Test report 2022-0535-EMC-TR-22-0178-V03

Designation:	CAP L2 C-Band F-DC
Manufacturer:	Andrew
Serial No(s):	FICLNB2221002
ID No.	7845390-1018 Rev: 00
Test Specification(s):	ANSI 63.26:2015 FCC Rules and Regulations as listed in 47 CFR, Part 20 and Part 27:2022-07-29
Test Plan:	"System_Info Blatt für CAP-L2 FCC" from customer.
Test Result:	**Passed**

Date of issue:	2022-12-15		Signature:
Version:	03	Technical Reviewer:	Thomas Gerngroß Test Engineer Digitally signed by Thomas Gerngroß DN: cn=Thomas Gerngroß, o=Bureau Veritas CPS Germany GmbH, ou=ECL, email=thomas.gerngross@bureauveritas.com, c=DE Date: 2022.12.15 14:21:36 +01'00'
Date of delivery:	2022-07-15		
Performance date:	2022-08-16 – 2022-11-25	Report Reviewer:	Thomas Hufnagel Test Engineer Digitally signed by Thomas Hufnagel Date: 2022.12.15 14:39:56 +01'00'

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Versions management:

V01.00	Initial release
V02.00	Correction of: PAPR values for wideband measurement at 3 dB >AGC for segment 3 in table in chapter 4.2.3 and correction of input power levels in the headliners of the plots for input power 0.3 dB < AGC in chapter 4.2.4; correction of test protocols for all segments in chapter 4.5.3, hereby maximum out-of-band power and margin corrected; removal of redundant empty page which former was the empty page 28 in version 1.
V03.00	Supplemental of 100 MHZ AWGN modulation measurements and supplemental of MIMO calculation in chapter “Effective radiated power, mean output power and zone enhancer gain”.

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, (07/29/2022 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 § 27.50 KDB 935210 D05 v01r04: 3.5
Peak to Average Ratio	§ 27.50
Occupied bandwidth Input-versus-output spectrum	§ 2.1049 KDB 935210 D05 v01r04: 3.4
Conducted spurious Emission at Antenna Terminal	§ 2.1051 § 27.53 KDB 935210 D05 v01r04: 3.6
Out-of-band emissions limits	§ 2.1051 § 27.53 KDB 935210 D05 v01r04: 3.6
Frequency stability	§ 2.1055 § 27.54
Field strength of spurious radiation	§ 2.1053 § 27.53
Out-of-band rejection	KDB 935210 D05 v01r04: 3.3
All measurements	ANSI 63.26

1.3 MEASUREMENT SUMMARY

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

Effective Radiated Power, mean output power and zone enhancer gain
The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r04: 3.5

OP-Mode Frequency Band, Direction, Input Power, Signal Type	**Final Result**
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Narrowband	Passed

47 CFR CHAPTER I FCC PART 27 Subpart C § 27.50
[Base Stations / Repeater]

Peak to Average Ratio
The measurement was performed according to ANSI C63.26

OP-Mode Frequency Band, Direction, Input Power, Signal Type	**Final Result**
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Narrowband	Passed

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

Occupied Bandwidth/Input-versus-output Spectrum
The measurement was performed according to ANSI C63.26, KDB 935210 D05 v01r04: 3.4

Final Result

OP-Mode Frequency Band, Direction, Input Power, Signal Type	**Final Result**
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 1, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 2, RF downlink, 3 dB > AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 0.3 dB < AGC, Narrowband	Passed
C-Band, segment 3, RF downlink, 3 dB > AGC, Narrowband	Passed

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

Conducted spurious emissions at antenna terminals
The measurement was performed according to ANSI C63.26

OP-Mode Frequency Band, Direction, Signal Type	**Final Result**
C-Band, segment 1, RF downlink, Wideband 1 and 2	Passed
C-Band, segment 1, RF downlink, Narrowband	Passed
C-Band, segment 2, RF downlink, Wideband 1 and 2	Passed
C-Band, segment 2, RF downlink, Narrowband	Passed
C-Band, segment 3, RF downlink, Wideband 1 and 2	Passed
C-Band, segment 3, RF downlink, 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 v01r04: 3.6

OP-Mode Band Edge, Frequency Band, Number of signals, Direction, Input Power, Signal Type	
Upper, C-Band segment 1, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 1, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 1, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 1, 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 1, 1, RF downlink, , 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 1, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 1, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 1, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 1, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, C-Band segment 1, 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, C-Band segment 1, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 1, 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 1, 2, RF downlink, , 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 1, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 1, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 1, 2, RF downlink, 3 dB > AGC, Wideband	Passed

OP-Mode

Band Edge, Frequency Band, Number of signals, Direction, Input Power, Signal Type	
Upper, C-Band segment 2, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 2, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 2, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 2, 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 2, 1, RF downlink, , 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 2, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 2, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 2, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 2, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, C-Band segment 2, 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, C-Band segment 2, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 2, 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 2, 2, RF downlink, , 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 2, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 2, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 2, 2, RF downlink, 3 dB > AGC, Wideband	Passed

OP-Mode

Band Edge, Frequency Band, Number of signals, Direction, Input Power, Signal Type	
Upper, C-Band segment 3, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 3, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 3, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 3, 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 3, 1, RF downlink, , 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 3, 1, RF downlink, 0.3 dB < AGC, Wideband 1 and 2	Passed
Lower, C-Band segment 3, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 3, 1, RF downlink, 3 dB > AGC, Wideband 1 and 2	Passed
Upper, C-Band segment 3, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, C-Band segment 3, 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, C-Band segment 3, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, C-Band segment 3, 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, C-Band segment 3, 2, RF downlink, , 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 3, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, C-Band segment 3, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, C-Band segment 3, 2, RF downlink, 3 dB > AGC, Wideband	Passed

47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]	**KDB 935210 D05 v01r04: 3.3**
Out-of-band rejection The measurement was performed according to ANSI C63.26; KDB 935210 D05 v01r04: 3.3	**Final Result**
OP-Mode Frequency Band, Direction	
C-Band, segment 1, RF downlink	Passed
C-Band, segment 2, RF downlink	Passed
C-Band, segment 3, RF downlink	Passed

47 CFR CHAPTER I FCC PART 27 Subpart C [Base Stations/Repeater]	**§ 2.1053, § 27.53**
Field strength of spurious radiation The measurement was performed according to ANSI C63.26	**Final Result**
OP-Mode Frequency Band, Test Frequency, Direction	
C-Band, segment 1, RF downlink	Passed
C-Band, segment 2, RF downlink	Passed
C-Band, segment 3, RF downlink	Passed

The test case frequency stability was not performed, since the EUT is not equipped with signal processing capabilities.

Report version control			
Version	**Release date**	**Change Description**	**Version validity**
Initial	2022-09-30	--	Invalid.
V2.00	2022-11-02	Correction of: PAPR values and AGC headliners in PAPR chapter; correction of test protocols in “Out-of-band emission limits” and removal of a redundant empty page	Invalid
V3.00	2022-11-30.	Supplemental of 100 MHZ AWGN modulation measurements.	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 Andrew Wireless Systems GmbH
Address:	Industriering 10 86675 Buchdorf Germany
Contact Person:	Mr. Frank Futter

2.3 MANUFACTURER DATA

Company Name:	Please see applicant data.
Address:	

3 TEST OBJECT DATA

3.1 GENERAL EUT DESCRIPTION

Kind of Device product description	Cellular Repeater
Product name	Cellular Repeater
Type	CAP L2 C-Band F-DC
Declared EUT data by the supplier	
General Product Description	The EUT is an industrial signal booster supporting the following: C-Band (3700 MHz – 3980 MHz) with three segements: Segment 1: 3700 MHz - 3800 MHz Segment 2: 3790 MHz - 3890 MHz Segment 3: 3880 MHz – 3980 MHz A RF operation is only supported for the downlink.
Booster Type	Industrial Signal Booster
Voltage Type	DC
Voltage Level	48 V nominal
Maximum Output Donor Port [Uplink]	-
Maximum Output Server Port [Downlink]	All segments: 23 dBm
Maximum Gain [Uplink]	-
Maximum Gain [Downlink]	All segments: 28 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	FICLNB22210020002
HW Version	7845390-1018 Rev.: 00
SW Version	4.50.0.29
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, DM77521	Power supply rack
	GE Power Electronisc Inc., CAR1212FPBC-Z, EC84946	Power plug-in module
AUX2	Commscope, ION-E WCS-2, SZAEAJ1744A0010	Module rack
	Commscope, ION-E OPT, SZBEAD1951A0125	Optical plug-in module
	Commscope, ION-E SUI, SZBEAC1934A0018	Interface card plug-in module
	Commscope, REF HB, SZBEAQ2210A0020	RF card plug-in module
	Commscope, REF HB, SZBEAQ2210A0028	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

OPERATING MODES

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

3.5.1 TEST CHANNELS

Segment of C-Band	Direction	Lower Frequency Band Edge [MHz]	Upper Frequency Band Edge [MHz]	Center Frequency [MHz]	Port
1	Downlink	3700.00	3800.00	3750.00	Donor
2	Downlink	3790.00	3890.00	3840.00	Donor
3	Downlink	3880.00	3980.00	3930.00	Donor

3.5.2 DEFINITION OF USED FREQUENCY BANDS

Narrowband: representation by a GSM signal
Wideband 1: representation by an AWGN signal with 4.1 MHz
Wideband 2: representation by an AWGN signal with 98.3 MHz

3.5.3 AUTOMATIC GAIN CONTROL LEVELS

AGC Levels

Segment of C-Band	Direction	Signal Type	AGC Start Pin [dBm]	AGC Start Pin -0.3 dB [dBm]	AGC Start Pin +3 dB [dBm]	Frequency [MHz]	Frequency
1	downlink	Narrowband	-3.20	-3.50	-0.20	3751.00	
2	downlink	Narrowband	-3.50	-3.80	-0.50	3841.00	
3	downlink	Narrowband	-3.40	-3.70	-0.40	3931.00	Mid (all AWGN) Mid+1 (GSM), also see chapter 3.5.4
1	downlink	Wideband 1	-4.00	-4.30	-1.00	3750.00	
2	downlink	Wideband 1	-4.20	-4.50	-1.20	3840.00	
3	downlink	Wideband 1	-4.20	-4.50	-1.20	3930.00	
1	downlink	Wideband 2	-3.80	-4.10	-0.80	3750.00	
2	downlink	Wideband 2	-4.00	-4.30	-1.00	3840.00	
3	downlink	Wideband 2	-3.80	-4.10	-0.80	3930.00	
1	downlink	Narrowband	-2.80	-3.10	0.20	3700.20	
2	downlink	Narrowband	-4.40	-4.70	-1.40	3790.20	
3	downlink	Narrowband	-4.20	-4.50	-1.20	3880.20	
1	downlink	Wideband 1	-4.40	-4.70	-1.40	3702.50	
2	downlink	Wideband 1	-5.60	-5.90	-2.60	3792.50	
3	downlink	Wideband 1	-5.20	-5.50	-2.20	3882.50	Low
1	downlink	Narrowband	-3.00	-3.30	0.00	3799.80	
2	downlink	Narrowband	-3.40	-3.70	-0.40	3889.80	
3	downlink	Narrowband	-3.60	-3.90	-0.60	3979.80	
1	downlink	Wideband 1	-4.80	-5.10	-1.80	3797.50	
2	downlink	Wideband 1	-5.00	-5.30	-2.00	3887.50	
3	downlink	Wideband 1	-5.20	-5.50	-2.20	3977.50	High
1	downlink	Narrowband	-4.20	-4.50	-1.20	3794.00	
2	downlink	Narrowband	-5.00	-5.30	-2.00	3796.30	
3	downlink	Narrowband	-4.60	-4.90	-1.60	3886.50	
1	downlink	Wideband 1	-4.80	-5.10	-1.80	3794.00	
2	downlink	Wideband 1	-5.60	-5.90	-2.60	3796.30	
3	downlink	Wideband 1	-5.20	-5.50	-2.20	3886.50	Max.Power

3.5.4 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.

3.6 PRODUCT LABELLING

3.6.1 FCC ID LABEL

Please refer to the documentation of the applicant.

3.6.2 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: 2022-09-16 - 2022-09-18 and 2022-11-22 – 2022-11-25

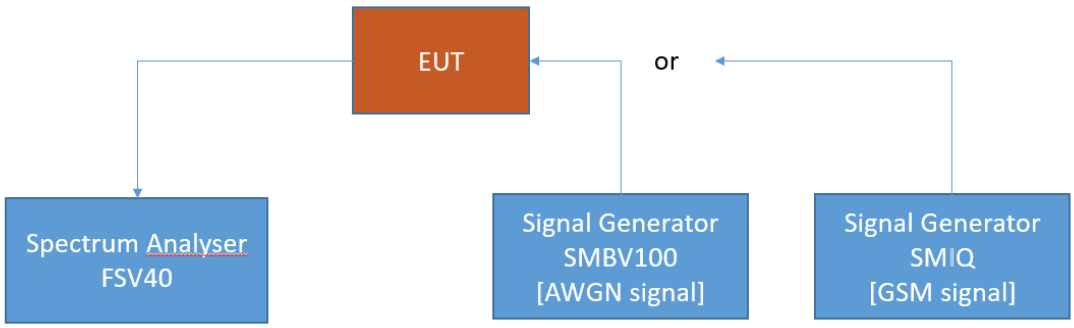
Environmental conditions: 23 ° C ± 5 K; 40 % r. F. ± 20 % r. F.

Test engineer: Thomas Hufnagel, Thomas Gerngroß

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

(j) The following power requirements apply to stations transmitting in the 3700-3980 MHz band:

(1) The power of each fixed or base station transmitting in the 3700-3980 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to an equivalent isotropically radiated power (EIRP) of 3280 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

(2) The power of each fixed or base station transmitting in the 3700-3980 MHz band and situated in any geographic location other than that described in paragraph (j)(1) of this section is limited to an EIRP of 1640 Watts/MHz. This limit applies to the aggregate power of all antenna elements in any given sector of a base station.

(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(4) Equipment employed must be authorized in accordance with the provisions of § 27.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (j)(5) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

(5) Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, and any other relevant factors, so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

4.1.3 TEST PROTOCOL

C-Band, segment 1, 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 1	0.3 dB < AGC	3794.00	-5.1	22.6	62.1	39.6	27.7
Wideband 1	3 dB > AGC	3794.00	-1.8	22.5	62.1	39.6	24.3
Wideband 2	0.3 dB < AGC	3750.00	-4.1	23.1	62.1	39.0	27.2
Wideband 2	3 dB > AGC	3750.00	-0.8	23.4	62.1	38.7	24.2
Narrowband	0.3 dB < AGC	3794.00	-4.5	23.1	62.1	39.0	27.6
Narrowband	3 dB > AGC	3794.00	-1.2	22.6	62.1	39.6	23.8

C-Band, segment 2, 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 1	0.3 dB < AGC	3796.30	-5.9	22.3	62.1	39.8	28.2
Wideband 1	3 dB > AGC	3796.30	-2.6	21.9	62.1	40.2	24.5
Wideband 2	0.3 dB < AGC	3840.00	-4.3	23.1	62.1	39.0	27.4
Wideband 2	3 dB > AGC	3840.00	-1.0	22.9	62.1	39.2	23.9
Narrowband	0.3 dB < AGC	3796.30	-4.3	22.8	62.1	39.3	27.1
Narrowband	3 dB > AGC	3796.30	-2.0	23.0	62.1	39.1	25.0

C-Band, segment 3, 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 1	0.3 dB < AGC	3886.50	-5.5	22.3	62.1	39.8	27.8
Wideband 1	3 dB > AGC	3886.50	-2.2	22.2	62.1	40.0	24.4
Wideband 2	0.3 dB < AGC	3930.00	-4.1	23.3	62.1	38.8	27.4
Wideband 2	3 dB > AGC	3930.00	-0.8	22.9	62.1	39.2	23.7
Narrowband	0.3 dB < AGC	3886.50	-4.9	23.1	62.1	39.0	28.0
Narrowband	3 dB > AGC	3886.50	-1.6	22.5	62.1	39.6	24.1

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

Maximum output power at the worst case consideration

The highest power level in the tables above is in wideband 2 segment 1 at $p_{highest}$ = 23.4 dBm at the channel 2 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:

$p_{EIRP\ 1CH}$ = 23.4 dBm + 9 dB = 32.4 dBm

The eqivalent power P is according the given formula:

$P_{EIRP\ 1CH}$ =

$$P\ EIRP\ 1CH\ [W] = 10EXP\quad \left(p\ EIRP\ 1CH\ [dBm] — 10\right) * 0.001\ [W]$$

This results in:

$$P\ EIRP\ 1CH\ [W] = 10EXP\quad \left(32.4\ [dBm] — 10\right) * 0.001\ [W]\ =\ 1.74\ W$$

Supposed all four antenna ports are working together in MIMO operation the worst case of the highest output power $p_{EIRP\ 4CH}$ is:

$p_{EIRP\ 4CH} = 4 * p_{EIRP\ 1CH}$

This results in:

$p_{EIRP\ 4CH}$ = 4 * 1.74 W =6.96 W

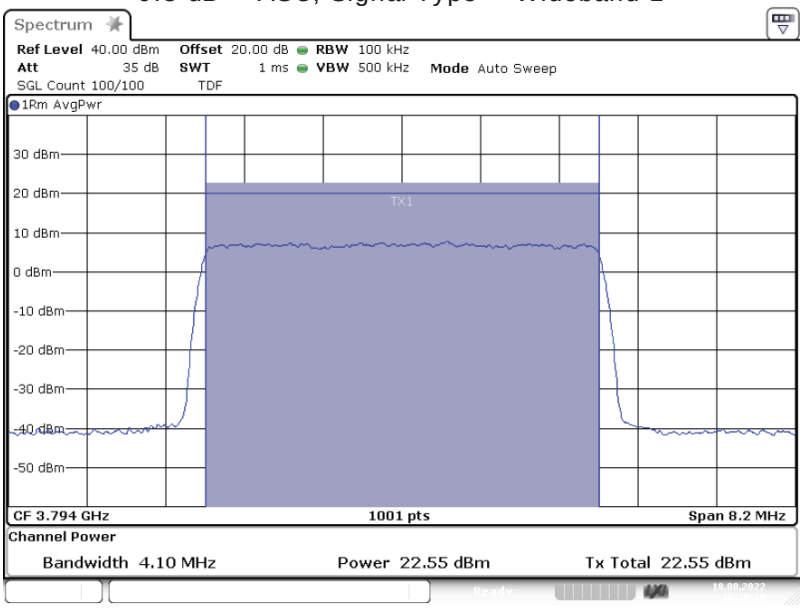
Final result of this consideration:

$p_{EIRP\ 4CH}$ = 6.96 W <1640 W, hereby 1640 W is the highest allowed limit in this band.

The DUT doesn't exceed the limit.

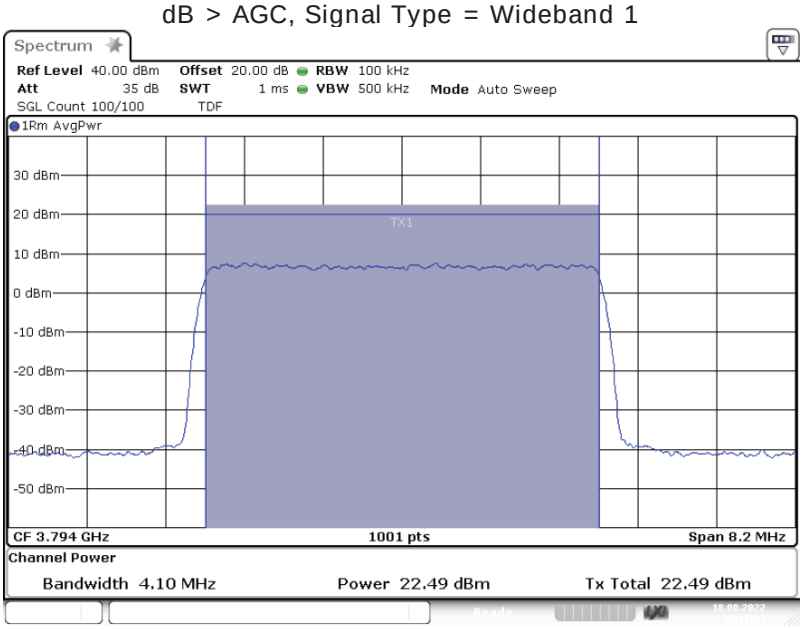
4.1.4 MEASUREMENT PLOT

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 0.3 dB < AGC, Signal Type = Wideband 1



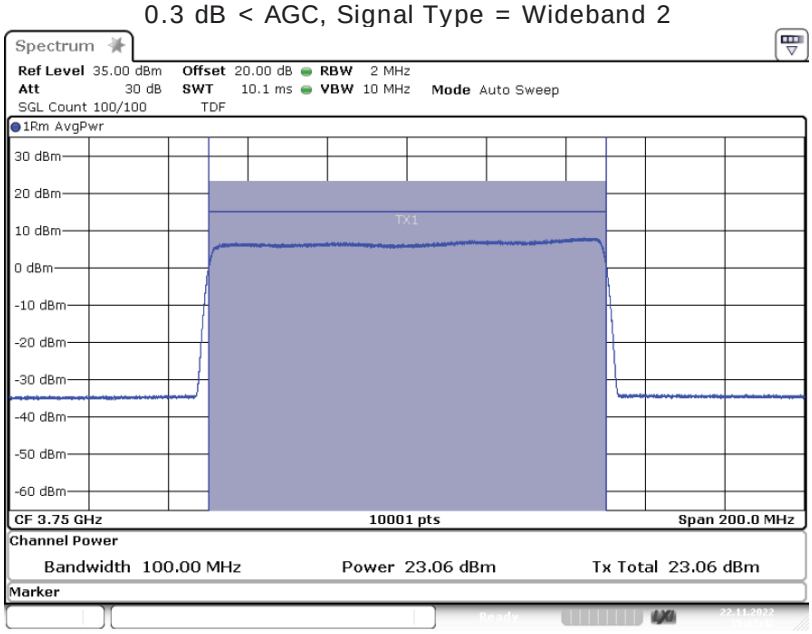
3.5.3 Power AWGN Out -0.3 3.79400G

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 3 dB > AGC, Signal Type = Wideband 1



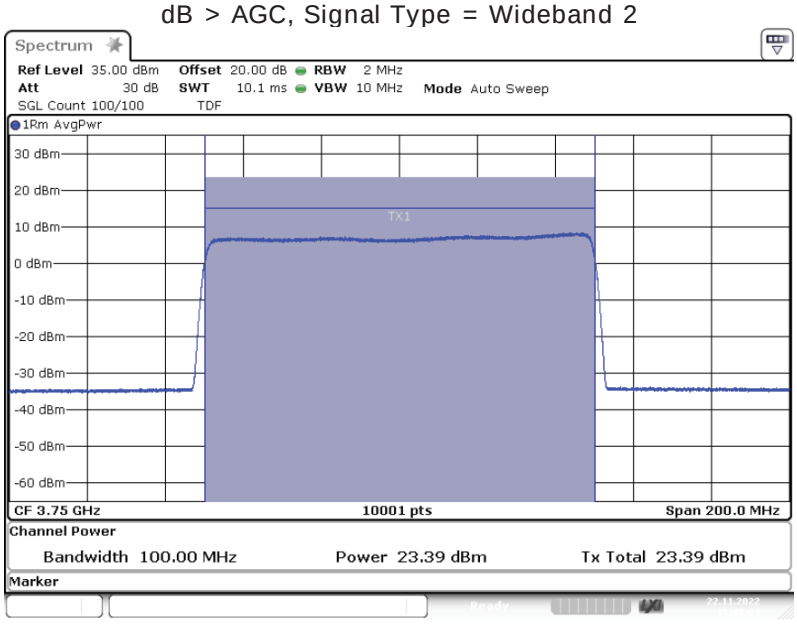
3.5.3 Power AWGN Out +3 3.79400G

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 0.3 dB < AGC, Signal Type = Wideband 2



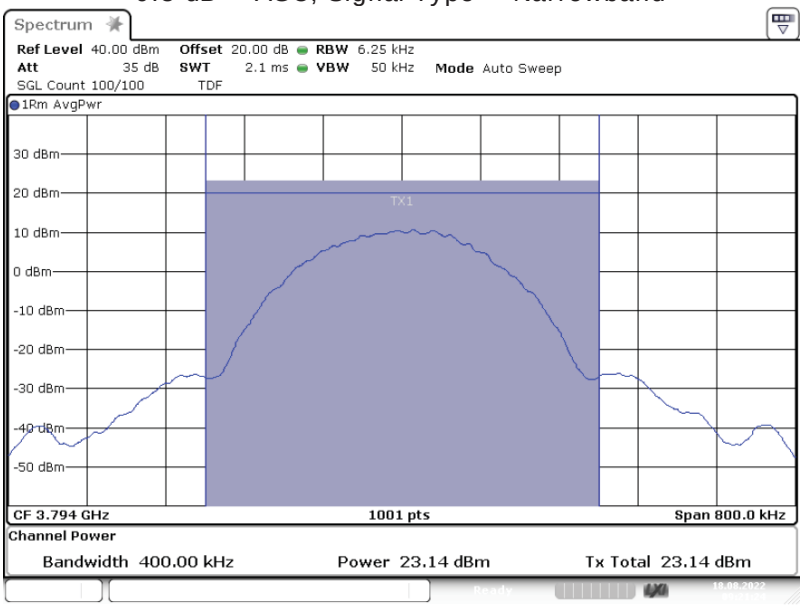
3.5.3 Power AWGN100 Out -0.3 3.75000G

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 3 dB > AGC, Signal Type = Wideband 2



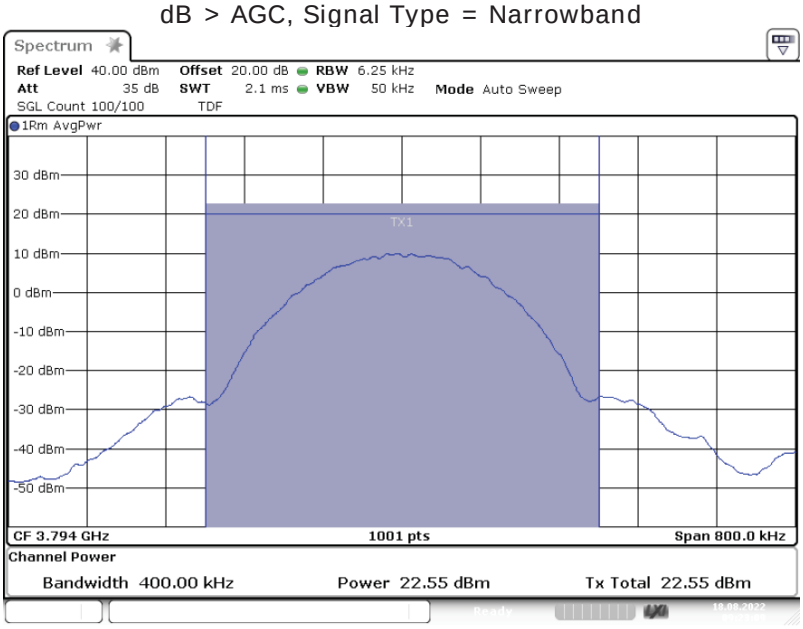
3.5.3 Power AWGN100 Out +3 3.75000G

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 0.3 dB < AGC, Signal Type = Narrowband



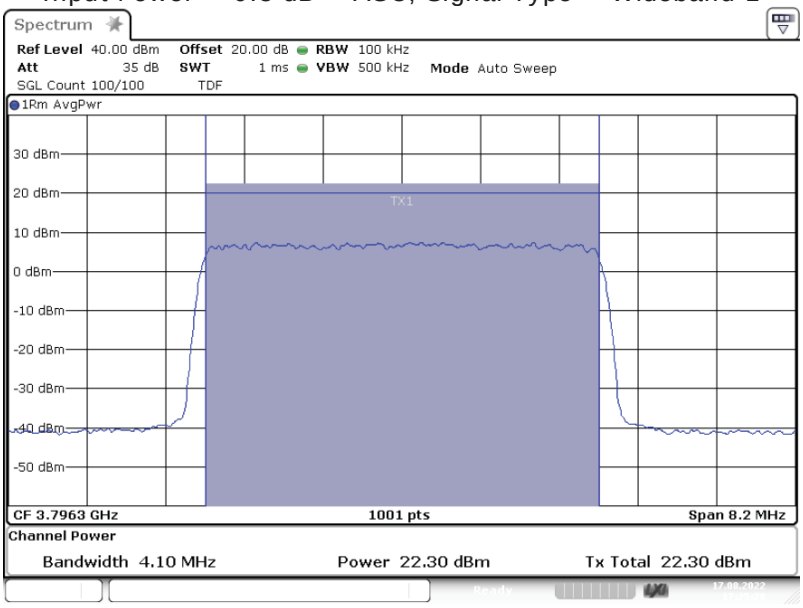
3.5.3 Power GSM Out -0.3 3.79400G

Frequency Band = C-Band, Frequency f_0, Segment 1, Direction = RF downlink, Input Power = 3 dB > AGC, Signal Type = Narrowband



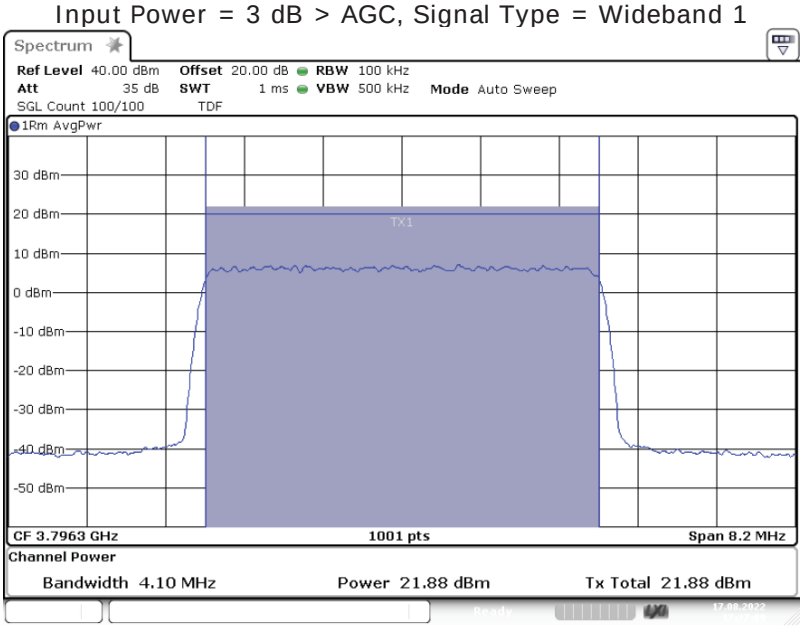
3.5.3 Power GSM Out +3 3.79400G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Wideband 1



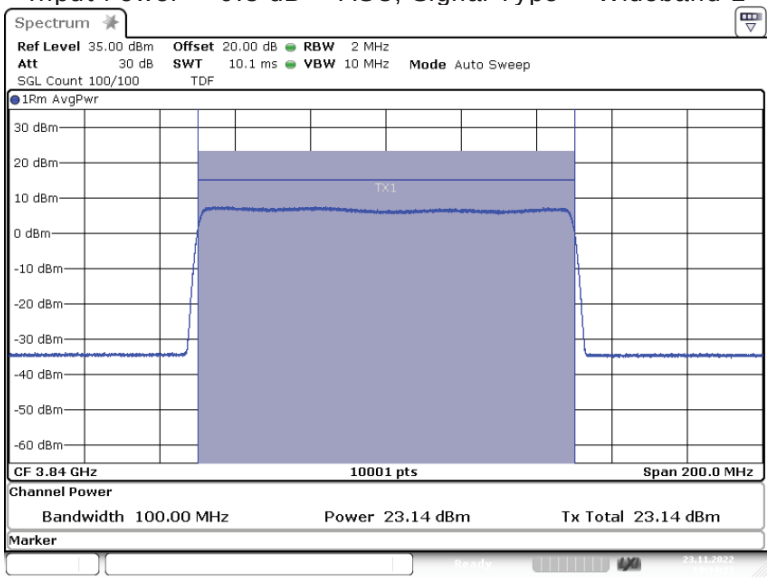
3.5.3 Power AWGN Out -0.3 3.79630G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Wideband 1



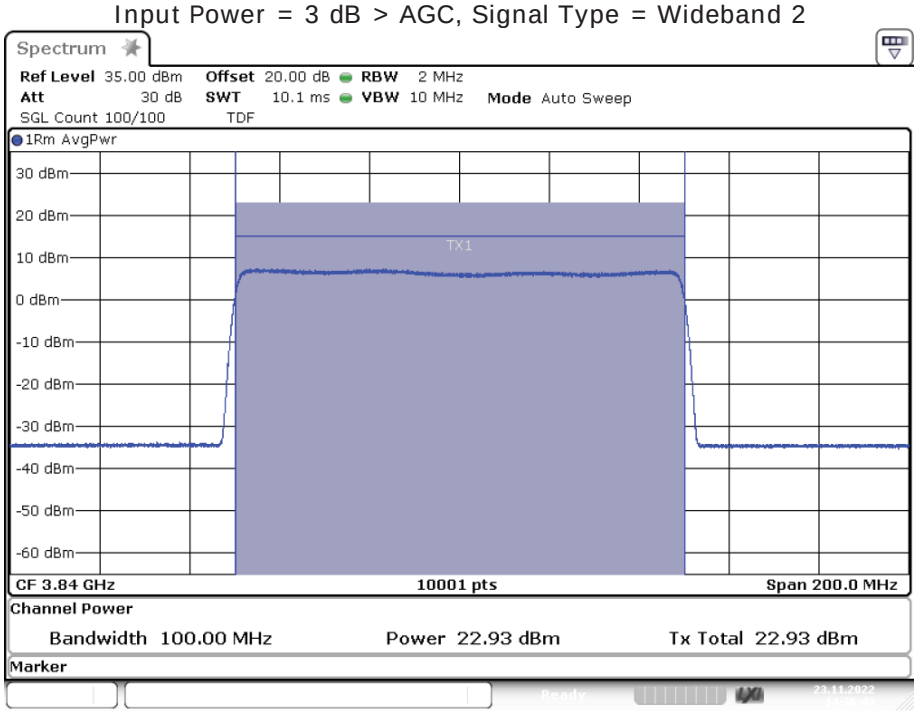
3.5.3 Power AWGN Out +3 3.79630G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Wideband 2



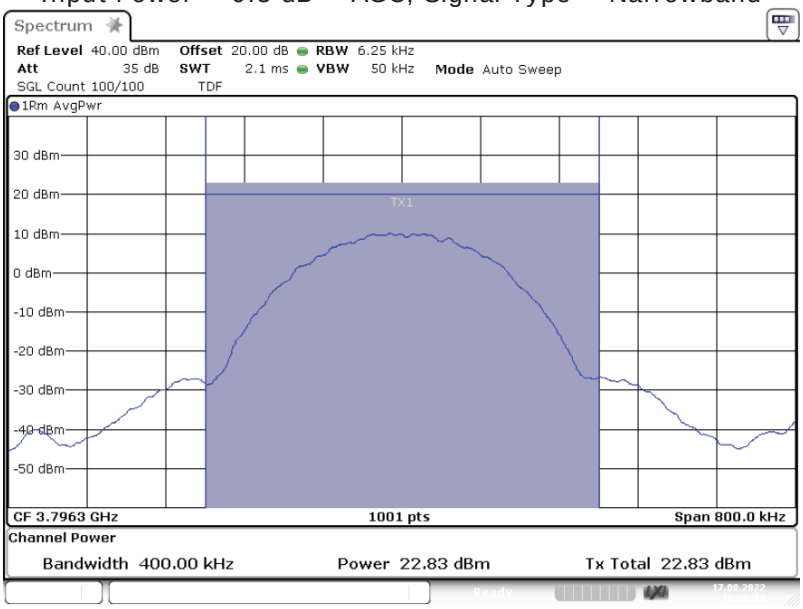
3.5.3 Power AWGN100 Out -0.3 3.84000G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Wideband 2



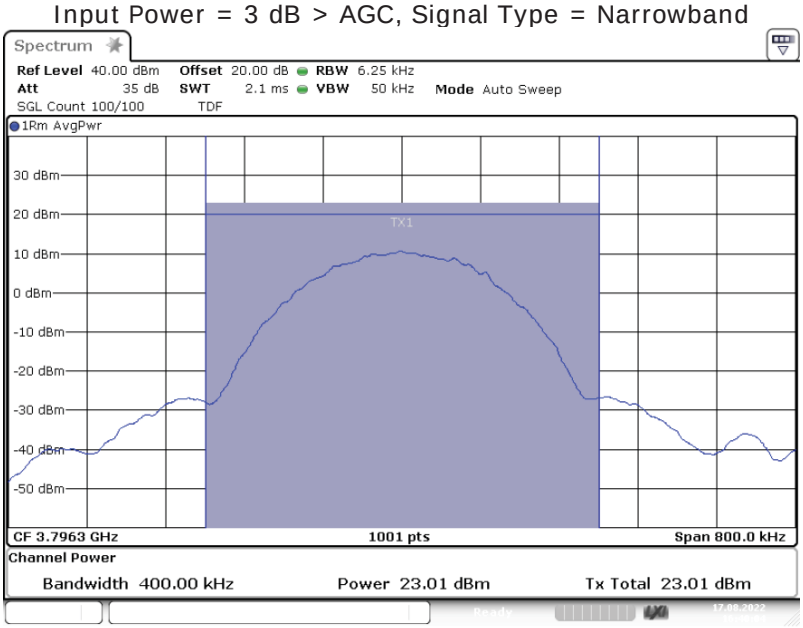
3.5.3 Power AWGN100 Out +3 3.84000G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Narrowband



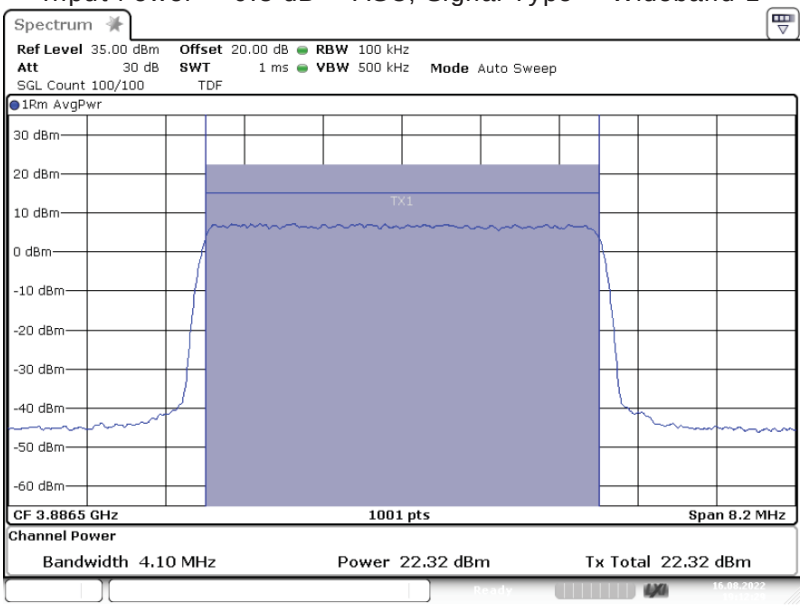
3.5.3 Power GSM Out -0.3 3.79630G

Frequency Band = C-Band, Frequency f_0, Segment 2, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Narrowband



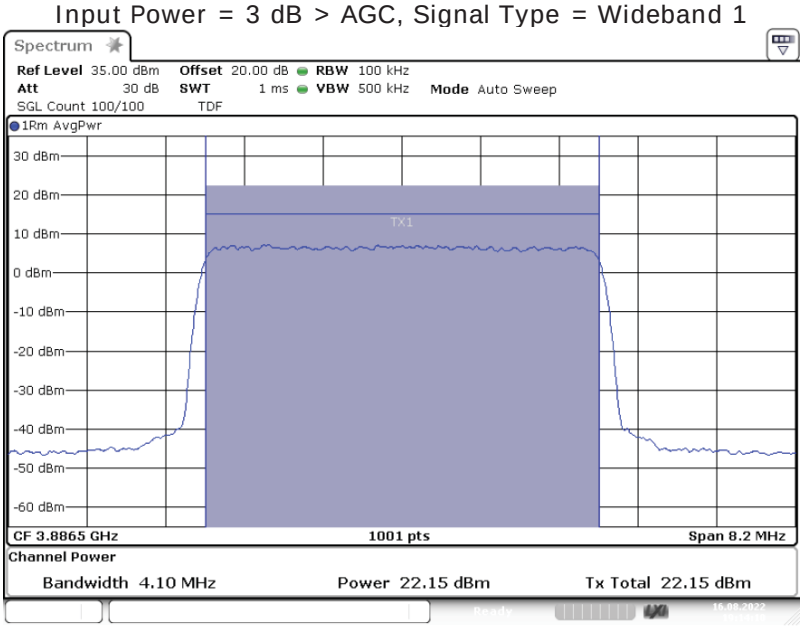
3.5.3 Power GSM Out +3 3.79630G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Wideband 1



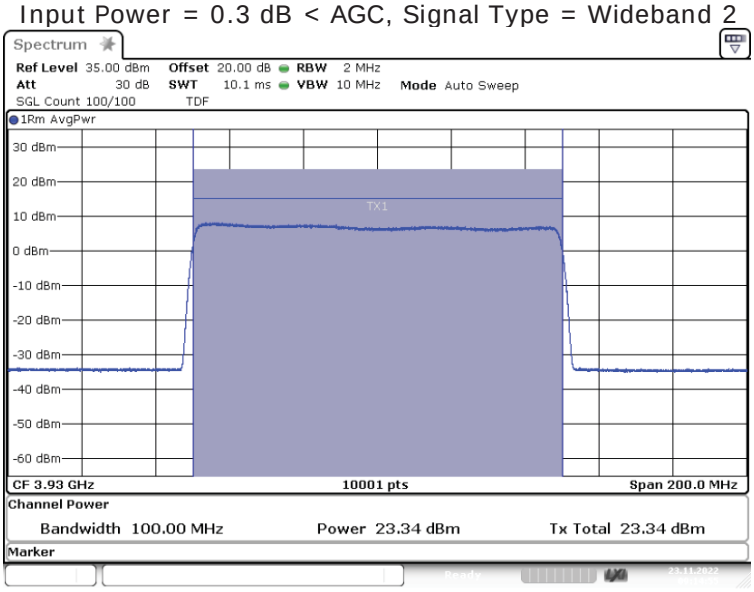
3.5.3 Power AWGN Out -0.3 3.88650G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Wideband 1



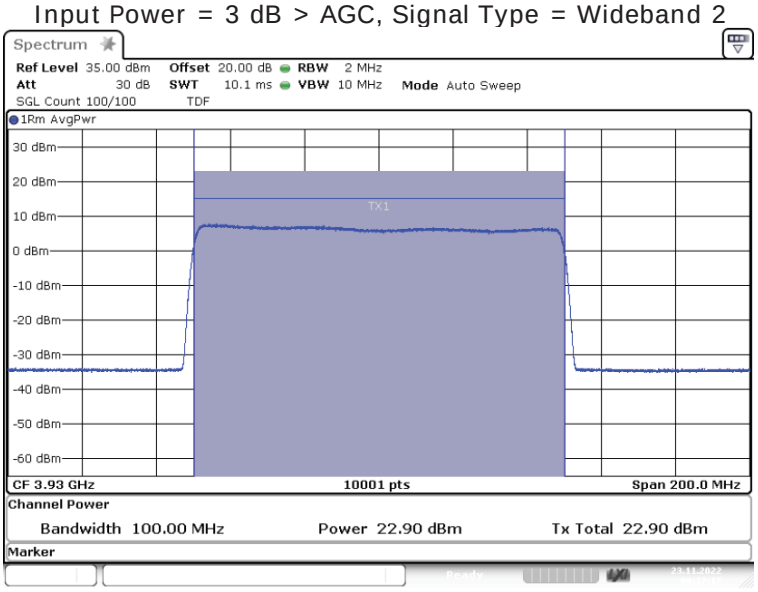
3.5.3 Power AWGN Out +3 3.88650G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Wideband 2



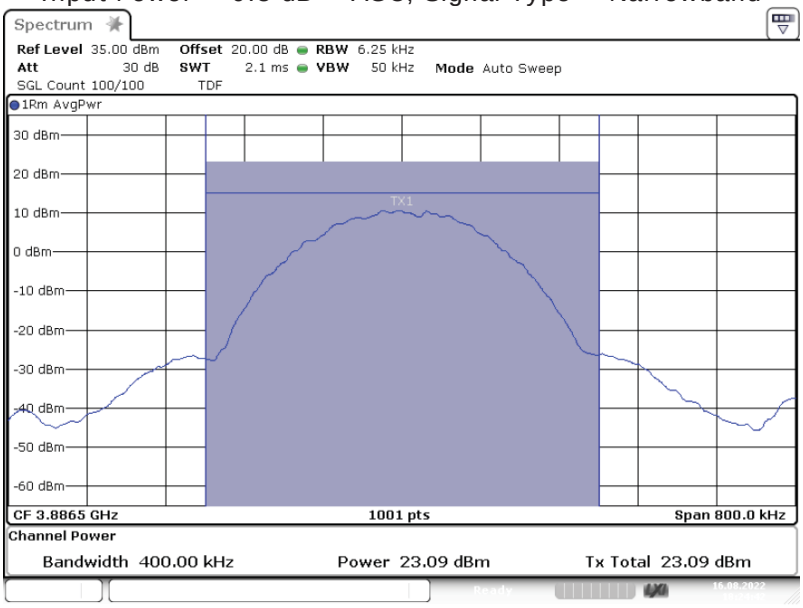
3.5.3 Power AWGN100 Out -0.3 3.93000G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Wideband 2



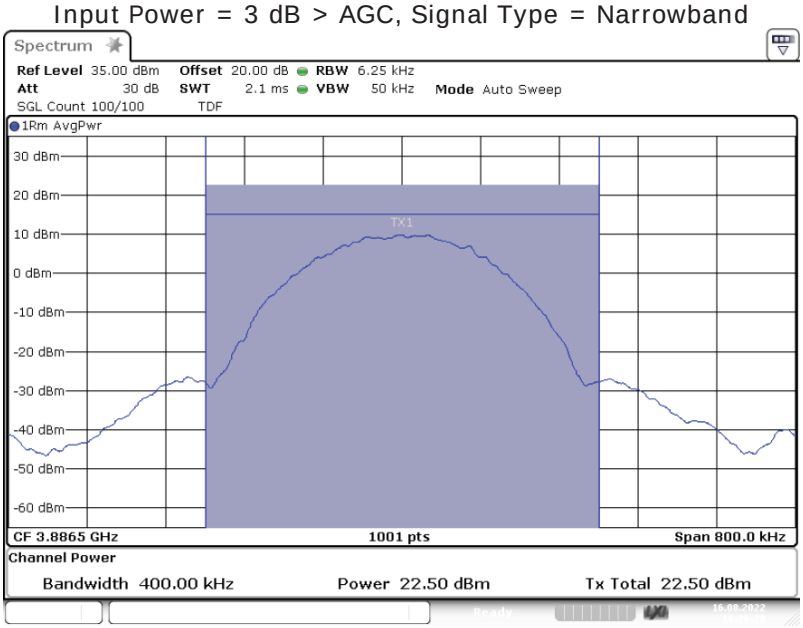
3.5.3 Power AWGN100 Out +3 3.93000G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 0.3 dB < AGC, Signal Type = Narrowband



3.5.3 Power GSM Out -0.3 3.88650G

Frequency Band = C-Band, Frequency f_0, Segment 3, Direction = RF downlink,
Input Power = 3 dB > AGC, Signal Type = Narrowband



3.5.3 Power GSM Out +3 3.88650G

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: 2022-09-16 – 2022-09-19 and 2022-11-22 – 2022-11-25

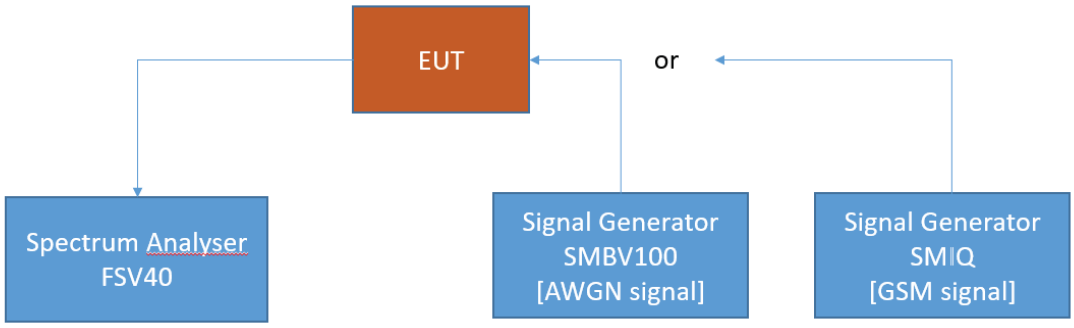
Environmental conditions: 23 ° C ± 5 K; 40 % r. F. ± 20 % r. F.

Test engineer: Thomas Hufnagel, Thomas Gerngroß

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

(j) The following power requirements apply to stations transmitting in the 3700-3980 MHz band:

(4) Equipment employed must be authorized in accordance with the provisions of § 27.51. Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (j)(5) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.2.3 TEST PROTOCOL

C-Band, segment 1, downlink						
Signal Type	**Input Power**	**Frequency [MHz]**	**Input Power [dBm]**	**PAPR [dB]**	**Limit PAPR [dB]**	**Margin to Limit [dB]**
Wideband 1	0.3 dB < AGC	3750.00	-4.3	8.4	13.0	4.6
Wideband 1	3 dB > AGC	3750.00	-1.0	8.4	13.0	4.6
Wideband 2	0.3 dB < AGC	3750.00	-4.1	8.5	13.0	4.5
Wideband 2	3 dB > AGC	3750.00	-0.8	8.5	13.0	4.5
Narrowband	0.3 dB < AGC	3751.00	-3.5	0.2	13.0	12.8
Narrowband	3 dB > AGC	3751.00	-0.2	0.2	13.0	12.8

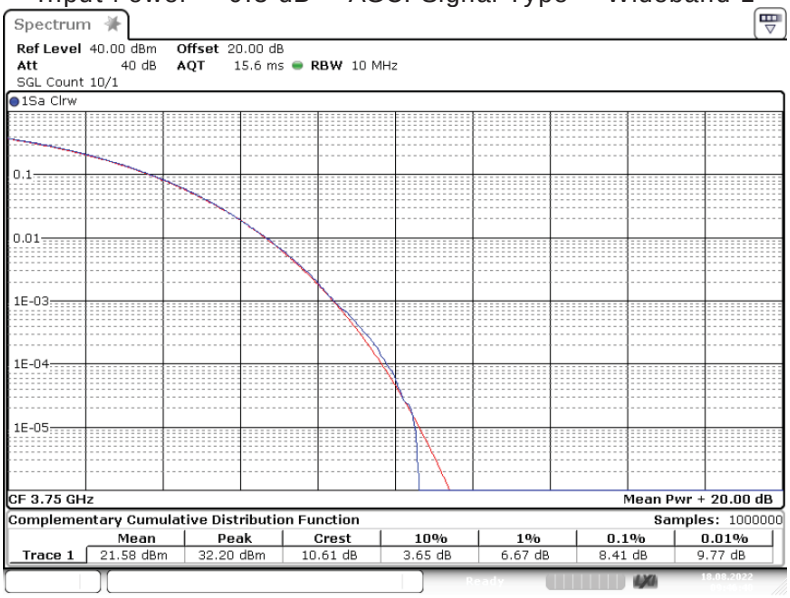
C-Band. segment 2. downlink						
Signal Type	**Input Power**	**Frequency [MHz]**	**Input Power [dBm]**	**PAPR [dB]**	**Limit PAPR [dB]**	**Margin to Limit [dB]**
Wideband 1	0.3 dB < AGC	3840.00	-4.5	8.4	13.0	4.6
Wideband 1	3 dB > AGC	3796.30	-1.2	8.4	13.0	4.6
Wideband 2	0.3 dB < AGC	3840.00	-4.3	8.4	13.0	4.6
Wideband 2	3 dB > AGC	3840.00	-1.0	8.5	13.0	4.5
Narrowband	0.3 dB < AGC	3841.00	-3.8	0.2	13.0	12.8
Narrowband	3 dB > AGC	3841.00	0.5	0.2	13.0	12.8

C-Band. segment 3. downlink						
Signal Type	**Input Power**	**Frequency [MHz]**	**Input Power [dBm]**	**PAPR [dB]**	**Limit PAPR [dB]**	**Margin to Limit [dB]**
Wideband 1	0.3 dB < AGC	3930.00	-4.5	8.4	13.0	4.6
Wideband 1	3 dB > AGC	3930.00	-1.2	8.4	13.0	4.6
Wideband 2	0.3 dB < AGC	3930.00	-4.1	8.5	13.0	4.5
Wideband 2	3 dB > AGC	3930.00	-0.8	8.5	13.0	4.5
Narrowband	0.3 dB < AGC	3931.00	-3.7	0.1	13.0	12.9
Narrowband	3 dB > AGC	3931.00	-0.4	0.2	13.0	12.8

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

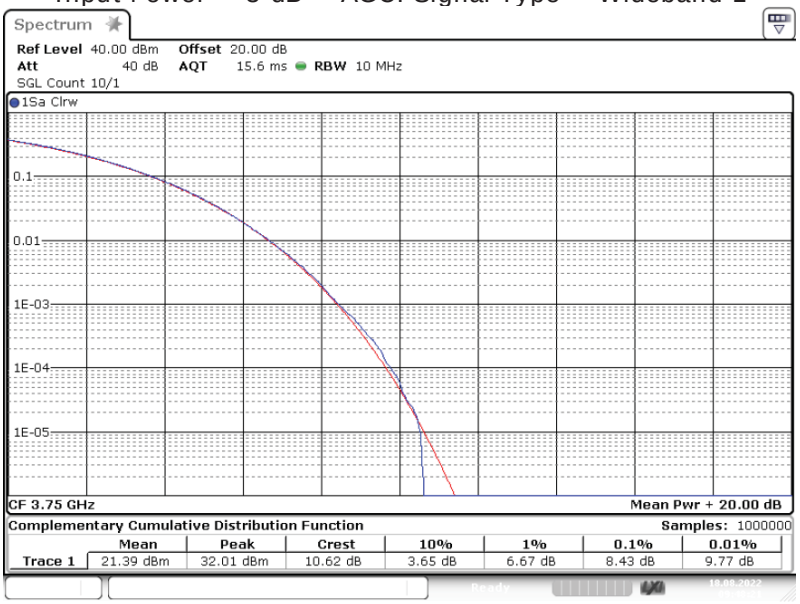
4.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE. “WORST CASE”)

Frequency Band = C-Band. Segment 1. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1



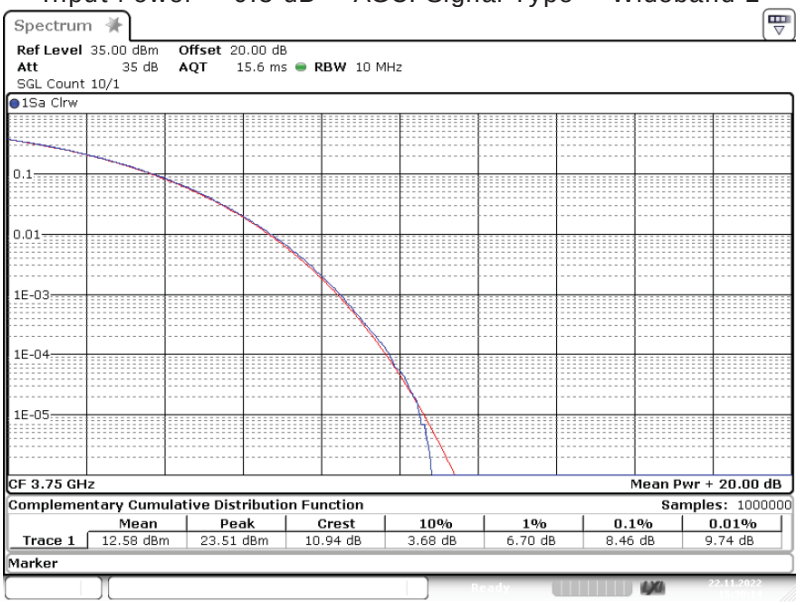
4.0 PAPR AWGN Out -0.3 3.750G

Frequency Band = C-Band. Segment 1. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1



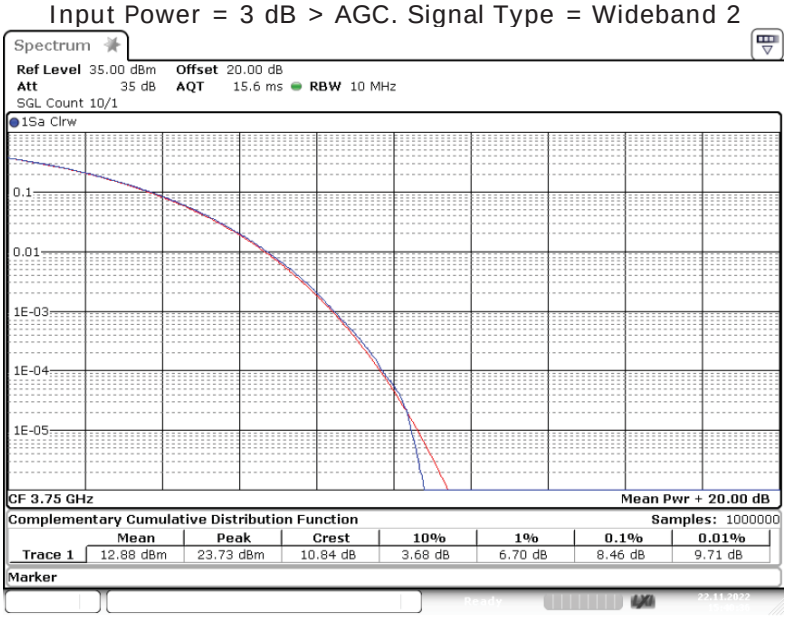
4.0 PAPR AWGN Out +3 3.750G

Frequency Band = C-Band. Segment 1. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2



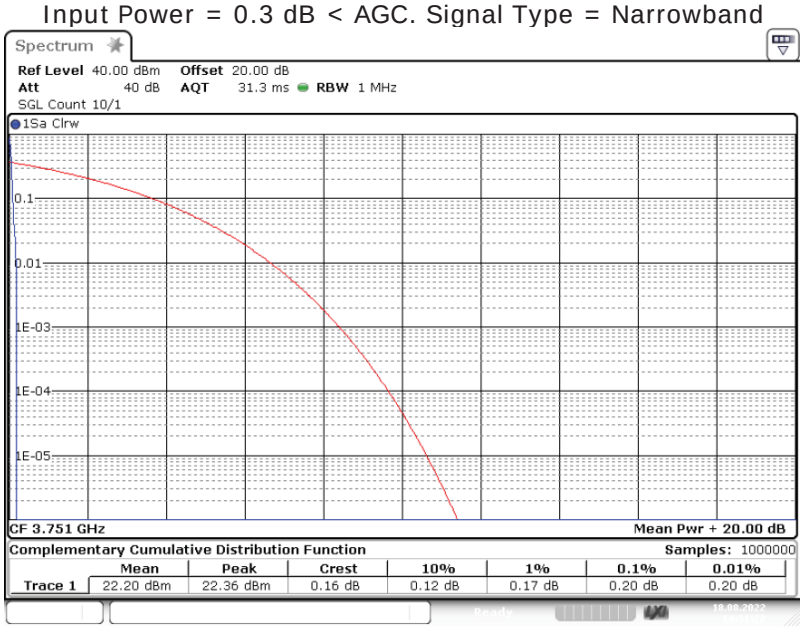
4.0 PAPR AWGN100 Out -0.3 3.750G

Frequency Band = C-Band. Segment 1. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2



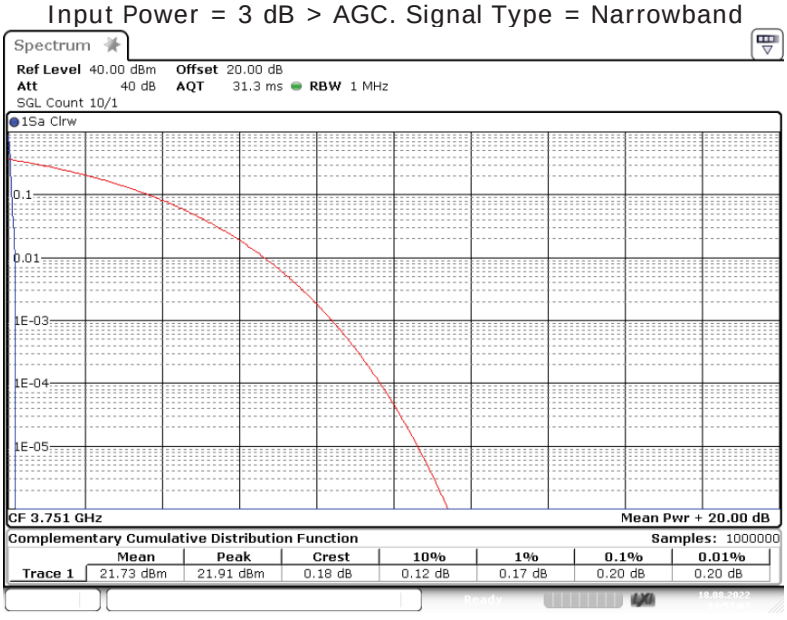
4.0 PAPR AWGN100 Out +3 3.750G

Frequency Band = C-Band. Segment 1. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



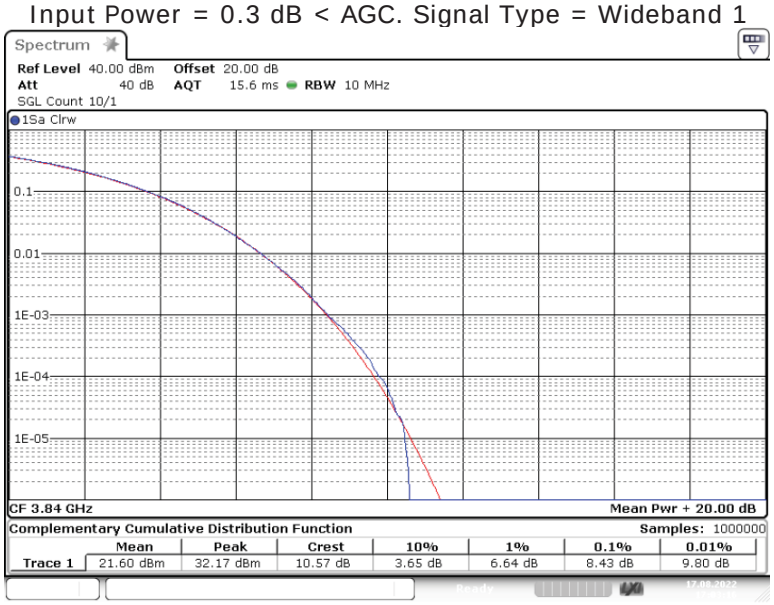
4.0 PAPR GSM Out -0.3 3.751G

Frequency Band = C-Band. Segment 1. Frequency f_{mid+1}. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband



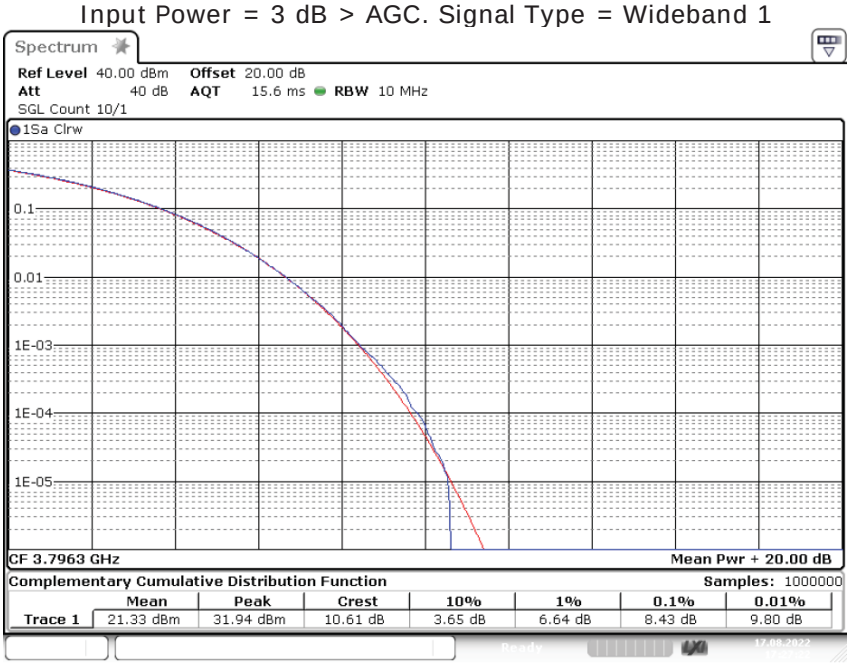
4.0 PAPR GSM Out +3 3.751G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1



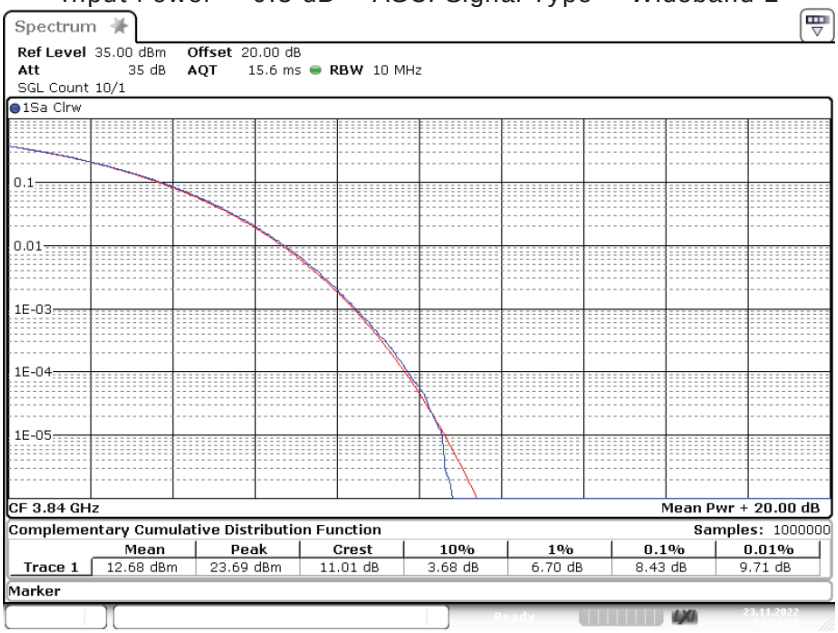
4.0 PAPR AWGN Out -0.3 3.840G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1



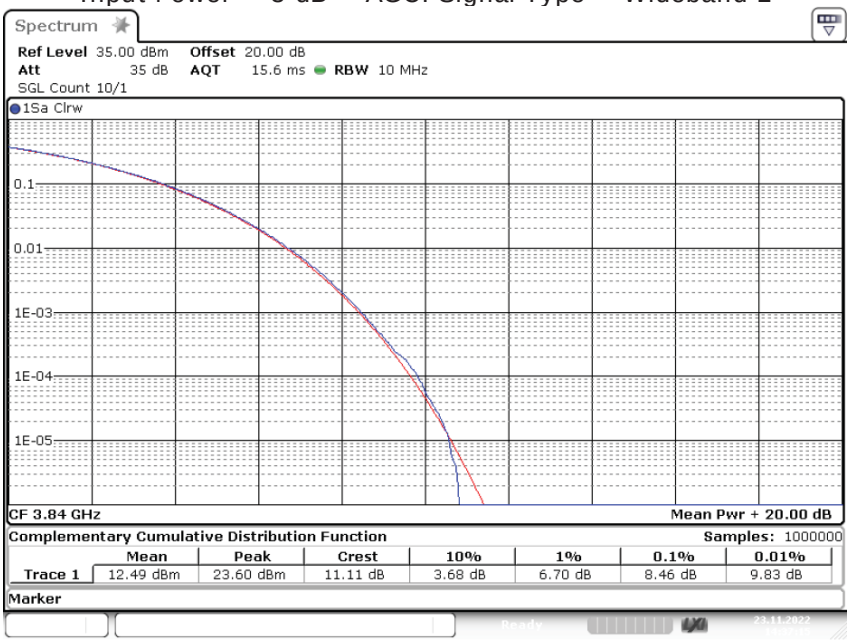
4.0 PAPR AWGN Out +3 3.796G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2



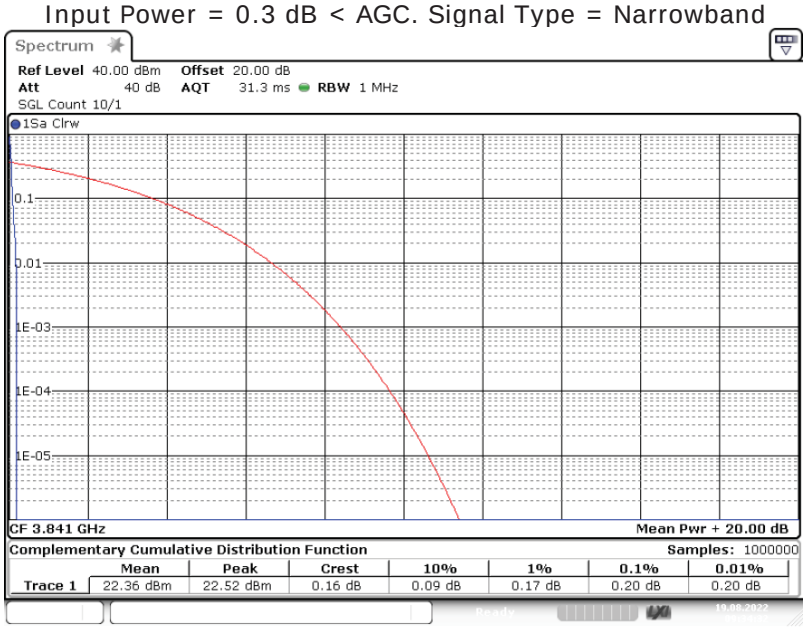
4.0 PAPR AWGN100 Out -0.3 3.840G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2



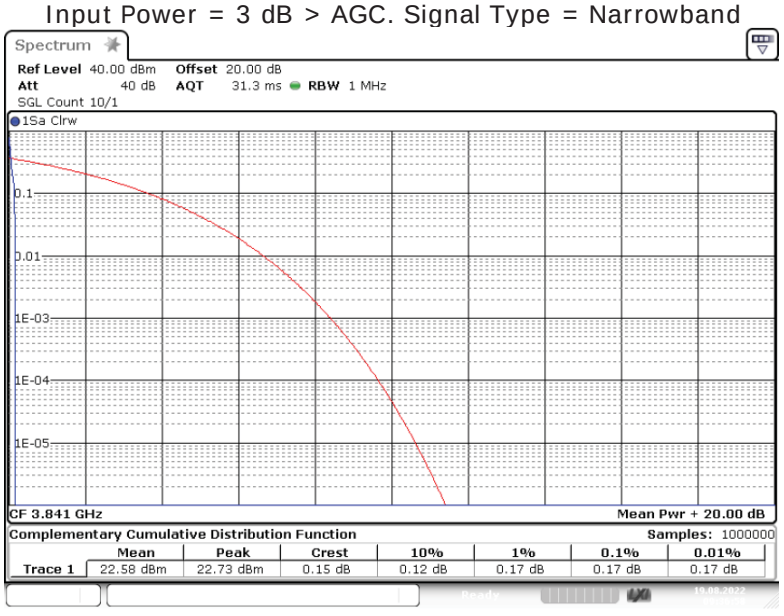
4.0 PAPR AWGN100 Out +3 3.840G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



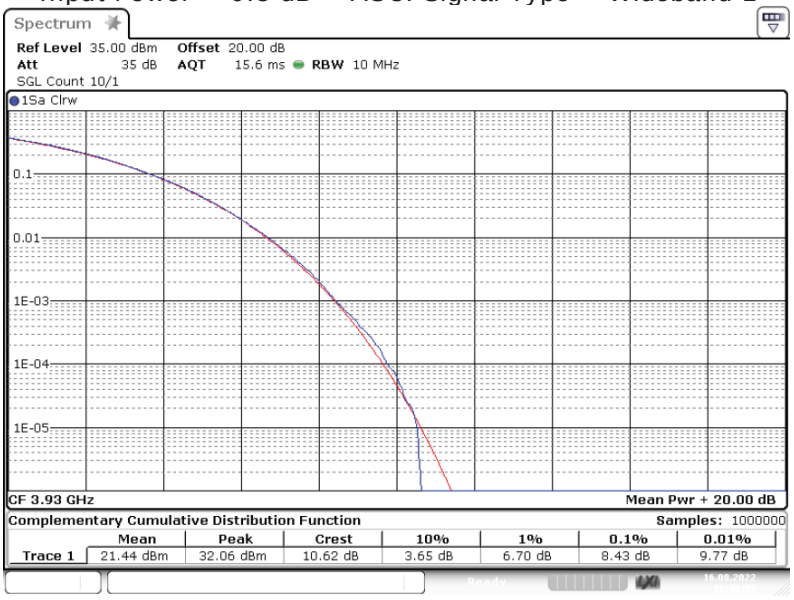
4.0 PAPR GSM Out -0.3 3.841G

Frequency Band = C-Band. Segment 2. Frequency f_0. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband



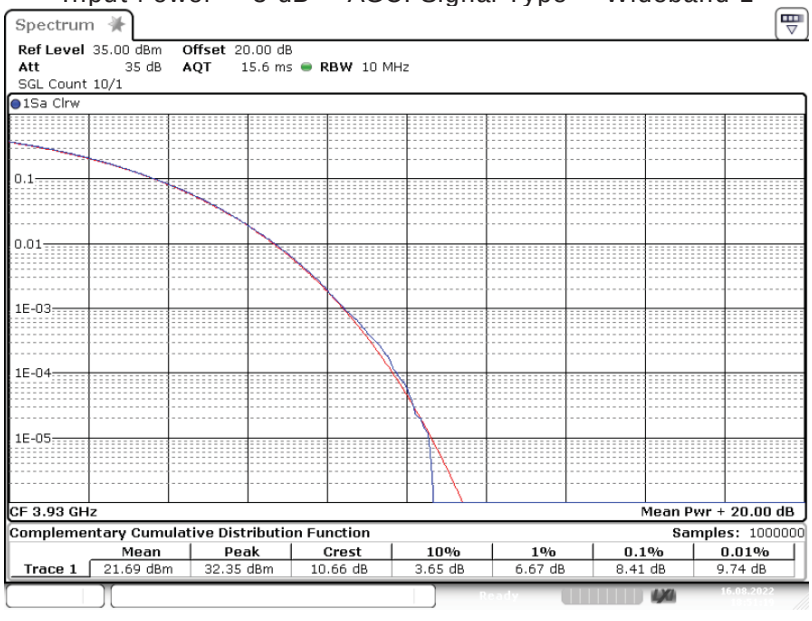
4.0 PAPR GSM Out +3 3.841G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1



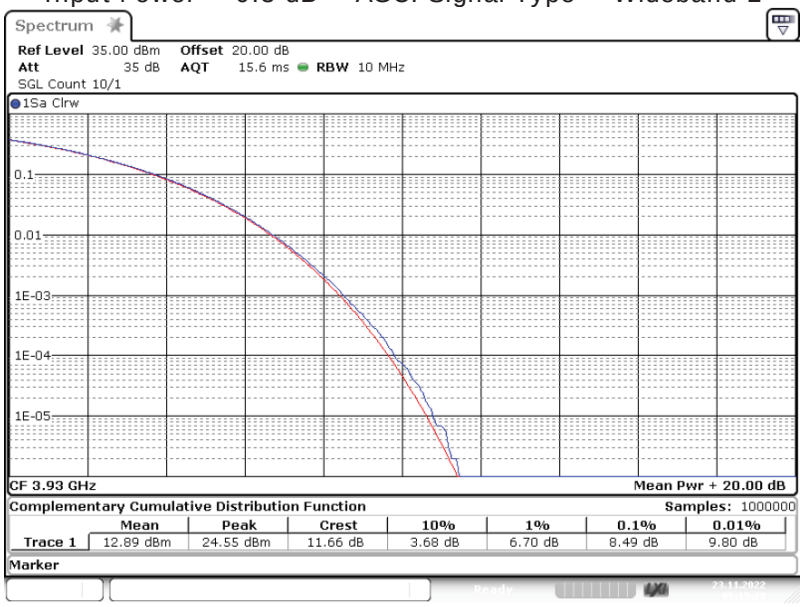
4.0 PAPR AWGN Out -0.3 3.930G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1



4.0 PAPR AWGN Out +3 3.930G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2

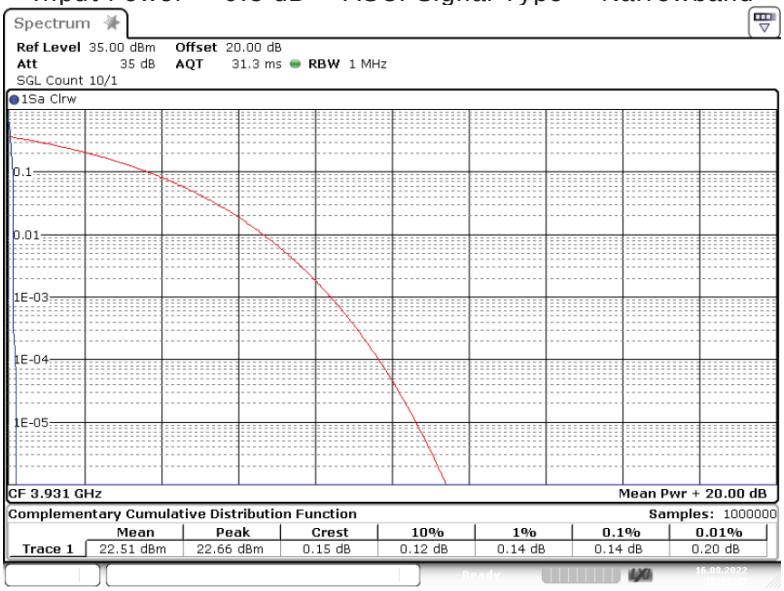


4.0 PAPR AWGN100 Out -0.3 3.930G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid.}$ Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2

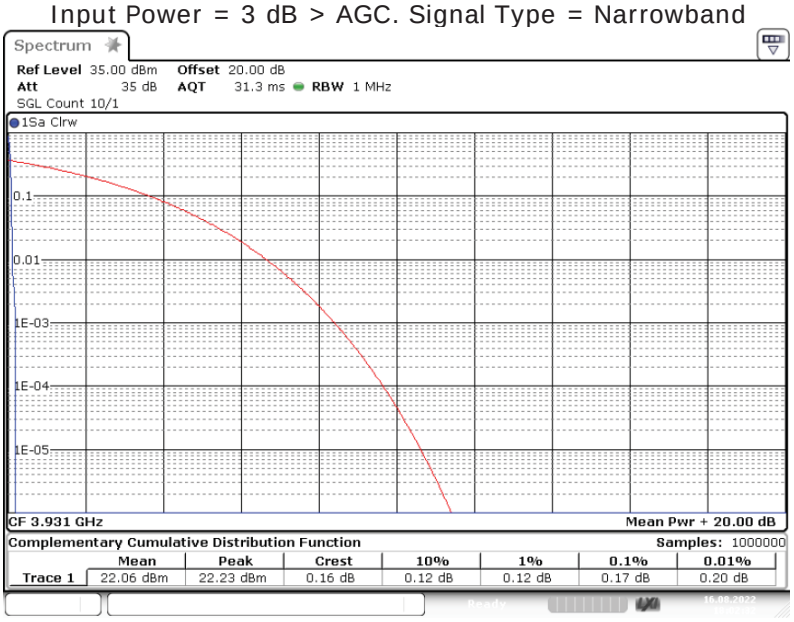
4.0 PAPR AWGN100 Out +3 3.930G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid+1.}$ Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



4.0 PAPR GSM Out -0.3 3.931G

Frequency Band = C-Band. Segment 3. Frequency $f_{mid+1.}$ Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband



4.0 PAPR GSM Out +3 3.931G

4.2.5 TEST 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: 2022-09-17 – 2022-09-19 and 2022-11-22 – 2022-11-25

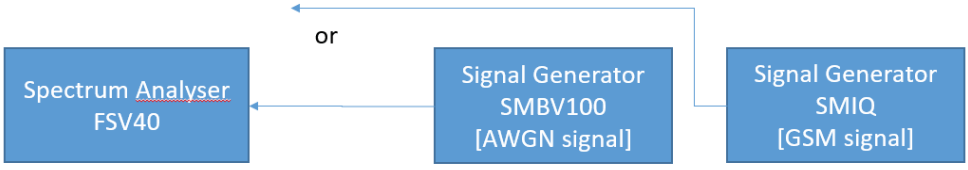
Environmental conditions: 23 ° C ± 5 K; 40 % r. F. ± 20 % r. F.

Test engineer: Thomas Hufnagel. Thomas Gerngroß

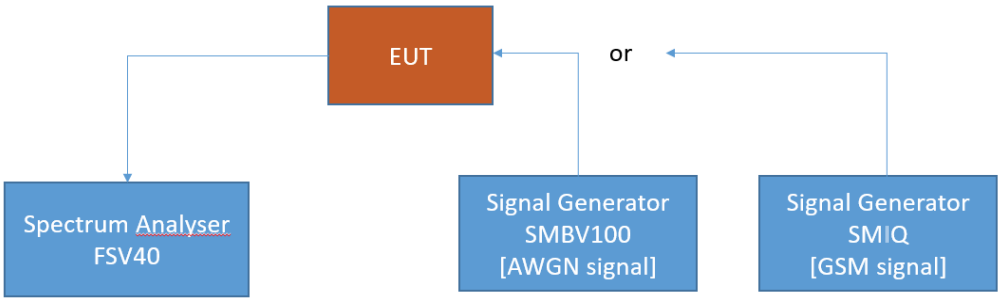
4.3.1 TEST DESCRIPTION

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

C-Band. segment 1. 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 1	0.3 dB < AGC	3750.00	4389.4	4390.7	1.3	205.0	203.7
Wideband 1	3 dB > AGC	3750.00	4390.7	4389.4	1.3	205.0	203.7
Wideband 2	0.3 dB < AGC	3750.00	103120	103225	105	4920	4815
Wideband 2	3 dB > AGC	3750.00	103360	103135	225	4920	4695
Narrowband	0.3 dB < AGC	3751.00	319.5	316.3	3.2	10.0	6.8
Narrowband	3 dB > AGC	3751.00	313.7	316.4	2.7	10.0	7.3

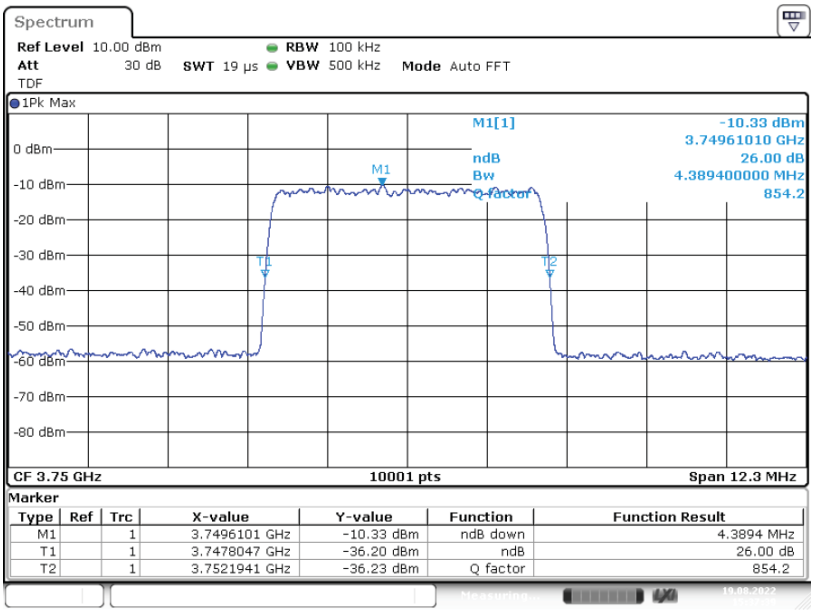
C-Band. segment 2. downlink							
Signal Type	**Input Power**	**Signal Frequency [MHz]**	**Occupied Bandwidth SG [kHz]**	**Occupied Bandwidth Booster [kHz]**	**Delta Occupied Bandwidth [kHz]**	**Limit Delta Occupied Bandwidth [kHz]**	**Margin to Limit [kHz]**
Wideband 1	0.3 dB < AGC	3840.00	4389.4	4389.4	0.0	205.0	205.0
Wideband 1	3 dB > AGC	3840.00	4389.4	4388.2	1.2	205.0	203.8
Wideband 2	0.3 dB < AGC	3840.00	103150	103105	45	205	160
Wideband 2	3 dB > AGC	3840.00	103075	103180	105	205	100
Narrowband	0.3 dB < AGC	3841.00	315.9	316.9	1.0	10.0	9.0
Narrowband	3 dB > AGC	3841.00	313.8	315.3	1.5	10.0	8.5

C-Band. segment 3. 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 1	0.3 dB < AGC	3930.00	4388.2	4387.0	1.2	205.0	203.8
Wideband 1	3 dB > AGC	3930.00	4389.4	4388.2	1.2	205.0	203.8
Wideband 2	0.3 dB < AGC	3930,00	103165	103075	90	4920	4830
Wideband 2	3 dB > AGC	3930,00	103300	103120	180	4920	4740
Narrowband	0.3 dB < AGC	3931.00	317.1	316.9	0.2	10.0	9.8
Narrowband	3 dB > AGC	3931.00	317.1	316.8	0.3	10.0	9.7

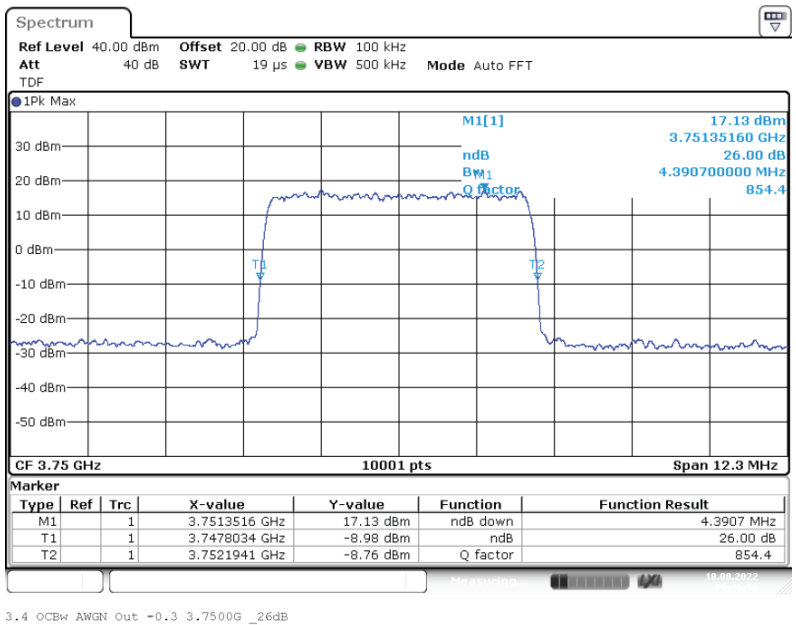
Remark: Please see next sub-clause for the measurement plot.

4.3.4 MEASUREMENT PLOT

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1

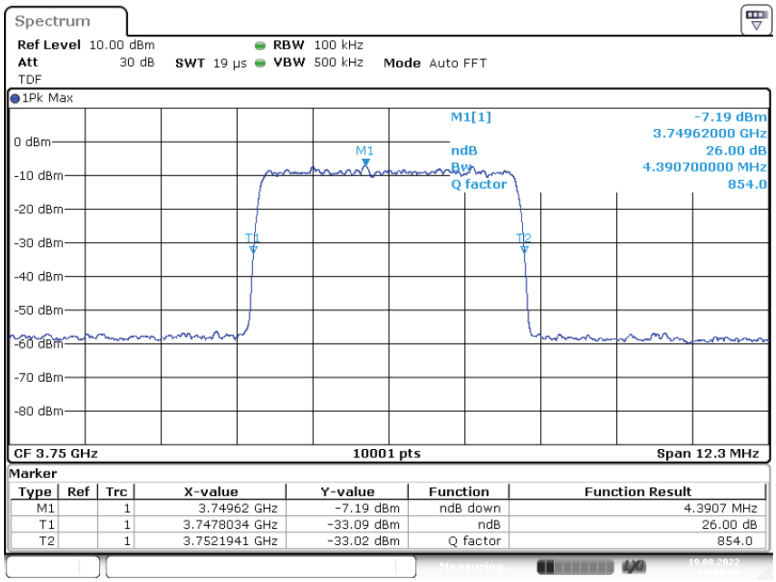


Input Signal

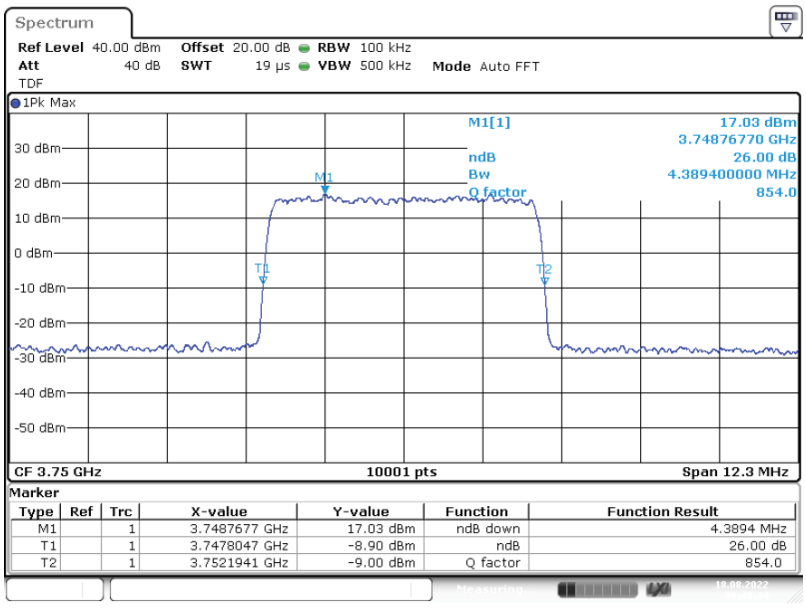


Output Signal

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1

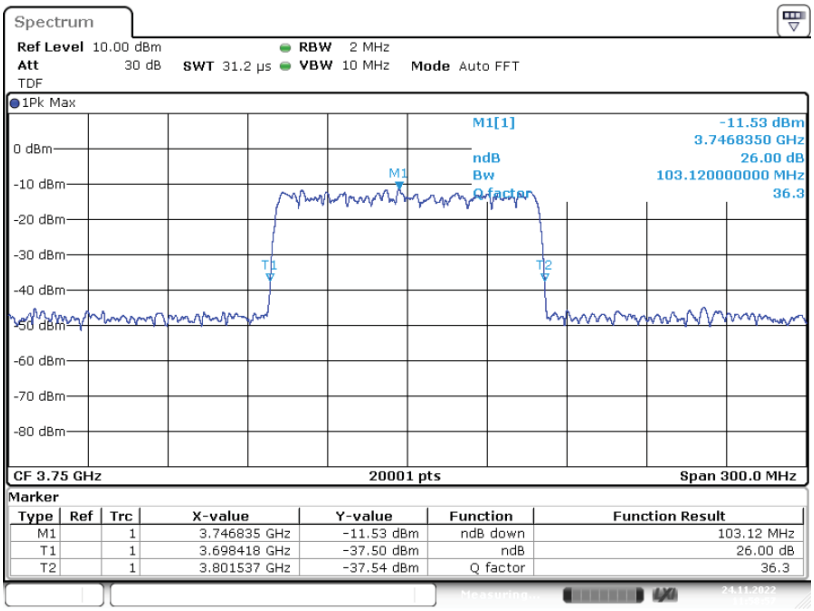


Input Signal



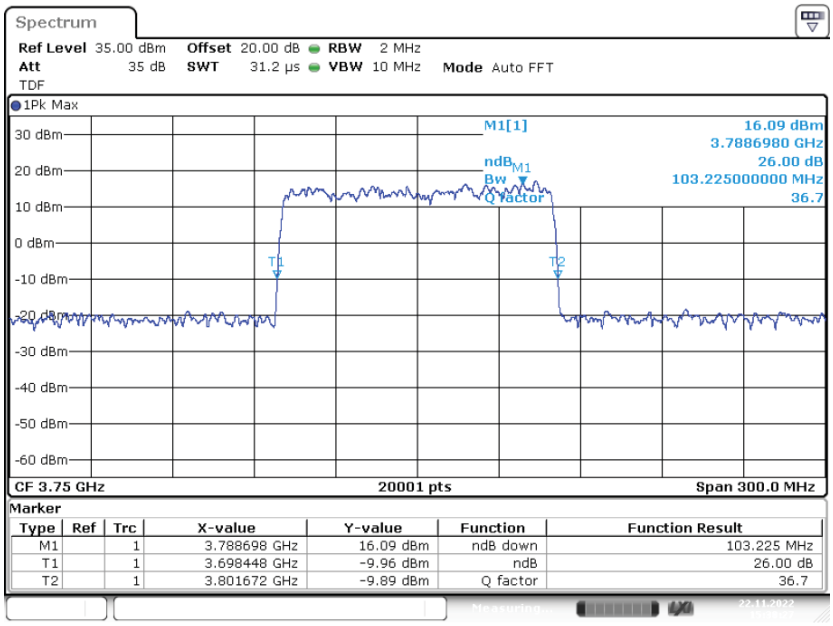
Output Signal

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2



3.4 OCBw AWGN100 In -0.3 3.7500G _26dB

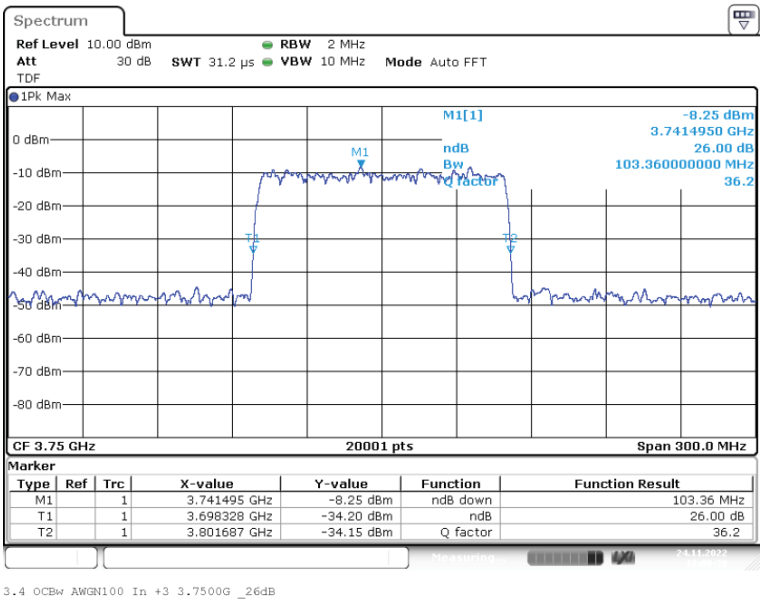
Input Signal



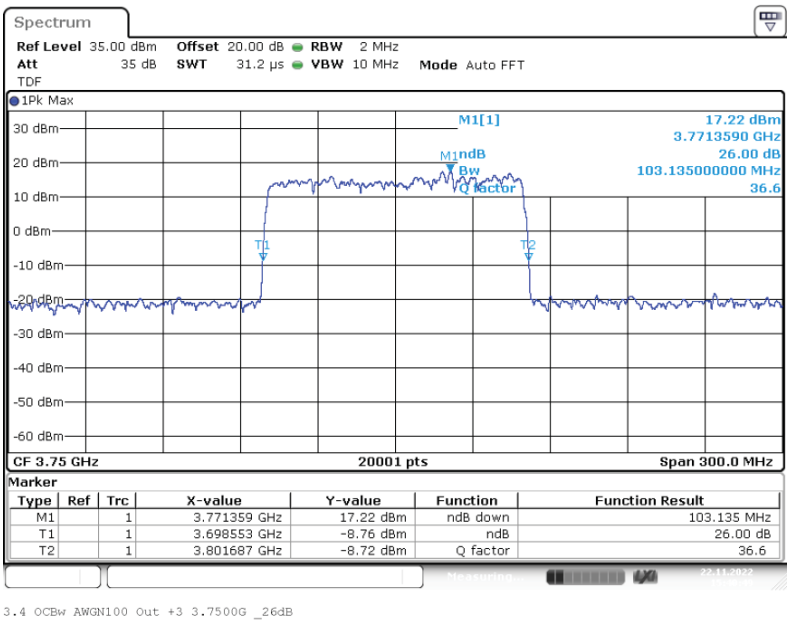
3.4 OCBw AWGN100 Out -0.3 3.7500G _26dB

Output Signal

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2

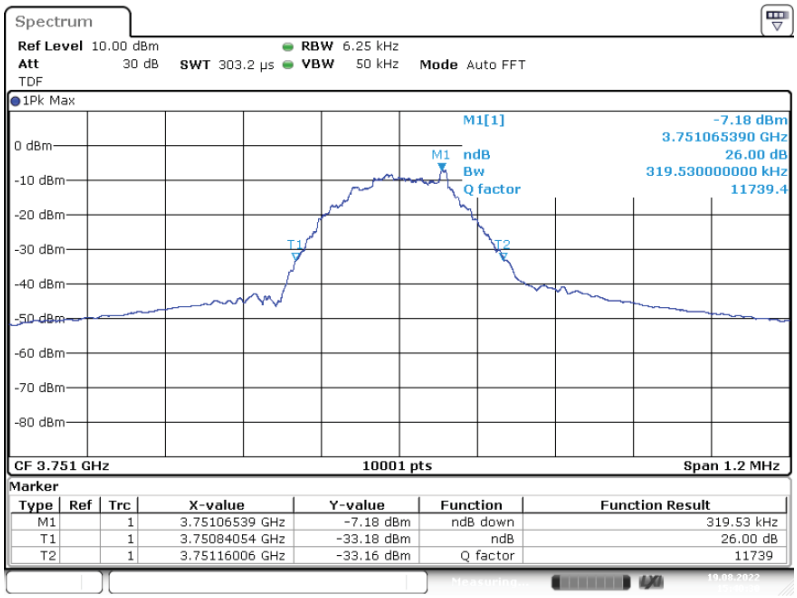


Input Signal



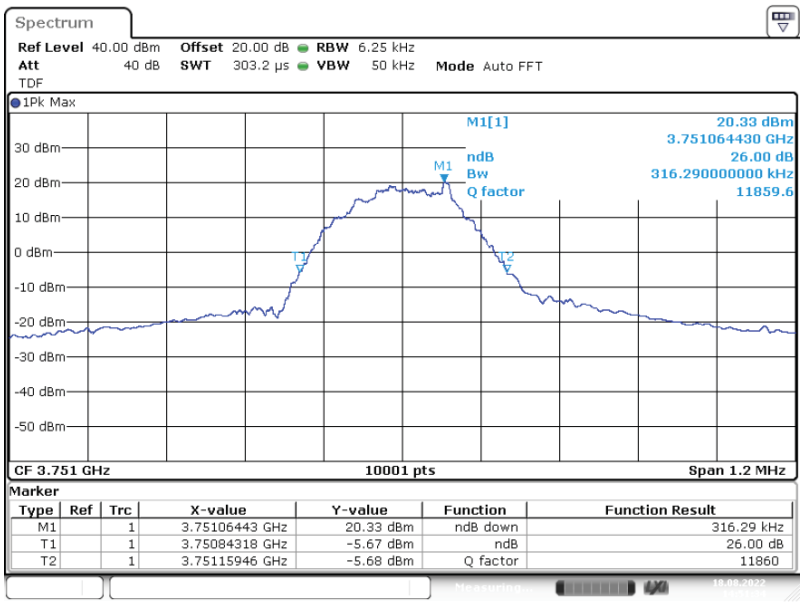
Output Signal

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



3.4 OCBw GSM In -0.3 3.7510G _26dB

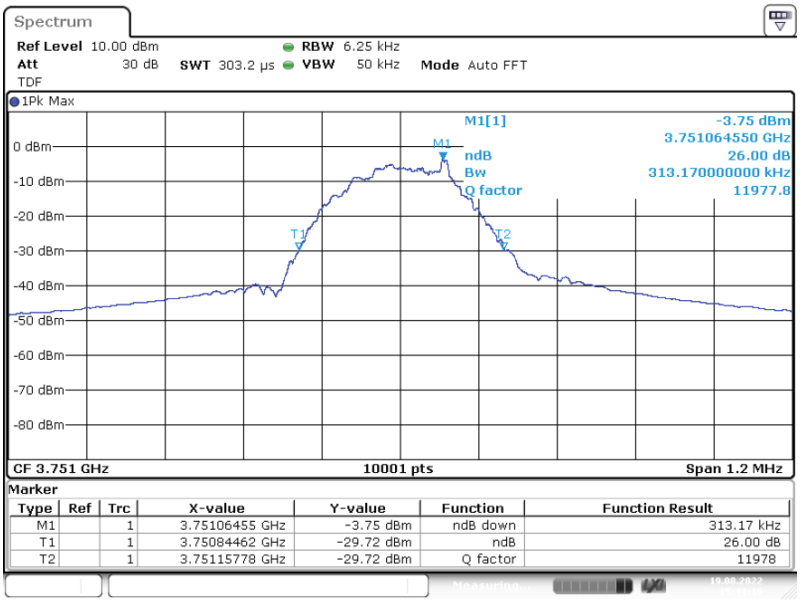
Input Signal



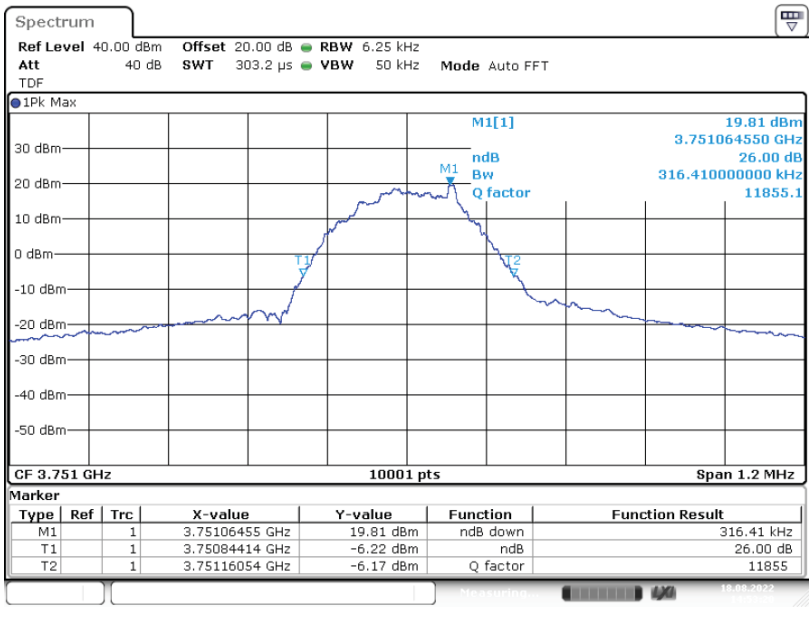
3.4 OCBw GSM Out -0.3 3.7510G _26dB

Output Signal

Frequency Band = C-Band. Segment 1. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband

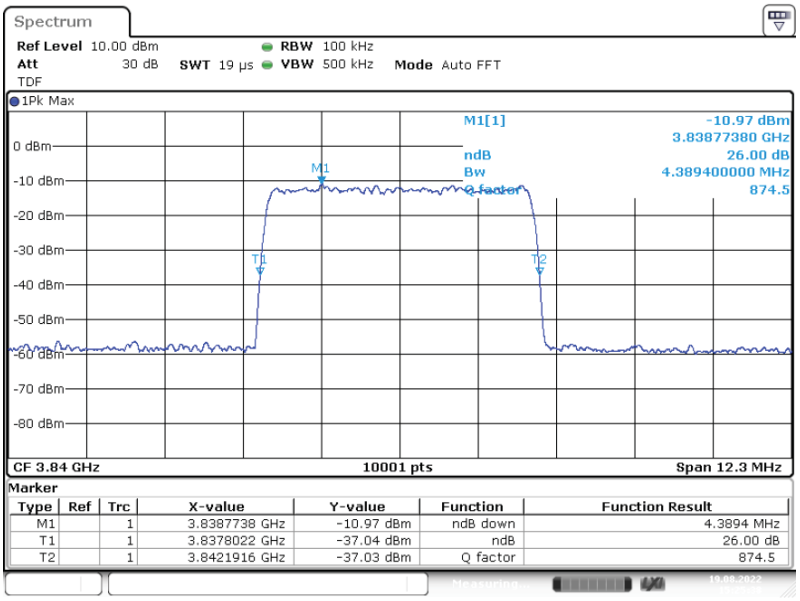


Input Signal



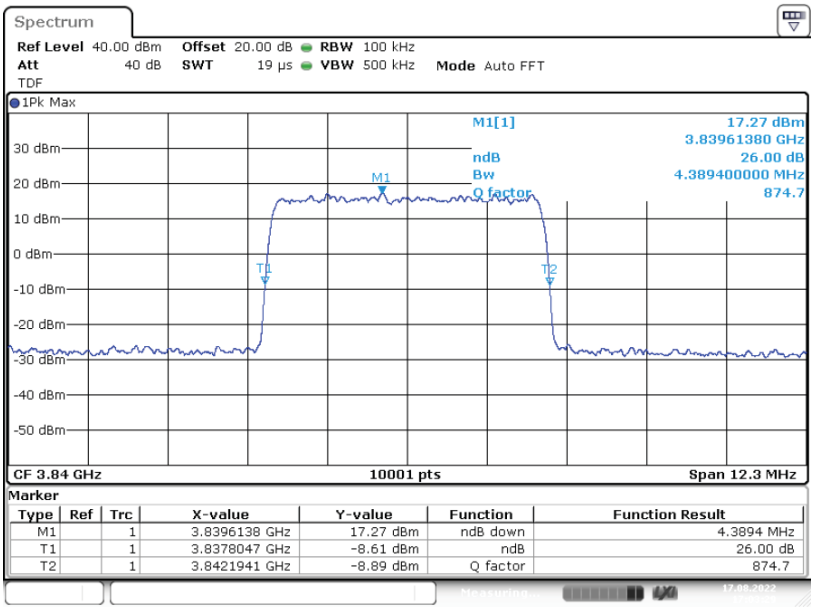
Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1



3.4 OCBw AWGN In -0.3 3.8400G _26dB

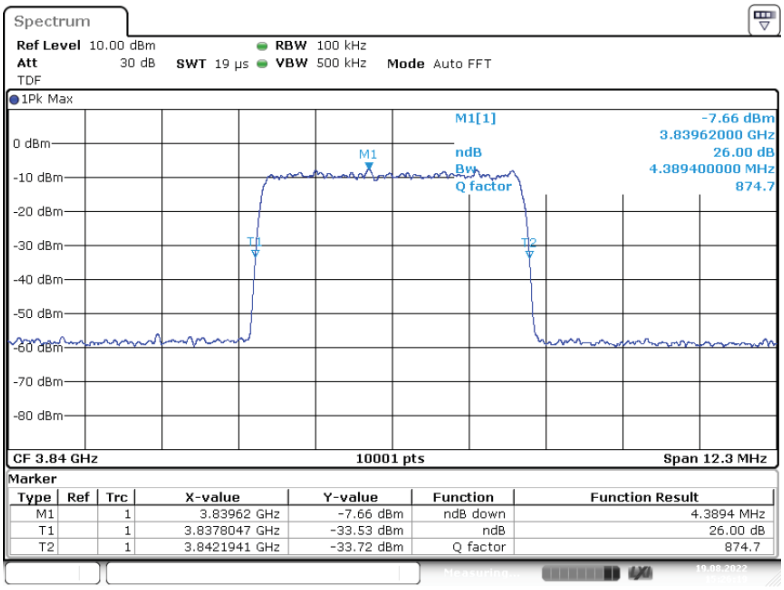
Input Signal



3.4 OCBw AWGN Out -0.3 3.8400G _26dB

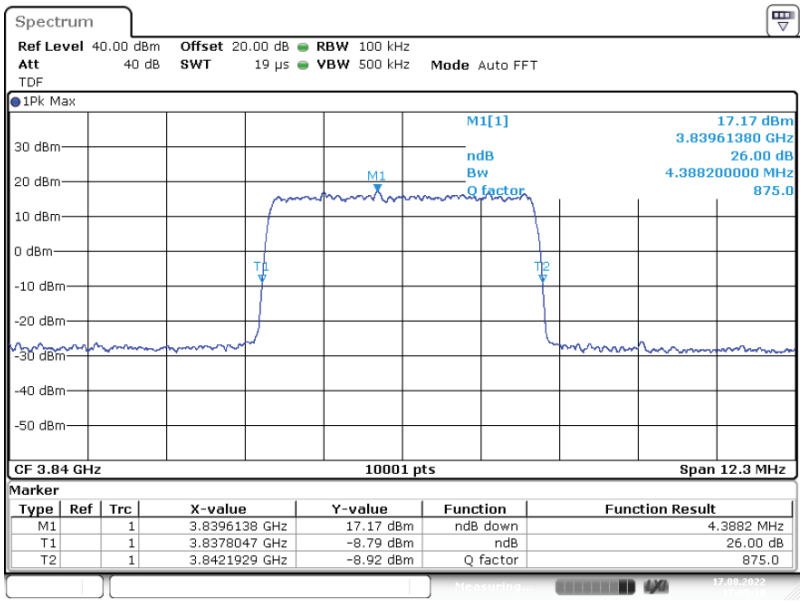
Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1



3.4 OCBw AWGN In +3 3.8400G _26dB

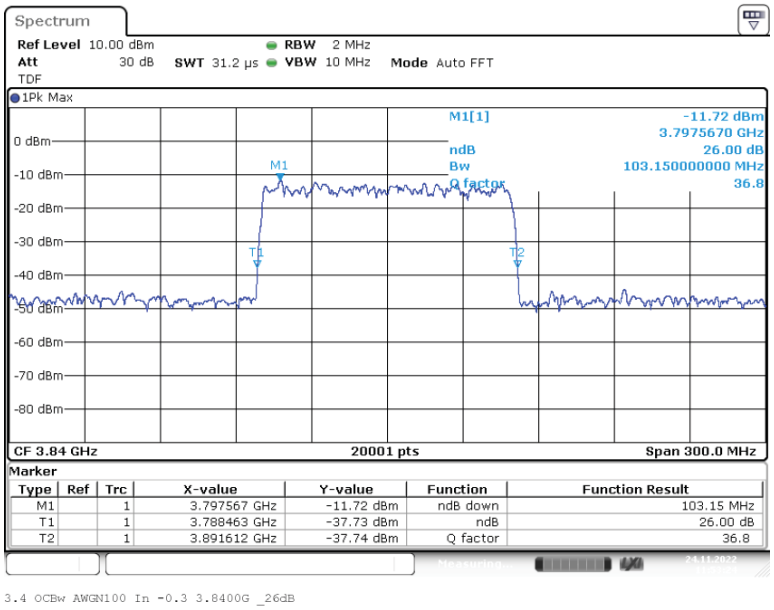
Input Signal



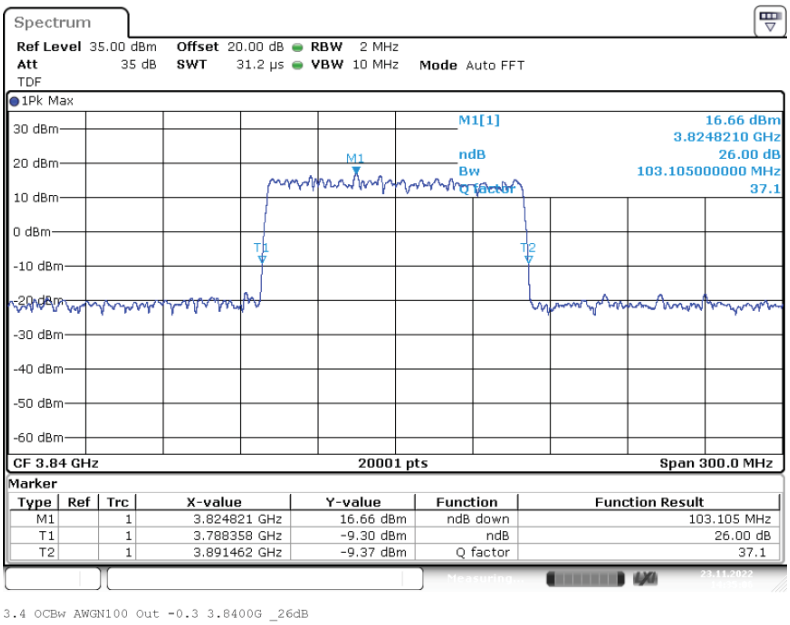
3.4 OCBw AWGN Out +3 3.8400G _26dB

Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2

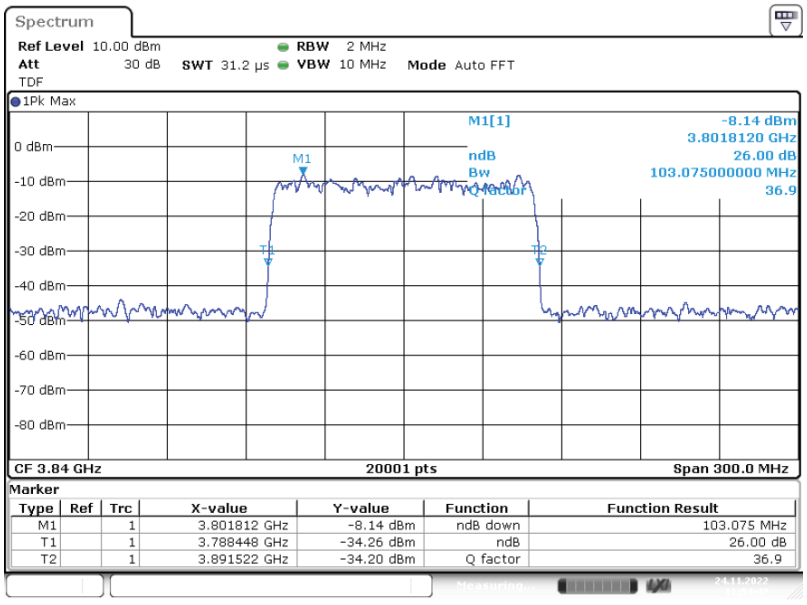


Input Signal



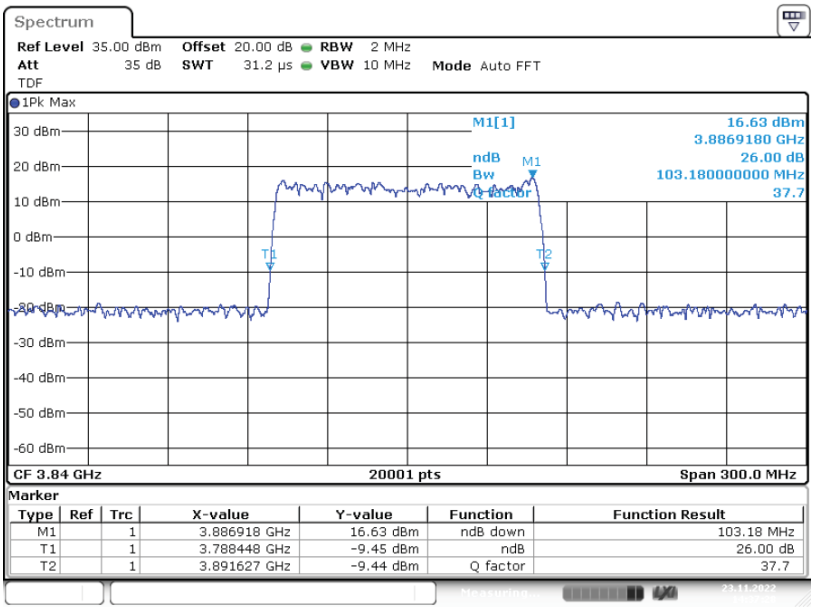
Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2



3.4 OCBw AWGN100 In +3 3.8400G _26dB

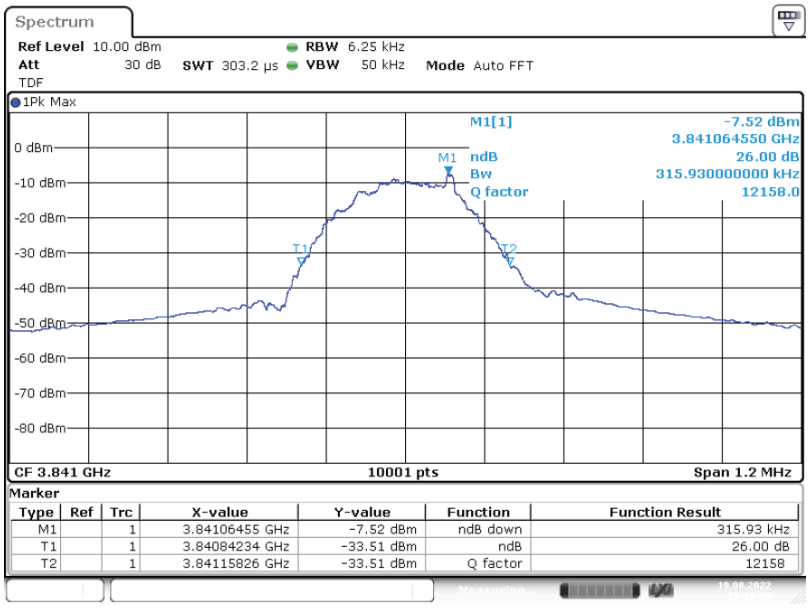
Input Signal



3.4 OCBw AWGN100 Out +3 3.8400G _26dB

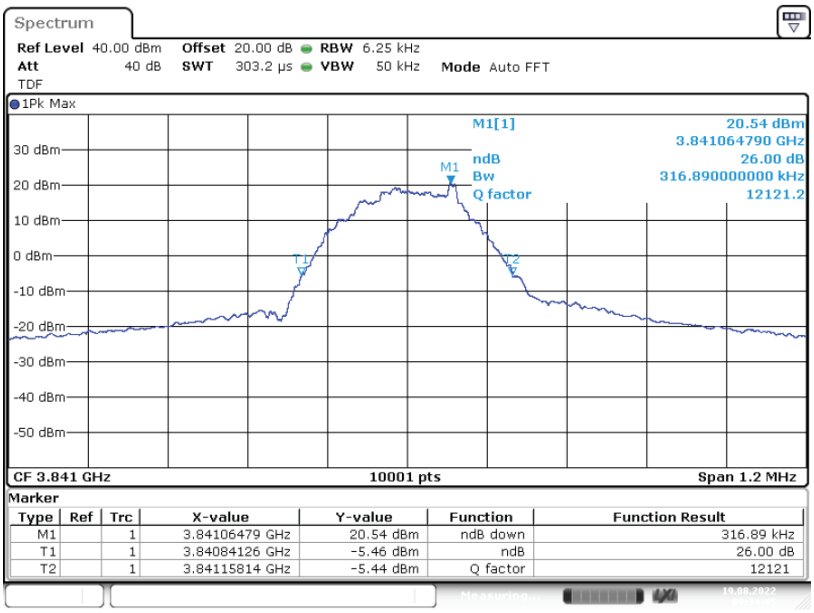
Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



3.4 OCBw GSM In -0.3 3.8410G _26dB

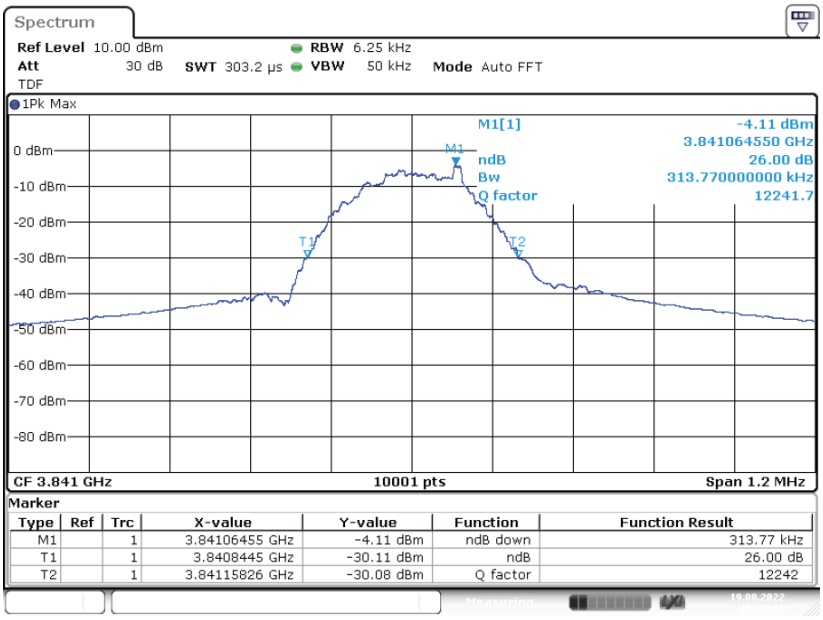
Input Signal



3.4 OCBw GSM Out -0.3 3.8410G _26dB

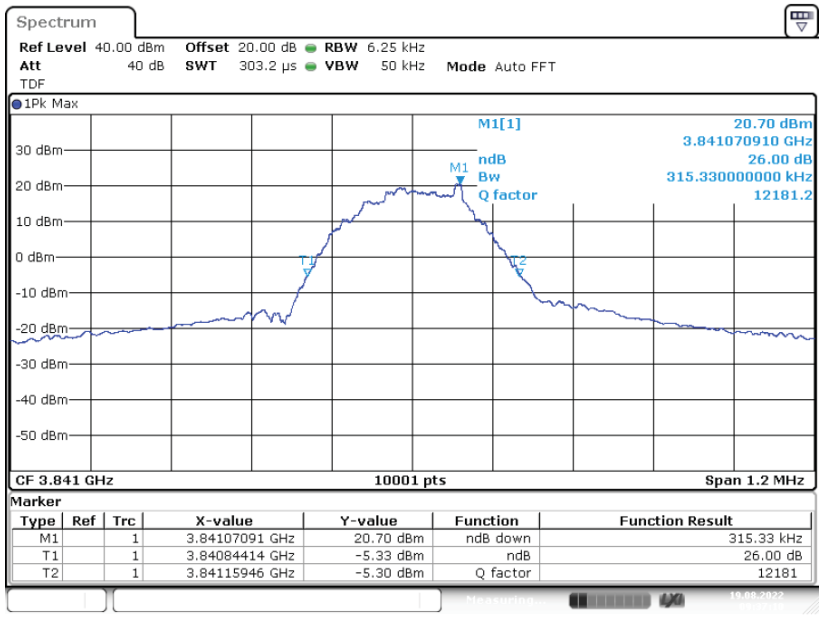
Output Signal

Frequency Band = C-Band. Segment 2. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband



3.4 OCBw GSM In +3 3.8410G _26dB

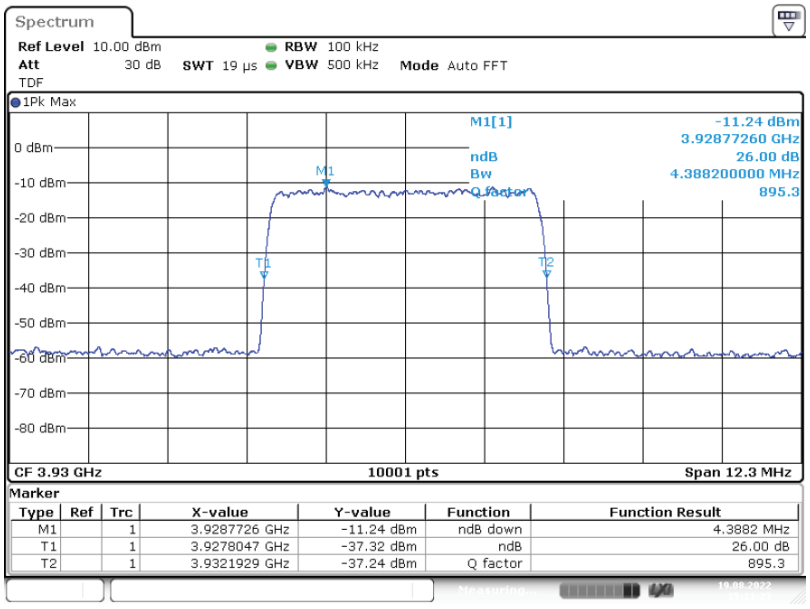
Input Signal



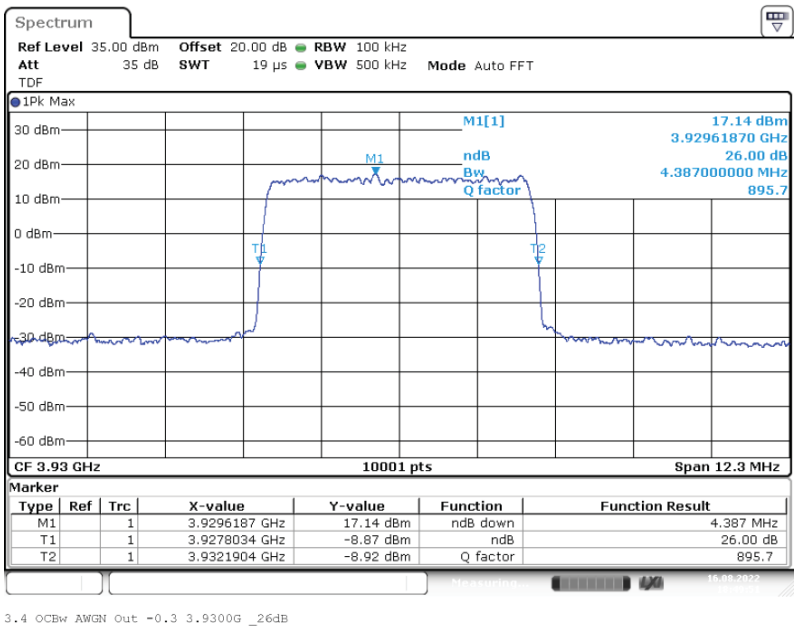
3.4 OCBw GSM Out +3 3.8410G _26dB

Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 1

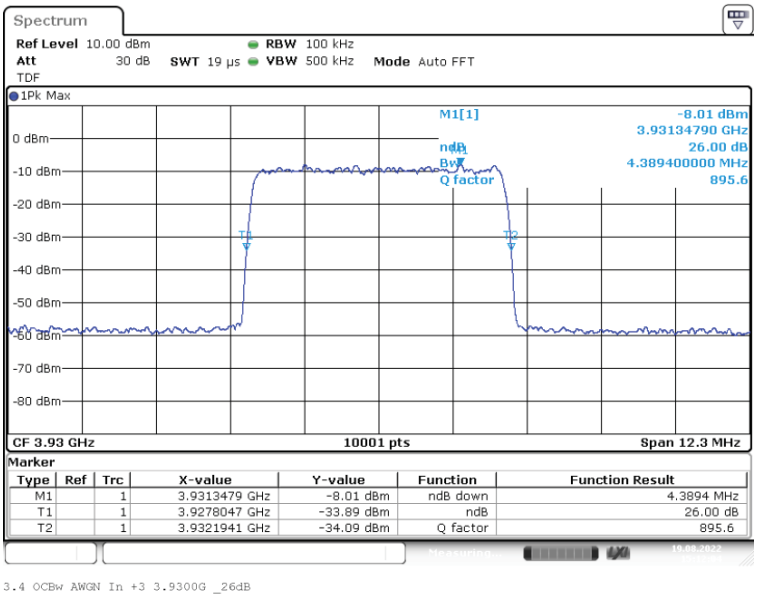


Input Signal

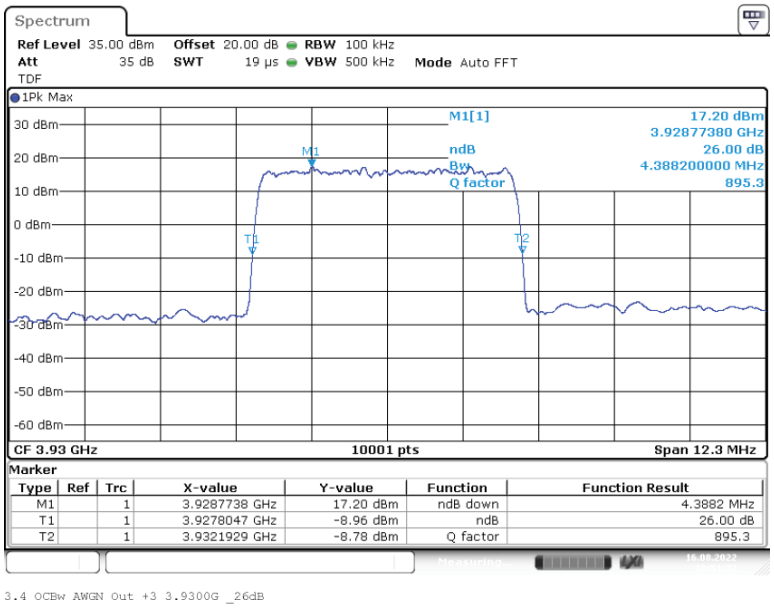


Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 1

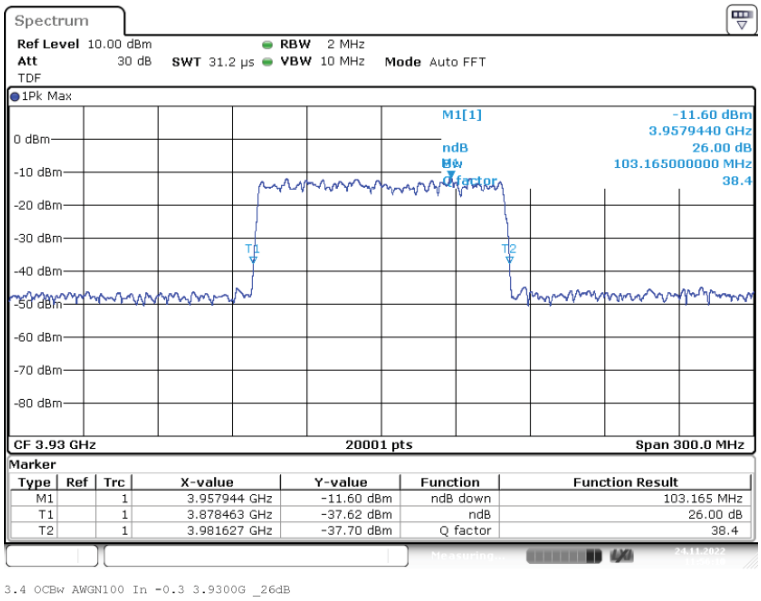


Input Signal

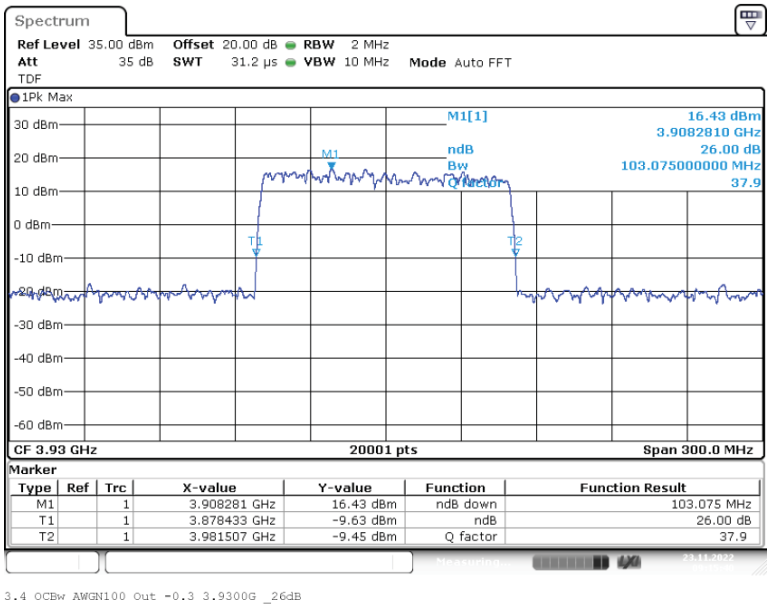


Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Wideband 2

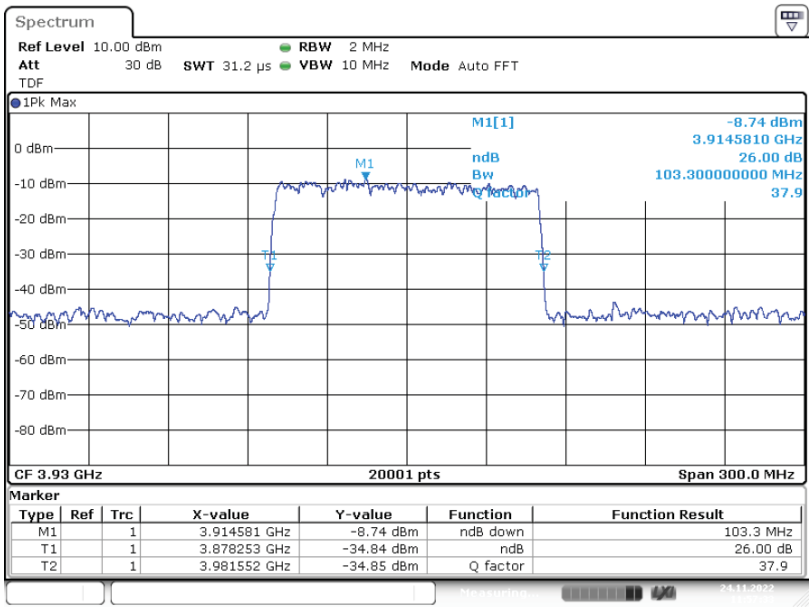


Input Signal

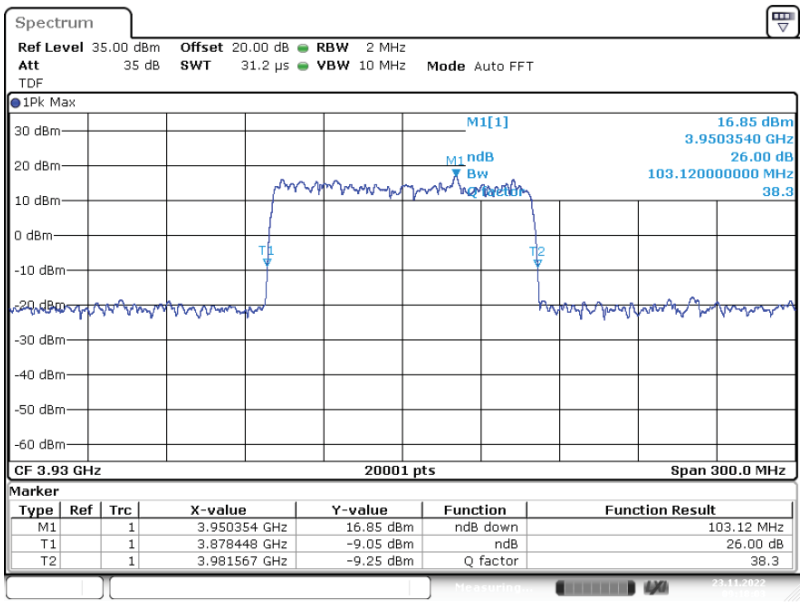


Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Wideband 2

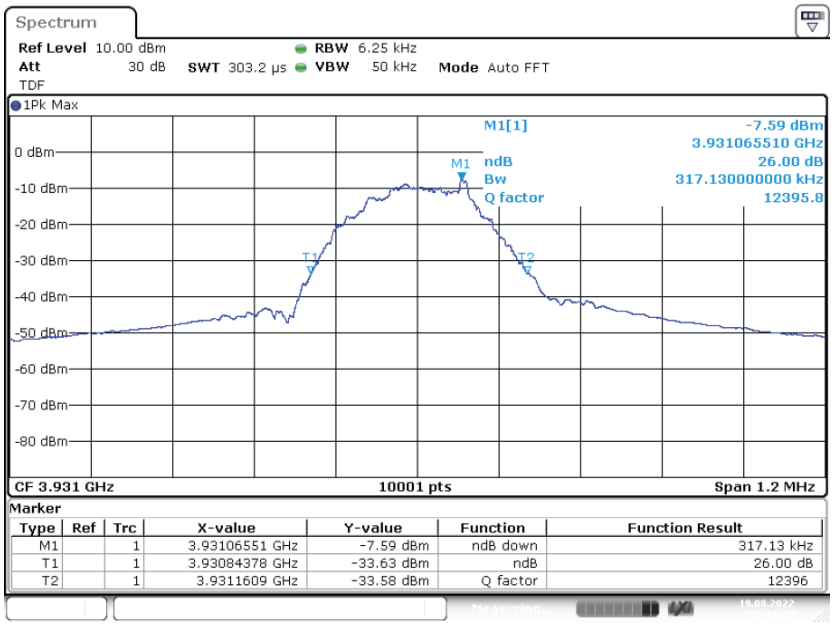


Input Signal



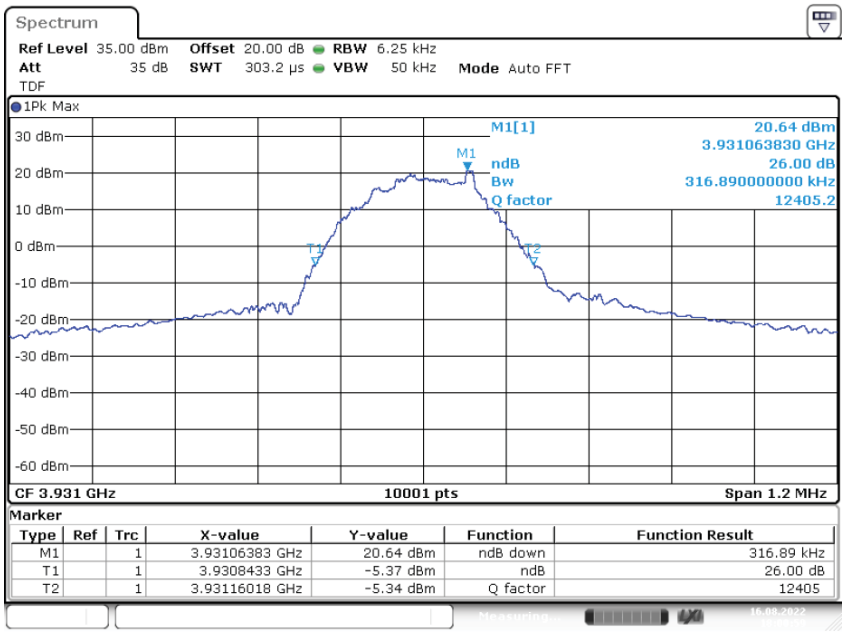
Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 0.3 dB < AGC. Signal Type = Narrowband



3.4 OCBw GSM In -0.3 3.9310G _26dB

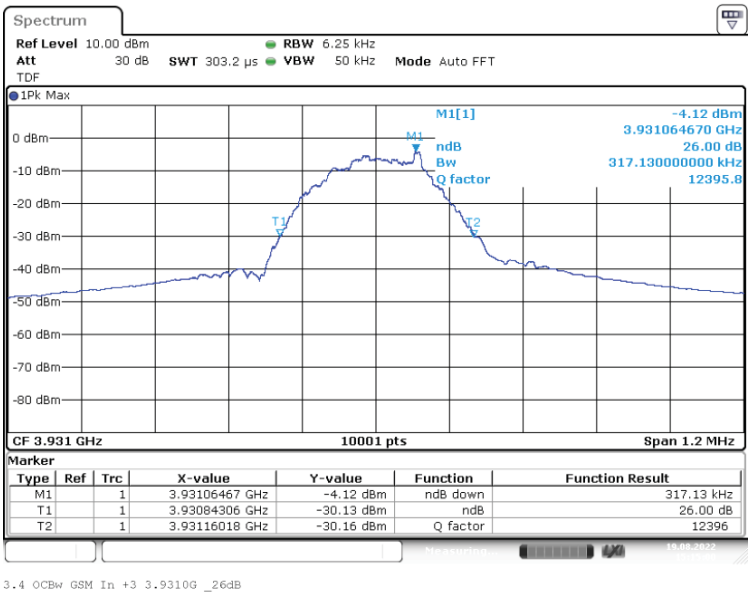
Input Signal



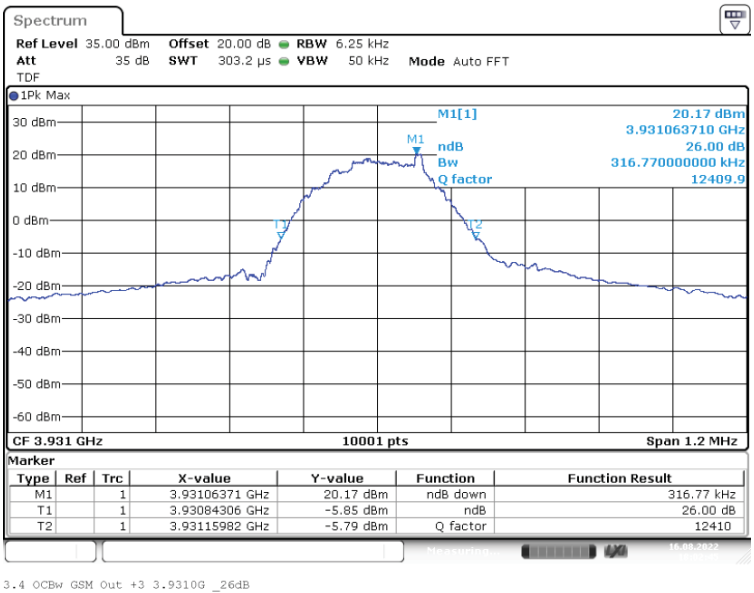
3.4 OCBw GSM Out -0.3 3.9310G _26dB

Output Signal

Frequency Band = C-Band. Segment 3. Direction = RF downlink.
Input Power = 3 dB > AGC. Signal Type = Narrowband



Input Signal



Output Signal

4.3.5 TEST EQUIPMENT USED

- Conducted