

# FCC TEST REPORT

**Product Name:** Smart Phone  
**Trade Mark:** BLU  
**Model No.:** C6L MAX  
**Report Number:** 2309266970RFM-1  
**Test Standards:** FCC 47 CFR Part 22 Subpart H  
FCC 47 CFR Part 24 Subpart E  
FCC 47 CFR Part 27 Subpart L  
**FCC ID:** YHLBLUC6LMXWW  
**Test Result:** PASS  
**Date of Issue:** October 20, 2023

Prepared for:

**BLU Products, Inc.**  
**8600 NW 36th Street, Suite #200 Doral, FL 33166**

Prepared by:

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October 20, 2023

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UTTR-RF-FCC23G-V1.1

## Version

| Version No. | Date             | Description |
|-------------|------------------|-------------|
| V1.0        | October 20, 2023 | Original    |



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## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

|                                 |                                                 |
|---------------------------------|-------------------------------------------------|
| <b>Applicant:</b>               | BLU Products, Inc.                              |
| <b>Address of Applicant:</b>    | 8600 NW 36th Street, Suite #200 Doral, FL 33166 |
| <b>Manufacturer:</b>            | BLU Products, Inc.                              |
| <b>Address of Manufacturer:</b> | 8600 NW 36th Street, Suite #200 Doral, FL 33166 |

### 1.2 EUT INFORMATION

#### 1.2.1 General Description of EUT

|                                                             |                                                                                                                                          |                                                            |                   |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-------------------|
| <b>Product Name:</b>                                        | Smart Phone                                                                                                                              |                                                            |                   |
| <b>Model No.:</b>                                           | C6L MAX                                                                                                                                  |                                                            |                   |
| <b>Trade Mark:</b>                                          | BLU                                                                                                                                      |                                                            |                   |
| <b>DUT Stage:</b>                                           | Identical Prototype                                                                                                                      |                                                            |                   |
| <b>EUT Supports Function:</b><br>(Provided by the customer) | GSM Bands:                                                                                                                               | GSM850/PCS 1900                                            |                   |
|                                                             | UTRA Bands:                                                                                                                              | WCDMA Band II/ Band IV/ Band V                             |                   |
|                                                             | E-UTRA Bands:                                                                                                                            | FDD Band 2/ Band 4/ Band 5/ Band 7/ Band 17<br>TDD Band 38 |                   |
|                                                             | 2.4 GHz ISM Band:                                                                                                                        | IEEE 802.11b/g/n<br>Bluetooth V4.2                         |                   |
|                                                             | RNSS Band:                                                                                                                               | 1559 MHz to 1610 MHz                                       | GPS/ BDS/ GLONASS |
|                                                             | BSR:                                                                                                                                     | VHF Band II                                                | FM                |
| <b>Software Version:</b>                                    | BLU_C0210_V13.0.G.05.02_TIGO 21-09-2023 14:22 (Provided by the customer)                                                                 |                                                            |                   |
| <b>Hardware Version:</b>                                    | FS170-76E (Provided by the customer)                                                                                                     |                                                            |                   |
| <b>Sample Received Date:</b>                                | September 26, 2023                                                                                                                       |                                                            |                   |
| <b>Sample Tested Date:</b>                                  | September 26, 2023 to October 17, 2023                                                                                                   |                                                            |                   |
| <b>Remark:</b>                                              | The above EUT's information was provided by customer. Please refer to the specifications or user's manual for more detailed description. |                                                            |                   |

#### 1.2.2 Description of Accessories

| Adapter           |                          |
|-------------------|--------------------------|
| <b>Model No.:</b> | US-AR-1001               |
| <b>Input:</b>     | 100-240 V~50/60 Hz 0.2 A |
| <b>Output:</b>    | 5.0 V $\equiv$ 1000 mA   |

| Battery                        |                             |
|--------------------------------|-----------------------------|
| <b>Model No.:</b>              | C846050300L                 |
| <b>Battery Type:</b>           | Lithium-ion Polymer Battery |
| <b>Rated Voltage:</b>          | 3.8 Vdc                     |
| <b>Limited Charge Voltage:</b> | 4.35 Vdc                    |
| <b>Rated Capacity:</b>         | 3000 mAh                    |

| Cable              |                            |
|--------------------|----------------------------|
| <b>Connector:</b>  | USB Cable                  |
| <b>Cable Type:</b> | Unshielded without ferrite |
| <b>Length:</b>     | 0.5 Meter                  |

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### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

|                                                    |                                      |                   |
|----------------------------------------------------|--------------------------------------|-------------------|
| <b>Support Networks:</b>                           | GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA |                   |
| <b>Type of Modulation:</b>                         | GSM/GPRS:                            | GMSK              |
|                                                    | EDGE:                                | GMSK, 8PSK        |
|                                                    | WCDMA                                | BPSK              |
|                                                    | HSDPA:                               | QPSK              |
|                                                    | HSUPA:                               | QPSK              |
| <b>Frequency Range:</b>                            | GSM/GPRS/EDGE 850:                   | 824.2-848.8 MHz   |
|                                                    | GSM/GPRS/EDGE 1900:                  | 1850.2-1909.8 MHz |
|                                                    | WCDMA Band II:                       | 1852.4-1907.6 MHz |
|                                                    | WCDMA Band IV:                       | 1712.4-1752.6 MHz |
|                                                    | WCDMA Band V:                        | 826.4-846.6 MHz   |
| <b>Max RF Output Power:</b>                        | GSM/GPRS 850:                        | 31.02 dBm         |
|                                                    | EDGE 850:                            | 23.46 dBm         |
|                                                    | GSM/GPRS 1900:                       | 29.31 dBm         |
|                                                    | EDGE 1900:                           | 24.78 dBm         |
|                                                    | WCDMA Band II:                       | 21.59 dBm         |
|                                                    | WCDMA Band IV:                       | 21.54 dBm         |
|                                                    | WCDMA Band V:                        | 20.69 dBm         |
| <b>Emission Designator:</b>                        | GSM/GPRS 850:                        | 245KGXW           |
|                                                    | EDGE 850:                            | 249KG7W           |
|                                                    | GSM/GPRS 1900:                       | 246KGXW           |
|                                                    | EDGE 1900:                           | 245KG7W           |
|                                                    | WCDMA Band II:                       | 4M18F9W           |
|                                                    | WCDMA Band IV:                       | 4M15F9W           |
|                                                    | WCDMA Band V:                        | 4M18F9W           |
| <b>Antenna Type:</b><br>(Provided by the customer) | FPCB Antenna                         |                   |
| <b>Antenna Gain:</b><br>(Provided by the customer) | GSM 850:                             | 0.01 dBi          |
|                                                    | PCS 1900:                            | -1.09 dBi         |
|                                                    | WCDMA Band II:                       | -1.09 dBi         |
|                                                    | WCDMA Band IV:                       | -1.11 dBi         |
|                                                    | WCDMA Band V:                        | 0.01 dBi          |
| <b>GPRS/EDGE Class:</b>                            | Class 12                             |                   |
| <b>Sample No.:</b>                                 | Radiated: S202309262172-ZJA05/6      |                   |
|                                                    | Conducted: S202309262172-ZJA02/6     |                   |
| <b>Normal Test Voltage:</b>                        | 3.8 Vdc                              |                   |
| <b>Extreme Test Voltage:</b>                       | 3.4 to 4.35Vdc                       |                   |
| <b>Extreme Test Temperature:</b>                   | -10 °C to +55 °C                     |                   |

## 1.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

### 1) Support Equipment

| Description | Manufacturer | Model No. | Serial Number | Supplied by |
|-------------|--------------|-----------|---------------|-------------|
| --          | --           | --        | --            | --          |

### 2) Support Cable

| Cable No. | Description   | Connector | Length    | Supplied by |
|-----------|---------------|-----------|-----------|-------------|
| 1         | Antenna Cable | SMA       | 0.1 Meter | UnionTrust  |

## 1.5 TEST LOCATION

### Shenzhen UnionTrust Quality and Technology Co., Ltd.

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## 1.6 TEST FACILITY

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

### CNAS-Lab Code: L9069

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

### A2LA-Lab Certificate No.: 4312.01

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### ISED Wireless Device Testing Laboratories

CAB identifier: CN0032

### FCC Accredited Lab.

Designation Number: CN1194

Test Firm Registration Number: 259480

## 1.7 DEVIATION FROM STANDARDS

None.

## 1.8 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER

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None.

### 1.10 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| No. | Item                                    | Measurement Uncertainty                                                  |
|-----|-----------------------------------------|--------------------------------------------------------------------------|
| 1   | Conducted Output Power                  | ±0.7 dB                                                                  |
| 2   | 99%&26dB Bandwidth                      | ±1.86 %                                                                  |
| 3   | Emission Mask                           | ±2.7 dBm                                                                 |
| 4   | Spurious emissions at antenna terminals | ±2.7 dBm                                                                 |
| 5   | Field strength of spurious radiation    | 30 MHz-1 GHz: ±4.9 dB<br>1 GHz-18 GHz: ±4.8 dB<br>18 GHz-40 GHz: ±5.1 dB |
| 6   | Frequency stability                     | ±6.5 x 10 <sup>-8</sup>                                                  |
| 7   | Humidity                                | ±3.9 %                                                                   |
| 8   | Temperature                             | ±0.62 °C                                                                 |
| 9   | DC Voltages                             | ±0.68 %                                                                  |

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## 2. TEST SUMMARY

| FCC 47 CFR Part 22 Subpart H Test Cases |                                                       |                                         |        |
|-----------------------------------------|-------------------------------------------------------|-----------------------------------------|--------|
| Test Item                               | Test Requirement                                      | Test Method                             | Result |
| Effective Radiated Power (ERP)          | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Conducted Output Power                  | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 22.913(a) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Peak-to-average ratio                   | FCC 47 CFR Part 22.913(a)                             | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| 99%&26dB Bandwidth                      | FCC 47 CFR Part 2.1049(h)                             | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Band Edge at antenna terminals          | FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)    | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Spurious emissions at antenna terminals | FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 22.917(a)(b) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Field strength of spurious radiation    | FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 22.917(a)(b) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Frequency stability                     | FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 22.355       | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |

| FCC 47 CFR Part 24 Subpart E Test Cases    |                                                       |                                         |        |
|--------------------------------------------|-------------------------------------------------------|-----------------------------------------|--------|
| Test Item                                  | Test Requirement                                      | Test Method                             | Result |
| Equivalent Isotropic Radiated Power (EIRP) | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Conducted Output Power                     | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 24.232(c) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Peak-to-average ratio                      | FCC 47 CFR Part 24.232(d)                             | KDB 971168 D01v03r01                    | PASS   |
| 99%&26dB Bandwidth                         | FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 24.238(b) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Band Edge at antenna terminals             | FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)    | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Spurious emissions at antenna terminals    | FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 24.238(a)(b) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Field strength of spurious radiation       | FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 24.238(a)(b) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Frequency stability                        | FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 24.235       | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |

| FCC 47 CFR Part 27 Subpart L Test Cases    |                                                         |                                         |        |
|--------------------------------------------|---------------------------------------------------------|-----------------------------------------|--------|
| Test Item                                  | Test Requirement                                        | Test Method                             | Result |
| Equivalent Isotropic Radiated Power (EIRP) | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Conducted Output Power                     | FCC 47 CFR Part 2.1046(a) & FCC 47 CFR Part 27.50(d)(4) | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Peak-to-average ratio                      | FCC 47 CFR Part 27.50(d)(5)                             | KDB 971168 D01v03r01                    | PASS   |
| 99%&26dB Bandwidth                         | FCC 47 CFR Part 2.1049(h) & FCC 47 CFR Part 27.53(h)    | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Band Edge at antenna terminals             | FCC 47 CFR Part 27.53(h)(1)                             | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Spurious emissions at antenna terminals    | FCC 47 CFR Part 2.1051 & FCC 47 CFR Part 27.53(h)       | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Field strength of spurious radiation       | FCC 47 CFR Part 2.1053 & FCC 47 CFR Part 27.53(h)       | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |
| Frequency stability                        | FCC 47 CFR Part 2.1055 & FCC 47 CFR Part 27.54          | ANSI C63.26-2015 & KDB 971168 D01v03r01 | PASS   |

#### Disclaimer and Explanations:

The declared of product specification and data (e.g. antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification.

### 3. EQUIPMENT LIST

| Radiated Emission Test Equipment List |                                                      |              |            |                            |             |               |
|---------------------------------------|------------------------------------------------------|--------------|------------|----------------------------|-------------|---------------|
| Used                                  | Equipment                                            | Manufacturer | Model No.  | Serial Number              | Cal. date   | Cal. Due date |
| <input checked="" type="checkbox"/>   | 3m SAC                                               | ETS-LINDGREN | 3M         | Euroshiedpn-CT001270-1317  | 22-Jan-2021 | 21-Jan-2024   |
| <input checked="" type="checkbox"/>   | Receiver                                             | R&S          | ESIB26     | 100114                     | 3-Nov-2022  | 2-Nov-2023    |
| <input checked="" type="checkbox"/>   | Broadband Antenna                                    | ETS-LINDGREN | 3142E      | 00201566                   | 13-Dec-2022 | 12-Dec-2023   |
| <input checked="" type="checkbox"/>   | 6dB Attenuator                                       | Talent       | RA6A5-N-18 | 18103001                   | 13-Dec-2022 | 12-Dec-2023   |
| <input checked="" type="checkbox"/>   | Preamplifier                                         | HP           | 8447F      | 2805A02960                 | 1-Nov-2022  | 31-Oct-2023   |
| <input checked="" type="checkbox"/>   | Double-Ridged Waveguide Horn Antenna (Pre-amplifier) | ETS-LINDGREN | 3117-PA    | 00201541                   | 16-Apr-2023 | 15-Apr-2025   |
| <input checked="" type="checkbox"/>   | Pre-amplifier                                        | ETS-LINDGREN | 00118385   | 00201874                   | 1-Nov-2022  | 31-Oct-2023   |
| <input checked="" type="checkbox"/>   | Double-Ridged Waveguide Horn Antenna (Pre-amplifier) | ETS-LINDGREN | 3116C-PA   | 00202652                   | 21-Nov-2022 | 20-Nov-2023   |
| <input checked="" type="checkbox"/>   | Pre-amplifier                                        | ETS-LINDGREN | 00118384   | 00202652                   | 21-Nov-2022 | 20-Nov-2023   |
| <input checked="" type="checkbox"/>   | Multi device Controller                              | ETS-LINDGREN | 7006-001   | 00160105                   | N/A         | N/A           |
| <input checked="" type="checkbox"/>   | Test Software                                        | Audix        | e3         | Software Version: 9.160323 |             |               |

| RF Conducted Test Equipment List    |                                     |              |           |                |             |               |
|-------------------------------------|-------------------------------------|--------------|-----------|----------------|-------------|---------------|
| Used                                | Equipment                           | Manufacturer | Model No. | Serial Number  | Cal. date   | Cal. Due date |
| <input checked="" type="checkbox"/> | EXA Signal Analyzer                 | KEYSIGHT     | N9010B    | MY62060155     | 19-Apr-2023 | 18-Apr-2024   |
| <input checked="" type="checkbox"/> | DC Source                           | KIKUSUI      | PWR400L   | LK003024       | N/A         | N/A           |
| <input checked="" type="checkbox"/> | Digital multimeter                  | FLUKE        | 15B+      | 30701460WS15   | 02-Nov-2022 | 01-Nov-2023   |
| <input checked="" type="checkbox"/> | Temp & Humidity chamber             | Votisch      | VT4002    | 58566133290020 | 14-Apr-2023 | 13-Apr-2024   |
| <input checked="" type="checkbox"/> | Wideband Radio Communication Tester | R&S          | CMW500    | 119583         | 14-Apr-2023 | 13-Apr-2024   |
| <input checked="" type="checkbox"/> | Wideband Radio Communication Tester | R&S          | CMW500    | 120932         | 14-Apr-2023 | 13-Apr-2024   |

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#### 4. TEST CONFIGURATION

##### 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

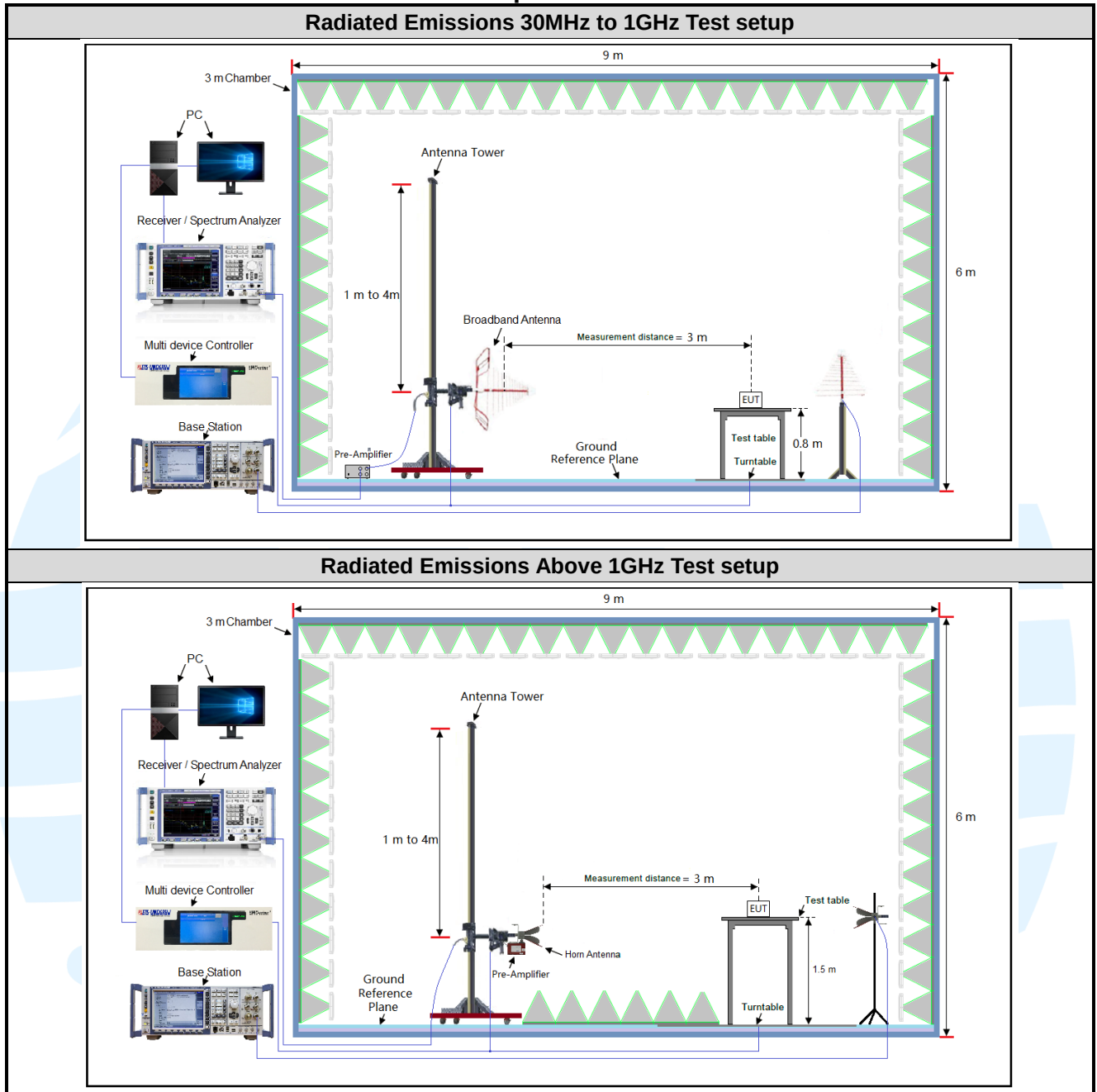
| Test Environment | Selected Values During Tests |             |                       |
|------------------|------------------------------|-------------|-----------------------|
| Test Condition   | Ambient                      |             |                       |
|                  | Temperature (°C)             | Voltage (V) | Relative Humidity (%) |
| TN/VN            | +15 to +35                   | 3.8         | 20 to 75              |
| TL/VL            | -10                          | 3.4         | 20 to 75              |
| TH/VL            | +55                          | 3.4         | 20 to 75              |
| TL/VH            | -10                          | 4.35        | 20 to 75              |
| TH/VH            | +55                          | 4.35        | 20 to 75              |

**Remark:**

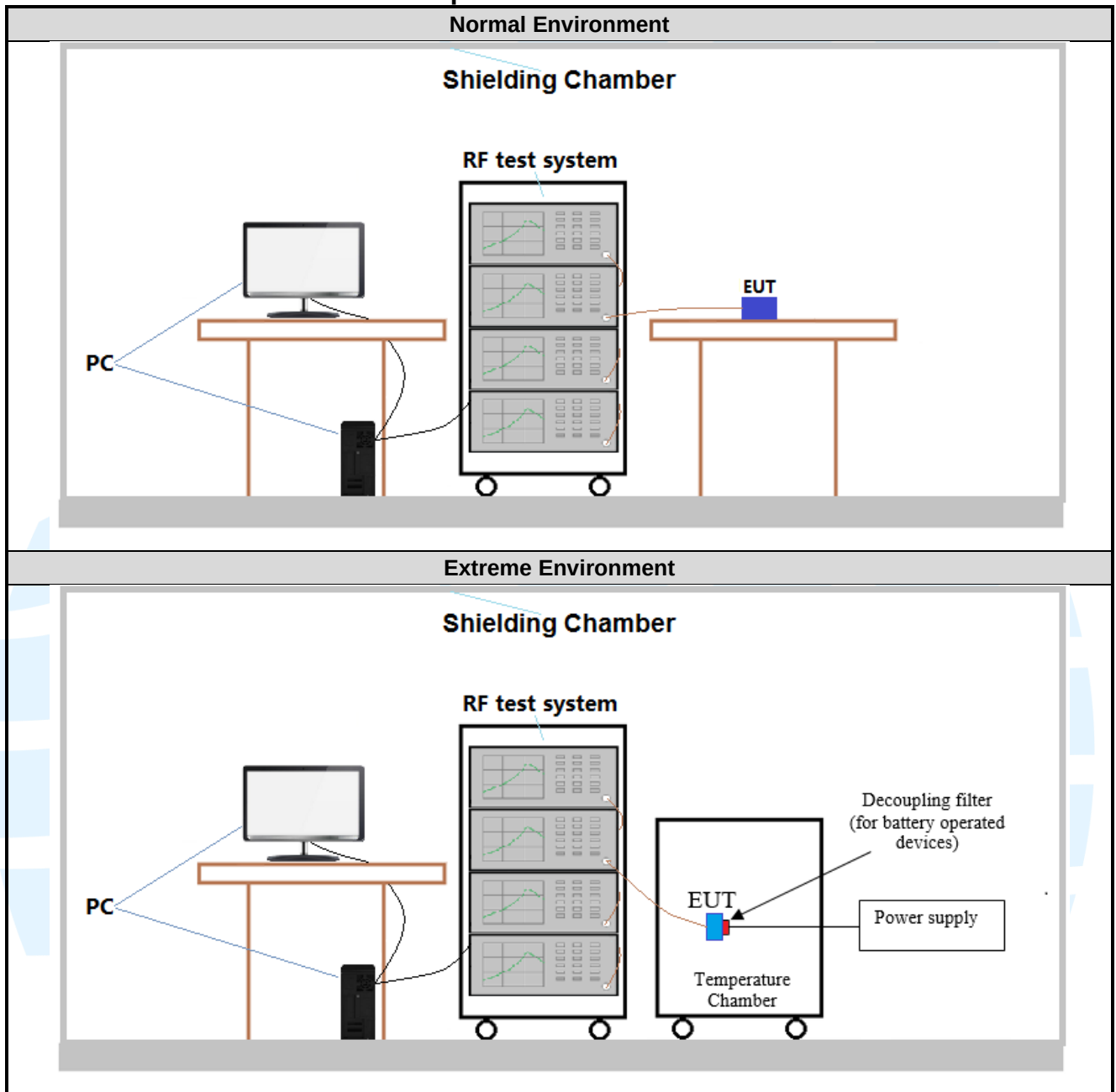
- 1) The EUT just work in such extreme temperature of -10 °C to +55 °C and the extreme voltage of 3.4 V to 4.35 V, so here the EUT is tested in the temperature of -10 °C to +55 °C and the voltage of 3.4 V to 4.35 V.
- 2) VN: Normal Voltage; TN: Normal Temperature;  
TL: Low Extreme Test Temperature; TH: High Extreme Test Temperature;  
VL: Low Extreme Test Voltage; VH: High Extreme Test Voltage.

## 4.2 TEST SETUP

### 4.2.1 For Radiated Emissions test setup



## 4.2.2 For Conducted RF test setup



### 4.3 TEST CHANNELS

| Bands                | Tx/Rx Frequency           | RF Channel   |              |              |
|----------------------|---------------------------|--------------|--------------|--------------|
|                      |                           | Low(L)       | Middle(M)    | High(H)      |
| GSM/GPRS/<br>EDGE850 | Tx<br>(824 MHz ~ 849 MHz) | Channel 128  | Channel 190  | Channel 251  |
|                      |                           | 824.2 MHz    | 836.6 MHz    | 848.8 MHz    |
| WCDMA band V         | Tx<br>(824 MHz ~ 849 MHz) | Channel 4132 | Channel 4182 | Channel 4233 |
|                      |                           | 826.4 MHz    | 836.4 MHz    | 846.6 MHz    |

| Bands                 | Tx/Rx Frequency           | RF Channel   |              |              |
|-----------------------|---------------------------|--------------|--------------|--------------|
|                       |                           | Low(L)       | Middle(M)    | High(H)      |
| GSM/GPRS/<br>EDGE1900 | Tx<br>(1850 MHz-1910 MHz) | Channel 512  | Channel 661  | Channel 810  |
|                       |                           | 1850.2 MHz   | 1880.0 MHz   | 1909.8 MHz   |
| WCDMA Band II         | Tx<br>(1850 MHz-1910 MHz) | Channel 9262 | Channel 9400 | Channel 9538 |
|                       |                           | 1852.4 MHz   | 1880.0 MHz   | 1907.6 MHz   |

| Bands         | Tx/Rx Frequency           | RF Channel   |              |              |
|---------------|---------------------------|--------------|--------------|--------------|
|               |                           | Low(L)       | Middle(M)    | High(H)      |
| WCDMA Band IV | Tx<br>(1710 MHz-1755 MHz) | Channel 1312 | Channel 1412 | Channel 1513 |
|               |                           | 1712.4 MHz   | 1732.4 MHz   | 1752.6 MHz   |

### 4.4 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.8Vdc battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 4.5 PRE-SCAN

Pre-scan under all rate at lowest middle and highest channel, find the transmitter power as below:  
SIM 1 Card Conducted transmitter power measurement result.

| GSM 850 Maximum Average Power (dBm) |           |              |           |
|-------------------------------------|-----------|--------------|-----------|
| Channel                             | 128       | 190          | 251       |
| Frequency(MHz)                      | 824.2 MHz | 836.6 MHz    | 848.8 MHz |
| GSM (GMSK, 1Tx-slot)                | 32.99     | <b>33.16</b> | 33.13     |
| GPRS (GMSK, 1Tx-slot)               | 33.02     | 33.14        | 33.11     |
| GPRS (GMSK, 2Tx-slot)               | 30.93     | 30.89        | 30.86     |
| GPRS (GMSK, 3Tx-slot)               | 29.03     | 28.96        | 28.94     |
| GPRS (GMSK, 4Tx-slot)               | 26.80     | 26.73        | 26.75     |
| EDGE (8PSK, 1Tx-slot)               | 25.45     | 25.60        | 25.21     |
| EDGE (8PSK, 2Tx-slot)               | 23.37     | 24.27        | 24.24     |
| EDGE (8PSK, 3Tx-slot)               | 21.03     | 21.58        | 21.51     |
| EDGE (8PSK, 4Tx-slot)               | 19.36     | 19.82        | 18.92     |

| PCS 1900 Maximum Average Power (dBm) |            |              |            |
|--------------------------------------|------------|--------------|------------|
| Channel                              | 512        | 661          | 810        |
| Frequency(MHz)                       | 1850.2 MHz | 1880.0 MHz   | 1909.8 MHz |
| GSM (GMSK, 1Tx-slot)                 | 30.30      | <b>30.40</b> | 30.19      |
| GPRS (GMSK, 1Tx-slot)                | 30.32      | 30.38        | 30.14      |
| GPRS (GMSK, 2Tx-slot)                | 28.17      | 27.93        | 27.64      |
| GPRS (GMSK, 3Tx-slot)                | 26.65      | 26.39        | 26.13      |
| GPRS (GMSK, 4Tx-slot)                | 24.71      | 24.44        | 24.12      |
| EDGE (8PSK, 1Tx-slot)                | 25.43      | 25.87        | 25.08      |
| EDGE (8PSK, 2Tx-slot)                | 23.57      | 24.33        | 23.35      |
| EDGE (8PSK, 3Tx-slot)                | 20.97      | 21.42        | 20.81      |
| EDGE (8PSK, 4Tx-slot)                | 18.12      | 18.20        | 17.46      |

| WCDMA Band II Maximum Average Power (dBm) |            |            |              |
|-------------------------------------------|------------|------------|--------------|
| Channel                                   | 9262       | 9400       | 9538         |
| Frequency (MHz)                           | 1852.4 MHz | 1880.0 MHz | 1907.6 MHz   |
| RMC 12.2K                                 | 22.59      | 22.66      | <b>22.68</b> |
| HSDPA Subtest-1                           | 21.86      | 21.65      | 21.45        |
| HSDPA Subtest-2                           | 21.59      | 21.46      | 21.16        |
| HSDPA Subtest-3                           | 21.70      | 21.28      | 20.90        |
| HSDPA Subtest-4                           | 21.43      | 21.30      | 21.13        |
| HSUPA Subtest-1                           | 21.38      | 21.45      | 21.31        |
| HSUPA Subtest-2                           | 21.87      | 21.80      | 21.48        |
| HSUPA Subtest-3                           | 21.82      | 21.47      | 21.40        |
| HSUPA Subtest-4                           | 21.77      | 21.76      | 21.44        |
| HSUPA Subtest-5                           | 21.85      | 21.74      | 21.44        |

| WCDMA Band IV Maximum Average Power (dBm) |            |            |            |
|-------------------------------------------|------------|------------|------------|
| Channel                                   | 1312       | 1412       | 1513       |
| Frequency (MHz)                           | 1712.4 MHz | 1732.4 MHz | 1752.6 MHz |
| RMC 12.2K                                 | 22.62      | 22.65      | 22.63      |
| HSDPA Subtest-1                           | 21.66      | 21.50      | 21.75      |
| HSDPA Subtest-2                           | 21.75      | 21.71      | 21.80      |
| HSDPA Subtest-3                           | 21.68      | 21.62      | 21.73      |
| HSDPA Subtest-4                           | 21.83      | 21.93      | 21.89      |
| HSUPA Subtest-1                           | 21.37      | 21.28      | 21.33      |
| HSUPA Subtest-2                           | 21.93      | 21.78      | 21.88      |
| HSUPA Subtest-3                           | 21.98      | 21.92      | 21.96      |
| HSUPA Subtest-4                           | 21.89      | 21.80      | 21.90      |
| HSUPA Subtest-5                           | 21.77      | 21.69      | 21.82      |

| WCDMA Band V Maximum Average Power (dBm) |           |           |           |
|------------------------------------------|-----------|-----------|-----------|
| Channel                                  | 4132      | 4182      | 4233      |
| Frequency (MHz)                          | 826.4 MHz | 836.4 MHz | 846.6 MHz |
| RMC 12.2K                                | 22.82     | 22.83     | 22.79     |
| HSDPA Subtest-1                          | 21.32     | 21.42     | 21.32     |
| HSDPA Subtest-2                          | 21.22     | 21.13     | 21.09     |
| HSDPA Subtest-3                          | 20.81     | 20.73     | 20.83     |
| HSDPA Subtest-4                          | 20.84     | 20.85     | 20.74     |
| HSUPA Subtest-1                          | 21.53     | 21.45     | 21.59     |
| HSUPA Subtest-2                          | 21.85     | 21.92     | 21.87     |
| HSUPA Subtest-3                          | 21.76     | 22.20     | 22.02     |
| HSUPA Subtest-4                          | 21.86     | 22.13     | 21.85     |
| HSUPA Subtest-5                          | 21.23     | 21.16     | 21.32     |

Pre-scan all bandwidth and RB, find worse case mode are chosen to the report, the worse mode applicability and tested channel detail as below:

| Band                   | Radiated                                                                                       | Conducted                                                                                     |
|------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| GSM/GPRS/EDGE 850/1900 | 1) GSM (GMSK, 1Tx-slot) Link<br>2) GPRS (GMSK, 1Tx-slot) Link<br>3) EDGE (8PSK, 1Tx-slot) Link | 1) GSM (GMSK,1Tx-slot) Link<br>2) GPRS (GMSK, 1Tx-slot) Link<br>3) EDGE (8PSK, 1Tx-slot) Link |
| WCDMA Band II/IVV      | RMC 12.2kbps Link                                                                              | RMC 12.2kbps Link                                                                             |

## 5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

### 5.1 REFERENCE DOCUMENTS FOR TESTING

| No. | Identity                                       | Document Title                                                                                                                     |
|-----|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| 1   | FCC 47 CFR Part 2                              | Frequency allocations and radio treaty matters; general rules and regulations                                                      |
| 2   | FCC 47 CFR Part 22                             | Public Mobile Services                                                                                                             |
| 3   | FCC 47 CFR Part 27                             | Miscellaneous Wireless Communications Services                                                                                     |
| 4   | FCC 47 CFR Part 24                             | Personal Communications Services                                                                                                   |
| 5   | ANSI C63.26-2015                               | American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services                                  |
| 6   | KDB 971168 D01                                 | KDB 971168 D01 Power Meas License Digital Systems v03r01                                                                           |
| 7   | KDB 412172 D01 Determining ERP and EIRP v01r01 | Guidelines for determining the effective radiated power (ERP) and isotropically radiated power (EIRP) of an RF transmitting system |

### 5.2 MAXIMUM ERP/EIRP

**Test Requirement:** FCC 47 CFR Part 2.1046(a),  
FCC 47 CFR Part 22.913(a),  
FCC 47 CFR Part 24.232(c),  
FCC 47 CFR Part 27.50(d)(4)

**Test Method:** KDB 971168 D01v03r01 Section 5.6 & ANSI C63.26-2015

**Limit:**

**FCC 47 CFR Part 22.913(a)**

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

**FCC 47 CFR Part 24.232(c)**

Mobile and portable stations are limited to 2 watts EIRP.

**FCC 47 CFR Part 27.50(d)(4)**

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

**Test Procedure:**

According to KDB 412172 D01 Power Approach,

- $ERP \text{ or } EIRP = P_T + G_T - L_C$
- $ERP = EIRP - 2.15$

where

- $P_T$  = transmitter output power, expressed in dBW, dBm, or PSD;
- $G_T$  = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- $L_C$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

**Test Setup:** Refer to section 4.2.1 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** See table below

| Band        |       | Ant.<br>Gain<br>(dBi) | Maximum ERP/EIRP (dBm) |       |       |                | Maximum ERP/EIRP (W) |        |        |              | Result |
|-------------|-------|-----------------------|------------------------|-------|-------|----------------|----------------------|--------|--------|--------------|--------|
|             |       |                       | Low                    | Mid   | High  | Limit<br>(dBm) | Low                  | Mid    | High   | Limit<br>(W) |        |
| PCS<br>1900 | GSM   | -1.09                 | 29.21                  | 29.31 | 29.10 | 33.01          | 0.8337               | 0.8531 | 0.8128 | 2            | Pass   |
|             | GPRS  |                       | 29.23                  | 29.29 | 29.05 | 33.01          | 0.8375               | 0.8492 | 0.8035 | 2            | Pass   |
|             | EGPRS |                       | 24.34                  | 24.78 | 23.99 | 33.01          | 0.2716               | 0.3006 | 0.2506 | 2            | Pass   |
| GSM 850     | GSM   | 0.01                  | 30.85                  | 31.02 | 30.99 | 38.45          | 1.2162               | 1.2647 | 1.2560 | 7            | Pass   |
|             | GPRS  |                       | 30.88                  | 31.00 | 30.97 | 38.45          | 1.2246               | 1.2589 | 1.2503 | 7            | Pass   |
|             | EGPRS |                       | 23.31                  | 23.46 | 23.07 | 38.45          | 0.2143               | 0.2218 | 0.2028 | 7            | Pass   |

| Band             |           | Ant.<br>Gain<br>(dBi) | Maximum ERP/EIRP (dBm) |       |       |                | Maximum ERP/EIRP (W) |        |        |              | Result |
|------------------|-----------|-----------------------|------------------------|-------|-------|----------------|----------------------|--------|--------|--------------|--------|
|                  |           |                       | Low                    | Mid   | High  | Limit<br>(dBm) | Low                  | Mid    | High   | Limit<br>(W) |        |
| WCDMA<br>Band II | RMC 12.2K | -1.09                 | 21.50                  | 21.57 | 21.59 | 33.01          | 0.1413               | 0.1435 | 0.1442 | 2            | Pass   |
|                  | HSDPA     |                       | 20.77                  | 20.56 | 20.36 | 33.01          | 0.1194               | 0.1138 | 0.1086 | 2            | Pass   |
|                  | HSUPA     |                       | 20.78                  | 20.71 | 20.39 | 33.01          | 0.1197               | 0.1178 | 0.1094 | 2            | Pass   |
| WCDMA<br>Band IV | RMC 12.2K | -1.11                 | 21.51                  | 21.54 | 21.52 | 30             | 0.1416               | 0.1426 | 0.1419 | 1            | Pass   |
|                  | HSDPA     |                       | 20.72                  | 20.82 | 20.78 | 30             | 0.1180               | 0.1208 | 0.1197 | 1            | Pass   |
|                  | HSUPA     |                       | 20.87                  | 20.81 | 20.85 | 30             | 0.1222               | 0.1205 | 0.1216 | 1            | Pass   |
| WCDMA<br>Band V  | RMC 12.2K | 0.01                  | 20.68                  | 20.69 | 20.65 | 38.45          | 0.1169               | 0.1172 | 0.1161 | 7            | Pass   |
|                  | HSDPA     |                       | 19.18                  | 19.28 | 19.18 | 38.45          | 0.0828               | 0.0847 | 0.0828 | 7            | Pass   |
|                  | HSUPA     |                       | 19.72                  | 20.06 | 19.88 | 38.45          | 0.0938               | 0.1014 | 0.0973 | 7            | Pass   |

Note: The maximum ERP/EIRP is calculated from max output power and antenna gain, the antenna gain provided by the customer, and the customer takes all the responsibilities for the accuracy of antenna gain.

### 5.3 CONDUCTED OUTPUT POWER

**Test Requirement:** FCC 47 CFR Part 2.1046(a),  
FCC 47 CFR Part 22.913(a),  
FCC 47 CFR Part 24.232(c),  
FCC 47 CFR Part 27.50(d)(4)

**Test Method:** KDB 971168 D01v03r01 & ANSI C63.26-2015

**Limit:**

**FCC 47 CFR Part 22.913(a)**

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

**FCC 47 CFR Part 24.232(c)**

Mobile and portable stations are limited to 2 watts EIRP.

**FCC 47 CFR Part 27.50(d)(4)**

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

**Test Procedure:**

The EUT was set up for the maximum power with GSM, GPRS, EDGE, WCDMA, CDMA2000, and LTE link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** The full result refer to section 4.5 for details.

## 5.4 PEAK-TO-AVERAGE RATIO

**Test Requirement:** FCC 47 CFR Part 22.913(a),  
FCC 47 CFR Part 24.232(c),  
FCC 47 CFR Part 27.50(d)(5)

**Test Method:** KDB 971168 D01v03r01 Section 5.7

**Limit:** In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB

**Test Procedure:**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth
- Set the number of counts to a value that stabilizes the measured CCDF curve
- Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** Please refer to Appendix A

**5.599%&26DB BANDWIDTH**

**Test Requirement:** FCC 47 CFR Part 2.1049(h),  
FCC 47 CFR Part 22.917(b),  
FCC 47 CFR Part 24.238(b),  
FCC 47 CFR Part 27.53(h)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4

**Limit:** No Limit, for reporting purposes only.

**Test Procedure:**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Pass

**Test Data:** Please refer to Appendix A

## 5.6 BAND EDGE AT ANTENNA TERMINALS

**Test Requirement:** FCC 47 CFR Part 2.1051,  
FCC 47 CFR Part 22.917(a),  
FCC 47 CFR Part 24.238(a),  
FCC 47 CFR Part 27.53(h)(1)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limit:**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**Test Procedure:**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -13 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.
- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Please refer to Appendix A

## 5.7 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

**Test Requirement:** FCC 47 CFR Part 2.1051,  
FCC 47 CFR Part 22.917(a)(b),  
FCC 47 CFR Part 24.238(a)(b),  
FCC 47 CFR Part 27.53(h)(1)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limit:**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**Test Procedure:**

The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range. b. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Setup:** Refer to section 4.2.2 for details.

**Instruments Used:** Refer to section 3 for details

**Test Mode:** Link mode

**Test Results:** Please refer to Appendix A

## 5.8 FIELD STRENGTH OF SPURIOUS RADIATION

**Test Requirement:** FCC 47 CFR Part 2.1053,  
FCC 47 CFR Part 22.917(a)(b),  
FCC 47 CFR Part 24.238(a)(b),  
FCC 47 CFR Part 27.53(h)(1)

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 7

**Limits:**

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13 dBm.

**Test Setup:** Refer to section 4.2.1 for details.

**Test Procedures:** KDB 971168 D01v03r01 Section 7

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

**The worst measurement data as follows:**

| GSM 850         |           |            |                   |             |       |        |            |
|-----------------|-----------|------------|-------------------|-------------|-------|--------|------------|
| No.             | Frequency | SA Reading | Correction factor | EIRP Result | Limit | Margin | Ant. Pol.  |
|                 | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm) | (dB)   |            |
| Lowest Channel  |           |            |                   |             |       |        |            |
| 1               | 793.028   | -88.7      | 41.8              | -46.9       | -13.0 | -33.9  | Horizontal |
| 2               | 919.132   | -87.9      | 43.0              | -44.9       | -13.0 | -31.9  | Horizontal |
| 3               | 972.283   | -88.1      | 43.0              | -45.2       | -13.0 | -32.2  | Horizontal |
| 4               | 1648.4    | -51.3      | 0.0               | -51.3       | -13.0 | -38.3  | Horizontal |
| 5               | 4121      | -57.5      | 9.6               | -47.9       | -13.0 | -34.9  | Horizontal |
| 6               | 776.485   | -88.6      | 41.5              | -47.0       | -13.0 | -34.0  | Vertical   |
| 7               | 875.013   | -88.0      | 42.6              | -45.4       | -13.0 | -32.4  | Vertical   |
| 8               | 986.044   | -87.9      | 43.1              | -44.8       | -13.0 | -31.8  | Vertical   |
| 9               | 1648.4    | -48.8      | 0.0               | -48.8       | -13.0 | -35.8  | Vertical   |
| 10              | 4121      | -54.8      | 9.6               | -45.3       | -13.0 | -32.3  | Vertical   |
| Middle Channel  |           |            |                   |             |       |        |            |
| 1               | 804.252   | -87.8      | 41.7              | -46.2       | -13.0 | -33.2  | Horizontal |
| 2               | 906.304   | -87.8      | 42.9              | -44.9       | -13.0 | -31.9  | Horizontal |
| 3               | 958.714   | -87.8      | 42.9              | -45.0       | -13.0 | -32.0  | Horizontal |
| 4               | 1673.2    | -49.6      | 0.2               | -49.5       | -13.0 | -36.5  | Horizontal |
| 5               | 4183      | -59.9      | 9.6               | -50.3       | -13.0 | -37.3  | Horizontal |
| 6               | 754.963   | -88.8      | 40.9              | -47.9       | -13.0 | -34.9  | Vertical   |
| 7               | 787.475   | -88.8      | 41.7              | -47.0       | -13.0 | -34.0  | Vertical   |
| 8               | 938.714   | -88.3      | 43.2              | -45.1       | -13.0 | -32.1  | Vertical   |
| 9               | 1673.2    | -48.8      | 0.2               | -48.6       | -13.0 | -35.6  | Vertical   |
| 10              | 4183      | -56.5      | 9.6               | -46.8       | -13.0 | -33.8  | Vertical   |
| Highest Channel |           |            |                   |             |       |        |            |
| 1               | 754.963   | -88.6      | 40.9              | -47.7       | -13.0 | -34.7  | Horizontal |
| 2               | 815.635   | -88.4      | 41.5              | -46.9       | -13.0 | -33.9  | Horizontal |
| 3               | 952.000   | -87.9      | 42.9              | -44.9       | -13.0 | -31.9  | Horizontal |
| 4               | 1697.6    | -50.2      | 0.3               | -50.0       | -13.0 | -37.0  | Horizontal |
| 5               | 4244      | -59.4      | 9.7               | -49.7       | -13.0 | -36.7  | Horizontal |
| 6               | 781.961   | -88.3      | 41.6              | -46.7       | -13.0 | -33.7  | Vertical   |
| 7               | 932.141   | -87.7      | 43.3              | -44.4       | -13.0 | -31.4  | Vertical   |
| 8               | 979.139   | -86.9      | 43.2              | -43.7       | -13.0 | -30.7  | Vertical   |
| 9               | 1697.6    | -50.1      | 0.3               | -49.8       | -13.0 | -36.8  | Vertical   |
| 10              | 4244      | -57.5      | 9.7               | -47.8       | -13.0 | -34.8  | Vertical   |

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| PCS 1900        |           |            |                   |             |       |        |            |
|-----------------|-----------|------------|-------------------|-------------|-------|--------|------------|
| No.             | Frequency | SA Reading | Correction factor | EIRP Result | Limit | Margin | Ant. Pol.  |
|                 | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm) | (dB)   |            |
| Lowest Channel  |           |            |                   |             |       |        |            |
| 1               | 856.76    | -79.5      | 13.1              | -66.4       | -13.0 | -53.4  | Horizontal |
| 2               | 925.613   | -80.6      | 14.7              | -65.9       | -13.0 | -52.9  | Horizontal |
| 3               | 979.139   | -80.5      | 14.9              | -65.6       | -13.0 | -52.6  | Horizontal |
| 4               | 3700.4    | -68.6      | 8.6               | -60.0       | -13.0 | -47.0  | Horizontal |
| 5               | 5550.6    | -66.6      | 12.1              | -54.5       | -13.0 | -41.5  | Horizontal |
| 6               | 833.013   | -81.1      | 13.1              | -68.0       | -13.0 | -55.0  | Vertical   |
| 7               | 899.958   | -80.8      | 14.3              | -66.5       | -13.0 | -53.5  | Vertical   |
| 8               | 938.714   | -81.3      | 14.7              | -66.6       | -13.0 | -53.6  | Vertical   |
| 9               | 3700.4    | -68.4      | 8.6               | -59.8       | -13.0 | -46.8  | Vertical   |
| 10              | 5550.6    | -63.2      | 12.1              | -51.1       | -13.0 | -38.1  | Vertical   |
| Middle Channel  |           |            |                   |             |       |        |            |
| 1               | 893.656   | -80.9      | 14.1              | -66.8       | -13.0 | -53.8  | Horizontal |
| 2               | 932.141   | -81.4      | 14.9              | -66.5       | -13.0 | -53.5  | Horizontal |
| 3               | 972.283   | -81.3      | 14.6              | -66.7       | -13.0 | -53.7  | Horizontal |
| 4               | 3760      | -64.7      | 8.8               | -55.9       | -13.0 | -42.9  | Horizontal |
| 5               | 5640      | -63.8      | 12.0              | -51.8       | -13.0 | -38.8  | Horizontal |
| 6               | 776.485   | -80.6      | 12.7              | -67.9       | -13.0 | -54.9  | Vertical   |
| 7               | 868.886   | -80.8      | 13.7              | -67.1       | -13.0 | -54.1  | Vertical   |
| 8               | 979.139   | -81.6      | 14.9              | -66.8       | -13.0 | -53.8  | Vertical   |
| 9               | 3760      | -65.6      | 8.8               | -56.8       | -13.0 | -43.8  | Vertical   |
| 10              | 5640      | -65.4      | 12.0              | -53.4       | -13.0 | -40.4  | Vertical   |
| Highest Channel |           |            |                   |             |       |        |            |
| 1               | 698.804   | -80.6      | 12.0              | -68.6       | -13.0 | -55.6  | Horizontal |
| 2               | 776.485   | -79.9      | 12.7              | -67.2       | -13.0 | -54.2  | Horizontal |
| 3               | 932.141   | -81.1      | 14.9              | -66.2       | -13.0 | -53.2  | Horizontal |
| 4               | 3819.6    | -62.6      | 9.0               | -53.7       | -13.0 | -40.7  | Horizontal |
| 5               | 5729.4    | -62.4      | 11.9              | -50.5       | -13.0 | -37.5  | Horizontal |
| 6               | 793.028   | -80.9      | 13.0              | -67.9       | -13.0 | -54.9  | Vertical   |
| 7               | 868.886   | -80.9      | 13.7              | -67.2       | -13.0 | -54.2  | Vertical   |
| 8               | 979.139   | -81.2      | 14.9              | -66.3       | -13.0 | -53.3  | Vertical   |
| 9               | 3819.6    | -65.9      | 9.0               | -57.0       | -13.0 | -44.0  | Vertical   |
| 10              | 5729.4    | -64.4      | 11.9              | -52.5       | -13.0 | -39.5  | Vertical   |

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| WCDMA Band II                  |           |            |                   |             |       |        |            |
|--------------------------------|-----------|------------|-------------------|-------------|-------|--------|------------|
| No.                            | Frequency | SA Reading | Correction factor | EIRP Result | Limit | Margin | Ant. Pol.  |
|                                | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm) | (dB)   |            |
| RMC 12.2kbps _ Lowest Channel  |           |            |                   |             |       |        |            |
| 1                              | 739.214   | -80.8      | 11.8              | -69.0       | -13.0 | -56.0  | Horizontal |
| 2                              | 798.62    | -79.8      | 13.0              | -66.8       | -13.0 | -53.8  | Horizontal |
| 3                              | 958.714   | -80.4      | 14.5              | -65.9       | -13.0 | -52.9  | Horizontal |
| 4                              | 3704.8    | -65.6      | 8.6               | -57.0       | -13.0 | -44.0  | Horizontal |
| 5                              | 5557.2    | -66.5      | 12.1              | -54.4       | -13.0 | -41.4  | Horizontal |
| 6                              | 689.051   | -80.1      | 11.6              | -68.5       | -13.0 | -55.5  | Vertical   |
| 7                              | 952.000   | -80.2      | 14.5              | -65.7       | -13.0 | -52.7  | Vertical   |
| 8                              | 1000      | -80.7      | 15.0              | -65.7       | -13.0 | -52.7  | Vertical   |
| 9                              | 3704.8    | -66.0      | 8.6               | -57.3       | -13.0 | -44.3  | Vertical   |
| 10                             | 3760      | -63.5      | 8.8               | -54.7       | -13.0 | -41.7  | Vertical   |
| 11                             | 5557.2    | -66.5      | 12.1              | -54.4       | -13.0 | -41.4  | Vertical   |
| 12                             | 5640      | -72.7      | 12.0              | -60.7       | -13.0 | -47.7  | Vertical   |
| RMC 12.2kbps _ Middle Channel  |           |            |                   |             |       |        |            |
| 1                              | 739.214   | -79.9      | 11.8              | -68.1       | -13.0 | -55.1  | Horizontal |
| 2                              | 850.76    | -80.3      | 13.1              | -67.2       | -13.0 | -54.2  | Horizontal |
| 3                              | 992.997   | -80.3      | 14.8              | -65.5       | -13.0 | -52.5  | Horizontal |
| 4                              | 3760      | -65.1      | 8.8               | -56.4       | -13.0 | -43.4  | Horizontal |
| 5                              | 5640      | -66.1      | 12.0              | -54.1       | -13.0 | -41.1  | Horizontal |
| 6                              | 856.76    | -80.6      | 13.1              | -67.5       | -13.0 | -54.5  | Vertical   |
| 7                              | 919.132   | -80.4      | 14.5              | -65.9       | -13.0 | -52.9  | Vertical   |
| 8                              | 979.139   | -80.4      | 14.9              | -65.5       | -13.0 | -52.5  | Vertical   |
| 9                              | 3760      | -63.8      | 8.8               | -55.0       | -13.0 | -42.0  | Vertical   |
| 10                             | 5640      | -66.7      | 12.0              | -54.7       | -13.0 | -41.7  | Vertical   |
| RMC 12.2kbps _ Highest Channel |           |            |                   |             |       |        |            |
| 1                              | 787.475   | -80.7      | 12.9              | -67.7       | -13.0 | -54.7  | Horizontal |
| 2                              | 881.184   | -80.5      | 13.7              | -66.9       | -13.0 | -53.9  | Horizontal |
| 3                              | 932.141   | -81.8      | 14.9              | -67.0       | -13.0 | -54.0  | Horizontal |
| 4                              | 3815.2    | -61.5      | 8.9               | -52.5       | -13.0 | -39.5  | Horizontal |
| 5                              | 5722.8    | -63.0      | 11.9              | -51.1       | -13.0 | -38.1  | Horizontal |
| 6                              | 739.214   | -81.1      | 11.8              | -69.3       | -13.0 | -56.3  | Vertical   |
| 7                              | 838.887   | -81.0      | 13.1              | -67.9       | -13.0 | -54.9  | Vertical   |
| 8                              | 906.304   | -80.9      | 14.4              | -66.5       | -13.0 | -53.5  | Vertical   |
| 9                              | 3815.2    | -60.2      | 8.9               | -51.3       | -13.0 | -38.3  | Vertical   |
| 10                             | 5722.8    | -68.2      | 11.9              | -56.3       | -13.0 | -43.3  | Vertical   |

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| WCDMA Band IV                 |           |            |                   |             |       |        |            |
|-------------------------------|-----------|------------|-------------------|-------------|-------|--------|------------|
| No.                           | Frequency | SA Reading | Correction factor | EIRP Result | Limit | Margin | Ant. Pol.  |
|                               | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm) | (dB)   |            |
| RMC 12.2kbps_ Lowest Channel  |           |            |                   |             |       |        |            |
| 1                             | 798.62    | -81.0      | 13.0              | -68.1       | -13.0 | -55.1  | Horizontal |
| 2                             | 925.613   | -80.8      | 14.7              | -66.1       | -13.0 | -53.1  | Horizontal |
| 3                             | 965.474   | -81.2      | 14.5              | -66.8       | -13.0 | -53.8  | Horizontal |
| 4                             | 3424.8    | -65.0      | 7.5               | -57.5       | -13.0 | -44.5  | Horizontal |
| 5                             | 5137.2    | -67.4      | 10.8              | -56.7       | -13.0 | -43.7  | Horizontal |
| 6                             | 833.013   | -80.6      | 13.1              | -67.5       | -13.0 | -54.5  | Vertical   |
| 7                             | 906.304   | -80.9      | 14.4              | -66.5       | -13.0 | -53.5  | Vertical   |
| 8                             | 932.141   | -81.2      | 14.9              | -66.4       | -13.0 | -53.4  | Vertical   |
| 9                             | 3424.8    | -66.3      | 7.5               | -58.8       | -13.0 | -45.8  | Vertical   |
| 10                            | 5137.2    | -67.3      | 10.8              | -56.5       | -13.0 | -43.5  | Vertical   |
| RMC 12.2kbps_ Middle Channel  |           |            |                   |             |       |        |            |
| 1                             | 899.958   | -81.3      | 14.3              | -67.0       | -13.0 | -54.0  | Horizontal |
| 2                             | 925.613   | -81.3      | 14.7              | -66.6       | -13.0 | -53.6  | Horizontal |
| 3                             | 992.997   | -80.6      | 14.8              | -65.7       | -13.0 | -52.7  | Horizontal |
| 4                             | 3464.8    | -65.4      | 7.7               | -57.7       | -13.0 | -44.7  | Horizontal |
| 5                             | 5197.2    | -64.6      | 10.9              | -53.7       | -13.0 | -40.7  | Horizontal |
| 6                             | 703.731   | -79.9      | 11.9              | -68.0       | -13.0 | -55.0  | Vertical   |
| 7                             | 804.252   | -80.8      | 12.9              | -67.9       | -13.0 | -54.9  | Vertical   |
| 8                             | 925.613   | -81.1      | 14.7              | -66.4       | -13.0 | -53.4  | Vertical   |
| 9                             | 3464.8    | -65.0      | 7.7               | -57.2       | -13.0 | -44.2  | Vertical   |
| 10                            | 5197.2    | -66.5      | 10.9              | -55.6       | -13.0 | -42.6  | Vertical   |
| RMC 12.2kbps_ Highest Channel |           |            |                   |             |       |        |            |
| 1                             | 833.013   | -80.5      | 13.1              | -67.4       | -13.0 | -54.4  | Horizontal |
| 2                             | 906.304   | -80.8      | 14.4              | -66.4       | -13.0 | -53.4  | Horizontal |
| 3                             | 938.714   | -80.7      | 14.7              | -66.0       | -13.0 | -53.0  | Horizontal |
| 4                             | 3505.200  | -65.2      | 8.0               | -57.2       | -13.0 | -44.2  | Horizontal |
| 5                             | 5257.800  | -66.4      | 11.2              | -55.3       | -13.0 | -42.3  | Horizontal |
| 6                             | 698.804   | -80.7      | 12.0              | -68.6       | -13.0 | -55.6  | Vertical   |
| 7                             | 793.028   | -80.9      | 13.0              | -67.9       | -13.0 | -54.9  | Vertical   |
| 8                             | 919.132   | -81.1      | 14.5              | -66.5       | -13.0 | -53.5  | Vertical   |
| 9                             | 3505.2    | -66.1      | 8.0               | -58.1       | -13.0 | -45.1  | Vertical   |
| 10                            | 5257.8    | -68.4      | 11.2              | -57.2       | -13.0 | -44.2  | Vertical   |

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| WCDMA Band V                   |           |            |                   |             |       |        |            |
|--------------------------------|-----------|------------|-------------------|-------------|-------|--------|------------|
| No.                            | Frequency | SA Reading | Correction factor | EIRP Result | Limit | Margin | Ant. Pol.  |
|                                | (MHz)     | (dBm)      | (dB/m)            | (dBm)       | (dBm) | (dB)   |            |
| RMC 12.2kbps _ Lowest Channel  |           |            |                   |             |       |        |            |
| 1                              | 793.028   | -89.0      | 41.8              | -47.2       | -13.0 | -34.2  | Horizontal |
| 2                              | 925.613   | -88.2      | 43.2              | -45.0       | -13.0 | -32.0  | Horizontal |
| 3                              | 992.997   | -86.6      | 43.2              | -43.4       | -13.0 | -30.4  | Horizontal |
| 4                              | 1652.8    | -59.8      | 0.1               | -59.7       | -13.0 | -46.7  | Horizontal |
| 5                              | 2479.2    | -62.1      | 4.1               | -58.1       | -13.0 | -45.1  | Horizontal |
| 6                              | 760.287   | -88.6      | 41.1              | -47.5       | -13.0 | -34.5  | Vertical   |
| 7                              | 793.028   | -89.1      | 41.8              | -47.3       | -13.0 | -34.3  | Vertical   |
| 8                              | 932.141   | -88.0      | 43.3              | -44.7       | -13.0 | -31.7  | Vertical   |
| 9                              | 1652.8    | -58.9      | 0.1               | -58.8       | -13.0 | -45.8  | Vertical   |
| 10                             | 2479.2    | -58.8      | 4.1               | -54.8       | -13.0 | -41.8  | Vertical   |
| RMC 12.2kbps _ Middle Channel  |           |            |                   |             |       |        |            |
| 1                              | 787.475   | -88.9      | 41.7              | -47.2       | -13.0 | -34.2  | Horizontal |
| 2                              | 887.398   | -87.9      | 42.4              | -45.4       | -13.0 | -32.4  | Horizontal |
| 3                              | 952.000   | -88.2      | 42.9              | -45.2       | -13.0 | -32.2  | Horizontal |
| 4                              | 1672.8    | -60.8      | 0.2               | -60.7       | -13.0 | -47.7  | Horizontal |
| 5                              | 2509.2    | -61.8      | 4.2               | -57.6       | -13.0 | -44.6  | Horizontal |
| 6                              | 689.051   | -88.4      | 40.4              | -48.0       | -13.0 | -35.0  | Vertical   |
| 7                              | 804.252   | -87.9      | 41.7              | -46.2       | -13.0 | -33.2  | Vertical   |
| 8                              | 938.714   | -88.1      | 43.2              | -44.9       | -13.0 | -31.9  | Vertical   |
| 9                              | 1672.8    | -60.9      | 0.2               | -60.8       | -13.0 | -47.8  | Vertical   |
| 10                             | 2509.2    | -57.7      | 4.2               | -53.5       | -13.0 | -40.5  | Vertical   |
| RMC 12.2kbps _ Highest Channel |           |            |                   |             |       |        |            |
| 1                              | 893.656   | -88.2      | 42.7              | -45.5       | -13.0 | -32.5  | Horizontal |
| 2                              | 958.714   | -87.9      | 42.9              | -45.0       | -13.0 | -32.0  | Horizontal |
| 3                              | 986.044   | -87.6      | 43.1              | -44.5       | -13.0 | -31.5  | Horizontal |
| 4                              | 1693.2    | -60.6      | 0.3               | -60.4       | -13.0 | -47.4  | Horizontal |
| 5                              | 2539.8    | -60.9      | 4.3               | -56.6       | -13.0 | -43.6  | Horizontal |
| 6                              | 698.804   | -89.8      | 40.8              | -49.0       | -13.0 | -36.0  | Vertical   |
| 7                              | 809.924   | -88.9      | 41.5              | -47.5       | -13.0 | -34.5  | Vertical   |
| 8                              | 938.714   | -88.3      | 43.2              | -45.1       | -13.0 | -32.1  | Vertical   |
| 9                              | 1693.2    | -61.4      | 0.3               | -61.1       | -13.0 | -48.1  | Vertical   |
| 10                             | 2539.8    | -59.7      | 4.3               | -55.5       | -13.0 | -42.5  | Vertical   |

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

## 5.9 FREQUENCY STABILITY

**Test Requirement:** FCC 47 CFR Part 2.1055 &  
FCC 47 CFR Part 22.355 &  
FCC 47 CFR Part 24.235 &  
FCC 47 CFR Part 27.54

**Test Method:** ANSI C63.26-2015 & KDB 971168 D01v03r01

**Limits:**

**FCC 47 CFR Part 22.355,**

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

**FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54**

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

**Test Setup:** Refer to section 4.2.2 for details.

**Test Procedures:**

1) Use CMW 500 with Frequency Error measurement capability.

a) Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$

b) Voltage = low voltage, 3.4 Vdc, Normal, 3.8 Vdc and High voltage, 4.35 Vdc.

2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

| Modulation       | Channel/<br>Frequency<br>(MHz) | Voltage<br>(Vdc) | Temperature<br>( $^{\circ}\text{C}$ ) | Deviation<br>(Hz) | Deviation<br>(ppm) | Limit<br>(ppm) | Result |
|------------------|--------------------------------|------------------|---------------------------------------|-------------------|--------------------|----------------|--------|
| GSM 850 1Tx-slot |                                |                  |                                       |                   |                    |                |        |
| GMSK             | 190 / 836.6                    | VL               | TN                                    | -3.57             | -0.0043            | $\pm 2.5$      | Pass   |
|                  |                                | VN               |                                       | -4.06             | -0.0049            | $\pm 2.5$      | Pass   |
|                  |                                | VH               |                                       | -4.89             | -0.0058            | $\pm 2.5$      | Pass   |
|                  |                                | VN               | 50                                    | -4.38             | -0.0052            | $\pm 2.5$      | Pass   |
|                  |                                |                  | 40                                    | -4.07             | -0.0049            | $\pm 2.5$      | Pass   |
|                  |                                |                  | 30                                    | -3.29             | -0.0039            | $\pm 2.5$      | Pass   |
|                  |                                |                  | 20                                    | -4.06             | -0.0049            | $\pm 2.5$      | Pass   |
|                  |                                |                  | 10                                    | -1.94             | -0.0023            | $\pm 2.5$      | Pass   |
|                  |                                |                  | 0                                     | -3.35             | -0.0040            | $\pm 2.5$      | Pass   |
|                  |                                |                  | -10                                   | -3.28             | -0.0039            | $\pm 2.5$      | Pass   |
|                  |                                |                  | -20                                   | -3.54             | -0.0042            | $\pm 2.5$      | Pass   |
|                  |                                |                  | -30                                   | 2.51              | 0.0030             | $\pm 2.5$      | Pass   |

| Modulation        | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit  | Result |
|-------------------|-----------------------|---------|-------------|-----------|-----------|--------|--------|
|                   | (MHz)                 | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm)  |        |
| GSM 1900 1Tx-slot |                       |         |             |           |           |        |        |
| GMSK              | 661 / 1880.0          | VL      | TN          | 7.38      | 0.0039    | Note 1 | Pass   |
|                   |                       | VN      |             | 6.28      | 0.0033    |        | Pass   |
|                   |                       | VH      |             | 8.14      | 0.0043    |        | Pass   |
|                   |                       | VN      | 50          | 0.71      | 0.0004    |        | Pass   |
|                   |                       |         | 40          | 9.54      | 0.0051    |        | Pass   |
|                   |                       |         | 30          | 10.49     | 0.0056    |        | Pass   |
|                   |                       |         | 20          | 6.28      | 0.0033    |        | Pass   |
|                   |                       |         | 10          | 5.21      | 0.0028    |        | Pass   |
|                   |                       |         | 0           | 7.33      | 0.0039    |        | Pass   |
|                   |                       |         | -10         | 6.14      | 0.0033    |        | Pass   |
|                   |                       |         | -20         | 7.39      | 0.0039    |        | Pass   |
|                   |                       |         | -30         | 4.92      | 0.0026    |        | Pass   |

| Modulation        | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit | Result |
|-------------------|-----------------------|---------|-------------|-----------|-----------|-------|--------|
|                   | (MHz)                 | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm) |        |
| EDGE 850 1Tx-slot |                       |         |             |           |           |       |        |
| 8PSK              | 190 / 836.6           | VL      | TN          | 12.14     | 0.0145    | ± 2.5 | Pass   |
|                   |                       | VN      |             | 10.83     | 0.0129    | ± 2.5 | Pass   |
|                   |                       | VH      |             | 11.79     | 0.0141    | ± 2.5 | Pass   |
|                   |                       | VN      | 50          | 9.66      | 0.0115    | ± 2.5 | Pass   |
|                   |                       |         | 40          | 8.57      | 0.0102    | ± 2.5 | Pass   |
|                   |                       |         | 30          | 9.07      | 0.0108    | ± 2.5 | Pass   |
|                   |                       |         | 20          | 10.83     | 0.0129    | ± 2.5 | Pass   |
|                   |                       |         | 10          | 6.99      | 0.0084    | ± 2.5 | Pass   |
|                   |                       |         | 0           | 8.63      | 0.0103    | ± 2.5 | Pass   |
|                   |                       |         | -10         | 7.46      | 0.0089    | ± 2.5 | Pass   |
|                   |                       |         | -20         | 8.98      | 0.0107    | ± 2.5 | Pass   |
|                   |                       |         | -30         | 10.25     | 0.0123    | ± 2.5 | Pass   |

| Modulation         | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit  | Result |
|--------------------|-----------------------|---------|-------------|-----------|-----------|--------|--------|
|                    | (MHz)                 | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm)  |        |
| EDGE 1900 1Tx-slot |                       |         |             |           |           |        |        |
| 8PSK               | 661 / 1880.0          | VL      | TN          | -5.41     | -0.0029   | Note 1 | Pass   |
|                    |                       | VN      |             | -3.29     | -0.0018   |        | Pass   |
|                    |                       | VH      |             | -2.17     | -0.0012   |        | Pass   |
|                    |                       | VN      | 50          | -3.45     | -0.0018   |        | Pass   |
|                    |                       |         | 40          | -3.82     | -0.0020   |        | Pass   |
|                    |                       |         | 30          | -2.76     | -0.0015   |        | Pass   |
|                    |                       |         | 20          | -3.29     | -0.0018   |        | Pass   |
|                    |                       |         | 10          | -2.21     | -0.0012   |        | Pass   |
|                    |                       |         | 0           | -3.32     | -0.0018   |        | Pass   |
|                    |                       |         | -10         | -3.19     | -0.0017   |        | Pass   |
|                    |                       |         | -20         | -4.47     | -0.0024   |        | Pass   |
|                    |                       |         | -30         | -5.13     | -0.0027   |        | Pass   |

| Modulation            | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit  | Result |
|-----------------------|-----------------------|---------|-------------|-----------|-----------|--------|--------|
|                       | (MHz)                 | (Vdc)   | (℃)         | (Hz)      | (ppm)     | (ppm)  |        |
| WCDMA II RMC 12.2Kbps |                       |         |             |           |           |        |        |
| BPSK                  | 9400 / 1880.0         | VL      | TN          | -3.83     | -0.0020   | Note 1 | Pass   |
|                       |                       | VN      |             | -5.62     | -0.0030   |        | Pass   |
|                       |                       | VH      |             | -4.12     | -0.0022   |        | Pass   |
|                       |                       | VN      | 50          | -5.44     | -0.0029   |        | Pass   |
|                       |                       |         | 40          | -4.88     | -0.0026   |        | Pass   |
|                       |                       |         | 30          | -4.31     | -0.0023   |        | Pass   |
|                       |                       |         | 20          | -5.62     | -0.0030   |        | Pass   |
|                       |                       |         | 10          | -4.37     | -0.0023   |        | Pass   |
|                       |                       |         | 0           | -5.24     | -0.0028   |        | Pass   |
|                       |                       |         | -10         | -4.29     | -0.0023   |        | Pass   |
|                       |                       |         | -20         | -5.84     | -0.0031   |        | Pass   |
|                       |                       |         | -30         | -5.49     | -0.0029   |        | Pass   |

| Modulation            | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit  | Result |
|-----------------------|-----------------------|---------|-------------|-----------|-----------|--------|--------|
|                       | (MHz)                 | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm)  |        |
| WCDMA IV RMC 12.2Kbps |                       |         |             |           |           |        |        |
| BPSK                  | 1412 / 1732.4         | VL      | TN          | 3.95      | 0.0023    | Note 1 | Pass   |
|                       |                       | VN      |             | 2.19      | 0.0013    |        | Pass   |
|                       |                       | VH      |             | 5.63      | 0.0032    |        | Pass   |
|                       |                       | VN      | 50          | 4.15      | 0.0024    |        | Pass   |
|                       |                       |         | 40          | 5.73      | 0.0033    |        | Pass   |
|                       |                       |         | 30          | 4.23      | 0.0024    |        | Pass   |
|                       |                       |         | 20          | 2.19      | 0.0013    |        | Pass   |
|                       |                       |         | 10          | 2.82      | 0.0016    |        | Pass   |
|                       |                       |         | 0           | 3.26      | 0.0019    |        | Pass   |
|                       |                       |         | -10         | 4.13      | 0.0024    |        | Pass   |
|                       |                       |         | -20         | 5.22      | 0.0030    |        | Pass   |
|                       |                       |         | -30         | 4.91      | 0.0028    |        | Pass   |

| Modulation           | Channel/<br>Frequency | Voltage | Temperature | Deviation | Deviation | Limit | Result |
|----------------------|-----------------------|---------|-------------|-----------|-----------|-------|--------|
|                      | (MHz)                 | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm) |        |
| WCDMA V RMC 12.2Kbps |                       |         |             |           |           |       |        |
| BPSK                 | 4182 / 836.4          | VL      | TN          | 5.29      | 0.0063    | ± 2.5 | Pass   |
|                      |                       | VN      |             | 7.73      | 0.0092    | ± 2.5 | Pass   |
|                      |                       | VH      |             | 8.34      | 0.0100    | ± 2.5 | Pass   |
|                      |                       | VN      | 50          | 8.39      | 0.0100    | ± 2.5 | Pass   |
|                      |                       |         | 40          | 6.69      | 0.0080    | ± 2.5 | Pass   |
|                      |                       |         | 30          | 8.35      | 0.0100    | ± 2.5 | Pass   |
|                      |                       |         | 20          | 7.73      | 0.0092    | ± 2.5 | Pass   |
|                      |                       |         | 10          | 6.83      | 0.0082    | ± 2.5 | Pass   |
|                      |                       |         | 0           | 5.54      | 0.0066    | ± 2.5 | Pass   |
|                      |                       |         | -10         | 6.32      | 0.0076    | ± 2.5 | Pass   |
|                      |                       |         | -20         | 7.19      | 0.0086    | ± 2.5 | Pass   |
|                      |                       |         | -30         | 4.92      | 0.0059    | ± 2.5 | Pass   |

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## APPENDIX A RF TEST DATA

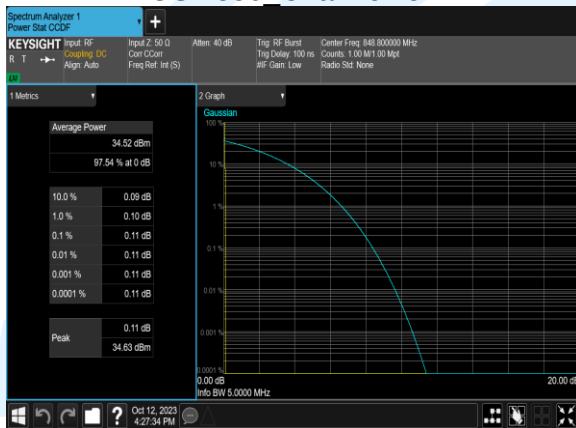
## A.1 GSM 850

## Peak to Average Ratio

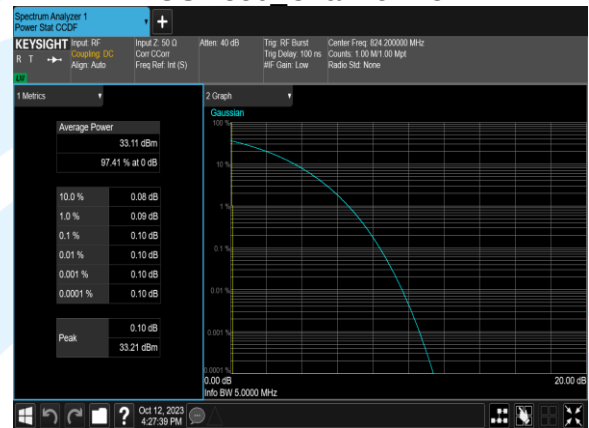
| Band      | Channel | Freq (MHz) | Slots | Result (dB) | Limit (dB) | Verdict |
|-----------|---------|------------|-------|-------------|------------|---------|
| GSM 850   | 251     | 848.8      | 1 Tx  | 0.11        | 13         | PASS    |
| GSM 850   | 128     | 824.2      | 1 Tx  | 0.10        | 13         | PASS    |
| GSM 850   | 190     | 836.6      | 1 Tx  | 0.09        | 13         | PASS    |
| GPRS 850  | 190     | 836.6      | 1 Tx  | 0.10        | 13         | PASS    |
| GPRS 850  | 128     | 824.2      | 1 Tx  | 0.09        | 13         | PASS    |
| GPRS 850  | 251     | 848.8      | 1 Tx  | 0.10        | 13         | PASS    |
| EGPRS 850 | 190     | 836.6      | 1 Tx  | 5.91        | 13         | PASS    |
| EGPRS 850 | 128     | 824.2      | 1 Tx  | 6.48        | 13         | PASS    |
| EGPRS 850 | 251     | 848.8      | 1 Tx  | 8.11        | 13         | PASS    |

## Test Graphs

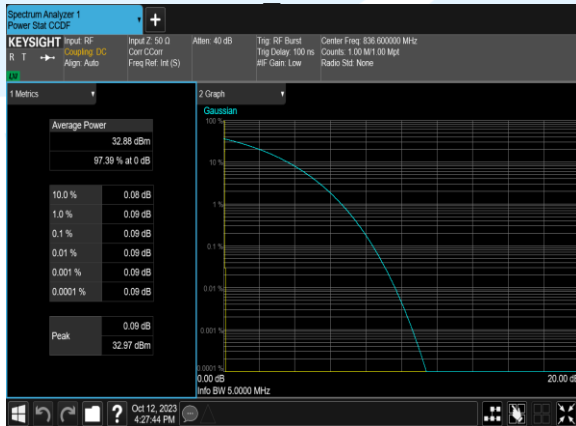
GSM850 Channel251



GSM850 Channel128



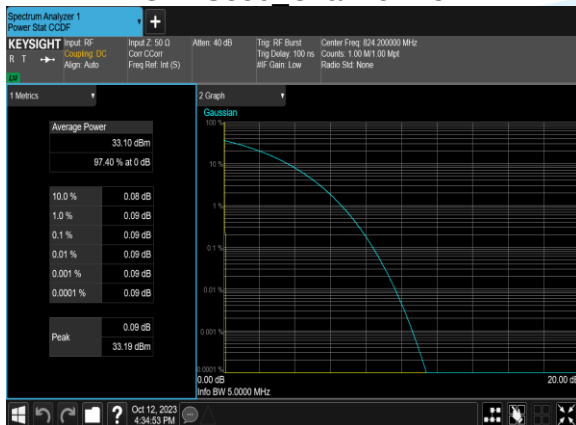
GSM850 Channel190



GPRS850 Channel190



GPRS850 Channel128



GPRS850 Channel251



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EGPRS850 Channel190



EGPRS850 Channel128



EGPRS850 Channel251

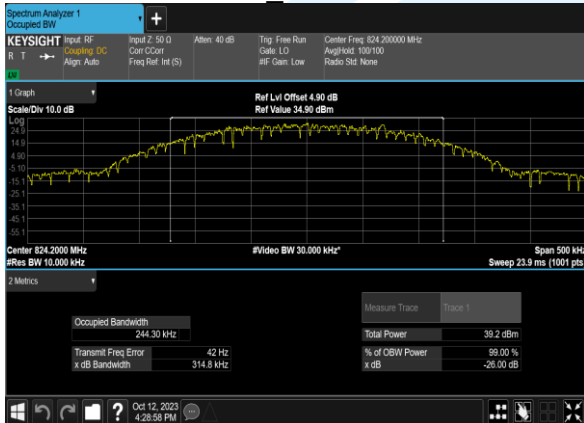


## Occupied Bandwidth

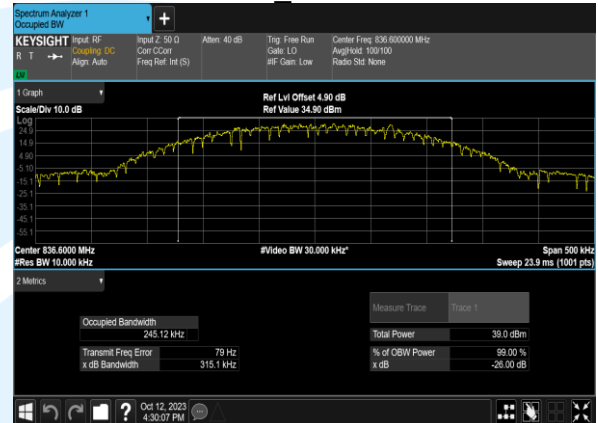
| Band      | Channel | Freq (MHz) | Slots | OBW (MHz) | 26dB BW (MHz) |
|-----------|---------|------------|-------|-----------|---------------|
| GSM 850   | 128     | 824.2      | 1 Tx  | 0.2443    | 0.3148        |
| GSM 850   | 190     | 836.6      | 1 Tx  | 0.24512   | 0.3151        |
| GSM 850   | 251     | 848.8      | 1 Tx  | 0.24497   | 0.313         |
| GPRS 850  | 190     | 836.6      | 1 Tx  | 0.24226   | 0.3187        |
| GPRS 850  | 251     | 848.8      | 1 Tx  | 0.24404   | 0.3201        |
| GPRS 850  | 128     | 824.2      | 1 Tx  | 0.2433    | 0.3116        |
| EGPRS 850 | 190     | 836.6      | 1 Tx  | 0.24636   | 0.3064        |
| EGPRS 850 | 251     | 848.8      | 1 Tx  | 0.24919   | 0.3129        |
| EGPRS 850 | 128     | 824.2      | 1 Tx  | 0.23885   | 0.310         |

## Test Graphs

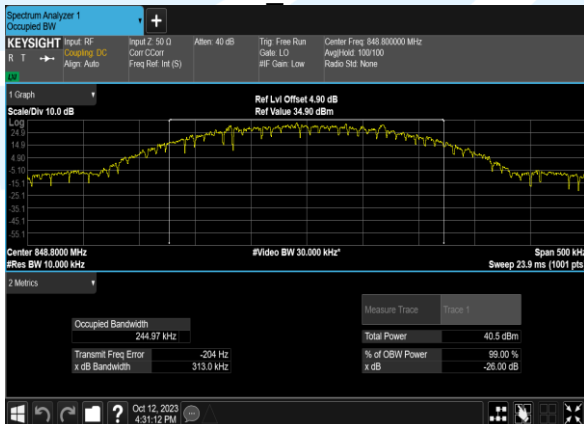
GSM850 Channel128



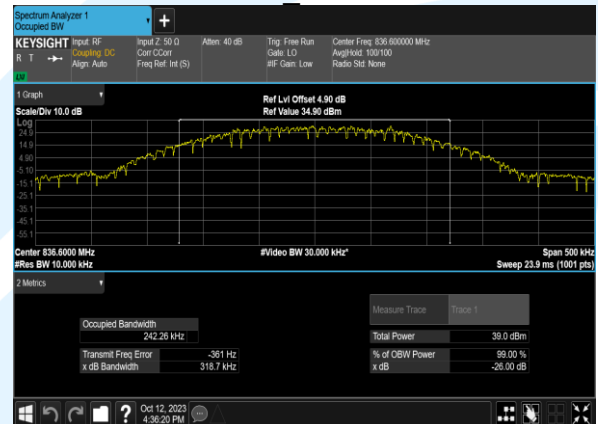
GSM850 Channel190



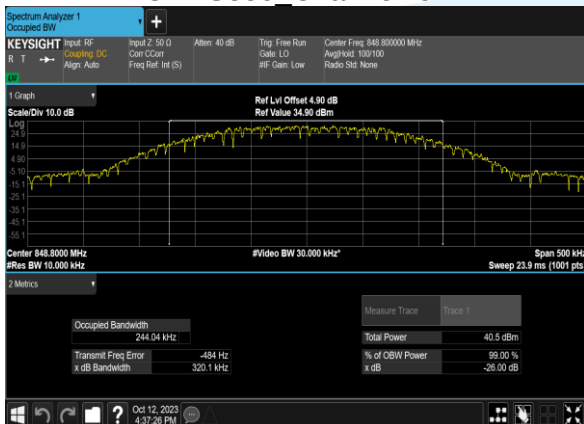
GSM850 Channel251



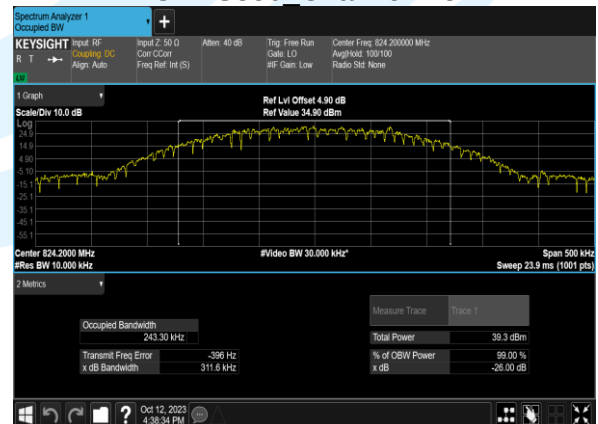
GPRS850 Channel190



GPRS850 Channel251



GPRS850 Channel128



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EGPRS850 Channel190



EGPRS850 Channel251



EGPRS850 Channel128

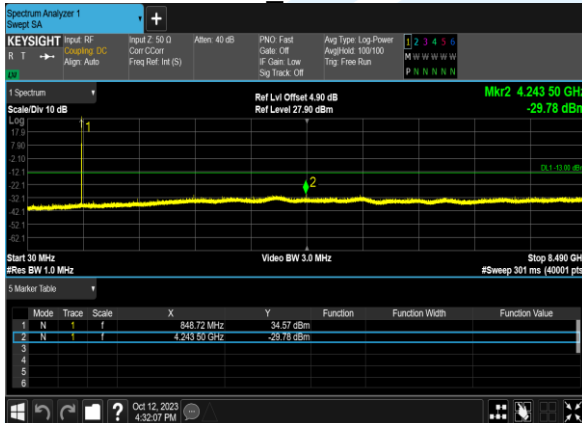


## Conducted Spurious Emissions

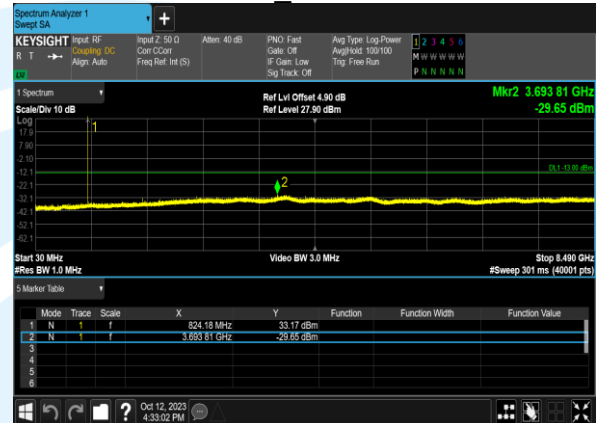
| Band      | Channel | Freq (MHz) | Slots | Result (dBm) | Limit (dBm) | Verdict |
|-----------|---------|------------|-------|--------------|-------------|---------|
| GSM 850   | 251     | 848.8      | 1 Tx  | -29.78       | -13         | PASS    |
| GSM 850   | 128     | 824.2      | 1 Tx  | -29.65       | -13         | PASS    |
| GSM 850   | 190     | 836.6      | 1 Tx  | -30.22       | -13         | PASS    |
| GPRS 850  | 190     | 836.6      | 1 Tx  | -30.12       | -13         | PASS    |
| GPRS 850  | 251     | 848.8      | 1 Tx  | -29.9        | -13         | PASS    |
| GPRS 850  | 128     | 824.2      | 1 Tx  | -29.61       | -13         | PASS    |
| EGPRS 850 | 128     | 824.2      | 1 Tx  | -29.81       | -13         | PASS    |
| EGPRS 850 | 251     | 848.8      | 1 Tx  | -29.98       | -13         | PASS    |
| EGPRS 850 | 190     | 836.6      | 1 Tx  | -30.01       | -13         | PASS    |

## Test Graphs

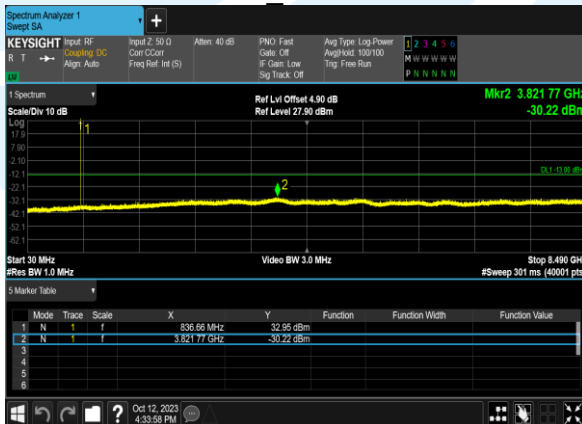
GSM850 Channel251



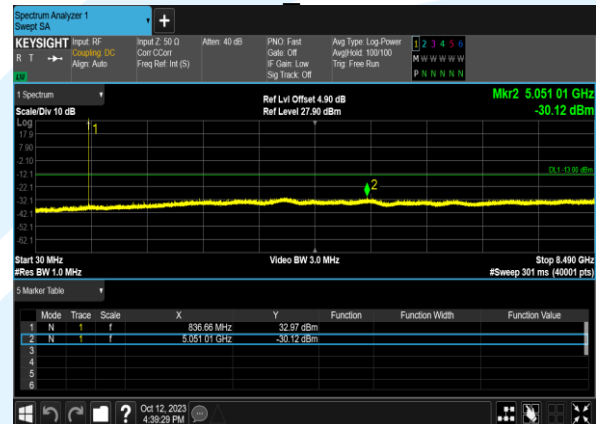
GSM850 Channel128



GSM850 Channel190



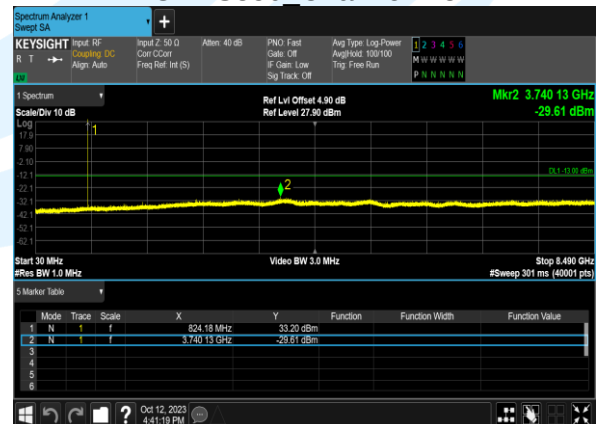
GPRS850 Channel190



GPRS850 Channel251



GPRS850 Channel128



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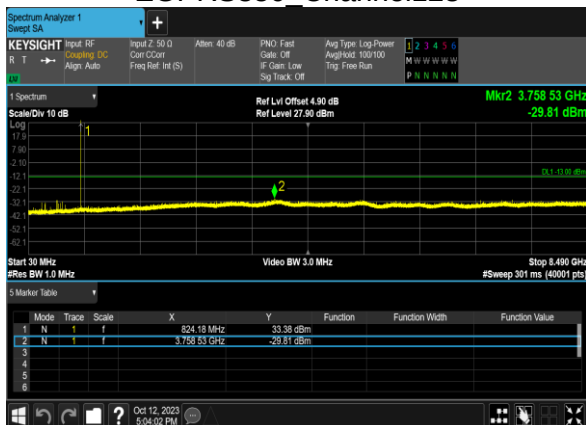
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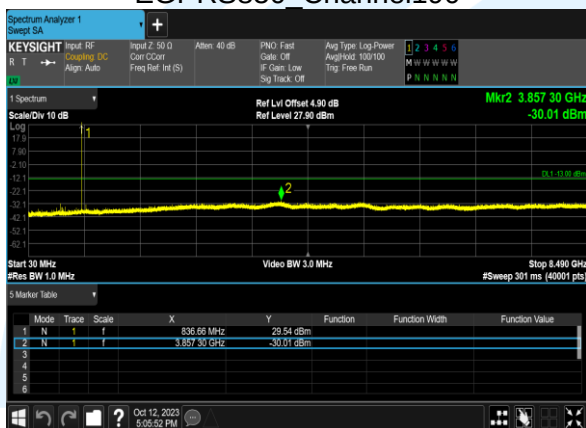
EGPRS850 Channel128



EGPRS850 Channel251



EGPRS850 Channel190

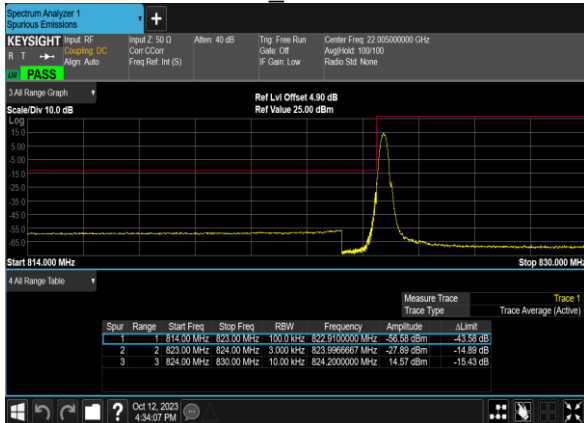


## Conducted Band Edge

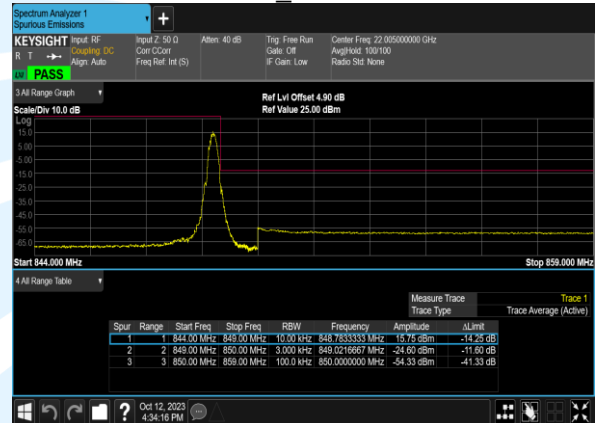
| Band      | Channel | Freq (MHz) | Slots | Result    | Verdict |
|-----------|---------|------------|-------|-----------|---------|
| GSM 850   | 128     | 824.2      | 1 Tx  | see graph | PASS    |
| GSM 850   | 251     | 848.8      | 1 Tx  | see graph | PASS    |
| GPRS 850  | 251     | 848.8      | 1 Tx  | see graph | PASS    |
| GPRS 850  | 128     | 824.2      | 1 Tx  | see graph | PASS    |
| EGPRS 850 | 251     | 848.8      | 1 Tx  | see graph | PASS    |
| EGPRS 850 | 128     | 824.2      | 1 Tx  | see graph | PASS    |

## Test Graphs

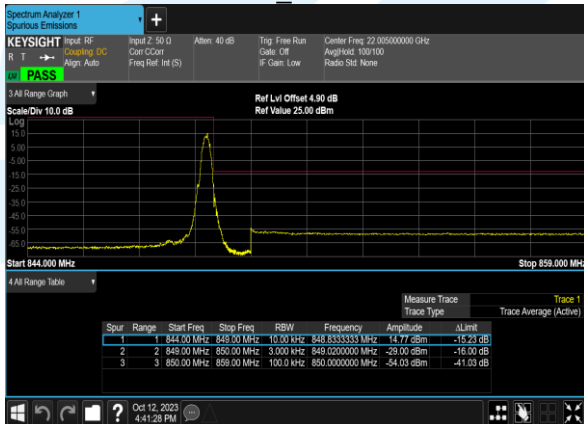
GSM850\_Channel128



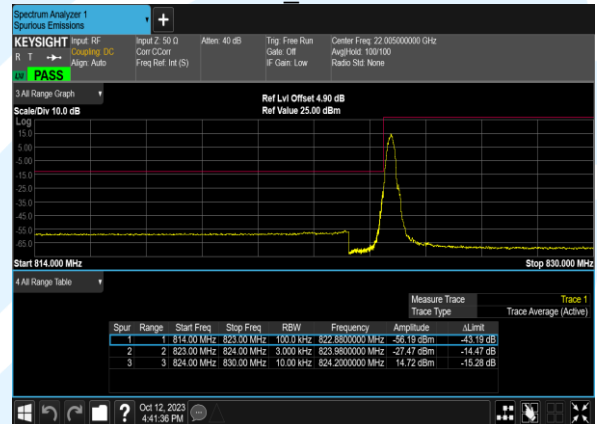
GSM850\_Channel251



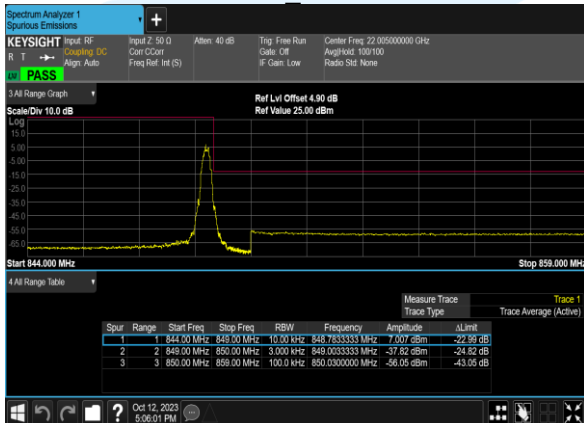
GPRS850\_Channel251



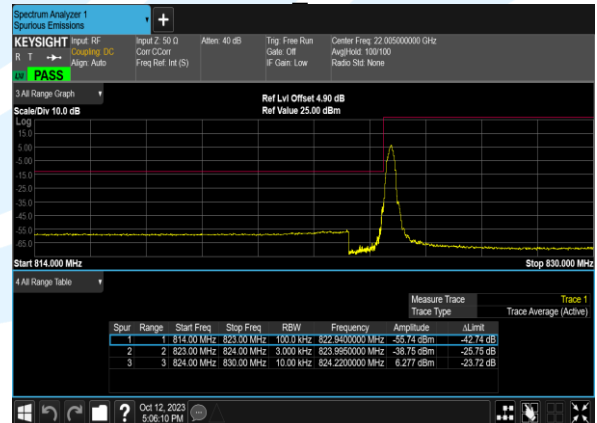
GPRS850\_Channel128



EGPRS850\_Channel251



EGPRS850\_Channel128



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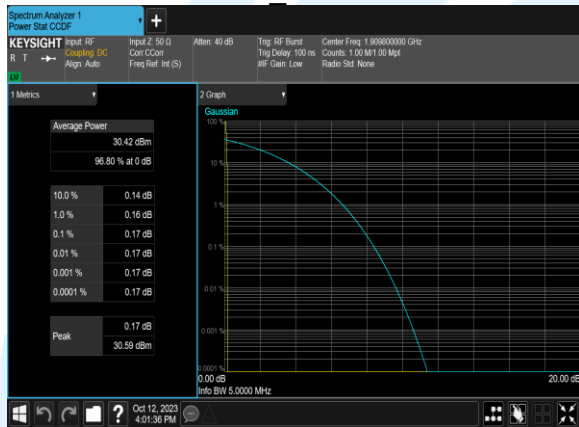
## A.2 PCS 1900

## Peak to Average Ratio

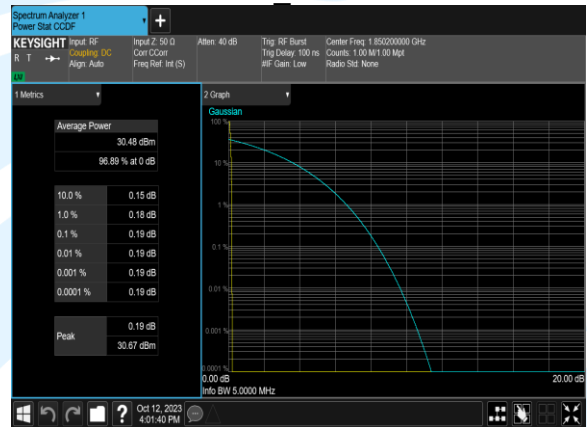
| Band       | Channel | Freq (MHz) | Slots | Result (dB) | Limit (dB) | Verdict |
|------------|---------|------------|-------|-------------|------------|---------|
| PCS 1900   | 810     | 1909.8     | 1 Tx  | 0.17        | 13         | PASS    |
| PCS 1900   | 512     | 1850.2     | 1 Tx  | 0.19        | 13         | PASS    |
| PCS 1900   | 661     | 1880.0     | 1 Tx  | 0.17        | 13         | PASS    |
| GPRS 1900  | 661     | 1880.0     | 1 Tx  | 0.17        | 13         | PASS    |
| GPRS 1900  | 512     | 1850.2     | 1 Tx  | 0.19        | 13         | PASS    |
| GPRS 1900  | 810     | 1909.8     | 1 Tx  | 0.17        | 13         | PASS    |
| EGPRS 1900 | 661     | 1880.0     | 1 Tx  | 4.06        | 13         | PASS    |
| EGPRS 1900 | 512     | 1850.2     | 1 Tx  | 4.25        | 13         | PASS    |
| EGPRS 1900 | 810     | 1909.8     | 1 Tx  | 5.02        | 13         | PASS    |

## Test Graphs

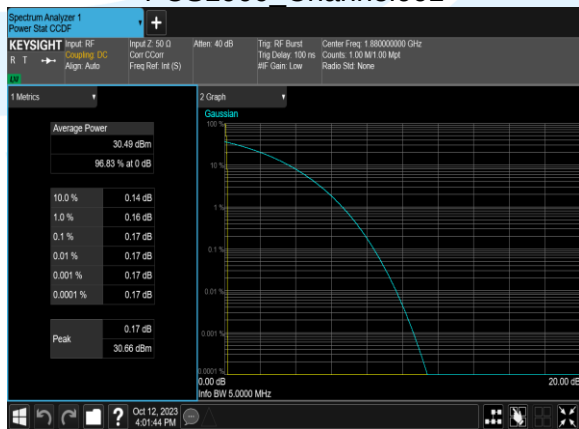
PCS1900 Channel810



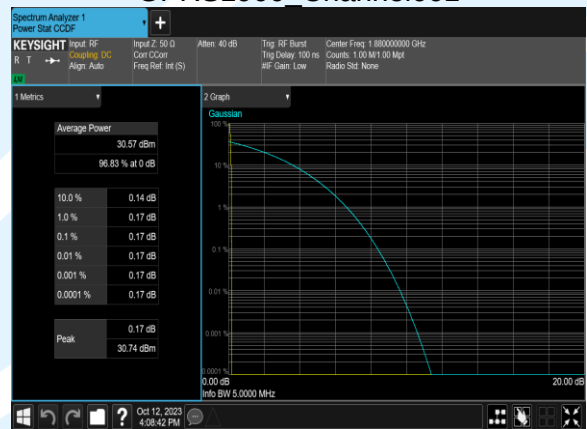
PCS1900 Channel512



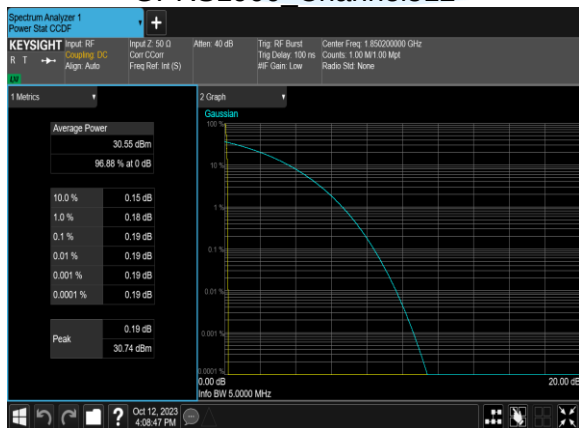
PCS1900 Channel661



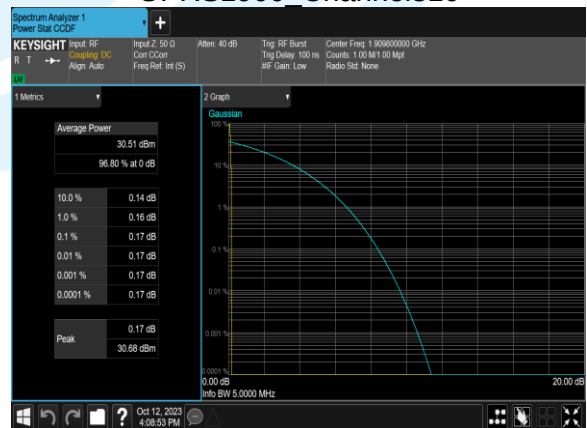
GPRS1900 Channel661



GPRS1900 Channel512



GPRS1900 Channel810



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EGPRS1900 Channel661



EGPRS1900 Channel512



EGPRS1900 Channel810

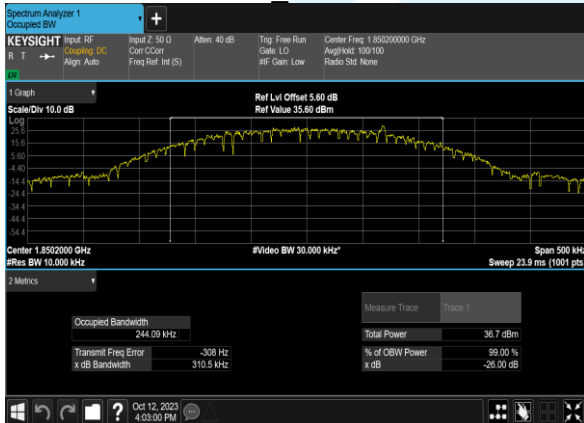


## Occupied Bandwidth

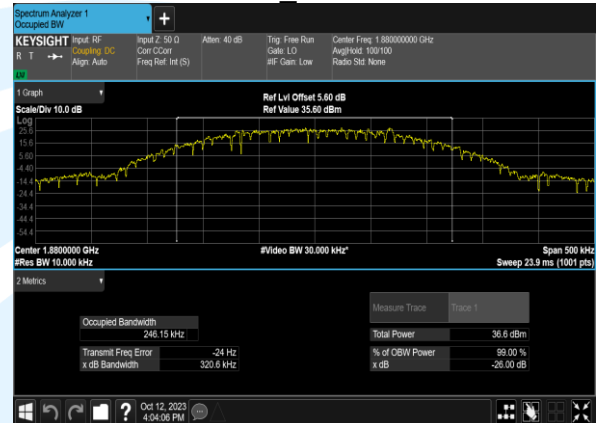
| Band       | Channel | Freq (MHz) | Slots | OBW (MHz) | 26dB BW (MHz) |
|------------|---------|------------|-------|-----------|---------------|
| PCS 1900   | 512     | 1850.2     | 1 Tx  | 0.24409   | 0.3105        |
| PCS 1900   | 661     | 1880.0     | 1 Tx  | 0.24615   | 0.3206        |
| PCS 1900   | 810     | 1909.8     | 1 Tx  | 0.24406   | 0.3038        |
| GPRS 1900  | 661     | 1880.0     | 1 Tx  | 0.24189   | 0.3062        |
| GPRS 1900  | 810     | 1909.8     | 1 Tx  | 0.24376   | 0.3147        |
| GPRS 1900  | 512     | 1850.2     | 1 Tx  | 0.24423   | 0.3179        |
| EGPRS 1900 | 661     | 1880.0     | 1 Tx  | 0.2451    | 0.3055        |
| EGPRS 1900 | 810     | 1909.8     | 1 Tx  | 0.2436    | 0.3061        |
| EGPRS 1900 | 512     | 1850.2     | 1 Tx  | 0.24378   | 0.3149        |

## Test Graphs

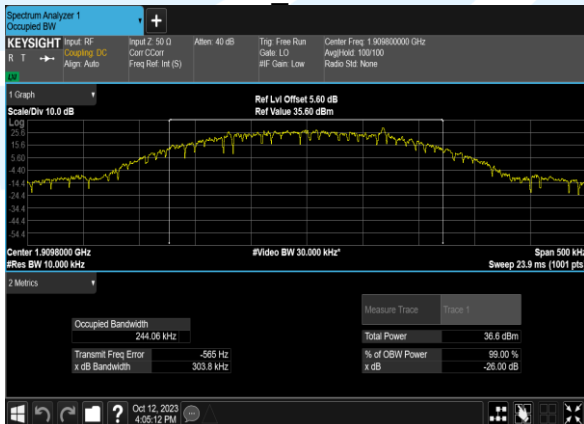
PCS1900 Channel512



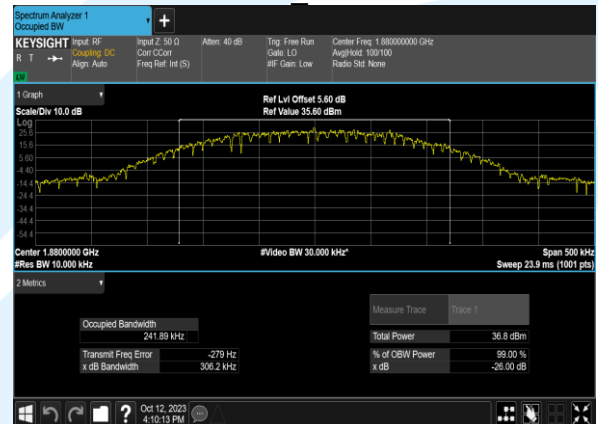
PCS1900 Channel661



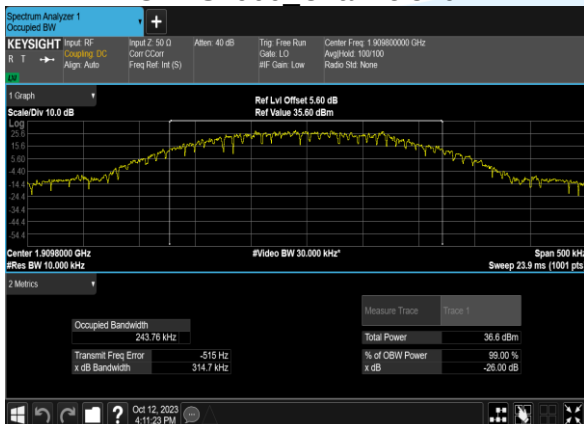
PCS1900 Channel810



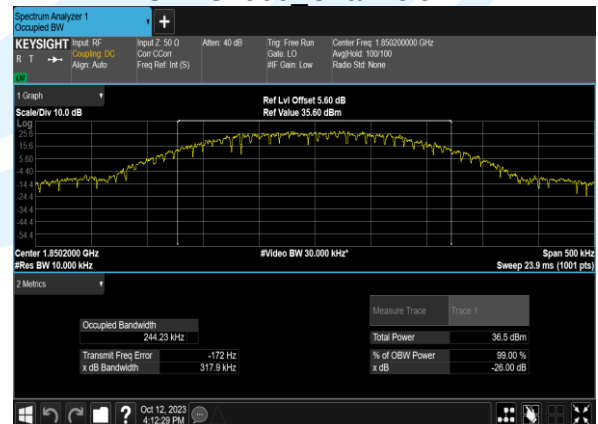
GPRS1900 Channel661



GPRS1900 Channel810



GPRS1900 Channel512



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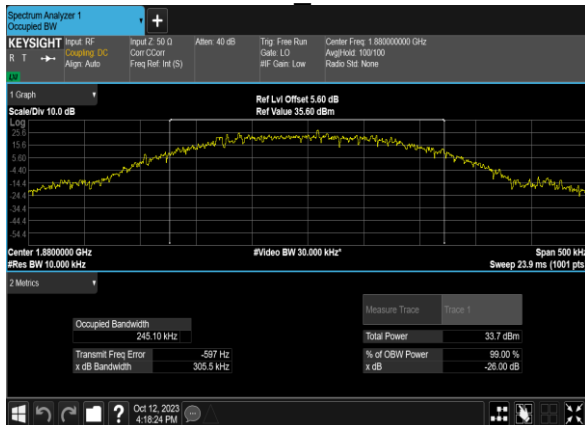
Fax: +86-755-28230886

E-mail: info@uttlab.com

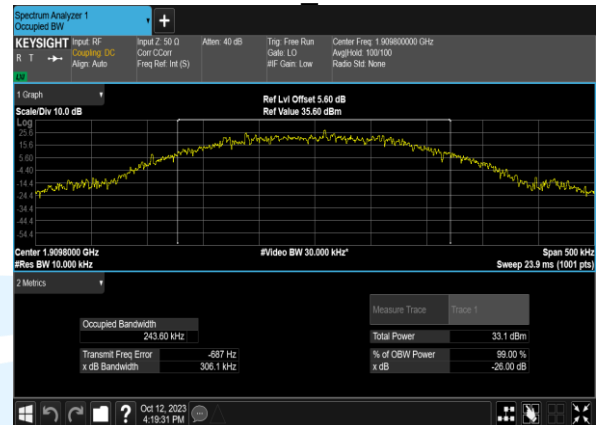
<http://www.uttlab.com>

UTTR-RF-FCC23G-V1.1

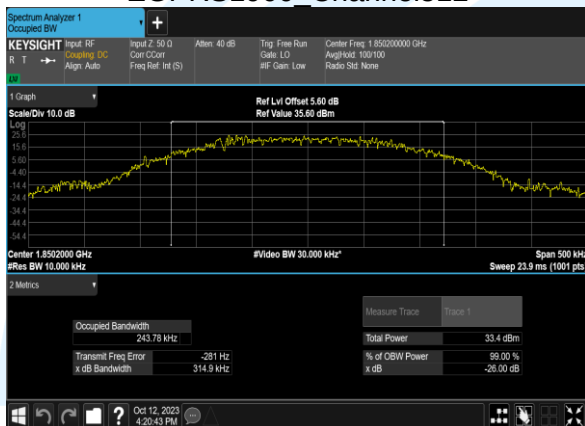
EGPRS1900 Channel661



EGPRS1900 Channel810



EGPRS1900 Channel512

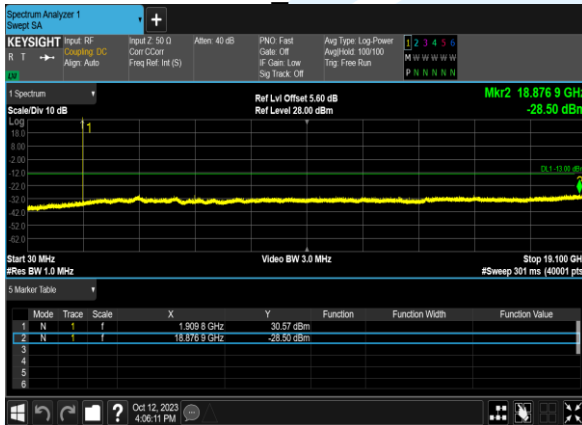


## Conducted Spurious Emissions

| Band       | Channel | Freq (MHz) | Slots | Result (dBm) | Limit (dBm) | Verdict |
|------------|---------|------------|-------|--------------|-------------|---------|
| PCS 1900   | 810     | 1909.8     | 1 Tx  | -28.5        | -13         | PASS    |
| PCS 1900   | 512     | 1850.2     | 1 Tx  | -28.83       | -13         | PASS    |
| PCS 1900   | 661     | 1880.0     | 1 Tx  | -27.9        | -13         | PASS    |
| GPRS 1900  | 661     | 1880.0     | 1 Tx  | -28.21       | -13         | PASS    |
| GPRS 1900  | 810     | 1909.8     | 1 Tx  | -28.29       | -13         | PASS    |
| GPRS 1900  | 512     | 1850.2     | 1 Tx  | -28.22       | -13         | PASS    |
| EGPRS 1900 | 512     | 1850.2     | 1 Tx  | -28.39       | -13         | PASS    |
| EGPRS 1900 | 810     | 1909.8     | 1 Tx  | -28.68       | -13         | PASS    |
| EGPRS 1900 | 661     | 1880.0     | 1 Tx  | -28.27       | -13         | PASS    |

## Test Graphs

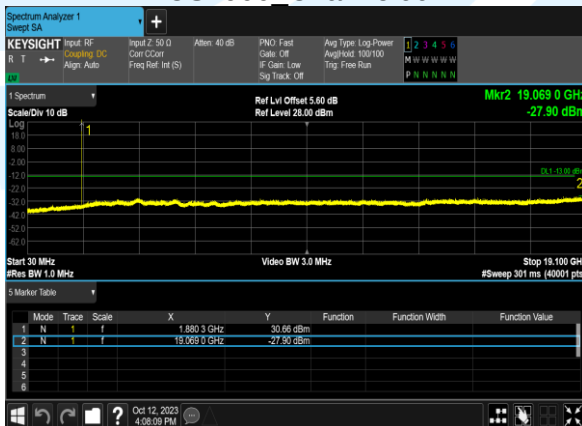
PCS1900 Channel810



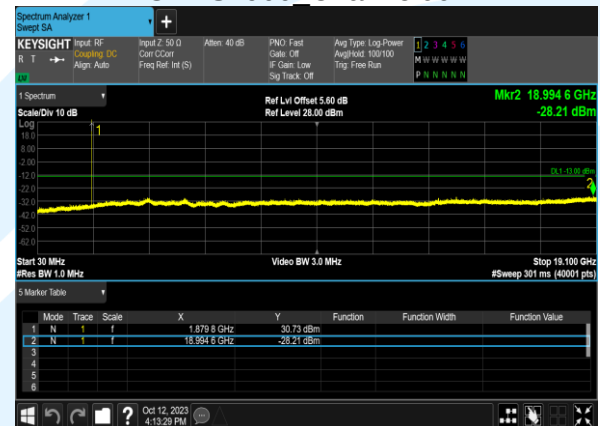
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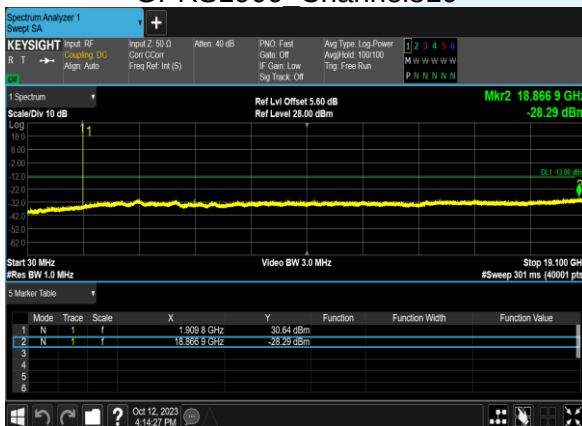
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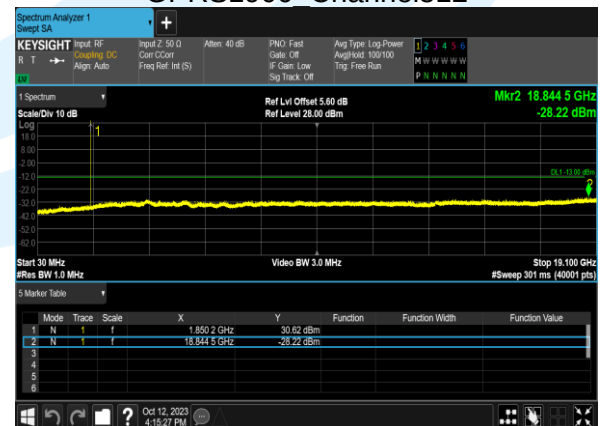
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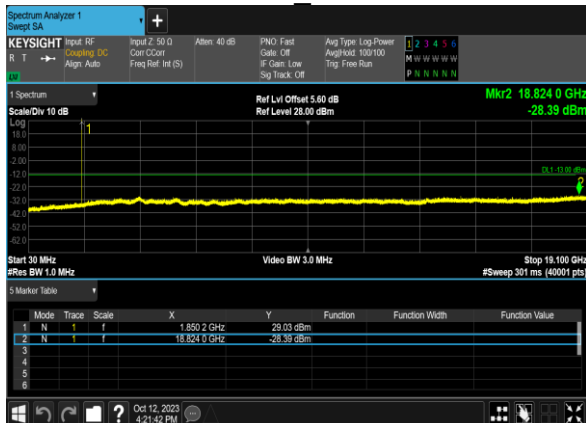
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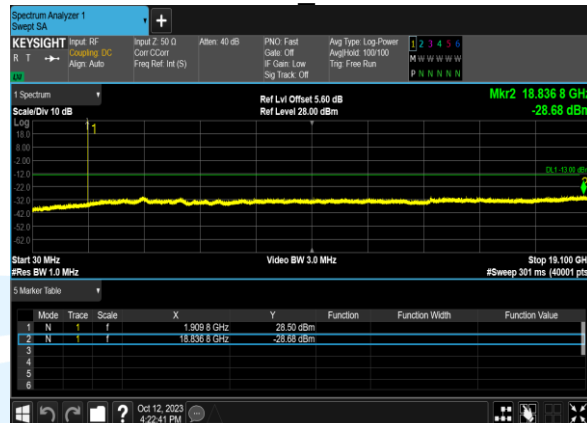
GPRS1900 Channel512



EGPRS1900 Channel512



EGPRS1900 Channel810



EGPRS1900 Channel661

