



**TEST REPORT**  
**ETSI EN 300 440 V2.2.1 (2018-07)**

**Report Reference No.**.....: **HK241217002-3ER**

Compiled by

( position+printed name+signature)...: Testing engineer Bella Huang

*Bella Huang*

Supervised by

( position+printed name+signature)...: Technique principal Sliver Wan

*Sliver Wan*

Approved by

( position+printed name+signature)...: Manager Jason Zhou

*Jason Zhou*

Date of issue.....: 2025/01/07

Representative Laboratory Name.....: Shenzhen HUAK Testing Technology Co., Ltd.

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

**Applicant's name**.....: ViewSonic Corporation

Address.....: 10 Pointe Dr. Suite 200. Brea, CA 92821, USA

**Test specification**..... :

Standard.....: **ETSI EN 300 440 V2.2.1 (2018-07)**

TRF Originator.....: Shenzhen HUAK Testing Technology Co., Ltd.

Master TRF.....: Dated 2017-12

Shenzhen HUAK Testing Technology Co., Ltd. All rights reserved.

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 WPD-900's interpretation of the reproduced material due to its placement and context.

**Product Name**..... : WPD-900

Trade Mark.....: ViewSonic

Product Model.....: VS20541

Serial Model.....: WPD-900-RX

Hardware version.....: V2.0

Software version.....: V2.0

Operation Frequency.....: From 5745MHz-5825MHz

Ratings.....: DC 5V From USB

Result.....: **PASS**



# TEST REPORT

<b>Test Report No. :</b>	<b>HK241217002-3ER</b>	2025/01/07
		Date of issue

Product Name : WPD-900

Product Model : VS20541

Serial Model : WPD-900-RX

**Applicant** : ViewSonic Corporation

Address : 10 Pointe Dr. Suite 200. Brea, CA 92821, USA

**Manufacturer** : Actions Microelectronics Co., Ltd.

Address : 201, No.9 Building, Software Park, KeJiZhongEr Road, GaoXinQu, NanShan, Shenzhen, China

<b>Test Result:</b>	<b>PASS</b>
---------------------	-------------

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



**\*\* Modified History \*\***

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/01/07	Jason Zhou



## Contents

<b>1.</b>	<b><u>TEST STANDARDS .....</u></b>	<b><u>5</u></b>
<b>2.</b>	<b><u>SUMMARY .....</u></b>	<b><u>6</u></b>
2.1.	General Remarks	6
2.2.	Product Description	6
2.3.	Equipment Under Test	6
2.4.	EUT configuration	7
2.5.	Test summary	7
2.6.	Modifications	7
<b>3.</b>	<b><u>TEST ENVIRONMENT .....</u></b>	<b><u>8</u></b>
3.1.	Information of the Test Laboratory	8
3.2.	Environmental conditions	8
3.3.	Statement of the measurement uncertainty	8
3.4.	Equipments Used during the Test	9
<b>4.</b>	<b><u>TEST CONDITIONS AND RESULTS .....</u></b>	<b><u>10</u></b>
4.1.	6dB Bandwidth	10
4.2.	Equivalent Isotropically Radiated Power (e.i.r.p)	13
4.3.	Permitted Range of Operating Frequencies	15
4.4.	Spurious emissions and cabinet	19
4.5.	Duty cycle	25
4.6.	Adjacent channel selectivity	26
4.7.	Blocking or desensitization	28
4.8.	Receiver Emissions	30
<b>5.</b>	<b><u>TEST SETUP PHOTOS OF THE EUT .....</u></b>	<b><u>35</u></b>
<b>6.</b>	<b><u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT .....</u></b>	<b><u>36</u></b>



## **1. TEST STANDARDS**

The tests were performed according to following standards:

[ETSI EN 300 440 V2.2.1 \(2018-07\)](#) : Short Range Devices (SRD);Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU



## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	2024/12/24
Testing commenced on	:	2024/12/24
Testing concluded on	:	2025/01/07

### 2.2. Product Description

Product Name:	WPD-900
Model/Type reference:	VS20541
List Model:	WPD-900-RX
Difference description	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: VS20541.
Power supply:	DC 5V From USB
Adapter information:	N/A
Antenna Type	PCB Antenna
Antenna Gain	1dBi
WLAN	Supported 802.11a/802.11n HT20
Operation frequency	IEEE 802.11a/ IEEE 802.11n HT20:5745MHz-5825MHz
Modulation Type	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)
Receiver category	Receiver category 2
Remark: The products are identical in interior structure, electrical circuits and components, just model names are different.	
Note: Antenna gain Refer to the antenna specifications. The cable loss data is obtained from the supplier. The test results in the report only apply to the tested sample.	

### 2.3. Equipment Under Test

#### Power supply system utilised

Power supply voltage	:	<input type="radio"/> 230V / 50 Hz	<input type="radio"/> 120V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 5V From USB



### Description of the test mode

Channel	Frequency (MHz)
149	5745
151	5755
153	5765
157	5785
159	5795
161	5805
165	5825

### 2.4. EUT configuration

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

- - supplied by the manufacturer
- - supplied by the lab

○ /	M/N: /
	Manufacturer: /

### 2.5. Test summary

ETSI EN 300 440 Requirements		
Equivalent isotropic radiated power(Radiated)	ETSI EN 300 440 Sub-clause 4.2.2	Pass
Permitted range of operating frequencies	ETSI EN 300 440 Sub-clause 4.2.3	Pass
Spurious emissions	ETSI EN 300 440 Sub-clause 4.2.4	Pass
Duty cycle	ETSI EN 300 440 Sub-clause 4.2.5	N/A
Additional requirements for FHSS equipment	ETSI EN 300 440 Sub-clause 4.2.6	N/A <sup>Note 1</sup>
Adjacent channel selectivity	ETSI EN 300 440 Sub-clause 4.3.3	Pass
Blocking or desensitization	ETSI EN 300 440 Sub-clause 4.3.4	Pass
Receiver Spurious emissions	ETSI EN 300 440 Sub-clause 4.3.5	Pass
Spectrum access techniques	ETSI EN 300 440 Sub-clause 4.4	Pass <sup>Note 2</sup>

Note 1: Which only applicable to FHSS system device.

Note 2: The manufacturer declares compliance with Section 4.4(Spectrum access techniques)

### 2.6. Modifications

No modifications were implemented to meet testing criteria.



### 3. TEST ENVIRONMENT

#### 3.1. Information of the Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.  
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.

#### 3.2. Environmental conditions

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

Normal Temperature: 25 °C  
High Temperature: 40 °C  
Low Temperature: -10 °C  
Normal Voltage : DC 5V  
High Voltage:DC 5.5V  
Low Voltage:DC 4.5V  
Relative Humidity: 55 %  
Air Pressure: 989 hPa

#### 3.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The WPD-900 is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics;Part 2 " and is documented in the Shenzhen HUAKE Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen HUAKE Testing Technology Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Conducted spurious emission	1.60 dB	(1)
Radiated spurious emission	2.20 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	2024/02/21	2026/02/20
Horn antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2026/02/20
Receiver	R&S	ESR-7	HKE-010	2024/02/20	2025/02/19
Spectrum analyzer	Agilent	N9020A	HKE-048	2024/02/20	2025/02/19
Spectrum analyzer	R&S	FSP40	HKE-025	2024/02/20	2025/02/19
Preamplifier	EMCI	EMC051845S E	HKE-015	2024/02/20	2025/02/19
Preamplifier	Agilent	83051A	HKE-016	2024/02/20	2025/02/19
High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	2025/02/19
Signal generator	Agilent	83630A	HKE-028	2024/02/20	2025/02/19
4 Ch. Simultaneous Sampling 14 Bits 2 MS/s	Agilent	U2531A	TW5406351 3	2024/02/20	2025/02/19
Power Sensor	Agilent	E9300A	HKE-086	2024/02/20	2025/02/19
RF automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	2025/02/19
Signal generator	Agilent	N5182A	HKE-029	2024/02/20	2025/02/19
Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	2025/02/19
RSE Test Software	Tonscend	JS36-RSE 5.0.0	HKE -184	/	/

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 cannot 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](mailto:service@cer-mark.com)

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



## 4. TEST CONDITIONS AND RESULTS

### 4.1. 6dB Bandwidth

#### Limit

N/A

#### Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### Test Configuration

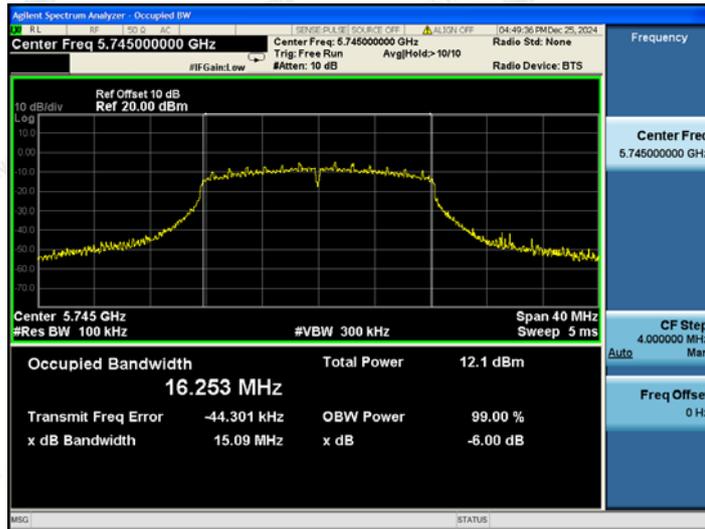


#### Test Results

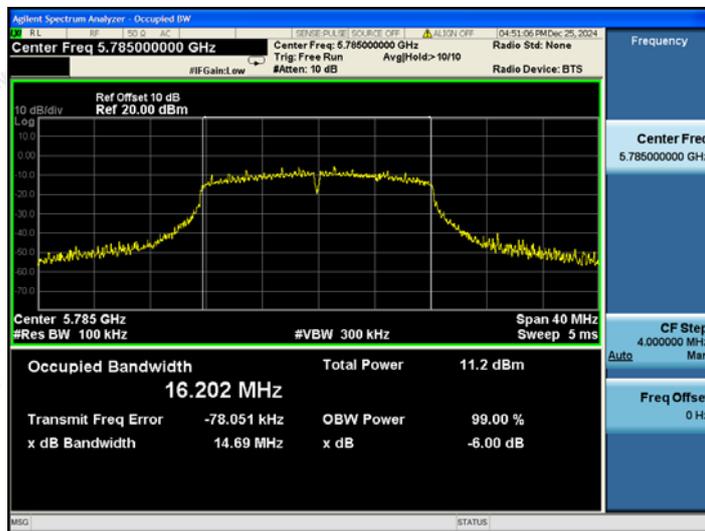
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11a	149	16.25	N/A	N/A
	157	16.20		
	165	16.23		
802.11 n HT 20	149	17.36	N/A	N/A
	157	17.32		
	165	17.37		



802.11a-5745



802.11a-5785



802.11a-5825



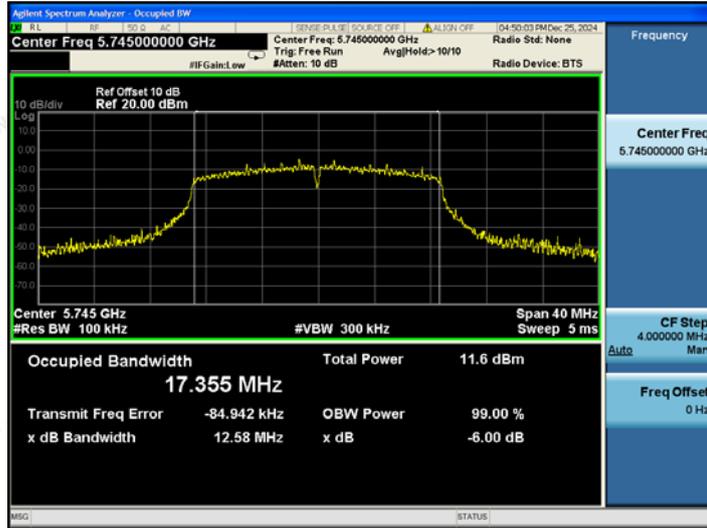
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity 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

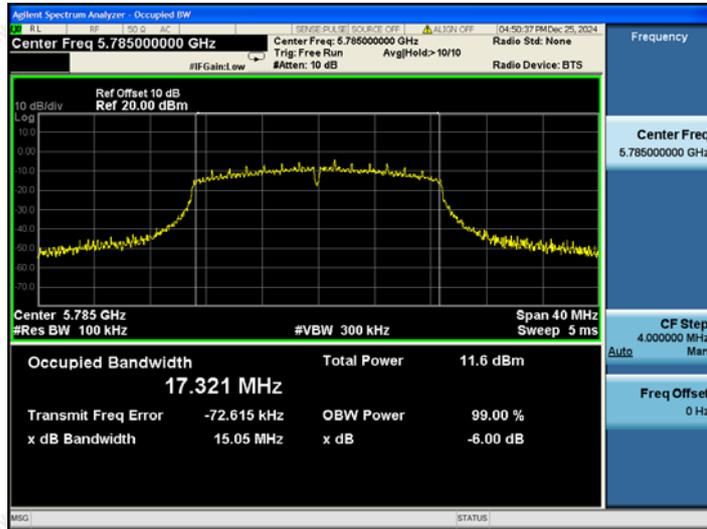
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



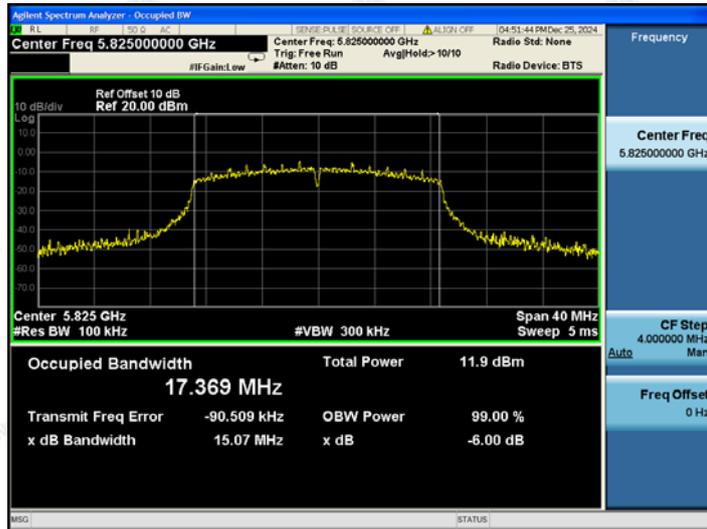
802.11n HT20-5745



802.11n HT20-5785



802.11n HT20-5825



The results shown in this test report refer only to the sample(s) unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAKE, this document cannot 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

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



### 4.2. Equivalent Isotropically Radiated Power (e.i.r.p)

#### LIMIT

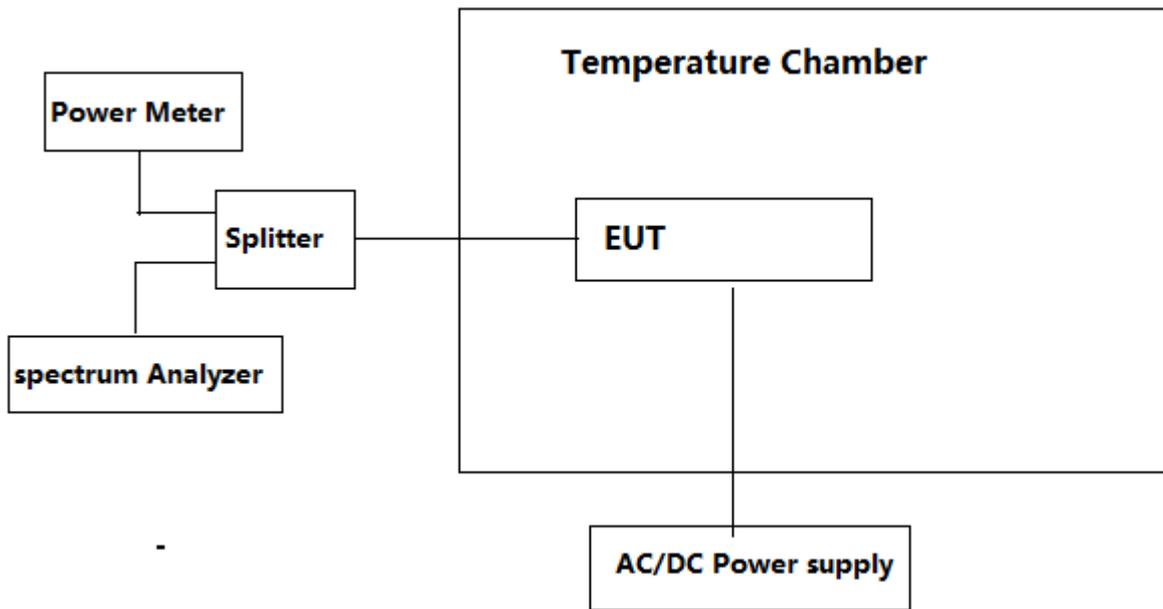
According to ETSI EN 300 440 clause 4.2.2.3.2

The transmitter maximum e.i.r.p. under normal and extreme test conditions shall not exceed the values given in table 2.

Table 2: Maximum radiated peak power (e.i.r.p.)

Frequency Bands	Power	Application	Notes
2 400 MHz to 2 483,5 MHz	10 mW e.i.r.p.	Non-specific short range devices	
2 400 MHz to 2 483,5 MHz	25 mW e.i.r.p.	Radio determination devices	
(a) 2 446 MHz to 2 454 MHz	500 mW e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
(b) 2 446 MHz to 2 454 MHz	4 W e.i.r.p.	Radio Frequency Identification (RFID) devices	See also table 4 and annex D
5 725 MHz to 5 875 MHz	25 mW e.i.r.p.	Non-specific short range devices	
9 200 MHz to 9 500 MHz	25 mW e.i.r.p.	Radio determination devices	
9 500 MHz to 9 975 MHz	25 mW e.i.r.p.	Radio determination devices	
10,5 GHz to 10,6 GHz	500 mW e.i.r.p.	Radio determination devices	
13,4 GHz to 14,0 GHz	25 mW e.i.r.p.	Radio determination devices	
17,1 GHz to 17,3 GHz	400 mW e.i.r.p.	Radio determination devices	See annex F
24,00 GHz to 24,25 GHz	100 mW e.i.r.p.	Non-specific short range devices and Radio determination devices	

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. Please refer to ETSI EN 300 440 clause 5 for the test conditions.
2. Please refer to ETSI EN 300 440 clause 4.2.2.3 for the measurement method.
3. According to the -6 dB channel bandwidth measurement result, the test procedure define in Sub-clause clause 4.2.2.3.2 is used for 802.11a HT20/802.11n HT20 test.



TEST RESULTS

802.11a							
Test conditions		Channel/ Frequency	Measured power (dBm)	Antenna Gain (dBi)	e.i.r.p (dBm)	Limit (dBm)	Result
Temperature (°C)	Voltage (V)						
+25°C	5.0V	149/5745	11.26	1	12.26	13.98	PASS
-10°C	5.5V		11.12	1	12.12		
	4.5V		11.07	1	12.07		
+40°C	5.5V		10.97	1	11.97		
	4.5V	10.17	1	11.17			
+25°C	5.0V	157/5785	11.85	1	12.85		
-10°C	5.5V		10.76	1	11.76		
	4.5V		11.07	1	12.07		
+40°C	5.5V		10.66	1	11.66		
	4.5V	11.14	1	12.14			
+25°C	5.0V	165/5825	11.67	1	12.67		
-10°C	5.5V		10.96	1	11.96		
	4.5V		10.35	1	11.35		
+40°C	5.5V		10.56	1	11.56		
	4.5V	10.45	1	11.45			

802.11n HT 20							
Test conditions		Channel/ Frequency	Measured power (dBm)	Antenna Gain (dBi)	e.i.r.p (dBm)	Limit (dBm)	Result
Temperature (°C)	Voltage (V)						
+25°C	5.0V	149/5745	10.75	1	11.75	13.98	PASS
-10°C	5.5V		10.52	1	11.52		
	4.5V		10.24	1	11.24		
+40°C	5.5V		9.65	1	10.65		
	4.5V	9.64	1	10.64			
+25°C	5.0V	157/5785	10.83	1	11.83		
-10°C	5.5V		9.97	1	10.97		
	4.5V		10.52	1	11.52		
+40°C	5.5V		10.04	1	11.04		
	4.5V	10.44	1	11.44			
+25°C	5.0V	165/5825	10.42	1	11.42		
-10°C	5.5V		9.92	1	10.92		
	4.5V		9.15	1	10.15		
+40°C	5.5V		9.72	1	10.72		
	4.5V	9.38	1	10.38			

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 cannot 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

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



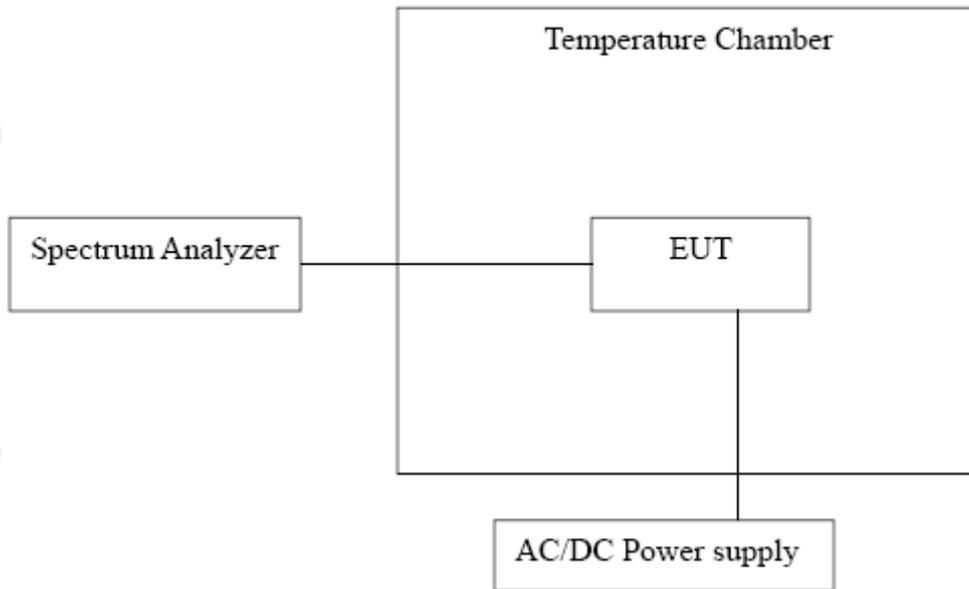
### 4.3. Permitted Range of Operating Frequencies

#### LIMIT

According to ETSI EN 300 440 clause 4.2.3.5

Frequency range Limit	
$F_{Low} > 5725G$	$F_{High} < 5875GHz$

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. Please refer to ETSI EN 300 440 clause 5 for the test conditions.
2. Please refer to ETSI EN 300 440 clause 4.2.3.3 for the measurement method.



**TEST RESULTS**

802.11a					
Test Condition		f <sub>L</sub> (MHz)	f <sub>H</sub> (MHz)	Limit	Result
Temperature (°C)	Voltage ( V )				
+25°C	5.0	5736.52	5833.36	f <sub>L</sub> ≧ 5725MHz and f <sub>H</sub> ≧ 5875MHzGHz	Pass
-10°C	5.5	5736.96	5833.76		
	4.5	5736.72	5833.84		
+40°C	5.5	5736.68	5833.43		
	4.5	5736.60	5833.52		

802.11n HT20					
Test Condition		f <sub>L</sub> (MHz)	f <sub>H</sub> (MHz)	Limit	Result
Temperature (°C)	Voltage ( V )				
+25°C	5.0	5735.92	5833.88	f <sub>L</sub> ≧ 5725MHz and f <sub>H</sub> ≧ 5875MHzGHz	Pass
-10°C	5.5	5735.56	5833.76		
	4.5	5735.64	5833.52		
+40°C	5.5	5735.62	5833.87		
	4.5	5735.76	5833.43		

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 cannot 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](mailto:service@cer-mark.com)

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



802.11a 5745



802.11a 5825



802.11n HT20 5745



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 HUAKE, this document cannot 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

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



802.11n HT20 5825



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 HUAKE, this document cannot 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

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

### 4.4. Spurious emissions and cabinet

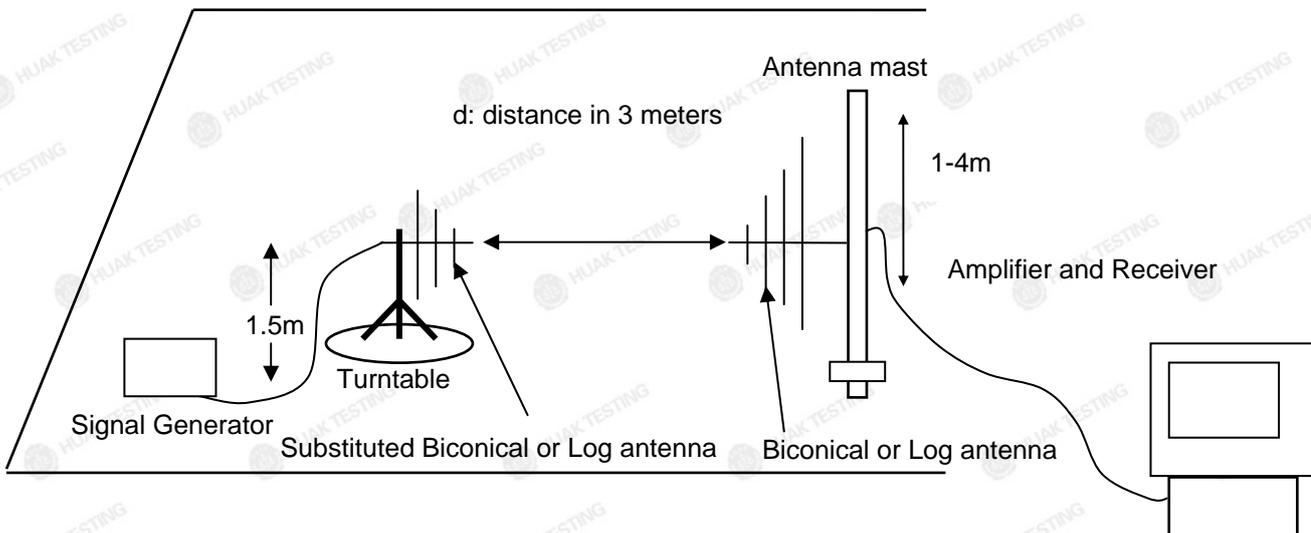
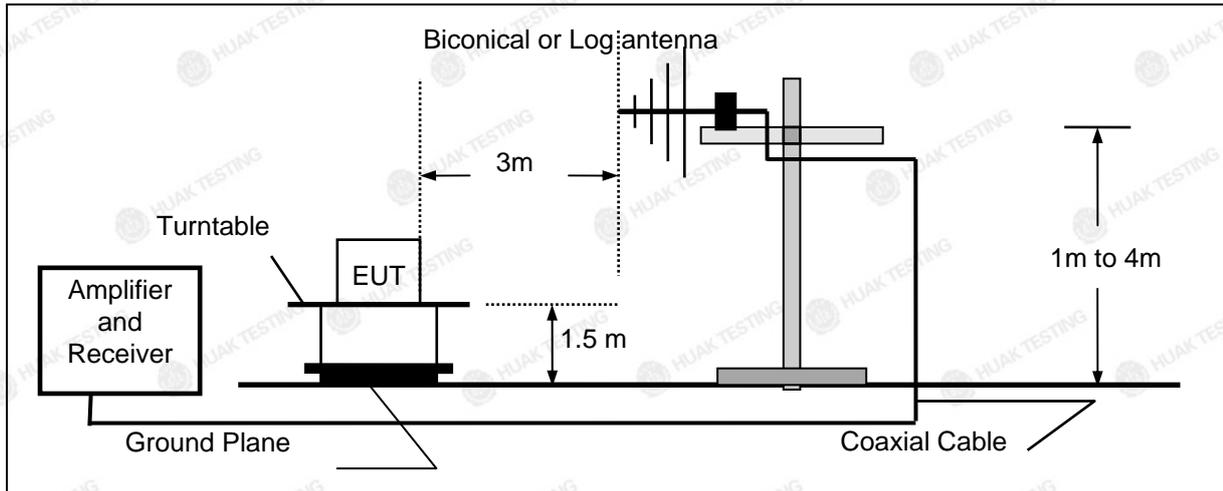
**LIMIT**

The power of the spurious emissions shall not exceed the limits of table

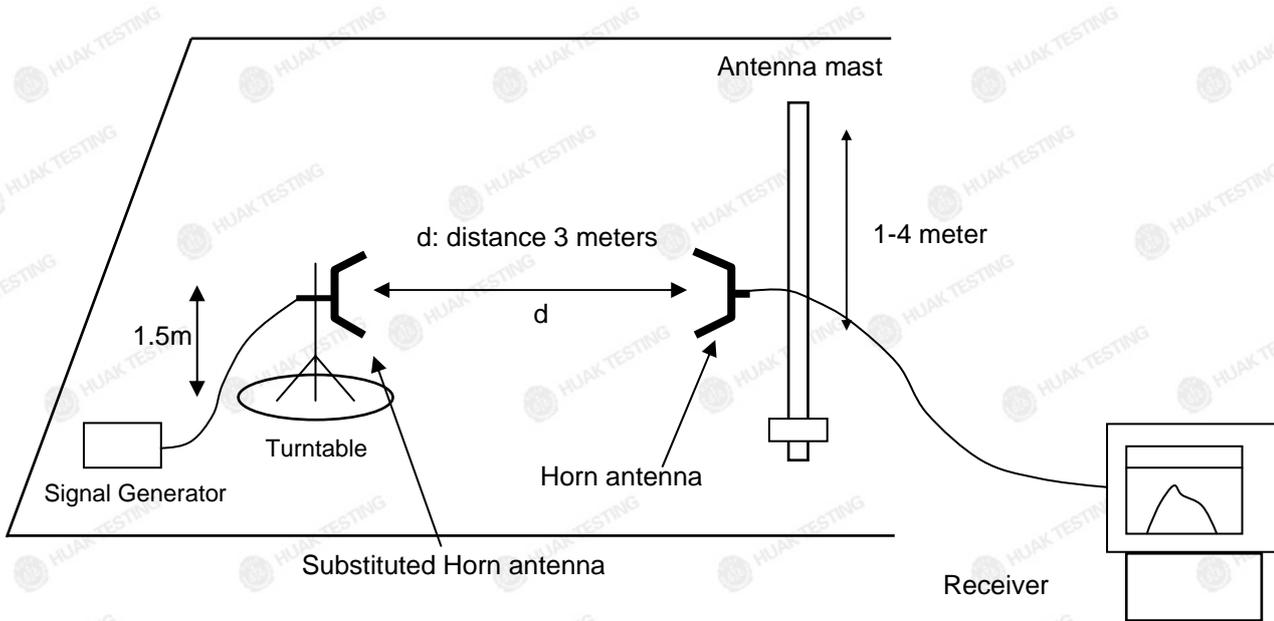
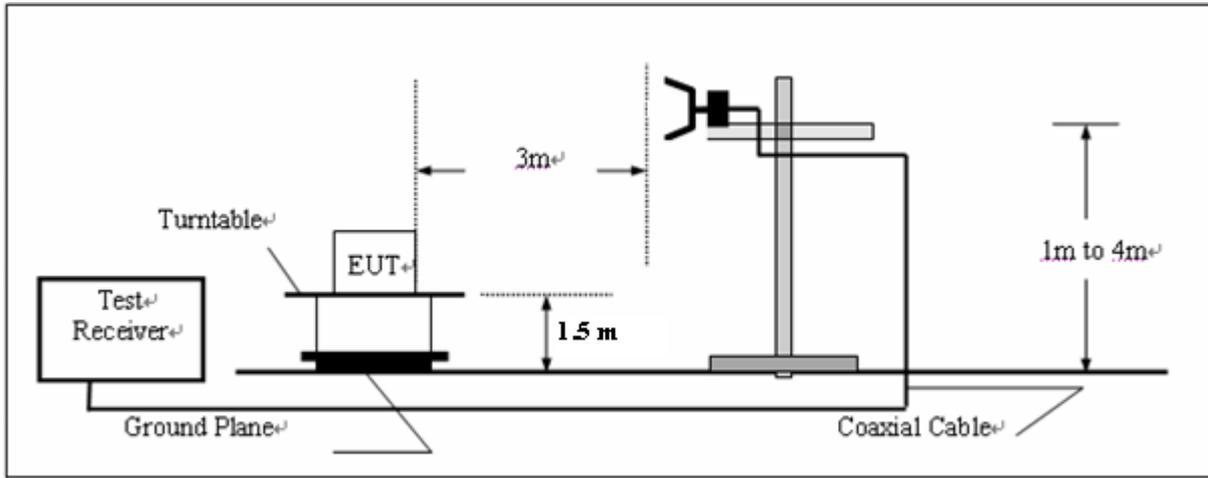
State	47 MHz to 74 MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤1 000 MHz	Frequencies > 1 000 MHz
Operating	4 nW /-54dBm	250 nW/-36dBm	1 μW /-30dBm
Standby	2 nW /-57dBm	2 nW /-57dBm	20 nW /-47dBm

**TEST CONFIGURATION**

Below 1GHz



Above 1GHz



**TEST PROCEDURE**

1. Please refer to ETSI EN 300 440 clause 5 for the test conditions.
2. Please refer to ETSI EN 300 440 clause 4.2.4.3 for the measurement method.



**TEST RESULTS**

Note: We tested at 802.11a/802.11n HT20 mode at the antenna single transmitting mode and the Mimo mode, and recorded the worst case 802.11n HT 20 mode at the Mimo mode. The measurement frequency range is from 25MHz to the 10<sup>th</sup> harmonic of the fundamental frequency, not exceeding 40GHz. 18GHz-40GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

**802.11n HT 20, CH 149, Horizontal/Vertical**

Below 1G

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
141.04	V	-76.19	-36	-40.19	PASS
211.86	V	-76.13	-54	-22.13	PASS
283.63	V	-78.00	-36	-42.00	PASS
370.59	V	-77.83	-36	-41.83	PASS
471.19	V	-73.89	-54	-19.89	PASS
798.89	V	-77.63	-54	-23.63	PASS
185.33	H	-71.98	-54	-17.98	PASS
232.10	H	-78.90	-36	-42.90	PASS
329.25	H	-72.78	-36	-36.78	PASS
395.23	H	-74.08	-36	-38.08	PASS
590.40	H	-80.34	-54	-26.34	PASS
835.21	H	-83.41	-54	-29.41	PASS
Note: 1. Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
2106.84	V	-58.44	-30	-28.44	PASS
2403.01	V	-56.92	-30	-26.92	PASS
3427.92	V	-55.40	-30	-25.40	PASS
4264.13	V	-56.99	-30	-26.99	PASS
5494.51	V	-52.11	-30	-22.11	PASS
5868.11	V	-51.22	-30	-21.22	PASS
2105.56	H	-49.88	-30	-19.88	PASS
2348.55	H	-58.04	-30	-28.04	PASS
3048.52	H	-54.31	-30	-24.31	PASS
3521.36	H	-58.03	-30	-28.03	PASS
4839.91	H	-52.82	-30	-22.82	PASS
6682.53	H	-53.72	-30	-23.72	PASS
<b>Note:</b> 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



802.11n HT 20, CH 165, Horizontal/Vertical

Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Below 1GHz:</b>					
189.44	V	-77.98	-36	-41.98	PASS
240.50	V	-75.81	-54	-21.81	PASS
286.26	V	-79.43	-36	-43.43	PASS
388.71	V	-79.89	-36	-43.89	PASS
456.84	V	-74.90	-54	-20.90	PASS
796.13	V	-79.82	-54	-25.82	PASS
186.90	H	-72.99	-54	-18.99	PASS
236.44	H	-75.10	-36	-39.10	PASS
309.93	H	-81.69	-36	-45.69	PASS
406.71	H	-75.28	-36	-39.28	PASS
574.74	H	-78.34	-54	-24.34	PASS
832.91	H	-80.79	-54	-26.79	PASS

Note:

- 1.Cable loss and antenna gain was combined in the calculated result.
2. Other point of the measurements are below 20dB from the limit.



Fre. (MHz)	ANT. Pol.	Result (dBm)	Limit	Margin	Conclusion
<b>Above 1GHz:</b>					
2057.25	V	-54.39	-30	-24.39	PASS
2551.32	V	-54.80	-30	-24.80	PASS
3655.82	V	-58.49	-30	-28.49	PASS
4414.76	V	-54.61	-30	-24.61	PASS
5422.49	V	-54.50	-30	-24.50	PASS
5971.92	V	-57.93	-30	-27.93	PASS
2357.62	H	-53.40	-30	-23.40	PASS
2290.14	H	-57.62	-30	-27.62	PASS
3049.81	H	-55.61	-30	-25.61	PASS
3853.01	H	-57.91	-30	-27.91	PASS
5042.42	H	-50.33	-30	-20.33	PASS
6663.43	H	-45.71	-30	-15.71	PASS
<b>Note:</b> 1.Cable loss and antenna gain was combined in the calculated result. 2. Other point of the measurements are below 20dB from the limit.					



### 4.5. Duty cycle

According to ETSI EN 300 440 clause 4.2.5.4

Table 4 defines the maximum duty cycle within a 1 hour period.

**Table 4: Duty cycle limits**

Frequency Band	Duty cycle	Application	Notes
2 400 MHz to 2 483,5 MHz	No Restriction	Generic use	
2 400 MHz to 2 483,5 MHz	No Restriction	Detection, movement and alert applications	
(a) 2 446 MHz to 2 454 MHz	No Restriction	RFID	Limits shown in annex D shall apply
(b) 2 446 MHz to 2 454 MHz	≤ 15 %	RFID	Limits shown in annex D shall apply
5 725 MHz to 5 875 MHz	No Restriction	Generic use	
9 200 MHz to 9 500 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
9 500 MHz to 9 975 MHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
10,5 GHz to 10,6 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
13,4 GHz to 14,0 GHz	No Restriction	Radiodetermination: radar, detection, movement and alert applications	
17,1 GHz to 17,3 GHz	DAA or equivalent techniques	Radiodetermination: GBSAR detecting and movement and alert applications	Limits shown in annex F shall apply
24,00 GHz to 24,25 GHz	No Restriction	Generic use and for Radiodetermination: radar, detection, movement and alert applications	

### TEST RESULTS

For device working in frequency band 5725MHz to 5875MHz, no duty cycle restricted.



### 4.6. Adjacent channel selectivity

#### LIMIT

Receiver category	Limit
1	-30dBm+k
2	No limit
3	No limit

The correction factor, k, is as follows:

$$K=-20\log f-10\log BW$$

Where:

-f is the frequency in GHz;

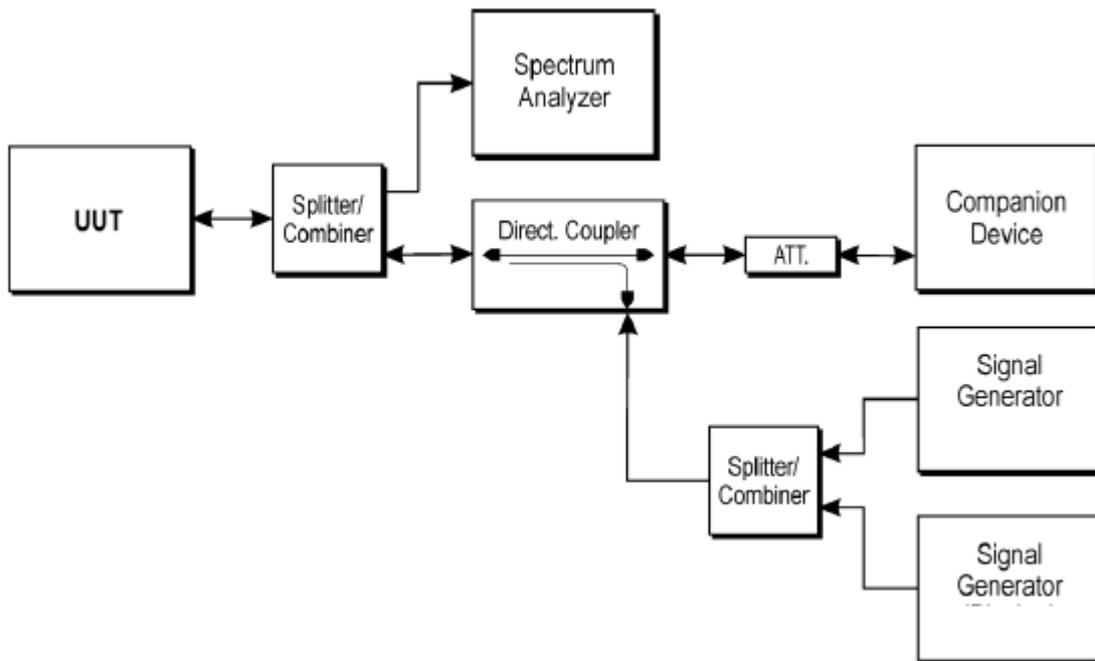
-BW is the channel bandwidth in MHz.

The factor k is limited within the following:

$$-40 \text{ dB} < k < 0 \text{ dB}$$

The manufacturer declare the BW is 20MHz,  $K=-20\log f(\text{Unwanted Signal Frequency})-13.01$ .

#### TEST PROCEDURE



#### TEST CONFIGURATION

- 1.Please refer to ETSI EN 300 440 clause 5 for the test conditions.
- 2.Please refer to ETSI EN 300 440 clause 4.3.3.3 for the measurement method.

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 cannot 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>.



**TEST RESULTS**

802.11a

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
153	20	5745	-41.14	-58.20	PASS
	20	5785	-46.25	-58.26	PASS
161	20	5785	-41.72	-58.26	PASS
	20	5825	-39.78	-58.32	PASS

802.11 n HT 20

Test Channel	BW(MHz)	Unwanted Signal Frequency(MHz)	Adjacent Frequency Signal Power Level (dBm)	Limit (dBm)	Result
153	20	5745	-44.81	-58.20	PASS
	20	5785	-39.31	-58.26	PASS
161	20	5785	-39.62	-58.26	PASS
	20	5825	-46.85	-58.32	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 cannot 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

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



### 4.7. Blocking or desensitization

#### LIMIT

Receiver category	Limit
1	-30dBm+k
2	-45dBm+k
3	-60dBm+k

The correction factor, k, is as follows:

$$K=-20\log f-10\log BW$$

Where:

-f is the frequency in GHz;

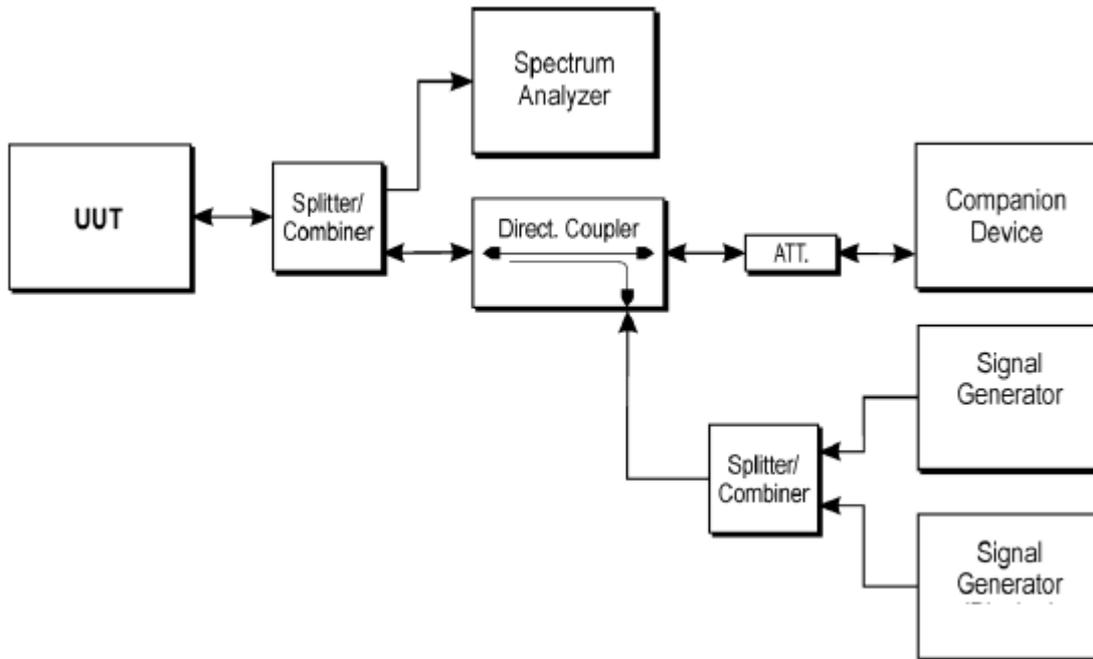
-BW is the channel bandwidth in MHz.

The factor k is limited within the following:

$$-40 \text{ dB} < k < 0\text{dB}$$

The manufacturer declare the BW is 20MHz,  $K=-20\log f(\text{Blocking Signal Frequency})-13.01$ .

#### TEST PROCEDURE



#### TEST CONFIGURATION

- 1.Please refer to ETSI EN 300 440 clause 5 for the test conditions.
- 2.Please refer to ETSI EN 300 440 clause 4.3.4.3 for the measurement method.



**TEST RESULTS**

802.11a

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
149	20	5545(10 time channel bandwidth frequency offset)	-50.81	-72.88	PASS
		5345(20 time channel bandwidth frequency offset)	-47.48	-72.56	PASS
		4745(50 time channel bandwidth frequency offset)	-42.83	-71.53	PASS
165	20	6025(10 time channel bandwidth frequency offset)	-50.43	-73.60	PASS
		6225(20 time channel bandwidth frequency offset)	-49.96	-73.89	PASS
		6825(50 time channel bandwidth frequency offset)	-47.72	-74.69	PASS

802.11 n HT 20

Test Channel	BW(MHz)	Blocking Signal Frequency(MHz)	Blocking Signal Power Level (dBm)	Limit (dBm)	Result
149	20	5545(10 time channel bandwidth frequency offset)	-53.58	-72.88	PASS
		5345(20 time channel bandwidth frequency offset)	-46.36	-72.56	PASS
		4745(50 time channel bandwidth frequency offset)	-48.01	-71.53	PASS
165	20	6025(10 time channel bandwidth frequency offset)	-49.78	-73.60	PASS
		6225(20 time channel bandwidth frequency offset)	-49.11	-73.89	PASS
		6825(50 time channel bandwidth frequency offset)	-45.65	-74.69	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 cannot 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](mailto:service@cer-mark.com)

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



## **4.8. Receiver Emissions**

### **LIMIT**

The power of any spurious emission shall not exceed 2 nW in the range 25 MHz to 1 GHz and shall not exceed 20 nW on frequencies above 1 GHz.

### **TEST CONFIGURATION**

The same as described in section 4.4

### **TEST PROCEDURE**

1. Please refer to ETSI EN 300 440 Sub-clause 5 for the test conditions.
2. Please refer to ETSI EN 300 440 Sub-clause 4.3.5.4 for the measurement method.

### **TEST RESULTS**

Remark: We tested at 802.11a/802.11n HT20 mode at the antenna single receiver mode and the Mimo mode, and recorded the worst case 802.11n HT 20 mode at the Mimo mode. The measurement frequency range is from 25MHz to the 10<sup>th</sup> harmonic of the fundamental frequency, not exceeding 40GHz. 18GHz-40GHz not recorded for no spurious point have a margin of less than 6 dB with respect to the limits.

ATTESTATION



802.11n HT 20, CH 149, Horizontal/Vertical

Below 1G

NO.	Freq. [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Path [dB]	Ant. Pol.
1	159.71	-77.99	-57	-20.99	4.71	0.00	Vertical
2	336.43	-79.51	-57	-22.51	3.29	0.00	Vertical
3	410.61	-75.83	-57	-18.83	3.18	0.00	Vertical
4	443.09	-74.52	-57	-17.52	3.15	0.00	Vertical
5	601.95	-80.92	-57	-23.92	3.72	0.00	Vertical
6	735.52	-75.81	-57	-18.81	4.03	0.00	Vertical
7	206.48	-76.85	-57	-19.85	3.42	0.00	Horizontal
8	258.64	-77.64	-57	-20.64	4.06	0.00	Horizontal
9	353.27	-77.29	-57	-20.29	3.81	0.00	Horizontal
10	443.06	-73.35	-57	-16.35	3.79	0.00	Horizontal
11	524.13	-75.53	-57	-18.53	3.55	0.00	Horizontal
12	732.07	-76.14	-57	-19.14	3.18	0.00	Horizontal

NOTE: Other point of the measurements are below 20dB from the limit.



Above 1G

NO.	Freq. [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Path [dB]	Ant. Pol.
1	1740.54	-76.75	-47	-29.75	7.95	0.00	Vertical
2	1798.98	-82.43	-47	-35.43	8.13	0.00	Vertical
3	2880.54	-77.35	-47	-30.35	5.65	0.00	Vertical
4	3620.48	-77.05	-47	-30.05	6.73	0.00	Vertical
5	4051.76	-82.63	-47	-35.63	7.27	0.00	Vertical
6	4477.05	-75.26	-47	-28.26	6.44	0.00	Vertical
7	1822.37	-79.71	-47	-32.71	7.51	0.00	Horizontal
8	3105.83	-82.46	-47	-35.46	6.98	0.00	Horizontal
9	3320.65	-76.84	-47	-29.84	5.47	0.00	Horizontal
10	3960.78	-76.59	-47	-29.59	6.73	0.00	Horizontal
11	4924.56	-78.82	-47	-31.82	7.54	0.00	Horizontal
12	5324.85	-78.57	-47	-31.57	8.12	0.00	Horizontal

NOTE: Other point of the measurements are below 20dB from the limit.



802.11n HT 20, CH 165, Horizontal/Vertical

Below 1G

NO.	Freq. [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Path [dB]	Ant. Pol.
1	194.15	-77.32	-57	-20.32	4.71	0.00	Vertical
2	335.65	-80.72	-57	-23.72	3.29	0.00	Vertical
3	407.45	-74.42	-57	-17.42	3.18	0.00	Vertical
4	425.88	-77.69	-57	-20.69	3.15	0.00	Vertical
5	607.15	-81.11	-57	-24.11	3.72	0.00	Vertical
6	774.54	-76.44	-57	-19.44	4.03	0.00	Vertical
7	198.75	-79.49	-57	-22.49	3.42	0.00	Horizontal
8	273.01	-84.15	-57	-27.15	4.06	0.00	Horizontal
9	357.47	-77.33	-57	-20.33	3.81	0.00	Horizontal
10	454.57	-76.92	-57	-19.92	3.79	0.00	Horizontal
11	518.01	-77.31	-57	-20.31	3.55	0.00	Horizontal
12	776.08	-74.55	-57	-17.55	3.18	0.00	Horizontal

NOTE: Other point of the measurements are below 20dB from the limit.



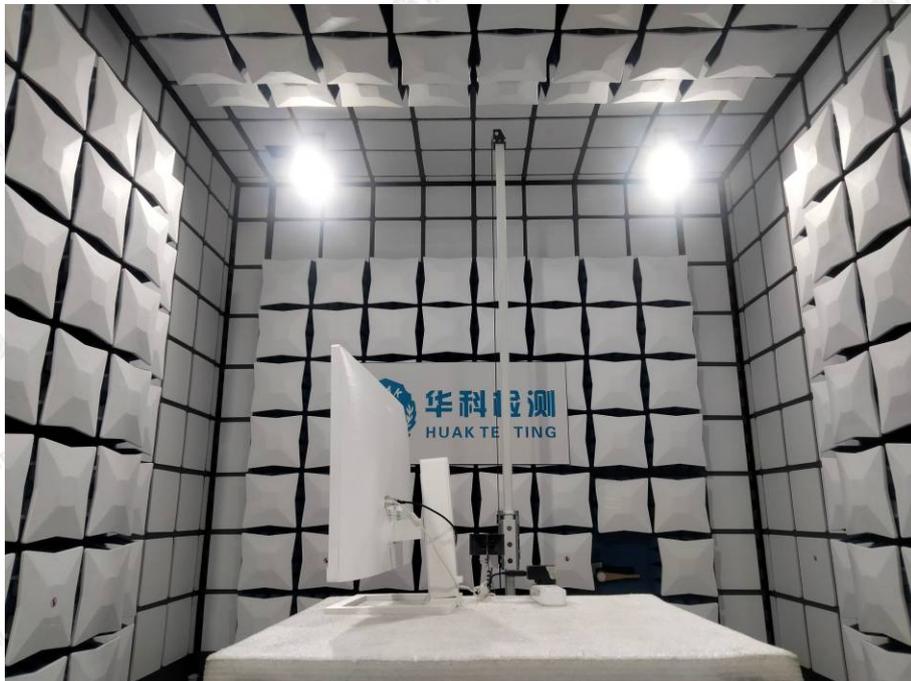
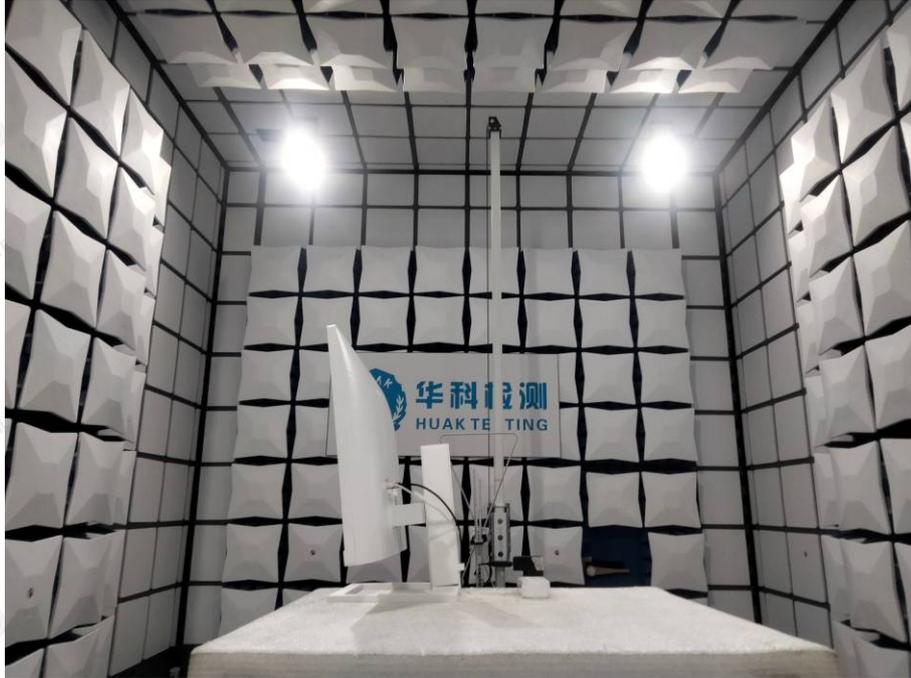
Above 1G

NO.	Freq. [MHz]	Level [dBm]	Limit [dBm]	Margin [dB]	Factor [dB]	Path [dB]	Ant. Pol.
1	1591.65	-81.09	-47	-34.09	7.95	0.00	Vertical
2	2079.33	-77.22	-47	-30.22	8.13	0.00	Vertical
3	2937.73	-78.29	-47	-31.29	5.65	0.00	Vertical
4	3593.76	-77.23	-47	-30.23	6.73	0.00	Vertical
5	3793.94	-82.39	-47	-35.39	7.27	0.00	Vertical
6	4504.73	-73.87	-47	-26.87	6.44	0.00	Vertical
7	1642.33	-79.21	-47	-32.21	7.51	0.00	Horizontal
8	2953.84	-80.45	-47	-33.45	6.98	0.00	Horizontal
9	3422.48	-77.24	-47	-30.24	5.47	0.00	Horizontal
10	4045.73	-77.03	-47	-30.03	6.73	0.00	Horizontal
11	4794.26	-75.39	-47	-28.39	7.54	0.00	Horizontal
12	5443.73	-78.13	-47	-31.13	8.12	0.00	Horizontal

NOTE: Other point of the measurements are below 20dB from the limit.



## 5. Test Setup Photos of the EUT



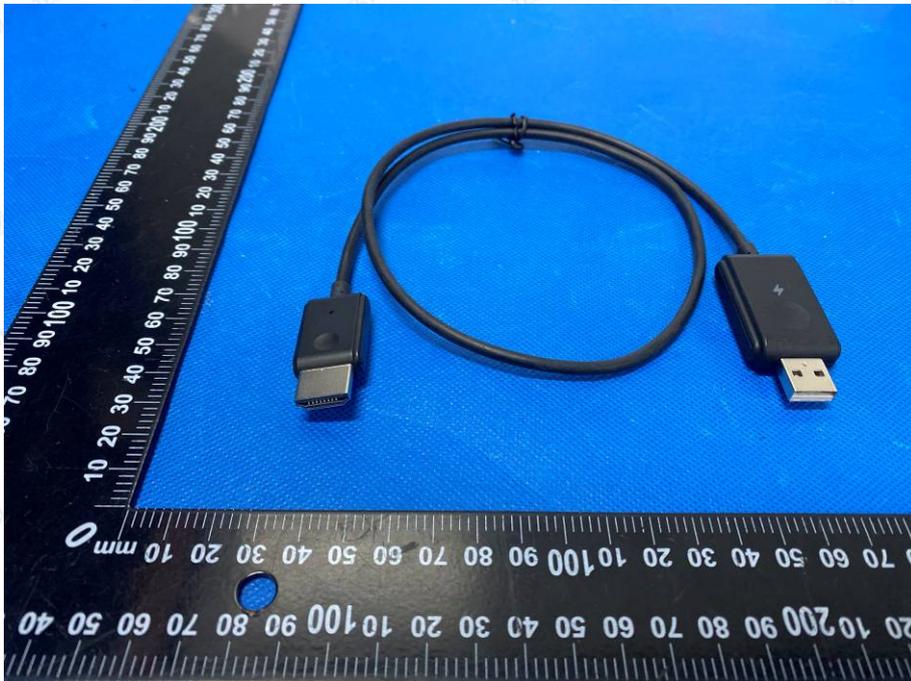
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity 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](mailto:service@cer-mark.com)

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



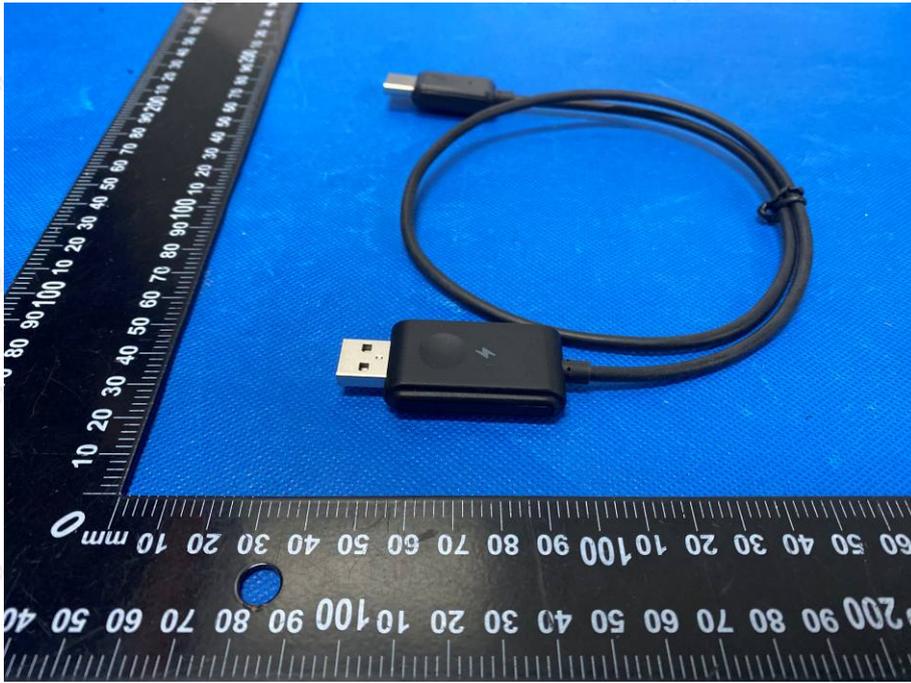
## 6. External and Internal Photos of the EUT



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 cannot 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](mailto:service@cer-mark.com)

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



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 cannot 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](mailto:service@cer-mark.com)

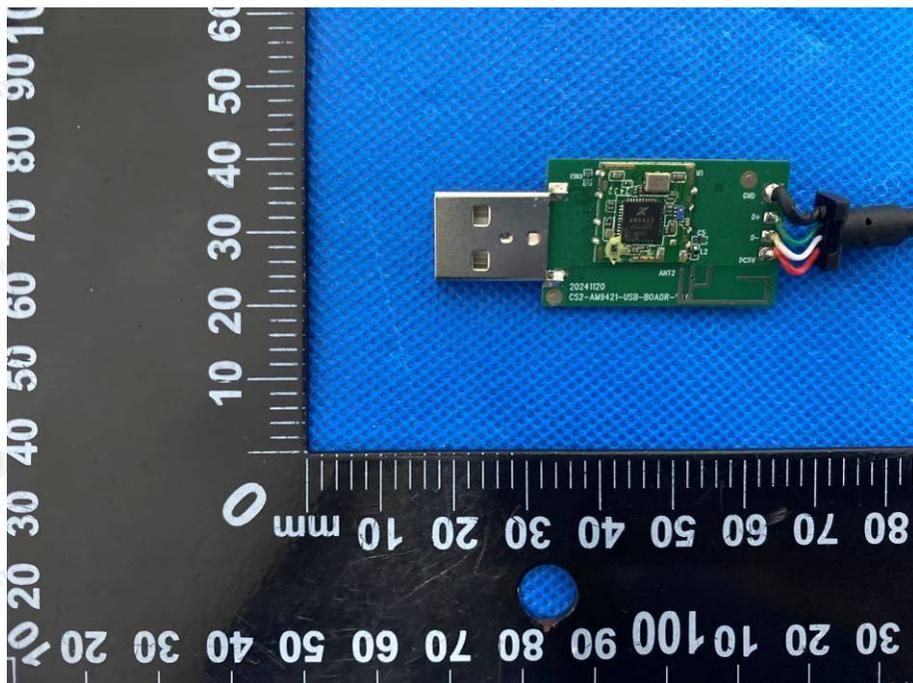
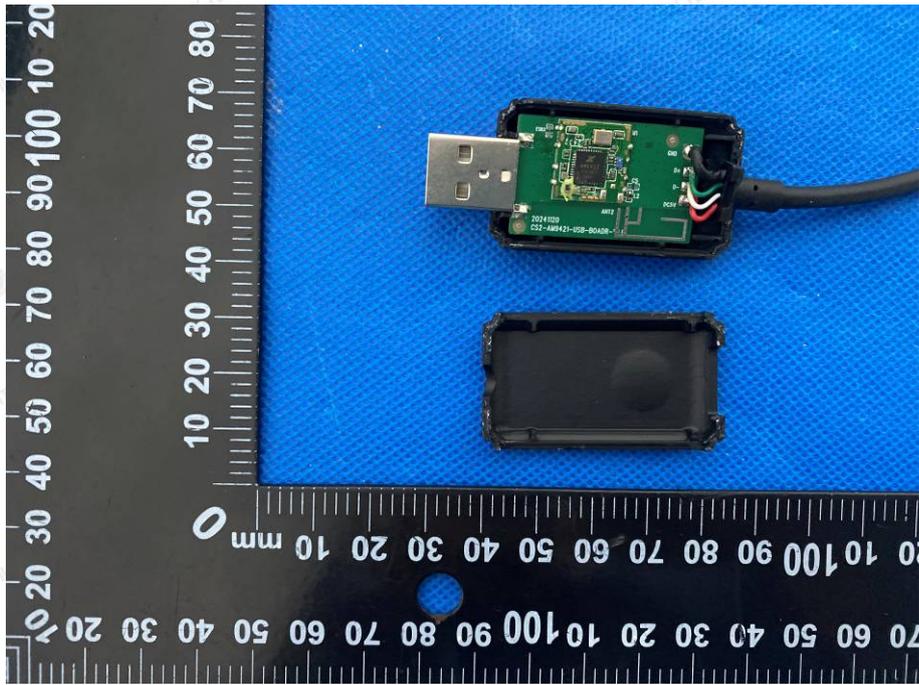
Address: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



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 cannot 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](mailto:service@cer-mark.com)

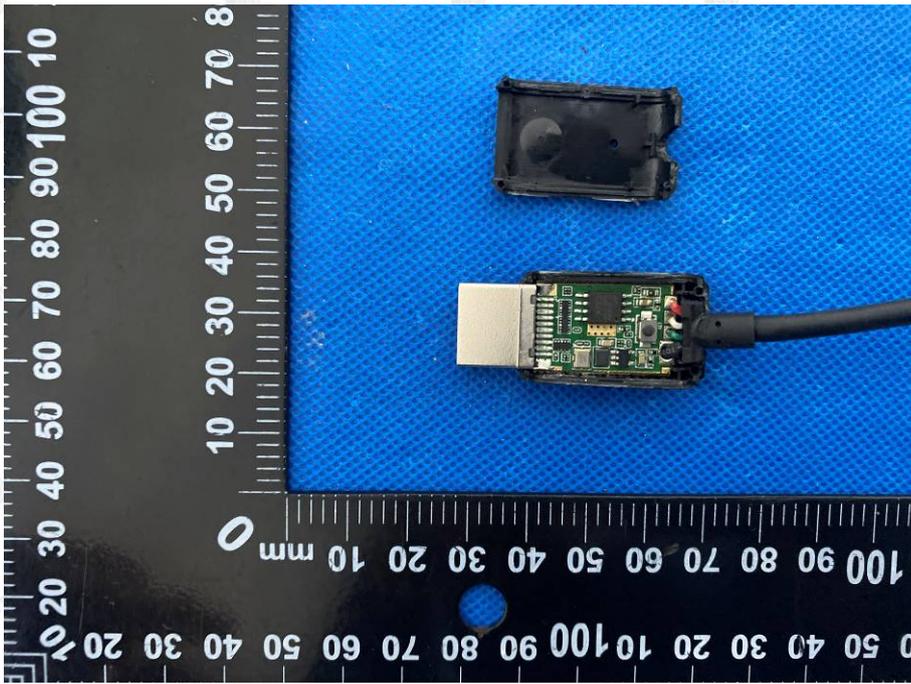
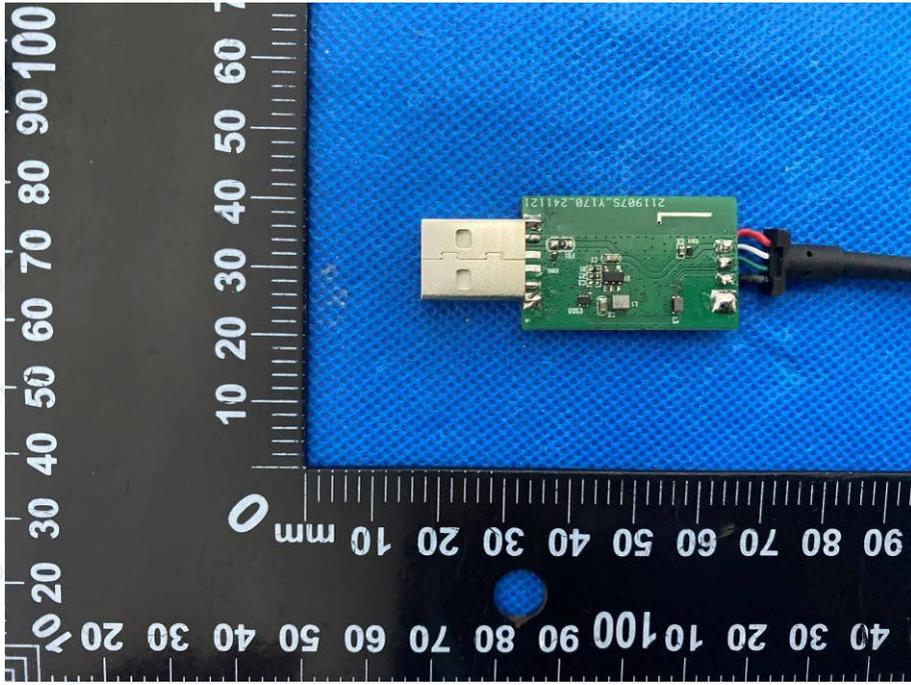
Addr: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



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 cannot 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](mailto:service@cer-mark.com)

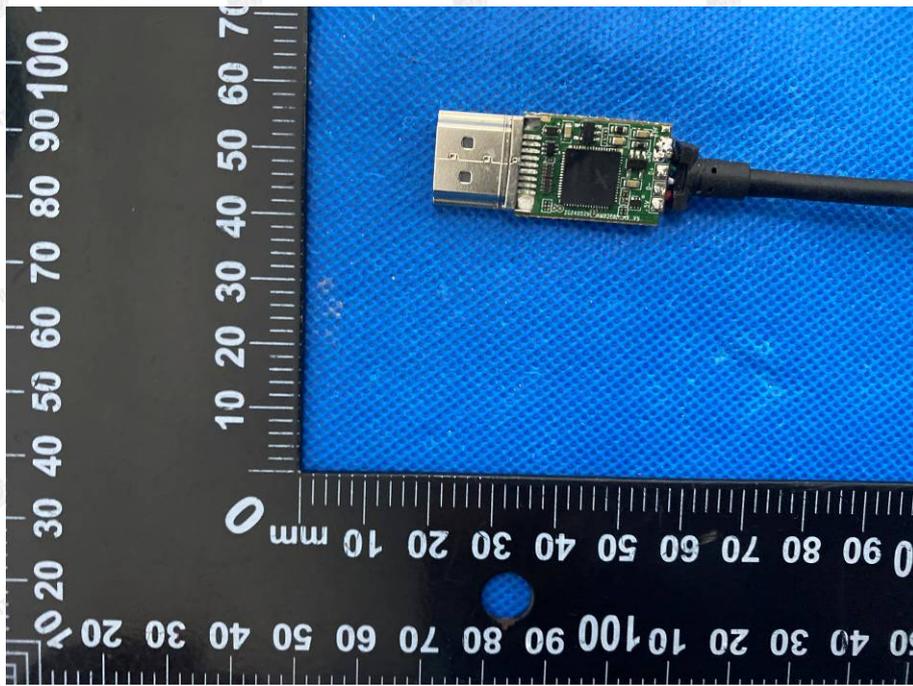
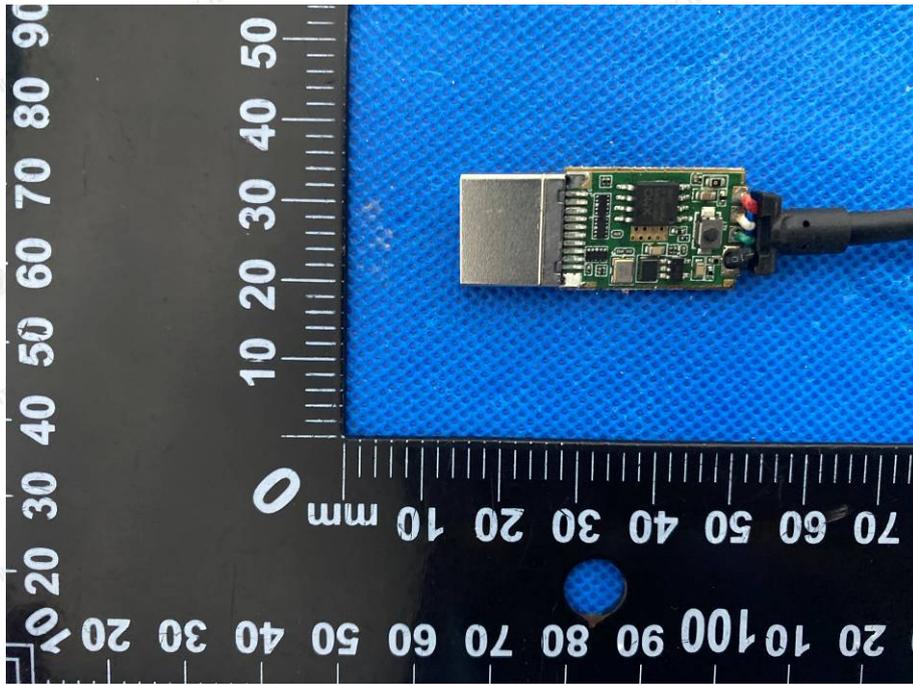
Addr: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



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 cannot 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](mailto:service@cer-mark.com)

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



.....End of Report.....