



TEST REPORT

No.24T04N001383-006-RF LTE

for

HMD Global Oy

Mobile Phone

Model Name: TA-1659

FCC ID: 2AJOTTA-1659

with

Hardware Version: FF646-MB-V0.2

Software Version: 0.2422.11.01

Issued Date: 2024-08-12

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
24T04N001383-006-RF LTE	Rev.0	1st edition	2024-08-12

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1. SUMMARY OF TEST REPORT

1.1. Test Items

Description	Mobile Phone
Model Name	TA-1659
Brand Name	Nokia
Applicant's name	HMD Global Oy
Manufacturer's Name	HMD Global Oy

1.2. Test Standards

FCC Part 2/22/24/27	10-1-23 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

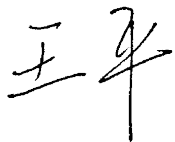
Address: Building G, Shenzhen International Innovation Center, No.1006 Shennan Road, Futian District, Shenzhen, Guangdong, P. R. China 518000

1.5. Project Data

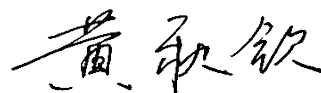
Testing Start Date: 2024-06-27

Testing End Date: 2024-07-20

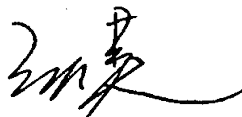
1.6. Signature



Wang Ping
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2. CLIENT INFORMATION

2.1. Applicant Information

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3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT

(AE)

3.1. About EUT

Description	Mobile Phone
Model Name	TA-1659
FCC ID	2AJOTTA-1659
Frequency Bands	LTE Bands 2/4/5/7/66
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

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
UT09aa	351368850001351	FF646-MB-V0.2	0.2422.11.01	2024-06-27
UT04aa	351368850001575	FF646-MB-V0.2	0.2422.11.01	2024-06-27

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

UT09aa are used for conduction test, UT04aa is used for radiation test.

3.3. Internal Identification of AE

AE ID* Description

AE1 Battery

AE1-1

Model	BA-L4M
Manufacturer	Guangdong Fenghua New Energy Co.,Ltd
Capacity	1450mAh
Nominal Voltage	3.7V

AE1-2

Model	BA-L4M
Manufacturer	SHENZHEN UTILITY ENERGYCO.,LTD.
Capacity	1450mAh
Nominal Voltage	3.7V

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

AE: ancillary equipment

3.4. General Description

The Equipment Under Test (EUT) is a model TA-1659 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.

4. REFERENCE DOCUMENTS

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

Reference	Title	Version
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-23 Edition
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-23 Edition
FCC Part 2	FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS	10-1-23 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-23 Edition
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB971168 D01	Power Meas License Digital Systems	v03r01

5. LABORATORY ENVIRONMENT

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

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

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

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz> 60 dB; 1MHz-18000MHz>90 dB
Electrical insulation	> 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

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

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 66

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(h)	A.4	P
5	Emission Bandwidth	2.1049/27.53(h)	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(a)/KDB971168 D01	A.8	P

7. STATEMENT

The Mobile Phone, TA-1659, HMD Global Oy is a variant of TA-1667 for testing. The differences between them do not affect the following test cases. Each test item has been spot check and the test results have not deteriorated.

According to the declaration, reused all other data from No.24T04N001372-004-RF LTE. For detail information please check the declaration provided by the manufacturer.

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

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

8. TEST EQUIPMENTS UTILIZED

No.	Description	Type	Manufacture	Series Number	Cal Due Date
1	Test Receiver	ESR7	R&S	101676	2024-11-22
2	Hybrid antenna	VULB 9163	Schwarzbeck	330	2027-04-21
3	Horn Antenna	3117	ETS-Lindgren	00066577	2025-04-17
4	Horn Antenna	QSH-SL-18-2 6-S-20	Q-par	17013	2026-02-01
5	Antenna	BBHA 9120D	Schwarzbeck	1593	2025-10-24
6	Antenna	QWH-SL-18-4 0-K-SG	Q-par	15979	2026-01-30
7	preamplifier	83017A	Agilent	MY39501110	/
8	Signal Generator	SMB100A	R&S	179725	2024-11-22
9	Fully Anechoic Chamber	FACT3-2.0	ETS-Lindgren	1285	2025-05-28
10	Spectrum Analyzer	FSV40	R&S	101192	2025-01-10
11	Universal Radio Communication Tester	CMU200	R&S	114545	2025-01-10
12	Universal Radio Communication Tester	CMW500	R&S	168719	2025-03-22
13	Power Supply	HMC8042	R&S	103284	2025-05-07
14	Universal Radio Communication Tester	CMW500	R&S	129146	2025-04-10
15	Spectrum Analyzer	FSW26	R&S	102197	2025-05-07
16	Temperature Chamber	SH-241	ESPEC	92007516	2024-10-15

Test software

Item	Name	Version
Radiated	EMC32	V10.50.40

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
1.4MHz	1 RB high	1909.3	22.66	22.81
		1880.0	22.73	22.37
		1850.7	22.49	22.47
	1 RB low	1909.3	22.66	22.69
		1880.0	22.73	22.11
		1850.7	22.54	22.67
	50% RB mid	1909.3	22.83	22.58
		1880.0	22.74	22.09
		1850.7	22.63	22.34
	100% RB	1909.3	22.34	21.29
		1880.0	22.23	21.13
		1850.7	21.97	21.16
3MHz	1 RB high	1908.5	22.73	22.75
		1880.0	22.68	22.20
		1851.5	22.57	22.47
	1 RB low	1908.5	22.69	22.76
		1880.0	22.62	22.14
		1851.5	22.59	22.46
	50% RB mid	1908.5	22.36	21.62
		1880.0	22.11	21.36
		1851.5	22.07	21.41
	100% RB	1908.5	22.34	21.57

Bandwidth	RB size/offset	Frequency(MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	1880.0	22.17	21.39
		1851.5	22.00	21.47
		1907.5	22.71	22.34
	1 RB low	1880.0	22.56	22.57
		1852.5	22.57	22.71
		1907.5	22.70	22.13
	50% RB mid	1880.0	22.43	22.51
		1852.5	22.47	22.42
		1907.5	22.07	21.34
	100% RB	1880.0	22.18	21.36
		1852.5	22.10	21.17
		1907.5	22.26	21.25
		1880.0	22.09	21.46
		1852.5	22.14	21.06
		1905.0	22.62	22.37
10MHz	1 RB high	1880.0	22.54	22.52
		1855.0	22.51	22.55
		1905.0	22.62	22.25
	1 RB low	1880.0	22.42	22.57
		1855.0	22.45	22.51
		1905.0	22.07	21.37
	50% RB mid	1880.0	22.08	21.44
		1855.0	21.95	21.11
		1905.0	22.07	21.46
	100% RB	1880.0	22.02	21.33
		1855.0	22.10	21.04
		1902.5	22.61	22.73
15MHz	1 RB high	1880.0	22.38	22.59
		1857.5	22.43	22.52
		1902.5	22.58	22.55
	1 RB low	1880.0	22.35	22.68
		1857.5	22.50	22.47
		1902.5	22.15	21.39
	50% RB mid	1880.0	22.00	21.40
		1857.5	22.01	21.26
		1902.5	22.20	21.49
	100% RB	1880.0	22.06	21.35
		1857.5	22.06	21.31
		1902.5	22.06	21.31

Bandwidth	RB size/offset	Frequency(MHz)	Power(dBm)	
			QPSK	16QAM
20MHz	1 RB high	1900.0	22.63	22.34
		1880.0	22.64	22.22
		1860.0	22.45	22.33
	1 RB low	1900.0	22.55	22.15
		1880.0	22.52	22.18
		1860.0	22.34	22.45
	50% RB mid	1900.0	22.12	21.38
		1880.0	22.14	21.24
		1860.0	22.10	21.02
	100% RB	1900.0	22.04	21.44
		1880.0	22.15	21.33
		1860.0	21.96	21.02

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

LTE band 4

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1754.3	22.64	22.79
		1732.5	22.57	22.61
		1710.7	22.54	22.25
	1 RB low	1754.3	22.66	22.79
		1732.5	22.59	22.70
		1710.7	22.54	22.28
	50% RB mid	1754.3	22.82	22.40
		1732.5	22.61	22.35
		1710.7	22.70	22.47
	100% RB	1754.3	22.31	21.12
		1732.5	22.07	21.08
		1710.7	22.28	21.21
3MHz	1 RB high	1753.5	22.68	22.72
		1732.5	22.41	22.10
		1711.5	22.67	22.61
	1 RB low	1753.5	22.65	22.88
		1732.5	22.46	22.12
		1711.5	22.68	22.86
	50% RB mid	1753.5	22.27	21.39
		1732.5	22.15	21.26
		1711.5	22.23	21.45
	100% RB	1753.5	22.23	21.42
		1732.5	22.10	21.24
		1711.5	22.29	21.34
5MHz	1 RB high	1752.5	22.59	22.81
		1732.5	22.62	22.11
		1712.5	22.48	22.74
	1 RB low	1752.5	22.60	22.71
		1732.5	22.58	22.11
		1712.5	22.51	22.86
	50% RB mid	1752.5	22.29	21.36
		1732.5	22.04	21.21
		1712.5	22.15	21.34
	100% RB	1752.5	22.28	21.23
		1732.5	22.16	21.18
		1712.5	22.25	21.16
10MHz	1 RB high	1750.0	22.66	22.93
		1732.5	22.52	22.73
		1715.0	22.43	22.65

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
	1 RB low	1750.0	22.69	22.81
		1732.5	22.38	22.78
		1715.0	22.59	22.86
	50% RB mid	1750.0	22.30	21.23
		1732.5	22.19	21.15
		1715.0	22.20	21.18
	100% RB	1750.0	22.34	21.26
		1732.5	22.14	21.18
		1715.0	22.23	21.24
15MHz	1 RB high	1747.5	22.70	22.76
		1732.5	22.60	22.19
		1717.5	22.57	22.68
	1 RB low	1747.5	22.76	22.85
		1732.5	22.57	22.15
		1717.5	22.74	22.91
	50% RB mid	1747.5	22.19	21.22
		1732.5	22.19	21.18
		1717.5	22.20	21.18
	100% RB	1747.5	22.26	21.32
		1732.5	22.06	21.21
		1717.5	22.14	21.20
20MHz	1 RB high	1745.0	22.62	22.85
		1732.5	22.46	22.73
		1720.0	22.56	22.64
	1 RB low	1745.0	22.64	22.88
		1732.5	22.49	22.88
		1720.0	22.71	22.83
	50% RB mid	1745.0	22.16	21.30
		1732.5	22.03	21.17
		1720.0	22.26	21.24
	100% RB	1745.0	22.21	21.20
		1732.5	22.09	21.28
		1720.0	22.23	21.23

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

LTE band 5

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	22.82	22.72
		836.5	22.53	22.63
		824.7	22.61	22.26
	1 RB low	848.3	22.59	22.67
		836.5	22.39	22.63
		824.7	22.61	22.25
	50% RB mid	848.3	22.77	22.46
		836.5	22.71	22.58
		824.7	22.80	22.56
	100% RB	848.3	22.29	21.47
		836.5	22.23	21.35
		824.7	22.28	21.49
3MHz	1 RB high	847.5	22.79	22.20
		836.5	22.52	22.14
		825.5	22.61	22.58
	1 RB low	847.5	22.70	22.09
		836.5	22.54	22.10
		825.5	22.57	22.75
	50% RB mid	847.5	22.27	21.46
		836.5	22.13	21.68
		825.5	22.31	21.66
	100% RB	847.5	22.27	21.36
		836.5	22.23	21.69
		825.5	22.28	21.71
5MHz	1 RB high	846.5	22.70	22.36
		836.5	22.56	23.10
		826.5	22.57	22.15
	1 RB low	846.5	22.48	22.22
		836.5	22.57	22.74
		826.5	22.66	22.12
	50% RB mid	846.5	22.22	21.41
		836.5	22.18	21.64
		826.5	22.27	21.65
	100% RB	846.5	22.21	21.37
		836.5	22.18	21.77
		826.5	22.17	21.75
10MHz	1 RB high	844.0	22.76	22.87
		836.5	22.74	22.17
		829.0	22.75	22.81

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
	1 RB low	844.0	22.69	23.04
		836.5	22.52	22.05
		829.0	22.74	22.83
	50% RB mid	844.0	22.28	21.22
		836.5	22.30	21.63
		829.0	22.21	21.43
	100% RB	844.0	22.32	21.29
		836.5	22.21	21.67
		829.0	22.26	21.23

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

LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
5MHz	1 RB high	2567.5	22.06	21.50
		2535.0	22.24	21.94
		2502.5	22.43	22.10
	1 RB low	2567.5	21.98	21.71
		2535.0	22.32	21.90
		2502.5	22.51	22.15
	50% RB mid	2567.5	21.67	20.72
		2535.0	21.91	20.91
		2502.5	22.12	21.06
	100% RB	2567.5	21.70	20.95
		2535.0	21.79	21.22
		2502.5	22.16	21.30
10MHz	1 RB high	2565.0	21.95	21.73
		2535.0	22.18	22.46
		2505.0	22.52	22.14
	1 RB low	2565.0	21.97	21.63
		2535.0	22.33	22.52
		2505.0	22.40	22.10
	50% RB mid	2565.0	21.58	21.00
		2535.0	21.79	21.19
		2505.0	22.08	21.06
	100% RB	2565.0	21.70	20.77
		2535.0	21.90	20.88
		2505.0	22.09	21.12
15MHz	1 RB high	2562.5	22.02	22.37
		2535.0	22.28	22.58
		2507.5	22.30	22.76
	1 RB low	2562.5	22.00	22.34
		2535.0	22.19	22.57
		2507.5	22.42	22.77
	50% RB mid	2562.5	21.77	20.61
		2535.0	21.91	20.93
		2507.5	21.99	21.10
	100% RB	2562.5	21.61	20.79
		2535.0	21.83	21.01
		2507.5	22.03	21.13
20MHz	1 RB high	2560.0	22.20	22.51

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
		2535.0	22.36	22.29
		2510.0	22.46	22.84
	1 RB low	2560.0	22.18	22.37
		2535.0	22.26	22.24
		2510.0	22.34	22.78
	50% RB mid	2560.0	21.70	20.85
		2535.0	21.90	20.94
		2510.0	22.10	21.07
	100% RB	2560.0	21.77	20.82
		2535.0	21.81	20.94
		2510.0	22.04	21.15

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

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Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1779.3	22.87	22.41
		1745.0	22.55	22.29
		1710.7	22.65	22.57
	1 RB low	1779.3	22.76	22.46
		1745.0	22.47	22.35
		1710.7	22.63	22.78
	50% RB mid	1779.3	22.92	22.68
		1745.0	22.78	22.33
		1710.7	22.61	22.49
	100% RB	1779.3	22.39	21.09
		1745.0	22.11	21.12
		1710.7	22.17	20.92
3MHz	1 RB high	1778.5	22.71	22.43
		1745.0	22.57	22.68
		1711.5	22.46	22.55
	1 RB low	1778.5	22.75	22.42
		1745.0	22.55	22.67
		1711.5	22.53	22.73
	50% RB mid	1778.5	22.34	21.46
		1745.0	22.17	21.33
		1711.5	22.14	21.29
	100% RB	1778.5	22.30	21.42
		1745.0	22.13	21.34
		1711.5	22.09	21.29
5MHz	1 RB high	1777.5	22.89	22.69
		1745.0	22.64	22.68
		1712.5	22.56	22.94
	1 RB low	1777.5	22.84	23.08
		1745.0	22.70	22.72
		1712.5	22.56	22.77
	50% RB mid	1777.5	22.35	21.48
		1745.0	22.06	21.23
		1712.5	22.18	21.25
	100% RB	1777.5	22.46	21.37
		1745.0	22.18	21.17
		1712.5	22.19	21.33
10MHz	1 RB high	1775.0	22.74	22.32

Bandwidth	RB size/offset	Frequency (MHz)	Power(dBm)	
			QPSK	16QAM
		1745.0	22.62	22.21
		1715.0	22.45	22.54
		1775.0	22.71	22.41
	1 RB low	1745.0	22.62	22.04
		1715.0	22.51	22.71
		1775.0	22.42	21.55
	50% RB mid	1745.0	22.21	21.44
		1715.0	22.48	21.38
		1775.0	22.46	21.40
	100% RB	1745.0	22.06	21.26
		1715.0	22.42	21.43
		1772.5	22.76	22.94
15MHz	1 RB high	1745.0	22.67	22.21
		1717.5	22.63	22.60
		1772.5	22.71	23.02
	1 RB low	1745.0	22.72	22.23
		1717.5	22.68	22.72
		1772.5	22.38	21.80
	50% RB mid	1745.0	22.15	21.26
		1717.5	22.18	21.14
		1772.5	22.32	21.76
	100% RB	1745.0	22.13	21.30
		1717.5	22.24	21.19
20MHz	1 RB high	1770.0	22.76	22.90
		1745.0	22.63	22.25
		1720.0	22.65	22.05
	1 RB low	1770.0	22.72	22.95
		1745.0	22.62	22.46
		1720.0	22.62	22.06
	50% RB mid	1770.0	22.22	21.44
		1745.0	22.17	21.25
		1720.0	22.17	21.48
	100% RB	1770.0	22.25	21.44
		1745.0	22.15	21.26
		1720.0	22.16	21.47

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

A.1.3 Radiated

A.1.3.1 Description

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

Rule Part 24.232(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(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP".

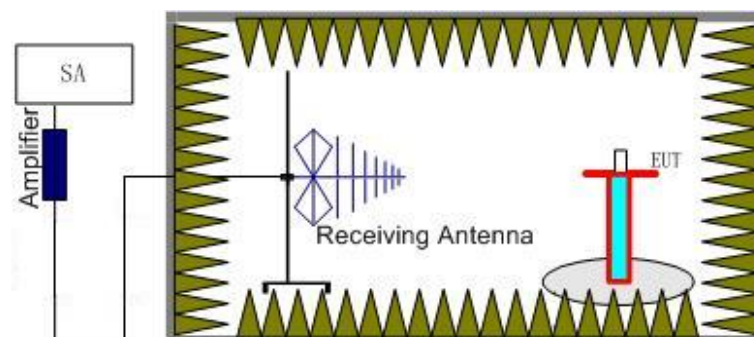
Rule Part 27.50(c) specifies "Portable stations (hand-held de-vices) are limited to 3 watts ERP".

Rule Part 27.50(a)(3) specifies "For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth."

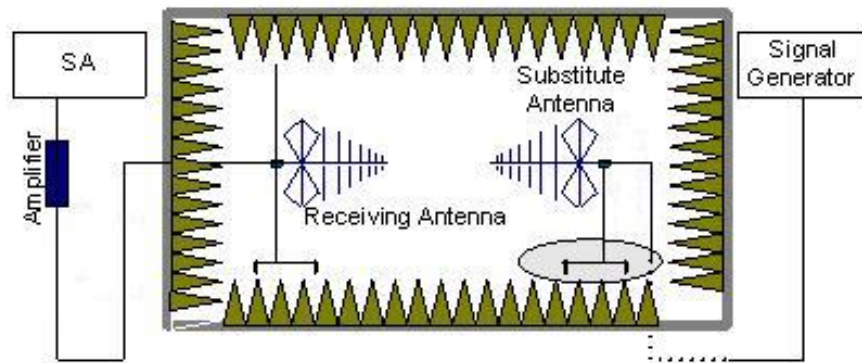
Rule Part 22.913(a) specifies "The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts."

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.



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:

$$\text{Power (EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

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, $ERP = EIRP - 2.15\text{dB}$.

A.1.3.3 Measurement result

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

Limits: $\leq 33\text{dBm}$ (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	-15.56	-29.30	8.10	21.84	33.00	H
1880.00	-15.70	-29.40	8.10	21.80	33.00	H
1909.30	-15.64	-29.30	8.10	21.76	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	-15.77	-29.30	8.10	21.63	33.00	H
1880.00	-15.88	-29.40	8.10	21.62	33.00	H
1908.50	-15.89	-29.30	8.10	21.51	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	-15.91	-29.30	8.10	21.49	33.00	H
1880.00	-16.00	-29.40	8.10	21.50	33.00	H
1907.50	-16.05	-29.30	8.10	21.35	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	-15.79	-29.30	8.10	21.61	33.00	H
1880.00	-15.96	-29.40	8.10	21.54	33.00	H
1905.00	-15.86	-29.30	8.10	21.54	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	-15.80	-29.30	8.10	21.60	33.00	H
1880.00	-16.01	-29.40	8.10	21.49	33.00	H
1902.50	-16.03	-29.30	8.10	21.37	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	-15.86	-29.30	8.10	21.54	33.00	H
1880.00	-16.11	-29.40	8.10	21.39	33.00	H
1900.00	-16.00	-29.30	8.10	21.40	33.00	H

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	-16.68	-29.30	8.10	20.72	33.00	H
1880.00	-16.79	-29.40	8.10	20.71	33.00	H
1909.30	-16.90	-29.30	8.10	20.50	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	-16.76	-29.30	8.10	20.64	33.00	H
1880.00	-17.00	-29.40	8.10	20.50	33.00	H
1908.50	-17.07	-29.30	8.10	20.33	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	-17.06	-29.30	8.10	20.34	33.00	H
1880.00	-17.17	-29.40	8.10	20.33	33.00	H
1907.50	-17.34	-29.30	8.10	20.06	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	-16.93	-29.30	8.10	20.47	33.00	H
1880.00	-17.09	-29.40	8.10	20.41	33.00	H
1905.00	-16.99	-29.30	8.10	20.41	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	-17.01	-29.30	8.10	20.39	33.00	H
1880.00	-17.23	-29.40	8.10	20.27	33.00	H
1902.50	-17.24	-29.30	8.10	20.16	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	-17.05	-29.30	8.10	20.35	33.00	H
1880.00	-17.37	-29.40	8.10	20.13	33.00	H
1900.00	-17.19	-29.30	8.10	20.21	33.00	H

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	-16.33	-29.60	8.10	21.38	30.00	H
1732.50	-16.00	-29.60	8.10	21.70	30.00	H
1754.30	-15.95	-29.50	8.10	21.65	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	-16.54	-29.60	8.10	21.16	30.00	H
1732.50	-16.18	-29.60	8.10	21.52	30.00	H
1753.50	-16.20	-29.50	8.10	21.40	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	-16.68	-29.60	8.10	21.02	30.00	H
1732.50	-16.30	-29.60	8.10	21.40	30.00	H
1752.50	-16.36	-29.50	8.10	21.24	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	-16.56	-29.60	8.10	21.14	30.00	H
1732.50	-16.26	-29.60	8.10	21.44	30.00	H
1750.00	-16.16	-29.50	8.10	21.44	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	-16.56	-29.60	8.10	21.14	30.00	H
1732.50	-16.31	-29.60	8.10	21.39	30.00	H
1747.50	-16.34	-29.50	8.10	21.26	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	-16.62	-29.60	8.10	21.08	30.00	H
1732.50	-16.41	-29.60	8.10	21.29	30.00	H
1745.00	-16.30	-29.50	8.10	21.30	30.00	H

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	-17.45	-29.60	8.10	20.25	30.00	H
1732.50	-17.09	-29.60	8.10	20.61	30.00	H
1754.30	-17.20	-29.50	8.10	20.40	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	-17.53	-29.60	8.10	20.17	30.00	H
1732.50	-17.30	-29.60	8.10	20.40	30.00	H
1753.50	-17.38	-29.50	8.10	20.22	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	-17.82	-29.60	8.10	19.88	30.00	H
1732.50	-17.47	-29.60	8.10	20.23	30.00	H
1752.50	-17.65	-29.50	8.10	19.95	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	-17.69	-29.60	8.10	20.01	30.00	H
1732.50	-17.39	-29.60	8.10	20.31	30.00	H
1750.00	-17.30	-29.50	8.10	20.30	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	-17.78	-29.60	8.10	19.92	30.00	H
1732.50	-17.53	-29.60	8.10	20.17	30.00	H
1747.50	-17.55	-29.50	8.10	20.05	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	-17.82	-29.60	8.10	19.88	30.00	H
1732.50	-17.67	-29.60	8.10	20.03	30.00	H
1745.00	-17.50	-29.50	8.10	20.10	30.00	H

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	-9.06	-33.60	-0.79	2.15	21.59	38.45	V
836.50	-9.22	-33.50	-0.74	2.15	21.39	38.45	V
848.30	-9.20	-33.50	-0.73	2.15	21.41	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	-9.19	-33.60	-0.84	2.15	21.42	38.45	V
836.50	-9.40	-33.50	-0.74	2.15	21.21	38.45	V
847.50	-9.41	-33.50	-0.73	2.15	21.21	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	-9.27	-33.60	-0.84	2.15	21.34	38.45	V
836.50	-9.51	-33.50	-0.74	2.15	21.10	38.45	V
846.50	-9.51	-33.50	-0.73	2.15	21.10	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	-9.35	-33.60	-0.84	2.15	21.26	38.45	V
836.50	-9.58	-33.50	-0.74	2.15	21.03	38.45	V
844.00	-9.56	-33.50	-0.78	2.15	21.00	38.45	V

LTE Band 5_1.4MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{ci} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
824.70	-10.08	-33.60	-0.79	2.15	20.57	38.45	V
836.50	-10.24	-33.50	-0.74	2.15	20.38	38.45	V
848.30	-10.36	-33.50	-0.73	2.15	20.26	38.45	V

LTE Band 5_3MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{ci} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
825.50	-10.18	-33.60	-0.84	2.15	20.43	38.45	V
836.50	-10.43	-33.50	-0.74	2.15	20.19	38.45	V
847.50	-10.49	-33.50	-0.73	2.15	20.13	38.45	V

LTE Band 5_5MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{ci} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
826.50	-10.31	-33.60	-0.84	2.15	20.30	38.45	V
836.50	-10.59	-33.50	-0.74	2.15	20.02	38.45	V
846.50	-10.52	-33.50	-0.73	2.15	20.10	38.45	V

LTE Band 5_10MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{ci} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	Correction (dB)	ERP(dBm)	Limit(dBm)	Polarization
829.00	-10.38	-33.60	-0.84	2.15	20.23	38.45	V
836.50	-10.62	-33.50	-0.74	2.15	20.00	38.45	V
844.00	-10.60	-33.50	-0.78	2.15	19.97	38.45	V

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	-17.12	-28.70	10.70	22.28	33.00	H
2535.00	-16.94	-28.60	10.70	22.36	33.00	H
2567.50	-17.17	-28.60	10.70	22.13	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	-17.43	-28.70	10.70	21.97	33.00	H
2535.00	-17.16	-28.60	10.70	22.14	33.00	H
2565.00	-17.47	-28.60	10.70	21.83	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	-17.51	-28.70	10.70	21.89	33.00	H
2535.00	-17.35	-28.60	10.70	21.95	33.00	H
2562.50	-17.49	-28.60	10.70	21.81	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	-17.81	-28.70	10.70	21.59	33.00	H
2535.00	-17.50	-28.60	10.70	21.80	33.00	H
2560.00	-17.83	-28.60	10.70	21.47	33.00	H

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	-18.19	-28.70	10.70	21.21	33.00	H
2535.00	-18.08	-28.60	10.70	21.22	33.00	H
2567.50	-18.08	-28.60	10.70	21.22	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	-18.39	-28.60	10.70	20.91	33.00	H
2565.00	-18.75	-28.60	10.70	20.55	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	-18.25	-28.70	10.70	21.15	33.00	H
2535.00	-18.24	-28.60	10.70	21.06	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	-18.78	-28.70	10.70	20.62	33.00	H
2535.00	-18.55	-28.60	10.70	20.75	33.00	H
2560.00	-18.80	-28.60	10.70	20.50	33.00	H

LTE Band 66- EIRP Part 27.50(d)(4)

Limits: ≤30dBm (1W)

LTE Band 66_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	-15.61	-29.60	8.10	22.09	30.00	H
1745.00	-15.77	-29.50	8.10	21.83	30.00	H
1779.30	-15.60	-29.50	8.10	22.00	30.00	H

LTE Band 66_3MHz_QPSK

Frequency(MHz)	P _{Mea} (dBm)	P _{cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1711.50	-15.83	-29.60	8.10	21.87	30.00	H
1745.00	-15.95	-29.50	8.10	21.65	30.00	H
1778.50	-15.85	-29.50	8.10	21.75	30.00	H

LTE Band 66_5MHz_QPSK

Frequency(MHz)	P _{Mea} (dBm)	P _{cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.50	-15.97	-29.60	8.10	21.73	30.00	H
1745.00	-16.07	-29.50	8.10	21.53	30.00	H
1777.50	-16.01	-29.50	8.10	21.59	30.00	H

LTE Band 66_10MHz_QPSK

Frequency(MHz)	P _{Mea} (dBm)	P _{cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1715.00	-16.05	-29.60	8.10	21.65	30.00	H
1745.00	-16.23	-29.50	8.10	21.37	30.00	H
1775.00	-16.11	-29.50	8.10	21.49	30.00	H

LTE Band 66_15MHz_QPSK

Frequency(MHz)	P _{Mea} (dBm)	P _{cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1717.50	-16.15	-29.60	8.10	21.55	30.00	H
1745.00	-16.38	-29.50	8.10	21.21	30.00	H
1772.53	-16.19	-29.50	8.10	21.41	30.00	H

LTE Band 66_20MHz_QPSK

Frequency(MHz)	P _{Mea} (dBm)	P _{cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1720.00	-16.31	-29.60	8.10	21.39	30.00	H
1745.00	-16.49	-29.50	8.10	21.11	30.00	H
1770.00	-16.35	-29.50	8.10	21.25	30.00	H

LTE Band 66_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	-16.63	-29.60	8.10	21.07	30.00	H
1745.00	-16.87	-29.50	8.10	20.73	30.00	H
1779.30	-16.65	-29.50	8.10	20.95	30.00	H

LTE Band 66_3MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{Cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1711.50	-16.72	-29.60	8.10	20.98	30.00	H
1745.00	-16.97	-29.50	8.10	20.63	30.00	H
1778.50	-16.93	-29.50	8.10	20.67	30.00	H

LTE Band 66_5MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{Cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1712.50	-17.01	-29.60	8.10	20.69	30.00	H
1745.00	-17.15	-29.50	8.10	20.45	30.00	H
1777.50	-17.10	-29.50	8.10	20.50	30.00	H

LTE Band 66_10MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{Cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1715.00	-17.08	-29.60	8.10	20.62	30.00	H
1745.00	-17.27	-29.50	8.10	20.33	30.00	H
1775.00	-17.15	-29.50	8.10	20.45	30.00	H

LTE Band 66_15MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{Cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1717.50	-17.17	-29.60	8.10	20.53	30.00	H
1745.00	-17.40	-29.50	8.10	20.20	30.00	H
1772.53	-17.20	-29.50	8.10	20.40	30.00	H

LTE Band 66_20MHz_16QAM

Frequency(MHz)	P _{Mea} (dBm)	P _{Cl} (dB)+ P _{Ag} (dB)	Ga Antenna Gain(dBi)	EIRP(dBm)	Limit(dBm)	Polarization
1720.00	-17.41	-29.60	8.10	20.29	30.00	H
1745.00	-17.54	-29.50	8.10	20.06	30.00	H
1770.00	-17.45	-29.50	8.10	20.15	30.00	H

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 = 2.82dB(30MHz-3GHz)/3.06dB(3GHz-18GHz)/2.40dB(18GHz-40GHz), k = 2

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

A.2 FIELD STRENGTH OF SPURIOUS RADIATION

Reference

FCC: CFR 2.1053, 22.917, 24.238, 27.53.

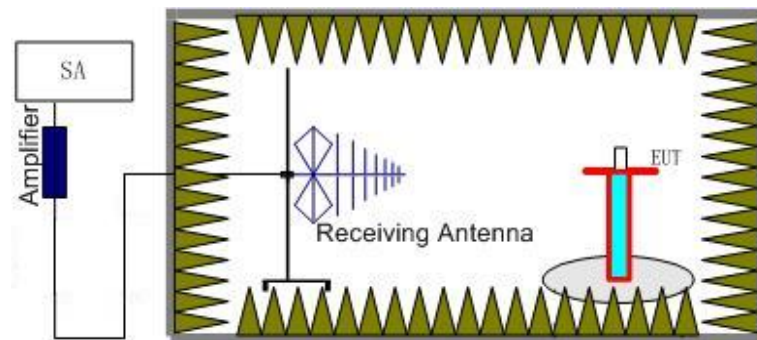
A.2.1 Measurement Method

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

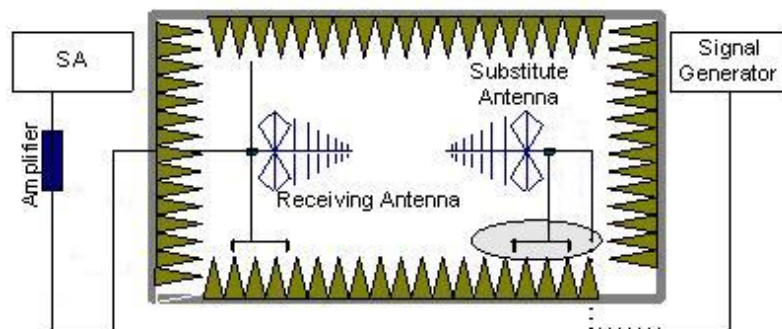
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917, 24.238, 27.53(h). The spectrum was scanned with the mobile station transmitting at carrier 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.



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:

$$\text{Power (EIRP)} = P_{Mea} - P_{pl} + G_a$$

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, $ERP = EIRP - 2.15\text{dB}$.

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.

LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16983.50	-43.41	2.90	16.50	-29.81	-13.00	H
17167.50	-42.11	2.90	14.50	-30.51	-13.00	H
17299.50	-41.37	3.20	14.50	-30.07	-13.00	H
17456.00	-39.45	2.90	14.50	-27.85	-13.00	H
17622.00	-37.51	3.30	12.80	-28.01	-13.00	H
17836.50	-37.99	3.60	12.80	-28.79	-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
16940.00	-44.08	2.90	16.50	-30.48	-13.00	H
17087.00	-43.18	2.90	14.50	-31.58	-13.00	H
17302.00	-42.80	3.20	14.50	-31.50	-13.00	H
17525.00	-39.96	2.90	12.80	-30.06	-13.00	H
17590.50	-39.40	3.30	12.80	-29.90	-13.00	H
17693.50	-40.28	3.30	12.80	-30.78	-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
16987.50	-44.44	2.90	16.50	-30.84	-13.00	H
17126.00	-43.14	2.90	14.50	-31.54	-13.00	H
17249.00	-42.55	3.20	14.50	-31.25	-13.00	H
17519.50	-39.39	2.90	12.80	-29.49	-13.00	H
17617.00	-39.29	3.30	12.80	-29.79	-13.00	H
17840.00	-39.20	3.60	12.80	-30.00	-13.00	H

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

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16892.00	-45.35	2.90	16.50	-31.75	-13.00	H
16989.50	-43.85	2.90	16.50	-30.25	-13.00	H
17364.00	-42.47	3.20	14.50	-31.17	-13.00	H
17402.00	-41.33	2.90	14.50	-29.73	-13.00	H
17624.00	-39.02	3.30	12.80	-29.52	-13.00	H
17833.50	-38.55	3.60	12.80	-29.35	-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
16962.00	-44.64	2.90	16.50	-31.04	-13.00	H
17135.00	-43.01	2.90	14.50	-31.41	-13.00	H
17300.00	-42.56	3.20	14.50	-31.26	-13.00	H
17507.50	-38.92	2.90	12.80	-29.02	-13.00	H
17551.50	-39.20	2.90	12.80	-29.30	-13.00	H
17832.00	-39.38	3.60	12.80	-30.18	-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
16987.50	-44.94	2.90	16.50	-31.34	-13.00	H
17134.50	-43.24	2.90	14.50	-31.64	-13.00	H
17290.50	-42.47	3.20	14.50	-31.17	-13.00	H
17473.50	-41.24	2.90	14.50	-29.64	-13.00	H
17553.50	-39.46	2.90	12.80	-29.56	-13.00	H
17776.00	-38.71	3.60	12.80	-29.51	-13.00	H

LTE Band 4, 1.4MHz, QPSK, Channel 19957

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5128.57	-36.75	1.30	12.50	-25.55	-13.00	H
16962.00	-44.50	2.90	16.50	-30.90	-13.00	H
17347.50	-42.81	3.20	14.50	-31.51	-13.00	H
17460.00	-40.13	2.90	14.50	-28.53	-13.00	H
17573.50	-39.39	3.30	12.80	-29.89	-13.00	H
17837.00	-39.57	3.60	12.80	-30.37	-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
16996.00	-44.54	2.90	16.50	-30.94	-13.00	H
17166.50	-43.33	2.90	14.50	-31.73	-13.00	H
17289.00	-42.19	3.20	14.50	-30.89	-13.00	H
17448.00	-41.26	2.90	14.50	-29.66	-13.00	H
17606.00	-39.39	3.30	12.80	-29.89	-13.00	H
17772.00	-39.37	3.60	12.80	-30.17	-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
5261.90	-40.62	1.80	12.50	-29.92	-13.00	V
16936.50	-44.83	2.90	16.50	-31.23	-13.00	H
17301.50	-42.46	3.20	14.50	-31.16	-13.00	H
17458.50	-41.73	2.90	14.50	-30.13	-13.00	H
17532.00	-39.50	2.90	12.80	-29.60	-13.00	H
17832.00	-38.83	3.60	12.80	-29.63	-13.00	H

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

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5129.05	-38.08	1.30	12.50	-26.88	-13.00	H
17005.50	-42.03	2.90	14.50	-30.43	-13.00	H
17252.00	-42.35	3.20	14.50	-31.05	-13.00	H
17452.00	-40.85	2.90	14.50	-29.25	-13.00	H
17532.50	-39.61	2.90	12.80	-29.71	-13.00	H
17820.00	-39.42	3.60	12.80	-30.22	-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
17003.00	-42.80	2.90	14.50	-31.20	-13.00	H
17119.00	-43.49	2.90	14.50	-31.89	-13.00	H
17340.00	-42.90	3.20	14.50	-31.60	-13.00	H
17493.00	-41.26	2.90	14.50	-29.66	-13.00	H
17624.00	-39.31	3.30	12.80	-29.81	-13.00	H
17821.50	-39.79	3.60	12.80	-30.59	-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
5261.90	-39.90	1.80	12.50	-29.20	-13.00	H
16999.00	-44.50	2.90	16.50	-30.90	-13.00	H
17186.50	-42.52	2.90	14.50	-30.92	-13.00	H
17457.50	-40.82	2.90	14.50	-29.22	-13.00	H
17578.00	-38.02	3.30	12.80	-28.52	-13.00	H
17834.00	-39.86	3.60	12.80	-30.66	-13.00	H

LTE Band 5, 1.4MHz, QPSK, Channel 20407

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
8565.00	-52.48	2.10	12.00	-44.73	-13.00	H
9099.25	-51.72	2.20	11.60	-44.47	-13.00	H
9218.00	-51.45	2.10	11.60	-44.10	-13.00	H
9305.50	-51.11	2.00	11.60	-43.66	-13.00	H
9429.25	-52.05	2.10	11.60	-44.70	-13.00	H
9474.00	-50.96	2.10	11.60	-43.61	-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
2508.75	-47.23	0.90	10.70	-39.58	-13.00	H
8425.75	-51.79	1.80	11.30	-44.44	-13.00	H
9223.75	-50.75	2.10	11.60	-43.40	-13.00	H
9300.50	-51.42	2.00	11.60	-43.97	-13.00	H
9474.25	-51.43	2.10	11.60	-44.08	-13.00	V
9708.75	-51.59	2.20	11.20	-44.74	-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
2543.75	-48.60	0.90	10.70	-40.95	-13.00	H
9100.75	-52.02	2.20	11.60	-44.77	-13.00	H
9224.00	-51.31	2.10	11.60	-43.96	-13.00	H
9304.00	-51.13	2.00	11.60	-43.68	-13.00	H
9426.75	-51.88	2.10	11.60	-44.53	-13.00	H
9474.25	-51.05	2.10	11.60	-43.70	-13.00	V

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

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
2472.92	-49.98	0.90	9.80	-43.23	-13.00	H
9155.00	-52.18	2.10	11.60	-44.83	-13.00	H
9223.00	-51.45	2.10	11.60	-44.10	-13.00	H
9299.75	-51.07	2.00	11.60	-43.62	-13.00	H
9474.00	-51.42	2.10	11.60	-44.07	-13.00	V
9682.25	-51.47	2.20	11.20	-44.62	-13.00	H

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

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit (dBm)	Polarization
2507.92	-45.31	0.90	10.70	-37.66	-13.00	H
9106.50	-51.35	2.10	11.60	-44.00	-13.00	H
9224.50	-51.19	2.10	11.60	-43.84	-13.00	H
9304.00	-51.37	2.00	11.60	-43.92	-13.00	H
9426.25	-51.65	2.10	11.60	-44.30	-13.00	H
9473.75	-51.34	2.10	11.60	-43.99	-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
2543.33	-49.32	0.90	10.70	-41.67	-13.00	H
9149.25	-51.37	2.10	11.60	-44.02	-13.00	H
9225.50	-51.16	2.10	11.60	-43.81	-13.00	H
9302.25	-51.11	2.00	11.60	-43.66	-13.00	H
9414.00	-51.58	2.10	11.60	-44.23	-13.00	H
9477.50	-51.66	2.10	11.60	-44.31	-13.00	V

LTE Band 7, 5MHz, QPSK, Channel 20775

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5000.95	-50.84	1.30	12.50	-39.64	-25.00	H
16956.00	-54.72	2.90	16.50	-41.12	-25.00	H
17258.00	-52.57	3.20	14.50	-41.27	-25.00	H
17459.50	-51.22	2.90	14.50	-39.62	-25.00	H
17612.00	-49.22	3.30	12.80	-39.72	-25.00	H
17840.00	-49.43	3.60	12.80	-40.23	-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	-49.78	1.20	12.50	-38.48	-25.00	H
16955.00	-54.53	2.90	16.50	-40.93	-25.00	H
17355.50	-52.75	3.20	14.50	-41.45	-25.00	H
17523.00	-49.65	2.90	12.80	-39.75	-25.00	H
17530.00	-49.77	2.90	12.80	-39.87	-25.00	H
17838.00	-49.65	3.60	12.80	-40.45	-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
5130.95	-51.47	1.30	12.50	-40.27	-25.00	H
16956.00	-54.77	2.90	16.50	-41.17	-25.00	H
17293.00	-52.64	3.20	14.50	-41.34	-25.00	H
17410.00	-51.42	2.90	14.50	-39.82	-25.00	H
17576.00	-49.16	3.30	12.80	-39.66	-25.00	H
17776.00	-49.50	3.60	12.80	-40.30	-25.00	H

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

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16950.50	-54.59	2.90	16.50	-40.99	-25.00	H
17119.00	-53.52	2.90	14.50	-41.92	-25.00	H
17353.50	-52.71	3.20	14.50	-41.41	-25.00	H
17456.00	-51.61	2.90	14.50	-40.01	-25.00	H
17573.00	-49.19	3.30	12.80	-39.69	-25.00	H
17840.00	-49.31	3.60	12.80	-40.11	-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
5065.71	-51.99	1.20	12.50	-40.69	-25.00	H
16959.50	-54.64	2.90	16.50	-41.04	-25.00	H
17277.00	-52.55	3.20	14.50	-41.25	-25.00	H
17502.50	-49.69	2.90	12.80	-39.79	-25.00	H
17627.50	-49.06	3.30	12.80	-39.56	-25.00	H
17833.50	-49.51	3.60	12.80	-40.31	-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
5130.95	-51.60	1.30	12.50	-40.40	-25.00	V
16935.50	-54.74	2.90	16.50	-41.14	-25.00	H
17230.50	-52.26	3.20	14.50	-40.96	-25.00	H
17523.50	-49.64	2.90	12.80	-39.74	-25.00	H
17618.50	-48.89	3.30	12.80	-39.39	-25.00	H
17840.00	-49.10	3.60	12.80	-39.90	-25.00	H

LTE Band 66, 1.4MHz, QPSK, Channel 131979

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16983.50	-44.73	2.90	16.50	-31.13	-13.00	H
17165.00	-42.79	2.90	14.50	-31.19	-13.00	H
17274.00	-42.46	3.20	14.50	-31.16	-13.00	H
17410.00	-41.37	2.90	14.50	-29.77	-13.00	H
17618.00	-38.59	3.30	12.80	-29.09	-13.00	H
17815.50	-39.42	3.60	12.80	-30.22	-13.00	H

LTE Band 66, 1.4MHz, QPSK, Channel 132322

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
5233.81	-37.54	1.80	12.50	-26.84	-13.00	H
17002.00	-41.43	2.90	14.50	-29.83	-13.00	H
17268.50	-41.74	3.20	14.50	-30.44	-13.00	H
17409.00	-39.64	2.90	14.50	-28.04	-13.00	H
17629.00	-37.55	3.30	12.80	-28.05	-13.00	H
17817.50	-37.78	3.60	12.80	-28.58	-13.00	H

LTE Band 66, 1.4MHz, QPSK, Channel 132665

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16931.50	-44.54	2.90	16.50	-30.94	-13.00	H
17119.00	-43.35	2.90	14.50	-31.75	-13.00	H
17303.50	-42.67	3.20	14.50	-31.37	-13.00	H
17503.00	-39.63	2.90	12.80	-29.73	-13.00	H
17595.00	-38.91	3.30	12.80	-29.41	-13.00	H
17767.50	-40.26	3.60	12.80	-31.06	-13.00	H

LTE Band 66, 1.4MHz, 16QAM, Channel 131979

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16977.00	-44.73	2.90	16.50	-31.13	-13.00	H
17116.00	-43.55	2.90	14.50	-31.95	-13.00	H
17366.50	-42.94	3.20	14.50	-31.64	-13.00	H
17450.50	-41.73	2.90	14.50	-30.13	-13.00	H
17529.50	-39.69	2.90	12.80	-29.79	-13.00	H
17827.50	-39.73	3.60	12.80	-30.53	-13.00	H

LTE Band 66, 1.4MHz, 16QAM, Channel 132322

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16987.00	-44.47	2.90	16.50	-30.87	-13.00	H
17211.50	-43.10	2.90	14.50	-31.50	-13.00	H
17299.50	-42.75	3.20	14.50	-31.45	-13.00	H
17462.00	-40.57	2.90	14.50	-28.97	-13.00	H
17616.00	-38.47	3.30	12.80	-28.97	-13.00	H
17836.00	-38.83	3.60	12.80	-29.63	-13.00	H

LTE Band 66, 1.4MHz, 16QAM, Channel 132665

Frequency(MHz)	P _{Mea} (dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit (dBm)	Polarization
16952.00	-43.73	2.90	16.50	-30.13	-13.00	H
17197.00	-43.25	2.90	14.50	-31.65	-13.00	H
17291.50	-41.85	3.20	14.50	-30.55	-13.00	H
17511.00	-39.92	2.90	12.80	-30.02	-13.00	H
17576.00	-38.65	3.30	12.80	-29.15	-13.00	H
17779.00	-38.90	3.60	12.80	-29.70	-13.00	H

Note: The maximum value of expanded measurement uncertainty for this test item is U = 2.82dB(30MHz-3GHz)/3.06dB(3GHz-18GHz)/2.40dB(18GHz-40GHz), k = 2

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°C.
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°C increments from -30°C to +50°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments remeasuring carrier frequency at each voltage. Pause at nominal voltage for 1.5 hours unpowered, to allow any self-heating to stabilize, before continuing.
6. Subject the EUT to overnight soak at +50°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10°C increments from -30°C to +50°C. 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°C during the measurement procedure.

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

A.3.2 Measurement results

LTE Band 2, 5MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	1850.270	1909.470		
50				-6.82	0.0036
40				-11.26	0.0060
30				-5.95	0.0032
10				-3.91	0.0021
0				-12.27	0.0065
-10				-1.22	0.0006
-20				-5.67	0.0030
-30				-7.04	0.0037

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1850.270	1909.470	-9.34	0.0050
4.20				5.26	0.0028

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

LTE Band 4, 10MHz bandwidth (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
50	3.70	1710.790	1754.820		
40				13.50	0.0078
30				7.88	0.0045
20				17.57	0.0101
10				5.74	0.0033
0				-2.42	0.0014
-10				15.68	0.0090
-20				4.33	0.0025
-30				4.74	0.0027

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1710.790	1754.820	30.47	0.0176
4.20				25.52	0.0147

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

LTE Band 5, 5MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
50	3.70	824.130	848.860		
40				10.74	0.0128
30				21.56	0.0258
20				28.08	0.0336
10				28.42	0.0340
0				16.57	0.0198
-10				4.68	0.0056
-20				-8.98	0.0107
-30				-25.21	0.0301

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	824.130	848.860	-6.62	0.0079
4.20				-10.74	0.0128

Expanded measurement uncertainty is 10 Hz, $k = 2$
LTE Band 7, 5MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	2500.020	2569.960		
50				-41.57	0.0164
40				-53.23	0.0210
30				-51.94	0.0205
10				-59.52	0.0235
0				-54.77	0.0216
-10				-49.68	0.0196
-20				-51.24	0.0202
-30				-61.50	0.0243

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	2500.020	2569.960	-55.42	0.0219
4.20				-38.98	0.0154

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

LTE Band 66, 1.4MHz bandwidth (worst case of all bandwidths)
Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.70	1710.310	1779.730		
50				32.42	0.0186
40				14.43	0.0083
30				24.40	0.0140
10				9.26	0.0053
0				4.42	0.0025
-10				-15.54	0.0089
-20				-24.71	0.0142
-30				-9.21	0.0053

Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	FL(MHz)	FH(MHz)	Offset(Hz)	Frequency error(ppm)
3.60	20	1710.310	1779.730	-17.45	0.0100
4.20				-31.63	0.0181

Expanded measurement uncertainty is 10Hz, k = 2

A.4 OCCUPIED BANDWIDTH

Reference

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

A.4.1 Occupied Bandwidth Results

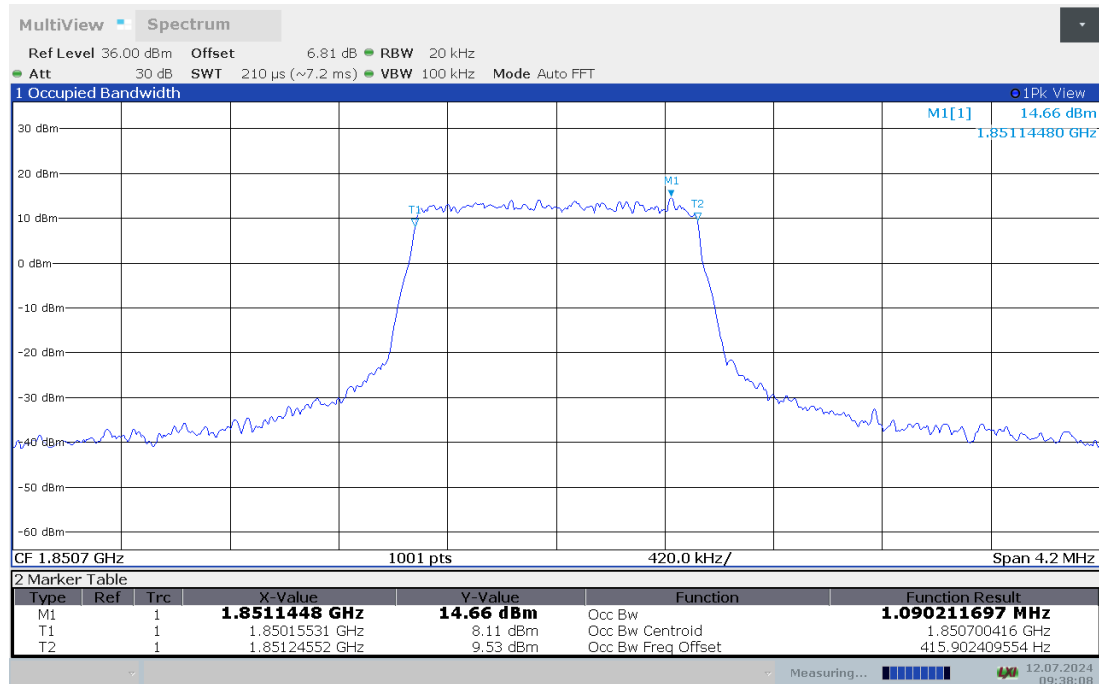
Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the US Cellular/PCS frequency bands. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the 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 $10\log(\text{OBW} / \text{RBW})$ below the reference level.
- d) Set the detection mode to peak, and the trace mode to max hold.
- e) Use the 99 % power bandwidth function of the spectrum analyzer and report the measured bandwidth.

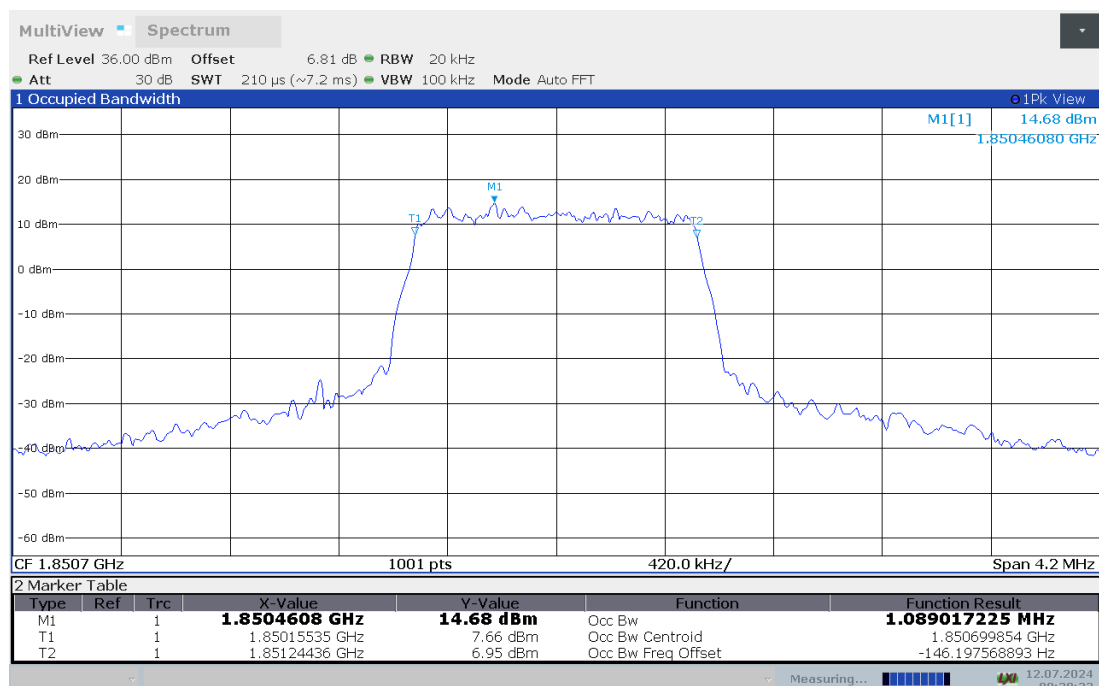
LTE band 2, 1.4MHz (99% BW)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1850.7	1.090	1.089
1880	1.083	1.093
1909.3	1.086	1.083

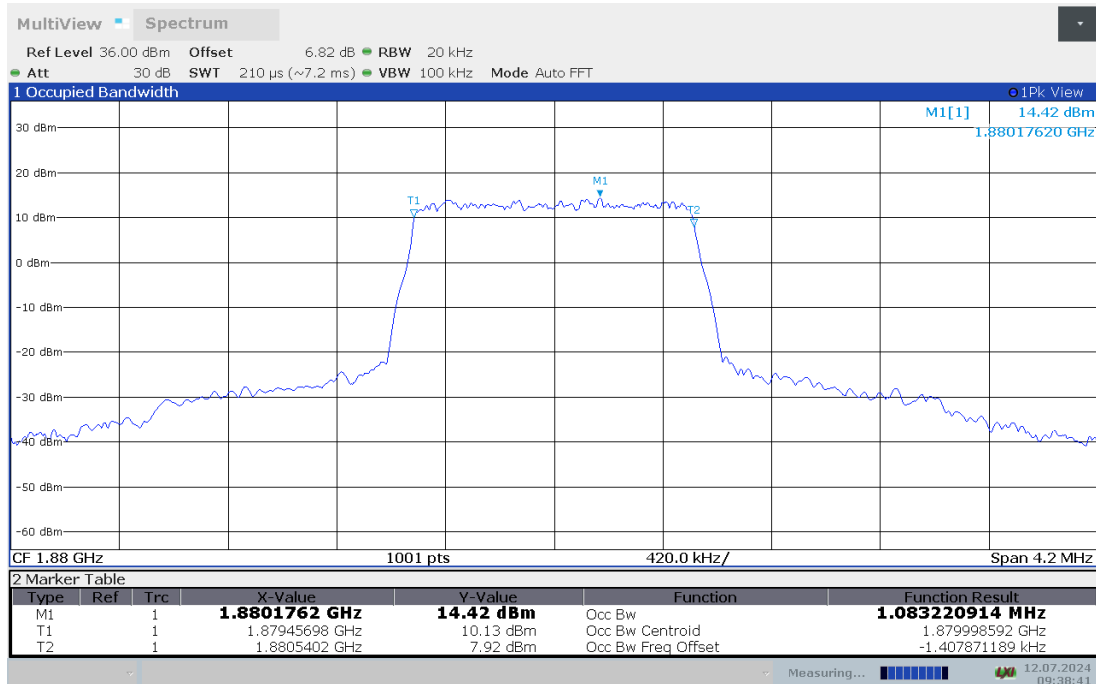
LTE band 2 , 1.4MHz Bandwidth,LOW,QPSK (99% BW)



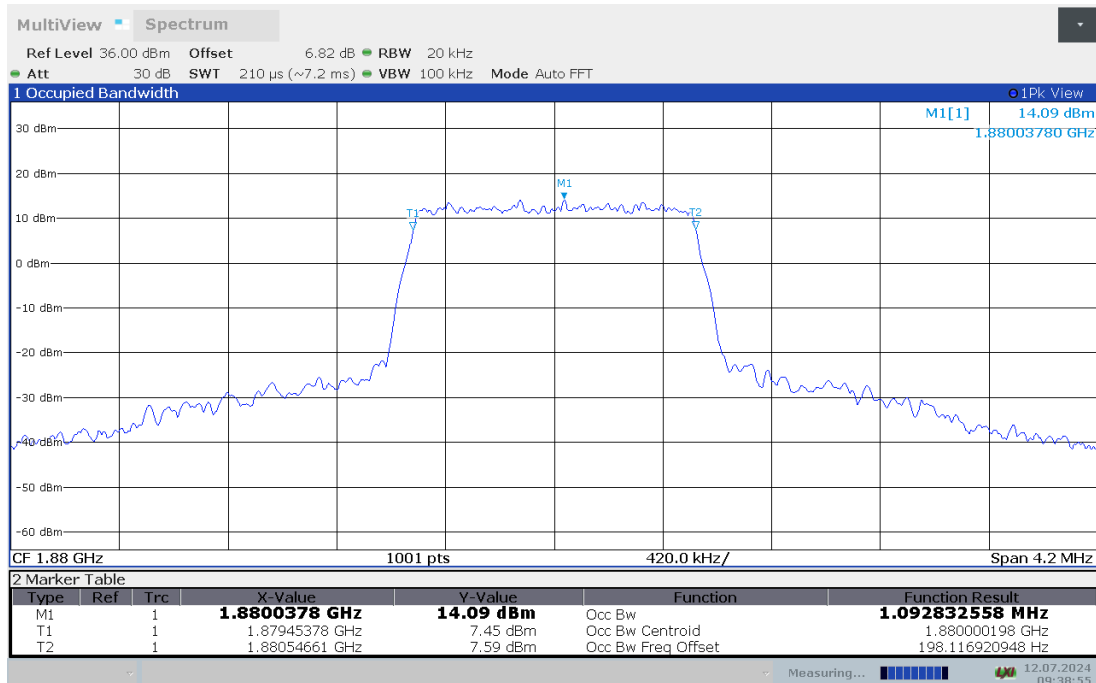
LTE band 2 , 1.4MHz Bandwidth,LOW,16QAM (99% BW)



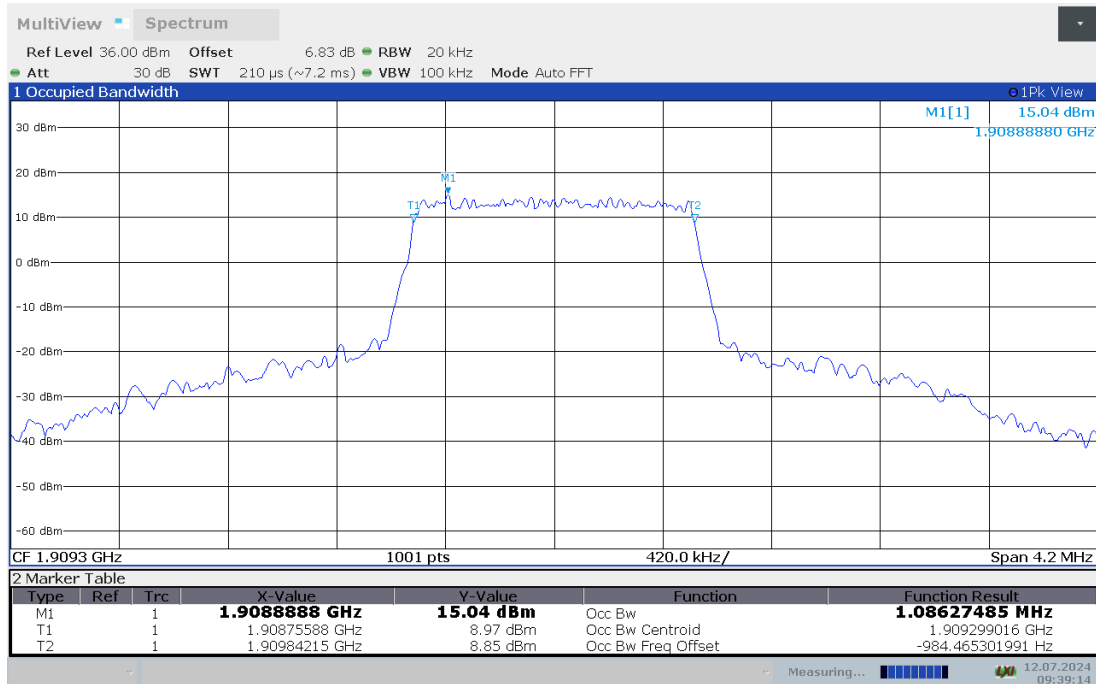
LTE band 2 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



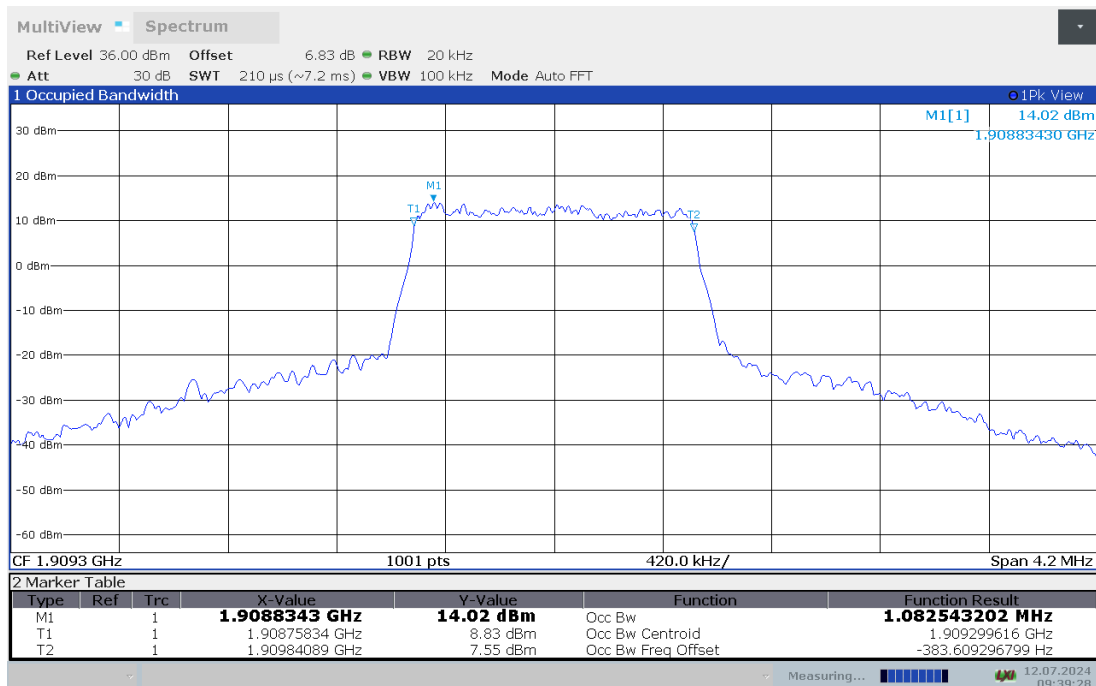
LTE band 2 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



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



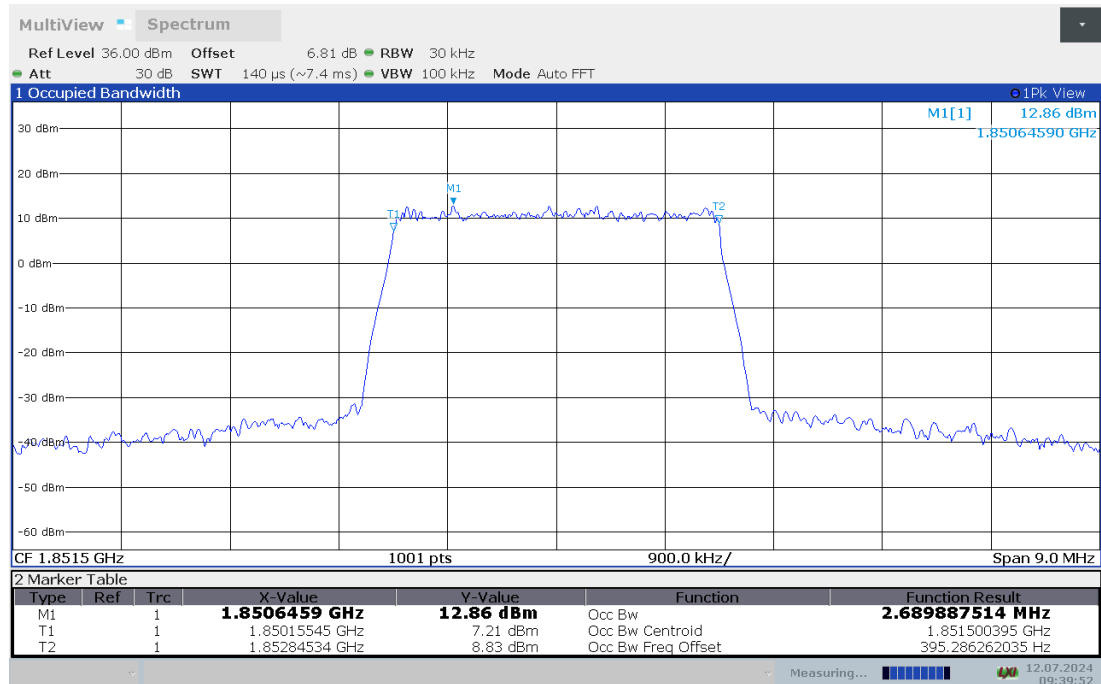
LTE band 2 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



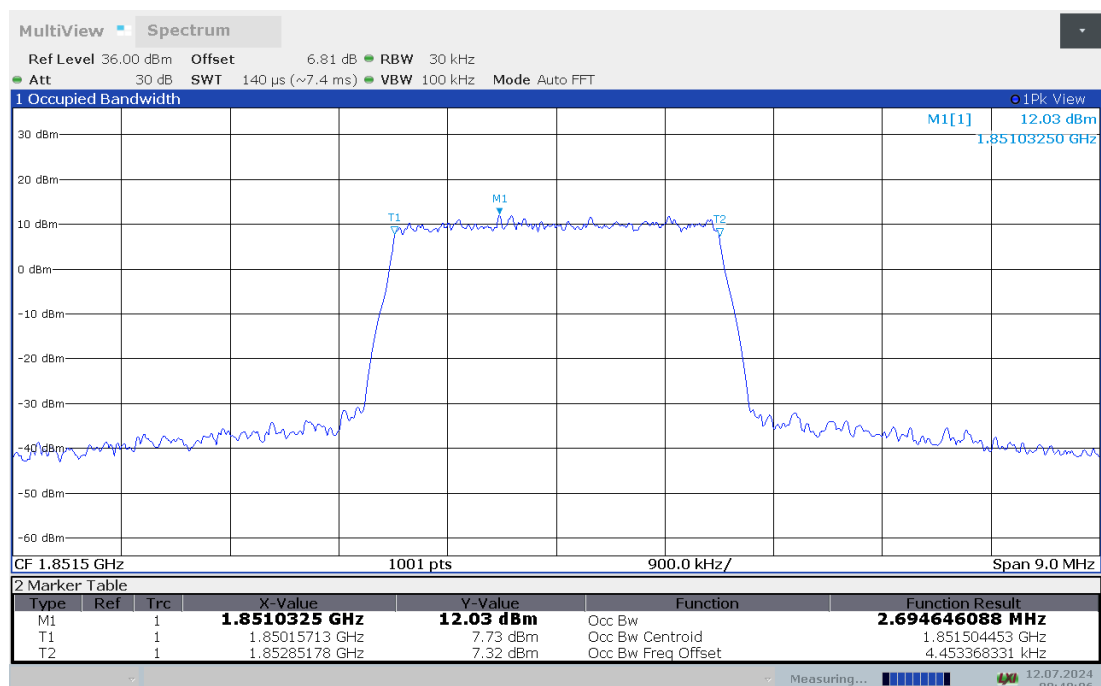
LTE band 2,3MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1851.5	2.690	2.695
1880	2.690	2.685
1908.5	2.692	2.689

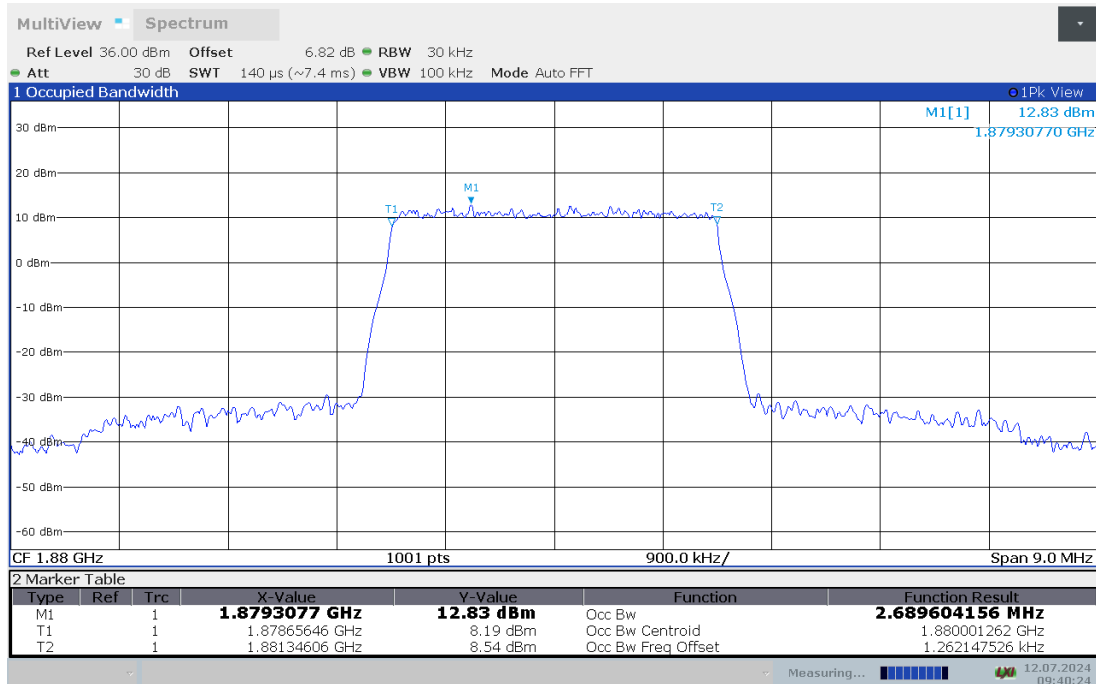
LTE band 2 , 3MHz Bandwidth,LOW,QPSK (99% BW)



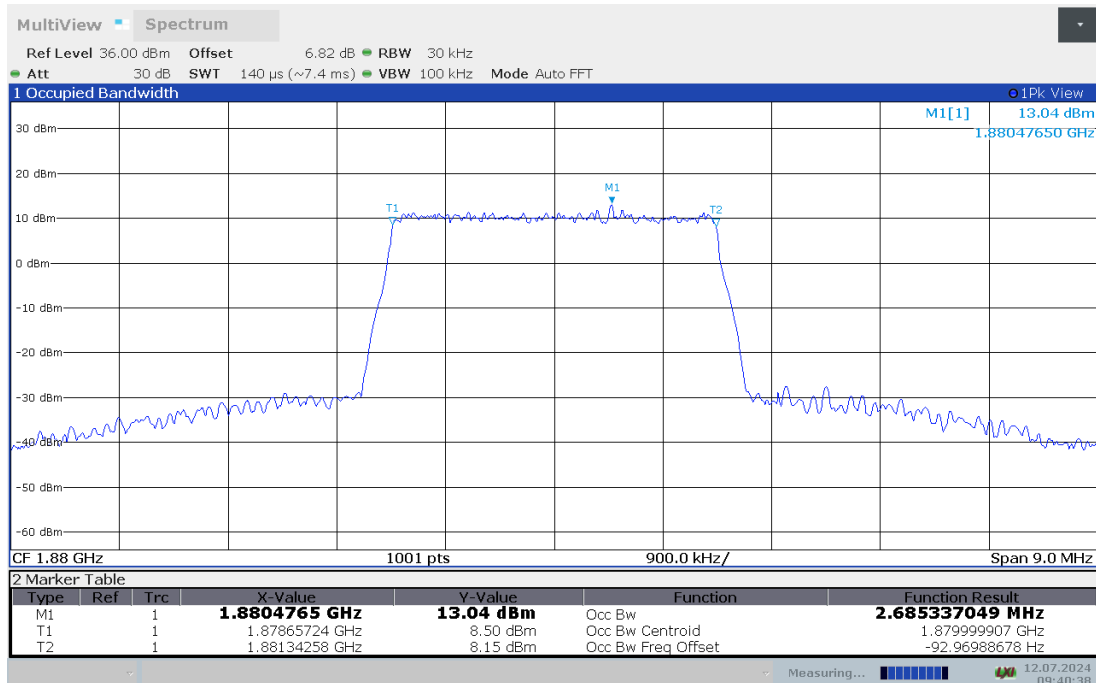
LTE band 2 , 3MHz Bandwidth,LOW,16QAM (99% BW)



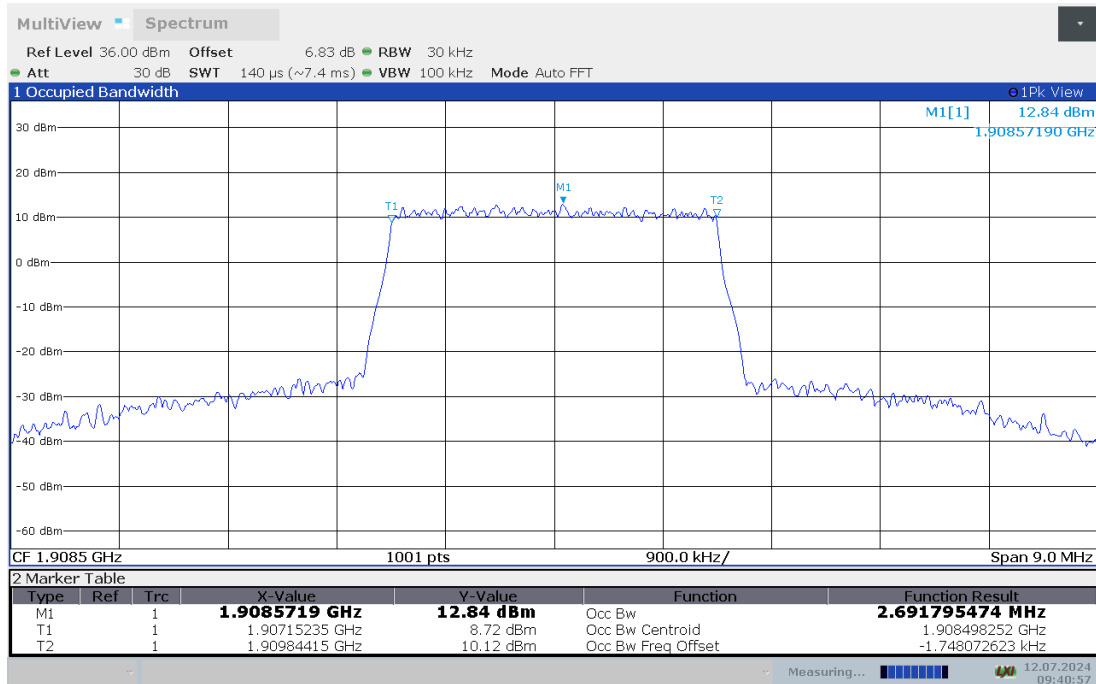
LTE band 2 , 3MHz Bandwidth,MID,QPSK (99% BW)



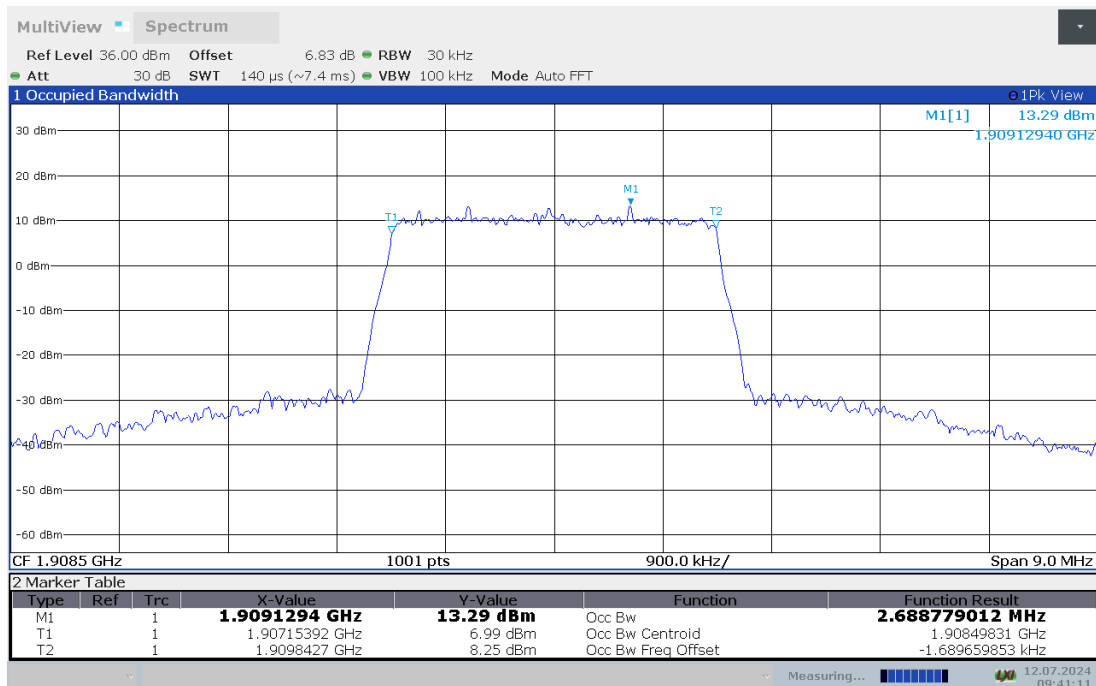
LTE band 2 , 3MHz Bandwidth,MID,16QAM (99% BW)



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



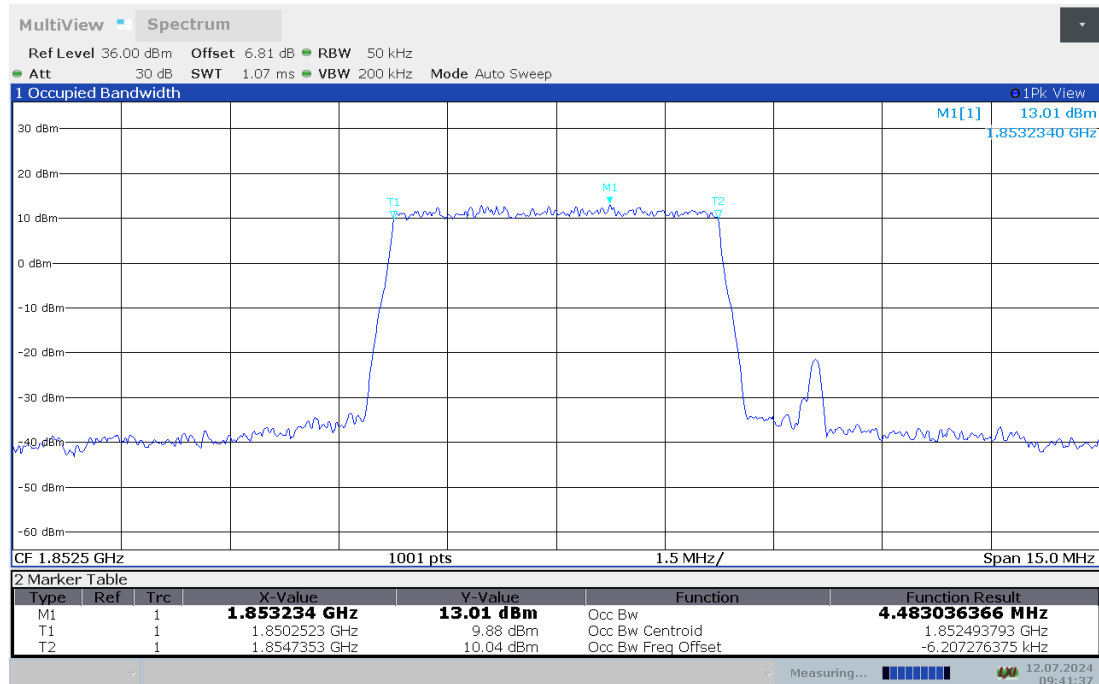
LTE band 2 , 3MHz Bandwidth,HIGH,16QAM (99% BW)



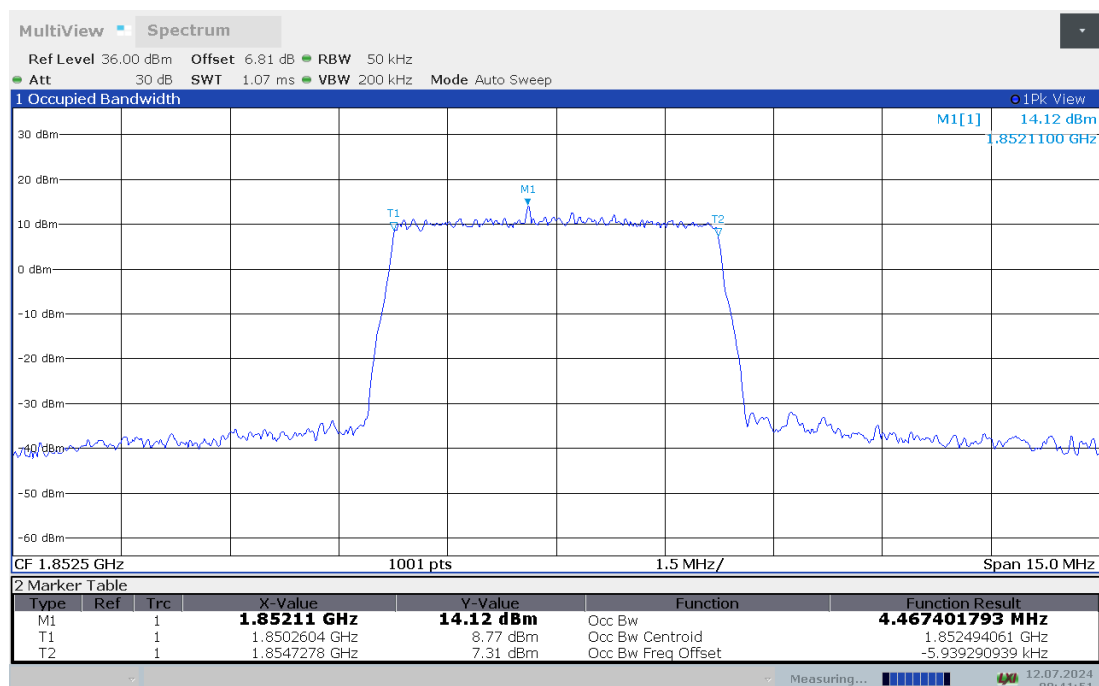
LTE band 2,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1852.5	4.483	4.467
1880	4.482	4.485
1907.5	4.467	4.479

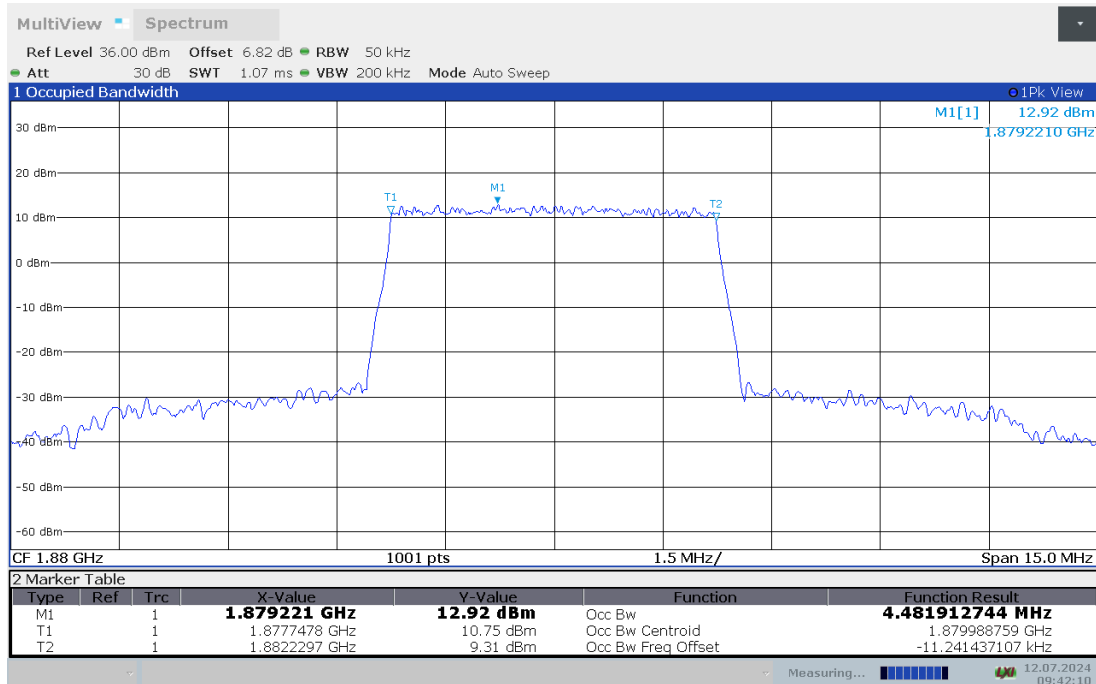
LTE band 2 , 5MHz Bandwidth,LOW,QPSK (99% BW)



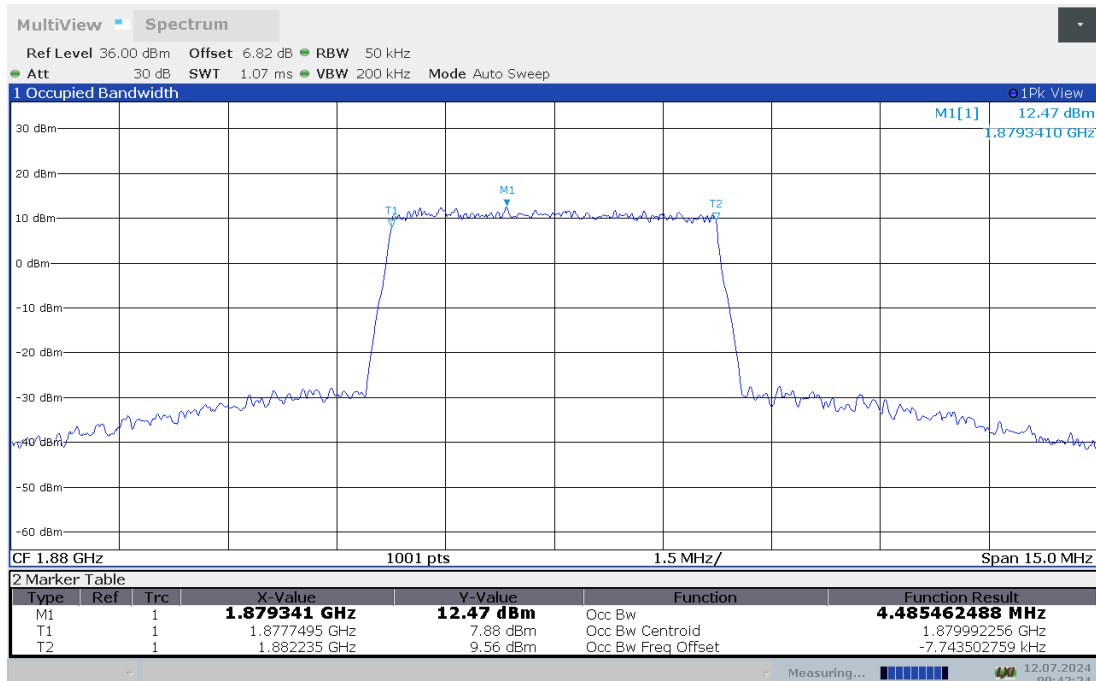
LTE band 2 , 5MHz Bandwidth,LOW,16QAM (99% BW)



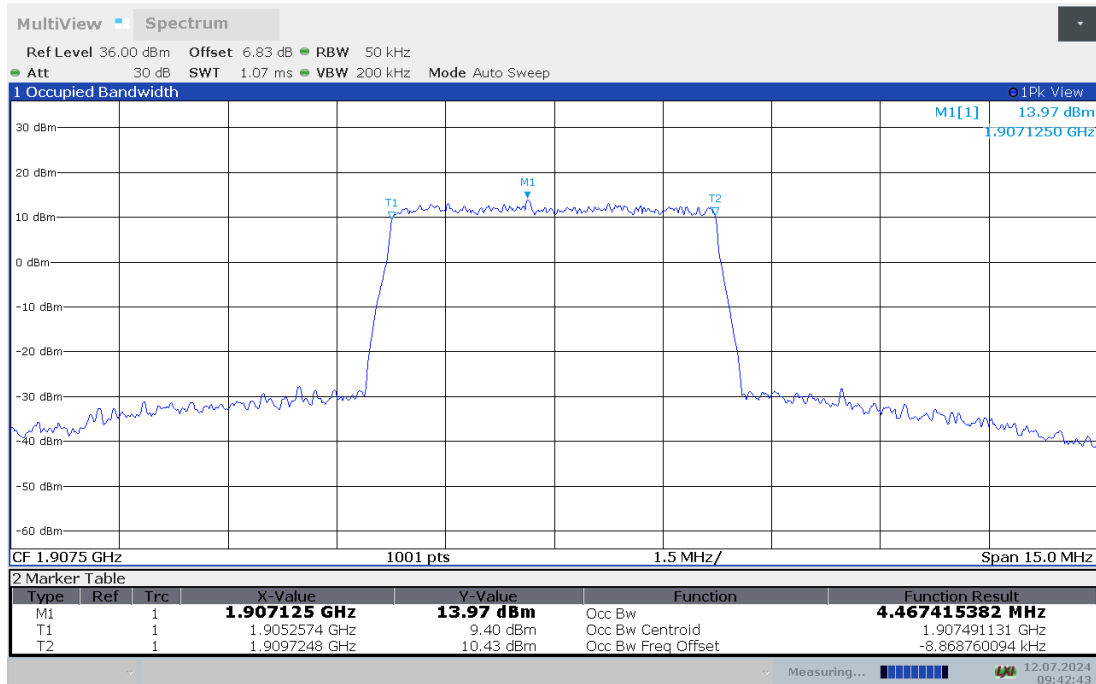
LTE band 2 , 5MHz Bandwidth,MID,QPSK (99% BW)



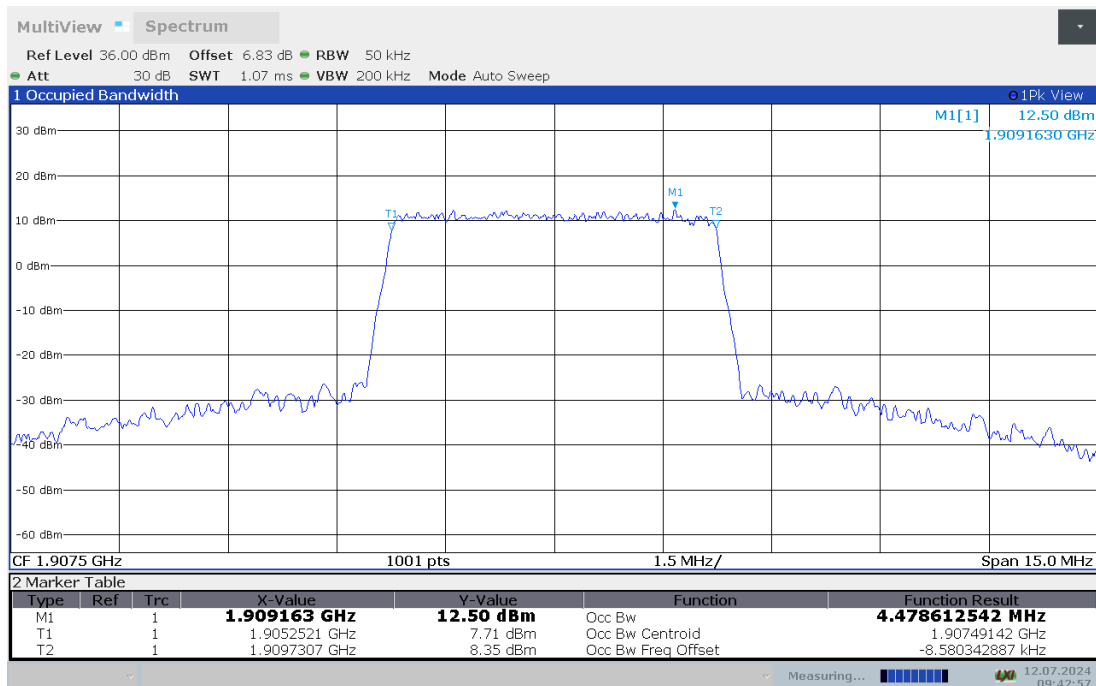
LTE band 2 , 5MHz Bandwidth,MID,16QAM (99% BW)



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



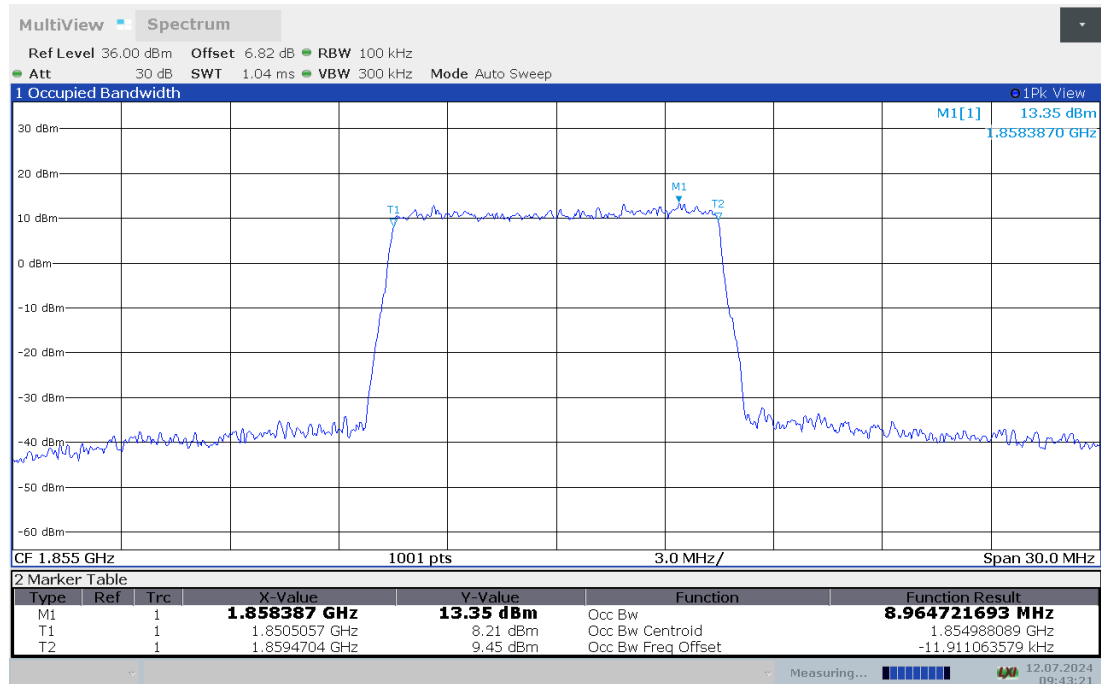
LTE band 2 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



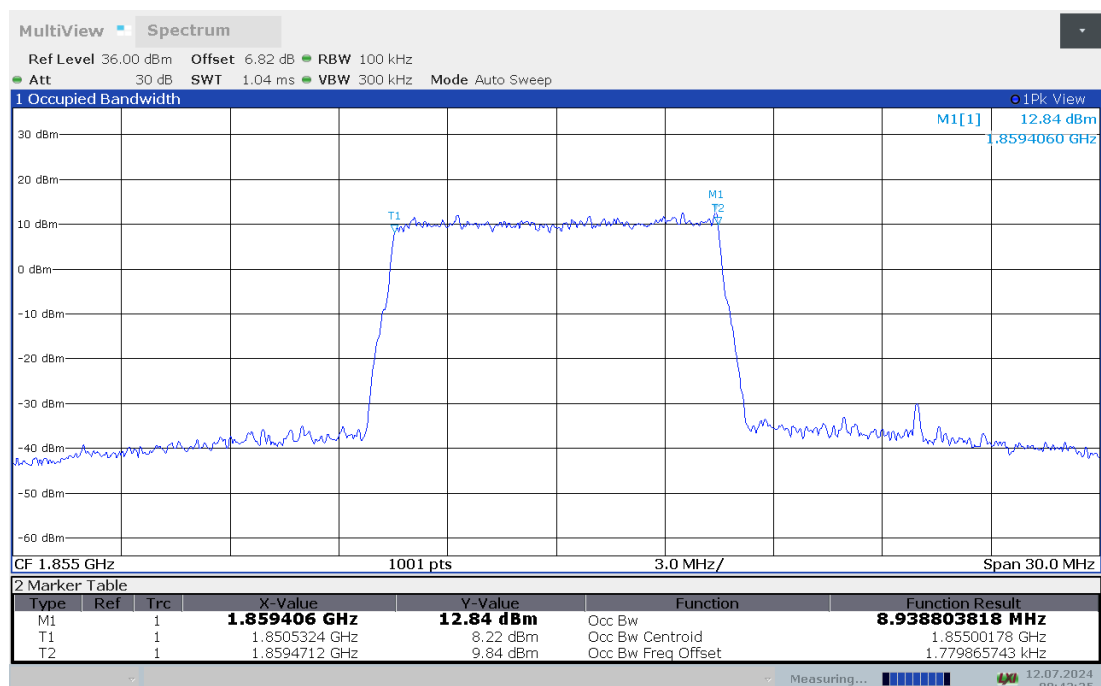
LTE band 2,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1855	8.965	8.939
1880	8.949	8.951
1905	8.964	8.956

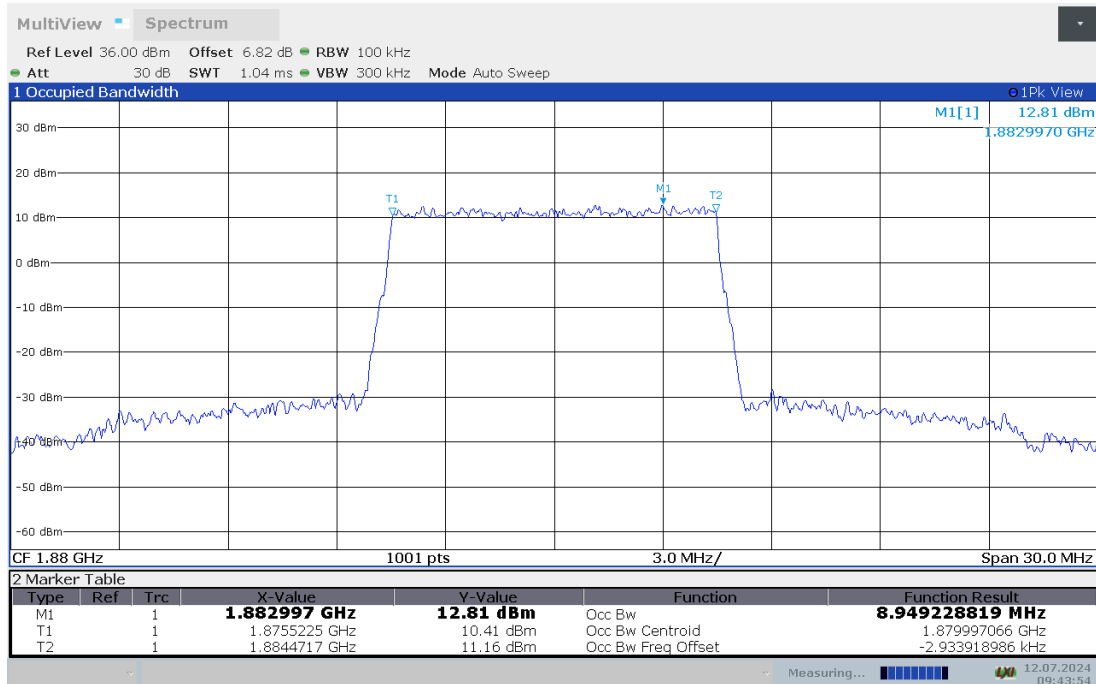
LTE band 2 , 10MHz Bandwidth,LOW,QPSK (99% BW)



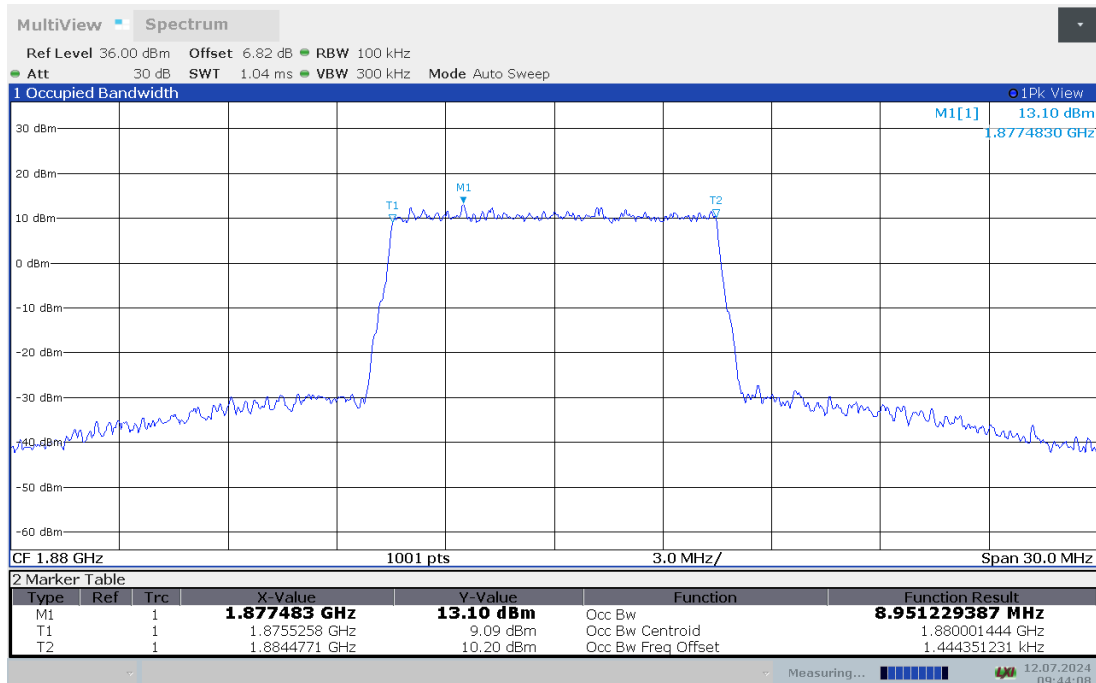
LTE band 2 , 10MHz Bandwidth,LOW,16QAM (99% BW)



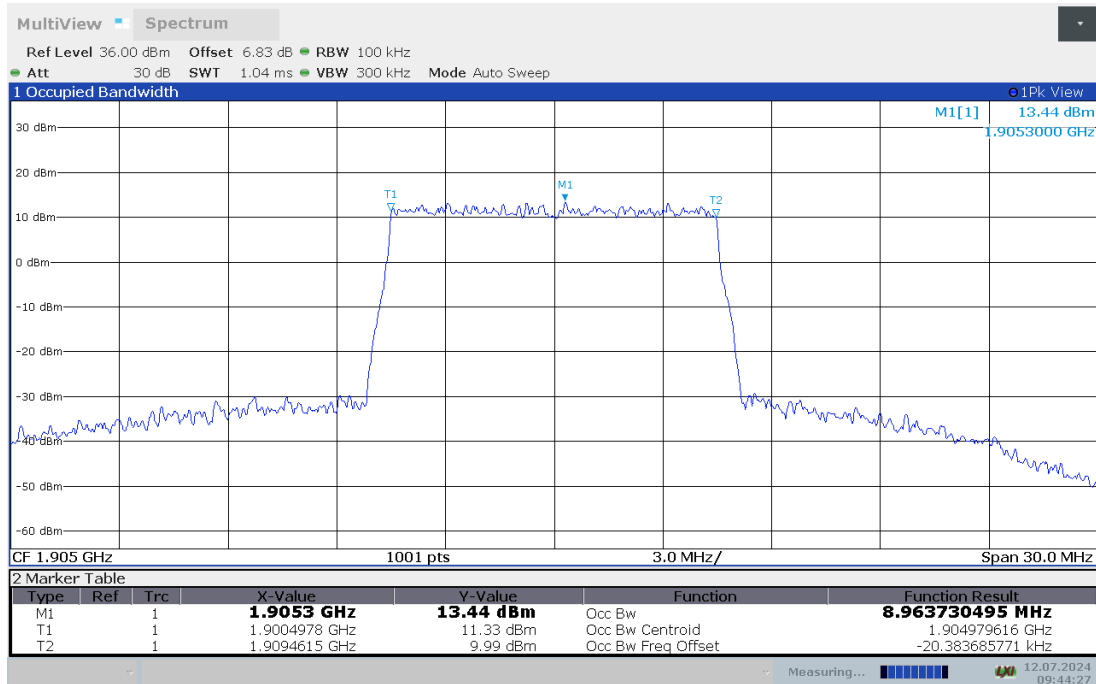
LTE band 2 , 10MHz Bandwidth,MID,QPSK (99% BW)



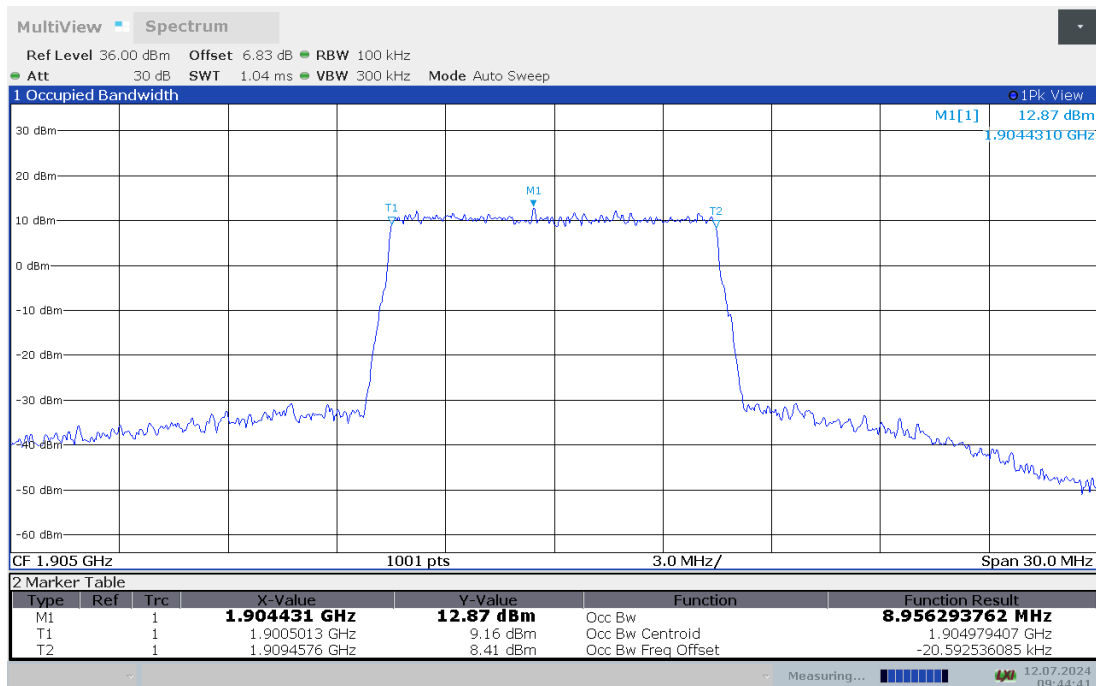
LTE band 2 , 10MHz Bandwidth,MID,16QAM (99% BW)



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



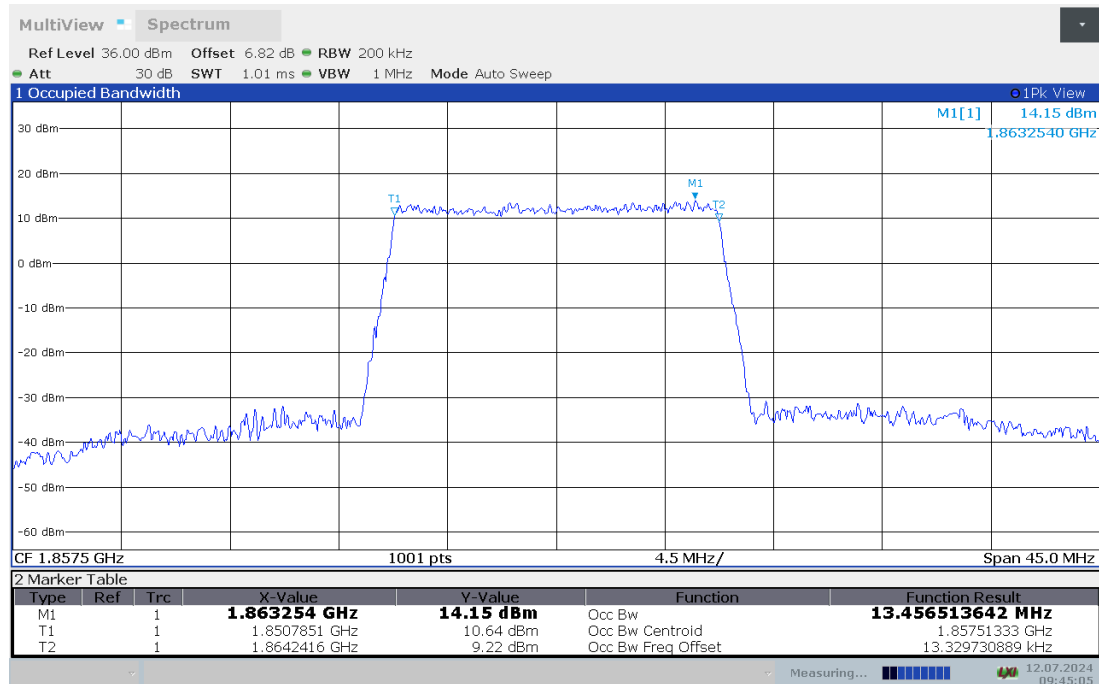
LTE band 2 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



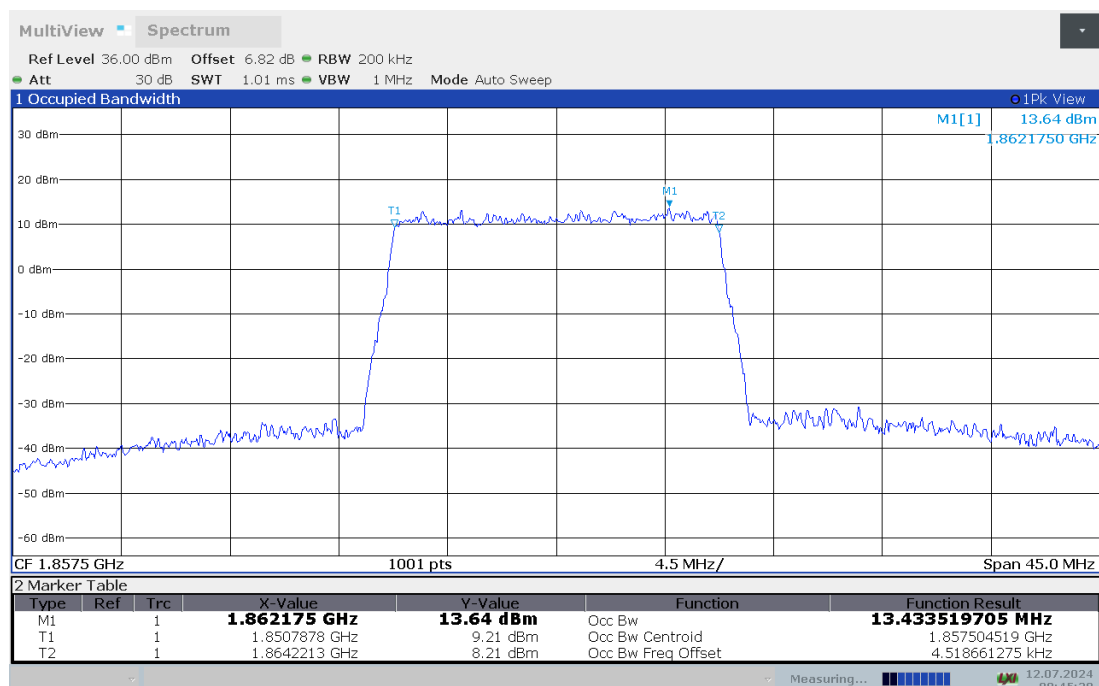
LTE band 2,15MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1857.5	13.457	13.434
1880	13.424	13.413
1902.5	13.450	13.474

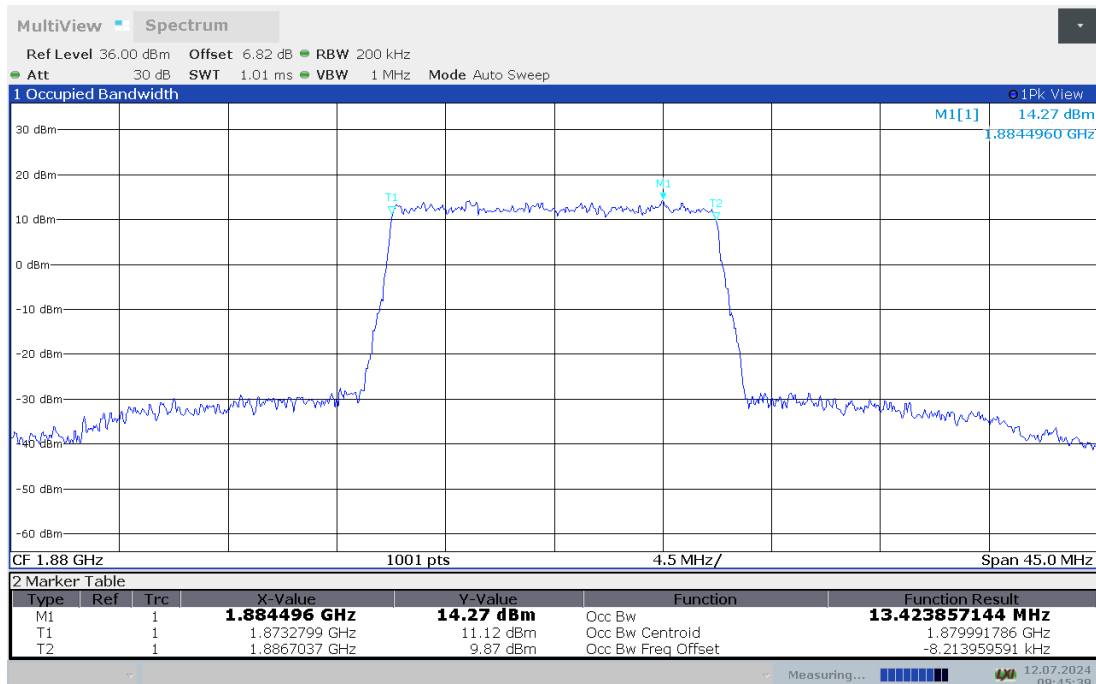
LTE band 2 , 15MHz Bandwidth,LOW,QPSK (99% BW)



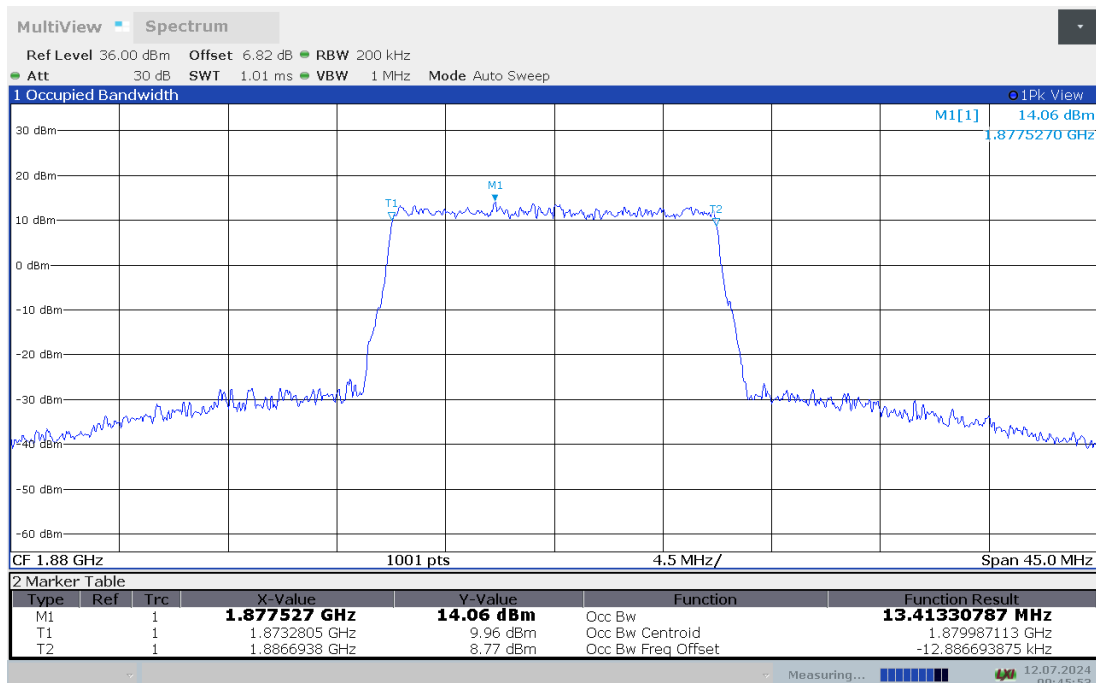
LTE band 2 , 15MHz Bandwidth,LOW,16QAM (99% BW)



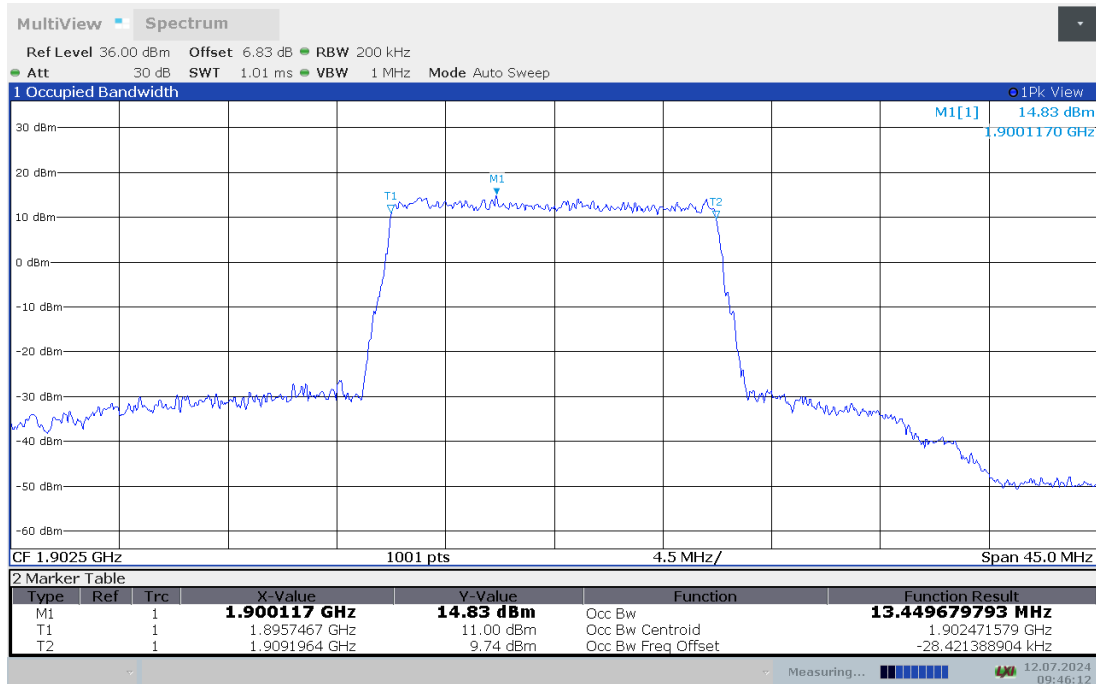
LTE band 2 , 15MHz Bandwidth,MID,QPSK (99% BW)



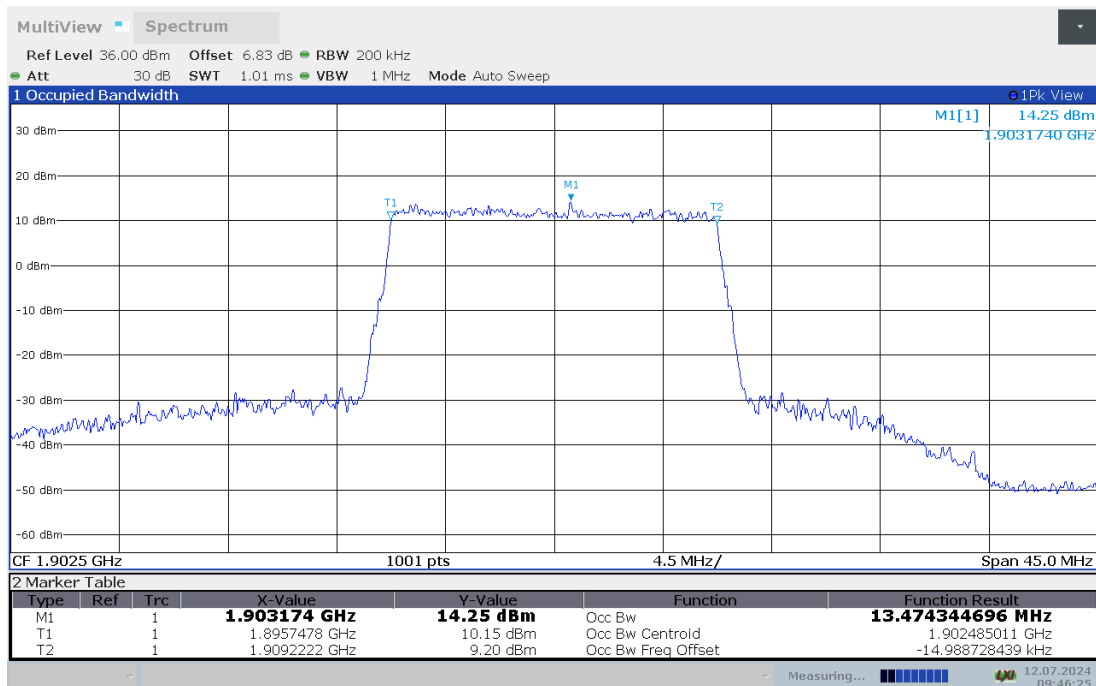
LTE band 2 , 15MHz Bandwidth,MID,16QAM (99% BW)



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



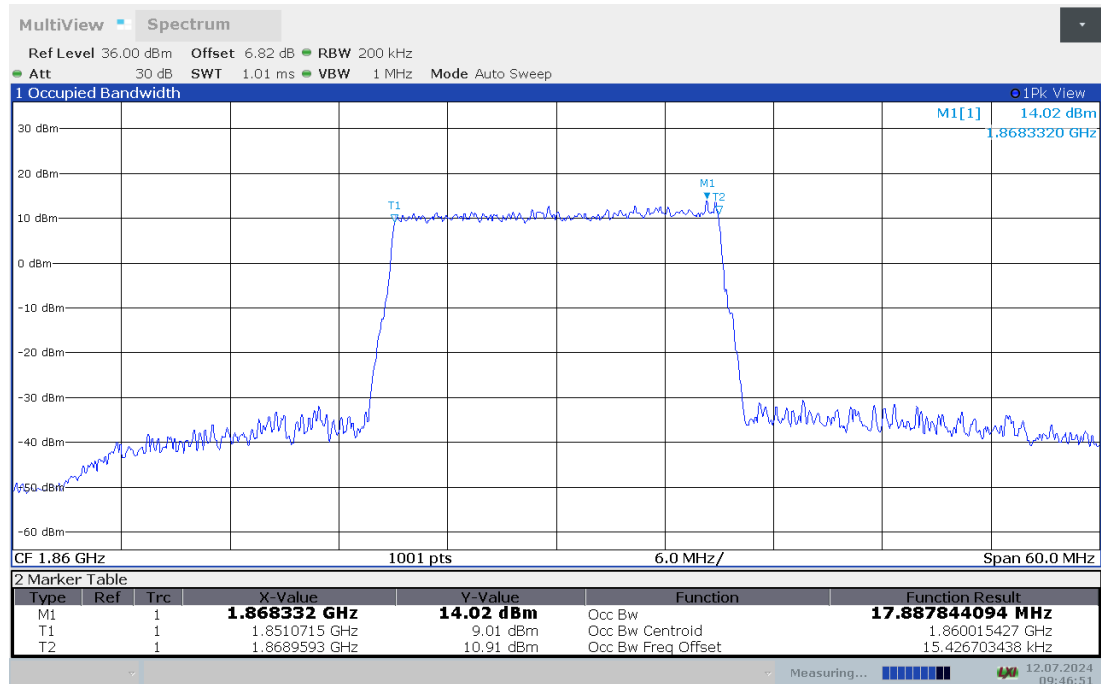
LTE band 2 , 15MHz Bandwidth,HIGH,16QAM (99% BW)



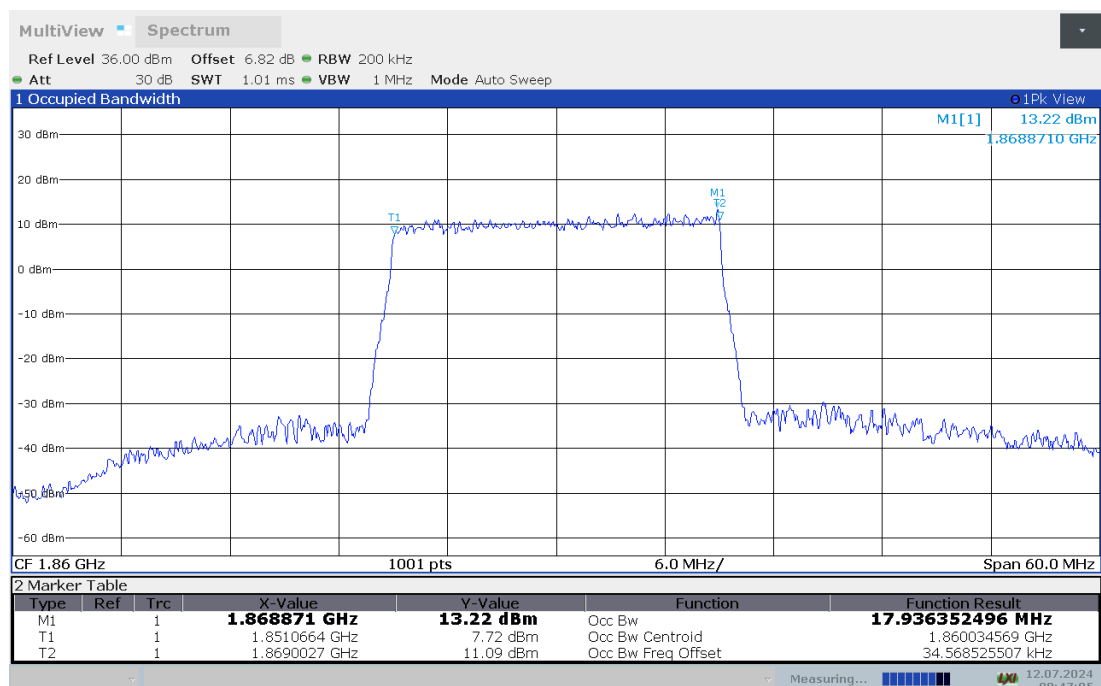
LTE band 2,20MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1860	17.888	17.936
1880	17.927	17.898
1900	17.914	17.899

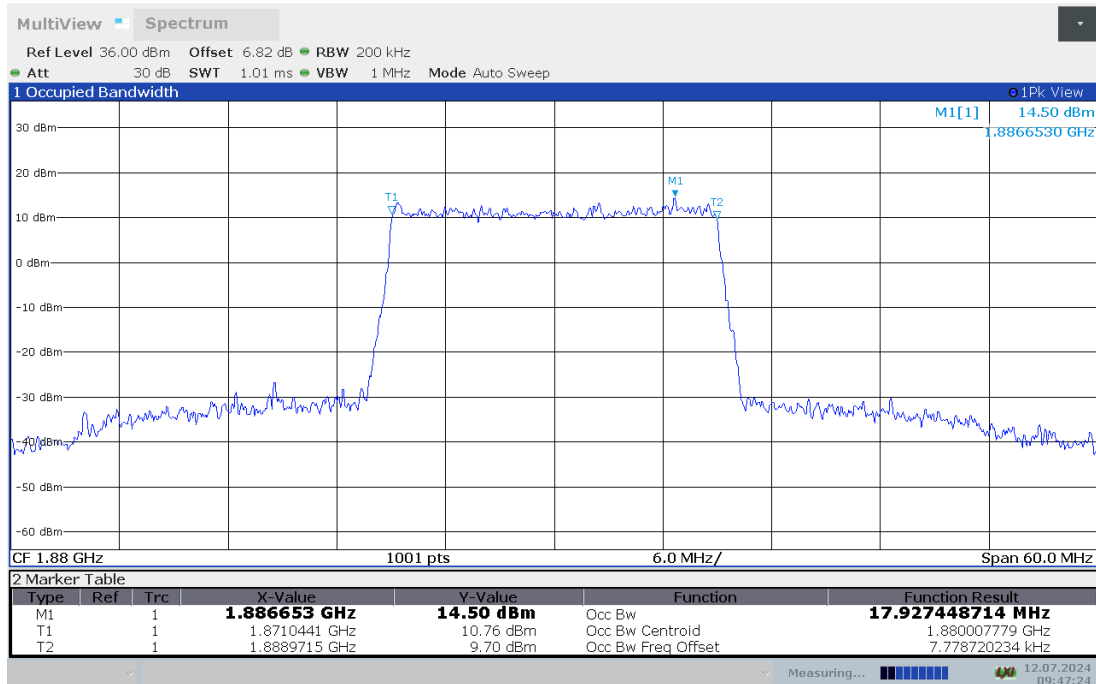
LTE band 2 , 20MHz Bandwidth,LOW,QPSK (99% BW)



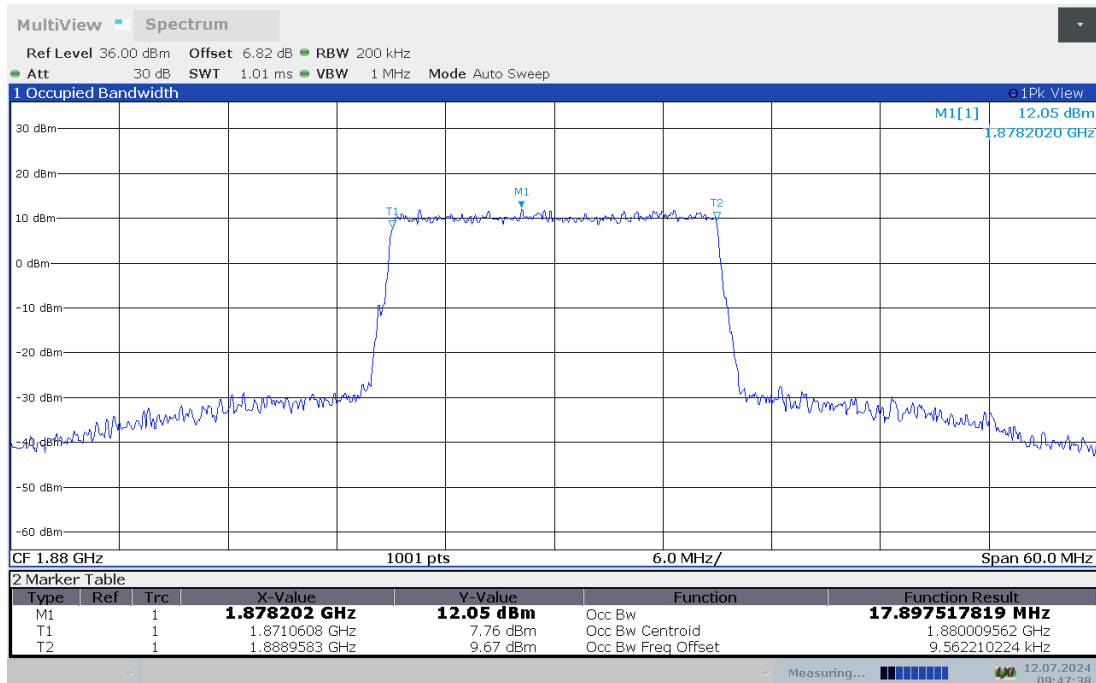
LTE band 2 , 20MHz Bandwidth,LOW,16QAM (99% BW)



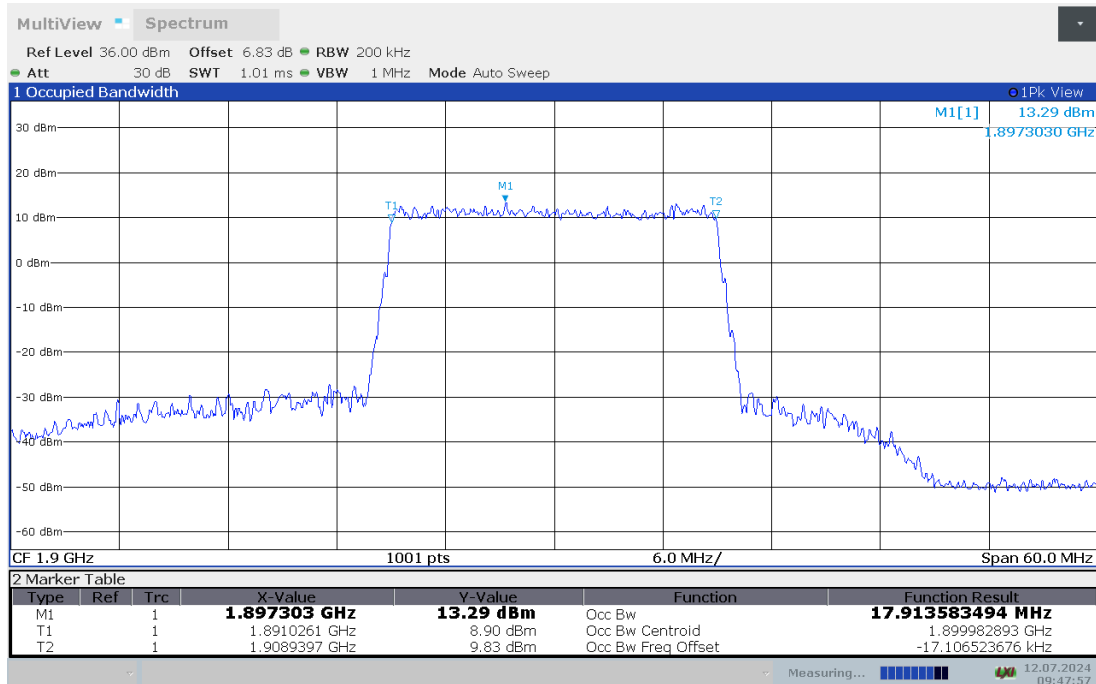
LTE band 2 , 20MHz Bandwidth,MID,QPSK (99% BW)



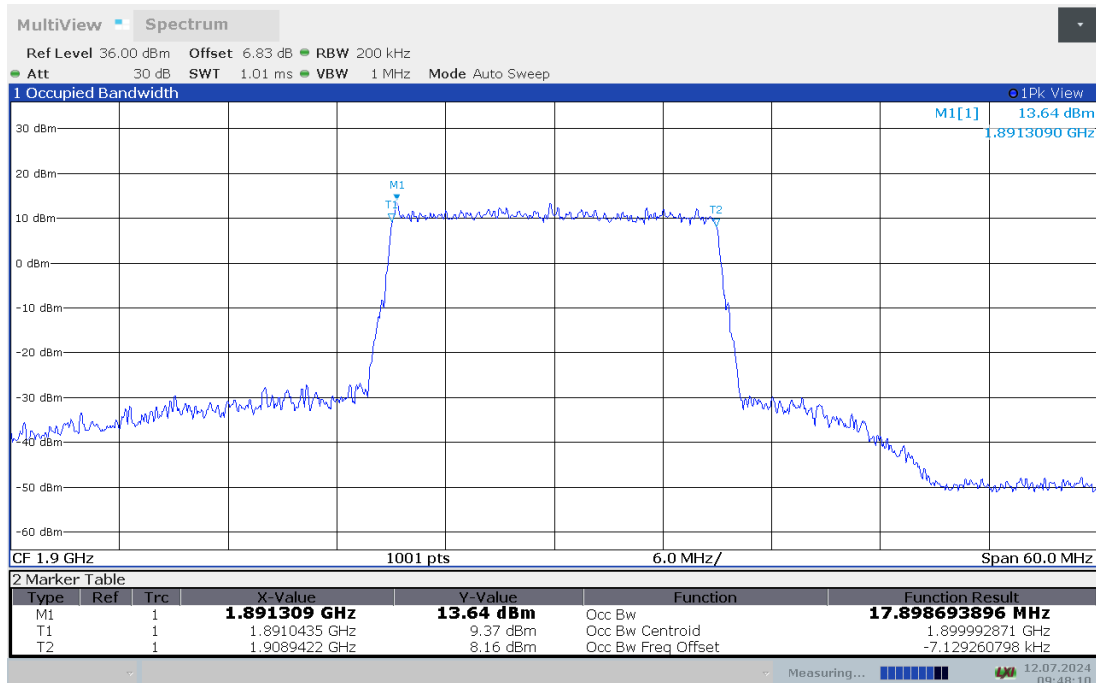
LTE band 2 , 20MHz Bandwidth,MID,16QAM (99% BW)



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



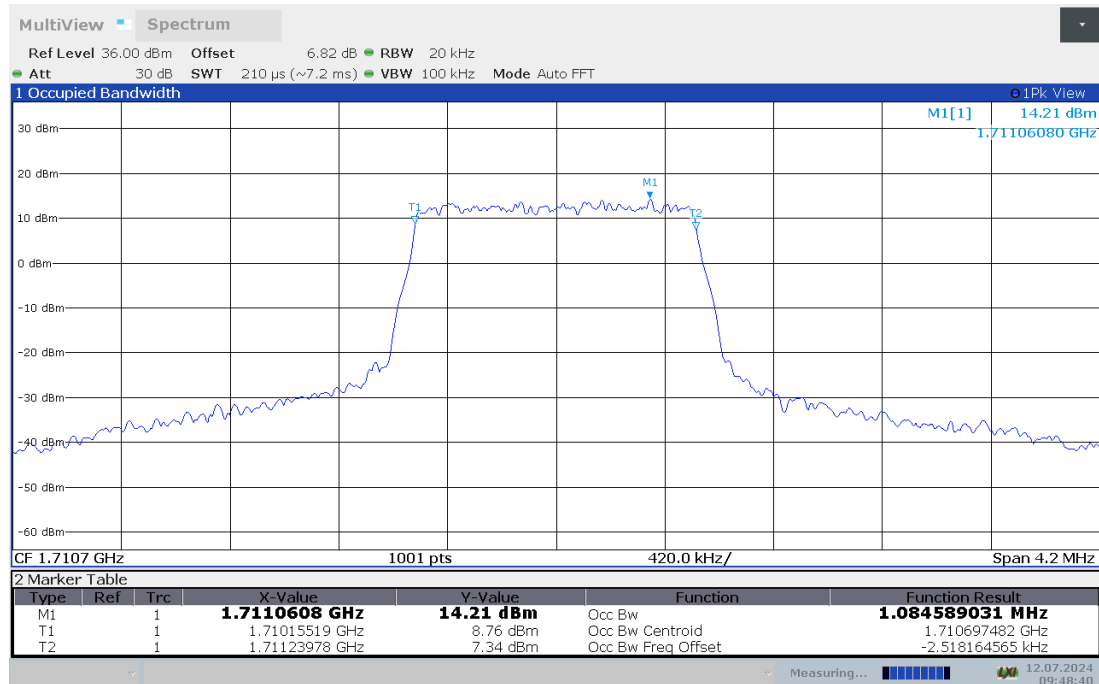
LTE band 2 , 20MHz Bandwidth,HIGH,16QAM (99% BW)



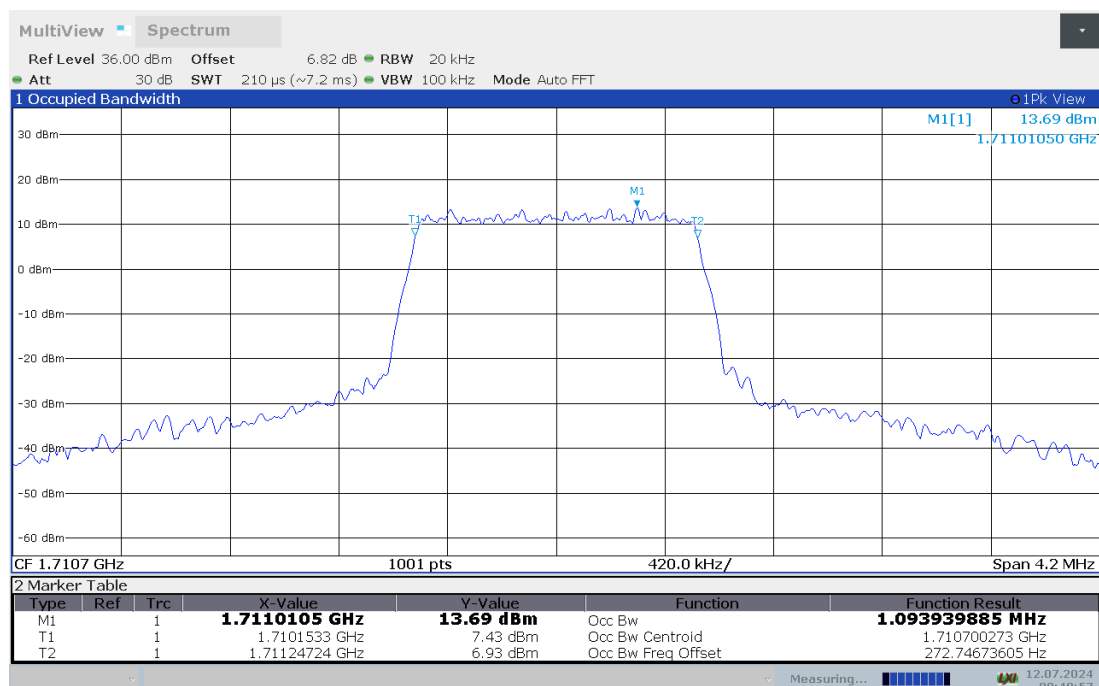
LTE band 4,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1710.7	1.085	1.094
1732.5	1.086	1.081
1754.3	1.092	1.086

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



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



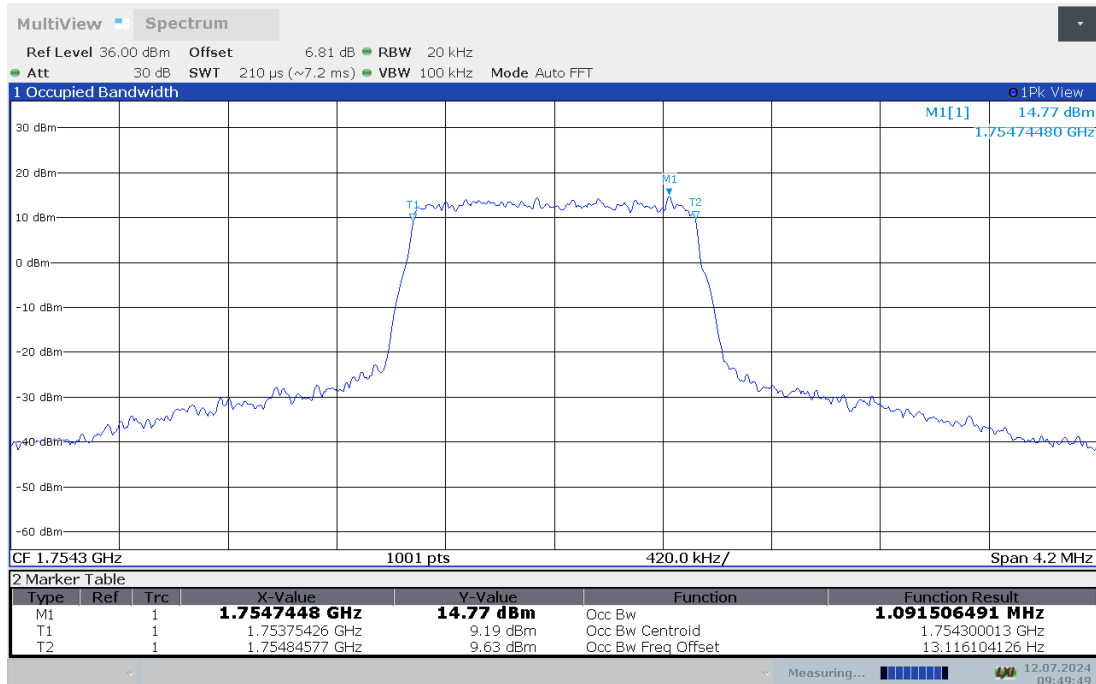
LTE band 4 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



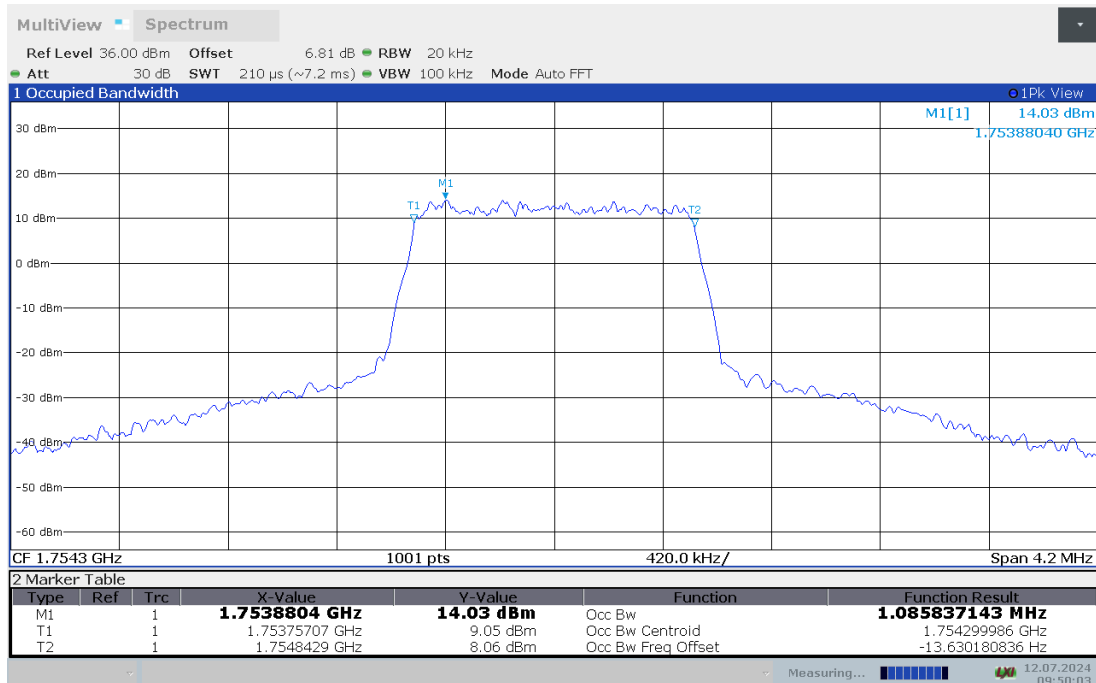
LTE band 4 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



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



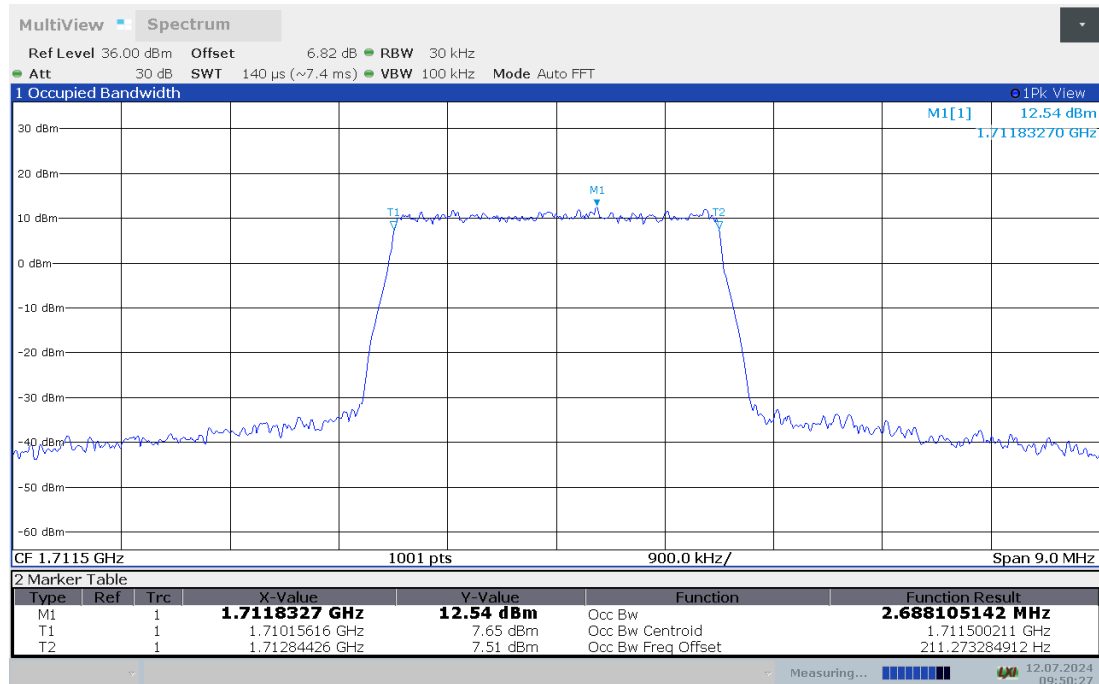
LTE band 4 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



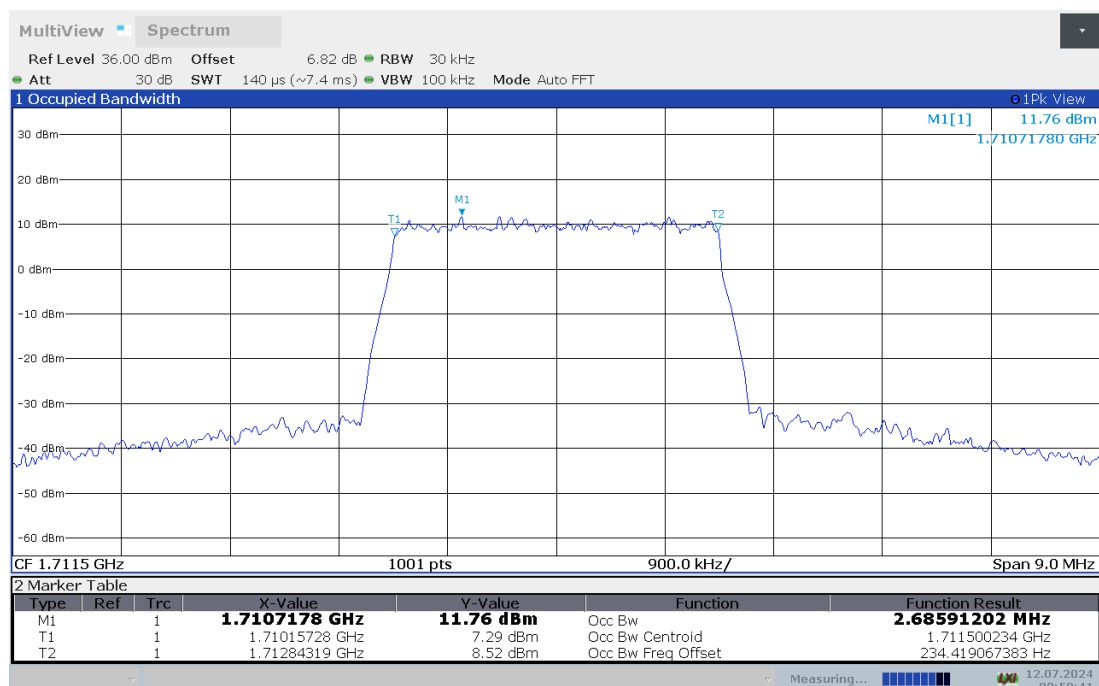
LTE band 4,3MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1711.5	2.688	2.686
1732.5	2.697	2.689
1753.5	2.692	2.693

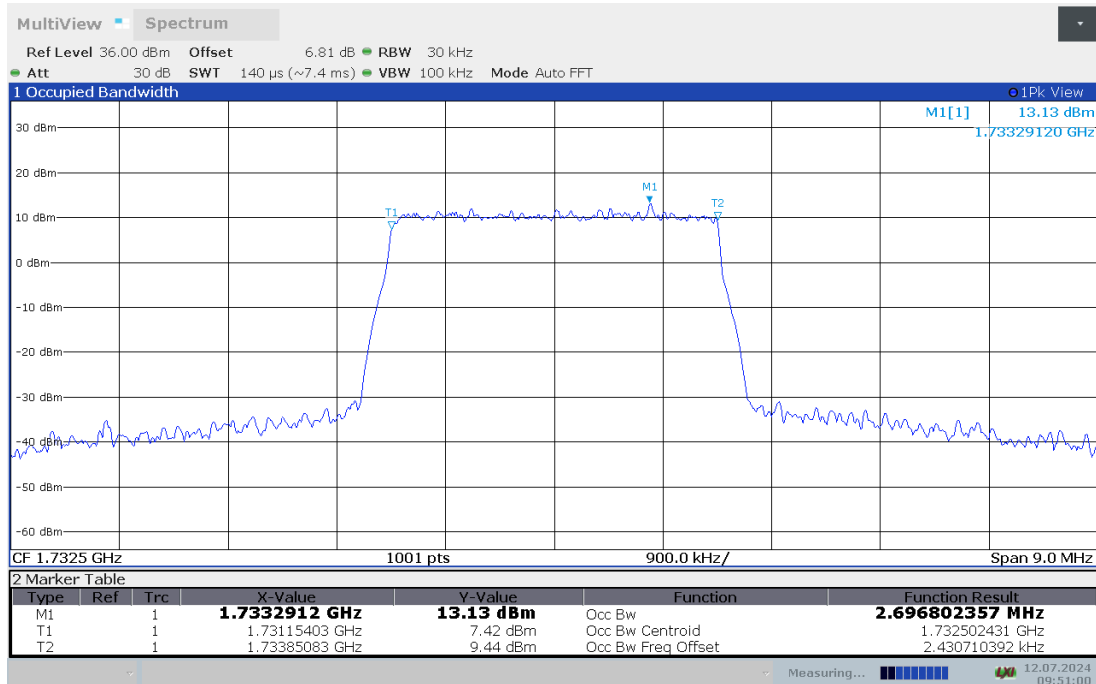
LTE band 4 , 3MHz Bandwidth,LOW,QPSK (99% BW)



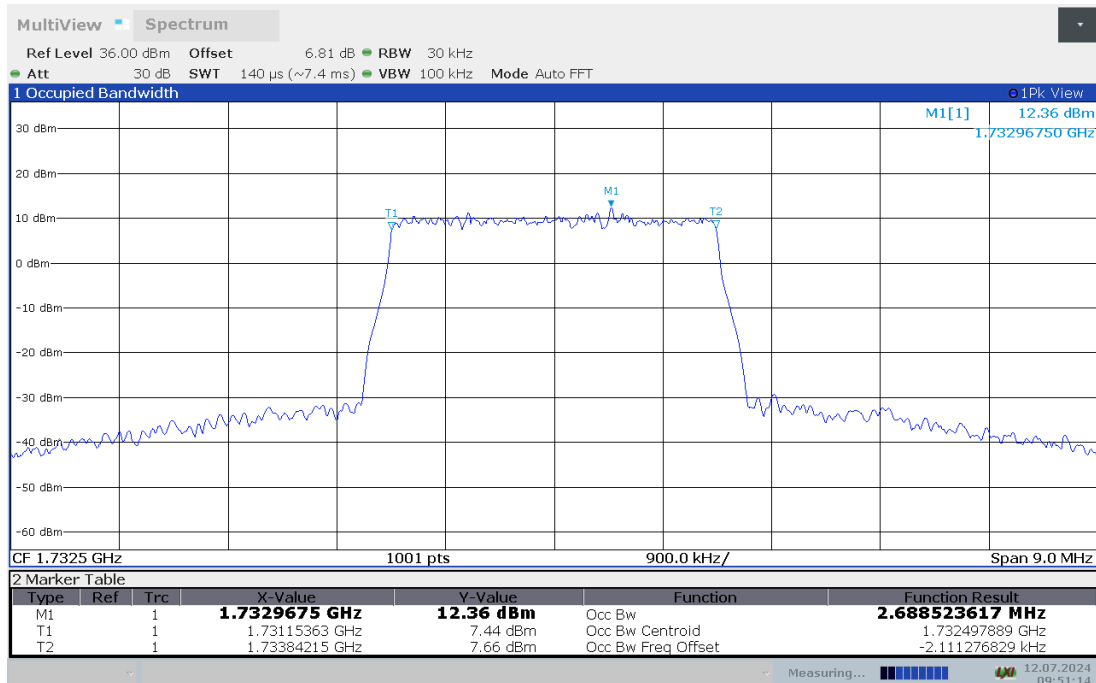
LTE band 4 , 3MHz Bandwidth,LOW,16QAM (99% BW)



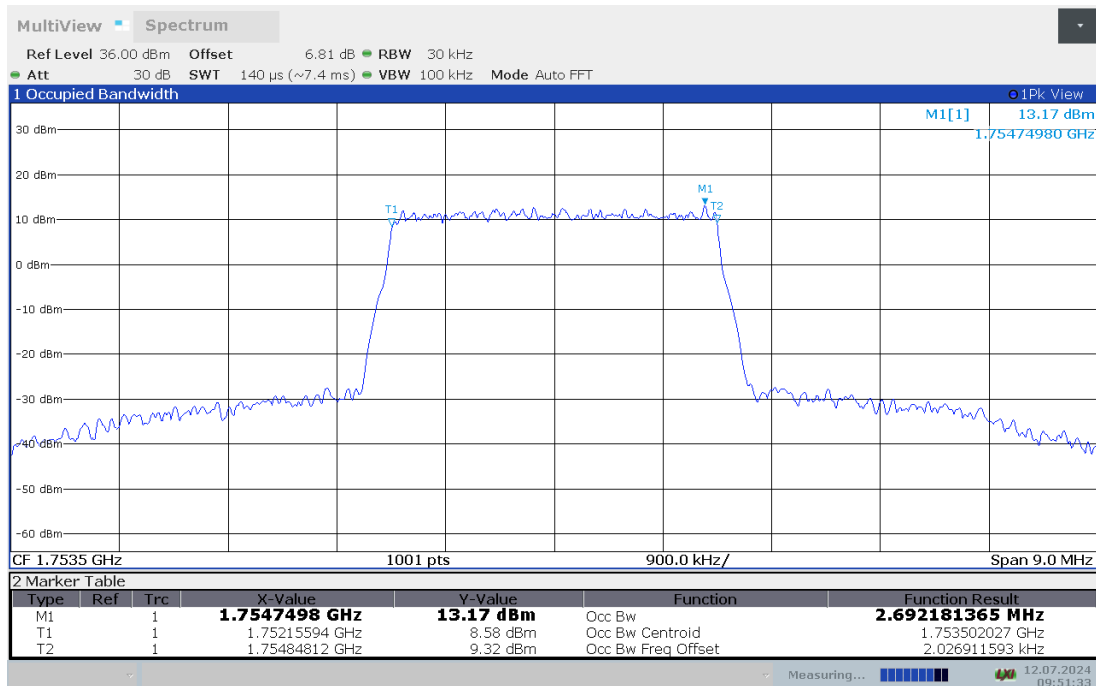
LTE band 4 , 3MHz Bandwidth,MID,QPSK (99% BW)



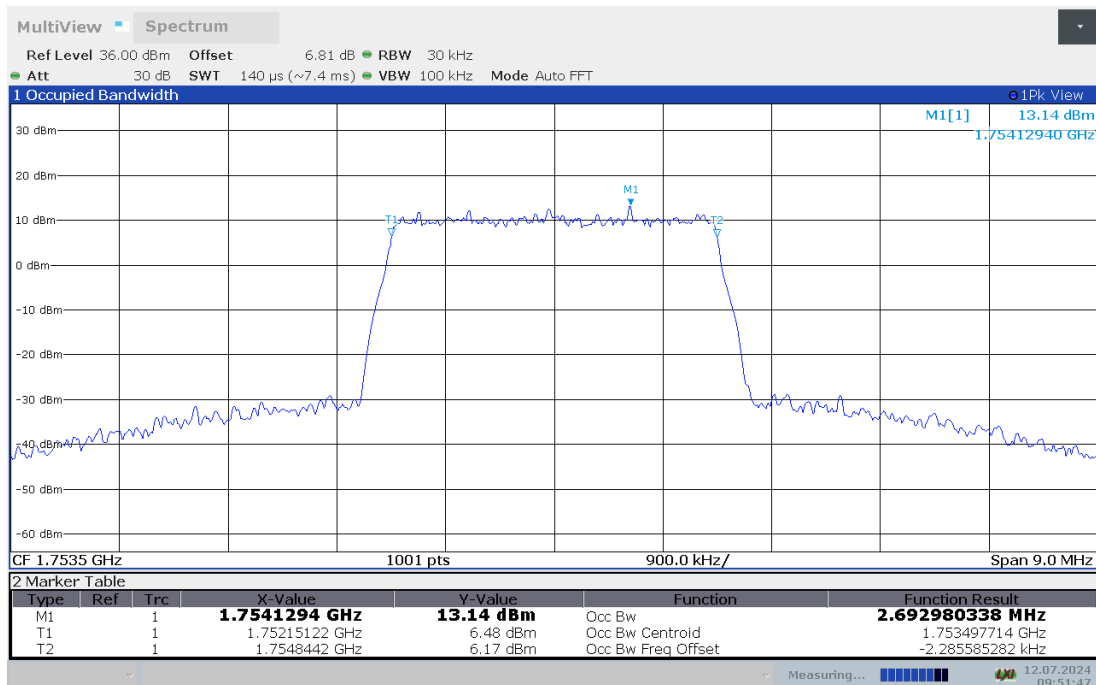
LTE band 4 , 3MHz Bandwidth,MID,16QAM (99% BW)



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



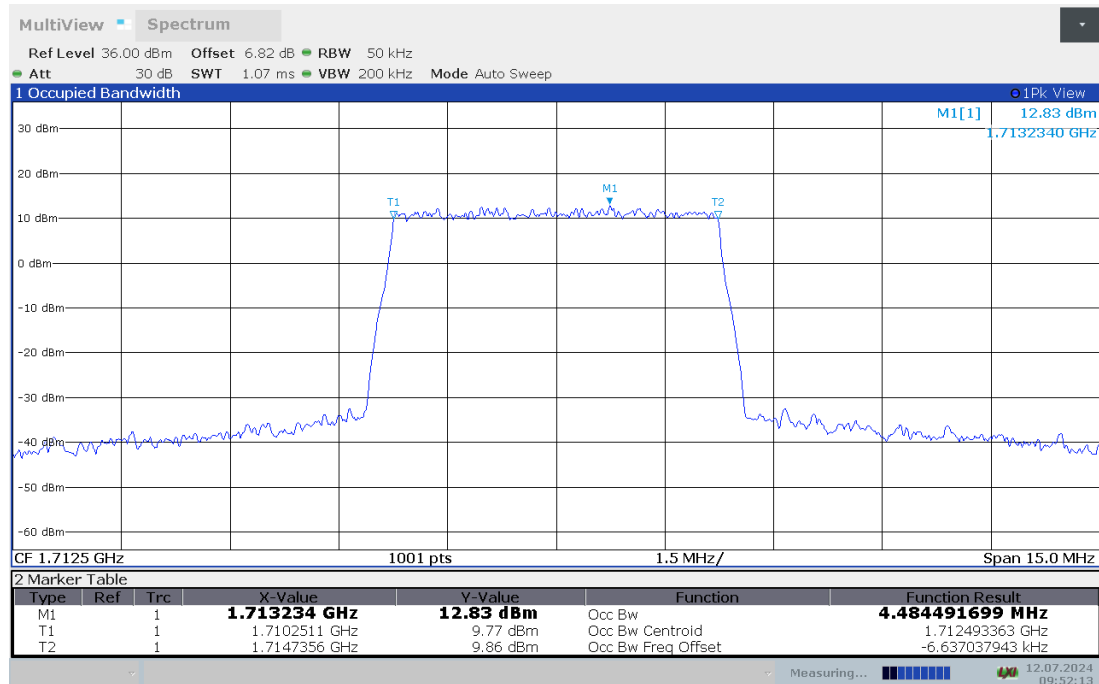
LTE band 4 , 3MHz Bandwidth,HIGH,16QAM (99% BW)



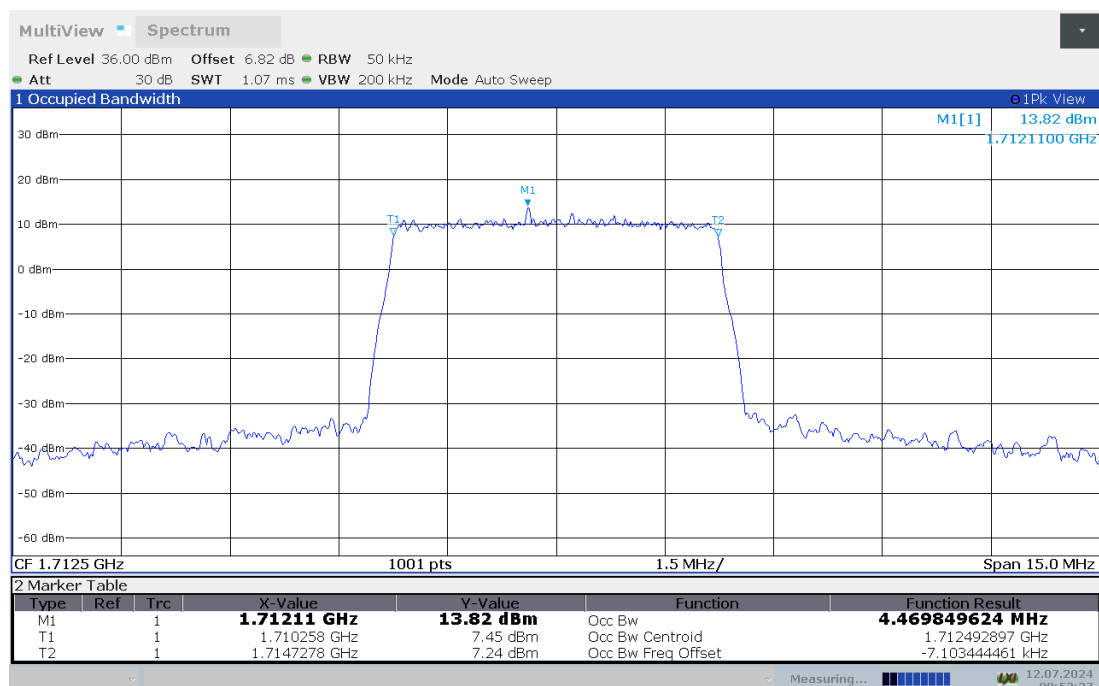
LTE band 4,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1712.5	4.484	4.470
1732.5	4.485	4.486
1752.5	4.468	4.479

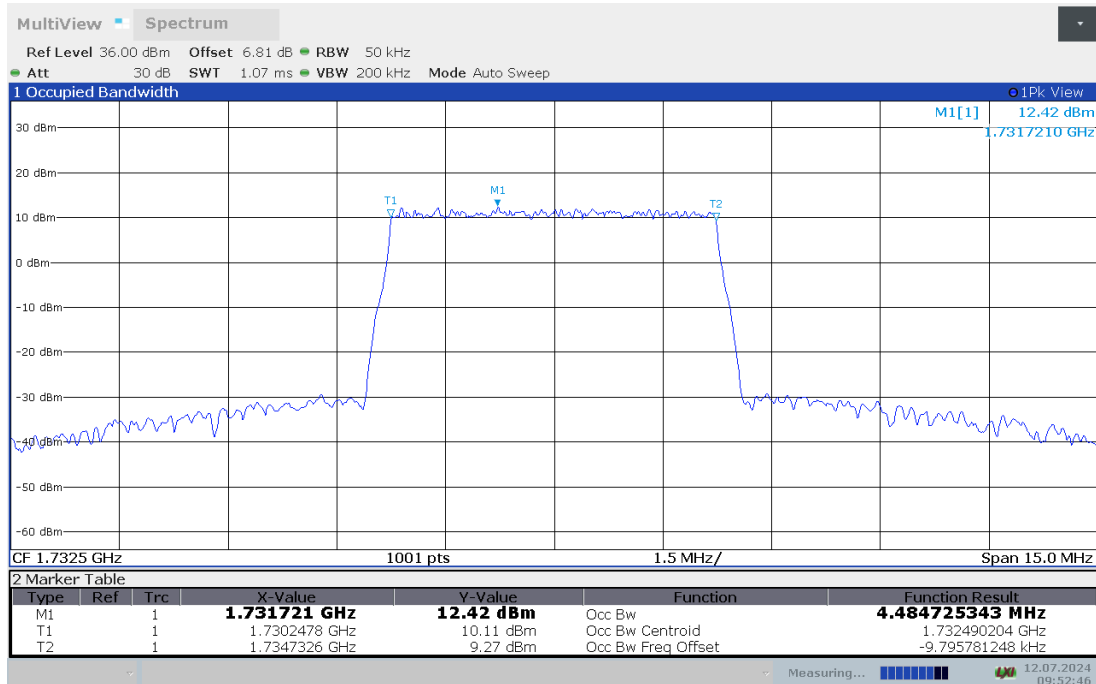
LTE band 4 , 5MHz Bandwidth,LOW,QPSK (99% BW)



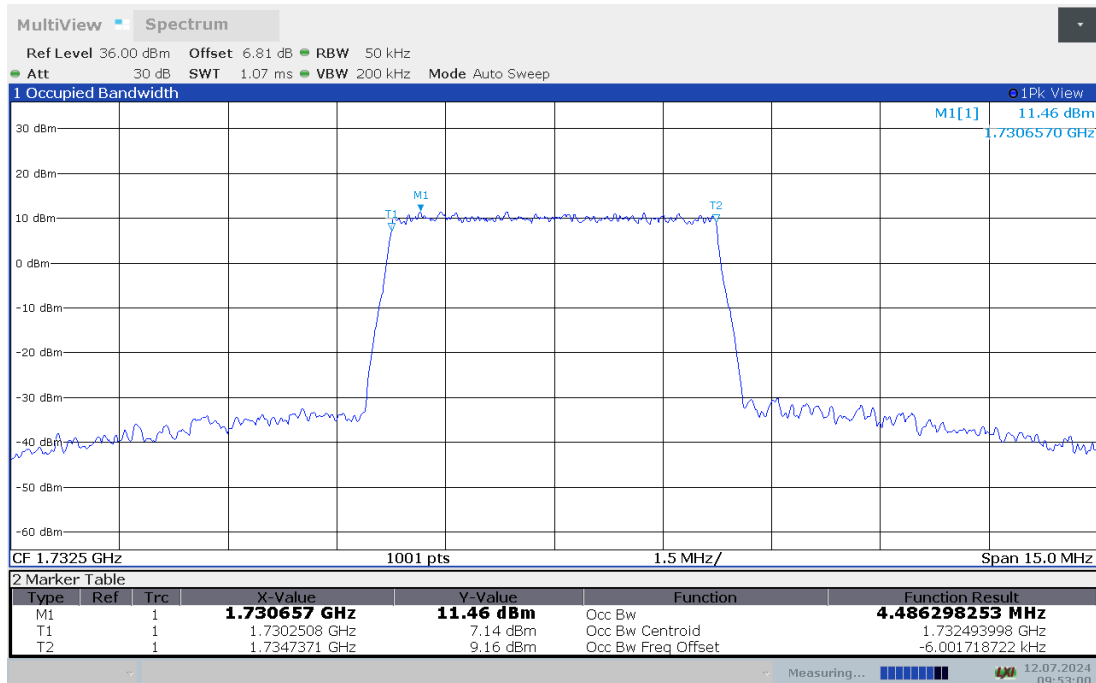
LTE band 4 , 5MHz Bandwidth,LOW,16QAM (99% BW)



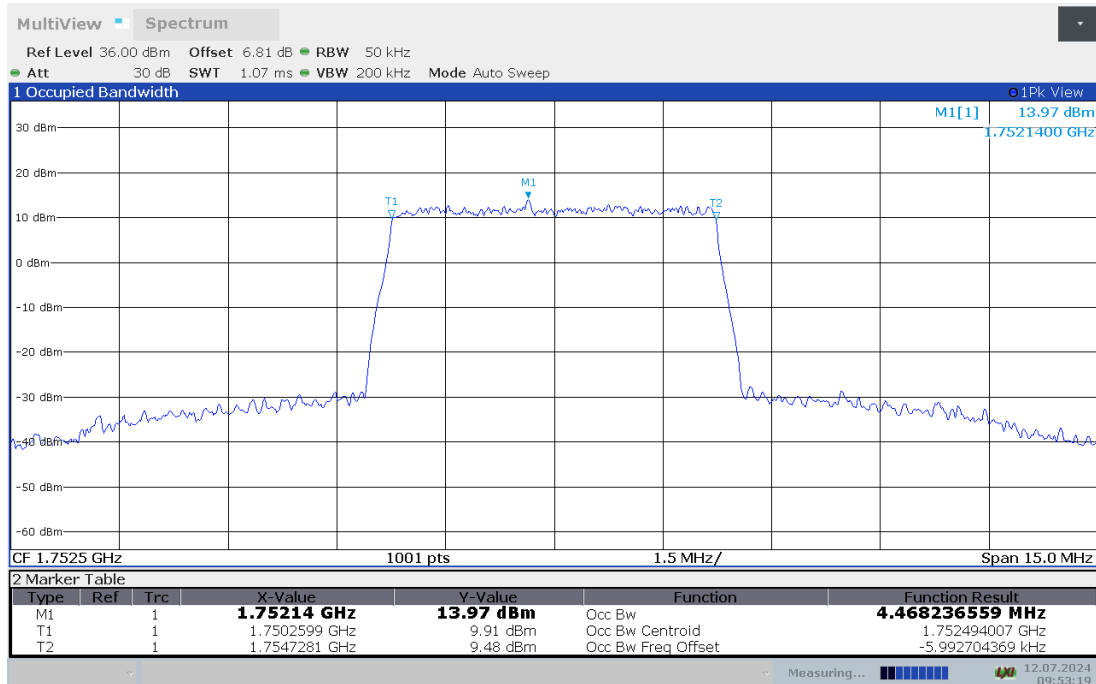
LTE band 4 , 5MHz Bandwidth,MID,QPSK (99% BW)



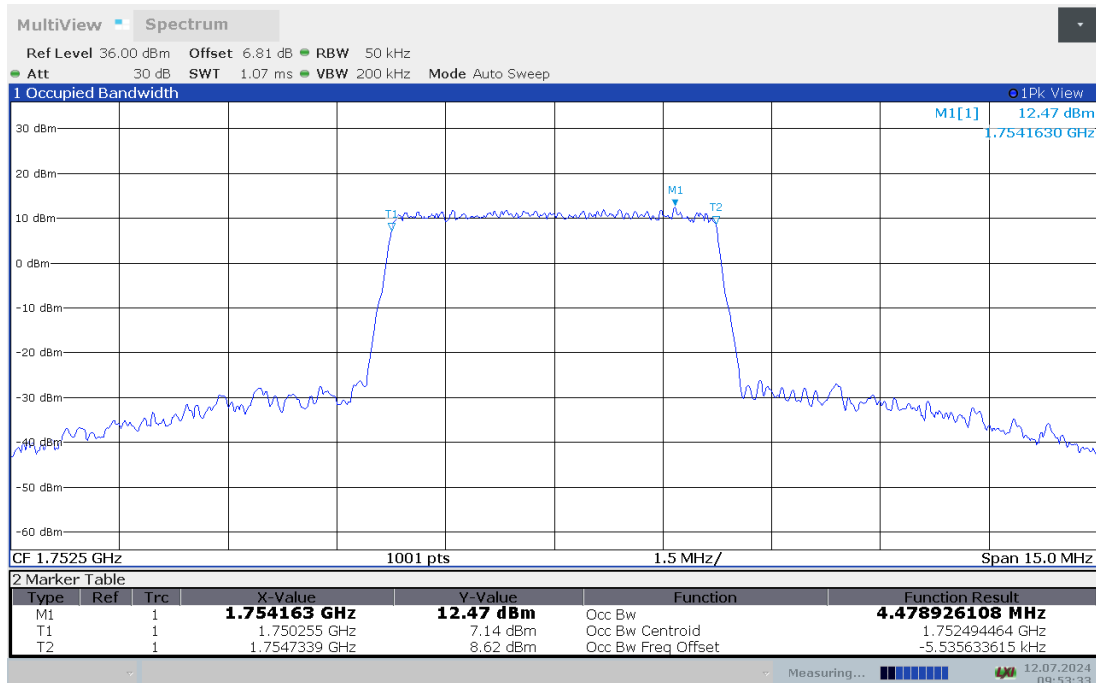
LTE band 4 , 5MHz Bandwidth,MID,16QAM (99% BW)



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



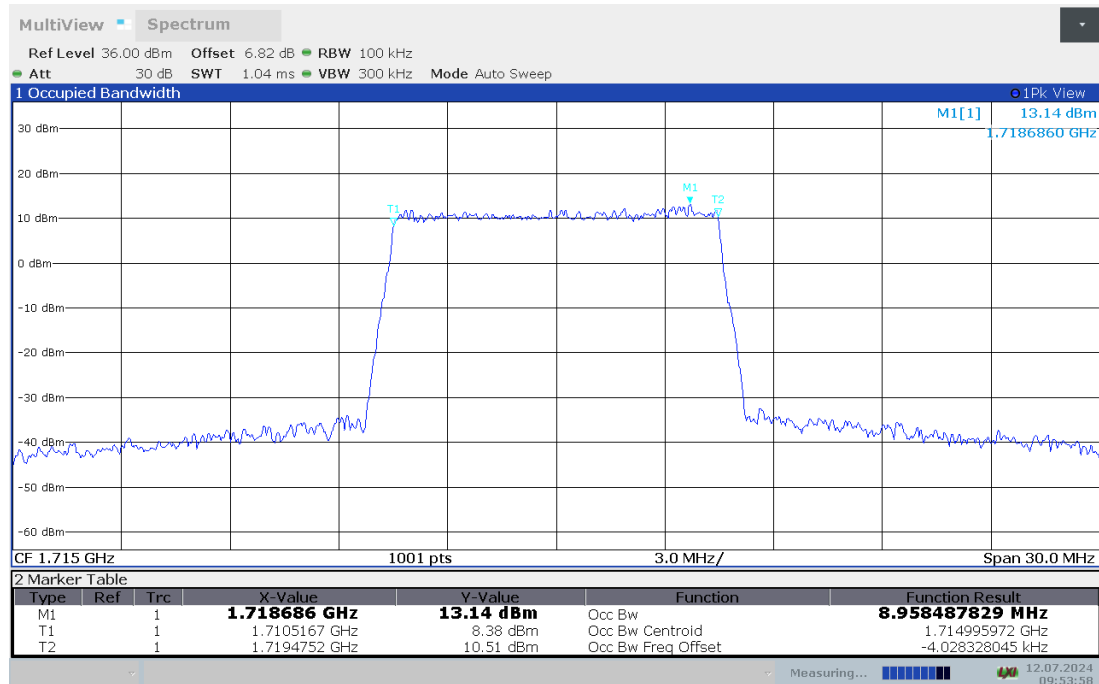
LTE band 4 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



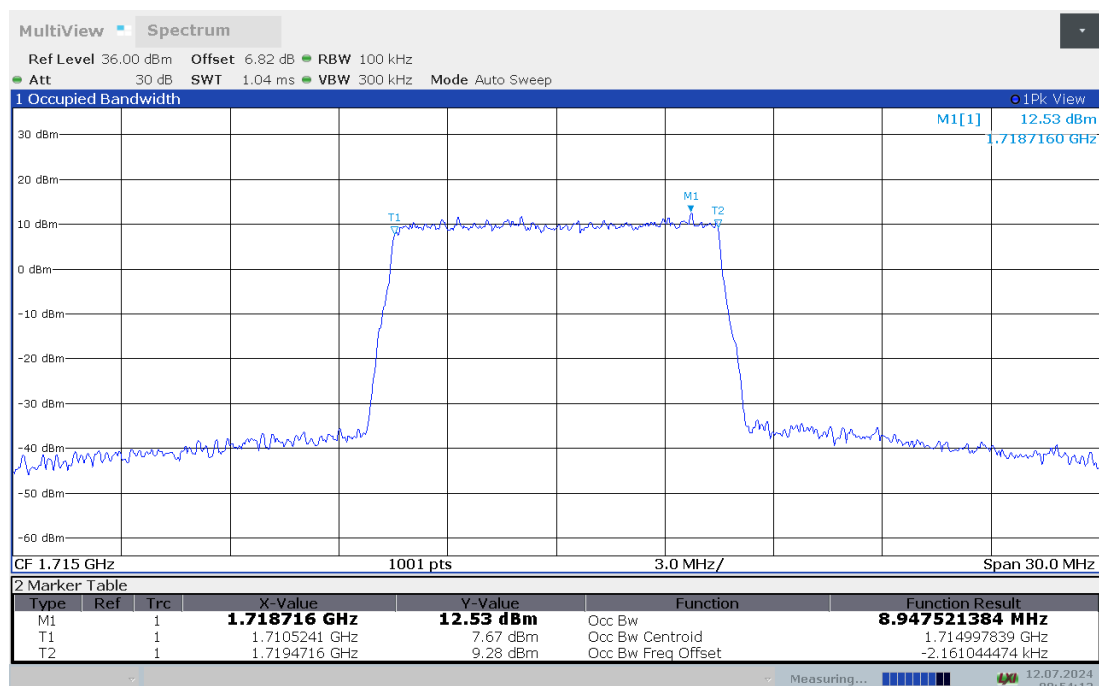
LTE band 4,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1715	8.958	8.948
1732.5	8.941	8.953
1750	8.957	8.963

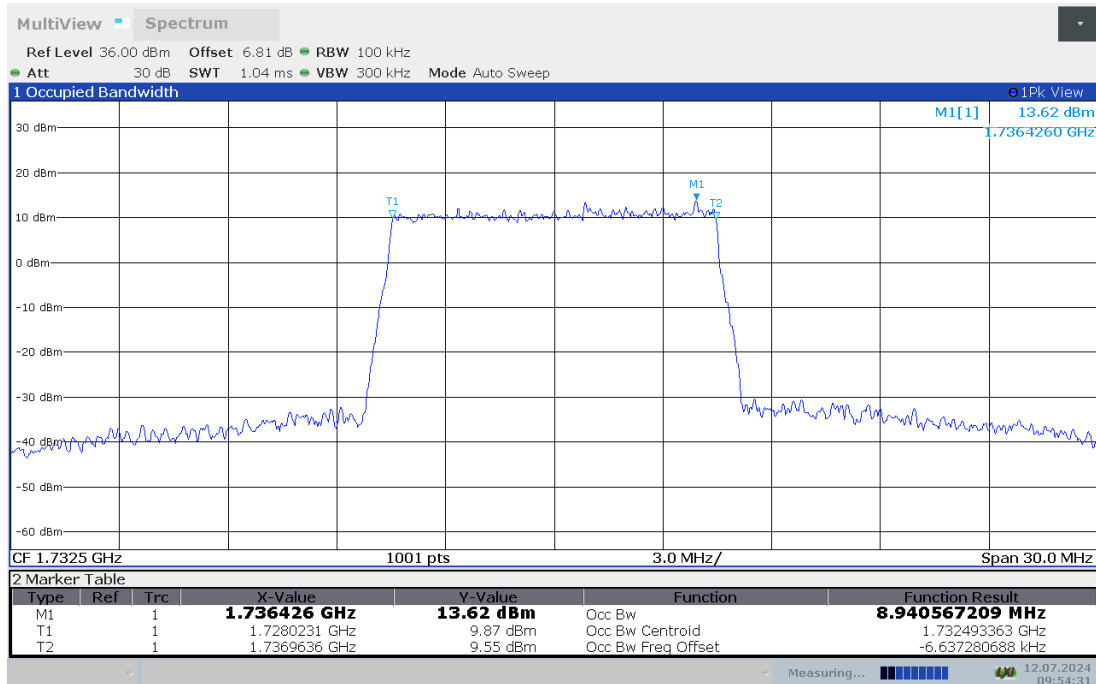
LTE band 4 , 10MHz Bandwidth,LOW,QPSK (99% BW)



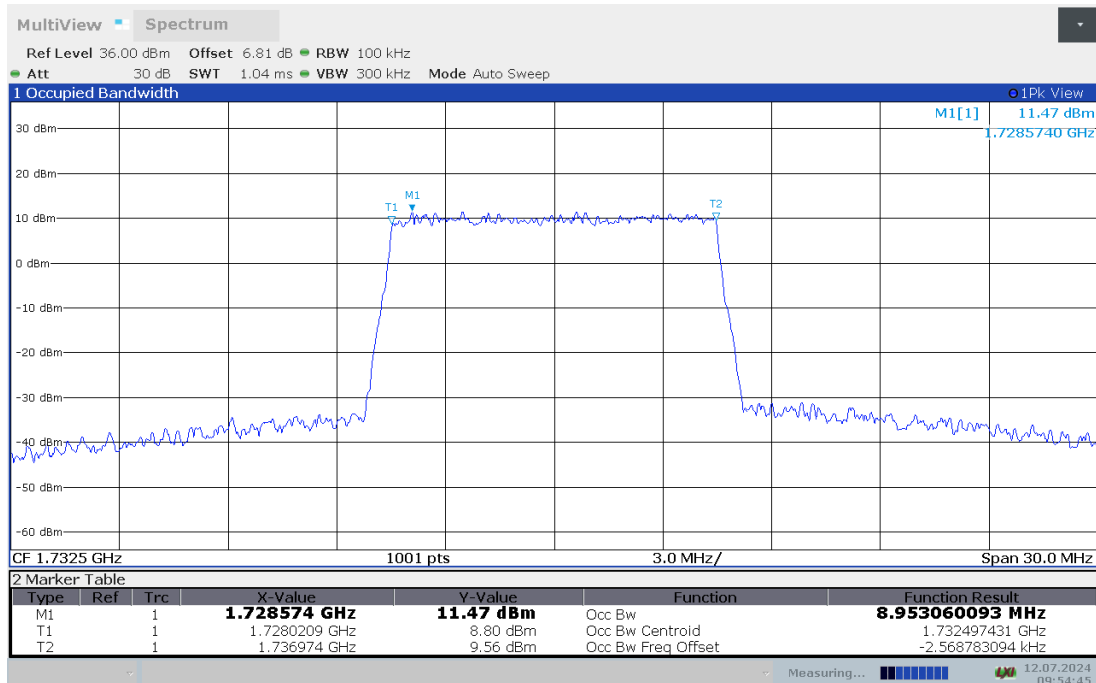
LTE band 4 , 10MHz Bandwidth,LOW,16QAM (99% BW)



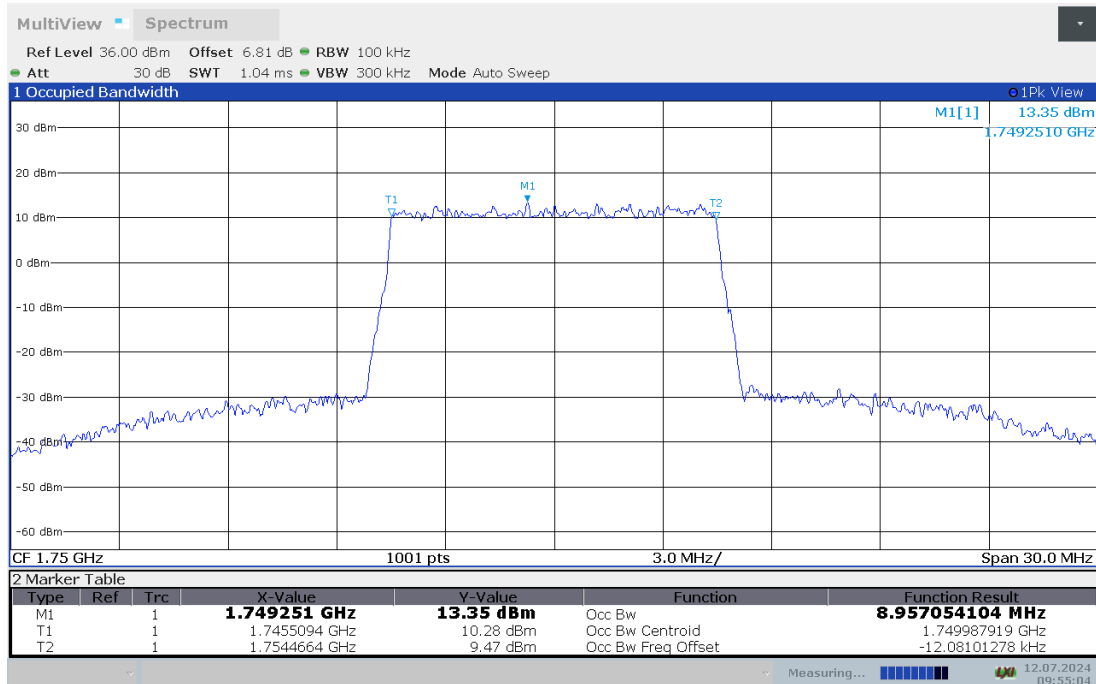
LTE band 4 , 10MHz Bandwidth,MID,QPSK (99% BW)



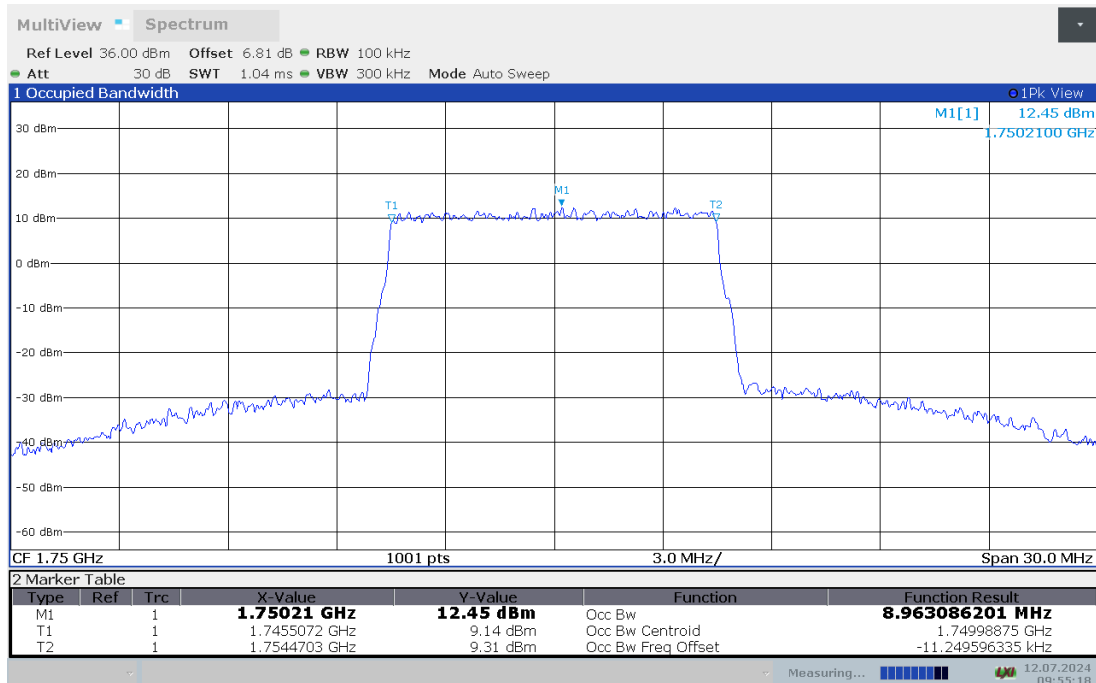
LTE band 4 , 10MHz Bandwidth,MID,16QAM (99% BW)



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



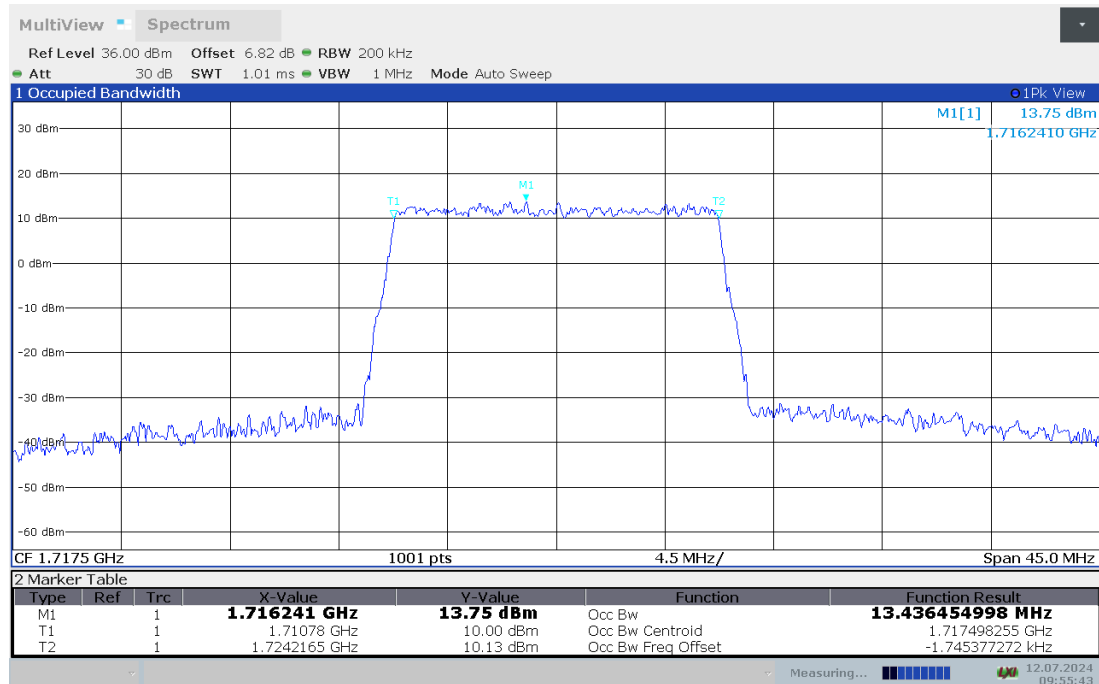
LTE band 4 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



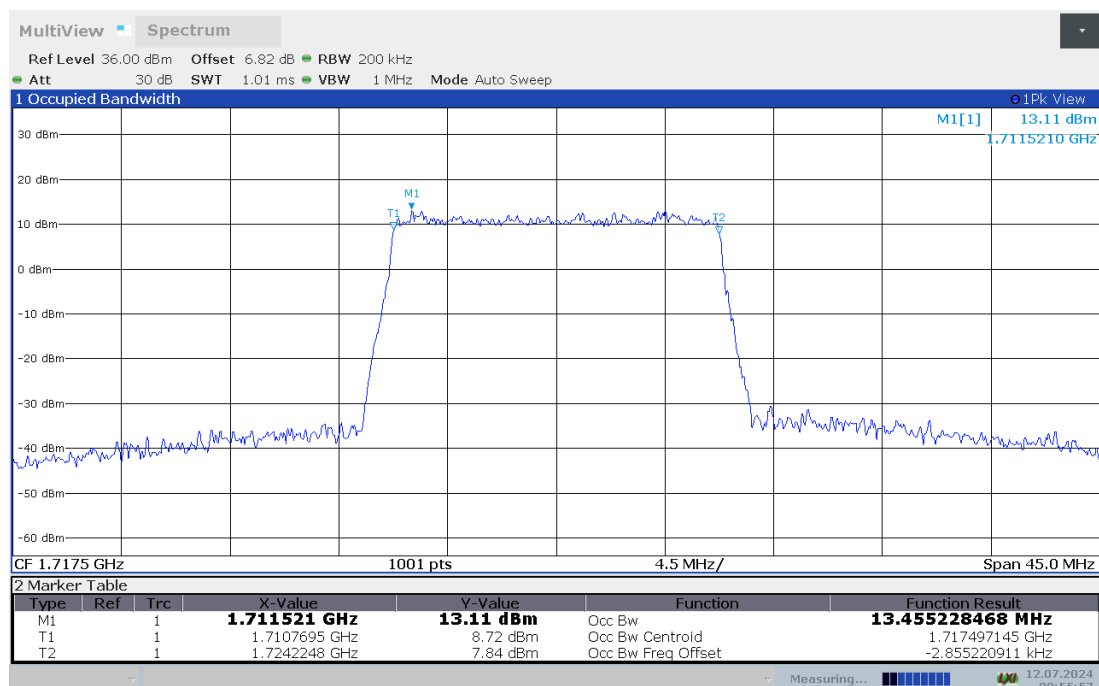
LTE band 4,15MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1717.5	13.436	13.455
1732.5	13.452	13.456
1747.5	13.471	13.467

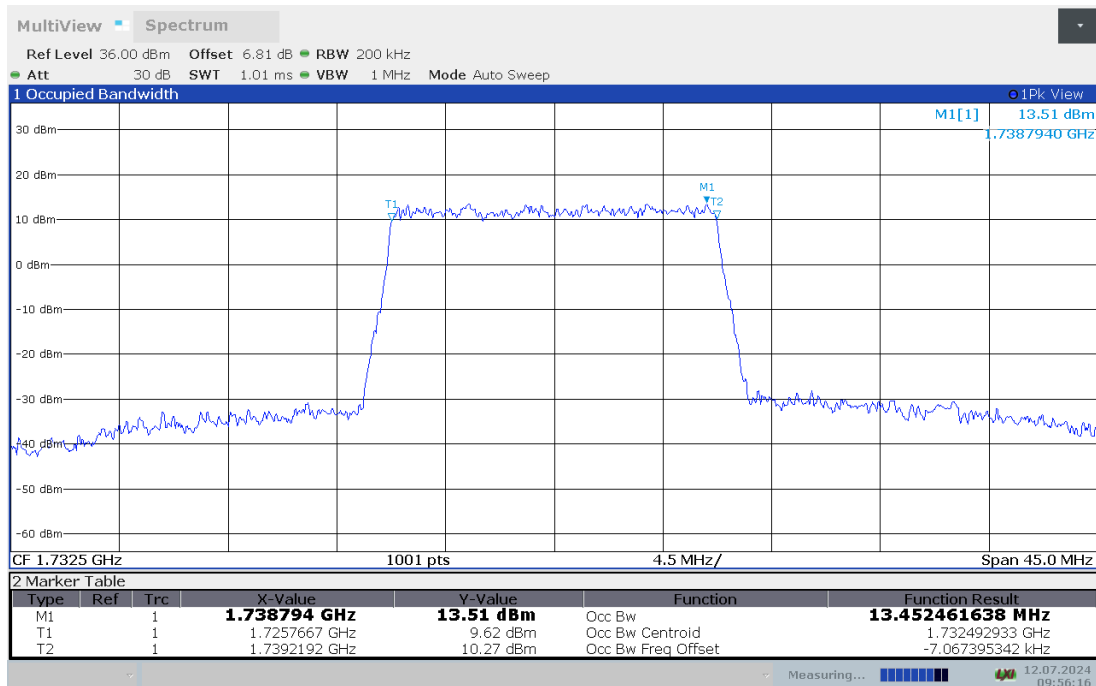
LTE band 4 , 15MHz Bandwidth,LOW,QPSK (99% BW)



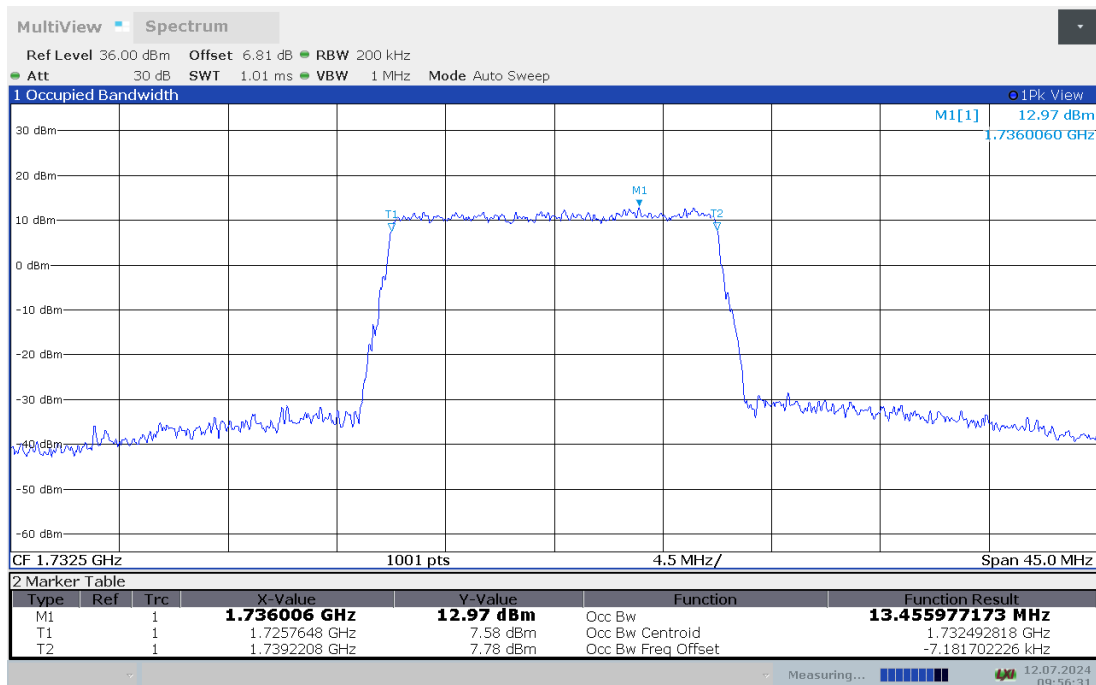
LTE band 4 , 15MHz Bandwidth,LOW,16QAM (99% BW)



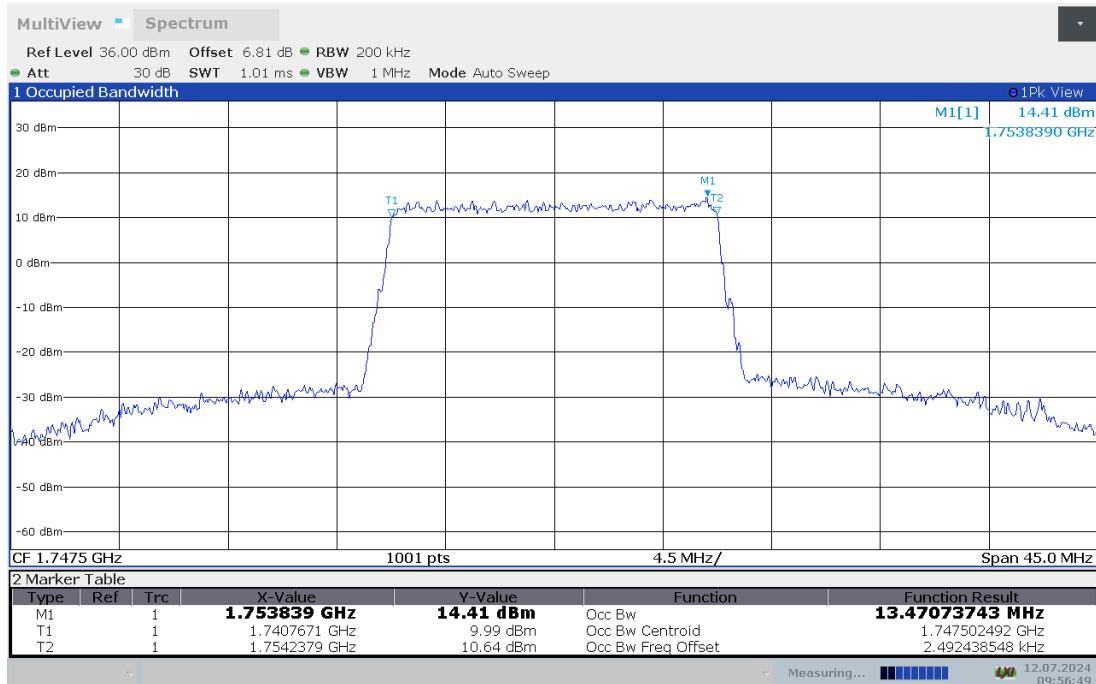
LTE band 4 , 15MHz Bandwidth,MID,QPSK (99% BW)



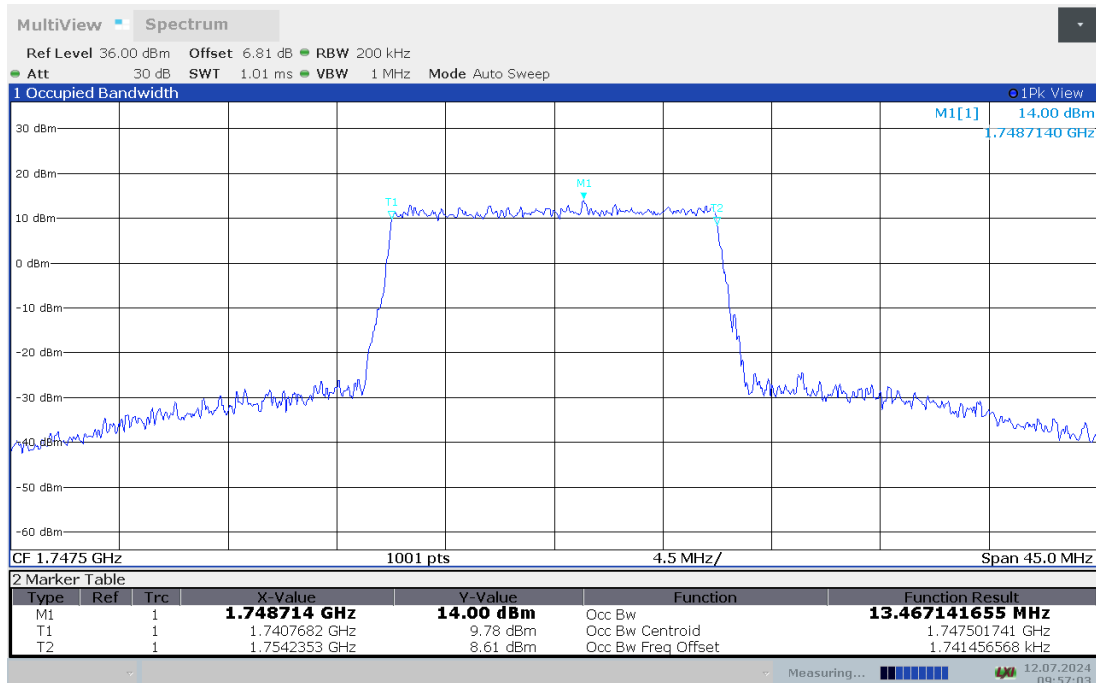
LTE band 4 , 15MHz Bandwidth,MID,16QAM (99% BW)



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



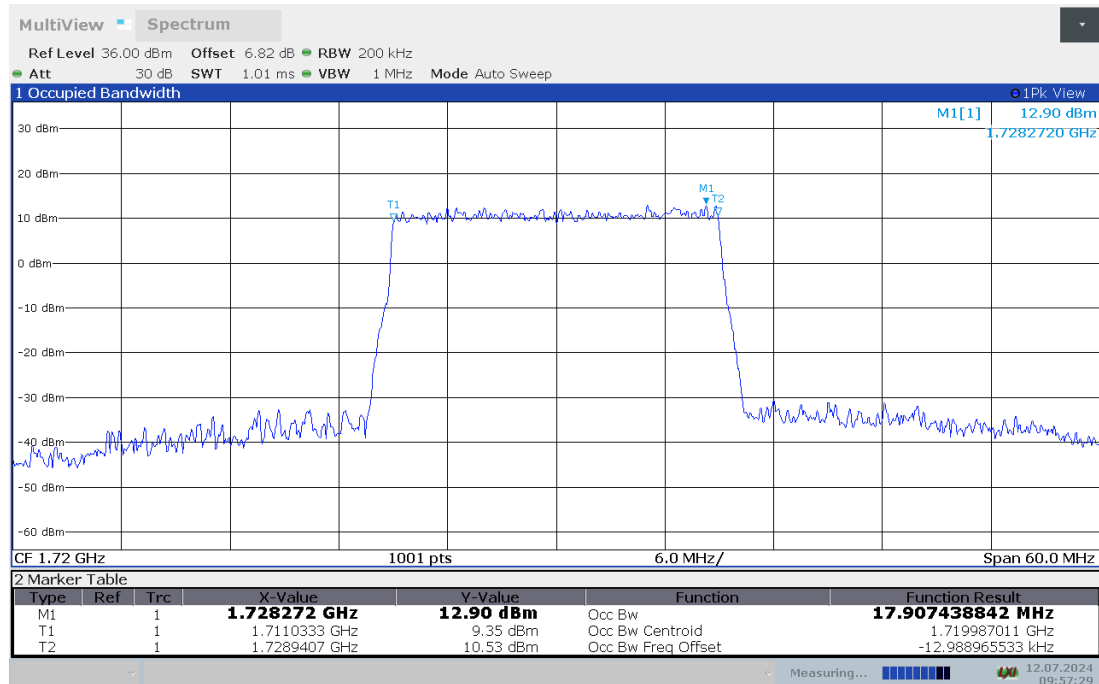
LTE band 4 , 15MHz Bandwidth,HIGH,16QAM (99% BW)



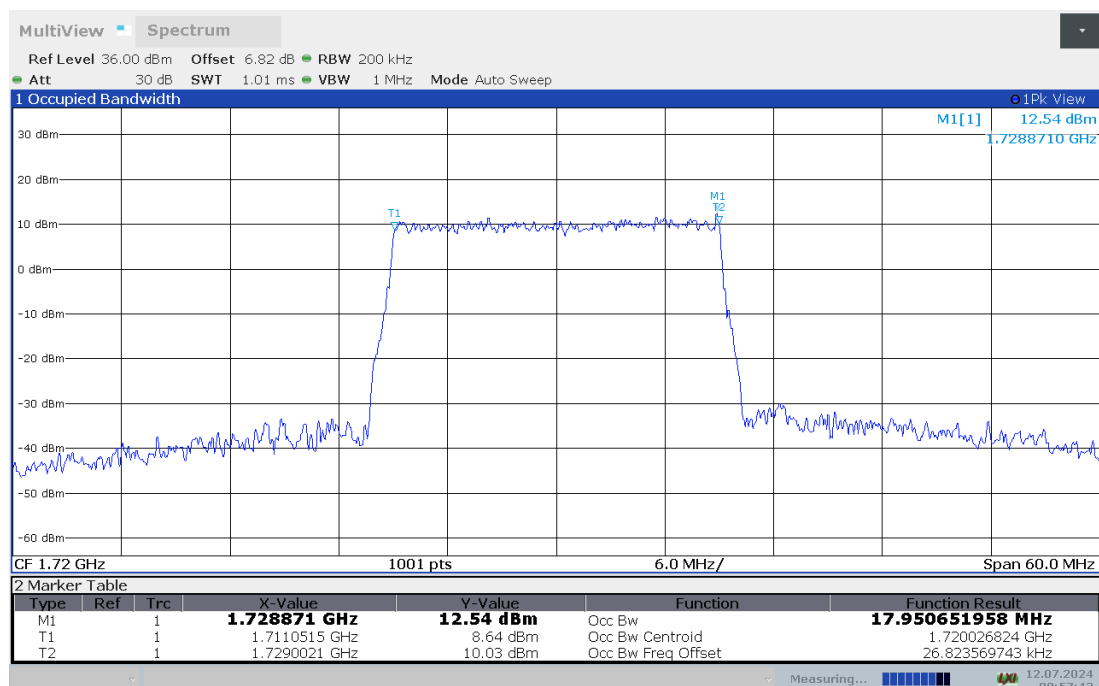
LTE band 4,20MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1720	17.907	17.951
1732.5	17.905	17.946
1745	17.934	17.944

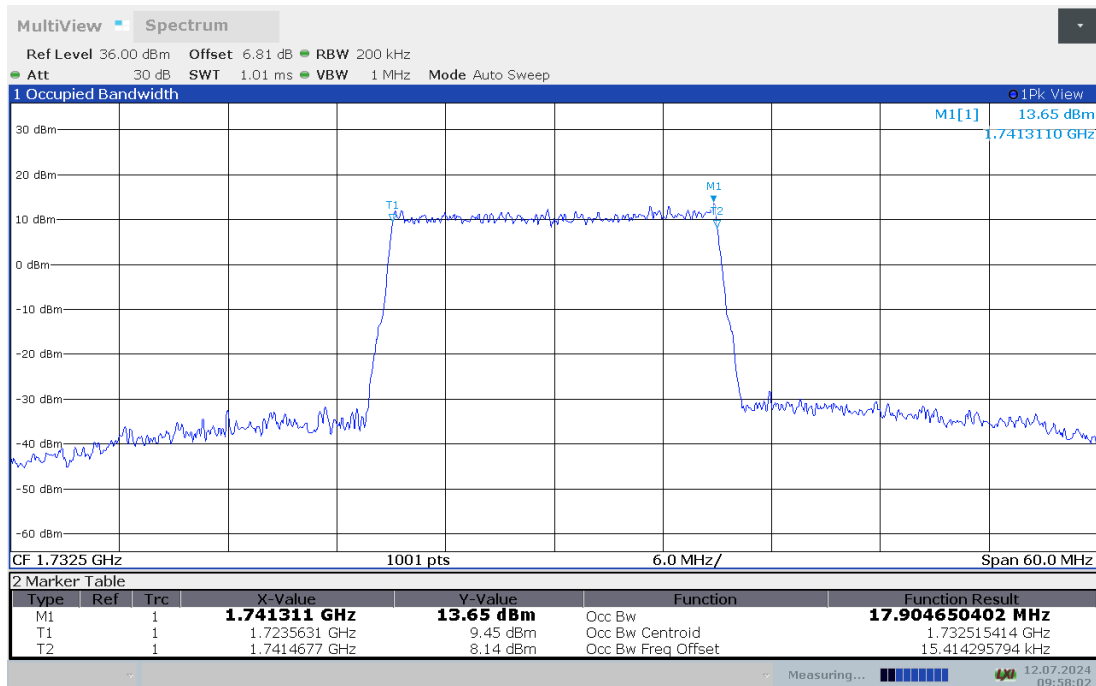
LTE band 4 , 20MHz Bandwidth,LOW,QPSK (99% BW)



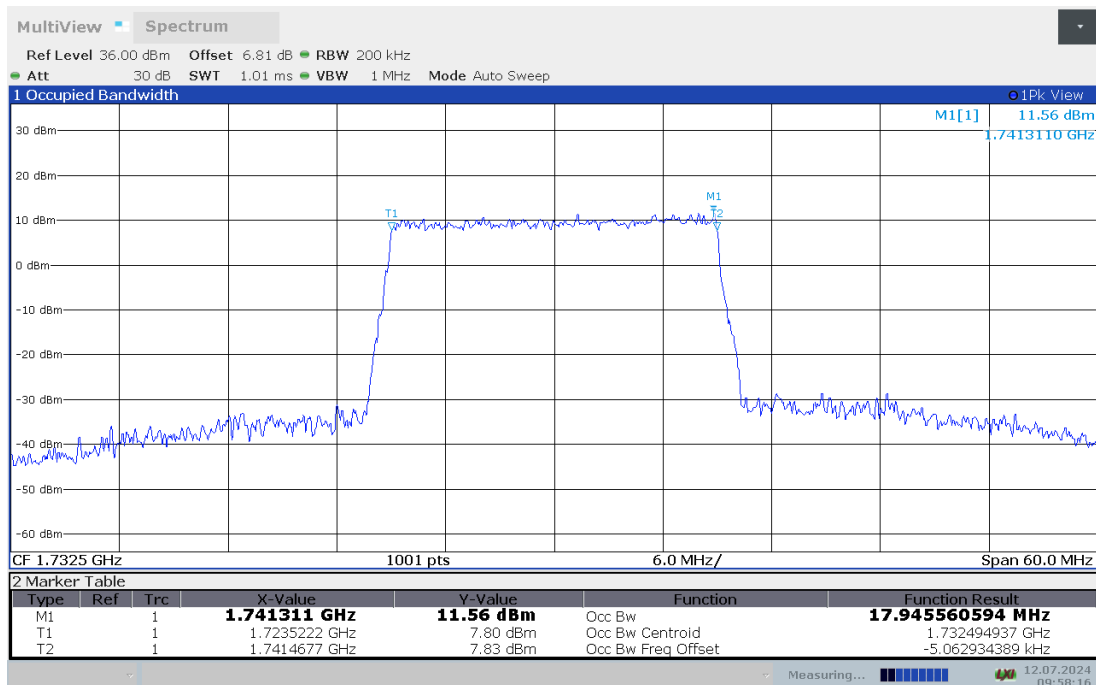
LTE band 4 , 20MHz Bandwidth,LOW,16QAM (99% BW)



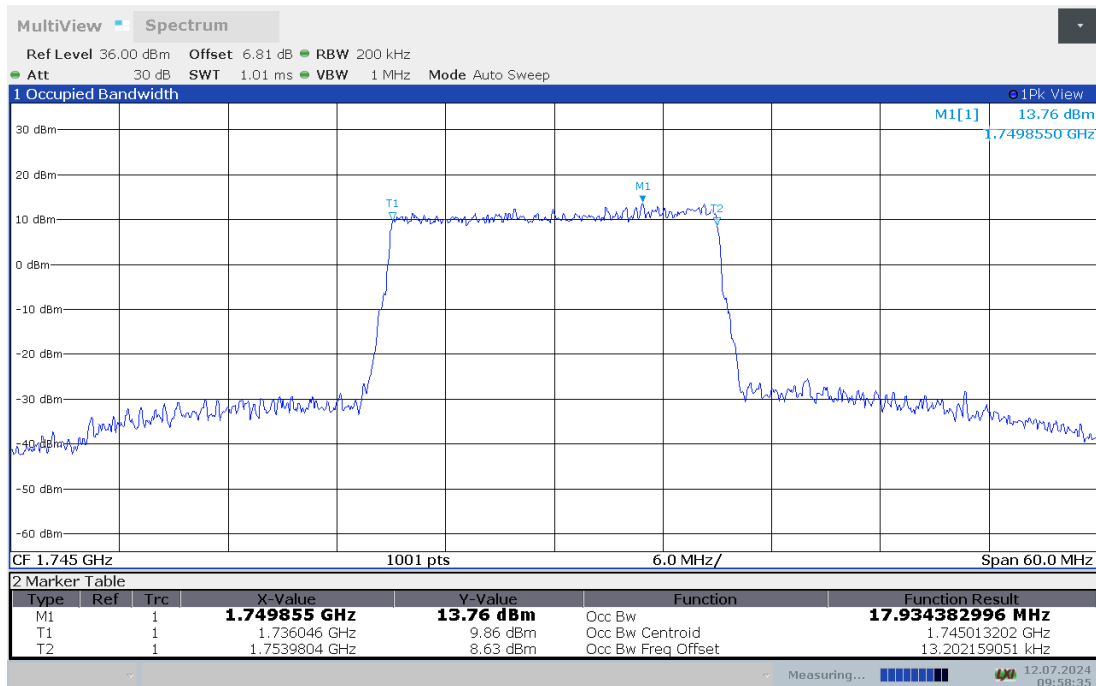
LTE band 4 , 20MHz Bandwidth,MID,QPSK (99% BW)



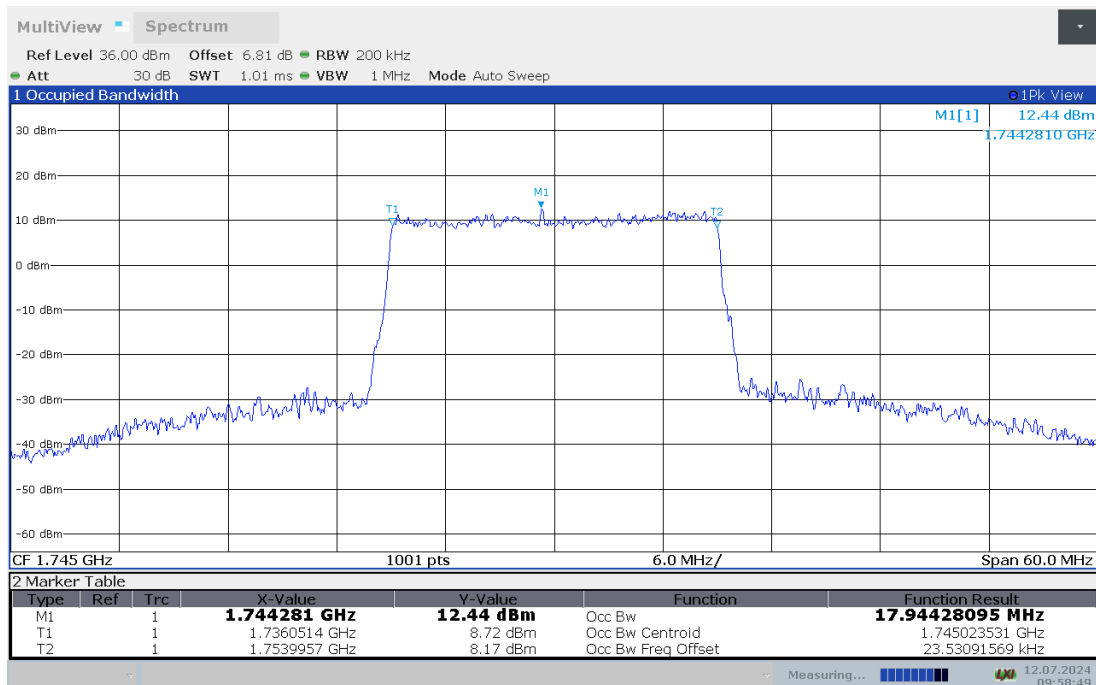
LTE band 4 , 20MHz Bandwidth,MID,16QAM (99% BW)



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



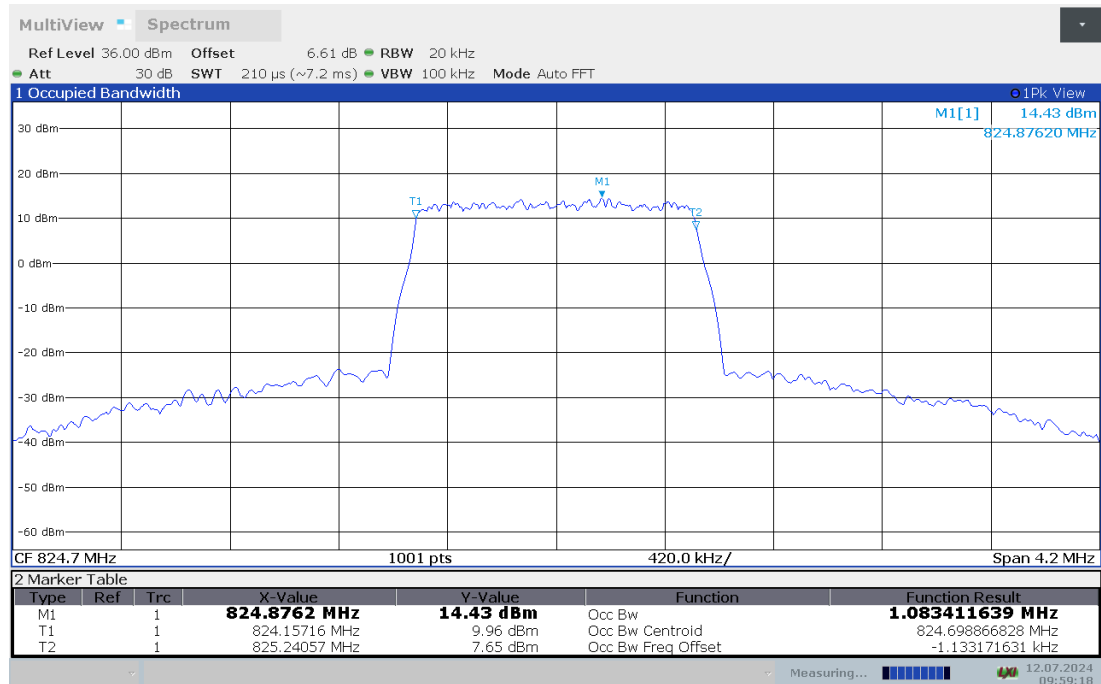
LTE band 4 , 20MHz Bandwidth,HIGH,16QAM (99% BW)



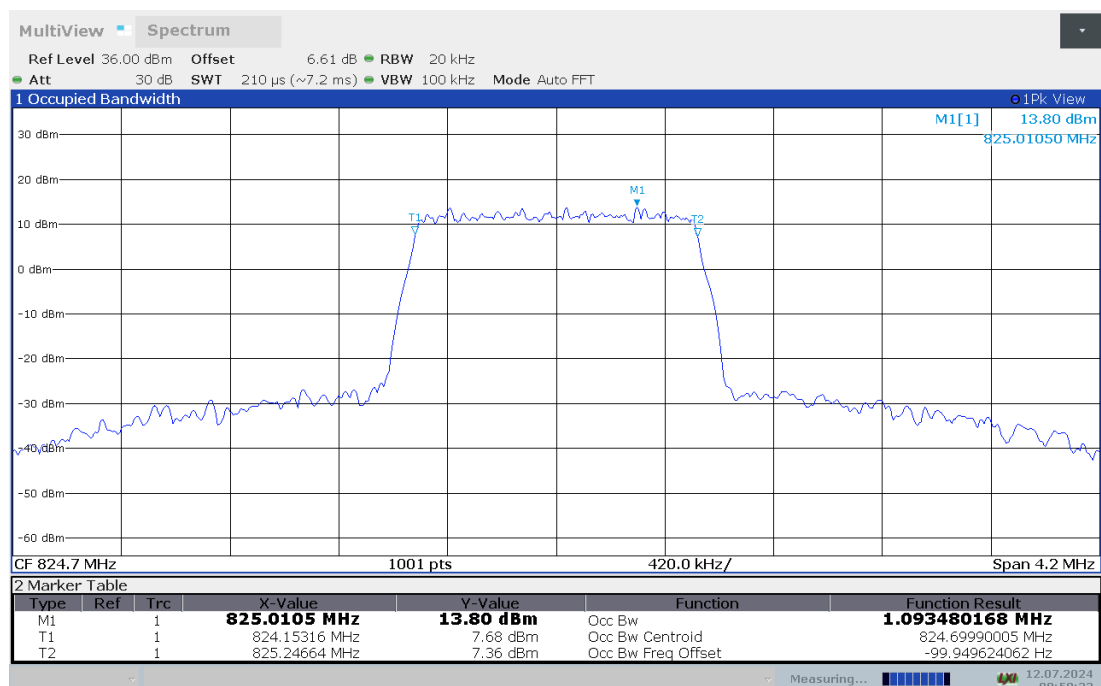
LTE band 5,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
824.7	1.083	1.093
836.5	1.087	1.083
848.3	1.090	1.088

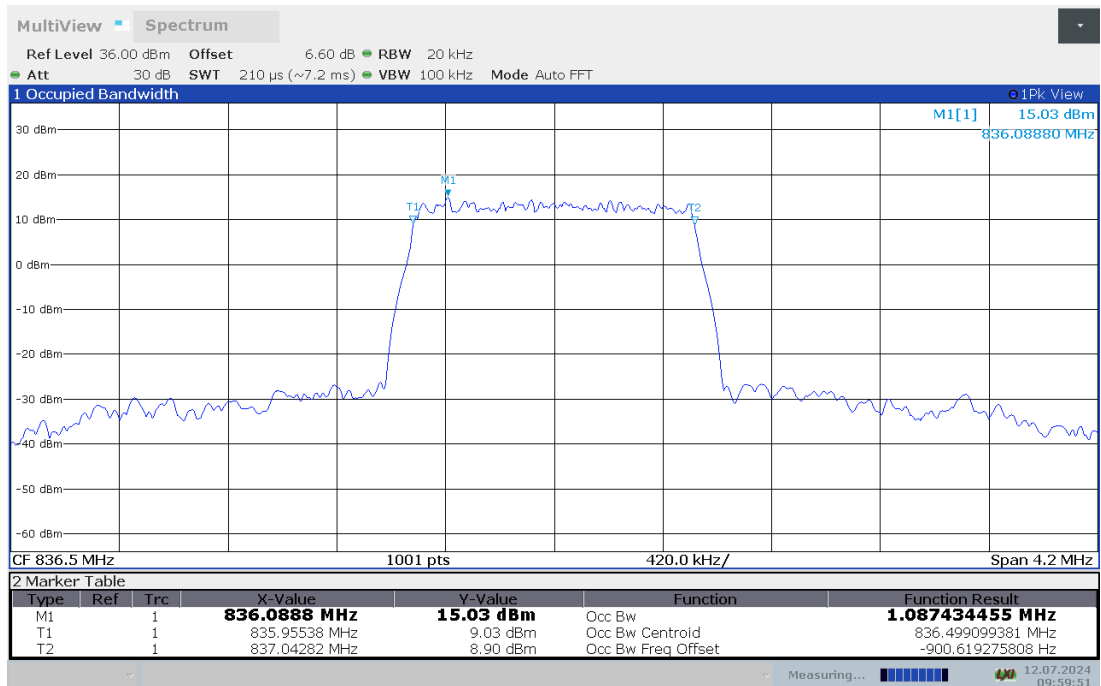
LTE band 5 , 1.4MHz Bandwidth,LOW,QPSK (99% BW)



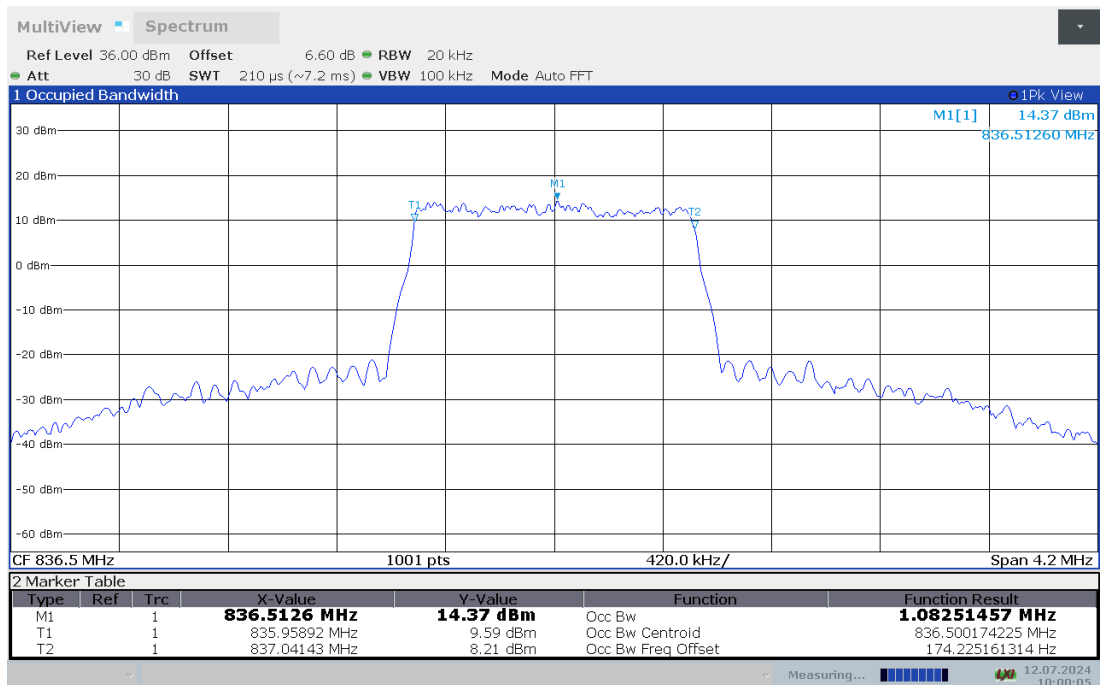
LTE band 5 , 1.4MHz Bandwidth,LOW,16QAM (99% BW)



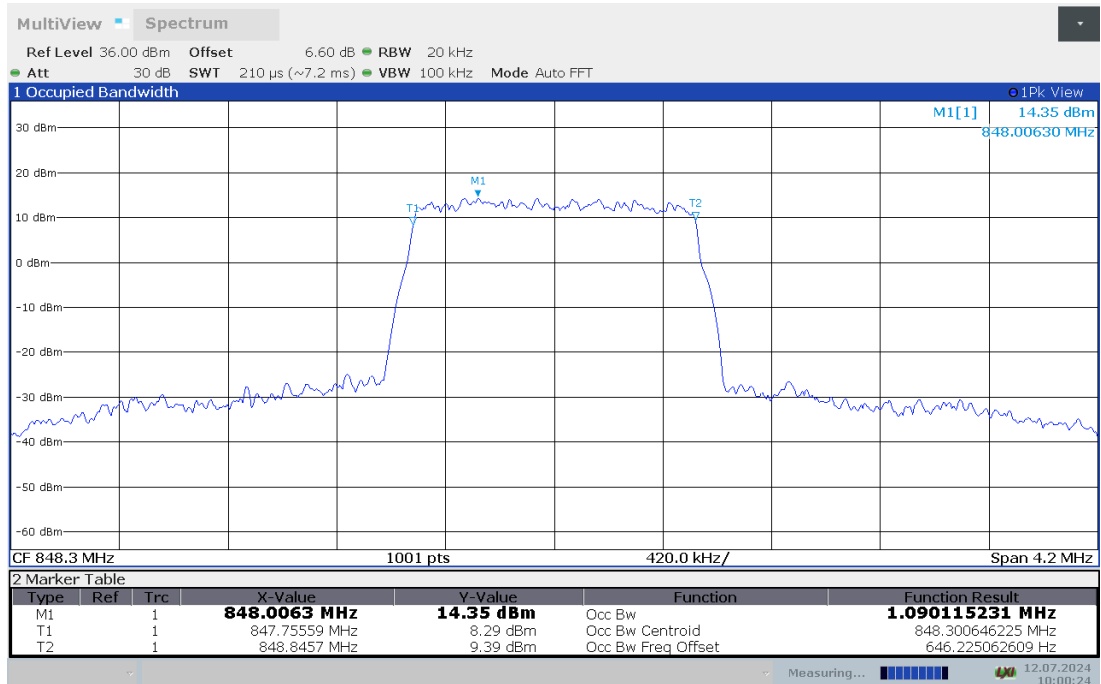
LTE band 5 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



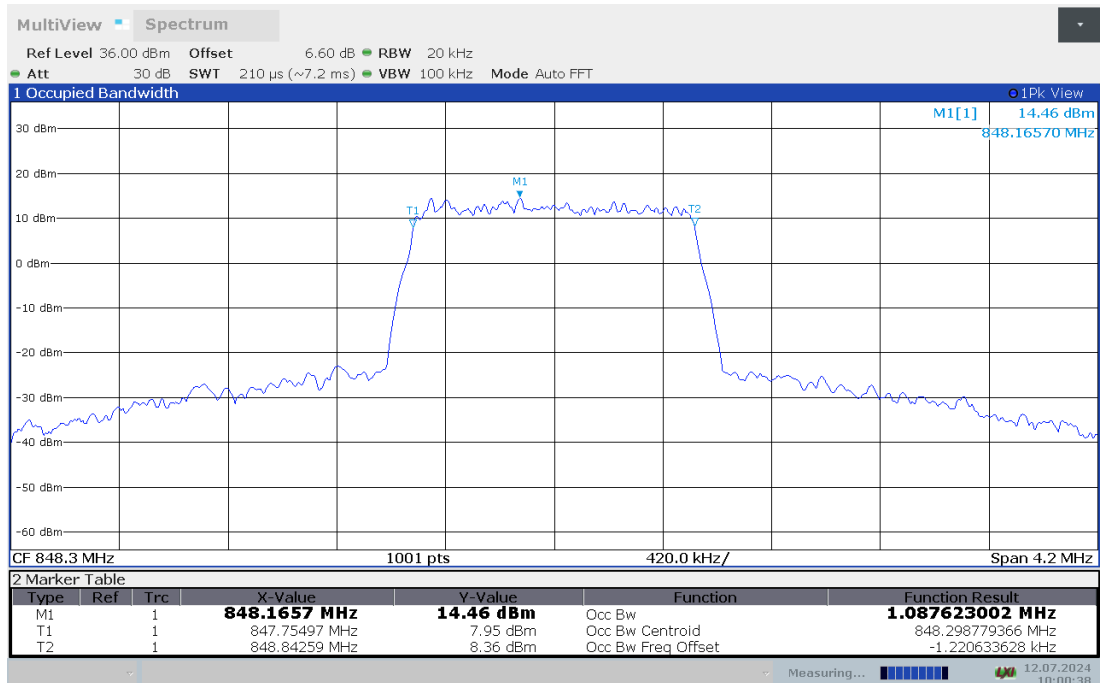
LTE band 5 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



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



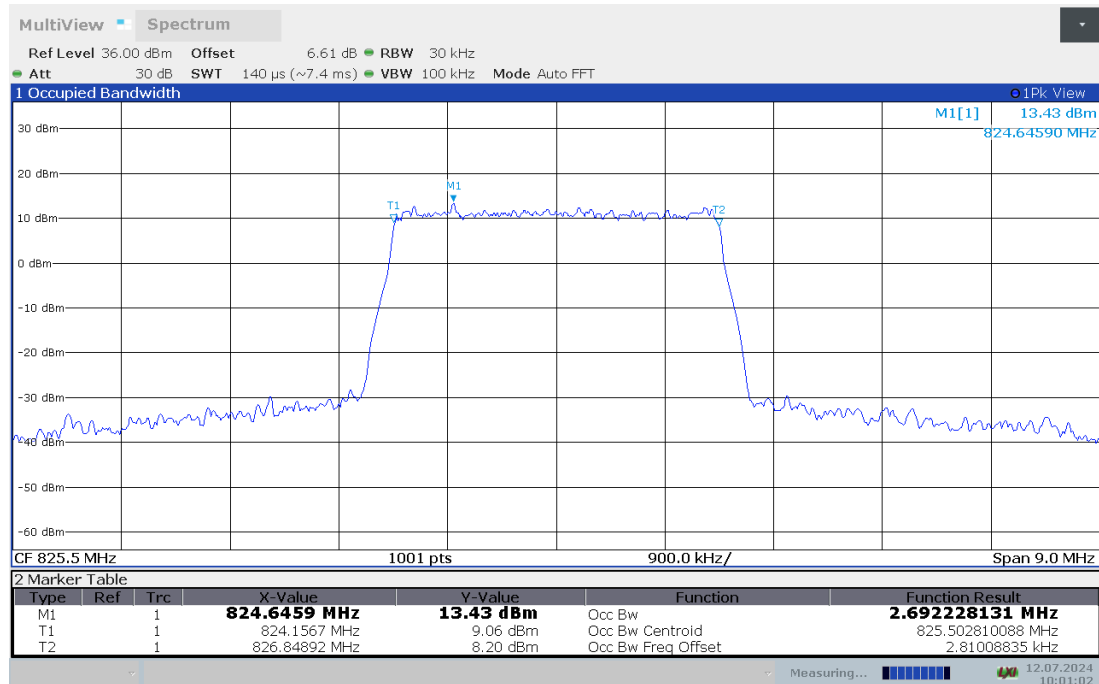
LTE band 5 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



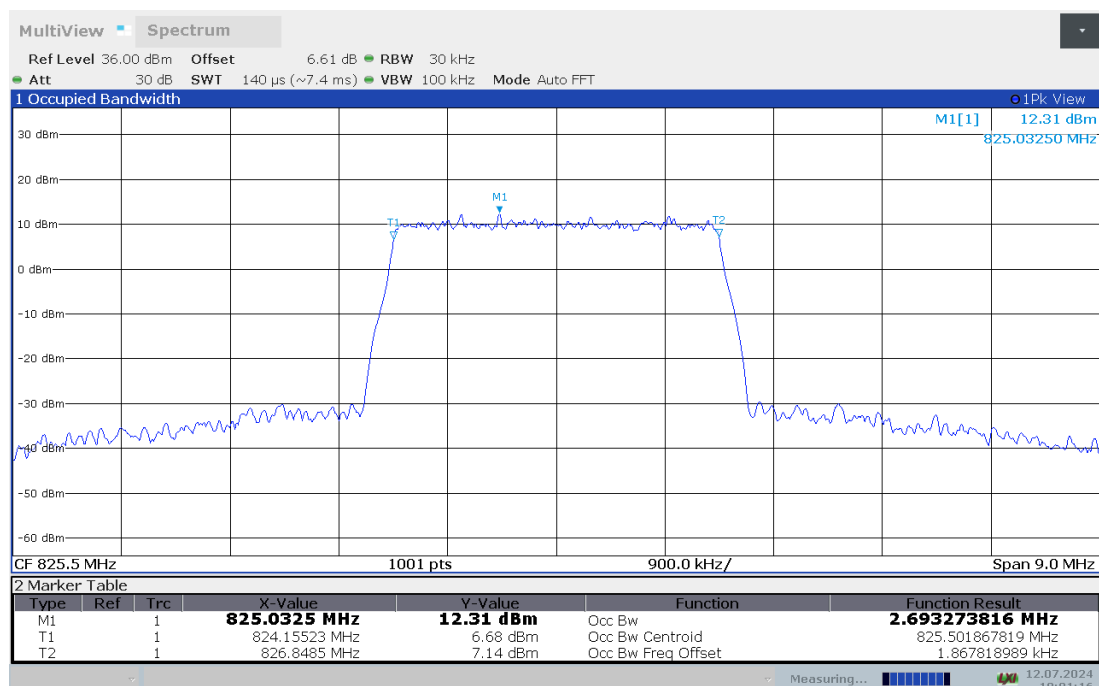
LTE band 5,3MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
825.5	2.692	2.693
836.5	2.699	2.690
847.5	2.689	2.690

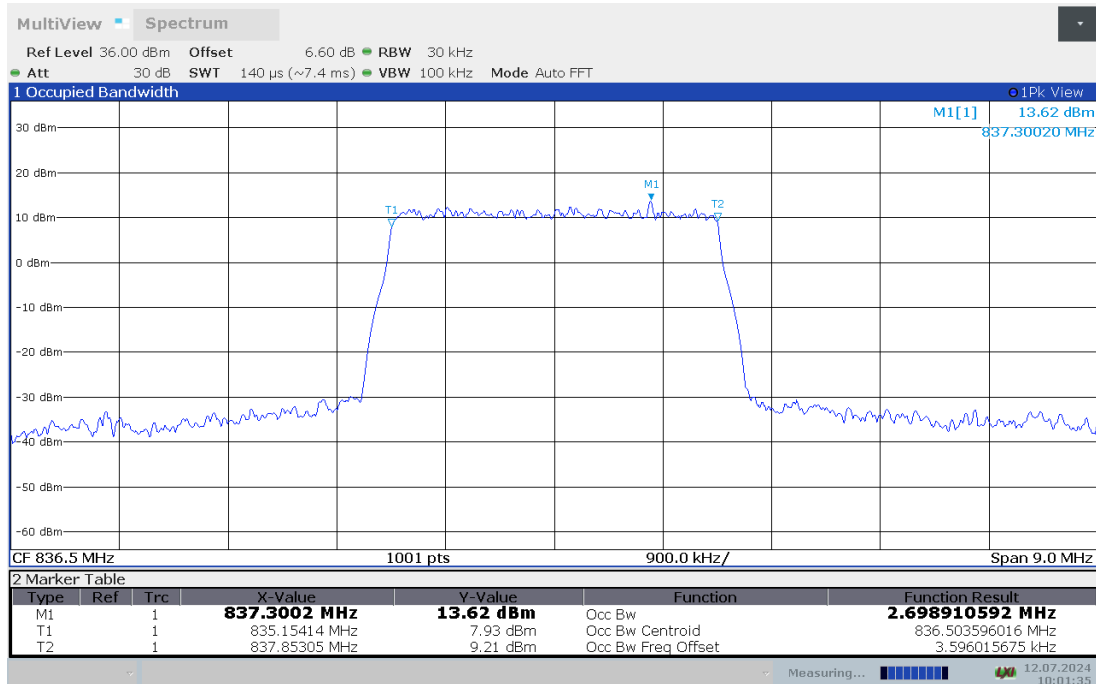
LTE band 5 , 3MHz Bandwidth,LOW,QPSK (99% BW)



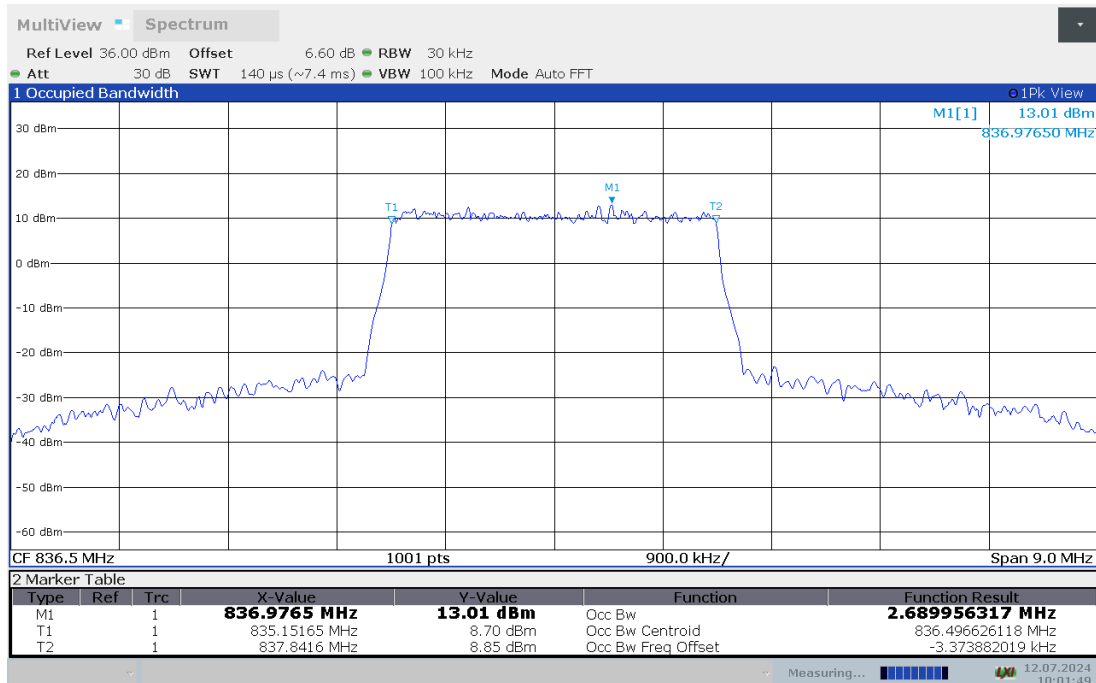
LTE band 5 , 3MHz Bandwidth,LOW,16QAM (99% BW)



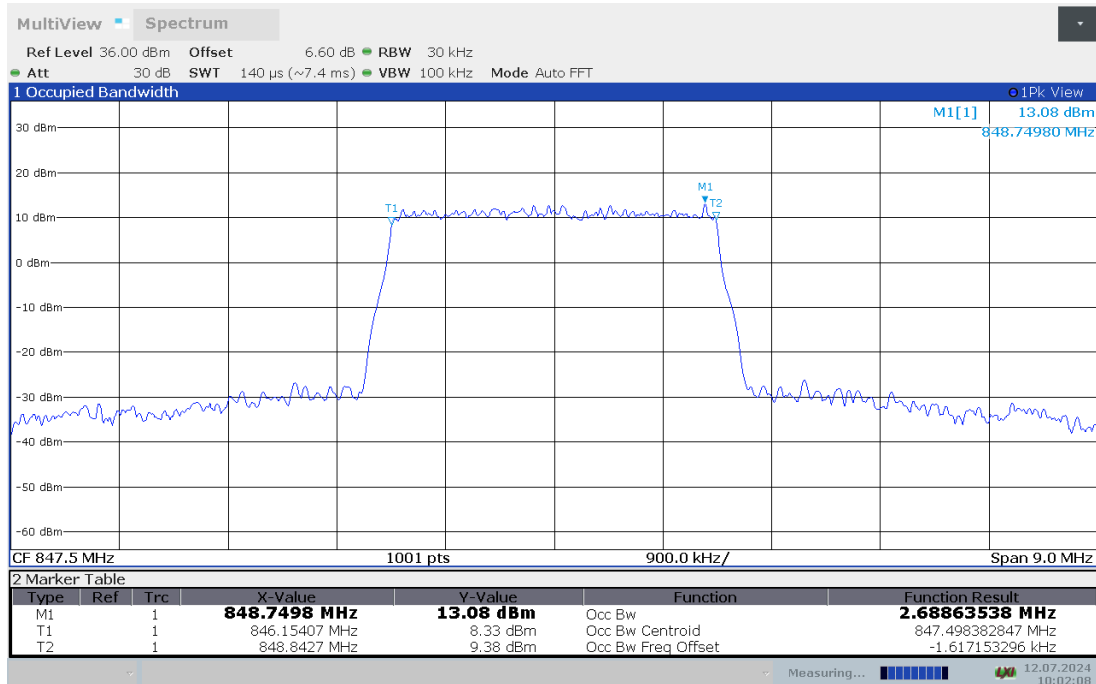
LTE band 5 , 3MHz Bandwidth,MID,QPSK (99% BW)



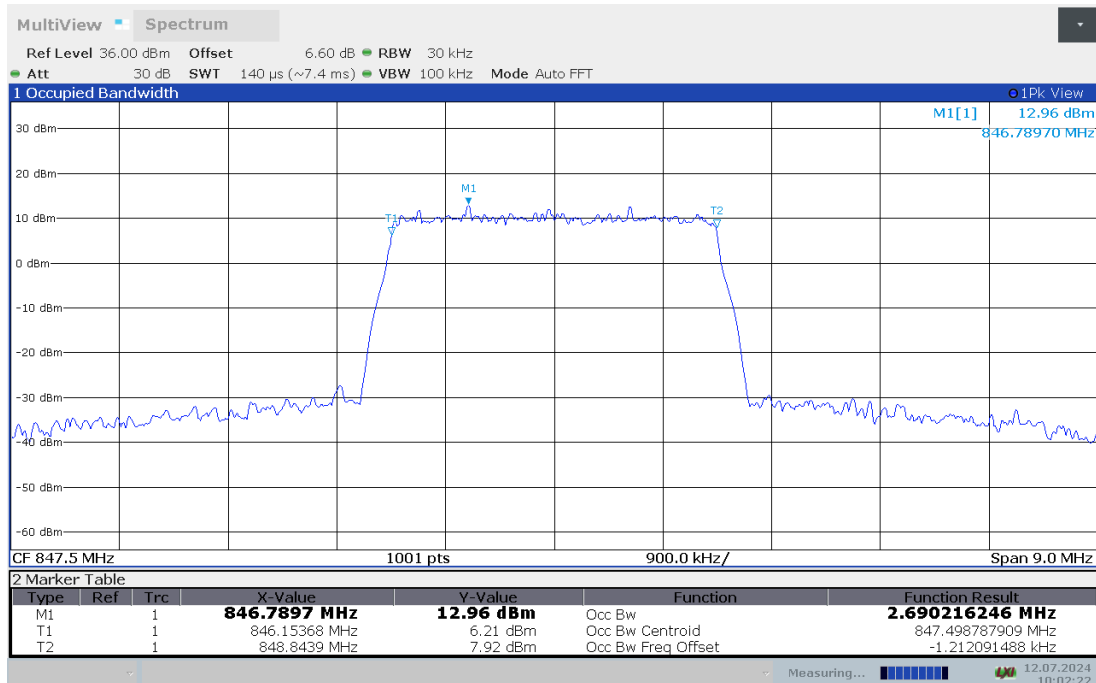
LTE band 5 , 3MHz Bandwidth,MID,16QAM (99% BW)



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



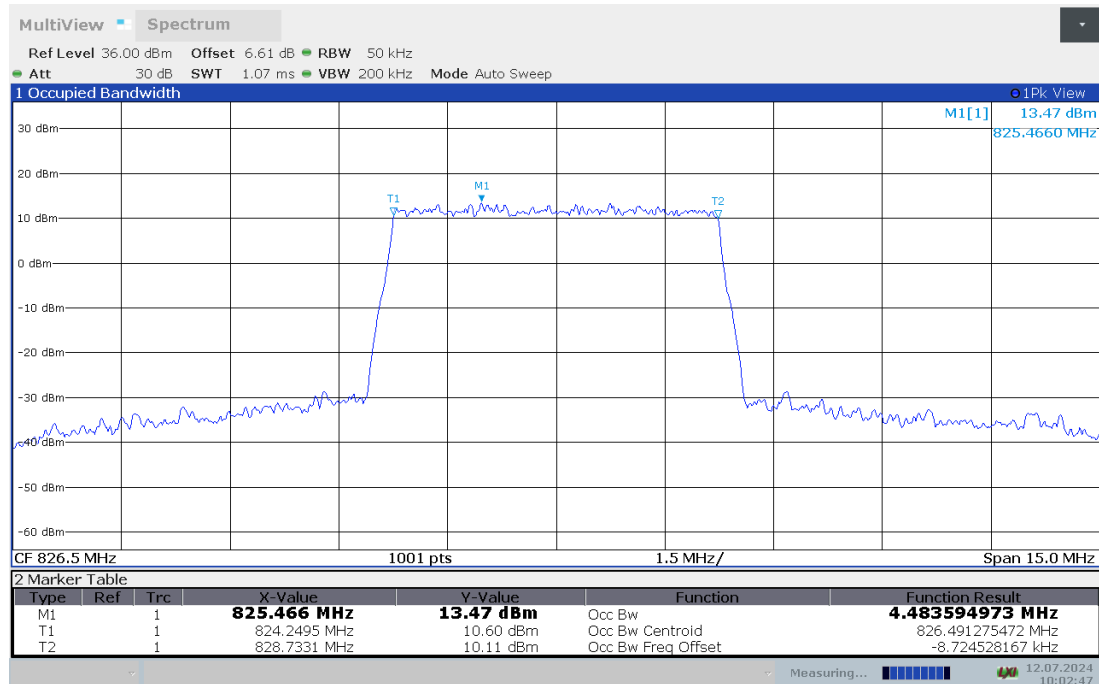
LTE band 5 , 3MHz Bandwidth,HIGH,16QAM (99% BW)



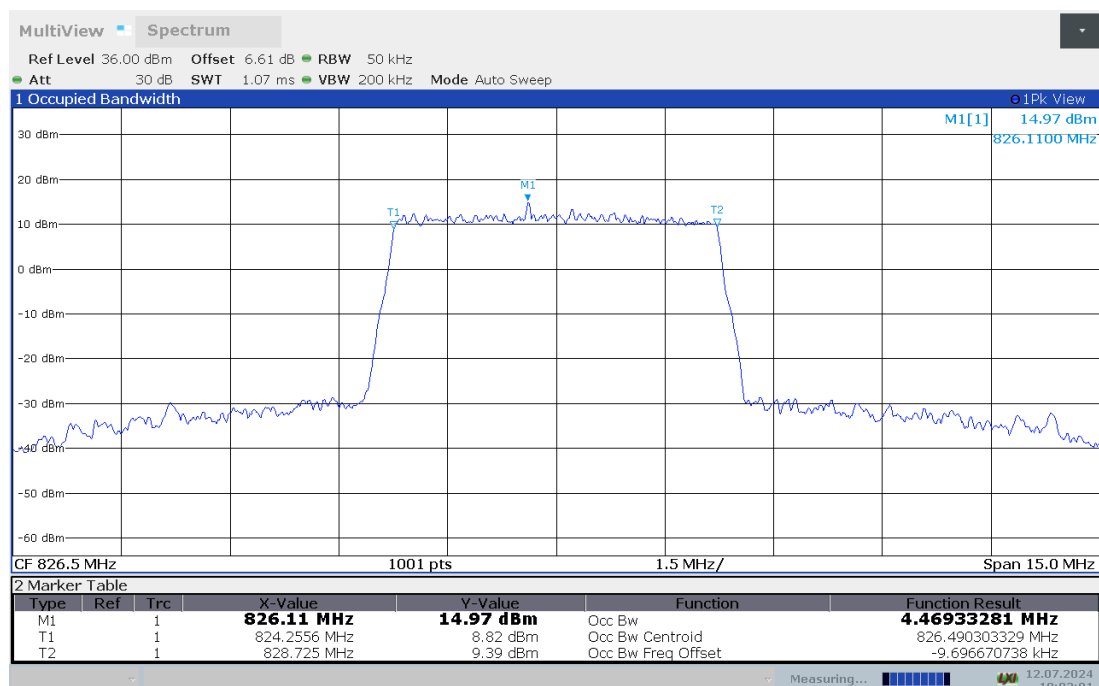
LTE band 5,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
826.5	4.484	4.469
836.5	4.485	4.489
846.5	4.469	4.481

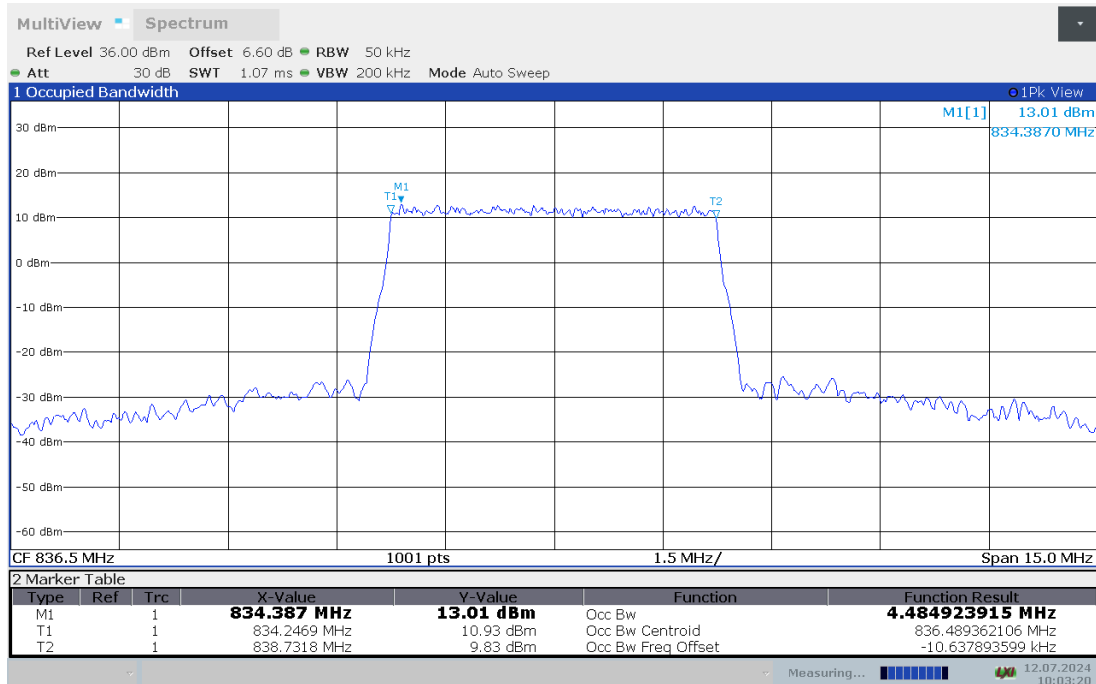
LTE band 5 , 5MHz Bandwidth,LOW,QPSK (99% BW)



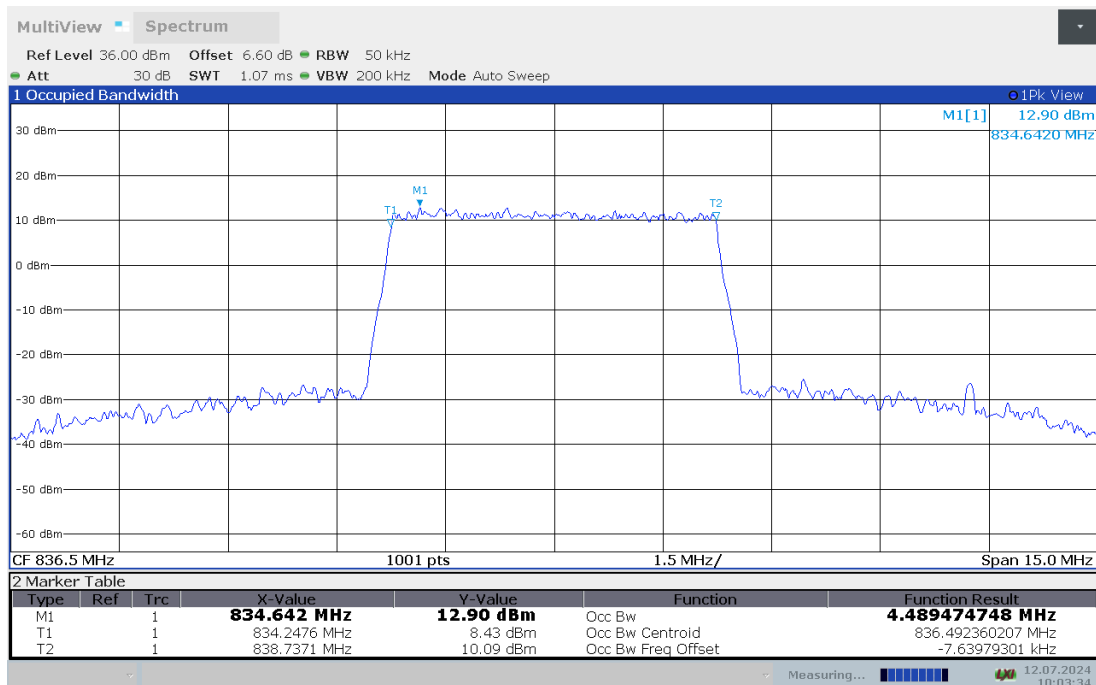
LTE band 5 , 5MHz Bandwidth,LOW,16QAM (99% BW)



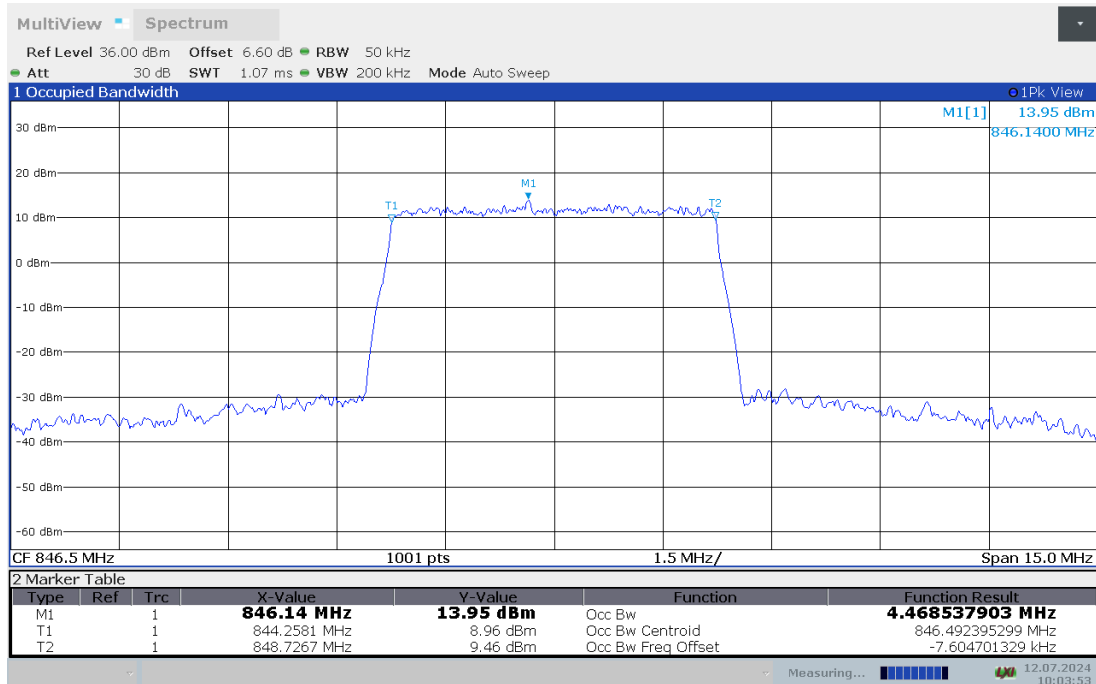
LTE band 5 , 5MHz Bandwidth,MID,QPSK (99% BW)



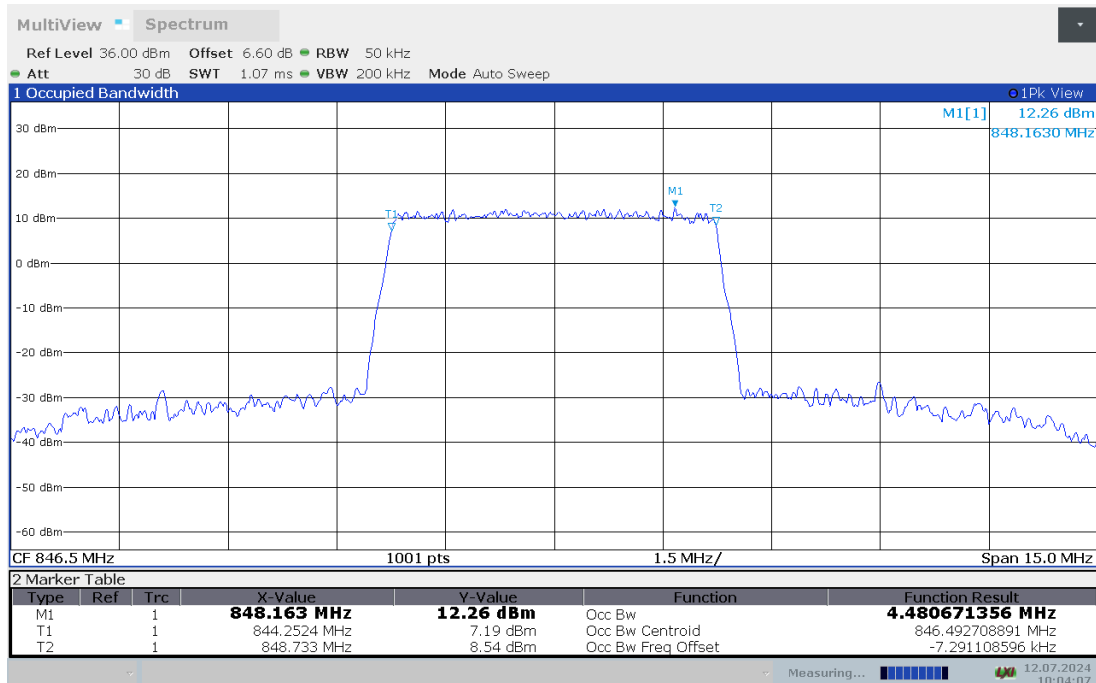
LTE band 5 , 5MHz Bandwidth,MID,16QAM (99% BW)



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



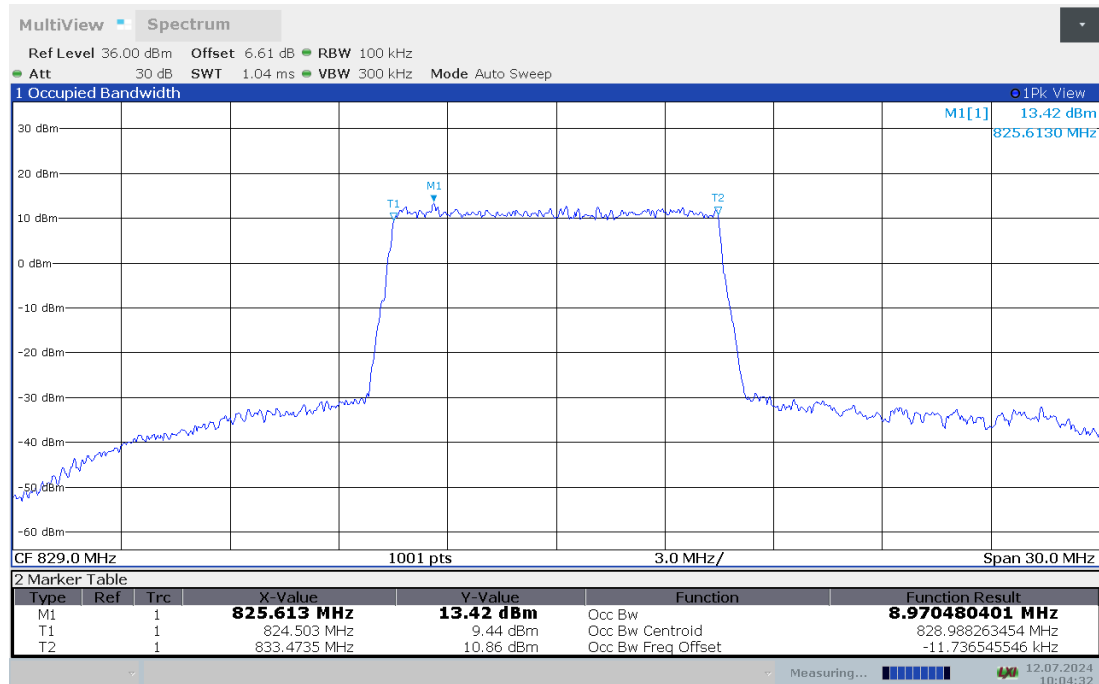
LTE band 5 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



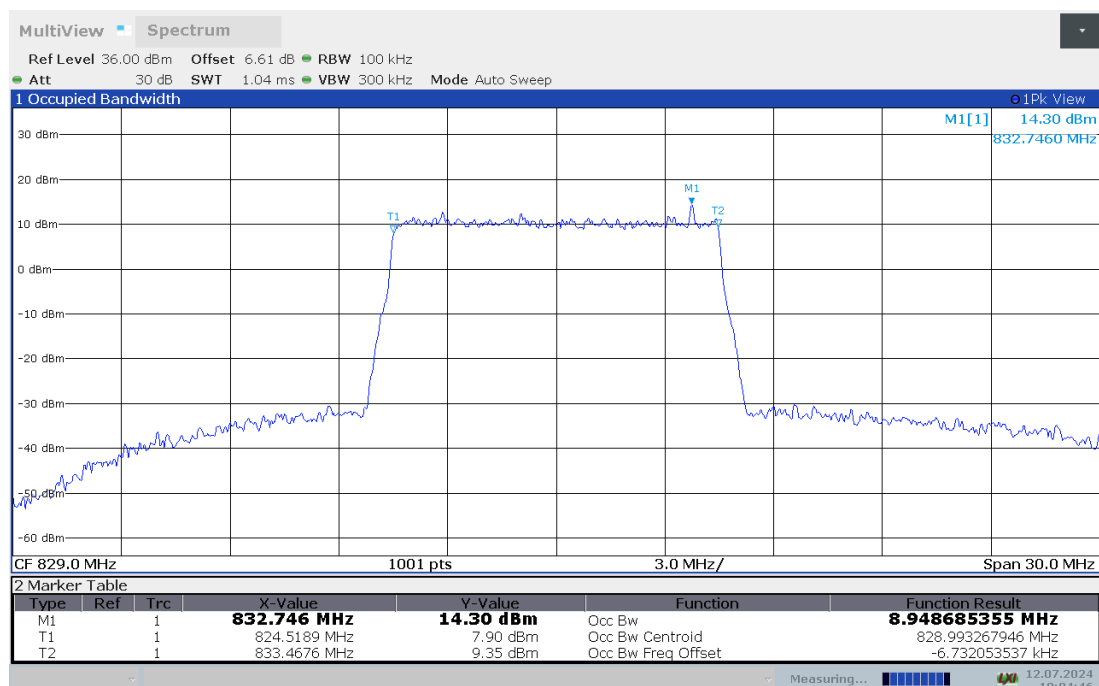
LTE band 5,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
829	8.970	8.949
836.5	8.950	8.936
844	8.961	8.955

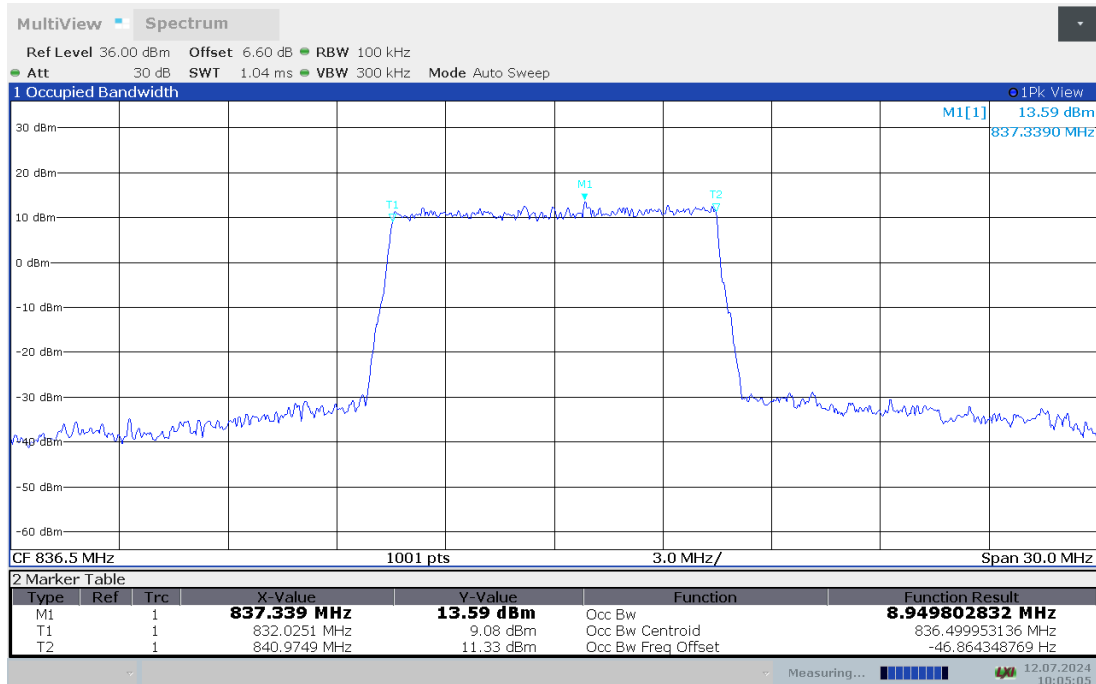
LTE band 5 , 10MHz Bandwidth,LOW,QPSK (99% BW)



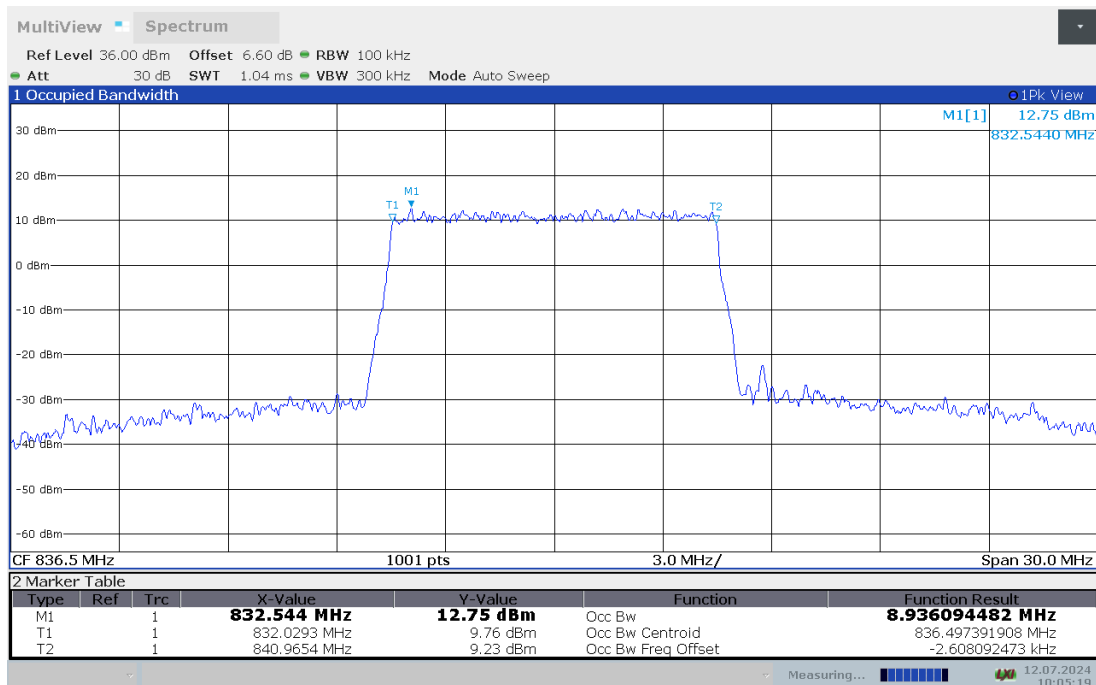
LTE band 5 , 10MHz Bandwidth,LOW,16QAM (99% BW)



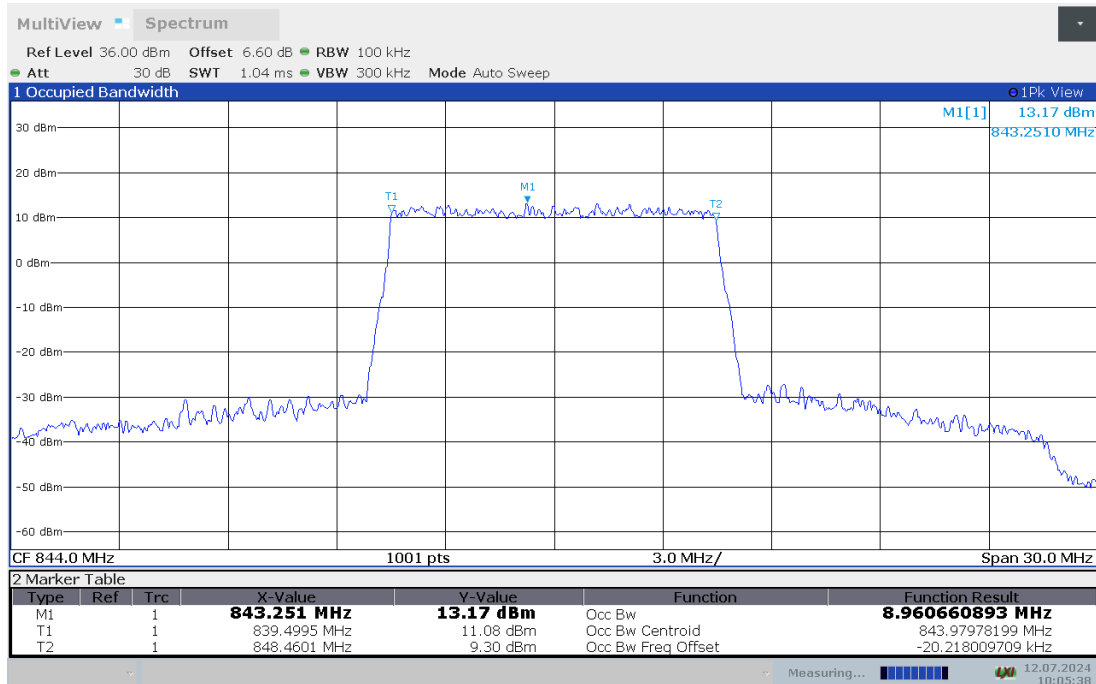
LTE band 5 , 10MHz Bandwidth,MID,QPSK (99% BW)



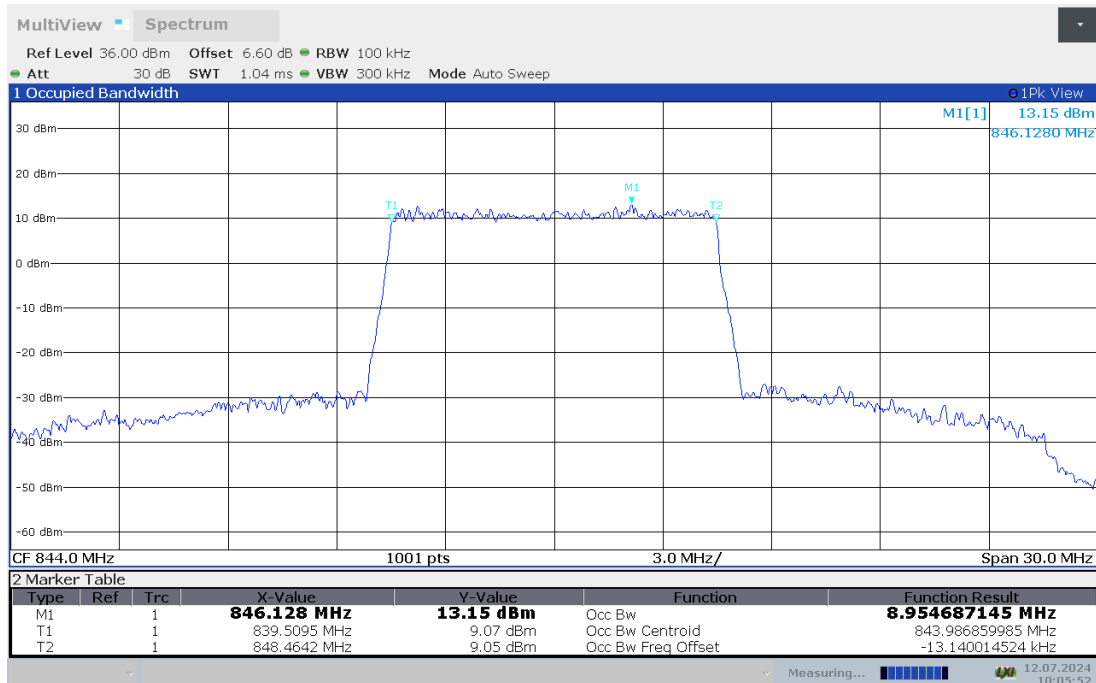
LTE band 5 , 10MHz Bandwidth,MID,16QAM (99% BW)



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



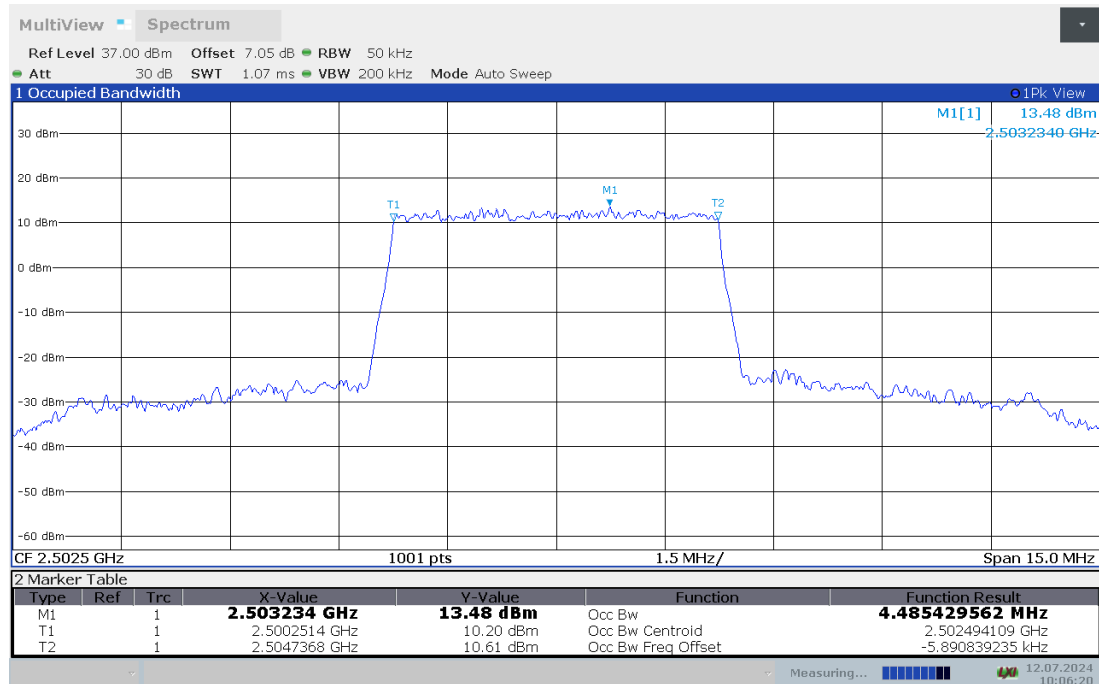
LTE band 5 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



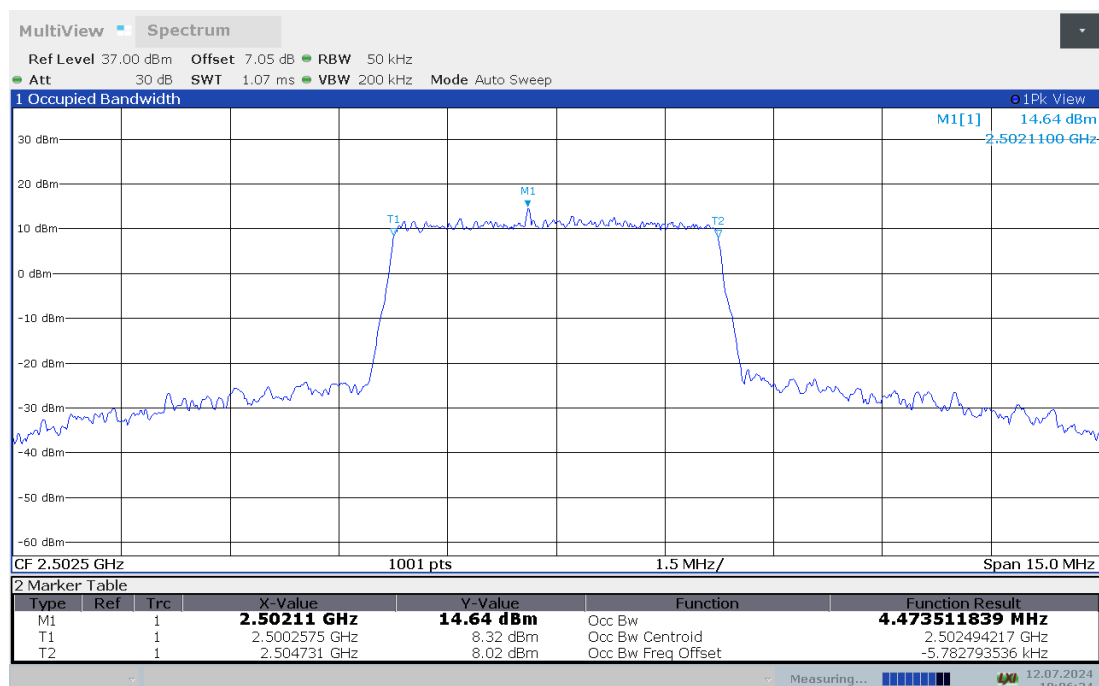
LTE band 7,5MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
2502.5	4.485	4.474
2535	4.485	4.484
2567.5	4.470	4.481

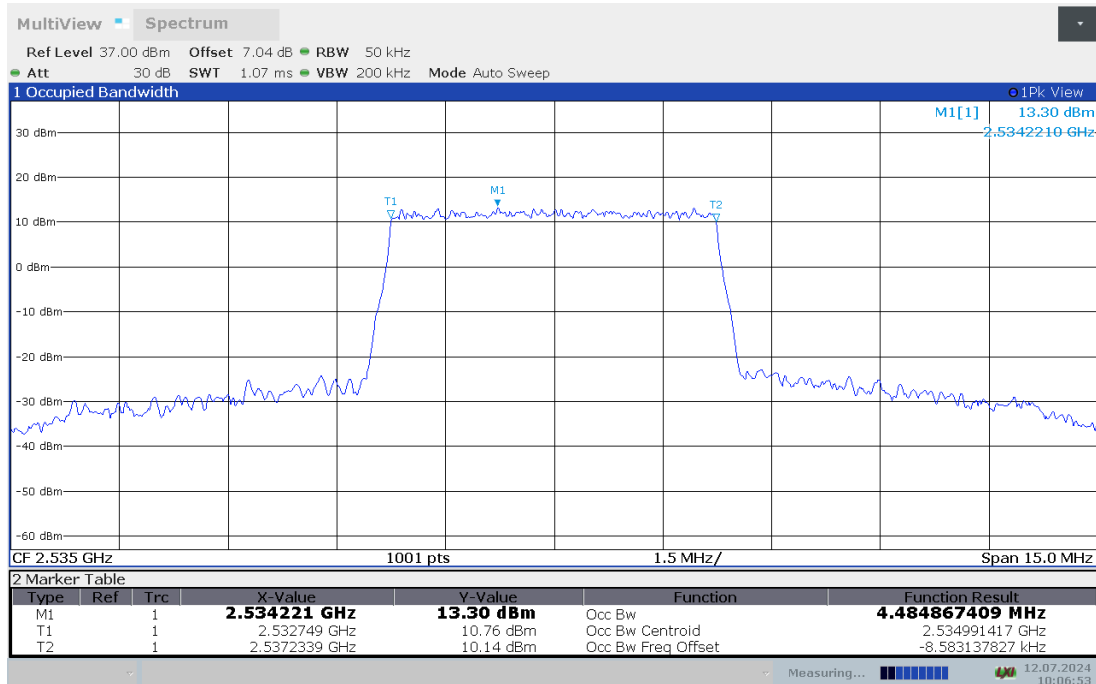
LTE band 7 , 5MHz Bandwidth,LOW,QPSK (99% BW)



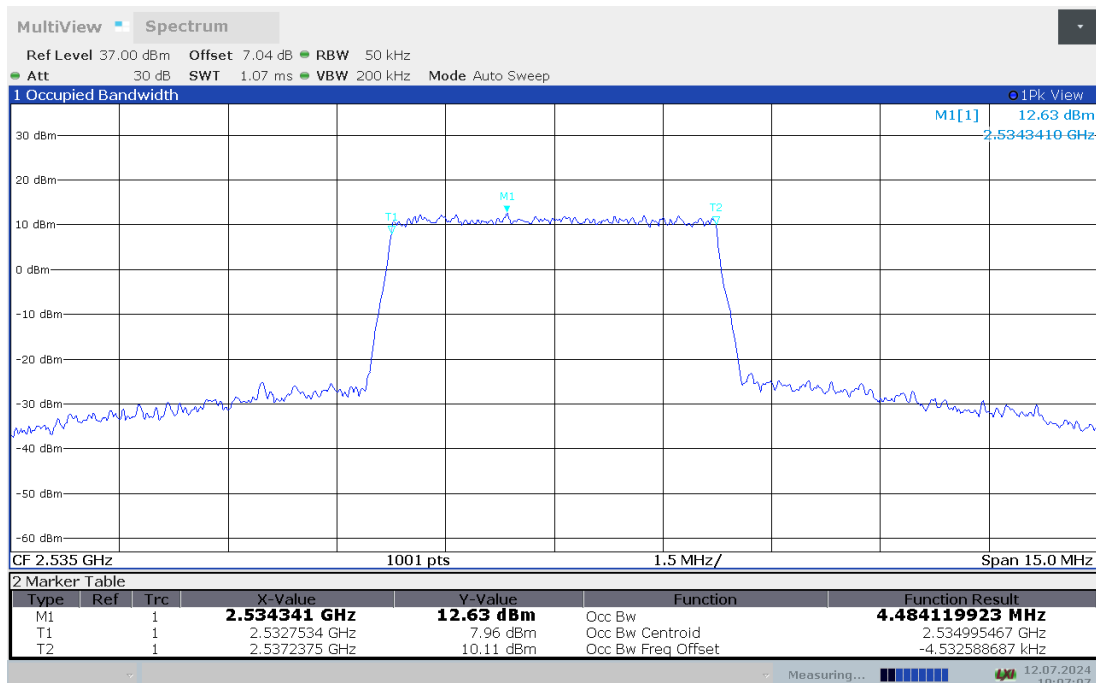
LTE band 7 , 5MHz Bandwidth,LOW,16QAM (99% BW)



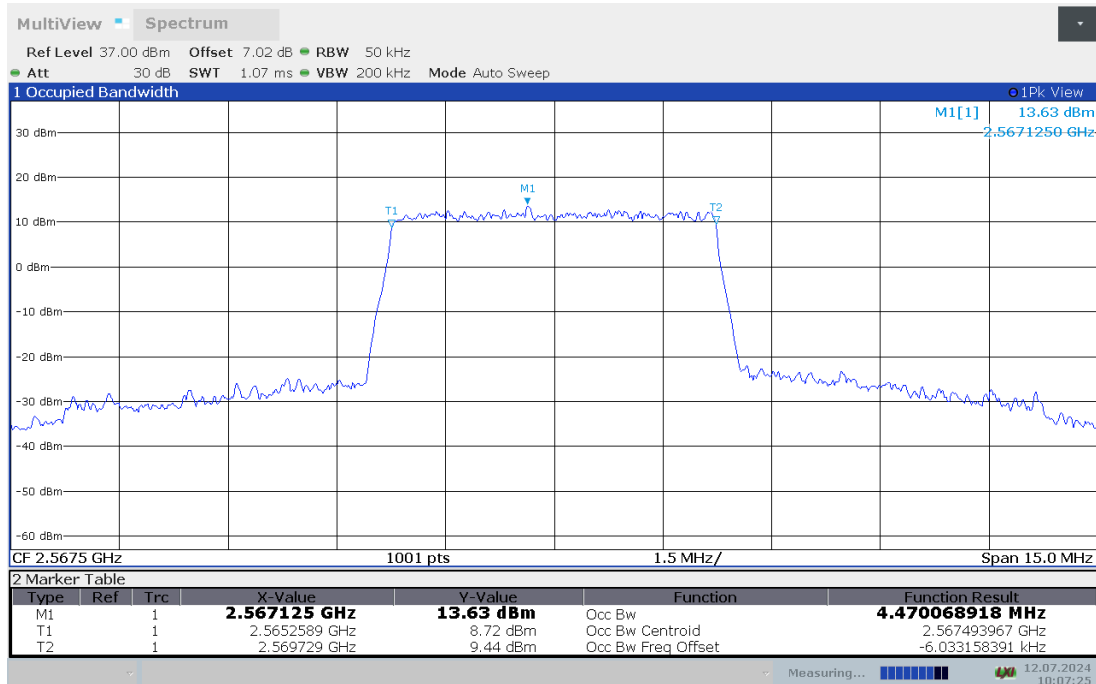
LTE band 7 , 5MHz Bandwidth,MID,QPSK (99% BW)



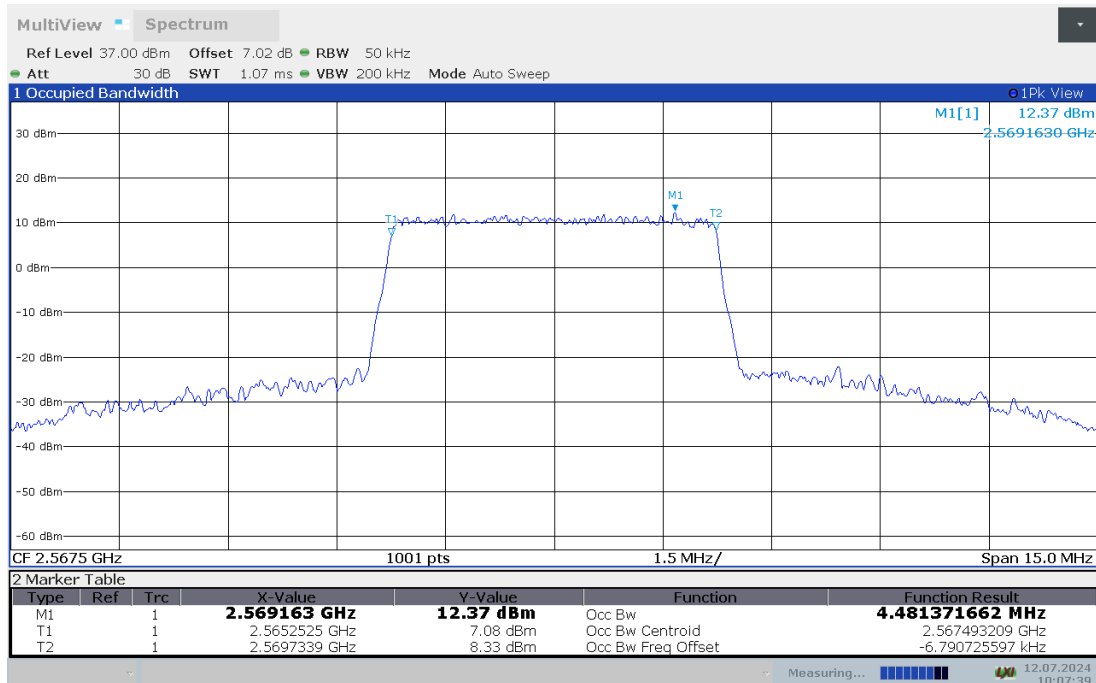
LTE band 7 , 5MHz Bandwidth,MID,16QAM (99% BW)



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



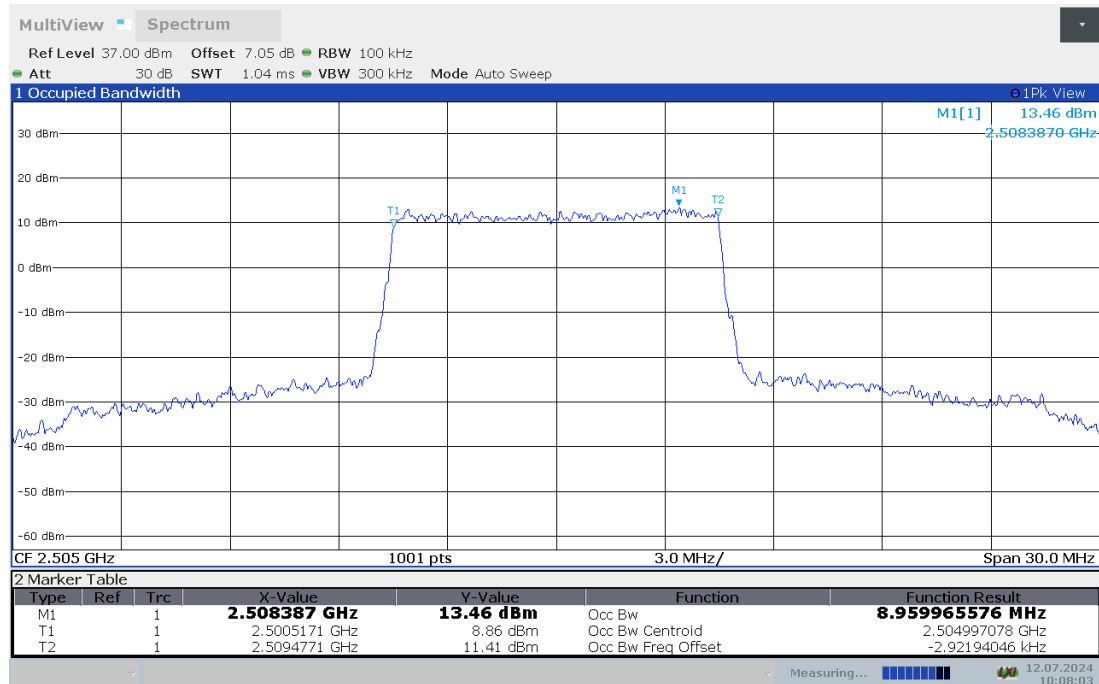
LTE band 7 , 5MHz Bandwidth,HIGH,16QAM (99% BW)



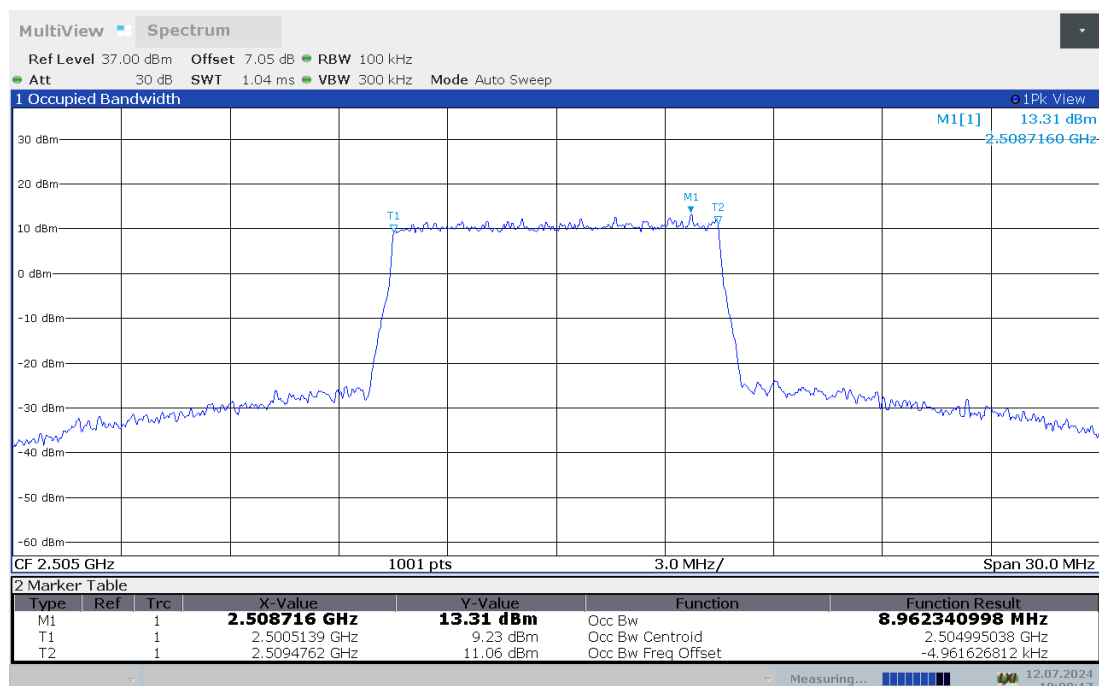
LTE band 7,10MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
2505	8.960	8.962
2535	8.939	8.961
2565	8.967	8.961

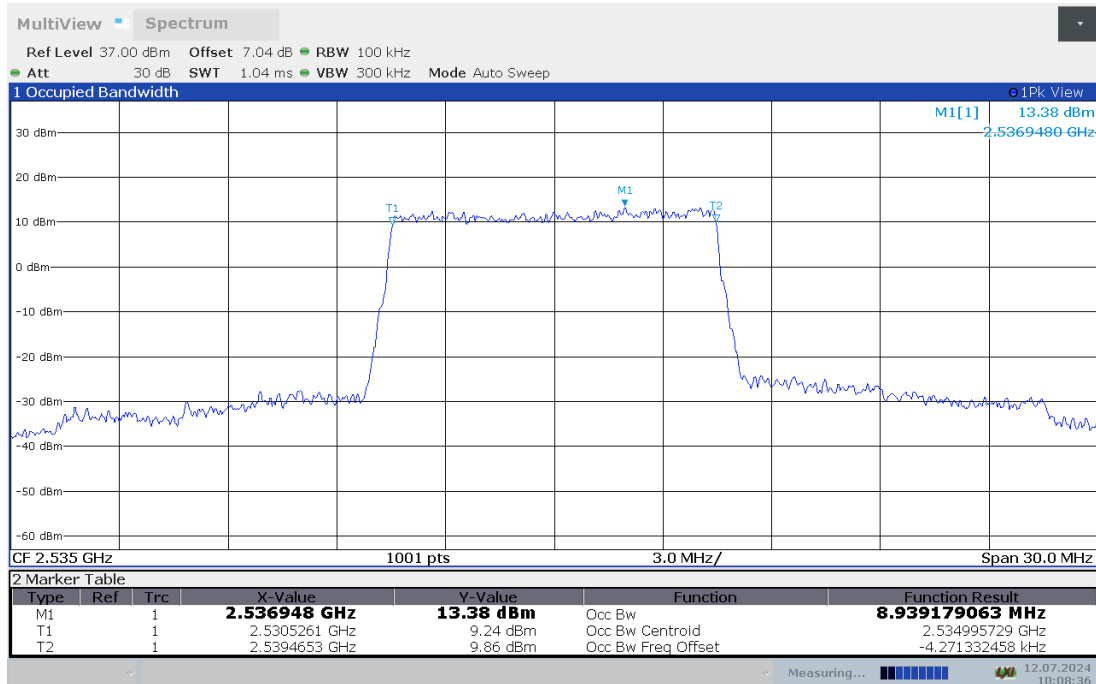
LTE band 7 , 10MHz Bandwidth,LOW,QPSK (99% BW)



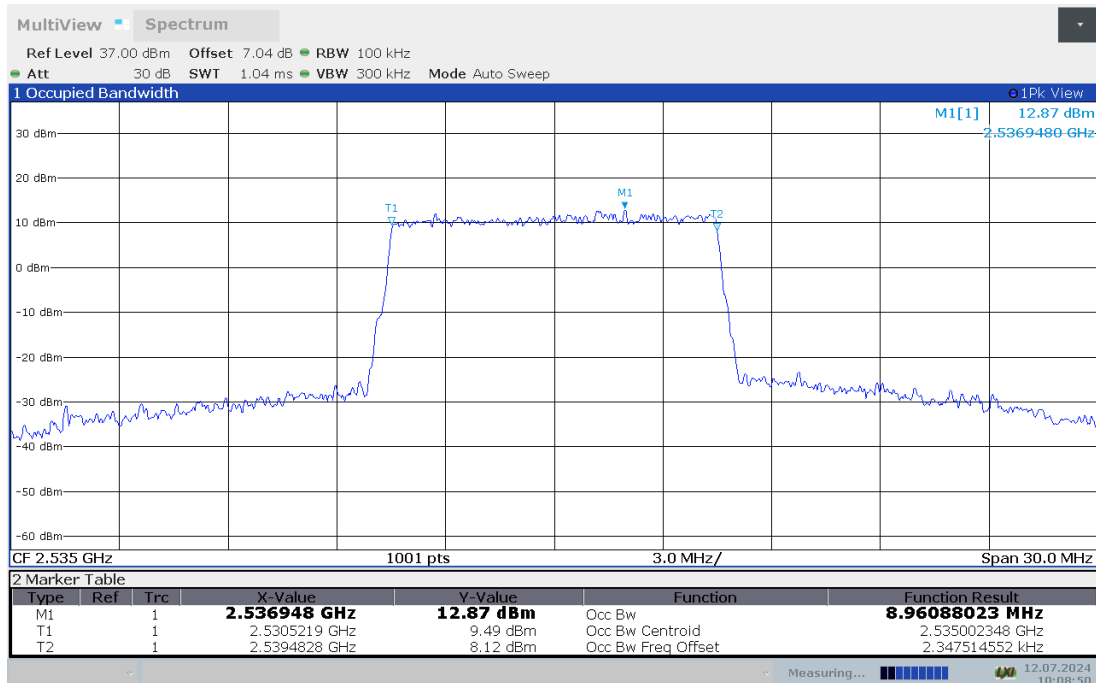
LTE band 7 , 10MHz Bandwidth,LOW,16QAM (99% BW)



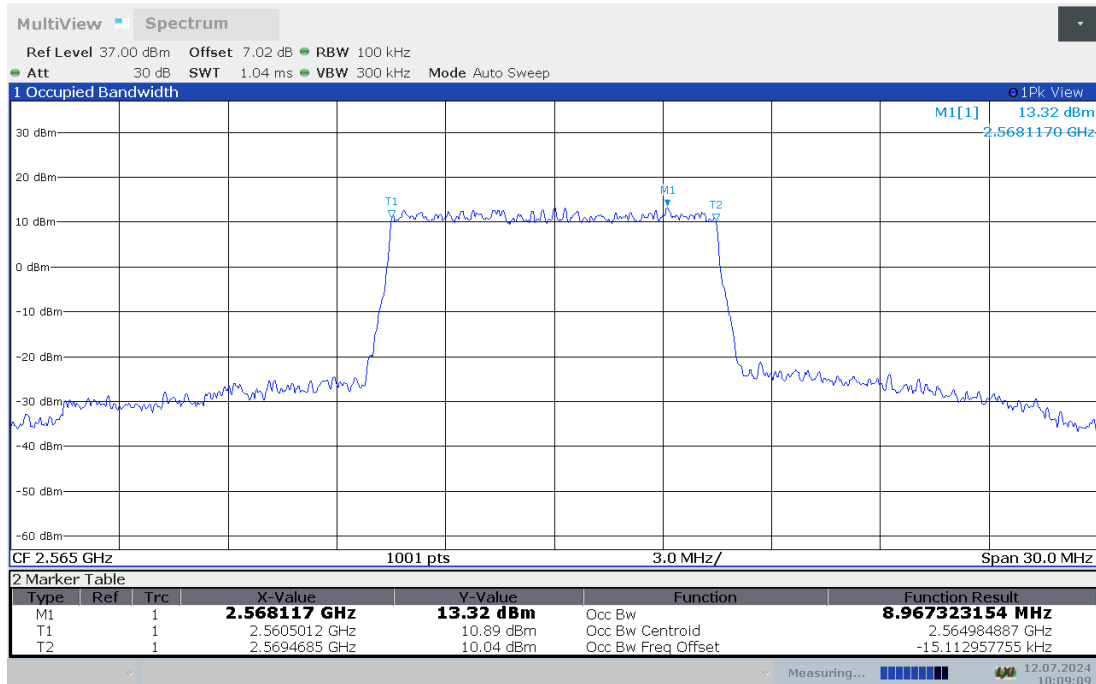
LTE band 7 , 10MHz Bandwidth,MID,QPSK (99% BW)



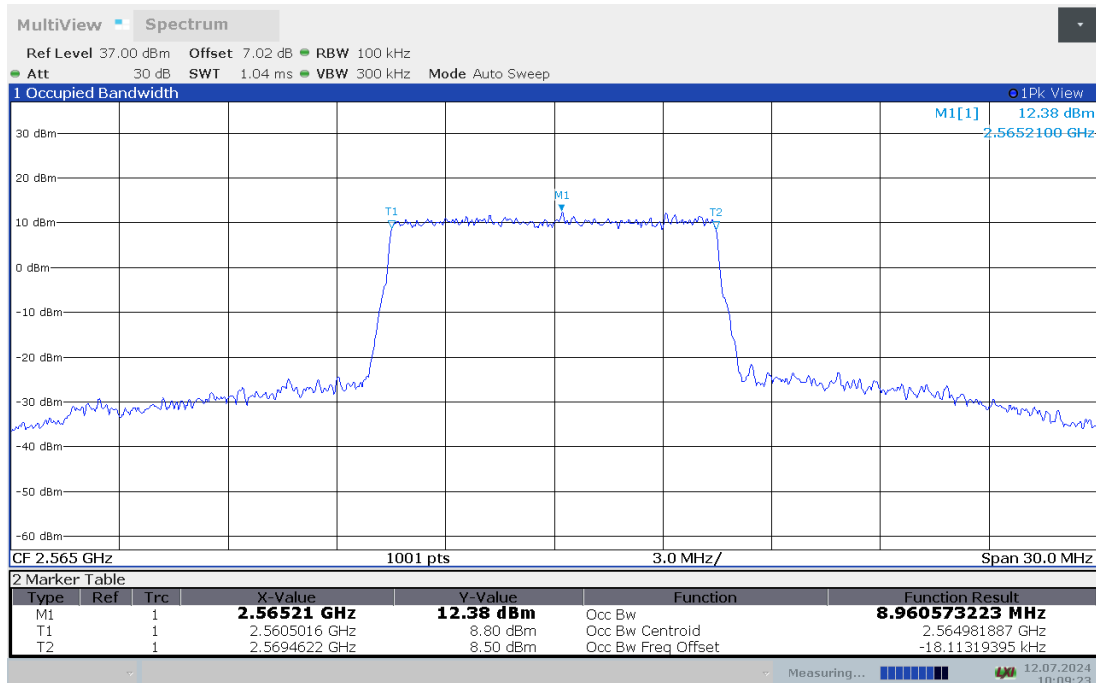
LTE band 7 , 10MHz Bandwidth,MID,16QAM (99% BW)



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



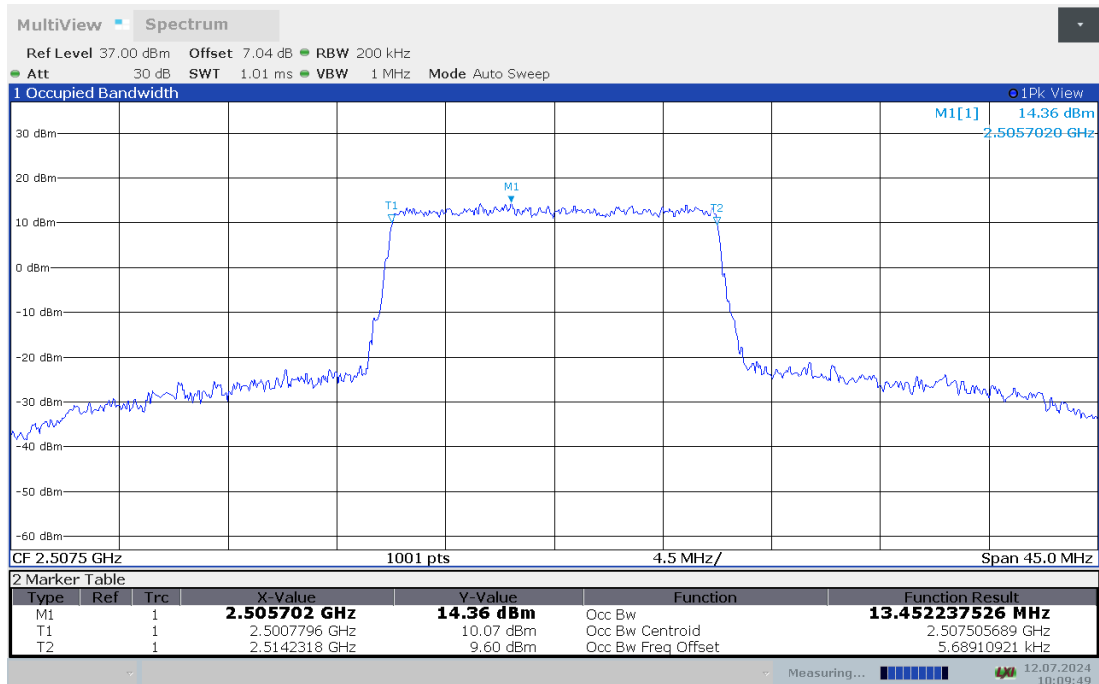
LTE band 7 , 10MHz Bandwidth,HIGH,16QAM (99% BW)



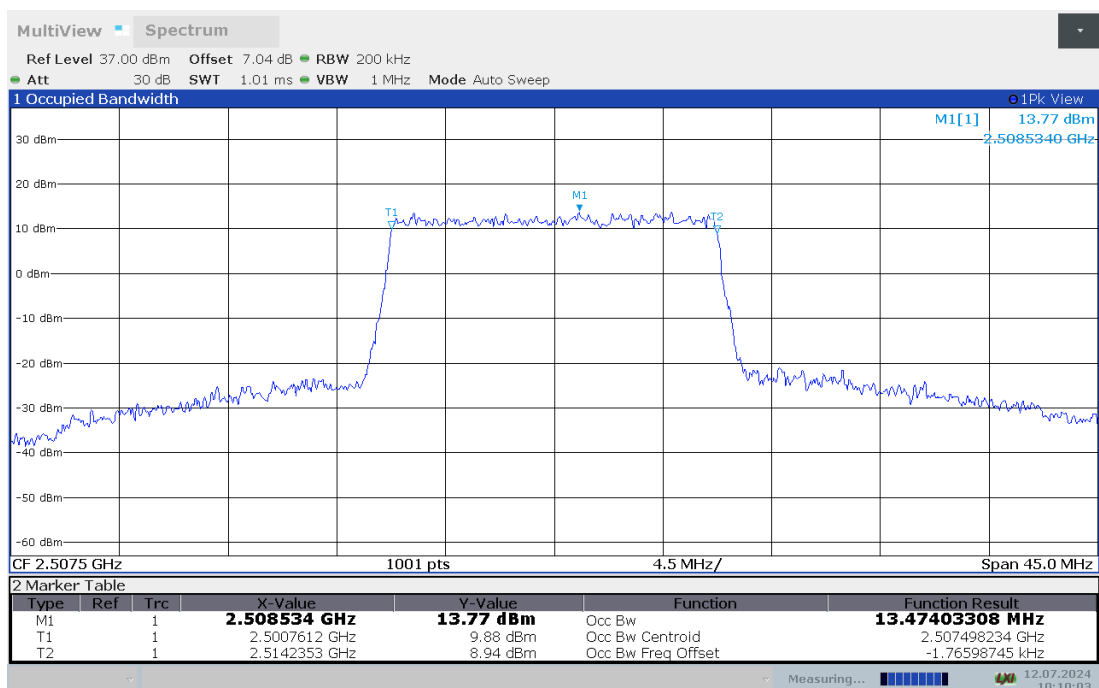
LTE band 7,15MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
2507.5	13.452	13.474
2535	13.410	13.455
2562.5	13.443	13.469

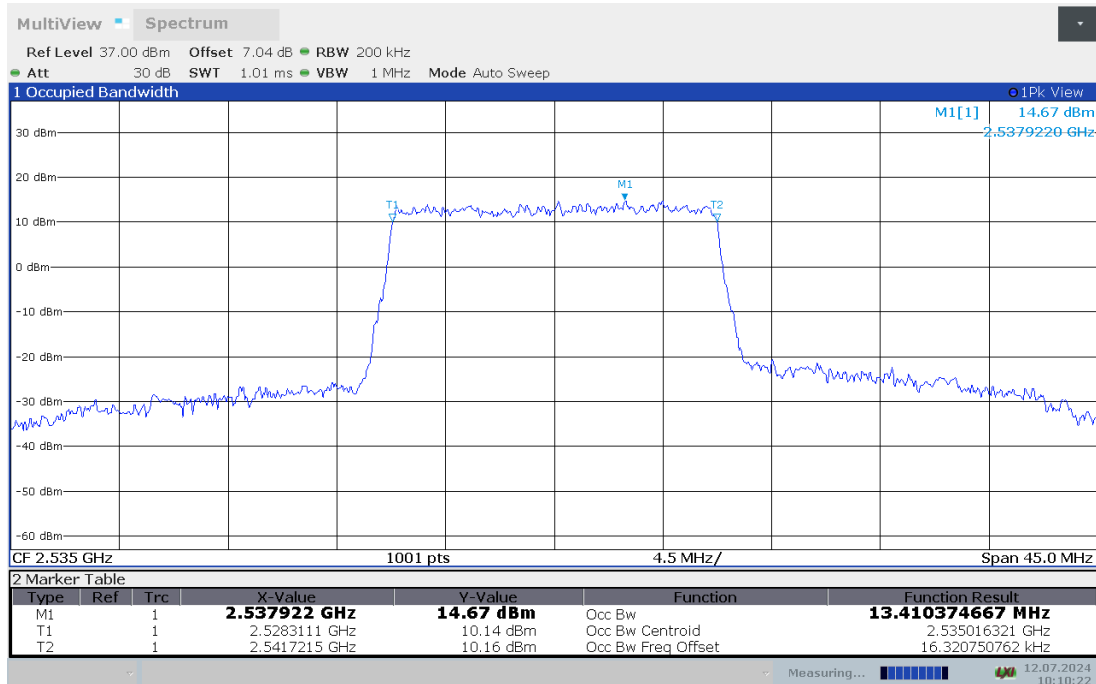
LTE band 7 , 15MHz Bandwidth,LOW,QPSK (99% BW)



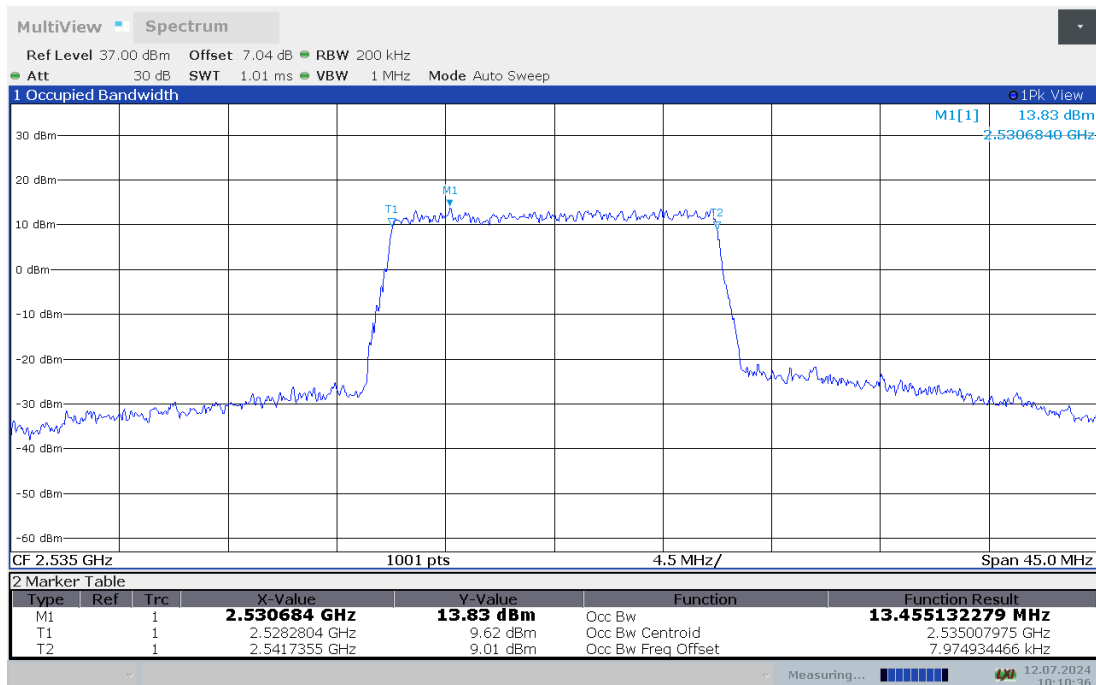
LTE band 7 , 15MHz Bandwidth,LOW,16QAM (99% BW)



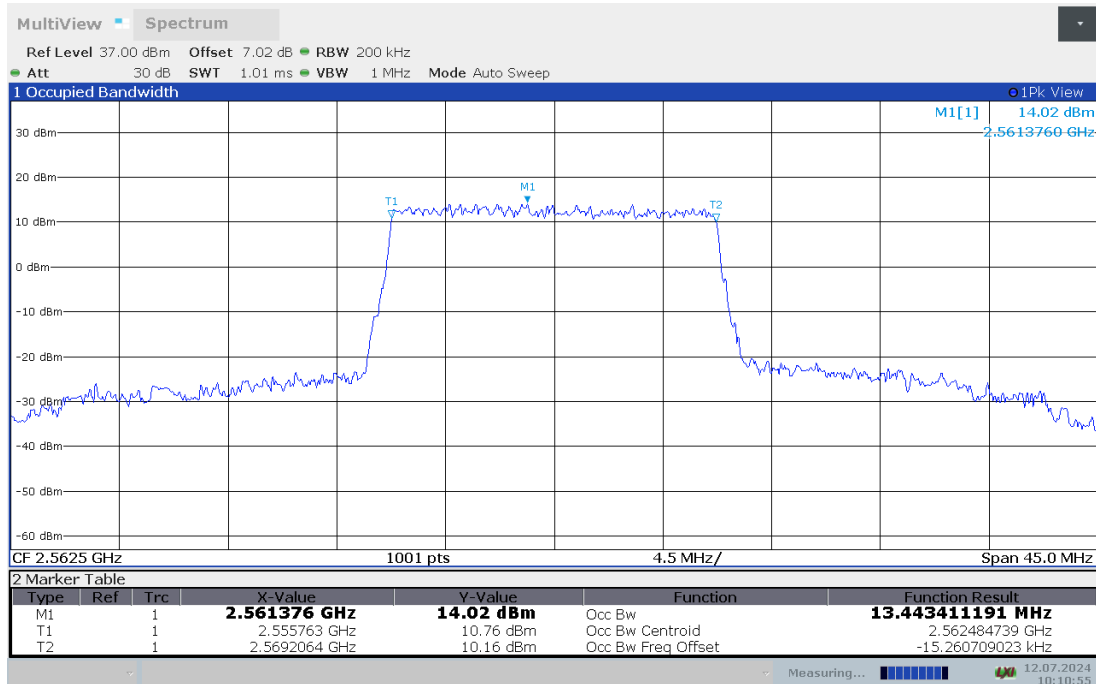
LTE band 7 , 15MHz Bandwidth,MID,QPSK (99% BW)



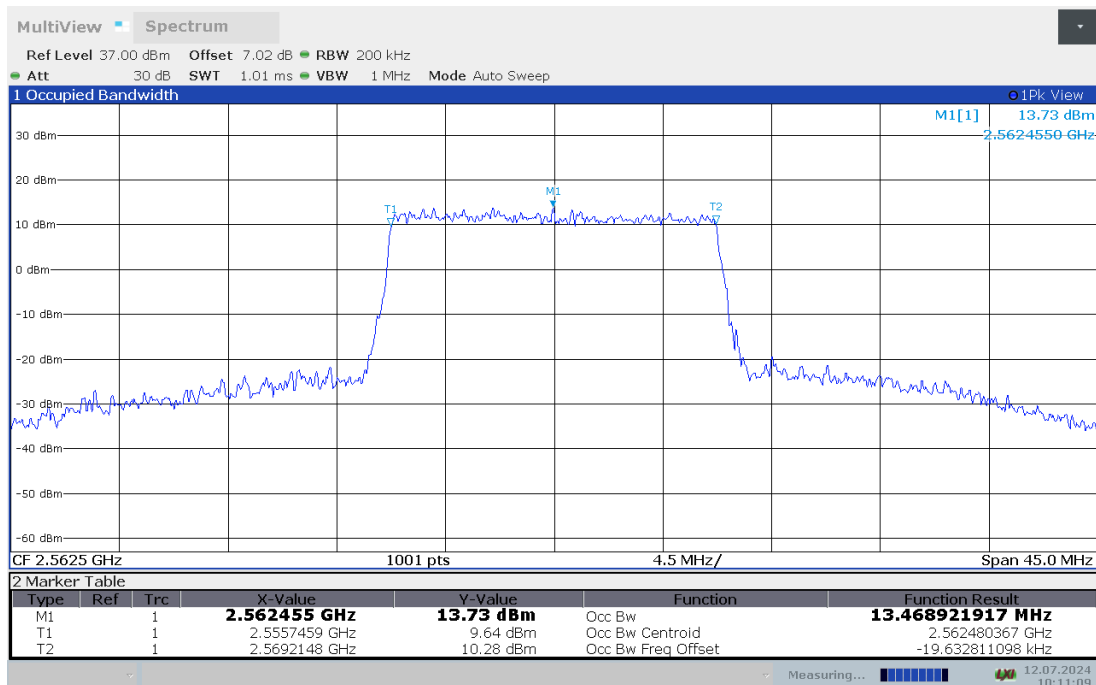
LTE band 7 , 15MHz Bandwidth,MID,16QAM (99% BW)



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



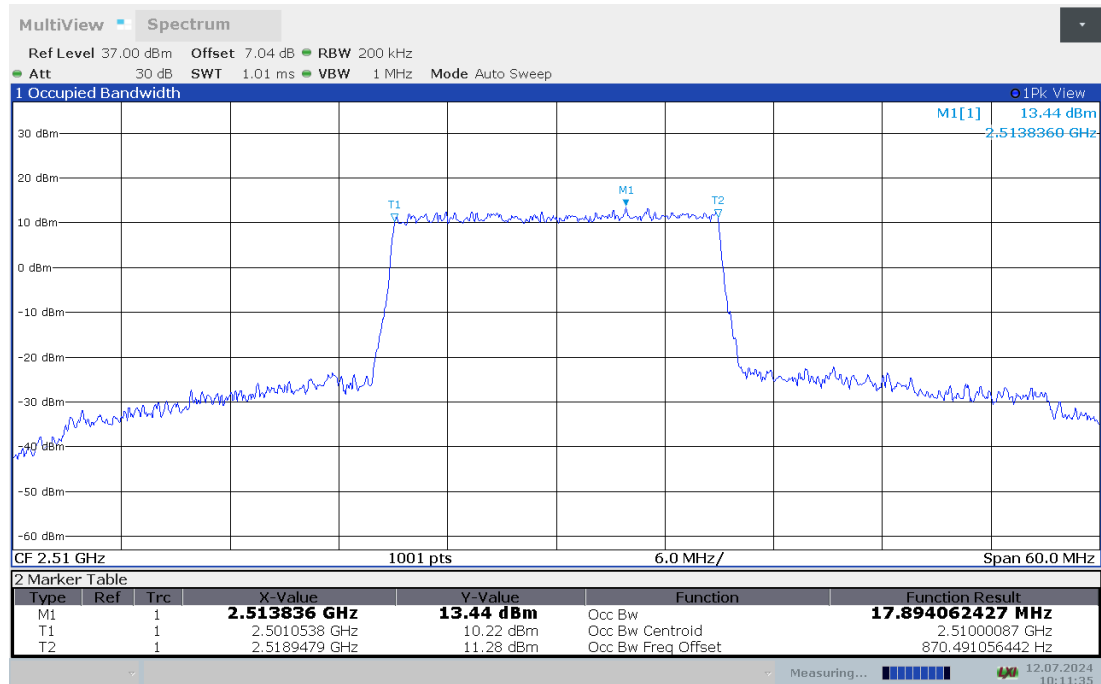
LTE band 7 , 15MHz Bandwidth,HIGH,16QAM (99% BW)



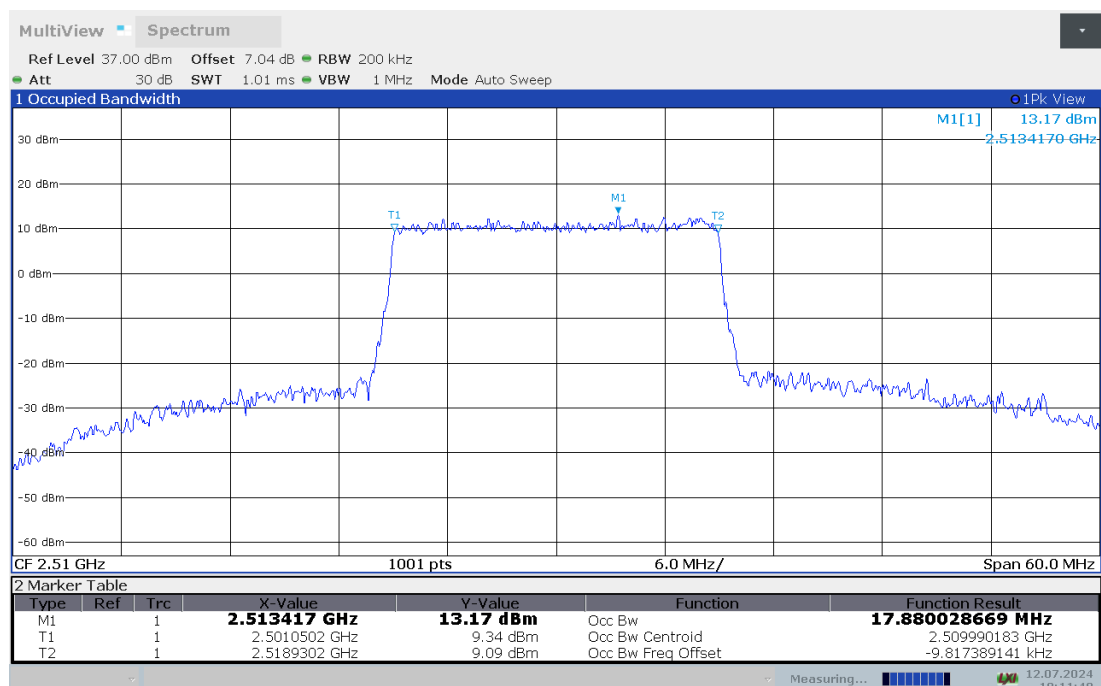
LTE band 7,20MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
2510	17.894	17.880
2535	17.901	17.938
2560	17.955	17.911

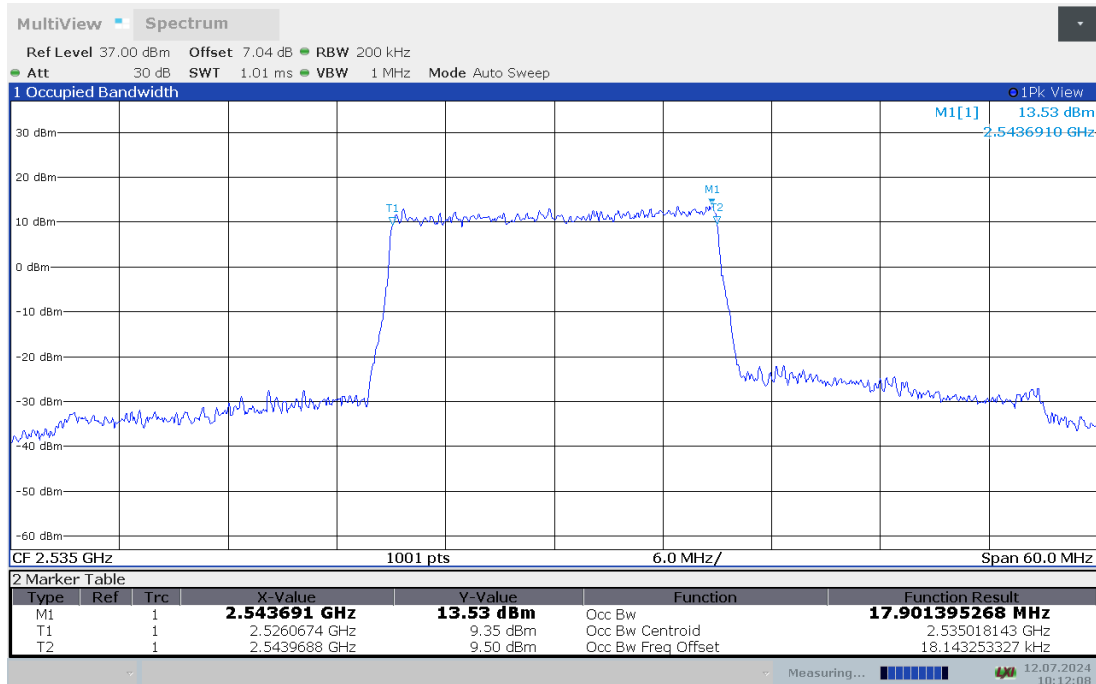
LTE band 7 , 20MHz Bandwidth,LOW,QPSK (99% BW)



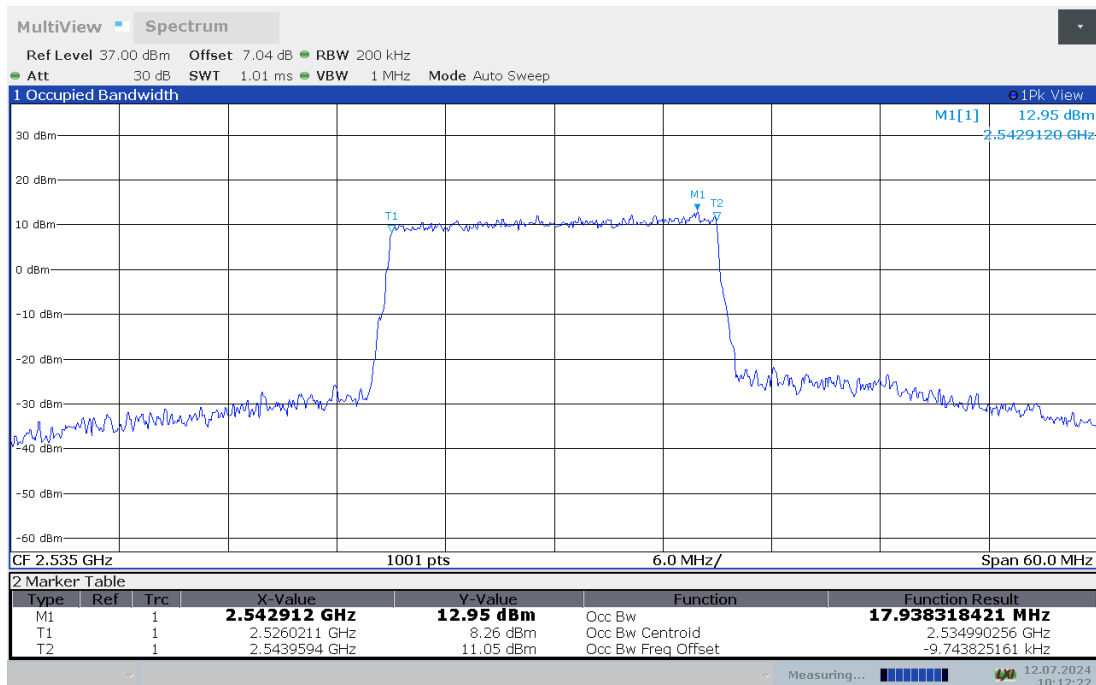
LTE band 7 , 20MHz Bandwidth,LOW,16QAM (99% BW)



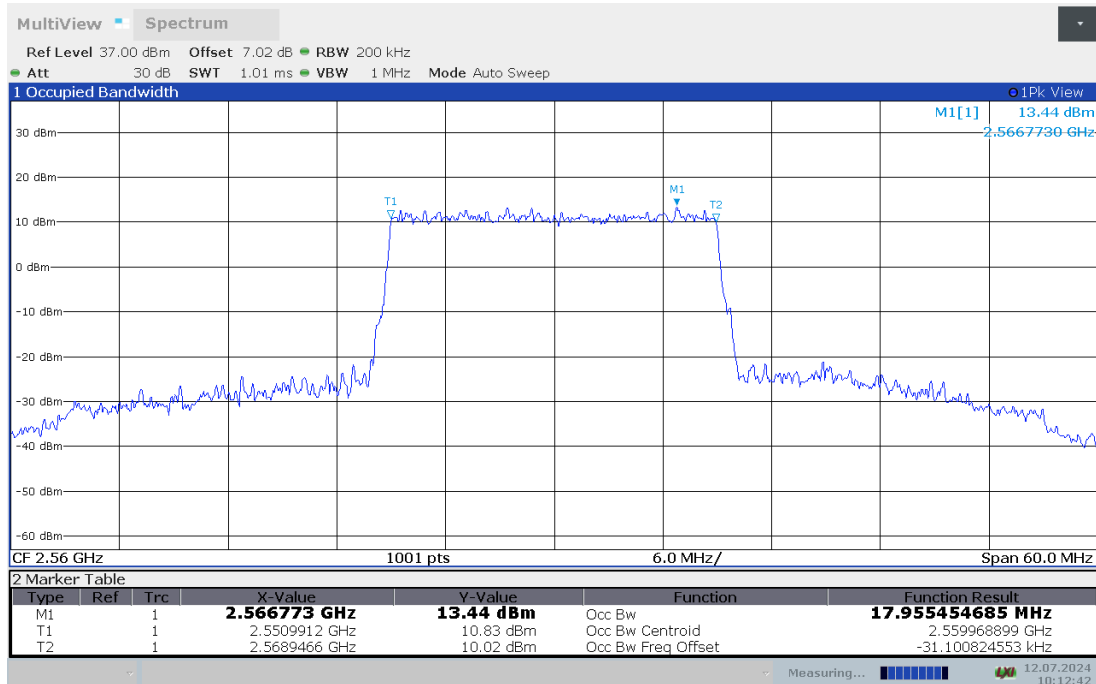
LTE band 7 , 20MHz Bandwidth,MID,QPSK (99% BW)



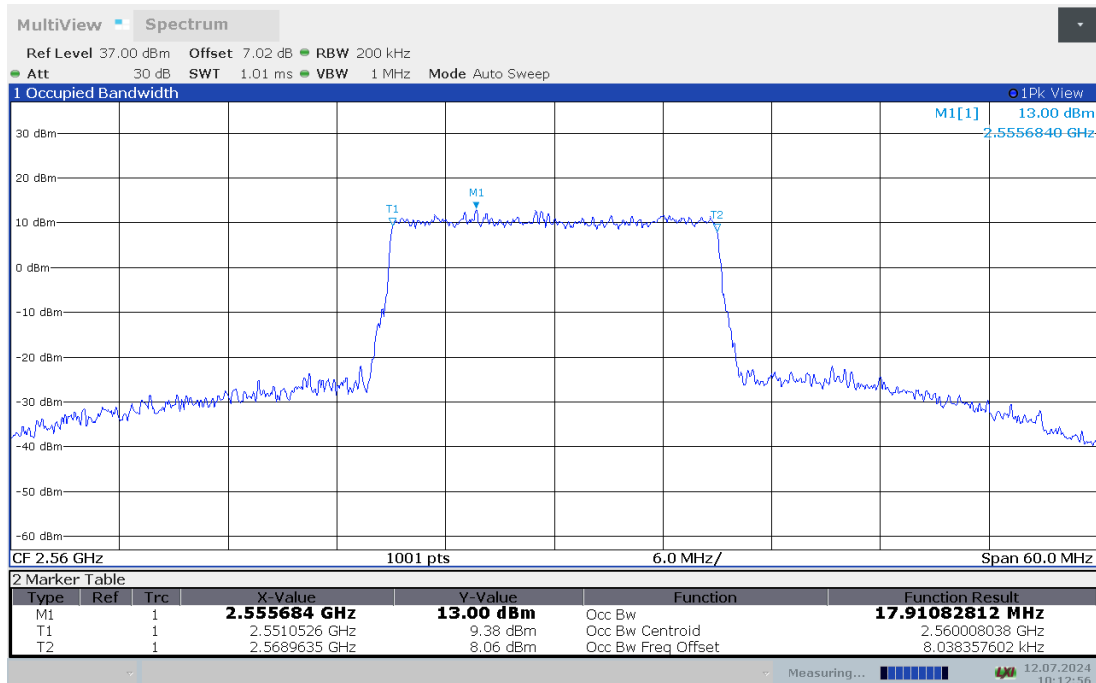
LTE band 7 , 20MHz Bandwidth,MID,16QAM (99% BW)



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



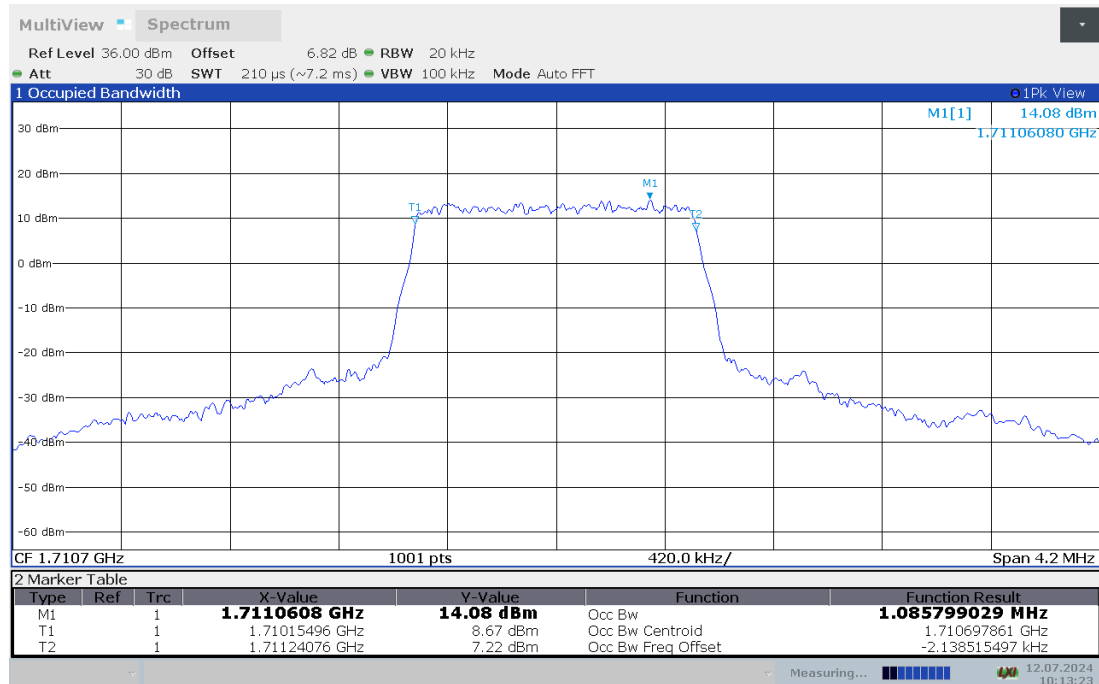
LTE band 7 , 20MHz Bandwidth,HIGH,16QAM (99% BW)



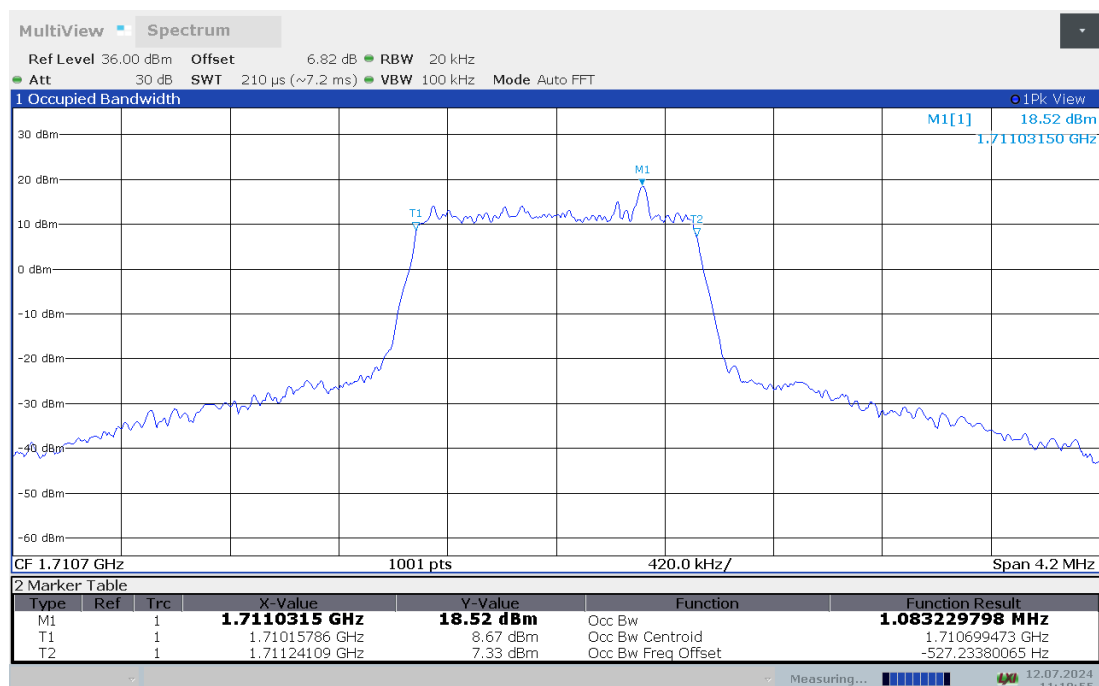
LTE band 66,1.4MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1710.7	1.086	1.083
1745	1.085	1.094
1779.3	1.086	1.082

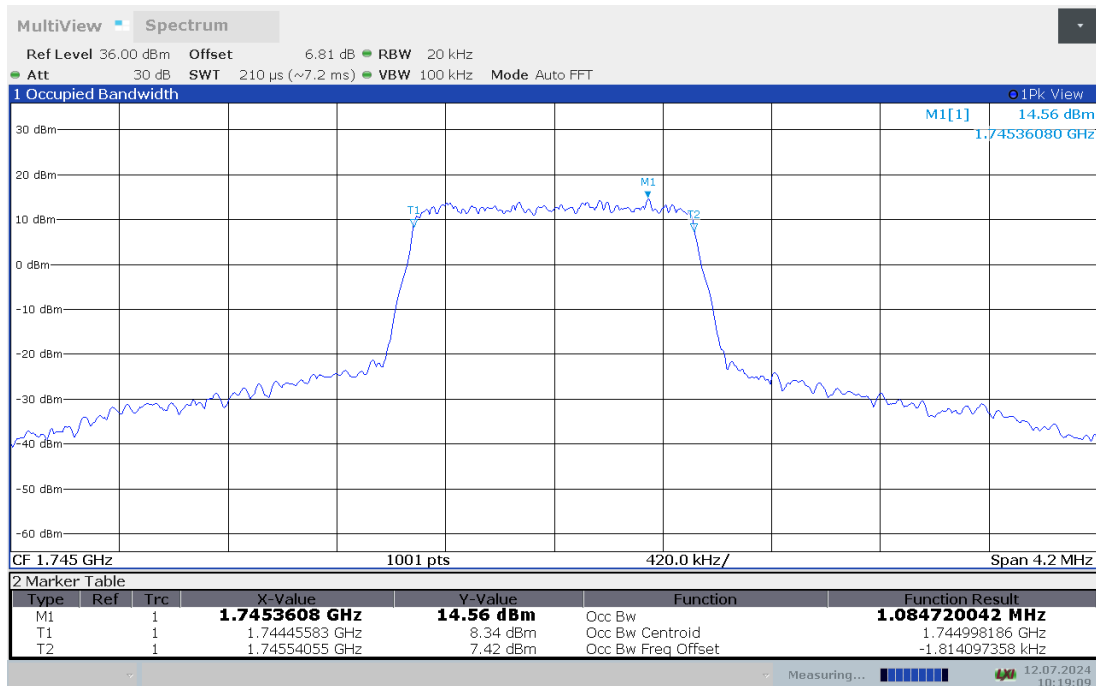
LTE band 66 , 1.4MHz Bandwidth,LOW,QPSK (99% BW)



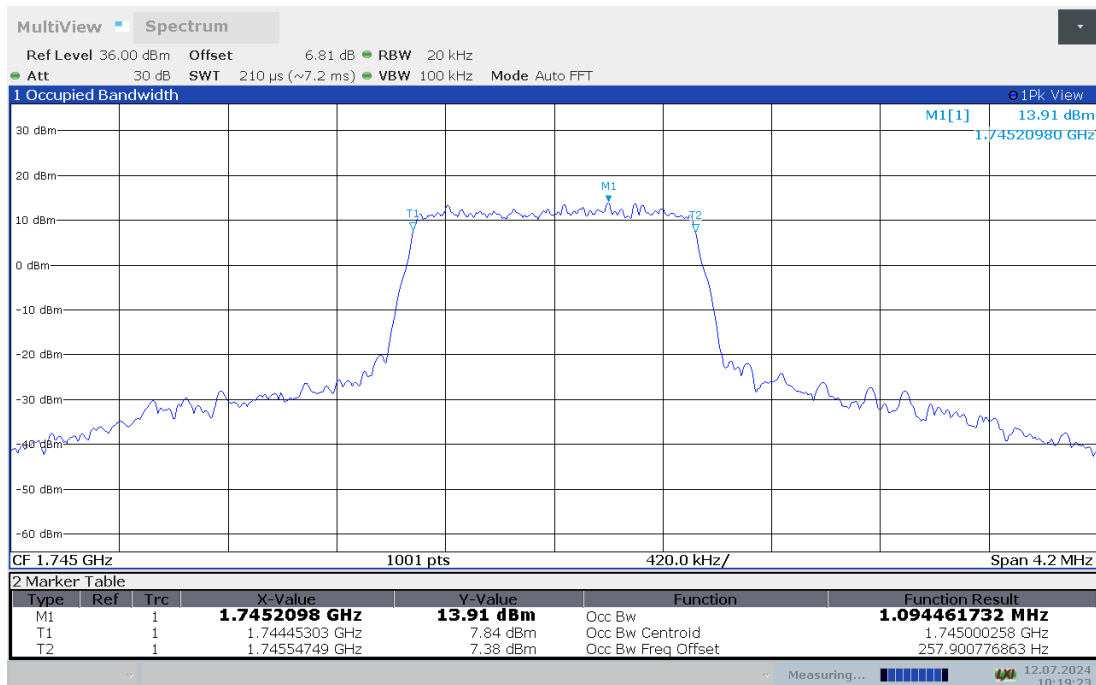
LTE band 66 , 1.4MHz Bandwidth,LOW,16QAM (99% BW)



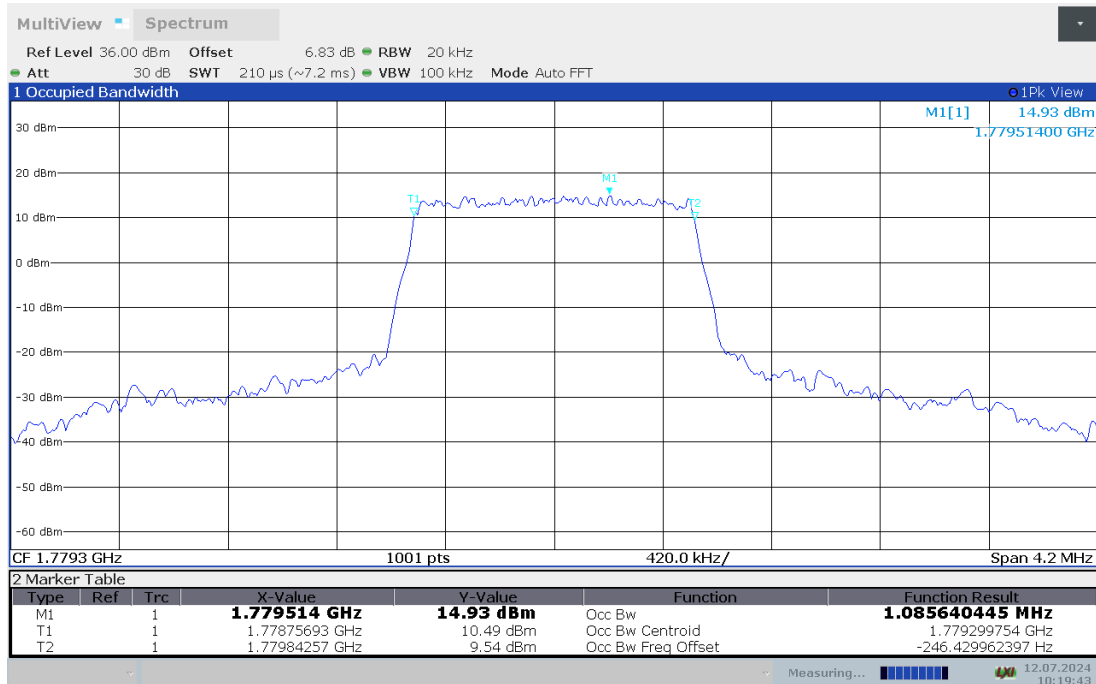
LTE band 66 , 1.4MHz Bandwidth,MID,QPSK (99% BW)



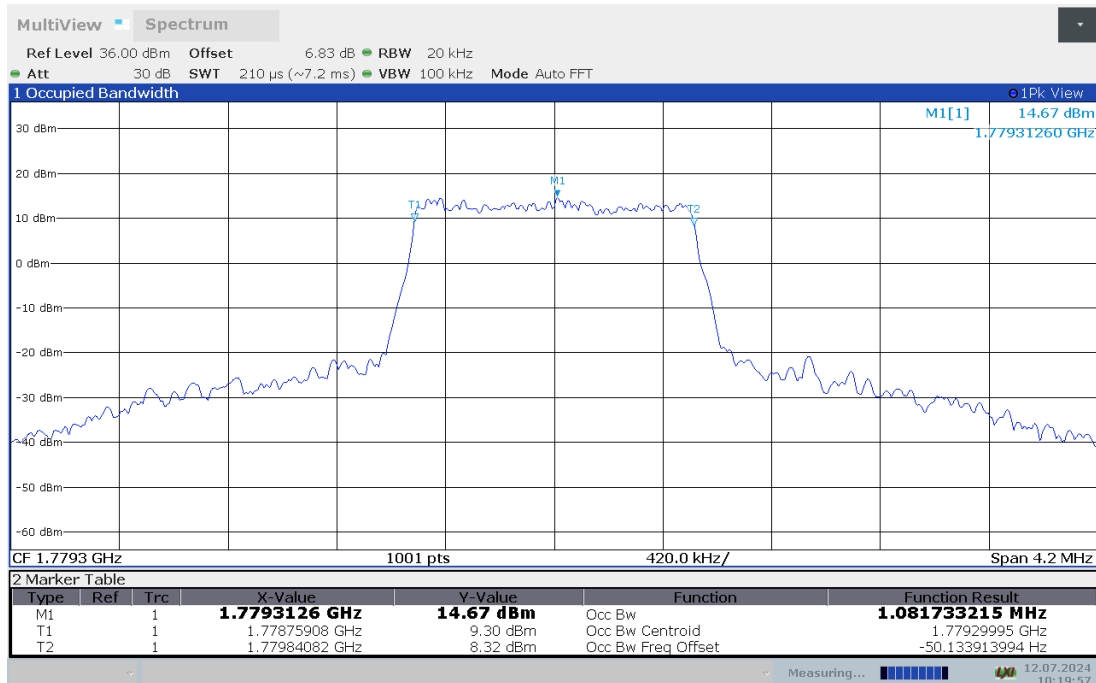
LTE band 66 , 1.4MHz Bandwidth,MID,16QAM (99% BW)



LTE band 66 , 1.4MHz Bandwidth,HIGH,QPSK (99% BW)



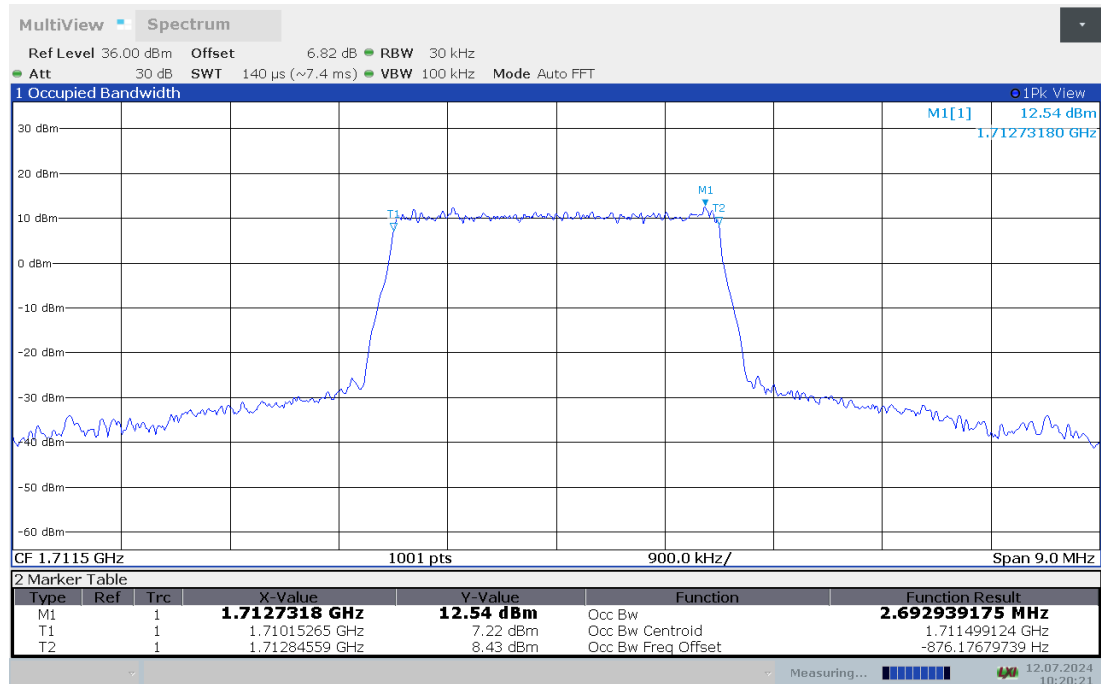
LTE band 66 , 1.4MHz Bandwidth,HIGH,16QAM (99% BW)



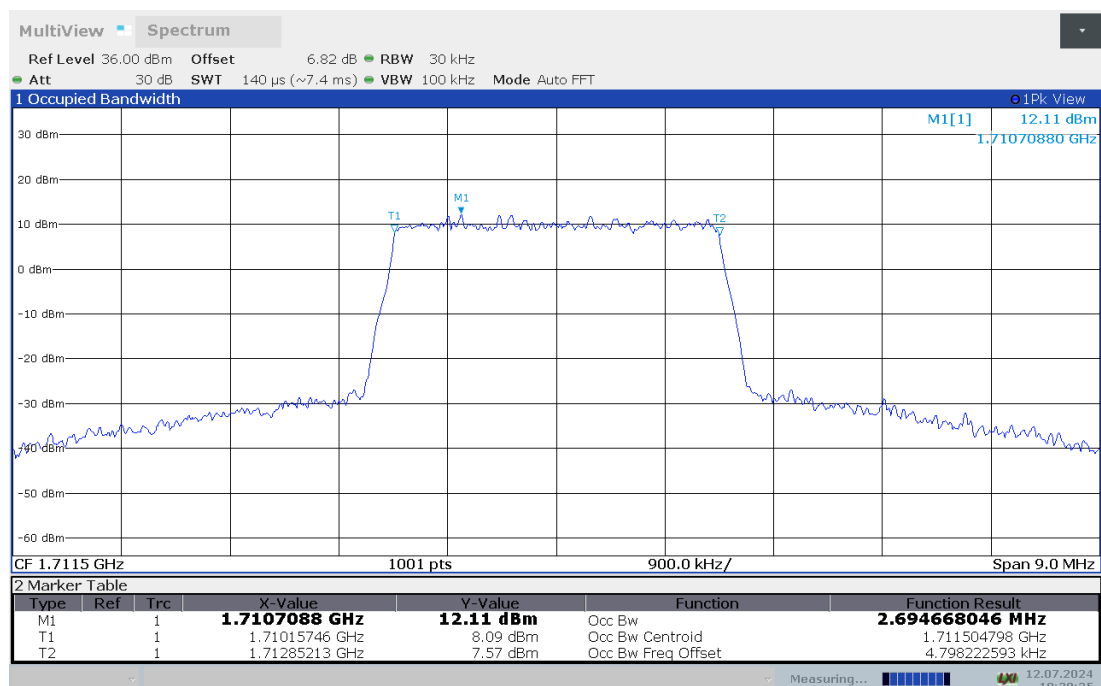
LTE band 66,3MHz(99%)

Frequency (MHz)	Occupied Bandwidth (99%)(MHz)	
	QPSK	16QAM
1711.5	2.693	2.695
1745	2.695	2.690
1778.5	2.694	2.693

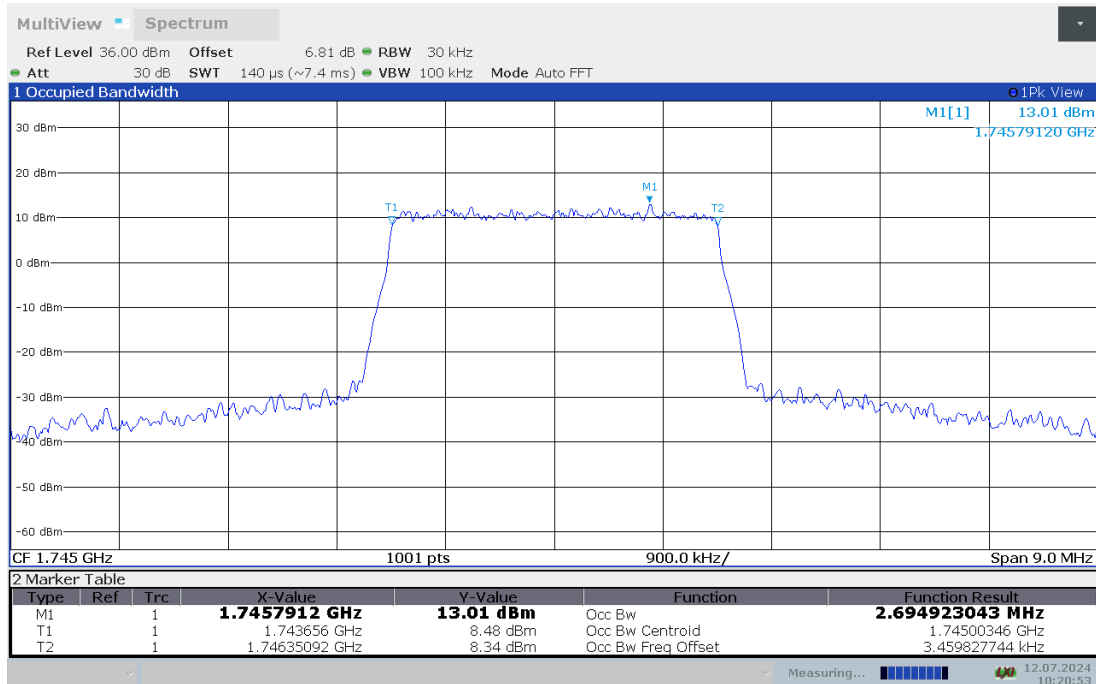
LTE band 66 , 3MHz Bandwidth,LOW,QPSK (99% BW)



LTE band 66 , 3MHz Bandwidth,LOW,16QAM (99% BW)



LTE band 66 , 3MHz Bandwidth,MID,QPSK (99% BW)



LTE band 66 , 3MHz Bandwidth,MID,16QAM (99% BW)

