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# RF Test Report

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Report No.: AGC00552200501EE14A

**PRODUCT DESIGNATION** : Smart Phone

**BRAND NAME** : HAFURY

**TEST MODEL** : M20

**APPLICANT** : Shenzhen Huafurui Technology Co., Ltd.

**DATE OF ISSUE** : Jul 22, 2020

**STANDARD(S)** : ETSI EN 303 345-1 V1.1.1 (2019-06)  
Draft ETSI EN 303 345-3 V1.1.0 (2019-11)

**REPORT VERSION** : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd.

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**Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Jul. 22, 2020	Valid	Re-certification

Note: The original test report Ref. No.( AGC00552200501EE14) (dated 2020-06-08), was modified on 2020-07-22 to include the following changes for:

- Updated brand name and model name;
- Updated battery brand name and model name;
- Changed software version. (It changes due to the change of the product model, does not affect the test result

For the above described changes, no further testing necessary.



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## 1. TEST RESULT CERTIFICATION

<b>Applicant</b>	Shenzhen Huafurui Technology Co., Ltd.
<b>Address</b>	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
<b>Manufacturer</b>	Shenzhen Huafurui Technology Co., Ltd.
<b>Address</b>	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
<b>Factory</b>	Shenzhen Huafurui Technology Co., Ltd.
<b>Address</b>	Unit 1401 &1402, 14/F, Jin qi zhi gu mansion (No. 4 building of Chong wen Garden), Crossing of the Liu xian street and Tang ling road, Tao yuan street, Nan shan district, Shenzhen,P.R. China
<b>Product Designation</b>	Smart Phone
<b>Brand Name</b>	HAFURY
<b>Test Model</b>	M20
<b>Date of test</b>	May 25, 2020~Jun 08, 2020
<b>Deviation</b>	None
<b>Test Result</b>	Pass

The above equipment was tested by ATTESTATION OF GLOBAL COMPLIANCE (SHENZHEN) CO., LTD. for compliance with the requirements set forth in the European Standard ETSI EN 303 345-3. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

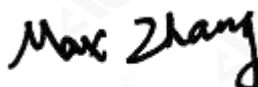
Prepared By



Calvin Liu  
(Project Engineer)

Jun. 08, 2020

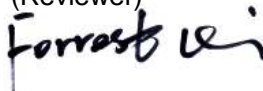
Reviewed By



Max Zhang  
(Reviewer)

Jul. 22, 2020

Approved By



Forrest Lei  
Authorized Officer

Jul. 22, 2020





## 2. TECHNICAL INFORMATION

### 2.1. EUT DESCRIPTION

Details of technical specification refer to the description in follows:

Hardware Version	TE647_MAIN_PCN_V1.0
Software Version	HAFURY_M20_A041CH_V03_20200713
Modulation method	Frequency modulation (FM)
Frequency band	VHF band II: 87.5 MHz to 108 MHz
Antenna Type	Integral antenna
Power Supply	DC 3.8V by battery or DC 5V by adapter

**NOTE:** For more information, please refer to User's Manual.

### 2.2. OBJECTIVE

Perform Radio Spectrum tests for CE Marking according to the provisions of article 3.2 of the Radio Equipment Directive (2014/53/EU) for the broadcast sound receivers.

### 2.3. TEST SIGNAL CONFIGURATIONS

The generated FM signals (wanted and unwanted) and the blocking signal shall be in accordance with table The configuration is based on Recommendation ITU-R BS.641 [i.6].

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	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).



## 2.4. TEST ITEMS AND THE RESULTS

Test items and the results are as below:

Basic Standard	Test Type	Result
EN 303 345-3 Clause 4.2	Sensitivity	Pass
EN 303 345-3 Clause 4.3	Adjacent channel selectivity and blocking	Pass

## 2.5. DESCRIPTION OF TEST MODES

NO.	TEST MODE DESCRIPTION
1	FM receiving mode at 98MHz

## 2.6. ENVIRONMENTAL CONDITIONS

- Temperature: 15-35°C
- Humidity: 30-60 %
- Atmospheric pressure: 86-106 kPa



### 3. TEST FACILITY

Test Site:	Attestation of Global Compliance (Shenzhen) Co., Ltd.
Address:	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

### 4. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Sensitivity,  $U_c = \pm 3.8\text{dB}$
- Uncertainty of Adjacent channel selectivity and blocking,  $U_c = \pm 3.8\text{dB}$



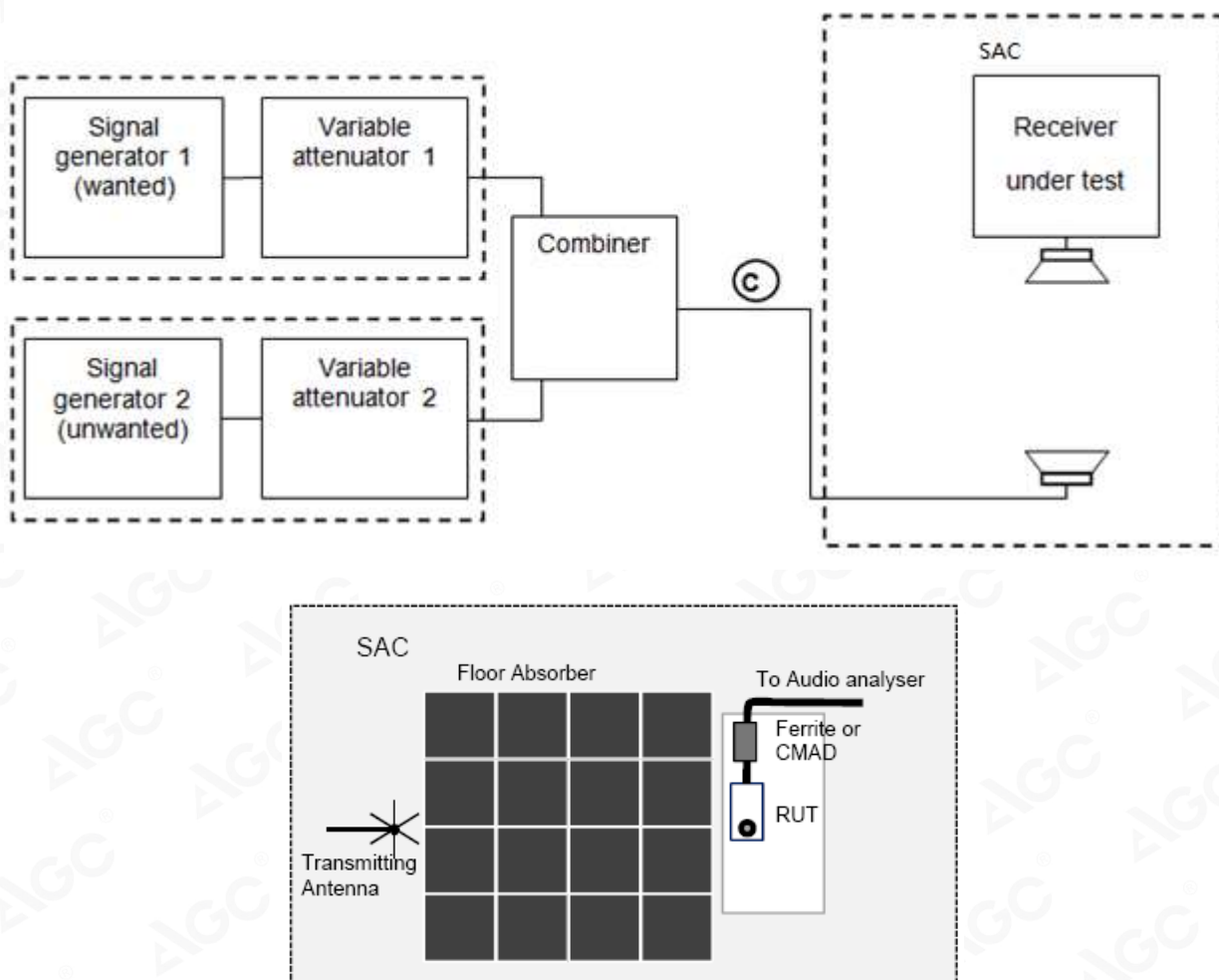
## 5. TECHNICAL REQUIREMENTS

### 5.1 SENSITIVITY

#### 5.1.1 MEASUREMENT EQUIPMENT USED:

Description	Manufacturer	Model No.	Calibration Date	Calibration Due.
MXG X-Series Vector Signal Generator	Agilent	N5182B	Sep. 09, 2019	Sep. 08, 2020
MXG X-Series Vector Signal Generator	Agilent	N5182A	Sep. 09, 2019	Sep. 08, 2020
Audio Analyzer	R&S	UPV	Sep. 02, 2019	Sep. 01, 2020
ANTENNA	SCHWARZBECK	VULB9168	Jan. 09, 2019	Jan. 08, 2021

#### 5.1.2 TEST SETUP:





### 5.1.3 TEST LIMITS:

The limits for sensitivity specified in the table 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  $\geq 40$  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).

#### FM sensitivity requirements

De-modulation	Tuned frequency band	Wanted signal Centre frequency (MHz)	Required sensitivity limit	
			Conducted (dBm)	Radiated (dB $\mu$ 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 $\mu$ V/m.

### 5.1.4 TEST PROCEDURE:

1. For radiated testing, the EUT is placed in semi anechoic chamber (SAC). The field strength generated by the signal generator applying to the EUT at 3 meters distance from the antenna is pre-calibrated before testing.
2. The 'unwanted' signal generator remains switched off for the duration of the test.
3. The 'wanted' signal generator is set to the required modulation method and test configuration as specified, and to the frequency specified. The signal level is adjusted to provide the level, as measured at  $\odot$ , specified plus 30 dB.
4. The receiver (EUT) is tuned to the frequency of the 'wanted' signal generator. The audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (that is less than 10 % total harmonic distortion) but of sufficient level to drive the measurement device.
5. The level of the 'wanted' signal generator is adjusted to provide the level, as measured at  $\odot$ .
6. The audio output, measured using the measurement device, is recorded as the signal level, S.
7. 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.
8. If the impairment criteria given are met then the receiver has passed the test.

### 5.1.5 TEST RESULTS:

FM (Integral antenna) VHF band II 98MHz					
Wanted Signal Level at $\odot$ (dB $\mu$ V/m)	S (mV)	N (mV)	SNR (dBQ)	Limit (dBQ)	Result
67	40.02	0.07	55.14	$\geq 40$	Pass



## 5.2 ADJACENT CHANNEL SELECTIVITY AND BLOCKING

### 5.2.1 MEASUREMENT EQUIPMENT USED:

Same as 5.1.1

### 5.2.2 TEST SETUP:

Same as 5.1.2

### 5.2.3 TEST LIMITS:

**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	$\pm N \times 100$ kHz	$\pm 800$ kHz

**Adjacent channel selectivity and blocking requirements**

Demodulation (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 $\mu$ 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  $\mu$  V/m.

### 5.2.4 TEST PROCEDURE:

- For radiated testing, the EUT is placed in semi anechoic chamber (SAC). The field strength generated by the signal generator applying to the EUT at 3 meters distance from the antenna is pre-calibrated before testing.
- The 'wanted' signal generator is set to the required modulation method and test configuration as specified, and to the frequency specified. The signal level is adjusted to provide the level, as measured at  $\odot$ , specified in above table, with the 'unwanted' generator switched off
- The receiver (EUT) is tuned to the frequency of the 'wanted' signal generator. The audio level shall be set so as to provide clean 1 kHz audio tone at the audio output (that is less than 10 % total harmonic distortion) but of sufficient level to drive the measurement device.



4. The 'unwanted' signal generator is set to the required modulation method and test configuration as specified. and to the frequency calculated from the wanted signal centre frequency and the required offset specified in above Table. The signal level is adjusted to provide the level, as measured at ©, specified in above Table, with the 'wanted' generator switched off. For the blocking test only, the audio modulation of the 'unwanted' signal shall be removed whilst measuring the level at ©.
5. The 'wanted' signal generator is switched back on.
6. The audio output, measured using the measurement device, is recorded as the signal level, S.
7. 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.
8. If the impairment criteria given are met then the receiver has passed the test.

#### 5.2.5 TEST RESULTS:

FM (Integral antenna) VHF band II 98MHz								
Adjacency	C Wanted signal level at © (dBµV/m)	I Unwanted Signal Level at © (dBµV/m)	Required I/C ratio (dB)	S(mV)	N(mV)	SNR (dBQ)	Limit (dBQ)	Result
N = -1 97.9MH	73	58	-15	41.12	0.08	54.22	≥ 40	Pass
N = +1 98.1 MHz	73	58	-15	41.12	0.08	54.22	≥ 40	Pass
N = -2 97.8 MHz	73	70	-3	41.12	0.08	54.22	≥ 40	Pass
N = +2 98.2 MHz	73	70	-3	41.12	0.08	54.22	≥ 40	Pass
N = -3 97.7 MHz	73	81	8	41.12	0.08	54.22	≥ 40	Pass
N = +3 98.3 MHz	73	81	8	41.12	0.08	54.22	≥ 40	Pass
Blocking 97.2 MHz	73	93	20	41.12	0.08	54.22	≥ 40	Pass
Blocking 98.8 MHz	73	93	20	41.12	0.08	54.22	≥ 40	Pass





**APPENDIX A: PHOTOGRAPHS OF TEST SETUP**

Sensitivity, Adjacent channel selectivity and blocking

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