

Test Report

Test Report No..... :	TCT220810E053	
Date of issue..... :	Sep. 14, 2022	
Testing laboratory	Shenzhen TCT Testing Technology Co., Ltd.	
Testing location/ address:	2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China	
Applicant's name..... :	Shenzhen Huafurui Technology Co., Ltd	
Address..... :	Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China	
Manufacturer's name ... :	Shenzhen Huafurui Technology Co., Ltd	
Address..... :	Unit 1401 & 1402, 14/F, Jinqi Zhigu Mansion (No. 4 Building of Chongwen Garden), Crossing of the Liuxian Street and Tangling Road, Taoyuan Street, Nanshan District, Shenzhen, P.R. China	
Standard(s)	ETSI EN 300 440 V2.2.1 (2018-07)	
Product Name..... :	Smartphone	
Trade Mark	CUBOT	
Model/Type reference..... :	POCKET 3	
Rating(s)..... :	Refer to EUT description of page 3	
Date of receipt of test item	Aug. 10, 2022	
Date (s) of performance of test..... :	Aug. 10, 2022 ~ Sep. 14, 2022	
Tested by (+signature) ... :	Brews XU	
Check by (+signature).... :	Beryl ZHAO	
Approved by (+signature):	Tomsin	



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TABLE OF CONTENTS

1. General Product Information	3
1.1. EUT description	3
1.2. Model(s) list.....	3
1.3. Operation Frequency	4
2. Test Result Summary	5
3. General Information.....	6
3.1. Test environment and mode.....	6
3.2. Description of Support Units.....	6
3.3. Test Instruments List	7
4. Facilities and Accreditations	8
4.1. Facilities	8
4.2. Location	8
4.3. Measurement Uncertainty.....	8
5. Transmit Requirement.....	9
5.1. Equivalent Isotropically Radiated Power.....	9
5.2. Permitted Range of Operating Frequencies.....	12
5.3. Unwanted emissions in the spurious domain.....	15
6. Receiver Requirement.....	20
6.1. Adjacent channel selectivity.....	20
6.2. Blocking or Desensitization.....	21
6.3. Receiver Spurious Radiation.....	23
7. Photographs of Test Configuration.....	26
8. Photographs of EUT	27

1. General Product Information

1.1. EUT description

Product Name.....:	Smartphone
Model/Type reference.....:	POCKET 3
Hardware Version.....:	TE155_XXA1
Software Version	CUBOT_POCKET 3_C033C_V01_20220728
Receiver Category.....:	3
Operation Frequency	5725MHz~5875MHz
Channel Separation.....:	20MHz, 40MHz, 80MHz
Modulation Technology	Orthogonal Frequency Division Multiplexing(OFDM)
(IEEE802.11a/802.11n)	
Modulation Type.....:	256QAM, 64QAM, 16QAM, BPSK, QPSK
Data speed	802.11a: 6Mbps-54Mbps 802.11n: 6.5Mbps-150Mbps 802.11ac: 6.5Mbps-433.3Mbps
Antenna Type.....:	Internal Antenna
Antenna Gain.....:	0.86dBi
Rating(s).....:	Adapter Information: Model: HJ-0502000W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5.0V, 2.0A, 10.0W Rechargeable Li-ion Battery DC 3.87V

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

1.2. Model(s) list

None.

1.3. Operation Frequency

For 802.11a/n/ac(HT20), 802.11n/ac(HT40) and 802.11ac(HT80)

Channel	Frequency	Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz		
151	5755MHz	165	5825MHz		
153	5765MHz				
155	5775MHz				
157	5785MHz				
159	5795MHz				

The EUT operation in above frequency list, and used test software to control the EUT for staying in continuous transmitting and receiving mode. So test frequency is below:

Band IV (5725MHz-5875MHz)

Test channel	Frequency (MHz)		
	802.11a/802.11n/ 802.11ac(HT20)	802.11n/802.11ac (VHT40)	802.11ac (VHT80)
Lowest channel	5745MHz	5755MHz	
Middle channel	5785MHz	----	5775MHz
Highest channel	5825MHz	5795MHz	

2. Test Result Summary

Radio Spectrum Matter (RSM) Part of Tx				
Test Item	Test Requirement	Test Method	Limit/Severity	Result
Equivalent isotropically radiated power	Clause 4.2.2	Clause 4.2.2.3	Clause 4.2.2.4	PASS
Permitted Range of Operating Frequencies	Clause 4.2.3	Clause 4.2.3.3	Clause 4.2.3.5	PASS
Unwanted emissions in the spurious domain	Clause 4.2.4	Clause 4.2.4.3	Clause 4.2.4.4	PASS
Duty cycle	Clause 4.2.5	Clause 4.2.5.3	Clause 4.2.5.4	N/A
Additional requirements for FHSS equipment	Clause 4.2.6	Clause 4.2.6.3	Clause 4.2.6.4	N/A

Radio Spectrum Matter (RSM) Part of Rx				
Test Item	Test Requirement	Test Method	Limit/Severity	Result
Adjacent channel selectivity	Clause 4.3.3	Clause 4.3.3.3	Clause 4.3.3.4	N/A
Blocking or desensitization	Clause 4.3.4	Clause 4.3.4.3	Clause 4.3.4.4	PASS
Spurious Radiations	Clause 4.3.5	Clause 4.3.5.3	Clause 4.3.5.4	PASS

Note:

1. Pass: Test item meets the requirement.
2. N/A: Test case does not apply to the test object.
3. The test result judgment is decided by the limit of test standard.

3. General Information

3.1. Test environment and mode

Item	Normal condition	Extreme condition			
		HVHT	LVHT	HVLT	LVLT
Temperature	+25°C	+40°C	+40°C	-10°C	-10°C
Voltage	DC 3.87V	DC 4.45V	DC 3.4V	DC 4.45V	DC 3.4V
Humidity	20%-95%				
Atmospheric Pressure:	1008 mbar				
Test Mode:					
Transmitting mode:		Keep the EUT in transmitting mode with modulation.			
Receiving mode:		Keep the EUT in receiving mode.			

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.

3.3. Test Instruments List

Radiated Emission				
Name	Model No.	Manufacturer	Date of Cal.	Due Date
EMI Test Receiver	ESIB7	R&S	Jul. 04, 2022	Jul. 03, 2023
Spectrum Analyzer	FSQ40	R&S	Jul. 04, 2022	Jul. 03, 2023
Pre-amplifier	8447D	HP	Jul. 04, 2022	Jul. 03, 2023
Pre-amplifier	LNPA_0118G-45	SKET	Feb. 25, 2022	Feb. 24, 2023
Pre-amplifier	LNPA_1840G-50	SKET	Feb. 25, 2022	Feb. 24, 2023
Broadband Antenna	VULB9163	Schwarzbeck	Jul. 06, 2022	Jul. 05, 2024
Horn Antenna	BBHA 9120D	Schwarzbeck	Jul. 06, 2022	Jul. 05, 2024
Horn Antenna	BBHA 9170	Schwarzbeck	Apr. 11, 2021	Apr. 10, 2023
Coaxial cable	RC-18G-N-M	SKET	Feb. 25, 2022	Feb. 24, 2024
Coaxial cable	RC_40G-K-M	SKET	Feb. 25, 2022	Feb. 24, 2024
Loop antenna	FMZB1519B	Schwarzbeck	Jun. 12, 2022	Jun. 11, 2024
Spectrum Analyzer	N9020A	Agilent	Jul. 05, 2022	Jul. 04, 2023
Signal Generator	N5182A	Agilent	Jul. 04, 2022	Jul. 03, 2023
Signal Generator	E4421B	Agilent	Jul. 05, 2022	Jul. 04, 2023

4. Facilities and Accreditations

4.1. Facilities

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

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

4.2. Location

Shenzhen TCT Testing Technology Co., Ltd.

Address: 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

4.3. Measurement Uncertainty

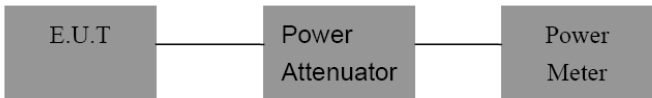
The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	± 3.10 dB
2	RF power, conducted	± 0.12 dB
3	Spurious emissions, conducted	± 0.11 dB
4	All emissions, radiated(<1 GHz)	± 4.56 dB
5	All emissions, radiated(1 GHz - 18 GHz)	± 4.22 dB
6	All emissions, radiated(18 GHz- 40 GHz)	± 4.36 dB
7	Temperature	$\pm 0.1^{\circ}\text{C}$
8	Humidity	$\pm 1.0\%$

5. Transmit Requirement

5.1. Equivalent Isotropically Radiated Power

5.1.1. Test Specification

Test Requirement:	EN 300 440 clause 4.2.2
Test Method:	EN 300 440 clause 4.2.2.3
Limit:	13.98dBm
Test Setup:	 <pre>graph LR; EUT[E.U.T.] --- PA[Power Attenuator] --- PM[Power Meter]</pre>
Test Procedure:	<ol style="list-style-type: none">1. According clause 4.2.3.0, The -6 dB bandwidth should be tested first;2. Base on step 1, the clause 4.2.3.1 was selected, the test setup as above;3. The output of the transmitter shall be connected to the power meter.4. The equivalent isotropically radiated power is then calculated from the measured value, the known antenna gain, relative to an isotropic antenna, and if applicable, any losses due to cables and connectors in the measurement system. <p>Remark: The -6 dB bandwidth of EUT is less than 1MHz.</p>
Test Instrument:	Refer to Item 3.3 for details
Test Mode:	Transmitting with modulation mode
Test Result:	PASS

5.1.2. Test Data

For 802.11a:

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5745MHz	7.73	0.86	8.59	13.98	PASS
5785MHz	8.86	0.86	9.72		
5825MHz	9.83	0.86	10.69		

Note: this factors have been set in test software.

For 802.11n (HT20):

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5745MHz	7.90	0.86	8.76	13.98	PASS
5785MHz	8.54	0.86	9.40		
5825MHz	9.71	0.86	10.57		

Note: this factors have been set in test software.

For 802.11ac (VHT20):

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5745MHz	7.84	0.86	8.70	13.98	PASS
5785MHz	8.85	0.86	9.71		
5825MHz	9.73	0.86	10.59		

Note: this factors have been set in test software.

For 802.11n (HT40):

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5755MHz	7.77	0.86	8.63	13.98	PASS
5795MHz	9.23	0.86	10.09		

Note: this factors have been set in test software.

For 802.11ac (VHT40):

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5755MHz	8.01	0.86	8.87	13.98	PASS
5795MHz	9.14	0.86	10.00		

Note: this factors have been set in test software.

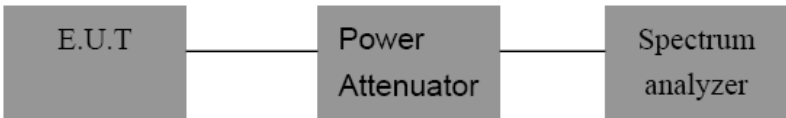
For 802.11ac (VHT80):

Channel	Output power (dBm)	Antenna Gain(dBi)	Max EIRP (dBm EIRP)	Limit (dBm EIRP)	Result
5775MHz	8.73	0.86	9.59	13.98	PASS

Note: this factors have been set in test software.

5.2. Permitted Range of Operating Frequencies

5.2.1. Test Specification

Test Requirement:	EN 300 440 clause 4.2.3.
Test Method:	EN 300 440 clause 4.2.3.3
Limit:	Within the band 5725MHz to 5875MHz
Test Setup:	 <pre> graph LR EUT[E.U.T] --- PA[Power Attenuator] PA --- SA[Spectrum analyzer] </pre>
Test Procedure:	<ol style="list-style-type: none"> 1. Put the spectrum analyser in video averaging mode with a minimum of 50 sweeps selected; 2. Select the lowest operating frequency of the equipment under test and activate the transmitter with modulation applied. The RF emission of the equipment shall be displayed on the spectrum analyser; 3. Using the marker of the spectrum analyser, find the lowest frequency below the operating frequency at which the spectral power density drops below the level given in clause 4.2.3. This frequency shall be recorded in the test report; 4. Select the highest operating frequency of the equipment under test and find the highest frequency at which the spectral power density drops below the value given in clause 4.2.3. This frequency shall be recorded in the test report; 5. The difference between the frequencies measured in steps 3) and 4) is the operating frequency range. It shall be recorded in the test report. <p>This measurement shall be repeated for each frequency range declared by the manufacturer.</p>
Test Instrument:	Refer to Item 3.3 for details
Test Mode:	Transmitting mode
Test Result:	PASS

5.2.2. Test Data

For 802.11a:

Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25℃	5735.70	5834.48	5725MHz - 5875MHz	PASS
4.45	40℃	5735.67	5834.42		
4.45	-10℃	5735.62	5834.47		
3.4	40℃	5735.68	5834.41		
3.4	-10℃	5735.64	5834.45		
Remark: Volt= Voltage, Temp= Temperature					

For 802.11n (HT20):

Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25°C	5735.34	5834.63	5725MHz - 5875MHz	PASS
4.45	40°C	5735.28	5834.60		
4.45	-10°C	5735.33	5834.55		
3.4	40°C	5735.26	5834.61		
3.4	-10°C	5735.31	5834.57		
Remark: Volt= Voltage, Temp= Temperature					

For 802.11ac (VHT20):

Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25℃	5735.34	5834.60	5725MHz - 5875MHz	PASS
4.45	40℃	5735.31	5834.54		
4.45	-10℃	5735.28	5834.58		
3.4	40℃	5735.30	5834.52		
3.4	-10℃	5735.33	5834.57		
Remark: Volt= Voltage, Temp= Temperature					

For 802.11n (HT40):

Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25°C	5736.45	5813.80	5725MHz - 5875MHz	PASS
4.45	40°C	5736.42	5813.74		
4.45	-10°C	5736.37	5813.79		
3.4	40°C	5736.44	5813.72		
3.4	-10°C	5736.39	5813.77		
Remark: Volt= Voltage, Temp= Temperature					

For 802.11ac (VHT40):

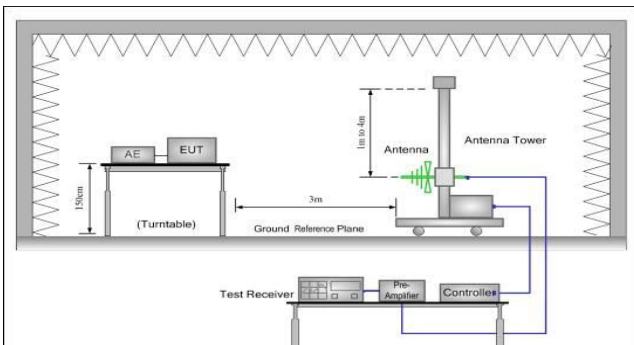
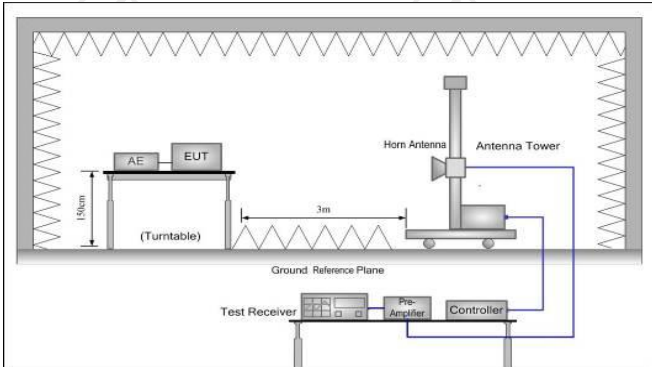
Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25°C	5736.25	5813.75	5725MHz - 5875MHz	PASS
4.45	40°C	5736.19	5813.72		
4.45	-10°C	5736.22	5813.67		
3.4	40°C	5736.18	5813.73		
3.4	-10°C	5736.21	5813.69		
Remark: Volt= Voltage, Temp= Temperature					

For 802.11ac (VHT80):

Test conditions		FL(MHz)	FH (MHz)	Limit	Result
Volt.(DC)	Temp.				
3.87	25°C	5736.66	5813.43	5725MHz - 5875MHz	PASS
4.45	40°C	5736.60	5813.40		
4.45	-10°C	5736.64	5813.35		
3.4	40°C	5736.58	5813.42		
3.4	-10°C	5736.61	5813.37		
Remark: Volt= Voltage, Temp= Temperature					

5.3. Unwanted emissions in the spurious domain

5.3.1. Test Specification

Test Requirement:	EN 300 440 clause 4.2.4																			
Test Method:	EN 300 440 clause 4.2.4.4																			
Limit:	<table><tr><td>Frequency ranges</td><td>47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz</td><td>Other frequencies ≤ 1 000 MHz</td><td>Frequencies > 1 000 MHz</td></tr><tr><td>State</td><td></td><td></td><td></td></tr><tr><td>Operating</td><td>4 nW</td><td>250 nW</td><td>1 μW</td></tr><tr><td>Standby</td><td>2 nW</td><td>2 nW</td><td>20 nW</td></tr></table>				Frequency ranges	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤ 1 000 MHz	Frequencies > 1 000 MHz	State				Operating	4 nW	250 nW	1 μW	Standby	2 nW	2 nW	20 nW
Frequency ranges	47 MHz to 74 MHz 87,5 MHz to 108 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other frequencies ≤ 1 000 MHz	Frequencies > 1 000 MHz																	
State																				
Operating	4 nW	250 nW	1 μW																	
Standby	2 nW	2 nW	20 nW																	
Test Setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p> 																			
Test Procedure:	<p>Substitution method was performed to determine the actual ERP emission levels of the EUT.</p> <p>The following test procedure as below:</p> <p>Below 1GHz test procedure:</p> <ol style="list-style-type: none">1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver.3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.4. The test antenna shall be raised and lowered from 1m to																			

4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

5. Repeat step 4 for test frequency with the test antenna polarized horizontally.
6. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The centre of the substitution antenna should be approximately at the same location as the centre of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non radiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
8. Repeat step 7 with both antennas horizontally polarized for each test frequency.
9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

$$ERP(dBm) = Pg(dBm) - \text{cable loss (dB)} + \text{antenna gain (dBd)}$$
 where: P_g is the generator output power into the substitution antenna.

Above 1GHz test procedure:

Different between above is the test site, change from Semi-Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.

Test Instruments:	Refer to Item 3.3 for details
Test Mode:	Transmitting mode
Test Result:	PASS

5.3.2. Test Data

20MHzBW

Low channel

Operation mode:	Tx mode		Channel	Lowest
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	Polarization	Level dBm(EIRP)		
103.45	Vertical	-68.55	-54.00	PASS
11490.00	V	-45.28	-30.00	
17235.00	V	-48.65	-30.00	
114.35	Horizontal	-68.92	-54.00	
11490.00	H	-42.17	-30.00	
17235.00	H	-47.03	-30.00	

High channel

Operation mode:	Tx mode		Channel	Highest
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	Polarization	Level dBm(EIRP)		
105.62	Vertical	-66.22	-54.00	PASS
11650.00	V	-46.76	-30.00	
17475.00	V	-50.01	-30.00	
115.34	Horizontal	-69.30	-54.00	
11650.00	H	-42.99	-30.00	
17475.00	H	-48.65	-30.00	

Note: 1. All the 802.11a/n/ac modes are tested and only the data of 802.11a mode presented which is the worst case.
2. Test Frequency range is up to 40GHz, and the test data below 25MHz and above 18000MHz is too lower than the limit, so not show in this report.

40MHzBW

Low channel

Operation mode:	Tx mode		Channel	Lowest
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	Polarization	Level dBm(EIRP)		
103.52	Vertical	-66.90	-54.00	PASS
11510.00	V	-49.71	-30.00	
17265.00	V	-53.59	-30.00	
117.37	Horizontal	-70.27	-54.00	
11510.00	H	-49.34	-30.00	
17265.00	H	-53.52	-30.00	

High channel

Operation mode:	Tx mode		Channel	Highest
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	Polarization	Level dBm(EIRP)		
102.78	Vertical	-67.39	-54.00	PASS
11590.00	V	-51.85	-30.00	
17385.00	V	-54.41	-30.00	
113.64	Horizontal	-69.85	-54.00	
11590.00	H	-50.12	-30.00	
17385.00	H	-53.00	-30.00	

Note: 1. All the 802.11/n/ac modes are tested and only the data of 802.11n mode presented which is the worst case.
2. Test Frequency range is up to 40GHz, and the test data below 25MHz and above 18000MHz is too lower than the limit, so not show in this report.

80MHzBW

Operation mode:	Standby mode		Channel	Highest
Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	Polarization	Level dBm(EIRP)		
104.70	Vertical	-67.56	-57.00	PASS
11550.00	V	-53.85	-47.00	
17325.00	V	-58.40	-47.00	
115.67	Horizontal	-69.86	-57.00	
11550.00	H	-53.43	-47.00	
17325.00	H	-56.77	-47.00	

Note: Test Frequency range is up to 40GHz, and the test data below 25MHz and above 18000MHz is too lower than the limit, so not show in this report.

6. Receiver Requirement

Receiver category

Category	Relevant Receiver Clauses	Risk Assessment of Receiver Performance
1	4.3.3, 4.3.4 and 4.3.5	Highly reliable SRD communication media; e.g. serving human life inherent systems (may result in a physical risk to a person).
2	4.3.4 and 4.3.5	Medium reliable SRD communication media e.g. causing Inconvenience to persons, which cannot simply be overcome by other means.
3	4.3.5	Standard reliable SRD communication media e.g. Inconvenience to persons, which can simply be overcome by other means (e.g. manual).
The EUT (Rx part) belong to Class 3 with no LBT function.		

6.1. Adjacent channel selectivity

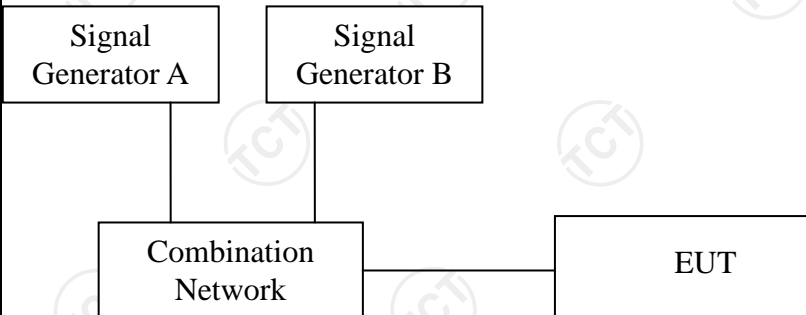
6.1.1. Test Specification

Test result:

Since the test applied to class 1 receivers only, so Not applicable.

6.2. Blocking or Desensitization

6.2.1. Test Specification

Test Requirement:	EN300 440 Clause 4.3.4								
Limit:	<table border="1"> <thead> <tr> <th>Receiver category</th><th>Limit</th></tr> </thead> <tbody> <tr> <td>1</td><td>-30 dBm + k</td></tr> <tr> <td>2</td><td>-45 dBm + k</td></tr> <tr> <td>3</td><td>-60 dBm + k</td></tr> </tbody> </table> <p> $k = -20\log f - 10\log BW$ Where: - f is the frequency in GHz; - BW is the channel bandwidth in MHz. The factor k is limited within the following: $-40 < k < 0$ dB. </p>	Receiver category	Limit	1	-30 dBm + k	2	-45 dBm + k	3	-60 dBm + k
Receiver category	Limit								
1	-30 dBm + k								
2	-45 dBm + k								
3	-60 dBm + k								
Test setup:	 <pre> graph TD SGA[Signal Generator A] --- CN[Combination Network] SGB[Signal Generator B] --- CN CN --- EUT[EUT] </pre>								
Test procedure:	Reference to Clause 4.3.4.3								
Test Instruments:	Refer to Item 3.3 for details								
Test mode:	Receiver								
Test results:	Pass								

6.2.2. Test data

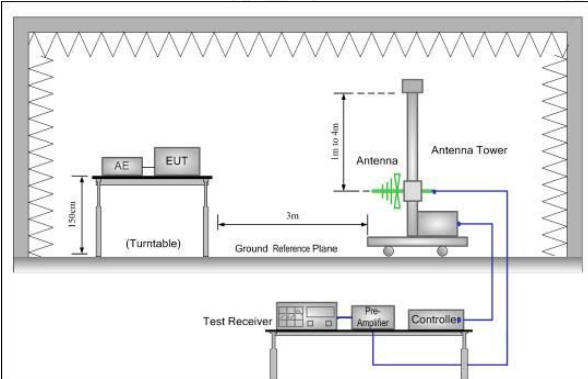
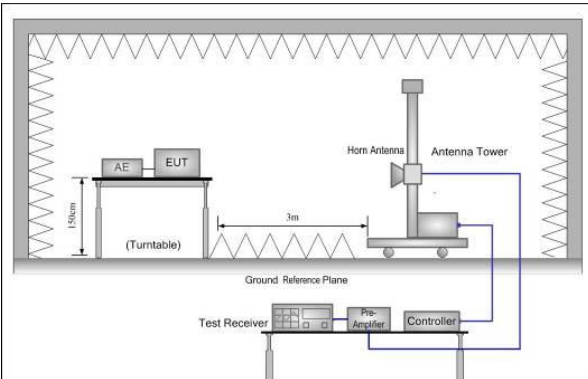
802.11ac20 : 5745MHz

Modulation	Test Condition		Sig A Level (dBm)	Channel offset (MHz)	Sig B Level (dBm)	Limit (dBm)
	Temperature (°C)	Voltage (V)				
OFDM	25	3.87	-65	-1000	-67.07	-87.66
				-400	-65.09	
				-200	-60.48	
				200	-61.60	
				400	-64.97	
				1000	-67.75	
k = -20log f -10logBW. Where BW=17.65MHz. so k=-27.66						

Note: All channels have been tested, and only the worst test data is show in this report.

6.3. Receiver Spurious Radiation

6.3.1. Test Specification

Test Requirement:	EN 300 440 clause 4.3.5						
Test Method:	EN 300 440 clause 8.3.4						
Limit:	<table border="1"> <thead> <tr> <th>Frequency</th><th>Limit (dBm)</th></tr> </thead> <tbody> <tr> <td>Frequencies $\leq 1\,000$ MHz</td><td>-57</td></tr> <tr> <td>Frequencies $> 1\,000$ MHz</td><td>-47</td></tr> </tbody> </table>	Frequency	Limit (dBm)	Frequencies $\leq 1\,000$ MHz	-57	Frequencies $> 1\,000$ MHz	-47
Frequency	Limit (dBm)						
Frequencies $\leq 1\,000$ MHz	-57						
Frequencies $> 1\,000$ MHz	-47						
Test Setup:	<p>Below 1GHz</p>  <p>Above 1GHz</p> 						
Test Procedure:	<p>Substitution method was performed to determine the actual ERP emission levels of the EUT. The following test procedure as below:</p> <p>Below 1GHz test procedure:</p> <ol style="list-style-type: none"> 1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider. 2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter. The output of the test antenna shall be connected to the measuring receiver. 3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test. 4. The test antenna shall be raised and lowered from 1m to 						

	<p>4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.</p> <ol style="list-style-type: none"> Repeat step 4 for test frequency with the test antenna polarized horizontally. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The centre of the substitution antenna should be approximately at the same location as the centre of the transmitter. At the lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non radiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. Repeat step 7 with both antennas horizontally polarized for each test frequency. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: $\text{ERP(dBm)} = \text{Pg(dBm)} - \text{cable loss (dB)} + \text{antenna gain (dBd)}$ <p>where: Pg is the generator output power into the substitution antenna.</p> <p>Above 1GHz test procedure: Different between above is the test site, change from Semi-Anechoic Chamber to fully Anechoic Chamber, and the test antenna do not need to raise from 1 to 4m, just test in 1.5m height.</p>
Test Instrument:	Refer to Item 3.3 for details
Test Mode:	Receiver mode
Test Result:	PASS

6.3.2. Test Data

Low channel

Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	polarization	Level dBm(EIRP)		
152.38	Vertical	-73.06	2nW/ -57dBm below 1GHz, 20nW/ -47dBm above 1GHz.	PASS
5714.54	V	-64.62		
6537.45	V	-64.53		
121.34	Horizontal	-72.15		
5715.12	H	-65.17		
6538.61	H	-66.25		

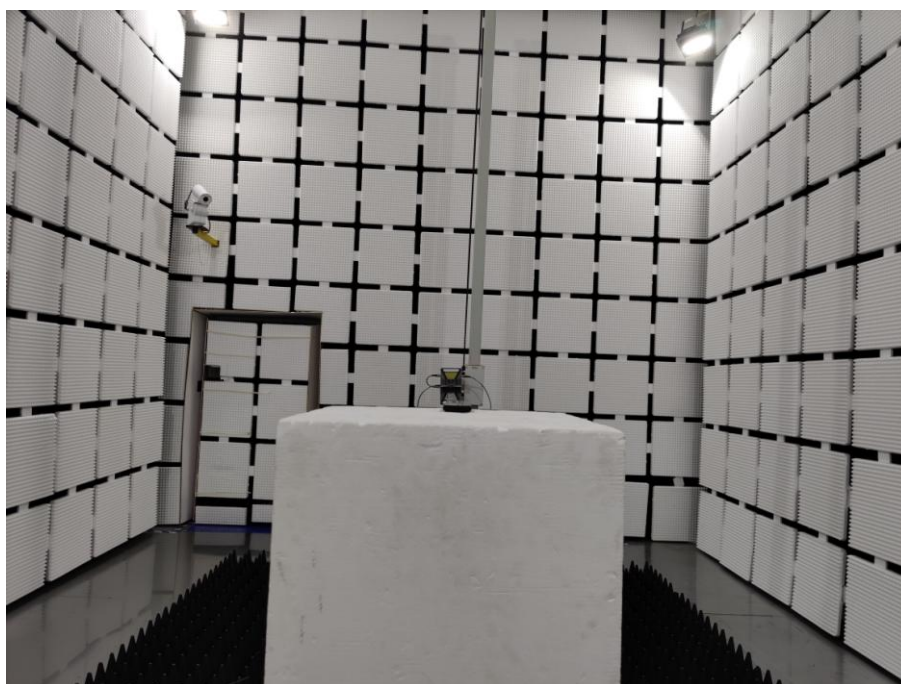
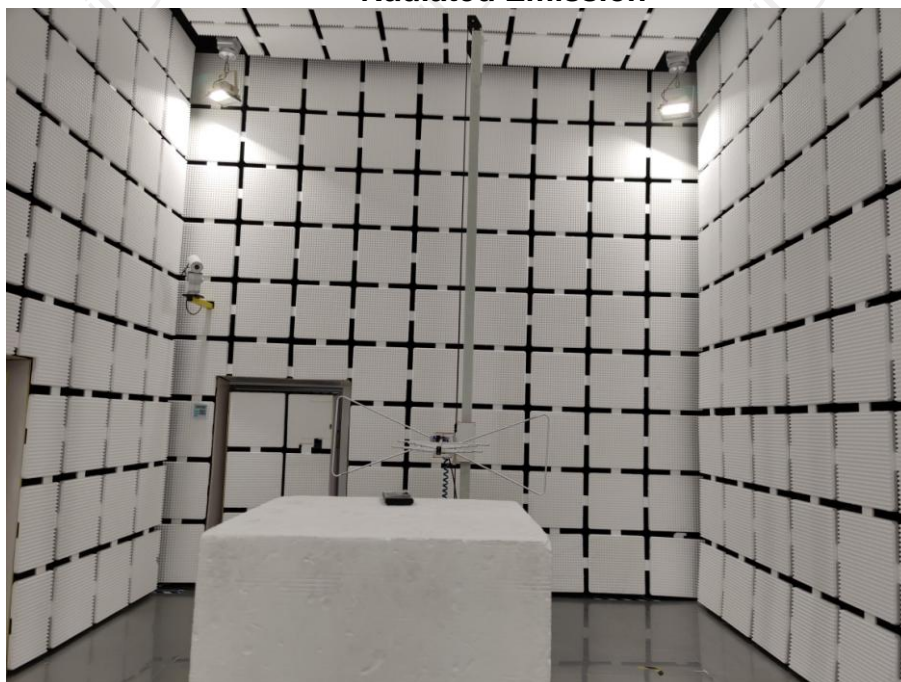
High channel

Frequency (MHz)	Spurious Emission		Limit dBm(EIRP)	Test Result
	polarization	Level dBm(EIRP)		
149.45	Vertical	-71.53	2nW/ -57dBm below 1GHz, 20nW/ -47dBm above 1GHz.	PASS
5724.61	V	-65.19		
6540.53	V	-68.02		
119.45	Horizontal	-72.49		
5724.13	H	-64.95		
6539.42	H	-68.60		

Note: 1. All the 802.11a/n/ac modes are tested and only the data of 802.11n(HT40) mode presented which is the worst case.
2. Test Frequency range is up to 40GHz, and the test data below 25MHz and above 18000MHz is too lower that the limit, so not show in this report.

7. Photographs of Test Configuration

Radiated Emission



8. Photographs of EUT

Refer to the test report No. TCT220810E059

*******END OF REPORT*******