

RED-Health Test Report

Client Name : Jinan USR IOT Technology Limited
Address : Room 203, 205, 208. Floor 2, Wuzhou Scientific Research
Building, No.1100 Shunfeng Street, Gaoxin District,
Jinan, Shandong, 250101, China
Product Name : Industrial 4G Modem
Date : May 20, 2019

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant : Jinan USR IOT Technology Limited
Manufacturer : Jinan USR IOT Technology Limited
Product Name : Industrial 4G Modem
Model No. : USR-G781, USR-G806, USR-G800 V2, USR-G808, USR-G809, USR-G810,
USR-G811, GW-R4513, GW-R5514, GW-R731
Trade Mark : 
Rating(s) : Input: DC 9-12V, 300mA Max

Test Standard(s) : EN 62311: 2008

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN 62311:2008 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt

Apr. 02, 2019

Date of Test

Apr. 02~ May 16, 2019

Prepared By



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Approved & Authorized Signer

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(Manager / Sally Zhang)

1. GENERAL INFORMATION

1.1. Client Information

Applicant	:	Jinan USR IOT Technology Limited
Address	:	Room 203, 205, 208. Floor 2, Wuzhou Scientific Research Building, No.1100 Shunfeng Street, Gaoxin District, Jinan, Shandong, 250101, China
Manufacturer	:	Jinan USR IOT Technology Limited
Address	:	Room 203, 205, 208. Floor 2, Wuzhou Scientific Research Building, No.1100 Shunfeng Street, Gaoxin District, Jinan, Shandong, 250101, China
Factory	:	Jinan USR IOT Technology Limited
Address	:	Room 203, 205, 208. Floor 2, Wuzhou Scientific Research Building, No.1100 Shunfeng Street, Gaoxin District, Jinan, Shandong, 250101, China

1.2. Description of Device (EUT)

Product Name	:	Industrial 4G Modem
Model No.	:	USR-G781, USR-G806, USR-G800 V2, USR-G808, USR-G809, USR-G810, USR-G811, GW-R4513, GW-R5514, GW-R731 (Note: All samples are the same except the name, so we prepare "USR-G781" for test only.)
Trade Mark	:	
Test Power Supply	:	AC 230V, 50Hz for adapter
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Product Description	:	Operation Frequency: GSM 900: 880 -915 MHz (TX); 935 - 960 MHz (RX) DCS1800: 1710 -1785 MHz (TX); 1805-1880 MHz (RX) WCDMA2100:1922.4MHz-1977.6MHz WCDMA900:882.4MHz-912.6MHz LTE :FDD:Band1:TX:1920MHz~1980MHz, RX:2110MHz~2170MHz LTE :FDD:Band3:TX:1710MHz~1785MHz, RX:1805MHz~1880MHz LTE :FDD:Band8:TX:880MHz~915MHz, RX:925MHz~960MHz LTE :TDD: Band38:2570MHz~2620MHz

		LTE :TDD: Band40:2300MHz~2400MHz
	Modulation Type:	GSM900/1800: GMSK,8PSK WCDMA900/2100:QPSK,16QAM LTE FDD:QPSK,16QAM
	Antenna Type:	GSM900/1800: Sucker External Antenna WCDMA900/2100: Sucker External Antenna LTE Band 1/3/8/38/40: Sucker External Antenna
	Antenna Gain(Peak):	GSM 900: 1.74 dBi DCS1800: 2.42 dBi WCDMA900: 1.74 dBi WCDMA2100: 3.82 dBi LTE Band 1: 3.82 dBi LTE Band 3: 2.42 dBi LTE Band 8: 1.74 dBi LTE Band 38: 3 dBi LTE Band 40: 3 dBi
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used during Test

Adapter	:	P/N:DQS151-120100-16312B Model:DQS151-120100-VV Input: AC 100-240V 50/60Hz 0.4A Max Output: DC 12.0V, 1.0A
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1.4. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, July 31, 2017.

ISED-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A-1, June 13, 2016.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. GENERAL PRODUCT INFORMATION

2.1. Basic Restriction

The essential requirements of Directive 99/519/EC in the article 3.1(a) and the limits must be taken from Council Recommendation 99/519/EC for General Population or from the ICNIRP Guidelines for Occupational Exposure. EN 50371:2002 Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields. The average power of EUT is less than 20mW then comply with basic restriction (1999/519/EC) without test.

2.2. Table for Filed Antenna

	Antenna Type	Gain (dBi)
GSM900	Sucker External Antenna	1.74
DCS1800	Sucker External Antenna	2.42
WCDMA 900	Sucker External Antenna	1.74
WCDMA 2100	Sucker External Antenna	3.82
LTE Band1	Sucker External Antenna	3.82
LTE Band3	Sucker External Antenna	2.42
LTE Band8	Sucker External Antenna	1.74
LTE Band38	Sucker External Antenna	3
LTE Band40	Sucker External Antenna	3

3. TEST RESULT

3.1. Limit

Council Recommendation 99/519/EC Annex III

Reference levels for electric, magnetic and electromagnetic fields (0Hz to 300GHz)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m ²)
0-1Hz	-	3,2×10 ⁴	4×10 ⁴	-
1-8Hz	1000	3,2×10 ⁴ /f ²	4×10 ⁴ /f ²	-
8-25Hz	1000	4000/f	5000/f	-
0.025Hz-0,8kHz	250/f	4/f	5/f ^{6,25}	-
0,8-3kHz	250/f	5	6,25	-
3-150kHz	87	5	6,25	-
0,15-1MHz	87	0.73/f	0,92/f	-
1-10MHz	87/f ^{1/2}	0.73/f	0,92/f	-
10-400MHz	28	0.073	0,092	2
400-2000MHz	1,375 f ^{1/2}	0,0037 f ^{1/2}	0,0046f ^{1/2}	f/200
2-300GHz	61	0,16	0,20	10

Note:

(1)As indicated in the frequency range column.

(2)For frequencies between 100kHz and 10GHz, Seq, E2, H2 and B2 are to be averaged over any six-minute period.

(3)For frequencies exceeding 10GHz, Seq, E2, H2 and B2 are to be averaged over any 68/1.05-minute period (.in GHz).

(4)No E-field value is provided for frequencies <1Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 20kV/m. Spark discharges causing stress or annoyance should be avoided.

3.2. Detailed results

3.2.1. MPE Evaluation

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P = Peak Power Input to antenna (Watts)

G =Antenna Gain (numeric)

R = distance to the center of radiation of antenna (in meter) = 0.20 m

Note:

1) P (Watts)=(10 ^ (dBm /10))/1000

2) G (Antenna gain in numeric) = 10^ (Antenna gain in dBi /10)

3) Duty factor=1

4) $\pi=3.142$

The maximum power density at a distance of 0.2 m for EUT is shown as below:

Test Mode	Antenna Gain(dBi)	Peak Output Power (dBm)	Peak Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
GSM900	1.74	28.02	0.6339	1	1.8822	10
DCS1800	2.42	25.64	0.3664	1	1.2725	10
WCDMA 900	1.74	24.18	0.2618	1	0.7775	10
WCDMA 2100	3.82	24.6	0.2884	1	1.3825	10
LTE Band1	3.82	24.1	0.2570	1	1.2322	10
LTE Band3	2.42	24.48	0.2805	1	0.9743	10
LTE Band8	1.74	25.39	0.3459	1	1.0272	10
LTE Band38	3	24.79	0.3013	1	1.1958	10
LTE Band40	3	25.41	0.3475	1	1.3793	10

----- End of Report -----