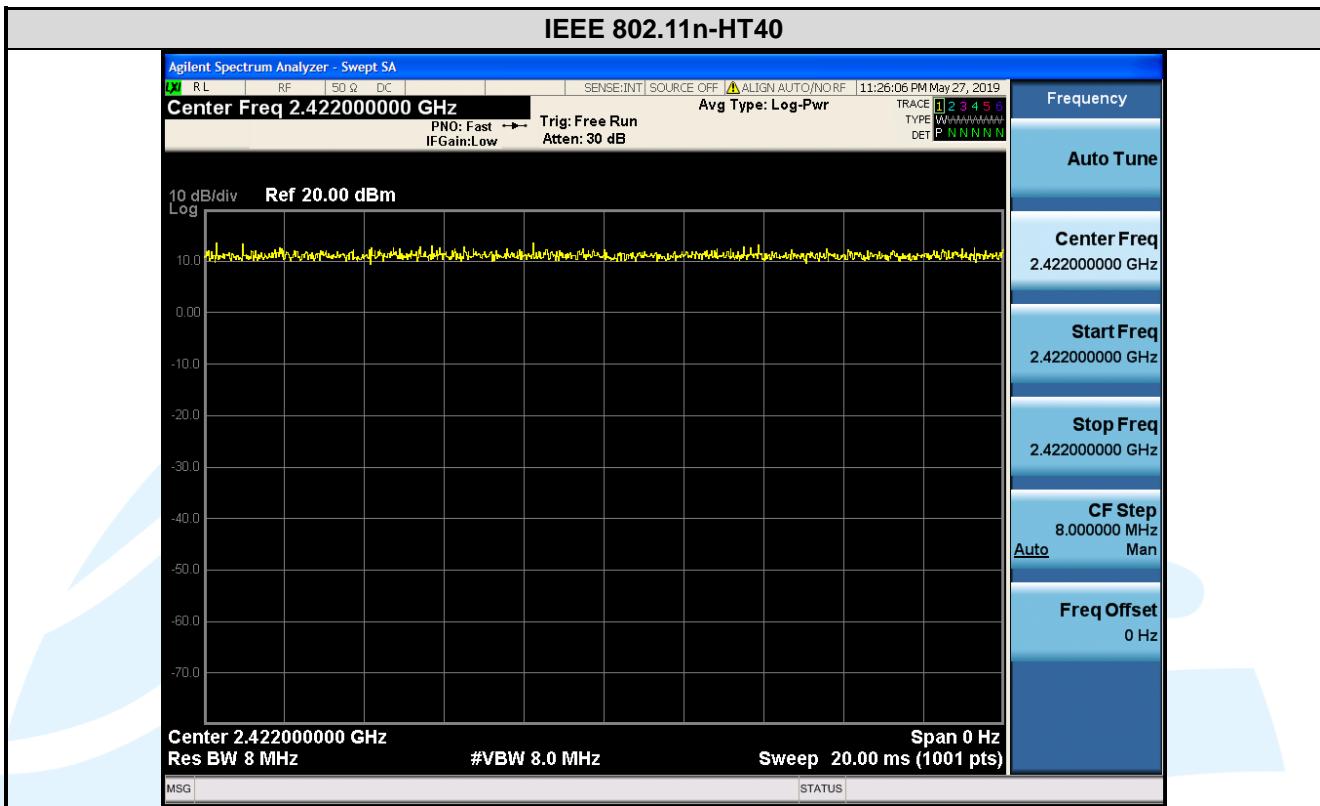
### Remark:

- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor =  $10 * \log(1/\text{Duty cycle})$ ;
- 3) Average factor =  $20 \log_{10} \text{Duty Cycle}$ .

### The test plots as follows







## 5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

### 5.1 REFERENCE DOCUMENTS FOR TESTING

No.	Identity	Document Title
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations
2	FCC 47 CFR Part 15	Radio Frequency Devices
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices
4	KDB 558074 D01 15.247 Meas Guidance v05r02	Guidance for compliance measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum system, and Hybrid system devices operating under Section 15.247 of the FCC rules

### 5.2 ANTENNA REQUIREMENT

Standard Requirement
<b>15.203 requirement:</b> 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.
<b>15.247(b) (4) requirement:</b> The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
<b>EUT Antenna:</b> Antenna in the interior of the equipment and no consideration of replacement. The gain of the antenna is 1.58 dBi.

### 5.3 CONDUCTED PEAK OUTPUT POWER

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section15.247 (b)(3)

**Test Method:** ANSI C63.10-2013 Clause 11.9.1.3

**Limit:** For systems using digital modulation in the 2400-2483.5 MHz bands: 1 Watt.

- Test Procedure:**
1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter.
  2. Measure out each test modes' peak or average output power, record the power level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.5.3 for details.

**Instruments Used:** Refer to section 3 for details

**Test Results:**

Mode	Channel/ Frequency (MHz)	Maximum Conducted Peak Power (dBm)	Limit (dBm)	Pss / Fail
IEEE 802.11b	1(2412)	18.04	30	Pass
	6(2437)	18.23	30	Pass
	11(2462)	18.47	30	Pass
IEEE 802.11g	1(2412)	21.64	30	Pass
	6(2437)	22.06	30	Pass
	11(2462)	21.63	30	Pass
IEEE 802.11n-HT20	1(2412)	21.51	30	Pass
	6(2437)	21.87	30	Pass
	11(2462)	21.11	30	Pass
IEEE 802.11n-HT40	3(2422)	20.38	30	Pass
	6(2437)	15.87	30	Pass
	9(2452)	19.04	30	Pass

Note: The antenna gain of 1.58 dBi less than 6dBi maximum permission antenna gain value based on 1 watt (30dBm) peak output power limit.

## 5.4.6 DB BANDWIDTH

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.247 (a)(2)

**Test Method:** ANSI C63.10-2013 Clause 11.8.1

**Limit:** For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

**Test Procedure:** Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

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 cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.5.3 for details.

**Instruments Used:** Refer to section 3 for details

**Test Results:**

Mode	Channel/ Frequency (MHz)	6 dB Bandwidth (MHz)	99% Bandwidth (MHz)	6 dB Bandwidth Limit	Pass / Fail
IEEE 802.11b	1(2412)	8.588	13.341	> 500 kHz	Pass
	6(2437)	8.573	13.568	> 500 kHz	Pass
	11(2462)	8.591	13.183	> 500 kHz	Pass
IEEE 802.11g	1(2412)	13.73	18.356	> 500 kHz	Pass
	6(2437)	13.74	16.934	> 500 kHz	Pass
	11(2462)	13.73	17.363	> 500 kHz	Pass
IEEE 802.11n-HT20	1(2412)	15.24	18.381	> 500 kHz	Pass
	6(2437)	14.23	17.822	> 500 kHz	Pass
	11(2462)	13.77	18.034	> 500 kHz	Pass
IEEE 802.11n-HT40	3(2422)	14.09	34.430	> 500 kHz	Pass
	6(2437)	15.23	35.330	> 500 kHz	Pass
	9(2452)	36.55	36.482	> 500 kHz	Pass

The test plots as follows:





## 5.5 POWER SPECTRAL DENSITY

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.247 (e)

**Test Method:** ANSI C63.10-2013 Clause 11.10.2

**Limit:** For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

**Test Procedure:** Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq 3 \times \text{RBW}$ .
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

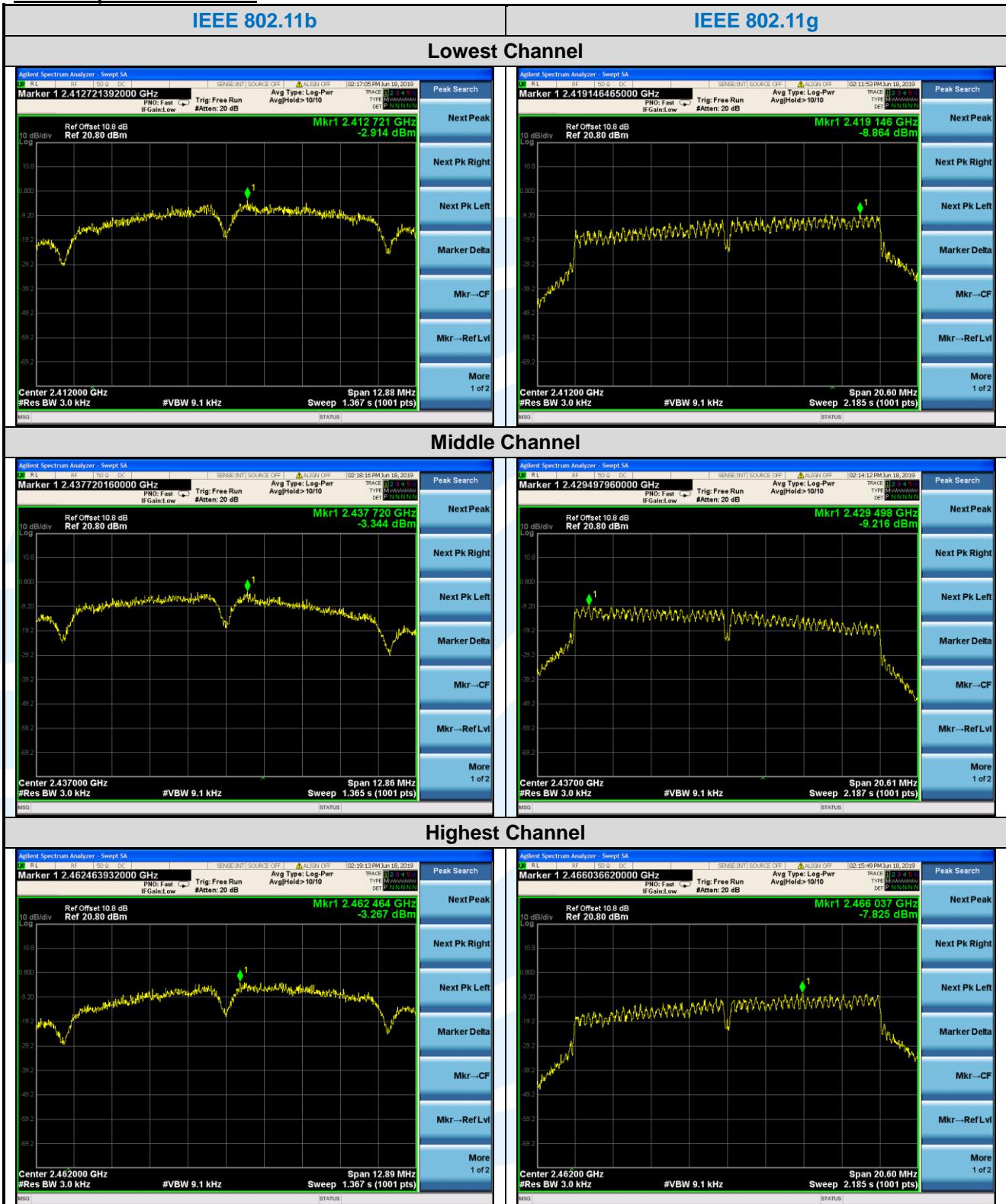
**Test Setup:** Refer to section 4.5.3 for details.

**Instruments Used:** Refer to section 3 for details

**Test Results:**

Mode	Channel/ Frequency (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Pass / Fail
IEEE 802.11b	1(2412)	-2.914	8	Pass
	6(2437)	-3.344	8	Pass
	11(2462)	-3.267	8	Pass
IEEE 802.11g	1(2412)	-8.864	8	Pass
	6(2437)	-9.216	8	Pass
	11(2462)	-7.825	8	Pass
IEEE 802.11n-HT20	1(2412)	-8.986	8	Pass
	6(2437)	-9.744	8	Pass
	11(2462)	-8.237	8	Pass
IEEE 802.11n-HT40	3(2422)	-8.785	8	Pass
	6(2437)	-17.726	8	Pass
	9(2452)	-15.154	8	Pass

The test plots as follows:





## 5.6 CONDUCTED OUT OF BAND EMISSION

**Test Requirement:** FCC 47 CFR Part 15 Subpart C Section 15.247(d)

**Test Method:** ANSI C63.10-2013 Clause 11.11

**Limit:** In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power.

**Test Procedure:** Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

**Step 1:Measurement Procedure REF**

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to  $\geq$  1.5 times the DTS bandwidth.
- c) Set the RBW = 100 kHz.
- d) Set the VBW  $\geq$  3 x RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.
- j) Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

**Step 2:Measurement Procedure OOB**

- a) Set RBW = 100 kHz.
- b) Set VBW  $\geq$  300 kHz.
- c) Detector = peak.
- d) Sweep = auto couple.
- e) Trace Mode = max hold.
- f) Allow trace to fully stabilize.
- g) Use the peak marker function to determine the maximum amplitude level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.5.3 for details.

**Instruments Used:** Refer to section 3 for details

**Test Results:** Pass

The test plots as follows:

