Choose Scandinavian trust

RADIO TEST REPORT

Report ID
REP019861

Project ID
PRJ0042471

Type of assessment:
Final product testing

Applicant:
EXFO Oy

Product:
Transportable Base Station System

Model:
FXm-Bmax

FCC ID:
2A7IGEXCBTSBMAX

IC Registration number:
28799-EXCBTSBMAX

Specifications:

- FCC 47 CFR Part 22, Subpart H
- FCC 47 CFR Part 24, Subpart E
- FCC 47 CFR Part 27, Subpart C
- FCC 47 CFR Part 90, Subpart S
- ISED RSS -119 Issue 12
- ISED RSS -130 Issue 2
- ISED RSS -132 Issue 4
- ISED RSS -133 Issue 6
- ISED RSS -139 Issue 4
- ISED RSS -199 Issue 4

Date of issue: April 3, 2024

Tarek Elkholy, EMC/RF Specialist
Tested by

Signature

Ketav Jani, EMC/RF Specialist
Tested by

Signature

Fahar A Sukkoor, EMC/RF Specialist
Reviewed by

Signature

Lab locations

Company name	Nemko Canada Inc.		
Facilities	*Ottawa site:* 303 River Road Ottawa, Ontario Canada K1V 1H2 Tel: +1 613 737 9680 Fax: +1 613 737 9691	*Montréal site:* 292 Labrosse Avenue Pointe-Claire, Québec Canada H9R 5L8 Tel: +1 514 694 2684 Fax: +1 514 694 3528	*Cambridge site:* 1-130 Saltsman Drive Cambridge, Ontario Canada N3E 0B2 Tel: +1 519 650 4811

Test site registration	**Organization**	**Recognition numbers and location**
	FCC/ISED	FCC: CA2040; IC: 2040A-4 (Ottawa/Almonte); FCC: CA2041; IC: 2040G-5 (Montreal); CA0101 (Cambridge)
Website	www.nemko.com	

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.
This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contained in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

Copyright notification

Table of Contents

Section 1 Report summary

1.1 Test specifications

FCC 47 CFR Part 22, Subpart H	Public Mobile Services - Cellular Radiotelephone Service
FCC 47 CFR Part 24, Subpart E	Personal Communications Services - Broadband PCS
FCC 47 CFR Part 27, Subpart C	Miscellaneous wireless communications services – Technical Standards
FCC 47 CFR Part 90, Subpart S	Private Land Mobile Radio Services - Regulations Governing Licensing and Use of Frequencies in the 806–824, 851–869, 896–901, and 935–940 MHz Bands
ISED RSS -119 Issue 12, Apr 2022	Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz
ISED RSS -130 Issue 2, Feb 2019	Equipment Operating in the Frequency Bands 617-652 MHz, 663-698 MHz, 698-756 MHz and 777-787 MHz
ISED RSS -132 Issue 4, Jan 2023	Cellular Systems Operating in the Bands 824-849 MHz and 869-894 MHz
ISED RSS -133 Issue 6, Jan 2018	2 GHz Personal Communications Services
ISED RSS -139 Issue 4, Sep 2022	Advanced Wireless Services Equipment Operating in the Bands 1710-1780 MHz and 2110-2200 MHz
ISED RSS -199 Issue 4, July 2023	Broadband Radio Service (BRS) Equipment Operating in the Band 2500-2690 MHz

1.2 Test methods

ANSI C63.26-2015	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services
FCC 47 CFR Part 2, Subpart J	Equipment authorization procedures
RSS-Gen Issue 5, March 2019	General Requirements for Compliance of Radio Apparatus

1.3 Exclusions

None

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was performed against all relevant requirements of the test standard except as noted in section 1.3 above. Results obtained indicate that the product under test complies In full with the requirements tested. The test results relate only to the items tested.

See "Summary of test results" for full details.

1.5 Test report revision history

Table 1.5-1: *Test report revision history*

Revision #	Date of issue	Details of changes made to test report
REP019861	April 3, 2024	Original report issued

Section 2 Engineering considerations

2.1 Modifications incorporated in the EUT for compliance

The following modifications were performed by Nemko Canada:
Upper part of the ventilation in one side of the EUT was covered by copper tape to pass the cabinet spurious emissions test for the LTE B41.

2.2 Technical judgment

As per the applicant's test plan the power limits of the Base stations and Repeaters are applied, not the power limits of the Mobile and Portable Stations.

2.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 3 Test conditions

3.1 Atmospheric conditions

Temperature	15 °C – 35 °C
Relative humidity	20 % – 75 %
Air pressure	86 kPa (860 mbar) – 106 kPa (1060 mbar)

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

3.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages ±5 %, for which the equipment was designed.

Section 4 Information provided by the applicant

4.1 Disclaimer

This section contains information provided by the applicant and has been utilized to support the test plan. Inaccurate information provided by the applicant can affect the validity of the results contained within this test report. Nemko accepts no responsibility for the information contained within this section and the impact it may have on the test plan and resulting measurements.

4.2 Applicant/Manufacturer

Applicant name	EXFO Oy
Applicant address	Elektroniikkatie 2, Oulu, FI-90590, Finland
Manufacturer name	EXFO Oy
Manufacturer address	Elektroniikkatie 2, Oulu, FI-90590, Finland

4.3 EUT information

Product	Transportable Base Station System
Model	FXm-Bmax
Serial number	6675-01-001
Power requirements	100-240 V_{AC}, 50/60 Hz
Description/theory of operation	The device is a Transportable Base Station System for wireless applications. It consists of control unit, transmitter units and amplifier unit.
Operational frequencies	CPU 4.1 GHz Oscillators 12 MHz 25 MHz 100 MHz
Software details	v1.3.19-1929addc

4.4 Technical information, GSM

Frequency band	B02, B05
Frequency Min (MHz)	B02, channel 516: 1931 MHz B05, channel 129: 869.4 MHz
Frequency Max (MHz)	B02, channel 806: 1989 MHz B05, channel 250: 893.6 MHz
FCC Rule Parts	B02, FCC 24E B05, FCC 22H
ISED Rule Parts	B02, RSS-133 B05, RSS-132
RF power Max (W), Conducted	37.2 W and (45.7 dBm)
Measured BW (kHz), 99% OBW	250.3 kHz
Type of modulation	8 PSK
Transmitter spurious, dBµV/m @ 3 m	35.9 dBµV/m at 72.2 MHz, Quasi Peak
Antenna information	Manufacturer: Huber+Suhner, MN: SENCITY® Rail MIMO Antenna, PN: 1399.17.0222, Gain: 5-7.5 dBi Manufacturer: Cojot, MN: WB525W, Gain: 1-7 dBi

4.5 Technical information, WCDMA

Frequency band	B02, B04, B05
Frequency Min (MHz)	B02, channel 9675: 1935 MHz B04, channel 1540: 2113 MHz B05, channel 4357: 871.4 MHz
Frequency Max (MHz)	B02, channel 9925: 1985 MHz B04, channel 1730: 2151 MHz B05, channel 4458: 891.6 MHz
FCC Rule Parts	B02, FCC 24E B04, FCC 27C B05, FCC 22H
ISED Rule Parts	B02, RSS-133 B04, RSS-139 B05, RSS-132
RF power Max (W), Conducted	33.9 W and (45.3 dBm)
Measured BW (MHz), 99% OBW	4.2 MHz
Type of modulation	QPSK
Transmitter spurious, dBµV/m @ 3 m	74.7 dBµV/m at 17.9 GHz, Average
Antenna information	Manufacturer: Huber+Suhner, MN: SENCITY® Rail MIMO Antenna, PN: 1399.17.0222, Gain: 5-7.5 dBi Manufacturer: Cojot, MN: WB525W, Gain: 1-7 dBi

4.6 Technical information, LTE

Frequency bandS	B02, B04, B05, B10, B12, B17, B25, B26_1, B26_2, B41, B66
Frequency Min (MHz)	B02, channel 630: 1933 MHz B04, channel 1980: 2113 MHz B05, channel 2425: 871.5 MHz B10, channel 4180: 2113 MHz B12, channel 5035: 731.5 MHz B17, channel 5755: 736.5 MHz B25, channel 8070: 1933 MHz B26_1, channel 8715: 861.5 MHz B26_2, channel 8815: 871.5 MHz B41*, channel 39680: 2499 MHz B66, channel 66466: 2113 MHz
Frequency Max (MHz)	B02, channel 1170: 1987 MHz B04, channel 2370: 2152 MHz B05, channel 2625: 891.5 MHz B10, channel 4720: 2167 MHz B12, channel 5155: 743.5 MHz B17, channel 5825: 743.5 MHz B25, channel 8660: 1992 MHz B26_1, channel 8765: 866.5 MHz B26_2, channel 9015: 891.5 MHz B41*, channel 41565: 2687 MHz B66, channel 67135: 2179.9 MHz
FCC Rule Parts	B02, FCC 24E B04, FCC 27C B05, FCC 22H B10, FCC 27C B12, FCC 27C B17, FCC 27C B25, FCC 24E B26_1, FCC 90S B26_2, FCC 22H B41, FCC 27C B66, FCC 27C
ISED Rule Parts	B02, RSS-133 B04, RSS-139 B05, RSS-132 B10, RSS-139 B12, RSS-130 B17, RSS-130 B25, RSS-133 B26_1, RSS-119 B26_2, RSS-132 B41, RSS-199 B66, RSS-139
RF power Max (W), Conducted	28.8 W and (44.6 dBm)
Measured BW (MHz), 99% OBW	4.5 MHz
Type of modulation	QPSK
Transmitter spurious, dBµV/m @ 3 m	61.8 dBµV/m at 7780.4 MHz, Average
Antenna information	Manufacturer: Huber+Suhner, MN: SENCITY® Rail MIMO Antenna, PN: 1399.17.0222, Gain: 5-7.5 dBi Manufacturer: Cojot, MN: WB525W, Gain: 1-7 dBi

Note: B41 is TDD, the rest of the bands are all FDD.

4.7 EUT setup details

Radio exercise details

Operating conditions	The EUT consists of 2G/3G/4G radio module, 5G NR radio module and control module. RF radio module RF output is feed to the RF amplifier input. A laptop loaded with control SW was used to control the RAT, modes, bandwidths, bands, channels number and power levels during the test.
Transmitter state	Continuous transmission
Receiver state	Standby mode

EUT setup configuration

Table 4.7-1: *EUT sub-assemblies*

Description	Brand name	Serial number, Part number, Model, Revision level
GSM/WCDMA/LTE radio module	EXFO	SN: 1370858, MN: FXm-XG, Rev. 4.1
5G NR radio module	EXFO	SN: 0000001, MN: FXm-NR, Rev. 1.0
Control unit	EXFO	SN: 1331134, MN: FXm-C, Rev. 3.0
AC/DC power adapter	TDK-Lambda	SN: 180900249, MN: DTM300PW240D1

Table 4.7-2: *EUT interface ports*

Description	Qty.
DC power input	1
Ethernet ports	3
USB-A port	1
External I/O port	1
RF Tx port	2
GPS ports	2
RF Rx ports	2
RF SMA ports	6
RF Pre out port	1

Table 4.7-3: *Support equipment*

Description	Brand name	Serial number, Part number, Model, Revision level
RF amplifier	EXFO	SN: 6675-01-001, MN: FXm-Bmax, Rev. 2.0
AC/DC adapter	Mean Well	SN: TC12016470, MN: RSP1500-24
Laptop	Lenovo	SN: R9-0WMCGA 19/11, MN: ThinkPad X390Yoga

Table 4.7-4: *Inter-connection cables*

Cable description	From	To	Length (m)
SMB RF cable	GSM/WCDMA/LTE radio module	RF amplifier Tx 1	0.4
SMB RF cable	5G NR radio module	RF amplifier Tx 2	0.4
DC power input	Control unit	AC/DC power adapter	1
Ethernet control cable	Control unit Eth-1 port	Laptop	3
Ethernet control cable	Control unit Eth-2 port	RF amplifier ethernet port	3

EUT test configuration continued

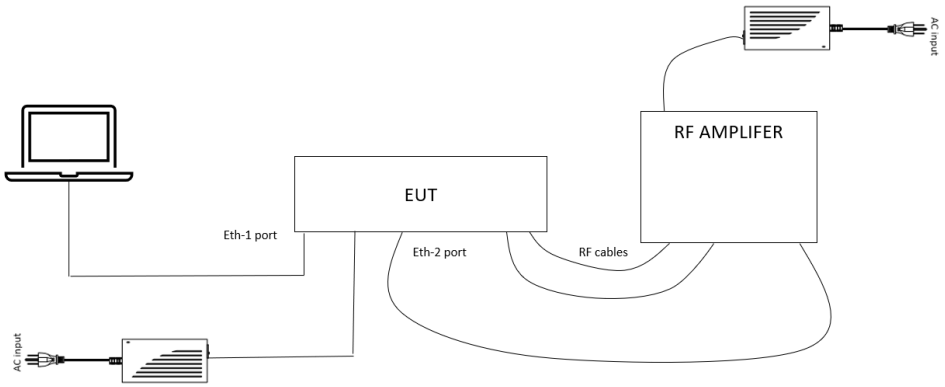

Figure 4.7-1: *Block diagram*

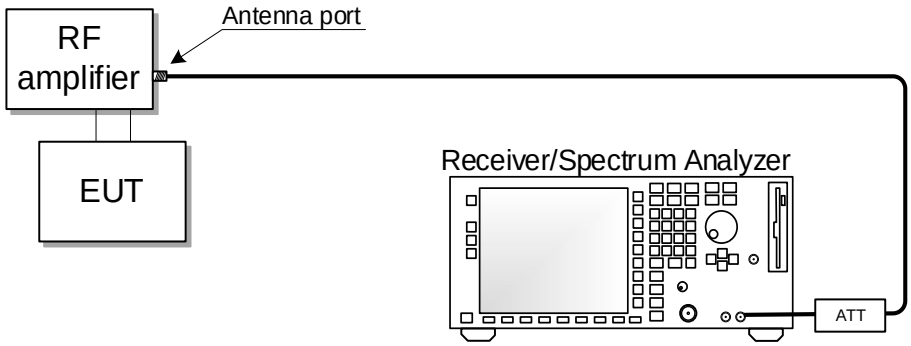

Figure 4.7-2: *Antenna port testing block diagram*

Section 5 Summary of test results

5.1 Testing location

Test location (s)	Cambridge

5.2 Testing period

Test start date	November 14, 2023	Test end date	November 30, 2023

5.3 Sample information

Receipt date	November 8, 2023	Nemko sample ID number(s)	PRJ00424710001, PRJ00424710002, PRJ00424710003, PRJ00424710004

5.4 FCC Part 2, 22, 24, 27 and 90 test requirements results

Table 5.4-1: *FCC requirements results*

Part	Test description	Verdict
§2.1049	Occupied bandwidth	Pass
§22.913	Effective radiated power limits	Pass
§24.232	Power and antenna height limits	Pass
§27.50	Power limits and duty cycle	Pass
§90.635	Limitations on power and antenna height	Pass
§2.1047	Modulation Characteristics	Pass
§22.917	Emission limitations for cellular equipment	Pass
§24.238	Emission limitations for Broadband PCS equipment	Pass
§27.53	Emission limits	Pass
§90.691	Emission mask requirements for EA-based systems	Pass
§2.1053	Measurements required: Field strength of spurious radiation	Pass
§2.1055	Measurements required: Frequency stability	Pass

Notes:
- GSM employs 8PSK modulation, signal bandwidth of 200 kHz.
- WCDMA employs QPSK modulation, signal bandwidth of 5 MHz.
- LTE employs QPSK modulation, signal bandwidth of 5 MHz.

5.5 ISED RSS-119, RSS-130, RSS-133, RSS-139, RSS-199 and RSS-Gen test requirements results

Table 5.5-1: *ISED requirements results*

Clause	Test description	Verdict
RSS-Gen, 6.7	Occupied bandwidth	Pass
RSS-119, 5.4	Transmitter Output Power	Pass
RSS-130, 4.6	Transmitter output power and effective radiated power (e.r.p.)	Pass
RSS-132, 5.4	Transmitter output power and equivalent radiated power	Pass
RSS-133, 6.4	Transmitter Output Power and Equivalent Isotropically Radiated Power	Pass
RSS-139, 5.5	Transmitter output power	Pass
RSS-199, 5.5	Transmitter power	Pass
RSS-119, 5.2	Types of Modulation	Pass
RSS-119, 5.8	Transmitter Unwanted Emissions	Pass
RSS-130, 4.7	Transmitter unwanted emissions	Pass
RSS-132, 5.5	Transmitter unwanted emissions	Pass
RSS-133, 6.5	Transmitter Unwanted Emissions	Pass
RSS-139, 5.6	Unwanted emission limits	Pass
RSS-199, 5.6	Unwanted emissions limits	Pass
RSS-Gen, 6.11	Transmitter Frequency Stability	Pass

Notes:
- GSM employs 8PSK modulation, signal bandwidth of 200 kHz.
- WCDMA employs QPSK modulation, signal bandwidth of 5 MHz.
- LTE employs QPSK modulation, signal bandwidth of 5 MHz.

Section 6 Test equipment

6.1 Test equipment list

Table 6.1-1: *Equipment list*

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
3 m EMI test chamber	TDK	SAC-3	FA003012	1 year	January 31, 2024
Flush mount turntable	SUNAR	FM2022	FA003006	—	NCR
Controller	SUNAR	SC110V	FA002976	—	NCR
Antenna mast	SUNAR	TLT2	FA003007	—	NCR
Receiver/spectrum analyzer	Rohde & Schwarz	ESR26	FA002969	1 year	February 10, 2024
Bilog antenna (30–2000 MHz)	SUNAR	JB1	FA003010	1 year	July 14, 2024
Horn antenna (1–18 GHz)	ETS Lindgren	3117	FA002911	1 year	May 31, 2024
Preamp (1–18 GHz)	ETS Lindgren	124334	FA002956	1 year	March 27, 2024
Horn antenna (18–40 GHz)	EMCO	3116B	FA002948	1 year	March 27, 2024
Preamp 18-40 GHz	None	PA1840	FA003323	1 year	March 27, 2024
50 Ω coax cable	Huber + Suhner	None	FA003047	1 year	July 27, 2024
50 Ω coax cable	Huber + Suhner	None	FA003402	1 year	July 27, 2024
Vector signal generator	Rohde & Schwarz	SMW200A	FA002970	1 Year	December 31, 2023
Spectrum analyzer	Rohde & Schwarz	FSW43	FA002971	1 year	December 31, 2023
Temperature Chamber	Espec	EPX-4H	FA003033	1 year	March 8, 2024

Notes: NCR - no calibration required

Table 6.1-2: *Automation software details*

Test description	Manufacturer of Software	Details
Software for Radio/EMC Measurements	Rohde & Schwarz	EMC32, Software for EMC Measurements, Version 10.60.00

Table 6.1-3: *Measurement uncertainty calculations based on equipment list*

Measurement	Measurement uncertainty, ±dB
Radiated spurious emissions (30 MHz to 1 GHz)	4.27
Radiated spurious emissions (1 GHz to 6 GHz)	4.74
Radiated spurious emissions (6 GHz to 18 GHz)	5.04
Radiated spurious emissions (18 GHz to 26 GHz)	4.47
Radiated spurious emissions (26 GHz to 40 GHz)	4.78
RF Output power measurement using Spectrum Analyzer	0.71
Conducted spurious emissions	0.90
Other antenna port measurements	0.81

Notes: UKAS Lab 34, TIA-603 and ETSI TR 100 028-1&2 have been used as guidance for measurement uncertainty reasonable estimations with regards to previous experience and validation of data. Nemko Canada Inc. follows these test methods in order to satisfy ISO/IEC 17025 requirements for estimation of uncertainty of measurement for wireless products. Measurement uncertainty calculations assume a coverage factor of K = 2 with 95% certainty.

Section 7 Testing data

7.1 Maximum output power at RF antenna connector and Occupied bandwidth

References, definitions and limits

FCC §22.913:

(a) (1) Base station and repeaters :500 Watts (57 dBm)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

FCC §24.232:

Base station:1640 Watts/MHz (62.1 dBm/MHz)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

FCC §27.50:

Power limits and duty cycle.

(d) The following power and antenna height requirements apply to stations transmitting in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz and 2180–2200 MHz bands:

(1) The power of each fixed or base station transmitting in the 1995–2000 MHz, 2110–2155 MHz, 2155–2180 MHz or 2180–2200 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:

(i) An equivalent isotropically radiated power (EIRP) of 3280 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 3280 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(2) The power of each fixed or base station transmitting in the 1995–2000 MHz, the 2110–2155 MHz 2155–2180 MHz band, or 2180–2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(i) An equivalent isotropically radiated power (EIRP) of 1640 watts when transmitting with an emission bandwidth of 1 MHz or less;

(ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(3) A licensee operating a base or fixed station in the 2110–2155 MHz band utilizing a power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must coordinate such operations in advance with all Government and non-Government satellite entities in the 2025–2110 MHz band. A licensee operating a base or fixed station in the 2110–2180 MHz band utilizing power greater than 1640 watts EIRP and greater than 1640 watts/MHz EIRP must be coordinated in advance with the following licensees authorized to operate within 120 kilometers (75 miles) of the base or fixed station operating in this band: All Broadband Radio Service (BRS) licensees authorized under this part in the 2155–2160 MHz band and all advanced wireless services (AWS) licensees authorized to operate on adjacent frequency blocks in the 2110–2180 MHz band.

(5) Equipment employed must be authorized in accordance with the provisions of §24.51. 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 (d)(6) 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.

(6) 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, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

FCC §90.635:

(a) Base station:1000 Watts (60 dBm)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

References, definitions and limits, continued

RSS-119, Clause 5.4:
Base station:110 Watts (50.4 dBm)

RSS-130, Clause 4.6:
RSS-139, Clause 5.5:
RSS-199, Clause 4.4:

Base stations and fixed stations:
2500-2690 MHz: 1640 Watts (62.1 dBm)
746-757 MHz and 776-788 MHz: 1000 Watts/MHz (60 dBm/MHz)
600 MHz and 698-746 MHz: 1000 Watts (60 dBm)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

RSS-132, Clause 5.4:

Base station and Repeaters e.i.r.p.: 820 Watts/5 MHz (59.1 dBm/5 MHz)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

RSS-133, Clause 6.4:

Base station:1640 Watts/MHz (62.1 dBm/MHz)
Maximum Peak-Average ratio, 0.1% (dB) must not exceed 13 dB.

Bandwidth

FCC §2.1049: Measurements required: 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:

RSS-Gen, Clause 6.7:
Occupied bandwidth (or 99% emission bandwidth) and x dB bandwidth
The occupied bandwidth or the “99% emission bandwidth” is defined as the frequency range between two points, one above and the other below the carrier frequency, within which 99% of the total transmitted power of the fundamental transmitted emission is contained. The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs.

Test summary

Verdict	Pass		
Test date	November 14, 2023	Temperature	21 °C
Tested by	Tarek Elkholy	Air pressure	974 mbar
Test location	Cambridge	Relative humidity	33 %

Observations, settings and special notes

- Output power was measured utilizing CCDF method per ANSI C63.26 Paragraph 5.2.3.4, Analyzing bandwidth is equal or larger than the signal bandwidth.
- PSD was measured using method described in per ANSI C63.26 Paragraph 5.2

Spectrum analyzer settings for PSD, the test was performed as per ANSI C63.26, subclause 5.2

Detector mode	RMS
Resolution bandwidth	1 MHz
Video bandwidth	>RBW
Trace mode	Averaging/Max Hold
Measurement time	Auto

Occupied bandwidth and Emission bandwidth tests were performed as per ANSI C63.26, subclause 5.4
Spectrum analyser settings:

Resolution bandwidth	1–5% of OBW
Video bandwidth	≥3 × RBW
Frequency span	1.5 × OBW
Detector mode	Peak
Trace mode	Max Hold

Test data

GSM									
Band	**Channel**	**Tx freq. (MHz)**	**Power level setting**	**Average power (dBm)**	**Peak power (dBm)**	**Peak-Average ratio 0.1% (dB)**	**Average power (dBm/MHz)**	**99% OBW (kHz)**	**26 dB EBW (kHz)**
B02	516	1931	44	44.7	45.3	0.6	43.7	248.2	311.7
	517	1931.2	44	45.1	45.7	0.6	44.8		
	540	1935.8	44	45.1	45.7	0.6			
	661	1960	44	45.2	45.7	0.6	44.8	244.7	311.7
	781	1984	44	44.8	45.4	0.6			
	805	1988.8	44	44.9	45.5	0.6	44.7		
	806	1989	44	44.3	44.6	0.4	44.6	249.6	315.7
B05	129	869.4	44	45.5	46.1	0.6	44.2	247.7	311.7
	155	874.6	44	44.0	44.6	0.6	42.7		
	189	881.4	44	45.7	46.2	0.6	44.4	249.2	314.7
	225	888.6	44	45.7	46.3	0.6	44.3		
	250	893.6	44	45.2	45.7	0.6	44.0	250.3	315.7

Test data, continued

WCDMA									
Band	**Channel**	**Tx freq. (MHz)**	**Power level setting**	**Average power (dBm)**	**Peak power (dBm)**	**Peak-Average ratio 0.1% (dB)**	**Average power (dBm/MHz)**	**99% OBW (MHz)**	**26 dB EBW (MHz)**
B02	9675	1935	40	44.1	53.0	8.0	44.2	4.2	4.7
	9680	1936	40	40.8	51.0	8.5	44.7		
	9690	1938	40	40.9	50.5	8.5			
	9700	1940	44	44.6	53.2	7.7			
	9800	1960	44	45.1	53.0	7.3	48.2	4.2	4.7
	9895	1979	44	44.8	53.8	8.1			
	9900	1980	44	44.9	53.8	8.0			
	9910	1982	42	42.7	52.0	8.1			
	9920	1984	40	41.1	51.4	9.0	43.5		
	9925	1985	40	40.4	50.9	8.9	44.7	4.2	4.7
B04	1540	2113	40	41.2	52.3	9.2	44.1	4.2	4.7
	1550	2115	40	40.7	52.2	9.1	42.8		
	1560	2117	44	44.2	54.5	8.9			
	1565	2118	44	44.6	54.9	9.1			
	1570	2119	44	45.2	55.1	8.8			
	1638	2132.6	44	44.0	54.6	9.2	48.4	4.2	4.7
	1705	2146	44	44.8	55.0	9.1			
	1710	2147	44	45.0	55.2	9.1			
	1715	2148	44	45.0	55.0	9.0			
	1720	2149	44	45.2	55.2	8.9			
	1725	2150	41	41.2	53.2	9.7	44.6		
	1730	2151	41	41.2	52.0	9.2	46.3	4.1	4.7
B05	4357	871.4	42	43.4	54.5	9.1	49.4	4.2	4.7
	4360	872	44	45.0	55.6	9.2	48.0		
	4370	874	44	44.3	55.3	9.0			
	4385	877	44	44.3	55.2	9.0			
	4408	881.6	44	45.0	56.0	9.1	48.0	4.1	4.7
	4430	886	44	45.3	55.9	9.0			
	4446	889	44	44.5	55.2	9.0			
	4455	891	44	44.8	55.4	9.1	48.4		
	4458	891.6	41	41.6	52.5	9.1	45.4	4.2	4.7

Test data, continued

LTE									
Band	**Channel**	**Tx freq. (MHz)**	**Power level setting**	**Average power (dBm)**	**Peak power (dBm)**	**Peak-Average ratio 0.1% (dB)**	**Average power (dBm/MHz)**	**99% OBW (MHz)**	**26 dB EBW (MHz)**
B02	630	1933	38	38.1	47.1	7.8	40.9	4.5	5.0
	640	1934	38	38.4	47.1	7.7	40.3		
	650	1935	38	38.6	48.0	7.9			
	660	1936	38	38.4	47.6	8.0			
	670	1937	38	38.4	47.1	7.7			
	680	1938	44	43.7	52.2	7.6			
	690	1939	44	44.4	52.8	7.5			
	900	1960	44	44.6	53.2	7.6	45.2	4.5	5.0
	1100	1980	44	43.9	52.5	7.7			
	1110	1981	44	43.2	52.4	7.8			
	1130	1983	44	43.4	52.6	7.8			
	1150	1985	40	40.5	49.8	8.0			
	1160	1986	40	39.2	48.2	7.6	40.7		
	1170	1987	40	38.9	48.1	7.8	41.5	4.5	5.0
B04	1980	2113	40	39.1	49.0	7.9	41.4	4.5	5.0
	1990	2114	40	39.5	49.6	8.0	41.3		
	2000	2115	40	39.6	49.3	8.0			
	2010	2116	40	39.1	50.5	8.1			
	2020	2117	44	43.6	53.8	8.1			
	2030	2118	44	43.7	53.2	7.9			
	2050	2120	44	43.8	53.9	8.0			
	2175	2132.5	44	43.7	53.0	7.9	45.1	4.5	5.0
	2325	2147.5	44	43.2	52.6	7.8			
	2340	2149	44	43.4	53.1	7.9			
	2350	2150	40	40.5	50.1	7.9			
	2360	2151	40	39.7	48.6	7.8	40.0		
	2370	2152	40	39.5	49.0	7.9	42.4	4.5	5.0
B05	2425	871.5	40	39.9	49.2	7.9	41.5	4.5	5.0
	2430	872	44	44.6	53.6	7.7	45.9		
	2451	874.1	44	43.6	53.2	7.8			
	2455	874.5	44	43.4	52.9	7.9			
	2525	881.5	44	43.4	52.7	7.9	45.4	4.5	5.0
	2599	888.9	44	42.8	52.3	7.8			
	2600	889	44	43.0	52.1	7.8			
	2620	891	44	43.0	52.0	7.8	45.9		
	2625	891.5	40	39.6	48.8	7.9	41.0	4.5	5.0

Test data, continued

LTE									
Band	**Channel**	**Tx freq. (MHz)**	**Power level setting**	**Average power (dBm)**	**Peak power (dBm)**	**Peak-Average ratio 0.1% (dB)**	**Average power (dBm/MHz)**	**99% OBW (MHz)**	**26 dB EBW (MHz)**
B10	4180	2113	40	38.9	48.2	7.8	40.7	4.5	5.0
	4200	2115	40	39.5	48.6	7.9	40.2		
	4220	2117	40	39.0	48.2	7.9			
	4230	2118	44	43.7	53.3	8.0			
	4240	2119	44	43.4	52.5	7.9			
	4450	2140	44	43.5	53.0	7.9	45.5	4.5	5.0
	4660	2161	44	43.6	52.8	7.9			
	4670	2162	44	43.0	52.5	7.9			
	4680	2163	40	39.7	49.1	8.0			
	4700	2165	40	39.3	48.2	7.9	40.2		
	4720	2167	40	39.7	49.0	7.9	41.0	4.5	5.0
B12	5035	731.5	40	37.1	46.5	7.9	37.8	4.5	5.0
	5060	734	44	41.4	51.3	8.0	41.6		
	5070	735	44	40.8	50.5	8.4			
	5095	737.5	44	41.8	51.0	7.8	42.5	4.5	5.0
	5100	738	44	41.2	51.1	8.0			
	5120	740	44	41.5	51.1	8.0			
	5140	742	44	41.3	50.6	7.8			
	5150	743	40	36.3	46.8	8.0	37.2		
	5155	743.5	40	37.3	47.4	8.0	40.0	4.5	5.0
B17	5755	736.5	40	36.3	46.9	7.9	37.0	4.5	5.0
	5760	737	44	40.3	49.4	7.8	42.9		
	5790	740	44	41.2	50.2	7.8	41.5	4.5	5.0
	5799	740.9	44	41.0	50.8	8.0	41.7		
	5825	743.5	40	37.4	46.7	7.8	39.1	4.5	5.0
B25	8070	1933	38	37.8	47.1	7.8	39.9	4.5	5.0
	8090	1935	38	38.6	48.0	7.9	39.6		
	8110	1937	40	39.5	48.1	7.7			
	8130	1939	44	44.1	52.1	7.4			
	8365	1962.5	44	44.6	53.4	7.7	44.9	4.5	5.0
	8600	19860	44	43.0	51.8	7.7			
	8620	1988	44	42.9	52.3	7.8			
	8640	1990	38	37.9	47.2	7.7	39.2		
	8660	1992	38	37.7	46.5	7.7	39.1	4.5	5.0

Test data, continued

LTE									
Band	**Channel**	**Tx freq. (MHz)**	**Power level setting**	**Average power (dBm)**	**Peak power (dBm)**	**Peak-Average ratio 0.1% (dB)**	**Average power (dBm/MHz)**	**99% OBW (MHz)**	**26 dB EBW (MHz)**
B26_1	8715	861.5	40	39.3	48.5	7.8	40.3	4.5	4.9
	8720	862	40	39.0	48.9	7.9	39.5		
	8730	863	44	43.3	52.5	7.8			
	8740	864	44	43.4	53.3	7.9	44.8	4.5	5.0
	8750	865	44	43.5	53.6	8.0			
	8760	866	40	39.1	49.0	7.9	41.9		
	8765	866.5	40	39.4	48.9	7.9	39.5	4.5	5.0
B26_2	8815	871.5	40	40.2	49.4	7.8	41.2	4.5	5.0
	8820	872	40	39.4	49.2	7.8	42.1		
	8840	874	44	43.5	53.2	8.0			
	8914	881.4	44	43.9	53.1	7.9	44.6	4.5	5.0
	8989	888.9	44	43.6	52.8	7.8			
	9010	891	40	39.4	49.0	7.7	40.2		
	9015	891.5	40	39.8	49.5	7.9	41.9	4.5	5.0
B41	39680	2499	36	33.2	44.1	9.5	32.8	4.5	5.0
	39700	2501	36	40.9	50.9	9.3	44.8		
	39720	2503	36	31.5	41.8	9.2			
	39730	2504	44	42.7	51.1	8.0			
	40620	2593	44	41.7	50.4	8.3	44.5	4.5	5.0
	41530	2684	40	39.0	48.0	8.4			
	41540	2685	32	29.3	38.6	8.4	31.9		
	41565	2687.5	32	29.4	38.6	8.4	31.9	4.5	5.1
B66	66466	2113	40	40.0	48.9	7.8	41.6	4.5	5.0
	66486	2115	40	39.3	48.6	8.0	41.4		
	66506	2117	44	43.6	53.2	7.9			
	66526	2119	44	43.6	53.0	7.9			
	66546	2121	44	43.6	53.3	7.9			
	66886	2155	44	43.3	52.3	7.8	44.4	4.5	5.0
	67135	2179.9	44	43.7	53.0	7.8	44.1	4.5	5.0

Test data, CCDF

Figure 7.1-1: *CCDF, GSM, B02, CH516*

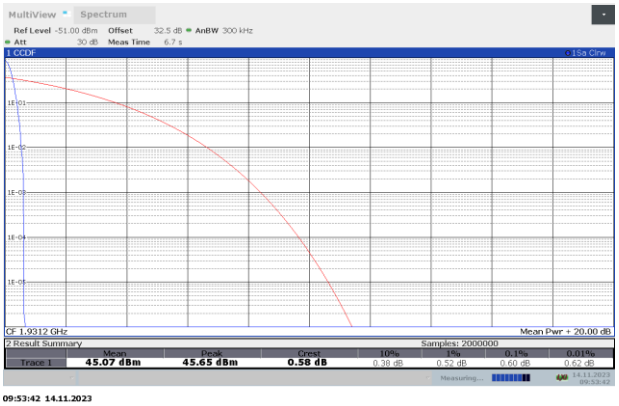

Figure 7.1-2: *CCDF, GSM, B02, CH517*

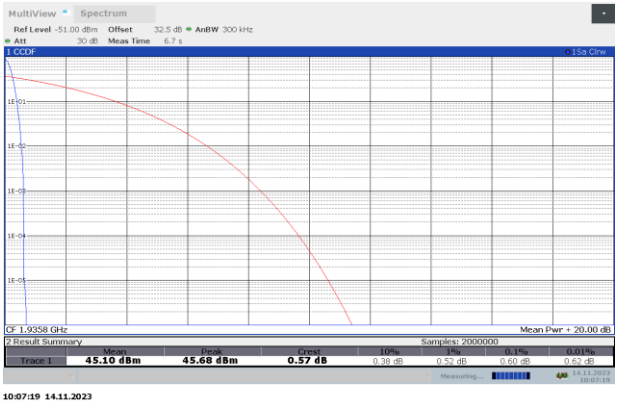

Figure 7.1-3: *CCDF, GSM, B02, CH540*

Figure 7.1-4: *CCDF, GSM, B02, CH661*

Figure 7.1-5: *CCDF, GSM, B02, CH781*

Figure 7.1-6: *CCDF, GSM, B02, CH805*

Test data, CCDF, continued

Figure 7.1-7: *CCDF, GSM, B02, CH806*

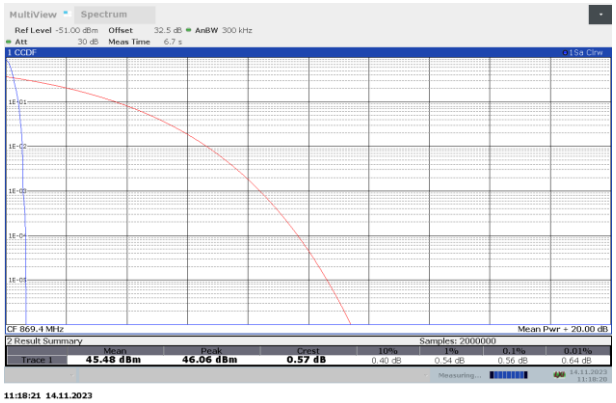

Figure 7.1-8: *CCDF, GSM, B05, CH129*

Figure 7.1-9: *CCDF, GSM, B05, CH155*

Figure 7.1-10: *CCDF, GSM, B05, CH189*

Figure 7.1-11: *CCDF, GSM, B05, CH225*

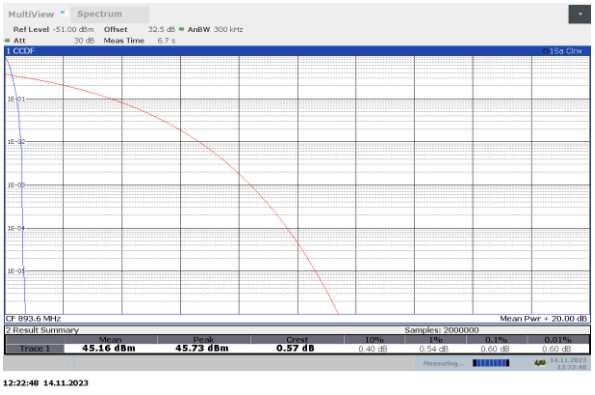

Figure 7.1-12: *CCDF, GSM, B05, CH250*

Test data, CCDF, continued

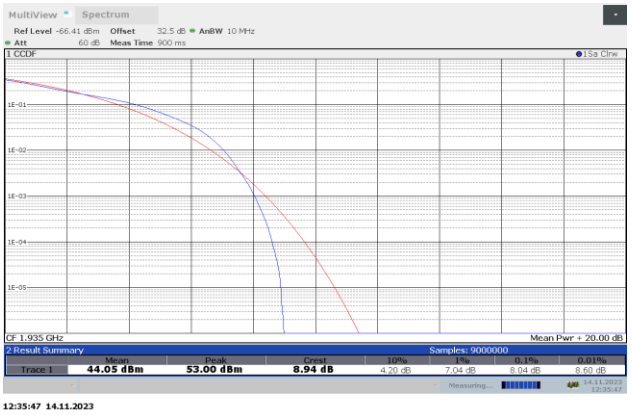

Figure 7.1-13: *CCDF, WCDMA, B02, CH9675*

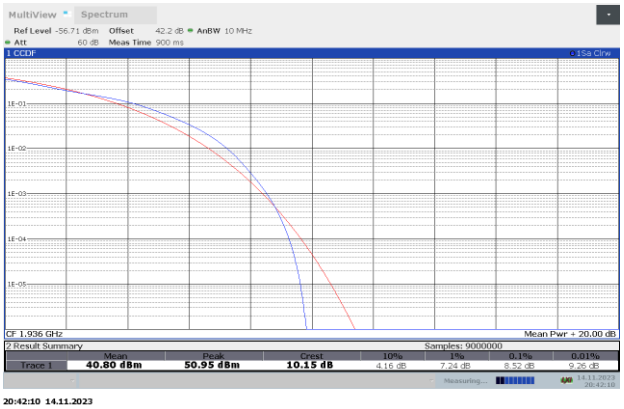

Figure 7.1-14: *CCDF, WCDMA, B02, CH9680*

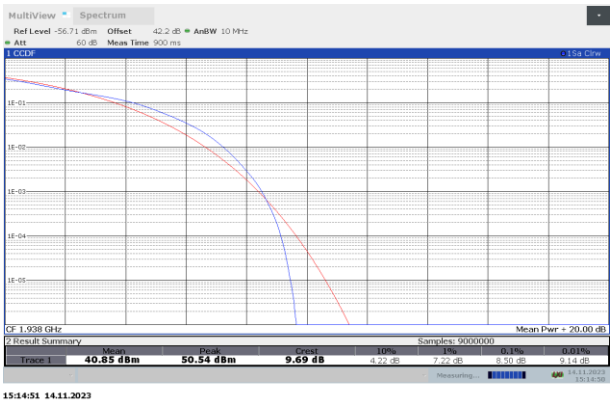

Figure 7.1-15: *CCDF, WCDMA, B02, CH9690*

Figure 7.1-16: *CCDF, WCDMA, B02, CH9700*

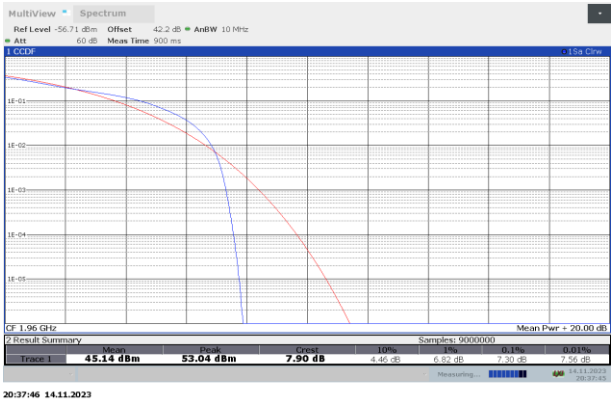

Figure 7.1-17: *CCDF, WCDMA, B02, CH9800*

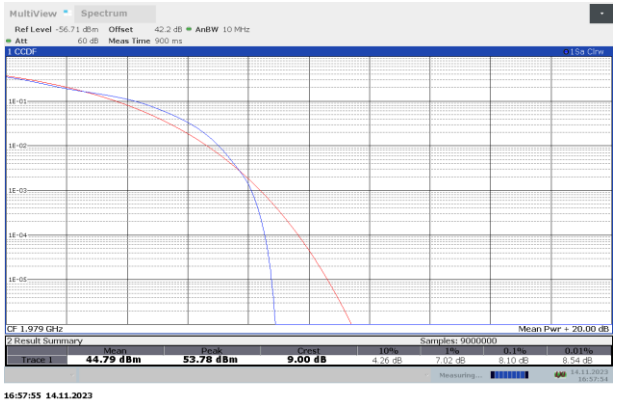

Figure 7.1-18: *CCDF, WCDMA, B02, CH9895*

Test data, CCDF, continued

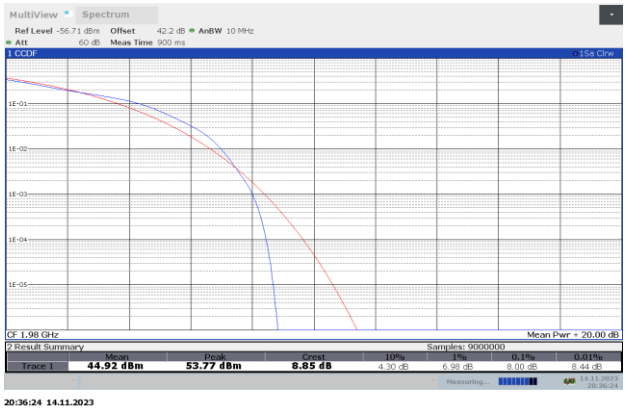

Figure 7.1-19: *CCDF, WCDMA, B02, CH9900*

Figure 7.1-20: *CCDF, WCDMA, B02, CH9910*

Figure 7.1-21: *CCDF, WCDMA, B02, CH9920*

Figure 7.1-22: *CCDF, WCDMA, B02, CH9925*

Figure 7.1-23: *CCDF, WCDMA, B04, CH1540*

Figure 7.1-24: *CCDF, WCDMA, B04, CH1550*

Test data, CCDF, continued

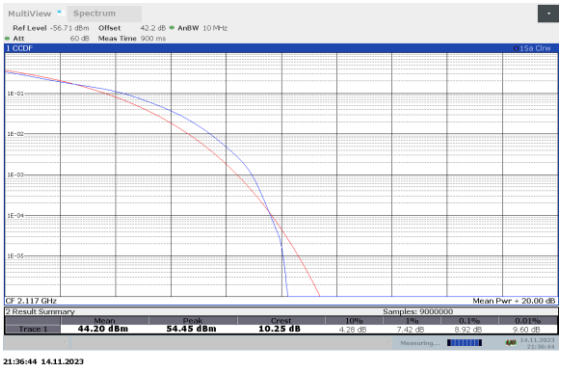

Figure 7.1-25: *CCDF, WCDMA, B04, CH1560*

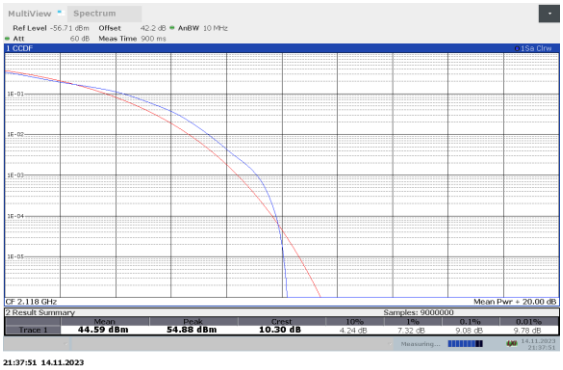

Figure 7.1-26: *CCDF, WCDMA, B04, CH1565*

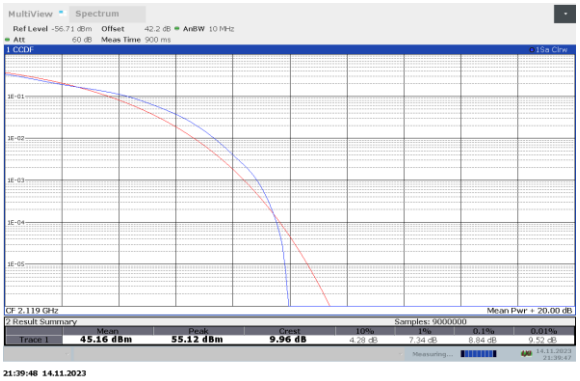

Figure 7.1-27: *CCDF, WCDMA, B04, CH1570*

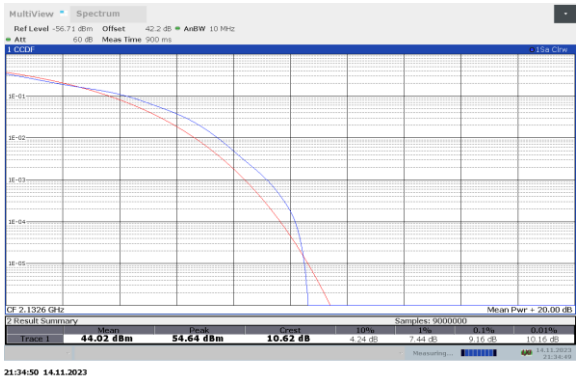

Figure 7.1-28: *CCDF, WCDMA, B04, CH1638*

Figure 7.1-29: *CCDF, WCDMA, B04, CH1705*

Figure 7.1-30: *CCDF, WCDMA, B04, CH1710*

Test data, CCDF, continued

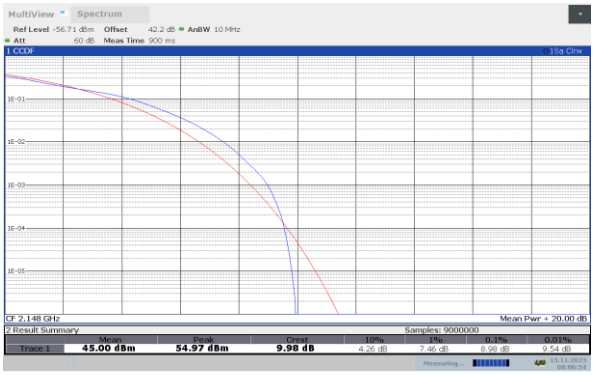

Figure 7.1-31: *CCDF, WCDMA, B04, CH1715*

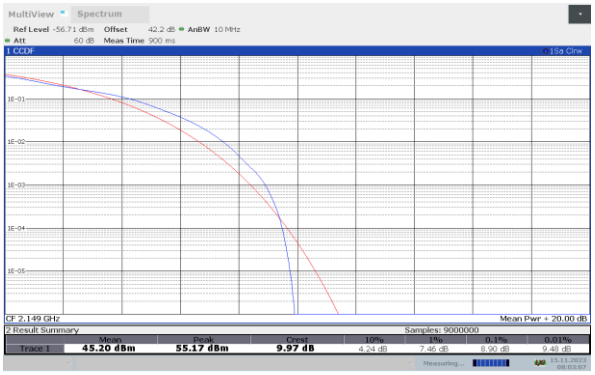

Figure 7.1-32: *CCDF, WCDMA, B04, CH1720*

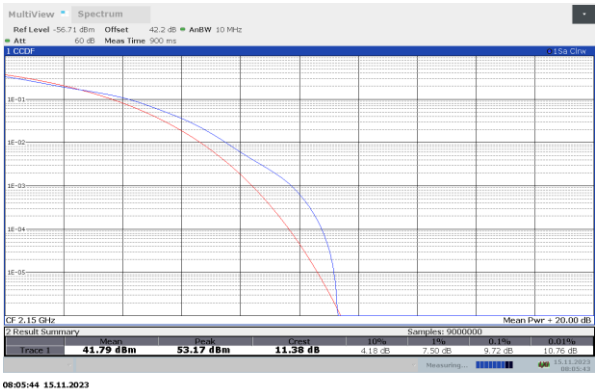

Figure 7.1-33: *CCDF, WCDMA, B04, CH1725*

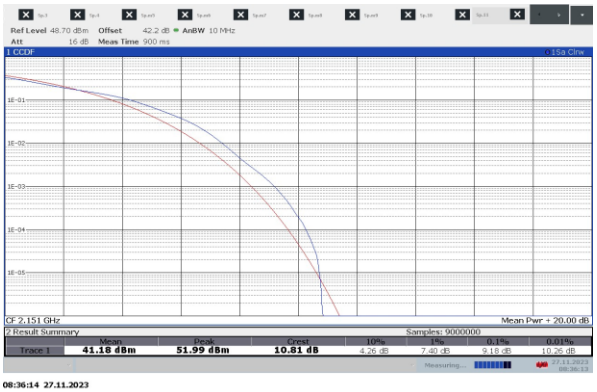

Figure 7.1-34: *CCDF, WCDMA, B04, CH1730*

Figure 7.1-35: *CCDF, WCDMA, B05, CH4357*

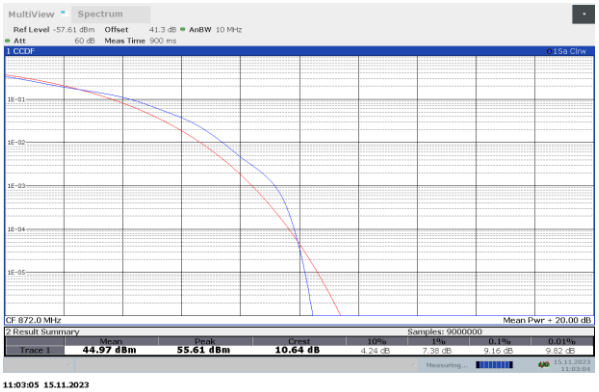

Figure 7.1-36: *CCDF, WCDMA, B05, CH4360*

Test data, CCDF, continued

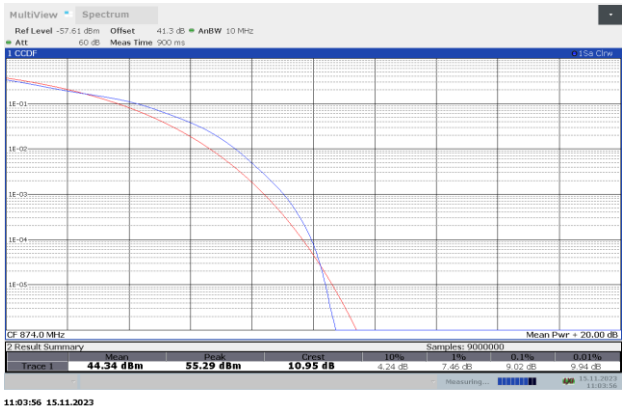

Figure 7.1-37: *CCDF, WCDMA, B05, CH4370*

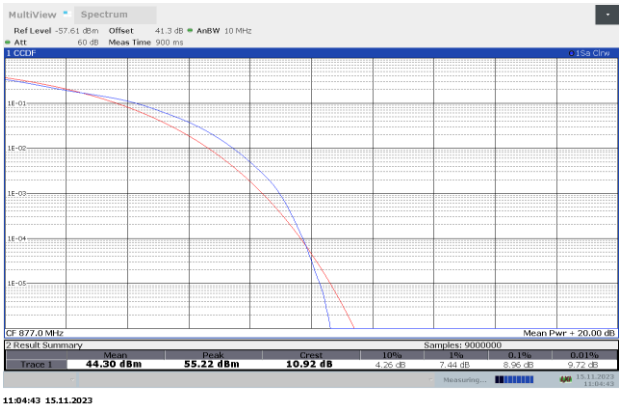

Figure 7.1-38: *CCDF, WCDMA, B05, CH4385*

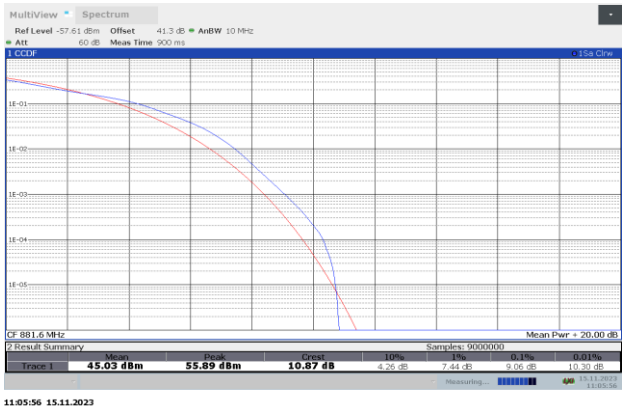

Figure 7.1-39: *CCDF, WCDMA, B05, CH4408*

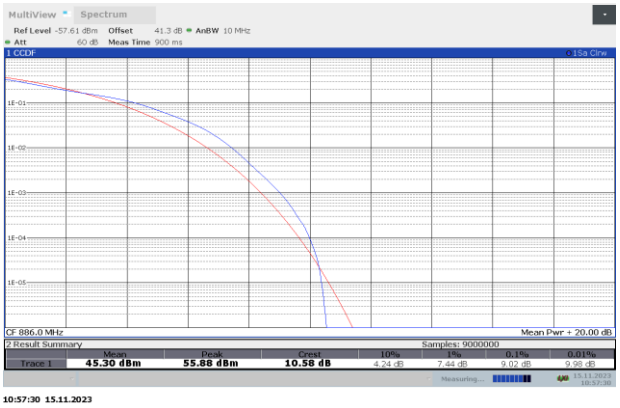

Figure 7.1-40: *CCDF, WCDMA, B05, CH4430*

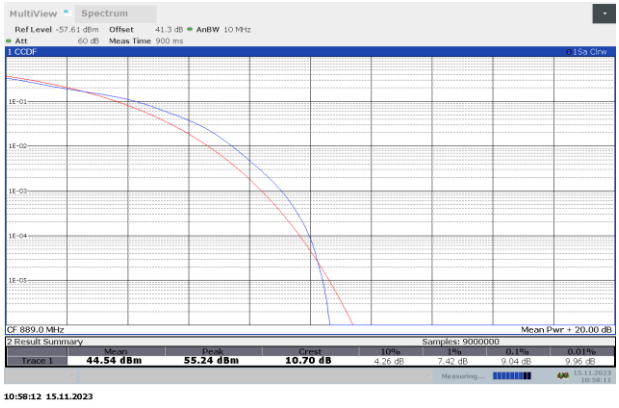

Figure 7.1-41: *CCDF, WCDMA, B05, CH4445*

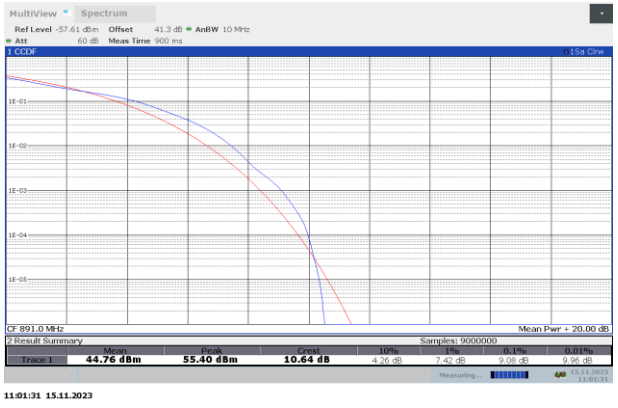

Figure 7.1-42: *CCDF, WCDMA, B05, CH4455*

Test data, CCDF, continued

Figure 7.1-43: *CCDF, WCDMA, B05, CH4458*

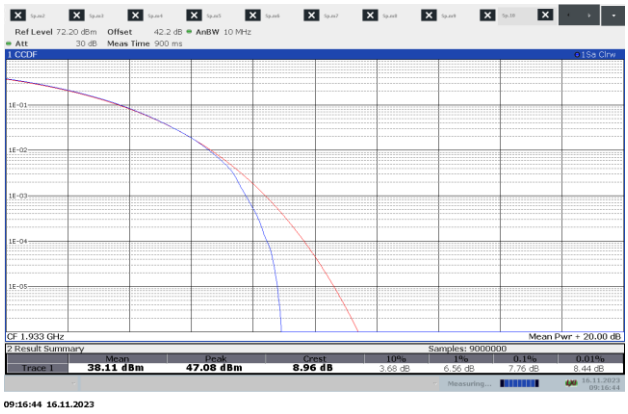

Figure 7.1-44: *CCDF, LTE, B02, CH630*

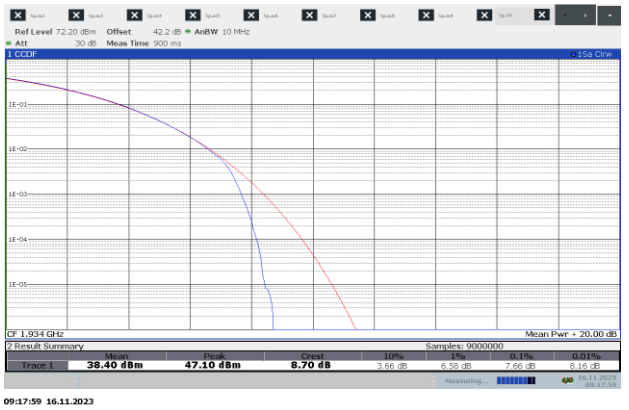

Figure 7.1-45: *CCDF, LTE, B02, CH640*

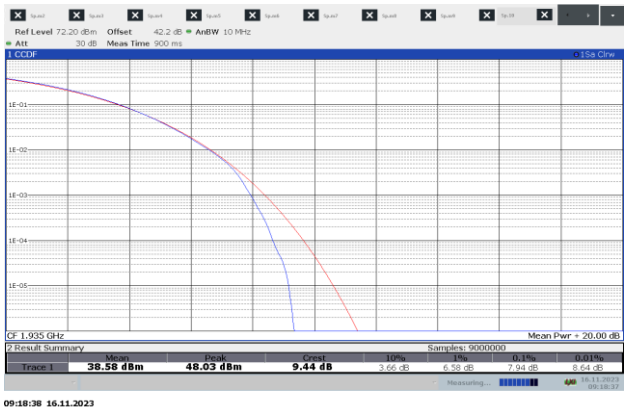

Figure 7.1-46: *CCDF, LTE, B02, CH650*

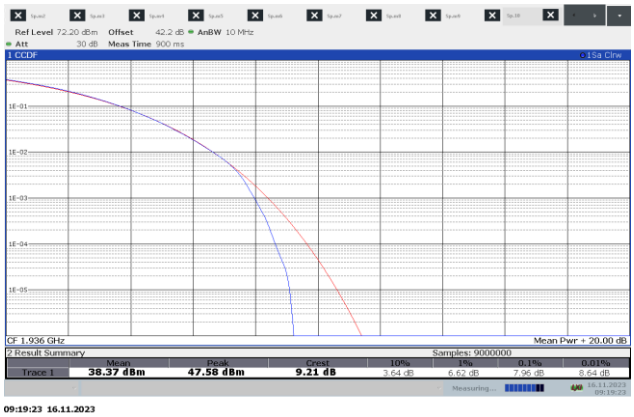

Figure 7.1-47: *CCDF, LTE, B02, CH660*

Figure 7.1-48: *CCDF, LTE, B02, CH670*

Test data, CCDF, continued

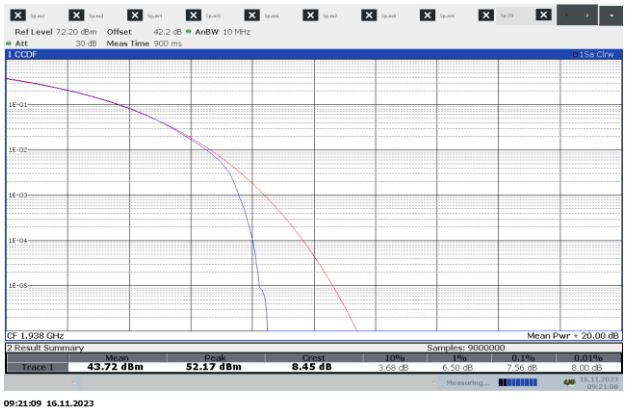

Figure 7.1-49: *CCDF, LTE, B02, CH680*

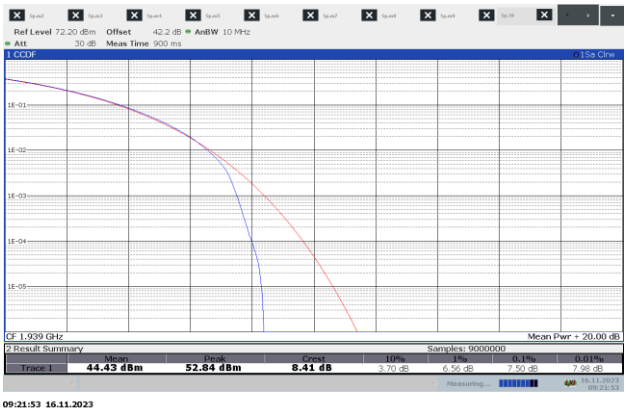

Figure 7.1-50: *CCDF, LTE, B02, CH690*

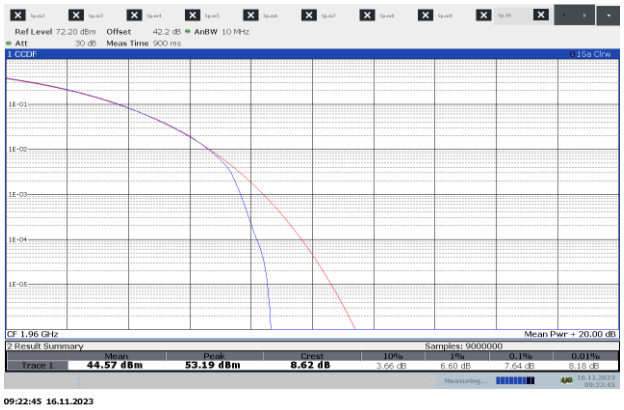

Figure 7.1-51: *CCDF, LTE, B02, CH900*

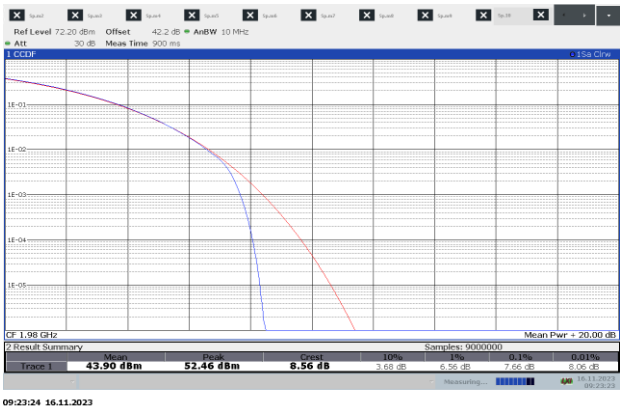

Figure 7.1-52: *CCDF, LTE, B02, CH1100*

Figure 7.1-53: *CCDF, LTE, B02, CH1110*

Figure 7.1-54: *CCDF, LTE, B02, CH1130*

Test data, CCDF, continued

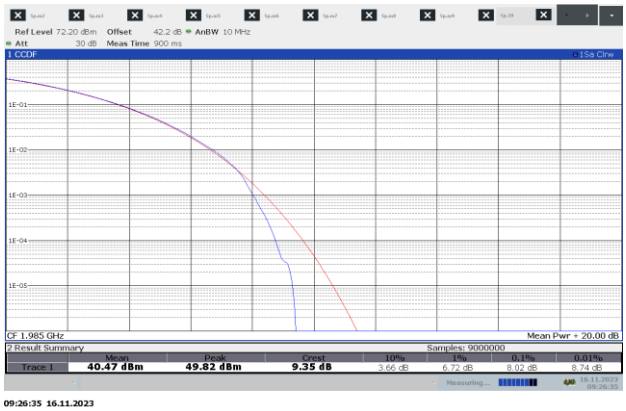

Figure 7.1-55: *CCDF, LTE, B02, CH1150*

Figure 7.1-56: *CCDF, LTE, B02, CH1160*

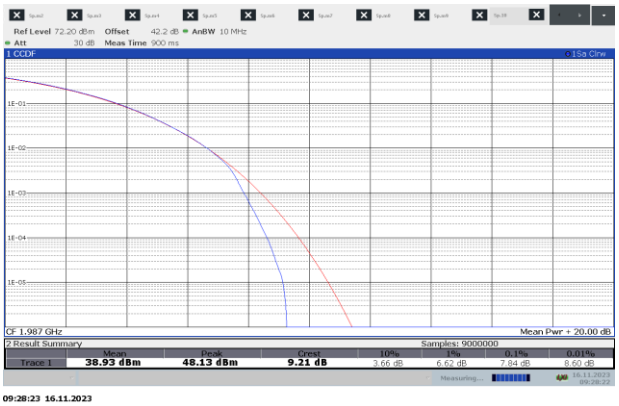

Figure 7.1-57: *CCDF, LTE, B02, CH1170*

Figure 7.1-58: *CCDF, LTE, B04, CH1980*

Figure 7.1-59: *CCDF, LTE, B04, CH1990*

Figure 7.1-60: *CCDF, LTE, B04, CH2000*

Test data, CCDF, continued

Figure 7.1-61: *CCDF, LTE, B04, CH2010*

Figure 7.1-62: *CCDF, LTE, B04, CH2020*

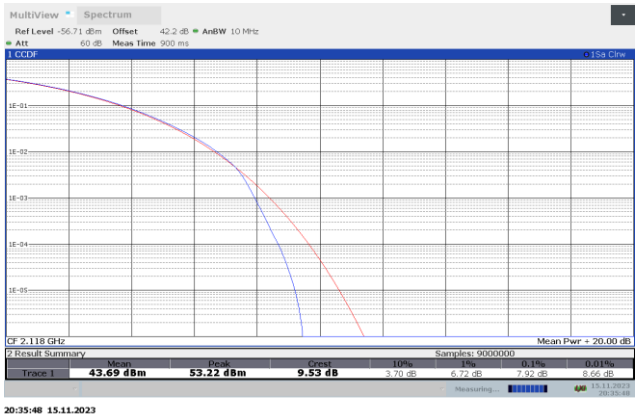

Figure 7.1-63: *CCDF, LTE, B04, CH2030*

Figure 7.1-64: *CCDF, LTE, B04, CH2050*

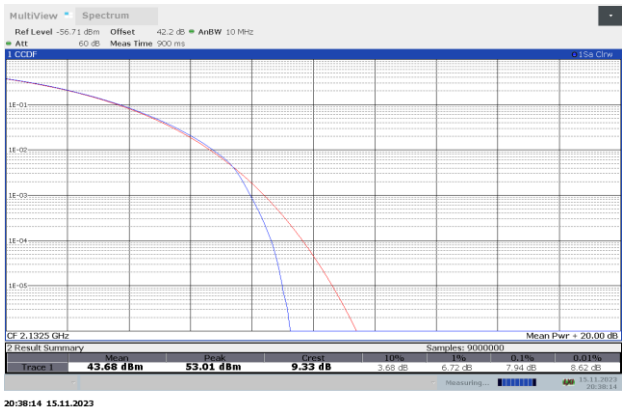

Figure 7.1-65: *CCDF, LTE, B04, CH2175*

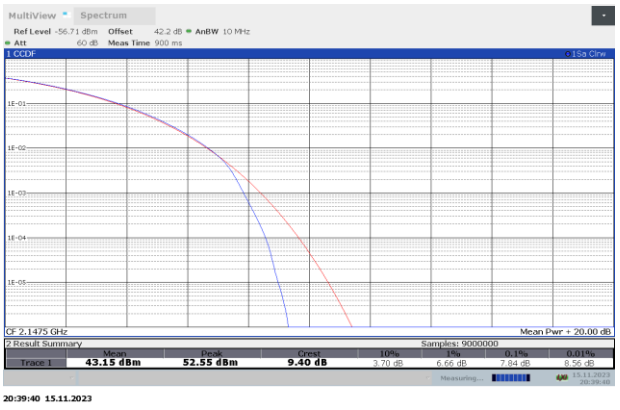

Figure 7.1-66: *CCDF, LTE, B04, CH2325*

Test data, CCDF, continued

Figure 7.1-67: *CCDF, LTE, B04, CH2340*

Figure 7.1-68: *CCDF, LTE, B04, CH2350*

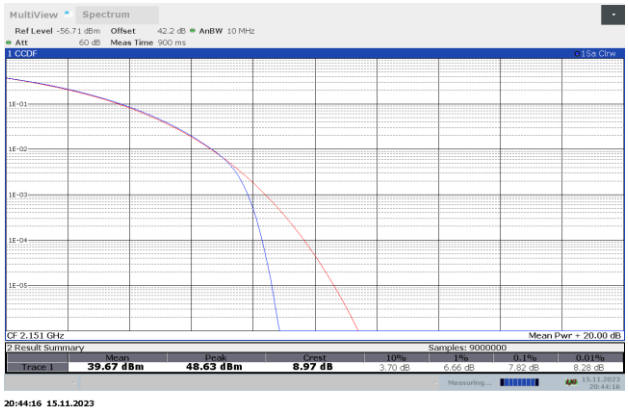

Figure 7.1-69: *CCDF, LTE, B04, CH2360*

Figure 7.1-70: *CCDF, LTE, B04, CH2370*

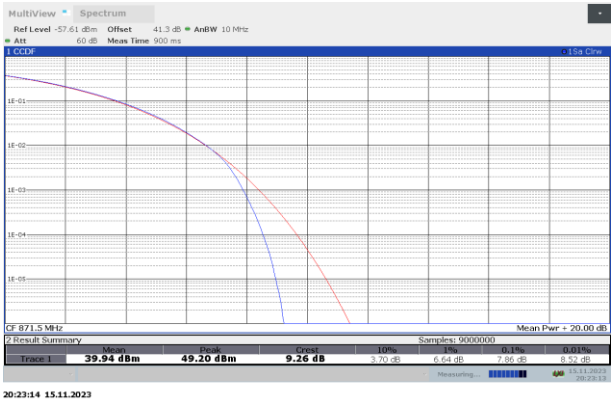

Figure 7.1-71: *CCDF, LTE, B05, CH2425*

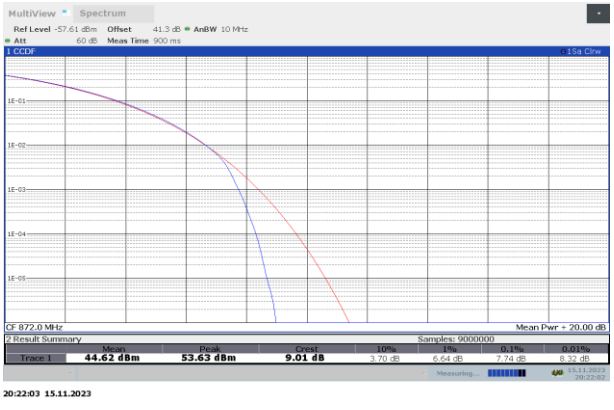

Figure 7.1-72: *CCDF, LTE, B05, CH2430*

Test data, CCDF, continued

Figure 7.1-73: *CCDF, LTE, B05, CH2451*

Figure 7.1-74: *CCDF, LTE, B05, CH2455*

Figure 7.1-75: *CCDF, LTE, B05, CH2525*

Figure 7.1-76: *CCDF, LTE, B05, CH2599*

Figure 7.1-77: *CCDF, LTE, B05, CH2600*

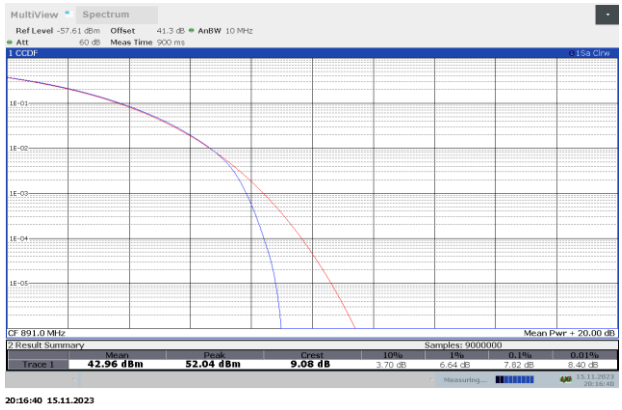

Figure 7.1-78: *CCDF, LTE, B05, CH2620*

Test data, CCDF, continued

Figure 7.1-79: *CCDF, LTE, B05, CH2625*

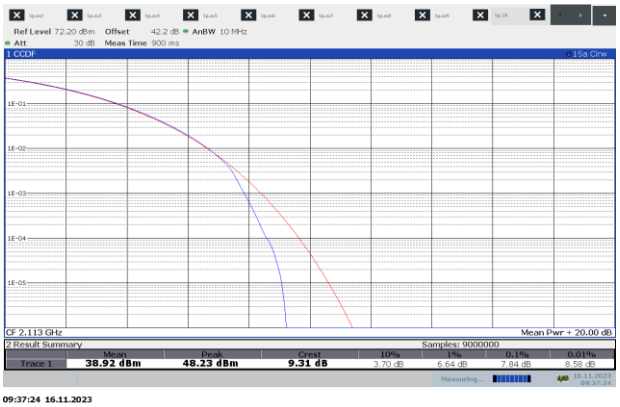

Figure 7.1-80: *CCDF, LTE, B10, CH4180*

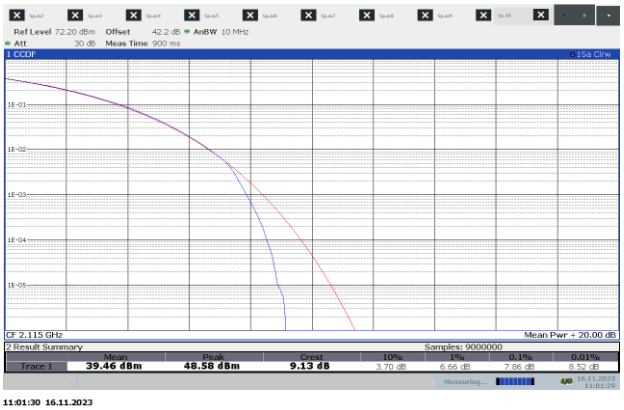

Figure 7.1-81: *CCDF, LTE, B10, CH4200*

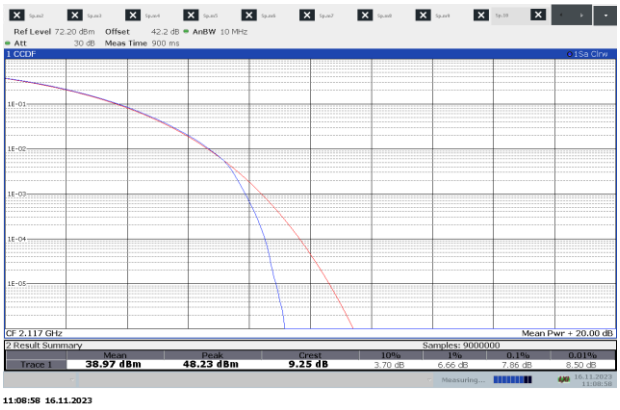

Figure 7.1-82: *CCDF, LTE, B10, CH4220*

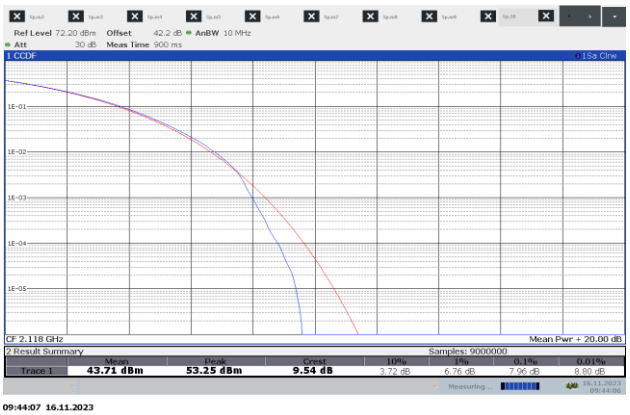

Figure 7.1-83: *CCDF, LTE, B10, CH4230*

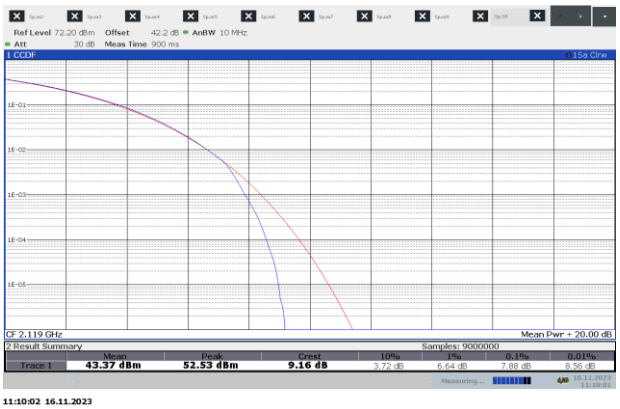

Figure 7.1-84: *CCDF, LTE, B10, CH4240*

Test data, CCDF, continued

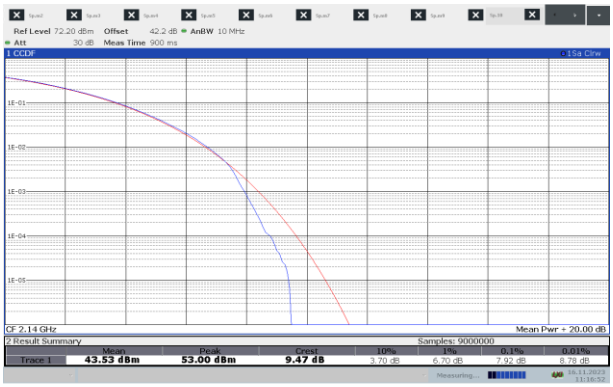

Figure 7.1-85: *CCDF, LTE, B10, CH4450*

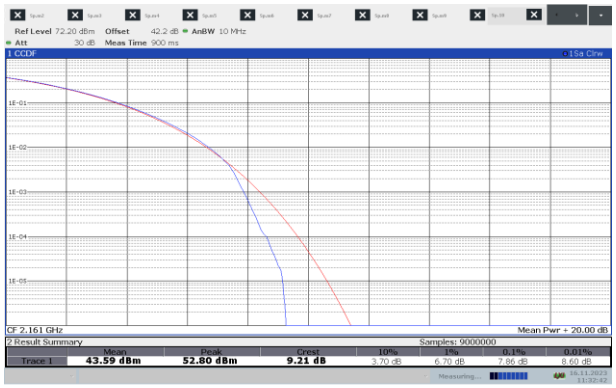

Figure 7.1-86: *CCDF, LTE, B10, CH4660*

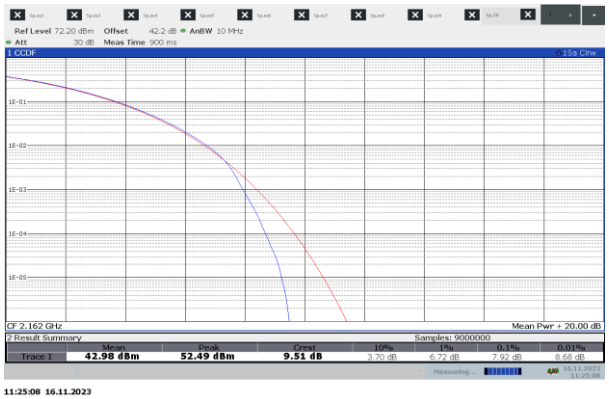

Figure 7.1-87: *CCDF, LTE, B10, CH4670*

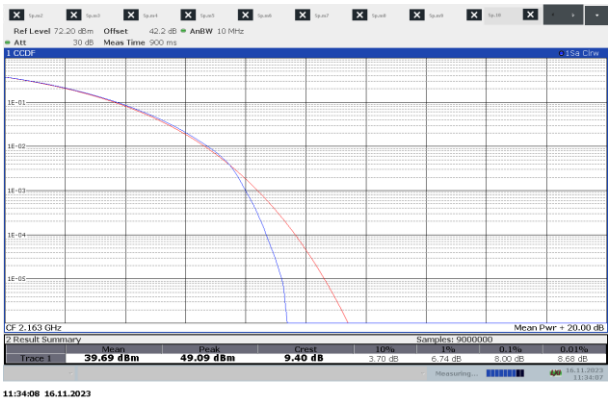

Figure 7.1-88: *CCDF, LTE, B10, CH4680*

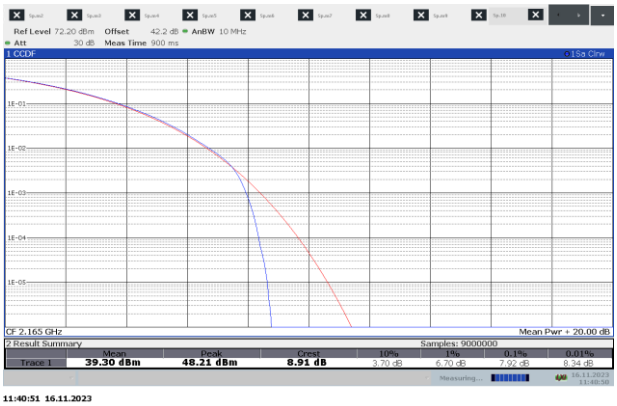

Figure 7.1-89: *CCDF, LTE, B10, CH4700*

Figure 7.1-90: *CCDF, LTE, B10, CH4720*

Test data, CCDF, continued

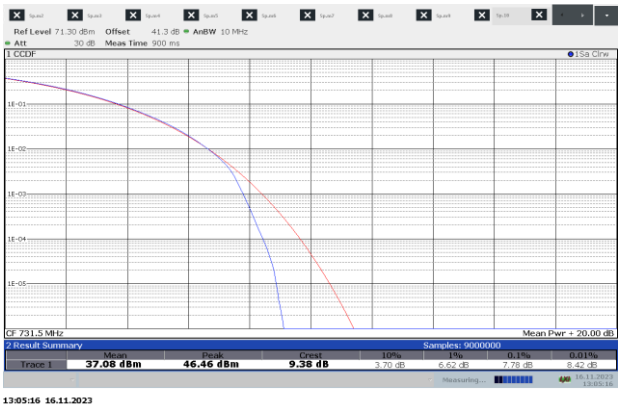

Figure 7.1-91: *CCDF, LTE, B12, CH5035*

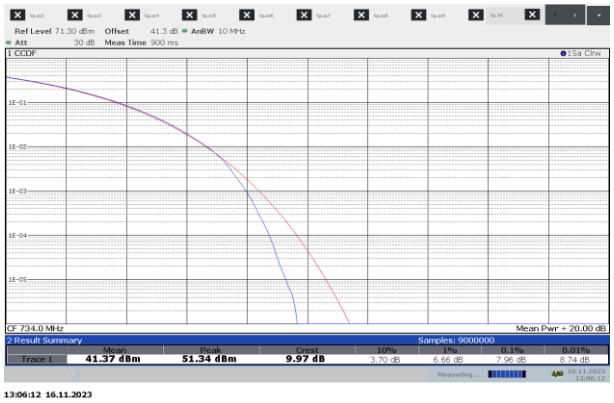

Figure 7.1-92: *CCDF, LTE, B12, CH5060*

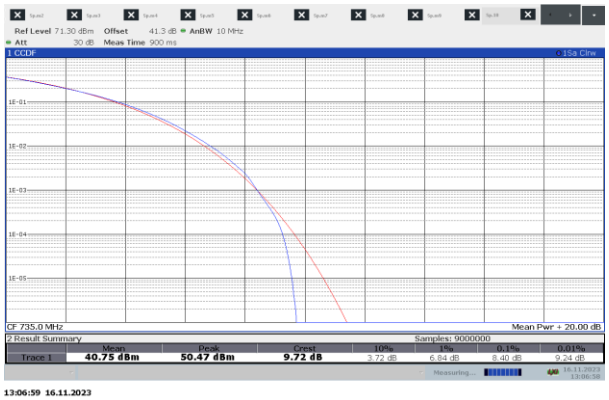

Figure 7.1-93: *CCDF, LTE, B12, CH5070*

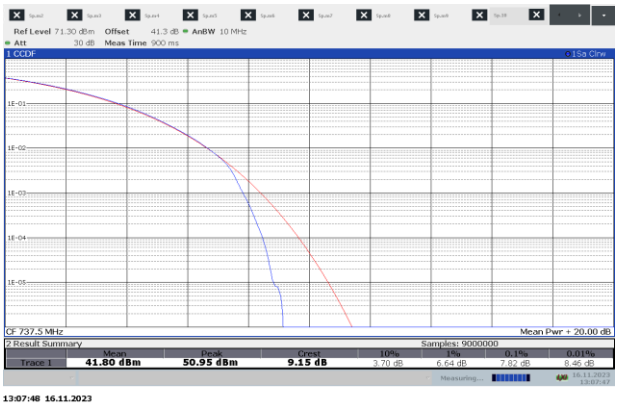

Figure 7.1-94: *CCDF, LTE, B12, CH5095*

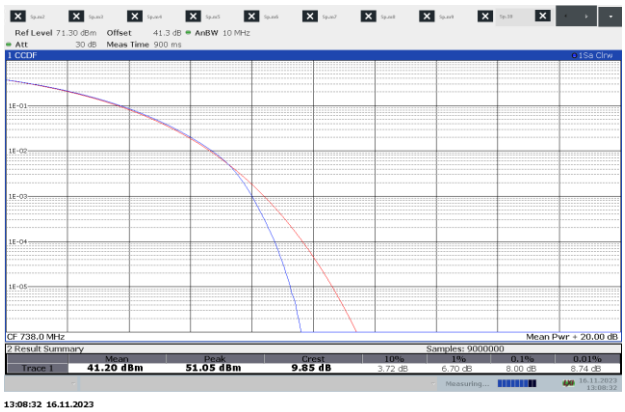

Figure 7.1-95: *CCDF, LTE, B12, CH5100*

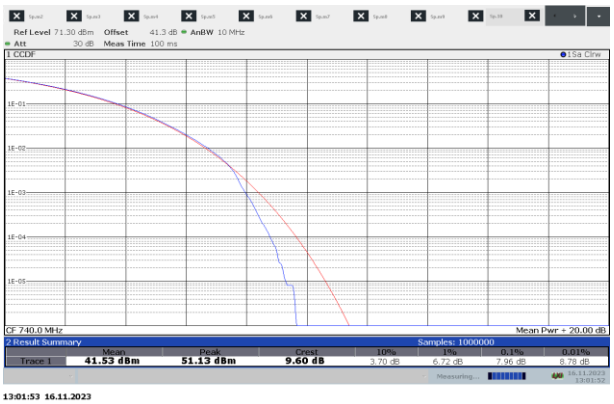

Figure 7.1-96: *CCDF, LTE, B12, CH5120*

Test data, CCDF, continued

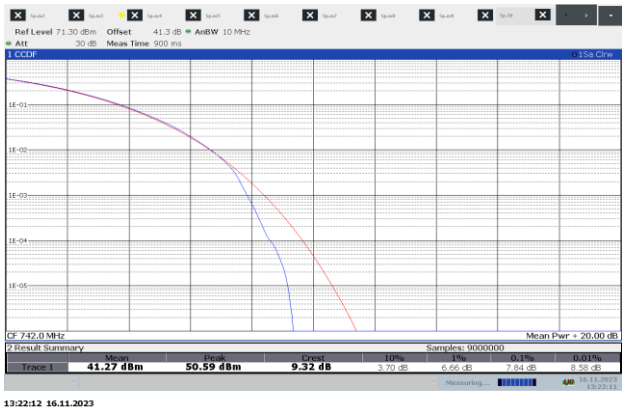

Figure 7.1-97: *CCDF, LTE, B12, CH5140*

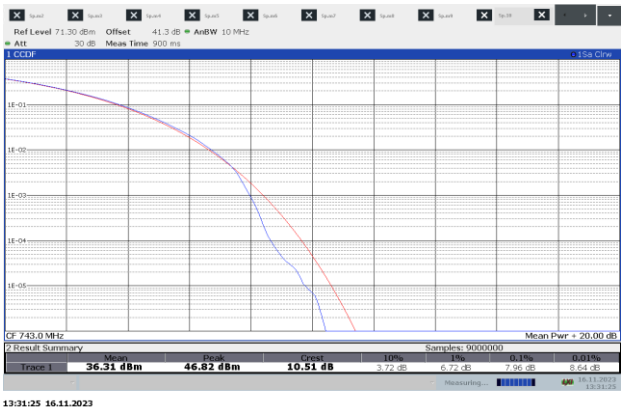

Figure 7.1-98: *CCDF, LTE, B12, CH5150*

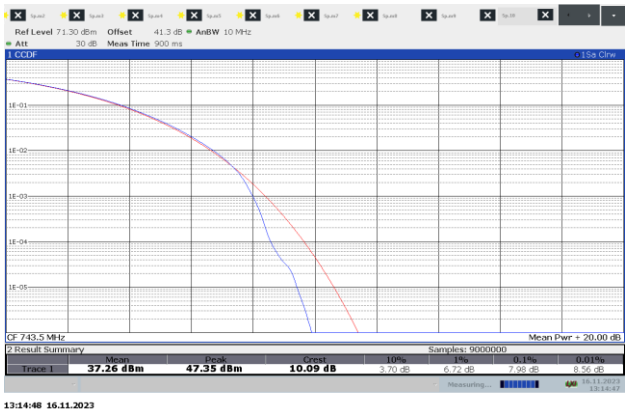

Figure 7.1-99: *CCDF, LTE, B12, CH5155*

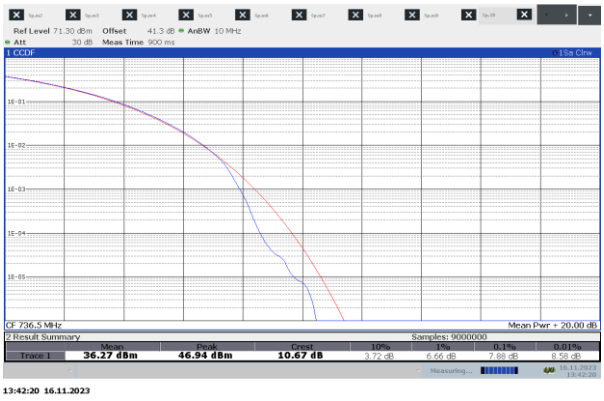

Figure 7.1-100: *CCDF, LTE, B17, CH5755*

Figure 7.1-101: *CCDF, LTE, B17, CH5760*

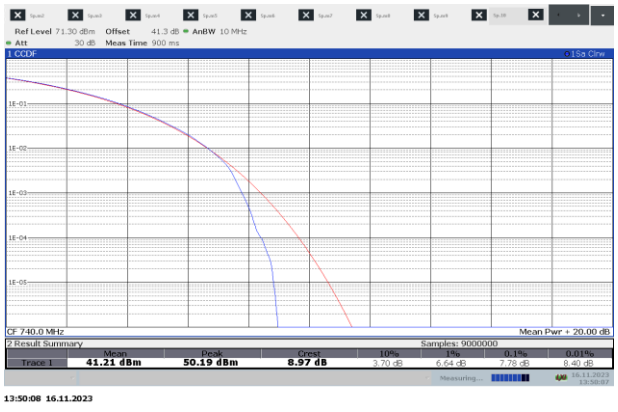

Figure 7.1-102: *CCDF, LTE, B17, CH5790*