

Page 1 of 142

FCC TEST REPORT

Test report On Behalf of Yuanfeng Technology Co., Ltd For **VECS IHUB** Model No.: VECS IHUB

FCC ID: 2A6YK-VECSIHUB

Prepared For : Yuanfeng Technology Co., Ltd

No. 18, Industrial East Road, Songshan Lake Development Zone, Dongguan, Guangdong, China

Prepared By :

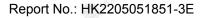
Shenzhen HUAK Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Date of Test: May. 05, 2022 ~ May. 17, 2022 Date of Report: May. 17, 2022 HK2205051851-3E **Report Number:**

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com

TEL: +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com





TEST RESULT CERTIFICATION

Applicant's name	Yuanfeng Technology Co., Ltd
Address	No. 18, Industrial East Road, Songshan Lake Development Zone, Dongguan, Guangdong, China
Manufacture's Name	Yuanfeng Technology Co., Ltd
Address	No. 18, Industrial East Road, Songshan Lake Development Zone, Dongguan, Guangdong, China
Product description	
Trade Mark:	N/A
Product name:	VECS IHUB
Model and/or type reference .:	VECS IHUB
Standards	FCC Rules and Regulations Part 15 Subpart E Section 15.407 ANSI C63.10: 2013

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen HUAK Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen HUAK Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Date of lest	
Date (s) of performance of tests	May. 05, 2022 ~ May. 17, 2022
Date of Issue	May. 17, 2022
Test Result	Pass

Prepared by:

samp Bian

Project Engineer

Reviewed by:

Approved by:

Project Supervisor

Technical Director

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



NG

^{PR}

TABLE OF CONTENTS

_		_
1.	TEST RESULT SUMMARY	
	1.1. TEST PROCEDURES AND RESULTS	
	1.2. INFORMATION OF THE TEST LABORATORY	
	1.3. MEASUREMENT UNCERTAINTY	6
2.	EUT DESCRIPTION	7
	2.1. GENERAL DESCRIPTION OF EUT	
	2.2. OPERATION FREQUENCY EACH OF CHANNEL	8
	2.3. OPERATION OF EUT DURING TESTING	
	2.4. DESCRIPTION OF TEST SETUP	9
3.	GENERA INFORMATION	10
	3.1. TEST ENVIRONMENT AND MODE	
	3.2. DESCRIPTION OF SUPPORT UNITS	
4.	TEST RESULTS AND MEASUREMENT DATA	
	4.1. CONDUCTED EMISSION	12
	4.2. MAXIMUM CONDUCTED OUTPUT POWER	
	4.3. 6DB EMISSION BANDWIDTH	
	4.4. 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH	19
	4.5. POWER SPECTRAL DENSITY	
	4.6. BAND EDGE	
	4.7. SPURIOUS EMISSION	113
	4.8. FREQUENCY STABILITY MEASUREMENT	
	4.9. ANTENNA REQUIREMENT	
5.	PHOTOGRAPHS OF TEST SETUP	
6.	PHOTOS OF THE EUT	142

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.



** Modified History **

	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	May. 17, 2022	Jason Zhou
			W
ESTING HUAK TESTING	HUM TESTING	NG UNANTISTING	al a
WAXTESTING	HUNKTEST		HUAKTESTING

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

HUAK TESTING

1. TEST RESULT SUMMARY

1.1. TEST PROCEDURES AND RESULTS

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	N/A
Maximum Conducted Output Power	§15.407(a)	PASS
6dB Emission Bandwidth	§15.407(e)	N/A
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a)	PASS
Power Spectral Density	§15.407(a)	PASS
Band edge	§15.407(b)/15.209/15.205	PASS
Radiated Emission	§15.407(b)/15.209/15.205	PASS
Frequency Stability	§15.407(g)	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. INFORMATION OF THE TEST LABORATORY

Shenzhen HUAK Testing Technology Co., Ltd. Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01. FCC Designation Number is CN1229. Canada IC CAB identifier is CN0045. CNAS Registration Number is L9589.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

FICATION

1.3. MEASUREMENT UNCERTAINTY

HUAK TESTING

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	±0.37dB
of 2	RF power, conducted	±3.35dB
3		
4 (All emissions, radiated(<1G)	±3.90dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



2. EUT DESCRIPTION

2.1. GENERAL DESCRIPTION OF EUT

Equipment:	VECS IHUB	THE	Th	Ģ
Model Name:	VECS IHUB			O HUNCT
Serial Model:	N/A		TESTING	
Model Difference:	N/A	AKTESTING	O HUAN	HUAK TESTING
Trade Mark:	N/A		WAK TESTING	
FCC ID:	2A6YK-VECSIHUB	HUAKTESTING	TAKTE	STING HUAK TEST
Operation Frequency:	IEEE 802.11a/n/ac/ax(IEEE 802.11n/ac/ax(H IEEE 802.11ac/ax(HT	T40) 5.190GHz		9
Modulation Technology:	IEEE 802.11a/n/ac/ax			G WAKT
Modulation Type:	OFDM, OFDMA	0.	0	0.
Antenna Type:	External Antenna	TESTING	HUAKTESTI	TESTING
Antenna Gain:	Antenna 1:1dBi Antenna 2:1dBi MIMO: 4.01dBi	ba.	AUAN TESTING	C HUMAN
Power Source:	DC 12V	HUAKTESTING	HAKTE	STING HUAK TEST
Power Supply:	DC 12V	Ð	0,	
Hardware Version	V2.1	STING	enti	G
Software Version:	V2.1	O HUAK ILL	O HUAK ILL	O HUNK I

Note: The EUT incorporates a MIMO function. Physically, it provides two completed transmitt ers and receivers(2T2R), two transmit signals are completely correlated, then, Direction gain= GANT + Array Gain(Array Gain=10 log(2) dB for power spectral density; Array Gain=0 for power measurement)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





2.2. OPERATION FREQUENCY EACH OF CHANNEL

802.11a/802.11n(HT20) 802.11ac(HT20)/ 802.11ax(HT20)		802.11n(HT40)/ 802.11ac(HT40)/ 802.11ax(HT40)		802.11ac(HT80)/ 802.11ax(HT80)	
Channel	Frequency	Channel	Frequency	Channel	Frequency
36	5180	38	5190	42	5210
40	5200	46	5230	O HO.	JAK TESTA
44	5220		40		0
48	5240	la.		NKTESTIN	
Natai	G HOM			to.	

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:

2.3. OPERATION OF EUT DURING TESTING

For 802.11a/n (HT20)/ac(HT20)/ax(HT20)

and I (5150	- 5250 MHz)	2	
Channel NumberChannelFrequency (MHz)36Low5180			
Low	5180		
Mid	5200		
High	5240		
	Channel Low Mid	Low 5180 Mid 5200	

For 802.11n (HT40)/ ac(HT40)/ax(HT40)

Band I (5150 - 5250 MHz)					
Channel Number Channel Frequency (MHz)					
38	Low	5190			
46	High	5230			

For 802.11ac(HT80)/ax(HT80)

Band I (5150 - 5250 MHz)			
Channel Number	Frequency (MHz)		
42 5210			

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com

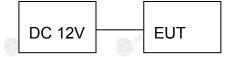


NG

IK.

2.4. DESCRIPTION OF TEST SETUP

Operation of EUT during testing:



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 X position

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



3. GENERA INFORMATION

3.1. TEST ENVIRONMENT AND MODE

perating Environment:			
Temperature:	25.0 °C	HUAKTES	HUAKTE
Humidity:	56 % RH	TING	
Atmospheric Pressure:	1010 mbar	HUAKTEST	TESTING

Test Mode:

	Keep the EUT in continuous transmitting
Engineering mode:	by select channel and modulations(The value of duty cycle is 100%)

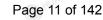
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 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.

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.

TESTING	Mode	3 NY TESTING	Data rate	AKTESTIN
	802.11a	O Hour	6 Mbps	O How
NG	802.11n(HT20)	B	MCS0	mG
HUAK	802.11n(HT40)	AUAK TEST	MCS0	HUAKTESI
802.11ac	:(HT20)/ac(HT40)/ac(HT80))	MCS0	
802.11ax	(HT20)/ax(HT40)/ax(HT80)) ⁶	MCS0	OK TESTING
Final Test	Mode:	·		
Operation mode: Keep the EUT in continuous transmitting with modulation			smitting	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com



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
1	G / WANTESTO	1	MAKTESTIN	s /

Note:

HUAK TESTING

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, 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.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



VCATION

4. TEST RESULTS AND MEASUREMENT DATA

4.1. CONDUCTED EMISSION

4.1.1. Test Specification

Frequency range (MHz)	kHz, Sweep time=a	auto				
150 kHz to 30 MHz RBW=9 kHz, VBW=30 I Frequency range (MHz)	MAK RESTU	auto				
RBW=9 kHz, VBW=30 k Frequency range (MHz)	MAK RESTU	auto				
Frequency range (MHz)	MAK RESTU	auto				
(MHz)	and the second second	RBW=9 kHz, VBW=30 kHz, Sweep time=auto				
(MHz)	Limit (d	BuV)				
13.2	Quasi-peak	Average				
0.15-0.5	66 to 56*	56 to 46*				
0.5-5	56	46				
5-30	60	50				
WAX TESTING	IS UAKTESTING	UAX TEST				
Reference	ce Plane					
Test table/Insulation plane	EMI Receiver	571146				
War War	HUAKTEL	HUAKTE				
 power through a line (L.I.S.N.). This proimpedance for the me 2. The peripheral device power through a LIS coupling impedance refer to the block photographs). 3. Both sides of A.C. conducted interference emission, the relative the interface cables me 	e impedance stabi ovides a 50ohm/ easuring equipmen es are also connect SN that provides with 50ohm term diagram of the line are checked ce. In order to find positions of equip nust be changed ac	lization networ 50uH couplin t. cted to the mai a 50ohm/50u ination. (Pleas test setup an d for maximur d the maximur oment and all o ccording to ANS				
	-m ^{NG}					
	5-30 Reference 40cm E.U.T AC power Test table/Insulation plane Remark: EUT Equipment Under Test LISN Line Impedence Stabilization N Test table height=0.8m Tx Mode 1. The E.U.T and simul power through a line (L.I.S.N.). This pro- impedance for the me 2. The peripheral device power through a Life coupling impedance refer to the block photographs). 3. Both sides of A.C. conducted interferen emission, the relative the interface cables n	5-30 60 Reference Plane Image: Stable / ISN Image: Stable / ISN Reference Plane ISN is power Image: Stable / ISN Reference Plane Image: Stable / ISN Reference Plane ISN ISN Reference Plane ISN ISN ISN ISN ISN is table / ISN is the image of the image				

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.



4.1.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESR-7	HKE-010	Feb. 18, 2022	Feb. 17, 2023
LISN	R&S	ENV216	HKE-002	Feb. 18, 2022	Feb. 17, 2023
Coax cable (9KHz-30MHz)	Times	381806-00 2	N/A	Feb. 18, 2022	Feb. 17, 2023
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).

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



F F

4.1.3. Test data

Not applicable. Note: EUT power supply by DC Power, so this test item not applicable.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

le:

4.2. MAXIMUM CONDUCTED OUTPUT POWER

4.2.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407(a)
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02.r01 Section E
Limit:	Frequency Band (MHz) Limit
	5150-5250 1W
Test Setup:	
	Power meter EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	 The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section E, 3, a. 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. Set to the maximum power setting and enable the EUT transmit continuously. Measure the conducted output power and record the results in the test report.
Test Result:	PASS
Remark:	Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0 Conducted output power= measurement power

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	Feb. 17, 2023
Power meter	Agilent	E4419B	HKE-085	Feb. 18, 2022	Feb. 17, 2023
Power Sensor	Agilent	E9300A	HKE-086	Feb. 18, 2022	Feb. 17, 2023
RF cable	Times	1-40G	HKE-034	Feb. 18, 2022	Feb. 17, 2023
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 18, 2022	Feb. 17, 2023

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



4.2.3. Test Data

	Configuration Band I (5150 - 5250 MHz)						
Mode	Test channel		imum Conduct put Power (dBr	FCC Limit	Result		
		Antenna port 1	Antenna port 2	MIMO	(dBm)		
11a 🗤	CH36	9.96	10.86	1	30	PASS	
11a	CH40	10.20	12.29	TESTING	30	PASS	
11a	CH48	11.81	11.35	() ⁴⁰ 1	30	PASS	
11n(HT20)	CH36	9.76	9.59	12.69	30	PASS	
11n(HT20)	CH40	9.99	10.03	13.02	30	PASS	
11n(HT20)	CH48	9.62	10.06	_o 12.86	30	PASS	
11n(HT40)	CH38	10.31	10.31	13.32	30	PASS	
11n(HT40)	CH46	10.17	10.82	13.52	30	PASS	
11ac(HT20)	CH36	9.75	9.45	12.61	30	PASS	
11ac(HT20)	CH40	9.99	9.84	12.93	30	PASS	
11ac(HT20)	CH48	9.61	9.84	12.74	30	PASS	
11ac(HT40)	CH38	10.30	10.19	13.26	30	PASS	
11ac(HT40)	CH46	10.17	10.72	13.46	30	PASS	
11ac(HT80)	CH42	10.18	10.45	13.33	30	PASS	
11ax(HT20)	CH36	9.39	9.25	12.33	30	PASS	
11ax(HT20)	CH40	9.69	9.69	12.70	30	PASS	
11ax(HT20)	CH48	9.35	9.75	12.56	30	PASS	
11ax(HT40)	CH38	9.76	9.75	12.77	30	PASS	
11ax(HT40)	CH46	9.64	10.12	12.90	30	PASS	
11ax(HT80)	CH42	9.74	9.96	12.86	30	PASS	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

CATION



4.3. 6DB EMISSION BANDWIDTH

4.3.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)		
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C		
Limit:	>500kHz		
Test Setup:	Spectrum Analyzer		
Test Mode:	Transmitting mode with modulation		
Test Procedure:	 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C. Set to the maximum power setting and enable the EUT transmit continuously. 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. Measure and record the results in the test report. 		
Test Result:	PASS		

4.3.2. Test Instruments

	RF Test Room				
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	[©] N9020A	HKE-048	Feb. 18, 2022	Feb. 17, 2023
RF cable	Times	1-40G	HKE-034	Feb. 18, 2022	Feb. 17, 2023
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 18, 2022	Feb. 17, 2023

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

4.3.3. Test data

N/A

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

4.4. 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

4.4.1. Test Specification

HUAK TESTING

Test Requirement:	47 CFR Part 15C Section 15.407
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C
Limit:	No restriction limits
Test Setup:	Spectrum Analyzer
Test Mode:	Transmitting mode with modulation
Test Procedure:	 KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section C. Set to the maximum power setting and enable the EUT transmit continuously. Make the measurement with the spectrum analyzer's resolution bandwidth RBW = 1% EBW, VBW≥3RBW, In order to make an accurate measurement. Measure and record the results in the test report.
Test Result:	PASS

4.4.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	Feb. 17, 2023
RF cable	Times	[©] 1-40G	HKE-034	Feb. 18, 2022	Feb. 17, 2023
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 18, 2022	Feb. 17, 2023

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



H

4.4.3. Test data

NT 1	0.		0	
Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	Verdict
11a 🌑	CH36	5180	18.52	PASS
🖗 11a	CH40	5200	18.52	PASS
11a	CH48	5240	18.48	PASS
11n(HT20)	CH36	5180	20.04	PASS
11n(HT20)	CH40	5200	19.92	PASS
11n(HT20)	CH48	5240	19.96	PASS
11n(HT40)	CH38	5190	39.12	PASS
11n(HT40)	CH46	5230	39.20	PASS
11ac(HT20)	CH36	5180	19.76	PASS
11ac(HT20)	CH40	5200	19.92	PASS
11ac(HT20)	CH48	5240	19.44	PASS
11ac(HT40)	CH38	5190	39.28	PASS
11ac(HT40)	CH46	5230	39.12	PASS
11ac(HT80)	CH42	5210	81.12	PASS
11ax(HT20)	CH36	5180	20.52	PASS
11ax(HT20)	CH40	5200	20.48	PASS
11ax(HT20)	CH48	5240	20.44	PASS
11ax(HT40)	CH38	5190	40.08	PASS
11ax(HT40)	CH46	5230	40.00	PASS
11ax(HT80)	CH42	5210	81.60	PASS

Test plots as follows:

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com/

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



NG

¦К

Band I (5150 - 5250 MHz)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

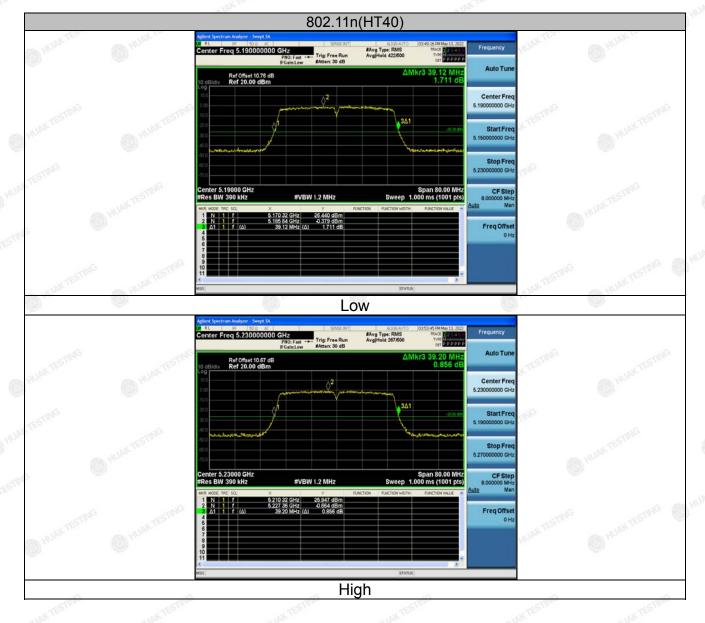




The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



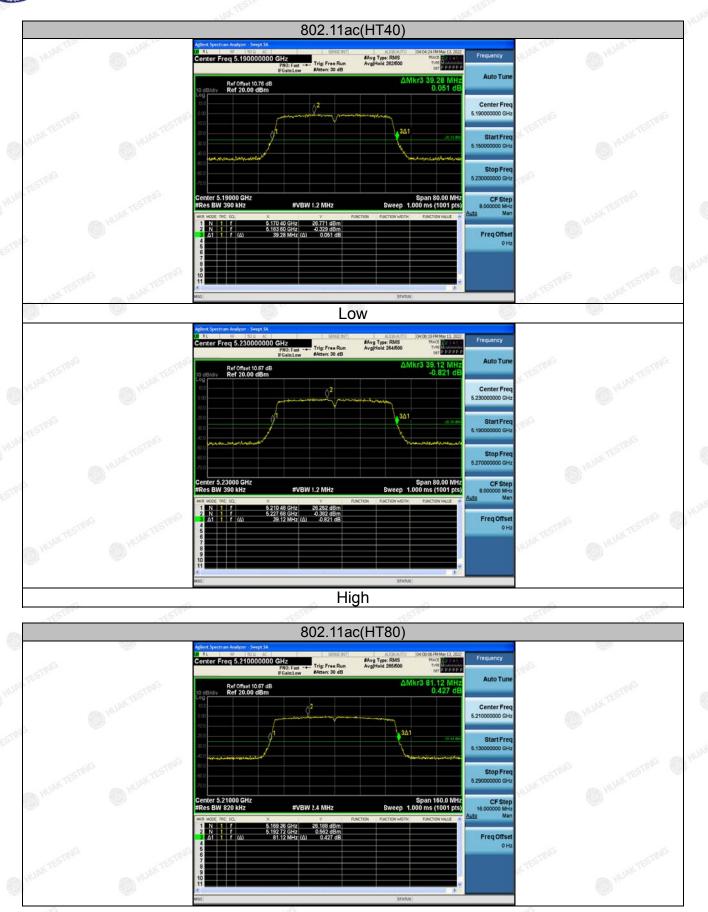
AFICATION



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



EST FIF



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



Page 27 of 142

Report No.: HK2205051851-3E



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



ANT 2		IAK TESTIN - WAK TEST	UNK TEST	- UNAK TES
Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	Verdict
11a	CH36	5180	18.44	PASS
11a 🔊	CH40	5200	18.40	PASS
11a	CH48	5240	18.40	PASS
11n(HT20)	CH36	5180	19.60	PASS
11n(HT20)	CH40	5200	19.72	PASS
11n(HT20)	CH48	5240	19.76	PASS
11n(HT40)	CH38	5190	39.28	PASS
11n(HT40)	CH46	5230	39.44	PASS
11ac(HT20)	CH36	5180	19.52	PASS
11ac(HT20)	CH40	5200	19.60	PASS
11ac(HT20)	CH48	5240	19.68	PASS
11ac(HT40)	CH38	5190	38.96	PASS
11ac(HT40)	CH46	5230	39.12	PASS
11ac(HT80)	CH42	5210	81.92	PASS
11ax(HT20)	CH36	5180	20.36	PASS
11ax(HT20)	CH40	5200	20.40	PASS
11ax(HT20)	CH48	5240	20.64	PASS
11ax(HT40)	CH38	5190	40.24	PASS
11ax(HT40)	CH46	5230	40.00	PASS
11ax(HT80)	CH42	5210	81.28	PASS

Test plots as follows:

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



Band I (5150 - 5250 MHz)



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



AFICATION



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



EST FIF



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com

CATION

4.5. POWER SPECTRAL DENSITY

4.5.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)			
Test Method:	KDB789033 D02 General UNII Test Procedures New Rules v02r01 Section F			
Limit:	17dBm/MHz for Band I 5150MHz-5250MHz			
Test Setup:	Spectrum Analyzer			
Test Mode:	Transmitting mode with modulation			
Test Procedure:	 Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. Set RBW =1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. Allow the sweeps to continue until the trace stabilizes. Use the peak marker function to determine the maximum amplitude level. The E.I.R.P spectral density used radiated test method. At a test site that has been validated using the procedures of ANSI C63.4 or the latest CISPR 16-1-4 for measurements above 1 GHz, so as to simulate a near free-space environment. 			
Test Result:	PASS			

4.5.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	Feb. 17, 2023
RF cable	Times	1-40G	HKE-034	Feb. 18, 2022	Feb. 17, 2023
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 18, 2022	Feb. 17, 2023

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

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



4.5.3. Test data

ANT 1

Configuration Band I (5150 - 5250 MHz)					
Mode	Test channel	Level [dBm/MHz]	Limit (dBm/MHz)	Result	
11a	CH36	5.05	17 munt 1	PASS	
11a	CH40	4.53	17	PASS	
11a	CH48	4.72	17	PASS	
11n(HT20)	CH36	4.77	° 🤍 17	PASS	
11n(HT20)	CH40	4.99	17	PASS	
11n(HT20)	CH48	4.27	17	PASS	
11n(HT40)	CH38	1.67	se 17	PASS	
11n(HT40)	CH46	1.74	17	PASS	
11ac(HT20)	CH36	4.3	17	PASS	
11ac(HT20)	CH40	5.71	17 HUMAN	PASS	
11ac(HT20)	CH48	4.5	17	PASS	
11ac(HT40)	CH38	1.74	17	PASS	
11ac(HT40)	CH46	1.17	° 🤍 17	PASS	
11ac(HT80)	CH42	-0.98	17	PASS	
11ax(HT20)	CH36	6.4	17	PASS	
11ax(HT20)	CH40	6.29	m ^G 17	PASS	
11ax(HT20)	CH48	6.18	17	PASS	
11ax(HT40)	CH38	3.13	17	PASS	
11ax(HT40)	CH46	2.29	17 mun 17	PASS	
11ax(HT80)	CH42	-0.19	17	PASS	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



Test plots as follows: Band I (5150 – 5250 MHz)



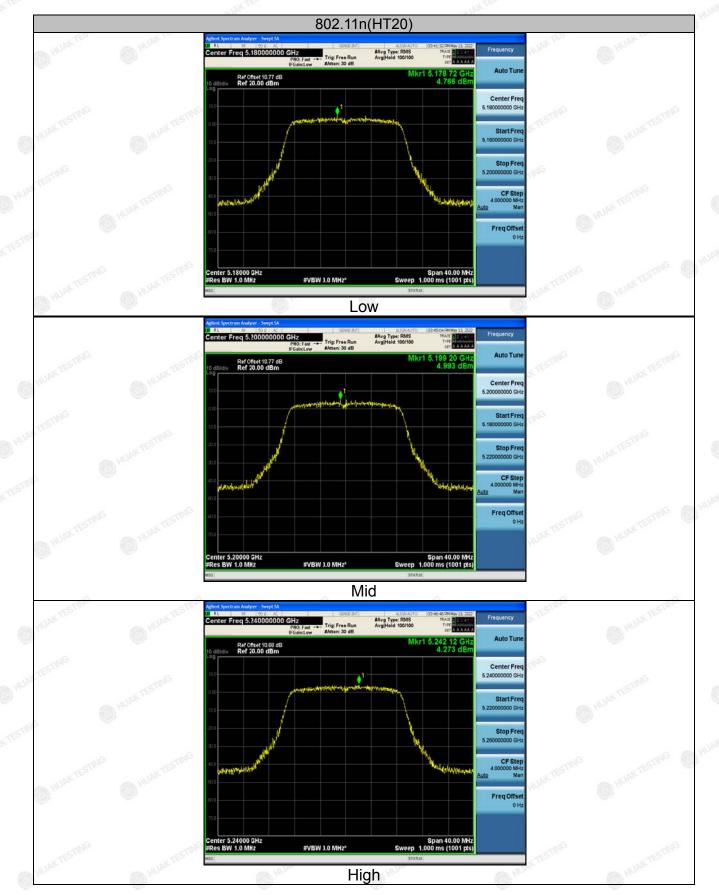
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



NG

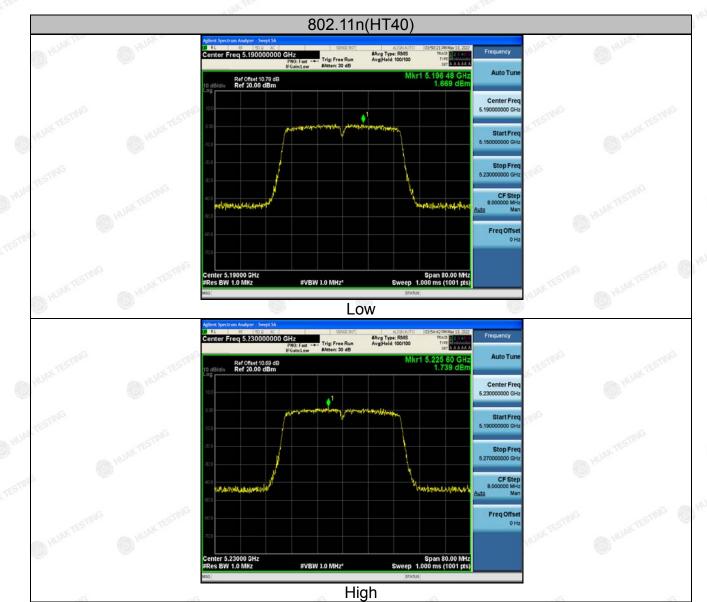
¦К



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL:+86-755 2302 9901 FAX:+86-755 2302 9901 E-mail: service@cer-mark.com

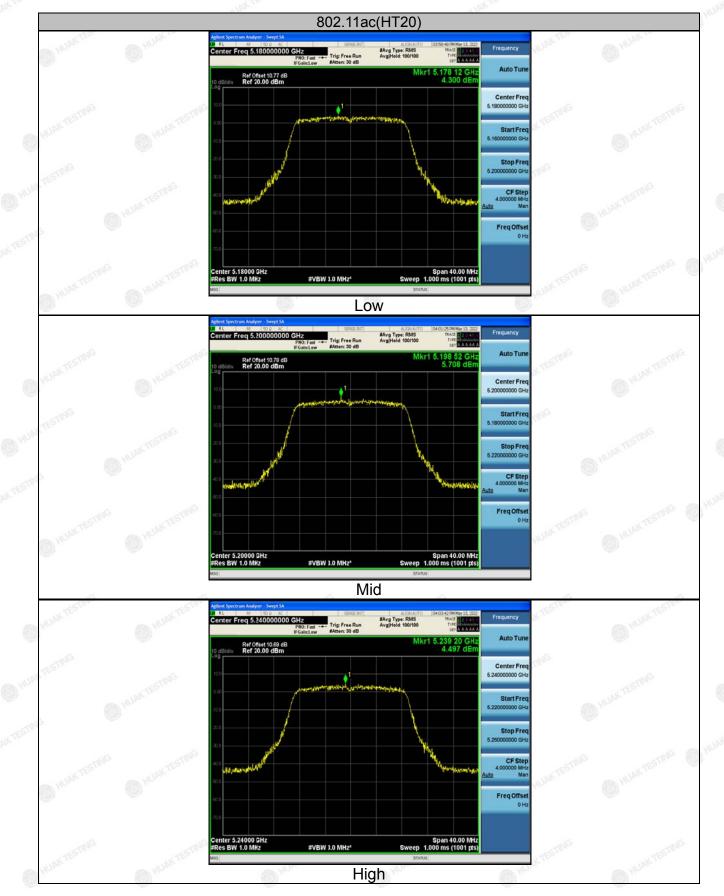




The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



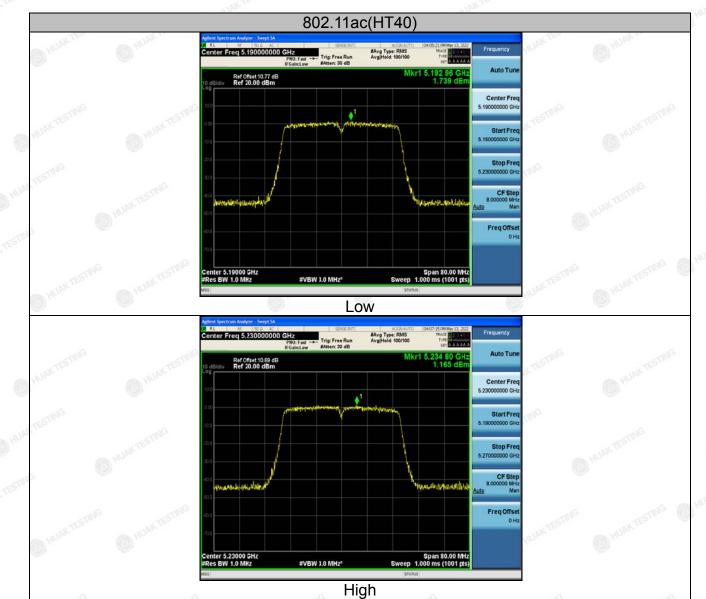


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



FICATION

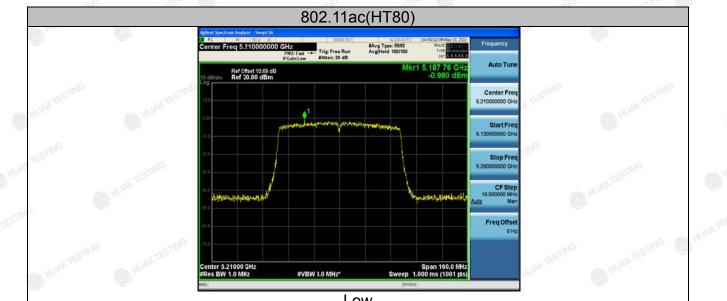


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



HUAK .



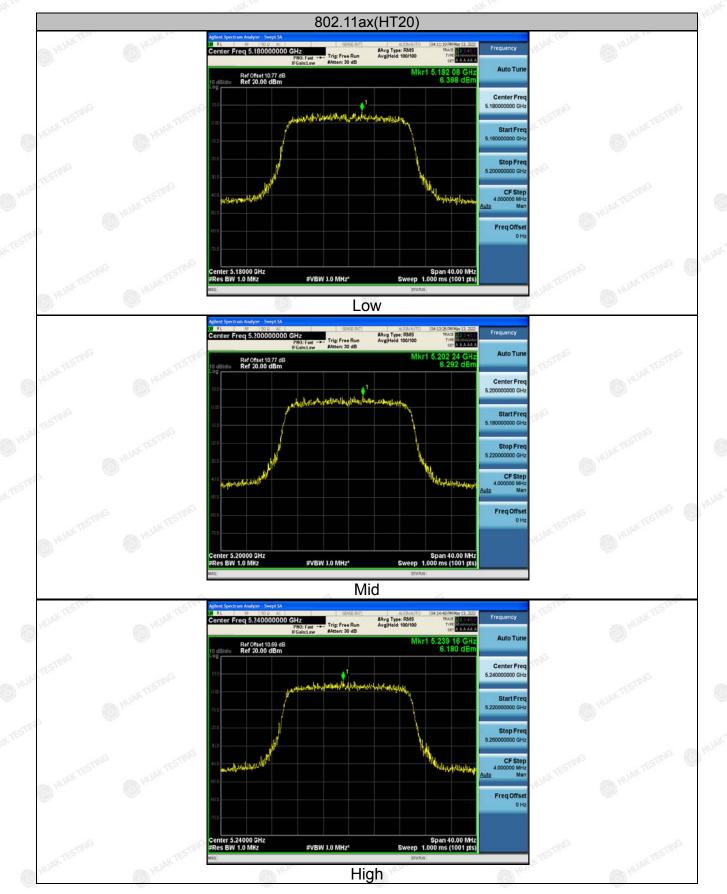
Low

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



HI APP



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

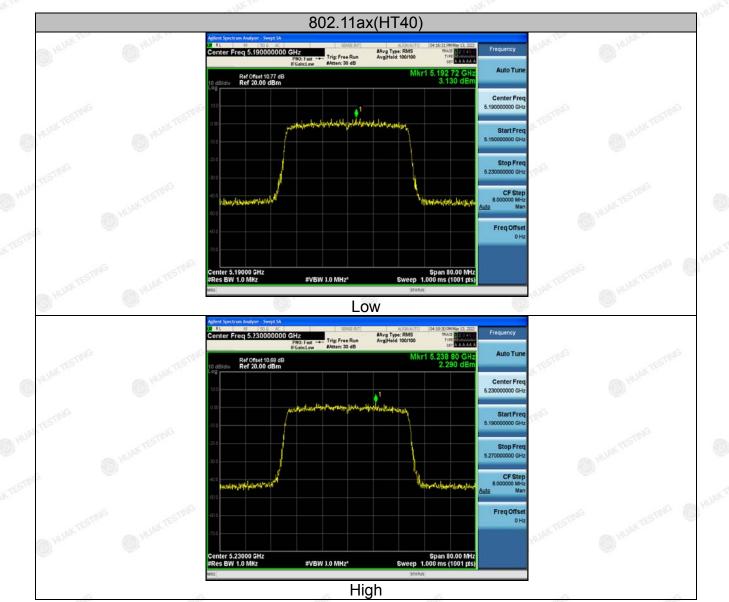
TEL:+86-755 2302 9901 FAX:+86-755 2302 9901 E-mail: service@cer-mark.com



G •

-PRO

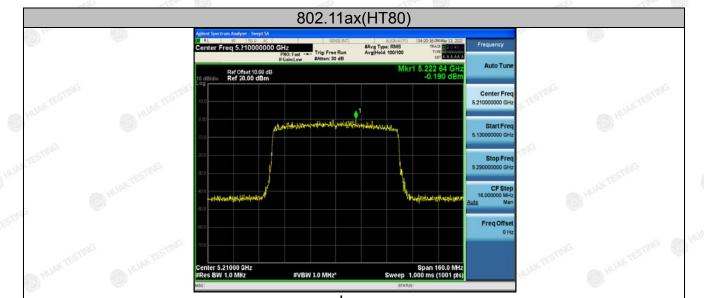
*



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com/

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com





Low

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com



TIFICATION

ANT 2

HUPS

Configuration Band I (5150 - 5250 MHz)					
Mode	Test channel	Level [dBm/MHz]	Limit (dBm/MHz)	Result	
11a	CH36	5.39	17 🔍	PASS	
11a	CH40	5.65	17	PASS	
11a	CH48	6.16	17	PASS	
11n(HT20)	CH36	5.03	17	PASS	
11n(HT20)	CH40	5.11	17	PASS	
11n(HT20)	CH48	4.66	17	PASS	
11n(HT40)	CH38	1.45	17	PASS	
11n(HT40)	CH46	1.97	17	PASS	
11ac(HT20)	CH36	4.43	17	PASS	
11ac(HT20)	CH40	4.6	17 🌒	PASS	
11ac(HT20)	CH48	4.49	17	PASS	
11ac(HT40)	CH38	1.26	17	PASS	
11ac(HT40)	CH46	2.46	17	PASS	
11ac(HT80)	CH42	-0.93	17	PASS	
11ax(HT20)	CH36	6.15	17	PASS	
11ax(HT20)	CH40	6.09	17 🤇	PASS	
11ax(HT20)	CH48	6.04	17	PASS	
11ax(HT40)	CH38	4.14	^{wo} 17	PASS	
11ax(HT40)	CH46	4.07	17 🌒	PASS	
11ax(HT80)	CH42	-0.13	17	PASS	

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

TEL: +86-755 2302 9901 FAX: +86-755 2302 9901 E-mail: service@cer-mark.com