

# FCC TEST REPORT

Test report On Behalf of Acer India Pvt Ltd. For Tablet PC Model No.: Acer One 8 T4-82L

FCC ID: 2AMY3-8T482L

Prepared for : Acer India Pvt Ltd. Embassy Heights 6th Floor, No.13, Magrath Road, (Next to Hosmat Hospital) Bangalore, 560025, India

Prepared By : Shenzhen HUAK Testing Technology Co., Ltd. 1F, B2 Building, JunfengZhongchengZhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China

 Date of Test:
 Jul. 31, 2020 ~Aug. 12, 2020

 Date of Report:
 Aug. 12, 2020

 Report Number:
 HK2007272064-3E



# **TEST RESULT CERTIFICATION**

Applicant's name	Acer India Pvt Ltd.
Address	Embassy Heights 6th Floor, No.13, Magrath Road, (Next to Hosmat Hospital) Bangalore, 560025, India
Manufacture's Name	SHENZHEN YUKO TECHNOLOGY CO., LTD
Address	6TH FLOOR, A9 BUILDING TIANRUI INDUSTRIAL PARK, FUYUAN 1ST RD, BAO'AN, SHENZHEN CHINA
Product description	
Trade Mark:	Acer
Product name:	Tablet PC
Model and/or type reference .:	Acer One 8 T4-82L
Standards	FCC Rules and Regulations Part 15 Subpart C Section 15.247 ANSI C63.10: 2013

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Date of	Test	-
Dute of		•

Date (s) of performance of tests:	Jul. 31, 2020 ~Aug. 12, 2020
Date of Issue	Aug. 12, 2020
Test Result	Pass

**Testing Engineer** 

: Goog Finl (Gary Qian) : Edan Mu

**Technical Manager** 

(Eden Hu)

Authorized Signatory :

Jason Zhou

(Jason Zhou)



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# \*\* Modifited History \*\*

Revison	Description	Issued Data	Remark
Revsion 1.0	Initial Test Report Release	Aug. 12, 2020	Jason Zhou



# 1. Test Result Summary

# **1.1. TEST PROCEDURES AND RESULTS**

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247 (c)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3)	PASS
6dB Emission Bandwidth	§15.247 (a)(2)	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	1§5.247(d)	PASS
Spurious Emission	§15.205/§15.209	PASS

#### Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

# **1.2. TEST FACILITY**

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address 1F, B2 Building, JunfengZhongchengZhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China



# **1.3. Measurement Uncertainty**

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%



# 2. EUT Description

# 2.1. GENERAL DESCRIPTION OF EUT

Equipment	Tablet PC
Model Name	Acer One 8 T4-82L
Serial No.	N/A
Model Difference	N/A
FCC ID	2AMY3-8T482L
Antenna Type	Internal Antenna
Antenna Gain	1dBi
Operation frequency	802.11b/g/n 20:2412~2462 MHz 802.11n 40: 2422~2452MHz
Number of Channels	802.11b/g/n20: 11CH 802.11n 40: 7CH
Modulation Type	CCK/OFDM/DBPSK/DAPSK
PowerSource	DC 3.8V from battery or DC 5V from adapter
Power Rating	DC 3.8V from battery or DC 5V from adapter



### **Carrier Frequency of Channels**

	Channel List for 802.11b/802.11g/802.11n (HT20)						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

	Channel List For 802.11n (HT40)						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
		04	2427	07	2442		
		05	2432	08	2447		
03	2422	06	2437	09	2452		

#### 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:

### 2.2. Operation of EUT during testing

**Operating Mode** 

The mode is used: Transmitting mode for 802.11b/802.11g/802.11n (HT20)

Low Channel: 2412MHz Middle Channel: 2437MHz High Channel: 2462MHz

The mode is used: Transmitting mode for 802.11n (HT40)

Low Channel: 2422MHz Middle Channel: 2437MHz High Channel: 2452MHz



# 2.3. DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and radiation below 1GHz testing:



Operation of EUT during Above1GHz Radiation testing:



 Adapter information Model: K-T100S02000U Input: 100-240V, 50/60Hz, 0.35A Output:5V, 2000mA

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is Z position



# 3. enera Information

### 3.1. Test environment and mode

Operating Environment:			
Temperature:	25.0 °C		
Humidity:	56 % RH		
Atmospheric Pressure:	1010 mbar		
Test Mode:			
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)		
The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground			

plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.For the full battery state and The output power to the maximum state.

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 in lowest channel, and found the follow list which it was worst case.

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)	6.5Mbps
802.11n(H40)	13.5Mbps

#### **Final Test Mode:**

Operation mode:	Keep the EUT in continuous transmitting
	with modulation

1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

2.According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20), 13.5Mbps for 802.11(H40). Duty cycle setting during the transmission is 98.5% with maximum power setting for all modulations.



### 3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



# 4. Test Results and Measurement Data

# 4.1. Conducted Emission

### **Test Specification**

Test Requirement:	FCC Part15 C Section 15.207			
Test Method:	ANSI C63.10:2013			
Frequency Range:	150 kHz to 30 MHz			
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto			
Limits:	Frequency range (MHz)         Limit (dBuV)           0.15-0.5         66 to 56*         56 to 46*           0.5-5         56         46           5-30         60         50			
Test Setup:	Reference Plane 40cm 80cm Filter AC power Filter AC power E.U.T AC power Filter AC power EMI Receiver Remark: E.U.T Equipment Under Test LISN Line Impedence Stabilization Network Test table height=0.8m			
Test Mode:	Charging + transmitting	g with modulation		
Test Procedure:	<ol> <li>Charging + transmitting with modulation</li> <li>The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</li> <li>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).</li> <li>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.</li> </ol>			
Test Result:	PASS			



#### **Test Instruments**

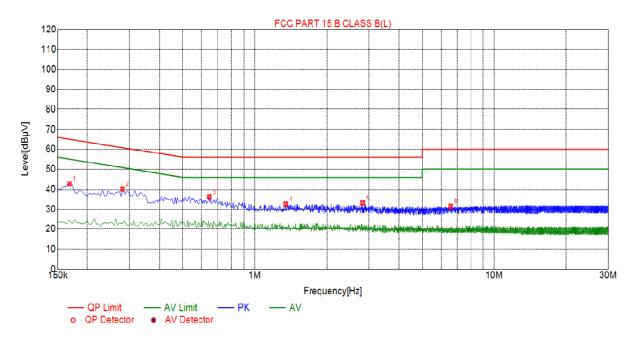
	Conducted Emission Shielding Room Test Site (843)						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due		
Receiver	R&S	ESCI 7	HKE-010	Dec. 26, 2019	Dec. 25, 2020		
LISN	R&S	ENV216	HKE-002	Dec. 26, 2019	Dec. 25, 2020		
Coax cable (9KHz-30MHz)	Times	381806-002	N/A	Dec. 26, 2019	Dec. 25, 2020		
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A		

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



# 4.2. Test Result

Test Specification: Line



Sus	Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре	
1	0.1680	42.93	10.01	65.06	22.13	32.92	PK	L	
2	0.2805	40.12	10.04	60.80	20.68	30.08	PK	L	
3	0.6450	36.33	10.05	56.00	19.67	26.28	PK	L	
4	1.3470	32.51	10.10	56.00	23.49	22.41	PK	L	
5	2.8230	33.15	10.21	56.00	22.85	22.94	PK	L	
6	6.5760	31.43	10.21	60.00	28.57	21.22	PK	L	

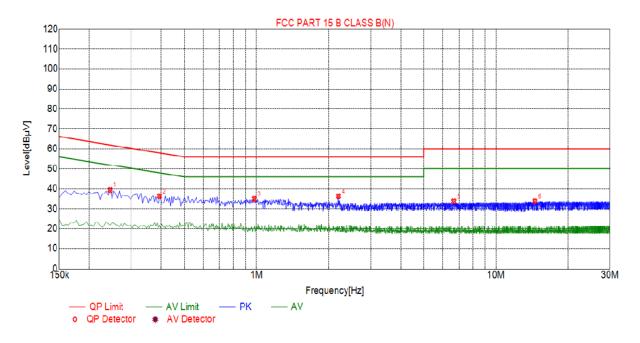
Remark: Margin = Limit - Level Correction factor = Cable lose + LISN insertion loss Level=Test receiver reading + correction factor

#### Notes:

- 1. An initial pre-scan was performed on the line 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
- 4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.



#### Test Specification: Neutral



Sus	Suspected List								
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Туре	
1	0.2445	39.31	10.03	61.94	22.63	29.28	PK	N	
2	0.3930	36.19	10.04	58.00	21.81	26.15	PK	N	
3	0.9780	34.85	10.06	56.00	21.15	24.79	PK	Ν	
4	2.1975	36.16	10.17	56.00	19.84	25.99	PK	Ν	
5	6.6705	33.66	10.21	60.00	26.34	23.45	PK	Ν	
6	14.5410	33.68	9.95	60.00	26.32	23.73	PK	N	

Remark: Margin = Limit - Level Correction factor = Cable lose + LISN insertion loss Level=Test receiver reading + correction factor

#### Notes:

1. An initial pre-scan was performed on the line 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.

If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.



# 4.3. Maximum Conducted Output Power

# **Test Specification**

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)				
Test Method:	KDB 558074				
Limit:	30dBm				
Test Setup:	Power meter EUT				
Test Mode:	Transmitting mode with modulation				
Test Procedure:	<ol> <li>Thansmitting mode with modulation</li> <li>The testing follows the Measurement Procedure of FCC KDB 558074 D01 15.247 Meas Guidance v05r02.</li> <li>The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Measure the Peak output power and record the results in the test report.</li> </ol>				
Test Result:	PASS				

### **Test Instruments**

RF Test Room						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	Dec. 25, 2020	
Power meter	Agilent	E4419B	HKE-085	Dec. 26, 2019	Dec. 25, 2020	
Power Sensor	Agilent	E9300A	HKE-086	Dec. 26, 2019	Dec. 25, 2020	
RF cable	Times	1-40G	HKE-034	Dec. 26, 2019	Dec. 25, 2020	
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	Dec. 25, 2020	

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).





### Test Data

TX 802.11b Mode						
Test Frequency		Maximum Peak Conducted Output Power	Conducted Output Power(AV)	LIMIT		
Channe	(MHz)	(dBm)	(dBm)	dBm		
CH01	2412	17.21	16.85	30		
CH06	2437	17.50	17.49	30		
CH11	2462	16.82	16.1	30		
		TX 802.11g Mode				
CH01	2412	15.24	14.72	30		
CH06	2437	15.13	14.89	30		
CH11	2462	15.02	14.78	30		
		TX 802.11n20 Mod	e			
CH01	2412	13.58	13.44	30		
CH06	2437	13.77	13.64	30		
CH11	2462	13.62	13.45	30		
		TX 802.11n40 Mod	e			
CH03	2422	12.66	12.28	30		
CH06	2437	13.14	12.9	30		
CH09	2452	12.93	12.74	30		



## 4.4. Emission Bandwidth

# **Test Specification**

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074
Limit:	>500kHz
Test Setup:	
	Spectrum Analyzer
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol> <li>The testing follows FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.</li> <li>Measure and record the results in the test report.</li> </ol>
Test Result:	PASS

### **Test Instruments**

RF Test Room						
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due	
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	Dec. 25, 2020	
RF cable	Times	1-40G	HKE-034	Dec. 26, 2019	Dec. 25, 2020	
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	Dec. 25, 2020	

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



### Test data

Test channel	6dB Emission Bandwidth (MHz)					
Test channer	802.11b	802.11g	802.11n(H20)	802.11n(H40)		
Lowest	7.050	10.11	10.12	15.14		
Middle	8.592	15.37	15.43	36.42		
Highest	7.111	8.910	8.895	10.19		
Limit:	>500k					
Test Result:		Р	ASS			

Test plots as follows:



#### 802.11b Modulation

#### Lowest channel



#### Middle channel







#### 802.11g Modulation

#### Lowest channel



#### Middle channel

flent Spectrum Analyzer - Oc RL RE 50.0		SENSE:INT	ALIGNAUTO 11:11:06 AM AUGO	4.2020
enter Freq 2.4370	00000 GHz	Center Freq: 2.437000000 G		Frequency
Ref Offse dB/div Ref 18.6	t 8.64 dB	PRACE. 20 00	Mkr1 2.43828 0 2.8088 d	
64 64	pholub	alanhart myren han han han sa	m da	Center Fre 2.437000000 Gł
1.4 1.4 1.4 1.4 1.4	Works and		and the second s	Ann.
.4 .4				
enter 2.437 GHz Res BW 100 kHz		#VBW 300 kHz	Span 40 Sweep 3.86	7 me CF Ste
	Ccupied Bandwidth 16.564 MHz		20.0 dBm	Auto M
Transmit Freq Er	ror -2.861	kHz OBW Power	99.00 %	0
x dB Bandwidth	15.37	MHz xdB	-6.00 dB	





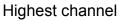
#### 802.11n (HT20) Modulation

#### Lowest channel



#### Middle channel

gilent Spectrum Analyzer - Occupied BV		SENSE:INT					
RL RF 50 R AC Center Freq 2.437000000	GHz Cente	r Freq: 2.437000000 GHz	Freq: 2.437000000 GHz Radio Std: N ee Run Avg[Hol4: 1/1				
Ref Offset 8.64 dE 0 dB/div Ref 18.64 dBm			Mkr		828 GHz 89 dBm		
36	mulunturkastrostart	1 In your hardburghardweeting	h			Center 2.43700000	
1.4 1.4 1.4 percentritored of the start of t			hundred a	www.www.	and a state of the		
1.4							
1.4							
enter 2.437 GHz Res BW 100 kHz	1	#VBW 300 kHz			an 40 MHz 3.867 ms	4.00000	
Occupied Bandwidth		Total Power	20.3	dBm		Auto	Ma
17	.719 MHz					Freq	Offs
Transmit Freq Error	3.206 kHz	OBW Power	99	.00 %			01
x dB Bandwidth	15.43 MHz	x dB	-6.1	00 dB			
30			STATUS				







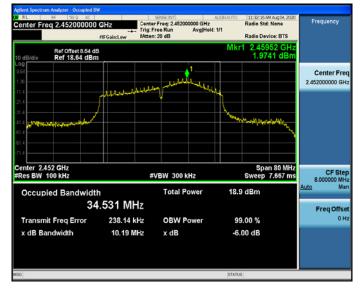
#### 802.11n (HT40) Modulation

	#IFGain:Low#A	ig: Free Run Avg Hol tten: 20 dB	4: 1/1 Radio Device: BT	Frequency
Ref Offsei 10 dB/div Ref 18.6			Mkr1 2.41576 0 2.0271 d	
8.64 1.36	لمسمسهم	alita politicalitation		Center Fre 2.422000000 GH
11.4 21.4 31.4				
41.4			Theorem for Marin and	
Center 2.422 GHz			Span 80	
#Res BW 100 kHz		#VBW 300 kHz	Sweep 7.667	
Occupied Band		Total Power	18.9 dBm	Auto Ma
	35.005 MHz	0.514/ 5	00 00 V	Freq Offs
Transmit Freq En			99.00 %	
x dB Bandwidth	15.14 MHz	x dB	-6.00 dB	

#### Lowest channel

### Middle channel

enter Freq 2.4370000	000 GHz Cent	sense INT ter Freq: 2.437000000 GHz Free Run Avg[Hold: en: 20 dB	Radio Ste		Frequency
Ref Offset 8.6 0 dB/div Ref 18.64 (			Mkr1 2.45 -0.322	452 GHz 295 dBm	
og 3.64 1.36	مللسلعالية	ماملىلىمارلىمارلىمىم يعط	2 <sup>1</sup>		Center Fre 2.437000000 GH
21.4 11.4	w		wind any delayer	in the second	
Center 2.437 GHz			Sn:	an 80 MHz I	
Res BW 100 kHz		#VBW 300 kHz		7.667 ms	CF Ste 8.000000 MH
Occupied Bandw	<sub>idth</sub> 36.593 MHz	Total Power	19.3 dBm		Auto Ma Freq Offse
Transmit Freq Error	7.873 kHz	OBW Power	99.00 %		0 H
x dB Bandwidth	36.42 MHz	x dB	-6.00 dB		





# 4.5. Power Spectral Density

# **Test Specification**

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol> <li>The testing follows Measurement procedure 10.2 method PKPSD of FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02</li> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Make the measurement with the spectrum analyzer's resolution bandwidth (RBW): 3 kHz ≤ RBW ≤ 100 kHz. Video bandwidth VBW ≥ 3 x RBW. Set the span to at least 1.5 times the OBW.</li> <li>Detector = Peak, Sweep time = auto couple.</li> <li>Employ trace averaging (Peak) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level.</li> <li>Measure and record the results in the test report.</li> </ol>
Test Result:	PASS

### **Test Instruments**

	RF Test Room										
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due						
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	Dec. 25, 2020						
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 26, 2019	Dec. 25, 2020						
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	Dec. 25, 2020						
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A						



**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

### Test data

EUT Set Mode	Channel	Result (dBm/30kHz)	Result (dBm/3kHz)
	Lowest	3.87	-6.13
802.11b	Middle	2.56	-7.44
	Highest	3.61	-6.39
	Lowest	-1.55	-11.55
802.11g	Middle	-2.11	-12.11
	Highest	-1.13	-11.13
	Lowest	-1.48	-11.48
802.11n(H20)	Middle	-5.26	-15.26
	Highest	-0.56	-10.56
	Lowest	-3.12	-13.12
802.11n(H40)	Middle	-5.96	-15.96
	Highest	-2.94	-12.94
PSD test result (dBm/3	kHz)= PSD test i	result (dBm/30kHz)-10	
Limit: 8dBm/3kHz			
Test Result:		PASS	

Test plots as follows:



#### 802.11b Modulation

Lowest channel



Middle channel







#### 802.11g Modulation

Lowest channel



#### Middle channel





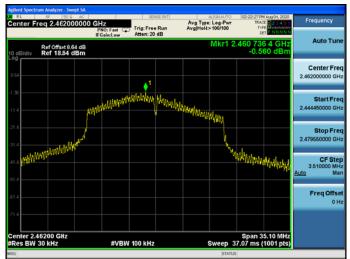


#### 802.11n (HT20) Modulation

Lowest channel enter Freq 2.412000000 GHz Frequency Trig: Free Run Atten: 20 dB Avg Type: Log-Pwr Avg|Hold>100/100 Auto Tur Ref Offset 8.64 dB Ref 18.64 dBm 228 5 G 1.481 dE Center Freq 2.412000000 GHz **♦**<sup>1</sup> Start Freq 2.394450000 GHz иłр Stop Freq 2.429550000 GHz tashanyiliyayay CF Step 3.510000 MHz Wheekyahala Ma Freq Offse 0 H nter 2.41200 GHz Is BW 30 kHz Span 35.10 MHz Sweep 37.07 ms (1001 pts) #VBW 100 kHz

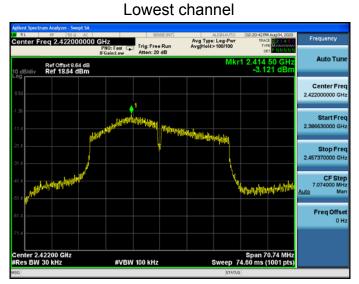
Middle channel







#### 802.11n (HT40) Modulation



Middle channel







# 4.6. Conducted Band Edge and Spurious Emission Measurement

# **Test Specification**

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074
Limit:	In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB / 30dB relative to the maximum PSD level in 100 kHz by RF conducted measurement and radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).
Test Setup:	
	Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol> <li>The testing follows FCC KDB Publication 558074 D01 15.247 Meas Guidance v05r02.</li> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).</li> <li>Measure and record the results in the test report.</li> <li>The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</li> </ol>
Test Result:	PASS



### **Test Instruments**

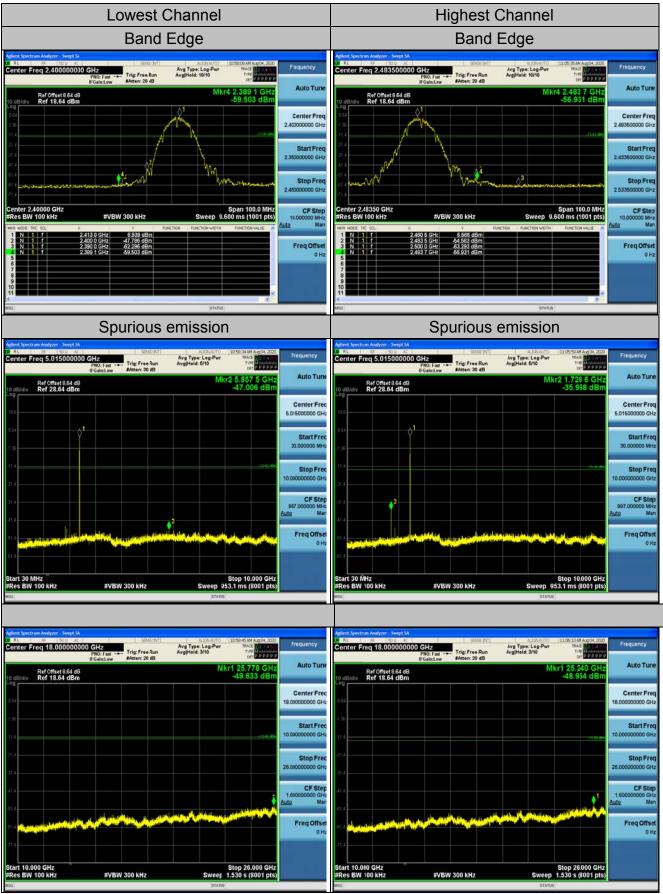
	RF Test Room										
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due						
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	Dec. 25, 2020						
High pass filter unit	Tonscend	JS0806-F	HKE-055	Dec. 26, 2019	Dec. 25, 2020						
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 26, 2019	Dec. 25, 2020						
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 26, 2019	Dec. 25, 2020						
RF test software	Tonscend	JS1120-B Version 2.6	HKE-083	N/A	N/A						

**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



### Test Data

#### 802.11b Modulation

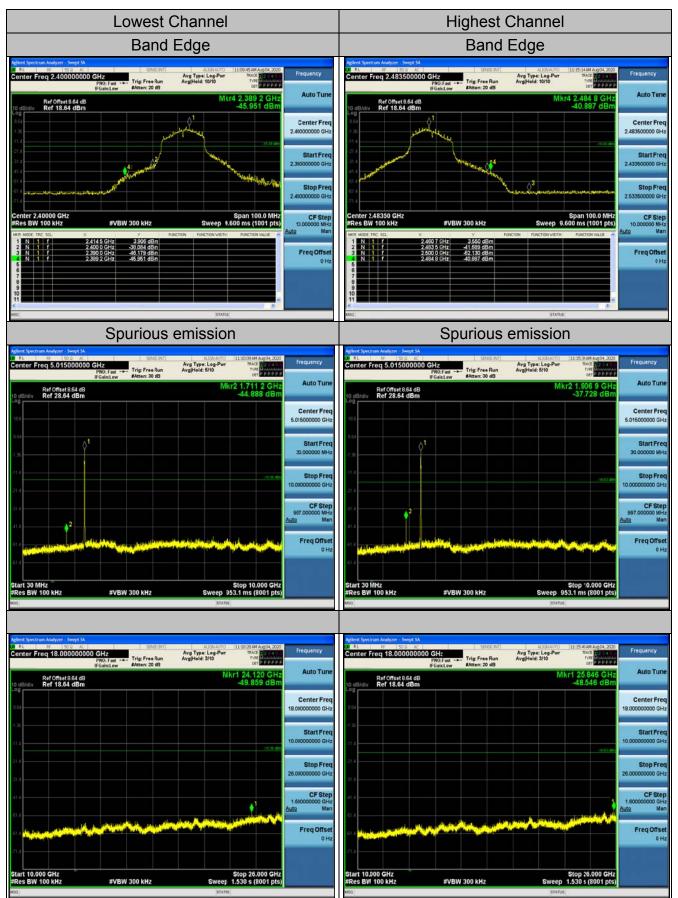




					middle	Chan	nel					
				S	purious	emis	sion					
Aglent Spectrum Analyzer - Swept DE 13. 2010 2010 2010 2010 Center Freq 5.0150001 Ref Offset 9.54 4	000 GHz PN0: Fast ++ IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold: 5/10	11:01:36 AM Aug 04, 2020 TRACE 12:2:4 4 TYPE MALAULAN CET D P D D P 12:4.874 2:GHz	Frequency Auto Tune	CO RL	req 18.000000	000 GHz PN0:Fast +++ IFGairLow	SDAE 947 Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pwr Avg Held: 3/10	11:01:47.4M.Aug04; 2020 TACE 12: 4 4 Fyre 12: 9 4 10 fyre 12: 9 9 9 9 9 9 9 fer 1 25:210 GHz	Frequency Auto Tune
10 dBJdiv Ref 28.54 dB	m			-43.221 dBm	Center Freq 5.015000000 GHz	10 dB/dly Log	Ref 18.64 dBn				-49 <u>.</u> 624 dBm	Center Free 18.00000000 GH
1.36	¢ <sup>1</sup>				Start Freq 30.000000 MHz	-1.36					-12.90 dbs	Start Fre 10.000000000 GH
(21.4				- 12 50 404	Stop Freq 10.00000000 GHz	-21,4						Stop Fre 26.00000000 GH
41.4		¢ <sup>2</sup>	a		CF Step 967.000000 MHz <u>Auto</u> Man Freg Offset	-41)4 -61,4		معاديه	Suffre, als Links	م النام الله المناطقة	- iteration of the second	CF Ste 1.60000000 GH Auto Ma Freq Offse
51.4 (51.4	ni anan nina ani <sub>leh</sub> a				0 Hz	-61.4 <b>- 14 - 14</b> -71,4:						Preq Onse 0 H
Start 30 MHz #Res BW 100 kHz	#VBW	300 kHz	Sweep 9:	Stop 10.000 GHz 53.1 ms (8001 pts)		Start 10.0 #Res BW		#VBW	300 kHz	Sweep	Stop 26.000 GHz 1.530 s (8001 pts)	



#### 802.11g Modulation

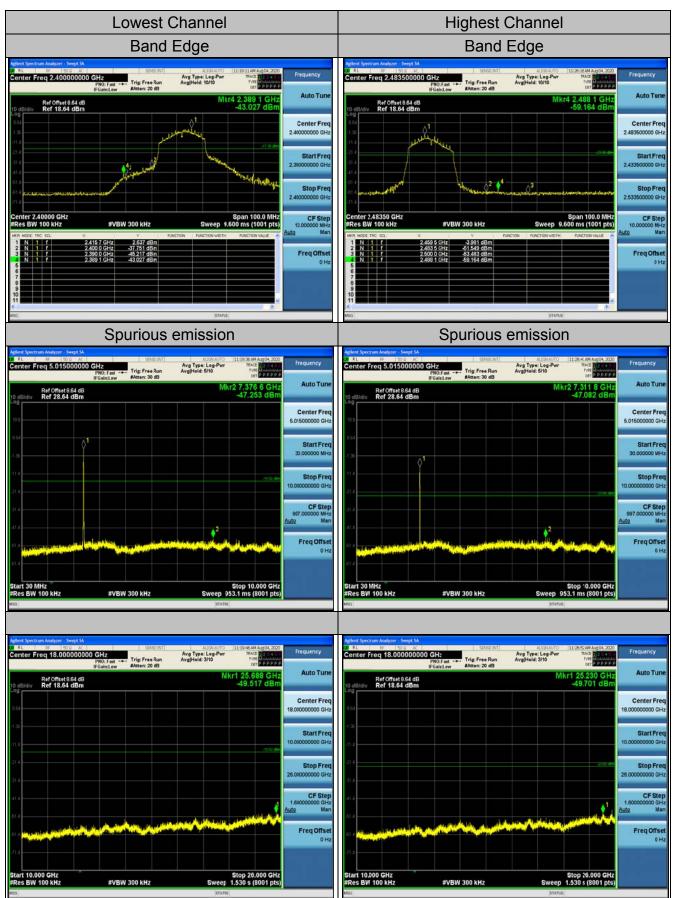




					middle	Chan	nel					
				S	purious	emis	sion					
Aglent Spectrum Analyzer - Swept TRL RE 500 A Center Freq 5.0150000	ic	Trig: Free Run	AUDHAUTO Avg Type: Log-Pwr Avg Hold: 5/10	11:12:25 AM Aug 04, 2020 TRACE 12:24 AM TYPE MARKED 2: 24 AM DET 2: 24 P. 24 P	frequency	LOO RL	rum Analyzer - Swe 89 50 0 req 18.0000	AC	Trig: Free Run #Atten: 20 dB	Avg Type: Log-Pw Avg[Hold: 3/10	11:12:45 AM Aug 04, 2020 T TACE 12:24 AU TYPE DET P P P P P	Frequency
Ref Offset 9.64 d Ref 28.64 dB	8		Mk	r2 1.728 6 GHz -38.697 dBm	Auto Tune	10 dB/div	Ref Offset 8.6 Ref 18.64 d	4 dB			Mkr1 25.224 GHz -50.210 dBm	Auto Tune
18.6					Center Freq 5.015000000 GHz	8.64						Center Fred 18.00000000 GH:
1.36	¢1				Start Freq 30.000000 MHz	-1.35						Start Fre 10.000000000 GH
21.4				- 37.26 dbs	Stop Freq 10.00000000 GHz	-21,4						Stop Free 25.000000000 GH
31.4 <b>2</b>					CF Step 997.000000 MHz Auto Man	-41,4 -61,4						CF Stej 1.600000000 GH Auto Mar
	Winner		dintra atal forma di	وبالجرية المريدان	Freq Offset 0 Hz	et 4	and the state of the	موالي المراجع المراجع مراجع المراجع ال	الغريب بالمهالين	, Particip Audition 2		Freq Offse 0 H
Start 30 MHz #Res BW 100 kHz	#VBM	V 300 kHz	Sweep 9	Stop 10.000 GHz 53.1 ms (8001 pts)		Start 10.0 #Res BW		#VE	300 kHz	Swee	Stop 26.000 GHz p 1.530 s (8001 pts)	
50			STATUS			MSS				STA	US	



#### 802.11n (HT20) Modulation

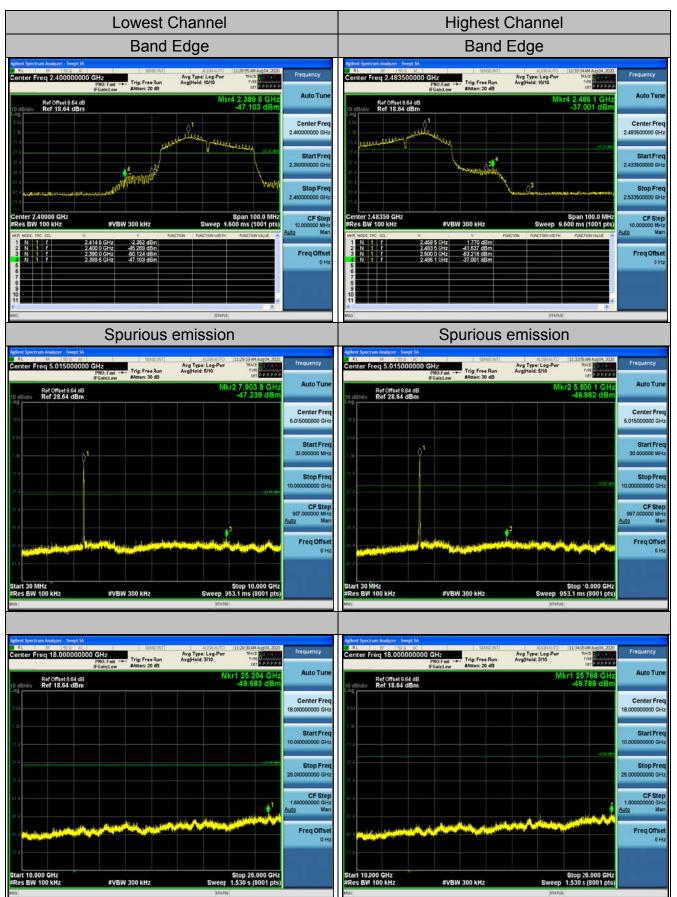




	middle Ch	annel				
S	purious er	nission				
Glent Spectrum Analyzer - Swept 9. ■ R. #F 1900 at ■ R	Frequency Cer	nt Spedrum Analyzer - Swept SA IL 85 50 0 40 hter Freq 18.00000000		Avg Type: Log-Pwr Avg Hold: 3/10	2156 AM Aug 04, 2020 TIACE 12 2 4 4 TYPE MINIMUM DET P P P P P P	Frequency
Ref Offset 9.54 d3 Mkr2 1.727 4 GHz o dBidiy Ref 28.54 dBm -43.355 dBm	Auto Tune	Ref Offset 8.64 dB Bidly Ref 18.64 dBm		Mkr1	25.024 GHz 50.357 dBm	Auto Tune
186	Center Freq 5.015000000 GHz					Center Fred 18.00000000 GHz
138	Start Freq 30.000000 MHz					Start Free 10.00000000 GH
11.4	Stop Freq 10.000000000 GHz -31.4				-20 97 albe	Stop Freq 26.00000000 GHz
31: X	CF Step 967.000000 MHz Auto Man				↓ <sup>1</sup>	CF Step 1.600000000 GH <u>Auto</u> Mar
	Freq Offset 0 Hz	المستخلف والمعادية	يتجاهده والمترك والمتلحة المتحيد والمتحي	antician a state and a state of the state of t		Freq Offse 0 H
Start 30 MHz Stop 10.000 GHz Res BW 100 kHz #VBW 300 kHz Sweep 953.1 ms (8001 pts)		rt 10.000 GHz IS BW 100 kHz	#VBW 300 kHz	Sweep 1.5	op 26.000 GHz 30 s (8001 pts)	
80. 814708	MSG			STATUS		



#### 802.11n (HT40) Modulation





				middle	Chanr	nel					
			S	purious	emis	sion					
glient Spectrum Analyzer - Swept SA RL RS 500 AC Center Freq 5.015000000		ALEXANTO Avg Type: Log-Pwr se Run Avg[Hold: 5/10	11:31:33 AM Aug 04, 2020 TRACE 12:33 4 15	Frequency	LOO RL	n Analyzer - Swept SA ISI III III III III III III III IIII IIII IIII III III III IIII IIII IIII	00 GHz	SPACE ANT	ALYONAUTO Avg Type: Log-Pwr Avg[Hold: 3/10	11:31:44 AM Aug 04, 2020 TRACE D 2 4 4	Frequency
Ref Offset 9.64 d3 0 dB/dly Ref 28.64 dBm	IFGain:Low #Atten:	30 dB	r2 3.154 3 GHz -47.624 dBm	Auto Tune	10 dB/div	Ref Offset 8.64 dB Ref 18.64 dBm	IFGainLow #At	ten: 20 dB		kr1 25.250 GHz -49.503 dBm	Auto Tu
10.6				Center Freq 5.015000000 GHz	8.64						Center Fr 18.000000000 G
36				Start Freq 30.000000 MHz	-1.36						Start Fr 10.000000000
14			3034.004	Stop Freq 10.00000000 GHz	-21,4					-50.24 @	Stop Fr 26.00000000 0
				CF Step 997.000000 MHz Auto Man	-41.4					<b>∮</b> 1.	CF Si 1.600000000 C Auto
	2 A Marine and a stability	a in the state of the	وشاطلونيا يعفروانونا	Freq Offset 0 Hz	et.4	a the set	بينا المدخور المريق	المنتقيبية الجبه	anis y Providence of a		Freq Offs 0
itart 30 MHz			Stop 10.000 GHz		371.4 Start 10.00	0 GHz				Stop 26.000 GHz	
Res BW 100 kHz	#VBW 300 kH	z Sweep 9: status	53.1 ms (8001 pts)		#Res BW 1		#VBW 300	kHz	Sweep	1.530 s (8001 pts)	

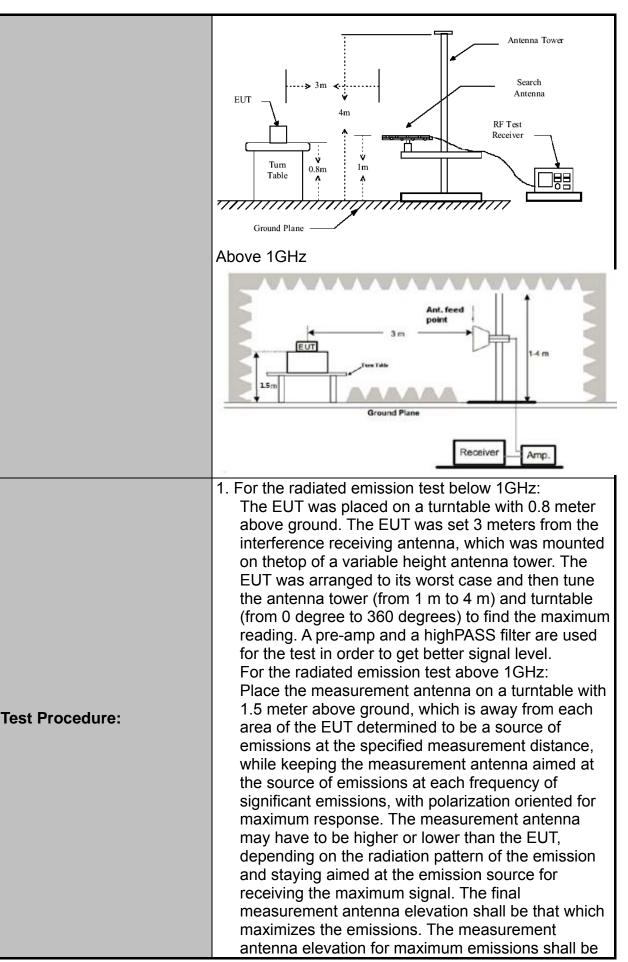


# 4.7. Radiated Spurious Emission Measurement

# **Test Specification**

Test Method:       ANSI C63.10: 2013         Frequency Range:       9 kHz to 25 GHz         Measurement Distance:       3 m         Antenna Polarization:       Horizontal & Vertical         Operation mode:       Transmitting mode with modulation         Receiver Setup:       Frequency       Detector       RBW       VBW       Remark         30MHz-1GHz       Quasi-peak       9kHz       30kHz       Quasi-peak       Value         30MHz-1GHz       Quasi-peak       10kHz       30kHz       Quasi-peak Value         30MHz-1GHz       Quasi-peak       10kHz       Average Value         30MHz-1GHz       Quasi-peak       10kHz       Average Value         30MHz-1GHz       Quasi-peak       10kHz       Average Value         30MHz-1GHz       Peak       1MHz       10hz       Average Value         4bove 1GHz       Peak       1MHz       300       30         1.705-30       30       30       30       30         3.88_216       150       3       216-960       200       3         Above 960       500       3       Average       Detector (meters)       Above 960       3         Above 1GHz       500       3       Average <th>Test Requirement:</th> <th>FCC Part15</th> <th>C Secti</th> <th>on</th> <th>15.209</th> <th></th> <th></th> <th></th>	Test Requirement:	FCC Part15	C Secti	on	15.209			
Measurement Distance:       3 m         Antenna Polarization:       Horizontal & Vertical         Operation mode:       Transmitting mode with modulation         Receiver Setup:       Image: Strate and Strat	Test Method:	ANSI C63.10	): 2013					
Antenna Polarization:       Horizontal & Vertical         Operation mode:       Transmitting mode with modulation         Receiver Setup:       Frequency       Detector       RBW       VBW       Remark         30MHz       150KHz       Quasi-peak       200Hz       11kHz       Quasi-peak Value         30MHz       150KHz       Quasi-peak       9kHz       300KHz       Quasi-peak Value         30MHz       160KHz       Quasi-peak       120KHz       Quasi-peak Value         Above 1GHz       Peak       1MHz       300KHz       Quasi-peak Value         0.009-0.490       2400F(KHz)       300       30         0.009-0.490       2400F(KHz)       300       30         0.490-1.705       24000F(KHz)       30       30         0.490-1.705       24000F(KHz)       30       30         0.490-1.705       24000F(KHz)       30       30         1.705-30       30       3       30       3         1.88-216       150       3       3       8-216       150       3         1.6960       200       3       3       3       4       Above 960       500       3       Average         Above 1GHz       500	Frequency Range:	9 kHz to 25 (	GHz					
Operation mode:       Transmitting mode with modulation         Frequency       Detector       RBW       VBW       Remark         9kHz       150kHz       Quasi-peak       20Hz       1kHz       Quasi-peak       20Hz         30MHz       Quasi-peak       9kHz       30kHz       Quasi-peak       Nature       Quasi-peak       Yalue         30MHz       30MHz       19Hz       19Hz       19Hz       19Hz       19Hz       19Hz       Quasi-peak       11HHz       30Hz       Quasi-peak       Value         Above 1GHz       Peak       11HHz       30HHz       10Hz       Average       30 <td< th=""><th>Measurement Distance:</th><th>3 m</th><th></th><th></th><th></th><th></th><th></th><th></th></td<>	Measurement Distance:	3 m						
Frequency       Detector       RBW       VBW       Remark         9kHz       150kHz       Quasi-peak       200Hz       1kHz       Quasi-peak Value         30MHz       Quasi-peak       9kHz       30kHz       Quasi-peak Value         30MHz       Quasi-peak       120KHz       Quasi-peak Value         30MHz       Quasi-peak       120KHz       Quasi-peak Value         30MHz       Quasi-peak       120KHz       Quasi-peak Value         Above 1GHz       Peak       1MHz       30Hz       Peak Value         0.009-0.490       2400/F(KHz)       300       0       0         0.490-1.705       2400/F(KHz)       30       30       30         1.705-30       30       30       30       30         126-960       200       3       3       3         216-960       200       3       3       3         160-960       500       3       3       3         161-960       200       3       3       3         Above 960       500       3       3       4         170-960       200       3       3       4         170-960       200       3	Antenna Polarization:	Horizontal &	Vertica					
PReceiver Setup:       9kHz-150kHz       Quasi-peak       200Hz       1kHz       Quasi-peak Value         30MHz       Quasi-peak       9kHz       30kHz       Quasi-peak Value       30kHz       Quasi-peak Value         30MHz       1GHz       Quasi-peak       120KHz       300KHz       Quasi-peak Value         30MHz       1GHz       Quasi-peak       110KHz       Quasi-peak Value         Above 1GHz       Peak       1MHz       30KHz       Quasi-peak Value         0.009-0.490       2400/F(KHz)       300       30         0.009-0.490       2400/F(KHz)       30       30         0.009-0.490       2400/F(KHz)       30       30         1705-30       30       30       30       30         1.705-30       30       30       30       30         1616-960       200       3       3       3         216-960       200       3       3       3         Above 960       500       3       2       3       4         Above 960       500       3       4       4       4       4         Above 1GHz       500       3       4       4       4       4       4 <t< th=""><th>Operation mode:</th><th>Transmitting</th><th>mode</th><th>with</th><th>modulati</th><th>on</th><th></th><th></th></t<>	Operation mode:	Transmitting	mode	with	modulati	on		
30MHz-1GHz       Quasi-peak       120KHz       300KHz       Quasi-peak Value         Above 1GHz       Peak       1MHz       30MHz       Peak Value         Peak       1MHz       10Hz       Average Value         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)         0.099-0.490       2400/F(KHz)       300         0.490-17.05       24000/F(KHz)       30         1.705-30       30       30         30-488       100       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Detector (meters)         Above 1GHz       500       3       Average         Above 1GHz       500       3       Average         For radiated emissions below 30MHz       For radiated emissions below 30MHz       For radiated emissions below 30MHz         Feat setup:	Dessiver Setur	9kHz- 150kHz 150kHz-	Quasi-p	eak	200Hz	1kHz		si-peak Value
Above 1GHz       Peak       1MHz       3MHz       Peak Value         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)         0.009-0.490       2400/F(KHz)       300         0.490-1.705       24000/F(KHz)       30         1.705-30       30       30         30-88       100       3         216-960       200       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Detector (meters)         Above 1GHz       500       3       Average         Above 1GHz       500       3       Peak         For radiated emissions below 30MHz	Receiver Setup:		Quasi-p	eak	120KHz	300KHz	Qua	si-peak Value
Peak       1MHz       10Hz       Average Value         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)         0.009-0.490       2400/F(KHz)       300         0.490-1.705       24000/F(KHz)       30         17705-30       30       30         30-88       100       3         216-960       200       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)         Above 1GHz       500       3       Average         For radiated emissions below 30MHz       For radiated emissions below 30MHz       Image: Strength for the strength for								
Limit:         Distance (meters)           0.009-0.490         2400/F(KHz)         300           0.490-1.705         24000/F(KHz)         300           1.705-30         30         30           30-88         100         3           216-960         200         3           Above 960         500         3           Frequency         Field Strength (microvolts/meter)         Detector (meters)           Above 1GHz         500         3           Peak         For radiated emissions below 30MHz			Peak	(	1MHz	10Hz	Ave	erage Value
Understand         0.490-1.705         24000/F(KHz)         30           1.705-30         30         30         30           30-88         100         3         30           88-216         150         3         216-960         200         3           Above 960         500         3         Detector         Detector           Above 960         500         3         Average           Above 1GHz         500         3         Average           5000         3         Peak         Peak         For radiated emissions below 30MHz		· · ·	-		(microvolts/	meter)		nce (meters)
1.705-30       30       30         30-88       100       3         88-216       150       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         For radiated emissions below 30MHz         Eur         Building and any of the second				-				
30-88       100       3         88-216       150       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         RX Antenna Oround Plane					. ,			
Limit:       88-216       150       3         216-960       200       3         Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         For radiated emissions below 30MHz         EUT         Beak								
Above 960       500       3         Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         Rx Antenna Ground Plane		88-216			150			3
Frequency       Field Strength (microvolts/meter)       Measurement Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         RX Antenne Ground Plane	Limit:							
Frequency       Field Strength (microvolts/meter)       Distance (meters)       Detector         Above 1GHz       500       3       Average         5000       3       Peak         For radiated emissions below 30MHz         For radiated emissions below 30MHz         Test setup:         Ground Plane		Above 960			500			3
Above 1GHz     5000     3     Peak       For radiated emissions below 30MHz       Test setup:		Frequency			-	Distan	се	Detector
Test setup:     5000     3     Peak		Above 1GHz				1		
Test setup:				5	5000 3			Peak
Test setup:		For radiated	emissio	ons	below 30	MHz		
30MHz to 1GHz	Test setup:	0.8 m		un Table				







	restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level				
	of the EUT measured by the peak detectoris 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, theemission measurement will be repeated using the quasi-peak detector and reported.				
	<ul> <li>5. Use the following spectrum analyzer settings:</li> <li>(1) Span shall wide enough to fully capture the emission being measured;</li> <li>(2) Set RBW=120 kHz for f &lt; 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak;Trace = max hold;</li> </ul>				
	<ul> <li>(3) Set RBW = 1 MHz, VBW= 3MHz for f 1 GHz for peak measurement.</li> <li>For average measurement:VBW = 10 Hz, when duty cycle is no less than 98 percent.VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimumtransmission duration over which the transmitter is on and is transmitting at its maximumpower control level for the tested mode of operation.</li> </ul>				
Test results:	PASS				



# **Test Instruments**

	Rad	iated Emissior	n Test Site (96	6)	
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESCI-7	HKE-010	Dec. 26, 2019	Dec. 25, 2020
Spectrum analyzer	Agilent	N9020A	HKE-048	Dec. 26, 2019	Dec. 25, 2020
Spectrum analyzer	R&S	FSP40	HKE-025	Dec. 26, 2019	Dec. 25, 2020
High gain antenna	Schwarzbeck	LB-180400KF	HKE-054	Dec. 26, 2019	Dec. 25, 2020
Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Dec. 26, 2019	Dec. 25, 2020
Preamplifier	EMCI	EMC051845S E	HKE-015	Dec. 26, 2019	Dec. 25, 2020
Preamplifier	Agilent	83051A	HKE-016	Dec. 26, 2019	Dec. 25, 2020
Loop antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Dec. 26, 2019	Dec. 25, 2020
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Dec. 26, 2019	Dec. 25, 2020
Horn antenna	Schwarzbeck	9120D	HKE-013	Dec. 26, 2019	Dec. 25, 2020
High pass filter unit	Tonscend	JS0806-F	HKE-055	Dec. 26, 2019	Dec. 25, 2020
Antenna Mast	Keleto	CC-A-4M	N/A	N/A	N/A
Position controller	Taiwan MF	MF7802	HKE-011	Dec. 26, 2019	Dec. 25, 2020
Radiated test software	Tonscend	TS+ Rev 2.5.0.0	HKE-082	N/A	N/A
RF cable	Times	9kHz-1GHz	HKE-117	Dec. 26, 2019	Dec. 25, 2020
RF cable	Times	1-40G	HKE-034	Dec. 26, 2019	Dec. 25, 2020
Horn Antenna	Schewarzbeck	BBHA 9170	HKE-017	Dec. 26, 2019	Dec. 25, 2020

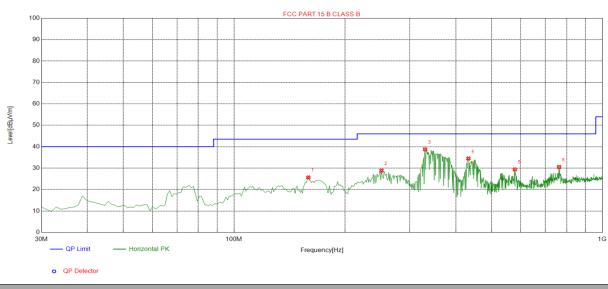
**Note:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



### **Test Data**

# All the test modes completed for test. only the worst result of (802.11b at 2412MHz) was reported as below:

#### Below 1GHz



#### Horizontal

Suspe	cted List								
NO.	Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	Delerity
NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
1	159.1391	-18.28	43.92	25.64	43.50	17.86	100	52	Horizontal
2	251.3814	-13.41	42.28	28.87	46.00	17.13	100	14	Horizontal
3	330.0300	-11.59	50.35	38.76	46.00	7.24	100	5	Horizontal
4	432.9530	-9.72	44.20	34.48	46.00	11.52	100	94	Horizontal
5	578.5986	-6.56	35.98	29.42	46.00	16.58	100	116	Horizontal
6	763.0831	-3.41	33.91	30.50	46.00	15.50	100	37	Horizontal

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level



#### Vertical



NO.	Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	Polarity
110.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	1 oldrity
1	35.8258	-15.88	47.93	32.05	40.00	7.95	100	236	Vertical
2	64.9550	-16.40	48.13	31.73	40.00	8.27	100	22	Vertical
3	72.7227	-18.16	48.83	30.67	40.00	9.33	100	348	Vertical
4	169.8198	-17.32	49.42	32.10	43.50	11.40	100	185	Vertical
5	351.3914	-11.64	41.19	29.55	46.00	16.45	100	169	Vertical
6	433.9239	-9.68	38.31	28.63	46.00	17.37	100	120	Vertical

Remark: Factor = Cable loss + Antenna factor - Preamplifier; Level = Reading + Factor; Margin = Limit - Level

# Harmonics and Spurious Emissions

### Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dBµV/m)	Limit@3m (dBµV/m)

Note: 1. Emission Level=Reading+ Cable loss-Antenna factor-Amp factor

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement



# Above 1GHz

# RADIATED EMISSION TEST

# LOW CH1 (802.11b Mode)/2412

Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
4824	63.65	-3.64	60.01	74	-13.99	peak
4824	44.71	-3.64	41.07	54	-12.93	AVG
7236	56.94	-0.95	55.99	74	-18.01	peak
7236	43.7	-0.95	42.75	54	-11.25	AVG
Remark: Factor	= Antenna Factor	+ Cable Loss –	Pre-amplifier.			

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
4824	64.05	-3.64	60.41	74	-13.59	peak
4824	46.31	-3.64	42.67	54	-11.33	AVG
7236	56	-0.95	55.05	74	-18.95	peak
7236	44.76	-0.95	43.81	54	-10.19	AVG
Remark: Factor	= Antenna Factor	+ Cable Loss –	Pre-amplifier.			



# MID CH6 (802.11b Mode)/2437

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector				
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре				
4874	62.75	-3.51	59.24	74	-14.76	peak				
4874	46.25	-3.51	42.74	54	-11.26	AVG				
7311	57.14	-0.82	56.32	74	-17.68	peak				
7311	48.4	-0.82	47.58	54	-6.42	AVG				
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.									

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
4874	64.38	-3.51	60.87	74	-13.13	peak
4874	46.68	-3.51	43.17	54	-10.83	AVG
7311	57.83	-0.82	57.01	74	-16.99	peak
7311	46.77	-0.82	45.95	54	-8.05	AVG
Remark: Factor	= Antenna Factor	+ Cable Loss –	Pre-amplifier.			



#### HIGH CH11 (802.11b Mode)/2462

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4924	65.39	-3.43	61.96	74	-12.04	peak		
4924	46	-3.43	42.57	54	-11.43	AVG		
7386	57.33	-0.75	56.58	74	-17.42	peak		
7386	42.37	-0.75	41.62	54	-12.38	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

#### Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
4924	61.91	-3.43	58.48	74	-15.52	peak
4924	45.36	-3.43	41.93	54	-12.07	AVG
7386	54.97	-0.75	54.22	74	-19.78	peak
7386	42.2	-0.75	41.45	54	-12.55	AVG
Remark: Factor	= Antenna Factor	+ Cable Loss –	Pre-amplifier.			

#### Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes bandedge frequency.

(3) \* denotes emission frequency which appearing within the Restricted Bands specified inprovision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) The emissions are attenuated more than 20dB below the permissible limits are not recorded in the report.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHzfor measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, theAverage Detected is not need completed. For example: Top Channel at Fundamental73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54dBuV/m(AV Limit), the Average Detected not need to completed.



# LOW CH1 (802.11g Mode)/2412

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4824	61.19	-3.64	57.55	74	-16.45	peak		
4824	48.91	-3.64	45.27	54	-8.73	AVG		
7236	55.23	-0.95	54.28	74	-19.72	peak		
7236	42.07	-0.95	41.12	54	-12.88	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4824	58.89	-3.64	55.25	74	-18.75	peak		
4824	47.02	-3.64	43.38	54	-10.62	AVG		
7236	55.01	-0.95	54.06	74	-19.94	peak		
7236	42.09	-0.95	41.14	54	-12.86	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# MID CH6 (802.11g Mode)/2437

### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4874	62.14	-3.51	58.63	74	-15.37	peak		
4874	44.60	-3.51	41.09	54	-12.91	AVG		
7311	56.70	-0.82	55.88	74	-18.12	peak		
7311	45.70	-0.82	44.88	54	-9.12	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4874	60.95	-3.51	57.44	74	-16.56	peak		
4874	47.2	-3.51	43.69	54	-10.31	AVG		
7311	56.87	-0.82	56.05	74	-17.95	peak		
7311	45.06	-0.82	44.24	54	-9.76	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

#### HIGH CH11 (802.11g Mode)/2462

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector			
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре			
4924	62.8	-3.43	59.37	74	-14.63	peak			
4924	47.35	-3.43	43.92	54	-10.08	AVG			
7386	56.13	-0.75	55.38	74	-18.62	peak			
7386	40.68	-0.75	39.93	54	-14.07	AVG			
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								

#### Horizontal:

Vertica	al:							
Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4924	58.83	-3.43	55.4	74	-18.6	peak		
4924	48.06	-3.43	44.63	54	-9.37	AVG		
7386	56.16	-0.75	55.41	74	-18.59	peak		
7386	38.23	-0.75	37.48	54	-16.52	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

#### Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes bandedge frequency.

(3) \* denotes emission frequency which appearing within the Restricted Bands specified inprovision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) The emissions are attenuated more than 20dB below the permissible limits are not recorded in the report.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHzfor measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54dBuV/m(AV Limit), the Average Detected not need to completed.



# LOW CH1 (802.11n/H20 Mode)/2412

### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4824	63.26	-3.64	59.62	74	-14.38	peak		
4824	44.62	-3.64	40.98	54	-13.02	AVG		
7236	53.37	-0.95	52.42	74	-21.58	peak		
7236	41.43	-0.95	40.48	54	-13.52	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4824	62.38	-3.64	58.74	74	-15.26	peak		
4824	46.85	-3.64	43.21	54	-10.79	AVG		
7236	57.99	-0.95	57.04	74	-16.96	peak		
7236	44.38	-0.95	43.43	54	-10.57	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# MID CH6 (802.11n/H20 Mode)/2437

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4874	56.33	-3.51	52.82	74.00	-21.18	peak		
4874	45.67	-3.51	42.16	54.00	-11.84	AVG		
7311	54.96	-0.82	54.14	74.00	-19.86	peak		
7311	44.37	-0.82	43.55	54.00	-10.45	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
4874	59.15	-3.51	55.64	74.00	-18.36	peak		
4874	45.42	-3.51	41.91	54.00	-12.09	AVG		
7311	53.33	-0.82	52.51	74.00	-21.49	peak		
7311	39.60	-0.82	38.78	54.00	-15.22	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# HIGH CH11 (802.11n/H20 Mode)/2462

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
4924	62.92	-3.43	59.49	74	-14.51	peak		
4924	46.99	-3.43	43.56	54	-10.44	AVG		
7386	56.3	-0.75	55.55	74	-18.45	peak		
7386	42.39	-0.75	41.64	54	-12.36	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
4924	62.38	-3.43	58.95	74	-15.05	peak		
4924	46.33	-3.43	42.9	54	-11.1	AVG		
7386	56.59	-0.75	55.84	74	-18.16	peak		
7386	47.07	-0.75	46.32	54	-7.68	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# LOW CH3 (802.11n/H40 Mode)/2422

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
4844	63.92	-3.63	60.29	74	-13.71	peak		
4844	40.61	-3.63	36.98	54	-17.02	AVG		
7266	56.36	-0.94	55.42	74	-18.58	peak		
7266	37.55	-0.94	36.61	54	-17.39	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
4844	60.46	-3.63	56.83	74	-17.17	peak		
4844	40.15	-3.63	36.52	54	-17.48	AVG		
7266	53.83	-0.94	52.89	74	-21.11	peak		
7266	36.17	-0.94	35.23	54	-18.77	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# MID CH6 (802.11n/H40 Mode)/2437

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Dotostor Typo		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
4874	61.44	-3.51	57.93	74	-16.07	peak		
4874	41.1	-3.51	37.59	54	-16.41	AVG		
7311	54.28	-0.82	53.46	74	-20.54	peak		
7311	37.29	-0.82	36.47	54	-17.53	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type		
4874	59.24	-3.51	55.73	74	-18.27	peak		
4874	45.68	-3.51	42.17	54	-11.83	AVG		
7311	53.05	-0.82	52.23	74	-21.77	peak		
7311	42.55	-0.82	41.73	54	-12.27	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



#### HIGH CH9 (802.11n/H40 Mode)/2452

#### Horizontal:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
4904	58.86	-3.43	55.43	74	-18.57	peak		
4904	43.53	-3.43	40.1	54	-13.9	AVG		
7356	52.32	-0.75	51.57	74	-22.43	peak		
7356	39.36	-0.75	38.61	54	-15.39	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
4904	60.12	-3.43	56.69	74	-17.31	peak		
4904	39.98	-3.43	36.55	54	-17.45	AVG		
7356	54.47	-0.75	53.72	74	-20.28	peak		
7356	46.59	-0.75	45.84	54	-8.16	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

#### Remark:

(1) Measuring frequencies from 1 GHz to the 25 GHz.

(2) "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency.
(3) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.

(4) The emissions are attenuated more than 20dB below the permissible limits are not recorded in the report.

(5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.

(6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/m(AV Limit), the Average Detected not need to completed.



# Test Result of Radiated Spurious at Band edges

# Operation Mode: 802.11b Mode TX CH Low (2412MHz)

#### Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2310.00	55.72	-5.81	49.91	74	-24.09	peak		
2310.00	46.81	-5.81	41	54	-13	AVG		
2390.00	60.62	-5.84	54.78	74	-19.22	peak		
2390.00	51.81	-5.84	45.97	54	-8.03	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delecior Type		
2310.00	56.27	-5.81	50.46	74	-23.54	peak		
2310.00	48.35	-5.81	42.54	54	-11.46	AVG		
2390.00	64.11	-5.84	58.27	74	-15.73	peak		
2390.00	47.28	-5.84	41.44	54	-12.56	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# Operation Mode: TX CH High (2462MHz)

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2483.50	57.86	-5.81	52.05	74	-21.95	peak		
2483.50	48.49	-5.81	42.68	54	-11.32	AVG		
2500.00	56.44	-6.06	50.38	74	-23.62	peak		
2500.00	46.49	-6.06	40.43	54	-13.57	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type	
2483.50	58.06	-5.81	52.25	74	-21.75	peak	
2483.50	48.97	-5.81	43.16	54	-10.84	AVG	
2500.00	56.82	-6.06	50.76	74	-23.24	peak	
2500.00	49.54	-6.06	43.48	54	-10.52	AVG	
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							
Remark: All the	other emissions n	ot reported were	e too low to read a	and deemed to c	omply with FCC	C limit.	



# Operation Mode: 802.11g Mode TX CH Low (2412MHz)

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2310.00	60.13	-5.81	54.32	74	-19.68	peak		
2310.00	46.39	-5.81	40.58	54	-13.42	AVG		
2390.00	48.88	-5.84	43.04	74	-30.96	peak		
2390.00	46.90	-5.84	41.06	54	-12.94	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2310.00	56.27	-5.81	50.46	74	-23.54	peak		
2310.00	46.74	-5.81	40.93	54	-13.07	AVG		
2390.00	62.63	-5.84	56.79	74	-17.21	peak		
2390.00	47.68	-5.84	41.84	54	-12.16	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							



# Operation Mode: TX CH High (2462MHz)

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2483.50	57.7	-5.65	52.05	74	-21.95	peak		
2483.50	47.4	-5.65	41.75	54	-12.25	AVG		
2500.00	56.08	-5.65	50.43	74	-23.57	peak		
2500.00	45.49	-5.65	39.84	54	-14.16	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2483.50	57.63	-5.65	51.98	74	-22.02	peak		
2483.50	47.72	-5.65	42.07	54	-11.93	AVG		
2500.00	53.39	-5.65	47.74	74	-26.26	peak		
2500.00	44.97	-5.65	39.32	54	-14.68	AVG		
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.								
Remark: All the	Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.							



# Operation Mode: 802.11n/H20 Mode TX CH Low (2412MHz)

#### Reading Result **Emission Level** Frequency Factor Limits Margin Detector Type (MHz) (dBµV) (dB) (dBµV/m) (dBµV/m) (dB) 2310.00 57.91 -5.81 52.1 74 -21.9 peak 2310.00 47.4 41.59 -12.41 AVG -5.81 54 2390.00 59.73 -5.84 53.89 74 -20.11 peak 2390.00 48.41 -5.84 42.57 54 -11.43 AVG Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type	
2310.00	56.30	-5.81	50.49	74	-23.51	peak	
2310.00	44.89	-5.81	39.08	54	-14.92	AVG	
2390.00	60.85	-5.84	55.01	74	-18.99	peak	
2390.00	47.25	-5.84	41.41	54	-12.59	AVG	
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



# Operation Mode: TX CH High (2462MHz)

## Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2483.50	58.76	-5.65	53.11	74	-20.89	peak		
2483.50	47.78	-5.65	42.13	54	-11.87	AVG		
2500.00	51.96	-5.65	46.31	74	-27.69	peak		
2500.00	45.94	-5.65	40.29	54	-13.71	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

#### Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type	
2483.50	55.16	-5.65	49.51	74	-24.49	peak	
2483.50	46.28	-5.65	40.63	54	-13.37	AVG	
2500.00	52.05	-5.65	46.4	74	-27.6	peak	
2500.00	45.19	-5.65	39.54	54	-14.46	AVG	
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							
Remark: All the	other emissions n	ot reported were	e too low to read a	nd deemed to c	omply with FCC	Climit.	



# Operation Mode: 802.11n/H40 Mode TX CH Low (2422MHz)

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2310.00	58.33	-5.81	52.52	74	-21.48	peak		
2310.00	/	-5.81	/	54	1	AVG		
2390.00	64.56	-5.84	58.72	74	-15.28	peak		
2390.00	51.22	-5.84	45.38	54	-8.62	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delecior Type	
2310.00	57.43	-5.81	51.62	74	-22.38	peak	
2310.00	/	-5.81	1	54	1	AVG	
2390.00	65.55	-5.84	59.71	74	-14.29	peak	
2390.00	51.27	-5.84	45.43	54	-8.57	AVG	
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.						



# Operation Mode: TX CH High (2452MHz)

# Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type		
2483.50	58.33	-5.65	52.68	74	-21.32	peak		
2483.50	1	-5.65	1	54	1	AVG		
2500.00	59.28	-5.65	53.63	74	-20.37	peak		
2500.00	1	-5.65	1	54	1	AVG		
Remark: Factor	Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Delector Type	
2483.50	58.44	-5.65	52.79	74	-21.21	peak	
2483.50	1	-5.65	1	54	1	AVG	
2500.00	57.28	-5.65	51.63	74	-22.37	peak	
2500.00	1	-5.65	1	54	1	AVG	
Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.							
Remark: All the	other emissions n	ot reported were	e too low to read a	nd deemed to c	omply with FCC	; limit.	



# 4.8. ANTENNA REQUIREMENT

#### **Standard Applicable**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed toensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antennaexceeds 6dBi.

#### Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of astandard antenna jack or electrical connector is prohibited. Further, this requirement does not apply tointentional radiators that must be professionally installed.

#### **Antenna Connected Construction**

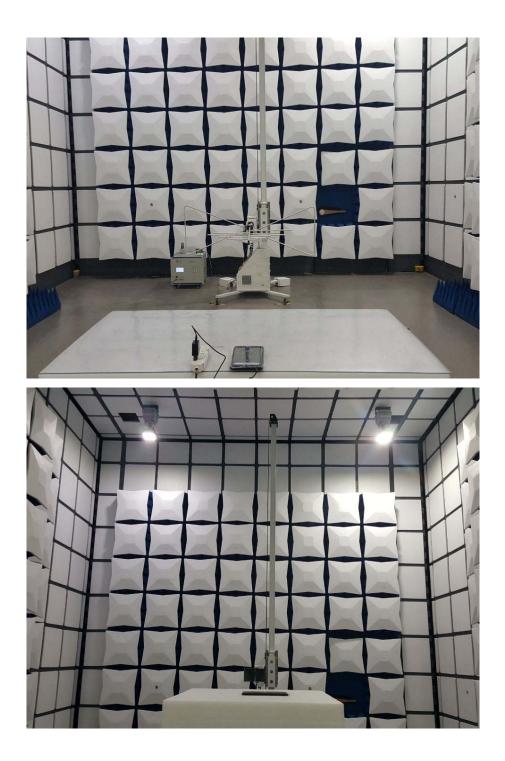
The antenna used in this product is a Internal Antenna which professional installation is required and cannot be dismantled easily. The directional gains of antenna used for transmitting is 1dBi.







# 4.9. PHOTOGRAPH OF TEST









# 4.10. PHOTOS OF THE EUT

Reference to the reporter : ANNEX A of external photos and ANNEX B of internal photos

-----End of test report------