TEST REPORT

No.I23N01648-RF LTE

for

TCL Communication Ltd.

LTE/WCDMA/GSM mobile phone

Model Name: T311E

FCC ID: 2ACCJB196

with

Hardware Version: V00

Software Version: T311E_OFCO_2SIM_V1.0_20230922_UNLOCK

Issued Date: 2023-10-16

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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I23N01648-RF LTE	Rev.0	1st edition	2023-10-16

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1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	LTE/WCDMA/GSM mobile phone
Model Name	T311E
Brand Name	TCL
Applicant's name	TCL Communication Ltd.
Manufacturer's Name	TCL Communication Ltd.

1.2. Test Standards

FCC Part 2	10-1-21 Edition
FCC Part 22/24/27	10-1-22 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: 2022-12-12 Testing End Date: 2022-12-27

1.6. Signature

Wang Ping

(Prepared this test report)

Huang Qiuqin

(Reviewed this test report)

Zhang Hao

(Approved this test report)

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2. CLIENT INFORMATION

2.1. Applicant Information

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2.2. Manufacturer Information

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Email：	nianxiang.jiang@tcl.com
Telephone:	+86 755 3661 1621

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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)

3.1. About EUT

Description	LTE/WCDMA/GSM mobile phone
Model Name	T311E
FCC ID	2ACCJB196
Frequency Bands	LTE Bands 2/4/5/7/13
Antenna	Integrated
Extreme vol. Limits	3.60V to 4.20V (nominal: 3.70V)
Condition of EUT as received	No abnormality in appearance

Note1: 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
UT06aa	353167580000594	V00	T311E_OFCO_2SIM_V1.0_20230922_UNLOCK	2022-12-12
UT04aa	353167580000636	V00	T311E_OFCO_2SIM_V1.0_20230922_UNLOCK	2022-12-12

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

UT06aa is used for conduction test, UT04aa is used for radiation test.

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery

AE1

Model	TLi010CA
Manufacturer	ZhongShan Tianmao Battery Co., Ltd.
Capacity	1030mAh
Nominal Voltage	3.70V

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

3.4. General Description

The Equipment Under Test (EUT) is a LTE/WCDMA/GSM mobile phone with integrated antenna. It consists of normal options: lithium battery, charger. Manual and specifications of the EUT were provided to fulfil the test. Samples undergoing test were selected by the Client.

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4. REFERENCE DOCUMENTS

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 24	PERSONAL COMMUNICATIONS SERVICES	10-1-20 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-20 Edition
FCC Part 27	MISCELLANEOUS WIRELESS 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

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5. LABORATORY ENVIRONMENT

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

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

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

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

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6. SUMMARY OF TEST RESULTS

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

LTE Band 2

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/24.232	A.1	P
2	Field Strength of Spurious Radiation	2.1053/24.238	A.2	P
3	Frequency Stability	2.1055/24.235	A.3	P
4	Occupied Bandwidth	2.1049/24.238	A.4	P
5	Emission Bandwidth	2.1049/24.238	A.5	P
6	Band Edge Compliance	2.1051/24.238	A.6	P
7	Conducted Spurious Emission	2.1051/24.238	A.7	P
8	Peak-to-Average Power Ratio	24.232/ KDB971168 D01	A.8	P

LTE Band 4

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/27.50(d)	A.1	P
2	Field Strength of Spurious Radiation	2.1053/27.53(h)	A.2	P
3	Frequency Stability	2.1055/27.54	A.3	P
4	Occupied Bandwidth	2.1049/27.53(g)	A.4	P
5	Emission Bandwidth	2.1049/27.53(g)	A.5	P
6	Band Edge Compliance	2.1051/27.53(h)	A.6	P
7	Conducted Spurious Emission	2.1051/27.53(h)	A.7	P
8	Peak-to-Average Power Ratio	27.50(d)/ KDB971168 D01	A.8	P

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LTE band 5

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	Frequency Stability	2.1055/22.355	A.3	P
4	Occupied Bandwidth	2.1049/22.917	A.4	P
5	Emission Bandwidth	2.1049/22.917	A.5	P
6	Band Edge Compliance	2.1051/22.917	A.6	P
7	Conducted Spurious Emission	2.1051/22.917	A.7	P
8	Peak-to-Average Power Ratio	KDB971168 D01	A.8	P

LTE Band 7

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/27.50(h)	A.1	P
2	Field Strength of Spurious Radiation	2.1053/27.53(m)	A.2	P
3	Frequency Stability	2.1055/27.54	A.3	P
4	Occupied Bandwidth	2.1049/27.53(m)	A.4	P
5	Emission Bandwidth	2.1049/27.53(m)	A.5	P
6	Band Edge Compliance	2.1051/27.53(m)	A.6	P
7	Conducted Spurious Emission	2.1051/27.53(m)	A.7	P
8	Peak-to-Average Power Ratio	27.50(a)/ KDB971168 D01	A.8	P

LTE Band 13

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	2.1046/27.50(b)	A.1	P
2	Field Strength of Spurious Radiation	2.1053/27.53(c)	A.2	P
3	Frequency Stability	2.1055/27.54	A.3	P
4	Occupied Bandwidth	2.1049/27.53(c)	A.4	P
5	Emission Bandwidth	2.1049/27.53(c)	A.5	P
6	Band Edge Compliance	2.1051/27.53(c)	A.6	P
7	Conducted Spurious Emission	2.1051/27.53(c)	A.7	P
8	Peak-to-Average Power Ratio	27.50(a)/ KDB971168 D01	A.8	P

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7. STATEMENT

According to the customer's description, T311E is a variant product of T311A.

All conduction results were from the initial model. The initial model report number is I22N02497-RF LTE.

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.

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8. TEST EQUIPMENTS UTILIZED

NO.	Description	TYPE	Manufacture	series number	CAL DUE DATE
1	Test Receiver	ESR7	R&S	101676	2023-11-23
2	BiLog Antenna	3142E	ETS-Lindgren	0224831	2024-05-27
3	Horn Antenna	3117	ETS-Lindgren	00066585	2025-03-15
4	Horn Antenna	QSH-SL-18 -26-S-20	Q-par	17013	2023-01-06
5	Antenna	BBHA 9120D	Schwarzbeck	1593	2025-10-24
6	Antenna	VUBA 9117	Schwarzbeck	207	2023-07-15
7	Antenna	QWH-SL-18 -40-K-SG	Q-par	15979	2023-01-06
8	preamplifier	83017A	Agilent	MY39501110	/
9	Signal Generator	SMB100A	R&S	179725	2023-11-23
10	Fully Anechoic Chamber	FACT3-2.0	ETS-Lindgren	1285	2023-05-29
11	Spectrum Analyzer	FSV40	R&S	101192	2023-01-12
12	Universal Radio Communication Tester	CMU200	R&S	114545	2023-01-12
13	Spectrum Analyzer	FSW26	R&S	102197	2023-11-24
14	Universal Radio Communication Tester	CMW500	R&S	129146	2023-04-24
15	DC Power Supply	DC Power Supply	Agilent Technologies	MY50450012	2023-11-13
16	Temperature Chamber	SH-241	ESPEC	92007516	2023-10-15

Test software

Item	Name	Vesion
Radiated	EMC32	V10.50.40

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ANNEX A: MEASUREMENT RESULTS

A.1 OUTPUT POWER

Reference

FCC: CFR Part 2.1046, 22.913, 24.232, 27.50.

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 peak output power and ERP/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 (bottom, middle and top of operational frequency range) for each bandwidth.

A.1.2.2 Measurement result

LTE band 2

Bandwidth	RB size/offset	Frequency(MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1909.3	22.25	21.84	21.79
		1880.0	22.50	21.63	21.94
		1850.7	22.64	22.18	22.31
	1 RB low	1909.3	22.18	21.83	21.90
		1880.0	22.51	21.75	21.85
		1850.7	22.54	22.19	22.30
	50% RB mid	1909.3	22.37	21.63	21.77
		1880.0	22.63	21.71	22.00
		1850.7	22.68	21.99	22.19
	100% RB	1909.3	21.33	20.08	20.86
		1880.0	21.54	20.41	21.09
		1850.7	21.72	20.63	21.03
3MHz	1 RB high	1908.5	22.42	21.86	21.73
		1880.0	22.49	21.39	21.66
		1851.5	22.58	21.99	22.22
	1 RB low	1908.5	22.25	21.90	21.76
		1880.0	22.55	21.47	21.67
		1851.5	22.57	22.15	22.18
	50% RB mid	1908.5	21.63	20.50	20.88
		1880.0	21.69	20.60	20.96
		1851.5	21.73	21.00	21.09
	100% RB	1908.5	21.59	20.45	20.96

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Bandwidth	RB size/offset	Frequency(MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
		1880.0	21.53	20.59	21.06
		1851.5	21.67	20.89	21.06
5MHz	1 RB high	1907.5	22.14	21.79	22.03
		1880.0	22.41	18.87	21.96
		1852.5	22.59	19.55	22.18
	1 RB low	1907.5	22.26	21.88	22.00
		1880.0	22.47	22.02	22.05
		1852.5	22.60	22.37	22.16
	50% RB mid	1907.5	21.35	21.16	20.99
		1880.0	21.52	21.11	20.99
		1852.5	21.70	21.11	21.16
	100% RB	1907.5	21.31	20.25	21.03
		1880.0	21.53	20.82	21.01
		1852.5	21.73	20.06	21.15
10MHz	1 RB high	1905.0	22.69	21.86	22.32
		1880.0	22.86	21.64	22.61
		1855.0	23.07	21.75	22.65
	1 RB low	1905.0	22.85	21.97	22.48
		1880.0	23.02	21.76	22.64
		1855.0	23.11	21.90	22.59
	50% RB mid	1905.0	21.30	20.66	20.87
		1880.0	21.61	20.62	21.08
		1855.0	21.67	20.75	21.08
	100% RB	1905.0	21.36	20.45	20.97
		1880.0	21.62	20.62	21.06
		1855.0	21.73	20.75	21.01
15MHz	1 RB high	1902.5	22.69	21.88	22.37
		1880.0	22.82	22.49	22.51
		1857.5	23.05	21.62	22.55
	1 RB low	1902.5	22.75	21.91	22.52
		1880.0	22.99	21.68	22.69
		1857.5	23.09	21.85	22.63
	50% RB mid	1902.5	21.35	20.51	20.97
		1880.0	21.57	20.67	21.10
		1857.5	21.75	20.85	21.17
	100% RB	1902.5	21.36	20.39	20.91
		1880.0	21.57	20.73	21.12
		1857.5	21.73	20.85	21.17

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Bandwidth	RB size/offset	Frequency(MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
20MHz	1 RB high	1900.0	22.68	22.36	22.35
		1880.0	22.90	21.47	22.15
		1860.0	23.10	22.27	22.81
	1 RB low	1900.0	22.83	22.48	22.44
		1880.0	23.17	21.77	22.26
		1860.0	23.23	22.27	22.75
	50% RB mid	1900.0	21.43	20.80	20.91
		1880.0	21.57	20.90	21.09
		1860.0	21.69	21.09	21.06
	100% RB	1900.0	21.44	20.78	20.84
		1880.0	21.51	20.93	21.12
		1860.0	21.66	21.09	21.04

Note: Expanded measurement uncertainty is U = 0.49dB, k = 1.96

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LTE band 4

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1754.3	21.22	20.85	20.71
		1732.5	21.12	20.38	20.49
		1710.7	20.96	20.39	20.69
	1 RB low	1754.3	21.21	20.91	20.48
		1732.5	21.08	20.64	20.83
		1710.7	20.93	20.27	20.64
	50% RB mid	1754.3	21.46	20.59	20.54
		1732.5	21.30	20.51	20.49
		1710.7	21.24	20.53	20.49
	100% RB	1754.3	20.37	18.98	19.27
		1732.5	20.36	19.25	19.33
		1710.7	20.28	19.25	19.40
3MHz	1 RB high	1753.5	21.24	20.90	20.43
		1732.5	21.05	20.90	20.27
		1711.5	21.05	20.65	20.21
	1 RB low	1753.5	21.26	20.92	20.48
		1732.5	21.09	21.18	20.54
		1711.5	20.99	20.95	20.32
	50% RB mid	1753.5	20.38	19.47	19.26
		1732.5	20.29	19.48	19.27
		1711.5	20.38	19.48	19.25
	100% RB	1753.5	20.35	19.55	19.48
		1732.5	20.28	19.37	19.34
		1711.5	20.32	19.45	19.46
5MHz	1 RB high	1752.5	21.24	20.27	20.34
		1732.5	21.08	21.06	20.96
		1712.5	20.98	20.08	20.22
	1 RB low	1752.5	21.35	20.29	20.26
		1732.5	21.11	21.07	20.95
		1712.5	21.04	20.34	20.70
	50% RB mid	1752.5	20.40	19.42	19.45
		1732.5	20.36	19.37	19.49
		1712.5	20.08	19.23	19.24
	100% RB	1752.5	20.37	19.63	19.51
		1732.5	20.39	19.34	19.49
		1712.5	20.11	19.35	19.28
10MHz	1 RB high	1750.0	21.33	20.91	20.39
		1732.5	21.14	20.52	20.67
		1715.0	21.10	20.24	20.42
	1 RB low	1750.0	21.42	21.12	20.46

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Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
		1732.5	21.22	20.52	20.63
		1715.0	21.02	20.42	20.60
	50% RB mid	1750.0	20.49	19.44	19.51
		1732.5	20.36	19.58	19.45
		1715.0	20.18	19.45	19.35
	100% RB	1750.0	20.41	19.38	19.46
		1732.5	20.32	19.39	19.36
		1715.0	20.17	19.23	19.24
15MHz	1 RB high	1747.5	21.39	20.27	20.45
		1732.5	21.32	20.35	20.53
		1717.5	21.31	20.52	20.62
	1 RB low	1747.5	21.31	20.77	20.77
		1732.5	21.39	20.47	20.66
		1717.5	21.27	20.42	20.62
	50% RB mid	1747.5	20.48	19.63	19.43
		1732.5	20.31	19.48	19.47
		1717.5	20.63	19.67	19.70
	100% RB	1747.5	20.43	19.48	19.45
		1732.5	20.41	19.41	19.34
		1717.5	20.56	19.63	19.61
20MHz	1 RB high	1745.0	21.47	20.57	20.73
		1732.5	21.38	21.34	20.91
		1720.0	21.36	21.01	20.27
	1 RB low	1745.0	21.32	20.98	21.08
		1732.5	21.33	21.17	20.57
		1720.0	21.33	21.04	20.40
	50% RB mid	1745.0	20.48	19.50	19.48
		1732.5	20.45	19.44	19.39
		1720.0	20.39	19.30	19.37
	100% RB	1745.0	20.47	19.54	19.61
		1732.5	20.35	19.51	19.34
		1720.0	20.27	19.42	19.29

Note: Expanded measurement uncertainty is U = 0.49dB, k = 1.96

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LTE band 5

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	23.43	22.44	22.40
		836.5	23.24	22.32	22.47
		824.7	23.15	22.17	22.15
	1 RB low	848.3	23.44	22.47	22.35
		836.5	23.12	22.04	22.16
		824.7	23.17	22.16	22.25
	50% RB mid	848.3	23.50	22.57	22.68
		836.5	23.45	22.57	22.59
		824.7	23.31	22.55	22.46
	100% RB	848.3	22.42	21.62	21.83
		836.5	22.38	21.10	21.28
		824.7	22.33	21.14	21.32
3MHz	1 RB high	847.5	23.44	23.03	22.53
		836.5	23.23	22.68	22.35
		825.5	23.21	22.72	22.30
	1 RB low	847.5	23.33	22.92	22.61
		836.5	23.12	22.52	22.07
		825.5	23.14	22.72	22.33
	50% RB mid	847.5	22.56	21.90	21.70
		836.5	22.29	21.37	21.16
		825.5	22.36	21.39	21.25
	100% RB	847.5	22.40	21.91	21.87
		836.5	22.44	21.31	21.33
		825.5	22.29	21.38	21.38
5MHz	1 RB high	846.5	23.48	22.89	22.67
		836.5	23.15	22.20	22.42
		826.5	23.25	22.38	22.64
	1 RB low	846.5	23.35	22.84	22.67
		836.5	23.14	22.22	22.46
		826.5	23.15	22.28	22.58
	50% RB mid	846.5	22.39	21.85	22.00
		836.5	22.31	21.33	21.42
		826.5	22.29	21.26	21.34
	100% RB	846.5	22.53	21.72	21.96
		836.5	22.30	21.44	21.47
		826.5	22.31	21.40	21.41
10MHz	1 RB high	844.0	23.37	22.46	22.40
		836.5	23.45	22.70	22.29
		829.0	23.33	22.85	22.52
	1 RB low	844.0	23.12	22.19	22.22

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Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
		836.5	23.18	22.58	22.30
		829.0	23.29	22.70	22.25
	50% RB mid	844.0	22.29	21.53	21.40
		836.5	22.28	21.32	21.34
		829.0	22.23	21.24	21.28
	100% RB	844.0	22.43	21.43	21.39
		836.5	22.36	21.32	21.41
		829.0	22.23	21.21	21.23

Note: Expanded measurement uncertainty is U = 0.49dB, k = 1.96

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LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	22.25	22.00	21.78
		2535.0	22.19	21.93	21.47
		2502.5	22.23	22.02	21.60
	1 RB low	2567.5	22.21	21.87	21.71
		2535.0	22.18	21.98	21.66
		2502.5	22.22	22.01	21.55
	50% RB mid	2567.5	21.37	20.52	20.56
		2535.0	21.36	20.49	20.33
		2502.5	21.32	20.44	20.23
	100% RB	2567.5	21.44	20.41	20.58
		2535.0	21.25	20.48	20.58
		2502.5	21.37	20.40	20.39
10MHz	1 RB high	2565.0	22.32	21.76	21.80
		2535.0	22.25	21.96	21.89
		2505.0	22.25	21.91	21.69
	1 RB low	2565.0	22.20	21.75	21.74
		2535.0	22.33	21.74	21.78
		2505.0	22.21	21.86	21.60
	50% RB mid	2565.0	21.36	20.75	20.63
		2535.0	21.31	20.68	20.58
		2505.0	21.33	20.68	20.67
	100% RB	2565.0	21.30	20.51	20.52
		2535.0	21.45	20.60	20.49
		2505.0	21.44	20.48	20.59
15MHz	1 RB high	2562.5	22.31	21.73	21.56
		2535.0	22.27	22.28	21.59
		2507.5	22.23	22.29	21.41
	1 RB low	2562.5	22.10	21.87	21.44
		2535.0	22.13	22.19	21.46
		2507.5	22.12	22.11	21.41
	50% RB mid	2562.5	21.42	20.62	20.48
		2535.0	21.35	20.50	20.51
		2507.5	21.36	20.41	20.43
	100% RB	2562.5	21.42	20.51	20.54
		2535.0	21.46	20.66	20.53
		2507.5	21.41	20.61	20.59
20MHz	1 RB high	2560.0	22.42	22.24	21.66

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Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
		2535.0	22.33	21.71	21.78
		2510.0	22.37	21.59	21.65
	1 RB low	2560.0	22.22	22.05	21.49
		2535.0	22.23	21.47	21.53
		2510.0	22.31	21.62	21.55
	50% RB mid	2560.0	21.34	20.54	20.60
		2535.0	21.36	20.57	20.62
		2510.0	21.29	20.53	20.59
	100% RB	2560.0	21.36	20.62	20.49
		2535.0	21.31	20.58	20.47
		2510.0	21.34	20.50	20.48

Note: Expanded measurement uncertainty is U = 0.49 dB, k = 1.96

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LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	23.25	22.62	22.47
		782.0	23.38	22.06	22.21
		779.5	23.35	22.05	22.41
	1 RB low	784.5	23.33	22.60	22.48
		782.0	23.46	22.31	22.64
		779.5	23.35	22.28	22.46
	50% RB mid	784.5	21.97	21.38	21.48
		782.0	22.15	21.26	21.32
		779.5	22.41	21.43	21.60
	100% RB	784.5	22.08	21.28	21.50
		782.0	22.32	21.45	21.44
		779.5	22.39	21.58	21.53
10MHz	1 RB high	782.0	23.23	22.28	22.55
	1 RB low	782.0	23.45	22.19	22.56
	50% RB mid	782.0	22.34	21.42	21.41
	100% RB	782.0	22.11	21.24	21.35

Note: Expanded measurement uncertainty is U = 0.49 dB, k = 1.96

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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(b) 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 27.50(d) specifies “Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP”.

Rule Part 27.50(b)(10) specifies Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP..

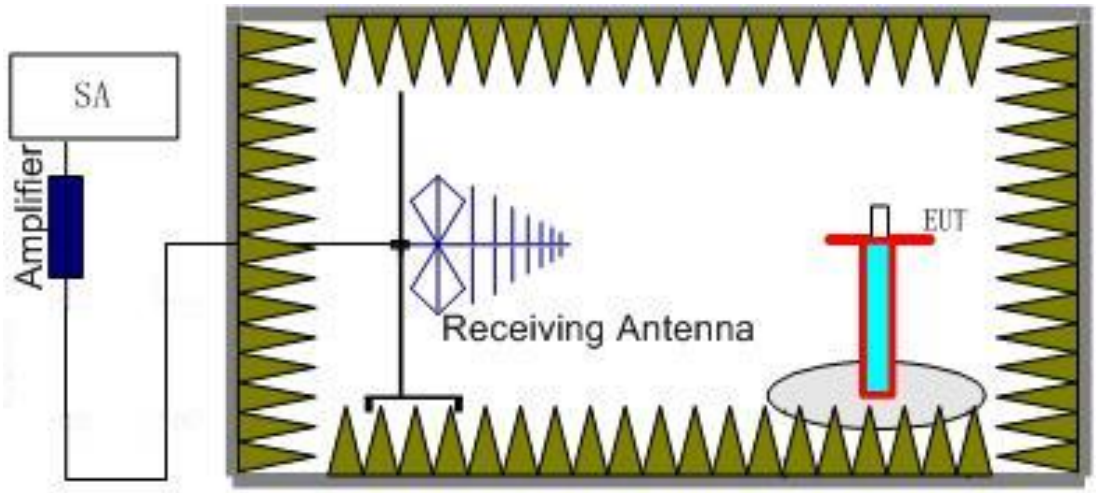
Rule Part 27.50(h)(2) specifies “Mobile stations are limited to 2.0 watts EIRP.”.

Rule Part 27.50(c) specifies “Portable stations (hand-held de-vices) are limited to 3 watts ERP.”.

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

1. For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, EUT was placed on a 80 cm high non-conductive stand at a 3 meter test distance from the receive antenna. For radiated measurements performed at frequencies above 1 GHz, EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. Receiving antenna was placed on the antenna mast 3 meters from the EUT. For emission measurements. The receiving antenna shall be varied from 1 m to 4 m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

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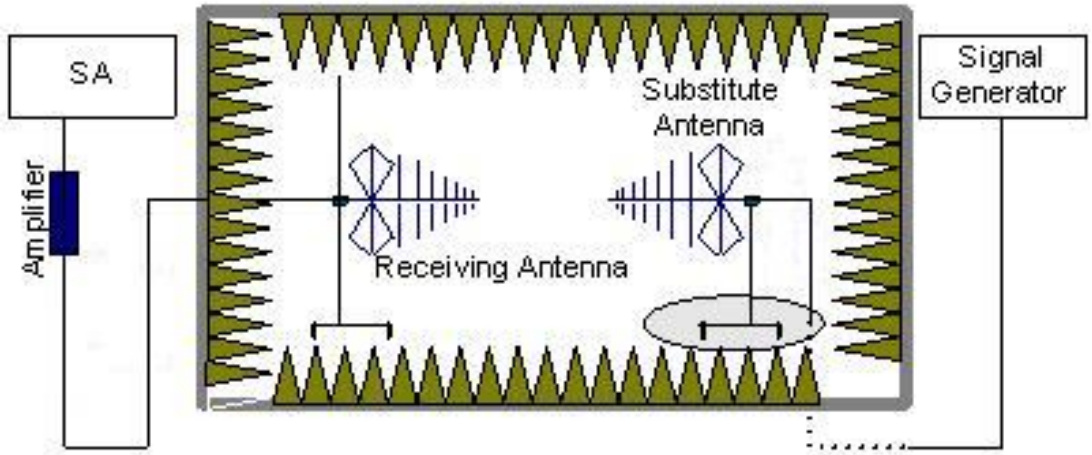

In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna and adjusts the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. An amplifier should be connected to the Signal Source output port. And the cable should be connected between the amplifier and the substitution antenna.
   The cable loss (P_{cl}), the substitution Antenna Gain(dBi) (G_a) and the amplifier Gain (P_{Ag}) should be recorded after test.
   The measurement results are obtained as described below:
   Power (EIRP) = $P_{Mea} - P_{Ag} - P_{cl} + G_a$
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

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A.1.3.3 Measurement result

LTE Band 2- EIRP Part 24. 232(c)

Limits: ≤33dBm (2W)

LTE Band 2_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.70	-16.72	-29.30	8.10	20.68	33.00	H
1880.00	-16.67	-29.40	8.10	20.83	33.00	H
1909.30	-16.82	-29.30	8.10	20.58	33.00	H

LTE Band 2_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1851.50	-16.85	-29.30	8.10	20.55	33.00	H
1880.00	-17.00	-29.40	8.10	20.50	33.00	H
1908.50	-17.04	-29.30	8.10	20.36	33.00	H

LTE Band 2_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.50	-16.60	-29.30	8.10	20.80	33.00	H
1880.00	-17.05	-29.40	8.10	20.45	33.00	H
1907.50	-16.78	-29.30	8.10	20.62	33.00	H

LTE Band 2_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1855.00	-16.61	-29.30	8.10	20.79	33.00	H
1880.00	-16.80	-29.40	8.10	20.70	33.00	H
1905.00	-16.42	-29.30	8.10	20.98	33.00	H

LTE Band 2_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1857.50	-16.94	-29.30	8.10	20.46	33.00	H
1880.00	-16.53	-29.40	8.10	20.97	33.00	H
1902.50	-16.45	-29.30	8.10	20.95	33.00	H

LTE Band 2_20MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1860.00	-16.77	-29.30	8.10	20.63	33.00	H
1880.00	-16.52	-29.40	8.10	20.98	33.00	H
1900.00	-16.48	-29.30	8.10	20.92	33.00	H

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LTE Band 2_1.4MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.70	-17.70	-29.30	8.10	19.70	33.00	H
1880.00	-17.99	-29.40	8.10	19.51	33.00	H
1909.30	-18.04	-29.30	8.10	19.36	33.00	H

LTE Band 2_3MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1851.50	-18.03	-29.30	8.10	19.37	33.00	H
1880.00	-17.93	-29.40	8.10	19.57	33.00	H
1908.50	-17.87	-29.30	8.10	19.53	33.00	H

LTE Band 2_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.50	-18.05	-29.30	8.10	19.35	33.00	H
1880.00	-17.36	-29.40	8.10	20.14	33.00	H
1907.50	-17.30	-29.30	8.10	20.10	33.00	H

LTE Band 2_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1855.00	-18.09	-29.30	8.10	19.31	33.00	H
1880.00	-17.39	-29.40	8.10	20.11	33.00	H
1905.00	-17.33	-29.30	8.10	20.07	33.00	H

LTE Band 2_15MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1857.50	-18.11	-29.30	8.10	19.29	33.00	H
1880.00	-17.43	-29.40	8.10	20.07	33.00	H
1902.50	-17.37	-29.30	8.10	20.03	33.00	H

LTE Band 2_20MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1860.00	-18.15	-29.30	8.10	19.25	33.00	H
1880.00	-17.46	-29.40	8.10	20.04	33.00	H
1900.00	-17.40	-29.30	8.10	20.00	33.00	H

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LTE Band 2_1.4MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1850.70	-18.09	-29.30	8.10	19.31	33.00	H
1880.00	-18.11	-29.40	8.10	19.39	33.00	H
1909.30	-18.05	-29.30	8.10	19.35	33.00	H

LTE Band 2_3MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1851.50	-18.12	-29.30	8.10	19.28	33.00	H
1880.00	-18.14	-29.40	8.10	19.36	33.00	H
1908.50	-18.08	-29.30	8.10	19.32	33.00	H

LTE Band 2_5MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1852.50	-18.15	-29.30	8.10	19.25	33.00	H
1880.00	-18.17	-29.40	8.10	19.33	33.00	H
1907.50	-18.10	-29.30	8.10	19.30	33.00	H

LTE Band 2_10MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1855.00	-17.97	-29.30	8.10	19.43	33.00	H
1880.00	-18.20	-29.40	8.10	19.30	33.00	H
1905.00	-18.13	-29.30	8.10	19.27	33.00	H

LTE Band 2_15MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1857.50	-18.01	-29.30	8.10	19.39	33.00	H
1880.00	-18.24	-29.40	8.10	19.26	33.00	H
1902.50	-18.17	-29.30	8.10	19.23	33.00	H

LTE Band 2_20MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1860.00	-18.15	-29.30	8.10	19.25	33.00	H
1880.00	-18.28	-29.40	8.10	19.22	33.00	H
1900.00	-18.22	-29.30	8.10	19.18	33.00	H

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LTE Band 4- EIRP Part 27.50(d)(4)

Limits: ≤30dBm (1W)

LTE Band 4_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1710.70	-17.99	-29.60	8.10	19.71	30.00	H
1732.50	-17.83	-29.60	8.10	19.87	30.00	H
1754.30	-17.81	-29.50	8.10	19.79	30.00	H

LTE Band 4_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1711.50	-18.03	-29.60	8.10	19.67	30.00	H
1732.50	-18.27	-29.60	8.10	19.43	30.00	H
1753.50	-18.14	-29.50	8.10	19.46	30.00	H

LTE Band 4_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.50	-18.07	-29.60	8.10	19.63	30.00	H
1732.50	-18.30	-29.60	8.10	19.40	30.00	H
1752.50	-18.17	-29.50	8.10	19.43	30.00	H

LTE Band 4_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1715.00	-18.10	-29.60	8.10	19.60	30.00	H
1732.50	-18.33	-29.60	8.10	19.37	30.00	H
1750.00	-18.21	-29.50	8.10	19.39	30.00	H

LTE Band 4_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1717.50	-18.14	-29.60	8.10	19.56	30.00	H
1732.50	-18.36	-29.60	8.10	19.34	30.00	H
1747.50	-18.25	-29.50	8.10	19.35	30.00	H

LTE Band 4_20MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1720.00	-18.20	-29.60	8.10	19.50	30.00	H
1732.50	-18.40	-29.60	8.10	19.30	30.00	H
1745.00	-18.29	-29.50	8.10	19.31	30.00	H

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LTE Band 4_1.4MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1710.70	-18.81	-29.60	8.10	18.89	30.00	H
1732.50	-19.01	-29.60	8.10	18.69	30.00	H
1754.30	-18.88	-29.50	8.10	18.72	30.00	H

LTE Band 4_3MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1711.50	-18.84	-29.60	8.10	18.86	30.00	H
1732.50	-19.02	-29.60	8.10	18.68	30.00	H
1753.50	-18.93	-29.50	8.10	18.67	30.00	H

LTE Band 4_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.50	-18.88	-29.60	8.10	18.82	30.00	H
1732.50	-19.05	-29.60	8.10	18.65	30.00	H
1752.50	-18.98	-29.50	8.10	18.62	30.00	H

LTE Band 4_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1715.00	-18.93	-29.60	8.10	18.77	30.00	H
1732.50	-19.10	-29.60	8.10	18.60	30.00	H
1750.00	-19.02	-29.50	8.10	18.58	30.00	H

LTE Band 4_15MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1717.50	-18.98	-29.60	8.10	18.72	30.00	H
1732.50	-19.15	-29.60	8.10	18.55	30.00	H
1747.50	-19.04	-29.50	8.10	18.56	30.00	H

LTE Band 4_20MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1720.00	-18.99	-29.60	8.10	18.71	30.00	H
1732.50	-19.17	-29.60	8.10	18.53	30.00	H
1745.00	-19.09	-29.50	8.10	18.51	30.00	H

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LTE Band 4_1.4MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1710.70	-19.54	-29.60	8.10	18.16	30.00	H
1732.50	-19.26	-29.60	8.10	18.44	30.00	H
1754.30	-19.29	-29.50	8.10	18.31	30.00	H

LTE Band 4_3MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1711.50	-19.27	-29.60	8.10	18.43	30.00	H
1732.50	-19.40	-29.60	8.10	18.30	30.00	H
1753.50	-19.40	-29.50	8.10	18.20	30.00	H

LTE Band 4_5MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.50	-19.39	-29.60	8.10	18.31	30.00	H
1732.50	-19.35	-29.60	8.10	18.35	30.00	H
1752.50	-19.43	-29.50	8.10	18.17	30.00	H

LTE Band 4_10MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1715.00	-19.43	-29.60	8.10	18.27	30.00	H
1732.50	-19.50	-29.60	8.10	18.20	30.00	H
1750.00	-19.17	-29.50	8.10	18.43	30.00	H

LTE Band 4_15MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1717.50	-19.38	-29.60	8.10	18.32	30.00	H
1732.50	-19.54	-29.60	8.10	18.16	30.00	H
1747.50	-19.20	-29.50	8.10	18.40	30.00	H

LTE Band 4_20MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1720.00	-19.49	-29.60	8.10	18.21	30.00	H
1732.50	-19.38	-29.60	8.10	18.32	30.00	H
1745.00	-19.25	-29.50	8.10	18.35	30.00	H

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LTE Band 5- ERP Part 22.913(a)

Limits: ≤38.45dBm (7W)

LTE Band 5_1.4MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.70	-9.51	-33.60	-0.79	2.15	21.15	38.45	V
836.50	-9.50	-33.50	-0.74	2.15	21.12	38.45	V
848.30	-9.24	-33.50	-0.73	2.15	21.38	38.45	V

LTE Band 5_3MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
825.50	-9.50	-33.60	-0.84	2.15	21.11	38.45	V
836.50	-9.54	-33.50	-0.74	2.15	21.07	38.45	V
847.50	-9.27	-33.50	-0.73	2.15	21.35	38.45	V

LTE Band 5_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.50	-9.53	-33.60	-0.84	2.15	21.08	38.45	V
836.50	-9.52	-33.50	-0.74	2.15	21.09	38.45	V
846.50	-9.28	-33.50	-0.73	2.15	21.34	38.45	V

LTE Band 5_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
829.00	-9.54	-33.60	-0.84	2.15	21.07	38.45	V
836.50	-9.57	-33.50	-0.74	2.15	21.04	38.45	V
844.00	-9.27	-33.50	-0.78	2.15	21.30	38.45	V

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LTE Band 5_1.4MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.70	-10.12	-33.60	-0.79	2.15	20.54	38.45	V
836.50	-10.11	-33.50	-0.74	2.15	20.50	38.45	V
848.30	-9.64	-33.50	-0.73	2.15	20.98	38.45	V

LTE Band 5_3MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
825.50	-10.10	-33.60	-0.84	2.15	20.51	38.45	V
836.50	-10.13	-33.50	-0.74	2.15	20.48	38.45	V
847.50	-9.65	-33.50	-0.73	2.15	20.97	38.45	V

LTE Band 5_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.50	-10.14	-33.60	-0.84	2.15	20.47	38.45	V
836.50	-10.16	-33.50	-0.74	2.15	20.45	38.45	V
846.50	-9.67	-33.50	-0.73	2.15	20.95	38.45	V

LTE Band 5_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
829.00	-10.18	-33.60	-0.84	2.15	20.43	38.45	V
836.50	-10.20	-33.50	-0.74	2.15	20.41	38.45	V
844.00	-9.67	-33.50	-0.78	2.15	20.90	38.45	V

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LTE Band 5_1.4MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.70	-10.51	-33.60	-0.79	2.15	20.15	38.45	V
836.50	-10.35	-33.50	-0.74	2.15	20.26	38.45	V
848.30	-10.41	-33.50	-0.73	2.15	20.21	38.45	V

LTE Band 5_3MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
825.50	-10.49	-33.60	-0.84	2.15	20.12	38.45	V
836.50	-10.38	-33.50	-0.74	2.15	20.23	38.45	V
847.50	-10.44	-33.50	-0.73	2.15	20.18	38.45	V

LTE Band 5_5MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.50	-10.33	-33.60	-0.84	2.15	20.28	38.45	V
836.50	-10.51	-33.50	-0.74	2.15	20.10	38.45	V
846.50	-10.38	-33.50	-0.73	2.15	20.24	38.45	V

LTE Band 5_10MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
829.00	-10.46	-33.60	-0.84	2.15	20.15	38.45	V
836.50	-10.35	-33.50	-0.74	2.15	20.26	38.45	V
844.00	-10.47	-33.50	-0.78	2.15	20.10	38.45	V

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LTE Band 7- EIRP Part 27.50(h)(2)

Limits: ≤33 dBm (2W)

LTE Band 7_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2502.50	-18.18	-28.70	10.70	21.22	33.00	H
2535.00	-18.01	-28.60	10.70	21.29	33.00	H
2567.50	-17.95	-28.60	10.70	21.35	33.00	H

LTE Band 7_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2505.00	-18.21	-28.70	10.70	21.19	33.00	H
2535.00	-18.04	-28.60	10.70	21.26	33.00	H
2565.00	-17.77	-28.60	10.70	21.53	33.00	H

LTE Band 7_15MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2507.50	-18.14	-28.70	10.70	21.26	33.00	H
2535.00	-17.87	-28.60	10.70	21.43	33.00	H
2562.50	-17.82	-28.60	10.70	21.48	33.00	H

LTE Band 7_20MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2510.00	-17.88	-28.70	10.70	21.52	33.00	H
2535.00	-18.10	-28.60	10.70	21.20	33.00	H
2560.00	-17.85	-28.60	10.70	21.45	33.00	H

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LTE Band 7_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2502.50	-18.63	-28.70	10.70	20.77	33.00	H
2535.00	-18.62	-28.60	10.70	20.68	33.00	H
2567.50	-18.38	-28.60	10.70	20.92	33.00	H

LTE Band 7_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2505.00	-18.60	-28.70	10.70	20.80	33.00	H
2535.00	-18.65	-28.60	10.70	20.65	33.00	H
2565.00	-18.43	-28.60	10.70	20.87	33.00	H

LTE Band 7_15MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2507.50	-18.74	-28.70	10.70	20.66	33.00	H
2535.00	-18.70	-28.60	10.70	20.60	33.00	H
2562.50	-18.47	-28.60	10.70	20.83	33.00	H

LTE Band 7_20MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2510.00	-18.67	-28.70	10.70	20.73	33.00	H
2535.00	-18.74	-28.60	10.70	20.56	33.00	H
2560.00	-18.50	-28.60	10.70	20.80	33.00	H

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LTE Band 7_5MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2502.50	-19.01	-28.70	10.70	20.39	33.00	H
2535.00	-18.99	-28.60	10.70	20.31	33.00	H
2567.50	-19.14	-28.60	10.70	20.16	33.00	H

LTE Band 7_10MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2505.00	-19.14	-28.70	10.70	20.26	33.00	H
2535.00	-18.93	-28.60	10.70	20.37	33.00	H
2565.00	-18.79	-28.60	10.70	20.51	33.00	H

LTE Band 7_15MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2507.50	-19.11	-28.70	10.70	20.29	33.00	H
2535.00	-18.88	-28.60	10.70	20.42	33.00	H
2562.50	-19.23	-28.60	10.70	20.07	33.00	H

LTE Band 7_20MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
2510.00	-19.25	-28.70	10.70	20.15	33.00	H
2535.00	-19.00	-28.60	10.70	20.30	33.00	H
2560.00	-19.25	-28.60	10.70	20.05	33.00	H

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LTE Band 13- ERP Part 27.50(b)(10)

Limits: ≤34.77dBm (3W)

LTE Band 13_5MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
779.50	-10.21	-34.00	-0.08	2.15	21.56	34.77	V
782.00	-10.05	-34.00	-0.13	2.15	21.68	34.77	V
784.50	-10.28	-34.00	-0.13	2.15	21.44	34.77	V

LTE Band 13_10MHz_QPSK

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
782.00	-10.15	-34.00	-0.13	2.15	21.57	34.77	V

LTE Band 13_5MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
779.50	-10.82	-34.00	-0.08	2.15	20.95	34.77	V
782.00	-11.07	-34.00	-0.13	2.15	20.65	34.77	V
784.50	-11.16	-34.00	-0.13	2.15	20.56	34.77	V

LTE Band 13_10MHz_16QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
782.00	-10.99	-34.00	-0.13	2.15	20.73	34.77	V

LTE Band 13_5MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
779.50	-11.47	-34.00	-0.08	2.15	20.30	34.77	V
782.00	-11.68	-34.00	-0.13	2.15	20.05	34.77	V
784.50	-11.54	-34.00	-0.13	2.15	20.18	34.77	V

LTE Band 13_10MHz_64QAM

Frequency(MHz)	P_{Mea}(dBm)	P_{cl}(dB)+ P_{Ag}(dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
782.00	-11.61	-34.00	-0.13	2.15	20.11	34.77	V

ANALYZER SETTINGS:

RBW = VBW = 8MHz for occupied bandwidths equal to or less than 5MHz.

RBW = VBW = 20MHz for occupied bandwidths equal to or greater than 10MHz.

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.87dB(30MHz-3GHz)/3.35dB(3GHz-18GHz)/2.68dB(18GHz-40GHz), k = 2

Note: Both of Vertical and Horizontal polarizations are evaluated, but only the worst case is recorded in this report.

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A.2 FIELD STRENGTH OF SPURIOUS RADIATION

Reference

FCC: CFR 2.1053, 22.917, 24.238, 27.53.

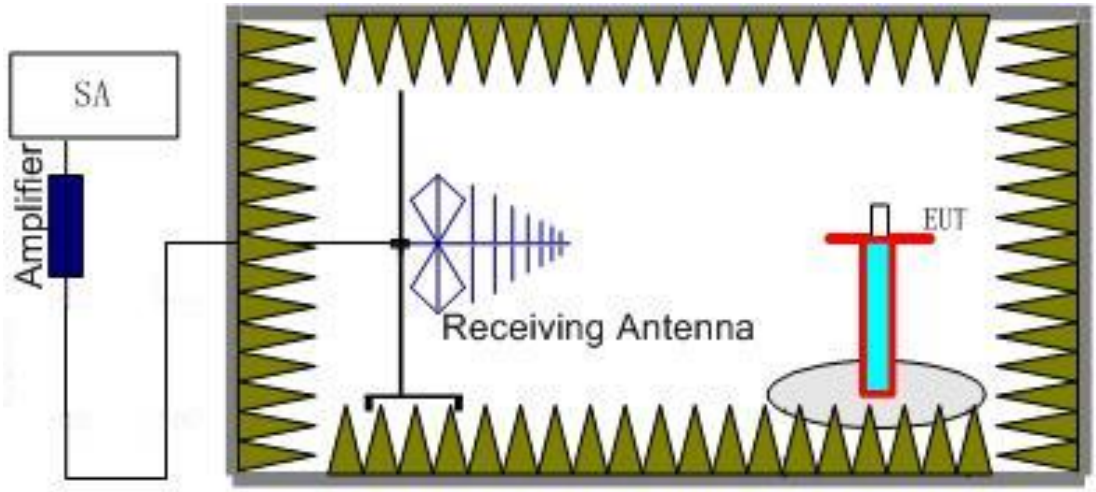
A.2.1 Measurement Method

This measurement is carried out in fully-anechoic chamber FAC-3.

The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, 24.238, and 27.53(h). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the all LTE Bands

The procedure of radiated spurious emissions is as follows:

1. For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, EUT was placed on a 80 cm high non-conductive stand at a 3 meter test distance from the receive antenna. For radiated measurements performed at frequencies above 1 GHz, EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. Receiving antenna was placed on the antenna mast 3 meters from the EUT. For emission measurements. The receiving antenna shall be varied from 1 m to 4 m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.

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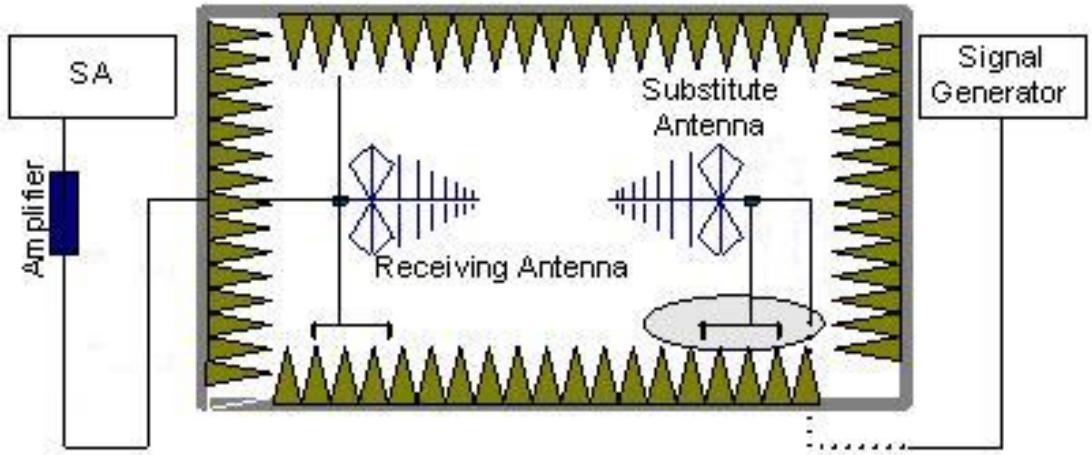

In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna and adjusts the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain(dBi) (G_a) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power (EIRP)=P_{Mea} - P_{pl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

A.2.2 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the test LTE Bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the test LTE Bands. into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

Only worst case result is given below.

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LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16996.00	-43.97	2.90	16.50	-30.37	-13.00	H
17116.50	-43.32	2.90	14.50	-31.72	-13.00	H
17287.50	-42.57	3.20	14.50	-31.27	-13.00	H
17502.50	-39.80	2.90	12.80	-29.90	-13.00	H
17592.50	-38.58	3.30	12.80	-29.08	-13.00	H
17799.50	-40.04	3.60	12.80	-30.84	-13.00	H

LTE Band 2, 1.4MHz, QPSK, Channel 18900

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3759.05	-41.18	1.10	12.20	-30.08	-13.00	H
17212.00	-44.35	2.90	14.50	-32.75	-13.00	H
17301.50	-43.30	3.20	14.50	-32.00	-13.00	H
17390.00	-43.44	2.90	14.50	-31.84	-13.00	H
17629.50	-40.34	3.30	12.80	-30.84	-13.00	H
17832.00	-40.35	3.60	12.80	-31.15	-13.00	H

LTE Band 2, 1.4MHz, QPSK, Channel 19193

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3817.62	-34.48	1.20	12.20	-23.48	-13.00	H
16991.50	-44.38	2.90	16.50	-30.78	-13.00	H
17193.50	-43.35	2.90	14.50	-31.75	-13.00	H
17448.00	-41.56	2.90	14.50	-29.96	-13.00	H
17574.00	-39.50	3.30	12.80	-30.00	-13.00	H
17838.00	-39.39	3.60	12.80	-30.19	-13.00	H

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LTE Band 2, 1.4MHz, 16QAM, Channel 18607

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16989.00	-43.72	2.90	16.50	-30.12	-13.00	H
17137.00	-42.65	2.90	14.50	-31.05	-13.00	H
17280.50	-42.41	3.20	14.50	-31.11	-13.00	H
17508.50	-39.49	2.90	12.80	-29.59	-13.00	H
17526.50	-40.03	2.90	12.80	-30.13	-13.00	H
17839.00	-39.86	3.60	12.80	-30.66	-13.00	H

LTE Band 2, 1.4MHz, 16QAM, Channel 18900

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3759.05	-41.99	1.10	12.20	-30.89	-13.00	H
16986.50	-44.98	2.90	16.50	-31.38	-13.00	H
17367.50	-42.27	3.20	14.50	-30.97	-13.00	H
17517.50	-39.86	2.90	12.80	-29.96	-13.00	H
17575.00	-39.14	3.30	12.80	-29.64	-13.00	H
17776.50	-39.55	3.60	12.80	-30.35	-13.00	H

LTE Band 2, 1.4MHz, 16QAM, Channel 19193

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3817.62	-34.56	1.20	12.20	-23.56	-13.00	H
16923.00	-44.60	2.90	16.50	-31.00	-13.00	H
17241.50	-43.01	3.20	14.50	-31.71	-13.00	H
17454.50	-41.42	2.90	14.50	-29.82	-13.00	H
17625.50	-39.25	3.30	12.80	-29.75	-13.00	H
17822.00	-39.18	3.60	12.80	-29.98	-13.00	H

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LTE Band 2, 1.4MHz, 64QAM, Channel 18607

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16936.00	-44.58	2.90	16.50	-30.98	-13.00	H
17172.50	-43.27	2.90	14.50	-31.67	-13.00	H
17363.50	-42.64	3.20	14.50	-31.34	-13.00	H
17506.00	-39.76	2.90	12.80	-29.86	-13.00	H
17570.00	-39.13	3.30	12.80	-29.63	-13.00	H
17828.00	-39.50	3.60	12.80	-30.30	-13.00	H

LTE Band 2, 1.4MHz, 64QAM, Channel 18900

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3759.05	-42.56	1.10	12.20	-31.46	-13.00	H
17211.00	-42.94	2.90	14.50	-31.34	-13.00	H
17227.00	-42.61	3.20	14.50	-31.31	-13.00	H
17496.50	-41.96	2.90	14.50	-30.36	-13.00	H
17592.50	-39.46	3.30	12.80	-29.96	-13.00	H
17713.00	-39.92	3.30	12.80	-30.42	-13.00	H

LTE Band 2, 1.4MHz, 64QAM, Channel 19193

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
3817.62	-33.59	1.20	12.20	-22.59	-13.00	H
17007.50	-42.59	2.90	14.50	-30.99	-13.00	H
17183.50	-42.61	2.90	14.50	-31.01	-13.00	H
17510.00	-39.14	2.90	12.80	-29.24	-13.00	H
17620.00	-39.48	3.30	12.80	-29.98	-13.00	H
17836.00	-39.46	3.60	12.80	-30.26	-13.00	H

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LTE Band 4, 1.4MHz, QPSK, Channel 19957

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16997.50	-44.32	2.90	16.50	-30.72	-13.00	H
17203.50	-42.76	2.90	14.50	-31.16	-13.00	H
17282.50	-42.12	3.20	14.50	-30.82	-13.00	H
17465.00	-41.21	2.90	14.50	-29.61	-13.00	H
17616.00	-39.44	3.30	12.80	-29.94	-13.00	H
17799.50	-39.30	3.60	12.80	-30.10	-13.00	H

LTE Band 4, 1.4MHz, QPSK, Channel 20175

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16932.00	-45.00	2.90	16.50	-31.40	-13.00	H
17199.50	-42.84	2.90	14.50	-31.24	-13.00	H
17235.50	-42.80	3.20	14.50	-31.50	-13.00	H
17518.50	-39.44	2.90	12.80	-29.54	-13.00	H
17598.50	-39.23	3.30	12.80	-29.73	-13.00	H
17838.50	-38.20	3.60	12.80	-29.00	-13.00	H

LTE Band 4, 1.4MHz, QPSK, Channel 20393

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16982.50	-44.49	2.90	16.50	-30.89	-13.00	H
17181.00	-43.07	2.90	14.50	-31.47	-13.00	H
17265.00	-42.57	3.20	14.50	-31.27	-13.00	H
17480.00	-41.95	2.90	14.50	-30.35	-13.00	H
17608.50	-38.78	3.30	12.80	-29.28	-13.00	H
17834.00	-39.52	3.60	12.80	-30.32	-13.00	H

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LTE Band 4, 1.4MHz, 16QAM, Channel 19957

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16980.50	-44.37	2.90	16.50	-30.77	-13.00	H
17196.00	-43.16	2.90	14.50	-31.56	-13.00	H
17274.50	-42.65	3.20	14.50	-31.35	-13.00	H
17451.50	-41.09	2.90	14.50	-29.49	-13.00	H
17587.50	-39.30	3.30	12.80	-29.80	-13.00	H
17776.50	-39.33	3.60	12.80	-30.13	-13.00	H

LTE Band 4, 1.4MHz, 16QAM, Channel 20175

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16940.00	-44.37	2.90	16.50	-30.77	-13.00	H
17151.50	-43.57	2.90	14.50	-31.97	-13.00	H
17365.50	-42.76	3.20	14.50	-31.46	-13.00	H
17514.50	-39.56	2.90	12.80	-29.66	-13.00	H
17586.00	-39.09	3.30	12.80	-29.59	-13.00	H
17822.00	-39.15	3.60	12.80	-29.95	-13.00	H

LTE Band 4, 1.4MHz, 16QAM, Channel 20393

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
17004.00	-42.63	2.90	14.50	-31.03	-13.00	H
17183.50	-42.55	2.90	14.50	-30.95	-13.00	H
17226.00	-42.58	3.20	14.50	-31.28	-13.00	H
17500.00	-39.68	2.90	12.80	-29.78	-13.00	H
17617.50	-39.14	3.30	12.80	-29.64	-13.00	H
17774.50	-39.82	3.60	12.80	-30.62	-13.00	H

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LTE Band 4, 1.4MHz, 64QAM, Channel 19957

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16996.00	-44.08	2.90	16.50	-30.48	-13.00	H
17198.00	-43.46	2.90	14.50	-31.86	-13.00	H
17363.00	-42.18	3.20	14.50	-30.88	-13.00	H
17504.00	-39.42	2.90	12.80	-29.52	-13.00	H
17615.00	-39.51	3.30	12.80	-30.01	-13.00	H
17817.50	-39.76	3.60	12.80	-30.56	-13.00	H

LTE Band 4, 1.4MHz, 64QAM, Channel 20175

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16965.50	-44.81	2.90	16.50	-31.21	-13.00	H
17191.50	-43.62	2.90	14.50	-32.02	-13.00	H
17267.00	-42.81	3.20	14.50	-31.51	-13.00	H
17439.00	-41.65	2.90	14.50	-30.05	-13.00	H
17606.00	-39.48	3.30	12.80	-29.98	-13.00	H
17773.00	-40.07	3.60	12.80	-30.87	-13.00	H

LTE Band 4, 1.4MHz, 64QAM, Channel 20393

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
7015.50	-40.88	1.80	12.00	-30.68	-13.00	V
16993.00	-44.86	2.90	16.50	-31.26	-13.00	H
17226.50	-42.75	3.20	14.50	-31.45	-13.00	H
17454.00	-41.20	2.90	14.50	-29.60	-13.00	H
17600.00	-39.48	3.30	12.80	-29.98	-13.00	H
17775.50	-39.61	3.60	12.80	-30.41	-13.00	H

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LTE Band 5, 1.4MHz, QPSK, Channel 20407

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8242.50	-48.96	2.20	11.30	-42.01	-13.00	V
9151.25	-51.43	2.10	11.60	-44.08	-13.00	H
9224.00	-51.41	2.10	11.60	-44.06	-13.00	H
9300.25	-50.78	2.00	11.60	-43.33	-13.00	H
9362.75	-51.81	2.00	11.60	-44.36	-13.00	V
9474.75	-51.10	2.10	11.60	-43.75	-13.00	V

LTE Band 5, 1.4MHz, QPSK, Channel 20525

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
9107.25	-51.77	2.10	11.60	-44.42	-13.00	H
9222.00	-51.33	2.10	11.60	-43.98	-13.00	H
9301.25	-51.07	2.00	11.60	-43.62	-13.00	H
9424.00	-51.65	2.10	11.60	-44.30	-13.00	H
9474.25	-51.00	2.10	11.60	-43.65	-13.00	V
9717.00	-51.69	2.20	11.20	-44.84	-13.00	H

LTE Band 5, 1.4MHz, QPSK, Channel 20643

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8419.25	-55.10	1.80	11.30	-47.75	-13.00	V
9147.50	-53.79	2.10	11.60	-46.44	-13.00	H
9222.50	-52.64	2.10	11.60	-45.29	-13.00	H
9296.75	-53.46	2.00	11.60	-46.01	-13.00	H
9425.50	-52.96	2.10	11.60	-45.61	-13.00	H
9474.25	-53.17	2.10	11.60	-45.82	-13.00	V

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LTE Band 5, 1.4MHz, 16QAM, Channel 20407

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
3297.14	-51.50	1.10	11.50	-43.25	-13.00	H
8242.50	-48.28	2.20	11.30	-41.33	-13.00	V
9221.75	-50.31	2.10	11.60	-42.96	-13.00	H
9300.25	-50.70	2.00	11.60	-43.25	-13.00	H
9368.00	-51.53	2.00	11.60	-44.08	-13.00	V
9471.25	-50.88	2.10	11.60	-43.53	-13.00	V

LTE Band 5, 1.4MHz, 16QAM, Channel 20525

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
9094.50	-50.97	2.20	11.60	-43.72	-13.00	H
9105.00	-51.65	2.20	11.60	-44.40	-13.00	H
9223.25	-50.45	2.10	11.60	-43.10	-13.00	H
9303.50	-50.88	2.00	11.60	-43.43	-13.00	H
9428.50	-51.36	2.10	11.60	-44.01	-13.00	H
9474.75	-51.28	2.10	11.60	-43.93	-13.00	V

LTE Band 5, 1.4MHz, 16QAM, Channel 20643

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8470.00	-54.69	1.80	11.30	-47.34	-13.00	H
9223.25	-52.76	2.10	11.60	-45.41	-13.00	H
9299.25	-53.42	2.00	11.60	-45.97	-13.00	H
9366.25	-54.73	2.00	11.60	-47.28	-13.00	H
9477.50	-53.68	2.10	11.60	-46.33	-13.00	V
9746.00	-53.80	2.20	11.20	-46.95	-13.00	H

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LTE Band 5, 1.4MHz, 64QAM, Channel 20407

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8242.50	-50.28	2.20	11.30	-43.33	-13.00	V
9149.50	-51.23	2.10	11.60	-43.88	-13.00	H
9219.25	-51.10	2.10	11.60	-43.75	-13.00	H
9308.00	-50.16	2.00	11.60	-42.71	-13.00	H
9478.00	-50.47	2.10	11.60	-43.12	-13.00	V
9653.75	-51.01	2.10	11.20	-44.06	-13.00	H

LTE Band 5, 1.4MHz, 64QAM, Channel 20525

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
9159.50	-51.86	2.10	11.60	-44.51	-13.00	H
9217.50	-50.37	2.10	11.60	-43.02	-13.00	H
9356.75	-50.60	2.00	11.60	-43.15	-13.00	V
9424.50	-50.83	2.10	11.60	-43.48	-13.00	H
9470.25	-50.92	2.10	11.60	-43.57	-13.00	V
9792.50	-50.65	2.30	11.20	-43.90	-13.00	H

LTE Band 5, 1.4MHz, 64QAM, Channel 20643

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8429.75	-52.02	1.80	11.30	-44.67	-13.00	H
8451.75	-52.08	1.80	11.30	-44.73	-13.00	H
9106.25	-51.77	2.20	11.60	-44.52	-13.00	H
9229.00	-51.23	2.10	11.60	-43.88	-13.00	H
9308.00	-51.09	2.00	11.60	-43.64	-13.00	H
9476.75	-51.20	2.10	11.60	-43.85	-13.00	V

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LTE Band 7, 5MHz, QPSK, Channel 20775

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5000.40	-45.88	1.30	12.50	-34.68	-25.00	H
10001.50	-43.85	2.20	11.30	-34.75	-25.00	H
17302.00	-45.48	3.20	14.50	-34.18	-25.00	H
17521.50	-44.24	2.90	12.80	-34.34	-25.00	H
17642.00	-44.33	3.30	12.80	-34.83	-25.00	H
17773.50	-43.43	3.60	12.80	-34.23	-25.00	H

LTE Band 7, 5MHz, QPSK, Channel 21100

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5065.71	-46.50	1.20	12.50	-35.20	-25.00	H
12664.50	-46.01	2.60	13.80	-34.81	-25.00	H
17301.00	-45.39	3.20	14.50	-34.09	-25.00	H
17463.50	-46.18	2.90	14.50	-34.58	-25.00	H
17615.50	-43.96	3.30	12.80	-34.46	-25.00	H
17839.50	-43.93	3.60	12.80	-34.73	-25.00	H

LTE Band 7, 5MHz, QPSK, Channel 21425

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
10262.00	-42.27	2.10	11.30	-33.07	-25.00	H
12826.50	-45.20	2.70	13.80	-34.10	-25.00	H
17252.00	-45.65	3.20	14.50	-34.35	-25.00	H
17427.00	-45.56	2.90	14.50	-33.96	-25.00	H
17592.50	-44.26	3.30	12.80	-34.76	-25.00	H
17837.00	-43.39	3.60	12.80	-34.19	-25.00	H

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LTE Band 7, 5MHz, 16QAM, Channel 20775

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
10001.50	-44.02	2.20	11.30	-34.92	-25.00	H
12502.00	-45.35	2.60	13.80	-34.15	-25.00	H
17229.00	-45.93	3.20	14.50	-34.63	-25.00	H
17525.00	-44.62	2.90	12.80	-34.72	-25.00	H
17568.00	-43.57	3.30	12.80	-34.07	-25.00	H
17820.00	-43.16	3.60	12.80	-33.96	-25.00	H

LTE Band 7, 5MHz, 16QAM, Channel 21100

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
12664.50	-46.64	2.60	13.80	-35.44	-25.00	H
17123.50	-46.40	2.90	14.50	-34.80	-25.00	H
17345.00	-45.86	3.20	14.50	-34.56	-25.00	H
17521.50	-44.65	2.90	12.80	-34.75	-25.00	H
17627.00	-44.24	3.30	12.80	-34.74	-25.00	H
17828.50	-43.79	3.60	12.80	-34.59	-25.00	H

LTE Band 7, 5MHz, 16QAM, Channel 21425

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
10261.50	-43.54	2.10	11.30	-34.34	-25.00	H
12827.00	-44.50	2.70	13.80	-33.40	-25.00	H
17216.00	-45.55	3.20	14.50	-34.25	-25.00	H
17500.50	-43.98	2.90	12.80	-34.08	-25.00	H
17619.50	-44.11	3.30	12.80	-34.61	-25.00	H
17824.00	-43.89	3.60	12.80	-34.69	-25.00	H

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LTE Band 7, 5MHz, 64QAM, Channel 20775

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5000.47	-45.69	1.30	12.50	-34.49	-25.00	H
12502.00	-46.79	2.60	13.80	-35.59	-25.00	H
17230.50	-46.07	3.20	14.50	-34.77	-25.00	H
17437.50	-45.89	2.90	14.50	-34.29	-25.00	H
17578.50	-43.49	3.30	12.80	-33.99	-25.00	H
17834.00	-43.95	3.60	12.80	-34.75	-25.00	H

LTE Band 7, 5MHz, 64QAM, Channel 21100

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16993.00	-48.06	2.90	16.50	-34.46	-25.00	H
17099.00	-45.70	2.90	14.50	-34.10	-25.00	H
17285.50	-45.36	3.20	14.50	-34.06	-25.00	H
17519.00	-44.04	2.90	12.80	-34.14	-25.00	H
17594.50	-43.55	3.30	12.80	-34.05	-25.00	H
17790.50	-43.85	3.60	12.80	-34.65	-25.00	H

LTE Band 7, 5MHz, 64QAM, Channel 21425

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
10261.50	-42.47	2.10	11.30	-33.27	-25.00	H
12827.00	-45.68	2.70	13.80	-34.58	-25.00	H
17362.50	-45.51	3.20	14.50	-34.21	-25.00	H
17408.00	-46.19	2.90	14.50	-34.59	-25.00	H
17594.00	-43.39	3.30	12.80	-33.89	-25.00	H
17774.00	-43.91	3.60	12.80	-34.71	-25.00	H

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LTE Band 13, 5MHz, QPSK, Channel 23205

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1562.00	-59.04	0.70	8.10	-53.79	-40.00	V
3886.50	-50.51	1.20	12.20	-41.66	-13.00	V
7773.00	-46.83	1.80	11.30	-39.48	-13.00	H
8551.12	-51.02	2.10	12.00	-43.27	-13.00	H
9301.50	-50.63	2.00	11.60	-43.18	-13.00	H
9473.88	-50.55	2.10	11.60	-43.20	-13.00	V

LTE Band 13, 5MHz, QPSK, Channel 23230

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1560.00	-57.21	0.70	8.10	-51.96	-40.00	H
5459.04	-53.75	1.30	12.50	-44.70	-13.00	H
6616.66	-53.50	1.70	12.40	-44.95	-13.00	H
9224.50	-51.09	2.10	11.60	-43.74	-13.00	H
9305.25	-50.71	2.00	11.60	-43.26	-13.00	H
9723.00	-50.55	2.20	11.20	-43.70	-13.00	H

LTE Band 13, 5MHz, QPSK, Channel 23255

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1564.50	-52.60	0.70	8.10	-47.35	-40.00	V
7330.88	-52.39	1.70	12.00	-44.24	-13.00	H
9095.38	-51.27	2.20	11.60	-44.02	-13.00	H
9299.62	-50.61	2.00	11.60	-43.16	-13.00	H
9475.62	-49.28	2.10	11.60	-41.93	-13.00	V
9735.75	-50.76	2.20	11.20	-43.91	-13.00	H

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LTE Band 13, 5MHz, 16QAM, Channel 23205

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1566.00	-58.87	0.70	8.10	-53.62	-40.00	V
9099.00	-51.65	2.20	11.60	-44.40	-13.00	H
9297.50	-50.65	2.00	11.60	-43.20	-13.00	H
9477.50	-50.75	2.10	11.60	-43.40	-13.00	V
9722.12	-50.67	2.20	11.20	-43.82	-13.00	H
9799.38	-51.15	2.30	11.20	-44.40	-13.00	H

LTE Band 13, 5MHz, 16QAM, Channel 23230

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1559.50	-56.96	0.70	8.10	-51.71	-40.00	H
8488.88	-51.63	1.80	11.30	-44.28	-13.00	H
9103.38	-50.99	2.20	11.60	-43.74	-13.00	H
9301.75	-50.59	2.00	11.60	-43.14	-13.00	H
9473.75	-51.01	2.10	11.60	-43.66	-13.00	V
9657.25	-50.97	2.10	11.20	-44.02	-13.00	H

LTE Band 13, 5MHz, 16QAM, Channel 23255

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1564.50	-54.73	0.70	8.10	-49.48	-40.00	V
1588.00	-60.47	0.70	8.10	-55.22	-13.00	V
7823.25	-51.49	1.80	11.30	-44.14	-13.00	H
9222.38	-49.78	2.10	11.60	-42.43	-13.00	H
9473.62	-50.84	2.10	11.60	-43.49	-13.00	V
9731.62	-50.14	2.20	11.20	-43.29	-13.00	H

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LTE Band 13, 5MHz, 64QAM, Channel 23205

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1567.50	-58.57	0.70	8.10	-53.32	-40.00	V
5441.25	-53.10	1.30	12.50	-44.05	-13.00	V
9300.50	-49.46	2.00	11.60	-42.01	-13.00	H
9469.25	-50.72	2.10	11.60	-43.37	-13.00	V
9752.62	-49.84	2.20	11.20	-42.99	-13.00	H
9793.88	-50.00	2.30	11.20	-43.25	-13.00	H

LTE Band 13, 5MHz, 64QAM, Channel 23230

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1559.50	-56.40	0.70	8.10	-51.15	-40.00	H
9101.50	-50.96	2.20	11.60	-43.71	-13.00	H
9300.00	-49.69	2.00	11.60	-42.24	-13.00	H
9474.75	-49.68	2.10	11.60	-42.33	-13.00	V
9748.38	-50.28	2.20	11.20	-43.43	-13.00	H
9792.50	-50.83	2.30	11.20	-44.08	-13.00	H

LTE Band 13, 5MHz, 64QAM, Channel 23255

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
1564.50	-54.70	0.70	8.10	-49.45	-40.00	V
8460.00	-51.17	1.80	11.30	-43.82	-13.00	H
9310.00	-49.52	2.00	11.60	-42.07	-13.00	H
9350.12	-51.21	2.00	11.60	-43.76	-13.00	V
9733.38	-50.89	2.20	11.20	-44.04	-13.00	H
9794.88	-50.99	2.30	11.20	-44.24	-13.00	H

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.87dB(30MHz-3GHz)/3.35dB(3GHz-18GHz)/2.68dB(18GHz-40GHz), k = 2

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A.3 FREQUENCY STABILITY

Reference

FCC: CFR Part 2.1055, 22.355, 24.235, 27.54.

A.3.1 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 -30℃.
3. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on mid channel of all bands, 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℃ increments from -30℃ to +50℃. 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℃.
7. With the EUT, powered via nominal voltage, connected to the CMW500 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℃ increments from -30℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5℃ 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.

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A.3.2 Measurement results

LTE Band 2, 20MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	1850.800	1909.230		
50				-6.54	0.0035
40				9.14	0.0049
30				-5.29	0.0028
10				-14.43	0.0077
0				-24.40	0.0130
-10				-28.65	0.0152
-20				-34.56	0.0184
-30				1.72	0.0009

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1850.800	1909.230	-1.89	0.0010
4.20				-6.85	0.0036

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

LTE Band 4, 20MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
50	3.70	1710.800	1754.280		
40				-1.16	0.0007
30				-3.61	0.0021
20				-5.08	0.0029
10				-1.62	0.0009
0				-2.89	0.0017
-10				0.64	0.0004
-20				-2.45	0.0014
-30				-2.72	0.0016

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1710.800	1754.280	-2.46	0.0014
4.20				-1.87	0.0011

panded measurement uncertainty is 10Hz, *k* = 2

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LTE Band 5, 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
50	3.70	824.360	848.630		
40				0.97	0.0012
30				0.37	0.0004
20				1.13	0.0014
10				1.72	0.0021
0				1.59	0.0019
-10				2.15	0.0026
-20				1.79	0.0021
-30				2.95	0.0035

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	824.360	848.630	1.97	0.0024
4.20				2.78	0.0033

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

LTE Band 7, 20MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	2500.540	2569.480		
50				-2.79	0.0011
40				-0.09	0.0000
30				-6.90	0.0027
10				-7.95	0.0031
0				-12.32	0.0049
-10				-5.99	0.0024
-20				-8.76	0.0035
-30				-3.91	0.0015

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	2500.540	2569.480	-9.93	0.0039
4.20				-6.15	0.0024

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

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LTE Band 13, 10MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	777.440	786.554		
50				-0.76	0.0010
40				-0.26	0.0003
30				-0.63	0.0008
10				0.22	0.0003
0				0.34	0.0004
-10				0.90	0.0012
-20				1.69	0.0022
-30				1.56	0.0020

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	777.440	786.554	2.07	0.0027
4.20				3.36	0.0043

Expanded measurement uncertainty is 10Hz, k = 2

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A.4 OCCUPIED BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53.

A.4.1 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.

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 10log (OBW / 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.

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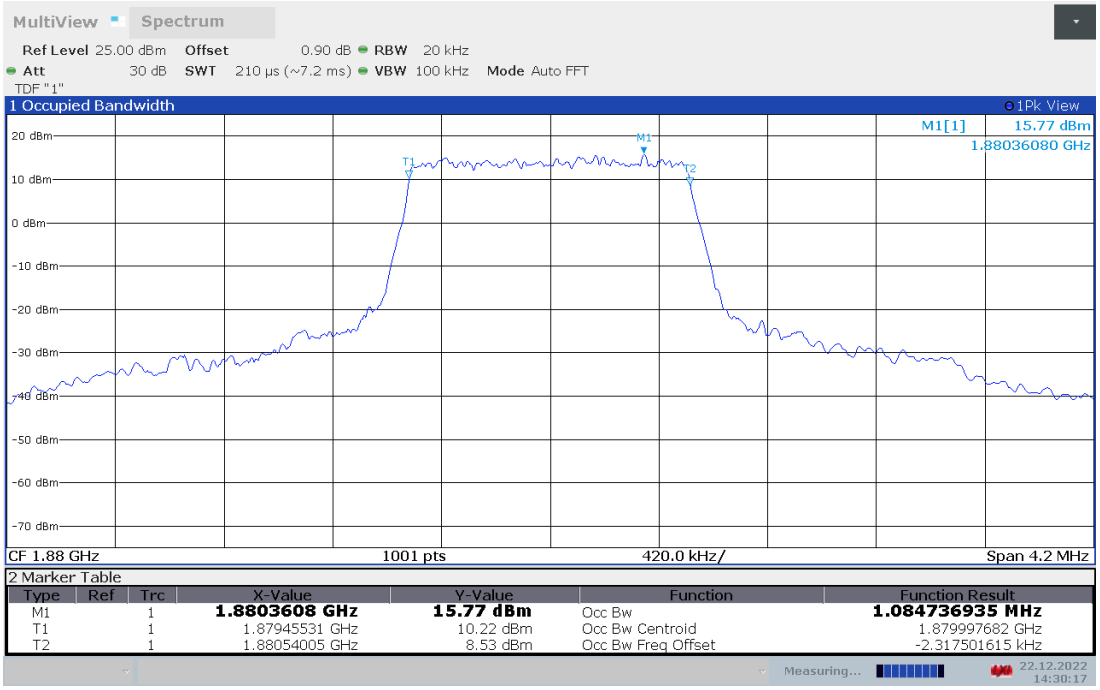
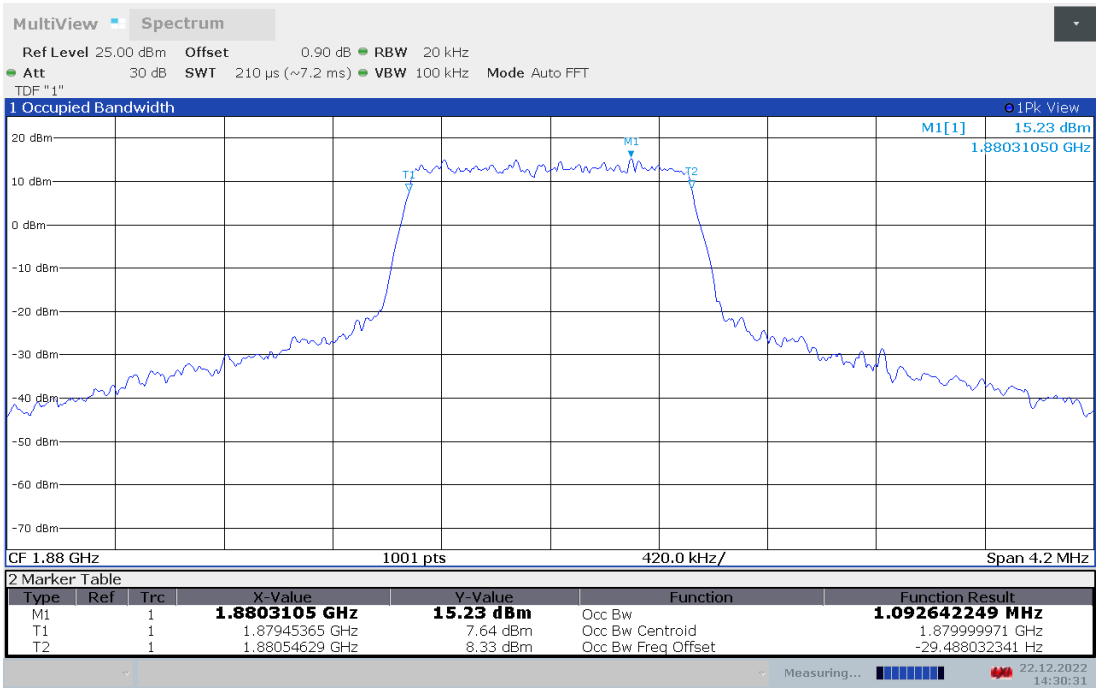
LTE band 2,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	1.085	1.093

LTE band 2 , 1.4MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 1.4MHz Bandwidth,16QAM (99% BW)



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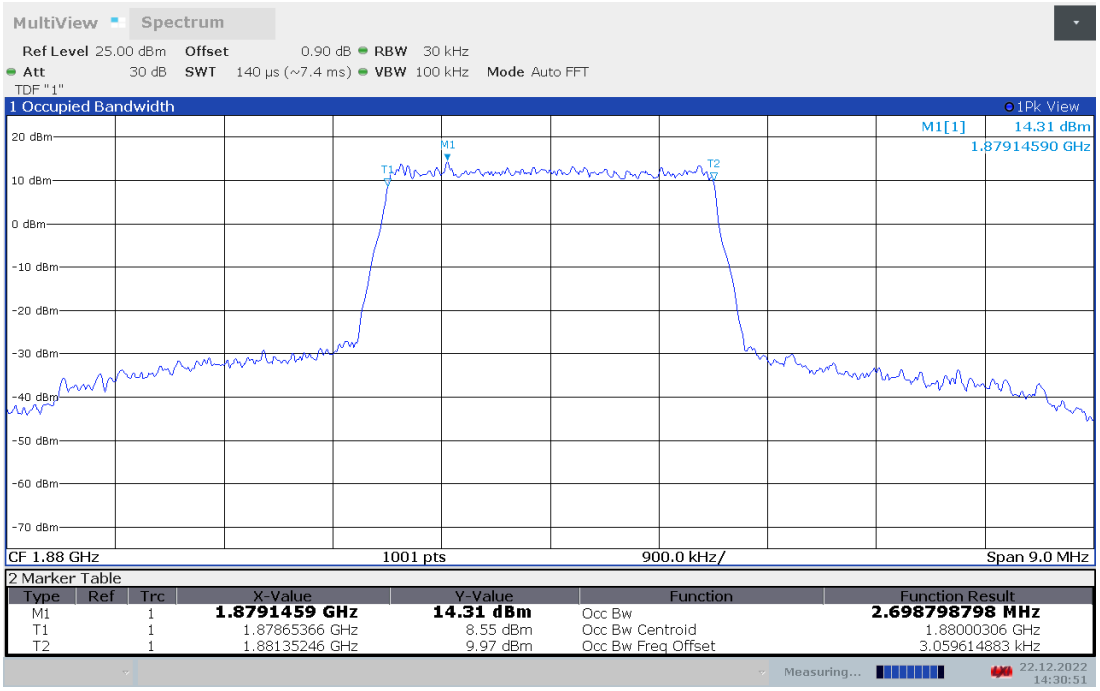
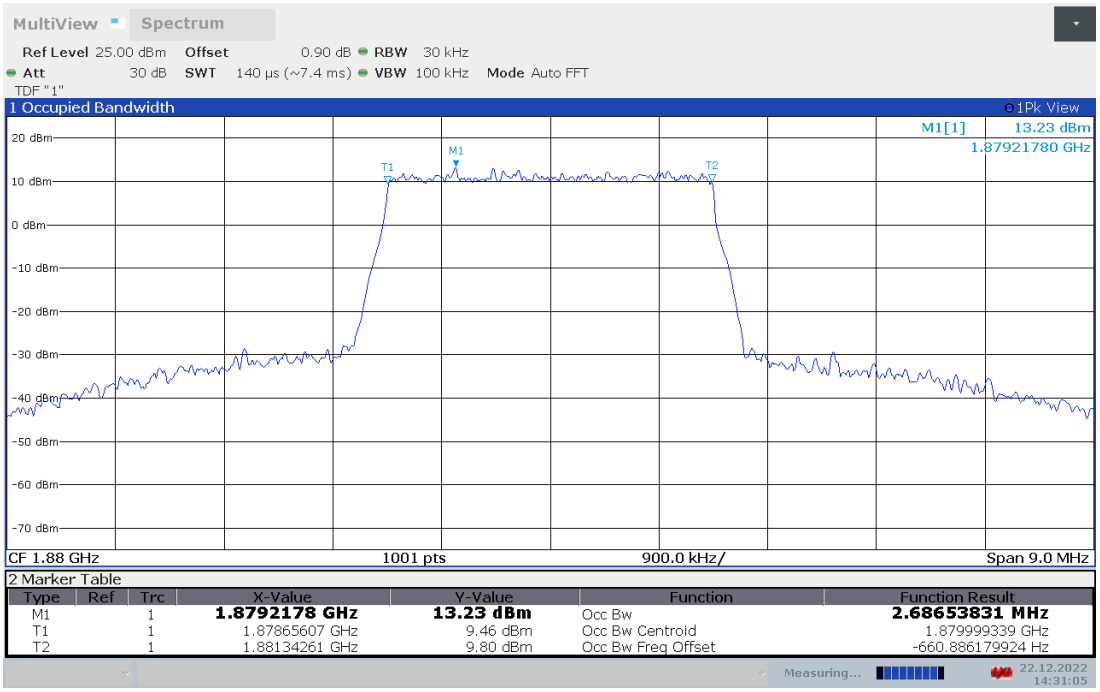
LTE band 2,3MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	2.699	2.687

LTE band 2 , 3MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 3MHz Bandwidth,16QAM (99% BW)



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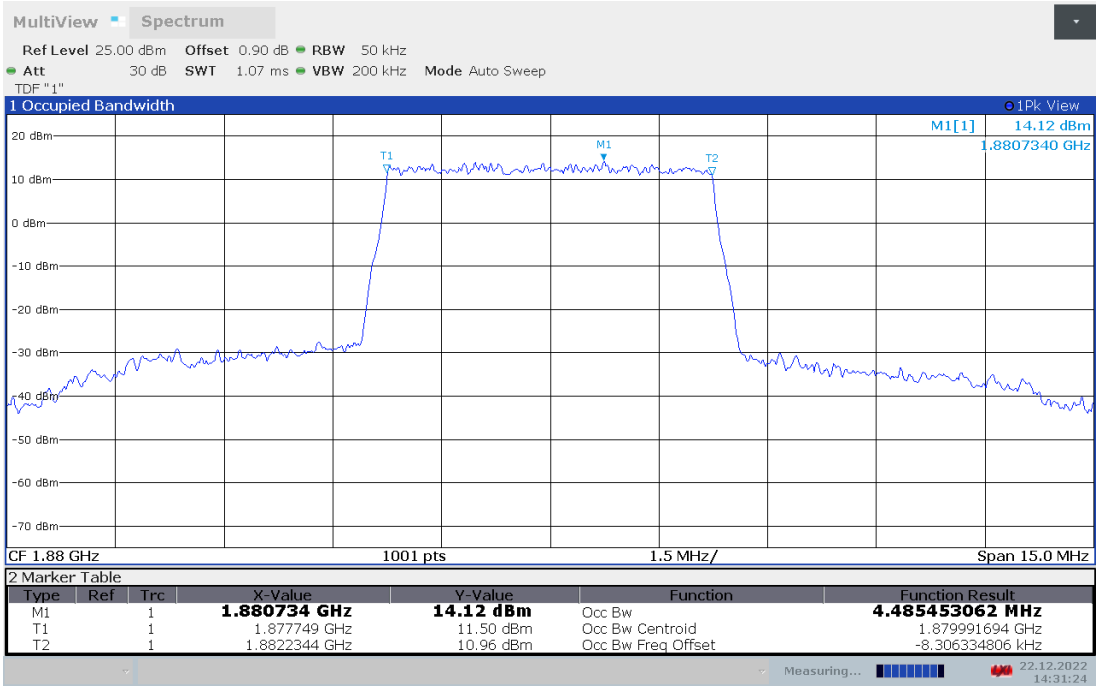
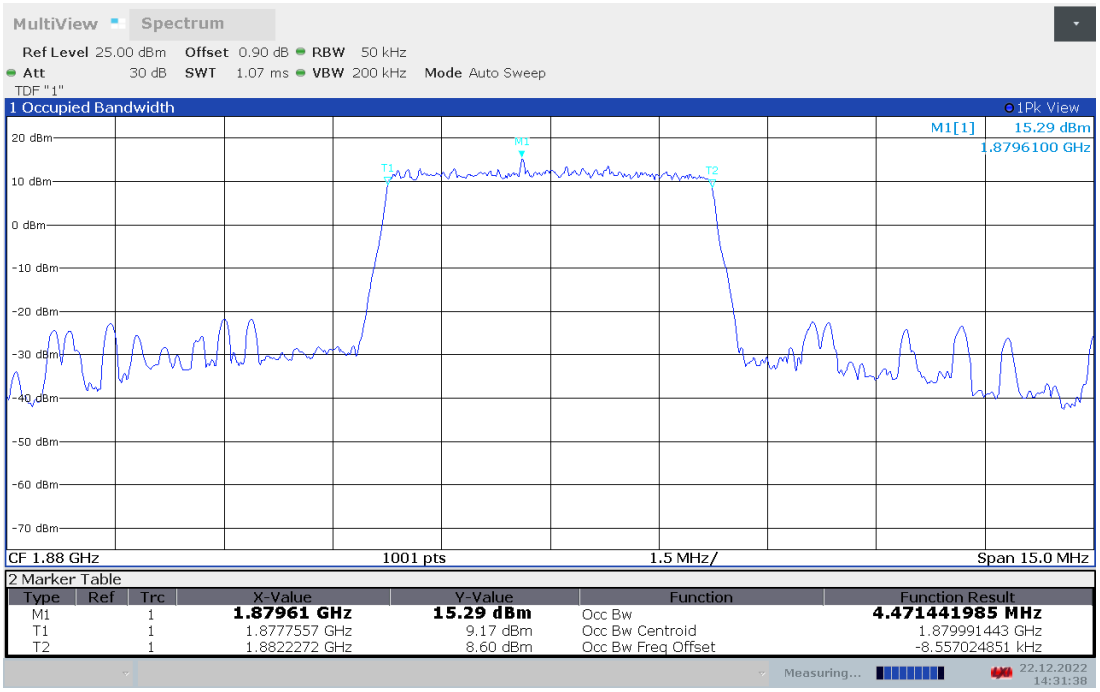
LTE band 2,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	4.485	4.471

LTE band 2 , 5MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 5MHz Bandwidth,16QAM (99% BW)



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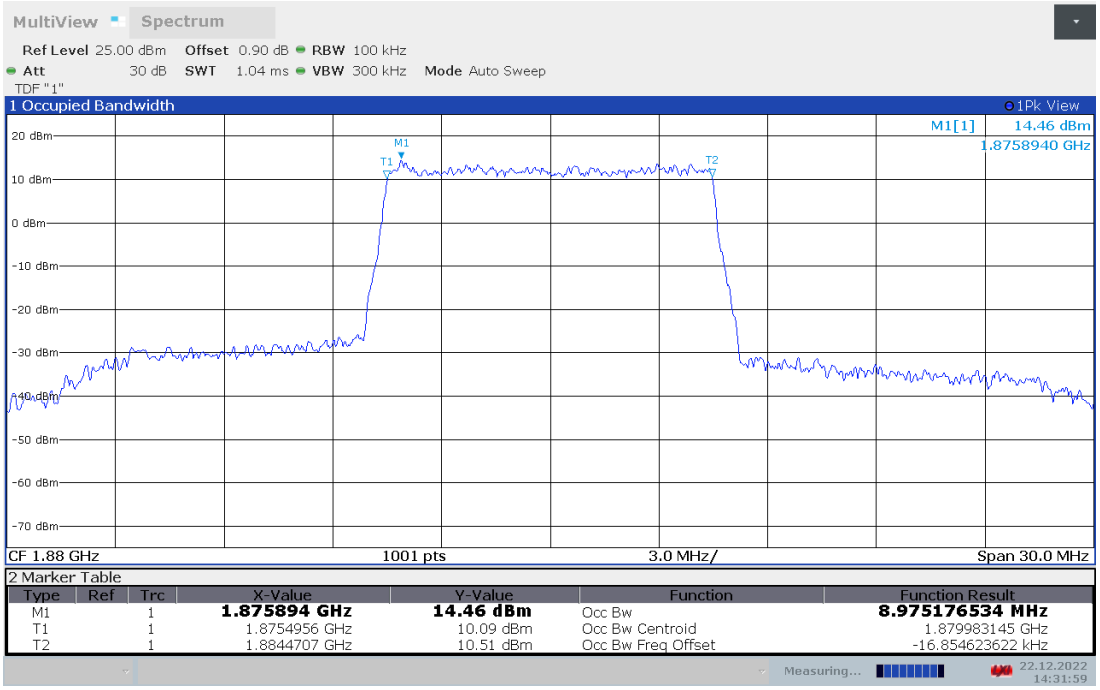
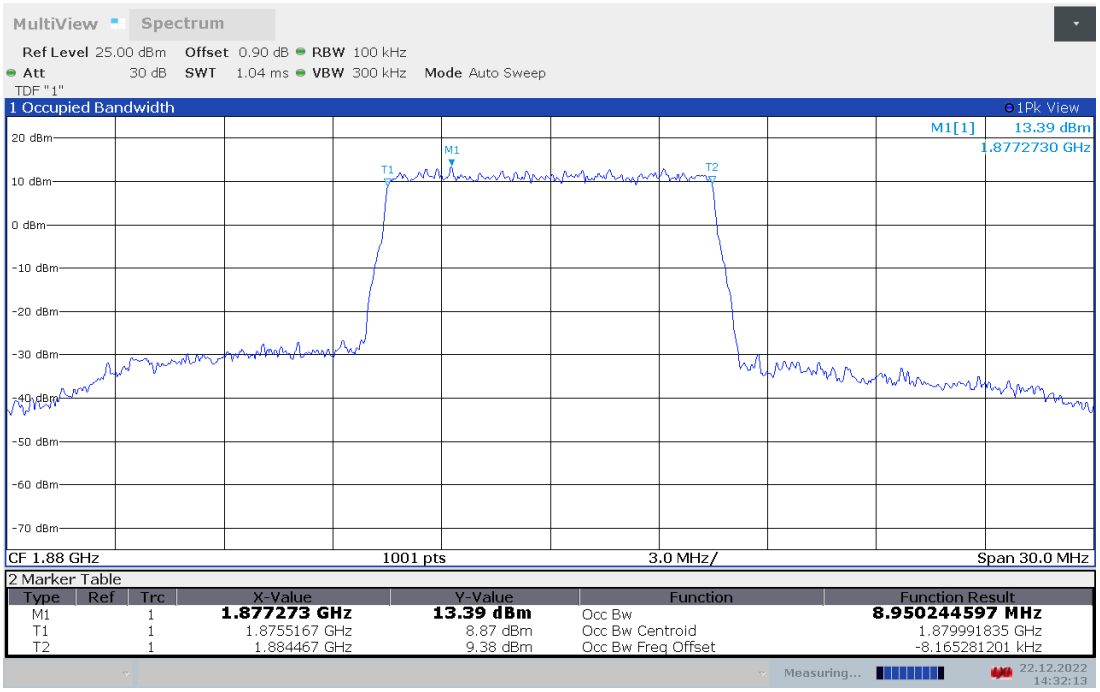
LTE band 2,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	8.975	8.950

LTE band 2 , 10MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 10MHz Bandwidth,16QAM (99% BW)



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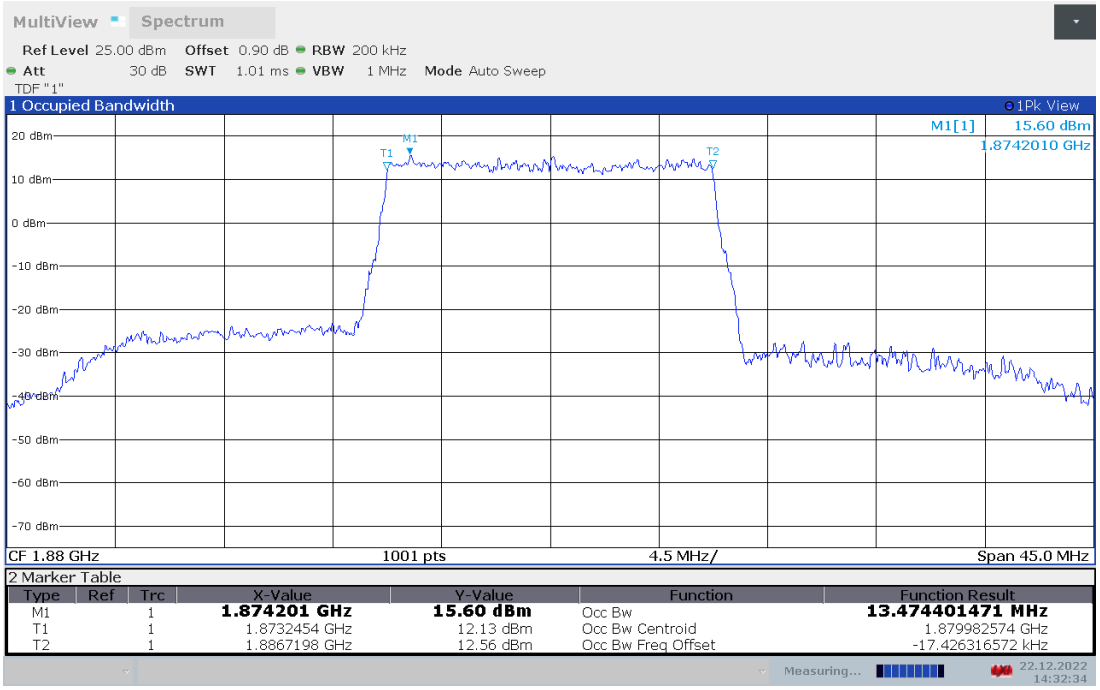
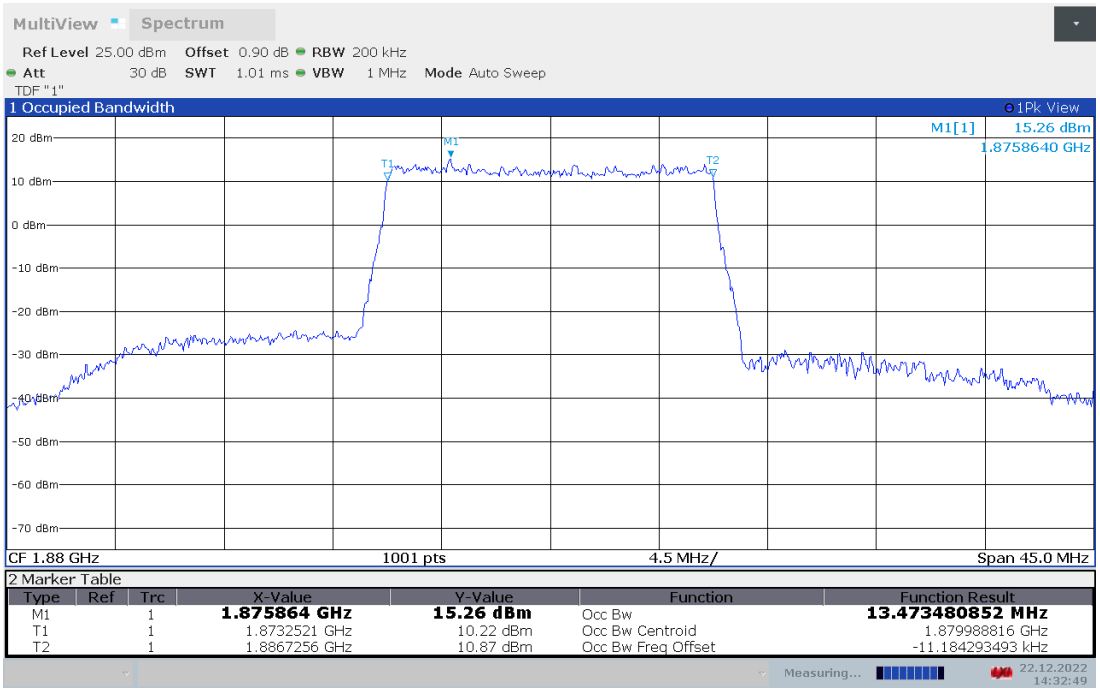
LTE band 2,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	13.474	13.473

LTE band 2 , 15MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 15MHz Bandwidth,16QAM (99% BW)



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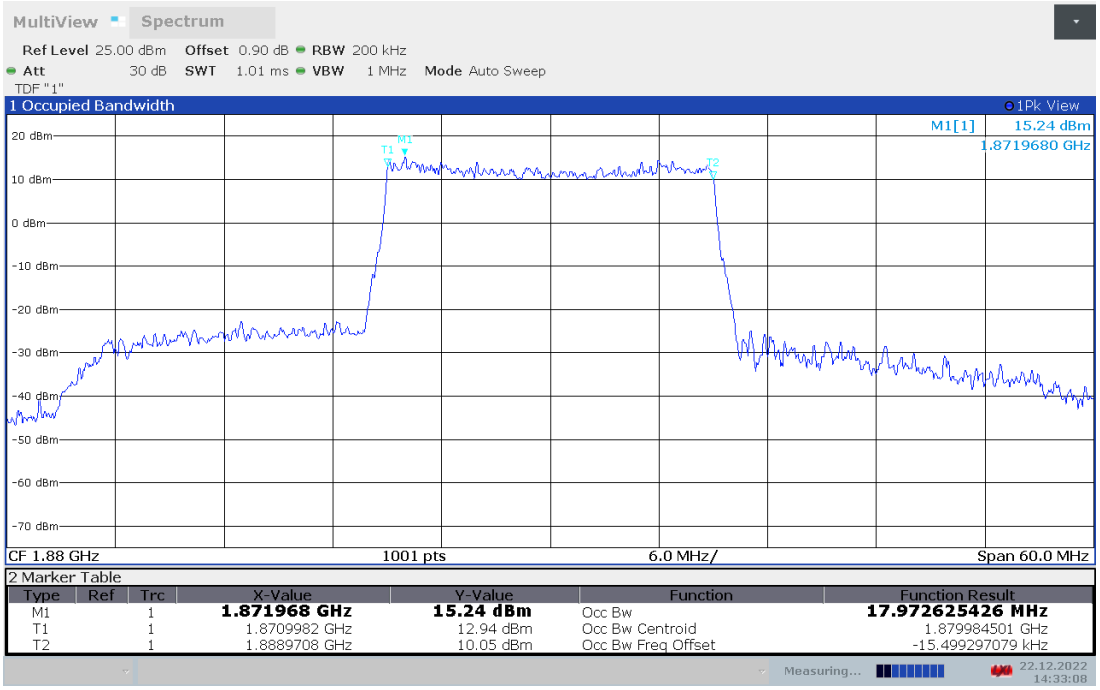
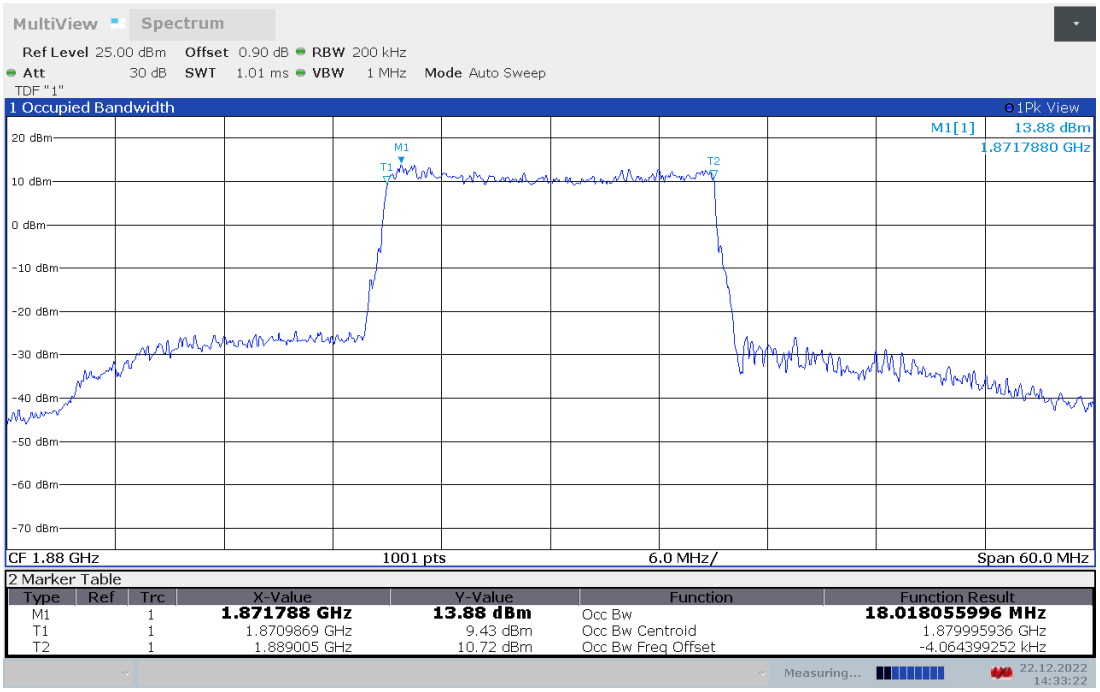
LTE band 2,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1880	17.973	18.018

LTE band 2 , 20MHz Bandwidth,QPSK (99% BW)



LTE band 2 , 20MHz Bandwidth,16QAM (99% BW)



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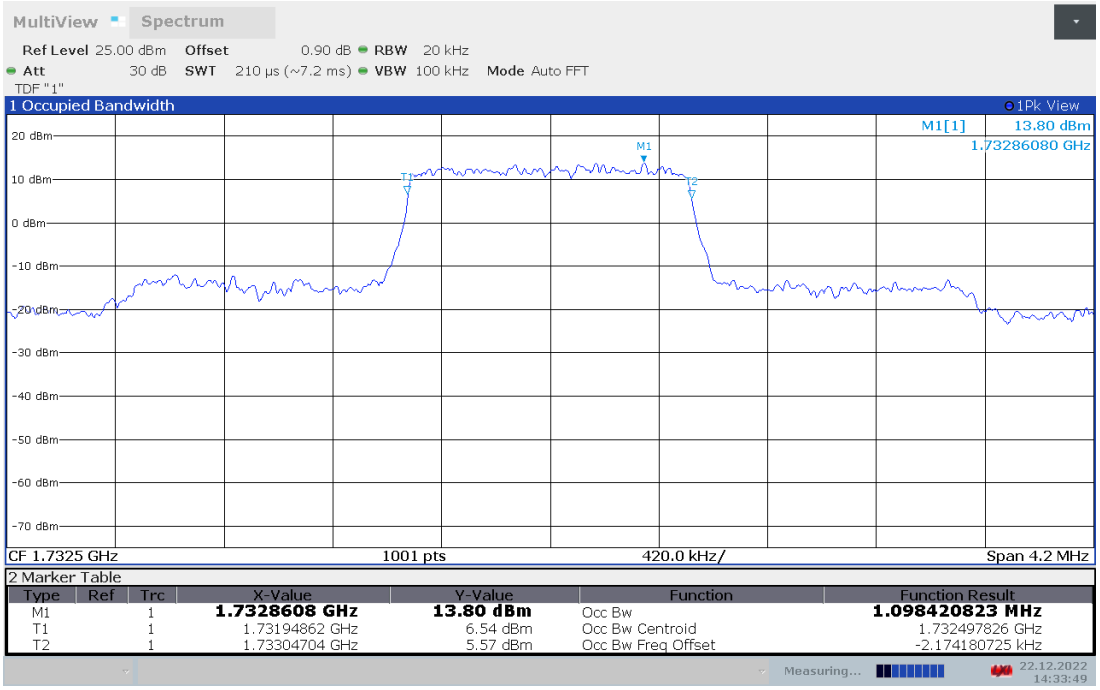
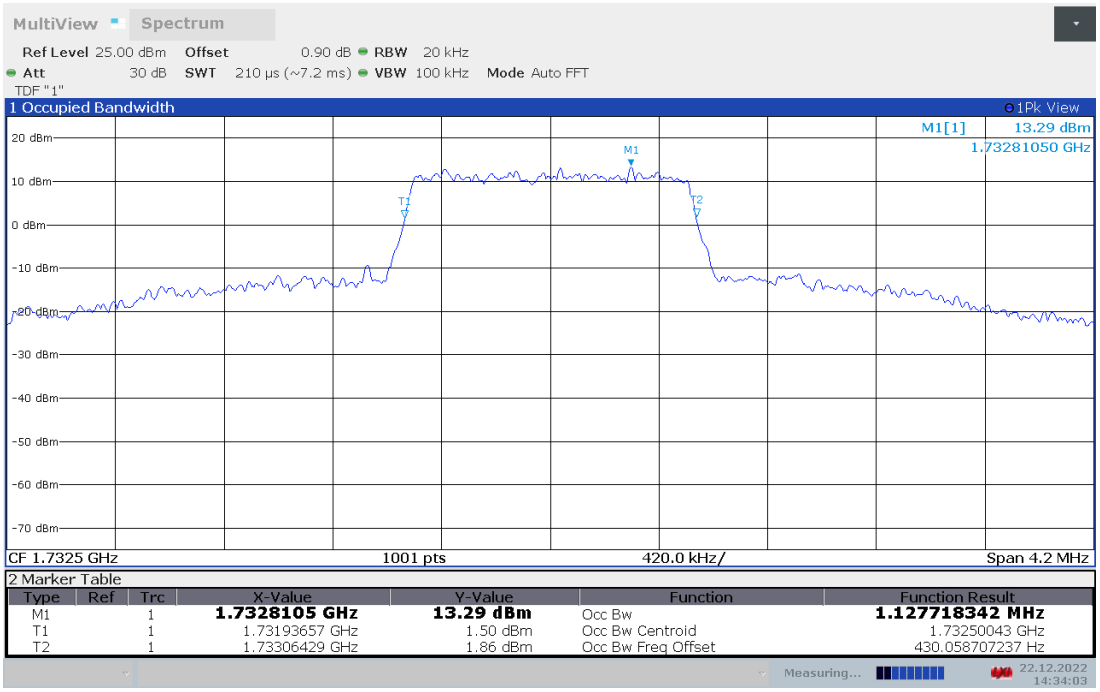
LTE band 4,1.4MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	1.098	1.128

LTE band 4 , 1.4MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 1.4MHz Bandwidth,16QAM (99% BW)



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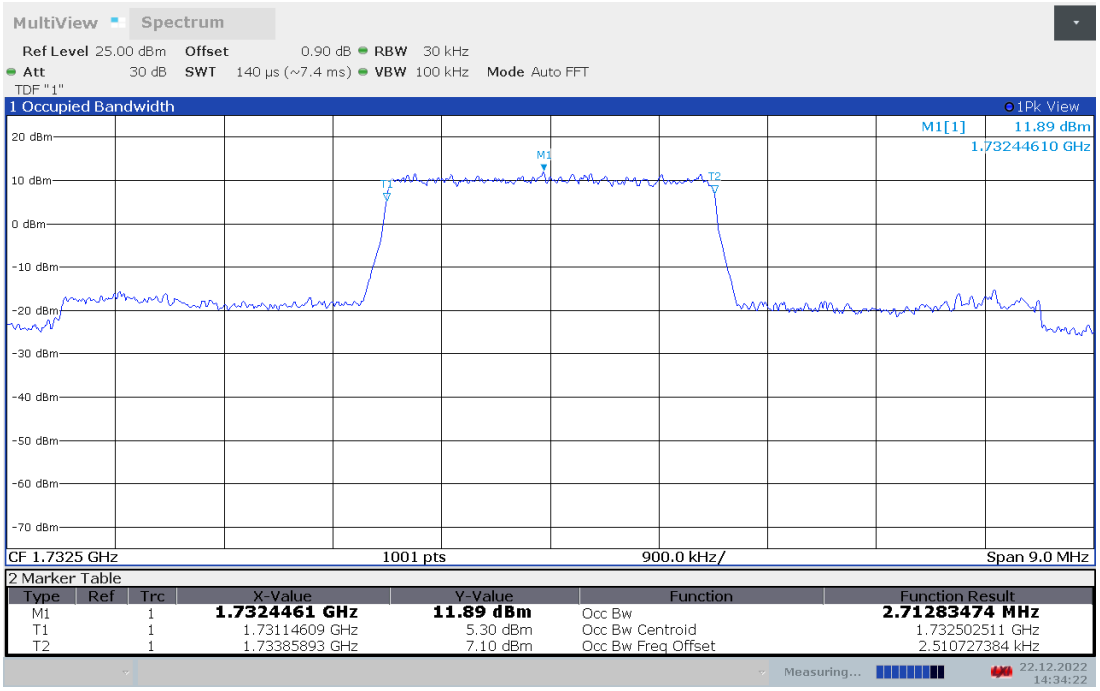
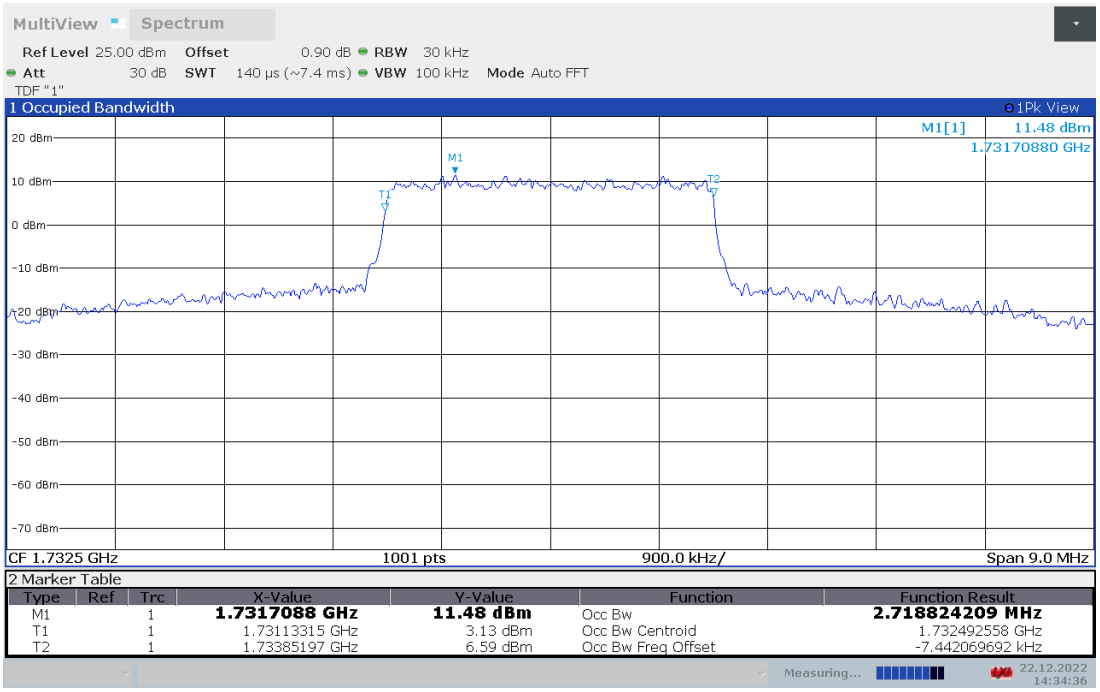
LTE band 4,3MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	2.713	2.719

LTE band 4 , 3MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 3MHz Bandwidth,16QAM (99% BW)



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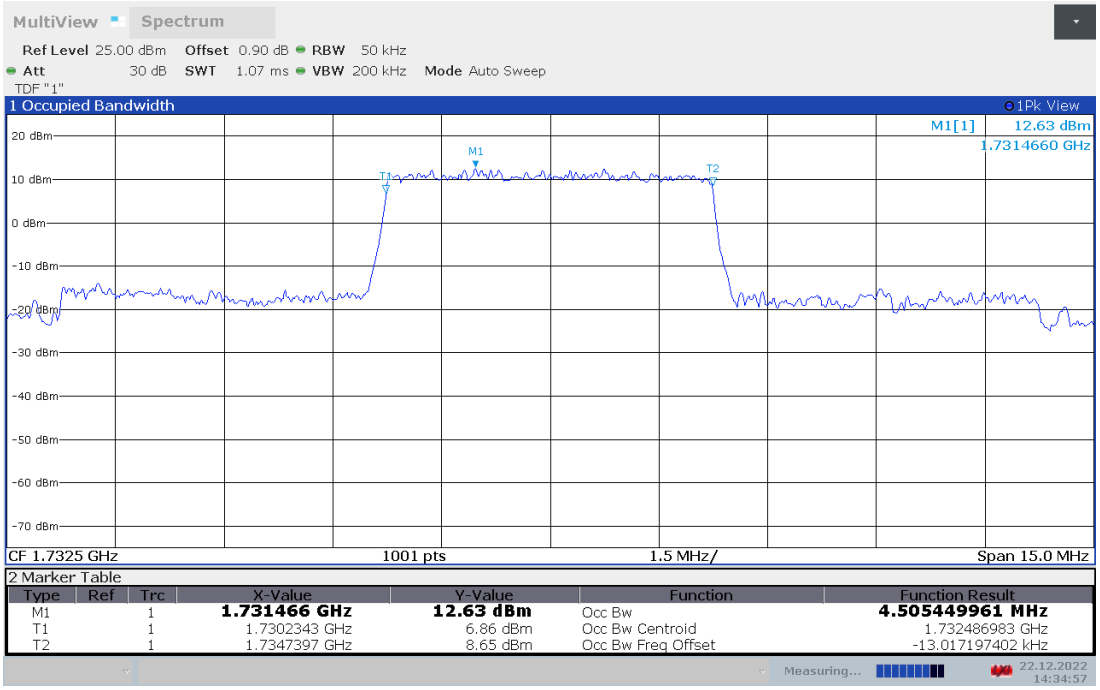
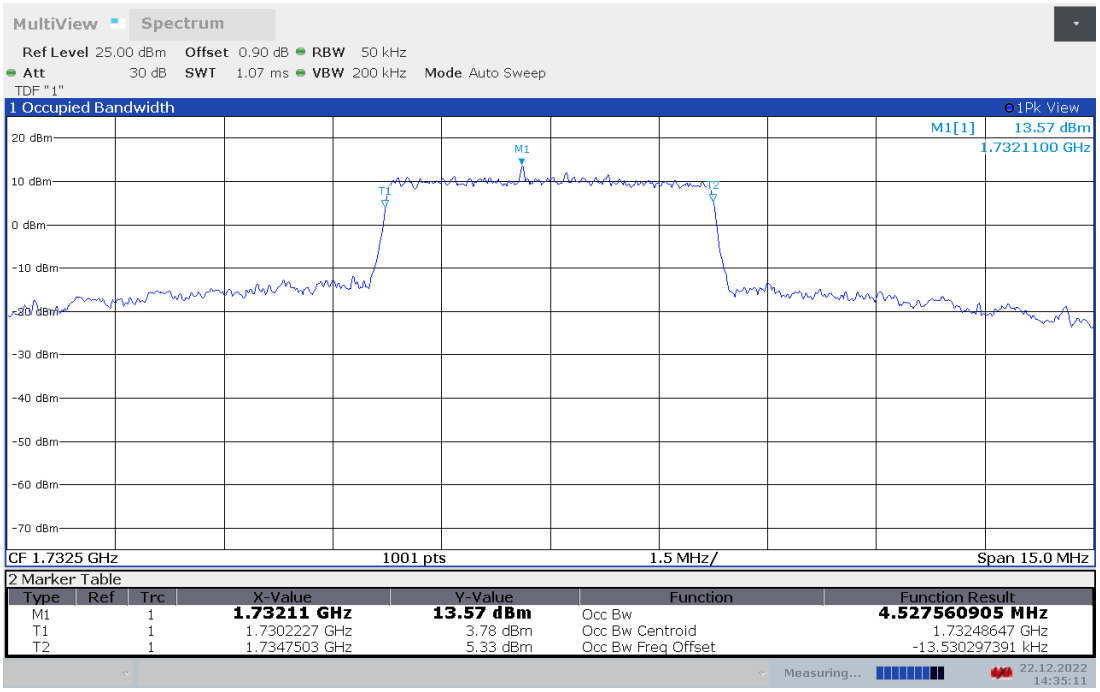
LTE band 4,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	4.505	4.528

LTE band 4 , 5MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 5MHz Bandwidth,16QAM (99% BW)



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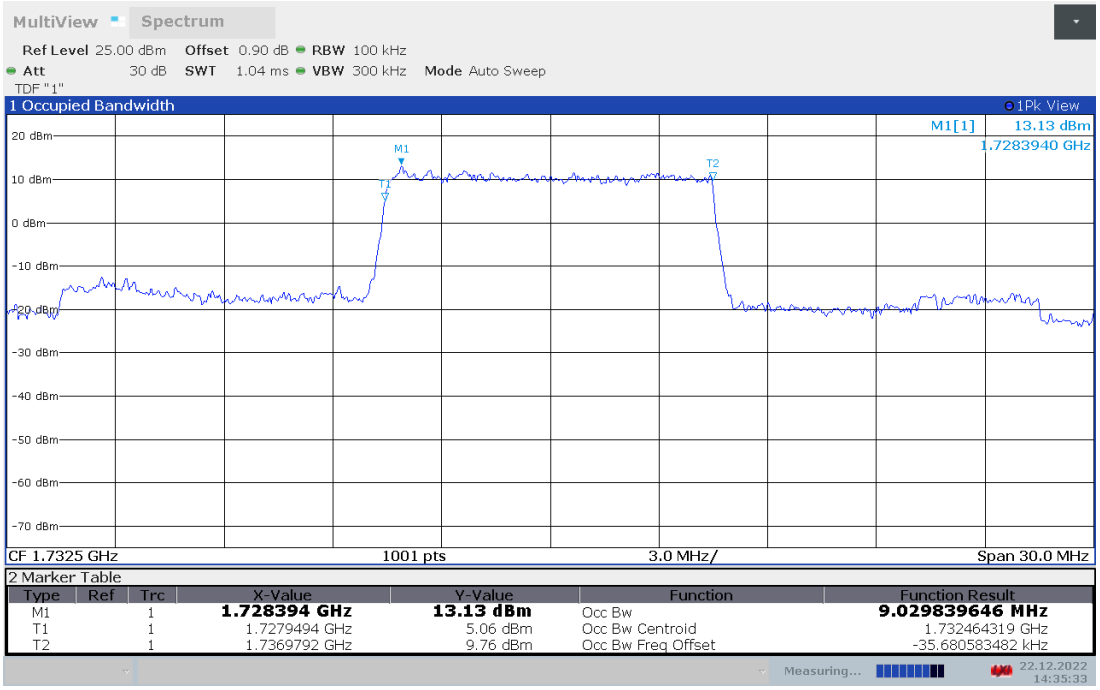
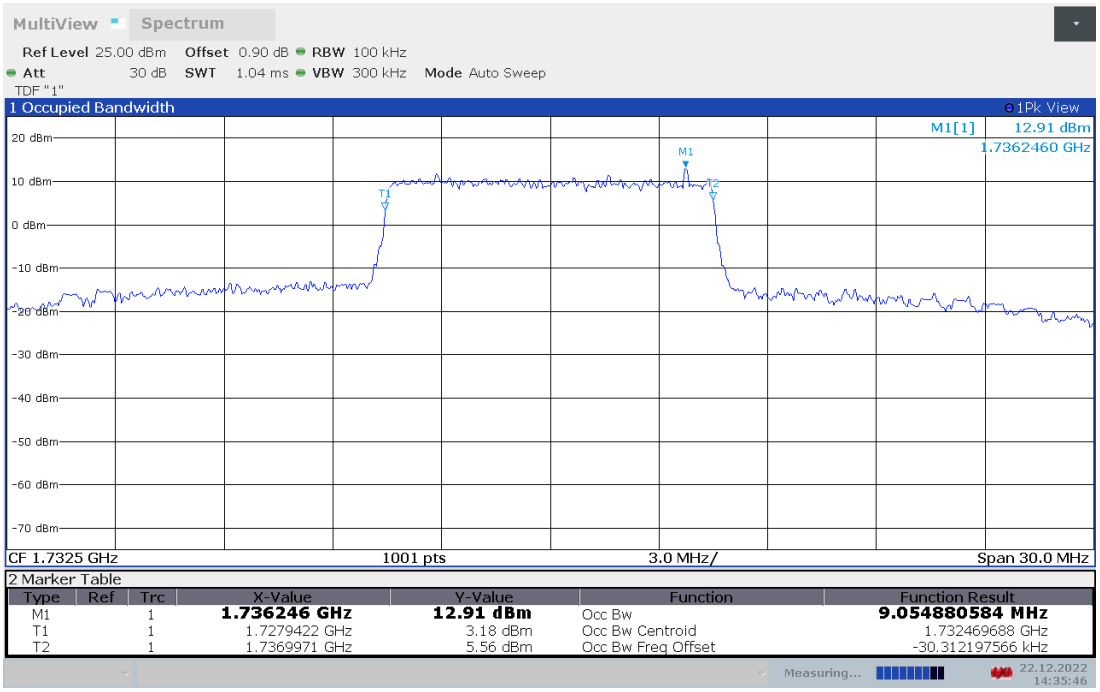
LTE band 4,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	9.030	9.055

LTE band 4 , 10MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 10MHz Bandwidth,16QAM (99% BW)



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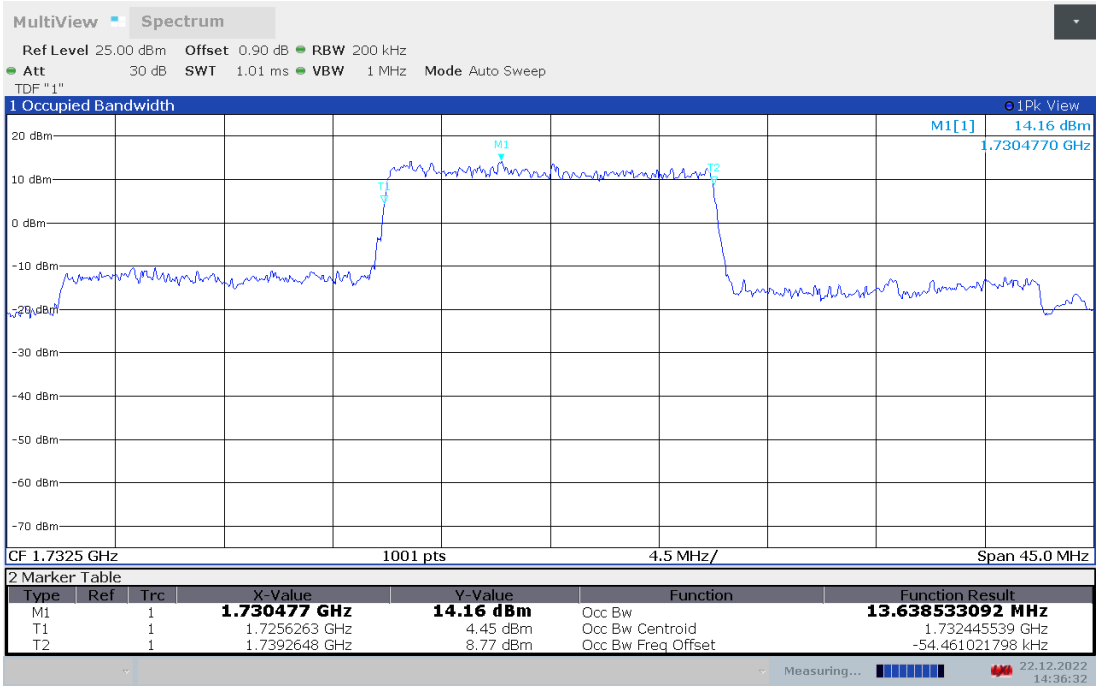
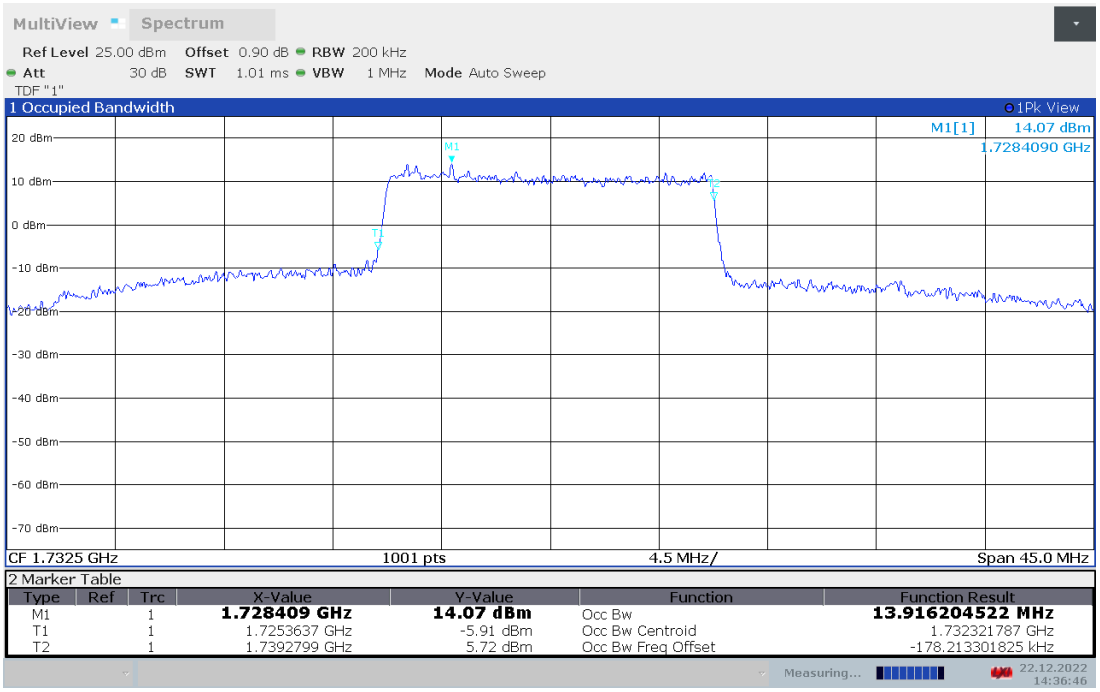
LTE band 4,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	13.639	13.916

LTE band 4 , 15MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 15MHz Bandwidth,16QAM (99% BW)



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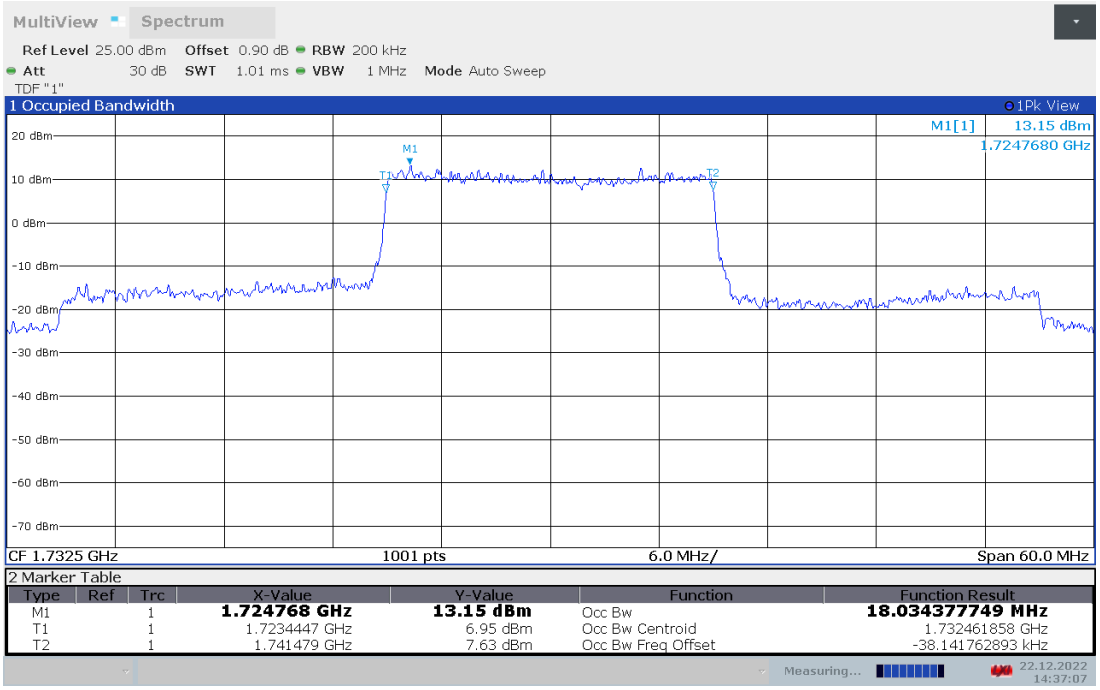
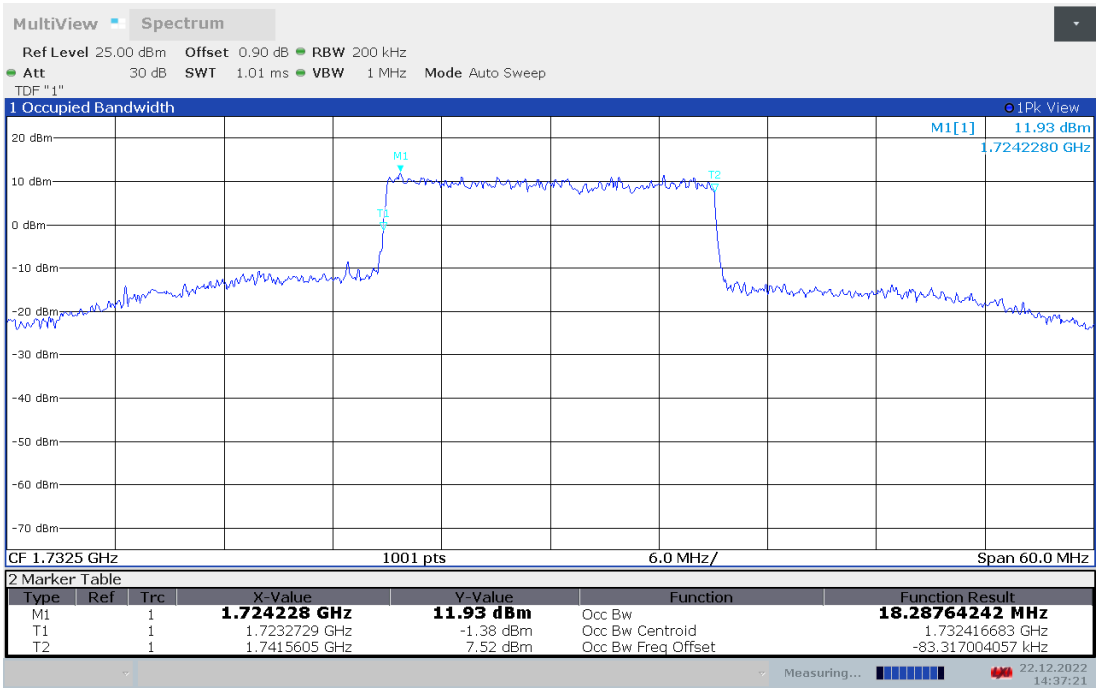
LTE band 4,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
1732.5	18.034	18.288

LTE band 4 , 20MHz Bandwidth,QPSK (99% BW)



LTE band 4 , 20MHz Bandwidth,16QAM (99% BW)



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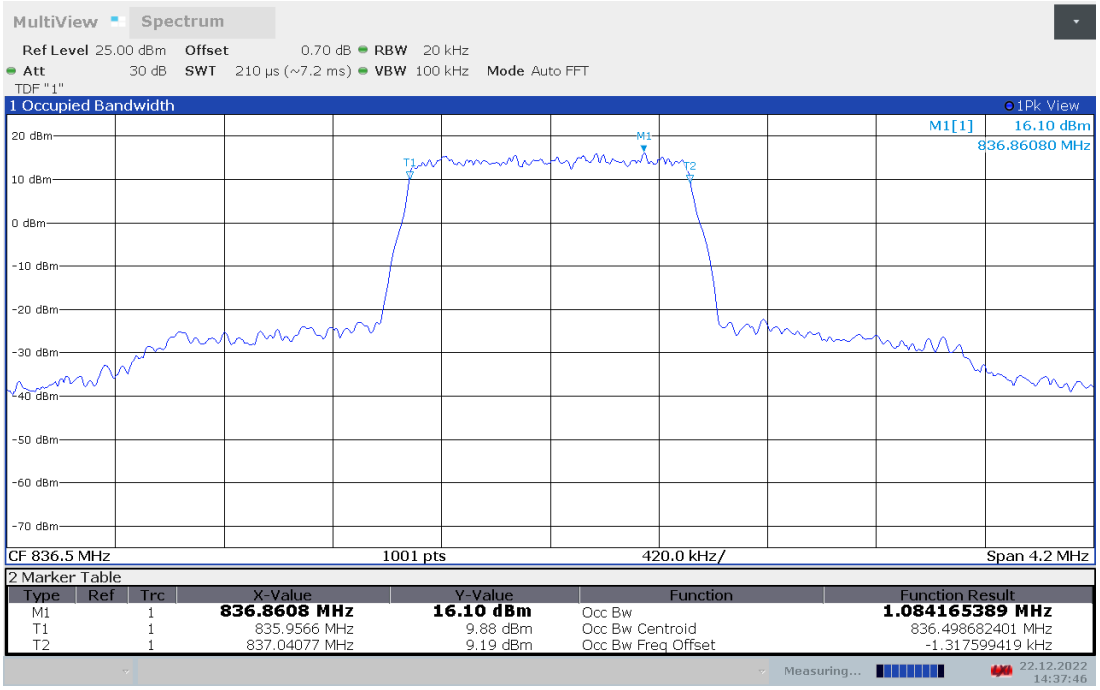
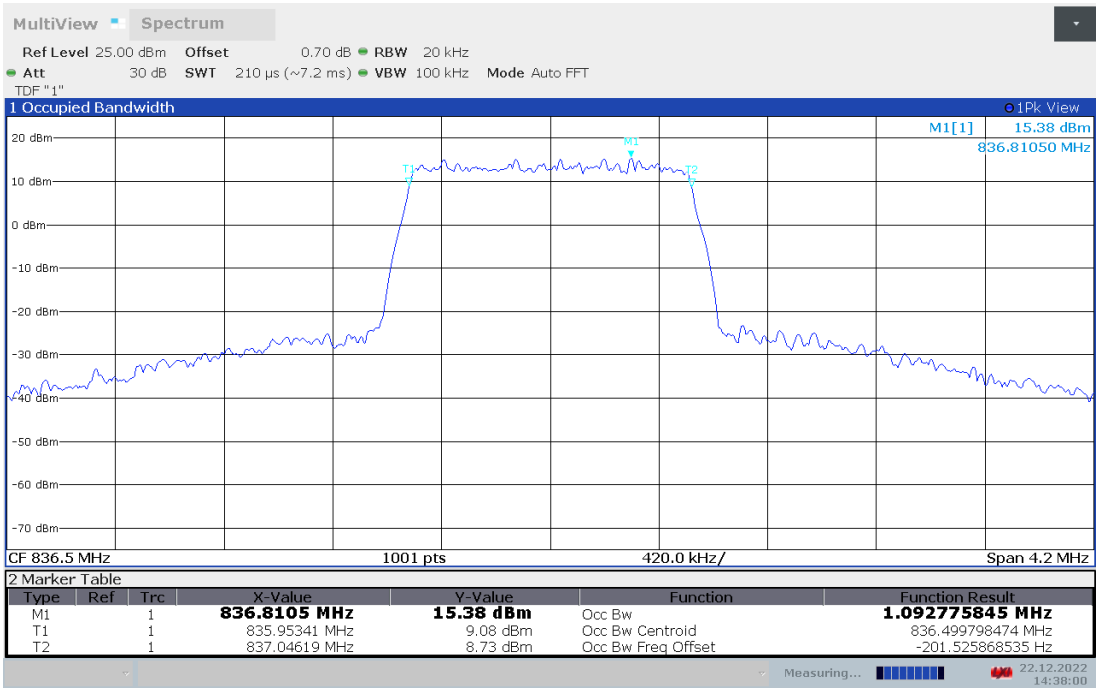
LTE band 5,1.4MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
836.5	1.084	1.093

LTE band 5 , 1.4MHz Bandwidth,QPSK (99% BW)



LTE band 5 , 1.4MHz Bandwidth,16QAM (99% BW)



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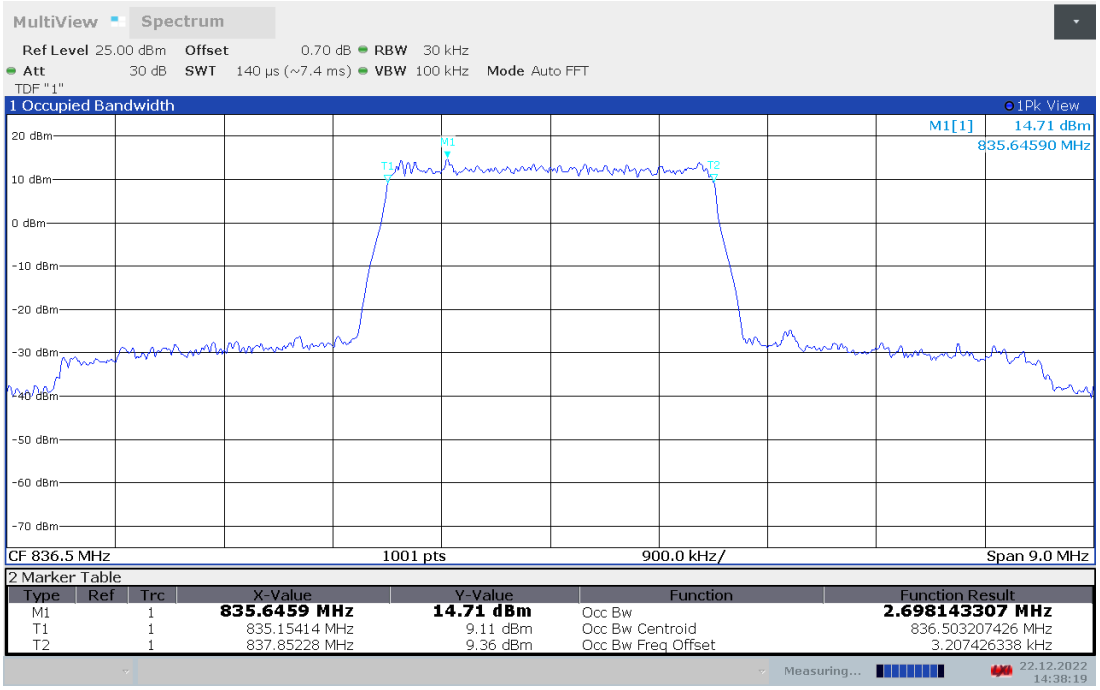
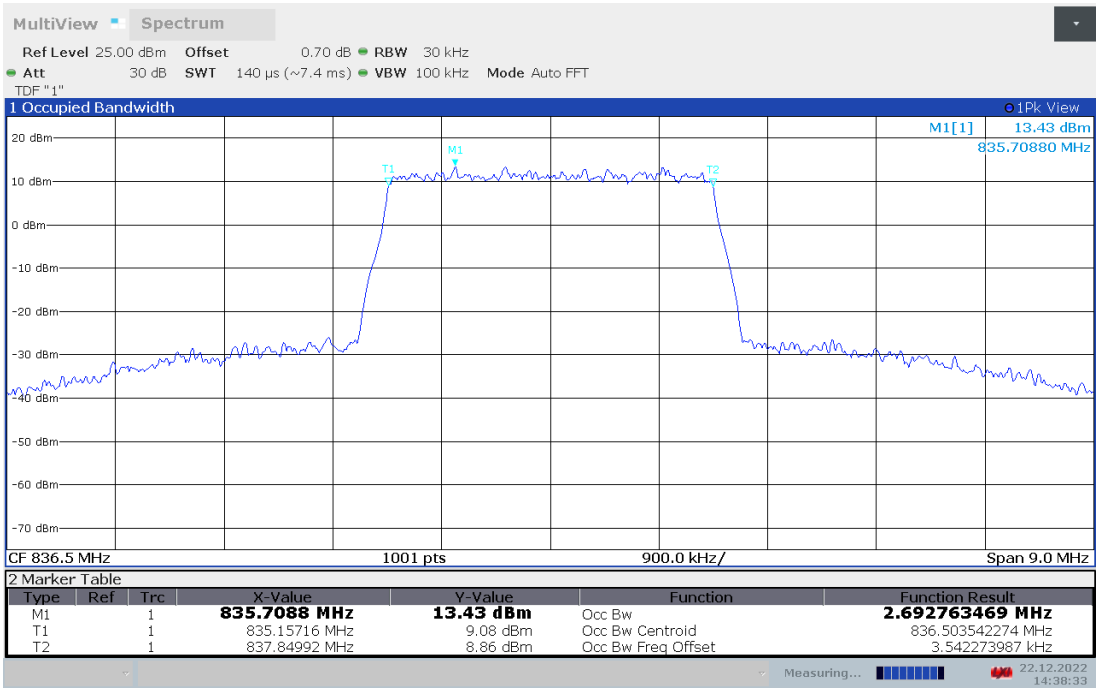
LTE band 5,3MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
836.5	2.698	2.693

LTE band 5 , 3MHz Bandwidth,QPSK (99% BW)



LTE band 5 , 3MHz Bandwidth,16QAM (99% BW)



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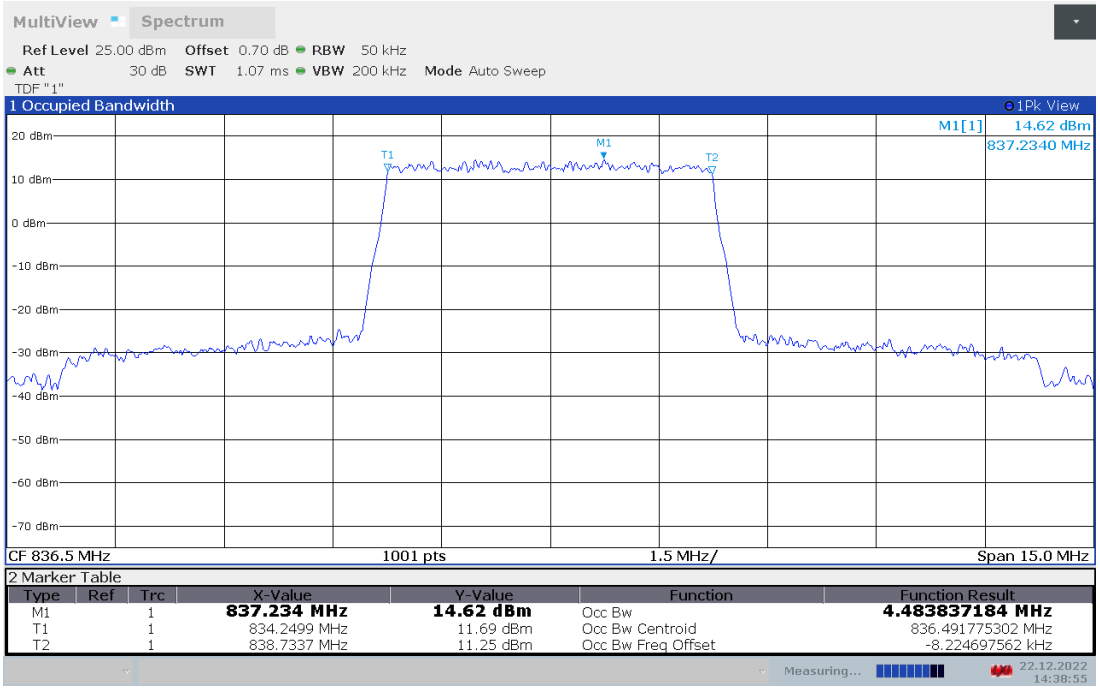
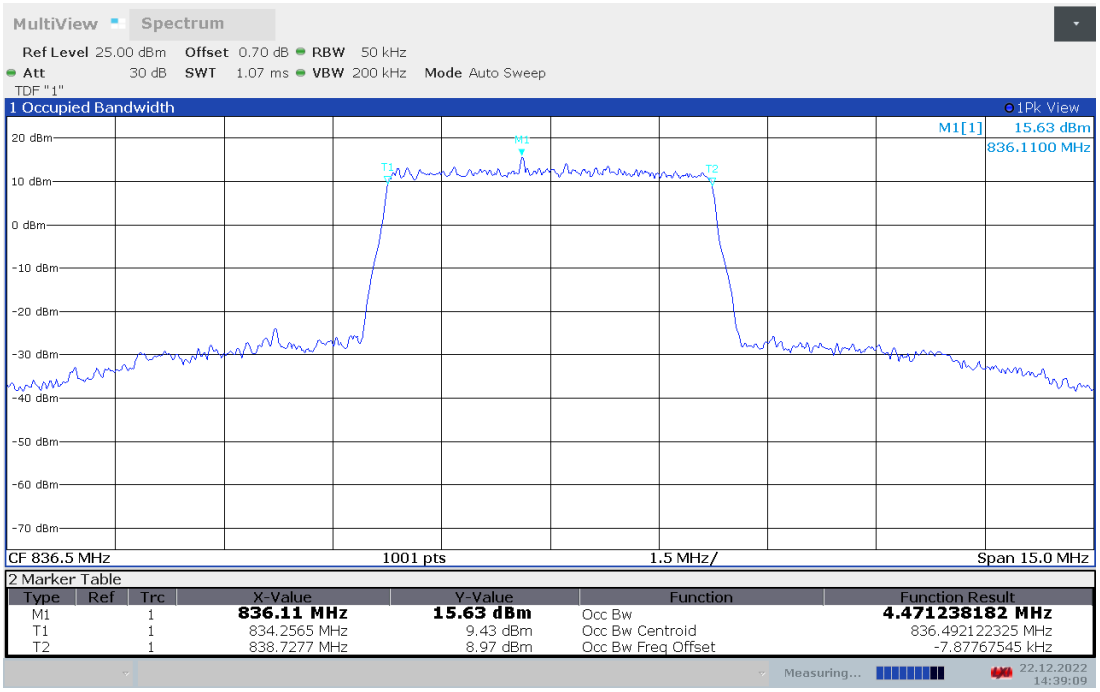
LTE band 5,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
836.5	4.484	4.471

LTE band 5 , 5MHz Bandwidth,QPSK (99% BW)



LTE band 5 , 5MHz Bandwidth,16QAM (99% BW)



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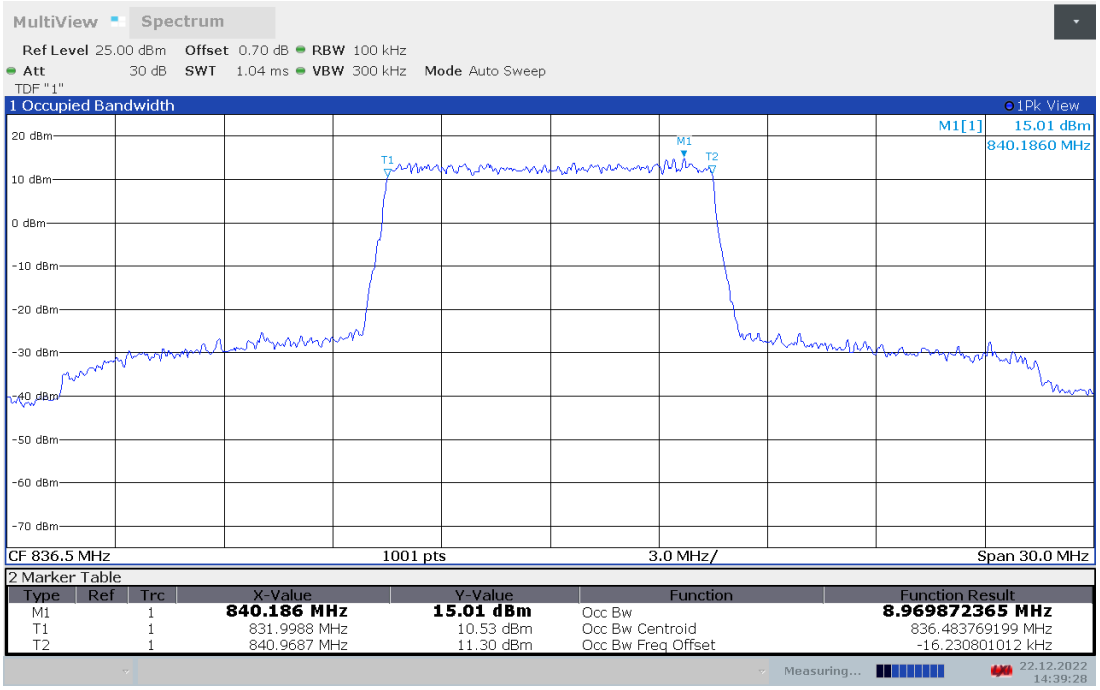
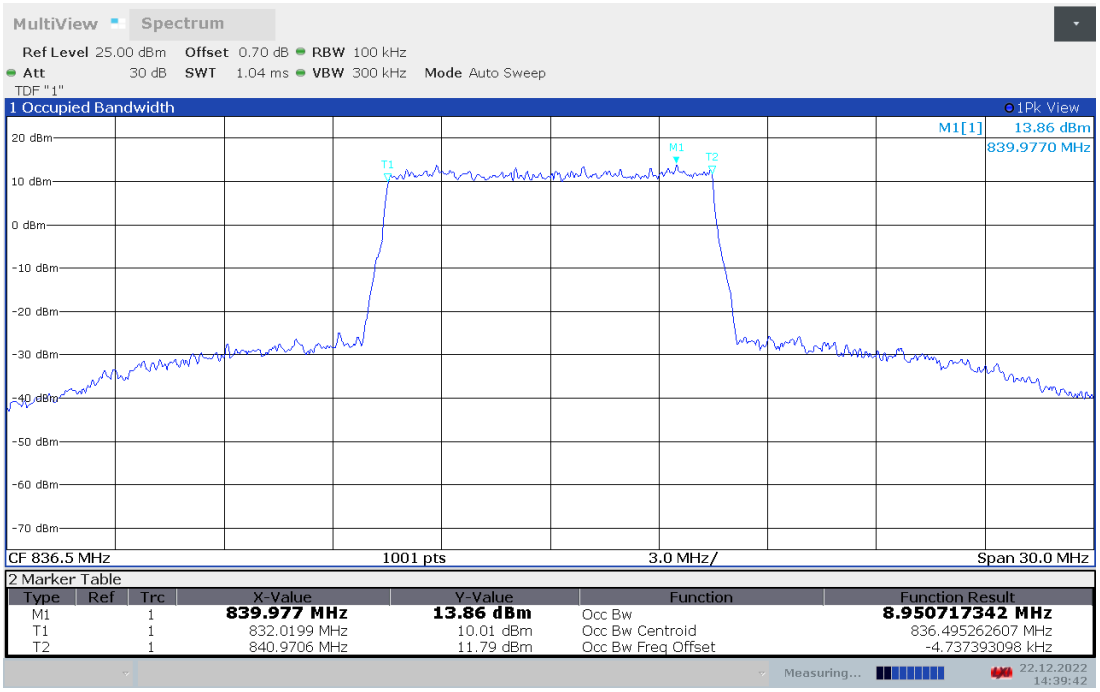
LTE band 5,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
836.5	8.970	8.951

LTE band 5 , 10MHz Bandwidth,QPSK (99% BW)



LTE band 5 , 10MHz Bandwidth,16QAM (99% BW)



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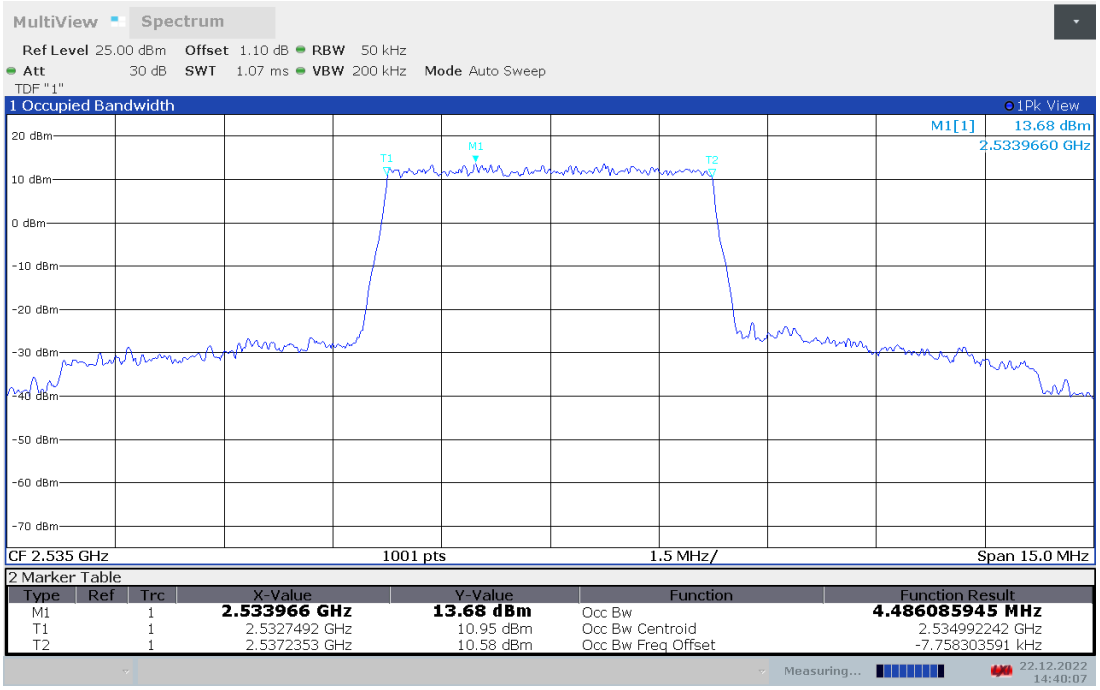
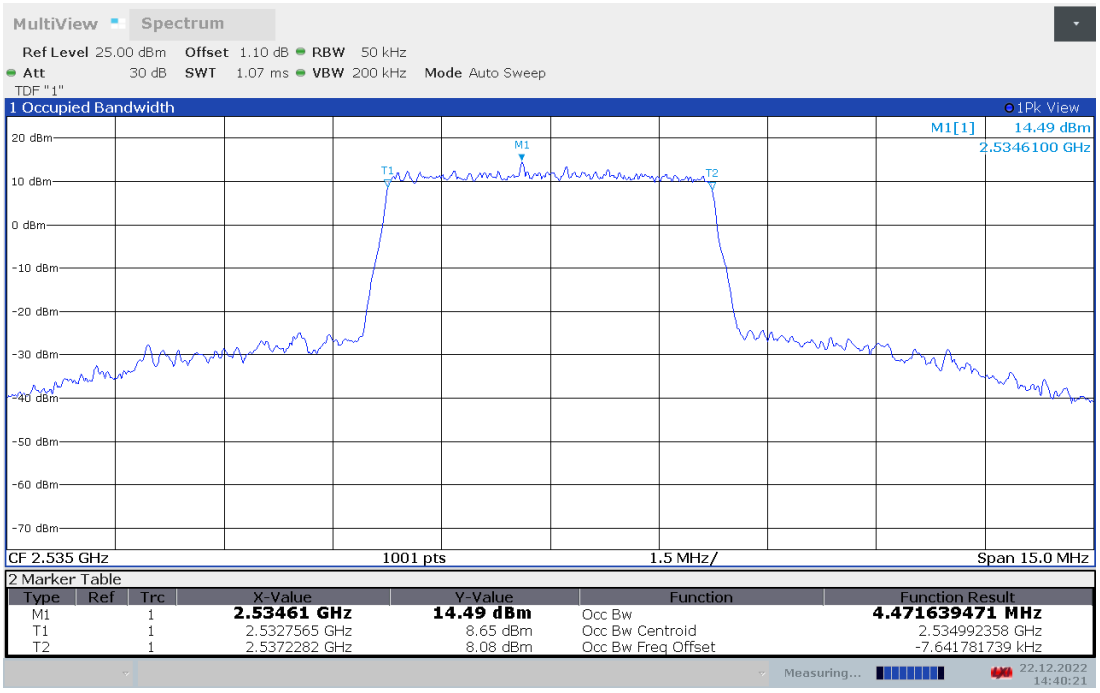
LTE band 7,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
2535	4.486	4.472

LTE band 7 , 5MHz Bandwidth,QPSK (99% BW)



LTE band 7 , 5MHz Bandwidth,16QAM (99% BW)



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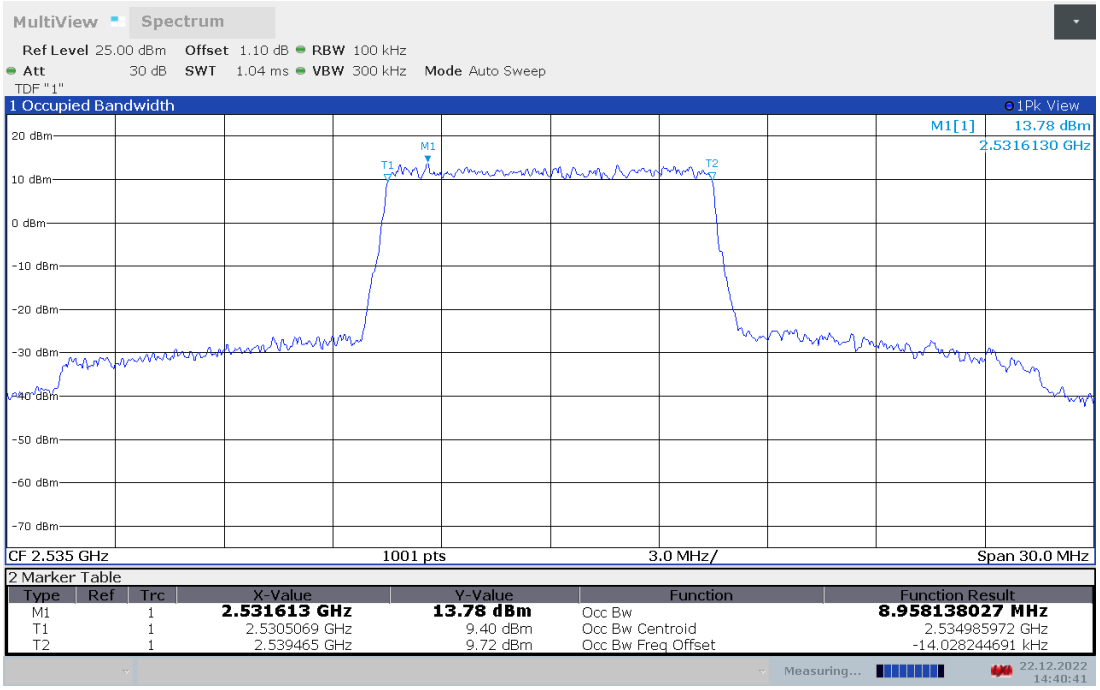
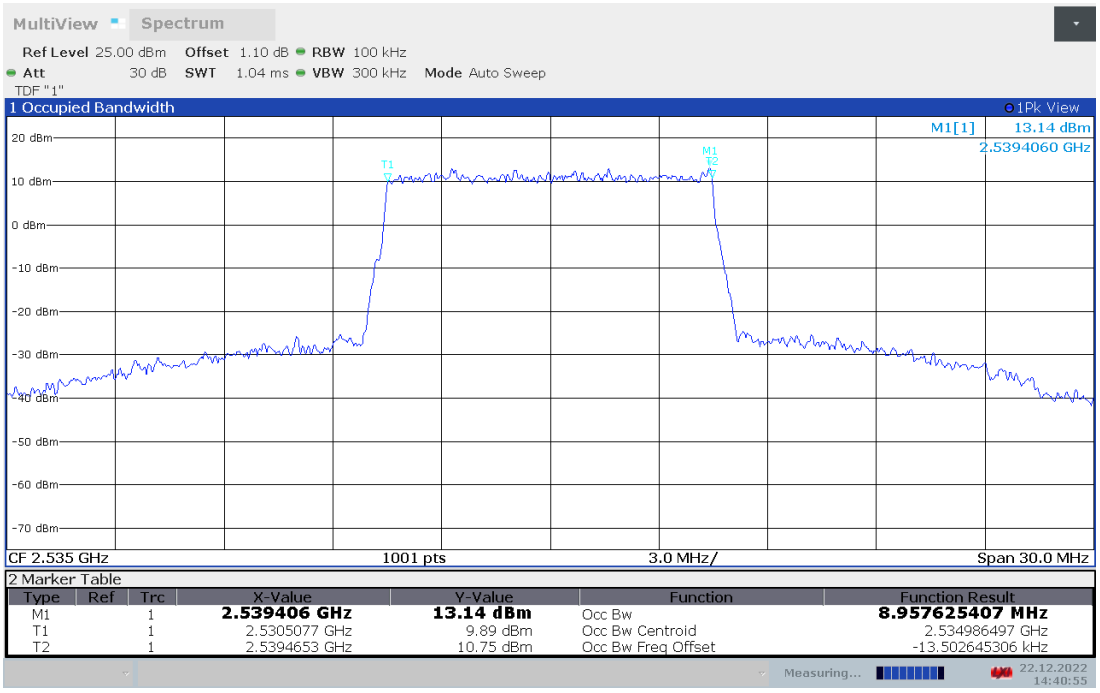
LTE band 7,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
2535	8.958	8.958

LTE band 7 , 10MHz Bandwidth,QPSK (99% BW)



LTE band 7 , 10MHz Bandwidth,16QAM (99% BW)



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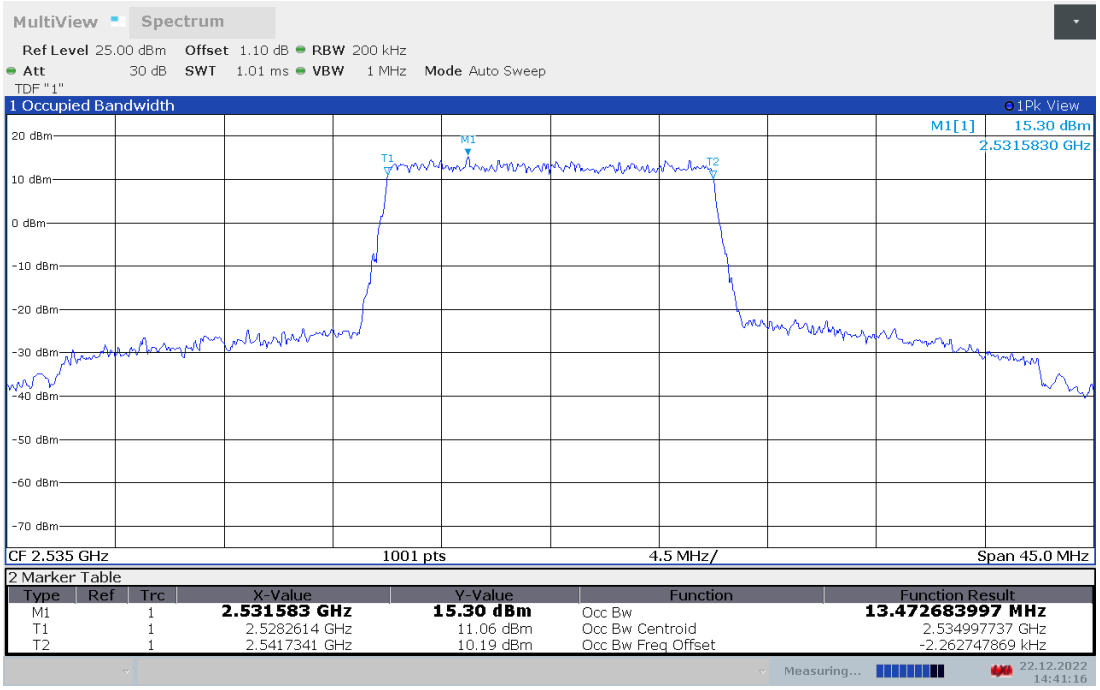
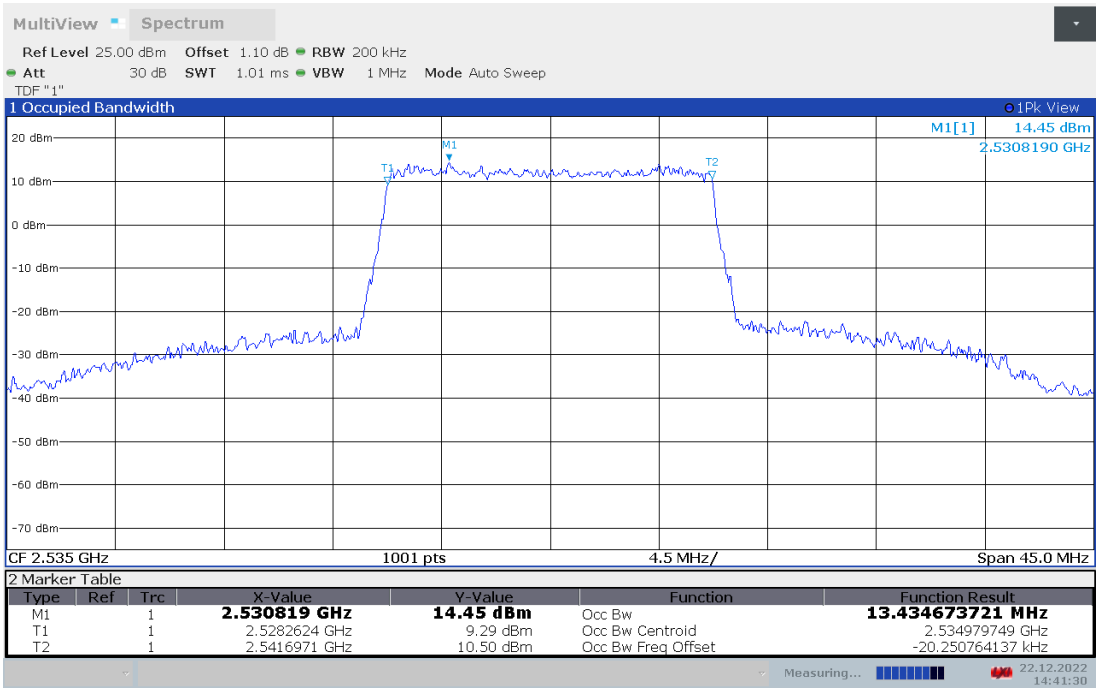
LTE band 7,15MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
2535	13.473	13.435

LTE band 7 , 15MHz Bandwidth,QPSK (99% BW)



LTE band 7 , 15MHz Bandwidth,16QAM (99% BW)



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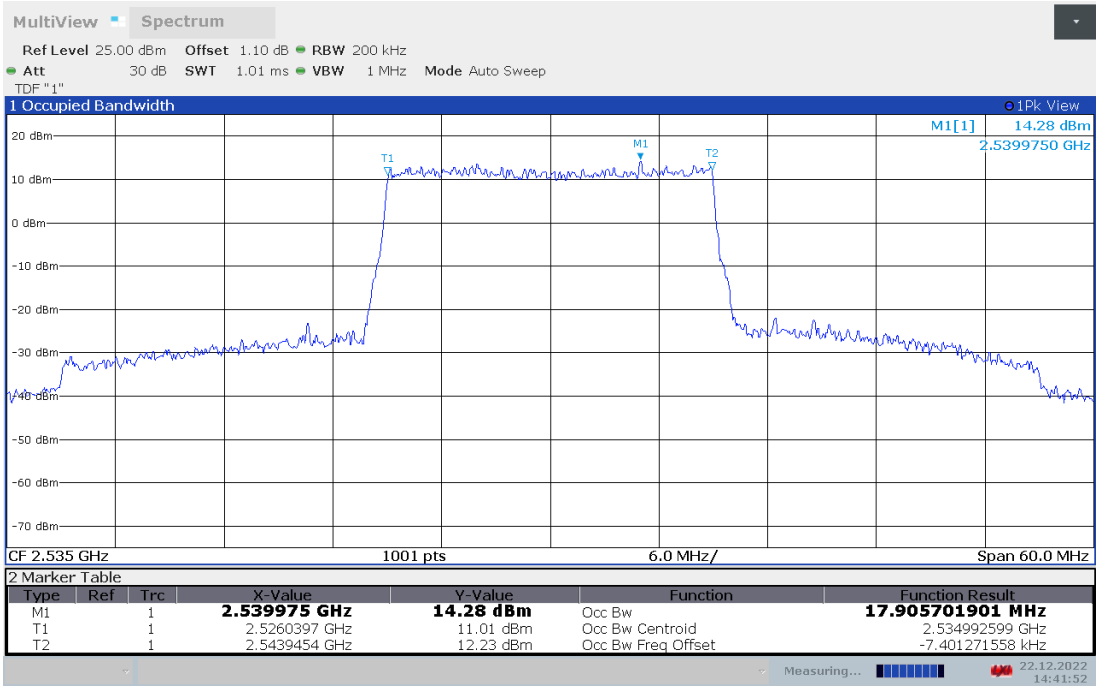
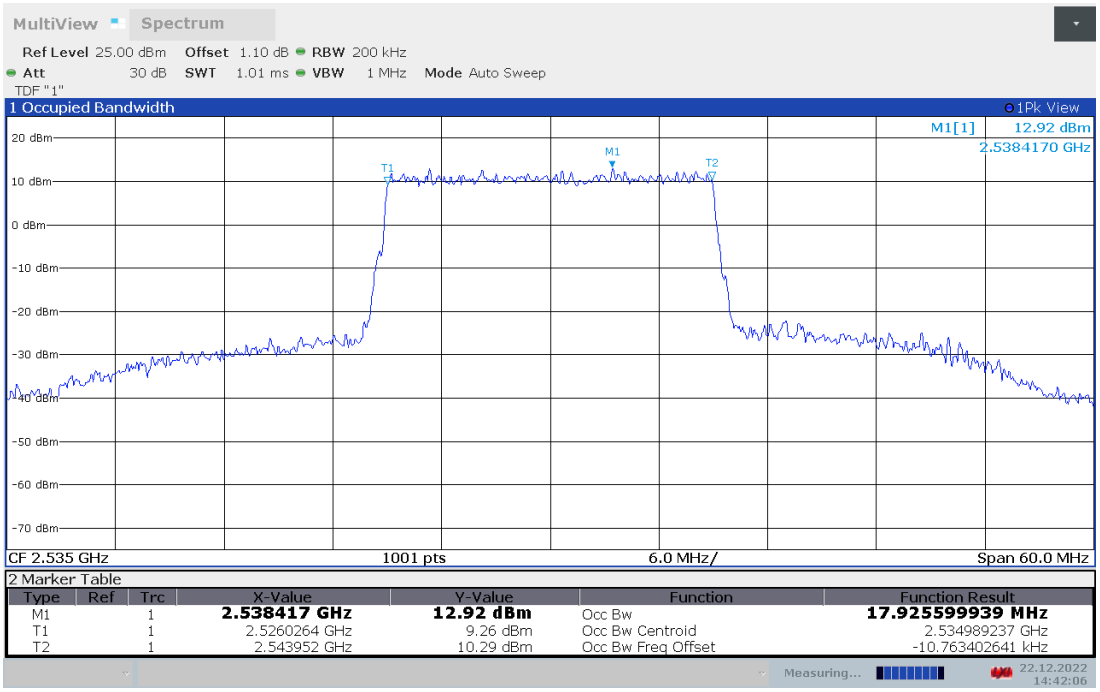
LTE band 7,20MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
2535	17.906	17.926

LTE band 7 , 20MHz Bandwidth,QPSK (99% BW)



LTE band 7 , 20MHz Bandwidth,16QAM (99% BW)



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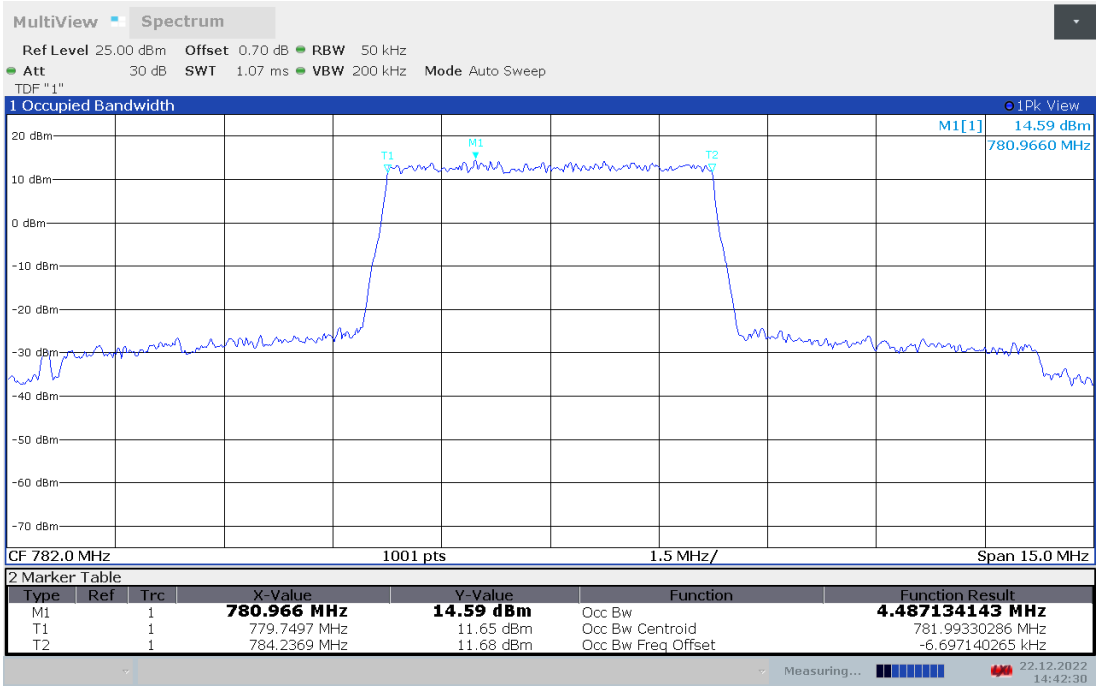
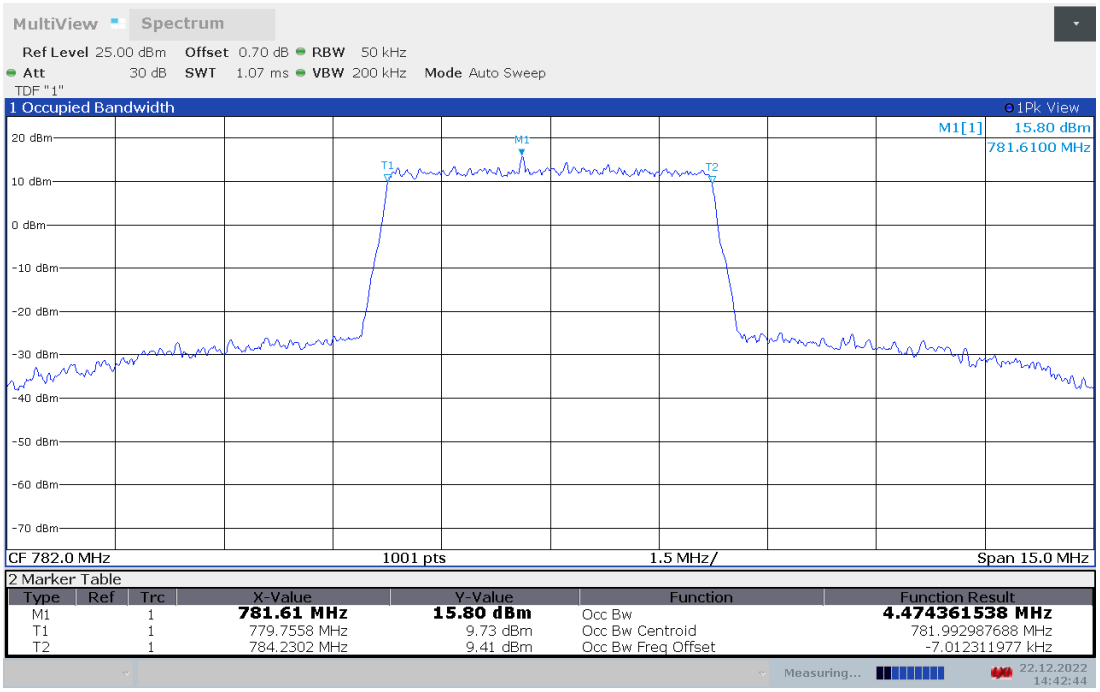
LTE band 13,5MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
782	4.487	4.474

LTE band 13 , 5MHz Bandwidth,QPSK (99% BW)



LTE band 13 , 5MHz Bandwidth,16QAM (99% BW)



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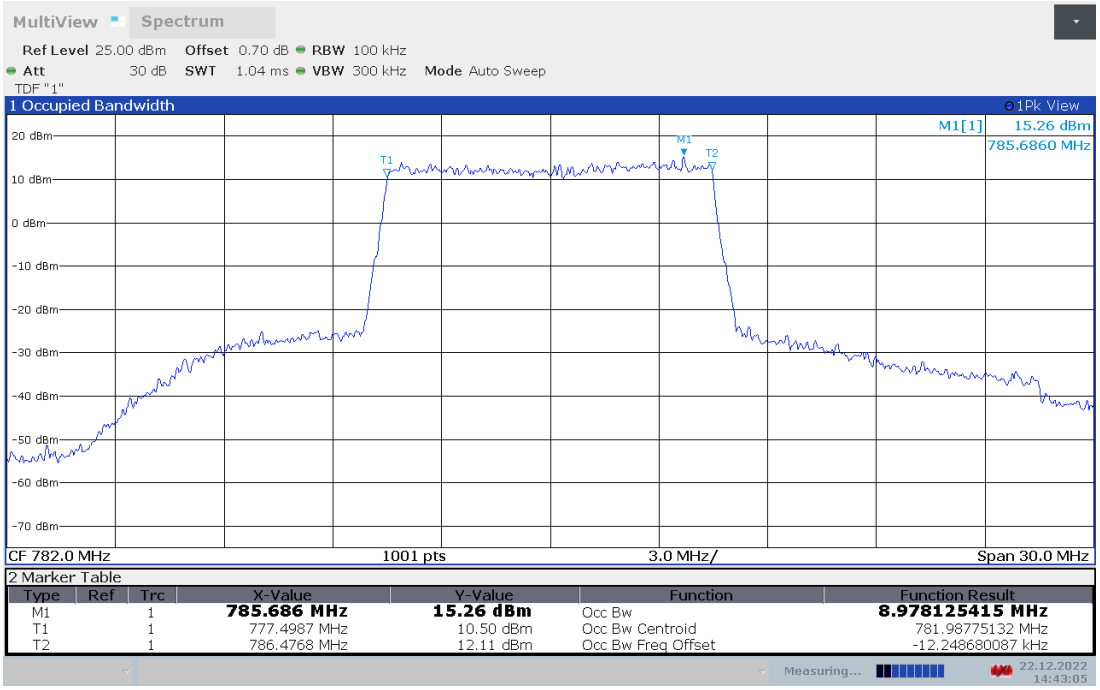
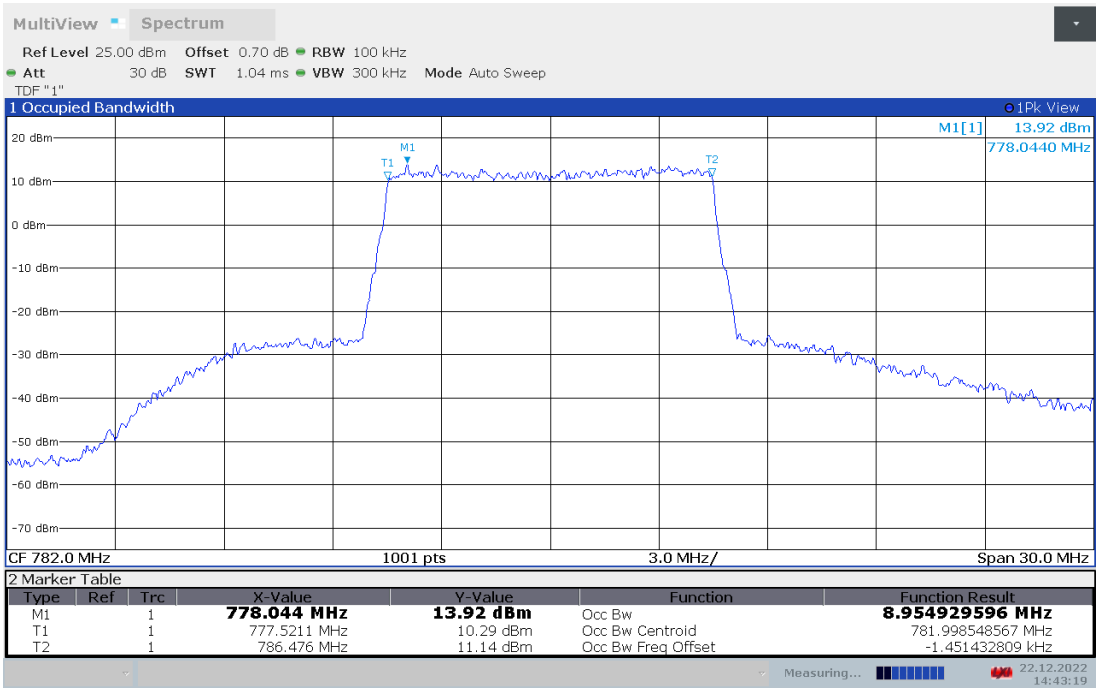
LTE band 13,10MHz(99% BW)

Frequency (MHz)	Occupied Bandwidth (99% BW)(MHz)	
	QPSK	16QAM
782	8.978	8.955

LTE band 13 , 10MHz Bandwidth,QPSK (99% BW)



LTE band 13 , 10MHz Bandwidth,16QAM (99% BW)



Note: Expanded measurement uncertainty is U = 3428 Hz, k = 2

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A.5 EMISSION BANDWIDTH

Reference

FCC: CFR Part 2.1049, 22.917, 24.238, 27.53.

A.5.1 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 10log (OBW / 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.5.2Emission 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. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.

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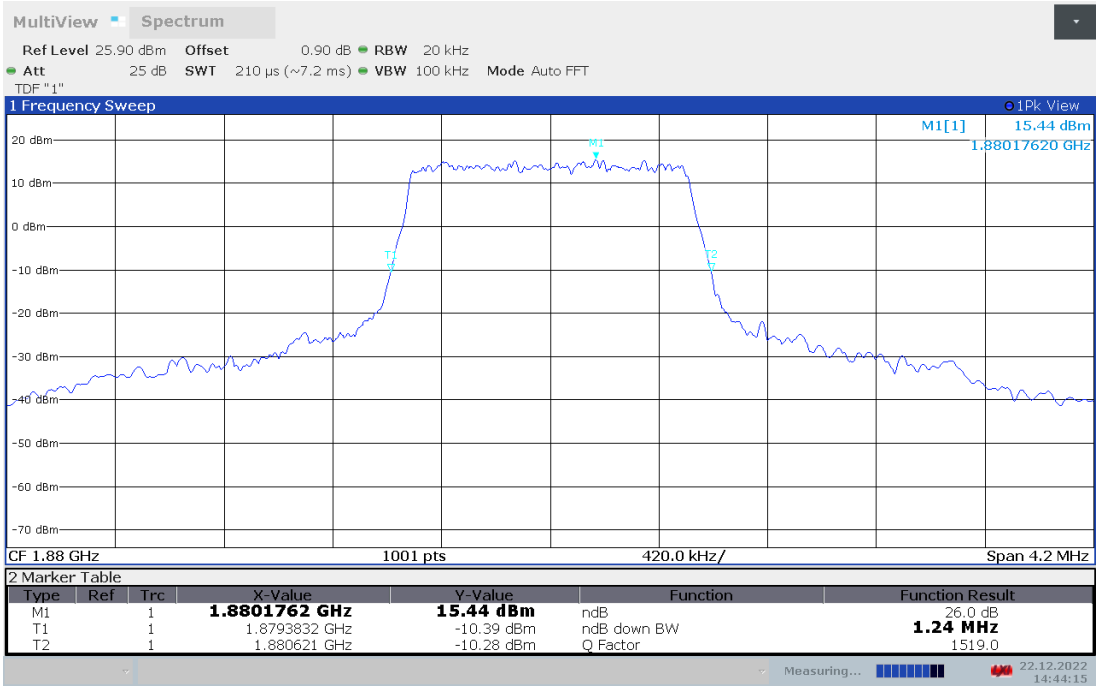
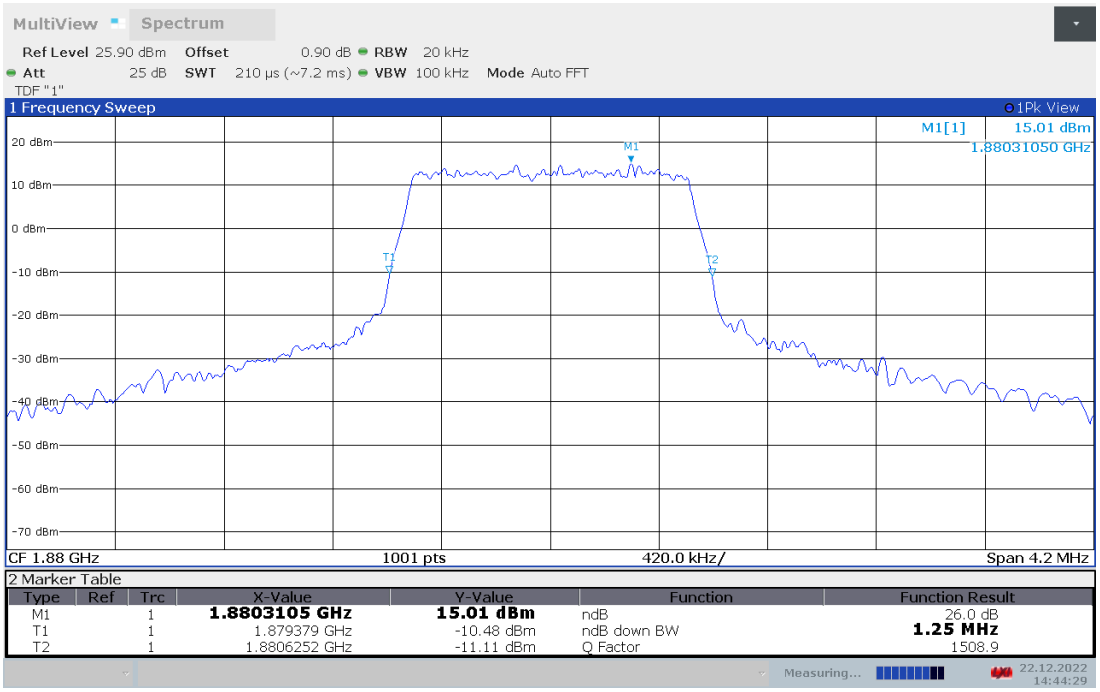
LTE band 2,1.4MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	1.238	1.246

LTE band 2 , 1.4MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 1.4MHz Bandwidth,16QAM (-26dBc BW)



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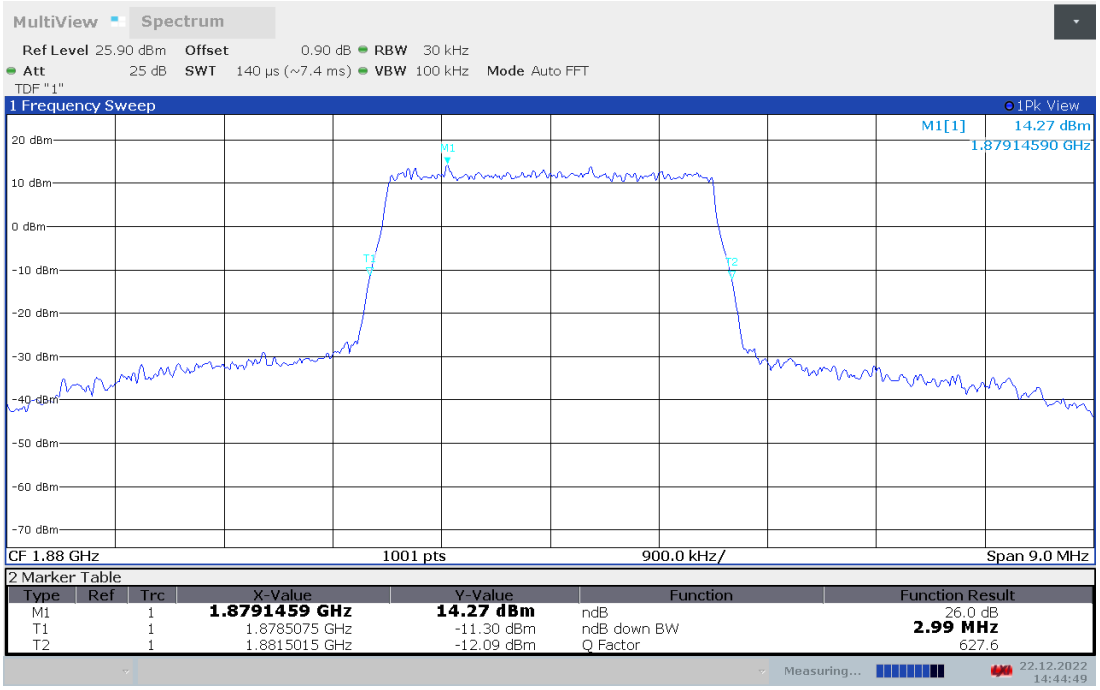
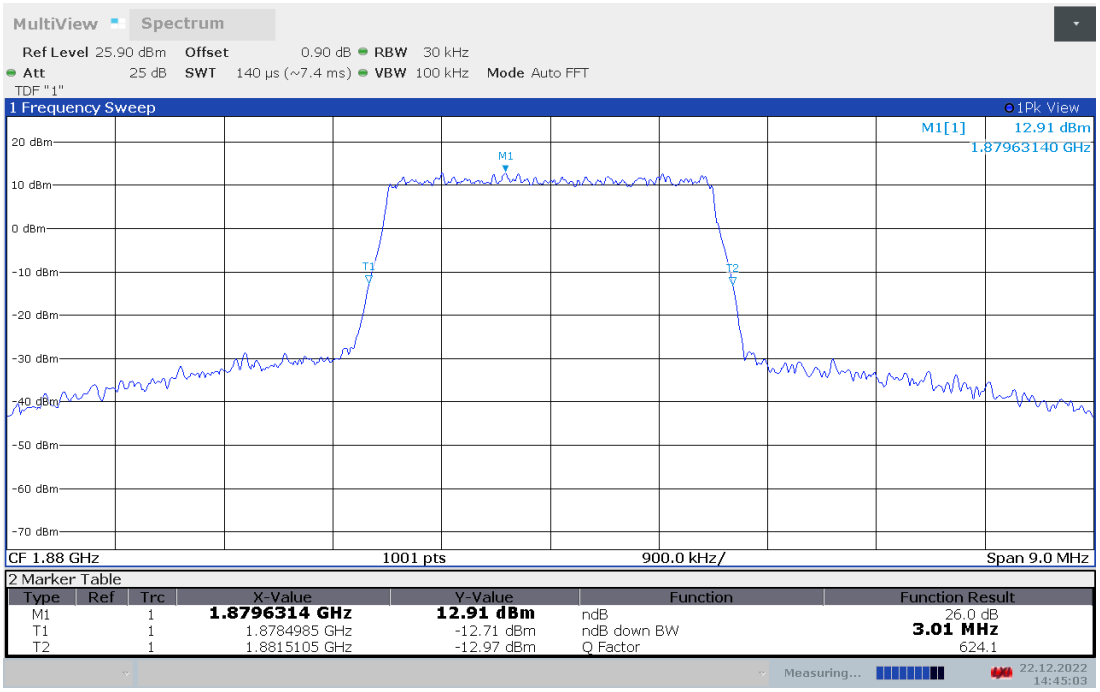
LTE band 2,3MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	2.994	3.012

LTE band 2 , 3MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 3MHz Bandwidth,16QAM (-26dBc BW)



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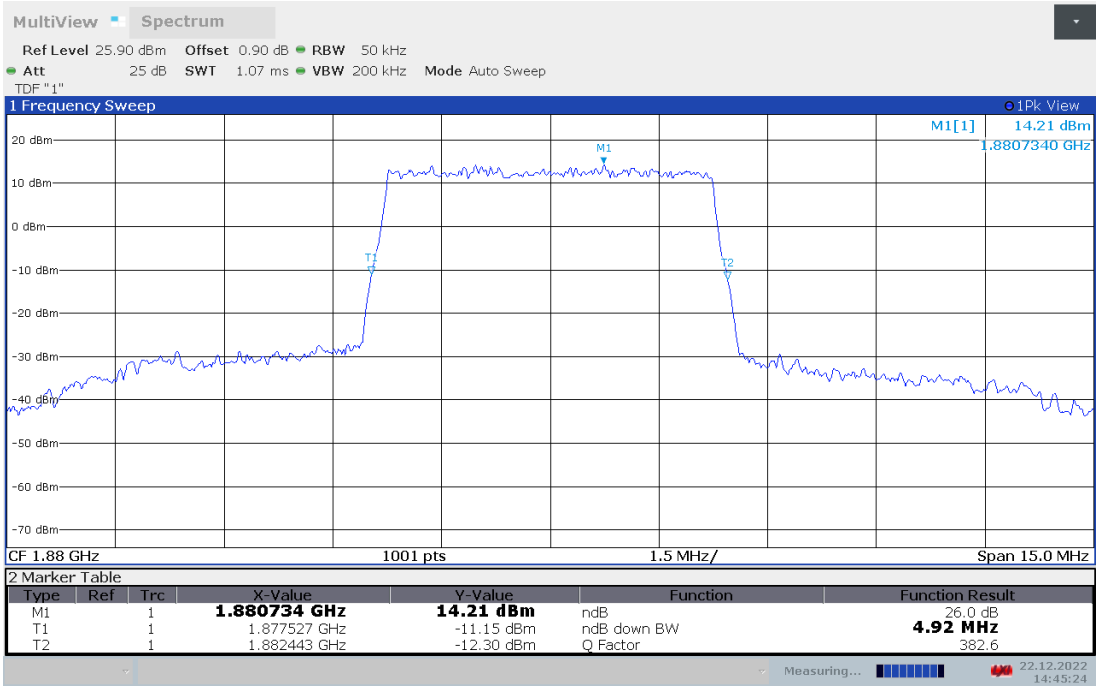
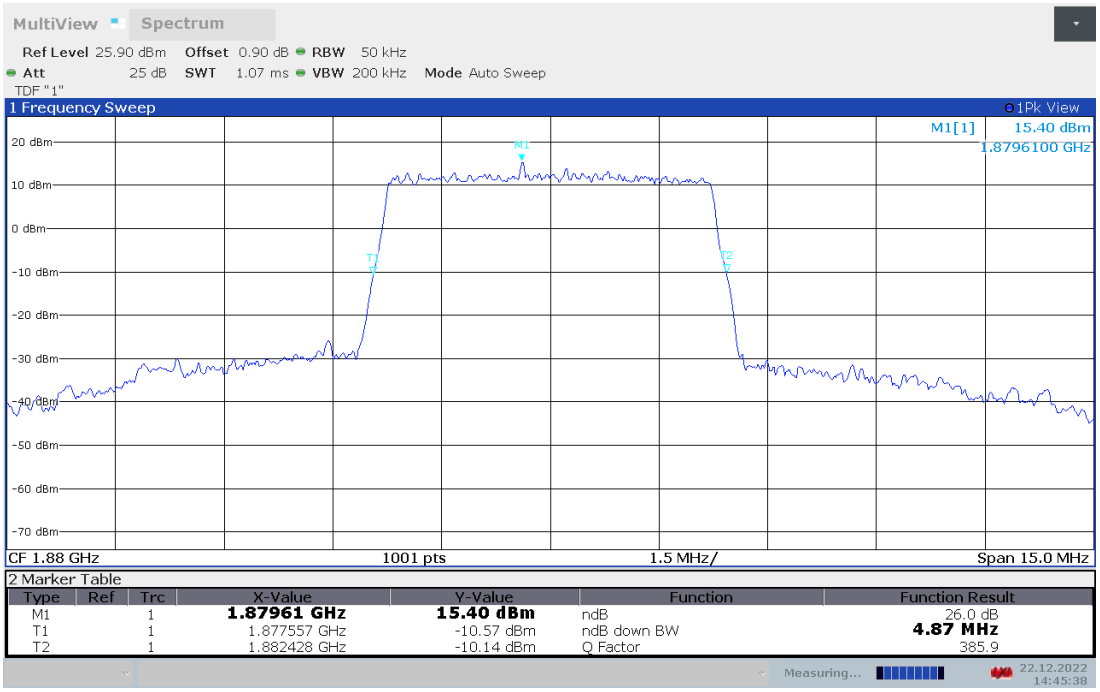
LTE band 2,5MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	4.915	4.870

LTE band 2 , 5MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 5MHz Bandwidth,16QAM (-26dBc BW)



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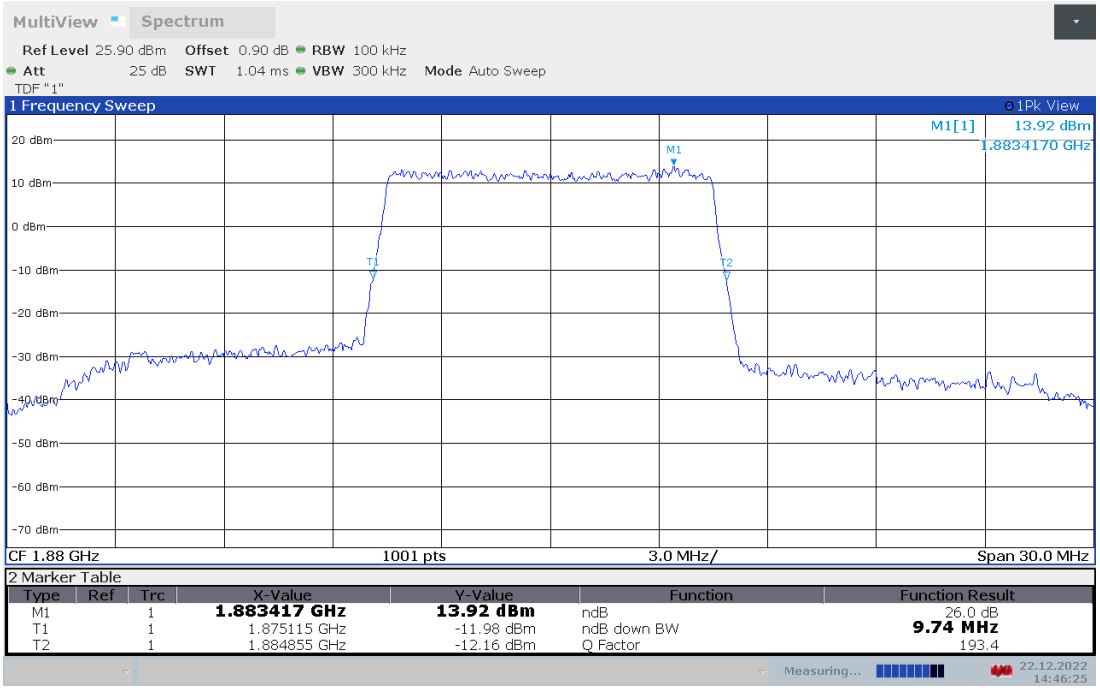
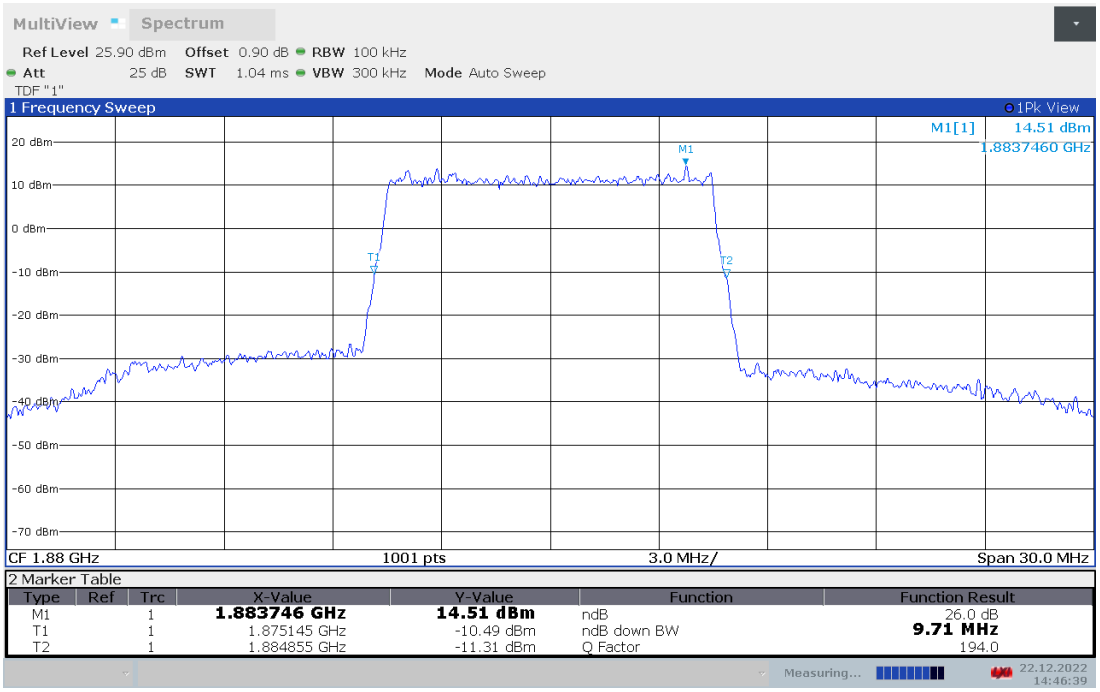
LTE band 2,10MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	9.740	9.710

LTE band 2 , 10MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 10MHz Bandwidth,16QAM (-26dBc BW)



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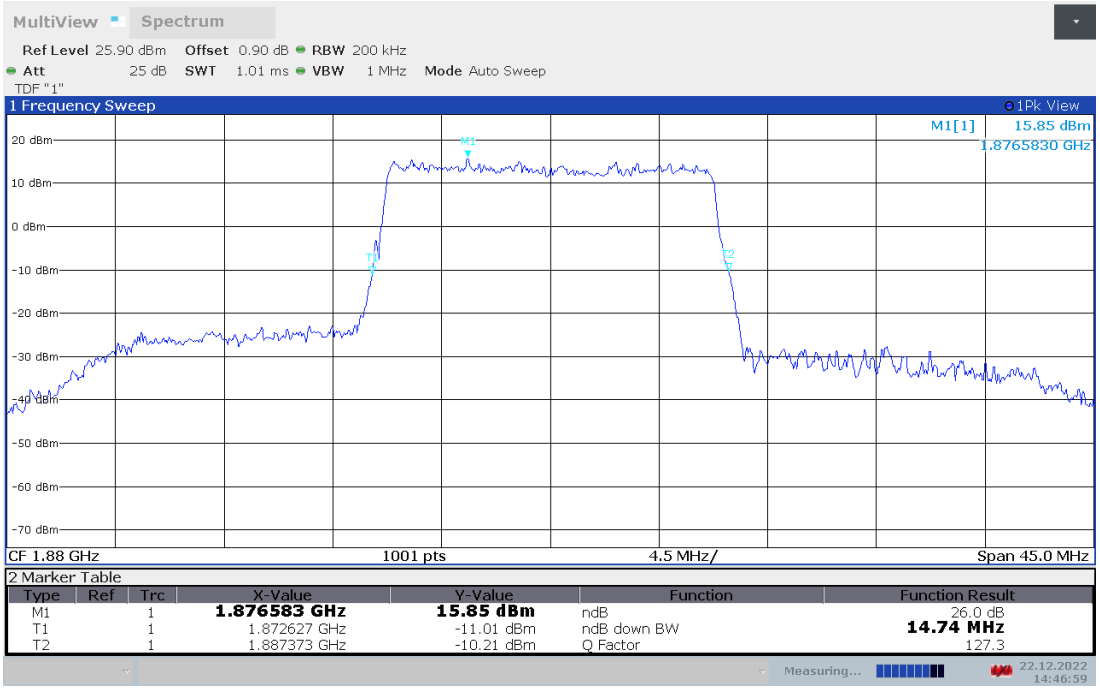
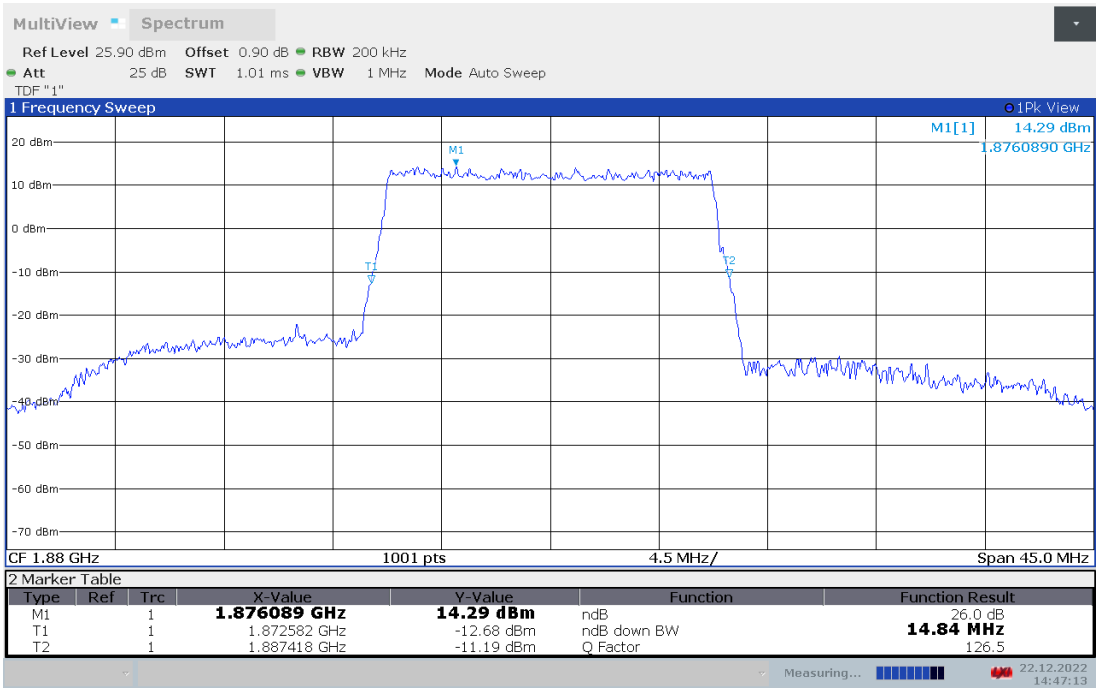
LTE band 2,15MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	14.745	14.835

LTE band 2 , 15MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 15MHz Bandwidth,16QAM (-26dBc BW)



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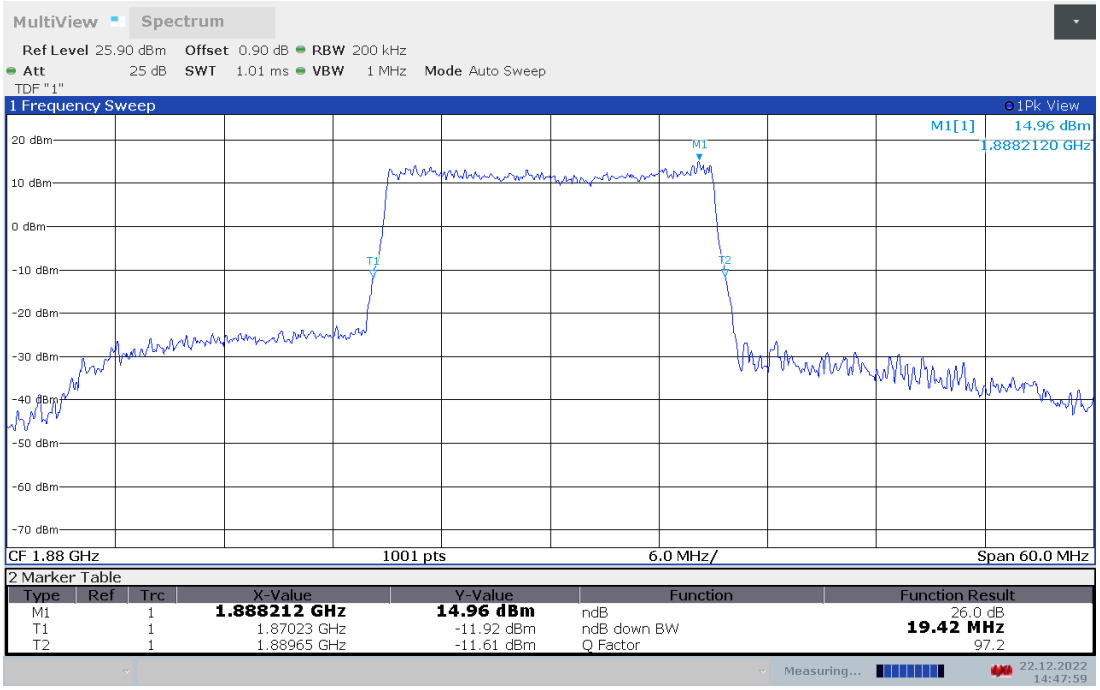
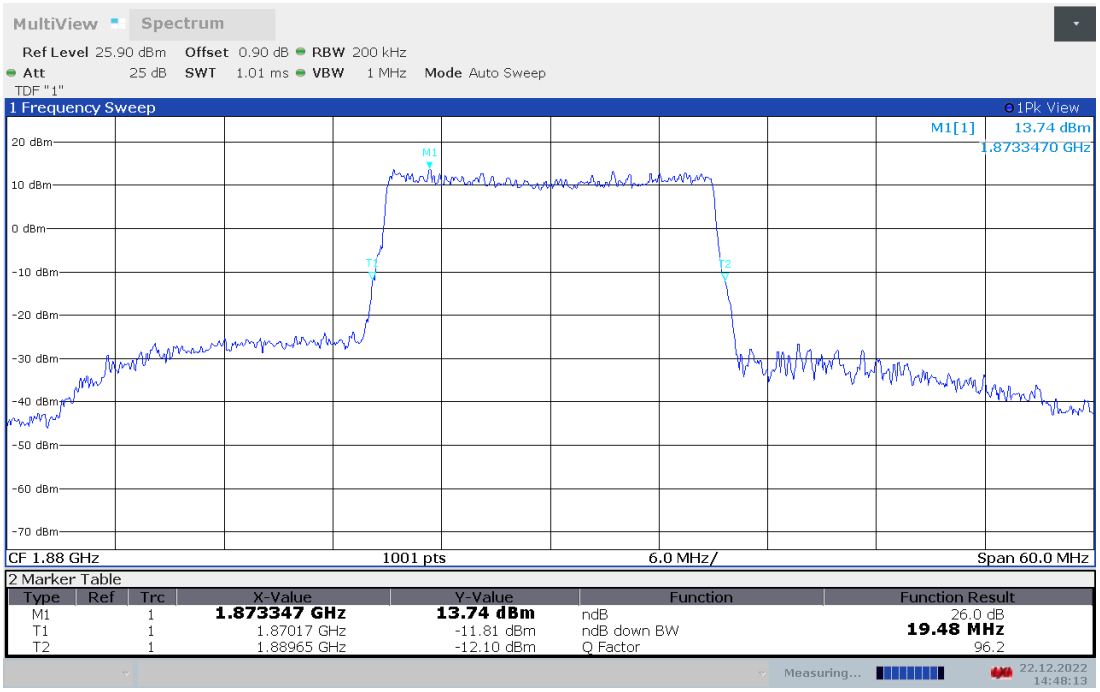
LTE band 2,20MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1880	19.421	19.481

LTE band 2 , 20MHz Bandwidth,QPSK (-26dBc BW)



LTE band 2 , 20MHz Bandwidth,16QAM (-26dBc BW)



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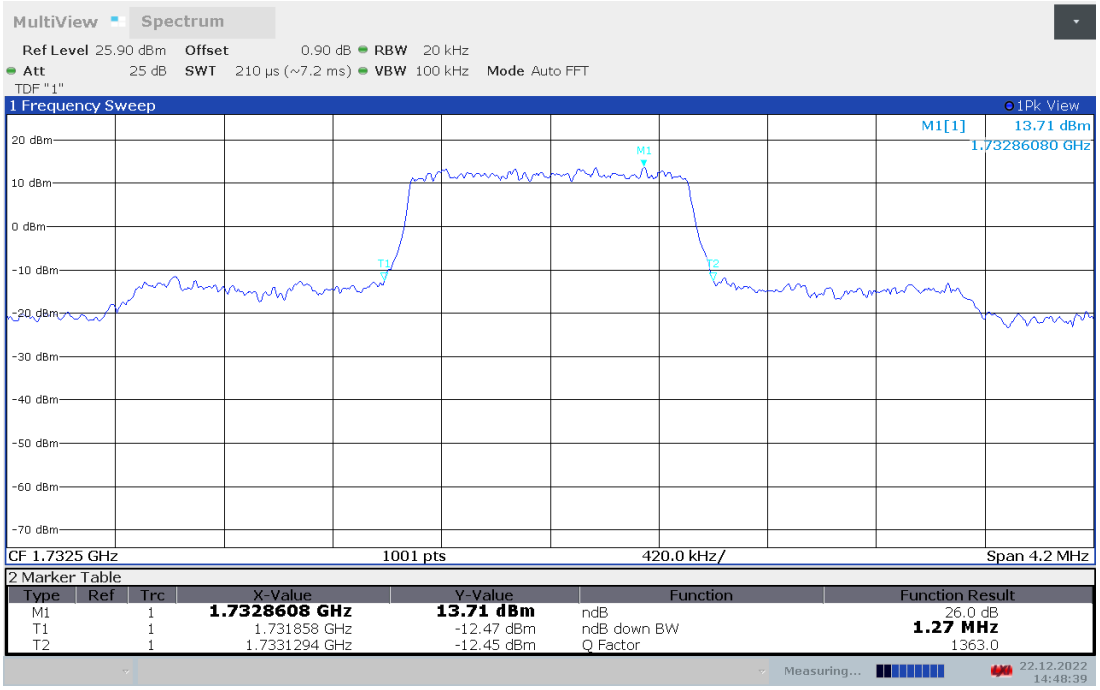
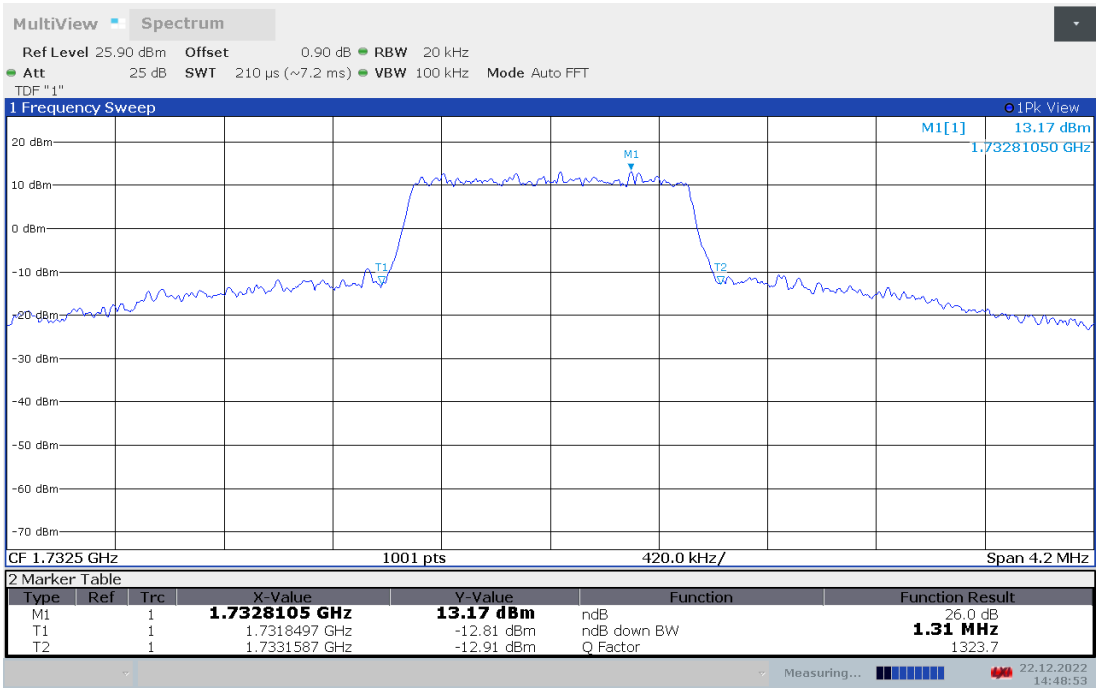
LTE band 4,1.4MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	1.271	1.309

LTE band 4 , 1.4MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 1.4MHz Bandwidth,16QAM (-26dBc BW)



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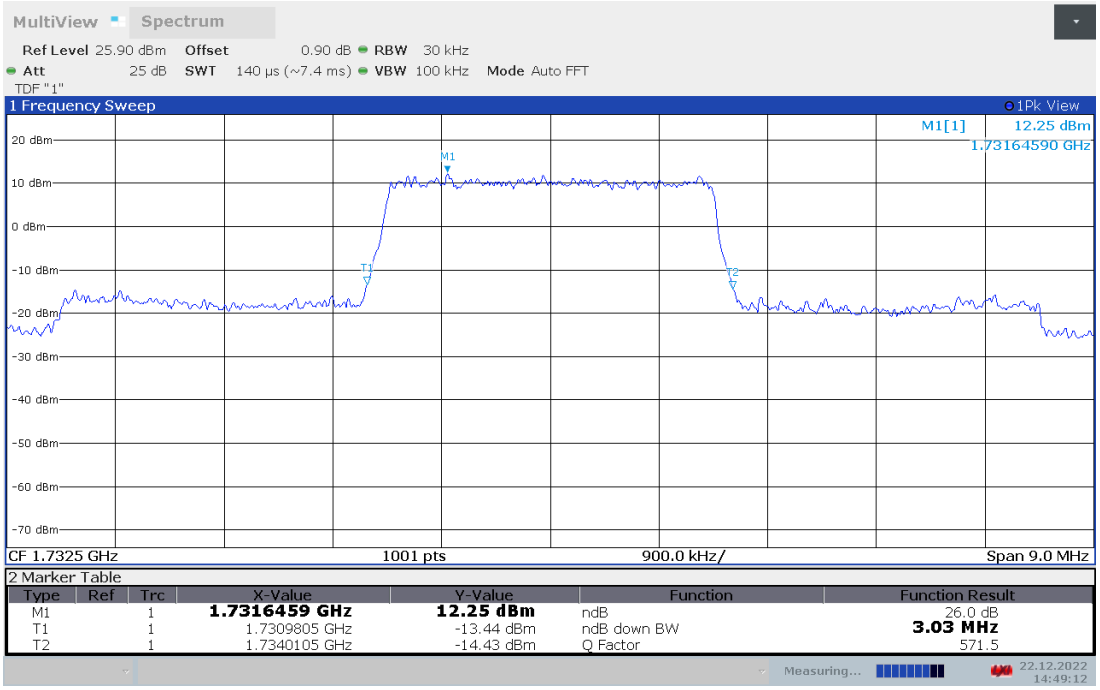
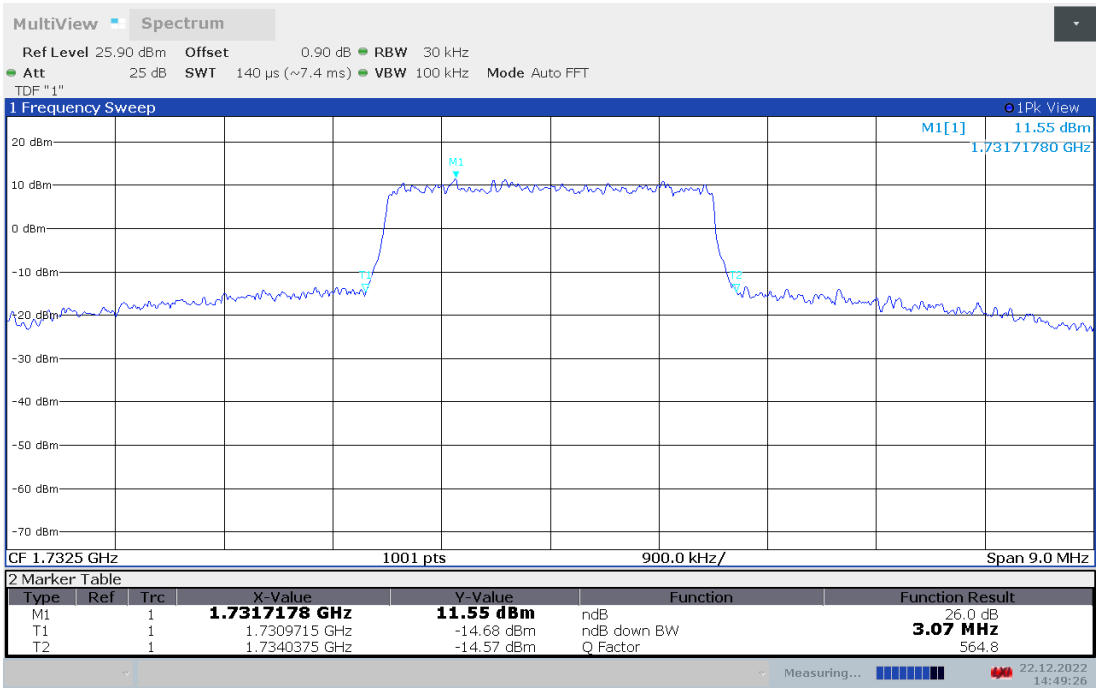
LTE band 4,3MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	3.030	3.066

LTE band 4 , 3MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 3MHz Bandwidth,16QAM (-26dBc BW)



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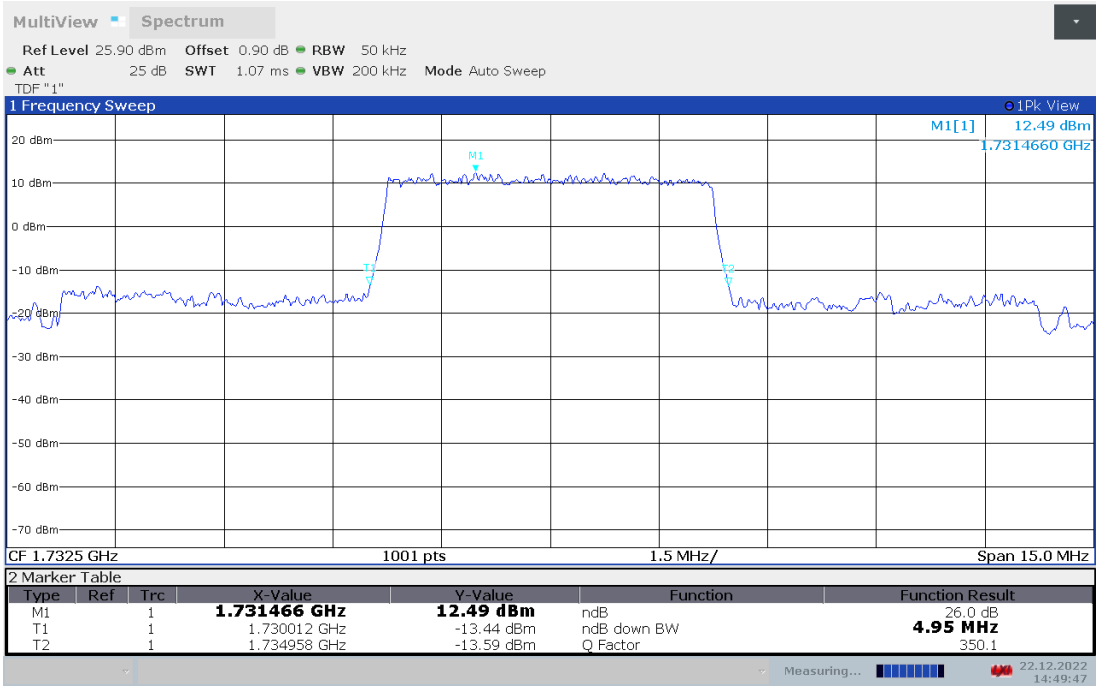
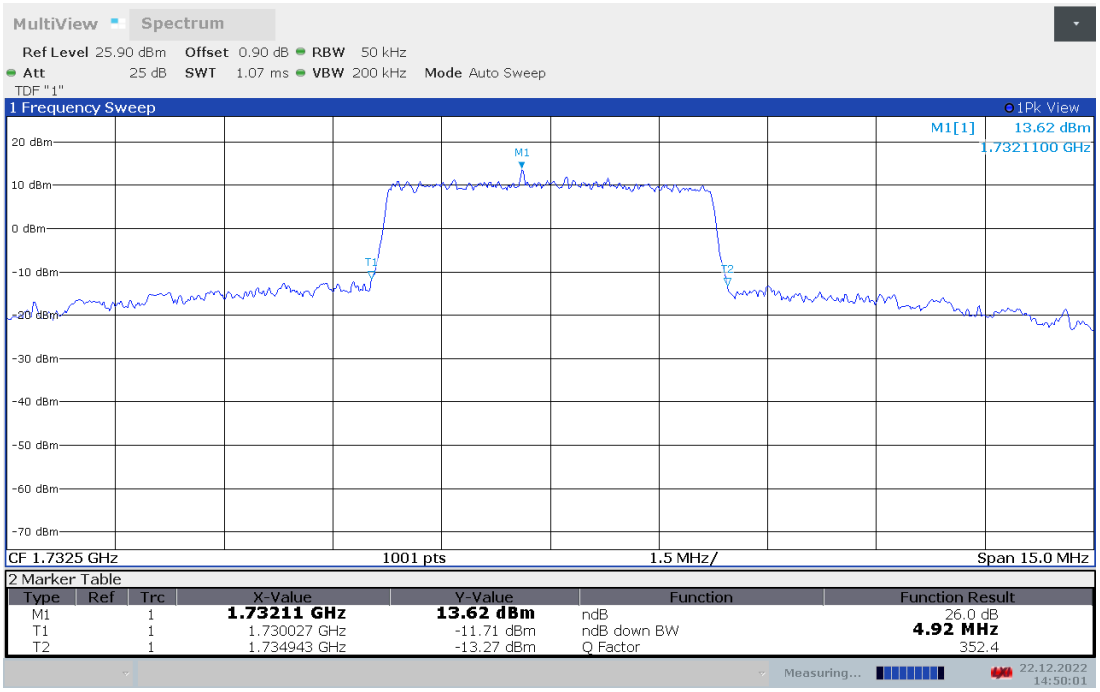
LTE band 4,5MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	4.945	4.915

LTE band 4 , 5MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 5MHz Bandwidth,16QAM (-26dBc BW)



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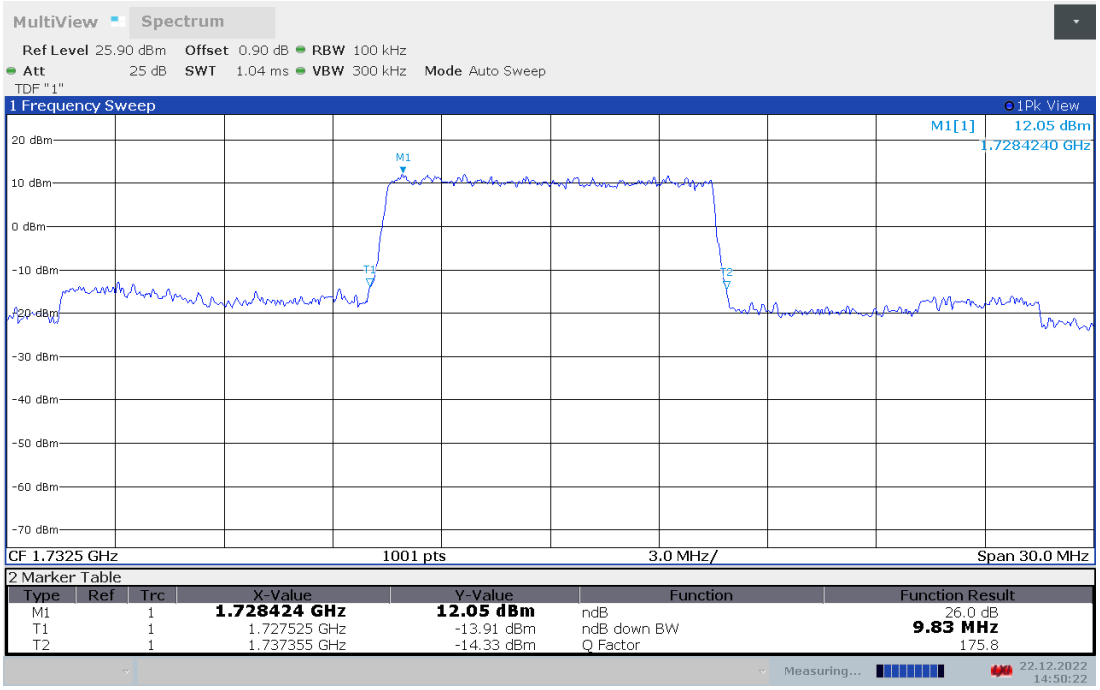
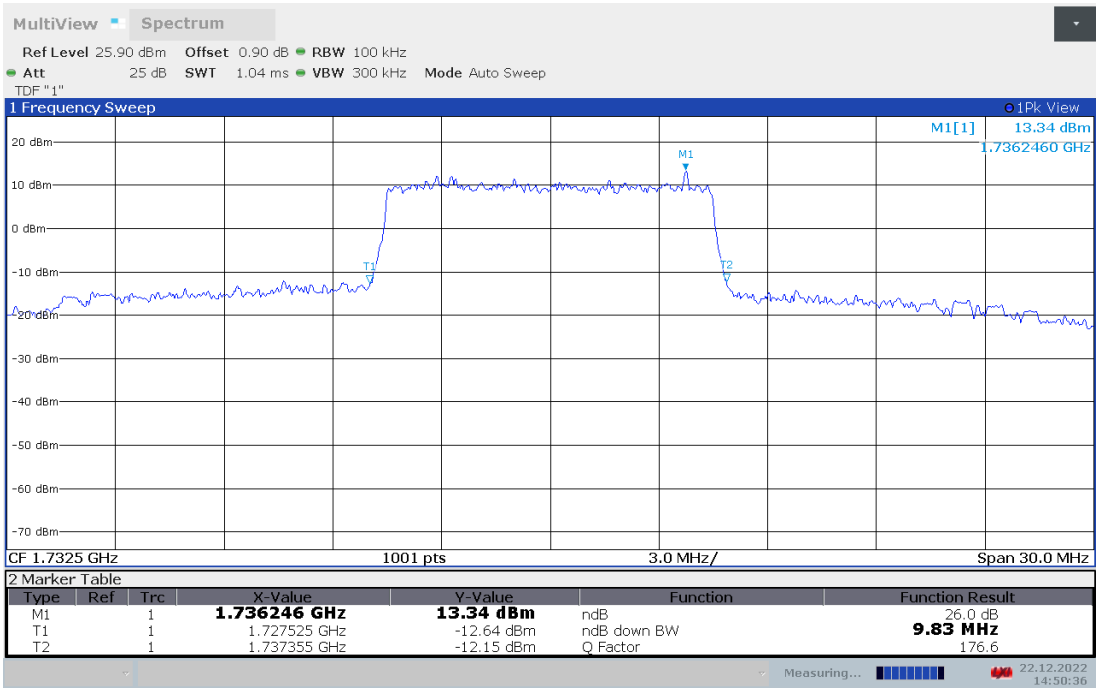
LTE band 4,10MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	9.830	9.830

LTE band 4 , 10MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 10MHz Bandwidth,16QAM (-26dBc BW)



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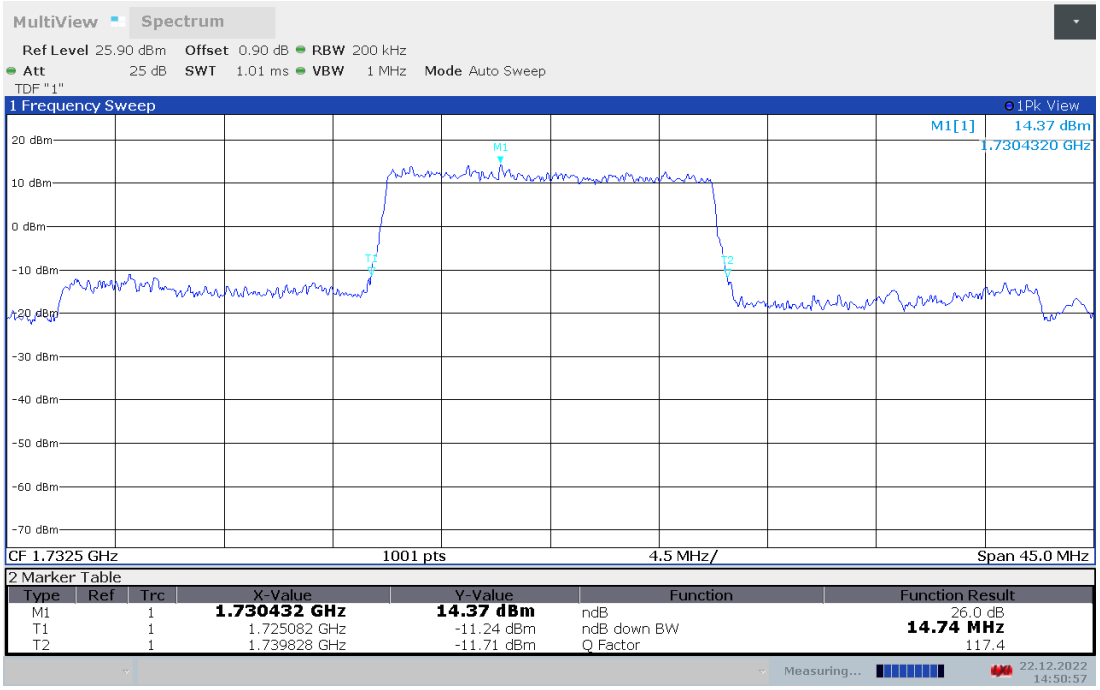
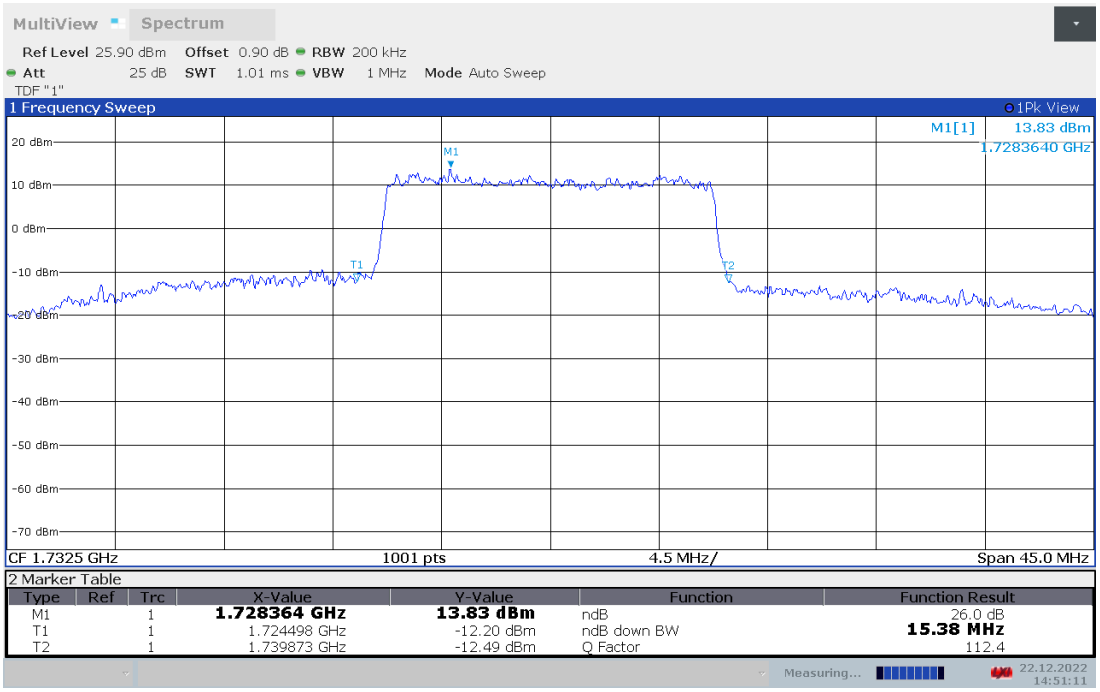
LTE band 4,15MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	14.745	15.375

LTE band 4 , 15MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 15MHz Bandwidth,16QAM (-26dBc BW)



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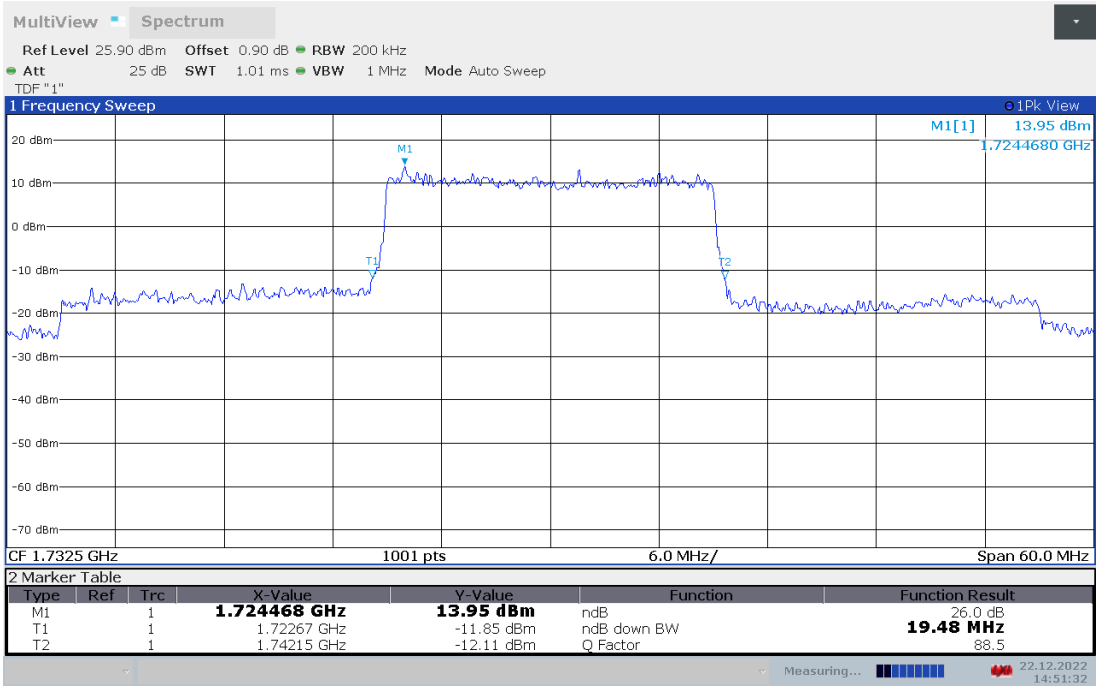
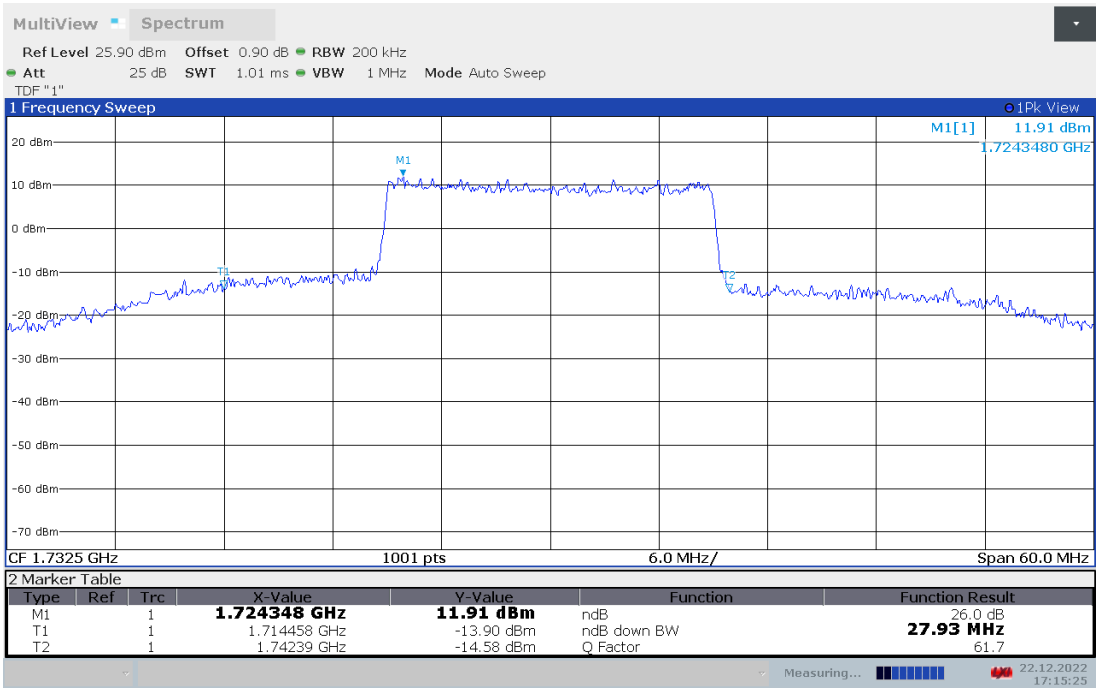
LTE band 4,20MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
1732.5	19.481	27.932

LTE band 4 , 20MHz Bandwidth,QPSK (-26dBc BW)



LTE band 4 , 20MHz Bandwidth,16QAM (-26dBc BW)



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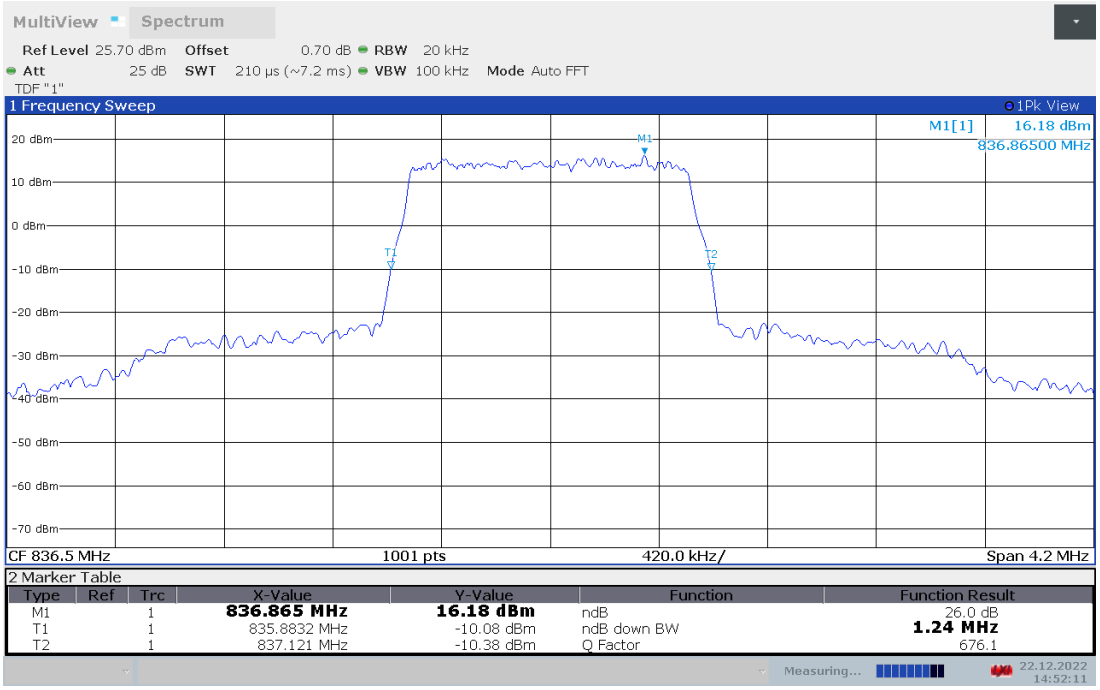
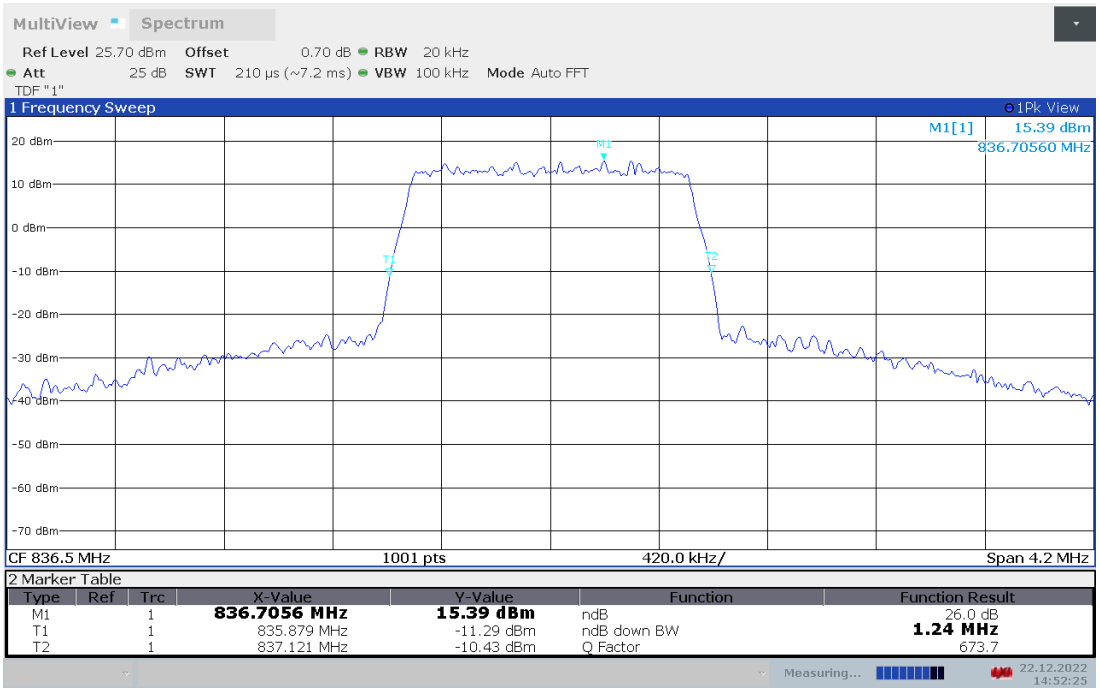
LTE band 5,1.4MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
836.5	1.238	1.242

LTE band 5 , 1.4MHz Bandwidth,QPSK (-26dBc BW)



LTE band 5 , 1.4MHz Bandwidth,16QAM (-26dBc BW)



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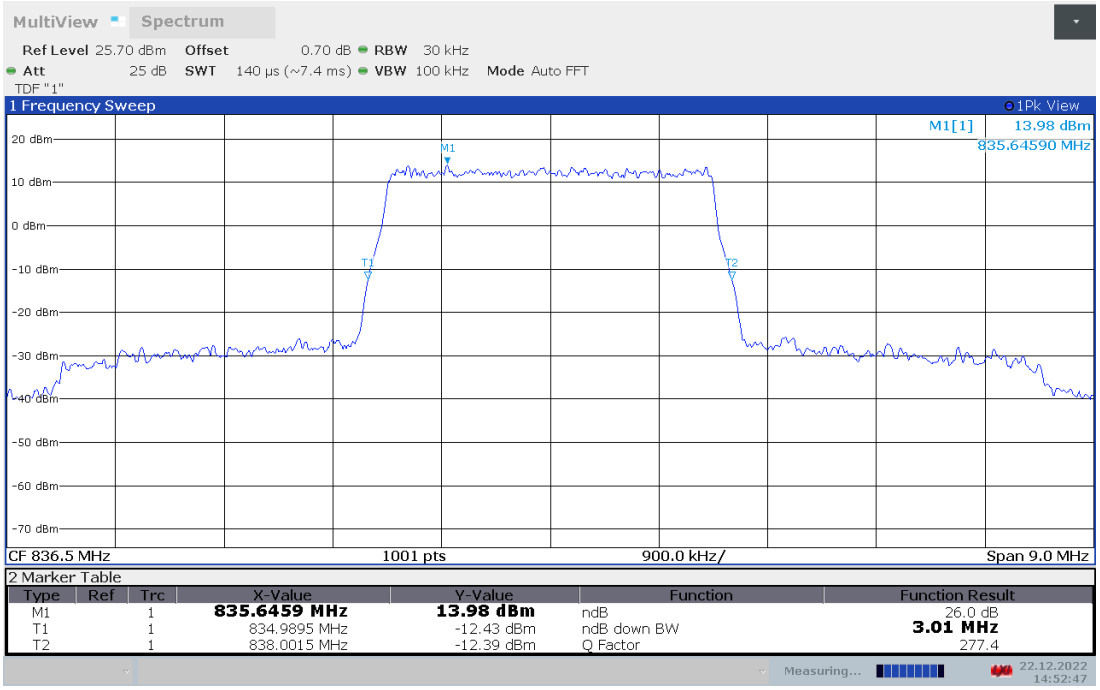
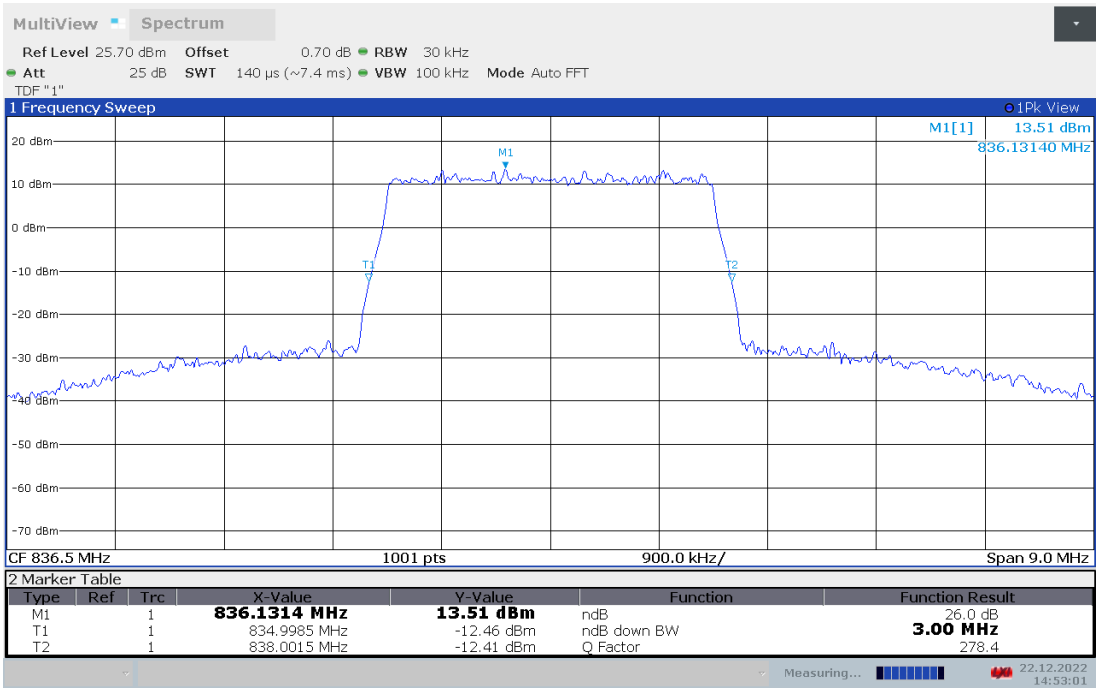
LTE band 5,3MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
836.5	3.012	3.003

LTE band 5 , 3MHz Bandwidth,QPSK (-26dBc BW)



LTE band 5 , 3MHz Bandwidth,16QAM (-26dBc BW)



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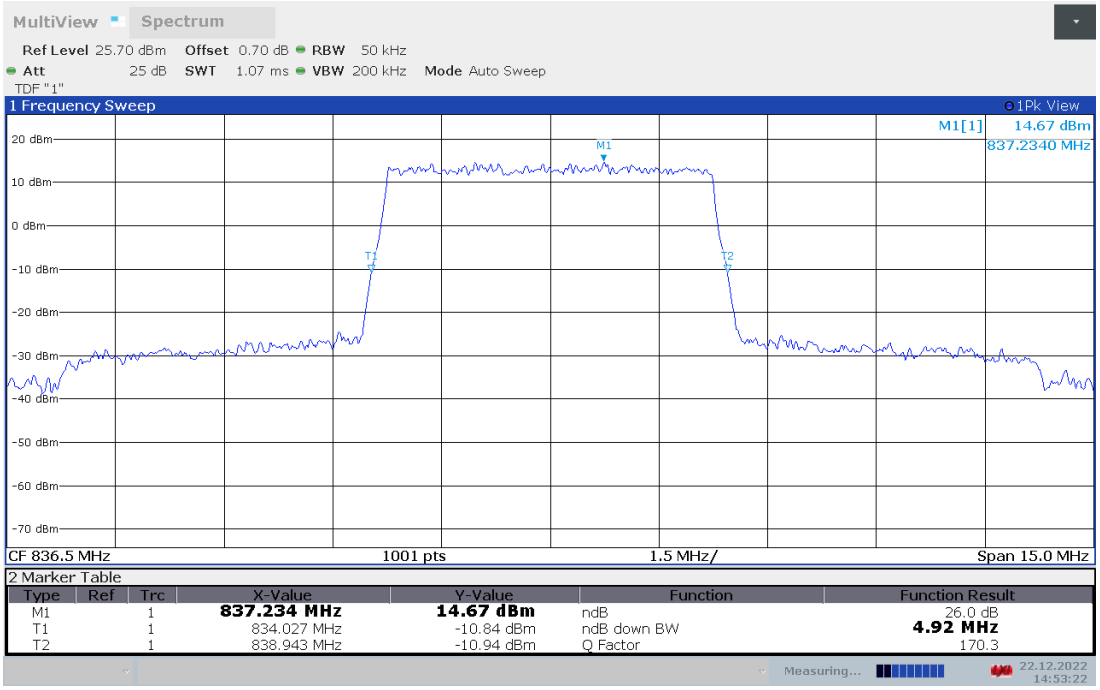
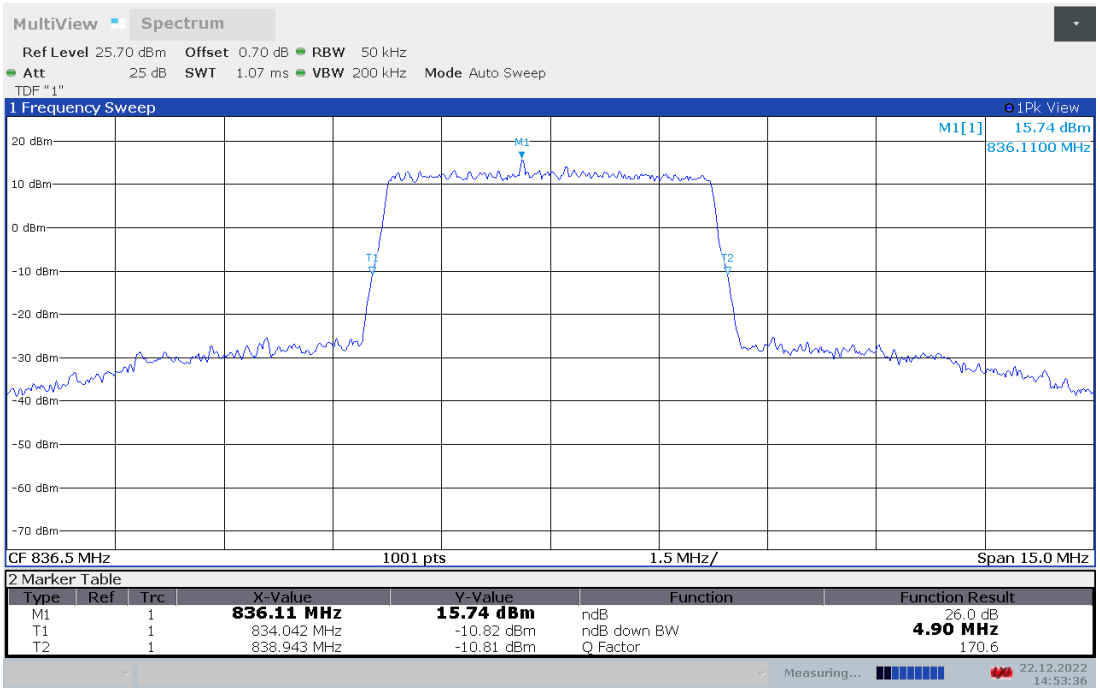
LTE band 5,5MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
836.5	4.915	4.900

LTE band 5 , 5MHz Bandwidth,QPSK (-26dBc BW)



LTE band 5 , 5MHz Bandwidth,16QAM (-26dBc BW)



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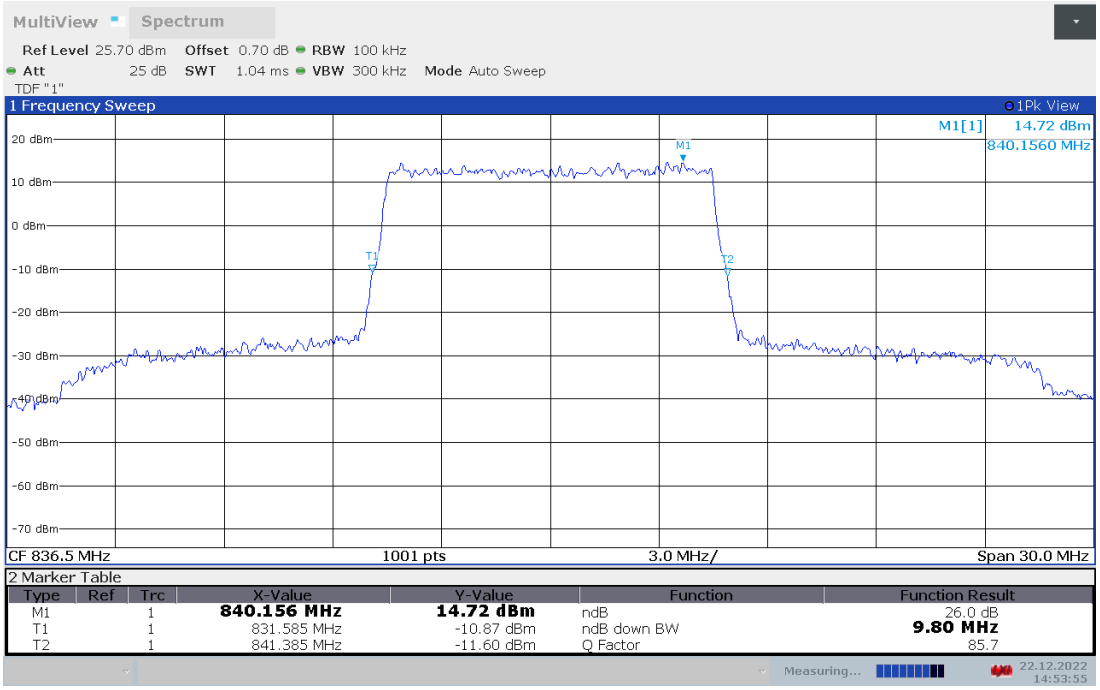
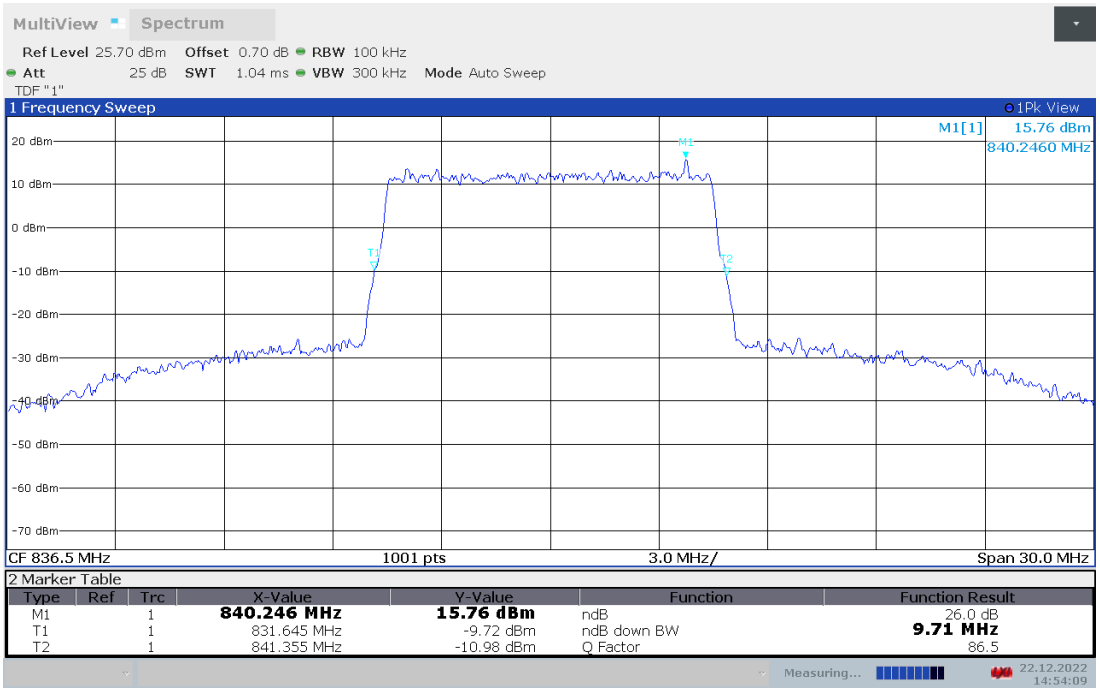
LTE band 5,10MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
836.5	9.800	9.710

LTE band 5 , 10MHz Bandwidth,QPSK (-26dBc BW)



LTE band 5 , 10MHz Bandwidth,16QAM (-26dBc BW)



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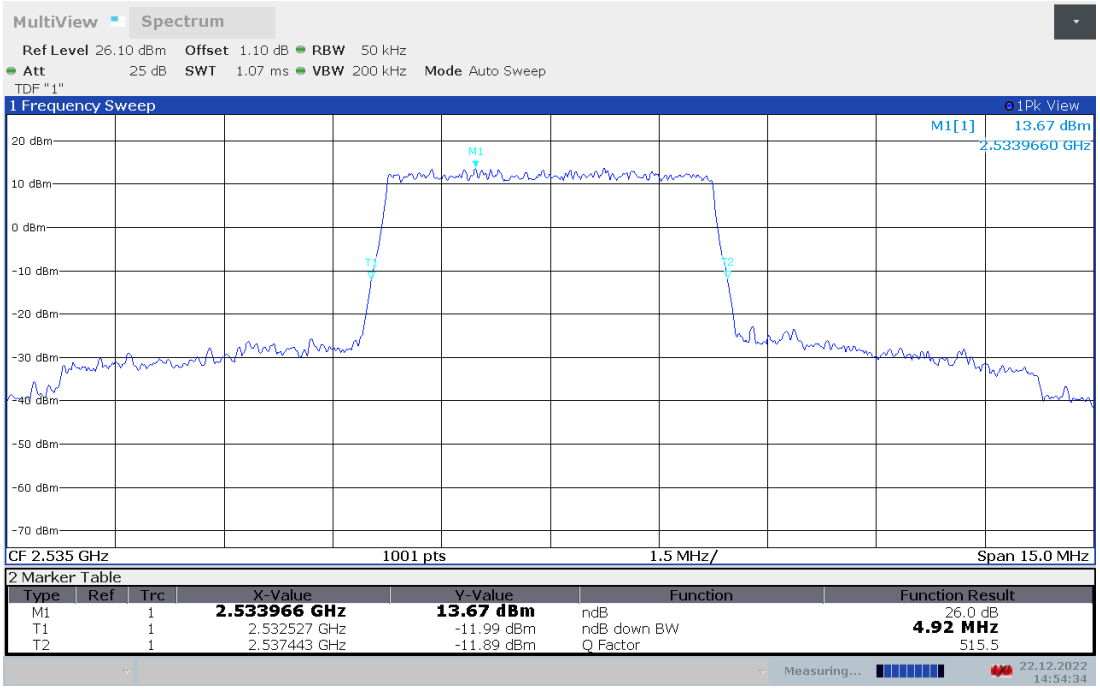
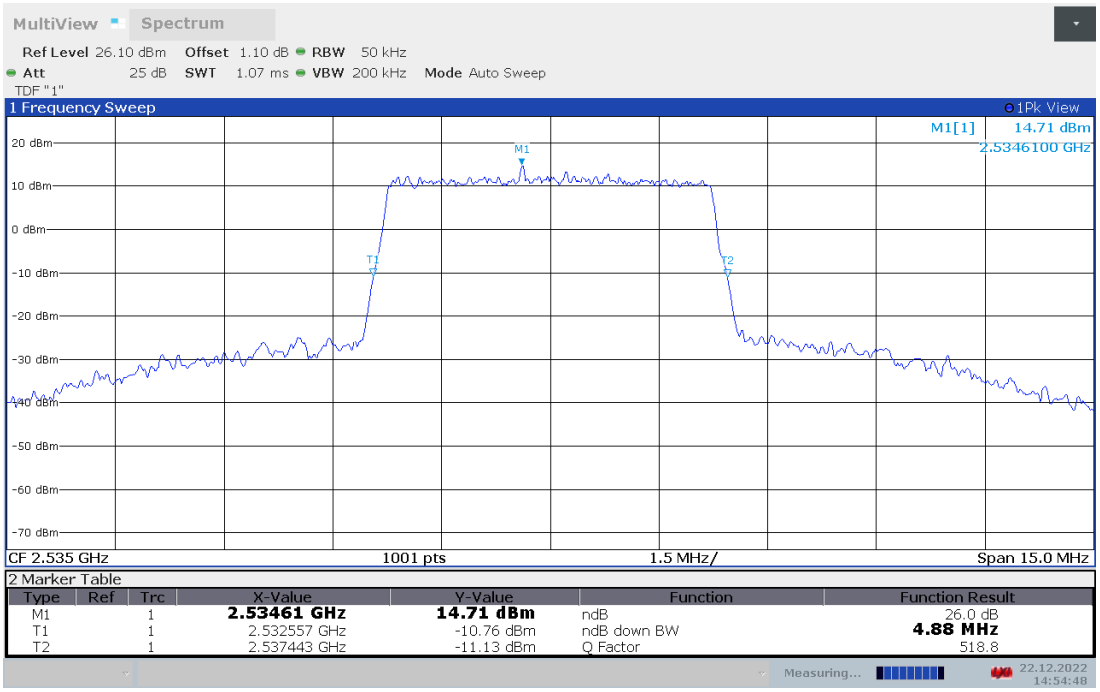
LTE band 7,5MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
2535	4.915	4.885

LTE band 7 , 5MHz Bandwidth,QPSK (-26dBc BW)



LTE band 7 , 5MHz Bandwidth,16QAM (-26dBc BW)



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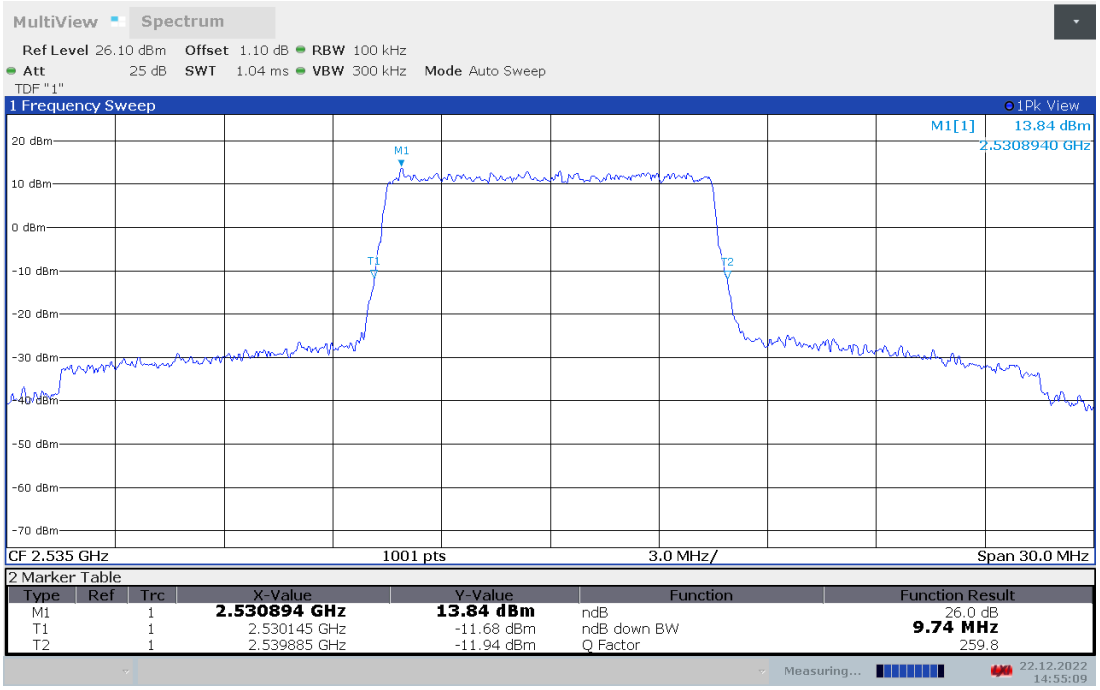
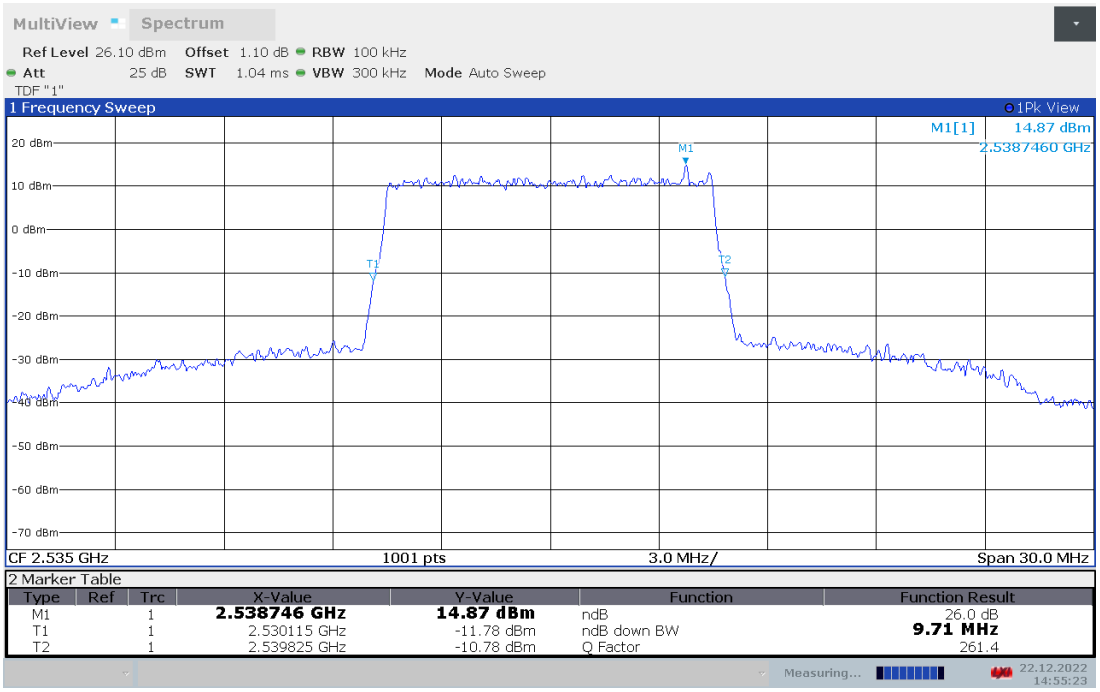
LTE band 7,10MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
2535	9.740	9.710

LTE band 7 , 10MHz Bandwidth,QPSK (-26dBc BW)



LTE band 7 , 10MHz Bandwidth,16QAM (-26dBc BW)



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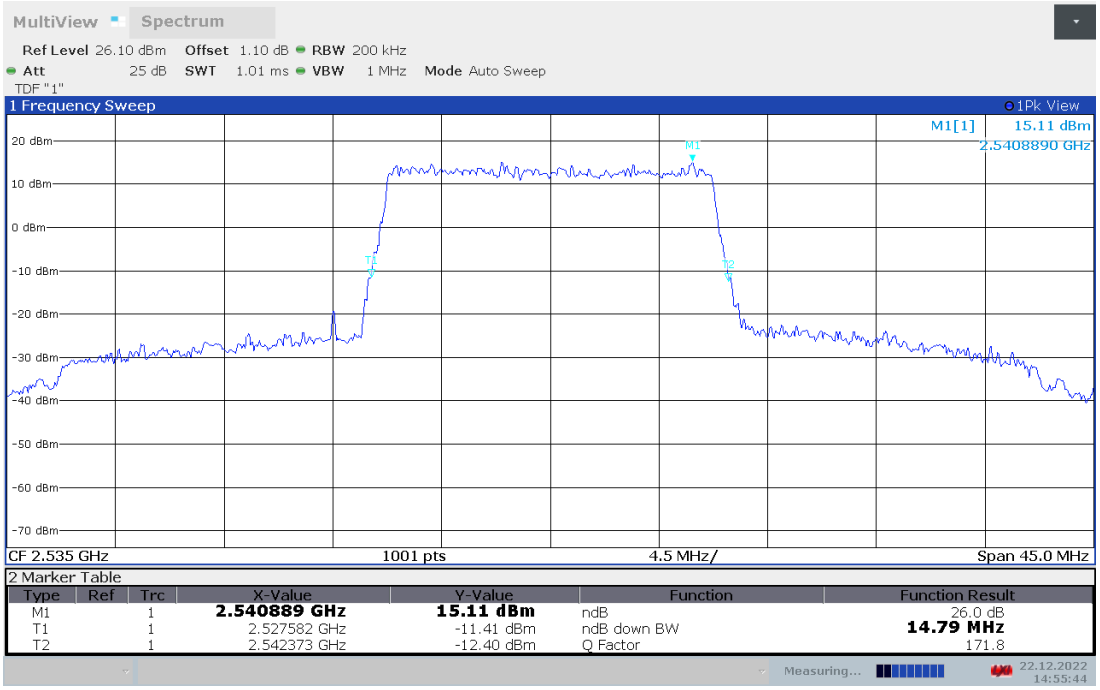
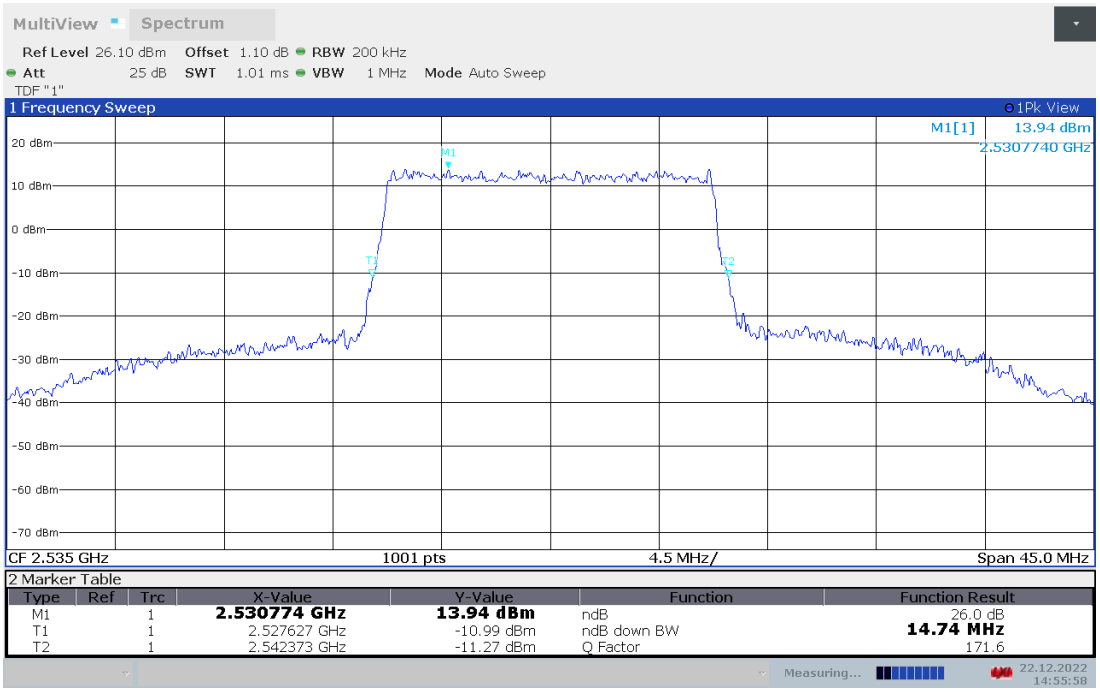
LTE band 7,15MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
2535	14.790	14.745

LTE band 7 , 15MHz Bandwidth,QPSK (-26dBc BW)



LTE band 7 , 15MHz Bandwidth,16QAM (-26dBc BW)



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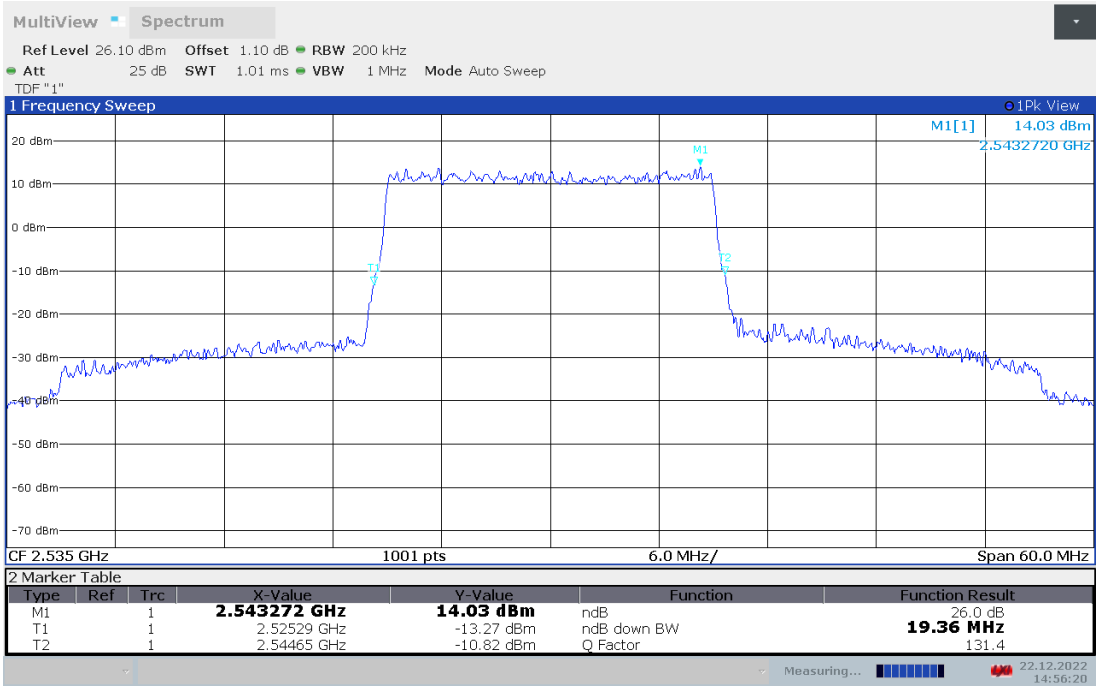
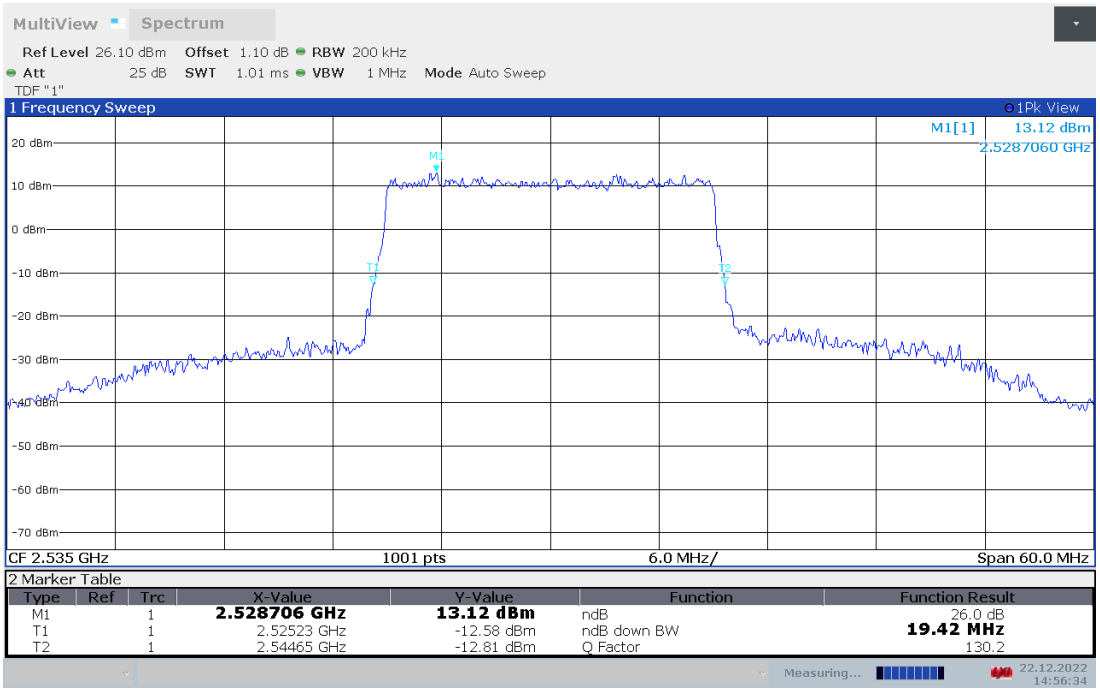
LTE band 7,20MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
2535	19.361	19.421

LTE band 7 , 20MHz Bandwidth,QPSK (-26dBc BW)



LTE band 7 , 20MHz Bandwidth,16QAM (-26dBc BW)



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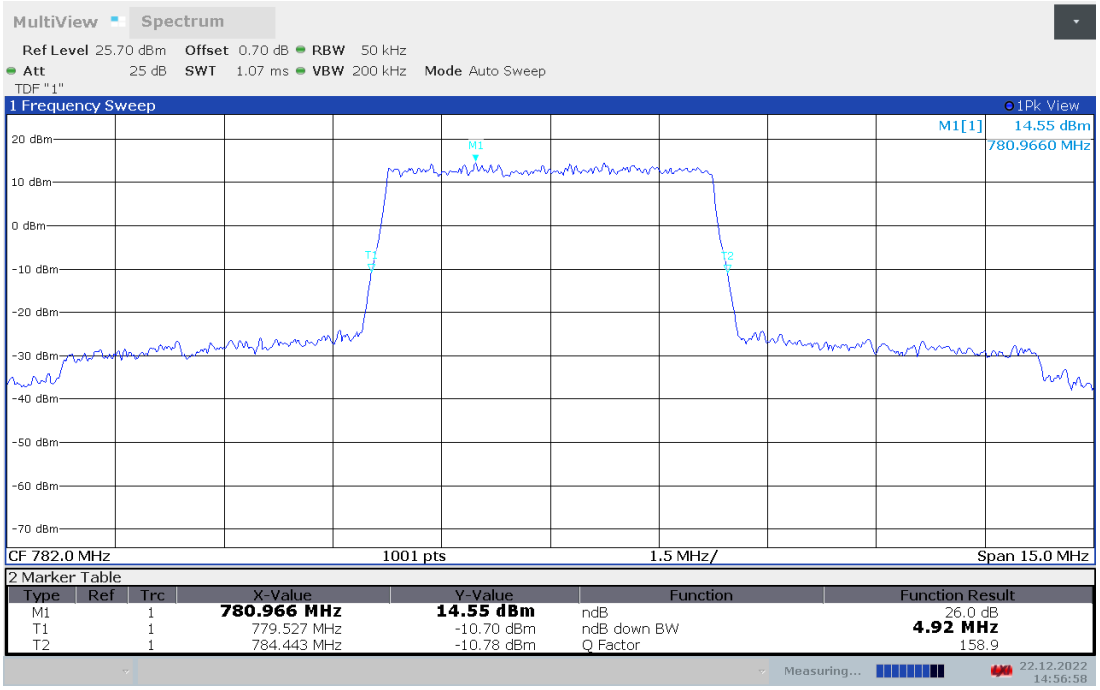
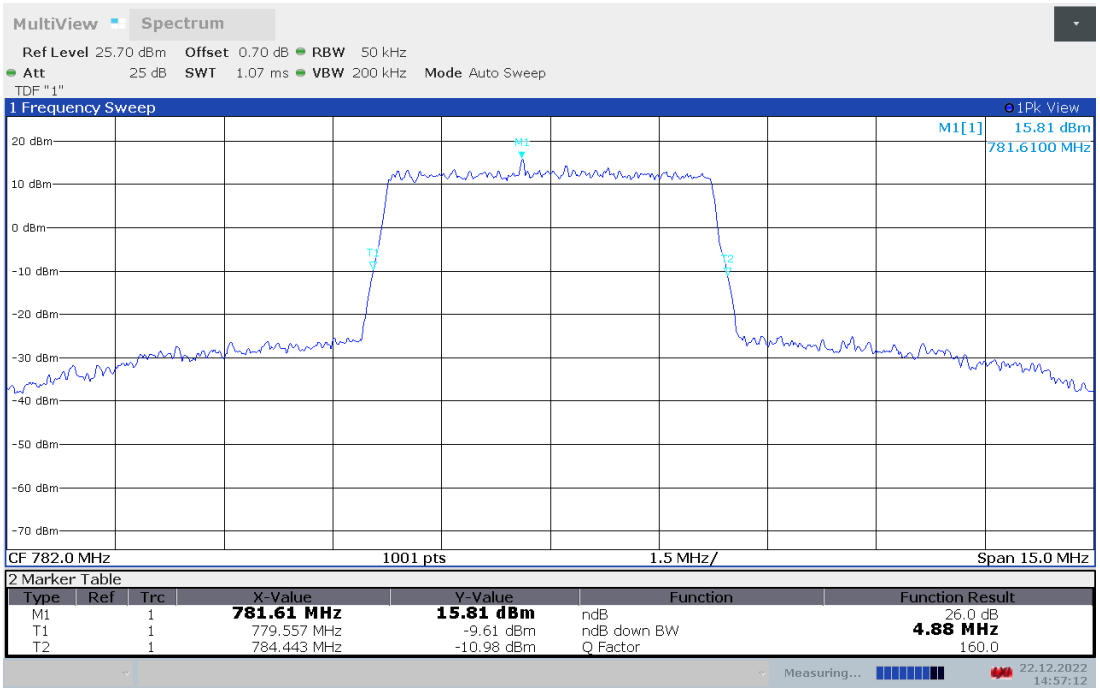
LTE band 13,5MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
782	4.915	4.885

LTE band 13 , 5MHz Bandwidth,QPSK (-26dBc BW)



LTE band 13 , 5MHz Bandwidth,16QAM (-26dBc BW)



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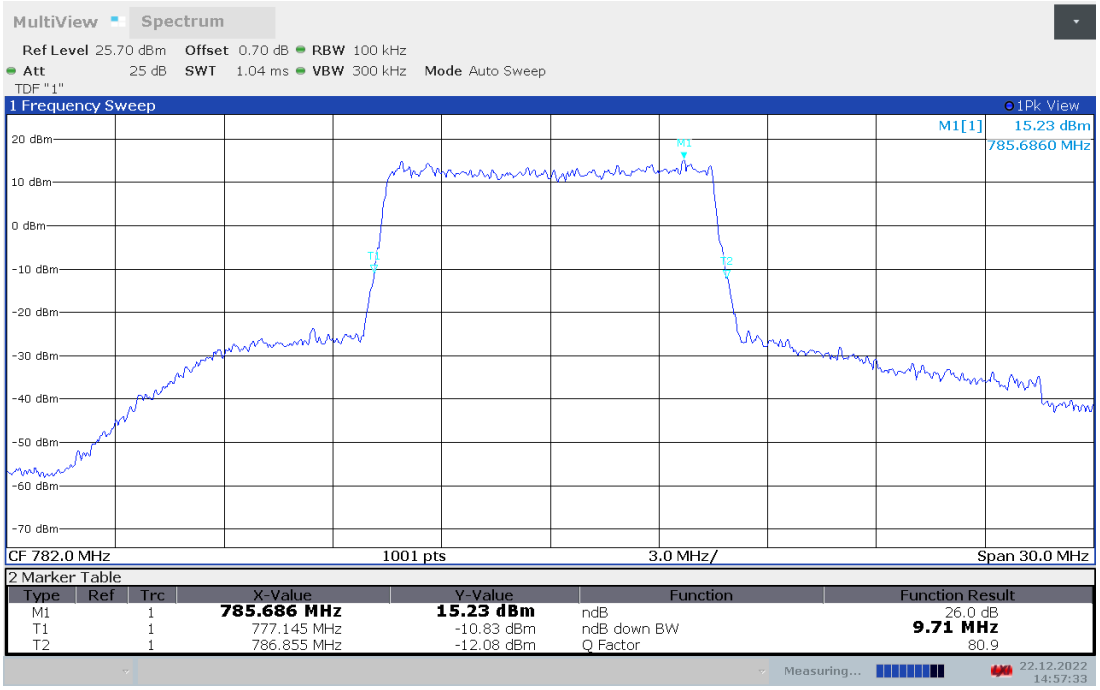
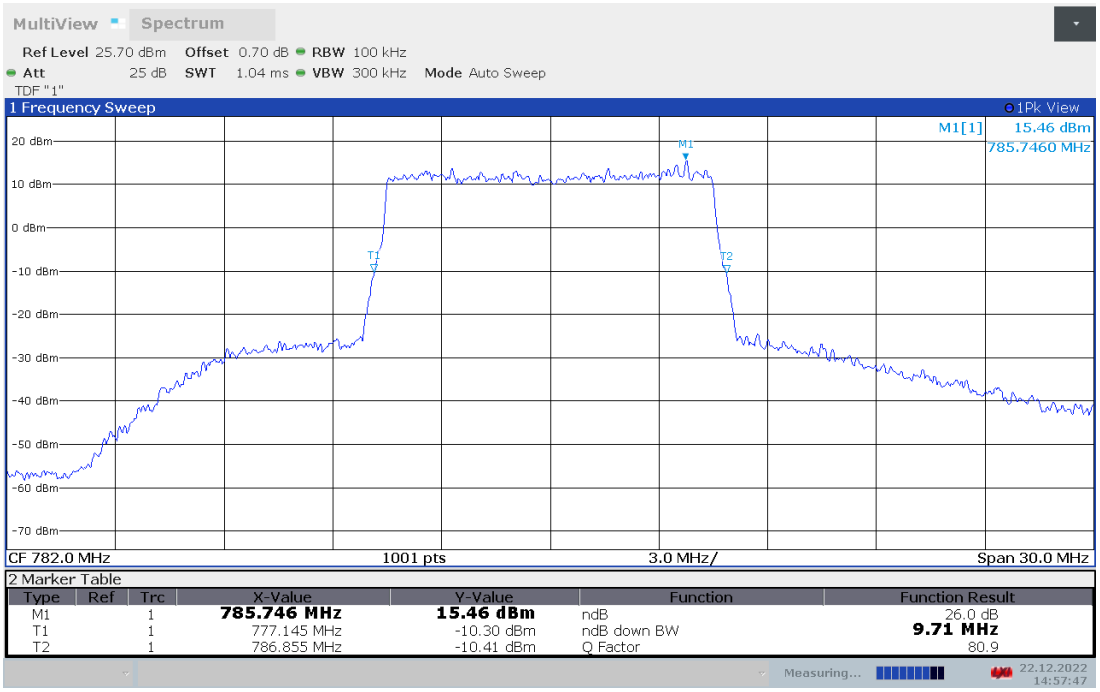
LTE band 13,10MHz(-26dBc BW)

Frequency(MHz)	Emission Bandwidth (-26dBc BW)(MHz)	
	QPSK	16QAM
782	9.710	9.710

LTE band 13 , 10MHz Bandwidth,QPSK (-26dBc BW)



LTE band 13 , 10MHz Bandwidth,16QAM (-26dBc BW)



Note: Expanded measurement uncertainty is U = 3428 Hz, k = 2

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A.6 BAND EDGE COMPLIANCE

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53.

A.6.1 Measurement limit

Part 22.917 For operations in the 824–849MHz band, the FCC limit is 43 +10 log (P)dB below the transmitter power(P) in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Part 24.238 Part 27.53(c)and Part 27.53(h) 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.

Part 27.53(m) specifies for mobile digital stations, the attenuation factor shall be not less than 40+ 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Part 27.53(g) states for operations in the 600 MHz band and the 698–746 MHz band, the power of any emission outside a licensee’s frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 +10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee’s frequency block, a resolution bandwidth of at least 30 kHz may be employed.

A.6.2Measurement 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 >= 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.

A.6.3 Measurement result

Only worst case result is given below

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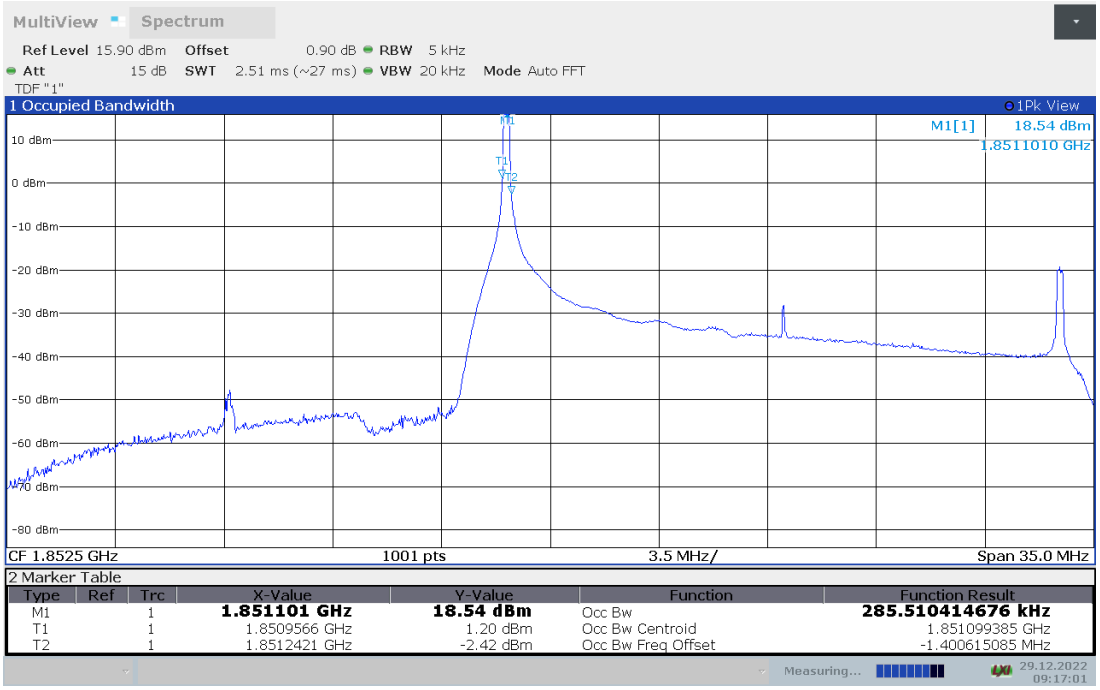
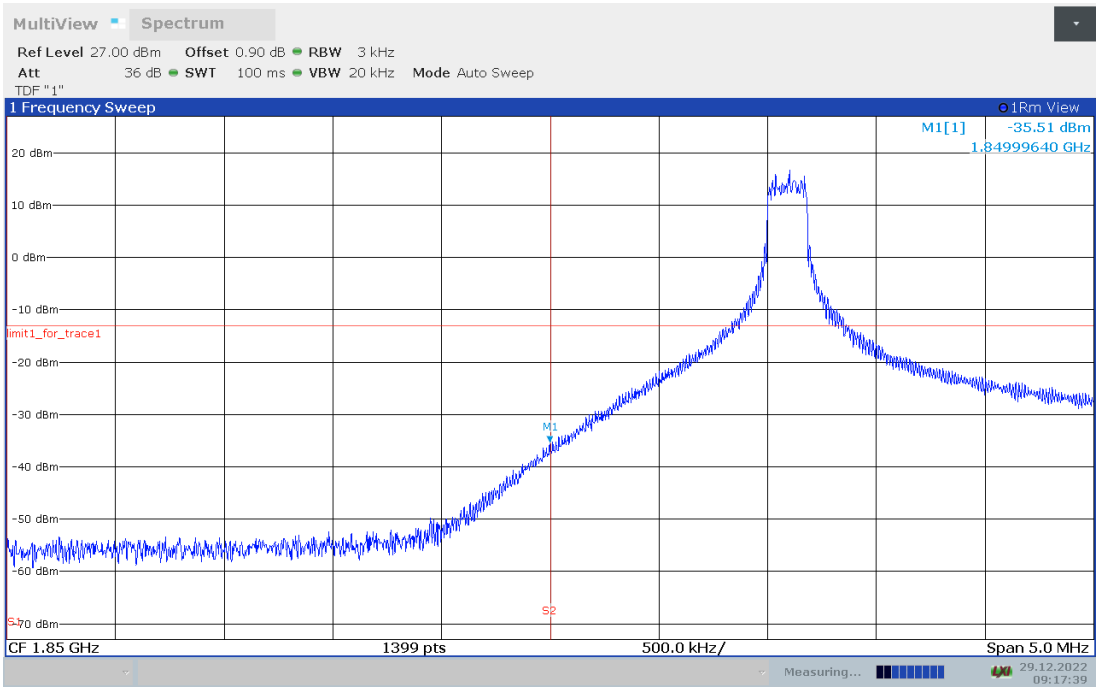
LTE band 2

OBW: 1RB-LOW_offset



LOW BAND EDGE BLOCK-1RB-LOW_offset



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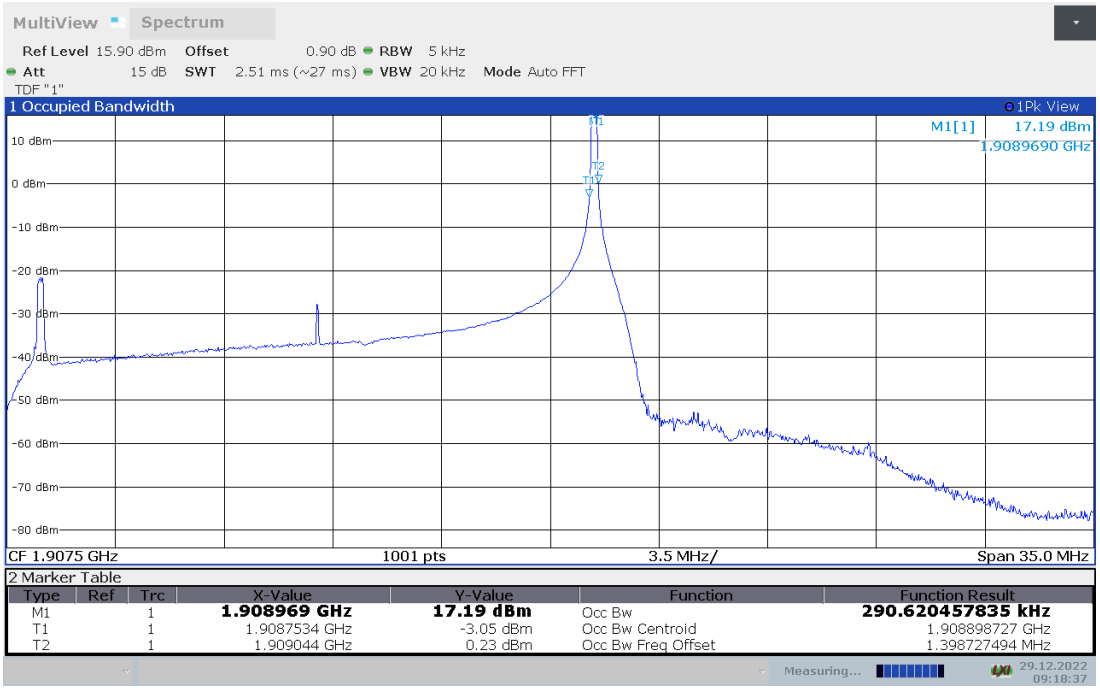
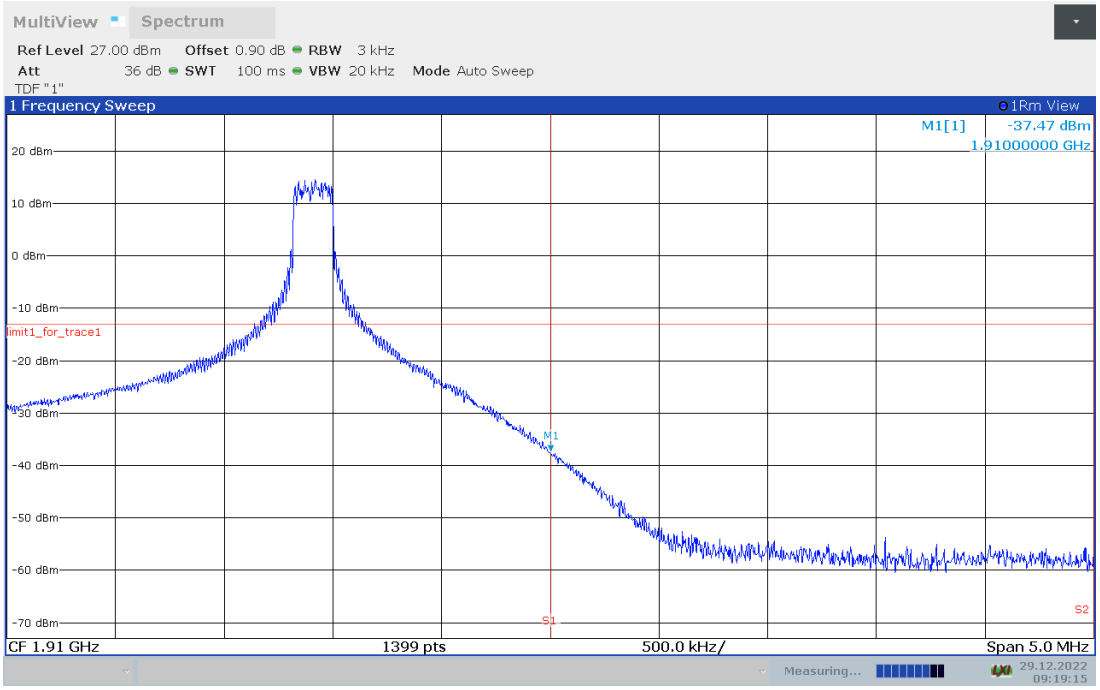
OBW: 1RB-HIGH_offset



HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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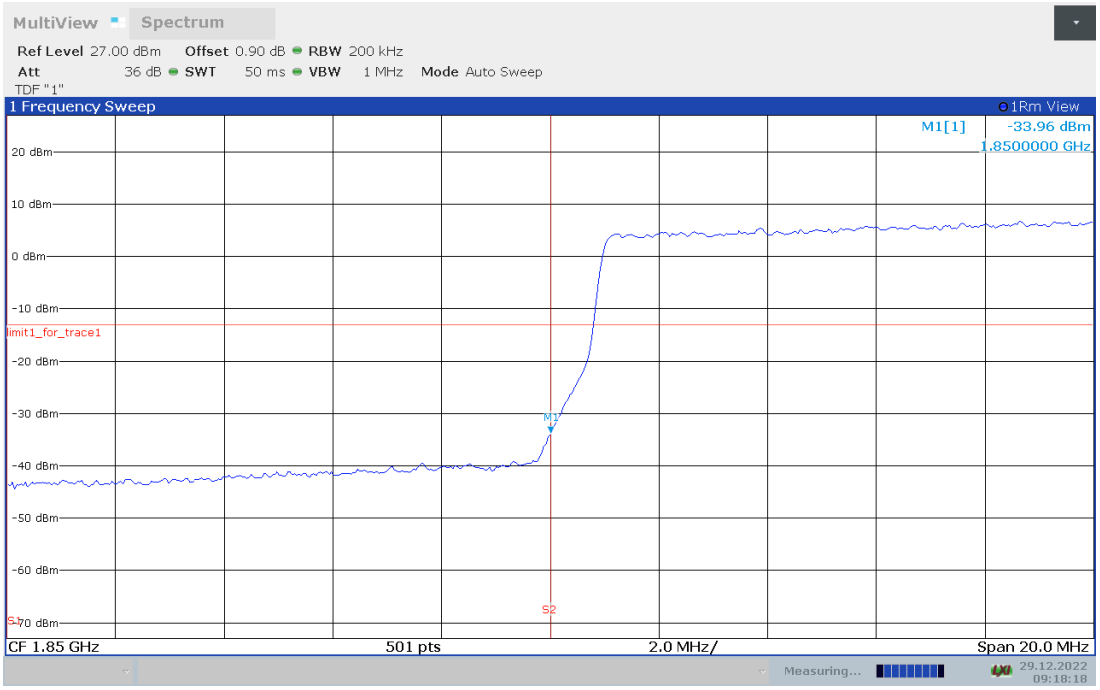
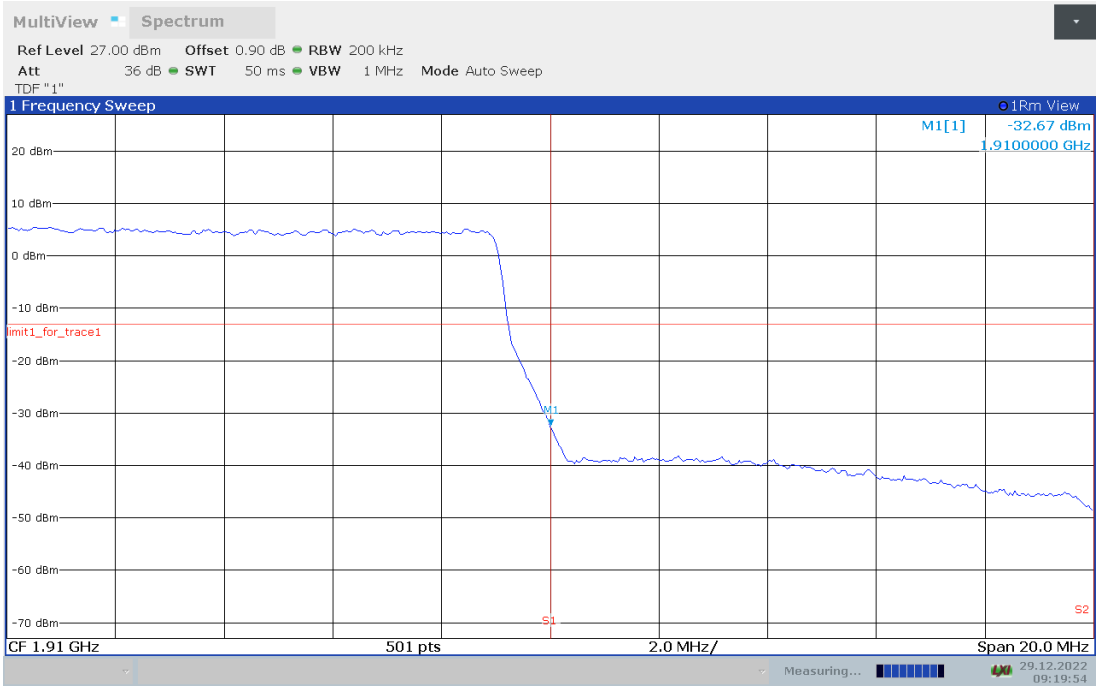
LOW BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB



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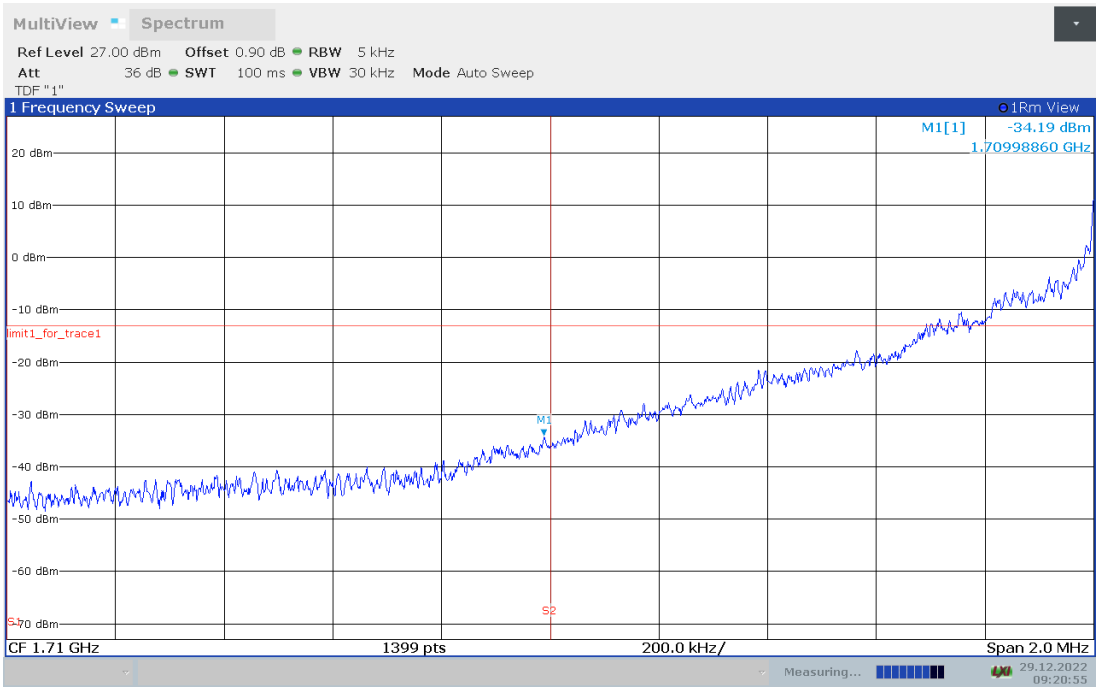
LTE band 4

OBW: 1RB-LOW_offset

LOW BAND EDGE BLOCK-1RB-LOW_offset



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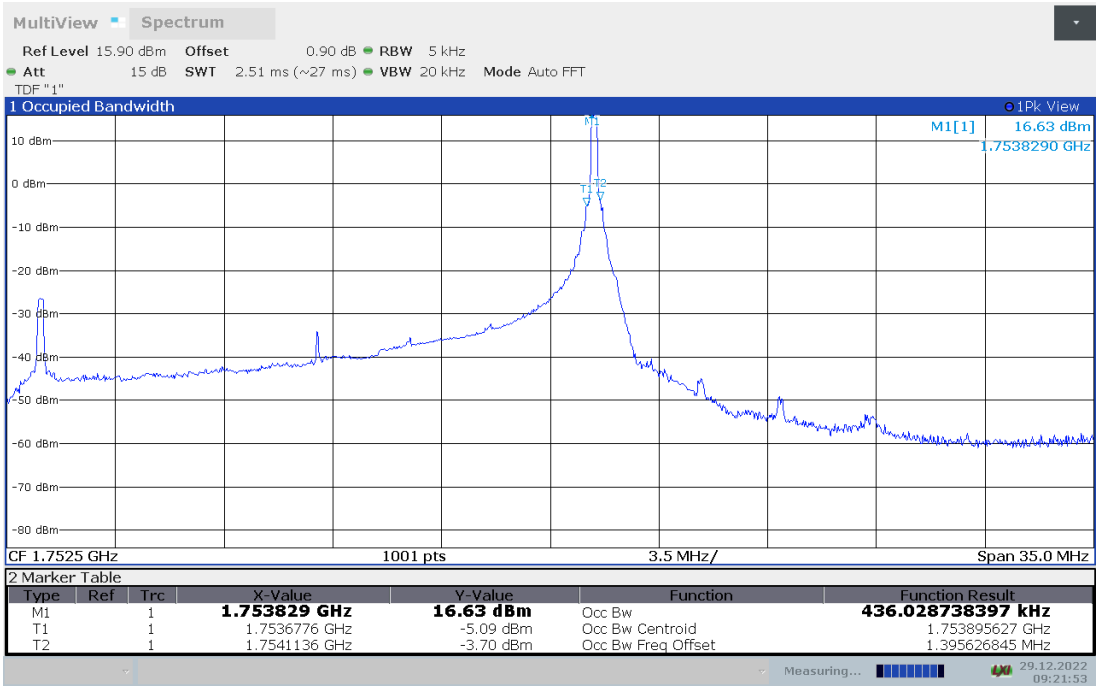
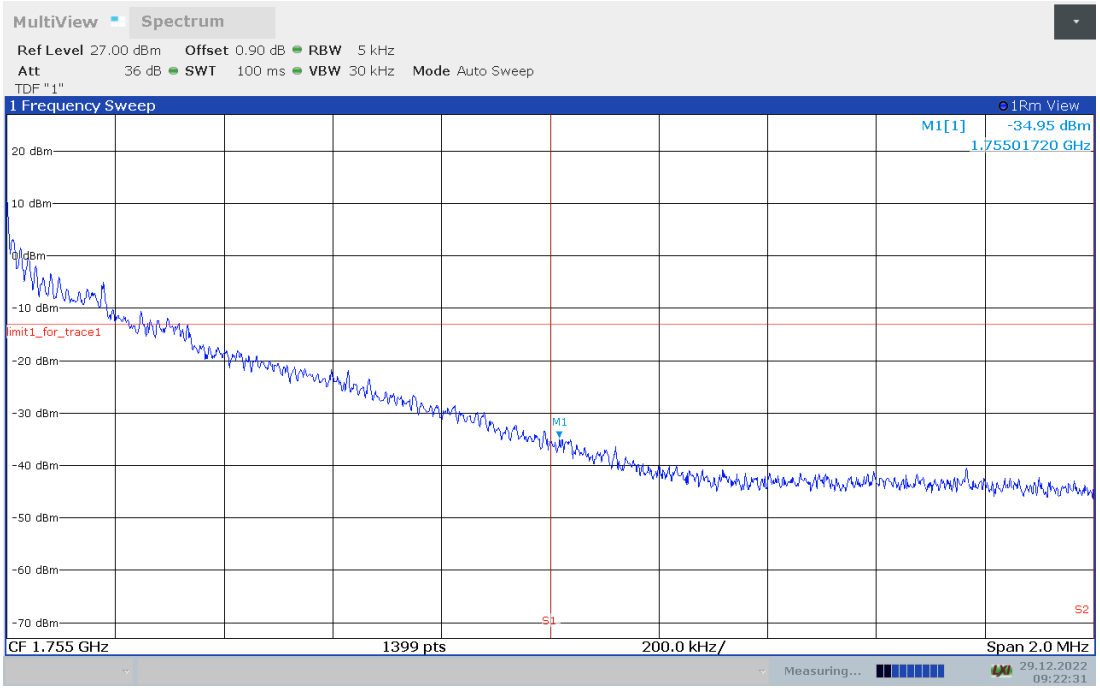
OBW: 1RB-HIGH_offset



HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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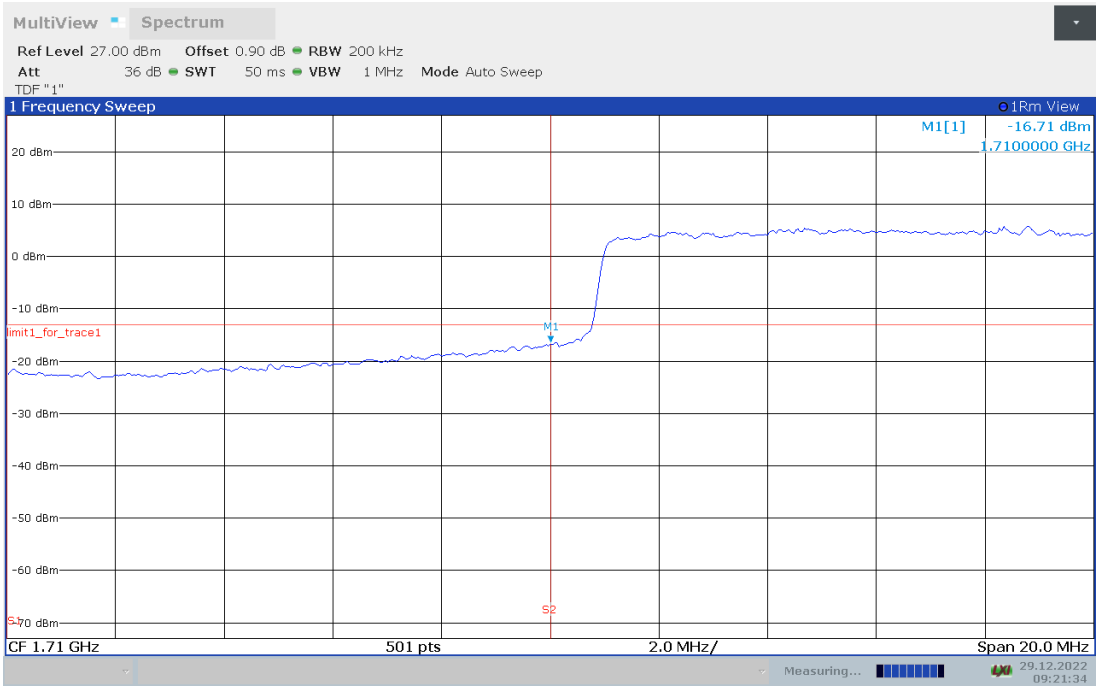
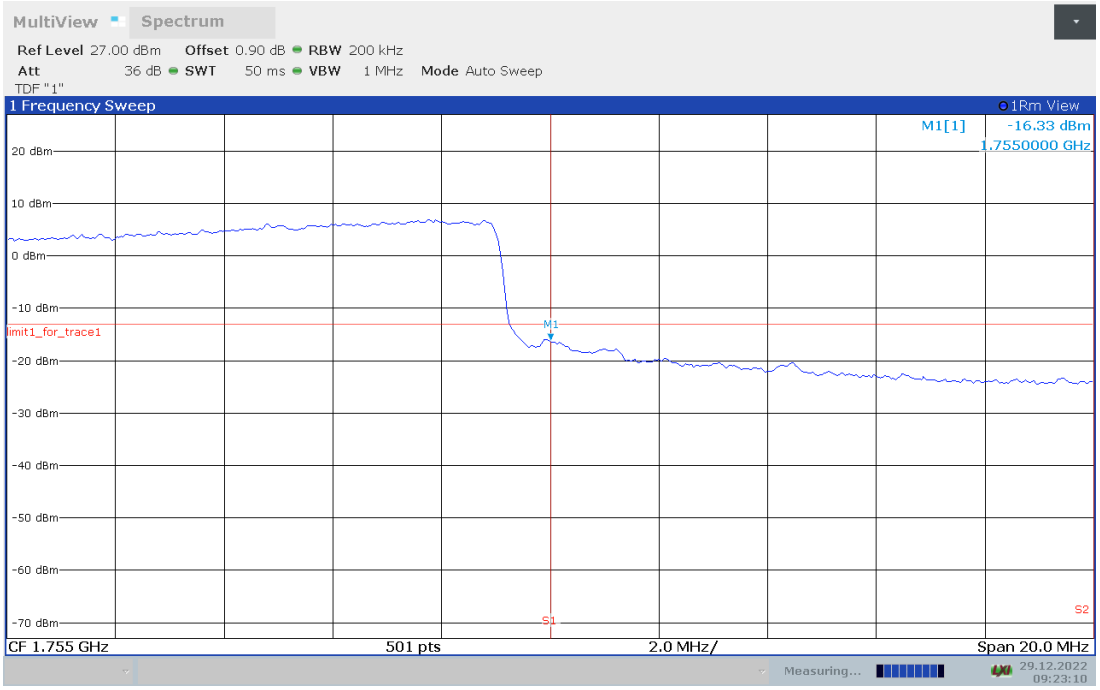
LOW BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB



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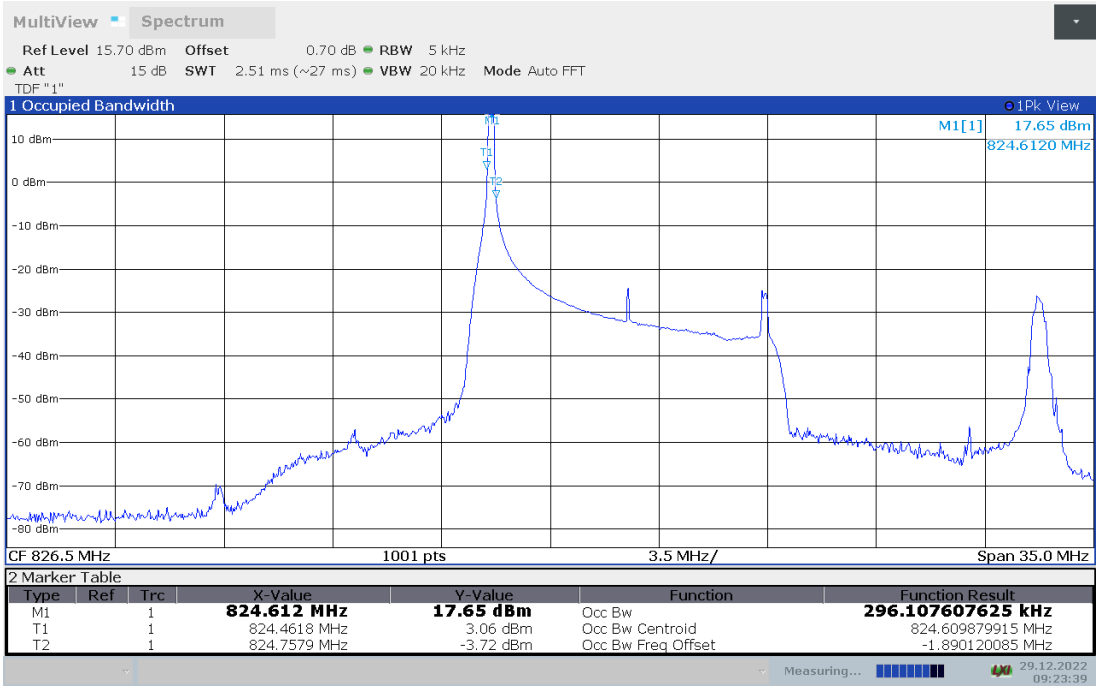
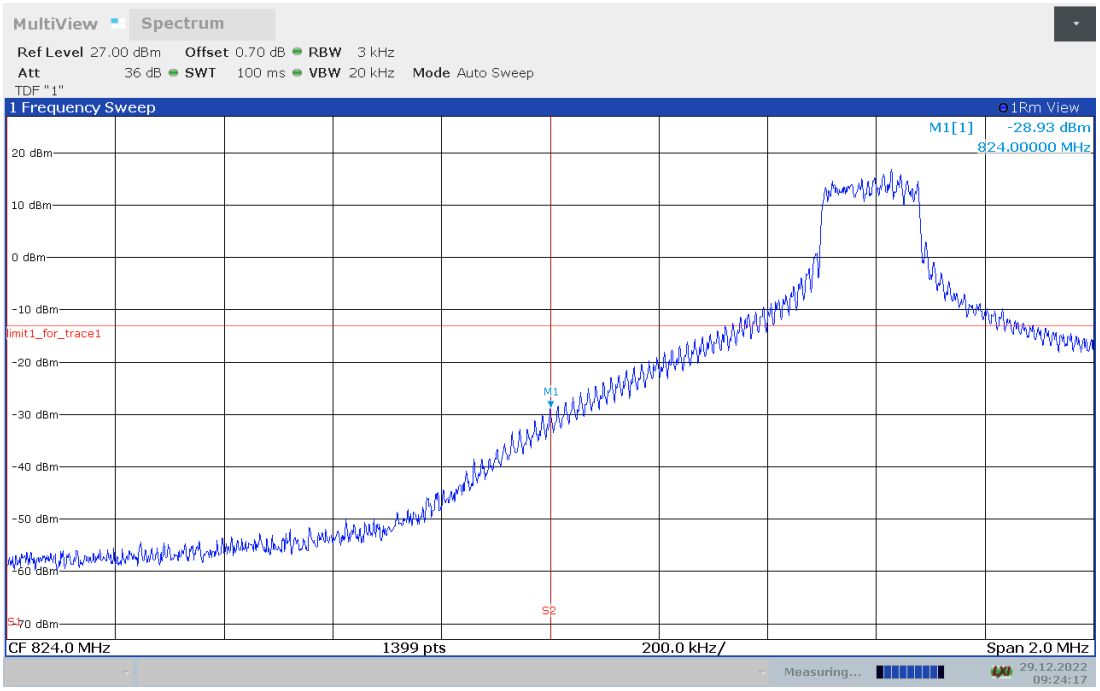
LTE band 5

OBW: 1RB-LOW_offset



LOW BAND EDGE BLOCK-1RB-LOW_offset



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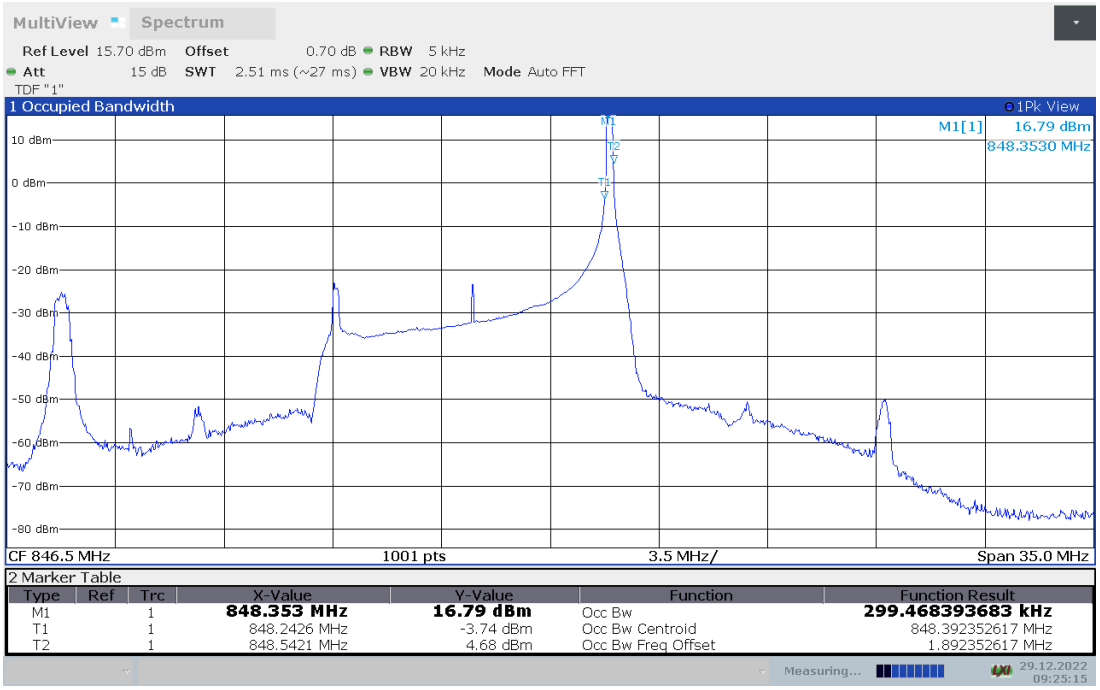
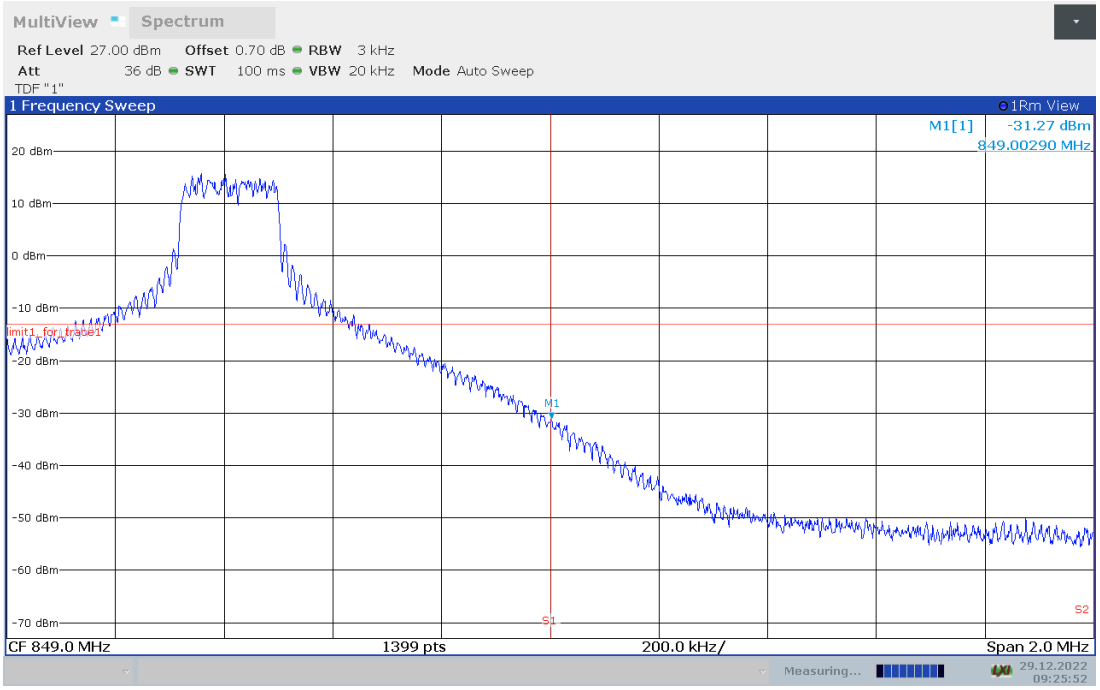


HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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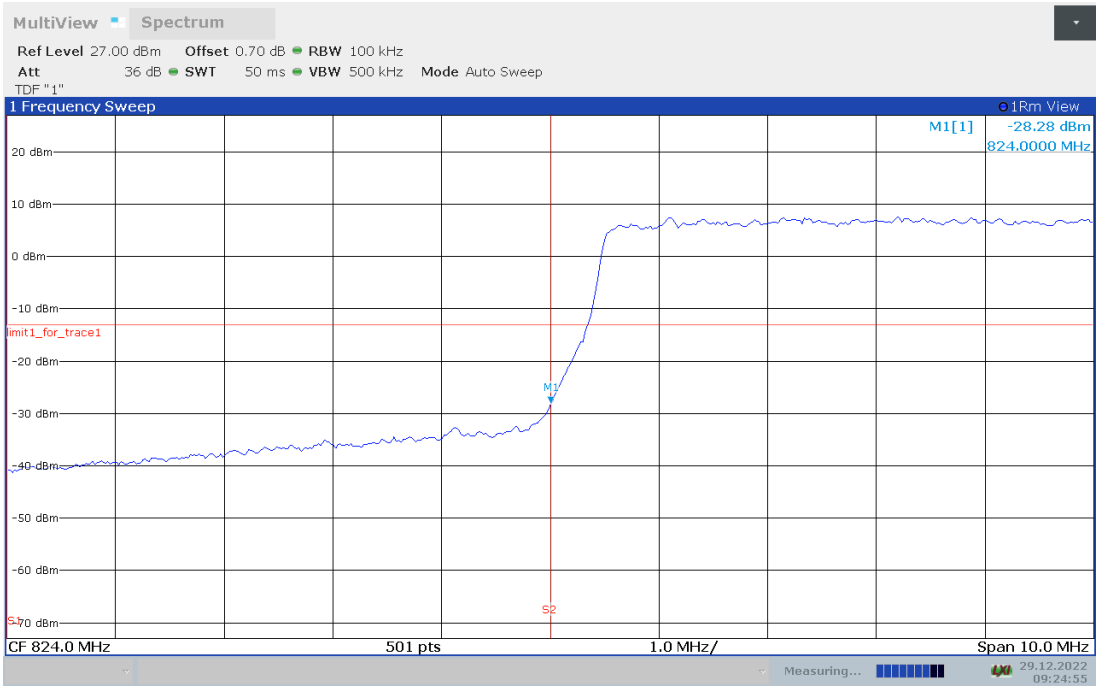
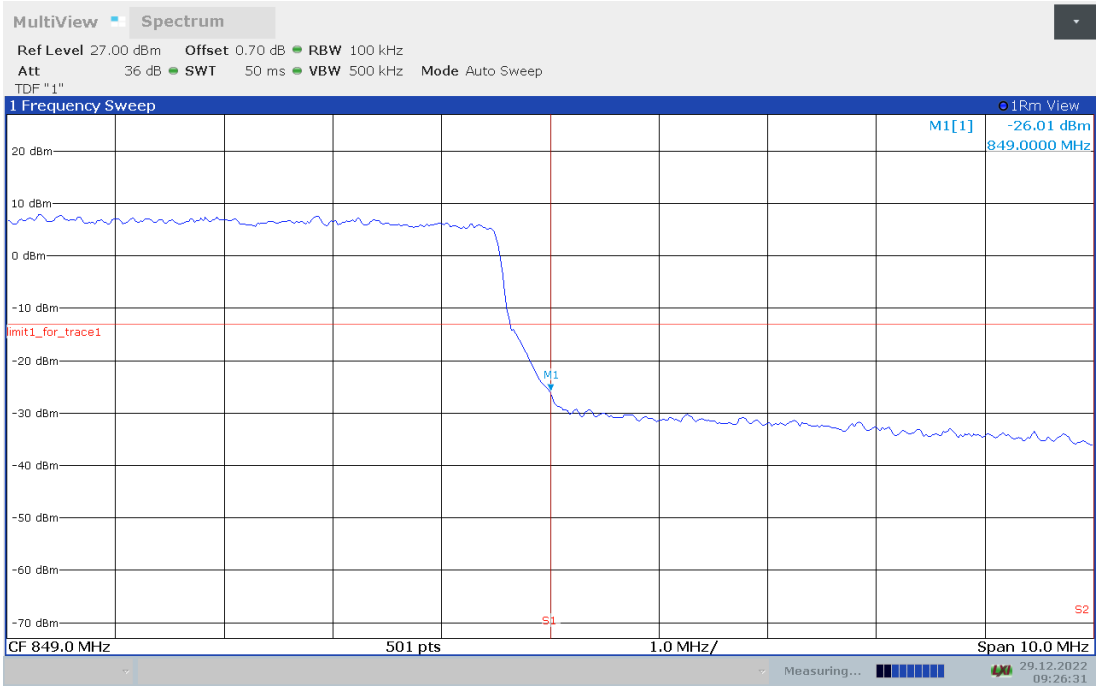
LOW BAND EDGE BLOCK-10M-100%RB



HIGH BAND EDGE BLOCK-10M-100%RB



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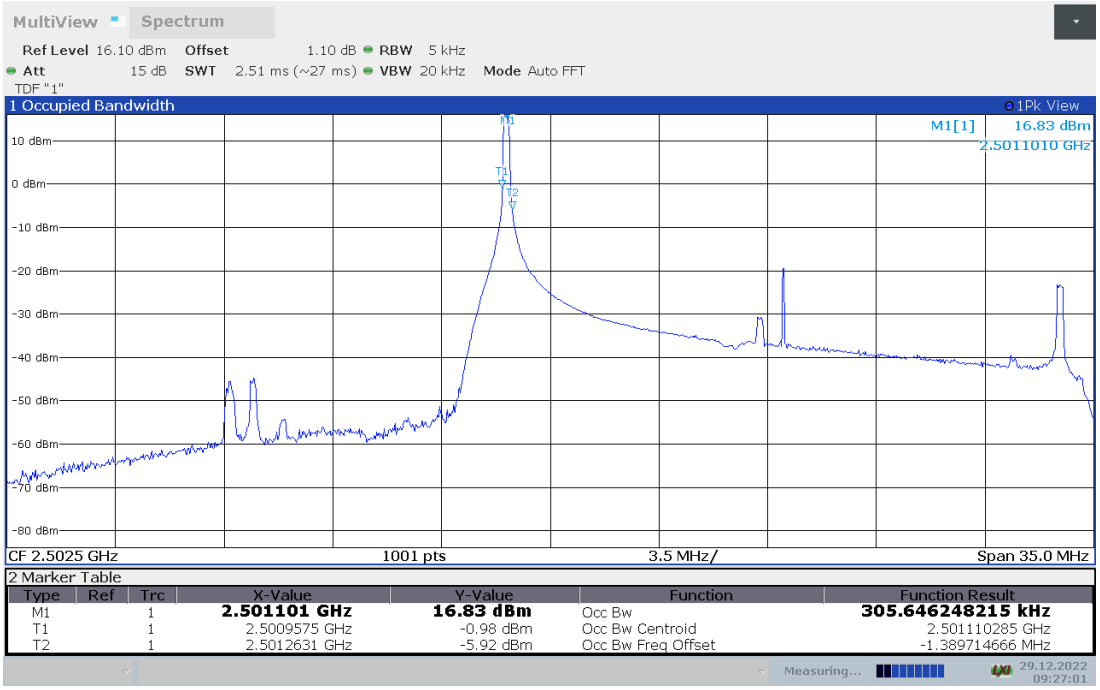
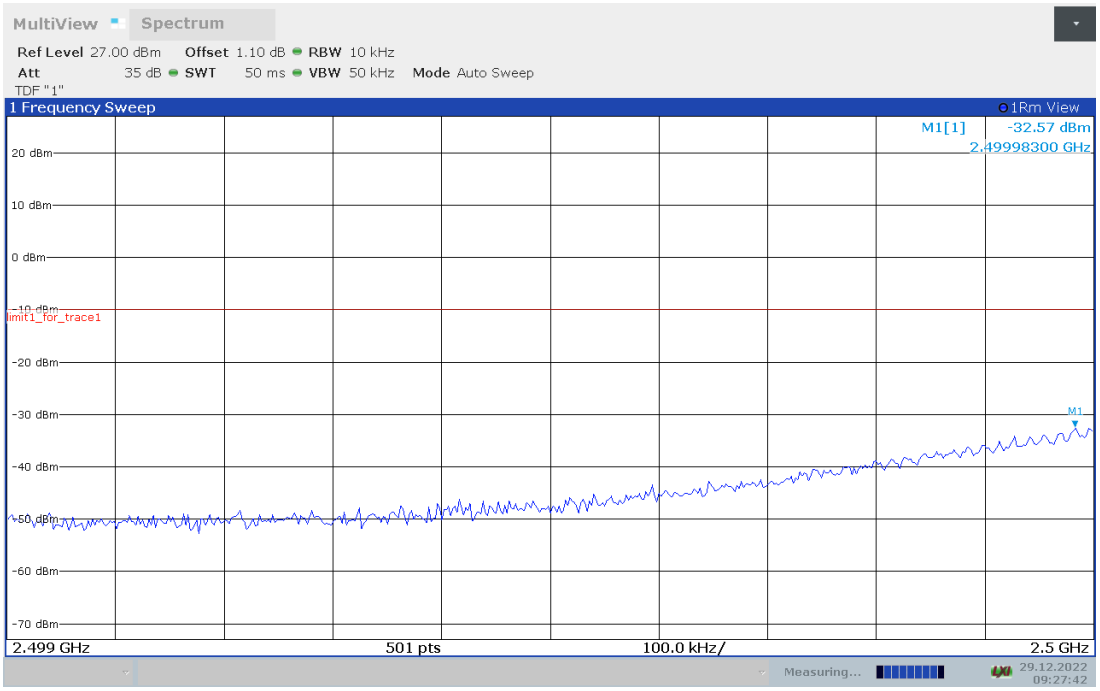
LTE band 7

OBW: 1RB-LOW_offset



LOW BAND EDGE BLOCK-1RB-LOW_offset



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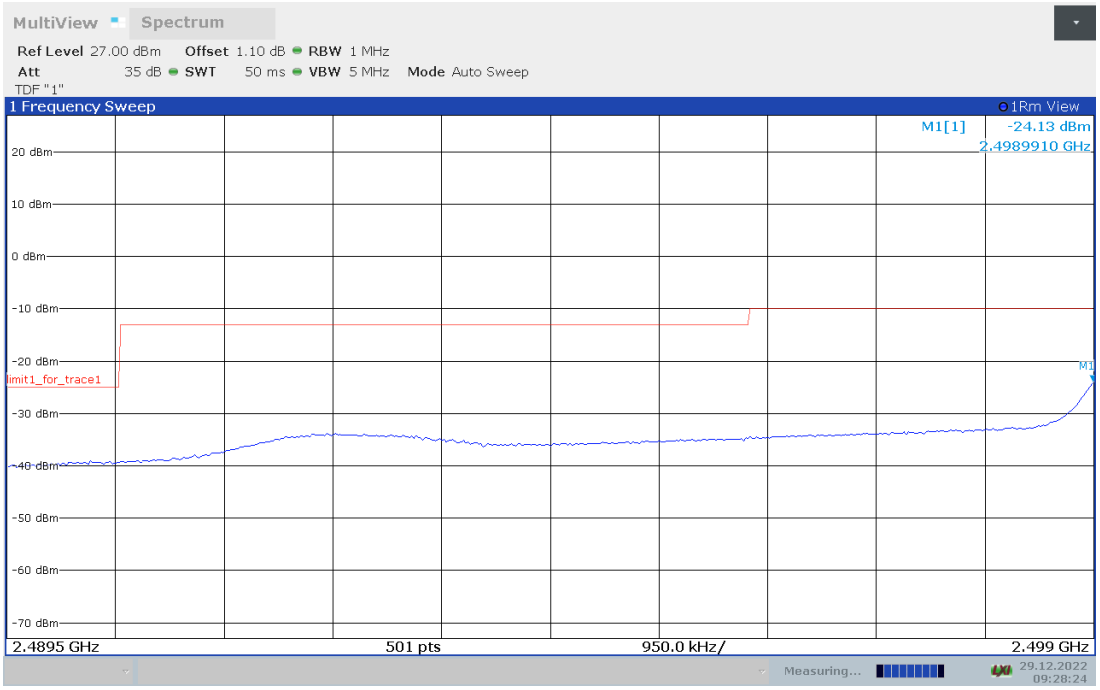
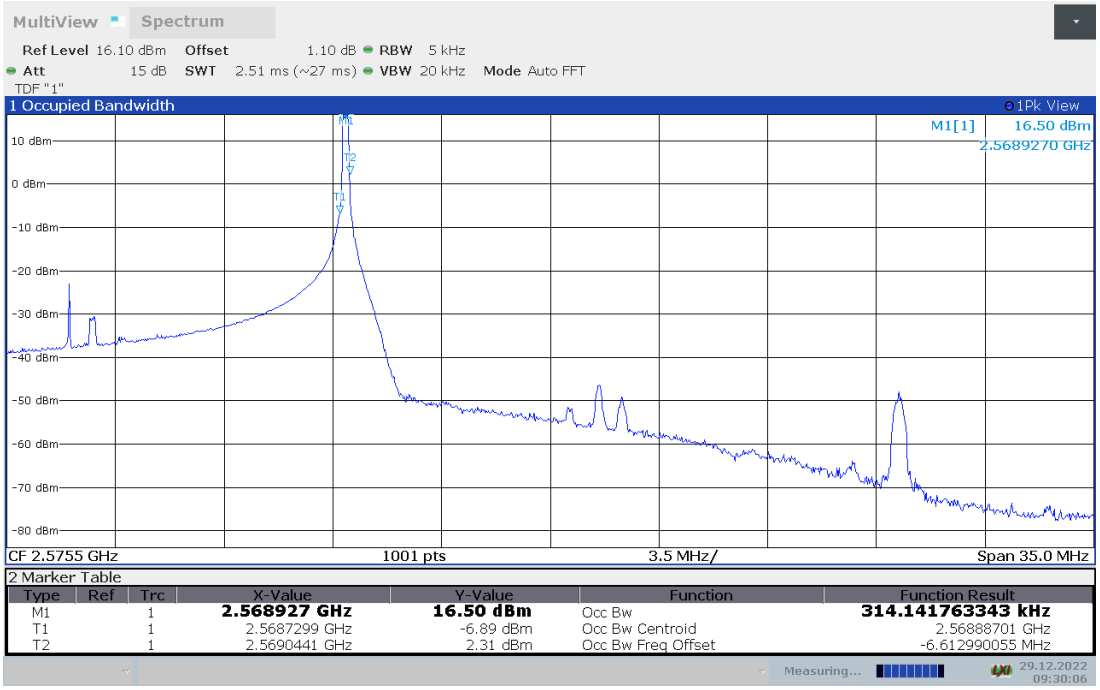
LOW BAND EDGE BLOCK-1RB-LOW_offset



OBW: 1RB-HIGH_offset



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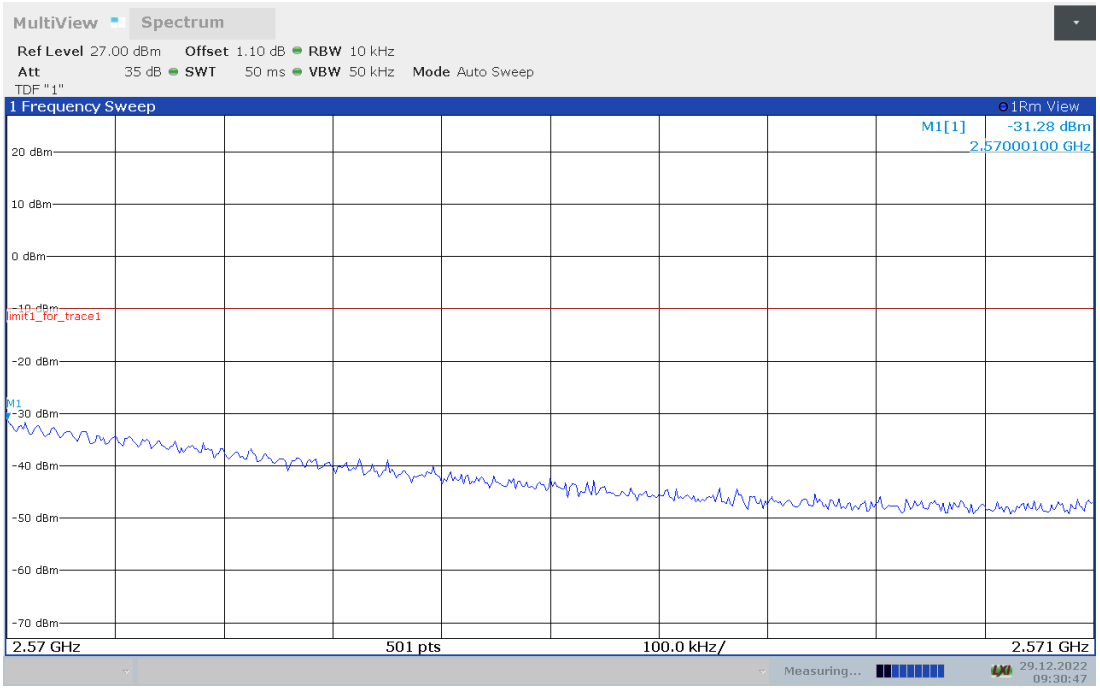
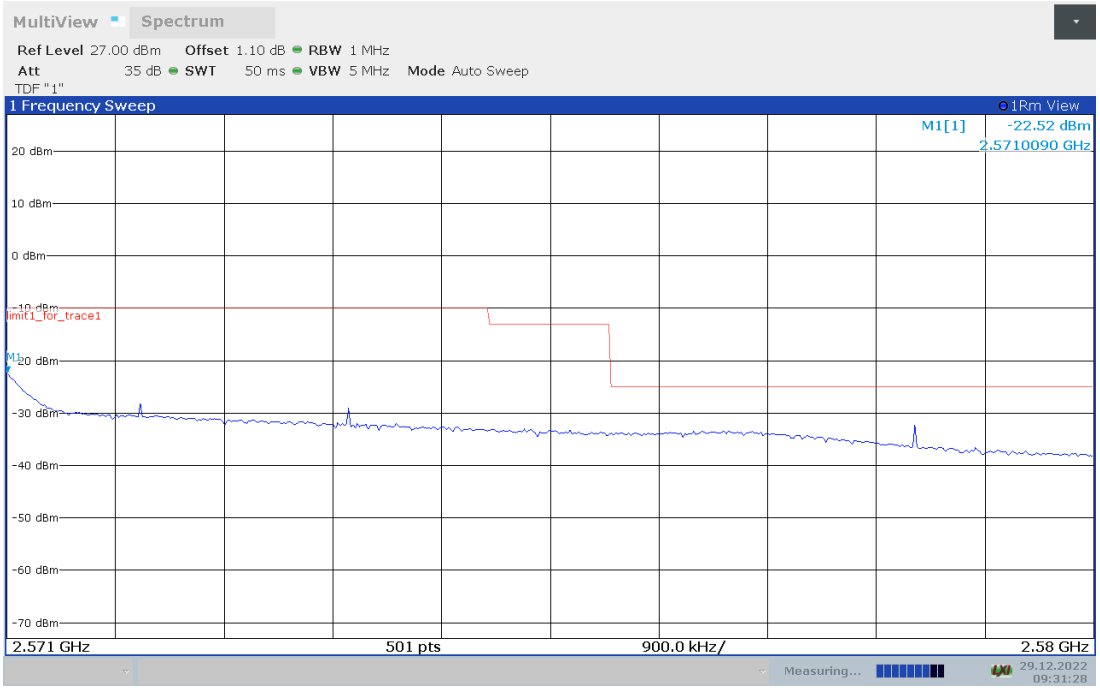
HIGH BAND EDGE BLOCK-1RB-HIGH_offset



HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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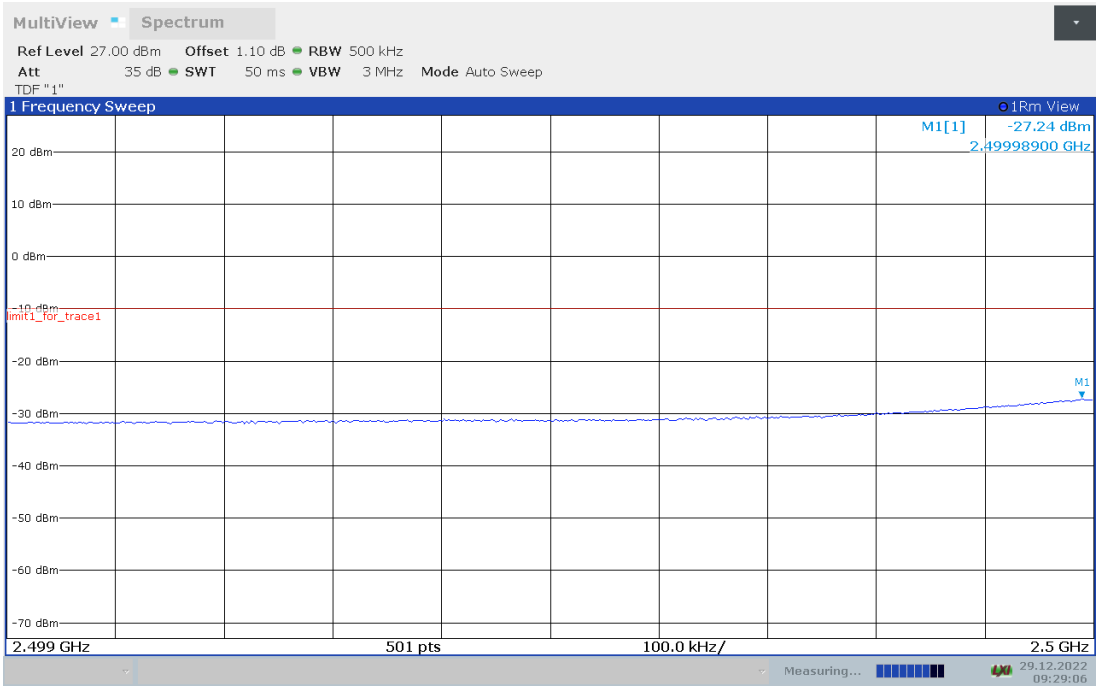
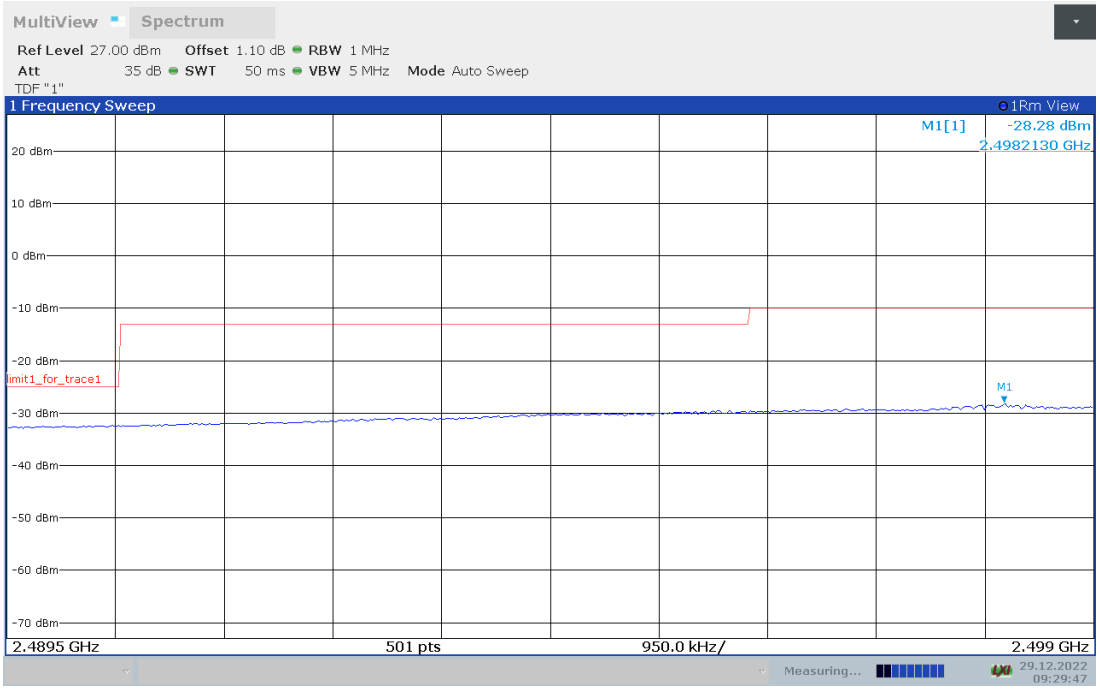
LOW BAND EDGE BLOCK-20M-100%RB



LOW BAND EDGE BLOCK-20M-100%RB



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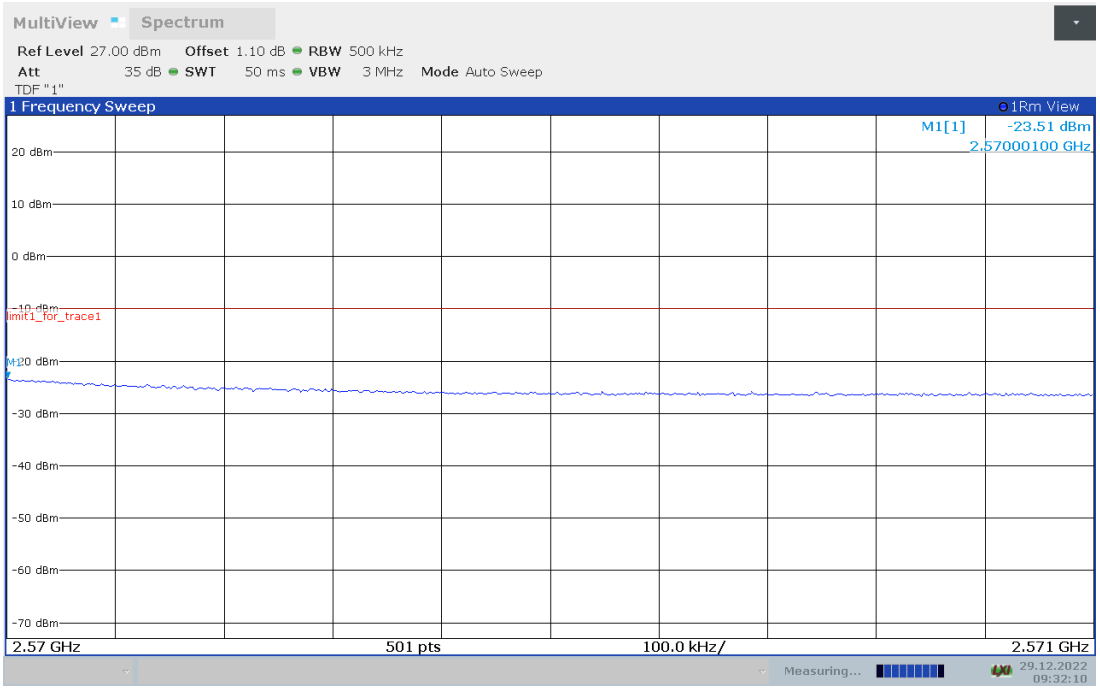
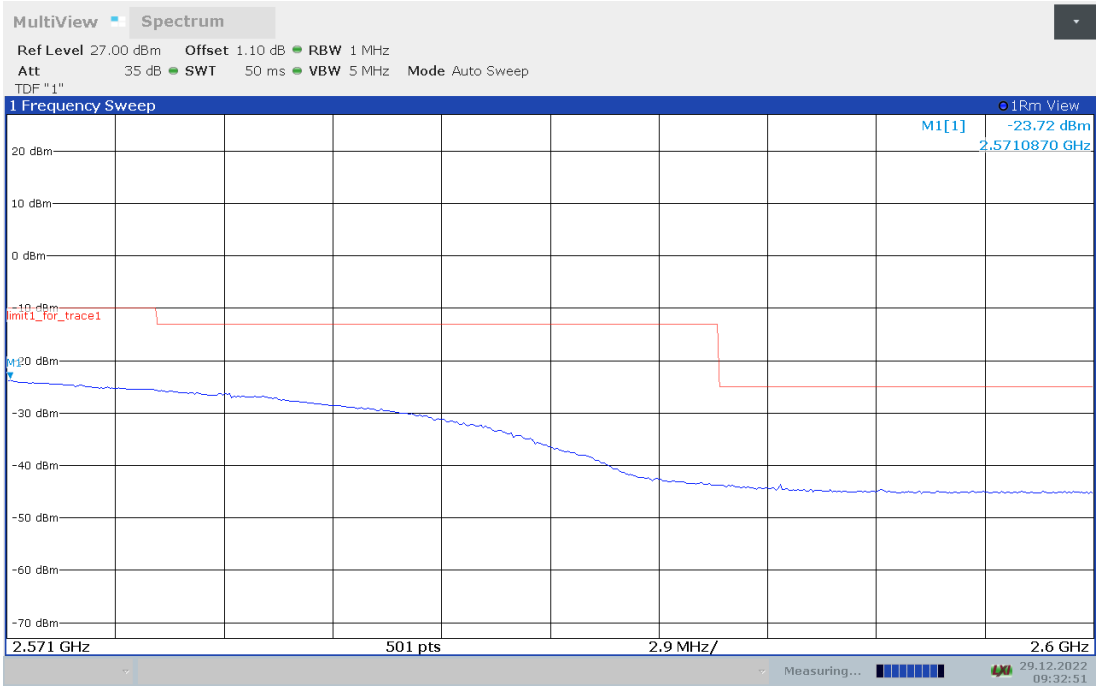
HIGH BAND EDGE BLOCK-20M-100%RB



HIGH BAND EDGE BLOCK-20M-100%RB



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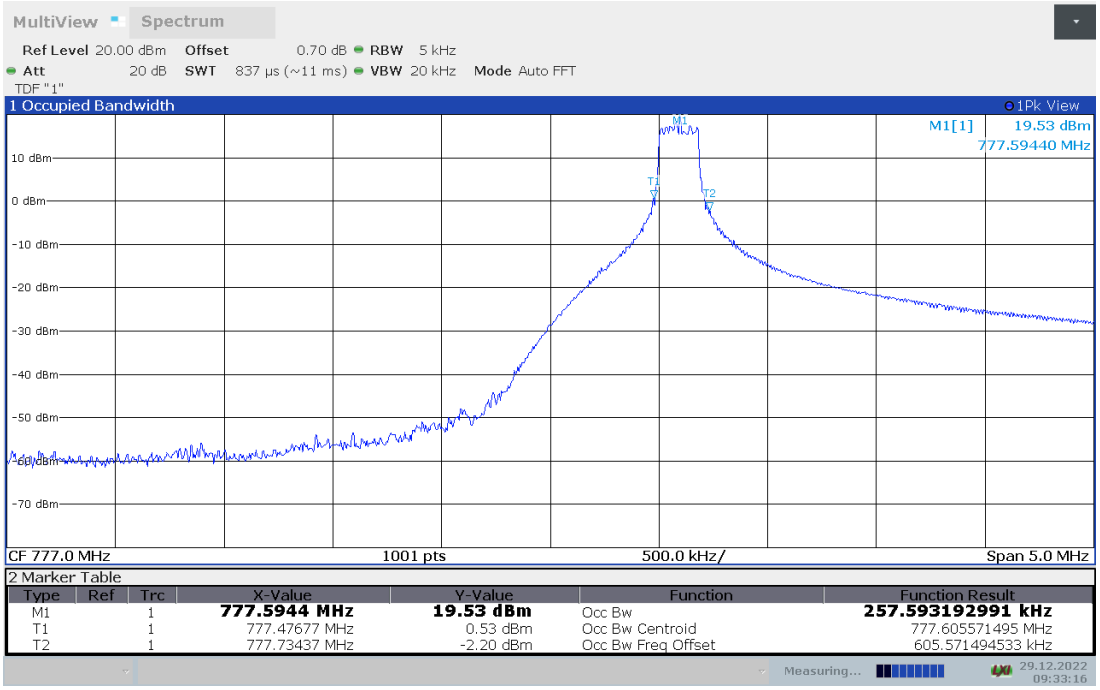
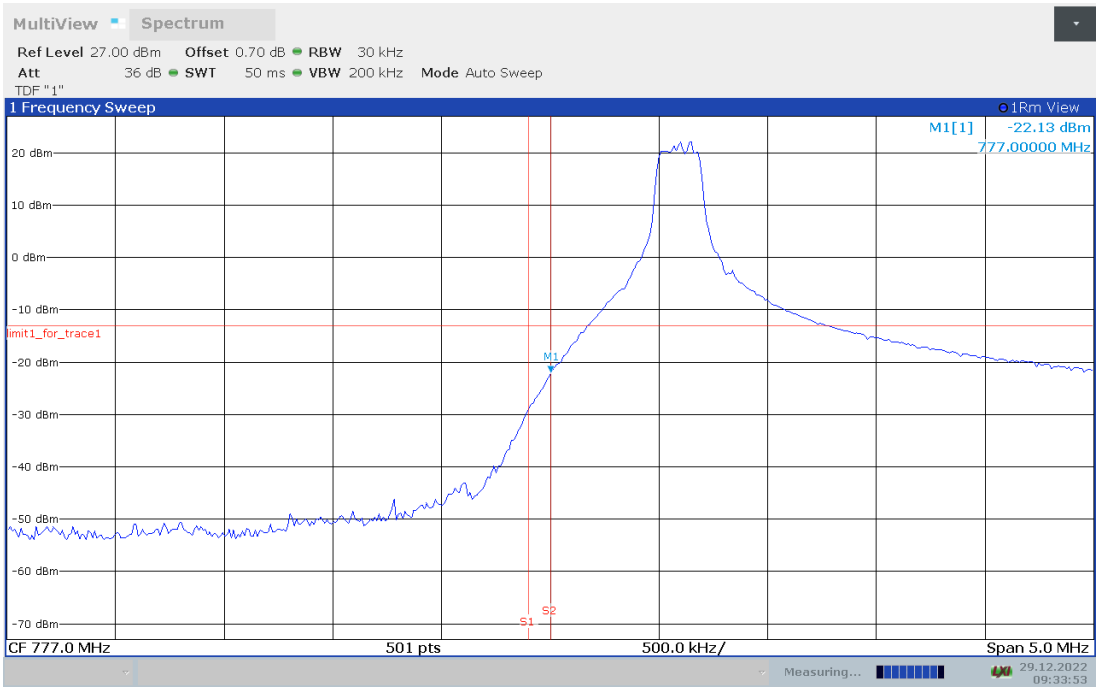
LTE band 13

OBW: 1RB-LOW_offset



LOW BAND EDGE BLOCK-1RB-LOW_offset



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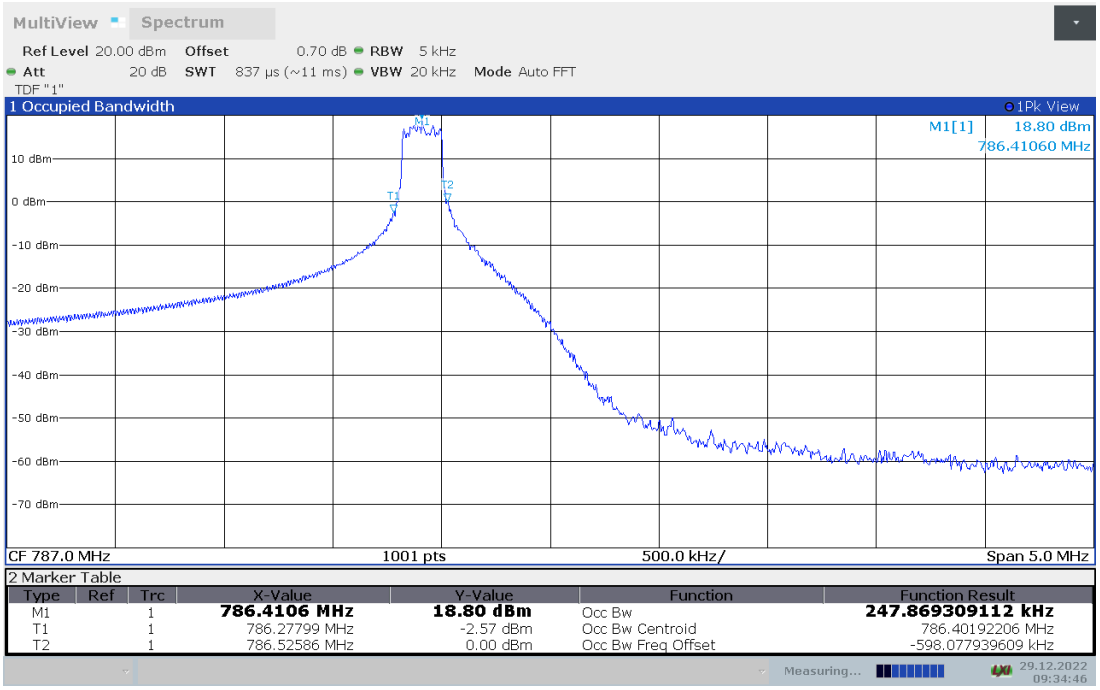
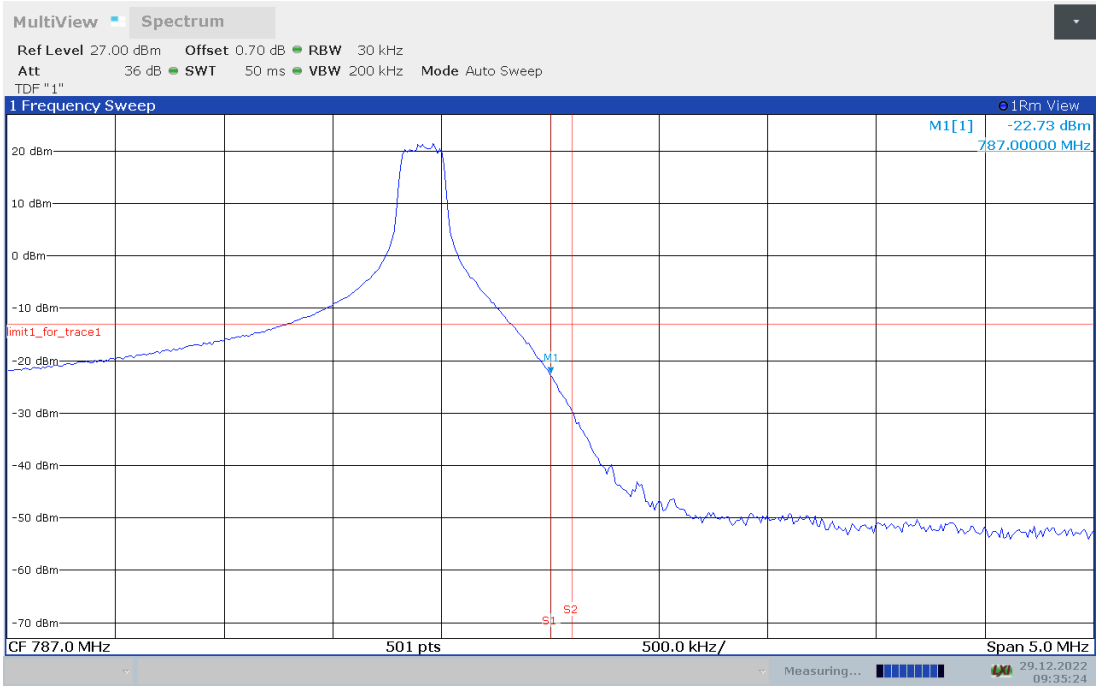
OBW: 1RB-HIGH_offset



HIGH BAND EDGE BLOCK-1RB-HIGH_offset



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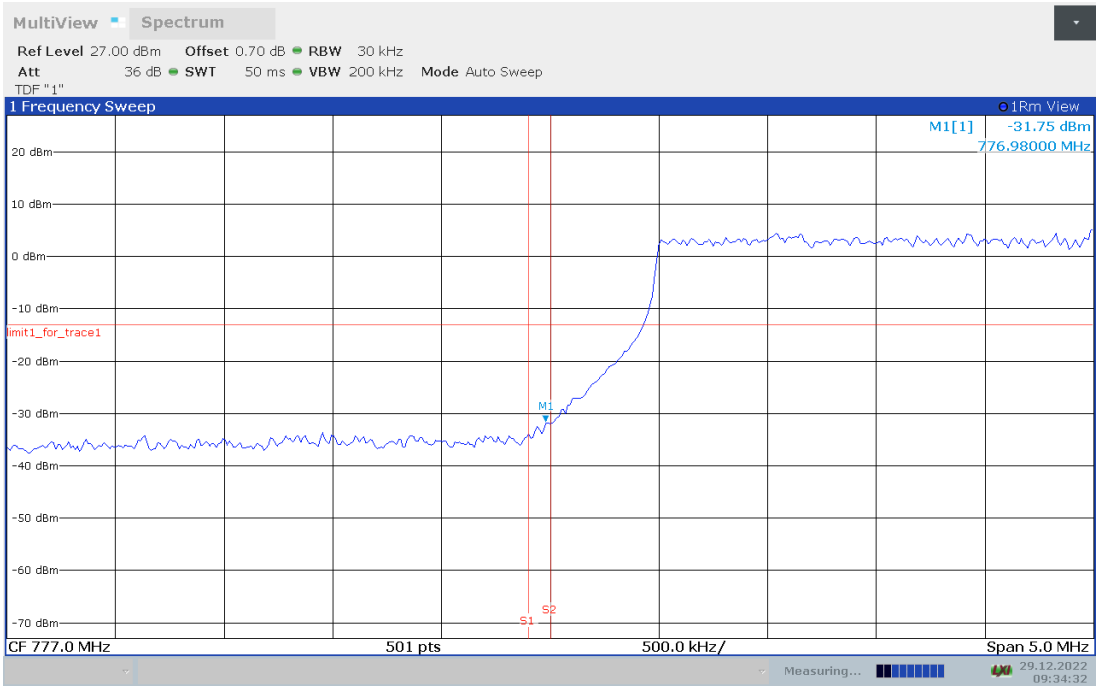
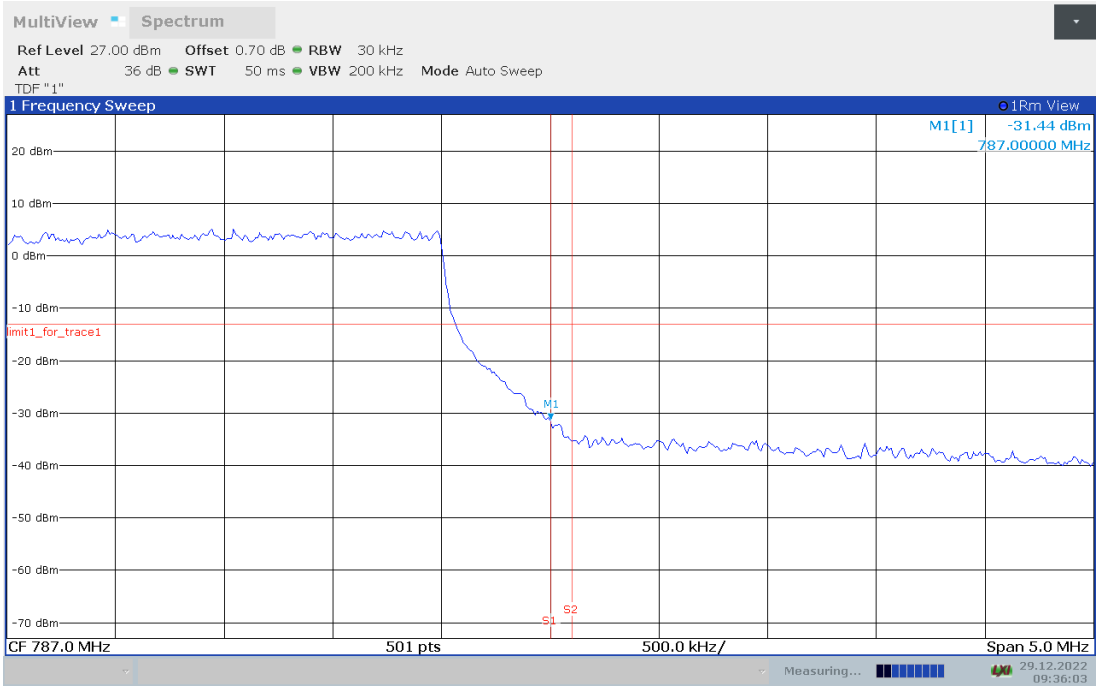
LOW BAND EDGE BLOCK-10M-100%RB



HIGH BAND EDGE BLOCK-10M-100%RB



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

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A.7 CONDUCTED SPURIOUS EMISSION

Reference

FCC: CFR Part 2.1051, 22.917, 24.238, 27.53.

A.7.1 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.
3. The number of sweep points of spectrum analyzer is set to 30001 which is greater than span/RBW.

A. 7.2 Measurement Limit

Part 22.917, Part 24，Part 27.53(c)238 and Part 27.53(h) 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.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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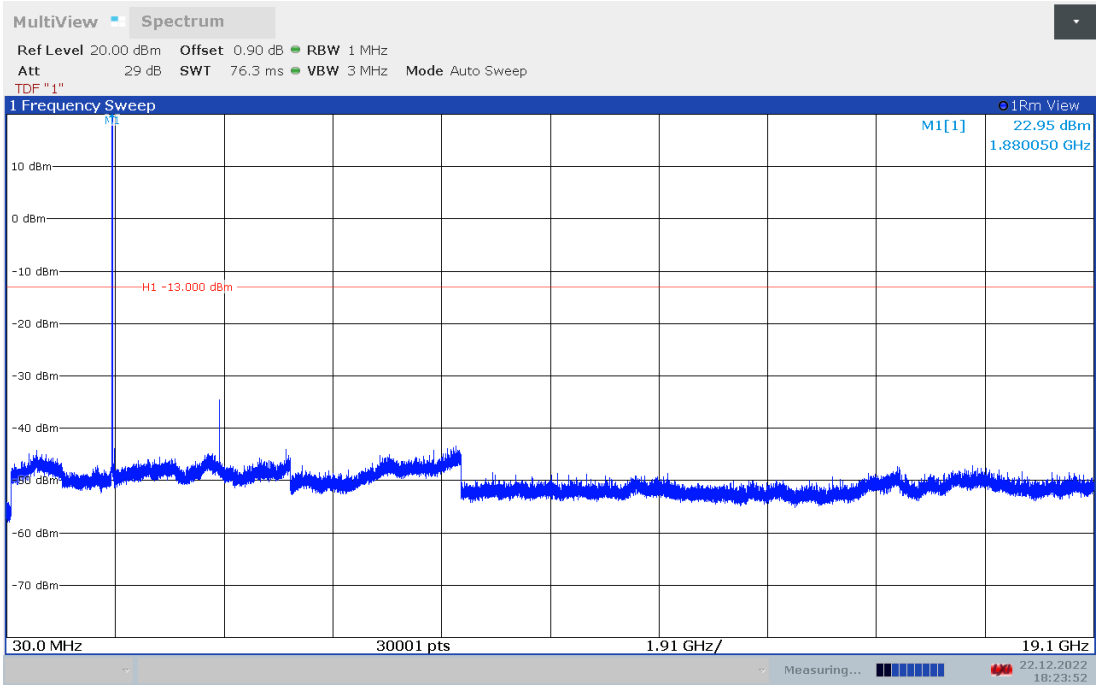
A. 7.3 Measurement result

Only worst case result is given below

LTE band 2 : 30MHz – 19.1GHz

Spurious emission limit –13dBm.

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



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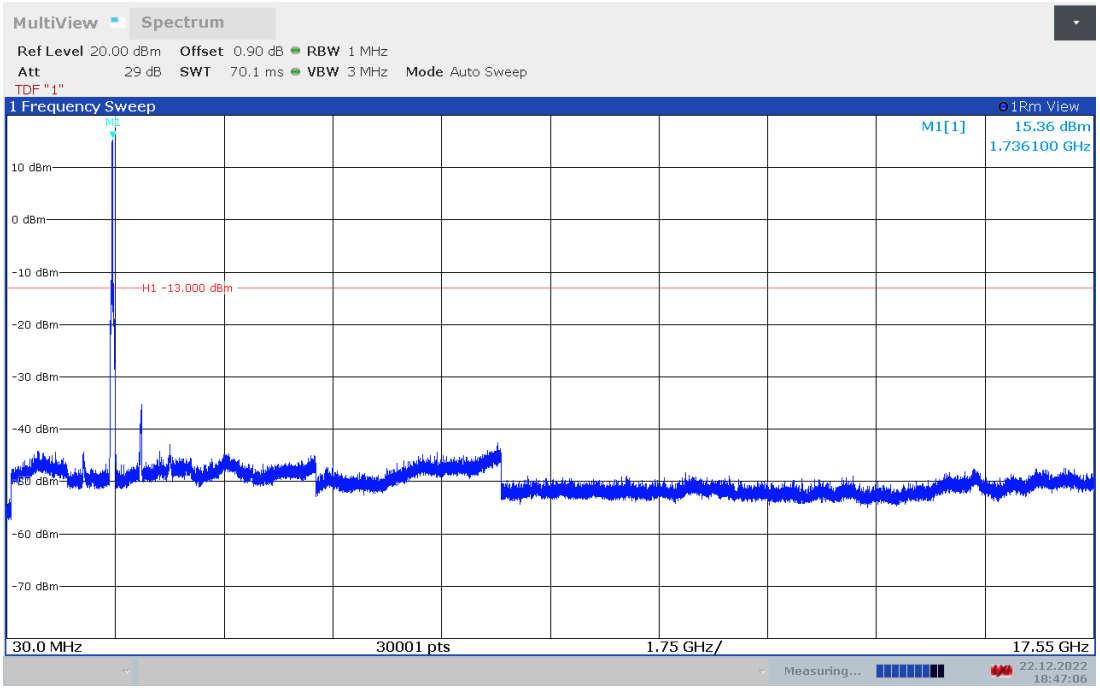
LTE band 4 : 30MHz – 17.55GHz

Spurious emission limit –13dBm.

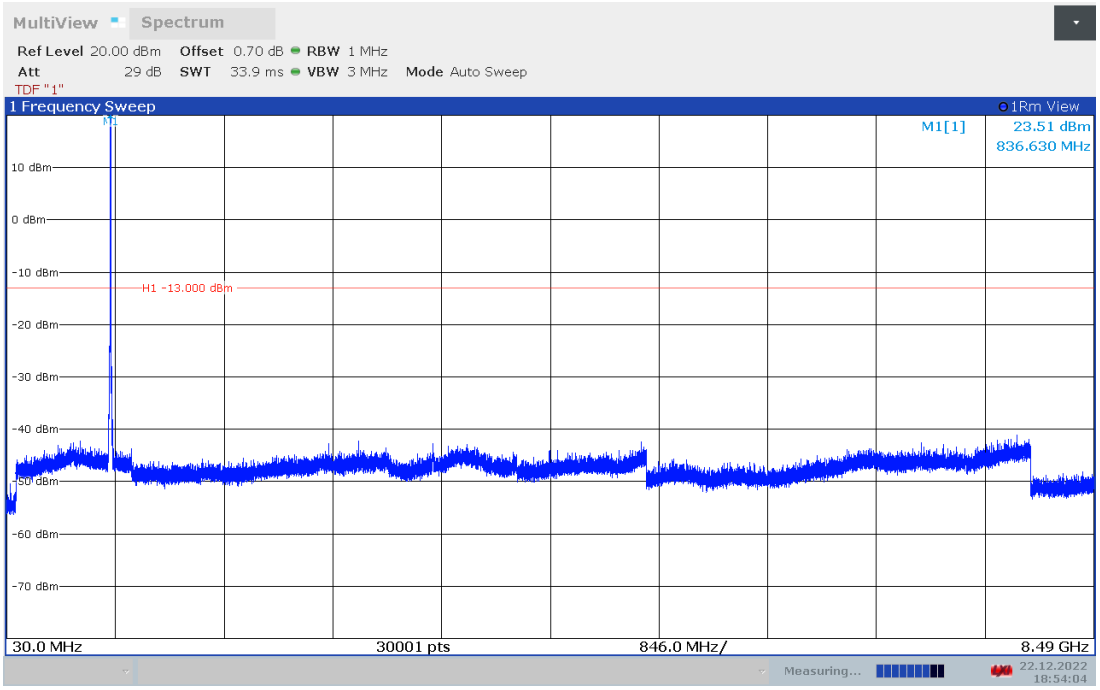
NOTE: peak above the limit line is the carrier frequency.



LTE band 5 20MHz QPSK: 30MHz – 8.49GHz

Spurious emission limit –25dBm.

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



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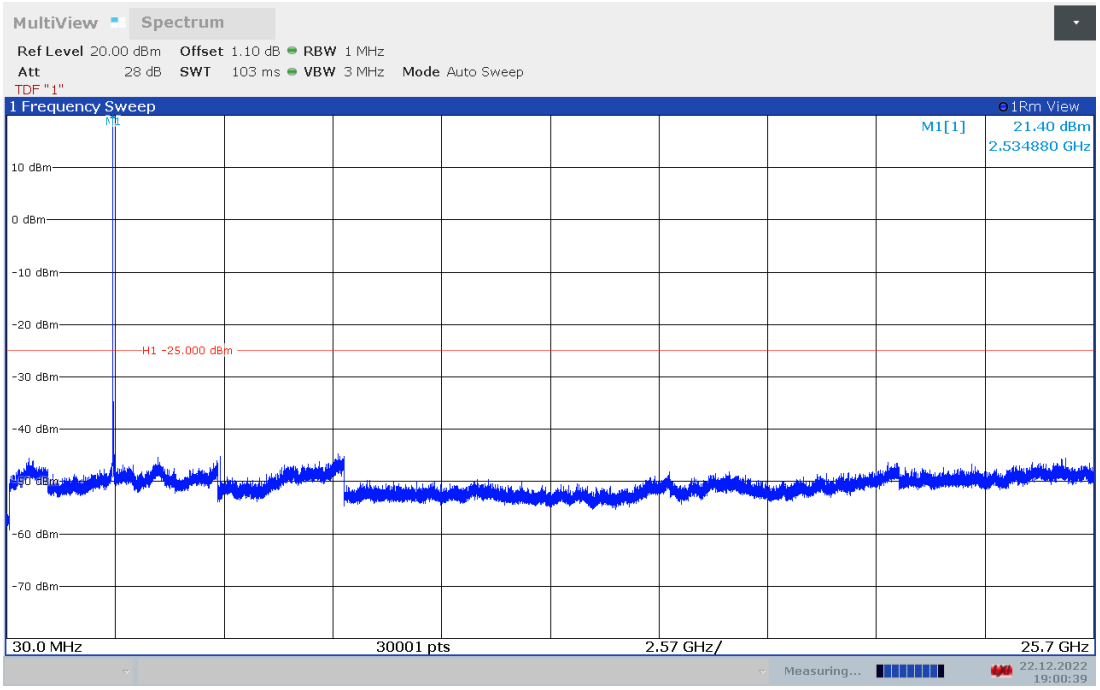
LTE band 7 20MHz QPSK: 30MHz – 25.7GHz

Spurious emission limit –25dBm.

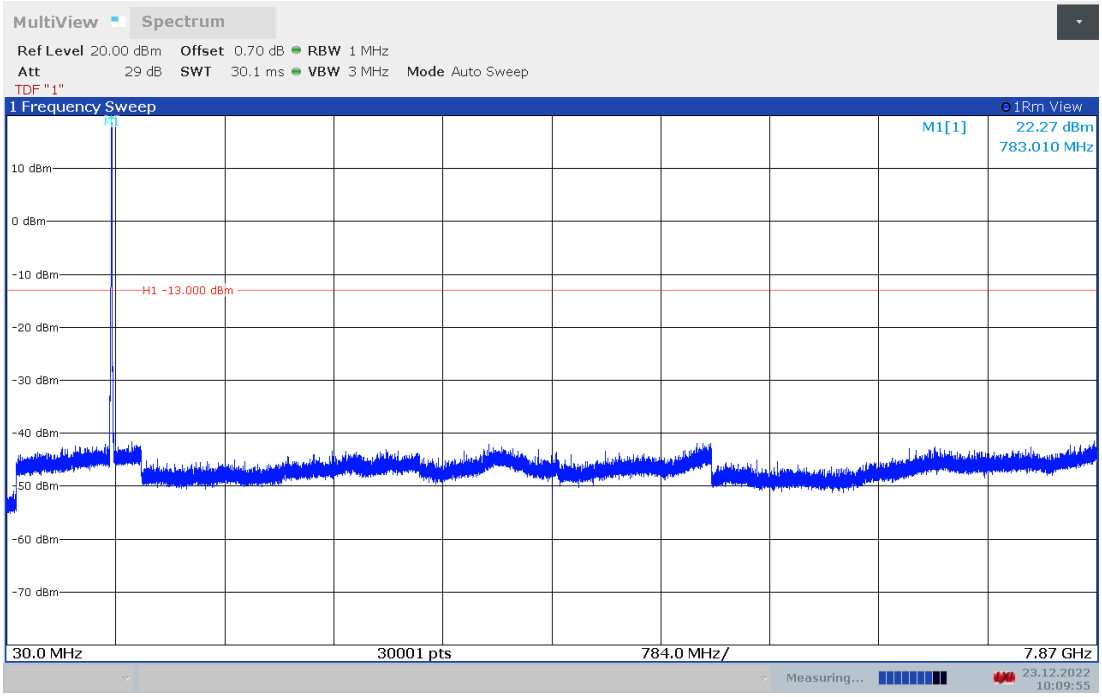
NOTE: peak above the limit line is the carrier frequency.



LTE band 13: 30MHz – 7.87GHz

Spurious emission limit –13dBm.

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



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A.8 PEAK-TO-AVERAGE POWER RATIO

Reference

FCC: CFR Part 24.232, 27.50(d), KDB971168 D01(5.7).

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 ≥ 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.8.1 Measurement limit

not exceed 13 dB

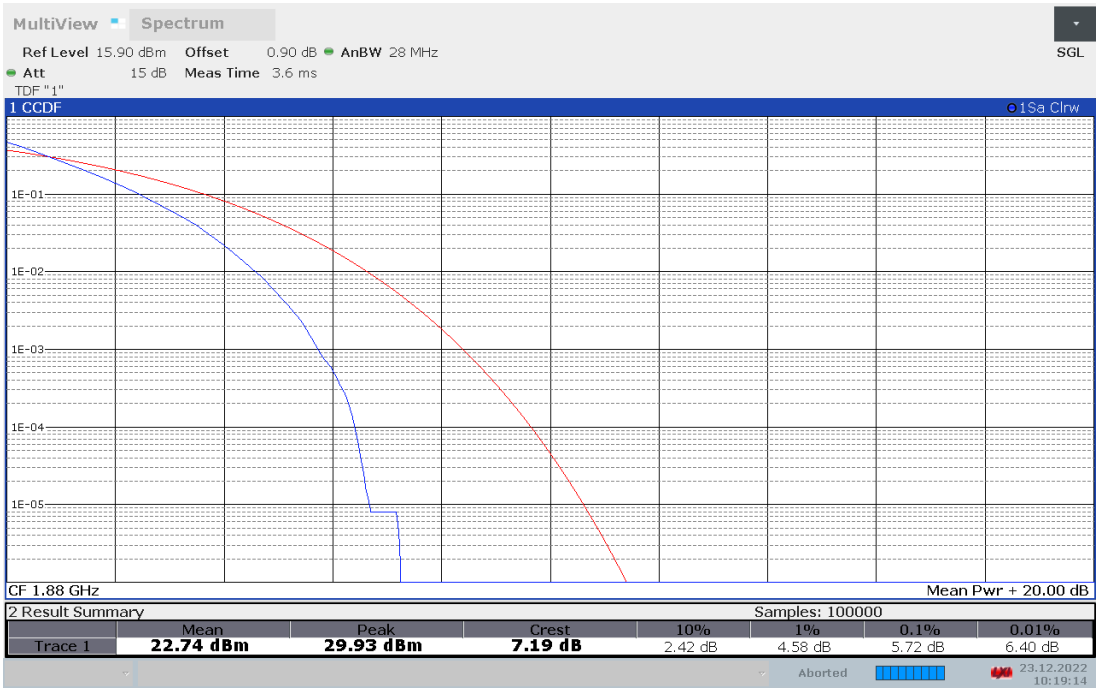
A.8.2 Measurement results

Only worst case result is given below

LTE band 2

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
1880.0	20	5.72	6.50

LTE band 2, 20MHz Bandwidth, QPSK (PAPR)



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LTE band 2, 20MHz Bandwidth, 16QAM (PAPR)

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LTE band 4

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
1732.5	20	6.16	6.84

LTE band 4, 20MHz Bandwidth, QPSK (PAPR)

LTE band 4, 20MHz Bandwidth, 16QAM (PAPR)

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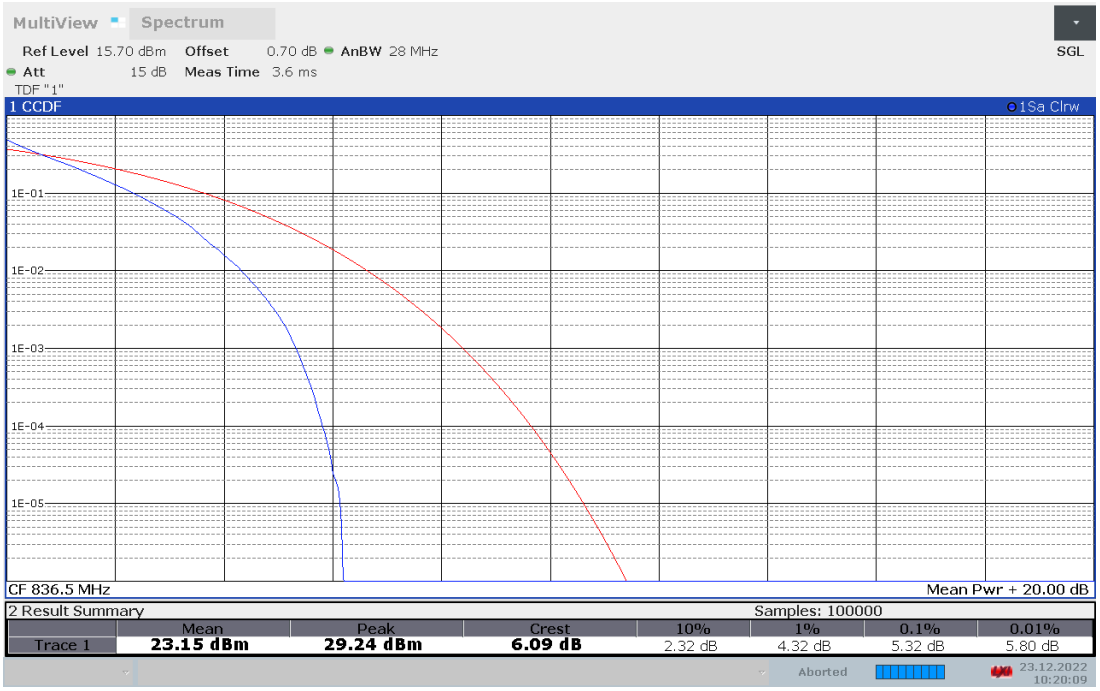
LTE band 5

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
826.5	10	5.32	6.06

LTE band 5, 10MHz Bandwidth, QPSK (PAPR)



LTE band 5, 10MHz Bandwidth, 16QAM (PAPR)

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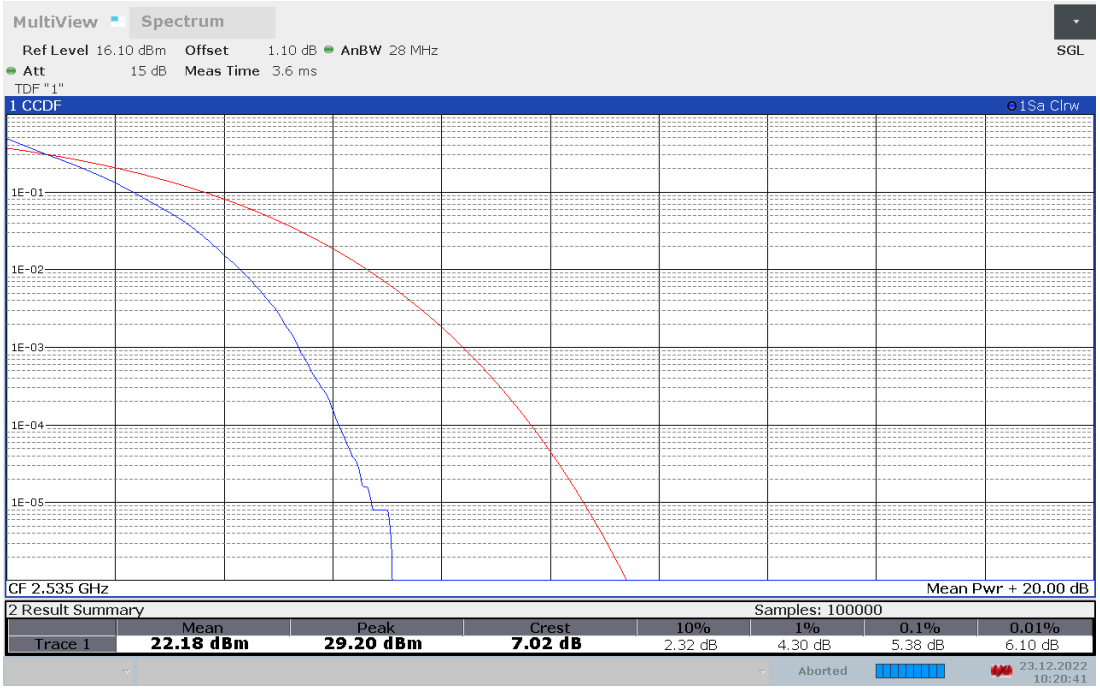
LTE band 7

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
2535.0	20	5.38	6.02

LTE band 7, 20MHz Bandwidth, QPSK (PAPR)



LTE band 7, 20MHz Bandwidth, 16QAM (PAPR)

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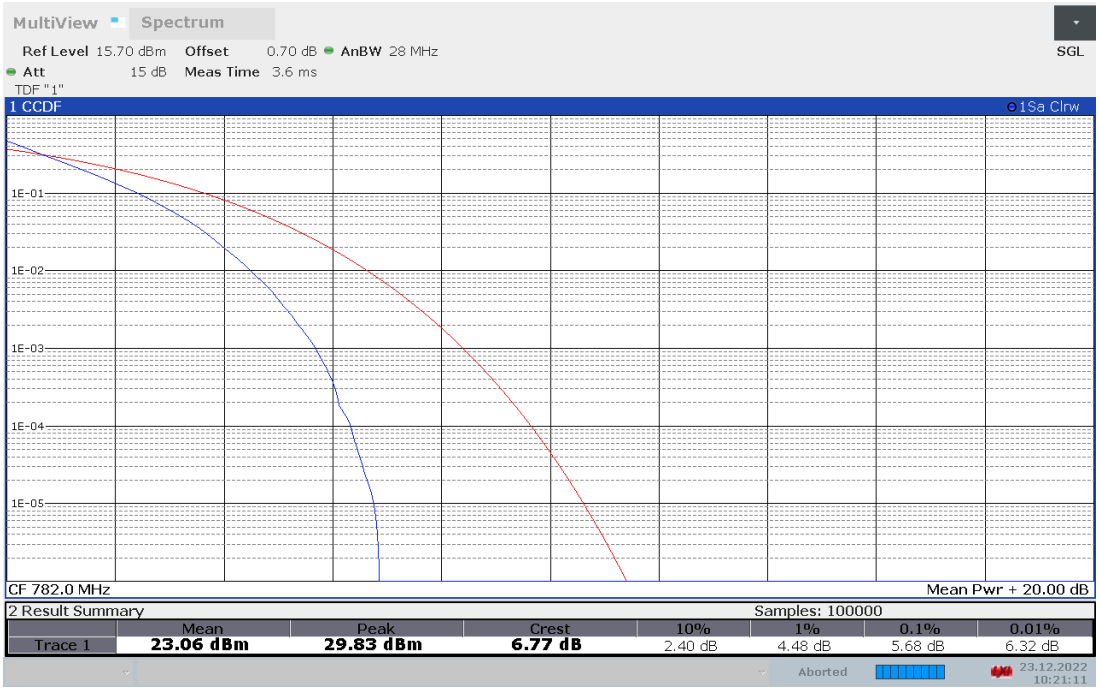
LTE band 13

Frequency(MHz)	Bandwidth(MHz)	PAPR(dB)	
		QPSK	16QAM
782.0	10	5.68	6.28

LTE band 13, 10MHz Bandwidth, QPSK (PAPR)



LTE band 13, 10MHz Bandwidth, 16QAM (PAPR)

Note: Expanded measurement uncertainty is U = 0.48, k = 2

*****END OF REPORT*****

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