



TEST REPORT

No. I20D00115-SRD22

For

Client: MobiWire SAS

Production: 4G Smart Phone

Model Name: MobiWire Sora |H5024,Smart E11 (H5024)

Brand Name: MobiWire,Vodafone

FCC ID: QPN-SORA

Hardware Version: V01A

Software Version: SORA_EU_V01_200630

Issued date: 2020-09-11

NOTE

1. The test results in this test report relate only to the devices specified in this report.
2. This report shall not be reproduced except in full without the written approval of East China Institute of Telecommunications.
3. For the test results, the uncertainty of measurement is not taken into account when judging the compliance with specification, and the results of measurement or the average value of measurement results are taken as the criterion of the compliance with specification directly.

Test Laboratory:

East China Institute of Telecommunications

Add: Block No.4, No.766, Jingang Road, Pudong District, Shanghai, P. R. China

Tel: +86 21 63843300

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Revision Version

| Report Number | Revision | Date | Memo |
|----------------------|-----------------|-------------|-----------------------------------|
| I20D00115-SRD22 | 00 | 2020-08-21 | Initial creation of test report |
| I20D00115-SRD22 | 01 | 2020-09-11 | First modification of test report |

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1. Test Laboratory

1.1. Testing Location

| | |
|---------------------|--------------------------------------------------------------------------|
| Company Name | East China Institute of Telecommunications |
| Address | Block No.4, No.766, Jingang Road, Pudong District, Shanghai, P. R. China |
| Postal Code | 201206 |
| Telephone | +86 21 63843300 |
| FCC registration No | CN1177 |

1.2. Testing Environment

| | |
|--------------------|-----------|
| Normal Temperature | 15°C-35°C |
| Relative Humidity | 20%-75% |

1.3. Project Data

| | |
|------------------|------------|
| Project Leader | Yu Anlu |
| 2020-05-11 | 2020-08-12 |
| Testing End Date | 2020-08-14 |

1.4. Signature



Liu Yan
(Prepared this test report)



Fan Songyan
(Reviewed this test report)



Zheng Zhongbin
(Approved this test report)

2. Client Information

2.1. Applicant Information

| | |
|--------------|--------------------------------------------------|
| Company Name | MobiWire SAS |
| Address | 79 avenue Francois Arago, 92000 NANTERRE France. |
| Telephone | +86 574 59555707 |
| Postcode | / |

2.2. Manufacturer Information

| | |
|--------------|--------------------------------------------------|
| Company Name | MobiWire SAS |
| Address | 79 avenue Francois Arago, 92000 NANTERRE France. |
| Telephone | +86 574 59555707 |
| Postcode | / |

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

| | |
|-------------------------|----------------------------------------|
| Production | 4G Smart Phone |
| Model name | MobiWire Sora H5024,Smart E11 (H5024) |
| BLE Frequency | 2402MHz-2480MHz |
| BLE Channel | Ch0-39 |
| BLE Modulation | GFSK |
| Extreme Temperature | -10/+55°C |
| Nominal Voltage | 3.80V |
| Extreme High Voltage | 4.35V |
| Extreme Low Voltage | 3.60V |
| Maximum of Antenna Gain | Bluetooth: 0dBi |

Note:

- a. Photographs of EUT are shown in ANNEX A of this test report.
- b. The value of the antenna gain is provided by the customer. For specific antenna information, please check the antenna specifications of the customer.

3.2. Internal Identification of EUT used during the test

| EUT ID* | SN or IMEI | HW Version | SW Version | Date of receipt |
|---------|-----------------|------------|--------------------|-----------------|
| N03 | 354392850000301 | V01A | SORA_EU_V01_200630 | 2020-07-24 |

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

| AE ID* | Description | Type | Manufacturer |
|--------|-------------|------|--------------|
| AE1 | RF cable | / | MobiWire SAS |

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Documents supplied by applicant

All technical documents are supplied by the client or manufacturer, which is the basis of testing.

4.2. Reference Documents for testing

The following documents listed in this section are referred for testing.

| Reference | Title | Version |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| FCC Part15 | FCC CFR 47, Part 15,Subpart C: 15.205 Restricted bands of operation; 15.209 Radiated emission limits, general requirements; 15.247 Operation within the bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz. | 2018-10-01 |
| ANSI C63.10 | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices | 2013 |
| KDB558074 | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 | v05r02 |

5. Test Results

5.1. Summary of Test Results

| Measurement Items | Sub-clause of Part15C | Verdict |
|----------------------------------------|-----------------------|---------|
| Transmitter Spurious Emission-Radiated | 15.247 | P |

Note: please refer to Annex A in this test report for the detailed test results.

The following terms are used in the above table.

| | |
|----|--------------------------------------------------------------------------------|
| P | Pass, the EUT complies with the essential requirements in the standard. |
| NP | Not Perform, the test was not performed by ECIT. |
| NA | Not Applicable, the test was not applicable. |
| F | Fail, the EUT does not comply with the essential requirements in the standard. |

Test Conditions

| | |
|------|--------------------|
| Tnom | Normal Temperature |
| Tmin | Low Temperature |
| Tmax | High Temperature |
| Vnom | Normal Voltage |
| Vmin | Low Voltage |
| Vmax | High Voltage |
| Hnom | Norm Humidity |
| Anom | Norm Air Pressure |

For this report, all the test case listed above are tested under Normal Temperature and Normal Voltage, and also under norm humidity, the specific conditions as following:

| | | |
|--------------|------|---------|
| Temperature | Tnom | 25°C |
| Voltage | Vnom | 3.80V |
| Humidity | Hnom | 48% |
| Air Pressure | Anom | 1010hPa |

5.2. Statements

The MobiWire Sora |H5024, Smart E11 (H5024) is a variant model for testing.

In this report, we only retest the radiation emission. And the conduct test results please refer to report No: I19D00035-SRD02-BLE, which was prepared by East China Institute of Telecommunications.

ECIT only performed test cases which identified with P/NP/NA/F results in Annex A.

ECIT has verified that the compliance of the tested device specified in section 3 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 4 of this test report.

6. Test Equipments Utilized

6.1. Radiated Emission Test System

| Item | Instrument Name | Type | SN | Manufacturer | Cal. Date | Cal. interval |
|------|--------------------------------------|----------|--------------|--------------|------------|---------------|
| 1 | Universal Radio Communication Tester | CMU200 | 123123 | R&S | 2020-05-10 | 1 year |
| 2 | EMI Test Receiver | ESU40 | 100307 | R&S | 2020-05-10 | 1 year |
| 3 | TRILOG Broadband Antenna | VULB9163 | VULB9163-515 | Schwarzbeck | 2020-02-28 | 2 years |
| 4 | Double- ridged Waveguide Antenna | ETS-3117 | 00135890 | ETS | 2020-02-28 | 2 years |
| 5 | 2-Line V-Network | ENV216 | 101380 | R&S | 2020-05-10 | 1 year |

Anechoic chamber

Fully anechoic chamber by ETS.

7. Measurement Uncertainty

Measurement uncertainty for all the testing in this report are within the limit specified in ECIT documents. The detailed measurement uncertainty is defined in ECIT documents.

| Measurement Items | Range | Confidence Level | Calculated Uncertainty |
|----------------------------------------|--------------------|------------------|------------------------|
| Peak Output Power-Conducted | 2402MHz-2480MHz | 95% | $\pm 0.544\text{dB}$ |
| Peak Power Spectral Density | 2402MHz-2480MHz | 95% | $\pm 0.544\text{dB}$ |
| 6dB Bandwidth | 2402MHz-2480MHz | 95% | $\pm 62.04\text{Hz}$ |
| Frequency Band Edges-Conducted | 2390MHz-2488.5MHz | 95% | $\pm 0.544\text{dB}$ |
| Conducted Emission | 30MHz-2GHz | 95% | $\pm 0.90\text{dB}$ |
| Conducted Emission | 2GHz-3.6GHz | 95% | $\pm 0.88\text{dB}$ |
| Conducted Emission | 3.6GHz-8GHz | 95% | $\pm 0.96\text{dB}$ |
| Conducted Emission | 8GHz-20GHz | 95% | $\pm 0.94\text{dB}$ |
| Conducted Emission | 20GHz-22GHz | 95% | $\pm 0.88\text{dB}$ |
| Conducted Emission | 22GHz-26GHz | 95% | $\pm 0.86\text{dB}$ |
| Transmitter Spurious Emission-Radiated | 9KHz-30MHz | 95% | $\pm 5.66\text{dB}$ |
| Transmitter Spurious Emission-Radiated | 30MHz-1000MHz | 95% | $\pm 4.98\text{dB}$ |
| Transmitter Spurious Emission-Radiated | 1000MHz -18000MHz | 95% | $\pm 5.06\text{dB}$ |
| Transmitter Spurious Emission-Radiated | 18000MHz -40000MHz | 95% | $\pm 5.20\text{dB}$ |
| AC Power line Conducted Emission | 0.15MHz-30MHz | 95% | $\pm 3.66\text{ db}$ |

8. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

| | |
|--------------------------|----------------------------|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 20 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Ground system resistance | < 0.5 Ω |

Control room did not exceed following limits along the EMC testing:

| | |
|--------------------------|----------------------------|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 30 %, Max. = 60 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

| | |
|------------------------------|--------------------------------------------|
| Temperature | Min. = 15 °C, Max. = 35 °C |
| Relative humidity | Min. = 25 %, Max. = 75 % |
| Shielding effectiveness | > 100 dB |
| Electrical insulation | > 10 kΩ |
| Ground system resistance | < 0.5 Ω |
| VSWR | Between 0 and 6 dB, from 1GHz to 18GHz |
| Site Attenuation Deviation | Between -4 and 4 dB, 30MHz to 1GHz |
| Uniformity of field strength | Between 0 and 6 dB, from 80MHz to 3000 MHz |

ANNEX A. Detailed Test Results

ANNEX A.1. Radiated Emission

A.6.1 Measurement Limit:

| Standard | Limit |
|----------------------------------------|------------------------------|
| FCC 47 CFR Part 15.247, 15.205, 15.209 | 20dB below peak output power |

In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a) (see 15.205(c)).

Limit in restricted band:

| Frequency of emission (MHz) | Field strength (uV/m) | Field strength (dBuV/m) |
|-----------------------------|-----------------------|-------------------------|
| 30~88 | 100 | 40 |
| 88~216 | 150 | 43.5 |
| 216~960 | 200 | 46 |
| Above 960 | 500 | 54 |

A.6.2 Test Method

Portable, small, lightweight, or modular devices that may be handheld, worn on the body, or placed on a table during operation shall be positioned on a non-conducting platform, the top of which is 80 cm above the reference ground plane. The preferred area occupied by the EUT arrangement is 1 m by 1.5 m, but it may be larger or smaller to accommodate various sized EUTs. For testing purposes, ceiling- and wall-mounted devices also shall be positioned on a tabletop (see also ANSI C63.10-2013 section 6.3.4 and 6.3.5). In making any tests involving handheld, body-worn, or ceiling-mounted equipment, it is essential to recognize that the measured levels may be dependent on the orientation (attitude) of the three orthogonal axes of the EUT. Thus, exploratory tests as specified in 8.3.1 shall be carried out for various axes orientations to determine the attitude having maximum or near-maximum emission level. The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

| Frequency of emission (MHz) | RBW/VBW | Sweep Time (s) |
|-----------------------------|---------------|----------------|
| 30~1000 | 100KHz/300KHz | 5 |
| 1000~4000 | 1MHz/3MHz | 15 |
| 4000~18000 | 1MHz/3MHz | 40 |
| 18000~26500 | 1MHz/3MHz | 20 |

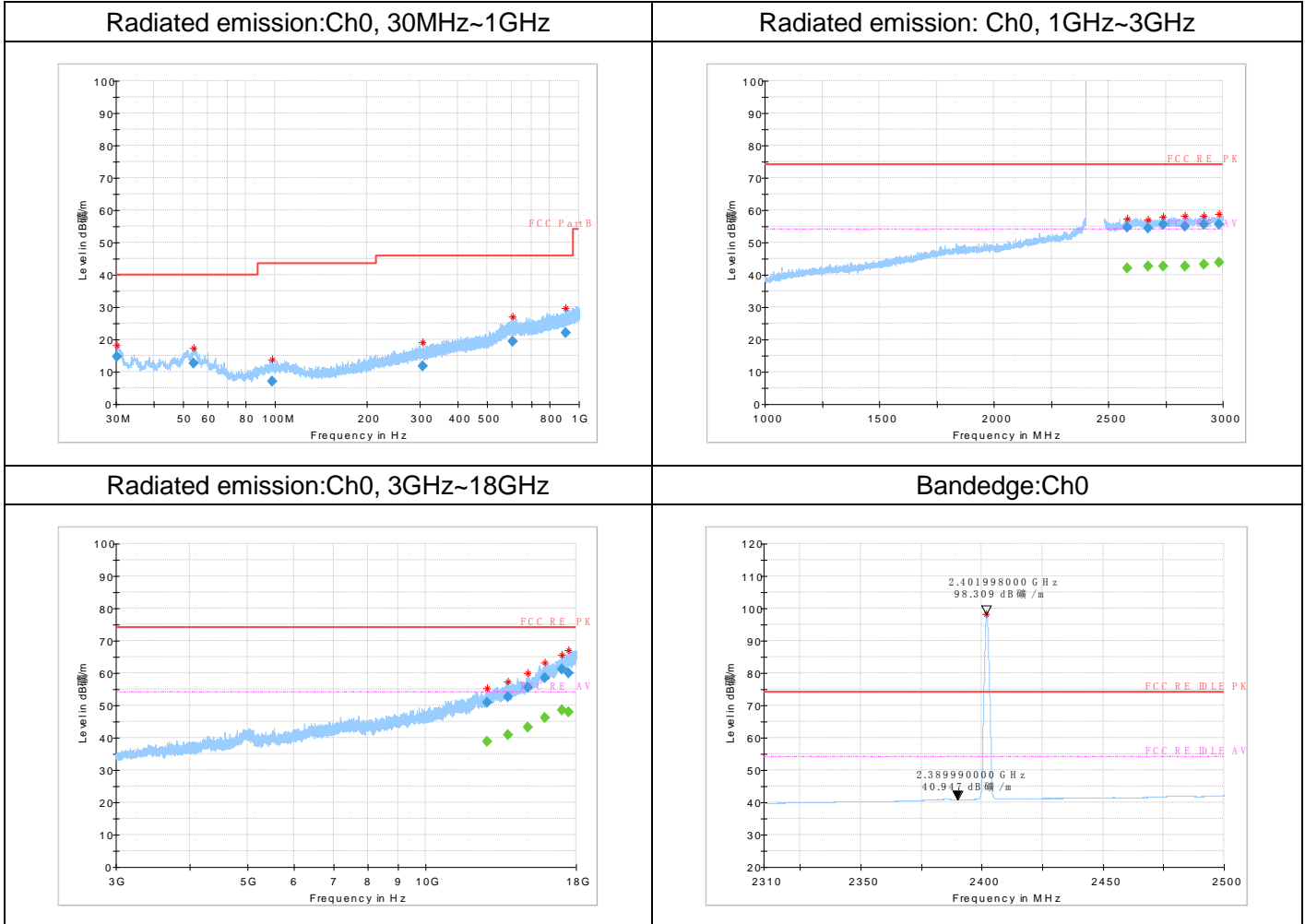
A.6.3 Measurement Results:

A “reference path loss” is established and A_{Rpi} is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

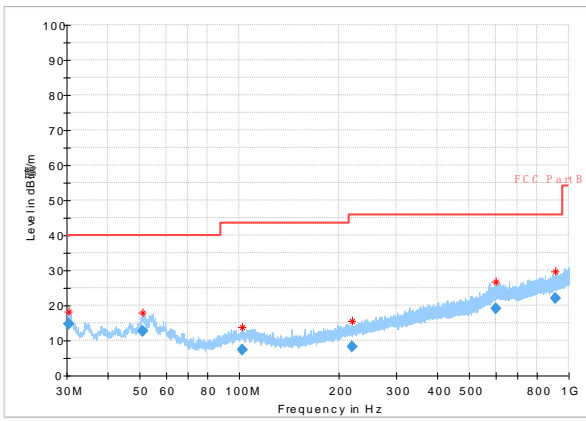
The measurement results are obtained as described below:

$$A_{Rpi} = \text{Cable loss} + \text{Antenna Gain} - \text{Preamplifier gain}$$

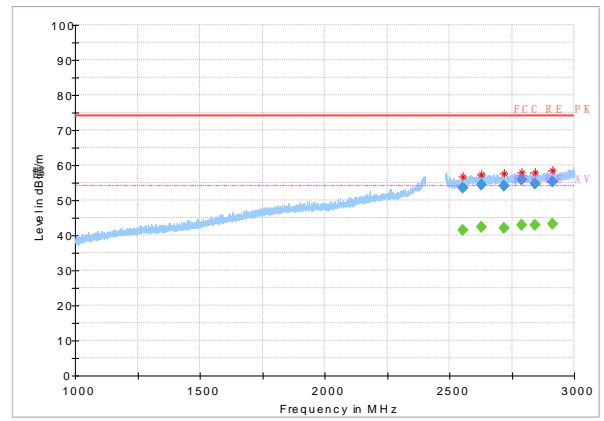
$$\text{Result} = P_{\text{Mea}} + A_{Rpi}$$



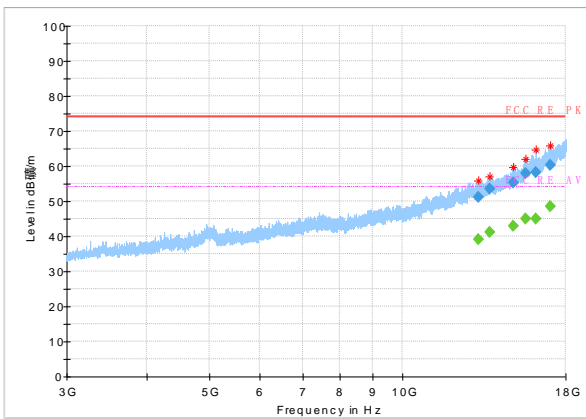
Radiated emission: Ch39, 30MHz~1GHz



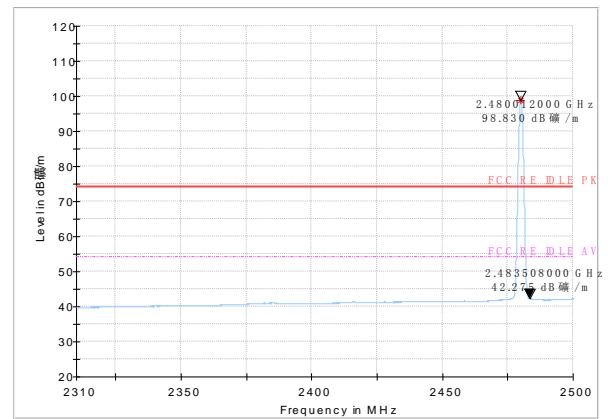
Radiated emission: Ch39, 1GHz~3GHz



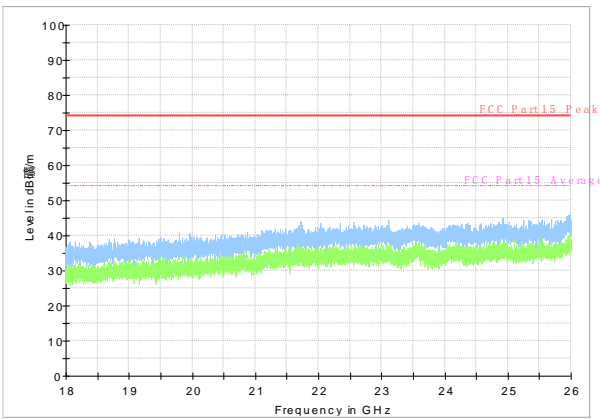
Radiated emission: Ch39, 3GHz~18GHz



Bandedge: Ch39



ALL Channel 18GHz~26GHz



/

/

Ch0 30MHz-1GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|-----------|--------------|----------|
| 30.3 | 14.8 | -17 | 31.8 | V |
| 54.1 | 12.74 | -15.4 | 28.14 | V |
| 97.7 | 7.17 | -16.2 | 23.37 | V |
| 307.2 | 11.66 | -11.2 | 22.86 | H |
| 605.9 | 19.34 | -2.9 | 22.24 | H |
| 902.9 | 21.93 | -0.5 | 22.43 | V |

Ch0 1GHz-3GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|-----------|--------------|----------|
| 2581.8 | 54.58 | 17.5 | 37.08 | V |
| 2673.8 | 54.43 | 17.8 | 36.63 | V |
| 2741.6 | 55.48 | 18 | 37.48 | V |
| 2834.9 | 55.08 | 18.3 | 36.78 | V |
| 2916.2 | 55.45 | 18.7 | 36.75 | H |
| 2985.5 | 55.71 | 19.3 | 36.41 | V |

Ch0 1GHz-3GHz (Average)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 2581.8 | 42.17 | 17.5 | 24.67 | V |
| 2673.8 | 42.55 | 17.8 | 24.75 | V |
| 2741.6 | 42.7 | 18 | 24.7 | V |
| 2834.9 | 42.74 | 18.3 | 24.44 | V |
| 2916.2 | 43.18 | 18.7 | 24.48 | H |
| 2985.5 | 43.75 | 19.3 | 24.45 | V |

Ch0 3GHz-18GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 12709.6 | 50.86 | 17.3 | 33.56 | H |
| 13790.4 | 52.71 | 18.3 | 34.41 | V |
| 14902.3 | 55.68 | 22.3 | 33.38 | H |
| 15958.8 | 58.44 | 25.3 | 33.14 | V |
| 17011.2 | 61.03 | 28.2 | 32.83 | H |
| 17464.3 | 59.9 | 28.7 | 31.2 | V |

Ch0 3GHz-18GHz (Average)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 14902.3 | 43.38 | 22.3 | 21.08 | H |
| 15958.8 | 46.13 | 25.3 | 20.83 | V |
| 17011.2 | 48.59 | 28.2 | 20.39 | H |
| 17464.3 | 47.86 | 28.7 | 19.16 | V |

Ch39 30MHz-1GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 30.3 | 14.64 | -17 | 31.64 | V |
| 51.0 | 12.73 | -15.5 | 28.23 | V |
| 102.1 | 7.24 | -15.8 | 23.04 | H |
| 220.2 | 8.35 | -13.8 | 22.15 | V |
| 599.6 | 19.23 | -3 | 22.23 | H |
| 908.3 | 21.95 | -0.4 | 22.35 | H |

Ch39 1GHz-3GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 2553.4 | 53.58 | 17.1 | 36.48 | H |
| 2628.9 | 54.5 | 17.8 | 36.7 | H |
| 2718.1 | 54.09 | 17.9 | 36.19 | V |
| 2788.8 | 55.8 | 18.2 | 37.6 | H |
| 2844.5 | 54.75 | 18.3 | 36.45 | H |
| 2913.6 | 55.4 | 18.7 | 36.7 | V |

Ch39 1GHz-3GHz (Average)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 2628.9 | 42.46 | 17.8 | 24.66 | H |
| 2718.1 | 42.18 | 17.9 | 24.28 | V |
| 2788.8 | 42.86 | 18.2 | 24.66 | H |
| 2844.5 | 42.87 | 18.3 | 24.57 | H |
| 2913.6 | 43.27 | 18.7 | 24.57 | V |
| 2628.9 | 42.46 | 17.8 | 24.66 | H |

Ch39 3GHz-18GHz (Peak)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 13171.2 | 51.05 | 17.5 | 33.55 | H |
| 13689.0 | 53.67 | 18.4 | 35.27 | H |
| 14939.2 | 55.23 | 21.9 | 33.33 | H |
| 15593.0 | 57.85 | 24.6 | 33.25 | V |
| 16184.2 | 58.38 | 24.4 | 33.98 | H |
| 17017.4 | 60.38 | 28.1 | 32.28 | V |

Ch39 3GHz-18GHz (Average)

| Frequency(MHz) | Result(dBuV/m) | ARpl(dB) | PMea(dBuV/m) | Polarity |
|----------------|----------------|----------|--------------|----------|
| 14939.2 | 42.93 | 21.9 | 21.03 | H |
| 15593.0 | 45.1 | 24.6 | 20.5 | V |
| 16184.2 | 44.98 | 24.4 | 20.58 | H |
| 17017.4 | 48.47 | 28.1 | 20.37 | V |

Note: Only the worst case is written in the report.

ANNEX B. Accreditation Certificate



Accredited Laboratory

A2LA has accredited

EAST CHINA INSTITUTE OF TELECOMMUNICATIONS
Shanghai, People's Republic of China

for technical competence in the field of
Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-JAF Communiqué dated April 2017).



Presented this 6th day of May 2019.



Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3682.01
Valid to February 28, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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