

ETSI EN 303 345-1 V1.1.1 (2019-06)
Final Draft ETSI EN 303 345-3 V1.1.1 (2021-03)

TEST REPORT

For

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Tested Model: NOTE 9

Report Type: Original Report	Product Type: Smartphone
Report Number: <u>SZ1210419-12396E-22E</u>	
Report Date: <u>2021-05-18</u>	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smartphone
Tested Model	NOTE 9
Trade mark	CUBOT
Frequency Range	87.5-108MHz
Modulation Technique	FM
Voltage Range	DC 3.85V from battery or DC 5V from adapter.
Date of Test	2021-05-09
Sample serial number	SZ1210419-12396E-RF-S1
Received date	2021-04-05
Sample/EUT Status	Good condition
Adapter 1 information	Model: HJ-0501500-UK Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 1.5A
Adapter 2 information	Model: HJ-0501500W2-EU Input: AC 100-240V, 50/60Hz, 0.3A Output: DC 5V, 1.5A

Objective

This test report is in accordance with ETSI EN 303 345-1 V1.1.1 (2019-06), Broadcast Sound Receivers; Part 1: Generic requirements and measuring methods and Final Draft ETSI EN 303 345-3 V1.1.1 (2021-03), Broadcast Sound Receivers; Part 3: FM broadcast sound service; Harmonised Standard for access to radio spectrum.

The objective is to determine the compliance of EUT with ETSI EN 303 345-1 V1.1.1 (2019-06) and Final Draft ETSI EN 303 345-3 V1.1.1 (2021-03).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 303 345-1 V1.1.1 (2019-06).

Measurement Uncertainty

Parameter		Uncertainty
Spurious Emissions, Radiated	9k-30MHz	±2.66dB
	30MHz-1000MHz	±4.28dB
	1GHz-18GHz	±4.98dB
	18GHz-26.5GHz	±5.06dB

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in normal mode.

Test signal configurations

FM Test:

The generated FM signals (wanted and unwanted) and the blocking signal shall be in accordance with table 1. The configuration is based on Recommendation ITU-R BS.641 [i.5].

Table 1: FM configuration

Parameter	FM signals		AM signal
	Wanted	Unwanted	Blocking
Audio modulation	1 kHz tone	Weighted noise Recommendation ITU-R BS.559-2 [3], clause 1, band- limited to 15 kHz (see note 1)	1 kHz tone
Other modulation parameters	±60,8 kHz peak deviation	15,9 kHz RMS deviation (see note 2)	80 % depth
Pilot tone	None	None	
NOTE 1: The filter shall have a cut-off frequency of 15 kHz and a minimum roll-off of 60 dB/octave. NOTE 2: This is equivalent to a quasi-peak deviation of 34,8 kHz and has pre-emphasis enabled. The quasi-peak level measurement is defined by Recommendation ITU-R BS.641 [i.5], clause 5; with pre-emphasis disabled the quasi-peak deviation is 32 kHz (14,5 kHz RMS).			

EUT Exercise Software

No Software was used

Equipment Modifications

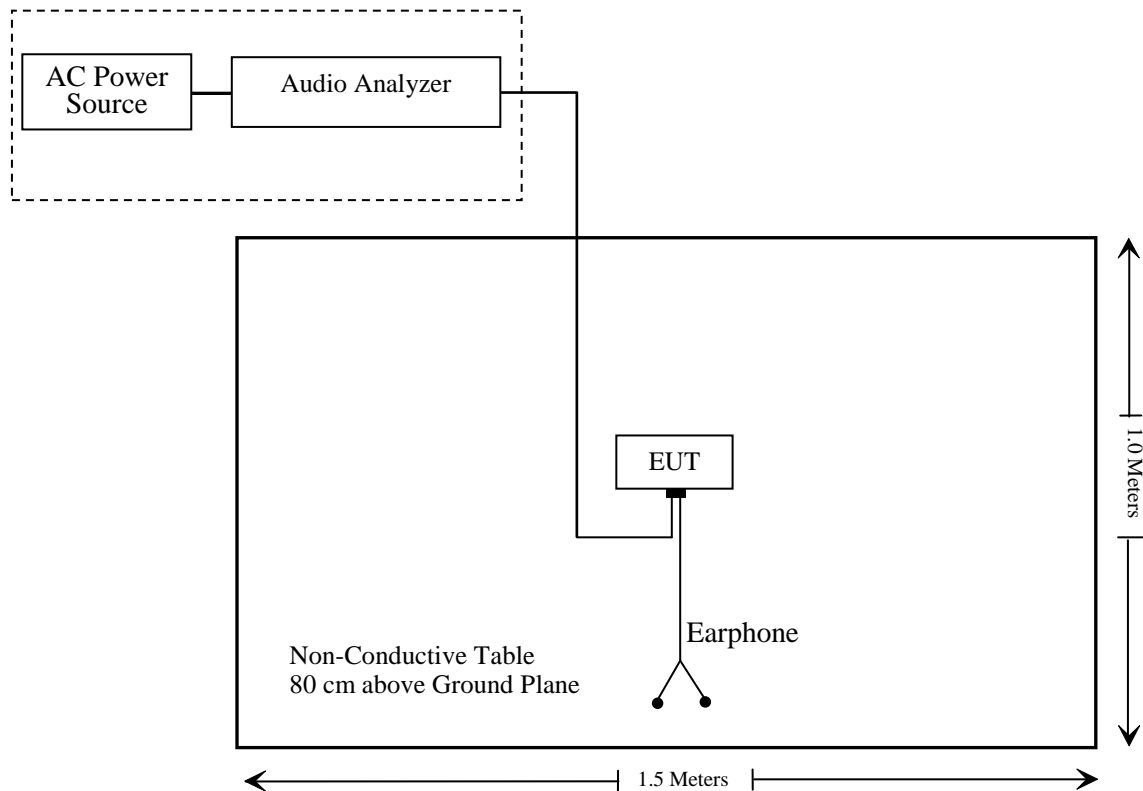
No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Audio Analyzer	UPV	1146.2003K02-101782-XP
Unknown	Earphone	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Audio cable	0.8	Earphone	EUT

Block Diagram of Test Setup

SUMMARY OF TEST RESULTS

Final DRAFT ETSI EN 303 345-3 V1.1.1 (2021-03)	Description of Test	Test Result
§ 4.2	Sensitivity	Compliance
§ 4.3	Adjacent channel selectivity and blocking	Compliance
§ 4.4	Unwanted emissions in the spurious domain	Compliance*

Compliance*: Unwanted emissions in the spurious domain test results refer to the report SZ1210419-12396E-01.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR	101817	2020/12/24	2021/12/23
Sonoma instrument	Pre-amplifier	310 N	186131	2020/12/25	2021/12/24
RF Coaxial Cable	Schwarzbeck	N-5m	No.1	2020/12/25	2021/12/24
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2020/01/05	2023/01/04
Agilent	MXG Vector Signal Generator	N5182B	MY53051503	2020/08/04	2021/08/03
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	154606	2020/12/25	2021/12/24
Rohde & Schwarz	Audio Analyzer	UPV	1146.2003K02-101782-XP	2020/07/10	2021/07/09

* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FINAL DRAFT ETSI EN 303 345-3 V1.1.1 (2021-03) §4.2 – SENSITIVITY**Applicable Standard**

The receiver sensitivity is the minimum wanted signal level required to provide a given level of audio quality.

Limit

The limits for sensitivity specified in table 2 shall apply. Each figure quoted is the required level of wanted signal which provides a given level of audio quality. The audio impairment criteria relevant for these tests is that the audio SNR ≥ 40 dBQ ref $\pm 60,8$ kHz deviation, and that there shall be 10 seconds of audio with no subjective impairments (e.g. clicks resulting from FM threshold effects).

Table 2: FM sensitivity requirements

De-modulation	Tuned frequency band	Wanted signal centre frequency (MHz)	Required sensitivity limit	
			Conducted (dBm)	Radiated (dB μ V/m)
FM	VHF band II	98	-90	50 (see note)
NOTE: For products with an integral antenna, the requirement is relaxed to 67 dB μ V/m.				

Test Procedure

The test procedure please refer to the ETSI EN 303 345-1 §5.3.4.1

Test Data**Environmental Conditions**

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-10.

Please refer to the following tables:

Test Mode: Receiving

FM Test:

Wanted Signal Centre Frequency (MHz)	Wanted Signal Level (dB μ V/m)	Impairment Criteria -Audio	Impairment Criteria -SNR (dBQ)	Limit	Result
98	67	clean audio	49	SNR ≥ 40 dBQ; clean audio	Pass

Note: Test performed with Radiated Test method.

FINAL DRAFT ETSI EN 303 345-3 V1.1.1 (2021-03) §4.3 –ADJACENT CHANNEL SELECTIVITY AND BLOCKING

Applicable Standard

The adjacent channel selectivity is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted signal which differs in frequency from the wanted signal by an amount equal to a small multiple of the adjacent channel spacing. The wanted and unwanted signals are of the same modulation type. The blocking ratio is a measure of the capability of the receiver to receive a wanted modulated signal without exceeding a given degradation due to the presence of an unwanted input signal at a given frequency separation. The wanted and unwanted signals are of different modulation types. In order to provide effective use of spectrum, devices shall be able to demodulate the tuned signal in the presence of similar signals in adjacent channels. In addition, testing shall also be performed to check the ability of the receiver to work effectively with interfering signals at a greater separation from the wanted signal (blocking). The channel spacings specified in table 3 shall apply.

Table 3: Channel spacing for adjacent channel selectivity and blocking

Demodulation	Tuned frequency band	Unwanted frequency (N = 2, 3, 4)	Unwanted frequency (blocking)
FM	VHF band II	$\pm N \times 100 \text{ kHz}$	$\pm 800 \text{ kHz}$

Limit

The limits for selectivity and blocking specified in table 4 shall apply with the channel spacings given in table 3. Each figure quoted is the minimum acceptable level of unwanted signal, relative to that of the wanted signal, which provides a given level of audio quality. The audio impairment criteria relevant for these tests is that the audio SNR $\geq 40 \text{ dBQ}$ ref $\pm 60,8 \text{ kHz}$ deviation, and that there shall be 10 seconds of audio with no subjective impairments (e.g. clicks resulting from FM threshold effects).

Table 4: Adjacent channel selectivity and blocking requirements

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 (dB μ V/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
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.								
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.								
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.								
NOTE 4: The wanted signal level for receivers with integral antenna is 73 dB μ V/m.								

Test Procedure

The test procedure please refer to the ETSI EN 303 345-1 §5.3.5.1

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	101.0 kPa

The testing was performed by Fan Yang on 2021-05-09.

Please refer to the following tables:

Test Mode: Receiving

FM Test:

Wanted Signal Centre Frequency (MHz)	Wanted Signal Level (dB μ V/m)	Test Case	Unwanted Signal Frequency (MHz)	I/C Ratio (dB)	Impairment Criteria -Audio	Impairment Criteria -SNR (dBQ)	Limit	Result
98	73	ACS +1	98.2	-15	clean audio	43	SNR \geq 40 dBQ; clean audio	Pass
		ACS +2	98.3	-3	clean audio	42		
		ACS +3	98.4	8	clean audio	43		
		ACS -1	97.8	-15	clean audio	44		
		ACS -2	97.7	-3	clean audio	43		
		ACS -3	97.6	8	clean audio	44		
		Block+800	98.8	20	clean audio	42		
		Block-800	97.2	20	clean audio	43		

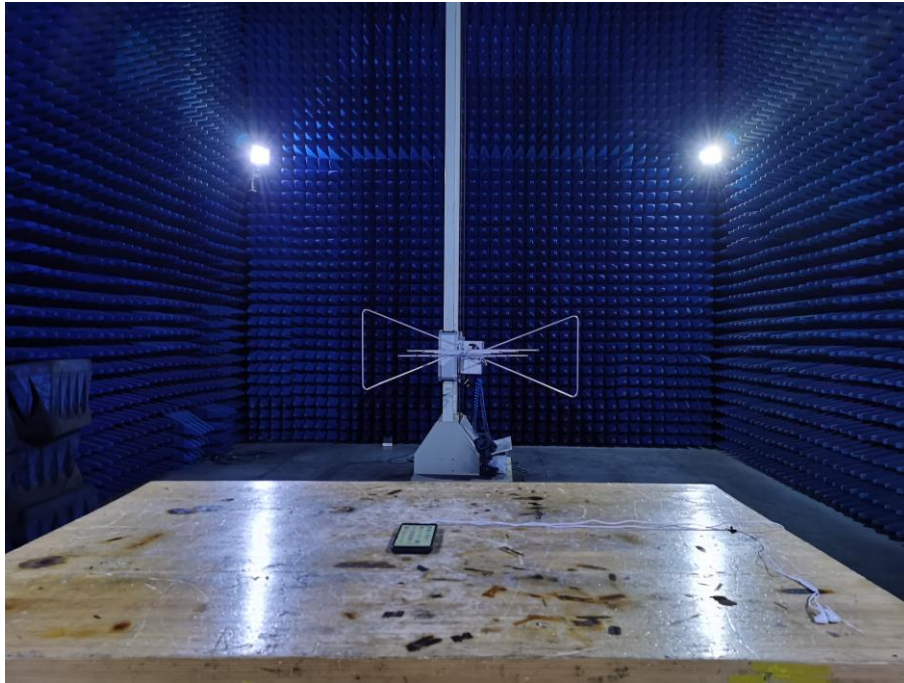
Note: Test performed with Radiated Test method.

EXHIBIT A - EUT PHOTOGRAPHS

Please refer to the Attachment.

EXHIBIT B - TEST SETUP PHOTOGRAPHS

SENSITIVITY



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