



TEST REPORT

No.I22N02501-RF GSM

for

Honor Device Co., Ltd.

Smart Phone

Model Name: RBN-NX1

FCC ID: 2AYGCRBN-NX1

with

Hardware Version: HN2VNEM

Software Version: 6.1.0.9(C900E9R1P1)

Issued Date: 2023-01-17

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of SAICT.

Test Laboratory:

SAICT, Shenzhen Academy of Information and Communications Technology

Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000.

Tel:+86(0)755-33322000, Fax:+86(0)755-33322001

Email: yewu@saict.ac.cn. www.saict.ac.cn



No.I22N02501-RF GSM

REPORT HISTORY

Report Number	Revision	Description	Issue Date
I22N02501-RF GSM	Rev.0	1st edition	2023-01-17

CONTENTS

1. SUMMARY OF TEST REPORT	4
1.1. TEST ITEMS.....	4
1.2. TEST STANDARDS.....	4
1.3. TEST RESULT	4
1.4. TESTING LOCATION	4
1.5. PROJECT DATA	4
1.6. SIGNATURE.....	4
2. CLIENT INFORMATION	5
2.1. APPLICANT INFORMATION	5
2.2. MANUFACTURER INFORMATION	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST	6
3.4. GENERAL DESCRIPTION	6
4. REFERENCE DOCUMENTS.....	7
4.1. REFERENCE DOCUMENTS FOR TESTING	7
5. LABORATORY ENVIRONMENT	8
6. SUMMARY OF TEST RESULTS.....	9
7. STATEMENT	10
8. TEST EQUIPMENTS UTILIZED	11
ANNEX A: MEASUREMENT RESULTS.....	12
A.1 OUTPUT POWER.....	12
A.2 FREQUENCY STABILITY	17
A.3 OCCUPIED BANDWIDTH.....	19
A.4 EMISSION BANDWIDTH	32
A.5 BAND EDGE COMPLIANCE	45
A.6 CONDUCTED SPURIOUS EMISSION	52
A.7 PEAK-TO-AVERAGE POWER RATIO	58

1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	Smart Phone
Model Name	RBN-NX1
Brand Name	HONOR
Applicant's name	Honor Device Co., Ltd.
Manufacturer's Name	Honor Device Co., Ltd.

1.2. Test Standards

FCC Part 2/22/24	10-1-20 Edition
ANSI C63.26	2015
KDB971168 D01	v03r01

1.3. Test Result

All test items are passed. Please refer to "6 Summary of Test Results" for detail.

1.4. Testing Location

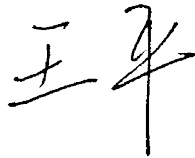
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

1.5. Project Data

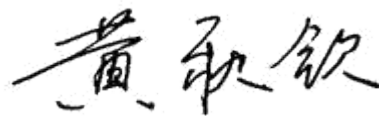
Testing Start Date: 2022-12-02

Testing End Date: 2022-12-28

1.6. Signature



Wang Ping
(Prepared this test report)



Huang Qiuqin
(Reviewed this test report)



Zhang Hao
(Approved this test report)



2. CLIENT INFORMATION

2.1. Applicant Information

Company Name: Honor Device Co., Ltd.
Address /Post: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China
Contact Person: Li Ming
Contact Email: liming136@hihonor.com
Telephone: 0755-61886688
Fax: /

2.2. Manufacturer Information

Company Name: Honor Device Co., Ltd.
Address /Post: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China
Contact Person: Li Ming
Contact Email: liming136@hihonor.com
Telephone: 0755-61886688
Fax: /

3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT

(AE)

3.1. About EUT

Description	Smart Phone
Model Name	RBN-NX1
FCC ID	2AYGCRBN-NX1
Frequency Bands	GSM850; PCS 1900
Antenna	Integrated
Extreme vol. Limits	3.60V to 4.45V (nominal: 3.87V)
Condition of EUT as received	No abnormality in appearance

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of SAICT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT01aa	868648060007462	HN2VNEM	6.1.0.9(C900E9R1P1)	2022-11-29

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery
AE2	RF cable

*AE ID: is used to identify the test sample in the lab internally.

3.4. General Description

RBN-NX1 is subscriber equipment in the GSM/WCDMA/LTE/5G NR system. The GSM frequency bands include GSM850, GSM900, DCS1800 and PCS1900. The UMTS frequency band includes band I, band II, band V and band VIII. The LTE frequency bands include band 1, band3, band 5, band 7, band 8, band 20, band 28A, band 32, band 38, band 40 and band 41. The 5G NR frequency bands include band 1, band3, band 7, band 8, band 20, band 28A, band 38, band 40, band 41, band 77(3.3GHz-3.8GHz) and band 78. But only GSM850 and GSM1900, UMTS frequency band II and band V, LTE frequency band 5, band 7, band 38, band 41, 5G NR frequency band 7,band 38, band 41, band 78(3450MHz-3550MHz) bands test data included in this report. The Mobile Phone implements such functions as RF signal receiving/transmitting, 5G NR/LTE/UMTS and GSM/GPRS/EDGE protocol processing, voice, video MMS service, GPS, AGPS, Wi-Fi etc. Externally it provides one micro SD card interface, earphone port (to provide voice service), and dual SIM/single SIM card interface.RBN-NX1 is single/dual SIM smart phone. It also provides Bluetooth module to synchronize data between a PC and the phone, or to use the built-in modem of the phone to access the Internet with a PC, or to exchange data with other Bluetooth devices.

4. REFERENCE DOCUMENTS

4.1. Reference Documents for Testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-20 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-20 Edition
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-20 Edition
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB971168 D01	Power Meas License Digital Systems	v03r01

5. LABORATORY ENVIRONMENT

Shielded room did not exceed following limits along the RF testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz>60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	>2 M Ω
Ground system resistance	< 4 Ω

Fully-anechoic chamber did not exceed following limits along the EMC testing

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 2M Ω
Ground system resistance	< 4 Ω
Voltage Standing Wave Ratio (VSWR)	$\leq$ 6 dB, from 1 to 18 GHz, 3 m distance
Uniformity of field strength	Between 0 and 6 dB, from 80 to 6000 MHz

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	F	Fail
	NA	Not applicable
	NM	Not measured

GSM850

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/22.913	A.1	P
2	Field Strength of Spurious Radiation	2.1053/22.917	A.2	P
3	Occupied Bandwidth	2.1049/22.917	A.3	P
4	Emission Bandwidth	2.1049/22.917	A.4	P
5	Band Edge Compliance	2.1051/22.917	A.5	P
6	Conducted Spurious Emission	2.1051/22.917	A.6	P
7	Peak-to-Average Power Ratio	KDB971168 D01	A.7	P

PCS1900

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/24.232	A.1	P
2	Frequency Stability	2.1055/24.235	A.2	P
3	Occupied Bandwidth	2.1049/24.238	A.3	P
4	Emission Bandwidth	2.1049/24.238	A.4	P
5	Band Edge Compliance	2.1051/24.238	A.5	P
6	Conducted Spurious Emission	2.1051/24.238	A.6	P

7. STATEMENT

Since the information of samples in this report is provided by the client, the laboratory is not responsible for the authenticity of sample information.

This report takes measured values as criterion of test conclusion. The test conclusion meets the limit requirements.

8. TEST EQUIPMENTS UTILIZED

NO.	Description	TYPE	Manufacture	series number	Cal Due Date	Cal.Interval
1	Universal Radio Communication Tester	E7515B	Keysight	MY59322022	2023-04-14	1 year
2	Universal Radio Communication Tester	MT8000A	Anritsu	6261987936	2023-03-29	1 year
3	Universal Radio Communication Tester	CMW500	R&S	129146	2023-04-24	1 year
4	Spectrum Analyzer	FSW26	R&S	102197	2023-11-24	1 year
5	Temperature Chamber	SH-241	ESPEC	92007516	2023-10-15	1 year
6	DC Power Supply	U3606A	Agilent Technologies	MY50450012	2023-11-13	1 year

ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

Reference

FCC: CFR Part 2.1046, 22.913, 24.232.

A.1.1 Summary

During the process of testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation.

This result contains max output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

A.1.2 Conducted

A.1.2.1 Method of Measurements

The EUT was set up for the max output power with pseudo random data modulation.

These measurements were done at 3 frequencies, 1850.2 MHz, 1880.0MHz and 1909.8MHz for PCS1900 band; 824.2MHz, 836.6MHz and 848.8MHz for GSM850 band. (bottom, middle and top of operational frequency range).

GSM850

	Power step	Nominal Peak output power (dBm)
GSM	5	33dBm(2W)
GPRS	3	33dBm(2W)
EGPRS	6	27dBm(0.5W)

Measurement result

GSM(GMSK)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	5	32.39
836.6	5	32.48
848.8	5	32.42

GPRS(GMSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	3	32.37
836.6	3	32.41
848.8	3	32.39

EGPRS(8PSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
824.2	6	26.76
836.6	6	26.80
848.8	6	26.75

Note: Expanded measurement uncertainty is $U = 0.49\text{dB}$, $k = 1.96$

PCS1900

	Power step	Nominal Peak output power (dBm)
GSM	0	30dBm(1W)
GPRS	3	30dBm(1W)
EGPRS	5	26dBm(0.4W)

Measurement result
GSM(GMSK)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	0	29.78
1880.0	0	29.97
1909.8	0	30.09

GPRS(GMSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	3	29.76
1880.0	3	29.88
1909.8	3	30.03

EGPRS(8PSK,1Slot)

Frequency(MHz)	Power Step	Output power(dBm)
1850.2	5	26.15
1880.0	5	26.21
1909.8	5	26.31

Note: Expanded measurement uncertainty is $U = 0.49\text{dB}$, $k = 1.96$

A.1.3 Radiated

A.1.3.1 Description

This is the test for the maximum radiated power from the EUT.

Rule Part 24.232(c) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

Rule Part 22.913(a) specifies " The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

A.1.3.2 Method of Measurement

ANSI C63.26 chapter 5.2.5.5: when working in decibels (i.e., logarithmic scale), the ERP and EIRP represent the sum of the transmit antenna gain (in dBd or dBi, respectively) and the conducted RF output power (expressed in dB relative to watts or milliwatts).

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows:

$$\text{ERP or EIRP} = \text{PMea} + \text{GT}$$

Where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as PMea , e.g., dBm or dBW)

PMea measured transmitter output power , in dBm.

GT gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

GSM 850-ERP 22.913(a)
Limits

	Power Step	Burst Peak ERP (dBm)
GSM	5	≤38.45dBm (7W)
GPRS	3	≤38.45dBm (7W)
EGPRS	6	≤38.45dBm (7W)

PCS1900-EIRP
Limits

	Power Step	Burst Peak EIRP (dBm)
GSM	0	≤33dBm (2W)
GPRS	3	≤33dBm (2W)
EGPRS	5	≤33dBm (2W)

Measurement result
GSM850
GSM(GMSK)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = 0.2 \text{ dBi}$
824.2	32.39	30.44
836.6	32.48	30.53
848.8	32.42	30.47

GPRS(GMSK,1Slot)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = 0.2 \text{ dBi}$
824.2	32.37	30.42
836.6	32.41	30.46
848.8	32.39	30.44

EGPRS(8PSK,1Slot)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = 0.2 \text{ dBi}$
824.2	26.76	24.81
836.6	26.80	24.85
848.8	26.75	24.80

PCS1900
GSM(GMSK)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = -0.6\text{dBi}$
1850.2	29.78	29.18
1880.0	29.97	29.37
1909.8	30.09	29.49

GPRS(GMSK,1Slot)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = -0.6\text{dBi}$
1850.2	29.76	29.16
1880.0	29.88	29.28
1909.8	30.03	29.43

EGPRS(8PSK,1Slot)

Frequency (MHz)	Conducted output power (dBm)	Radiated output power (dBm) $G_T = -0.6\text{dBi}$
1850.2	26.15	25.55
1880.0	26.21	25.61
1909.8	26.31	25.71

A.2 FREQUENCY STABILITY

Reference

FCC: CFR Part 2.1055, 22.355, 24.235.

A.2.1 Method of Measurement

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a "call mode". This is accomplished with the use of R&S CMW500.

1. Measure the carrier frequency at room temperature.
2. Subject the EUT to overnight soak at -10°C.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on mid channel of PCS 1900 and GSM850, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
4. Repeat the above measurements at 10°C increments from -10°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMUW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10°C increments from -10°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. As this transceiver is considered "Hand carried, battery powered equipment" Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of the lower, higher and nominal voltage. Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress.

A.2.2 Measurement results

GSM 850

Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.87	824.028	848.500		
50				-0.42	0.0010
40				0.61	0.0015
30				1.16	0.0028
10				-2.45	0.0059
0				-1.61	0.0039
-10				-0.78	0.0019

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	824.028	848.500	-1.00	0.0024
4.45				2.49	0.0059

Expanded measurement uncertainty is 10Hz, $k = 2$

PCS 1900

Frequency Error vs Voltage

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.87	1850.032	1909.960		
50				-2.81	0.0030
40				-0.48	0.0005
30				6.68	0.0071
10				0.90	0.0010
0				-1.03	0.0011
-10				1.45	0.0015

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1850.032	1909.960	5.65	0.0060
4.45				1.03	0.0011

Expanded measurement uncertainty is 10Hz, $k = 2$

A.3 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238.

A.3.1 Measurement Procedure

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least $10\log(\text{OBW} / \text{RBW})$ below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

A.3.2 Occupied Bandwidth Results

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

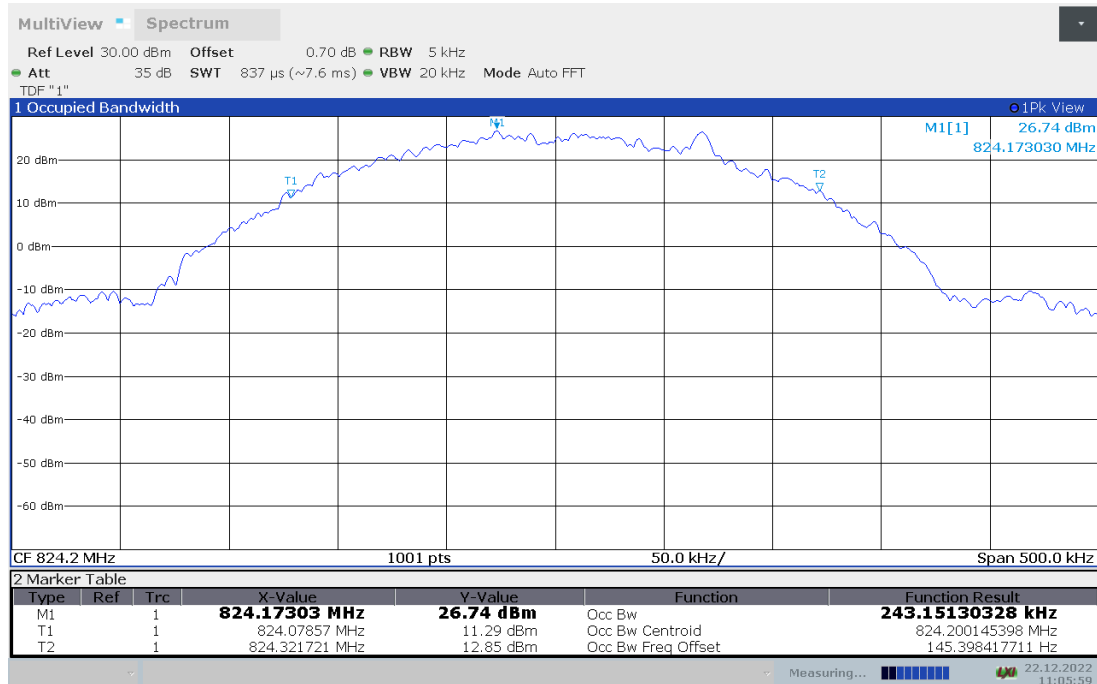
GSM850 (99 %)

GSM

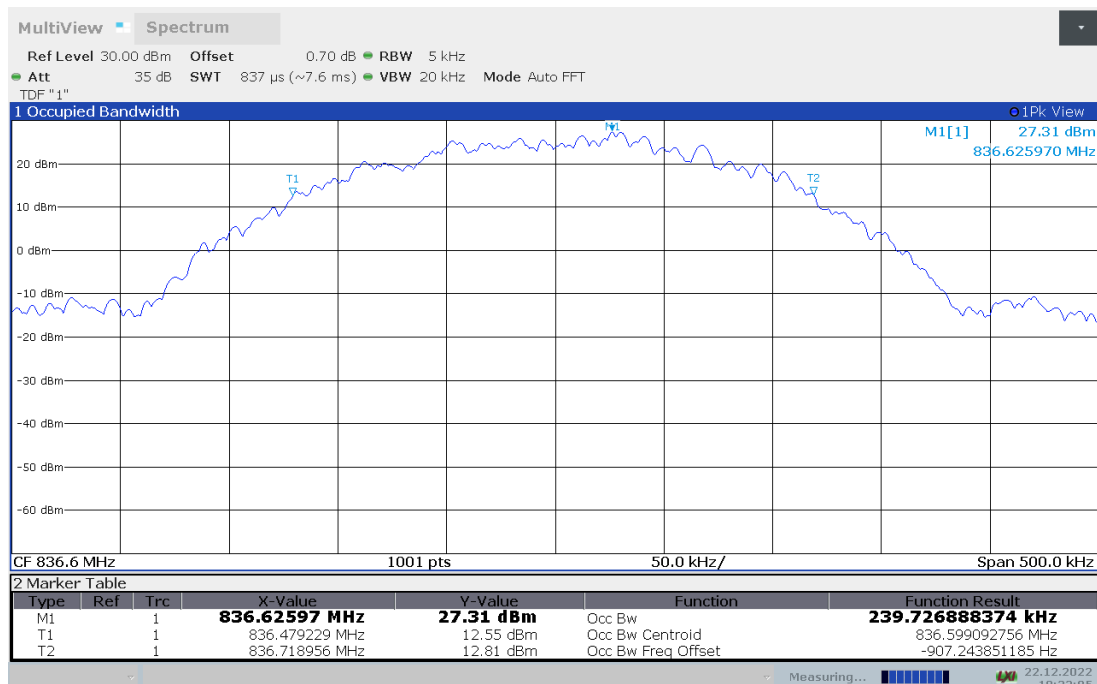
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
824.2	243.151
836.6	239.727
848.8	240.890

GSM850

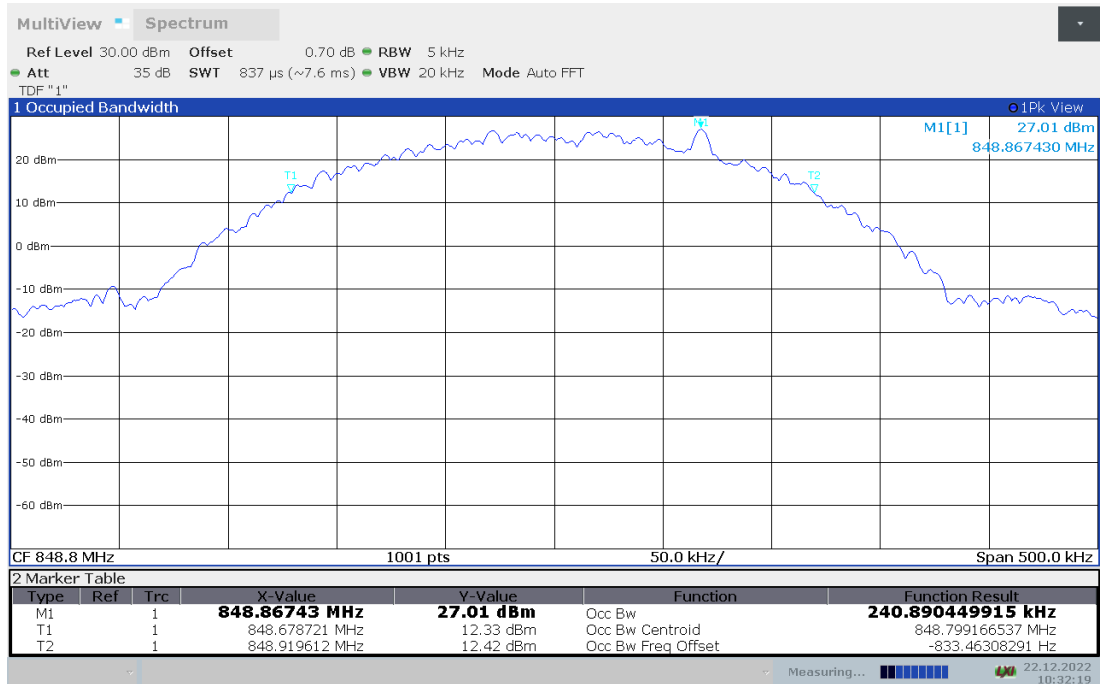
Channel 128-Occupied Bandwidth (99% BW)



Channel 190-Occupied Bandwidth (99% BW)



Channel 251-Occupied Bandwidth (99% BW)



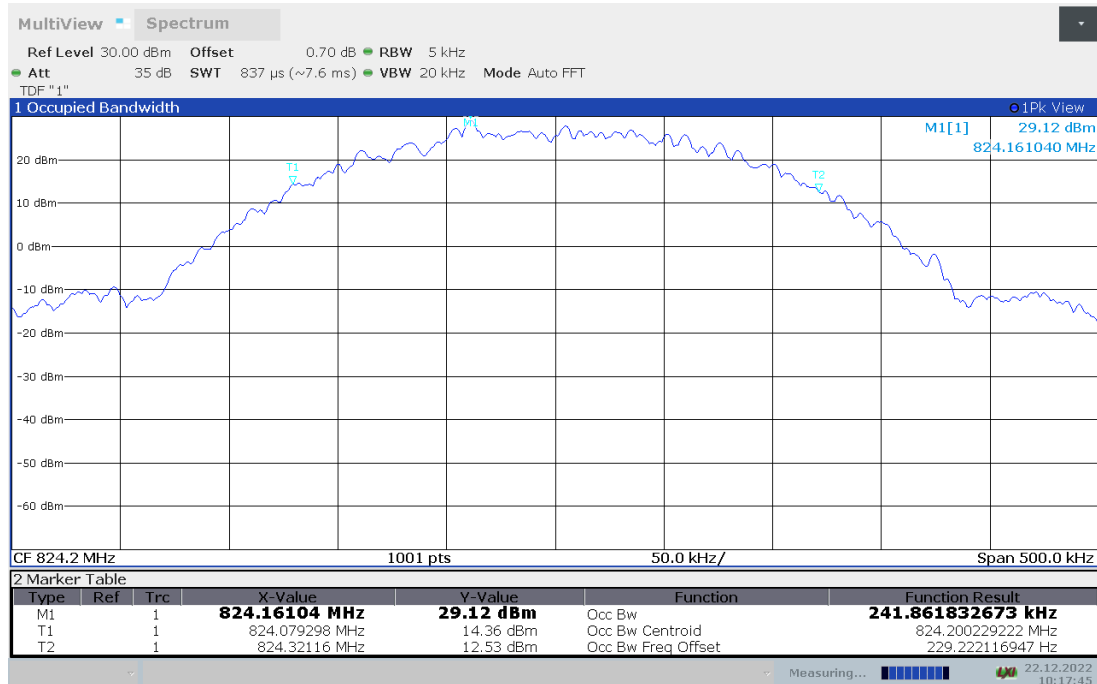
GSM850 (99 %)

GPRS

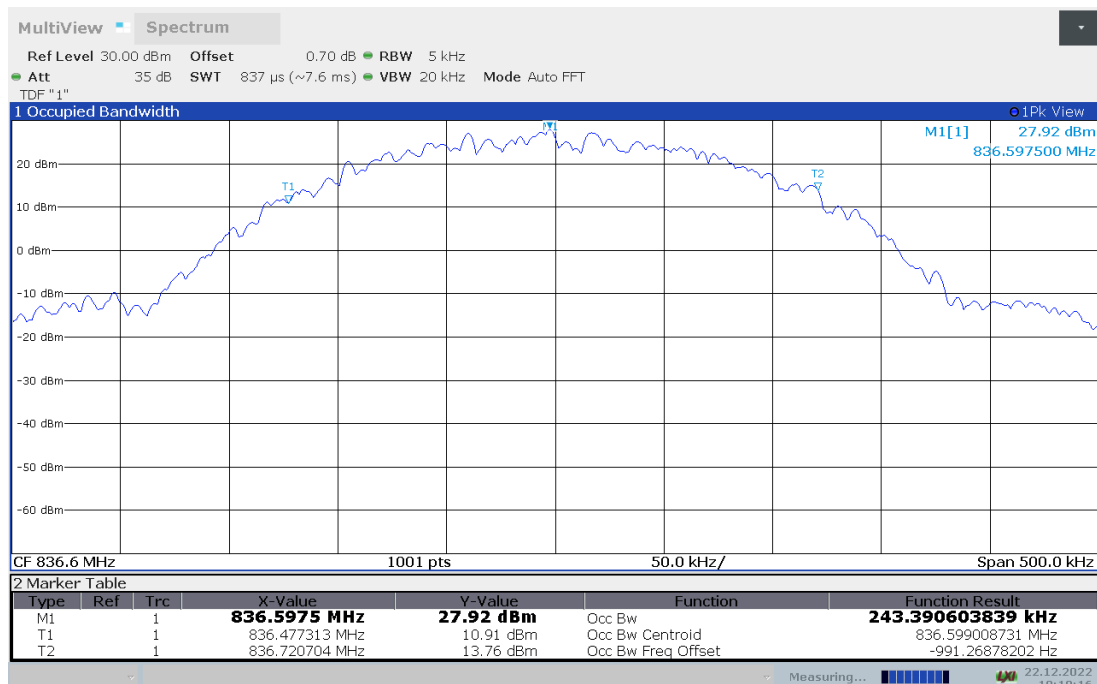
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
824.2	241.862
836.6	243.391
848.8	242.611

GSM850

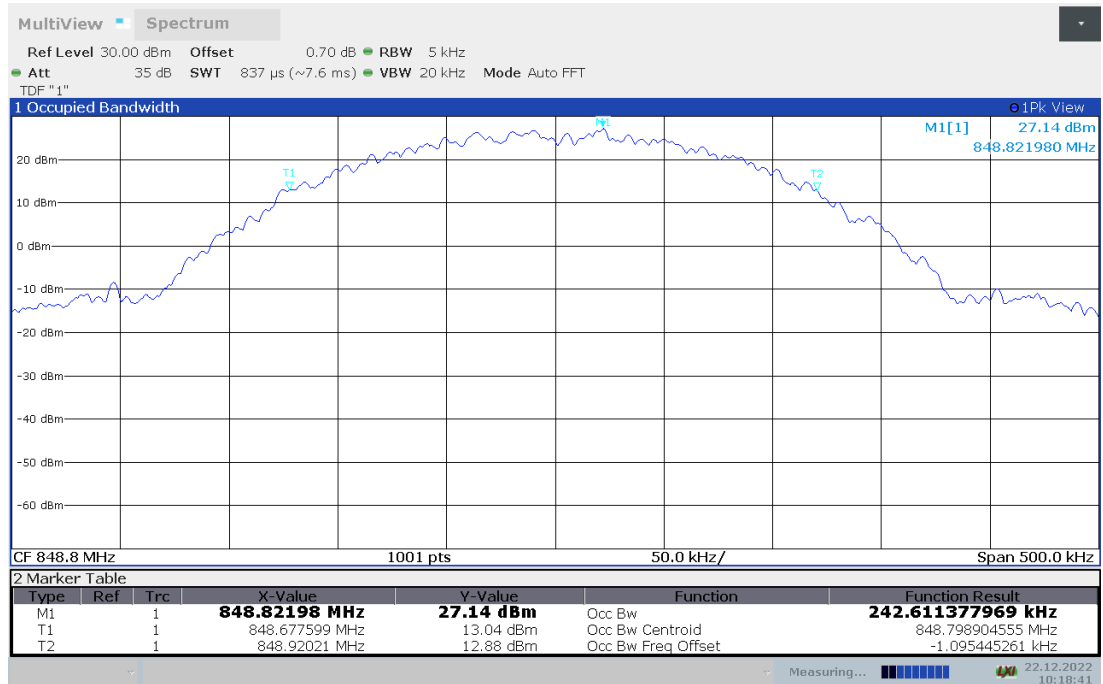
Channel 128-Occupied Bandwidth (99% BW)



Channel 190-Occupied Bandwidth (99% BW)



Channel 251-Occupied Bandwidth (99% BW)



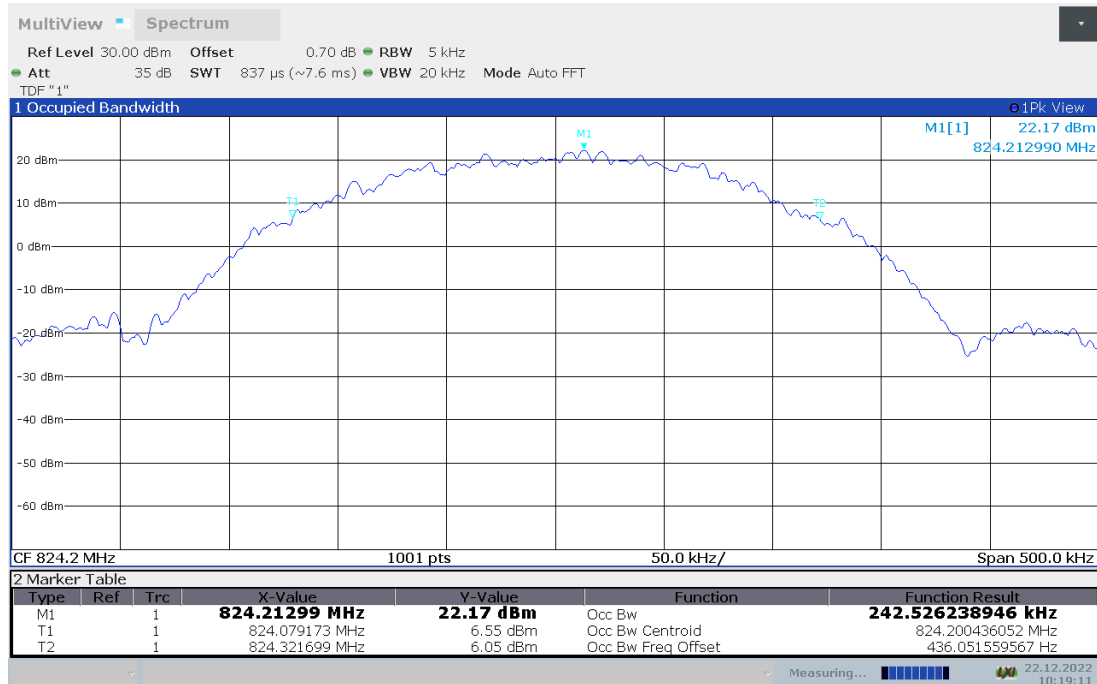
GSM850 (99 %)

EGPRS

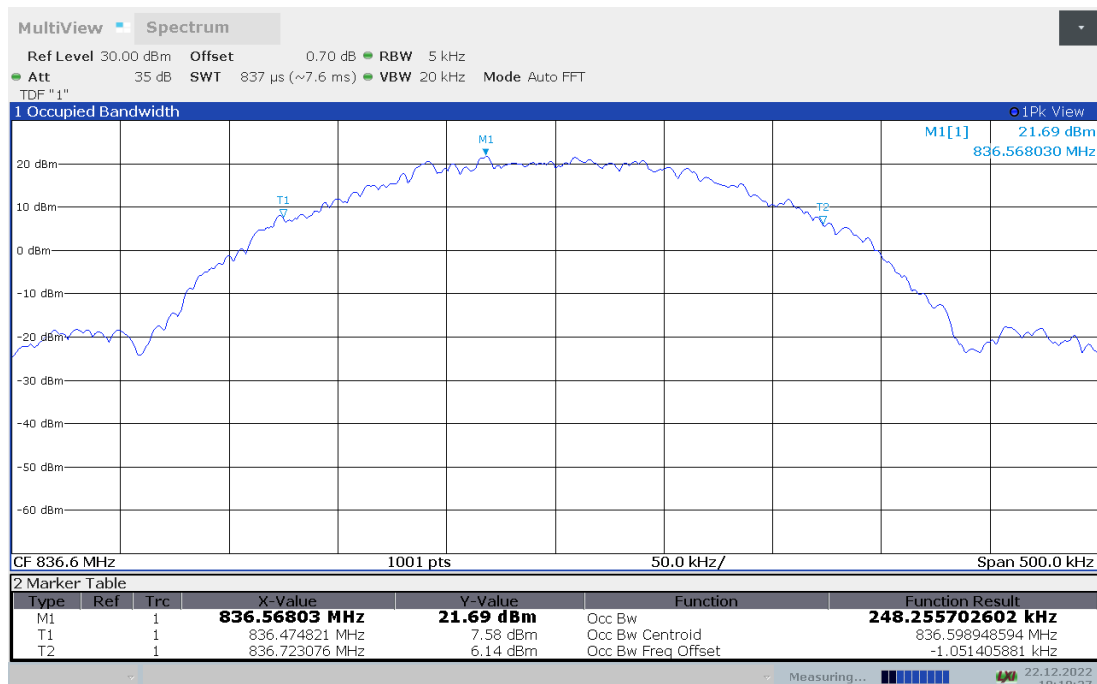
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
824.2	242.526
836.6	248.256
848.8	244.864

GSM850

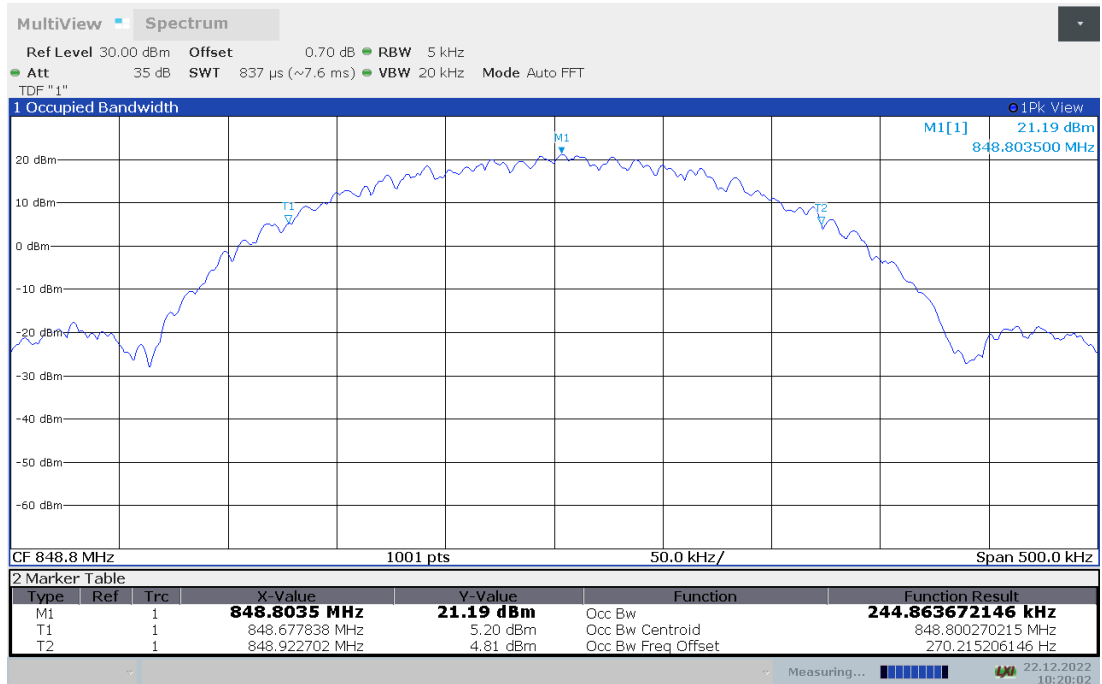
Channel 128-Occupied Bandwidth (99% BW)



Channel 190-Occupied Bandwidth (99% BW)



Channel 251-Occupied Bandwidth (99% BW)

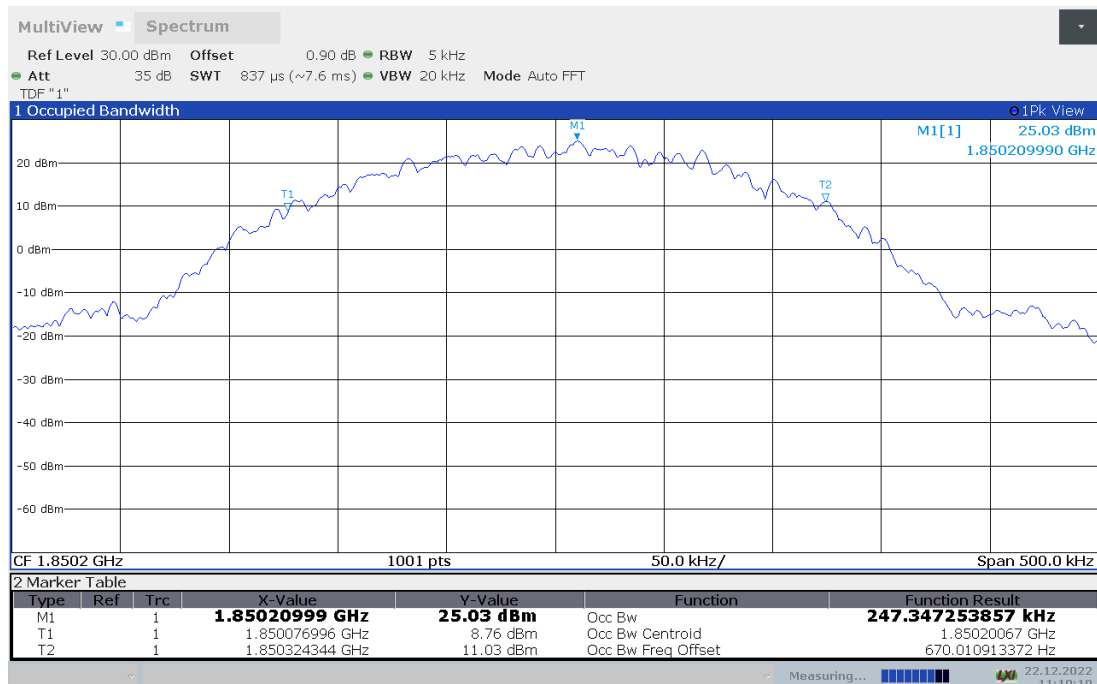


PCS1900 (99 %) GSM

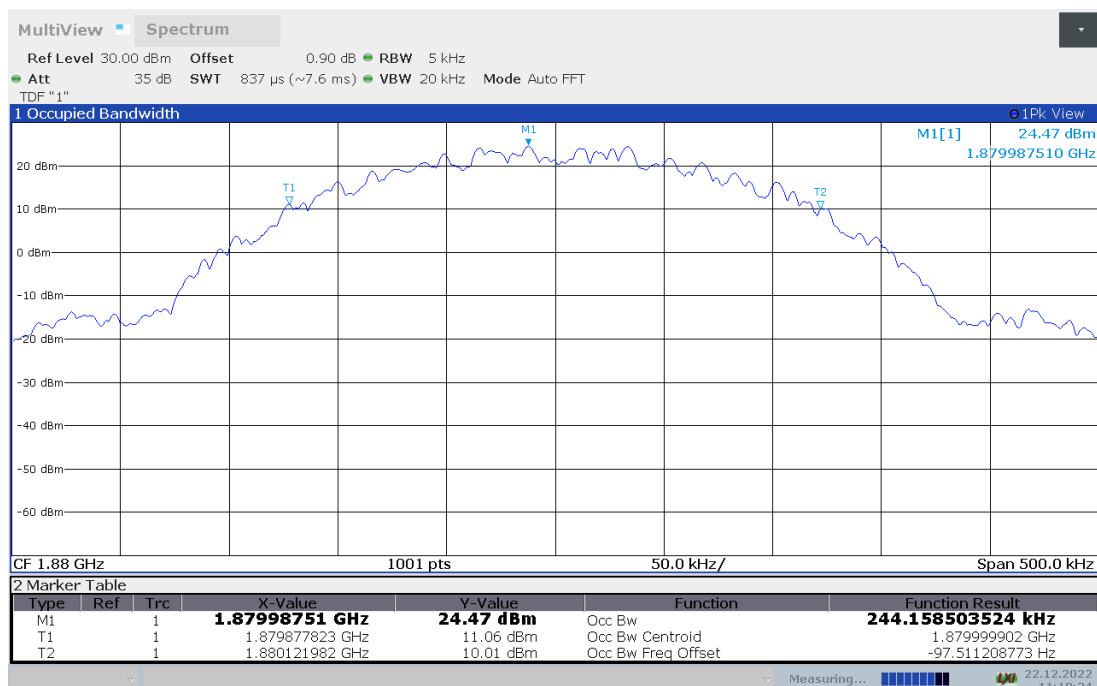
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
1850.2	247.347
1880	244.159
1909.8	247.690

PCS1900

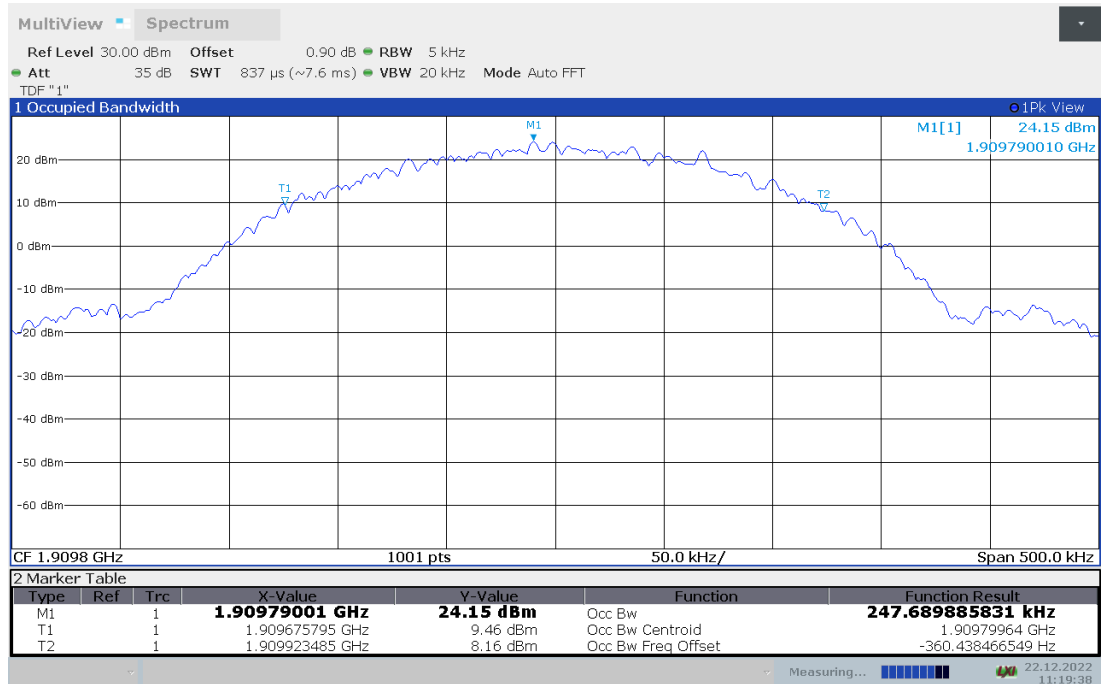
Channel 512-Occupied Bandwidth (99% BW)



Channel 661-Occupied Bandwidth (99% BW)



Channel 810-Occupied Bandwidth (99% BW)



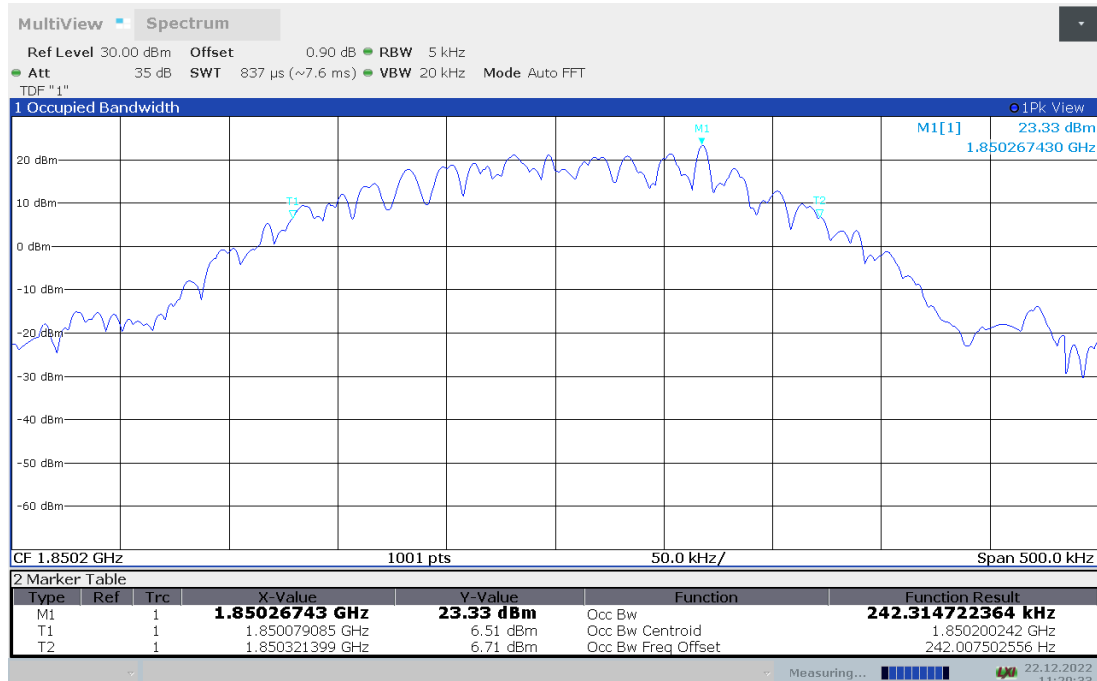
PCS1900 (99 %)

GPRS

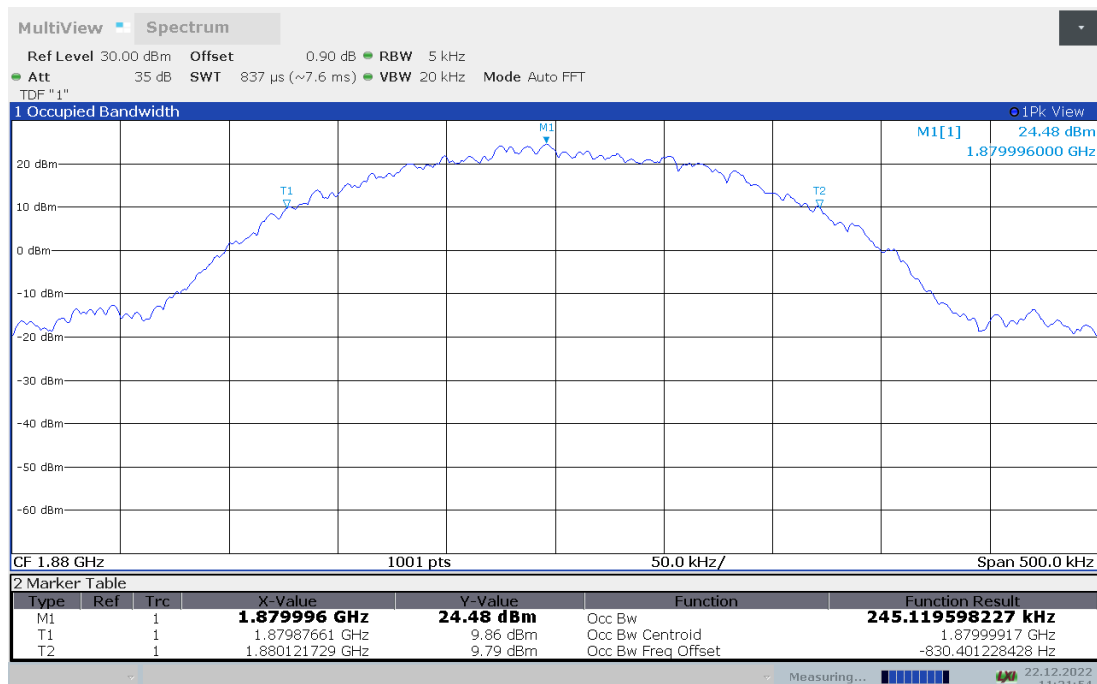
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
1850.2	242.315
1880	245.120
1909.8	244.106

PCS1900

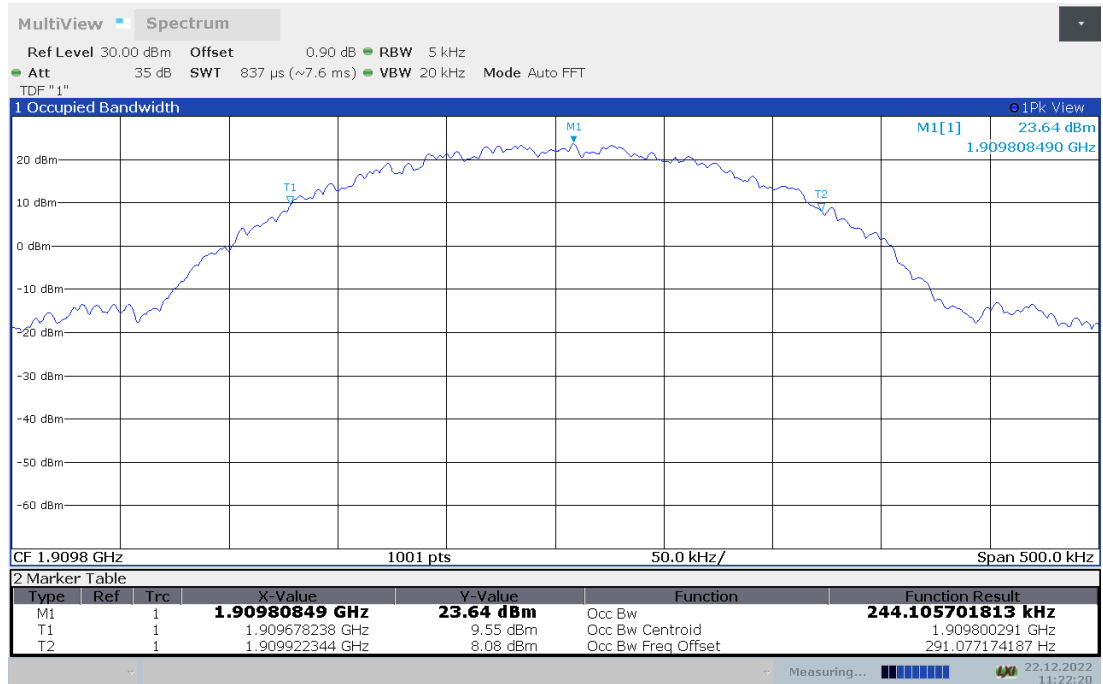
Channel 512-Occupied Bandwidth (99% BW)



Channel 661-Occupied Bandwidth (99% BW)



Channel 810-Occupied Bandwidth (99% BW)



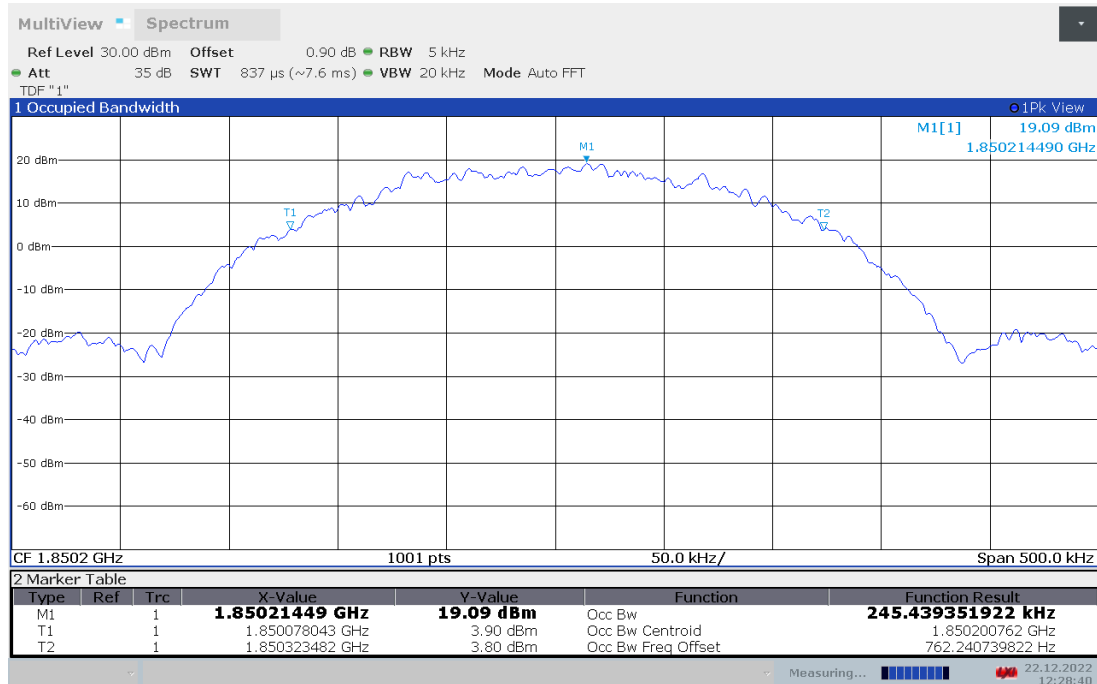
PCS1900 (99 %)

EGPRS

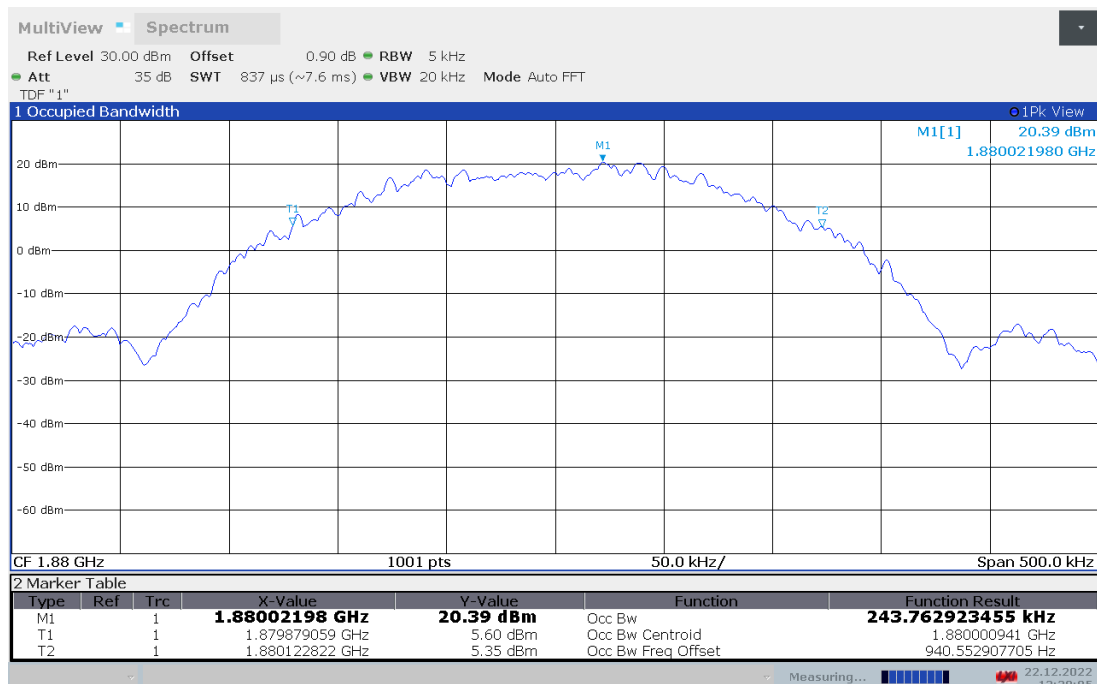
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)
1850.2	245.439
1880	243.763
1909.8	247.005

PCS1900

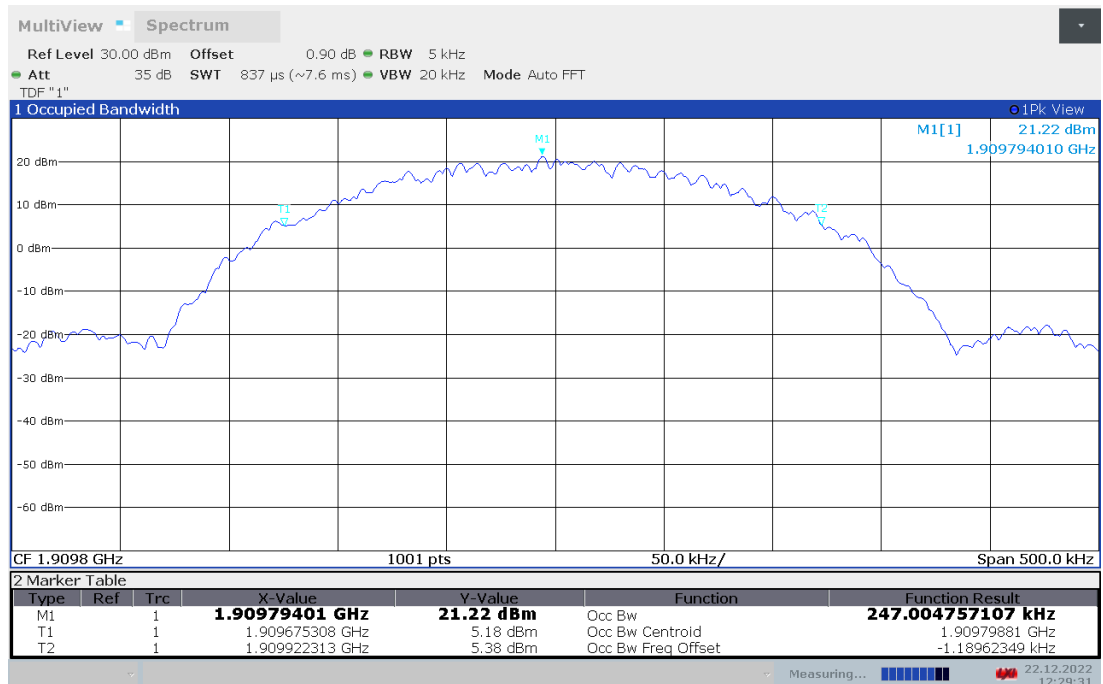
Channel 512-Occupied Bandwidth (99% BW)



Channel 661-Occupied Bandwidth (99% BW)



Channel 810-Occupied Bandwidth (99% BW)



Note: Expanded measurement uncertainty is $U = 3428\text{Hz}$, $k = 2$

A.4 EMISSION BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238

A.4.1 Measurement Procedure

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.

- a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the OBW).
- b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.
- c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least $10\log(\text{OBW} / \text{RBW})$ below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 26dB bandwidth function of the spectrum analyzer and report the measured bandwidth.

A.4.2 Emission Bandwidth Results

Similar to conducted emissions; Emission bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of PCS1900 band and GSM850 band. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

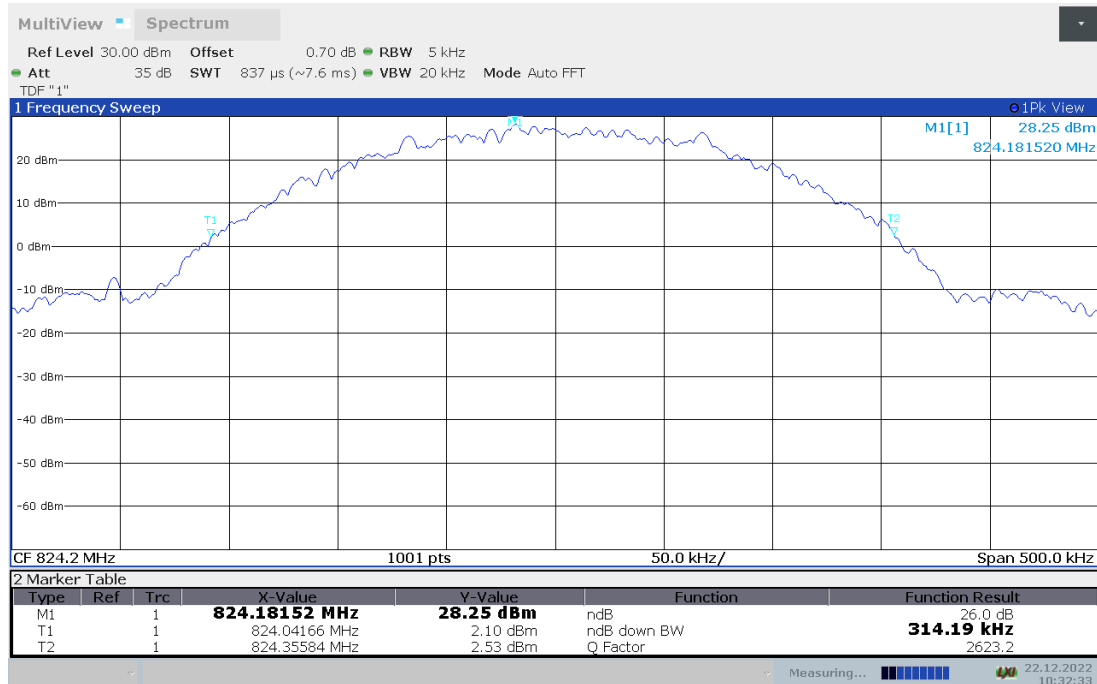
GSM850 (-26dBc)

GSM

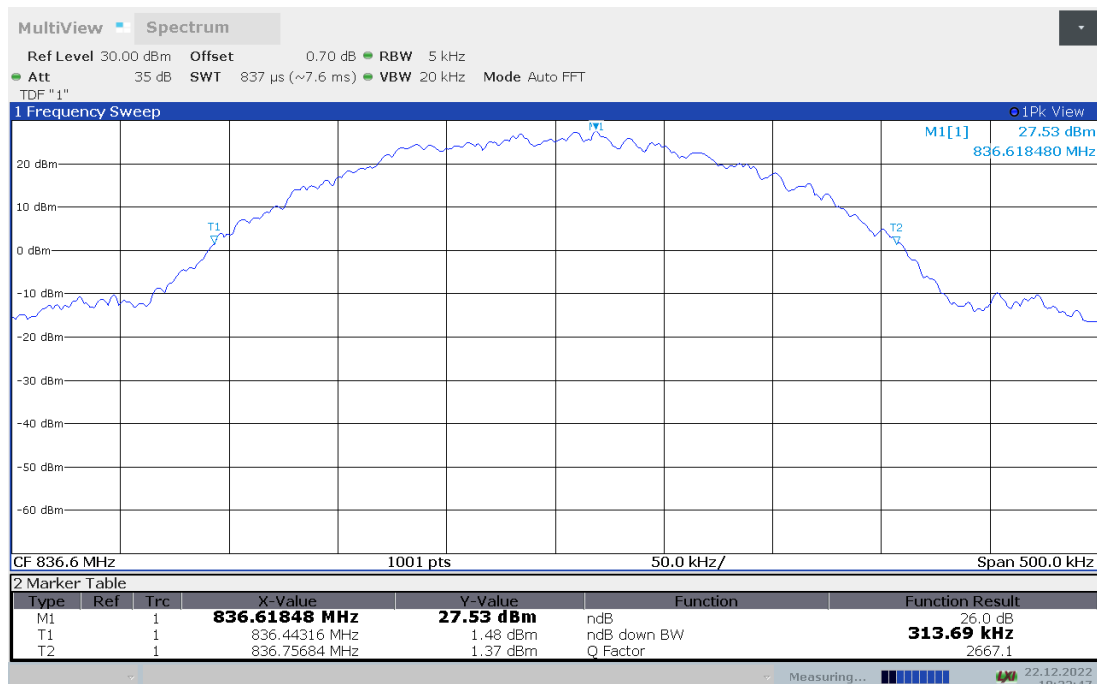
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
824.2	314.190
836.6	313.690
848.8	312.690

GSM850

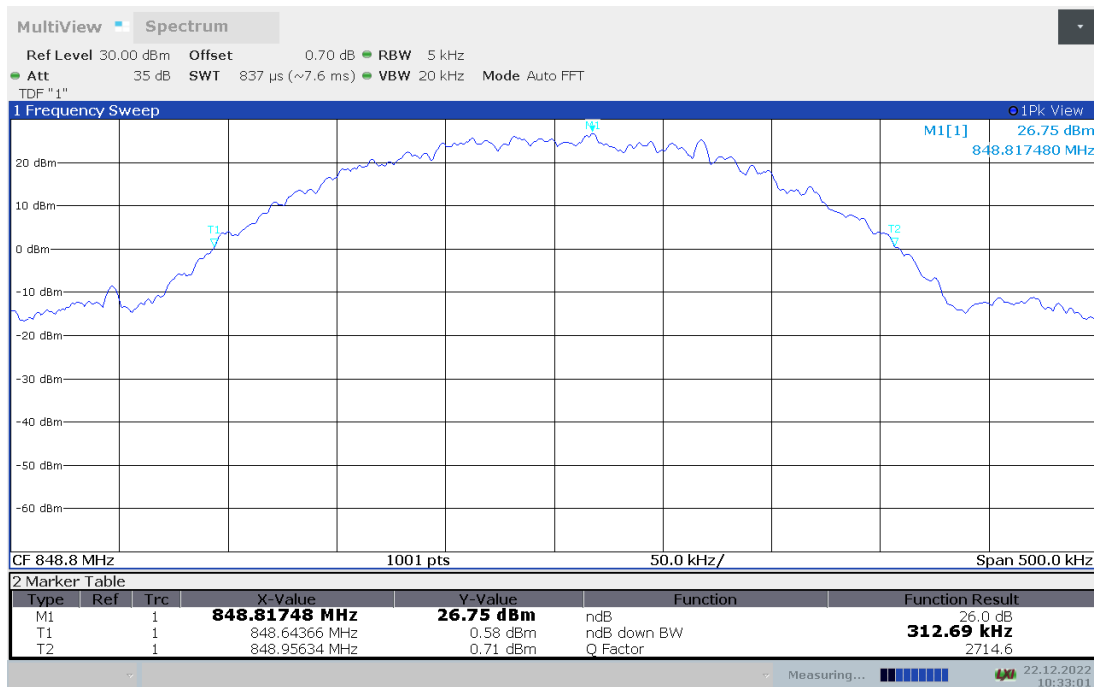
Channel 128-Emission Bandwidth (-26dBc BW)



Channel 190-Emission Bandwidth (-26dBc BW)



Channel 251-Emission Bandwidth (-26dBc BW)



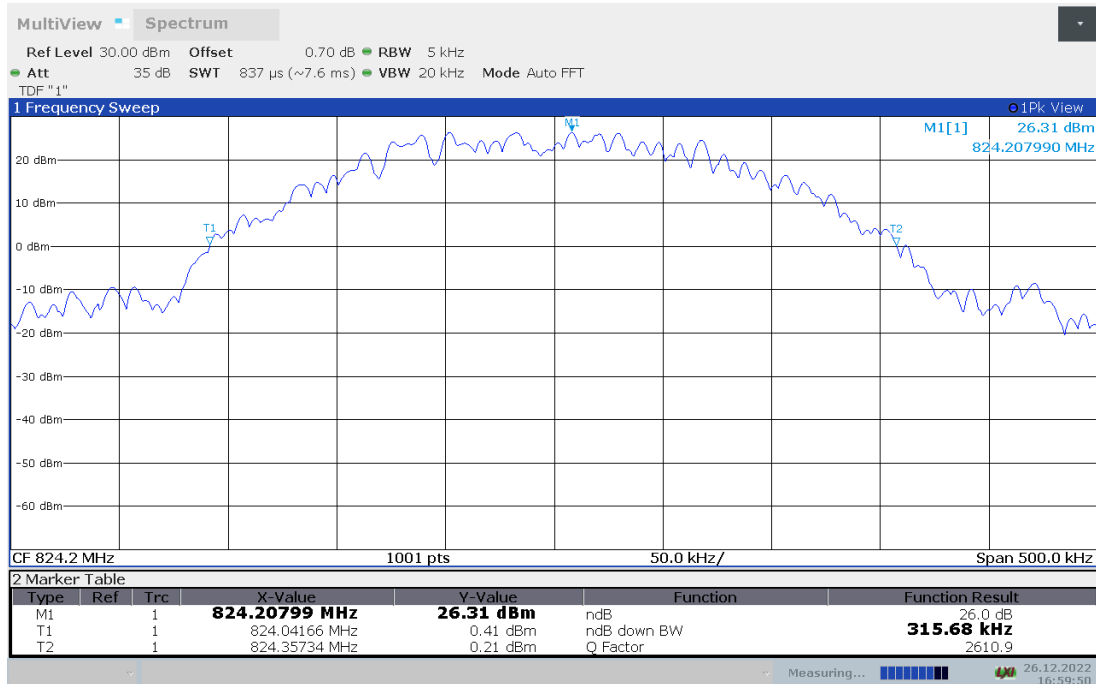
GSM850 (-26dBc)

GPRS

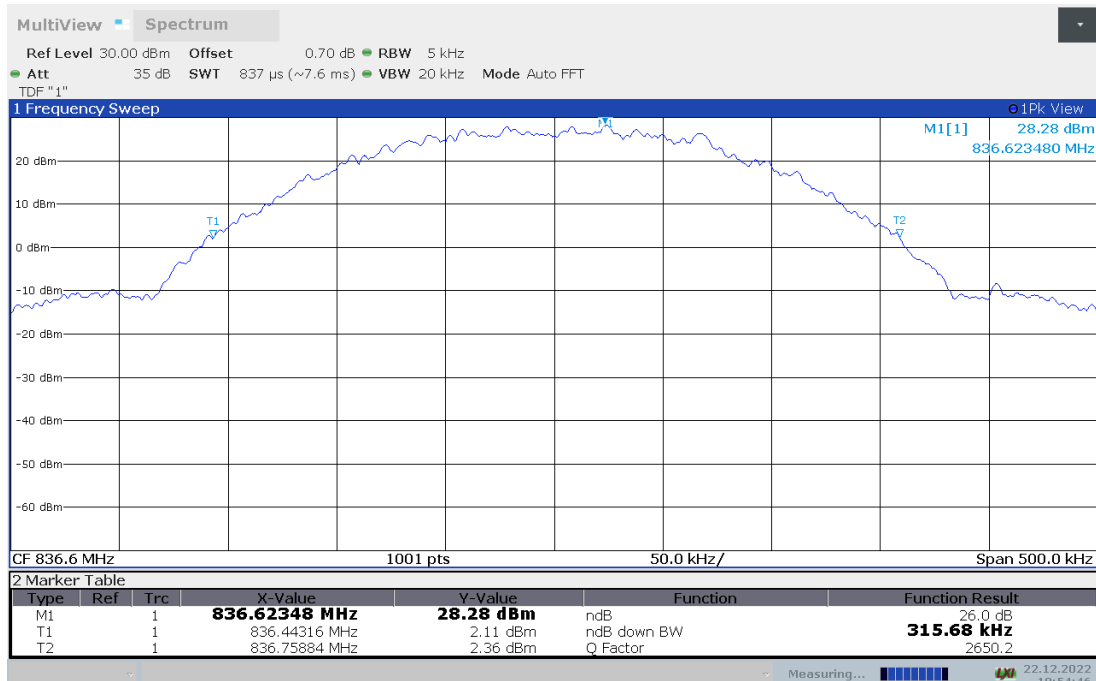
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
824.2	315.680
836.6	315.680
848.8	314.690

GSM850

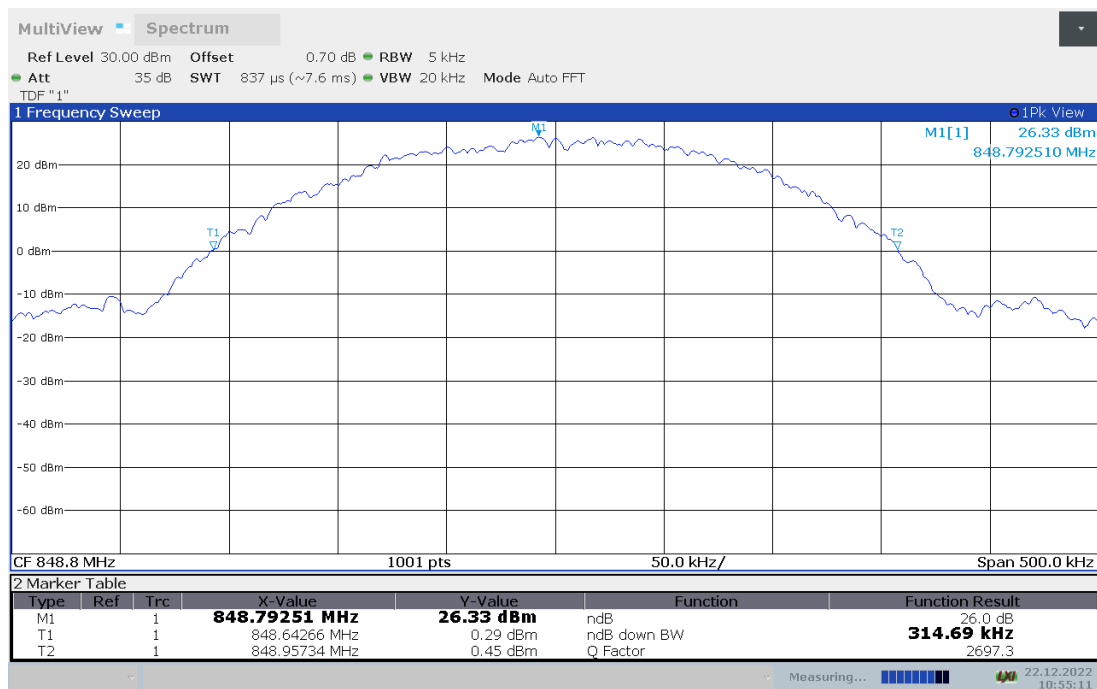
Channel 128-Emission Bandwidth (-26dBc BW)



Channel 190-Emission Bandwidth (-26dBc BW)



Channel 251-Emission Bandwidth (-26dBc BW)



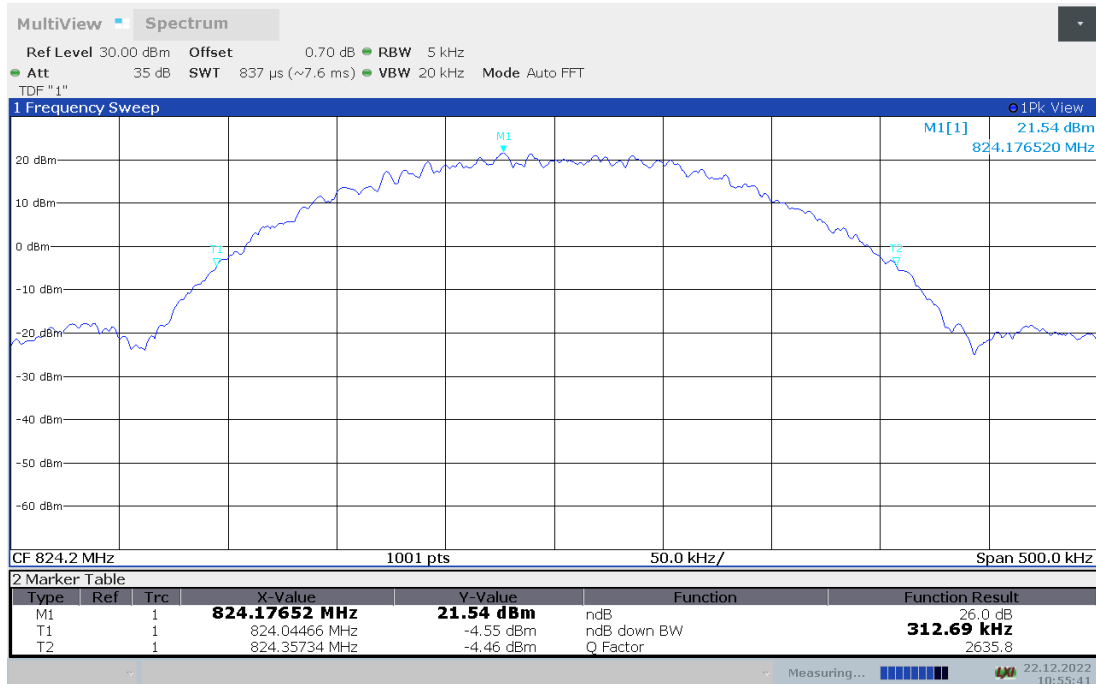
GSM850 (-26dBc)

EGPRS

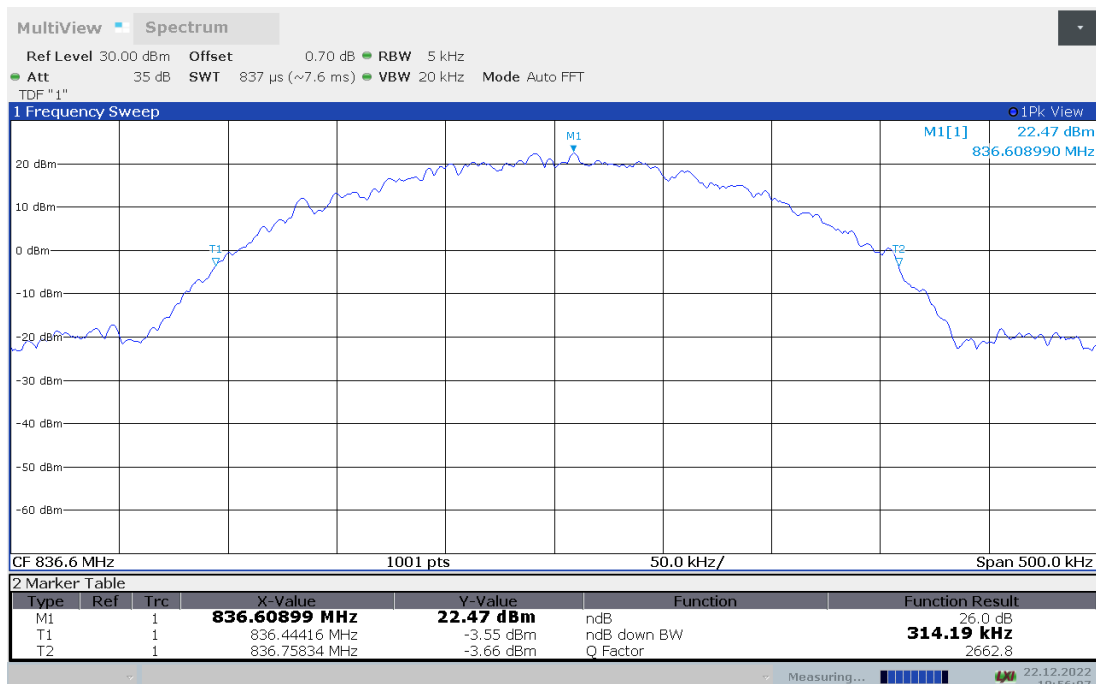
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
824.2	312.690
836.6	314.190
848.8	313.190

GSM850

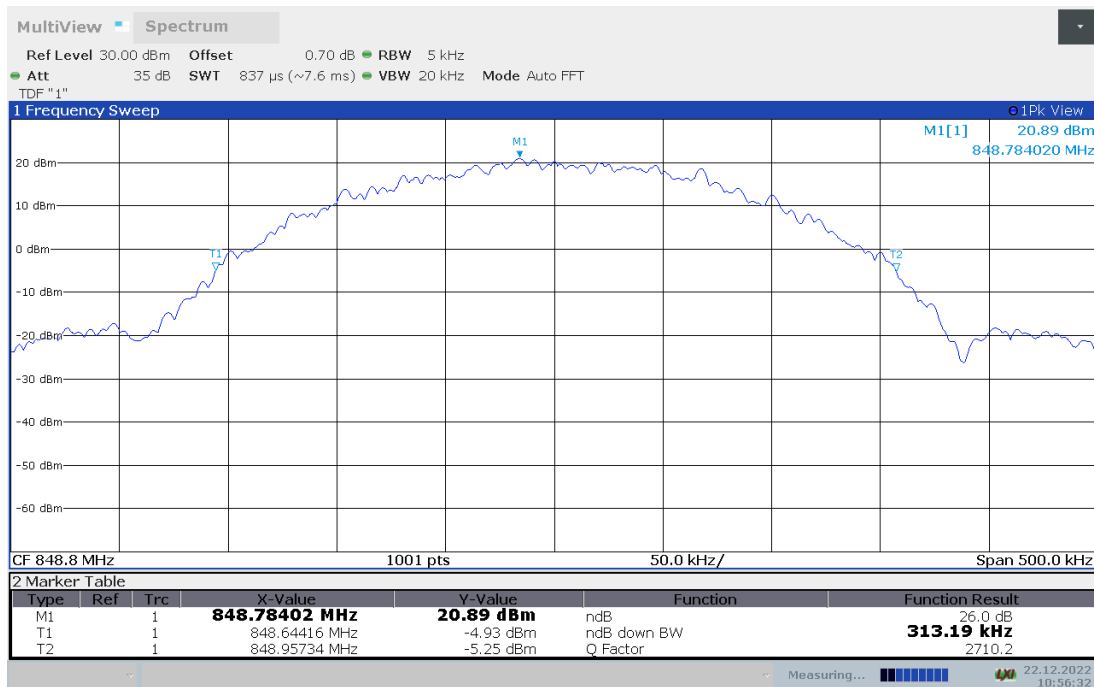
Channel 128-Emission Bandwidth (-26dBc BW)



Channel 190-Emission Bandwidth (-26dBc BW)



Channel 251-Emission Bandwidth (-26dBc BW)

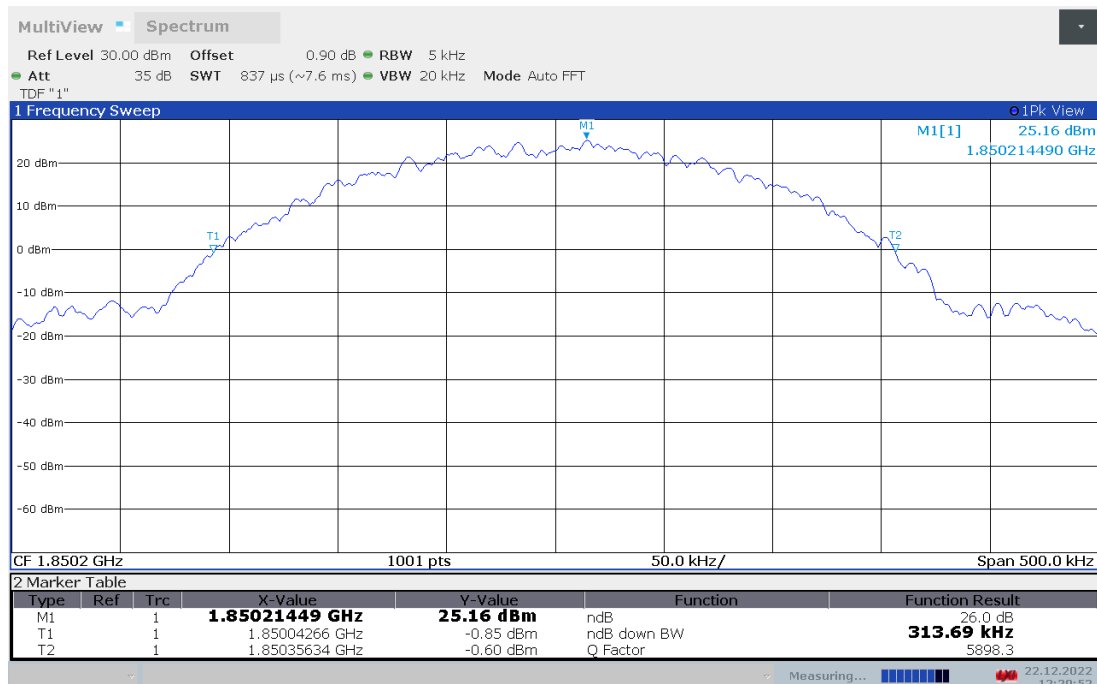


PCS1900 (-26dBc) GSM

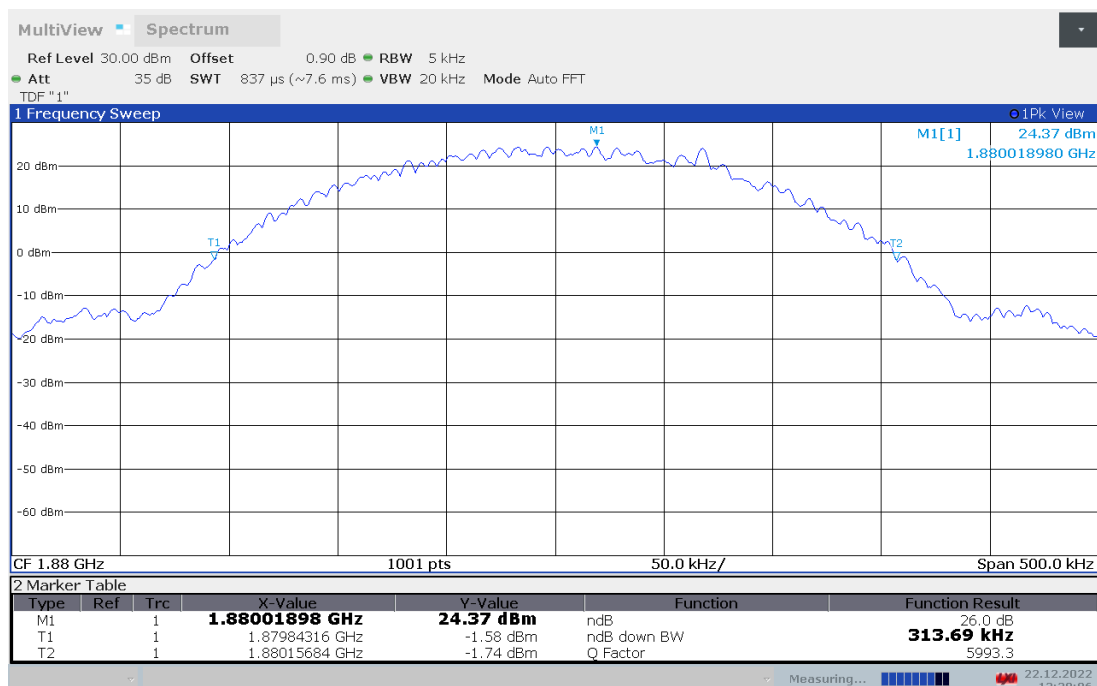
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
1850.2	313.690
1880	313.690
1909.8	311.690

PCS1900

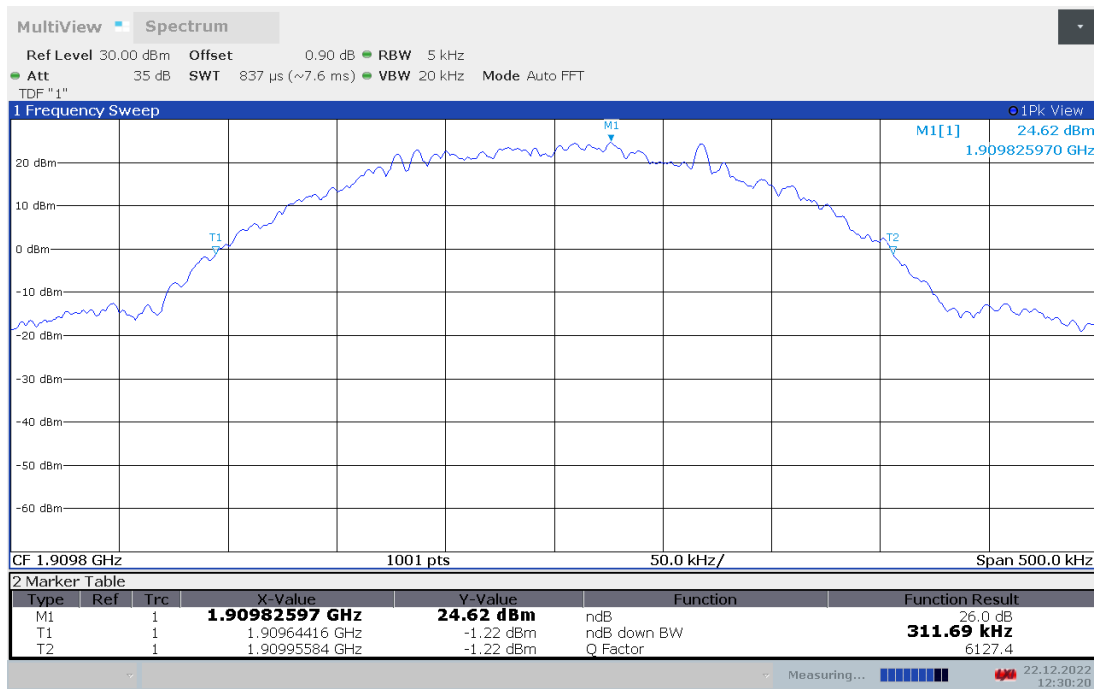
Channel 512-Emission Bandwidth (-26dBc BW)



Channel 661-Emission Bandwidth (-26dBc BW)



Channel 810-Emission Bandwidth (-26dBc BW)



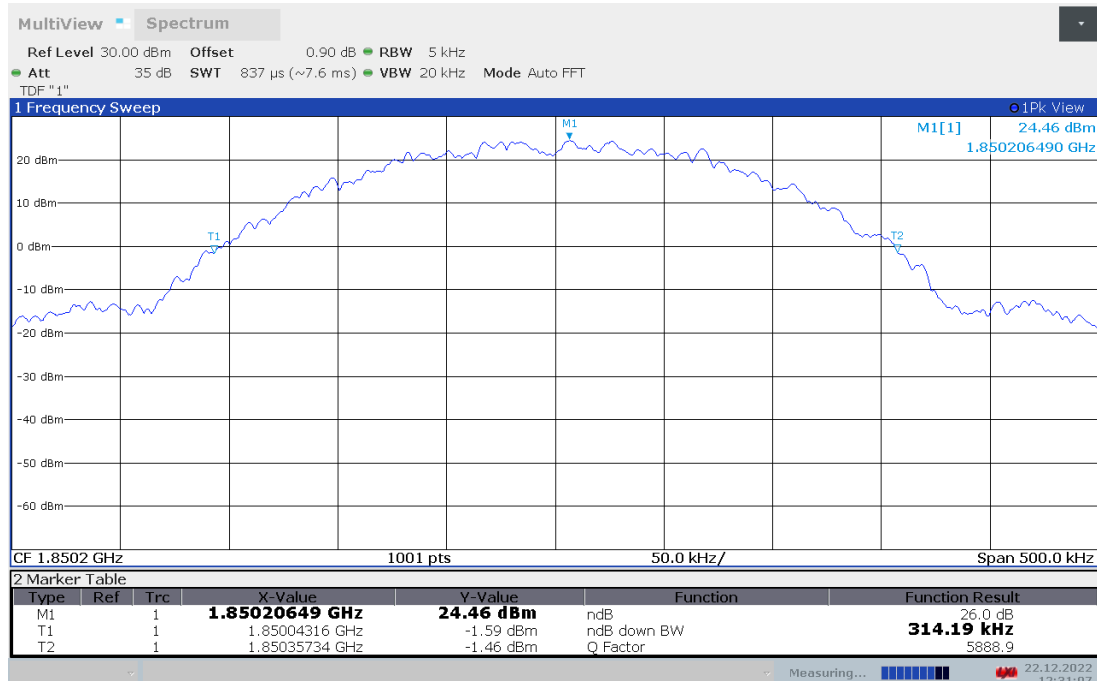
PCS1900 (-26dBc)

GPRS

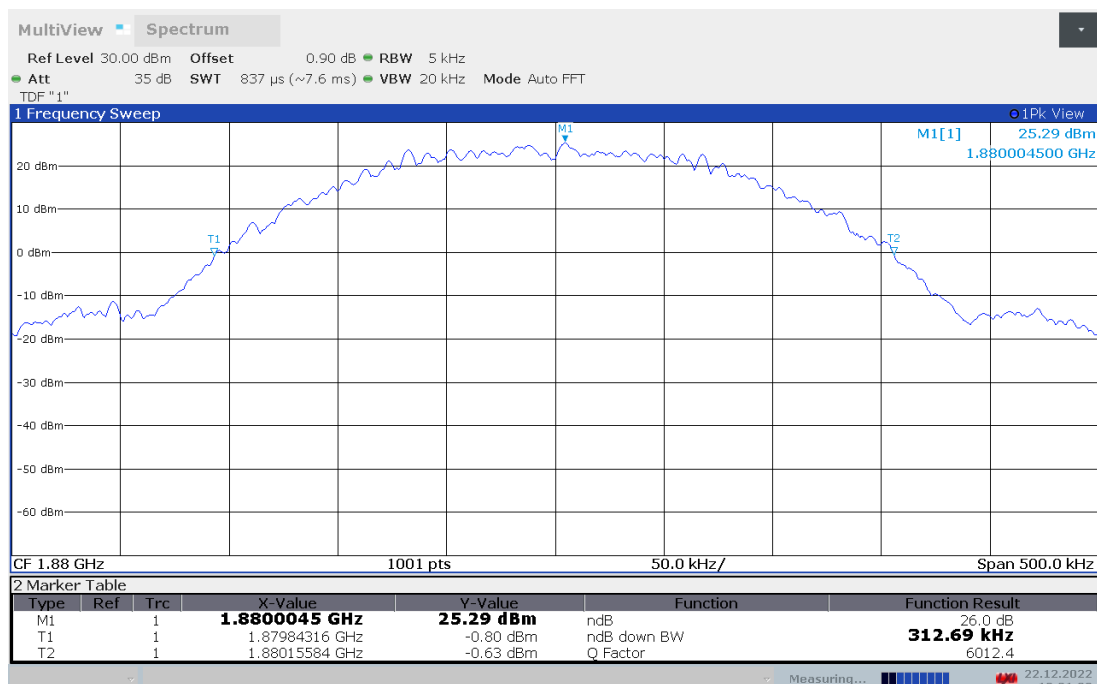
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
1850.2	314.190
1880	312.690
1909.8	319.180

PCS1900

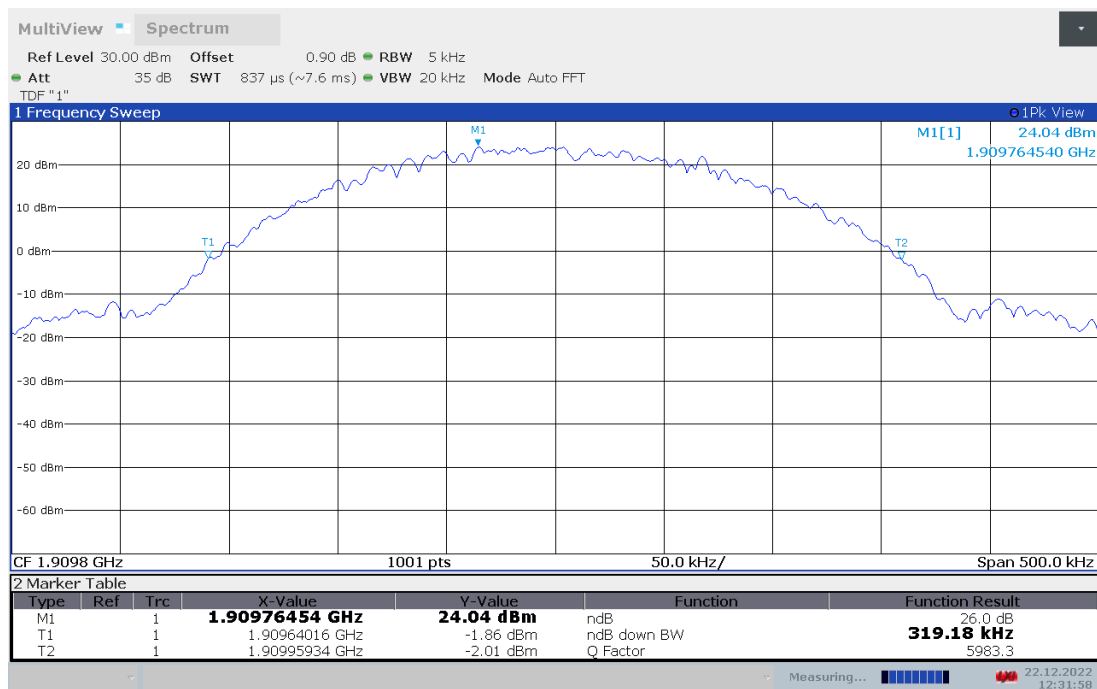
Channel 512-Emission Bandwidth (-26dBc BW)



Channel 661-Emission Bandwidth (-26dBc BW)



Channel 810-Emission Bandwidth (-26dBc BW)



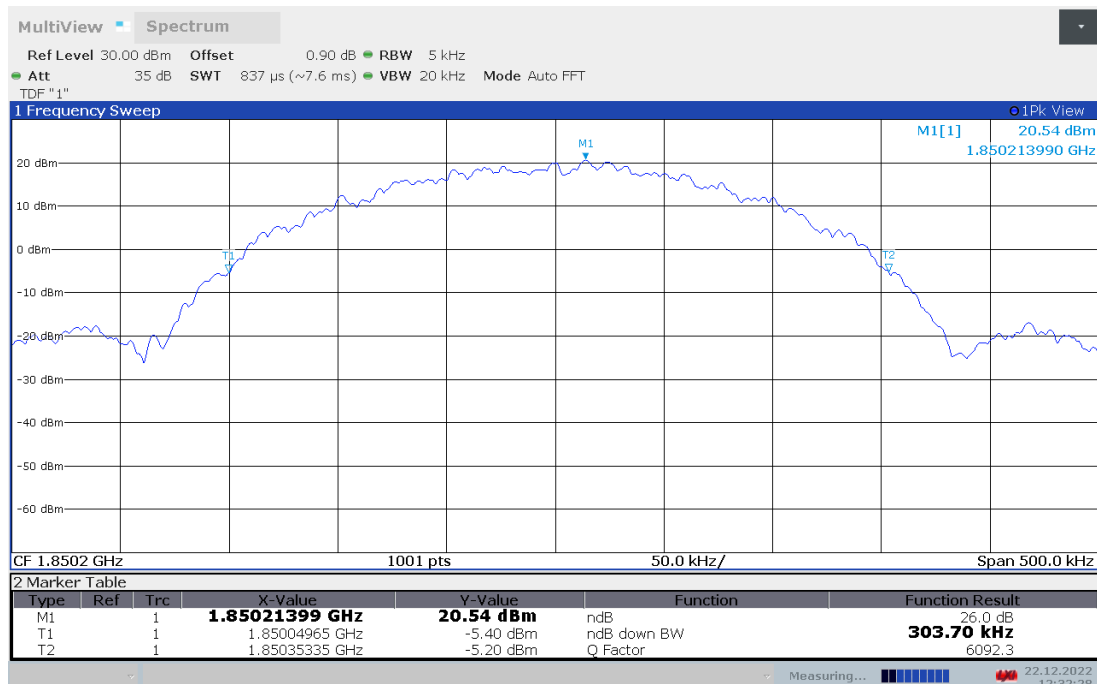
PCS1900 (-26dBc)

EGPRS

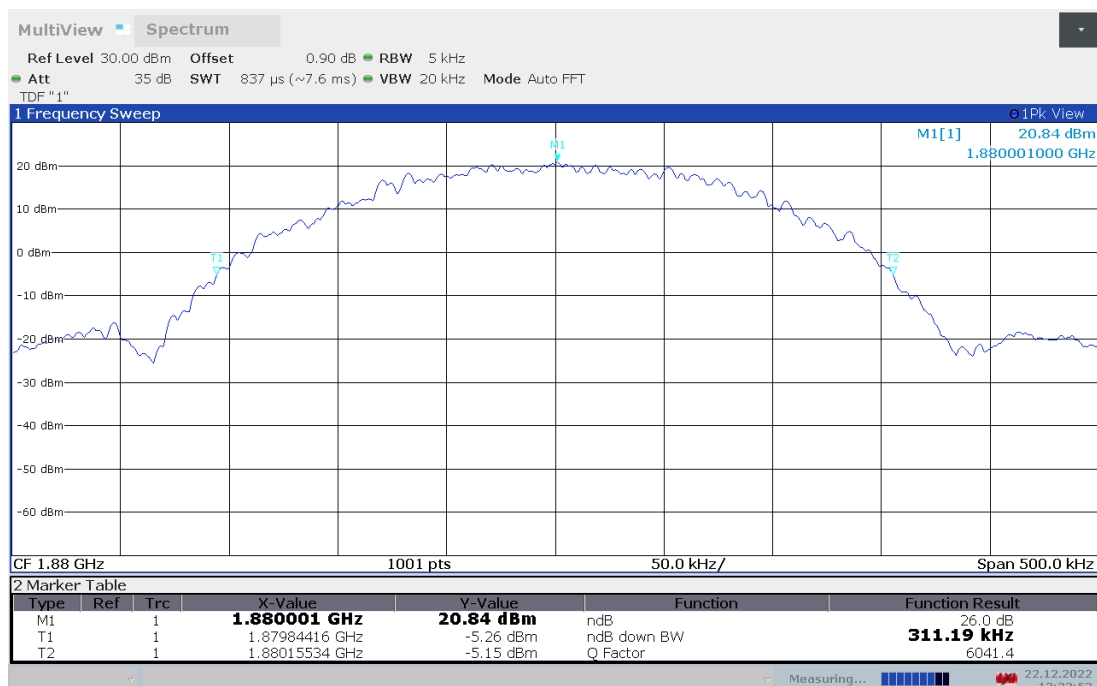
Frequency (MHz)	Emission Bandwidth (-26dBc)(kHz)
1850.2	303.700
1880	311.190
1909.8	311.190

PCS1900

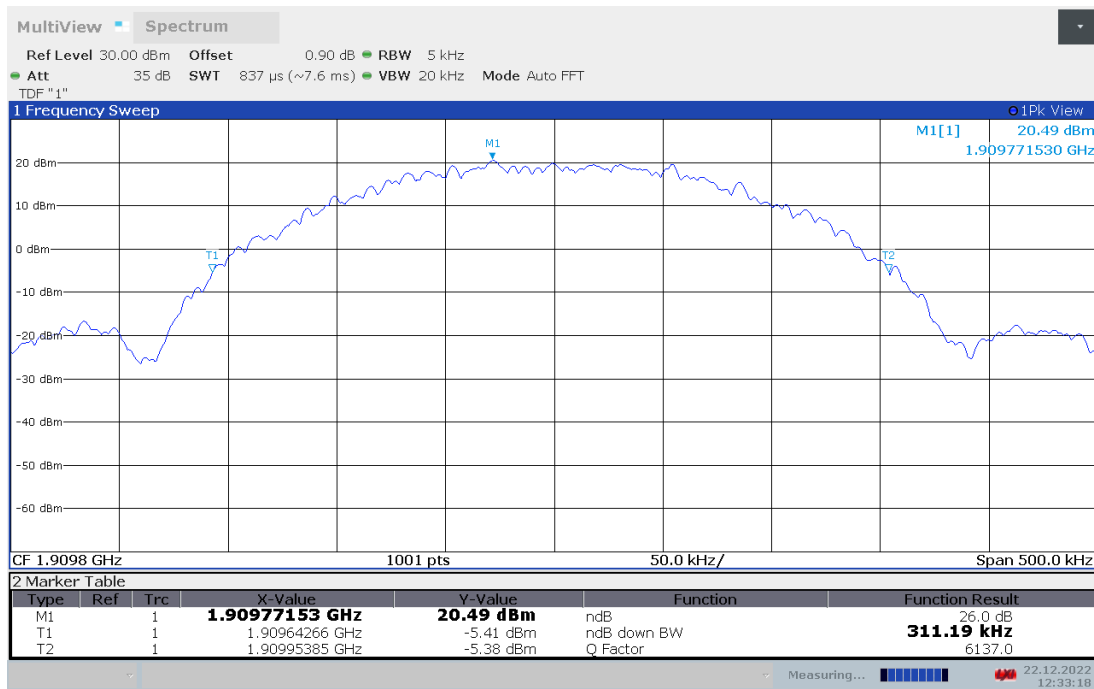
Channel 512-Emission Bandwidth (-26dBc BW)



Channel 661-Emission Bandwidth (-26dBc BW)



Channel 810-Emission Bandwidth (-26dBc BW)



Note: Expanded measurement uncertainty is $U = 3428\text{Hz}$, $k = 2$

A.5 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 2.1051, 22.917, 24.238

Measurement limit

On any frequency outside frequency band of the US Cellular/PCS spectrum, the power of any emission shall be attenuated below the transmitter power (P , in Watts) by at least $43 + 10 \log(P)$ dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm. A relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

Measurement Procedure

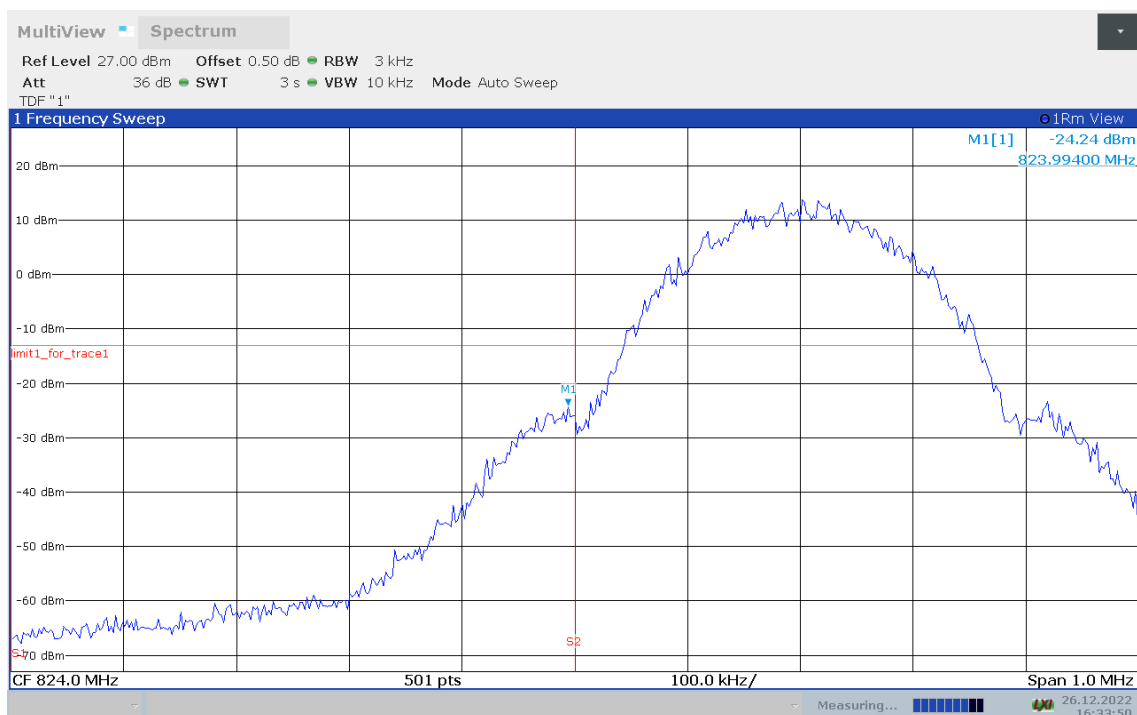
The testing follows ANSI C63.26

- a) The EUT was connected to spectrum analyzer and system simulator via a power divider.
- b) The band edges of low and high channels for the highest RF powers were measured.
- c) Set RBW $\geq 1\%$ EBW in the 1MHz band immediately outside and adjacent to the band edge.
- d) Set spectrum analyzer with RMS detector.
- e) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
- f) Checked that all the results comply with the emission limit line.

Only worst case result is given below

GSM 850

LOW BAND EDGE BLOCK-A-Channel 128

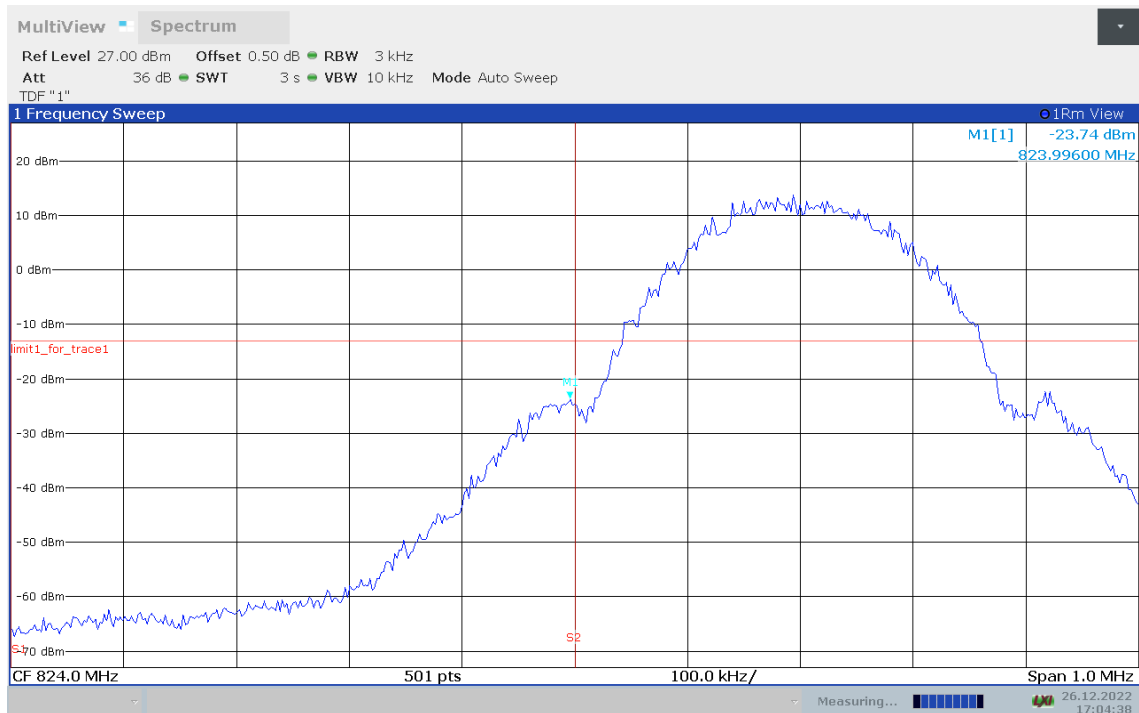


HIGH BAND EDGE BLOCK-C –Channel 251



GPRS 850

LOW BAND EDGE BLOCK-A-Channel 128

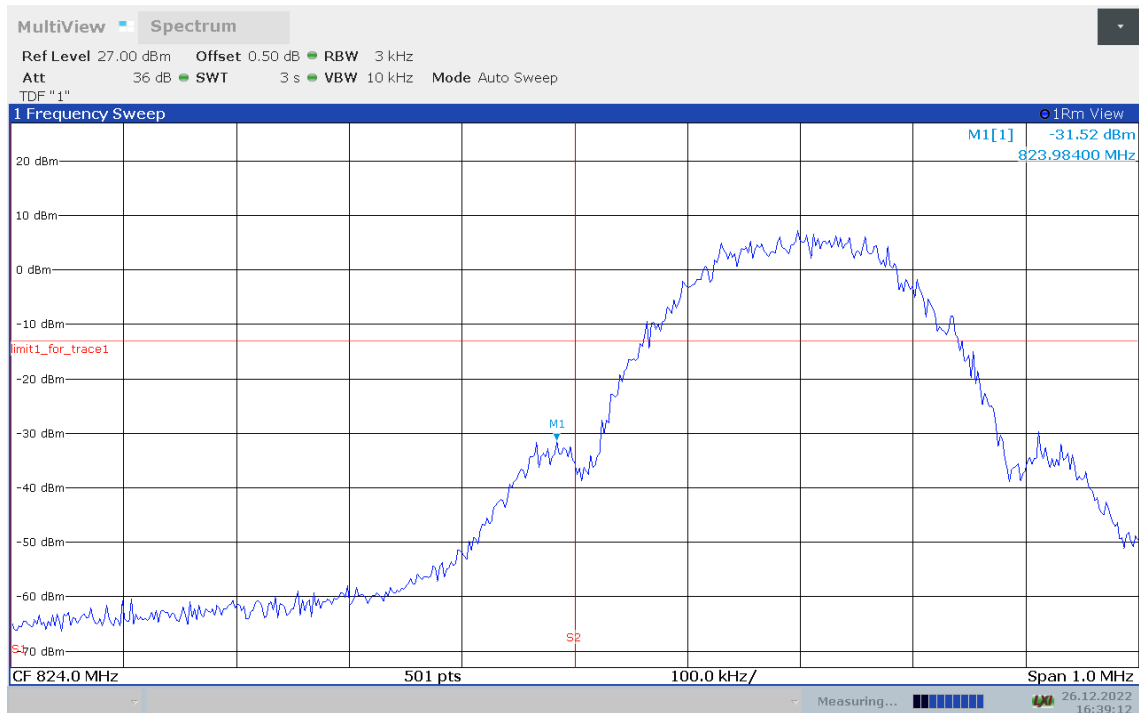


HIGH BAND EDGE BLOCK-C-Channel 251



EGPRS 850

LOW BAND EDGE BLOCK-A-Channel 128

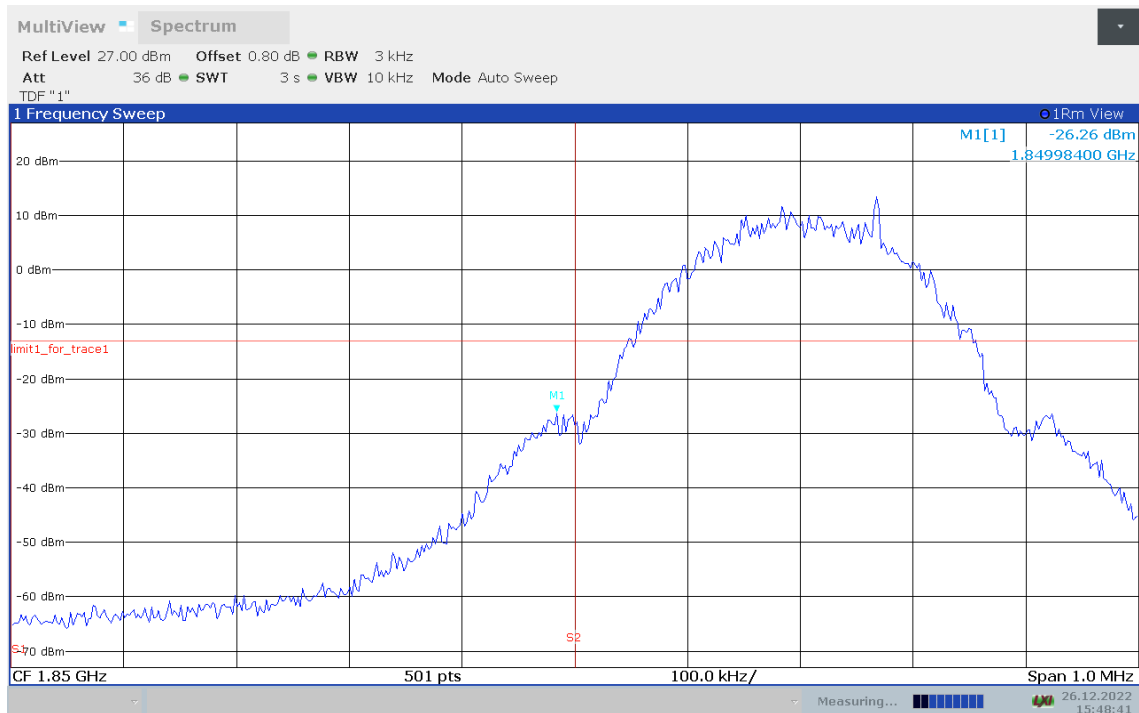


HIGH BAND EDGE BLOCK-C-Channel 251



PCS 1900

LOW BAND EDGE BLOCK-A-Channel 512

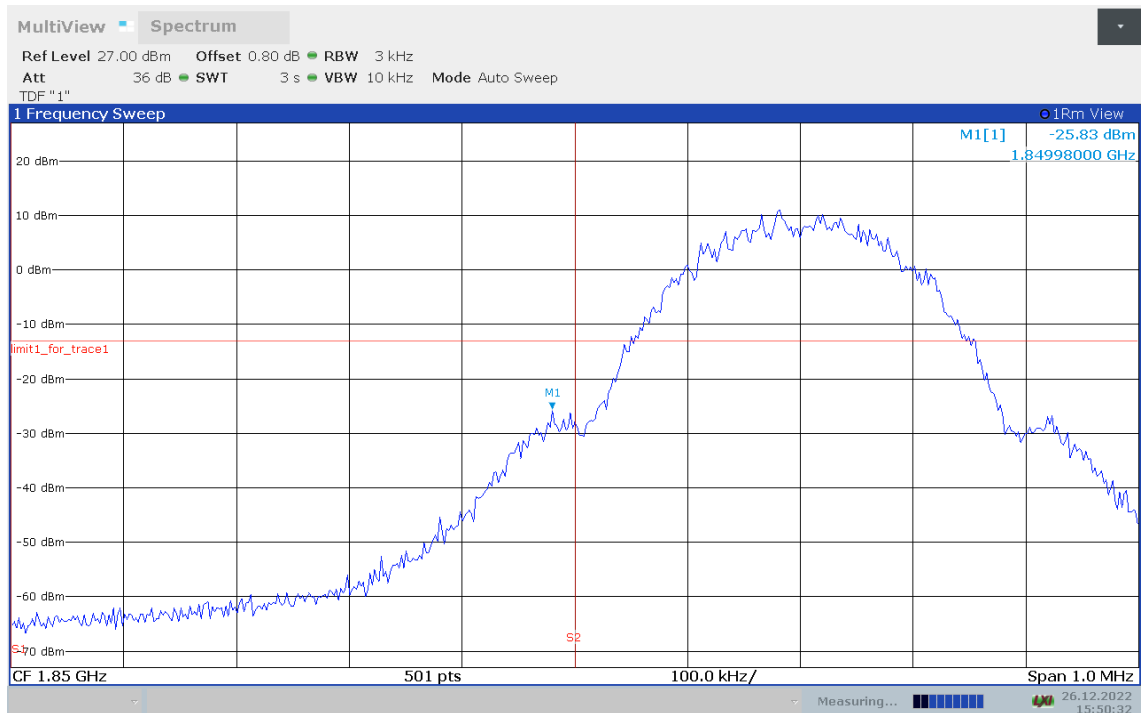


HIGH BAND EDGE BLOCK-C-Channel 810

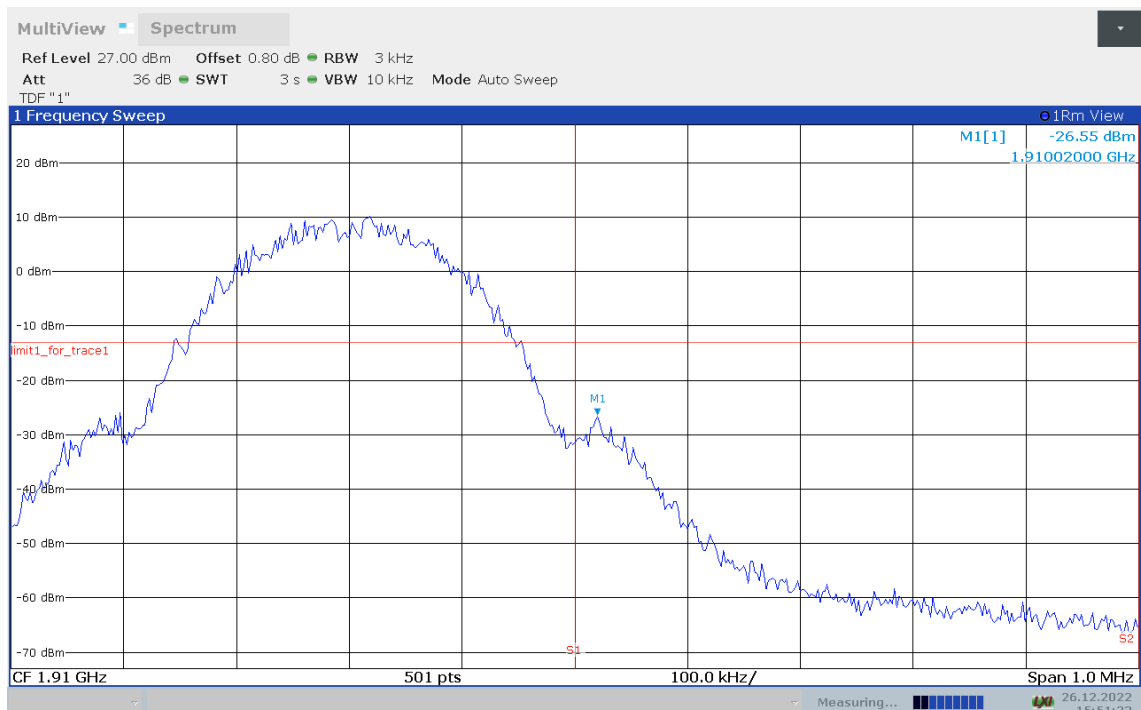


GPRS 1900

LOW BAND EDGE BLOCK-A-Channel 512



HIGH BAND EDGE BLOCK-C-Channel 810



EGPRS 1900

LOW BAND EDGE BLOCK-A-Channel 512



HIGH BAND EDGE BLOCK-C-Channel 810



Note: Expanded measurement uncertainty is $U = 0.49\text{dB}(100\text{kHz}-2\text{GHz})/1.21\text{dB}(2\text{GHz}-26.5\text{GHz})$, $k = 1.96$

A.6 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1051, 22.917, 24.238

A.6.1 Measurement Method

The following steps outline the procedure used to measure the conducted emissions from the EUT.

1. Determine frequency range for measurements: From CFR 2.1051 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency. For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 9 GHz, data taken from 10 MHz to 25 GHz.
2. Determine EUT transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

GSM850 Transmitter

Channel	Frequency (MHz)
128	824.2
190	836.6
251	848.8

PCS1900 Transmitter

Channel	Frequency (MHz)
512	1850.2
661	1880.0
810	1909.8

A. 7.2 Measurement Limit

Part 24.238 and Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

The specification that emissions shall be attenuated below the transmitter power (P) by at least $43 + 10 \log(P)$ dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.6.3 Measurement result

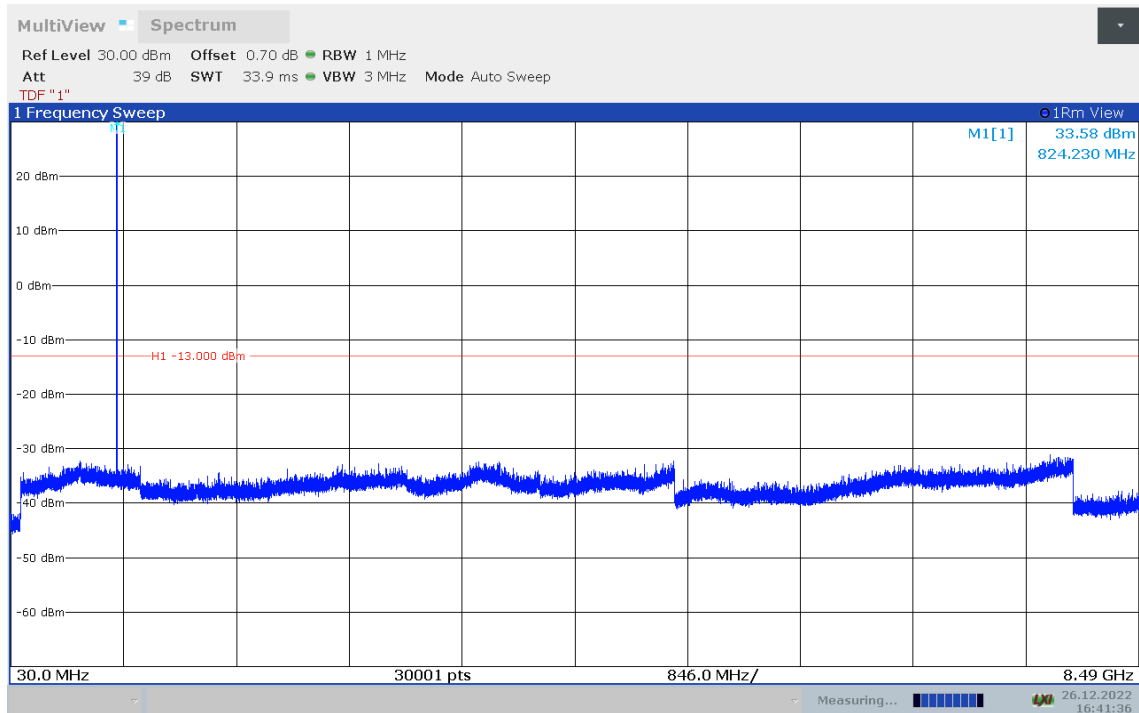
Only worst case result is given below

GSM850

Channel 128: 30MHz–8.49 GHz

Spurious emission limit –13dBm

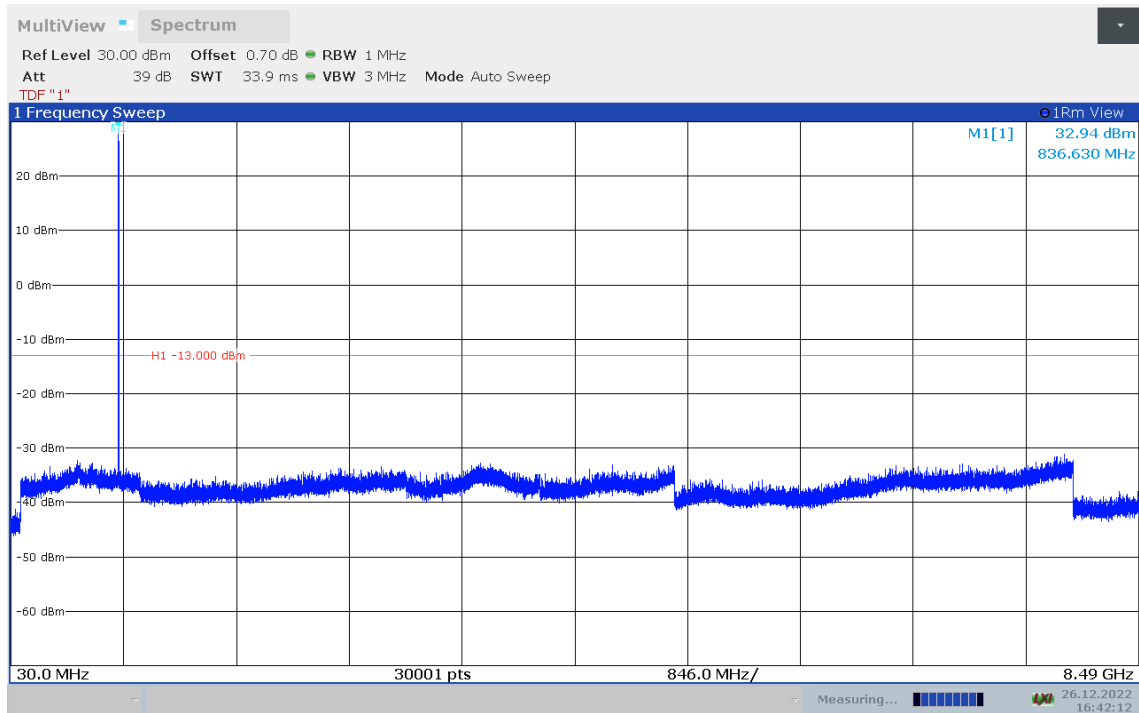
NOTE: peak above the limit line is the carrier frequency..



Channel 190: 30MHz – 8.49GHz

Spurious emission limit –13dBm

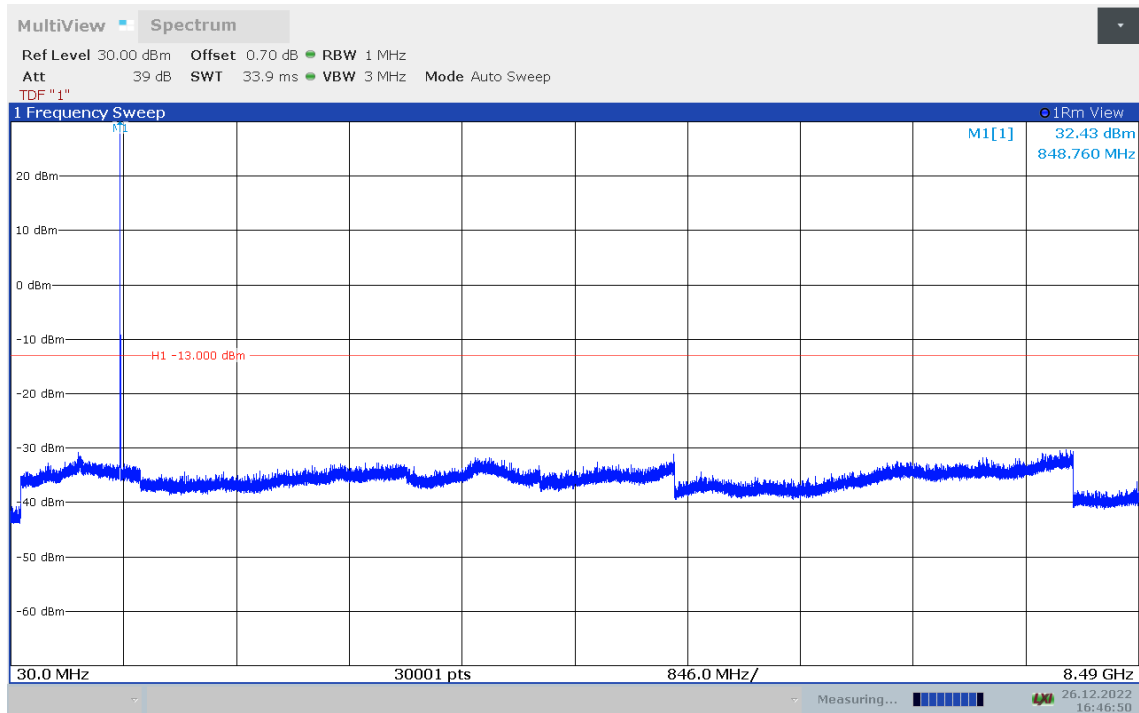
NOTE: peak above the limit line is the carrier frequency.



Channel 251: 30MHz – 8.49 GHz

Spurious emission limit –13dBm.

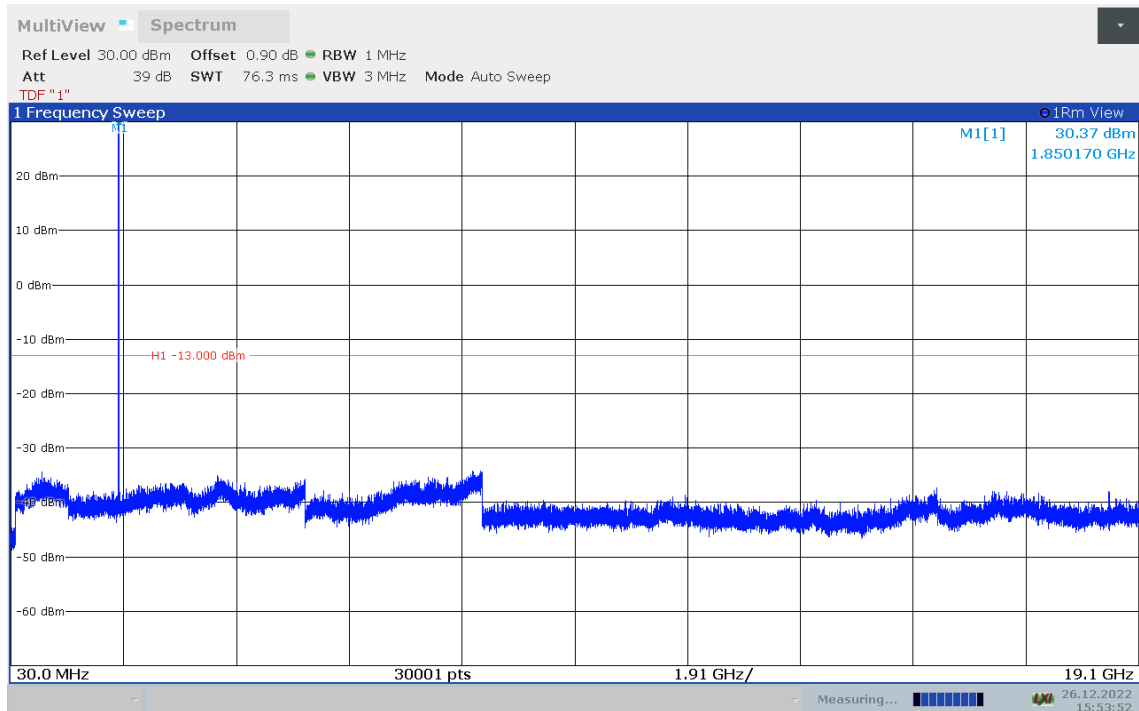
NOTE: peak above the limit line is the carrier frequency.



PCS1900

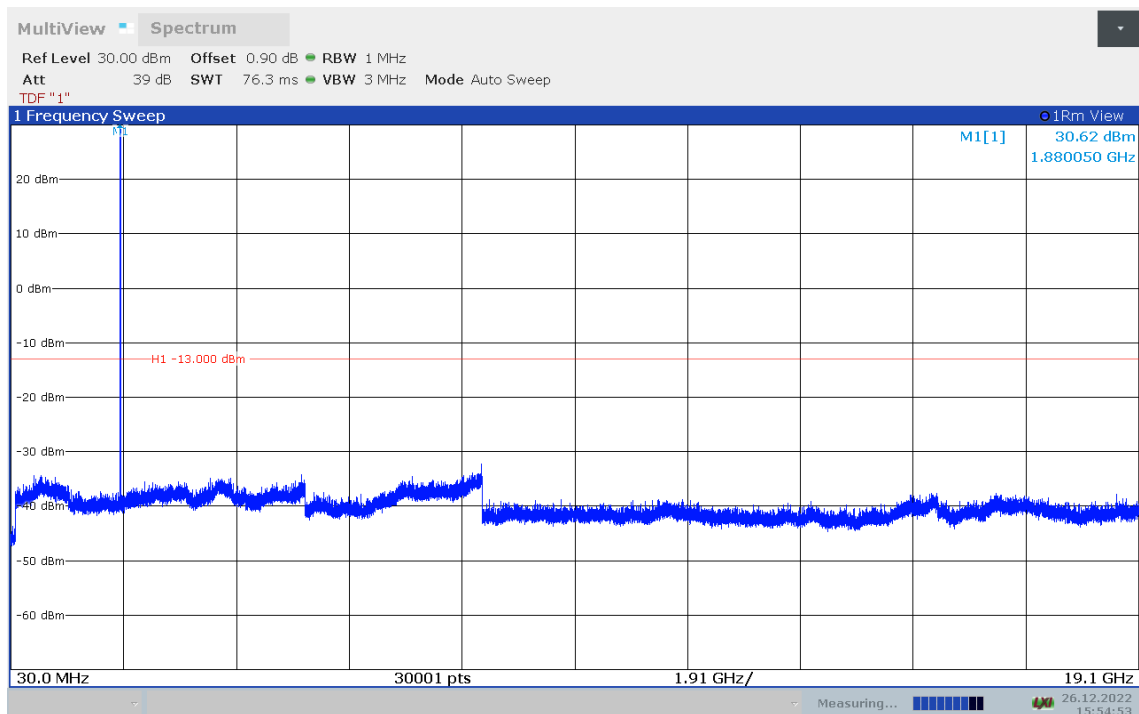
Channel 512: 30MHz – 19.1GHz

Spurious emission limit –13dBm.



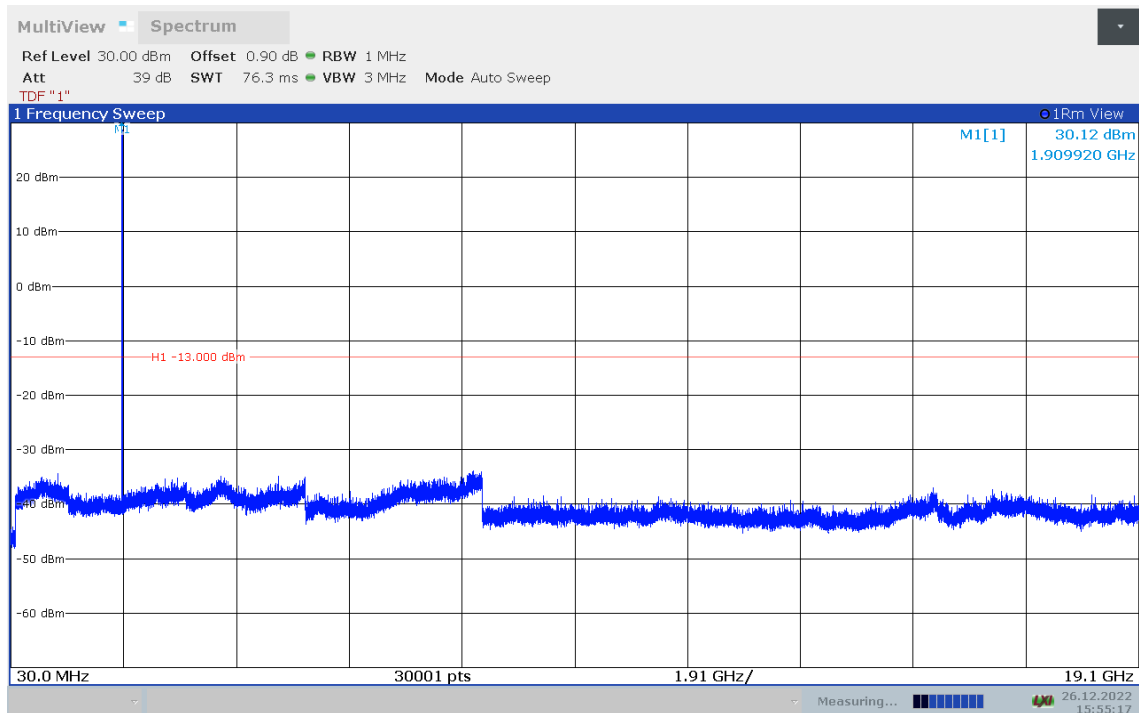
Channel 661: 30MHz –19.1GHz

Spurious emission limit –13dBm



Channel 810: 30MHz –19.1GHz

Spurious emission limit –13dBm.



Note: Expanded measurement uncertainty is $U = 0.49\text{dB}(100\text{KHz}-2\text{GHz})/1.21\text{dB}(2\text{GHz}-26.5\text{GHz})$, $k = 1.96$

A.7 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232, KDB971168 D01.

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.

- a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
- b) Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
- c) Set the number of counts to a value that stabilizes the measured CCDF curve;
- d) Set the measurement interval to 1 ms
- e) Record the maximum PAPR level associated with a probability of 0.1%

A.7.1 Measurement limit

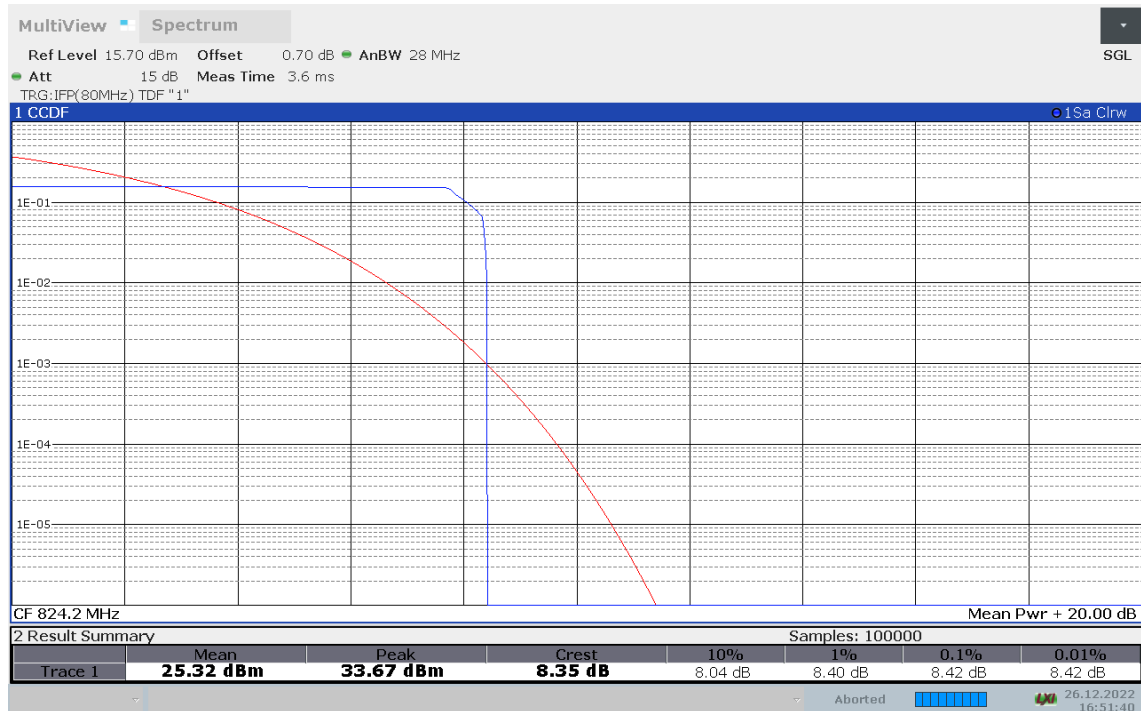
not exceed 13 dB

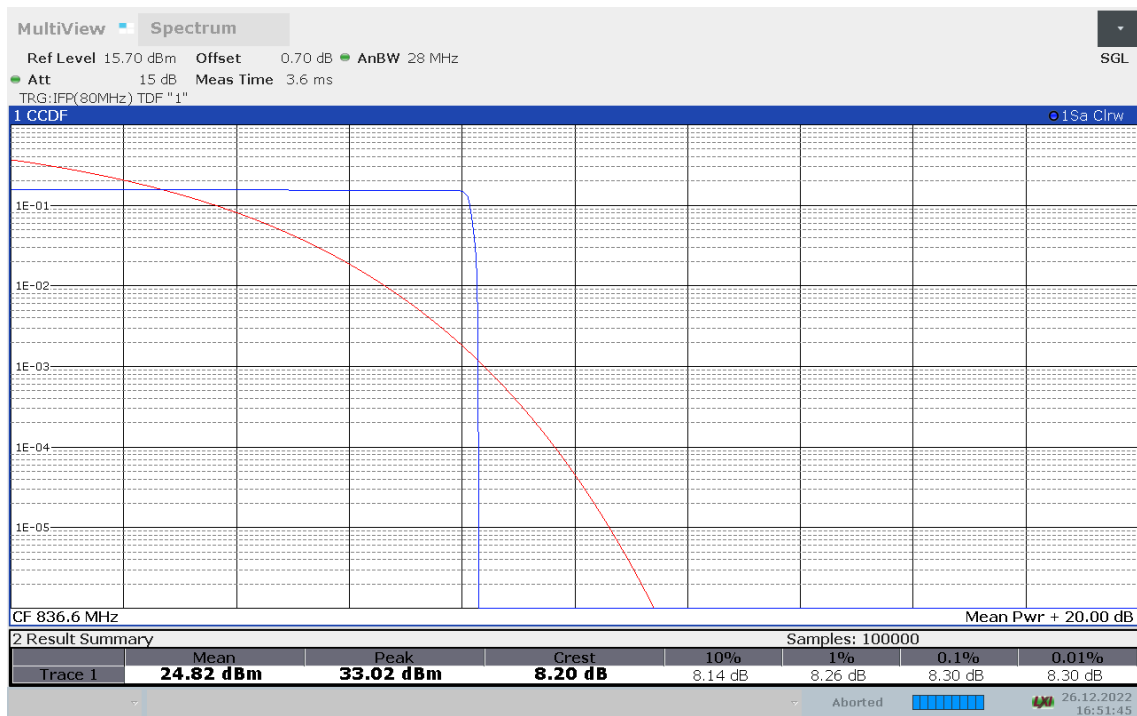
A.7.2 Measurement results

Only worst case result is given below

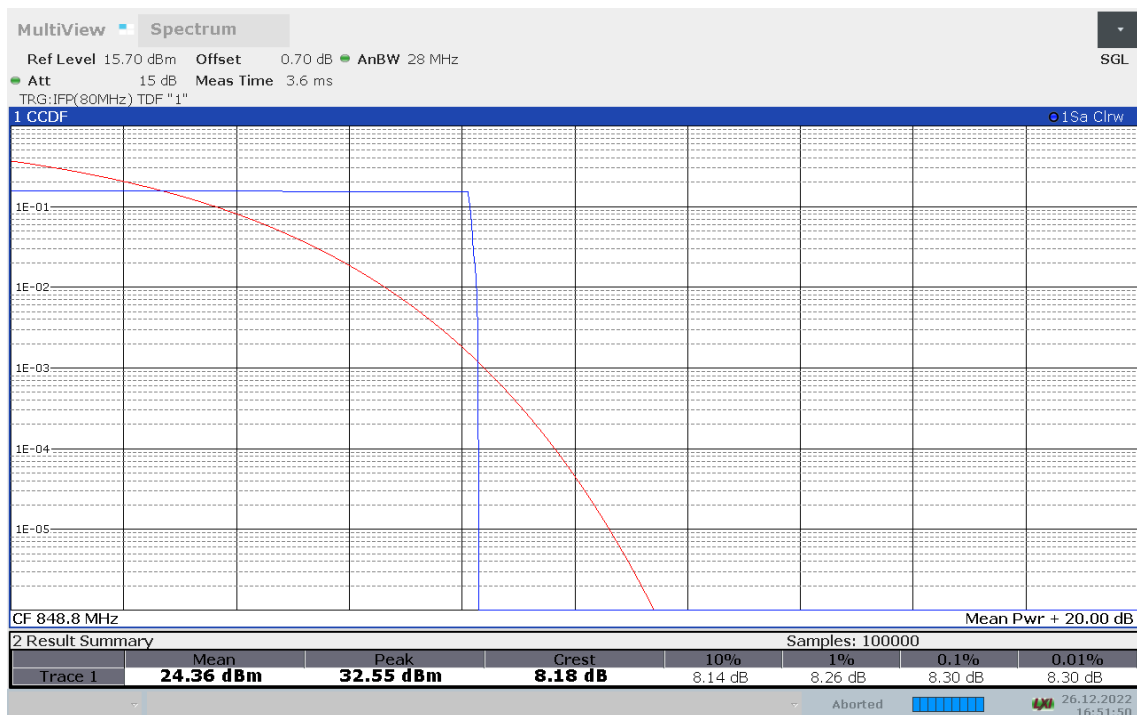
GSM850

Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
824.2	8.30
836.6	8.42
848.8	8.30

GSM 850
Channel 128- Peak-to-average Power Ratio

Channel 190- Peak-to-average Power Ratio



Channel 251- Peak-to-average Power Ratio

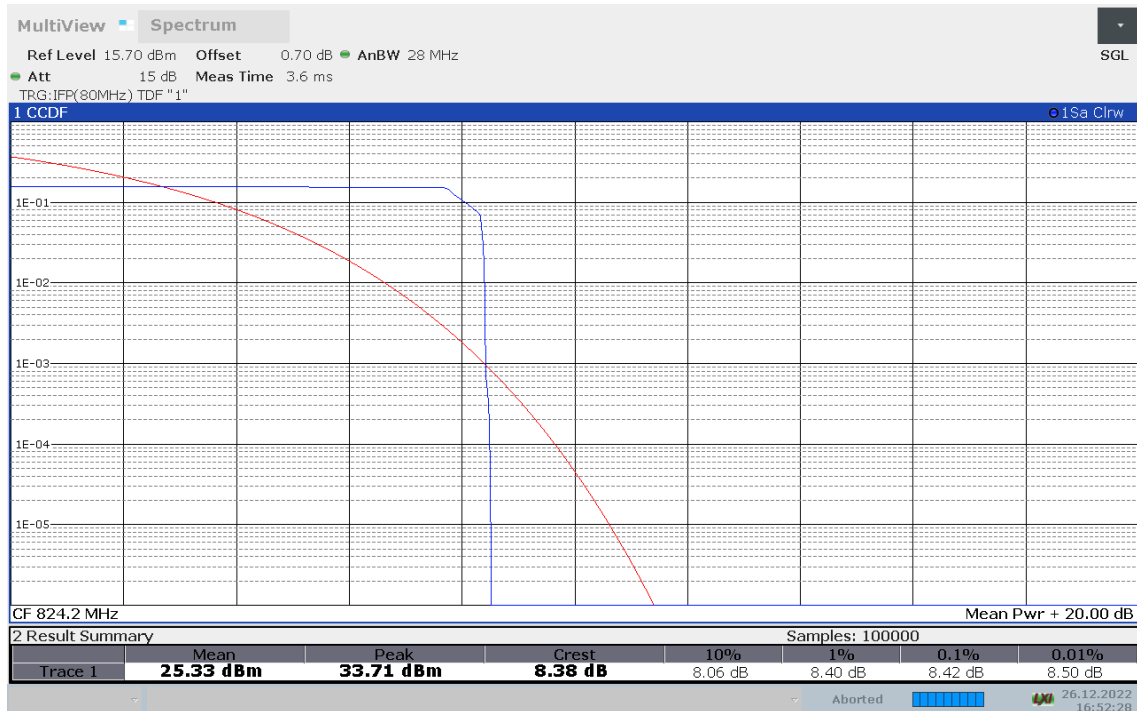


GPRS 850 (PAPR)

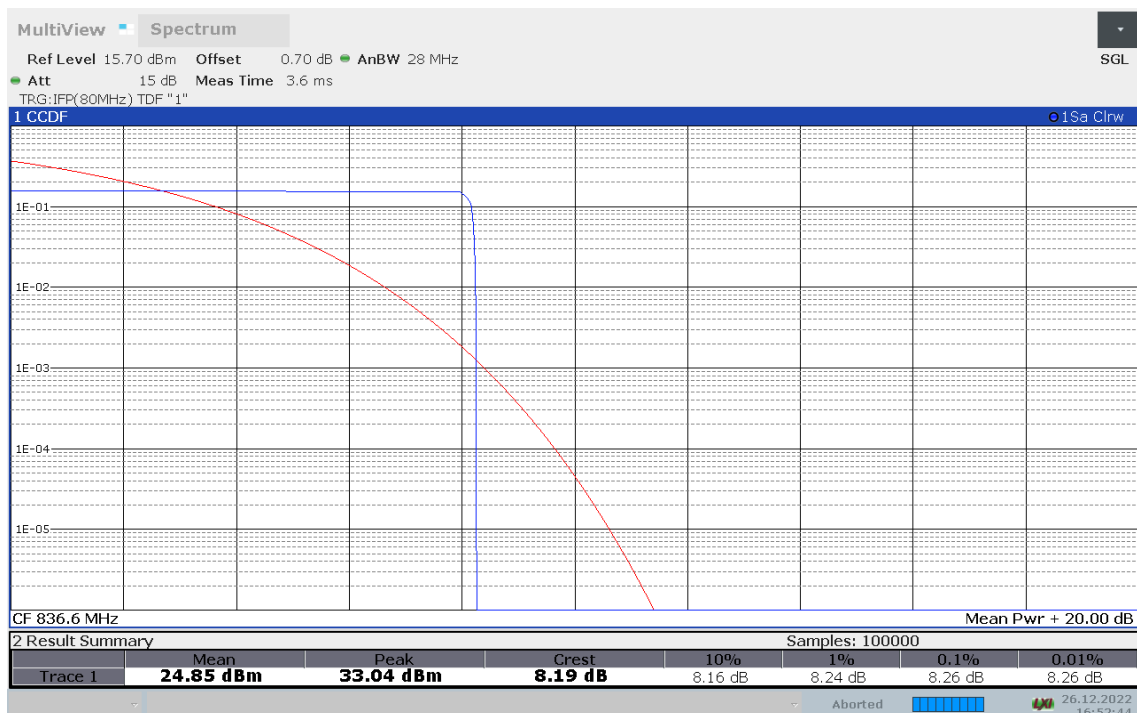
Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
824.2	8.26
836.6	8.42
848.8	8.28

GPRS 850

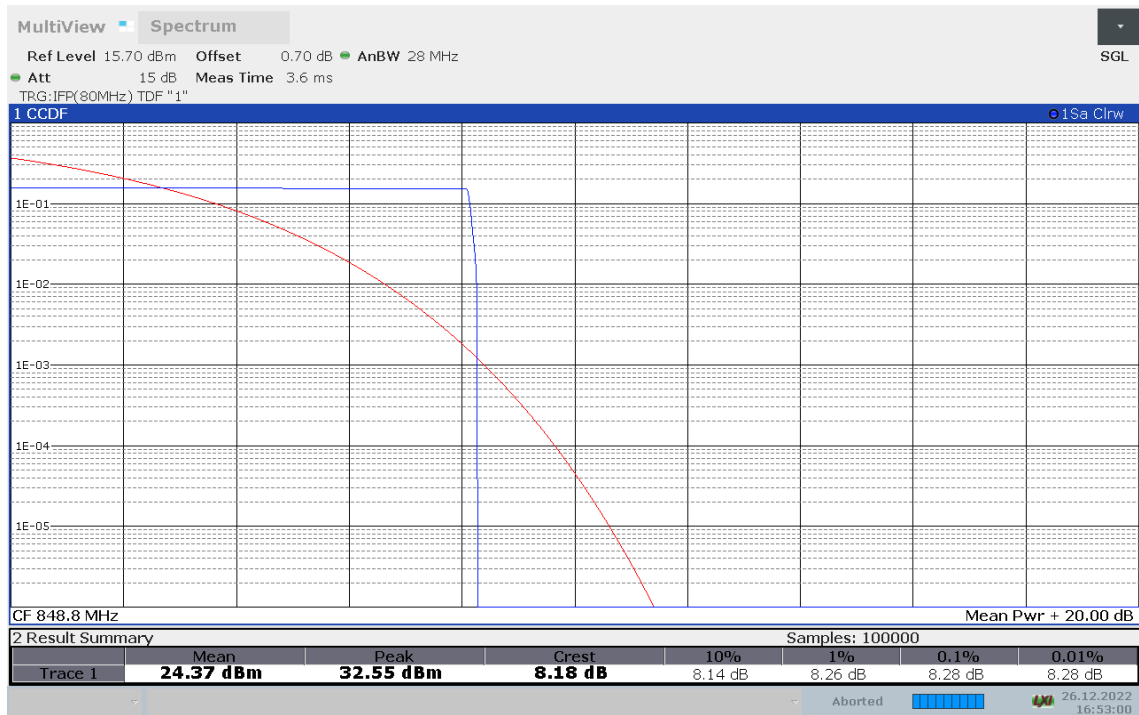
Channel 128- Peak-To-Average Power Ratio(PAPR)



Channel 190- Peak-To-Average Power Ratio(PAPR)



Channel 251- Peak-To-Average Power Ratio(PAPR)

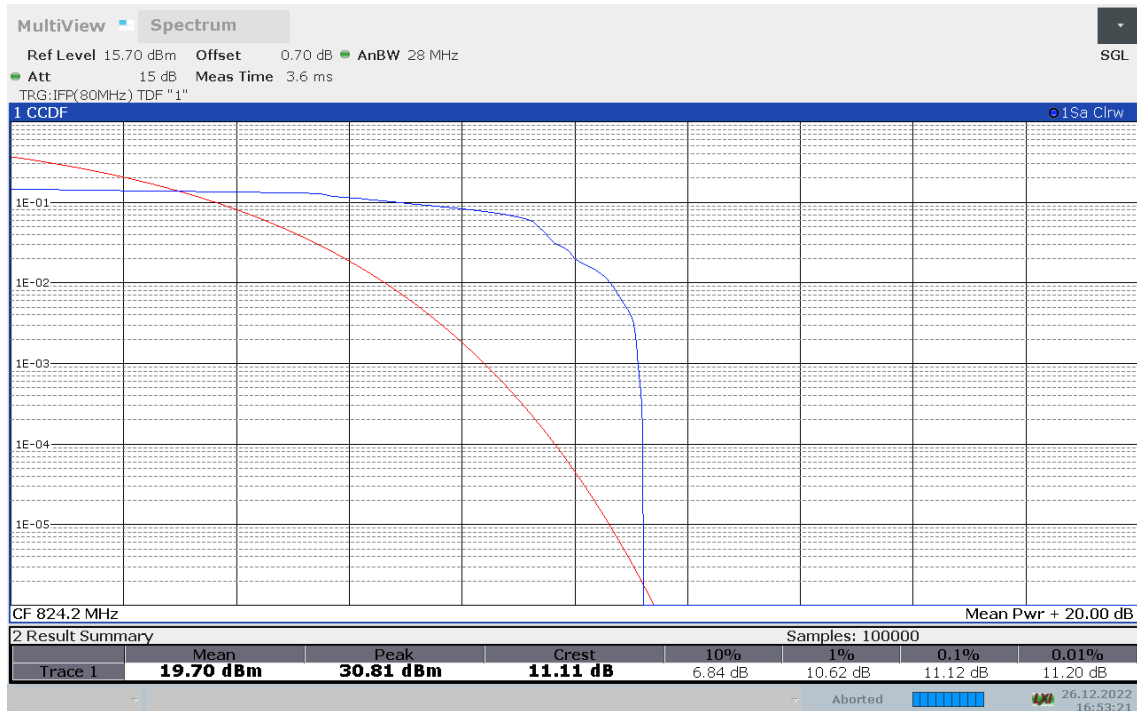


EGPRS 850 (PAPR)

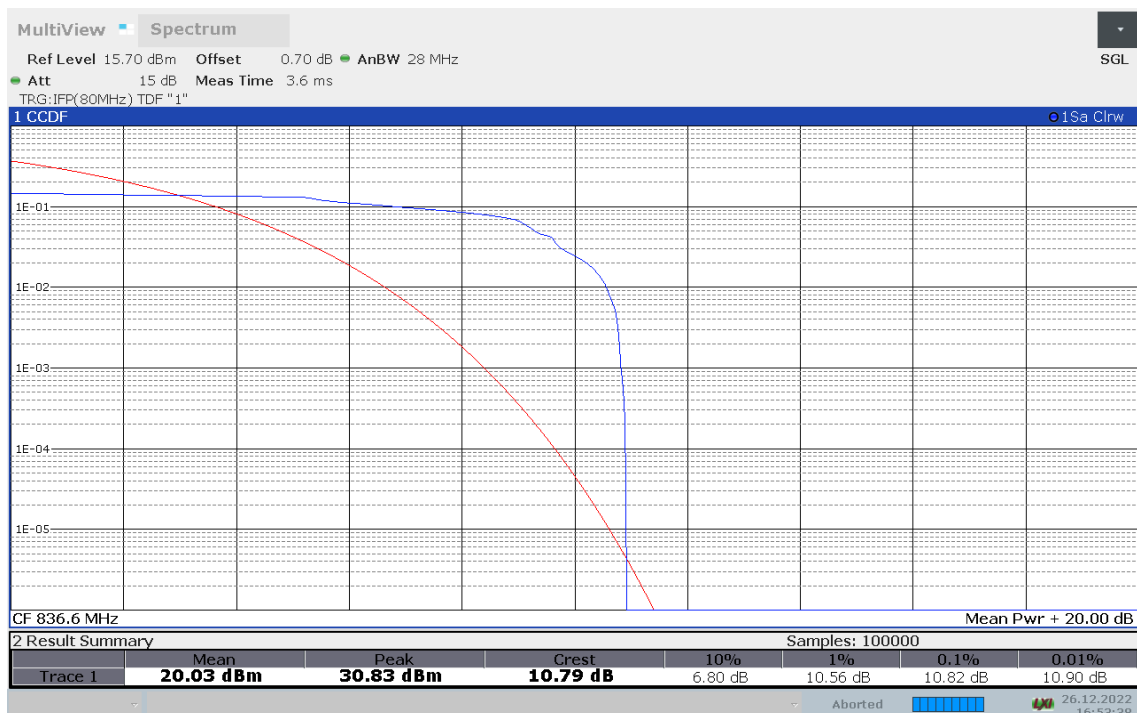
Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
824.2	10.82
836.6	11.12
848.8	11.10

EGPRS 850

Channel 128- Peak-To-Average Power Ratio(PAPR)



Channel 190- Peak-To-Average Power Ratio(PAPR)



Channel 251- Peak-To-Average Power Ratio(PAPR)

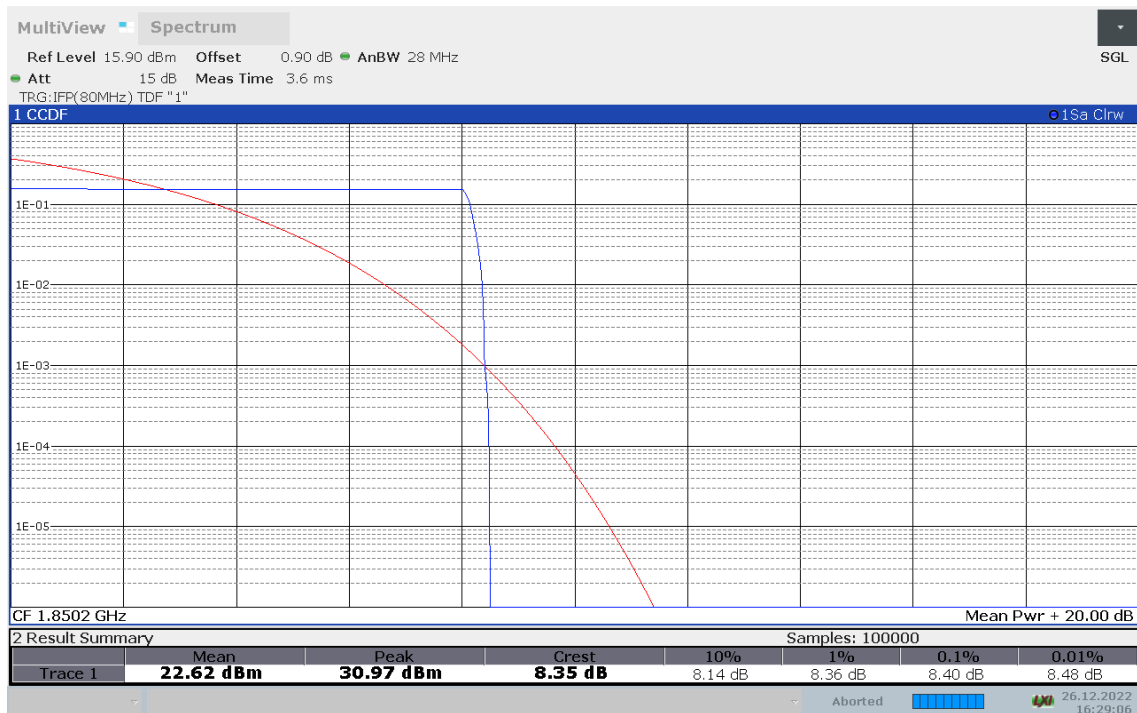


PCS1900 (PAPR)

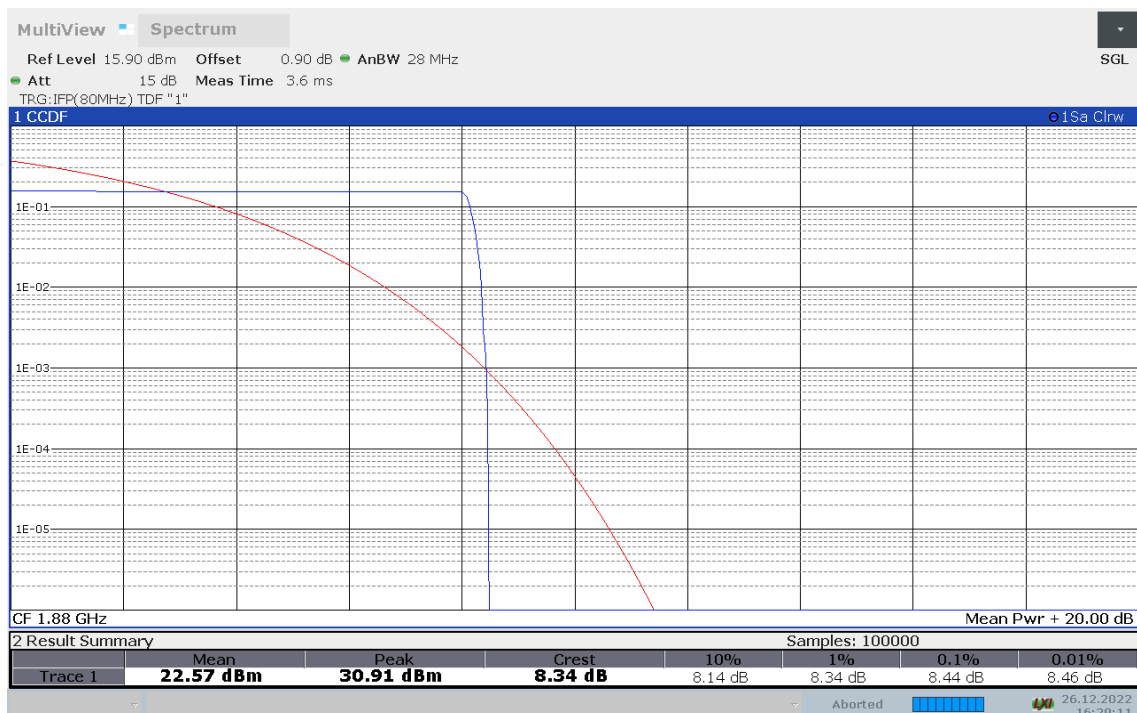
Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
1852.4	8.44
1880.0	8.40
1909.7	8.44

PCS 1900

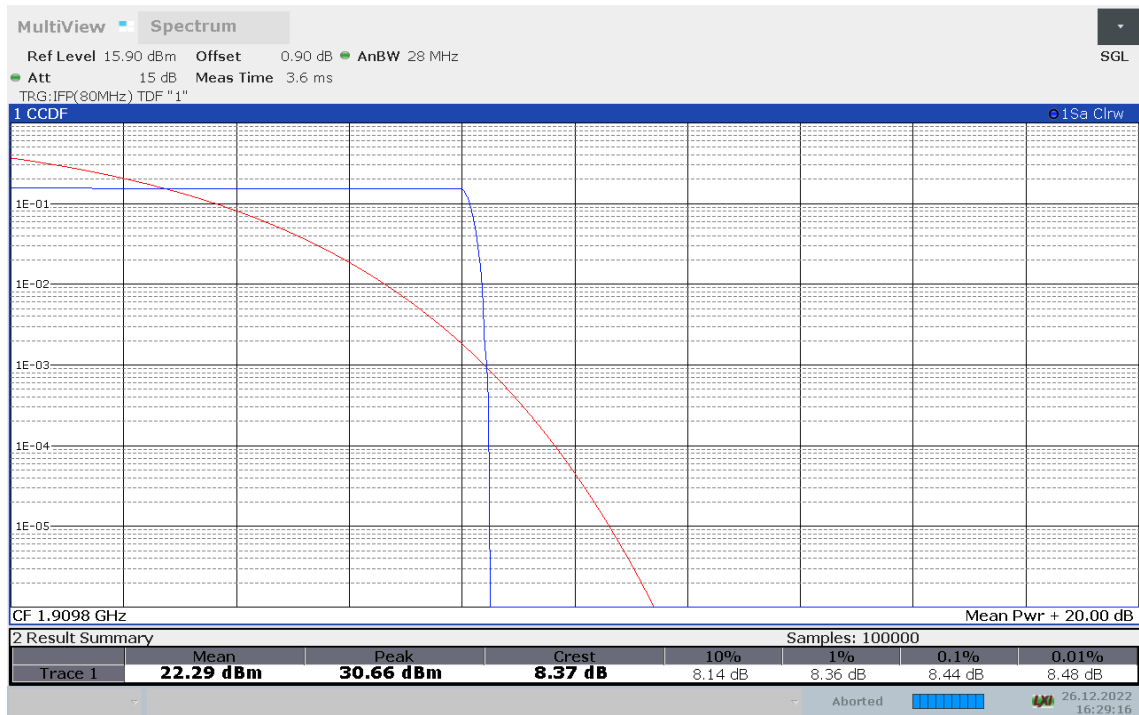
Channel 512- Peak-To-Average Power Ratio(PAPR)



Channel 661- Peak-To-Average Power Ratio(PAPR)



Channel 810- Peak-To-Average Power Ratio(PAPR)

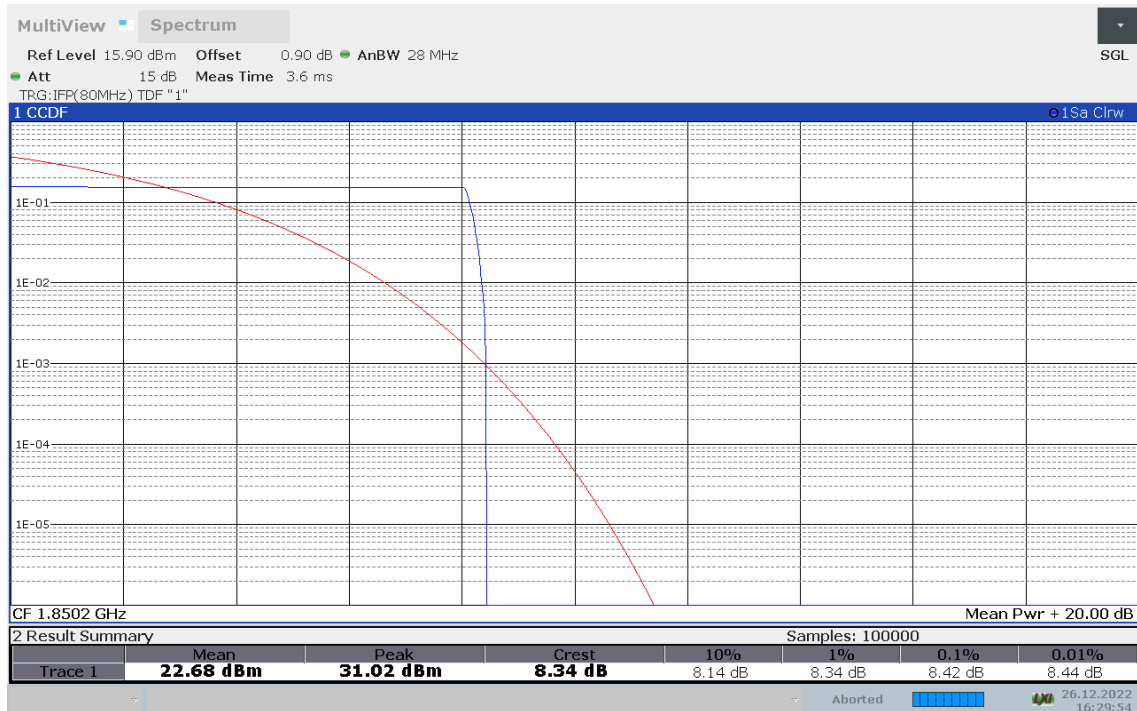


GPRS1900 (PAPR)

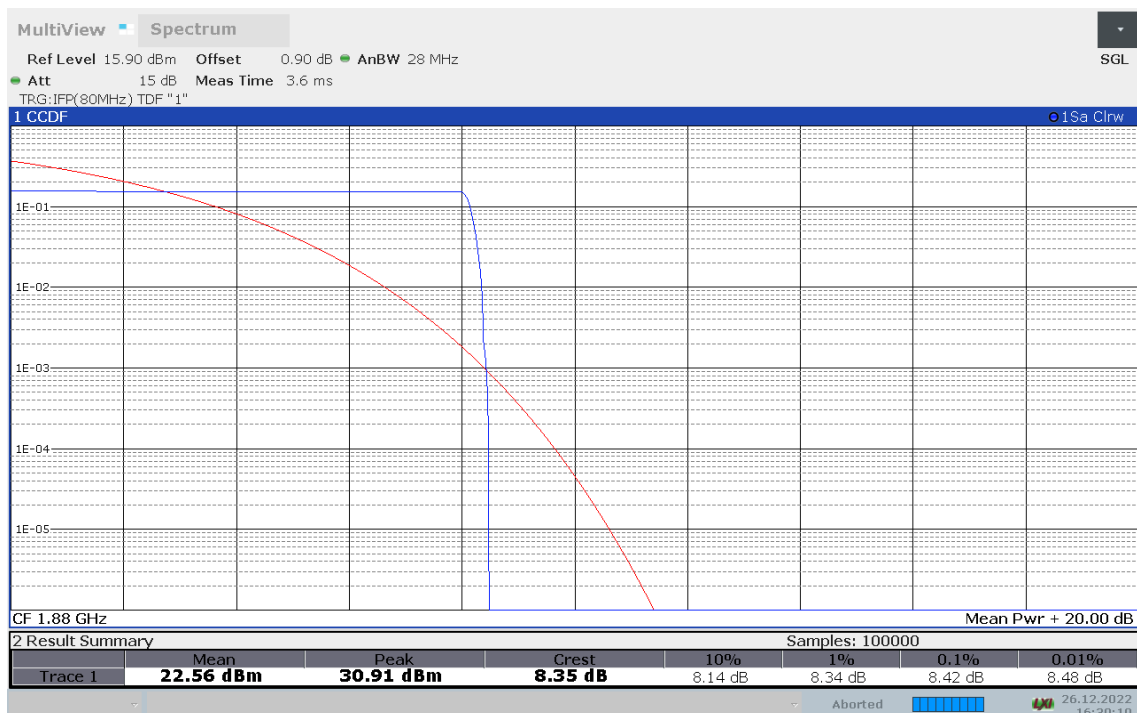
Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
1852.4	8.42
1880.0	8.42
1909.7	8.44

GPRS 1900

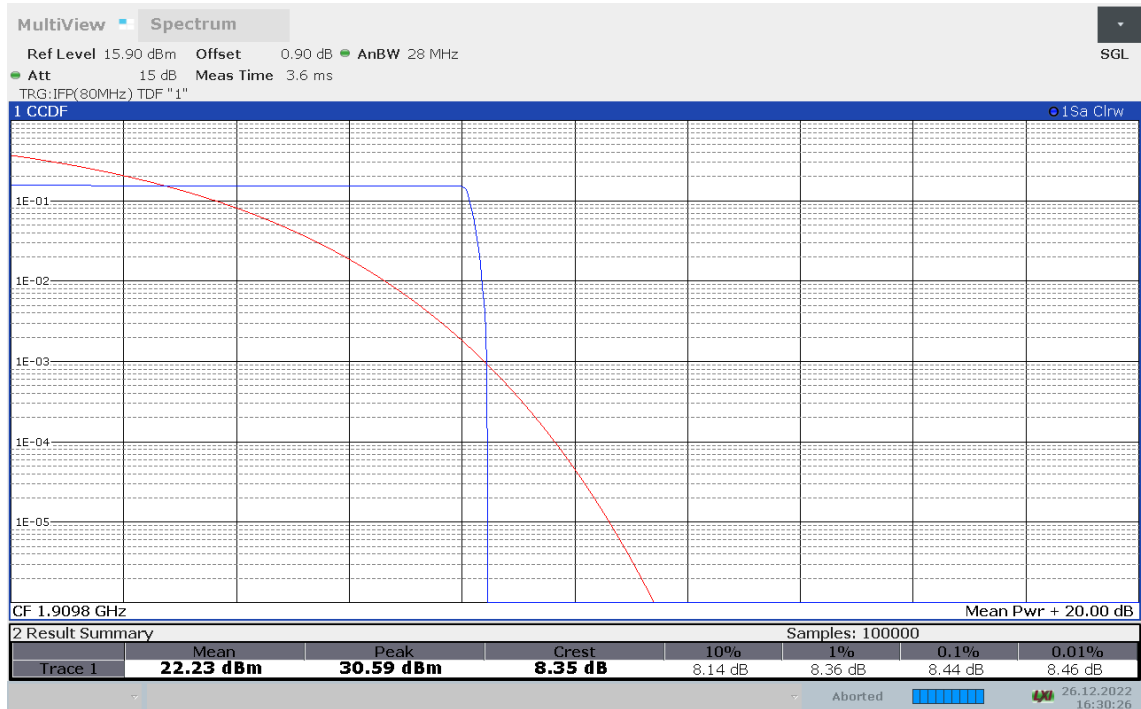
Channel 512- Peak-To-Average Power Ratio(PAPR)



Channel 661- Peak-To-Average Power Ratio(PAPR)



Channel 810- Peak-To-Average Power Ratio(PAPR)



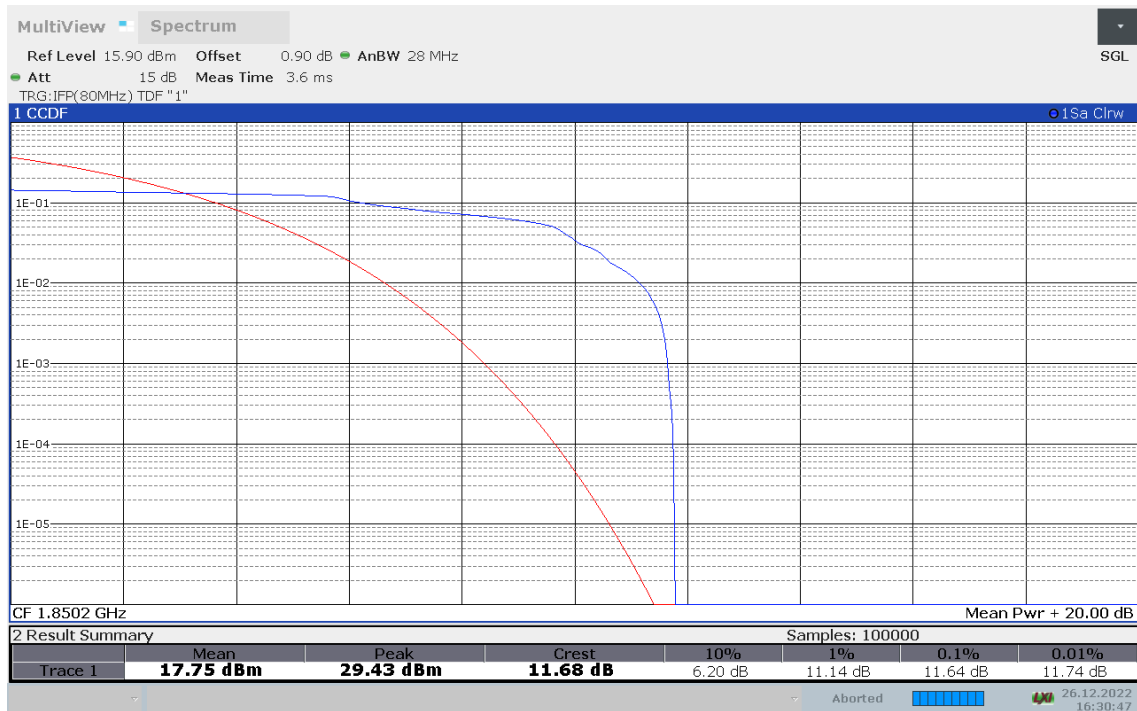
Note: Expanded measurement uncertainty is $U = 0.49$ dB, $k = 2$

EGPRS1900 (PAPR)

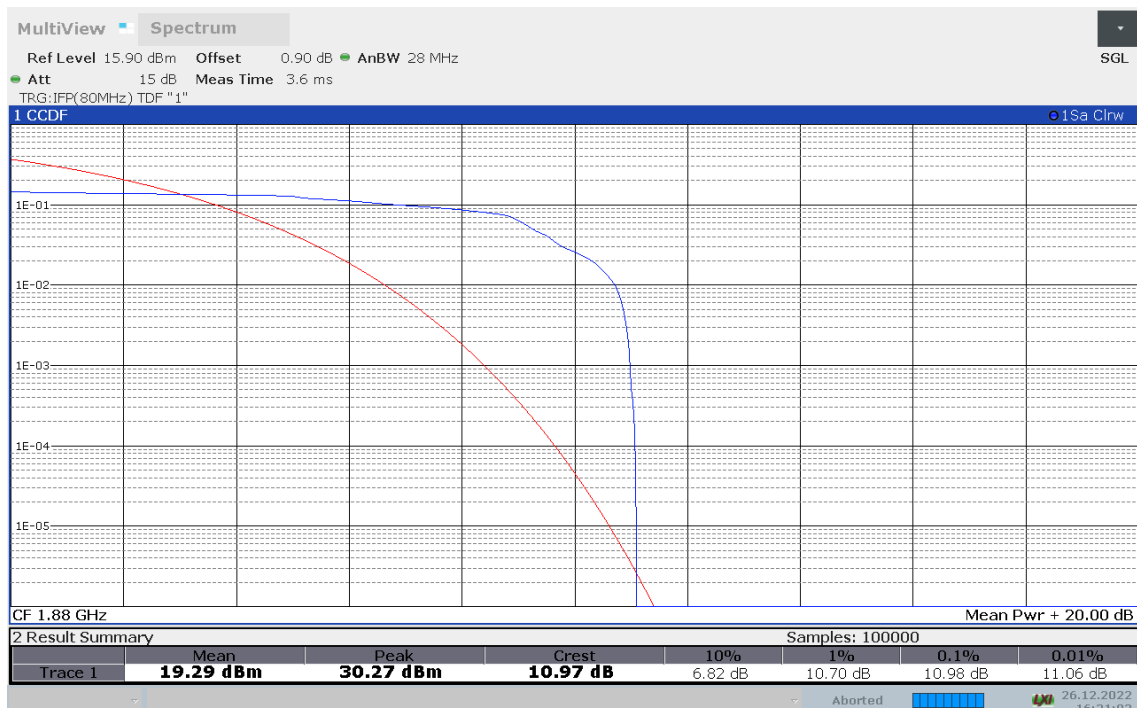
Frequency(MHz)	Peak-To-Average Power Ratio(PAPR)(dB)
1852.4	10.98
1880.0	11.64
1909.7	11.18

EGPRS 1900

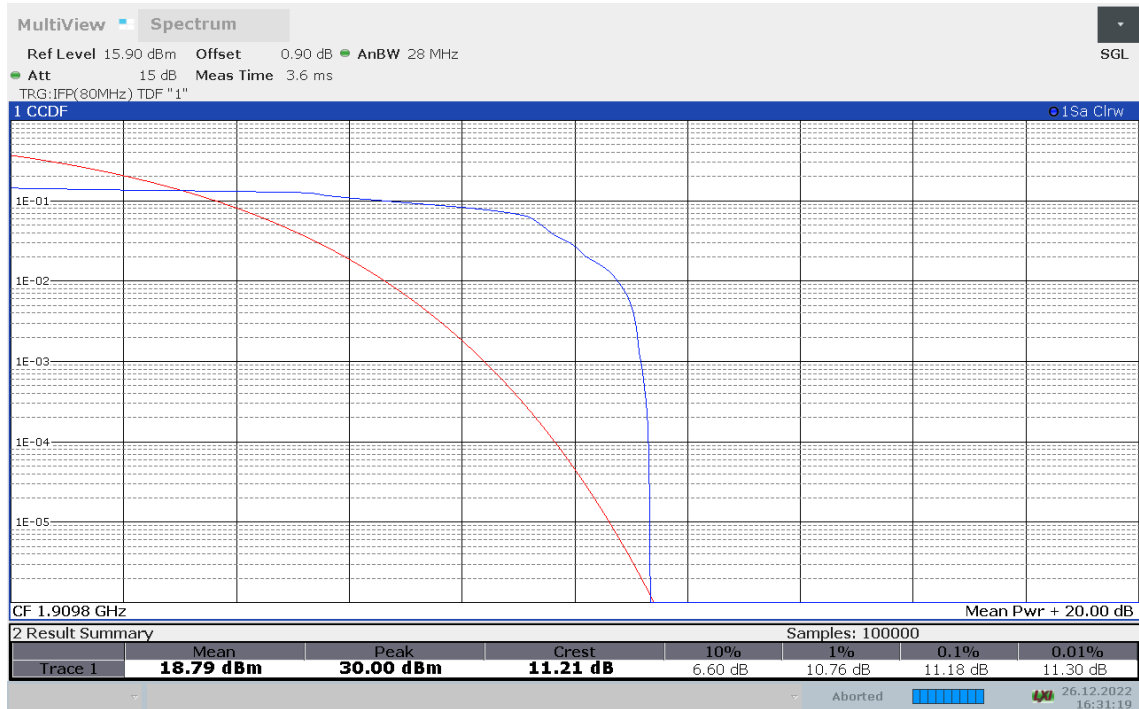
Channel 512- Peak-To-Average Power Ratio(PAPR)



Channel 661- Peak-To-Average Power Ratio(PAPR)



Channel 810- Peak-To-Average Power Ratio(PAPR)



END OF REPORT