



# FCC RF Test Report

APPLICANT : VINFAST TRADING AND PRODUCTION  
JOINT STOCK COMPANY

EQUIPMENT : MULTIMEDIA HEAD UNIT

BRAND NAME : VINFAST

MODEL NAME : VF-EC32U

FCC ID : 2A6HEVF-EC32U

STANDARD : 47 CFR Part 2, 22(H), 24(E), 27(L)

CLASSIFICATION : PCS Licensed Transmitter (PCB)

TEST DATE(S) : Sep. 01, 2023

We, Sporton International Inc. (Kunshan), would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.26-2015 and shown compliance with the applicable technical standards.

This product installed a RF module (Brand Name: Quectel, Model Name: AG35-NA, FCC ID: XMR201905AG35NA), during the test, only Conducted power, ERP/ EIRP and RSE test items are tested in this report, all the other test results are leveraged from module RF report.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia



**Sporton International Inc. (Kunshan)**

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China**



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## REVISION HISTORY

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FG362705A  | Rev. 01 | Initial issue of report | Nov. 10, 2023 |
|            |         |                         |               |
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|            |         |                         |               |

## SUMMARY OF TEST RESULT

| Report Section | FCC Rule                                         | Description                                   | Limit                  | Result      | Remark                                        |
|----------------|--------------------------------------------------|-----------------------------------------------|------------------------|-------------|-----------------------------------------------|
| 3.4            | §2.1046                                          | Conducted Output Power                        | -                      | Report Only | -                                             |
|                | §22.913(a)(5)                                    | Effective Radiated Power                      | < 7 Watts              | PASS        | -                                             |
|                | §24.232(c)                                       | Equivalent Isotropic Radiated Power           | < 2 Watts              | PASS        | -                                             |
|                | §27.50(d)(4)                                     | Equivalent Isotropic Radiated Power           | < 1 Watts              | PASS        | -                                             |
| 3.5            | §24.232(d)                                       | Peak-to-Average Ratio                         | < 13 dB                | PASS        | 1                                             |
| 3.6            | §2.1049                                          | Occupied Bandwidth                            | Reporting Only         | PASS        | 1                                             |
| 3.7            | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | Band Edge Measurement                         | < 43+10log10(P[Watts]) | PASS        | 1                                             |
| 3.8            | §2.1051<br>§22.917(a)<br>§24.238(a)<br>§27.53(h) | Conducted Emission                            | < 43+10log10(P[Watts]) | PASS        | 1                                             |
| 3.9            | §2.1055<br>§22.355                               | Frequency Stability for Temperature & Voltage | < 2.5 ppm for Part 22  | PASS        | 1                                             |
|                | §2.1055<br>§24.235<br>§27.54                     |                                               | Within Authorized Band |             |                                               |
| 4.4            | §2.1053; §22.917(a);<br>§24.238(a); §27.53(h)    | Field Strength of Spurious Radiation          | < 43+10log10(P[Watts]) | PASS        | Under limit<br>16.92 dB at<br>2512.000<br>MHz |

**Remark 1:** All test results were leveraged from module RF report which can refer to Report No. FG912203A.

### Conformity Assessment Condition:

- The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
- The measurement uncertainty please refer to each test result in the section "Measurement Uncertainty"

### Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.



# 1 General Description

## 1.1 Applicant

**VINFAST TRADING AND PRODUCTION JOINT STOCK COMPANY**

Dinh Vu - Cat Hai Economic Zone, Cat Hai Island, Cat Hai Town, Cat Hai District, Hai Phong City, Vietnam

## 1.2 Manufacturer

**VINFAST TRADING AND PRODUCTION JOINT STOCK COMPANY**

Dinh Vu - Cat Hai Economic Zone, Cat Hai Island, Cat Hai Town, Cat Hai District, Hai Phong City, Vietnam

## 1.3 Product Feature of Equipment Under Test

| Product Feature |                         |
|-----------------|-------------------------|
| Equipment       | MULTIMEDIA HEAD UNIT    |
| Brand Name      | VINFAST                 |
| Model Name      | VF-EC32U                |
| FCC ID          | 2A6HEVF-EC32U           |
| SN Code         | Radiation: 230530D00011 |
| HW Version      | EEP70005507             |
| SW Version      | SOW70005570             |
| EUT Stage       | Identical Prototype     |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

## 1.4 Product Specification of Equipment Under Test

| Standards-related Product Specification |                                                                                                                                                                                        |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Tx Frequency</b>                     | <b>GPRS/EDGE:</b><br>850: 824 MHz ~ 849 MHz<br>1900: 1850MHz ~ 1910MHz<br><b>WCDMA:</b><br>Band V: 824 MHz ~ 849 MHz<br>Band II: 1850 MHz ~ 1910 MHz<br>Band IV: 1710 MHz ~ 1755 MHz   |
| <b>Rx Frequency</b>                     | <b>GPRS/EDGE:</b><br>850: 869 MHz ~ 894 MHz<br>1900: 1930 MHz ~ 1990 MHz<br><b>WCDMA:</b><br>Band V: 869 MHz ~ 894 MHz<br>Band II: 1930 MHz ~ 1990 MHz<br>Band IV: 2110 MHz ~ 2155 MHz |
| <b>Maximum Output Power to Antenna</b>  | <b>GPRS/EDGE:</b><br>850: 31.98 dBm<br>1900: 29.04 dBm<br><b>WCDMA:</b><br>Band V: 22.82 dBm<br>Band II: 22.68 dBm<br>Band IV: 22.90 dBm                                               |
| <b>Antenna Type</b>                     | PCB Antenna                                                                                                                                                                            |
| <b>Antenna Gain</b>                     | Cellular Band: 0.7 dBi<br>PCS Band: 2.1 dBi<br>AWS Band: 3.5 dBi                                                                                                                       |
| <b>Type of Modulation</b>               | GPRS: GMSK<br>EDGE: GMSK / 8PSK<br>WCDMA: BPSK<br>HSPA: QPSK<br>HSPA+ : 16QAM<br>DC-HSDPA: 64QAM                                                                                       |

## 1.5 Modification of EUT

No modifications are made to the EUT during all test items.



## 1.6 Maximum ERP/EIRP Power, and Emission Designator

| FCC Rule | Frequency Band | Frequency Range (MHz) | Type of Modulation | Maximum ERP/EIRP (W) |
|----------|----------------|-----------------------|--------------------|----------------------|
| Part 22  | GSM850 (GPRS)  | 824.2 ~ 848.8         | GMSK               | 1.1298               |
| Part 22  | GSM850 (EDGE)  | 824.2 ~ 848.8         | 8PSK               | 0.3388               |
| Part 22  | WCDMA Band V   | 826.4 ~ 846.6         | BPSK               | 0.1371               |
| Part 24  | GSM1900 (GPRS) | 1850.2 ~ 1909.8       | GMSK               | 1.3002               |
| Part 24  | GSM1900 (EDGE) | 1850.2 ~ 1909.8       | 8PSK               | 0.5754               |
| Part 24  | WCDMA Band II  | 1852.4 ~ 1907.6       | BPSK               | 0.3006               |
| Part 27  | WCDMA Band IV  | 1712.4 ~ 1752.6       | BPSK               | 0.4365               |

## 1.7 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

|                    |                                                                                                                                                |                     |                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------------|
| Test Firm          | Sporton International Inc. (Kunshan)                                                                                                           |                     |                                |
| Test Site Location | No. 1098, Pengxi North Road, Kunshan Economic Development Zone<br>Jiangsu Province 215300 People's Republic of China<br>TEL : +86-512-57900158 |                     |                                |
| Test Site No.      | Sporton Site No.                                                                                                                               | FCC Designation No. | FCC Test Firm Registration No. |
|                    | 03CH04-KS                                                                                                                                      | CN1257              | 314309                         |

## 1.8 Test Software

| Item | Site      | Manufacturer | Name | Version |
|------|-----------|--------------|------|---------|
| 1.   | 03CH04-KS | AUDIX        | E3   | 210616  |

## 1.9 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ ANSI C63.26-2015
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

## 2 Test Configuration of Equipment Under Test

### 2.1 Test Mode

Antenna port conducted and radiated test items were performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

Radiated measurements were performed with rotating EUT in different three orthogonal test planes to find the maximum emission.(X-Plane)

Radiated emissions were investigated as following frequency range:

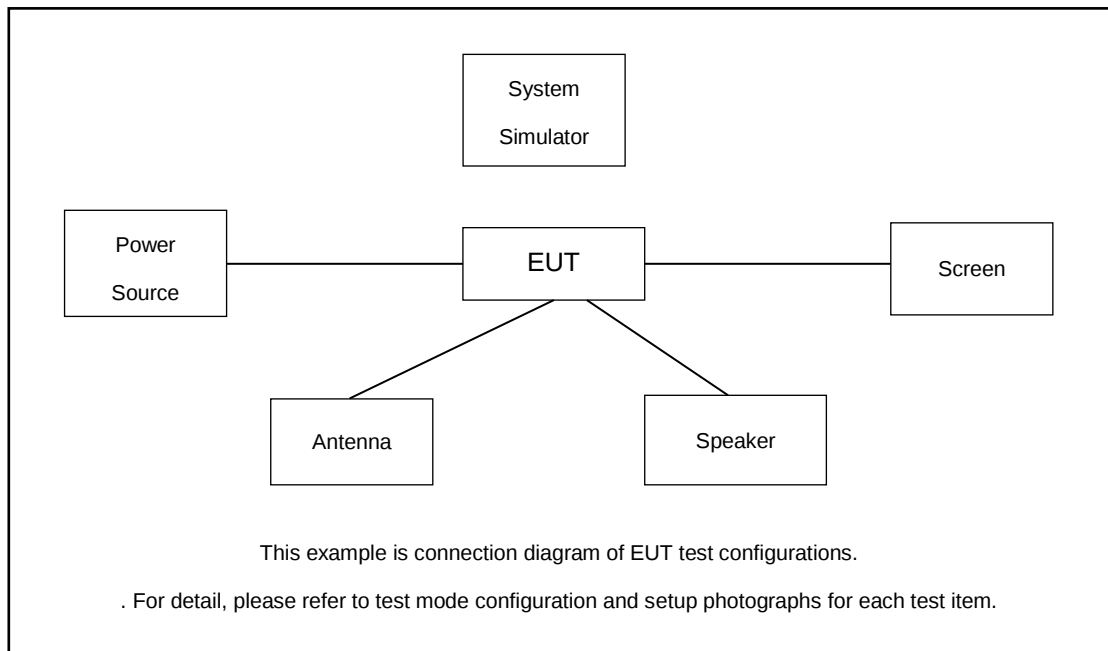
1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19100 MHz for GSM1900 and WCDMA Band II.

All modes and data rates and positions were investigated.

Test modes are chosen to be reported as the worst case configuration below:

| Test Modes    |                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------|
| Band          | Radiated TCs                                                                                             |
| GSM 850       | <ul style="list-style-type: none"> <li>■ GPRS 1 Tx slots Link</li> <li>■ EDGE 1 Tx slots Link</li> </ul> |
| GSM 1900      | <ul style="list-style-type: none"> <li>■ GPRS 1 Tx slots Link</li> <li>■ EDGE 1 Tx slots Link</li> </ul> |
| WCDMA Band V  | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps Link</li> </ul>                                    |
| WCDMA Band II | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps Link</li> </ul>                                    |
| WCDMA Band IV | <ul style="list-style-type: none"> <li>■ RMC 12.2Kbps Link</li> </ul>                                    |

## 2.2 Connection Diagram of Test System



The EUT has been configuration operated in a manner tended to maximize its emission characteristics in a typical application.

## 2.3 Support Unit used in test configuration

| Item | Equipment        | Trade Name | Model No.   | FCC ID | Data Cable | Power Cord        |
|------|------------------|------------|-------------|--------|------------|-------------------|
| 1.   | System Simulator | Anritsu    | MT8820/8821 | N/A    | N/A        | Unshielded, 1.8 m |
| 2.   | DC Power         | GWINSTEK   | PLR36-10    | N/A    | N/A        | Unshielded,1.8m   |
| 3.   | Antenna          | N/A        | N/A         | N/A    | N/A        | N/A               |
| 4.   | Speaker          | N/A        | N/A         | N/A    | N/A        | N/A               |
| 5.   | Screen           | N/A        | N/A         | N/A    | N/A        | N/A               |

## 2.4 Frequency List of Low/Middle/High Channels

| Frequency List   |                        |        |        |         |
|------------------|------------------------|--------|--------|---------|
| Band             | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| GSM850           | Channel                | 128    | 189    | 251     |
|                  | Frequency              | 824.2  | 836.4  | 848.8   |
| WCDMA<br>Band V  | Channel                | 4132   | 4182   | 4233    |
|                  | Frequency              | 826.4  | 836.4  | 846.6   |
| GSM1900          | Channel                | 512    | 661    | 810     |
|                  | Frequency              | 1850.2 | 1880.0 | 1909.8  |
| WCDMA<br>Band II | Channel                | 9262   | 9400   | 9538    |
|                  | Frequency              | 1852.4 | 1880.0 | 1907.6  |
| WCDMA<br>Band IV | Channel                | 1312   | 1413   | 1513    |
|                  | Frequency              | 1712.4 | 1732.6 | 1752.6  |

### 3 Conducted Test Result

#### 3.1 Conducted Output Power and ERP/EIRP

##### 3.1.1 Description of the Conducted Output Power and ERP/EIRP

A system simulator was used to establish communication with the EUT. Its parameters were set to enforce EUT transmitting at the maximum power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 7 Watts for GSM850 and WCDMA Band V.

The EIRP of mobile transmitters must not exceed 2 Watts for GSM1900 and WCDMA Band II.

The EIRP of mobile transmitters must not exceed 1 Watts for WCDMA Band IV.

According to KDB 412172 D01 Power Approach,

$EIRP = P_T + G_T - L_C$ ,  $ERP = EIRP - 2.15$ , where

$P_T$  = transmitter output power in dBm

$G_T$  = gain of the transmitting antenna in dBi

$L_C$  = signal attenuation in the connecting cable between the transmitter and antenna in dB

##### 3.1.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.2
2. The transmitter output port was connected to the system simulator.
3. Set EUT at maximum power through the system simulator.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure and record the power level from the system simulator.

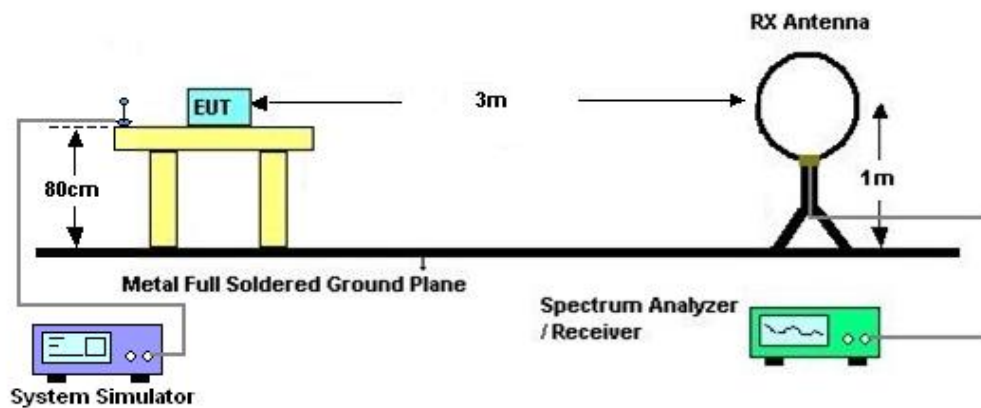
## 4 Radiated Test Items

### 4.1 Measuring Instruments

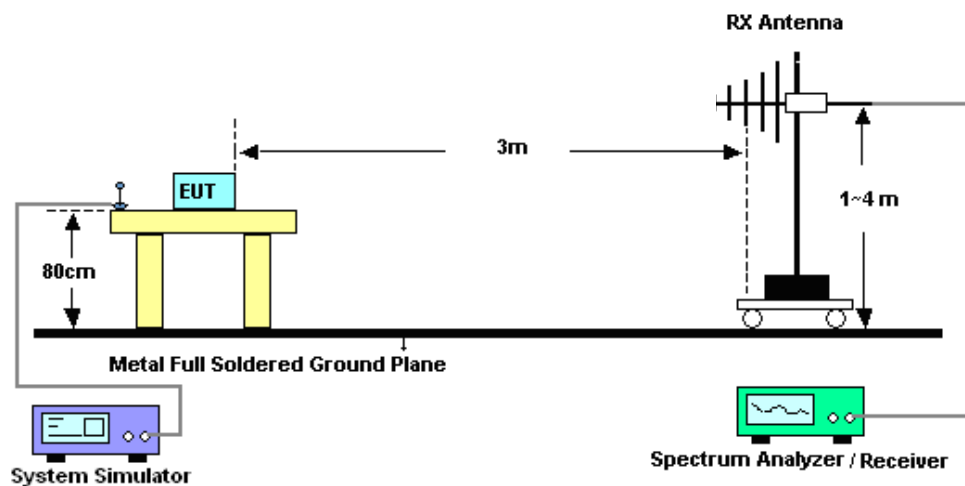
See list of measuring instruments of this test report.

### 4.2 Test Setup

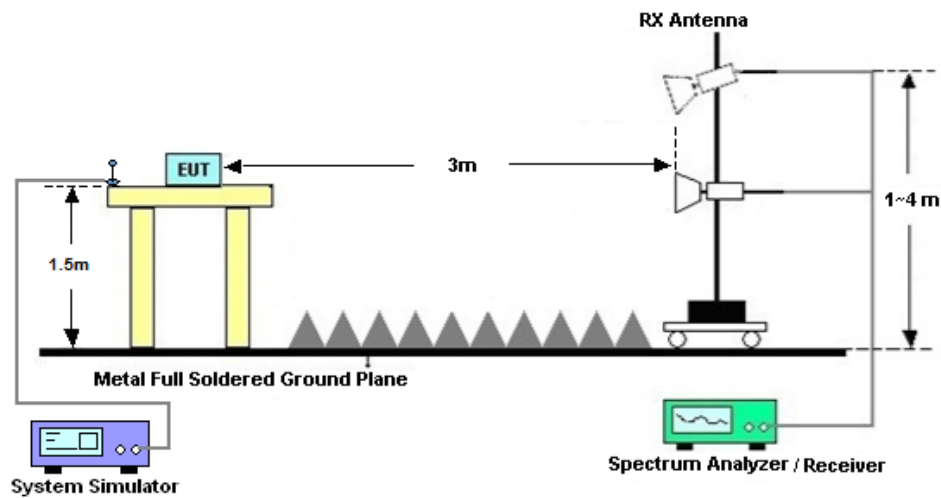
#### 4.2.1 For radiated test below 30MHz



#### 4.2.2 For radiated test from 30MHz to 1GHz



#### 4.2.3 For radiated test above 1GHz



#### 4.3 Test Result of Radiated Test

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

Please refer to Appendix B.

## 4.4 Field Strength of Spurious Radiation Measurement

### 4.4.1 Description of Field Strength of Spurious Radiated Measurement

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least  $43 + 10 \log (P)$  dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 4.4.2 Test Procedures

1. The testing follows ANSI C63.26 Section 5.5
2. The EUT was placed on a rotatable wooden table 0.8 meters for frequency below 1GHz and 1.5 meter for frequency above 1GHz above the ground.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
4. The table was rotated 360 degrees to determine the position of the highest spurious emission.
5. The height of the receiving antenna is varied between one meter and four meters to search for the maximum spurious emission for both horizontal and vertical polarizations.
6. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking record of maximum spurious emission.
7. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
8. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
9. Taking the record of output power at antenna port.
10. Repeat step 7 to step 8 for another polarization.
11.  $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
12.  $ERP \text{ (dBm)} = EIRP - 2.15$
13. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
14. The limit line is derived from  $43 + 10\log(P)$  dB below the transmitter power P(Watts)



## 5 List of Measuring Equipment

| Instrument            | Manufacturer | Model No.   | Serial No. | Characteristics   | Calibration Date | Test Date     | Due Date      | Remark                |
|-----------------------|--------------|-------------|------------|-------------------|------------------|---------------|---------------|-----------------------|
| EXA Spectrum Analyzer | Keysight     | N9010B      | MY57471079 | 10Hz-44G,MAX 30dB | Oct. 12, 2022    | Sep. 01, 2023 | Oct. 11, 2023 | Radiation (03CH04-KS) |
| Loop Antenna          | R&S          | HFH2-Z2E    | 101125     | 9kHz~30MHz        | Sep. 22, 2022    | Sep. 01, 2023 | Sep. 21, 2023 | Radiation (03CH04-KS) |
| Bilog Antenna         | TeseQ        | CBL6111D    | 49922      | 30MHz-1GHz        | Apr. 09, 2023    | Sep. 01, 2023 | Apr. 08, 2024 | Radiation (03CH04-KS) |
| Horn Antenna          | Schwarzbeck  | BBHA9120D   | 1284       | 1GHz~18GHz        | Oct. 16, 2022    | Sep. 01, 2023 | Oct. 15, 2023 | Radiation (03CH04-KS) |
| SHF-EHF Horn          | Com-power    | AH-840      | 101070     | 18GHz~40GHz       | Jan. 08, 2023    | Sep. 01, 2023 | Jan. 07, 2024 | Radiation (03CH04-KS) |
| Amplifier             | SONOMA       | 310N        | 380827     | 9KHz-1GHz         | Jul. 06, 2023    | Sep. 01, 2023 | Jul. 05, 2024 | Radiation (03CH04-KS) |
| Amplifier             | MITEQ        | EM18G40G GA | 060728     | 18~40GHz          | Jan. 05, 2023    | Sep. 01, 2023 | Jan. 04, 2024 | Radiation (03CH04-KS) |
| high gain Amplifier   | EM           | EM01G18G A  | 060840     | 1Ghz-18Ghz        | Oct. 12, 2022    | Sep. 01, 2023 | Oct. 11, 2023 | Radiation (03CH04-KS) |
| Amplifier             | Agilent      | 8449B       | 3008A02370 | 1Ghz-18Ghz        | Oct. 12, 2022    | Sep. 01, 2023 | Oct. 11, 2023 | Radiation (03CH04-KS) |
| AC Power Source       | Chroma       | 61601       | F104090004 | N/A               | NCR              | Sep. 01, 2023 | NCR           | Radiation (03CH04-KS) |
| Turn Table            | ChamPro      | EM 1000-T   | 060762-T   | 0~360 degree      | NCR              | Sep. 01, 2023 | NCR           | Radiation (03CH04-KS) |
| Antenna Mast          | ChamPro      | EM 1000-A   | 060762-A   | 1 m~4 m           | NCR              | Sep. 01, 2023 | NCR           | Radiation (03CH04-KS) |

NCR: No Calibration Required

## 6 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.26-2015. All the measurement uncertainty value were shown with a coverage  $K=2$  to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

|                                                                         |         |
|-------------------------------------------------------------------------|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.82 dB |
|-------------------------------------------------------------------------|---------|

### Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

|                                                                         |         |
|-------------------------------------------------------------------------|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.56 dB |
|-------------------------------------------------------------------------|---------|

### Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

|                                                                         |         |
|-------------------------------------------------------------------------|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ ) | 3.54 dB |
|-------------------------------------------------------------------------|---------|

----- THE END -----



## Appendix A. Test Results of Conducted Test

|                 |            |                     |         |
|-----------------|------------|---------------------|---------|
| Test Engineer : | Simle Wang | Temperature :       | 22~23°C |
|                 |            | Relative Humidity : | 40~42%  |

### Conducted Output Power(Average power) and ERP/EIRP

| GSM850          | Burst Average Power (dBm) |       |       | ERP(W) |        |        |
|-----------------|---------------------------|-------|-------|--------|--------|--------|
| TX Channel      | 128                       | 189   | 251   | L      | M      | H      |
| Frequency (MHz) | 824.2                     | 836.4 | 848.8 |        |        |        |
| GPRS 1 Tx slot  | 31.95                     | 31.94 | 31.98 | 1.1220 | 1.1194 | 1.1298 |
| GPRS 2 Tx slots | 28.56                     | 28.64 | 28.61 | 0.5140 | 0.5236 | 0.5200 |
| GPRS 3 Tx slots | 27.28                     | 27.27 | 27.41 | 0.3828 | 0.3819 | 0.3945 |
| GPRS 4 Tx slots | 25.53                     | 25.62 | 25.61 | 0.2559 | 0.2612 | 0.2606 |
| EDGE 1 Tx slot  | 26.58                     | 26.75 | 26.62 | 0.3258 | 0.3388 | 0.3289 |
| EDGE 2 Tx slots | 22.73                     | 22.90 | 22.88 | 0.1343 | 0.1396 | 0.1390 |
| EDGE 3 Tx slots | 21.62                     | 21.71 | 21.77 | 0.1040 | 0.1062 | 0.1076 |
| EDGE 4 Tx slots | 19.65                     | 19.73 | 19.65 | 0.0661 | 0.0673 | 0.0661 |

| GSM1900         | Burst Average Power (dBm) |       |        | EIRP(W) |        |        |
|-----------------|---------------------------|-------|--------|---------|--------|--------|
| TX Channel      | 512                       | 661   | 810    | L       | M      | H      |
| Frequency (MHz) | 1850.2                    | 1880  | 1909.8 |         |        |        |
| GPRS 1 Tx slot  | 28.85                     | 29.01 | 29.04  | 1.2445  | 1.2912 | 1.3002 |
| GPRS 2 Tx slots | 26.40                     | 26.64 | 26.79  | 0.7079  | 0.7482 | 0.7745 |
| GPRS 3 Tx slots | 24.52                     | 24.75 | 24.94  | 0.4592  | 0.4842 | 0.5058 |
| GPRS 4 Tx slots | 22.62                     | 22.82 | 22.98  | 0.2965  | 0.3105 | 0.3221 |
| EDGE 1 Tx slot  | 25.39                     | 25.50 | 25.48  | 0.5610  | 0.5754 | 0.5728 |
| EDGE 2 Tx slots | 22.57                     | 22.83 | 22.87  | 0.2931  | 0.3112 | 0.3141 |
| EDGE 3 Tx slots | 21.61                     | 21.70 | 21.73  | 0.2350  | 0.2399 | 0.2415 |
| EDGE 4 Tx slots | 19.42                     | 19.53 | 19.64  | 0.1419  | 0.1455 | 0.1493 |



| Band                    | WCDMA V |       |       | ERP(W) |        |        |
|-------------------------|---------|-------|-------|--------|--------|--------|
| TX Channel              | 4132    | 4182  | 4233  |        |        |        |
| Rx Channel              | 4357    | 4407  | 4458  |        |        |        |
| Frequency (MHz)         | 826.4   | 836.4 | 846.6 | L      | M      | H      |
| RMC 12.2Kbps            | 22.78   | 22.82 | 22.79 | 0.1358 | 0.1371 | 0.1361 |
| HSDPA Subtest-1         | 21.79   | 21.77 | 21.74 | 0.1081 | 0.1076 | 0.1069 |
| HSDPA Subtest-2         | 21.88   | 21.99 | 22.04 | 0.1104 | 0.1132 | 0.1146 |
| HSDPA Subtest-3         | 20.82   | 20.76 | 20.91 | 0.0865 | 0.0853 | 0.0883 |
| HSDPA Subtest-4         | 20.89   | 20.80 | 20.91 | 0.0879 | 0.0861 | 0.0883 |
| HSUPA Subtest-1         | 20.96   | 21.04 | 21.11 | 0.0893 | 0.0910 | 0.0925 |
| HSUPA Subtest-2         | 19.32   | 19.37 | 19.29 | 0.0612 | 0.0619 | 0.0608 |
| HSUPA Subtest-3         | 20.27   | 20.32 | 20.42 | 0.0762 | 0.0771 | 0.0789 |
| HSUPA Subtest-4         | 19.36   | 19.32 | 19.53 | 0.0618 | 0.0612 | 0.0643 |
| HSUPA Subtest-5         | 21.25   | 21.22 | 21.40 | 0.0955 | 0.0948 | 0.0989 |
| HSPA+ (16QAM) Subtest-1 | 18.83   | 18.94 | 18.75 | 0.0547 | 0.0561 | 0.0537 |

| Band                    | WCDMA IV |        |        | EIRP(W) |        |        |
|-------------------------|----------|--------|--------|---------|--------|--------|
| TX Channel              | 1312     | 1413   | 1513   |         |        |        |
| Rx Channel              | 1537     | 1638   | 1738   |         |        |        |
| Frequency (MHz)         | 1712.4   | 1732.6 | 1752.6 | L       | M      | H      |
| RMC 12.2Kbps            | 22.49    | 22.90  | 22.87  | 0.3972  | 0.4365 | 0.4335 |
| HSDPA Subtest-1         | 21.48    | 21.72  | 21.82  | 0.3148  | 0.3327 | 0.3404 |
| HSDPA Subtest-2         | 21.58    | 21.90  | 22.02  | 0.3221  | 0.3467 | 0.3565 |
| HSDPA Subtest-3         | 21.04    | 21.28  | 21.36  | 0.2844  | 0.3006 | 0.3062 |
| HSDPA Subtest-4         | 20.82    | 21.28  | 21.38  | 0.2704  | 0.3006 | 0.3076 |
| HSUPA Subtest-1         | 21.30    | 21.62  | 21.75  | 0.3020  | 0.3251 | 0.3350 |
| HSUPA Subtest-2         | 19.44    | 19.81  | 19.78  | 0.1968  | 0.2143 | 0.2128 |
| HSUPA Subtest-3         | 20.50    | 20.63  | 20.84  | 0.2512  | 0.2588 | 0.2716 |
| HSUPA Subtest-4         | 19.46    | 19.82  | 19.88  | 0.1977  | 0.2148 | 0.2178 |
| HSUPA Subtest-5         | 21.35    | 21.61  | 21.74  | 0.3055  | 0.3243 | 0.3342 |
| HSPA+ (16QAM) Subtest-1 | 19.06    | 19.52  | 19.53  | 0.1803  | 0.2004 | 0.2009 |



| Band                    | WCDMA II |       |        | EIRP(W) |        |        |
|-------------------------|----------|-------|--------|---------|--------|--------|
| TX Channel              | 9262     | 9400  | 9538   |         |        |        |
| Rx Channel              | 9662     | 9800  | 9938   |         |        |        |
| Frequency (MHz)         | 1852.4   | 1880  | 1907.6 | L       | M      | H      |
| RMC 12.2Kbps            | 22.68    | 22.45 | 22.48  | 0.3006  | 0.2851 | 0.2871 |
| HSDPA Subtest-1         | 21.59    | 21.39 | 21.35  | 0.2339  | 0.2234 | 0.2213 |
| HSDPA Subtest-2         | 21.59    | 21.41 | 21.50  | 0.2339  | 0.2244 | 0.2291 |
| HSDPA Subtest-3         | 21.20    | 20.89 | 20.94  | 0.2138  | 0.1991 | 0.2014 |
| HSDPA Subtest-4         | 21.15    | 20.87 | 20.85  | 0.2113  | 0.1982 | 0.1972 |
| HSUPA Subtest-1         | 21.58    | 21.34 | 21.50  | 0.2333  | 0.2208 | 0.2291 |
| HSUPA Subtest-2         | 19.64    | 19.40 | 19.57  | 0.1493  | 0.1413 | 0.1469 |
| HSUPA Subtest-3         | 20.66    | 20.35 | 20.48  | 0.1888  | 0.1758 | 0.1811 |
| HSUPA Subtest-4         | 19.59    | 19.44 | 19.43  | 0.1476  | 0.1426 | 0.1422 |
| HSUPA Subtest-5         | 21.43    | 21.33 | 21.32  | 0.2254  | 0.2203 | 0.2198 |
| HSPA+ (16QAM) Subtest-1 | 19.07    | 18.97 | 18.96  | 0.1309  | 0.1279 | 0.1276 |



## Appendix B. Test Results of Radiated Test

### Radiated Spurious Emission

|                 |         |                     |         |
|-----------------|---------|---------------------|---------|
| Test Engineer : | Carl Ni | Temperature :       | 23~25°C |
|                 |         | Relative Humidity : | 41~42%  |

| GSM850 (GPRS 1 Tx slots) |                   |             |               |                   |                    |                      |                       |                    |
|--------------------------|-------------------|-------------|---------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                  | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                   | 1672              | -58.70      | -13           | -45.70            | -65.67             | 1.58                 | 10.70                 | H                  |
|                          | 2512              | -33.20      | -13           | -20.20            | -41.45             | 2.10                 | 12.50                 | H                  |
|                          | 3344              | -60.01      | -13           | -47.01            | -68.90             | 2.86                 | 13.90                 | H                  |
|                          | 4184              | -44.84      | -13           | -31.84            | -52.43             | 3.41                 | 13.15                 | H                  |
|                          | 1672              | -52.09      | -13           | -39.09            | -59.06             | 1.58                 | 10.70                 | V                  |
|                          | 2512              | -30.92      | -13           | -17.92            | -39.17             | 2.10                 | 12.50                 | V                  |
|                          | 3344              | -58.22      | -13           | -45.22            | -67.11             | 2.86                 | 13.90                 | V                  |
|                          | 4184              | -47.56      | -13           | -34.56            | -55.15             | 3.41                 | 13.15                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

| GSM850 (EDGE 1 Tx slots) |                   |             |               |                   |                    |                      |                       |                    |
|--------------------------|-------------------|-------------|---------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                  | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                   | 1672              | -55.15      | -13           | -42.15            | -62.12             | 1.58                 | 10.70                 | H                  |
|                          | 2512              | -35.12      | -13           | -22.12            | -43.37             | 2.102                | 12.50                 | H                  |
|                          | 3344              | -61.31      | -13           | -48.31            | -70.20             | 2.856                | 13.90                 | H                  |
|                          | 4184              | -62.43      | -13           | -49.43            | -70.02             | 3.406                | 13.15                 | H                  |
|                          | 1672              | -52.33      | -13           | -39.33            | -59.30             | 1.58                 | 10.70                 | V                  |
|                          | 2512              | -29.92      | -13           | -16.92            | -38.17             | 2.10                 | 12.50                 | V                  |
|                          | 3344              | -56.52      | -13           | -43.52            | -65.41             | 2.86                 | 13.90                 | V                  |
|                          | 4184              | -59.42      | -13           | -46.42            | -67.01             | 3.41                 | 13.15                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



| GSM1900 (GPRS 1 Tx slots) |                   |              |               |                   |                    |                      |                       |                    |
|---------------------------|-------------------|--------------|---------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                   | Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                    | 3765              | -57.56       | -13           | -44.56            | -69.82             | 2.64                 | 14.90                 | H                  |
|                           | 5640              | -55.46       | -13           | -42.46            | -67.32             | 2.94                 | 14.80                 | H                  |
|                           | 7515              | -52.86       | -13           | -39.86            | -62.63             | 3.39                 | 13.16                 | H                  |
|                           | 3765              | -57.38       | -13           | -44.38            | -69.64             | 2.64                 | 14.90                 | V                  |
|                           | 5640              | -56.30       | -13           | -43.30            | -68.16             | 2.94                 | 14.80                 | V                  |
|                           | 7515              | -53.09       | -13           | -40.09            | -62.86             | 3.39                 | 13.16                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

| GSM1900 (EDGE 1 Tx slots) |                   |              |               |                   |                    |                      |                       |                    |
|---------------------------|-------------------|--------------|---------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                   | Frequency ( MHz ) | EIRP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                    | 3765              | -58.00       | -13           | -45.00            | -70.26             | 2.64                 | 14.90                 | H                  |
|                           | 5640              | -55.73       | -13           | -42.73            | -67.59             | 2.94                 | 14.80                 | H                  |
|                           | 7515              | -53.15       | -13           | -40.15            | -62.92             | 3.39                 | 13.16                 | H                  |
|                           | 3765              | -57.93       | -13           | -44.93            | -70.19             | 2.64                 | 14.90                 | V                  |
|                           | 5640              | -56.44       | -13           | -43.44            | -68.30             | 2.94                 | 14.80                 | V                  |
|                           | 7515              | -53.04       | -13           | -40.04            | -62.81             | 3.39                 | 13.16                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

| WCDMA Band V(RMC 12.2Kbps) |                   |             |               |                   |                    |                      |                       |                    |
|----------------------------|-------------------|-------------|---------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel                    | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle                     | 1672              | -64.83      | -13           | -51.83            | -71.80             | 1.58                 | 10.70                 | H                  |
|                            | 2512              | -60.03      | -13           | -47.03            | -68.28             | 2.102                | 12.50                 | H                  |
|                            | 3344              | -61.53      | -13           | -48.53            | -70.42             | 2.856                | 13.90                 | H                  |
|                            | 1672              | -63.91      | -13           | -50.91            | -70.88             | 1.58                 | 10.70                 | V                  |
|                            | 2512              | -59.64      | -13           | -46.64            | -67.89             | 2.10                 | 12.50                 | V                  |
|                            | 3344              | -61.55      | -13           | -48.55            | -70.44             | 2.86                 | 13.90                 | V                  |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.



| WCDMA Band II(RMC 12.2Kbps) |                      |                 |                  |                         |                          |                            |                             |                       |
|-----------------------------|----------------------|-----------------|------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                     | Frequency<br>( MHz ) | EIRP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Middle                      | 3765                 | -57.81          | -13              | -44.81                  | -70.07                   | 2.64                       | 14.90                       | H                     |
|                             | 5640                 | -55.07          | -13              | -42.07                  | -66.93                   | 2.94                       | 14.80                       | H                     |
|                             | 7515                 | -52.96          | -13              | -39.96                  | -62.73                   | 3.39                       | 13.16                       | H                     |
|                             | 3765                 | -56.82          | -13              | -43.82                  | -69.08                   | 2.64                       | 14.90                       | V                     |
|                             | 5640                 | -55.67          | -13              | -42.67                  | -67.53                   | 2.94                       | 14.80                       | V                     |
|                             | 7515                 | -52.64          | -13              | -39.64                  | -62.41                   | 3.39                       | 13.16                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

| WCDMA Band IV(RMC 12.2Kbps) |                      |                 |                  |                         |                          |                            |                             |                       |
|-----------------------------|----------------------|-----------------|------------------|-------------------------|--------------------------|----------------------------|-----------------------------|-----------------------|
| Channel                     | Frequency<br>( MHz ) | EIRP<br>( dBm ) | Limit<br>( dBm ) | Over<br>Limit<br>( dB ) | S.G.<br>Power<br>( dBm ) | TX Cable<br>loss<br>( dB ) | TX Antenna<br>Gain<br>(dBi) | Polarization<br>(H/V) |
| Middle                      | 3465                 | -57.56          | -13              | -44.56                  | -68.30                   | 2.604                      | 13.34                       | H                     |
|                             | 5190                 | -46.09          | -13              | -33.09                  | -56.60                   | 3.011                      | 13.52                       | H                     |
|                             | 6930                 | -54.40          | -13              | -41.40                  | -64.60                   | 3.271                      | 13.47                       | H                     |
|                             | 3465                 | -56.34          | -13              | -43.34                  | -67.08                   | 2.604                      | 13.34                       | V                     |
|                             | 5190                 | -51.80          | -13              | -38.80                  | -62.31                   | 3.011                      | 13.52                       | V                     |
|                             | 6930                 | -54.63          | -13              | -41.63                  | -64.83                   | 3.271                      | 13.47                       | V                     |

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.