



# TEST REPORT

## No. I22Z62243-WMD03

for

**Honor Device Co., Ltd.**

**Smart Phone**

**Model Name: CRT-LX3**

**FCC ID: 2AYGCCRT-LX3**

with

**Hardware Version: HL3CRTM**

**Software Version: 6.1.0.90(C900E21R1P2)**

**Issued Date: 2022-12-14**

**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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I22Z62243-WMD03	Rev.0	1 <sup>st</sup> edition	2022-12-14

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

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## **1. Test Laboratory**

### **1.1. Introduction & Accreditation**

Telecommunication Technology Labs, CAICT is an ISO/IEC 17025:2017 accredited test laboratory under NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP) with lab code 600118-0 and is also an FCC accredited test laboratory (CN5017), and ISED accredited test laboratory (CN0066). The detail accreditation scope can be found on NVLAP website.

### **1.2. Testing Location**

Location 1: CTTL (huayuan North Road)

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

### **1.3. Testing Environment**

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### **1.4. Project Data**

Testing Start Date: 2022-11-25  
Testing End Date: 2022-12-02

### **1.5. Signature**



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**Dong Yuan**  
**(Prepared this test report)**



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**Zhou Yu**  
**(Reviewed this test report)**



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**Zhao Hui Lin**  
**Deputy Director of the laboratory**  
**(Approved this test report)**



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: Honor Device Co., Ltd.  
Address /Post: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China

### **2.2. Manufacturer Information**

Company Name: Honor Device Co., Ltd.  
Address /Post: Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, P.R.China

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

#### **3.1. About EUT**

Description	Smart Phone
Model Name	CRT-LX3
FCC ID	2AYGCCRT-LX3
Antenna	Integrated
Extreme vol. Limits	3.6VDC to 4.48VDC (nominal: 3.89VDC)
Extreme temp. Tolerance	0°C to +35°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**

<b>EUT ID*</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>	<b>Date of receipt</b>
UT05a	866902060024791/ 866902060025095	HL3CRTM	6.1.0.90(C900E21R1P2)	2022-11-23

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

#### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Description</b>
AE1	Battery
AE2	Battery
<b>AE1</b>	
Model	HB416594EGW
Manufacturer	Honor Device Co., Ltd.(SCUD)
Capacitance	4400mAh
<b>AE2</b>	
Model	HB416594EGW
Manufacturer	Honor Device Co., Ltd.(Desay)
Capacitance	4400mAh

\*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.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	10-1-21 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-21 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-21 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-21 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	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	24.238	P
5	Band Edge Compliance	24.238	P
6	Conducted Spurious Emission	24.238	P
7	Peak-to-Average Power Ratio	24.232	P

### LTE Band 4

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

### LTE Band 5

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



**LTE Band 7**

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

**LTE Band 12**

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

**LTE Band 17**

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	27.53	P
5	Band Edge Compliance	27.53	P
6	Conducted Spurious Emission	27.53	P
7	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	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	2.1049	P
5	Band Edge Compliance	90.691	P
6	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	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	22.917	P
5	Band Edge Compliance	22.917	P
6	Conducted Spurious Emission	22.917	P

**LTE Band 38**

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

**LTE Band 41**

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

**LTE Band 66**

Items	Test Name	Clause in FCC rules	Verdict
1	Output Power	27.50	P
2	Frequency Stability	2.1055	P
3	Occupied Bandwidth	2.1049	P
4	Emission Bandwidth	27.53	P
5	Band Edge Compliance	27.53	P
6	Conducted Spurious Emission	27.53	P
7	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.

## 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 and 64QAM 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	2023-01-17	25 months
Spectrum Analyzer	FSU	200030	R&S	2023-05-25	1 year
Climate Chamber	SH-242	93008556	ESPEC	2023-12-23	3 years

## 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	64QAM
1.4MHz	1 RB high	1909.3	22.85	21.87	21.20
		1880.0	22.85	21.87	21.26
		1850.7	22.98	22.06	20.90
	1 RB low	1909.3	22.88	21.86	21.24
		1880.0	22.88	21.85	21.25
		1850.7	23.01	22.02	20.91
	50% RB mid	1909.3	22.87	21.94	21.18
		1880.0	22.95	22.01	21.27
		1850.7	23.13	22.31	21.05
	100% RB	1909.3	21.90	21.01	19.87
		1880.0	21.92	21.08	19.95
		1850.7	22.05	21.24	20.19
3MHz	1 RB high	1908.5	22.90	22.42	21.16
		1880.0	22.92	22.52	21.24
		1851.5	23.05	22.61	21.28
	1 RB low	1908.5	22.89	22.45	21.15
		1880.0	23.01	22.54	21.23
		1851.5	23.09	22.70	21.35
	50% RB mid	1908.5	21.89	21.05	19.93
		1880.0	21.91	21.09	19.99
		1851.5	22.03	21.19	20.11
	100% RB	1908.5	21.93	20.95	19.92

		1880.0	21.94	20.99	19.97
		1851.5	22.03	21.06	20.06
5MHz	1 RB high	1907.5	22.85	21.75	20.84
		1880.0	22.90	21.81	20.86
		1852.5	23.00	21.94	20.97
	1 RB low	1907.5	22.79	21.70	20.81
		1880.0	22.90	21.79	20.90
		1852.5	23.06	21.97	21.02
	50% RB mid	1907.5	21.87	21.00	19.94
		1880.0	21.93	21.03	19.98
		1852.5	22.05	21.14	20.15
	100% RB	1907.5	21.91	20.90	19.94
		1880.0	21.96	20.96	19.95
		1852.5	22.02	21.08	20.05
10MHz	1 RB high	1905.0	22.95	22.47	21.16
		1880.0	22.92	22.47	21.16
		1855.0	23.00	22.60	21.25
	1 RB low	1905.0	22.93	22.42	21.16
		1880.0	22.93	22.50	21.23
		1855.0	23.08	22.66	21.37
	50% RB mid	1905.0	21.82	21.00	19.91
		1880.0	21.97	21.10	20.04
		1855.0	22.10	21.15	20.22
	100% RB	1905.0	21.96	20.96	20.02
		1880.0	22.02	21.03	20.09
		1855.0	22.07	21.09	20.17
15MHz	1 RB high	1902.5	22.86	22.40	21.10
		1880.0	22.85	22.44	21.12
		1857.5	22.91	22.51	21.16
	1 RB low	1902.5	22.91	22.46	21.18
		1880.0	22.88	22.50	21.17
		1857.5	23.05	22.63	21.32
	50% RB mid	1902.5	21.88	20.99	19.92
		1880.0	21.98	21.02	19.99
		1857.5	22.10	21.09	20.11
	100% RB	1902.5	21.92	20.91	19.91
		1880.0	22.00	21.01	20.05
		1857.5	22.09	21.09	20.10
20MHz	1 RB high	1900.0	22.89	22.16	21.02
		1880.0	22.84	22.16	21.01
		1860.0	22.87	22.19	21.02
	1 RB low	1900.0	22.91	22.21	21.03
		1880.0	22.91	22.20	21.05



		1860.0	23.04	22.32	21.20
	50% RB mid	1900.0	21.68	21.07	19.79
		1880.0	21.84	21.08	19.98
		1860.0	22.07	21.11	20.21
	100% RB	1900.0	21.81	20.88	19.91
		1880.0	21.96	21.03	20.05
		1860.0	22.04	21.10	20.15



**LTE band 4**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1754.3	23.02	21.99	20.82
		1732.5	22.86	21.87	21.18
		1710.7	22.63	21.62	21.01
	1 RB low	1754.3	22.95	21.93	20.81
		1732.5	22.83	21.83	21.18
		1710.7	22.69	21.69	21.04
	50% RB mid	1754.3	23.03	21.99	21.26
		1732.5	22.92	21.90	21.16
		1710.7	22.74	21.85	20.63
	100% RB	1754.3	21.99	21.13	19.96
		1732.5	21.87	21.04	19.82
		1710.7	21.75	20.91	19.80
3MHz	1 RB high	1753.5	23.11	22.50	21.27
		1732.5	22.92	22.42	21.17
		1711.5	22.78	22.24	21.00
	1 RB low	1753.5	23.05	22.48	21.22
		1732.5	22.96	22.41	21.15
		1711.5	22.82	22.27	21.00
	50% RB mid	1753.5	22.05	21.21	20.08
		1732.5	21.95	21.08	20.02
		1711.5	21.76	20.87	19.78
	100% RB	1753.5	22.02	21.06	20.03
		1732.5	21.93	20.94	19.86
		1711.5	21.73	20.74	19.70
5MHz	1 RB high	1752.5	23.03	21.92	21.03
		1732.5	22.96	21.80	20.96
		1712.5	22.78	21.64	20.77
	1 RB low	1752.5	23.01	21.86	20.99
		1732.5	22.91	21.78	20.94
		1712.5	22.76	21.64	20.76
	50% RB mid	1752.5	21.99	21.15	20.07
		1732.5	21.94	21.01	19.94
		1712.5	21.73	20.82	19.77
	100% RB	1752.5	22.00	21.10	20.01
		1732.5	21.89	20.95	19.91
		1712.5	21.71	20.78	19.70
10MHz	1 RB high	1750.0	23.08	22.53	21.30
		1732.5	22.98	22.46	21.23
		1715.0	22.88	22.34	21.09
	1 RB low	1750.0	23.07	22.50	21.28

		1732.5	22.92	22.40	21.16	
		1715.0	22.77	22.30	21.00	
		1750.0	22.10	21.08	20.11	
	50% RB mid	1732.5	21.99	21.00	20.08	
		1715.0	21.77	20.83	19.84	
		1750.0	22.05	21.10	20.06	
		1732.5	21.96	20.96	20.00	
100% RB	1715.0	21.76	20.81	19.77		
	1750.0	22.05	21.10	20.06		
	1732.5	21.96	20.96	20.00		
15MHz	1 RB high	1747.5	23.07	22.53	21.29	
		1732.5	23.02	22.52	21.20	
		1717.5	22.81	22.32	21.09	
	1 RB low	1747.5	23.00	22.53	21.24	
		1732.5	22.86	22.41	21.16	
		1717.5	22.79	22.30	21.01	
	50% RB mid	1747.5	22.14	21.11	20.12	
		1732.5	22.09	20.98	20.07	
		1717.5	21.87	20.83	19.86	
	100% RB	1747.5	22.16	21.16	20.12	
		1732.5	22.04	21.03	20.03	
		1717.5	21.83	20.85	19.83	
	20MHz	1 RB high	1745.0	23.07	22.34	21.21
			1732.5	23.06	22.33	21.20
			1720.0	23.02	22.27	21.09
1 RB low		1745.0	22.99	22.26	21.13	
		1732.5	22.86	22.11	21.00	
		1720.0	22.81	22.07	20.94	
50% RB mid		1745.0	22.10	21.14	20.19	
		1732.5	22.06	21.01	20.13	
		1720.0	21.86	20.90	19.95	
100% RB		1745.0	22.07	21.19	20.15	
		1732.5	21.99	21.08	20.06	
		1720.0	21.81	20.90	19.89	

**LTE band 5**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	24.10	23.11	21.98
		836.5	24.17	23.20	22.58
		824.7	24.22	23.28	22.15
	1 RB low	848.3	24.10	23.11	21.98
		836.5	24.19	23.23	22.59
		824.7	24.19	23.19	22.13
	50% RB mid	848.3	24.09	23.16	22.44
		836.5	24.26	23.49	22.23
		824.7	24.23	23.38	22.65
	100% RB	848.3	23.25	22.29	21.15
		836.5	23.30	22.43	21.38
		824.7	23.30	22.43	21.30
3MHz	1 RB high	847.5	24.07	23.54	22.30
		836.5	24.14	23.70	22.44
		825.5	24.20	23.83	22.52
	1 RB low	847.5	24.11	23.58	22.31
		836.5	24.17	23.76	22.43
		825.5	24.23	23.82	22.46
	50% RB mid	847.5	23.08	22.27	21.14
		836.5	23.24	22.39	21.28
		825.5	23.22	22.40	21.29
	100% RB	847.5	23.13	22.15	21.12
		836.5	23.29	22.28	21.25
		825.5	23.22	22.25	21.20
5MHz	1 RB high	846.5	23.99	22.87	21.98
		836.5	24.09	23.01	22.12
		826.5	24.14	23.08	22.18
	1 RB low	846.5	23.97	22.89	22.03
		836.5	24.10	23.02	22.12
		826.5	24.09	23.04	22.12
	50% RB mid	846.5	23.10	22.26	21.12
		836.5	23.30	22.37	21.33
		826.5	23.33	22.41	21.35
	100% RB	846.5	23.13	22.15	21.15
		836.5	23.27	22.29	21.24
		826.5	23.27	22.32	21.29
10MHz	1 RB high	844.0	24.12	23.60	22.33
		836.5	24.17	23.71	22.41
		829.0	24.21	23.85	22.49
	1 RB low	844.0	24.16	23.73	22.39



		836.5	24.22	23.81	22.49
		829.0	24.16	23.75	22.41
	50% RB mid	844.0	23.09	22.20	21.16
		836.5	23.26	22.30	21.34
		829.0	23.36	22.40	21.38
	100% RB	844.0	23.15	22.13	21.18
		836.5	23.26	22.25	21.29
		829.0	23.33	22.33	21.35

**LTE band 7**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	23.29	22.36	21.43
		2535.0	23.35	22.43	21.52
		2502.5	23.42	22.31	21.40
	1 RB low	2567.5	23.22	22.25	21.31
		2535.0	23.36	22.39	21.46
		2502.5	23.46	22.36	21.46
	50% RB mid	2567.5	22.36	21.35	20.40
		2535.0	22.41	21.46	20.52
		2502.5	22.56	21.59	20.65
	100% RB	2567.5	22.33	21.28	20.32
		2535.0	22.41	21.34	20.50
		2502.5	22.53	21.49	20.61
10MHz	1 RB high	2565.0	23.37	22.34	21.20
		2535.0	23.45	22.45	21.31
		2505.0	23.59	22.55	21.42
	1 RB low	2565.0	23.33	22.27	21.13
		2535.0	23.40	22.35	21.21
		2505.0	23.56	22.51	21.35
	50% RB mid	2565.0	22.35	21.40	20.41
		2535.0	22.49	21.52	20.62
		2505.0	22.63	21.67	20.74
	100% RB	2565.0	22.33	21.38	20.34
		2535.0	22.48	21.52	20.55
		2505.0	22.59	21.65	20.64
15MHz	1 RB high	2562.5	23.27	22.56	21.55
		2535.0	23.38	22.69	21.69
		2507.5	23.41	22.74	21.71
	1 RB low	2562.5	23.25	22.56	21.58
		2535.0	23.36	22.68	21.62
		2507.5	23.54	22.81	21.84
	50% RB mid	2562.5	22.39	21.32	20.34
		2535.0	22.55	21.47	20.54
		2507.5	22.68	21.60	20.66
	100% RB	2562.5	22.38	21.33	20.40
		2535.0	22.52	21.48	20.57
		2507.5	22.63	21.59	20.65
20MHz	1 RB high	2560.0	23.18	22.71	21.07
		2535.0	23.29	22.81	21.19
		2510.0	23.26	22.81	21.09
	1 RB low	2560.0	23.22	22.72	21.15



		2535.0	23.28	22.78	21.18
		2510.0	23.38	22.91	21.25
	50% RB mid	2560.0	22.30	21.32	20.32
		2535.0	22.41	21.44	20.50
		2510.0	22.50	21.57	20.56
	100% RB	2560.0	22.30	21.32	20.38
		2535.0	22.42	21.45	20.55
		2510.0	22.52	21.53	20.59

**LTE band 12**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	715.3	24.20	23.14	22.49
		707.5	24.20	23.23	22.60
		699.7	24.23	23.25	22.58
	1 RB low	715.3	24.20	23.14	22.47
		707.5	24.21	23.22	22.63
		699.7	24.16	23.15	22.51
	50% RB mid	715.3	24.21	23.20	22.50
		707.5	24.27	23.34	22.61
		699.7	24.25	23.31	22.57
	100% RB	715.3	23.28	22.35	21.23
		707.5	23.25	22.41	21.27
		699.7	23.30	22.40	21.33
3MHz	1 RB high	714.5	24.24	23.16	22.04
		707.5	24.21	23.73	22.46
		700.5	24.23	23.75	22.47
	1 RB low	714.5	24.30	23.21	22.13
		707.5	24.27	23.84	22.47
		700.5	24.21	23.76	22.44
	50% RB mid	714.5	23.24	22.42	21.33
		707.5	23.24	22.44	21.38
		700.5	23.31	22.45	21.40
	100% RB	714.5	23.26	22.27	21.30
		707.5	23.27	22.34	21.34
		700.5	23.31	22.35	21.35
5MHz	1 RB high	713.5	24.14	23.00	22.08
		707.5	24.15	23.05	22.14
		701.5	24.14	23.02	22.12
	1 RB low	713.5	24.08	22.95	22.06
		707.5	24.14	23.06	22.18
		701.5	24.11	23.01	22.11
	50% RB mid	713.5	23.20	22.35	21.33
		707.5	23.30	22.41	21.40
		701.5	23.33	22.43	21.42
	100% RB	713.5	23.23	22.26	21.27
		707.5	23.27	22.30	21.34
		701.5	23.28	22.31	21.32
10MHz	1 RB high	711.0	24.24	23.69	22.44
		707.5	24.17	23.66	22.38
		704.0	24.19	23.73	22.42
	1 RB low	711.0	24.24	23.81	22.47

		707.5	24.27	23.80	22.50
		704.0	24.19	23.73	22.41
	50% RB mid	711.0	23.23	22.33	21.35
		707.5	23.35	22.38	21.44
	100% RB	704.0	23.30	22.39	21.44
		711.0	23.27	22.27	21.39
		707.5	23.32	22.33	21.42
		704.0	23.32	22.31	21.40

**LTE band 13**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	24.17	23.06	22.18
		782.0	24.16	23.03	22.16
		779.5	24.13	23.04	22.16
	1 RB low	784.5	24.11	23.02	22.14
		782.0	24.16	23.08	22.17
		779.5	24.10	23.03	22.13
	50% RB mid	784.5	23.31	22.35	21.32
		782.0	23.28	22.36	21.31
		779.5	23.31	22.35	21.33
	100% RB	784.5	23.26	22.25	21.21
		782.0	23.25	22.26	21.23
		779.5	23.24	22.26	21.19
10MHz	1 RB high	782.0	24.25	23.74	22.50
	1 RB low	782.0	24.22	23.76	22.45
	50% RB mid	782.0	23.33	22.39	21.40
	100% RB	782.0	23.30	22.29	21.32



**LTE band 17**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	713.5	24.02	22.90	22.00
		710.0	23.98	22.86	22.01
		706.5	24.00	22.91	22.01
	1 RB low	713.5	24.02	22.92	22.00
		710.0	24.06	22.98	22.05
		706.5	24.06	22.96	22.02
	50% RB mid	713.5	23.02	22.15	21.13
		710.0	23.09	22.21	21.17
		706.5	23.17	22.23	21.25
	100% RB	713.5	23.06	22.08	21.10
		710.0	23.13	22.17	21.16
		706.5	23.12	22.19	21.19
10MHz	1 RB high	711.0	24.15	23.58	22.33
		710.0	24.11	23.58	22.34
		709.0	24.05	23.48	22.26
	1 RB low	711.0	24.16	23.70	22.36
		710.0	24.11	23.66	22.37
		709.0	24.13	23.69	22.37
	50% RB mid	711.0	23.06	22.24	21.16
		710.0	23.11	22.21	21.21
		709.0	23.15	22.27	21.25
	100% RB	711.0	23.16	22.18	21.21
		710.0	23.17	22.17	21.23
		709.0	23.18	22.17	21.25

**LTE band 26(814MHz~824MHz)**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	823.3	24.19	23.29	22.67
		819.0	24.29	23.32	22.73
		814.7	24.20	23.27	22.60
	1 RB low	823.3	24.23	23.25	22.65
		819.0	24.30	23.34	22.70
		814.7	24.26	23.26	22.60
	50% RB mid	823.3	24.31	23.41	22.64
		819.0	24.35	23.48	22.74
		814.7	24.31	23.55	22.34
	100% RB	823.3	23.35	22.48	21.32
		819.0	23.42	22.59	21.39
		814.7	23.39	22.54	21.45
3MHz	1 RB high	822.5	24.20	23.78	22.49
		819.0	24.25	23.83	22.52
		815.5	24.27	23.80	22.60
	1 RB low	822.5	24.26	23.84	22.52
		819.0	24.29	23.87	22.53
		815.5	24.34	23.83	22.56
	50% RB mid	822.5	23.22	22.40	21.30
		819.0	23.30	22.47	21.36
		815.5	23.30	22.45	21.34
	100% RB	822.5	23.27	22.32	21.27
		819.0	23.30	22.35	21.30
		815.5	23.30	22.32	21.28
5MHz	1 RB high	821.5	24.18	23.11	22.22
		819.0	24.22	23.15	22.22
		816.5	24.28	23.23	22.33
	1 RB low	821.5	24.26	23.19	22.28
		819.0	24.21	23.15	22.21
		816.5	24.25	23.24	22.26
	50% RB mid	821.5	23.30	22.43	21.35
		819.0	23.32	22.46	21.41
		816.5	23.41	22.44	21.43
	100% RB	821.5	23.31	22.34	21.30
		819.0	23.35	22.37	21.31
		816.5	23.36	22.39	21.32
10MHz	1 RB high	819.0	24.28	23.86	22.58
	1 RB low	819.0	24.30	23.86	22.56
	50% RB mid	819.0	23.40	22.49	21.48
	100% RB	819.0	23.41	22.39	21.42

**LTE band 26(824MHz~849MHz)**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	24.16	23.12	22.45
		836.5	24.13	23.17	22.56
		824.7	24.19	23.24	22.13
	1 RB low	848.3	24.16	23.11	22.46
		836.5	24.18	23.19	22.54
		824.7	24.19	23.25	22.16
	50% RB mid	848.3	24.20	23.17	22.49
		836.5	24.21	23.30	22.54
		824.7	24.32	23.55	22.34
	100% RB	848.3	23.28	22.35	21.22
		836.5	23.25	22.34	21.23
		824.7	23.31	22.48	21.37
3MHz	1 RB high	847.5	24.22	23.58	22.39
		836.5	24.16	23.69	22.44
		825.5	24.21	23.81	22.53
	1 RB low	847.5	24.14	23.59	22.33
		836.5	24.22	23.77	22.44
		825.5	24.25	23.86	22.51
	50% RB mid	847.5	23.19	22.28	21.19
		836.5	23.19	22.34	21.25
		825.5	23.26	22.36	21.29
	100% RB	847.5	23.19	22.19	21.15
		836.5	23.22	22.23	21.20
		825.5	23.26	22.27	21.23
5MHz	1 RB high	846.5	24.16	23.00	22.12
		836.5	24.09	23.02	22.14
		826.5	24.20	23.09	22.18
	1 RB low	846.5	24.11	23.03	22.14
		836.5	24.12	23.05	22.15
		826.5	24.20	23.12	22.20
	50% RB mid	846.5	23.17	22.26	21.21
		836.5	23.25	22.35	21.27
		826.5	23.30	22.42	21.33
	100% RB	846.5	23.24	22.24	21.23
		836.5	23.25	22.27	21.25
		826.5	23.27	22.29	21.28
10MHz	1 RB high	844.0	24.27	23.69	22.46
		836.5	24.17	23.72	22.41
		829.0	24.20	23.78	22.50
	1 RB low	844.0	24.14	23.70	22.42

		836.5	24.20	23.84	22.50
		829.0	24.25	23.80	22.50
	50% RB mid	844.0	23.17	22.31	21.22
		836.5	23.30	22.39	21.37
		829.0	23.34	22.44	21.40
	100% RB	844.0	23.24	22.25	21.28
		836.5	23.32	22.31	21.33
829.0		23.37	22.39	21.40	
15MHz	1 RB high	841.5	24.15	23.62	22.36
		836.5	24.10	23.68	22.35
		831.5	24.06	23.63	22.35
	1 RB low	841.5	24.14	23.71	22.40
		836.5	24.14	23.76	22.43
		831.5	24.14	23.77	22.45
	50% RB mid	841.5	23.30	22.28	21.25
		836.5	23.33	22.31	21.29
		831.5	23.37	22.31	21.34
	100% RB	841.5	23.30	22.24	21.23
		836.5	23.32	22.27	21.30
		831.5	23.36	22.35	21.36

**LTE band 38**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2617.5	22.61	21.89	21.17
		2595.0	22.78	22.02	21.31
		2572.5	22.76	21.78	20.77
	1 RB low	2617.5	22.64	21.94	21.21
		2595.0	22.77	22.02	21.32
		2572.5	22.78	21.81	20.80
	50% RB mid	2617.5	21.72	20.83	19.64
		2595.0	21.87	20.94	19.85
		2572.5	21.87	20.97	19.91
	100% RB	2617.5	21.71	20.75	19.65
		2595.0	21.87	20.91	19.84
		2572.5	21.89	20.95	19.85
10MHz	1 RB high	2615.0	22.71	21.81	20.68
		2595.0	22.84	21.96	20.83
		2575.0	22.84	21.93	20.77
	1 RB low	2615.0	22.76	21.89	20.76
		2595.0	22.91	22.01	20.85
		2575.0	22.91	22.01	20.86
	50% RB mid	2615.0	21.80	20.90	19.78
		2595.0	21.90	20.94	19.87
		2575.0	21.90	21.00	19.91
	100% RB	2615.0	21.81	20.91	19.80
		2595.0	21.92	20.98	19.90
		2575.0	21.93	21.00	19.96
15MHz	1 RB high	2612.5	22.69	21.90	20.91
		2595.0	22.77	22.00	21.03
		2577.5	22.85	22.07	21.04
	1 RB low	2612.5	22.76	21.99	21.00
		2595.0	22.90	22.14	21.16
		2577.5	22.93	22.15	21.16
	50% RB mid	2612.5	21.83	20.84	19.73
		2595.0	21.91	20.91	19.86
		2577.5	21.93	20.92	19.92
	100% RB	2612.5	21.85	20.86	19.84
		2595.0	21.97	20.97	19.93
		2577.5	21.95	20.97	19.98
20MHz	1 RB high	2610.0	22.68	21.94	20.94
		2595.0	22.78	22.03	21.04
		2580.0	22.90	22.14	21.14
	1 RB low	2610.0	22.80	22.04	21.05



		2595.0	22.91	22.18	21.18
		2580.0	22.99	22.18	21.19
	50% RB mid	2610.0	21.78	20.91	19.84
		2595.0	21.85	21.02	19.93
		2580.0	21.91	21.01	20.00
	100% RB	2610.0	21.79	20.82	19.86
		2595.0	21.89	20.93	19.94
		2580.0	21.90	20.96	20.02

**LTE band 41**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	22.60	21.89	21.22
		2593.0	22.87	22.13	21.41
		2498.5	23.03	22.06	21.05
	1 RB low	2687.5	22.54	21.88	21.18
		2593.0	22.92	22.18	21.48
		2498.5	23.03	22.03	21.00
	50% RB mid	2687.5	21.73	20.82	19.69
		2593.0	21.95	21.06	19.90
		2498.5	22.16	21.27	20.15
	100% RB	2687.5	21.67	20.74	19.60
		2593.0	21.92	20.99	19.85
		2498.5	22.12	21.15	20.12
10MHz	1 RB high	2685.0	22.70	21.88	20.73
		2593.0	22.96	22.07	20.93
		2501.0	23.25	22.30	21.16
	1 RB low	2685.0	22.60	21.74	20.63
		2593.0	23.03	22.15	21.02
		2501.0	23.21	22.26	21.10
	50% RB mid	2685.0	21.72	20.77	19.69
		2593.0	21.98	21.05	19.90
		2501.0	22.23	21.28	20.24
	100% RB	2685.0	21.71	20.77	19.67
		2593.0	22.03	21.05	19.97
		2501.0	22.19	21.26	20.21
15MHz	1 RB high	2682.5	22.59	21.85	20.91
		2593.0	22.86	22.09	21.09
		2503.5	23.24	22.42	21.40
	1 RB low	2682.5	22.59	21.80	20.90
		2593.0	22.96	22.22	21.22
		2503.5	23.14	22.31	21.33
	50% RB mid	2682.5	21.71	20.70	19.64
		2593.0	22.00	21.00	19.90
		2503.5	22.30	21.24	20.25
	100% RB	2682.5	21.71	20.70	19.69
		2593.0	22.01	21.02	20.02
		2503.5	22.26	21.24	20.24
20MHz	1 RB high	2680.0	22.66	21.93	20.98
		2593.0	22.89	22.16	21.17
		2506.0	23.30	22.51	21.54
	1 RB low	2680.0	22.56	21.84	20.85



		2593.0	22.96	22.24	21.23
		2506.0	23.14	22.33	21.35
	50% RB mid	2680.0	21.62	20.71	19.64
		2593.0	21.96	21.06	20.02
		2506.0	22.26	21.28	20.39
	100% RB	2680.0	21.61	20.64	19.67
		2593.0	21.98	21.00	20.04
		2506.0	22.24	21.25	20.33



**LTE band 66**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1779.3	23.33	22.38	21.74
		1745.0	23.30	22.44	21.40
		1710.7	23.23	22.24	21.59
	1 RB low	1779.3	23.37	22.42	21.79
		1745.0	23.31	22.43	21.44
		1710.7	23.27	22.21	21.62
	50% RB mid	1779.3	23.49	22.72	21.61
		1745.0	23.36	22.61	21.33
		1710.7	23.31	22.56	21.34
	100% RB	1779.3	22.47	21.39	20.79
		1745.0	22.34	21.52	20.52
		1710.7	22.32	21.51	20.40
3MHz	1 RB high	1778.5	23.45	23.04	21.74
		1745.0	23.43	22.42	21.27
		1711.5	23.40	22.41	21.24
	1 RB low	1778.5	23.47	23.05	21.72
		1745.0	23.46	22.48	21.35
		1711.5	23.39	22.43	21.28
	50% RB mid	1778.5	22.51	21.62	20.50
		1745.0	22.43	21.51	20.42
		1711.5	22.46	21.51	20.43
	100% RB	1778.5	22.51	21.48	20.59
		1745.0	22.42	21.38	20.50
		1711.5	22.39	21.36	20.48
5MHz	1 RB high	1777.5	23.25	22.32	21.46
		1745.0	23.15	22.25	21.35
		1712.5	23.19	22.30	21.40
	1 RB low	1777.5	23.21	22.28	21.35
		1745.0	23.19	22.27	21.34
		1712.5	23.15	22.24	21.34
	50% RB mid	1777.5	22.33	21.42	20.43
		1745.0	22.27	21.35	20.36
		1712.5	22.30	21.40	20.37
	100% RB	1777.5	22.31	21.27	20.36
		1745.0	22.27	21.21	20.33
		1712.5	22.25	21.23	20.32
10MHz	1 RB high	1775.0	23.35	22.35	21.20
		1745.0	23.27	22.27	21.12
		1715.0	23.33	22.32	21.19
	1 RB low	1775.0	23.34	22.33	21.18

		1745.0	23.32	22.28	21.13	
		1715.0	23.31	22.27	21.10	
	50% RB mid	1775.0	22.32	21.45	20.44	
		1745.0	22.22	21.42	20.40	
	100% RB	1715.0	22.36	21.38	20.45	
		1775.0	22.34	21.38	20.41	
		1745.0	22.33	21.36	20.39	
15MHz	1 RB high	1715.0	22.34	21.37	20.38	
		1772.5	23.27	22.62	21.61	
		1745.0	23.14	22.57	21.57	
	1 RB low	1717.5	23.26	22.65	21.64	
		1772.5	23.15	22.58	21.56	
		1745.0	23.23	22.60	21.58	
	50% RB mid	1717.5	23.21	22.57	21.58	
		1772.5	22.38	21.34	20.36	
		1745.0	22.29	21.31	20.29	
	100% RB	1717.5	22.35	21.32	20.37	
		1772.5	22.34	21.32	20.39	
		1745.0	22.33	21.30	20.39	
	20MHz	1 RB high	1717.5	22.35	21.33	20.40
			1770.0	23.17	22.75	21.11
1745.0			23.05	22.64	20.96	
1 RB low		1720.0	23.17	22.75	21.10	
		1770.0	23.09	22.66	20.99	
		1745.0	23.14	22.71	21.04	
50% RB mid		1720.0	23.11	22.64	20.99	
		1770.0	22.27	21.33	20.31	
		1745.0	22.21	21.31	20.28	
100% RB		1720.0	22.34	21.35	20.42	
		1770.0	22.25	21.23	20.34	
		1745.0	22.30	21.28	20.37	
		1720.0	22.34	21.34	20.39	

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

## **A.2 Frequency Stability**

### **A.2.1 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°C.
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°C increments from -30°C to +50°C. 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°C.
7. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the center channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.
8. Repeat the above measurements at 10 °C decrements from +50°C to -30°C. Allow at least 1.5 hours at each temperature, unpowered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5°C during the measurement procedure.

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

## A.2.2 Measurement results

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

#### Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1850.481	1909.359		
50				4.95	0.0026
40				5.41	0.0029
30				4.59	0.0024
10				4.48	0.0024
0				2.88	0.0015
-10				6.94	0.0037
-20				3.72	0.0020
-30				2.19	0.0012

#### Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1850.481	1909.359	47.14	0.0251
4.48				6.28	0.0033

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

#### Frequency Error vs Temperature

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1710.641	1754.455		
50				-3.52	0.0020
40				-1.33	0.0008
30				-0.96	0.0006
10				-2.25	0.0013
0				0.50	0.0003
-10				-0.37	0.0002
-20				-1.23	0.0007
-30				-4.02	0.0023

#### Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1710.641	1754.455	-2.03	0.0012
4.48				-3.91	0.0023

**LTE Band 5, 10MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	824.256	848.808		
50				8.37	0.0100
40				-2.83	0.0034
30				-2.93	0.0035
10				-2.85	0.0034
0				0.37	0.0004
-10				-1.54	0.0018
-20				-2.26	0.0027
-30				-5.05	0.0060

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.256	848.808	-0.73	0.0009
4.48				-1.49	0.0018

**LTE Band 7, 20MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2500.353	2569.615		
50				0.99	0.0004
40				-2.96	0.0012
30				0.89	0.0004
10				-2.32	0.0009
0				0.20	0.0001
-10				34.16	0.0135
-20				-3.42	0.0013
-30				-0.37	0.0001

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2500.353	2569.615	42.36	0.0167
4.48				2.93	0.0012

**LTE Band 12, 10MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	699.417	715.583		
50				-9.36	0.0132
40				-11.60	0.0164
30				-12.82	0.0181
10				-14.25	0.0201
0				-12.36	0.0175
-10				-10.96	0.0155
-20				-10.71	0.0151
-30				-8.93	0.0126

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	699.417	715.583	-9.61	0.0136
4.48				-10.30	0.0146

**LTE Band 13, 10MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	777.465	786.535		
50				-15.34	0.0196
40				-12.92	0.0165
30				-13.59	0.0174
10				-12.75	0.0163
0				-10.66	0.0136
-10				-13.26	0.0170
-20				-10.57	0.0135
-30				-14.22	0.0182

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	777.465	786.535	-15.02	0.0192
4.48				-10.73	0.0137

**LTE Band 17, 10MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	704.385	715.551		
50				-13.23	0.0186
40				-12.46	0.0175
30				-12.57	0.0177
10				-11.03	0.0155
0				-11.50	0.0162
-10				-15.11	0.0213
-20				-11.62	0.0164
-30				-14.91	0.0210

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	704.385	715.551	-11.63	0.0164
4.48				-17.61	0.0248

**LTE Band 26(814MHz~824MHz), 10MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	814.250	823.712		
50				3.99	0.0049
40				-3.39	0.0041
30				-1.50	0.0018
10				-2.96	0.0036
0				-1.37	0.0017
-10				-2.06	0.0025
-20				-2.05	0.0025
-30				-2.05	0.0025

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	814.250	823.712	-4.51	0.0055
4.48				-3.08	0.0038

**LTE Band 26(824MHz~849MHz), 15MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	824.313	848.736		
50				0.97	0.0012
40				1.36	0.0016
30				0.01	0.0000
10				-0.64	0.0008
0				-0.16	0.0002
-10				-1.52	0.0018
-20				0.39	0.0005
-30				-1.17	0.0014

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	824.313	848.736	-3.13	0.0037
4.48				-1.26	0.0015

**LTE Band 38, 20MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2570.513	2619.455		
50				0.39	0.0002
40				-1.14	0.0004
30				-3.35	0.0013
10				2.49	0.0010
0				5.26	0.0020
-10				-2.49	0.0010
-20				2.65	0.0010
-30				0.96	0.0004

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2570.513	2619.455	-1.39	0.0005
4.48				-0.97	0.0004



**LTE Band 41, 20MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	2496.417	2689.487		
50				0.21	0.0001
40				2.12	0.0008
30				0.50	0.0002
10				1.19	0.0005
0				0.11	0.0000
-10				1.22	0.0005
-20				1.00	0.0004
-30				-1.02	0.0004

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	2496.417	2689.487	55.36	0.0213
4.48				2.98	0.0011

**LTE Band 66, 20MHz bandwidth QPSK (worst case of all bandwidths)**
**Frequency Error vs Temperature**

Temperature(°C)	Voltage(V)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
20	3.89	1710.705	1779.487		
50				4.41	0.0025
40				2.39	0.0014
30				1.90	0.0011
10				32.69	0.0187
0				-0.77	0.0004
-10				-1.47	0.0008
-20				2.03	0.0012
-30				-3.56	0.0020

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.6	20	1710.705	1779.487	-3.19	0.0018
4.48				0.09	0.0001

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

### **A.3 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.

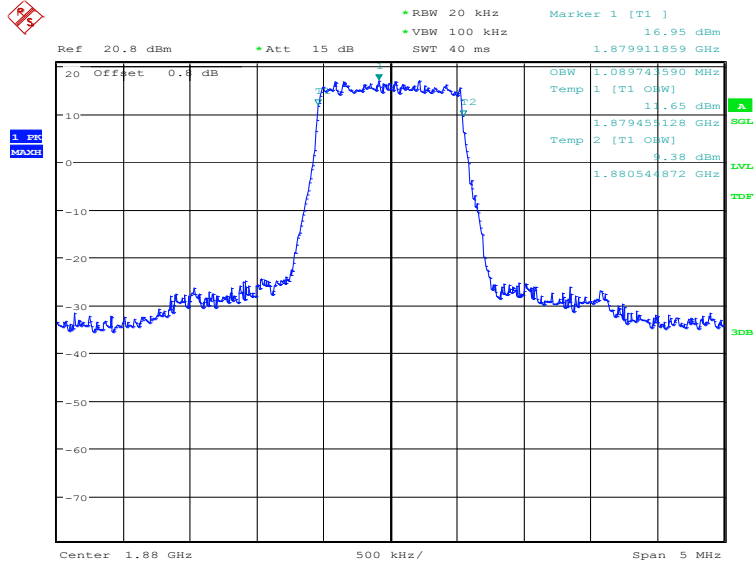
The measurement method is from ANSI C63.26:

- 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  $\geq 3 \times$  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%)

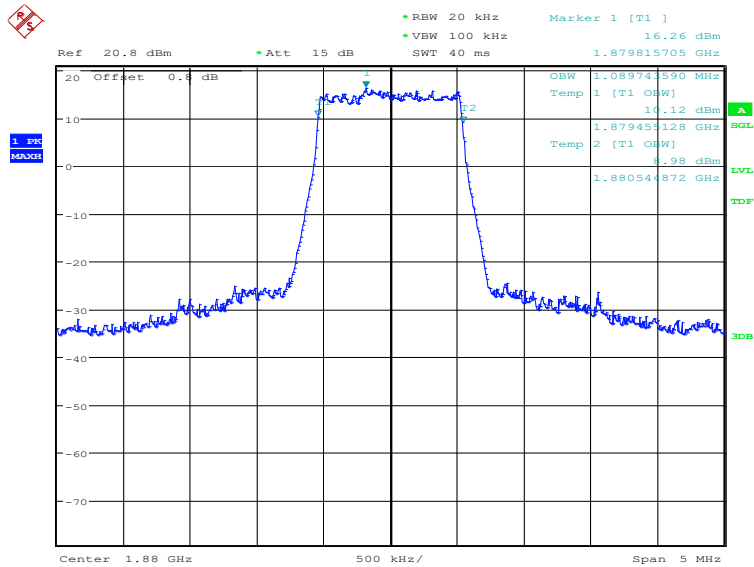
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	1089.74	1089.74

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



Date: 28.NOV.2022 10:25:00

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

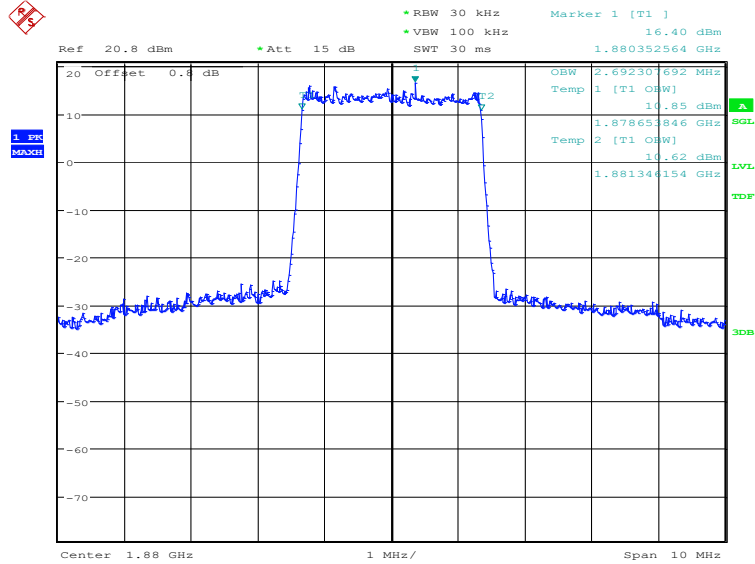


Date: 28.NOV.2022 10:25:40

### LTE band 2, 3MHz (99%)

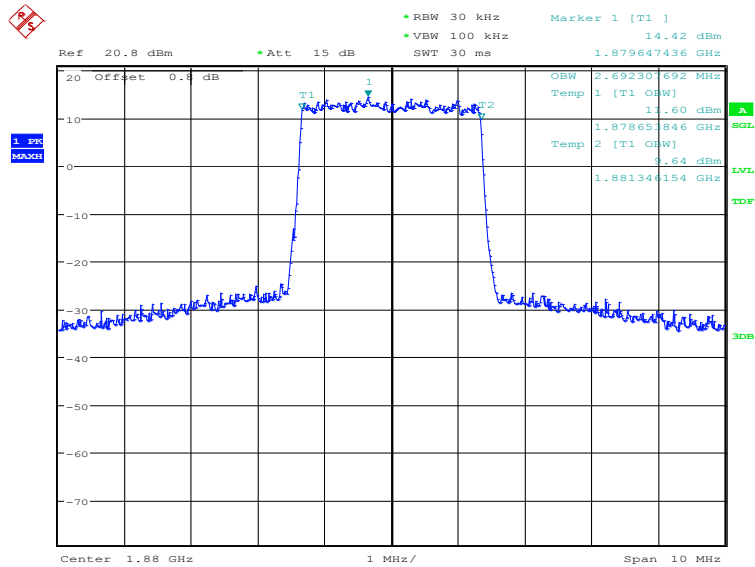
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 28.NOV.2022 10:26:22

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

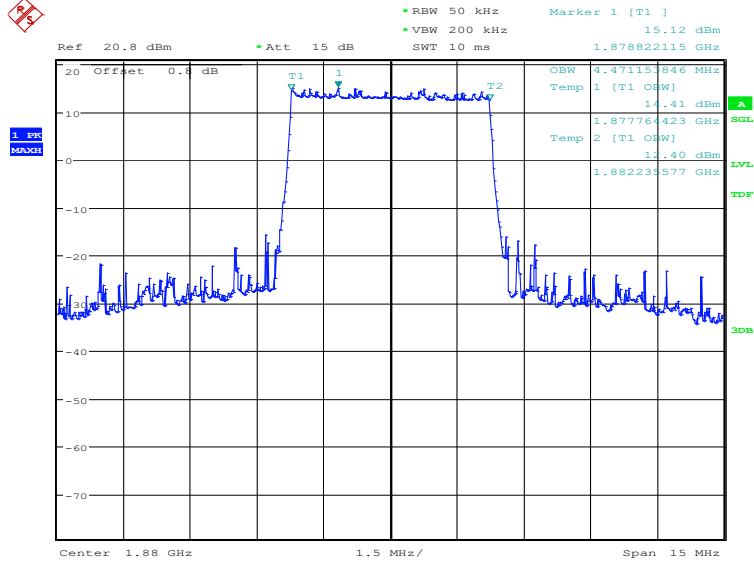


Date: 28.NOV.2022 10:27:02

**LTE band 2, 5MHz (99%)**

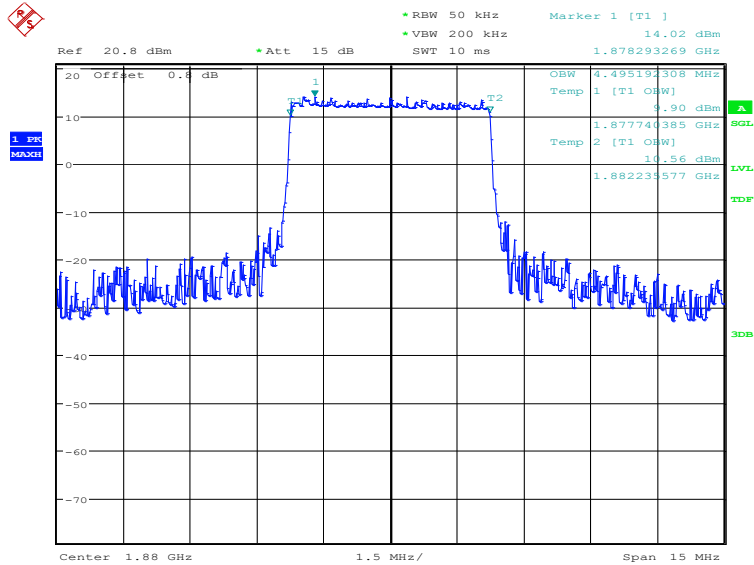
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	4471.15	4495.19

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



Date: 28.NOV.2022 10:27:44

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

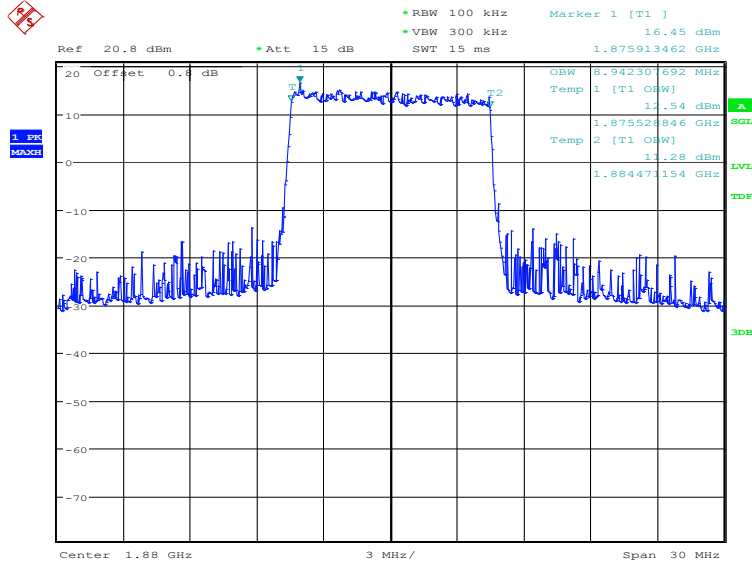


Date: 28.NOV.2022 10:28:24

### LTE band 2, 10MHz (99%)

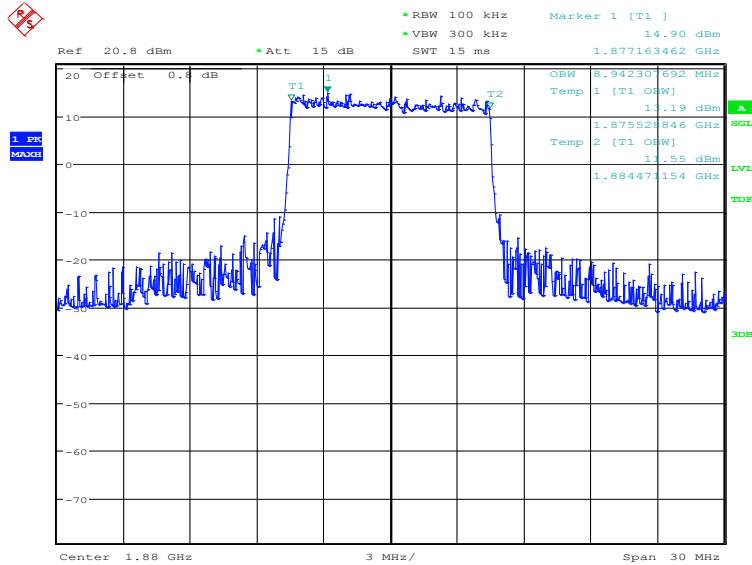
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 28.NOV.2022 10:29:05

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

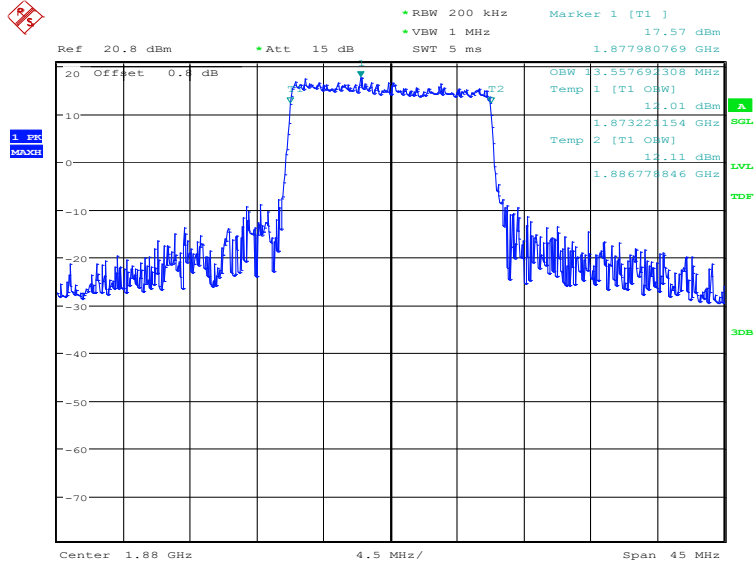


Date: 28.NOV.2022 10:29:45

**LTE band 2, 15MHz (99%)**

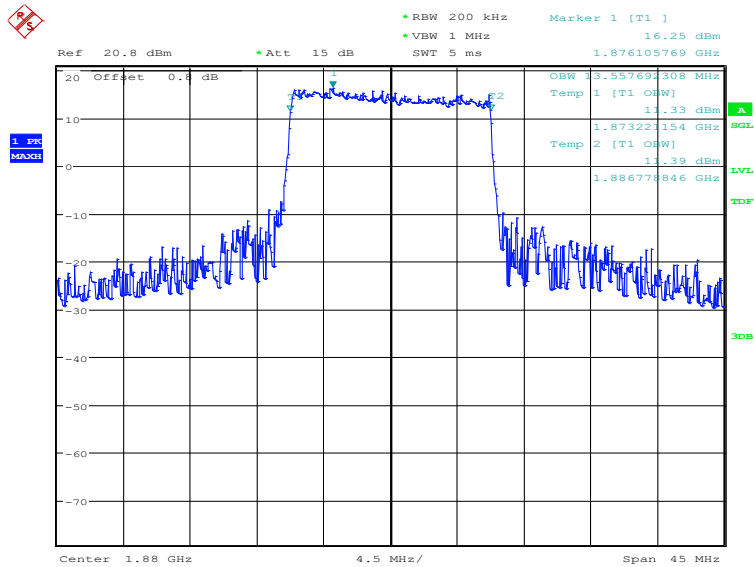
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	13557.69	13557.69

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



Date: 28.NOV.2022 10:30:27

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

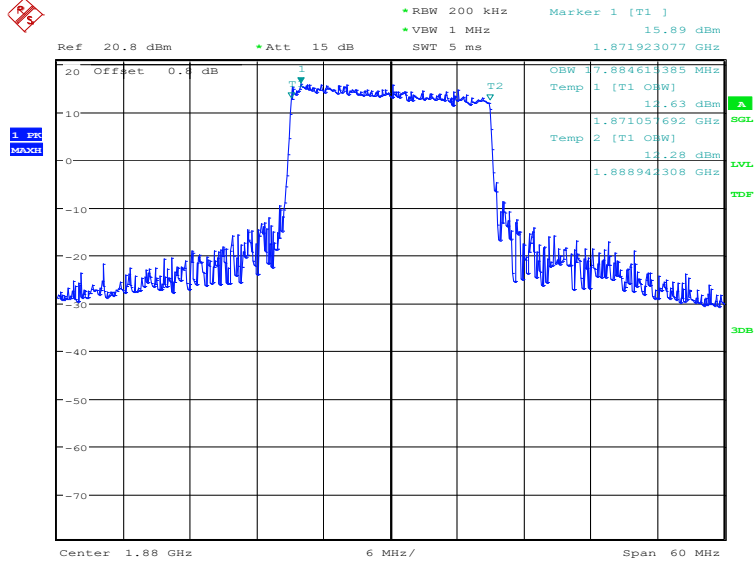


Date: 28.NOV.2022 10:31:07

**LTE band 2, 20MHz (99%)**

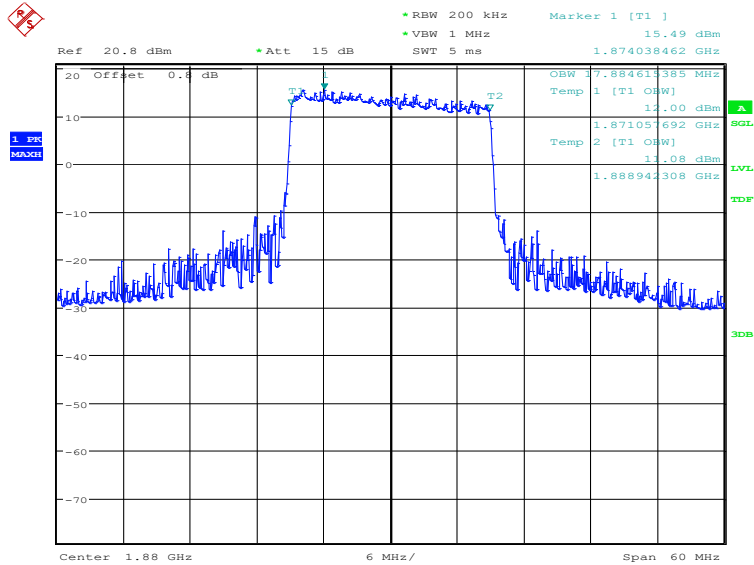
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1880.0	QPSK	16QAM
	17884.62	17884.62

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



Date: 28.NOV.2022 10:31:48

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



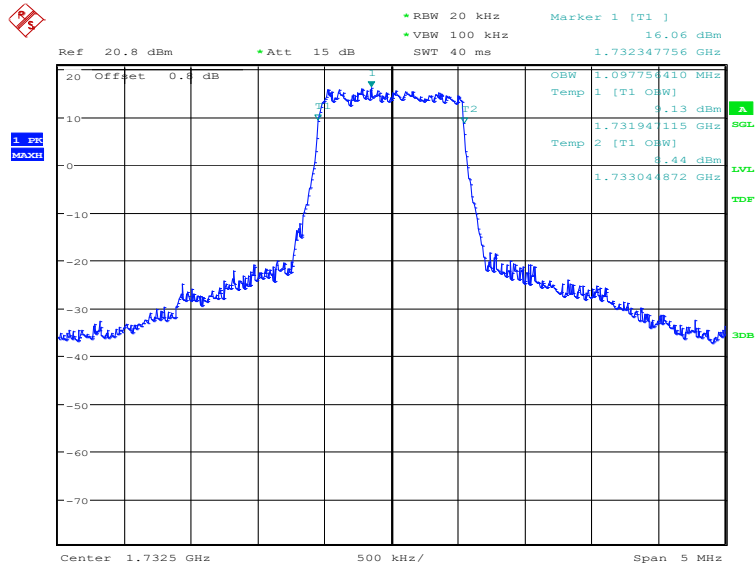
Date: 28.NOV.2022 10:32:28



### LTE band 4, 1.4MHz (99%)

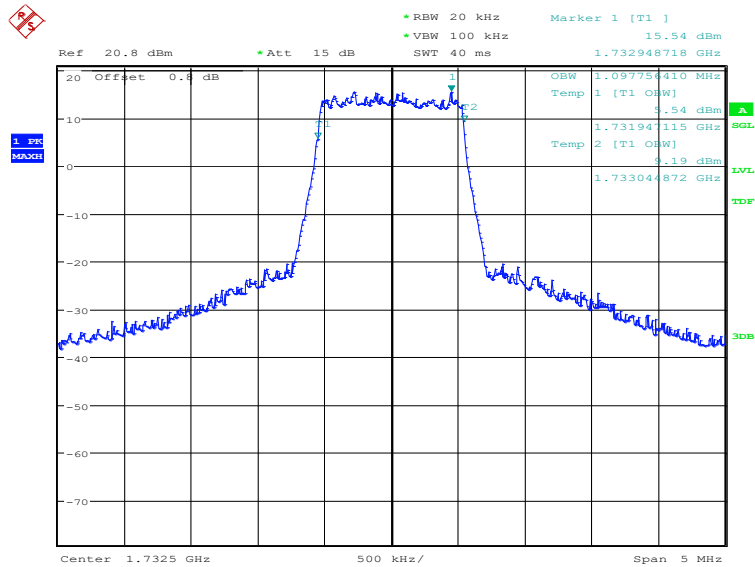
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	1097.76	1097.76

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



Date: 28.NOV.2022 10:33:11

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

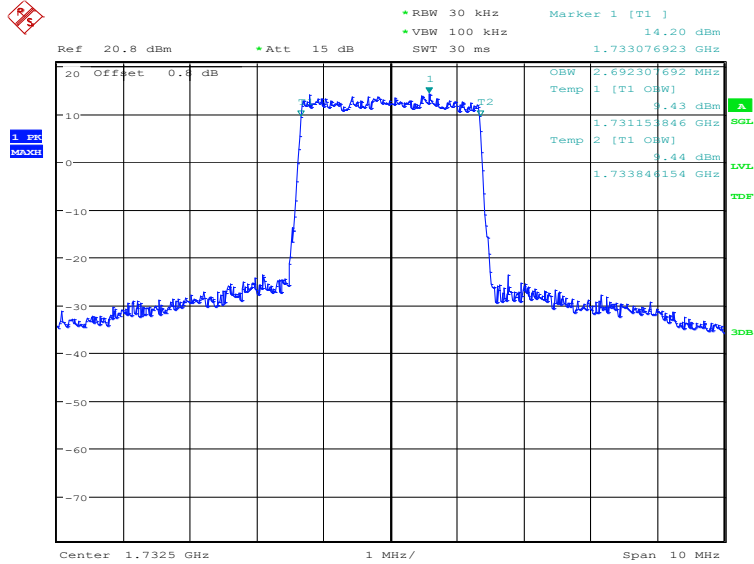


Date: 28.NOV.2022 10:33:51

**LTE band 4, 3MHz (99%)**

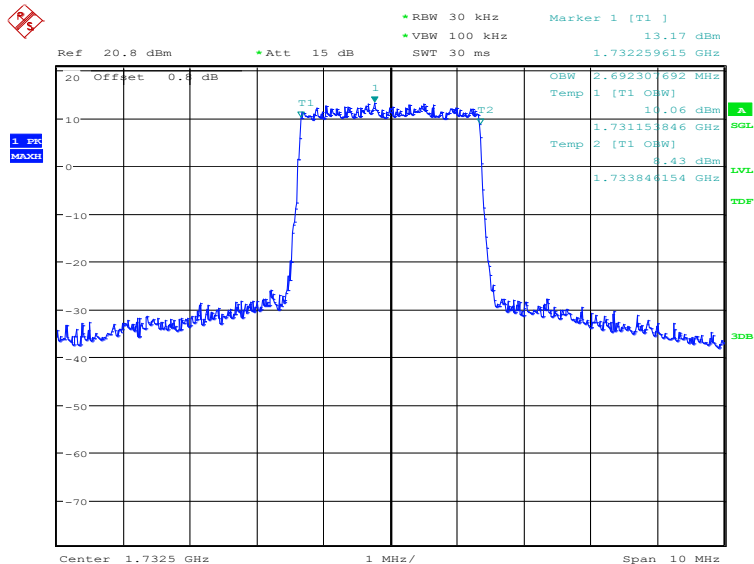
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 28.NOV.2022 10:34:32

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

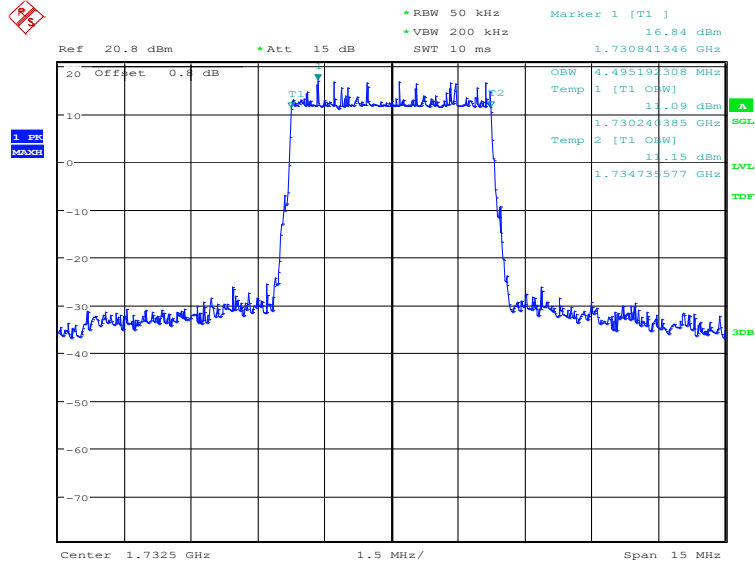


Date: 28.NOV.2022 10:35:11

### LTE band 4, 5MHz (99%)

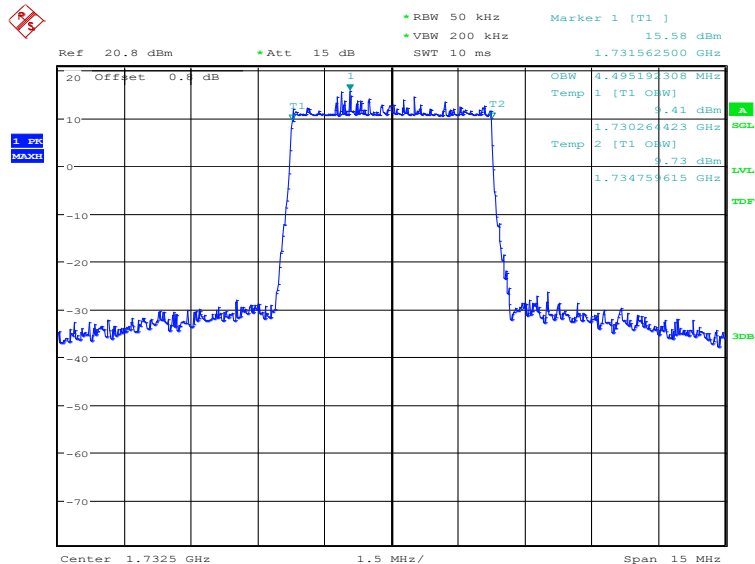
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	4495.19	4495.19

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



Date: 28.NOV.2022 10:35:53

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

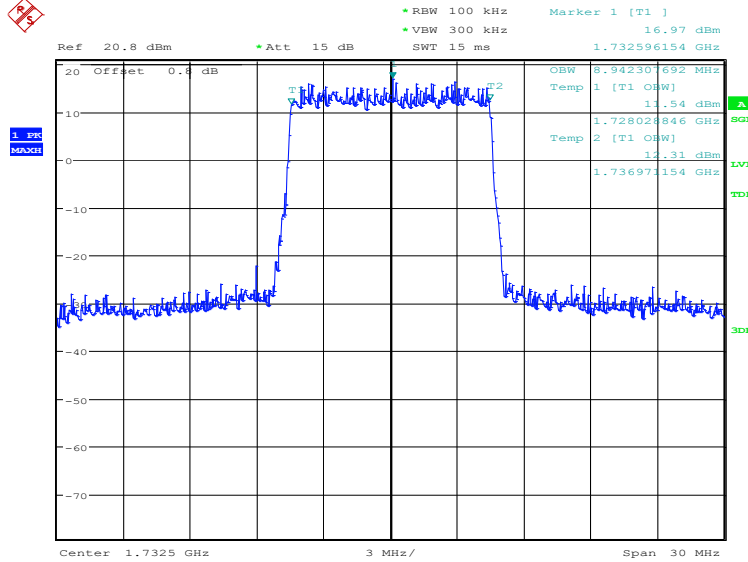


Date: 28.NOV.2022 10:36:32

**LTE band 4, 10MHz (99%)**

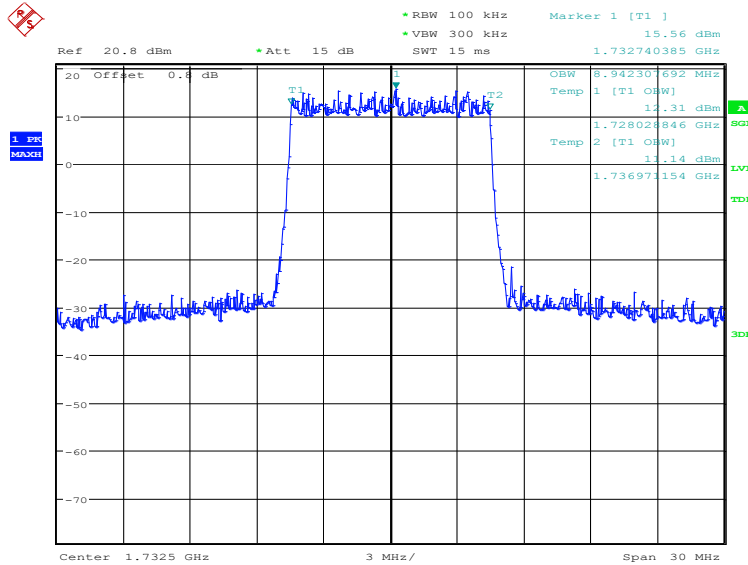
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 28.NOV.2022 10:37:13

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

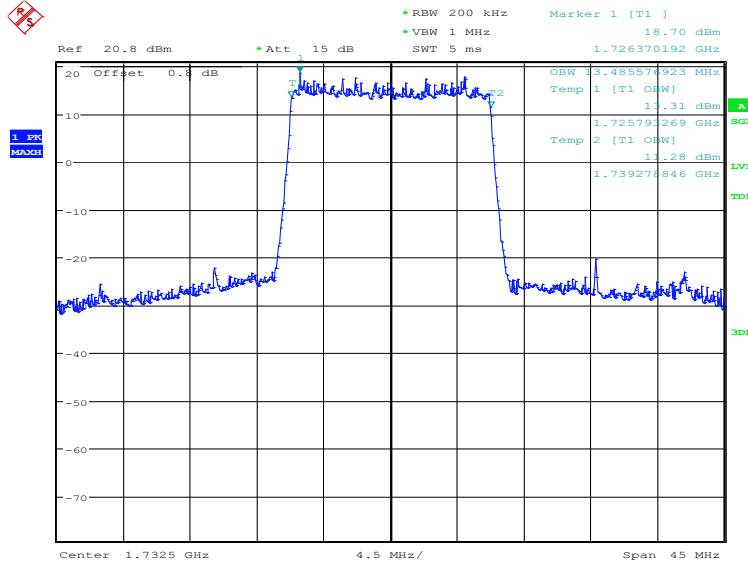


Date: 28.NOV.2022 10:37:53

### LTE band 4, 15MHz (99%)

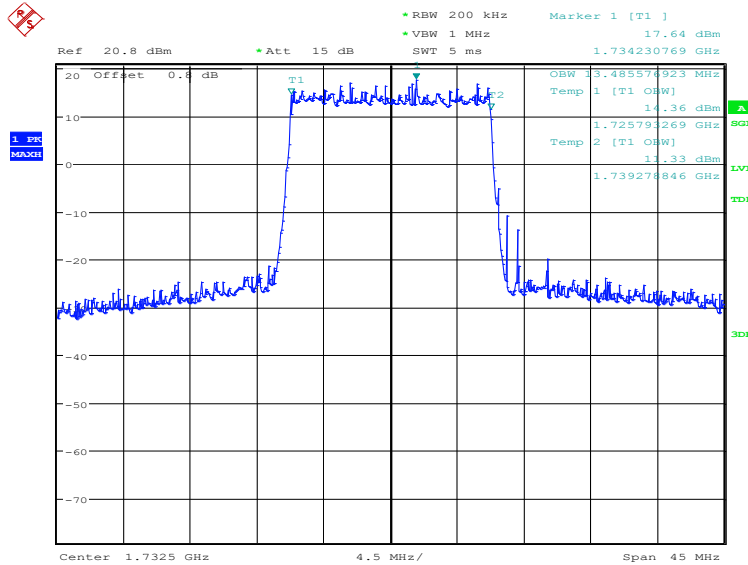
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 28.NOV.2022 10:38:34

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

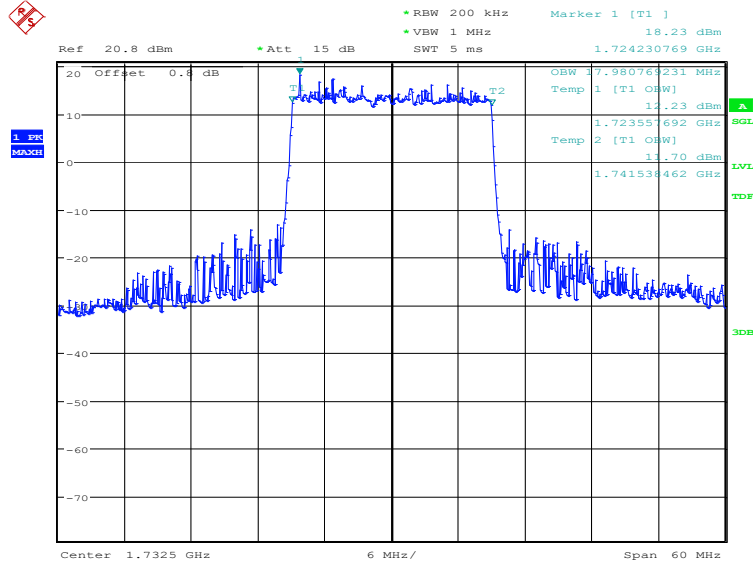


Date: 28.NOV.2022 10:39:14

### LTE band 4, 20MHz (99%)

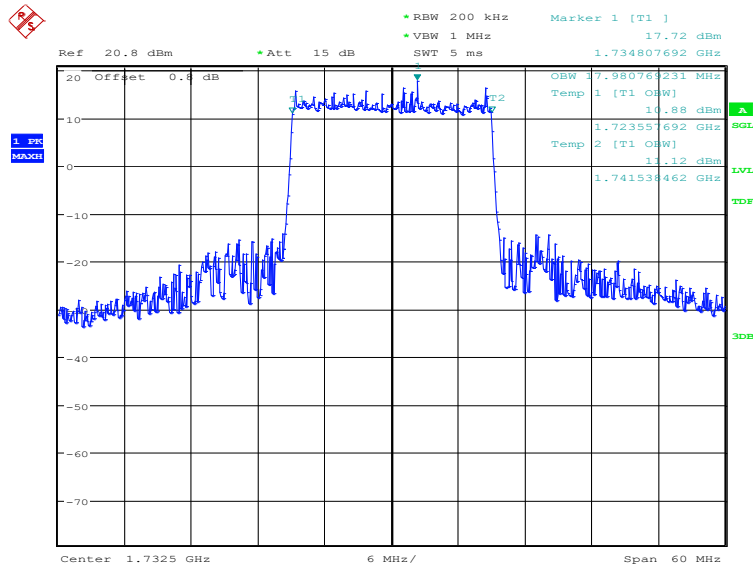
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1732.5	QPSK	16QAM
	17980.77	17980.77

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



Date: 28.NOV.2022 10:39:55

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

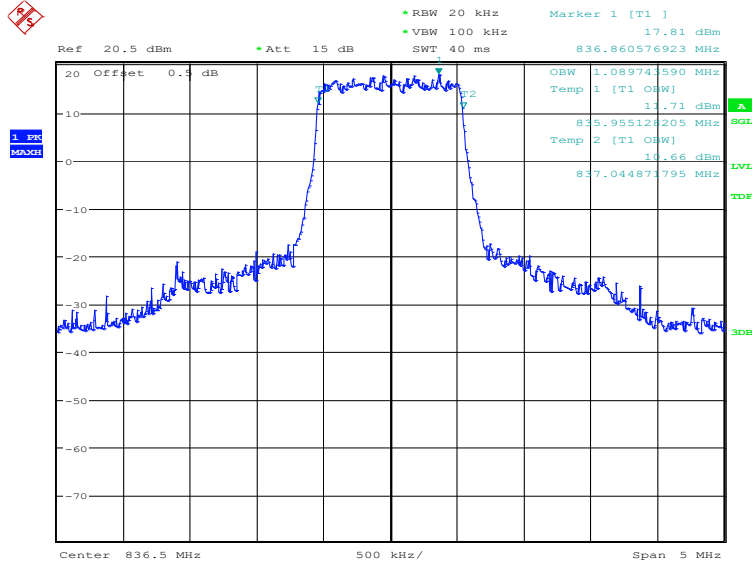


Date: 28.NOV.2022 10:40:35

**LTE band 5, 1.4MHz (99%)**

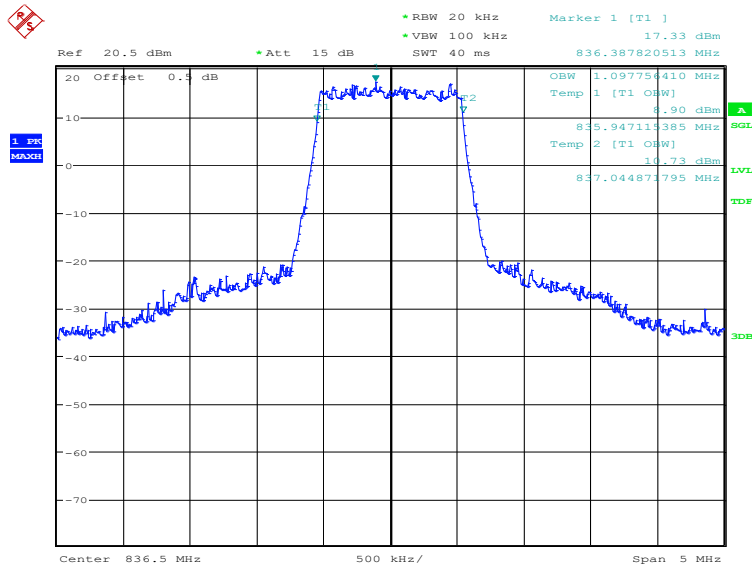
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1089.74	1097.76

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



Date: 24.NOV.2022 18:35:52

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

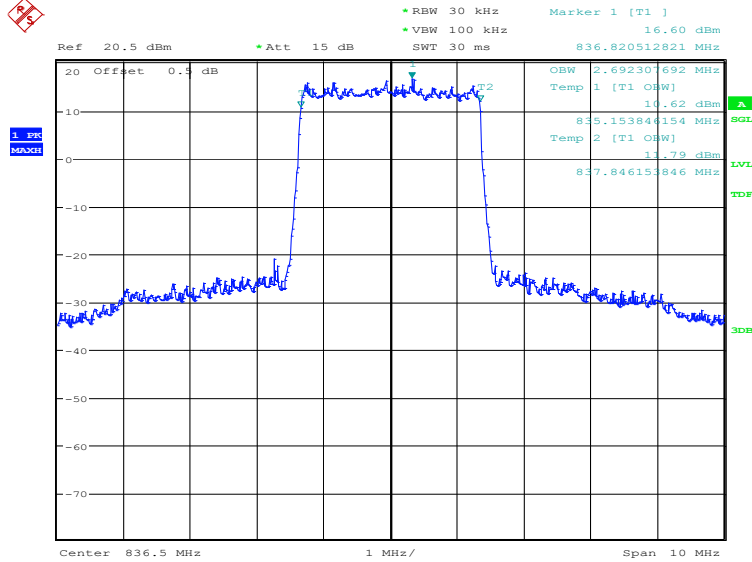


Date: 24.NOV.2022 18:36:32

**LTE band 5, 3MHz (99%)**

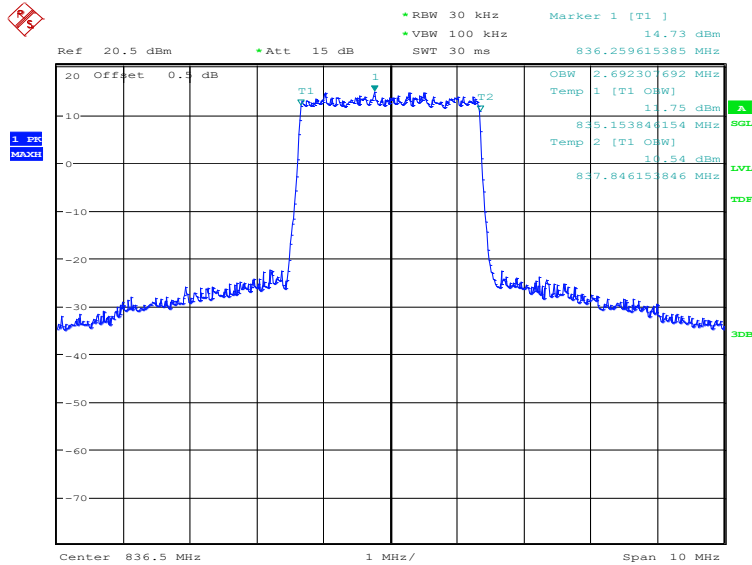
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 24.NOV.2022 18:37:13

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



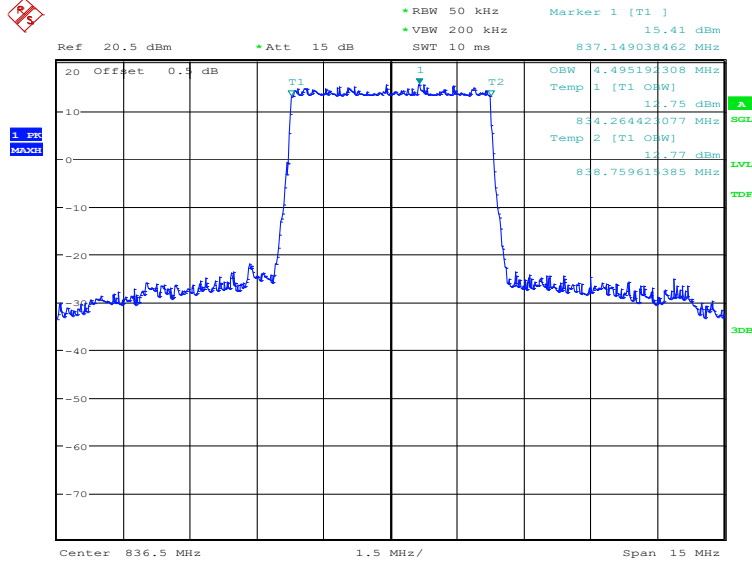
Date: 24.NOV.2022 18:37:53



### LTE band 5, 5MHz (99%)

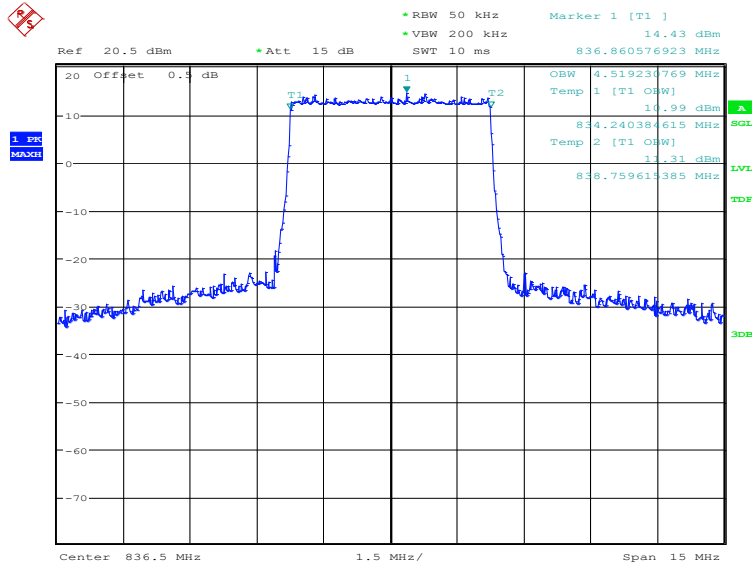
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4519.23

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



Date: 24.NOV.2022 18:38:34

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

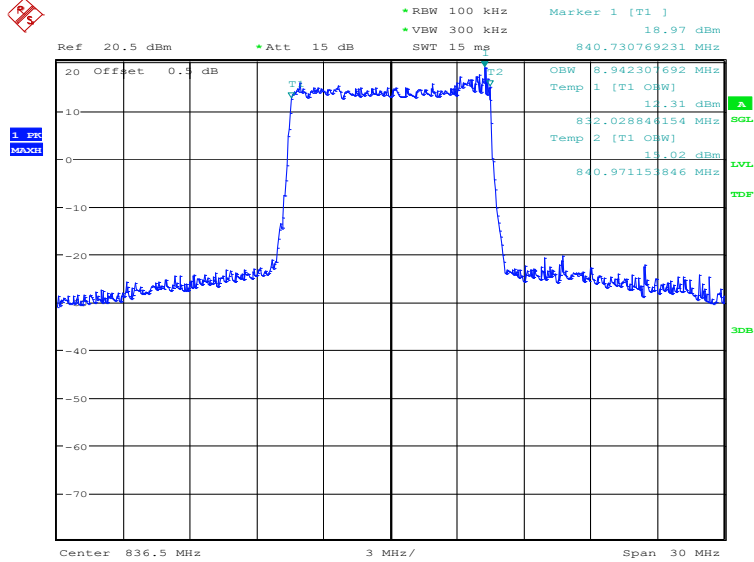


Date: 24.NOV.2022 18:39:14

**LTE band 5, 10MHz (99%)**

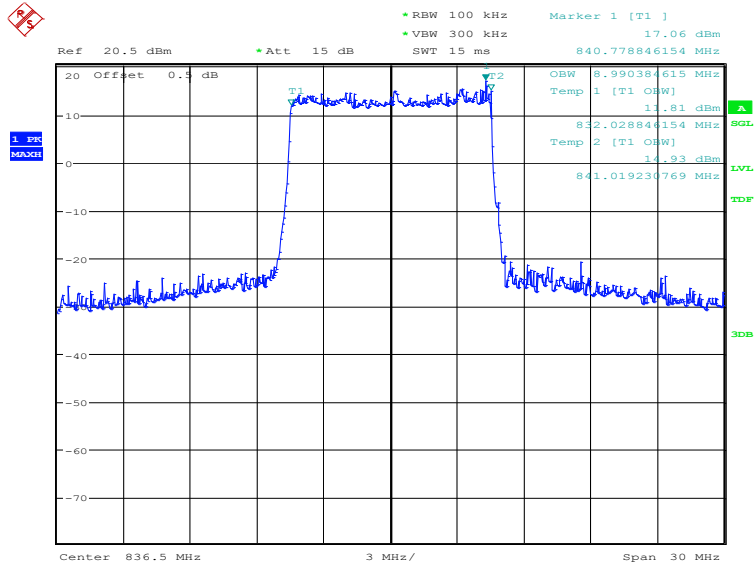
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8990.38

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



Date: 24.NOV.2022 18:39:55

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

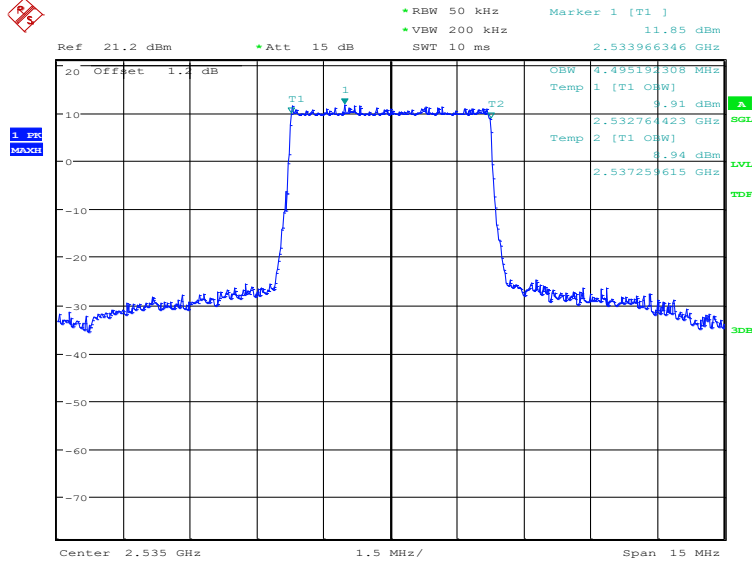


Date: 24.NOV.2022 18:40:35

### LTE band 7, 5MHz (99%)

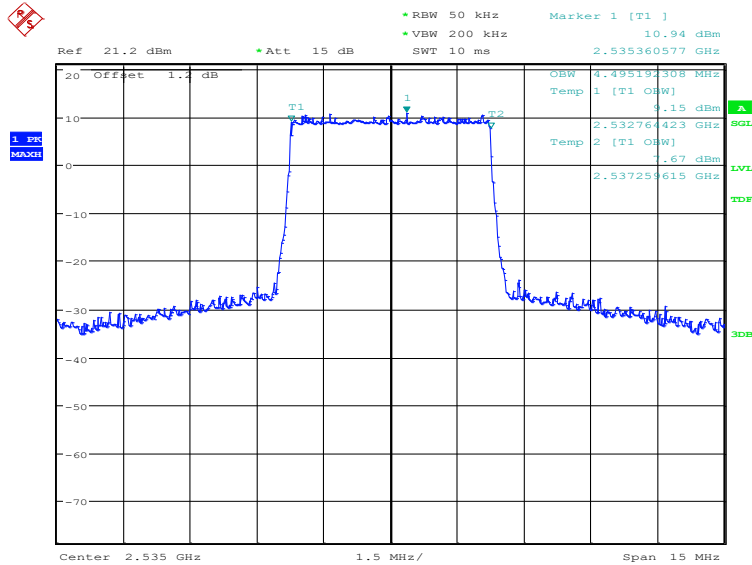
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 28.NOV.2022 14:49:38

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

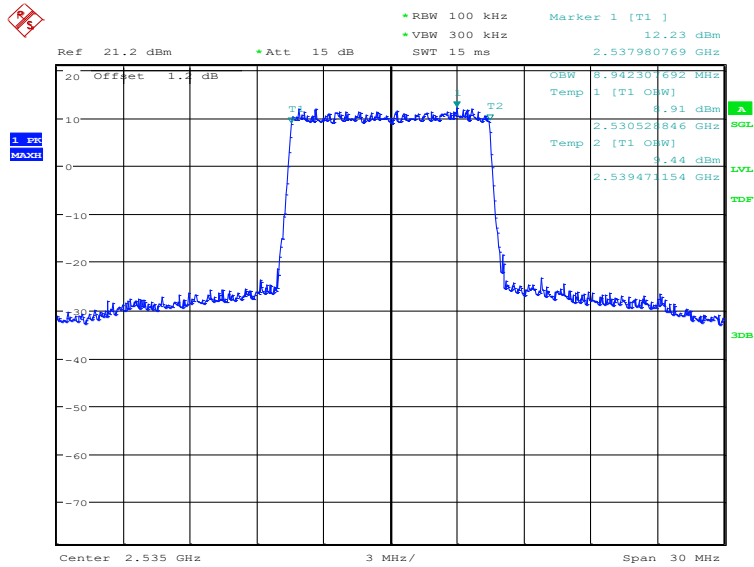


Date: 28.NOV.2022 14:50:18

### LTE band 7, 10MHz (99%)

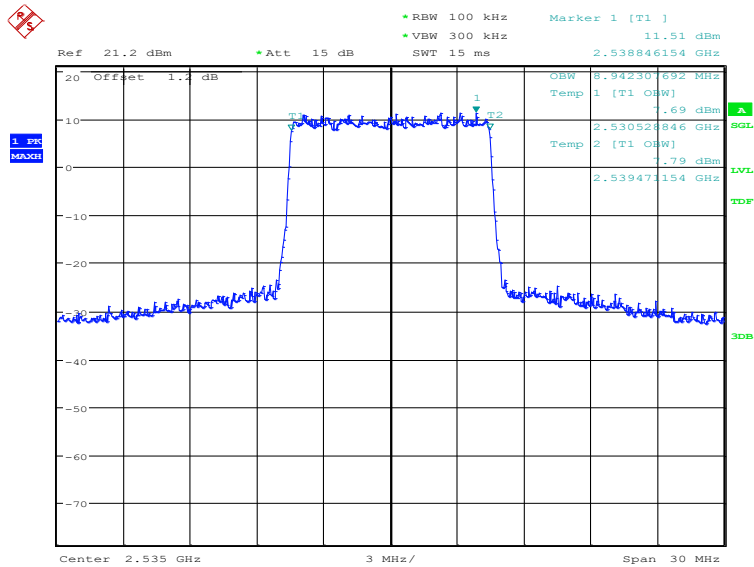
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 28.NOV.2022 14:51:00

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

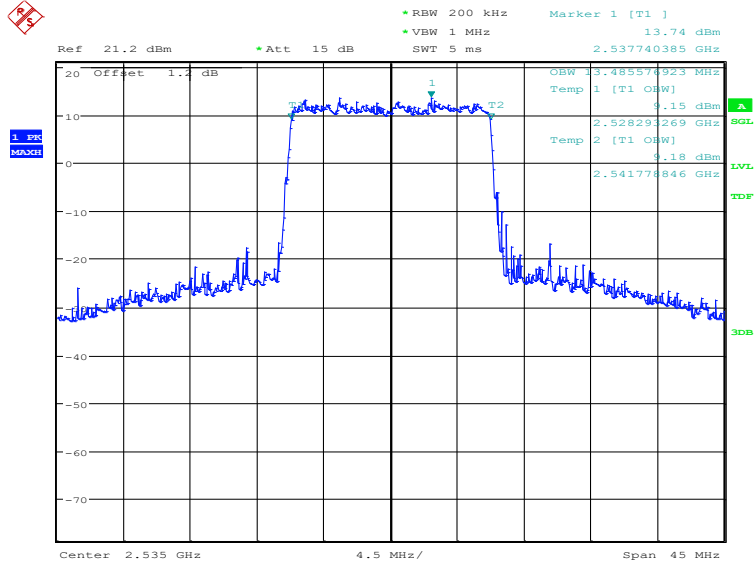


Date: 28.NOV.2022 14:51:39

**LTE band 7, 15MHz (99%)**

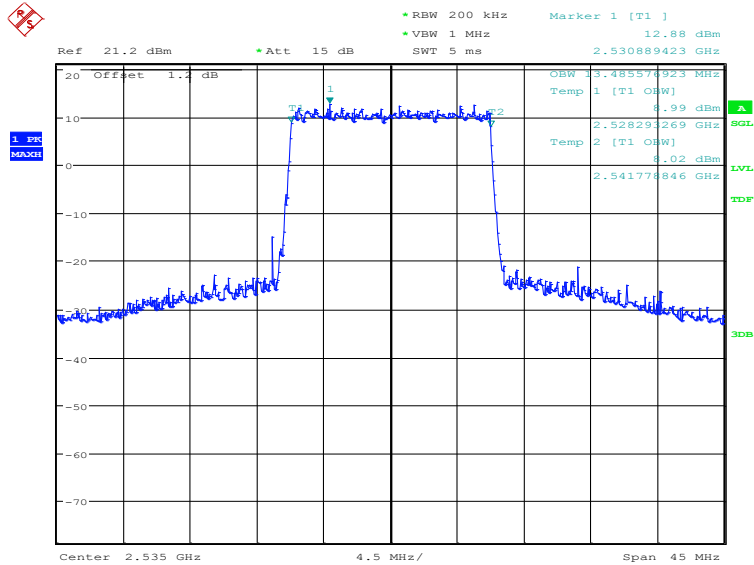
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 28.NOV.2022 14:52:21

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

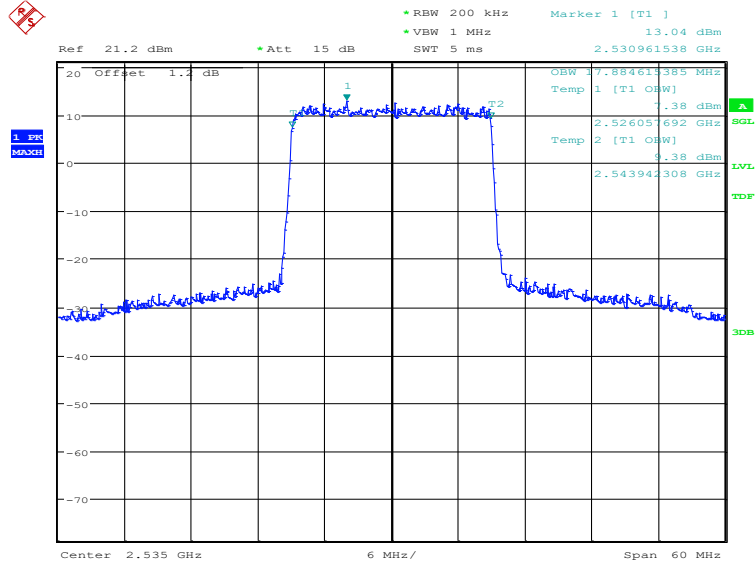


Date: 28.NOV.2022 14:53:01

### LTE band 7, 20MHz (99%)

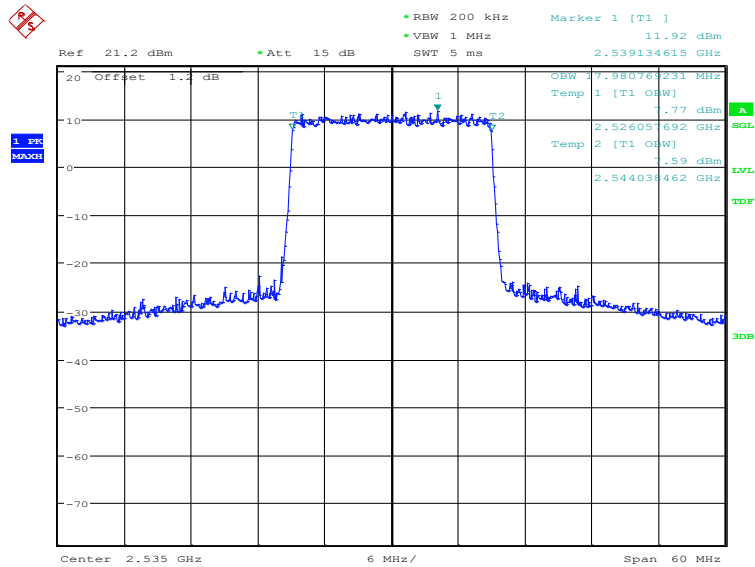
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2535.0	QPSK	16QAM
	17884.62	17980.77

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



Date: 28.NOV.2022 14:53:42

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

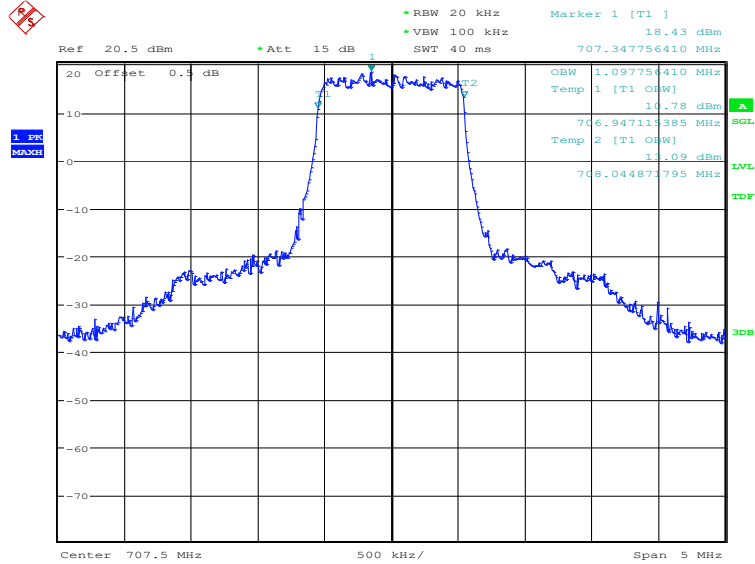


Date: 28.NOV.2022 14:54:22

### LTE band 12, 1.4MHz (99%)

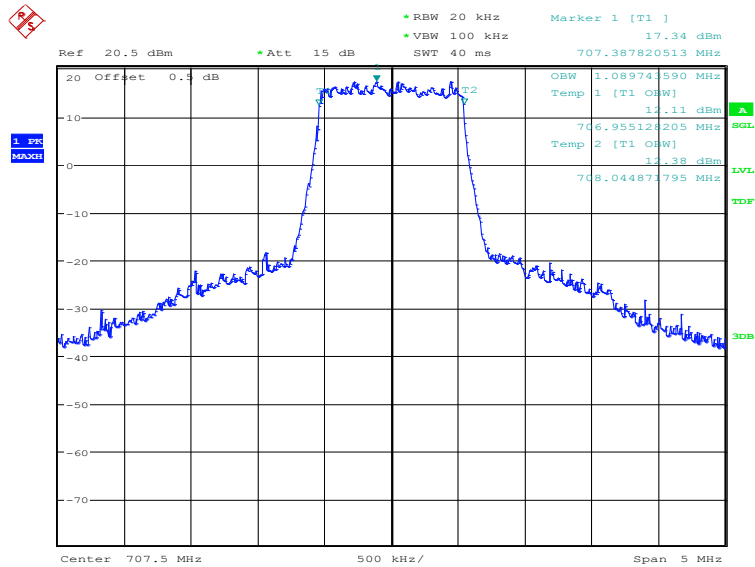
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	1097.76	1089.74

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



Date: 24.NOV.2022 18:41:17

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

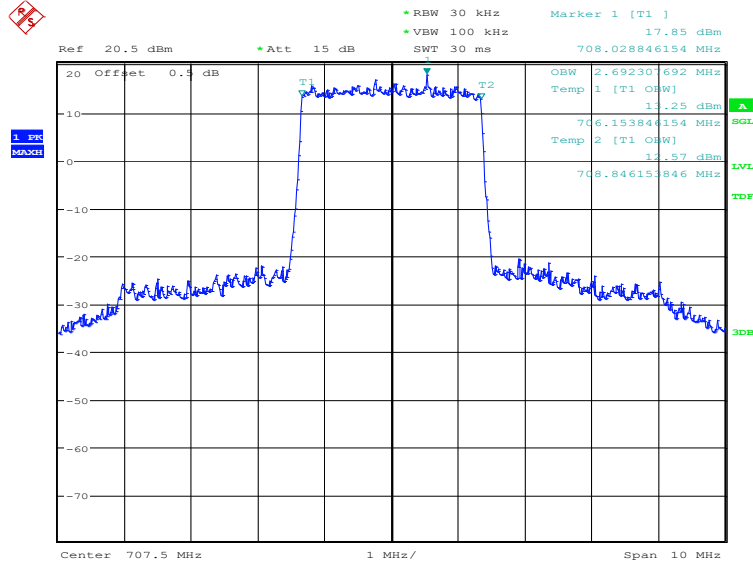


Date: 24.NOV.2022 18:41:57

### LTE band 12, 3MHz (99%)

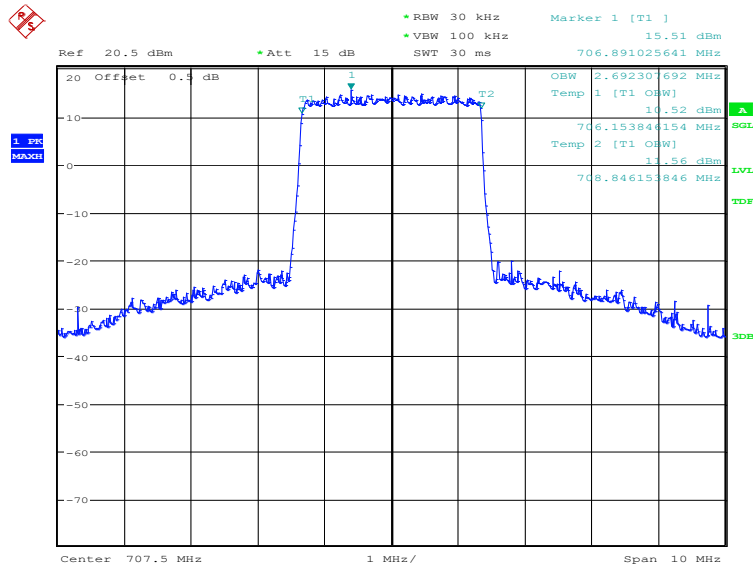
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 24.NOV.2022 18:42:39

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



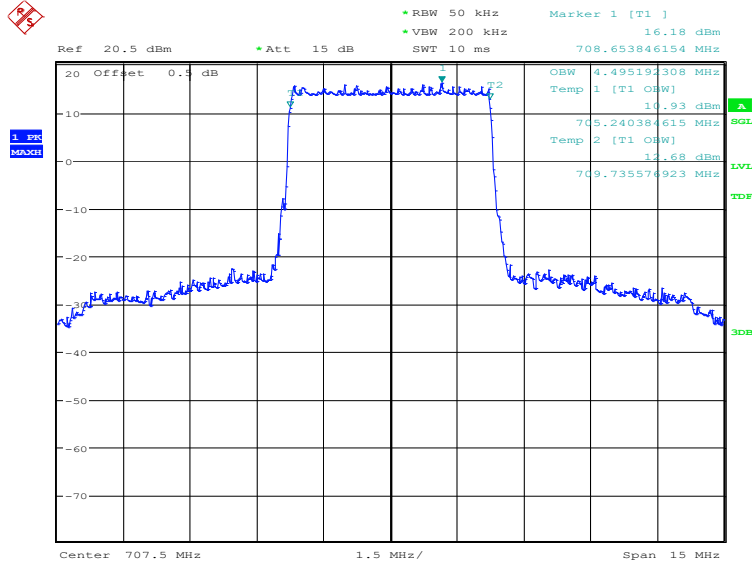
Date: 24.NOV.2022 18:43:18



**LTE band 12, 5MHz (99%)**

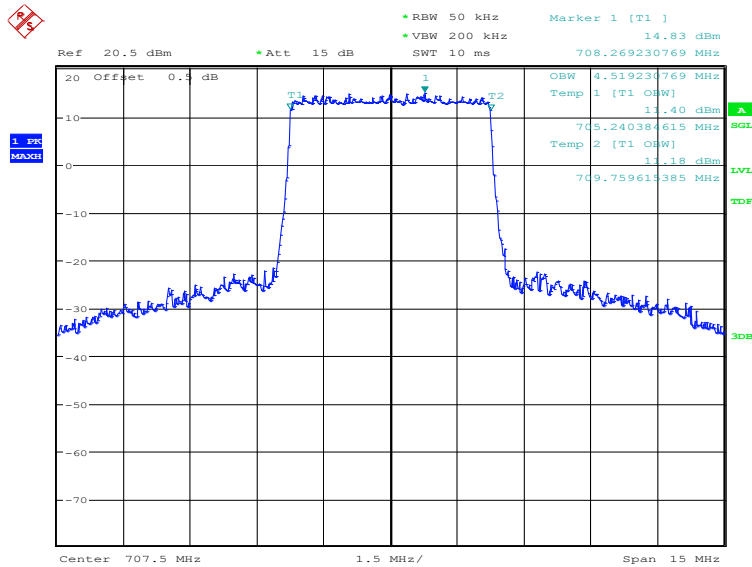
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	4495.19	4519.23

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



Date: 24.NOV.2022 18:44:00

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

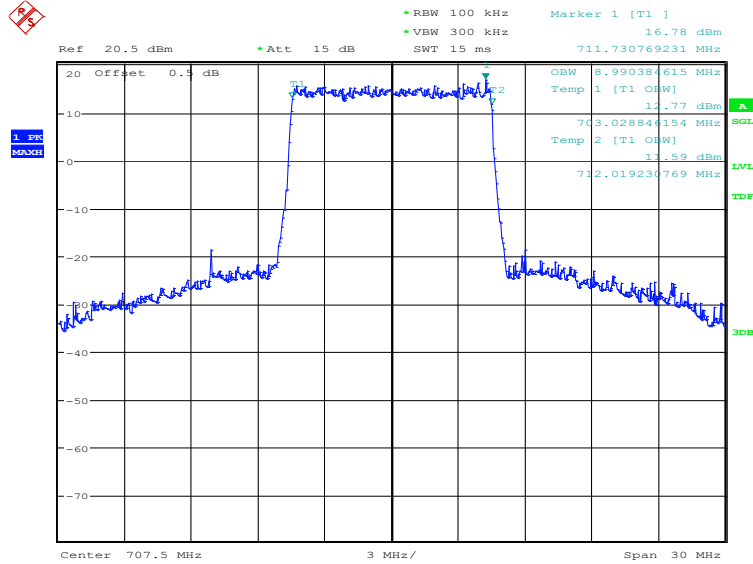


Date: 24.NOV.2022 18:44:39

### LTE band 12, 10MHz (99%)

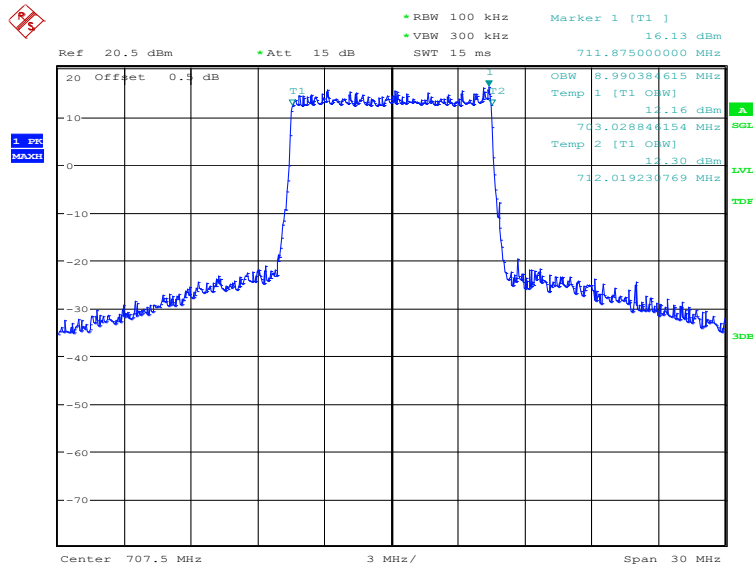
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8990.38	8990.38

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



Date: 24.NOV.2022 18:45:20

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

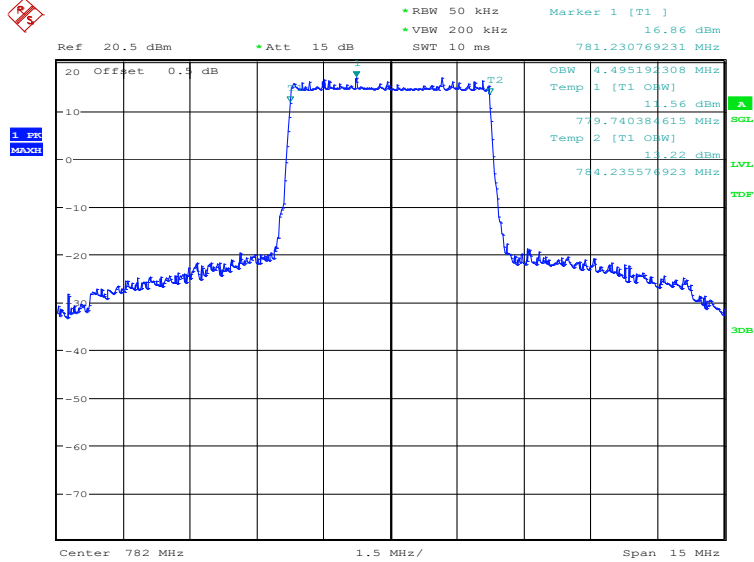


Date: 24.NOV.2022 18:46:00

**LTE band 13, 5MHz (99%)**

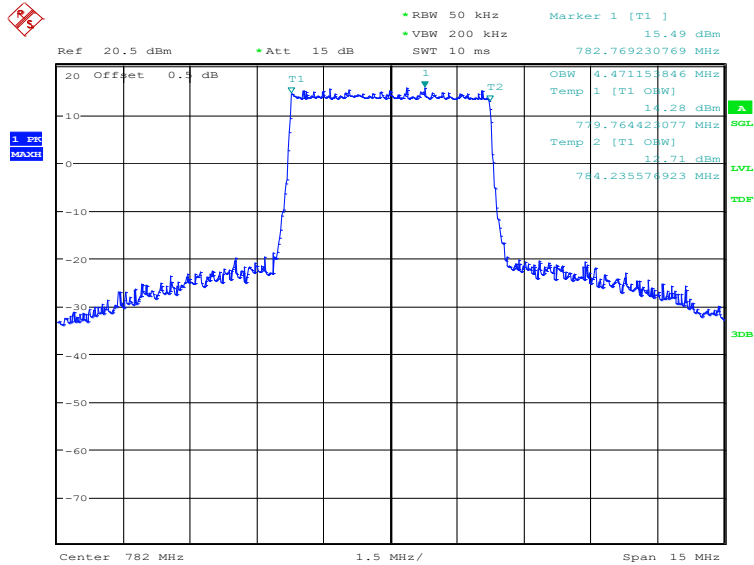
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4495.19	4471.15

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



Date: 24.NOV.2022 18:46:43

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

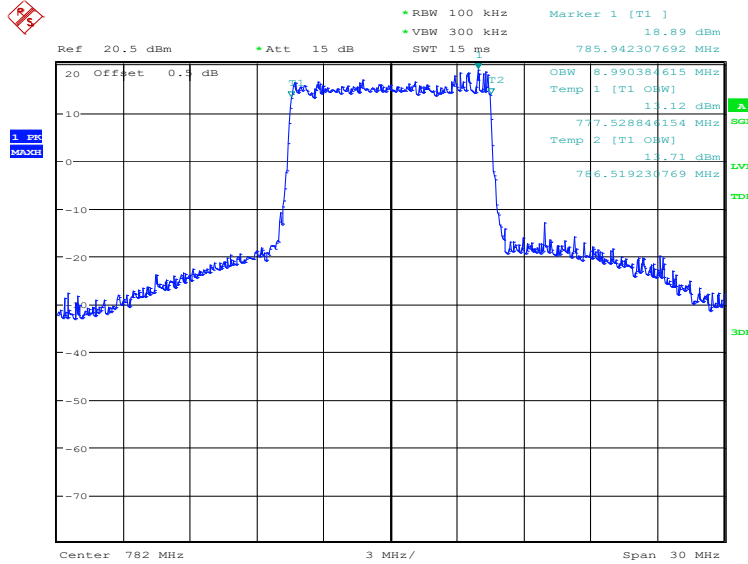


Date: 24.NOV.2022 18:47:22

**LTE band 13, 10MHz (99%)**

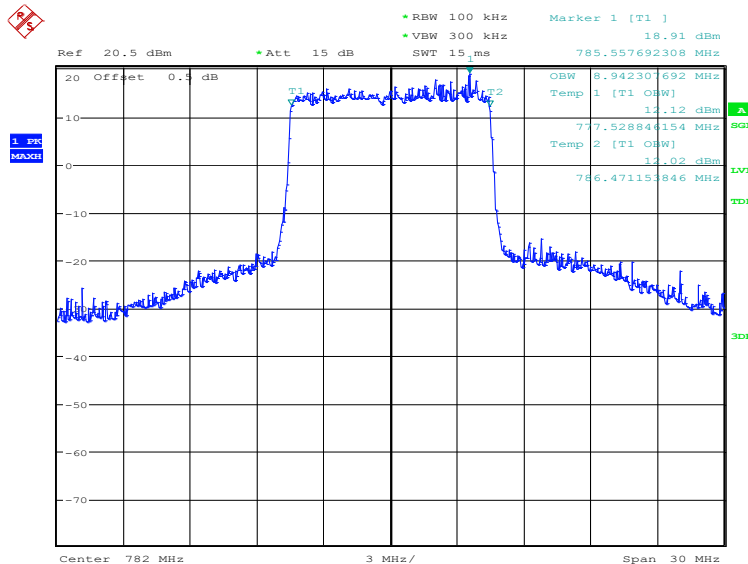
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	8990.38	8942.31

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



Date: 24.NOV.2022 18:48:04

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

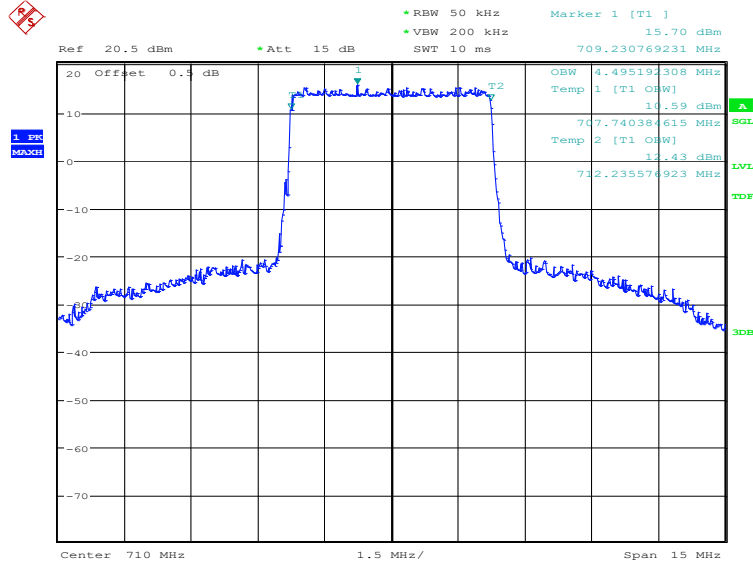


Date: 24.NOV.2022 18:48:43

**LTE band 17, 5MHz(99% BW)**

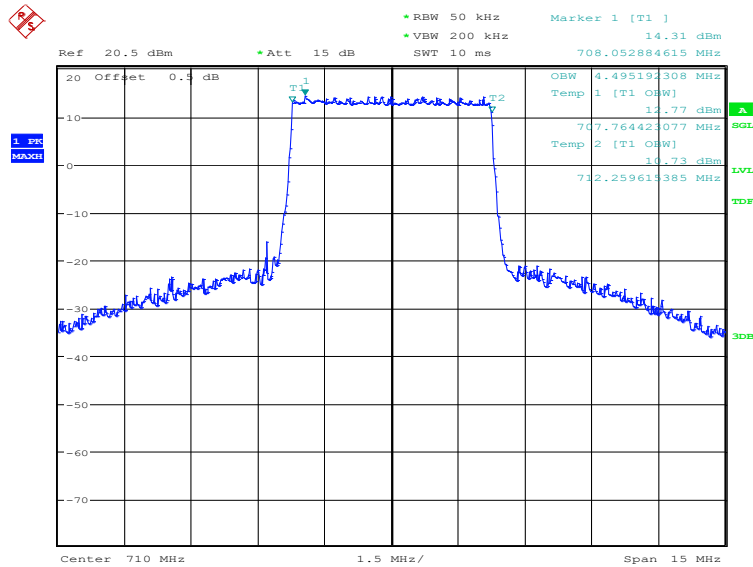
Frequency(MHz)	Occupied Bandwidth (99% BW) (kHz)	
	710.0	QPSK
4495.19		4495.19

**LTE band 17, 5MHz Bandwidth, QPSK (99% BW)**



Date: 24.NOV.2022 18:49:26

**LTE band 17, 5MHz Bandwidth,16QAM (99% BW)**

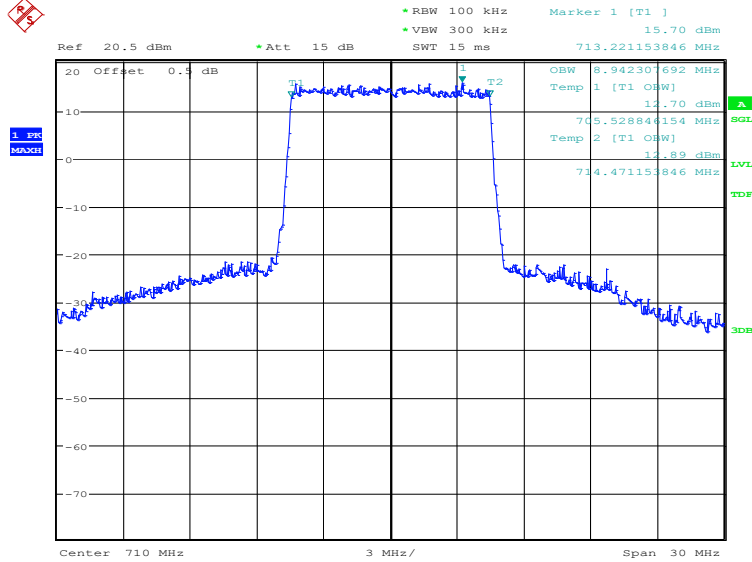


Date: 24.NOV.2022 18:50:06

### LTE band 17, 10MHz(99% BW)

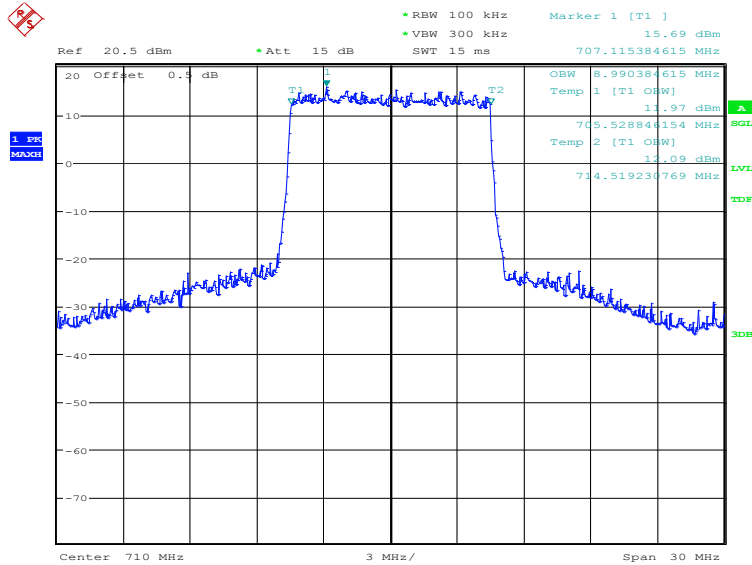
Frequency(MHz)	Occupied Bandwidth (99% BW) (kHz)	
	710.0	QPSK
	8942.31	8990.38

### LTE band 17, 10MHz Bandwidth, QPSK (99% BW)



Date: 24.NOV.2022 18:50:47

### LTE band 17, 10MHz Bandwidth, 16QAM (99% BW)

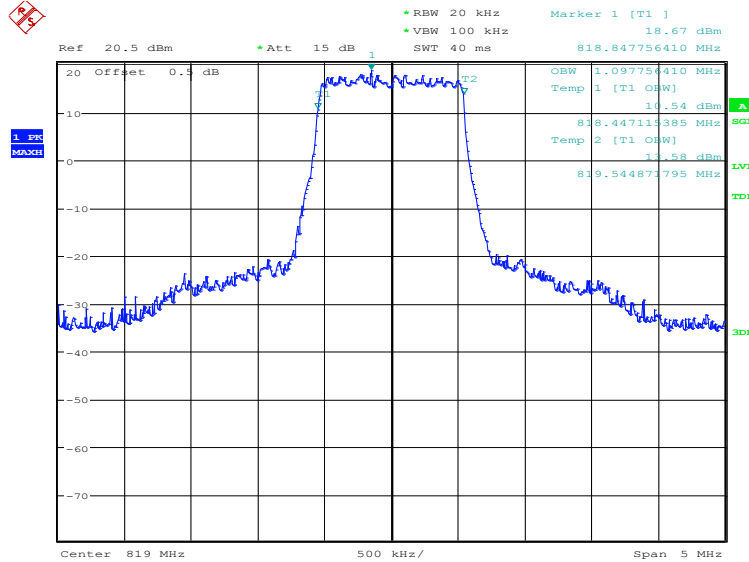


Date: 24.NOV.2022 18:51:27

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

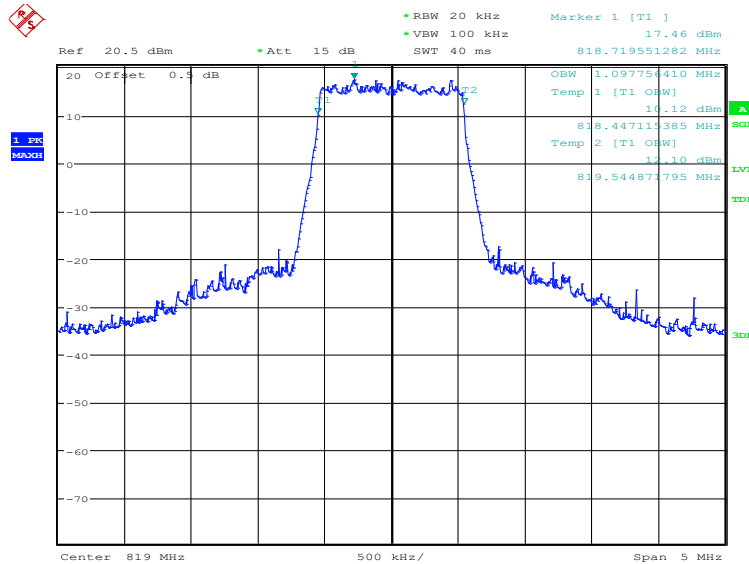
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	1097.76	1097.76

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



Date: 24.NOV.2022 19:00:32

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

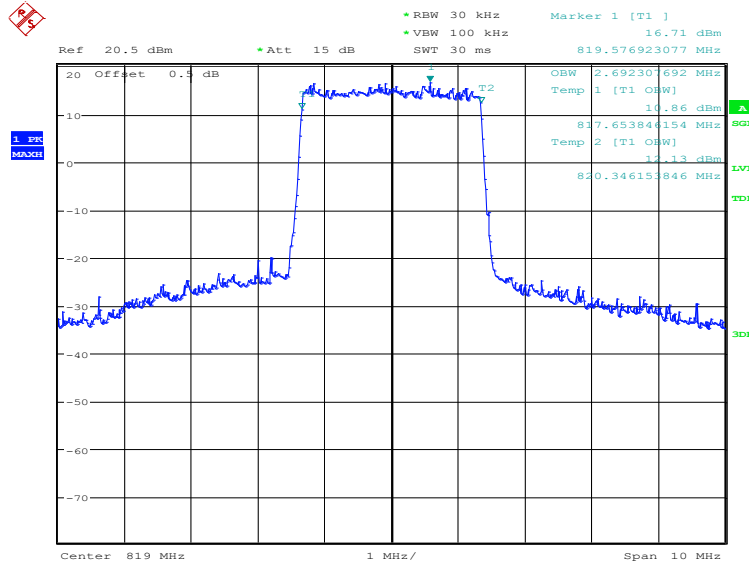


Date: 24.NOV.2022 19:01:12

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

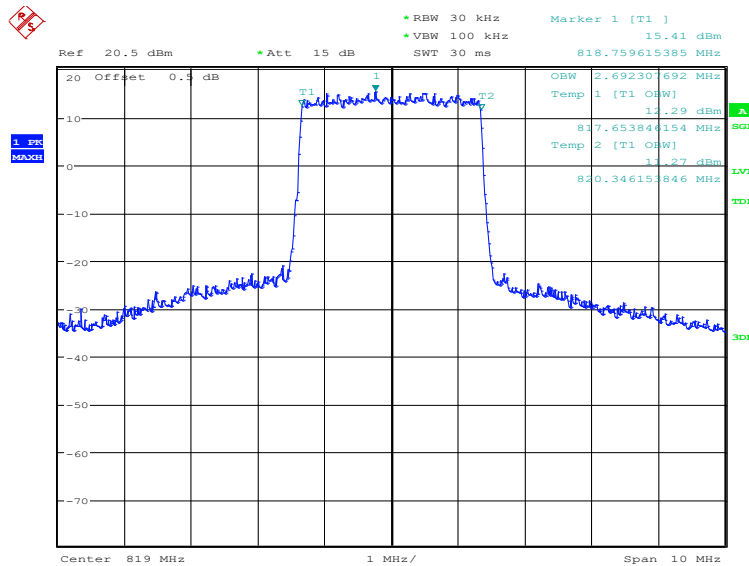
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 24.NOV.2022 19:01:59

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



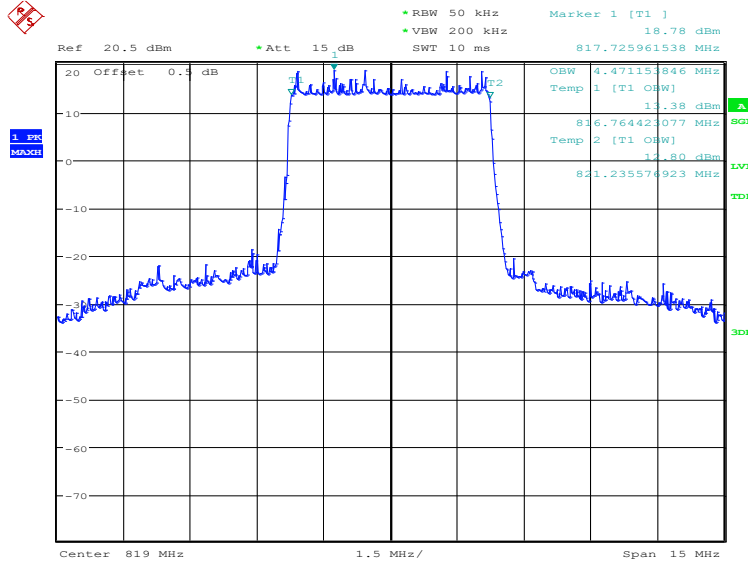
Date: 24.NOV.2022 19:02:39



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

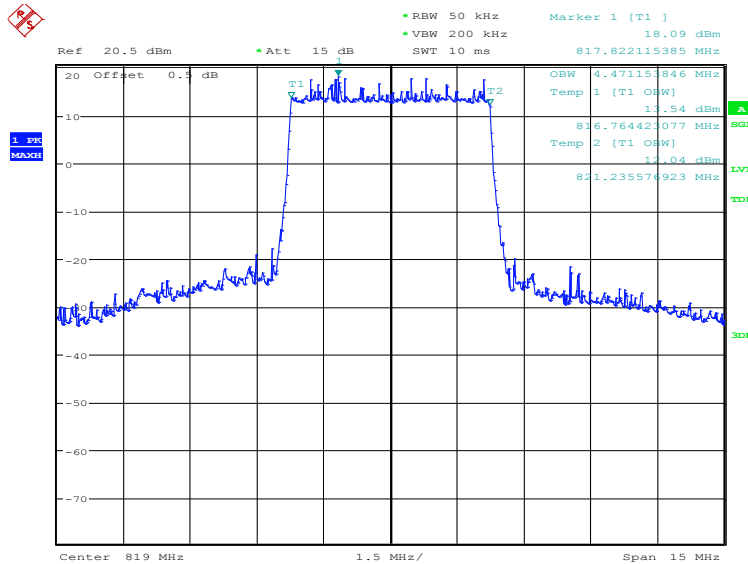
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	4471.15	4471.15

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



Date: 24.NOV.2022 19:03:20

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

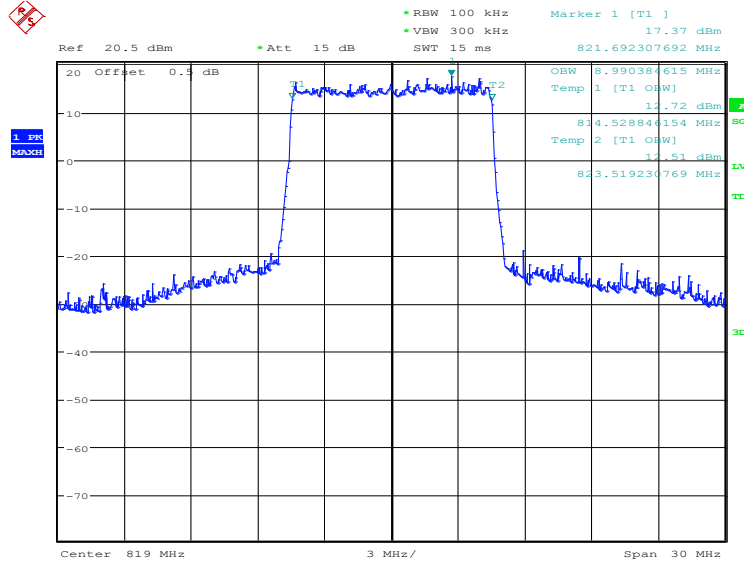


Date: 24.NOV.2022 19:04:00

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

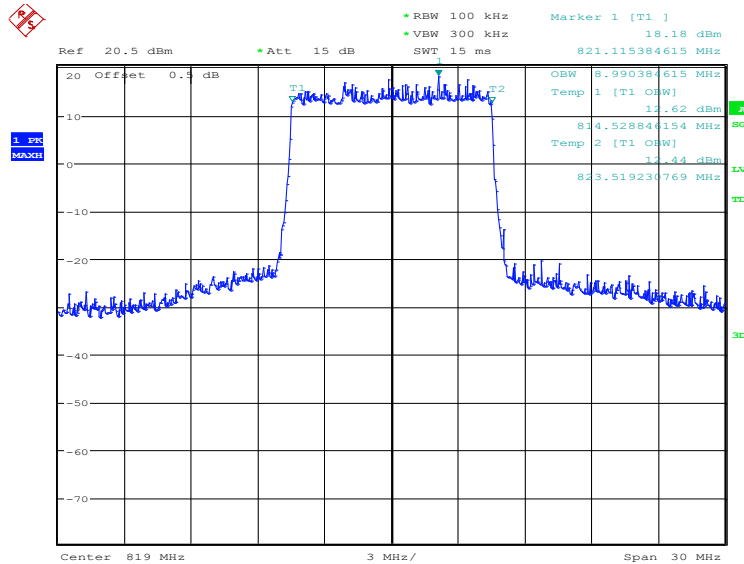
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8990.38	8990.38

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



Date: 24.NOV.2022 19:04:41

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

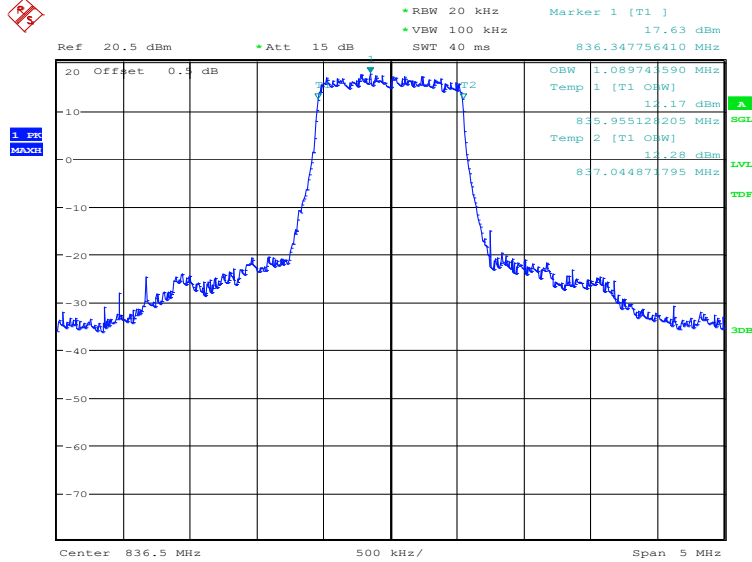


Date: 24.NOV.2022 19:05:21

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

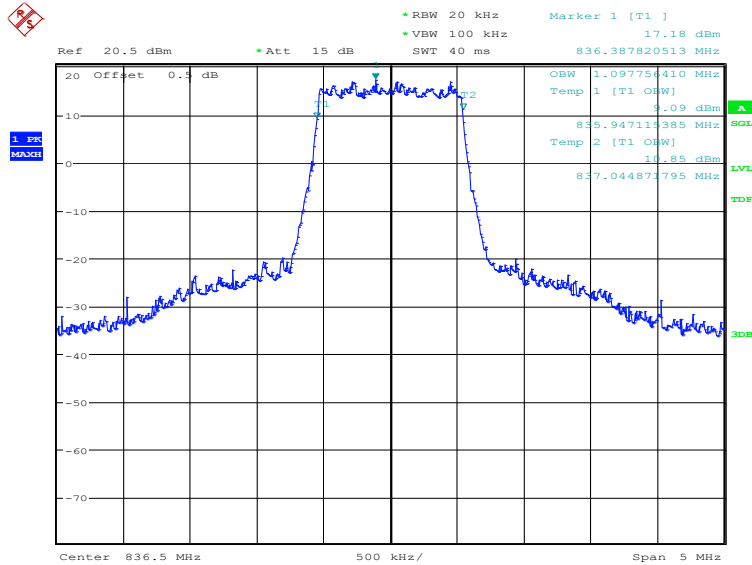
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1089.74	1097.76

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



Date: 24.NOV.2022 18:52:10

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

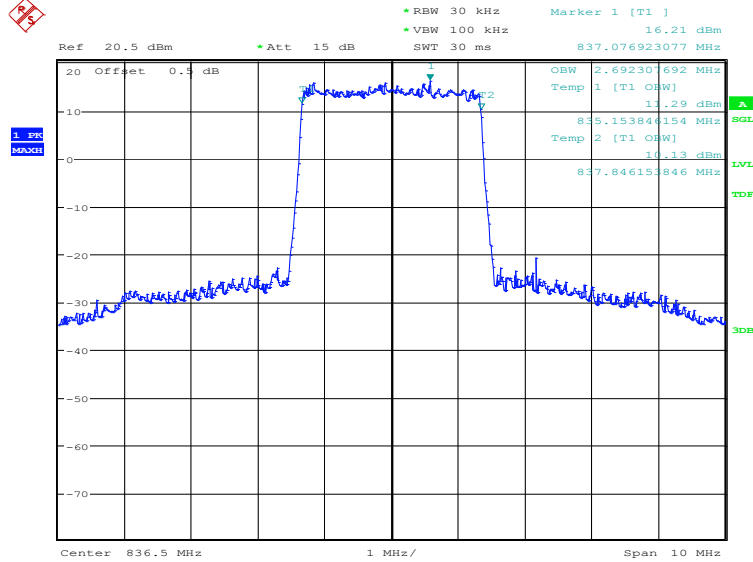


Date: 24.NOV.2022 18:52:49

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

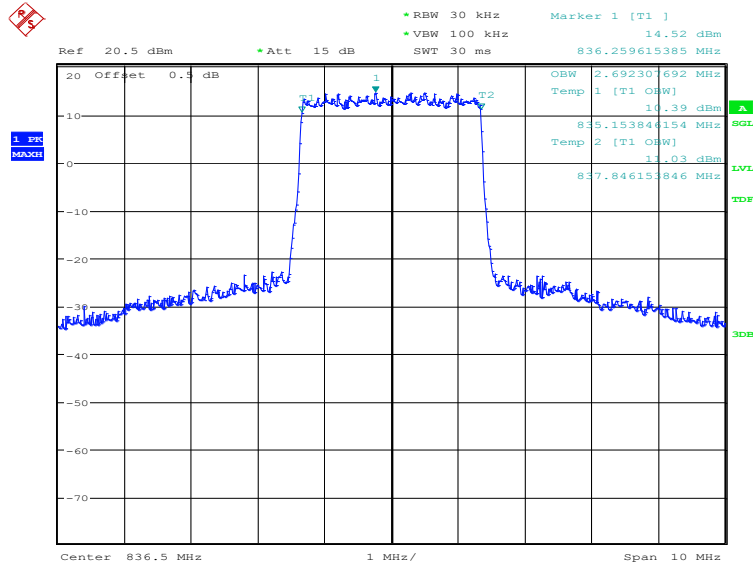
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2692.31	2692.31

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



Date: 24.NOV.2022 18:53:31

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

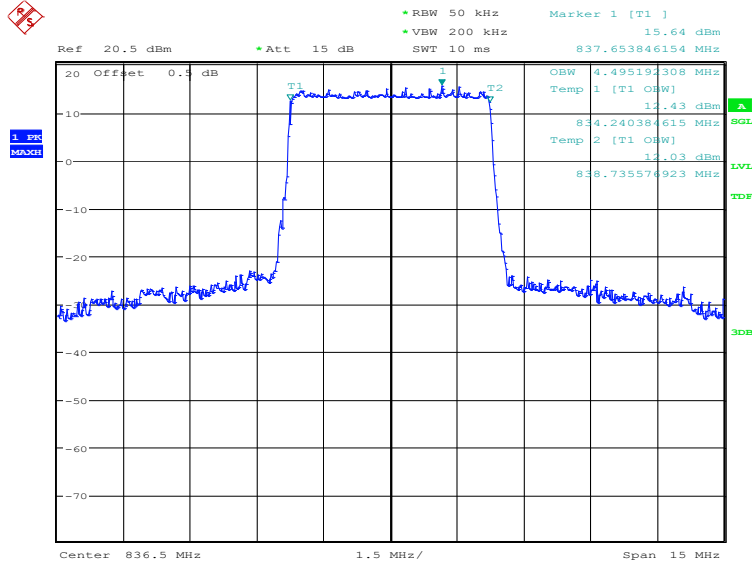


Date: 24.NOV.2022 18:54:10

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

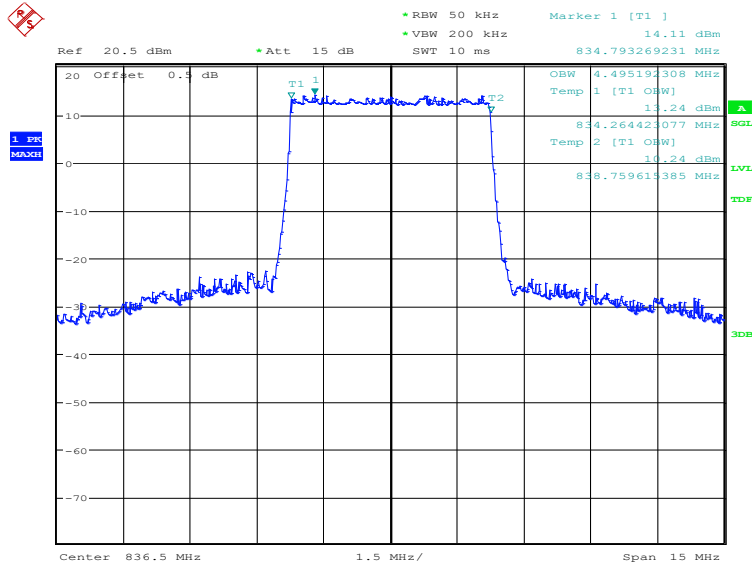
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4495.19

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



Date: 24.NOV.2022 18:54:52

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

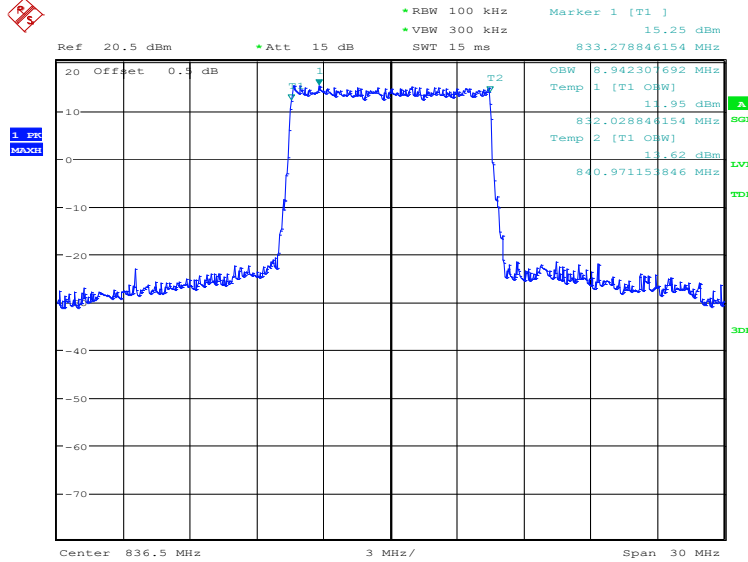


Date: 24.NOV.2022 18:55:31

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

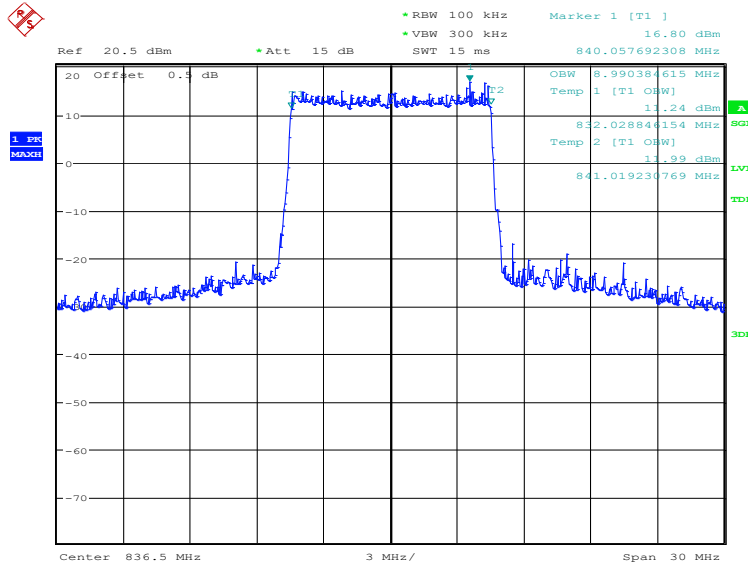
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8990.38

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



Date: 24.NOV.2022 18:57:08

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

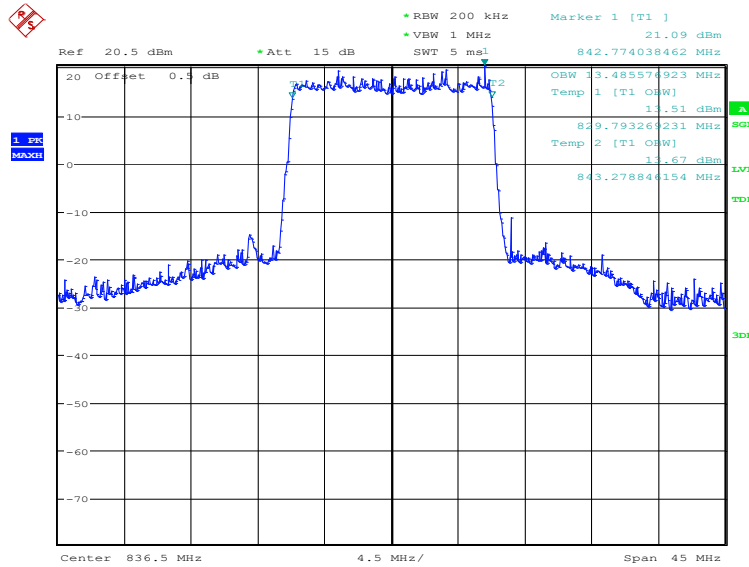


Date: 24.NOV.2022 18:57:48

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

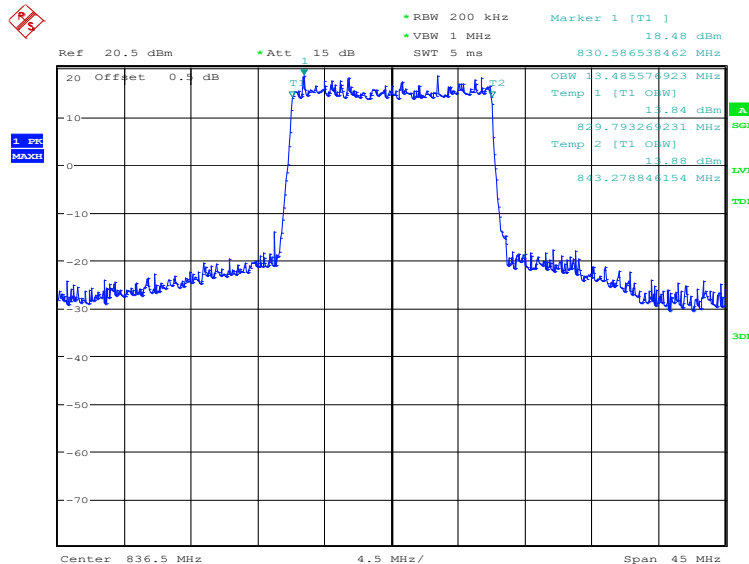
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 24.NOV.2022 18:58:29

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

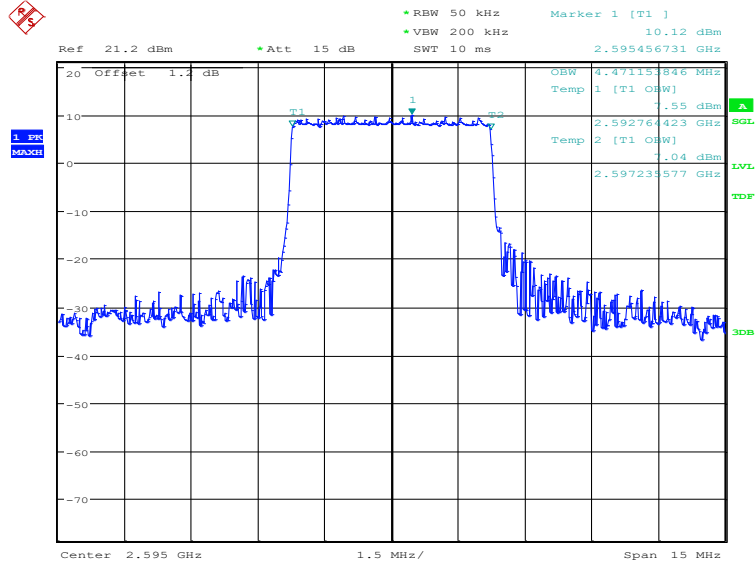


Date: 24.NOV.2022 18:59:09

### LTE band 38, 5MHz (99%)

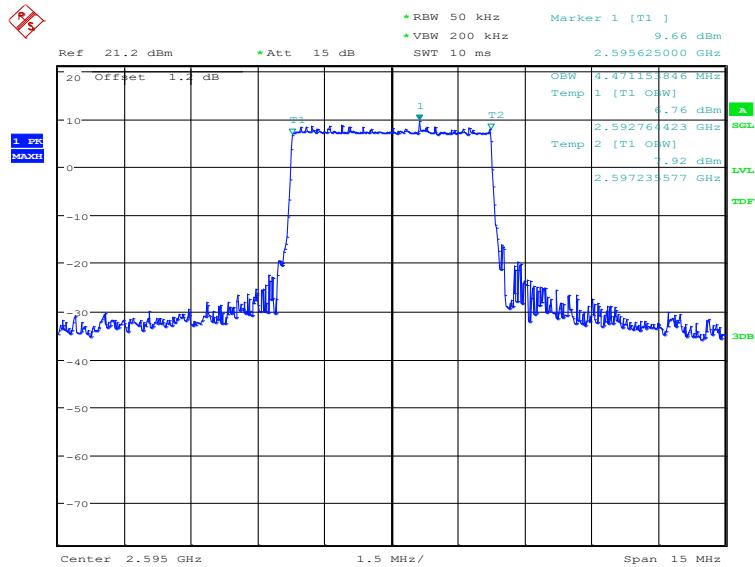
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	4471.15	4471.15

### LTE band 38, 5MHz Bandwidth, QPSK (99% BW)



Date: 28.NOV.2022 14:55:49

### LTE band 38, 5MHz Bandwidth, 16QAM (99% BW)



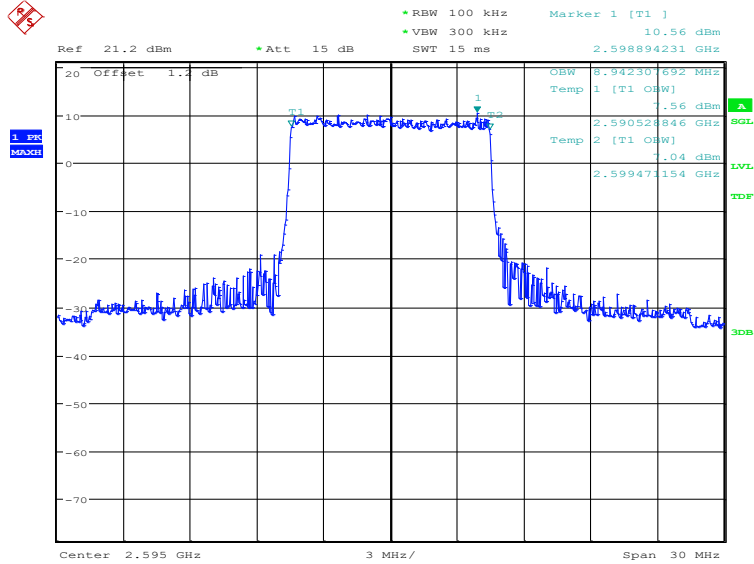
Date: 28.NOV.2022 14:56:29



**LTE band 38, 10MHz (99%)**

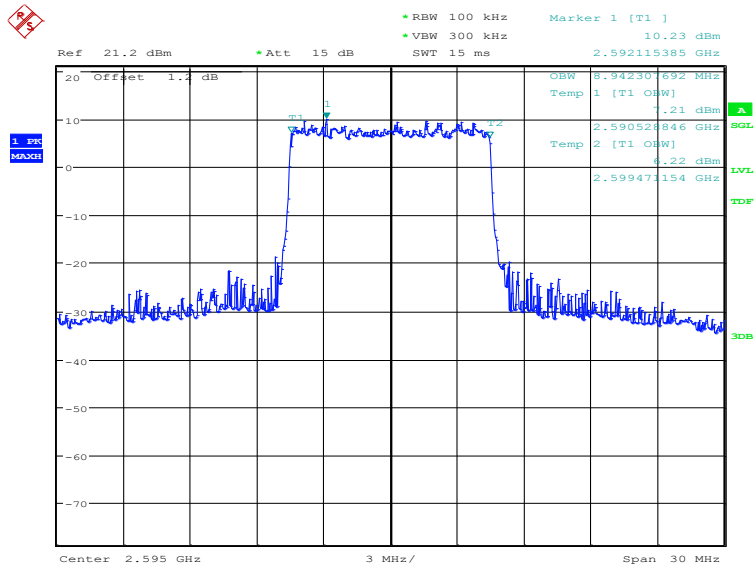
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	8942.31	8942.31

**LTE band 38, 10MHz Bandwidth, QPSK (99% BW)**



Date: 28.NOV.2022 14:57:11

**LTE band 38, 10MHz Bandwidth, 16QAM (99% BW)**

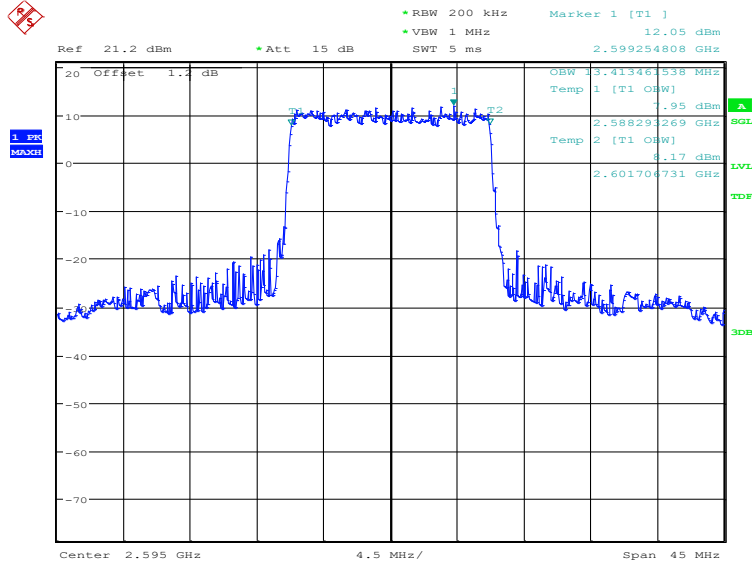


Date: 28.NOV.2022 14:57:51

**LTE band 38,15MHz (99%)**

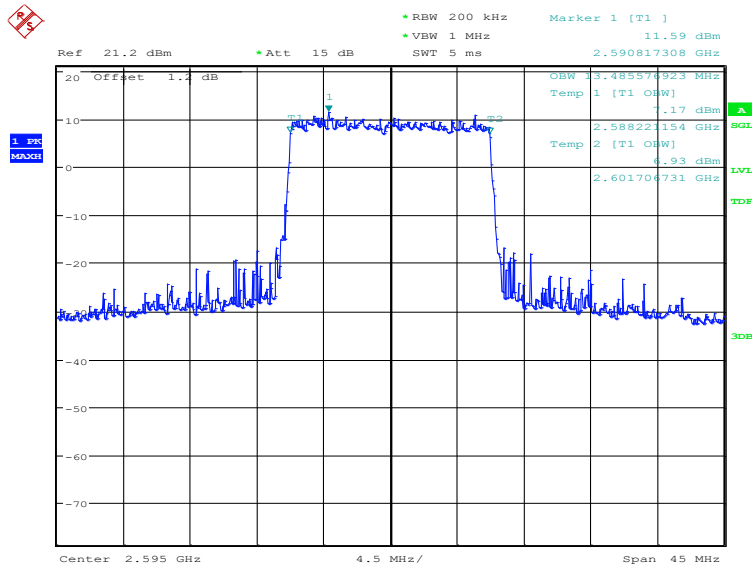
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	13413.46	13485.58

**LTE band 38,15MHz Bandwidth, QPSK (99% BW)**



Date: 28.NOV.2022 14:58:32

**LTE band 38, 15MHz Bandwidth,16QAM (99% BW)**

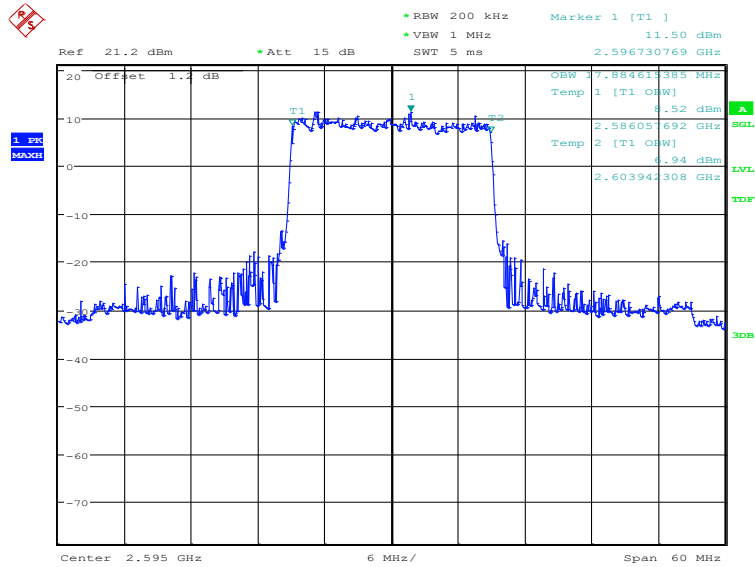


Date: 28.NOV.2022 14:59:12

### LTE band 38, 20MHz (99%)

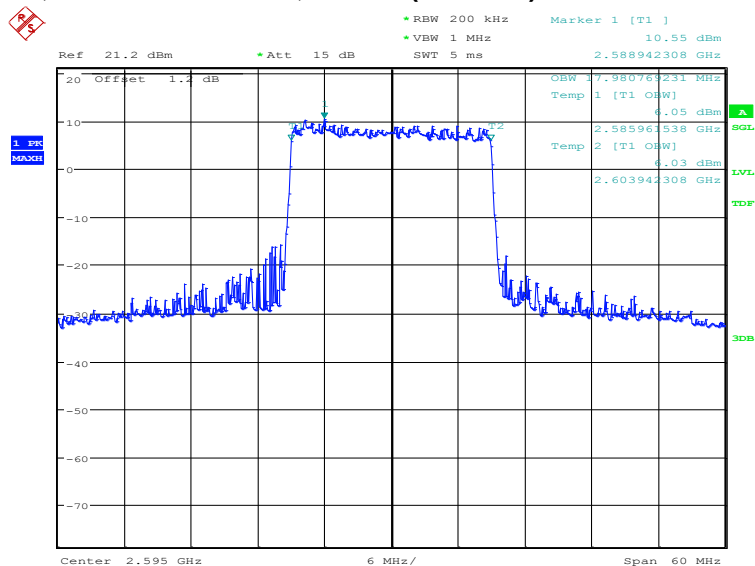
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2595.0	QPSK	16QAM
	17884.62	17980.77

### LTE band 38, 20MHz Bandwidth, QPSK (99% BW)



Date: 28.NOV.2022 14:59:54

### LTE band 38, 20MHz Bandwidth, 16QAM (99% BW)

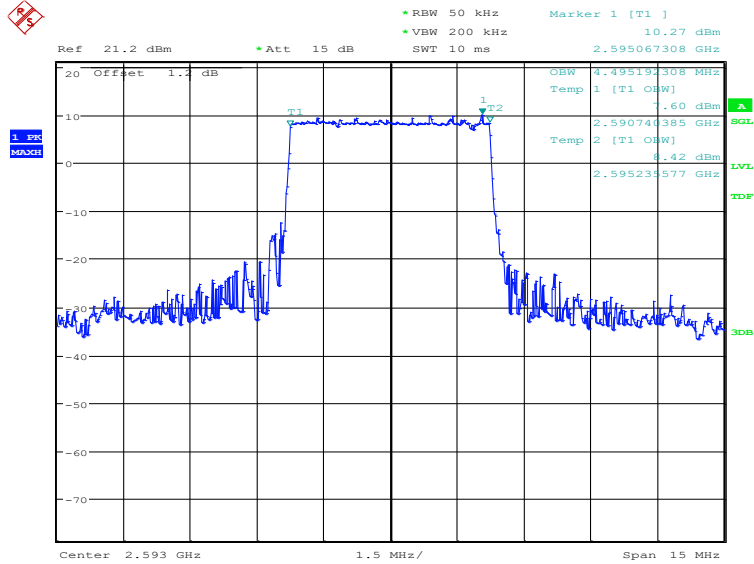


Date: 28.NOV.2022 15:00:34

**LTE band 41, 5MHz (99%)**

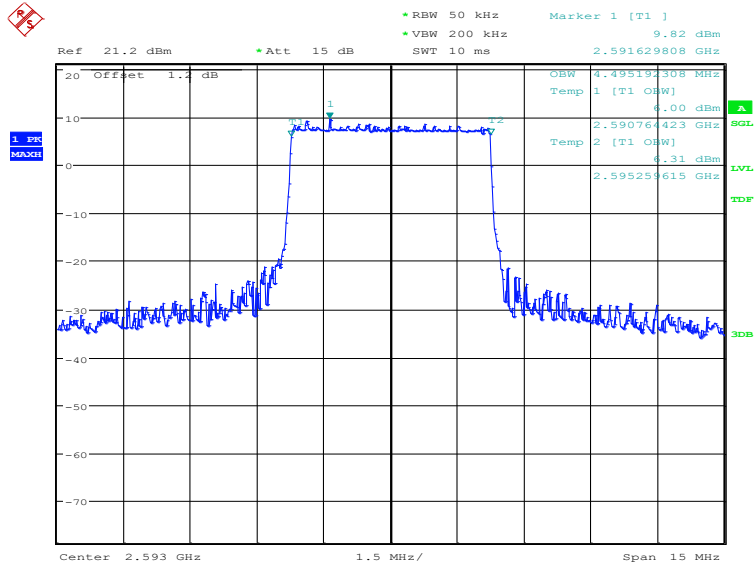
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	4495.19	4495.19

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



Date: 28.NOV.2022 15:01:17

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

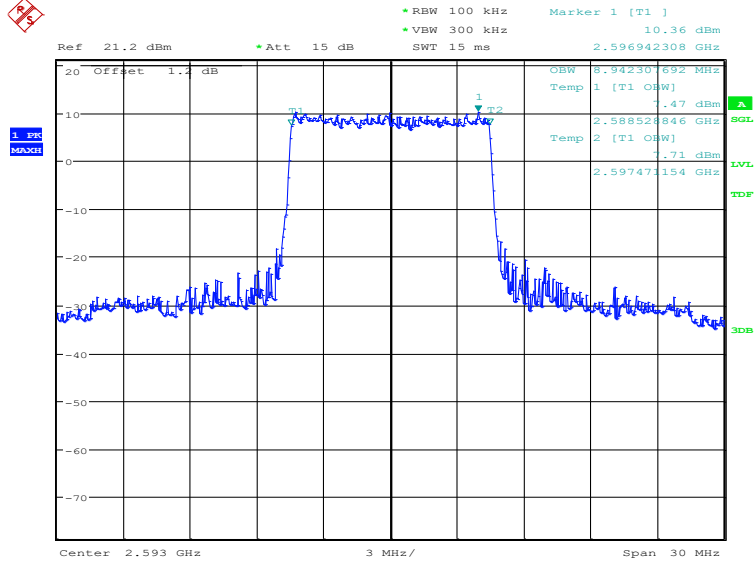


Date: 28.NOV.2022 15:01:57

### LTE band 41, 10MHz (99%)

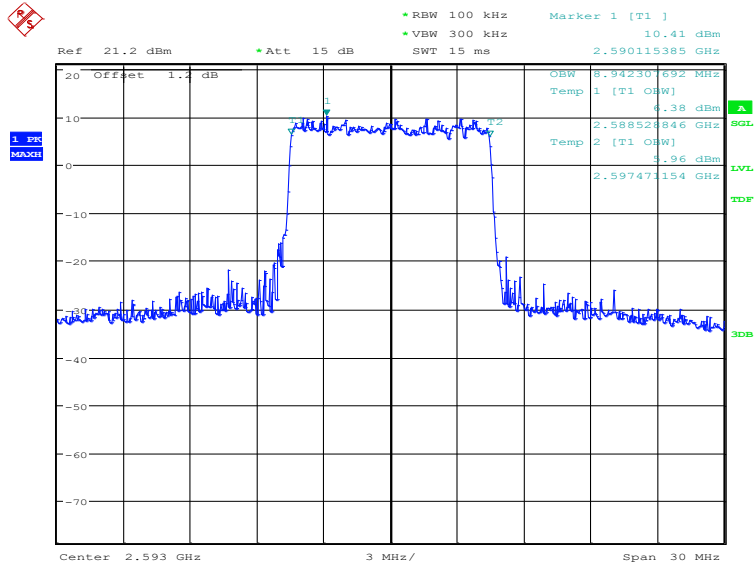
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 28.NOV.2022 15:02:38

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

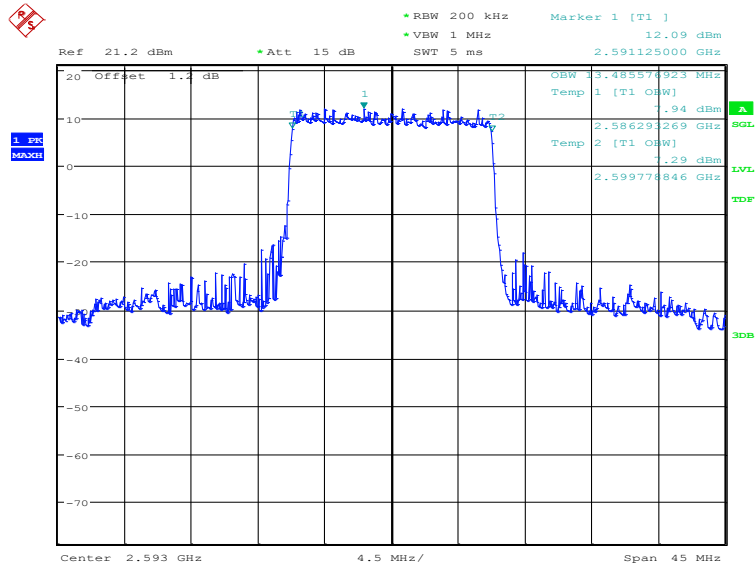


Date: 28.NOV.2022 15:03:18

### LTE band 41, 15MHz (99%)

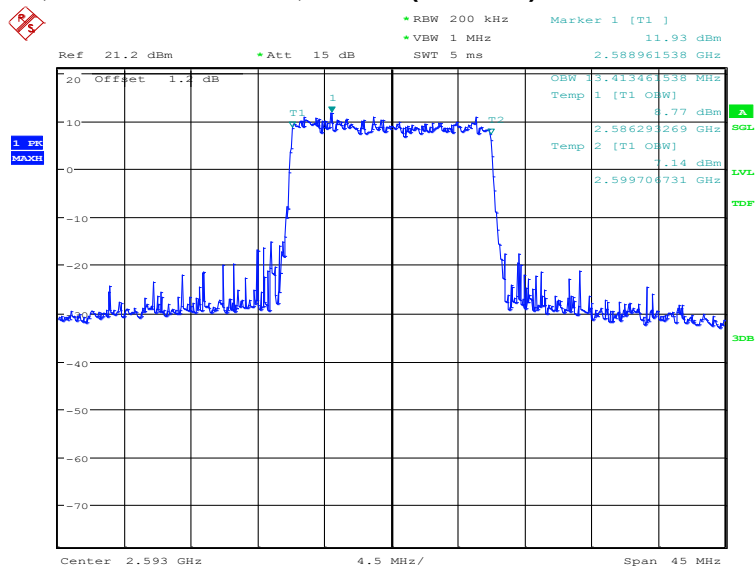
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	13485.58	13413.46

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



Date: 28.NOV.2022 15:04:00

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

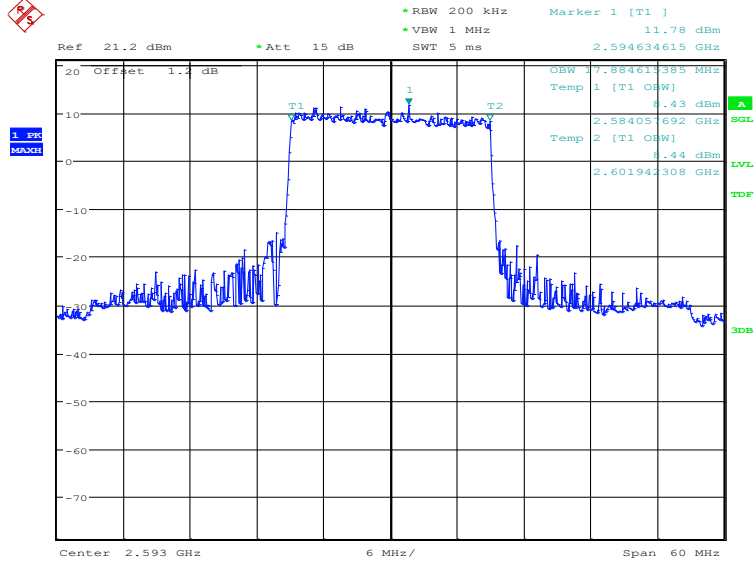


Date: 28.NOV.2022 15:04:40

**LTE band 41, 20MHz (99%)**

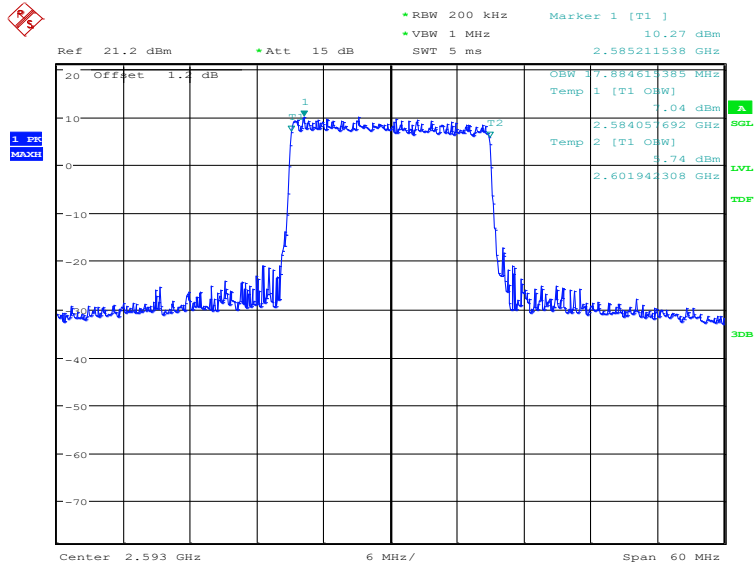
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	17884.62	17884.62

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



Date: 28.NOV.2022 15:05:21

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

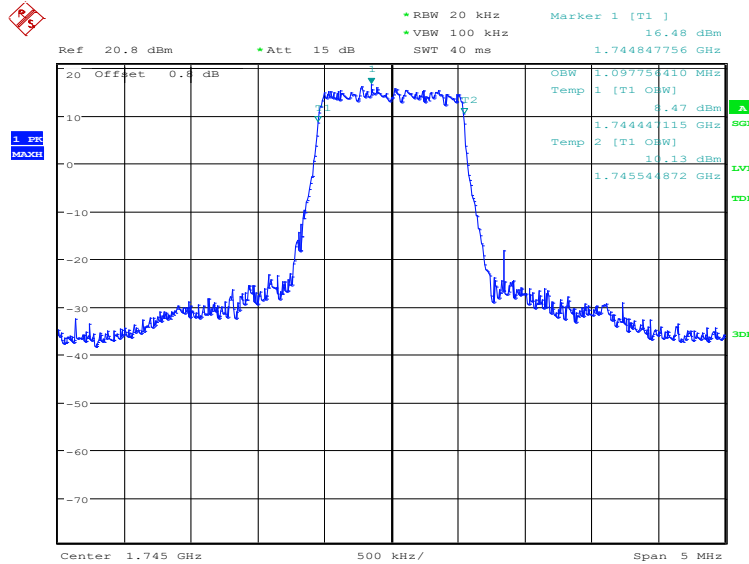


Date: 28.NOV.2022 15:06:01

### LTE band 66, 1.4MHz (99%)

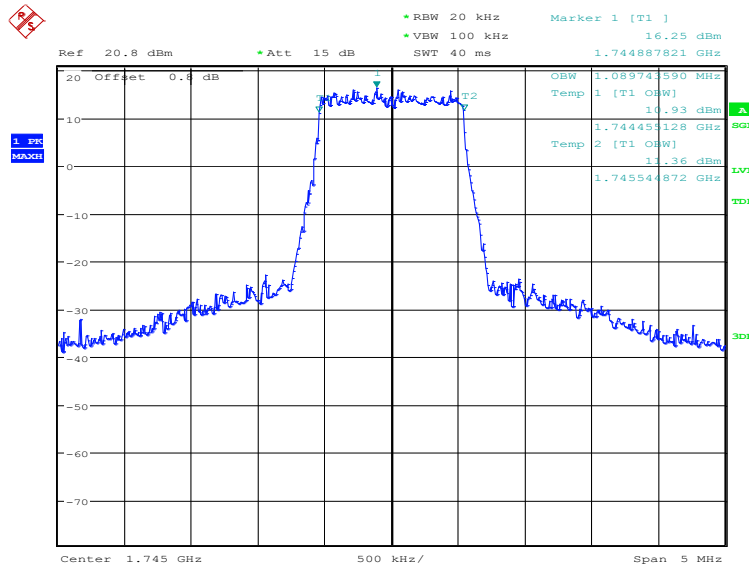
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	1097.76	1089.74

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



Date: 28.NOV.2022 10:41:17

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



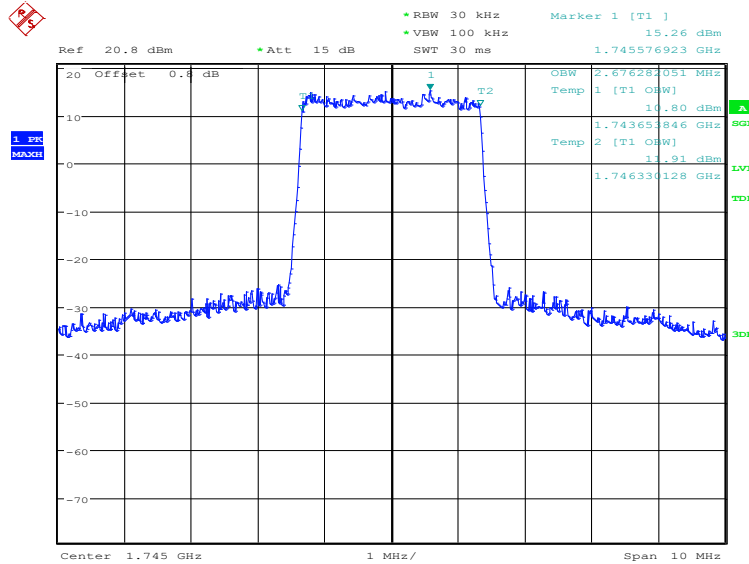
Date: 28.NOV.2022 10:41:57



### LTE band 66, 3MHz (99%)

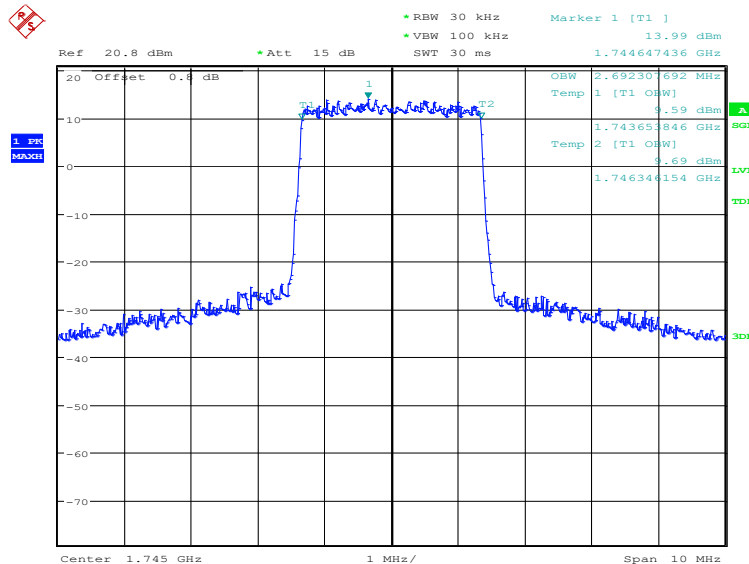
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	2676.28	2692.31

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



Date: 28.NOV.2022 10:42:38

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

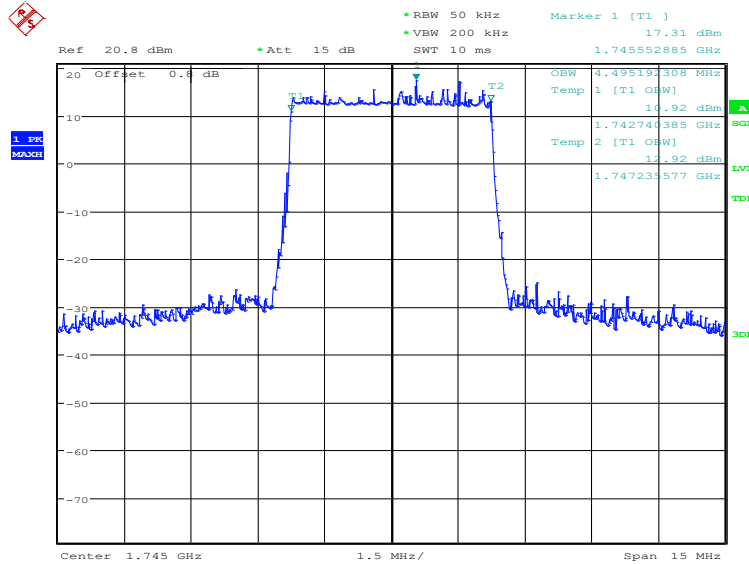


Date: 28.NOV.2022 10:43:18

### LTE band 66, 5MHz (99%)

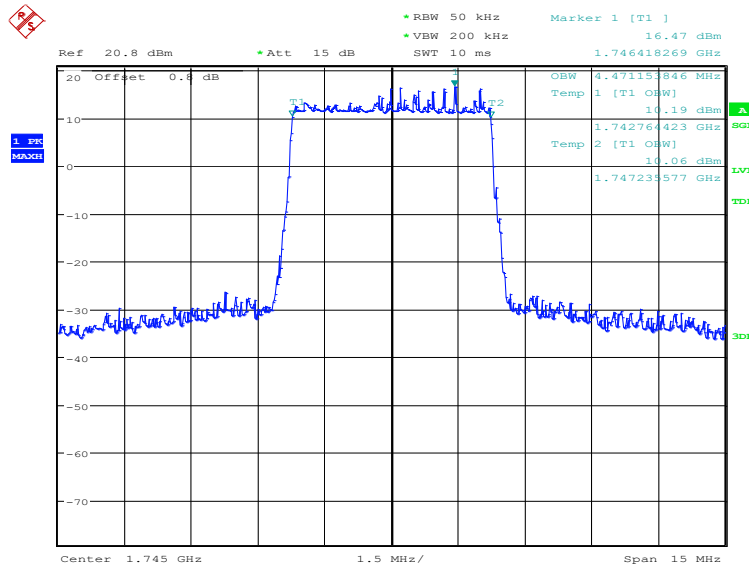
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	4495.19	4471.15

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



Date: 28.NOV.2022 10:43:59

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

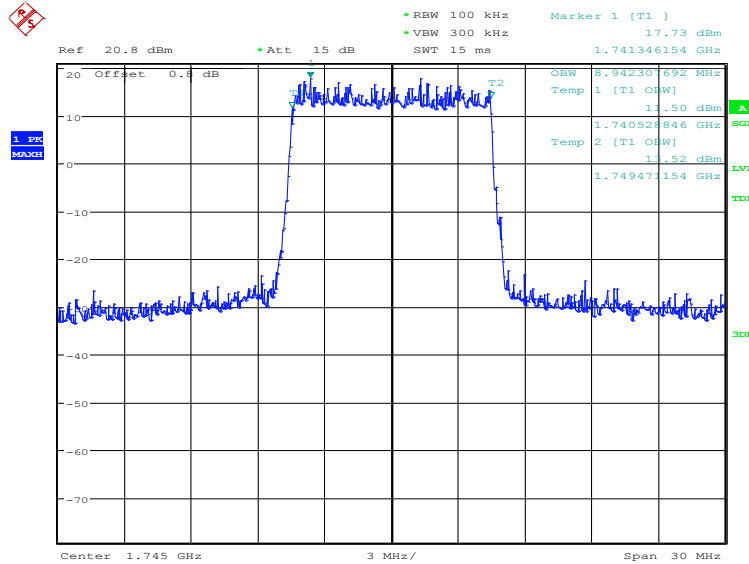


Date: 28.NOV.2022 10:44:39

### LTE band 66, 10MHz (99%)

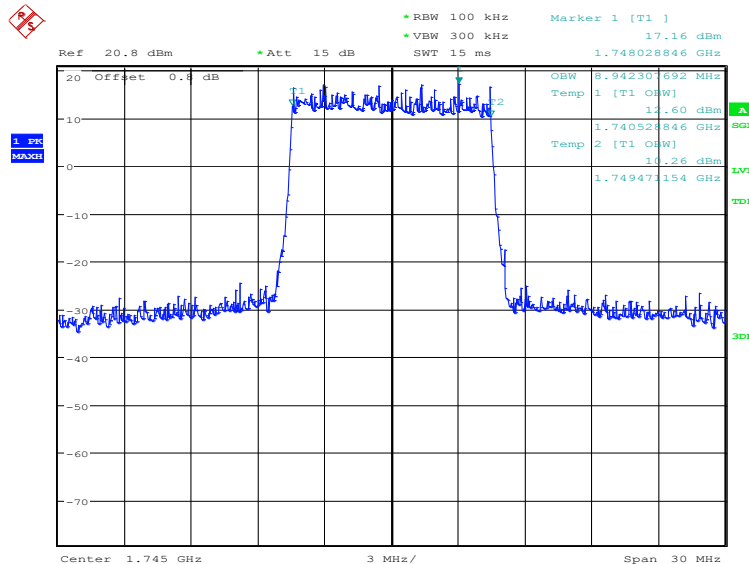
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 28.NOV.2022 10:45:20

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

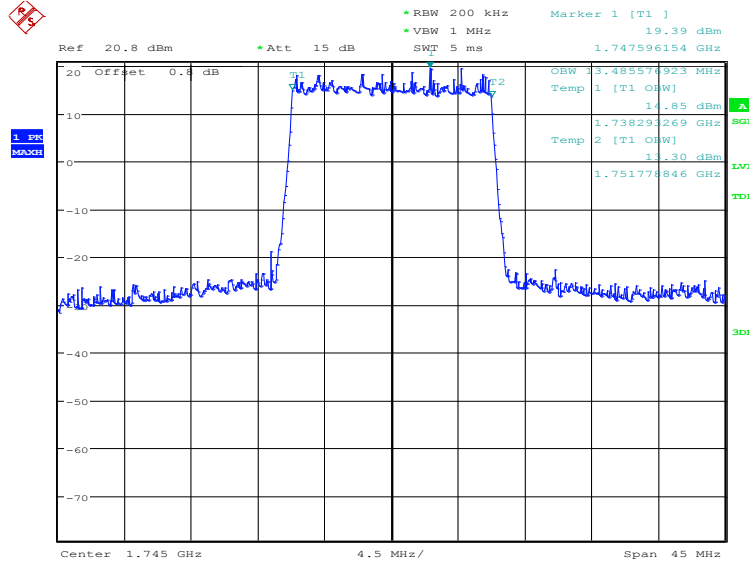


Date: 28.NOV.2022 10:46:00

### LTE band 66, 15MHz (99%)

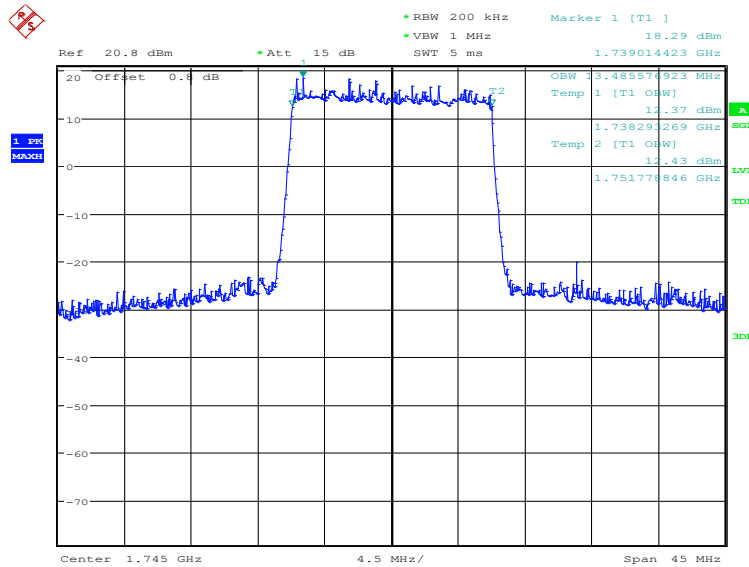
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 28.NOV.2022 10:46:41

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

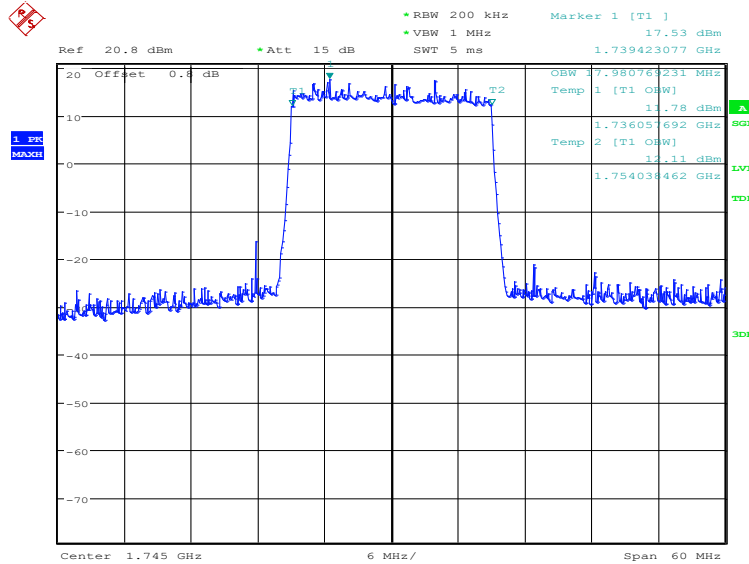


Date: 28.NOV.2022 10:47:21

### LTE band 66, 20MHz (99%)

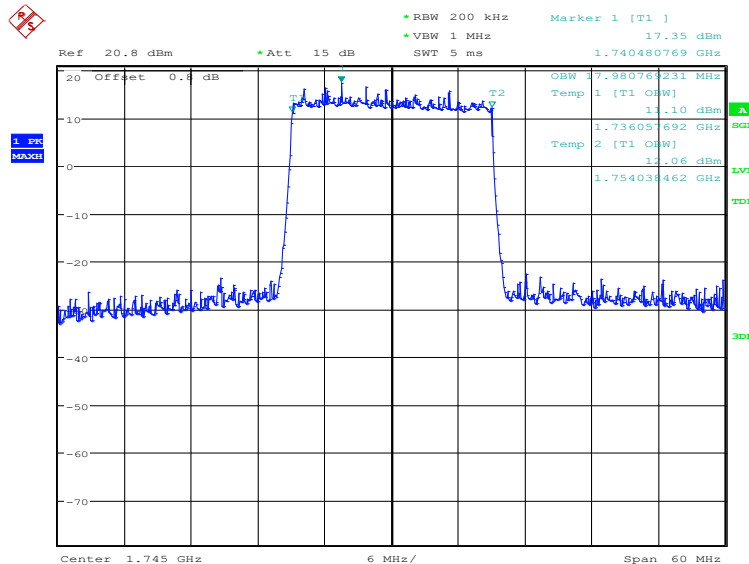
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1745.0	QPSK	16QAM
	17980.77	17980.77

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



Date: 28.NOV.2022 10:48:02

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



Date: 28.NOV.2022 10:48:42

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

#### **A.4 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.

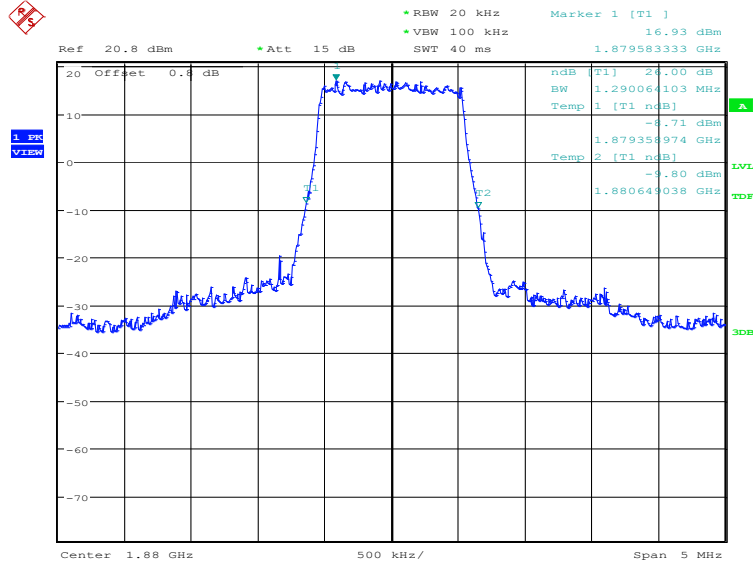
The measurement method is from ANSI C63.26:

- 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  $\geq 3 \times$  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.

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

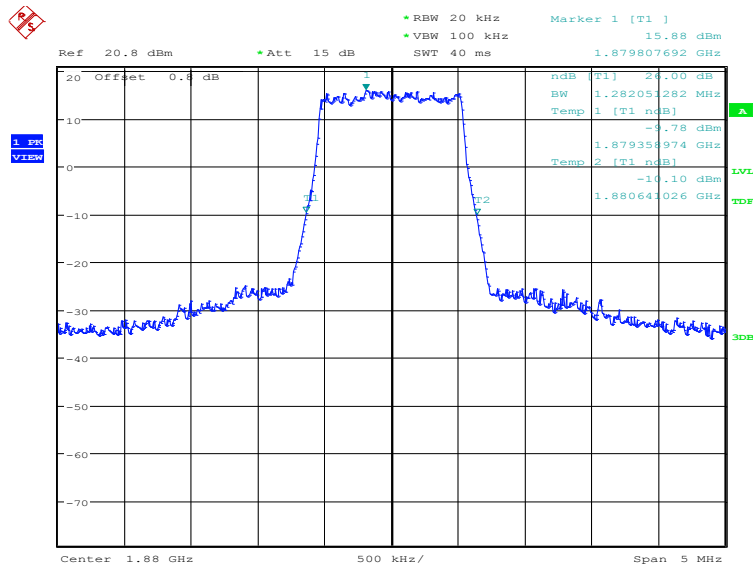
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	1290.06	1282.05

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



Date: 28.NOV.2022 10:50:00

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

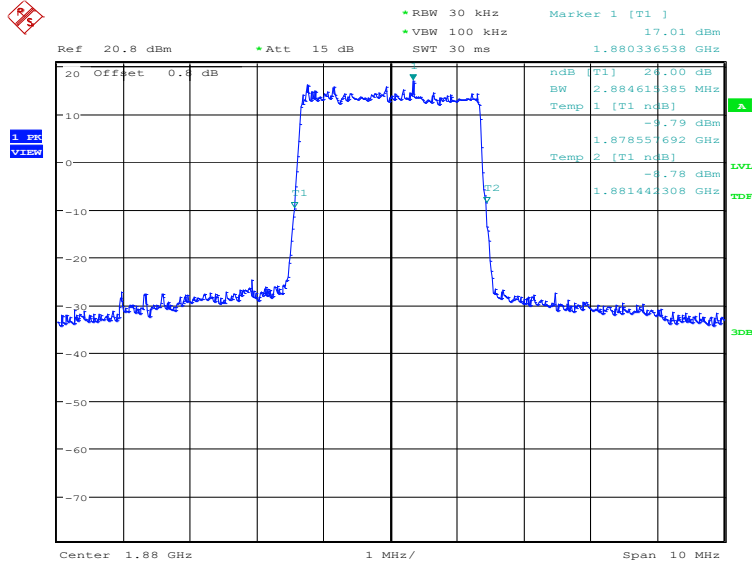


Date: 28.NOV.2022 10:50:40

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

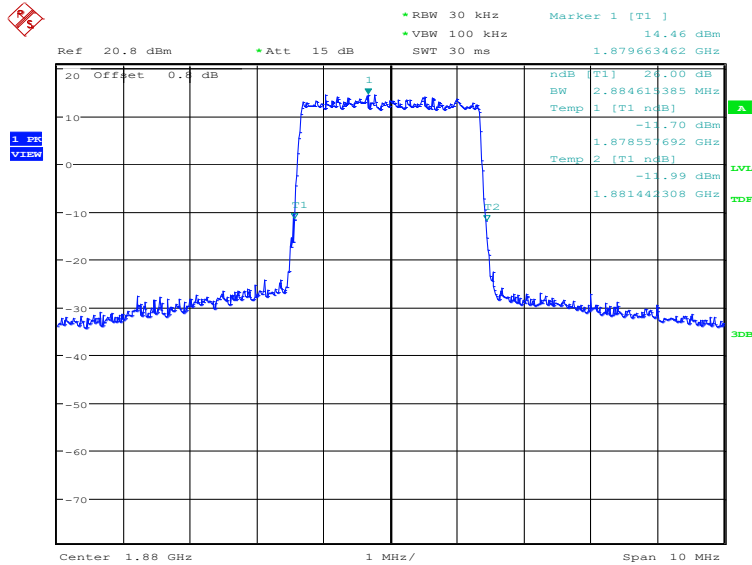
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
	1880.0	QPSK
	2884.62	2884.62

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



Date: 28.NOV.2022 10:51:22

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



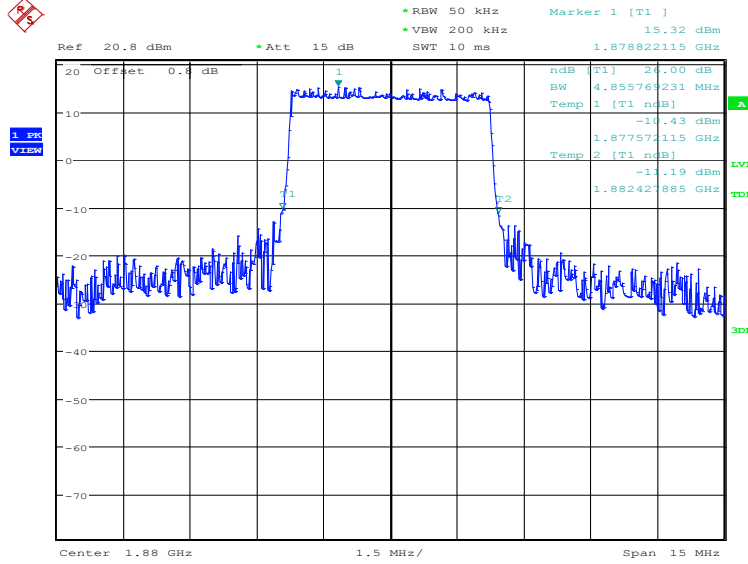
Date: 28.NOV.2022 10:52:02



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

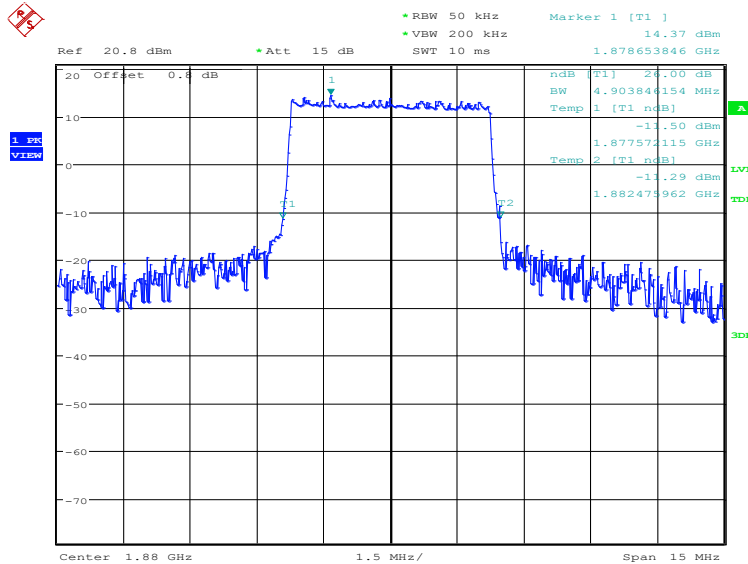
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	4855.77	4903.85

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



Date: 28.NOV.2022 10:52:44

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

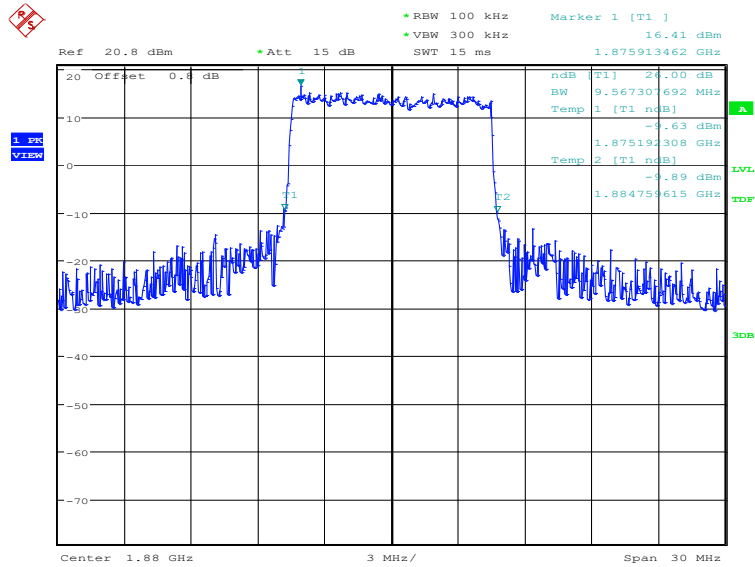


Date: 28.NOV.2022 10:53:24

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

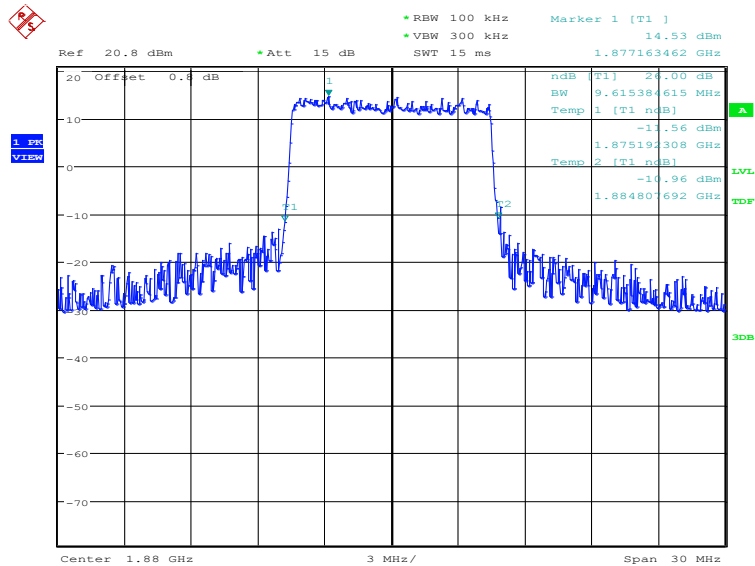
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	9567.31	9615.38

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



Date: 28.NOV.2022 10:54:05

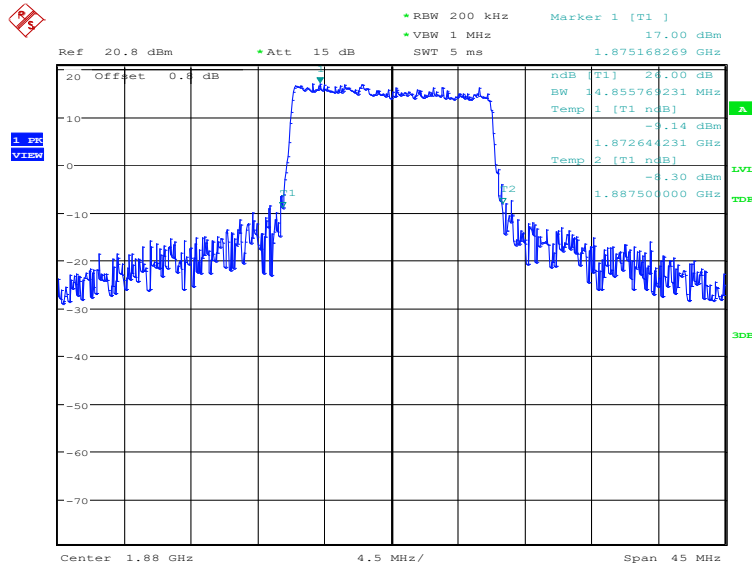
### LTE band 2, 10MHz Bandwidth, 16QAM (-26dBc BW)



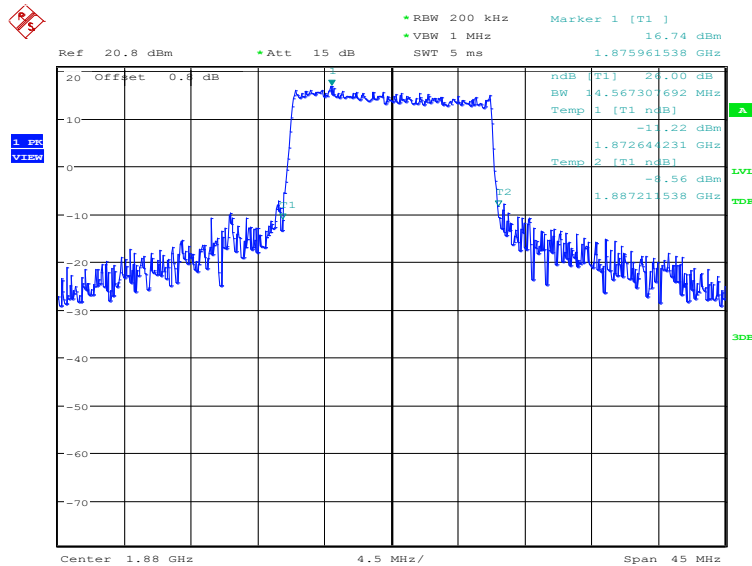
Date: 28.NOV.2022 10:54:46

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

Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
1880.0	QPSK	16QAM
	14855.77	14567.31

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


Date: 28.NOV.2022 10:55:27

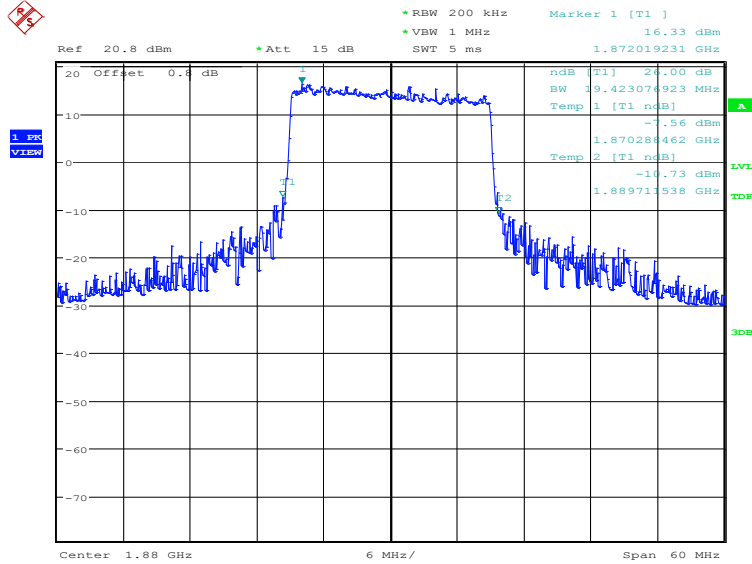
**LTE band 2, 15MHz Bandwidth, 16QAM (-26dBc BW)**


Date: 28.NOV.2022 10:56:08

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

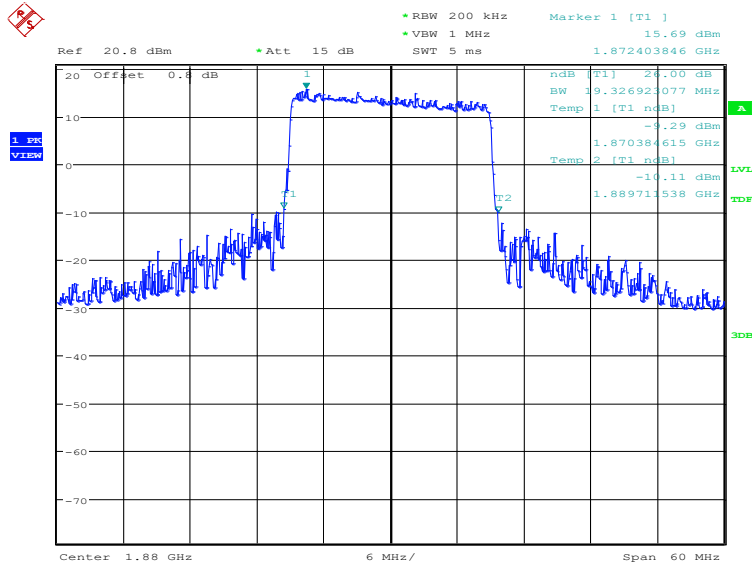
Frequency(MHz)	Emission Bandwidth (-26dBc)(kHz)	
	1880.0	QPSK
	19423.08	19326.92

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



Date: 28.NOV.2022 10:56:49

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



Date: 28.NOV.2022 10:57:29