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D-PL-12024-06-04



**BUREAU
VERITAS**

ECL-TA Test Report No.: 19-001

ION-E System
CAP H 23/23/25T/25T F-AC-F1-APE
Cellular Repeater

FCC ID XS5-CAPH2325

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1 APPLIED STANDARDS AND TEST SUMMARY

1.1 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, (10/01/2018 Edition). The following subparts are applicable to the results in this test report.

Part 2, Subpart J - Equipment Authorization Procedures, Certification

Part 20, Commercial Mobile 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

§ 27.54 – Frequency stability

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 v01r03, 2019-04-15.
- 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 complied with all performed tests as listed in chapter 1.3 Measurement Summary / Signatures.

1.2 FCC-IC CORRELATION TABLE

Correlation of measurement requirements for Industrial Signal Booster from FCC

Measurement	FCC Reference
Effective radiated power, mean output power and zone enhancer gain	§2.1046 §27.50 KDB 935210 D05 v01r03: 3.5
Peak to Average Ratio	§27.50
Occupied bandwidth Input-versus-output spectrum	§2.1049 KDB 935210 D05 v01r03: 3.4
Conducted spurious Emission at Antenna Terminal	§2.1051 §27.53
Out-of-band emissions limits	§2.1051 §27.53 KDB 935210 D05 v01r03: 3.6
Frequency stability	§2.1055 §27.54
Field strength of spurious radiation	§2.1053 §27.53
Out-of-band rejection	KDB 935210 D05 v01r03: 3.3

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, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (MBS), 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, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Wideband	Passed



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

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, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (MBS), 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, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Wideband	Passed

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

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, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (LBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 41 BRS (MBS), RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (MBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (MBS), 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, 0.3 dB < AGC, Wideband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Narrowband	Passed
Band 41 BRS (UBS), RF downlink, 3 dB > AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 0.3 dB < AGC, Wideband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Narrowband	Passed
Band 30 WCS 2300, RF downlink, 3 dB > AGC, Wideband	Passed



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

Conducted spurious emissions at antenna terminals

The measurement was performed according to ANSI C63.26

Final Result

OP-Mode

Frequency Band, Test Frequency, Direction, Signal Type

Band 41 BRS (LBS), high, RF downlink, Narrowband	Passed
Band 41 BRS (LBS), high, RF downlink, Wideband	Passed
Band 41 BRS (LBS), low, RF downlink, Narrowband	Passed
Band 41 BRS (LBS), low, RF downlink, Wideband	Passed
Band 41 BRS (LBS), mid, RF downlink, Narrowband	Passed
Band 41 BRS (LBS), mid, RF downlink, Wideband	Passed
Band 41 BRS (MBS), high, RF downlink, Narrowband	Passed
Band 41 BRS (MBS), high, RF downlink, Wideband	Passed
Band 41 BRS (MBS), low, RF downlink, Narrowband	Passed
Band 41 BRS (MBS), low, RF downlink, Wideband	Passed
Band 41 BRS (MBS), mid, RF downlink, Narrowband	Passed
Band 41 BRS (MBS), mid, RF downlink, Wideband	Passed
Band 41 BRS (UBS), high, RF downlink, Narrowband	Passed
Band 41 BRS (UBS), high, RF downlink, Wideband	Passed
Band 41 BRS (UBS), low, RF downlink, Narrowband	Passed
Band 41 BRS (UBS), low, RF downlink, Wideband	Passed
Band 41 BRS (UBS), mid, RF downlink, Narrowband	Passed
Band 41 BRS (UBS), mid, RF downlink, Wideband	Passed
Band 30 WCS 2300, high, RF downlink, Narrowband	Passed
Band 30 WCS 2300, high, RF downlink, Wideband	Passed
Band 30 WCS 2300, low, RF downlink, Narrowband	Passed
Band 30 WCS 2300, low, RF downlink, Wideband	Passed
Band 30 WCS 2300, mid, RF downlink, Narrowband	Passed
Band 30 WCS 2300, mid, RF downlink, Wideband	Passed



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

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

Lower, Band 41 BRS (LBS), 1, RF downlink, 0.3 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, Narrowband	Passed
Lower, Band 41 BRS (LBS), 1, 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, 0.3 dB < AGC, Wideband	Passed
Lower, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Lower, Band 41 BRS (MBS), 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, Band 41 BRS (MBS), 1, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, Band 41 BRS (MBS), 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 41 BRS (MBS), 1, RF downlink, 3 dB > AGC, Wideband	Passed
Lower, Band 41 BRS (MBS), 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, Band 41 BRS (MBS), 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, Band 41 BRS (MBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 41 BRS (MBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Lower, Band 41 BRS (UBS), 1, RF downlink, 0.3 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, Narrowband	Passed
Lower, Band 41 BRS (UBS), 1, 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, 0.3 dB < AGC, Wideband	Passed
Lower, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Lower, Band 30 WCS, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, Band 30 WCS, 1, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, Band 30 WCS, 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 30 WCS, 1, RF downlink, 3 dB > AGC, Wideband	Passed
Lower, Band 30 WCS, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Lower, Band 30 WCS, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Lower, Band 30 WCS, 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Lower, Band 30 WCS, 2, RF downlink, 3 dB > AGC, Wideband	Passed



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

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, Narrowband	Passed
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, Narrowband	Passed
Upper, Band 41 BRS (LBS), 1, 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, 0.3 dB < AGC, Wideband	Passed
Upper, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 41 BRS (LBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, Band 41 BRS (MBS), 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, Band 41 BRS (MBS), 1, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, Band 41 BRS (MBS), 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 41 BRS (MBS), 1, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, Band 41 BRS (MBS), 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, Band 41 BRS (MBS), 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, Band 41 BRS (MBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 41 BRS (MBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, Band 41 BRS (UBS), 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
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, Narrowband	Passed
Upper, Band 41 BRS (UBS), 1, 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, 0.3 dB < AGC, Wideband	Passed
Upper, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 41 BRS (UBS), 2, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, Band 30 WCS, 1, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, Band 30 WCS, 1, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, Band 30 WCS, 1, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 30 WCS, 1, RF downlink, 3 dB > AGC, Wideband	Passed
Upper, Band 30 WCS, 2, RF downlink, 0.3 dB < AGC, Narrowband	Passed
Upper, Band 30 WCS, 2, RF downlink, 0.3 dB < AGC, Wideband	Passed
Upper, Band 30 WCS, 2, RF downlink, 3 dB > AGC, Narrowband	Passed
Upper, Band 30 WCS, 2, RF downlink, 3 dB > AGC, Wideband	Passed

**47 CFR CHAPTER I FCC PART 27 Subpart C [Base KDB 935210 D05 v01r03: 3.3
Stations/Repeater]**

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 (MBS), RF downlink

Passed

Band 41 BRS (UBS), RF downlink

Passed

Band 30 WCS, RF downlink

Passed

**47 CFR CHAPTER I FCC PART 27 Subpart C [Base §2.1053, §27.53
Stations/Repeater]**

Field strength of spurious radiation

The measurement was performed according to ANSI C63.26

Final Result

OP-Mode

Frequency Band, Test Frequency, Direction

Band 41 BRS (LBS), high, RF downlink

Passed

Band 41 BRS (LBS), low, RF downlink

Passed

Band 41 BRS (LBS), mid, RF downlink

Passed

Band 41 BRS (MBS), high, RF downlink

Passed

Band 41 BRS (MBS), low, RF downlink

Passed

Band 41 BRS (MBS), mid, RF downlink

Passed

Band 41 BRS (UBS), high, RF downlink

Passed

Band 41 BRS (UBS), low, RF downlink

Passed

Band 41 BRS (UBS), mid, RF downlink

Passed

Band 30 WCS, high, RF downlink

Passed

Band 30 WCS, low, RF downlink

Passed

Band 30 WCS, mid, 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	2019-12-05	--	valid

2 ADMINISTRATIVE DATA

2.1 TESTING LABORATORY

Company Name: Bureau Veritas CPS Germany GmbH

Address: Thurn-und-Taxis-Straße 18
90411 Nürnberg
Germany

The test facility is accredited by the following accreditation organisation:

Laboratory accreditation no: DAKKS D-PL-12024-06-03,
DAKKS D-PL-12024-06-04
BNetz-CAB-19/21-20

FCC Designation Number: DE0023

FCC Test Firm Registration: 366481

ISED CAB identifier: DE0016

Responsible for accreditation scope: Mr. Florian Mosandl

2.2 PROJECT DATA

Responsible for testing and report: Mr. Thomas Hufnagel

Employees who performed the tests: Mr. Thomas Hufnagel

2.3 APPLICANT DATA

Company Name: Commscope
Andrew Wireless Systems GmbH

Address: Industriering 10
86675 Buchdorf Germany

Contact Person: Mr. Frank Futter

2.4 MANUFACTURER DATA

Company Name: 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	ION-E System CAP H 23/23/25T/25T F-AC-F1-APE
Declared EUT data by the supplier	
General Product Description	The EUT is an industrial signal booster supporting the following: Band 30 (WCS-2300): 2350 – 2360 MHz Band 41 (BRS-2500), Broadband Radio Service: • Lower Band Segment (LBS): 2496- 2568 MHz • Middle Band Segment (MBS): 2572 – 2614 MHz • Upper Band Segment (UBS): 2618 – 2690 MHz 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] (measured)	Band 41 (BRS-2500), Broadband Radio Service: • Lower Band Segment (LBS): 2496- 2568 MHz • Middle Band Segment (MBS): 2572 – 2614 MHz • Upper Band Segment (UBS): 2618 – 2690 MHz Band 30 (WCS-2300):
Maximum Gain [Uplink]	-
Maximum Gain [Downlink] (measured)	Band 41 (BRS-2500), Broadband Radio Service: • Lower Band Segment (LBS): 2496- 2568 MHz • Middle Band Segment (MBS): 2572 – 2614 MHz • Upper Band Segment (UBS): 2618 – 2690 MHz Band 30 (WCS-2300):

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	BGCHFA1935001
HW Version	7835476-0001 Rev: 00; CAP H 23/23/25T/25T F-AC-F1-APE
SW Version	2.7.0.168
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, S/N)	Description
AUX1	GE Energy, 14CS12226993; Cherokee International, psu_12-1_0_1 and psu_1_0	Power Supply
AUX2	Commscope, SZAEAJ1719A0003	Subrack

Explanations of abbreviations:

LBS: lower band segment: This is the BRS band with the customer's definition "BRS Low"
MBS: middle band segment: This is the BRS band with the customer's definition "BRS Mid"
UBS: upper band segment: This is the BRS band with the customer's definition "BRS High"

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.

3.6 OPERATING MODES

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

3.6.1 TEST CHANNELS

Band	Direction	Lower Frequency Band Edge [MHz]	Upper Frequency Band Edge [MHz]	Center Frequency [MHz]	Port
41 (BRS (UBS))	downlink	2618	2690	2654	Donor
41 (BRS (MBS))	downlink	2572	2614	2593	Donor
41 (BRS (LBS))	downlink	2496	2568	2532	Donor
30 (WCS)	downlink	2350	2360	2355	Donor



3.6.2 AUTOMATIC GAIN CONTROL LEVELS

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 (UBS)	downlink	Narrowband	-3.2	-3.5	-0.2	2654.0	Mid
41(BRS (MBS)	downlink	Narrowband	-2.9	-3.2	0.1	2593.0	
41(BRS (LBS)	downlink	Narrowband	-2.9	-3.2	0.0	2532.0	
30 (WCS)	downlink	Narrowband	-3.2	-3.5	-0.2	2355.0	
41(BRS (UBS)	downlink	Wideband	-2.7	-3.0	0.4	2654.0	
41(BRS (MBS)	downlink	Wideband	-2.0	-2.3	1.0	2593.0	
41(BRS (LBS)	downlink	Wideband	-2.9	-3.2	0.1	2532.0	
30 (WCS)	downlink	Wideband	-3.3	-3.6	-0.4	2355.0	
41(BRS (UBS)	downlink	Narrowband	-2.0	-2.3	0.9	2618.0	Low
41(BRS (MBS)	downlink	Narrowband	-2.7	-3.0	0.2	2572.0	
41(BRS (LBS)	downlink	Narrowband	-1.3	-1.6	1.7	2496.0	
30 (WCS)	downlink	Narrowband	-3.7	-4.0	-0.5	2350.0	
41(BRS (UBS)	downlink	Wideband	-1.6	-1.9	1.4	2618.0	
41(BRS (MBS)	downlink	Wideband	-2.0	-2.3	1.0	2572.0	
41(BRS (LBS)	downlink	Wideband	-1.1	-1.4	1.9	2496.0	
30 (WCS)	downlink	Wideband	-3.4	-3.7	-0.4	2350.0	
41(BRS (UBS)	downlink	Narrowband	-0.5	-0.8	2.5	2690.0	High
41(BRS (MBS)	downlink	Narrowband	-2.5	-2.8	0.6	2614.0	
41(BRS (LBS)	downlink	Narrowband	-1.3	-1.6	1.8	2568.0	
30 (WCS)	downlink	Narrowband	-3.7	-4.0	-0.6	2360.0	
41(BRS (UBS)	downlink	Wideband	-0.4	-0.7	2.7	2690.0	
41(BRS (MBS)	downlink	Wideband	-1.7	-2.0	1.4	2614.0	
41(BRS (LBS)	downlink	Wideband	-1.0	-1.3	1.9	2568.0	
30 (WCS)	downlink	Wideband	-3.3	-3.6	-0.4	2360.0	
41(BRS (UBS)	downlink	Narrowband	-2.9	-3.2	0.2	2650.0	Max. Power
41(BRS (MBS)	downlink	Narrowband	-2.8	-3.1	0.2	2595.0	
41(BRS (LBS)	downlink	Narrowband	-3.0	-3.3	0.0	2534.0	
30 (WCS)	downlink	Narrowband	-3.7	-4.0	-0.6	2357.8	
41(BRS (UBS)	downlink	Wideband	-2.5	-2.8	0.6	2650.0	
41(BRS (MBS)	downlink	Wideband	-2.0	-2.3	1.0	2595.0	
41(BRS (LBS)	downlink	Wideband	-2.9	-3.2	0.2	2534.0	
30 (WCS)	downlink	Wideband	-3.3	-3.6	-0.4	2357.5	

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 GENERAL REMARKS

Unless otherwise noted the tests are done with antenna output port ANT 1 except at determining the output level of the output ports ANT 1 and ANT 2 together (MIMO) at the point "Effective Radiated Power, mean output power and zone enhancer gain".

At the measuring point "Field strength of spurious radiation" the two output ports ANT 1 and ANT 2 are together in function according KDB 935210 D02 v04r02 chapter II (o) (2).

The frequency stability test is not performed because the EUT is not equipped with signal processing capabilities.

Explanations of abbreviations for the BRS frequency bands:

LBS: lower band segment: This is the BRS band with the customer's definition
"BRS Low"

MBS: middle band segment: This is the BRS band with the customer's definition
"BRS Mid"

UBS: upper band segment: This is the BRS band with the customer's definition
"BRS High"

5 TEST RESULTS

5.1 EFFECTIVE RADIATED POWER, MEAN OUTPUT POWER AND ZONE ENHANCER GAIN

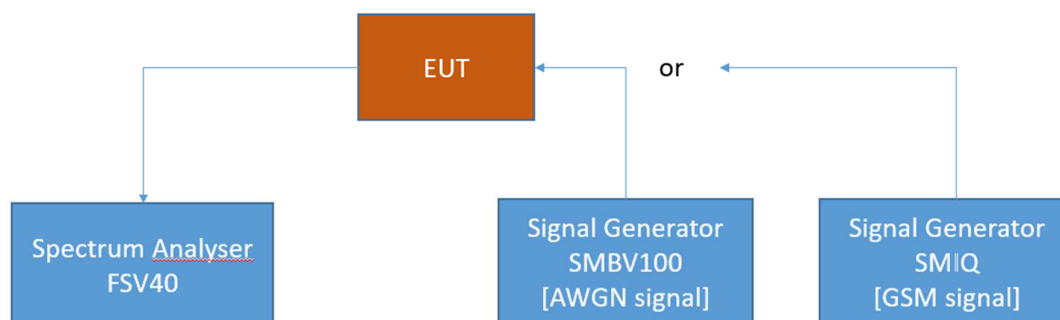
Standard FCC Part 27, §27.50

The test was performed according to:
ANSI C63.26, KDB 935210 D05 v01r03: 3.5

5.1.1 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.

5.1.2 TEST REQUIREMENTS / LIMITS

Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§ 27.50

Band 30:

(a) The following power limits and related requirements apply to stations transmitting in the 2305-2320 MHz band or the 2345-2360 MHz band.

(1) *Base and fixed stations.* (i) For base and fixed stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band:

(A) The average equivalent isotropically radiated power (EIRP) must not exceed 2,000 watts within any 5 megahertz of authorized bandwidth and must not exceed 400 watts within any 1 megahertz of authorized bandwidth.

(B) The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

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 $33 \text{ dBW} + 10\log(X/Y) \text{ dBW}$, 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: $\text{EIRP} = 33 \text{ dBW} + 10 \log(X/Y) \text{ dBW} + 10 \log(360/\text{beamwidth}) \text{ dBW}$, 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.

5.1.3 TEST PROTOCOL

Band 41 BRS (LBS), downlink, ANT 1							
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	2534.0	-3.2	39.0	64.3	25.3	42.2
Wideband	3 dB > AGC	2534.0	0.2	39.3	64.3	25.0	39.1
Narrowband	0.3 dB < AGC	2534.0	-3.3	39.2	61.7	22.5	42.5
Narrowband	3 dB > AGC	2534.0	0.0	39.1	61.7	22.6	39.1

Band 41 BRS (MBS), downlink, ANT 1							
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	2595.0	-2.3	40.6	64.3	23.7	42.9
Wideband	3 dB > AGC	2595.0	1.0	40.7	64.3	23.6	39.7
Narrowband	0.3 dB < AGC	2595.0	-3.1	40.3	61.7	21.4	43.4
Narrowband	3 dB > AGC	2595.0	0.2	40.7	61.7	21.0	40.5

Band 41 BRS (UBS), downlink, ANT 1							
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	2650.0	-2.8	40.4	64.3	23.9	43.2
Wideband	3 dB > AGC	2650.0	0.6	40.4	64.3	23.9	39.8
Narrowband	0.3 dB < AGC	2650.0	-3.2	40.3	61.7	21.4	43.5
Narrowband	3 dB > AGC	2650.0	0.2	40.5	61.7	21.2	40.3

Band 30 WCS, downlink, ANT 1							
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	2357.5	-3.6	40.1	63.0	22.9	43.7
Wideband	3 dB > AGC	2357.5	-0.4	40.0	63.0	23.0	40.4
Narrowband	0.3 dB < AGC	2357.8	-4.0	40.2	56.0	15.8	44.2
Narrowband	3 dB > AGC	2357.8	-0.6	40.1	56.0	15.9	40.7

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

**Band 41 BRS (LBS),
downlink, ANT 2**

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	2553.0	-1.7	40.2	64.3	24.1	41.9
Wideband	3 dB > AGC	2553.0	1.6	40.3	64.3	24.0	38.7
Narrowband	0.3 dB < AGC	2553.0	-2.1	40.1	61.7	21.6	42.3
Narrowband	3 dB > AGC	2553.0	1.3	40.1	61.7	21.6	38.8

**Band 41 BRS (MBS),
downlink, ANT 2**

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	2590.0	-0.7	40.5	64.3	23.8	41.2
Wideband	3 dB > AGC	2590.0	2.6	40.5	64.3	23.8	37.9
Narrowband	0.3 dB < AGC	2590.0	-2.2	40.1	61.7	21.6	42.3
Narrowband	3 dB > AGC	2590.0	1.2	40.3	61.7	21.4	39.1

**Band 41 BRS (UBS),
downlink, ANT 2**

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	2660.0	-1.5	40.1	64.3	24.2	41.6
Wideband	3 dB > AGC	2660.0	1.8	40.3	64.3	24.0	38.5
Narrowband	0.3 dB < AGC	2660.0	-1.7	39.8	61.7	21.9	41.5
Narrowband	3 dB > AGC	2660.0	1.4	40.0	61.7	21.7	38.6

**Band 30 WCS, downlink,
ANT 2**

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	2352.4	-4.1	40.8	63.0	22.2	44.9
Wideband	3 dB > AGC	2352.4	-0.9	41.0	63.0	22.0	41.9
Narrowband	0.3 dB < AGC	2352.4	-4.2	41.0	56.0	15.0	45.2
Narrowband	3 dB > AGC	2352.4	-0.8	41.0	56.0	15.0	41.8

Band 41 BRS (LBS), downlink, ANT 1 & 2, MIMO at f_0		
Signal Type	Input Power	Maximum Average Output Power [dBm]
Wideband	0.3 dB < AGC	42.7
Wideband	3 dB > AGC	42.8
Narrowband	0.3 dB < AGC	42.7
Narrowband	3 dB > AGC	42.6

Band 41 BRS (MBS), downlink, ANT 1 & 2, MIMO at f_0		
Signal Type	Input Power	Maximum Average Output Power [dBm]
Wideband	0.3 dB < AGC	43.6
Wideband	3 dB > AGC	43.6
Narrowband	0.3 dB < AGC	43.2
Narrowband	3 dB > AGC	43.5

Band 41 BRS (UBS), downlink, ANT 1 & 2, MIMO at f_0		
Signal Type	Input Power	Maximum Average Output Power [dBm]
Wideband	0.3 dB < AGC	43.3
Wideband	3 dB > AGC	43.4
Narrowband	0.3 dB < AGC	43.1
Narrowband	3 dB > AGC	43.3

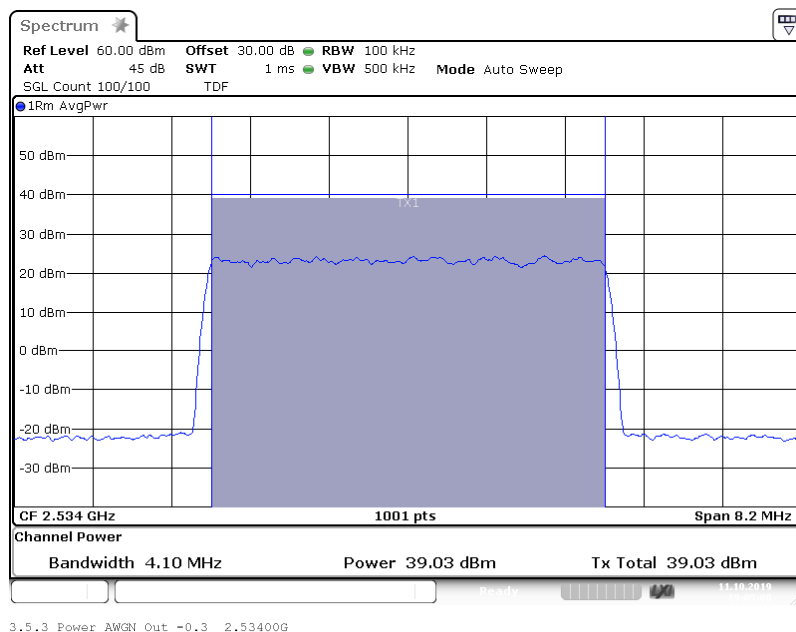
Band 30 WCS 2300, downlink, ANT 1 & 2, MIMO at f_0		
Signal Type	Input Power	Maximum Average Output Power [dBm]
Wideband	0.3 dB < AGC	43.5
Wideband	3 dB > AGC	43.5
Narrowband	0.3 dB < AGC	43.6
Narrowband	3 dB > AGC	43.6



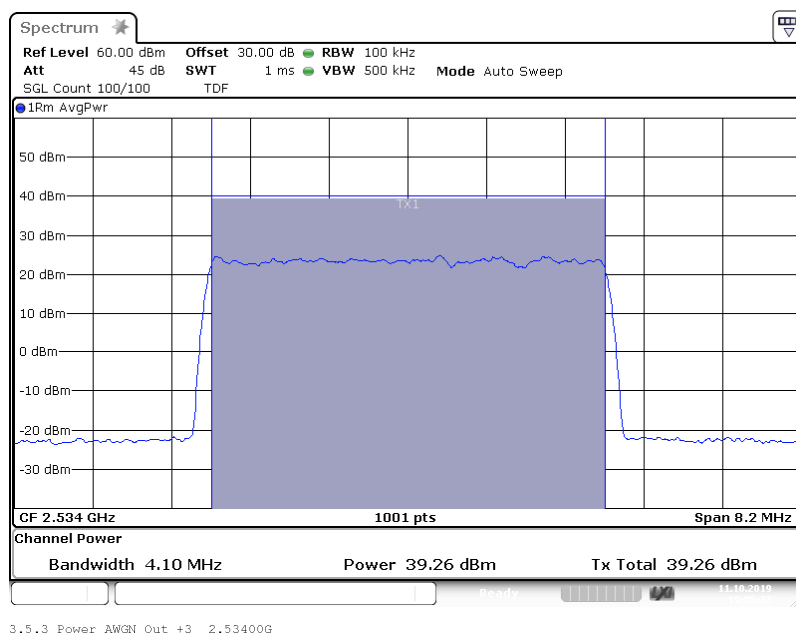
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5.1.4 MEASUREMENT PLOT ANT 1(SHOWING THE HIGHEST VALUE, "WORST CASE")

Band: BRS (LBS) ANT 1; Frequency: 2.5340 GHz; Band Edge: f0;
Mod: AWGN; Output Power 0.3 dB < AGC



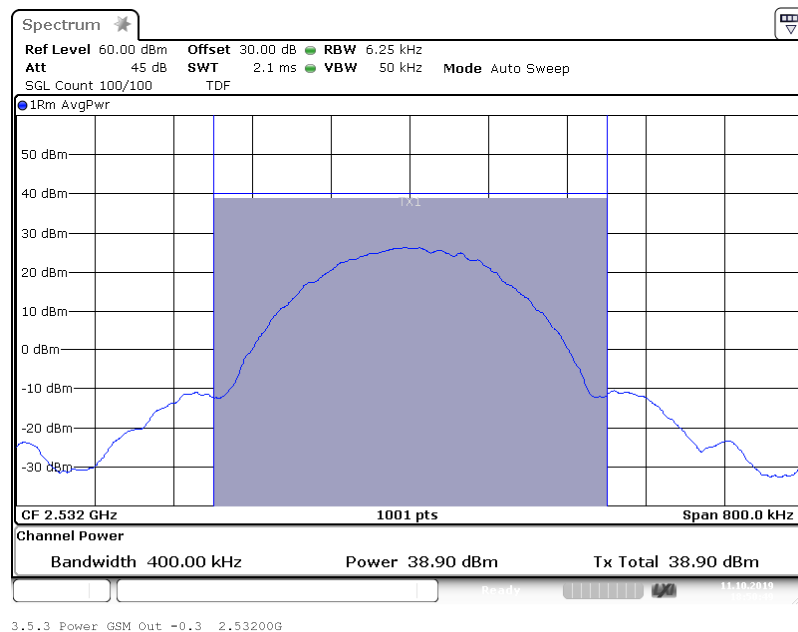
Band: BRS (LBS) ANT 1; Frequency: 2.5340 GHz; Band Edge: f0;
Mod: AWGN; Output Power 3 dB > AGC



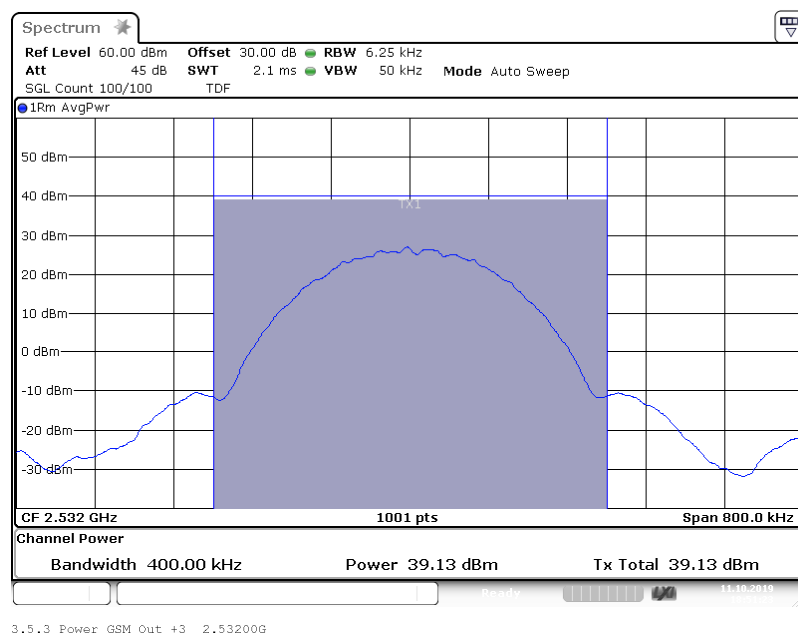


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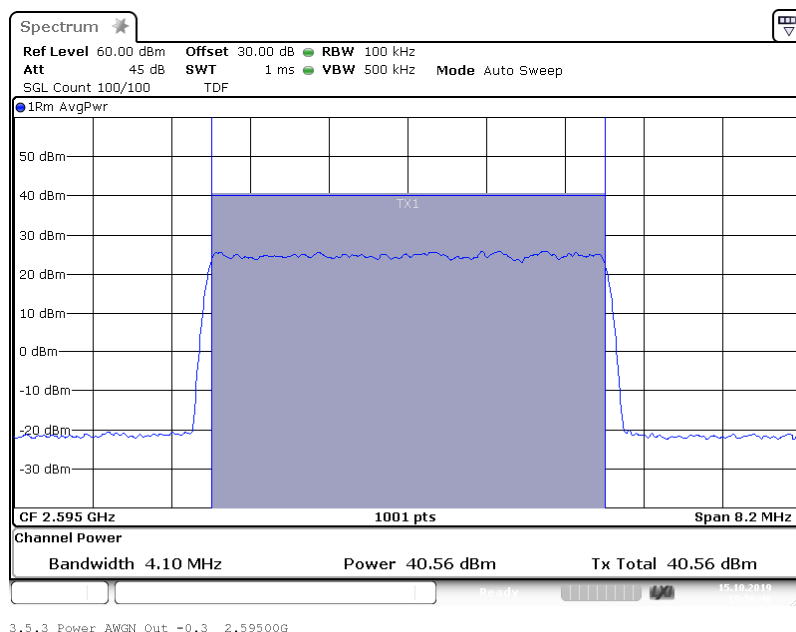
Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: GSM; Output Power 0.3 dB < AGC



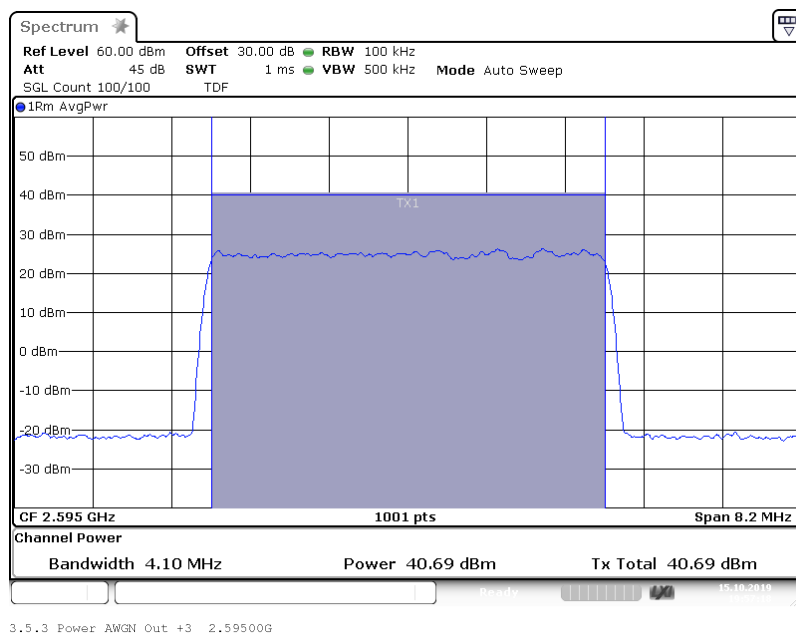
Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: GSM; Output Power 3 dB > AGC



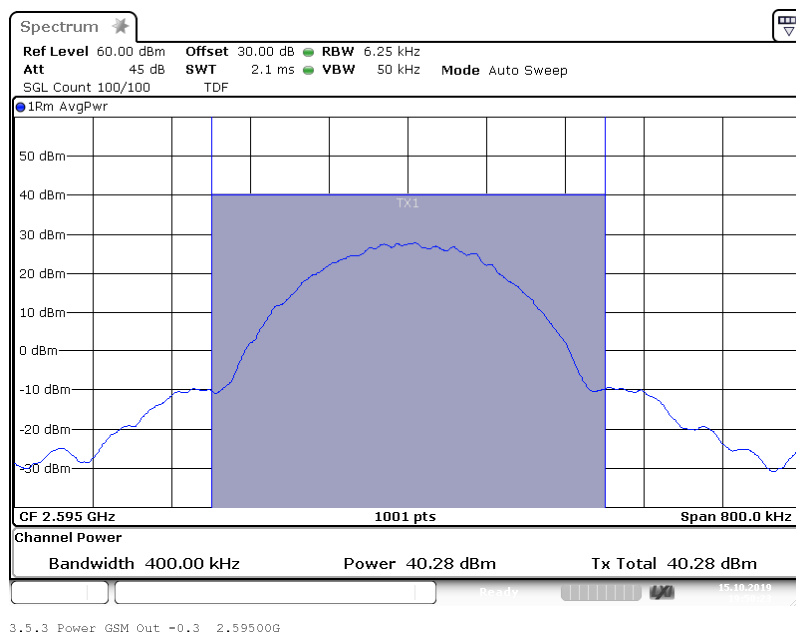
Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: AWGN; Output Power 0.3 dB < AGC



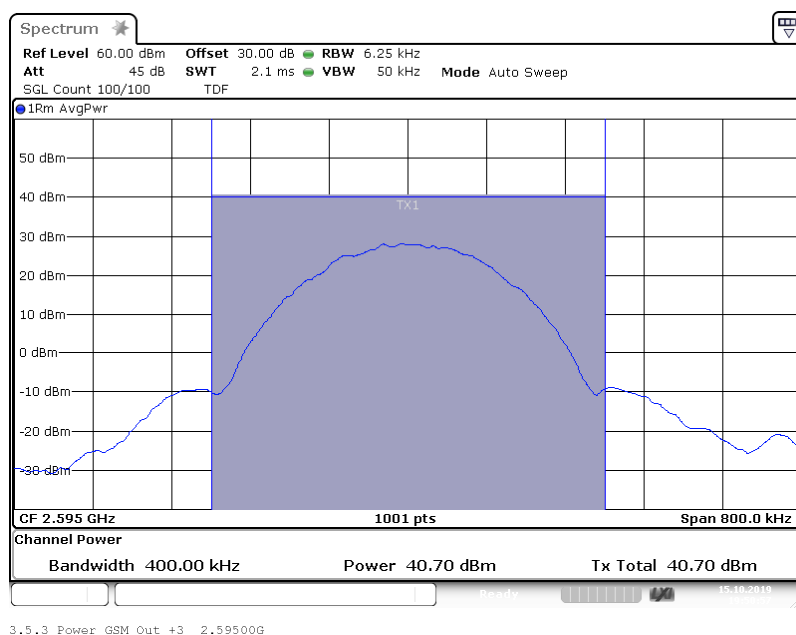
Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: AWGN; Output Power 3 dB > AGC



Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: GSM; Output Power 0.3 dB < AGC



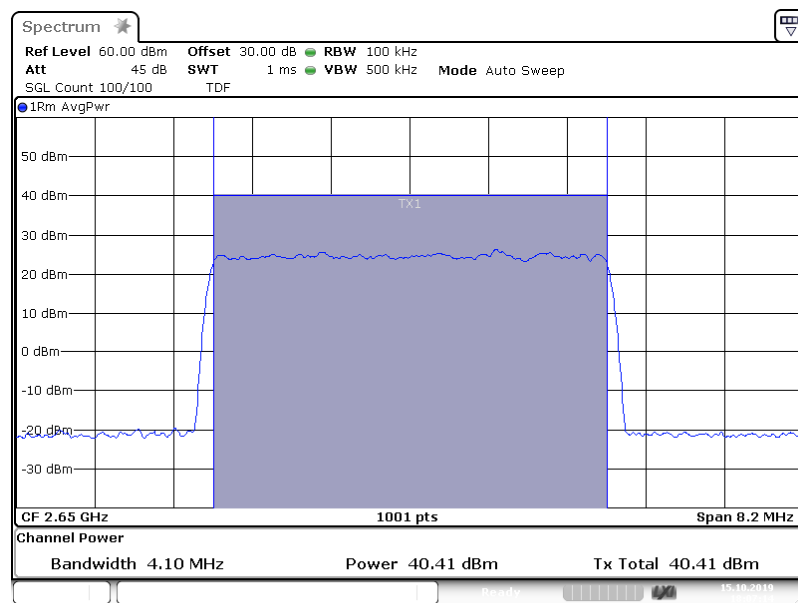
Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: GSM; Output Power 3 dB > AGC





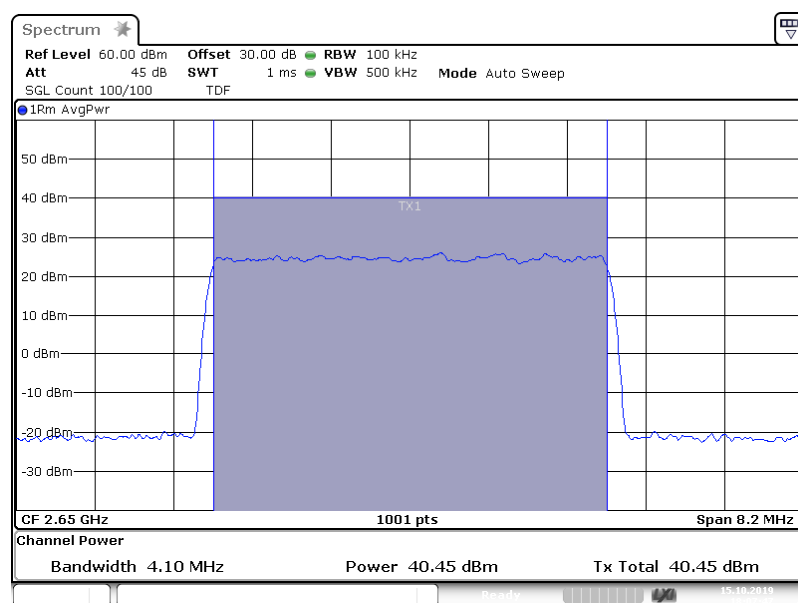
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Band: BRS (UBS) ANT 1; Frequency: 2.6500 GHz; Band Edge: f0;
Mod: AWGN; Output Power 0.3 dB < AGC



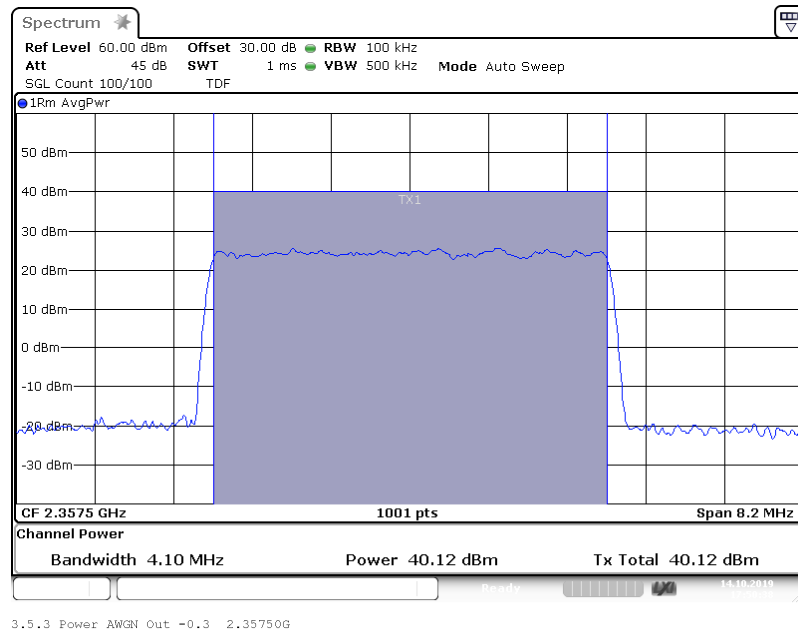
3.5.3 Power AWGN Out -0.3 2.65000G

Band: BRS (UBS) ANT 1; Frequency: 2.6500 GHz; Band Edge: f0;
Mod: AWGN; Output Power 3 dB > AGC

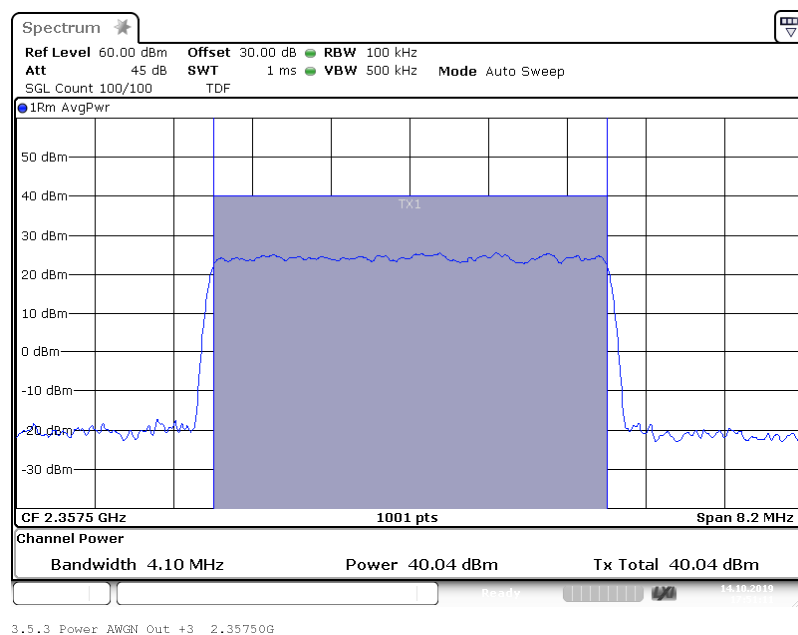


3.5.3 Power AWGN Out +3 2.65000G

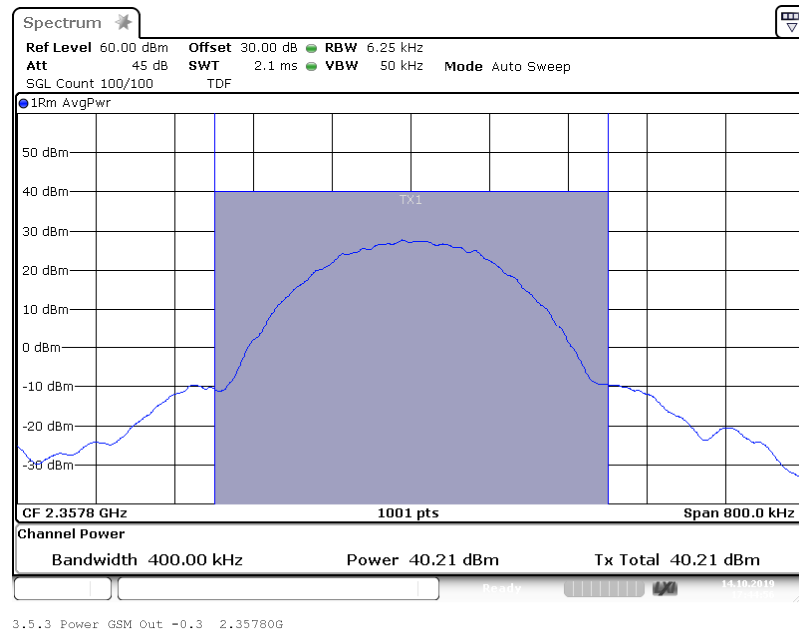
Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: AWGN; Output Power 0.3 dB < AGC



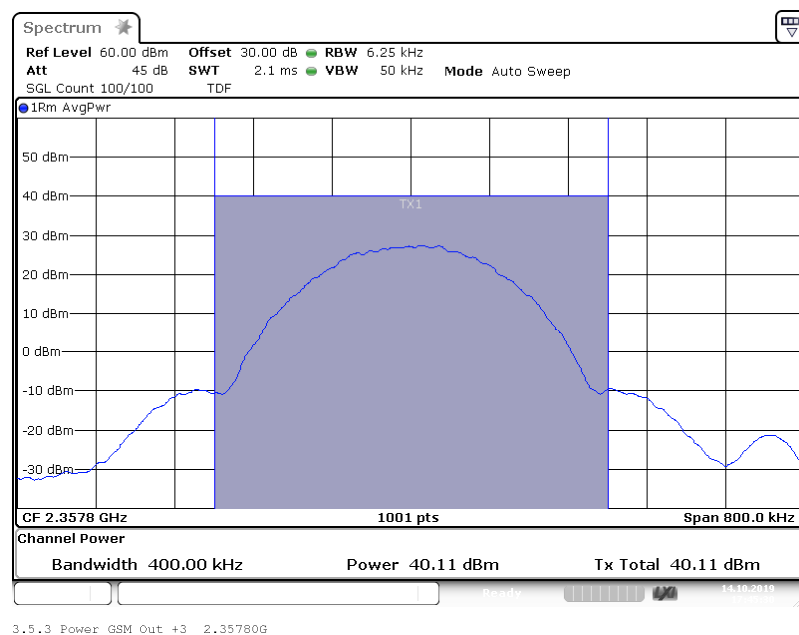
Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: AWGN; Output Power 3 dB > AGC



Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: GSM; Output Power 0.3 dB < AGC



Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: GSM; Output Power 3 dB > AGC



5.1.5 TEST EQUIPMENT USED

- Conducted

5.2 PEAK TO AVERAGE RATIO

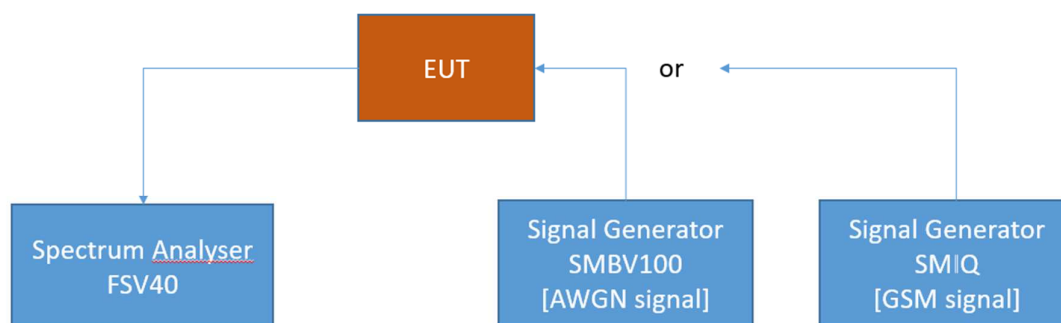
Standard FCC Part 27, §27.50

The test was performed according to:
ANSI C63.26

5.2.1 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.

5.2.2 TEST REQUIREMENTS / LIMITS

Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§ 27.50

Band 30:

(a) The following power limits and related requirements apply to stations transmitting in the 2305-2320 MHz band or the 2345-2360 MHz band.

(B) The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

Band 41:

For the band 41(BRS, LBS/MBS/UBS) exists no FCC peak-to-average power ratio (PAPR) limit. Although here no limit exists, a fictive limit with the same value as in band 30 in the table above is set and the margin to this fictive limit is calculated.

5.2.3 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	2532.0	-3.2	8.9	13.0	4.1
Wideband	3 dB > AGC	2534.0	0.2	8.9	13.0	4.1
Narrowband	0.3 dB < AGC	2534.0	-3.3	0.2	13.0	12.8
Narrowband	3 dB > AGC	2532.0	0.0	0.2	13.0	12.8

Band 41 BRS (MBS), 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	2595.0	-2.3	8.8	13.0	4.2
Wideband	3 dB > AGC	2595.0	1.0	8.8	13.0	4.2
Narrowband	0.3 dB < AGC	2593.0	-3.2	0.2	13.0	12.8
Narrowband	3 dB > AGC	2595.0	0.2	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	2650.0	-2.8	9.0	13.0	4.0
Wideband	3 dB > AGC	2650.0	0.6	8.9	13.0	4.1
Narrowband	0.3 dB < AGC	2650.0	-3.2	0.2	13.0	12.8
Narrowband	3 dB > AGC	2654.0	-0.2	0.2	13.0	12.8

Band 30 WCS, downlink						
Signal Type	Input Power	Frequency [MHz]	Input Power [dBm]	PAPR [dB]	Limit PAPR [dB]	Margin to Limit [dB]
Wideband	0.3 dB < AGC	2358.0	-3.6	9.0	13.0	4.0
Wideband	3 dB > AGC	2358.0	-0.4	9.0	13.0	4.0
Narrowband	0.3 dB < AGC	2355.0	-3.5	0.2	13.0	12.8
Narrowband	3 dB > AGC	2355.0	-0.2	0.2	13.0	12.8

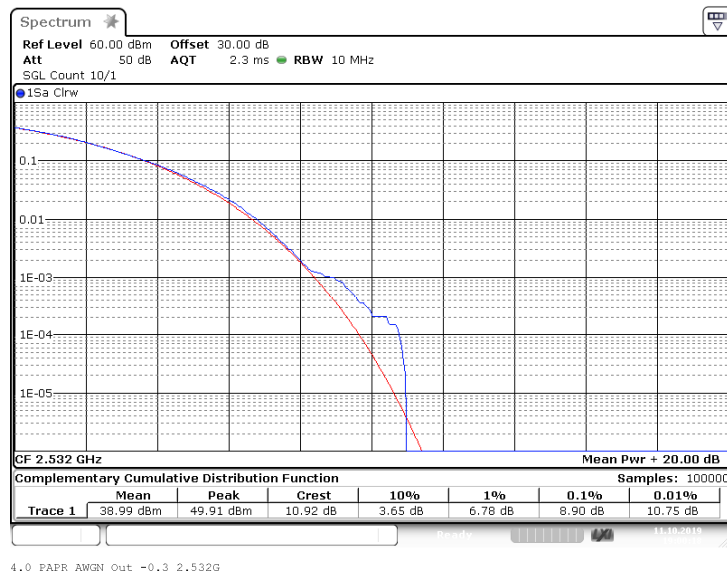
Remarks: Please see next sub-clause for the measurement plot. For the BRS band a fictive limit is set because for this band no FCC limit exists.



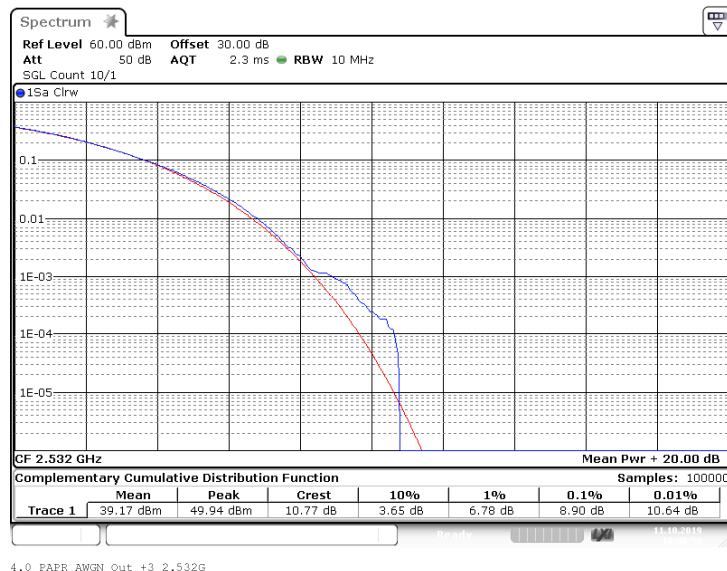
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5.2.4 MEASUREMENT PLOT (SHOWING THE HIGHEST VALUE, "WORST CASE")

Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: AWGN; PAPR 0.3 dB < AGC



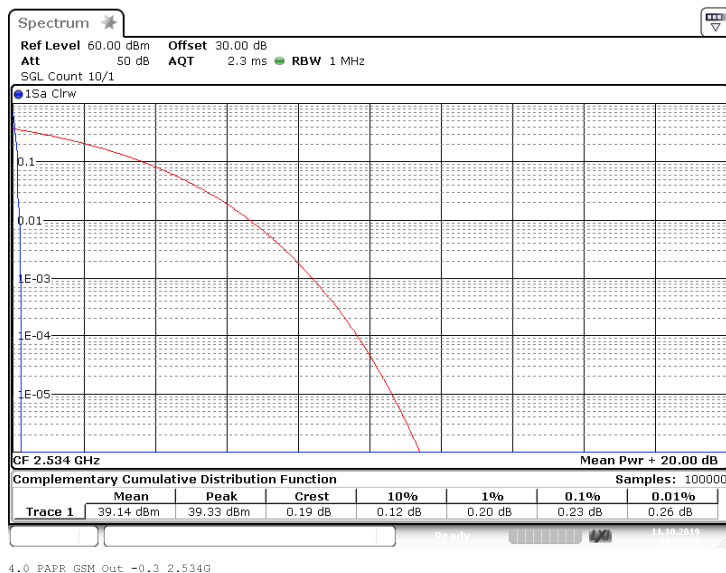
Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: AWGN; PAPR 3 dB > AGC



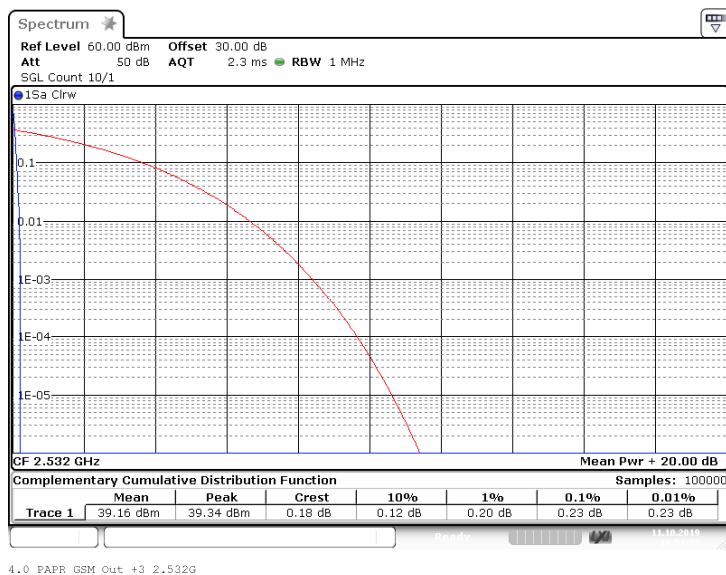


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Band: BRS (LBS) ANT 1; Frequency: 2.5340 GHz; Band Edge: f0;
Mod: GSM; Output Power 0.3 dB < AGC



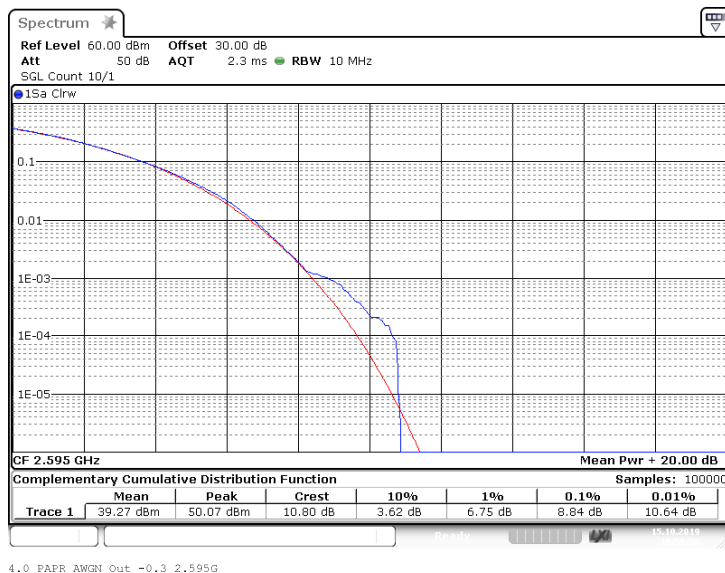
Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: GSM; Output Power 3 dB > AGC



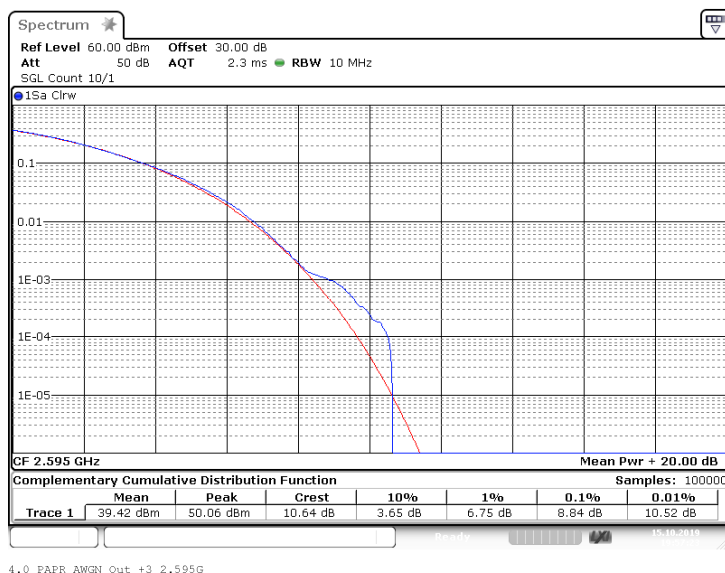


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: AWGN; PAPR 0.3 dB < AGC



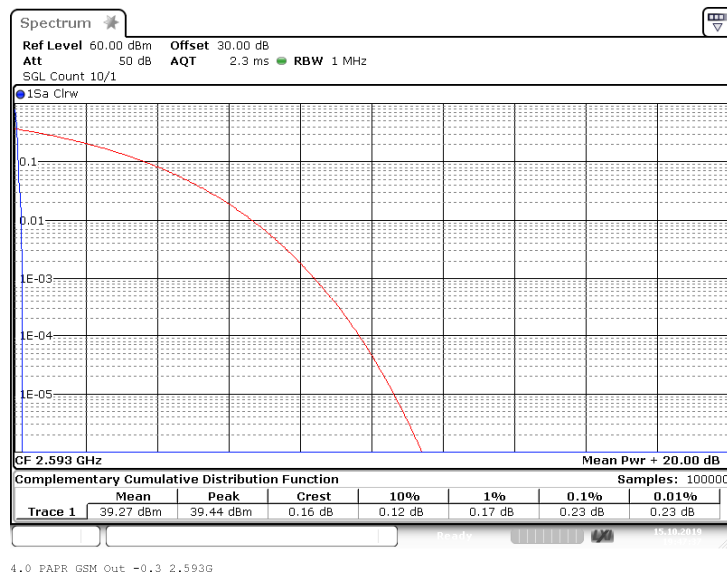
Band: BRS (MBS) ANT 1; Frequency: 2.5954 GHz; Band Edge: f0;
Mod: AWGN; PAPR 3 dB > AGC



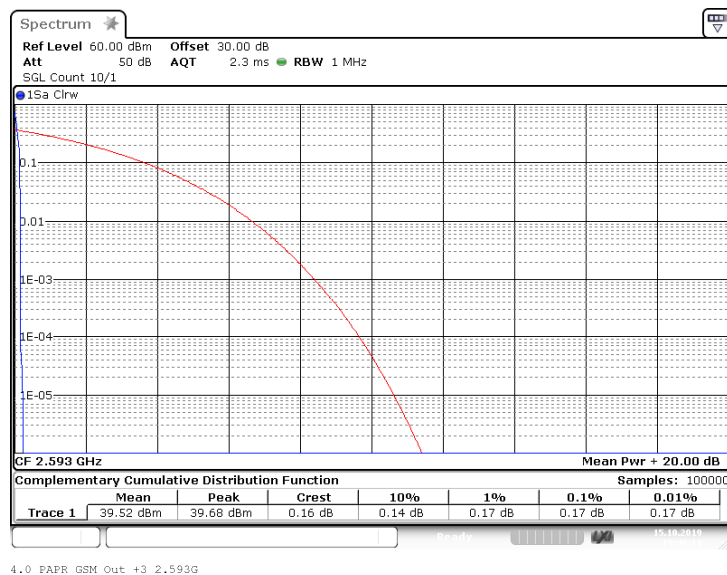


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: GSM; PAPR 0.3 dB < AGC



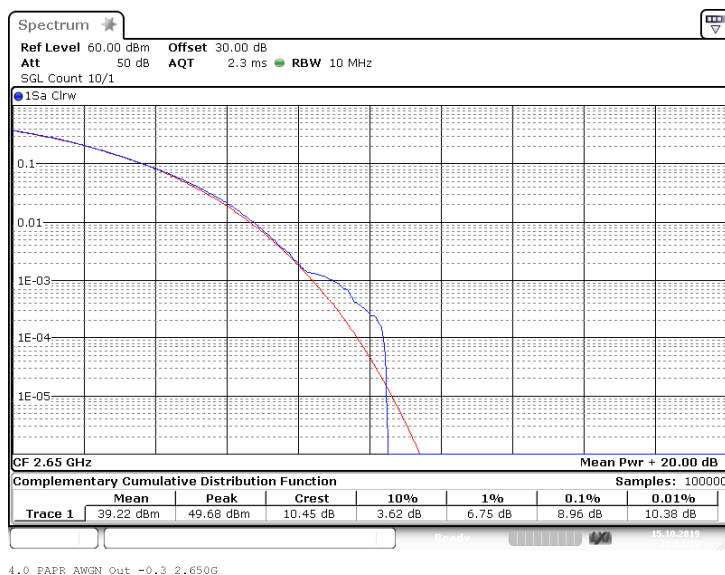
Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: GSM; PAPR 3 dB > AGC



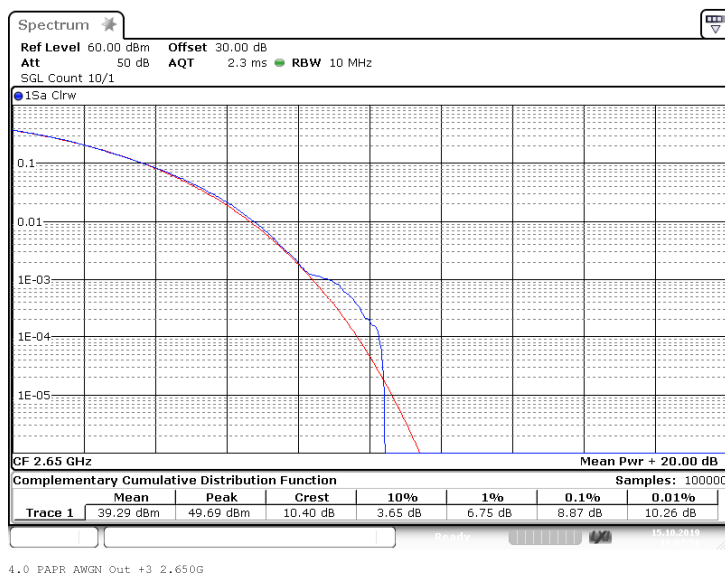


BUREAU
VERITAS

Band: BRS (UBS) ANT 1; Frequency: 2.6500 GHz; Band Edge: f0;
Mod: AWGN; PAPR 0.3 dB < AGC



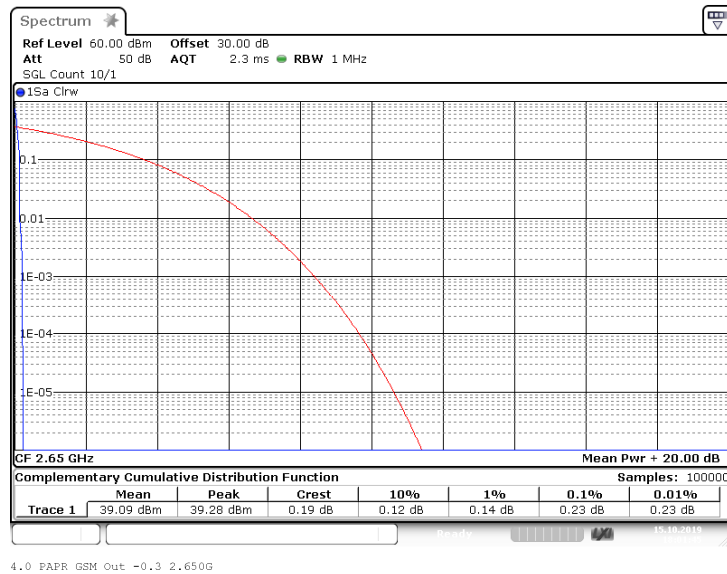
Band: BRS (UBS) ANT 1; Frequency: 2.6500 GHz; Band Edge: f0;
Mod: AWGN; PAPR 3 dB > AGC



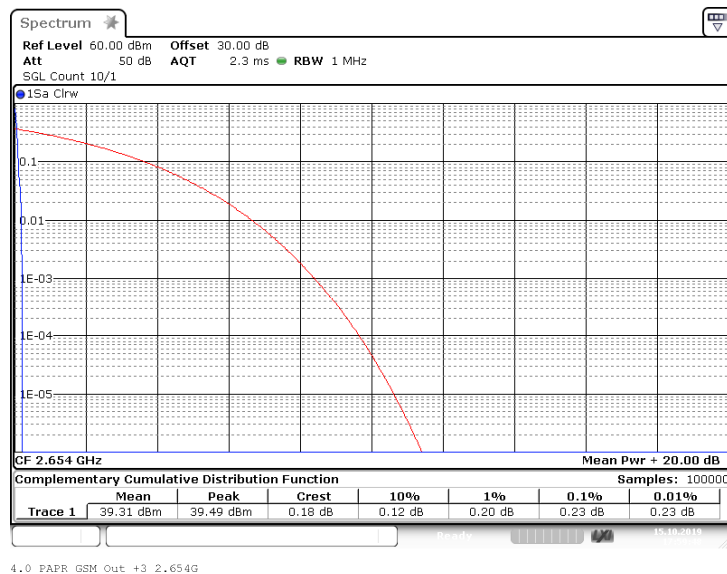


BUREAU
VERITAS

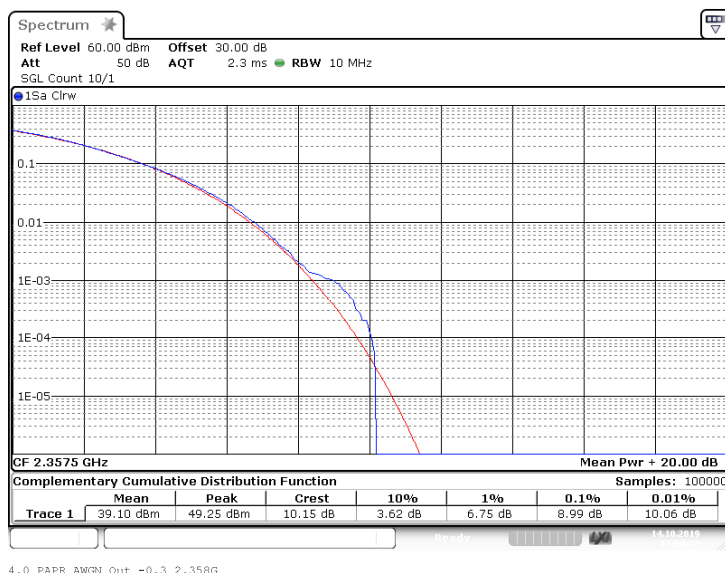
Band: BRS (UBS) ANT 1; Frequency: 2.6500 GHz; Band Edge: f0;
Mod: GSM; PAPR 0.3 dB < AGC



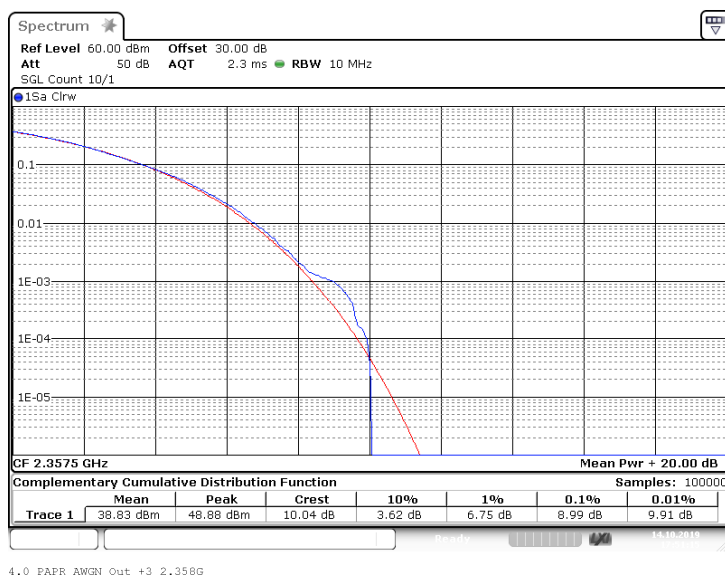
Band: BRS (UBS) ANT 1; Frequency: 2.6540 GHz; Band Edge: mid;
Mod: GSM; PAPR 3 dB > AGC



Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: AWGN; PAPR 0.3 dB < AGC



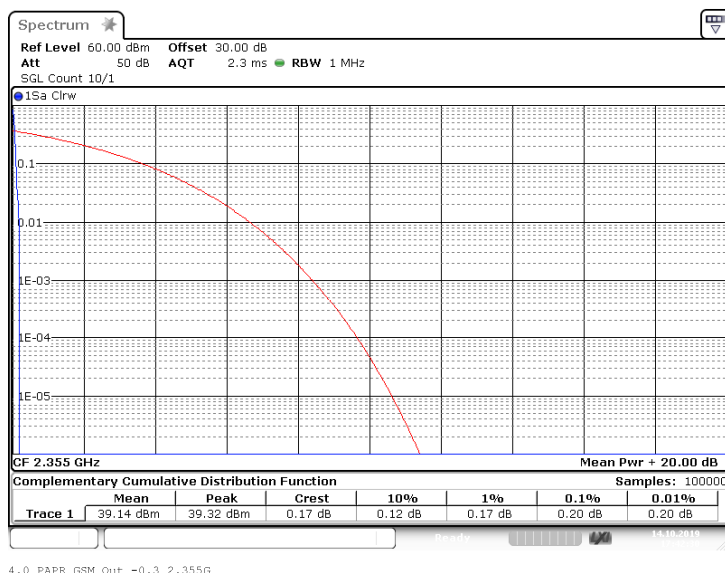
Band: WCS 2300; Frequency: 2.3578 GHz; Band Edge: f0;
Mod: AWGN; PAPR 3 dB > AGC



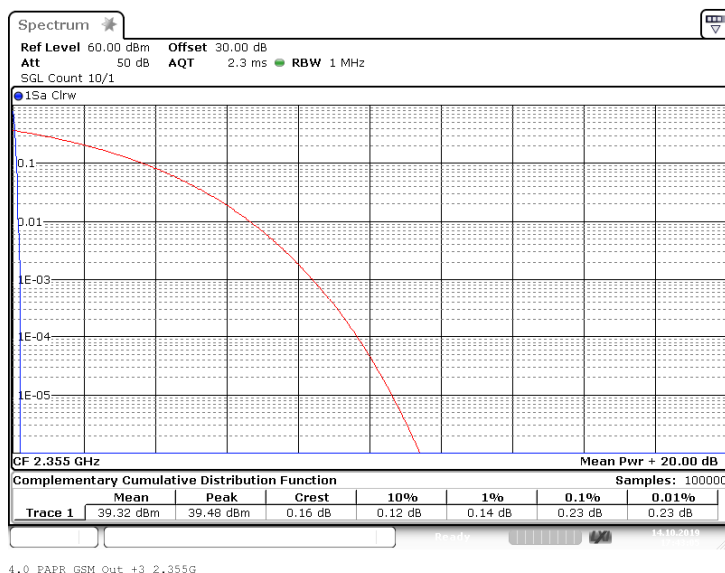


BUREAU
VERITAS

Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: GSM; PAPR 0.3 dB < AGC



Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: GSM; PAPR 3 dB > AGC



5.2.5 TEST EQUIPMENT USED

- Conducted

5.3 OCCUPIED BANDWIDTH / INPUT-VERSUS-OUTPUT SPECTRUM

Standard FCC Part 2.1049; Occupied Bandwidth

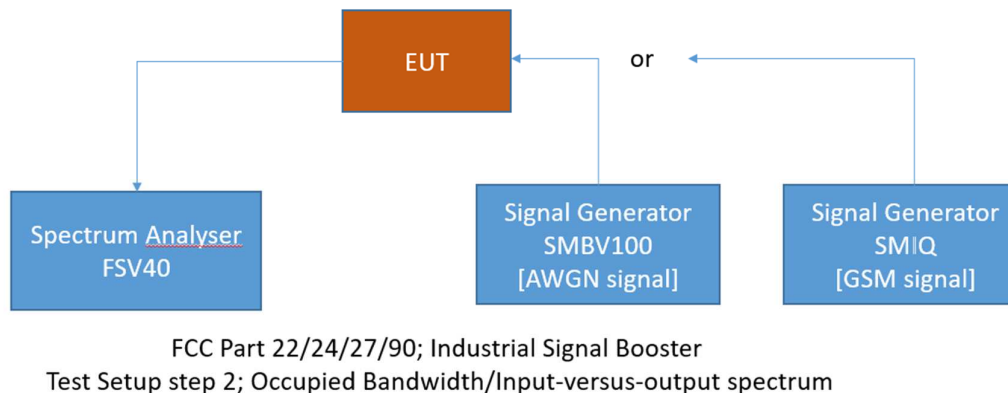
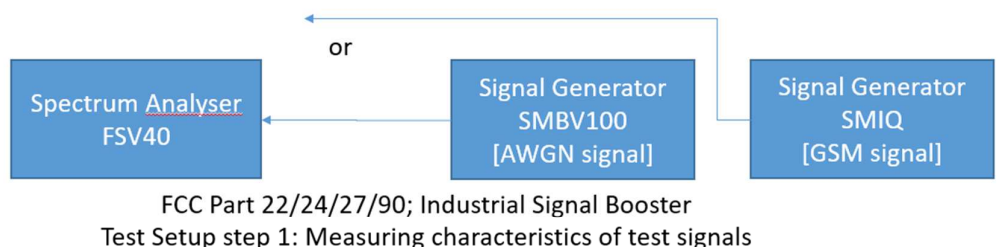
The test was performed according to:

ANSI C63.26, KDB 935210 D05 v01r03: 3.4

5.3.1 TEST DESCRIPTION

This test case is intended to demonstrate compliance to the applicable conducted spurious emission limits per FCC §2.1049, RSS-GEN 6.4 and RSS-131-5.2.2

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



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

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



5.3.2 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 0.3 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.

5.3.3 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	2532.0	4330.4	4335.3	4.9	205.0	200.1
Wideband	3 dB > AGC	2532.0	4327.9	4335.3	7.4	205.0	197.6
Narrowband	0.3 dB < AGC	2532.0	309.3	315.8	6.5	10.0	3.5
Narrowband	3 dB > AGC	2532.0	309.4	316.1	6.7	10.0	3.3

Band 41 BRS (MBS), 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	2593.0	4329.2	4336.5	7.3	205.0	197.7
Wideband	3 dB > AGC	2593.0	4327.9	4334.1	6.2	205.0	198.8
Narrowband	0.3 dB < AGC	2593.0	309.6	316.8	7.2	10.0	2.8
Narrowband	3 dB > AGC	2593.0	309.7	318.4	8.7	10.0	1.3

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	2654.0	4329.2	4335.3	6.1	205.0	198.9
Wideband	3 dB > AGC	2654.0	4327.9	4335.3	7.4	205.0	197.6
Narrowband	0.3 dB < AGC	2654.0	309.3	317.6	8.3	10.0	1.7
Narrowband	3 dB > AGC	2654.0	309.9	316.8	6.9	10.0	3.1

Band 30 WCS, 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	2355.0	4329.2	4331.6	2.4	205.0	202.6
Wideband	3 dB > AGC	2355.0	4329.2	4332.9	3.7	205.0	201.3
Narrowband	0.3 dB < AGC	2355.0	309.5	310.1	0.6	10.0	9.4
Narrowband	3 dB > AGC	2355.0	309.7	315.9	6.2	10.0	3.8

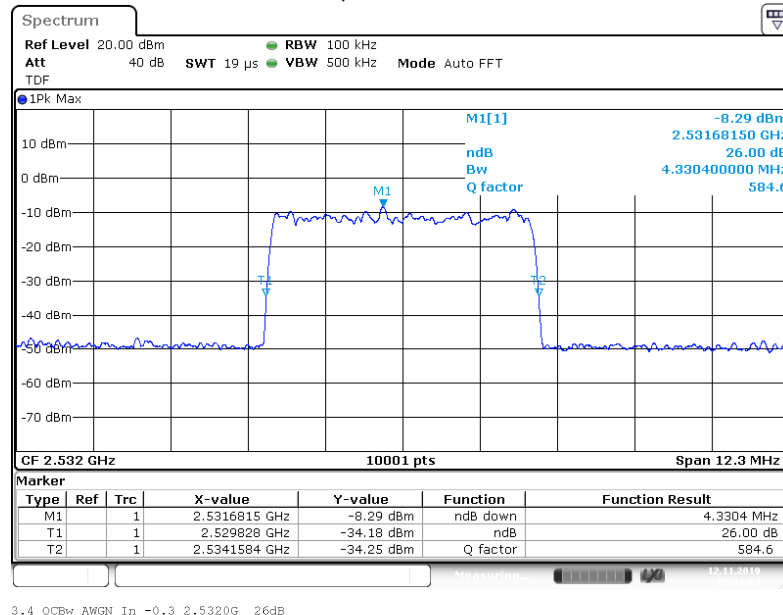
Remark: Please see next sub-clause for the measurement plot.



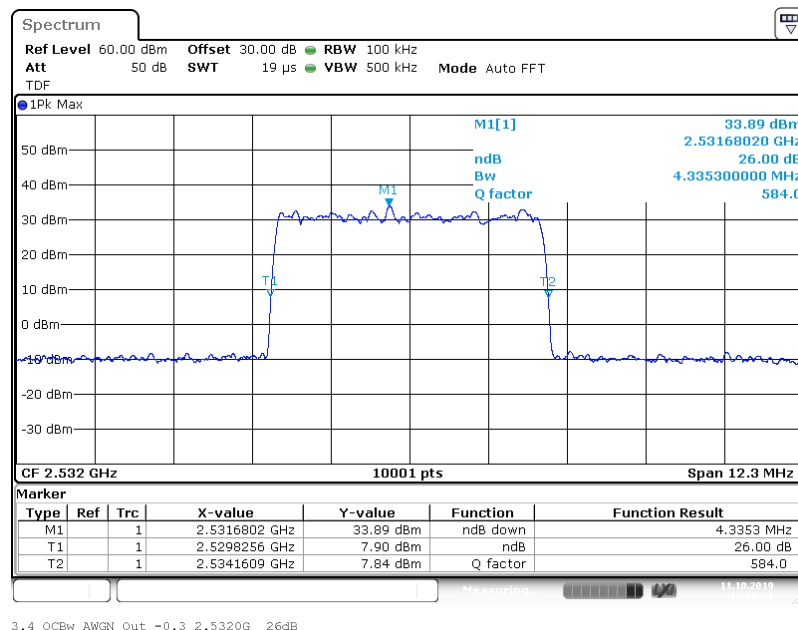
BUREAU
VERITAS

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

Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: AWGN; OCBw 0.3 dB < AGC



Input Signal

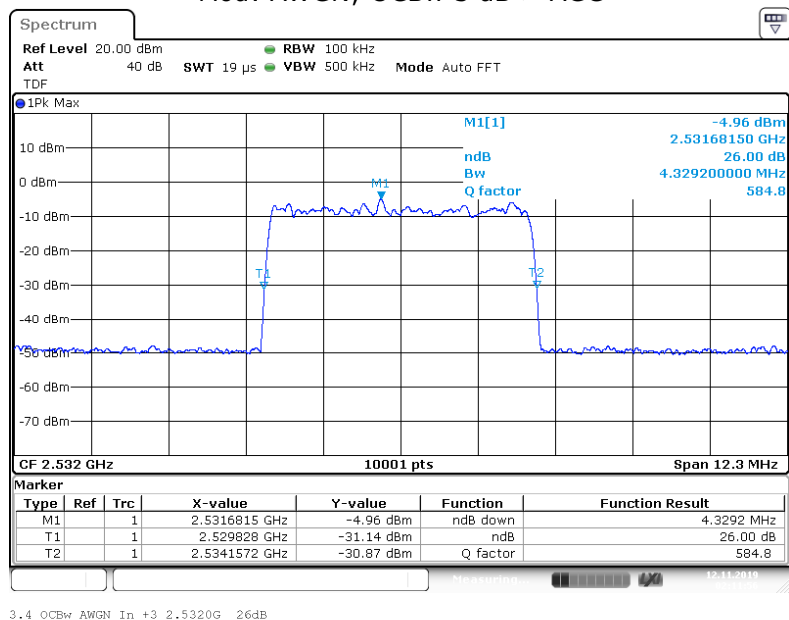


Output Signal

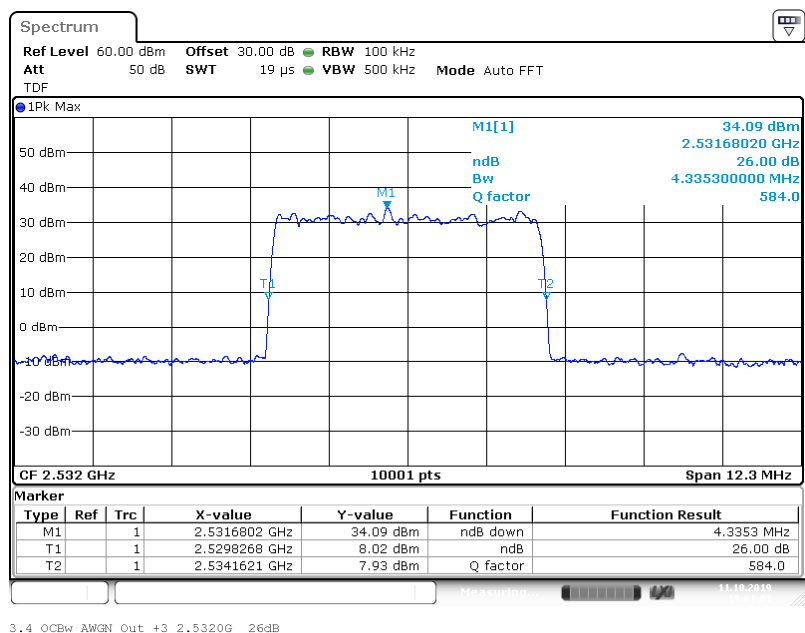


BUREAU
VERITAS

Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: AWGN; OCBw 3 dB > AGC



Input Signal

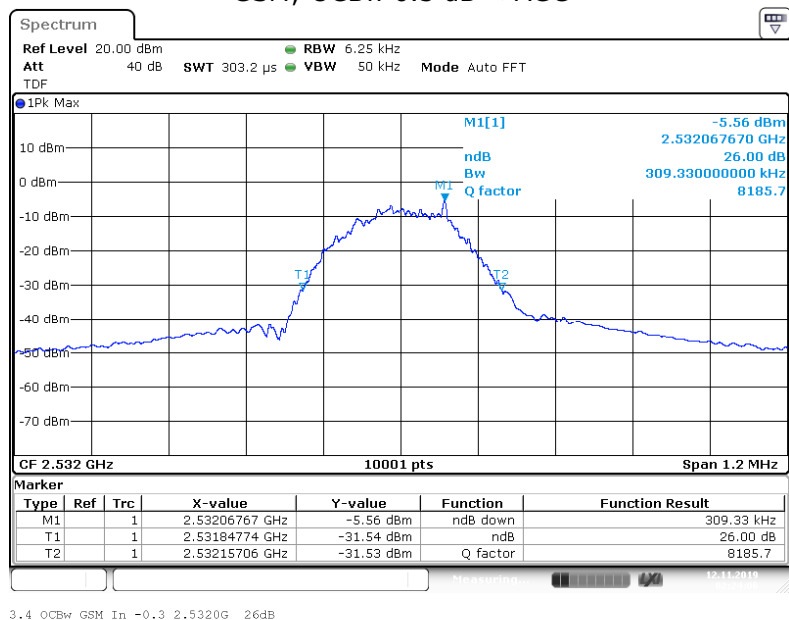


Output Signal

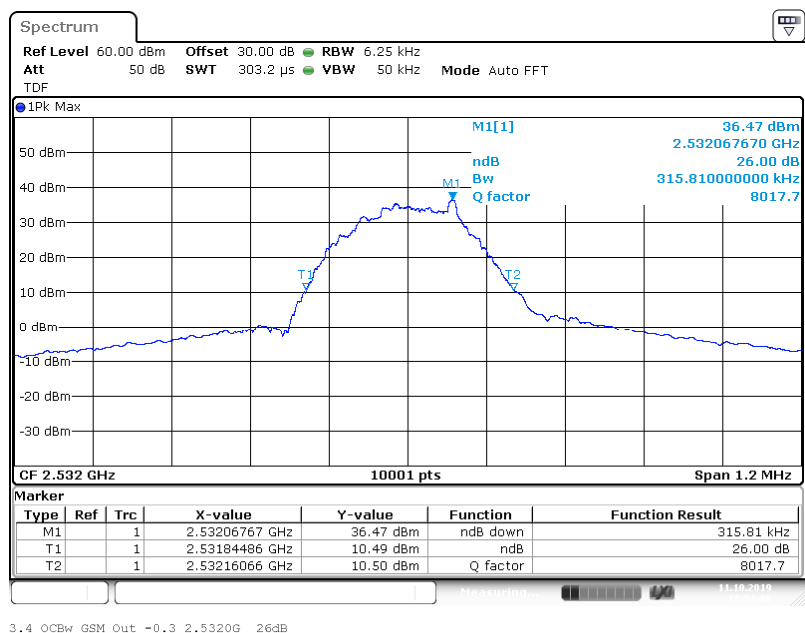


BUREAU
VERITAS

Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid; Mod:
GSM; OCBw 0.3 dB < AGC



Input Signal

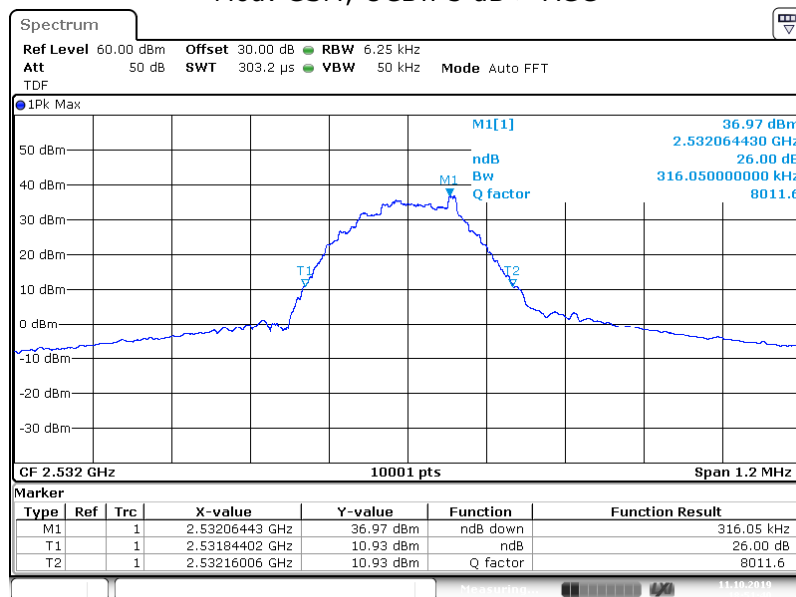


Output Signal

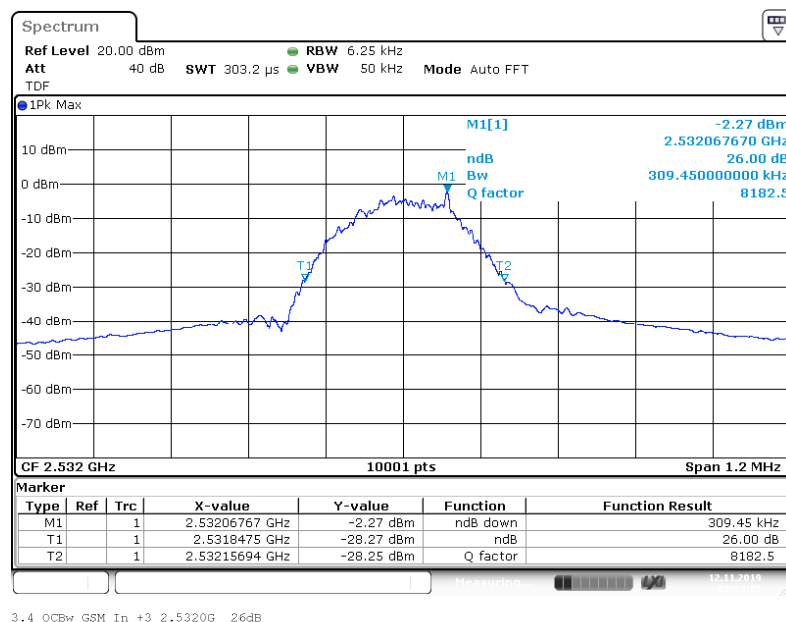


BUREAU
VERITAS

Band: BRS (LBS) ANT 1; Frequency: 2.5320 GHz; Band Edge: mid;
Mod: GSM; OCBw 3 dB > AGC



Input Signal

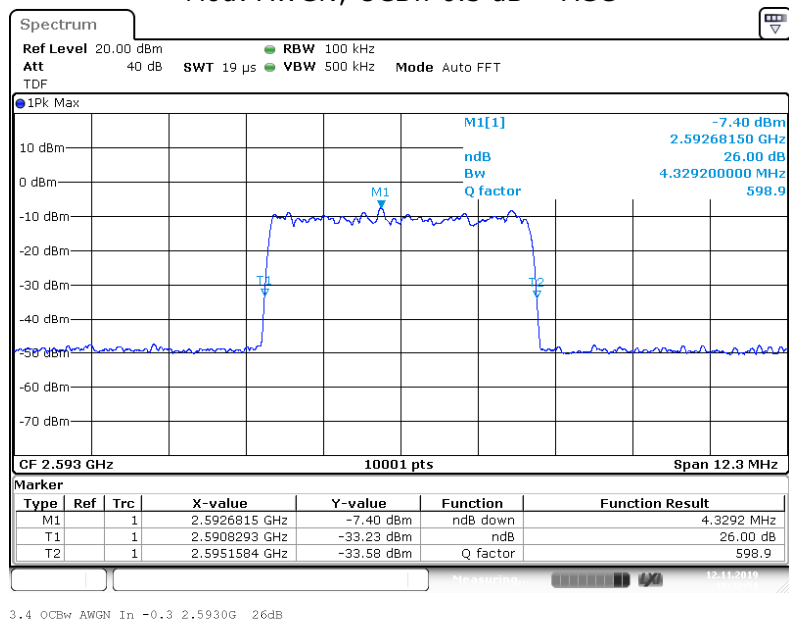


Output Signal

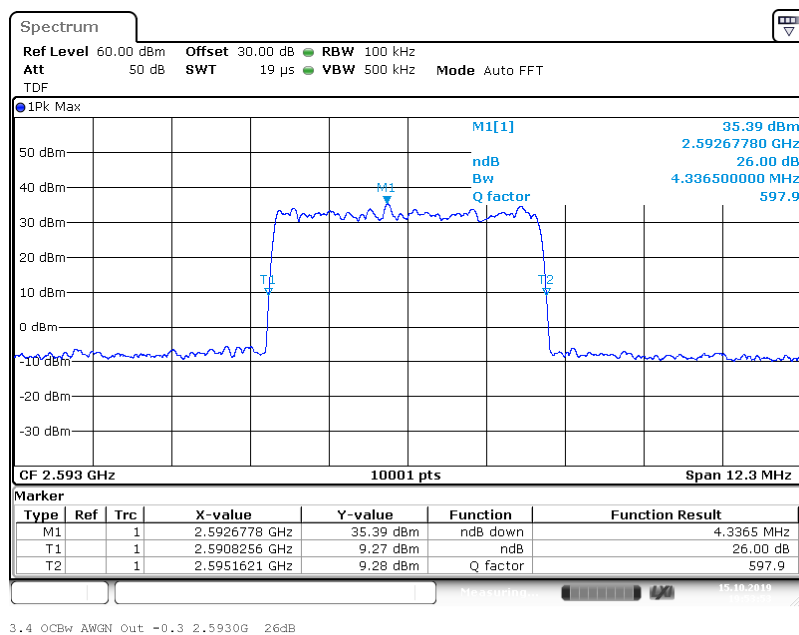


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: AWGN; OCBw 0.3 dB < AGC



Input Signal

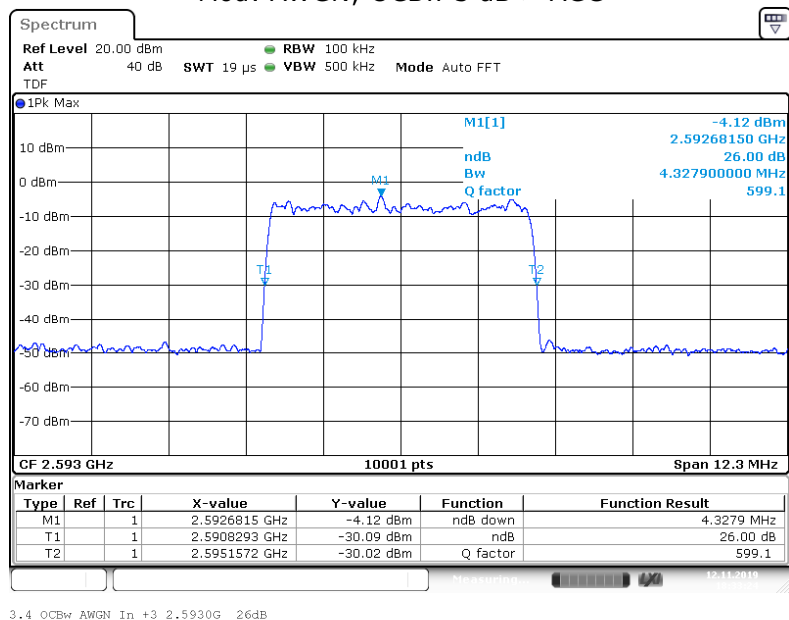


Output Signal

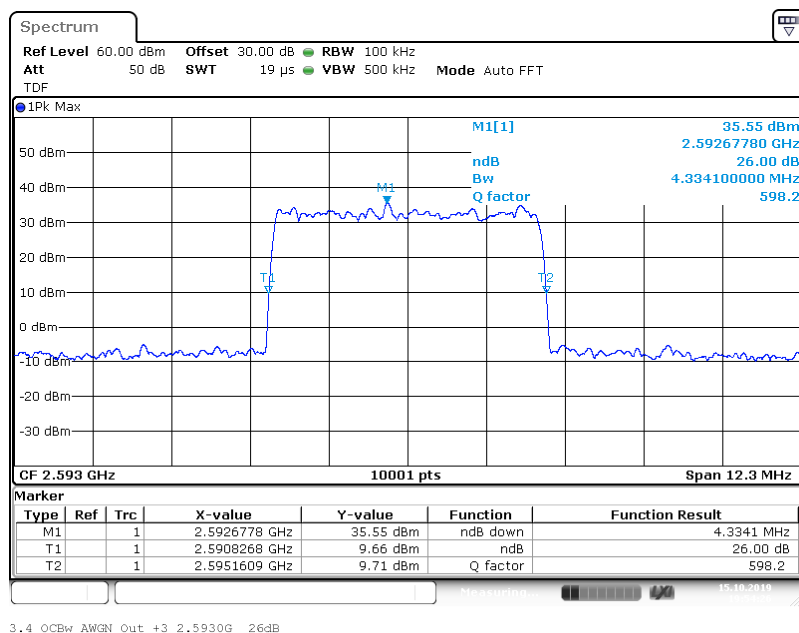


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: AWGN; OCBw 3 dB > AGC



Input Signal

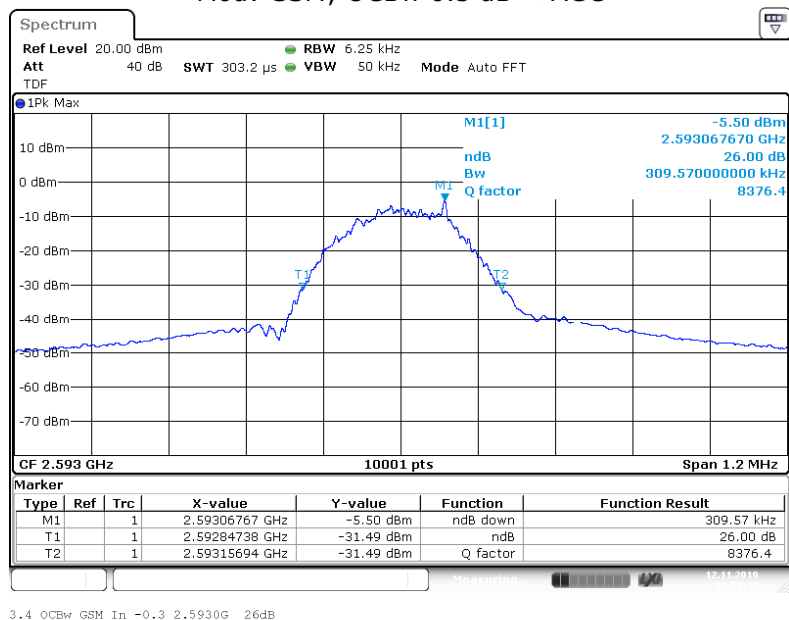


Output Signal

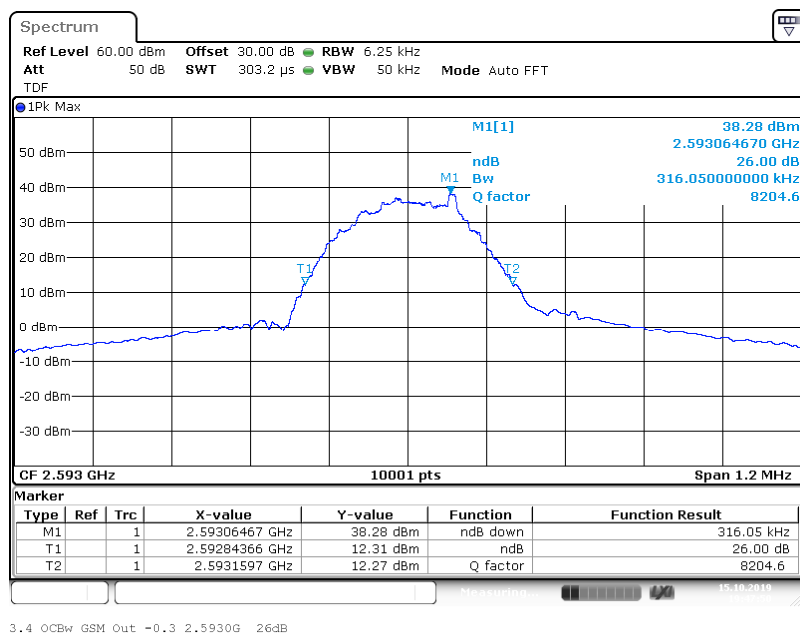


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: GSM; OCBw 0.3 dB < AGC



Input Signal

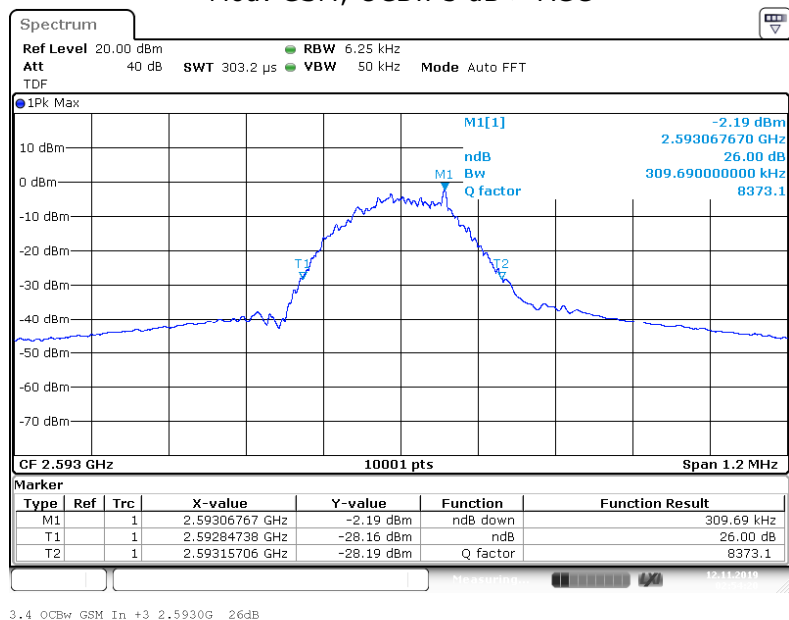


Output Signal

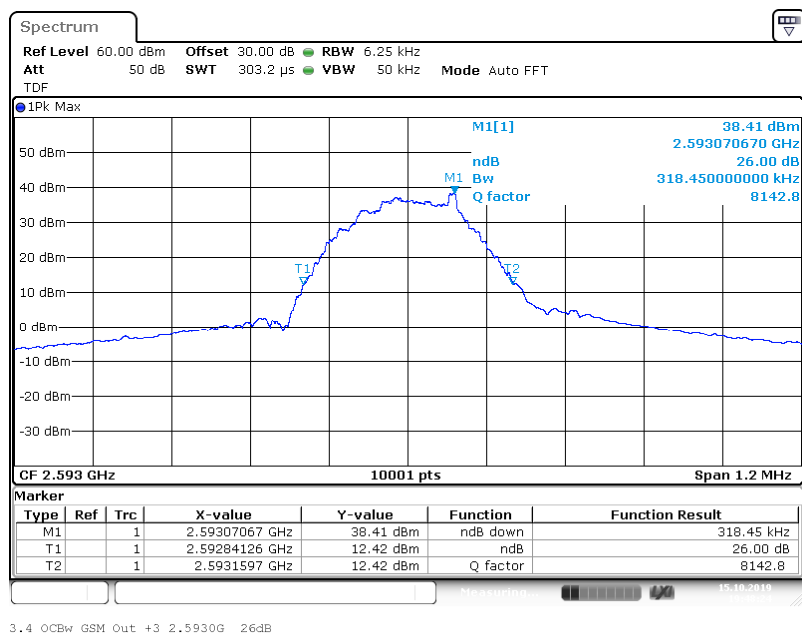


BUREAU
VERITAS

Band: BRS (MBS) ANT 1; Frequency: 2.5930 GHz; Band Edge: mid;
Mod: GSM; OCBw 3 dB > AGC



Input Signal

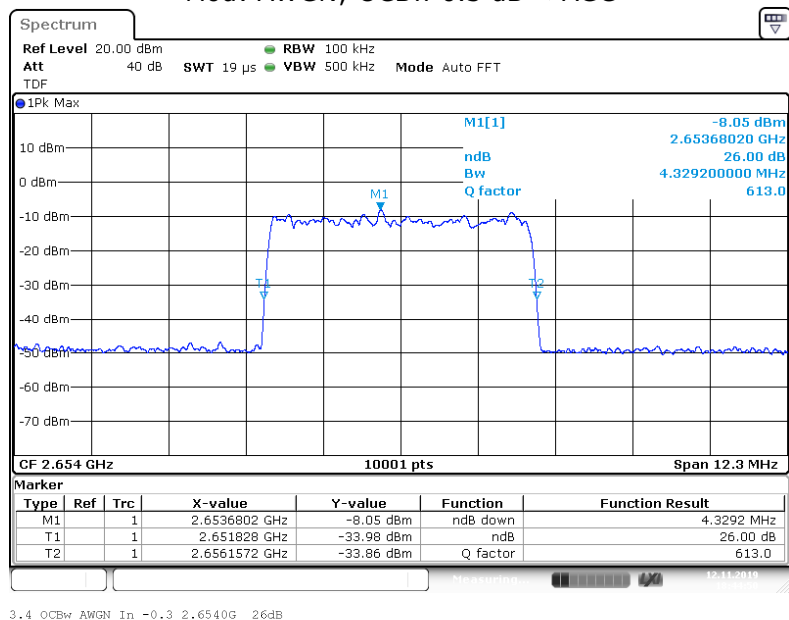


Output Signal

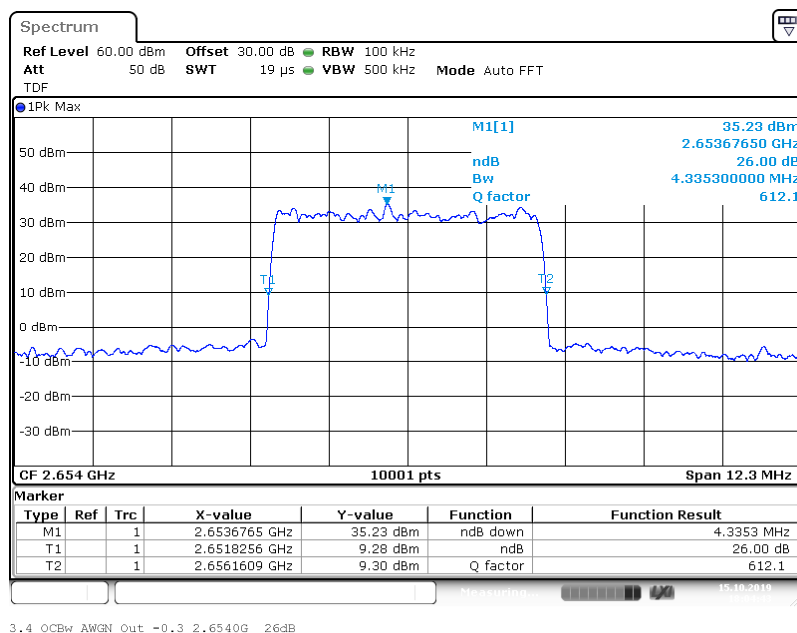


BUREAU
VERITAS

Band: BRS (UBS) ANT 1; Frequency: 2.6540 GHz; Band Edge: mid;
Mod: AWGN; OCBw 0.3 dB < AGC



Input Signal

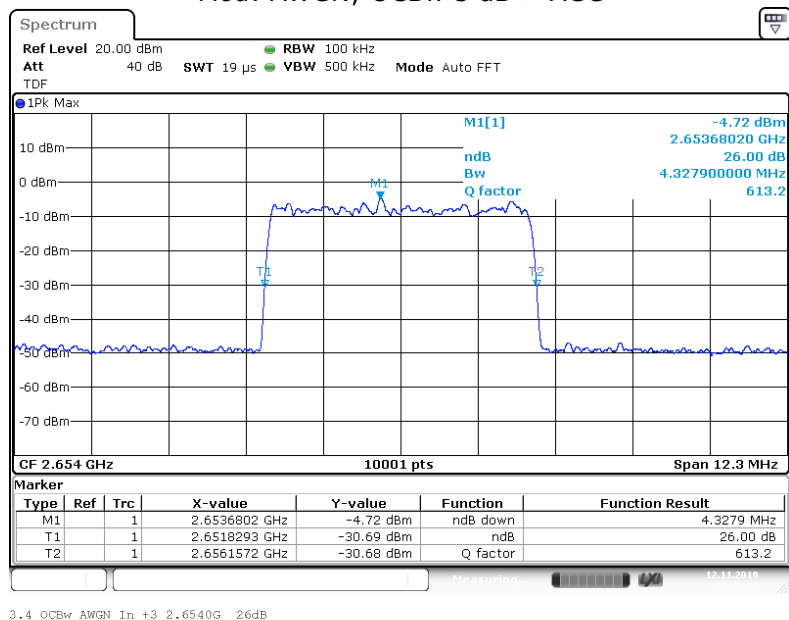


Output Signal

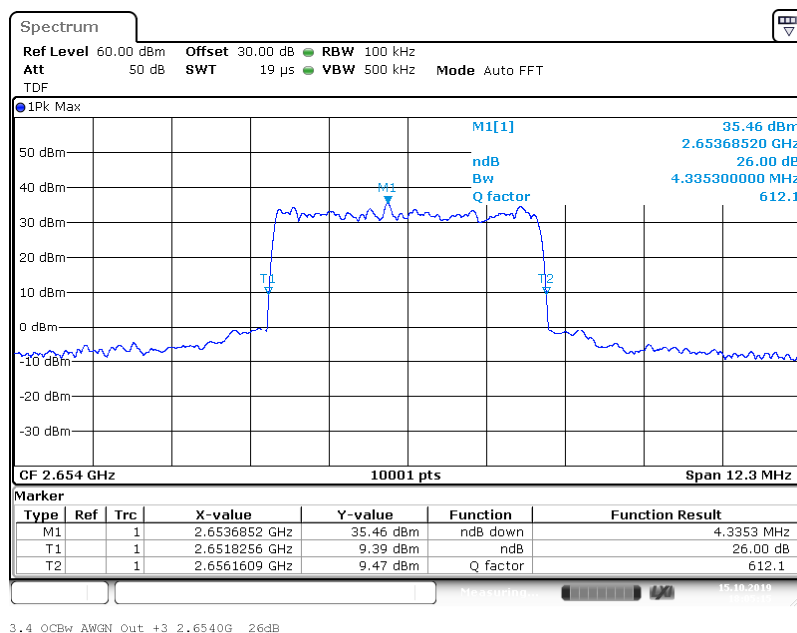


BUREAU
VERITAS

Band: BRS (UBS) ANT 1; Frequency: 2.6540 GHz; Band Edge: mid;
Mod: AWGN; OCBw 3 dB > AGC



Input Signal

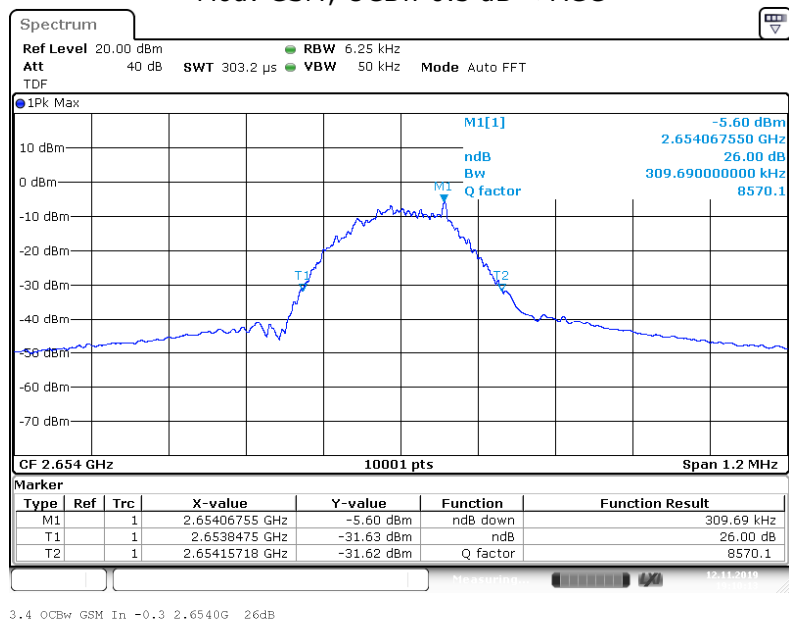


Output Signal

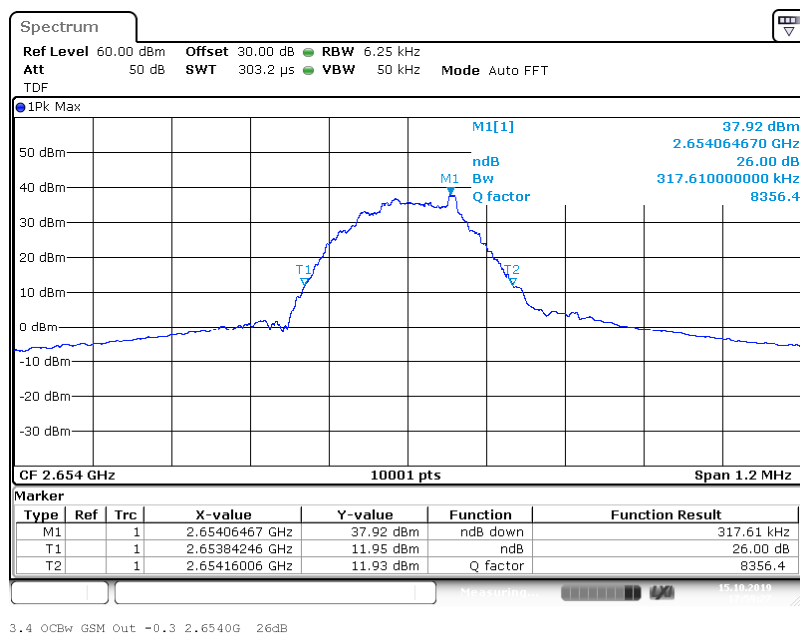


BUREAU
VERITAS

Band: BRS (UBS) ANT 1; Frequency: 2.6540 GHz; Band Edge: mid;
Mod: GSM; OCBw 0.3 dB < AGC



Input Signal

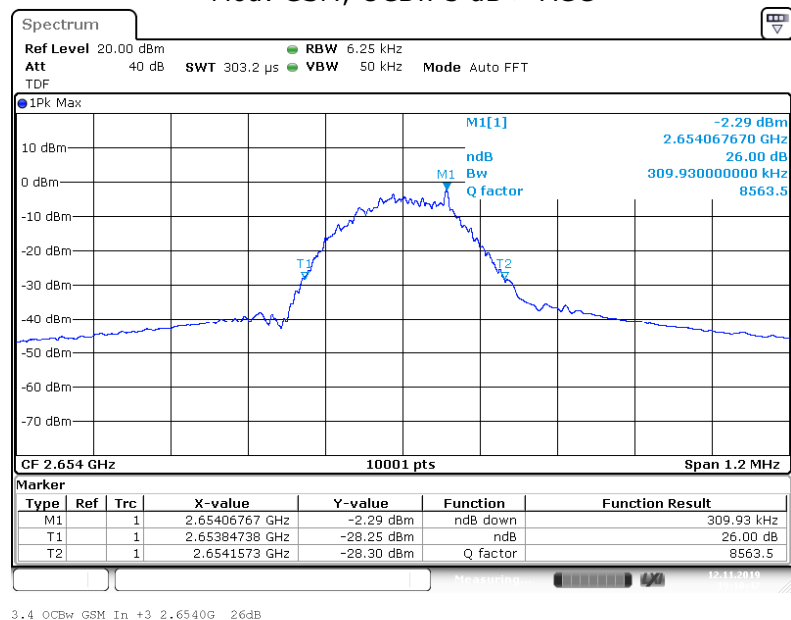


Output Signal

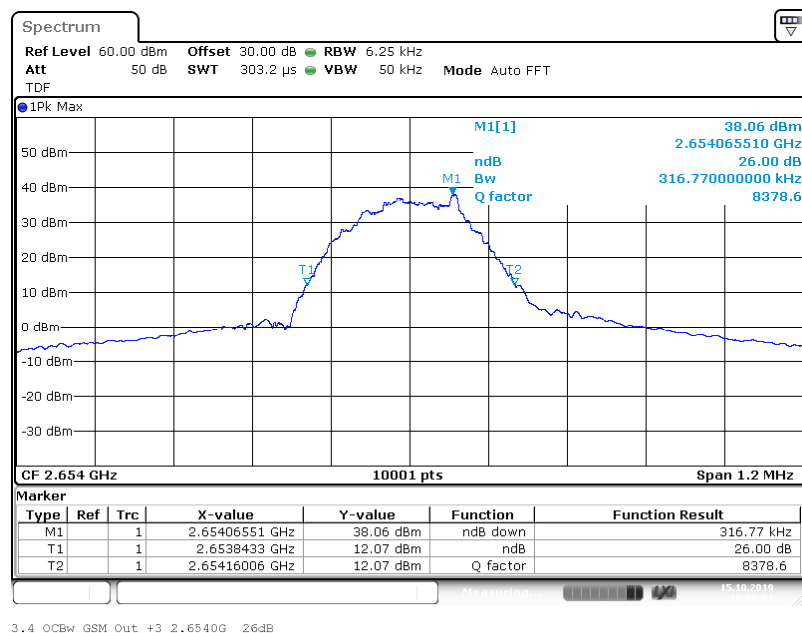


BUREAU
VERITAS

Band: BRS (UBS) ANT 1; Frequency: 2.6540 GHz; Band Edge: mid;
Mod: GSM; OCBw 3 dB > AGC



Input Signal

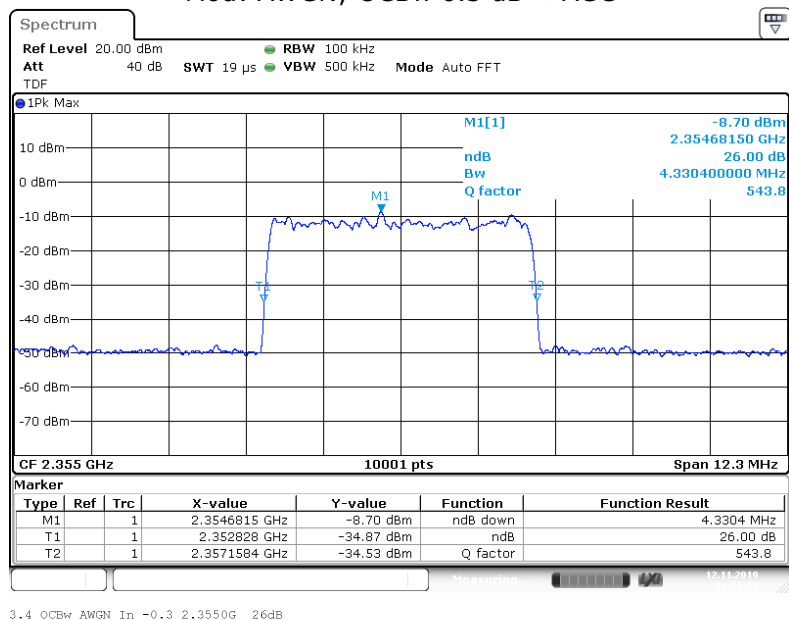


Output Signal

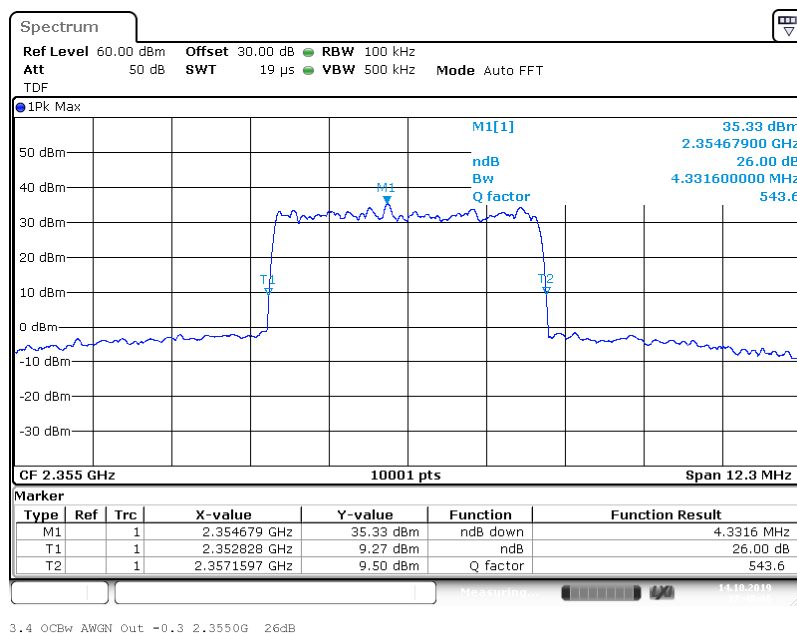


BUREAU
VERITAS

Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: AWGN; OCBw 0.3 dB < AGC



Input Signal

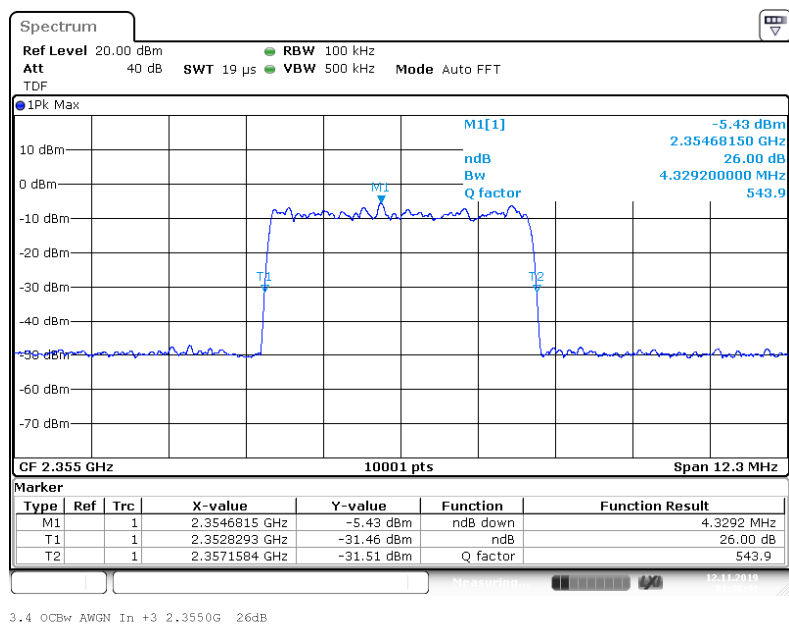


Output Signal

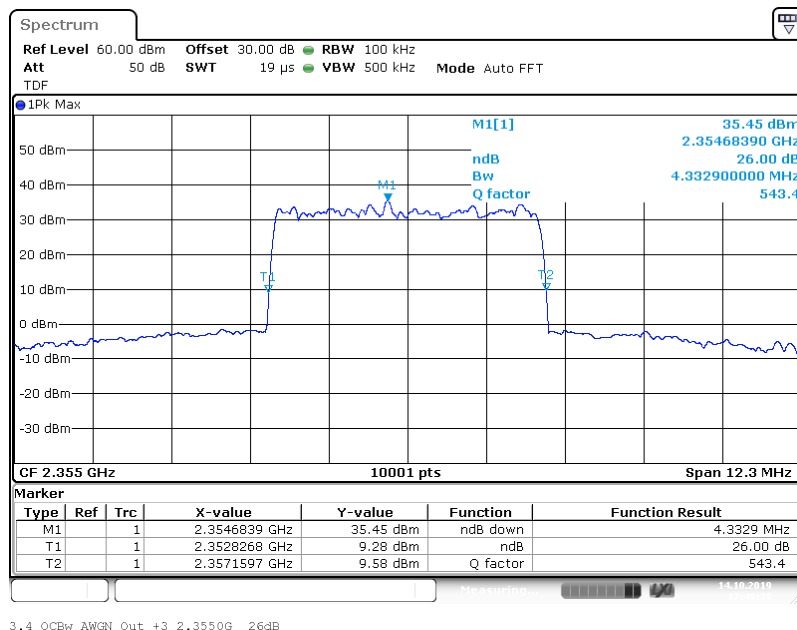


BUREAU
VERITAS

Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: AWGN; OCBw 3 dB > AGC



Input Signal

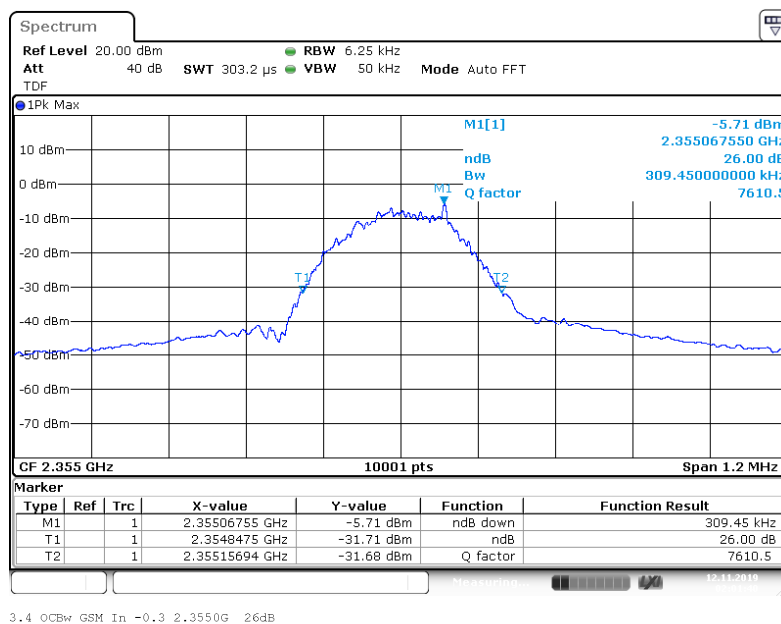


Output Signal

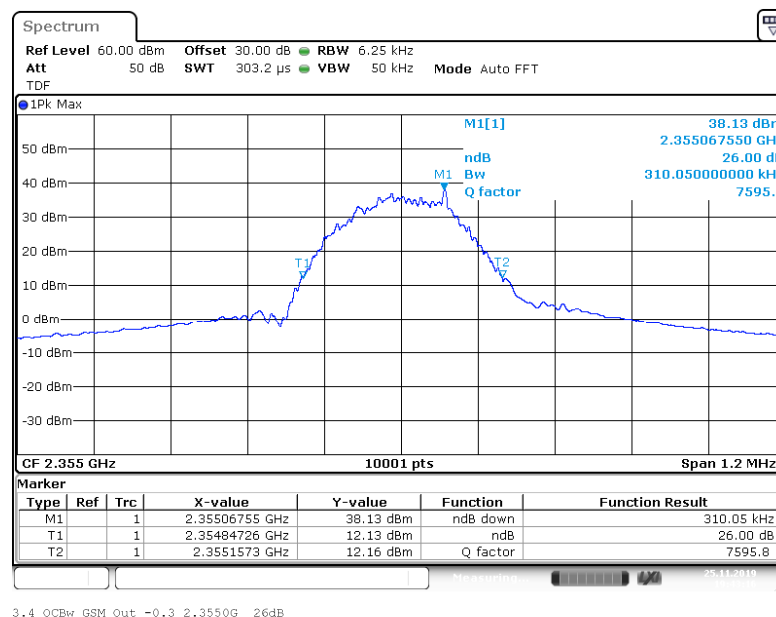


BUREAU
VERITAS

Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: GSM; OCBw 0.3 dB < AGC



Input Signal

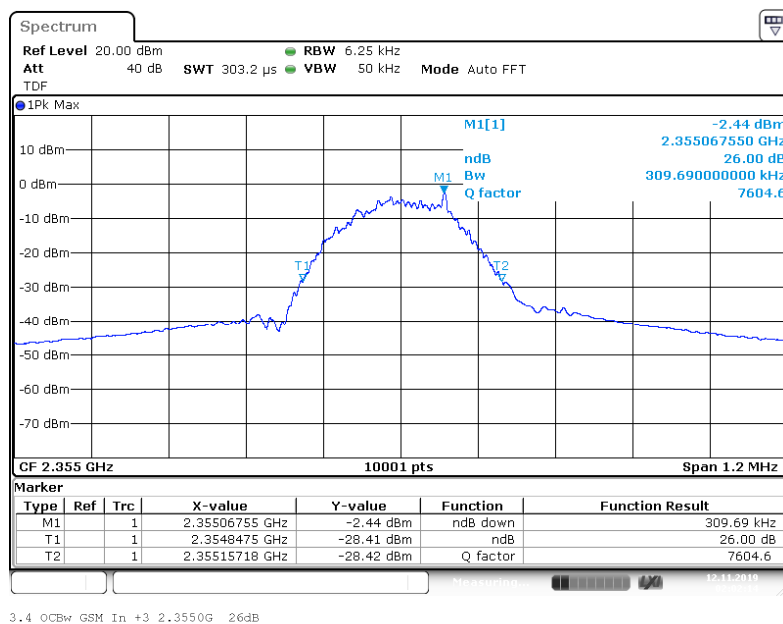


Output Signal

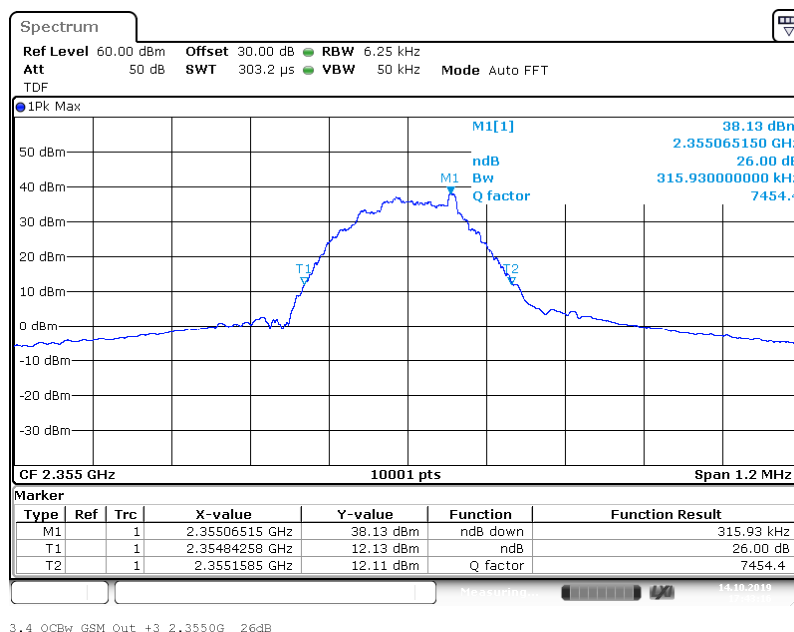


BUREAU
VERITAS

Band: WCS 2300; Frequency: 2.3550 GHz; Band Edge: mid;
Mod: GSM; OCBw 3 dB > AGC



Input Signal



Output Signal

5.3.5 TEST EQUIPMENT USED

- Conducted

5.4 CONDUCTED SPURIOUS EMISSIONS AT ANTENNA TERMINALS

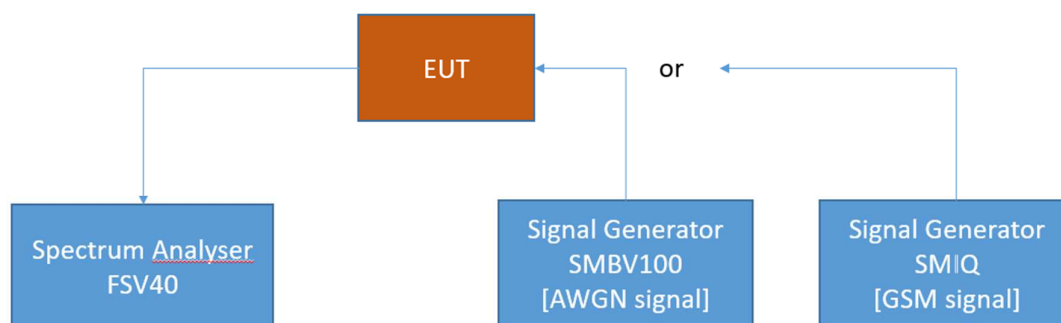
Standard FCC Part §2.1051, §27.53

The test was performed according to:
ANSI C63.26

5.4.1 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.

5.4.2 TEST REQUIREMENTS / LIMITS

FCC Part 2.1051; Measurement required: Spurious emissions at antenna terminal:

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in §2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

Part 27; Miscellaneous Wireless Communication Services

Subpart C – Technical standards

§27.53 – Emission limits

Band 30 WCS:

(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

(1) For base and fixed stations' operations in the 2305-2320 MHz band and the 2345-2360 MHz band:

(i) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than $75 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $70 + 10 \log (P)$ dB on all frequencies between 2287.5 and 2300 MHz, $72 + 10 \log (P)$ dB on all frequencies between 2285 and 2287.5 MHz, and $75 + 10 \log (P)$ dB below 2285 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2362.5 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2362.5 and 2365 MHz, $70 + 10 \log (P)$ dB on all frequencies between 2365 and 2367.5 MHz, $72 + 10 \log (P)$ dB on all frequencies between 2367.5 and 2370 MHz, and $75 + 10 \log (P)$ dB above 2370 MHz.

(2) For fixed customer premises equipment (CPE) stations operating in the 2305-2320 MHz band and the 2345-2360 MHz band transmitting with more than 2 watts per 5 megahertz average EIRP:

(i) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, and not less than $75 + 10 \log (P)$ dB on all frequencies between 2320 and 2345 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $70 + 10 \log (P)$ dB on all frequencies between 2287.5 and 2300 MHz, $72 + 10 \log (P)$ dB on all frequencies between 2285 and 2287.5 MHz, and $75 + 10 \log (P)$ dB below 2285 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2362.5 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2362.5 and 2365 MHz, $70 + 10 \log (P)$ dB on all frequencies between 2365 and 2367.5 MHz, $72 + 10 \log (P)$ dB on all frequencies between 2367.5 and 2370 MHz, and $75 + 10 \log (P)$ dB above 2370 MHz.

(3) For fixed CPE stations operating in the 2305-2320 MHz and 2345-2360 MHz bands transmitting with 2 watts per 5 megahertz average EIRP or less:

(i) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and

between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i) By a factor of not less than: $43 + 10 \log (P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz;

(iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz.

(5) *Measurement procedure.* Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.*, 1 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(6) [Reserved]

(7) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power;

(8) Waiver requests of any of the out-of-band emission limits in paragraphs (a)(1) through (a)(7) of this section shall be entertained only if interference protection equivalent to that afforded by the limits is shown;

(9) [Reserved]

(10) The out-of-band emissions limits in paragraphs (a)(1) through (a)(3) of this section may be modified by the private contractual agreement of all affected licensees, who must maintain a copy of the agreement in their station files and disclose it to prospective assignees, transferees, or spectrum lessees and, upon request, to the Commission.

Band 41BRS (LBS/MBS/UBS):

(m) For BRS and EBS stations, the power of any emissions outside the licensee's frequency bands of operation shall be attenuated below the transmitter power (P) measured in watts in accordance with the standards below. If a licensee has multiple contiguous channels, out-of-band emissions shall be measured from the upper and lower edges of the contiguous channels.

(1) Prior to the transition, and thereafter, solely within the MBS, for analog operations with an EIRP in excess of -9 dBW, the signal shall be attenuated at the channel edges by at least 38 dB relative to the peak visual carrier, then linearly sloping from that level to at least 60 dB of attenuation at 1 MHz below the lower band edge and 0.5 MHz above the upper band edge, and attenuated at least 60 dB at all other frequencies.

(2) For digital base stations, the attenuation shall be not less than $43 + 10 \log (P)$ dB, unless a documented interference complaint is received from an adjacent channel licensee with an overlapping Geographic Service Area. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS No. 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.



5.4.3 TEST PROTOCOL

Band 41, BRS (LBS), downlink							
Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	Narrowband	0.00986	-42.2	RMS	1	-33.0	12.2
low	Narrowband	0.14285	-38.2	RMS	10	-23.0	15.2
low	Narrowband	2634.7	-26.2	RMS	1000	-13.0	13.2
low	Narrowband	20281	-20.6	RMS	1000	-13.0	7.6
mid	Narrowband	0.05000	-38.9	RMS	1	-33.0	5.9
mid	Narrowband	62.87	-35.4	RMS	10	-13.0	22.4
mid	Narrowband	2575.9	-25.3	RMS	100	-23.0	2.3
mid	Narrowband	20272	-20.6	RMS	1000	-13.0	7.6
high	Narrowband	0.00941	-42.6	RMS	1	-33.0	9.6
high	Narrowband	0.15782	-40.7	RMS	10	-23.0	17.7
high	Narrowband	47.45	-35.7	RMS	100	-13.0	22.7
high	Narrowband	2593.1	-23.2	RMS	1000	-13.0	10.2
high	Narrowband	20309	-20.8	RMS	1000	-13.0	7.8
low	Wideband	0.01222	-42.9	RMS	1	-33.0	9.9
low	Wideband	0.16381	-36.4	RMS	10	-23.0	13.4
low	Wideband	2495.0	-26.5	RMS	100	-23.0	3.5
low	Wideband	20297	-20.4	RMS	1000	-13.0	7.4
mid	Wideband	0.05599	-37.0	RMS	10	-23.0	14.0
mid	Wideband	20297	-20.6	RMS	1000	-13.0	7.6
high	Wideband	0.01981	-41.7	RMS	1	-33.0	8.7
high	Wideband	0.15483	-37.3	RMS	10	-23.0	14.3
high	Wideband	2569.0	-24.9	RMS	100	-23.0	1.9
high	Wideband	20301	-20.6	RMS	1000	-13.0	7.6



Band 41, BRS (MBS), downlink							
Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	Narrowband	0.01201	-43.0	RMS	1	-33.0	10.0
low	Narrowband	0.13985	-39.0	RMS	10	-23.0	16.0
low	Narrowband	2562.2	-26.5	RMS	1000	-13.0	13.5
low	Narrowband	20317	-20.5	RMS	1000	-13.0	7.5
mid	Narrowband	0.06198	-39.0	RMS	10	-23.0	16.0
mid	Narrowband	2492.8	-26.6	RMS	1000	-13.0	13.6
mid	Narrowband	20291	-19.9	RMS	1000	-13.0	6.9
high	Narrowband	0.01123	-42.2	RMS	1	-33.0	9.2
high	Narrowband	0.06498	-38.4	RMS	10	-23.0	15.4
high	Narrowband	2562.0	-25.2	RMS	1000	-13.0	12.2
high	Narrowband	20307	-20.5	RMS	1000	-13.0	7.5
low	Wideband	0.00964	-42.1	RMS	1	-33.0	9.1
low	Wideband	0.7089	-38.4	RMS	10	-23.0	15.4
low	Wideband	2570.9	-23.7	RMS	100	-23.0	0.7
low	Wideband	20316	-20.5	RMS	1000	-13.0	7.5
mid	Wideband	0.01956	-42.0	RMS	1	-33.0	9.0
mid	Wideband	0.26265	-36.0	RMS	10	-23.0	-13.0
mid	Wideband	20298	-20.7	RMS	1000	-13.0	-7.7
high	Wideband	0.01048	-42.0	RMS	1	-33.0	9.0
high	Wideband	0.08594	-35.7	RMS	10	-23.0	12.7
high	Wideband	2615.1	-24.1	RMS	100	-23.0	1.1
high	Wideband	20310	-20.3	RMS	1000	-13.0	7.3



Band 41, BRS (UBS), downlink							
Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	Narrowband	0.02072	-43.2	RMS	1	-33.0	10.2
low	Narrowband	0.14584	-40.5	RMS	10	-23.0	17.5
low	Narrowband	2518.3	-26.3	RMS	1000	-13.0	13.3
low	Narrowband	20294	-20.4	RMS	1000	-13.0	7.4
mid	Narrowband	0.01094	-43.3	RMS	1	-33.0	10.3
mid	Narrowband	0.18478	-39.5	RMS	10	-23.0	16.5
mid	Narrowband	2554.3	-26.2	RMS	1000	-13.0	13.2
mid	Narrowband	20280	-20.6	RMS	1000	-13.0	7.6
high	Narrowband	0.00944	-42.6	RMS	1	-33.0	9.6
high	Narrowband	0.10691	-38.0	RMS	10	-23.0	15.0
high	Narrowband	2588.5	-18.8	RMS	1000	-13.0	5.8
high	Narrowband	20317	-20.6	RMS	1000	-13.0	7.6
low	Wideband	0.05300	-38.4	RMS	10	-23.0	15.4
low	Wideband	2616.9	-24.1	RMS	100	-23.0	1.1
low	Wideband	20280	-20.6	RMS	1000	-13.0	7.6
mid	Wideband	0.08894	-37.8	RMS	10	-23.0	14.8
mid	Wideband	20270	-20.5	RMS	1000	-13.0	7.5
high	Wideband	0.10092	-39.7	RMS	10	-23.0	16.7
high	Wideband	2600.8	-25.4	RMS	1000	-13.0	12.4
high	Wideband	20299	-20.3	RMS	1000	-13.0	7.3

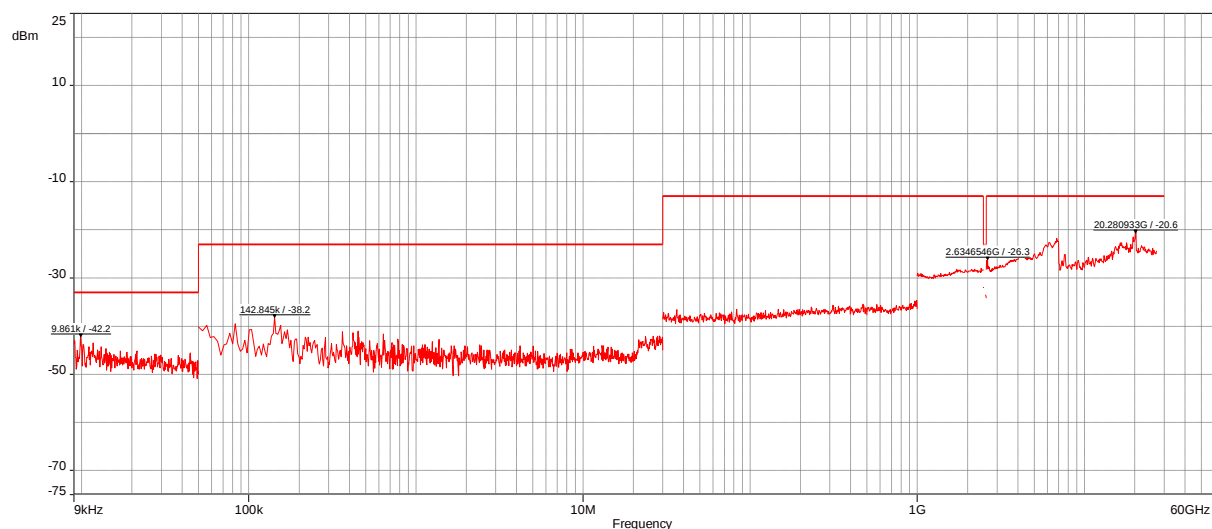


Band 41, WCS 2300, downlink							
Test Frequency	Signal Type	Spurious Freq. [MHz]	Spurious Level [dBm]	Detector	RBW [kHz]	Limit [dBm]	Margin to Limit [dB]
low	Narrowband	0.01235	-43.7	RMS	1	-33.0	10.7
low	Narrowband	0.13686	-38.3	RMS	10	-23.0	15.3
low	Narrowband	20323	-20.4	RMS	1000	-13.0	7.4
mid	Narrowband	0.01028	-42.0	RMS	1	-33.0	9.0
mid	Narrowband	0.06498	-38.6	RMS	10	-23.0	15.6
mid	Narrowband	20289	-20.8	RMS	1000	-13.0	7.8
high	Narrowband	0.00993	-41.9	RMS	1	-33.0	8.9
high	Narrowband	0.06498	-38.4	RMS	10	-23.0	15.4
high	Narrowband	20288	-20.0	RMS	1000	-13.0	7.0
low	Wideband	0.01212	-42.2	RMS	1	-33.0	9.2
low	Wideband	0.14584	-36.6	RMS	10	-23.0	13.6
low	Wideband	2.3490	-25.3	RMS	100	-23.0	2.3
low	Wideband	29317	-20.4	RMS	1000	-13.0	7.4
mid	Wideband	0.00964	-42.4	RMS	1	-33.0	9.4
mid	Wideband	0.05300	-36.7	RMS	10	-23.0	13.7
mid	Wideband	2349.0	-27.4	RMS	100	-23.0	4.4
mid	Wideband	2361.0	-26.9	RMS	100	-23.0	3.9
mid	Wideband	20317	-20.5	RMS	1000	-13.0	7.5
high	Wideband	0.01924	-42.2	RMS	1	-33.0	9.2
high	Wideband	0.0300	-35.4	RMS	10	-23.0	12.4
high	Wideband	2361.0	-23.8	RMS	100	-23.0	0.8
high	Wideband	20295	-20.4	RMS	1000	-13.0	7.4

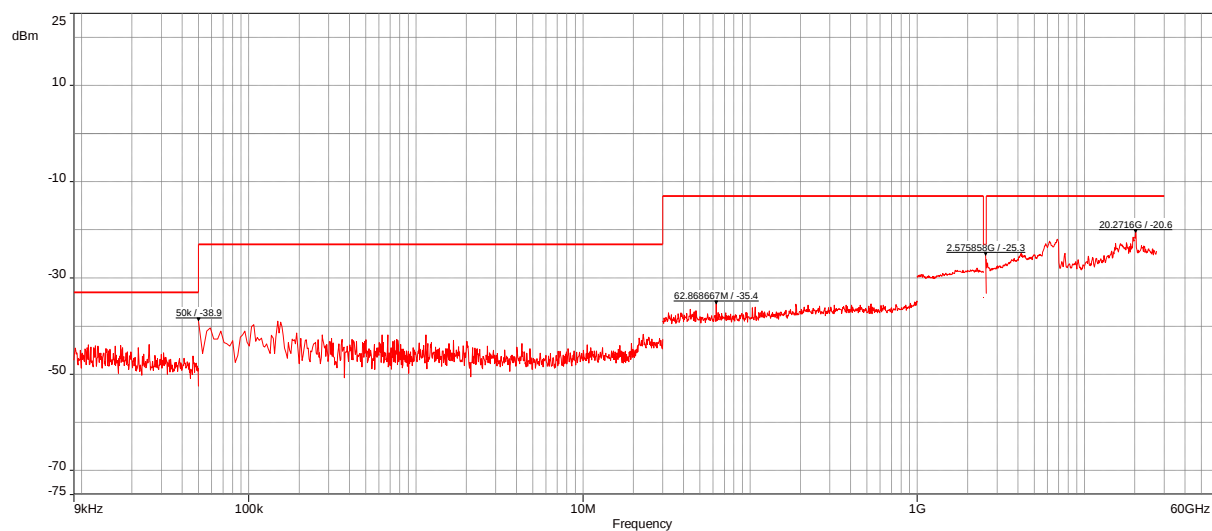
Remark: Please see next sub-clause for the measurement plot.

5.4.4 MEASUREMENT PLOT

Frequency Band = Band 41 BRS (LBS), Test Frequency = low, Direction = RF downlink, Signal Type = Narrowband



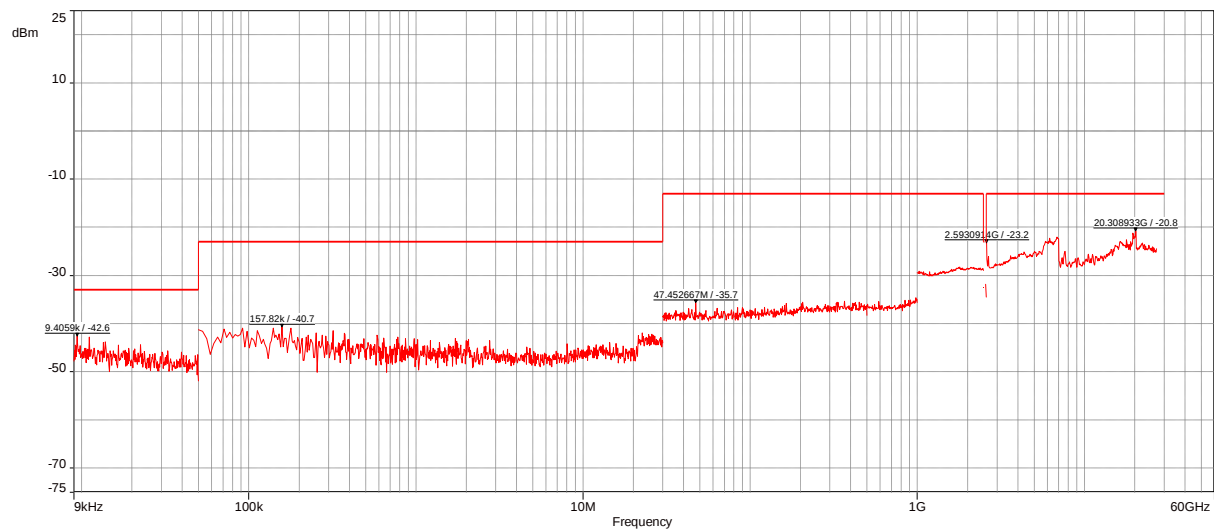
Frequency Band = Band 41 BRS (LBS), Test Frequency = mid, Direction = RF downlink, Signal Type = Narrowband





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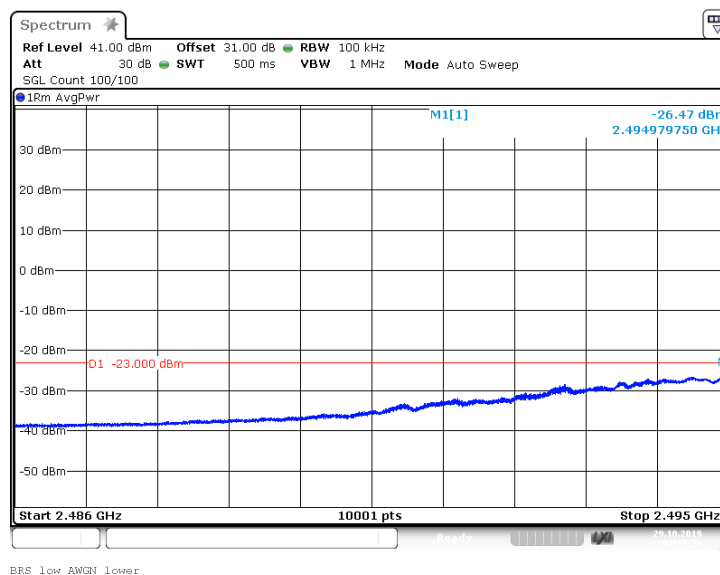
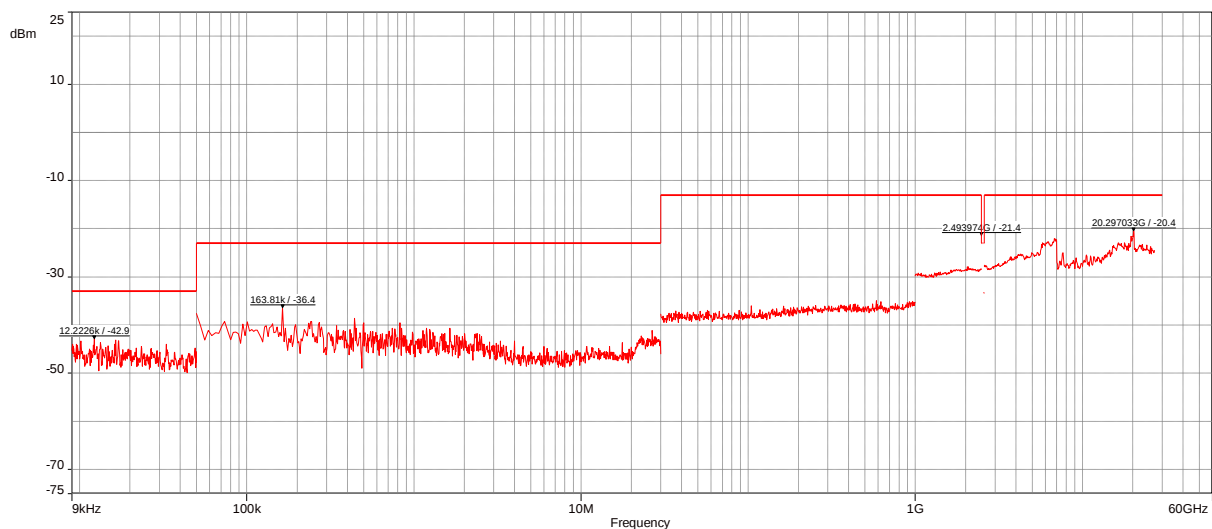
Frequency Band = Band 41 BRS (LBS), Test Frequency = high, Direction = RF downlink, Signal
Type = Narrowband





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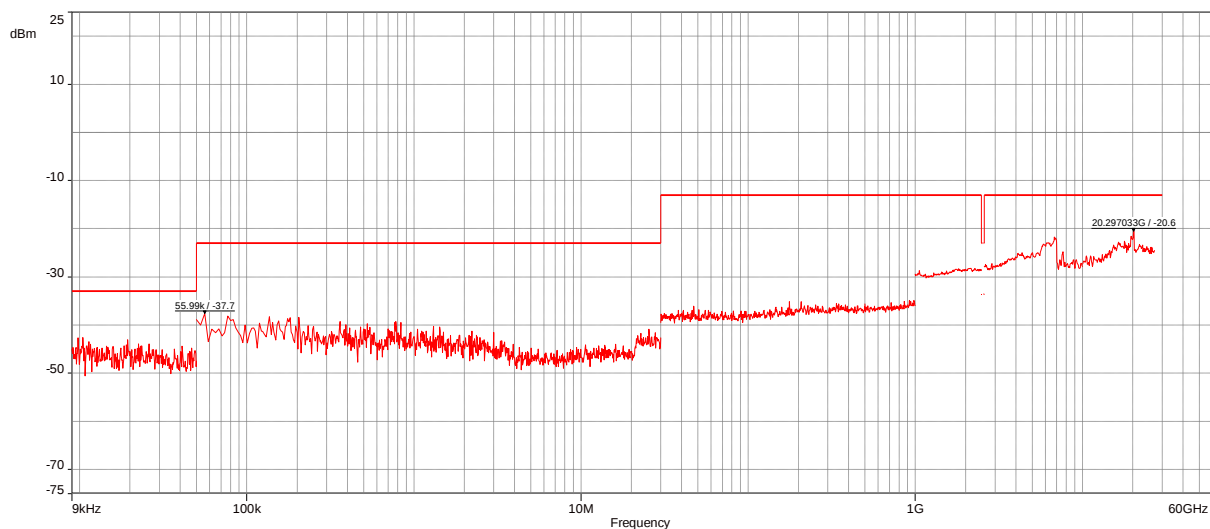
Frequency Band = Band 41 BRS (LBS), Test Frequency = low, Direction = RF downlink, Signal Type = Wideband





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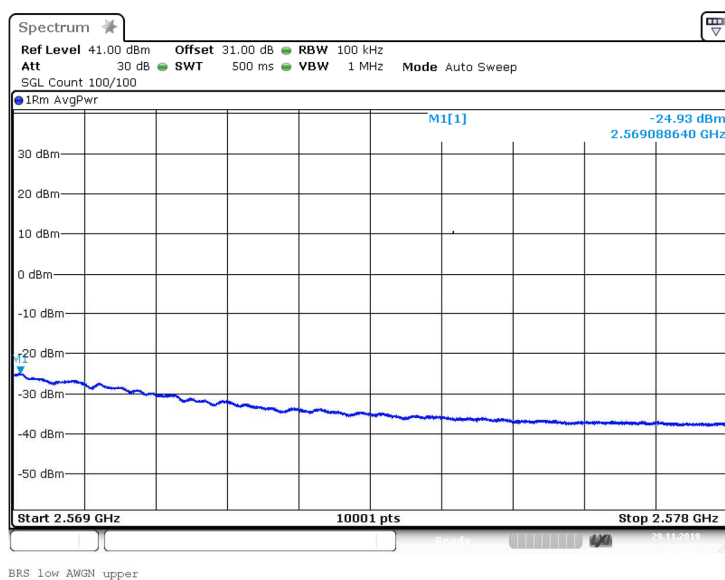
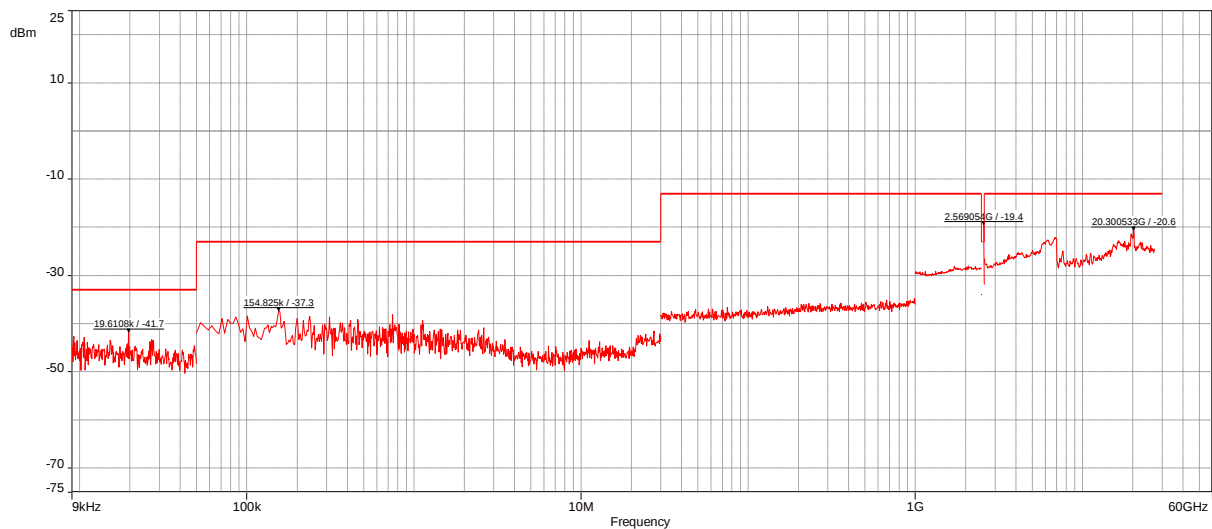
Frequency Band = Band 41 BRS (LBS), Test Frequency = mid, Direction = RF downlink, Signal
Type = Wideband





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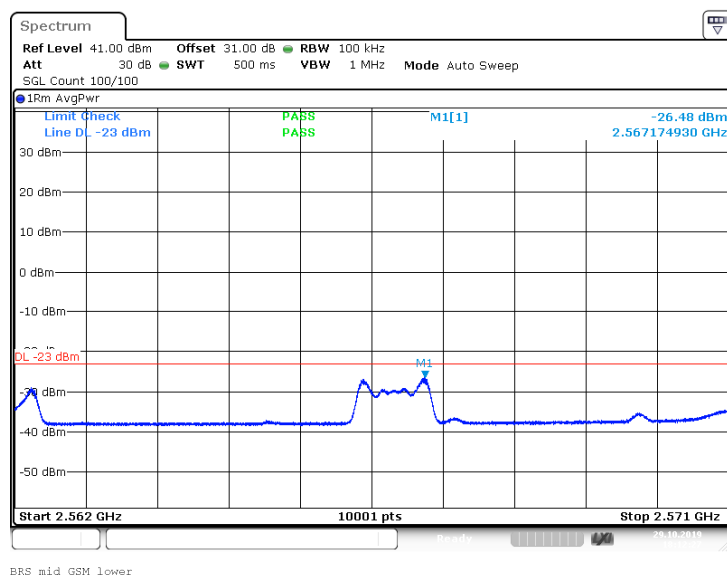
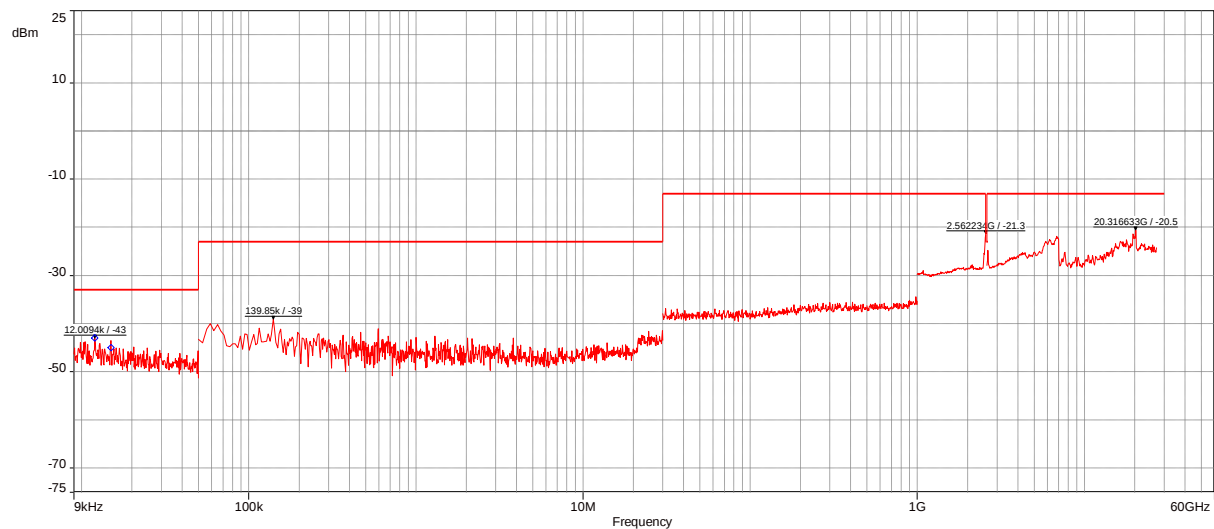
Frequency Band = Band 41 BRS (LBS), Test Frequency = high, Direction = RF downlink, Signal Type = Wideband





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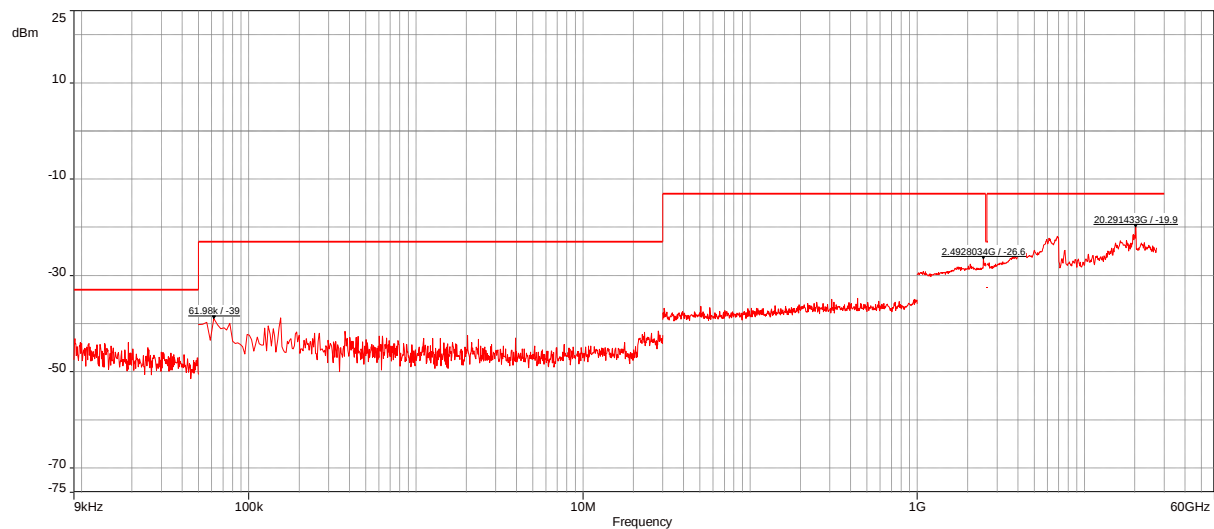
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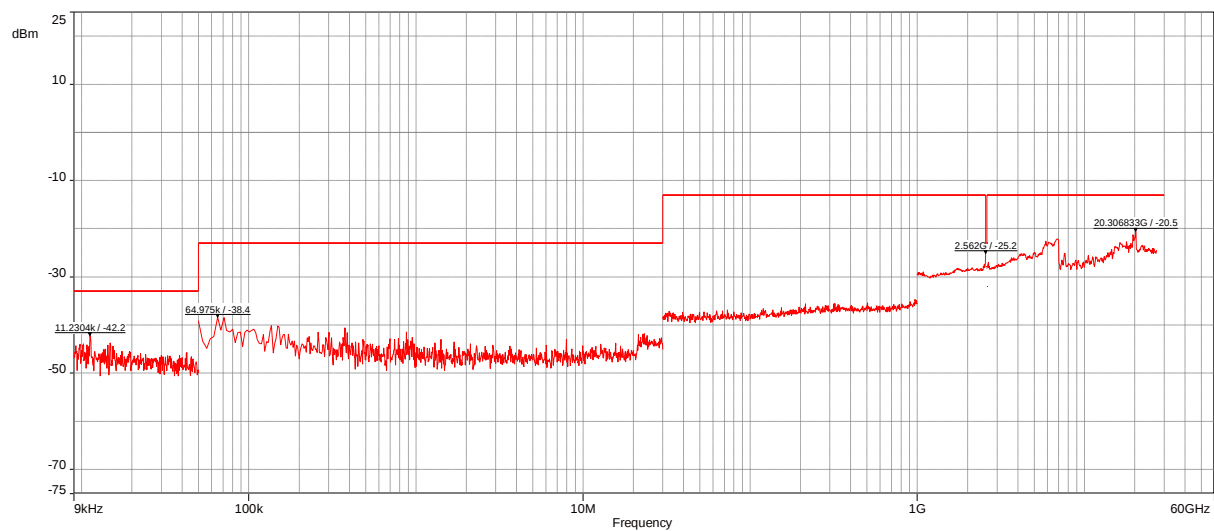


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Frequency Band = Band 41 BRS (MBS), Test Frequency = mid, Direction = RF downlink, Signal Type = Narrowband



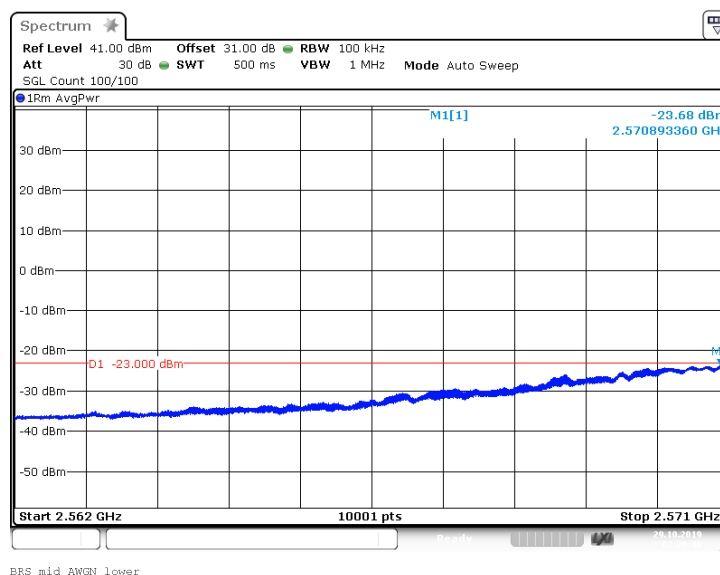
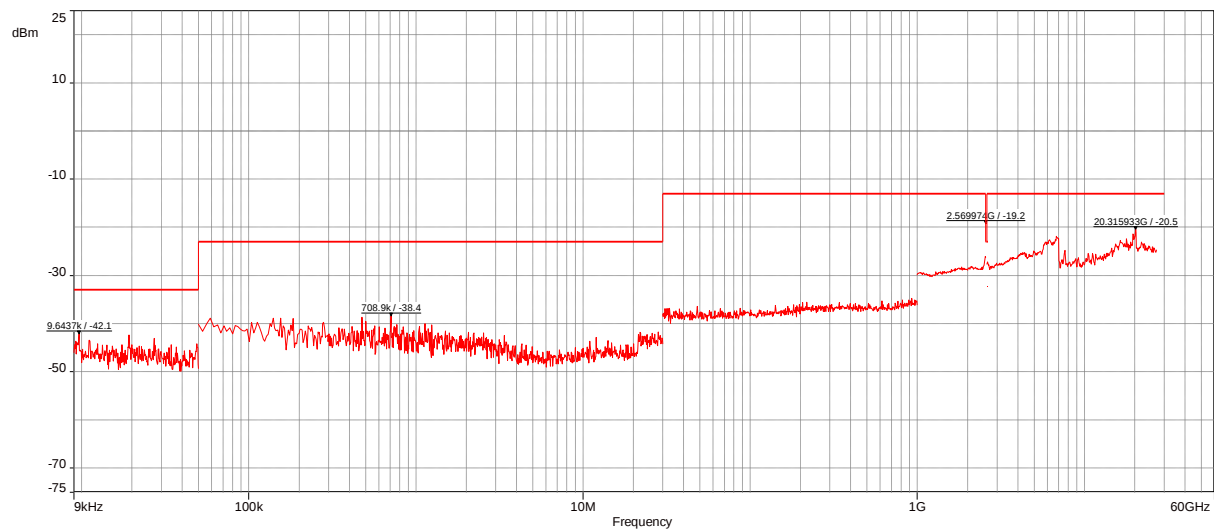
Frequency Band = Band 41 BRS (MBS), Test Frequency = high, Direction = RF downlink, Signal Type = Narrowband





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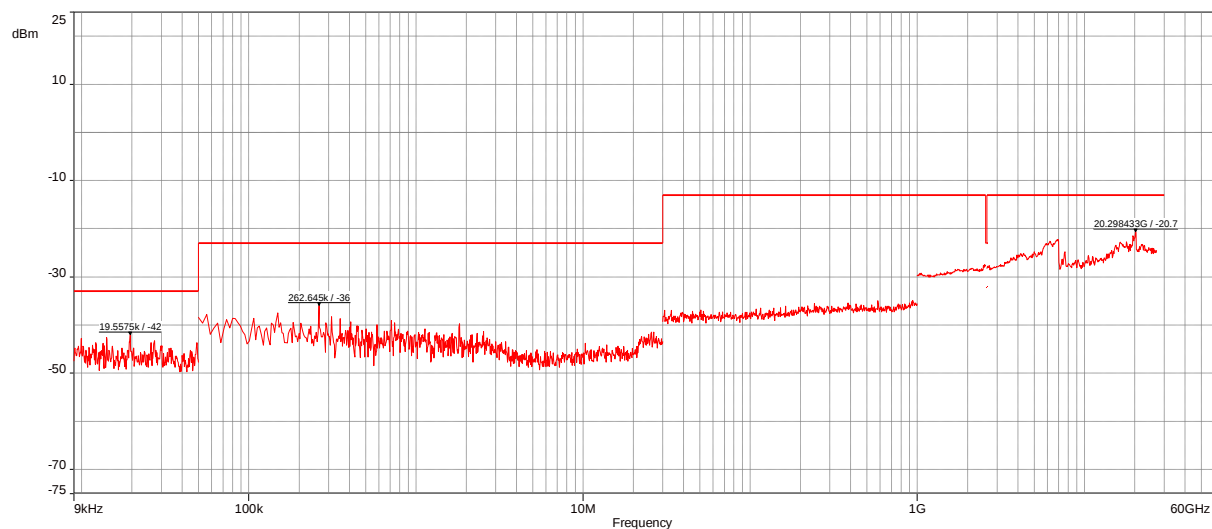
Frequency Band = Band 41 BRS (MBS), Test Frequency = low, Direction = RF downlink, Signal Type = Wideband





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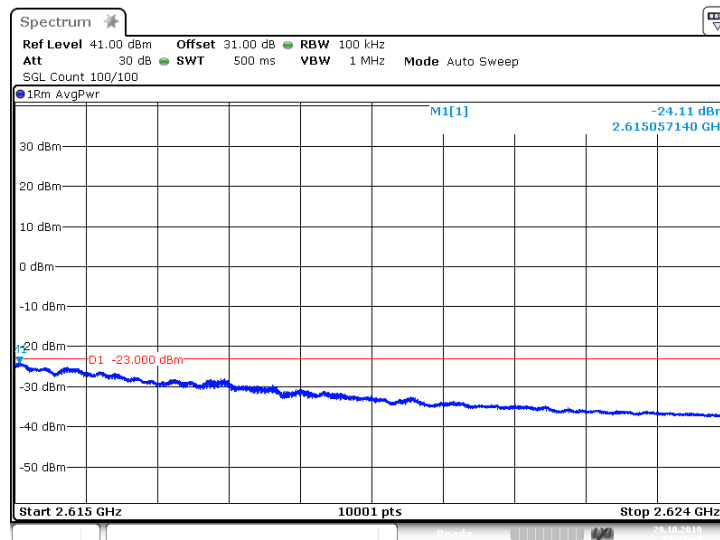
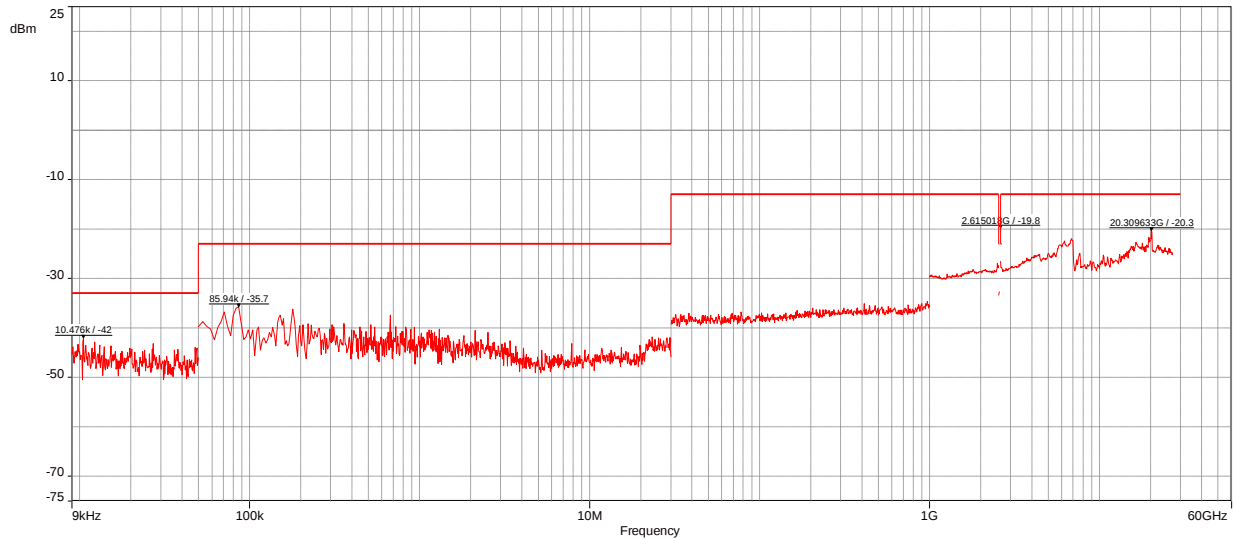
Frequency Band = Band 41 BRS (MBS), Test Frequency = mid, Direction = RF downlink, Signal
Type = Wideband





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Frequency Band = Band 41 BRS (MBS), Test Frequency = high, Direction = RF downlink,
Signal Type = Wideband

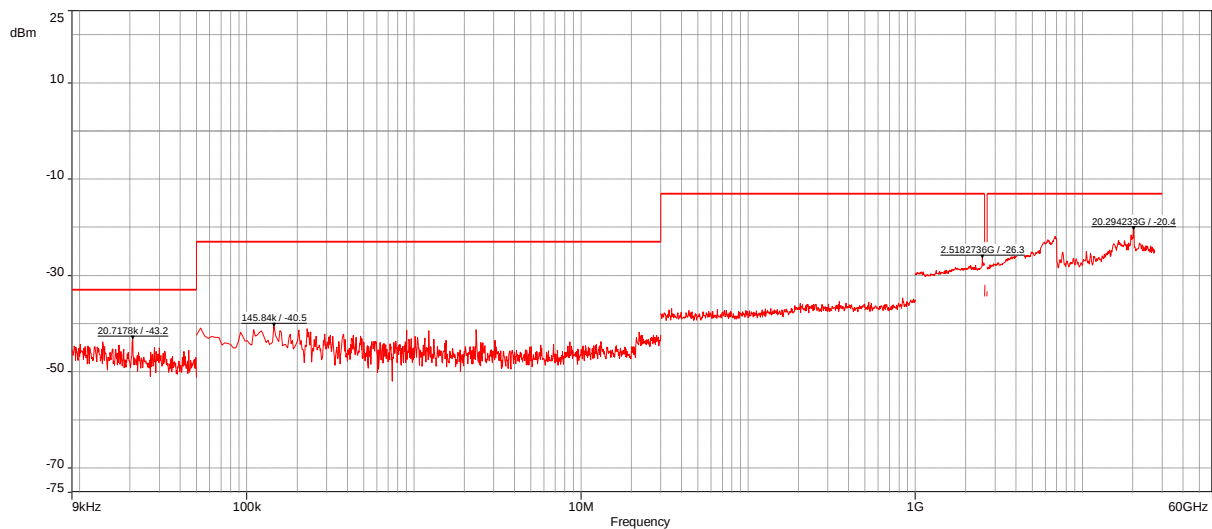


BRS mid AWGN upper

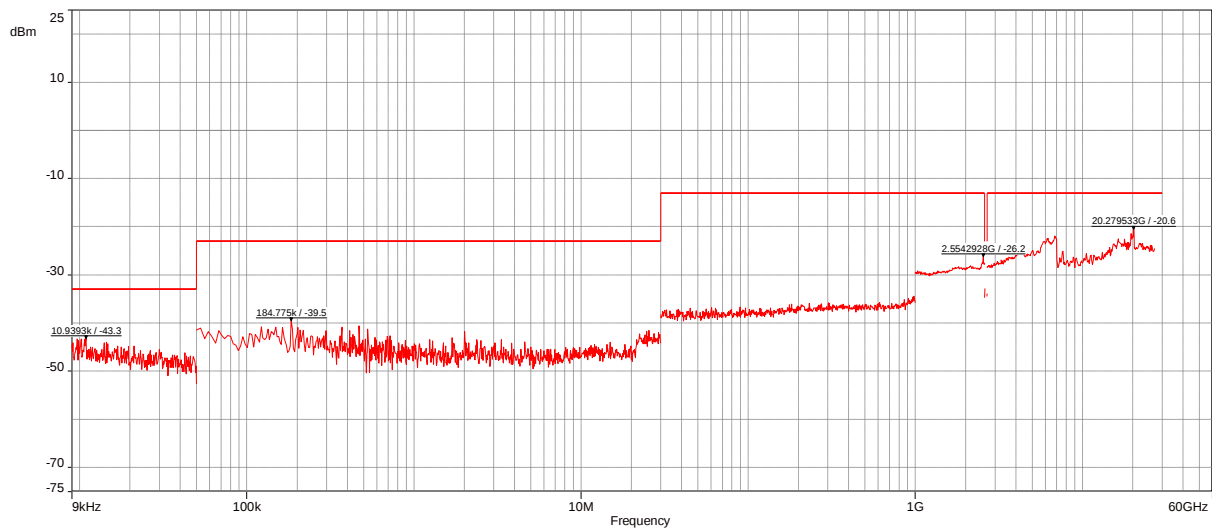


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Frequency Band = Band 41 BRS (UBS), Test Frequency = low, Direction = RF downlink, Signal Type = Narrowband



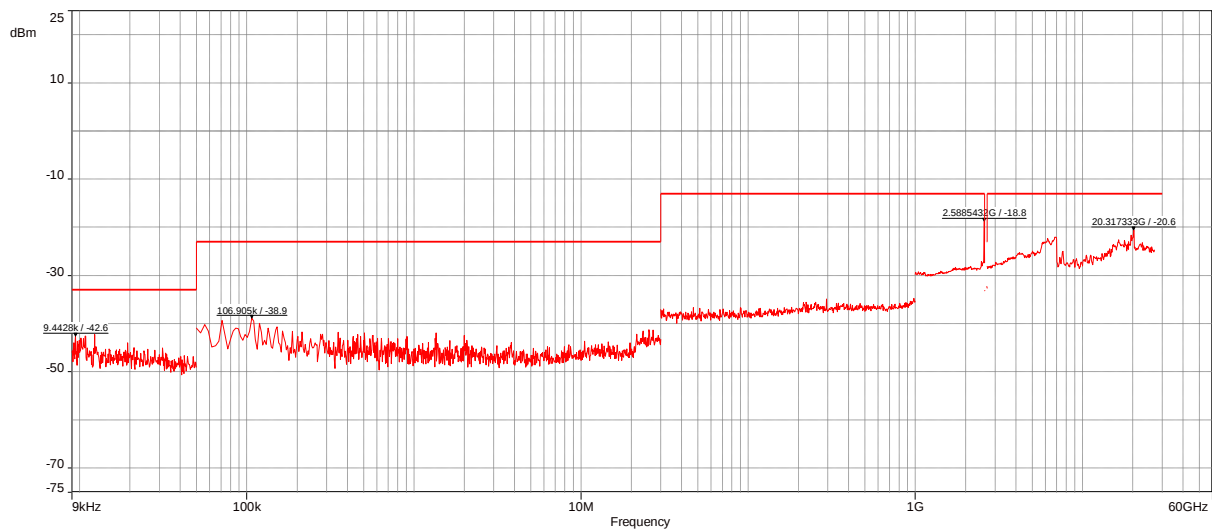
Frequency Band = Band 41 BRS (UBS), Test Frequency = mid, Direction = RF downlink, Signal Type = Narrowband





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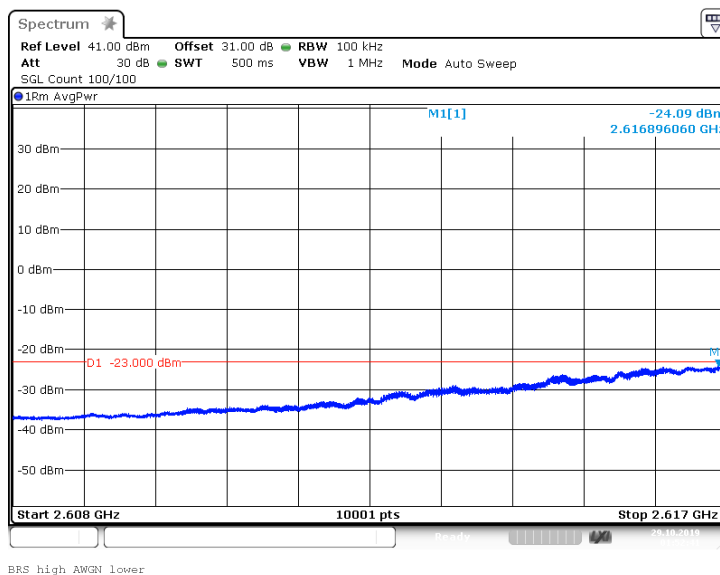
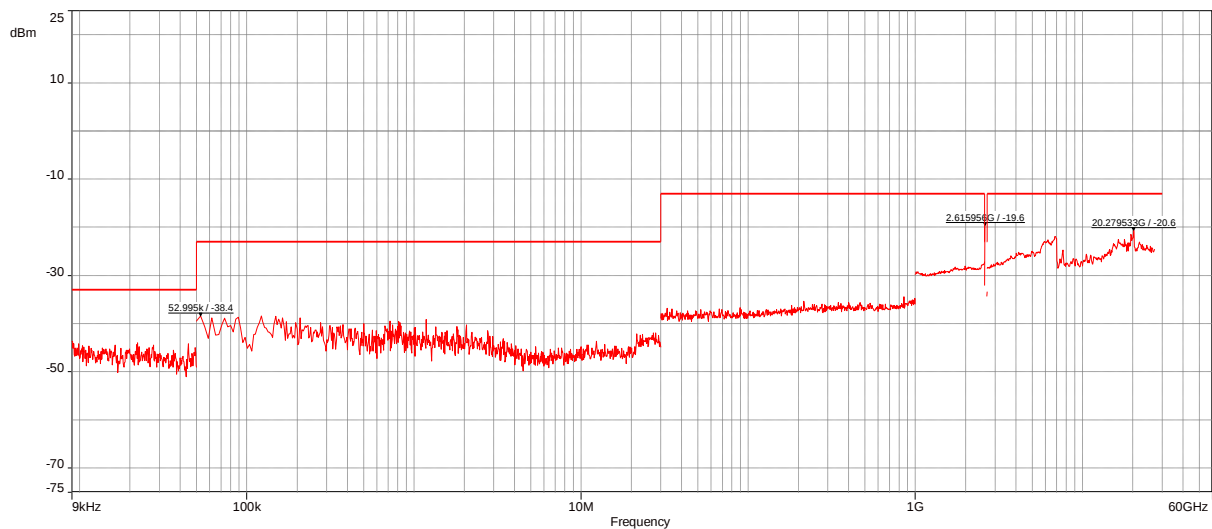
Frequency Band = Band 41 BRS (UBS), Test Frequency = high, Direction = RF downlink,
Signal Type = Narrowband



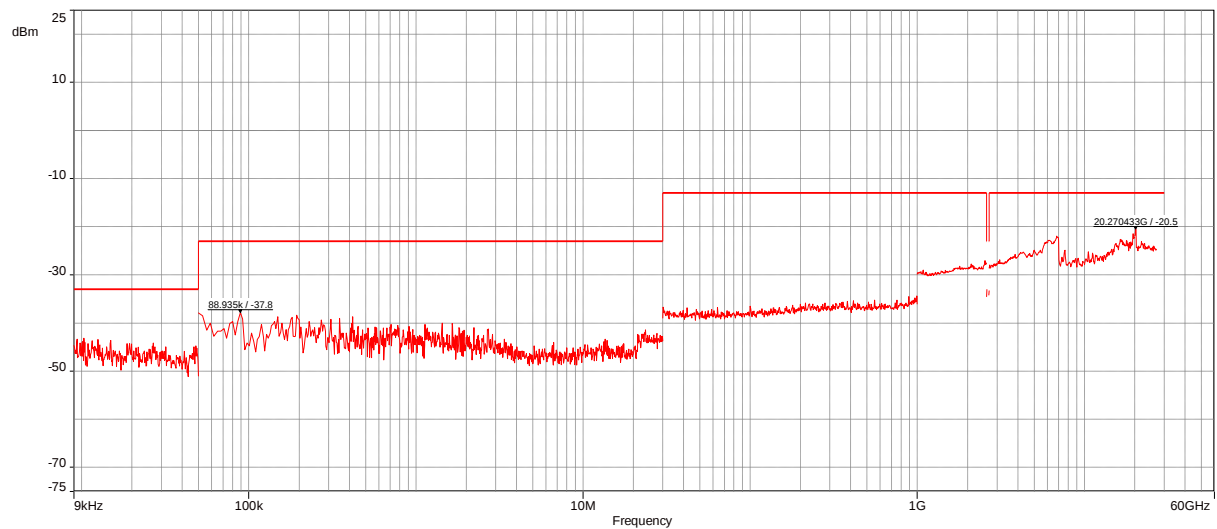


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VERITAS

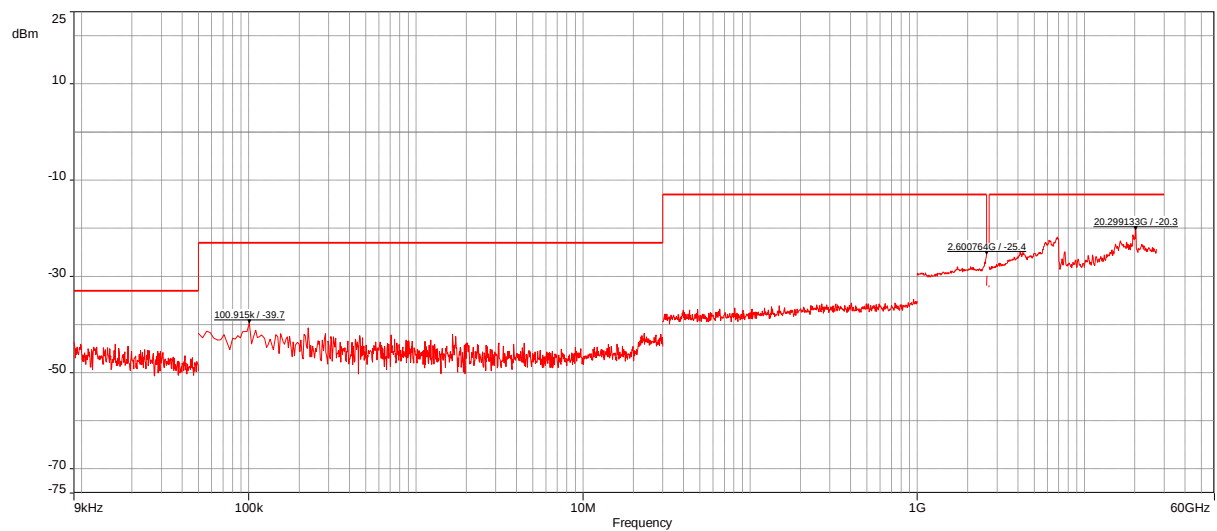
Frequency Band = Band 41 BRS (UBS), Test Frequency = low, Direction = RF downlink, Signal Type = Wideband



Frequency Band = Band 41 BRS (UBS), Test Frequency = mid, Direction = RF downlink, Signal Type = Wideband



Frequency Band = Band 41 BRS (UBS), Test Frequency = high, Direction = RF downlink, Signal Type = Wideband





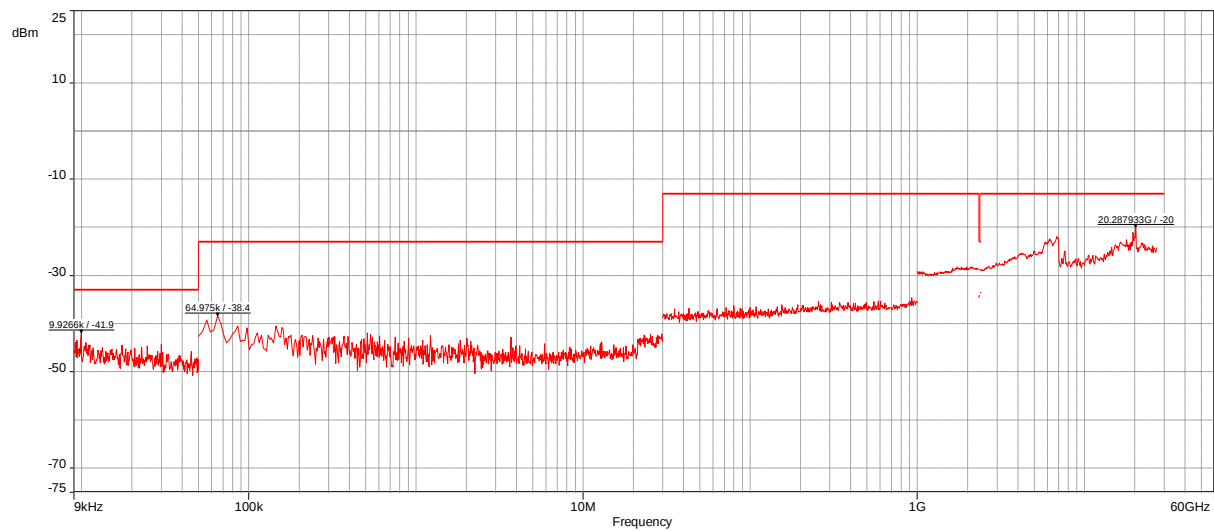
The image shows a spectral plot with the following characteristics:

- Y-axis:** Power Spectral Density (dBm), ranging from -75 to 25.
- X-axis:** Frequency (Hz), ranging from 9 kHz to 60 GHz on a logarithmic scale.
- Plot Data:** A red line representing the measured spectrum, which is noisy and shows several distinct steps or changes in power level.
- Annotations:** Three specific frequency points are labeled:
 - 12.3497k / -43.7
 - 136.855k / -38.3
 - 20.322933G / -20.4



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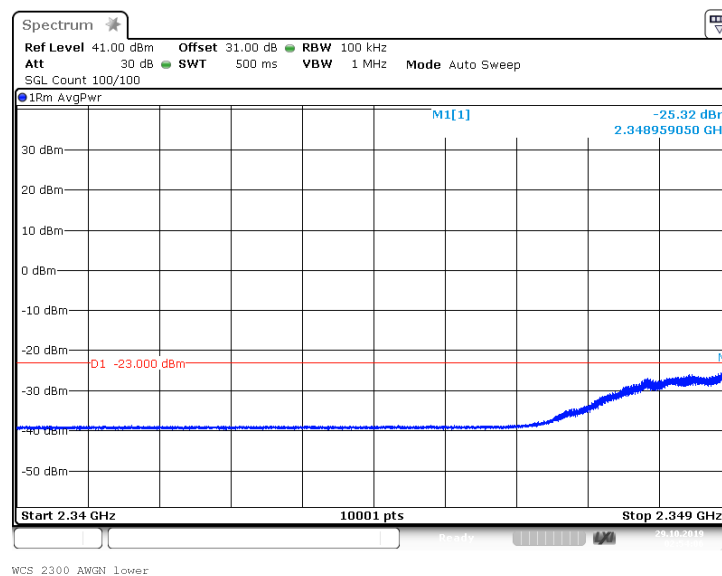
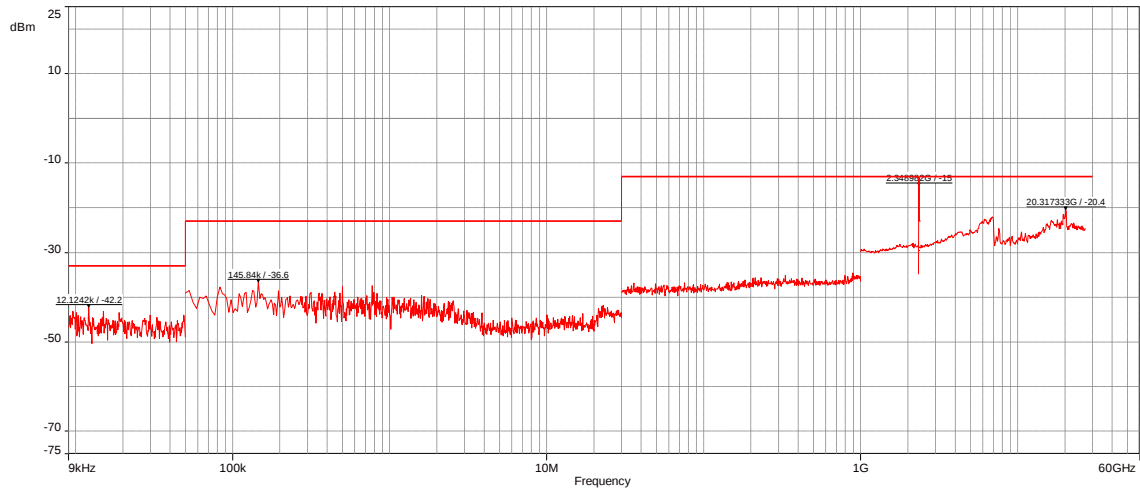
Frequency Band = Band 30 WCS 2300, Test Frequency = high, Direction = RF downlink, Signal
Type = Narrowband





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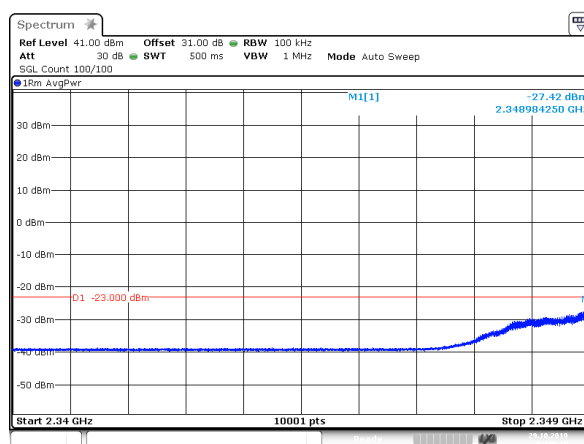
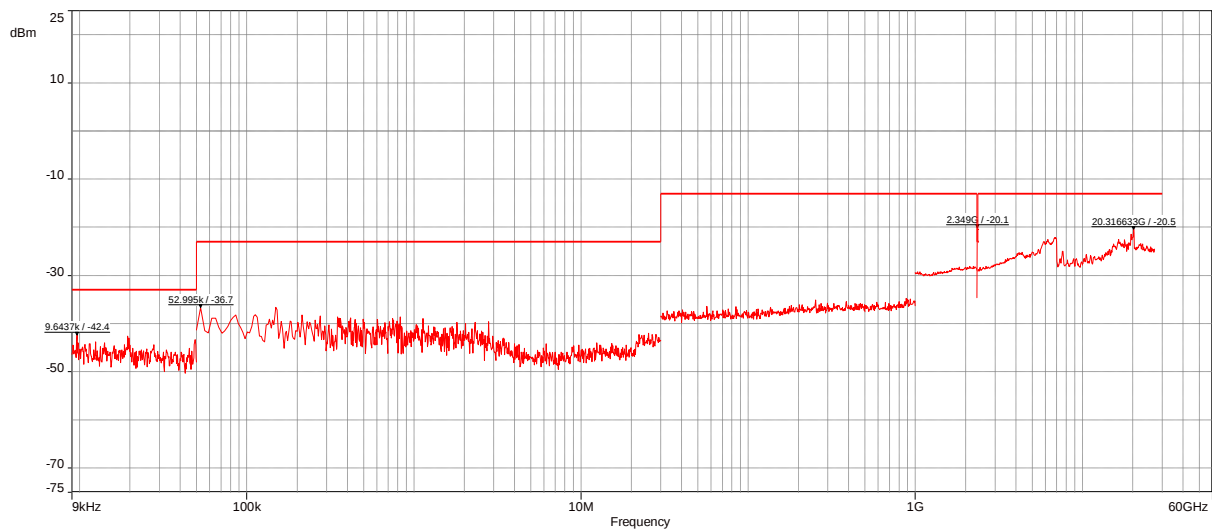
Frequency Band = Band 30 WCS 2300, Test Frequency = low, Direction = RF downlink, Signal Type = Wideband



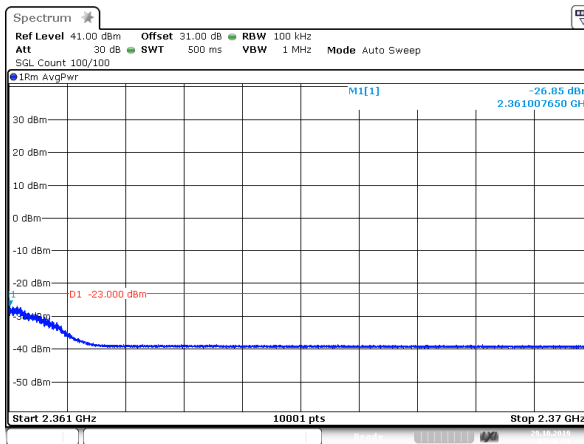


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Frequency Band = Band 30 WCS 2300, Test Frequency = mid, Direction = RF downlink, Signal Type = Wideband



WCS 2300 AWGN mid part 1

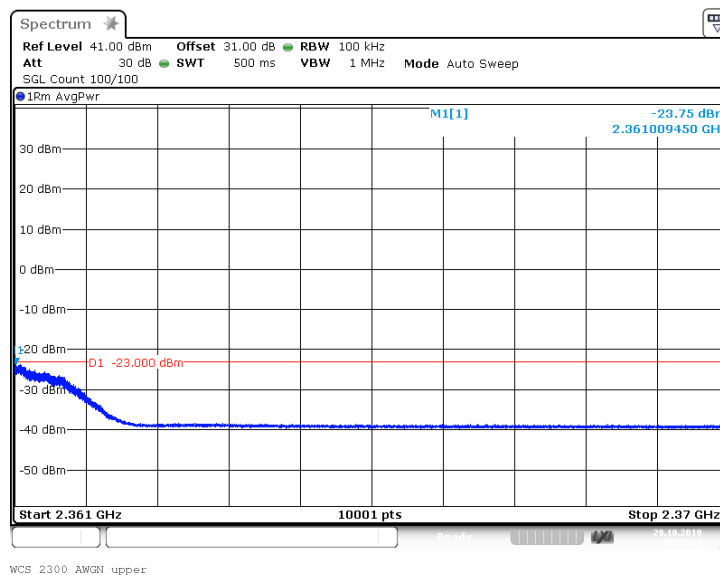
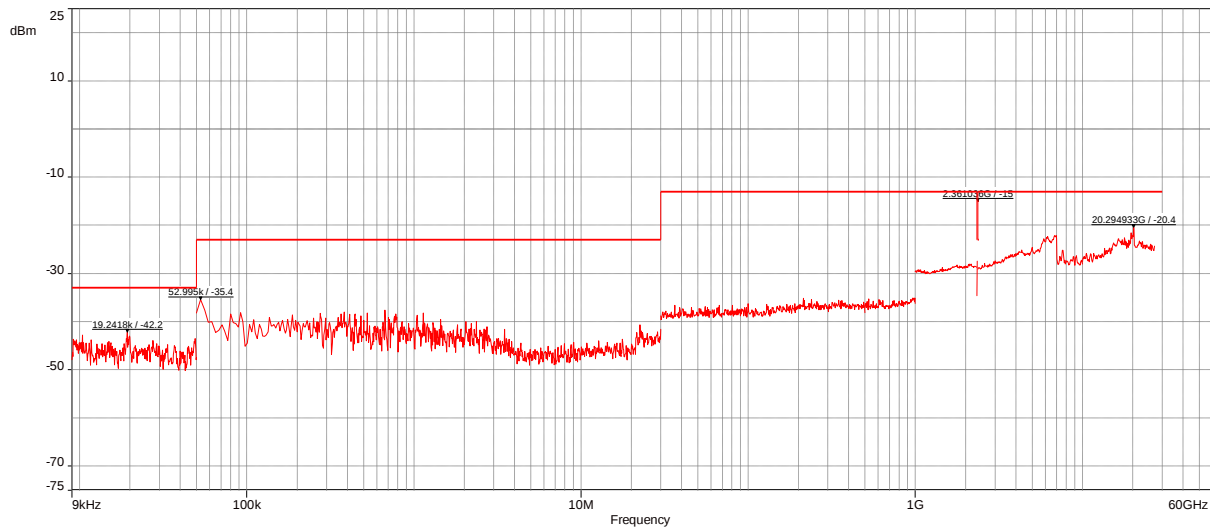


WCS 2300 AWGN mid part 2



BUREAU
VERITAS

Frequency Band = Band 30 WCS 2300, Test Frequency = high, Direction = RF downlink, Signal Type = Wideband



5.4.5 TEST EQUIPMENT USED

- Conducted