

# FCC Measurement/Technical Report on

## NAR Compenser

## LTE-MBC-NAR2

FCC ID: RK7MBC-NAR2  
IC: 4774A-MBCNAR2

**Test Report Reference:** MDE\_MOLEX\_1901\_FCC\_01\_rev01

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**Note:**

The following test results relate only to the devices specified in this document. This report shall not be reproduced in parts without the written approval of the test laboratory.

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## 1 APPLIED STANDARDS AND TEST SUMMARY

### 1.1 APPLIED STANDARDS

#### **Type of Authorization**

Certification for an Wideband Consumer signal Booster.

#### **Applicable FCC Rules**

Prepared in accordance with the requirements of FCC Rules and Regulations as listed in 47 CFR Ch.1 Parts 2 and 20, 22, 24, 27 (10-1-18 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 20, Commercial Mobiles Serviced

§ 20.21 Signal Boosters

Part 22, Subpart H – Cellular Radiotelephone Service

§ 22.905 – Channels for cellular service

§ 22.913 – Effective radiated power limits

§ 22.917 – Emission limitations for cellular equipment

Part 24 E – Personal Communication Services

§ 24.229 - Frequencies

§ 24.232 – Power and antenna height limits

§ 24.238 – Emission limitations for Broadband PCS equipment

Part 27 – Miscellaneous Wireless Communication Services

§ 27.5 (b), (c) - Frequencies

§ 27.50 (b) (c) – Power limits and duty cycle

§ 27.53 (c), (f), (g), (h) – Emission limits

The tests were selected and performed with reference to the **FCC Public Notice 935210** applying “**Wideband Consumer Signal Booster Compliance Measurement Guidance**” **935210 D03 v04r03, 2019-04-15**.

## Summary Test Results:

The EUT complied with all performed tests as listed in chapter 1.3 Measurement Summary / Signatures.

## 1.2 FCC-IC CORRELATION TABLE

### FCC-ISED Correlation of measurement requirements for Wideband Consumer Signal Booster from FCC and ISED Canada

| Measurement                                    | FCC reference                       | ISED reference           |
|------------------------------------------------|-------------------------------------|--------------------------|
| Anti-oscillation                               | §20.21(e)(8)(ii)(A)<br>§20.21(e)(5) | RSS-131 Issue 3: 5.1.1.1 |
| Gain control                                   | §20.21(e)(8)(ii)(B)                 | RSS-131 Issue 3: 5.1.1.2 |
| Power down                                     | §20.21(e)(8)(i)(H)                  | RSS-131 Issue 3: 5.1.1.3 |
| Interference avoidance for wireless subsystems | §20.21(e)(8)(ii)(C)                 | RSS-131 Issue 3: 5.1.1.4 |
| Bidirectional capability                       | §20.21(e)(8)(i)(B)                  | RSS-131 Issue 3: 5.1.2   |
| Noise limits                                   | §20.21(e)(8)(i)(A)                  | RSS-131 Issue 3: 5.1.3.1 |
| Gain limits                                    | §20.21(e)(8)(i)(C)(1)               | RSS-131 Issue 3: 5.1.3.2 |
| Power limits                                   | §20.21(e)(8)(i)(D)                  | RSS-131 Issue 3: 5.1.3.3 |
| Out-of-band emission limits                    | §20.21(e)(8)(i)(E)                  | RSS-131 Issue 3: 5.1.3.4 |
| Intermodulation limits                         | §20.21(e)(8)(i)(F)                  | RSS-131 Issue 3: 5.1.3.5 |
| Transmit power off mode                        | §20.21(e)(8)(i)(H)                  | RSS-131 Issue 3: 5.1.3.6 |
| Uplink inactivity                              | §20.21(e)(8)(i)(I)                  | RSS-131 Issue 3: 5.1.3.7 |

### 1.3 MEASUREMENT SUMMARY / SIGNATURES

#### 47 CFR CHAPTER I FCC PART 20 §20.21

#### § 20.21 (e)(3) Frequency Bands

Authorized Frequency Band

The measurement was performed according to KDB 935210 D03

**Final Result**

| OP-Mode                   | Setup    | Date       | FCC       | ISED      |
|---------------------------|----------|------------|-----------|-----------|
| Frequency Band, Direction |          |            |           |           |
| Band 12, Downlink         | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 12, Uplink           | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 13, Downlink         | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 13, Uplink           | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 2, Downlink          | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 2, Uplink            | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 4, Downlink          | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 4, Uplink            | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 5, Downlink          | S01_AA01 | 2020-01-20 | Performed | Performed |
| Band 5, Uplink            | S01_AA01 | 2020-01-20 | Performed | Performed |

#### 47 CFR CHAPTER I FCC PART 20 §20.21

#### § 20.21 (e)(8)(i)(D) Power Limits; § 20.21 (e)(8)(i)(B) Bidirectional Capability

Maximum Power

The measurement was performed according to KDB 935210 D03

**Final Result**

| OP-Mode                                | Setup    | Date       | FCC    | ISED   |
|----------------------------------------|----------|------------|--------|--------|
| Frequency Band, Direction, Signal Type |          |            |        |        |
| Band 12, Downlink, AWGN                | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 12, Downlink, Pulsed CW           | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 12, Uplink, AWGN                  | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 12, Uplink, Pulsed CW             | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 13, Downlink, AWGN                | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 13, Downlink, Pulsed CW           | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 13, Uplink, AWGN                  | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 13, Uplink, Pulsed CW             | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 2, Downlink, AWGN                 | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 2, Downlink, Pulsed CW            | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 2, Uplink, AWGN                   | S01_AA01 | 2020-01-20 | Passed | Passed |
| Band 2, Uplink, Pulsed CW              | S01_AA01 | 2020-01-20 | Passed | Passed |
| Band 4, Downlink, AWGN                 | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 4, Downlink, Pulsed CW            | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 4, Uplink, AWGN                   | S01_AA01 | 2020-01-20 | Passed | Passed |
| Band 4, Uplink, Pulsed CW              | S01_AA01 | 2020-01-20 | Passed | Passed |
| Band 5, Downlink, AWGN                 | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 5, Downlink, Pulsed CW            | S01_AA01 | 2020-01-21 | Passed | Passed |
| Band 5, Uplink, AWGN                   | S01_AA01 | 2020-01-20 | Passed | Passed |
| Band 5, Uplink, Pulsed CW              | S01_AA01 | 2020-01-20 | Passed | Passed |

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§20.21**

**§ 20.21 (e)(8)(i)(C)(2) Booster Gain  
Limits; § 20.21 (e)(8)(i)(B) Bidirectional  
Capability**

Maximum Booster Gain

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                         | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|----------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Signal Type |              |             |            |             |
| Band 12, Downlink, AWGN                | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 12, Downlink, Pulsed CW           | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 12, Uplink, AWGN                  | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 12, Uplink, Pulsed CW             | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Downlink, AWGN                | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Downlink, Pulsed CW           | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Uplink, AWGN                  | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Uplink, Pulsed CW             | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 2, Downlink, AWGN                 | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 2, Downlink, Pulsed CW            | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 2, Uplink, AWGN                   | S01_AA01     | 2020-01-20  | Passed     | Passed      |
| Band 2, Uplink, Pulsed CW              | S01_AA01     | 2020-01-20  | Passed     | Passed      |
| Band 4, Downlink, AWGN                 | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 4, Downlink, Pulsed CW            | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 4, Uplink, AWGN                   | S01_AA01     | 2020-01-20  | Passed     | Passed      |
| Band 4, Uplink, Pulsed CW              | S01_AA01     | 2020-01-20  | Passed     | Passed      |
| Band 5, Downlink, AWGN                 | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 5, Downlink, Pulsed CW            | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 5, Uplink, AWGN                   | S01_AA01     | 2020-01-20  | Passed     | Passed      |
| Band 5, Uplink, Pulsed CW              | S01_AA01     | 2020-01-20  | Passed     | Passed      |

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**§ 20.21 (e)(8)(i)(F) Intermodulation Limits**

Intermodulation

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                         | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|----------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Input Power |              |             |            |             |
| Band 12, Downlink, AGC                 | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 12, Uplink, AGC                   | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 12, Uplink, AGC+10dB              | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 13, Downlink, AGC                 | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 13, Uplink, AGC                   | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 13, Uplink, AGC+10dB              | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 2, Downlink, AGC                  | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 2, Uplink, AGC                    | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 2, Uplink, AGC+10dB               | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 4, Downlink, AGC                  | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 4, Uplink, AGC                    | S01_AB01     | 2020-01-23  | Passed     | Passed      |
| Band 4, Uplink, AGC+10dB               | S01_AB01     | 2020-01-23  | Passed     | Passed      |
| Band 5, Downlink, AGC                  | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 5, Uplink, AGC                    | S01_AA01     | 2020-01-22  | Passed     | Passed      |

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**§20.21**
**§ 20.21 (e)(8)(i)(F) Intermodulation Limits**
**Intermodulation**

The measurement was performed according to KDB 935210 D03

**Final Result**
**OP-Mode**

Frequency Band, Direction, Input Power

Band 5, Uplink, AGC+10dB

**Setup**

S01\_AA01

**Date**

2020-01-22

**FCC**

Passed

**ISED**

Passed

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**
**§ 20.21 (e)(8)(i)(E) Out-of-bands Limits**
**Out-of-band Emission**

The measurement was performed according to KDB 935210 D03

**Final Result**
**OP-Mode**

Frequency Band, Direction, Signal Type, Band Edge

Band 12, Downlink, CDMA, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Downlink, CDMA, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Downlink, GSM, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Downlink, GSM, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Downlink, LTE, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Downlink, LTE, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, CDMA, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, CDMA, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, GSM, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, GSM, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, LTE, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 12, Uplink, LTE, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, CDMA, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, CDMA, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, GSM, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, GSM, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, LTE, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Downlink, LTE, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, CDMA, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, CDMA, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, GSM, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, GSM, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, LTE, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 13, Uplink, LTE, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, CDMA, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, CDMA, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, GSM, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, GSM, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, LTE, lower

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Downlink, LTE, upper

S01\_AA01

2020-01-27

Passed

Passed

Band 2, Uplink, CDMA, lower

S01\_AA01

2020-01-24

Passed

Passed

Band 2, Uplink, CDMA, upper

S01\_AA01

2020-01-24

Passed

Passed

Band 2, Uplink, GSM, lower

S01\_AA01

2020-01-24

Passed

Passed

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**§20.21**

**§ 20.21 (e)(8)(i)(E) Out-of-bands Limits**

Out-of-band Emission

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                                    | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Signal Type, Band Edge |              |             |            |             |
| Band 2, Uplink, GSM, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 2, Uplink, LTE, lower                        | S01_AA01     | 2020-01-23  | Passed     | Passed      |
| Band 2, Uplink, LTE, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Downlink, CDMA, lower                     | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Downlink, CDMA, upper                     | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Downlink, GSM, lower                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Downlink, GSM, upper                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Downlink, LTE, lower                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Downlink, LTE, upper                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 4, Uplink, CDMA, lower                       | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Uplink, CDMA, upper                       | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Uplink, GSM, lower                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Uplink, GSM, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Uplink, LTE, lower                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 4, Uplink, LTE, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Downlink, CDMA, lower                     | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Downlink, CDMA, upper                     | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Downlink, GSM, lower                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Downlink, GSM, upper                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Downlink, LTE, lower                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Downlink, LTE, upper                      | S01_AA01     | 2020-01-27  | Passed     | Passed      |
| Band 5, Uplink, CDMA, lower                       | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Uplink, CDMA, upper                       | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Uplink, GSM, lower                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Uplink, GSM, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Uplink, LTE, lower                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |
| Band 5, Uplink, LTE, upper                        | S01_AA01     | 2020-01-24  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 2.1051 Spurious emissions at antenna terminals**

Conducted Spurious Emissions

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Downlink         | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 12, Uplink           | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 13, Downlink         | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 2, Downlink          | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 4, Downlink          | S01_AA01     | 2020-01-22  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 2.1051 Spurious emissions at antenna terminals**

Conducted Spurious Emissions

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 4, Uplink            | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 5, Downlink          | S01_AA01     | 2020-01-22  | Passed     | Passed      |
| Band 5, Uplink            | S01_AA01     | 2020-01-22  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 20.21 (e)(8)(i)(A) Noise Limits; § 20.21 (e)(8)(i)(H) Transmitter Power Off Mode**

Maximum Transmitter Noise Power

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                         | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|----------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Signal Type |              |             |            |             |
| Band 12, Downlink, None                | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 12, Uplink, AWGN DL               | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 12, Uplink, None                  | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 13, Downlink, None                | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 13, Uplink, AWGN DL               | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 13, Uplink, None                  | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 2, Downlink, None                 | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 2, Uplink, AWGN DL                | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 2, Uplink, None                   | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 4, Downlink, None                 | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 4, Uplink, AWGN DL                | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 4, Uplink, None                   | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 5, Downlink, None                 | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 5, Uplink, AWGN DL                | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 5, Uplink, None                   | S01_AA01     | 2020-01-28  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 20.21 (e)(8)(i)(A) Noise Limits; § 20.21 (e)(8)(i)(H) Transmitter Power Off Mode**

Variable Uplink Noise Timing

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Uplink           | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 4, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 5, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 20.21 (e)(8)(i)(I) Uplink Inactivity**

**Uplink Inactivity**

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Uplink           | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 4, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |
| Band 5, Uplink            | S01_AA01     | 2020-01-28  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 20.21 (e)(8)(i)(C)(1) Booster Gain Limits, § 20.21 (e)(8)(i)(H) Transmit Power Off Mode**

**Variable Booster Gain**

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Uplink           | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 4, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 5, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 20.21 (e)(8)(i)(C)(1) Booster Gain Limits, § 20.21 (e)(8)(i)(H) Transmit Power Off Mode**

**Variable Uplink Gain Timing**

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Uplink           | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 4, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |
| Band 5, Uplink            | S01_AA01     | 2020-01-29  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 2.1049 Occupied Bandwidth**

**Occupied Bandwidth**

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                         | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|----------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Signal Type |              |             |            |             |
| Band 12, Downlink, CDMA                | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 12, Downlink, GSM                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 12, Downlink, LTE                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 12, Uplink, CDMA                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 2.1049 Occupied Bandwidth**

Occupied Bandwidth

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>                         | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|----------------------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction, Signal Type |              |             |            |             |
| Band 12, Uplink, GSM                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 12, Uplink, LTE                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Downlink, CDMA                | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Downlink, GSM                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Downlink, LTE                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Uplink, CDMA                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Uplink, GSM                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 13, Uplink, LTE                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Downlink, CDMA                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Downlink, GSM                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Downlink, LTE                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Uplink, CDMA                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Uplink, GSM                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 2, Uplink, LTE                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Downlink, CDMA                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Downlink, GSM                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Downlink, LTE                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Uplink, CDMA                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Uplink, GSM                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 4, Uplink, LTE                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Downlink, CDMA                 | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Downlink, GSM                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Downlink, LTE                  | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Uplink, CDMA                   | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Uplink, GSM                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |
| Band 5, Uplink, LTE                    | S01_AA01     | 2020-01-30  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20**  
**§20.21**

**§ 20.21 (e)(8)(ii)(A) Ant-Oscillation, §**  
**20.21 (e)(5) Anti-Oscillation**

Oscillation Restart

The measurement was performed according to KDB 935210 D03

**Final Result**

| <b>OP-Mode</b>            | <b>Setup</b> | <b>Date</b> | <b>FCC</b> | <b>ISED</b> |
|---------------------------|--------------|-------------|------------|-------------|
| Frequency Band, Direction |              |             |            |             |
| Band 12, Downlink         | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 12, Uplink           | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Downlink         | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 13, Uplink           | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 2, Downlink          | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 2, Uplink            | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 4, Downlink          | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 4, Uplink            | S01_AA01     | 2020-01-21  | Passed     | Passed      |
| Band 5, Downlink          | S01_AA01     | 2020-01-21  | Passed     | Passed      |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 20.21 (e)(8)(ii)(A) Ant-Oscillation, §  
20.21 (e)(5) Anti-Oscillation**

Oscillation Restart

The measurement was performed according to KDB 935210 D03

**Final Result**

| OP-Mode                   | Setup    | Date       | FCC    | ISED   |
|---------------------------|----------|------------|--------|--------|
| Frequency Band, Direction |          |            |        |        |
| Band 5, Uplink            | S01_AA01 | 2020-01-21 | Passed | Passed |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 20.21 (e)(8)(ii)(A) Ant-Oscillation, §  
20.21 (e)(5) Anti-Oscillation**

Oscillation Shutdown or Mitigation

The measurement was performed according to KDB 935210 D03

**Final Result**

| OP-Mode                                          | Setup    | Date       | FCC       | ISED      |
|--------------------------------------------------|----------|------------|-----------|-----------|
| Frequency Band, Direction                        |          |            |           |           |
| Band 12, Downlink                                | S01_AA01 | 2020-01-22 | Passed    | Passed    |
| Band 12, Uplink                                  | S01_AA01 | 2020-01-21 | Performed | Performed |
| Remark: EUT does not start up at 30 dB below AGC |          |            |           |           |
| Band 13, Downlink                                | S01_AA01 | 2020-01-22 | Passed    | Passed    |
| Band 13, Uplink                                  | S01_AA01 | 2020-01-21 | Performed | Performed |
| Remark: EUT does not start up at 30 dB below AGC |          |            |           |           |
| Band 2, Downlink                                 | S01_AA01 | 2020-01-22 | Passed    | Passed    |
| Band 2, Uplink                                   | S01_AA01 | 2020-01-21 | Performed | Performed |
| Remark: EUT does not start up at 30 dB below AGC |          |            |           |           |
| Band 4, Downlink                                 | S01_AA01 | 2020-01-22 | Passed    | Passed    |
| Band 4, Uplink                                   | S01_AA01 | 2020-01-21 | Performed | Performed |
| Remark: EUT does not start up at 30 dB below AGC |          |            |           |           |
| Band 5, Downlink                                 | S01_AA01 | 2020-01-22 | Passed    | Passed    |
| Band 5, Uplink                                   | S01_AA01 | 2020-01-21 | Performed | Performed |
| Remark: EUT does not start up at 30 dB below AGC |          |            |           |           |

**47 CFR CHAPTER I FCC PART 20  
§20.21**

**§ 2.1053 Field strength of Spurious  
Radiation**

Radiated Spurious Emissions

The measurement was performed according to KDB 935210 D03

**Final Result**

| OP-Mode                                | Setup    | Date       | FCC    | ISED   |
|----------------------------------------|----------|------------|--------|--------|
| Frequency Band, Direction              |          |            |        |        |
| Band 12, Downlink                      | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 12, Uplink                        | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 13, Downlink                      | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 13, Uplink                        | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 2, Downlink                       | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 2, Uplink                         | S01_AB01 | 2020-01-22 | Passed | Passed |
| Remark: 1880 MHz is an wanted signal   |          |            |        |        |
| Band 4, Downlink                       | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 4, Uplink                         | S01_AB01 | 2020-01-22 | Passed | Passed |
| Remark: 1732.5 MHz is an wanted signal |          |            |        |        |
| Band 5, Downlink                       | S01_AB01 | 2020-01-22 | Passed | Passed |
| Band 5, Uplink                         | S01_AB01 | 2020-01-22 | Passed | Passed |

N/A: Not applicable

N/P: Not performed

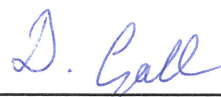
## 2 REVISION HISTORY

| Report version control |              |                                                                                                                   |                  |
|------------------------|--------------|-------------------------------------------------------------------------------------------------------------------|------------------|
| Version                | Release date | Change Description                                                                                                | Version validity |
| initial                | 2020-02-13   | --                                                                                                                | valid            |
| rev01                  | 2020-03-20   | Added marker values to result table and added additional markers to plots in chapter conducted spurious emissions | valid            |

COMMENT: -



(responsible for accreditation scope)  
Dipl.-Ing. Marco Kullik



(responsible for testing and report)  
Dipl.-Ing. Daniel Gall



7 layers GmbH, Borsigstr. 11  
40880 Ratingen, Germany  
Phone +49 (0)2102 749 0

### 3 ADMINISTRATIVE DATA

#### 3.1 TESTING LABORATORY

Company Name: 7layers GmbH  
Address: Borsigstr. 11  
40880 Ratingen  
Germany

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no: DAKKS D-PL-12140-01-01 | D-PL-12140-01-02 | D-PL-12140-01-03  
FCC Designation Number: DE0015  
FCC Test Firm Registration: 929146  
ISED CAB Identifier: DE0007; ISED#: 3699A  
Responsible for accreditation scope: Dipl.-Ing. Marco Kullik  
Report Template Version: 2019-12-16

#### 3.2 PROJECT DATA

Responsible for testing and report: Dipl.-Ing. Daniel Gall  
Employees who performed the tests: documented internally at 7Layers  
Date of Report: 2020-03-20  
Testing Period: 2020-01-20 to 2020-01-30

#### 3.3 APPLICANT DATA

Company Name: Molex CVS Dabendorf GmbH  
Address: Märkische Straße 72  
15806 Zossen  
Germany  
Contact Person: Ines Baufeld

### 3.4 MANUFACTURER DATA

Company Name: Molex CVS Dabendorf GmbH

Address: Märkische Straße 72  
15806 Zossen  
Germany

Contact Person: Sebastian Dern

## 4 TEST OBJECT DATA

### 4.1 GENERAL EUT DESCRIPTION

|                                          |                                                                                                                                                                                                    |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kind of Device product description       | Consumer mobile Signal Booster supporting bands 2, 4, 5, 12, 13                                                                                                                                    |
| Product name / Model                     | LTE-MBC-NAR2                                                                                                                                                                                       |
| Type number                              | 17400213                                                                                                                                                                                           |
| <b>Declared EUT data by the supplier</b> |                                                                                                                                                                                                    |
| General Product Description              | The EUT is a single housing wideband consumer signal booster with a single donor and single server port. It supports the eFDD bands 2, 4, 5, 12 and 13. Spectrum block filtering is not supported. |
| Booster Type                             | Mobile Wideband Consumer Signal Booster                                                                                                                                                            |
| Booster Connection                       | Direct Contact Coupling (e.g. cradle type)                                                                                                                                                         |
| MSCL Value                               | 7 dB                                                                                                                                                                                               |
| Voltage Type                             | DC                                                                                                                                                                                                 |
| Voltage Level                            | 12 V                                                                                                                                                                                               |
| Maximum Output Donor Port [Uplink]:      | 22.0 dBm (conducted)                                                                                                                                                                               |
| Maximum Output Server Port [Downlink]:   | 1.0 dBm (conducted)                                                                                                                                                                                |
| Maximum Gain [Uplink]                    | 22.1 dB                                                                                                                                                                                            |
| Maximum Gain [Downlink]                  | 22.4 dB                                                                                                                                                                                            |
| The EUT provides the following ports:    | Donor Port: Input BS-Signal, Output MS-Signal<br>Server Port: Input MS-Signal, Output BS-Signal<br>DC Port                                                                                         |

The below Variant models are declared by the manufacturer as electrically identical but have not been tested:

| Product name / Model | Product Type number |
|----------------------|---------------------|
| LTE-MBC-NAR2         | 17401213            |
| LTE-MBC-NAR2         | 17400214            |
| LTE-MBC-NAR2         | 17402213            |

#### 4.2 EUT MAIN COMPONENTS

| Sample Name      | Sample Code                | Description |
|------------------|----------------------------|-------------|
| EUT aa01         | DE1386008aa01              |             |
| Sample Parameter | Value                      |             |
| Serial No.       | 0D0FKW-00117.01.2098210013 |             |
| HW Version       | 004                        |             |
| SW Version       | 0003                       |             |
| Comment          |                            |             |

| Sample Name      | Sample Code                | Description |
|------------------|----------------------------|-------------|
| EUT ab01         | DE1386008ab01              |             |
| Sample Parameter | Value                      |             |
| Serial No.       | 0D0FKW-00117.01.2098210011 |             |
| HW Version       | 004                        |             |
| SW Version       | 0003                       |             |
| Comment          |                            |             |

NOTE: The short description is used to simplify the identification of the EUT in this test report.

#### 4.3 ANCILLARY EQUIPMENT

For the purposes of this test report, ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Ancillary Equipment can influence the test results.

| Device | Details<br>(Manufacturer, Type Model, OUT Code) | Description |
|--------|-------------------------------------------------|-------------|
| -      | -                                               | -           |

#### 4.4 AUXILIARY EQUIPMENT

For the purposes of this test report, auxiliary equipment is defined as equipment which is used temporarily to enable operational and control features especially used for the tests of the EUT which is not used during normal operation or equipment that is used during the tests in combination with the EUT but is not subject of this test report. It is necessary to configure the system in a typical fashion, as a customer would normally use it. But nevertheless Auxiliary Equipment can influence the test results.

| Device | Details<br>(Manufacturer, Type Model, HW, SW, S / N) | Description |
|--------|------------------------------------------------------|-------------|
| -      | -                                                    | -           |

## 4.5 EUT SETUPS

This chapter describes the combination of EUTs and equipment used for testing. The rationale for selecting the EUTs, ancillary and auxiliary equipment and interconnecting cables, is to test a representative configuration meeting the requirements of the referenced standards.

| Setup    | Combination of EUTs | Description and Rationale |
|----------|---------------------|---------------------------|
| S01_AA01 | EUT aa01            | Representative Setup      |
| S01_AB01 | EUT ab01            | Representative Setup      |

## 4.6 OPERATING MODES

This chapter describes the operating modes of the EUTs used for testing.

### 4.6.1 TEST CHANNELS

| Band | Direction | Lower Frequency Band Edge [MHz] | Upper Frequency Band Edge [MHz] | Center Frequency [MHz] | Port   |
|------|-----------|---------------------------------|---------------------------------|------------------------|--------|
| 2    | downlink  | 1930.00                         | 1990.00                         | 1960.00                | Donor  |
| 4    | downlink  | 2110.00                         | 2155.00                         | 2132.50                | Donor  |
| 5    | downlink  | 869.00                          | 894.00                          | 881.50                 | Donor  |
| 12   | downlink  | 728.00                          | 746.00                          | 737.00                 | Donor  |
| 13   | downlink  | 746.00                          | 756.00                          | 751.00                 | Donor  |
| 2    | uplink    | 1850.00                         | 1910.00                         | 1880.00                | Server |
| 4    | uplink    | 1710.00                         | 1755.00                         | 1732.50                | Server |
| 5    | uplink    | 824.00                          | 849.00                          | 836.50                 | Server |
| 12   | uplink    | 698.00                          | 716.00                          | 707.00                 | Server |
| 13   | uplink    | 777.00                          | 787.00                          | 782.00                 | Server |

## 4.7 PRODUCT LABELLING

### 4.7.1 FCC ID LABEL

Please refer to the documentation of the applicant.

### 4.7.2 LOCATION OF THE LABEL ON THE EUT

Please refer to the documentation of the applicant.

## 5 TEST RESULTS

### 5.1 AUTHORIZED FREQUENCY BAND

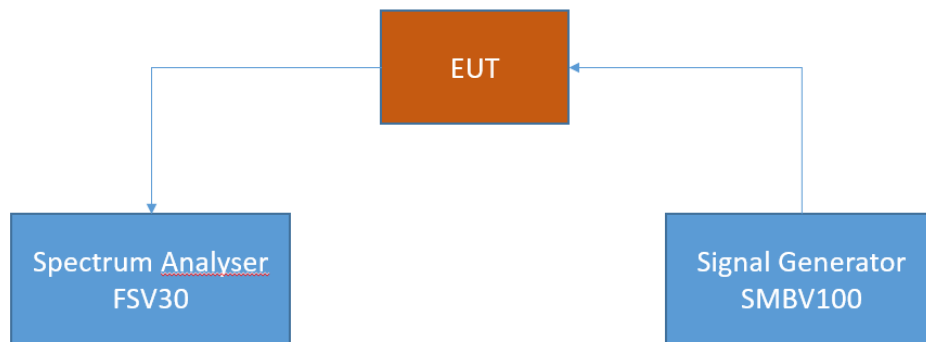
Standard

**The test was performed according to:**  
KDB 935210 D03

#### 5.1.1 TEST DESCRIPTION

This test case is intended to confirm that the signal booster only operates on the CMRS frequency bands authorized for use by the NPS. In addition, this test will identify the frequency at which the maximum gain is realized within each CMRS operational band, which then serves as a basis for subsequent tests.

The EUT was connected to the test setup according to the following diagram :



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.1; Authorized Frequency Band Verification

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

#### 5.1.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21 (e)(3) Frequency Bands

For this test case exists no applicable limit.

### 5.1.3 TEST PROTOCOL

Ambient temperature: 25 °C  
 Air Pressure: 1036 hPa  
 Humidity: 34 %

Band 2, downlink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 1930.000        | -7.0               |
| Highest Power   | 1951.090        | -5.5               |
| Upper Band Edge | 1990.000        | -7.0               |

Band 4, downlink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 2110.000        | -6.0               |
| Highest Power   | 2110.411        | -6.0               |
| Upper Band Edge | 2155.000        | -6.8               |

Band 5, downlink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 869.000         | -6.1               |
| Highest Power   | 875.750         | -5.8               |
| Upper Band Edge | 894.000         | -6.7               |

Band 12, downlink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 728.000         | -4.6               |
| Highest Power   | 745.930         | -3.6               |
| Upper Band Edge | 746.000         | -3.6               |

Band 13, downlink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 746.000         | -4.6               |
| Highest Power   | 752.580         | -4.4               |
| Upper Band Edge | 756.000         | -5.0               |

Band 2, uplink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 1850.000        | 16.3               |
| Highest Power   | 1865.870        | 18.1               |
| Upper Band Edge | 1910.000        | 14.0               |

Band 4, uplink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 1710.000        | 16.9               |
| Highest Power   | 1719.751        | 18.2               |
| Upper Band Edge | 1755.000        | 17.9               |

Band 5, uplink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 824.000         | 16.7               |
| Highest Power   | 834.391         | 17.6               |
| Upper Band Edge | 849.000         | 15.9               |

Band 12, uplink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 698.000         | 17.7               |
| Highest Power   | 709.010         | 17.8               |
| Upper Band Edge | 716.000         | 17.1               |

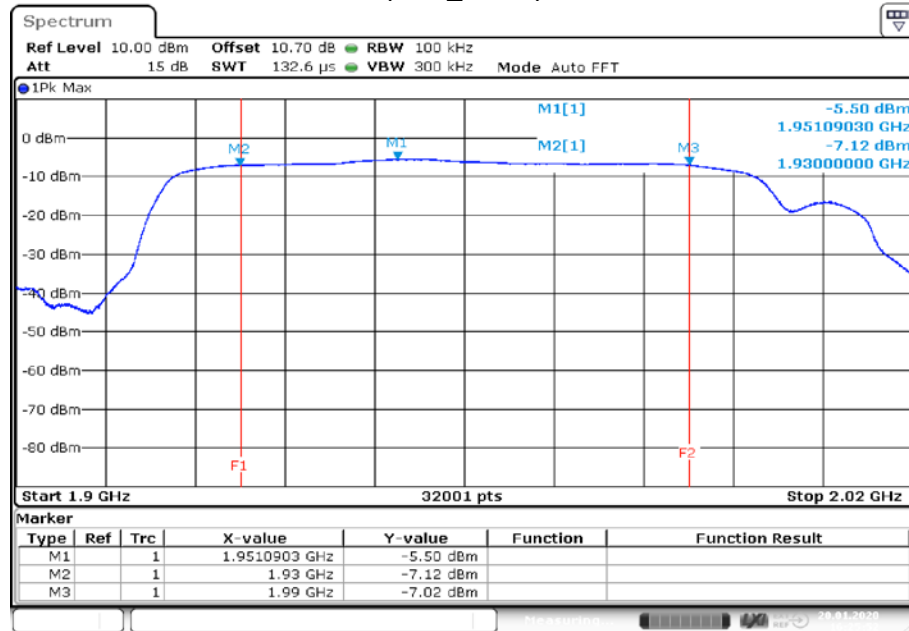
Band 13, uplink

| Frequency       | Frequency [MHz] | Output Power [dBm] |
|-----------------|-----------------|--------------------|
| Lower Band Edge | 777.000         | 16.4               |
| Highest Power   | 780.390         | 17.5               |
| Upper Band Edge | 787.000         | 16.8               |

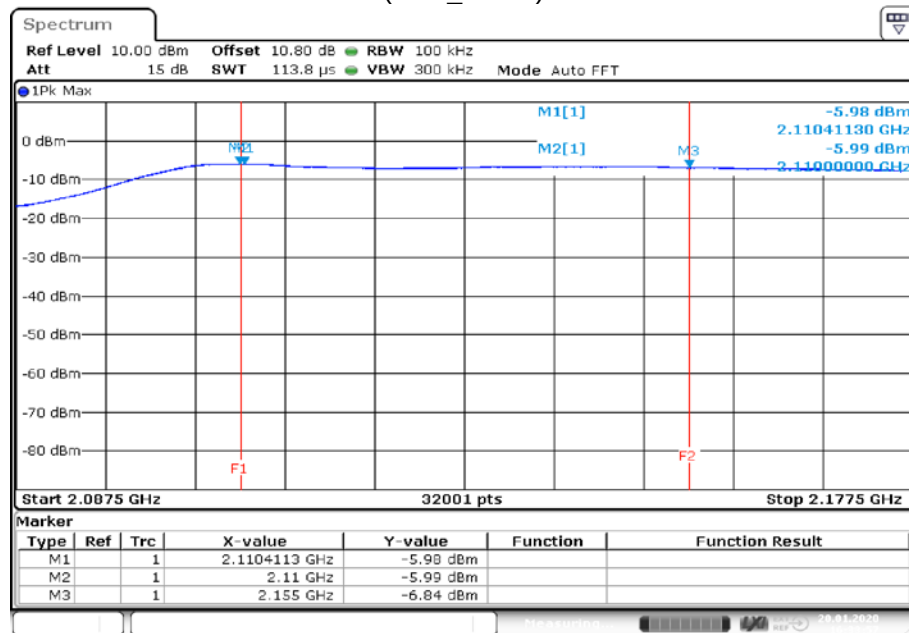
Remark: Please see next sub-clause for the measurement plot.

#### 5.1.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

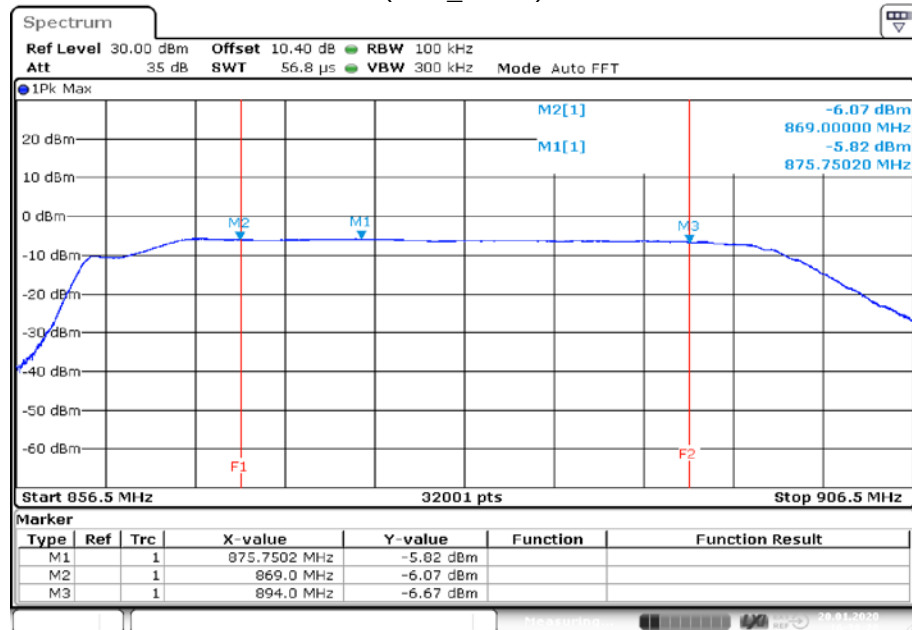
Frequency Band = Band 2, Direction = Downlink  
(S01\_AA01)



Frequency Band = Band 4, Direction = Downlink  
(S01\_AA01)

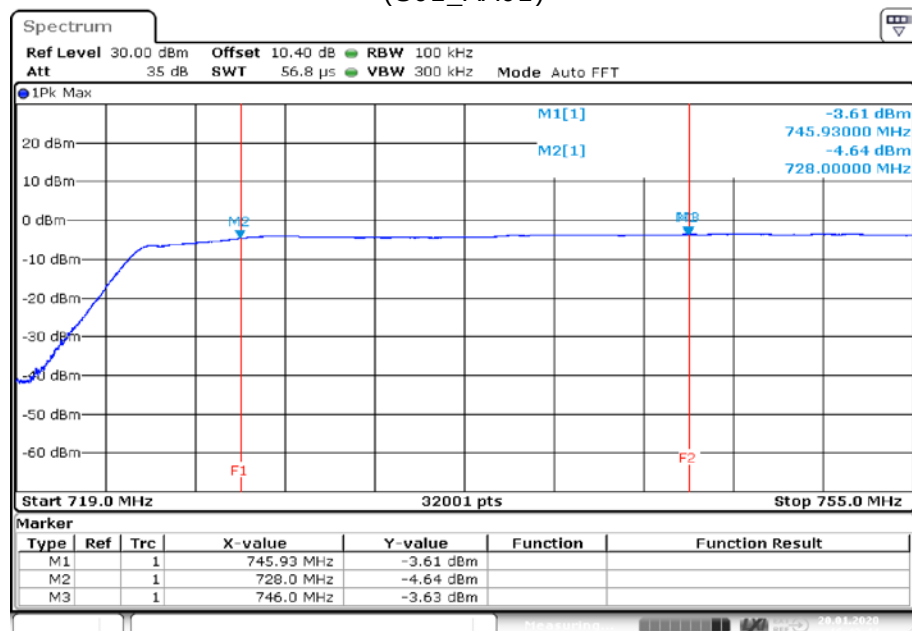


Frequency Band = Band 5, Direction = Downlink  
(S01\_AA01)



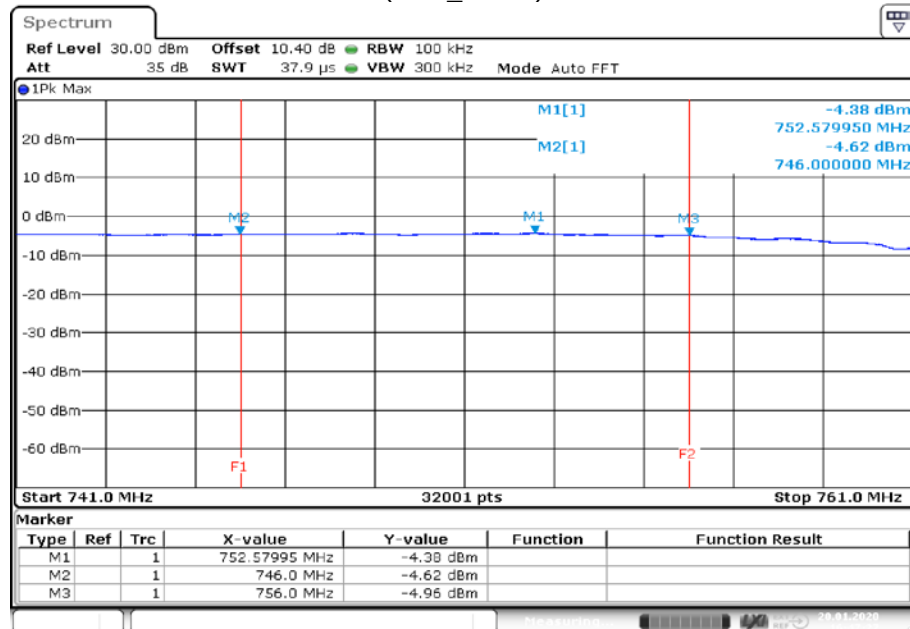
Date: 20.JAN.2020 16:38:28

Frequency Band = Band 12, Direction = Downlink  
(S01\_AA01)

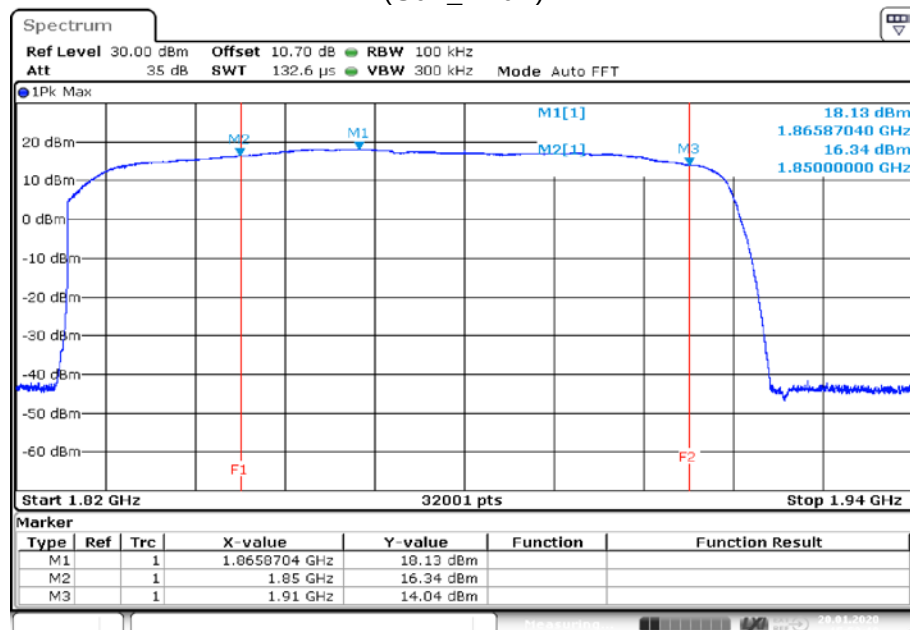


Date: 20.JAN.2020 16:42:44

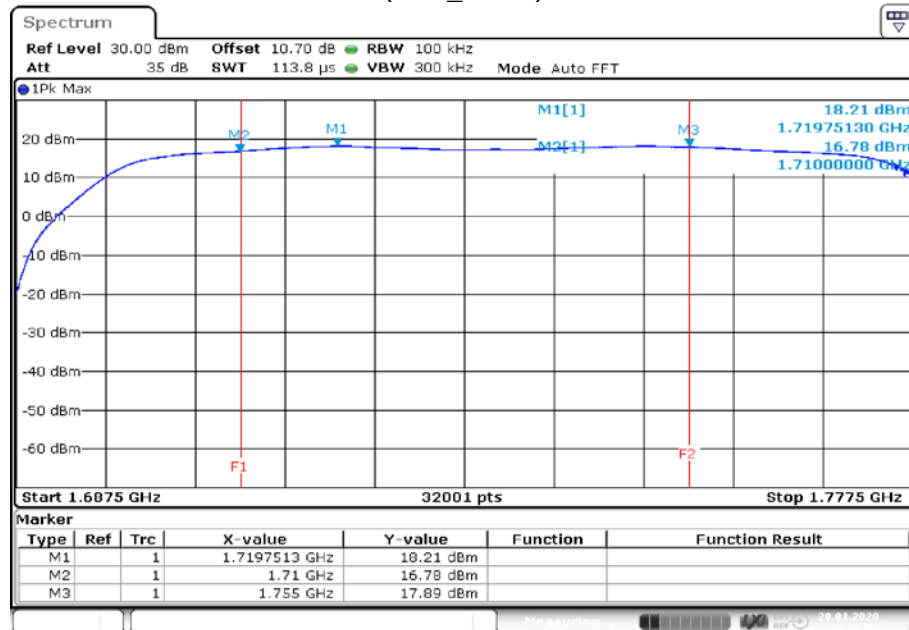
Frequency Band = Band 13, Direction = Downlink  
(S01\_AA01)



Frequency Band = Band 2, Direction = Uplink  
(S01\_AA01)

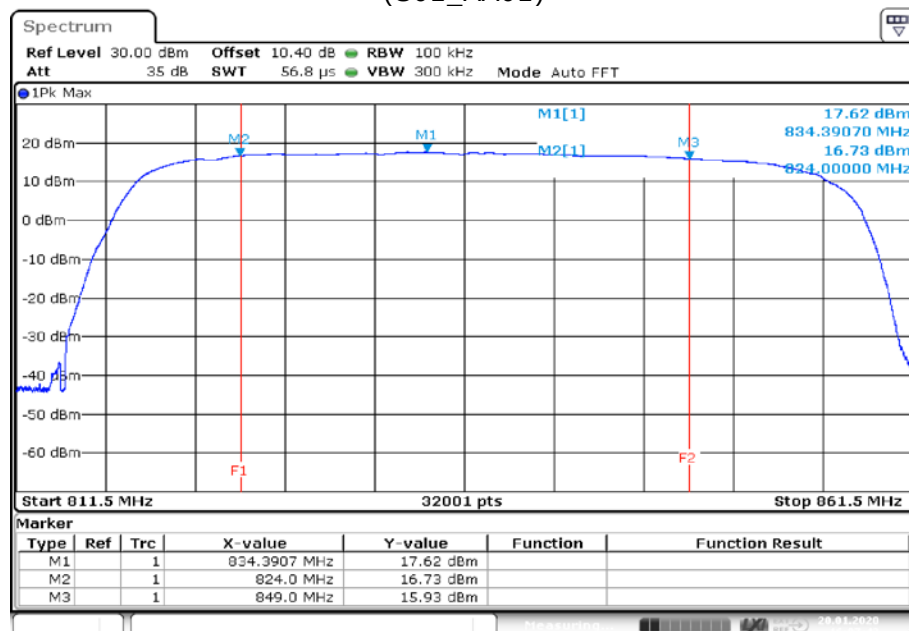


Frequency Band = Band 4, Direction = Uplink  
(S01\_AA01)



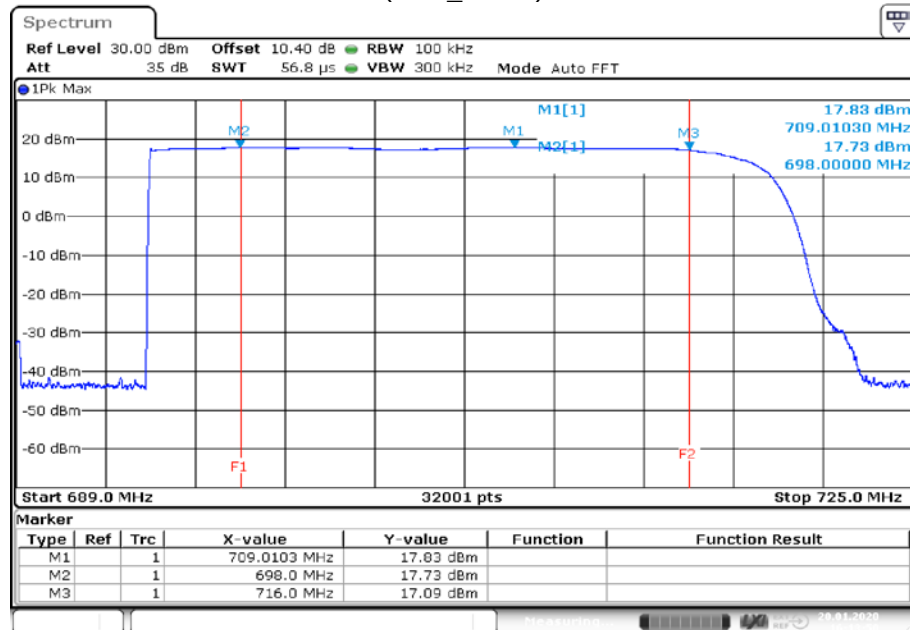
Date: 20.JAN.2020 16:00:55

Frequency Band = Band 5, Direction = Uplink  
(S01\_AA01)



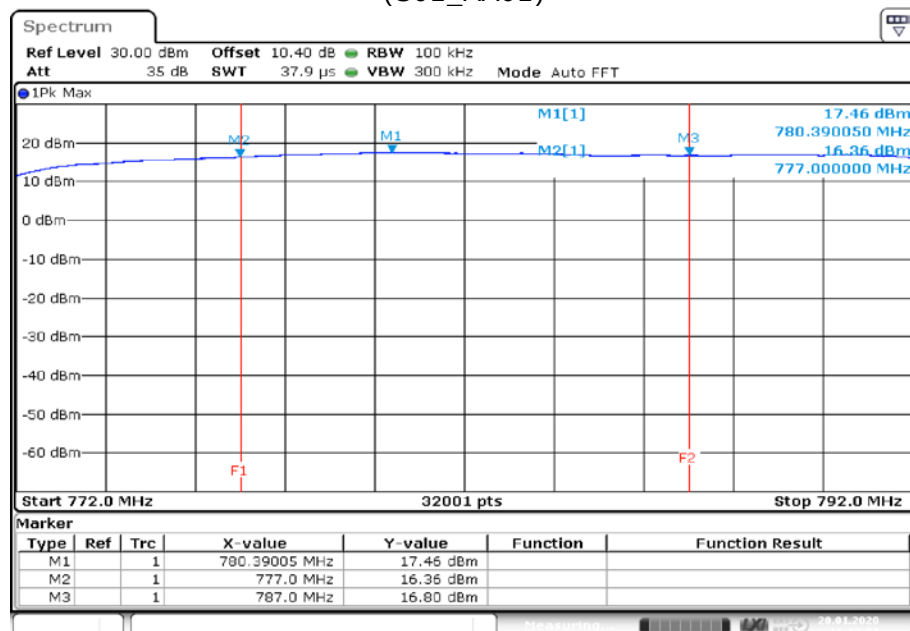
Date: 20.JAN.2020 16:07:42

Frequency Band = Band 12, Direction = Uplink  
(S01\_AA01)



Date: 20.JAN.2020 16:13:50

Frequency Band = Band 13, Direction = Uplink  
(S01\_AA01)



Date: 20.JAN.2020 16:17:58

### 5.1.5 TEST EQUIPMENT USED

- R&S TS8997

## 5.2 MAXIMUM POWER

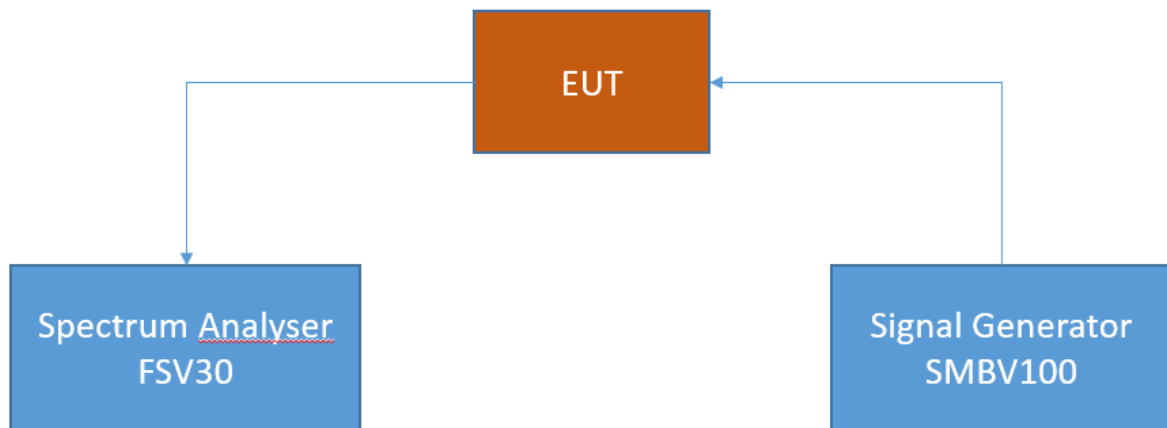
Standard

**The test was performed according to:**  
KDB 935210 D03

### 5.2.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster power limits and requirements as specified in §§ 20.21(e)(8)(i)(D) and 20.21(e)(8)(i)(B) for wideband consumer signal boosters.

The EUT was connected to the test setup according to the following diagram:



### FCC Part 20.21; Consumer Signal Booster – Test Setup 7.2; Maximum Power

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

### 5.2.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(D)

*Power Limits.* A booster's uplink power must not exceed 1 watt composite conducted power and equivalent isotropic radiated power (EIRP) for each band of operation. Composite downlink power shall not exceed 0.05 watt (17 dBm) conducted and EIRP for each band of operation. Compliance with power limits will use instrumentation calibrated in terms of RMS equivalent voltage.

FCC Part 20, § 20.21(e)(8)(i)(B)

**Bidirectional Capability.** Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.05 watts. One-way consumer boosters (*i.e.*, uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering may be used provided the uplink filter attenuation is not less than the downlink filter attenuation, and where RSSI is measured after spectrum block filtering is applied referenced to the booster's input port for each band of operation.

### 5.2.3 TEST PROTOCOL

Ambient temperature: 25 °C  
Air Pressure: 1036 hPa  
Humidity: 34 %

Band 2, downlink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 1951.090        | -20.0                       | 0.4                        | 0.4                        | ---                            | 17.0                           | ---                        | 16.6                       |
| AWGN        | 1951.090        | -23.0                       | -1.8                       | -1.0                       | ---                            | 17.0                           | ---                        | 18.0                       |

Band 4, downlink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 2110.411        | -20.0                       | 0.0                        | 0.0                        | ---                            | 17.0                           | ---                        | 17.0                       |
| AWGN        | 2110.411        | -23.9                       | -2.8                       | -2.1                       | ---                            | 17.0                           | ---                        | 19.1                       |

Band 5, downlink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 875.750         | -20.0                       | 0.5                        | 0.5                        | ---                            | 17.0                           | ---                        | 16.5                       |
| AWGN        | 875.750         | -23.4                       | -1.5                       | -1.3                       | ---                            | 17.0                           | ---                        | 18.3                       |

Band 12, downlink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 745.930         | -20.0                       | 0.6                        | 0.6                        | ---                            | 17.0                           | ---                        | 16.4                       |
| AWGN        | 745.930         | -21.7                       | 0.5                        | 0.6                        | ---                            | 17.0                           | ---                        | 16.4                       |

Band 13, downlink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 752.580         | -20.0                       | 1.0                        | 1.0                        | ---                            | 17.0                           | ---                        | 16.0                       |
| AWGN        | 752.580         | -22.2                       | 0.2                        | 0.3                        | ---                            | 17.0                           | ---                        | 16.7                       |

Band 2, uplink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 1865.870        | 2.6                         | 21.0                       | 21.5                       | 17.0                           | 30.0                           | 4.0                        | 8.5                        |
| AWGN        | 1865.870        | -1.9                        | 19.7                       | 19.8                       | 17.0                           | 30.0                           | 2.7                        | 10.2                       |

Band 4, uplink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 1719.751        | 0.9                         | 21.3                       | 21.6                       | 17.0                           | 30.0                           | 4.3                        | 8.4                        |
| AWGN        | 1719.751        | -2.1                        | 19.9                       | 20.0                       | 17.0                           | 30.0                           | 2.9                        | 10.0                       |

Band 5, uplink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 834.391         | 3.6                         | 20.6                       | 22.0                       | 17.0                           | 30.0                           | 3.6                        | 8.0                        |
| AWGN        | 834.391         | -1.3                        | 19.8                       | 19.9                       | 17.0                           | 30.0                           | 2.8                        | 10.1                       |

Band 12, uplink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 709.010         | 4.1                         | 21.8                       | 21.9                       | 17.0                           | 30.0                           | 4.8                        | 8.1                        |
| AWGN        | 709.010         | -1.8                        | 19.8                       | 20.0                       | 17.0                           | 30.0                           | 2.8                        | 10.0                       |

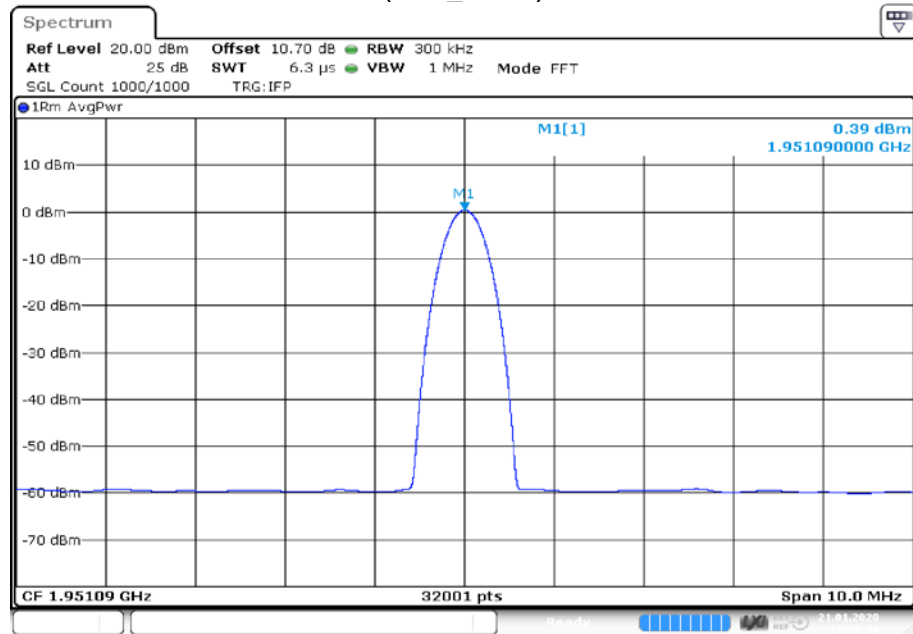
Band 13, uplink

| Signal Type | Frequency [MHz] | AGC Start Input Power [dBm] | Minimum Output Power [dBm] | Maximum Output Power [dBm] | Lower Limit Output Power [dBm] | Upper Limit Output Power [dBm] | Margin to Lower Limit [dB] | Margin to Upper Limit [dB] |
|-------------|-----------------|-----------------------------|----------------------------|----------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|
| Pulsed CW   | 780.390         | 4.1                         | 21.6                       | 21.8                       | 17.0                           | 30.0                           | 4.6                        | 8.2                        |
| AWGN        | 780.390         | -2.4                        | 19.7                       | 19.7                       | 17.0                           | 30.0                           | 2.7                        | 10.3                       |

Remark: Please see next sub-clause for the measurement plot.

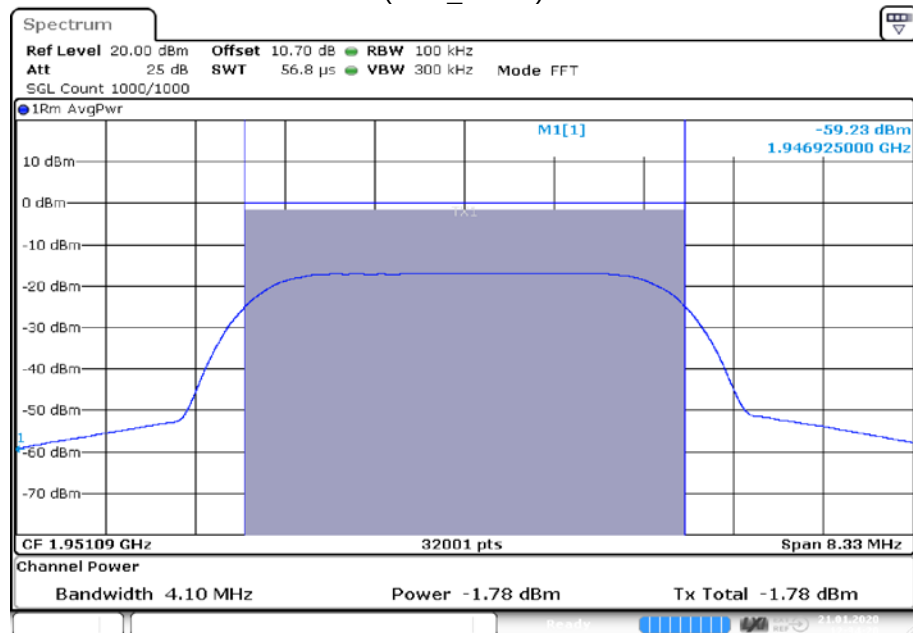
#### 5.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Frequency Band = Band 2, Direction = Downlink, Signal Type = Pulsed CW  
(S01\_AA01)

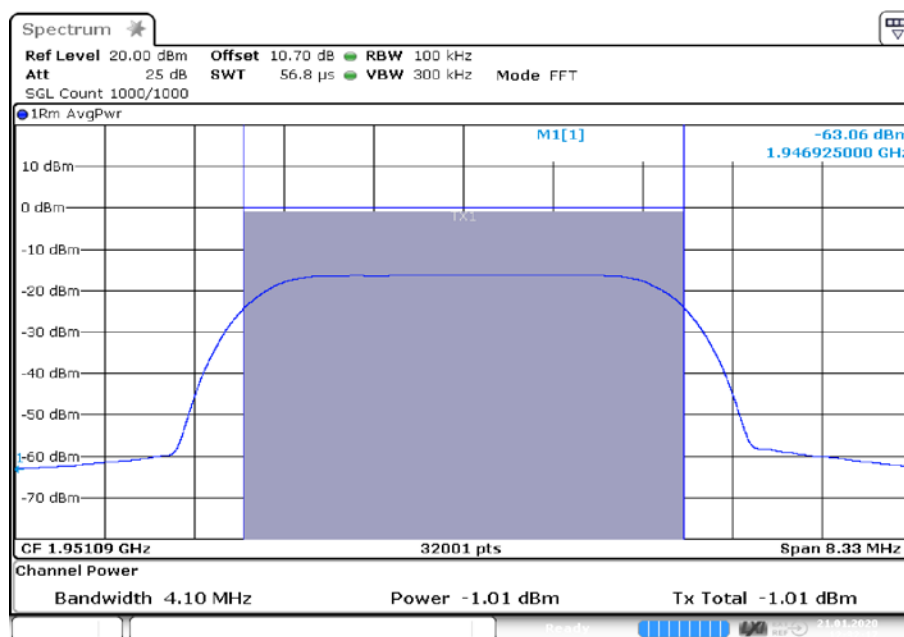


Date: 21.JAN.2020 12:36:05

Frequency Band = Band 2, Direction = Downlink, Signal Type = AWGN  
(S01\_AA01)

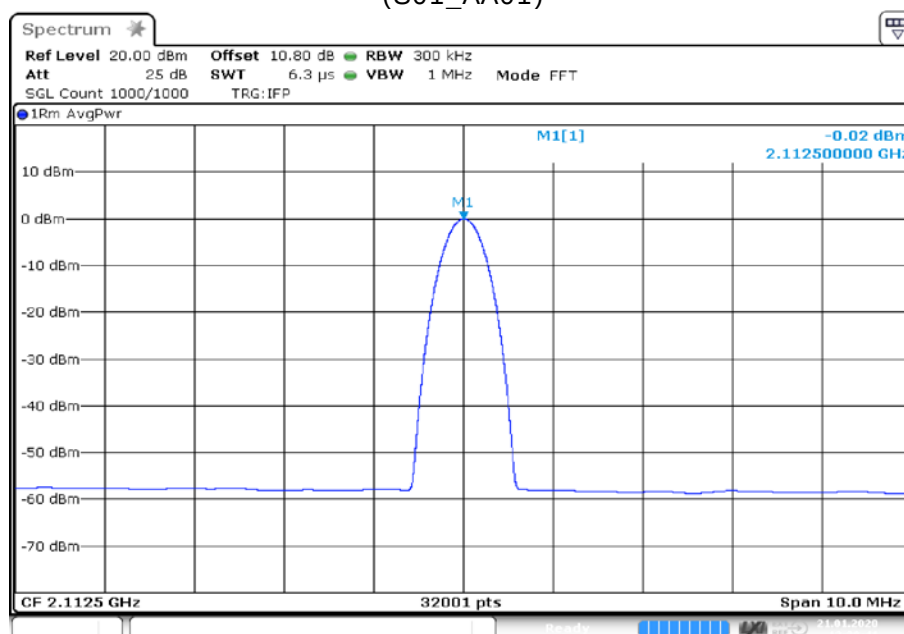


Date: 21.JAN.2020 12:34:19



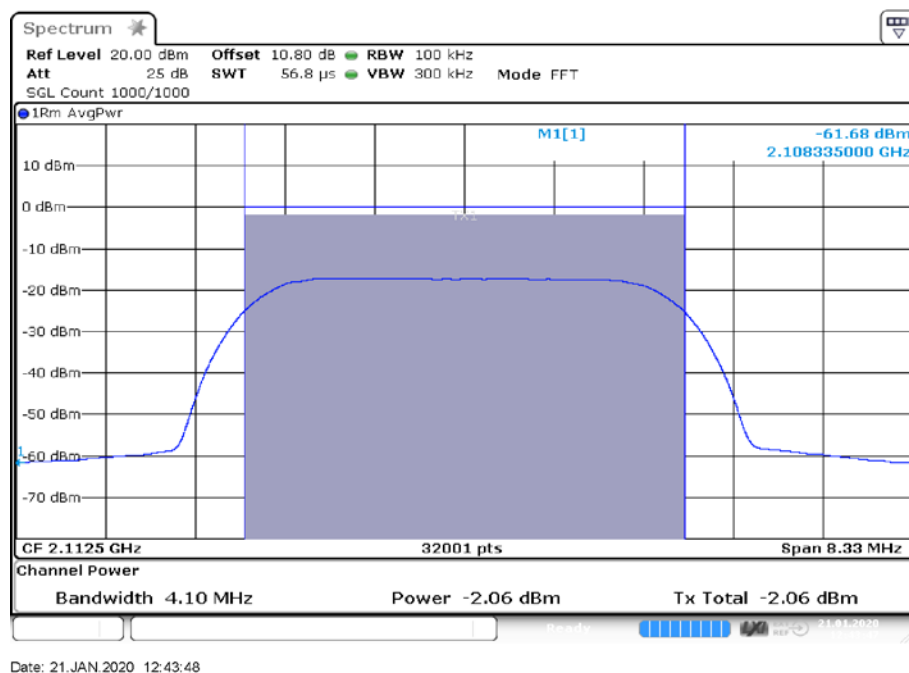
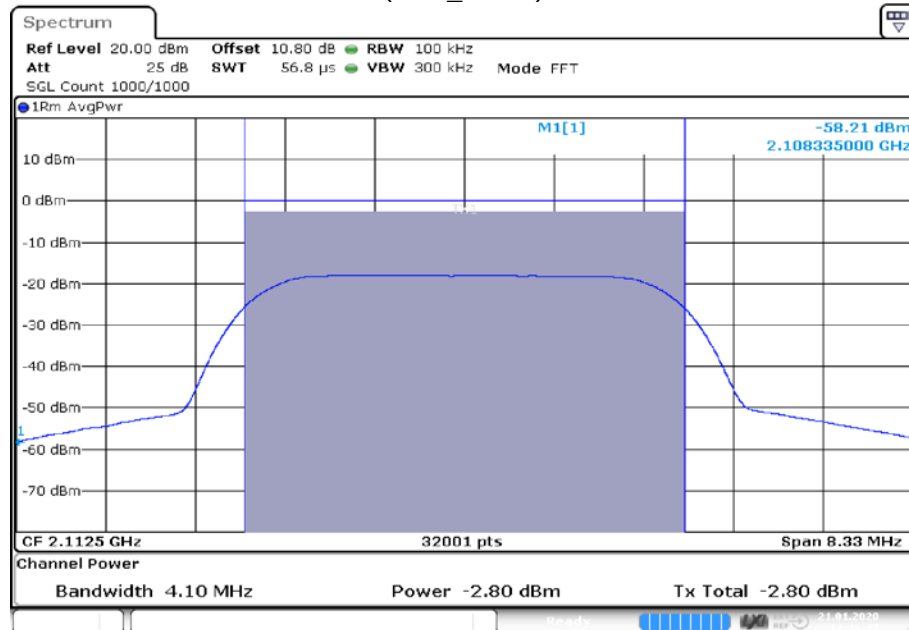
Date: 21.JAN.2020 12:32:17

Frequency Band = Band 4, Direction = Downlink, Signal Type = Pulsed CW  
(S01\_AA01)

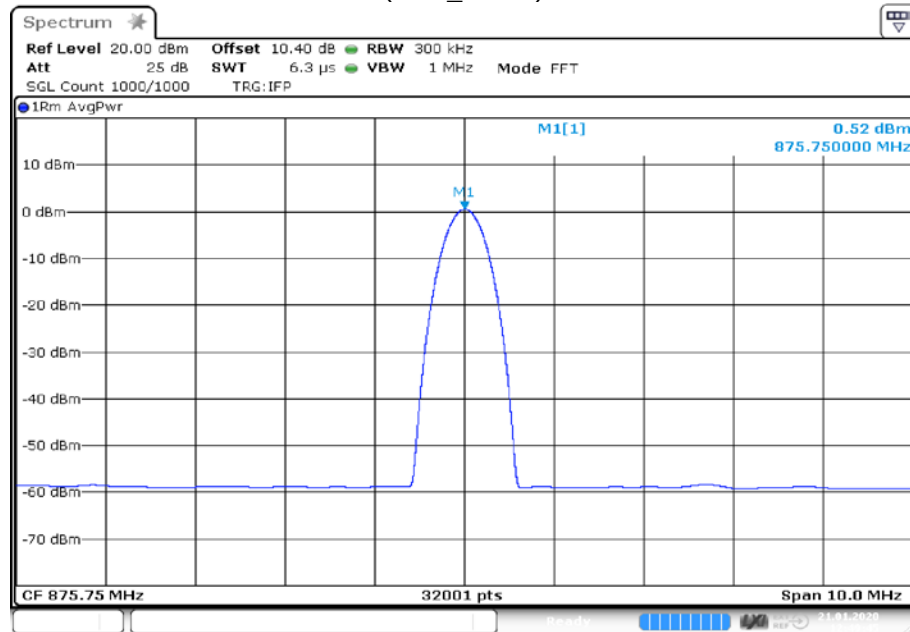


Date: 21.JAN.2020 12:39:42

Frequency Band = Band 4, Direction = Downlink, Signal Type = AWGN  
(S01\_AA01)

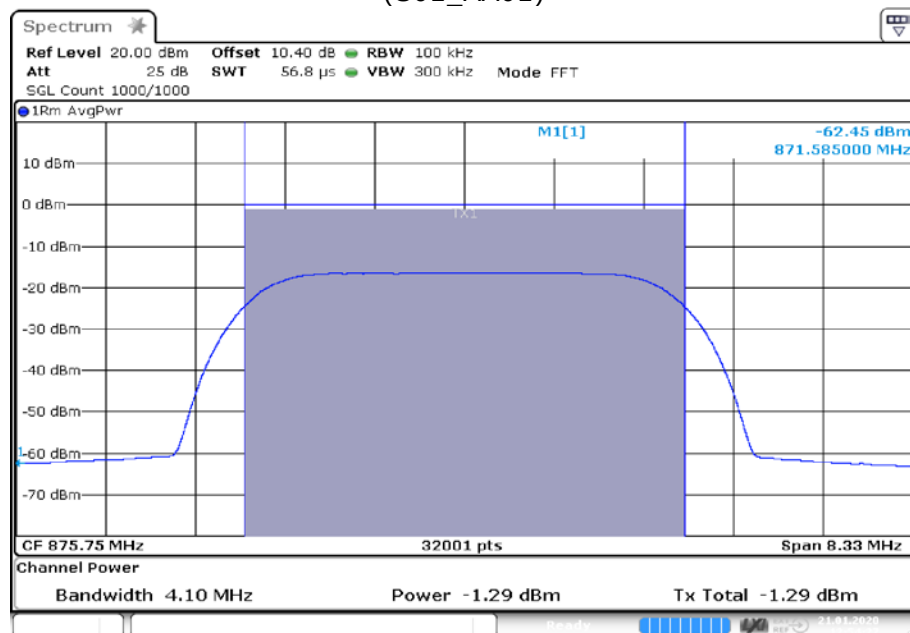


Frequency Band = Band 5, Direction = Downlink, Signal Type = Pulsed CW  
(S01\_AA01)

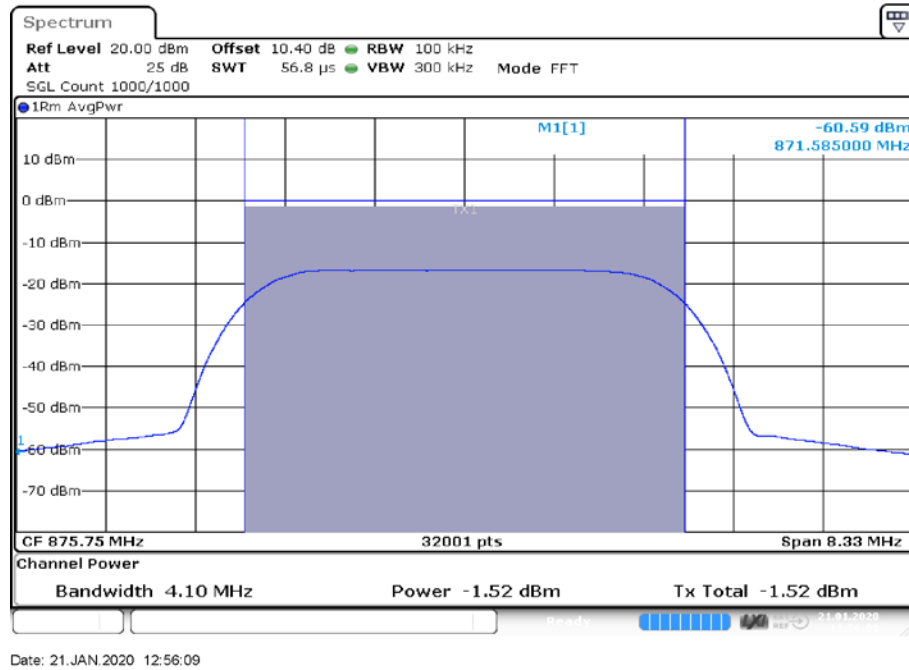


Date: 21.JAN.2020 12:49:46

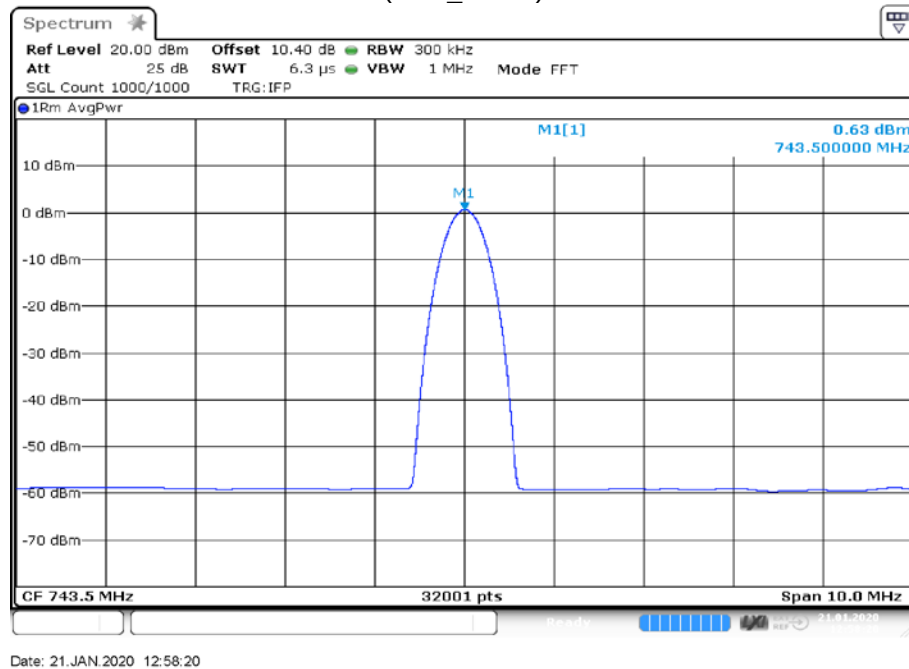
Frequency Band = Band 5, Direction = Downlink, Signal Type = AWGN  
(S01\_AA01)



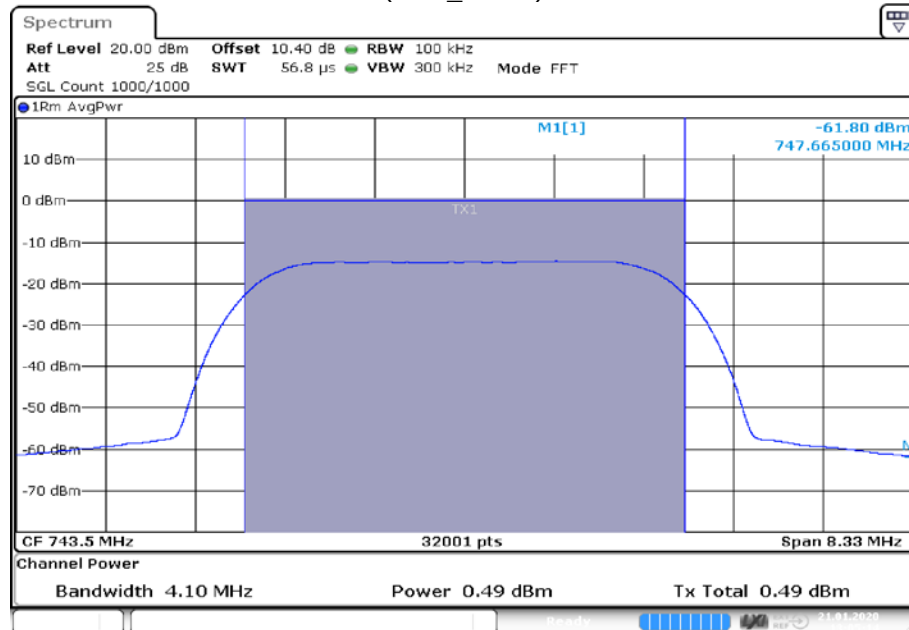
Date: 21.JAN.2020 12:54:28



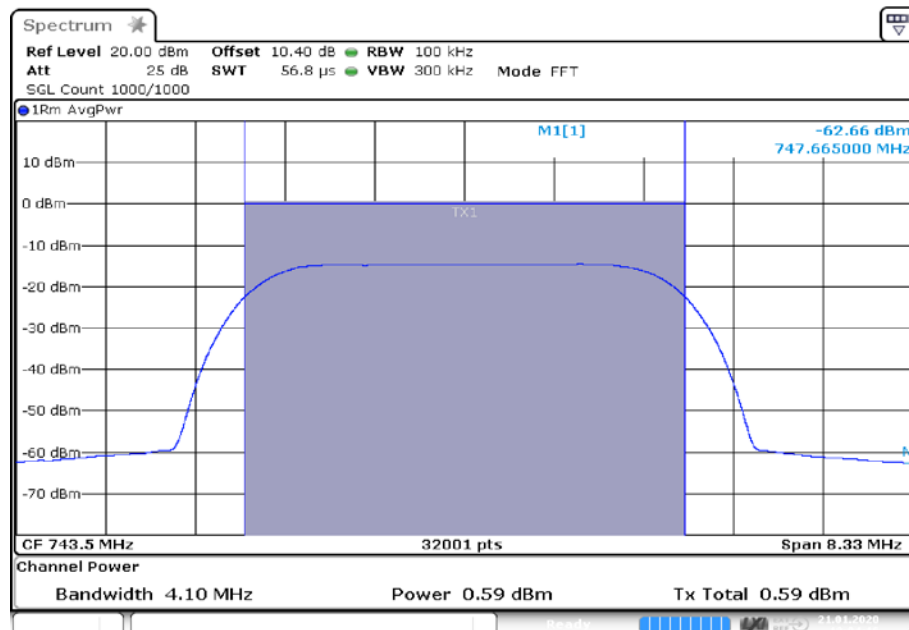
Frequency Band = Band 12, Direction = Downlink, Signal Type = Pulsed CW  
 (S01\_AA01)



Frequency Band = Band 12, Direction = Downlink, Signal Type = AWGN  
(S01\_AA01)

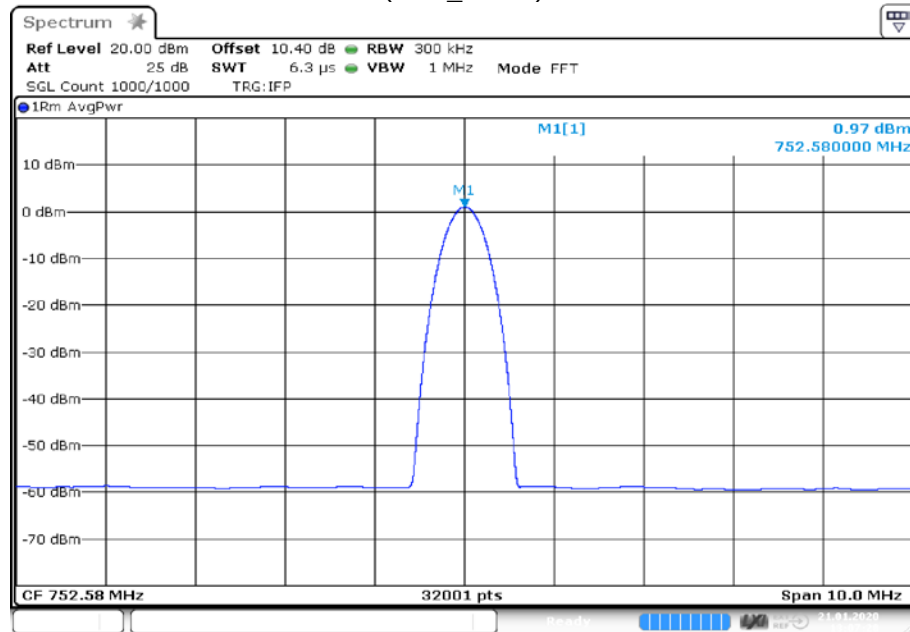


Date: 21.JAN.2020 13:05:14



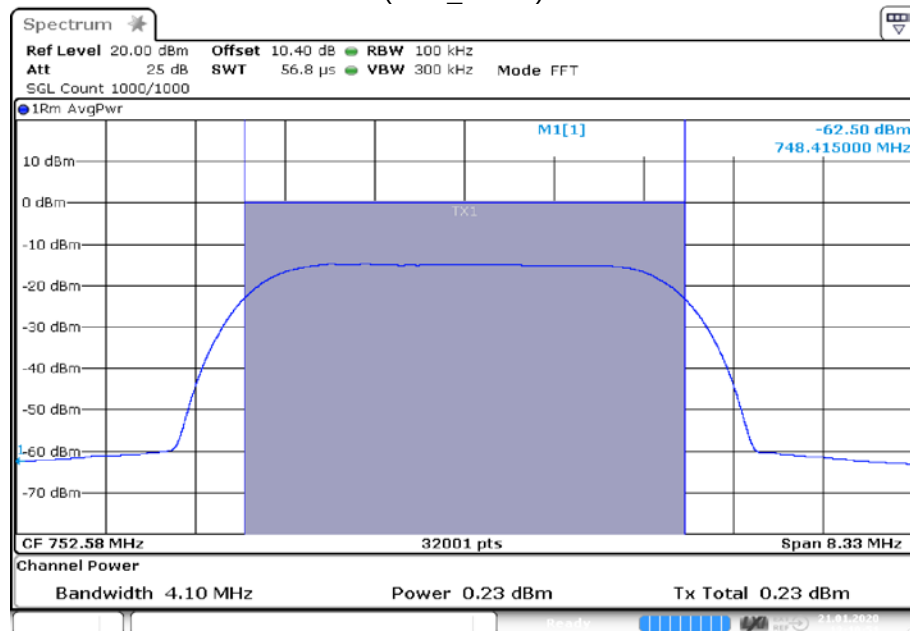
Date: 21.JAN.2020 13:04:17

Frequency Band = Band 13, Direction = Downlink, Signal Type = Pulsed CW  
(S01\_AA01)

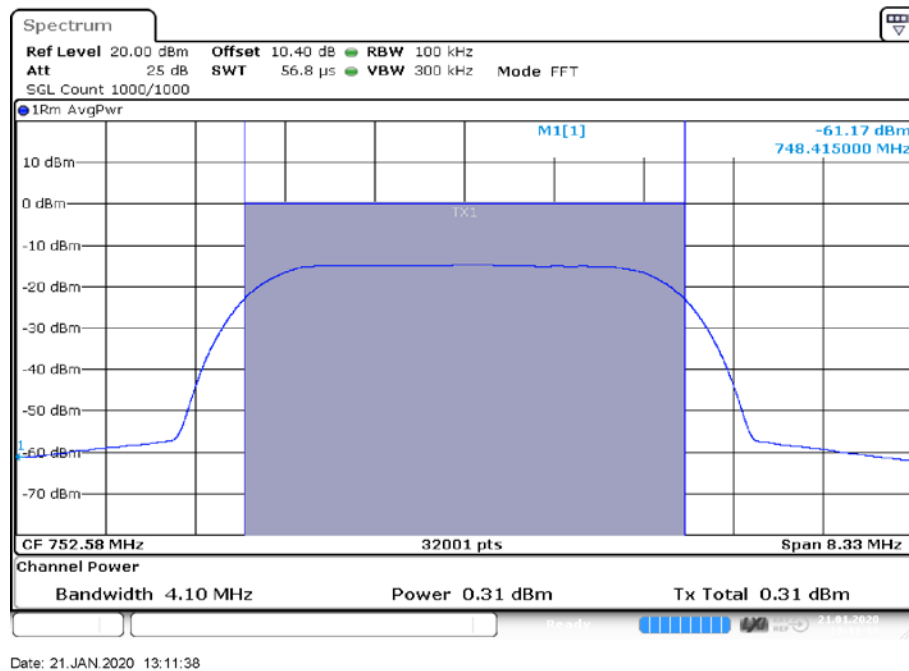


Date: 21.JAN.2020 13:07:29

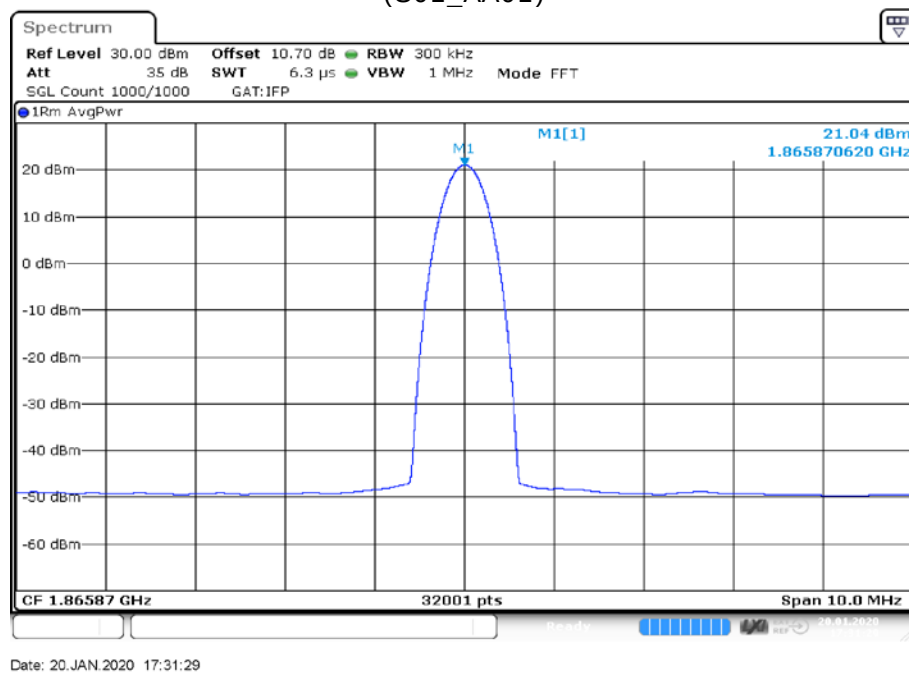
Frequency Band = Band 13, Direction = Downlink, Signal Type = AWGN  
(S01\_AA01)

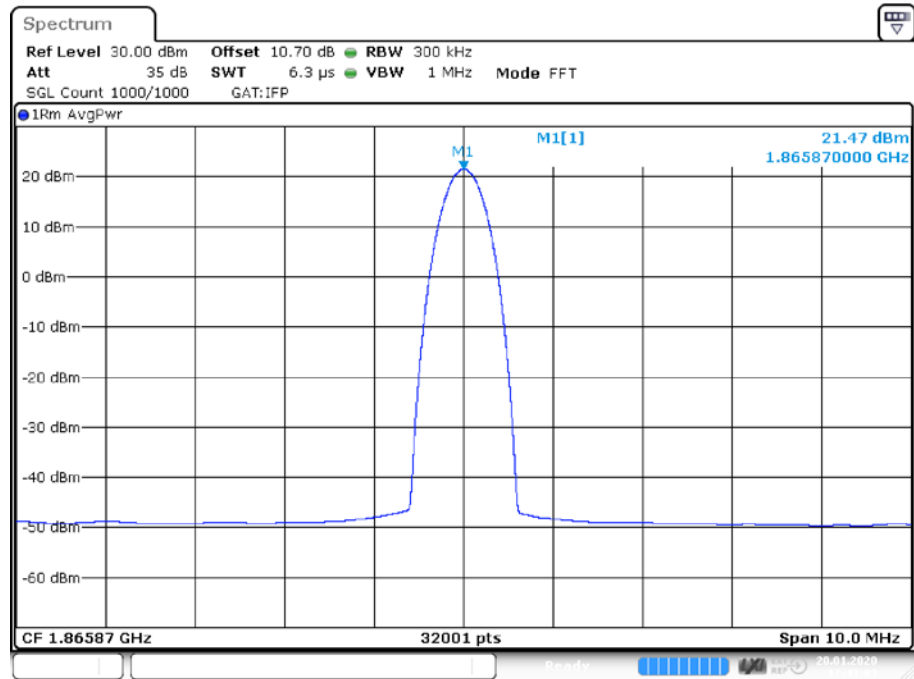


Date: 21.JAN.2020 13:10:52

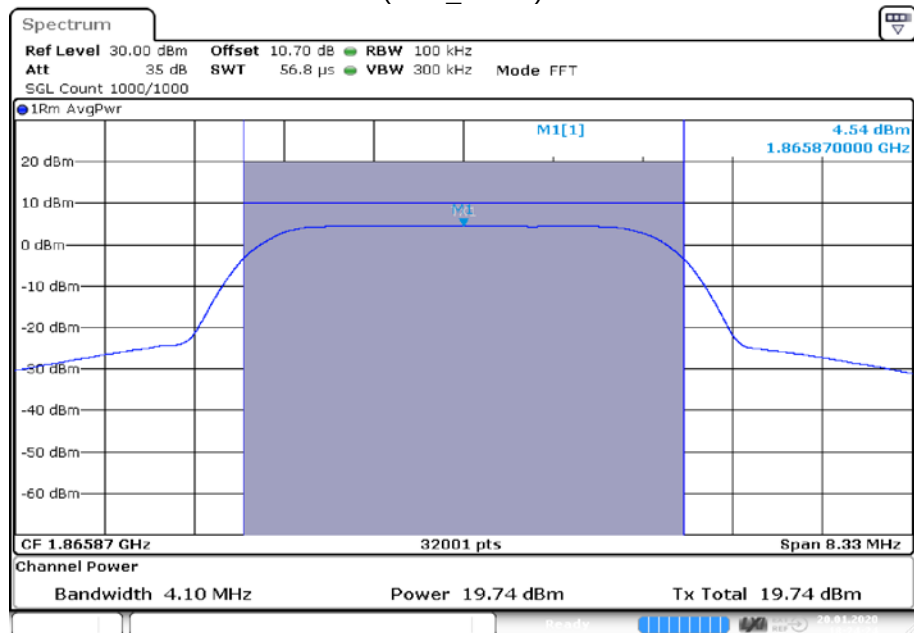


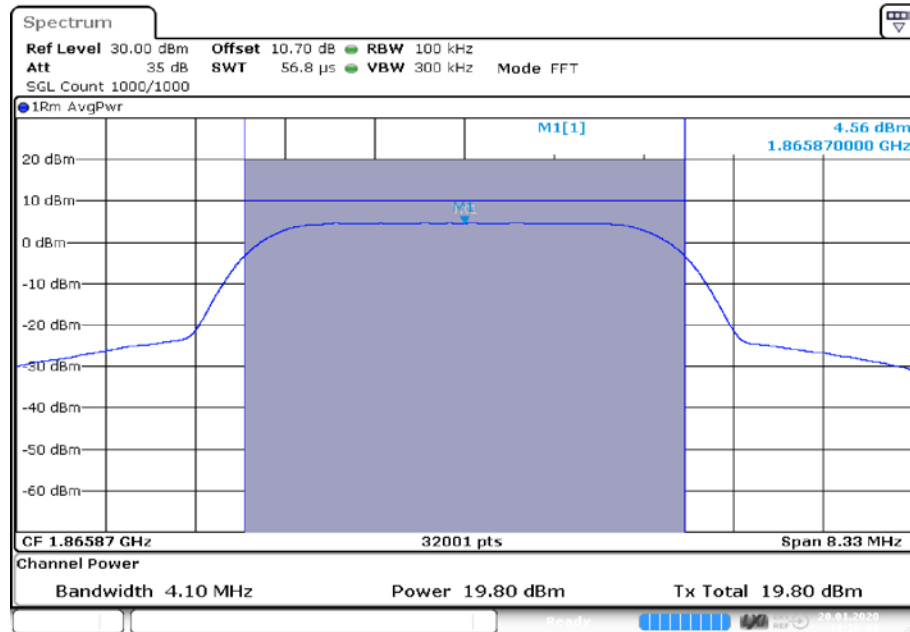
Frequency Band = Band 2, Direction = Uplink, Signal Type = Pulsed CW  
(S01\_AA01)





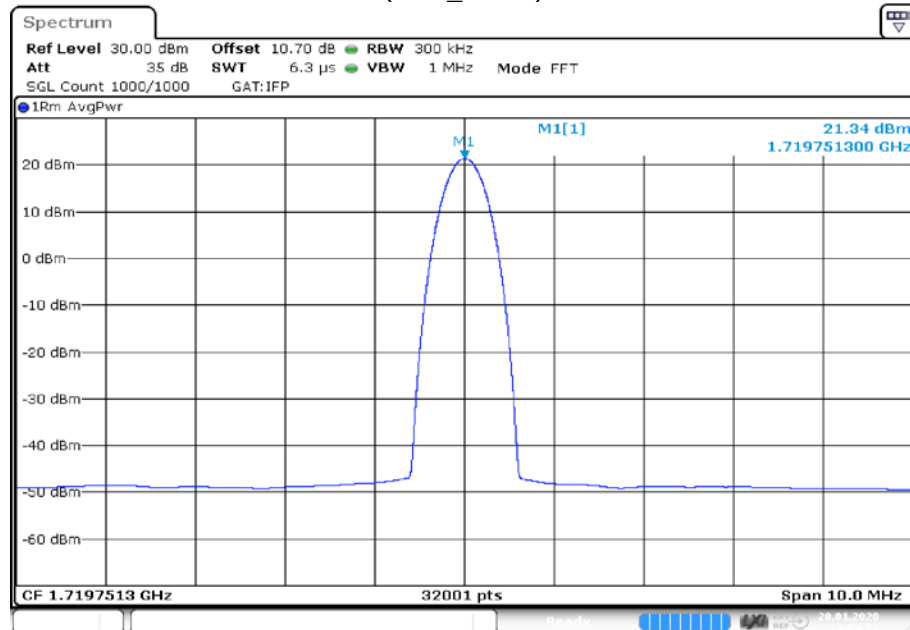
Frequency Band = Band 2, Direction = Uplink, Signal Type = AWGN  
 (S01\_AA01)



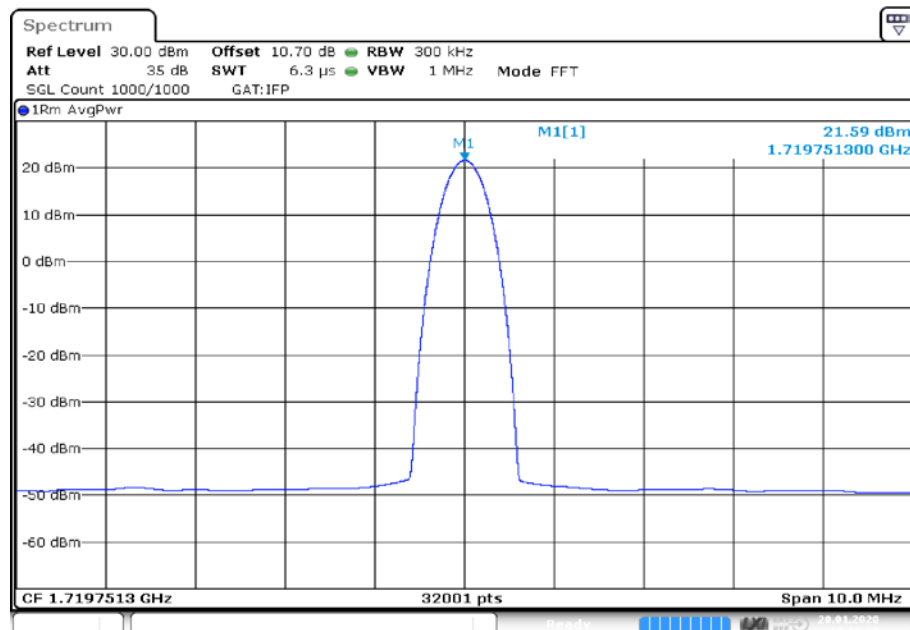


Date: 20. JAN 2020 18:20:08

Frequency Band = Band 4, Direction = Uplink, Signal Type = Pulsed CW  
(S01\_AA01)

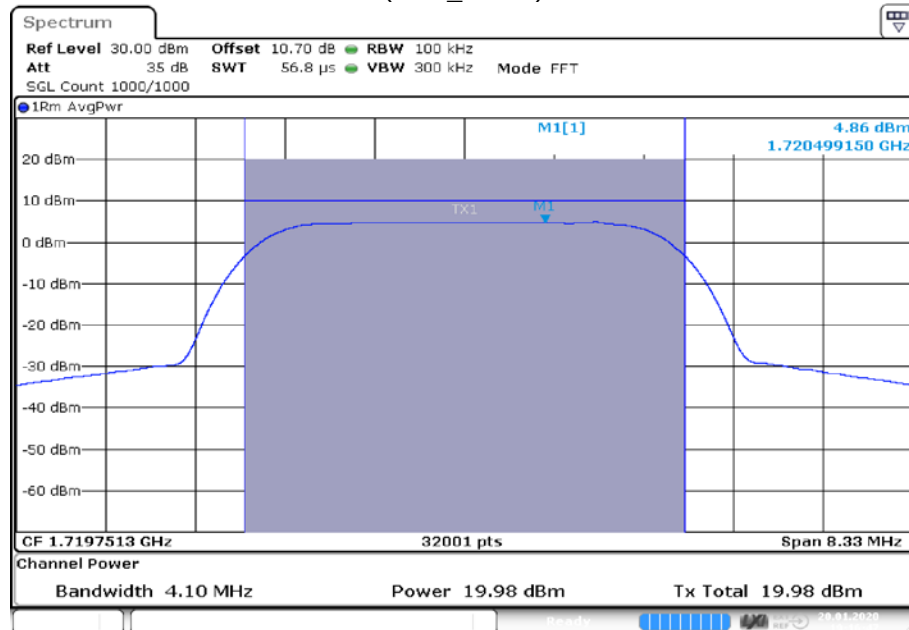


Date: 20.JAN.2020 19:04:28

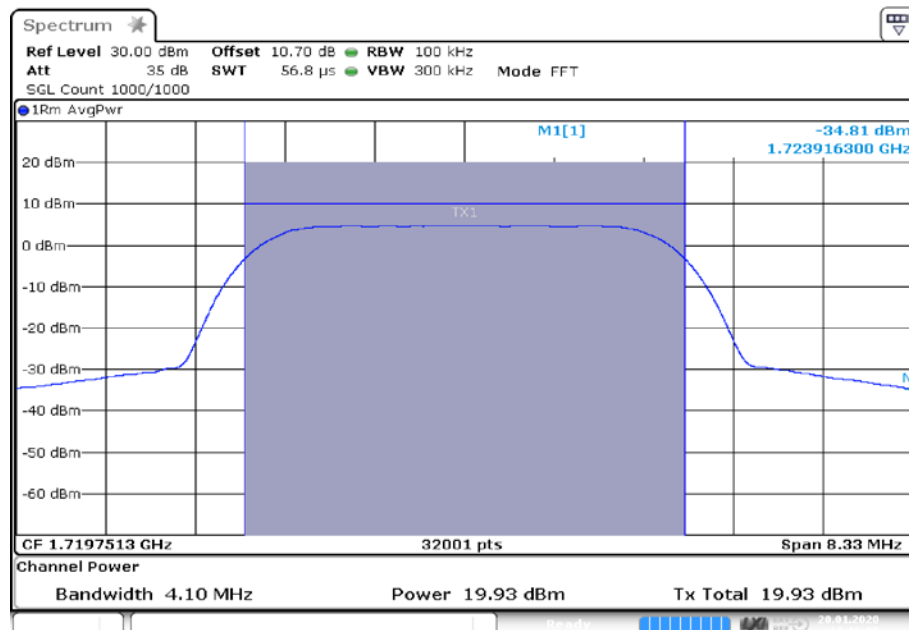


Date: 20.JAN.2020 19:06:12

Frequency Band = Band 4, Direction = Uplink, Signal Type = AWGN  
(S01\_AA01)

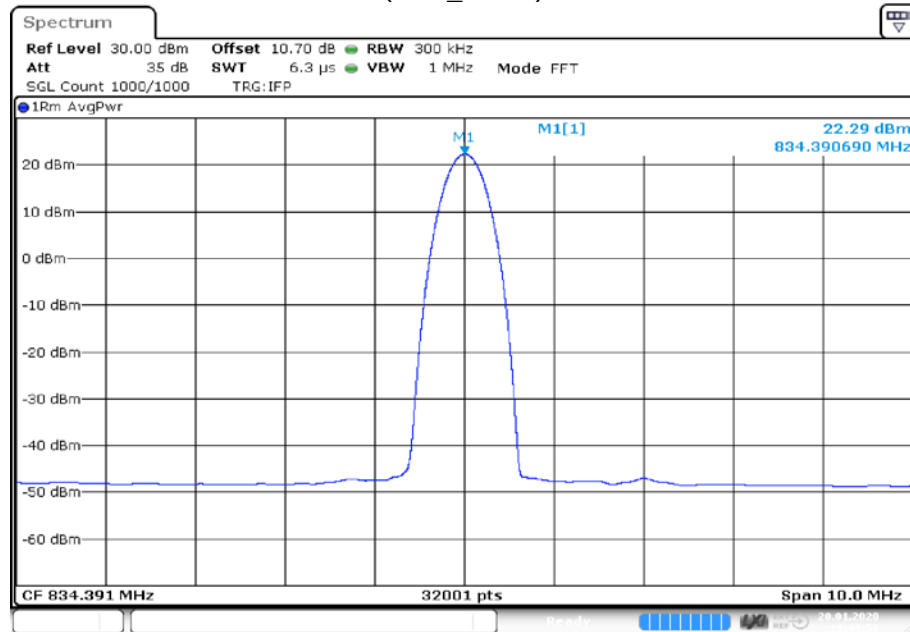


Date: 20.JAN.2020 19:16:47



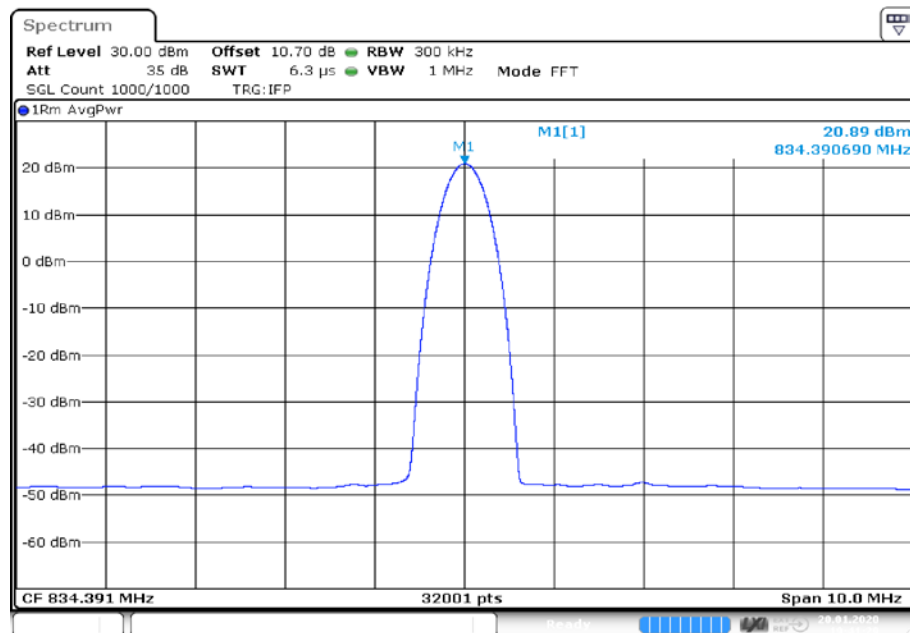
Date: 20.JAN.2020 19:16:05

Frequency Band = Band 5, Direction = Uplink, Signal Type = Pulsed CW  
(S01\_AA01)



Date: 20.JAN.2020 19:43:57

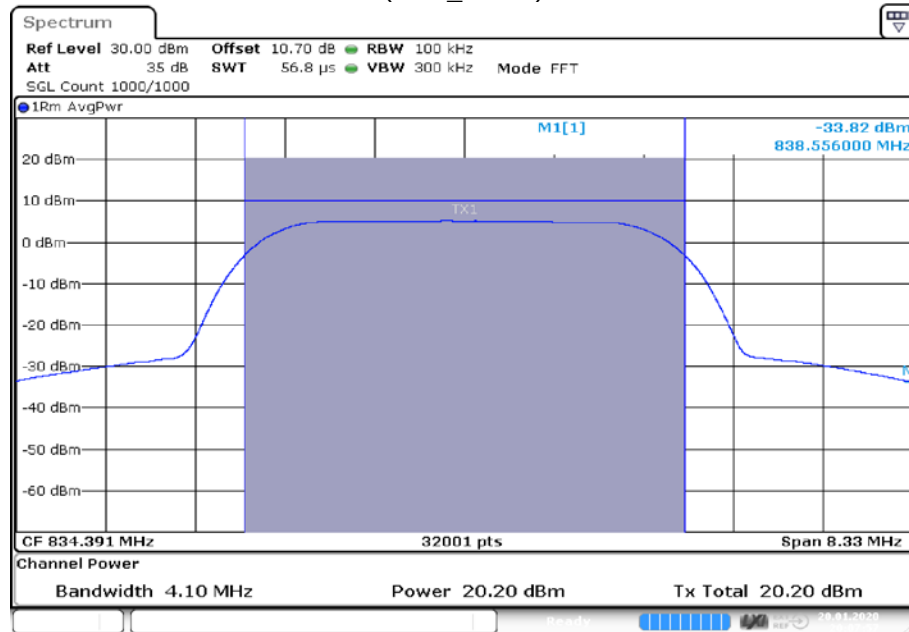
Note: Wrong offset, actual value is 0.3 dB lower



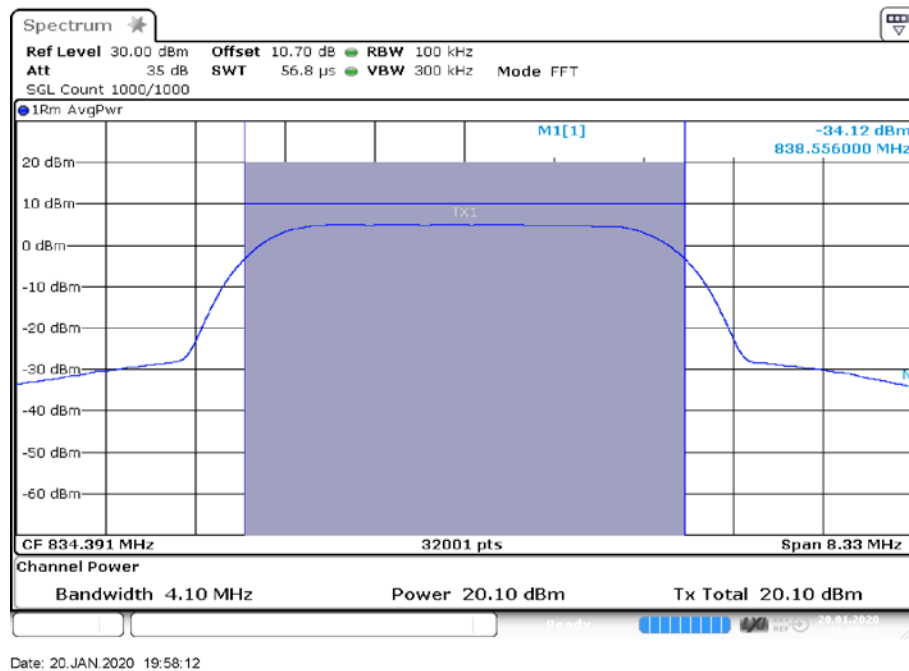
Date: 20.JAN.2020 19:41:29

Note: Wrong offset, actual value is 0.3 dB lower

Frequency Band = Band 5, Direction = Uplink, Signal Type = AWGN  
(S01\_AA01)

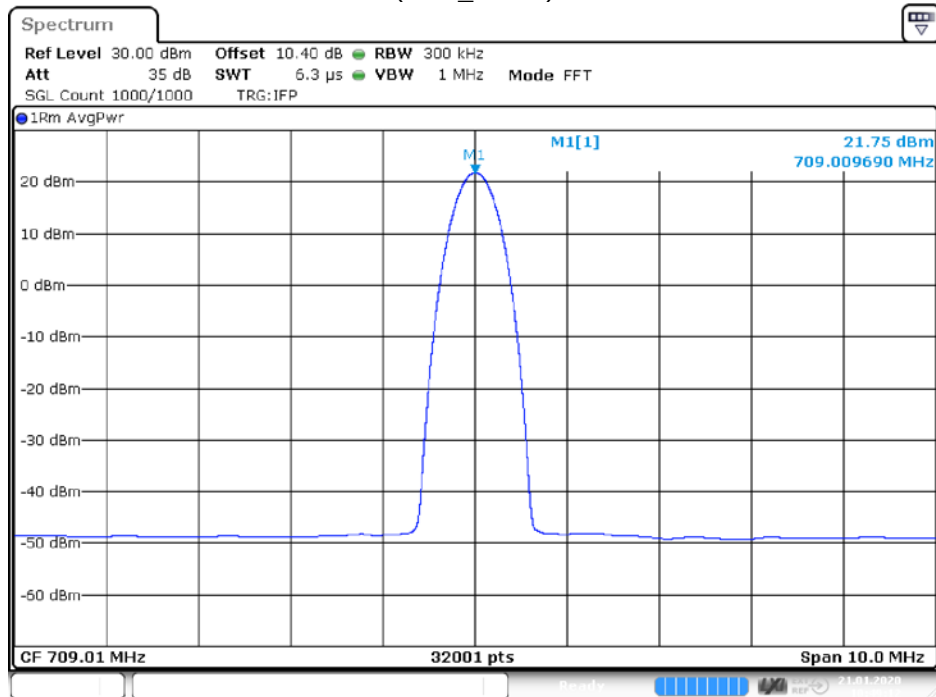


Note: Wrong offset, actual value is 0.3 dB lower

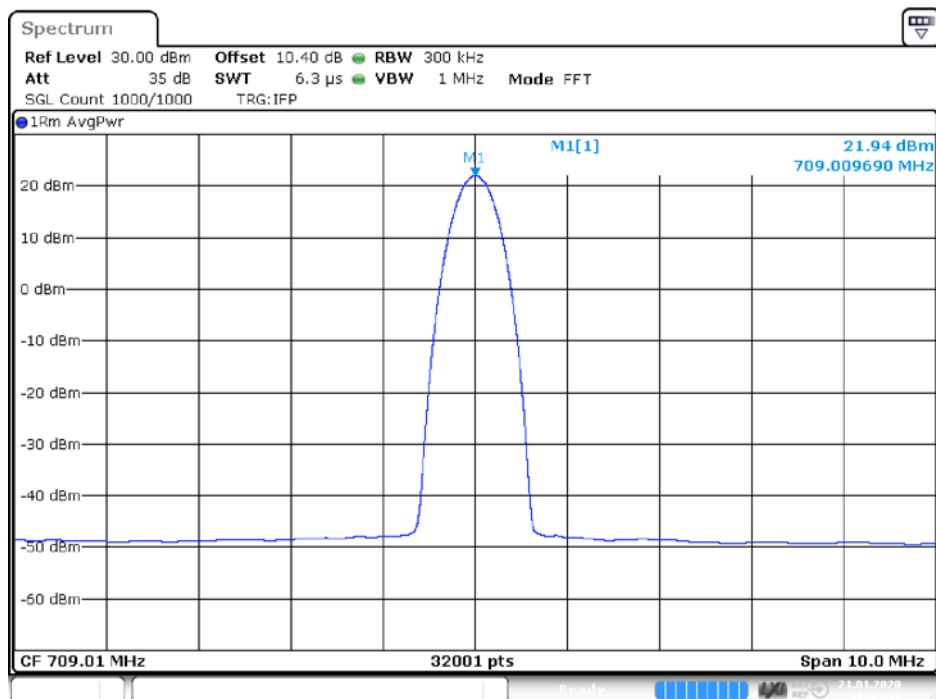


Note: Wrong offset, actual value is 0.3 dB lower

Frequency Band = Band 12, Direction = Uplink, Signal Type = Pulsed CW  
(S01\_AA01)

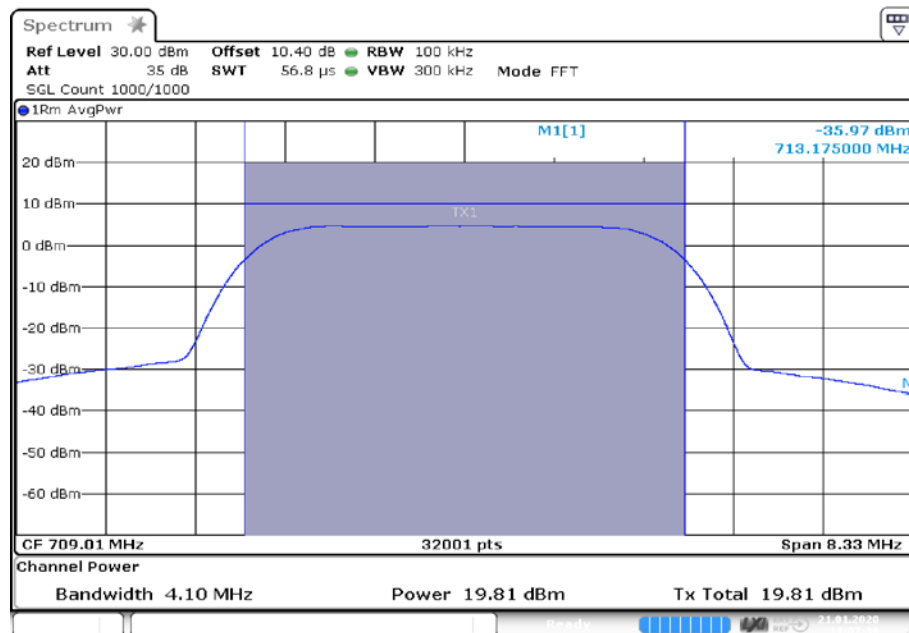
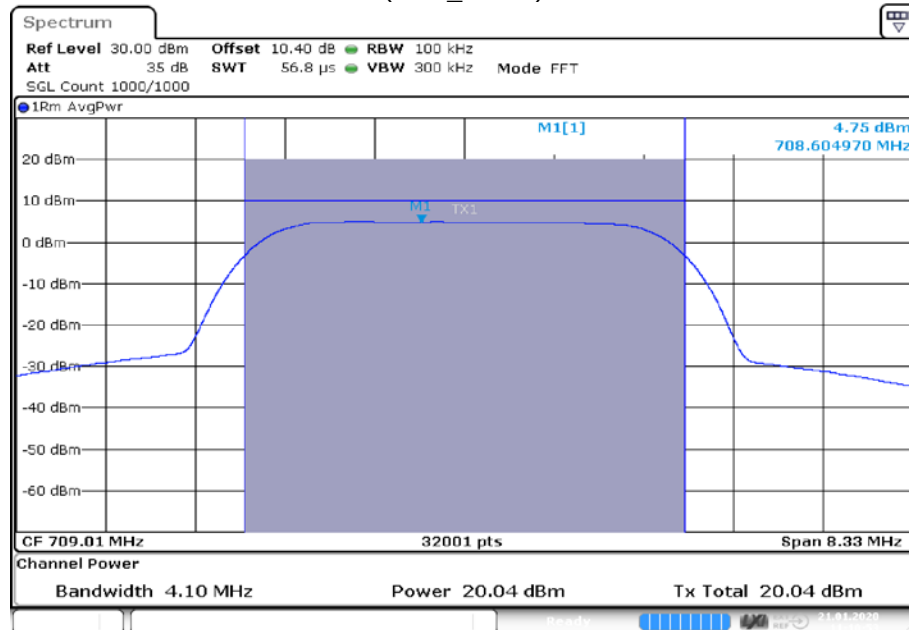


Date: 21.JAN.2020 10:49:13

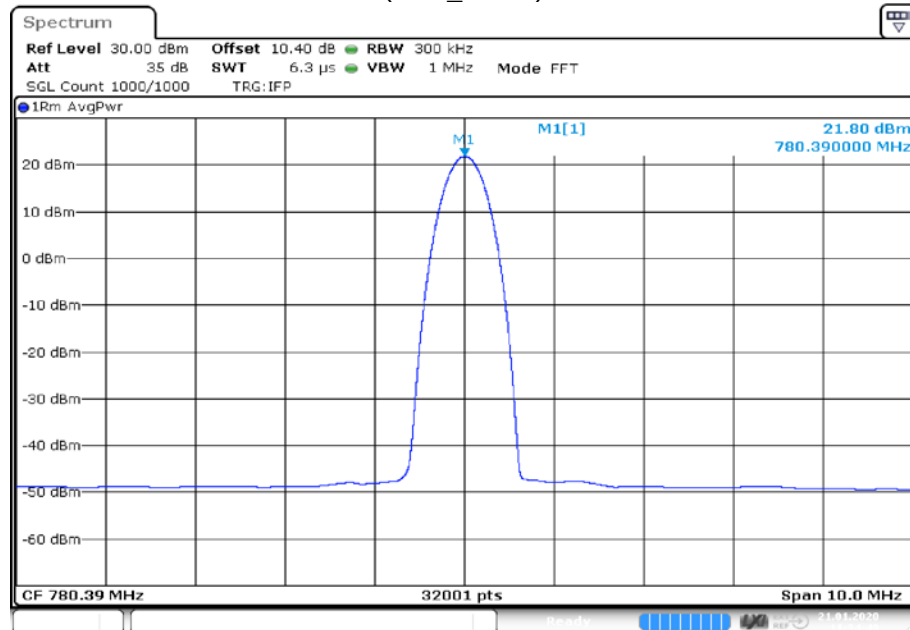


Date: 21.JAN.2020 10:53:37

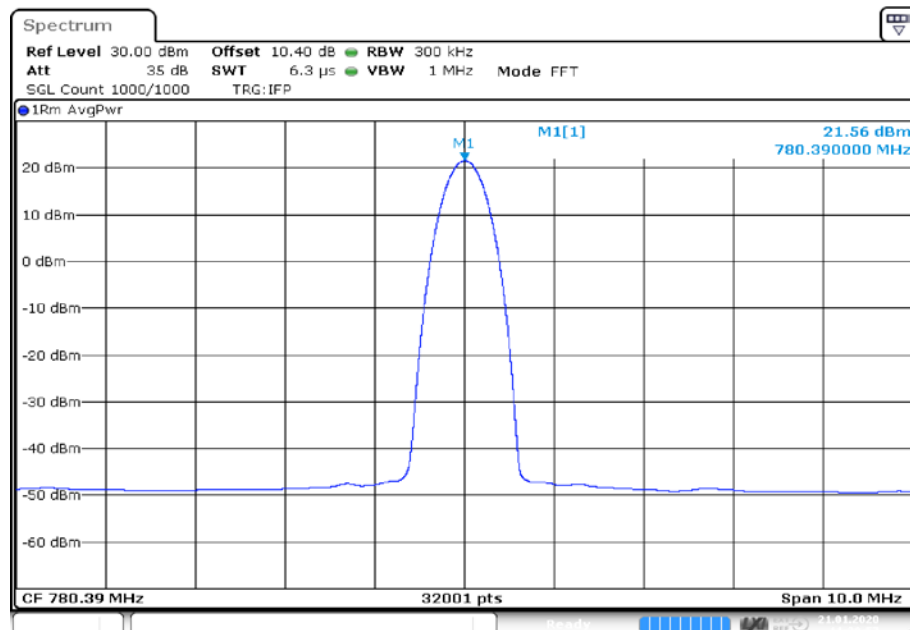
Frequency Band = Band 12, Direction = Uplink, Signal Type = AWGN  
(S01\_AA01)



Frequency Band = Band 13, Direction = Uplink, Signal Type = Pulsed CW  
(S01\_AA01)

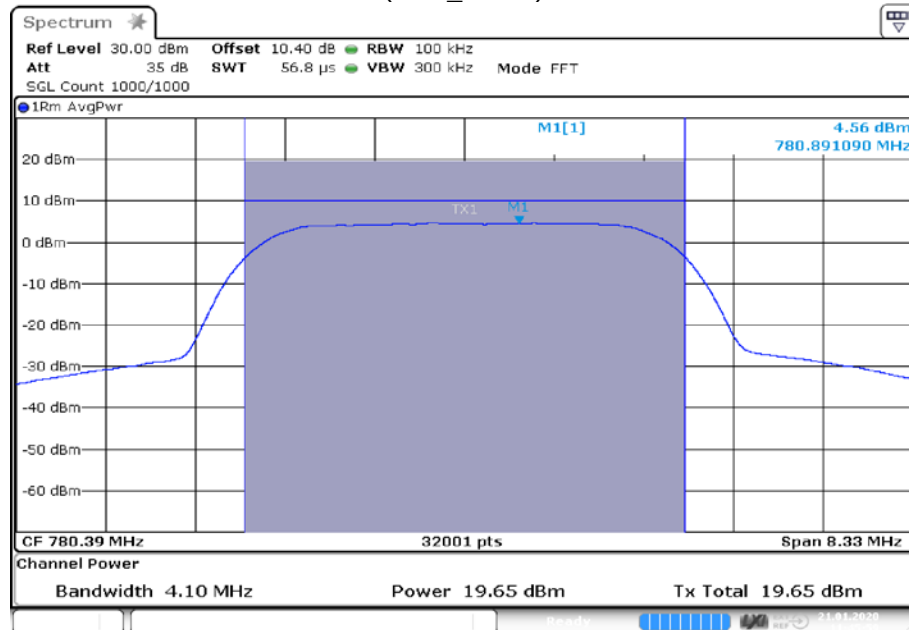


Date: 21.JAN.2020 11:34:50

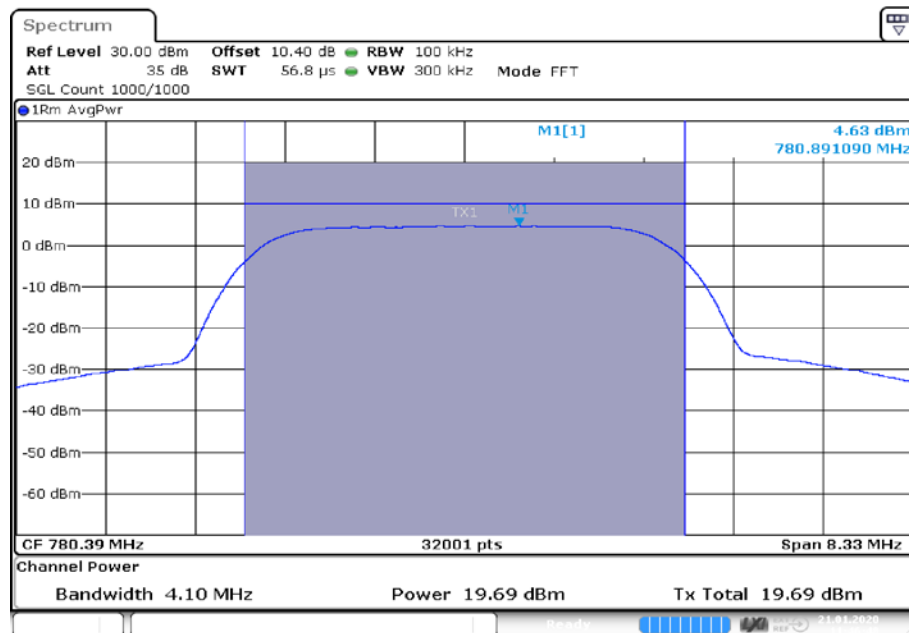


Date: 21.JAN.2020 11:39:57

Frequency Band = Band 13, Direction = Uplink, Signal Type = AWGN  
(S01\_AA01)



Date: 21.JAN.2020 11:46:00



Date: 21.JAN.2020 11:46:48

## 5.2.5 TEST EQUIPMENT USED

- R&S TS8997

### 5.3 MAXIMUM BOOSTER GAIN

Standard

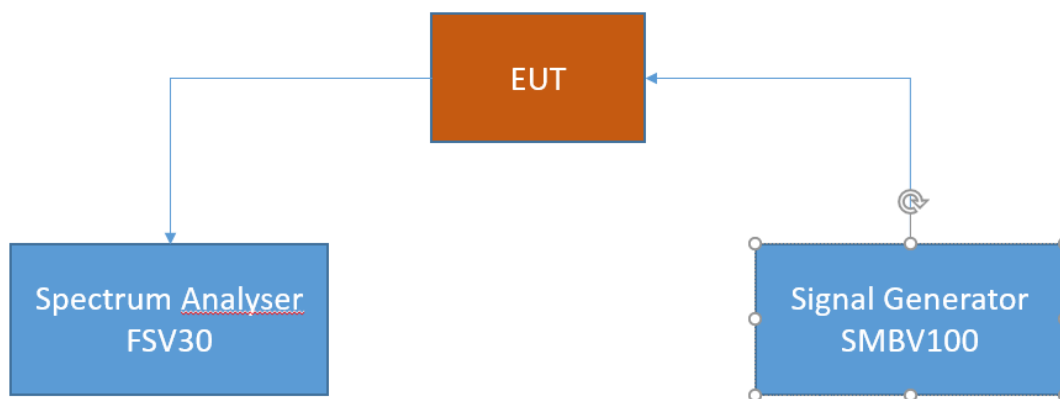
**The test was performed according to:**  
KDB 935210 D03

#### 5.3.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster gain limits and bidirectional capabilities as specified in § 20.21(e)(8)(i)(C)(2) and § 20.21(e)(8)(i)(B) for wideband consumer signal boosters.

The results of this test case are computed by the measurement values from test case 7.1 and 7.2.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.3; Maximum Booster Gain

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

#### 5.3.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(C)(2)

**Booster Gain Limits.** The uplink and downlink maximum gain of a Consumer Booster referenced to its input and output ports shall not exceed the following limits:

- (i) Fixed Booster maximum gain shall not exceed  $6.5 \text{ dB} + 20 \text{ Log}_{10} (\text{Frequency})$
- (ii) Where, Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.
- (iii) Mobile Booster maximum gain shall not exceed 50 dB when using an inside antenna (e.g., inside a vehicle), 23 dB when using direct contact coupling (e.g., cradle-type boosters), or 15 dB when directly connected (e.g., boosters with a physical connection to the phone).

FCC Part 20, § 20.21(e)(8)(i)(B)

*Bidirectional Capability.* Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.05 watts. One-way consumer boosters (*i.e.*, uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering may be used provided the uplink filter attenuation is not less than the downlink filter attenuation, and where RSSI is measured after spectrum block filtering is applied referenced to the booster's input port for each band of operation.

Note:

The margin for equivalent uplink and downlink gain is considered as 9 dB. This margin is a provisional specification determined by the ANSI ASC C63® task group working in collaboration and consultation with FCC OET Laboratory Division staff.

### 5.3.3 TEST PROTOCOL

Ambient temperature: 25 °C  
 Air Pressure: 1036 hPa  
 Humidity: 34 %  
 Band 2

| Signal Type | Maximum Gain Downlink [dB] | Maximum Gain Uplink [dB] | Difference Gain [dB] | Absolut Gain Limit [dB] | Difference Gain Limit [dB] | Margin Absolute Gain Downlink [dB] | Margin Absolute Gain Uplink [dB] | Margin Difference Gain [dB] |
|-------------|----------------------------|--------------------------|----------------------|-------------------------|----------------------------|------------------------------------|----------------------------------|-----------------------------|
| Pulsed CW   | 20.4                       | 18.4                     | 2.0                  | 23.0                    | 9.0                        | 2.6                                | 4.6                              | 7.1                         |
| AWGN        | 22.0                       | 21.7                     | 0.3                  | 23.0                    | 9.0                        | 1.0                                | 1.3                              | 8.7                         |

Band 4

| Signal Type | Maximum Gain Downlink [dB] | Maximum Gain Uplink [dB] | Difference Gain [dB] | Absolut Gain Limit [dB] | Difference Gain Limit [dB] | Margin Absolute Gain Downlink [dB] | Margin Absolute Gain Uplink [dB] | Margin Difference Gain [dB] |
|-------------|----------------------------|--------------------------|----------------------|-------------------------|----------------------------|------------------------------------|----------------------------------|-----------------------------|
| Pulsed CW   | 20.0                       | 20.6                     | 0.6                  | 23.0                    | 9.0                        | 3.0                                | 2.4                              | 8.4                         |
| AWGN        | 21.8                       | 22.0                     | 0.2                  | 23.0                    | 9.0                        | 1.2                                | 1.0                              | 8.8                         |

Band 5

| Signal Type | Maximum Gain Downlink [dB] | Maximum Gain Uplink [dB] | Difference Gain [dB] | Absolut Gain Limit [dB] | Difference Gain Limit [dB] | Margin Absolute Gain Downlink [dB] | Margin Absolute Gain Uplink [dB] | Margin Difference Gain [dB] |
|-------------|----------------------------|--------------------------|----------------------|-------------------------|----------------------------|------------------------------------|----------------------------------|-----------------------------|
| Pulsed CW   | 20.5                       | 17.0                     | 3.5                  | 23.0                    | 9.0                        | 2.5                                | 6.0                              | 5.5                         |
| AWGN        | 22.1                       | 21.1                     | 1.0                  | 23.0                    | 9.0                        | 0.9                                | 1.9                              | 8.0                         |

Band 12

| Signal Type | Maximum Gain Downlink [dB] | Maximum Gain Uplink [dB] | Difference Gain [dB] | Absolut Gain Limit [dB] | Difference Gain Limit [dB] | Margin Absolute Gain Downlink [dB] | Margin Absolute Gain Uplink [dB] | Margin Difference Gain [dB] |
|-------------|----------------------------|--------------------------|----------------------|-------------------------|----------------------------|------------------------------------|----------------------------------|-----------------------------|
| Pulsed CW   | 20.6                       | 17.7                     | 3.0                  | 23.0                    | 9.0                        | 2.4                                | 5.4                              | 6.0                         |
| AWGN        | 22.3                       | 20.0                     | 2.3                  | 23.0                    | 9.0                        | 0.7                                | 3.0                              | 6.8                         |

Band 13

| Signal Type | Maximum Gain Downlink [dB] | Maximum Gain Uplink [dB] | Difference Gain [dB] | Absolut Gain Limit [dB] | Difference Gain Limit [dB] | Margin Absolute Gain Downlink [dB] | Margin Absolute Gain Uplink [dB] | Margin Difference Gain [dB] |
|-------------|----------------------------|--------------------------|----------------------|-------------------------|----------------------------|------------------------------------|----------------------------------|-----------------------------|
| Pulsed CW   | 21.0                       | 17.6                     | 3.4                  | 23.0                    | 9.0                        | 2.0                                | 5.4                              | 5.6                         |
| AWGN        | 22.4                       | 22.1                     | 0.4                  | 23.0                    | 9.0                        | 0.6                                | 1.0                              | 8.6                         |

Remark: Values are taken from measurements of test case Maximum Power.

### 5.3.4 TEST EQUIPMENT USED

- R&S TS8997

## 5.4 INTERMODULATION

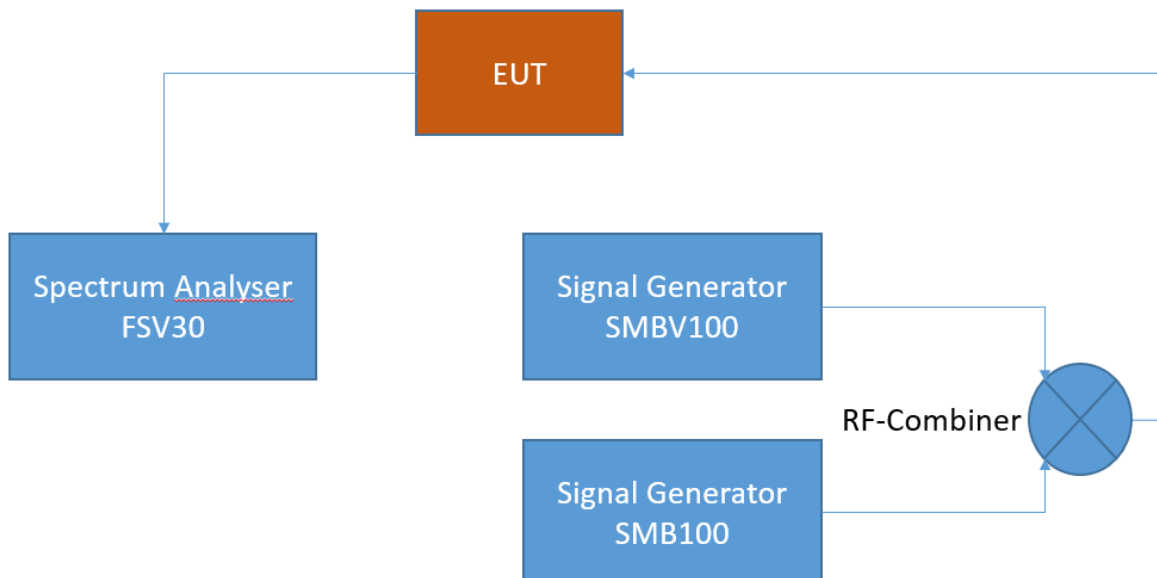
Standard

**The test was performed according to:**  
KDB 935210 D03

### 5.4.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the intermodulation limit § 20.21(e)(8)(i)(F) for wideband consumer signal boosters.

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.4; Intermodulation

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

### 5.4.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(F)

*Intermodulation Limits.* The transmitted intermodulation products of a consumer booster at its uplink and downlink ports shall not exceed the power level of –19 dBm for the supported bands of operation. Compliance with intermodulation limits will use boosters operating at maximum gain and maximum rated output power, with two continuous wave (CW) input signals spaced 600 kHz apart and centered in the pass band of the booster, and with a 3 kHz measurement bandwidth.

### 5.4.3 TEST PROTOCOL

Ambient temperature: 23 °C  
 Air Pressure: 1030 hPa  
 Humidity: 34 %  
 Band 2, downlink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 1950.8   | 1951.4   | -21.4                      | -49.6                          | -19.0                        | 30.6                 |
|             | 1950.8   | 1951.4   | -20.0                      | -46.5                          | -19.0                        | 27.5                 |

Band 4, downlink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 2110.1   | 2110.7   | -22.1                      | -49.3                          | -19.0                        | 30.3                 |
|             | 2110.1   | 2110.7   | -20.0                      | -45.0                          | -19.0                        | 26.0                 |

Band 5, downlink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 875.5    | 876.1    | -22.1                      | -55.1                          | -19.0                        | 36.1                 |
|             | 875.5    | 876.1    | -20.0                      | -52.9                          | -19.0                        | 33.9                 |

Band 12, downlink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 745.4    | 746.0    | -20.3                      | -52.2                          | -19.0                        | 33.2                 |
|             | 745.4    | 746.0    | -20.0                      | -48.5                          | -19.0                        | 29.5                 |

Band 13, downlink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 752.3    | 752.9    | -20.0                      | -51.7                          | -19.0                        | 32.7                 |

Band 2, uplink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 1865.6   | 1866.2   | -0.2                       | -22.5                          | -19.0                        | 3.5                  |
|             | 1865.6   | 1866.2   | 1.8                        | -22.5                          | -19.0                        | 3.5                  |
|             | 1865.6   | 1866.2   | 3.8                        | -22.2                          | -19.0                        | 3.2                  |
|             | 1865.6   | 1866.2   | 5.8                        | -24.5                          | -19.0                        | 5.5                  |
|             | 1865.6   | 1866.2   | 7.8                        | -22.6                          | -19.0                        | 3.6                  |
| AGC+10dB    | 1865.6   | 1866.2   | 9.8                        | -22.7                          | -19.0                        | 3.7                  |

Band 4, uplink

| Input Power | f1 [MHz] | f2 [MHz] | Combined Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|----------------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 1719.5   | 1720.1   | -1.0                       | -22.1                          | -19.0                        | 3.1                  |
|             | 1719.5   | 1720.1   | 1.0                        | -20.7                          | -19.0                        | 1.7                  |
|             | 1719.5   | 1720.1   | 3.0                        | -21.1                          | -19.0                        | 2.1                  |
|             | 1719.5   | 1720.1   | 5.0                        | -21.9                          | -19.0                        | 2.9                  |
|             | 1719.5   | 1720.1   | 7.0                        | -23.5                          | -19.0                        | 4.5                  |
| AGC+10dB    | 1719.5   | 1720.1   | 9.0                        | -22.5                          | -19.0                        | 3.5                  |

Band 5, uplink

| Input Power | f1 [MHz] | f2 [MHz] | Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|-------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 834.1    | 834.7    | -0.2              | -28.7                          | -19.0                        | 9.7                  |
|             | 834.1    | 834.7    | 1.8               | -26.0                          | -19.0                        | 7.0                  |
|             | 834.1    | 834.7    | 3.8               | -26.0                          | -19.0                        | 7.0                  |
|             | 834.1    | 834.7    | 5.8               | -26.4                          | -19.0                        | 7.4                  |
|             | 834.1    | 834.7    | 7.8               | -27.4                          | -19.0                        | 8.4                  |
| AGC+10dB    | 834.1    | 834.7    | 9.8               | -28.4                          | -19.0                        | 9.4                  |

Band 12, uplink

| Input Power | f1 [MHz] | f2 [MHz] | Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|-------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 708.7    | 709.3    | 0.0               | -22.5                          | -19.0                        | 3.5                  |
|             | 708.7    | 709.3    | 2.0               | -22.4                          | -19.0                        | 3.4                  |
|             | 708.7    | 709.3    | 4.0               | -22.3                          | -19.0                        | 3.3                  |
|             | 708.7    | 709.3    | 6.0               | -22.5                          | -19.0                        | 3.5                  |
|             | 708.7    | 709.3    | 8.0               | -22.2                          | -19.0                        | 3.2                  |
| AGC+10dB    | 708.7    | 709.3    | 10.0              | -22.2                          | -19.0                        | 3.2                  |

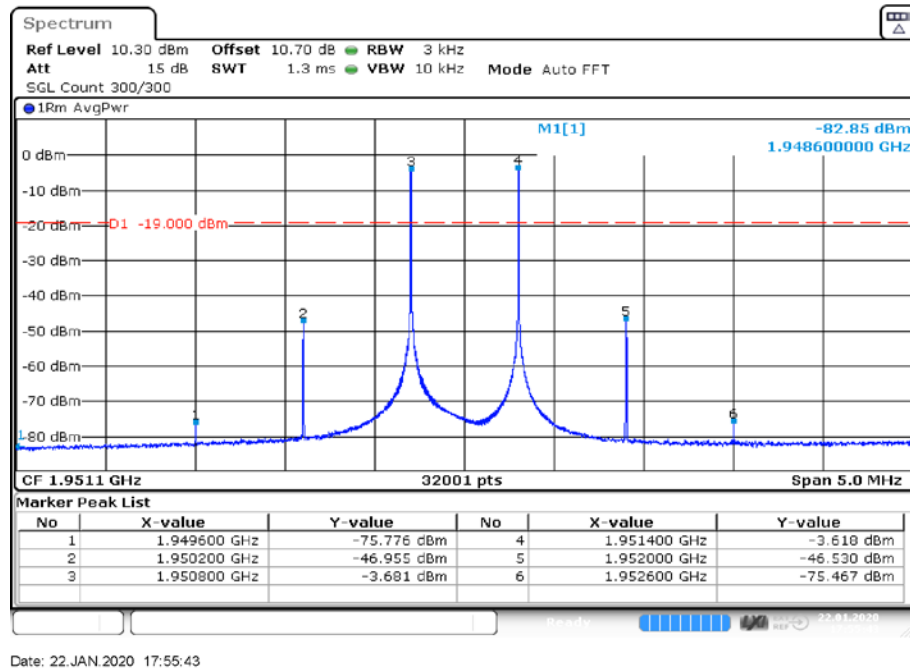
Band 13, uplink

| Input Power | f1 [MHz] | f2 [MHz] | Input Power [dBm] | Maximum Inter modulation [dBm] | Inter modulation Limit [dBm] | Margin to Limit [dB] |
|-------------|----------|----------|-------------------|--------------------------------|------------------------------|----------------------|
| AGC         | 780.1    | 780.7    | -0.5              | -27.7                          | -19.0                        | 8.7                  |
|             | 780.1    | 780.7    | 1.5               | -27.9                          | -19.0                        | 8.9                  |
|             | 780.1    | 780.7    | 3.5               | -27.7                          | -19.0                        | 8.7                  |
|             | 780.1    | 780.7    | 5.5               | -27.6                          | -19.0                        | 8.6                  |
|             | 780.1    | 780.7    | 7.5               | -27.3                          | -19.0                        | 8.3                  |
| AGC+10dB    | 780.1    | 780.7    | 9.5               | -27.3                          | -19.0                        | 8.3                  |

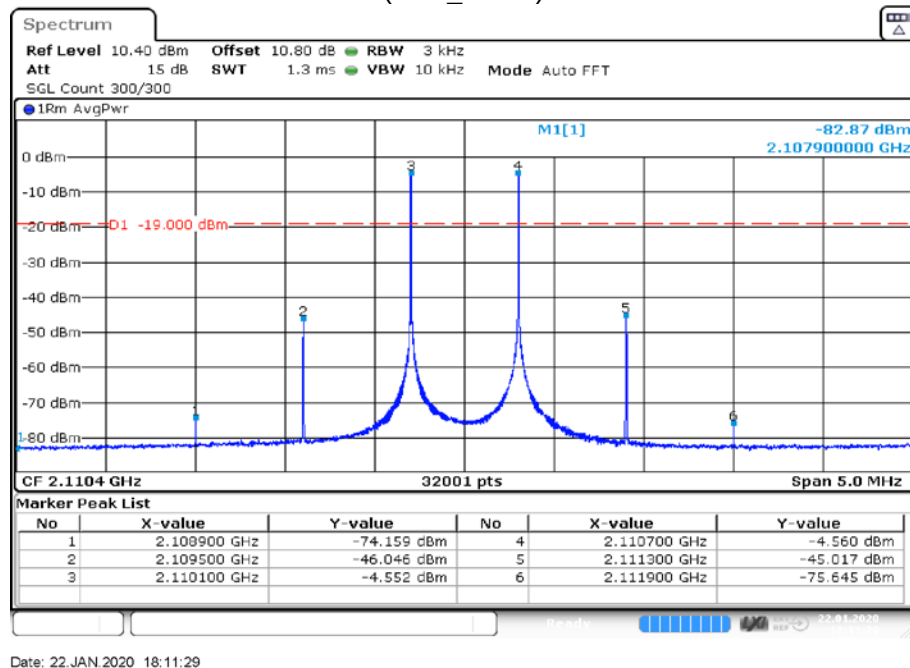
Remark: Please see next sub-clause for the measurement plot.

#### 5.4.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

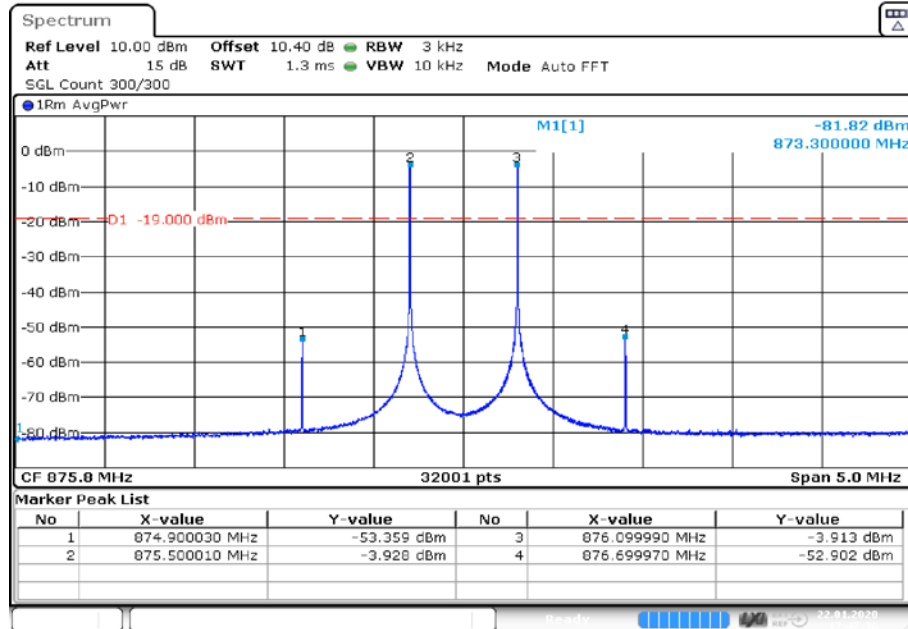
Frequency Band = Band 2, Direction = Downlink, Input Power = AGC  
(S01\_AA01)



Frequency Band = Band 4, Direction = Downlink, Input Power = AGC  
(S01\_AA01)

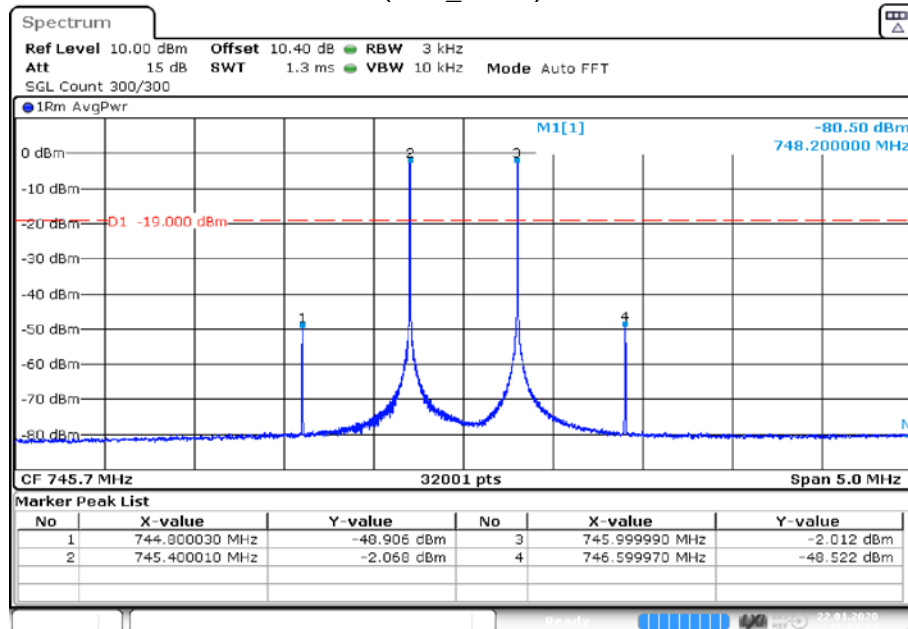


Frequency Band = Band 5, Direction = Downlink, Input Power = AGC  
(S01\_AA01)



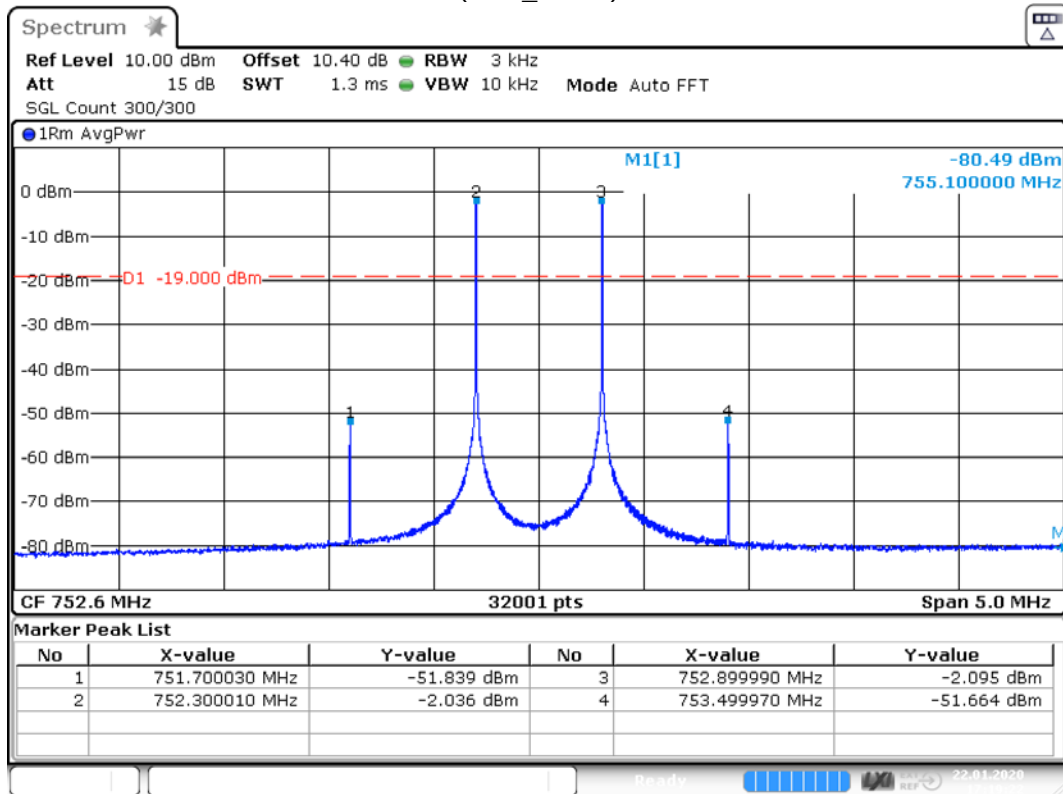
Date: 22.JAN.2020 17:47:36

Frequency Band = Band 12, Direction = Downlink, Input Power = AGC  
(S01\_AA01)



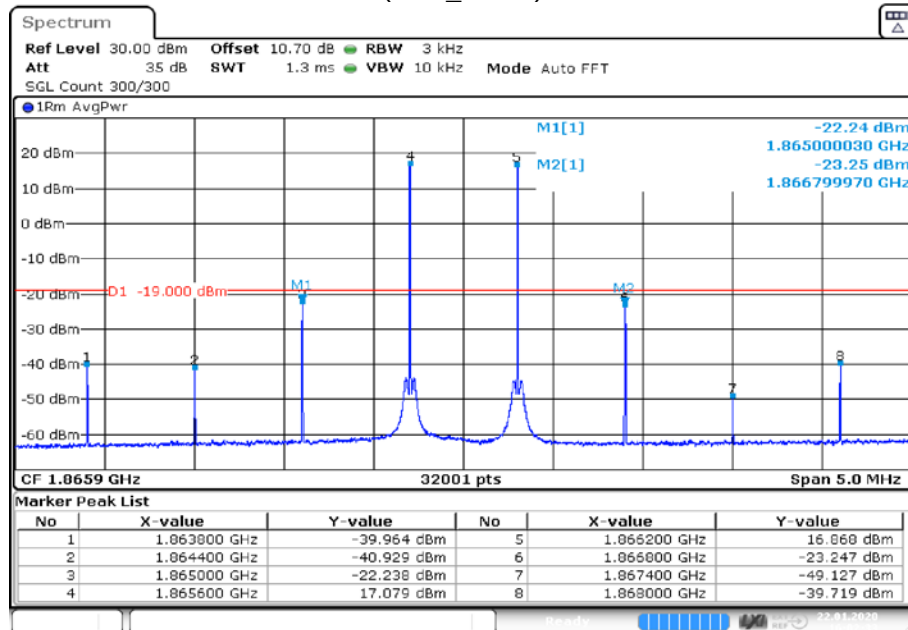
Date: 22.JAN.2020 17:34:03

Frequency Band = Band 13, Direction = Downlink, Input Power = AGC  
(S01\_AA01)



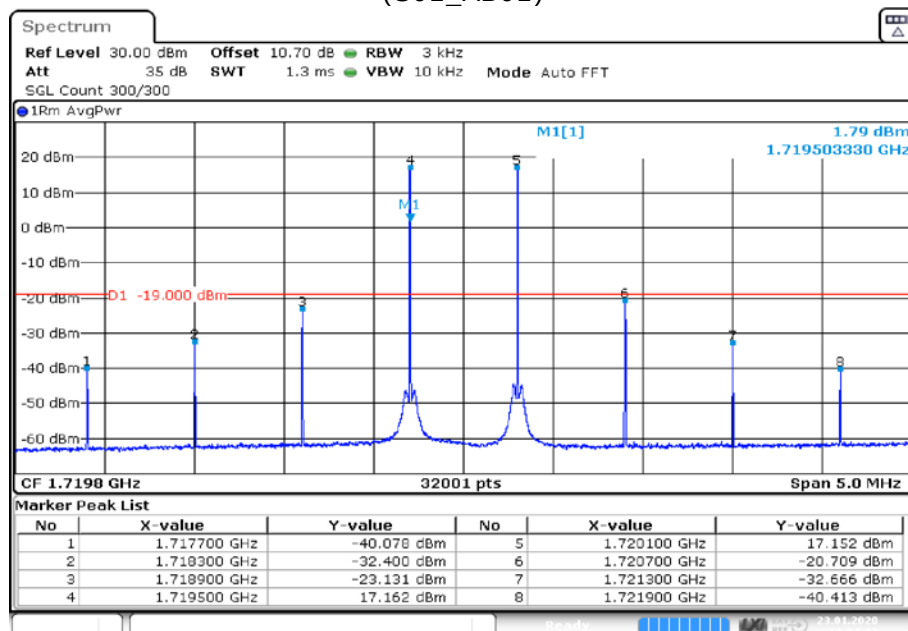
Date: 22.JAN.2020 17:19:22

Frequency Band = Band 2, Direction = Uplink, Input Power = AGC  
(S01\_AA01)



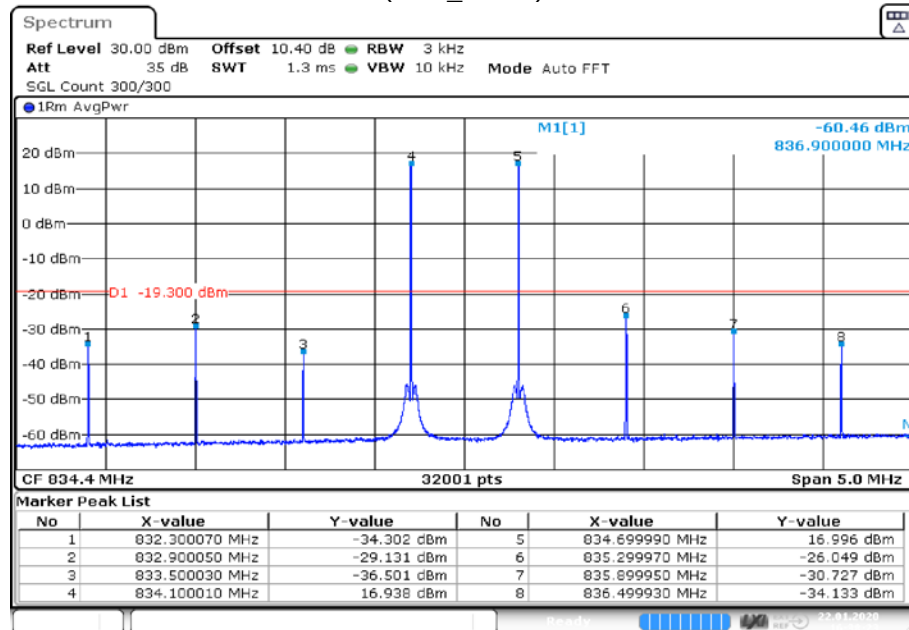
Date: 22.JAN.2020 16:02:33

Frequency Band = Band 4, Direction = Uplink, Input Power = AGC  
(S01\_AB01)

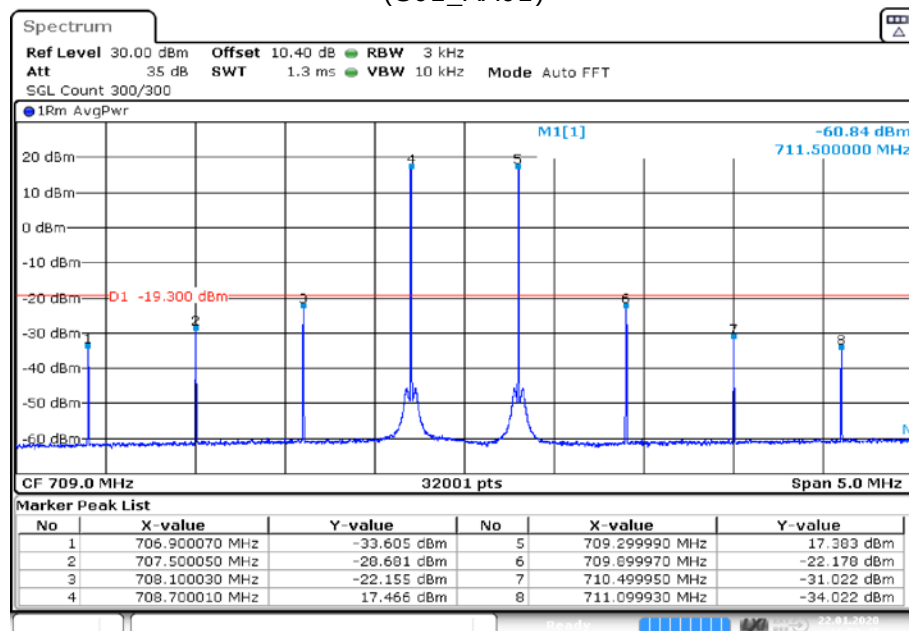


Date: 23.JAN.2020 18:04:01

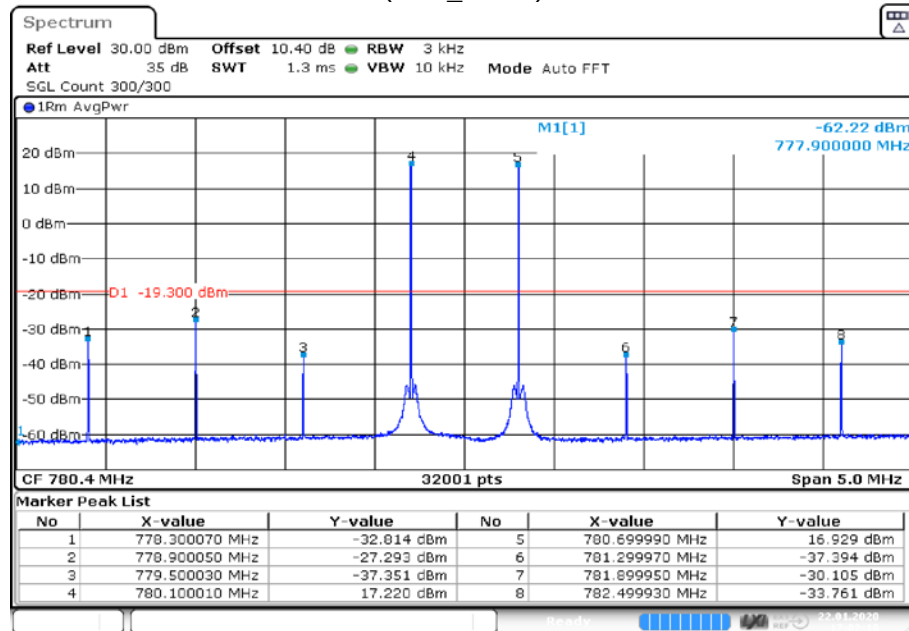
Frequency Band = Band 5, Direction = Uplink, Input Power = AGC  
(S01\_AA01)



Frequency Band = Band 12, Direction = Uplink, Input Power = AGC  
(S01\_AA01)



Frequency Band = Band 13, Direction = Uplink, Input Power = AGC  
(S01\_AA01)



Date: 22.JAN.2020 17:02:10

#### 5.4.5 TEST EQUIPMENT USED

- R&S TS8997

## 5.5 OUT-OF-BAND EMISSION

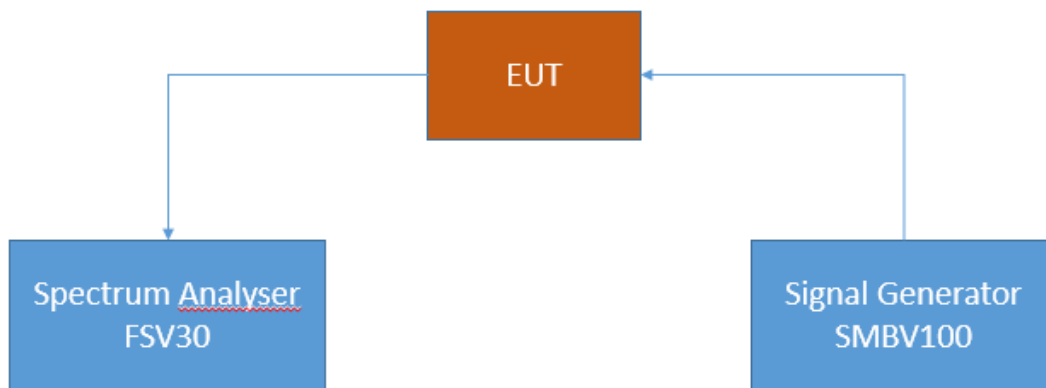
Standard

**The test was performed according to:**  
KDB 935210 D03

### 5.5.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the out-of-band emission limit § 20.21(e)(8)(i)(E) for wideband consumer signal boosters. The limits itself come from the applicable rule for each operating as listed in Appendix A of KDB 935210 D03

The EUT was connected to the test setup according to the following diagram:



FCC Part 20.21; Consumer Signal Booster – Test Setup 7.5; Out-of-band emissions

The attenuation of the measuring and stimulus path are known for each measured frequency and are considered.

The Spectrum Analyzer settings can be directly found in the measurement diagrams.

### 5.5.2 TEST REQUIREMENTS / LIMITS

FCC Part 20, § 20.21(e)(8)(i)(E)

*Out of Band Emission Limits.* Booster out of band emissions (OOBE) shall be at least 6 dB below the FCC's mobile emission limits for the supported bands of operation. Compliance to OOBE limits will utilize high peak-to-average CMRS signal types.

Part 22, Subpart H – Cellular Radiotelephone Service; Band 5 (Cellular)

§ 22.917 – Emission limitations for cellular equipment

(a) *Out of band emissions.* 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.

#### Part 24 E – Personal Communication Services

##### § 24.238 – Emission limitations for Broadband PCS equipment; Band 2 (Broadband PCS)

(a) *Out of band emissions.* 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.

#### Part 27 – Miscellaneous Wireless Communication Services;

##### Band 4 (AWS-1)

##### § 27.53 (h) – Emission limits

(1) *General protection levels.* Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

(2) *Additional protection levels.* Notwithstanding the foregoing paragraph (h)(1) of this section:

(i) Operations in the 2180-2200 MHz band are subject to the out-of-band emission requirements set forth in §27.1134 for the protection of federal government operations operating in the 2200-2290 MHz band.

(ii) For operations in the 2000-2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

(iii) For operations in the 1915-1920 MHz band, the power of any emission between 1930-1995 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

(iv) For operations in the 1995-2000 MHz band, the power of any emission between 2005-2020 MHz shall be attenuated below the transmitter power (P) in watts by at least  $70 + 10 \log_{10}(P)$  dB.

Band 12 (Lower 700 MHz)  
§ 27.53 (g) – Emission limits

For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed

Band 13 (Upper 700 MHz)  
§ 27.53 (c), (f) – Emission limits

(c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log (P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

### 5.5.3 TEST PROTOCOL

Ambient temperature: 23 – 26 °C  
 Air Pressure: 997 – 1017 hPa  
 Humidity: 33 %  
 Band 2, downlink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 1989.80                | -20.0                       | -33.4                           | -19.0                         | 14.4                 |
| LTE         | upper     | 1987.50                | -23.0                       | -45.8                           | -19.0                         | 26.8                 |
| CDMA        | upper     | 1988.75                | -23.0                       | -53.4                           | -19.0                         | 34.4                 |
| GSM         | lower     | 1930.20                | -20.0                       | -34.3                           | -19.0                         | 15.3                 |
| LTE         | lower     | 1932.50                | -23.0                       | -45.4                           | -19.0                         | 26.4                 |
| CDMA        | lower     | 1931.25                | -23.0                       | -55.1                           | -19.0                         | 36.1                 |

Band 4, downlink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 2154.80                | -20.0                       | -33.1                           | -19.0                         | 14.1                 |
| LTE         | upper     | 2152.50                | -23.9                       | -45.9                           | -19.0                         | 26.9                 |
| CDMA        | upper     | 2153.75                | -23.9                       | -51.7                           | -19.0                         | 32.7                 |
| GSM         | lower     | 2110.20                | -20.0                       | -32.8                           | -19.0                         | 13.8                 |
| LTE         | lower     | 2112.50                | -23.9                       | -45.6                           | -19.0                         | 26.6                 |
| CDMA        | lower     | 2111.25                | -23.9                       | -50.8                           | -19.0                         | 31.8                 |

Band 5, downlink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 893.80                 | -20.0                       | -31.6                           | -19.0                         | 12.6                 |
| LTE         | upper     | 891.50                 | -23.4                       | -45.9                           | -19.0                         | 26.9                 |
| CDMA        | upper     | 892.75                 | -23.4                       | -56.3                           | -19.0                         | 37.3                 |
| GSM         | lower     | 869.20                 | -20.0                       | -32.1                           | -19.0                         | 13.1                 |
| LTE         | lower     | 871.50                 | -23.4                       | -45.3                           | -19.0                         | 26.3                 |
| CDMA        | lower     | 870.25                 | -23.4                       | -55.8                           | -19.0                         | 36.8                 |

Band 12, downlink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 745.80                 | -20.0                       | -31.9                           | -19.0                         | 12.9                 |
| LTE         | upper     | 743.50                 | -21.7                       | -43.5                           | -19.0                         | 24.5                 |
| CDMA        | upper     | 744.75                 | -21.7                       | -56.1                           | -19.0                         | 37.1                 |
| GSM         | lower     | 728.20                 | -20.0                       | -32.0                           | -19.0                         | 13.0                 |
| LTE         | lower     | 730.50                 | -21.7                       | -43.7                           | -19.0                         | 24.7                 |
| CDMA        | lower     | 729.25                 | -21.7                       | -56.8                           | -19.0                         | 37.8                 |

Band 13, downlink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 755.80                 | -20.0                       | -31.9                           | -19.0                         | 12.9                 |
| LTE         | upper     | 753.50                 | -22.2                       | -44.0                           | -19.0                         | 25.0                 |
| CDMA        | upper     | 754.75                 | -22.2                       | -56.1                           | -19.0                         | 37.1                 |
| GSM         | lower     | 746.20                 | -20.0                       | -32.3                           | -19.0                         | 13.3                 |
| LTE         | lower     | 748.50                 | -22.2                       | -43.7                           | -19.0                         | 24.7                 |
| CDMA        | lower     | 747.25                 | -22.2                       | -56.0                           | -19.0                         | 37.0                 |

Band 2, uplink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 1909.80                | 2.6                         | -34.4                           | -19.0                         | 15.4                 |
| LTE         | upper     | 1907.50                | -1.9                        | -23.4                           | -19.0                         | 4.4                  |
| CDMA        | upper     | 1908.75                | -1.9                        | -23.9                           | -19.0                         | 4.9                  |
| GSM         | lower     | 1850.20                | 2.6                         | -34.9                           | -19.0                         | 15.9                 |
| LTE         | lower     | 1852.50                | -1.9                        | -22.4                           | -19.0                         | 3.4                  |
| CDMA        | lower     | 1851.25                | -1.9                        | -28.1                           | -19.0                         | 9.1                  |

Band 4, uplink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 1754.80                | 0.9                         | -33.5                           | -19.0                         | 14.5                 |
| LTE         | upper     | 1752.50                | -2.1                        | -24.0                           | -19.0                         | 5.0                  |
| CDMA        | upper     | 1753.75                | -2.1                        | -30.1                           | -19.0                         | 11.1                 |
| GSM         | lower     | 1710.20                | 0.9                         | -34.6                           | -19.0                         | 15.6                 |
| LTE         | lower     | 1712.50                | -2.1                        | -23.9                           | -19.0                         | 4.9                  |
| CDMA        | lower     | 1711.25                | -2.1                        | -28.8                           | -19.0                         | 9.8                  |

Band 5, uplink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 848.80                 | 3.6                         | -32.7                           | -19.0                         | 13.7                 |
| LTE         | upper     | 846.50                 | -1.3                        | -20.8                           | -19.0                         | 1.8                  |
| CDMA        | upper     | 847.75                 | -1.3                        | -24.5                           | -19.0                         | 5.5                  |
| GSM         | lower     | 824.20                 | 3.6                         | -33.3                           | -19.0                         | 14.3                 |
| LTE         | lower     | 826.50                 | -1.3                        | -21.9                           | -19.0                         | 2.9                  |
| CDMA        | lower     | 825.25                 | -1.3                        | -26.3                           | -19.0                         | 7.3                  |

Band 12, uplink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 715.80                 | 4.1                         | -29.7                           | -19.0                         | 10.7                 |
| LTE         | upper     | 713.50                 | -1.8                        | -26.0                           | -19.0                         | 7.0                  |
| CDMA        | upper     | 714.75                 | -1.8                        | -27.7                           | -19.0                         | 8.7                  |
| GSM         | lower     | 698.20                 | 4.1                         | -29.6                           | -19.0                         | 10.6                 |
| LTE         | lower     | 700.50                 | -1.8                        | -23.9                           | -19.0                         | 4.9                  |
| CDMA        | lower     | 699.25                 | -1.8                        | -27.8                           | -19.0                         | 8.8                  |

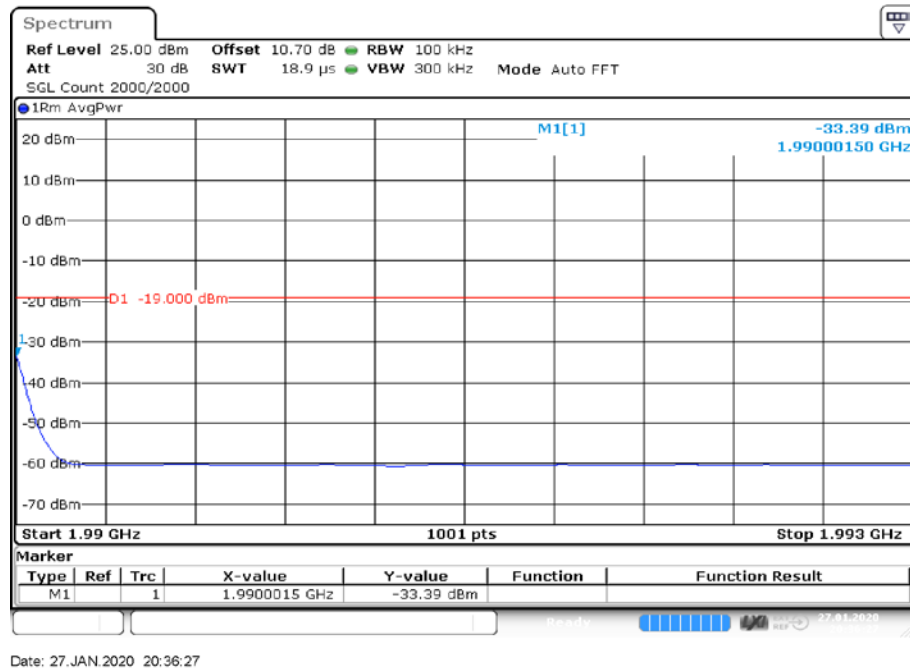
Band 13, uplink

| Signal Type | Band Edge | Signal Frequency [MHz] | AGC Start Input Power [dBm] | Maximum Out-of-band Power [dBm] | Limit Out-of-band Power [dBm] | Margin to Limit [dB] |
|-------------|-----------|------------------------|-----------------------------|---------------------------------|-------------------------------|----------------------|
| GSM         | upper     | 786.80                 | 4.1                         | -30.2                           | -19.0                         | 11.2                 |
| LTE         | upper     | 784.50                 | -2.4                        | -27.9                           | -19.0                         | 8.9                  |
| CDMA        | upper     | 785.75                 | -2.4                        | -32.5                           | -19.0                         | 13.5                 |
| GSM         | lower     | 777.20                 | 4.1                         | -29.7                           | -19.0                         | 10.7                 |
| LTE         | lower     | 779.50                 | -2.4                        | -29.4                           | -19.0                         | 10.4                 |
| CDMA        | lower     | 778.25                 | -2.4                        | -32.6                           | -19.0                         | 13.6                 |

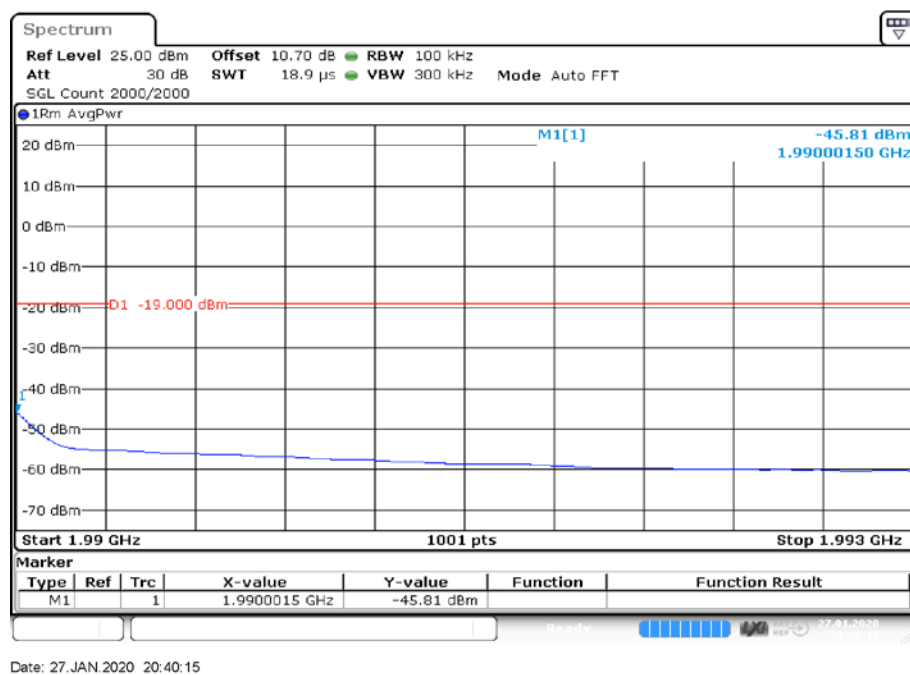
Remark: Please see next sub-clause for the measurement plot.

#### 5.5.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

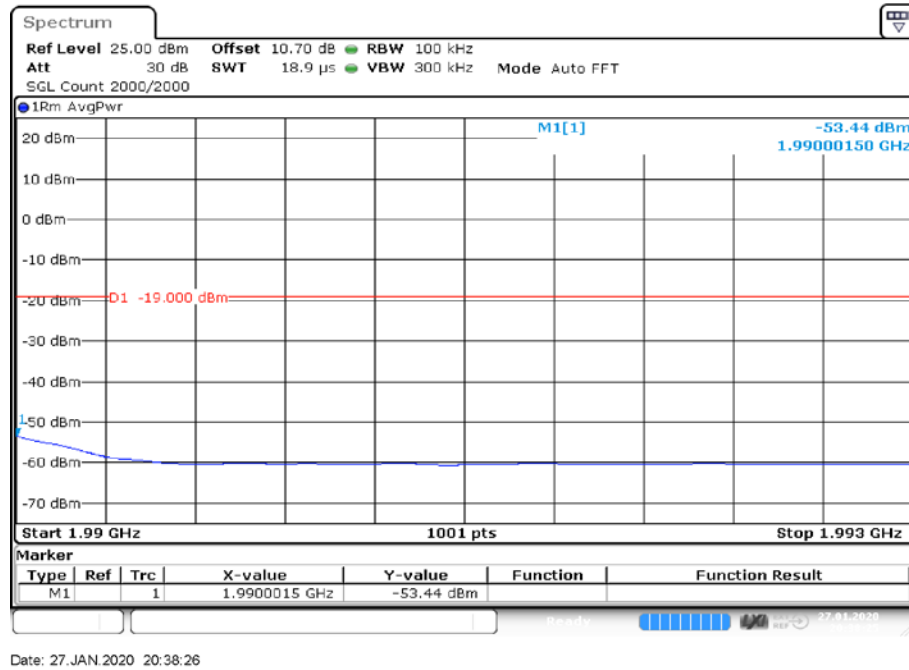
Frequency Band = Band 2, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01\_AA01)



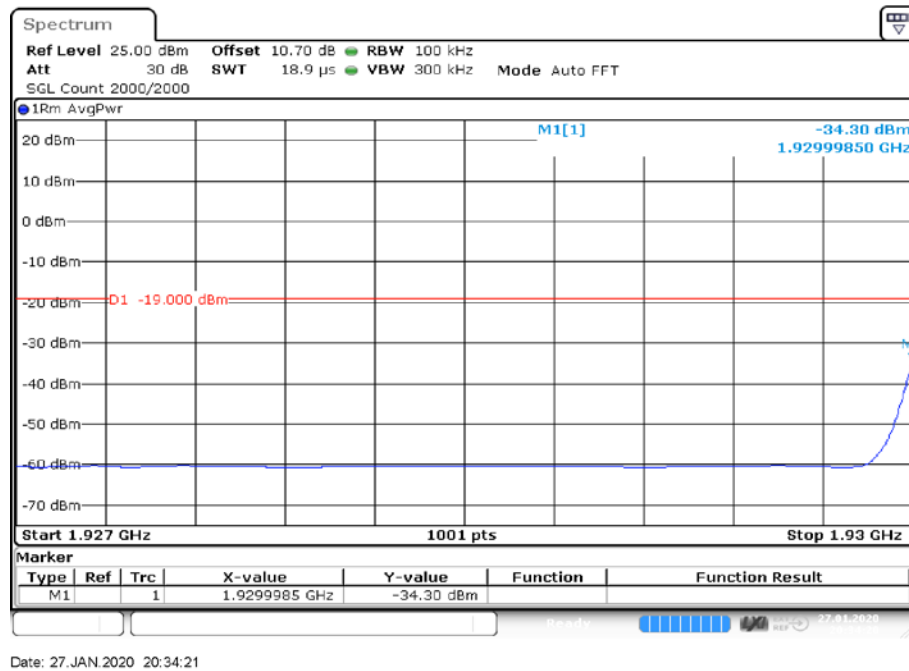
Frequency Band = Band 2, Direction = Downlink, Signal Type = LTE, Band Edge = upper (S01\_AA01)



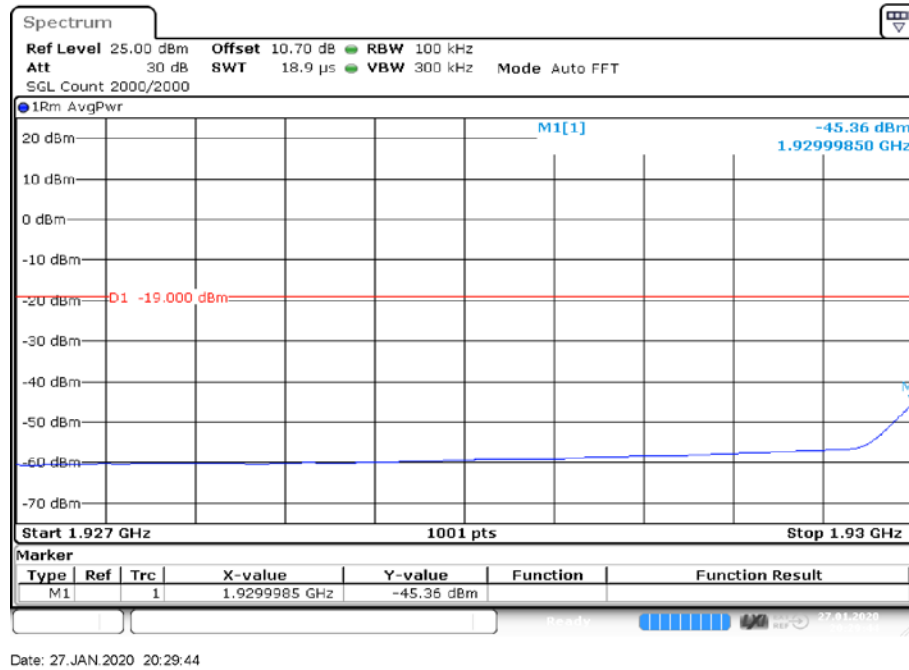
Frequency Band = Band 2, Direction = Downlink, Signal Type = CDMA, Band Edge = upper (S01\_AA01)



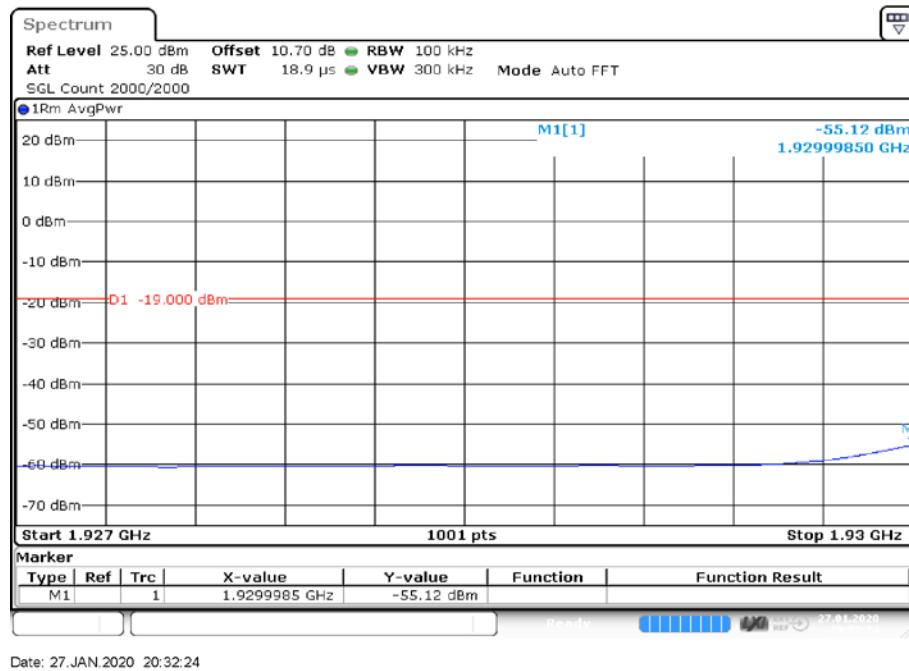
Frequency Band = Band 2, Direction = Downlink, Signal Type = GSM, Band Edge = lower (S01\_AA01)



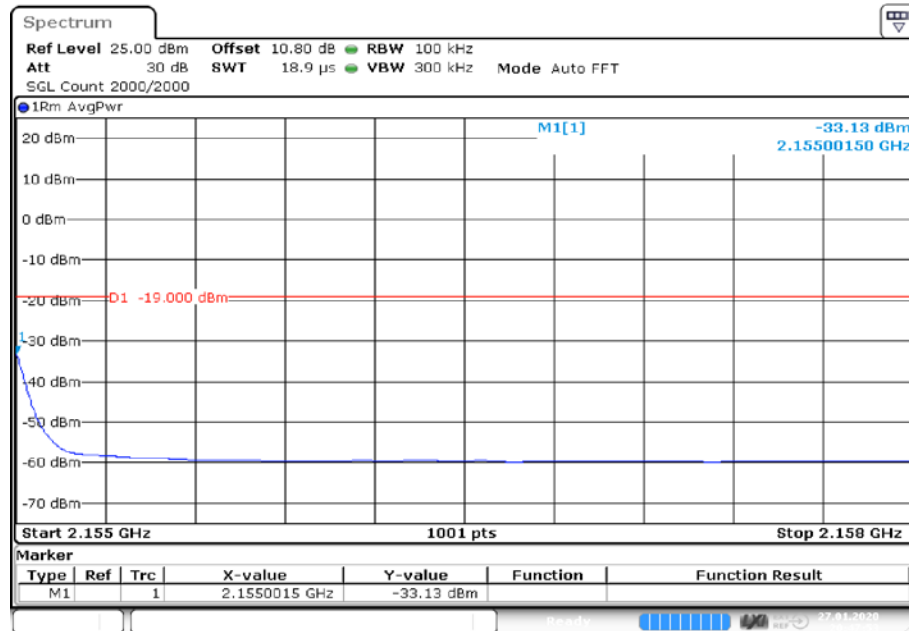
Frequency Band = Band 2, Direction = Downlink, Signal Type = LTE, Band Edge = lower (S01\_AA01)



Frequency Band = Band 2, Direction = Downlink, Signal Type = CDMA, Band Edge = lower (S01\_AA01)

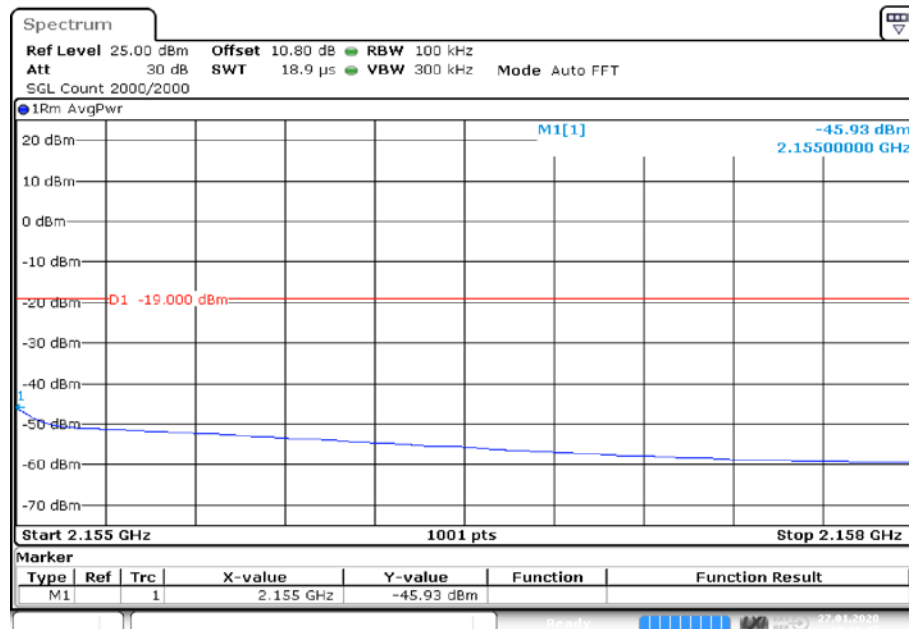


Frequency Band = Band 4, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01\_AA01)



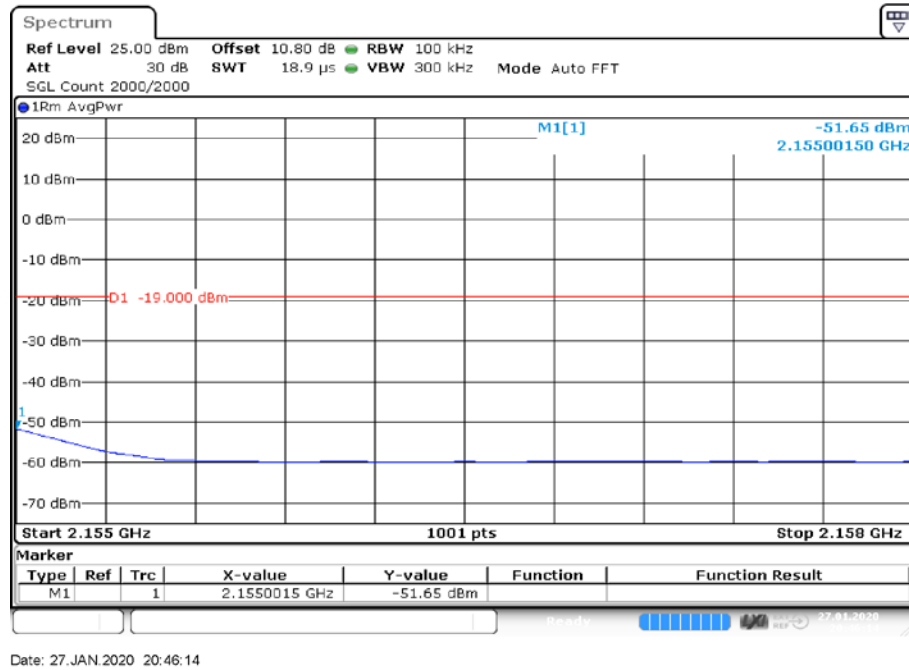
Date: 27.JAN.2020 20:47:54

Frequency Band = Band 4, Direction = Downlink, Signal Type = LTE, Band Edge = upper (S01\_AA01)

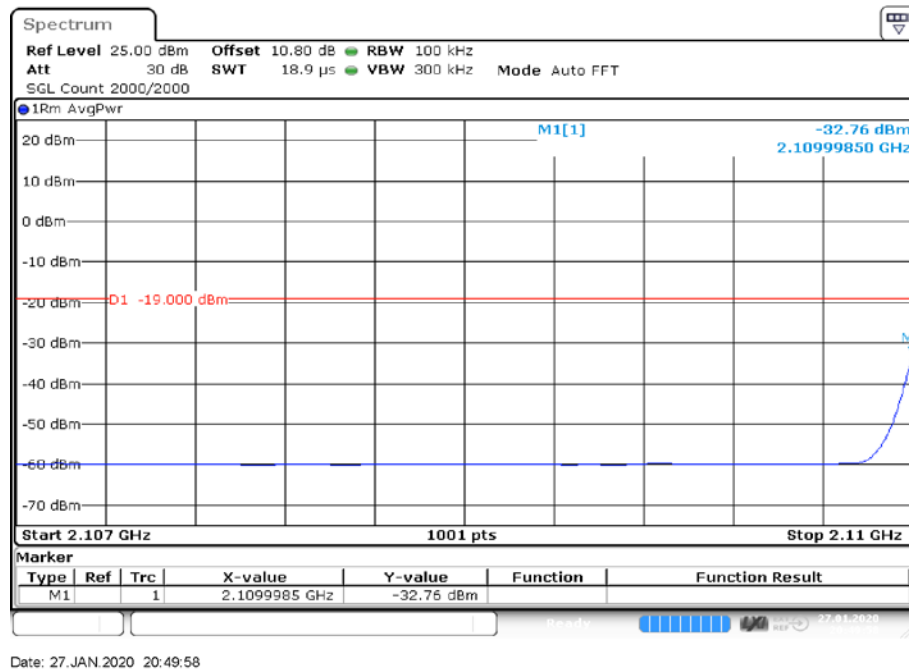


Date: 27.JAN.2020 20:43:45

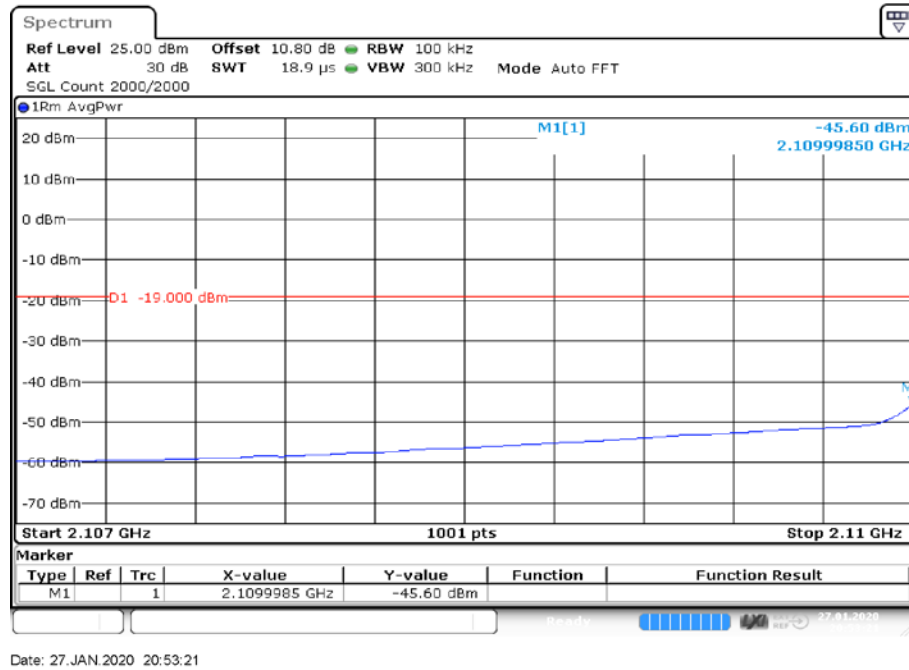
Frequency Band = Band 4, Direction = Downlink, Signal Type = CDMA, Band Edge = upper (S01\_AA01)



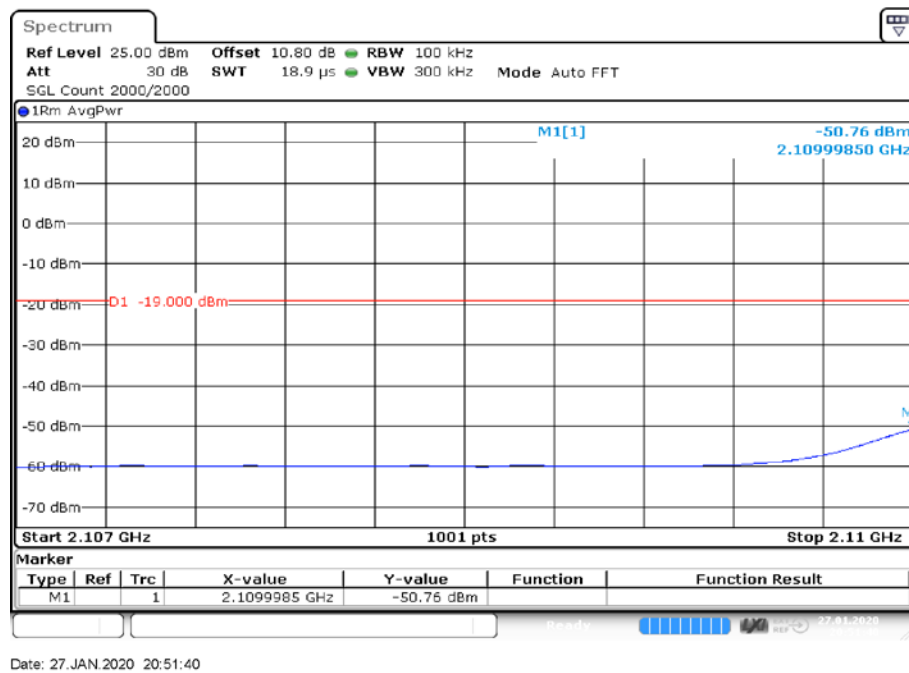
Frequency Band = Band 4, Direction = Downlink, Signal Type = GSM, Band Edge = lower (S01\_AA01)



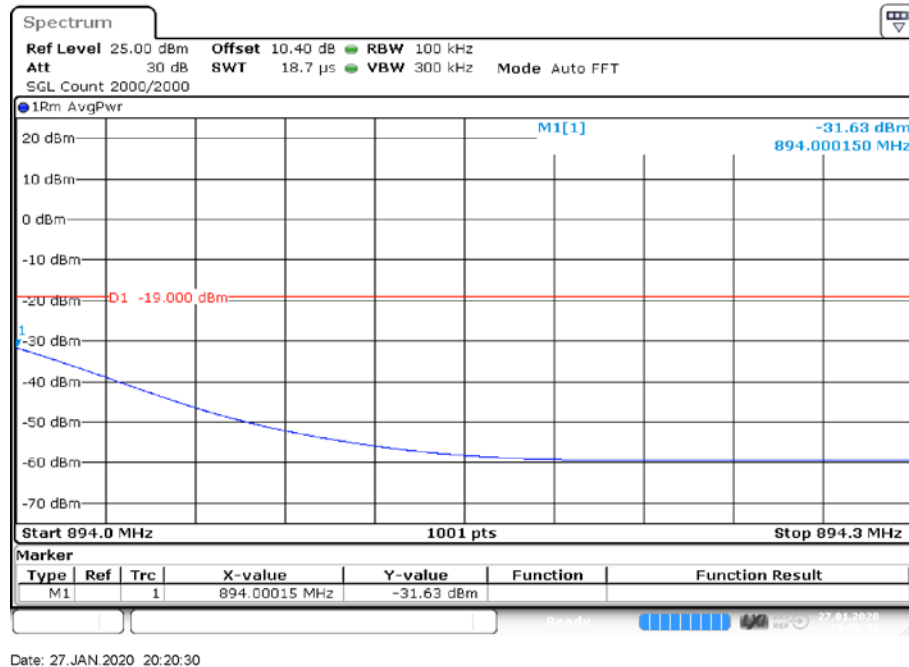
Frequency Band = Band 4, Direction = Downlink, Signal Type = LTE, Band Edge = lower (S01\_AA01)



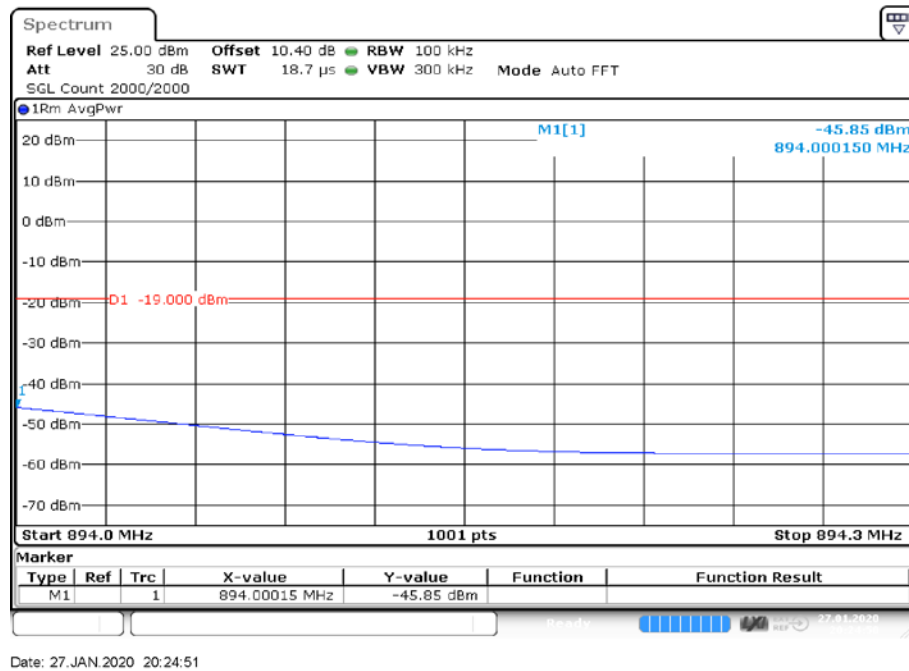
Frequency Band = Band 4, Direction = Downlink, Signal Type = CDMA, Band Edge = lower (S01\_AA01)



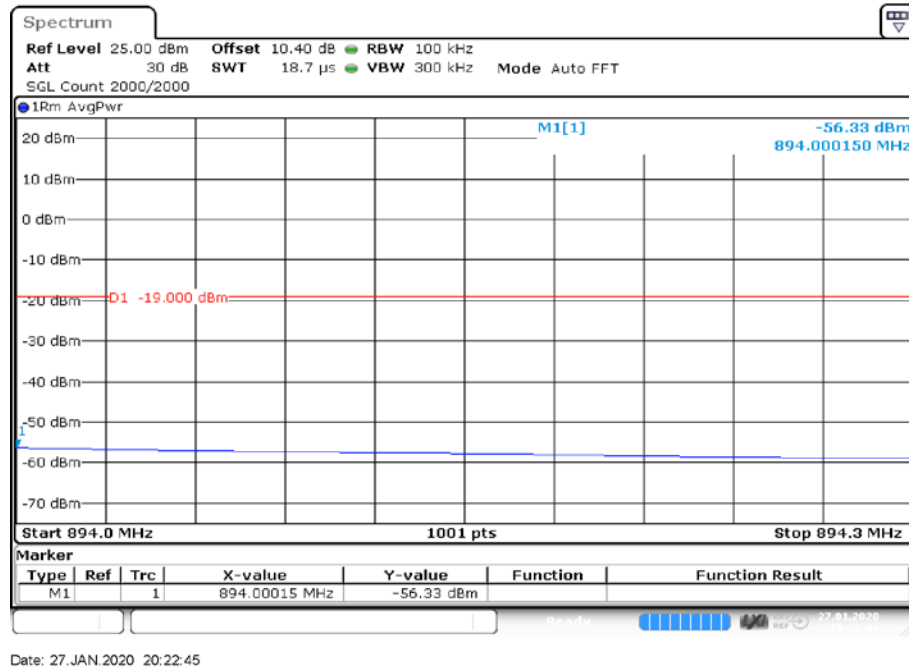
Frequency Band = Band 5, Direction = Downlink, Signal Type = GSM, Band Edge = upper (S01\_AA01)



Frequency Band = Band 5, Direction = Downlink, Signal Type = LTE, Band Edge = upper (S01\_AA01)



Frequency Band = Band 5, Direction = Downlink, Signal Type = CDMA, Band Edge = upper  
(S01\_AA01)



Frequency Band = Band 5, Direction = Downlink, Signal Type = GSM, Band Edge = lower  
(S01\_AA01)

