

# TEST REPORT

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Report Number : SZ1230414-19311E-RF-22D

## Test Standard (s)

ETSI EN 303 413 V1.2.1 (2021-04)

## Sample Description

Product Type: Smartphone  
Model No.: KINGKONG STAR  
Multiple Model(s) No.: N/A  
Trade Mark: CUBOT  
Date Received: 2023/04/14  
Report Date: 2023/05/24

Test Result:	Pass*
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\* In the configuration tested, the EUT complied with the standards above.

**Prepared and Checked By:**

**Approved By:**

Gala Liu

Gala Liu  
RF Engineer

Nancy Wang  
RF Supervisor

Note: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk "\*". Customer model name, addresses, names, trademarks etc. are not considered data.

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	SZ1230414-19311E-RF-22D	Original Report	2023-05-24

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Frequency Range	GPS L1 C/A: 1559-1610 MHz
Modulation Technique	BPSK
Voltage Range	DC3.87V from rechargeable Li-ion battery or DC 5/9/12V from adapter
Sample serial number	24O8-1 (RF Conducted Test) 24O8-2 (RF Radiated Test) (Assigned by BACL, Shenzhen)
Sample/EUT Status	Good condition
Adapter Information	Model:HJ-PD33W-EU Input: AC100-240V~50/60Hz 0.8A Output: DC 5.0V.3.0A 15.0W OR DC9.0V. 3.0A 27.0W OR DC 12.0V.2.75A 33.0W MAX

### Objective

This test report is in accordance with ETSI EN 303 413 V1.2.1 (2021-04), Satellite Earth Stations and Systems (SES); Global Navigation Satellite System (GNSS) receivers; Radio equipment operating in the 1 164 MHz to 1 300 MHz and 1 559 MHz to 1 610 MHz frequency bands; Harmonised Standard for access to radio spectrum.

The objective is to determine the compliance of EUT with ETSI EN 303 413 V1.2.1 (2021-04).

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 5F(B-West) , 6F, 7F, the 3rd Phase of Wan Li Industrial Building D, Shihua Rd, FuTian Free Trade Zone, Shenzhen, China.

Each test item follows test standards and with no deviation.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

### EUT Exercise Software

No exercise software.

### Special Accessories

No special accessory.

### Equipment Modifications

No modification was made to the EUT.

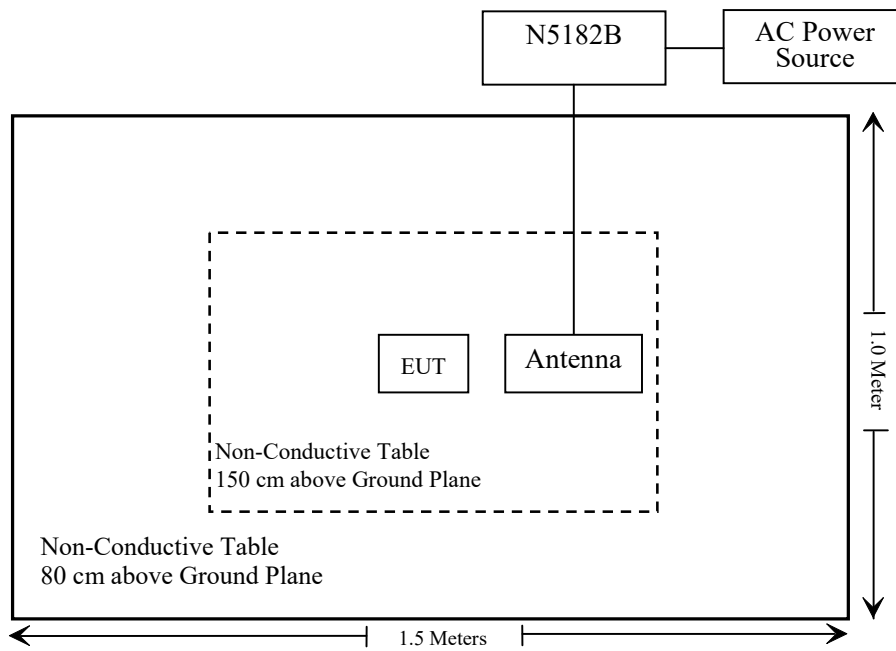
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Agilent	MXG Vector Signal Generator	N5182B	MY53051503

### External I/O Cable

Cable Description	Length (m)	From Port	To
/	/	/	/

## Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

<b>ETSI EN 303 413 V1.2.1 (2021-04)</b>	<b>Description of Test</b>	<b>Test Result</b>
§ 4.2.1	Receiver blocking	Compliant
§ 4.2.2	Receiver spurious emissions test	Compliant

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102455	2022/07/28	2023/07/27
Sonoma instrument	Pre-amplifier	310 N	186238	2022/11/11	2023/11/10
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2020/12/22	2023/12/21
Unknown	Cable	Chamber Cable 1	F-03-EM236	2022/11/11	2023/11/10
Unknown	Cable	Chamber Cable 4	EC-007	2022/11/11	2023/11/10
Agilent	Signal Generator	N5183A	MY51040755	2023/02/08	2024/02/07
Agilent	MXG Vector Signal Generator	N5182B	MY53051503	2022/07/04	2023/07/03
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Rohde & Schwarz	Spectrum Analyzer	FSV40	101605	2022/07/04	2023/07/03
COM-POWER	Pre-amplifier	PA-122	181919	2022/11/25	2023/11/24
Sunol Sciences	Horn Antenna	3115	9107-3694	2021/01/15	2024/01/14
A.H.System	Horn Antenna	SAS-200/571	135	2021/07/14	2024/07/13
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2022/11/25	2023/11/24
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2022/11/25	2023/11/24

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).



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**ETSI EN 303 413 V1.2.1 (2021-04) §4.2.1 –RECEIVER BLOCKING**

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**Applicable Standard**

Receiver blocking is a measure of the capability of the GUE to receive a wanted signal without exceeding a given degradation due to the presence of an unwanted input signal operating in accordance with the allocation table of the ITU Radio Regulations [i.13] in frequency bands adjacent or near-adjacent to the relevant RNSS band.

**Test Procedure**

For GUE utilizing the 1 559 MHz to 1 610 MHz RNSS band:

- 1) Configure the GNSS signal generator to simulate the GNSS constellations and GNSS signals from table 4-1 declared as supported by the GUE, with power levels and other details as specified in clause B.2.
- 2) With the blocking signal switched off, the EUT shall be given sufficient time to acquire all simulated satellites from the declared GNSS constellations.
- 3) Record the  $C/N_0$  value(s) reported by the EUT under the condition in step 2). Sufficient filtering shall be used to obtain stable value(s).  $C/N_0$  may be averaged over time and across all the simulated satellites for a particular GNSS constellation and GNSS signal. However,  $C/N_0$  shall not be averaged across different satellite signals in the same GNSS constellation or across different GNSS constellations. For a multi-GNSS constellation and/or multi-GNSS signal EUT, there shall be a separate  $C/N_0$  value recorded for each GNSS constellation and each GNSS signal supported.
- 4) The blocking signal generator shall be configured to generate the signal defined in table 4-4, at the first test point centre frequency and signal power level as specified in table 4-2.
- 5) The blocking signal shall be switched on, and the EUT's  $C/N_0$  value(s) recorded as in step 3). The difference(s) between this value(s) and the value(s) recorded in step 3) is the  $C/N_0$  degradation caused by the blocking signal for this test point.
- 6) Test point Pass/Fail Criteria: If the  $C/N_0$  degradation from step 5) does not exceed the value in equation (4-1), then this test point is set to "pass". If the  $C/N_0$  degradation exceeds the value in equation (4-1), then this test point is set to "fail". For a multi-GNSS constellation and/or multi-GNSS signal EUT, there shall be a separate pass/fail determination for each GNSS constellation and for each GNSS signal supported. If the  $C/N_0$  degradation exceeds the value in equation (4-1) for any supported GNSS constellation or supported GNSS signal, then this test point is set to "fail".
- 7) Step 1) through step 6) shall be repeated for all test point centre frequencies (and associated signal power level) specified in table 4-2.

For GUE utilizing the 1 164 MHz to 1 300 MHz RNSS bands:

For a GUE also utilizing the RNSS bands in the 1 164 MHz to 1 300 MHz range, the test method in clause 5.4.3 (step 1) through step 7), inclusive), shall be repeated using the adjacent frequency test point centre frequencies and associated signal power levels specified in table 4-3.

If the EUT passes the C/N<sub>0</sub> degradation tests as defined in both clause 5.4.3 and clause 5.4.4, the EUT shall be deemed to "pass". If the C/N<sub>0</sub> degradation test fails tests as defined in either or both of clause 5.4.3 or clause 5.4.4, the EUT shall be deemed to "fail".

## Test Data

### Environmental Conditions

Temperature:	24.5 °C
Relative Humidity:	50 %
ATM Pressure:	101.0 kPa

*The testing was performed by Tom Liu on 2023-04-07.*

*EUT operation mode: Receiving*

Frequency bands, Receiver blocking test point centre frequencies and power levels for the 1559 MHz to 1610 MHz GNSS band

Supported GNSS	Frequency band (MHz)	Test point centre frequency (MHz)	Measured C/N <sub>0</sub>			Limit (dB)	Result
			Without interfering signal (dB-Hz)	With interfering signal (dB-Hz)	Decrease of C/N <sub>0</sub> (dB)		
GPS L1 C/A	1518-1525	1524	42.0	42.2	0.2	1	Pass
	1525-1549	1548	42.0	42.3	0.3	1	Pass
	1549-1559	1554	42.0	42.2	0.2	1	Pass
	1610-1626	1615	42.0	42.4	0.4	1	Pass
	1626-1640	1627	42.0	42.5	0.5	1	Pass

**Test Result: Pass**

## **ETSI EN 303 413 V1.2.1 (2021-04) §4.2.2 –RECEIVER SPURIOUS EMISSIONS TEST**

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### **Test conditions**

See clause 5.1 for the environmental test conditions. These measurements shall only be performed at the normal test conditions stated in clause 5.1.

Testing shall be performed when the EUT is in receive-only operating mode and the manufacturer shall ensure that the receiver remains active for the duration of the test. For this reason, GNSS signals may be required for this test. The manufacturer shall indicate whether GNSS signals were present or not in the test report.

The level of spurious emissions shall be measured as, either:

- a) their power in a specified load (conducted spurious emissions) and their effective radiated power when radiated by the cabinet or structure of the EUT (cabinet radiation); or
- b) the effective radiated power when radiated by cabinet and antenna in case of an EUT with integral antenna and with no temporary antenna connector.

### **Test Procedure**

Pre-scan:

The procedure in step 1) to step 4) below shall be used to identify potential unwanted emissions of the EUT:

- 1) The sensitivity of the spectrum analyser should be such that the noise floor is at least 12 dB below the limits given in table 4-5.
- 2) The emissions over the range 30 MHz to 1 000 MHz shall be identified.

Spectrum analyser settings:

- . Resolution bandwidth: 100 kHz
- . Video bandwidth: 300 kHz
- . Filter type: 3 dB (Gaussian)
- . Detector mode: Peak
- . Trace Mode: Max Hold
- . Sweep Points:  $\geq 19\,400$  (for spectrum analysers not supporting this high number of sweep points, the frequency band may be segmented)
- . Sweep time: Auto

Wait for the trace to stabilize. Any emissions identified during the sweeps above and that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.5.2.1.3 and compared to the limits given in table 4-5.

3) The emissions over the range 1 GHz to 8,3 GHz shall be identified.

Spectrum analyser settings:

- . Resolution bandwidth: 1 MHz
- . Video bandwidth: 3 MHz
- . Filter type: 3 dB (Gaussian)
- . Detector mode: Peak
- . Trace Mode: Max Hold
- . Sweep Points:  $\geq 14\ 600$  (for spectrum analysers not supporting this high number of sweep points, the frequency band may be segmented)
- . Sweep time: Auto

Wait for the trace to stabilize. Any emissions identified during the sweeps above that fall within the 6 dB range below the applicable limit or above, shall be individually measured using the procedure in clause 5.5.2.1.3 and compared to the limits given in table 4-5.

4) In case of conducted measurements on smart antenna systems (equipment with multiple receive chains), step 2) and step 3) shall be repeated for each of the active receive chains,  $A_{ch}$ .

The limits used to identify emissions during this pre-scan shall be reduced by  $10 \times \log_{10}(A_{ch})$ .

Measurement of the emissions identified during the pre-scan:

The procedure in step 1) to step 4) below shall be used to accurately measure the individual unwanted emissions identified during the pre-scan measurements above. This method assumes the spectrum analyser has a Time Domain Power function.

1) The level of the emissions shall be measured using the following spectrum analyser settings:

- Measurement Mode: Time Domain Power.
- Centre Frequency: Frequency of the emission identified during the pre-scan.
- Resolution Bandwidth: 100 kHz ( $< 1\text{ GHz}$ ) / 1 MHz ( $> 1\text{ GHz}$ ).
- Video Bandwidth: 300 kHz ( $< 1\text{ GHz}$ ) / 3 MHz ( $> 1\text{ GHz}$ ).
- Frequency Span: Zero Span.
- Sweep mode: Single Sweep.
- Sweep time: 30 ms.
- Sweep points:  $\geq 30\ 000$ .
- Trigger: Video (for burst signals) or Manual (for continuous signals).
- Detector: RMS.

2) Set a window where the start and stop indicators match the start and end of the burst with the highest level and record the RMS value of the power measured within this window. If the spurious emission to be measured is a continuous transmission, the measurement window shall be set to the start and stop times of the sweep.

3) In case of conducted measurements on smart antenna systems (equipment with multiple receive chains), step 2) shall be repeated for each of the active receive chains, Ach. Sum the measured power (within the observed window) for each of the active receive chains.

4) The value defined in step 3) shall be compared to the limits defined in table 4-5.

Radiated measurement:

The test site as described in ETSI EN 300 328 [1], annex B and the applicable measurement procedures as described in ETSI EN 300 328 [1], annex C shall be used.

The test procedure is further described in clause 5.5.2.1.

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25~25.5 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by York Yang on 2023-04-26 for below 1GHz and Zenos Qiao on 2023-04-28 for above 1GHz.*

*Test Mode: Receiving(GPS L1 C/A)-worst case*

Frequency (MHz)	Receiver Reading (dBμV)	Turn Table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	EN 303 413	
			Height (m)	Polar (H/V)	Substituted Level (dBm)	Cable (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
953.5	32.31	275	1.1	H	-64.2	1.36	0.0	-65.56	-57	8.56
953.5	32.05	216	1.1	V	-62.0	1.36	0.0	-63.36	-57	6.36
1471.55	42.23	165	1.8	H	-66.4	1.60	8.50	-59.50	-47	12.50
1471.55	42.65	66	2.1	V	-66.3	1.60	8.50	-59.40	-47	12.40

**Note 1:** The unit of antenna gain is dBd for frequency below 1GHz and is dBi for frequency above 1GHz.

**Note 2:**

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

## **EXHIBIT A - EUT PHOTOGRAPHS**

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Please refer to the report number is SZ1230414-19311E-EUT.

## EXHIBIT B – TEST SETUP PHOTOGRAPHS

**Radiated Spurious Emissions Test View (Below 1GHz)**



**Radiated Spurious Emissions Test View (Above 1GHz)**



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