



FCC RADIO TEST REPORT

FCC ID : 2AJN7-TP00128B
Equipment : Notebook Computer
Brand Name : Lenovo
Model Name : TP00128B
Applicant : LC Future Center Limited Taiwan Branch
7F., No.780, Beian Rd., Zhongshan Dist., Taipei 104, Taiwan
Manufacturer : LCFC (HeFei) Electronics Technology Co., Ltd.
No. 3188-1, Yungu Road (Hefei Export Processing Zone), Hefei
Economics & Technology Development Area, Anhui, CHINA
Standard : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)

Equipment: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

The product was received on Sep. 06, 2021 and testing was performed from Oct. 12, 2021 to Jan. 10, 2022. We, Sporton International Inc. Wensan Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.

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

Louis Wu

Approved by: Louis Wu

Sporton International Inc. Wensan Laboratory



Table of Contents

| | |
|--|-----------|
| History of this test report..... | 3 |
| Summary of Test Result..... | 4 |
| 1 General Description | 6 |
| 1.1 Product Feature of Equipment Under Test | 6 |
| 1.2 Product Specification of Equipment Under Test | 7 |
| 1.3 Modification of EUT | 7 |
| 1.4 Testing Location | 8 |
| 1.5 Applicable Standards | 8 |
| 2 Test Configuration of Equipment Under Test | 9 |
| 2.1 Test Mode..... | 9 |
| 2.2 Connection Diagram of Test System | 10 |
| 2.3 Support Unit used in test configuration | 10 |
| 2.4 Frequency List of Low/Middle/High Channels..... | 10 |
| 3 Conducted Test Result | 11 |
| 3.1 Measuring Instruments..... | 11 |
| 3.2 Conducted Output Power and ERP/EIRP | 12 |
| 4 Radiated Test Items | 13 |
| 4.1 Measuring Instruments..... | 13 |
| 4.2 Test Setup | 13 |
| 4.3 Test Result of Radiated Test..... | 14 |
| 4.4 Field Strength of Spurious Radiation Measurement | 15 |
| 5 List of Measuring Equipment..... | 16 |
| 6 Uncertainty of Evaluation | 18 |
| Appendix A. Test Results of Conducted Test | |
| Appendix B. Test Results of Radiated Test | |
| Appendix C. Test Setup Photographs | |



History of this test report

| Report No. | Version | Description | Issued Date |
|------------|---------|-------------------------|---------------|
| FG190605A | 01 | Initial issue of report | Jan. 25, 2022 |
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Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) | Remark |
|---------------|---|---|--------------------|--------------------------------------|
| 3.2 | §2.1046 | Conducted Output Power | Pass | - |
| | §22.913 (a)(5) | Effective Radiated Power (WCDMA Band V) | | |
| | §24.232 (c) | Equivalent Isotropic Radiated Power (WCDMA Band II) | | |
| | §27.50 (d)(4) | Equivalent Isotropic Radiated Power (WCDMA Band IV) | | |
| - | §24.232 (d) | Peak-to-Average Ratio | - | See Note |
| - | §2.1049 §22.917 (b) §24.238 (b) §27.53 (g) | Occupied Bandwidth (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV) | - | See Note |
| - | §2.1051 §22.917 (a) §24.238 (a) §27.53 (g) | Band Edge Measurement (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV) | - | See Note |
| - | §2.1051 §22.917 (a) §24.238 (a) §27.53 (g) | Conducted Emission (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV) | - | See Note |
| - | §2.1055 §22.355 §24.235 §27.54 | Frequency Stability Temperature & Voltage | - | See Note |
| 4.4 | §2.1053 §22.917 (a) §24.238 (a) §27.53 (h) | Field Strength of Spurious Radiation (WCDMA Band V) (WCDMA Band II) (WCDMA Band IV) | Pass | Under limit 27.69 dB at 5198.000 MHz |

Note:

1. The certified module (model: FM350-GL) which supports normal mode and TX switching mode being integrated into a notebook computer. Spot check on both modes were performed and no degradation occur. Thus the module test results were leveraged in this report and additionally reporting the spot check results in this report.
2. In normal mode, Conducted power was verified to be consistent with the original modular approval, so the output power level in the original modular grant is referenced in this report for determining ERP/EIRP of this host product, and verified the TX switching mode of Radiated Spurious Emission and Conducted power.



Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sheng Kuo

Report Producer: Ruby Zou

1 General Description

1.1 Product Feature of Equipment Under Test

| Product Feature | |
|---------------------------------|---------------------------|
| Equipment | Notebook Computer |
| Brand Name | Lenovo |
| Model Name | TP00128B |
| FCC ID | 2AJN7-TP00128B |
| Sample 1 | EUT with Amphenol Antenna |
| Sample 2 | EUT with JYT/NVC Antenna |
| EUT supports Radios application | WCDMA/HSPA/LTE/5G NR/GNSS |
| EUT Stage | Production Unit |

Remark:

1. The above EUT's information was declared by manufacturer.
2. Equipment: Fibocom FM350-GL tested inside of Lenovo Notebook Computer.

| | Normal mode | TX switching mode |
|---------------|---|--|
| | TX/RX | TX/RX |
| Ant_0 (Main) | WCDMA : 2/4/5 LTE : 2/4/5/7/12/13/14/17/25/26/30/38/66/71 NR : 2/5/7/25/30/38/66/71 | WCDMA : 5 LTE : 5/12/13/14/17/26/41/48/71 NR : 5/41/71/77/78 |
| Ant_2 (MIMO2) | LTE : 41/48 NR : 41/77/78 | WCDMA : 2/4 LTE : 2/4/7/25/30/38/66 NR : 2/7/25/30/38/66 |

| WWAN Antenna Information | | | | |
|--------------------------|--------------|-----------------|-----------------|---|
| Main Antenna | Manufacturer | Amphenol | Peak gain (dBi) | WCDMA Band II: 0.50 WCDMA Band IV: 0.95 WCDMA Band V: -0.43 |
| | Part number | TKC114-16-000-C | Type | PIFA |
| | Manufacturer | JYT/NVC | Peak gain (dBi) | WCDMA Band II: -1.83 WCDMA Band IV: -1.18 WCDMA Band V: -2.02 |
| | Part number | JYAAE0154HR | Type | PIFA |
| MIMO 2 Antenna | Manufacturer | Amphenol | Peak gain (dBi) | WCDMA Band II: 0.60 WCDMA Band IV: 1.00 |
| | Part number | TKC113-16-000-C | Type | PIFA |
| | Manufacturer | JYT/NVC | Peak gain (dBi) | WCDMA Band II: -1.31 WCDMA Band IV: -3.23 |
| | Part number | JYAAE0155HR | Type | PIFA |

Remark: The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

1.2 Product Specification of Equipment Under Test

| Product Specification is subject to this standard | |
|---|--|
| Tx Frequency | WCDMA: Band V: 826.4 MHz ~ 846.6 MHz Band II: 1852.4 MHz ~ 1907.6 MHz Band IV: 1712.4 MHz ~ 1752.6 MHz |
| Rx Frequency | WCDMA: Band V: 871.4 MHz ~ 891.6 MHz Band II: 1932.4 MHz ~ 1987.6 MHz Band IV: 2112.4 MHz ~ 2152.6 MHz |
| Maximum Output Power to Antenna | <Main Antenna> WCDMA: Band V: 23.60 dBm Band II: 23.46 dBm Band IV: 23.45 dBm |
| | <MIMO 2 Antenna> WCDMA: Band II: 23.83 dBm Band IV: 23.87 dBm |
| Type of Modulation | WCDMA: BPSK (Uplink) HSDPA: 64QAM (Downlink) HSUPA: QPSK (Uplink) |

1.3 Modification of EUT

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



1.4 Testing Location

| | |
|-----------------------|--|
| Test Site | Sporton International Inc. EMC & Wireless Communications Laboratory |
| Test Site Location | No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333 |
| Test Site No. | Sporton Site No. |
| | TH03-HY (TAF Code: 1190) |
| Test Engineer | Benjamin Lin |
| Temperature (°C) | 23.5~25 |
| Relative Humidity (%) | 49.4~52 |
| Remark | The Conducted test item subcontracted to Sporton International Inc. EMC & Wireless Communications Laboratory |

| | |
|-----------------------|--|
| Test Site | Sporton International Inc. Wensan Laboratory |
| Test Site Location | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010 |
| Test Site No. | Sporton Site No. |
| | 03CH12-HY |
| Test Engineer | Jack Cheng, Lance Chiang and Chuan Chu |
| Temperature (°C) | 21.6~26.2 |
| Relative Humidity (%) | 56~68 |

Note: The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190 and TW3786

1.5 Applicable Standards

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

- ♦ ANSI C63.26-2015
- ♦ ANSI / TIA-603-E
- ♦ FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
- ♦ FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01r01
- ♦ FCC KDB 414788 D01 Radiated Test Site v01r01

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. The TAF code is not including all the FCC KDB listed without accreditation.



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.

For radiated measurement, the measured emission level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in Tablet Type (three orthogonal axis (X: flat, Y: portrait, Z: landscape)) and Notebook Type, adjusting the measurement antenna orientation, following C63.26 exploratory test procedures and find (<Ant. Main>: Y Plane without accessory for Cellular Band and AWS Band; Y Plane with accessory for PCS Band; <Ant. MIMO2>: Y Plane with accessory for PCS Band; Z Plane without accessory for AWS Band) as worst plane.

Radiated emissions were investigated as following frequency range:

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

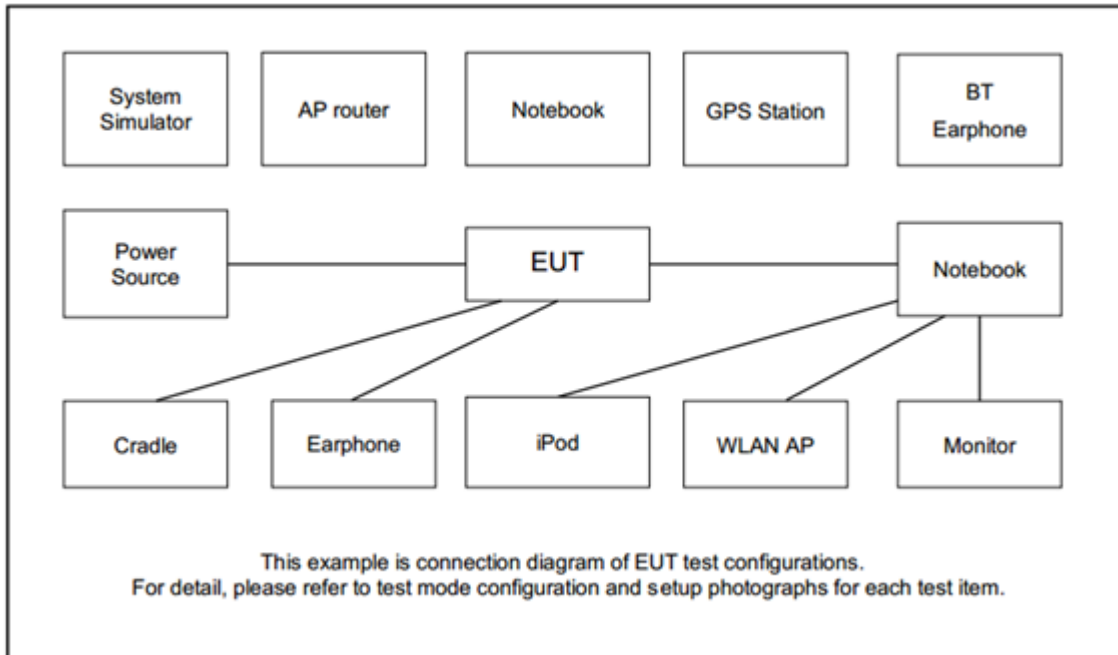
All modes, data rates and positions were investigated.

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

| Test Modes | | |
|---------------|---------------------|---------------------|
| Band | Radiated TCs | Conducted TCs |
| WCDMA Band V | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| WCDMA Band II | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |
| WCDMA Band IV | ■ RMC 12.2Kbps Link | ■ RMC 12.2Kbps Link |

Remark: All the radiated test cases were performed with Sample 1.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration

| Item | Equipment | Brand Name | Model No. | FCC ID | Data Cable | Power Cord |
|------|------------------|------------|-----------|--------------|-------------------|-------------------|
| 1. | System Simulator | Anritsu | MT8821C | N/A | N/A | Unshielded, 1.8 m |
| 2. | iPod Earphone | Apple | N/A | Verification | Unshielded, 1.0 m | N/A |

2.4 Frequency List of Low/Middle/High Channels

| Frequency List | | | | |
|----------------|------------------------|--------|--------|---------|
| Band | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| WCDMA Band V | Channel | 4132 | 4182 | 4233 |
| | Frequency | 826.4 | 836.4 | 846.6 |
| WCDMA Band II | Channel | 9262 | 9400 | 9538 |
| | Frequency | 1852.4 | 1880.0 | 1907.6 |
| WCDMA Band IV | Channel | 1312 | 1413 | 1513 |
| | Frequency | 1712.4 | 1732.6 | 1752.6 |

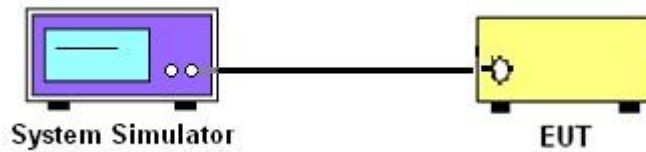
3 Conducted Test Result

3.1 Measuring Instruments

See list of measuring instruments of this test report.

3.1.1 Test Setup

3.1.2 Conducted Output Power



3.1.3 Test Result of Conducted Test

Please refer to Appendix A.



3.2 Conducted Output Power and ERP/EIRP

3.2.1 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 WCDMA Band V

The EIRP of mobile transmitters must not exceed 2 Watts for 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

3.2.2 Test Procedures

1. The transmitter output port was connected to the system simulator.
2. Set EUT at maximum power through system simulator.
3. Select the lowest, middle, and the highest channels for each band and different modulation.
4. Measure the maximum burst average power for GSM and maximum average power for other modulation signal.

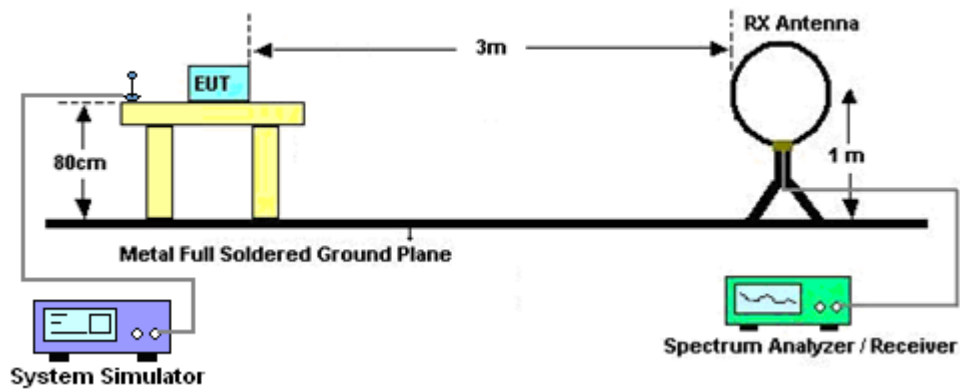
4 Radiated Test Items

4.1 Measuring Instruments

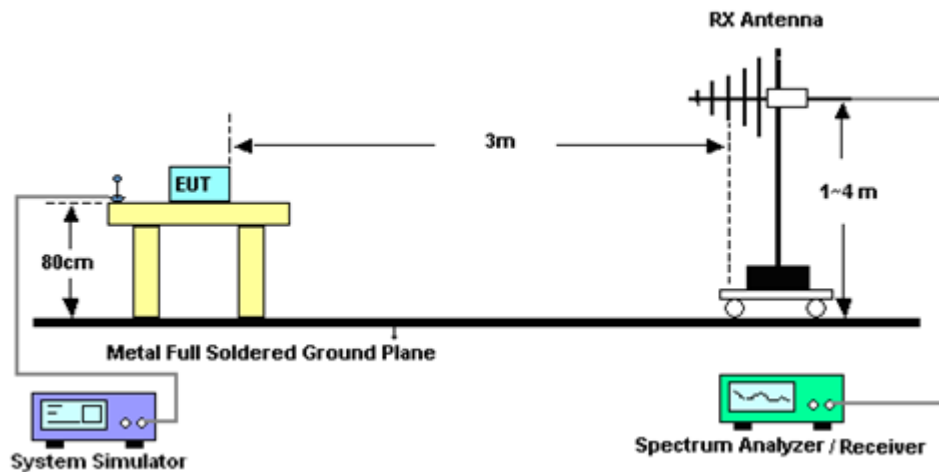
See list of measuring instruments of this test report.

4.2 Test Setup

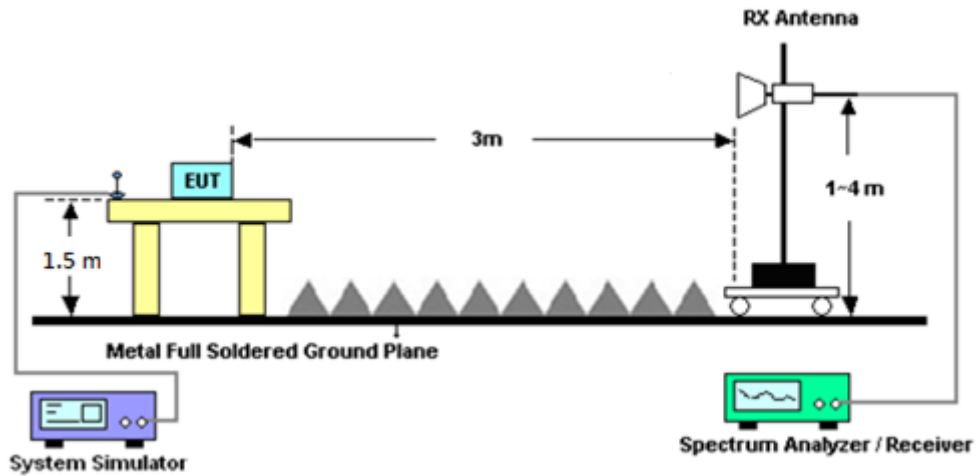
For radiated test below 30MHz



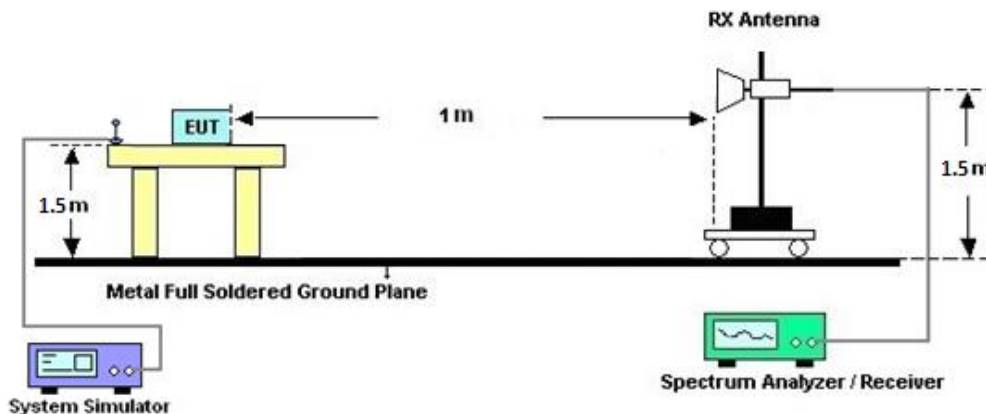
For radiated test from 30MHz to 1GHz



For radiated test above 1GHz



For radiated test above 18GHz



4.3 Test Result of Radiated Test

Please refer to Appendix B.

Note:

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

There is adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.



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

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

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



5 List of Measuring Equipment

| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|------------------------|------------------------|-----------------------------|------------------|---------------------------|------------------|-----------------------------|---------------|-----------------------|
| Base Station (Measure) | Rohde & Schwarz | CMU200 | 117995 | GSM / GPRS / WCDMA / CDMA | Jul. 13, 2021 | Oct. 12, 2021~Jan. 10, 2022 | Jul. 12, 2022 | Conducted (TH03-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100315 | 9 kHz~30 MHz | Jan. 04, 2021 | Oct. 14, 2021~Nov. 13, 2021 | Jan. 03, 2022 | Radiation (03CH12-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100488 | 9 kHz~30 MHz | Sep. 07, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Sep. 06, 2022 | Radiation (03CH12-HY) |
| Bilog Antenna | TESEQ | CCBL 6111D & 00800N1D01N-06 | 41912 & 05 | 30MHz~1GHz | Feb. 08, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Feb. 07, 2022 | Radiation (03CH12-HY) |
| Bilog Antenna | TESEQ | CCBL 6111D & 00800N1D01N-06 | 40103 & 07 | 30MHz~1GHz | Apr. 28, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Apr. 27, 2022 | Radiation (03CH12-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1328 | 1GHz~18GHz | Nov. 23, 2020 | Oct. 14, 2021~Nov. 13, 2021 | Nov. 22, 2021 | Radiation (03CH12-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1328 | 1GHz~18GHz | Dec. 03, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Dec. 02, 2022 | Radiation (03CH12-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 9120D-1212 | 1GHz~18GHz | May 18, 2021 | Oct. 14, 2021~Jan. 08, 2022 | May 17, 2022 | Radiation (03CH12-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | 00993 | 18GHz~40GHz | Nov. 19, 2020 | Oct. 14, 2021~Nov. 13, 2021 | Nov. 18, 2021 | Radiation (03CH12-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | 00993 | 18GHz~40GHz | Nov. 30, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Nov. 29, 2022 | Radiation (03CH12-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170576 | 18GHz~40GHz | May 21, 2021 | Oct. 14, 2021~Jan. 08, 2022 | May 20, 2022 | Radiation (03CH12-HY) |
| Preamplifier | COM-POWER | PA-103 | 161075 | 10MHz~1GHz | Mar. 24, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Mar. 23, 2022 | Radiation (03CH12-HY) |
| Preamplifier | Agilent | 8449B | 3008A02375 | 1GHz~26.5GHz | May 25, 2021 | Oct. 14, 2021~Jan. 08, 2022 | May 24, 2022 | Radiation (03CH12-HY) |
| Preamplifier | JPA0118-55-303K | JPA0118-55-303K | 1710001800054002 | 1GHz-18GHz | Jun. 16, 2021 | Oct. 14, 2021~Nov. 13, 2021 | Jun. 15, 2022 | Radiation (03CH12-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz~40GHz | Dec. 11, 2020 | Oct. 14, 2021~Nov. 13, 2021 | Dec. 10, 2021 | Radiation (03CH12-HY) |
| Preamplifier | E-INSTRUMENT TECH LTD. | ERA-100M-18G-56-01-A70 | EC1900249 | 1GHz-18GHz | Dec. 22, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Dec. 21, 2022 | Radiation (03CH12-HY) |
| Preamplifier | EMEC | EM18G40G | 060801 | 18GHz~40GHz | Jun. 22, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Jun. 21, 2022 | Radiation (03CH12-HY) |
| Spectrum Analyzer | Agilent | N9010A | MY53470118 | 10Hz~44GHz | Jan. 15, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Jan. 14, 2022 | Radiation (03CH12-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9837/4PE | 9kHz~30MHz | Mar. 11, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Mar. 10, 2022 | Radiation (03CH12-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126E | 0058/126E | 30MHz~18GHz | Dec. 11, 2020 | Oct. 14, 2021~Nov. 13, 2021 | Dec. 10, 2021 | Radiation (03CH12-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 126E | 0058/126E | 30MHz~18GHz | Dec. 10, 2021 | Dec. 28, 2021~Jan. 08, 2022 | Dec. 09, 2022 | Radiation (03CH12-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 505134/2 | 30MHz~40GHz | Feb. 22, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Feb. 21, 2022 | Radiation (03CH12-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | 800740/2 | 30MHz~40GHz | Feb. 22, 2021 | Oct. 14, 2021~Jan. 08, 2022 | Feb. 21, 2022 | Radiation (03CH12-HY) |



| Instrument | Brand Name | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|--------------|------------|--------------------------------------|------------|-----------------------------|------------------|---------------------------------|---------------|--------------------------|
| Antenna Mast | EMEC | AM-BS-4500-B | N/A | 1m~4m | N/A | Oct. 14, 2021~ Jan. 08, 2022 | N/A | Radiation (03CH12-HY) |
| Turn Table | EMEC | TT2000 | N/A | 0~360 Degree | N/A | Oct. 14, 2021~ Jan. 08, 2022 | N/A | Radiation (03CH12-HY) |
| Software | Audix | E3 6.2009-8-24 | RK-000989 | N/A | N/A | Oct. 14, 2021~ Jan. 08, 2022 | N/A | Radiation (03CH12-HY) |
| Filter | Wainwright | WLKS1200-12 SS | SN2 | 1.2GHz Low Pass Filter | Mar. 17, 2021 | Oct. 14, 2021~ Jan. 08, 2022 | Mar. 16, 2022 | Radiation (03CH12-HY) |
| Filter | Wainwright | WHKX12-2700 -3000-18000-6 0ST | SN2 | 3GHz High Pass Filter | Jul. 12, 2021 | Oct. 14, 2021~ Jan. 08, 2022 | Jul. 11, 2022 | Radiation (03CH12-HY) |
| Filter | Wainwright | WHKX8-5872. 5-6750-18000- 40ST | SN2 | 6.75GHz High Pass Filter | Mar. 17, 2021 | Oct. 14, 2021~ Jan. 08, 2022 | Mar. 16, 2022 | Radiation (03CH12-HY) |



6 Uncertainty of Evaluation

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

| | |
|---|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.10 dB |
|---|---------|

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

| | |
|---|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 3.39 dB |
|---|---------|

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

| | |
|---|---------|
| Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$) | 4.34 dB |
|---|---------|



Appendix A. Test Results of Conducted Test

<Main Antenna>

| WCDMA Band V Maximum Average Power [dBm] (GT - LC = -0.43 dB) | | | | | |
|---|----------|-------|--------------|-----------|---------|
| Channel | 4132 | 4182 | 4233 | ERP (dBm) | ERP (W) |
| Frequency | 826.4 | 836.4 | 846.6 | | |
| RMC 12.2K | 23.55 | 23.50 | 23.60 | 21.02 | 0.1265 |
| Limit | ERP < 7W | | | Result | Pass |

| WCDMA Band II Maximum Average Power [dBm] (GT - LC = 0.5 dB) | | | | | |
|--|--------------|-------|--------|------------|----------|
| Channel | 9262 | 9400 | 9538 | EIRP (dBm) | EIRP (W) |
| Frequency | 1852.4 | 1880 | 1907.6 | | |
| RMC 12.2K | 23.46 | 23.40 | 23.19 | 23.96 | 0.2489 |
| Limit | EIRP < 2W | | | Result | Pass |

| WCDMA Band IV Maximum Average Power [dBm] (GT - LC = 0.95 dB) | | | | | |
|---|-----------|--------|--------------|------------|----------|
| Channel | 1312 | 1413 | 1513 | EIRP (dBm) | EIRP (W) |
| Frequency | 1712.4 | 1732.6 | 1752.6 | | |
| RMC 12.2K | 23.41 | 23.44 | 23.45 | 24.40 | 0.2754 |
| Limit | EIRP < 1W | | | Result | Pass |



<MIMO 2 Antenna>

| WCDMA Band II Maximum Average Power [dBm] (GT - LC = 0.6 dB) | | | | | |
|--|-----------|-------|--------|------------|----------|
| Channel | 9262 | 9400 | 9538 | EIRP (dBm) | EIRP (W) |
| Frequency | 1852.4 | 1880 | 1907.6 | | |
| RMC 12.2K | 23.73 | 23.83 | 23.76 | 24.43 | 0.2773 |
| Limit | EIRP < 2W | | | Result | Pass |

| WCDMA Band IV Maximum Average Power [dBm] (GT - LC = 1 dB) | | | | | |
|--|-----------|--------|--------|------------|----------|
| Channel | 1312 | 1413 | 1513 | EIRP (dBm) | EIRP (W) |
| Frequency | 1712.4 | 1732.6 | 1752.6 | | |
| RMC 12.2K | 23.87 | 23.77 | 23.72 | 24.87 | 0.3069 |
| Limit | EIRP < 1W | | | Result | Pass |



Appendix B. Test Results of Radiated Test

<Sample 1>

<Main Antenna>

WCDMA 850

| WCDMA 850 | | | | | | | | | |
|-----------|-------------------|-------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | ERP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 1652 | -61.06 | -13 | -48.06 | -70.71 | -66.67 | 0.92 | 8.68 | H |
| | 2479 | -50.07 | -13 | -37.07 | -64.01 | -57.45 | 1.15 | 10.67 | H |
| | 3305 | -55.44 | -13 | -42.44 | -71.49 | -64.00 | 1.32 | 12.03 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 1652 | -61.51 | -13 | -48.51 | -70.62 | -67.12 | 0.92 | 8.68 | V |
| | 2479 | -48.04 | -13 | -35.04 | -62.15 | -55.42 | 1.15 | 10.67 | V |
| | 3305 | -54.95 | -13 | -41.95 | -71.47 | -63.51 | 1.32 | 12.03 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| Middle | 1672 | -60.69 | -13 | -47.69 | -70.41 | -66.37 | 0.93 | 8.75 | H |
| | 2509 | -49.95 | -13 | -36.95 | -63.9 | -57.36 | 1.15 | 10.71 | H |
| | 3345 | -55.35 | -13 | -42.35 | -71.33 | -64.00 | 1.33 | 12.13 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 1672 | -60.81 | -13 | -47.81 | -69.9 | -66.49 | 0.93 | 8.75 | V |
| | 2509 | -48.67 | -13 | -35.67 | -62.82 | -56.08 | 1.15 | 10.71 | V |
| | 3345 | -54.80 | -13 | -41.80 | -71.24 | -63.45 | 1.33 | 12.13 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |



| | | | | | | | | | |
|---------|------|--------|-----|--------|--------|--------|------|-------|---|
| Highest | 1693 | -60.70 | -13 | -47.70 | -70.47 | -66.45 | 0.94 | 8.83 | H |
| | 2539 | -53.11 | -13 | -40.11 | -67.08 | -60.55 | 1.16 | 10.75 | H |
| | 3386 | -55.35 | -13 | -42.35 | -71.24 | -64.09 | 1.34 | 12.23 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 1693 | -60.45 | -13 | -47.45 | -69.52 | -66.20 | 0.94 | 8.83 | V |
| | 2539 | -52.18 | -13 | -39.18 | -66.28 | -59.62 | 1.16 | 10.75 | V |
| | 3386 | -54.97 | -13 | -41.97 | -71.3 | -63.71 | 1.34 | 12.23 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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



WCDMA 1700

| WCDMA 1700 | | | | | | | | | |
|------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 3425 | -54.51 | -13 | -41.51 | -71.23 | -65.48 | 1.35 | 12.32 | H |
| | 5137 | -48.66 | -13 | -35.66 | -71.24 | -59.81 | 1.65 | 12.79 | H |
| | 6850 | -46.07 | -13 | -33.07 | -72.29 | -56.44 | 1.74 | 12.11 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3425 | -54.12 | -13 | -41.12 | -71.26 | -65.09 | 1.35 | 12.32 | V |
| | 5137 | -47.62 | -13 | -34.62 | -69.95 | -58.77 | 1.65 | 12.79 | V |
| | 6850 | -46.35 | -13 | -33.35 | -72.16 | -56.72 | 1.74 | 12.11 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| Middle | 3462 | -53.92 | -13 | -40.92 | -71 | -64.98 | 1.35 | 12.41 | H |
| | 5198 | -40.69 | -13 | -27.69 | -63.28 | -51.91 | 1.66 | 12.88 | H |
| | 6930 | -45.21 | -13 | -32.21 | -71.84 | -55.48 | 1.73 | 12.00 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3462 | -53.73 | -13 | -40.73 | -71.2 | -64.79 | 1.35 | 12.41 | V |
| | 5198 | -42.72 | -13 | -29.72 | -65.15 | -53.94 | 1.66 | 12.88 | V |
| | 6930 | -45.55 | -13 | -32.55 | -71.73 | -55.82 | 1.73 | 12.00 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |



| | | | | | | | | | |
|---------|------|--------|-----|--------|--------|--------|------|-------|---|
| Highest | 3505 | -53.75 | -13 | -40.75 | -71.25 | -64.89 | 1.36 | 12.50 | H |
| | 5258 | -48.87 | -13 | -35.87 | -71.66 | -60.15 | 1.68 | 12.96 | H |
| | 7010 | -44.68 | -13 | -31.68 | -71.7 | -54.84 | 1.73 | 11.88 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3505 | -53.39 | -13 | -40.39 | -71.23 | -64.53 | 1.36 | 12.50 | V |
| | 5258 | -49.12 | -13 | -36.12 | -71.68 | -60.40 | 1.68 | 12.96 | V |
| | 7010 | -45.25 | -13 | -32.25 | -71.79 | -55.41 | 1.73 | 11.88 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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



WCDMA 1900

| WCDMA 1900 | | | | | | | | | |
|------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 3708 | -51.54 | -13 | -38.54 | -70.11 | -62.75 | 1.41 | 12.62 | H |
| | 5557 | -49.24 | -13 | -36.24 | -72.13 | -60.80 | 1.74 | 13.30 | H |
| | 7410 | -44.95 | -13 | -31.95 | -71.91 | -54.25 | 1.94 | 11.24 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3708 | -52.10 | -13 | -39.10 | -70.82 | -63.31 | 1.41 | 12.62 | V |
| | 5557 | -49.03 | -13 | -36.03 | -71.47 | -60.59 | 1.74 | 13.30 | V |
| | 7410 | -45.16 | -13 | -32.16 | -71.97 | -54.46 | 1.94 | 11.24 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| Middle | 3762 | -52.06 | -13 | -39.06 | -70.76 | -63.29 | 1.43 | 12.66 | H |
| | 5640 | -48.50 | -13 | -35.50 | -71.45 | -60.07 | 1.73 | 13.30 | H |
| | 7518 | -45.43 | -13 | -32.43 | -71.92 | -54.54 | 1.99 | 11.10 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3762 | -52.04 | -13 | -39.04 | -70.96 | -63.27 | 1.43 | 12.66 | V |
| | 5640 | -48.92 | -13 | -35.92 | -71.46 | -60.49 | 1.73 | 13.30 | V |
| | 7518 | -45.42 | -13 | -32.42 | -71.87 | -54.53 | 1.99 | 11.10 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |



| | | | | | | | | | |
|---------|------|--------|-----|--------|--------|--------|------|-------|---|
| Highest | 3816 | -52.05 | -13 | -39.05 | -70.86 | -63.30 | 1.44 | 12.69 | H |
| | 5722 | -48.04 | -13 | -35.04 | -71.38 | -59.61 | 1.73 | 13.30 | H |
| | 7632 | -45.74 | -13 | -32.74 | -71.81 | -54.86 | 2.01 | 11.13 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3816 | -51.83 | -13 | -38.83 | -70.88 | -63.08 | 1.44 | 12.69 | V |
| | 5722 | -49.12 | -13 | -36.12 | -71.84 | -60.69 | 1.73 | 13.30 | V |
| | 7632 | -45.86 | -13 | -32.86 | -71.84 | -54.98 | 2.01 | 11.13 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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



<MIMO 2 Antenna>

WCDMA 1900

| WCDMA 1900 | | | | | | | | | |
|------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Lowest | 3708 | -52.48 | -13 | -39.48 | -71.05 | -63.69 | 1.41 | 12.62 | H |
| | 5556 | -49.03 | -13 | -36.03 | -71.92 | -60.59 | 1.74 | 13.30 | H |
| | 7410 | -44.15 | -13 | -31.15 | -71.11 | -53.45 | 1.94 | 11.24 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3708 | -52.47 | -13 | -39.47 | -71.19 | -63.68 | 1.41 | 12.62 | V |
| | 5556 | -49.53 | -13 | -36.53 | -71.97 | -61.09 | 1.74 | 13.30 | V |
| | 7410 | -44.77 | -13 | -31.77 | -71.58 | -54.07 | 1.94 | 11.24 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |
| Middle | 3762 | -52.56 | -13 | -39.56 | -71.26 | -63.79 | 1.43 | 12.66 | H |
| | 5640 | -48.42 | -13 | -35.42 | -71.37 | -59.99 | 1.73 | 13.30 | H |
| | 7518 | -45.21 | -13 | -32.21 | -71.7 | -54.32 | 1.99 | 11.10 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3762 | -52.01 | -13 | -39.01 | -70.93 | -63.24 | 1.43 | 12.66 | V |
| | 5640 | -48.44 | -13 | -35.44 | -70.98 | -60.01 | 1.73 | 13.30 | V |
| | 7518 | -45.40 | -13 | -32.40 | -71.85 | -54.51 | 1.99 | 11.10 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |



| | | | | | | | | | |
|---------|------|--------|-----|--------|--------|--------|------|-------|---|
| Highest | 3816 | -52.34 | -13 | -39.34 | -71.15 | -63.59 | 1.44 | 12.69 | H |
| | 5722 | -47.93 | -13 | -34.93 | -71.27 | -59.50 | 1.73 | 13.30 | H |
| | 7632 | -45.36 | -13 | -32.36 | -71.43 | -54.48 | 2.01 | 11.13 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3816 | -51.97 | -13 | -38.97 | -71.02 | -63.22 | 1.44 | 12.69 | V |
| | 5722 | -48.50 | -13 | -35.50 | -71.22 | -60.07 | 1.73 | 13.30 | V |
| | 7632 | -45.40 | -13 | -32.40 | -71.38 | -54.52 | 2.01 | 11.13 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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



WCDMA 1700

| WCDMA 1700 | | | | | | | | | |
|------------|-------------------|--------------|---------------|-------------------|-------------------|--------------------|----------------------|-----------------------|--------------------|
| Channel | Frequency (MHz) | EIRP (dBm) | Limit (dBm) | Over Limit (dB) | SPA Reading (dBm) | S.G. Power (dBm) | TX Cable loss (dB) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle | 3462 | -53.56 | -13 | -40.56 | -70.8 | -64.62 | 1.35 | 12.41 | H |
| | 5198 | -49.82 | -13 | -36.82 | -71.43 | -61.04 | 1.66 | 12.88 | H |
| | 6927 | -45.89 | -13 | -32.89 | -71.73 | -56.16 | 1.73 | 12.00 | H |
| | | | | | | | | | H |
| | | | | | | | | | H |
| | 3462 | -53.51 | -13 | -40.51 | -71.14 | -64.57 | 1.35 | 12.41 | V |
| | 5198 | -48.91 | -13 | -35.91 | -70.36 | -60.13 | 1.66 | 12.88 | V |
| | 6927 | -46.60 | -13 | -33.60 | -71.99 | -56.87 | 1.73 | 12.00 | V |
| | | | | | | | | | V |
| | | | | | | | | | V |

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