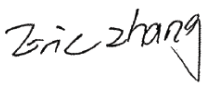
**CTC Laboratories, Inc.**

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China
Tel: +86-755- 27521059 Fax: +86-755- 27521011 Http://www.sz-ctc.org.cn

# TEST REPORT

| | |
|---|---|
| **Report No. ·····:** | **CTC20221207E07** |
| **FCC ID·····:** | **2AYD5-I22T01** |
| **Applicant·····:** | **Imin Technology Pte Ltd** |
| Address·····: | 11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943 |
| Manufacturer·····: | Imin Technology Pte Ltd |
| Address·····: | 11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943 |
| **Product Name·····:** | **POS Device** |
| Trade Mark·····: | / |
| Model/Type reference·····: | I22T01 |
| Listed Model(s) ·····: | / |
| **Standard·····:** | **FCC CFR47 PART 22H, 24E, 27L** |
| Date of receipt of test sample.: | Jul. 06, 2022 |
| Date of testing……..: | Jul. 07, 2022 ~ Jul. 29, 2022 |
| Date of issue……....: | Jul. 30, 2022 |
| **Result……:** | **PASS** |

| | | |
|---|---|---|
| Compiled by:<br>(Printed name+signature) | Terry Su |  |
| Supervised by:<br>(Printed name+signature) | Eric Zhang |  |
| Approved by:<br>(Printed name+signature) | Totti Zhao |  |

| | |
|---|---|
| **Testing Laboratory Name…:** | **CTC Laboratories, Inc.** |
| Address……..: | 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China |

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# 1. SUMMARY

## 1.1. Test Standards

FCC Rules Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
FCC Rules Part 22: PRIVATE LAND MOBILE RADIO SERVICES.
FCC Rules Part 24: PUBLIC MOBILE SERVICES
FCC Rules Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES
FCC Rules Part 90S: Regulations Governing Licensing and Use of Frequencies in the 806-824, 851-869, 896-901, and 935-940 MHz Bands
TIA/EIA 603 E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
ANSI C63.26: 2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
KDB 971168 D01 Power Meas License Digital Systems v03: MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
RSS-Gen Issue 5: General Requirements for Compliance of Radio Apparatus.
RSS-132 Issue 3: Cellular Telephone Systems Operating in the Bands 824-849MHz and 869-894MHz.
RSS-133 Issue 6: 2 GHz Personal Communications Services.
RSS-139 Issue 3: Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710-1780 MHz and 2110-2180 MHz.

## 1.2. Report version

| Revised No. | Date of issue | Description |
|---|---|---|
| 01 | Jul. 30, 2022 | Original |
| | | |
| | | |
| | | |

## 1.3. Test Description

| Test Item | Section in CFR 47 | RSS Rule | Result | Test Engineer |
|---|---|---|---|---|
| Conducted Output Power | Part 2.1046<br>Part 22.913(a)<br>Part 24.232(c)<br>Part 27.50 | RSS-132(5.4)<br>RSS-133(6.4)<br>RSS-139(6.5) | Pass | Alicia Liu |
| Peak-to-Average Ratio | Part 24.232<br>Part 27.50 | RSS-132(5.4)<br>RSS-133(6.4) | Pass | Alicia Liu |
| 99% Occupied Bandwidth & 26 dB Bandwidth | Part 2.1049<br>Part 22.917(b)<br>Part 24.238(b)<br>Part 27.53 | RSS-GEN(6.6)<br>RSS-133(6.5) | Pass | Alicia Liu |
| Band Edge | Part 2.1051<br>Part 22.917<br>Part 24.238<br>Part 27.53 | RSS-132(5.5)<br>RSS-133(6.5) | Pass | Alicia Liu |
| Conducted Spurious Emissions | Part 2.1051<br>Part 22.917<br>Part 24.238<br>Part 27.53 | RSS-132(5.5)<br>RSS-133(6.5)<br>RSS-139(6.6) | Pass | Alicia Liu |
| Frequency stability vs temperature | Part 2.1055(a)(1)(b)<br>Part 22.355<br>Part 24.235<br>Part 27.54 | RSS-GEN(6.11)<br>RSS-132(5.3)<br>RSS-139(6.4) | Pass | Alicia Liu |
| Frequency stability vs voltage | Part 2.1055(d)(1)(2)<br>Part 22.355<br>Part 24.235<br>Part 27.54 | RSS-GEN(6.11)<br>RSS-132(5.3)<br>RSS-139(6.4) | Pass | Alicia Liu |
| ERP and EIRP | Part 22.913(a)<br>Part 24.232(b)<br>Part 27.50 | RSS-132(5.4)<br>RSS-133(6.4)<br>RSS-139(6.5) | Pass | Alicia Liu |
| Radiated Spurious Emissions | Part 2.1053<br>Part 22.917<br>Part 24.238<br>Part 27.53 | RSS-132(5.5)<br>RSS-133(6.5)<br>RSS-139(6.6) | Pass | Alicia Liu |
| Receiver Spurious Emissions | / | RSS-GEN(7.1.3) | N/A | N/A |

Note: The measurement uncertainty is not included in the test result.
The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, Part 22, Part 24, Part 27, and Part 90, FCC KDB 971168 D01 v03r01/ D02 v02r01, KDB 412172 D01 v01r01, ANSI C63.26:2015, IC RSS-132, RSS-133 and RSS-139.

## 1.4. Test Facility

**Address of the report laboratory**

**CTC Laboratories, Inc.**

Add: 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

**Laboratory accreditation**

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

**A2LA-Lab Cert. No.: 4340.01**

CTC Laboratories, Inc. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in th e identified field of testing.

**Industry Canada (Registration No.: 9783A, CAB Identifier: CN0029)**

CTC Laboratories, Inc. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Jan, 2016.

**FCC (Registration No.: 951311, Designation Number CN1208)**

CTC Laboratories, Inc. EMC Laboratory has been registered and fully described in a report filed with the (FCC)Federal Communications Commission. The acceptance letter from the FCC is maintained inour fi les. Registration 951311, Aug 26, 2017.

## 1.5. 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 TR-100028-01" Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the CTC Laboratories, Inc. 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 CTC Laboratories, Inc. is reported:

| Test Items | Measurement Uncertainty | Notes |
|---|---|---|
| Frequency stability | 25 Hz | (1) |
| Transmitter power conducted | 0.57 dB | (1) |
| Transmitter power Radiated | 2.20 dB | (1) |
| Conducted spurious emission 9KHz-12.75 GHz | 1.60 dB | (1) |
| Conducted Emission 9KHz-30MHz | 3.39 dB | (1) |
| Radiated Emission 30~1000MHz | 4.24 dB | (1) |
| Radiated Emission 1~18GHz | 5.16 dB | (1) |
| Radiated Emission 18-40GHz | 5.54 dB | (1) |
| Occupied Bandwidth | --------- | (1) |
| Emission Mask | --------- | (1) |
| Modulation Characteristic | --------- | (1) |
| Transmitter Frequency Behavior | --------- | (1) |

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

## 1.6. Environmental conditions

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

| | |
|---|---|
| Normal Temperature: | 20°C-25°C |
| Relative Humidity: | 50 %-55 % |
| Air Pressure: | 101kPa |

# 2. GENERAL INFORMATION

## 2.1. Client Information

| | |
|---|---|
| Applicant: | Imin Technology Pte Ltd |
| Address: | 11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943 |
| Manufacturer: | Imin Technology Pte Ltd |
| Address: | 11 Bishan Street 21, #03-05 Bosch Building, Singapore 573943 |

## 2.2. General Description of EUT

| | |
|---|---|
| Product Name: | POS Device |
| Trade Mark: | / |
| Model/Type reference: | I22T01 |
| Listed Model(s): | / |
| Power supply: | 24Vdc/2.5A from AC/DC Adapter |
| Adapter Model: | AD65CM240250A<br>Input: 100-240V~ 50/60Hz 1.5A Max<br>Output: 24Vdc/2.5A |
| Hardware version: | / |
| Software version: | / |
| **GSM** | |
| Operation Band: | GSM 850: UL: 824MHz~849MHz, DL: 869MHz~894MHz<br>PCS 1900: UL: 1850MHz~1910, DL: 1930MHz~1990MHz |
| Supported Type: | GPRS/EGPRS |
| Modulation Type: | GMSK for GPRS, 8PSK for EGPRS |
| Antenna Type: | FPC Antenna |
| Antenna Gain: | Main Antenna:<br>GSM 850: -0.4dBi<br>PCS 1900: 1.2dBi |
| **WCDMA** | |
| Operation Band: | Band II: UL: 1852.4MHz~1907.6MHz, DL: 1932.6MHz~1987.4MHz<br>Band V: UL: 826.4MHz~846.6MHz, DL: 871.6MHz~1891.4MHz |
| Modulation Type: | QPSK for WCDMA/HSUPA/HSDPA |
| Antenna Type: | FPC Antenna |
| Antenna Gain: | Main Antenna:<br>WCDMA II: 1.1dBi<br>WCDMA V: 0.4dBi |

## 2.3. Description of Test Modes and Test Frequency

The EUT has been tested under typical operating condition. The CMW500 used to control the EUT staying in continuous transmitting and receiving mode for testing.

**Test Frequency:**

| GSM 850 | | PCS 1900 | |
|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 128 | 824.20 | 512 | 1850.20 |
| 190 | 836.60 | 661 | 1880.00 |
| 251 | 848.80 | 810 | 1909.80 |

| WCDMA Band II | | WCDMA Band V | |
|---|---|---|---|
| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| 9262 | 1852.40 | 4132 | 826.40 |
| 9400 | 1880.00 | 4183 | 836.60 |
| 9538 | 1907.60 | 4233 | 846.60 |

## 2.4. Measurement Instruments List

| Tonscend JS0806-2 Test system | | | | | |
|---|---|---|---|---|---|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated until |
| 1 | Spectrum Analyzer | KEYSIGHT | N9020A | 100231 | Dec. 23, 2022 |
| 2 | Spectrum Analyzer | Rohde & Schwarz | FUV40-N | 101331 | Mar. 15, 2023 |
| 3 | Spectrum Analyzer | Rohde & Schwarz | FSU26 | 100105 | Dec. 23, 2022 |
| 4 | MXG Vector Signal Generator | Agilent | N5182A | MY47420864 | Dec. 23, 2022 |
| 5 | Signal Generator | Agilent | E8257D | MY46521908 | Dec. 23, 2022 |
| 6 | Power Sensor | Agilent | U2021XA | MY5365004 | Mar. 15, 2023 |
| 7 | Power Sensor | Agilent | U2021XA | MY5365006 | Mar. 15, 2023 |
| 8 | Simultaneous Sampling DAQ | Agilent | U2531A | TW54493510 | Mar. 15, 2023 |
| 9 | Climate Chamber | TABAI | PR-4G | A8708055 | Dec. 23, 2022 |
| 10 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | 116410 | Dec. 23, 2022 |
| 11 | Climate Chamber | ESPEC | MT3065 | / | Dec. 23, 2022 |
| 12 | 300328 v2.2.2 test system | TONSCEND | v2.6 | / | / |

| Radiated emission | | | | | |
|---|---|---|---|---|---|
| Item | Test Equipment | Manufacturer | Model No. | Serial No. | Calibrated Until |
| 1 | Trilog-Broadband Antenna | Schwarzbeck | VULB 9168 | 9168-759 | Nov. 09, 2022 |
| 2 | Horn Antenna | Schwarzbeck | BBHA 9120D | 9120D-647 | Dec. 23, 2022 |
| 3 | Test Receiver | Keysight | N9038A | MY56400071 | Dec. 23, 2022 |
| 4 | Broadband Premplifier | SCHWARZBECK | BBV9743B | 259 | Dec. 23, 2022 |
| 5 | Mirowave Broadband Amplifier | SCHWARZBECK | BBV9718C | 111 | Dec. 23, 2022 |
| 6 | Loop Antenna | LAPLAC | RF300 | 9138 | Dec. 23, 2022 |
| 7 | Ultra-Broadband Antenna | Schwarzbeck | BBHA9170 | 25841 | Dec. 23, 2022 |
| 8 | Mirowave Broadband Amplifier | Schwarzbeck | BBV 9717 | 154 | Dec. 23, 2022 |
| 9 | Wideband Radio Communication Tester | Rohde & Schwarz | CMW500 | 116410 | Dec. 23, 2022 |

Note: 1. The Cal. Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

# 3. TEST ITEM AND RESULTS

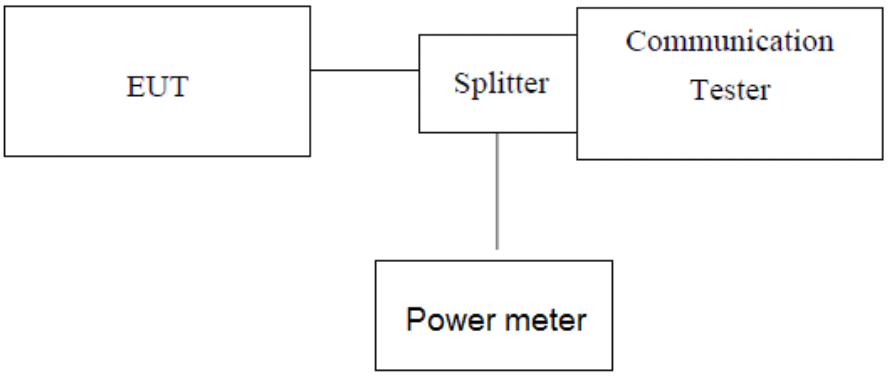
## 3.1. Conducted Output Power

**LIMIT**

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

IC: RSS132§5.4; RSS133§6.4 and RSS139§6.5.

**TEST CONFIGURATION**




*Note: Measurement setup for testing on Antenna connector*

**TEST PROCEDURE**

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum PK burst power and maximum Avg. burst power.

**TEST RESULTS**

| GSM850 | | Conducted Power (dBm) | | |
|---|---|---|---|---|
| | | CH128 | CH190 | CH251 |
| | | 824.20MHz | 836.60MHz | 848.80MHz |
| GPRS (GMSK) | 1TXslot | 33.19 | 33.21 | 33.25 |
| | 2TXslots | 31.16 | 31.13 | 31.12 |
| | 3TXslots | 29.11 | 29.07 | 29.06 |
| | 4TXslots | 26.97 | 26.92 | 26.93 |
| EGPRS (8PSK) | 1TXslot | 27.77 | 27.59 | 27.71 |
| | 2TXslots | 27.54 | 27.46 | 27.61 |
| | 3TXslots | 25.75 | 25.72 | 25.85 |
| | 4TXslots | 23.70 | 23.67 | 23.78 |

| GSM1900 | | Conducted Power (dBm) | | |
|---|---|---|---|---|
| | | CH512 | CH661 | CH810 |
| | | 1850.2MHz | 1880.0MHz | 1909.8MHz |
| GPRS (GMSK) | 1TXslot | 29.19 | 29.43 | 29.75 |
| | 2TXslots | 27.10 | 27.24 | 27.38 |
| | 3TXslots | 25.65 | 25.80 | 25.94 |
| | 4TXslots | 23.59 | 23.74 | 23.87 |
| EGPRS (8PSK) | 1TXslot | 26.63 | 26.81 | 26.77 |
| | 2TXslots | 24.67 | 24.98 | 24.92 |
| | 3TXslots | 22.53 | 22.83 | 22.83 |
| | 4TXslots | 20.29 | 20.63 | 20.65 |

| WCDMA Band II | | Conducted Power (dBm) | | |
|---|---|---|---|---|
| | | CH9262 | CH9400 | CH9538 |
| | | 1852.40 | 1880.00 | 1907.60 |
| RMC 12.2K | | 21.56 | 21.67 | 21.90 |
| HSDPA | Subtest-1 | 21.61 | 21.67 | 21.88 |
| | Subtest-2 | 21.58 | 21.68 | 21.89 |
| | Subtest-3 | 21.61 | 21.68 | 21.88 |
| | Subtest-4 | 21.60 | 21.67 | 21.90 |
| HSUPA | Subtest-1 | 17.25 | 18.22 | 18.86 |
| | Subtest-2 | 18.16 | 18.63 | 18.95 |
| | Subtest-3 | 19.50 | 19.83 | 20.25 |
| | Subtest-4 | 18.52 | 18.99 | 19.53 |
| | Subtest-5 | 20.50 | 20.81 | 21.39 |

| WCDMA Band V | | Conducted Power (dBm) | | |
|---|---|---|---|---|
| | | CH4132 | CH4182 | CH4233 |
| | | 826.40 | 836.40 | 846.60 |
| RMC 12.2K | | 23.25 | 23.22 | 23.24 |
| HSDPA | Subtest-1 | 23.27 | 23.23 | 23.19 |
| | Subtest-2 | 23.26 | 23.24 | 23.26 |
| | Subtest-3 | 23.20 | 23.19 | 23.20 |
| | Subtest-4 | 23.25 | 23.16 | 23.19 |
| HSUPA | Subtest-1 | 20.61 | 21.25 | 20.71 |
| | Subtest-2 | 20.64 | 21.35 | 20.79 |
| | Subtest-3 | 20.66 | 21.30 | 20.81 |
| | Subtest-4 | 20.10 | 20.73 | 20.16 |
| | Subtest-5 | 22.32 | 22.81 | 22.25 |

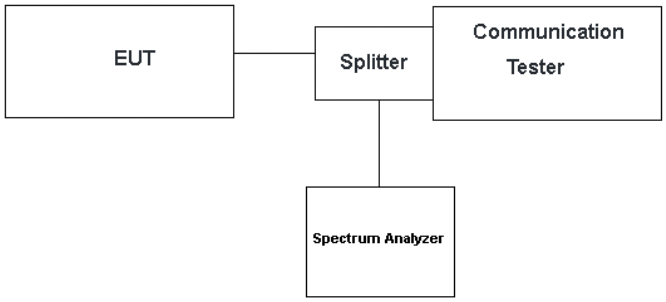
## 3.2. Peak-to-Average Ratio

**LIMIT**

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

**TEST CONFIGURATION**

- For Peak-to-Average Ratio




**TEST PROCEDURE**

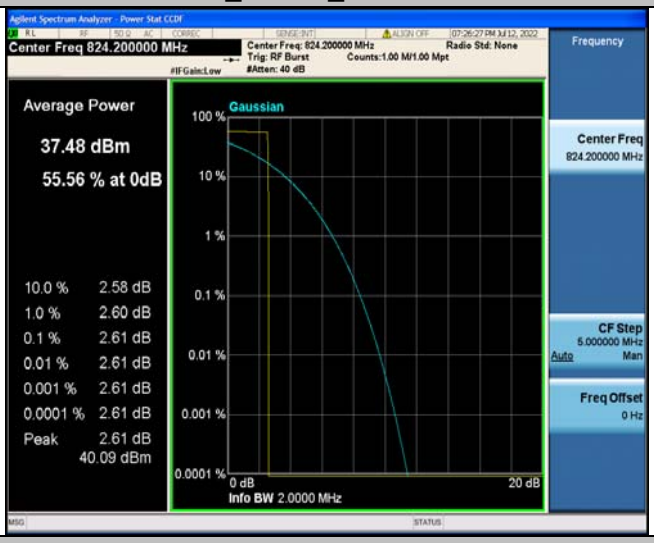
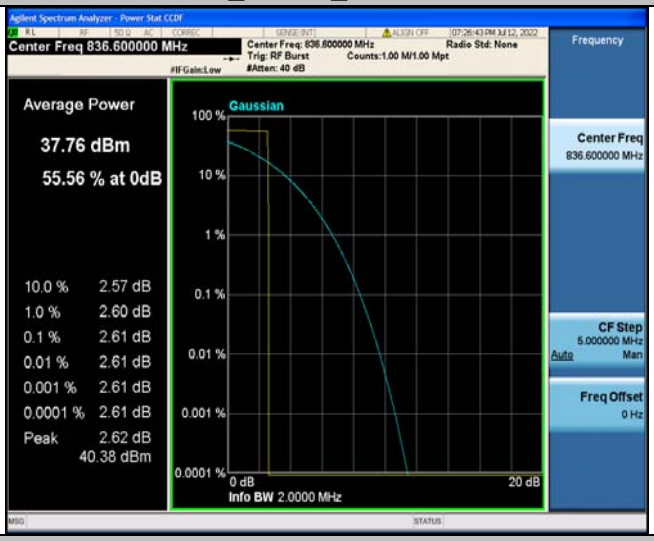
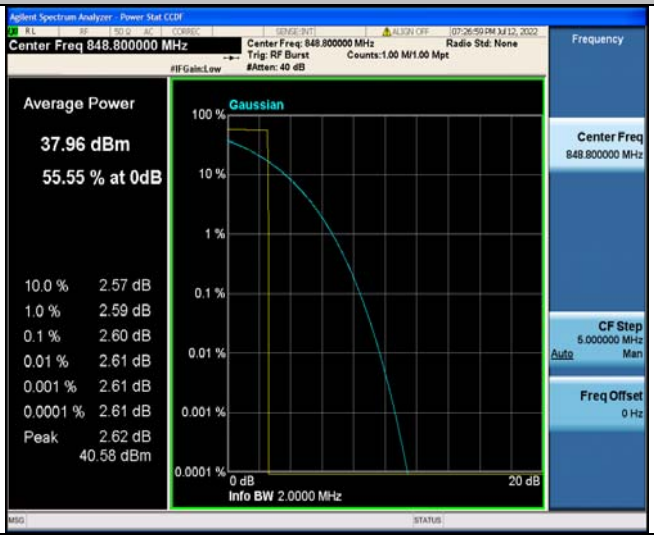
- For Peak-to-Average Ratio

1. The testing follows FCC KDB 971168 v02r02 Section 5.7.1.
2. The EUT was connected to spectrum and communication tester via a splitter
3. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyser.
4. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
6. Record the deviation as Peak to Average Ratio.

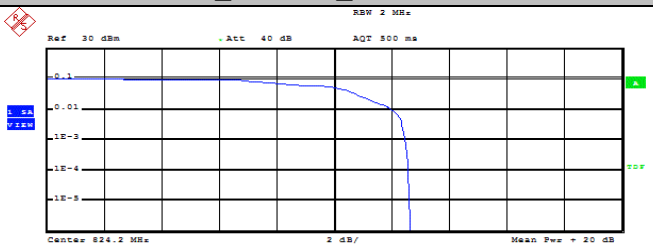
**TEST RESULTS**

| EUT Mode | Channel | Frequency (MHz) | Peak-to-Average Ratio(dB) | Limit (dB) | Result |
|---|---|---|---|---|---|
| GSM 850 GPRS | 128 | 824.20 | 2.61 | 13 | PASS |
| | 190 | 836.60 | 2.61 | 13 | |
| | 251 | 848.80 | 2.60 | 13 | |
| GSM 850 EGPRS | 128 | 824.20 | 12.47 | 13 | |
| | 190 | 836.60 | 12.21 | 13 | |
| | 251 | 848.80 | 8.49 | 13 | |
| PCS 1900 GPRS | 512 | 1850.20 | 2.61 | 13 | |
| | 661 | 1880.00 | 2.60 | 13 | |
| | 810 | 1909.80 | 2.60 | 13 | |
| PCS 1900 EGPRS | 512 | 1850.20 | 12.50 | 13 | |
| | 661 | 1880.00 | 12.21 | 13 | |
| | 810 | 1909.80 | 8.43 | 13 | |

| EUT Mode | Channel | Frequency (MHz) | Peak-to-Average Ratio(dB) | Limit (dB) | Result |
|---|---|---|---|---|---|
| WCDMA Band II WCDMA | 9262 | 1852.40 | 2.92 | 13 | PASS |
| | 9400 | 1880.00 | 2.70 | 13 | |
| | 9538 | 1907.60 | 2.85 | 13 | |
| WCDMA Band II HSDPA | 9262 | 1852.40 | 2.92 | 13 | |
| | 9400 | 1880.00 | 2.69 | 13 | |
| | 9538 | 1907.60 | 2.85 | 13 | |
| WCDMA Band II HSUPA | 9262 | 1852.40 | 2.92 | 13 | |
| | 9400 | 1880.00 | 4.26 | 13 | |
| | 9538 | 1907.60 | 4.24 | 13 | |
| WCDMA Band V WCDMA | 4132 | 826.40 | 3.33 | 13 | |
| | 4183 | 836.60 | 3.40 | 13 | |
| | 4233 | 846.60 | 3.56 | 13 | |
| WCDMA Band V HSDPA | 4132 | 826.40 | 3.33 | 13 | |
| | 4183 | 836.60 | 3.39 | 13 | |
| | 4233 | 846.60 | 3.59 | 13 | |
| WCDMA Band V HSUPA | 4132 | 826.40 | 3.32 | 13 | |
| | 4183 | 836.60 | 3.40 | 13 | |
| | 4233 | 846.60 | 3.56 | 13 | |

| GSM 850_ GPRS_ Lowest channel |
|---|
|  |
| GSM 850_ GPRS_ Middle channel |
|  |
| GSM 850_ GPRS_ Highest channel |
|  |

## GSM 850_ EGPRS_ Lowest channel




Complementary Cumulative Distribution Function (1000000 samples)

| | Trace 1 |
|---|---|
| Mean | 20.25 dBm |
| Peak | 32.88 dBm |
| Crest | 12.64 dB |
| 10% @ | 4.17 dB |
| 1% @ | 11.99 dB |
| .1% @ | 12.47 dB |

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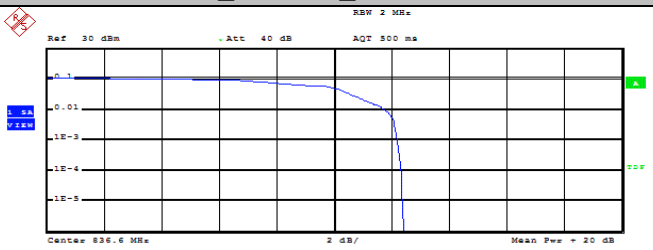
## GSM 850_ EGPRS_ Middle channel




Complementary Cumulative Distribution Function (1000000 samples)

| | Trace 1 |
|---|---|
| Mean | 20.48 dBm |
| Peak | 32.88 dBm |
| Crest | 12.40 dB |
| 10% @ | 6.12 dB |
| 1% @ | 11.76 dB |
| .1% @ | 12.21 dB |

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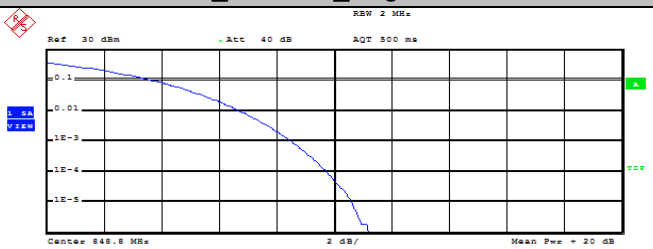
## GSM 850_ EGPRS_ Highest channel




Complementary Cumulative Distribution Function (1000000 samples)

| | Trace 1 |
|---|---|
| Mean | -32.06 dBm |
| Peak | -20.52 dBm |
| Crest | 11.54 dB |
| 10% @ | 3.65 dB |
| 1% @ | 6.70 dB |
| .1% @ | 8.49 dB |

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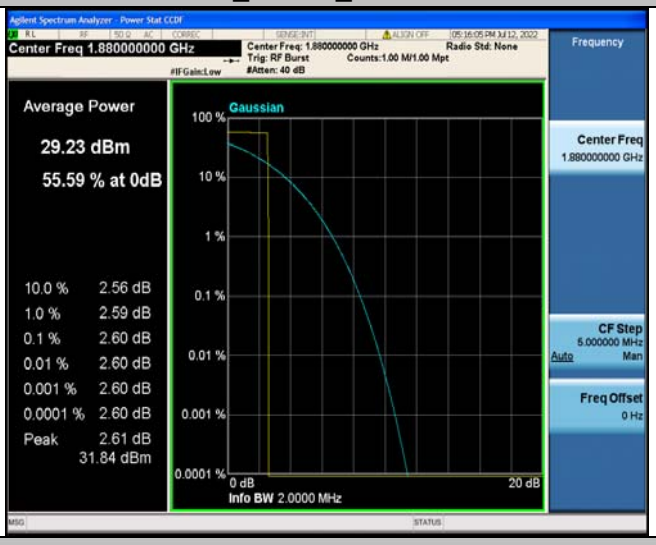
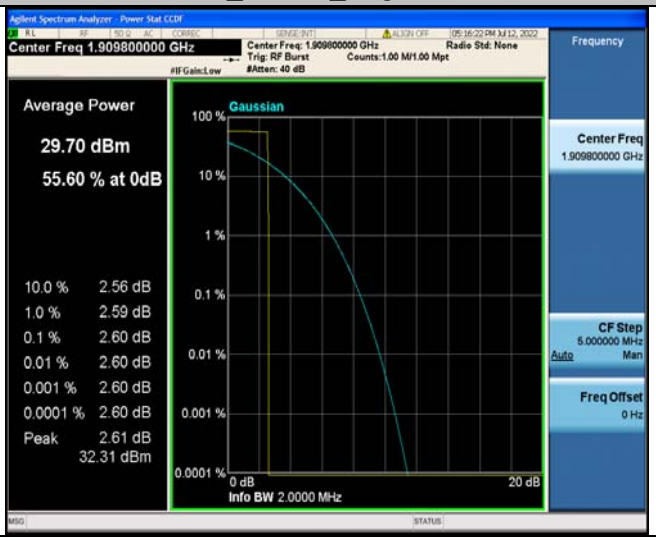
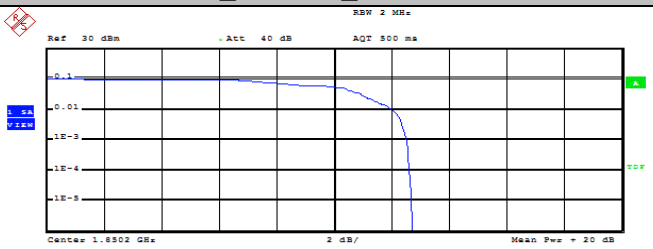
| PCS 1900_ GPRS_ Lowest channel |
| --- |
|  |
| PCS 1900_ GPRS_ Middle channel |
|  |
| PCS 1900_ GPRS_ Highest channel |
|  |

## PCS 1900_ EGPRS_ Lowest channel




| | Trace 1 |
|---|---|
| Mean | 20.11 dBm |
| Peak | 32.81 dBm |
| Crest | 12.71 dB |
| 10% @ | 2.69 dB |
| 1% @ | 11.99 dB |
| .1% @ | 12.50 dB |

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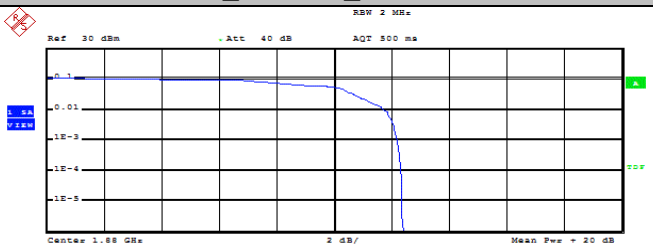
## PCS 1900_ EGPRS_ Middle channel




| | Trace 1 |
|---|---|
| Mean | 20.69 dBm |
| Peak | 33.10 dBm |
| Crest | 12.41 dB |
| 10% @ | 5.38 dB |
| 1% @ | 11.73 dB |
| .1% @ | 12.21 dB |

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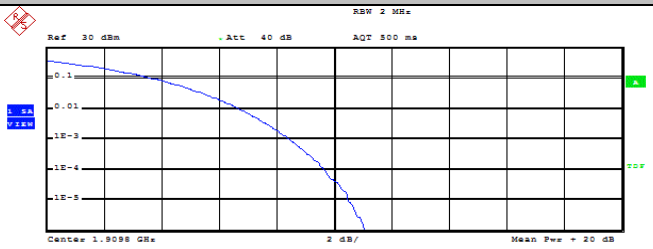
## PCS 1900_ EGPRS_ Highest channel




| | Trace 1 |
|---|---|
| Mean | -30.31 dBm |
| Peak | -19.25 dBm |
| Crest | 11.06 dB |
| 10% @ | 3.65 dB |
| 1% @ | 6.70 dB |
| .1% @ | 8.43 dB |

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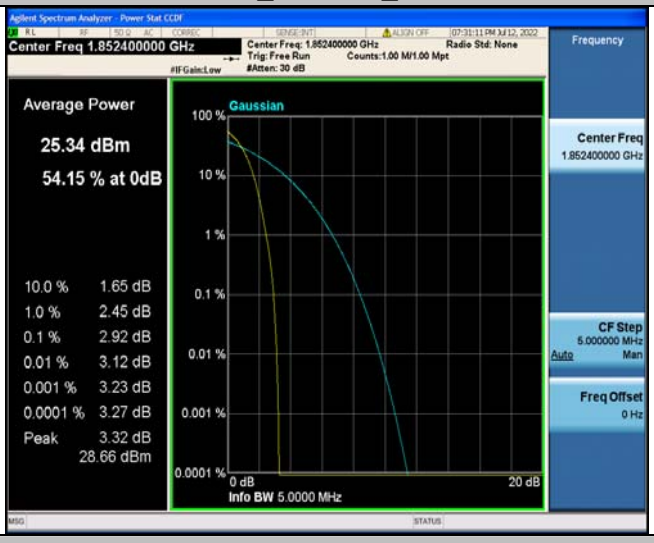
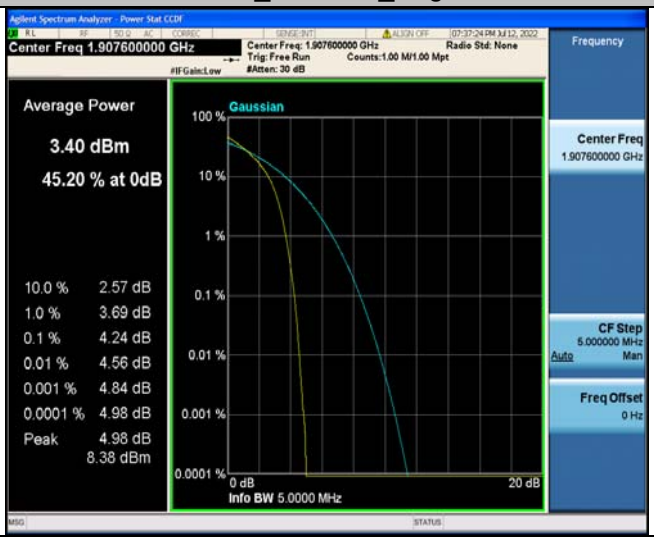
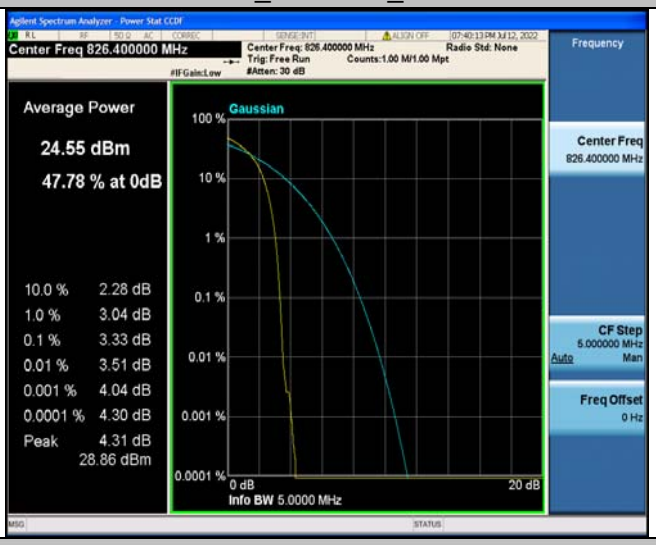
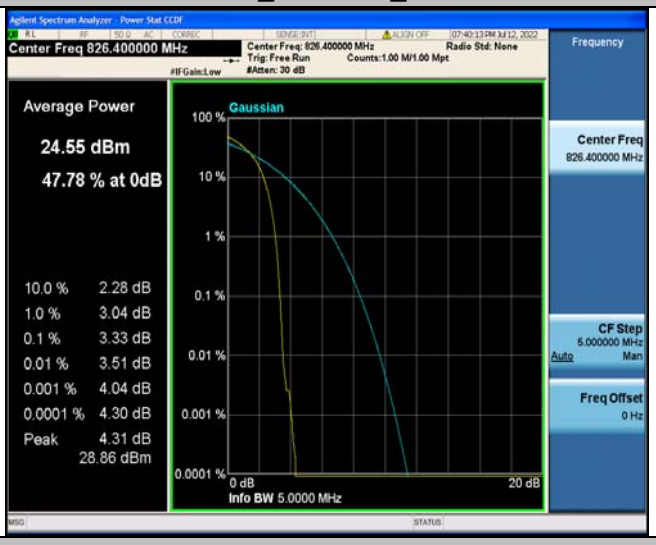
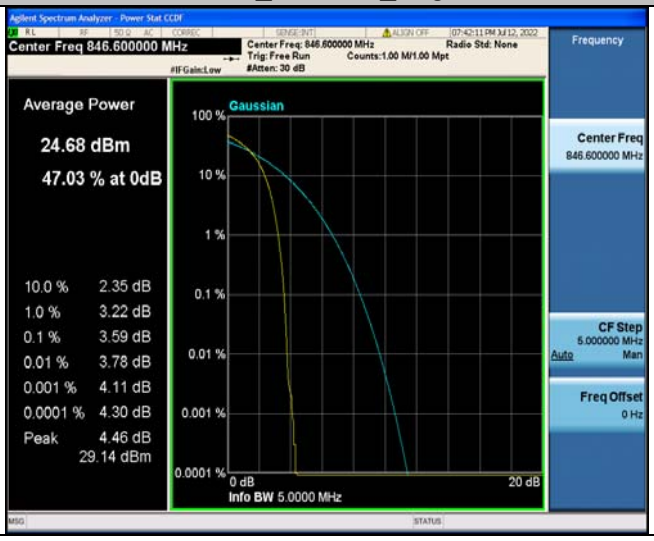
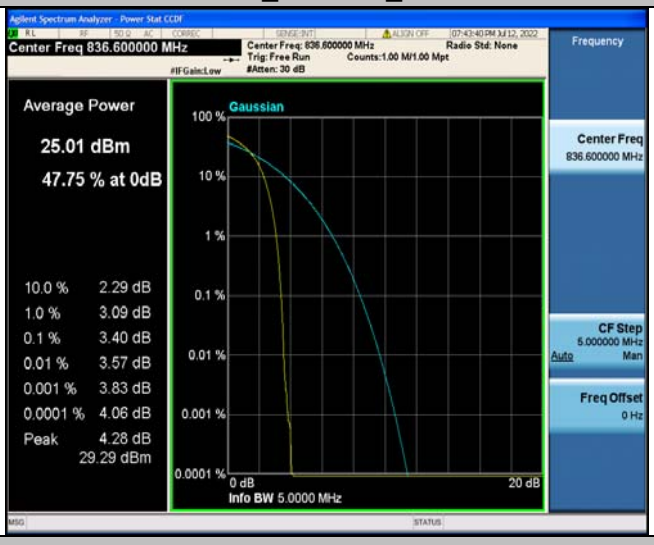
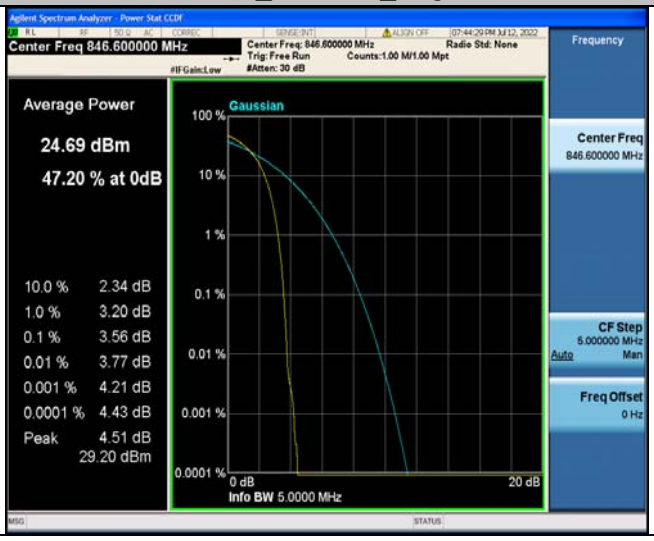
| WCDMA Band II_ WCDMA_ Lowest channel |
| --- |
|  |
| WCDMA Band II_ WCDMA_ Middle channel |
|  |
| WCDMA Band II_ WCDMA_ Highest channel |
|  |

| WCDMA Band II_ HSDPA _ Lowest channel |
|---|
|  |
| WCDMA Band II_ HSDPA _ Middle channel |
|  |
| WCDMA Band II_ HSDPA _ Highest channel |
|  |

| WCDMA Band II_ HSUPA _ Lowest channel |
|---|
|  |
| WCDMA Band II_ HSUPA _ Middle channel |
|  |
| WCDMA Band II_ HSUPA _ Highest channel |
|  |

| WCDMA Band V_ WCDMA_ Lowest channel |
| --- |
|  |
| WCDMA Band V_ WCDMA_ Middle channel |
|  |
| WCDMA Band V_ WCDMA_ Highest channel |
|  |

| WCDMA Band V_ HSDPA _ Lowest channel |
|---|
|  |
| WCDMA Band V_ HSDPA _ Middle channel |
|  |
| WCDMA Band V_ HSDPA _ Highest channel |
|  |

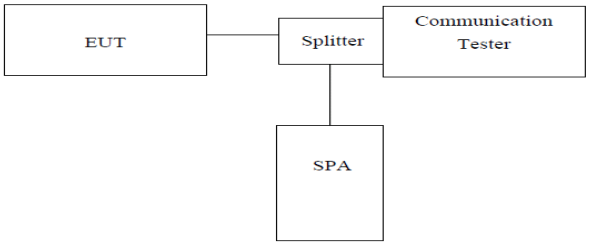
| WCDMA Band V_ HSUPA _ Lowest channel |
|---|
|  |
| WCDMA Band V_ HSUPA _ Middle channel |
|  |
| WCDMA Band V_ HSUPA _ Highest channel |
|  |

## 3.3. Occupy Bandwidth

**LIMIT**

For reporting purposes only.

**TEST CONFIGURATION**




*Note: Measurement setup for testing on Antenna connector*

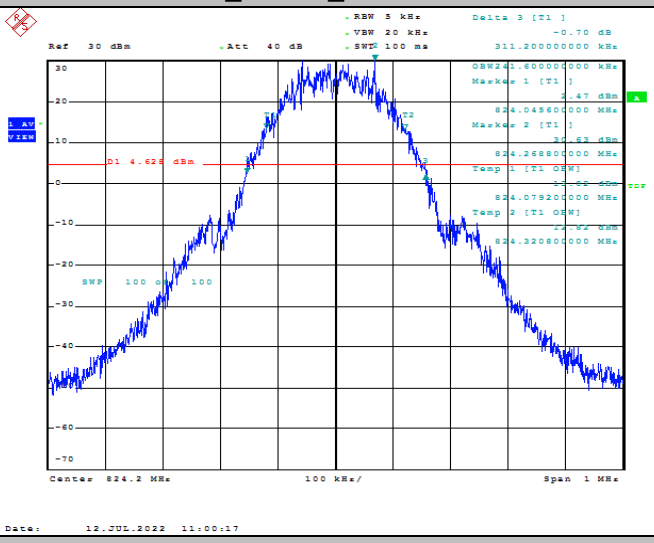
**TEST PROCEDURE**

1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer
2. RBW was set to about 1% of emission BW, VBW≥3 times RBW.
3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

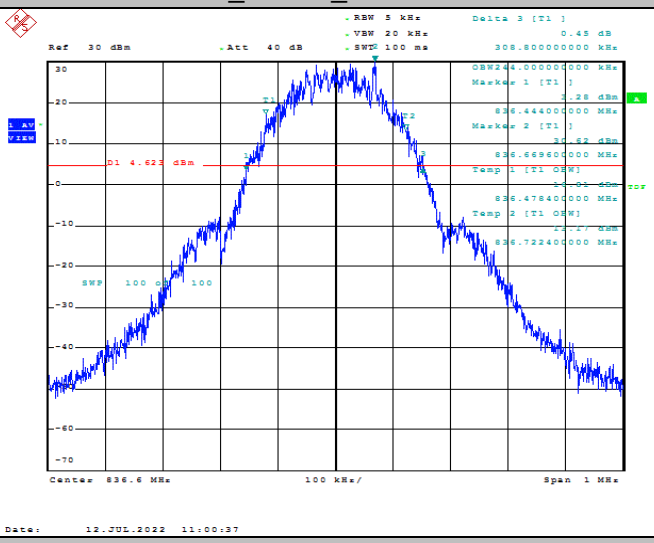
**TEST RESULTS**

| EUT Mode | Channel | Frequency (MHz) | 99% Occupy bandwidth (MHz) | -26dB bandwidth (MHz) |
|---|---|---|---|---|
| GSM 850 (GPRS) | 128 | 824.20 | 0.242 | 0.311 |
| | 190 | 836.60 | 0.244 | 0.309 |
| | 251 | 848.80 | 0.244 | 0.307 |
| EGPRS 850 (8PSK,1Slot) | 128 | 824.20 | 0.250 | 0.303 |
| | 190 | 836.60 | 0.248 | 0.307 |
| | 251 | 848.80 | 0.250 | 0.307 |
| PCS1900 (GPRS) | 512 | 1850.20 | 0.242 | 0.310 |
| | 661 | 1880.00 | 0.240 | 0.308 |
| | 810 | 1909.80 | 0.242 | 0.313 |
| EGPRS 1900 (8PSK,1Slot) | 512 | 1850.20 | 0.252 | 0.317 |
| | 661 | 1880.00 | 0.250 | 0.322 |
| | 810 | 1909.80 | 0.251 | 0.323 |
| WCDMA Band II (QPSK) | 9262 | 1852.40 | 4.168 | 4.704 |
| | 9400 | 1880.00 | 4.168 | 4.696 |
| | 9538 | 1907.60 | 4.168 | 4.696 |
| WCDMA Band V (QPSK) | 4132 | 826.40 | 4.168 | 4.680 |
| | 4183 | 836.60 | 4.176 | 4.680 |
| | 4233 | 846.60 | 4.168 | 4.680 |

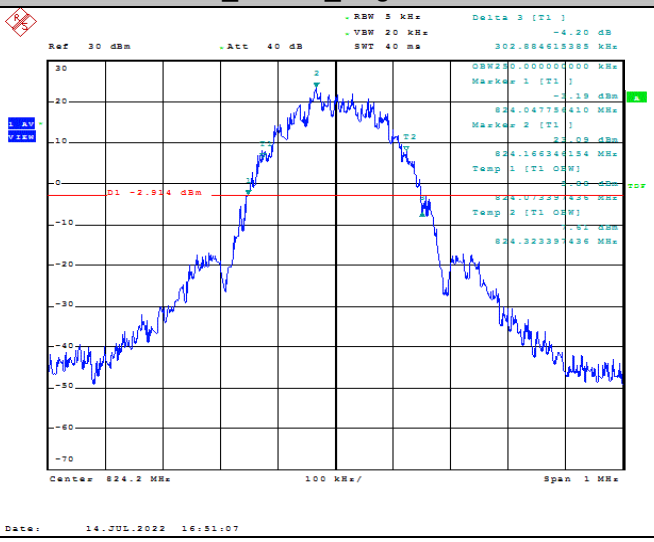
## GSM 850_ GPRS_ Lowest channel



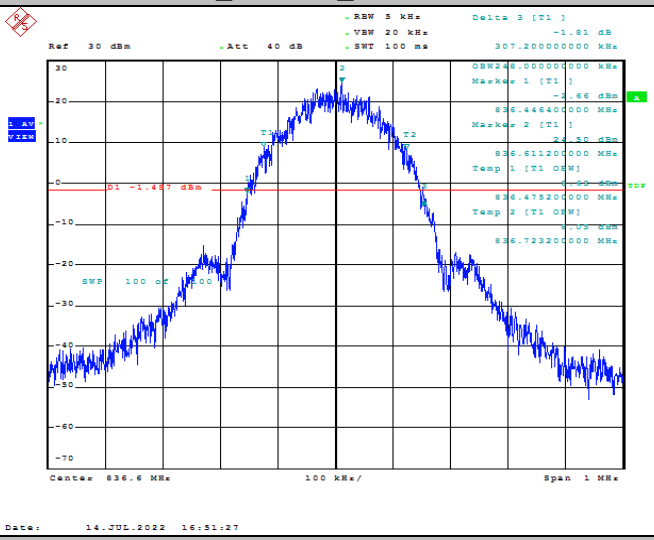

## GSM 850_ GPRS_ Middle channel



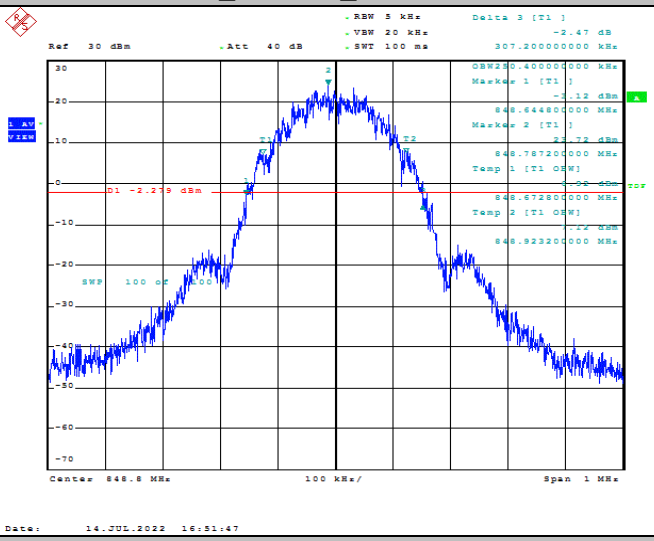

## GSM 850_ GPRS_ Highest channel



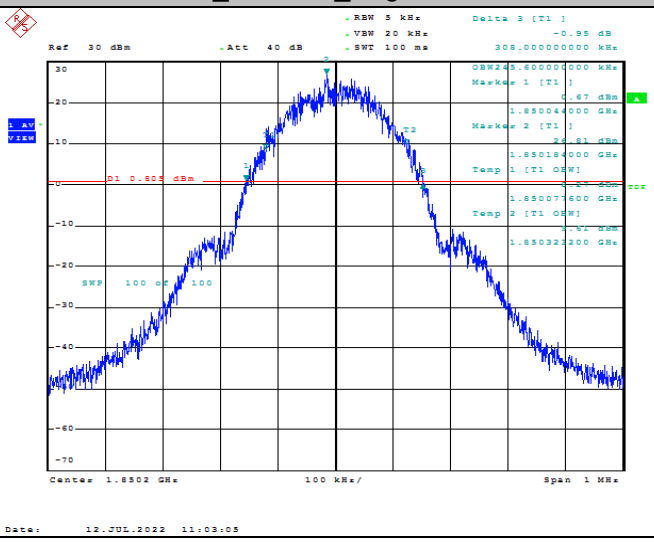
## GSM 850_ EGPRS_ Lowest channel



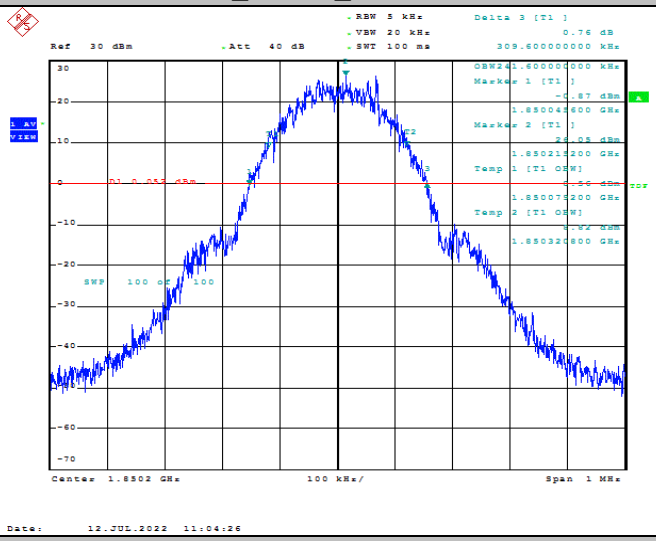

## GSM 850_ EGPRS_ Middle channel



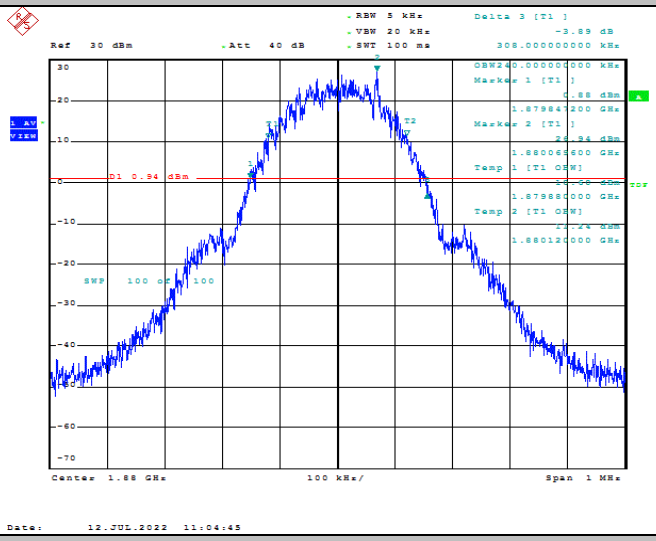

## GSM 850_ EGPRS_ Highest channel



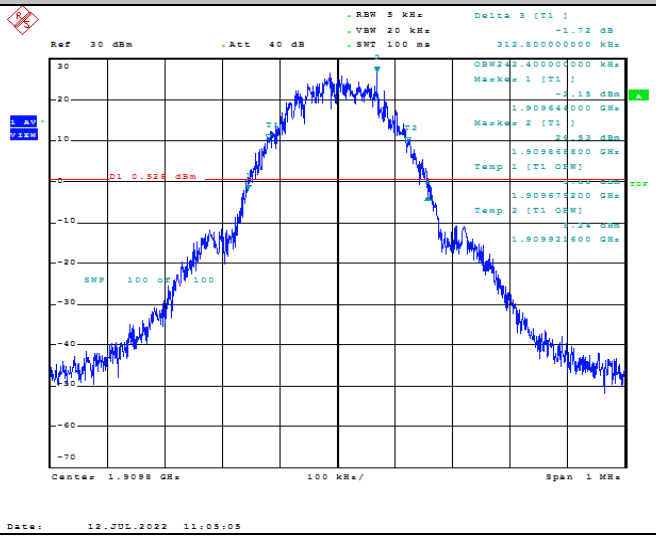
PCS 1900_ GPRS_ Lowest channel



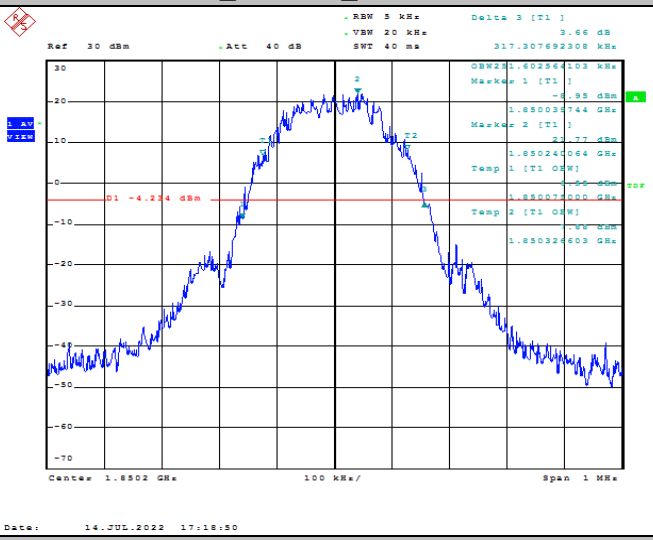

PCS 1900_ GPRS_ Middle channel



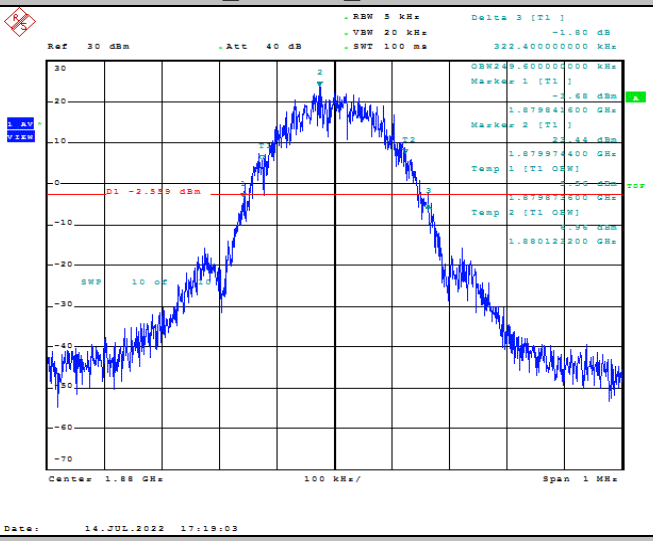

PCS 1900_ GPRS_ Highest channel



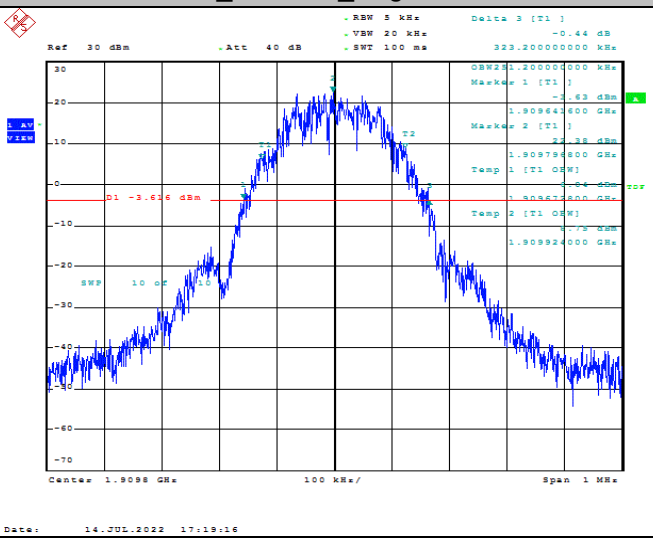
## PCS 1900_ EGPRS_ Lowest channel



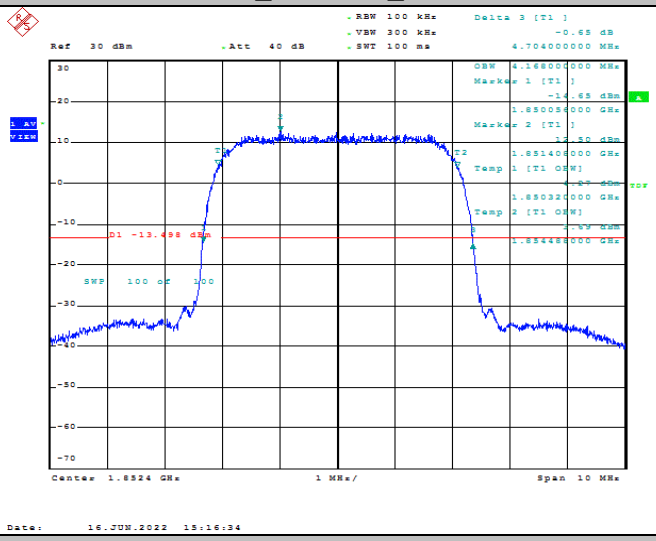

## PCS 1900_ EGPRS_ Middle channel



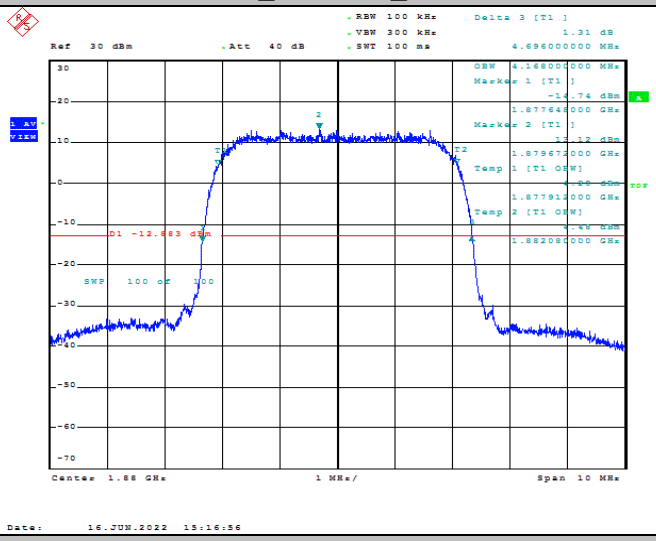

## PCS 1900_ EGPRS_ Highest channel



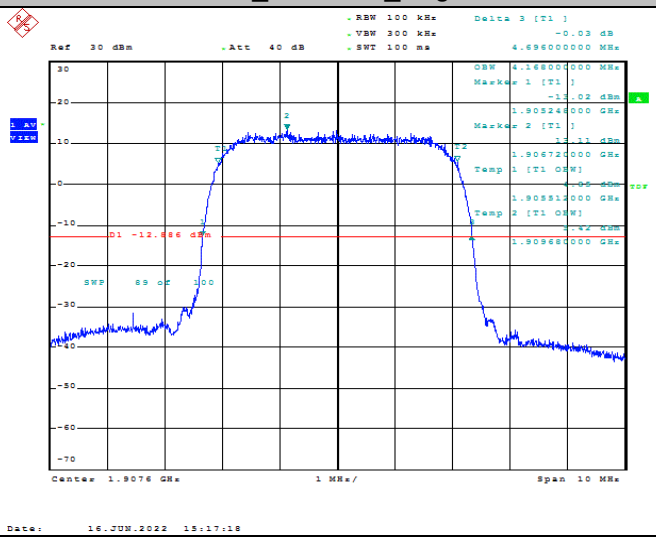
WCDMA Band II_ WCDMA_ Lowest channel



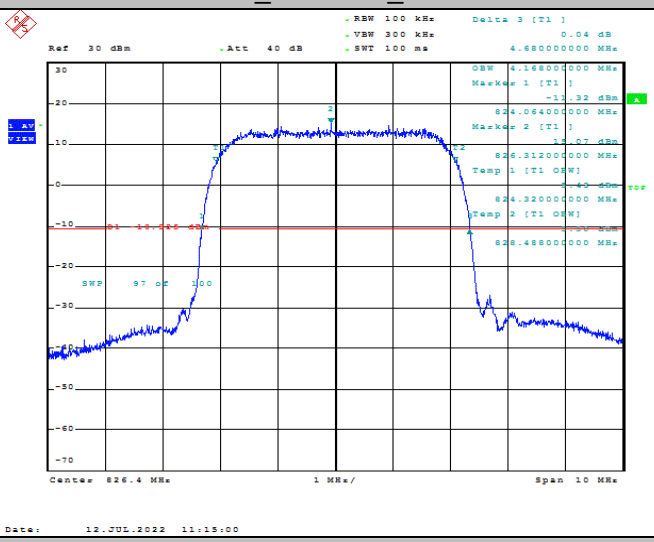

WCDMA Band II_ WCDMA_ Middle channel



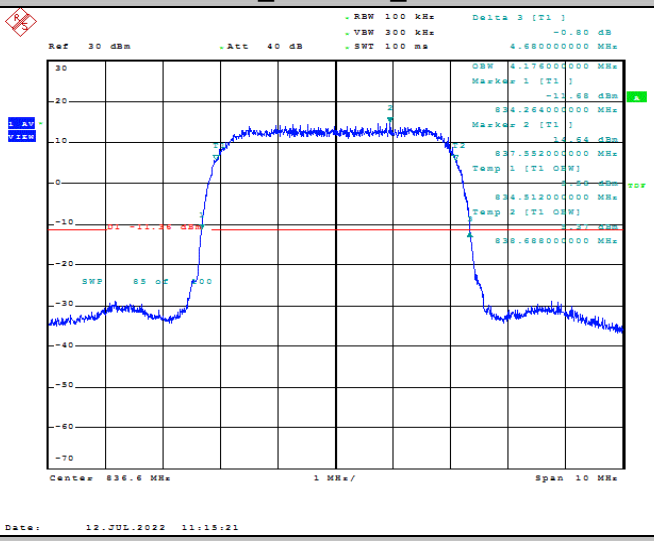

WCDMA Band II_ WCDMA_ Highest channel



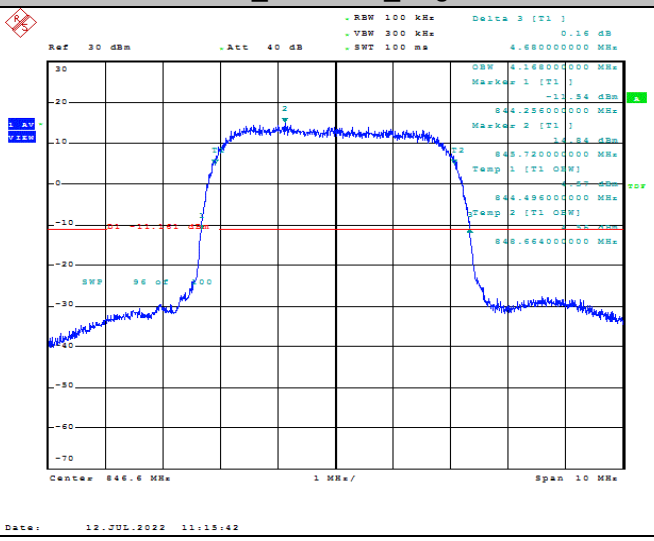
## WCDMA Band V_ WCDMA_ Lowest channel




## WCDMA Band V_ WCDMA_ Middle channel




## WCDMA Band V_ WCDMA_ Highest channel



## 3.4. Out Of Band Emissions

**LIMIT**

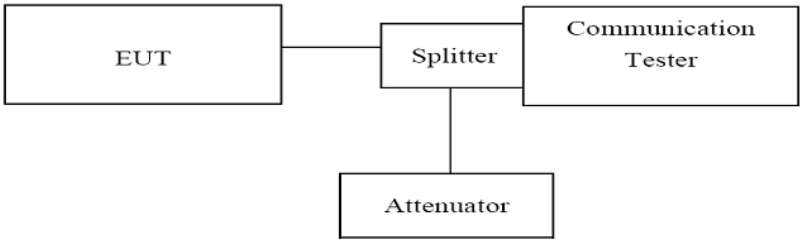
FCC: §22.917, §24.238, §27.53 (h), §90.691

The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

RSS132§5.5, RSS133§6.5, RSS139§6.6

The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. Sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

**TEST RESULTS**

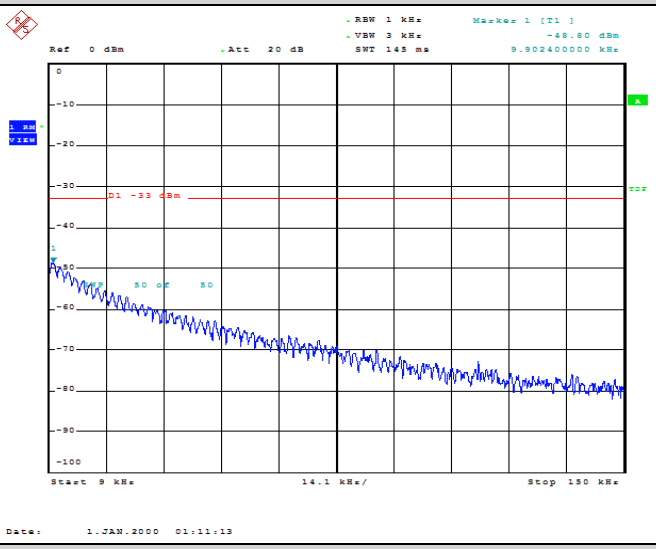
| Band | Channel | PCL | Frequency Range(MHz) | Max.Freq. (MHz) | Result (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|---|
| GPRS 850 | 128 | 3 | 0.009~0.15MHz | 0.01 | -48.8 | -33 | PASS |
| GPRS 850 | 128 | 3 | 0.15~30MHz | 0.68 | -48.94 | -13 | PASS |
| GPRS 850 | 128 | 3 | 30~1000MHz | 591.57 | -39.8 | -13 | PASS |
| GPRS 850 | 128 | 3 | 1000~3000MHz | 1697.47 | -28.8 | -13 | PASS |
| GPRS 850 | 128 | 3 | 3000~10000MHz | 3395.27 | -33.08 | -13 | PASS |
| GPRS 850 | 190 | 3 | 0.009~0.15MHz | 0.01 | -48.34 | -33 | PASS |
| GPRS 850 | 190 | 3 | 0.15~30MHz | 0.64 | -48.51 | -13 | PASS |
| GPRS 850 | 190 | 3 | 30~1000MHz | 964.5 | -39.34 | -13 | PASS |
| GPRS 850 | 190 | 3 | 1000~3000MHz | 1697.6 | -28.37 | -13 | PASS |
| GPRS 850 | 190 | 3 | 3000~10000MHz | 3395.27 | -32.99 | -13 | PASS |
| GPRS 850 | 251 | 3 | 0.009~0.15MHz | 0.01 | -48.66 | -33 | PASS |
| GPRS 850 | 251 | 3 | 0.15~30MHz | 0.66 | -48.5 | -13 | PASS |
| GPRS 850 | 251 | 3 | 30~1000MHz | 970.9 | -40 | -13 | PASS |
| GPRS 850 | 251 | 3 | 1000~3000MHz | 1697.33 | -29.59 | -13 | PASS |
| GPRS 850 | 251 | 3 | 3000~10000MHz | 3395.27 | -33.04 | -13 | PASS |
| EGPRS 850 | 128 | 8 | 0.009~0.15MHz | 0.04 | -38.87 | -33 | PASS |
| EGPRS 850 | 128 | 8 | 0.15~30MHz | 0.68 | -47.87 | -13 | PASS |
| EGPRS 850 | 128 | 8 | 30~1000MHz | 949.88 | -40.09 | -13 | PASS |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EGPRS 850 | 128 | 8 | 1000~3000MHz | 2725.67 | -44.53 | -13 | PASS |
| EGPRS 850 | 128 | 8 | 3000~10000MHz | 4942.03 | -48.01 | -13 | PASS |
| EGPRS 850 | 190 | 8 | 0.009~0.15MHz | 0.02 | -40.12 | -33 | PASS |
| EGPRS 850 | 190 | 8 | 0.15~30MHz | 0.62 | -47.39 | -13 | PASS |
| EGPRS 850 | 190 | 8 | 30~1000MHz | 994.92 | -39.3 | -13 | PASS |
| EGPRS 850 | 190 | 8 | 1000~3000MHz | 1697.53 | -28.41 | -13 | PASS |
| EGPRS 850 | 190 | 8 | 3000~10000MHz | 3395.27 | -43.89 | -13 | PASS |
| EGPRS 850 | 251 | 8 | 0.009~0.15MHz | 0.03 | -39.69 | -33 | PASS |
| EGPRS 850 | 251 | 8 | 0.15~30MHz | 0.63 | -46.98 | -13 | PASS |
| EGPRS 850 | 251 | 8 | 30~1000MHz | 949.98 | -38.45 | -13 | PASS |
| EGPRS 850 | 251 | 8 | 1000~3000MHz | 1698 | -30.1 | -13 | PASS |
| EGPRS 850 | 251 | 8 | 3000~10000MHz | 4941.1 | -46.5 | -13 | PASS |
| GPRS 1900 | 512 | 0 | 0.009~0.15MHz | 0.01 | -52.76 | -43 | PASS |
| GPRS 1900 | 512 | 0 | 0.15~30MHz | 0.63 | -47.09 | -23 | PASS |
| GPRS 1900 | 512 | 0 | 30~1000MHz | 958.81 | -39.62 | -13 | PASS |
| GPRS 1900 | 512 | 0 | 1000~3000MHz | 2986.47 | -44.35 | -13 | PASS |
| GPRS 1900 | 512 | 0 | 3000~10000MHz | 5729.53 | -48.02 | -13 | PASS |
| GPRS 1900 | 512 | 0 | 10000~18000MHz | 17972.8 | -50.29 | -13 | PASS |
| GPRS 1900 | 661 | 0 | 0.009~0.15MHz | 0.01 | -52.94 | -43 | PASS |
| GPRS 1900 | 661 | 0 | 0.15~30MHz | 0.68 | -46.87 | -23 | PASS |
| GPRS 1900 | 661 | 0 | 30~1000MHz | 769.63 | -39.27 | -13 | PASS |
| GPRS 1900 | 661 | 0 | 1000~3000MHz | 2429.8 | -44.2 | -13 | PASS |
| GPRS 1900 | 661 | 0 | 3000~10000MHz | 7639.37 | -42.88 | -13 | PASS |
| GPRS 1900 | 661 | 0 | 10000~18000MHz | 17985.6 | -50.12 | -13 | PASS |
| GPRS 1900 | 810 | 0 | 0.009~0.15MHz | 0.01 | -52.99 | -43 | PASS |
| GPRS 1900 | 810 | 0 | 0.15~30MHz | 0.68 | -47.05 | -23 | PASS |
| GPRS 1900 | 810 | 0 | 30~1000MHz | 954.05 | -39.34 | -13 | PASS |
| GPRS 1900 | 810 | 0 | 1000~3000MHz | 2599.93 | -44.4 | -13 | PASS |
| GPRS 1900 | 810 | 0 | 3000~10000MHz | 7639.83 | -45.53 | -13 | PASS |
| GPRS 1900 | 810 | 0 | 10000~18000MHz | 17965.33 | -50.31 | -13 | PASS |
| EGPRS 1900 | 512 | 2 | 0.009~0.15MHz | 0.01 | -47.76 | -43 | PASS |
| EGPRS 1900 | 512 | 2 | 0.15~30MHz | 0.6 | -47.73 | -23 | PASS |
| EGPRS 1900 | 512 | 2 | 30~1000MHz | 798.27 | -39.44 | -13 | PASS |
| EGPRS 1900 | 512 | 2 | 1000~3000MHz | 2550 | -44.46 | -13 | PASS |
| EGPRS 1900 | 512 | 2 | 3000~10000MHz | 4690.27 | -47.23 | -13 | PASS |
| EGPRS 1900 | 512 | 2 | 10000~18000MHz | 17976.27 | -48.19 | -13 | PASS |
| EGPRS 1900 | 661 | 2 | 0.009~0.15MHz | 0.03 | -50.27 | -43 | PASS |
| EGPRS 1900 | 661 | 2 | 0.15~30MHz | 0.7 | -47.84 | -23 | PASS |
| EGPRS 1900 | 661 | 2 | 30~1000MHz | 879.07 | -39.53 | -13 | PASS |
| EGPRS 1900 | 661 | 2 | 1000~3000MHz | 2628.87 | -44.51 | -13 | PASS |
| EGPRS 1900 | 661 | 2 | 3000~10000MHz | 3819.47 | -39.26 | -13 | PASS |
| EGPRS 1900 | 661 | 2 | 10000~18000MHz | 17961.6 | -48.21 | -13 | PASS |
| EGPRS 1900 | 810 | 2 | 0.009~0.15MHz | 0.01 | -48.69 | -43 | PASS |
| EGPRS 1900 | 810 | 2 | 0.15~30MHz | 0.63 | -45.84 | -23 | PASS |

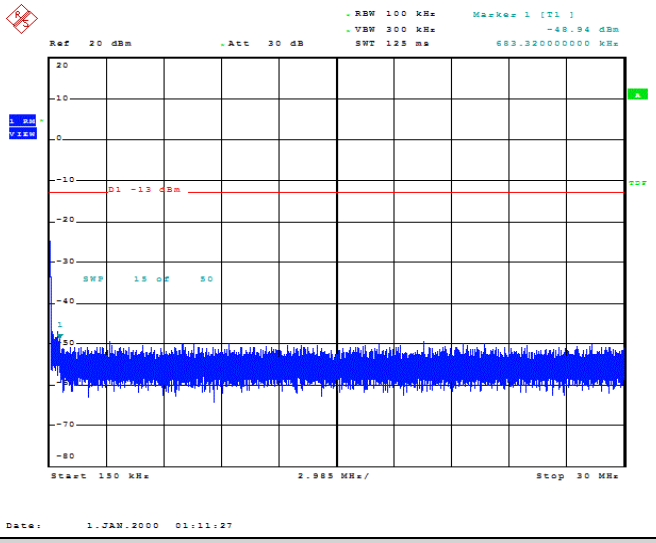
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EGPRS 1900 | 810 | 2 | 30~1000MHz | 837.88 | -39.76 | -13 | PASS |
| EGPRS 1900 | 810 | 2 | 1000~3000MHz | 2671.93 | -44.49 | -13 | PASS |
| EGPRS 1900 | 810 | 2 | 3000~10000MHz | 3819.47 | -39.38 | -13 | PASS |
| EGPRS 1900 | 810 | 2 | 10000~18000MHz | 17988.8 | -48.2 | -13 | PASS |

| Band | Channel | Frequency Range (Mhz) | Frequency (dBm) | Result (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| Band 2 | 9262 | 0.15~30MHz | 0.63 | -46.35 | -23 | PASS |
| Band 2 | 9262 | 30~1000MHz | 959.45 | -39.37 | -13 | PASS |
| Band 2 | 9262 | 1000~3000MHz | 2717.6 | -35.59 | -13 | PASS |
| Band 2 | 9262 | 3000~10000MHz | 3703.27 | -38.17 | -13 | PASS |
| Band 2 | 9262 | 10000~20000MHz | 17952 | -40.86 | -13 | PASS |
| Band 2 | 9262 | 0.009~0.15MHz | 0.02 | -71.19 | -43 | PASS |
| Band 2 | 9400 | 30~1000MHz | 870.41 | -39.38 | -13 | PASS |
| Band 2 | 9400 | 10000~20000MHz | 19164.33 | -41.43 | -13 | PASS |
| Band 2 | 9400 | 1000~3000MHz | 2614 | -35.39 | -13 | PASS |
| Band 2 | 9400 | 0.15~30MHz | 0.63 | -47.96 | -23 | PASS |
| Band 2 | 9400 | 0.009~0.15MHz | 0.01 | -69.15 | -43 | PASS |
| Band 2 | 9400 | 3000~10000MHz | 3757.4 | -41.16 | -13 | PASS |
| Band 2 | 9538 | 10000~20000MHz | 19087.33 | -41.2 | -13 | PASS |
| Band 2 | 9538 | 3000~10000MHz | 3817.13 | -38.21 | -13 | PASS |
| Band 2 | 9538 | 0.009~0.15MHz | 0.01 | -71.19 | -43 | PASS |
| Band 2 | 9538 | 0.15~30MHz | 0.66 | -48.71 | -23 | PASS |
| Band 2 | 9538 | 30~1000MHz | 930.55 | -38.82 | -13 | PASS |
| Band 2 | 9538 | 1000~3000MHz | 2328.27 | -35.14 | -13 | PASS |
| Band 5 | 4132 | 0.15~30MHz | 0.67 | -48.42 | -13 | PASS |
| Band 5 | 4132 | 30~1000MHz | 970.93 | -34.55 | -13 | PASS |
| Band 5 | 4132 | 1000~3000MHz | 2757.87 | -34.4 | -13 | PASS |
| Band 5 | 4132 | 3000~10000MHz | 9968.03 | -47.41 | -13 | PASS |
| Band 5 | 4132 | 10000~18000MHz | 17893.07 | -41.9 | -13 | PASS |
| Band 5 | 4132 | 0.009~0.15MHz | 0.01 | -68.99 | -33 | PASS |
| Band 5 | 4183 | 30~1000MHz | 949.43 | -34.94 | -13 | PASS |
| Band 5 | 4183 | 10000~18000MHz | 17927.2 | -42.57 | -13 | PASS |
| Band 5 | 4183 | 1000~3000MHz | 2435.4 | -35.35 | -13 | PASS |
| Band 5 | 4183 | 0.15~30MHz | 0.64 | -46.18 | -13 | PASS |
| Band 5 | 4183 | 0.009~0.15MHz | 0.01 | -70.92 | -33 | PASS |
| Band 5 | 4183 | 3000~10000MHz | 5026.03 | -44.86 | -13 | PASS |
| Band 5 | 4233 | 10000~18000MHz | 17888.53 | -41.74 | -13 | PASS |
| Band 5 | 4233 | 0.009~0.15MHz | 0.01 | -70.21 | -33 | PASS |
| Band 5 | 4233 | 0.15~30MHz | 0.68 | -48.03 | -13 | PASS |
| Band 5 | 4233 | 30~1000MHz | 991.3 | -35.55 | -13 | PASS |
| Band 5 | 4233 | 1000~3000MHz | 2404.13 | -35.49 | -13 | PASS |
| Band 5 | 4233 | 3000~10000MHz | 5072.47 | -48.69 | -13 | PASS |

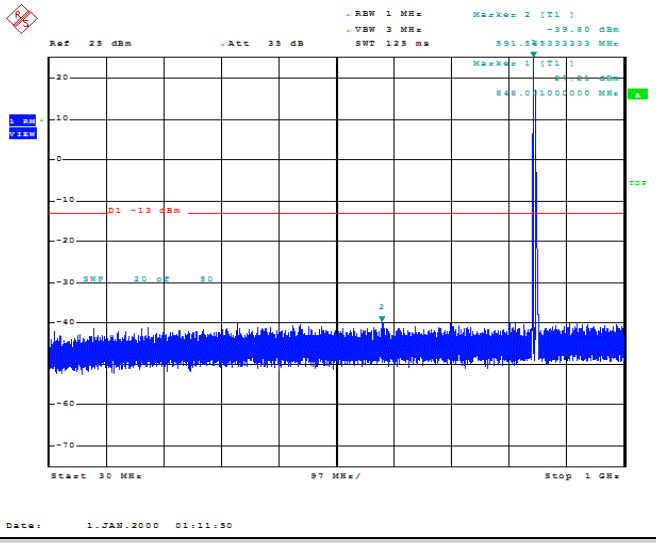
GPRS 850-128-0.009~0.15MHz



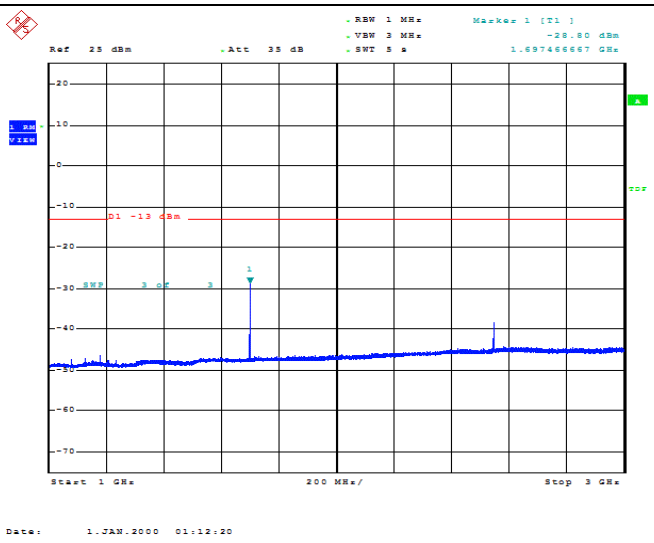

GPRS 850-128-0.15~30MHz



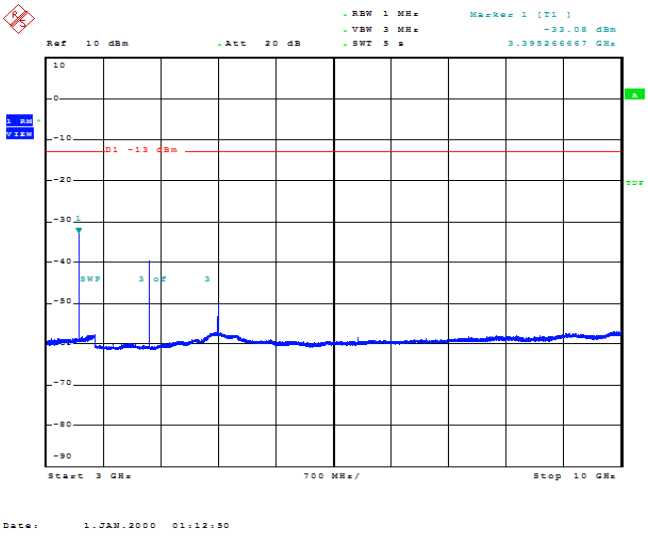

GPRS 850-128-30~1000MHz



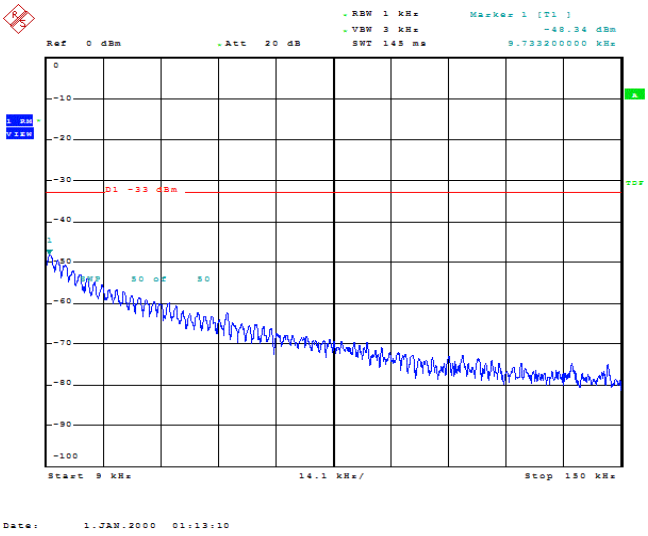

GPRS 850-128-1000~3000MHz



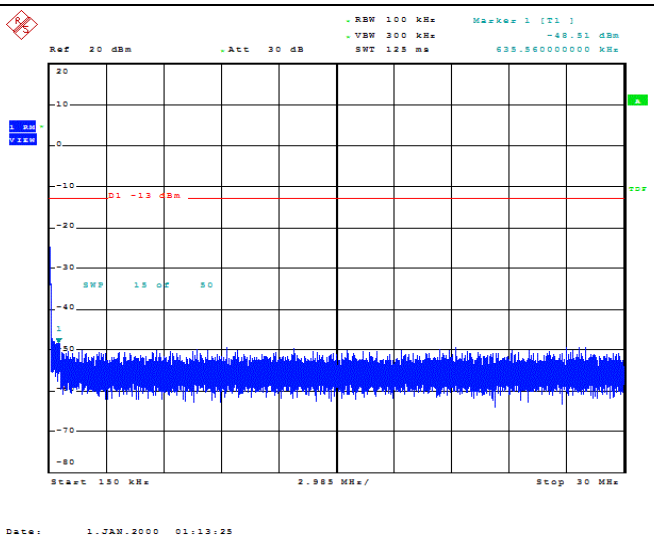

GPRS 850-128-3000~10000MHz



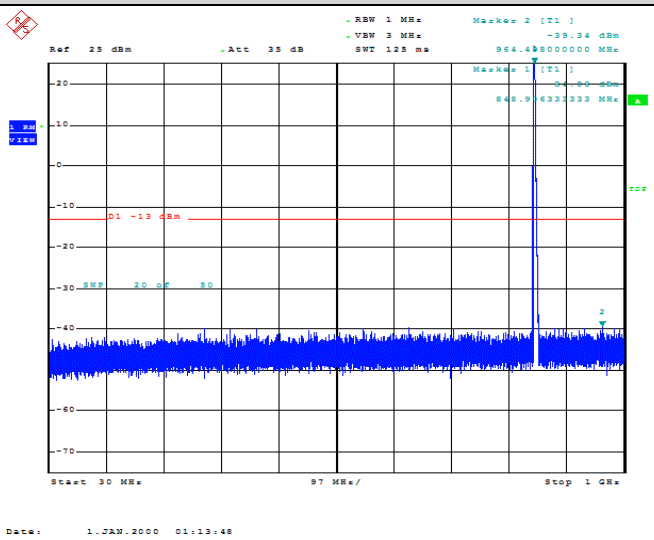

GPRS 850-190-0.009~0.15MHz



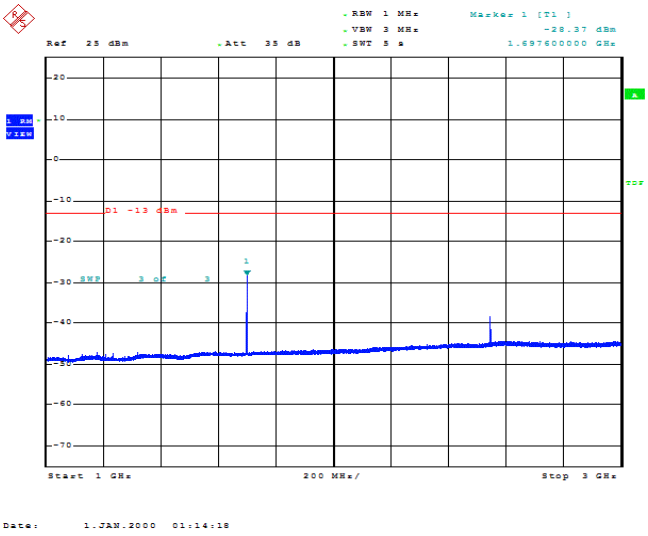

GPRS 850-190-0.15~30MHz



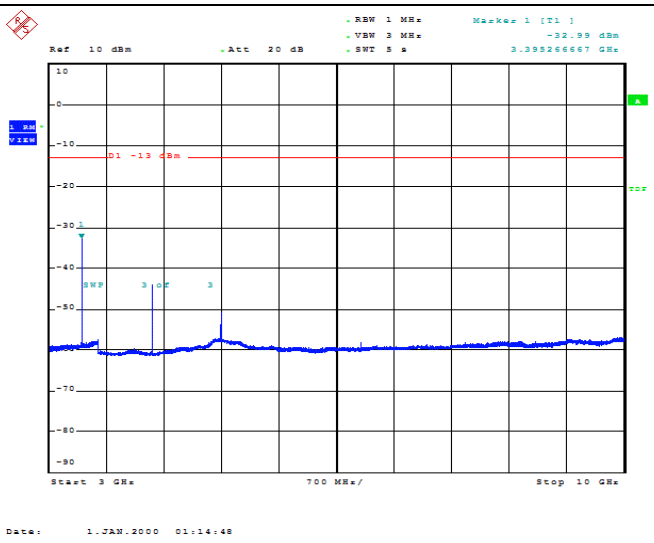

GPRS 850-190-30~1000MHz



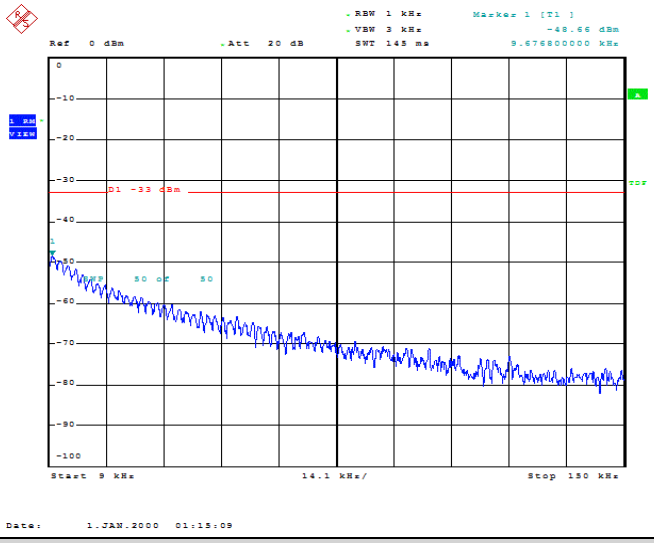

GPRS 850-190-1000~3000MHz



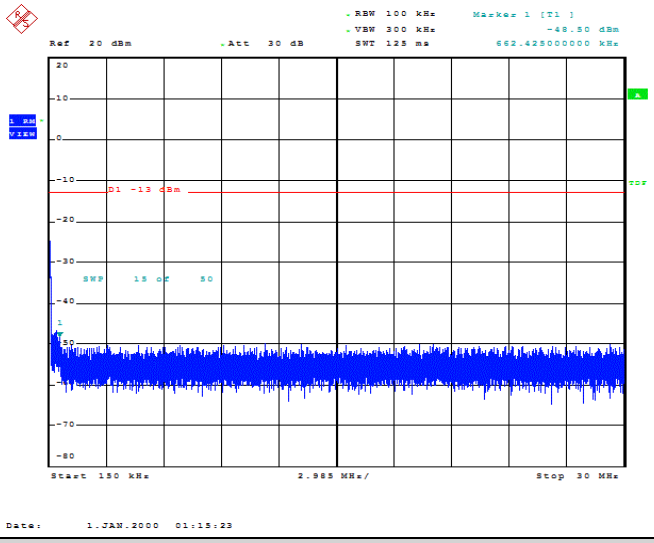

GPRS 850-190-3000~10000MHz



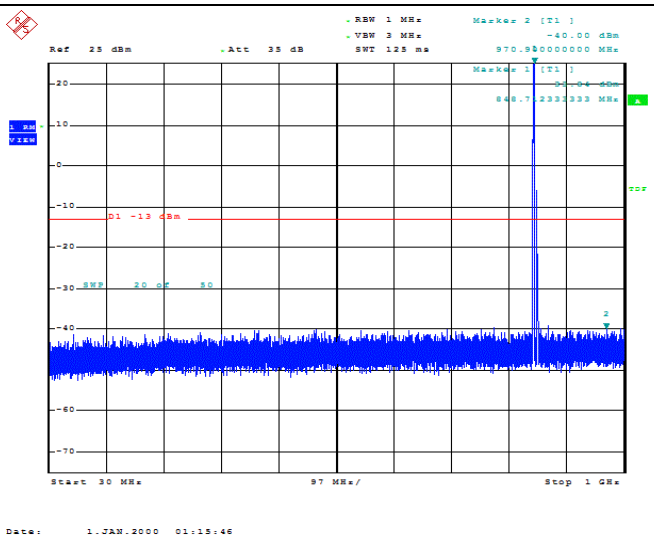

GPRS 850-251-0.009~0.15MHz



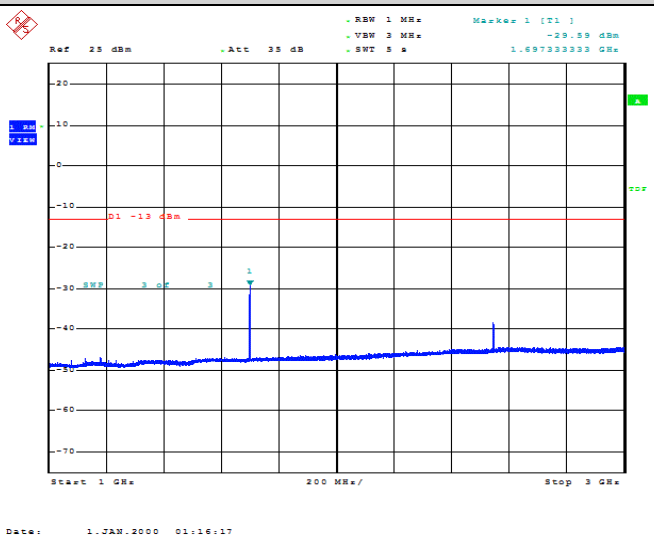

GPRS 850-251-0.15~30MHz



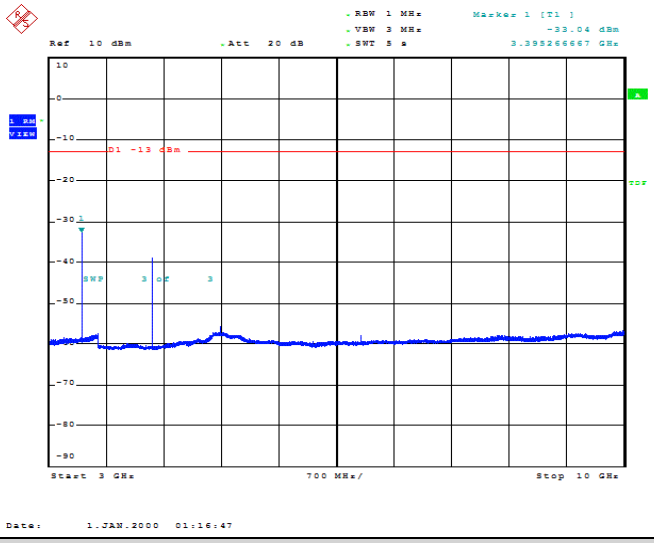

GPRS 850-251-30~1000MHz



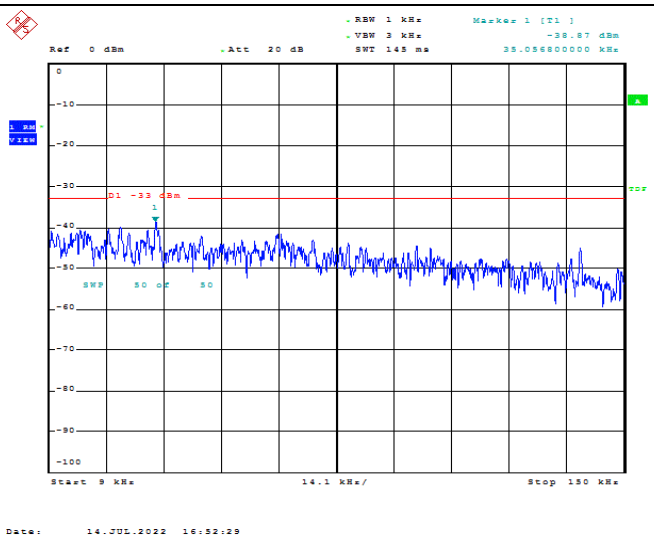

GPRS 850-251-1000~3000MHz



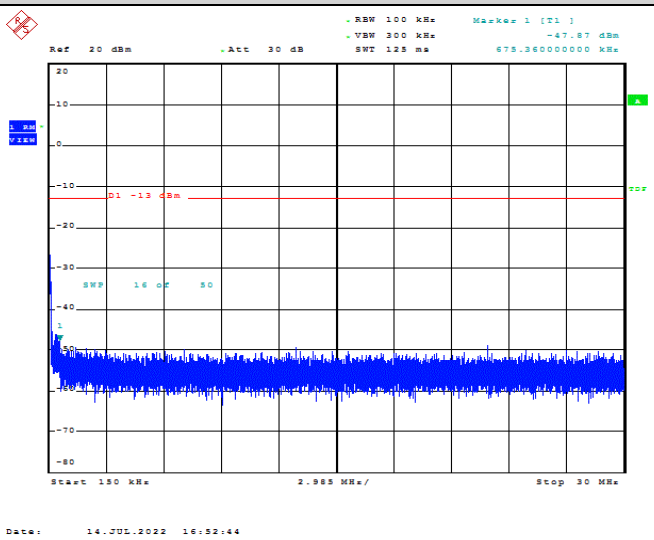

GPRS 850-251-3000~10000MHz



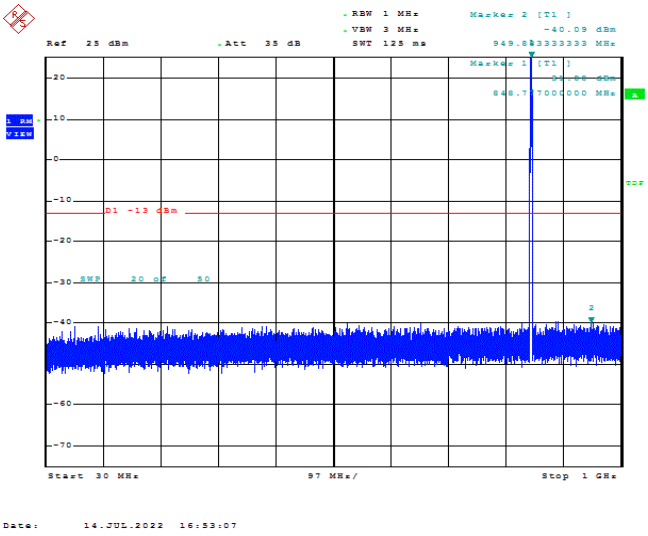

EGPRS 850-128-0.009~0.15MHz



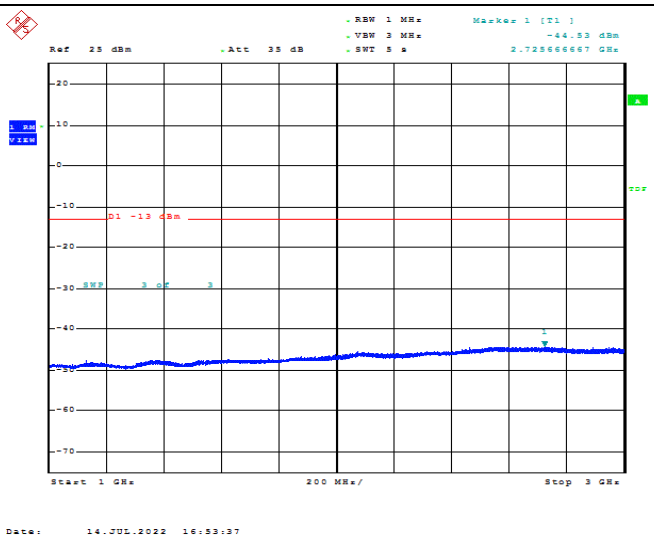

EGPRS 850-128-0.15~30MHz



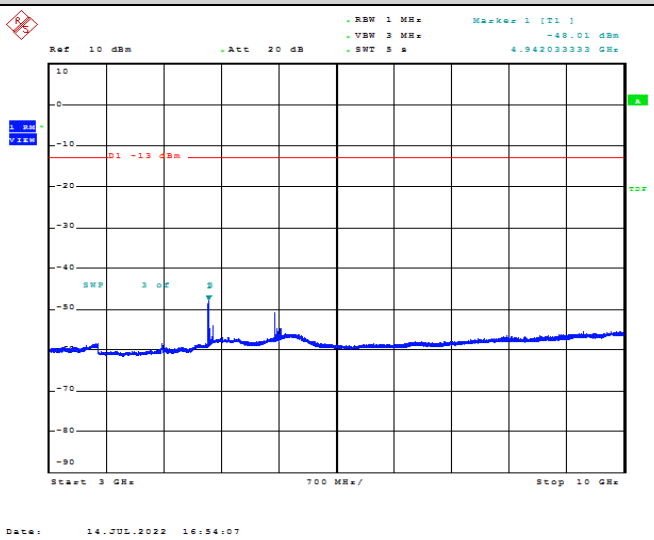

EGPRS 850-128-30~1000MHz



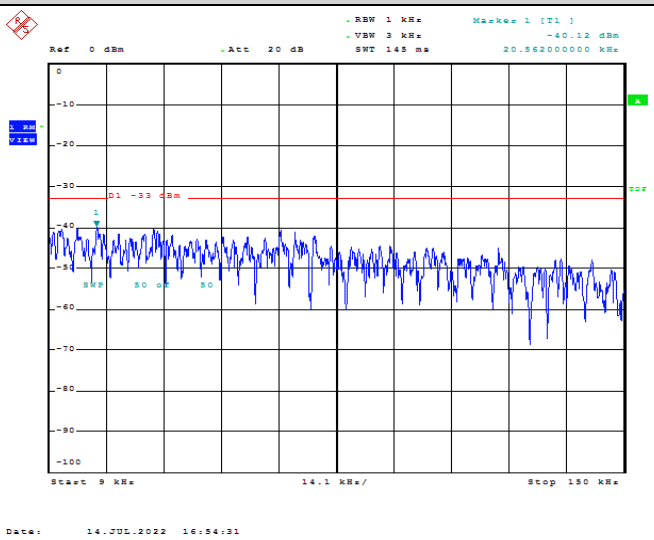

EGPRS 850-128-1000~3000MHz



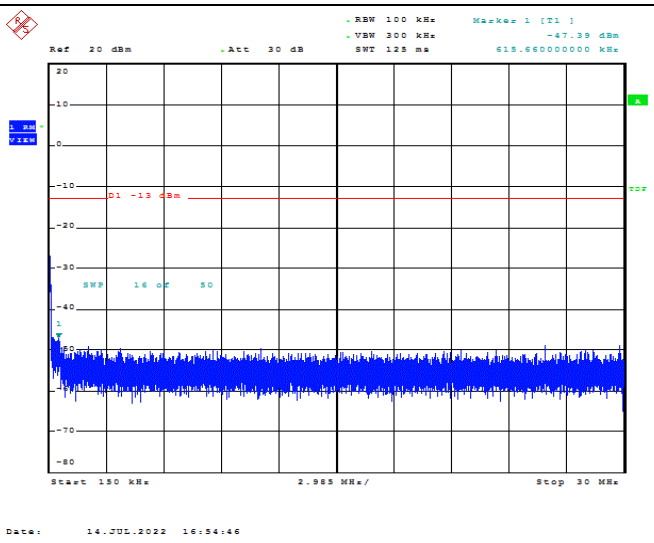

EGPRS 850-128-3000~10000MHz



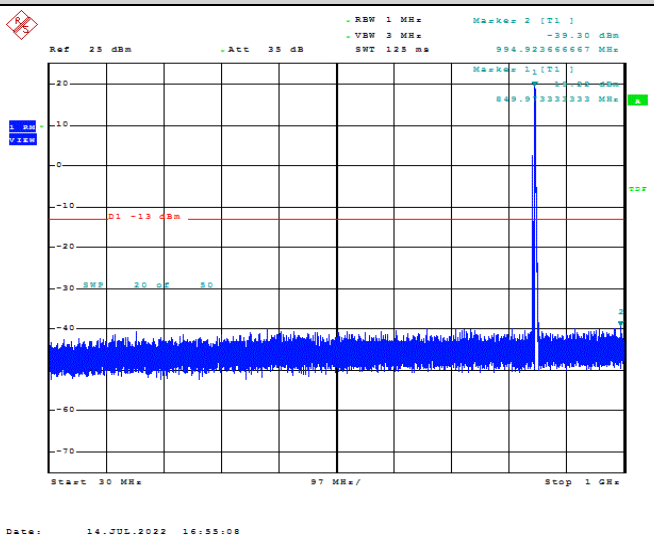

EGPRS 850-190-0.009~0.15MHz



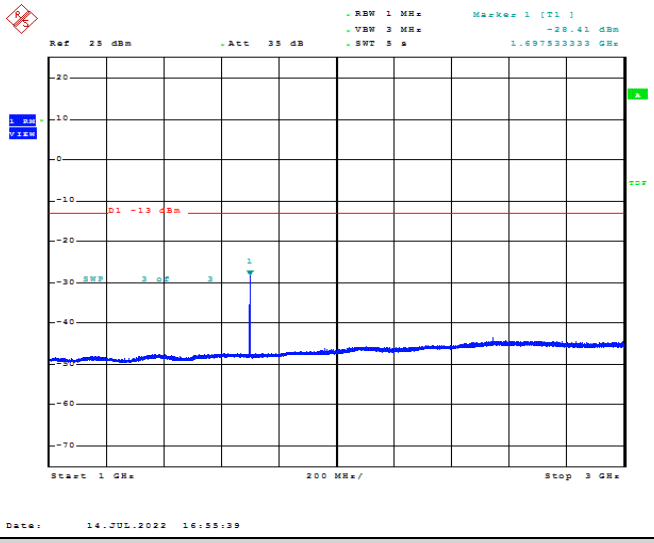

EGPRS 850-190-0.15~30MHz



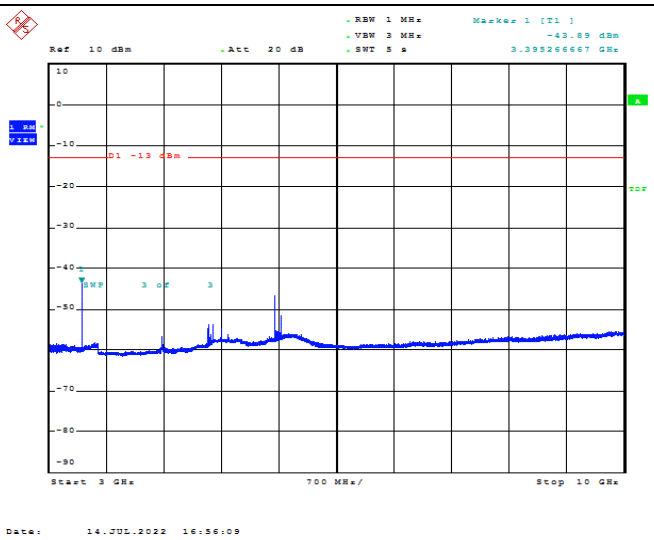

EGPRS 850-190-30~1000MHz



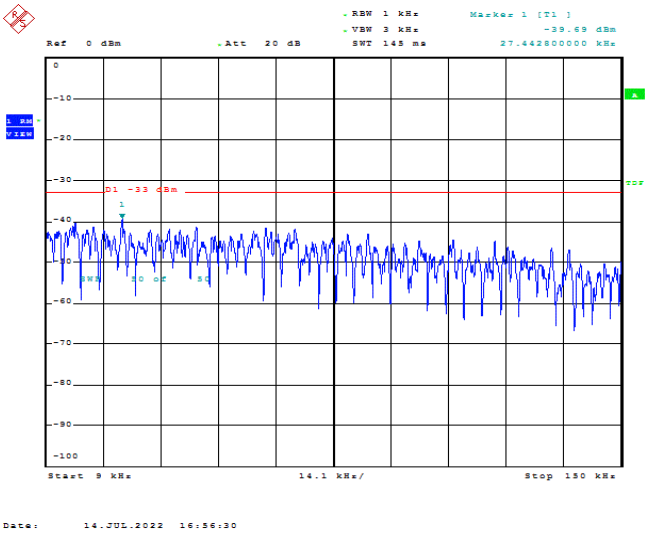

EGPRS 850-190-1000~3000MHz



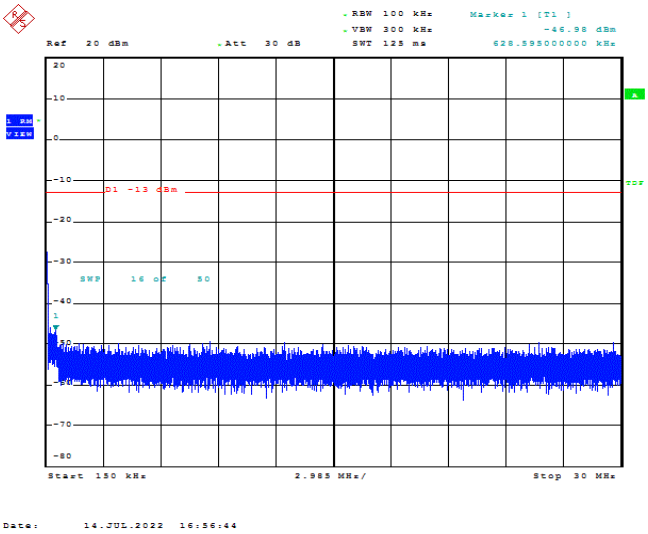

EGPRS 850-190-3000~10000MHz



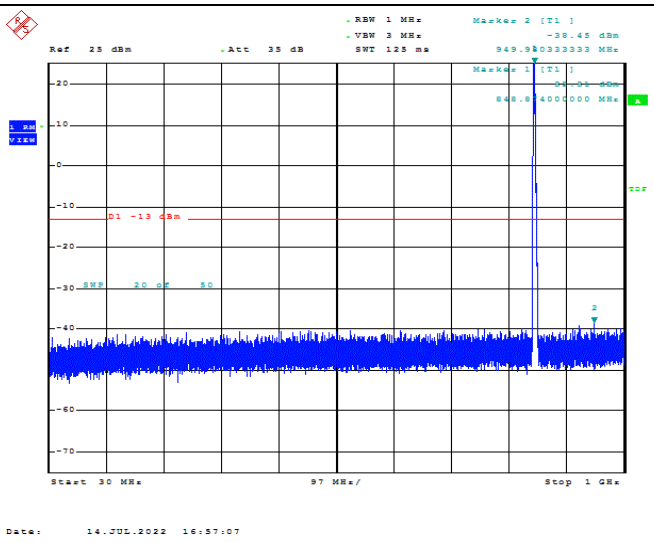

EGPRS 850-251-0.009~0.15MHz



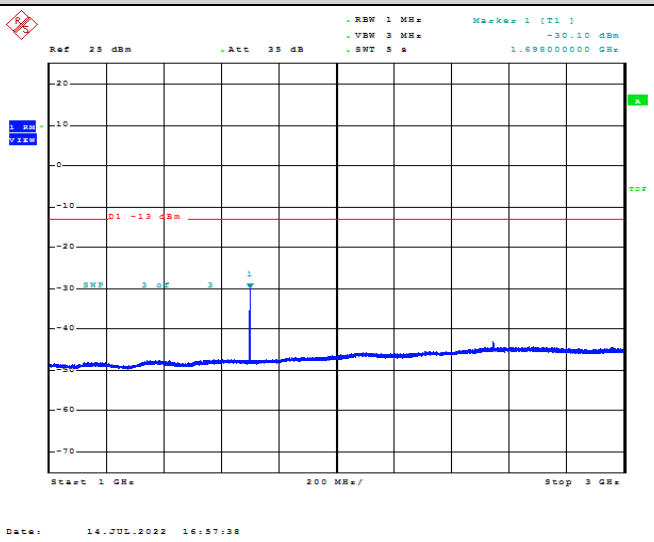

EGPRS 850-251-0.15~30MHz



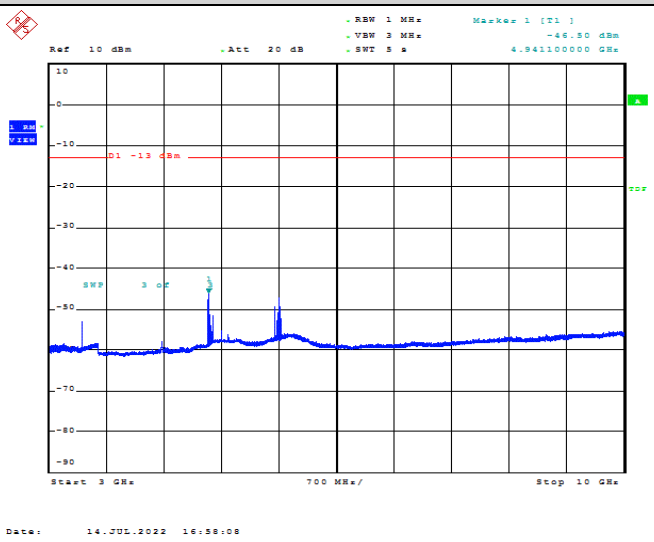

EGPRS 850-251-30~1000MHz



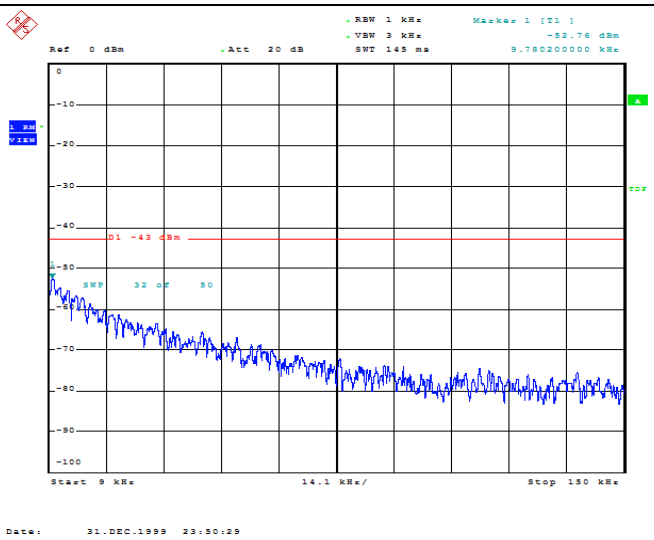

EGPRS 850-251-1000~3000MHz



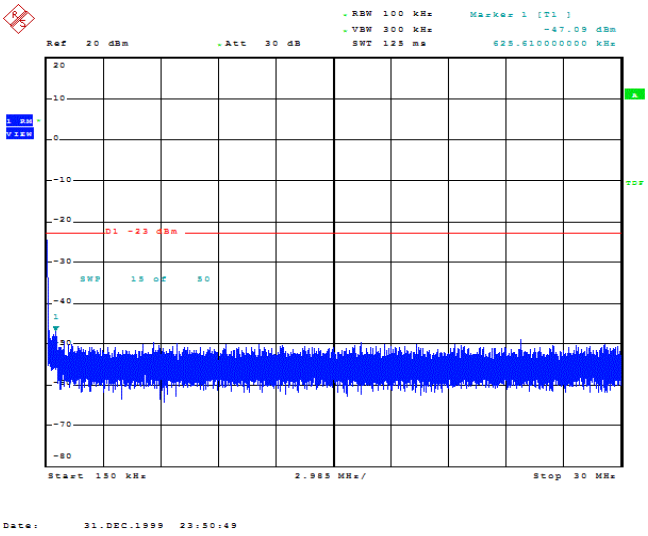

EGPRS 850-251-3000~10000MHz



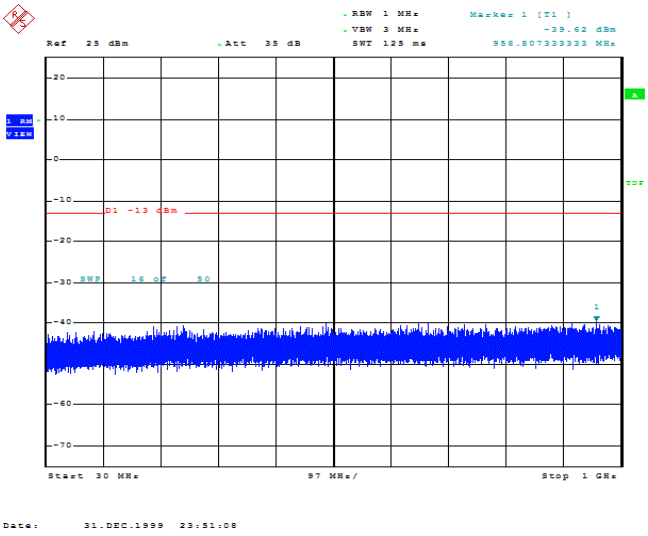

GPRS 1900-512-0.009~0.15MHz



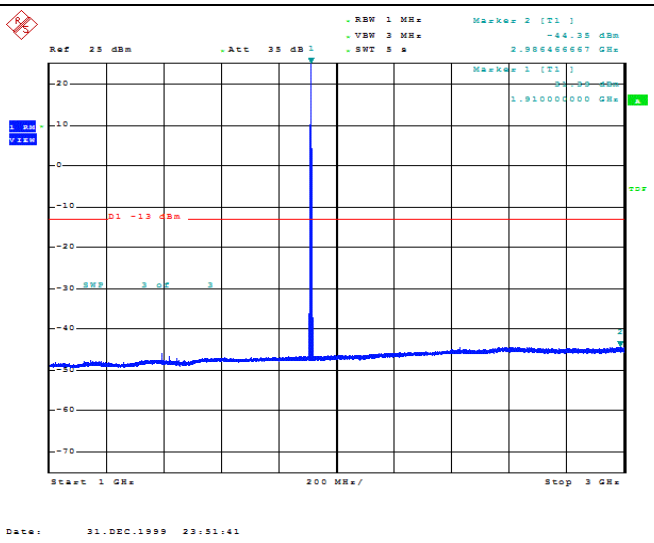

GPRS 1900-512-0.15~30MHz



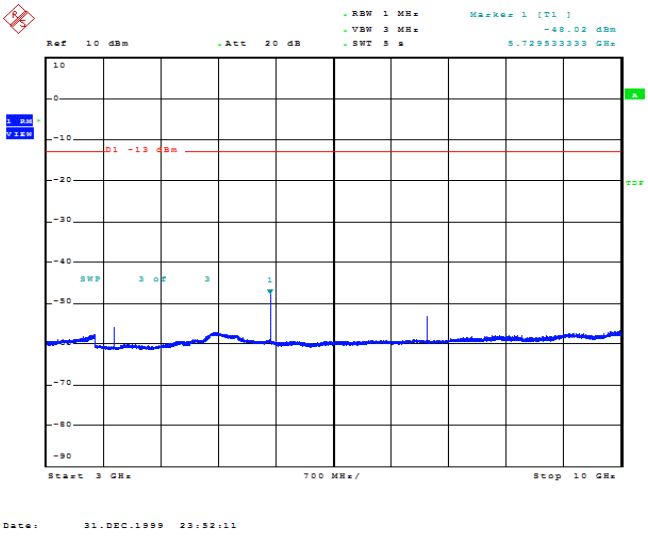

GPRS 1900-512-30~1000MHz



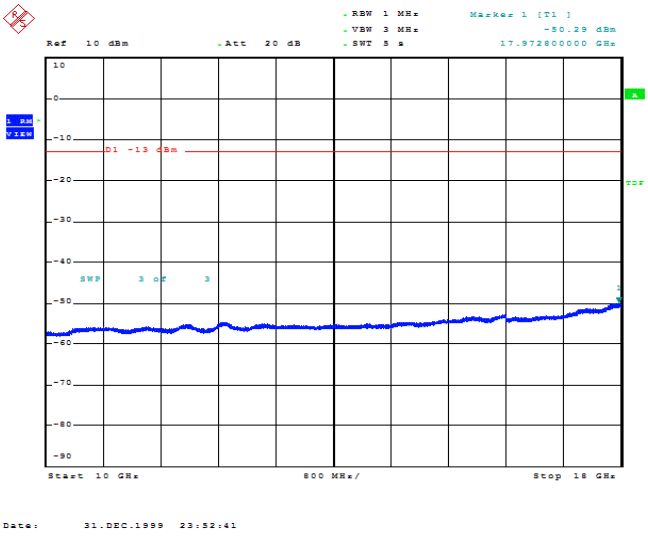

GPRS 1900-512-1000~3000MHz



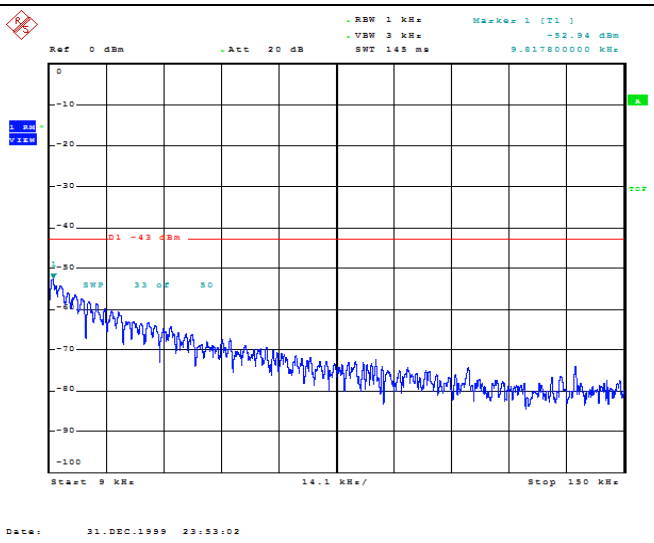

GPRS 1900-512-3000~10000MHz



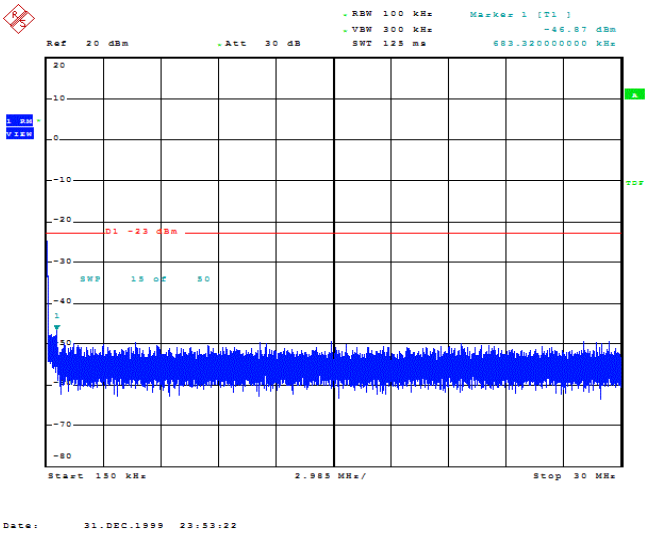

GPRS 1900-512-10000~18000MHz



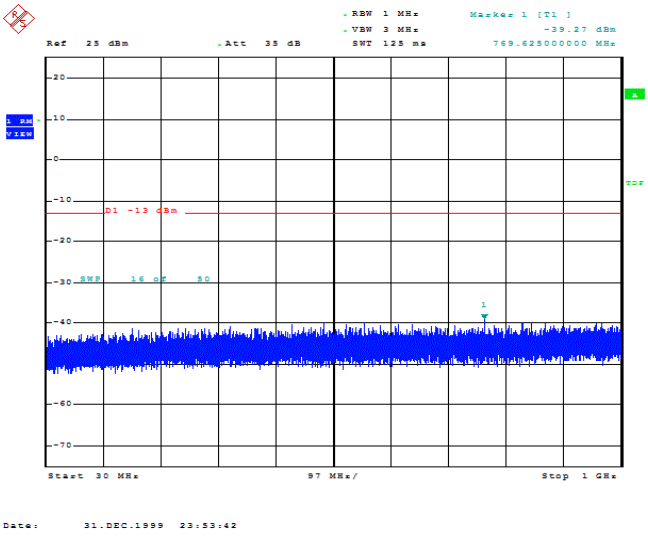

GPRS 1900-661-0.009~0.15MHz



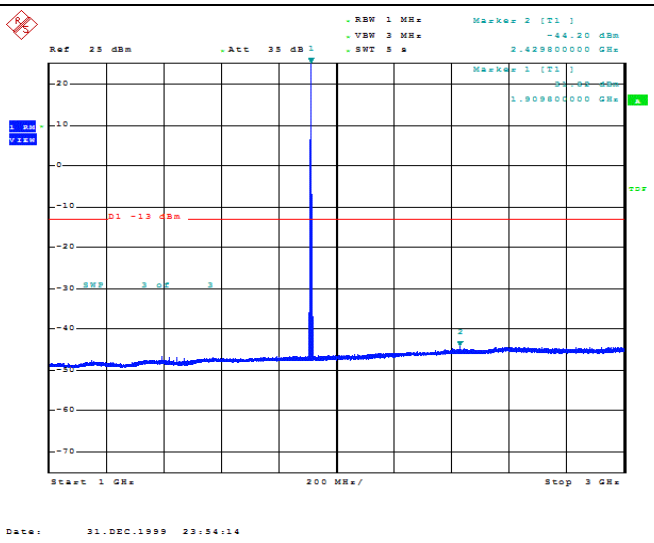

GPRS 1900-661-0.15~30MHz



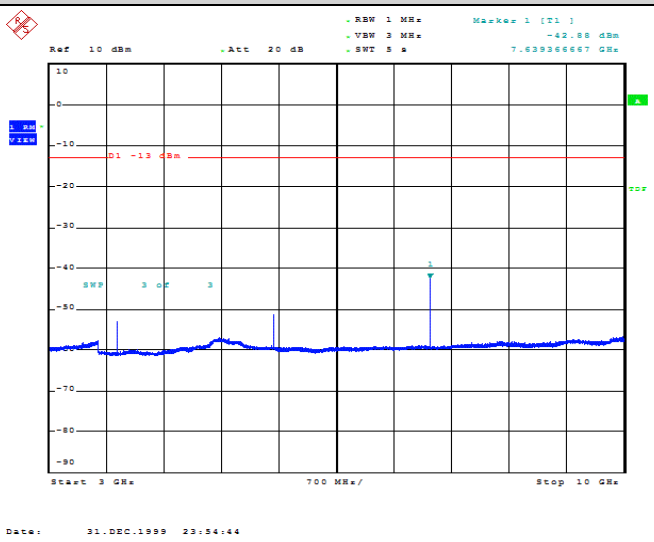

GPRS 1900-661-30~1000MHz



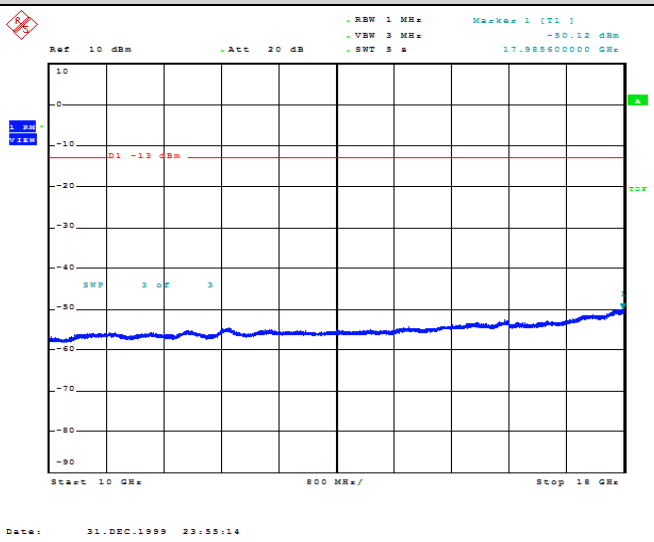

GPRS 1900-661-1000~3000MHz



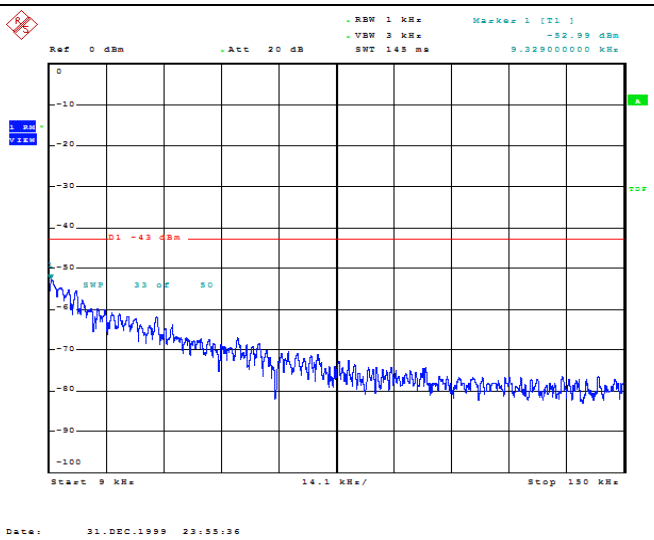

GPRS 1900-661-3000~10000MHz



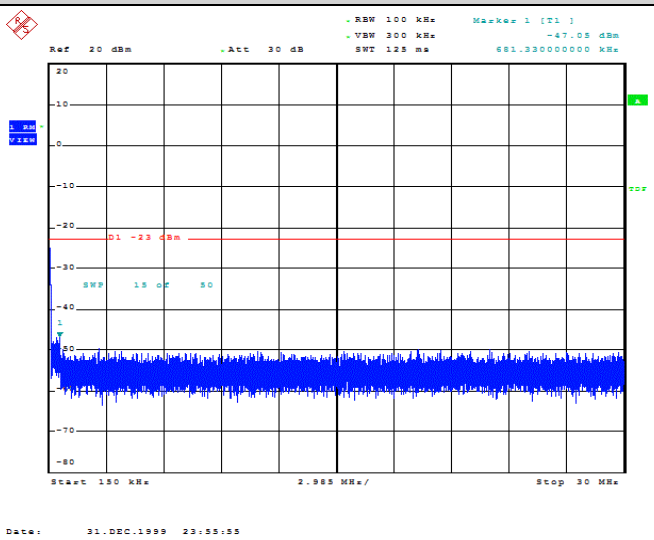

GPRS 1900-661-10000~18000MHz



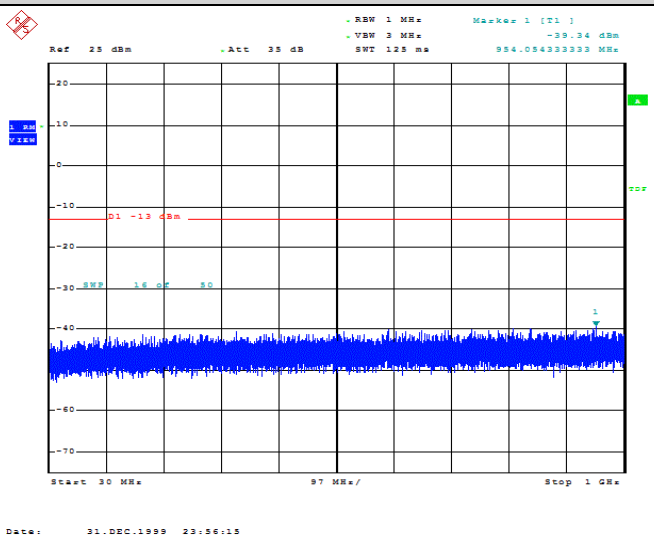

GPRS 1900-810-0.009~0.15MHz



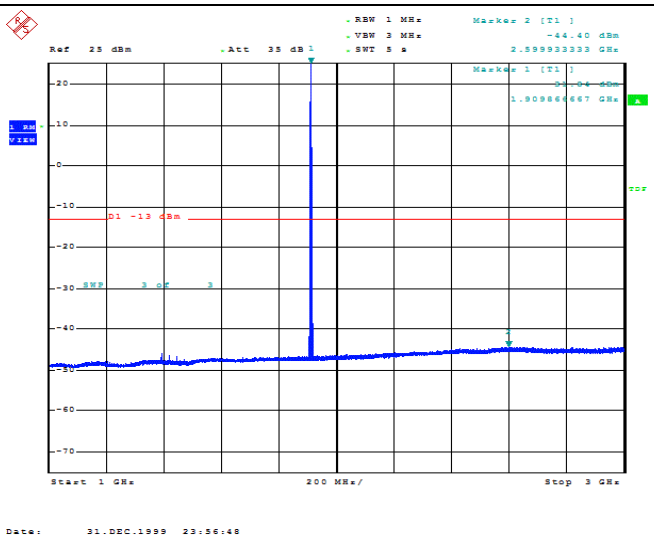

GPRS 1900-810-0.15~30MHz



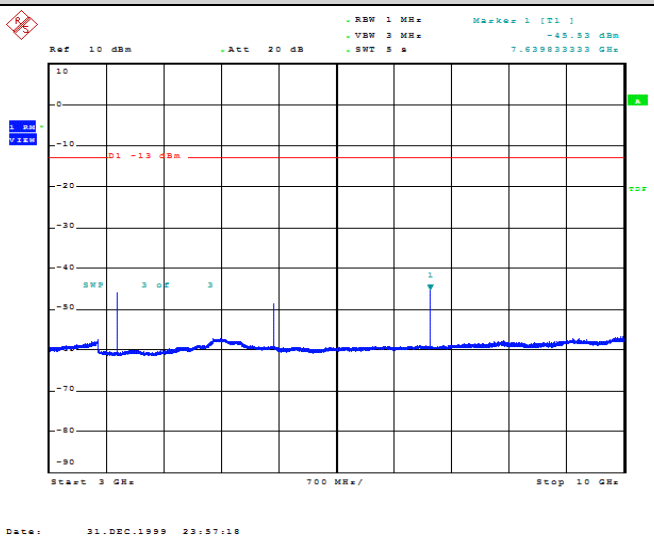

GPRS 1900-810-30~1000MHz



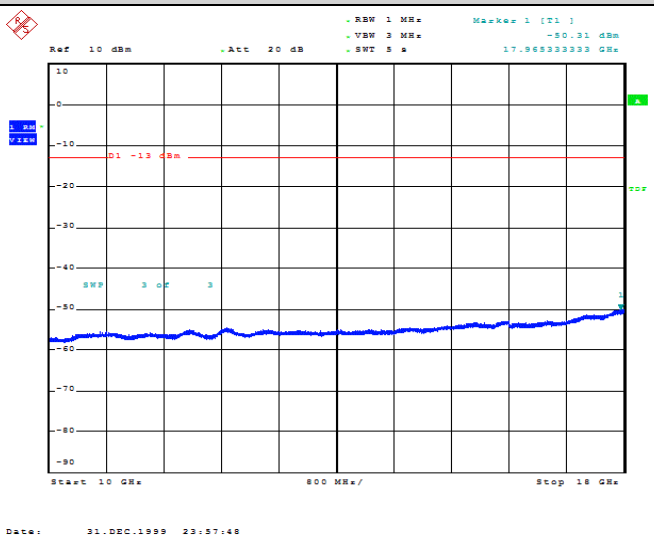

GPRS 1900-810-1000~3000MHz



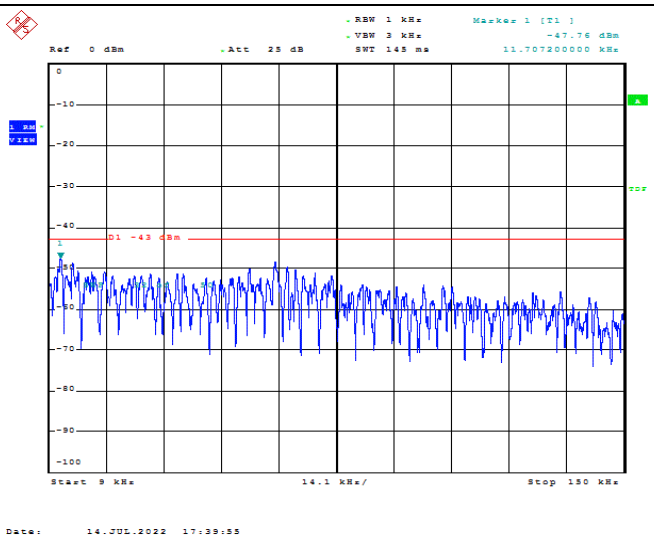

GPRS 1900-810-3000~10000MHz



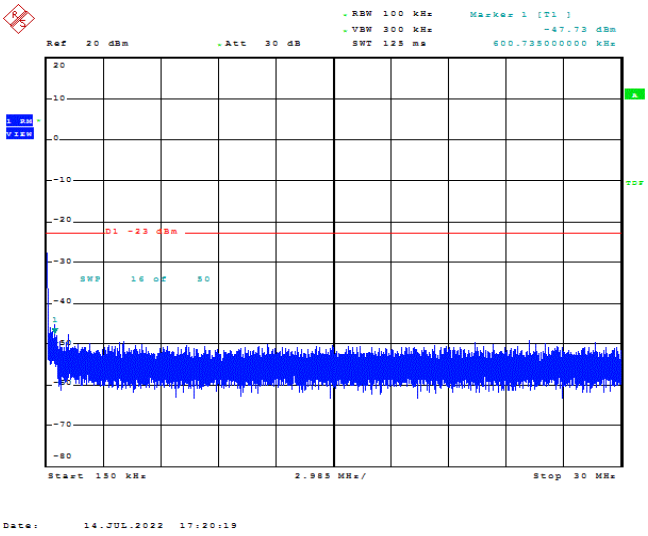

GPRS 1900-810-10000~18000MHz



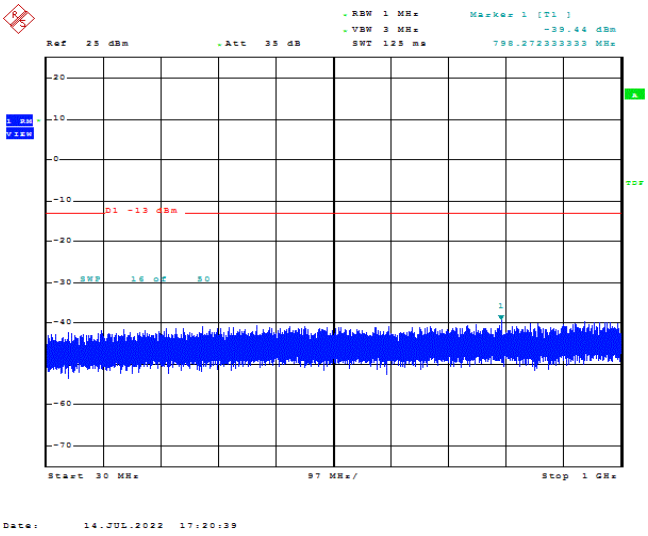

EGPRS 1900-512-0.009~0.15MHz



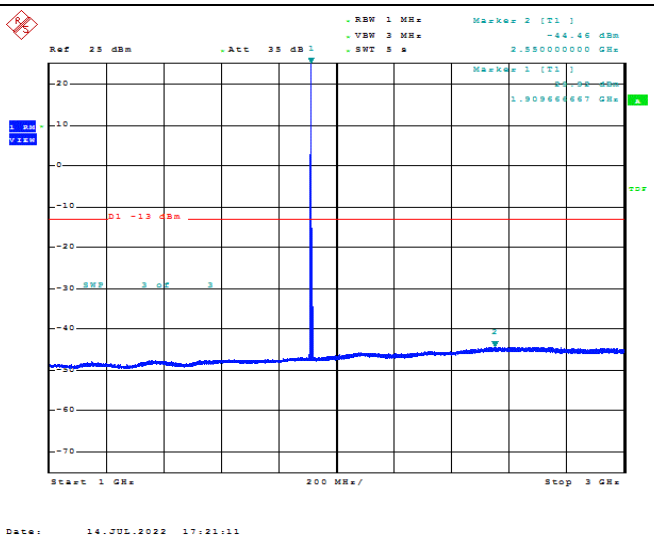

EGPRS 1900-512-0.15~30MHz



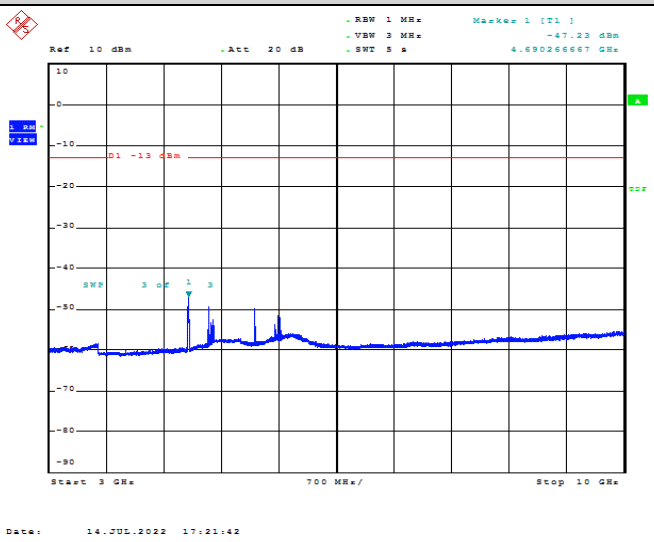

EGPRS 1900-512-30~1000MHz



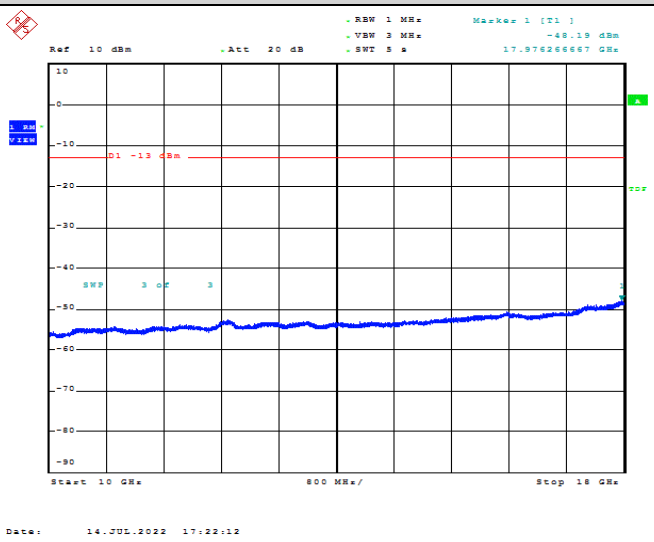

EGPRS 1900-512-1000~3000MHz



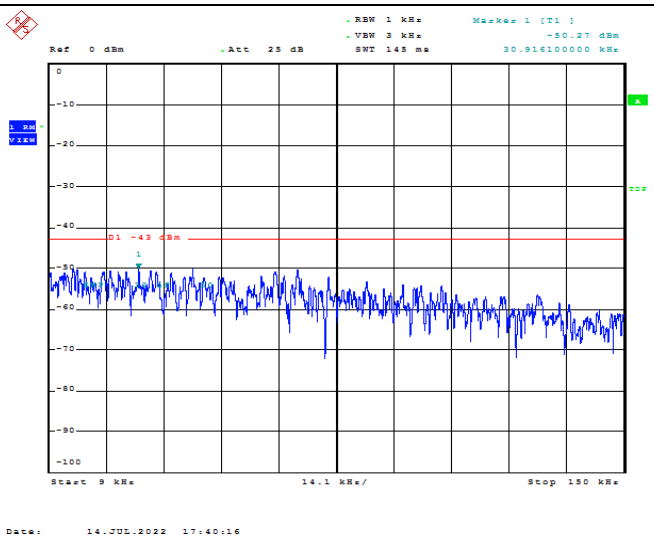

EGPRS 1900-512-3000~10000MHz



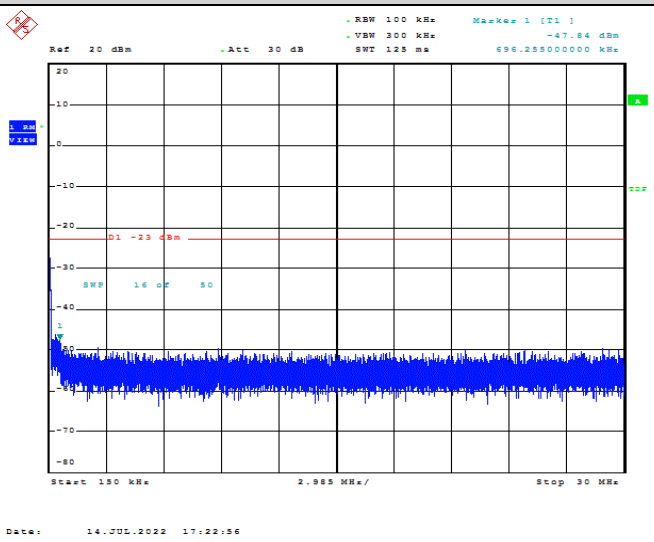

EGPRS 1900-512-10000~18000MHz



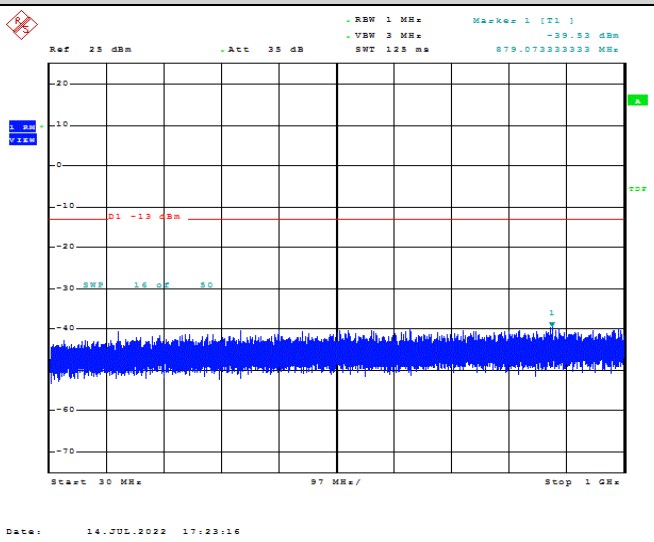

EGPRS 1900-661-0.009~0.15MHz



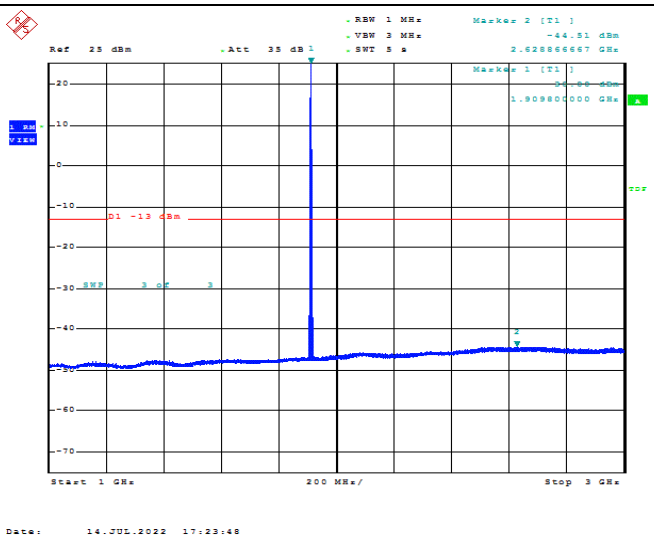

EGPRS 1900-661-0.15~30MHz



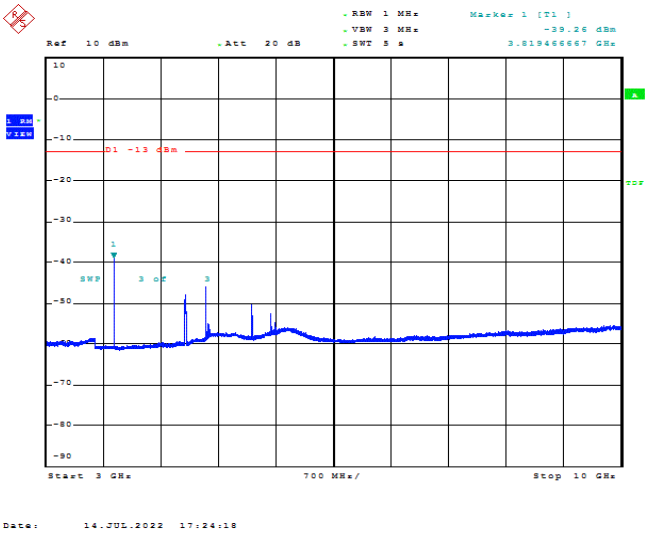

EGPRS 1900-661-30~1000MHz



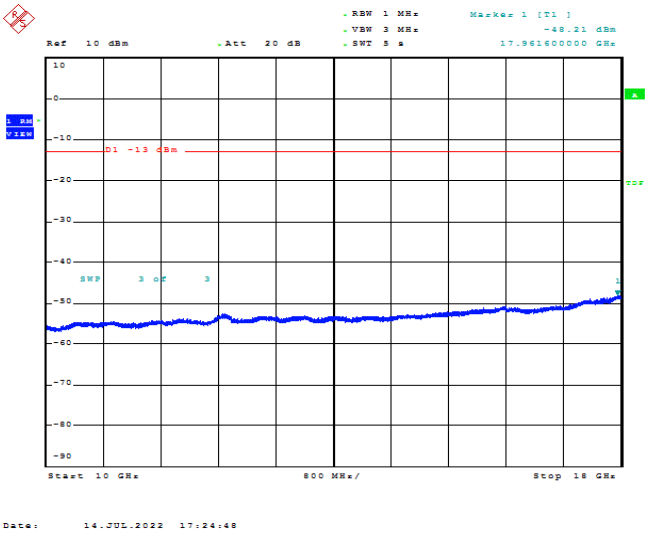

EGPRS 1900-661-1000~3000MHz



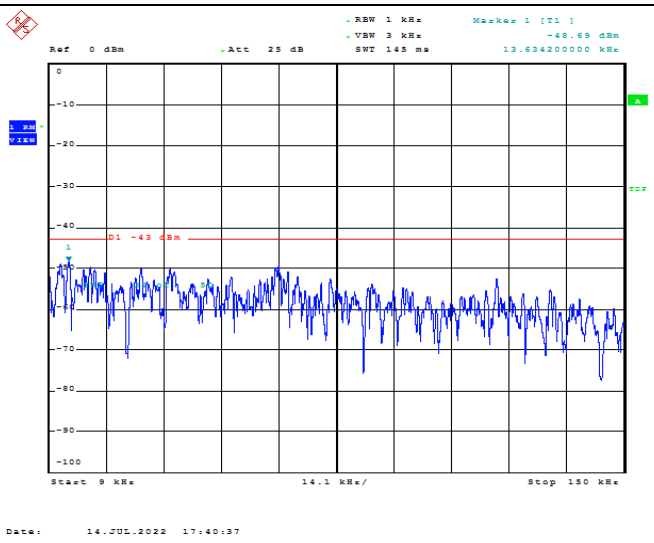

EGPRS 1900-661-3000~10000MHz



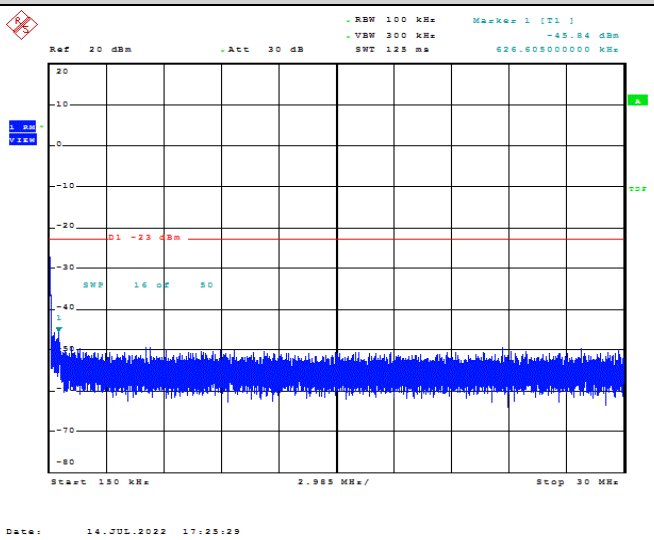

EGPRS 1900-661-10000~18000MHz



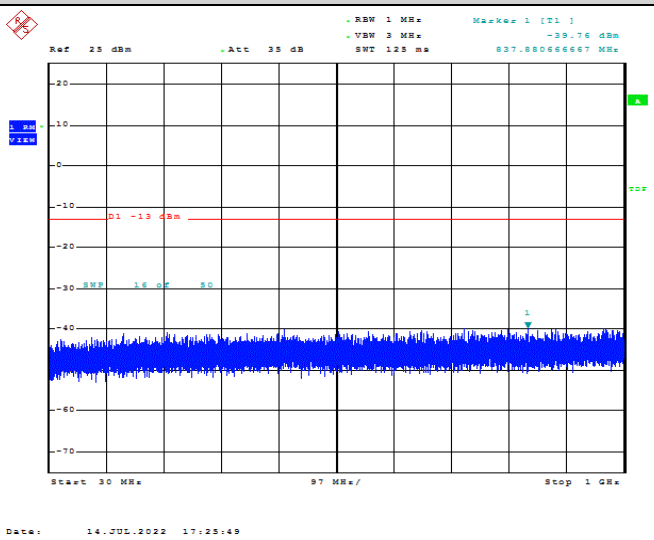

EGPRS 1900-810-0.009~0.15MHz



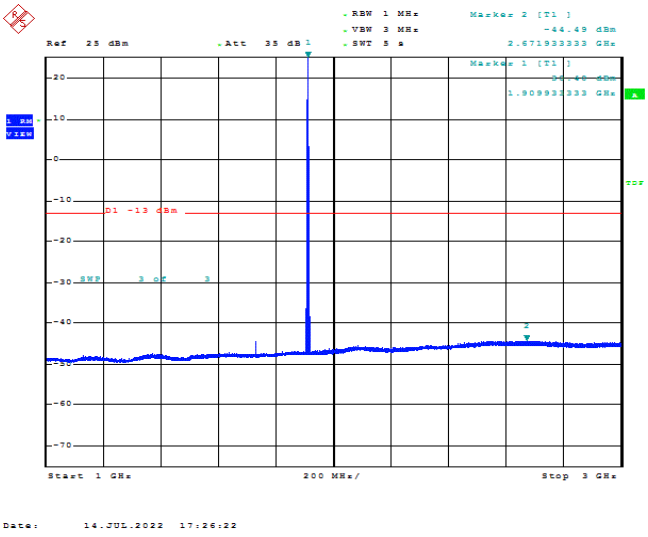

EGPRS 1900-810-0.15~30MHz



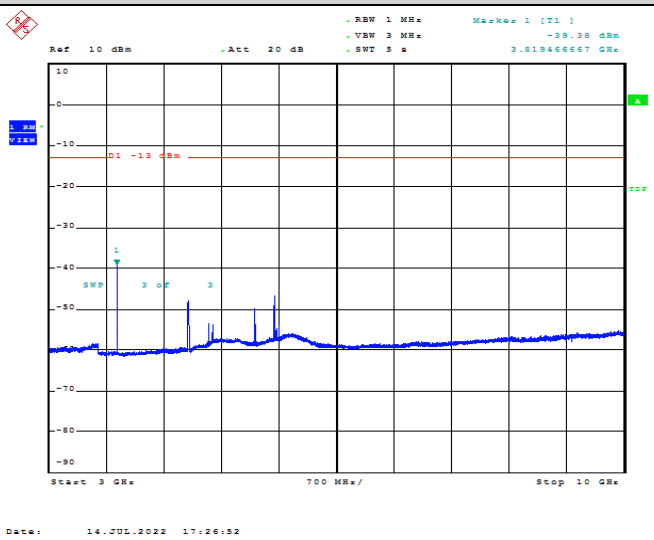

EGPRS 1900-810-30~1000MHz



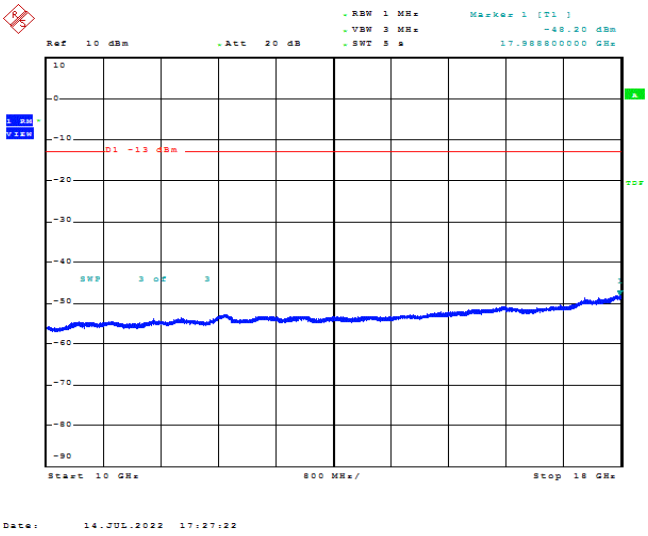

EGPRS 1900-810-1000~3000MHz



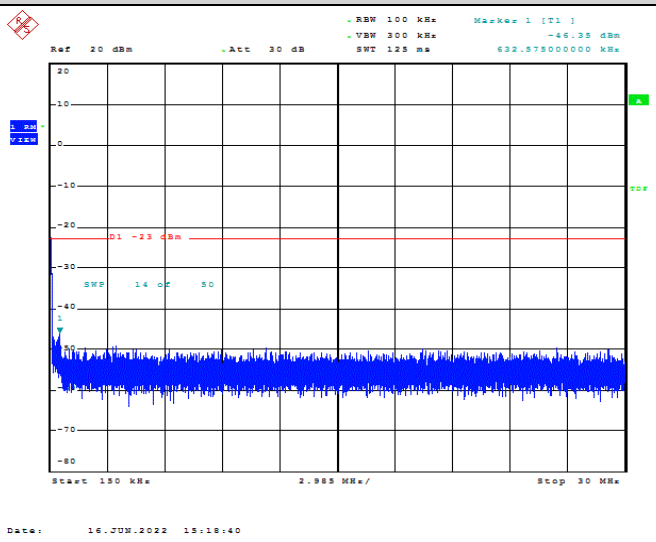

EGPRS 1900-810-3000~10000MHz



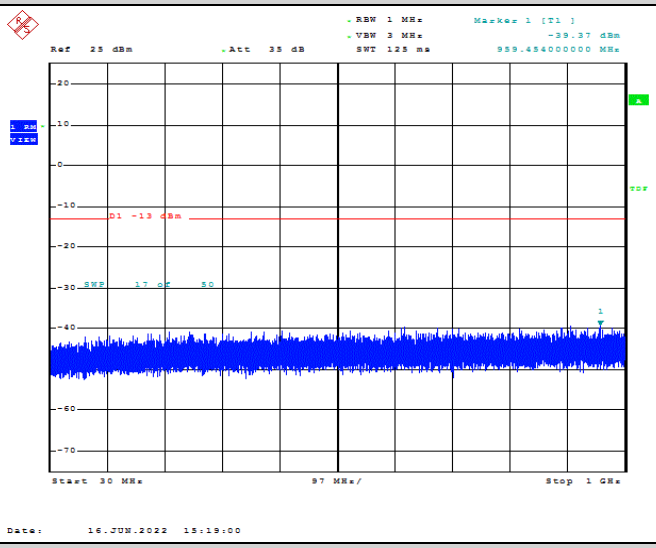

EGPRS 1900-810-10000~18000MHz



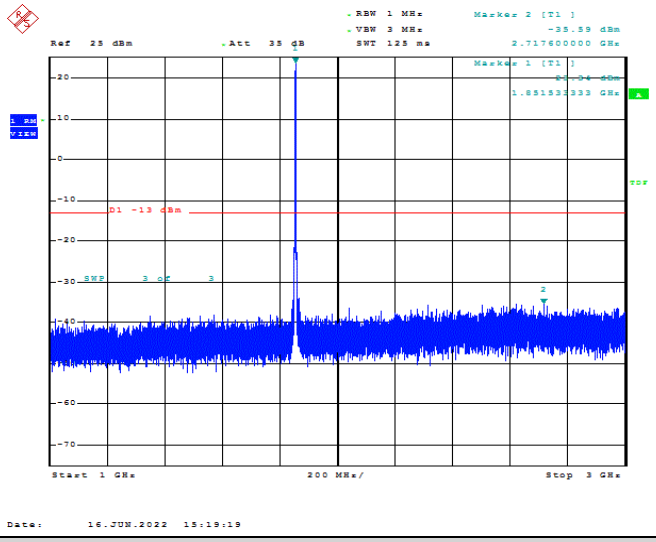
Band 2-9262-0.15~30MHz



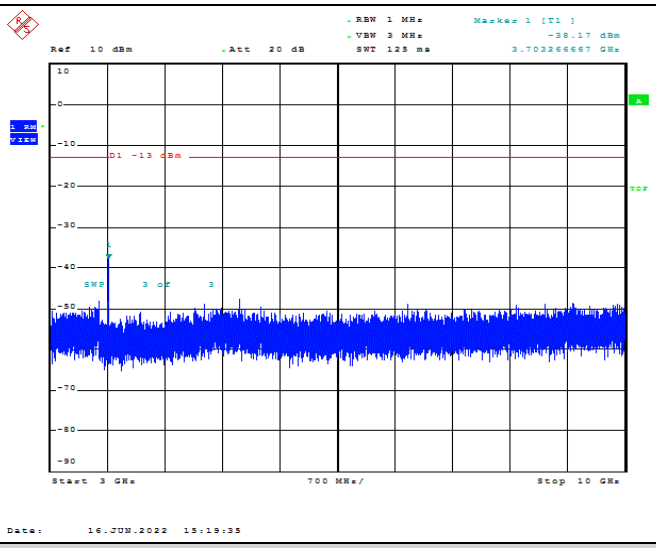

Band 2-9262-30~1000MHz



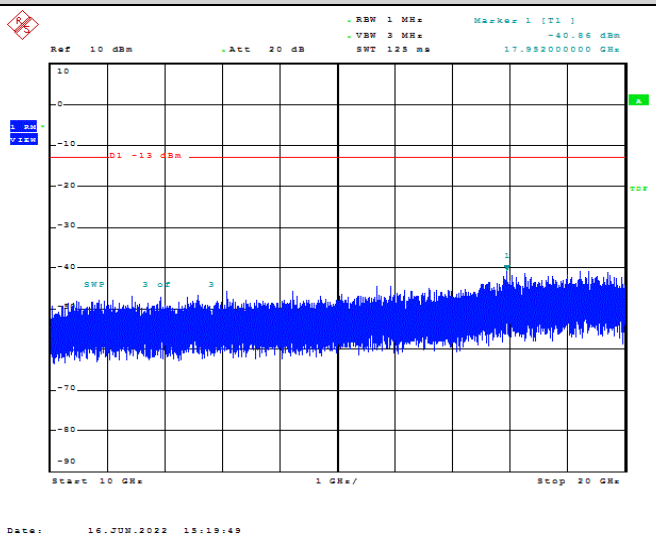

Band 2-9262-1000~3000MHz



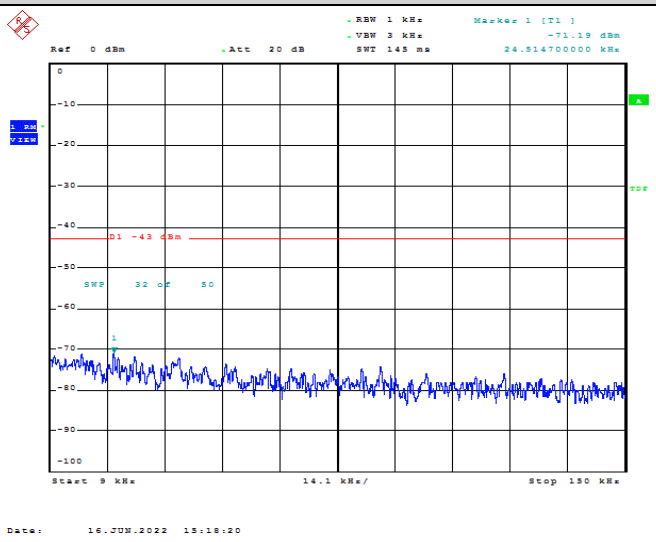

Band 2-9262-3000~10000MHz



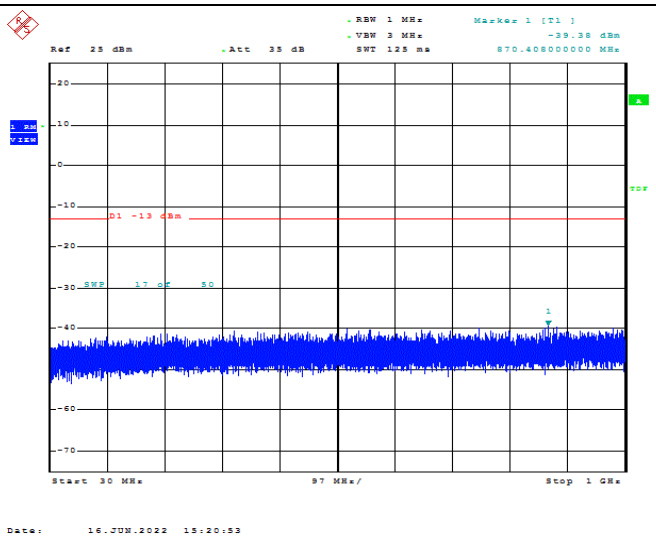

Band 2-9262-10000~20000MHz



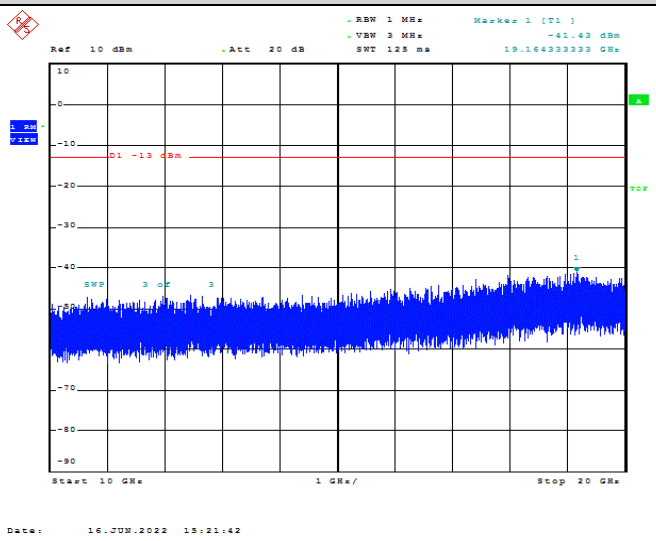

Band 2-9262-0.009~0.15MHz



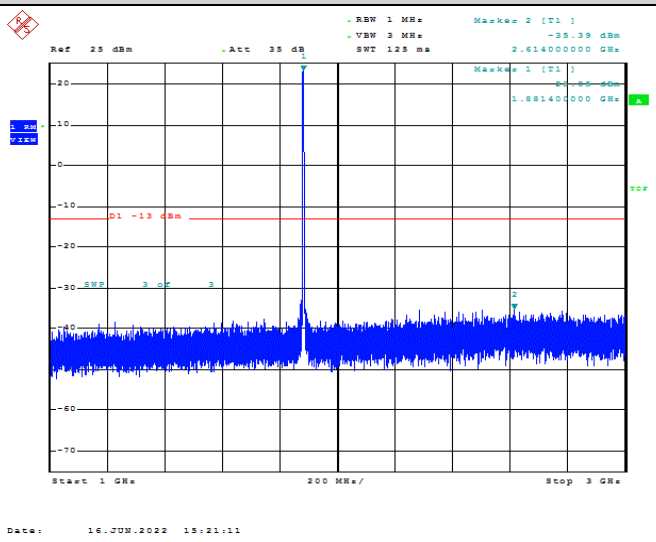

Band 2-9400-30~1000MHz



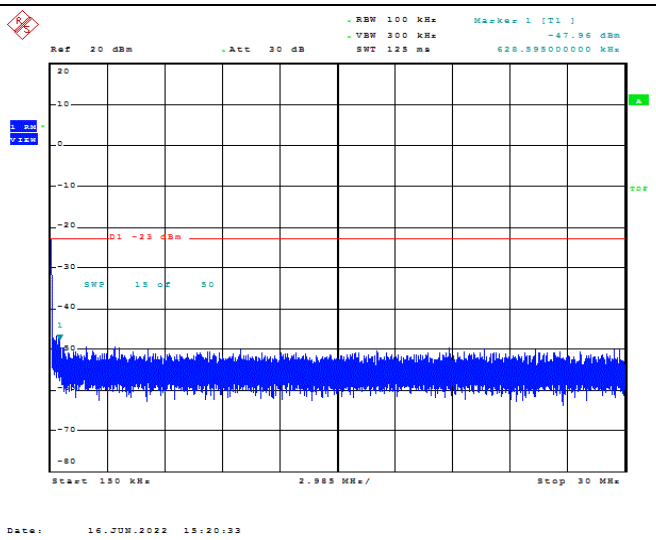

Band 2-9400-10000~20000MHz



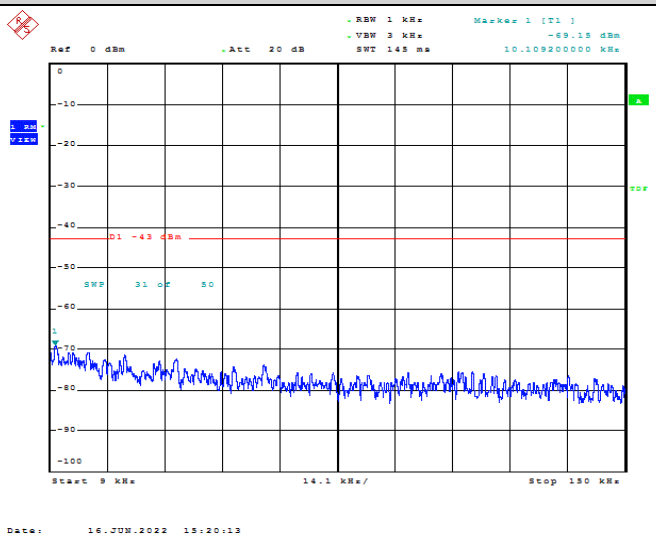

Band 2-9400-1000~3000MHz



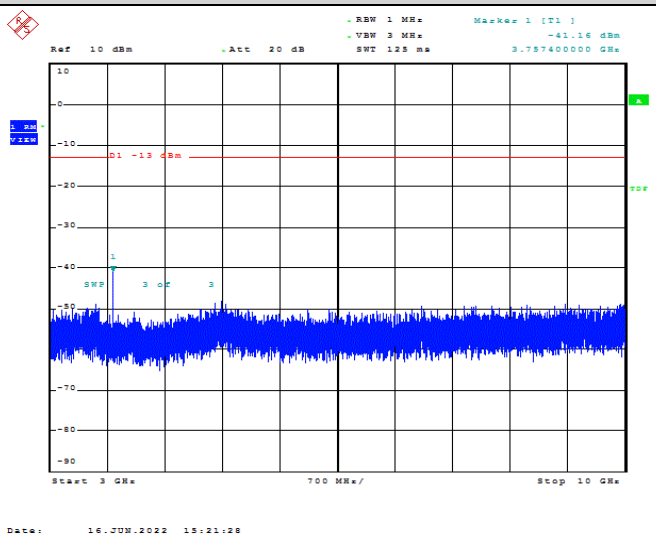

Band 2-9400-0.15~30MHz



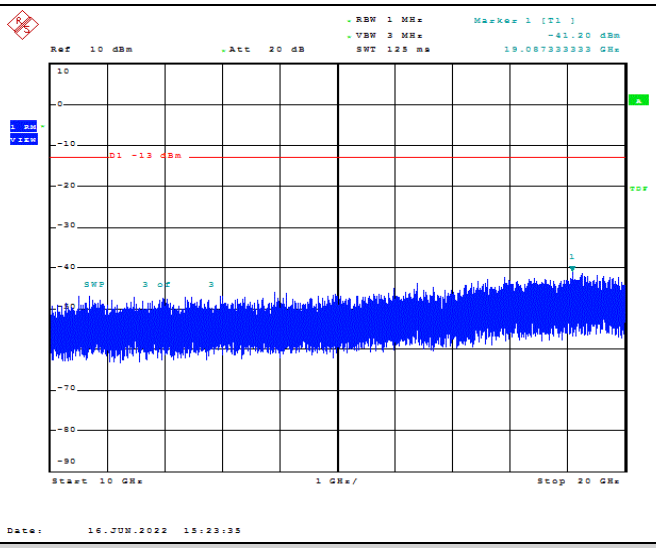

Band 2-9400-0.009~0.15MHz



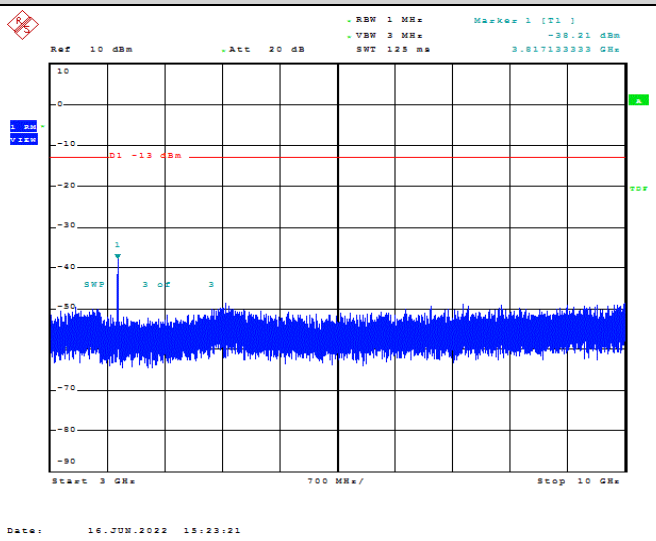

Band 2-9400-3000~10000MHz



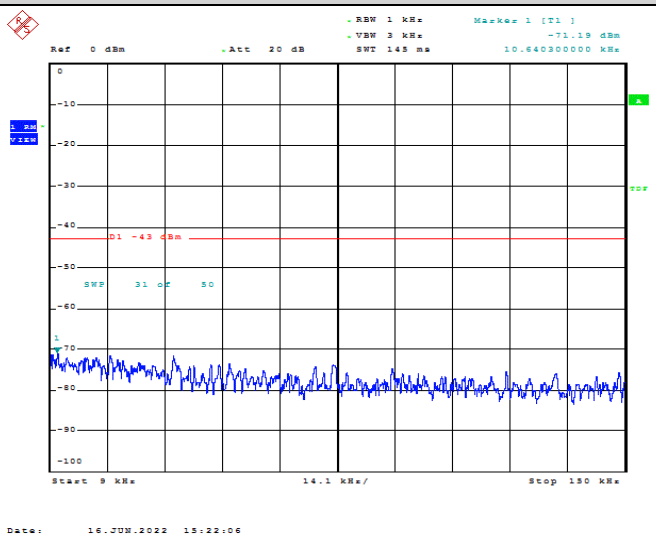

Band 2-9538-10000~20000MHz



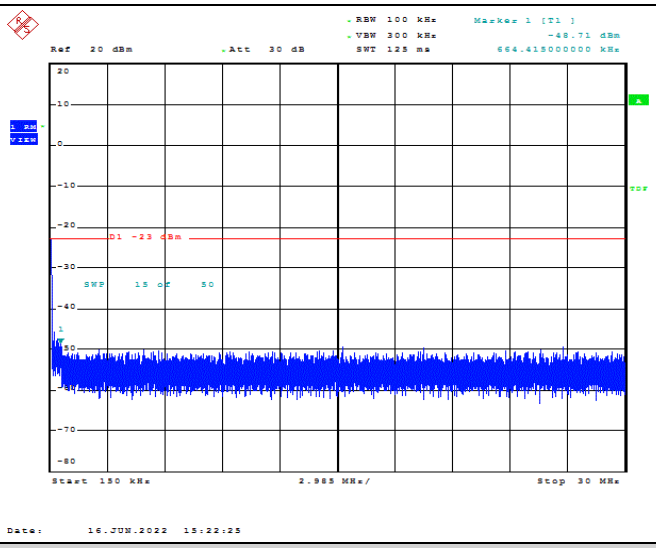

Band 2-9538-3000~10000MHz



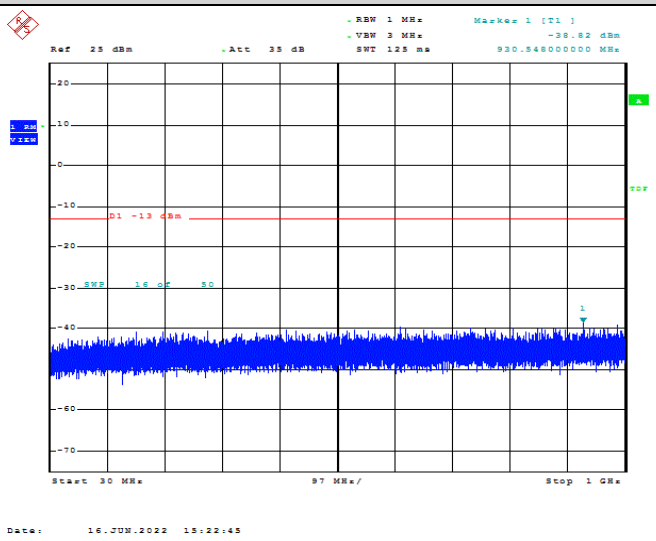

Band 2-9538-0.009~0.15MHz



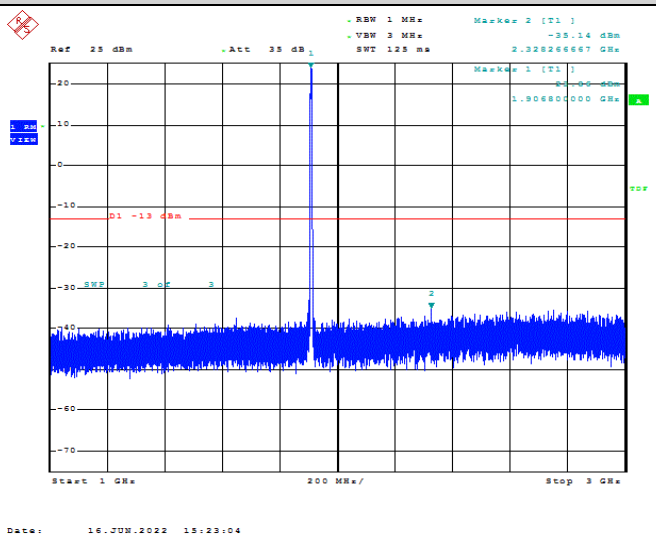

Band 2-9538-0.15~30MHz



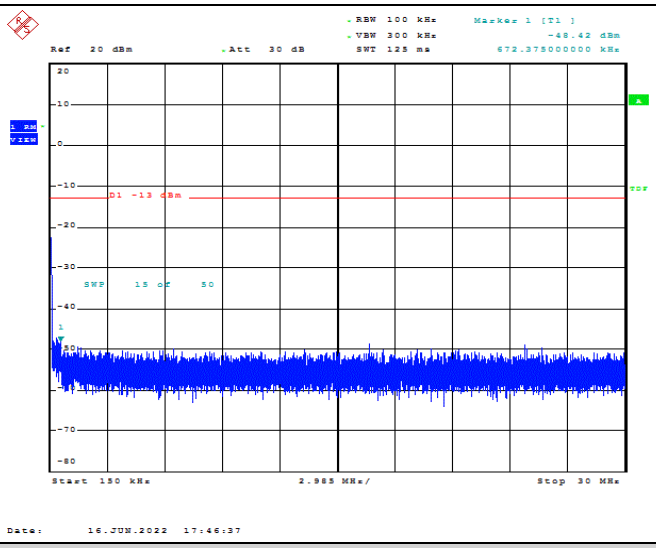

Band 2-9538-30~1000MHz



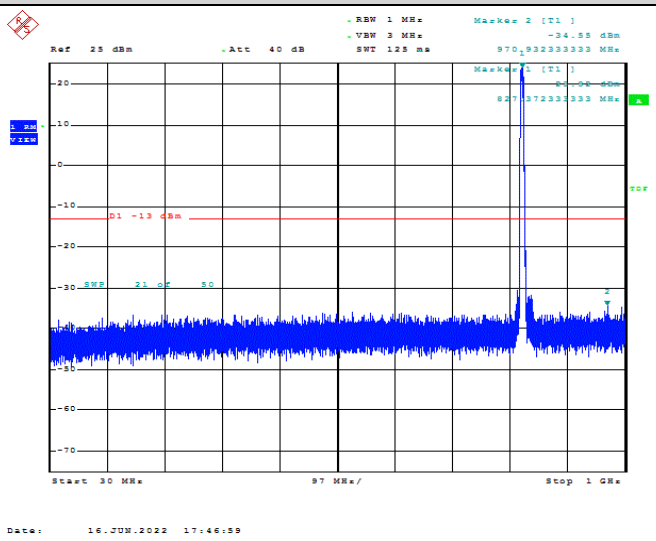

Band 2-9538-1000~3000MHz



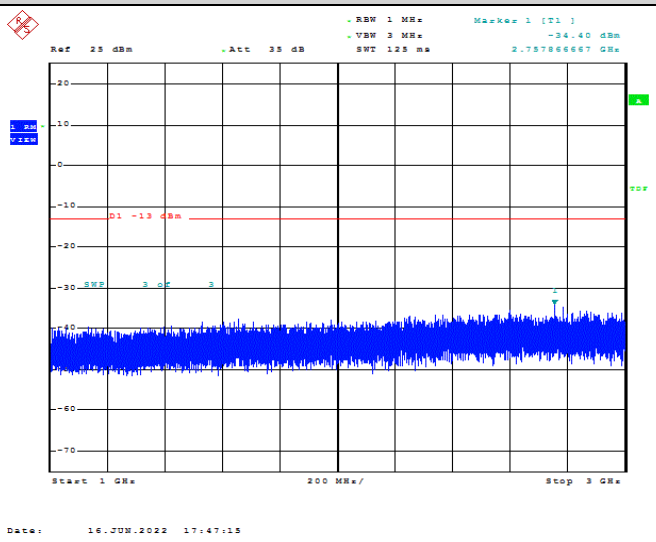

Band 5-4132-0.15~30MHz



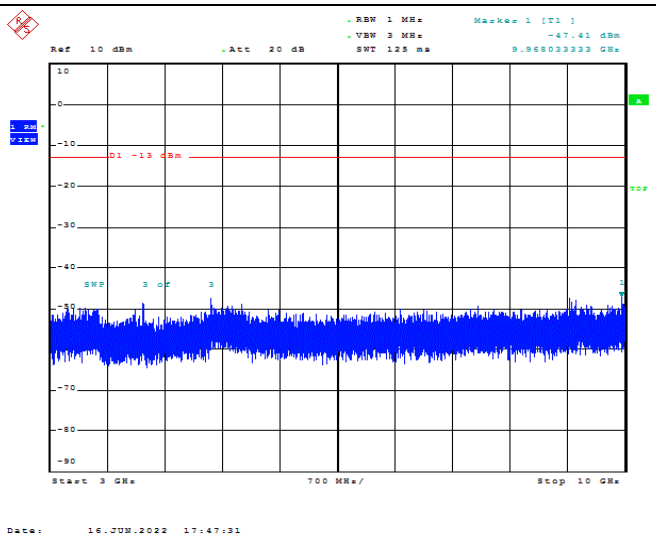

Band 5-4132-30~1000MHz



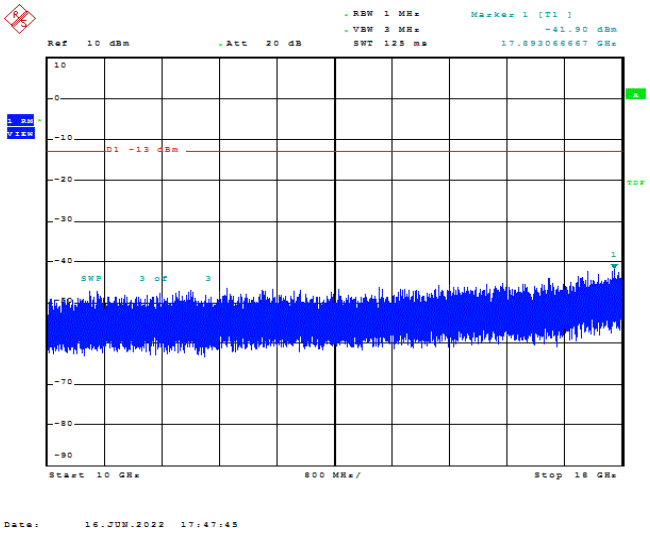

Band 5-4132-1000~3000MHz



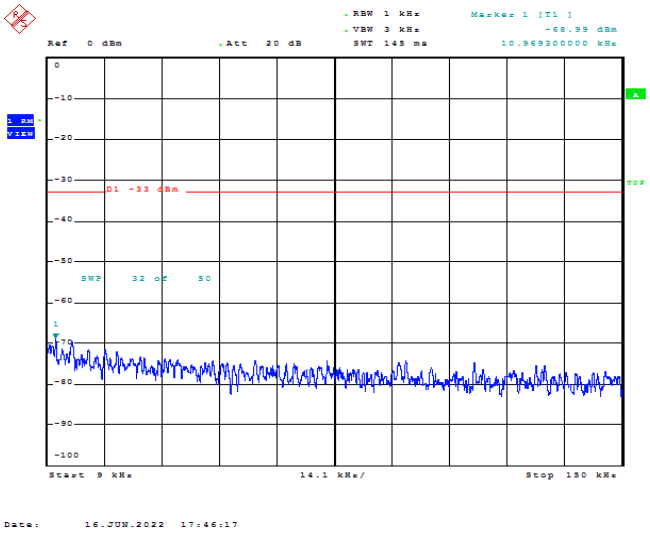

Band 5-4132-3000~10000MHz



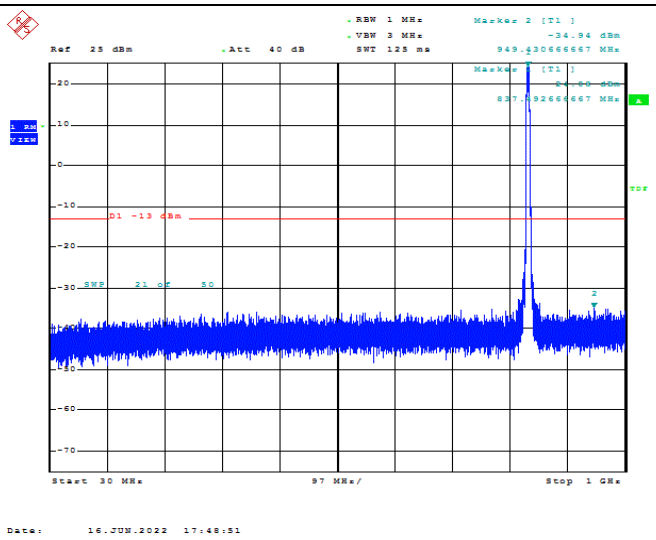

Band 5-4132-10000~18000MHz



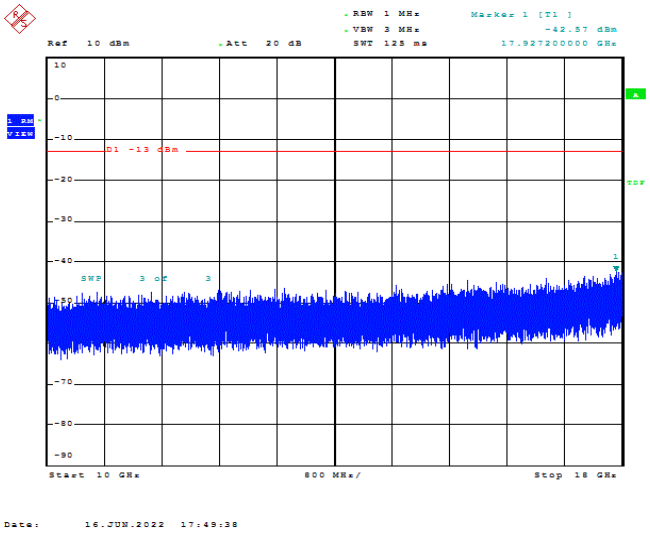

Band 5-4132-0.009~0.15MHz



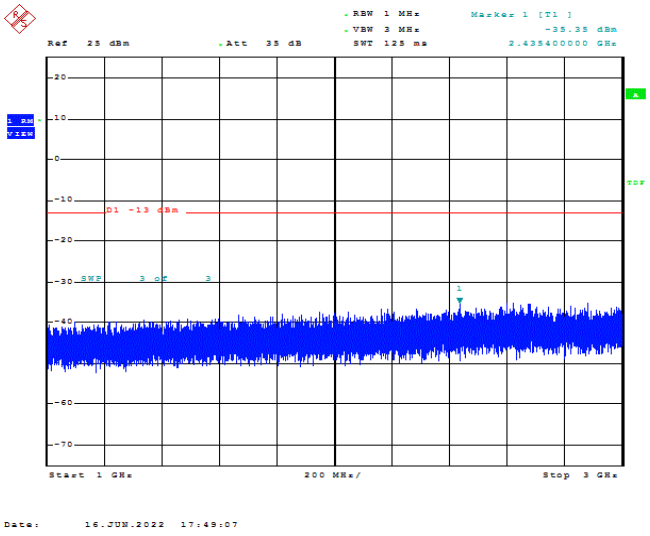

Band 5-4183-30~1000MHz



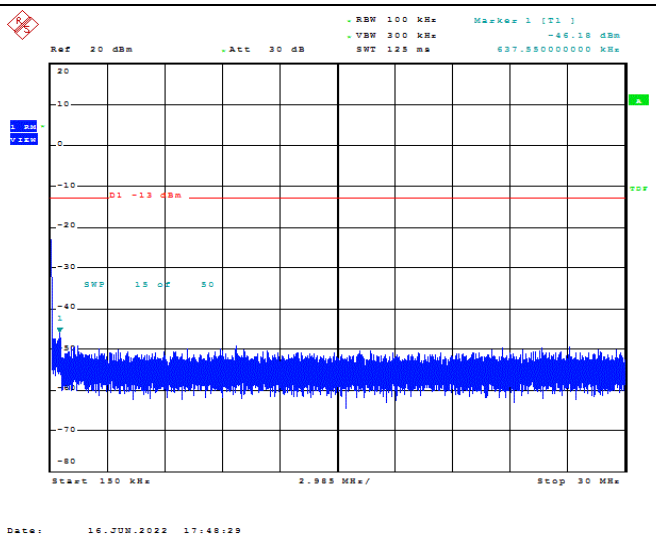

Band 5-4183-10000~18000MHz



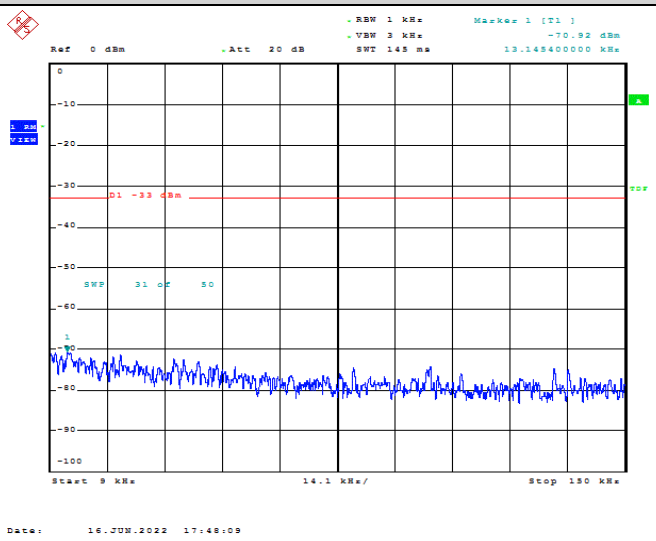

Band 5-4183-1000~3000MHz



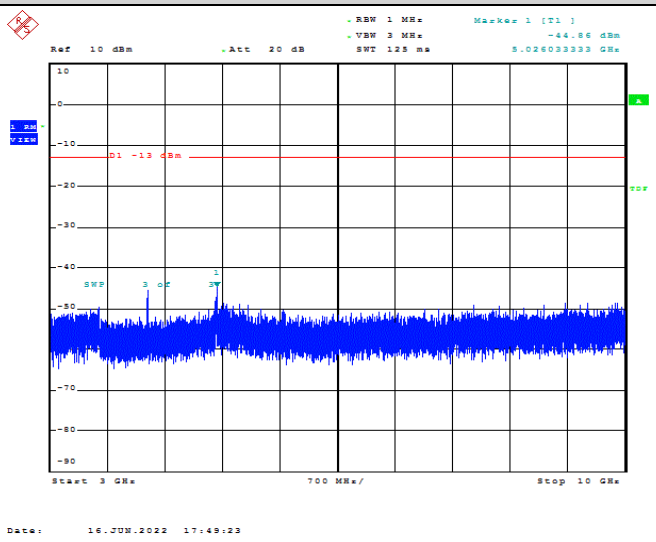

Band 5-4183-0.15~30MHz



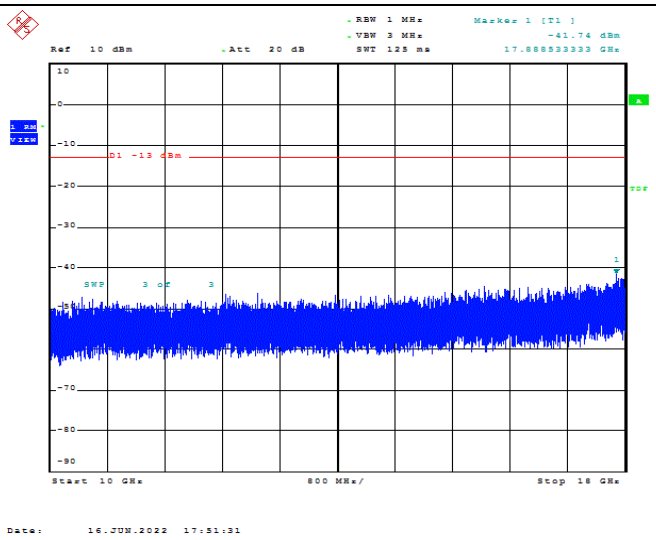

Band 5-4183-0.009~0.15MHz



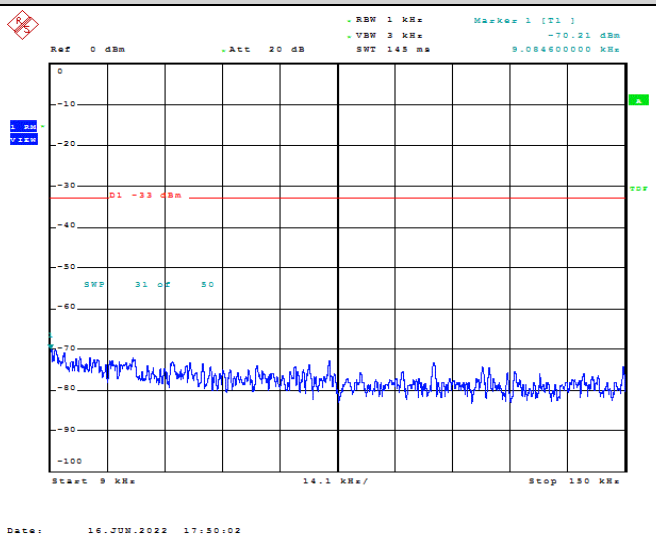

Band 5-4183-3000~10000MHz



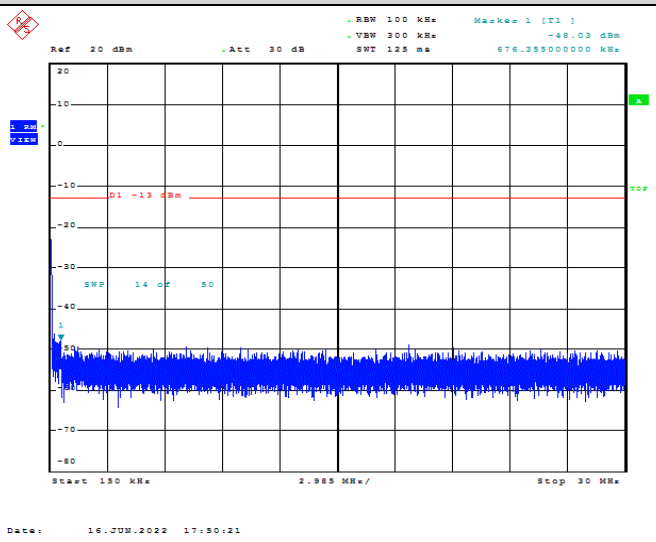

Band 5-4233-10000~18000MHz



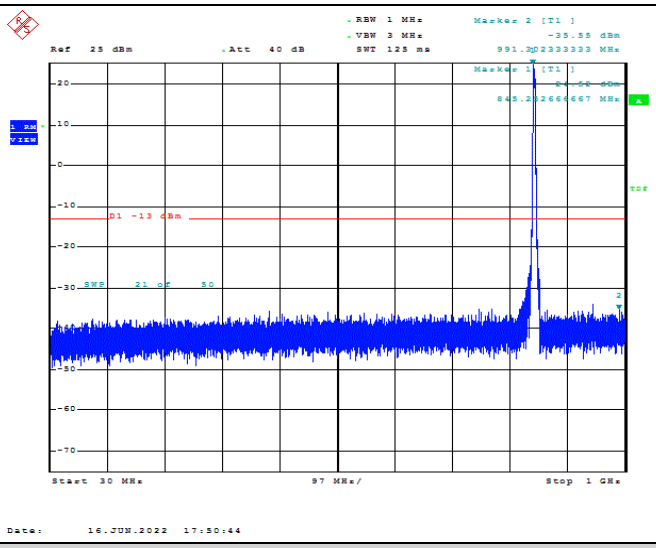

Band 5-4233-0.009~0.15MHz



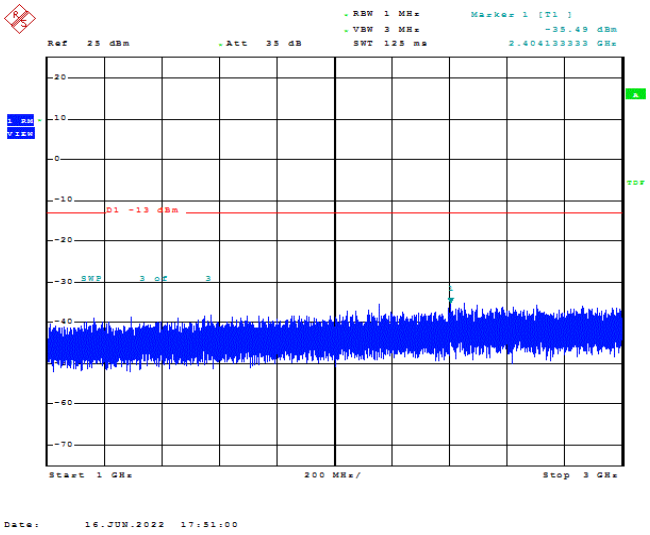

Band 5-4233-0.15~30MHz



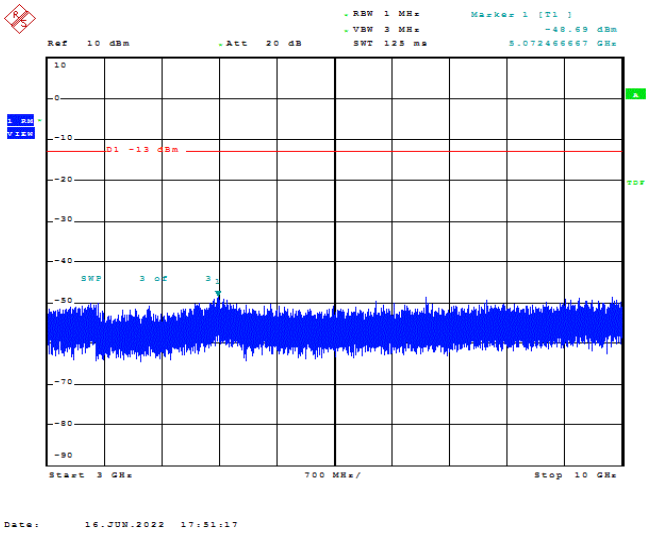

Band 5-4233-30~1000MHz




Band 5-4233-1000~3000MHz




Band 5-4233-3000~10000MHz

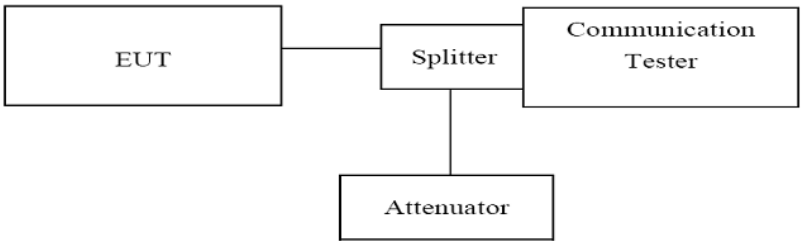


## 3.5. Receiver Spurious Emissions at Antenna Terminal

**LIMIT**

RSS-GEN7.1.3, Receiver-spurious emissions at any discrete frequency shall not exceed 2 nW in the band 30-1000 MHz, nor 5 nW above 1000 MHz.

**TEST CONFIGURATION**




**TEST PROCEDURE**

1. The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.
2. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.
3. Set the RBW= 100kHz, VBW =300kHz, Below 1GHz
4. Set the RBW= 1MHz, VBW = 3MHz, Above1GHz,
5. Start=30MHz, Stop= 10th harmonic.

**TEST RESULTS**

Note: Not Applicable.

## 3.6. Band Edge compliance

**LIMIT**

FCC: §22.917, §24.238, §27.53 (h)

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

RSS132§5.5

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1,the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 +10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5

Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment’s operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

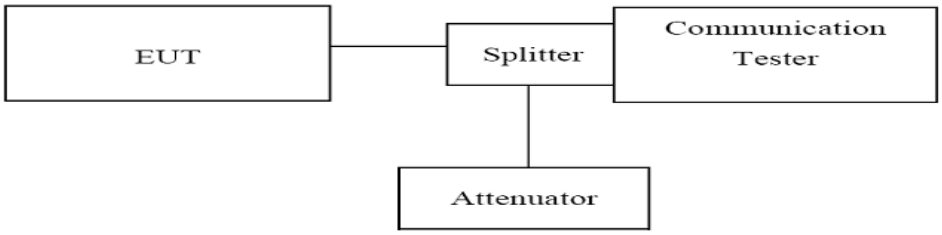
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment’s smallest operating frequency block,Footnote2 which can contain the equipment’s occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10 log10 p (watts) dB.

(ii) After the first 1.0 MHz outside the equipment’s smallest operating frequency block, which can contain the equipment’s occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

## TEST CONFIGURATION




## TEST PROCEDURE

The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

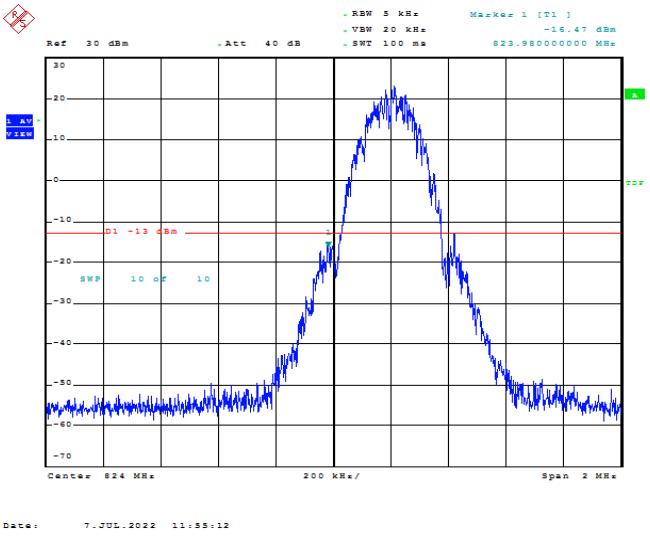
For each band edge measurement:

- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

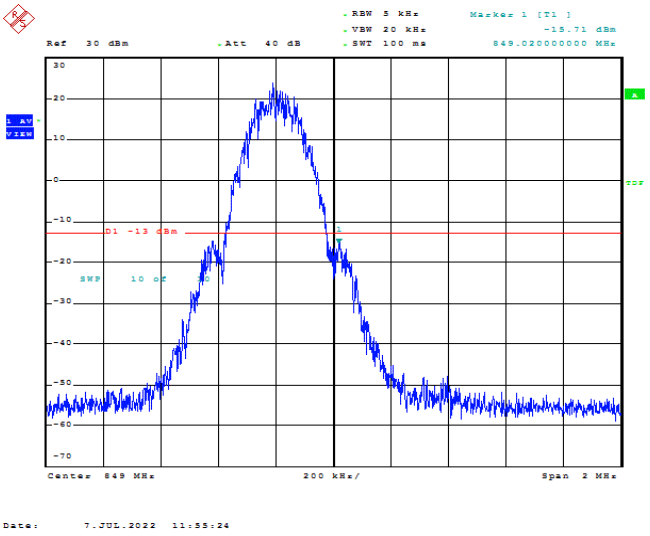
## TEST RESULTS

| Band | Channel | Freq (MHz) | Result (dBm) | Limit(dBm) | Verdict |
|---|---|---|---|---|---|
| GPRS 850 | 128 | 823.98 | -15.65 | -13 | PASS |
| GPRS 850 | 251 | 849.02 | -14.64 | -13 | PASS |
| EGPRS 850 | 128 | 823.98 | -16.02 | -13 | PASS |
| EGPRS 850 | 251 | 849.03 | -17.57 | -13 | PASS |
| GPRS 1900 | 512 | 1849.98 | -17.49 | -13 | PASS |
| GPRS 1900 | 810 | 1910.02 | -18.66 | -13 | PASS |
| EGPRS 1900 | 512 | 1849.98 | -16.20 | -13 | PASS |
| EGPRS 1900 | 810 | 1910.01 | -13.84 | -13 | PASS |
| Band 2 | 9262 | 1850.00 | -25.21 | -13 | PASS |
| Band 2 | 9538 | 1910.00 | -24.89 | -13 | PASS |
| Band 5 | 4132 | 824.00 | -28.64 | -13 | PASS |
| Band 5 | 4233 | 849.00 | -27.56 | -13 | PASS |

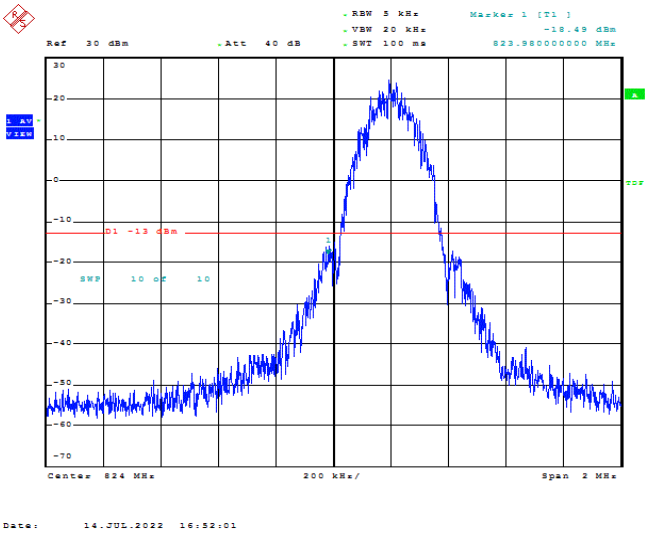
GPRS 850-128



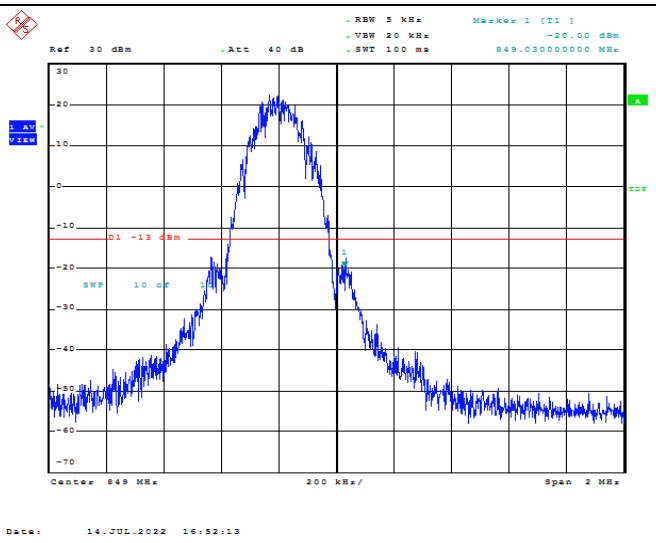

GPRS 850-251



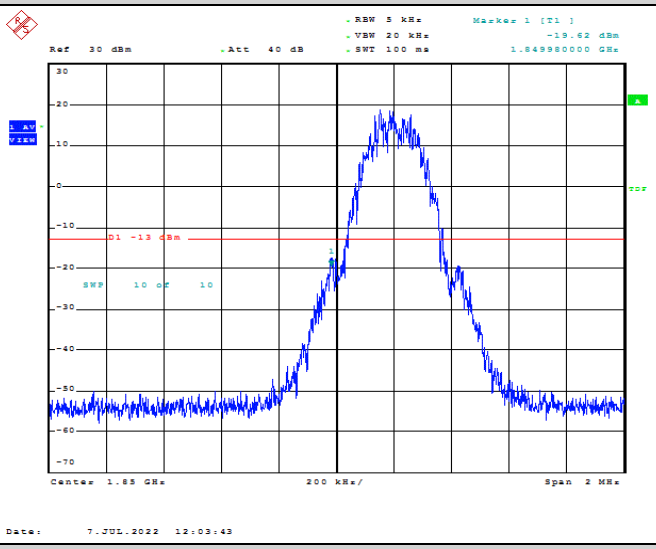

EGPRS 850-128



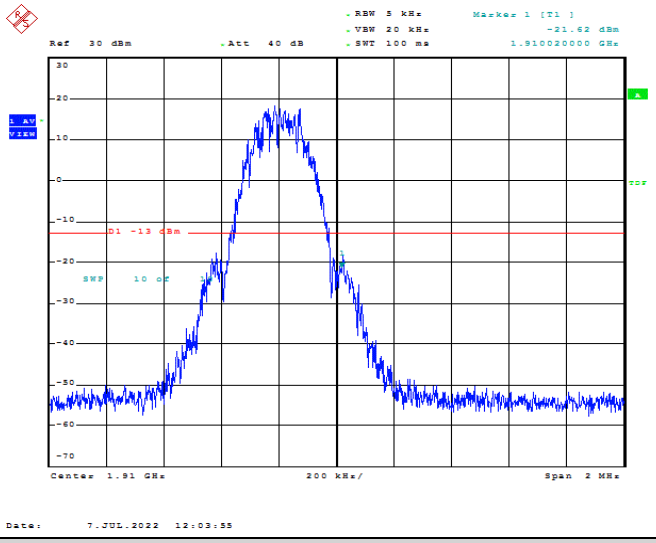

EGPRS 850-251



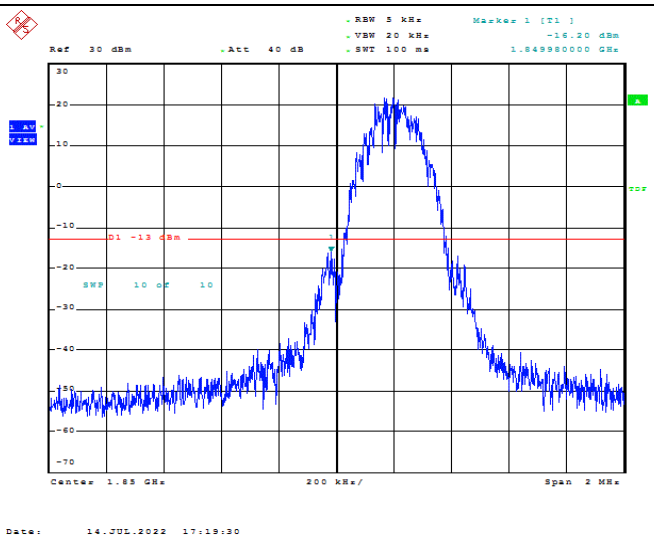

GPRS 1900-512



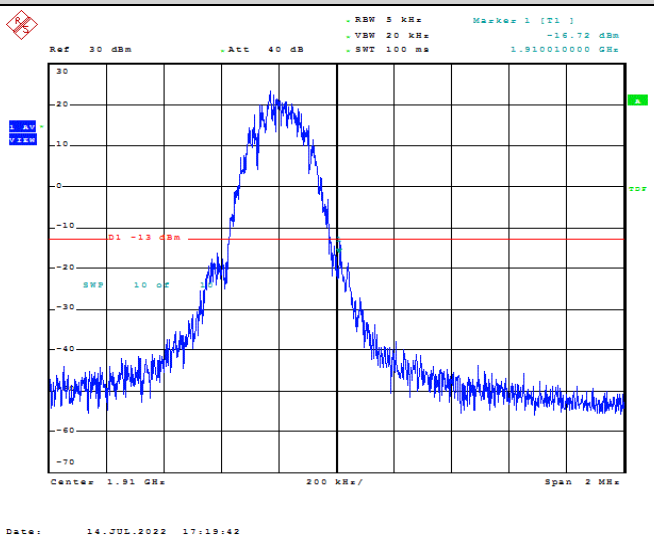

GPRS 1900-810



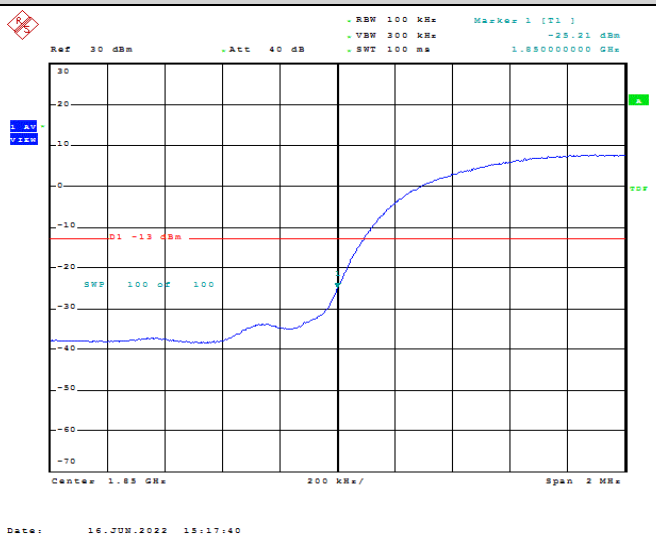

EGPRS 1900-512



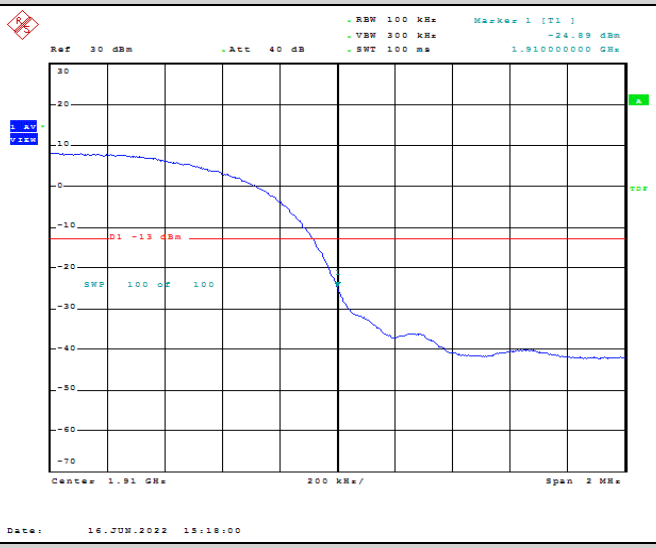

EGPRS 1900-810



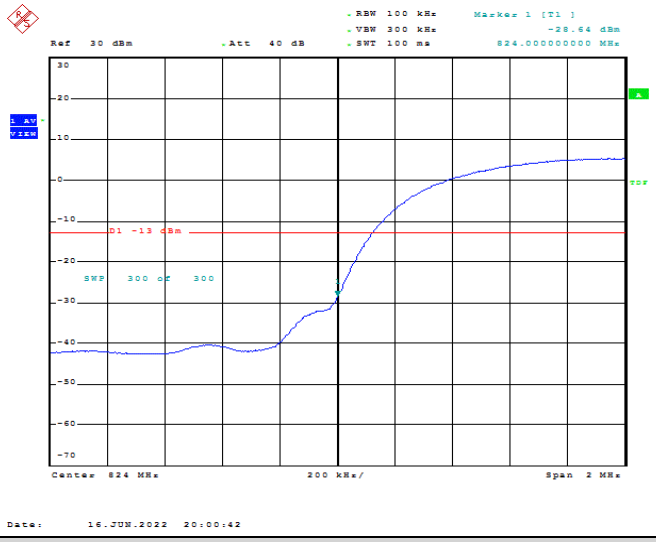
Band 2-9262



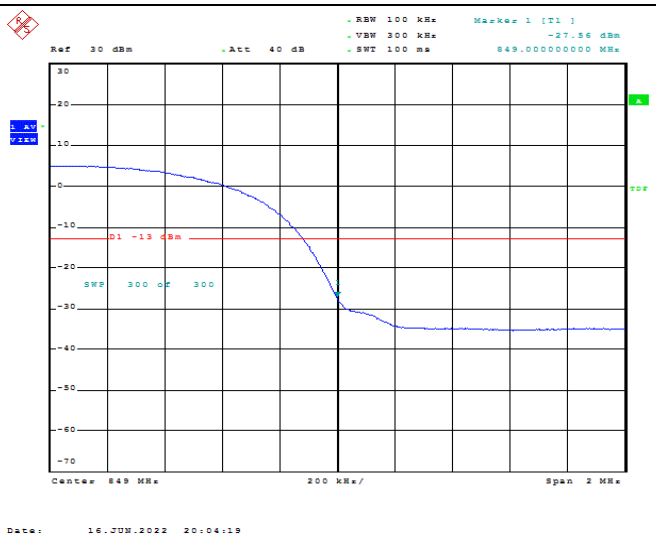

Band 2-9538




Band 5-4132




Band 5-4233


RBW 100 kHz
VBW 300 kHz
SWT 100 ms
Marker 1 [T1 ]
-27.56 dBm
849.000000000 MHz
Ref 30 dBm
Att 40 dB
D1 -13 dBm
SWP 300 of 300
Center 849 MHz
200 kHz/
Span 2 MHz
Date: 16.JUN.2022 20:04:19

## 3.7. Radiated Power Measurement

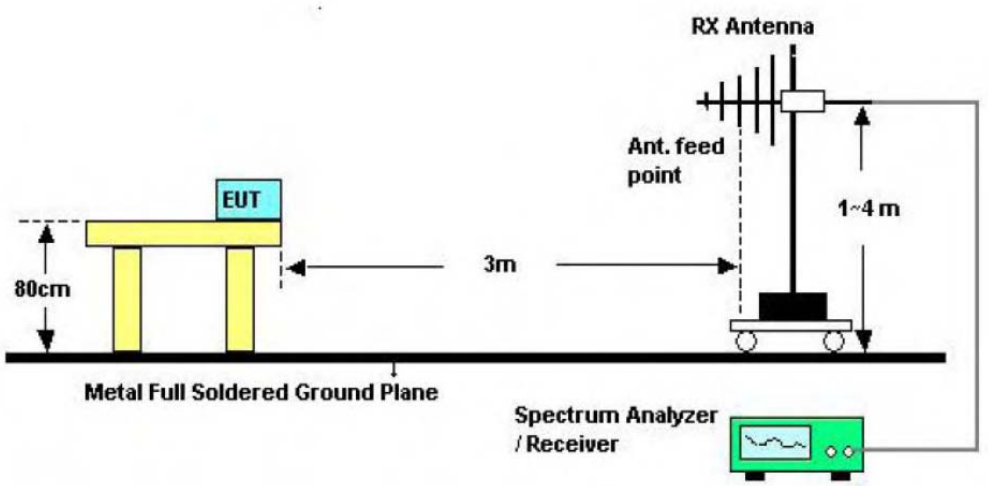
**LIMIT**

FCC: §2.1046, §22.913, §24.232, §27.50 and §90.635

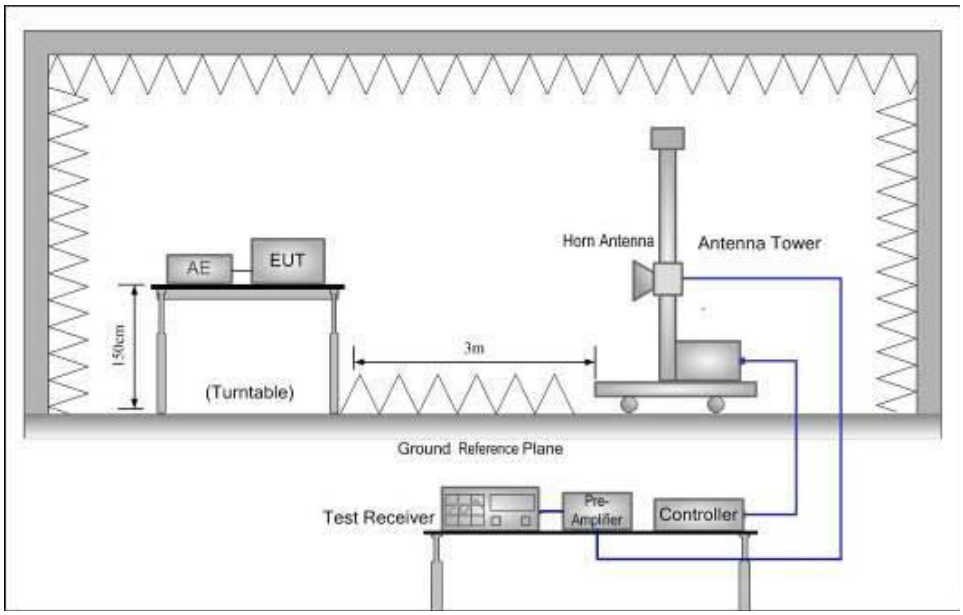
IC: RSS132§5.4; RSS133§6.4 and RSS139§6.5.

**TEST CONFIGURATION**

For the actual test configuration, please refer to the related Item – EUT Test Photos.




Below 1GHz




Above 1GHz

**TEST PROCEDURE**

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:
   Power(EIRP)=PMea- PAg - Pcl + Ga
   We used N5182A microwave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substitution test; The measurement results are amend as described below:
   Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
   ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

**TEST RESULTS**

Remark:
1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “X axis” position was the worst, and test data recorded in this report.
2. Pre-scan all antenna, only show the test data for worse case antenna on the test report.

*Measurement Data (worst case):*

| Mode | Channel | Antenna Pol. | ERP | Limit (dBm) | Result |
|---|---|---|---|---|---|
| GPRS 850 | 128 | V | 32.64 | 38.45 | Pass |
| | | H | 26.15 | | |
| | 190 | V | 32.70 | | |
| | | H | 26.70 | | |
| | 251 | V | 31.44 | | |
| | | H | 25.34 | | |
| EGPRS 850 | 128 | V | 28.49 | 38.45 | Pass |
| | | H | 24.31 | | |
| | 190 | V | 28.51 | | |
| | | H | 24.88 | | |
| | 251 | V | 29.61 | | |
| | | H | 28.49 | | |

| Mode | Channel | Antenna Pol. | ERIP | Limit (dBm) | Result |
|---|---|---|---|---|---|
| GPRS 1900 | 512 | V | 30.00 | 33.00 | Pass |
| | | H | 25.77 | | |
| | 661 | V | 30.57 | | |
| | | H | 25.73 | | |
| | 810 | V | 30.55 | | |
| | | H | 25.01 | | |
| EGPRS 1900 | 512 | V | 27.86 | 33.00 | Pass |
| | | H | 23.07 | | |
| | 661 | V | 27.58 | | |
| | | H | 23.17 | | |
| | 810 | V | 27.68 | | |
| | | H | 23.52 | | |

| Mode | Channel | Antenna Pol. | EIRP | Limit (dBm) | Result |
|---|---|---|---|---|---|
| WCDMA Band II (QPSK) | 9262 | V | 22.83 | 33.00 | Pass |
| | | H | 20.71 | | |
| | 9400 | V | 22.22 | | |
| | | H | 20.65 | | |
| | 9538 | V | 22.87 | | |
| | | H | 20.56 | | |

| Mode | Channel | Antenna Pol. | ERP | Limit (dBm) | Result |
|---|---|---|---|---|---|
| WCDMA Band V (QPSK) | 4132 | V | 24.18 | 38.45 | Pass |
| | | H | 22.02 | | |
| | 4183 | V | 24.96 | | |
| | | H | 22.72 | | |
| | 4233 | V | 24.14 | | |
| | | H | 22.00 | | |

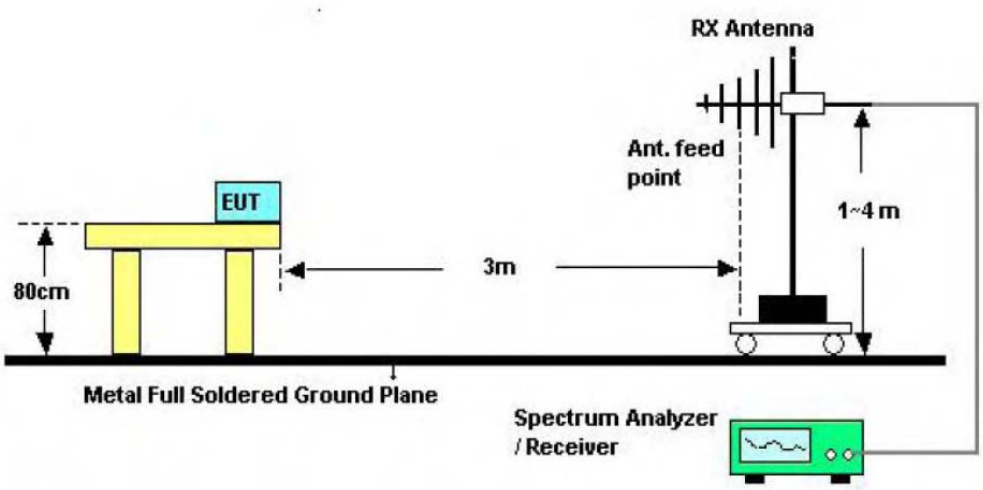
## 3.8. Radiated Spurious Emission

**LIMIT**

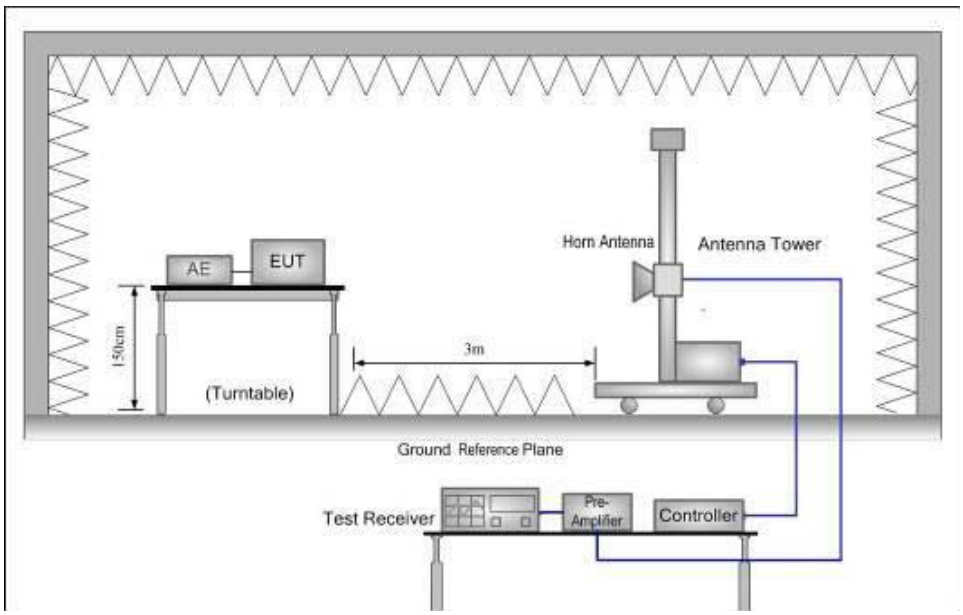
FCC: §22.917(a), §24.238(a), §27.53 (h), §90.691
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.
RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P ( dBW) by at least 43 + 10 log10p (watts).
(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 +10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.
RSS133§6.5
Equipment shall comply with the limits in (i) and (ii) below.
(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.
RSS139§6.6
(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,Footnote2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10log10 p (watts) dB.
(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

**TEST CONFIGURATION**

For the actual test configuration, please refer to the related Item – EUT Test Photos.




Below 1GHz




Above 1GHz

**TEST PROCEDURE**

1. EUT was placed on a 1.50 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.50m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl) ,the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:
   Power(EIRP)=PMea- PAg - Pcl + Ga
   We used SMF100A microwave signal generator which signal level can up to 33dBm,so we not used

power Amplifier for substitution test; The measurement results are amend as described below:
Power(EIRP)=PMea- Pcl + Ga

7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dBi) and known input power.
   ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.
8. Test frequency range should extend to 10$^{th}$ harmonic of highest fundamental frequency.

**TEST RESULTS**

Remark:
1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.
2. Pre-scan all antenna, only show the test data for worse case antenna on the test report.

| GPRS 850 | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 128 | 1648.8 | Horizontal | -36.52 | -13.00 | Pass |
| | 2473.2 | Horizontal | -47.02 | | |
| | 1648.8 | Vertical | -47.43 | | |
| | 2473.2 | Vertical | -50.48 | | |
| 190 | 1673.2 | Horizontal | -40.96 | | |
| | 2509.8 | Horizontal | -45.31 | | |
| | 1673.2 | Vertical | -41.03 | | |
| | 2509.8 | Vertical | -51.72 | | |
| 251 | 1697.6 | Horizontal | -33.29 | | |
| | 2546.4 | Horizontal | -42.82 | | |
| | 1697.6 | Vertical | -40.05 | | |
| | 2546.4 | Vertical | -45.61 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

| EGPRS 850 | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 128 | 1648.8 | Horizontal | -37.80 | -13.00 | Pass |
| | 2473.2 | Horizontal | -46.69 | | |
| | 1648.8 | Vertical | -48.17 | | |
| | 2473.2 | Vertical | -54.15 | | |
| 190 | 1673.2 | Horizontal | -40.85 | | |
| | 2509.8 | Horizontal | -48.61 | | |
| | 1673.2 | Vertical | -43.87 | | |
| | 2509.8 | Vertical | -50.19 | | |
| 251 | 1697.6 | Horizontal | -36.82 | | |
| | 2546.4 | Horizontal | -40.58 | | |
| | 1697.6 | Vertical | -41.19 | | |
| | 2546.4 | Vertical | -48.13 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

| GPRS 1900 | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 512 | 3700.4 | Horizontal | -46.14 | -13.00 | Pass |
| | 5550.6 | Horizontal | -49.39 | | |
| | 3700.4 | Vertical | -49.04 | | |
| | 5550.6 | Vertical | -56.62 | | |
| 661 | 3760 | Horizontal | -43.33 | | |
| | 5640 | Horizontal | -54.13 | | |
| | 3760 | Vertical | -44.60 | | |
| | 5640 | Vertical | -52.03 | | |
| 810 | 3819.6 | Horizontal | -37.78 | | |
| | 5729.4 | Horizontal | -43.61 | | |
| | 3819.6 | Vertical | -45.55 | | |
| | 5729.4 | Vertical | -52.27 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

| EGPRS 1900 | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 512 | 3700.4 | Horizontal | -42.19 | -13.00 | Pass |
| | 5550.6 | Horizontal | -50.31 | | |
| | 3700.4 | Vertical | -50.65 | | |
| | 5550.6 | Vertical | -55.21 | | |
| 661 | 3760 | Horizontal | -46.47 | | |
| | 5640 | Horizontal | -50.75 | | |
| | 3760 | Vertical | -46.06 | | |
| | 5640 | Vertical | -54.44 | | |
| 810 | 3819.6 | Horizontal | -35.73 | | |
| | 5729.4 | Horizontal | -45.66 | | |
| | 3819.6 | Vertical | -46.63 | | |
| | 5729.4 | Vertical | -50.16 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

| WCDMA Band II | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 9262 | 3705.20 | Vertical | -36.65 | -13.00 | Pass |
| | 5557.80 | Vertical | -50.98 | | |
| | 3705.20 | Horizontal | -49.16 | | |
| | 5557.80 | Horizontal | -52.80 | | |
| 9400 | 3760.00 | Vertical | -42.04 | | |
| | 5640.00 | Vertical | -51.97 | | |
| | 3760.00 | Horizontal | -43.62 | | |
| | 5640.00 | Horizontal | -50.39 | | |
| 9538 | 3814.80 | Vertical | -42.15 | | |
| | 5722.20 | Vertical | -52.54 | | |
| | 3814.80 | Horizontal | -41.08 | | |
| | 5722.20 | Horizontal | -47.56 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

| WCDMA Band V | | | | | |
|---|---|---|---|---|---|
| Channel | Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
| | | Polarization | Level (dBm) | | |
| 4132 | 1653.20 | Vertical | -40.84 | -13.00 | Pass |
| | 2479.80 | Vertical | -53.12 | | |
| | 1653.20 | Horizontal | -48.86 | | |
| | 2479.80 | Horizontal | -52.59 | | |
| 4183 | 1672.80 | Vertical | -40.84 | | |
| | 2509.20 | Vertical | -52.36 | | |
| | 1672.80 | Horizontal | -47.11 | | |
| | 2509.20 | Horizontal | -54.33 | | |
| 4233 | 1692.80 | Vertical | -41.01 | | |
| | 2539.20 | Vertical | -51.01 | | |
| | 1692.80 | Horizontal | -44.42 | | |
| | 2539.20 | Horizontal | -53.58 | | |

Remark：

1. The emission levels of below 1 GHz are very lower than the limit above10dB and not show in test report.

## 3.9. Frequency stability

**LIMIT**

FCC §22.355, §90.213

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

FCC §24.235 & §27.54

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

RSS132§5.3

The carrier frequency shall not depart from the reference frequency in excess of ±2.5 SRSP for mobile stations and±1.5 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS133§6.3

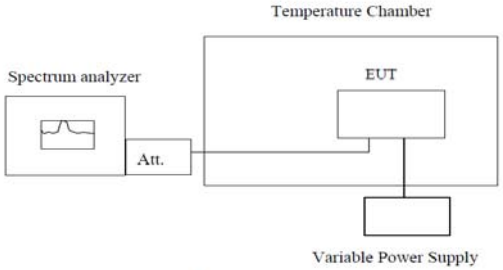
The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and±1.0 ppm for base stations.

In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS139§6.4

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

**TEST CONFIGURATION**




**Note :** Measurement setup for testing on Antenna connector

**TEST PROCEDURE**

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to 0℃. After the temperature stabilized for

approximately 30 minutes recorded the frequency.

6. Repeat step measure with 0℃ increased per stage until the highest temperature of +50℃ reached.
7. Reduce the input voltage to specified extreme voltage variation (+/- 10%) and endpoint, record the maximum frequency change.

**TEST RESULTS**

| Voltage | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Band | Channel | PCL | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| GPRS 850 | 128 | 3 | VL | NT | -1.23 | -0.001492 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | VN | NT | -2.68 | -0.003252 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | VH | NT | -3.00 | -0.003640 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | VL | NT | 3.42 | 0.004088 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | VN | NT | 8.72 | 0.010423 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | VH | NT | 1.74 | 0.002080 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | VL | NT | 3.07 | 0.003617 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | VN | NT | 10.75 | 0.012665 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | VH | NT | 5.00 | 0.005891 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | VL | NT | 16.66 | 0.020214 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | VN | NT | 14.92 | 0.018102 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | VH | NT | 18.21 | 0.022094 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | VL | NT | 18.05 | 0.021575 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | VN | NT | 15.79 | 0.018874 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | VH | NT | 16.37 | 0.019567 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | VL | NT | 14.75 | 0.017377 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | VN | NT | 16.53 | 0.019475 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | VH | NT | 13.30 | 0.015669 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | VL | NT | 5.46 | 0.002951 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | VN | NT | 0.61 | 0.000330 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | VH | NT | 0.55 | 0.000297 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | VL | NT | -1.52 | -0.000809 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | VN | NT | 2.16 | 0.001149 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | VH | NT | -2.23 | -0.001186 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | VL | NT | -5.49 | -0.002875 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | VN | NT | -1.10 | -0.000576 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | VH | NT | 0.58 | 0.000304 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | VL | NT | 15.76 | 0.008518 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | VN | NT | 14.59 | 0.007886 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | VH | NT | 18.53 | 0.010015 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | VL | NT | 15.40 | 0.008191 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | VN | NT | 13.43 | 0.007144 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | VH | NT | 12.14 | 0.006457 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | VL | NT | 17.89 | 0.009367 | ±2.5 | PASS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| EGPRS 1900 | 810 | 2 | VN | NT | 15.59 | 0.008163 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | VH | NT | 19.82 | 0.010378 | ±2.5 | PASS |

| Voltage | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Channel | Voltage (Vdc) | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| Band 2 | 9262 | VL | NT | 4.54 | 0.002451 | ±2.5 | PASS |
| Band 2 | 9262 | VN | NT | 1.89 | 0.001020 | ±2.5 | PASS |
| Band 2 | 9262 | VH | NT | -8.38 | -0.004524 | ±2.5 | PASS |
| Band 2 | 9400 | VL | NT | 6.93 | 0.003686 | ±2.5 | PASS |
| Band 2 | 9400 | VN | NT | 4.30 | 0.002287 | ±2.5 | PASS |
| Band 2 | 9400 | VH | NT | -2.93 | -0.001559 | ±2.5 | PASS |
| Band 2 | 9538 | VL | NT | 11.82 | 0.006196 | ±2.5 | PASS |
| Band 2 | 9538 | VN | NT | -0.92 | -0.000482 | ±2.5 | PASS |
| Band 2 | 9538 | VH | NT | 2.41 | 0.001263 | ±2.5 | PASS |
| Band 5 | 4132 | VL | NT | -0.31 | -0.000375 | ±2.5 | PASS |
| Band 5 | 4132 | VN | NT | -2.92 | -0.003533 | ±2.5 | PASS |
| Band 5 | 4132 | VH | NT | -0.16 | -0.000194 | ±2.5 | PASS |
| Band 5 | 4183 | VL | NT | 1.54 | 0.001841 | ±2.5 | PASS |
| Band 5 | 4183 | VN | NT | 2.51 | 0.003000 | ±2.5 | PASS |
| Band 5 | 4183 | VH | NT | 0.38 | 0.000454 | ±2.5 | PASS |
| Band 5 | 4233 | VL | NT | 1.19 | 0.001406 | ±2.5 | PASS |
| Band 5 | 4233 | VN | NT | 1.30 | 0.001536 | ±2.5 | PASS |
| Band 5 | 4233 | VH | NT | -1.32 | -0.001559 | ±2.5 | PASS |

| Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Band | Channel | PCL | Voltage [Vdc] | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| GPRS 850 | 128 | 3 | NV | 0 | -2.94 | -0.003567 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | NV | 10 | -3.81 | -0.004623 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | NV | 20 | -4.75 | -0.005763 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | NV | 30 | -0.74 | -0.000898 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | NV | 40 | 1.45 | 0.001759 | ±2.5 | PASS |
| GPRS 850 | 128 | 3 | NV | 50 | -1.42 | -0.001723 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 0 | 7.17 | 0.008570 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 10 | 6.81 | 0.008140 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 20 | 2.84 | 0.003395 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 30 | 3.68 | 0.004399 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 40 | 7.72 | 0.009228 | ±2.5 | PASS |
| GPRS 850 | 190 | 3 | NV | 50 | 7.65 | 0.009144 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 0 | 6.20 | 0.007304 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 10 | -1.84 | -0.002168 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 20 | 1.39 | 0.001638 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 30 | 6.49 | 0.007646 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 40 | 2.45 | 0.002886 | ±2.5 | PASS |
| GPRS 850 | 251 | 3 | NV | 50 | 4.33 | 0.005101 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 0 | 12.46 | 0.015118 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 10 | 16.30 | 0.019777 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 20 | 13.95 | 0.016926 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 30 | 18.34 | 0.022252 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 40 | 13.33 | 0.016173 | ±2.5 | PASS |
| EGPRS 850 | 128 | 8 | NV | 50 | 16.37 | 0.019862 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 0 | 14.88 | 0.017786 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 10 | 11.14 | 0.013316 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 20 | 16.82 | 0.020105 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 30 | 16.24 | 0.019412 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 40 | 14.59 | 0.017440 | ±2.5 | PASS |
| EGPRS 850 | 190 | 8 | NV | 50 | 15.27 | 0.018252 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 0 | 12.14 | 0.014303 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 10 | 15.30 | 0.018025 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 20 | 14.95 | 0.017613 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 30 | 9.69 | 0.011416 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 40 | 15.72 | 0.018520 | ±2.5 | PASS |
| EGPRS 850 | 251 | 8 | NV | 50 | 15.30 | 0.018025 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | NV | 0 | 3.33 | 0.001800 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | NV | 10 | 4.81 | 0.002600 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | NV | 20 | 6.17 | 0.003335 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | NV | 30 | 18.47 | 0.009983 | ±2.5 | PASS |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| GPRS 1900 | 512 | 0 | NV | 40 | 15.27 | 0.008253 | ±2.5 | PASS |
| GPRS 1900 | 512 | 0 | NV | 50 | 7.59 | 0.004102 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 0 | 10.04 | 0.005340 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 10 | 8.94 | 0.004755 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 20 | 9.01 | 0.004793 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 30 | 4.68 | 0.002489 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 40 | 13.43 | 0.007144 | ±2.5 | PASS |
| GPRS 1900 | 661 | 0 | NV | 50 | -4.55 | -0.002420 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 0 | 1.26 | 0.000660 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 10 | 7.81 | 0.004089 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 20 | 5.55 | 0.002906 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 30 | 10.85 | 0.005681 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 40 | 8.07 | 0.004226 | ±2.5 | PASS |
| GPRS 1900 | 810 | 0 | NV | 50 | 1.81 | 0.000948 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 0 | 13.33 | 0.007205 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 10 | 15.63 | 0.008448 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 20 | 15.53 | 0.008394 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 30 | 10.40 | 0.005621 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 40 | 16.72 | 0.009037 | ±2.5 | PASS |
| EGPRS 1900 | 512 | 2 | NV | 50 | 10.01 | 0.005410 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 0 | 11.53 | 0.006133 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 10 | 16.11 | 0.008569 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 20 | 12.17 | 0.006473 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 30 | 13.14 | 0.006989 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 40 | 7.91 | 0.004207 | ±2.5 | PASS |
| EGPRS 1900 | 661 | 2 | NV | 50 | 14.66 | 0.007798 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 0 | 17.72 | 0.009278 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 10 | 17.60 | 0.009216 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 20 | 8.65 | 0.004529 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 30 | 17.27 | 0.009043 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 40 | 19.69 | 0.010310 | ±2.5 | PASS |
| EGPRS 1900 | 810 | 2 | NV | 50 | 19.11 | 0.010006 | ±2.5 | PASS |

| Temperature | | | | | | | |
|---|---|---|---|---|---|---|---|
| Band | Channel | Voltage (Vdc) | Temperature (℃) | Deviation (Hz) | Deviation (ppm) | Limit (ppm) | Verdict |
| Band 2 | 9262 | NV | 0 | 2.20 | 0.001188 | ±2.5 | PASS |
| Band 2 | 9262 | NV | 10 | -9.92 | -0.005355 | ±2.5 | PASS |
| Band 2 | 9262 | NV | 20 | 7.40 | 0.003995 | ±2.5 | PASS |
| Band 2 | 9262 | NV | 30 | -3.27 | -0.001765 | ±2.5 | PASS |
| Band 2 | 9262 | NV | 40 | -0.85 | -0.000459 | ±2.5 | PASS |
| Band 2 | 9262 | NV | 50 | 0.50 | 0.000270 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 0 | 4.97 | 0.002644 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 10 | -5.87 | -0.003122 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 20 | -0.79 | -0.000420 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 30 | -0.36 | -0.000191 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 40 | 1.38 | 0.000734 | ±2.5 | PASS |
| Band 2 | 9400 | NV | 50 | -8.65 | -0.004601 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 0 | 1.58 | 0.000828 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 10 | 13.55 | 0.007103 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 20 | 0.06 | 0.000031 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 30 | 1.81 | 0.000949 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 40 | 5.27 | 0.002763 | ±2.5 | PASS |
| Band 2 | 9538 | NV | 50 | 5.18 | 0.002715 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 0 | 1.31 | 0.001585 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 10 | -1.67 | -0.002021 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 20 | -3.14 | -0.003800 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 30 | -0.12 | -0.000145 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 40 | 0.72 | 0.000871 | ±2.5 | PASS |
| Band 5 | 4132 | NV | 50 | -0.01 | -0.000012 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 0 | -2.37 | -0.002833 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 10 | -2.10 | -0.002510 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 20 | 0.05 | 0.000060 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 30 | 0.45 | 0.000538 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 40 | 0.54 | 0.000645 | ±2.5 | PASS |
| Band 5 | 4183 | NV | 50 | 1.92 | 0.002295 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 0 | -0.12 | -0.000142 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 10 | -0.63 | -0.000744 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 20 | -0.39 | -0.000461 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 30 | 0.54 | 0.000638 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 40 | 0.87 | 0.001028 | ±2.5 | PASS |
| Band 5 | 4233 | NV | 50 | 1.30 | 0.001536 | ±2.5 | PASS |

**********THE END**********