



# TEST REPORT

## No. I21Z62522-WMD03

for

**TCL Communication Ltd.**

**GSM/UMTS/LTE mobile phone**

**Model Name: T408DL,4058L,4058G**

**FCC ID: 2ACCJN059**

with

**Hardware Version: 03**

**Software Version: KE26**

**Issued Date: 2022-01-25**

**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>
I21Z62522-WMD03	Rev.0	1 <sup>st</sup> edition	2022-01-25

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

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: 2021-12-10  
Testing End Date: 2022-01-24

### 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: TCL Communication Ltd.  
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### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
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Contact: Peter yang  
Email: peter.yang@tcl.com  
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Fax: +86 755 3661 2000-81722

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

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

Description	GSM/UMTS/LTE mobile phone
Model Name	T408DL,4058L,4058G
FCC ID	2ACCJN059
Antenna	Embedded
Output power	27.45dBm maximum EIRP measured for LTE Band 41
Extreme vol. Limits	3.5VDC to 4.4VDC (nominal: 3.8VDC)
Extreme temp. Tolerance	-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**

<b>EUT ID*</b>	<b>IMEI</b>	<b>HW Version</b>	<b>SW Version</b>	<b>Date of receipt</b>
UT31a	016144000210052	03	KE26	2021-12-10
UT32a	016144000013894	03	KE26	2021-12-10

\*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

AE1

Model	TLi017C1
Manufacturer	BYD
Capacitance	1780mAh

AE2

Model	TLi017C7
Manufacturer	veken
Capacitance	1780mAh

\*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 client or manufacturer, which are the bases of testing.

### **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	10-1-20 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-20 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-20 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-20 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. Laboratory Environment

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz - 1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

## 6. Summary Of Test Result

### LTE Band 12

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 25 (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 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) (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 41**

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

### LTE Band 71

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.

LTE Band 25, Band 66 and Band 26 overlaps the entire frequency range of LTE Band 2, Band 4, and Band 5. Therefore, test data provided in this report covers Band 2, Band 4, Band 5 as well as Band 25, Band 66, Band 26.

LTE Band 41 is tested by power class 2.

#### 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.

## 7. 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	2022-06-02	1 year
Climate Chamber	SH-242	93008556	ESPEC	2023-12-23	3 years
Test Receiver	E4440A	MY48250642	Agilent	2022-03-04	1 year
Universal Radio Communication Tester	CMW500	143008	R&S	2022-12-01	1 year
EMI Antenna	VULB9163	9163-235	Schwarzbeck	2022-04-07	1 year
Signal Generator	N5183A	MY49060052	Agilent	2022-07-11	1 year
EMI Antenna	3117	00058889	ETS-Lindgren	2022-11-07	1 year
EMI Antenna	LB-7180-NF	2030013000041	A-INFO	2022-02-28	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.

##### A.1.2.2 Measurement Result

#### LTE band 12

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	715.3	22.71	21.39
		707.5	22.70	21.47
		699.7	22.42	21.49
	1 RB low	715.3	22.70	21.53
		707.5	22.59	21.56
		699.7	22.21	21.62
	50% RB mid	715.3	22.87	21.34
		707.5	22.72	21.32
		699.7	22.38	21.35
	100% RB	715.3	21.79	20.59
		707.5	21.78	20.43
		699.7	21.41	20.43
3MHz	1 RB high	714.5	22.72	21.98
		707.5	22.70	21.97
		700.5	22.78	22.10
	1 RB low	714.5	22.77	22.11
		707.5	22.75	22.09
		700.5	22.79	22.10
	50% RB mid	714.5	21.81	20.91
		707.5	21.81	20.92
		700.5	21.82	20.98

	100% RB	714.5	21.75	20.83
		707.5	21.76	20.82
		700.5	21.80	20.88
5MHz	1 RB high	713.5	22.64	21.95
		707.5	22.64	21.89
		701.5	22.69	21.99
	1 RB low	713.5	22.68	21.94
		707.5	22.72	22.03
		701.5	22.69	21.91
	50% RB mid	713.5	21.87	20.88
		707.5	21.81	20.85
		701.5	21.83	20.90
	100% RB	713.5	21.80	20.87
		707.5	21.76	20.80
		701.5	21.82	20.89
10MHz	1 RB high	711.0	22.71	22.04
		707.5	22.69	21.97
		704.0	22.68	22.01
	1 RB low	711.0	22.79	22.06
		707.5	22.78	21.94
		704.0	22.77	22.07
	50% RB mid	711.0	21.81	20.87
		707.5	21.78	20.84
		704.0	21.82	20.88
	100% RB	711.0	21.76	20.81
		707.5	21.76	20.81
		704.0	21.88	20.95

**LTE band 13**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	784.5	22.25	21.48
		782.0	22.18	21.53
		779.5	22.20	21.54
	1 RB low	784.5	22.24	21.39
		782.0	22.26	21.48
		779.5	22.23	21.50
	50% RB mid	784.5	21.38	20.45
		782.0	21.40	20.41
		779.5	21.41	20.46
	100% RB	784.5	21.39	20.45
		782.0	21.29	20.36
		779.5	21.37	20.46
10MHz	1 RB high	782.0	22.31	21.54
	1 RB low	782.0	22.34	21.68
	50% RB mid	782.0	21.39	20.46
	100% RB	782.0	21.32	20.38



**LTE band 25**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1914.3	22.58	21.89
		1882.5	22.52	21.86
		1850.7	22.56	21.85
	1 RB low	1914.3	22.59	21.79
		1882.5	22.52	21.74
		1850.7	22.54	21.87
	50% RB mid	1914.3	22.77	21.68
		1882.5	22.65	21.66
		1850.7	22.69	21.63
	100% RB	1914.3	21.68	20.73
		1882.5	21.58	20.65
		1850.7	21.63	20.67
3MHz	1 RB high	1913.5	22.69	22.01
		1882.5	22.65	21.95
		1851.5	22.67	21.86
	1 RB low	1913.5	22.65	21.96
		1882.5	22.61	22.29
		1851.5	22.66	21.91
	50% RB mid	1913.5	21.72	20.80
		1882.5	21.63	20.64
		1851.5	21.67	20.64
	100% RB	1913.5	21.69	20.66
		1882.5	21.60	20.59
		1851.5	21.62	20.63
5MHz	1 RB high	1912.5	22.61	21.83
		1882.5	22.56	21.87
		1852.5	22.62	21.89
	1 RB low	1912.5	22.60	21.92
		1882.5	22.56	21.76
		1852.5	22.57	21.90
	50% RB mid	1912.5	21.75	20.74
		1882.5	21.67	20.65
		1852.5	21.72	20.68
	100% RB	1912.5	21.69	20.68
		1882.5	21.64	20.63
		1852.5	21.69	20.68
10MHz	1 RB high	1910.0	22.72	22.02
		1882.5	22.67	21.98

	1 RB low	1855.0	22.72	21.95
		1910.0	22.70	22.03
		1882.5	22.65	21.92
	50% RB mid	1855.0	22.68	22.01
		1910.0	21.74	20.73
		1882.5	21.67	20.67
	100% RB	1855.0	21.77	20.77
		1910.0	21.76	20.73
		1882.5	21.74	20.74
15MHz	1 RB high	1855.0	21.84	20.82
		1910.0	21.76	20.73
		1882.5	21.74	20.74
	1 RB low	1907.5	22.63	21.91
		1882.5	22.55	21.89
		1857.5	22.60	21.90
	50% RB mid	1907.5	22.59	21.92
		1882.5	22.59	21.83
		1857.5	22.58	21.82
	100% RB	1907.5	21.78	20.72
		1882.5	21.70	20.68
		1857.5	21.73	20.71
20MHz	1 RB high	1907.5	21.80	20.78
		1882.5	21.72	20.69
		1857.5	21.79	20.77
	1 RB low	1905.0	22.46	21.81
		1882.5	22.37	21.61
		1860.0	22.38	21.75
	50% RB mid	1905.0	22.41	21.58
		1882.5	22.38	21.65
		1860.0	22.38	21.63
	100% RB	1905.0	21.74	20.73
		1882.5	21.68	20.68
		1860.0	21.74	20.76
	1 RB high	1905.0	21.76	20.76
		1882.5	21.68	20.66
		1860.0	21.77	20.74

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

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	823.3	22.93	22.05
		819.0	22.91	22.04
		814.7	22.92	21.97
	1 RB low	823.3	22.91	21.99
		819.0	22.94	21.99
		814.7	22.92	21.97
	50% RB mid	823.3	23.05	22.34
		819.0	23.10	22.33
		814.7	23.02	22.32
	100% RB	823.3	22.02	21.19
		819.0	22.05	21.22
		814.7	22.03	21.22
3MHz	1 RB high	822.5	22.96	22.03
		819.0	22.92	21.99
		815.5	22.95	21.96
	1 RB low	822.5	22.96	22.02
		819.0	22.93	22.01
		815.5	22.98	22.03
	50% RB mid	822.5	21.97	21.07
		819.0	21.96	21.10
		815.5	21.98	21.09
	100% RB	822.5	22.01	20.99
		819.0	22.00	20.99
		815.5	21.97	20.97
5MHz	1 RB high	821.5	22.91	22.07
		819.0	22.83	22.03
		816.5	22.95	22.07
	1 RB low	821.5	22.89	22.02
		819.0	22.85	21.98
		816.5	22.88	22.06
	50% RB mid	821.5	21.99	21.15
		819.0	21.99	21.13
		816.5	22.01	21.09
	100% RB	821.5	22.09	21.08
		819.0	22.02	21.00
		816.5	21.97	20.93
10MHz	1 RB high	819.0	22.96	22.04
	1 RB low	819.0	22.98	22.03



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	50% RB mid	819.0	22.98	22.02
	100% RB	819.0	22.95	21.99

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

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	848.3	22.86	21.94
		836.5	22.89	21.99
		824.7	22.91	22.05
	1 RB low	848.3	22.86	21.93
		836.5	22.87	21.90
		824.7	22.92	22.01
	50% RB mid	848.3	22.99	22.22
		836.5	23.04	22.20
		824.7	23.09	22.36
	100% RB	848.3	21.95	21.13
		836.5	22.03	21.18
		824.7	22.00	21.22
3MHz	1 RB high	847.5	22.88	21.90
		836.5	22.87	21.91
		825.5	22.97	22.01
	1 RB low	847.5	22.87	21.94
		836.5	22.87	21.94
		825.5	23.01	22.07
	50% RB mid	847.5	21.89	21.00
		836.5	21.93	21.02
		825.5	21.93	21.08
	100% RB	847.5	21.92	20.89
		836.5	21.94	20.89
		825.5	21.97	20.96
5MHz	1 RB high	846.5	22.81	21.93
		836.5	22.83	21.96
		826.5	22.86	22.00
	1 RB low	846.5	22.80	21.96
		836.5	22.80	21.95
		826.5	22.89	22.06
	50% RB mid	846.5	21.94	21.03
		836.5	21.90	21.07
		826.5	22.03	21.13
	100% RB	846.5	21.91	20.90
		836.5	21.93	20.91
		826.5	22.06	21.05
10MHz	1 RB high	844.0	22.94	21.99
		836.5	22.92	21.97

	1 RB low	829.0	22.94	21.98
		844.0	22.92	22.00
		836.5	22.91	21.94
	50% RB mid	829.0	22.98	22.01
		844.0	21.98	21.16
		836.5	21.84	21.15
	100% RB	829.0	22.24	21.18
		844.0	22.05	21.11
		836.5	21.96	20.99
15MHz	1 RB high	829.0	22.14	21.21
		841.5	22.84	22.26
		836.5	22.84	22.33
	1 RB low	831.5	22.86	22.33
		841.5	22.86	22.28
		836.5	22.85	22.30
	50% RB mid	831.5	22.90	22.38
		841.5	22.06	21.04
		836.5	21.93	20.98
	100% RB	831.5	22.05	21.00
		841.5	22.12	21.12
		836.5	21.93	20.90
		831.5	21.97	20.96

**LTE band 41**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	2687.5	26.08	25.17
		2593.0	26.19	25.27
		2498.5	25.92	25.05
	1 RB low	2687.5	26.21	25.31
		2593.0	26.25	25.32
		2498.5	25.99	24.99
	50% RB mid	2687.5	25.34	24.29
		2593.0	25.40	24.30
		2498.5	25.09	24.01
	100% RB	2687.5	25.26	24.23
		2593.0	25.23	24.25
		2498.5	24.99	23.96
10MHz	1 RB high	2685.0	26.16	25.26
		2593.0	26.25	25.37
		2501.0	26.09	25.16
	1 RB low	2685.0	26.45	24.46
		2593.0	26.36	25.46
		2501.0	25.98	25.10
	50% RB mid	2685.0	25.38	24.32
		2593.0	25.36	24.32
		2501.0	25.07	24.05
	100% RB	2685.0	25.40	24.40
		2593.0	25.37	24.34
		2501.0	25.10	24.08
15MHz	1 RB high	2682.5	26.03	25.16
		2593.0	26.09	25.20
		2503.5	25.95	25.09
	1 RB low	2682.5	26.41	25.47
		2593.0	26.27	25.36
		2503.5	25.89	25.01
	50% RB mid	2682.5	25.36	24.28
		2593.0	25.33	24.23
		2503.5	25.06	23.99
	100% RB	2682.5	25.35	24.32
		2593.0	25.30	24.26
		2503.5	25.06	24.01



20MHz	1 RB high	2680.0	25.68	24.78
		2593.0	25.72	24.82
		2506.0	25.70	24.82
	1 RB low	2680.0	26.07	25.16
		2593.0	25.95	25.02
		2506.0	25.49	24.58
	50% RB mid	2680.0	25.33	24.30
		2593.0	25.20	24.18
		2506.0	24.92	23.89
	100% RB	2680.0	25.28	24.25
		2593.0	25.17	24.13
		2506.0	24.95	23.91



**LTE band 66**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
1.4MHz	1 RB high	1779.3	22.62	21.92
		1745.0	22.72	22.03
		1710.7	22.76	22.03
	1 RB low	1779.3	22.60	21.87
		1745.0	22.72	22.09
		1710.7	22.73	22.08
	50% RB mid	1779.3	22.78	21.83
		1745.0	22.89	21.86
		1710.7	22.94	21.94
	100% RB	1779.3	21.72	20.83
		1745.0	21.80	20.88
		1710.7	21.87	20.92
3MHz	1 RB high	1778.5	22.65	21.90
		1745.0	22.73	22.09
		1711.5	22.82	22.13
	1 RB low	1778.5	22.65	21.87
		1745.0	22.75	22.02
		1711.5	22.77	22.00
	50% RB mid	1778.5	21.69	20.72
		1745.0	21.77	20.84
		1711.5	21.80	20.86
	100% RB	1778.5	21.64	20.65
		1745.0	21.75	20.73
		1711.5	21.75	20.79
5MHz	1 RB high	1777.5	22.65	21.78
		1745.0	22.65	21.78
		1712.5	22.66	21.92
	1 RB low	1777.5	22.67	21.77
		1745.0	22.65	22.00
		1712.5	22.66	21.86
	50% RB mid	1777.5	22.16	20.66
		1745.0	21.80	20.77
		1712.5	21.84	20.80
	100% RB	1777.5	22.11	20.61
		1745.0	21.75	20.73
		1712.5	21.80	20.79
10MHz	1 RB high	1775.0	23.13	22.47
		1745.0	23.19	22.43

	1 RB low	1715.0	23.30	22.45
		1775.0	23.10	22.42
		1745.0	23.24	22.28
	50% RB mid	1715.0	23.24	22.14
		1775.0	22.16	21.20
		1745.0	22.30	21.27
	100% RB	1715.0	22.34	21.24
		1775.0	22.20	21.19
		1745.0	22.29	21.21
15MHz	1 RB high	1715.0	22.36	21.16
		1775.0	22.20	21.19
		1745.0	22.29	21.21
	1 RB low	1772.5	23.00	22.29
		1745.0	23.07	22.38
		1717.5	23.15	22.50
	50% RB mid	1772.5	22.96	22.32
		1745.0	23.18	22.50
		1717.5	23.24	22.49
	100% RB	1772.5	22.15	21.13
		1745.0	22.23	21.23
		1717.5	22.31	21.25
20MHz	1 RB high	1772.5	22.10	21.12
		1745.0	22.21	21.22
		1717.5	22.33	21.29
	1 RB low	1770.0	22.38	21.71
		1745.0	22.48	21.82
		1720.0	22.51	21.66
	50% RB mid	1770.0	22.39	21.67
		1745.0	22.54	21.85
		1720.0	22.57	21.91
	100% RB	1770.0	21.67	20.64
		1745.0	21.80	20.77
		1720.0	21.84	20.83
	1 RB high	1770.0	21.57	20.54
		1745.0	21.81	20.78
		1720.0	21.85	20.85

**LTE band 71**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)	
			QPSK	16QAM
5MHz	1 RB high	695.5	22.96	21.85
		680.5	22.84	21.72
		665.5	22.52	21.82
	1 RB low	695.5	22.98	21.75
		680.5	22.93	21.81
		665.5	22.52	21.81
	50% RB mid	695.5	22.15	20.72
		680.5	22.09	20.63
		665.5	21.75	20.70
	100% RB	695.5	22.09	20.78
		680.5	21.97	20.63
		665.5	21.66	20.67
10MHz	1 RB high	693.0	23.13	22.37
		680.5	23.02	22.33
		668.0	23.06	22.21
	1 RB low	693.0	23.20	22.45
		680.5	23.09	22.47
		668.0	22.99	21.96
	50% RB mid	693.0	22.21	21.21
		680.5	22.22	21.22
		668.0	22.00	21.00
	100% RB	693.0	22.24	21.25
		680.5	22.27	21.24
		668.0	22.08	20.77
15MHz	1 RB high	690.5	22.98	22.25
		680.5	22.98	22.32
		670.5	22.97	22.30
	1 RB low	690.5	23.03	22.35
		680.5	23.05	22.42
		670.5	23.14	22.49
	50% RB mid	690.5	22.18	21.13
		680.5	22.21	21.17
		670.5	22.28	21.21
	100% RB	690.5	22.14	21.11
		680.5	22.19	21.17
		670.5	22.21	21.20



20MHz	1 RB high	688.0	22.29	21.71
		680.5	22.24	21.54
		673.0	22.24	21.53
	1 RB low	688.0	22.35	21.70
		680.5	22.35	21.66
		673.0	22.43	21.73
	50% RB mid	688.0	21.74	20.69
		680.5	21.70	20.70
		673.0	21.69	20.69
	100% RB	688.0	21.61	20.56
		680.5	21.71	20.69
		673.0	21.59	20.59

### A.1.3 Radiated

#### A.1.3.1 Description

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

**FDD Band 12:** 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 ".

**LTE Band 13:** 27.50(b)(10) specifies " Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP."

**LTE Band 25:** Rule Part 24.232(c) specifies "Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications."

**LTE Band 26(814-824):** Rule Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts".

**LTE Band 26(824-849):** Rule Part 22.913 specifies ""The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts".

**LTE Band 66:** Rule Part 27.50(d) specifies "Fixed, mobile, and portable (handheld) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP."

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

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

**FDD Band 7/41:** 27.50(h)(2) specifies " *Mobile and other user stations.* Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power".

**LTE Band 71:** Rule 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 ".

#### A.1.3.2 Method of Measurement

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

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

$$\text{ERP or EIRP} = P_{\text{Mea}} + G_{\text{T}}$$

Where

ERP or EIRP                      effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as  $P_{\text{Mea}}$ , e.g., dBm or dBW)

$P_{\text{Mea}}$                               measured transmitter output power or PSD, in dBm or dBW

$G_{\text{T}}$                                       gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

**A.1.3.3 Measurement result**
**LTE band 12**
**Limits:  $\leq 34.77$ dBm (3W)**
**Max ERP: 21.22dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) $G_T = 0.5$ dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	715.3	22.71	21.39	/	21.06	19.74	/
		707.5	22.7	21.47	/	21.05	19.82	/
		699.7	22.42	21.49	/	20.77	19.84	/
	1 RB low	715.3	22.7	21.53	/	21.05	19.88	/
		707.5	22.59	21.56	/	20.94	19.91	/
		699.7	22.21	21.62	/	20.56	19.97	/
	50% RB mid	715.3	22.87	21.34	/	21.22	19.69	/
		707.5	22.72	21.32	/	21.07	19.67	/
		699.7	22.38	21.35	/	20.73	19.70	/
	100% RB	715.3	21.79	20.59	/	20.14	18.94	/
		707.5	21.78	20.43	/	20.13	18.78	/
		699.7	21.41	20.43	/	19.76	18.78	/
3MHz	1 RB high	714.5	22.72	21.98	/	21.07	20.33	/
		707.5	22.7	21.97	/	21.05	20.32	/
		700.5	22.78	22.1	/	21.13	20.45	/
	1 RB low	714.5	22.77	22.11	/	21.12	20.46	/
		707.5	22.75	22.09	/	21.10	20.44	/
		700.5	22.79	22.1	/	21.14	20.45	/
	50% RB mid	714.5	21.81	20.91	/	20.16	19.26	/
		707.5	21.81	20.92	/	20.16	19.27	/
		700.5	21.82	20.98	/	20.17	19.33	/
	100% RB	714.5	21.75	20.83	/	20.10	19.18	/
		707.5	21.76	20.82	/	20.11	19.17	/
		700.5	21.8	20.88	/	20.15	19.23	/
5MHz	1 RB high	713.5	22.64	21.95	/	20.99	20.30	/
		707.5	22.64	21.89	/	20.99	20.24	/
		701.5	22.69	21.99	/	21.04	20.34	/
	1 RB low	713.5	22.68	21.94	/	21.03	20.29	/
		707.5	22.72	22.03	/	21.07	20.38	/
		701.5	22.69	21.91	/	21.04	20.26	/
	50% RB mid	713.5	21.87	20.88	/	20.22	19.23	/
		707.5	21.81	20.85	/	20.16	19.20	/
		701.5	21.83	20.9	/	20.18	19.25	/
	100% RB	713.5	21.8	20.87	/	20.15	19.22	/
		707.5	21.76	20.8	/	20.11	19.15	/



		701.5	21.82	20.89	/	20.17	19.24	/
10MHz	1 RB high	711	22.71	22.04	/	21.06	20.39	/
		707.5	22.69	21.97	/	21.04	20.32	/
		704	22.68	22.01	/	21.03	20.36	/
	1 RB low	711	22.79	22.06	/	21.14	20.41	/
		707.5	22.78	21.94	/	21.13	20.29	/
		704	22.77	22.07	/	21.12	20.42	/
	50% RB mid	711	21.81	20.87	/	20.16	19.22	/
		707.5	21.78	20.84	/	20.13	19.19	/
		704	21.82	20.88	/	20.17	19.23	/
	100% RB	711	21.76	20.81	/	20.11	19.16	/
		707.5	21.76	20.81	/	20.11	19.16	/
		704	21.88	20.95	/	20.23	19.30	/

**LTE band 13**
**Limits: ≤34.77 dBm (3W)**
**Max ERP: 20.69dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> = 0.5dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	22.25	21.48	/	20.60	19.83	/
		782	22.18	21.53	/	20.53	19.88	/
		779.5	22.20	21.54	/	20.55	19.89	/
	1 RB low	784.5	22.24	21.39	/	20.59	19.74	/
		782	22.26	21.48	/	20.61	19.83	/
		779.5	22.23	21.50	/	20.58	19.85	/
	50% RB mid	784.5	21.38	20.45	/	19.73	18.80	/
		782	21.40	20.41	/	19.75	18.76	/
		779.5	21.41	20.46	/	19.76	18.81	/
	100% RB	784.5	21.39	20.45	/	19.74	18.80	/
		782	21.29	20.36	/	19.64	18.71	/
		779.5	21.37	20.46	/	19.72	18.81	/
10MHz	1 RB high	782	22.31	21.54	/	20.66	19.89	/
	1 RB low	782	22.34	21.68	/	20.69	20.03	/
	50% RB mid	782	21.39	20.46	/	19.74	18.81	/
	100% RB	782	21.32	20.38	/	19.67	18.73	/



**LTE band 25**
**Limit: ≤33 dBm (2W)**
**Max EIRP: 23.52dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> = 0.8dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	1914.3	22.58	21.89	/	23.38	22.69	/
		1882.5	22.52	21.86	/	23.32	22.66	/
		1850.7	22.56	21.85	/	23.36	22.65	/
	1 RB low	1914.3	22.59	21.79	/	23.39	22.59	/
		1882.5	22.52	21.74	/	23.32	22.54	/
		1850.7	22.54	21.87	/	23.34	22.67	/
	50% RB mid	1914.3	22.77	21.68	/	23.57	22.48	/
		1882.5	22.65	21.66	/	23.45	22.46	/
		1850.7	22.69	21.63	/	23.49	22.43	/
	100% RB	1914.3	21.68	20.73	/	22.48	21.53	/
		1882.5	21.58	20.65	/	22.38	21.45	/
		1850.7	21.63	20.67	/	22.43	21.47	/
3MHz	1 RB high	1913.5	22.69	22.01	/	23.49	22.81	/
		1882.5	22.65	21.95	/	23.45	22.75	/
		1851.5	22.67	21.86	/	23.47	22.66	/
	1 RB low	1913.5	22.65	21.96	/	23.45	22.76	/
		1882.5	22.61	22.29	/	23.41	23.09	/
		1851.5	22.66	21.91	/	23.46	22.71	/
	50% RB mid	1913.5	21.72	20.8	/	22.52	21.60	/
		1882.5	21.63	20.64	/	22.43	21.44	/
		1851.5	21.67	20.64	/	22.47	21.44	/
	100% RB	1913.5	21.69	20.66	/	22.49	21.46	/
		1882.5	21.6	20.59	/	22.40	21.39	/
		1851.5	21.62	20.63	/	22.42	21.43	/
5MHz	1 RB high	1912.5	22.61	21.83	/	23.41	22.63	/
		1882.5	22.56	21.87	/	23.36	22.67	/
		1852.5	22.62	21.89	/	23.42	22.69	/
	1 RB low	1912.5	22.6	21.92	/	23.40	22.72	/
		1882.5	22.56	21.76	/	23.36	22.56	/
		1852.5	22.57	21.9	/	23.37	22.70	/
	50% RB mid	1912.5	21.75	20.74	/	22.55	21.54	/
		1882.5	21.67	20.65	/	22.47	21.45	/
		1852.5	21.72	20.68	/	22.52	21.48	/
	100% RB	1912.5	21.69	20.68	/	22.49	21.48	/
		1882.5	21.64	20.63	/	22.44	21.43	/
		1852.5	21.69	20.68	/	22.49	21.48	/

10MHz	1 RB high	1910	22.72	22.02	/	23.52	22.82	/
		1882.5	22.67	21.98	/	23.47	22.78	/
		1855	22.72	21.95	/	23.52	22.75	/
	1 RB low	1910	22.7	22.03	/	23.50	22.83	/
		1882.5	22.65	21.92	/	23.45	22.72	/
		1855	22.68	22.01	/	23.48	22.81	/
	50% RB mid	1910	21.74	20.73	/	22.54	21.53	/
		1882.5	21.67	20.67	/	22.47	21.47	/
		1855	21.77	20.77	/	22.57	21.57	/
	100% RB	1910	21.76	20.73	/	22.56	21.53	/
		1882.5	21.74	20.74	/	22.54	21.54	/
		1855	21.84	20.82	/	22.64	21.62	/
15MHz	1 RB high	1907.5	22.63	21.91	/	23.43	22.71	/
		1882.5	22.55	21.89	/	23.35	22.69	/
		1857.5	22.6	21.9	/	23.40	22.70	/
	1 RB low	1907.5	22.59	21.92	/	23.39	22.72	/
		1882.5	22.59	21.83	/	23.39	22.63	/
		1857.5	22.58	21.82	/	23.38	22.62	/
	50% RB mid	1907.5	21.78	20.72	/	22.58	21.52	/
		1882.5	21.7	20.68	/	22.50	21.48	/
		1857.5	21.73	20.71	/	22.53	21.51	/
	100% RB	1907.5	21.8	20.78	/	22.60	21.58	/
		1882.5	21.72	20.69	/	22.52	21.49	/
		1857.5	21.79	20.77	/	22.59	21.57	/
20MHz	1 RB high	1905	22.46	21.81	/	23.26	22.61	/
		1882.5	22.37	21.61	/	23.17	22.41	/
		1860	22.38	21.75	/	23.18	22.55	/
	1 RB low	1905	22.41	21.58	/	23.21	22.38	/
		1882.5	22.38	21.65	/	23.18	22.45	/
		1860	22.38	21.63	/	23.18	22.43	/
	50% RB mid	1905	21.74	20.73	/	22.54	21.53	/
		1882.5	21.68	20.68	/	22.48	21.48	/
		1860	21.74	20.76	/	22.54	21.56	/
	100% RB	1905	21.76	20.76	/	22.56	21.56	/
		1882.5	21.68	20.66	/	22.48	21.46	/
		1860	21.77	20.74	/	22.57	21.54	/

**LTE band 26(814MHz~824MHz)**
**Limit: ≤100 W**
**Max ERP: 21.45dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> =0.5dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	823.3	22.93	22.05	/	21.28	20.40	/
		819	22.91	22.04	/	21.26	20.39	/
		814.7	22.92	21.97	/	21.27	20.32	/
	1 RB low	823.3	22.91	21.99	/	21.26	20.34	/
		819	22.94	21.99	/	21.29	20.34	/
		814.7	22.92	21.97	/	21.27	20.32	/
	50% RB mid	823.3	23.05	22.34	/	21.40	20.69	/
		819	23.1	22.33	/	21.45	20.68	/
		814.7	23.02	22.32	/	21.37	20.67	/
	100% RB	823.3	22.02	21.19	/	20.37	19.54	/
		819	22.05	21.22	/	20.40	19.57	/
		814.7	22.03	21.22	/	20.38	19.57	/
3MHz	1 RB high	822.5	22.96	22.03	/	21.31	20.38	/
		819	22.92	21.99	/	21.27	20.34	/
		815.5	22.95	21.96	/	21.30	20.31	/
	1 RB low	822.5	22.96	22.02	/	21.31	20.37	/
		819	22.93	22.01	/	21.28	20.36	/
		815.5	22.98	22.03	/	21.33	20.38	/
	50% RB mid	822.5	21.97	21.07	/	20.32	19.42	/
		819	21.96	21.1	/	20.31	19.45	/
		815.5	21.98	21.09	/	20.33	19.44	/
	100% RB	822.5	22.01	20.99	/	20.36	19.34	/
		819	22	20.99	/	20.35	19.34	/
		815.5	21.97	20.97	/	20.32	19.32	/
5MHz	1 RB high	821.5	22.91	22.07	/	21.26	20.42	/
		819	22.83	22.03	/	21.18	20.38	/
		816.5	22.95	22.07	/	21.30	20.42	/
	1 RB low	821.5	22.89	22.02	/	21.24	20.37	/
		819	22.85	21.98	/	21.20	20.33	/
		816.5	22.88	22.06	/	21.23	20.41	/
	50% RB mid	821.5	21.99	21.15	/	20.34	19.50	/
		819	21.99	21.13	/	20.34	19.48	/
		816.5	22.01	21.09	/	20.36	19.44	/
	100% RB	821.5	22.09	21.08	/	20.44	19.43	/
		819	22.02	21	/	20.37	19.35	/
		816.5	21.97	20.93	/	20.32	19.28	/



10MHz	1 RB high	819	22.96	22.04	/	21.31	20.39	/
	1 RB low	819	22.98	22.03	/	21.33	20.38	/
	50% RB mid	819	22.98	22.02	/	21.33	20.37	/
	100% RB	819	22.95	21.99	/	21.30	20.34	/

**LTE band 26(824MHz~849MHz)**
**Limit: ≤ 7 W**
**Max ERP: 21.44dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> =0.5dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	22.86	21.94	/	21.21	20.29	/
		836.5	22.89	21.99	/	21.24	20.34	/
		824.7	22.91	22.05	/	21.26	20.40	/
	1 RB low	848.3	22.86	21.93	/	21.21	20.28	/
		836.5	22.87	21.9	/	21.22	20.25	/
		824.7	22.92	22.01	/	21.27	20.36	/
	50% RB mid	848.3	22.99	22.22	/	21.34	20.57	/
		836.5	23.04	22.2	/	21.39	20.55	/
		824.7	23.09	22.36	/	21.44	20.71	/
	100% RB	848.3	21.95	21.13	/	20.30	19.48	/
		836.5	22.03	21.18	/	20.38	19.53	/
		824.7	22	21.22	/	20.35	19.57	/
3MHz	1 RB high	847.5	22.88	21.9	/	21.23	20.25	/
		836.5	22.87	21.91	/	21.22	20.26	/
		825.5	22.97	22.01	/	21.32	20.36	/
	1 RB low	847.5	22.87	21.94	/	21.22	20.29	/
		836.5	22.87	21.94	/	21.22	20.29	/
		825.5	23.01	22.07	/	21.36	20.42	/
	50% RB mid	847.5	21.89	21	/	20.24	19.35	/
		836.5	21.93	21.02	/	20.28	19.37	/
		825.5	21.93	21.08	/	20.28	19.43	/
	100% RB	847.5	21.92	20.89	/	20.27	19.24	/
		836.5	21.94	20.89	/	20.29	19.24	/
		825.5	21.97	20.96	/	20.32	19.31	/
5MHz	1 RB high	846.5	22.81	21.93	/	21.16	20.28	/
		836.5	22.83	21.96	/	21.18	20.31	/
		826.5	22.86	22	/	21.21	20.35	/
	1 RB low	846.5	22.8	21.96	/	21.15	20.31	/
		836.5	22.8	21.95	/	21.15	20.30	/
		826.5	22.89	22.06	/	21.24	20.41	/
	50% RB mid	846.5	21.94	21.03	/	20.29	19.38	/
		836.5	21.9	21.07	/	20.25	19.42	/
		826.5	22.03	21.13	/	20.38	19.48	/
	100% RB	846.5	21.91	20.9	/	20.26	19.25	/
		836.5	21.93	20.91	/	20.28	19.26	/
		826.5	22.06	21.05	/	20.41	19.40	/

10MHz	1 RB high	844	22.94	21.99	/	21.29	20.34	/
		836.5	22.92	21.97	/	21.27	20.32	/
		829	22.94	21.98	/	21.29	20.33	/
	1 RB low	844	22.92	22	/	21.27	20.35	/
		836.5	22.91	21.94	/	21.26	20.29	/
		829	22.98	22.01	/	21.33	20.36	/
	50% RB mid	844	21.98	21.16	/	20.33	19.51	/
		836.5	21.84	21.15	/	20.19	19.50	/
		829	22.24	21.18	/	20.59	19.53	/
	100% RB	844	22.05	21.11	/	20.40	19.46	/
		836.5	21.96	20.99	/	20.31	19.34	/
		829	22.14	21.21	/	20.49	19.56	/
15MHz	1 RB high	841.5	22.84	22.26	/	21.19	20.61	/
		836.5	22.84	22.33	/	21.19	20.68	/
		831.5	22.86	22.33	/	21.21	20.68	/
	1 RB low	841.5	22.86	22.28	/	21.21	20.63	/
		836.5	22.85	22.3	/	21.20	20.65	/
		831.5	22.9	22.38	/	21.25	20.73	/
	50% RB mid	841.5	22.06	21.04	/	20.41	19.39	/
		836.5	21.93	20.98	/	20.28	19.33	/
		831.5	22.05	21	/	20.40	19.35	/
	100% RB	841.5	22.12	21.12	/	20.47	19.47	/
		836.5	21.93	20.9	/	20.28	19.25	/
		831.5	21.97	20.96	/	20.32	19.31	/

**LTE band 41**
**Limits: ≤33 dBm (2W)**
**Max EIRP: 27.45dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> = 1dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	26.08	25.17	/	27.08	26.17	/
		2593	26.19	25.27	/	27.19	26.27	/
		2498.5	25.92	25.05	/	26.92	26.05	/
	1 RB low	2687.5	26.21	25.31	/	27.21	26.31	/
		2593	26.25	25.32	/	27.25	26.32	/
		2498.5	25.99	24.99	/	26.99	25.99	/
	50% RB mid	2687.5	25.34	24.29	/	26.34	25.29	/
		2593	25.40	24.30	/	26.40	25.30	/
		2498.5	25.09	24.01	/	26.09	25.01	/
	100% RB	2687.5	25.26	24.23	/	26.26	25.23	/
		2593	25.23	24.25	/	26.23	25.25	/
		2498.5	24.99	23.96	/	25.99	24.96	/
10MHz	1 RB high	2685	26.16	25.26	/	27.16	26.26	/
		2593	26.25	25.37	/	27.25	26.37	/
		2501	26.09	25.16	/	27.09	26.16	/
	1 RB low	2685	26.45	24.46	/	27.45	25.46	/
		2593	26.36	25.46	/	27.36	26.46	/
		2501	25.98	25.10	/	26.98	26.10	/
	50% RB mid	2685	25.38	24.32	/	26.38	25.32	/
		2593	25.36	24.32	/	26.36	25.32	/
		2501	25.07	24.05	/	26.07	25.05	/
	100% RB	2685	25.40	24.40	/	26.40	25.40	/
		2593	25.37	24.34	/	26.37	25.34	/
		2501	25.10	24.08	/	26.10	25.08	/
15MHz	1 RB high	2682.5	26.03	25.16	/	27.03	26.16	/
		2593	26.09	25.20	/	27.09	26.20	/
		2503.5	25.95	25.09	/	26.95	26.09	/
	1 RB low	2682.5	26.41	25.47	/	27.41	26.47	/
		2593	26.27	25.36	/	27.27	26.36	/
		2503.5	25.89	25.01	/	26.89	26.01	/
	50% RB mid	2682.5	25.36	24.28	/	26.36	25.28	/
		2593	25.33	24.23	/	26.33	25.23	/
		2503.5	25.06	23.99	/	26.06	24.99	/
	100% RB	2682.5	25.35	24.32	/	26.35	25.32	/
		2593	25.30	24.26	/	26.30	25.26	/
		2503.5	25.06	24.01	/	26.06	25.01	/

20MHz	1 RB high	2680	25.68	24.78	/	26.68	25.78	/
		2593	25.72	24.82	/	26.72	25.82	/
		2506	25.70	24.82	/	26.70	25.82	/
	1 RB low	2680	26.07	25.16	/	27.07	26.16	/
		2593	25.95	25.02	/	26.95	26.02	/
		2506	25.49	24.58	/	26.49	25.58	/
	50% RB mid	2680	25.33	24.30	/	26.33	25.30	/
		2593	25.20	24.18	/	26.20	25.18	/
		2506	24.92	23.89	/	25.92	24.89	/
	100% RB	2680	25.28	24.25	/	26.28	25.25	/
		2593	25.17	24.13	/	26.17	25.13	/
		2506	24.95	23.91	/	25.95	24.91	/



**LTE band 66**
**Limits: ≤30dBm (1W)**
**Max EIRP: 24.10dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> =0.8dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
1.4MHz	1 RB high	1779.3	22.62	21.92	/	23.42	22.72	/
		1745	22.72	22.03	/	23.52	22.83	/
		1710.7	22.76	22.03	/	23.56	22.83	/
	1 RB low	1779.3	22.60	21.87	/	23.40	22.67	/
		1745	22.72	22.09	/	23.52	22.89	/
		1710.7	22.73	22.08	/	23.53	22.88	/
	50% RB mid	1779.3	22.78	21.83	/	23.58	22.63	/
		1745	22.89	21.86	/	23.69	22.66	/
		1710.7	22.94	21.94	/	23.74	22.74	/
	100% RB	1779.3	21.72	20.83	/	22.52	21.63	/
		1745	21.80	20.88	/	22.60	21.68	/
		1710.7	21.87	20.92	/	22.67	21.72	/
3MHz	1 RB high	1778.5	22.65	21.90	/	23.45	22.70	/
		1745	22.73	22.09	/	23.53	22.89	/
		1711.5	22.82	22.13	/	23.62	22.93	/
	1 RB low	1778.5	22.65	21.87	/	23.45	22.67	/
		1745	22.75	22.02	/	23.55	22.82	/
		1711.5	22.77	22.00	/	23.57	22.80	/
	50% RB mid	1778.5	21.69	20.72	/	22.49	21.52	/
		1745	21.77	20.84	/	22.57	21.64	/
		1711.5	21.80	20.86	/	22.60	21.66	/
	100% RB	1778.5	21.64	20.65	/	22.44	21.45	/
		1745	21.75	20.73	/	22.55	21.53	/
		1711.5	21.75	20.79	/	22.55	21.59	/
5MHz	1 RB high	1777.5	22.65	21.78	/	23.45	22.58	/
		1745	22.65	21.78	/	23.45	22.58	/
		1712.5	22.66	21.92	/	23.46	22.72	/
	1 RB low	1777.5	22.67	21.77	/	23.47	22.57	/
		1745	22.65	22.00	/	23.45	22.80	/
		1712.5	22.66	21.86	/	23.46	22.66	/
	50% RB mid	1777.5	22.16	20.66	/	22.96	21.46	/
		1745	21.80	20.77	/	22.60	21.57	/
		1712.5	21.84	20.80	/	22.64	21.60	/
	100% RB	1777.5	22.11	20.61	/	22.91	21.41	/
		1745	21.75	20.73	/	22.55	21.53	/
		1712.5	21.80	20.79	/	22.60	21.59	/

10MHz	1 RB high	1775	23.13	22.47	/	23.93	23.27	/
		1745	23.19	22.43	/	23.99	23.23	/
		1715	23.30	22.45	/	24.10	23.25	/
	1 RB low	1775	23.10	22.42	/	23.90	23.22	/
		1745	23.24	22.28	/	24.04	23.08	/
		1715	23.24	22.14	/	24.04	22.94	/
	50% RB mid	1775	22.16	21.20	/	22.96	22.00	/
		1745	22.30	21.27	/	23.10	22.07	/
		1715	22.34	21.24	/	23.14	22.04	/
	100% RB	1775	22.20	21.19	/	23.00	21.99	/
		1745	22.29	21.21	/	23.09	22.01	/
		1715	22.36	21.16	/	23.16	21.96	/
15MHz	1 RB high	1772.5	23.00	22.29	/	23.80	23.09	/
		1745	23.07	22.38	/	23.87	23.18	/
		1717.5	23.15	22.50	/	23.95	23.30	/
	1 RB low	1772.5	22.96	22.32	/	23.76	23.12	/
		1745	23.18	22.50	/	23.98	23.30	/
		1717.5	23.24	22.49	/	24.04	23.29	/
	50% RB mid	1772.5	22.15	21.13	/	22.95	21.93	/
		1745	22.23	21.23	/	23.03	22.03	/
		1717.5	22.31	21.25	/	23.11	22.05	/
	100% RB	1772.5	22.10	21.12	/	22.90	21.92	/
		1745	22.21	21.22	/	23.01	22.02	/
		1717.5	22.33	21.29	/	23.13	22.09	/
20MHz	1 RB high	1770	22.38	21.71	/	23.18	22.51	/
		1745	22.48	21.82	/	23.28	22.62	/
		1720	22.51	21.66	/	23.31	22.46	/
	1 RB low	1770	22.39	21.67	/	23.19	22.47	/
		1745	22.54	21.85	/	23.34	22.65	/
		1720	22.57	21.91	/	23.37	22.71	/
	50% RB mid	1770	21.67	20.64	/	22.47	21.44	/
		1745	21.80	20.77	/	22.60	21.57	/
		1720	21.84	20.83	/	22.64	21.63	/
	100% RB	1770	21.57	20.54	/	22.37	21.34	/
		1745	21.81	20.78	/	22.61	21.58	/
		1720	21.85	20.85	/	22.65	21.65	/

**LTE band 71**
**Limits: ≤34.77 dBm (3W)**
**Max ERP: 21.55dBm**

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			Radiated Power (dBm) G <sub>T</sub> =0.5dBi		
			QPSK	16QAM	64QAM	QPSK	16QAM	64QAM
5MHz	1 RB high	695.5	22.96	21.85	/	21.31	20.20	/
		680.5	22.84	21.72	/	21.19	20.07	/
		665.5	22.52	21.82	/	20.87	20.17	/
	1 RB low	695.5	22.98	21.75	/	21.33	20.10	/
		680.5	22.93	21.81	/	21.28	20.16	/
		665.5	22.52	21.81	/	20.87	20.16	/
	50% RB mid	695.5	22.15	20.72	/	20.50	19.07	/
		680.5	22.09	20.63	/	20.44	18.98	/
		665.5	21.75	20.7	/	20.10	19.05	/
	100% RB	695.5	22.09	20.78	/	20.44	19.13	/
		680.5	21.97	20.63	/	20.32	18.98	/
		665.5	21.66	20.67	/	20.01	19.02	/
10MHz	1 RB high	693	23.13	22.37	/	21.48	20.72	/
		680.5	23.02	22.33	/	21.37	20.68	/
		668	23.06	22.21	/	21.41	20.56	/
	1 RB low	693	23.2	22.45	/	21.55	20.80	/
		680.5	23.09	22.47	/	21.44	20.82	/
		668	22.99	21.96	/	21.34	20.31	/
	50% RB mid	693	22.21	21.21	/	20.56	19.56	/
		680.5	22.22	21.22	/	20.57	19.57	/
		668	22	21	/	20.35	19.35	/
	100% RB	693	22.24	21.25	/	20.59	19.60	/
		680.5	22.27	21.24	/	20.62	19.59	/
		668	22.08	20.77	/	20.43	19.12	/
15MHz	1 RB high	690.5	22.98	22.25	/	21.33	20.60	/
		680.5	22.98	22.32	/	21.33	20.67	/
		670.5	22.97	22.3	/	21.32	20.65	/
	1 RB low	690.5	23.03	22.35	/	21.38	20.70	/
		680.5	23.05	22.42	/	21.40	20.77	/
		670.5	23.14	22.49	/	21.49	20.84	/
	50% RB mid	690.5	22.18	21.13	/	20.53	19.48	/
		680.5	22.21	21.17	/	20.56	19.52	/
		670.5	22.28	21.21	/	20.63	19.56	/
	100% RB	690.5	22.14	21.11	/	20.49	19.46	/
		680.5	22.19	21.17	/	20.54	19.52	/
		670.5	22.21	21.2	/	20.56	19.55	/

20MHz	1 RB high	688	22.29	21.71	/	20.64	20.06	/
		680.5	22.24	21.54	/	20.59	19.89	/
		673	22.24	21.53	/	20.59	19.88	/
	1 RB low	688	22.35	21.7	/	20.70	20.05	/
		680.5	22.35	21.66	/	20.70	20.01	/
		673	22.43	21.73	/	20.78	20.08	/
	50% RB mid	688	21.74	20.69	/	20.09	19.04	/
		680.5	21.7	20.7	/	20.05	19.05	/
		673	21.69	20.69	/	20.04	19.04	/
	100% RB	688	21.61	20.56	/	19.96	18.91	/
		680.5	21.71	20.69	/	20.06	19.04	/
		673	21.59	20.59	/	19.94	18.94	/

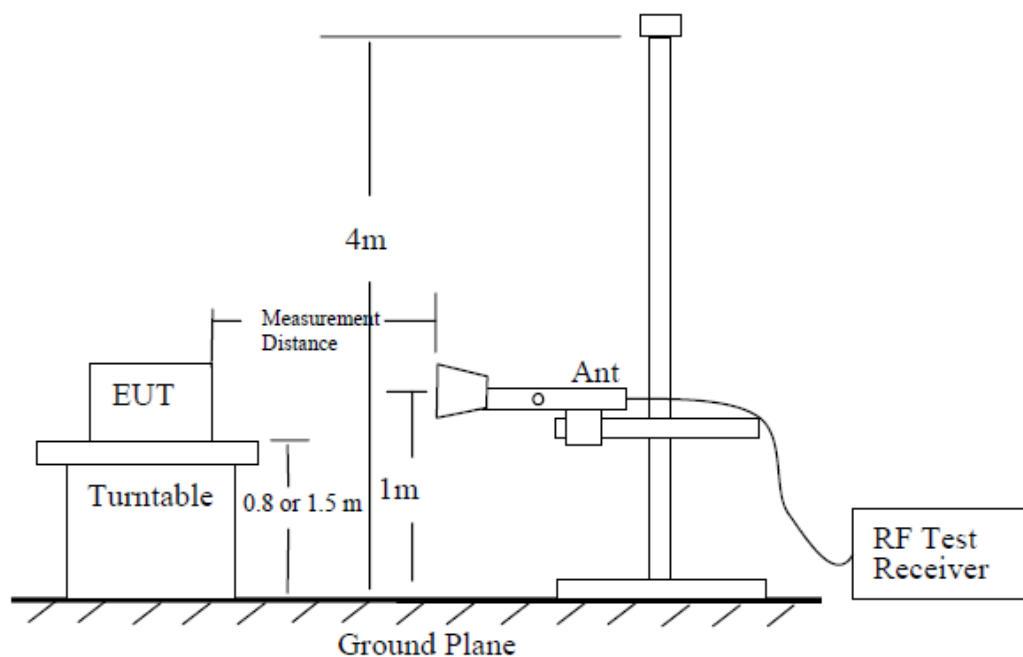
## **A.2 Emission Limit**

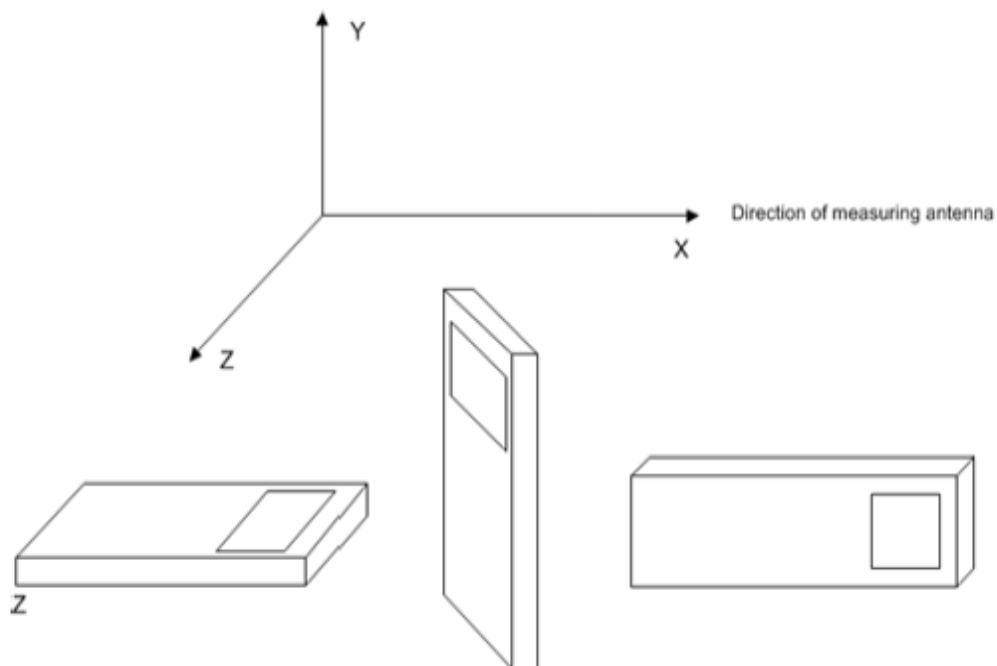
The measurements procedures in C63.26 are used.

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 the LTE Bands 12/13/25/26/41/71.

### **The procedure of radiated spurious emissions is as follows:**

Using the test configuration as follow, measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits.





The emission characteristics of the EUT can be identified from the pre-scan measurement information.

Exploratory radiated measurements (pre-scans) may be performed to determine the general EUT radiated emissions characteristics and, when necessary, the EUT-to-measurement antenna orientation that produces the maximum emission amplitude. Pre-scans shall only be used to determine the emission frequencies (i.e., not amplitude levels). The information garnered from a pre-scan can then be used to perform final compliance measurements using either the substitution or direct field strength method.

For radiated emissions measurements performed at frequencies less than or equal to 1 GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80 cm above the reference ground plane. Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1 m to 4 m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e., field strength or received power). When orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25 cm.

The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.

For radiated measurements performed at frequencies above 1 GHz, the EUT shall be placed on an RF transparent table or support at a nominal height of 1.5 m above the ground plane. When maximizing the emissions from the EUT for measurement, the EUT and its transmitting antenna(s) shall be rotated through 360°. For each mode of operation to be tested, the frequency spectrum (based on findings from exploratory measurements) shall be monitored. Final measurements shall be performed for the worst case combination(s) of variable technical parameters that result in the maximum measured emission amplitude, record the frequency and amplitude of the highest fundamental emission (if applicable), and the frequency and amplitude data for the six highest-amplitude spurious emissions.

### A.2.2 Measurement Limit

**FDD Band 12:** 27.53(g) specifies " 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 13:** 27.53(f) specifies " For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. "

**FDD Band 25:** Part 24.238 specifies "(a) Out of band emissions. 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 26(814-824MHz):** 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  $116 \log_{10}(f/6.1)$  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  $43 + 10 \log_{10}(P)$  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.

**FDD Band 26(824-849MHz):** Part 22.917 specifies " a) Out of band emissions. 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 66:** 27.53(h) specifies "AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10} (P)$  dB"

**FDD Band 71:** 27.53(g) specifies " 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 41:** 27.53(m) (4) specifies " For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log (P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log (P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that  $43 + 10 \log (P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log (P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees. "

### **A.2.3 Measurement Results**

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 12/13/25/26/41/71 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 30MHz to 26GHz.



**Measurement Results:**
**LTE Band 12, 1.4MHz, QPSK, Channel 23017**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1400.01	-40.63	-3.24	4.98	2.15	-41.04	-13.00	28.04	V
2099.00	-49.29	-4.19	4.90	2.15	-50.73	-13.00	37.73	V
2804.00	-45.82	-4.92	6.65	2.15	-46.24	-13.00	33.24	V
3508.02	-59.60	-5.53	8.21	2.15	-59.07	-13.00	46.07	H
4194.02	-58.08	-6.19	9.09	2.15	-57.33	-13.00	44.33	H
4888.01	-58.02	-6.73	9.79	2.15	-57.11	-13.00	44.11	H

**LTE Band 12, 1.4MHz, QPSK, Channel 23095**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1415.01	-40.46	-3.25	5.06	2.15	-40.80	-13.00	27.80	H
2123.00	-49.03	-4.21	4.97	2.15	-50.42	-13.00	37.42	V
2825.00	-46.31	-4.95	6.69	2.15	-46.72	-13.00	33.72	H
3545.02	-57.45	-5.77	8.26	2.15	-57.11	-13.00	44.11	H
4232.02	-57.31	-6.26	9.13	2.15	-56.59	-13.00	43.59	H
4951.01	-57.01	-6.69	9.85	2.15	-56.00	-13.00	43.00	H

**LTE Band 12, 1.4MHz, QPSK, Channel 23173**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1431.01	-37.00	-3.28	5.14	2.15	-37.29	-13.00	24.29	H
2146.00	-46.78	-4.24	5.04	2.15	-48.13	-13.00	35.13	H
2851.00	-45.22	-4.96	6.73	2.15	-45.60	-13.00	32.60	H
3572.02	-57.85	-6.05	8.30	2.15	-57.75	-13.00	44.75	H
4292.02	-59.08	-6.20	9.19	2.15	-58.24	-13.00	45.24	H
4995.01	-57.32	-6.61	9.90	2.15	-56.18	-13.00	43.18	V

**LTE Band 13, 5MHz, QPSK, Channel 23205**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1555.12	-67.65	-3.47	5.40	2.15	-67.87	-13.00	54.87	H
2336.22	-48.13	-4.44	5.61	2.15	-49.11	-13.00	36.11	V
3119.02	-54.88	-5.38	7.29	2.15	-55.12	-13.00	42.12	V
3893.02	-59.23	-6.10	8.75	2.15	-58.73	-13.00	45.73	H
4673.02	-58.09	-6.48	9.57	2.15	-57.15	-13.00	44.15	H
5451.51	-58.64	-6.88	10.53	2.15	-57.14	-13.00	44.14	V

**LTE Band 13, 5MHz, QPSK, Channel 23230**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1564.30	-67.03	-3.48	5.38	0.00	-67.28	-40.00	27.28	H
2346.01	-49.03	-4.45	5.64	2.15	-49.99	-13.00	36.99	H
3129.02	-55.38	-5.40	7.31	2.15	-55.62	-13.00	42.62	V
3911.02	-59.06	-6.12	8.78	2.15	-58.55	-13.00	45.55	H
4693.02	-58.58	-6.50	9.59	2.15	-57.64	-13.00	44.64	V
5475.51	-57.90	-6.97	10.57	2.15	-56.45	-13.00	43.45	V

**LTE Band 13, 5MHz, QPSK, Channel 23255**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1569.26	-67.12	-3.48	5.38	0.00	-67.37	-40.00	27.37	H
2348.64	-48.71	-4.46	5.65	2.15	-49.67	-13.00	36.67	H
3138.52	-57.03	-5.38	7.33	2.15	-57.23	-13.00	44.23	V
3918.52	-58.84	-6.12	8.79	2.15	-58.32	-13.00	45.32	H
4700.52	-57.13	-6.51	9.60	2.15	-56.19	-13.00	43.19	H
5492.51	-57.63	-7.03	10.59	2.15	-56.22	-13.00	43.22	H

**LTE Band 25, 1.4MHz, QPSK, Channel 26047**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3702.02	-55.22	-6.42	8.48	-53.16	-13.00	40.16	V
5554.02	-55.11	-7.19	10.59	-51.71	-13.00	38.71	H
7406.01	-52.13	-8.13	12.09	-48.17	-13.00	35.17	V
9799.01	-52.92	-9.03	13.10	-48.85	-13.00	35.85	H
11197.01	-49.88	-9.41	13.16	-46.13	-13.00	33.13	V
13499.01	-43.94	-10.64	14.20	-40.38	-13.00	27.38	V

**LTE Band 25, 1.4MHz, QPSK, Channel 26365**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3765.02	-55.31	-6.25	8.57	-52.99	-13.00	39.99	V
5648.02	-55.36	-7.27	10.57	-52.06	-13.00	39.06	V
7533.01	-53.90	-8.26	12.23	-49.93	-13.00	36.93	H
9389.01	-54.02	-9.05	13.33	-49.74	-13.00	36.74	H
11250.01	-49.92	-9.70	13.15	-46.47	-13.00	33.47	H
13155.01	-45.39	-10.69	13.72	-42.36	-13.00	29.36	V

**LTE Band 25, 1.4MHz, QPSK, Channel 26683**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3829.02	-56.42	-6.06	8.66	-53.82	-13.00	40.82	H
5744.02	-46.75	-7.27	10.55	-43.47	-13.00	30.47	H
7657.01	-49.76	-8.23	12.33	-45.66	-13.00	32.66	V
9572.01	-54.21	-9.28	13.33	-50.16	-13.00	37.16	H
11529.01	-50.67	-9.81	13.09	-47.39	-13.00	34.39	H
13410.01	-44.81	-10.57	14.07	-41.31	-13.00	28.31	V

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2455.00	-45.55	-4.58	5.97	2.15	-46.31	-13.00	33.31	V
6528.01	-56.22	-7.51	11.03	2.15	-54.85	-13.00	41.85	H
7316.01	-52.30	-8.10	11.98	2.15	-50.57	-13.00	37.57	H
8128.01	-53.45	-8.37	12.70	2.15	-51.27	-13.00	38.27	V
8971.00	-51.88	-9.10	13.09	2.15	-50.04	-13.00	37.04	H
9786.00	-51.61	-9.00	13.11	2.15	-49.65	-13.00	36.65	H

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1638.01	-53.13	-3.56	5.25	2.15	-53.59	-13.00	40.59	H
2459.00	-33.34	-4.58	5.98	2.15	-34.09	-13.00	21.09	V
3289.02	-59.51	-5.29	7.69	2.15	-59.26	-13.00	46.26	H
4114.02	-56.83	-6.04	9.01	2.15	-56.01	-13.00	43.01	H
4926.01	-57.49	-6.73	9.83	2.15	-56.54	-13.00	43.54	H
5736.01	-55.77	-7.28	10.55	2.15	-54.65	-13.00	41.65	H

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1841.01	-52.03	-3.80	4.89	2.15	-53.09	-13.00	40.09	V
2665.00	-45.92	-4.76	6.40	2.15	-46.43	-13.00	33.43	H
3107.02	-57.77	-5.34	7.26	2.15	-58.00	-13.00	45.00	V
4133.02	-56.89	-6.05	9.03	2.15	-56.06	-13.00	43.06	H
5084.01	-56.39	-6.73	10.02	2.15	-55.25	-13.00	42.25	H
5752.01	-56.12	-7.26	10.55	2.15	-54.98	-13.00	41.98	H

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1633.01	-54.57	-3.55	5.26	2.15	-55.01	-13.00	42.01	H
2458.00	-38.94	-4.58	5.97	2.15	-39.70	-13.00	26.70	H
3309.02	-60.39	-5.29	7.74	2.15	-60.09	-13.00	47.09	H
4124.02	-56.43	-6.04	9.02	2.15	-55.60	-13.00	42.60	H
4930.01	-57.36	-6.72	9.83	2.15	-56.40	-13.00	43.40	H
5753.01	-55.79	-7.26	10.55	2.15	-54.65	-13.00	41.65	H

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1673.01	-54.70	-3.58	5.19	2.15	-55.24	-13.00	42.24	H
2527.00	-46.88	-4.65	6.15	2.15	-47.53	-13.00	34.53	H
3329.02	-59.42	-5.30	7.79	2.15	-59.08	-13.00	46.08	H
4183.02	-57.46	-6.17	9.08	2.15	-56.70	-13.00	43.70	H
5036.01	-57.23	-6.59	9.95	2.15	-56.02	-13.00	43.02	H
5836.01	-57.04	-7.19	10.53	2.15	-55.85	-13.00	42.85	H

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

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1697.01	-54.99	-3.60	5.15	2.15	-55.59	-13.00	42.59	H
2545.00	-45.99	-4.66	6.18	2.15	-46.62	-13.00	33.62	H
3406.02	-60.18	-5.37	7.97	2.15	-59.73	-13.00	46.73	H
4243.02	-57.56	-6.25	9.14	2.15	-56.82	-13.00	43.82	H
5105.01	-56.52	-6.79	10.05	2.15	-55.41	-13.00	42.41	H
5944.01	-56.83	-7.47	10.51	2.15	-55.94	-13.00	42.94	H

**LTE Band 41, 5MHz, QPSK, Channel 39675**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
4998.02	-53.83	-6.61	9.90	-50.54	-25.00	25.54	H
7496.01	-50.99	-8.38	12.20	-47.17	-25.00	22.17	H
9995.01	-45.95	-9.18	12.90	-42.23	-25.00	17.23	V
12491.01	-49.96	-10.20	13.20	-46.96	-25.00	21.96	V
14993.00	-43.90	-11.21	14.01	-41.10	-25.00	16.10	H
17489.00	-38.54	-12.70	14.88	-36.36	-25.00	11.36	V

**LTE Band 41, 5MHz, QPSK, Channel 40620**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2593.00	22.19	-4.70	6.27	23.76	-25.00	-48.76	V
5187.02	-48.69	-6.94	10.16	-45.47	-25.00	20.47	H
7781.01	-53.38	-8.31	12.42	-49.27	-25.00	24.27	H
9060.01	-53.76	-9.04	13.14	-49.66	-25.00	24.66	V
10375.01	-52.05	-9.76	13.05	-48.76	-25.00	23.76	V
11658.01	-49.00	-9.69	13.07	-45.62	-25.00	20.62	H

**LTE Band 41, 5MHz, QPSK, Channel 41565**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
2688.00	22.33	-4.78	6.44	23.99	-25.00	-48.99	V
4025.02	-60.35	-6.05	8.93	-57.47	-25.00	32.47	V
5375.02	-51.08	-6.88	10.43	-47.53	-25.00	22.53	V
6742.02	-55.24	-7.97	11.29	-51.92	-25.00	26.92	H
8063.01	-49.88	-8.32	12.65	-45.55	-25.00	20.55	V
9413.01	-54.60	-9.10	13.35	-50.35	-25.00	25.35	V

**LTE Band 66, 1.4MHz QPSK, Channel 131979**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3421.02	-49.04	-5.38	8.01	-46.41	-13.00	33.41	V
5082.02	-69.41	-6.72	10.01	-66.12	-13.00	53.12	H
6861.01	-65.48	-7.81	11.43	-61.86	-13.00	48.86	H
8599.01	-64.49	-8.49	13.02	-59.96	-13.00	46.96	H
10318.01	-62.84	-9.67	13.03	-59.48	-13.00	46.48	V
11999.01	-59.94	-10.06	13.00	-57.00	-13.00	44.00	H

**LTE Band 66, 1.4MHz, QPSK, Channel 132322**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3490.02	-54.03	-5.50	8.18	-51.35	-13.00	38.35	V
5200.02	-69.66	-6.96	10.18	-66.44	-13.00	53.44	H
6992.01	-64.75	-8.24	11.59	-61.40	-13.00	48.40	H
8728.01	-64.48	-8.44	13.05	-59.87	-13.00	46.87	H
10503.01	-62.67	-9.64	13.10	-59.21	-13.00	46.21	V
12256.01	-60.15	-10.02	13.10	-57.07	-13.00	44.07	H

**LTE Band 66, 1.4MHz, QPSK, Channel 132665**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
3559.02	-59.48	-5.92	8.28	-57.12	-13.00	44.12	V
5388.02	-70.26	-6.85	10.44	-66.67	-13.00	53.67	H
7162.01	-65.33	-8.18	11.79	-61.72	-13.00	48.72	H
8846.01	-64.66	-8.75	13.07	-60.34	-13.00	47.34	V
10650.01	-61.56	-9.29	13.13	-57.72	-13.00	44.72	H
12402.01	-59.60	-10.43	13.16	-56.87	-13.00	43.87	H

**LTE Band 71, 5MHz, QPSK, Channel 133147**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1331.01	-52.20	-3.15	4.62	2.15	-52.88	-13.00	39.88	V
1997.01	-46.55	-4.04	4.61	2.15	-48.13	-13.00	35.13	V
2685.00	-45.05	-4.77	6.43	2.15	-45.54	-13.00	32.54	H
3353.02	-59.98	-5.32	7.85	2.15	-59.60	-13.00	46.60	H
4016.02	-57.59	-6.05	8.92	2.15	-56.87	-13.00	43.87	H
4661.02	-57.24	-6.47	9.56	2.15	-56.30	-13.00	43.30	H

**LTE Band 71, 5MHz, QPSK, Channel 133297**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1361.01	-52.32	-3.19	4.78	2.15	-52.88	-13.00	39.88	V
2042.00	-44.57	-4.14	4.73	2.15	-46.13	-13.00	33.13	V
2708.00	-45.60	-4.79	6.47	2.15	-46.07	-13.00	33.07	H
3403.02	-59.98	-5.36	7.97	2.15	-59.52	-13.00	46.52	H
4092.02	-57.32	-6.04	8.99	2.15	-56.52	-13.00	43.52	H
4777.01	-56.92	-6.62	9.68	2.15	-56.01	-13.00	43.01	H

**LTE Band 71, 5MHz, QPSK, Channel 133447**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Correction (dB)	Peak ERP (dBm)	Limit (dBm)	Margin (dB)	Polarization
1391.01	-54.17	-3.22	4.93	2.15	-54.61	-13.00	41.61	V
2087.00	-45.60	-4.18	4.86	2.15	-47.07	-13.00	34.07	V
2787.00	-46.68	-4.90	6.62	2.15	-47.11	-13.00	34.11	V
3460.02	-59.01	-5.45	8.10	2.15	-58.51	-13.00	45.51	H
4202.02	-57.64	-6.21	9.10	2.15	-56.90	-13.00	43.90	H
4851.01	-57.41	-6.72	9.75	2.15	-56.53	-13.00	43.53	H

Sample: 1391.01MHz

Power (EIRP) = P<sub>Mea</sub> + P<sub>pl</sub> + G<sub>a</sub>

Power (-54.61dBm) = P<sub>Mea</sub> (-54.17dBm)+ P<sub>pl</sub> (-3.22dB)+ G<sub>a</sub>(4.93dBi) -2.15

Note: Expanded measurement uncertainty is U = 5.16 dB, 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°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 increments 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.3.2 Measurement results

#### 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	3.8	699.481	715.519		
50				-5.42	0.0077
40				-1.40	0.0020
30				-3.08	0.0044
10				-2.00	0.0028
0				-0.51	0.0007
-10				-0.87	0.0012
-20				-1.95	0.0028
-30				-3.63	0.0051

##### Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	699.481	715.519	-1.85	0.0026
4.4				-3.55	0.0050

#### 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	3.8	777.465	786.519		
50				2.63	0.0034
40				1.83	0.0023
30				0.44	0.0006
10				1.16	0.0015
0				2.10	0.0027
-10				-1.27	0.0016
-20				-0.86	0.0011
-30				1.04	0.0013

##### Frequency Error vs Voltage

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	777.465	786.519	2.83	0.0036
4.4				-1.39	0.0018

**LTE Band 25, 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	3.8	1850.833	1914.199		
50				0.43	0.0002
40				0.34	0.0002
30				-3.16	0.0017
10				-2.85	0.0015
0				-2.45	0.0013
-10				-0.76	0.0004
-20				-1.95	0.0010
-30				-1.63	0.0009

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1850.833	1914.199	-1.06	0.0006
4.4				-2.05	0.0011

**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	3.8	814.389	823.601		
50				0.00	0.0000
40				-3.09	0.0038
30				-2.85	0.0035
10				-1.67	0.0020
0				-3.02	0.0037
-10				-0.87	0.0011
-20				-0.70	0.0009
-30				-4.16	0.0051

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	814.389	823.601	-0.93	0.0011
4.4				0.50	0.0006

**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	3.8	824.601	848.447		
50				2.68	0.0032
40				0.50	0.0006
30				1.67	0.0020
10				0.84	0.0010
0				4.01	0.0048
-10				2.53	0.0030
-20				-1.07	0.0013
-30				2.78	0.0033

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	824.601	848.447	1.90	0.0023
4.4				0.50	0.0006

**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	3.8	2496.353	2689.583		
50				-2.95	0.0011
40				-4.12	0.0016
30				2.37	0.0009
10				-3.42	0.0013
0				-4.43	0.0017
-10				-5.89	0.0023
-20				-4.22	0.0016
-30				-2.62	0.0010

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	2496.353	2689.583	-2.83	0.0011
4.4				-3.32	0.0013

**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	3.8	1710.865	1779.199		
50				-1.56	0.0009
40				-1.13	0.0006
30				-0.34	0.0002
10				-3.06	0.0018
0				-1.53	0.0009
-10				0.33	0.0002
-20				-0.29	0.0002
-30				-1.30	0.0007

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	1710.865	1779.199	-1.97	0.0011
4.4				-0.86	0.0005

**LTE Band 71, 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	3.8	663.994	697.006		
50				0.82	0.0012
40				2.70	0.0040
30				1.10	0.0016
10				0.84	0.0012
0				-1.16	0.0017
-10				-0.86	0.0013
-20				-0.99	0.0015
-30				2.46	0.0036

**Frequency Error vs Voltage**

Voltage(V)	Temperature(°C)	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	Offset(Hz)	Frequency error(ppm)
3.5	20	663.994	697.006	2.12	0.0031
4.4				0.99	0.0015

#### **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.

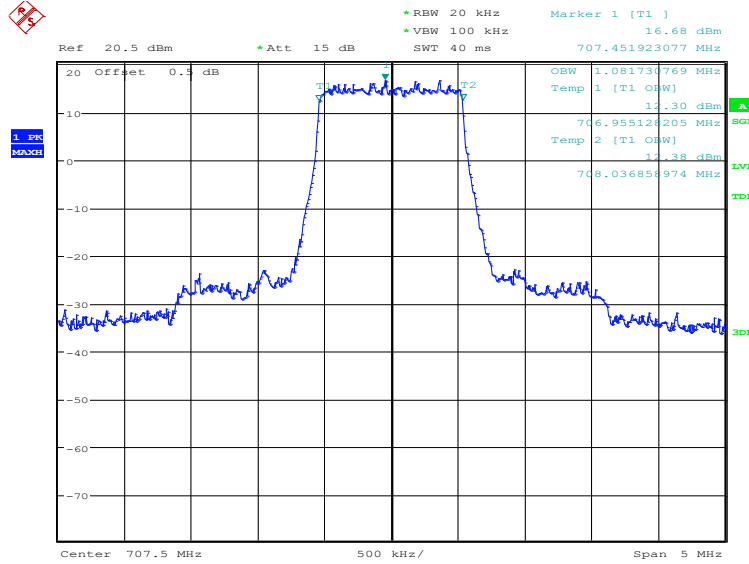
The measurement method is from ANSI C63.26:

- 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  $\geq 3 \times$  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.

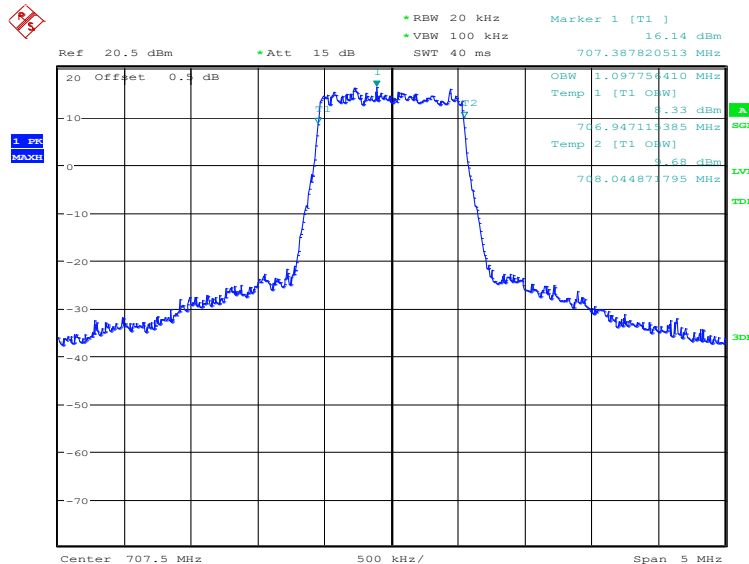
### LTE band 12, 1.4MHz (99%)

Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	1081.73	1097.76

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



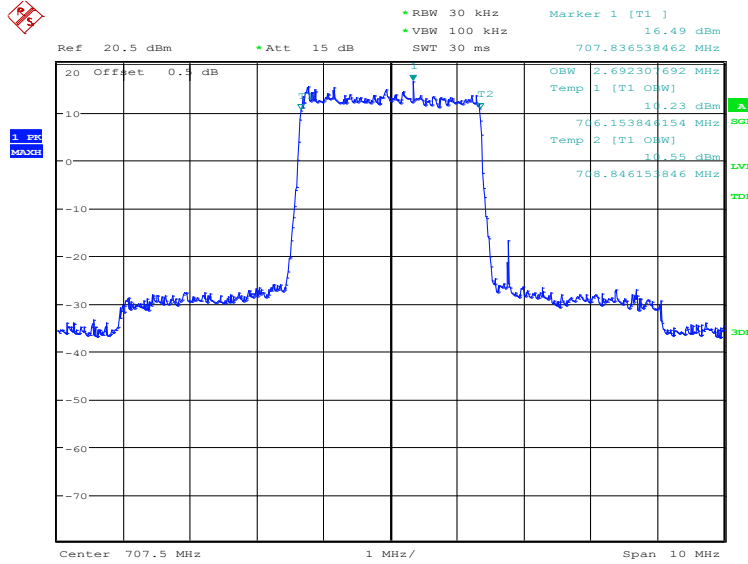
### LTE band 12, 1.4MHz Bandwidth, 16QAM (99% BW)



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

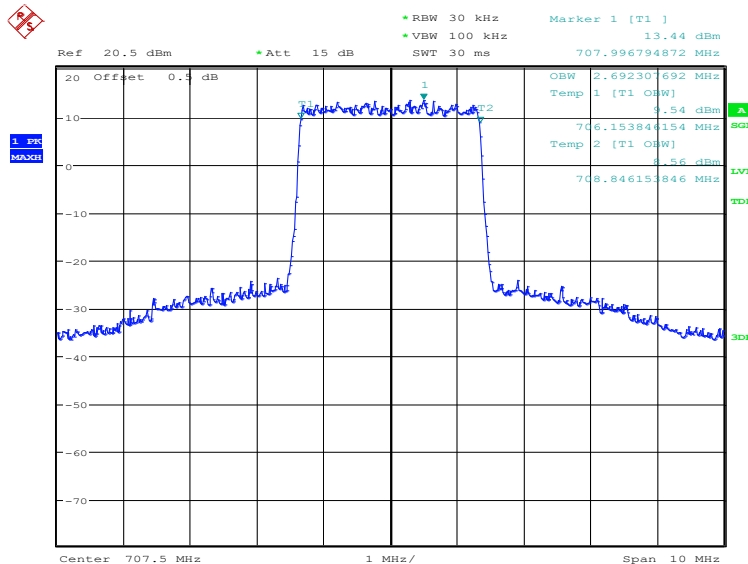
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	2692.31	2692.31

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



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



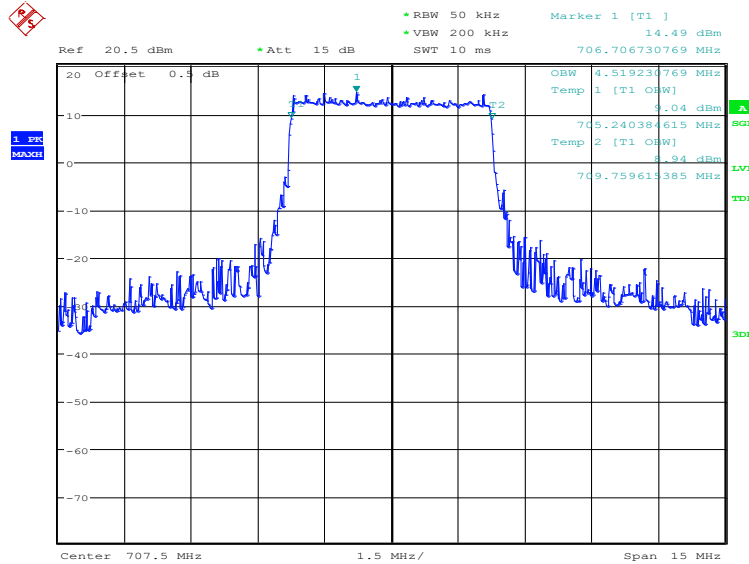
Date: 16.DEC.2021 18:42:01



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

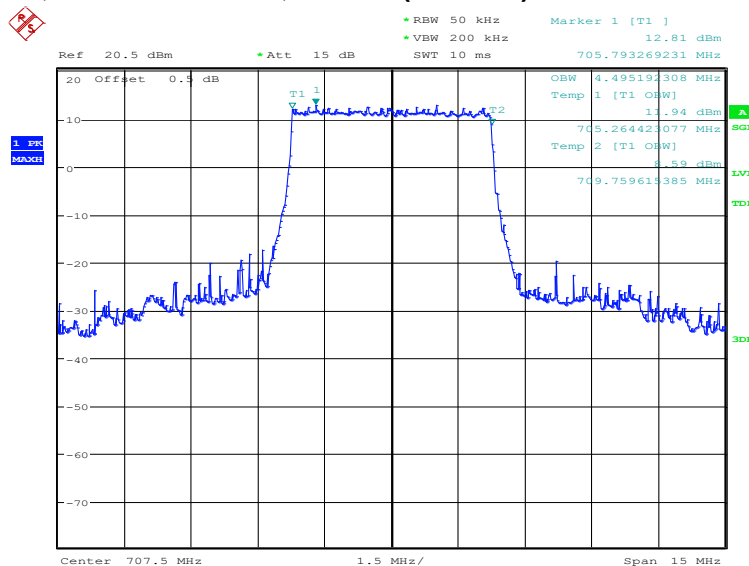
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	4519.23	4495.19

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



Date: 16.DEC.2021 18:42:42

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

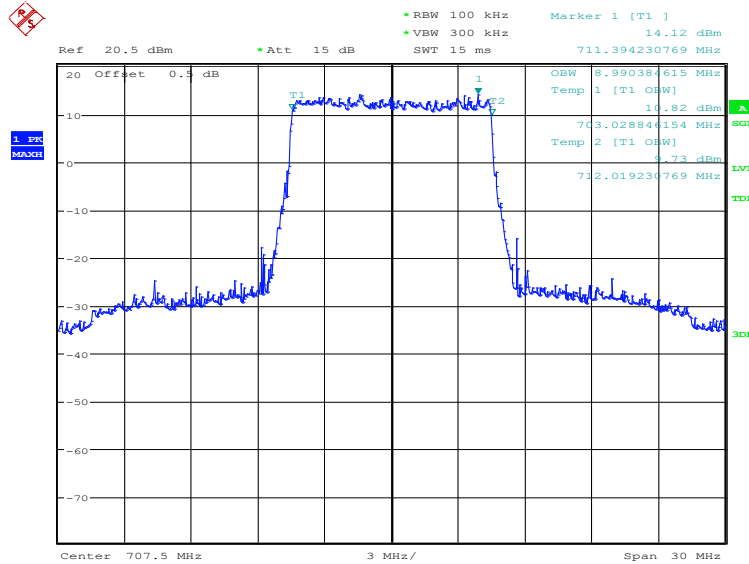


Date: 16.DEC.2021 18:43:22

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

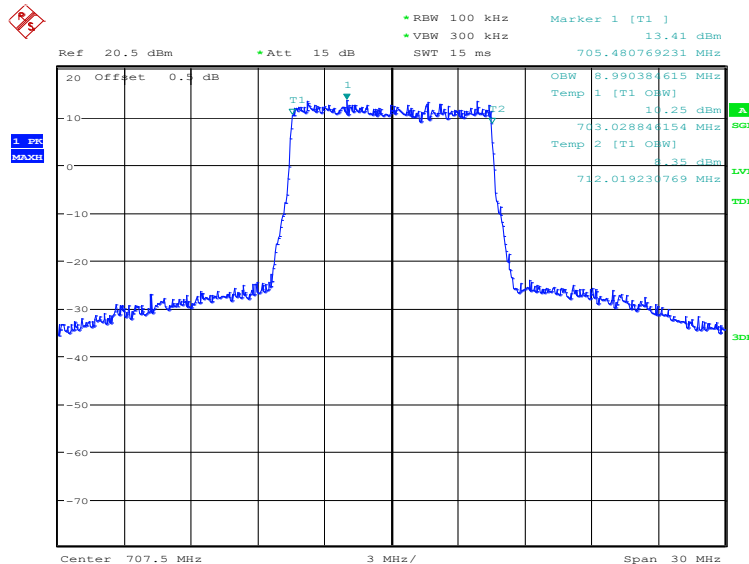
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
707.5	QPSK	16QAM
	8990.38	8990.38

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



Date: 16.DEC.2021 18:44:03

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

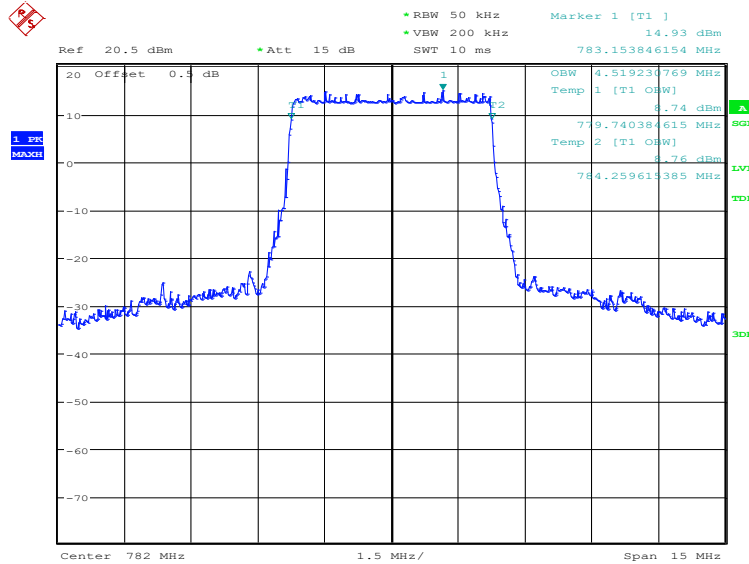


Date: 16.DEC.2021 18:44:42

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

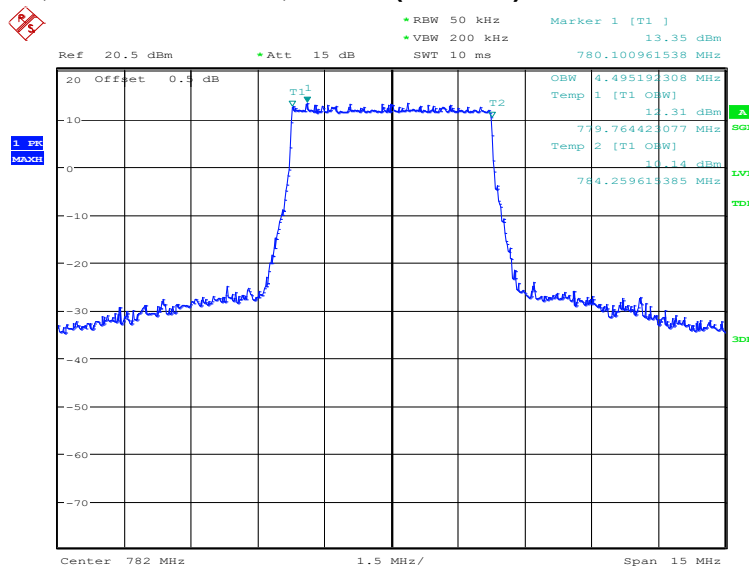
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	4519.23	4495.19

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



Date: 16.DEC.2021 18:45:25

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

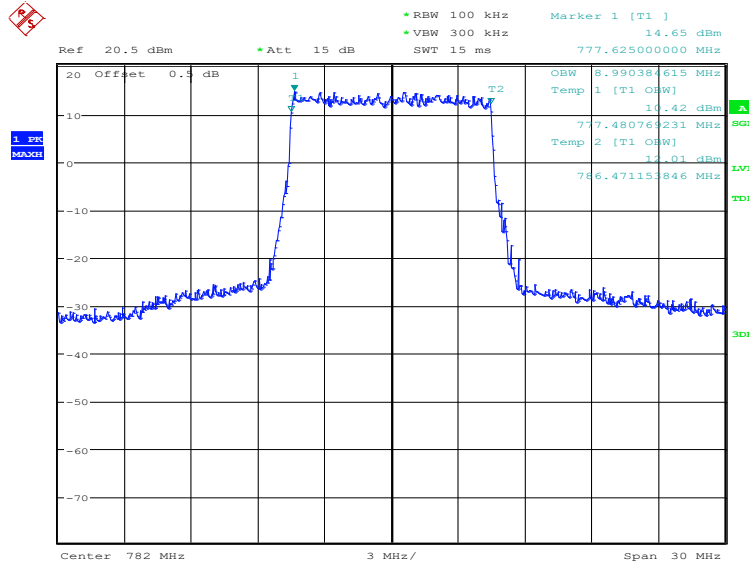


Date: 16.DEC.2021 18:46:04

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

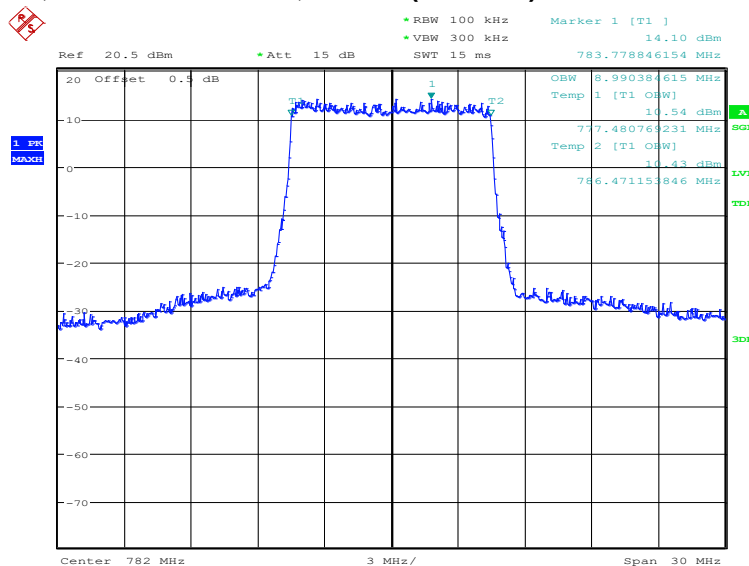
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
782.0	QPSK	16QAM
	8990.38	8990.38

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



Date: 16.DEC.2021 18:46:46

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

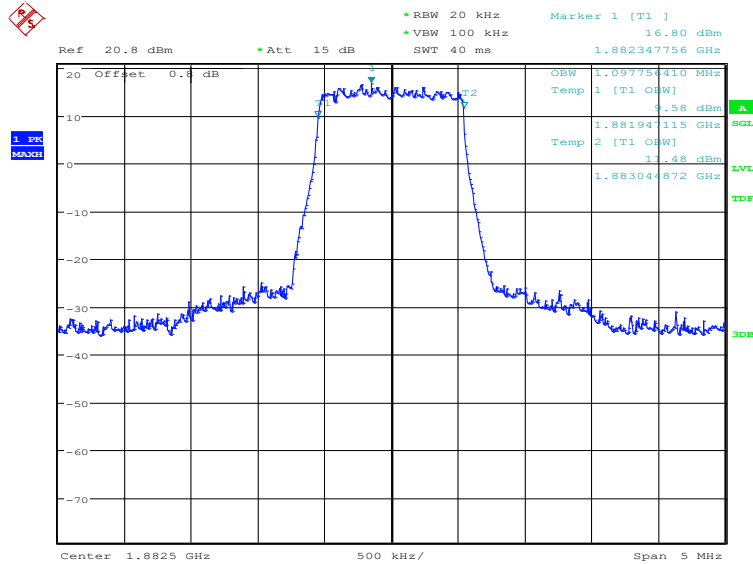


Date: 16.DEC.2021 18:47:25

### LTE band 25, 1.4MHz (99%)

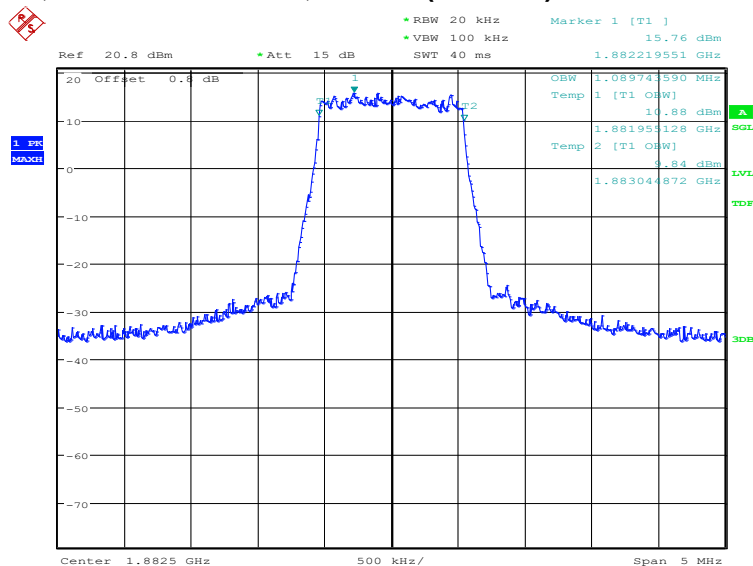
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	1097.76	1089.74

### LTE band 25, 1.4MHz Bandwidth, QPSK (99% BW)



Date: 16.DEC.2021 18:48:07

### LTE band 25, 1.4MHz Bandwidth, 16QAM (99% BW)

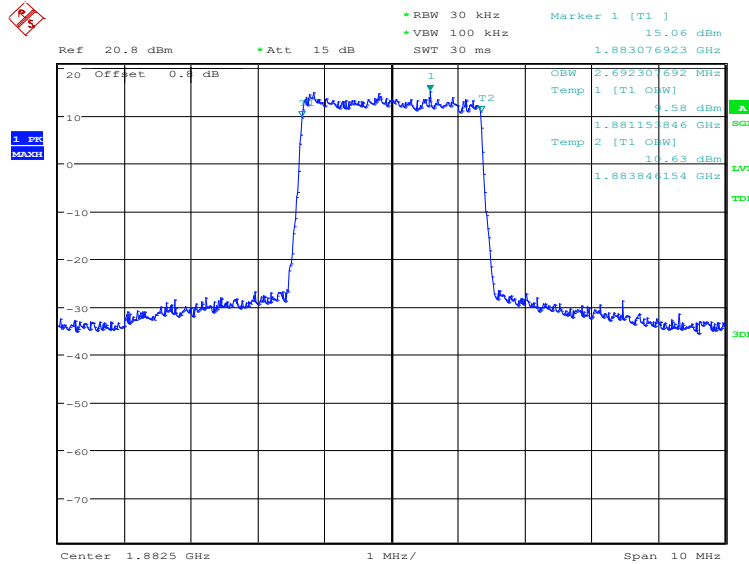


Date: 16.DEC.2021 18:48:47

### LTE band 25, 3MHz (99%)

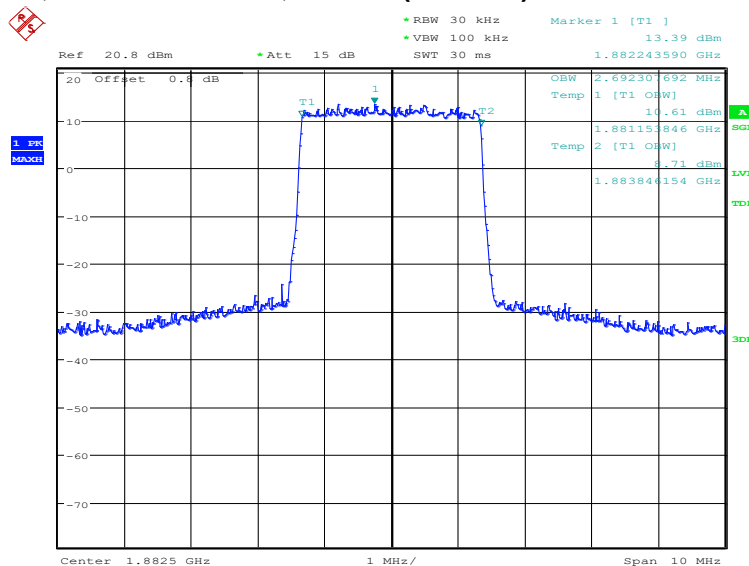
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	2692.31	2692.31

### LTE band 25, 3MHz Bandwidth, QPSK (99% BW)



Date: 16.DEC.2021 18:49:28

### LTE band 25, 3MHz Bandwidth, 16QAM (99% BW)

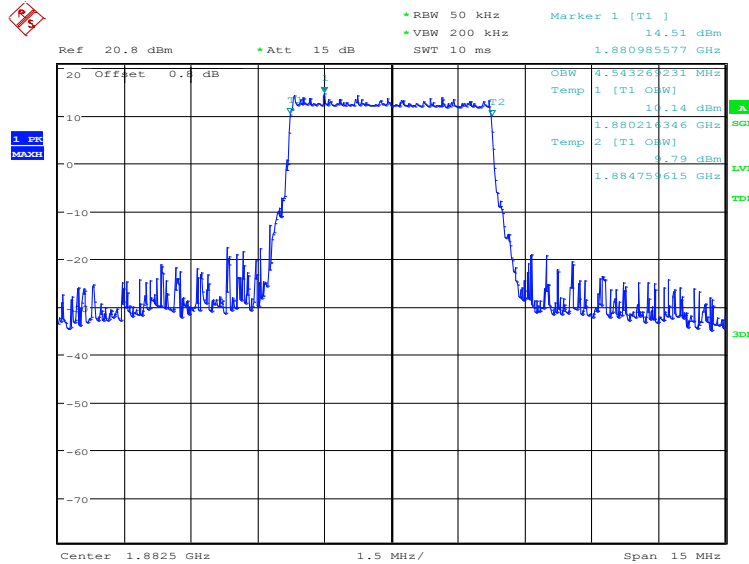


Date: 16.DEC.2021 18:50:08

### LTE band 25, 5MHz (99%)

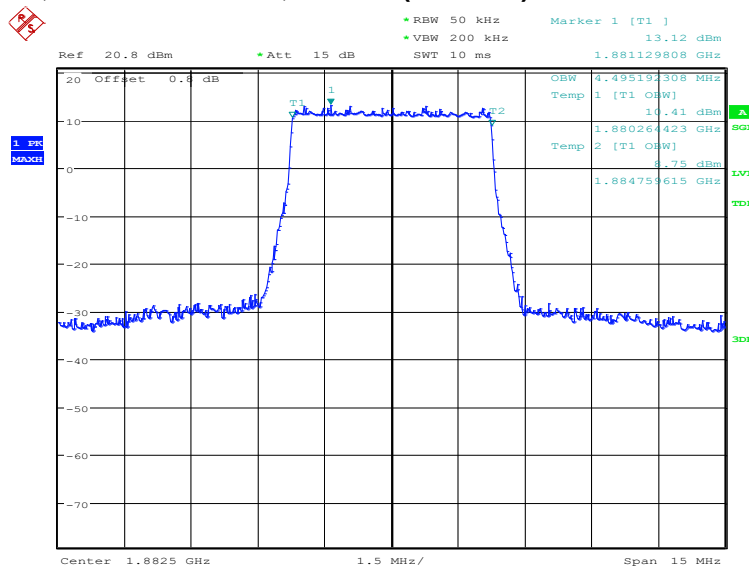
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	4543.27	4495.19

### LTE band 25, 5MHz Bandwidth, QPSK (99% BW)



Date: 16.DEC.2021 18:50:48

### LTE band 25, 5MHz Bandwidth, 16QAM (99% BW)

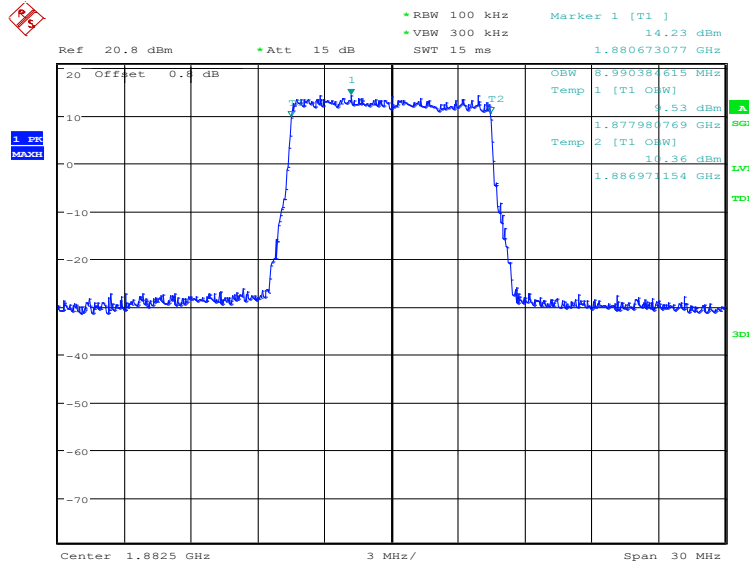


Date: 16.DEC.2021 18:51:28

### LTE band 25, 10MHz (99%)

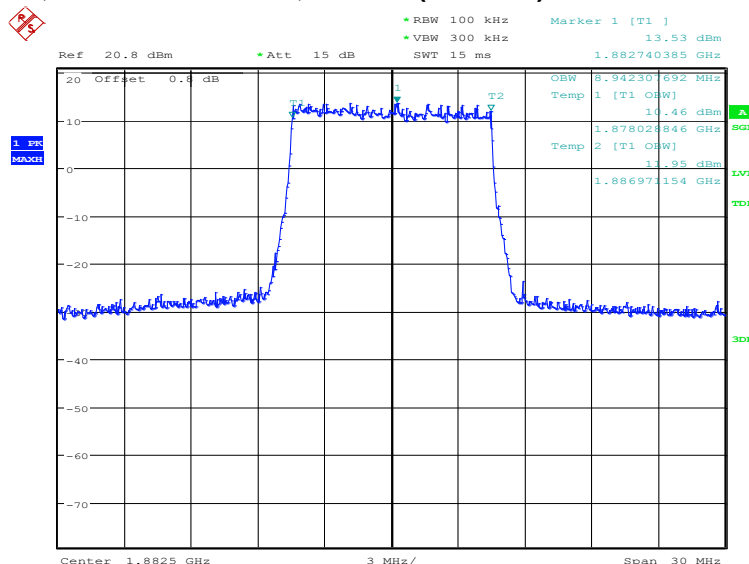
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	8990.38	8942.31

### LTE band 25, 10MHz Bandwidth, QPSK (99% BW)



Date: 16.DEC.2021 18:52:09

### LTE band 25, 10MHz Bandwidth, 16QAM (99% BW)



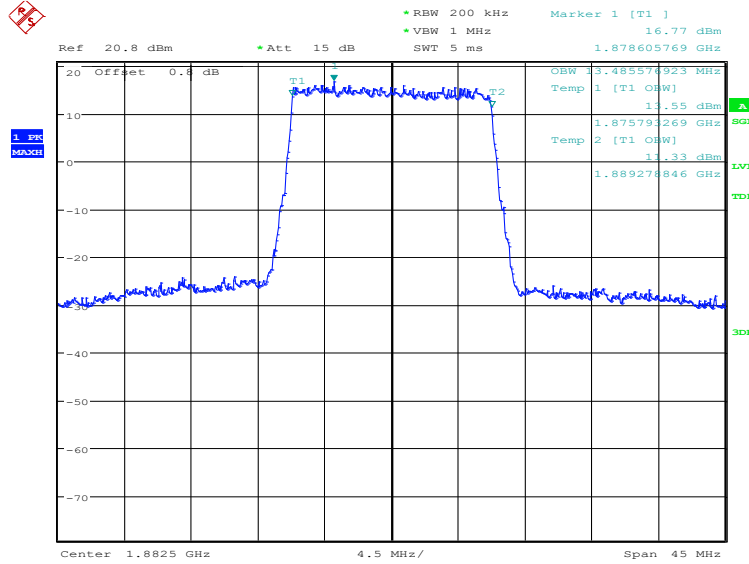
Date: 16.DEC.2021 18:52:49



**LTE band 25, 15MHz (99%)**

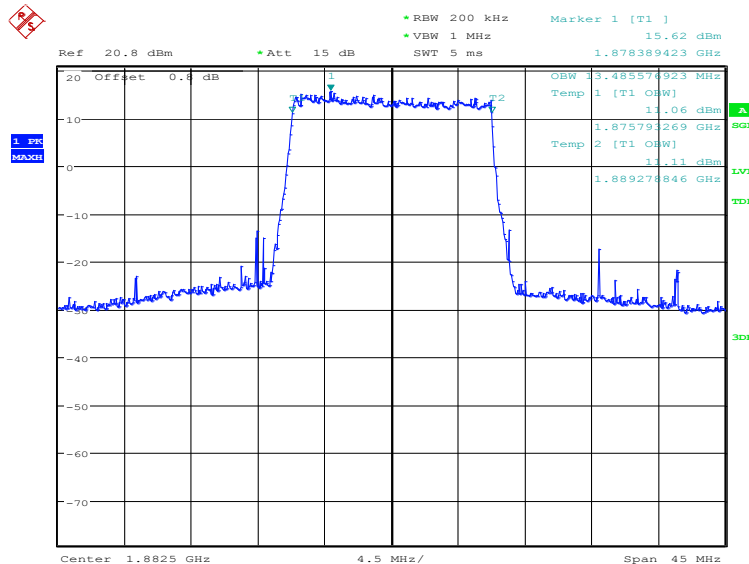
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	13485.58	13485.58

**LTE band 25, 15MHz Bandwidth, QPSK (99% BW)**



Date: 16.DEC.2021 18:53:29

**LTE band 25, 15MHz Bandwidth, 16QAM (99% BW)**

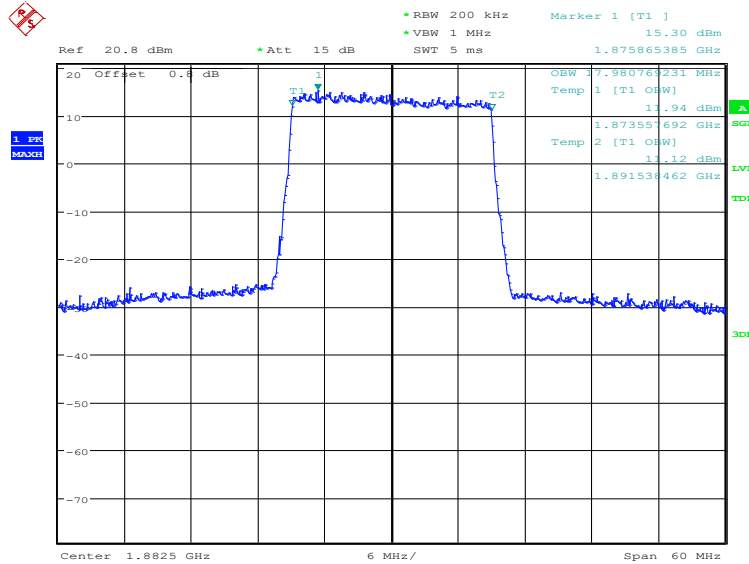


Date: 16.DEC.2021 18:54:09

### LTE band 25, 20MHz (99%)

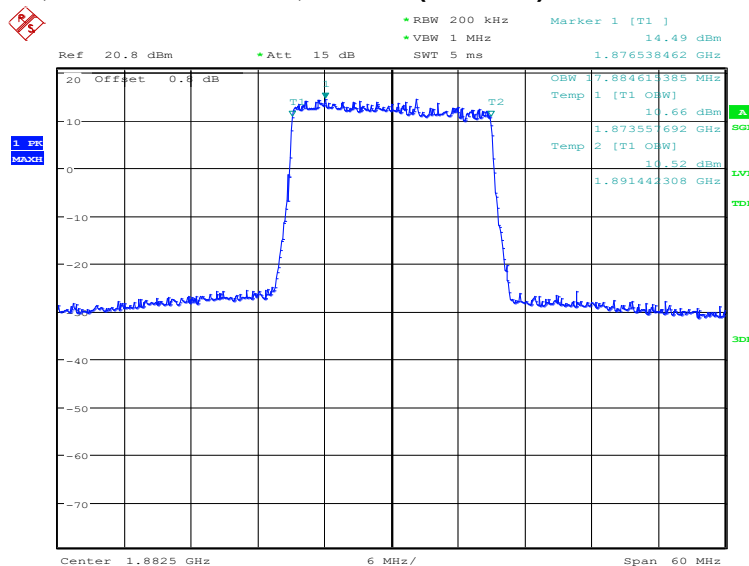
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
1882.5	QPSK	16QAM
	17980.77	17884.62

### LTE band 25, 20MHz Bandwidth, QPSK (99% BW)



Date: 16.DEC.2021 18:54:50

### LTE band 25, 20MHz Bandwidth, 16QAM (99% BW)

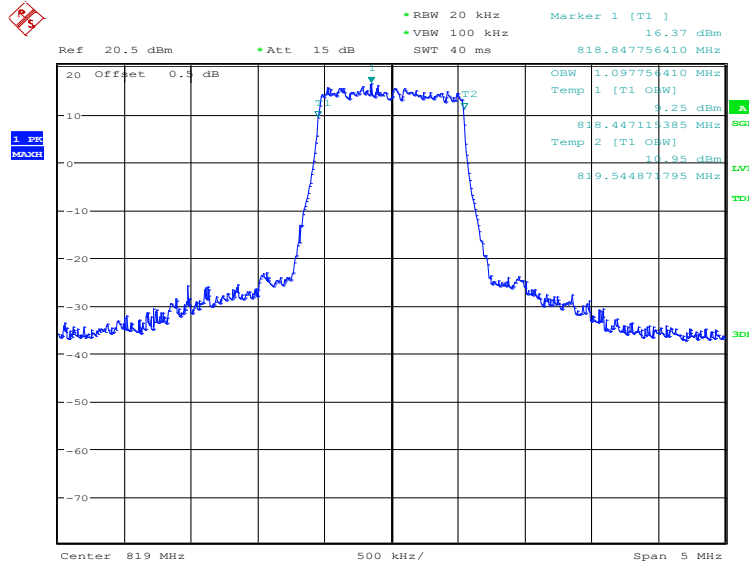


Date: 16.DEC.2021 18:55:29

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

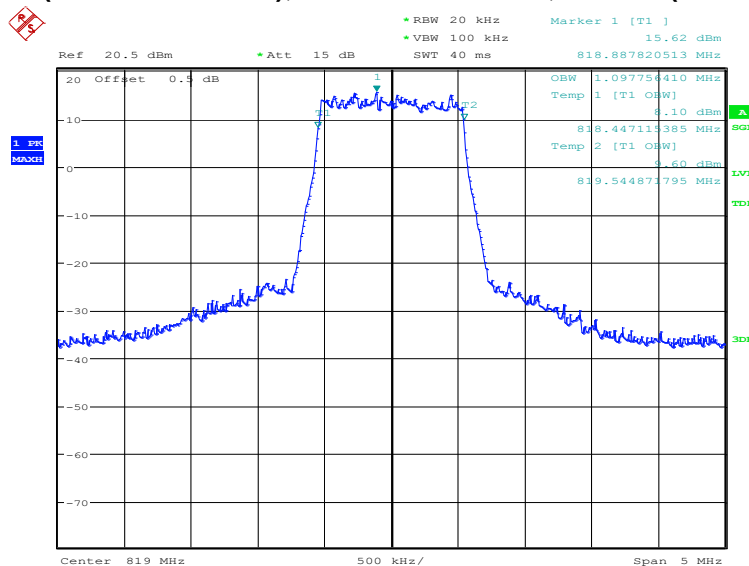
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	1097.76	1097.76

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



Date: 16.DEC.2021 19:03:37

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

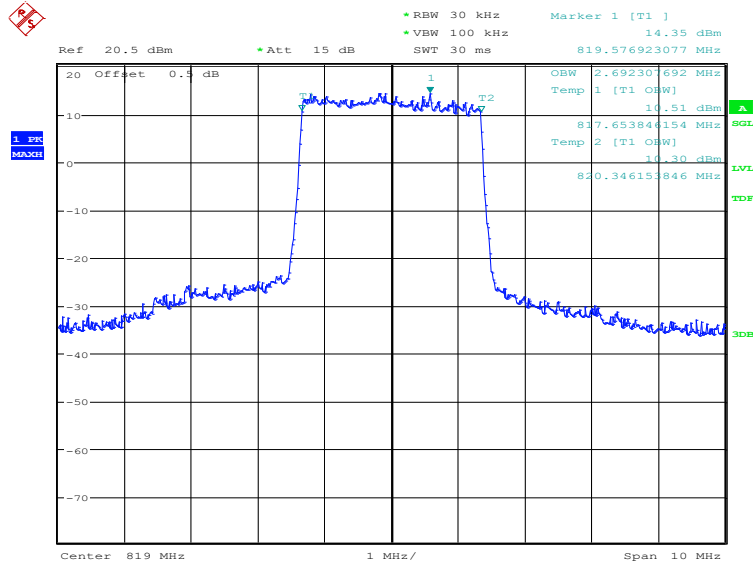


Date: 16.DEC.2021 19:04:16

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

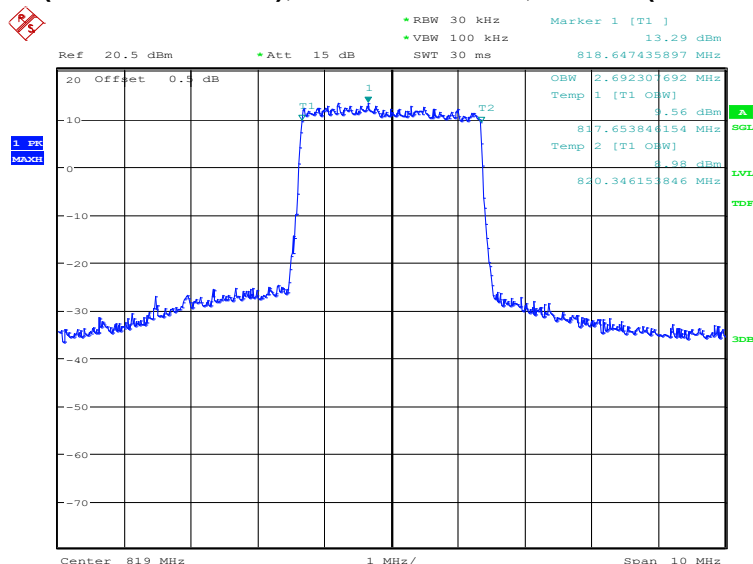
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	2692.31	2692.31

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



Date: 16.DEC.2021 19:04:57

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

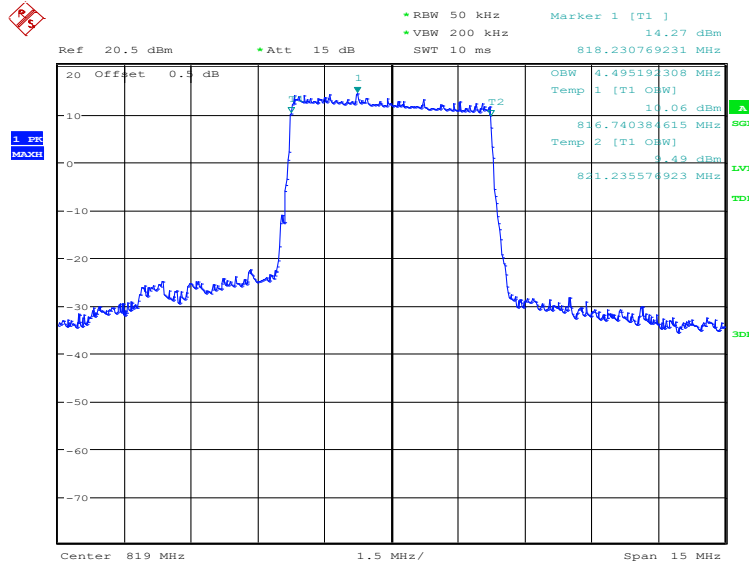


Date: 16.DEC.2021 19:05:37

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

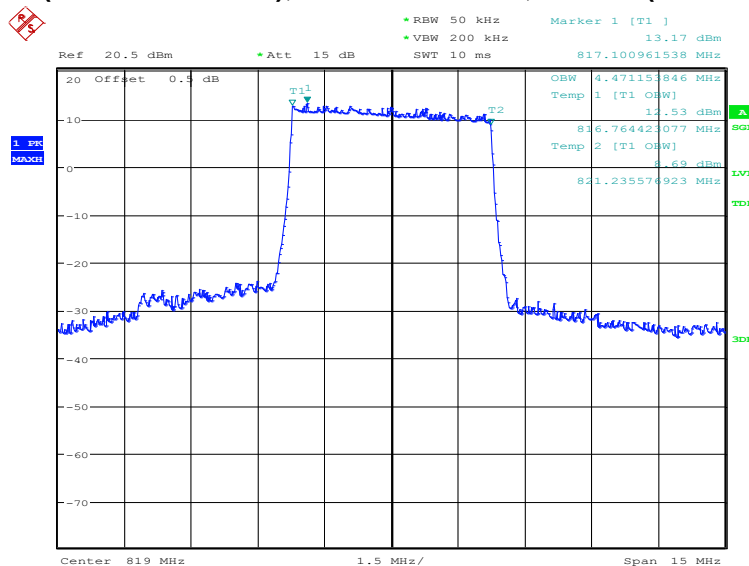
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	4495.19	4471.15

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



Date: 16.DEC.2021 19:06:18

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

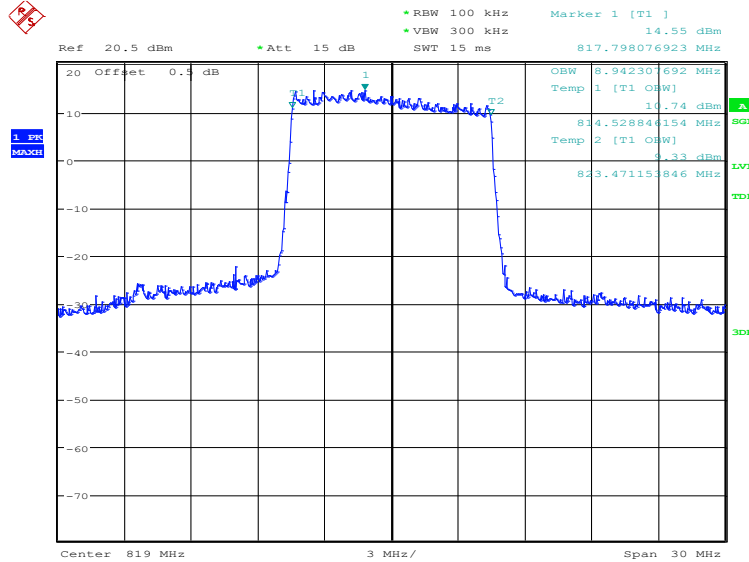


Date: 16.DEC.2021 19:06:57

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

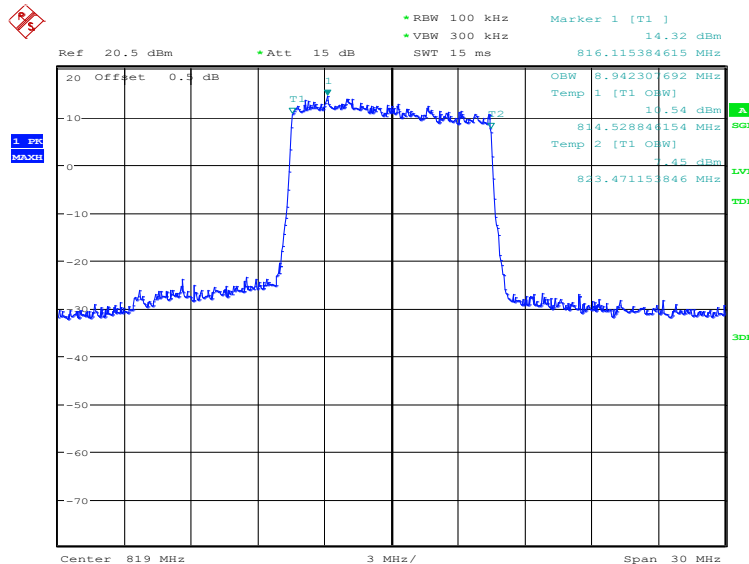
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
819.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 16.DEC.2021 19:07:39

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

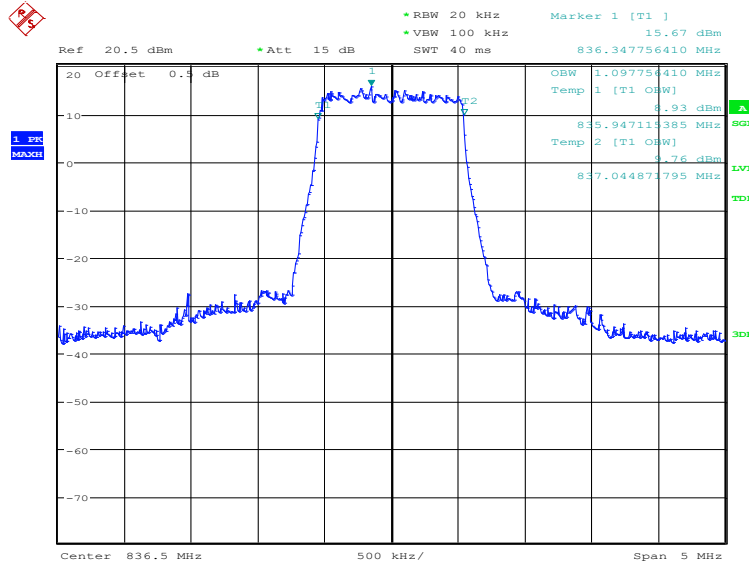


Date: 16.DEC.2021 19:08:18

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

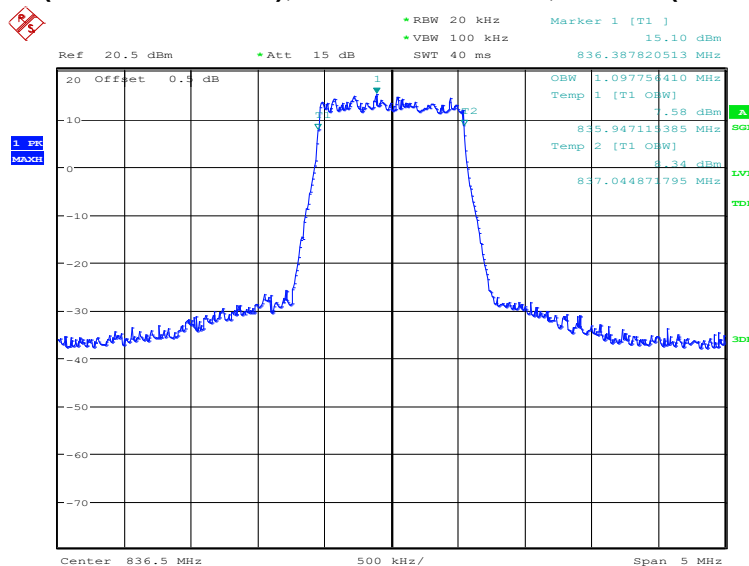
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	1097.76	1097.76

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



Date: 16.DEC.2021 18:56:12

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

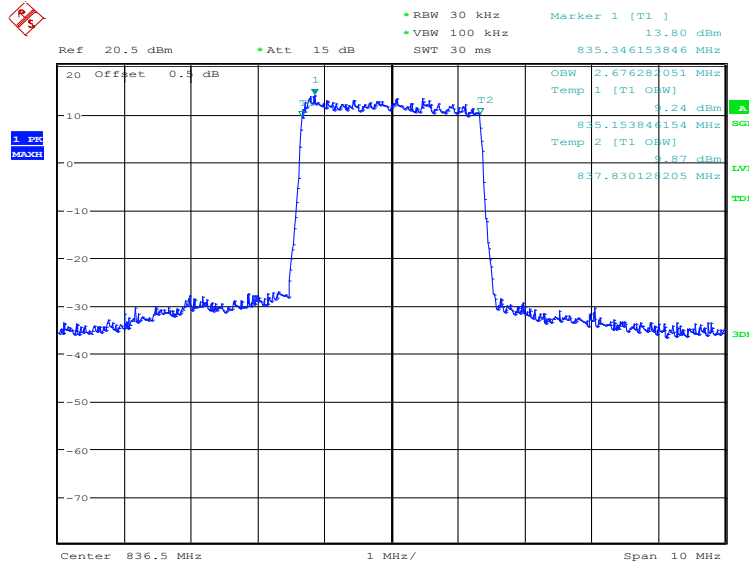


Date: 16.DEC.2021 18:56:52

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

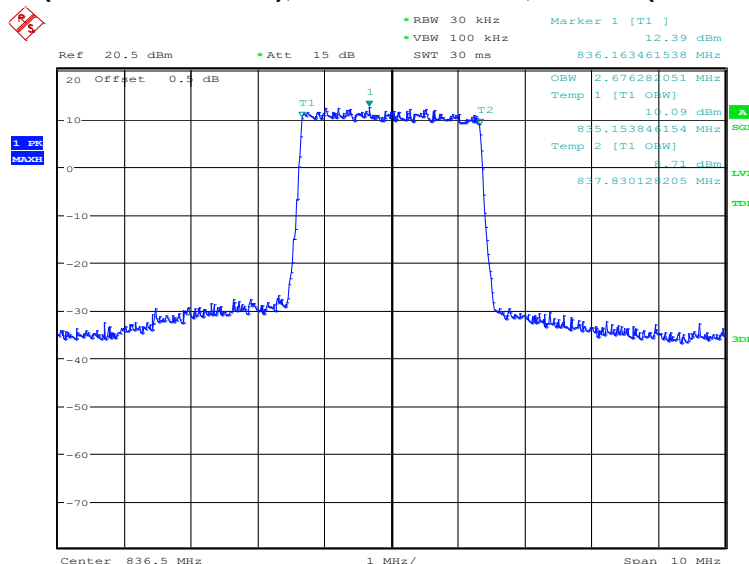
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	2676.28	2676.28

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



Date: 16.DEC.2021 18:57:33

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



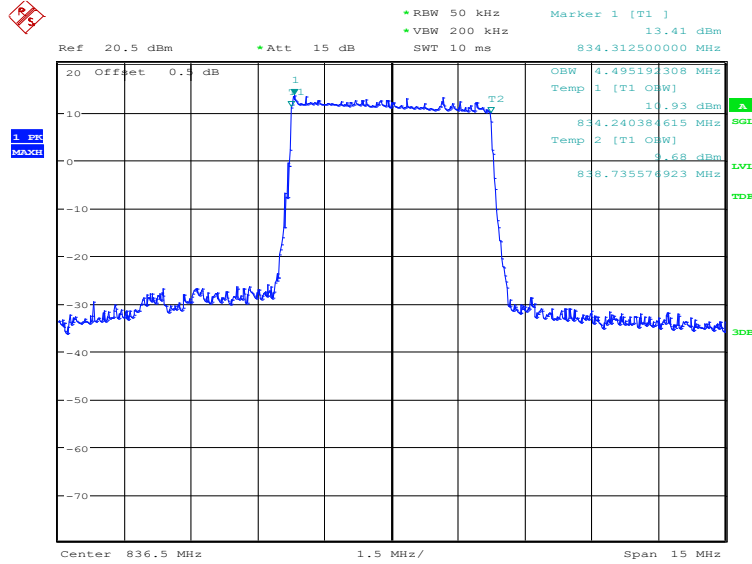
Date: 16.DEC.2021 18:58:12



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

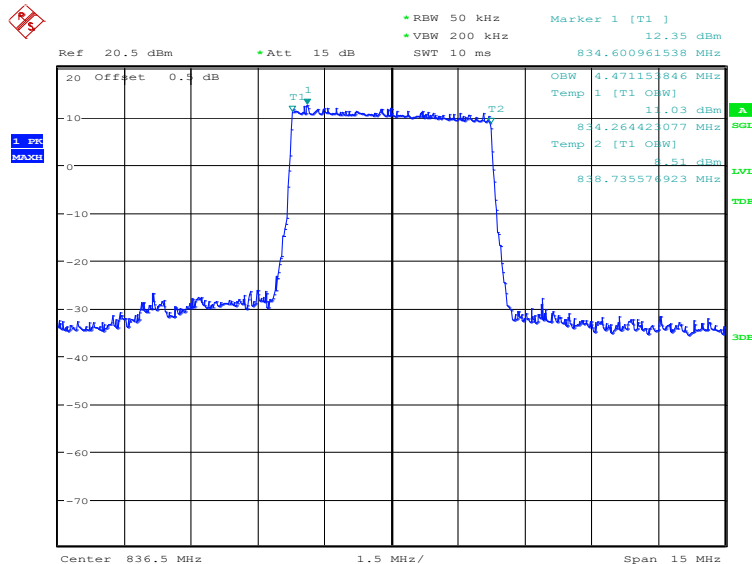
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	4495.19	4471.15

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



Date: 16.DEC.2021 18:58:53

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

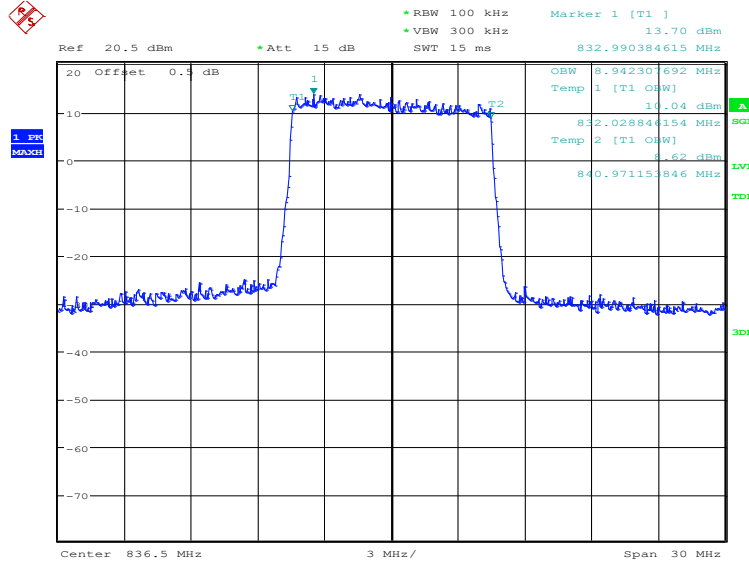


Date: 16.DEC.2021 18:59:33

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

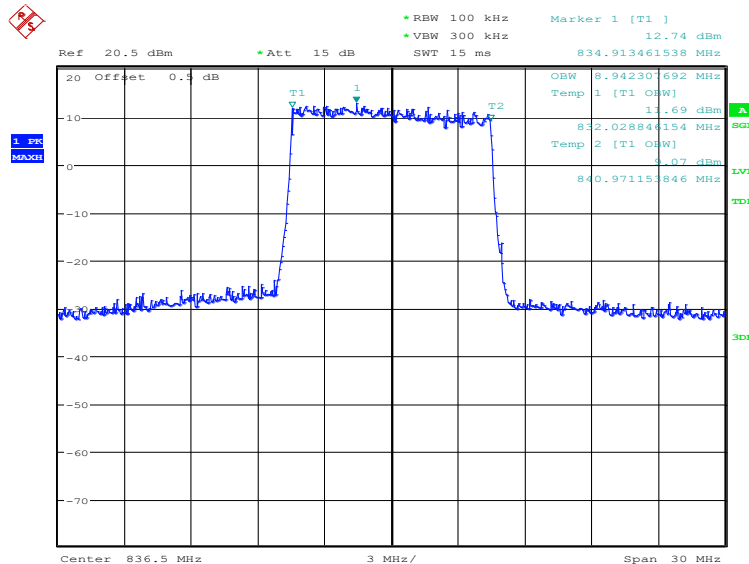
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	8942.31	8942.31

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



Date: 16.DEC.2021 19:00:14

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

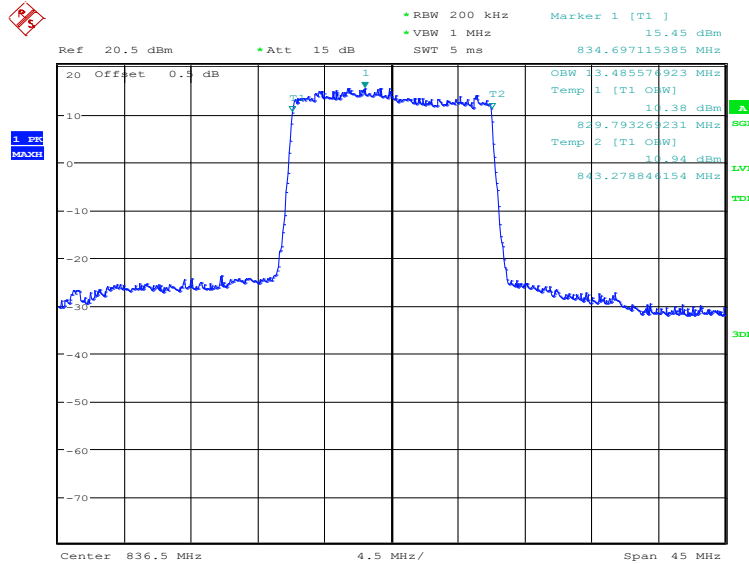


Date: 16.DEC.2021 19:00:54

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

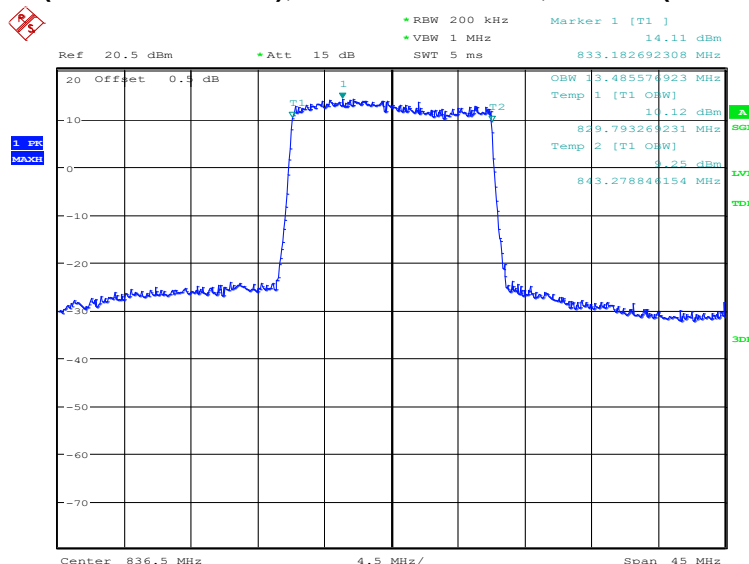
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
836.5	QPSK	16QAM
	13485.58	13485.58

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



Date: 16.DEC.2021 19:01:35

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

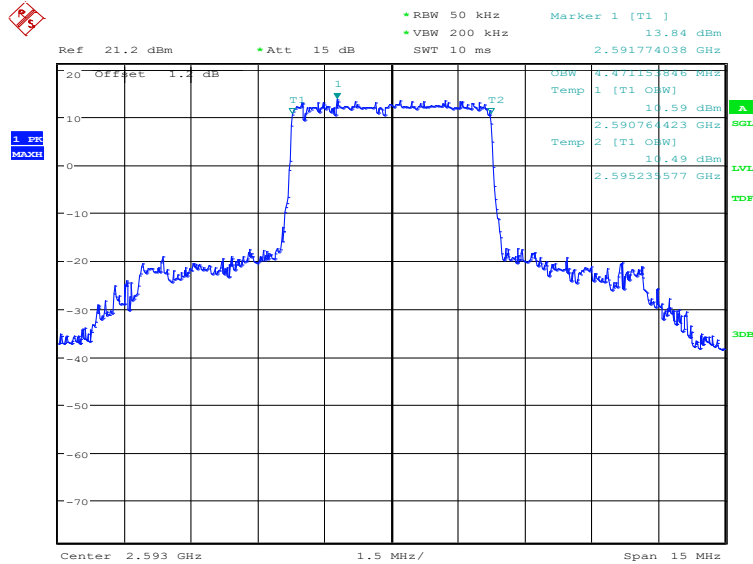


Date: 16.DEC.2021 19:02:14

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

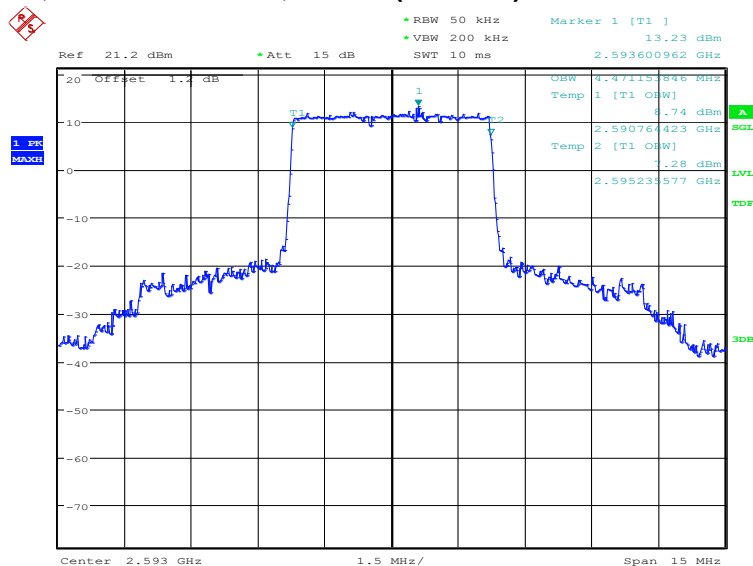
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	4471.15	4471.15

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



Date: 16.DEC.2021 19:17:51

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

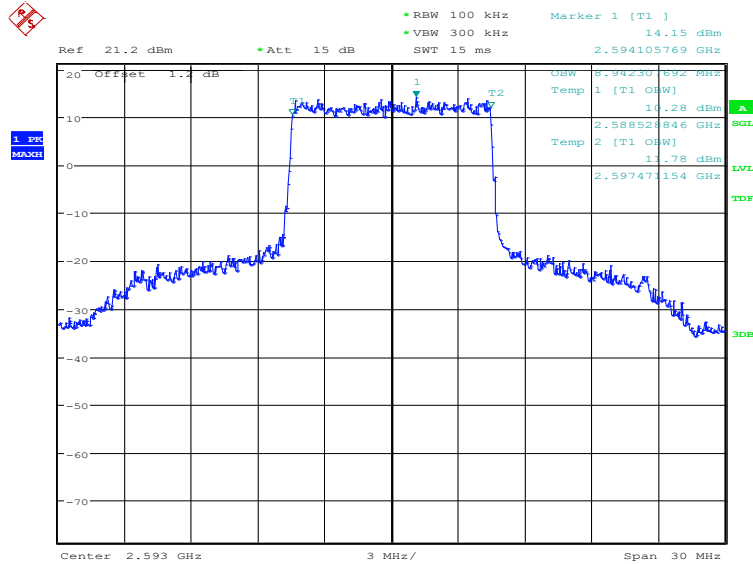


Date: 16.DEC.2021 19:18:31

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

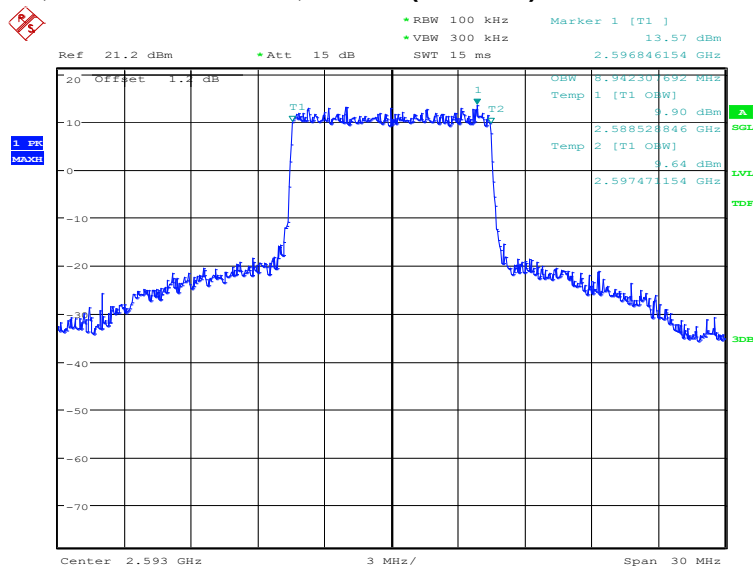
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	8942.31	8942.31

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



Date: 16.DEC.2021 19:19:12

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

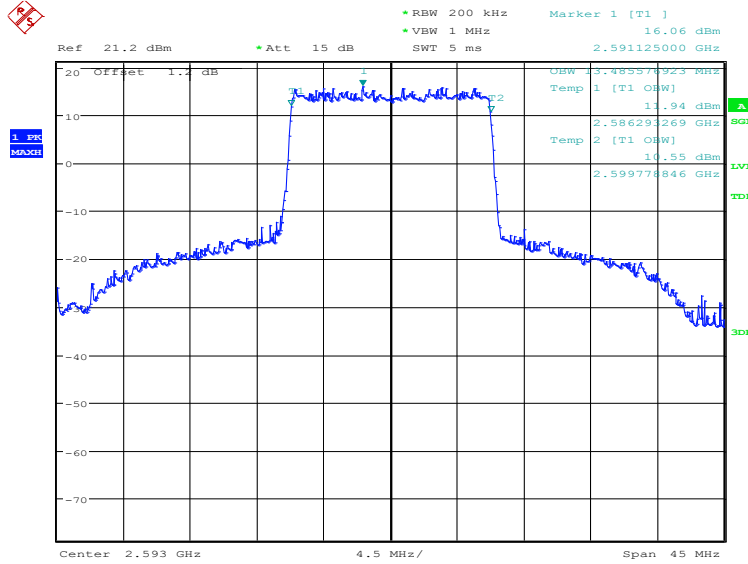


Date: 16.DEC.2021 19:19:52

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

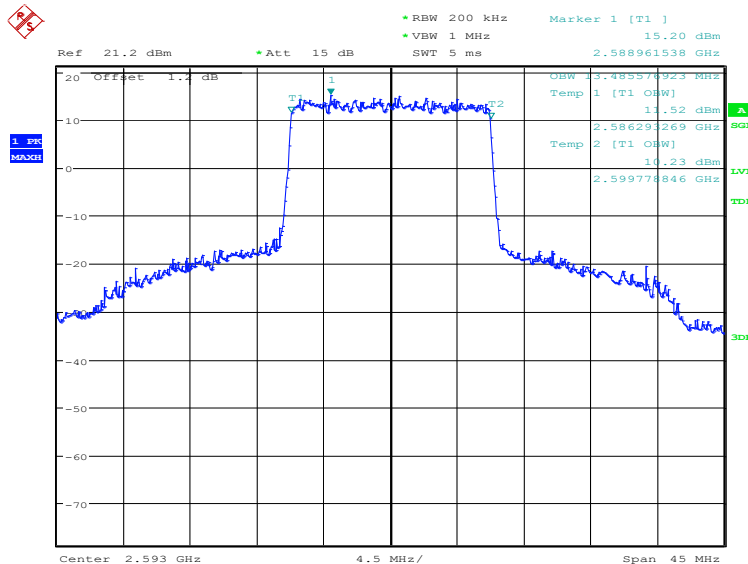
Frequency(MHz)	Occupied Bandwidth (99%)(kHz)	
2593.0	QPSK	16QAM
	13485.58	13485.58

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



Date: 16.DEC.2021 19:20:33

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



Date: 16.DEC.2021 19:21:13