# Test report 2023-0337-EMC-TR-24-0001-V01

| | |
|---|---|
| Designation: | CAP MX 6/7E/80-85/17/E/19/23/25 T-AC [BRS] |
| Manufacturer: | Commscope |
| Serial No(s): | TJCXAA2305302 |
| ID No. | 7830127-0001 Rev: 04 |
| FCC ID | X5S-CAPMX |
| Test Specification(s): | Class 2 Permissive Change<br>Partly of FCC Rules and Regulations as listed in 47 CFR, Part 20 and Part 27:2024-01-01<br>EFFECTIVE RADIATED POWER, MEAN OUTPUT POWER AND ZONE ENHANCER GAIN<br>OCCUPIED BANDWIDTH/INPUT-VERSUS-OUTPUT SPECTRUM<br>OUT-OF-BAND EMISSION LIMITS<br>OUT-OF-BAND REJECTION |
| | |
| Test Plan: | “CAP MX Frequenzen” from customer |
| | |
| **Test Result:** | **Passed** |

| | | | |
|---|---|---|---|
| Date of issue: | 2024-06-12 | | Signature: |
| Version: | 01 | Technical Reviewer: | Gerhard Gass<br>Test Engineer<br>Digital unterschrieben von Gerhard Gass<br>DN: cn=Gerhard Gass, o=Bureau Veritas CPS Germany GmbH, ou=EMC, email=gerhard.gass@bureauveritas.com, c=DE<br>Datum: 2024.06.14 09:47:31 +02'00' |
| Date of delivery: | 2023-11-20 | | |
| Performance date: | 2023-12-19 to 2023-12-20 | Report Reviewer: | Thomas Hufnagel<br>Test Engineer<br>Digitally signed by Thomas Hufnagel<br>Date: 2024.06.14 09:52:37 +02'00' |

Bundesnetzagentur

BNetzA-CAB-19/21-20

ilac-MRA

DAkkS Deutsche Akkreditierungsstelle D-PL-12024-06-02



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| | |
|---|---|
| **Client:** | Commscope<br>Andrew Wireless System GmbH<br>Industriering 10<br>86675 Buchdorf<br>Germany |
| **Test laboratory:** | Bureau Veritas Consumer Products Services Germany GmbH<br>Thurn-und-Taxis-Straße 18<br>D-90411 Nürnberg<br>Tel.: +49 40 74041 0 |
| **Test location:** | Bureau Veritas Consumer Products Services Germany GmbH<br>Thurn-und-Taxis-Straße 18<br>D-90411 Nürnberg |

| | |
|---|---|
| Laboratory accreditation no: | DAkkS D-PL-12024-06-04<br>BNETZA-CAB-19/21-20 |
| FCC Designation Number: | DE0023 |
| FCC Test Firm Registration: | 366481 |

**Versions management:**

| | |
|---|---|
| V 01.00 | Initial release |

## Table of Contents

# 1 APPLIED STANDARDS AND TEST SUMMARY

## 1.1 CFR APPLIED STANDARDS

**Type of Authorization**
Certification for an Industrial 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, 27, (01/01/2024 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 Services

§ 20.21 Signal Boosters

Part 27; Miscellaneous Wireless Communications Services
Subpart C – Technical standards

§ 27.50 – Power and duty cycle limits
§ 27.53 – Emission limits

The tests were selected and performed with reference to:

- FCC Public Notice 935210 applying "Signal Boosters Basic Certification Requirements" 935210 D02 v04r02, 2019-04-15.
- FCC Public Notice 935210 applying "Measurement guidance for industrial and non-consumer signal booster, repeater and amplifier devices" 935210 D05 v01r04, 2020-04-03.
- FCC Public Notice 971168 applying "Measurement guidance for certification of licensed digital transmitters" 971168 D01 v03r01,2018-04-09
- ANSI C63.26: 2015

**Summary Test Results:**

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

## 1.2 FCC REFERENCE TABLE

| Measurement | FCC reference |
|---|---|
| Effective radiated power, mean output power and zone enhancer gain | § 2.1046<br>§ 27.50<br>KDB 935210 D05 v01r04: 3.5 |
| Peak to Average Ratio | § 27.50 |
| Occupied bandwidth<br>Input-versus-output spectrum | § 2.1049<br>KDB 935210 D05 v01r04: 3.4 |
| Conducted spurious Emission at Antenna Terminal | § 2.1051<br>§ 27.53<br>KDB 935210 D05 v01r04: 3.6 |
| Out-of-band emissions limits | § 2.1051<br>§ 27.53<br>KDB 935210 D05 v01r04: 3.6 |
| Frequency stability | § 2.1055<br>§ 27.54 |
| Out-of-band rejection | KDB 935210 D05 v01r04: 3.3 |
| All measurements | ANSI 63.26 |

## 1.3 MEASUREMENT SUMMARY/SIGNATURES

| **47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** | **§2.1046, §27.50** |
|---|---|
| Effective Radiated Power, mean output power and zone enhancer gain | |
| The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r03: 3.5 | **Final Result** |
| **OP-Mode** | |
| Frequency Band, Direction, Input Power, Signal Type | |
| Band 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband | Passed |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| Band 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband 5G | Passed |

| **47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** | **§27.50** |
|---|---|
| Peak to Average Ratio | |
| The measurement was performed according to ANSI C63.26 | **Final Result** |
| **OP-Mode** | |
| Frequency Band, Direction, Input Power, Signal Type | |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband | Passed |

**47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** **§2.1049**

Occupied Bandwidth / Input-versus-output Spectrum

The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r03: 3.4 **Final Result**

**OP-Mode**

| Frequency Band, Direction, Input Power, Signal Type | |
|---|---|
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband | Passed |
| BAND 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| BAND 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband | Passed |
| BAND 41 BRS (UBS), RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| BAND 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband 5G | Passed |

| **47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** | **§2.1051, §27.53** |
|---|---|
| Conducted spurious emissions at antenna terminals<br>The measurement was performed according to ANSI C63.26 | **Final Result** |
| **OP-Mode** | |
| Frequency Band, Test Frequency, Direction, Signal Type | |
| BAND 41 BRS (LBS), low, RF downlink, Wideband | Passed |
| BAND 41 BRS (LBS), mid, RF downlink, Wideband | Passed |
| BAND 41 BRS (LBS), high, RF downlink, Wideband | Passed |
| BAND 41 BRS (LBS)low, RF downlink, Narrowband | Passed |
| BAND 41 BRS (LBS), mid, RF downlink, Narrowband | Passed |
| BAND 41 BRS (LBS), high, RF downlink, Narrowband | Passed |
| BAND 41 BRS (LBS), low, RF downlink, Wideband 5G | Passed |
| BAND 41 BRS (LBS), mid, RF downlink, Wideband 5G | Passed |
| BAND 41 BRS (LBS), high, RF downlink, Wideband 5G | Passed |
| BAND 41 BRS (UBS), low, RF downlink, Wideband | Passed |
| BAND 41 BRS (UBS), mid, RF downlink, Wideband | Passed |
| BAND 41 BRS (UBS), high, RF downlink, Wideband | Passed |
| BAND 41 BRS (UBS)low, RF downlink, Narrowband | Passed |
| BAND 41 BRS (UBS), mid, RF downlink, Narrowband | Passed |
| BAND 41 BRS (UBS), high, RF downlink, Narrowband | Passed |
| BAND 41 BRS (UBS), low, RF downlink, Wideband 5G | Passed |
| BAND 41 BRS (UBS), mid, RF downlink, Wideband 5G | Passed |
| BAND 41 BRS (UBS), high, RF downlink, Wideband 5G | Passed |

**47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** **§2.1051, § 27.53**

Out-of-band emission limits

The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r03: 3.6

**Final Result**

**OP-Mode**

| Band Edge, Frequency Band, Number of signals, Direction, Input Power, Signal Type | |
|---|---|
| Upper, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Upper, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Wideband | Passed |
| Upper, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| Upper, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| Upper, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Upper, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Wideband | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Lower, Band 41 BRS (LBS), 1, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Upper, Band 41 BRS (LBS), 2, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Upper, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Wideband | Passed |
| Upper, Band 41 BRS (LBS), 2, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Upper, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Lower, Band 41 BRS (LBS), 2, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Lower, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Wideband | Passed |
| Lower, Band 41 BRS (LBS), 2, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Lower, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Narrowband | Passed |

**47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** **§2.1051, § 27.53**

Out-of-band emission limits

The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r03: 3.6

**Final Result**

**OP-Mode**

| Band Edge, Frequency Band, Number of signals, Direction, Input Power, Signal Type | |
|---|---|
| Upper, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Upper, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Wideband | Passed |
| Upper, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| Upper, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| Upper, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Upper, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Wideband | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Wideband 5G | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Wideband 5G | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Lower, Band 41 BRS (UBS), 1, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Upper, Band 41 BRS (UBS), 2, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Upper, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Wideband | Passed |
| Upper, Band 41 BRS (UBS), 2, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Upper, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Narrowband | Passed |
| Lower, Band 41 BRS (UBS), 2, RF downlink, 0.3 dB < AGC, Wideband | Passed |
| Lower, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Wideband | Passed |
| Lower, Band 41 BRS (UBS), 2, RF downlink, 0.3 dB < AGC, Narrowband | Passed |
| Lower, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Narrowband | Passed |

| | |
|---|---|
| **47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** | **KDB 935210 D05 v01r03: 3.3** |
| Out-of-band rejection | |
| The measurement was performed according to ANSI C63.26 | **Final Result** |
| **OP-Mode** | |
| Frequency Band, Direction | |
| Band 41 BRS (LBS), RF downlink | Passed |
| Band 41 BRS (UBS), RF downlink | Passed |

| | |
|---|---|
| **47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]** | **§2.1055, §27.54** |
| Frequency stability | |
| | **Final Result** |
| **OP-Mode** | |
| Not applicable | Not applicable |

| Report version control | | | |
|---|---|---|---|
| **Version** | **Release date** | **Change Description** | **Version validity** |
| Initial | 2024-06-12 | -- | Valid |
| | | | |

# 2 ADMINISTRATIVE DATA

## 2.1 TESTING LABORATORY

Bureau Veritas Consumer Products Services
Germany GmbH
Thurn-und-Taxis-Straße 18
D-90411 Nürnberg
Tel.: +49 40 74041 0
Fax: +49 40 74041-2755

## 2.2 APPLICANT DATA

| | |
|---|---|
| Company Name: | Commscope<br>Andrew Wireless Systems GmbH |
| Address: | Industriering 10<br>86675 Buchdorf<br>Germany |
| Contact Person: | Mr. Jiri Cecka |

## 2.3 MANUFACTURER DATA

| | |
|---|---|
| Company Name: | Please see applicant data. |
| Address: | Please see applicant data. |

# 3 TEST OBJECT DATA

## 3.1 GENERAL EUT DESCRIPTION

| | |
|---|---|
| Kind of Device product description | Cellular Repeater |
| Product name | Cellular Repeater |
| Type | CAP MX 6/7E/80-85/17/E/19/23/25 T-AC |
| **Declared EUT data by the supplier** | |
| General Product Description | The EUT is an industrial signal booster supporting the following:<br><br>Band 41 (BRS-2500), Broadband Radio Service:<br>● Lower Band Segment (LBS): 2496- 2596 MHz<br>● Upper Band Segment (UBS): 2590 – 2690 MHz<br><br>A RF operation is only supported for the downlink. |
| Booster Type | Industrial Signal Booster |
| Voltage Type | AC |
| Voltage Level | 100 to 240 V |
| Maximum Output Donor Port [Uplink] | - |
| Maximum Output Server Port [Downlink] | 32 dBm |
| Maximum Gain [Uplink] | - |
| Maximum Gain [Downlink] | 33 dB |

**The main components of the EUT are listed and described in chapter 3.2 EUT Main components.**

## 3.2 EUT MAIN COMPONENTS

| **Sample Parameter** | **Value** |
|---|---|
| Serial Number | F TJCXAA2305302 |
| HW Version | 7830127-0001 Rev: 04 |
| SW Version | V5.0.0.191 |
| Comment | ----- |

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

## 3.3 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 (Manufacturer, Type Model, OUT Code)** | **Description** |
|---|---|---|
| - | - | - |

## 3.4 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 (Manufacturer, Type, S/N)** | **Description** |
|---|---|---|
| AUX1 | Commscope, ION-E PSU Shelf AC, HD20886 | Power supply rack |
| | GE Power Electronisc Inc., CAR1212FPBC-Z, HF27298 | Power plug-in module |
| AUX2 | Commscope, ION-E WCS-4, SZAEH1722A0002 | Module rack |
| | Commscope, ION-E OPT, SZBEAD1951A0011 | Optical plug-in module |
| | Commscope, RFD HB, SZBEAQ2123A0007 | RF card plug-in module |
| | Commscope, RFD HB, SZBEAQ2147A0009 | RF card plug-in module |
| | Commscope, RFD HB, SZBEAQ2210A0003 | RF card plug-in module |
| | Commscope, ION-E RFD, SZBEAG1503A0016 | RF card plug-in module |
| | Commscope, ION-E RFD, SZBEAG1505A0009 | RF card plug-in module |

## 3.5 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 |
|---|---|---|
| | , | Setup for all tests |

## 3.6 OPERATING MODES

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

### 3.6.1 TEST CHANNELS

| Band name | Direction | Lower Frequency Band Edge [MHz] | Upper Frequency Band Edge [MHz] | Center Frequency [MHz] | Port |
|---|---|---|---|---|---|
| 41, BRS (LBS) | Downlink | 2496 | 2596 | 2546 | Donor |
| 41, BRS (UBS) | Downlink | 2590 | 2690 | 2640 | Donor |

Note:

In the previous tests three bands, LBS, MBS and UBS were tested, this was a division of the whole band into this named three part.
In comparison to previous tests the whole band now is divided into two bands named LBS and UBS. This is necessary because supplementary a 5G signal handling with a test signal of f = 98.3 MHz is used: To test this type of signal the division of the whole band into two 100 MHz parts is necessary.

### 3.6.2 DEFINITION OF USED FREQUENCY BANDS

Narrowband: representation by a GSM signal
Wideband : representation by an AWGN signal with 4.1 MHz
Wideband 5G: representation by an AWGN signal with 98.3 MHz

## 3.6.3 AUTOMATIC GAIN CONTROL LEVEL

| **AGC Levels** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Band** | **Direction** | **Signal Type** | **AGC Start Pin [dBm]** | **AGC Start Pin -0.3 dB [dBm]** | **AGC Start Pin +3 dB [dBm]** | **Frequency [MHz]** | **Frequency** |
| 41, BRS (LBS) | Downlink | Wideband | -2.9 | -3.2 | 0.1 | 2546.0 | Mid |
| 41, BRS (LBS) | Downlink | Narrowband | -2.9 | -3.2 | 0.1 | 2547.0 | |
| 41, BRS (LBS) | Downlink | Wideband 5G | -3.0 | -3.3 | 0.0 | 2546.0 | |
| 41, BRS (UBS) | Downlink | Wideband | -3.5 | -3.8 | -0.5 | 2640.0 | |
| 41, BRS (UBS) | Downlink | Narrowband | -3.5 | -3.8 | -0.5 | 2641.0 | |
| 41, BRS (UBS) | Downlink | Wideband 5G | -3.5 | -3.8 | -0.5 | 2640.0 | |
| 41, BRS (LBS) | Downlink | Wideband | -3.0 | -3.3 | 0.0 | 2498.5 | Low |
| 41, BRS (LBS) | Downlink | Narrowband | -3.0 | -3.3 | 0.0 | 2496.2 | |
| 41, BRS (UBS) | Downlink | Wideband | -3.8 | -4.1 | -0.8 | 2592.5 | |
| 41, BRS (UBS) | Downlink | Narrowband | -3.6 | -3.9 | -0.6 | 2590.2 | |
| 41, BRS (LBS) | Downlink | Wideband | -3.6 | -3.9 | -0.6 | 2593.5 | High |
| 41, BRS (LBS) | Downlink | Narrowband | -3.2 | -3.5 | -0.2 | 2595.8 | |
| 41, BRS (UBS) | Downlink | Wideband | -4.2 | -4.5 | -1,2 | 2687.5 | |
| 41, BRS (UBS) | Downlink | Narrowband | -4.0 | -4.3 | -1.0 | 2689.8 | |
| 41, BRS (LBS) | Downlink | Wideband | -4.0 | -4.3 | -1.0 | 2593.4 | Max. Power |
| 41, BRS (LBS) | Downlink | Narrowband | -3.6 | -4.0 | -0.6 | 2593.4 | |
| 41, BRS (LBS) | Downlink | Wideband 5G | -3.8 | -4.1 | -0.8 | 2546.0 | |
| 41, BRS (UBS) | Downlink | Wideband | -4.5 | -4.8 | -1.5 | 2687.5 | |
| 41, BRS (UBS) | Downlink | Narrowband | -4.4 | -4.8 | -1.4 | 2687.5 | |
| 41, BRS (UBS) | Downlink | Wideband 5G | -4.3 | -4.6 | -1.3 | 2640.0 | |

If the measured frequency $f_0$ for the max power has a too low distance to the band edges, because in the tests modulated signals must be used: The next possible frequency to the according band edge is used.
For example for minimum distances to the band edges:

GSM signal (narrowband): 0.2 MHz
AWGN signal (wideband): 2.5 MHz
AWGN signal (wideband 5G): Here only measurements at the mid frequency are possible, because the signal band has the same bandwidth as the used channel.

### 3.6.4 REMARKS TO THE MEASUREMENTS

Cause of an inappropriate control mode in the transmission of the narrowband signal (GSM signal) at $f_{mid}$, $f_{mid}$ is increased by 1 MHz, Hereby the abbreviations are:

$f_{mid}$ for wideband signals (AWGN signals)
$f_{mid+1}$ for narrowband signals (GSM signals)

In the real use of the repeater narrowband signals aren't used.

## 3.7 PRODUCT LABELLING

### 3.7.1 FCC ID LABEL

Please refer to the documentation of the applicant.

### 3.7.2 LOCATION OF THE LABEL ON THE EUT

Please refer to the documentation of the applicant.

# 4 TEST RESULTS

## 4.1 EFFECTIVE RADIATED POWER, MEAN OUTPUT POWER AND ZONE ENHANCER GAIN

Standard FCC Part 27, §27.50

**The test was performed according to:**
ANSI C63.26, KDB KDB 935210 D05 v01r04: 3.5

**Test date**: 2023-12-19 – 2023-12-20

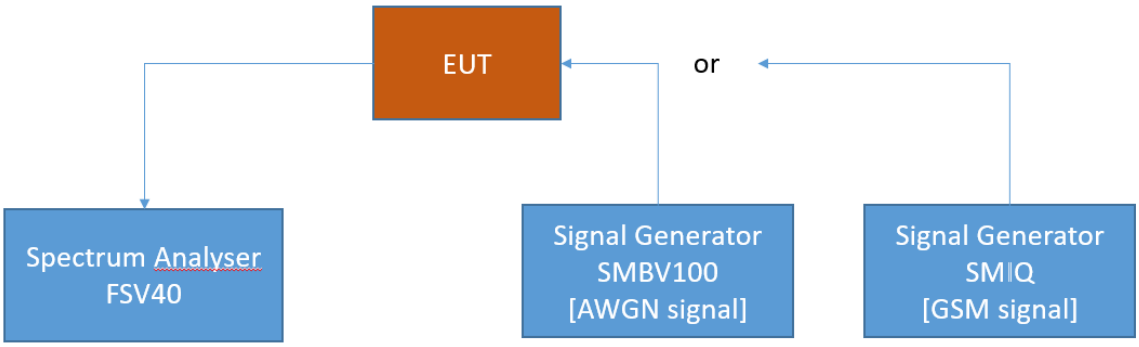
**Environmental conditions**: 23 °C ± 5 K; 40 % r. F. ± 20 % r. F.

**Test engineer**: Thomas Hufnagel

### 4.1.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster power and gain limits and requirements for industrial signal boosters.

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




FCC Part 22/24/27/90 Industrial signal booster – Test Setup; RF Output Power / Gain

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.

## 4.1.2 TEST REQUIREMENTS/LIMITS

**Part 27; Miscellaneous Wireless Communication Services**

**Subpart C – Technical standards**

**§ 27.50**

**Band 41:**

(h) The following power limits shall apply in the BRS and EBS:

(1) *Main, booster and base stations.* (i) The maximum EIRP of a main, booster or base station shall not exceed 33 dBW + 10log(X/Y) dBW, where X is the actual channel width in MHz and Y is either 6 MHz if prior to transition or the station is in the MBS following transition or 5.5 MHz if the station is in the LBS and UBS following transition, except as provided in paragraph (h)(1)(ii) of this section.

(ii) If a main or booster station sectorizes or otherwise uses one or more transmitting antennas with a non-omnidirectional horizontal plane radiation pattern, the maximum EIRP in dBW in a given direction shall be determined by the following formula: EIRP = 33 dBW + 10 log(X/Y) dBW + 10 log(360/beamwidth) dBW, where X is the actual channel width in MHz, Y is either (i) 6 MHz if prior to transition or the station is in the MBS following transition or (ii) 5.5 MHz if the station is in the LBS and UBS following transition, and beamwidth is the total horizontal plane beamwidth of the individual transmitting antenna for the station or any sector measured at the half-power points.

## 4.1.3 TEST PROTOCOL

| **Band 41, BRS (LBS), downlink** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Input Power [dBm]** | **Maximum Average Output Power [dBm]** | **Limit Average Output Power [dBm]** | **Margin to Limit [dB]** | **Gain [dB]** |
| Wideband | 0.3 dB < AGC | 2593.4 | -4.3 | 33.2 | 51.6 | 18.4 | 37.5 |
| Wideband | 3 dB > AGC | 2593.4 | -1.0 | 32.8 | 51.6 | 18.8 | 33.8 |
| Narrowband | 0.3 dB < AGC | 2593.4 | -4.0 | 33.5 | 62.6 | 29.1 | 37.5 |
| Narrowband | 3 dB > AGC | 2593.4 | -0.6 | 33.1 | 62.6 | 29.5 | 33.7 |
| Wideband 5G | 0.3 dB < AGC | 2546.0 | -4.1 | 33.0 | 75.9 | 42.9 | 37.1 |
| Wideband 5G | 3 dB > AGC | 2546.0 | -0.8 | 32.6 | 75.9 | 43.3 | 33.4 |

| **Band 41, BRS (UBS), downlink** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Input Power [dBm]** | **Maximum Average Output Power [dBm]** | **Limit Average Output Power [dBm]** | **Margin to Limit [dB]** | **Gain [dB]** |
| Wideband | 0.3 dB < AGC | 2687.5 | -4.8 | 32.3 | 51.6 | 19.3 | 37.1 |
| Wideband | 3 dB > AGC | 2687.5 | -1.5 | 33.6 | 51.6 | 18.0 | 35.1 |
| Narrowband | 0.3 dB < AGC | 2687.5 | -4.8 | 32.3 | 62.6 | 30.3 | 37.1 |
| Narrowband | 3 dB > AGC | 2687.5 | -1.4 | 33.2 | 62.6 | 29.4 | 34.6 |
| Wideband 5G | 0.3 dB < AGC | 2640.0 | -4.6 | 32.2 | 75.9 | 43.7 | 36.8 |
| Wideband 5G | 3 dB > AGC | 2640.0 | -1.3 | 32.5 | 75.9 | 43.4 | 33.8 |

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

**Maximum output power (EIRP) in consideration together with the send antenna**

Calculation for the highest power level of the test protocol table:

The highest power level in the table above is
$p_{highest}$ = 33.6 dBm at the channel which has the most output power of all channels.

Hereby at an antenna gain of $G_{dB}$ = 9 dBi the highest effecitve radiated output power EIRP $p_{EIRP\ 1CH}$ of one channel is:

$p_{EIRP\ 1CH} = p_{highest} + G_{dB}$

This results in:

$p_{EIRP\ 1CH}$ = 33.6 dBm + 9 dB = 42.6 dBm

The equivalent power p is according the given formula:

$p_{EIRP\ 1CH}$:

$$p\ EIRP\ 1CH\ [W] = 10\mathrm{EXP}(p\ EIRP\ 1CH\ [dBm]\ /\ 10) * 0.001\ [W]$$

This results in:

$$p\ EIRP\ 1CH\ [W] = 10\mathrm{EXP}(42.6\ [dBm]\ /\ 10) * 0.001\ [W] = 18.2\ \mathrm{W}$$

This repeater only has one output port, therefore the power of only one port is considered (no MIMO function possible):

$p_{EIRP\ 1CH}$ = 1 * $p_{EIRP\ 1CH}$

This results in:

$p_{EIRP\ 1CH}$ = 1 * 18.2 W =18.2 W

Now this value expressed in the unit dBW is:

$p_{EIRP\ 1CH}$:

$$p\ EIRP\ 1CH\ [dBW] = 10 * LOG(p\ EIRP\ 1CH\ [W])$$

This results in:

$$p\ EIRP\ 1CH\ [dBW] = 10 * LOG(18.2\ [W]) = 12.6\ \text{dBW}$$

$p_{EIRP\ 1CH}$ = 12.6 dBW < 21.6 dBW, hereby 21.6 dBW is the highest allowed limit in this case.

The limits for the signals are:

Narrowband (Bandwidth = 400 kHz): 21.6 dBW
Wideband (Bandwidth = 5 MHz): 32.6 dBW
Wideband 5G (Bandwidth = 100 MHz): 45.6 dBW

According this calculation the EIRP for power levels is:

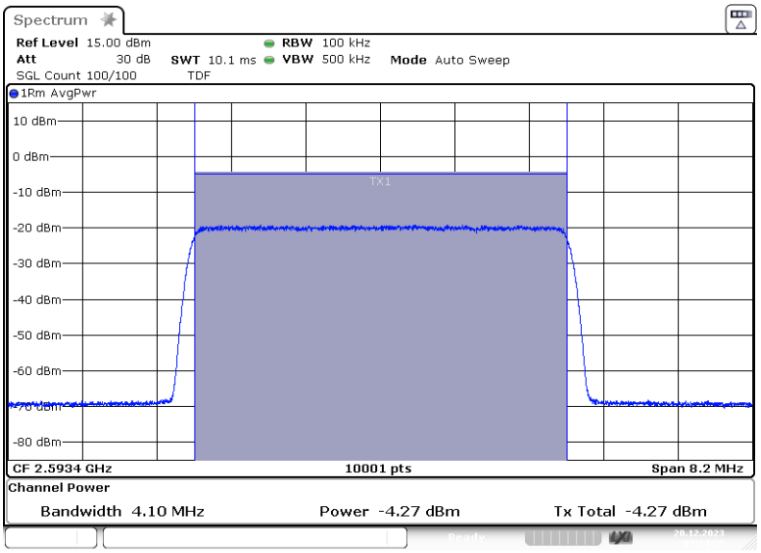
| **Band 41, BRS (LBS), downlink** | | | | | | |
|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Maximum average output repeater plus send antenna with one output port [dBm]** | **Maximum average output repeater plus send antenna with one output port [dBW]** | **Limit according FCC rules [dBW]** | **PASS/ FAIL** |
| Wideband | 0.3 dB < AGC | 2593.4 | 42.2 | 12.2 | 21.6 | PASS |
| Wideband | 3 dB > AGC | 2593.4 | 41.8 | 11.8 | 21.6 | PASS |
| Narrowband | 0.3 dB < AGC | 2593.4 | 42.5 | 12.5 | 32.6 | PASS |
| Narrowband | 3 dB > AGC | 2593.4 | 42.1 | 12.1 | 32.6 | PASS |
| Wideband 5G | 0.3 dB < AGC | 2546.0 | 42.0 | 12.0 | 45.9 | PASS |
| Wideband 5G | 3 dB > AGC | 2546.0 | 41.6 | 11.6 | 45.9 | PASS |

| **Band 41, BRS (UBS), downlink** | | | | | | |
|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Maximum average output repeater plus send antenna with one output port [dBm]** | **Maximum average output repeater plus send antenna with one output port [dBW]** | **Limit according FCC rules [dBW]** | **PASS/ FAIL** |
| Wideband | 0.3 dB < AGC | 2687.5 | 41.3 | 11.3 | 21.6 | PASS |
| Wideband | 3 dB > AGC | 2687.5 | 42.6 | 12.6 | 21.6 | PASS |
| Narrowband | 0.3 dB < AGC | 2687.5 | 41.3 | 11.3 | 32.6 | PASS |
| Narrowband | 3 dB > AGC | 2687.5 | 42.2 | 12.2 | 32.6 | PASS |
| Wideband 5G | 0.3 dB < AGC | 2640.0 | 41.2 | 11.2 | 45.9 | PASS |
| Wideband 5G | 3 dB > AGC | 2640.0 | 41.5 | 11.5 | 45.9 | PASS |

**The DUT doesn’t exceed the limit.**

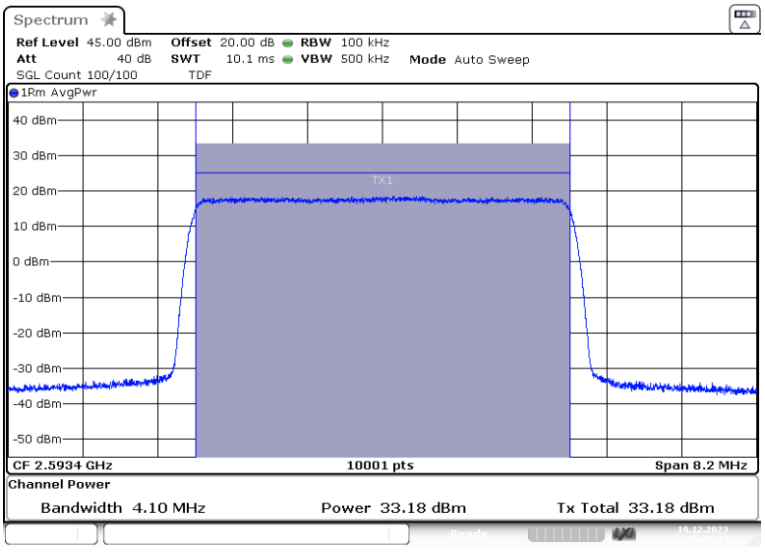
## 4.1.4 MEASUREMENT PLOT

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN;
Input Power 0.3 dB < AGC



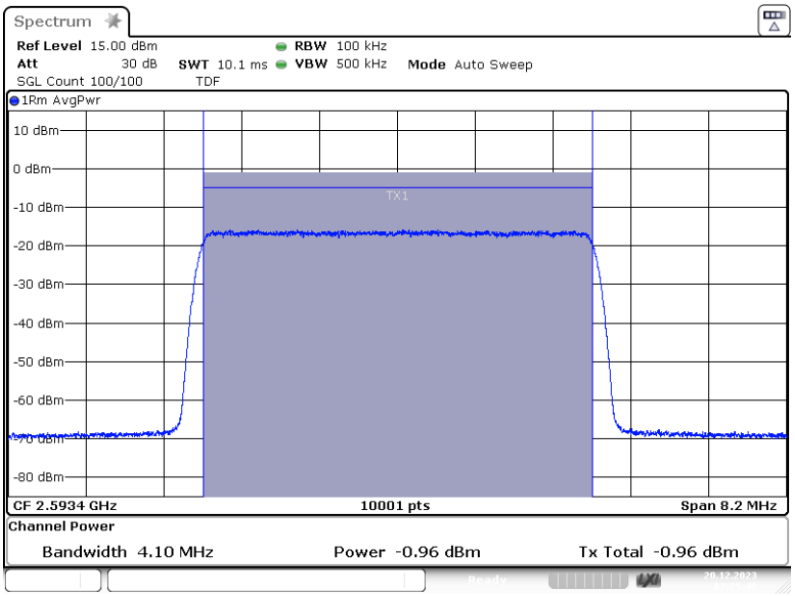

3.5.3 Power AWGN In-0.3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN;
Output Power 0.3 dB < AGC



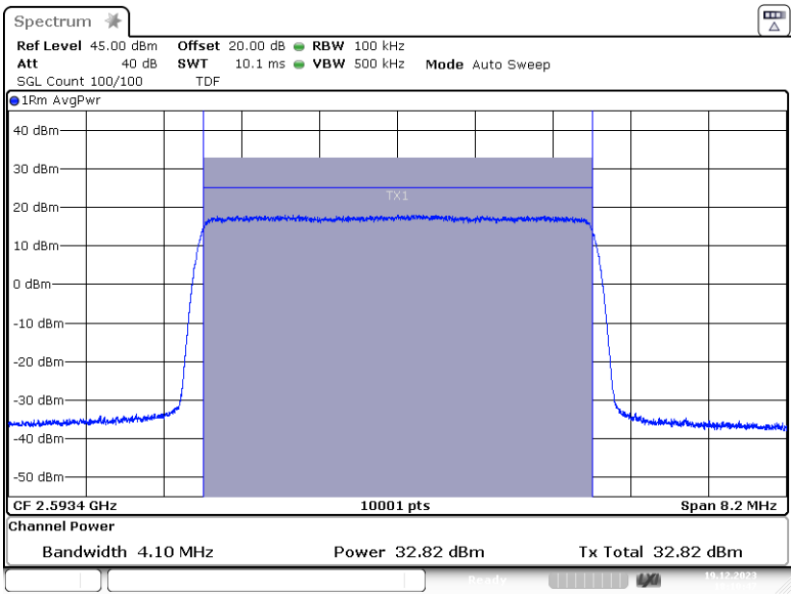

3.5.3 Power AWGN Out -0.3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN;
Input Power 3 dB > AGC



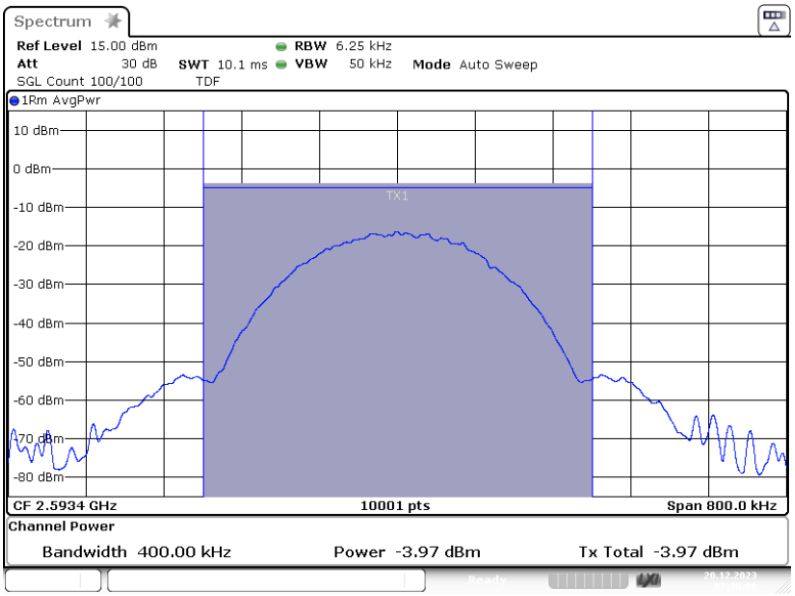

3.5.3 Power AWGN In+3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN;
Output Power 3 dB > AGC



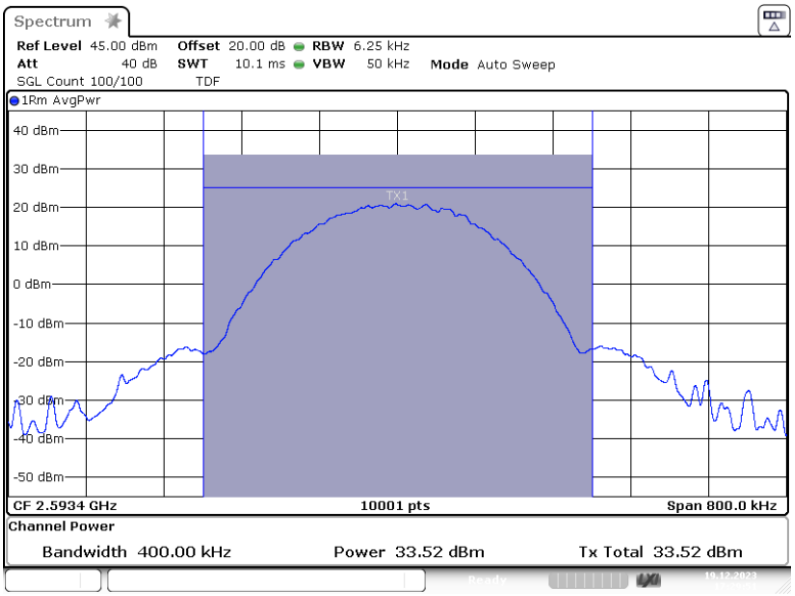

3.5.3 Power AWGN Out +3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM;
Input Power 0.3 dB < AGC



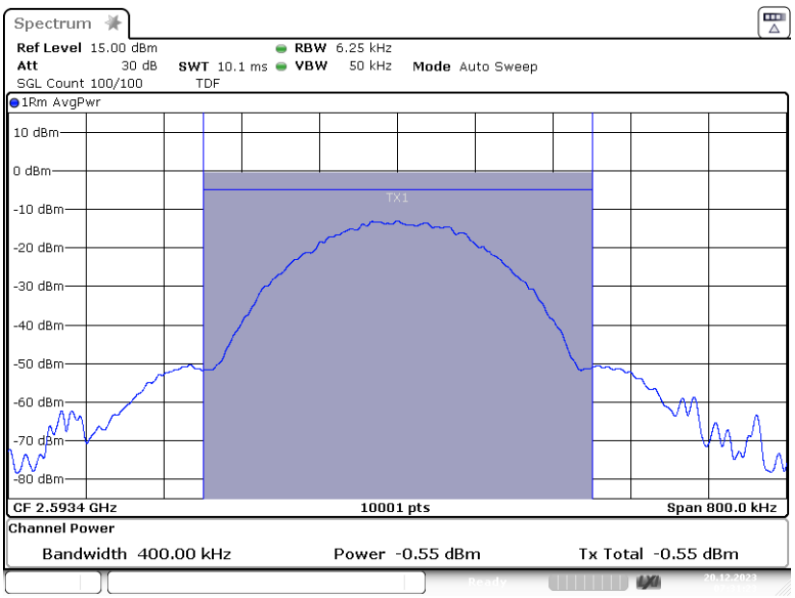

3.5.3 Power GSM In-0.3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM;
Output Power 0.3 dB < AGC



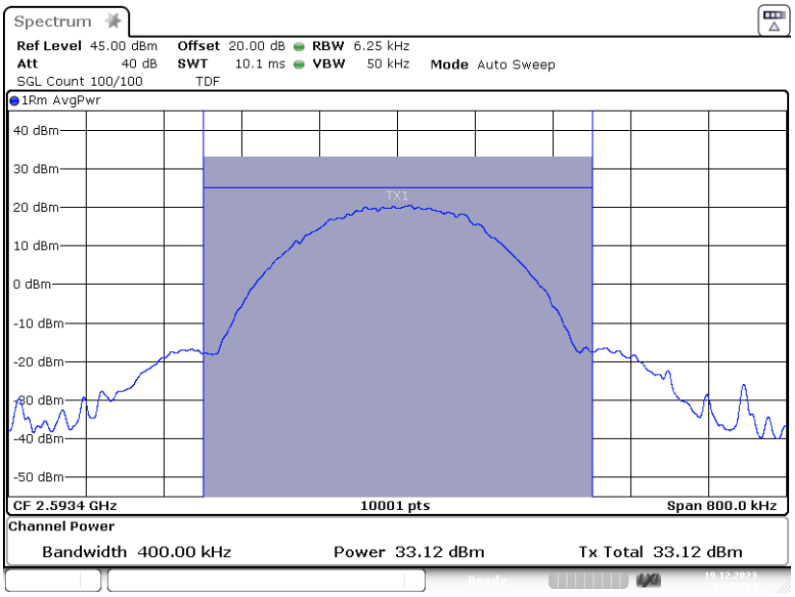

3.5.3 Power GSM Out -0.3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM;
Input Power 3 dB > AGC



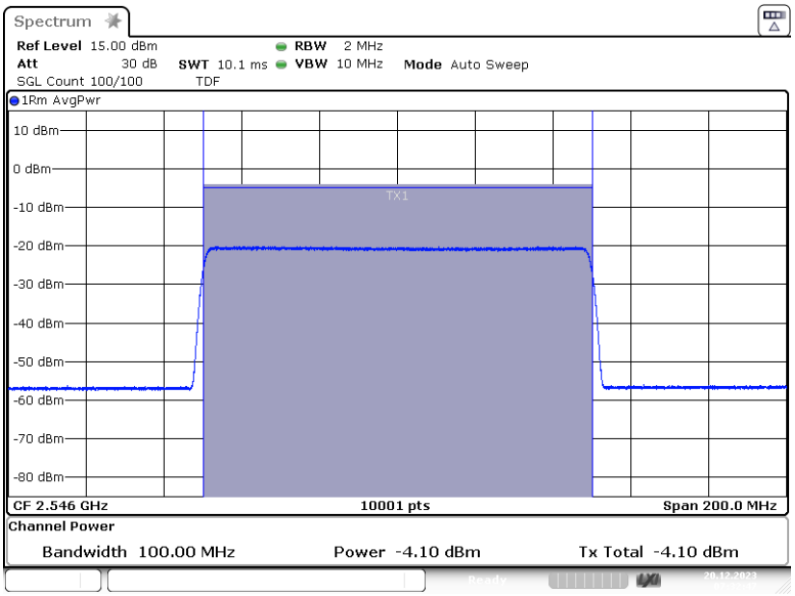

3.5.3 Power GSM In+3 2.59340G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM;
Output Power 3 dB > AGC



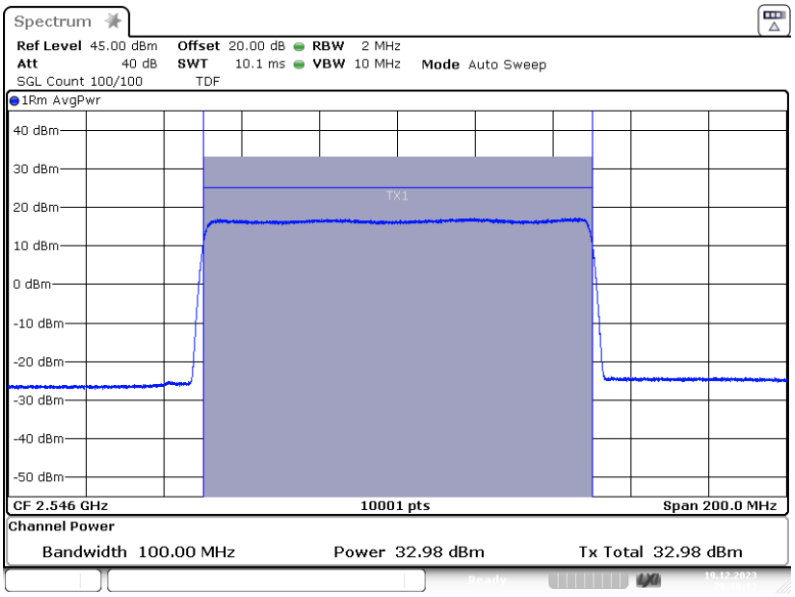

3.5.3 Power GSM Out +3 2.59340G

Band 41 BRS LBS; Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Input Power 0.3 dB < AGC



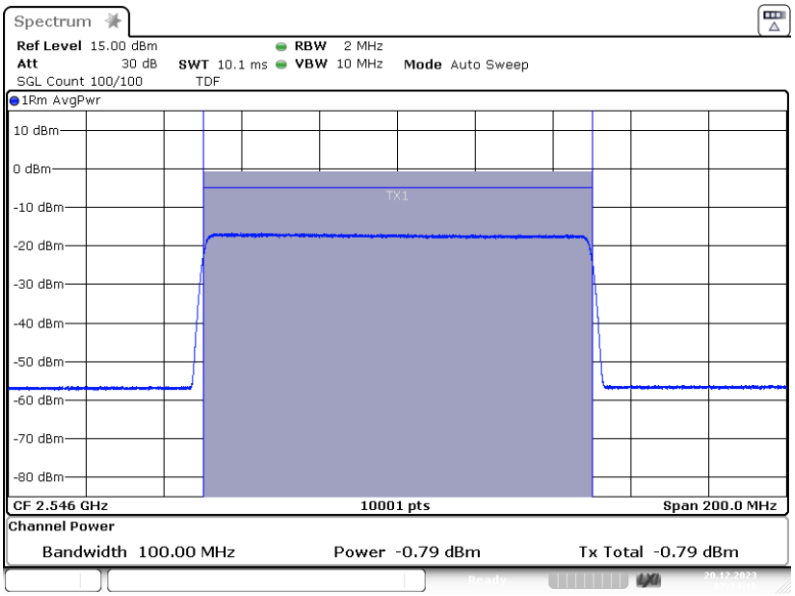

3.5.3 Power AWGN100 In-0.3 2.54600G

Band 41 BRS LBS; Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Output Power 0.3 dB < AGC



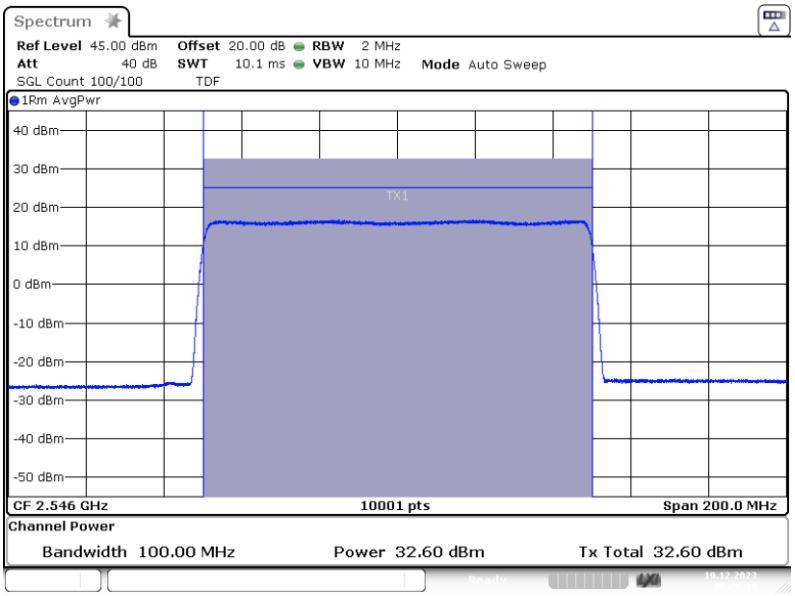

3.5.3 Power AWGN100 Out -0.3 2.54600G

Band 41 BRS LBS; Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Input Power 3 dB > AGC



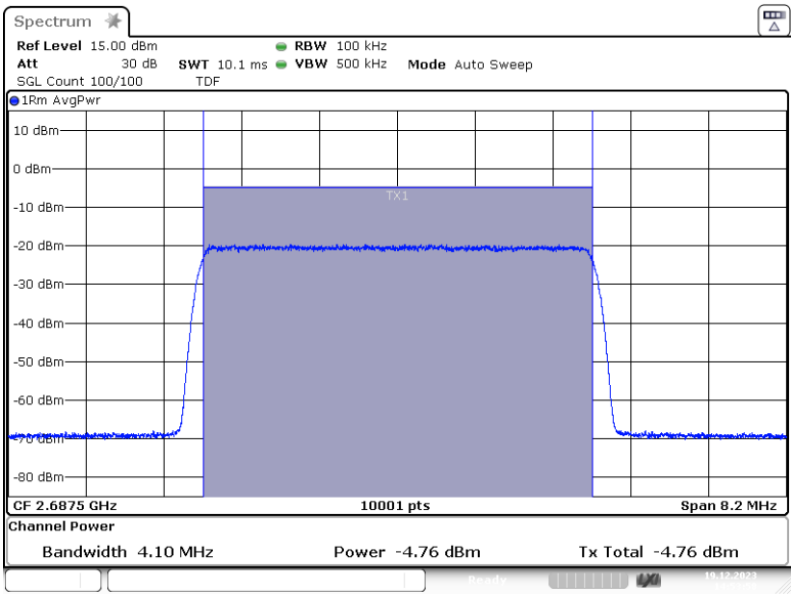

3.5.3 Power AWGN100 In+3 2.54600G

Band 41 BRS LBS; Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Output Power 3 dB > AGC



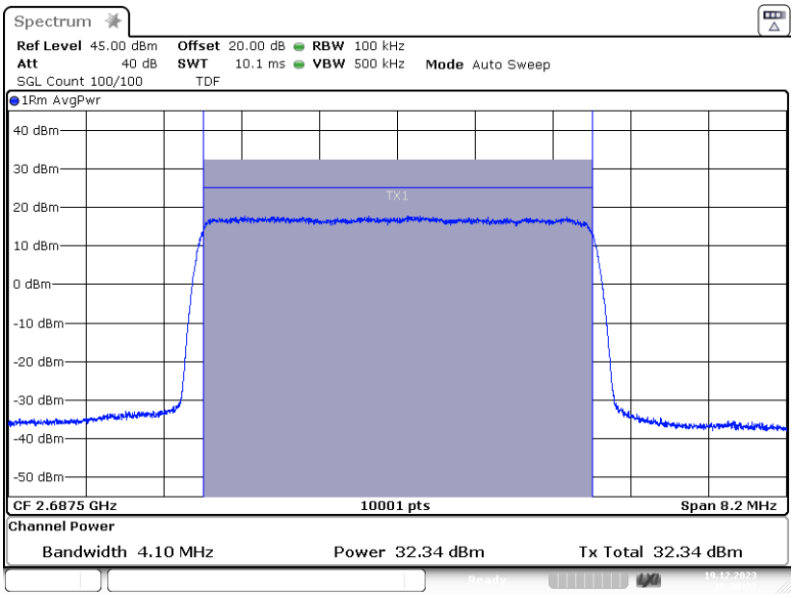

3.5.3 Power AWGN100 Out +3 2.54600G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN;
Input Power 0.3 dB < AGC



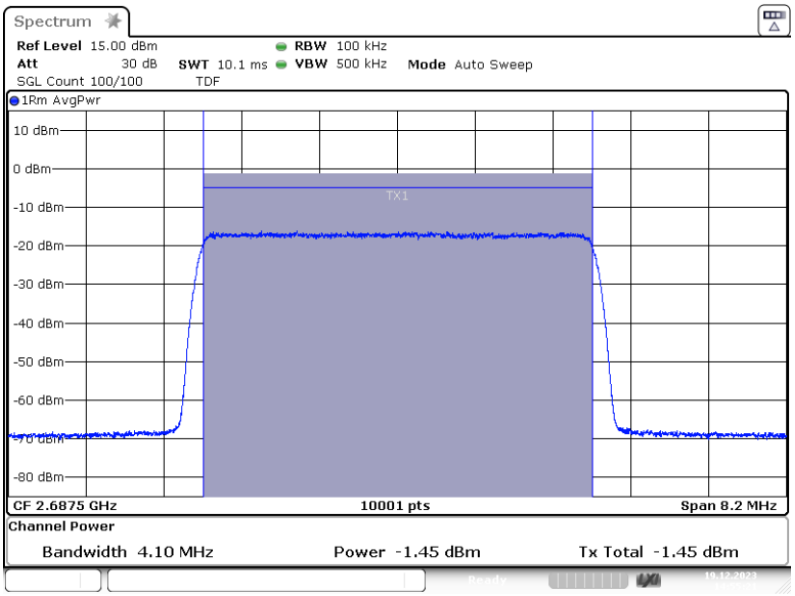

3.5.3 Power AWGN In-0.3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN;
Output Power 0.3 dB < AGC



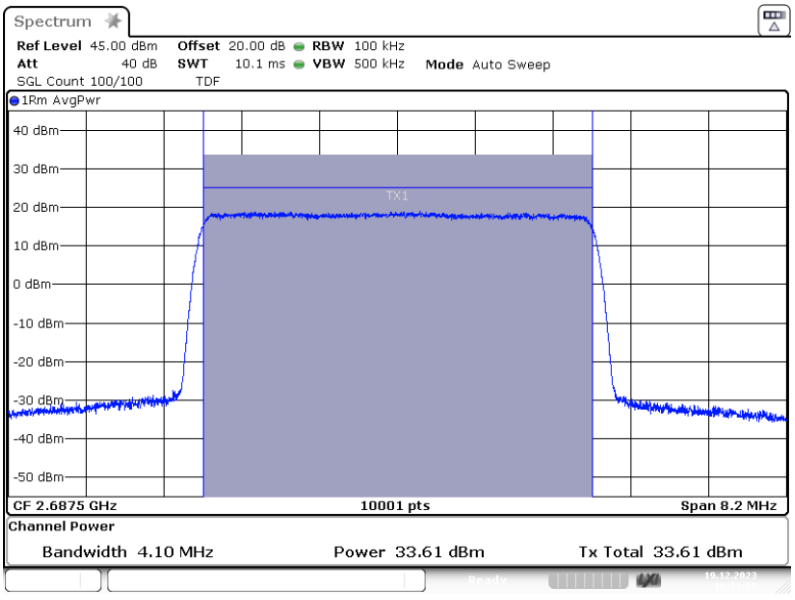

3.5.3 Power AWGN Out -0.3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN;
Input Power 3 dB > AGC



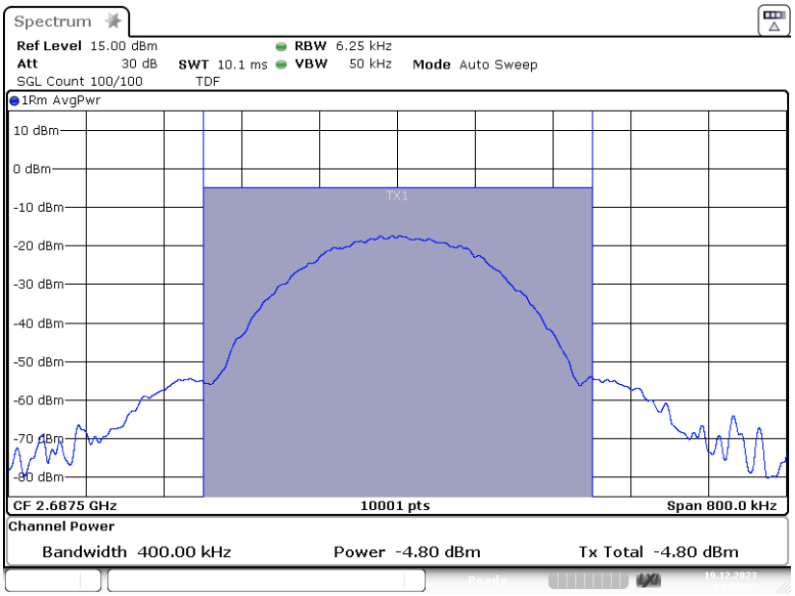

3.5.3 Power AWGN In+3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN;
Output Power 3 dB > AGC



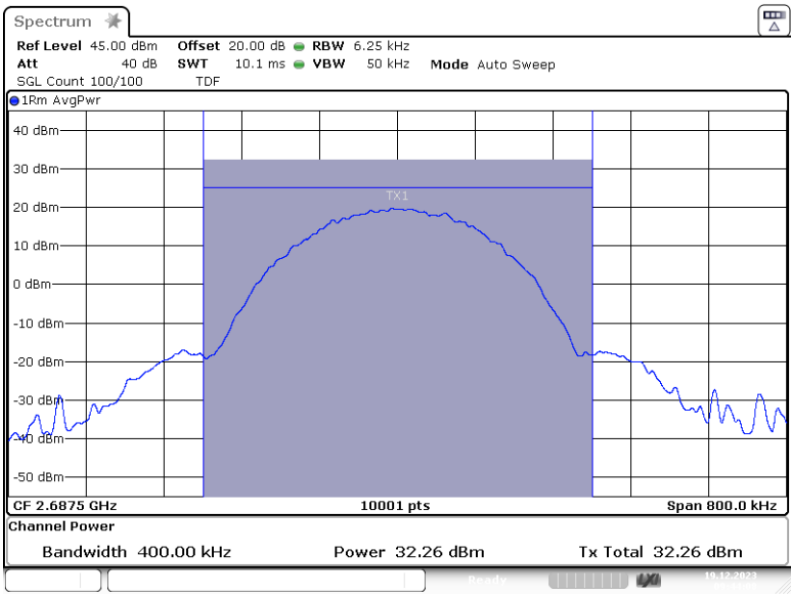

3.5.3 Power AWGN Out +3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM;
Input Power 0.3 dB < AGC



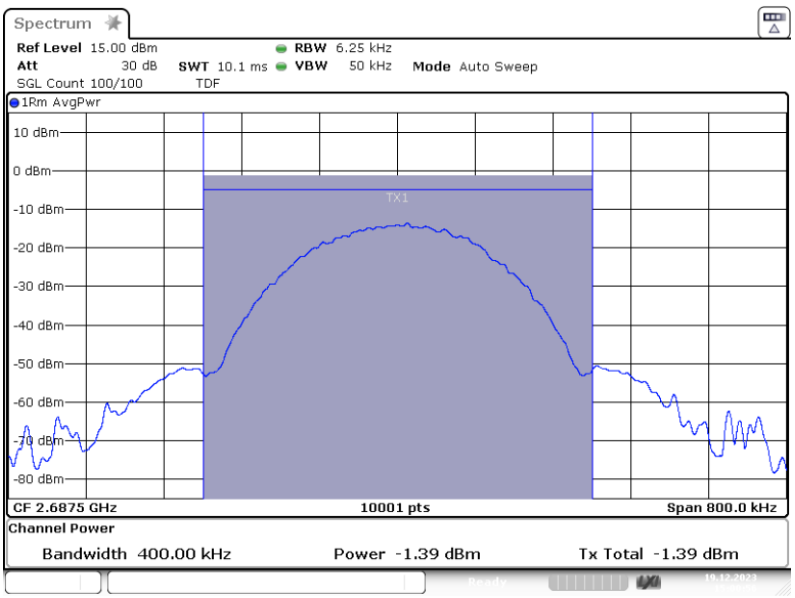

3.5.3 Power GSM In-0.3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM;
Output Power 0.3 dB < AGC



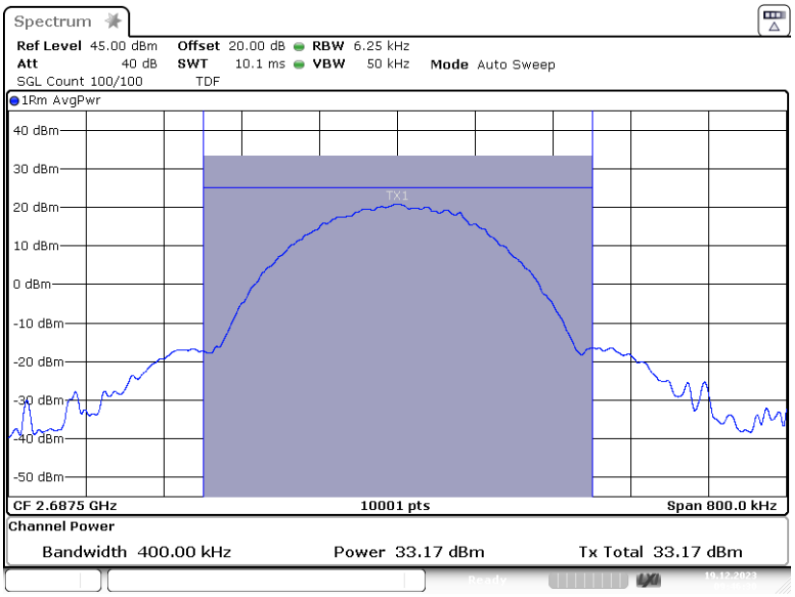

3.5.3 Power GSM Out -0.3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM;
Input Power 3 dB > AGC



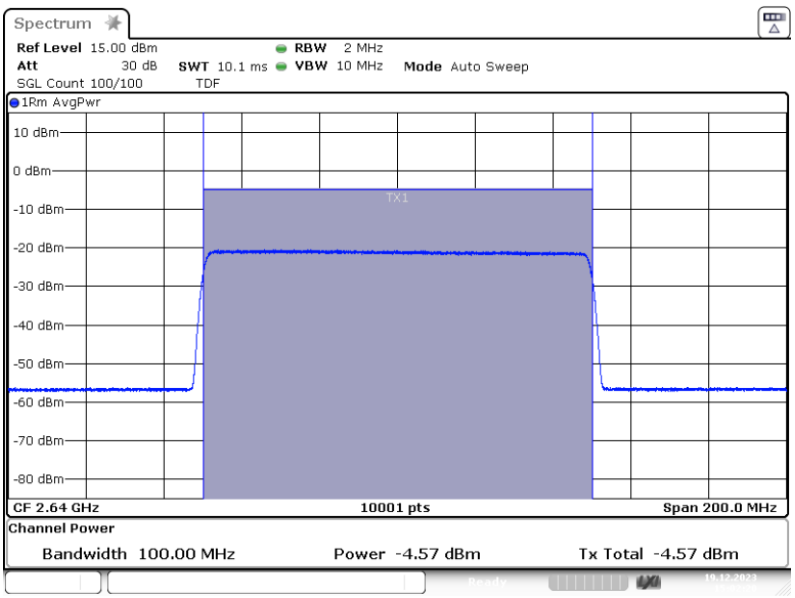

3.5.3 Power GSM In+3 2.68750G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM;
Output Power 3 dB > AGC



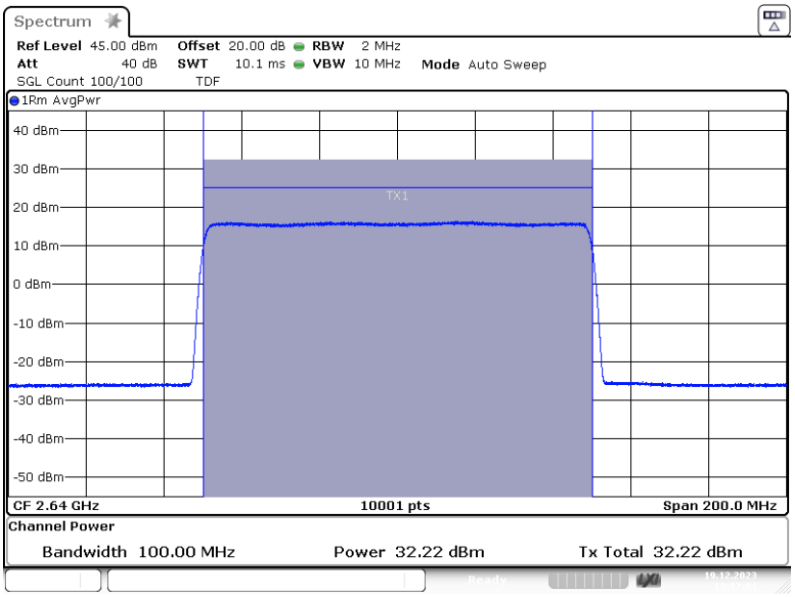

3.5.3 Power GSM Out +3 2.68750G

Band 41 BRS UBS; Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100;
Input Power 0.3 dB < AGC



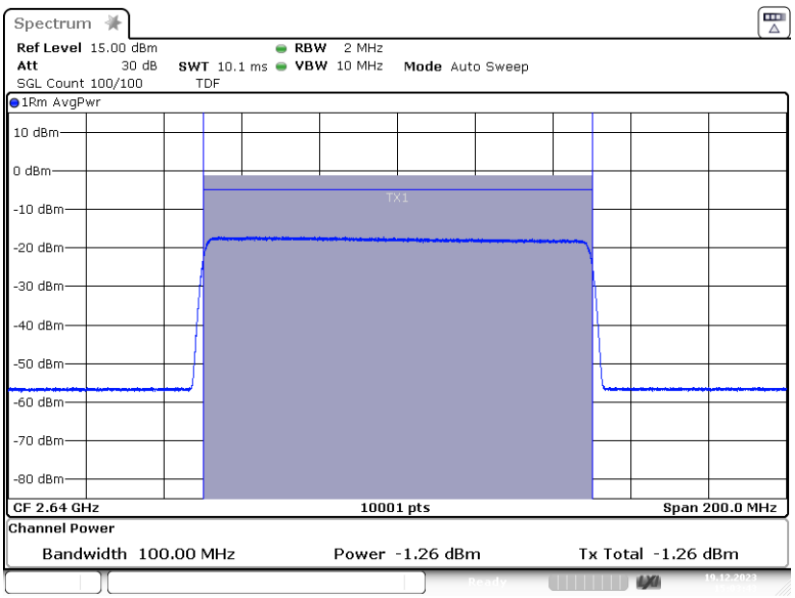

3.5.3 Power AWGN100 In-0.3 2.64000G

Band 41 BRS UBS; Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100;
Output Power 0.3 dB < AGC



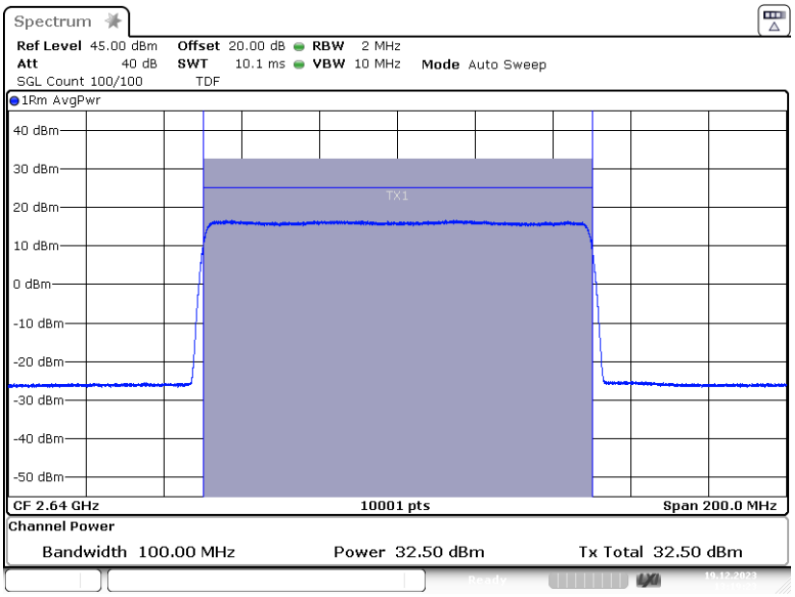

3.5.3 Power AWGN100 Out -0.3 2.64000G

Band 41 BRS UBS; Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100;
Input Power 3 dB > AGC




3.5.3 Power AWGN100 In+3 2.64000G

Band 41 BRS UBS; Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100;
Output Power 3 dB > AGC




3.5.3 Power AWGN100 Out +3 2.64000G

### 4.1.5 TEST EQUIPMENT USED

- Conducted

## 4.2 PEAK TO AVERAGE RATIO

Standard FCC Part 27, §27.50

**The test was performed according to:**
ANSI C63.26

**Test date**: 2023-12-19 – 2023-12-20

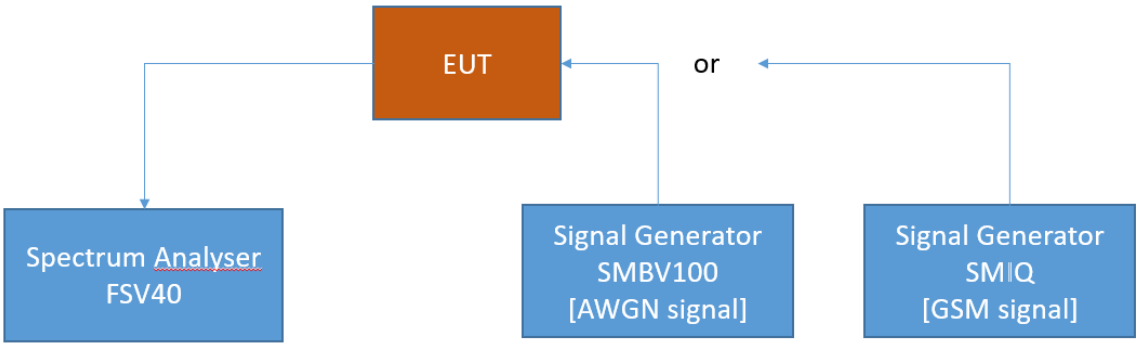
**Environmental conditions**: 23 °C ± 5 K; 40 % r. F. ± 20 % r. F.

**Test engineer**: Thomas Hufnagel

### 4.2.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the signal booster power and gain limits and requirements for industrial signal boosters.

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




FCC Part 22/24/27/90 Industrial signal booster – Test Setup; RF Output Power / Gain

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.

## 4.2.2 TEST REQUIREMENTS/LIMITS

**Part 27; Miscellaneous Wireless Communication Services**

**Subpart C – Technical standards**

**§ 27.50**

**Band 41:**
For the band 41(BRS, LBS/UBS) exists no FCC peak-to-average power ratio (PAPR) limit. Although here no limit exits, a fictive limit with the usual 13 dB value is set and the margin to this fictive limit is calculated.

## 4.2.3 TEST PROTOCOL

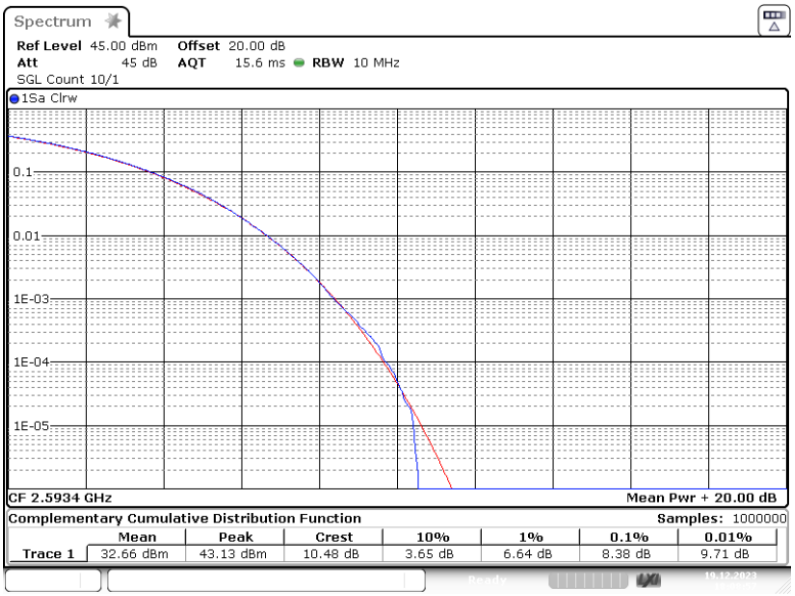
| **Band 41 BRS (LBS), downlink** | | | | | | |
|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Input Power [dBm]** | **PAPR [dB]** | **Fictive Limit PAPR [dB]** | **Margin to fictive Limit [dB]** |
| Wideband | 0.3 dB < AGC | 2593.4 | -4.3 | 8.4 | 13.0 | 4.6 |
| Wideband | 3 dB > AGC | 2593.4 | -1.0 | 8.4 | 13.0 | 4.6 |
| Narrowband | 0.3 dB < AGC | 2593.4 | -4.0 | 0.2 | 13.0 | 12.8 |
| Narrowband | 3 dB > AGC | 2593.4 | -0.6 | 0.2 | 13.0 | 12.8 |

| **Band 41 BRS (UBS), downlink** | | | | | | |
|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Frequency [MHz]** | **Input Power [dBm]** | **PAPR [dB]** | **Fictive Limit PAPR [dB]** | **Margin to Fictive Limit [dB]** |
| Wideband | 0.3 dB < AGC | 2687.5 | -4.8 | 8.3 | 13.0 | 4.7 |
| Wideband | 3 dB > AGC | 2687.5 | -1.5 | 8.3 | 13.0 | 4.7 |
| Narrowband | 0.3 dB < AGC | 2687.5 | -4.8 | 0.1 | 13.0 | 12.9 |
| Narrowband | 3 dB > AGC | 2687.5 | -1.4 | 0.2 | 13.0 | 12.8 |

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

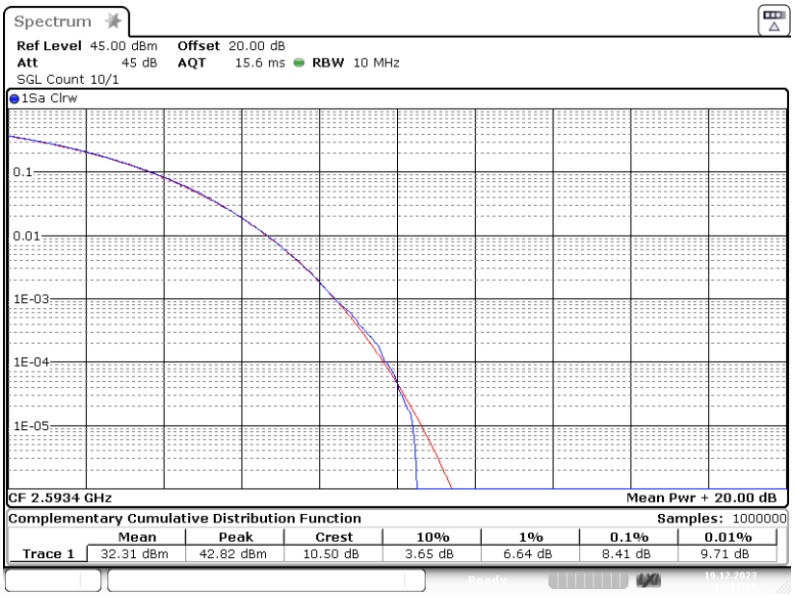
## 4.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE. "WORST CASE")

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN; PAPR 0.3 dB < AGC



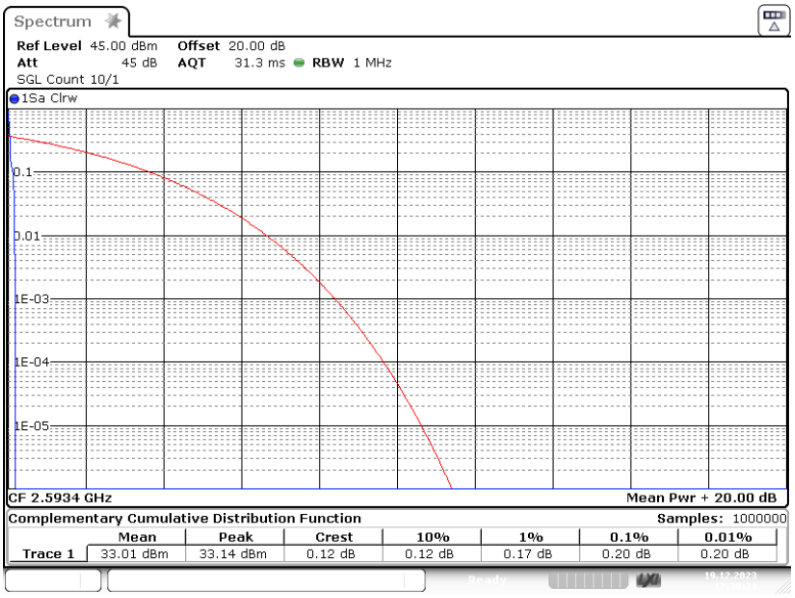

4.0 PAPR AWGN Out -0.3 2.593G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: AWGN; PAPR 3 dB > AGC



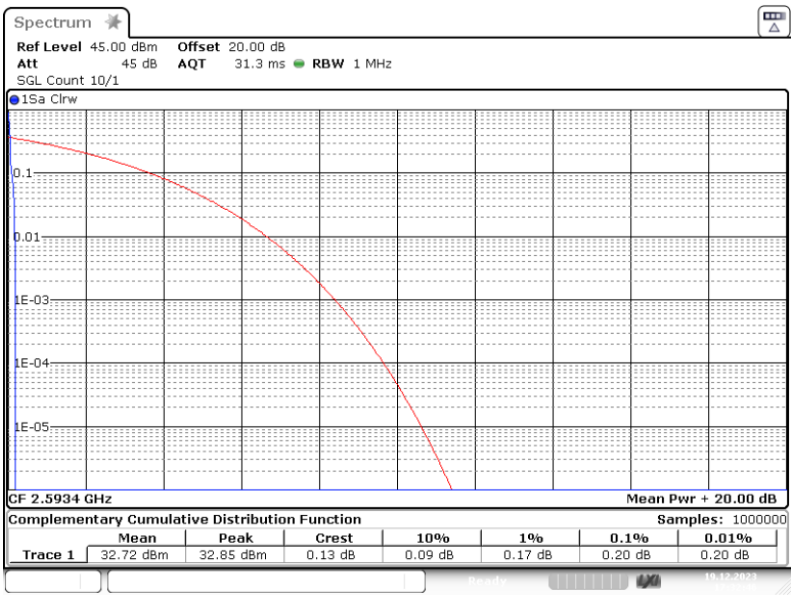

4.0 PAPR AWGN Out +3 2.593G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM; PAPR 0.3 dB < AGC



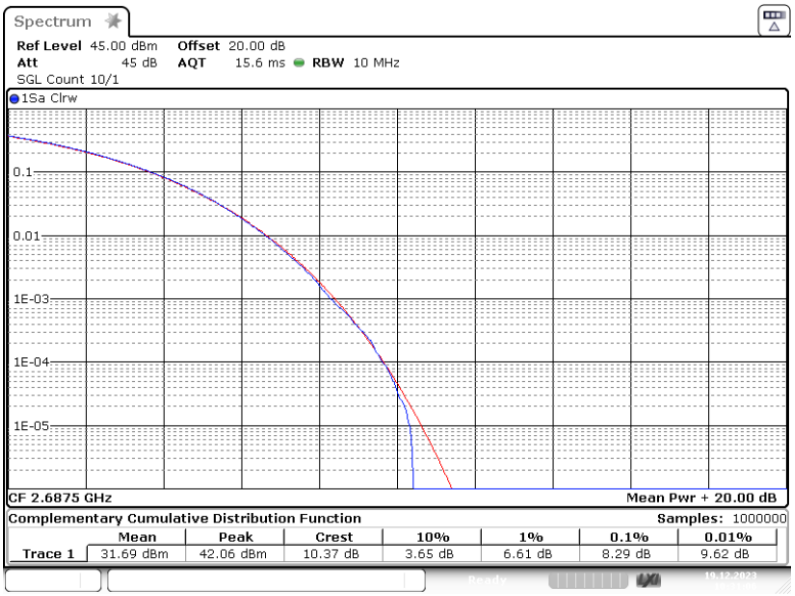

4.0 PAPR GSM Out -0.3 2.593G

Band 41 BRS LBS; Frequency: 2.5934 GHz; Band Edge: f0; Mod: GSM; PAPR 3 dB > AGC



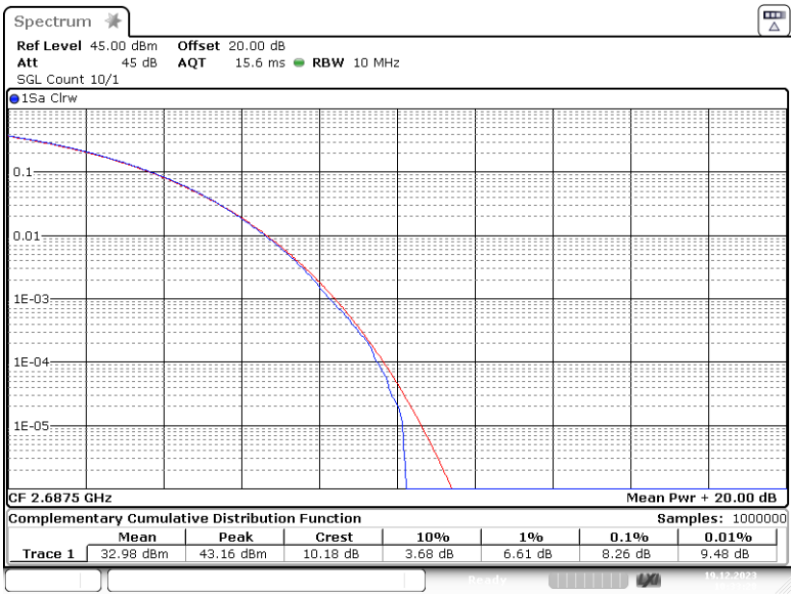

4.0 PAPR GSM Out +3 2.593G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN; PAPR 0.3 dB < AGC



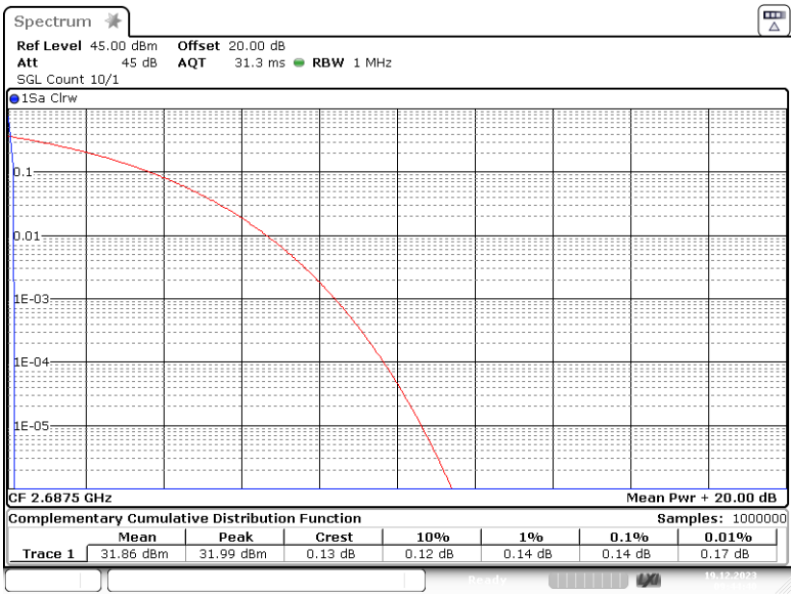

4.0 PAPR AWGN Out -0.3 2.688G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: AWGN; PAPR 3 dB > AGC



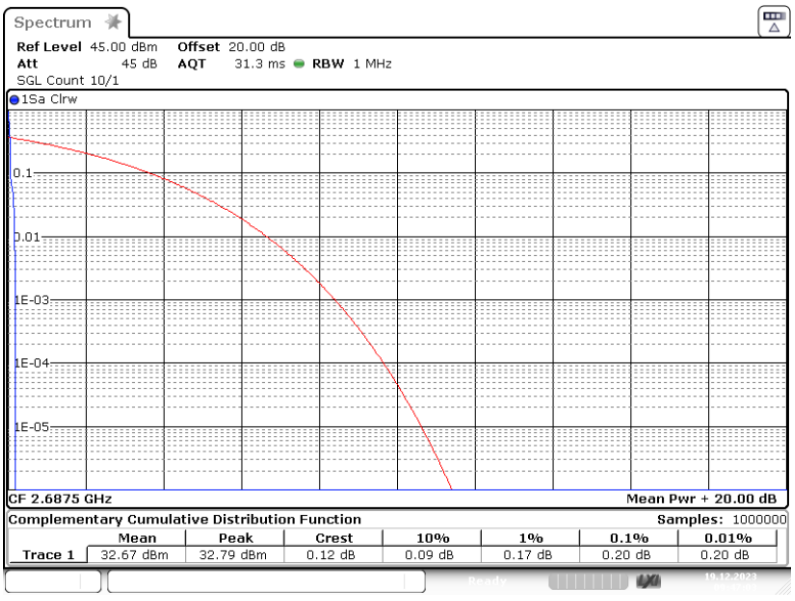

4.0 PAPR AWGN Out +3 2.688G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM; PAPR 0.3 dB < AGC




4.0 PAPR GSM Out -0.3 2.688G

Band 41 BRS UBS; Frequency: 2.6875 GHz; Band Edge: f0; Mod: GSM; PAPR 3 dB > AGC




4.0 PAPR GSM Out +3 2.688G

### 4.2.5 STEST EQUIPMENT USED

- Conducted

## 4.3 OCCUPIED BANDWIDTH/INPUT-VERSUS-OUTPUT SPECTRUM

Standard FCC Part 2.1049; Occupied Bandwidth

**The test was performed according to:**
ANSI C63.26. KDB KDB 935210 D05 v01r04: 3.4

**Test date**: 2023-12-19 – 2023-12-20

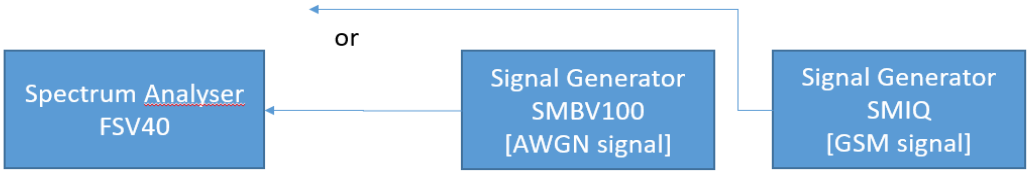
**Environmental conditions**: 23 °C ± 5 K; 40 % r. F. ± 20 % r. F.

**Test engineer**: Thomas Hufnagel

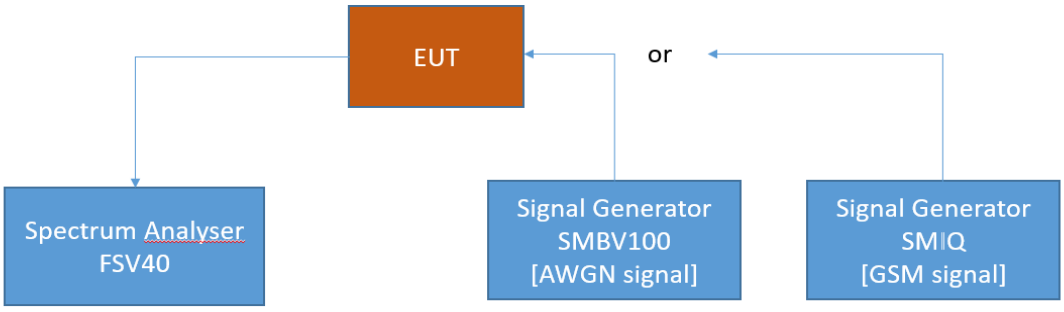
### 4.3.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission limits per FCC §2.1049

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




FCC Part 22/24/27/90; Industrial Signal Booster
Test Setup step 1: Measuring characteristics of test signals




FCC Part 22/24/27/90; Industrial Signal Booster
Test Setup step 2; Occupied Bandwidth/Input-versus-output spectrum

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.

## 4.3.2 TEST REQUIREMENTS/LIMITS

**FCC Part 2.1049; Occupied Bandwidth:**

The occupied bandwidth. that is the frequency bandwidth such that. below its lower and above its upper frequency limits. the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(h) Transmitters employing digital modulation techniques—when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks. pseudo-random generators or other devices required in normal service. Additionally. the occupied bandwidth shall be shown for operation with any devices used for modifying the spectrum when such devices are optional at the discretion of the user.

(i) Transmitters designed for other types of modulation—when modulated by an appropriate signal of sufficient amplitude to be representative of the type of service in which used. A description of the input signal should be supplied.

## 4.3.3 TEST PROTOCOL

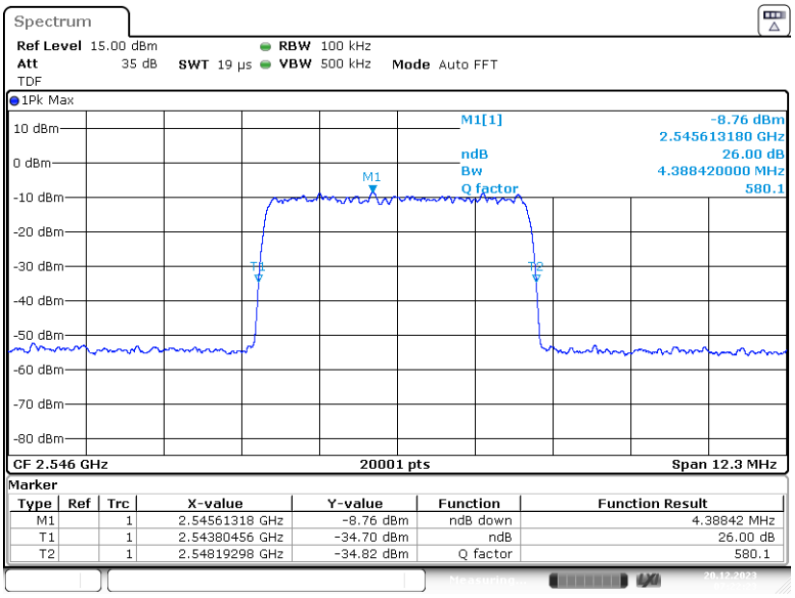
| **Band 41 BRS (LBS), downlink** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Signal Frequency [MHz]** | **Occupied Bandwidth SG [kHz]** | **Occupied Bandwidth Booster [kHz]** | **Delta Occupied Bandwidth [kHz]** | **Limit Delta Occupied Bandwidth [kHz]** | **Margin to Limit [kHz]** |
| Wideband | 0.3 dB < AGC | 2546.0 | 4388.4 | 4386.6 | 1.0 | 205.0 | 203.2 |
| Wideband | 3 dB > AGC | 2546.0 | 4386.6 | 4386.0 | 0.6 | 205.0 | 204.4 |
| Narrowband | 0.3 dB < AGC | 2547.0 | 317.1 | 317.6 | 0.5 | 10.0 | 9.5 |
| Narrowband | 3 dB > AGC | 2547.0 | 321.2 | 311.2 | 10.0 | 10.0 | 0.0 |
| Wideband 5G | 0.3 dB < AGC | 2546.0 | 103180 | 103105 | 75 | 4915 | 4840 |
| Wideband 5G | 3 dB > AGC | 2546.0 | 103150 | 103165 | 15 | 4915 | 4900 |

| **Band 41 BRS (UBS), downlink** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Signal Type** | **Input Power** | **Signal Frequency [MHz]** | **Occupied Bandwidth SG [kHz]** | **Occupied Bandwidth Booster [kHz]** | **Delta Occupied Bandwidth [kHz]** | **Limit Delta Occupied Bandwidth [kHz]** | **Margin to Limit [kHz]** |
| Wideband | 0.3 dB < AGC | 2640.0 | 4387.2 | 4387.8 | 0.6 | 205.0 | 204.4 |
| Wideband | 3 dB > AGC | 2640.0 | 4389.0 | 4390.9 | 1.9 | 205.0 | 203.1 |
| Narrowband | 0.3 dB < AGC | 2641.0 | 314.9 | 316.8 | 1.9 | 10.0 | 8.1 |
| Narrowband | 3 dB > AGC | 2641.0 | 318.6 | 317.0 | 1.6 | 10.0 | 8.4 |
| Wideband 5G | 0.3 dB < AGC | 2640.0 | 103210 | 103105 | 105 | 4915 | 4810 |
| Wideband 5G | 3 dB > AGC | 2640.0 | 103150 | 103300 | 150 | 4915 | 4765 |

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

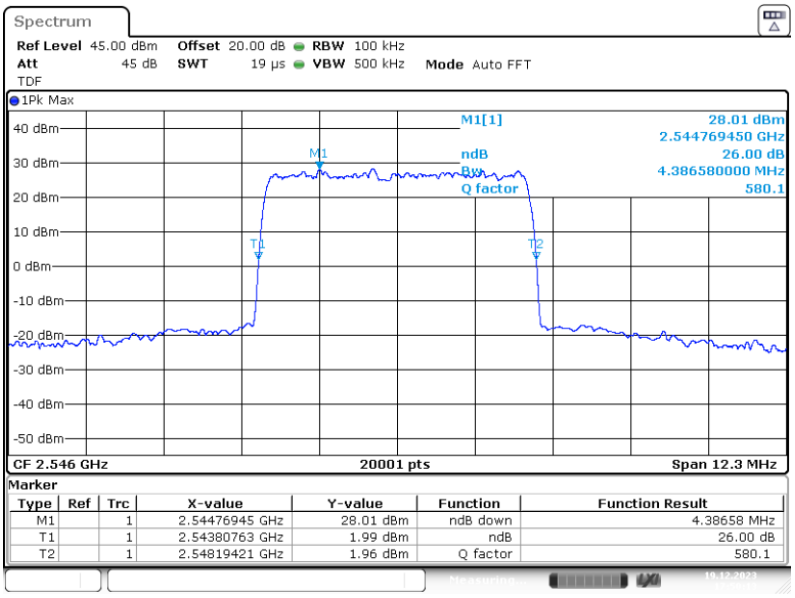
## 4.3.4 MEASUREMENT PLOT

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN
Input OCBw 0.3 dB < AGC



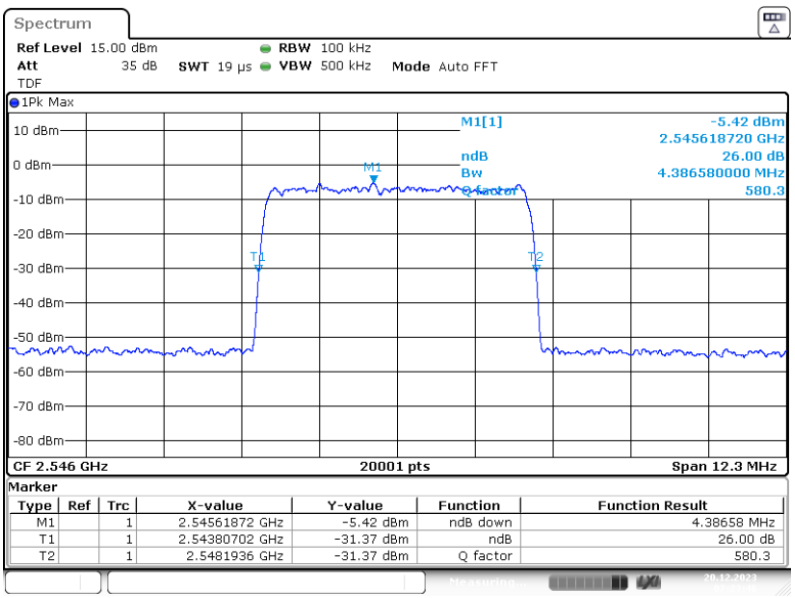

3.4 OCBw AWGN In-0.3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN;
Output OCBw 0.3 dB < AGC



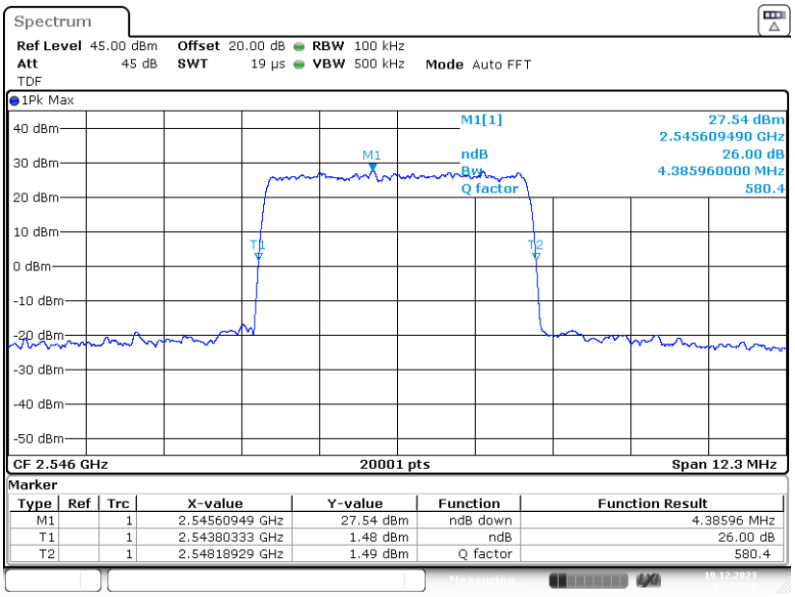

3.4 OCBw AWGN Out -0.3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN;
Input OCBw 3 dB > AGC



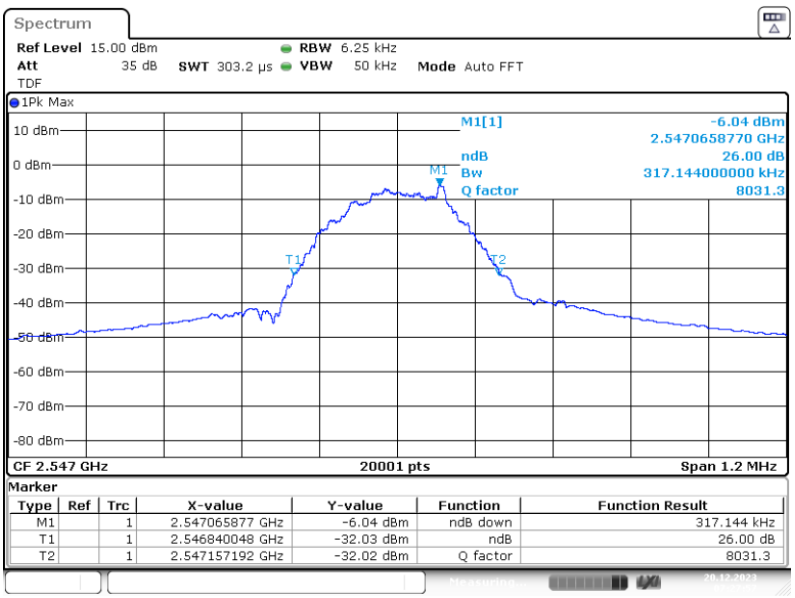

3.4 OCBw AWGN In+3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN;
Output OCBw 3 dB > AGC



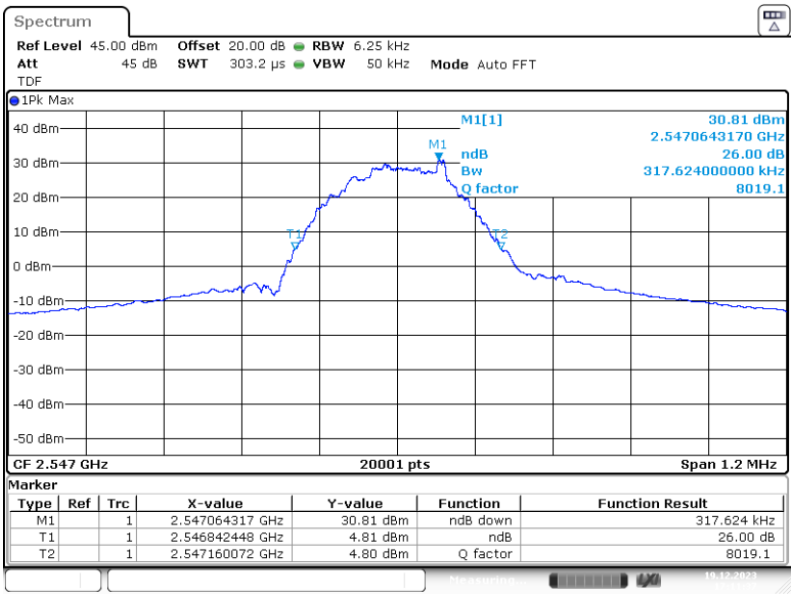

3.4 OCBw AWGN Out +3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5470 GHz; Band Edge: mid; Mod: GSM;
Input OCBw 0.3 dB < AGC



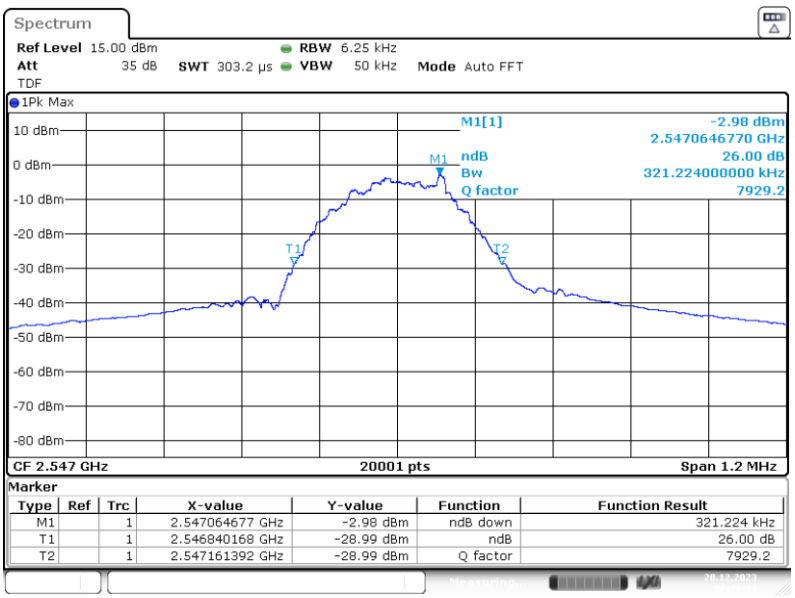

3.4 OCBw GSM In-0.3 2.5470G _26dB

Band 41 BRS (LBS); Frequency: 2.5470 GHz; Band Edge: mid; Mod: GSM;
Output OCBw 0.3 dB < AGC



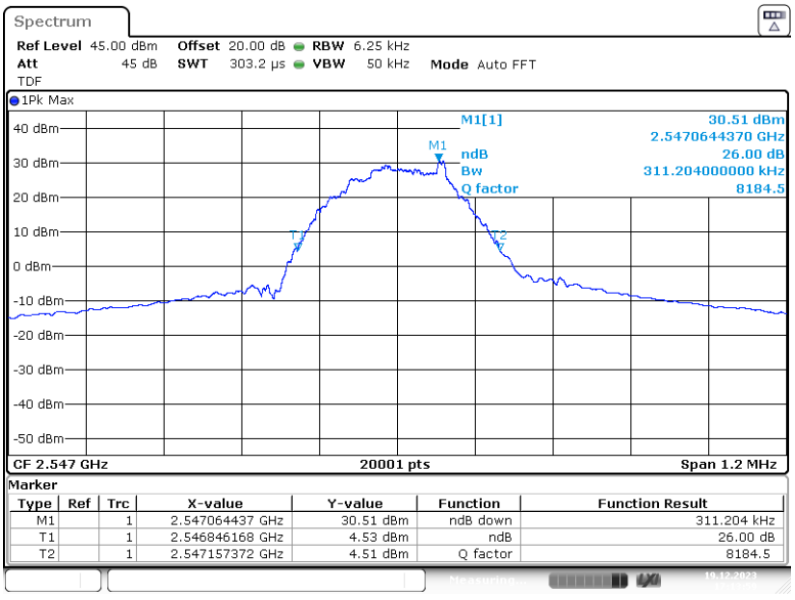

3.4 OCBw GSM Out -0.3 2.5470G _26dB

Band 41 BRS (LBS); Frequency: 2.5470 GHz; Band Edge: mid; Mod: GSM;
Input OCBw 3 dB > AGC



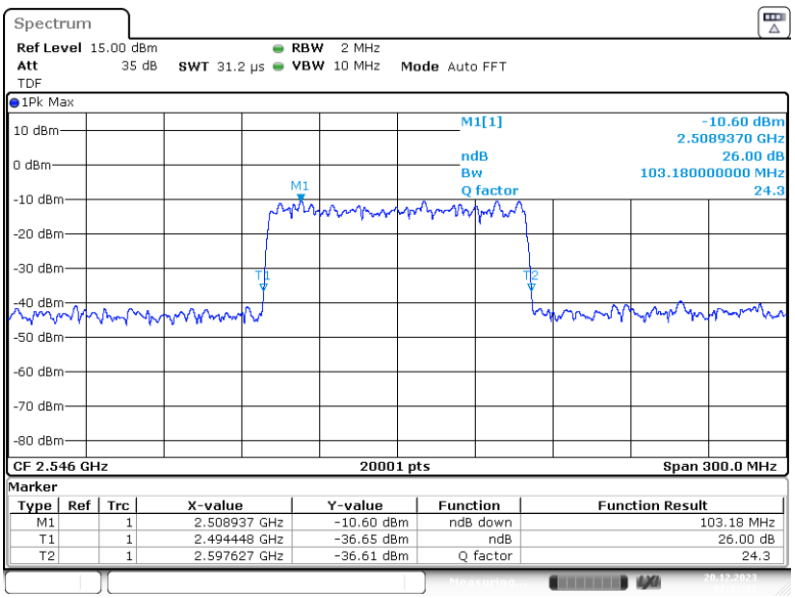

3.4 OCBw GSM In+3 2.5470G _26dB

Band 41 BRS (LBS); Frequency: 2.5470 GHz; Band Edge: mid; Mod: GSM;
Output OCBw 3 dB > AGC



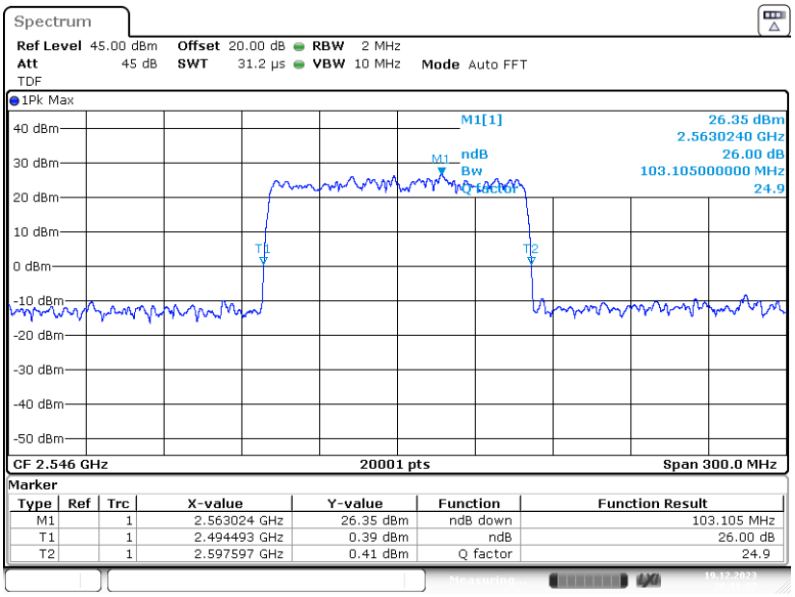

3.4 OCBw GSM Out +3 2.5470G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Input OCBw 0.3 dB < AGC



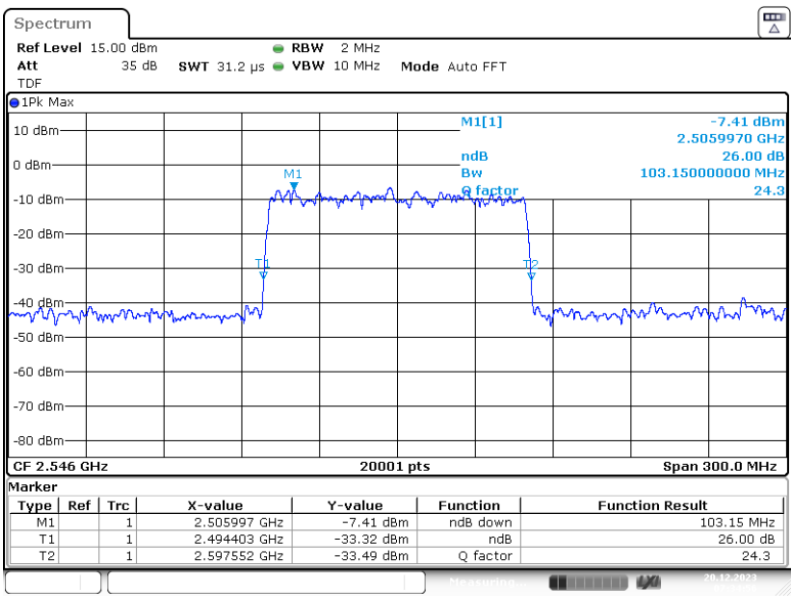

3.4 OCBw AWGN100 In-0.3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Output OCBw 0.3 dB < AGC



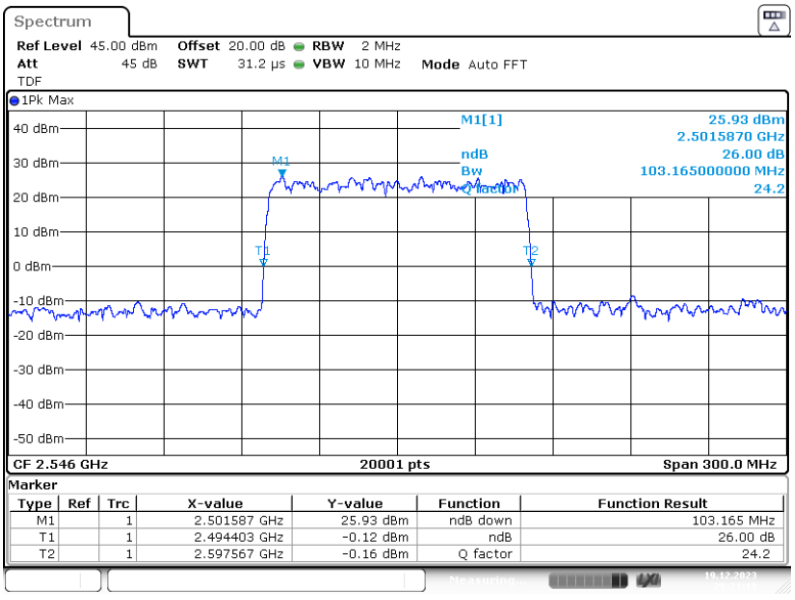

3.4 OCBw AWGN100 Out -0.3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Input OCBw 3 dB > AGC



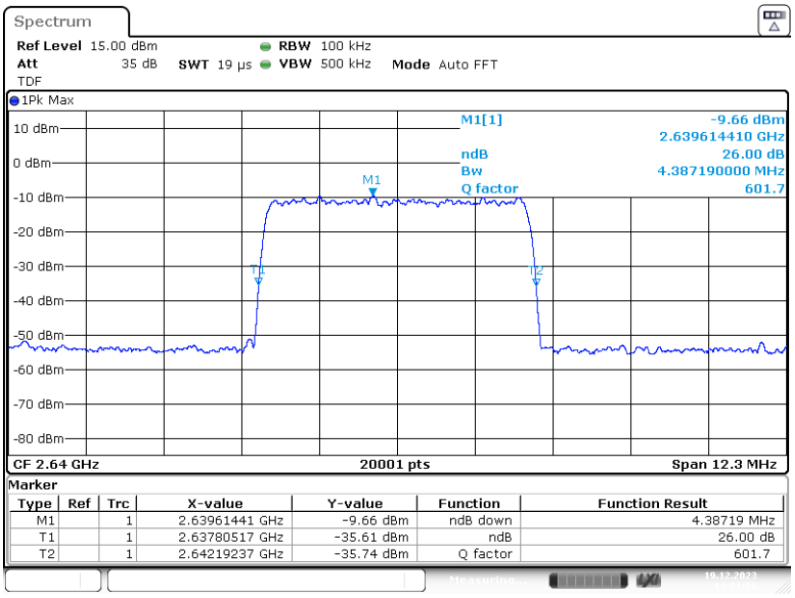

3.4 OCBw AWGN100 In+3 2.5460G _26dB

Band 41 BRS (LBS); Frequency: 2.5460 GHz; Band Edge: mid; Mod: AWGN100;
Output OCBw 3 dB > AGC



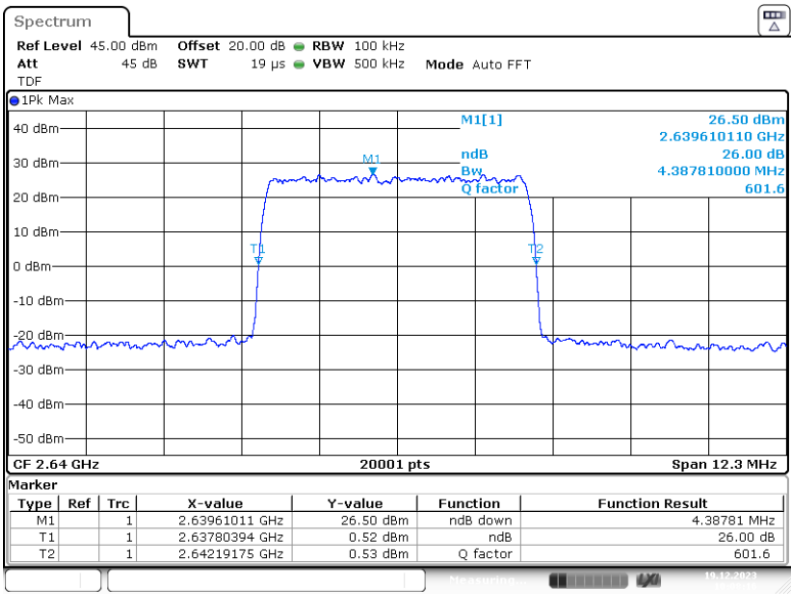

3.4 OCBw AWGN100 Out +3 2.5460G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN; Input OCBw 0.3 dB < AGC



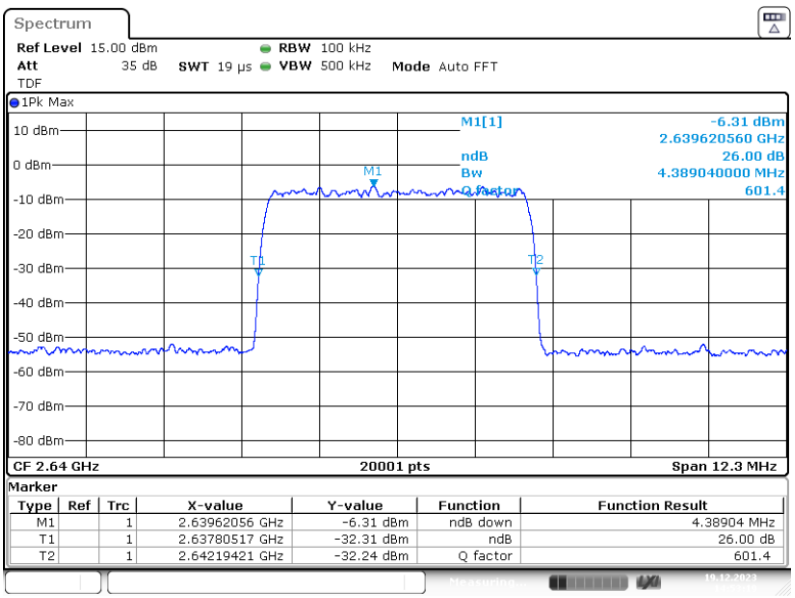

3.4 OCBw AWGN In-0.3 2.6400G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN; Output OCBw 0.3 dB < AGC



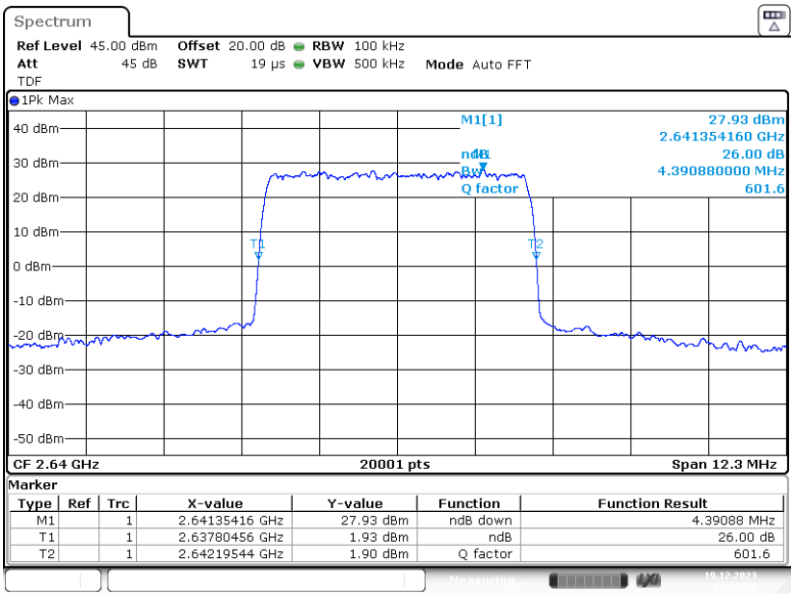

3.4 OCBw AWGN Out -0.3 2.6400G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN; Input OCBw 3 dB > AGC



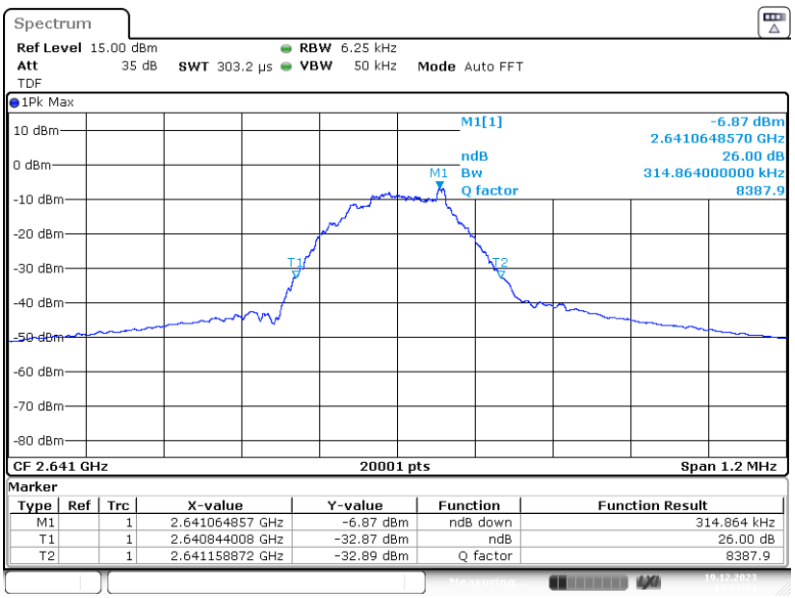

3.4 OCBw AWGN In+3 2.6400G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN; Output OCBw 3 dB > AGC



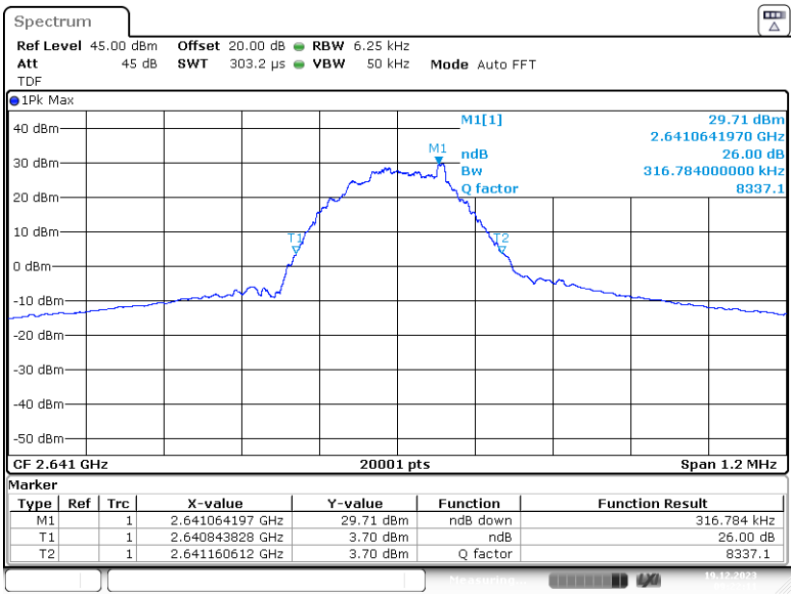

3.4 OCBw AWGN Out +3 2.6400G _26dB

.Band 41 BRS (UBS); Frequency: 2.6410 GHz; Band Edge: mid; Mod: GSM; Input OCBw 0.3 dB < AGC



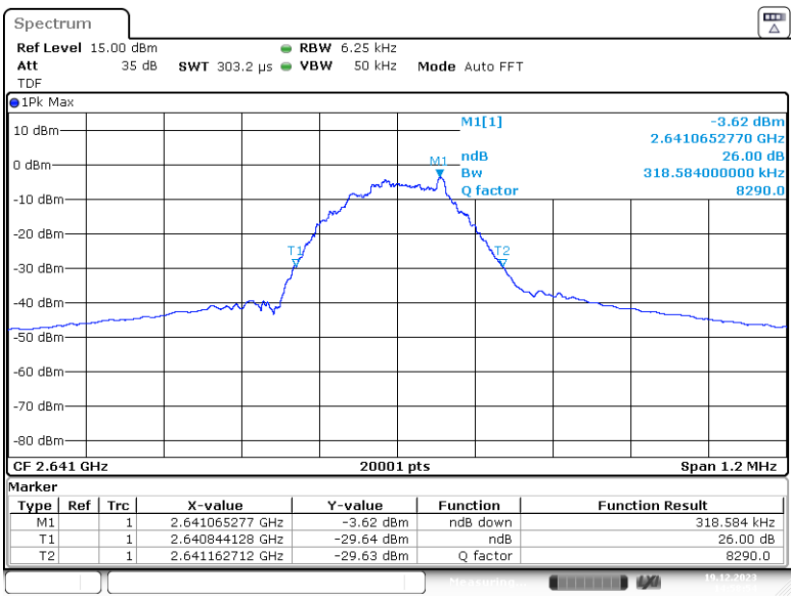

3.4 OCBw GSM In-0.3 2.6410G _26dB

.Band 41 BRS (UBS); Frequency: 2.6410 GHz; Band Edge: mid; Mod: GSM; Output OCBw 0.3 dB < AGC



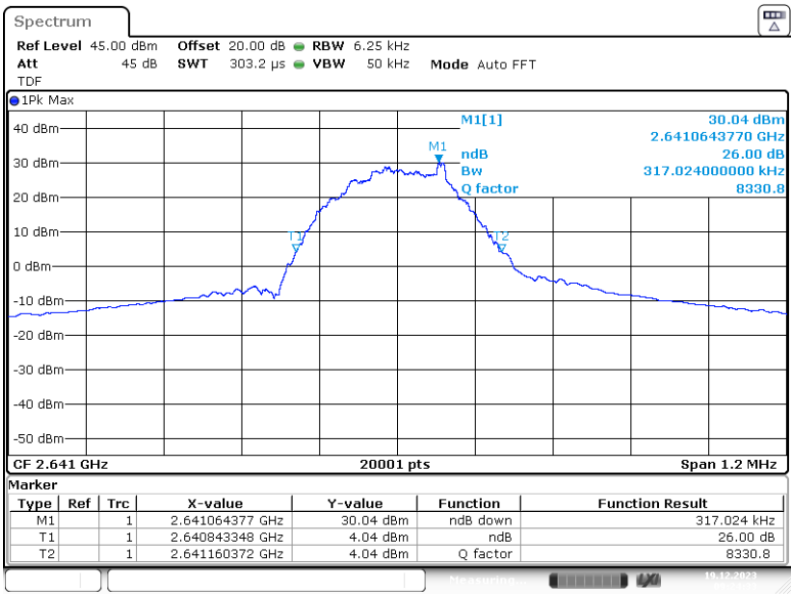

3.4 OCBw GSM Out -0.3 2.6410G _26dB

.Band 41 BRS (UBS); Frequency: 2.6410 GHz; Band Edge: mid; Mod: GSM; Input OCBw 3 dB > AGC



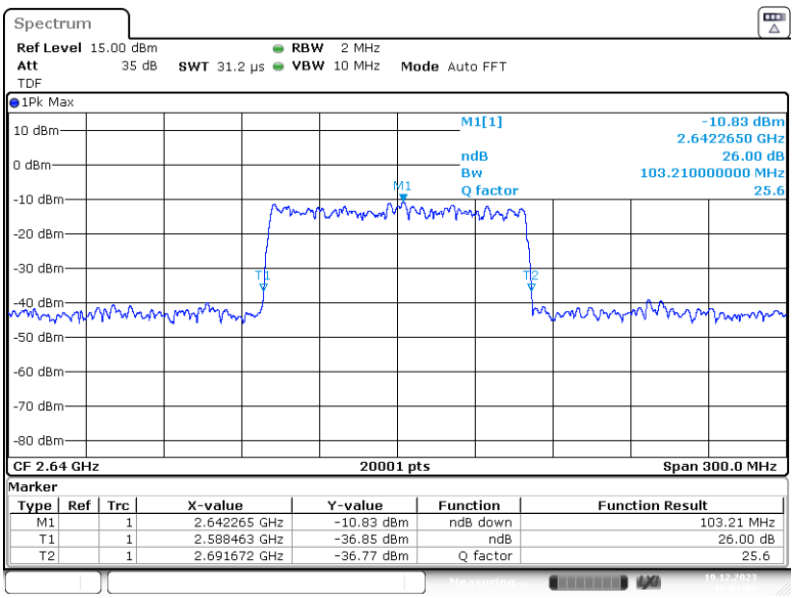

3.4 OCBw GSM In+3 2.6410G _26dB

.Band 41 BRS (UBS); Frequency: 2.6410 GHz; Band Edge: mid; Mod: GSM; Output OCBw 3 dB > AGC



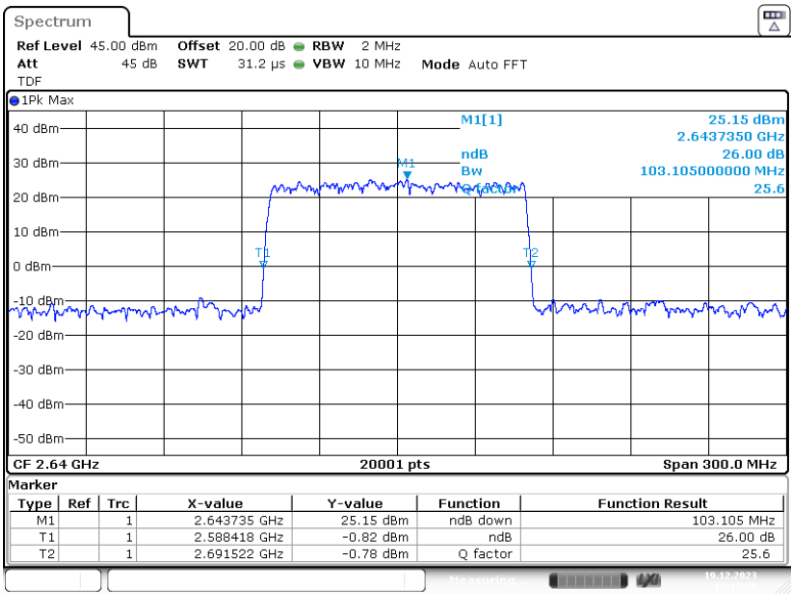

3.4 OCBw GSM Out +3 2.6410G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100; Input OCBw 0.3 dB < AGC




3.4 OCBw AWGN100 In-0.3 2.6400G _26dB

.Band 41 BRS (UBS); Frequency: 2.6400 GHz; Band Edge: mid; Mod: AWGN100; Output OCBw 0.3 dB < AGC




3.4 OCBw AWGN100 Out -0.3 2.6400G _26dB