TEST REPORT

No.23T04Z70533-09

for

SAMSUNG Electronics Co., Ltd.

Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN

Model Name: SM-A057M/DS, SM-A057M

FCC ID: ZCASMA057M

with

Hardware Version: REV1.0

Software Version: A057M.001

Issued Date: 2023-11-22

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 CTTL.

Test Laboratory:

CTTL-Telecommunication Technology Labs, CAICT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel:+86(0)10-62304633-2512, Fax:+86(0)10-62304633-2504

Email: cttl_terminals@caict.ac.cn, website: www.caict.ac.cn

REPORT HISTORY

Report Number	Revision	Description	Issue Date
23T04Z70533-09	Rev.0	1st edition	2023-11-20
23T04Z70533-09	Rev.1	Updated all the results of LTE Band 5, 7, 38 and 41	2023-11-22

Note: the latest revision of the test report supersedes all previous version.

CONTENTS

1. Test Laboratory

1.1. Introduction & Accreditation

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under American Association for Laboratory Accreditation (A2LA) with lab code 7049.01, and is also an FCC accredited test laboratory (CN1349), and ISED accredited test laboratory (CAB identifier:CN0066). The detail accreditation scope can be found on A2LA website.

1.2. Testing Location

Location 1: CTTL (huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191

Location 2: CTTL (BDA)

Address: No.18A, Kangding Street, Beijing Economic-Technology Development Area, Beijing, P. R. China 100176

1.3. Testing Environment

Normal Temperature: 15-35℃

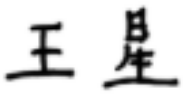
Relative Humidity: 20-75%

1.4. Project Data

Testing Start Date: 2023-11-02

Testing End Date: 2023-11-22

1.5. Signature



Wang Xing

(Prepared this test report)

Zhou Yu

(Reviewed this test report)

Zhao Hui Lin

(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	SAMSUNG Electronics Co., Ltd.
Address /Post:	19 Chapin Rd.,Building D Pine Brook, NJ 07058
Contact:	Jenni Chun
Email:	j1.chun@samsung.com
Telephone:	+1-201-937-4203

2.2. Manufacturer Information

Company Name:	Samsung Electronics Co., Ltd.
Address /Post:	Samsung R5, Maetan dong 129, Samsung ro Youngtong gu, Suwon city 443 742, Korea
Contact:	Sunghoon Cho
Email:	ggobi.cho@samsung.com
Telephone:	+82-10-2722-4159

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN
Model Name	SM-A057M/DS, SM-A057M
FCC ID	ZCASMA057M
Antenna	Embedded
Output power	23.66 dBm maximum EIRP measured for LTE B41
Extreme Voltage	3.6VDC to 4.1VDC (nominal: 3.85VDC)
Extreme Temperature	-10°C to +55°C

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

3.2. Internal Identification of EUT used during the test

EUT ID*	SN	HW Version	SW Version	Date of receipt
UT13a	2370533UT13a	REV1.0	A057M.001	2023-11-02
UT10a	2370553UT10a	REV1.0	A057M.001	2023-11-01

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

3.3. Internal Identification of AE used during the test

AE ID*	Description
AE1	Battery

AE1

Model	SLC-51
Manufacturer	Ningde Amperex Technology Limited
Capacitance	4900mAh

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

4. Reference Documents

4.1. Documents supplied by applicant

EUT parameters are supplied by the customer, which are the bases of testing. CAICT is not responsible for the accuracy of customer supplied technical information that may affect the test results (for example, antenna gain and loss of customer supplied cable).

4.2. Reference Documents for testing

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

Reference	Title	Version
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-22 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-22 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-22 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-22 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.26	American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services	2015
KDB 971168 D01	MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS	v03r01

5. Summary of Test Result

LTE Band 2

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	24.232	P
2	Emission Limit	2.1051/24.238	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	24.238	P
6	Band Edge Compliance	24.238	P
7	Conducted Spurious Emission	24.238	P
8	Peak-to-Average Power Ratio	24.232	P

LTE Band 5

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	22.913	P
2	Emission Limit	2.1051/22.917	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	22.917	P
6	Band Edge Compliance	22.917	P
7	Conducted Spurious Emission	22.917	P

LTE Band 7

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 12 (17)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 13

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 26(814MHz~824MHz)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	90.635	P
2	Emission Limit	2.1051/90.691	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	2.1049	P
6	Band Edge Compliance	90.691	P
7	Conducted Spurious Emission	90.691	P

LTE Band 26(824MHz~849MHz)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	22.913	P
2	Emission Limit	2.1051/22.917	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	22.917	P
6	Band Edge Compliance	22.917	P
7	Conducted Spurious Emission	22.917	P

LTE Band 41 (38)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

LTE Band 66 (4)

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Emission Limit	2.1051/27.53	P
3	Frequency Stability	2.1055	P
4	Occupied Bandwidth	2.1049	P
5	Emission Bandwidth	27.53	P
6	Band Edge Compliance	27.53	P
7	Conducted Spurious Emission	27.53	P
8	Peak-to-Average Power Ratio	27.50	P

Terms used in Verdict column

P	Pass. The EUT complies with the essential requirements in the standard.
NP	Not Performed. The test was not performed by CTTL.
NA	Not Applicable.The test was not applicable.
BR	Re-use test data from basic model report.
F	Fail. The EUT does not comply with the essential requirements in the standard.

All the test results are based on normal power.

Measurement uncertainty is not taken into account when stating conformity with a specified requirement.

LTE Band 66, Band 12 and Band 41 overlaps the entire frequency range of LTE Band 4, Band 17 and Band 38. Therefore, test data provided in this report covers Band 4, Band 17, Band 38 as well as Band 66, Band 12, Band 41.

LTE Band 41 is tested by power class 3.

Explanation of worst-case configuration

The worst-case scenario for all measurements is based on the conducted output power measurement investigation results. Output power was measured on QPSK,16QAM modulations. It was found that QPSK was the worst case. All testing was performed using QPSK modulations to represent the worst case unless otherwise stated. The test results shown in the following sections represent the worst case emission.

6. Test Equipment Utilized

Description	Type	Series Number	Manufacture	Cal Due Date	Calibration Interval
Wideband Radio Communication Tester	CMW500	159082	R&S	2024-02-10	13 months
Spectrum Analyzer	FSU	200030	R&S	2024-06-25	13 months
Climate chamber	SH-241	92004642	ESPEC	2024-11-16	13 months
Test Receiver	FSV30	101525	R&S	2024-02-11	1 year
EMI Antenna	VULB9163	9163-235	Schwarzbeck	2024-06-10	1 year
EMI Antenna	LB-7180-NF	J20300130005	A-INFO	2024-05-25	1 year
EMI Antenna	LB-180400-25-C-KF	J211060826	A-INFO	2024-03-02	1 year
EMI Antenna	3115	00167252	ETS-Lindgren	2024-01-28	1 year
Signal Generator	SMF100A	101295	R&S	2024-02-08	1 year
Power Amplifier	5S1G4	0341863	AR	/	/
Universal Radio Communication Tester	CMW500	143008	R&S	2024-01-03	1 year

Annex A: Measurement Results

A.1 Output Power

A.1.1 Summary

During the process of testing, the EUT was controlled via communication tester to ensure max power transmission and proper modulation.

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.

The results below include a correction factor for cable loss that is provided by the customer.

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	23.58	22.03
		1880.0	23.73	22.24
		1850.7	23.73	22.16
	1 RB low	1909.3	23.56	22.28
		1880.0	23.81	22.19
		1850.7	23.85	22.25
	50% RB mid	1909.3	23.77	22.50
		1880.0	23.70	22.37
		1850.7	23.98	22.49
	100% RB	1909.3	22.35	21.42
		1880.0	22.31	21.76
		1850.7	22.37	21.65
3MHz	1 RB high	1908.5	23.72	22.35
		1880.0	23.75	22.30
		1851.5	23.79	22.13
	1 RB low	1908.5	23.72	22.06
		1880.0	23.54	22.06
		1851.5	23.75	22.11
	50% RB mid	1908.5	22.29	21.73
		1880.0	22.29	21.92
		1851.5	22.34	21.70

	100% RB	1908.5	22.31	21.82
		1880.0	22.29	21.93
		1851.5	22.38	21.77
5MHz	1 RB high	1907.5	23.61	22.83
		1880.0	23.53	22.05
		1852.5	23.56	22.02
	1 RB low	1907.5	23.68	22.25
		1880.0	23.65	22.00
		1852.5	23.63	22.27
	50% RB mid	1907.5	22.24	21.74
		1880.0	22.32	21.91
		1852.5	22.32	21.63
	100% RB	1907.5	22.26	22.05
		1880.0	22.28	21.71
		1852.5	22.37	21.75
10MHz	1 RB high	1905.0	23.82	22.21
		1880.0	23.92	22.28
		1855.0	23.66	22.36
	1 RB low	1905.0	23.85	22.43
		1880.0	23.83	22.23
		1855.0	23.37	22.26
	50% RB mid	1905.0	22.41	21.87
		1880.0	22.36	22.15
		1855.0	22.40	21.77
	100% RB	1905.0	22.42	21.70
		1880.0	22.33	21.89
		1855.0	22.41	21.86
15MHz	1 RB high	1902.5	23.87	22.35
		1880.0	23.72	22.39
		1857.5	23.57	22.31
	1 RB low	1902.5	23.91	22.09
		1880.0	23.62	22.36
		1857.5	23.04	22.43
	50% RB mid	1902.5	22.50	21.90
		1880.0	22.45	21.86
		1857.5	22.52	21.88
	100% RB	1902.5	22.50	21.98
		1880.0	22.46	21.75
		1857.5	22.46	21.90

20MHz	1 RB high	1900.0	23.84	22.26
		1880.0	23.92	22.29
		1860.0	23.85	22.26
	1 RB low	1900.0	24.05	22.43
		1880.0	23.59	22.29
		1860.0	23.59	22.33
	50% RB mid	1900.0	22.57	21.94
		1880.0	22.60	21.87
		1860.0	22.57	22.01
	100% RB	1900.0	22.64	21.85
		1880.0	22.55	21.97
		1860.0	22.63	21.94

LTE band 5

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	24.87	23.21
		836.5	24.93	23.50
		824.7	24.96	23.39
	1 RB low	848.3	24.82	23.18
		836.5	24.98	23.47
		824.7	24.87	23.58
	50% RB mid	848.3	24.96	23.34
		836.5	24.93	23.45
		824.7	24.98	23.49
	100% RB	848.3	23.33	22.52
		836.5	23.36	22.70
		824.7	23.21	22.72
3MHz	1 RB high	847.5	25.00	23.00
		836.5	24.95	23.65
		825.5	24.69	23.31
	1 RB low	847.5	24.99	22.99
		836.5	24.83	23.24
		825.5	24.95	23.29
	50% RB mid	847.5	23.28	22.44
		836.5	23.53	22.65
		825.5	23.21	22.63
	100% RB	847.5	23.26	22.53
		836.5	23.44	22.63
		825.5	23.36	22.56
5MHz	1 RB high	846.5	24.93	23.27
		836.5	24.47	23.36
		826.5	24.54	23.05
	1 RB low	846.5	24.77	23.21
		836.5	24.56	23.13
		826.5	24.95	23.37
	50% RB mid	846.5	23.36	22.58
		836.5	23.42	22.55
		826.5	23.19	22.47
	100% RB	846.5	23.26	22.47
		836.5	23.31	22.65
		826.5	23.24	22.61
10MHz	1 RB high	844.0	24.65	23.21
		836.5	24.75	23.28

		829.0	24.29	23.17
	1 RB low	844.0	24.27	23.31
		836.5	24.30	23.19
		829.0	24.74	23.37
	50% RB mid	844.0	23.24	22.70
		836.5	23.31	22.81
		829.0	23.13	22.48
	100% RB	844.0	23.25	22.53
		836.5	23.19	22.50
		829.0	23.13	22.48

LTE band 7

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2567.5	23.70	23.01
		2535.0	23.40	22.62
		2502.5	23.36	22.26
	1 RB low	2567.5	23.37	22.90
		2535.0	23.36	22.49
		2502.5	23.34	22.24
	50% RB mid	2567.5	22.36	21.47
		2535.0	22.17	21.13
		2502.5	21.89	20.90
	100% RB	2567.5	22.30	21.10
		2535.0	22.14	21.03
		2502.5	21.88	20.83
10MHz	1 RB high	2565.0	23.84	23.22
		2535.0	23.54	22.70
		2505.0	23.22	22.29
	1 RB low	2565.0	23.44	22.93
		2535.0	23.37	22.62
		2505.0	23.30	22.28
	50% RB mid	2565.0	22.30	21.55
		2535.0	22.24	21.30
		2505.0	22.08	20.96
	100% RB	2565.0	22.25	21.29
		2535.0	22.11	20.94
		2505.0	22.06	20.95
15MHz	1 RB high	2562.5	23.91	23.12
		2535.0	23.56	22.60
		2507.5	23.27	22.25
	1 RB low	2562.5	23.36	23.12
		2535.0	23.41	22.71
		2507.5	23.29	22.24
	50% RB mid	2562.5	22.37	21.31
		2535.0	22.21	21.06
		2507.5	22.10	20.95
	100% RB	2562.5	22.39	21.18
		2535.0	22.14	20.99
		2507.5	21.82	20.85
20MHz	1 RB high	2560.0	23.90	23.17
		2535.0	23.54	22.75
		2510.0	23.31	22.40
	1 RB low	2560.0	23.45	23.09

		2535.0	23.48	22.65
		2510.0	23.25	22.43
	50% RB mid	2560.0	22.45	21.50
		2535.0	22.23	21.24
		2510.0	22.05	21.03
	100% RB	2560.0	22.39	21.28
		2535.0	22.13	21.13
		2510.0	22.00	20.97

LTE band 12

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	715.3	24.09	22.03
		707.5	24.38	22.09
		699.7	24.19	22.06
	1 RB low	715.3	24.11	22.01
		707.5	24.41	22.41
		699.7	24.15	22.13
	50% RB mid	715.3	24.54	22.29
		707.5	24.48	22.73
		699.7	24.18	22.21
	100% RB	715.3	22.68	21.62
		707.5	22.91	21.76
		699.7	22.69	21.57
3MHz	1 RB high	714.5	23.93	22.12
		707.5	24.31	22.34
		700.5	24.35	22.32
	1 RB low	714.5	24.09	22.01
		707.5	24.30	22.03
		700.5	24.22	22.07
	50% RB mid	714.5	22.70	21.91
		707.5	22.98	21.99
		700.5	22.81	22.07
	100% RB	714.5	22.85	21.97
		707.5	22.92	21.84
		700.5	22.85	21.83
5MHz	1 RB high	713.5	23.84	22.02
		707.5	24.07	22.20
		701.5	24.23	22.11
	1 RB low	713.5	24.19	22.05
		707.5	24.17	22.12
		701.5	24.08	22.07
	50% RB mid	713.5	22.85	21.49
		707.5	22.98	22.02
		701.5	22.88	21.73
	100% RB	713.5	22.76	21.99
		707.5	22.92	21.99
		701.5	22.77	21.75
10MHz	1 RB high	711.0	23.90	22.08
		707.5	24.26	22.09

		704.0	24.18	22.29
	1 RB low	711.0	24.05	22.39
		707.5	24.22	22.00
		704.0	24.01	22.11
	50% RB mid	711.0	22.91	22.02
		707.5	22.94	21.94
		704.0	22.74	22.00
	100% RB	711.0	22.84	21.94
		707.5	22.90	22.04
		704.0	22.76	21.88

LTE band 13

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	784.5	23.99	22.23
		782.0	23.74	22.01
		779.5	24.02	22.11
	1 RB low	784.5	23.95	22.26
		782.0	23.94	22.07
		779.5	23.78	22.29
	50% RB mid	784.5	22.75	21.79
		782.0	22.88	21.97
		779.5	22.89	21.85
	100% RB	784.5	22.80	21.84
		782.0	22.87	21.80
		779.5	22.81	21.93
10MHz	1 RB high	782.0	23.92	22.43
	1 RB low	782.0	24.05	22.11
	50% RB mid	782.0	22.78	22.02
	100% RB	782.0	22.82	21.77

LTE band 26(814MHz~824MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	823.3	24.25	22.16
		819.0	24.25	22.17
		814.7	24.36	22.38
	1 RB low	823.3	24.22	22.08
		819.0	24.33	22.12
		814.7	24.48	22.44
	50% RB mid	823.3	24.18	22.50
		819.0	24.20	22.15
		814.7	24.26	22.38
	100% RB	823.3	22.87	22.05
		819.0	22.96	22.18
		814.7	22.87	21.89
3MHz	1 RB high	822.5	24.20	22.14
		819.0	24.47	22.15
		815.5	24.20	22.07
	1 RB low	822.5	24.38	22.21
		819.0	24.36	22.27
		815.5	24.29	22.21
	50% RB mid	822.5	22.82	22.07
		819.0	22.88	22.11
		815.5	22.89	21.99
	100% RB	822.5	22.89	22.03
		819.0	22.94	22.02
		815.5	22.91	21.96
5MHz	1 RB high	821.5	23.95	22.16
		819.0	24.16	22.11
		816.5	24.27	22.03
	1 RB low	821.5	24.31	22.24
		819.0	24.14	22.15
		816.5	23.94	22.08
	50% RB mid	821.5	22.93	22.02
		819.0	22.90	22.03
		816.5	22.87	21.95
	100% RB	821.5	22.90	21.96
		819.0	22.91	21.98
		816.5	22.86	21.93
10MHz	1 RB high	819.0	24.38	22.25
	1 RB low	819.0	24.48	22.22

	50% RB mid	819.0	22.98	22.23
	100% RB	819.0	22.93	21.99

LTE band 26(824MHz~849MHz)

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	24.17	22.03
		836.5	24.12	22.40
		824.7	24.35	22.38
	1 RB low	848.3	24.06	22.02
		836.5	24.06	22.35
		824.7	24.25	22.37
	50% RB mid	848.3	24.15	22.48
		836.5	24.14	22.20
		824.7	24.11	22.13
	100% RB	848.3	22.83	22.05
		836.5	22.89	21.94
		824.7	22.85	21.90
3MHz	1 RB high	847.5	24.23	22.41
		836.5	24.33	22.06
		825.5	24.25	22.18
	1 RB low	847.5	24.21	22.22
		836.5	24.35	22.03
		825.5	24.21	22.17
	50% RB mid	847.5	22.84	21.90
		836.5	23.07	22.12
		825.5	22.97	22.13
	100% RB	847.5	22.82	21.82
		836.5	22.89	22.05
		825.5	22.94	22.10
5MHz	1 RB high	846.5	24.11	22.30
		836.5	24.34	22.21
		826.5	24.23	22.11
	1 RB low	846.5	24.21	22.05
		836.5	24.22	22.07
		826.5	24.23	22.07
	50% RB mid	846.5	22.91	22.00
		836.5	23.05	22.07
		826.5	23.01	22.10
	100% RB	846.5	22.89	21.97
		836.5	22.95	21.83
		826.5	22.98	21.89
10MHz	1 RB high	844.0	24.36	22.57
		836.5	24.23	22.22

		829.0	24.30	22.68
	1 RB low	844.0	24.60	22.80
		836.5	24.20	22.32
		829.0	24.14	22.84
	50% RB mid	844.0	22.88	22.19
		836.5	23.05	22.24
		829.0	23.00	22.19
	100% RB	844.0	22.94	22.00
		836.5	22.90	21.97
		829.0	22.97	22.04
15MHz	1 RB high	841.5	24.14	22.61
		836.5	24.22	22.67
		831.5	24.40	22.49
	1 RB low	841.5	24.36	22.47
		836.5	24.29	22.71
		831.5	24.08	22.62
	50% RB mid	841.5	22.94	22.11
		836.5	23.03	22.09
		831.5	22.97	22.02
	100% RB	841.5	22.97	21.98
		836.5	22.91	21.95
		831.5	22.93	21.98

LTE band 41

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2687.5	24.16	22.86
		2593.0	24.08	22.92
		2498.5	24.14	22.56
	1 RB low	2687.5	24.34	22.47
		2593.0	24.47	22.84
		2498.5	24.48	22.33
	50% RB mid	2687.5	23.28	22.17
		2593.0	23.32	22.63
		2498.5	22.82	22.18
	100% RB	2687.5	23.34	22.15
		2593.0	23.35	22.44
		2498.5	22.82	21.99
10MHz	1 RB high	2685.0	24.31	22.75
		2593.0	24.21	22.83
		2501.0	24.11	22.29
	1 RB low	2685.0	24.52	22.51
		2593.0	24.65	22.84
		2501.0	24.36	22.59
	50% RB mid	2685.0	23.36	22.27
		2593.0	23.33	22.62
		2501.0	22.87	22.23
	100% RB	2685.0	23.29	22.12
		2593.0	23.28	22.36
		2501.0	22.92	22.16
15MHz	1 RB high	2682.5	24.18	22.87
		2593.0	23.96	22.83
		2503.5	24.11	22.66
	1 RB low	2682.5	24.50	22.45
		2593.0	24.55	22.85
		2503.5	24.30	22.46
	50% RB mid	2682.5	23.27	22.19
		2593.0	23.42	22.58
		2503.5	22.81	22.18
	100% RB	2682.5	23.32	22.37
		2593.0	23.28	22.47
		2503.5	22.79	22.06

20MHz	1 RB high	2680.0	24.27	22.82
		2593.0	24.15	22.86
		2506.0	24.30	22.35
	1 RB low	2680.0	24.47	22.55
		2593.0	24.60	23.02
		2506.0	24.45	22.30
	50% RB mid	2680.0	23.31	22.33
		2593.0	23.39	22.63
		2506.0	22.94	22.17
	100% RB	2680.0	23.30	22.31
		2593.0	23.42	22.45
		2506.0	22.97	22.11

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Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1779.3	23.24	22.27
		1745.0	24.03	22.52
		1710.7	24.06	22.06
	1 RB low	1779.3	23.34	22.53
		1745.0	24.09	22.56
		1710.7	24.18	22.16
	50% RB mid	1779.3	23.20	22.36
		1745.0	24.25	22.84
		1710.7	24.38	22.29
	100% RB	1779.3	22.05	22.11
		1745.0	23.16	22.17
		1710.7	22.81	21.74
3MHz	1 RB high	1778.5	23.79	22.38
		1745.0	24.35	22.61
		1711.5	24.21	22.09
	1 RB low	1778.5	23.22	22.57
		1745.0	24.43	22.60
		1711.5	24.20	22.82
	50% RB mid	1778.5	22.42	21.90
		1745.0	23.16	22.18
		1711.5	22.88	21.75
	100% RB	1778.5	22.30	21.95
		1745.0	23.19	22.09
		1711.5	22.81	21.75
5MHz	1 RB high	1777.5	23.66	22.13
		1745.0	24.01	22.58
		1712.5	24.06	22.09
	1 RB low	1777.5	23.43	22.49
		1745.0	24.29	22.49
		1712.5	23.94	22.15
	50% RB mid	1777.5	22.80	21.95
		1745.0	23.15	21.96
		1712.5	22.78	21.74
	100% RB	1777.5	22.90	21.99
		1745.0	23.16	21.92
		1712.5	22.91	22.08
10MHz	1 RB high	1775.0	23.93	22.13
		1745.0	24.09	22.48

		1715.0	24.28	22.10
	1 RB low	1775.0	24.15	22.54
		1745.0	24.41	22.51
		1715.0	24.26	22.10
	50% RB mid	1775.0	23.04	22.18
		1745.0	23.19	21.95
		1715.0	22.86	21.72
	100% RB	1775.0	23.41	22.03
		1745.0	23.20	21.95
		1715.0	22.99	21.75
15MHz	1 RB high	1772.5	23.58	22.07
		1745.0	23.66	22.37
		1717.5	24.31	22.47
	1 RB low	1772.5	23.66	22.45
		1745.0	24.38	22.47
		1717.5	24.20	22.17
	50% RB mid	1772.5	23.22	22.18
		1745.0	23.13	21.99
		1717.5	22.84	21.70
	100% RB	1772.5	23.11	22.19
		1745.0	23.17	22.12
		1717.5	22.86	21.78
20MHz	1 RB high	1770.0	24.12	22.49
		1745.0	24.11	22.48
		1720.0	24.24	22.23
	1 RB low	1770.0	24.21	22.48
		1745.0	24.42	22.61
		1720.0	24.18	22.22
	50% RB mid	1770.0	23.13	22.01
		1745.0	23.17	22.09
		1720.0	22.99	21.76
	100% RB	1770.0	23.17	22.09
		1745.0	23.23	22.05
		1720.0	22.99	21.76

Note: Expanded measurement uncertainty is U = 0.578 dB, k = 2.

A.1.3 Radiated

A.1.3.1 Description

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

FDD Band 2: Part 24.232(c) specifies "Mobile and portable stations are limited to 2 watts EIRP".

FDD Band 4/66: Part 27.50(d)(4) specifies "Fixed, mobile, and portable(handheld) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP".

FDD Band 5/26(824MHz~849MHz): Part 22.913(a) specifies "The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts".

FDD Band 7/ TDD Band 41: Part 27.50(h)(2) specifies "Mobile stations are limited to 2.0 watts EIRP".

FDD Band 12/17: Part 27.50(c) (10) specifies "Portable stations (hand-held devices) in the 600 MHz uplink band and the 698–746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP".

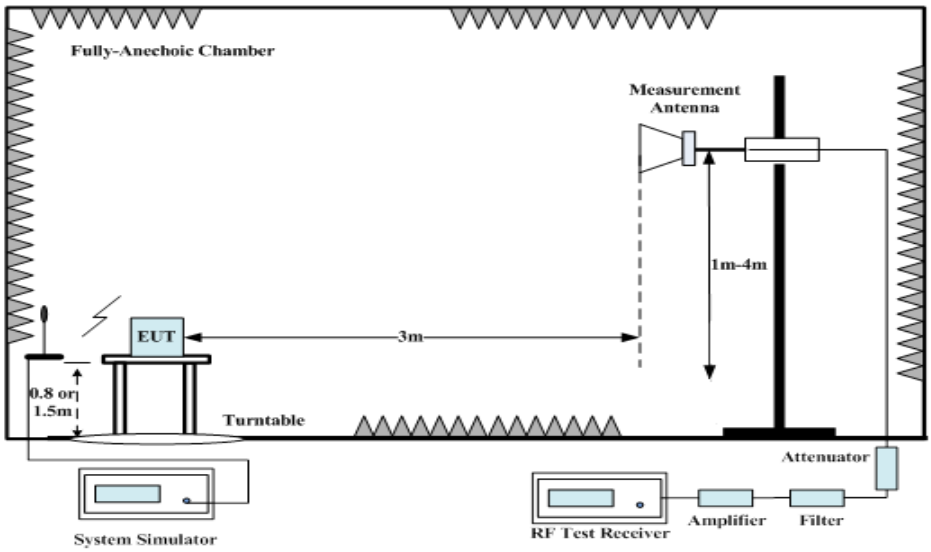
FDD Band 13: Part 27.50(b) specifies "Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP".

LTE Band 26(814MHz~824MHz)： Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts (50dBm)".

A.1.3.2 Method of Measurement

The measurements procedures in ANSI C63.26 are used.

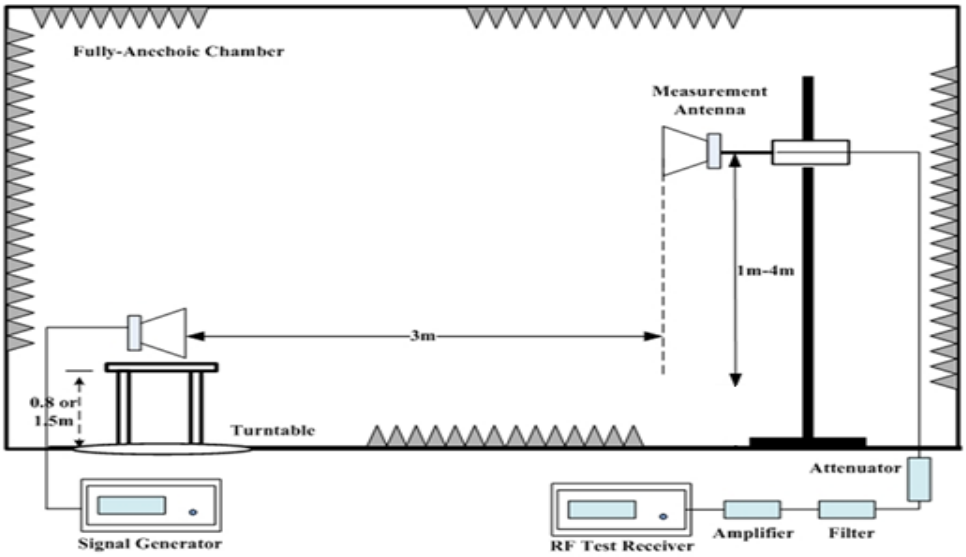
1. EUT was placed on a 0.8/1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The receiving antenna shall be varied from 1 to 4m in height above the reference ground. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and the EUT is manipulated through all orthogonal planes representative of its typical use. The test is carried out with both vertical and horizontal polarization of the receiving antenna.The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with rms 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. Adjust 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 (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 - 2.15.

The antenna gain provided by the client may affect the validity of the measurement results in this report, and the client shall bear the impact and consequences arising therefrom.

A.1.3.3 Measurement result

LTE Band 2-EIRP

Limits: ≤33dBm (2W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	1850.70	-23.52	2.92	43.75	4.87	22.18	33.00	10.82	H
		1880.00	-23.91	2.85	43.75	4.82	21.81	33.00	11.19	H
		1909.30	-25.39	2.87	43.77	4.76	20.27	33.00	12.73	H
	3	1851.50	-23.65	2.87	43.75	4.87	22.10	33.00	10.90	H
		1880.00	-23.97	2.85	43.75	4.82	21.75	33.00	11.25	H
		1908.50	-25.47	2.89	43.78	4.76	20.18	33.00	12.82	H
	5	1852.50	-23.47	2.87	43.75	4.87	22.28	33.00	10.72	H
		1880.00	-23.98	2.85	43.75	4.82	21.74	33.00	11.26	H
		1907.50	-25.40	2.84	43.77	4.77	20.30	33.00	12.70	H
	10	1855.00	-23.32	2.88	43.74	4.86	22.40	33.00	10.60	H
		1880.00	-24.05	2.85	43.75	4.82	21.67	33.00	11.33	H
		1905.00	-25.66	2.87	43.77	4.77	20.01	33.00	12.99	H
	15	1857.50	-22.91	2.87	43.75	4.86	22.83	33.00	10.17	H
		1880.00	-23.89	2.85	43.75	4.82	21.83	33.00	11.17	H
		1902.50	-25.48	2.86	43.77	4.78	20.21	33.00	12.79	H
	20	1860.00	-22.67	2.86	43.75	4.85	23.07	33.00	9.93	H
		1880.00	-23.76	2.85	43.75	4.82	21.96	33.00	11.04	H
		1900.00	-24.91	2.87	43.77	4.78	20.77	33.00	12.23	H
16QAM	1.4	1850.70	-25.68	2.92	43.75	4.87	20.02	33.00	12.98	H
		1880.00	-26.07	2.85	43.75	4.82	19.65	33.00	13.35	H
		1909.30	-27.63	2.87	43.77	4.76	18.03	33.00	14.97	H
	3	1851.50	-25.85	2.87	43.75	4.87	19.90	33.00	13.10	H
		1880.00	-26.23	2.85	43.75	4.82	19.49	33.00	13.51	H
		1908.50	-27.39	2.89	43.78	4.76	18.26	33.00	14.74	H
	5	1852.50	-25.77	2.87	43.75	4.87	19.98	33.00	13.02	H
		1880.00	-26.40	2.85	43.75	4.82	19.32	33.00	13.68	H
		1907.50	-27.68	2.84	43.77	4.77	18.02	33.00	14.98	H
	10	1855.00	-25.44	2.88	43.74	4.86	20.28	33.00	12.72	H
		1880.00	-25.93	2.85	43.75	4.82	19.79	33.00	13.21	H
		1905.00	-27.17	2.87	43.77	4.77	18.50	33.00	14.50	H
	15	1857.50	-25.30	2.87	43.75	4.86	20.44	33.00	12.56	H
		1880.00	-26.49	2.85	43.75	4.82	19.23	33.00	13.77	H
		1902.50	-27.38	2.86	43.77	4.78	18.31	33.00	14.69	H
	20	1860.00	-25.24	2.86	43.75	4.85	20.50	33.00	12.50	H
		1880.00	-26.07	2.85	43.75	4.82	19.65	33.00	13.35	H
		1900.00	-26.98	2.87	43.77	4.78	18.20	33.00	14.80	H

LTE Band 5-ERP

Limits: ≤38.45dBm (7W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	824.70	-26.48	2.26	45.79	0.95	2.15	15.85	38.45	22.60	V
		836.50	-26.69	2.26	45.66	0.82	2.15	15.38	38.45	23.07	V
		848.30	-27.03	2.27	45.55	0.80	2.15	14.90	38.45	23.55	V
	3	825.50	-26.48	2.26	45.79	0.94	2.15	15.84	38.45	22.61	V
		836.50	-26.77	2.26	45.66	0.82	2.15	15.30	38.45	23.15	V
		847.50	-27.14	2.27	45.56	0.81	2.15	14.81	38.45	23.64	V
	5	826.50	-26.50	2.25	45.77	0.93	2.15	15.80	38.45	22.65	V
		836.50	-26.70	2.26	45.66	0.82	2.15	15.37	38.45	23.08	V
		846.50	-27.06	2.26	45.56	0.82	2.15	14.91	38.45	23.54	V
	10	829.00	-26.82	2.25	45.77	0.90	2.15	15.45	38.45	23.00	V
		836.50	-26.77	2.26	45.66	0.82	2.15	15.30	38.45	23.15	V
		844.00	-27.08	2.26	45.59	0.82	2.15	14.92	38.45	23.53	V
16QAM	1.4	824.70	-26.59	2.26	45.79	0.95	2.15	15.74	38.45	22.71	V
		836.50	-26.87	2.26	45.66	0.82	2.15	15.20	38.45	23.25	V
		848.30	-27.31	2.27	45.55	0.80	2.15	14.62	38.45	23.83	V
	3	825.50	-26.75	2.26	45.79	0.94	2.15	15.57	38.45	22.88	V
		836.50	-27.00	2.26	45.66	0.82	2.15	15.07	38.45	23.38	V
		847.50	-27.36	2.27	45.56	0.81	2.15	14.59	38.45	23.86	V
	5	826.50	-26.65	2.25	45.77	0.93	2.15	15.65	38.45	22.80	V
		836.50	-27.01	2.26	45.66	0.82	2.15	15.06	38.45	23.39	V
		846.50	-27.24	2.26	45.56	0.82	2.15	14.73	38.45	23.72	V
	10	829.00	-27.18	2.25	45.77	0.90	2.15	15.09	38.45	23.36	V
		836.50	-26.97	2.26	45.66	0.82	2.15	15.10	38.45	23.35	V
		844.00	-27.26	2.26	45.59	0.82	2.15	14.74	38.45	23.71	V

LTE Band 7- EIRP

Limits: ≤33 dBm (2W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	5	2502.50	-24.69	3.58	45.68	6.10	23.51	33.00	9.49	H
		2535.00	-24.51	3.63	44.82	6.16	22.84	33.00	10.16	H
		2567.50	-26.75	3.65	44.92	6.22	20.74	33.00	12.26	H
	10	2505.00	-24.96	3.59	45.64	6.11	23.20	33.00	9.80	H
		2535.00	-24.59	3.63	44.82	6.16	22.76	33.00	10.24	H
		2565.00	-26.53	3.65	44.97	6.22	21.01	33.00	11.99	H
	15	2507.50	-24.32	3.59	44.92	6.11	23.12	33.00	9.88	H
		2535.00	-24.50	3.63	44.82	6.16	22.85	33.00	10.15	H
		2562.50	-27.24	3.65	45.67	6.21	20.99	33.00	12.01	V
	20	2510.00	-24.94	3.58	45.36	6.12	22.96	33.00	10.04	H
		2535.00	-24.53	3.63	44.82	6.16	22.82	33.00	10.18	H
		2560.00	-27.50	3.63	45.98	6.21	21.06	33.00	11.94	V
16QAM	5	2502.50	-25.20	3.58	45.68	6.10	23.00	33.00	10.00	H
		2535.00	-24.85	3.63	44.82	6.16	22.50	33.00	10.50	H
		2567.50	-27.35	3.65	44.92	6.22	20.14	33.00	12.86	H
	10	2505.00	-25.54	3.59	45.64	6.11	22.62	33.00	10.38	H
		2535.00	-24.85	3.63	44.82	6.16	22.50	33.00	10.50	H
		2565.00	-27.33	3.65	44.97	6.22	20.21	33.00	12.79	H
	15	2507.50	-24.88	3.59	44.92	6.11	22.56	33.00	10.44	H
		2535.00	-25.21	3.63	44.82	6.16	22.14	33.00	10.86	H
		2562.50	-27.42	3.65	45.67	6.21	20.81	33.00	12.19	V
	20	2510.00	-25.37	3.58	45.36	6.12	22.53	33.00	10.47	H
		2535.00	-24.88	3.63	44.82	6.16	22.47	33.00	10.53	H
		2560.00	-27.94	3.63	45.98	6.21	20.62	33.00	12.38	V

LTE Band 12 - ERP

Limits: ≤34.77dBm (3W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	699.70	-25.96	1.90	44.66	0.77	2.15	15.42	34.77	19.63	V
		707.50	-25.80	1.91	44.94	0.62	2.15	15.70	34.77	19.07	V
		715.30	-25.38	1.92	45.26	0.50	2.15	16.31	34.77	18.46	V
	3	700.50	-25.93	1.90	44.68	0.76	2.15	15.46	34.77	19.31	V
		707.50	-25.83	1.91	44.94	0.62	2.15	15.67	34.77	19.10	V
		714.50	-25.57	1.92	45.26	0.50	2.15	16.12	34.77	18.65	V
	5	701.50	-26.28	1.90	44.81	0.74	2.15	15.22	34.77	19.55	V
		707.50	-25.76	1.91	44.94	0.62	2.15	15.74	34.77	19.03	V
		713.50	-25.67	1.92	45.22	0.50	2.15	15.98	34.77	18.79	V
	10	704.00	-26.12	1.91	44.93	0.70	2.15	15.45	34.77	19.32	V
		707.50	-25.69	1.91	44.94	0.62	2.15	15.81	34.77	18.96	V
		711.00	-25.74	1.92	45.19	0.53	2.15	15.91	34.77	18.86	V
16QAM	1.4	699.70	-28.23	1.90	44.66	0.77	2.15	13.15	34.77	21.62	V
		707.50	-27.37	1.91	44.94	0.62	2.15	14.13	34.77	20.64	V
		715.30	-27.46	1.92	45.26	0.50	2.15	14.23	34.77	20.54	V
	3	700.50	-27.95	1.90	44.68	0.76	2.15	13.44	34.77	21.33	V
		707.50	-27.79	1.91	44.94	0.62	2.15	13.71	34.77	21.06	V
		714.50	-27.78	1.92	45.26	0.50	2.15	13.91	34.77	20.86	V
	5	701.50	-28.55	1.90	44.81	0.74	2.15	12.95	34.77	21.82	V
		707.50	-28.19	1.91	44.94	0.62	2.15	13.31	34.77	21.46	V
		713.50	-27.89	1.92	45.22	0.50	2.15	13.76	34.77	21.01	V
	10	704.00	-28.08	1.91	44.93	0.70	2.15	13.49	34.77	21.28	V
		707.50	-28.03	1.91	44.94	0.62	2.15	13.47	34.77	21.30	V
		711.00	-27.98	1.92	45.19	0.53	2.15	13.67	34.77	21.10	V

LTE Band 13 - ERP

Limits: ≤34.77dBm (3W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	Correctio n (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	5	779.50	-25.41	2.01	45.64	0.04	2.15	16.11	34.77	18.66	V
		782.00	-25.84	2.01	45.65	0.09	2.15	15.74	34.77	19.03	V
		784.50	-26.13	2.01	45.67	0.16	2.15	15.54	34.77	19.23	V
	10	782.00	-25.88	2.01	45.65	0.09	2.15	15.70	34.77	19.07	V
16QAM	5	779.50	-27.53	2.01	45.64	0.04	2.15	13.99	34.77	20.78	V
		782.00	-28.03	2.01	45.65	0.09	2.15	13.55	34.77	21.22	V
		784.50	-28.16	2.01	45.67	0.16	2.15	13.51	34.77	21.26	V
	10	782.00	-28.08	2.01	45.65	0.09	2.15	13.50	34.77	21.27	V

LTE Band 26(814MHz~824MHz)- ERP

Limits: ≤50dBm (100W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	Correctio n (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	814.70	-26.04	2.13	45.86	0.89	2.15	16.43	50.00	33.57	H
		819.00	-26.07	2.19	45.84	1.05	2.15	16.48	50.00	33.52	H
		823.30	-24.99	2.24	45.79	0.55	2.15	16.96	50.00	33.04	H
	3	815.50	-26.51	2.14	45.87	0.93	2.15	16.00	50.00	34.00	H
		819.00	-26.20	2.19	45.84	1.05	2.15	16.35	50.00	33.65	H
		822.50	-25.03	2.23	45.81	0.33	2.15	16.73	50.00	33.27	H
	5	816.50	-26.26	2.16	45.88	0.98	2.15	16.29	50.00	33.71	H
		819.00	-25.98	2.19	45.84	1.05	2.15	16.57	50.00	33.43	H
		821.50	-25.58	2.22	45.82	0.71	2.15	16.58	50.00	33.42	H
	10	819.00	-26.06	2.19	45.84	1.05	2.15	16.49	50.00	33.51	H
16QAM	1.4	814.70	-28.37	2.13	45.86	0.89	2.15	14.10	50.00	35.90	H
		819.00	-28.08	2.19	45.84	1.05	2.15	14.47	50.00	35.53	H
		823.30	-27.17	2.24	45.79	0.55	2.15	14.78	50.00	35.22	H
	3	815.50	-28.50	2.14	45.87	0.93	2.15	14.01	50.00	35.99	H
		819.00	-28.40	2.19	45.84	1.05	2.15	14.15	50.00	35.85	H
		822.50	-26.99	2.23	45.81	0.33	2.15	14.77	50.00	35.23	H
	5	816.50	-28.47	2.16	45.88	0.98	2.15	14.08	50.00	35.92	H
		819.00	-28.29	2.19	45.84	1.05	2.15	14.26	50.00	35.74	H
		821.50	-27.67	2.22	45.82	0.71	2.15	14.49	50.00	35.51	H
	10	819.00	-28.09	2.19	45.84	1.05	2.15	14.46	50.00	35.54	H

LTE Band 26(824MHz~849MHz) - ERP

Limits: ≤38.45dBm (7W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	Correction (dB)	ERP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	824.70	-25.65	2.26	45.79	0.95	2.15	16.68	38.45	21.77	H
		836.50	-24.88	2.26	45.66	0.82	2.15	17.19	38.45	21.26	H
		848.30	-24.56	2.27	45.55	0.80	2.15	17.37	38.45	21.08	H
	3	825.50	-25.53	2.26	45.79	0.94	2.15	16.79	38.45	21.66	H
		836.50	-24.50	2.26	45.66	0.82	2.15	17.57	38.45	20.88	H
		847.50	-25.02	2.27	45.56	0.81	2.15	16.93	38.45	21.52	H
	5	826.50	-25.36	2.25	45.77	0.93	2.15	16.94	38.45	21.51	H
		836.50	-24.54	2.26	45.66	0.82	2.15	17.53	38.45	20.92	H
		846.50	-25.22	2.26	45.56	0.82	2.15	16.75	38.45	21.70	H
	10	829.00	-25.16	2.25	45.77	0.90	2.15	17.11	38.45	21.34	H
		836.50	-24.39	2.26	45.66	0.82	2.15	17.68	38.45	20.77	H
		844.00	-25.05	2.26	45.59	0.82	2.15	16.95	38.45	21.50	H
	15	831.50	-25.08	2.12	45.71	0.87	2.15	17.23	38.45	21.22	H
		836.50	-24.84	2.26	45.66	0.82	2.15	17.23	38.45	21.22	H
		841.50	-25.13	2.26	45.61	0.82	2.15	16.89	38.45	21.56	H
16QAM	1.4	824.70	-27.44	2.26	45.79	0.95	2.15	14.89	38.45	23.56	H
		836.50	-26.97	2.26	45.66	0.82	2.15	15.10	38.45	23.35	H
		848.30	-27.30	2.27	45.55	0.80	2.15	14.63	38.45	23.82	H
	3	825.50	-27.58	2.26	45.79	0.94	2.15	14.74	38.45	23.71	H
		836.50	-26.92	2.26	45.66	0.82	2.15	15.15	38.45	23.30	H
		847.50	-27.26	2.27	45.56	0.81	2.15	14.69	38.45	23.76	H
	5	826.50	-27.29	2.25	45.77	0.93	2.15	15.01	38.45	23.44	H
		836.50	-26.98	2.26	45.66	0.82	2.15	15.09	38.45	23.36	H
		846.50	-27.24	2.26	45.56	0.82	2.15	14.73	38.45	23.72	H
	10	829.00	-27.30	2.25	45.77	0.90	2.15	14.97	38.45	23.48	H
		836.50	-26.91	2.26	45.66	0.82	2.15	15.16	38.45	23.29	H
		844.00	-27.16	2.26	45.59	0.82	2.15	14.84	38.45	23.61	H
	15	831.50	-27.41	2.12	45.71	0.87	2.15	14.90	38.45	23.55	H
		836.50	-27.14	2.26	45.66	0.82	2.15	14.93	38.45	23.52	H
		841.50	-27.32	2.26	45.61	0.82	2.15	14.70	38.45	23.75	H

LTE band 41- EIRP

Limits: ≤33dBm (2W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	P_{Mea} (dBm)	P_{cl} (dB)	P_{Ag} (dB)	G_a (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	5	2498.50	-24.79	3.58	45.59	6.10	23.32	33.00	9.68	H
		2593.00	-27.59	3.69	44.93	6.27	19.92	33.00	13.08	V
		2687.50	-27.11	3.73	44.98	6.44	20.58	33.00	12.42	H
	10	2501.00	-24.51	3.58	45.65	6.10	23.66	33.00	9.34	H
		2593.00	-27.74	3.69	44.93	6.27	19.77	33.00	13.23	V
		2685.00	-26.13	3.73	44.98	6.43	21.55	33.00	11.45	H
	15	2503.50	-26.28	3.58	45.65	6.11	21.90	33.00	11.10	H
		2593.00	-27.00	3.69	44.93	6.27	20.51	33.00	12.49	V
		2682.50	-27.05	3.73	44.98	6.43	20.63	33.00	12.37	H
	20	2506.00	-24.48	3.59	45.15	6.11	23.19	33.00	9.81	H
		2593.00	-27.19	3.69	44.93	6.27	20.32	33.00	12.68	V
		2680.00	-27.27	3.73	44.97	6.42	20.39	33.00	12.61	H
16QAM	5	2498.50	-25.70	3.58	45.59	6.10	22.41	33.00	10.59	H
		2593.00	-28.46	3.69	44.93	6.27	19.05	33.00	13.95	H
		2687.50	-27.79	3.73	44.98	6.44	19.90	33.00	13.10	H
	10	2501.00	-24.95	3.58	45.65	6.10	23.22	33.00	9.78	H
		2593.00	-28.24	3.69	44.93	6.27	19.27	33.00	13.73	V
		2685.00	-26.99	3.73	44.98	6.43	20.69	33.00	12.31	H
	15	2503.50	-26.59	3.58	45.65	6.11	21.59	33.00	11.41	H
		2593.00	-27.80	3.69	44.93	6.27	19.71	33.00	13.29	V
		2682.50	-28.30	3.73	44.98	6.43	19.38	33.00	13.62	H
	20	2506.00	-25.34	3.59	45.15	6.11	22.33	33.00	10.67	H
		2593.00	-28.02	3.69	44.93	6.27	19.49	33.00	13.51	V
		2680.00	-28.07	3.73	44.97	6.42	19.59	33.00	13.41	H

Frequency: 2680.00MHz

Peak EIRP (dBm) = PMea (-28.58dBm) + Ga (6.42dBi) +PAg (44.97dB) - Pcl (3.58dB) =19.08dBm

LTE Band 66- EIRP

Limits: ≤30dBm (1W)

Mod.	Bandwidth (MHz)	Frequency (MHz)	PMea (dBm)	Pcl (dB)	PAg (dB)	Ga (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Ant.Pol
QPSK	1.4	1710.70	-22.83	3.17	44.10	5.12	23.22	30.00	6.78	H
		1745.00	-22.32	3.68	44.16	5.06	23.22	30.00	6.78	H
		1779.30	-23.93	3.04	44.03	5.01	22.08	30.00	7.92	H
	3	1711.50	-22.50	3.40	44.10	5.12	23.32	30.00	6.68	H
		1745.00	-22.32	3.68	44.16	5.06	23.22	30.00	6.78	H
		1778.50	-23.45	3.04	44.03	5.01	22.56	30.00	7.44	H
	5	1712.50	-22.35	3.66	44.10	5.12	23.21	30.00	6.79	H
		1745.00	-22.19	3.68	44.16	5.06	23.35	30.00	6.65	H
		1777.50	-23.13	3.04	44.04	5.01	22.88	30.00	7.12	H
	10	1715.00	-22.33	3.56	44.10	5.11	23.32	30.00	6.68	H
		1745.00	-22.20	3.68	44.16	5.06	23.34	30.00	6.66	H
		1775.00	-22.68	3.05	44.05	5.01	23.33	30.00	6.67	H
	15	1717.50	-22.24	3.47	44.11	5.11	23.51	30.00	6.49	H
		1745.00	-22.35	3.68	44.16	5.06	23.19	30.00	6.81	H
		1772.50	-22.83	3.05	44.06	5.01	23.19	30.00	6.81	H
	20	1720.00	-22.32	3.37	44.11	5.10	23.52	30.00	6.48	H
		1745.00	-22.32	3.68	44.16	5.06	23.22	30.00	6.78	H
		1770.00	-23.20	3.05	44.07	5.01	22.84	30.00	7.16	H
16QAM	1.4	1710.70	-24.95	3.17	44.10	5.12	21.10	30.00	8.90	H
		1745.00	-23.81	3.68	44.16	5.06	21.73	30.00	8.27	H
		1779.30	-24.71	3.04	44.03	5.01	21.30	30.00	8.70	H
	3	1711.50	-24.88	3.40	44.10	5.12	20.94	30.00	9.06	H
		1745.00	-23.96	3.68	44.16	5.06	21.58	30.00	8.42	H
		1778.50	-24.88	3.04	44.03	5.01	21.13	30.00	8.87	H
	5	1712.50	-24.64	3.66	44.10	5.12	20.92	30.00	9.08	H
		1745.00	-23.94	3.68	44.16	5.06	21.60	30.00	8.40	H
		1777.50	-24.87	3.04	44.04	5.01	21.14	30.00	8.86	H
	10	1715.00	-24.47	3.56	44.10	5.11	21.18	30.00	8.82	H
		1745.00	-23.68	3.68	44.16	5.06	21.86	30.00	8.14	H
		1775.00	-24.77	3.05	44.05	5.01	21.24	30.00	8.76	H
	15	1717.50	-24.78	3.47	44.11	5.11	20.97	30.00	9.03	H
		1745.00	-23.99	3.68	44.16	5.06	21.55	30.00	8.45	H
		1772.50	-25.03	3.05	44.06	5.01	20.99	30.00	9.01	H
	20	1720.00	-24.94	3.37	44.11	5.10	20.90	30.00	9.10	H
		1745.00	-23.73	3.68	44.16	5.06	21.81	30.00	8.19	H
		1770.00	-25.08	3.05	44.07	5.01	20.96	30.00	9.04	H

Peak EIRP (dBm) = PMea (-28.07dBm) + Ga (6.42dBi) +PAg (44.97dB) - Pcl (3.58dB) =19.59dBm

Note: Expanded measurement uncertainty is U = 5.76dB, *k* = 2.

A.2 Emission Limit

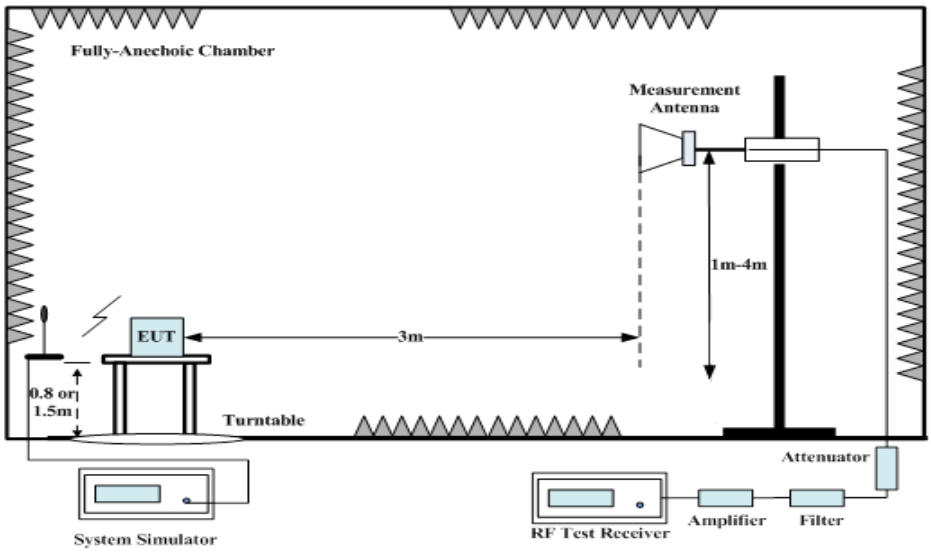
A.2.1 Measurement Method

The measurement procedures in ANSI C63.26 are used.

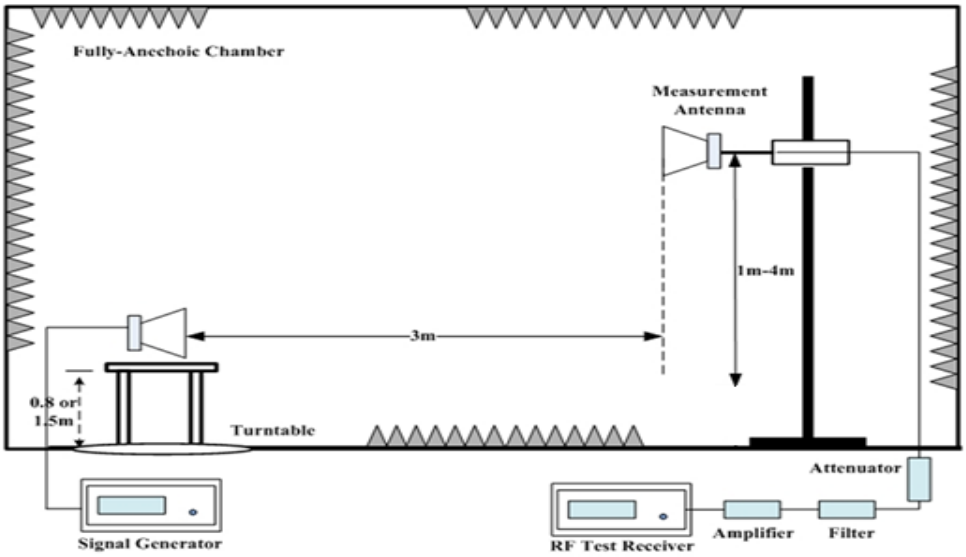
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of each LTE Band.

The procedure of radiated spurious emissions is as follows:

For measurements performed at frequencies less than or equal to 1 GHz, the EUT was placed on a 80cm-high non-conductive support; For measurements performed at frequencies above 1GHz,EUT was placed on a 1.5-meter-high non-conductive support. A measurement antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. In the initial test, the height of the measurement antenna was varied from 1 m to 4 m 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 non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



1. 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).
2. 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. The height of measurement antenna varied between 1 m to 4 m to maximize the received signal amplitude for each emission that was detected and measured in the initial test. 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 reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test was performed with the measurement antenna in both vertical and horizontal polarization.

3. The Path loss (P_{pl}) between the Signal Source and the Substitution Antenna and the Substitution Antenna Gain (G_a) were recorded after test.A amplifier was connected in for the test. The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
4. The measurement results are obtained as described below:

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

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

A.2.2 Measurement Limit

FDD Band 2: Part 24.238 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.

FDD Band 4/66: 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.

FDD Band 5/26(824MHz~849MHz): Part 22.917 specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

FDD Band 7/41: 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 + 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.

FDD Band 12/13: 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.

FDD Band 26(814MHz~824MHz): Part 90.691 states that out-of-band emission requirement shall apply only to the ''outer'' channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows: For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116\text{Log}_{10}(f/6.1)$ decibels or 50 + 10 Log_{10}(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10\text{Log}_{10}$(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

A.2.3 Measurement Results

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of each LTE Band. 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 each LTE Band 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. The range of evaluated frequency is from 9 kHz to 26GHz.

Note 1: Both of Vertical and Horizontal polarizations are evaluated, but only the worst case is recorded in this report.

A.2.4 Measurement Results Table

Frequency	Channel	Frequency Range	Result
LTE Bands	Low	9kHz-26GHz	Pass
	Middle	9kHz-26GHz	Pass
	High	9kHz-26GHz	Pass

A.2.5 Sweep Table

Subrange	RBW	VBW
9~150 kHz	0.2kHz	0.6kHz
150kHz~30MHz	9kHz	27kHz
30MHz~1 GHz	100KHz	300KHz
1~26 GHz	1 MHz	3 MHz

A.2.6 Measurement Result

LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3701.50	-46.02	6.42	8.48	-43.96	-13.00	30.96	V
5506.00	-58.87	7.08	10.60	-55.35	-13.00	42.35	V
7403.00	-51.81	8.13	12.08	-47.86	-13.00	34.86	V
9276.00	-55.24	9.10	13.27	-51.07	-13.00	38.07	V
11077.00	-53.88	9.88	13.18	-50.58	-13.00	37.58	H
13001.00	-55.74	10.47	13.50	-52.71	-13.00	39.71	V

LTE Band 2, 1.4MHz, QPSK, Channel 18900

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3760.00	-50.24	6.26	10.30	-46.20	-13.00	33.20	V
5639.50	-58.35	7.27	11.20	-54.42	-13.00	41.42	H
7520.00	-50.26	8.31	10.30	-48.27	-13.00	35.27	H
9433.00	-53.77	9.20	11.67	-51.30	-13.00	38.30	H
11318.00	-52.90	10.01	12.78	-50.13	-13.00	37.13	V
13181.00	-51.45	10.58	12.62	-49.41	-13.00	36.41	H

LTE Band 2, 1.4MHz, QPSK, Channel 19193

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3818.50	-47.84	6.08	8.65	-45.27	-13.00	32.27	V
5728.00	-57.85	7.30	10.55	-54.60	-13.00	41.60	V
7637.50	-54.54	8.14	12.31	-50.37	-13.00	37.37	H
9528.50	-54.98	9.44	13.37	-51.05	-13.00	38.05	V
11501.00	-53.25	9.81	13.10	-49.96	-13.00	36.96	H
13332.50	-53.70	10.58	13.97	-50.31	-13.00	37.31	V

LTE Band 5, 1.4MHz, QPSK, Channel 20407

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1657.00	-56.92	3.02	6.34	2.15	-55.75	-13.00	42.75	H
2474.50	-47.75	4.33	5.83	2.15	-48.40	-13.00	35.40	V
3296.50	-61.19	3.58	7.70	2.15	-59.22	-13.00	46.22	V
4111.00	-59.76	4.03	9.28	2.15	-56.66	-13.00	43.66	V
4934.00	-58.75	4.89	10.27	2.15	-55.52	-13.00	42.52	H
5759.00	-58.18	5.82	10.90	2.15	-55.25	-13.00	42.25	H

LTE Band 5, 1.4MHz, QPSK, Channel 20525

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1673.00	-56.63	2.78	6.33	2.15	-55.23	-13.00	42.23	H
2510.00	-46.44	4.42	5.80	2.15	-47.21	-13.00	34.21	V
3340.50	-61.34	3.18	7.88	2.15	-58.79	-13.00	45.79	H
4193.00	-58.83	4.13	9.31	2.15	-55.80	-13.00	42.80	V
5021.50	-58.31	5.50	10.54	2.15	-55.42	-13.00	42.42	V
5854.00	-57.57	5.60	10.85	2.15	-54.47	-13.00	41.47	V

LTE Band 5, 1.4MHz, QPSK, Channel 20643

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1696.50	-54.30	2.92	6.30	2.15	-53.07	-13.00	40.07	H
2545.50	-45.63	4.61	5.80	2.15	-46.59	-13.00	33.59	V
3408.00	-60.25	3.47	8.26	2.15	-57.61	-13.00	44.61	H
4240.00	-58.21	4.44	9.39	2.15	-55.41	-13.00	42.41	H
5075.00	-58.60	5.30	10.52	2.15	-55.53	-13.00	42.53	V
5949.00	-57.91	5.47	11.00	2.15	-54.53	-13.00	41.53	H

LTE Band 7, 5 MHz, QPSK, Channel 20775

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5005.00	-60.45	5.15	10.51	-55.09	-25.00	30.09	H
7508.00	-52.38	7.70	12.36	-47.72	-25.00	22.72	V
10002.50	-53.73	9.36	13.40	-49.69	-25.00	24.69	V
12513.00	-49.38	12.37	13.60	-48.15	-25.00	23.15	H
15028.00	-47.27	14.73	14.10	-47.90	-25.00	22.90	V
17531.50	-38.13	19.68	14.43	-43.38	-25.00	18.38	V

LTE Band 7, 5 MHz, QPSK, Channel 21100

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5075.00	-60.73	5.30	10.52	-55.51	-25.00	30.51	H
7605.50	-53.90	7.58	12.30	-49.18	-25.00	24.18	V
10146.50	-54.29	9.72	13.25	-50.76	-25.00	25.76	V
12678.00	-51.46	11.71	13.52	-49.65	-25.00	24.65	H
15213.50	-46.68	15.70	13.99	-48.39	-25.00	23.39	H
17751.00	-38.59	19.56	14.65	-43.50	-25.00	18.50	H

LTE Band 7, 5 MHz, QPSK, Channel 21425

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5135.00	-58.13	5.55	10.58	-53.10	-25.00	28.10	V
7703.00	-55.72	6.72	12.40	-50.04	-25.00	25.04	V
10284.50	-52.09	10.64	13.30	-49.43	-25.00	24.43	H
12844.50	-48.46	12.99	13.50	-47.95	-25.00	22.95	V
15418.50	-46.84	14.92	13.76	-48.00	-25.00	23.00	V
17958.50	-37.67	20.03	14.80	-42.90	-25.00	17.90	H

LTE Band 12, 1.4MHz, QPSK, Channel 23017

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1341.50	-46.40	3.16	4.68	2.15	-47.03	-13.00	34.03	V
2013.50	-40.46	4.09	4.64	2.15	-42.06	-13.00	29.06	V
2673.00	-36.64	4.76	6.41	2.15	-37.14	-13.00	24.14	V
3363.00	-58.73	5.33	7.87	2.15	-58.34	-13.00	45.34	H
4029.00	-55.90	6.05	8.93	2.15	-55.17	-13.00	42.17	V
4702.00	-56.62	6.51	9.60	2.15	-55.68	-13.00	42.68	H

LTE Band 12, 1.4MHz, QPSK, Channel 23095

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1409.00	-46.54	3.25	5.03	2.15	-46.91	-13.00	33.91	H
2124.00	-40.39	4.21	4.97	2.15	-41.78	-13.00	28.78	H
2831.50	-35.64	4.95	6.70	2.15	-36.04	-13.00	23.04	V
3540.50	-57.27	5.72	8.26	2.15	-56.88	-13.00	43.88	V
4256.50	-56.62	6.23	9.16	2.15	-55.84	-13.00	42.84	V
4938.50	-56.46	6.71	9.84	2.15	-55.48	-13.00	42.48	V

LTE Band 12, 1.4MHz, QPSK, Channel 23173

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1435.50	-46.99	3.28	5.16	2.15	-47.26	-13.00	34.26	V
2158.00	-40.04	4.26	5.07	2.15	-41.38	-13.00	28.38	V
2860.50	-36.34	4.96	6.75	2.15	-36.70	-13.00	23.70	H
3578.00	-57.27	6.11	8.31	2.15	-57.22	-13.00	44.22	V
4281.50	-55.55	6.21	9.18	2.15	-54.73	-13.00	41.73	H
5003.00	-55.63	6.60	9.90	2.15	-54.48	-13.00	41.48	H

LTE Band 13, 5MHz, QPSK, Channel 23205

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1559.00	-55.32	3.47	5.39	0.00	-55.55	-40.00	15.55	V
2358.61	-53.93	4.47	5.68	2.15	-54.87	-13.00	41.87	H
3102.50	-63.10	5.33	7.25	2.15	-63.33	-13.00	50.33	V
3917.50	-63.22	6.12	8.78	2.15	-62.71	-13.00	49.71	V
4715.00	-62.68	6.52	9.62	2.15	-61.73	-13.00	48.73	H
5500.00	-62.11	7.06	10.60	2.15	-60.72	-13.00	47.72	V

LTE Band 13, 5MHz, QPSK, Channel 23230

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1559.00	-63.29	3.47	5.39	0.00	-63.52	-40.00	23.52	H
2346.70	-54.42	4.45	5.64	2.15	-55.38	-13.00	42.38	H
3127.50	-64.10	5.40	7.31	2.15	-64.34	-13.00	51.34	H
3907.50	-64.05	6.11	8.77	2.15	-63.54	-13.00	50.54	V
4695.00	-62.80	6.50	9.60	2.15	-61.85	-13.00	48.85	V
5475.00	-62.13	6.97	10.57	2.15	-60.68	-13.00	47.68	H

LTE Band 13, 5MHz, QPSK, Channel 23255

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1557.60	-61.98	3.47	5.40	0.00	-60.05	-40.00	20.05	H
2353.65	-53.72	4.46	5.66	2.15	-54.67	-13.00	41.67	V
3127.50	-64.26	5.40	7.31	2.15	-64.50	-13.00	51.50	H
3927.50	-64.04	6.12	8.80	2.15	-63.51	-13.00	50.51	V
4697.50	-62.39	6.50	9.60	2.15	-61.44	-13.00	48.44	V
5480.00	-62.06	6.98	10.57	2.15	-60.62	-13.00	47.62	H

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26797

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1630.50	-56.82	3.55	5.27	2.15	-57.25	-13.00	44.25	V
2474.50	-42.43	4.60	6.02	2.15	-43.16	-13.00	30.16	V
3284.50	-59.21	5.28	7.68	2.15	-58.96	-13.00	45.96	H
4127.50	-57.76	6.04	9.03	2.15	-56.92	-13.00	43.92	V
4930.00	-57.07	6.72	9.83	2.15	-56.11	-13.00	43.11	H
5778.00	-55.55	7.22	10.54	2.15	-54.38	-13.00	41.38	V

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 26915

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1673.00	-55.64	3.58	5.19	2.15	-56.18	-13.00	43.18	V
2509.50	-46.29	4.63	6.12	2.15	-46.95	-13.00	33.95	V
3337.00	-58.74	5.31	7.81	2.15	-58.39	-13.00	45.39	H
4183.00	-57.24	6.17	9.08	2.15	-56.48	-13.00	43.48	V
5027.50	-57.07	6.57	9.94	2.15	-55.85	-13.00	42.85	H
5875.00	-55.62	7.31	10.53	2.15	-54.55	-13.00	41.55	V

LTE Band 26(824MHz~849MHz), 1.4MHz, QPSK, Channel 27033

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1716.00	-55.32	3.61	5.11	2.15	-55.97	-13.00	42.97	H
2545.00	-46.13	4.66	6.18	2.15	-46.76	-13.00	33.76	H
3393.00	-59.35	5.36	7.94	2.15	-58.92	-13.00	45.92	V
4246.50	-57.43	6.24	9.15	2.15	-56.67	-13.00	43.67	V
5095.50	-57.21	6.76	10.03	2.15	-56.09	-13.00	43.09	V
5941.50	-55.72	7.47	10.51	2.15	-54.83	-13.00	41.83	H

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26697

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1633.00	-56.52	3.55	5.26	2.15	-56.96	-13.00	43.96	V
2444.50	-37.10	4.57	5.93	2.15	-37.89	-13.00	24.89	V
3258.50	-58.42	5.28	7.62	2.15	-58.23	-13.00	45.23	V
4058.50	-56.78	6.04	8.96	2.15	-56.01	-13.00	43.01	H
4907.00	-56.96	6.73	9.81	2.15	-56.03	-13.00	43.03	V
5696.50	-56.44	7.29	10.56	2.15	-55.32	-13.00	42.32	H

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26740

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1642.50	-56.08	3.56	5.24	2.15	-56.55	-13.00	43.55	V
2457.50	-45.46	4.58	5.97	2.15	-46.22	-13.00	33.22	H
3276.00	-59.19	5.28	7.66	2.15	-58.96	-13.00	45.96	V
4102.00	-57.97	6.04	9.00	2.15	-57.16	-13.00	44.16	H
4915.00	-56.71	6.73	9.82	2.15	-55.77	-13.00	42.77	V
5715.50	-56.56	7.30	10.56	2.15	-55.45	-13.00	42.45	H

LTE Band 26(814MHz~824MHz), 1.4MHz, QPSK, Channel 26783

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Correction	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polorization
1838.50	-52.68	3.80	4.89	2.15	-53.74	-13.00	40.74	V
2470.50	-46.71	4.59	6.01	2.15	-47.44	-13.00	34.44	H
3112.50	-57.74	5.36	7.27	2.15	-57.98	-13.00	44.98	H
4192.50	-56.64	6.19	9.09	2.15	-55.89	-13.00	42.89	H
4959.50	-56.54	6.67	9.86	2.15	-55.50	-13.00	42.50	V
5954.50	-53.93	7.47	10.51	2.15	-53.04	-13.00	40.04	H

LTE Band 41, 5MHz, QPSK, Channel 39657

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
4997.50	-60.10	5.17	10.40	-54.87	-25.00	29.87	H
7496.50	-50.75	7.70	12.30	-46.15	-25.00	21.15	V
10003.50	-53.77	9.36	13.39	-49.74	-25.00	24.74	V
12505.50	-49.09	12.36	13.60	-47.85	-25.00	22.85	V
14980.00	-47.21	14.78	14.10	-47.89	-25.00	22.89	H
17489.50	-38.04	19.74	14.39	-43.39	-25.00	18.39	H

LTE Band 41, 5MHz, QPSK, Channel 40620

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5200.50	-60.62	5.70	10.45	-55.87	-25.00	30.87	H
7779.50	-56.02	7.37	12.40	-50.99	-25.00	25.99	V
10377.00	-49.64	10.71	13.30	-47.05	-25.00	22.05	V
12955.50	-50.15	12.50	13.67	-48.98	-25.00	23.98	H
15571.50	-46.11	16.63	13.60	-49.14	-25.00	24.14	V
17993.00	-37.80	19.95	14.80	-42.95	-25.00	17.95	V

LTE Band 41, 5MHz, QPSK, Channel 41565

Frequency (MHz)	SG (dBm)	CableLoss (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
5375.00	-50.67	5.75	10.65	-45.77	-25.00	20.77	H
8051.00	-55.41	7.81	12.75	-50.47	-25.00	25.47	V
10750.50	-52.72	9.83	13.25	-49.30	-25.00	24.30	V
13438.50	-49.37	12.56	14.54	-47.39	-25.00	22.39	H
16118.00	-42.93	17.07	13.44	-46.56	-25.00	21.56	V
17979.50	-38.00	19.98	14.80	-43.18	-25.00	18.18	V

LTE Band 66, 1.4MHz QPSK, Channel 131979

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3421.50	-67.07	5.38	8.01	-64.44	-13.00	51.44	V
5132.50	-66.37	6.85	10.09	-63.13	-13.00	50.13	V
6844.50	-67.01	7.83	11.41	-63.43	-13.00	50.43	H
8583.00	-66.07	8.52	13.02	-61.57	-13.00	48.57	V
10316.50	-64.12	9.67	13.03	-60.76	-13.00	47.76	H
11922.50	-62.10	10.41	13.02	-59.49	-13.00	46.49	V

LTE Band 66, 1.4MHz, QPSK, Channel 132322

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3490.00	-68.59	5.50	8.18	-65.91	-13.00	52.91	H
5235.00	-68.29	7.00	10.23	-65.06	-13.00	52.06	V
7000.50	-65.31	8.30	11.60	-62.01	-13.00	49.01	V
8739.50	-65.85	8.48	13.05	-61.28	-13.00	48.28	V
10439.00	-63.96	9.74	13.08	-60.62	-13.00	47.62	H
12263.00	-64.28	10.02	13.11	-61.19	-13.00	48.19	V

LTE Band 66, 1.4MHz, QPSK, Channel 132665

Frequency (MHz)	P_{Mea} (dBm)	P_{pl} (dB)	AntennaGain (dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polorization
3607.00	-69.59	6.41	8.35	-67.65	-13.00	54.65	V
5367.50	-69.48	6.90	10.41	-65.97	-13.00	52.97	H
7067.00	-65.85	8.20	11.68	-62.37	-13.00	49.37	V
8918.50	-65.84	8.91	13.08	-61.67	-13.00	48.67	H
10712.50	-65.74	9.34	13.14	-61.94	-13.00	48.94	V
12465.50	-64.27	10.27	13.19	-61.35	-13.00	48.35	H

Note: Peak EIRP (dBm) = PMea(dBm) - Path Loss(dB) + Antenna Gain(dBi)

Note: Expanded measurement uncertainty is U = 5.76dB, *k* = 2.

A.3 Frequency Stability

A.3.1 Method of Measurement

Frequency stability is a measure of the frequency drift due to temperature and supply voltage variations, with reference to the frequency measured at +20 °C and rated supply voltage. Two reference points are established at the applicable unwanted emissions limit using a RBW equal to the RBW required by the unwanted emissions specification of the applicable regulatory standard. These reference points measured using the lowest and highest channel of operation shall be identified as F_L and F_H respectively.

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 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 middle channel for each LTE band, 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. Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring 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 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 ℃ decrements from +50℃ to -30℃. Allow at least 1.5 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.

A.3.2 Measurement results

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1850.833	1909.199	0.87	0.0005
50				0.99	0.0005
40				1.69	0.0009
30				-0.97	0.0005
10				-0.27	0.0001
0				0.77	0.0004
-10				-1.17	0.0006
-20				1.07	0.0006
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1850.833	1909.199	1.73	0.0009
4.1				1.89	0.0010

LTE Band 5, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	824.417	848.583	6.64	0.0079
50				5.84	0.0070
40				5.62	0.0067
30				5.75	0.0069
10				0.16	0.0002
0				-0.49	0.0006
-10				-0.27	0.0003
-20				4.76	0.0057
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.417	848.583	5.08	0.0061
4.1				5.42	0.0065

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2500.673	2569.391		
50				-0.72	0.0003
40				1.36	0.0005
30				-1.73	0.0007
10				-0.26	0.0001
0				-1.99	0.0008
-10				0.16	0.0001
-20				-0.76	0.0003
-30				1.03	0.0004

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2500.673	2569.391	-0.51	0.0002
4.1				-4.22	0.0017

LTE Band 12, 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	699.481	715.519		
50				6.69	0.0095
40				7.75	0.0110
30				6.62	0.0094
10				7.31	0.0103
0				5.36	0.0076
-10				5.49	0.0078
-20				6.08	0.0086
-30				5.97	0.0084

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	699.481	715.519	1.17	0.0017
4.1				5.12	0.0072

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

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	777.465	786.519		
50				-0.77	0.0010
40				-1.10	0.0014
30				-2.25	0.0029
10				-0.50	0.0006
0				-5.71	0.0073
-10				-0.39	0.0005
-20				-1.19	0.0015
-30				-0.94	0.0012

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	777.465	786.519	-0.16	0.0002
4.1				0.39	0.0005

LTE Band 26(814MHz~824MHz), 10MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	814.389	823.611		
50				-0.46	0.0006
40				5.52	0.0067
30				-0.64	0.0008
10				-0.89	0.0011
0				-0.76	0.0009
-10				-0.66	0.0008
-20				4.82	0.0059
-30				-0.57	0.0007

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	814.389	823.611	5.48	0.0067
4.1				5.49	0.0067

LTE Band 26(824MHz~849MHz), 15MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	824.577	848.471	5.22	0.0062
50				6.68	0.0080
40				6.22	0.0074
30				5.91	0.0071
10				5.82	0.0070
0				5.64	0.0067
-10				5.62	0.0067
-20				-2.46	0.0029
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.577	848.471	5.82	0.0070
4.1				5.71	0.0068

LTE Band 41, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	2496.513	2689.455	0.74	0.0003
50				2.92	0.0011
40				4.65	0.0018
30				5.97	0.0023
10				3.33	0.0013
0				1.62	0.0006
-10				-0.84	0.0003
-20				6.24	0.0024
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2496.513	2689.455	5.02	0.0019
4.1				3.16	0.0012

LTE Band 66, 20MHz bandwidth QPSK (worst case of all bandwidths)

Frequency Error vs Temperature

Temperature(℃)	Voltage(V)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
20	3.85	1710.833	1779.199	0.27	0.0002
50				0.77	0.0004
40				0.06	0.0000
30				1.02	0.0006
10				-0.30	0.0002
0				0.46	0.0003
-10				-0.21	0.0001
-20				0.11	0.0001
-30					

Frequency Error vs Voltage

Voltage(V)	Temperature(℃)	F_L(MHz)	F_H(MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1710.833	1779.199	-0.41	0.0002
4.1				-0.27	0.0002

Note: Expanded measurement uncertainty is U = 0.01 PPM, *k* = 2.

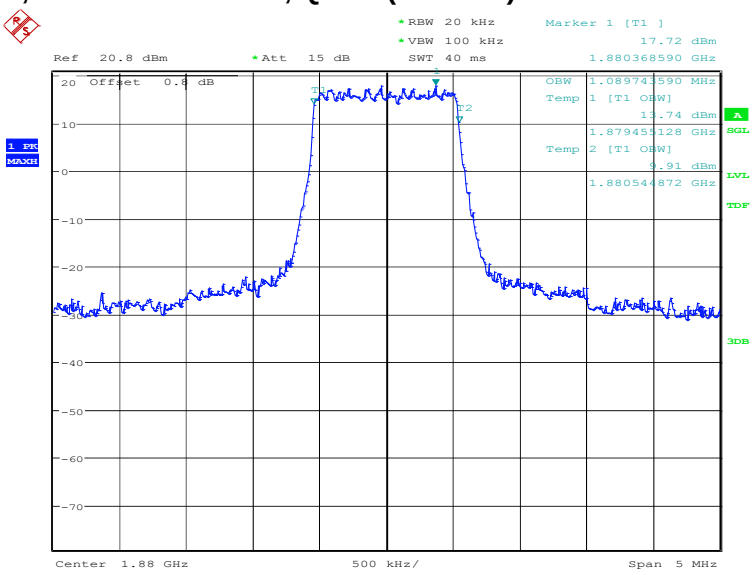
A.4 Occupied Bandwidth

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the mid frequencies frequency. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.
The measurement method is from ANSI C63.26:
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.
b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.
c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
d) Set the detection mode to peak, and the trace mode to max-hold.

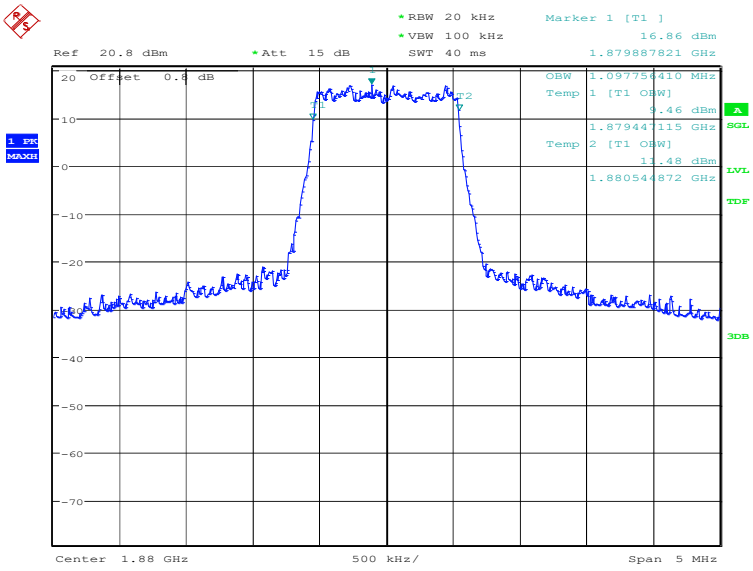
LTE band 2, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	1089.74	1097.76

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



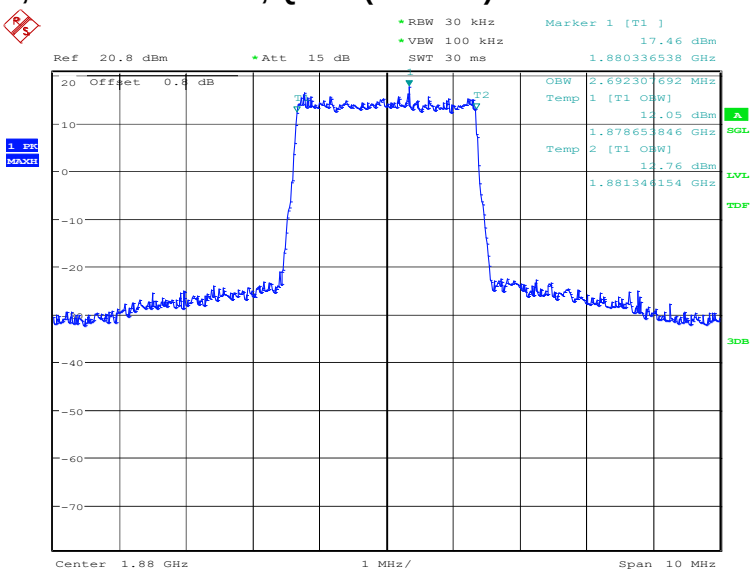
LTE band 2, 1.4MHz Bandwidth, 16QAM (99% BW)



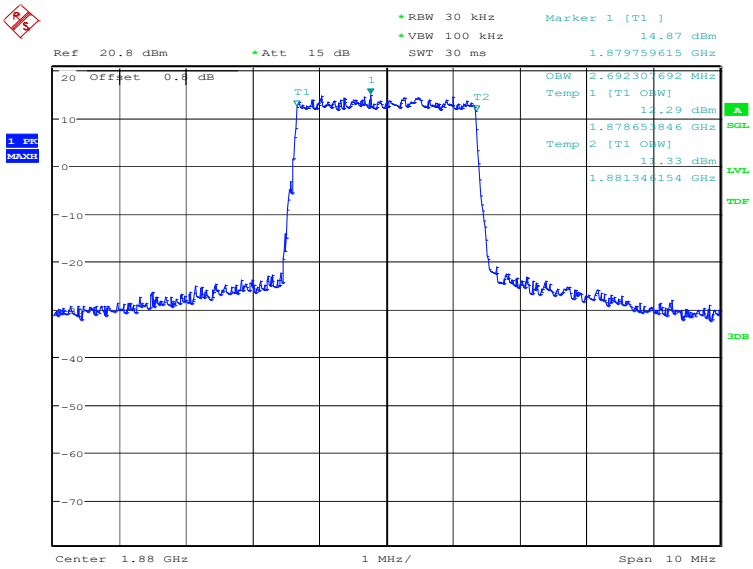
LTE band 2, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	2692.31	2692.31

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



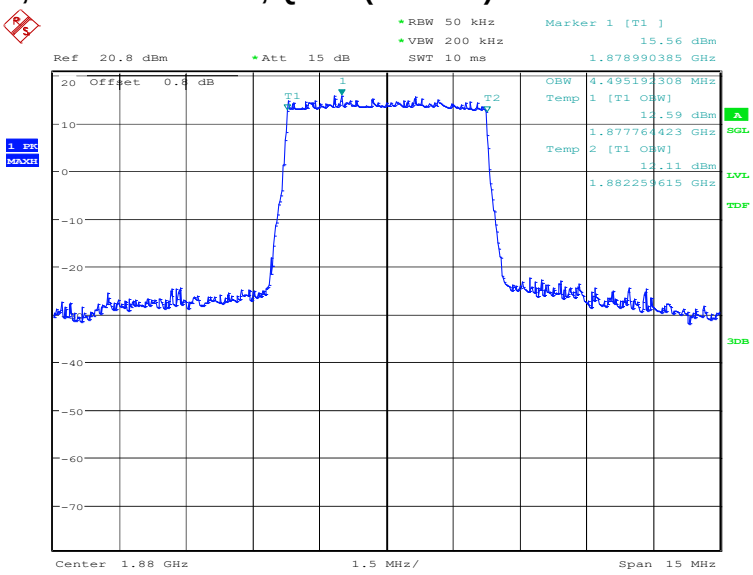
LTE band 2, 3MHz Bandwidth, 16QAM (99% BW)



LTE band 2, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	4495.19	4471.15

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



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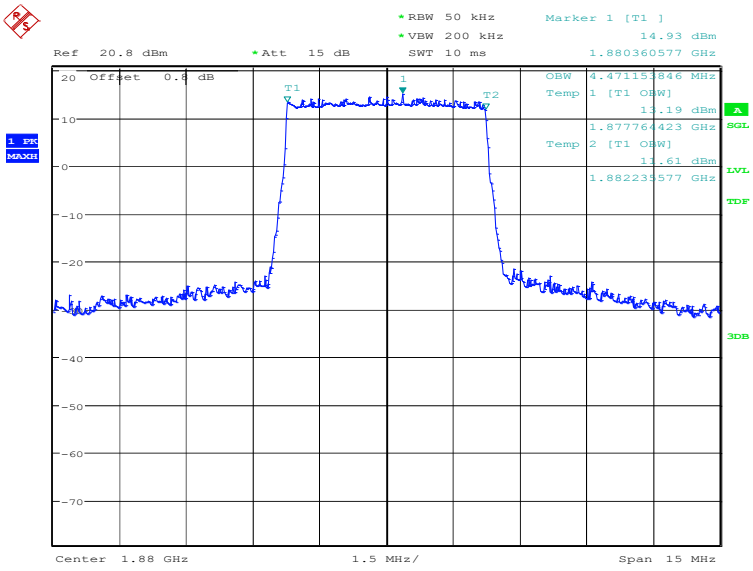
LTE band 2, 5MHz Bandwidth, 16QAM (99% BW)



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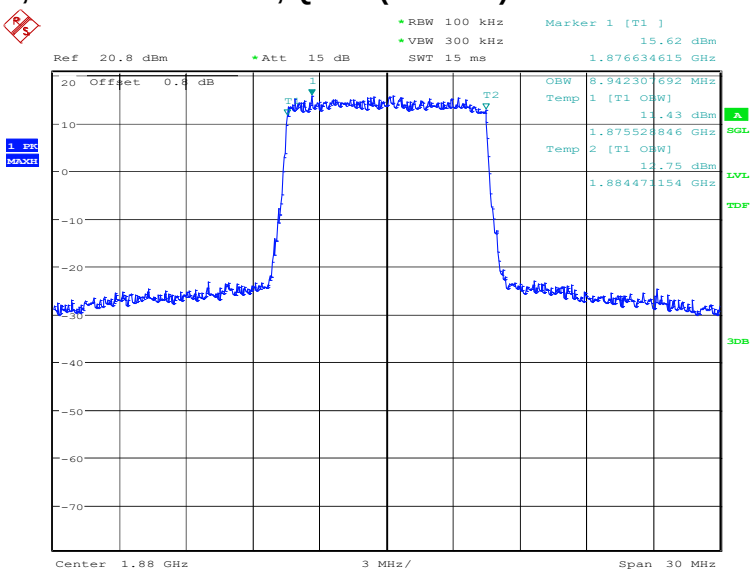
LTE band 2, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	8942.31	8942.31

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



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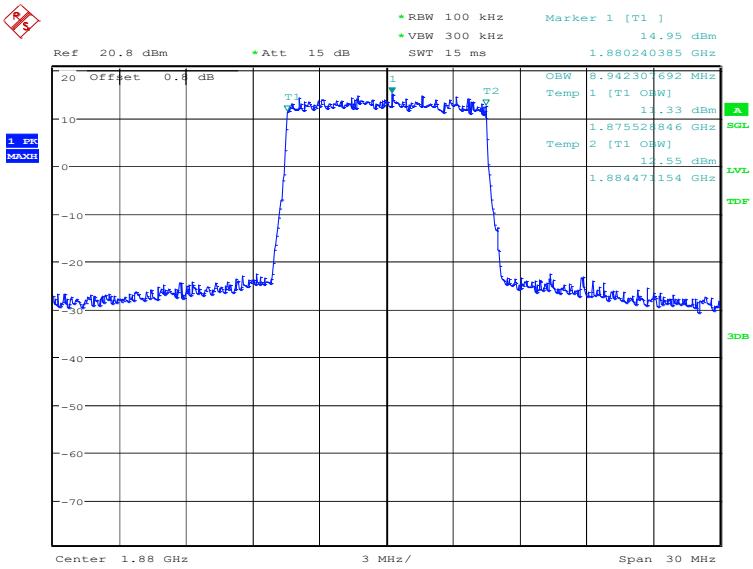
LTE band 2, 10MHz Bandwidth, 16QAM (99% BW)



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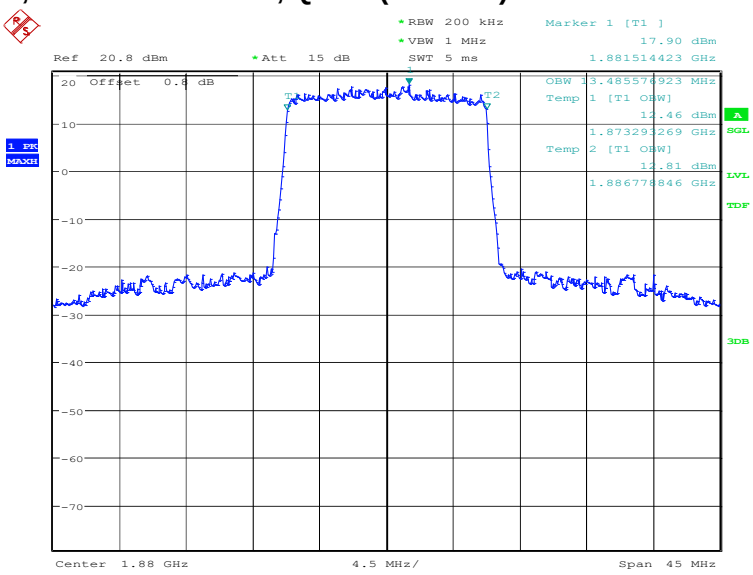
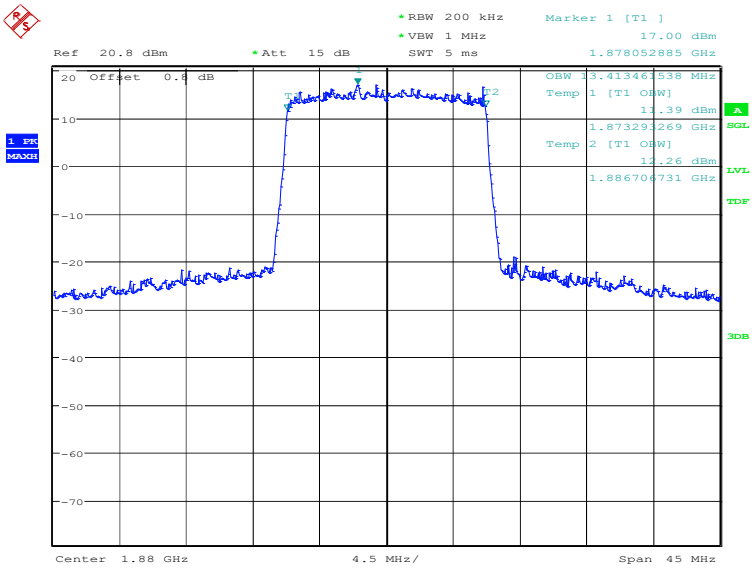
LTE band 2, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	13485.58	13413.46

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



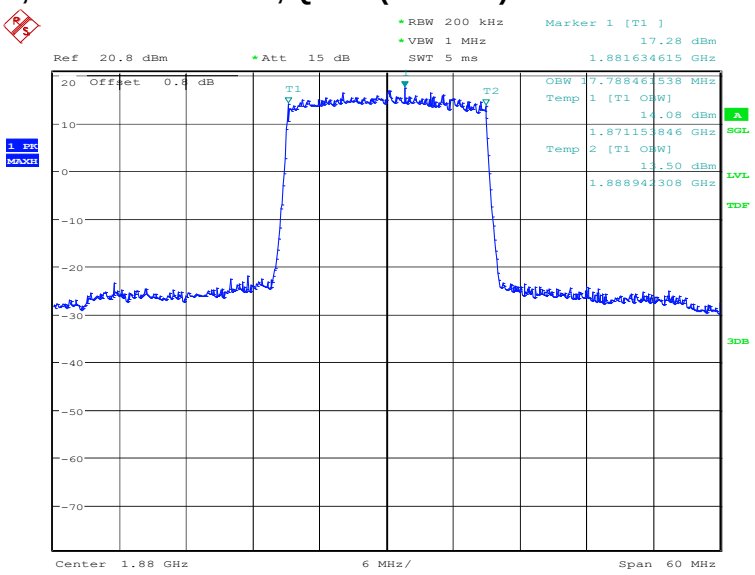
LTE band 2, 15MHz Bandwidth, 16QAM (99% BW)



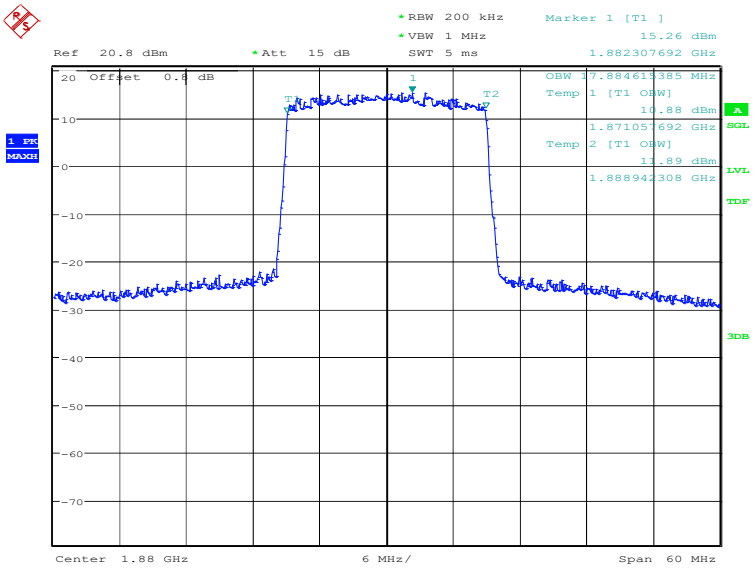
LTE band 2, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	17788.46	17884.62

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



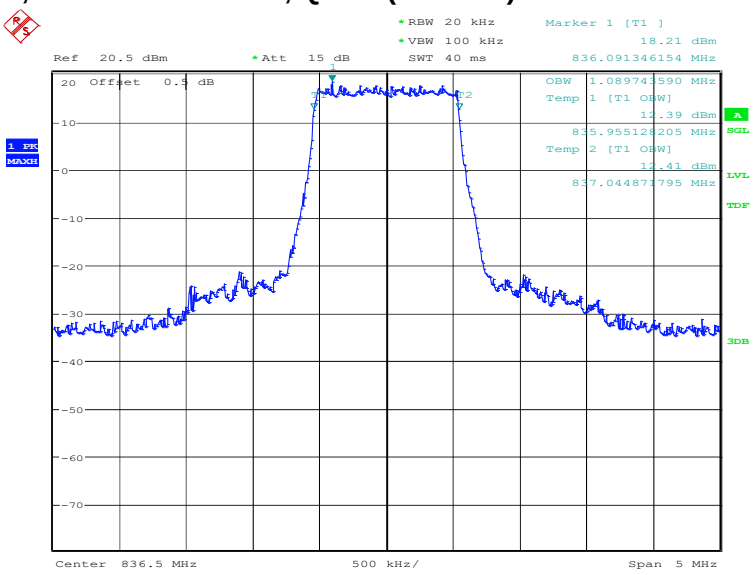
LTE band 2, 20MHz Bandwidth, 16QAM (99% BW)



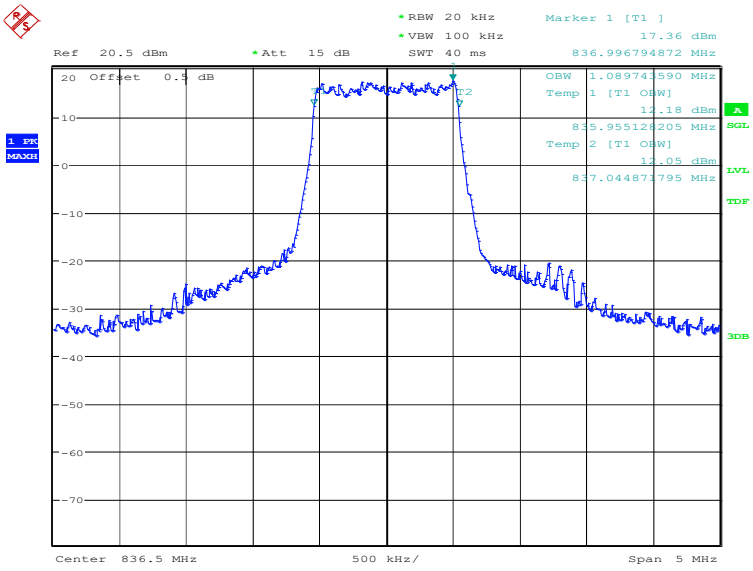
LTE band 5, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1089.74	1089.74

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



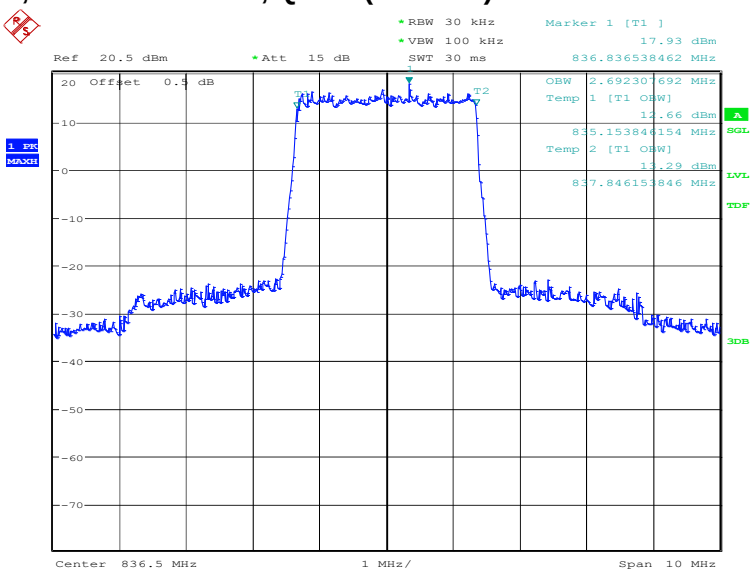
LTE band 5, 1.4MHz Bandwidth, 16QAM (99% BW)



LTE band 5, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

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



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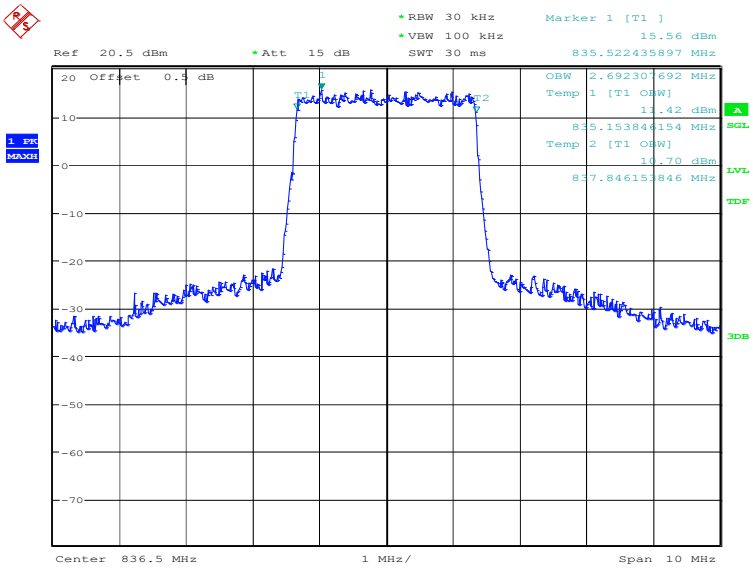
LTE band 5, 3MHz Bandwidth, 16QAM (99% BW)

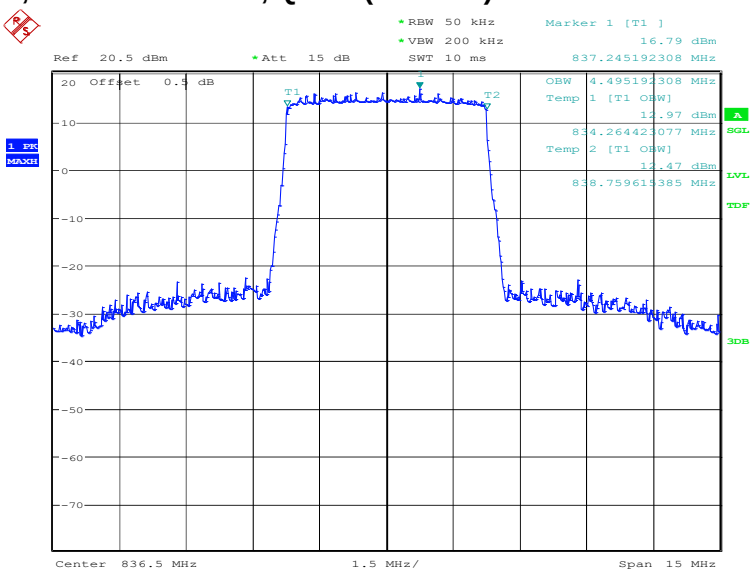


Date: 20.NOV.2023 13:06:07

LTE band 5, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4471.15

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



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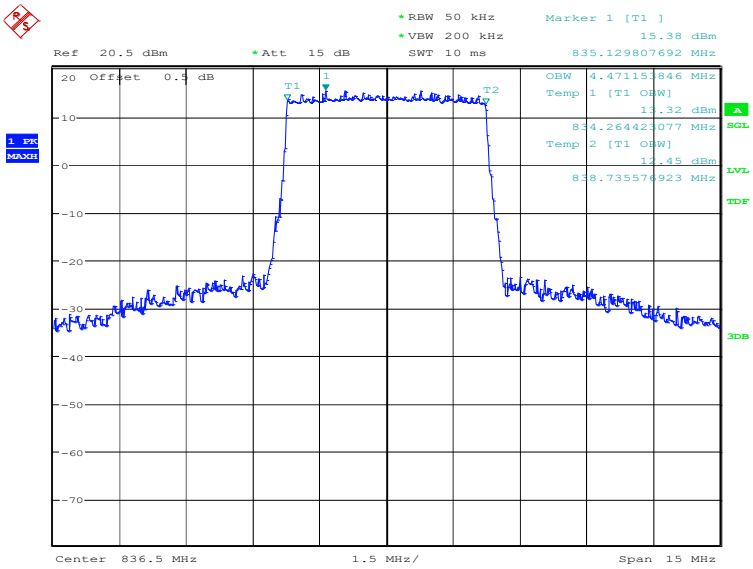
LTE band 5, 5MHz Bandwidth, 16QAM (99% BW)



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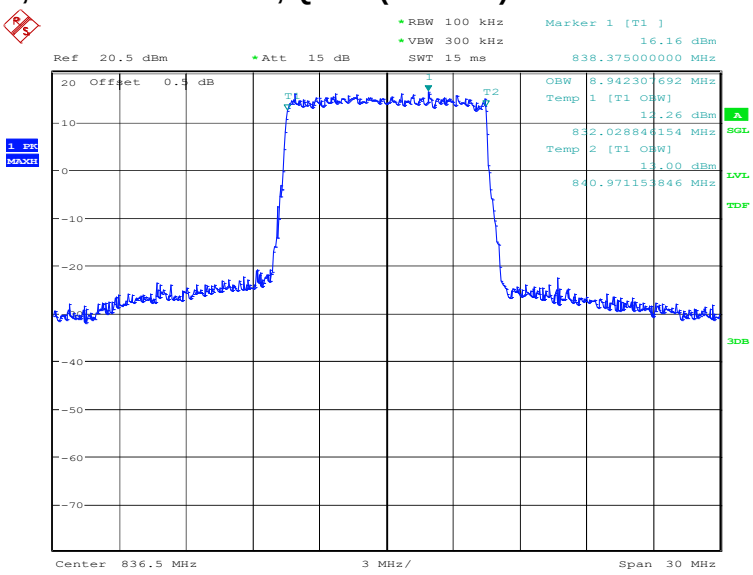
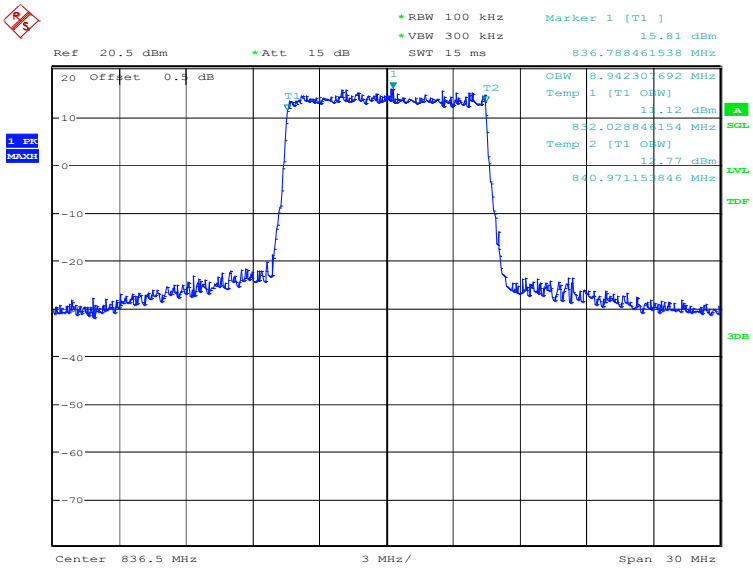
LTE band 5, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8942.31

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



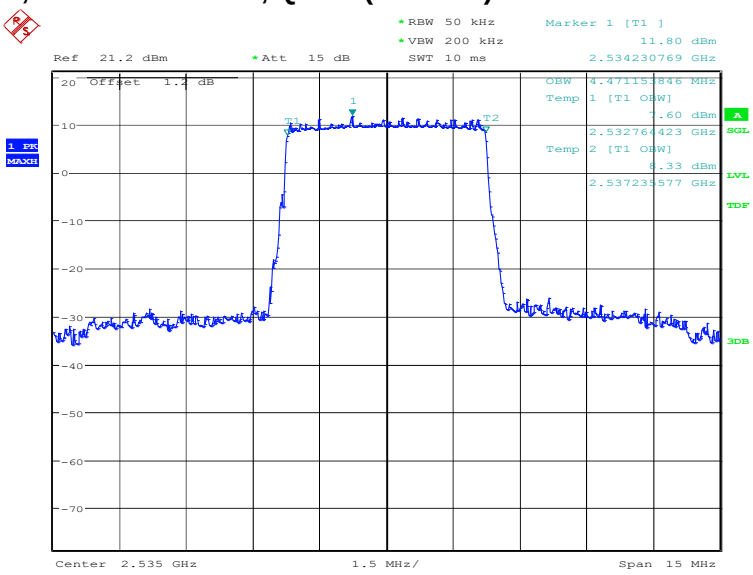
LTE band 5, 10MHz Bandwidth, 16QAM (99% BW)



LTE band 7, 5MHz (99%)

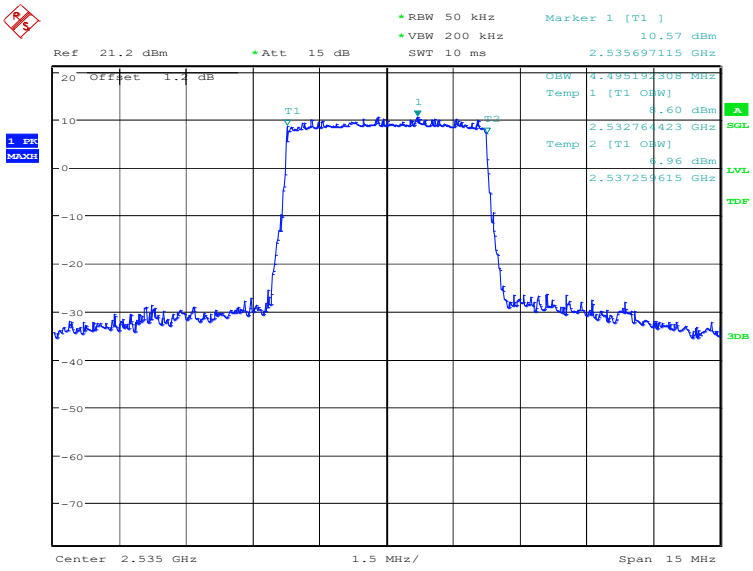
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	4471.15	4495.19

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



Date: 20.NOV.2023 13:09:34

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

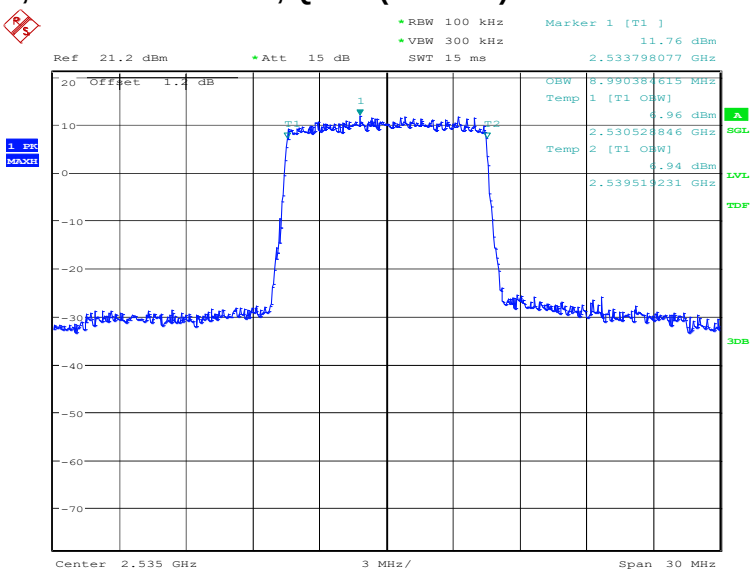


Date: 20.NOV.2023 13:10:14

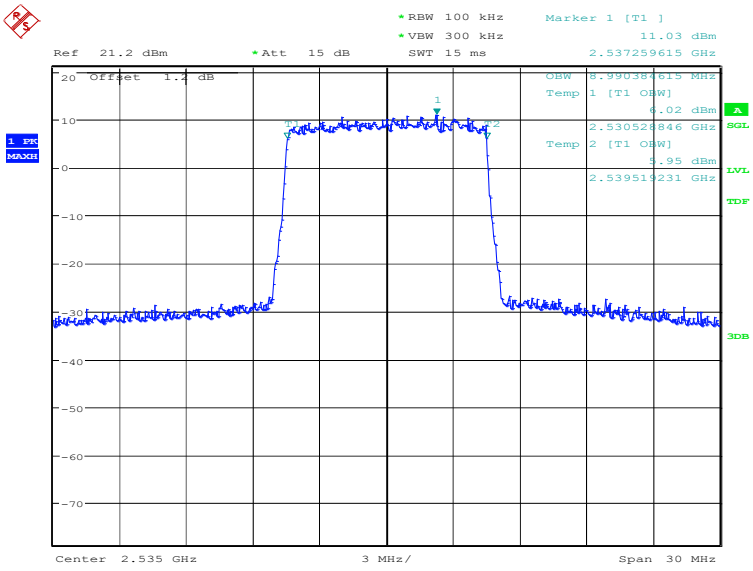
LTE band 7, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	8990.38	8990.38

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



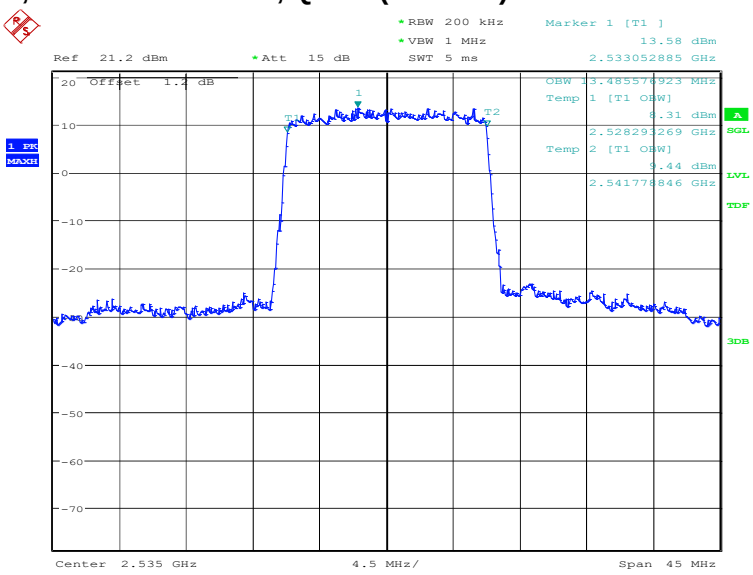
LTE band 7, 10MHz Bandwidth, 16QAM (99% BW)



LTE band 7, 15MHz (99%)

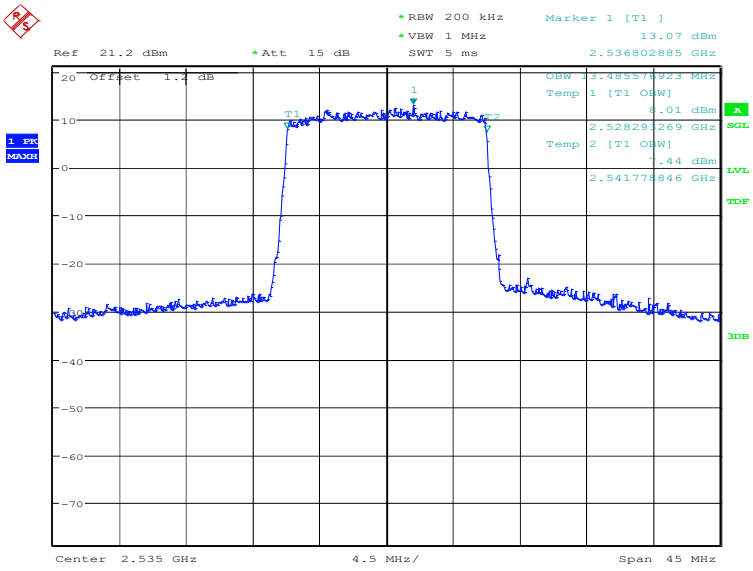
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 20.NOV.2023 13:12:18

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

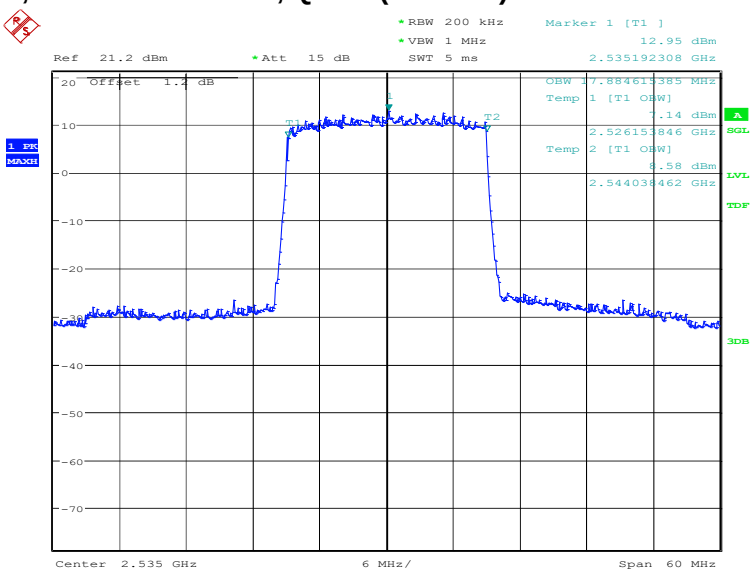


Date: 20.NOV.2023 13:12:58

LTE band 7, 20MHz (99%)

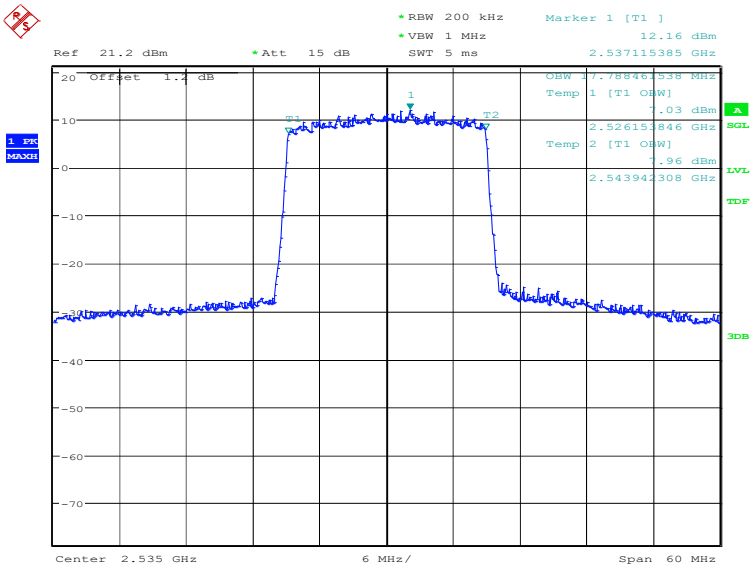
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	17884.62	17788.46

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



Date: 20.NOV.2023 13:13:39

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

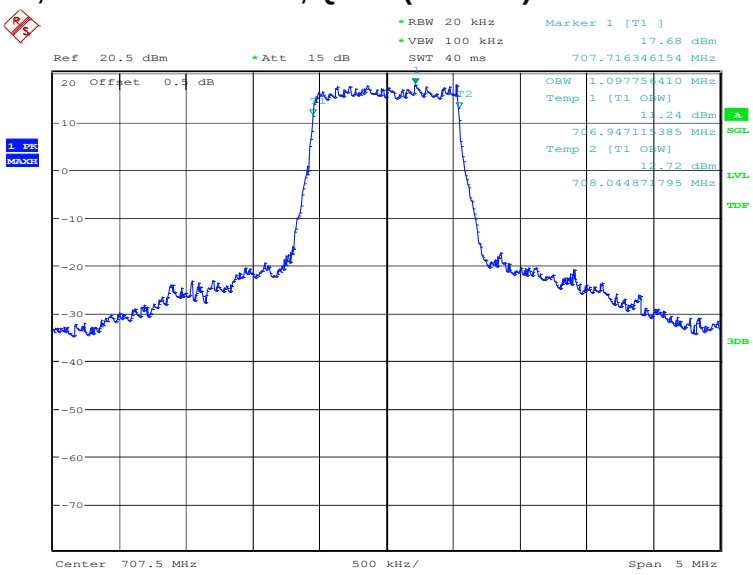


Date: 20.NOV.2023 13:14:20

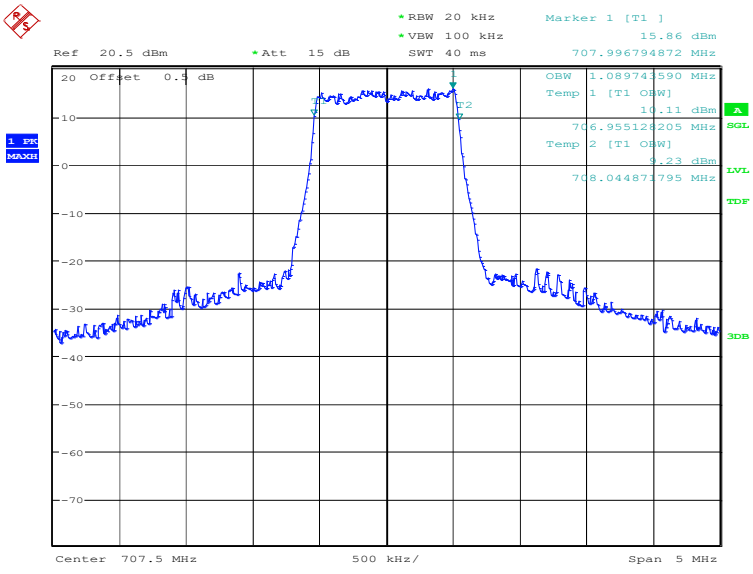
LTE band 12, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	1097.76	1089.74

LTE band 12, 1.4MHz Bandwidth, QPSK (99% BW)



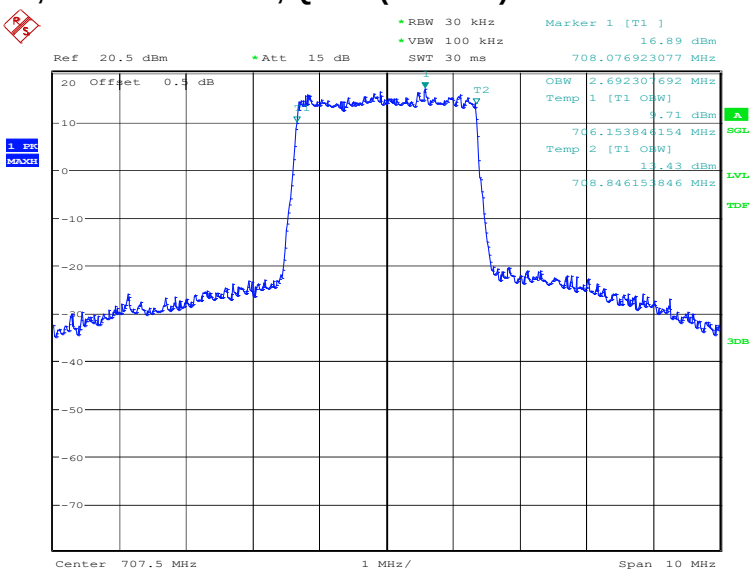
LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)



LTE band 12, 3MHz (99%)

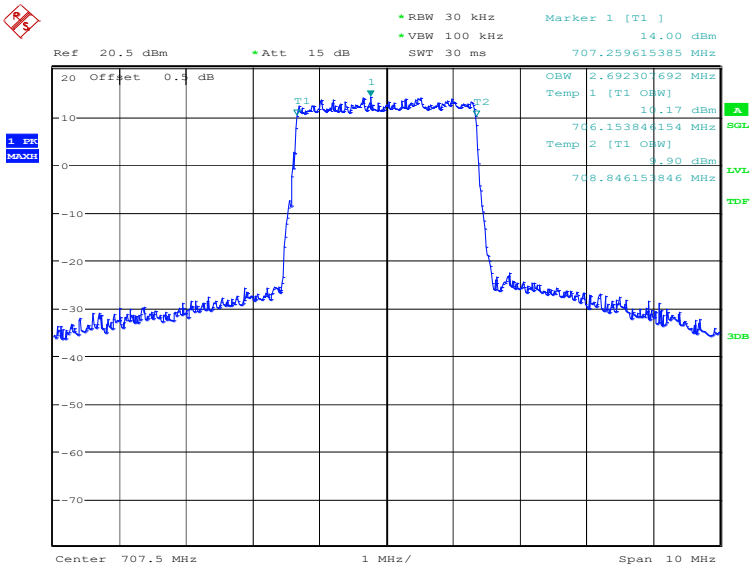
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

LTE band 12, 3MHz Bandwidth, QPSK (99% BW)



Date: 5.NOV.2023 10:49:14

LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)

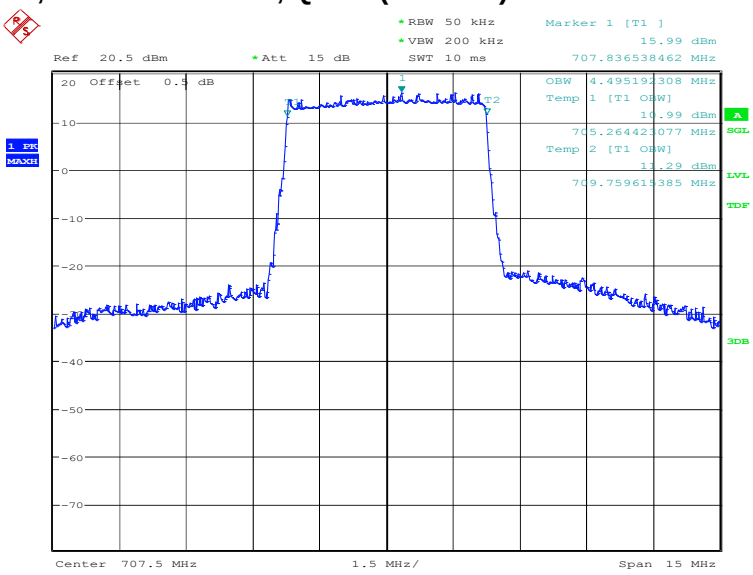


Date: 5.NOV.2023 10:49:55

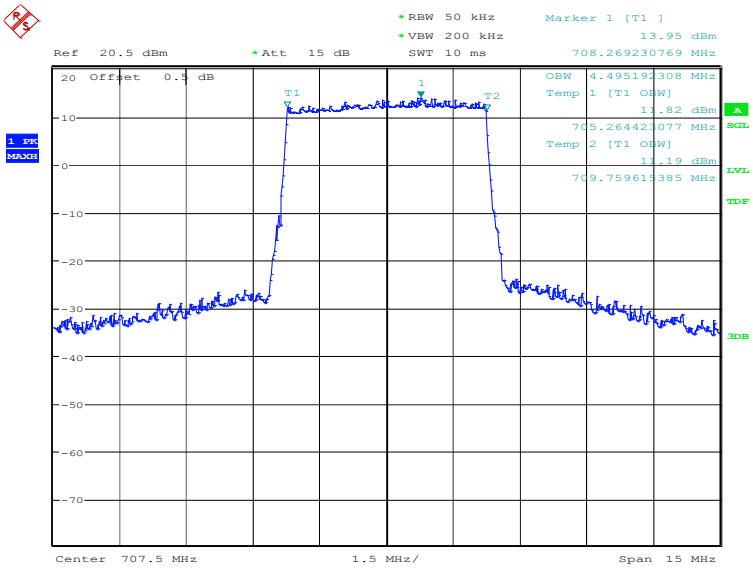
LTE band 12, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	4495.19	4495.19

LTE band 12, 5MHz Bandwidth, QPSK (99% BW)



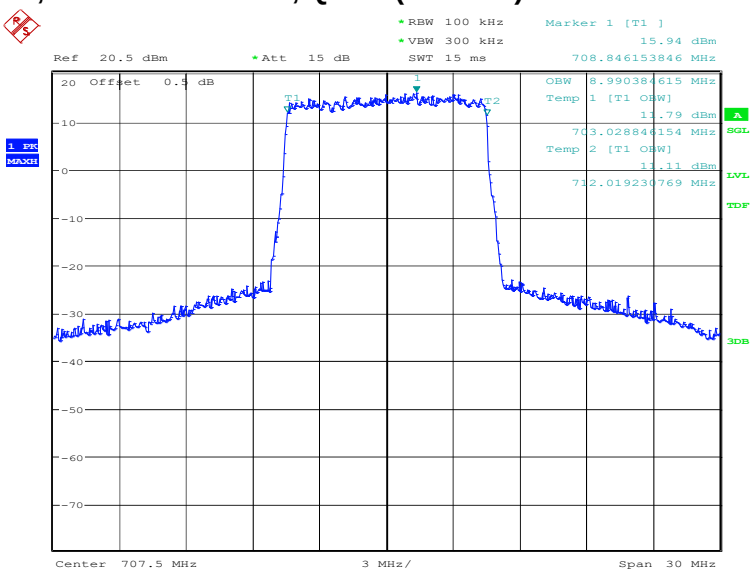
LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)



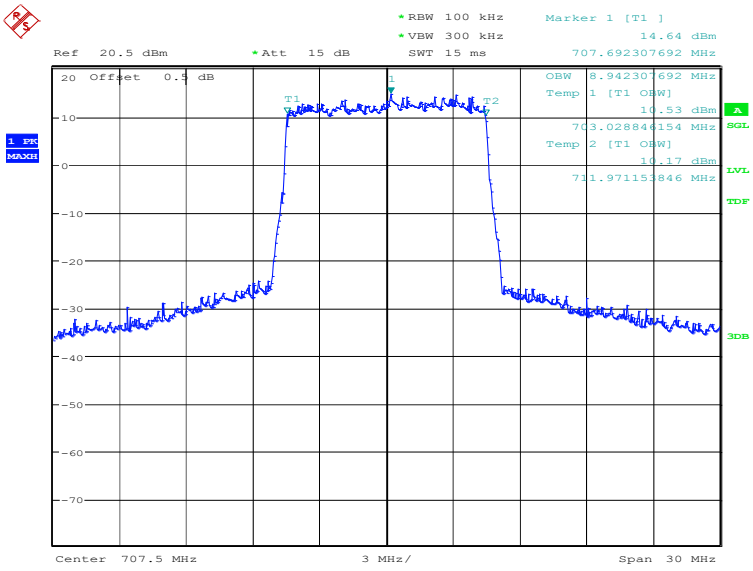
LTE band 12, 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8990.38	8942.31

LTE band 12, 10MHz Bandwidth, QPSK (99% BW)



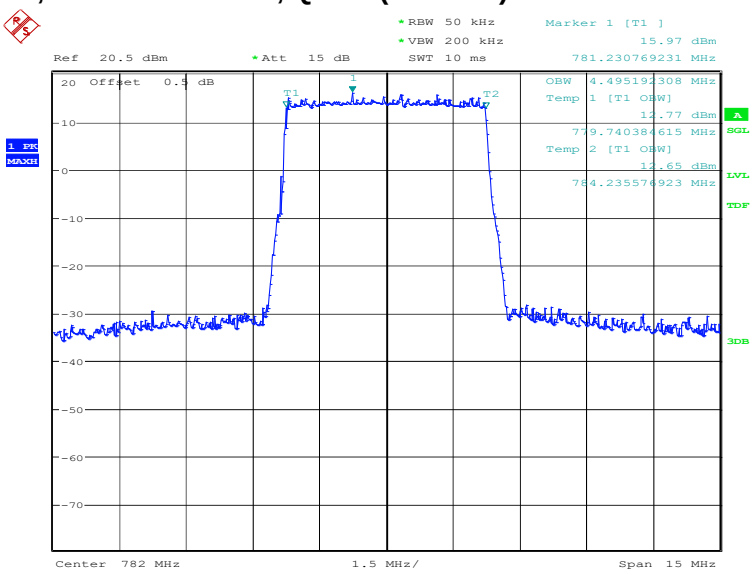
LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)



LTE band 13, 5MHz (99%)

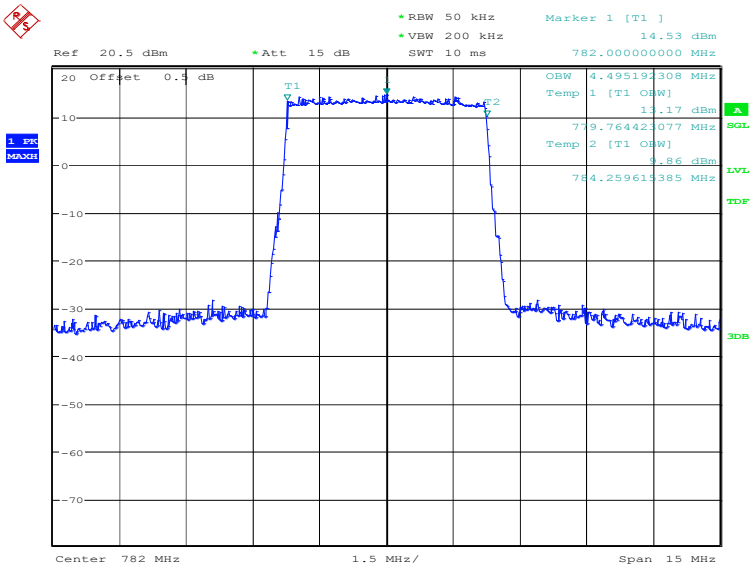
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 5.NOV.2023 10:53:22

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

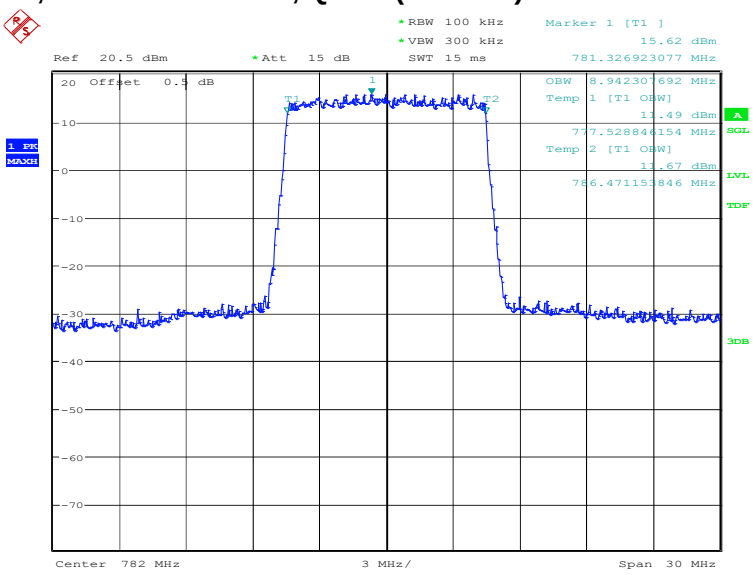


Date: 5.NOV.2023 10:54:03

LTE band 13, 10MHz (99%)

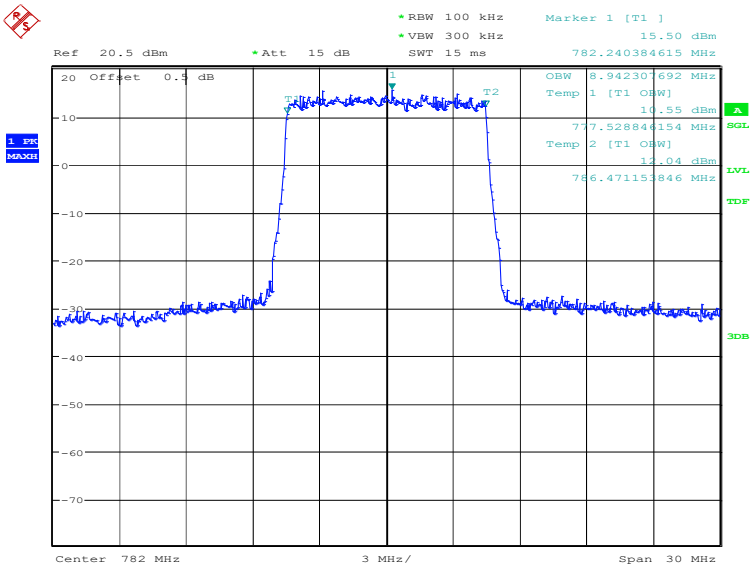
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 5.NOV.2023 10:54:45

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

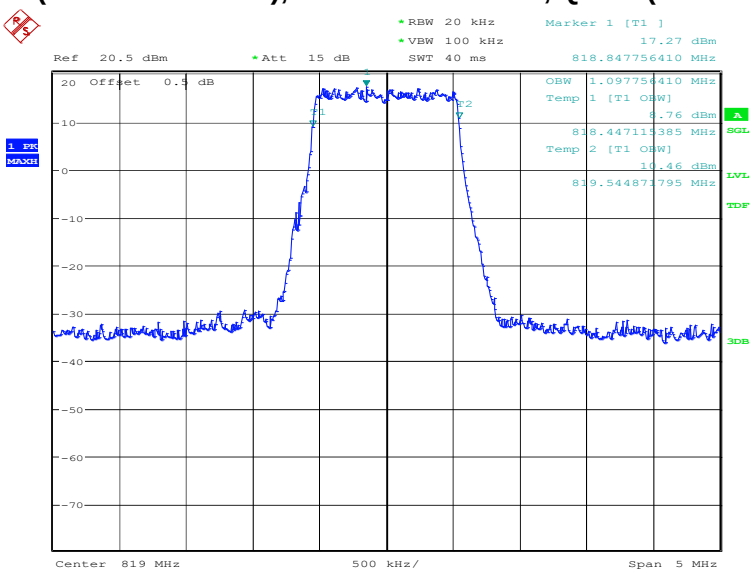


Date: 5.NOV.2023 10:55:25

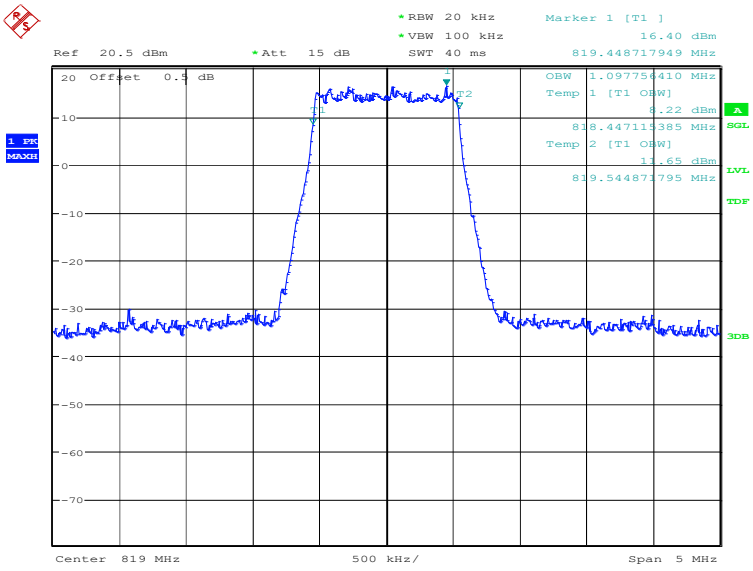
LTE band 26(814MHz~824MHz), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	1097.76	1097.76

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, QPSK (99% BW)



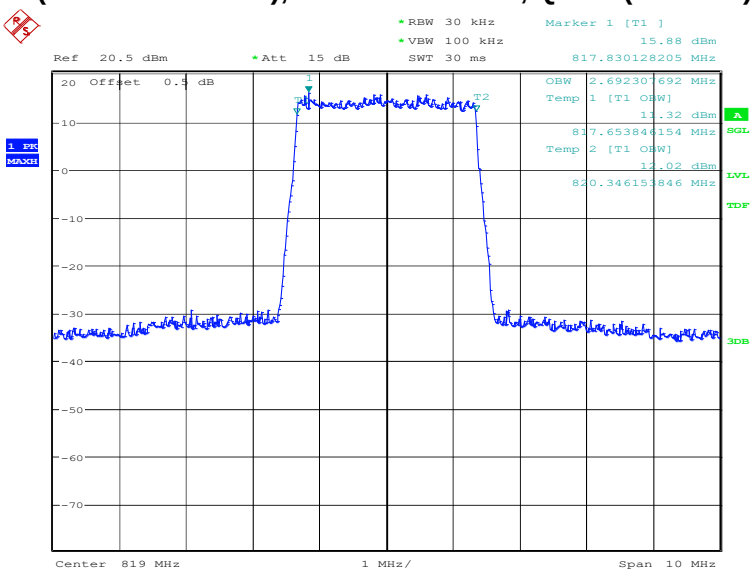
LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 16QAM (99% BW)



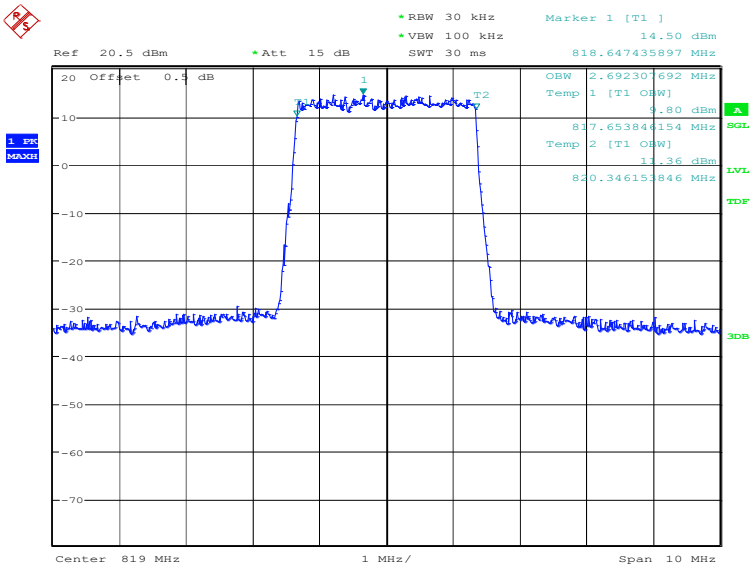
LTE band 26(814MHz~824MHz), 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

LTE band 26(814MHz~824MHz), 3MHz Bandwidth, QPSK (99% BW)



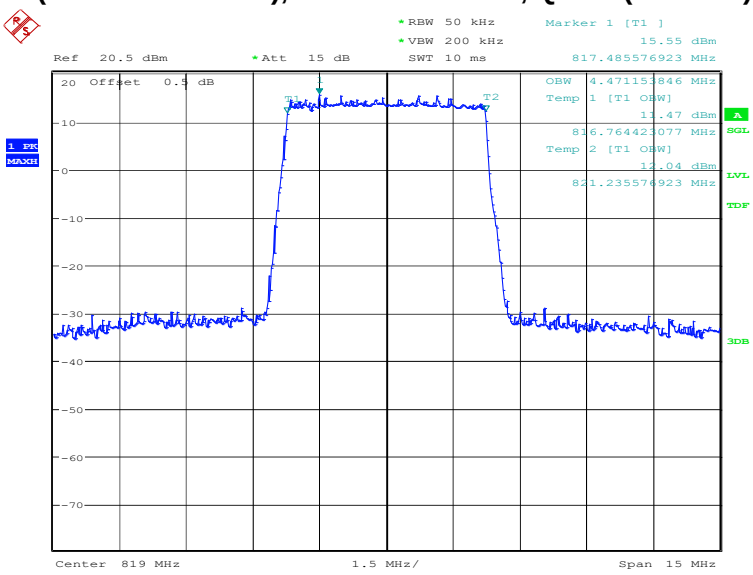
LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 16QAM (99% BW)



LTE band 26(814MHz~824MHz), 5MHz (99%)

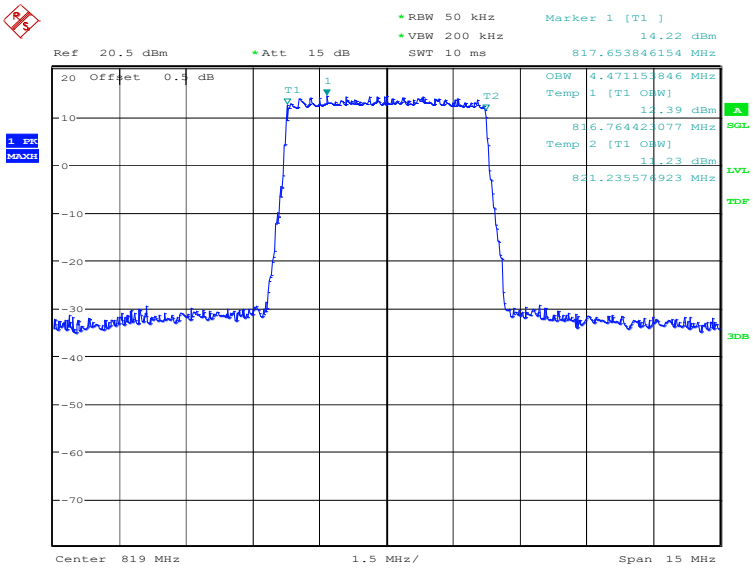
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	4471.15	4471.15

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, QPSK (99% BW)



Date: 5.NOV.2023 11:06:28

LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 16QAM (99% BW)

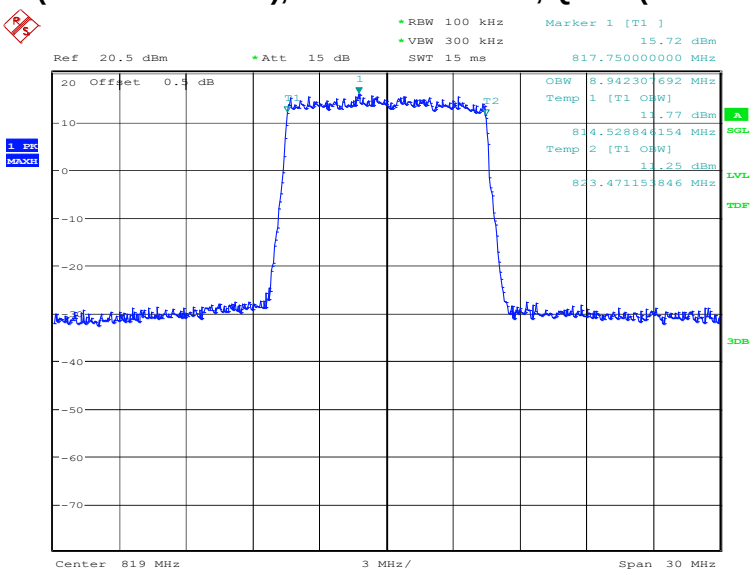


Date: 5.NOV.2023 11:07:08

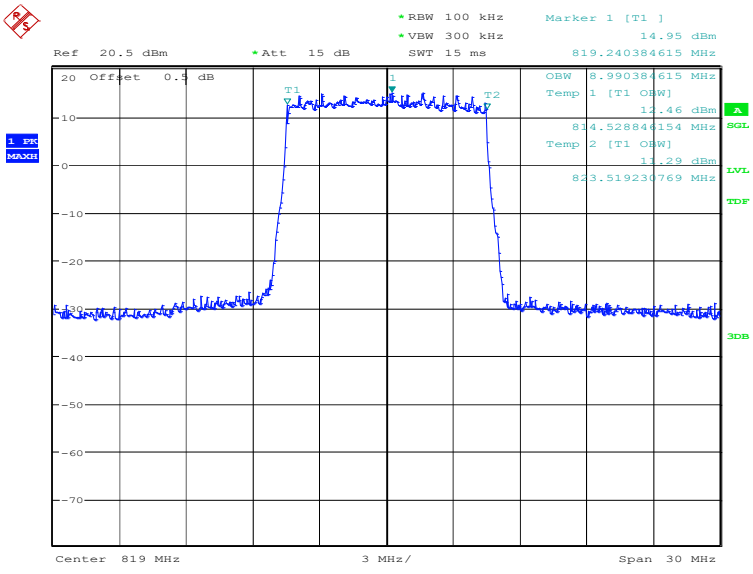
LTE band 26(814MHz~824MHz), 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8942.31	8990.38

LTE band 26(814MHz~824MHz), 10MHz Bandwidth, QPSK (99% BW)



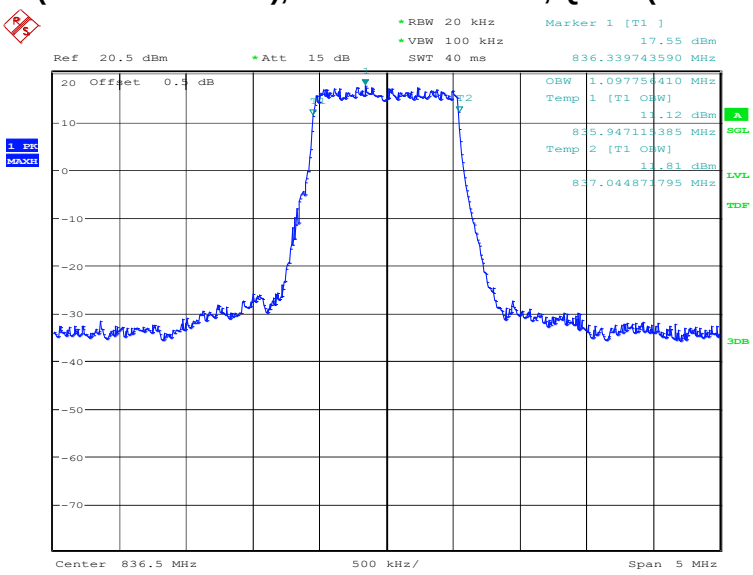
LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 16QAM (99% BW)



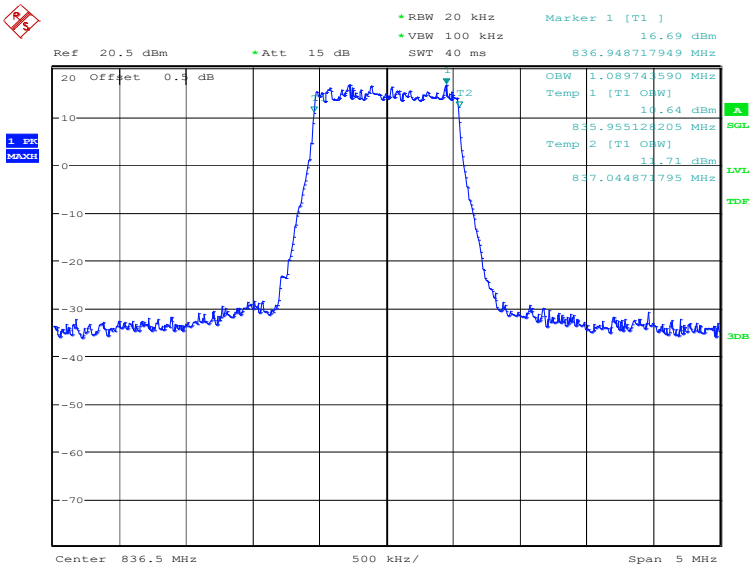
LTE band 26(824MHz~849MHz), 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1097.76	1089.74

LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)



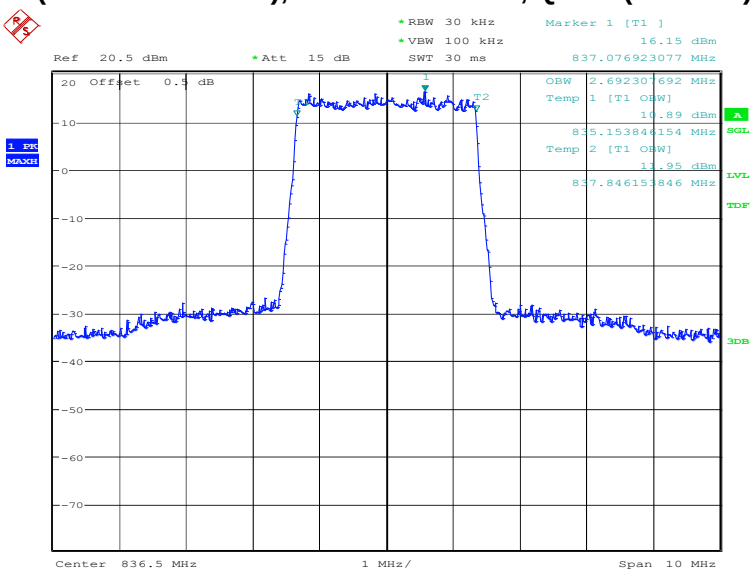
LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 16QAM (99% BW)



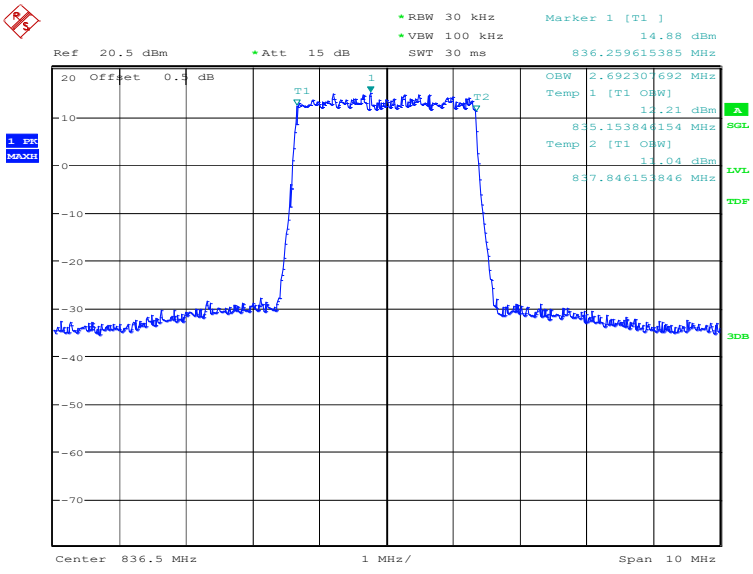
LTE band 26(824MHz~849MHz), 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

LTE band 26(824MHz~849MHz), 3MHz Bandwidth, QPSK (99% BW)



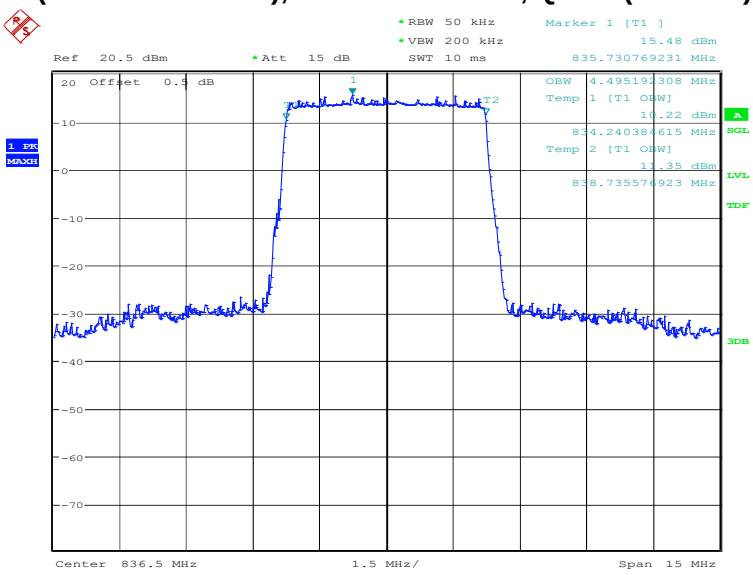
LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 16QAM (99% BW)



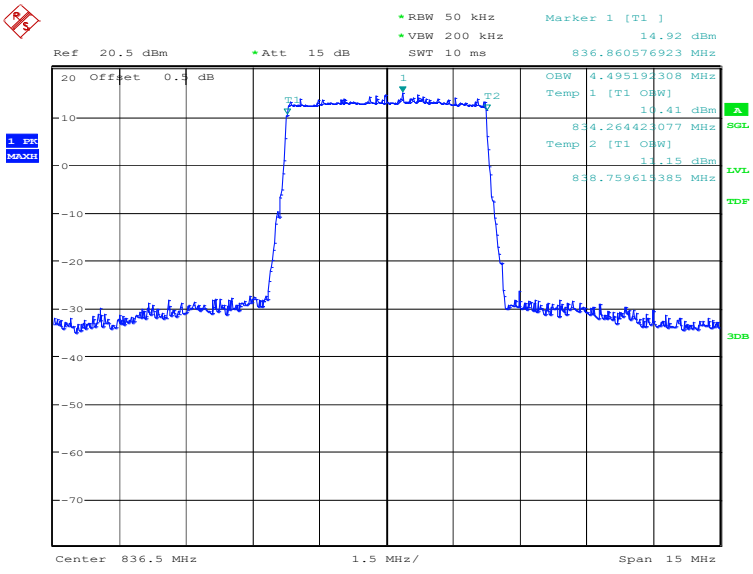
LTE band 26(824MHz~849MHz), 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4495.19

LTE band 26(824MHz~849MHz), 5MHz Bandwidth, QPSK (99% BW)



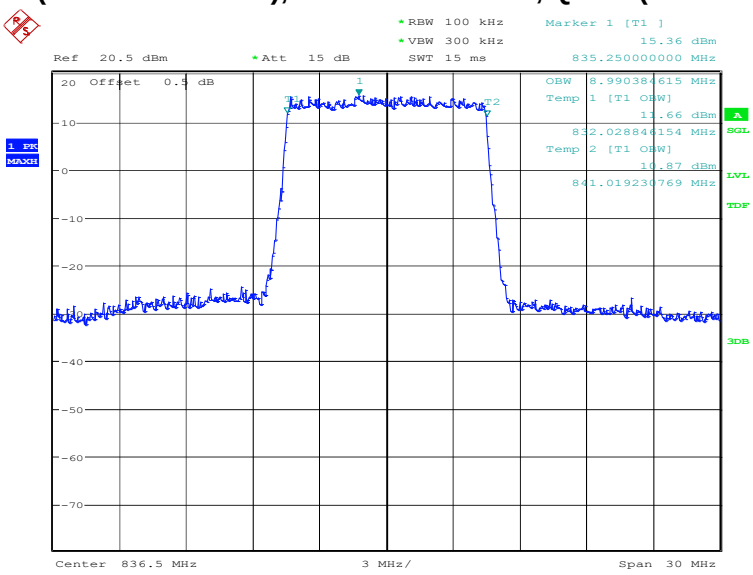
LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 16QAM (99% BW)



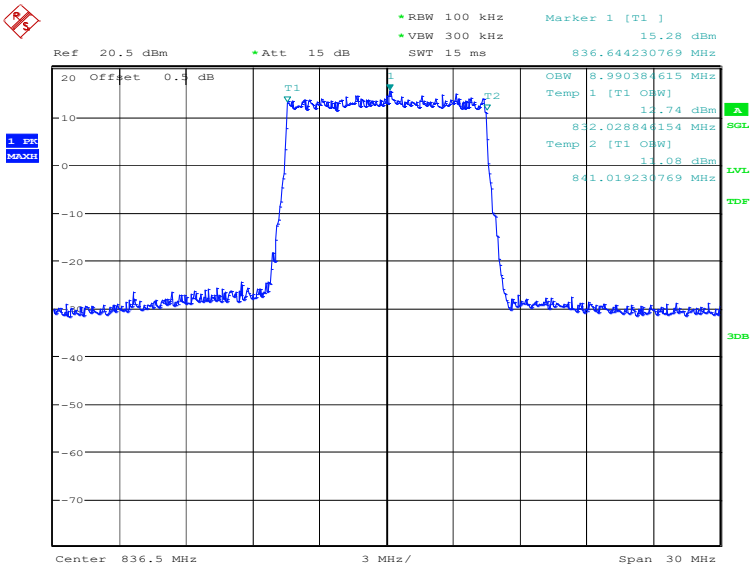
LTE band 26(824MHz~849MHz), 10MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8990.38	8990.38

LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)



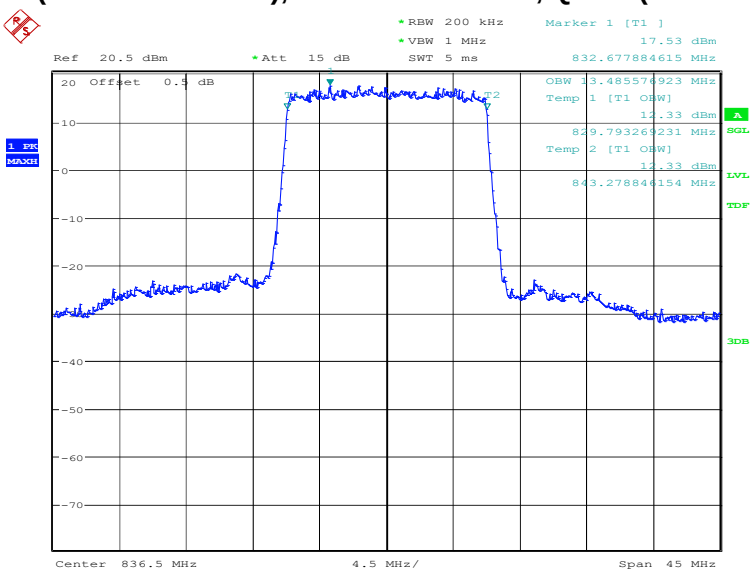
LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 16QAM (99% BW)



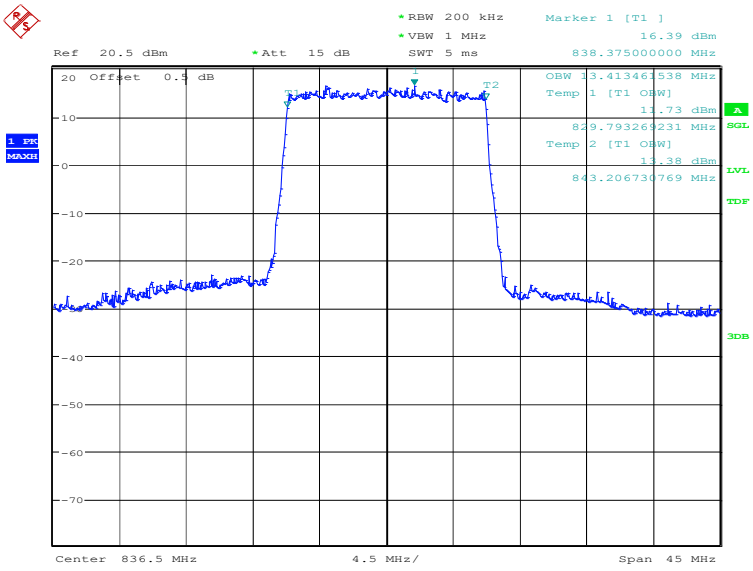
LTE band 26(824MHz~849MHz), 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	13485.58	13413.46

LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)



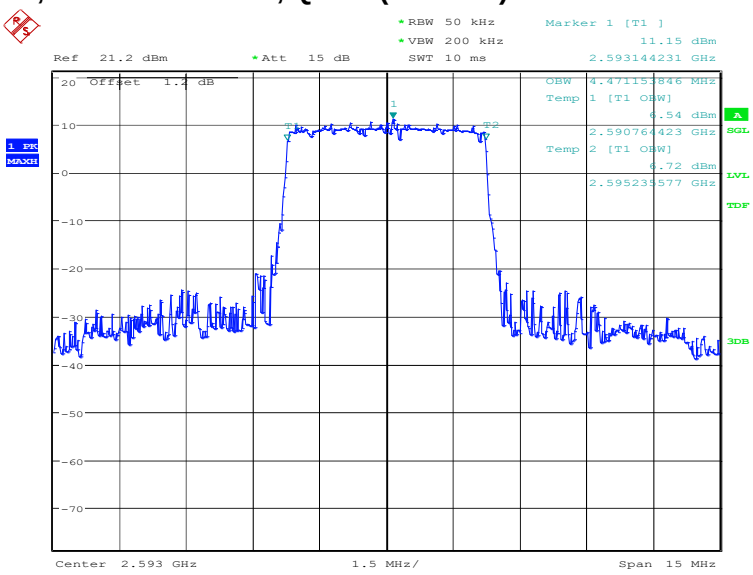
LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 16QAM (99% BW)



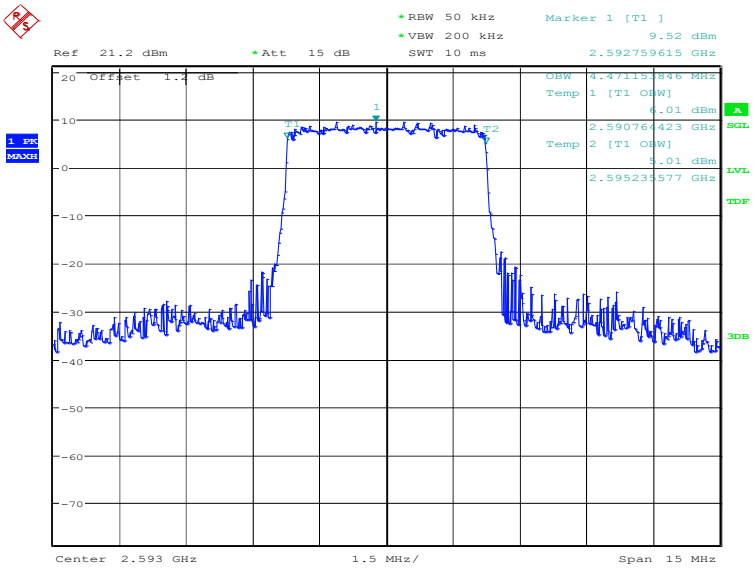
LTE band 41, 5MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	4471.15	4471.15

LTE band 41, 5MHz Bandwidth, QPSK (99% BW)



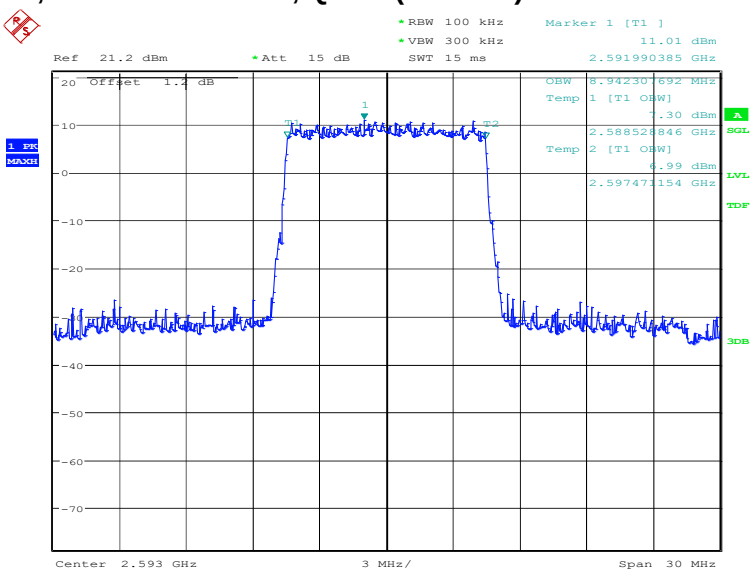
LTE band 41, 5MHz Bandwidth,16QAM (99% BW)



LTE band 41, 10MHz (99%)

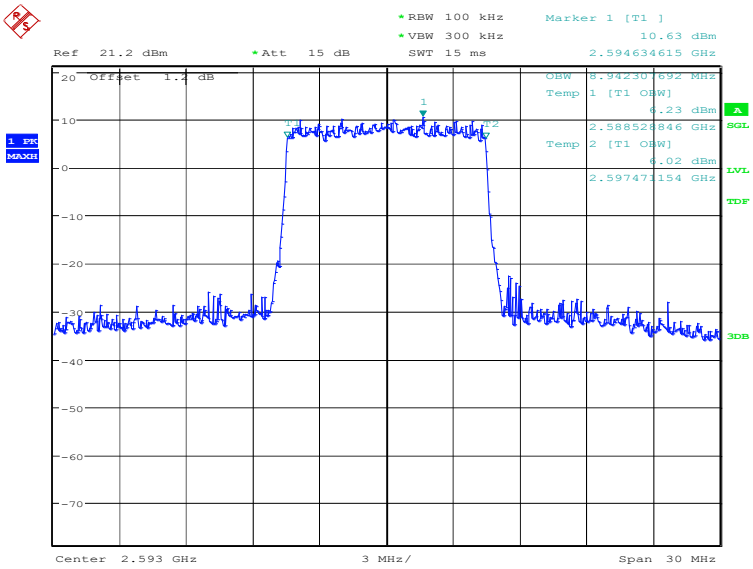
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

LTE band 41, 10MHz Bandwidth, QPSK (99% BW)



Date: 20.NOV.2023 13:17:09

LTE band 41, 10MHz Bandwidth,16QAM (99% BW)

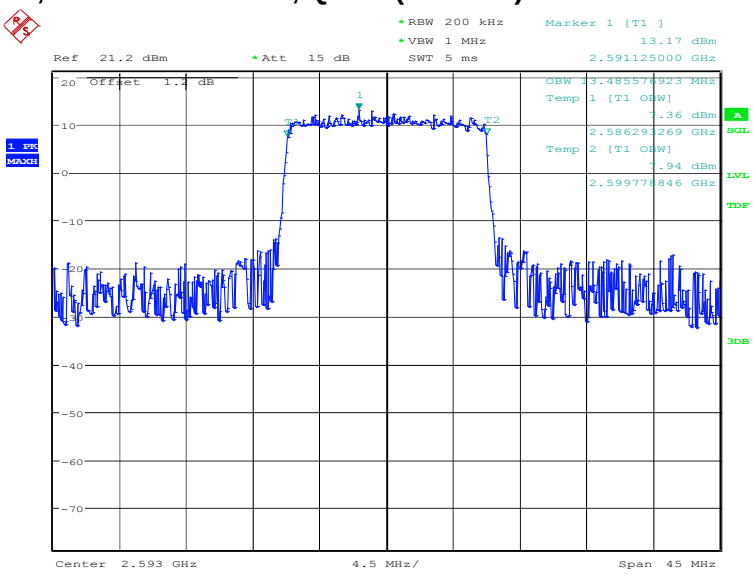


Date: 20.NOV.2023 13:17:50

LTE band 41, 15MHz (99%)

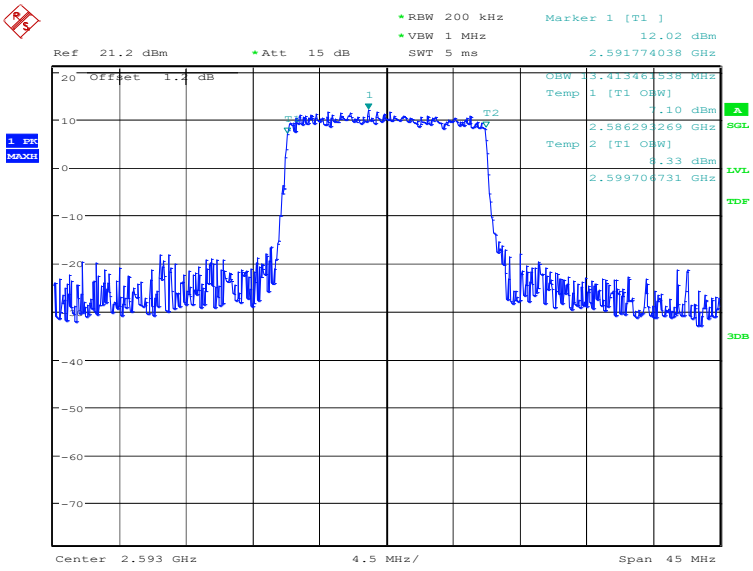
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	13485.58	13413.46

LTE band 41, 15MHz Bandwidth, QPSK (99% BW)



Date: 20.NOV.2023 13:18:32

LTE band 41, 15MHz Bandwidth,16QAM (99% BW)

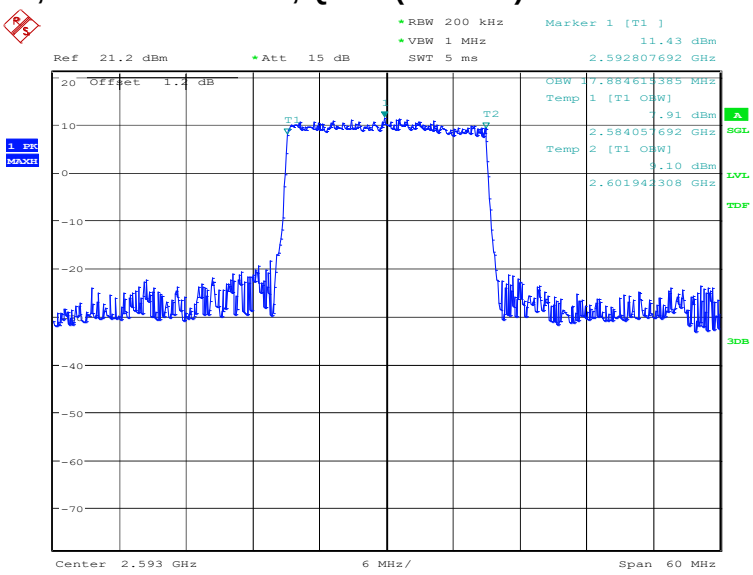


Date: 20.NOV.2023 13:19:12

LTE band 41, 20MHz (99%)

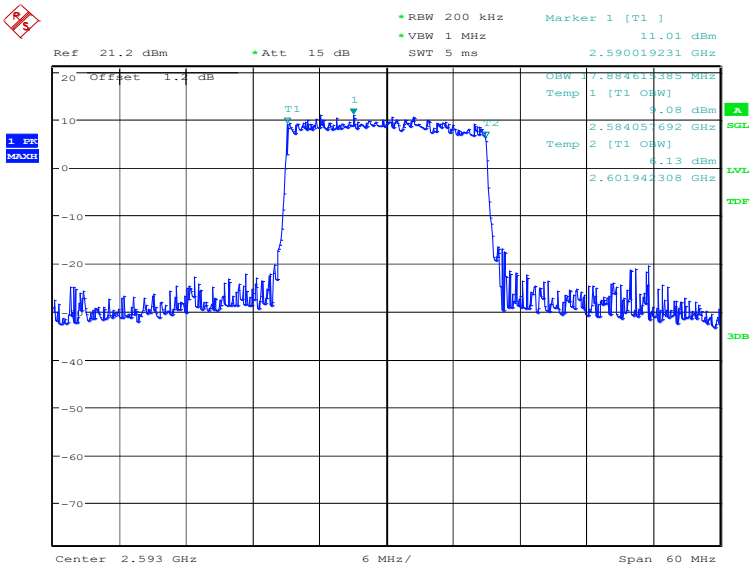
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	17884.62	17884.62

LTE band 41, 20MHz Bandwidth, QPSK (99% BW)



Date: 20.NOV.2023 13:19:54

LTE band 41, 20MHz Bandwidth,16QAM (99% BW)

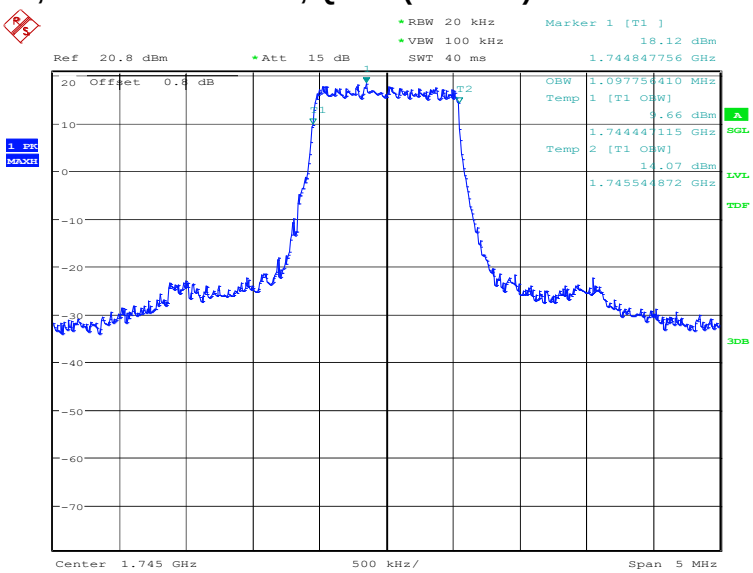


Date: 20.NOV.2023 13:20:34

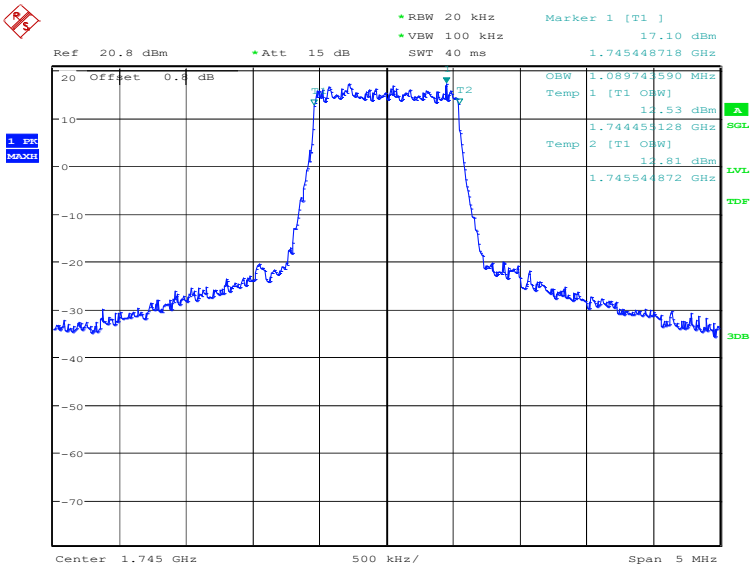
LTE band 66, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	1097.76	1089.74

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



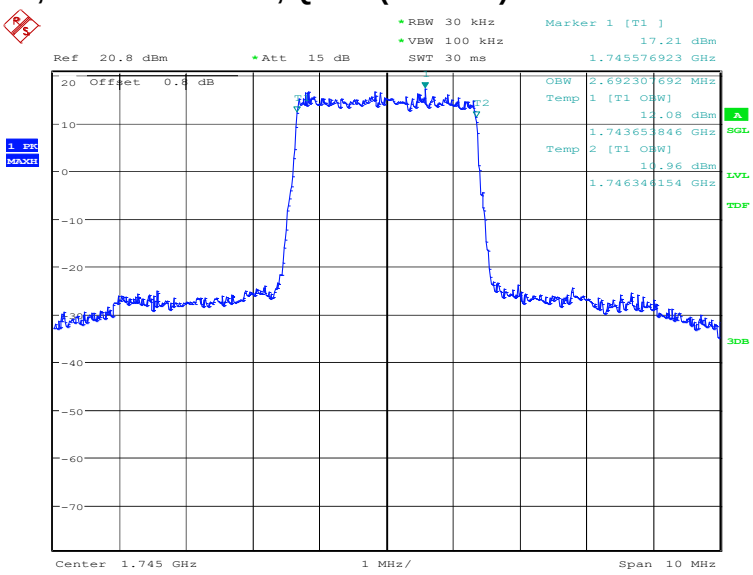
LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)



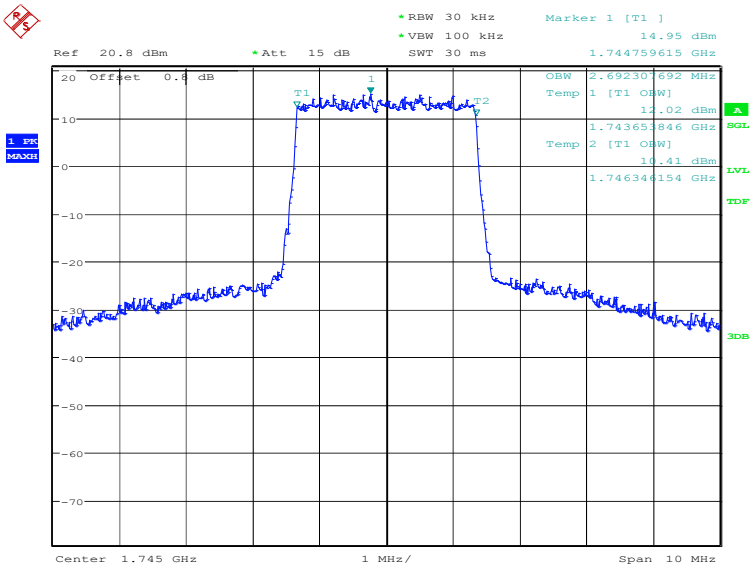
LTE band 66, 3MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	2692.31	2692.31

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



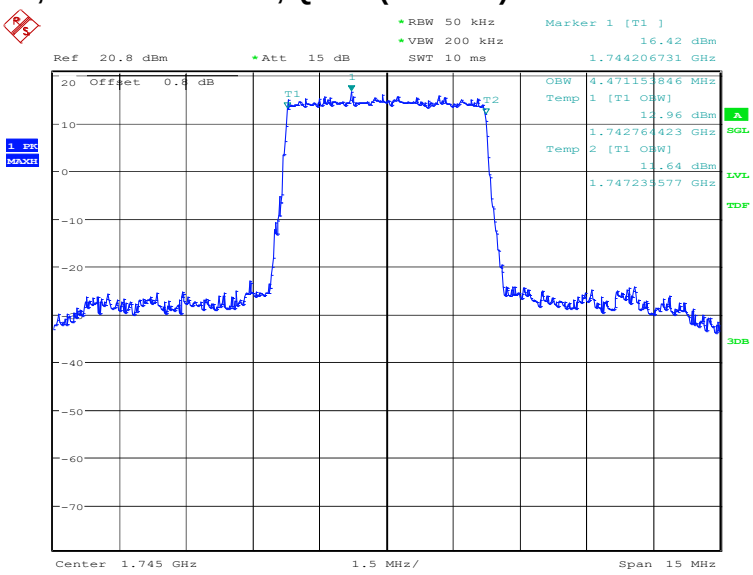
LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)



LTE band 66, 5MHz (99%)

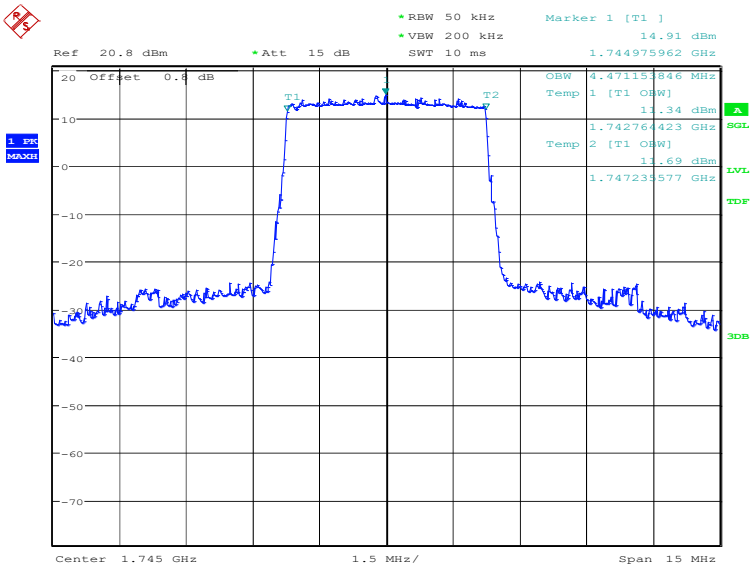
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	4471.15	4471.15

LTE band 66, 5MHz Bandwidth, QPSK (99% BW)



Date: 5.NOV.2023 11:11:59

LTE band 66, 5MHz Bandwidth, 16QAM (99% BW)

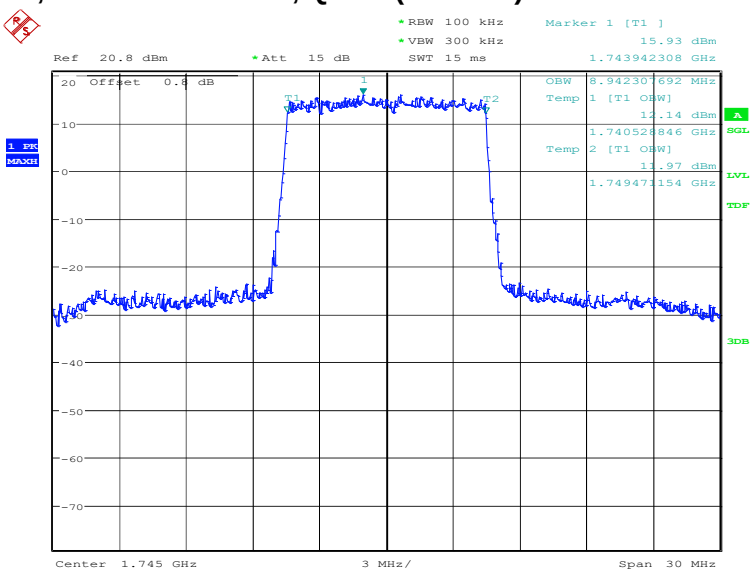


Date: 5.NOV.2023 11:12:40

LTE band 66, 10MHz (99%)

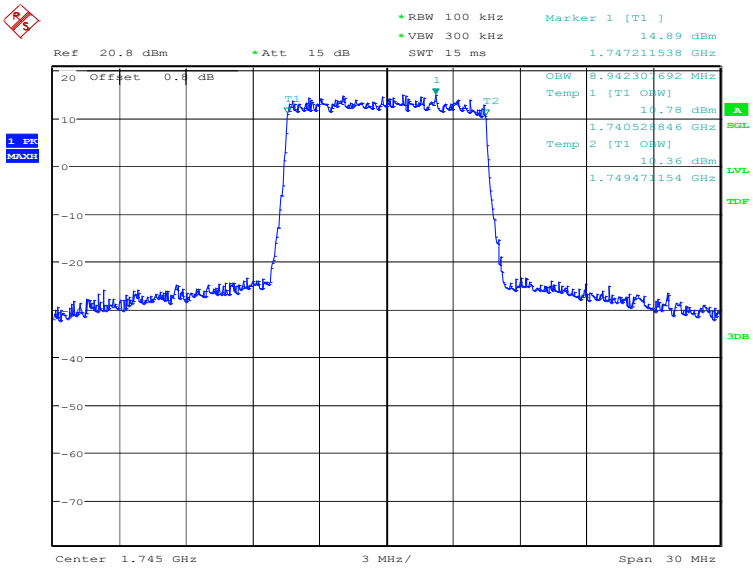
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	8942.31	8942.31

LTE band 66, 10MHz Bandwidth, QPSK (99% BW)



Date: 5.NOV.2023 11:13:22

LTE band 66, 10MHz Bandwidth, 16QAM (99% BW)

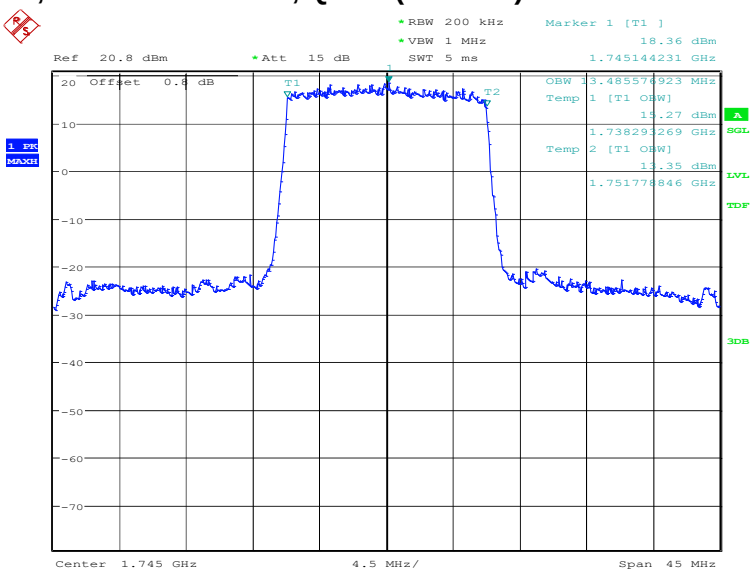


Date: 5.NOV.2023 11:14:03

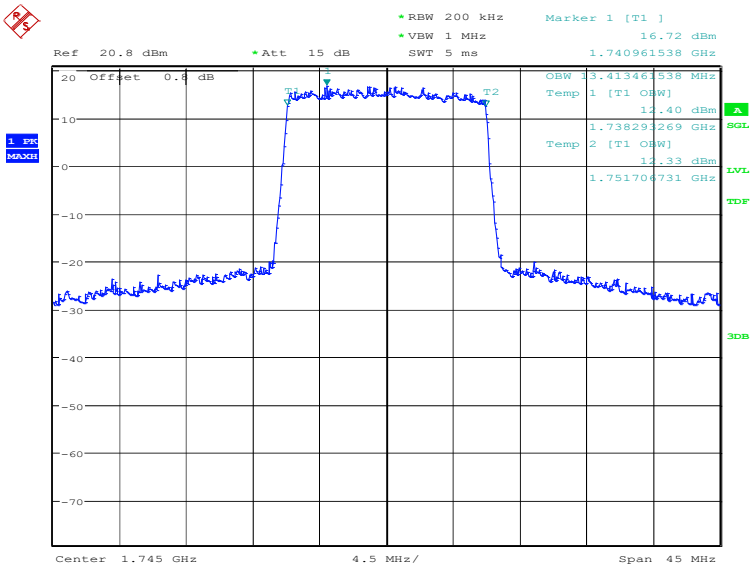
LTE band 66, 15MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	13485.58	13413.46

LTE band 66, 15MHz Bandwidth, QPSK (99% BW)



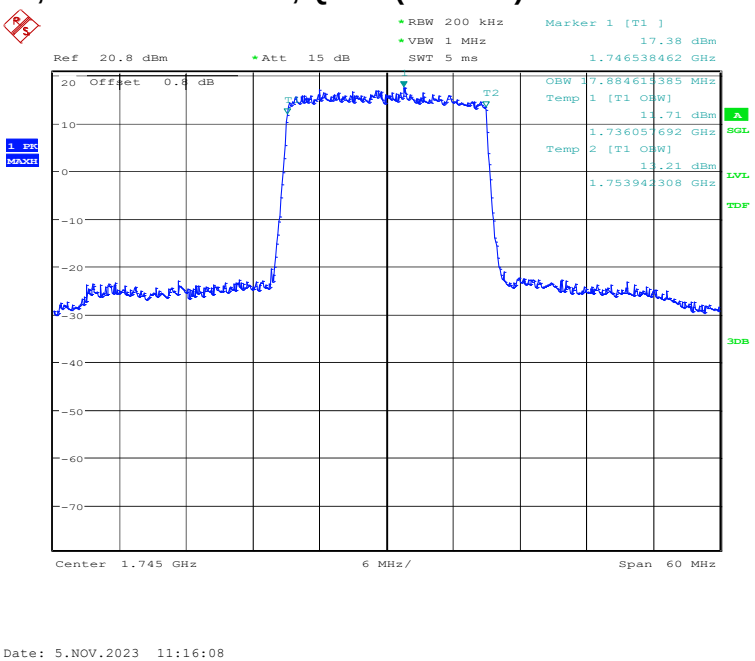
LTE band 66, 15MHz Bandwidth, 16QAM (99% BW)



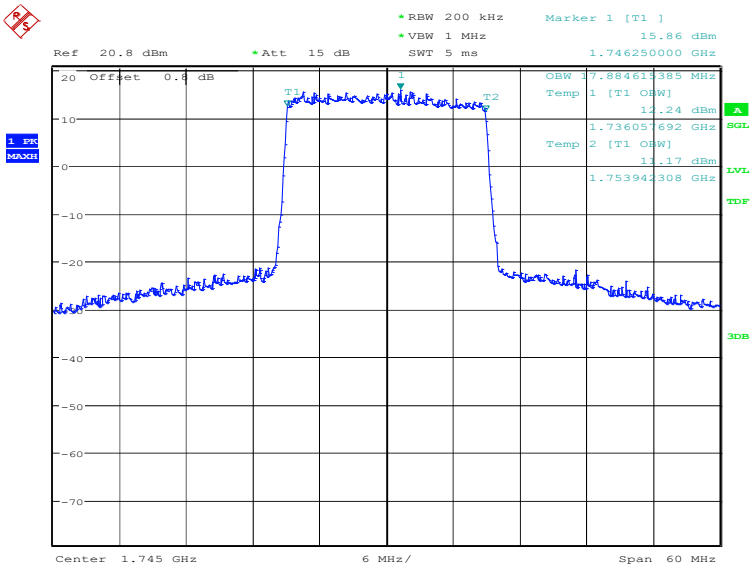
LTE band 66, 20MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	17884.62	17884.62

LTE band 66, 20MHz Bandwidth, QPSK (99% BW)



LTE band 66, 20MHz Bandwidth, 16QAM (99% BW)



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

A.5 Emission Bandwidth

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. Table below lists the measured -26dBc BW. Spectrum analyzer plots are included on the following pages.
The measurement method is from ANSI C63.26:
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.
b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.
c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation.
d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target “−X dB” requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.
e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.