

Test Report

Test Report No..... :	TCT231117E012	
Date of issue..... :	Dec. 28, 2023	
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 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China	
Manufacturer's name ... :	Shenzhen Huafurui Technology Co., Ltd.	
Address..... :	Unit 601-03, 6/F, Block A, Building 1, Ganfeng Technology Building, No. 993 Jiaxian Road, Xiangjiaotang Community, Bantian Street, Longgang District, Shenzhen, P.R. China	
Standard(s)	ETSI EN 303 345-1 V1.1.1 (2019-06) ETSI EN 303 345-3 V1.1.1 (2021-06)	
Product Name..... :	Smartphone	
Trade Mark	CUBOT	
Model/Type reference..... :	A1	
Rating(s)..... :	Refer to EUT description of page 3	
Date of receipt of test item	Nov. 17, 2023	
Date (s) of performance of test..... :	Nov. 17, 2023 - Dec. 28, 2023	
Tested by (+signature) ... :	Rleo LIU	
Check by (+signature)..... :	Beryl ZHAO	
Approved by (+signature):	Tomsin	



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1. General Product Information

1.1. EUT description

Product Name.....:	Smartphone
Model/Type reference.....:	A1
Hardware Version.....:	E97C_V1.0X
Software Version.....:	CUBOT_A1_E041_V01
Operation Frequency	87.5MHz – 108MHz
Modulation Technology	FM
Antenna Type.....:	Earphone Antenna
Rating(s).....:	Adapter Information: Model: HJ-0502000W2-EU Input: AC 100–240 V, 50/ 60 Hz, 0.3 A Output: DC 5.0 V, 2.0 A Output Power: 10.0 W 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.

2. Test Result Summary

Radio Spectrum Matter (RSM)				
Test Item	Test Requirement	Test Method	Limit/Severity	Result
Sensitivity	EN 303 345-3 Clause 4.2	EN 303 345-1 Clause 5.3.4	EN 303 345-3 Clause 4.2.2	PASS
Receiver adjacent channel selectivity and blocking	EN 303 345-3 Clause 4.3	EN 303 345-1 Clause 5.3.5	EN 303 345-3 Clause 4.3.2	PASS
Unwanted emissions in the spurious domain	EN 303 345-3 Clause 4.4	EN 303 345-3 Clause 4.4.3	EN 303 345-3 Clause 4.4.2	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
Temperature	+25°C
Voltage	DC 3.87V
Humidity	20%-95%
Atmospheric Pressure:	1008 mbar
Test Mode:	
Receiver mode:	Keep the EUT in receiver mode with modulation.

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
Pre-amplifier	8447D	HP	Jun. 28, 2023	Jun. 27, 2024
Pre-amplifier	LNPA_0118G-45	SKET	Feb. 21, 2023	Feb. 20, 2024
Pre-amplifier	LNPA_1840G-50	SKET	Feb. 21, 2023	Feb. 20, 2024
Broadband Antenna	VULB9163	Schwarzbeck	Jul. 02, 2023	Jul. 01, 2024
Horn Antenna	BBHA 9120D	Schwarzbeck	Jul. 02, 2023	Jul. 01, 2024
Horn Antenna	BBHA 9170	Schwarzbeck	Feb. 25, 2023	Feb. 24, 2024
Universal Radio Communication Tester	CMU200	R&S	Jun. 29, 2023	Jun. 28, 2024
Wideband Radio Communication Tester	CMW500	R&S	Feb. 21, 2023	Feb. 20, 2024
Signal Generator	N5182A	Agilent	Jun. 29, 2023	Jun. 28, 2024
Coaxial cable	RC_18G-N-M	SKET	Feb. 25, 2022	Feb. 24, 2024
Spectrum Analyzer	N9020A	Agilent	Jun. 29, 2023	Jun. 28, 2024

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 recognized by Innovation, Science and Economic Development 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 expanded 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	Temperature	$\pm 0.1^{\circ}\text{C}$
2	Humidity	$\pm 1.0\%$
3	Spurious Emissions, Conducted	$\pm 1\text{ dB}$
4	All emissions, radiated(<1 GHz)	$\pm 4.56\text{ dB}$
5	All emissions, radiated(1 GHz - 18 GHz)	$\pm 4.22\text{ dB}$

5. Technical Requirement

5.1. Sensitivity

5.1.1. Test Specification

Test Requirement:	ETSI EN303 345-3 Clause 4.2												
Test Method:	ETSI EN303 345-1 Clause 5.3.4												
Limit:	<p style="text-align: center;">Table 2: FM sensitivity requirements</p> <table border="1"> <thead> <tr> <th rowspan="2">De-modulation</th> <th rowspan="2">Tuned frequency band</th> <th rowspan="2">Wanted signal centre frequency (MHz)</th> <th colspan="2">Required sensitivity limit</th> </tr> <tr> <th>Conducted (dBm)</th> <th>Radiated (dBµV/m)</th> </tr> </thead> <tbody> <tr> <td>FM</td> <td>VHF band II</td> <td>98</td> <td>-90</td> <td>50 (see note)</td> </tr> </tbody> </table> <p>NOTE: For products with an integral antenna, the requirement is relaxed to 67 dBµV/m.</p>	De-modulation	Tuned frequency band	Wanted signal centre frequency (MHz)	Required sensitivity limit		Conducted (dBm)	Radiated (dBµV/m)	FM	VHF band II	98	-90	50 (see note)
De-modulation	Tuned frequency band				Wanted signal centre frequency (MHz)	Required sensitivity limit							
		Conducted (dBm)	Radiated (dBµV/m)										
FM	VHF band II	98	-90	50 (see note)									
Test Setup:													
Test Procedure:	<ol style="list-style-type: none"> 1) The 'unwanted' signal generator remains switched off for the duration of the test. 2) The 'wanted' signal generator is set to the required modulation method, test signal configuration and centre frequency. The signal level is adjusted with the modulation disabled to the required sensitivity level plus 6 dB, as measured at ©. The modulation is enabled. 3) The receiver is tuned to the frequency of the 'wanted' signal generator. For a receiver without a digital frequency display, the receiver shall be tuned for optimum THD+N (i.e. as it would be tuned by a user for best quality). The receiver's audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (minimum distortion, that is typically less than 3 % total harmonic distortion, but no more than 10 % total harmonic distortion) but of sufficient level to drive the measurement device. 4) The level of the 'wanted' signal generator is reduced by 6dB. 5) The audio output, measured using the measurement device, is recorded as the signal level, S. 6) The modulating audio signal for the 'wanted' signal generator is removed. The audio output, measured using the measurement device, is recorded as the noise level, N. <p>NOTE: Modulation is disabled when setting the power level to</p>												

	prevent sideband power from influencing the measurement. Sideband power is not considered when measuring the power of analogue signals.
Test Instrument:	Refer to Item 3.3 for details
Test Mode:	Receiver mode with FM modulation
Test Result:	PASS

5.1.2. Test Data

Modulation		FM		Tuned frequency band		VHF band II		
Wanted Signal Centre Frequency (MHz)	Wanted Signal Level (dB μ V/m)	Total Harmonic Distortion (%)	Signal Level (dBV)	Noise Level (dBV)	SNR (dBQ)	SNR Limit (dBQ)	Audio Quality	Result
98	67	0.28	4.63	-54.37	59.00	40	Clean Audio	PASS

5.2. Adjacent channel selectivity and blocking

5.2.1. Test Specification

Test Requirement:	ETSI EN303 345-3 Clause 4.3								
Test Method:	ETSI EN303 345-1 Clause 5.3.5								
Limit:	De-modulation (see note 1)	Tuned frequency band	C Wanted signal centre frequency (MHz)	C Wanted signal level		Required I/C ratio (see notes 2 and 3)			
				Conducted (dBm)	Radiated (dBμV/m)	N = 2 (dB)	N = 3 (dB)	N = 4 (dB)	Blocking (dB)
	FM (built-in or integral antenna)	VHF band II	98	n/a	56 (see note 4)	-15	-3	8	20
	FM (external antenna)	VHF band II	98	-84	n/a	3	17	30	30
<p>NOTE 1: The ACS and blocking requirements are currently separated into different limits for radiated and conducted testing methods. These limits are likely to be unified in a future revision of the present document. Users of the present document should consult frequently the latest list published in the Official Journal of the European Union.</p> <p>NOTE 2: The frequency of the interferer shall be calculated using the channel spacing data in table 3 for each of the 6 defined adjacent channels $N = \{-4, -3, -2, +2, +3, +4\}$ and the two blocking offsets. Each row of table 4 thus defines 8 individual tests.</p> <p>NOTE 3: The minimum level of I for the relevant level of impairment is calculated by adding the I/C ratio to the wanted C level.</p> <p>NOTE 4: The wanted signal level for receivers with integral antenna is 73 dBμV/m.</p>									
Test Setup:									
Test Procedure:									
	<p>1) The 'wanted' signal generator is set to the required modulation method, test signal configuration, and centre frequency. The signal level is adjusted with the modulation disabled to the specified wanted signal level, as measured at ©, with the 'unwanted' generator switched off.</p> <p>2) The 'unwanted' signal generator is set to the required modulation method, test signal configuration, and centre frequency calculated from the wanted signal centre</p>								

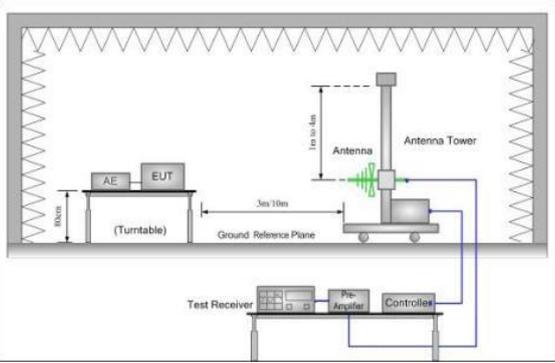
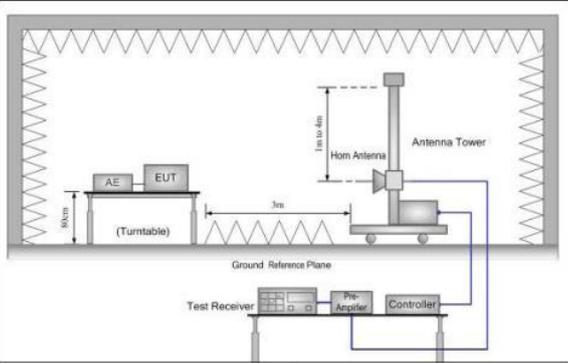
	<p>frequency and the required frequency offset. The signal level is adjusted with the modulation disabled to provide the level calculated from the wanted signal level and the required level offset, as measured at ©, with the 'wanted' generator switched off.</p> <p>3) The 'wanted' signal generator is switched back on. Modulation is enabled for both signal generators.</p> <p>4) The receiver is tuned to the frequency of the 'wanted' signal generator. For a receiver without a digital frequency display, the receiver shall be tuned for optimum THD+N (i.e. as it would be tuned by a user for best quality). The receiver's audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (minimum distortion, that is typically less than 3 % total harmonic distortion, but no more than 10 % total harmonic distortion) but of sufficient level to drive the measurement device.</p> <p>5) The audio output, measured using the measurement device, is recorded as the signal level, S.</p> <p>6) The modulating audio signal for the 'wanted' signal generator is removed. The audio output, measured using the measurement device, is recorded as the noise level, N.</p> <p>NOTE: Modulation is disabled when setting the power levels to prevent sideband power from influencing the measurement. Sideband power is not considered when measuring the power of analogue signals.</p>
Test Instruments:	Refer to Item 3.3 for details
Test Mode:	Receiver mode with FM modulation
Test Result:	PASS

5.2.2. Test Data

Modulation			FM		Tuned frequency band		VHF band II	
Adjacency	C Wanted Signal Level (dB μ V/m)	I Unwanted Signal Level (dB μ V/m)	Required I/C ratio Limit (dB)	Signal Level (dBV)	Noise Level (dBV)	SNR (dBQ)	SNR Limit (dBQ)	Audio Quality
N=-2 (97.8MHz)	73	58	-15	4.61	-55.72	60.33	40	Clean Audio
N=+2 (98.2MHz)	73	58	-15	4.59	-55.70	60.29	40	Clean Audio
N=-3 (97.7MHz)	73	70	-3	4.53	-55.74	60.27	40	Clean Audio
N=+3 (98.3MHz)	73	70	-3	4.67	-55.69	60.36	40	Clean Audio
N=-4 (97.6MHz)	73	81	8	4.52	-55.65	60.17	40	Clean Audio
N=+4 (98.4MHz)	73	81	8	4.50	-55.71	60.21	40	Clean Audio
Blocking (97.2MHz)	73	93	20	4.51	-55.73	60.24	40	Clean Audio
Blocking (98.8MHz)	73	93	20	4.62	-55.76	60.38	40	Clean Audio
Result	PASS							

5.3. Unwanted emissions in the spurious domain

5.3.1. Test Specification

Test Requirement:	ETSI EN303 345-3 Clause 4.4		
Test Method:	ETSI EN303 345-3 Clause 4.4.3		
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-230MHz	40.0	Quasi-peak Value
	230MHz-1GHz	47.0	Quasi-peak Value
	1GHz-3GHz	50.0	Average Value
		70.0	Peak Value
	3GHz-6GHz	54.0	Average Value
74.0		Peak Value	
Test Setup:	<p>Below 1GHz</p> 		
	<p>Above 1GHz</p> 		
Test Procedure:	<p>From 30MHz to 1GHz:</p> <ol style="list-style-type: none"> 1. The radiated emissions test was conducted in a semi-anechoic chamber. 2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation. 3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum 		

	<p>plots of the EUT.</p> <p>4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.</p> <p>Above 1GHz:</p> <p>1. The radiated emissions test was conducted in a fully-anechoic chamber.</p> <p>2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.</p> <p>3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum plots of the EUT.</p> <p>4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.</p>
Test Instrument:	Refer to Item 3.3 for details
Test Mode:	Receiver mode with FM modulation (1 kHz tone)
Test Result:	PASS

5.3.2. Test data

From 30MHz to 1GHz:

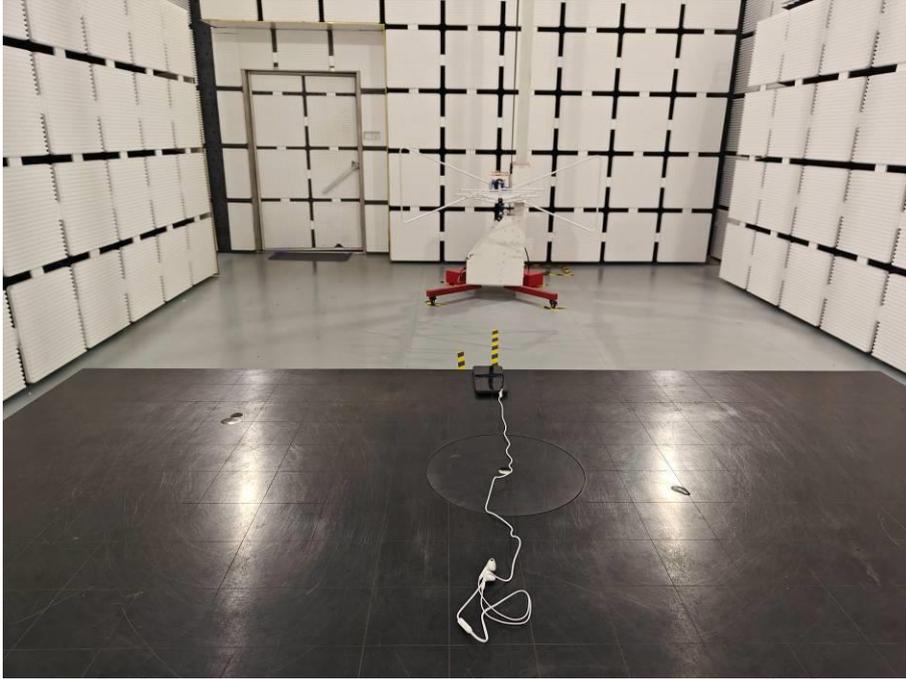
Frequency (MHz)	Ant. Pol. H/V	QP reading (dBμV)	Correction Factor (dB/m)	Emission Level (dBμV/m)	QP limit (dBμV/m)	Margin (dB)
187.0958	H	17.19	11.61	28.80	40	-11.20
935.5463	H	10.94	26.03	36.97	47	-10.03
159.7844	V	16.93	14.99	31.92	40	-8.08
187.7529	V	19.01	11.61	30.62	40	-9.38

Note:

1. Emission Level (dBμV/m)=Peak Reading (dBμV) + Correction Factor(dB/m);
2. Correction Factor(dB/m)= Antenna Factor(dB/m) + Cable loss(dB) – Pre-amplifier(dB)
3. Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. Data of measurement shown “---“in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.

6. Photographs of Test Configuration

Radiated Emission



7. Photographs of EUT

Refer to the test report No. TCT231117E017

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