

# FCC TEST REPORT

Test report On Behalf of INVEGUA SAS ZESE For Mobile Phone Model No.: CR-MP3019

## FCC ID: 2A2KFCR-MP3019

Prepared for : INVEGUA SAS ZESE Calle 7 # 6 - 57 of 102A, Riohacha-Guajira, Colombia

Prepared By : Shenzhen Tongzhou Testing Co.,Ltd 1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

Date of Test: 2021/6/10 ~ 2021/7/2

Date of Report: 2021/7/12

Report Number: TZ210602321-E3

The test report apply only to the specific sample(s) tested under stated test conditions It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



## **TEST RESULT CERTIFICATION**

| Applicant's name:              | INVEGUA SAS ZESE  |
|--------------------------------|---|
| Address:                       | Calle 7 # 6 - 57 of 102A, Riohacha-Guajira, Colombia            |
| Manufacture's Name             | INVEGUA SAS ZESE  |
| Address:                       | Calle 7 # 6 - 57 of 102A, Riohacha-Guajira, Colombia            |
| Product description            |   |
| Trade Mark                     | CROWN   |
| Product name:                  | Mobile Phone  |
| Model and/or type reference .: | CR-MP3019   |
| Standards                      | FCC Rules and Regulations Part 22 & Part 24<br>ANSI C63.26:2015 |

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Tongzhou Testing Co.,Ltd is acknowledged as copyright owner and source of the material. Shenzhen Tongzhou Testing Co.,Ltd takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

| Date of Test                      |                      |
|-----------------------------------|----------------------|
| Date (s) of performance of tests: | 2021/6/10 ~ 2021/7/2 |
| Date of Issue                     | 2021/7/12            |
| Test Result:                      | Pass                 |

2

Testing Engineer

Anna Hu

(Anna Hu)

Technical Manager :

Hugo Chen

(Hugo Chen)

Authorized Signatory:

Zhan?

(Andy Zhang)



## **Revision History**

| Revision | Issue Date | Revisions     | Revised By |
|----------|------------|---------------|------------|
| 000      | 2021/7/12  | Initial Issue | Andy Zhang |
|          |            |               |            |
|          |            |               |            |



## Contents

| 1 | TES        | ST STANDARDS                                      | 5  |  |
|---|------------|---|----|--|
| 2 | SUI        | MMARY   | 6  |  |
|   | 2.1        |   | 6  |  |
|   | 2.2        |   |    |  |
|   | 2.3        |   |    |  |
|   | 2.4        |   |    |  |
|   | 2.5        |   |    |  |
|   | 2.6<br>2.7 | RELATED SUBMITTAL(S) / GRANT (S)<br>MODIFICATIONS |    |  |
| 3 | TES        | ST ENVIRONMENT                                    | 9  |  |
|   |            |   |    |  |
|   |            | TEST FACILITY                                     |    |  |
|   |            | ENVIRONMENTAL CONDITIONS<br>Test Description      |    |  |
|   | 3.3<br>3.4 |   |    |  |
|   | 3.5        |   |    |  |
|   | 0.0        |   |    |  |
| 4 | DES        | SCRIPTION OF TEST MODES                           | 13 |  |
|   |            |   |    |  |
| 5 | TES        | ST CONDITIONS AND RESULTS                         | 13 |  |
| • |            |   |    |  |
|   | 5.1        | OUTPUT POWER                                      |    |  |
|   |            | 5.1.1 CONDUCTED OUTPUT POWER                      | 13 |  |
|   |            | 5.1.2 RADIATED OUTPUT POWER                       | 16 |  |
|   | 5.2        | PEAK-TO-AVERAGE RATIO                             |    |  |
|   |            | 5.2.1 MEASUREMENT METHOD                          | 19 |  |
|   |            | 5.2.2 PROVISIONS APPLICABLE                       | 19 |  |
|   |            | 5.2.3 MEASUREMENT RESULT                          |    |  |
|   | 5.3        | OCCUPIED BANDWIDTH                                | 21 |  |
|   |            | 5.3.1 MEASUREMENT METHOD                          | 21 |  |
|   |            | 5.3.2 PROVISIONS APPLICABLE                       | 21 |  |
|   |            | 5.3.3 MEASUREMENT RESULT                          |    |  |
|   | 5.4        | BAND EDGE   | 25 |  |
|   |            | 5.4.1 MEASUREMENT METHOD                          | 25 |  |
|   |            | 5.4.2 PROVISIONS APPLICABLE                       | 25 |  |
|   |            | 5.4.3 MEASUREMENT RESULT                          |    |  |
|   | 5.5        | SPURIOUS EMISSION                                 | 30 |  |
|   |            | 5.5.1 CONDUCTED SPURIOUS EMISSION                 | 30 |  |
|   |            | 5.5.2 RADIATED SPURIOUS EMISSION                  |    |  |
|   |            | 5.5.2.4 MEASUREMENT RESULT                        | 53 |  |
|   | 5.6        | FREQUENCY STABILITY                               | 54 |  |
|   |            | 5.6.1 MEASUREMENT METHOD                          | 54 |  |
|   |            | 5.6.2 PROVISIONS APPLICABLE                       |    |  |
|   |            | 5.6.3 MEASUREMENT RESULT                          |    |  |
|   |            |   |    |  |
| 6 |            |   | 60 |  |

| 6 | APPENDIX A: PHOTOGRAPHS OF TEST SETUP6 | <b>30</b> |
|---|--|-----------|
|---|--|-----------|

### 1 TEST STANDARDS

The tests were performed according to following standards:

FCC Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS

FCC Part 22 Subpart H: PRIVATE LAND MOBILE RADIO SERVICES.

FCC Part 24 Subpart E: PUBLIC MOBILE SERVICES

<u>ANSI/TIA-603-E-2016</u>: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

ANSI C63.26-2015: IEEE/ANSI Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

FCCKDB971168D01 Power Meas License Digital Systems



## 2 SUMMARY

## 2.1 Product Description

| - UT                               |   |
|------------------------------------|---|
| EUT                                | : Mobile Phone  |
| Model Number                       | : CR-MP3019   |
| Model Declaration                  | : N/A   |
| Test Model                         | : CR-MP3019   |
| Power Supply                       | : N/A   |
| Hardware version                   | : 2631-MB-V0.1  |
| Software version                   | : 2631_XDSD_U530_CROWN_YFXY   |
| Sample ID                          | : TZ210602321-2#  |
| Bluetooth                          |   |
| Bluetooth Version                  | : V2.1 + EDR  |
| Channel Number                     | : 79 Channels   |
| Modulation Technology              | : GFSK, π/4-DQPSK, 8-DPSK   |
| Data Rates                         | : 1/2/3Mbps   |
| Antenna Type And Gain              | : Internal Antenna,0.42dBi  |
| WiFi                               |   |
| WLAN                               | : Supported IEEE 802.11b/g/n  |
| WLAN FCC Operation<br>Frequency    | IEEE 802.11b:2412-2462MHz<br>: IEEE 802.11g:2412-2462MHz<br>IEEE 802.11n HT20:2412-2462MHz  |
| WLAN Channel Number                | : 11 Channels for 2412-2462MHz(IEEE 802.11b/g/n HT20)   |
| WLAN Modulation Technology         | IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)<br>: IEEE 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)<br>IEEE 802.11n: OFDM (64QAM, 16QAM, QPSK, BPSK) |
| Antenna Type And Gain              | : Internal Antenna, 0.42 dBi(Max.)  |
| GSM                                |   |
| Support Bands                      | ⊠GSM 850<br>: ⊠PCS 1900<br>⊠GSM 900<br>⊠PCS 1800  |
| GSM FCC Operation Frequency        | . GSM850(UL: 824 – 849 MHz/DL: 869 – 894 MHz)<br>GSM1900(UL: 1850 –1910 MHz/DL: 1930 – 1990 MHz)  |
| Channel Separation                 | : 0.2MHz  |
| Modulation Technology              | : GMSK  |
| Antenna Type And Gain              | Internal Antenna,<br>: GSM850:-0.17dBi;<br>PCS1900:0.51dBi  |
| ote: Antenna position refer to FUT | Photos  |

Note: Antenna position refer to EUT Photos



#### GSM Card Slot :

|          | Maximum ERP/EIRP<br>(dBm) | Max. Conducted Power<br>(dBm) | Max. Average<br>Burst Power (dBm) |
|----------|---------------------------|-------------------------------|-----------------------------------|
| GSM 850  | 27.30                     | 32.24                         | 31.99                             |
| PCS 1900 | 25.74                     | 30.30                         | 30.09                             |



#### 2.2 Host System Configuration List and Details

| Manufacturer | Description | Model | Serial Number | Certificate |
|--------------|-------------|-------|---------------|-------------|
|              |             |       |               |             |

#### 2.3 Short description of the Equipment under Test (EUT)

EUT is subscriber equipment in the GSM system. Frequency bands Shows in section 2.1.

#### 2.4 Normal Accessory setting

Fully charged battery was used during the test.

#### 2.5 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

 $\Box$  supplied by the lab  $\Box$  supplied by the manufacturer

| Manufacturer | Description | Model | Serial<br>Number | Certificate |
|--------------|-------------|-------|------------------|-------------|
| N/A          | N/A         | N/A   | N/A              | N/A         |
|              |             |       |                  |             |

#### 2.6 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2A2KFCR-MP3019 filing to comply with FCC Part 22 and FCC Part 24 Rules.

#### 2.7 Modifications

No modifications were implemented to meet testing criteria.



## 3 TEST ENVIRONMENT

#### 3.1 Test Facility

#### FCC

Designation Number: CN1275 Test Firm Registration Number: 167722 Shenzhen Tongzhou Testing Co.,Ltd has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

#### A2LA

Certificate Number: 5463.01 Shenzhen Tongzhou Testing Co.,Ltd has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

#### IC

ISED#: 22033 CAB identifier: CN0099 Shenzhen Tongzhou Testing Co.,Ltd has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010

#### 3.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

| Temperature:          | 15-35 ° C |
|-----------------------|-----------|
|                       |           |
| Humidity:             | 30-60 %   |
|                       |           |
| Atmospheric pressure: | 950-      |



## 3.3 Test Description

### PCS 1900:

| Test Item                                 | FCC Rule No.         | Requirements  | Judgement |
|---|----------------------|---|-----------|
| Effective (Isotropic)<br>Radiated Power   | 2.1046,<br>24.232(c) | EIRP ≤ 2W(33dBm)  | Pass      |
| Bandwidth                                 | 2.1049<br>24.238(a)  | OBW: No limit.<br>EBW: No limit.  | Pass      |
| Band Edges                                | 2.1051,<br>24.238(a) | -13dBm  | Pass      |
| Spurious Emission at<br>Antenna Terminals | 2.1051,<br>24.238(a) | -13dBm  | Pass      |
| Field Strength of<br>Spurious Radiation   | 2.1053,<br>24.238(a) | -13dBm  | Pass      |
| Frequency Stability                       | 2.1055,<br>24.235    | the fundamental emission stays<br>within the authorized frequency<br>block. | Pass      |
| Peak to average ratio                     | 24.232(d)            | <13dB   | Pass      |

#### GSM850:

| Test Item                                 | FCC Rule No.            | Requirements  | Judgement |
|---|-------------------------|---|-----------|
| Effective (Isotropic)<br>Radiated Power   | 2.1046,<br>22.913(a)    | ERP ≤ 7W(38.5dBm)   | Pass      |
| Occupied Bandwidth                        | 2.1049                  | OBW: No limit.  | Pass      |
| Emission Bandwidth                        | 22.917(b)               | EBW: No limit.  | Pass      |
| Band Edges<br>Compliance                  | 2.1051,<br>22.917(a)(b) | -13dBm  | Pass      |
| Spurious Emission at<br>Antenna Terminals | 2.1051,<br>22.917       | -13dBm  | Pass      |
| Field Strength of<br>Spurious Radiation   | 2.1053,<br>22.917       | -13dBm  | Pass      |
| Frequency Stability                       | 2.1055,<br>22.355       | the fundamental emissions stay<br>within the authorized bands of<br>operation. (2.5ppm) | Pass      |
| Peak to average ratio                     | 2.1046,<br>2.913(a)     | <13dB   | Pass      |



## 3.4 Equipment Used during the Test

| Item | Test Equipment                      | Manufacturer     | Model No.        | Serial No.   | Calibration<br>Date | Calibration<br>Due Date |
|------|-------------------------------------|------------------|------------------|--------------|---------------------|-------------------------|
| 1    | MXA Signal<br>Analyzer              | Keysight         | N9020A           | MY52091623   | 2021/1/4            | 2022/1/3                |
| 2    | Power Sensor                        | Agilent          | U2021XA          | MY5365004    | 2021/1/4            | 2022/1/3                |
| 3    | Power Meter                         | Agilent          | U2531A           | TW53323507   | 2021/1/4            | 2022/1/3                |
| 4    | Loop Antenna                        | schwarzbeck      | FMZB1519B        | 00023        | 2019/11/16          | 2022/11/15              |
| 5    | Wideband Antenna                    | schwarzbeck      | VULB 9163        | 958          | 2019/11/16          | 2022/11/15              |
| 6    | Horn Antenna                        | schwarzbeck      | 9120D-1141       | 1574         | 2019/11/16          | 2022/11/15              |
| 7    | EMI Test Receiver                   | R&S              | ESCI             | 100849/003   | 2021/1/4            | 2022/1/3                |
| 8    | Controller                          | MF               | MF7802           | N/A          | N/A                 | N/A                     |
| 9    | Amplifier                           | schwarzbeck      | BBV 9743         | 209          | 2021/1/4            | 2022/1/3                |
| 10   | Amplifier                           | Tonscend         | TSAMP-<br>0518SE |              | 2021/1/4            | 2022/1/3                |
| 11   | RF Cable(below<br>1GHz)             | HUBER+SUHNE<br>R | RG214            | N/A          | 2021/1/4            | 2022/1/3                |
| 12   | RF Cable(above<br>1GHz)             | HUBER+SUHNE<br>R | RG214            | N/A          | 2021/1/4            | 2022/1/3                |
| 12   | RE test software                    | Tonscend         | JS32-RE          | V2.0.2.0     | N/A                 | N/A                     |
| 14   | Test Software                       | Tonscend         | JS1120-3         | V2.5.77.0418 | N/A                 | N/A                     |
| 15   | Horn Antenna                        | A-INFO           | LB-180400-<br>KF | J211020657   | 2020/10/12          | 2022/10/11              |
| 16   | Amplifier                           | CDSA             | PAP-1840         | 17021        | 2020/10/10          | 2021/10/09              |
| 17   | Spectrum Analyzer                   | R&S              | FSP40            | 100550       | 2021/1/10           | 2022/1/9                |
| 18   | UNIVERSAL<br>RADIO<br>COMMUNICATION | R&S              | CMW500           | 101855       | 2021/1/4            | 2022/1/3                |
| 19   | Signal Generator                    | Keysight         | N5182A           | MY4620709    | 2021/1/4            | 2022/1/3                |

#### 3.5 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to ETSI TR 100 028 " Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics" and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Tongzhou Testing Co.,Ltd is reported:

| Test                                | Range      | Measurem<br>ent      | Note |
|-------------------------------------|------------|----------------------|------|
| Radiated Emission                   | 30~1000MHz | 3.10 dB              | (1)  |
| Radiated Emission                   | 1~18GHz    | 3.70 dB              | (1)  |
| Radiated Emission                   | 18-40GHz   | 3.90 dB              | (1)  |
| Conducted Disturbance               | 0.15~30MHz | 1.63 dB              | (1)  |
| Conducted Power                     | 9KHz~18GHz | 0.61 dB              | (1)  |
| Spurious RF Conducted Emission      | 9KHz~40GHz | 1.22 dB              | (1)  |
| Band Edge Compliance of RF Emission | 9KHz~40GHz | 1.22 dB              | (1)  |
| Occuiped Bandwidth                  | 9KHz~40GHz | -                    | (1)  |
| Frequency Error                     | 9KHz~40GHz | 1 x 10 <sup>-7</sup> | (1)  |

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.



### 4 DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMU 200)to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both GSM and PCS frequency band. \*\*\*Note: GSM/GPRS 850, GSM/GPRS 1900 mode have been tested during the test.

The worst condition was recorded in the test report if no other modes test data.

#### 5 TEST CONDITIONS AND RESULTS

#### **5.1 OUTPUT POWER**

- 5.1.1 CONDUCTED OUTPUT POWER
- 5.1.1.1 MEASUREMENT METHOD

The transmitter output port was connected to base station.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Measure the maximum burst average power and average power for other modulation signal.

The EUT was setup for the max output power with pseudo random data modulation. Power was measured with Spectrum Analyzer. The measurements were performed on all modes(GSM/GPRS 850, GSM/GPRS 1900)at 3 typical channels(the Top Channel, the Middle Channel and the Bottom Channel) for each band.

#### 5.1.1.2 MEASUREMENT RESULT



## GSM 850

| Mode                | Frequency<br>(MHz) | Peak<br>Power | Avg.Burst<br>Power | Duty cycle<br>Factor(dB) | Frame<br>Power<br>(dBm) | Peak to<br>Average<br>Ratio |
|---------------------|--------------------|---------------|--------------------|--------------------------|-------------------------|-----------------------------|
|                     | 824.2              | 32.24         | 31.94              | -9                       | 22.94                   | 0.30                        |
| GSM850              | 836.6              | 32.13         | 31.89              | -9                       | 22.89                   | 0.23                        |
|                     | 848.8              | 32.24         | 31.99              | -9                       | 22.99                   | 0.25                        |
| 0000050             | 824.2              | 31.81         | 31.53              | -9                       | 22.53                   | 0.28                        |
| GPRS850<br>(1 Slot) | 836.6              | 31.59         | 31.46              | -9                       | 22.46                   | 0.13                        |
| (1000)              | 848.8              | 31.93         | 31.79              | -9                       | 22.79                   | 0.14                        |
| 0000050             | 824.2              | 30.37         | 30.21              | -6                       | 24.21                   | 0.16                        |
| GPRS850<br>(2 Slot) | 836.6              | 30.01         | 29.76              | -6                       | 23.76                   | 0.25                        |
| (2 0101)            | 848.8              | 30.10         | 29.84              | -6                       | 23.84                   | 0.25                        |
| 0000050             | 824.2              | 29.26         | 29.02              | -4.26                    | 24.76                   | 0.24                        |
| GPRS850<br>(3 Slot) | 836.6              | 29.25         | 29.07              | -4.26                    | 24.81                   | 0.18                        |
| (3 5101)            | 848.8              | 29.04         | 28.77              | -4.26                    | 24.51                   | 0.28                        |
| 0000050             | 824.2              | 27.36         | 27.16              | -3                       | 24.16                   | 0.20                        |
| GPRS850<br>(4 Slot) | 836.6              | 27.43         | 27.19              | -3                       | 24.19                   | 0.24                        |
| (+ 0101)            | 848.8              | 27.00         | 26.82              | -3                       | 23.82                   | 0.19                        |



## PCS 1900

| Mode                 | Frequency<br>(MHz) | Peak Power | Avg.Burst<br>Power | Duty cycle<br>Factor(dB) | Frame<br>Power(dBm) | Peak to<br>Average<br>Ratio |
|----------------------|--------------------|------------|--------------------|--------------------------|---------------------|-----------------------------|
|                      | 1850.2             | 30.30      | 30.09              | -9                       | 21.09               | 0.21                        |
| GSM1900              | 1880               | 30.02      | 29.75              | -9                       | 20.75               | 0.27                        |
|                      | 1909.8             | 30.01      | 29.90              | -9                       | 20.90               | 0.11                        |
| GPRS1900<br>(1 Slot) | 1850.2             | 29.79      | 29.50              | -9                       | 20.50               | 0.29                        |
|                      | 1880               | 29.67      | 29.51              | -9                       | 20.51               | 0.16                        |
|                      | 1909.8             | 29.42      | 29.14              | -9                       | 20.14               | 0.29                        |
| 00004000             | 1850.2             | 27.95      | 27.67              | -6                       | 21.67               | 0.28                        |
| GPRS1900<br>(2 Slot) | 1880               | 27.94      | 27.73              | -6                       | 21.73               | 0.20                        |
| (2 0101)             | 1909.8             | 27.86      | 27.62              | -6                       | 21.62               | 0.24                        |
| 00004000             | 1850.2             | 26.66      | 26.53              | -4.26                    | 22.27               | 0.12                        |
| GPRS1900<br>(3 Slot) | 1880               | 26.65      | 26.51              | -4.26                    | 22.25               | 0.14                        |
| (3 5101)             | 1909.8             | 26.82      | 26.53              | -4.26                    | 22.27               | 0.29                        |
| 00004000             | 1850.2             | 25.73      | 25.49              | -3                       | 22.49               | 0.24                        |
| GPRS1900<br>(4 Slot) | 1880               | 26.00      | 25.79              | -3                       | 22.79               | 0.21                        |
| (4 3101)             | 1909.8             | 25.99      | 25.81              | -3                       | 22.81               | 0.18                        |



### 5.1.2 RADIATED OUTPUT POWER

#### 5.1.2.1 MEASUREMENT METHOD

The measurements procedures specified in ANSI/TIA-603-E-2016 were applied.

1. Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signal operating below 1GHz are performed using dipole antennas. Measurements on signals operating above 1GHz are performed using broadband horn antennas. All measurements are performed as RMS average measurements while the EUT operating at its maximum duty cycle, at maximum power, and at the approximate frequencies.

2. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

3. The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. TheARpl is the attenuation of "reference path loss", and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

4. The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

5. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

6. The EUT is then put into continuously transmitting mode at its maximum power level.

7. Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 24.232 (b) and (c). The "reference path loss" from Step1 is added to this result.

8. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

9. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi...

#### 5.1.2.2 PROVISIONS APPLICABLE

| Mode          | FCC Part Section(s) | Nominal Peak Power   |
|---------------|---------------------|----------------------|
| GSM/GPRS 850  | 22.913(a)(2)        | <=38.45dBm (7W). ERP |
| GSM/GPRS 1900 | 24.232(c)           | <=33dBm (2W). EIRP   |



#### 5.1.2.3 Measurement Result

|      | Radiated Power (ERP) for GSM 850 |               |               |            |  |  |  |  |  |  |  |
|------|----------------------------------|---------------|---------------|------------|--|--|--|--|--|--|--|
|      |                                  | Res           | Result        |            |  |  |  |  |  |  |  |
| Mode | Frequency                        | Max. Peak ERP | Polarization  | Conclusion |  |  |  |  |  |  |  |
|      |                                  | (dBm)         | Of Max. E.R.P |            |  |  |  |  |  |  |  |
|      | 824.2                            | 27.30         | Horizontal    | Pass       |  |  |  |  |  |  |  |
|      | 836.6                            | 26.04         | Horizontal    | Pass       |  |  |  |  |  |  |  |
| GSM  | 848.8                            | 27.05         | Horizontal    | Pass       |  |  |  |  |  |  |  |
| GSIM | 824.2                            | 24.13         | Vertical      | Pass       |  |  |  |  |  |  |  |
|      | 836.6                            | 24.30         | Vertical      | Pass       |  |  |  |  |  |  |  |
|      | 848.8                            | 24.38         | Vertical      | Pass       |  |  |  |  |  |  |  |
|      | 824.2                            | 26.44         | Horizontal    | Pass       |  |  |  |  |  |  |  |
|      | 836.6                            | 26.41         | Horizontal    | Pass       |  |  |  |  |  |  |  |
| GPRS | 848.8                            | 25.14         | Horizontal    | Pass       |  |  |  |  |  |  |  |
| GPRO | 824.2                            | 21.34         | Vertical      | Pass       |  |  |  |  |  |  |  |
|      | 836.6                            | 21.31         | Vertical      | Pass       |  |  |  |  |  |  |  |
|      | 848.8                            | 21.06         | Vertical      | Pass       |  |  |  |  |  |  |  |



|       | Radiated Power (E.I.R.P) for GSM1900 |               |                 |            |  |  |  |  |  |  |  |
|-------|--------------------------------------|---------------|-----------------|------------|--|--|--|--|--|--|--|
|       |                                      | Res           | ult             |            |  |  |  |  |  |  |  |
| Mode  | Frequency                            | Max. Peak ERP | Polarization    | Conclusion |  |  |  |  |  |  |  |
|       |                                      | (dBm)         | Of Max. E.I.R.P |            |  |  |  |  |  |  |  |
|       | 1850.2                               | 25.41         | Horizontal      | Pass       |  |  |  |  |  |  |  |
|       | 1880.0                               | 25.74         | Horizontal      | Pass       |  |  |  |  |  |  |  |
| GSM   | 1909.8                               | 25.41         | Horizontal      | Pass       |  |  |  |  |  |  |  |
| GSIVI | 1850.2                               | 20.45         | Vertical        | Pass       |  |  |  |  |  |  |  |
|       | 1880.0                               | 21.84         | Vertical        | Pass       |  |  |  |  |  |  |  |
|       | 1909.8                               | 21.04         | Vertical        | Pass       |  |  |  |  |  |  |  |
|       | 1850.2                               | 23.81         | Horizontal      | Pass       |  |  |  |  |  |  |  |
|       | 1880.0                               | 24.68         | Horizontal      | Pass       |  |  |  |  |  |  |  |
|       | 1909.8                               | 22.77         | Horizontal      | Pass       |  |  |  |  |  |  |  |
| GPRS  | 1850.2                               | 20.52         | Vertical        | Pass       |  |  |  |  |  |  |  |
|       | 1880.0                               | 21.43         | Vertical        | Pass       |  |  |  |  |  |  |  |
|       | 1909.8                               | 21.39         | Vertical        | Pass       |  |  |  |  |  |  |  |

Note: Above is the worst mode data.



#### **5.2 PEAK-TO-AVERAGE RATIO**

#### 5.2.1 **MEASUREMENT METHOD**

Use one of the procedures presented in 4.1 to measure the total peak power and record as PPk. Use one of the applicable procedures presented 4.2 to measure the total average power and record as PAvg. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = PPk (dBm) - PAvg (dBm).

#### 5.2.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. 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.



### 5.2.3 MEASUREMENT RESULT

| Modes                  | Max<br>Peak to Average<br>Ratio(dB) | Upper limit(dB) | Result |
|------------------------|-------------------------------------|-----------------|--------|
| GSM850                 | 0.30                                | 13              | Pass   |
| PCS1900                | 0.29                                | 13              | Pass   |
| Note: refer to section | of 5.1.1.2.                         |                 |        |



#### 5.3 OCCUPIED BANDWIDTH

#### 5.3.1 **MEASUREMENT METHOD**

1. The Occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper Frequency limits, the mean power radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

2. RBW=1~5% of the expected OBW, VBW>=3 x RBW, Detector=Peak, Trace mode=max hold, Sweep=auto couple, and the trace was allowed to stabilize.

#### 5.3.2 **PROVISIONS APPLICABLE**

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

#### 5.3.3 MEASUREMENT RESULT

| Band    | Channel | Occupied Bandwidth<br>(kHz) | 26dB Bandwidth<br>(kHz) | Limit(kHz) | Verdict |
|---------|---------|-----------------------------|-------------------------|------------|---------|
| GSM850  | 128     | 248.2                       | 313                     |            | PASS    |
| GSM850  | 190     | 242.3                       | 314                     |            | PASS    |
| GSM850  | 251     | 244.2                       | 312                     |            | PASS    |
| GSM1900 | 512     | 245.0                       | 305                     |            | PASS    |
| GSM1900 | 661     | 244.9                       | 315                     |            | PASS    |
| GSM1900 | 810     | 243.6                       | 309                     |            | PASS    |



#### GSM850-824.2-@26dB and 99PCT Bandwidth

|                    | trum Analyzer - Occu      |                       |                       |              |             |   |           |            |            |                        |
|--------------------|---------------------------|-----------------------|-----------------------|--------------|-------------|---|-----------|------------|------------|------------------------|
| (X) RL<br>Center F | RF 50 Ω                   |                       | SENSE:PULSE ALIGN OFF |              |             | 05:39:09 PM Jun 17, 2021<br>Radio Std: None |           | Frequency  |            |                        |
| Conter I           |                           | 井 🖁 Trig: Fre         |                       |              |             |   | ice: BTS  |            |            |                        |
|                    |                           | #IFU                  | Gain:Low              | #Atten. 1    | 0 40        |   |           | Radio Dev  |            |                        |
| 10 dB/div          | Ref Offset 2<br>Ref 35.00 |                       |                       |              |             | - <u>,</u>                                  | 1         |            |            |                        |
| Log<br>25.0        |                           |                       |                       | W            | though -    |   |           |            |            | Center Freq            |
| 15.0               |                           |                       |                       | ALL MUNUTANI | " "Www      | <u>n.</u>                                   |           |            |            | 824.200000 MHz         |
| 5.00               |                           |                       | اليمر                 |              |             | Mr.   |           |            |            |                        |
| -5.00              |                           |                       | N.                    |              |             | <u> </u>                                    |           |            |            |                        |
| -15.0              |                           | 1 <sup>111</sup> 11   | w <sup>ul</sup>       | _            |             |   | mm hren . |            |            |                        |
| -25.0              | ( <b>1</b> 400.00)        | م <sup>م</sup> ر ۱۱ م |                       |              |             |   | 1 'YL     | Va.        |            |                        |
| -35.0              | - manahara                |                       |                       |              |             |   |           | Man Marker | ullun llun |                        |
| -45.0 m            | - Vilani                  |                       |                       | -            |             |   |           |            |            |                        |
| -55.0              |                           |                       |                       |              |             |   |           |            | 19         |                        |
| Center 3           | 824.2 MHz                 |                       |                       |              |             |   |           | Sna        | an 1 MHz   |                        |
|                    | 5.1 kHz                   |                       |                       | #VI          | #VBW 15 kHz |   |           |            | 36.8 ms    | CF Step<br>100.000 kHz |
| Occu               | ipied Bandv               | vidth                 |                       |              | Total Po    | wer   | 37.7      | / dBm      |            | <u>Auto</u> Man        |
|                    |                           | 248                   | .19 I                 | кНz          |             |   |           |            |            | Freq Offset            |
| Trans              | Transmit Freq Error 537   |                       |                       | 37 Hz        | OBW Po      | wer   | 99        | 9.00 %     |            | 0 Hz                   |
| x dB l             | Bandwidth                 |                       | 312.5                 | 5 kHz        | x dB        |   | -26.      | 00 dB      |            |                        |
|                    |                           |                       |                       |              |             |   |           |            |            |                        |
|                    |                           |                       |                       |              |             |   | 4         |            |            |                        |
| MSG                |                           |                       |                       |              |             |   |           | 5          |            |                        |

## GSM850-836.6-@26dB and 99PCT Bandwidth

|                      | um Analyzer - Occi        |        |                 |                       |   |                 |                |                           |                        |             |                    |
|----------------------|---------------------------|--------|-----------------|-----------------------|---|-----------------|----------------|---------------------------|------------------------|-------------|--------------------|
| (XIRL<br>Center Er   | RF 50 Ω                   |        |                 |                       | SENSE:PULSE ALIGN OFF                               |                 |                | 05:41:27 PM<br>Radio Std: | 4 Jun 17, 2021<br>None | Fr          | equency            |
|                      | eq 050.000                |        | ÷               | 📕 🕂 Trig: F           | ┘ Trig: Free Run Avg Hold: 100/100<br>#Atten: 18 dB |                 |                |                           | ice: BTS               |             |                    |
|                      |                           | #IFC   | Gain:Low        | #Atten                |   |                 |                |                           | Ice: B15               |             |                    |
| 10 dB/div            | Ref Offset 2<br>Ref 35.00 |        |                 |                       |   |                 |                |                           |                        |             |                    |
| 25.0                 |                           |        |                 | and the second        | $r^{\mu}$   |                 |                |                           |                        | 6           | enter Freq         |
| 15.0                 |                           |        |                 | /w/ <sup>uu</sup> ··· | - " \w  | <sup>4</sup> 11 |                |                           |                        |             | .600000 MHz        |
| 5.00                 |                           |        | <u>m</u> h      |                       |   | h               |                |                           |                        |             |                    |
| -5.00                |                           |        | N               |                       |   | h               |                |                           |                        |             |                    |
| -15.0                |                           |        | 4 <sup>71</sup> |                       |   |                 | March Charles  |                           |                        |             |                    |
| -25.0                | for ward                  | prod - |                 |                       |   |                 | C              | W mart                    |                        |             |                    |
| -35.0                | m. Arman                  |        |                 |                       |   |                 |                | የ የሌላው                    | · WWWWW                |             |                    |
| -45.0                |                           |        |                 |                       |   |                 |                |                           | יאיי                   |             |                    |
|                      |                           |        |                 |                       |   |                 |                |                           |                        |             |                    |
| Center 83<br>#Res BW |                           |        |                 | #                     | /BW 15 ki   | H7              |                |                           | an 1 MHz<br>36.8 ms    |             | CF Step            |
|                      |                           |        |                 |                       |   |                 |                | oweep 30.8 ms             |                        |             | 100.000 kHz<br>Man |
| Occup                | bied Band                 | width  |                 |                       | Total P   | ower            | 38.0           | 6 dBm                     |                        | <u>Auto</u> |                    |
|                      |                           | 242    | .27 k           | кНz                   |   |                 |                |                           |                        |             | Freq Offset        |
| Transn               | nit Freq Erro             | or     | 41              | 16 Hz                 | OBW F   | Power           | 99             | 9.00 %                    |                        |             | 0 Hz               |
| x dB B               | x dB Bandwidth            |        | 314.1           | l kHz                 | x dB  |                 | -26.           | .00 dB                    |                        |             |                    |
|                      |                           |        |                 |                       |   |                 |                |                           |                        |             |                    |
|                      |                           |        |                 |                       |   |                 |                |                           |                        |             |                    |
| MSG                  |                           |        |                 |                       |   |                 | <b>I</b> STATU | s                         |                        |             |                    |
|                      |                           |        |                 |                       |   |                 |                |                           |                        |             |                    |



#### GSM850-848.8-@26dB and 99PCT Bandwidth

|       |  | rum Analyzer - Occ      |             |            |         |                       |  |          |  |           |                     |                   |            |
|-------|--|-------------------------|-------------|------------|---------|-----------------------|--|----------|--|-----------|---------------------|-------------------|------------|
|       | M RL RF 50 Ω AC CORREC<br>Center Freq 848.800000 MHz |                         |             |            |         | SENSE:PULSE ALIGN OFF |  |          | 05:42:21 PM Jun 17, 2021<br>Radio Std: None  |           | Frequency           |                   |            |
| 00    |  |                         |             |            | 🛻 Trig  |                       |  |          | Radio Dev  | I BTC     |                     |                   |            |
|       |  |                         | #IF0        | Gain:Low   | #A0     | ten: 1d               | a 🛛  |          |  | Radio Dev | Ice: BIS            |                   |            |
|       | dB/div   | Ref Offset<br>Ref 35.00 |             |            |         |                       |  |          |  |           |                     |                   |            |
| 25.0  |  |                         |             |            |         | -0 A P                | A-mar A  |          |  |           |                     | Center F          | rea        |
| 15.0  | o  |                         |             |            | N WWW Y | ዀላዮ                   | transingly and the second seco |          |  |           |                     | 848.800000 N      | - 1        |
| 5.0   | 0  |                         |             | گاہیں      |         |                       |  | "h       |  |           |                     |                   |            |
| -5.00 | 0  |                         |             | , d        |         |                       |  | - Vh     |  |           |                     |                   |            |
| -15.0 | 0  |                         | NUM         | over all a |         |                       |  | <b>`</b> | And the second s |           |                     |                   |            |
| -25.0 | 0  |                         | י.<br>איזען |            |         |                       |  |          | · · · · · · · · · · · · · · · · · · ·  |           |                     |                   |            |
| -35.0 | 0  | Name Sandar             | ·           |            |         |                       |  | _        |  | - Kowen   | 10 <sup>4</sup>     |                   |            |
| -45.0 | O Charles  | ~may ~                  |             |            |         |                       |  |          |  | 1.4       | White M             |                   |            |
| -55.0 |  |                         |             |            |         |                       |  | _        |  |           |                     |                   |            |
|       |  | 48.8 MHz                |             |            |         |                       |  |          |  | - Cr.     | on 4 Milla          |                   |            |
|       |  | 5.1 kHz                 |             |            |         | #VBW 15 kHz           |  |          |  |           | an 1 MHz<br>36.8 ms | CF St             |            |
| F     |  |                         |             |            |         |                       |  |          |  | · · ·     |                     | 100.000 I<br>Auto | кнz<br>Man |
|       | Occu   | pied Band <sup>,</sup>  | width       |            |         |                       | Total Po   | wer      | 38.2   | 2 dBm     |                     |                   |            |
|       |  |                         | 244         | .19 I      | kHz     |                       |  |          |  |           |                     | Freq Off          | fset       |
| ן ו   | Trans  | mit Freq Erre           | or          | 22         | 24 Hz   |                       | OBW Po   | ower     | 99   | 9.00 %    |                     | 0                 | ) Hz       |
| Ι,    | dB E   | Bandwidth               |             | 311.9      | 9 kHz   |                       | x dB   |          | -26.   | 00 dB     |                     |                   |            |
|       |  |                         |             |            |         |                       |  |          |  |           |                     |                   |            |
|       |  |                         |             |            |         |                       |  |          |  |           |                     |                   |            |
|       |  |                         |             |            |         |                       |  |          |  |           |                     |                   |            |
| MSG   |  |                         |             |            |         |                       |  |          | Ko STATU:  | s         |                     |                   |            |

## GSM1900-1850.2-@26dB and 99PCT Bandwidth

|                       | ım Analyzer - Occ        |  |   |      |                        |                         |      |          |           |                           |                        |             |                        |
|-----------------------|--------------------------|--|---|------|------------------------|-------------------------|------|----------|-----------|---------------------------|------------------------|-------------|------------------------|
| (X) RL<br>Center Fr   | RF 50 Ω<br>eq 1.85020    |  |   |      |                        | E:PULSE<br>reg: 1.85020 | 0000 |          | ALIGN OFF | 05:53:27 PM<br>Radio Std: | 1 Jun 17, 2021<br>None | F           | requency               |
|                       | <u>cq 1.03020</u>        |  | Gain:Low                                | ÷    | Trig: Fre<br>#Atten: 1 | Run                     |      | vg Hold: | 100/100   | Radio Devi                | ice: BTS               |             |                        |
| 10 dB/div             | Ref Offset:<br>Ref 35.00 |  |   |      |                        |                         |      |          |           |                           |                        |             |                        |
| 25.0                  |                          |  |   |      | ᠬᠬᡢᡢ                   | hannalange felfe        |      |          |           |                           |                        |             | Center Freq            |
| 15.0<br>5.00          |                          |  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ | wh s | - <u>1</u>             | ~~~~~                   | ·η   | wh.      |           |                           |                        | 1.85        | 0200000 GHz            |
| -5.00                 |                          | er tin                                 | יין,<br>אר <sub>י ש</sub>               |      |                        |                         |      |          | h t a-    |                           |                        |             |                        |
| -25.0                 | Mr                       | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |   |      |                        |                         |      | γm       | virv<br>h | and the second            |                        |             |                        |
| -35.0<br>-45.0        | M. Marana Marana         |  |   |      |                        |                         |      |          |           | - I Many                  | <u>୰</u> ୶୵୶ୄୄୗ୷୶      |             |                        |
| -55.0                 |                          |  |   |      |                        |                         |      |          |           |                           |                        |             |                        |
| Center 1.3<br>#Res BW |                          |  |   |      | #VE                    | 3W 15 kH                | ١z   |          |           |                           | an 1 MHz<br>36.8 ms    |             | CF Step<br>100.000 kHz |
| Occup                 | ied Band                 | width                                  |   |      |                        | Total P                 | ٥w   | /er      | 35.6      | i dBm                     |                        | <u>Auto</u> | Man                    |
|                       |                          | 245                                    | .03                                     | kН   | Z                      |                         |      |          |           |                           |                        |             | Freq Offset            |
| Transm                | nit Freq Erre            | or                                     | -3.08                                   | 5 kH | Ιz                     | OBW P                   | ٥v   | /er      | 99        | 0.00 %                    |                        |             | 0 Hz                   |
| x dB B                | andwidth                 |  | 305.                                    | 3 k⊦ | łz                     | x dB                    |      |          | -26.      | 00 dB                     |                        |             |                        |
|                       |                          |  |   |      |                        |                         |      |          |           |                           |                        |             |                        |
| MSG                   |                          |  |   |      |                        |                         |      |          |           | 3                         |                        |             |                        |
|                       |                          |  |   |      |                        |                         |      |          |           |                           |                        |             |                        |



## GSM1900-1880-@26dB and 99PCT Bandwidth

|                       | m Analyzer - Occu         | pied BW     |          |                     |                         |          |                  |                           |                           |                               |
|-----------------------|---------------------------|-------------|----------|---------------------|-------------------------|----------|------------------|---------------------------|---------------------------|-------------------------------|
| (XIRL<br>Contor Fre   | RF 50 Ω<br>eq 1.880000    |             |          |                     | E:PULSE<br>req: 1.88000 |          | ALIGN OFF        | 05:55:47 Pr<br>Radio Std: | 4 Jun 17, 2021            | Frequency                     |
| Center Fre            | eq 1.00000                |             | +        | 🚽 Trig: Fre         | e Run                   | Avg Hold | : 100/100        |                           |                           |                               |
|                       |                           | #IFG        | iain:Low | #Atten: 1           | 8 dB                    |          |                  | Radio Dev                 | ice: BTS                  |                               |
| 10 dB/div             | Ref Offset 2<br>Ref 35.00 |             |          |                     |                         |          |                  |                           |                           |                               |
| Log<br>25.0           |                           |             |          |                     |                         |          |                  |                           |                           | Contor From                   |
| 15.0                  |                           |             |          | warm /              | monthly.                |          |                  |                           |                           | Center Freq<br>1.88000000 GHz |
| 5.00                  |                           |             | N        | μ <mark>Ν΄ '</mark> | °~~,                    | MAR      |                  |                           |                           | 1.550000000 G112              |
| -5.00                 |                           |             |          |                     |                         | "\       |                  |                           |                           |                               |
| -15.0                 |                           | - Par       | N.       |                     |                         | <u> </u> | Proch            |                           |                           |                               |
|                       |                           | all and the | <u>ل</u> |                     |                         | ý        |                  |                           |                           |                               |
| -35.0                 | mappiner                  | <b>ν</b> Ι  |          |                     |                         |          | י איז            | WWW Jow Party             |                           |                               |
| -45.0                 | man we                    |             |          |                     |                         |          |                  |                           | <sup>N</sup> WYNGHUY AV I |                               |
| -55.0                 |                           |             |          |                     |                         |          |                  |                           |                           |                               |
|                       |                           |             |          |                     |                         |          |                  |                           |                           |                               |
| Center 1.8<br>#Res BW |                           |             |          | #VE                 | 3W 15 kH                | z        |                  |                           | an 1 MHz<br>36.8 ms       | CF Step<br>100.000 kHz        |
| Occup                 | ied Bandv                 | vidth       |          |                     | Total Po                | ower     | 34.8             | 8 dBm                     |                           | <u>Auto</u> Man               |
|                       |                           | 244         | .87 k    | Hz                  |                         |          |                  |                           |                           | Freq Offset                   |
| Transm                | it Freq Erro              | r           | 3.017    | kHz                 | OBW P                   | ower     | 99               | 9.00 %                    |                           | 0 Hz                          |
| x dB Ba               | andwidth                  |             | 315.4    | kHz                 | x dB                    |          | -26.             | 00 dB                     |                           |                               |
|                       |                           |             |          |                     |                         |          |                  |                           |                           |                               |
| MSG                   |                           |             |          |                     |                         |          | <b>I</b> o statu | s                         |                           |                               |

## GSM1900-1909.8-@26dB and 99PCT Bandwidth

| Agilent Spectrum Analyzer - Occupied BW            |           |   |                   |   |                                |
|--|-----------|---|-------------------|---|--------------------------------|
| RL RF 50 Ω AC C     Center Freq 1.909800000 G      |           | SENSE:PULSE<br>Center Freg: 1.90980                   | ALIGN OFF         | 05:56:45 PM Jun 17, 2021<br>Radio Std: None | Frequency                      |
|  |           | Trig: Free Run<br>#Atten: 18 dB                       | Avg Hold: 100/100 | Radio Device: BTS                           |                                |
| Ref Offset 27 dB<br>10 dB/div <b>Ref 35.00 dBm</b> |           |   |                   |   |                                |
| Log<br>25.0<br>15.0                                |           | UNDEN VICATION AND AND AND AND AND AND AND AND AND AN | m                 |   | Center Freq<br>1.909800000 GHz |
| 5.00<br>-5.00<br>-15.0<br>-25.0                    |           |   |                   |   |                                |
| -25.0<br>-35.0<br>-45.0                            |           |   |                   | Watter Willing Conference                   |                                |
| -55.0  |           |   |                   |   |                                |
| Center 1.91 GHz<br>#Res BW 5.1 kHz                 |           | #VBW 15 kH  | Iz                | Span 1 MHz<br>Sweep 36.8 ms                 |                                |
| Occupied Bandwidth                                 |           | Total P   | ower 34.2         | 2 dBm                                       | <u>Auto</u> Man                |
| 24   | 3.61 kH   | Z   |                   |   | Freq Offset                    |
| Transmit Freq Error                                | -2.072 kH | lz OBW P  | ower 9            | 9.00 %                                      | 0 Hz                           |
| x dB Bandwidth                                     | 308.5 k⊦  | lz xdB  | -26.              | .00 dB                                      |                                |
|  |           |   |                   |   |                                |
| MSG  |           |   | STATU             | S   |                                |



#### 5.4 BAND EDGE

#### 5.4.1 MEASUREMENT METHOD

1. All out of band emissions are measured with an analyzer spectrum connected to the antenna terminal of the EUT while the EUT at its maximum duty cycle, at maximum power, and at the approximate frequencies. All data rates were investigated to determine the worst case configuration

2. The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

3. Start and stop frequency were set such that the band edge would be placed in the center of the plot.

4. Span was set large enough so as to capture all out of band emissions near the band edge.

5. RBW>1% of the emission bandwidth, VBW >=3 x RBW, Detector=RMS, Number of points>=2 x Span/RBW,

Trace mode=max hold, Sweep time=auto couple, and the trace was allowed to stabilize

#### 5.4.2 **PROVISIONS APPLICABLE**

As Specified in FCC rules of 22.917(a), 24.238(a)and KDB 971168 D1 V03R01.

#### 5.4.3 MEASUREMENT RESULT



#### GSM1900-GPRS-1850.2@Pass

| Agile                        | nt Spe            | ectrur   | n An           | alyzer -                | Swe             | pt S/    | ł                         |        |                                    |           |          |      |              |             |         |       |       |                                     |        |              |          |            |                            |                        |   |
|------------------------------|-------------------|----------|----------------|-------------------------|-----------------|----------|---------------------------|--------|------------------------------------|-----------|----------|------|--------------|-------------|---------|-------|-------|-------------------------------------|--------|--------------|----------|------------|----------------------------|------------------------|---|
| ເ <mark>೫</mark> ℝ<br>Cer    |                   | Fre      | RF<br>Pq       | 1.849                   | <sup>50 Ω</sup> |          | 00 G                      |        |                                    |           | S        |      | E:PULS       |             |         | vg Ty | pe:   | AUTO/N<br>RMS<br>00/100             | JO RF  | 02:49        | TRAG     | CE 1 2     | 24,202<br>2345<br>VMM/     | 56                     | Frequency                                 |
|                              | B/di <sup>,</sup> |          |                | Offse<br>f 30.0         |                 |          | ĬF                        |        | Wide<br>n:Low                      |           | #Atte    |      |              |             |         | gino  |       | /lkr1                               | 1.     |              | D<br>000 |            | 1 N N N                    | z N                    | Auto Tune                                 |
| 20.0<br>10.0                 |                   |          |                |                         |                 |          |                           |        |                                    |           |          |      |              |             | M       | March | ()MAR | n <sup>a</sup> n <sup>a</sup> trich | (veres | Y<br>Yiriniy | Mul.     |            |                            |                        | Center Freq<br>1.849950000 GHz            |
|                              |                   |          |                |                         |                 |          |                           |        |                                    |           |          |      | <b>h</b> ana | <b>≹</b> 1/ | WV<br>V |       |       |                                     |        |              | יי<br>   | N.<br>- N. | <u>ю</u><br>ц <b>∕-1</b> 0 | ∋m<br>4 <sub>y</sub> n | Start Fred<br>1.849450000 GHz             |
| -40.0<br>-50.0<br>-60.0      | لإطراب            | 'nınlırı | <b>/40</b> /44 | الإسرام (۱۹۷۵)<br>00 GH | hinghaph        | ስ<br>ምትም | hyth <b>r</b> adianth<br> | Natori | 4.11 <sup>4</sup> 17 <sup>14</sup> | der nå fr | AND CALL |      |              |             |         |       |       |                                     |        |              |          |            |                            |                        | Stop Frec<br>1.850450000 GHz              |
| <u> </u>                     | rt 1.<br>s B      |          |                |                         | iz              |          | ×                         |        | #VE                                | sw ·      | 11 kH    | łz*  |              |             | ICTION  |       |       | veep                                | 81     |              | ns (     |            | 1 pt                       | s)                     | CF Step<br>100.000 kHz<br><u>Auto</u> Mar |
| 1<br>2<br>3<br>4<br>5<br>6   | N                 | 1        | f              |                         |                 |          | 50 000                    | 000    | GHz                                |           | -16.95   | 8 dE | 3m           |             |         |       |       |                                     |        |              |          |            |                            |                        | Freq Offset<br>0 Hz                       |
| 7<br>8<br>9<br>10<br>11<br>< |                   |          |                |                         |                 |          |                           |        |                                    |           |          |      |              |             |         |       |       |                                     |        |              |          |            | >                          |                        |   |
| MSG                          |                   |          |                |                         |                 |          |                           |        |                                    |           |          |      |              |             |         |       |       |                                     | TUS    |              |          |            |                            |                        |   |

## GSM1900-GPRS-1909.8@Pass

| Agilent Spectrum Analyzer - Swept S      | 5A                       |  |  |  |
|--|--------------------------|--|--|--|
| 🕅 RL RF 50 Ω ΑΦ<br>Center Freq 1.9100500 | 000 GHz                  | #Avg Type: RMS                                     | 02:47:41 PM Nov 24, 2020<br>TRACE 1 2 3 4 5 6<br>TYPE MWWWWW   | Frequency  |
| Ref Offset 27 dB                         | IFGain:Low #Atten: 18 dE | 3  | 910 020 0 GHz<br>-13.663 dBm   | Auto Tune  |
| Log                                      | V Vilene Mark and Marken |  |  | Center Freq<br>1.910050000 GHz                   |
| -10.0<br>-20.0<br>-30.0                  |                          | Keffianse  | -13.00 dBm   | <b>Start Freq</b><br>1.909550000 GHz             |
| -40.0                                    |                          | Hartyn llyn gan gan gan gan gan gan gan gan gan ga | <sup>י</sup> וריזיילקאניגיעיקערייריקאנאיזיין איזיין אי | <b>Stop Freq</b><br>1.910550000 GHz              |
| Start 1.9095500 GHz<br>#Res BW 3.9 kHz   | #VBW 11 kHz*             | Sto  | p 1.9105500 GHz<br>.60 ms (2001 pts)<br>FUNCTION VALUE   | <b>CF Step</b><br>100.000 kHz<br><u>Auto</u> Man |
| 2<br>3<br>4<br>5<br>6<br>7               | -13.663 dBm              |  | s  | Freq Offset<br>0 Hz                              |
| 8<br>9<br>10<br>11<br><                  |                          |  |  |  |



#### GSM1900-Voice-1850.2@Pass

|   | 50:2@1 035   |  |                             |                              |
|---|--|--|-----------------------------|------------------------------|
| Agilent Spectrum Analyzer - Swept                 |  |  |                             |                              |
| ເ₩ RL   RF   50 Ω<br>Center Freq 1.849950         | AC CORREC SENSE:PU<br>000 GHz<br>PNO: Wide ↔ Trig: Free Ri   | #Avg Type: RMS                                   | TRACE 123456<br>TYPE MWWWWW | Frequency                    |
|   | IFGain:Low #Atten: 18 di   | 8  | 850 000 0 GHz               | Auto Tune                    |
| Ref Offset 27 dl<br>10 dB/div Ref 30.00 dB<br>Log |  |  | -18.459 dBm                 |                              |
| 20.0  |  |  | mila.                       | Center Freq                  |
| 10.0  |  | www.handhanalanalanalanalanalanalanalanalanalana | W WWW WWW                   | 1.849950000 GHz              |
|   |  | 1 M  | ች<br>                       | Start Freq                   |
| -20.0   | mathy the terms and the second s | ант <mark>и</mark> ни                            | "MARA A                     | 1.849450000 GHz              |
| -40.0   | A START AND A START  |  |                             |                              |
| -50.0   | www.waterheader  |  |                             | Stop Fred<br>1.850450000 GHz |
| Start 1.8494500 GHz                               |  | Ct   | op 1.8504500 GHz            |                              |
| #Res BW 3.9 kHz                                   | #VBW 11 kHz*   | Sweep 8  | 1.60 ms (2001 pts)          | CF Step<br>100.000 kHz       |
|   | × Y<br>.850 000 0 GHz -18.459 dBm  | FUNCTION FUNCTION WIDTH                          | FUNCTION VALUE              | <u>Auto</u> Mar              |
| 2<br>3<br>4                                       |  |  |                             | Freq Offset                  |
| 5<br>6  |  |  |                             | 0 Hz                         |
| 7<br>8<br>9                                       |  |  |                             |                              |
| 10<br>11  |  |  | <u> </u>                    |                              |
| MSG   | in and a second s  |  |                             |                              |
|   |  | <b>N</b>   |                             |                              |

## GSM1900-Voice-1909.8@Pass

| Agilent Spectrum Analyzer - Swept SA  |               |  |                    |  |
|---|---------------|--|--------------------|--|
| M         RL         RF         50 Ω         AC         CORREC           Center Freq 1.910050000 GHz  |               | ALIGN AUTO/NORF 02:43:3<br>#Avg Type: RMS<br>Avg Hold: 100/100 | RACE 1 2 3 4 5 6   | Frequency  |
| PNO: Wide ←<br>IFGain:Low<br>Ref Offset 27 dB<br>10 dB/div Ref 30.00 dBm  | #Atten: 18 dB |  |                    | Auto Tune  |
|   |               |  |                    | Center Freq<br>1.910050000 GHz                   |
| -10.0   |               | Stop 1 9   | -13.00 dBm         | <b>Start Freq</b><br>1.909550000 GHz             |
| -40.0   |               | ┙┉┉┉┉┉┉╷┑┪┿╎╎╏┈╌┉╗╢┉╌╦╍╦┿╗╠┥┉┵┉╅╔┥                             | har myrraetal aynr | <b>Stop Freq</b><br>1.910550000 GHz              |
| #Res BW 3.9 kHz #VB   | W 11 kHz*     | Sweep 81.60 m  | 00000 0112         | <b>CF Step</b><br>100.000 kHz<br><u>Auto</u> Man |
| 1         N         1         f         1.910 000 0 GHz           2         -         -         -         -           3         -         -         -         -           4         -         -         -         -           5         -         -         -         -           6         -         -         -         -           7         -         -         -         - | -18.682 dBm   |  | I                  | Freq Offset<br>0 Hz                              |
| 8<br>9<br>10<br>11<br><   |               |  | <u> </u>           |  |
| MSG   |               |  |                    |  |



#### GSM850-GPRS-824.2@Pass

| Agilent Spectrum Analyzer - Swe |  |                  | N AUTO/NORF 02:52:32 PM  | 1Nov 24, 2020   |                         |
|---------------------------------|--|------------------|--|-----------------|-------------------------|
| Center Freq 823.950             | 0000 MHz   | #Avg Type        | RMS TRAC   | E123456 Frequen | icy                     |
| •                               | PNO: Wide ++++ Trig: Fre<br>IFGain:Low #Atten: *   |                  | 100/100 IYP<br>DE  |                 |                         |
|                                 | IFGail.Low written.  | • 40             | Mkr1 824.000   | Auto            | Tune                    |
| Ref Offset 27                   |  |                  |  | I3 dBm          |                         |
| 10 dB/div Ref 30.00 d           | dBm  |                  | -22.0  |                 |                         |
| 20.0                            |  |                  |  | Cente           | r Fred                  |
| 10.0                            |  | i tanki d        | Whater and a start | 823.95000       |                         |
|                                 |  | A alway a second | ' 'Why we have   | 825.95000       |                         |
| 0.00                            |  | NV N             |  |                 |                         |
| -10.0                           |  | 1,               |  | Star            | t Freq                  |
| -20.0                           |  |                  |  | 523.45000       |                         |
| -30.0                           | Meter I I I I I I I I I I I I I I I I I I I  |                  |  |                 |                         |
| -40.0                           | and a second sec |                  |  |                 |                         |
| -50.0                           | All and Al   |                  |  | Stop            | o Freq                  |
| -50.0                           | Les hearing and a plant provide the  |                  |  | 824.45000       | 00 MHz                  |
| -60.0 100 -60.0                 |  |                  |  |                 |                         |
| Start 823.4500 MHz              |  |                  | Stop 824.4   | 500 MHz         | 04                      |
| #Res BW 3.9 kHz                 | #VBW 11 kHz*   | s                | Sweep 81.60 ms (2  |                 | <b>- Step</b><br>00 kHz |
|                                 |  |                  | •  | Auto            | Man                     |
| MKR MODE TRC SCL                | × Y<br>824.000 0 MHz -22.013 d   |                  | CTION WIDTH FUNCTIO  |                 |                         |
| 2                               | 024.000 0 111 12 -22.010 0   |                  |  |                 |                         |
| 3 4                             |  |                  |  | Freq            |                         |
| 5                               |  |                  |  | =               | 0 Hz                    |
| 6 7                             |  |                  |  |                 |                         |
| 8                               |  |                  |  |                 |                         |
| 9                               |  |                  |  |                 |                         |
| 10                              |  |                  |  | ~               |                         |
| C                               | III III  |                  |  |                 |                         |
| MSG                             |  |                  | STATUS   |                 |                         |
|                                 |  |                  | - 1  |                 |                         |

#### GSM850-GPRS-848.8@Pass

| Agilent Spectrum Analyzer - Swept SA   |               |  |  |                                    |
|--|---------------|--|--|------------------------------------|
| M         RL         RF         50 Ω         AC         CORREC           Center Freq 849.050000 MHz  | SENSE:PULSE   | ALIGN AUTO/NOR<br>#Avg Type: RMS<br>Avg Hold: 100/100  | F 02:52:47 PM Nov 24, 2020<br>TRACE 1 2 3 4 5 6<br>TYPE MWWWWW | Frequency                          |
| PN0: Wide →<br>IFGain:Low<br>Ref Offset 27 dB  | #Atten: 18 dB |  | 849.000 0 MHz  | Auto Tune                          |
| 10 dB/div Ref 30.00 dBm  |               |  | -18.568 dBm  | Center Freq<br>849.050000 MHz      |
| 0.00<br>-10.0<br>-20.0   |               |  | -13:00 dBm   | Start Freq<br>848.550000 MHz       |
| -30.0  |               | and the state of t | <sup>ምም</sup> ትር የሚያስት በ የምምምምምምምምምምምምምምምምምምምምምምምምምምምምምምምምምምም  | Stop Freq<br>849.550000 MHz        |
| Start 848.5500 MHz<br>#Res BW 3.9 kHz #VBV   | V 11 kHz*     | Sweep 8  | 1.60 ms (2001 pts)   | CF Step<br>100.000 kHz<br>Auto Man |
| MKS         MODE         TRC         SCI         X           1         N         1         f         849.000 0 MHz         2           2         -         -         -         -         -           3         -         -         -         -         -           4         -         -         -         -         -         -           5         - | -18.568 dBm   | TION FUNCTION WIDTH  | FUNCTION VALUE   | Freq Offset<br>0 Hz                |
| 7         8           9         10           11         11   |               |  | v  |                                    |
| MSG  | 100           | STATUS   |  |                                    |



#### GSM850-Voice-824.2@Pass

| 0000000                        | inzer ass  |                  |                                    |                             |                 |
|--------------------------------|--|------------------|------------------------------------|-----------------------------|-----------------|
| Agilent Spectrum Analyzer - Sw | rept SA  |                  |                                    |                             |                 |
| <b>LX/</b> RL RF 50 Ω          | AC CORREC  | SENSE:PULSE      | \Lambda ALIGN AUTO/NO F            | RF 02:52:01 PM Nov 24, 2020 | -               |
| Center Freq 823.95             | 0000 MHz   | 1                | #Avg Type: RMS                     | TRACE 1 2 3 4 5 6           |                 |
|                                | PNO: Wide ++-  | 🚽 Trig: Free Run | Avg Hold: 100/100                  |                             |                 |
|                                | IFGain:Low   | #Atten: 18 dB    |                                    | DET A N N N N N             |                 |
| <b></b>                        |  |                  | Miland                             | 823.995 5 MHz               | Auto Tune       |
| Ref Offset 27                  | 7 dB   |                  | IVIKET                             |                             |                 |
| 10 dB/div Ref 30.00            | dBm  |                  |                                    | -18.344 dBm                 |                 |
| Log                            |  |                  |                                    |                             |                 |
| 20.0                           |  |                  |                                    |                             | Center Fred     |
|                                |  |                  |                                    | 4WA.m.                      |                 |
| 10.0                           |  |                  | and a second and the second second | 1 or Minimum Andrews        | 823.950000 MHz  |
| 0.00                           |  |                  | Y                                  | 17/1 <sub>11</sub>          |                 |
|                                |  |                  | 5                                  | h 1                         |                 |
| -10.0                          |  | <b>▲</b> 1,,     | f                                  | -13.00 dDm                  | Start Freq      |
| -20.0                          |  |                  |                                    | 1 m 1 m 1 m                 |                 |
| 20.0                           |  |                  |                                    |                             | 823.450000 MHz  |
| -30.0                          |  | Jul In           |                                    |                             |                 |
| -40.0                          |  | and the          |                                    |                             |                 |
| -40.0                          |  |                  |                                    |                             | Stop Freq       |
| -50.0                          | a builden hit he   | W.               |                                    |                             |                 |
| -60.0                          | A REAL PROPERTY AND A REAL |                  |                                    |                             | 824.450000 MHz  |
|                                | 11110.1  |                  |                                    |                             |                 |
|                                |  |                  |                                    |                             |                 |
| Start 823.4500 MHz             |  |                  | _                                  | Stop 824.4500 MHz           | CF Step         |
| #Res BW 3.9 kHz                | ۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲<br>۲  | 11 kHz*          | Sweep 8                            | 31.60 ms (2001 pts)         | 100.000 kHz     |
| MKR MODE TRC SCL               | ×  |                  | ICTION FUNCTION WIDTH              | FUNCTION VALUE              | <u>Auto</u> Man |
|                                | 823.995 5 MHz  | -18.344 dBm      | FUNCTION WIDTH                     |                             |                 |
|                                | 823.995 5 MHZ  | -18.344 dBm      |                                    |                             |                 |
| 3                              |  |                  |                                    | <u> </u>                    | Freq Offset     |
| 4                              |  |                  |                                    |                             |                 |
| 5                              |  |                  |                                    |                             | 0 Hz            |
| 6                              |  |                  |                                    |                             |                 |
| 7                              |  |                  |                                    |                             |                 |
| 8                              |  |                  |                                    |                             |                 |
| 9                              |  |                  |                                    |                             |                 |
| 10                             |  |                  |                                    |                             |                 |
|                                |  | I                |                                    | ×                           |                 |
|                                |  |                  | -4                                 |                             |                 |
| MSG                            |  |                  |                                    | s                           |                 |
|                                |  |                  |                                    |                             |                 |

#### GSM850-Voice-848.8@Pass

| Agilent Spectrum Analyzer - Swept SA  |   |  |   |   |
|---|---|--|---|---|
| Center Freq 849.050000 MHz  | SENSE:PULSE                             | ALIGN AUTO/NORF<br>#Avg Type: RMS<br>Avg Hold: 100/100   | 02:52:17 PMNov 24, 2020<br>TRACE 1 2 3 4 5 6                  | Frequency                                 |
| PNO: Wide -<br>IFGain:Low<br>Ref Offset 27 dB<br>10 dB/div Ref 30.00 dBm  | #Atten: 18 dB                           | -  | TYPE MUMUU<br>DET A N N N N N<br>849.000 0 MHz<br>-19.914 dBm | Auto Tune                                 |
|   | и — — — — — — — — — — — — — — — — — — — |  |   | Center Freq<br>849.050000 MHz             |
| -10.0<br>-20.0<br>-30.0   |   |  | -13.00 dBm  | Start Freq<br>848.550000 MHz              |
| -40.0   |   | ้ <sup>ให้ก</sup> ัดไข่ไข้ทำให้อาการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการเลืองการ<br>Si | rine water to and the second                                  | Stop Freq<br>849.550000 MHz               |
| Start 848.5500 MHz           #Res BW 3.9 kHz         #VB           MXR MODE TRE SEL         X   | W 11 kHz*                               |  | top 849.5500 MHz<br>.60 ms (2001 pts)<br>FUNCTION VALUE       | CF Step<br>100.000 kHz<br><u>Auto</u> Man |
| 1         N         1         f         849,000 0 MHz           2         -         -         -         -           3         -         -         -         -           4         -         -         -         -           5         -         -         -         -           6         -         -         -         -           7         -         -         -         - | -19.914 dBm                             |  |   | Freq Offset<br>0 Hz                       |
| 8 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1   | ing                                     | STATUS   | <br>>   |   |



#### **5.5 SPURIOUS EMISSION**

#### 5.5.1 CONDUCTED SPURIOUS EMISSION

#### 5.5.1.1 MEASUREMENT METHOD

The following steps outline the procedure used to measure the conducted emissions from the EUT. 1. The level of the carrier and the various conducted spurious and harmonic frequency is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at maximum power, and at the approximate frequencies. All data rates were investigated to determine the worst case configuration.

2. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the equipment of PCS1900 band, this equates to a frequency range of 30 MHz to 19.1 GHz, data taken from 30 MHz to 20 GHz. For GSM850, data taken from 30 MHz to 9 GHz.

3. Determine EUT transmit frequencies: the following typical channelswere chosen to conducted emissions testing.

| Typical Channels for testing of GSM 850 |                 |  |  |  |  |  |  |
|---|-----------------|--|--|--|--|--|--|
| Channel                                 | Frequency (MHz) |  |  |  |  |  |  |
| 128                                     | 824.2           |  |  |  |  |  |  |
| 190                                     | 836.6           |  |  |  |  |  |  |
| 251                                     | 848.8           |  |  |  |  |  |  |

| Typical Channel | Is for testing of PCS 1900 |
|-----------------|----------------------------|
| Channel         | Frequency (MHz)            |
| 512             | 1850.2                     |
| 661             | 1880.0                     |
| 810             | 1909.8                     |



#### 5.5.1.2 PROVISIONS APPLICABLE

On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

#### 5.5.1.3 MEASUREMENT RESULT

Pass



#### GSM850-824.2-GPRS@1GHz-9GHz@Pass

|   | Spectr |           | halyzer - Si          |                   |                       |                  |           |         |      |                   |              |                    |          |  |    |   |
|---|--------|-----------|-----------------------|-------------------|-----------------------|------------------|-----------|---------|------|-------------------|--------------|--------------------|----------|--|----|---|
| Cent  | er Fi  | RI<br>req |                       | Ω AC 00000        |                       |                  |           | E:PULSE |      | #Avg Ty<br>Avg Ho | ype: R       |                    | TR/      | PM Jun 17, 202<br>ACE 1 2 3 4 5<br>YPE M WWWWW | 6  | Frequency   |
| 10 dB   | (div   |           | f Offset 2<br>f 20.00 |                   |                       | :Fast ⊶<br>n:Low | #Atten: 2 |         |      |                   | 10. 100      |                    | r1 1.64  | 9 2 GH   | z  | Auto Tune   |
| 10.00 -<br>-10.00 -                             |        |           |                       |                   |                       |                  |           |         |      |                   |              |                    |          | -13.00 dB                                      |    | Center Freq<br>5.000000000 GHz                      |
| -20.0 -<br>-30.0<br>-40.0 -                     |        | • 1       |                       | anti Manta Harita | , det at lite for the |                  |           |         |      |                   | (h. dis juis | in the part of the |          |  |    | Start Freq<br>1.000000000 GHz                       |
| -50.0 -<br>-60.0 -<br>-70.0 -                   |        |           |                       |                   |                       |                  |           |         |      |                   |              |                    |          |  |    | <b>Stop Fred</b><br>9.000000000 GHz                 |
| Start<br>#Res                                   | BW     | 1.0       | MHz                   | ×                 |                       | #VB\             | W 3.0 MHz | 2       | FUNC |                   |              | ep 13<br>NWDTH     | .33 ms ( | 9.000 GH<br>20001 pts                          | 5) | <b>CF Step</b><br>800.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | N 1    | f         |                       | 1.6               | 649 2 0               | GHz              | -23.460 d | Bm      |      |                   |              |                    |          |  |    | Freq Offset<br>0 Hz                                 |
| 11<br>MSG                                       |        |           |                       |                   |                       |                  | IIII      |         |      |                   | Ę            |                    | 3        |  | ~  |   |

## GSM850-824.2-GPRS@30mHz-1GHz@Pass

|   |          | ctrui | n An       | alyzer -                                  | Swep       | t SA         |        |                    |     |                  |    |  |       |      |                            |     |       |           |                                  |     |   |
|---|----------|-------|------------|---|------------|--------------|--------|--------------------|-----|------------------|----|--|-------|------|----------------------------|-----|-------|-----------|----------------------------------|-----|---|
| Cen   |          | Fre   | RF<br>eq ( | 515.0                                     | າ ລ<br>000 | ac<br>100    | MHz    |                    |     | 1                |    |  |       | Түре | ALIGN OF<br>RMS<br>100/100 | F   | 05:   | TRAG      | MJun 17,2<br>2E 1 2 3<br>PE MWWW | 456 | Frequency                                   |
| 10 d  | B/div    | ,     |            | Offset<br>f 35.0                          |            |              |        | 10: Fas<br>Sain:Lo |     | #Atten: 2        |    |  |       |      |                            | Mk  |       | ₀<br>786. | 99 M<br>89 de                    | Hz  | Auto Tune                                   |
| Log<br>25.0<br>15.0<br>5.00                     |          |       |            |   |            |              |        |                    |     |                  |    |  |       |      |                            |     |       |           |                                  |     | Center Freq<br>515.000000 MHz               |
| -5.00<br>-15.0<br>-25.0                         |          |       |            |   |            |              |        |                    |     |                  |    |  |       |      |                            | 1   |       |           | -13.00                           |     | Start Freq<br>30.000000 MHz                 |
| -35.0<br>-45.0<br>-55.0                         | ni fujin |       |            | en in |            | hin ingingin | in and |                    |     |                  |    | iya qalada ya ka |       | **** |                            |     |       |           |                                  |     | <b>Stop Freq</b><br>1.000000000 GHz         |
| Star<br>#Re                                     |          | N 1   | 1 O.       | MHz                                       |            | ×            |        | #\                 | VBW | 3.0 MHz          | z  | FUNC   | DTION |      | weep                       |     | 1 E E | ns (2     | 0000 G<br>0001 j                 |     | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | N        | 1     | f          |   |            | 7            | 86.99  | 9 MHz              |     | <u>-28.889</u> d | Bm |  |       |      |                            |     |       |           |                                  |     | Freq Offset<br>0 Hz                         |
| 10<br>11<br><                                   |          |       |            |   |            |              |        |                    |     | IIII             |    |  |       |      | <b>I</b> ∕o st≉            | TUS |       |           |                                  | >   |   |



#### GSM850-824.2-Voice@1GHz-9GHz@Pass

| Agilent Spe                                     |          |  |  |                         |           |    |         |                                    |               |   |  |
|---|----------|--|--|-------------------------|-----------|----|---------|------------------------------------|---------------|---|--|
| Center  | Freq     | 00.00  | 00000 GH   |                         |           |    | #Avg Ty | ALIGN OFF<br>pe: RMS<br>d: 100/100 | TRA           | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE M WWWWWW | Frequency                                    |
| 10 dB/div                                       |          | f Offset 27  | 'dB  | NO: Fast  +<br>Gain:Low | #Atten: 2 |    |         |                                    | ⊳<br>kr1 1.64 | ET P N N N N N                                  | Auto Tune                                    |
|   | <u> </u> |  |  |                         |           |    |         |                                    |               | -13.00 dBm                                      | Center Freq<br>5.000000000 GHz               |
| -20.0   |          | الأحجاب والمارية المراجعين<br>المحور المحور المحور المحود المحود الم | in the state of the |                         |           |    |         |                                    |               |   | Start Freq<br>1.000000000 GHz                |
| -50.0<br>-60.0<br>-70.0                         |          |  |  |                         |           |    |         |                                    |               |   | Stop Freq<br>9.000000000 GHz                 |
| Start 1.0<br>#Res B\<br>MKE MODE                | N 1.0    | MHz  | ×  | #VB                     | W 3.0 MHz |    |         | Sweep 1                            | 3.33 ms (2    | 0.000 GHz<br>0001 pts)                          | CF Step<br>800.000000 MHz<br><u>Auto</u> Man |
| 1 N<br>2 3<br>4 5<br>6 7<br>7 8<br>9 9<br>10 11 | 1 F      |  | 1.649  | 2 GHz                   | -23.255 d | Bm |         |                                    |               |   | Freq Offset<br>0 Hz                          |
| MSG   |          |  |  |                         |           |    |         | <b>Ko</b> statu                    | JS            |   | U  |

## GSM850-824.2-Voice@30mHz-1GHz@Pass

|   |       | ctrui | n An       | alyzer - S  | Swep | t SA                                  |          |                |              |            |          |       |     |       |        |                                  |      |      |                       |                               |        |   |  |
|---|-------|-------|------------|-------------|------|---------------------------------------|----------|----------------|--------------|------------|----------|-------|-----|-------|--------|----------------------------------|------|------|-----------------------|-------------------------------|--------|---|--|
| Cen   |       | Fre   | RF<br>eq ( | 50<br>515.0 |      | AC                                    | MHz      |                |              | <b>_</b> , | SENS     | E:PUL |     |       | д Тур- | ALIGN OFI<br>e: RMS<br>: 100/100 | F    | 05:  | TRAG                  | MJun 17<br>2E 1 2 3<br>PE MWW | 456    |   | Frequency  |
| 10 d  | B/div | ,     |            | Offset      |      |                                       |          | NO: H<br>Gain: | ast ⊷<br>Low |            | Atten: 2 |       |     |       |        |                                  | Mkı  |      | ₀<br>858.             | 14 N<br>97 d                  | 1Hz    | í | Auto Tune  |
| Log<br>25.0<br>15.0<br>5.00                           |       |       |            |             |      |                                       |          |                |              |            |          |       |     |       |        |                                  |      |      |                       |                               |        |   | Center Freq<br>515.000000 MHz                      |
| -5.00<br>-15.0<br>-25.0                               |       |       |            |             |      |                                       |          |                |              |            |          |       |     |       |        |                                  |      |      | <b>♦</b> <sup>1</sup> |                               | 00 dBm |   | Start Freq<br>30.000000 MHz                        |
| -35.0<br>-45.0<br>-55.0                               |       |       |            |             |      | i i i i i i i i i i i i i i i i i i i | uni-tent |                |              |            |          |       |     |       |        |                                  |      |      |                       |                               |        |   | <b>Stop Freq</b><br>1.00000000 GHz                 |
| Star<br>#Re   |       | N 1   | .0 I       | MHz         |      | ×                                     |          |                | #VB\         | N 3.       | 0 MHz    | z     | FUN | CTION |        | weep                             | 1.33 | 33 r | ns (2                 | 0000                          | pts)   |   | <b>CF Step</b><br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11 | N     | 1     | f          |             |      |                                       | 858.1    | 4 MI           |              | -28        | 3.897 d  | Bm    |     |       |        |                                  |      |      |                       |                               |        |   | Freq Offset<br>0 Hz                                |
| MSG   |       |       |            |             |      |                                       |          |                |              |            |          |       |     |       |        | <b>I</b> o sta                   | TUS  |      |                       |                               | _      |   |  |



#### GSM850-836.6-GPRS@1GHz-9GHz@Pass

|   | oectrun |          | lyzer - Swe   |        |                        |           |           |          |         |                                  |                       |  |  |
|---|---------|----------|---|--------|------------------------|-----------|-----------|----------|---------|----------------------------------|-----------------------|--|--|
| w. RL<br>Cente  | r Fre   | RF<br>q5 | 50 Ω<br>.00000  | 0000 G |                        |           | ISE:PULSE |          | vg Typ  | ALIGN OFF<br>e: RMS<br>: 100/100 | TRA                   | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE MWWWWWW | Frequency                                    |
| 10 dB/d   |         |          | Offset 27<br><b>20.00 c</b>   | dB     | PNO: Fast<br>FGain:Low | #Atten:   |           |          | ginoia. |                                  | □<br>< <u>r1 1.67</u> | 4 0 GHz<br>86 dBm                              | Auto Tune                                    |
|   |         |          | 20.00 (   |        |                        |           |           |          |         |                                  |                       | -13.00 dBm                                     | Center Freq<br>5.000000000 GHz               |
| -20.0<br>-30.0<br>-40.0                                 | (       |          | مر العربي ال<br>العربي العربي |        |                        |           |           |          |         |                                  |                       |  | Start Fred<br>1.000000000 GHz                |
| -50.0   |         |          |   |        |                        |           |           |          |         |                                  |                       |  | <b>Stop Fred</b><br>9.000000000 GHz          |
| Start 1<br>#Res I                                       | 3W 1.   | .0 IV    |   | ×      | #VI                    | вw з.о мн | z         | FUNCTION |         | weep 13                          | 3.33 ms (2            | .000 GHz<br>20001 pts)                         | CF Step<br>800.000000 MHz<br><u>Auto</u> Man |
| 1 N<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11 |         | f        |   |        | 40 GHz                 | -22.486   |           |          |         |                                  |                       |  | Freq Offset<br>0 Hz                          |
| K<br>MSG  |         |          |   |        |                        | 1111      | 1         |          |         | <b>I</b> o statu                 | s                     |  |  |

## GSM850-836.6-GPRS@30mHz-1GHz@Pass

|                                      |       | ctru                                  | m An       | alyzer -                                     | Swep    | ot SA     |             |                  |             |         |        |      |                    |      |   |      |                      |                                    |        |   |
|--------------------------------------|-------|---------------------------------------|------------|--|---------|-----------|-------------|------------------|-------------|---------|--------|------|--------------------|------|---|------|----------------------|------------------------------------|--------|---|
| Cen                                  |       | Fre                                   | RF<br>Pq ( | 515.0  | 0 Q     | AC<br>000 | MHz         |                  |             | 7       | NSE:PU |      |                    | Туре | ALIGN OF  | F    | 05:41:32<br>TR,<br>T | PM Jun 17,<br>ACE 1 2 3<br>YPE MWW | 456    | Frequency                                   |
| 10 d                                 | B/div | ,                                     |            | Offsel                                       |         |           |             | NO: Fa<br>Gain:L | ist ↔<br>ow | #Atten: |        |      |                    |      |   | Mkr  | 1 745                | DET P N N                          | 1Hz    | Auto Tune                                   |
| Log<br>25.0<br>15.0<br>5.00          |       |                                       |            |  |         |           |             |                  |             |         |        |      |                    |      |   |      |                      |                                    |        | Center Freq<br>515.000000 MHz               |
| -5.00<br>-15.0<br>-25.0              |       |                                       |            |  |         |           |             |                  |             |         | _      |      |                    |      | <b>●</b> <sup>1</sup>   |      |                      |                                    | 00 dBm | Start Freq<br>30.000000 MHz                 |
| -35.0<br>-45.0<br>-55.0              |       | i i i i i i i i i i i i i i i i i i i |            | <b>,,,,,,,,</b> ,,,,,,,,,,,,,,,,,,,,,,,,,,,, | wighter |           | up in e ful | i yi biyon       |             |         |        |      | i i genide pi plat |      | in the second |      |                      |                                    |        | <b>Stop Freq</b><br>1.000000000 GHz         |
| Star<br>#Re                          |       | N 1                                   | .0 I       | MHz  |         | ×         |             | #                | VBW         | 3.0 MH  | lz     | FUNI | CTION              |      | weep  | 1.33 |                      |                                    | pts)   | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8 | N     | 1                                     | f          |  |         |           | 745.9       | 1 MH:            | z           | -29.154 | dBm    |      |                    |      |   |      |                      |                                    |        | Freq Offset<br>0 Hz                         |
| 9<br>10<br>11<br><                   |       |                                       |            |  |         |           |             |                  |             |         |        |      |                    |      | <b>K</b> STA  | TUS  |                      |                                    | >      |   |



#### GSM850-836.6-Voice@1GHz-9GHz@Pass

| Agilent Spec  |            |   |          |                      |           |         |                         |        |                |           |   |  |
|---|------------|---|----------|----------------------|-----------|---------|-------------------------|--------|----------------|-----------|---|--|
| Center I  | RF<br>Freq | 00.00   | 00000 GH |                      |           | E:PULSE | #Avg T<br>Avg Ho        | ype: R |                | TRA       | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE MWWWWW | Frequency                                    |
|   |            | f Offset 27   | dB       | NO: Fast<br>Gain:Low | #Atten: 2 |         |                         |        |                | r1 1.674  | 4 0 GHz<br>81 dBm                             | Auto Tune                                    |
| 10 dB/div<br>10.0   | Re         | f 20.00 (   |          |                      |           |         |                         |        |                | -20.4     | -13.00 dDm                                    | Center Freq<br>5.00000000 GHz                |
| -20.0<br>-30.0  | <b>1</b>   | المحركمينا با يتعاد العبرينين<br>العرب المعرار في العبرينين |          |                      |           |         | renter for bits ( Lie , |        |                |           |   | Start Freq<br>1.000000000 GHz                |
| -50.0<br>-60.0<br>-70.0   |            |   |          |                      |           |         |                         |        |                |           |   | Stop Freq<br>9.000000000 GHz                 |
| Start 1.0<br>#Res BV  | V 1.0      | MHz   |          | #VE                  | W 3.0 MHz |         |                         |        | ep 13<br>NWDTH | .33 ms (2 | .000 GHz<br>0001 pts)                         | CF Step<br>800.000000 MHz<br><u>Auto</u> Man |
| 1         N           2         3           3         -           6         -           7         -           8         -           9         -           10         -           11         - | 1 f        |   |          | 0 GHz                | -23.481 d |         |                         |        |                |           |   | Freq Offset<br>0 Hz                          |
| MSG   |            |   |          |                      |           |         |                         | ¢      | STATUS         | 3         | >   |  |

## GSM850-836.6-Voice@30mHz-1GHz@Pass

|   |       | ctrur | n An       | alyzer - S   | wept S | 5A             |                     |     |   |       |      |      |      |                               |      |         |   |     |   |
|---|-------|-------|------------|--------------|--------|----------------|---------------------|-----|---|-------|------|------|------|-------------------------------|------|---------|---|-----|---|
| Cen                                       |       | Fre   | RF<br>eq ( | 50<br>515.00 |        | 0 MH           |                     |     | ]   | e Run |      |      | Түре | ALIGN OFF<br>: RMS<br>100/100 | 1    | TRA     | M Jun 17, 2<br>CE <u>1</u> 2 3 4<br>PE M <del>W W</del> | 156 | Frequency                                   |
| 10 d                                      | B/div |       |            | Offset 2     |        | IF             | PNO: Fas<br>Gain:Lo |     | #Atten: 2   |       |      |      |      |                               | lkr  | 1 939.  | 76 M<br>81 dE   | Hz  | Auto Tune                                   |
| Log<br>25.0<br>15.0<br>5.00               |       |       |            |              |        |                |                     |     |   |       |      |      |      |                               |      |         |   |     | Center Freq<br>515.000000 MHz               |
| -5.00<br>-15.0<br>-25.0                   |       |       |            |              |        |                |                     |     |   |       |      |      |      |                               |      |         | -13.00  | dBm | Start Freq<br>30.000000 MHz                 |
| -35.0<br>-45.0<br>-55.0                   |       |       |            |              |        | an la tha faga |                     |     | te de service de la complete de la c |       |      |      |      |                               |      |         |   |     | <b>Stop Freq</b><br>1.000000000 GHz         |
| Star<br>#Re                               |       | N 1   | 1 O.       | VIHz         |        | ×              | #                   | vbw | 7 3.0 MHz   | 2     | FUNC | TION |      | weep 1                        | .333 | 3 ms (2 | 0000 G<br>20001 p                                       |     | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | N     | 1     | f          |              |        | 939.7          | 76 MHz              |     | <u>-28.581 d</u>  | Bm    |      |      |      |                               |      |         |   |     | Freq Offset<br>0 Hz                         |
| 9<br>10<br>11<br><                        |       |       |            |              |        |                |                     |     | IIII  |       |      |      |      | STAT                          | JS   |         |   | >   |   |



#### GSM850-848.8-GPRS@1GHz-9GHz@Pass

| Agilent Spect  |                         |                      | pt SA   |                         |           |         |               |        |                               |           |   |  |
|--|-------------------------|----------------------|---------|-------------------------|-----------|---------|---------------|--------|-------------------------------|-----------|---|--|
| Center F   | <sub>RF</sub><br>req 5. | 50 Ω<br>00000        | 0000 GH |                         |           | E:PULSE |               | ј Туре | ALIGN OFF<br>: RMS<br>100/100 | TRA       | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE M WWWWWW | Frequency                                    |
| 10 dB/div  |                         | offset 27<br>20.00 d | dB      | NO: Fast  •<br>Gain:Low | #Atten: 2 |         |               |        |                               | r1 5.83   | 1 6 GHz<br>50 dBm                               | Auto Tune                                    |
|  |                         | 20.00 0              |         |                         |           |         |               |        |                               |           | -13.00 dBm                                      | Center Freq<br>5.000000000 GHz               |
| -20.0<br>-30.0<br>-40.0  |                         |                      |         |                         |           | i hindi | 1<br>Internet |        |                               |           |   | <b>Start Freq</b><br>1.000000000 GHz         |
| -50.0<br>-60.0<br>-70.0  |                         |                      |         |                         |           |         |               |        |                               |           |   | <b>Stop Freq</b><br>9.000000000 GHz          |
| Start 1.00<br>#Res BW  | 1.0 M                   |                      | ×       | #VB                     | W 3.0 MHz |         | FUNCTION      |        | weep 13                       | .33 ms (2 | .000 GHz<br>20001 pts)                          | CF Step<br>800.000000 MHz<br><u>Auto</u> Man |
| 1         N           2         3           3         4           5         6           7         8           9         10           11         11 | f                       |                      | 5.831   | 6 GHz                   | -23.850 d |         |               |        |                               |           |   | Freq Offset<br>0 Hz                          |
| MSG  |                         |                      |         |                         | IIII      |         |               |        |                               | 5         |   |  |

## GSM850-848.8-GPRS@30mHz-1GHz@Pass

| Agiler   |       | ctru | m An       | alyzer   | - Swe          | ept SA     |      |             |                  |  |         |        |    |   |       |        |                               |      |                       |           |                           |                        |   |  |
|--|-------|------|------------|--|----------------|------------|------|-------------|------------------|--|---------|--------|----|---|-------|--------|-------------------------------|------|-----------------------|-----------|---------------------------|------------------------|---|--|
| Cen  |       | Fre  | RF<br>eq : |  | 50 Ω<br>000    | AC<br>1000 | MH   |             |                  |  | ]<br>   | SENSE  |    |   |       | у Туре | ALIGN OF<br>e: RMS<br>100/100 |      | 05:                   | TRA       | CE 1 2                    | 7,2021<br>3456<br>MMMM |   | Frequency  |
| 10 d   | B/div | ,    |            | <sup>- Offs</sup><br>f 35.   |                |            |      | PNO<br>FGai | : Fast<br>in:Lov | N N                                    |         | en: 24 |    |   | 0181  |        |                               |      |                       | ⊳<br>815. | ет <mark>Р N</mark><br>31 | MHz<br>dBm             | 1 | Auto Tune  |
| Log<br>25.0<br>15.0<br>5.00                                |       |      |            |  |                |            |      |             |                  |  |         |        |    |   |       |        |                               |      |                       |           |                           |                        |   | Center Freq<br>515.000000 MHz                      |
| -5.00<br>-15.0<br>-25.0                                    |       |      |            |  |                |            |      |             |                  |  |         |        |    |   |       |        |                               |      | <b>●</b> <sup>1</sup> |           |                           | 3.00 dBm               |   | Start Freq<br>30.000000 MHz                        |
| -35.0<br>-45.0<br>-55.0                                    | -     |      |            | i a la se la s | <u>Un fije</u> |            |      |             |                  | ************************************** |         |        |    | , de la compañía de<br>La compañía de la comp |       |        |                               |      |                       |           |                           |                        |   | <b>Stop Freq</b><br>1.000000000 GHz                |
| Star<br>#Re  |       | W 1  | .0         | MHz  |                | `<br>>     | <    |             |                  | /BW                                    | ' 3.0 ľ |        |    | FUN   | CTION |        | weep                          |      | 33 r                  |           | 000                       | <u> </u>               | I | <b>CF Step</b><br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11<br>< | N     | 1    | f          |  |                |            | 815. | 31 N        | MHz              |  | -28.7(  | 67 dE  | 3m |   |       |        |                               |      |                       |           |                           |                        |   | Freq Offset<br>0 Hz                                |
| MSG  |       |      |            |  |                |            |      |             |                  |  |         |        |    |   |       |        | <b>I</b> ost/                 | ATUS |                       |           |                           |                        |   |  |



#### GSM850-848.8-Voice@1GHz-9GHz@Pass

| Agilent                             | Spec     | trun |      |        |            |           |   |       |       |            |       |         |    |    |      |     |      |                         |               |      |           |              |                           |        |   |
|-------------------------------------|----------|------|------|--------|------------|-----------|---|-------|-------|------------|-------|---------|----|----|------|-----|------|-------------------------|---------------|------|-----------|--------------|---------------------------|--------|---|
| Cent                                | er F     | Fre  | RF   |        | ີ 2<br>000 | AC<br>000 | 0 G   |       |       |            | ]     | SENS    |    |    |      |     | Тури | ALIGN<br>e: RM<br>100/1 | s             | 05   | TRA       | CE 1         | 17, 202<br>2 3 4 5<br>WWW | 56     | Frequency                                   |
| 10 dB/                              | / alia . |      |      | Offset |            |           | 1   |       | in:Lo | st ⊶►<br>w |       | tten: 2 |    |    |      |     |      | 100/1                   |               |      | ،<br>2.63 | оет  Р<br>44 | GH                        | Z<br>Z | Auto Tune                                   |
| 10 dB/<br>Log -<br>10.0 -<br>0.00 - | iaiv     |      |      | 20.0   |            | 5111      |   |       |       |            |       |         |    |    |      |     |      |                         |               |      | 2-7.0     |              | -13.00 df                 |        | <b>Center Fre</b><br>5.000000000 GH         |
| -20.0 -<br>-30.0 -                  |          |      |      |        |            | 1         | i ale de la composición de la composici |       | -     |            |       |         |    |    | 4.44 |     |      |                         |               |      |           |              |                           | *      | <b>Start Free</b><br>1.000000000 GH         |
| -50.0 -<br>-60.0 -<br>-70.0 -       |          |      | -    |        |            |           |   |       |       |            |       |         |    |    |      |     |      |                         |               |      |           |              |                           |        | Stop Free<br>9.000000000 GH                 |
| Start<br>#Res                       | BW       | V 1  | .0 1 | ٨Hz    |            | ×         |   |       | #\    | VBW        | / 3.0 | MHz     |    | FL | INCT | ION |      |                         | p 13<br>WIDTH | 3.33 |           | 200          | 0 GH<br>01 pt             |        | CF Step<br>800.000000 MH<br><u>Auto</u> Mar |
|                                     |          | 1    | f    |        |            |           | 2.63  | 4 4 9 | GHz   |            | -24.  | 535 dl  | Bm |    |      |     |      |                         |               |      |           |              |                           |        | Freq Offse<br>0 H                           |
| MSG                                 |          |      |      |        |            |           |   |       |       |            |       |         |    |    |      |     |      | <b>K</b>                | STATU         | s    |           |              |                           |        | <u> </u>                                    |

# GSM850-848.8-Voice@30mHz-1GHz@Pass

| Agilen  |       | ctrui   | m An       | alyzer          | - Swe       | ept SA |         |                   |       |          |        |           |       |      |                               |        |                   |   |    |   |
|---|-------|---------|------------|-----------------|-------------|--------|---------|-------------------|-------|----------|--------|-----------|-------|------|-------------------------------|--------|-------------------|---|----|---|
| Cen   |       | Fre     | RF<br>Pq ( | 515.0           | 50Ω<br>000  | AC     | MHz     |                   |       | ]        | ISE:PU |           |       | Түре | ALIGN OFF<br>: RMS<br>100/100 | 05     | TRA               | M Jun 17, 2<br>CE <u>1</u> 2 3 4<br>PE M <del>WWV</del> | 56 | Frequency                                   |
| 10 d  | B/div | ,       |            | Offse<br>f 35.0 |             |        |         | NO: Fa<br>Gain:Li | ist 🔸 | #Atten:  |        |           |       |      |                               |        | □<br>852.         | 37 MI<br>61 dB  | Hz | Auto Tune                                   |
| Log<br>25.0<br>15.0<br>5.00                     |       |         |            |                 |             |        |         |                   |       |          |        |           |       |      |                               |        |                   |   |    | Center Freq<br>515.000000 MHz               |
| -5.00<br>-15.0<br>-25.0                         |       |         |            |                 |             |        |         |                   |       |          |        |           |       |      |                               |        | • <sup>1</sup> =  | -13.00  |    | Start Freq<br>30.000000 MHz                 |
| -35.0<br>-45.0<br>-55.0                         |       | Heister |            | teri i firi     | () un all y |        | inte la |                   |       |          |        | i yaya yi |       |      |                               |        | i <u>hardenta</u> |   |    | <b>Stop Freq</b><br>1.000000000 GHz         |
| Star<br>#Re                                     |       | N 1     | .0 I       | MHz             |             | ×      |         | #                 | VBW   | ' 3.0 MH | z      | FUN       | CTION |      | weep 1.                       | .333 I | nis (2            | 0000 G<br>0001 p  |    | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | N     | 1       | f          |                 |             |        | 852.3   | 7 MH:             |       | -20.961  | dBm    |           |       |      |                               |        |                   |   |    | Freq Offset<br>0 Hz                         |
| 11<br>MSG                                       |       |         |            | ļ               |             |        |         |                   |       |          |        |           |       |      |                               | ıs     |                   |   |    |   |



### GSM1900-1850.2-GPRS@13.6GHz-20GHz@Pass

|                                |        | ectru       | m An     | alyzer - S  | Swept S |             |                    |              |                                      |         |      |      |                                |        |          |  |   |                                       |
|--------------------------------|--------|-------------|----------|-------------|---------|-------------|--------------------|--------------|--------------------------------------|---------|------|------|--------------------------------|--------|----------|--|---|---------------------------------------|
| Cen                            | -      | Fre         | RF<br>eq | 50<br>16.80 |         | 0000        |                    |              | ]                                    | E:PULSE |      | Туре | ALIGN OFF<br>: RMS<br>100/100  | 05:5   | TRAG     | M Jun 17,2<br>CE <u>1</u> 2 3 4<br>PE M <del>W W</del> | 156   | Frequency                             |
| 10 di                          | D (dia |             |          | Offset      |         | 1<br>}      | PNO: Fa<br>FGain:L | ast ↔<br>Low | #Atten: 2                            |         |      |      |                                |        | □<br>119 | 04 G<br>67 dE  | Hz  | Auto Tune                             |
| 10.0<br>10.0<br>0.00           |        | •           |          | 20.00       |         |             |                    |              |                                      |         |      |      |                                |        | -+1-     | -13.00   |   | Center Frec<br>16.800000000 GH2       |
| -20.0<br>-30.0<br>-40.0        |        | i i i i i i | -        |             |         |             |                    |              | , j. S. bilaitá ant bir an Uni.<br>1 |         |      |      | las un et sa de stat de side a |        |          |  | at the second | <b>Start Fred</b><br>13.600000000 GHz |
| -50.0<br>-60.0<br>-70.0        |        |             |          |             |         |             |                    |              |                                      |         |      |      |                                |        |          |  |   | Stop Frec<br>20.000000000 GH:         |
| Star<br>#Re:                   | s B    | W 1         | .01      | ИНz         |         |             | #                  | #VBW         | 3.0 MHz                              |         |      |      | weep 10                        | 6.00 n | 15 (2    | .000 G<br>0001 p                                       |   | CF Step<br>640.000000 MHz<br>Auto Mar |
| MKR 1<br>2<br>3<br>4<br>5<br>6 | N      |             | f        |             |         | ×<br>19.119 | 04 GH              |              | -18.467 dl                           | 3m      | FUNC | FUN  | CTION WIDTH                    |        | UNCTU    | UN VALUE   |   | Freq Offse                            |
| 7<br>8<br>9<br>10<br>11        |        |             |          |             |         |             |                    |              | IIU                                  |         |      |      |                                |        |          |  | >   |                                       |
| MSG                            |        |             |          |             |         |             |                    |              |                                      |         |      |      |                                | S      |          |  |   |                                       |

### GSM1900-1850.2-GPRS@1GHz-7GHz@Pass

|   |                | rum A                 | nalyz | er - Swe          | ept SA      |        |                     |     |                                    |         |         |             |      |                               |        |           |                                       |     |   |
|---|----------------|-----------------------|-------|-------------------|-------------|--------|---------------------|-----|------------------------------------|---------|---------|-------------|------|-------------------------------|--------|-----------|---------------------------------------|-----|---|
| Cen                                       |                | req                   |       | 50 Ω<br>00000     | AC<br>10000 |        | z                   |     | 1                                  | E:PULSE |         |             | Туре | ALIGN OFF<br>: RMS<br>100/100 | 05:54  | TRAC      | I Jun 17, 202<br>1 2 3 4 5<br>E MWWWW | 56  | Frequency   |
| 10 di                                     | B/div          |                       |       | fset 27<br>5.00 ( |             |        | IO: Fast<br>ain:Lov |     | #Atten: 2                          |         |         |             |      |                               |        | DE<br>817 | 7 GH                                  | z I | Auto Tune   |
| Log<br>25.0<br>15.0<br>5.00               |                |                       |       |                   |             |        |                     |     |                                    |         |         |             |      |                               |        |           |                                       | _   | Center Freq<br>4.000000000 GHz                      |
| -5.00<br>-15.0<br>-25.0                   |                | y das J Mar a Bar San |       |                   |             |        |                     |     | and the state of the second second |         | - Luuri | الم الم الم |      | , Maria Maria and Sala        | 1      |           | -13.00 dE                             | Ðm  | Start Freq<br>1.000000000 GHz                       |
| -35.0<br>-45.0<br>-55.0                   |                |                       |       |                   |             |        |                     |     |                                    |         |         |             |      |                               |        |           |                                       | _   | <b>Stop Freq</b><br>7.000000000 GHz                 |
| #Re                                       | t 1.04<br>s BW | 1.0                   | мн    | z                 | X           |        | #V                  | /BW | 3.0 MHz                            | 2       | FUNC    | TION        |      | weep 1                        | 0.67 m | s (20     | 000 GH<br>0001 pt:<br>NVALUE          |     | <b>CF Step</b><br>600.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | N              | 1 f                   |       |                   | 5           | .817 7 | 7 GHz               |     | -25.112 d                          | Bm      |         |             |      |                               |        |           |                                       |     | Freq Offset<br>0 Hz                                 |
| 10<br>11<br><                             |                |                       |       |                   |             |        |                     |     | 1111                               |         |         |             |      | STATU                         | JS     |           |                                       | ~   |   |



#### GSM1900-1850.2-GPRS@30mHz-1GHz@Pass

|                               | Spectru |            | alyzer - Swe |    |                     |      |            |         |        |         |                                    |         |       |   |      |   |
|-------------------------------|---------|------------|--------------|----|---------------------|------|------------|---------|--------|---------|------------------------------------|---------|-------|---|------|---|
| (X) RL<br>Cente               | er Fro  | RF<br>eq ( | 50 Ω         |    | CORREC              |      | 1          | E:PULSE |        | #Avg Ty | ALIGN OFF<br>pe: RMS<br>d: 100/100 | 05:54   | TRAC  | I Jun 17, 2021<br>E 1 2 3 4 5 6<br>E MWWWWW |      | Frequency                                       |
| 10 dB/                        | ali     |            | Offset 27    |    | PNO: Fa<br>IFGain:L |      | #Atten: 24 |         |        | Avgino  |                                    |         | DE    | 65 MHz                                      | 1    | Auto Tune                                       |
| 10.00 -<br>10.00 -            |         |            | 20.00 (      |    |                     |      |            |         |        |         |                                    |         |       | -13.00 dDm                                  |      | Center Freq<br>515.000000 MHz                   |
| -20.0 -<br>-30.0 -            |         |            |              |    |                     |      |            |         | é duga |         |                                    |         |       | 1   |      | Start Freq<br>30.000000 MHz                     |
| -50.0 -<br>-60.0 -<br>-70.0 - |         |            |              |    |                     |      |            |         |        |         |                                    |         |       |   | 1.   | <b>Stop Freq</b><br>000000000 GHz               |
| Start<br>#Res                 | BW 1    | 1.0 [      | MHz          |    | #                   | ¢VBW | 3.0 MHz    |         | FUNC   |         | Sweep                              | 1.333 m | s (20 | 000 GHz<br>0001 pts)<br>NVALUE              | Auto | <b>CF Step</b><br>97.000000 MHz<br><u>o</u> Man |
|                               | N 1     | f          |              | 95 | 4.65 MH:            | Z    | -28.702 df | 3m      |        |         |                                    |         |       |   |      | Freq Offset<br>0 Hz                             |
| MSG                           |         |            |              |    |                     |      |            |         |        |         | <b>По</b> sta                      | TUS     |       |   |      |   |

### GSM1900-1850.2-GPRS@7GHz-13.6GHz@Pass

|                |           | ctrum    | n Ana     | lyzer - Sv        |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  |   |                            |
|----------------|-----------|----------|-----------|-------------------|----------|-----------|----------------------|-----------------|----------------------------|--------|----------------|-------------------|----------|-------------------------------|--------------------|--|---|----------------------------|
| Cen            |           | Fre      | RF<br>q 1 | 50 s              |          |           | Hz                   |                 | 1                          | E:PULS |                |                   | Type     | ALIGN OFF<br>: RMS<br>100/100 | TR                 | PM Jun 17, 2021<br>ACE 1 2 3 4 5<br>YPE MWWWWW | 6 | Frequency                  |
|                |           |          |           |                   |          |           | NO: Fast<br>Gain:Lov |                 | #Atten: 2                  |        |                | Avgin             |          |                               |                    | B 44 GHz                                       | N | Auto Tune                  |
| 10 d           | B/div     |          |           | Offset 2<br>20.00 |          |           |                      |                 |                            |        |                |                   |          |                               |                    | 077 dBm  |   |                            |
| Log<br>10.0    |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  | l | Center Freq                |
| 0.00           |           |          | _         |                   | _        |           |                      |                 |                            |        |                |                   |          |                               |                    |  | ł | 10.300000000 GHz           |
| -10.0          |           |          |           |                   | -        |           |                      | _               |                            |        |                |                   |          |                               |                    | dDm  |   |                            |
| -20.0          | - 41- 10- | المريطة  | الملاد    | العديد ورزاميه    |          | Indust in |                      | والمعادمة والمع | وريقاقينان وقفوار والمراجع |        | . Las ales and | ر او هم خانگ و رو | dan same | أسرار فريتين بمع مقرمانه      | فالمعادمة المعادمة | all conceptibility and a start                 |   | Start Freq                 |
| -30.0<br>-40.0 |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  | ] | 7.00000000 GHz             |
| -50.0          |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  | I |                            |
| -60.0          |           |          |           |                   | _        |           |                      |                 |                            |        |                |                   |          |                               |                    |  |   | Stop Freq                  |
| -70.0          |           |          | -         |                   | _        |           |                      |                 |                            |        |                |                   |          |                               |                    |  | ╢ | 13.600000000 GHz           |
| Star           |           |          |           |                   |          |           | 1                    |                 |                            |        |                |                   |          |                               |                    | 3.600 GHz                                      |   | CF Step                    |
| #Re            |           |          |           | /IHz              |          |           | #V                   | /BW             | 3.0 MHz                    |        |                |                   |          | <u> </u>                      |                    | 20001 pts                                      | - | 660.000000 MHz<br>Auto Man |
| MKR<br>1       | MODE      | TRC<br>1 | SCI.<br>f |                   | ×<br>13. | 193 44    | 4 GHz                |                 | -24.077 dl                 | 3m     | FUNC           | TION              | FUN      | CTION WIDTH                   | FUNC               | TION VALUE                                     |   | <u>Auto</u> man            |
| 2              |           |          |           |                   |          |           |                      |                 |                            | -      |                |                   |          |                               |                    |  |   | Freq Offset                |
| 4              |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  |   | 0 Hz                       |
| 6              |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  |   |                            |
| 8              |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    |  |   |                            |
| 10<br>11       |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               |                    | ~  |   |                            |
| MSG            |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          |                               | -                  |  |   |                            |
| MSG            |           |          |           |                   |          |           |                      |                 |                            |        |                |                   |          | STATU:                        | 2                  |  |   |                            |



### GSM1900-1850.2-Voice@13.6GHz-20GHz@Pass

| Agilent Spect   | rum An      | alyzer - Swej   |  |                       |   |       |         |                           |        |           |  |  |
|---|-------------|-----------------|--|-----------------------|---|-------|---------|---------------------------|--------|-----------|--|--|
| Center F  | RF<br>req ' | 50 Ω<br>16.8000 | 00000 0  |                       |   | e Run |         | AL<br>Type: I<br>lold: 10 |        | TRA       | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE M WWWWW | Frequency                                    |
| 10 dB/div   |             | Offset 27       | IF<br>dB   | PNO: Fast<br>Gain:Low | #Atten: 2   |       |         |                           |        | 18.984    | 96 GHz<br>65 dBm                               | Auto Tune                                    |
| 10.00   |             | 20.00 4         |  |                       |   |       |         |                           |        | <u> </u>  | -13.00 dDm                                     | Center Freq<br>16.80000000 GHz               |
| -20.0<br>-30.0  |             |                 | روي بالماريم و الارامي<br>روي بالماريم و الارامي |                       | in the product of the state of |       |         |                           |        |           |  | <b>Start Fred</b><br>13.600000000 GHz        |
| -50.0<br>-60.0<br>-70.0   |             |                 |  |                       |   |       |         |                           |        |           |  | Stop Frec<br>20.000000000 GHz                |
| Start 13.0<br>#Res BW   | 1.0         | MHz             | X  | #VE                   | 3W 3.0 MH   |       | UNCTION |                           | eep 16 | .00 ms (2 | 0.000 GHz<br>20001 pts)                        | CF Step<br>640.000000 MHz<br><u>Auto</u> Man |
| 1 N<br>2<br>3<br>4<br>5<br>6                                    | 1 f         |                 | 18.984 9   | 96 GHz                | -19.465 d   |       |         | FUNCT                     |        | FUNCT     |  | Freq Offset<br>0 Hz                          |
| 0           7           8           9           10           11 |             |                 |  |                       |   |       |         |                           |        |           |  |  |
| MSG   |             |                 |  |                       |   |       |         |                           |        | 3         |  |  |

# GSM1900-1850.2-Voice@1GHz-7GHz@Pass

|                            |               | trum A       | nalyz    | er - Swe              | ept SA |           |                      |            |                   |    |          |                   |       |            |      |        |   |           |                                       |
|----------------------------|---------------|--------------|----------|-----------------------|--------|-----------|----------------------|------------|-------------------|----|----------|-------------------|-------|------------|------|--------|---|-----------|---------------------------------------|
| Cen                        | -             |              | ۶<br>4.0 | 50 Ω<br>  <b>0000</b> | AC     |           | z                    |            | 1                 |    |          | #Avg T<br>Avg Ho  | ype:  |            | 05:4 | TRAG   | M Jun 17, 20<br>CE <u>1</u> 2 3 4<br>PE M WWW | 56        | Frequency                             |
|                            |               |              |          | fset 27               |        | PN<br>IFG | 10: Fast<br>Gain:Lov | t⊶ ⊫⊶<br>w | #Atten: 2         |    |          | Avgino            |       |            |      | .70    | et  P N N N<br>B 5 GH                         | N N<br>IZ | Auto Tune                             |
| 10 di<br>Log               | B/div         | R            | ef 3     | 5.00 c                | iBm    |           |                      |            |                   |    |          |                   |       |            | -2   | :4.7   | 60 dB   | m         |                                       |
| 25.0<br>15.0<br>5.00       |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   | _         | Center Freq<br>4.000000000 GHz        |
| -5.00                      |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   |           |                                       |
| -15.0                      |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        | -13.00  | dBm       | Start Freq                            |
|                            |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   |           | 1.00000000 GHz                        |
| -25.0                      |               | بالمتر وسأله |          | ومعلايدة              |        | <b>.</b>  |                      |            | initia a la fatta |    | الم يطري | والمتحدث والمراجع |       |            |      |        | An of Antonia Alberta                         | (inter    |                                       |
| -35.0                      |               |              |          |                       |        |           |                      |            | 1. and 1          |    |          |                   |       |            |      |        |   |           | Stop Freq                             |
| -45.0                      |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   |           | 7.000000000 GHz                       |
| -55.0                      |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   |           |                                       |
|                            | t 1.0<br>s BW |              |          | z                     |        |           | #\                   | /BW        | 3.0 MHz           | :  |          |                   | Sw    | eep 1      |      |        | .000 GI<br>0001 p                             |           | CF Step<br>600.000000 MHz<br>Auto Man |
|                            | MODE          | TRC SI       |          |                       | ×      | 700 /     |                      |            | Y                 |    | FUNC     | TION              | FUNCT | TION WIDTH |      | UNCTIO | on value                                      | ^         | Auto Iviaii                           |
| 1<br>2<br>3<br>4<br>5<br>6 | N             |              |          |                       | 2.     | /08 6     | 5 GHz                |            | -24.760 d         | Bm |          |                   |       |            |      |        |   | -         | Freq Offset<br>0 Hz                   |
| 7<br>8<br>9<br>10          |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   |           |                                       |
| 10                         |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            |      |        |   | ~         |                                       |
| MSG                        |               |              |          |                       |        |           |                      |            |                   |    |          |                   |       |            | JS   |        |   |           |                                       |



#### GSM1900-1850.2-Voice@30mHz-1GHz@Pass

|   |        | ectru   |          | alyzer -                              |   | t SA  |            |                 |              |  |        |      |         |      |  |        |                |                           |        |                                      |
|---|--------|---------|----------|---------------------------------------|---|---|------------|-----------------|--------------|--|--------|------|---------|------|--|--------|----------------|---------------------------|--------|--------------------------------------|
| Cen   |        | Fre     | RF<br>eq | 515.0                                 |   | AC 000  | COR        | :               |              |  | SE:PUL |      | #Avg    | Туре | ALIGN OFF<br>: RMS<br>100/100  | т      | RACE 1         | 17,2021<br>23456<br>MMMMM |        | Frequency                            |
| 10 di   | D (dia |         |          | Offset                                |   |   |            | NO: F<br>Gain:l | ast ↔<br>Low | #Atten:2   |        |      | O A BIU |      |  | kr1 86 | DET P          | NNNN                      | ×<br>] | Auto Tune                            |
| 10.0<br>10.0<br>-10.0                           |        | v       |          | 1 20.0                                |   | <u>, , , , , , , , , , , , , , , , , , , </u> |            |                 |              |  |        |      |         |      |  |        |                | -13:00 dBm                |        | Center Freq<br>515.000000 MHz        |
| -20.0<br>-30.0<br>-40.0                         | Nive   | la equi |          | er i likilen jerisi<br>Tana tanga pag | - |   | and kine b | i și de la c    | ali star     | inde Jaal and Hanston and Land<br>Hanston Annual and Appropriate | e lei  |      |         |      | ્ તું આ દિવ્યુ છે. કુ વાળ કે બાળ કરે છે કે જ જ<br>વ્યુક્ત અને કુ અને કુ અને કુ અને કે અને કુ |        |                | an i star se te i         |        | <b>Start Freq</b><br>30.000000 MHz   |
| -50.0<br>-60.0<br>-70.0                         |        |         |          |                                       |   |   |            |                 |              |  |        |      |         |      |  |        |                |                           |        | <b>Stop Freq</b><br>1.000000000 GHz  |
| Star<br>#Re                                     | s B    | W 1     | 1.0      | MHz                                   |   | ×   |            | Ĵ               | #VBW         | / 3.0 MH   | z      | FUNI | OTION   |      | weep 1.:   | 333 ms | 1.000<br>(200) |                           |        | CF Step<br>97.000000 MHz<br>.uto Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | N      | 1       | f        |                                       |   | 8   | 63.52      | 2 MH            |              | -28.960 c  | iBm    |      |         |      |  |        |                |                           |        | Freq Offset<br>0 Hz                  |
| 11<br>MSG                                       |        | 1       | I        | ļ                                     |   |   |            |                 |              | 1111   |        |      |         |      | <b>I</b> o STATU:  | s      |                | × ×                       |        |                                      |

# GSM1900-1850.2-Voice@7GHz-13.6GHz@Pass

|                                 |       | trum   | Ana              | yzer - Sv         | wept SA |           |                      |     |           |       |         |        |                                      |           |   |                                      |
|---------------------------------|-------|--------|------------------|-------------------|---------|-----------|----------------------|-----|-----------|-------|---------|--------|--------------------------------------|-----------|---|--------------------------------------|
| Cen                             |       | Free   | RF<br><b>q 1</b> | 50 s<br>0.300     | Ω AC    |           | Hz                   |     |           | e Run |         | /g Typ | ALIGN OFF<br>e: RMS<br>: 100/100     | TR.       | PM Jun 17, 2021<br><sup>ACE</sup> 1 2 3 4 5 6<br>YPE M <del>WWWWM</del> | Frequency                            |
| 10 di                           | 3/div |        |                  | Offset 2<br>20.00 |         | Pr<br>IFG | NO: Fast<br>Sain:Lov | v   | #Atten: 2 |       |         |        |                                      | 12.494    | 17 GHz<br>346 dBm   | Auto Tune                            |
| Log<br>10.0<br>0.00<br>-10.0    |       |        |                  |                   |         |           |                      |     |           |       |         |        |                                      |           | -13.00 dDm  | Center Fred<br>10.300000000 GHz      |
| -20.0<br>-30.0<br>-40.0         |       | ii) ai | <b>47</b> 414    | nt nin di k       |         |           |                      | 444 |           |       |         |        | ليان معادي مناسب المراجع المراجع الم |           |   | Start Fred<br>7.000000000 GHz        |
| -50.0<br>-60.0<br>-70.0         |       |        |                  |                   |         |           |                      |     |           |       |         |        |                                      |           |   | <b>Stop Fred</b><br>13.600000000 GHz |
| Star<br>#Re:                    | s BV  | V 1.   | 0 14             |                   |         |           | #V                   | вw  | 3.0 MHz   | -     | UNCTION |        | weep 12                              | 2.00 ms ( | 3.600 GHz<br>20001 pts)   |                                      |
| 1<br>2<br>3<br>4<br>5<br>6<br>7 | N     | 1      | f                |                   | 12.     | 494 17    | 7 GHz                |     | -23.346 d | Bm    |         |        |                                      |           |   | Freq Offset<br>0 Hz                  |
| 8<br>9<br>10<br>11<br><         |       |        |                  |                   |         |           |                      |     | IIII      |       |         |        | <b>I</b> statu                       | s         | ~   |                                      |



### GSM1900-1880-GPRS@13.6GHz-20GHz@Pass

| Agilent Spect  | rum An | alyzer - Swe  |               |                         |                                  |         |        |                               |            |   |  |
|--|--------|---|---------------|-------------------------|----------------------------------|---------|--------|-------------------------------|------------|---|--|
| Center F   | req '  | 00.00   | 00000 0       |                         |                                  |         | ј Туре | ALIGN OFF<br>: RMS<br>100/100 | TRA        | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>(PE M WWWWW | Frequency                                    |
| 10 dB/div  |        | Offset 27   | dB            | PNO: Fast<br>Gain:Low   | #Atten: 2                        |         |        |                               | 19.054     | 72 GHz  | Auto Tune                                    |
|  |        | 20.00 0   |               |                         |                                  |         |        |                               | 1_         | -13.00 dBm                                      | Center Freq<br>16.80000000 GHz               |
| -20.0<br>-30.0<br>-40.0  |        | and and the second s |               | ing in the filling with | natal un di Bach a Literatura du |         |        |                               |            | a an        | Start Freq<br>13.600000000 GHz               |
| -50.0<br>-60.0<br>-70.0  |        |   |               |                         |                                  |         |        |                               |            |   | <b>Stop Freq</b><br>20.000000000 GHz         |
| Start 13.<br>#Res BW   | 1.0    | MHz   |               | #VE                     | 3W 3.0 MH2                       | UNCTION |        | weep 16<br>monworth           | 6.00 ms (2 | 0.000 GHz<br>20001 pts)                         | CF Step<br>640.000000 MHz<br><u>Auto</u> Man |
| Att MUDe           1         N           2         3           3 |        |   | ×<br>19.054 7 | 72 GHz                  | -18.527 d                        |         |        |                               |            |   | Freq Offset                                  |
| MSG  |        | +   |               | · ·                     |                                  |         | •      |                               | s          |   |  |

### GSM1900-1880-GPRS@1GHz-7GHz@Pass

| Agilen                                    |       | trun | n Ana    | alyze | r - Sw       | ept SA      |       |     |                  |     |         |        |         |      |      |       |                               |      |                        |        |                                  |  |
|---|-------|------|----------|-------|--------------|-------------|-------|-----|------------------|-----|---------|--------|---------|------|------|-------|-------------------------------|------|------------------------|--------|----------------------------------|--|
| Cent                                      |       | Fre  | RF<br>q4 | 1.00  | 50 Ω<br>0000 | AC<br>0000  | 0 G   |     |                  |     | 1       |        | E:PULSE |      |      | Туре  | ALIGN OFF<br>: RMS<br>100/100 | 0    | 5:56:04 P<br>TRA<br>TV | CE 1 2 | 7,2021<br>3456<br><del>MMM</del> | Frequency  |
| 10 dE                                     | 3/div |      |          |       | et 27        | ′ dB<br>dBm | IF    |     | : Fast<br>in:Lov |     |         | en: 24 |         |      |      | 1010. |                               |      | 2.65<br>-24.2          | 84     | GHz                              | Auto Tune  |
| 25.0<br>15.0                              |       |      |          |       |              |             |       |     |                  |     |         |        |         |      |      |       |                               |      |                        |        |                                  | Center Freq<br>4.00000000 GHz                      |
| -5.00<br>-15.0<br>-25.0                   |       |      |          |       | الفدادي بم   | La de adre  |       | 1=  |                  |     |         |        |         |      | 1    |       |                               |      | والمتعادية والمعادية   |        | .00 dBm                          | <b>Start Freq</b><br>1.000000000 GHz               |
| -35.0<br>-45.0<br>-55.0                   |       |      |          |       |              |             |       |     |                  |     |         |        |         |      |      |       |                               |      |                        |        |                                  | <b>Stop Freq</b><br>7.000000000 GHz                |
| Star<br>#Res                              | s BV  | V 1. | .0 N     |       |              | ×           | <     |     | #V               | /BW | ' 3.0 N | ИНz    |         | FUNC | TION |       | weep 1                        | 0.67 | <u> </u>               |        | pts)                             | <b>CF Step</b><br>600.000000 MHz<br><u>uto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | N     | 1    | f        |       |              |             | 2.658 | 340 | GHz              |     | -24.2   | 13 dE  | 3m      |      |      |       |                               |      |                        |        |                                  | Freq Offset<br>0 Hz                                |
| 10<br>11<br><                             |       |      |          |       |              |             |       |     |                  |     | III     | 11     |         |      |      |       | <b>I</b> stati                | us   |                        |        | >                                |  |



### GSM1900-1880-GPRS@30mHz-1GHz@Pass

| Agilent Spect                         | rum Anal    | yzer - Swe                      | pt SA                  |  |                                  |          |                   |       |                                  |              |   |  |
|---------------------------------------|-------------|---------------------------------|------------------------|--|----------------------------------|----------|-------------------|-------|----------------------------------|--------------|---|--|
| (XI RL<br>Center F                    | RF<br>req 5 | <u>50 ຊ</u><br>15.000           | 000 MH                 |  |                                  | SE:PULSE |                   | g Typ | ALIGN OFF<br>e: RMS<br>: 100/100 | TRA          | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>PE M WARMAN | Frequency  |
| 10 dB/div                             |             | )<br>ffset 27<br><b>20.00</b> c | dB                     | PNO: Fast<br>Gain:Low  | #Atten::                         |          |                   |       |                                  | ۔<br>kr1 847 | 95 MHz<br>34 dBm                                | Auto Tune  |
|                                       |             | 20.00 0                         |                        |  |                                  |          |                   |       |                                  |              | -13.00 dBm                                      | Center Fred<br>515.000000 MHz                      |
| -20.0<br>-30.0<br>-40.0               | intre live  | an in the second lie            | fels et al litter poor | n jing B. d. a. B. dalahan judit.<br>gang gan Vi wati ping gan | ente la pala a preja de la preja |          | irdier gy rathing |       |                                  |              |   | Start Freq<br>30.000000 MHz                        |
| -50.0<br>-60.0<br>-70.0               |             |                                 |                        |  |                                  |          |                   |       |                                  |              |   | Stop Frec<br>1.000000000 GHz                       |
| Start 30.0<br>#Res BW                 | 1.0 M       | Hz                              | ×                      | #VE  | SW 3.0 MH                        | _        | FUNCTION          |       | weep 1.                          | 333 ms (2    | 0000 GHz<br>20001 pts)                          | <b>CF Step</b><br>97.000000 MHz<br><u>Auto</u> Mar |
| 1 N<br>2 3<br>4 5<br>6 7<br>8 9<br>10 |             |                                 |                        | 95 MHz   | -27.934 (                        |          |                   |       |                                  |              |   | Freq Offset<br>0 Hz                                |
| MSG                                   |             |                                 |                        |  | IIII                             |          |                   |       |                                  | s            | ×   |  |

### GSM1900-1880-GPRS@7GHz-13.6GHz@Pass

|             |          | ctrum | Ana              | lyzer - Sw              | ept SA   |             |                    |    |                |                |        |                            |                          |                       |  |        |                                |
|-------------|----------|-------|------------------|-------------------------|----------|-------------|--------------------|----|----------------|----------------|--------|----------------------------|--------------------------|-----------------------|--|--------|--------------------------------|
| Cen         | -        | Free  | RF<br><b>q 1</b> | 50 Ω<br>0.3000          |          |             | lz                 |    | 1              |                |        | //<br>#Avg Typ<br>Avg Hold |                          | TRA                   | M Jun 17, 2021<br>CE 1 2 3 4 5 1<br>PE M WWWWW | 6      | Frequency                      |
| _           |          |       |                  |                         |          | PNC<br>IFGa | D: Fast<br>ain:Low |    | #Atten: 24     |                |        | Arginola                   |                          | 1                     | PNNNN  | N      | Auto Tune                      |
| 10 d        | B/div    |       |                  | Offset 27<br>20.00 (    |          |             |                    |    |                |                |        |                            | Mkr1                     |                       | 72 GHz<br>34 dBm                               |        |                                |
| Log<br>10.0 |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 11     |                                |
| 0.00        |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 11     | Center Freq<br>10.30000000 GHz |
| -10.0       |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 1      | 10.30000000 GHz                |
|             |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       | <u>1 -13.00 dDm</u>                            | -<br>- |                                |
| -20.0       | ut. Lula |       | -                | una Lana a Intel Lanada | مدر المل |             | ير الم             |    | معاهدين وراحيا | وروار والمراجع |        | والمراجع المرافع المرافع   | un autom des anno longer | والتقاربية والمتعادية | a contraction of the second                    |        | Start Freq                     |
| -30.0       | 1        |       | -1.0             |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 11     | 7.000000000 GHz                |
| -40.0       |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 1      |                                |
| -50.0       |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 11     | Stop Freq                      |
| -60.0       |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 11     | 13.600000000 GHz               |
| -70.0       |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 1      |                                |
| Star        |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          | Stop 13               | .600 GHz                                       | 11     | CF Step                        |
| #Re         | s Bl     | N 1.  | 0 M              | IHz                     |          |             | #V                 | вW | 3.0 MHz        |                |        | S                          | weep 12                  | 2.00 ms (2            | 20001 pts                                      |        | 660.000000 MHz                 |
| MKR         |          | TRC   |                  |                         | Х        |             |                    |    | Y              |                | FUNCTI | ON   FUI                   | NCTION WIDTH             | FUNCT                 | ON VALUE                                       | ſ      | <u>Auto</u> Man                |
| 1           | Ν        | 1     | f                |                         | 12.8     | 35 72       | GHz                |    | -23.934 di     | 3m             |        |                            |                          |                       |  | ŀ      |                                |
| 3           |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  |        | Freq Offset                    |
| 4           |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  | 1      | 0 Hz                           |
| 6<br>7      |          |       | +                |                         |          |             |                    |    |                |                |        |                            |                          |                       |  |        |                                |
| 8<br>9      |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  |        |                                |
| 10          |          |       |                  |                         |          |             |                    |    |                |                |        |                            |                          |                       |  |        |                                |
| 11          |          |       |                  |                         |          |             |                    |    | 00             |                |        |                            |                          |                       | ~  |        |                                |
| MSG         |          |       |                  |                         |          |             |                    |    |                |                |        |                            | <b>I</b> statu           | s                     |  |        |                                |
|             |          |       |                  |                         |          |             |                    |    |                |                |        |                            | -                        |                       |  |        |                                |



### GSM1900-1880-Voice@13.6GHz-20GHz@Pass

|   | pectrum | Anal        | yzer - Swe                   |  |                       |           |           |          |                  |                                  |            |  |  |
|---|---------|-------------|------------------------------|--|-----------------------|-----------|-----------|----------|------------------|----------------------------------|------------|--|--|
| (XI RL<br>Cente                                   | r Fre   | RF<br>q 1   | 50 Ω<br>6.8000               | 00000 C  |                       |           | ISE:PULSE |          | Avg Typ          | ALIGN OFF<br>e: RMS<br>: 100/100 | TRA        | PM Jun 17, 2021<br>ACE 1 2 3 4 5 6<br>YPE MWWWWW | Frequency                                    |
| 10 dB/d   |         |             | Offset 27<br><b>20.00</b> d  | dB   | PNO: Fast<br>Gain:Low |           |           |          | - and the second |                                  | 18.974     | 72 GHz   | Auto Tune                                    |
|   |         |             | 20.00 0                      |  |                       |           |           |          |                  |                                  | 1          | -13.00 dBm                                       | Center Freq<br>16.80000000 GHz               |
| -20.0   |         | <b>1</b> 44 | i kalan sina kasa si juta si | a a statistica a st |                       |           |           |          |                  |                                  |            |  | Start Freq<br>13.600000000 GHz               |
| -50.0<br>-60.0<br>-70.0                           |         |             |                              |  |                       |           |           |          |                  |                                  |            |  | <b>Stop Freq</b><br>20.000000000 GHz         |
| Start '<br>#Res I                                 | 3W 1.   | 0 M         |                              | ×  | #VI                   | BW 3.0 MH | z         | FUNCTION |                  | weep 16                          | 6.00 ms (2 | 0.000 GHz<br>20001 pts)                          | CF Step<br>640.000000 MHz<br><u>Auto</u> Man |
| 1 N<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 |         | f           |                              | 18.974 7   | 72 GHz                | -19.633   | dBm       | FUNCTION |                  |                                  |            |  | Freq Offset<br>0 Hz                          |
| 11<br>K<br>MSG                                    |         |             |                              |  |                       | 1111      |           |          |                  |                                  | s          | ×  |  |

### GSM1900-1880-Voice@1GHz-7GHz@Pass

| Agilen                                    | nt Spec | ctrur | n Ana     | alyze | r - Sw       | ept S/ | 4    |     |   |            |         |        |         |      |      |             |                               |         |                   |        |                                   |  |
|---|---------|-------|-----------|-------|--------------|--------|------|-----|---|------------|---------|--------|---------|------|------|-------------|-------------------------------|---------|-------------------|--------|-----------------------------------|--|
| Cen                                       | -       | Fre   | RF<br>q 4 | 1.00  | 50 Ω<br>0000 |        |      |     | z   |            | 1       | SENSE  | E:PULSE |      |      | Туре        | ALIGN OFF<br>: RMS<br>100/100 | (       | 05:48:53 F<br>TRA | CE 1 2 | 7,2021<br>3456<br><del>MMMN</del> | Frequency  |
| 10 d                                      | B/div   |       |           |       | et 27        |        |      |     | 0: Fas<br>ain:Lo  | st ⊶►<br>w |         | en: 24 |         |      |      | 1014.       |                               |         | 2.47<br>-24.4     | 4 2 (  | GHZ                               | Auto Tune  |
| Log<br>25.0<br>15.0<br>5.00               |         |       |           |       |              |        |      |     |   |            |         |        |         |      |      |             |                               |         |                   |        |                                   | Center Freq<br>4.000000000 GHz                     |
| -5.00<br>-15.0<br>-25.0                   |         |       |           |       | a patis      |        | 1    |     | , sa ta di sa d |            |         |        |         |      |      | ( فعل مثالة |                               | .11.111 |                   | -13    | .00 dBm                           | <b>Start Freq</b><br>1.000000000 GHz               |
| -35.0<br>-45.0<br>-55.0                   |         |       |           |       | han - real   |        |      |     |   |            |         |        |         |      |      |             |                               |         |                   |        |                                   | <b>Stop Freq</b><br>7.000000000 GHz                |
| Star<br>#Re                               |         | N 1   | .0 P      |       | <u>.</u>     |        | ×    |     | #\  | VBW        | 1 3.0 P | ИНz    |         | FUNC | TION |             | weep 1                        | 0.67    | · ·               |        | pts)                              | <b>CF Step</b><br>600.000000 MHz<br><u>uto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9 | N       | 1     | f         |       |              |        | 2.47 | 742 | GHz   |            | -24.49  | 92 dE  | 3m      |      |      |             |                               |         |                   |        |                                   | Freq Offset<br>0 Hz                                |
| 10<br>11<br><                             |         |       |           |       |              |        |      |     |   |            | 11      |        |         |      |      |             | <b>K</b> STAT                 | US      |                   |        | >                                 |  |



#### GSM1900-1880-Voice@30mHz-1GHz@Pass

|   |          | ctru  |                 | alyzer - S     | A              |     |                   |     |           |                                       |     |       |          |  |                |            |                                     |       |   |
|---|----------|---|-----------------|----------------|----------------|-----|-------------------|-----|-----------|---------------------------------------|-----|-------|----------|--|----------------|------------|-------------------------------------|-------|---|
| Cen   |          | Fre   | RF<br>eq        | 50<br>515.00   | 0 MI           |     |                   |     | 1         | SE:PU                                 |     |       | Тур      | ALIGN OFF<br>e: RMS<br>100/100           |                | TRAC       | 1 Jun 17, 20<br>E 1 2 3 4<br>E MWWW | 56    | Frequency                                   |
| 10 di   | Didis    |   |                 | Offset 2       |                |     | ): Fast<br>in:Lov |     | #Atten: 2 |                                       |     | Avgir | 1010.    |  |                | DE<br>61.1 | 63 MH                               | N N   | Auto Tune                                   |
| 10.0<br>10.0<br>0.00                            |          | <u>,                                     </u> |                 | 1 20.00        |                |     |                   |     |           |                                       |     |       |          |  |                |            | -13:00 d                            |       | Center Freq<br>515.000000 MHz               |
| -20.0<br>-30.0<br>-40.0                         | with the | u di più                                      | <b>i juli</b> i | isioni ini ini | hile point and | ,   |                   |     |           | i i i i i i i i i i i i i i i i i i i |     |       |          | a gana a sa a sa a sa a sa a sa a sa a s | ar (healthin a | 1-         |                                     | idadi | Start Free<br>30.000000 MHz                 |
| -50.0<br>-60.0<br>-70.0                         |          |   |                 |                |                |     |                   |     |           |                                       |     |       |          |  |                |            |                                     |       | <b>Stop Fred</b><br>1.000000000 GHz         |
| Star<br>#Re:                                    | s B      | W 1   | .0              | MHz            | <br>×          |     |                   | /BW | 7 3.0 MH2 |                                       | FUN | CTION |          | weep 1.3                                 | 333 ms         | 5 (2       | 0000 GH<br>0001 p1                  |       | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10 | N        | 1   | f               |                | 861            | .63 | MHz               |     | -29.037 d | Bm                                    |     |       |          |  |                |            |                                     |       | Freq Offsel<br>0 Hz                         |
| 11<br>K<br>MSG                                  |          |   | -               | ļ              |                |     |                   |     | 1111      |                                       |     |       | <u> </u> | <b>I</b> o statu:                        | 5              |            | <b>&gt;</b>                         |       |   |

### GSM1900-1880-Voice@7GHz-13.6GHz@Pass

|             | Spectru       | m Ana      | ılyzer - Sv       | vept SA   |  |                    |        |                      |         |               |                  |       |                   |       |         |  |                   |                 |                 |
|-------------|---------------|------------|-------------------|-----------|--|--------------------|--------|----------------------|---------|---------------|------------------|-------|-------------------|-------|---------|--|-------------------|-----------------|-----------------|
| Cente       | er Fro        | RF<br>eq 1 | 50 s<br>0.300     |           |  | Hz                 |        | 1                    | E:PULSE |               | #Avg 1<br>Avg He | Гуре: |                   | 05:   | TRA     | M Jun 17,<br>CE <u>1</u> 2 3<br>PE M <del>W/</del> | 456               | Frequ           | ency            |
|             |               |            |                   |           |  | 0: Fast<br>ain:Low |        | #Atten: 2            |         |               | Avgin            |       | Mkr               | 1 1 2 | D       | ET P N N   | INNN              | Au              | ito Tune        |
| 10 dB/      | div           |            | Offset 2<br>20.00 |           |  |                    |        |                      |         |               |                  |       | IVINI             |       |         | 17 d   |                   |                 |                 |
| Log<br>10.0 |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   |       |         |  |                   | Cen             | ter Freg        |
| 0.00 -      |               | _          |                   |           |  |                    | _      |                      |         |               |                  |       |                   |       |         |  | _                 |                 | 0000 GHz        |
| -10.0       |               | -          |                   |           |  |                    | _      |                      |         |               |                  |       |                   | -     | 1 —     | -13.   | <del>30 dDm</del> |                 |                 |
| -20.0       | ويتعاملون وال |            |                   |           | the state of                             | المرابق الم        | وهبيال | بعقد والمعالية والغا |         | ورهامه الرائد | و ماناد امر ا    |       | ومرادع والمساليات |       |         | ور المراجع الم                                     | ورور المالية      | St              | art Freq        |
| -30.0       |               |            |                   |           | 19-19-19-19-19-19-19-19-19-19-19-19-19-1 |                    | ,      |                      |         |               |                  |       |                   |       | هندا به |  |                   | 7.00000         | 0000 GHz        |
| -50.0 -     |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   |       |         |  | _                 |                 |                 |
| -60.0 —     |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   | _     |         |  |                   | St<br>13.60000  | op Freq         |
| -70.0       |               | -          |                   |           |  |                    | -      |                      |         |               |                  |       |                   |       |         |  | _                 | 13.500000       | 5000 GH2        |
| Start       |               |            |                   |           |  |                    |        |                      |         |               |                  | _     |                   |       |         | .600   |                   |                 | CF Step         |
| #Res        |               |            | /IHz              |           |  | #V                 | BW     | 3.0 MHz              |         |               |                  |       | eep 1             |       | · ·     |  |                   | 660.000<br>Auto | 0000 MHz<br>Man |
|             |               | f          |                   | ×<br>12.4 | 84 93                                    | GHz                |        | -23.717 dl           | Bm      | FUNC          | TION             | FUNC  | TION WIDTH        |       | FUNCTI  | ON VALUE   |                   |                 |                 |
| 2           |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   |       |         |  |                   | Fre             | q Offset        |
| 4           |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   |       |         |  |                   |                 | 0 Hz            |
| 6 7         |               |            |                   |           |  | _                  |        |                      |         |               |                  |       |                   |       |         |  |                   |                 |                 |
| 8           |               |            |                   |           |  | _                  |        |                      |         |               |                  |       |                   |       |         |  |                   |                 |                 |
| 10<br>11    |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   |       |         |  | ~                 |                 |                 |
| MSG         |               |            |                   |           |  |                    |        |                      |         |               |                  |       |                   | JS    |         |  | >                 |                 |                 |



### GSM1900-1909.8-GPRS@13.6GHz-20GHz@Pass

| Agilent Spect   | rum Anal     | yzer - Swept             |           |                         |                               |               |       |         |             |  |  |
|---|--------------|--------------------------|-----------|-------------------------|-------------------------------|---------------|-------|---------|-------------|--|--|
| Center F  | RF<br>req 10 |                          | 0000 G    |                         | <b>_</b>                      | #Avg<br>Avalt | Type: | RMS     | TRA         | M Jun 17, 2021<br>CE 1 2 3 4 5 6<br>/PE M <del>WW/WW</del> | Frequency                                    |
| 10 dB/div   |              | )ffset 27 di<br>20.00 dB | IFC<br>B  | NO: Fast  •<br>Gain:Low | #Atten: 2                     |               |       |         | ،<br>19.064 | 00 GHz   | Auto Tune                                    |
| 10.0<br>0.00  |              |                          |           |                         |                               |               |       |         | <b></b> 1-  | -13:00 dDm   | Center Freq<br>16.800000000 GHz              |
| -20.0<br>-30.0<br>-40.0   |              |                          |           |                         | forge und hid optimization of |               |       |         |             |  | Start Freq<br>13.60000000 GHz                |
| -50.0<br>-60.0<br>-70.0   |              |                          |           |                         |                               |               |       |         |             |  | <b>Stop Fred</b><br>20.000000000 GHz         |
| Start 13.0<br>#Res BW   | 1.0 M        |                          | ×         | #VB                     | W 3.0 MHz                     | UNCTION       |       | veep 16 | .00 ms (2   | 0.000 GHz<br>20001 pts)                                    | CF Step<br>640.000000 MHz<br><u>Auto</u> Man |
| 1 N<br>2<br>3<br>4<br>5<br>6                                    | 1 f          |                          | 19.064 00 | 0 GHz                   | -19.233 d                     |               | FUNC  |         | FUNCT       |  | Freq Offset<br>0 Hz                          |
| 0           7           8           9           10           11 |              |                          |           |                         |                               |               |       |         |             |  |  |
| MSG   |              |                          |           |                         |                               |               |       |         | 3           |  |  |

### GSM1900-1909.8-GPRS@1GHz-7GHz@Pass

| MR.L       RF       50.2       AC       CORREC       SENSEPLASE       Autor Single       Frequency         Center Freq 4.000000000000000000000000000000000000   | Agilen           |       | ctru |      |      | r - Sw   | ept SA     |                 |             |              |            |      |      |                                  |                            |              |               |                     |     |                 |
|---|------------------|-------|------|------|------|----------|------------|-----------------|-------------|--------------|------------|------|------|----------------------------------|----------------------------|--------------|---------------|---------------------|-----|-----------------|
| PHO: Fast with the second s |                  |       | Fre  | 1.0  |      |          |            | 0 GH            | lz          |              | 7          |      |      | #Avg Ty                          | pe: RMS                    | 05:57        | TRAC          | E12345              | 6   | Frequency       |
| Log       Image: Start Control of the start                        |                  |       |      |      |      |          |            | IF              |             |              |            |      |      |                                  |                            |              | 162           | T P NNNN            | z I | Auto Tune       |
| 25.0  |                  | B/div | /    | Rei  | f 35 | .00      | <u>dBm</u> |                 |             |              |            |      |      |                                  |                            | -24          | 4.4           | 93 abr              | n   |                 |
| 5.00      1      1  | 25.0<br>15.0     |       |      |      |      |          |            |                 |             |              |            |      |      |                                  |                            |              |               |                     |     |                 |
| 15.0       .13.00 dBm       .13.00 dBm       .13.00 dBm       .13.00 dBm         .25.0  |                  |       |      |      |      |          |            |                 |             |              |            |      |      |                                  |                            |              |               |                     |     |                 |
| -25.0   |                  |       |      |      |      |          |            |                 |             | <b>1</b> 1=  |            |      |      |                                  |                            | _            |               | -13.00 dE           | Im  |                 |
| -45.0       -45.0 <td< td=""><td>-25.0</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td>ور الألور الدور</td><td>a gentrates</td><td>V<br/>Idaadaa</td><td>la fadina</td><td></td><td>n</td><td>and the strike is a state of the</td><td>والتفصير وأفقطته والترويين</td><td>الاست المالي</td><td>الولا أأساليه</td><td>و بار بار بار معنام</td><td>d.u</td><td></td></td<>   | -25.0            | 1     |      |      |      |          |            | ور الألور الدور | a gentrates | V<br>Idaadaa | la fadina  |      | n    | and the strike is a state of the | والتفصير وأفقطته والترويين | الاست المالي | الولا أأساليه | و بار بار بار معنام | d.u |                 |
| -65.0       -55.0 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>4</td><td>Stop Freq</td></td<>  |                  |       |      |      |      |          |            |                 |             | 1            |            |      |      |                                  |                            |              |               |                     | 4   | Stop Freq       |
| #Res BW 1.0 MHz         #VBW 3.0 MHz         Sweep 10.67 ms (20001 pts)         600.00000 MHz           MRG MODE TRC SCL         X         Y         FUNCTION WIDTH         FUNCTION WIDTH         FUNCTION WALLE           1         N         1         f         3.162.7 GHz         -24.493 dBm         Auto         Man           2         -         -         -         -         -         FUNCTION WIDTH         FUNCTION WALLE         Auto         Man           4         -   |                  |       |      |      |      |          |            |                 |             |              |            |      |      |                                  |                            |              |               |                     |     | 7.000000000 GHz |
| MKR MODE         TC SCL         X         Y         FUNCTION         FUNCTION WIDTH         FUNCTION WALLE         Image: Constraint of the second   | #Re              | s Bl  | W 1  | .0 1 | ИНz  | <u>.</u> |            |                 | #\          | VBW          | / 3.0 MHz  |      |      |                                  | -                          | 0.67 m       | is (2         | 0001 pt             |     | 600.000000 MHz  |
| 2   |                  |       |      |      |      |          |            |                 | 7 CH7       |              | 24 493 di  | 2    | FUNC | TION F                           | UNCTION WIDT               | H FL         | UNCTIO        | IN VALUE            | ^   |                 |
| 8   | 2<br>3<br>4<br>5 |       |      |      |      |          |            | 3.102           |             |              | -24.435 ui | 2111 |      |                                  |                            |              |               |                     |     | -               |
|   | 8<br>9<br>10     |       |      |      |      |          |            |                 |             |              |            |      |      |                                  |                            |              |               |                     |     |                 |
|   | 11               |       |      |      |      |          |            |                 |             |              | 111        |      |      |                                  |                            |              |               |                     | ~   |                 |
|   | MSG              |       |      |      |      |          |            |                 |             |              |            |      |      |                                  | To STAT                    | US           |               |                     |     |                 |



#### GSM1900-1909.8-GPRS@30mHz-1GHz@Pass

|  |          | ectru      |                | alyzer -        |            | ot SA     |       |     |                |    |            |    |      |      |     |                                |       |           |  |    |   |
|--|----------|------------|----------------|-----------------|------------|-----------|-------|-----|----------------|----|------------|----|------|------|-----|--------------------------------|-------|-----------|--|----|---|
| Cen  |          | Fre        | RF<br>eq       | 515.0           | ີ 2<br>000 | AC<br>100 | MHz   |     |                |    | SENSI      |    |      |      | Тур | ALIGN OFF<br>e: RMS<br>100/100 | 05:5  | TRAC      | M Jun 17,20<br>2E <u>1</u> 2 3 4<br>PE M WWW | 56 | Frequency                                   |
| 10 d   | Bidi     |            |                | Offset          |            |           |       |     | Fast +<br>:Low | •• | #Atten: 24 |    |      | Avgi |     |                                |       | ₀<br>955. | 09 MI<br>04 dB                               |    | Auto Tune                                   |
| Log<br>10.0<br>0.00  | F        | •          |                | 1 20.0          |            |           |       |     |                |    |            |    |      |      |     |                                |       |           | -13.00                                       |    | Center Freq<br>515.000000 MHz               |
| -20.0<br>-30.0<br>-40.0                                    | ni stadi | ,          | i i fa         | n al baint mark | put de     |           |       |     |                |    |            |    |      |      |     |                                |       |           | et internet                                  |    | Start Freq<br>30.000000 MHz                 |
| -50.0<br>-60.0<br>-70.0                                    |          |            |                |                 |            |           |       |     |                |    |            |    |      |      |     |                                |       |           |  |    | <b>Stop Fred</b><br>1.000000000 GHz         |
| Star<br>#Re  | s B'     | <b>W</b> 1 | 1.0  <br>  SOI | MHz             |            | ×         |       |     |                |    | 3.0 MHz    |    | FUNC | TION |     | weep 1.3                       | 333 n | 15 (2     | 0000 G<br>0001 p                             |    | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>9<br>10<br>11 | N        |            | f              |                 |            |           | 955.0 | 9 M |                |    | -28.804 df | 3m |      |      |     |                                |       |           |  |    | Freq Offset<br>0 Hz                         |
| MSG  |          |            |                |                 |            |           |       |     |                |    |            |    |      |      |     | To STATU:                      | s     |           |  |    | <u>.</u>                                    |

### GSM1900-1909.8-GPRS@7GHz-13.6GHz@Pass

|                |          | ctrum   |           | lyzer - Sv        |     |        |                      |            |   |       |                  |                                    |             |     |  |                |                                   |
|----------------|----------|---------|-----------|-------------------|-----|--------|----------------------|------------|---|-------|------------------|------------------------------------|-------------|-----|--|----------------|-----------------------------------|
| Cen            |          | Fre     | RF<br>q 1 | 50 s<br>0.300     |     |        | Hz                   | <br>1      | e:PULSE   |       | #Avg Ty          | ALIGN OFF<br>pe: RMS<br>d: 100/100 | 05:         | TRA | M Jun 17, 20<br>CE 1 2 3 4<br>PE M WWW | 56             | Frequency                         |
| _              |          |         |           |                   |     |        | NO: Fast<br>Gain:Lov | #Atten: 2  |   |       | Arginor          |                                    | 4.40        | D   | ET P N N N                             | ΝN             | Auto Tune                         |
| 10 d           | B/div    |         |           | Offset 2<br>20.00 |     |        |                      |            |   |       |                  | IVIKI                              |             |     | 77 GH<br>38 dB                         |                |                                   |
| Log<br>10.0    |          |         |           |                   |     |        |                      |            |   |       |                  |                                    | _           |     |  |                | Center Freq                       |
| 0.00           | $\vdash$ |         | +         |                   |     |        |                      |            |   |       |                  |                                    |             |     |  | -              | 10.30000000 GHz                   |
| -10.0<br>-20.0 |          |         |           |                   |     |        |                      |            |   |       |                  |                                    |             | 1   | -13.00+                                | <del>:Dm</del> |                                   |
| -30.0          | lugari,  | 1. I.I. | -         |                   |     |        | والمترافع المراجع    |            | المارية إعراق التعديلة. (1)<br>مركز المركز المركز الم |       | والبيانة ألجرتها |                                    | - Alexandre |     |  | -              | Start Freq<br>7.000000000 GHz     |
| -40.0          |          |         | -         |                   |     |        |                      |            |   |       |                  |                                    |             |     |  |                |                                   |
| -50.0<br>-60.0 |          |         |           |                   |     |        |                      |            |   |       |                  |                                    |             |     |  |                | Stop Freq                         |
| -70.0          | _        |         | _         |                   | -   |        |                      |            |   |       |                  |                                    |             |     |  | -              | 13.600000000 GHz                  |
| Star<br>#Re    |          |         |           |                   |     |        | -#3.4                | 3.0 MHz    |   |       |                  | Sweep 1                            |             |     | 600 GI                                 |                | CF Step                           |
| #Re<br>MKB     |          |         |           |                   | ×   |        | #V                   | 3.0 IVITZ  |   | FUNCT |                  | Notion widt                        |             | · · |  | LS)            | 660.000000 MHz<br><u>Auto</u> Man |
| 1              | Ν        | 1       | f         |                   | 12. | 467 77 | 7 GHz                | -22.938 dl | Bm  |       |                  |                                    |             |     |  |                |                                   |
| 3              | _        |         |           |                   |     |        |                      |            |   |       |                  |                                    |             |     |  |                | Freq Offset<br>0 Hz               |
| 5<br>6<br>7    | _        |         |           |                   |     |        |                      |            | _   |       |                  |                                    | _           |     |  | _              |                                   |
| 8              |          |         |           |                   |     |        |                      |            |   |       |                  |                                    |             |     |  |                |                                   |
| 10<br>11       |          |         |           |                   |     |        |                      |            |   |       |                  |                                    |             |     |  | ~              |                                   |
| MSG            |          |         |           |                   |     |        |                      |            |   |       |                  |                                    | rus         |     | >                                      |                |                                   |



### GSM1900-1909.8-Voice@13.6GHz-20GHz@Pass

|                         |                | rum   | Ana              | lyzer - Swe    | ept SA |         |                     |     |                 |       |      |      |      |                               |        |          |  |    |                                       |
|-------------------------|----------------|-------|------------------|----------------|--------|---------|---------------------|-----|-----------------|-------|------|------|------|-------------------------------|--------|----------|--|----|---------------------------------------|
| <mark>⊮</mark> ℝ<br>Cen |                | rec   | RF<br>q <b>1</b> | 50 Ω<br>6.8000 | AC     |         | Hz                  |     | ]               | E:PUL |      |      | Туре | ALIGN OFF<br>: RMS<br>100/100 | 05:5   | TRA      | M Jun 17, 2<br>CE <u>1</u> 2 3 4<br>PE M <del>W M/</del> | 56 | Frequency                             |
|                         |                |       |                  | Offset 27      |        |         | IO: Fast<br>ain:Lov |     | #Atten: 2       |       |      | Avgr |      |                               |        | ₀<br>024 | 32 G   | Hz | Auto Tune                             |
| 10 d<br>Log             | B/div          | R     | ₹ef              | 20.00 c        | 1Bm    |         |                     |     |                 |       |      |      |      |                               | -1     | 9.6      | 98 dE  | ۶m |                                       |
| 10.0<br>0.00<br>-10.0   |                |       |                  |                |        |         |                     |     |                 |       |      |      |      |                               |        | 1-       | -13.00   |    | Center Freq<br>16.80000000 GHz        |
| -20.0                   |                |       |                  |                |        |         |                     |     | 1.40            |       |      |      |      |                               |        | )'       |  |    |                                       |
| -30.0<br>-40.0          |                |       |                  | dii tayaya ta  |        | alstin. |                     |     |                 |       |      |      |      |                               |        |          |  |    | Start Freq<br>13.60000000 GHz         |
| -50.0<br>-60.0          |                |       | +                |                |        |         |                     |     |                 |       |      |      |      |                               |        |          |  |    | Stop Freq<br>20.000000000 GHz         |
| -70.0                   |                |       | +                |                |        |         |                     |     |                 |       |      |      |      |                               |        |          |  |    |                                       |
| #Re                     | rt 13.<br>s BW | / 1.0 | 0 N              |                |        |         | #\                  | /BW | / 3.0 MHz       |       |      |      |      | weep 16                       | 6.00 m | is (2    | •  |    | CF Step<br>640.000000 MHz<br>Auto Man |
| MKR<br>1                | MODE 1         |       | 5CU<br>f         |                | X      | 24.22   | GHz                 |     | Y<br>-19.698 dl | 2     | FUNC | TION | FUN  | CTION WIDTH                   | F      | UNCTI    | ON VALUE   | ^  | Adio Mari                             |
| 2<br>3<br>4<br>5<br>6   |                |       | -                |                | 19.0   | 24 32   |                     |     | -19.098 0       | DIII  |      |      |      |                               |        |          |  |    | Freq Offset<br>0 Hz                   |
| 7<br>8<br>9<br>10       |                |       |                  |                |        |         |                     |     |                 |       |      |      |      |                               |        |          |  |    |                                       |
| <<br>MSG                |                |       |                  |                |        |         |                     |     | IIII            |       |      |      |      | <b>I</b> o statu              | s      |          |  |    |                                       |

### GSM1900-1909.8-Voice@1GHz-7GHz@Pass

| Agilen               |        | ctru |           |      | r - Sw       | ept SA |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
|----------------------|--------|------|-----------|------|--------------|--------|------------|----------------|---------------|-----------|--------|-----|--------|------|-------------------------------|-----------------------|--------|---|--------|--------------------------------|
| Cen                  |        | Fre  | RF<br>Pq4 |      | 50 Ω<br>0000 |        | 0 GI       |                |               | 1         | E:PULS |     | #Avg T | Гуре | ALIGN OFF<br>: RMS<br>100/100 |                       | TRACE  | un 17, 2021<br>1 2 3 4 5<br>M <del>WWWW</del> | 6      | Frequency                      |
|                      |        |      | Ref       | Offs | set 27       | 7 dB   |            | NO: F<br>Gain: | ast ⊶►<br>Low | #Atten: 2 |        | I   | Avgine |      |                               |                       | DET    | 9 GHz   | N<br>Z | Auto Tune                      |
| 10 d<br>Log          | B/div  | /    | Re        | f 35 | .00          | dBm    |            |                |               |           |        |     |        |      |                               | -24                   | .49    | 6 dBm   | ונ     |                                |
| 25.0<br>15.0<br>5.00 |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        | Center Freq<br>4.000000000 GHz |
| -5.00                |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   | I      |                                |
| -15.0                |        |      |           |      |              |        | <b>—</b> 1 |                |               |           |        |     |        | _    |                               |                       |        | -13.00 dBr                                    | n      | Start Freq                     |
| -25.0                |        |      |           |      |              |        |            |                | . Int si.     |           |        |     |        |      |                               | الله ومغمسونا عروا بر |        |   |        | 1.000000000 GHz                |
| -35.0                | u a la | t de | w.        |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
| -45.0                |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        | Stop Freq                      |
| -55.0                |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        | 7.000000000 GHz                |
|                      |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
| Star<br>#Re          |        |      |           |      | 2            |        |            | :              | #VBW          | / 3.0 MHz | z      |     |        | Sv   | veep 10                       |                       |        | 000 GHz<br>001 pts                            | )      | CF Step<br>600.000000 MHz      |
|                      | MODE   | TRC  |           |      |              | ×      |            |                |               | Y         |        | FUN | TION   | FUNC | CTION WIDTH                   | FUN                   | ICTION | VALUE   |        | <u>Auto</u> Man                |
| 1<br>2<br>3          | N      | 1    | f         |      |              |        | 2.629      | 9 GF           |               | -24.496 d | Bm     |     |        |      |                               |                       |        |   | ľ      | Freq Offset                    |
| 4                    |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        | 0 Hz                           |
| 5                    |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
| - 7<br>- 8           |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
| 9<br>10              |        |      |           | -    |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   |        |                                |
| 11                   |        |      |           |      |              |        |            |                |               |           |        |     |        |      |                               |                       |        |   | •      |                                |
| MSG                  |        |      |           |      |              |        |            |                |               |           |        |     |        |      | <b>I</b> statu                | s                     |        | >   |        |                                |
|                      |        |      |           |      |              |        |            |                |               |           |        |     |        |      | <b>-</b>                      |                       |        |   |        |                                |



#### GSM1900-1909.8-Voice@30mHz-1GHz@Pass

|   |      | ctru  |            | alyzer - Sv                           |       |       |                                  |     |            |       |      |  |                |                               |       |   |   |    |   |
|---|------|-------|------------|---------------------------------------|-------|-------|----------------------------------|-----|------------|-------|------|--|----------------|-------------------------------|-------|---|---|----|---|
| Cen   | -    | Fre   | RF<br>Pq ( | 50 s<br>515.00                        |       | MHz   | RREC                             |     |            | E:PUL |      |  | Гуре           | ALIGN OFF<br>: RMS<br>100/100 | 05:51 | TRAC  | M Jun 17,20<br>2E <u>1</u> 2 3 4<br>PE M <del>W M M</del> | 56 | Frequency                                   |
| 10 d  |      |       |            | Offset 2                              |       | IFO   | NO: Fas<br>Gain:Lo               |     | #Atten: 2  |       | rı   | Avgin  | 014.           |                               |       | B3.   | 93 MI<br>88 dB  |    | Auto Tune                                   |
| 10.0<br>10.0<br>0.00                                  |      | ,<br> | Ke         | 20.00                                 |       |       |                                  |     |            |       |      |  |                |                               |       |   | -13.00  |    | Center Freq<br>515.000000 MHz               |
| -20.0<br>-30.0<br>-40.0                               | ų.   |       | y siley    |                                       |       |       | روبار روبار روبار<br>اورار روبار |     |            | hin I |      | D. Antonio de la constante de l<br>La constante de la constante de | <b>pl</b> Asir |                               |       | , in the second seco |   | 4  | Start Freq<br>30.000000 MHz                 |
| -50.0<br>-60.0<br>-70.0                               |      |       |            |                                       |       |       |                                  |     |            |       |      |  |                |                               |       |   |   |    | <b>Stop Fred</b><br>1.000000000 GHz         |
| Star<br>#Re   | s Bl | W 1   | .0 I       | MHz                                   | ·<br> | <     | #\                               | vbw | 3.0 MHz    |       | FUNC | CTION  |                | weep 1.3                      | 333 m | s (2  | 0000 GI<br>0001 p   |    | CF Step<br>97.000000 MHz<br><u>Auto</u> Man |
| 1<br>2<br>3<br>4<br>5<br>6<br>7<br>8<br>9<br>10<br>11 | N    | 1     | f          |                                       |       | 783.9 | 3 MHz                            |     | -29,388 dl | Bm    |      |  |                |                               |       |   |   |    | Freq Offset<br>0 Hz                         |
| MSG   |      |       |            | · · · · · · · · · · · · · · · · · · · |       |       |                                  |     |            |       |      |  |                |                               |       |   |   |    |   |

### GSM1900-1909.8-Voice@7GHz-13.6GHz@Pass

|             |            | ctrun |           | alyzer - Sv         |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     |                                |
|-------------|------------|-------|-----------|---------------------|---------|--------|----------------------|------------|------------------|----------------------|--------------|----------------------------|-------------|--------------------------|-------------|---------|--------------------------------------|-----|--------------------------------|
| Cen         |            | Fre   | RF<br>9 1 | 50 s<br>10.300      |         |        | Hz                   |            | 1                | e:PULSE              |              | #Avg T<br>Avg Ho           | ype:        |                          | 05:51       | TRAC    | M Jun 17,2<br>2E 1 2 3 4<br>PE M WWW | 56  | Frequency                      |
|             |            |       | Ref       | Offset 2            | 7 dB    |        | NO: Fast<br>Gain:Lov |            | #Atten: 2        |                      |              | - Crains                   |             |                          |             | □<br>22 | 16 G                                 | Hz  | Auto Tune                      |
| 10 d        | B/div      |       |           | 20.00               |         |        |                      |            |                  |                      |              |                            |             |                          | -23         | 3.8     | 07 dE                                | m   |                                |
| Log<br>10.0 |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     | Center Freq<br>10.30000000 GHz |
| -10.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         | 43.00                                | dDm | 10.000000000000                |
| -20.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         | <b>1</b> <sup>2</sup>                | aom |                                |
| -30.0       | ياس الديان |       |           | فالحمر ذير والمحافة |         |        | بدلاسمانى            | متر فأترتن | وبالفناف ورارهما | بالمقاط والتقال سلحا | يعقر ويتأريس | مل المقاضر والمحدي         | ور المعالية | و من العالية العالمة الم | a substance |         |                                      | -   | Start Freq                     |
| -40.0       |            | 1     |           |                     | <b></b> |        |                      |            |                  |                      |              | and the last of the second |             |                          |             |         |                                      |     | 7.000000000 GHz                |
| -40.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     |                                |
| -60.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     | Stop Freq                      |
| -70.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     | 13.60000000 GHz                |
| -70.0       |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     |                                |
| Star<br>#Re |            |       |           |                     |         |        | #V                   | вw         | 3.0 MHz          |                      |              |                            | Sw          | eep 12                   |             |         | .600 G<br>0001 p                     |     | CF Step<br>660.000000 MHz      |
| MKB         | MODE       | TRE   | SCI       |                     | ×       |        |                      |            | Y                |                      | FUNC         | TION                       |             | ION WIDTH                |             | · ·     | IN VALUE                             |     | <u>Auto</u> Man                |
| 1           | N          | 1     | f         |                     |         | 122 16 | 5 GHz                |            | -23.807 d        |                      |              |                            |             |                          |             |         |                                      |     |                                |
| 2           |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      | -   | Freq Offset                    |
| 4           |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     | 0 Hz                           |
| 6           |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      | =   |                                |
| 7           |            |       |           |                     |         |        |                      |            |                  | _                    |              |                            |             |                          |             |         |                                      | -   |                                |
| 9<br>10     |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      |     |                                |
| 10          |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          |             |         |                                      | ~   |                                |
| <           |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             | ~                        |             |         |                                      |     |                                |
| MSG         |            |       |           |                     |         |        |                      |            |                  |                      |              |                            |             |                          | s           |         |                                      |     |                                |



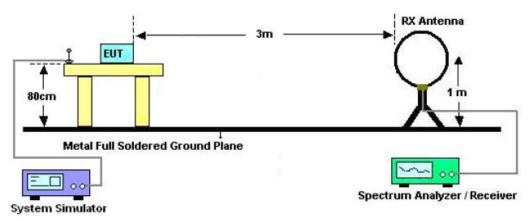
#### 5.5.2 RADIATED SPURIOUS EMISSION

#### 5.5.2.1 MEASUREMENT METHOD

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8.If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.

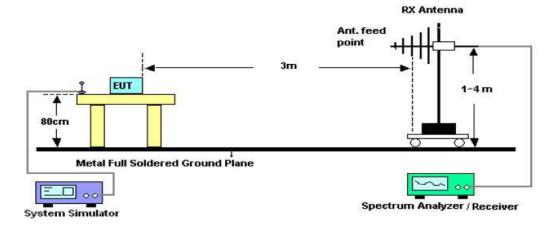
#### 5.5.2.2 TEST SETUP



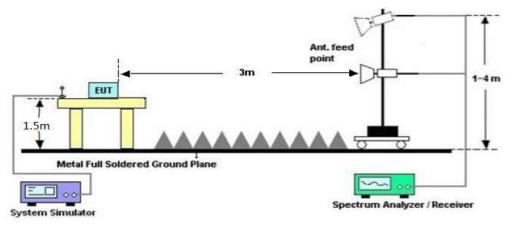


### Radiated Emission Test-Setup Frequency Below 30MHz

RADIATED EMISSION TEST SETUP 30MHz-1000MHz



#### RADIATED EMISSION TEST SETUP ABOVE 1000MHz



#### 5.5.2.3 PROVISIONS APPLICABLE

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum,
 the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least
 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at



least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out. **Note:** only result the worst condition of each test mode:



### 5.5.2.4 MEASUREMENT RESULT

#### GSM 850:

| The Worst Test Results for Channel 128/824.2 MHz |                |        |        |            |  |  |  |  |  |  |  |
|--|----------------|--------|--------|------------|--|--|--|--|--|--|--|
| Frequency  | Emission Level | Limits | Margin | Comment    |  |  |  |  |  |  |  |
| (MHz)  | (dBm)          | (dBm)  | (dB)   | Comment    |  |  |  |  |  |  |  |
| 1648.07  | -59.64         | -13    | 46.64  | Horizontal |  |  |  |  |  |  |  |
| 3296.47  | -38.65         | -13    | 25.65  | Horizontal |  |  |  |  |  |  |  |
| 4944.87  | -55.60         | -13    | 42.60  | Horizontal |  |  |  |  |  |  |  |
| 1648.08  | -42.07         | -13    | 29.07  | Vertical   |  |  |  |  |  |  |  |
| 3296.43  | -51.45         | -13    | 38.45  | Vertical   |  |  |  |  |  |  |  |
| 4944.95  | -45.01         | -13    | 32.01  | Vertical   |  |  |  |  |  |  |  |

#### PCS 1900:

| The Worst Test Results for Channel 661/1880.0 MHz |                |        |        |            |  |  |  |  |  |  |  |
|---|----------------|--------|--------|------------|--|--|--|--|--|--|--|
| Frequency   | Emission Level | Limits | Margin | Comment    |  |  |  |  |  |  |  |
| (MHz)   | (dBm)          | (dBm)  | (dB)   | Comment    |  |  |  |  |  |  |  |
| 3759.64   | -57.89         | -13    | 44.89  | Horizontal |  |  |  |  |  |  |  |
| 7519.64   | -41.43         | -13    | 28.43  | Horizontal |  |  |  |  |  |  |  |
| 11279.61  | -53.78         | -13    | 40.78  | Horizontal |  |  |  |  |  |  |  |
| 3759.70   | -42.24         | -13    | 29.24  | Vertical   |  |  |  |  |  |  |  |
| 7519.68   | -52.90         | -13    | 39.90  | Vertical   |  |  |  |  |  |  |  |
| 11279.69  | -44.39         | -13    | 31.39  | Vertical   |  |  |  |  |  |  |  |

#### Note:

11. Margin = Limit - Emission Level

12. Below 30MHZ no Spurious found and Above is the worst mode data.



### **5.6 FREQUENCY STABILITY**

#### 5.6.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMU200 DIGITAL RADIO COMMUNICATION TESTER.

1 Measure the carrier frequency at room temperature.

2 Subject the EUT to overnight soak at -10 $^{\circ}$ C.

3 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on channel 661 for PCS 1900 band , channel 190 for GSM 850 band, channel 9400 for UMTS band II, channel 1412 for UMTS band IV and channel 4175 for UMTS band V measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

4 Repeat the above measurements at  $10^{\circ}$ C increments from  $-10^{\circ}$ C to  $+50^{\circ}$ C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

5 Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

6 Subject the EUT to overnight soak at +50℃.

7 With the EUT, powered via nominal voltage, connected to the CMU200 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

8 Repeat the above measurements at  $10^{\circ}$ C increments from +50°C to -10°C. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

9 At all temperature levels hold the temperature to +/-  $0.5\,^\circ\!\mathrm{C}$  during the measurement procedure.

#### 5.6.2 **PROVISIONS APPLICABLE**

#### 5.6.2.1 FOR HAND CARRIED BATTERY POWERED EQUIPMENT

According to the ANSI/TIA-603-E-2016, the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.4VDC and 4.2VDC, with a nominal voltage of 3.7VDC. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of -10 % and +12.5 %. For the purposes of measuring frequency stability these voltage limits are to be used.



#### 5.6.2.2 FOR EQUIPMENT POWERED BY PRIMARY SUPPLY VOLTAGE

According to the ANSI/TIA-603-E-2016,the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. For this EUT section 2.1055(d)(1) applies. This requires varying primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment, the normal environment temperature is 20°C.



### 5.6.3 MEASUREMENT RESULT

Pass

### For GSM

### Test Band=GSM850/GSM1900

|          |              |       | Volta       | ge        |           |       |         |
|----------|--------------|-------|-------------|-----------|-----------|-------|---------|
| Dand     | Dand Channel |       | Temperature | Deviation | Deviation | Limit | Vordiat |
| Band     | Channel      | (Vdc) | (°C)        | (Hz)      | (ppm)     | (ppm) | Verdict |
| GSM850   | 128          | VL    | TN          | 10.85     | 0.0130    | 2.5   | PASS    |
| GSM850   | 128          | VN    | TN          | 8.39      | 0.0100    | 2.5   | PASS    |
| GSM850   | 128          | VH    | TN          | 12.16     | 0.0145    | 2.5   | PASS    |
| GSM850   | 190          | VL    | TN          | 7.19      | 0.0086    | 2.5   | PASS    |
| GSM850   | 190          | VN    | TN          | 12.95     | 0.0155    | 2.5   | PASS    |
| GSM850   | 190          | VH    | TN          | 7.97      | 0.0095    | 2.5   | PASS    |
| GSM850   | 251          | VL    | TN          | 8.7       | 0.0104    | 2.5   | PASS    |
| GSM850   | 251          | VN    | TN          | 7.11      | 0.0085    | 2.5   | PASS    |
| GSM850   | 251          | VH    | TN          | 9.72      | 0.0116    | 2.5   | PASS    |
| GPRS850  | 128          | VL    | TN          | 3.28      | 0.0039    | 2.5   | PASS    |
| GPRS850  | 128          | VN    | TN          | 4.02      | 0.0048    | 2.5   | PASS    |
| GPRS850  | 128          | VH    | TN          | 5.54      | 0.0066    | 2.5   | PASS    |
| GPRS850  | 190          | VL    | TN          | 6.32      | 0.0076    | 2.5   | PASS    |
| GPRS850  | 190          | VN    | TN          | 5.47      | 0.0065    | 2.5   | PASS    |
| GPRS850  | 190          | VH    | TN          | 1.66      | 0.0020    | 2.5   | PASS    |
| GPRS850  | 251          | VL    | TN          | 6.54      | 0.0078    | 2.5   | PASS    |
| GPRS850  | 251          | VN    | TN          | 6.33      | 0.0076    | 2.5   | PASS    |
| GPRS850  | 251          | VH    | TN          | 4.68      | 0.0056    | 2.5   | PASS    |
| GSM1900  | 512          | VL    | TN          | 12.34     | 0.0066    | 2.5   | PASS    |
| GSM1900  | 512          | VN    | TN          | 11.41     | 0.0061    | 2.5   | PASS    |
| GSM1900  | 512          | VH    | TN          | 12.41     | 0.0066    | 2.5   | PASS    |
| GSM1900  | 661          | VL    | TN          | 26.09     | 0.0139    | 2.5   | PASS    |
| GSM1900  | 661          | VN    | TN          | 23.09     | 0.0123    | 2.5   | PASS    |
| GSM1900  | 661          | VH    | TN          | 25.89     | 0.0138    | 2.5   | PASS    |
| GSM1900  | 810          | VL    | TN          | 24.85     | 0.0132    | 2.5   | PASS    |
| GSM1900  | 810          | VN    | TN          | 28.78     | 0.0153    | 2.5   | PASS    |
| GSM1900  | 810          | VH    | TN          | 24.89     | 0.0132    | 2.5   | PASS    |
| GPRS1900 | 512          | VL    | TN          | 7.81      | 0.0042    | 2.5   | PASS    |
| GPRS1900 | 512          | VN    | TN          | 8.68      | 0.0046    | 2.5   | PASS    |
| GPRS1900 | 512          | VH    | TN          | 11.7      | 0.0062    | 2.5   | PASS    |
| GPRS1900 | 661          | VL    | TN          | 22.91     | 0.0122    | 2.5   | PASS    |
| GPRS1900 | 661          | VN    | TN          | 28.25     | 0.0150    | 2.5   | PASS    |
| GPRS1900 | 661          | VH    | TN          | 27.19     | 0.0145    | 2.5   | PASS    |
| GPRS1900 | 810          | VL    | TN          | 26.92     | 0.0143    | 2.5   | PASS    |
| GPRS1900 | 810          | VN    | TN          | 23.04     | 0.0123    | 2.5   | PASS    |
| GPRS1900 | 810          | VH    | TN          | 23.78     | 0.0126    | 2.5   | PASS    |



|         |         |         | Temper      | ature     |           |       |         |
|---------|---------|---------|-------------|-----------|-----------|-------|---------|
| Derel   |         | Voltage | Temperature | Deviation | Deviation | Limit |         |
| Band    | Channel | (Vdc)   | (°C)        | (Hz)      | (ppm)     | (ppm) | Verdict |
| GSM850  | 128     | VN      | -30         | 9.36      | 0.0112    | 2.5   | PASS    |
| GSM850  | 128     | VN      | -20         | 6.89      | 0.0082    | 2.5   | PASS    |
| GSM850  | 128     | VN      | -10         | 9.88      | 0.0118    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 0           | 9.09      | 0.0109    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 10          | 9.4       | 0.0112    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 20          | 8.09      | 0.0097    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 30          | 8.85      | 0.0106    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 40          | 10.52     | 0.0126    | 2.5   | PASS    |
| GSM850  | 128     | VN      | 50          | 9.05      | 0.0108    | 2.5   | PASS    |
| GSM850  | 190     | VN      | -30         | 9.91      | 0.0119    | 2.5   | PASS    |
| GSM850  | 190     | VN      | -20         | 12.66     | 0.0151    | 2.5   | PASS    |
| GSM850  | 190     | VN      | -10         | 8.59      | 0.0103    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 0           | 10.07     | 0.0120    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 10          | 8.7       | 0.0104    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 20          | 8.76      | 0.0105    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 30          | 9.03      | 0.0108    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 40          | 8.46      | 0.0101    | 2.5   | PASS    |
| GSM850  | 190     | VN      | 50          | 10.21     | 0.0122    | 2.5   | PASS    |
| GSM850  | 251     | VN      | -30         | 8.7       | 0.0104    | 2.5   | PASS    |
| GSM850  | 251     | VN      | -20         | 8.52      | 0.0102    | 2.5   | PASS    |
| GSM850  | 251     | VN      | -10         | 8.96      | 0.0107    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 0           | 9.78      | 0.0117    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 10          | 7.28      | 0.0087    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 20          | 7.05      | 0.0084    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 30          | 6.18      | 0.0074    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 40          | 11.89     | 0.0142    | 2.5   | PASS    |
| GSM850  | 251     | VN      | 50          | 10.53     | 0.0126    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | -30         | 5.51      | 0.0066    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | -20         | 9.05      | 0.0108    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | -10         | 8.07      | 0.0097    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 0           | 9.95      | 0.0119    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 10          | 8.66      | 0.0104    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 20          | 8.41      | 0.0101    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 30          | 10.36     | 0.0124    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 40          | 8.22      | 0.0098    | 2.5   | PASS    |
| GPRS850 | 128     | VN      | 50          | 8.86      | 0.0106    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | -30         | 5.82      | 0.0070    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | -20         | 8.06      | 0.0096    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | -10         | 3.5       | 0.0042    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | 0           | 0.68      | 0.0008    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | 10          | -0.2      | -0.0002   | 2.5   | PASS    |
| GPRS850 | 190     | VN      | 20          | 2.7       | 0.0032    | 2.5   | PASS    |
| GPRS850 | 190     | VN      | 30          | -1.17     | -0.0014   | 2.5   | PASS    |
| GPRS850 | 190     | VN      | 40          | 0.06      | 0.0001    | 2.5   | PASS    |

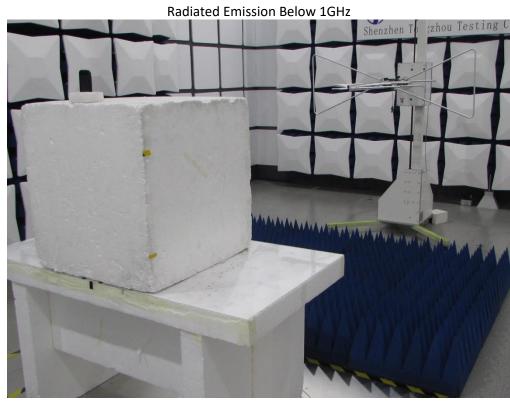


| GPRS850  | 190 | VN | 50  | -0.29 | -0.0003 | 2.5 | PASS |
|----------|-----|----|-----|-------|---------|-----|------|
| GPRS850  | 251 | VN | -30 | 9     | 0.0108  | 2.5 | PASS |
| GPRS850  | 251 | VN | -20 | 7.83  | 0.0094  | 2.5 | PASS |
| GPRS850  | 251 | VN | -10 | 7.19  | 0.0086  | 2.5 | PASS |
| GPRS850  | 251 | VN | 0   | 6.31  | 0.0075  | 2.5 | PASS |
| GPRS850  | 251 | VN | 10  | 6.89  | 0.0082  | 2.5 | PASS |
| GPRS850  | 251 | VN | 20  | 5.87  | 0.0070  | 2.5 | PASS |
| GPRS850  | 251 | VN | 30  | 2.73  | 0.0033  | 2.5 | PASS |
| GPRS850  | 251 | VN | 40  | 5.51  | 0.0066  | 2.5 | PASS |
| GPRS850  | 251 | VN | 50  | 5.8   | 0.0069  | 2.5 | PASS |
| GSM1900  | 512 | VN | -30 | 12.98 | 0.0069  | 2.5 | PASS |
| GSM1900  | 512 | VN | -20 | 11.51 | 0.0061  | 2.5 | PASS |
| GSM1900  | 512 | VN | -10 | 8.29  | 0.0044  | 2.5 | PASS |
| GSM1900  | 512 | VN | 0   | 10.53 | 0.0056  | 2.5 | PASS |
| GSM1900  | 512 | VN | 10  | 8.82  | 0.0047  | 2.5 | PASS |
| GSM1900  | 512 | VN | 20  | 7.16  | 0.0038  | 2.5 | PASS |
| GSM1900  | 512 | VN | 30  | 9.37  | 0.0050  | 2.5 | PASS |
| GSM1900  | 512 | VN | 40  | 13.09 | 0.0070  | 2.5 | PASS |
| GSM1900  | 512 | VN | 50  | 10.09 | 0.0054  | 2.5 | PASS |
| GSM1900  | 661 | VN | -30 | 27.24 | 0.0145  | 2.5 | PASS |
| GSM1900  | 661 | VN | -20 | 24.78 | 0.0132  | 2.5 | PASS |
| GSM1900  | 661 | VN | -10 | 23.29 | 0.0124  | 2.5 | PASS |
| GSM1900  | 661 | VN | 0   | 26.43 | 0.0141  | 2.5 | PASS |
| GSM1900  | 661 | VN | 10  | 26.26 | 0.0140  | 2.5 | PASS |
| GSM1900  | 661 | VN | 20  | 29.16 | 0.0155  | 2.5 | PASS |
| GSM1900  | 661 | VN | 30  | 27.81 | 0.0148  | 2.5 | PASS |
| GSM1900  | 661 | VN | 40  | 26.7  | 0.0142  | 2.5 | PASS |
| GSM1900  | 661 | VN | 50  | 28.78 | 0.0153  | 2.5 | PASS |
| GSM1900  | 810 | VN | -30 | 27.12 | 0.0144  | 2.5 | PASS |
| GSM1900  | 810 | VN | -20 | 26.94 | 0.0143  | 2.5 | PASS |
| GSM1900  | 810 | VN | -10 | 23.74 | 0.0126  | 2.5 | PASS |
| GSM1900  | 810 | VN | 0   | 22.15 | 0.0118  | 2.5 | PASS |
| GSM1900  | 810 | VN | 10  | 23.64 | 0.0126  | 2.5 | PASS |
| GSM1900  | 810 | VN | 20  | 27.91 | 0.0148  | 2.5 | PASS |
| GSM1900  | 810 | VN | 30  | 31.55 | 0.0168  | 2.5 | PASS |
| GSM1900  | 810 | VN | 40  | 29.38 | 0.0156  | 2.5 | PASS |
| GSM1900  | 810 | VN | 50  | 27.51 | 0.0146  | 2.5 | PASS |
| GPRS1900 | 512 | VN | -30 | 13.11 | 0.0070  | 2.5 | PASS |
| GPRS1900 | 512 | VN | -20 | 12.21 | 0.0065  | 2.5 | PASS |
| GPRS1900 | 512 | VN | -10 | 19.66 | 0.0105  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 0   | 17.38 | 0.0092  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 10  | 18.56 | 0.0099  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 20  | 10.23 | 0.0054  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 30  | 19.01 | 0.0101  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 40  | 20.66 | 0.0110  | 2.5 | PASS |
| GPRS1900 | 512 | VN | 50  | 20.55 | 0.0109  | 2.5 | PASS |
| GPRS1900 | 661 | VN | -30 | 28.3  | 0.0151  | 2.5 | PASS |



|          | l   |    |     |       |        | ~ - |      |
|----------|-----|----|-----|-------|--------|-----|------|
| GPRS1900 | 661 | VN | -20 | 24.15 | 0.0128 | 2.5 | PASS |
| GPRS1900 | 661 | VN | -10 | 22.6  | 0.0120 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 0   | 31.5  | 0.0168 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 10  | 23.72 | 0.0126 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 20  | 27.89 | 0.0148 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 30  | 33.07 | 0.0176 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 40  | 24.88 | 0.0132 | 2.5 | PASS |
| GPRS1900 | 661 | VN | 50  | 29.89 | 0.0159 | 2.5 | PASS |
| GPRS1900 | 810 | VN | -30 | 22.05 | 0.0117 | 2.5 | PASS |
| GPRS1900 | 810 | VN | -20 | 24.93 | 0.0133 | 2.5 | PASS |
| GPRS1900 | 810 | VN | -10 | 32.58 | 0.0173 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 0   | 28.81 | 0.0153 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 10  | 31.64 | 0.0168 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 20  | 29.68 | 0.0158 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 30  | 24.69 | 0.0131 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 40  | 30.69 | 0.0163 | 2.5 | PASS |
| GPRS1900 | 810 | VN | 50  | 28.7  | 0.0153 | 2.5 | PASS |





# 6 APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Radiated Emission Above 1GHz



----END OF REPORT----