



# **TEST REPORT**

Report Reference No	CHTEW19080058	Report verification:
Project No:	SHT1906076103EW	
FCC ID:	YPVITALCOMFIXX	Exportion ChTW130000S
Applicant's name:	ITALCOM GROUP	
Address	1728 Coral Way, Coral Gables	Miami,Florida,United States
Manufacturer	Emocom Technology Co., Lim	ited
Address	Unit 17,9/F., Tower A, New Ma Museum Road, Tsimshatsui, k	
Test item description:	4G telephone	
Trade Mark	NYX Mobile	
Model/Type reference:	FIXX	
Listed Model(s)	-	
Standard:	FCC CFR Title 47 Part 15 Su	bpart C Section 15.247
Date of receipt of test sample:	Jun 28, 2019	
Date of testing	Jun 29, 2019- Aug 13, 2019	
Date of issue	Aug 14, 2019	
Result:	PASS	
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Testing Laboratory Name: :	Shenzhen Huatongwei Intern	national Inspection Co., Ltd.
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The test report merely correspond to the test sample.

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# 1. TEST STANDARDS AND REPORT VERSION

#### 1.1. Test Standards

The tests were performed according to following standards:

<u>FCC Rules Part 15.247</u>: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10:2013: American National Standard forTesting Unlicensed Wireless Devices

<u>KDB 558074 D01 15.247 Meas Guidance v05:</u> Guidance for Compliance Measurements on Digital Transmission System, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating under Section 15.247 of The FCC Rules

#### 1.2. Report version

Revision No.	Date of issue	Description
N/A	2019-08-13	Original

# 2. TEST DESCRIPTION

Test Item	FCC Rule	Result	Test Engineer	
Antenna requirement	15.203/15.247(c) PASS		Kang Yang	
Line Conducted Emissions (AC Main)	15.207	PASS	Kang Yang	
Conducted Peak Output Power	15.247(b)(3) PASS Br		Bruce Wong	
Power Spectral Density	15.247(e)	PASS	Bruce Wong	
6dB Bandwidth	15.247(a)(2)	PASS	Bruce Wong	
Restricted band	15.247(d)/15.205	PASS	Bruce Wong	
Spurious Emissions	15.247(d)/15.209	PASS	Bruce Wong	

Note: The measurement uncertainty is not included in the test result.

# 3. <u>SUMMARY</u>

# 3.1. Client Information

Applicant:	ITALCOM GROUP
Address:	1728 Coral Way, Coral Gables, Miami, Florida, United States
Manufacturer:	Emocom Technology Co., Limited
Address:	Unit 17,9/F., Tower A, New Mandarin Plaza, No.14 Science Museum Road, Tsimshatsui, Kowloon, Hong Kong.

## 3.2. Product Description

Name of EUT:	4G telephone	
Trade Mark:	NYX Mobile	
Model No.:	FIXX	
Listed Model(s):	-	
IMEI:	Conducted: 865757040000589 Radiated: 865757040000513	
Power supply:	DC 3.7V	
Adapter information: Input:100-240Va.c., 50/60Hz, 150mA Max Output:5.0Vd.c., 1.0A		
Hardware version:	NYX_FIXX_001	
Software version:	FIXX_AMXNYX_V001R	
WIFI		
Supported type:	802.11b/802.11g/802.11n(HT20)	
Modulation: DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)		
Operation frequency:	2412MHz~2462MHz	
Channel number:	11	
Channel separation:	5MHz	
Antenna type:	Dipole Antenna	
Antenna gain:	3.0dBi	

## 3.3. Operation state

#### Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(HT20)			
Channel Frequency (MHz)			
01	2412		
02 2417			
06	2437		
10	2457		
11	2462		

#### > <u>Test mode</u>

For RF test items

The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).

For AC power line conducted emissions:

The EUT was set to connect with the WLAN AP under large package sizes transmission.

For Radiated suprious emissions test item:

The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

### 3.4. EUT configuration

#### The following peripheral devices and interface cables were connected during the measurement:

supplied by the manufacturer

0	<ul> <li>supplied by the</li> </ul>	e lab

o /		Manufacturer:	/
	Model No.:	/	
o /		Manufacturer:	/
	7	Model No.:	/

#### 3.5. Modifications

No modifications were implemented to meet testing criteria.

# 4. TEST ENVIRONMENT

### 4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

## 4.2. Test Facility

#### CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory 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.

#### FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

#### IC-Registration No.:5377A

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377A.

#### ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

## 4.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

#### 4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.51 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.51 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.02 dB	(1)
Radiated Emissions below 1GHz	4.90 dB	(1)
Radiated Emissions above 1GHz	4.96 dB	(1)
Occupied Bandwidth	70 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

# 4.5. Equipments Used during the Test

•	Conducted Emission					
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
•	Shielded Room	Albatross projects	N/A	N/A	2018/09/28	2023/09/27
•	EMI Test Receiver	R&S	ESCI	101247	2018/10/27	2019/10/26
•	Artificial Mains	SCHWARZBECK	NNLK 8121	573	2018/10/27	2019/10/26
•	Pulse Limiter	R&S	ESH3-Z2	100499	2018/10/27	2019/10/26
•	RF Connection Cable	HUBER+SUHNER	EF400	N/A	2018/11/15	2019/11/14
•	Test Software	R&S	ES-K1	N/A	N/A	N/A
0	Single Balanced Telecom Pair ISN	FCC	FCC-TLISN-T2-02	20371	2018/10/28	2019/10/27
0	Two Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T4-02	20373	2018/10/28	2019/10/27
0	Four Balanced Telecom Pairs ISN	FCC	FCC-TLISN-T8-02	20375	2018/10/28	2019/10/27
0	V-Network	R&S	ESH3-Z6	100211	2018/10/27	2019/10/26
0	V-Network	R&S	ESH3-Z6	100210	2018/10/27	2019/10/26
0	2-Line V-Network	R&S	ESH3-Z5	100049	2018/10/27	2019/10/26

•	Radiated Emission-6th test site									
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)				
•	Semi-Anechoic Chamber	Albatross projects	SAC-3m-02	N/A	2018/09/30	2021/09/29				
•	EMI Test Receiver	R&S	ESCI	100900	2018/10/28	2019/10/27				
•	Loop Antenna	R&S	HFH2-Z2	100020	2017/11/20	2020/11/19				
•	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	546	2017/04/05	2020/04/04				
•	Pre-Amplifer	SCHWARZBECK	BBV 9742	N/A	2018/11/15	2019/11/14				
•	RF Connection Cable	HUBER+SUHNER	N/A	N/A	2018/09/28	2019/09/27				
•	RF Connection Cable	HUBER+SUHNER	SUCOFLEX104	501184/4	2018/09/28	2019/09/27				
•	Test Software	R&S	ES-K1	N/A	N/A	N/A				
•	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A				
•	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A				

•	Radiated emission-7th test site									
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)				
•	Semi-Anechoic Chamber	Albatross projects	SAC-3m-01	N/A	2018/09/30	2021/09/29				
•	Spectrum Analyzer	R&S	FSP40	100597	2018/10/27	2019/10/26				
•	Horn Antenna	SCHWARZBECK	9120D	1011	2017/03/27	2020/03/26				
•	Pre-amplifier	BONN	BLWA0160-2M	1811887	2018/11/14	2019/11/13				
•	Pre-amplifier	CD	PAP-0102	12004	2018/11/14	2019/11/13				
•	Broadband Pre- amplifier	SCHWARZBECK	BBV 9718	9718-248	2019/04/26	2020/04/25				
•	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	2018/11/15	2019/11/14				
•	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	2018/11/15	2019/11/14				
•	Test Software	Audix	E3	N/A	N/A	N/A				

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•	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
•	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A

•	RF Conducted Method									
Used	Test Equipment Manufactur		Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)				
•	Signal and spectrum Analyzer	R&S	FSV40	100048	2018/10/28	2019/10/27				
•	Spectrum Analyzer	Agilent	N9020A	MY50510187	2018/09/29	2019/09/28				
•	OSP	R&S	OSP120	101317	N/A	N/A				
0	Radio communication tester	R&S	CMW500	137688-Lv	2018/09/29	2019/09/28				
0	Test software	Tonscend	JS1120-1(LTE)	N/A	N/A	N/A				
0	Test software	Tonscend	JS1120-2(WIFI)	N/A	N/A	N/A				
0	Test software	Tonscend	JS1120-3(WCDMA)	N/A	N/A	N/A				
0	Test software	Tonscend	JS1120-4(GSM)	N/A	N/A	N/A				

# 5. TEST CONDITIONS AND RESULTS

## 5.1. Antenna requirement <u>REQUIREMENT:</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.203:

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 anantenna 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.

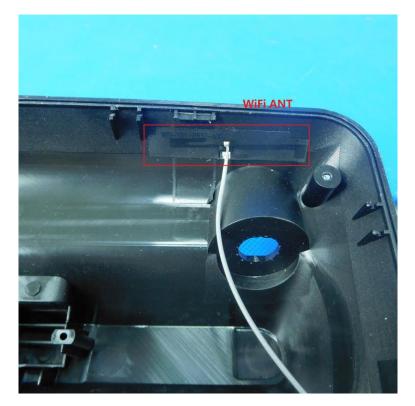
#### FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

#### TEST RESULTS

#### ☑ Passed □ Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



# 5.2. Conducted Emissions (AC Main)

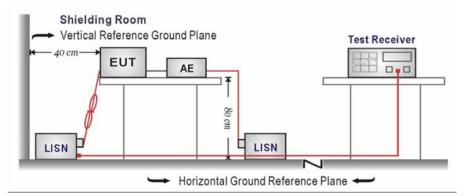
## <u>LIMIT</u>

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

	Limit (dBuV)			
Frequency range (MHz)	Quasi-peak	Average		
0.15-0.5	66 to 56*	56 to 46*		
0.5-5	56	46		
5-30	60	50		

\* Decreases with the logarithm of the frequency.

#### **TEST CONFIGURATION**



#### TEST PROCEDURE

- 1. The EUT was setup according to ANSI C63.10:2013 requirements.
- The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
- 3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
- 4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
- 5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor,was individually connected through a LISN to the input power source.
- 6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
- Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
- 8. During the above scans, the emissions were maximized by cable manipulation.

#### TEST MODE:

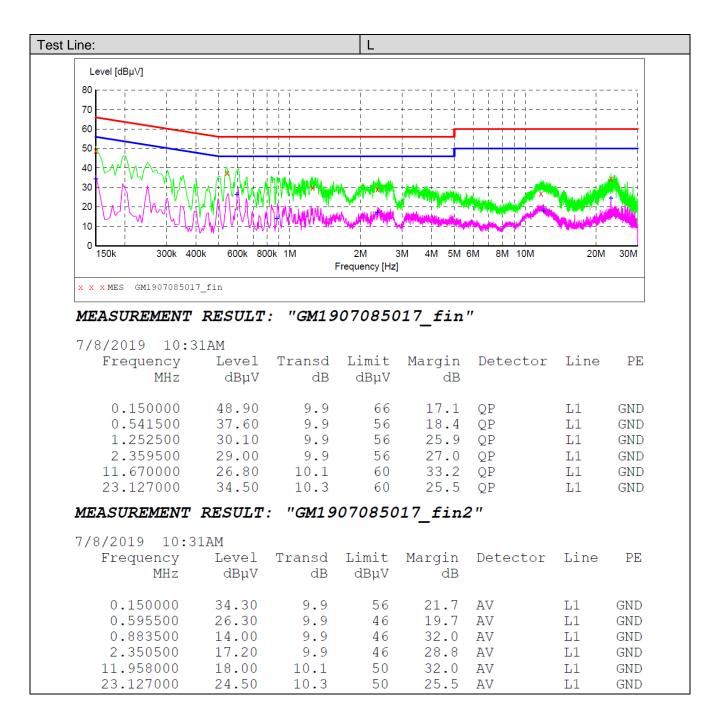
Please refer to the clause 3.3

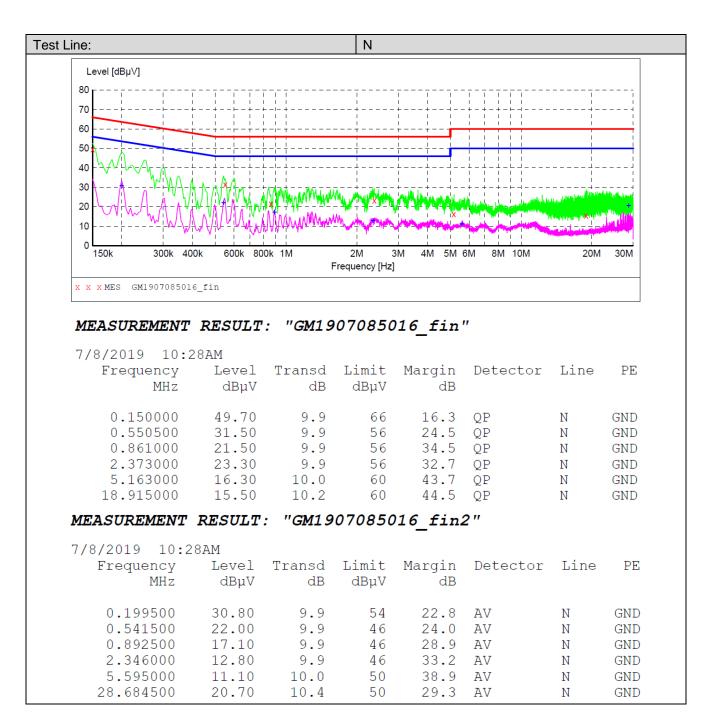
#### TEST RESULTS

☑ Passed □ Not Applicable

Note:

- 1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit -Level

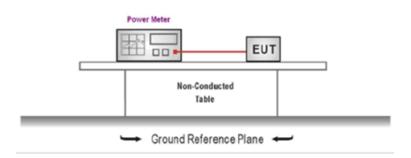




# 5.3. Conducted Peak Output Power LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): 30dBm

#### **TEST CONFIGURATION**



#### TEST PROCEDURE

- 1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
- 2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
- 3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
- 4. Record the measurement data.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

🛛 Passed

**Not Applicable** 

Туре	Channel	Peak Output power (dBm)	Average Output power (dBm)	Limit (dBm)	Result
	01	13.95	13.53		
802.11b	06	12.91	12.41	≤30.00	Pass
	11	13.54	11.67		
	01	12.42	9.17		
802.11g	06	11.88	7.98	≤30.00	Pass
	11	12.61	8.66		
	01	12.01	8.32		
802.11n(HT20)	06	12.53	8.89	≤30.00	Pass
	11	12.05	8.52		

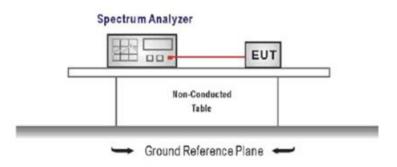
## 5.4. Power Spectral Density

#### <u>LIMIT</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):

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

#### **TEST CONFIGURATION**



#### TEST PROCEDURE

- 1. Connect the antenna port(s) to the spectrum analyzer input,
- Configure the spectrum analyzer as shown below: Center frequency=DTS channel center frequency Span =1.5 times the DTS bandwidth RBW = 3 kHz ≤ RBW ≤ 100 kHz, VBW ≥ 3 × RBW Sweep time = auto couple Detector = peak Trace mode = max hold
- 3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
- 4. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

#### TEST MODE:

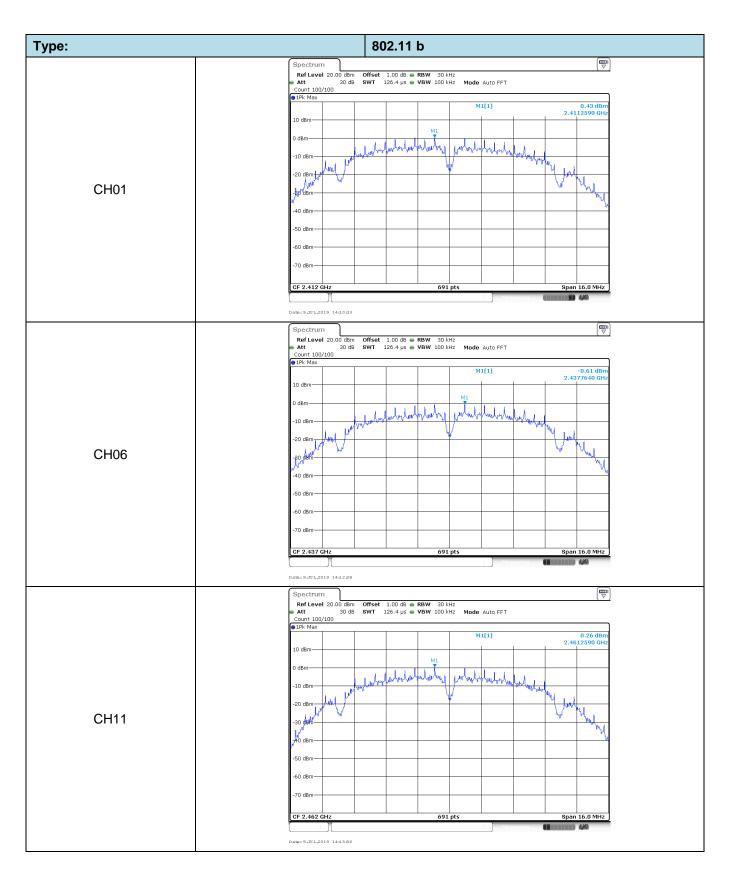
Please refer to the clause 3.3

#### TEST RESULTS

☑ Passed □ Not Applicable

Туре	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result	
	01	0.43			
802.11b	06	-0.61	≤8.00	Pass	
	11	0.26			
	01	-11.93			
802.11g	06	-10.84	≤8.00	Pass	
	11	-11.80			
	01	-11.92			
802.11n(HT20)	06	-11.66	≤8.00	Pass	
	11	-11.82			

Test plot as follows:



Type: 802.11 g Spectrum Ref Level 20.00 dBm Att 30 dB Count 100/100 PIPk Max Offset 1.00 dB ● RBW 30 kHz SWT 189.6 µs ● VBW 100 kHz Mode Auto FFT M1[1] -11.93 df 2.4051260 G LO dBm ) dBrr 10 dBm manufacture and brown manufacture -20 dBm CH01 30 dBm N 40 dBm Asig dem--Mato 60 dBm 70 dBm 691 pts CF 2.412 GH Sn 25.0 MHz 10.00 Data:9.JUL.2019 14:39:4 ₽ Spectrum RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz Att 30 dB SWT 189.6 µs ● VBW 100 kHz Mode Auto FFT Count 100/100 -10.84 dB 2.4444890 G M1[1] 10 dBm 0 dBm--10 dBm moundance and bearing bearing and the second 20 dBm CH06 -30 dBm 40 dBm month <mark>ሥህ/<sup>መ</sup> -50 dBm-</mark> -60 dBm 70 dBm-CF 2.437 GH 691 pts Span 25.0 MHz 1 14 Date:9.JUL.2019 14:42:05 Spectrum 
 Ref Level
 20.00 dBm
 Offset
 1.00 dB
 RBW
 30 kHz

 Att
 30 dB
 SWT
 189.6 µs
 VBW
 100 kHz
 Mode
 Auto FFT
 Count 100/100 M1[1] -11.80 dB 2.4613850 GF 10 dBm-0 dBm 10 dBm moundary manual manufacture 20 dBr CH11 30 dBm τų. N 40 dBm ,sių dishi -60 dBm 70 dBm Span 25.0 MHz 691 pts CF 2.462 GH 111 1.446 Date: 9.JUL.2019 14:44:55

Туре:	802.11n(HT20)
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz ● Att 30 dB SWT 189.6 μs ● VBW 100 kHz Mode Auto FFT
	Count 100/100  IPk Max
	10 dBm
	0 dBm
	-10 dBm Winnwightwarthan Winn man man man man man man man man man m
01107	-20 dBm
CH01	-30 dBm
	-40 d8m
	high the second
	-60 dBm
	-70 dBm
	CF 2.412 GHz 691 pts Span 25.0 MHz
	Date:9.JUL.2019 14:4929
	Spectrum (
	RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz ● Att 30 dB SWT 189.6 µs ● VBW 100 kHz Mode Auto FFT
	Count 100/100
	M1[1] -11.66 dBm 2.4444890 GHz
	10 dBm
	0 dBm
	-10 dam M1
	-20 dam
CH06	-30 dBm
	-40 dsm/+/
	NUM
	-60 dBm
	-/U 08m
	CF 2.437 GHz 691 pts Span 25.0 MHz
	Dama:9,JUL2019 14:5:5:4
	Spectrum 🕎
	RefLevel 20.00 dBm Offset 1.00 dB ● RBW 30 kHz ● Att 30 dB SWT 189.6 µS ● VBW 100 kHz Mode Auto FFT
	M1[1] -11.82 dBm 2.4601190 GHz
	10 dBm
	0 dBm
	-10 dBm white work when when when when when when when when
CH11	-30 d8m
	-40 dBm
	-60 dBm
	-70 dBm
	CF 2.462 GHz 691 pts Span 25.0 MHz
	Measuring Constant D AA
	Dams:9JUL2019 145822

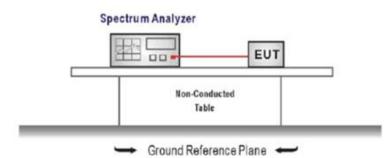
# 5.5. 6dB bandwidth

#### <u>LIMIT</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### **TEST CONFIGURATION**



#### TEST PROCEDURE

- 1. Connect the antenna port(s) to the spectrum analyzer input.
- 2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).

Center Frequency =DTS channel center frequency Span=2 x DTS bandwidth RBW = 100 kHz, VBW ≥ 3 × RBW Sweep time= auto couple Detector = Peak Trace mode = max hold

- Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
- 4. 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, and record the pertinent measurements.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

🛛 Passed	Not Applicable				
Туре	Channel	6dB Bandwidth (MHz)	Limit (kHz)	Result	
	01	8.88			
802.11b	06	9.15	≥500	Pass	
	11	8.64			
	01	14.55			
802.11g	06	16.47	≥500	Pass	
	11	16.14			
	01	16.41			
802.11n(HT20)	06	17.64	≥500	Pass	
	11	16.35			

Test plot as follows:

Type: 802.11 b Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset 1.00 dB ● RBW 100 kHz SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT -5.71 dE 2.4072000 G 1.15 dE 2.4105000 G M1[1] LO dBm M2[1] Ţ ) dBm 1 -4.851 A.A. LAG3 10 dBm 20 dBm 30 dBm M CH01 -40 dBm-М Var mon -50 dBm 60 dBm 70 dBm CF 2.412 GHz 1001 pts Span 30.0 MHz Y-value -5.71 dBm 1.15 dBm -0.52 dB Type Ref Trc Function Function Result X-value value 2.4072 GHz 2.4105 GHz 8.88 MHz M2 M1 Date:9.JUL.2019 14:10:20 Spectrum Ref Level 20.50 dBm Att 30 dB Mode Auto FFT Count 500/500 -6.69 d 2.4324400 c M1[1] 10 dBm M2[1] 2.4375100 GH 0 dBm M1 Nulu MAG 01 -5.843 10 dBm -20 dBm 30 dBm \_ \_/~\/ s M CH06 40 dBm⇒ 50 dBm 60 dBm 70 dBm CF 2.437 GH 1001 pt: Span 30.0 MHz larke Type Ref Trc M1 1 X-value 2.43244 GHz 2.43751 GHz 9.15 MHz Y-value -6.69 dBm 0.16 dBm -0.47 dB Function Function Result M2 D3 М1 Date:9.JUL.2019 14:12:15 ♥ Spectrum 
 Ref Level
 20.50 dBm
 Offset
 1.00 dB
 RBW
 100 kHz

 Att
 30 dB
 SWT
 75.9 μs
 VBW
 300 kHz
 Mode
 Auto FFT
 Count 500/500 M1[1] -5.74 dB 2.4574400 GH 10 dBm M2[1] 1.24 dB 2.4625100 GF WWWWWWWWW 0 dBm June 01 -4.763 -10 dBm -20 dBm 30 dBr CH11 40 dBm -vy m 50 dBr 60 dBm 70 dBm CF 2.463 Span 30.0 larke 
 Y-value
 Function

 -5.74 dBm
 -0.24 dBm

 -0.55 dB
 -0.55 dB
 X-value 2.45744 GHz 2.46251 GHz 8.64 MHz Type Ref Trc Function Result MI Date:9.JUL.2019 14:15:43

Гуре:	802.11 g
	Spectrum         (₩)           Ref Level 20.50 dBm         Offset 1.00 dB ● RBW 100 kHz           Att         30 dB         SWT         75.9 μs ● VBW 300 kHz         Mode Auto FFT           Count 500/500         ● JFk View         ●         FK         View
	10 dBm         M1[1]         -12.35 dBm           10 dBm         2,4038100 GHz         -5.92 dBm           0 dBm         0 dBm         2,4037600 GHz
CH01	-20 dBm
	-60 dBm
	CF 2.412 GHz         1001 pts         Span 30.0 MHz           Marker         Yope         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.40391 GHz         -12.35 dBm         -12.35 dBm         -12.35 dBm         -12.35 dBm         -13.55 dHz         -1.15 dB         -11.55 dHz         -1.15 dB         -11.55 dHz         -1.15 dB         -11.55 dHz         -1.15 dB         -1.15
	D3     m1     1     1     1     1       Data::9012.019     14:3927     14:3927     14:3927
	Ref Level 20.50 dBm         Offset 1.00 dB         RBW 100 kHz           ● Att         30 dB         SWT         75.9 µs         ● VBW 300 kHz         Mode Auto FFT           Count 500/500         ●         ●         ●         M1[1]         -14.32 dBm
	10 dBm 2.4307600 GHz 0 dBm 2.4307600 GHz -10 dBm 01 -14.137 dBm 4.45710 And 4.5710 And 4.57100 And 4.5710 And
CH06	-20 dBm
	-50 dBm
	CF 2.437 GHz         1001 pts         Span 30.0 MHz           Marker         Ype         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.42801 GHz         -14.32 dBm         -0.11 dB         -0.11 dB           D3         M1         1         16.47 MHz         -0.11 dB         -0.11 dB
	Daw:9.JULZ019 14x1x99   Spectrum
	Ref Level 20.50 dBm         Offset 1.00 dB         RBW 100 kHz           Att         30 dB         SWT         75.9 µs         VBW 300 kHz         Mode Auto FFT           Count 500/500         Count 500/500         VBW         100 kHz         -13.53 dBm           0 dB         M1[1]         -13.53 dBm         2.4588100 GHz           10 dBm         M1[1]         -2.4588100 GHz
	10 dsm         M2[1]         -7.26 dBm           0 dsm         2.4644900 GHz           -10 dsm         01 -13.257 dbm         M2           -20 dsm         -10 dsm         -10 dsm
CH11	-30 dBm
	-60 dBm -70 dBm -70 dBm -72 462 GHz UCF 2.462 GHz -70 dBm -70
	Marker           Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.45381 GHz         -13.53 dBm

802.11n(HT20) Type: Spectrum Ref Level 20.50 dBm Att 30 dB Count 500/500 1Pk View Offset 1.00 dB ● RBW 100 kHz SWT 75.9 µs ● VBW 300 kHz Mode Auto FFT -14.16 dE 2.4031800 G -8.10 dE 2.4132600 G M1[1] LO dBm M2[1] ) dBm M2 10 dBm - WWW Man a sault 01 -14.10 193--20 dBm -30 dBm CH01 -40 dBm hN No dem-N 60 dBm 70 dBm CF 2.412 GHz 1001 pts Span 30.0 MHz X-value 2.40318 GHz 2.41326 GHz 16.41 MHz Y-value -14.16 dBm -8.10 dBm -1.84 dB Type Ref Trc Function Function Result M2 M1 Date:9.JUL.2019 14:49:14 Spectrum RefLevel 20.50 dBm Att 30 dB 
 Offset
 1.00 dB ●
 RBW
 100 kHz

 SWT
 75.9 μs
 • VBW
 300 kHz
 Mode Auto FFT Count 500/500 -14.56 d 2.4281800 ( M1[1] 10 dBm M2[1] -7.06 dB 2.4420100 GF 0 dBm-X 10 dBm--20 dBm 30 dBm Myr CH06 maria 199.49.00 50 dBm 60 dBm 70 dBm CF 2.437 GH 1001 pt Span 30.0 MHz larke Type Ref Trc M1 1 X-value 2.42818 GHz 2.44201 GHz 17.64 MHz Y-value -14.56 dBm -7.06 dBm 1.48 dB Function Function Result M2 D3 М1 440 Date:9.JUL.2019 14:55:41 ♥ Spectrum 
 Ref Level
 20.50 dBm
 Offset
 1.00 dB
 RBW
 100 kHz

 Att
 30 dB
 SWT
 75.9 μs
 VBW
 300 kHz
 Mode
 Auto FFT
 Count 500/500 M1[1] -13.21 dB 2.4532100 GF 10 dBm M2[1] -7.07 dB 2.4632600 GI 0 dBm Å -10 dBm Intal h. -20 dBm 30 dBr CH11 40 dBm rst yew. -60 dBm 70 dBm CF 2.46 Span 30.0 larke X-value 2.45321 GHz 2.46326 GHz 16.35 MHz 
 Y-value
 Function

 -13.21 dBm
 -7.07 dBm

 -0.32 dB
 -0.32 dB
 Type Ref Trc Function Result М1 Date: 9.JUL.2019 14:58:09

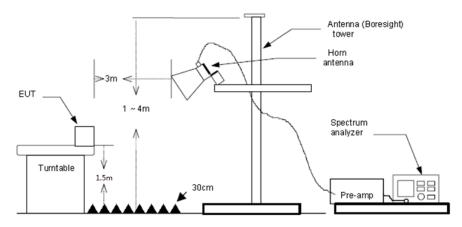
## 5.6. Restricted band

#### <u>LIMIT</u>

#### FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

#### **TEST CONFIGURATION**



### TEST PROCEDURE

- 1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3) The EUT waspositioned such that the distance from antenna to the EUT was 3 meters.
- 4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find themaximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- The receiver set as follow: RBW=1MHz, VBW=3MHz PEAK detector for Peak value. RBW=1MHz, VBW=3MHz RMS detector for Average value.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

#### ☑ Passed □ Not Applicable

Note:

1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor

#### Report No.: CHTEW19080058

802.11b				CH01			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2310.00	13.34	35.78	49.12	74.00	24.88	Horizontal	Peak
2390.00	17.19	35.50	52.69	74.00	21.31	Horizontal	Peak
2310.00	15.52	35.78	51.30	74.00	22.70	Vertical	Peak
2390.00	16.32	35.50	51.82	74.00	22.18	Vertical	Peak
2310.00	12.12	35.78	47.90	54.00	6.10	Horizontal	Average
2390.00	12.56	35.50	48.06	54.00	5.94	Horizontal	Average
2310.00	15.23	35.78	51.01	54.00	2.99	Vertical	Average
2390.00	15.87	35.50	51.37	54.00	2.63	Vertical	Average

802.11b			С	H11			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2483.50	14.99	35.31	50.30	74.00	23.70	Horizontal	Peak
2500.00	15.46	35.28	50.74	74.00	23.26	Horizontal	Peak
2483.50	16.56	35.31	51.87	74.00	22.13	Vertical	Peak
2500.00	14.85	35.28	50.13	74.00	23.87	Vertical	Peak
2483.50	14.18	35.31	49.49	54.00	4.51	Horizontal	Average
2500.00	14.62	35.28	49.90	54.00	4.10	Horizontal	Average
2483.50	15.85	35.31	51.16	54.00	2.84	Vertical	Average
2500.00	12.90	35.28	48.18	54.00	5.82	Vertical	Average

#### Report No.: CHTEW19080058

802.11g			С	H01			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2310.00	14.74	35.78	50.52	74.00	23.48	Horizontal	Peak
2390.00	13.96	35.50	49.46	74.00	24.54	Horizontal	Peak
2310.00	17.18	35.78	52.96	74.00	21.04	Vertical	Peak
2390.00	16.69	35.50	52.19	74.00	21.81	Vertical	Peak
2310.00	13.40	35.78	49.18	54.00	4.82	Horizontal	Average
2390.00	13.16	35.50	48.66	54.00	5.34	Horizontal	Average
2310.00	16.38	35.78	52.16	54.00	1.84	Vertical	Average
2390.00	16.03	35.50	51.53	54.00	2.47	Vertical	Average

802.11g			С	H11			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2483.50	15.58	35.31	50.89	74.00	23.11	Horizontal	Peak
2500.00	15.18	35.28	50.46	74.00	23.54	Horizontal	Peak
2483.50	16.69	35.31	52.00	74.00	22.00	Vertical	Peak
2500.00	15.20	35.28	50.48	74.00	23.52	Vertical	Peak
2483.50	14.17	35.31	49.48	54.00	4.52	Horizontal	Average
2500.00	13.88	35.28	49.16	54.00	4.84	Horizontal	Average
2483.50	16.32	35.31	51.63	54.00	2.37	Vertical	Average
2500.00	13.79	35.28	49.07	54.00	4.93	Vertical	Average

#### Report No.: CHTEW19080058

802.11n(HT20	)		C	CH01			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2310.00	14.08	35.78	49.86	74.00	24.14	Horizontal	Peak
2390.00	14.57	35.50	50.07	74.00	23.93	Horizontal	Peak
2310.00	15.05	35.78	50.83	74.00	23.17	Vertical	Peak
2390.00	14.79	35.50	50.29	74.00	23.71	Vertical	Peak
2310.00	12.77	35.78	48.55	54.00	5.45	Horizontal	Average
2390.00	13.98	35.50	49.48	54.00	4.52	Horizontal	Average
2310.00	13.84	35.78	49.62	54.00	4.38	Vertical	Average
2390.00	14.26	35.50	49.76	54.00	4.24	Vertical	Average

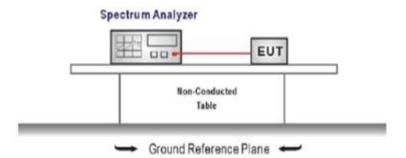
802.11n(HT20	))		С	H11			
Frequency (MHz)	Read Level (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin (dB)	Polarization	Test value
2483.50	14.28	35.31	49.59	74.00	24.41	Horizontal	Peak
2500.00	15.19	35.28	50.47	74.00	23.53	Horizontal	Peak
2483.50	14.62	35.31	49.93	74.00	24.07	Vertical	Peak
2500.00	15.36	35.28	50.64	74.00	23.36	Vertical	Peak
2483.50	12.82	35.31	48.13	54.00	5.87	Horizontal	Average
2500.00	12.82	35.28	48.10	54.00	5.90	Horizontal	Average
2483.50	14.00	35.31	49.31	54.00	4.69	Vertical	Average
2500.00	13.75	35.28	49.03	54.00	4.97	Vertical	Average

# 5.7. Band edge and Spurious Emissions (conducted)

#### FCC CFR Title 47 Part 15 Subpart C Section15.247 (d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1. Connect the antenna port(s) to the spectrum analyzer input.
- 2. Establish a reference level by using the following procedure

Center frequency=DTS channel center frequency The span = 1.5 times the DTS bandwidth. RBW = 100 kHz, VBW ≥ 3 x RBW Detector = peak, Sweep time = auto couple, Trace mode = max hold Allow trace to fully stabilize Use the peak marker function to determine the maximum PSD level

Note: the channel found to contain the maximum PSD level can be used to establish the reference level. Emission level measurement

 Emission level measurement Set the center frequency and span to encompass frequency range to be measured RBW = 100 kHz, VBW ≥ 3 x RBW Detector = peak, Sweep time = auto couple, Trace mode = max hold Allow trace to fully stabilize Use the peak marker function to determine the maximum amplitude level.
 Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmit

- 4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter waveform on the spectrum analyzer.
- Ensure that the amplitude of all unwanted emission outside of the authorized frequency band excluding restricted frequency bands) are attenuated by at least the minimum requirements specified (at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz). Report the three highest emission relative to the limit.

#### TEST MODE:

Please refer to the clause 3.3

#### TEST RESULTS

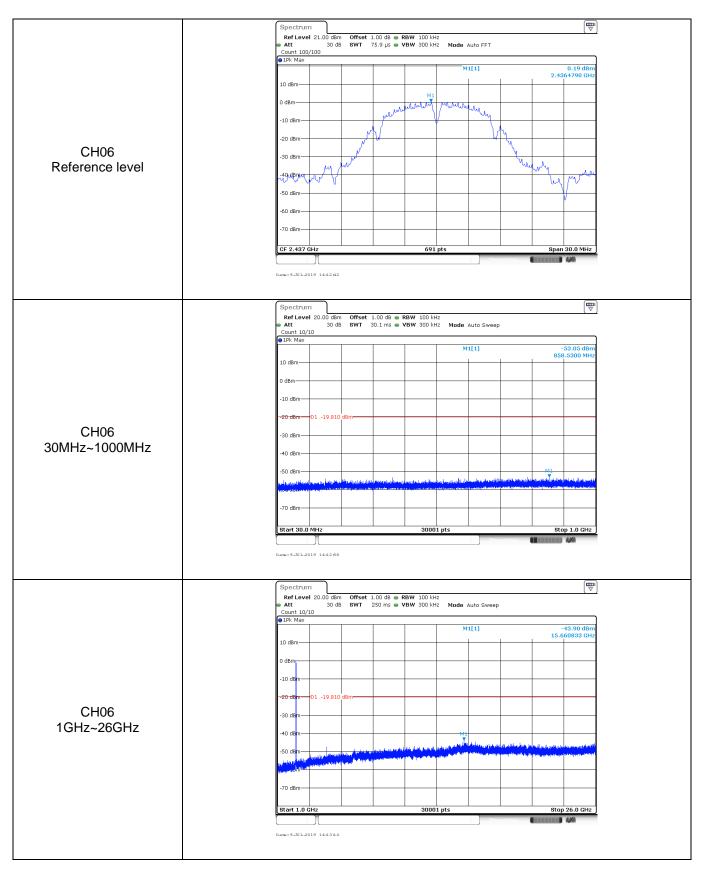
☑ Passed □ Not Applicable

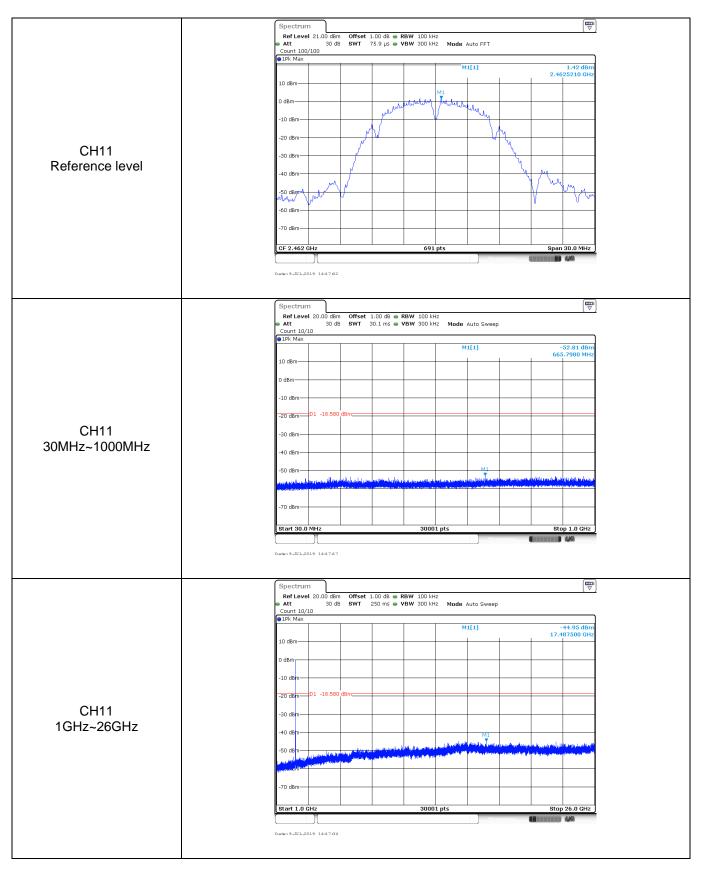
Test Item:	Bandedge	Т	Гуре:		802.11 b	
	c	pectrum Ref Level 20.00 dBm Offse Att 30 dB SWT Jount 300/300 Pik Max		00 kHz 00 kHz <b>Mode</b> Auto FFT		
CH01	10 0. -1 72 -3	UPK Max 0 dBm 0 dBm 0 dBm 0 dBm 0 dBm 0 dBm 0 dBm 0 dBm		M1[1] M2[1]	1.25 dBm 2.410570 GHz M45.91 dBm 2.410700 GHz M65.91 dBm M65.91	
	4 ~5 .7 .5 	0 dBm 0 dBm 0 dBm tart 2.31 GHz tart 2.31 GHz mker ype Ref Trc X-vc M1 1 2.2.	alue   Y-vali	691 pts	Stop 2.422 GHz Function Result	
		M2         1           M3         1           M4         1           M5         1           0         0	2.4 GHz -45.9 2.39 GHz -59.3 2.31 GHz -59.4	3 dBm 5 dBm 1 dBm 3 dBm	<b></b>	
	c		et 1.00 dB	00 kHz Mode Auto FFT	,	)
	0	0 dBm M1 dBm M1 0 dBm M1 A	Can the second s	M1[1] M2[1]	1.52 dBm 2.4605090 GHz -56.86 dBm 2.4835000 GHz	
CH11	-3 -4 -4	o dBm 401 -18.480 dBm 0 dBm		r Ma		
	St	0 dBm tart 2.452 GHz arker ype   Ref   Trc   X-va M1   1 2.44 M2   1 2	alue Y-val	691 pts	Stop 2.5 GHz Function Result	
	Dat	M3 1	2.5 GHz -59.5	9 dBm 6 dBm	<b>()</b> (1) (1) (2)	

Test Item:	Bandedge	Type:		802.11 g					
	👄 Att	20.00 dBm Offset 1.00 dB	<b>BW</b> 100 kHz <b>BW</b> 300 kHz <b>Mode</b> Auto FFT						
	Count 300 IPK Max 10 dBm 0 dBm -10 dBm	300	M1[1] M2[1]	-5.92 dBm 2.405710 GHz -40.40 dBm M1 2.400000 GHz					
CH01	-20 d8m- -30 d8m- -40 d8m- -50 d8m-	D1 -25.920 dBm		envelue					
	Ass demo-t -70 dBm- Start 2.31 Marker	GHz	691 pts	Stop 2.422 GHz					
	Type         Re           M1         M2           M3         M4           M5         M5	1 2.40571 GHz 1 2.4 GHz 1 2.39 GHz 1 2.39 GHz 1 2.39 GHz 1 2.399762 GHz	Y-value         Function           -5.92 dBm	Function Result					
	Ref Leve Att Count 300	Spectrum Ref Level 20.00 dBm Offset 1.00 dB ● RBW 100 kHz							
CH11	● 1Pk Max 10 dBm 0 dBm	MI NJ ALLALA	M1[1] M2[1]	-6.32 dBm 2.4607180 GHz -52.47 dBm 2.4835000 GHz					
	-29 dBm -30 dBm -40 dBm- -50 dBm-	D1 -26.320 dBm	Manna						
	-60 dBm		691 pts	Stop 2.5 GHz					
	Type Re           M1           M2           M3           M4	Trc         X-value           1         2.460718 GHz           1         2.4835 GHz           1         2.4836522 GHz	Y-value         Function           -6.32 dbm         -5.24 dbm           -52.47 dbm         -59.85 dbm           -51.64 dbm         -51.64 dbm						

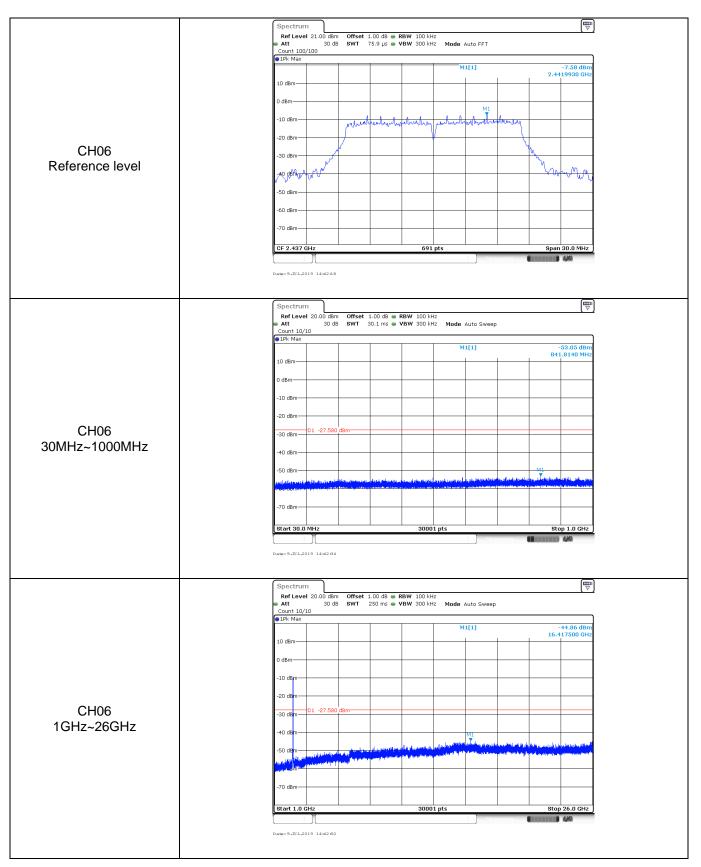
Test Item:	Bandedge	Ту	pe:	802.11 n(HT20)
	Rei • Att	30 dB SWT 24	1.00 dB <b>e RBW</b> 100 kHz 46.5 μs <b>e VBW</b> 300 kHz <b>Mode</b> Auto	FFT (
CH01	● 1Pk 10 dt -10 c -20 c -30 c -40 c -50 c +63 c -70 c	im	M1[1] M2[1]	-6.31 dBm 2.405710 GHz -42.79 dBm M1 2.400000 GHz M1 2.400000 GHz
		e         Ref         Trc         X-value           11         1         2.4057           12         1         2.           13         1         2.3	1 GHz -6.31 dBm 4 GHz -42.79 dBm 9 GHz -56.20 dBm 11 GHz -59.38 dBm	Function Result
	Rei • Att	30 dB <b>SWT</b> 1: nt 300/300	1.00 dB <b>● RBW</b> 100 kHz 13.8 µs <b>● VBW</b> 300 kHz <b>Mode</b> Auto	FFT
		n M1	M1[1] M2[1]	-7.11 dBm 2.4607870 GHz -52.52 dBm 2.4835000 GHz
CH11	- 20 c 730 c -40 c -50 c -60 c -70 c	8m 027.110 d8m		Mg .
	Star Nark Typy h	t 2.452 GHz er e Ref Trc X-value 11 2.46078 12 1 2.463	17 GHz -7.11 dBm 15 GHz -52.52 dBm 5 GHz -60.05 dBm	Stop 2.5 GHz
		JUL.2019 14:58:42		

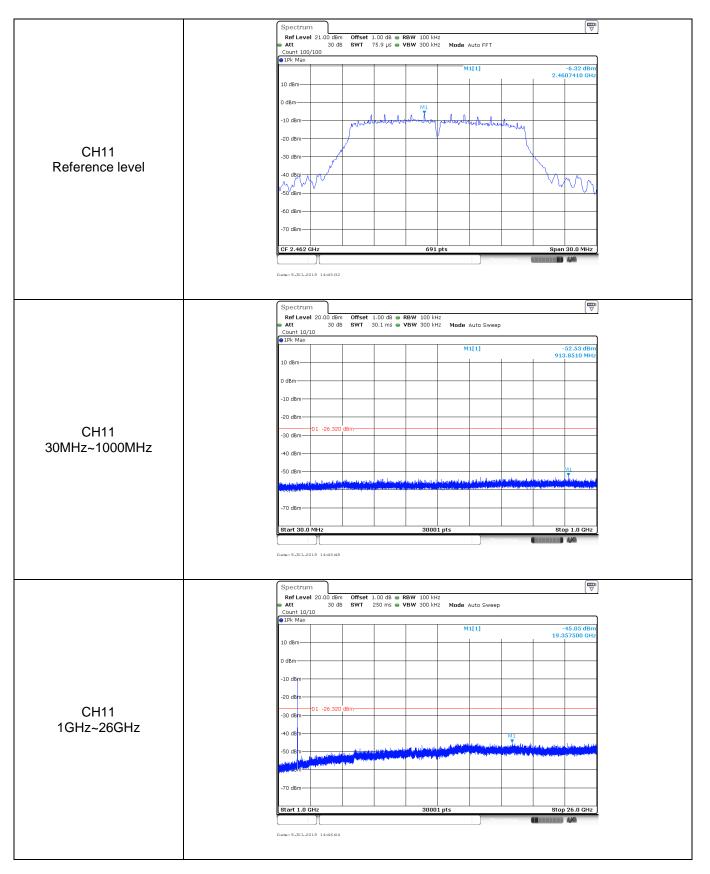
est Item:	SE		Type:			802.11 b
		Spectrum				
		🕳 Att 30 dB S	Offset 1.00 dB	BW 100 kHz BW 300 kHz Mode	Auto FFT	
		Count 100/100 Pk Max				
		10 40			M1[1]	1.65 dBm 2.4104800 GHz
		10 dBm		M1		
		0 dBm	whiteh	www.	why	
		-10 dBm	M	Υ Υ	t Mr.	
01104		-20 dBm	W W		- V 7	
CH01		-30 dBm	2			24
Reference level		-40 dBm				- Muran
		-50 dBm				V ~ VV~~
		-60 dBm				
		-70 dBm				
		CF 2.412 GHz		691 pts		Span 30.0 MHz
				031 pts	Measuring	
		Date:9JUL.2019 14:10:58				
		Spectrum Ref Level 20.00 dBm C	Offset 1.00 dB 🕳	RBW 100 kHz		
		Att 30 dB 5 Count 10/10	WT 30.1 ms 🕳	/BW 300 kHz Mode	Auto Sweep	
		● 1Pk Max			M1[1]	-53.21 dBm
		10 dBm			1	821.8330 MHz
		0 dBm				
		-10 dBm				
		-20 dBm D1 -18.350 dBm				
CH01		-30 dBm				
30MHz~1000MHz						
		-40 dBm				
		-50 dBm	and the state of the second second	and the state of the	والدمية ومطاورها ومقاراتهم	hoursense. To be leader to see a status read, or to
		and the set of the second s	d to an a the first fille shifting a share	na po de la fosicie de la casa de la distanción de		
		-70 dBm				
		Start 30.0 MHz		30001 pts		Stop 1.0 GHz
		Date: 9.JUL.2019 14:11:14			Measuring	
		Data: 95012019 141114				
		Spectrum				
		Ref Level 20.00 dBm C	Offset 1.00 dB 👄 F WT 250 ms 👄 V	BW 100 kHz BW 300 kHz Mode	Auto Sweep	(*)
		Count 10/10				
					M1[1]	-44.47 dBm 16.692500 GHz
		10 dBm				
		0 dBm				
		-10 dBm				
		-20 dBm D1 -18.350 dBm				
CH01 1GHz~26GHz		-30 dBm				
		-40 dBm			M1	
		-50 dBm	the state of the s	والمحاولة والمحاولة والمحاول والمحاولة	allow for all parts bounds	a dinaka ang karal pananan ang sanag sanaha ang karang sanaha Mang sanaha na sanaha na sanaha na sanaha na sanaha na sanaha
			provingent allowing provident in the second	a - M. Bonn, of the Meridian		
		-70 d8m				
		Start 1.0 GHz		30001 pts	Measuring	Stop 26.0 GHz



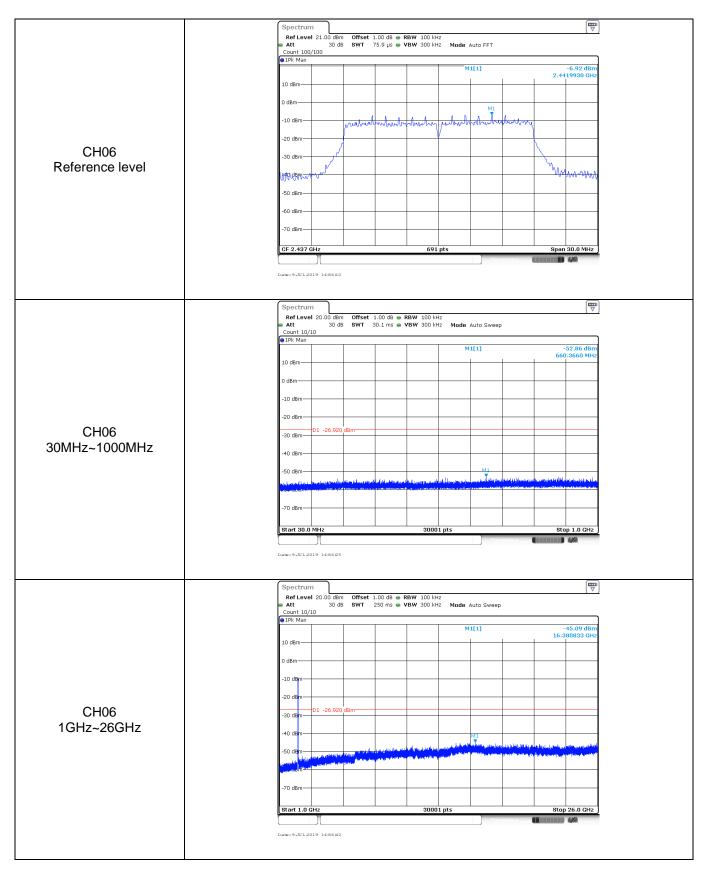


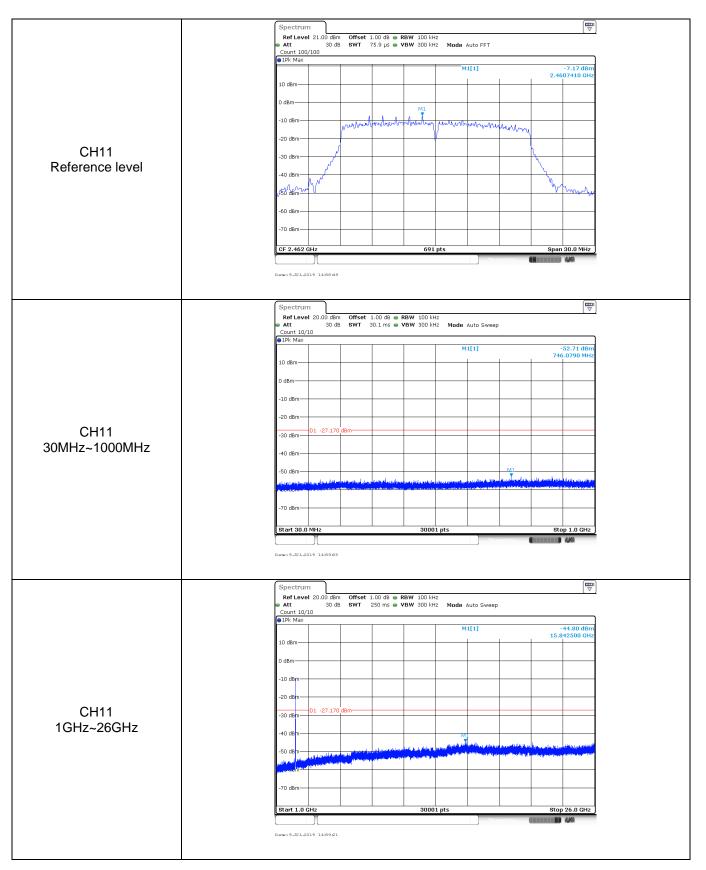
est Item:	SE	Type: 802.11 g
		Spectrum RefLevel 21.00 dBm Offset 1.00 dB ● RBW 100 kHz
		● Att 30 dB SWT 75.9 μs ● VBW 300 kHz Mode Auto FFT Count 100/100 ● TFK Max
		M1[1] -7.67 dBm 2.4057480 GHz
		10 dBm
		0 dBm
		-10 dBm manufacture pertendence and a second
01107		-20 d8m
CH01 Reference level		-30 d8m
Reference level		-40 dbm
		-50 dBm
		-60 dBm-
		-70 dBm-
		CF 2.412 GHz 691 pts Span 30.0 MHz
		Date: 9.70 L.2019 14:40.90
		Spectrum RefLevel 20.00 dBm Offset 1.00 dB ● RBW 100 kHz
		Att 30 dB SWT 30.1ms VBW 300 kHz Mode Auto Sweep Count 10/10
		●1Pk Max M1[1] -52.37 dBm
		10 dBm 755.4870 MHz
		0 dBm
		-10 dBm
		-20 dBm-
CH01		-30 dBm 01 -27.670 dBm
30MHz~1000MHz		-40 dBm-
		-50 dBm
		-70 dBm-
		Start 30.0 MHz         30001 pts         Stop 1.0 GHz
		Messering.
		Daw:9.JJL2019 14:0016
		Spectrum (🕎
		RefLevel 20.00 dBm Offset 1.00 dB ● RBW 100 kHz ● Att 30 dB SWT 250 ms ● VBW 300 kHz Mode Auto Sweep
		Count 10/10
		10 dBm 44.57 dBm 25.834167 GHz
		0 dBm
		-10 dgm
		-20 dBm
CH01 1GHz~26GHz		-30 d8m
		-40 dBm
		-70 dBm
		Start 1.0 GHz         30001 pts         Stop 26.0 GHz





Test Item:	SE	Type: 802.11 n(HT
		Spectrum
		● Att 30 dB SWT 75.9 μs ● VBW 300 kHz Mode Auto FFT Count 100/100 ● Tek Max
		M1[1] -6.46 dBm 2.4057480 GHz
		10 dBm
		O dBm
		-10 dBm - mutultantantantantantantantantantantantantant
CH01		-20 dBm
Reference level		-30 dBm
		-40 dBm
		Noo dem
		-60 dBm-
		-70 dBm-
		CF 2.412 GHz 691 pts Span 30.0 MHz
		Data: 9.JUL.2019 14:52:51
		Spectrum 🕎
		RefLevel 20.00 dBm Offset 1.00 dB
		●1Pk Max M1[1] -52.64 dBm
		10 dBm 871.2370 MHz
		0 dBm
		-10 dBm
		-20 dBm
CH01		-30 dBm
30MHz~1000MHz		-40 dBm
		-50 dBm
		-70 dBm
		Start 30.0 MHz 30001 pts Stop 1.0 GHz
		Nessuring
		Date:9JUL2019 14:33:07
		Spectrum 🕎
		RefLevel 20:00 dBm Offset 1:00 dB
		Count 10/10
		M1[1]44.52 dBm 15.925833 GHz
		0 dBm
		- 10 dgm
		-20 dgm
CH01		-30 dBm
1GHz~26GHz		-40 d8m
		- Source in the second se
		-70 dBm
		Start 1.0 GHz     30001 pts     Stop 26.0 GHz
		Dam:9.JUL.2019 14:53:23
	1	





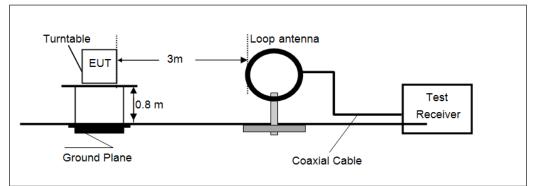
# 5.8. Spurious Emissions (radiated) LIMIT

# FCC CFR Title 47 Part 15 Subpart C Section 15.209

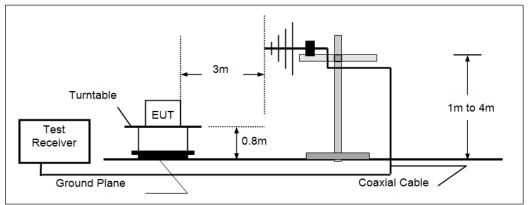
Frequency	Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	Quasi-peak
88MHz-216MHz	43.50	Quasi-peak
216MHz-960MHz	46.00	Quasi-peak
960MHz-1GHz	54.00	Quasi-peak
Above 1GHz	54.00	Average
	74.00	Peak

# **TEST CONFIGURATION**

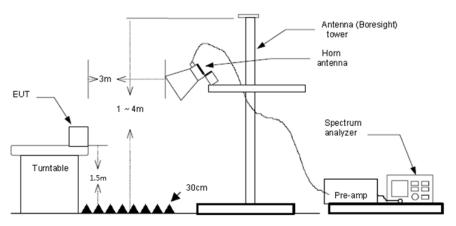
> 9kHz ~30MHz



# > 30MHz ~ 1GHz



Above 1GHz



# TEST PROCEDURE

- 1. The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
- 4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
- 5. Set to the maximum power setting and enable the EUT transmit continuously.
- 6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
    - (2) Below 1 GHz:
      - RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold; If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
    - (3) From 1 GHz to 10<sup>th</sup> harmonic: RBW=1MHz, VBW=3MHz Peak detector for Peak value. RBW=1MHz, VBW=3MHz RMS detector for Average value.

# TEST MODE:

Please refer to the clause 3.3

# TEST RESULTS

☑ Passed □ Not Applicable

Note:

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

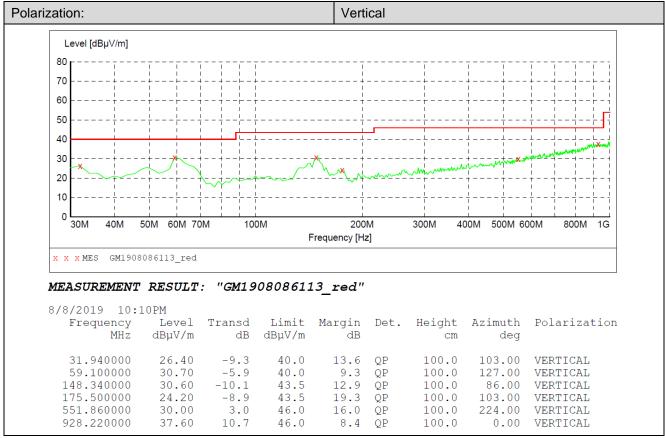
# > 9kHz ~ 30MHz

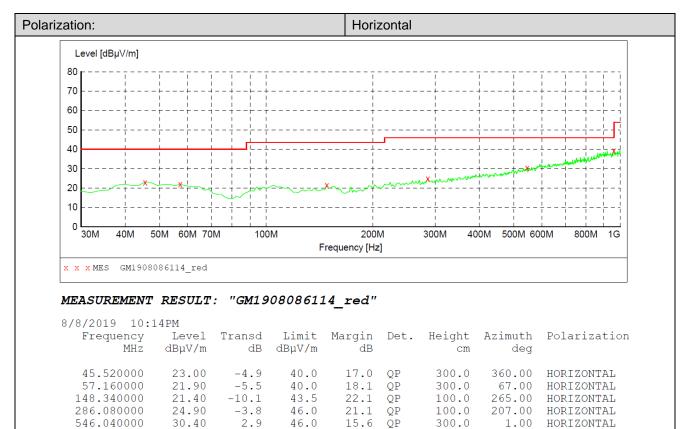
The EUT was pre-scanned the frequency band (9kHz~30MHz), found the radiated level lower than the limit, so don't show on the report.

#### > 30MHz ~1000MHz

Have pre-scan all modulation mode, found the 802.11b mode CH01 which it was worst case, so only the worst case's data on the test report.

#### > 30MHz ~ 1GHz





39.30

10.9

46.0

6.7 QP

959.260000

HORIZONTAL

271.00

300.0

# ➢ 1 GHz ~ 25 GHz

802.11b		CH01							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value		
3188.4375	34.37	0.78	35.15	74.00	38.85	Vertical	Peak		
4078.5000	33.39	3.20	36.59	74.00	37.41	Vertical	Peak		
5476.7500	31.29	9.03	40.32	74.00	33.68	Vertical	Peak		
7333.2500	31.37	16.16	47.53	74.00	26.47	Vertical	Peak		
3163.4688	34.26	0.65	34.91	74.00	39.09	Horizontal	Peak		
3999.1875	32.90	3.02	35.92	74.00	38.08	Horizontal	Peak		
5056.6875	31.29	8.39	39.68	74.00	34.32	Horizontal	Peak		
7234.8438	31.04	16.01	47.05	74.00	26.95	Horizontal	Peak		

802.11b		CH06							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value		
3078.2813	34.48	0.22	34.70	74.00	39.30	Vertical	Peak		
3966.8750	32.40	2.90	35.30	74.00	38.70	Vertical	Peak		
5228.5313	31.31	8.83	40.14	74.00	33.86	Vertical	Peak		
7446.3438	31.19	16.39	47.58	74.00	26.42	Vertical	Peak		
2850.6250	31.30	1.26	32.56	74.00	41.44	Horizontal	Peak		
4043.2500	31.99	3.12	35.11	74.00	38.89	Horizontal	Peak		
5119.8438	31.56	8.84	40.40	74.00	33.60	Horizontal	Peak		
7296.5313	30.21	16.05	46.26	74.00	27.74	Horizontal	Peak		

802.11b		CH11						
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value	
2806.5625	31.71	1.98	33.69	74.00	40.31	Vertical	Peak	
4000.6563	32.33	3.02	35.35	74.00	38.65	Vertical	Peak	
5109.5625	31.68	8.82	40.50	74.00	33.50	Vertical	Peak	
7234.8438	30.92	16.01	46.93	74.00	27.07	Vertical	Peak	
2806.5625	30.79	1.98	32.77	74.00	41.23	Horizontal	Peak	
4121.0938	32.21	3.37	35.58	74.00	38.42	Horizontal	Peak	
5224.1250	31.22	8.85	40.07	74.00	33.93	Horizontal	Peak	
7792.9688	30.49	17.29	47.78	74.00	26.22	Horizontal	Peak	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

#### Report No.: CHTEW19080058

802.11g		CH01							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value		
3110.5938	33.94	0.38	34.32	74.00	39.68	Vertical	Peak		
3911.0625	33.90	2.71	36.61	74.00	37.39	Vertical	Peak		
5260.8438	31.47	8.66	40.13	74.00	33.87	Vertical	Peak		
7399.3438	30.93	16.37	47.30	74.00	26.70	Vertical	Peak		
3060.6563	33.76	0.15	33.91	74.00	40.09	Horizontal	Peak		
4414.8438	30.58	4.98	35.56	74.00	38.44	Horizontal	Peak		
5115.4375	31.16	8.83	39.99	74.00	34.01	Horizontal	Peak		
7159.9375	30.87	15.77	46.64	74.00	27.36	Horizontal	Peak		

802.11g				CH06			
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value
3010.7188	34.73	-0.07	34.66	74.00	39.34	Vertical	Peak
4328.1875	31.86	4.09	35.95	74.00	38.05	Vertical	Peak
5445.9063	31.16	8.86	40.02	74.00	33.98	Vertical	Peak
8041.1875	31.42	18.25	49.67	74.00	24.33	Vertical	Peak
3170.8125	33.53	0.69	34.22	74.00	39.78	Horizontal	Peak
3902.2500	33.37	2.68	36.05	74.00	37.95	Horizontal	Peak
4823.1563	33.00	7.08	40.08	74.00	33.92	Horizontal	Peak
6653.2188	30.58	13.32	43.90	74.00	30.10	Horizontal	Peak

802.11g	CH11							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value	
2816.8438	31.18	1.82	33.00	74.00	41.00	Vertical	Peak	
3971.2813	32.18	2.92	35.10	74.00	38.90	Vertical	Peak	
5089.0000	31.47	8.70	40.17	74.00	33.83	Vertical	Peak	
7346.4688	30.55	16.20	46.75	74.00	27.25	Vertical	Peak	
3163.4688	33.99	0.65	34.64	74.00	39.36	Horizontal	Peak	
4201.8750	31.83	3.82	35.65	74.00	38.35	Horizontal	Peak	
5144.8125	31.24	8.88	40.12	74.00	33.88	Horizontal	Peak	
7315.6250	30.55	16.10	46.65	74.00	27.35	Horizontal	Peak	

Remark:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.

3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

802.11n(HT20) CH01							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value
2812.4375	31.10	1.89	32.99	74.00	41.01	Vertical	Peak
3649.6250	33.37	1.52	34.89	74.00	39.11	Vertical	Peak
4823.1563	34.21	7.08	41.29	74.00	32.71	Vertical	Peak
7024.8125	30.18	15.23	45.41	74.00	28.59	Vertical	Peak
3050.3750	34.58	0.10	34.68	74.00	39.32	Horizontal	Peak
4212.1563	31.14	3.81	34.95	74.00	39.05	Horizontal	Peak
5163.9063	30.52	8.92	39.44	74.00	34.56	Horizontal	Peak
7058.5938	31.37	15.32	46.69	74.00	27.31	Horizontal	Peak

802.11n(HT20) CH06							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value
2835.9375	31.70	1.50	33.20	74.00	40.80	Vertical	Peak
3702.5000	33.63	1.60	35.23	74.00	38.77	Vertical	Peak
4823.1563	34.46	7.08	41.54	74.00	32.46	Vertical	Peak
7018.9375	30.99	15.22	46.21	74.00	27.79	Vertical	Peak
2805.0938	30.46	2.01	32.47	74.00	41.53	Horizontal	Peak
3862.5938	32.11	2.42	34.53	74.00	39.47	Horizontal	Peak
5221.1875	30.97	8.87	39.84	74.00	34.16	Horizontal	Peak
7960.4063	30.26	17.84	48.10	74.00	25.90	Horizontal	Peak

802.11n(HT20	2.11n(HT20) CH11							
Frequency (MHz)	Read Level (dBuV/m)	Factor (dB/m)	Level (dBuV/m)	Limit Line (dBuV/m)	Margin(dB)	Polarization	Test value	
2843.2813	32.97	1.38	34.35	74.00	39.65	Vertical	Peak	
3642.2813	33.36	1.51	34.87	74.00	39.13	Vertical	Peak	
5081.6563	31.29	8.63	39.92	74.00	34.08	Vertical	Peak	
6547.4688	31.26	12.82	44.08	74.00	29.92	Vertical	Peak	
3137.0313	32.83	0.51	33.34	74.00	40.66	Horizontal	Peak	
4021.2188	31.29	3.07	34.36	74.00	39.64	Horizontal	Peak	
5144.8125	30.99	8.88	39.87	74.00	34.13	Horizontal	Peak	
6958.7188	30.35	14.73	45.08	74.00	28.92	Horizontal	Peak	

Remark:

- 1. Final Level = Receiver Read level + Antenna Factor + Cable Loss Preamplifier Factor
- 2. The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- 3. The emission levels of other frequencies(test frequency band is 1GHz to 25GHz) are very lower than the limit and not show in test report.

# 6. TEST SETUP PHOTOS

# Conducted Emissions (AC Mains)

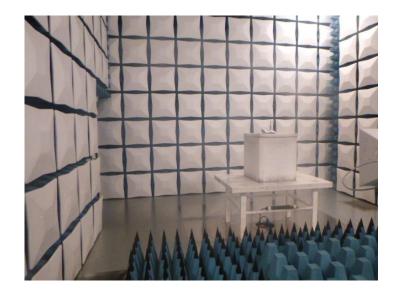


## **Radiated Emissions**





Shenzhen Huatongwei International Inspection Co., Ltd.



# 7. EXTERANAL AND INTERNAL PHOTOS

Reference to the test report No. CHTEW19080055

-----End of Report------