



# TEST REPORT

## No. I19Z62229-WMD03

for

**TCL Communication Ltd.**

**HSUPA/HSDPA/UMTS 5 Bands/GSM Quad Bands/LTE 17 bands**

**mobile phone**

**Model Name: T770B**

**FCC ID: 2ACCJN036**

with

**Hardware Version: 03**

**Software Version: 3C2G**

**Issued Date: 2020-02-24**

**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.

**Test Laboratory:**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I19Z62229-WMD03	Rev.0	1 <sup>st</sup> edition	2020-02-24

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 17025:2005 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 (Shouxiang)

Address: No. 51 Shouxiang Science Building, Xueyuan Road,  
Haidian District, Beijing, P. R. China 100191

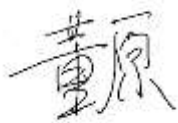
### 1.3. Testing Environment

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

### 1.4. Project data

Testing Start Date: 2019-12-15  
Testing End Date: 2020-02-22

### 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.  
Address /Post: 5/F, Building 22E, 22 Science Park East Avenue, Hong Kong Science Park, Shatin, NT, Hong Kong  
Contact: Gong Zhizhou  
Email: zhizhou.gong@tcl.com  
Telephone: 0086-755-36611722  
Fax: 0086-755-36612000-81722

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

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

Description	HSUPA/HSDPA/UMTS 5 Bands/GSM Quad Bands/LTE 17 bands mobile phone
Model Name	T770B
FCC ID	2ACCJN036
Antenna	Embedded
Output power	24.64dBm maximum EIRP measured for LTE Band 41
Extreme vol. Limits	3.6VDC to 4.4VDC (nominal: 3.85VDC)
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>
UT03a	352901100004681/ 352901100004699	03	3C2G	2019-01-03
UT14a	015658000201457	03	3C2G	2019-12-17

\*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	TLp038D7
Manufacturer	VEKEN
Capacitance	3860mAh
AE2	
Model	TLp038D1
Manufacturer	BYD
Capacitance	3860mAh

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

## 4. Reference Documents

### 4.1. 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	10-1-18 Edition
FCC Part 22	PUBLIC MOBILE SERVICES	10-1-18 Edition
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	10-1-18 Edition
FCC Part 90	PRIVATE LAND MOBILE RADIO SERVICES	10-1-18 Edition
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI/TIA-102.CAAA -E	DIGITAL C4FMCQPSK TRANSCEIVER MEASUREMENT METHODS	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

**Control room / conducted chamber** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	>2 MΩ
Ground system resistance	< 0.5 Ω

**Fully-anechoic chamber 2** (8.6 meters×6.1 meters×3.85 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
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

### 6.1. Summary of test results

#### LTE Band 7

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

#### LTE Band 12

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**

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)**

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**

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.

## 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.

## 7. Test Equipment Utilized

NO.	Description	TYPE	series number	MANUFACTURE	CAL DUE DATE	Calibration interval
1	Universal Radio Communication Tester	CMW500	159082	R&S	2020-12-24	1 year
2	Spectrum Analyzer	FSU26	200030	R&S	2020-06-03	1 year
3	Climate chamber	SH-242	93008556	ESPEC	2020-12-21	3 year
4	EMI Antenna	VULB9163	9163-301	Schwarzbeck	2020-02-29	1 year
5	EMI Antenna	3117	00058889	ETS-Lindgren	2020-11-18	1 year
6	EMI Antenna	3117	00119024	ETS-Lindgren	2020-02-25	1 year
7	EMI Antenna	9117	167	Schwarzbeck	2020-05-27	1 year
8	Signal Generator	N5183A	MY49060052	R&S	2020-06-24	1 year
9	Test Receiver	E4440A	MY48250642	Agilent	2020-03-18	1 year
10	Universal Radio Communication Tester	CMW500	143008	R&S	2020-11-26	1 year

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 OUTPUT POWER**

#### **A.1.1 Summary**

During the process of testing, the EUT was controlled via Rhode & Schwarz Universal Radio Communication Tester (CMW500) or Anritsu Radio Communication Analyzer (MT8821C) 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 7**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	23.17	21.95	21.07
		2535	23.22	21.96	21.08
		2502.5	23.06	22.26	21.38
	1 RB low	2567.5	23.14	21.88	21.00
		2535	23.17	21.88	21.00
		2502.5	22.96	22.22	21.34
	50% RB mid	2567.5	22.23	21.36	20.56
		2535	22.18	21.32	20.52
		2502.5	22.14	21.35	20.55
	100% RB	2567.5	22.20	21.25	20.45
		2535	22.20	21.24	20.44
		2502.5	22.16	21.25	20.45
10MHz	1 RB high	2565	23.09	21.88	21.00
		2535	23.18	21.72	20.84
		2505	23.03	22.12	21.24
	1 RB low	2565	23.06	21.87	20.99
		2535	23.01	21.64	20.76
		2505	23.02	22.08	21.20
	50% RB mid	2565	22.23	21.38	20.58
		2535	22.21	21.24	20.44

	100% RB	2505	22.14	21.28	20.48
		2565	22.34	21.39	20.59
		2535	22.22	21.22	20.42
		2505	22.06	21.16	20.36
15MHz	1 RB high	2562.5	23.18	21.74	20.94
		2535	23.02	21.11	20.31
		2507.5	23.07	21.57	20.77
	1 RB low	2562.5	23.09	21.65	20.85
		2535	23.00	21.06	20.26
		2507.5	23.08	21.50	20.70
	50% RB mid	2562.5	22.26	21.27	20.47
		2535	22.21	21.20	20.40
		2507.5	22.04	21.14	20.34
	100% RB	2562.5	22.21	21.27	20.47
		2535	22.15	21.21	20.41
		2507.5	22.02	21.07	20.27
20MHz	1 RB high	2560	23.10	21.80	21.00
		2535	23.08	21.66	20.86
		2510	23.07	21.60	20.80
	1 RB low	2560	22.98	21.65	20.85
		2535	23.01	21.66	20.86
		2510	22.93	21.49	20.69
	50% RB mid	2560	22.28	21.41	20.59
		2535	22.29	21.33	20.53
		2510	22.14	21.19	20.39
	100% RB	2560	22.25	21.39	20.59
		2535	22.23	21.28	20.48
		2510	22.12	21.18	20.38

**LTE band 12**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	715.3	23.71	21.38	20.49
		707.5	23.88	21.59	20.70
		699.7	23.83	21.84	20.95
	1 RB low	715.3	23.66	21.33	20.44
		707.5	23.92	21.59	20.70
		699.7	23.87	21.88	20.99
	50% RB mid	715.3	23.74	21.62	20.73
		707.5	23.92	21.62	20.73
		699.7	23.91	21.75	20.86
	100% RB	715.3	21.69	21.52	20.63
		707.5	21.84	21.55	20.66
		699.7	21.79	21.34	20.45
3MHz	1 RB high	714.5	23.73	21.26	20.37
		707.5	23.93	21.89	21.00
		700.5	23.88	21.52	20.63
	1 RB low	714.5	23.77	21.27	20.38
		707.5	23.89	21.88	20.99
		700.5	23.96	21.60	20.71
	50% RB mid	714.5	21.86	21.61	20.72
		707.5	21.96	21.63	20.74
		700.5	21.95	21.59	20.70
	100% RB	714.5	21.88	21.50	20.61
		707.5	21.89	21.58	20.69
		700.5	21.92	21.48	20.59
5MHz	1 RB high	713.5	23.75	21.49	20.60
		707.5	23.85	21.67	20.78
		701.5	23.98	22.06	21.17
	1 RB low	713.5	23.78	21.51	20.62
		707.5	23.88	21.65	20.76
		701.5	23.94	22.05	21.16
	50% RB mid	713.5	21.87	21.59	20.70
		707.5	21.94	21.68	20.79
		701.5	21.95	21.70	20.81
	100% RB	713.5	21.83	21.40	20.51
		707.5	21.92	21.60	20.71
		701.5	22.07	21.69	20.80
10MHz	1 RB high	711.0	23.93	21.41	20.52
		707.5	23.97	21.88	20.99





		704.0	23.90	21.53	20.64
	1 RB low	711.0	23.89	21.45	20.56
		707.5	23.85	21.78	20.89
		704.0	23.87	21.51	20.62
	50% RB mid	711.0	21.98	21.63	20.74
		707.5	21.93	21.61	20.72
		704.0	22.00	21.75	20.86
	100% RB	711.0	21.98	21.57	20.68
		707.5	21.95	21.61	20.72
		704.0	21.99	21.65	20.76

**LTE band 13**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	24.01	22.39	21.83
		782	24.03	22.26	21.82
		779.5	23.97	22.37	21.83
	1 RB low	784.5	23.98	22.29	21.94
		782	24.10	22.30	21.86
		779.5	24.00	22.25	21.94
	50% RB mid	784.5	22.03	21.63	20.99
		782	21.99	21.69	21.05
		779.5	22.07	21.79	21.15
	100% RB	784.5	22.00	21.52	20.88
		782	21.97	21.61	20.97
		779.5	22.03	21.67	21.03
10MHz	1 RB high	782.0	23.93	22.06	21.87
	1 RB low	782.0	23.95	22.67	21.96
	50% RB mid	782.0	22.01	21.72	21.08
	100% RB	782.0	21.98	21.64	21.00

**LTE band 25**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1914.3	23.96	21.51	20.52
		1882.5	24.18	21.77	20.78
		1850.7	24.15	22.05	21.06
	1 RB low	1914.3	23.98	21.58	20.59
		1882.5	24.25	21.73	20.74
		1850.7	24.20	22.04	21.05
	50% RB mid	1914.3	24.08	21.82	20.83
		1882.5	24.10	21.78	20.79
		1850.7	24.20	21.96	20.97
	100% RB	1914.3	22.08	21.65	20.66
		1882.5	22.11	21.78	20.79
		1850.7	22.13	21.59	20.60
3MHz	1 RB high	1913.5	24.16	21.53	20.54
		1882.5	24.22	21.60	20.61
		1851.5	24.13	22.06	21.07
	1 RB low	1913.5	24.21	21.58	20.59
		1882.5	24.22	21.63	20.64
		1851.5	24.19	22.06	21.07
	50% RB mid	1913.5	22.25	21.66	20.67
		1882.5	22.27	21.90	20.91
		1851.5	22.19	21.85	20.86
	100% RB	1913.5	22.31	21.55	20.56
		1882.5	22.20	21.77	20.78
		1851.5	22.18	21.77	20.78
5MHz	1 RB high	1912.5	24.05	21.61	20.62
		1882.5	24.21	22.24	21.25
		1852.5	24.19	21.78	20.79
	1 RB low	1912.5	24.12	21.67	20.68
		1882.5	24.22	22.20	21.21
		1852.5	24.20	21.80	20.81
	50% RB mid	1912.5	22.01	21.68	20.69
		1882.5	22.26	21.90	20.91
		1852.5	22.20	21.82	20.83
	100% RB	1912.5	22.00	21.58	20.59
		1882.5	22.24	21.84	20.85
		1852.5	22.15	21.66	20.67
10MHz	1 RB high	1910.0	24.23	21.59	20.60
		1882.5	24.30	21.70	20.71

	1 RB low	1855.0	24.24	22.12	21.13
		1910.0	24.23	21.56	20.57
		1882.5	24.32	21.77	20.78
	50% RB mid	1855.0	24.28	22.12	21.13
		1910.0	22.20	21.70	20.71
		1882.5	22.25	21.84	20.85
	100% RB	1855.0	22.18	21.77	20.78
		1910.0	22.21	21.61	20.62
		1882.5	22.25	21.78	20.79
15MHz	1 RB high	1855.0	22.12	21.77	20.78
		1910.0	22.21	21.61	20.62
		1882.5	22.25	21.78	20.79
	1 RB low	1907.5	23.87	21.83	20.84
		1882.5	24.13	21.58	20.59
		1857.5	24.18	22.06	21.07
	50% RB mid	1907.5	24.00	21.89	20.90
		1882.5	24.18	21.64	20.65
		1857.5	24.23	22.12	21.13
	100% RB	1907.5	21.97	21.55	20.56
		1882.5	22.20	21.79	20.80
		1857.5	22.22	21.89	20.90
20MHz	1 RB high	1907.5	21.90	21.54	20.55
		1882.5	22.13	21.80	20.81
		1857.5	22.19	21.83	20.84
	1 RB low	1905.0	23.86	21.97	20.98
		1882.5	24.19	22.13	21.14
		1860.0	24.20	22.17	21.18
	50% RB mid	1905.0	23.91	22.02	21.03
		1882.5	24.21	22.14	21.15
		1860.0	24.22	22.10	21.11
	100% RB	1905.0	21.99	21.58	20.59
		1882.5	22.22	21.84	20.85
		1860.0	22.27	21.80	20.81
1 RB high	1905.0	21.95	21.57	20.58	
	1882.5	22.21	21.73	20.74	
	1860.0	22.25	21.77	20.78	

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

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	823.3	22.91	22.03	21.06
		819.0	22.88	21.98	20.73
		814.7	22.77	21.88	20.99
	1 RB low	823.3	22.94	22.01	21.07
		819.0	22.87	22.00	21.17
		814.7	22.77	21.90	21.06
	50% RB mid	823.3	22.99	22.29	21.11
		819.0	22.92	22.23	20.76
		814.7	22.90	22.17	20.99
	100% RB	823.3	21.86	21.19	19.87
		819.0	21.83	21.14	19.84
		814.7	21.79	21.09	19.88
3MHz	1 RB high	822.5	22.99	22.05	21.23
		819.0	22.88	21.98	21.14
		815.5	22.87	21.98	20.80
	1 RB low	822.5	22.87	22.04	21.15
		819.0	22.88	22.05	21.00
		815.5	22.90	22.04	20.91
	50% RB mid	822.5	21.99	21.19	19.96
		819.0	21.96	21.07	19.90
		815.5	21.87	21.05	19.88
	100% RB	822.5	22.00	21.01	19.92
		819.0	21.91	21.00	19.93
		815.5	21.89	20.90	19.76
5MHz	1 RB high	821.5	22.96	22.12	21.19
		819.0	22.90	22.05	21.17
		816.5	22.95	22.12	21.24
	1 RB low	821.5	22.92	22.06	21.08
		819.0	22.84	22.01	21.24
		816.5	22.89	22.06	21.10
	50% RB mid	821.5	21.96	21.08	19.97
		819.0	21.98	21.15	19.85
		816.5	22.00	21.17	19.88
	100% RB	821.5	22.04	21.06	19.90
		819.0	21.94	21.03	19.92
		816.5	21.96	21.05	19.91
10MHz	1 RB high	819.0	22.97	22.17	21.24
	1 RB low	819.0	22.97	22.18	21.21



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	50% RB mid	819.0	22.97	22.21	21.13
	100% RB	819.0	22.90	22.08	21.08

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

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	848.3	22.83	21.95	21.01
		836.5	22.89	22.00	20.70
		824.7	22.89	22.01	21.06
	1 RB low	848.3	22.79	21.92	21.09
		836.5	22.85	22.00	21.04
		824.7	22.90	22.03	21.13
	50% RB mid	848.3	22.91	22.22	21.04
		836.5	22.98	22.28	20.98
		824.7	23.00	22.28	20.95
	100% RB	848.3	21.83	21.08	19.86
		836.5	21.88	21.19	19.79
		824.7	21.88	21.21	19.84
3MHz	1 RB high	847.5	22.84	21.96	21.18
		836.5	22.95	22.07	21.14
		825.5	22.98	22.06	21.19
	1 RB low	847.5	22.89	22.07	21.06
		836.5	22.96	22.08	21.11
		825.5	22.99	22.15	21.00
	50% RB mid	847.5	21.96	21.13	19.86
		836.5	21.97	21.15	19.86
		825.5	21.99	21.13	19.91
	100% RB	847.5	21.96	20.99	19.77
		836.5	21.95	21.00	19.98
		825.5	21.94	21.03	19.79
5MHz	1 RB high	846.5	22.85	22.00	21.01
		836.5	22.98	22.17	21.08
		826.5	23.07	22.21	21.11
	1 RB low	846.5	22.95	22.12	21.06
		836.5	22.98	22.16	21.12
		826.5	22.97	22.14	21.09
	50% RB mid	846.5	22.03	21.15	19.90
		836.5	22.03	21.18	20.00
		826.5	21.99	21.15	19.79
	100% RB	846.5	22.00	21.04	19.88
		836.5	22.00	21.07	19.78
		826.5	22.11	21.11	19.99
10MHz	1 RB high	844.0	22.88	22.00	21.07
		836.5	22.96	22.08	21.25

	1 RB low	829.0	22.92	22.56	20.99	
		844.0	23.04	22.10	21.05	
		836.5	23.02	22.06	21.14	
	50% RB mid	829.0	22.96	22.62	21.23	
		844.0	22.05	21.23	19.99	
		836.5	21.99	21.21	19.97	
	100% RB	829.0	22.08	21.21	20.00	
		844.0	22.01	21.17	19.88	
		836.5	22.02	21.10	19.95	
	15MHz	1 RB high	829.0	22.05	21.20	19.98
			841.5	22.91	22.42	21.15
			836.5	22.96	22.46	21.19
1 RB low		831.5	22.90	22.43	21.05	
		841.5	23.03	22.55	21.02	
		836.5	23.08	22.54	21.21	
50% RB mid		831.5	23.02	22.53	21.12	
		841.5	21.97	21.02	19.89	
		836.5	21.98	21.06	19.90	
100% RB		831.5	22.01	21.14	19.98	
		841.5	21.79	20.94	19.91	
		836.5	21.90	21.07	19.89	
		831.5	22.02	21.07	19.90	



**LTE band 41**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	24.58	22.42	21.69
		2593.0	24.64	22.16	21.43
		2498.5	24.18	22.17	21.44
	1 RB low	2687.5	24.50	22.42	21.69
		2593.0	24.24	22.16	21.43
		2498.5	24.00	22.35	21.62
	50% RB mid	2687.5	22.57	22.20	21.47
		2593.0	22.54	22.21	21.48
		2498.5	22.23	21.98	21.25
	100% RB	2687.5	22.53	22.19	21.46
		2593.0	22.52	22.14	21.41
		2498.5	22.26	21.87	21.14
10MHz	1 RB high	2685.0	24.58	22.62	21.89
		2593.0	24.63	22.45	21.72
		2501.0	24.14	22.26	21.53
	1 RB low	2685.0	24.57	22.63	21.90
		2593.0	24.55	22.38	21.65
		2501.0	24.11	22.20	21.47
	50% RB mid	2685.0	22.61	22.11	21.38
		2593.0	22.37	22.30	21.57
		2501.0	22.34	22.02	21.29
	100% RB	2685.0	22.67	22.33	21.60
		2593.0	22.53	22.18	21.45
		2501.0	22.22	21.90	21.17
15MHz	1 RB high	2682.5	24.51	22.67	21.94
		2593.0	24.68	22.57	21.84
		2503.5	24.02	22.24	21.51
	1 RB low	2682.5	24.60	22.43	21.70
		2593.0	24.29	22.53	21.80
		2503.5	24.19	22.19	21.46
	50% RB mid	2682.5	22.48	22.24	21.51
		2593.0	22.53	22.17	21.44
		2503.5	22.19	21.91	21.18
	100% RB	2682.5	22.60	22.25	21.52
		2593.0	22.44	22.11	21.38
		2503.5	22.19	21.76	21.03

20MHz	1 RB high	2680.0	24.52	22.68	21.95
		2593.0	24.36	22.51	21.78
		2506.0	24.19	22.36	21.63
	1 RB low	2680.0	24.58	22.37	21.64
		2593.0	24.55	22.10	21.37
		2506.0	24.30	22.15	21.42
	50% RB mid	2680.0	22.78	22.27	21.54
		2593.0	22.68	22.33	21.60
		2506.0	22.27	21.94	21.21
	100% RB	2680.0	22.66	22.27	21.54
		2593.0	22.55	22.25	21.52
		2506.0	22.26	21.90	21.17

**LTE band 66**

Bandwidth	RB size/offset	Frequency (MHz)	Power (dBm)		
			QPSK	16QAM	64QAM
1.4MHz	1 RB high	1779.3	24.06	21.64	20.59
		1745.0	24.15	21.85	20.66
		1710.7	24.14	21.98	20.79
	1 RB low	1779.3	24.06	21.68	20.57
		1745.0	24.19	21.84	20.65
		1710.7	24.18	21.96	20.77
	50% RB mid	1779.3	24.11	21.95	20.76
		1745.0	24.20	21.87	20.68
		1710.7	24.03	21.94	20.75
	100% RB	1779.3	22.02	21.81	20.62
		1745.0	22.03	21.84	20.65
		1710.7	22.01	21.53	20.34
3MHz	1 RB high	1778.5	24.10	21.56	20.57
		1745.0	24.14	22.11	20.92
		1711.5	24.08	21.72	20.53
	1 RB low	1778.5	24.05	21.57	20.68
		1745.0	24.13	22.14	20.95
		1711.5	24.18	21.72	20.53
	50% RB mid	1778.5	22.14	21.85	20.66
		1745.0	22.16	21.87	20.68
		1711.5	22.14	21.85	20.66
	100% RB	1778.5	22.15	21.78	20.59
		1745.0	22.18	21.84	20.65
		1711.5	22.14	21.68	20.49
5MHz	1 RB high	1777.5	24.07	21.79	20.60
		1745.0	24.24	21.92	20.73
		1712.5	24.07	22.23	21.04
	1 RB low	1777.5	24.12	21.83	20.64
		1745.0	24.27	21.87	20.68
		1712.5	24.18	22.14	20.95
	50% RB mid	1777.5	22.19	21.84	20.65
		1745.0	22.20	21.93	20.74
		1712.5	22.15	21.92	20.73
	100% RB	1777.5	22.15	21.72	20.53
		1745.0	22.20	21.84	20.65
		1712.5	22.16	21.81	20.62
10MHz	1 RB high	1775.0	24.05	21.66	20.76
		1745.0	24.11	21.67	20.69

	1 RB low	1715.0	24.07	22.16	20.97
		1775.0	24.11	21.71	20.52
		1745.0	24.16	21.65	20.56
	50% RB mid	1715.0	24.25	22.04	20.85
		1775.0	22.13	21.87	20.68
		1745.0	22.22	21.86	20.67
	100% RB	1715.0	22.20	21.85	20.66
		1775.0	22.12	21.80	20.61
		1745.0	22.22	21.82	20.63
15MHz	1 RB high	1715.0	22.16	21.82	20.63
		1775.0	22.12	21.80	20.61
		1745.0	22.22	21.82	20.63
	1 RB low	1772.5	24.10	22.05	20.86
		1745.0	24.08	21.64	20.69
		1717.5	24.13	22.15	20.96
	50% RB mid	1772.5	24.10	22.00	20.81
		1745.0	24.17	21.59	20.83
		1717.5	24.21	22.07	20.88
100% RB	1772.5	22.17	21.72	20.53	
	1745.0	22.20	21.82	20.63	
	1717.5	22.16	21.87	20.68	
20MHz	1 RB high	1772.5	22.14	21.72	20.53
		1745.0	22.13	21.83	20.64
		1717.5	22.16	21.82	20.63
	1 RB low	1770.0	24.07	22.18	20.99
		1745.0	24.12	22.19	21.00
		1720.0	24.18	22.12	20.93
	50% RB mid	1770.0	24.14	22.16	20.97
		1745.0	24.15	22.12	20.93
		1720.0	24.17	22.03	20.84
100% RB	1770.0	22.15	21.77	20.58	
	1745.0	22.22	21.85	20.66	
	1720.0	22.20	21.84	20.65	
	1 RB high	1770.0	22.19	21.79	20.60
		1745.0	22.15	21.82	20.63
		1720.0	22.16	21.85	20.66

### A.1.3 Radiated

#### A.1.3.1 Description

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

Rule Part 22.913(a) specifies "Mobile stations are limited to 2.0 watts EIRP."

Rule Part 24.232(b) specifies, "Mobile/portable stations are limited to 2 watts e.i.r.p. Peak power" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."

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

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

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

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

Rule Part 90.635(b) specifies "The maximum output power of the transmitter for mobile stations is 100 watts(50dBm)".

#### A.1.3.2 Method of Measurement

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:

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

$$\text{ERP} = P_{\text{Mea}} + G_{\text{T}} - 2.15\text{dBi}$$

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 7- EIRP

Limits:  $\leq 33$  dBm (2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			$G_T$ (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
5MHz	1 RB high	2567.5	23.17	21.95	21.07	-1.3	21.87	20.65	19.77
		2535	23.22	21.96	21.08	-1.3	21.92	20.66	19.78
		2502.5	23.06	22.26	21.38	-1.3	21.76	20.96	20.08
	1 RB low	2567.5	23.14	21.88	21.00	-1.3	21.84	20.58	19.70
		2535	23.17	21.88	21.00	-1.3	21.87	20.58	19.70
		2502.5	22.96	22.22	21.34	-1.3	21.66	20.92	20.04
	50% RB mid	2567.5	22.23	21.36	20.56	-1.3	20.93	20.06	19.26
		2535	22.18	21.32	20.52	-1.3	20.88	20.02	19.22
		2502.5	22.14	21.35	20.55	-1.3	20.84	20.05	19.25
	100% RB	2567.5	22.20	21.25	20.45	-1.3	20.90	19.95	19.15
		2535	22.20	21.24	20.44	-1.3	20.90	19.94	19.14
		2502.5	22.16	21.25	20.45	-1.3	20.86	19.95	19.15
10MHz	1 RB high	2565	23.09	21.88	21.00	-1.3	21.79	20.58	19.70
		2535	23.18	21.72	20.84	-1.3	21.88	20.42	19.54
		2505	23.03	22.12	21.24	-1.3	21.73	20.82	19.94
	1 RB low	2565	23.06	21.87	20.99	-1.3	21.76	20.57	19.69
		2535	23.01	21.64	20.76	-1.3	21.71	20.34	19.46
		2505	23.02	22.08	21.20	-1.3	21.72	20.78	19.90
	50% RB mid	2565	22.23	21.38	20.58	-1.3	20.93	20.08	19.28
		2535	22.21	21.24	20.44	-1.3	20.91	19.94	19.14
		2505	22.14	21.28	20.48	-1.3	20.84	19.98	19.18
	100% RB	2565	22.34	21.39	20.59	-1.3	21.04	20.09	19.29
		2535	22.22	21.22	20.42	-1.3	20.92	19.92	19.12
		2505	22.06	21.16	20.36	-1.3	20.76	19.86	19.06
15MHz	1 RB high	2562.5	23.18	21.74	20.94	-1.3	21.88	20.44	19.64
		2535	23.02	21.11	20.31	-1.3	21.72	19.81	19.01
		2507.5	23.07	21.57	20.77	-1.3	21.77	20.27	19.47
	1 RB low	2562.5	23.09	21.65	20.85	-1.3	21.79	20.35	19.55
		2535	23.00	21.06	20.26	-1.3	21.70	19.76	18.96
		2507.5	23.08	21.50	20.70	-1.3	21.78	20.20	19.40
	50% RB mid	2562.5	22.26	21.27	20.47	-1.3	20.96	19.97	19.17
		2535	22.21	21.20	20.40	-1.3	20.91	19.90	19.10

	100% RB	2507.5	22.04	21.14	20.34	-1.3	20.74	19.84	19.04
		2562.5	22.21	21.27	20.47	-1.3	20.91	19.97	19.17
		2535	22.15	21.21	20.41	-1.3	20.85	19.91	19.11
		2507.5	22.02	21.07	20.27	-1.3	20.72	19.77	18.97
20M Hz	1 RB high	2560	23.10	21.80	21.00	-1.3	21.80	20.50	19.70
		2535	23.08	21.66	20.86	-1.3	21.78	20.36	19.56
		2510	23.07	21.60	20.80	-1.3	21.77	20.30	19.50
	1 RB low	2560	22.98	21.65	20.85	-1.3	21.68	20.35	19.55
		2535	23.01	21.66	20.86	-1.3	21.71	20.36	19.56
		2510	22.93	21.49	20.69	-1.3	21.63	20.19	19.39
	50% RB mid	2560	22.28	21.41	20.59	-1.3	20.98	20.11	19.29
		2535	22.29	21.33	20.53	-1.3	20.99	20.03	19.23
		2510	22.14	21.19	20.39	-1.3	20.84	19.89	19.09
	100% RB	2560	22.25	21.39	20.59	-1.3	20.95	20.09	19.29
		2535	22.23	21.28	20.48	-1.3	20.93	19.98	19.18
		2510	22.12	21.18	20.38	-1.3	20.82	19.88	19.08

**LTE Band 12 - ERP**
**Limits:** ≤34.77dBm (3W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
1.4 MHz	1 RB high	715.3	23.71	21.38	20.49	-0.8	20.76	18.43	17.54
		707.5	23.88	21.59	20.70	-0.8	20.93	18.64	17.75
		699.7	23.83	21.84	20.95	-0.8	20.88	18.89	18.00
	1 RB low	715.3	23.66	21.33	20.44	-0.8	20.71	18.38	17.49
		707.5	23.92	21.59	20.70	-0.8	20.97	18.64	17.75
		699.7	23.87	21.88	20.99	-0.8	20.92	18.93	18.04
	50% RB mid	715.3	23.74	21.62	20.73	-0.8	20.79	18.67	17.78
		707.5	23.92	21.62	20.73	-0.8	20.97	18.67	17.78
		699.7	23.91	21.75	20.86	-0.8	20.96	18.80	17.91
	100% RB	715.3	21.69	21.52	20.63	-0.8	18.74	18.57	17.68
		707.5	21.84	21.55	20.66	-0.8	18.89	18.60	17.71
		699.7	21.79	21.34	20.45	-0.8	18.84	18.39	17.50
3MHz	1 RB high	714.5	23.73	21.26	20.37	-0.8	20.78	18.31	17.42
		707.5	23.93	21.89	21.00	-0.8	20.98	18.94	18.05
		700.5	23.88	21.52	20.63	-0.8	20.93	18.57	17.68
	1 RB low	714.5	23.77	21.27	20.38	-0.8	20.82	18.32	17.43
		707.5	23.89	21.88	20.99	-0.8	20.94	18.93	18.04
		700.5	23.96	21.60	20.71	-0.8	21.01	18.65	17.76
	50% RB mid	714.5	21.86	21.61	20.72	-0.8	18.91	18.66	17.77
		707.5	21.96	21.63	20.74	-0.8	19.01	18.68	17.79
		700.5	21.95	21.59	20.70	-0.8	19.00	18.64	17.75
	100% RB	714.5	21.88	21.50	20.61	-0.8	18.93	18.55	17.66
		707.5	21.89	21.58	20.69	-0.8	18.94	18.63	17.74
		700.5	21.92	21.48	20.59	-0.8	18.97	18.53	17.64
5MHz	1 RB high	713.5	23.75	21.49	20.60	-0.8	20.80	18.54	17.65
		707.5	23.85	21.67	20.78	-0.8	20.90	18.72	17.83
		701.5	23.98	22.06	21.17	-0.8	21.03	19.11	18.22
	1 RB low	713.5	23.78	21.51	20.62	-0.8	20.83	18.56	17.67
		707.5	23.88	21.65	20.76	-0.8	20.93	18.70	17.81
		701.5	23.94	22.05	21.16	-0.8	20.99	19.10	18.21
	50% RB mid	713.5	21.87	21.59	20.70	-0.8	18.92	18.64	17.75
		707.5	21.94	21.68	20.79	-0.8	18.99	18.73	17.84
		701.5	21.95	21.70	20.81	-0.8	19.00	18.75	17.86
	100% RB	713.5	21.83	21.40	20.51	-0.8	18.88	18.45	17.56
		707.5	21.92	21.60	20.71	-0.8	18.97	18.65	17.76



		701.5	22.07	21.69	20.80	-0.8	19.12	18.74	17.85
10M Hz	1 RB high	711.0	23.93	21.41	20.52	-0.8	20.98	18.46	17.57
		707.5	23.97	21.88	20.99	-0.8	21.02	18.93	18.04
		704.0	23.90	21.53	20.64	-0.8	20.95	18.58	17.69
	1 RB low	711.0	23.89	21.45	20.56	-0.8	20.94	18.50	17.61
		707.5	23.85	21.78	20.89	-0.8	20.90	18.83	17.94
		704.0	23.87	21.51	20.62	-0.8	20.92	18.56	17.67
	50% RB mid	711.0	21.98	21.63	20.74	-0.8	19.03	18.68	17.79
		707.5	21.93	21.61	20.72	-0.8	18.98	18.66	17.77
		704.0	22.00	21.75	20.86	-0.8	19.05	18.80	17.91
	100% RB	711.0	21.98	21.57	20.68	-0.8	19.03	18.62	17.73
		707.5	21.95	21.61	20.72	-0.8	19.00	18.66	17.77
		704.0	21.99	21.65	20.76	-0.8	19.04	18.70	17.81

**LTE Band 13- ERP**
**Limits:** ≤34.77 dBm (3W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
5MHz	1 RB high	784.5	24.01	22.39	21.83	-1.3	20.56	18.94	18.38
		782	24.03	22.26	21.82	-1.3	20.58	18.81	18.37
		779.5	23.97	22.37	21.83	-1.3	20.52	18.92	18.38
	1 RB low	784.5	23.98	22.29	21.94	-1.3	20.53	18.84	18.49
		782	24.10	22.30	21.86	-1.3	20.65	18.85	18.41
		779.5	24.00	22.25	21.94	-1.3	20.55	18.80	18.49
	50% RB mid	784.5	22.03	21.63	20.99	-1.3	18.58	18.18	17.54
		782	21.99	21.69	21.05	-1.3	18.54	18.24	17.60
		779.5	22.07	21.79	21.15	-1.3	18.62	18.34	17.70
	100% RB	784.5	22.00	21.52	20.88	-1.3	18.55	18.07	17.43
		782	21.97	21.61	20.97	-1.3	18.52	18.16	17.52
		779.5	22.03	21.67	21.03	-1.3	18.58	18.22	17.58
10MHz	1 RB high	782.0	23.93	22.06	21.87	-1.3	20.48	18.61	18.42
	1 RB low	782.0	23.95	22.67	21.96	-1.3	20.50	19.22	18.51
	50% RB mid	782.0	22.01	21.72	21.08	-1.3	18.56	18.27	17.63
	100% RB	782.0	21.98	21.64	21.00	-1.3	18.53	18.19	17.55

**LTE Band 25- EIRP**
**Limits:** ≤33dBm (2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
1.4 MHz	1 RB high	1914.3	23.96	21.51	20.52	-2.4	21.56	19.11	18.12
		1882.5	24.18	21.77	20.78	-2.4	21.78	19.37	18.38
		1850.7	24.15	22.05	21.06	-2.4	21.75	19.65	18.66
	1 RB low	1914.3	23.98	21.58	20.59	-2.4	21.58	19.18	18.19
		1882.5	24.25	21.73	20.74	-2.4	21.85	19.33	18.34
		1850.7	24.20	22.04	21.05	-2.4	21.80	19.64	18.65
	50% RB mid	1914.3	24.08	21.82	20.83	-2.4	21.68	19.42	18.43
		1882.5	24.10	21.78	20.79	-2.4	21.70	19.38	18.39
		1850.7	24.20	21.96	20.97	-2.4	21.80	19.56	18.57
	100% RB	1914.3	22.08	21.65	20.66	-2.4	19.68	19.25	18.26
		1882.5	22.11	21.78	20.79	-2.4	19.71	19.38	18.39
		1850.7	22.13	21.59	20.60	-2.4	19.73	19.19	18.20
3MHz	1 RB high	1913.5	24.16	21.53	20.54	-2.4	21.76	19.13	18.14
		1882.5	24.22	21.60	20.61	-2.4	21.82	19.20	18.21
		1851.5	24.13	22.06	21.07	-2.4	21.73	19.66	18.67
	1 RB low	1913.5	24.21	21.58	20.59	-2.4	21.81	19.18	18.19
		1882.5	24.22	21.63	20.64	-2.4	21.82	19.23	18.24
		1851.5	24.19	22.06	21.07	-2.4	21.79	19.66	18.67
	50% RB mid	1913.5	22.25	21.66	20.67	-2.4	19.85	19.26	18.27
		1882.5	22.27	21.90	20.91	-2.4	19.87	19.50	18.51
		1851.5	22.19	21.85	20.86	-2.4	19.79	19.45	18.46
	100% RB	1913.5	22.31	21.55	20.56	-2.4	19.91	19.15	18.16
		1882.5	22.20	21.77	20.78	-2.4	19.80	19.37	18.38
		1851.5	22.18	21.77	20.78	-2.4	19.78	19.37	18.38
5MHz	1 RB high	1912.5	24.05	21.61	20.62	-2.4	21.65	19.21	18.22
		1882.5	24.21	22.24	21.25	-2.4	21.81	19.84	18.85
		1852.5	24.19	21.78	20.79	-2.4	21.79	19.38	18.39
	1 RB low	1912.5	24.12	21.67	20.68	-2.4	21.72	19.27	18.28
		1882.5	24.22	22.20	21.21	-2.4	21.82	19.80	18.81
		1852.5	24.20	21.80	20.81	-2.4	21.80	19.40	18.41
	50% RB mid	1912.5	22.01	21.68	20.69	-2.4	19.61	19.28	18.29
		1882.5	22.26	21.90	20.91	-2.4	19.86	19.50	18.51
		1852.5	22.20	21.82	20.83	-2.4	19.80	19.42	18.43
	100% RB	1912.5	22.00	21.58	20.59	-2.4	19.60	19.18	18.19
		1882.5	22.24	21.84	20.85	-2.4	19.84	19.44	18.45

		1852.5	22.15	21.66	20.67	-2.4	19.75	19.26	18.27
10M Hz	1 RB high	1910.0	24.23	21.59	20.60	-2.4	21.83	19.19	18.20
		1882.5	24.30	21.70	20.71	-2.4	21.90	19.30	18.31
		1855.0	24.24	22.12	21.13	-2.4	21.84	19.72	18.73
	1 RB low	1910.0	24.23	21.56	20.57	-2.4	21.83	19.16	18.17
		1882.5	24.32	21.77	20.78	-2.4	21.92	19.37	18.38
		1855.0	24.28	22.12	21.13	-2.4	21.88	19.72	18.73
	50% RB mid	1910.0	22.20	21.70	20.71	-2.4	19.80	19.30	18.31
		1882.5	22.25	21.84	20.85	-2.4	19.85	19.44	18.45
		1855.0	22.18	21.77	20.78	-2.4	19.78	19.37	18.38
	100% RB	1910.0	22.21	21.61	20.62	-2.4	19.81	19.21	18.22
		1882.5	22.25	21.78	20.79	-2.4	19.85	19.38	18.39
		1855.0	22.12	21.77	20.78	-2.4	19.72	19.37	18.38
15M Hz	1 RB high	1907.5	23.87	21.83	20.84	-2.4	21.47	19.43	18.44
		1882.5	24.13	21.58	20.59	-2.4	21.73	19.18	18.19
		1857.5	24.18	22.06	21.07	-2.4	21.78	19.66	18.67
	1 RB low	1907.5	24.00	21.89	20.90	-2.4	21.60	19.49	18.50
		1882.5	24.18	21.64	20.65	-2.4	21.78	19.24	18.25
		1857.5	24.23	22.12	21.13	-2.4	21.83	19.72	18.73
	50% RB mid	1907.5	21.97	21.55	20.56	-2.4	19.57	19.15	18.16
		1882.5	22.20	21.79	20.80	-2.4	19.80	19.39	18.40
		1857.5	22.22	21.89	20.90	-2.4	19.82	19.49	18.50
	100% RB	1907.5	21.90	21.54	20.55	-2.4	19.50	19.14	18.15
		1882.5	22.13	21.80	20.81	-2.4	19.73	19.40	18.41
		1857.5	22.19	21.83	20.84	-2.4	19.79	19.43	18.44
20M Hz	1 RB high	1905.0	23.86	21.97	20.98	-2.4	21.46	19.57	18.58
		1882.5	24.19	22.13	21.14	-2.4	21.79	19.73	18.74
		1860.0	24.20	22.17	21.18	-2.4	21.80	19.77	18.78
	1 RB low	1905.0	23.91	22.02	21.03	-2.4	21.51	19.62	18.63
		1882.5	24.21	22.14	21.15	-2.4	21.81	19.74	18.75
		1860.0	24.22	22.10	21.11	-2.4	21.82	19.70	18.71
	50% RB mid	1905.0	21.99	21.58	20.59	-2.4	19.59	19.18	18.19
		1882.5	22.22	21.84	20.85	-2.4	19.82	19.44	18.45
		1860.0	22.27	21.80	20.81	-2.4	19.87	19.40	18.41
	100% RB	1905.0	21.95	21.57	20.58	-2.4	19.55	19.17	18.18
		1882.5	22.21	21.73	20.74	-2.4	19.81	19.33	18.34
		1860.0	22.25	21.77	20.78	-2.4	19.85	19.37	18.38

**LTE Band 26(814MHz~824MHz)- ERP**
**Limits:** ≤50dBm (100W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
1.4 MHz	1 RB high	823.3	22.91	22.03	21.06	-2.1	18.66	17.78	16.81
		819.0	22.88	21.98	20.73	-2.1	18.63	17.73	16.48
		814.7	22.77	21.88	20.99	-2.1	18.52	17.63	16.74
	1 RB low	823.3	22.94	22.01	21.07	-2.1	18.69	17.76	16.82
		819.0	22.87	22.00	21.17	-2.1	18.62	17.75	16.92
		814.7	22.77	21.90	21.06	-2.1	18.52	17.65	16.81
	50% RB mid	823.3	22.99	22.29	21.11	-2.1	18.74	18.04	16.86
		819.0	22.92	22.23	20.76	-2.1	18.67	17.98	16.51
		814.7	22.90	22.17	20.99	-2.1	18.65	17.92	16.74
	100% RB	823.3	21.86	21.19	19.87	-2.1	17.61	16.94	15.62
		819.0	21.83	21.14	19.84	-2.1	17.58	16.89	15.59
		814.7	21.79	21.09	19.88	-2.1	17.54	16.84	15.63
3MHz	1 RB high	822.5	22.99	22.05	21.23	-2.1	18.74	17.80	16.98
		819.0	22.88	21.98	21.14	-2.1	18.63	17.73	16.89
		815.5	22.87	21.98	20.80	-2.1	18.62	17.73	16.55
	1 RB low	822.5	22.87	22.04	21.15	-2.1	18.62	17.79	16.90
		819.0	22.88	22.05	21.00	-2.1	18.63	17.80	16.75
		815.5	22.90	22.04	20.91	-2.1	18.65	17.79	16.66
	50% RB mid	822.5	21.99	21.19	19.96	-2.1	17.74	16.94	15.71
		819.0	21.96	21.07	19.90	-2.1	17.71	16.82	15.65
		815.5	21.87	21.05	19.88	-2.1	17.62	16.80	15.63
	100% RB	822.5	22.00	21.01	19.92	-2.1	17.75	16.76	15.67
		819.0	21.91	21.00	19.93	-2.1	17.66	16.75	15.68
		815.5	21.89	20.90	19.76	-2.1	17.64	16.65	15.51
5MHz	1 RB high	821.5	22.96	22.12	21.19	-2.1	18.71	17.87	16.94
		819.0	22.90	22.05	21.17	-2.1	18.65	17.80	16.92
		816.5	22.95	22.12	21.24	-2.1	18.70	17.87	16.99
	1 RB low	821.5	22.92	22.06	21.08	-2.1	18.67	17.81	16.83
		819.0	22.84	22.01	21.24	-2.1	18.59	17.76	16.99
		816.5	22.89	22.06	21.10	-2.1	18.64	17.81	16.85
	50% RB mid	821.5	21.96	21.08	19.97	-2.1	17.71	16.83	15.72
		819.0	21.98	21.15	19.85	-2.1	17.73	16.90	15.60
		816.5	22.00	21.17	19.88	-2.1	17.75	16.92	15.63
	100% RB	821.5	22.04	21.06	19.90	-2.1	17.79	16.81	15.65
		819.0	21.94	21.03	19.92	-2.1	17.69	16.78	15.67
		816.5	21.96	21.05	19.91	-2.1	17.71	16.80	15.66



I19Z62229-WMD03

10M Hz	1 RB high	819.0	22.97	22.17	21.24	-2.1	18.72	17.92	16.99
	1 RB low	819.0	22.97	22.18	21.21	-2.1	18.72	17.93	16.96
	50% RB mid	819.0	22.97	22.21	21.13	-2.1	18.72	17.96	16.88
	100% RB	819.0	22.90	22.08	21.08	-2.1	18.65	17.83	16.83

**LTE Band 26(824MHz~849MHz)- ERP**
**Limits:** ≤38.45dBm (7W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
1.4 MHz	1 RB high	848.3	22.83	21.95	21.01	-2.1	18.58	17.70	16.76
		836.5	22.89	22.00	20.70	-2.1	18.64	17.75	16.45
		824.7	22.89	22.01	21.06	-2.1	18.64	17.76	16.81
	1 RB low	848.3	22.79	21.92	21.09	-2.1	18.54	17.67	16.84
		836.5	22.85	22.00	21.04	-2.1	18.60	17.75	16.79
		824.7	22.90	22.03	21.13	-2.1	18.65	17.78	16.88
	50% RB mid	848.3	22.91	22.22	21.04	-2.1	18.66	17.97	16.79
		836.5	22.98	22.28	20.98	-2.1	18.73	18.03	16.73
		824.7	23.00	22.28	20.95	-2.1	18.75	18.03	16.70
	100% RB	848.3	21.83	21.08	19.86	-2.1	17.58	16.83	15.61
		836.5	21.88	21.19	19.79	-2.1	17.63	16.94	15.54
		824.7	21.88	21.21	19.84	-2.1	17.63	16.96	15.59
3MHz	1 RB high	847.5	22.84	21.96	21.18	-2.1	18.59	17.71	16.93
		836.5	22.95	22.07	21.14	-2.1	18.70	17.82	16.89
		825.5	22.98	22.06	21.19	-2.1	18.73	17.81	16.94
	1 RB low	847.5	22.89	22.07	21.06	-2.1	18.64	17.82	16.81
		836.5	22.96	22.08	21.11	-2.1	18.71	17.83	16.86
		825.5	22.99	22.15	21.00	-2.1	18.74	17.90	16.75
	50% RB mid	847.5	21.96	21.13	19.86	-2.1	17.71	16.88	15.61
		836.5	21.97	21.15	19.86	-2.1	17.72	16.90	15.61
		825.5	21.99	21.13	19.91	-2.1	17.74	16.88	15.66
	100% RB	847.5	21.96	20.99	19.77	-2.1	17.71	16.74	15.52
		836.5	21.95	21.00	19.98	-2.1	17.70	16.75	15.73
		825.5	21.94	21.03	19.79	-2.1	17.69	16.78	15.54
5MHz	1 RB high	846.5	22.85	22.00	21.01	-2.1	18.60	17.75	16.76
		836.5	22.98	22.17	21.08	-2.1	18.73	17.92	16.83
		826.5	23.07	22.21	21.11	-2.1	18.82	17.96	16.86
	1 RB low	846.5	22.95	22.12	21.06	-2.1	18.70	17.87	16.81
		836.5	22.98	22.16	21.12	-2.1	18.73	17.91	16.87
		826.5	22.97	22.14	21.09	-2.1	18.72	17.89	16.84
	50% RB mid	846.5	22.03	21.15	19.90	-2.1	17.78	16.90	15.65
		836.5	22.03	21.18	20.00	-2.1	17.78	16.93	15.75
		826.5	21.99	21.15	19.79	-2.1	17.74	16.90	15.54
	100% RB	846.5	22.00	21.04	19.88	-2.1	17.75	16.79	15.63
		836.5	22.00	21.07	19.78	-2.1	17.75	16.82	15.53
		826.5	22.11	21.11	19.99	-2.1	17.86	16.86	15.74

10M Hz	1 RB high	844.0	22.88	22.00	21.07	-2.1	18.63	17.75	16.82
		836.5	22.96	22.08	21.25	-2.1	18.71	17.83	17.00
		829.0	22.92	22.56	20.99	-2.1	18.67	18.31	16.74
	1 RB low	844.0	23.04	22.10	21.05	-2.1	18.79	17.85	16.80
		836.5	23.02	22.06	21.14	-2.1	18.77	17.81	16.89
		829.0	22.96	22.62	21.23	-2.1	18.71	18.37	16.98
	50% RB mid	844.0	22.05	21.23	19.99	-2.1	17.80	16.98	15.74
		836.5	21.99	21.21	19.97	-2.1	17.74	16.96	15.72
		829.0	22.08	21.21	20.00	-2.1	17.83	16.96	15.75
	100% RB	844.0	22.01	21.17	19.88	-2.1	17.76	16.92	15.63
		836.5	22.02	21.10	19.95	-2.1	17.77	16.85	15.70
		829.0	22.05	21.20	19.98	-2.1	17.80	16.95	15.73
15M Hz	1 RB high	841.5	22.91	22.42	21.15	-2.1	18.66	18.17	16.90
		836.5	22.96	22.46	21.19	-2.1	18.71	18.21	16.94
		831.5	22.90	22.43	21.05	-2.1	18.65	18.18	16.80
	1 RB low	841.5	23.03	22.55	21.02	-2.1	18.78	18.30	16.77
		836.5	23.08	22.54	21.21	-2.1	18.83	18.29	16.96
		831.5	23.02	22.53	21.12	-2.1	18.77	18.28	16.87
	50% RB mid	841.5	21.97	21.02	19.89	-2.1	17.72	16.77	15.64
		836.5	21.98	21.06	19.90	-2.1	17.73	16.81	15.65
		831.5	22.01	21.14	19.98	-2.1	17.76	16.89	15.73
	100% RB	841.5	21.79	20.94	19.91	-2.1	17.54	16.69	15.66
		836.5	21.90	21.07	19.89	-2.1	17.65	16.82	15.64
		831.5	22.02	21.07	19.90	-2.1	17.77	16.82	15.65



**LTE Band 41- EIRP**
**Limits:** ≤33dBm (2W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
5MHz	1 RB high	2687.5	24.58	22.42	21.69	-1.0	23.58	21.42	20.69
		2593.0	24.64	22.16	21.43	-1.0	23.64	21.16	20.43
		2498.5	24.18	22.17	21.44	-1.0	23.18	21.17	20.44
	1 RB low	2687.5	24.50	22.42	21.69	-1.0	23.50	21.42	20.69
		2593.0	24.24	22.16	21.43	-1.0	23.24	21.16	20.43
		2498.5	24.00	22.35	21.62	-1.0	23.00	21.35	20.62
	50% RB mid	2687.5	22.57	22.20	21.47	-1.0	21.57	21.20	20.47
		2593.0	22.54	22.21	21.48	-1.0	21.54	21.21	20.48
		2498.5	22.23	21.98	21.25	-1.0	21.23	20.98	20.25
	100% RB	2687.5	22.53	22.19	21.46	-1.0	21.53	21.19	20.46
		2593.0	22.52	22.14	21.41	-1.0	21.52	21.14	20.41
		2498.5	22.26	21.87	21.14	-1.0	21.26	20.87	20.14
10MHz	1 RB high	2685.0	24.58	22.62	21.89	-1.0	23.58	21.62	20.89
		2593.0	24.63	22.45	21.72	-1.0	23.63	21.45	20.72
		2501.0	24.14	22.26	21.53	-1.0	23.14	21.26	20.53
	1 RB low	2685.0	24.57	22.63	21.90	-1.0	23.57	21.63	20.90
		2593.0	24.55	22.38	21.65	-1.0	23.55	21.38	20.65
		2501.0	24.11	22.20	21.47	-1.0	23.11	21.20	20.47
	50% RB mid	2685.0	22.61	22.11	21.38	-1.0	21.61	21.11	20.38
		2593.0	22.37	22.30	21.57	-1.0	21.37	21.30	20.57
		2501.0	22.34	22.02	21.29	-1.0	21.34	21.02	20.29
	100% RB	2685.0	22.67	22.33	21.60	-1.0	21.67	21.33	20.60
		2593.0	22.53	22.18	21.45	-1.0	21.53	21.18	20.45
		2501.0	22.22	21.90	21.17	-1.0	21.22	20.90	20.17
15MHz	1 RB high	2682.5	24.51	22.67	21.94	-1.0	23.51	21.67	20.94
		2593.0	24.68	22.57	21.84	-1.0	23.68	21.57	20.84
		2503.5	24.02	22.24	21.51	-1.0	23.02	21.24	20.51
	1 RB low	2682.5	24.60	22.43	21.70	-1.0	23.60	21.43	20.70
		2593.0	24.29	22.53	21.80	-1.0	23.29	21.53	20.80
		2503.5	24.19	22.19	21.46	-1.0	23.19	21.19	20.46
	50% RB mid	2682.5	22.48	22.24	21.51	-1.0	21.48	21.24	20.51
		2593.0	22.53	22.17	21.44	-1.0	21.53	21.17	20.44
		2503.5	22.19	21.91	21.18	-1.0	21.19	20.91	20.18
	100% RB	2682.5	22.60	22.25	21.52	-1.0	21.60	21.25	20.52
		2593.0	22.44	22.11	21.38	-1.0	21.44	21.11	20.38

		2503.5	22.19	21.76	21.03	-1.0	21.19	20.76	20.03
20M Hz	1 RB high	2680.0	24.52	22.68	21.95	-1.0	23.52	21.68	20.95
		2593.0	24.36	22.51	21.78	-1.0	23.36	21.51	20.78
		2506.0	24.19	22.36	21.63	-1.0	23.19	21.36	20.63
	1 RB low	2680.0	24.58	22.37	21.64	-1.0	23.58	21.37	20.64
		2593.0	24.55	22.10	21.37	-1.0	23.55	21.10	20.37
		2506.0	24.30	22.15	21.42	-1.0	23.30	21.15	20.42
	50% RB mid	2680.0	22.78	22.27	21.54	-1.0	21.78	21.27	20.54
		2593.0	22.68	22.33	21.60	-1.0	21.68	21.33	20.60
		2506.0	22.27	21.94	21.21	-1.0	21.27	20.94	20.21
	100% RB	2680.0	22.66	22.27	21.54	-1.0	21.66	21.27	20.54
		2593.0	22.55	22.25	21.52	-1.0	21.55	21.25	20.52
		2506.0	22.26	21.90	21.17	-1.0	21.26	20.90	20.17

**LTE Band 66- EIRP**
**Limits:** ≤30dBm (1W)

Bandwidth	RB size/offset	Frequency (MHz)	Conducted Power (dBm)			G <sub>T</sub> (dBi)	Radiated Power (dBm)		
			QPSK	16QAM	64QAM		QPSK	16QAM	64QAM
1.4 MHz	1 RB high	1779.3	24.06	21.64	20.59	-1.8	22.26	19.84	18.79
		1745.0	24.15	21.85	20.66	-1.8	22.35	20.05	18.86
		1710.7	24.14	21.98	20.79	-1.8	22.34	20.18	18.99
	1 RB low	1779.3	24.06	21.68	20.57	-1.8	22.26	19.88	18.77
		1745.0	24.19	21.84	20.65	-1.8	22.39	20.04	18.85
		1710.7	24.18	21.96	20.77	-1.8	22.38	20.16	18.97
	50% RB mid	1779.3	24.11	21.95	20.76	-1.8	22.31	20.15	18.96
		1745.0	24.20	21.87	20.68	-1.8	22.40	20.07	18.88
		1710.7	24.03	21.94	20.75	-1.8	22.23	20.14	18.95
	100% RB	1779.3	22.02	21.81	20.62	-1.8	20.22	20.01	18.82
		1745.0	22.03	21.84	20.65	-1.8	20.23	20.04	18.85
		1710.7	22.01	21.53	20.34	-1.8	20.21	19.73	18.54
3MHz	1 RB high	1778.5	24.10	21.56	20.57	-1.8	22.30	19.76	18.77
		1745.0	24.14	22.11	20.92	-1.8	22.34	20.31	19.12
		1711.5	24.08	21.72	20.53	-1.8	22.28	19.92	18.73
	1 RB low	1778.5	24.05	21.57	20.68	-1.8	22.25	19.77	18.88
		1745.0	24.13	22.14	20.95	-1.8	22.33	20.34	19.15
		1711.5	24.18	21.72	20.53	-1.8	22.38	19.92	18.73
	50% RB mid	1778.5	22.14	21.85	20.66	-1.8	20.34	20.05	18.86
		1745.0	22.16	21.87	20.68	-1.8	20.36	20.07	18.88
		1711.5	22.14	21.85	20.66	-1.8	20.34	20.05	18.86
	100% RB	1778.5	22.15	21.78	20.59	-1.8	20.35	19.98	18.79
		1745.0	22.18	21.84	20.65	-1.8	20.38	20.04	18.85
		1711.5	22.14	21.68	20.49	-1.8	20.34	19.88	18.69
5MHz	1 RB high	1777.5	24.07	21.79	20.60	-1.8	22.27	19.99	18.80
		1745.0	24.24	21.92	20.73	-1.8	22.44	20.12	18.93
		1712.5	24.07	22.23	21.04	-1.8	22.27	20.43	19.24
	1 RB low	1777.5	24.12	21.83	20.64	-1.8	22.32	20.03	18.84
		1745.0	24.27	21.87	20.68	-1.8	22.47	20.07	18.88
		1712.5	24.18	22.14	20.95	-1.8	22.38	20.34	19.15
	50% RB mid	1777.5	22.19	21.84	20.65	-1.8	20.39	20.04	18.85
		1745.0	22.20	21.93	20.74	-1.8	20.40	20.13	18.94
		1712.5	22.15	21.92	20.73	-1.8	20.35	20.12	18.93
	100% RB	1777.5	22.15	21.72	20.53	-1.8	20.35	19.92	18.73
		1745.0	22.20	21.84	20.65	-1.8	20.40	20.04	18.85

		1712.5	22.16	21.81	20.62	-1.8	20.36	20.01	18.82
10M Hz	1 RB high	1775.0	24.05	21.66	20.76	-1.8	22.25	19.86	18.96
		1745.0	24.11	21.67	20.69	-1.8	22.31	19.87	18.89
		1715.0	24.07	22.16	20.97	-1.8	22.27	20.36	19.17
	1 RB low	1775.0	24.11	21.71	20.52	-1.8	22.31	19.91	18.72
		1745.0	24.16	21.65	20.56	-1.8	22.36	19.85	18.76
		1715.0	24.25	22.04	20.85	-1.8	22.45	20.24	19.05
	50% RB mid	1775.0	22.13	21.87	20.68	-1.8	20.33	20.07	18.88
		1745.0	22.22	21.86	20.67	-1.8	20.42	20.06	18.87
		1715.0	22.20	21.85	20.66	-1.8	20.40	20.05	18.86
	100% RB	1775.0	22.12	21.80	20.61	-1.8	20.32	20.00	18.81
		1745.0	22.22	21.82	20.63	-1.8	20.42	20.02	18.83
		1715.0	22.16	21.82	20.63	-1.8	20.36	20.02	18.83
15M Hz	1 RB high	1772.5	24.10	22.05	20.86	-1.8	22.30	20.25	19.06
		1745.0	24.08	21.64	20.69	-1.8	22.28	19.84	18.89
		1717.5	24.13	22.15	20.96	-1.8	22.33	20.35	19.16
	1 RB low	1772.5	24.10	22.00	20.81	-1.8	22.30	20.20	19.01
		1745.0	24.17	21.59	20.83	-1.8	22.37	19.79	19.03
		1717.5	24.21	22.07	20.88	-1.8	22.41	20.27	19.08
	50% RB mid	1772.5	22.17	21.72	20.53	-1.8	20.37	19.92	18.73
		1745.0	22.20	21.82	20.63	-1.8	20.40	20.02	18.83
		1717.5	22.16	21.87	20.68	-1.8	20.36	20.07	18.88
	100% RB	1772.5	22.14	21.72	20.53	-1.8	20.34	19.92	18.73
		1745.0	22.13	21.83	20.64	-1.8	20.33	20.03	18.84
		1717.5	22.16	21.82	20.63	-1.8	20.36	20.02	18.83
20M Hz	1 RB high	1770.0	24.07	22.18	20.99	-1.8	22.27	20.38	19.19
		1745.0	24.12	22.19	21.00	-1.8	22.32	20.39	19.20
		1720.0	24.18	22.12	20.93	-1.8	22.38	20.32	19.13
	1 RB low	1770.0	24.14	22.16	20.97	-1.8	22.34	20.36	19.17
		1745.0	24.15	22.12	20.93	-1.8	22.35	20.32	19.13
		1720.0	24.17	22.03	20.84	-1.8	22.37	20.23	19.04
	50% RB mid	1770.0	22.15	21.77	20.58	-1.8	20.35	19.97	18.78
		1745.0	22.22	21.85	20.66	-1.8	20.42	20.05	18.86
		1720.0	22.20	21.84	20.65	-1.8	20.40	20.04	18.85
	100% RB	1770.0	22.19	21.79	20.60	-1.8	20.39	19.99	18.80
		1745.0	22.15	21.82	20.63	-1.8	20.35	20.02	18.83
		1720.0	22.16	21.85	20.66	-1.8	20.36	20.05	18.86

## **A.2 EMISSION LIMIT**

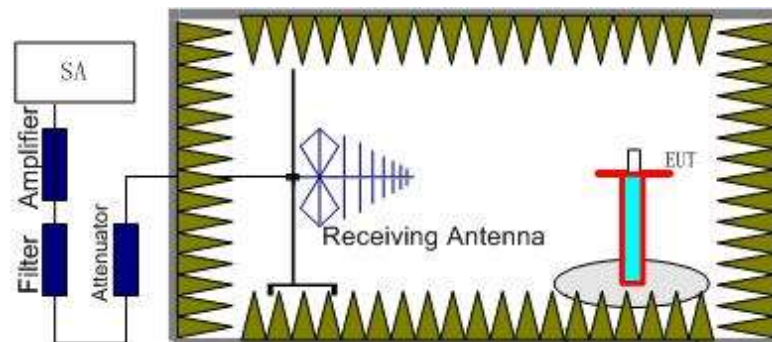
### **A.2.1 Measurement Method**

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully anechoic chamber FAC-3.

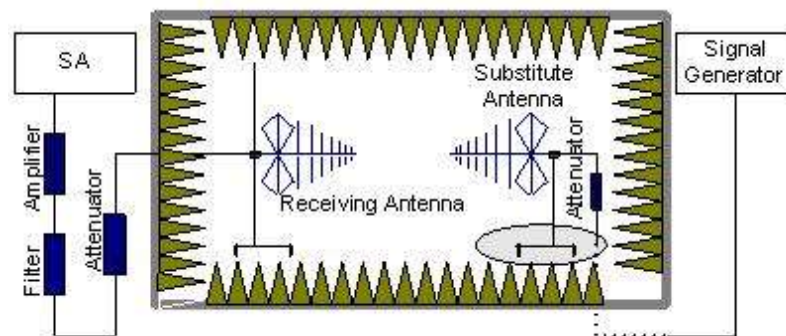
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 7,12,13,25,26,41,66.

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

1. EUT was placed on a 1.5-meter-high non-conductive stand at a 3-meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360 and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



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



In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere

with the radiation pattern of the antenna. A power ( $P_{Mea}$ ) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss ( $P_{pl}$ ) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain ( $G_a$ ) should be recorded after test.

An amplifier should be connected in for the test.

The Path loss ( $P_{pl}$ ) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

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

5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dB}$ .

### A.2.2 Measurement Limit

Part 22.917, Part 24.238 and Part 27.53(h) specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power ( $P$ ) by a factor of at least  $43 + 10 \log(P)$  dB.

The specification that emissions shall be attenuated below the transmitter power ( $P$ ) by at least  $43 + 10 \log(P)$  dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

Part 27.53(m)(4) specifies for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  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.

Part 27.53(c) states for operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the 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, in accordance with the following: (1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power ( $P$ ) by at least  $43 + 10 \log(P)$  dB; (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power ( $P$ ) by at least  $43 + 10 \log(P)$  dB; (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 +$



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10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations.

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



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

Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 7,12,13,25,26,41,66. 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 7,12,13,25,26,41,66 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.



**LTE Band 7, 5 MHz, QPSK, Channel 20775**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5010.02	-53.74	-6.59	9.91	-50.42	-25.00	25.42	H
7512.01	-36.03	-8.34	12.21	-32.16	-25.00	7.16	H
10020.01	-50.24	-9.24	12.91	-46.57	-25.00	21.57	V
12527.01	-49.59	-10.25	13.22	-46.62	-25.00	21.62	V
14999.00	-45.81	-11.21	14.00	-43.02	-25.00	18.02	H
17525.00	-43.00	-12.82	14.94	-40.88	-25.00	15.88	H

**LTE Band 7, 5 MHz, QPSK, Channel 21100**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5073.02	-53.97	-6.70	10.00	-50.67	-25.00	25.67	H
7609.01	-34.89	-8.01	12.29	-30.61	-25.00	5.61	H
10150.01	-50.84	-9.38	12.96	-47.26	-25.00	22.26	V
12681.01	-49.56	-10.33	13.31	-46.58	-25.00	21.58	H
15224.00	-45.36	-11.37	13.87	-42.86	-25.00	17.86	V
17728.00	-44.37	-12.34	15.22	-41.49	-25.00	16.49	H

**LTE Band 7, 5 MHz, QPSK, Channel 21425**

Frequency (MHz)	P <sub>Mea</sub> (dBm)	Path Loss(dB)	Antenna Gain(dBi)	Peak EIRP (dBm)	Limit (dBm)	Margin (dB)	Polarization
5138.02	-55.45	-6.86	10.09	-52.22	-25.00	27.22	V
7709.01	-38.02	-8.41	12.37	-34.06	-25.00	9.06	H
10280.01	-48.70	-9.57	13.01	-45.26	-25.00	20.26	V
12857.01	-49.49	-10.62	13.41	-46.70	-25.00	21.70	H
15391.00	-46.17	-11.38	13.77	-43.78	-25.00	18.78	V
17987.00	-43.88	-12.90	15.58	-41.20	-25.00	16.20	V

**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
1401.01	-54.30	-3.24	4.99	2.15	-54.70	-13.00	41.70	H
2099.00	-45.53	-4.19	4.90	2.15	-46.97	-13.00	33.97	H
2805.00	-52.47	-4.92	6.65	2.15	-52.89	-13.00	39.89	V
3499.02	-54.53	-5.52	8.20	2.15	-54.00	-13.00	41.00	H
4192.02	-55.44	-6.19	9.09	2.15	-54.69	-13.00	41.69	H
4906.01	-55.05	-6.73	9.81	2.15	-54.12	-13.00	41.12	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
1429.01	-57.95	-3.27	5.13	2.15	-58.24	-13.00	45.24	V
2123.00	-49.65	-4.21	4.97	2.15	-51.04	-13.00	38.04	H
2835.00	-51.56	-4.95	6.70	2.15	-51.96	-13.00	38.96	H
3538.02	-53.58	-5.70	8.25	2.15	-53.18	-13.00	40.18	V
4259.02	-55.25	-6.23	9.16	2.15	-54.47	-13.00	41.47	H
4941.01	-55.17	-6.71	9.84	2.15	-54.19	-13.00	41.19	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	-59.33	-3.28	5.14	2.15	-59.62	-13.00	46.62	H
2146.00	-51.10	-4.24	5.04	2.15	-52.45	-13.00	39.45	V
2868.00	-51.80	-4.97	6.76	2.15	-52.16	-13.00	39.16	V
3577.02	-54.15	-6.10	8.31	2.15	-54.09	-13.00	41.09	V
4301.02	-54.67	-6.19	9.20	2.15	-53.81	-13.00	40.81	H
5017.01	-55.35	-6.57	9.92	2.15	-54.15	-13.00	41.15	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
1559.01	-55.34	-3.47	5.39	2.15	-55.57	-13.00	42.57	H
2339.00	-49.58	-4.44	5.62	2.15	-50.55	-13.00	37.55	H
3105.02	-54.24	-5.34	7.25	2.15	-54.48	-13.00	41.48	V
3899.02	-55.48	-6.11	8.76	2.15	-54.98	-13.00	41.98	H
4665.02	-54.26	-6.48	9.57	2.15	-53.32	-13.00	40.32	V
5460.01	-55.39	-6.91	10.54	2.15	-53.91	-13.00	40.91	H

**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
1565.01	-57.45	-3.48	5.38	2.15	-57.70	-13.00	44.70	H
2347.00	-50.70	-4.45	5.64	2.15	-51.66	-13.00	38.66	V
3114.02	-54.47	-5.37	7.27	2.15	-54.72	-13.00	41.72	V
3900.02	-55.24	-6.11	8.76	2.15	-54.74	-13.00	41.74	V
4693.02	-54.56	-6.50	9.59	2.15	-53.62	-13.00	40.62	H
5465.01	-54.93	-6.93	10.55	2.15	-53.46	-13.00	40.46	H

**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
1569.01	-57.64	-3.48	5.38	2.15	-57.89	-13.00	44.89	H
2354.00	-51.08	-4.46	5.66	2.15	-52.03	-13.00	39.03	V
3136.02	-53.95	-5.39	7.33	2.15	-54.16	-13.00	41.16	H
3925.02	-55.43	-6.12	8.80	2.15	-54.90	-13.00	41.90	H
4711.02	-54.99	-6.51	9.61	2.15	-54.04	-13.00	41.04	H
5505.01	-54.38	-7.08	10.60	2.15	-53.01	-13.00	40.01	V

**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
5556.02	-39.35	-7.19	10.59	-35.95	-13.00	22.95	V
9264.01	-51.66	-9.07	13.26	-47.47	-13.00	34.47	H
11678.01	-50.33	-9.65	13.06	-46.92	-13.00	33.92	H
13584.01	-46.78	-10.81	14.25	-43.34	-13.00	30.34	V
15030.00	-44.91	-11.26	13.98	-42.19	-13.00	29.19	V
17293.00	-41.85	-12.37	14.44	-39.78	-13.00	26.78	H

**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
5652.02	-39.13	-7.27	10.57	-35.83	-13.00	22.83	V
9419.01	-51.11	-9.13	13.35	-46.89	-13.00	33.89	V
11246.01	-51.47	-9.67	13.15	-47.99	-13.00	34.99	V
13129.01	-47.88	-10.81	13.68	-45.01	-13.00	32.01	H
15078.00	-45.20	-11.32	13.95	-42.57	-13.00	29.57	H
16964.00	-41.68	-12.24	13.79	-40.13	-13.00	27.13	H

**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
5747.02	-39.76	-7.27	10.55	-36.48	-13.00	23.48	V
9578.01	-51.47	-9.26	13.32	-47.41	-13.00	34.41	V
11533.01	-50.99	-9.81	13.09	-47.71	-13.00	34.71	H
13448.01	-47.92	-10.60	14.13	-44.39	-13.00	31.39	H
15317.00	-45.23	-11.30	13.81	-42.72	-13.00	29.72	V
17259.00	-42.77	-12.36	14.37	-40.76	-13.00	27.76	H

**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
2444.00	-45.16	-4.57	5.93	2.15	-45.95	-13.00	32.95	H
6513.01	-53.21	-7.51	11.02	2.15	-51.85	-13.00	38.85	H
7342.01	-52.21	-8.11	12.01	2.15	-50.46	-13.00	37.46	H
8141.01	-53.01	-8.40	12.71	2.15	-50.85	-13.00	37.85	H
8948.00	-51.29	-9.02	13.09	2.15	-49.37	-13.00	36.37	H
9771.00	-51.82	-8.97	13.13	2.15	-49.81	-13.00	36.81	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	-58.52	-3.56	5.25	2.15	-58.98	-13.00	45.98	H
2457.00	-46.03	-4.58	5.97	2.15	-46.79	-13.00	33.79	H
3282.02	-55.39	-5.28	7.68	2.15	-55.14	-13.00	42.14	V
4083.02	-54.94	-6.04	8.98	2.15	-54.15	-13.00	41.15	H
4922.01	-54.79	-6.73	9.82	2.15	-53.85	-13.00	40.85	V
5745.01	-54.26	-7.27	10.55	2.15	-53.13	-13.00	40.13	V

**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
2470.00	-43.17	-4.59	6.01	2.15	-43.90	-13.00	30.90	H
6725.01	-52.15	-7.99	11.27	2.15	-51.02	-13.00	38.02	V
7592.01	-52.66	-8.01	12.27	2.15	-50.55	-13.00	37.55	H
8362.00	-51.78	-8.65	12.89	2.15	-49.69	-13.00	36.69	H
8902.00	-50.82	-8.85	13.08	2.15	-48.74	-13.00	35.74	H
9986.00	-50.53	-9.17	12.91	2.15	-48.94	-13.00	35.94	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
1650.01	-57.31	-3.57	5.23	2.15	-57.80	-13.00	44.80	H
2474.00	-43.98	-4.60	6.02	2.15	-44.71	-13.00	31.71	H
3308.02	-55.00	-5.29	7.74	2.15	-54.70	-13.00	41.70	H
4129.02	-55.57	-6.05	9.03	2.15	-54.74	-13.00	41.74	H
4929.01	-55.38	-6.73	9.83	2.15	-54.43	-13.00	41.43	H
5787.01	-54.07	-7.21	10.54	2.15	-52.89	-13.00	39.89	V

**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	-56.43	-3.58	5.19	2.15	-56.97	-13.00	43.97	H
2510.00	-42.34	-4.63	6.12	2.15	-43.00	-13.00	30.00	H
3353.02	-54.73	-5.32	7.85	2.15	-54.35	-13.00	41.35	H
4188.02	-54.83	-6.18	9.09	2.15	-54.07	-13.00	41.07	V
5004.01	-55.14	-6.60	9.91	2.15	-53.98	-13.00	40.98	H
5861.01	-53.05	-7.27	10.53	2.15	-51.94	-13.00	38.94	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	-55.92	-3.60	5.15	2.15	-56.52	-13.00	43.52	H
2545.00	-39.15	-4.66	6.18	2.15	-39.78	-13.00	26.78	H
3396.02	-55.38	-5.36	7.95	2.15	-54.94	-13.00	41.94	V
4242.02	-51.08	-6.25	9.14	2.15	-50.34	-13.00	37.34	V
5109.01	-54.40	-6.80	10.05	2.15	-53.30	-13.00	40.30	H
5939.01	-53.06	-7.47	10.51	2.15	-52.17	-13.00	39.17	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
4999.02	-58.45	-6.60	9.90	-55.15	-25.00	30.15	H
7499.01	-37.50	-8.39	12.20	-33.69	-25.00	8.69	H
9995.01	-52.56	-9.18	12.90	-48.84	-25.00	23.84	H
12489.01	-49.87	-10.20	13.20	-46.87	-25.00	21.87	V
14987.00	-46.20	-11.21	14.01	-43.40	-25.00	18.40	H
17491.00	-43.41	-12.70	14.88	-41.23	-25.00	16.23	H

**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
6472.02	-54.94	-7.54	10.97	-51.51	-25.00	26.51	H
7784.01	-34.26	-8.31	12.43	-30.14	-25.00	5.14	H
9055.01	-54.27	-9.05	13.13	-50.19	-25.00	25.19	H
10379.01	-50.35	-9.77	13.05	-47.07	-25.00	22.07	V
11666.01	-49.78	-9.67	13.07	-46.38	-25.00	21.38	H
12936.01	-49.36	-10.49	13.46	-46.39	-25.00	21.39	V

**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
4030.02	-57.67	-6.05	8.93	-54.79	-25.00	29.79	V
5382.02	-55.21	-6.87	10.43	-51.65	-25.00	26.65	H
6714.02	-55.03	-7.98	11.26	-51.75	-25.00	26.75	V
8067.01	-40.93	-8.32	12.65	-36.60	-25.00	11.60	H
9390.01	-54.26	-9.05	13.33	-49.98	-25.00	24.98	V
10740.01	-52.20	-9.40	13.15	-48.45	-25.00	23.45	H

**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
3422.02	-39.10	-5.38	8.01	-36.47	-13.00	23.47	H
5137.02	-34.73	-6.86	10.09	-31.50	-13.00	18.50	H
6845.01	-48.24	-7.83	11.41	-44.66	-13.00	31.66	V
8556.01	-35.97	-8.57	13.01	-31.53	-13.00	18.53	V
10267.01	-53.10	-9.53	13.01	-49.62	-13.00	36.62	V
11979.01	-49.76	-10.15	13.00	-46.91	-13.00	33.91	V

**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	-54.62	-5.50	8.18	-51.94	-13.00	38.94	H
5239.02	-39.97	-7.00	10.23	-36.74	-13.00	23.74	H
6983.01	-54.43	-8.17	11.58	-51.02	-13.00	38.02	V
8728.01	-45.67	-8.44	13.05	-41.06	-13.00	28.06	V
10474.01	-52.45	-9.69	13.09	-49.05	-13.00	36.05	H
12217.01	-50.43	-10.05	13.09	-47.39	-13.00	34.39	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
3560.02	-57.69	-5.93	8.28	-55.34	-13.00	42.34	V
5342.02	-45.23	-6.95	10.38	-41.80	-13.00	28.80	V
7122.01	-55.46	-8.16	11.75	-51.87	-13.00	38.87	H
8900.01	-54.49	-8.85	13.08	-50.26	-13.00	37.26	H
10671.01	-52.05	-9.30	13.13	-48.22	-13.00	35.22	V
12457.01	-50.28	-10.29	13.18	-47.39	-13.00	34.39	H

Sample: 3560.02MHz

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

Power(-55.34 dBm)= P<sub>Mea</sub>(-57.69 dBm)+ P<sub>pl</sub> (-5.93dBm) +G<sub>a</sub>(8.28 dBm)



## **A.3 FREQUENCY STABILITY**

### **A.3.1 Method of Measurement**

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER and Anritsu MT8821C Radio Communication Analyzer.

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 or MT8821C, and in a simulated call on middle channel for LTE band 7,12,13,25,26,41,66, 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 -30°C to +50°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 between 3.6VDC and 4.4VDC, with a nominal voltage of 3.85VDC. 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 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	3.85	2500.417	2569.535		
50				-4.69	0.0020
40				12.88	0.0055
30				18.94	0.0081
10				-2.87	0.0012
0				17.87	0.0077
-10				3.18	0.0014
-20				15.85	0.0068
-30				12.60	0.0054

##### 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	2500.417	2569.535	-1.79	0.0008
4.4				12.36	0.0053

#### 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	3.85	699.481	715.519		
50				-4.65	0.0066
40				-5.78	0.0082
30				-6.25	0.0088
10				-7.18	0.0101
0				-9.95	0.0141
-10				-9.07	0.0128
-20				-11.29	0.0160
-30				-11.22	0.0159

##### 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	699.481	715.519	-10.47	0.0148
4.4				-9.19	0.0130

**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	3.85	777.465	786.519		
50				-2.02	0.0026
40				-1.73	0.0022
30				-0.06	0.0001
10				2.00	0.0026
0				0.60	0.0008
-10				2.56	0.0033
-20				-0.60	0.0008
-30				0.47	0.0006

**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	786.519	-1.26	0.0016
4.4				4.63	0.0059

**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	3.85	1850.785	1914.183		
50				15.72	0.0084
40				-0.08	0.0000
30				0.07	0.0000
10				-4.64	0.0025
0				-3.85	0.0020
-10				6.86	0.0036
-20				-4.65	0.0025
-30				6.18	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)
3.6	20	1850.785	1914.183	-3.28	0.0017
4.4				-4.32	0.0023

**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	3.85	814.370	823.620		
50				-3.88	0.0047
40				-4.41	0.0054
30				-3.03	0.0037
10				-4.95	0.0060
0				3.96	0.0048
-10				4.02	0.0049
-20				2.48	0.0030
-30				9.34	0.0114

**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	814.370	823.620	-2.20	0.0027
4.4				-1.43	0.0017

**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	3.85	824.513	848.455		
50				-3.30	0.0039
40				-0.77	0.0009
30				9.87	0.0118
10				-1.57	0.0019
0				-1.31	0.0016
-10				2.13	0.0025
-20				1.59	0.0019
-30				3.26	0.0039

**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	824.513	848.455	-1.01	0.0012
4.4				-0.05	0.0001

**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	3.85	2496.112	2689.840		
50				-22.76	0.0088
40				1.25	0.0005
30				1.42	0.0005
10				-29.77	0.0115
0				-3.11	0.0012
-10				0.82	0.0003
-20				1.51	0.0006
-30				-1.67	0.0006

**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	2496.112	2689.840	-22.76	0.0088
4.4				1.42	0.0005

**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	3.85	1710.785	1779.215		
50				-2.17	0.0012
40				4.49	0.0026
30				-2.75	0.0016
10				18.34	0.0105
0				17.37	0.0100
-10				18.58	0.0106
-20				16.82	0.0096
-30				-2.36	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	1710.785	1779.215	-2.17	0.0012
4.4				-2.75	0.0016

## **A.4 OCCUPIED BANDWIDTH**

### **A.4.1 Occupied Bandwidth Results**

Occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the mid frequency. The table below lists the measured 99% BW. Spectrum analyzer plots are included on the following pages.

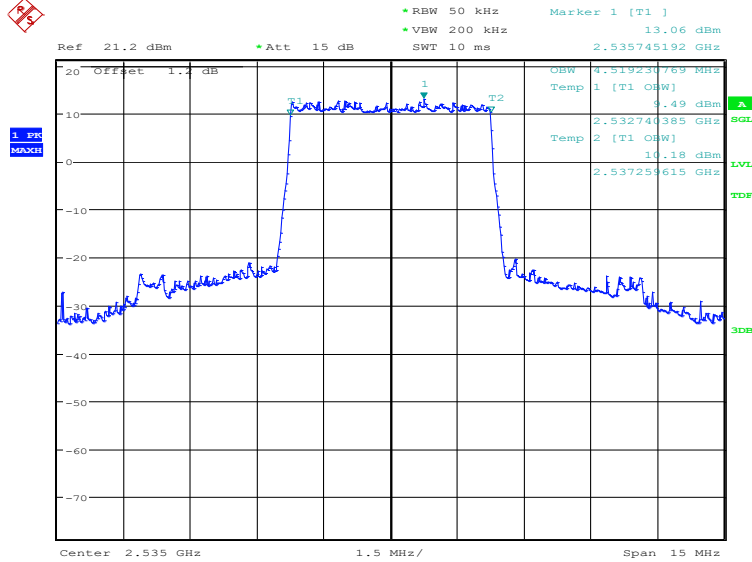
The measurement method is from ANSI C63.26:

- 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 7, 5MHz (99%)

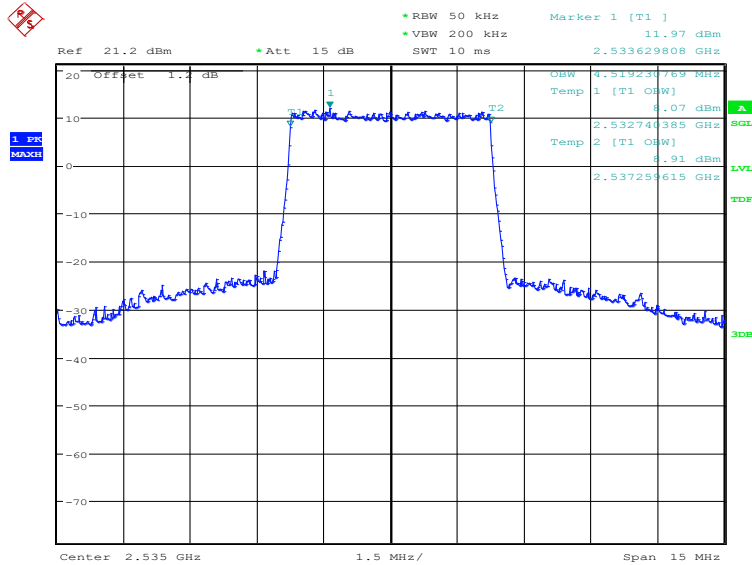
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2535.0	4519.23	4519.23	4519.23

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



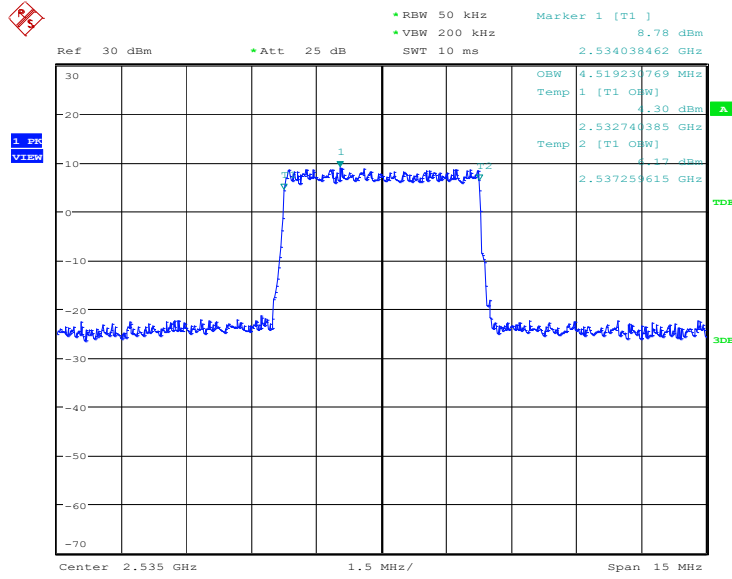
Date: 17.DEC.2019 09:54:54

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



Date: 17.DEC.2019 09:56:17

LTE band 7, 5MHz Bandwidth,64QAM (99% BW)



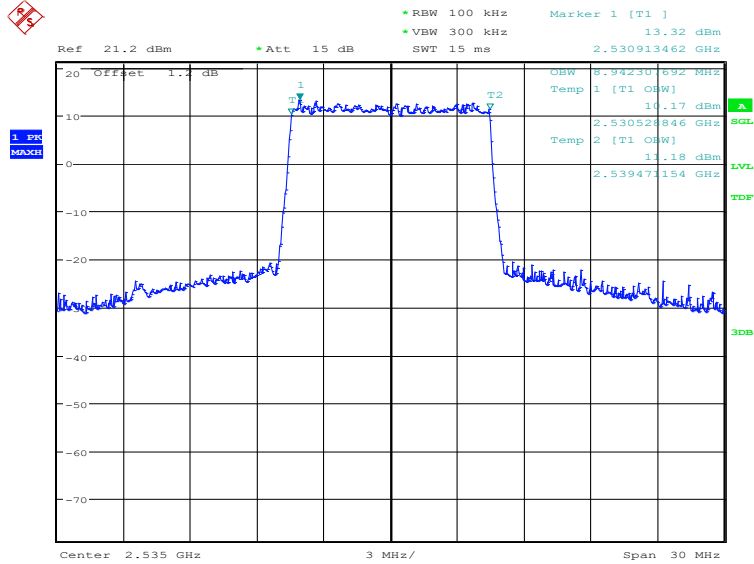
Date: 19.DEC.2019 12:57:53



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

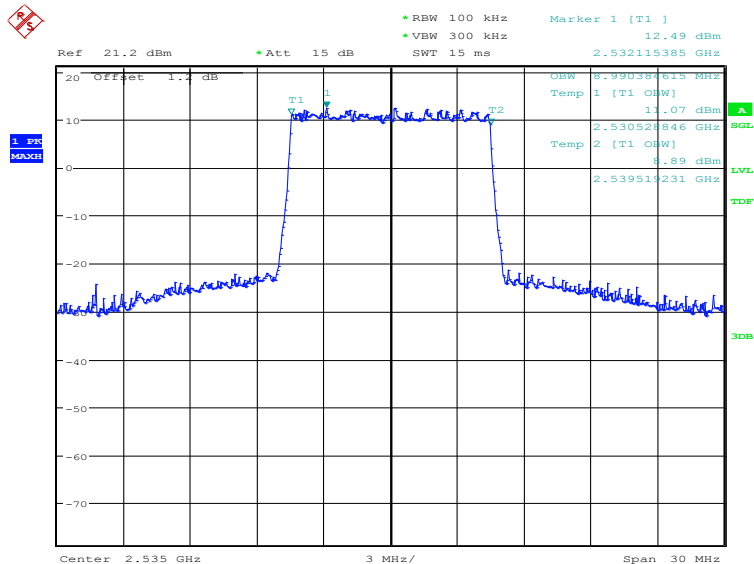
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2535.0	8942.31	8990.38	8990.38

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



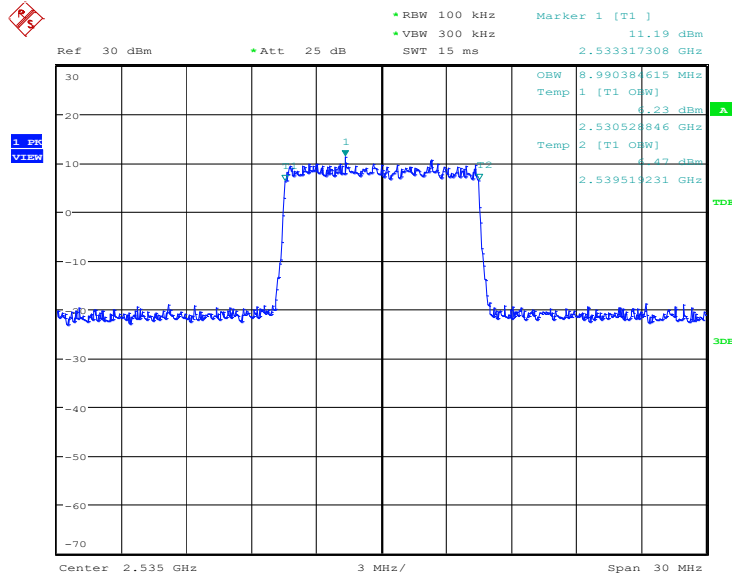
Date: 17.DEC.2019 09:57:42

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



Date: 17.DEC.2019 09:59:06

LTE band 7, 10MHz Bandwidth, 64QAM (99% BW)

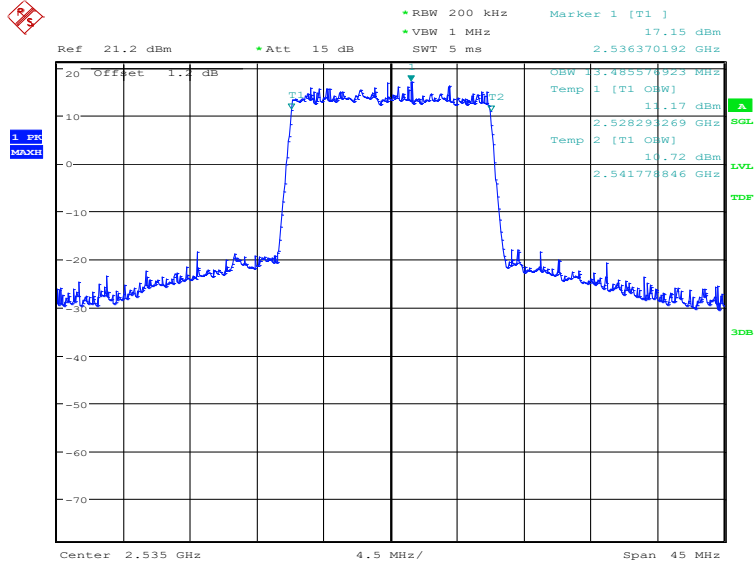


Date: 19.DEC.2019 12:39:44

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

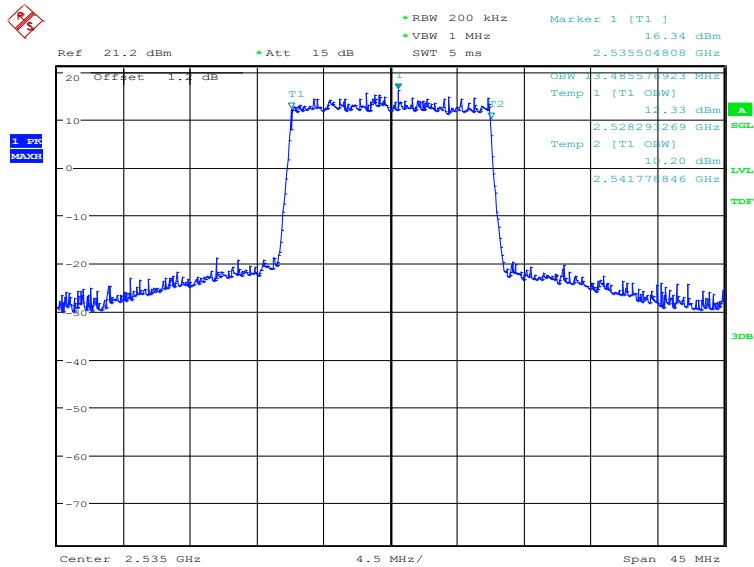
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2535.0	13485.58	13485.58	13485.58

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



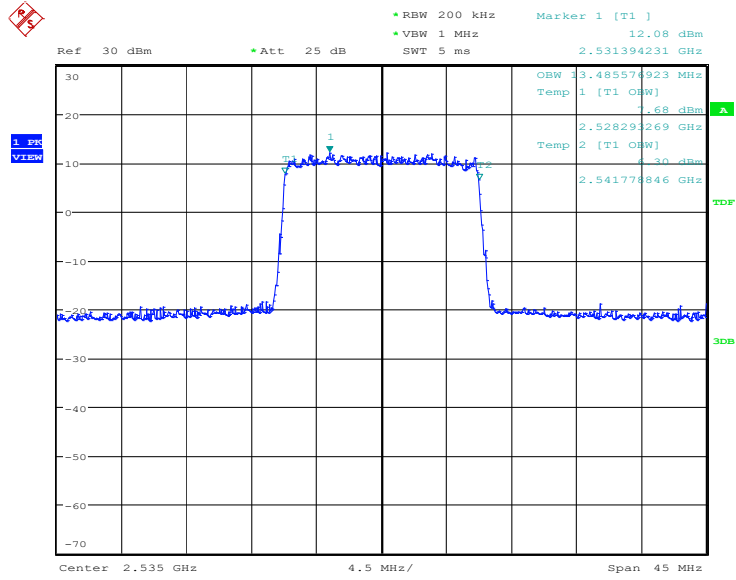
Date: 17.DEC.2019 10:00:31

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



Date: 17.DEC.2019 10:01:55

LTE band 7, 15MHz Bandwidth, 64QAM (99% BW)

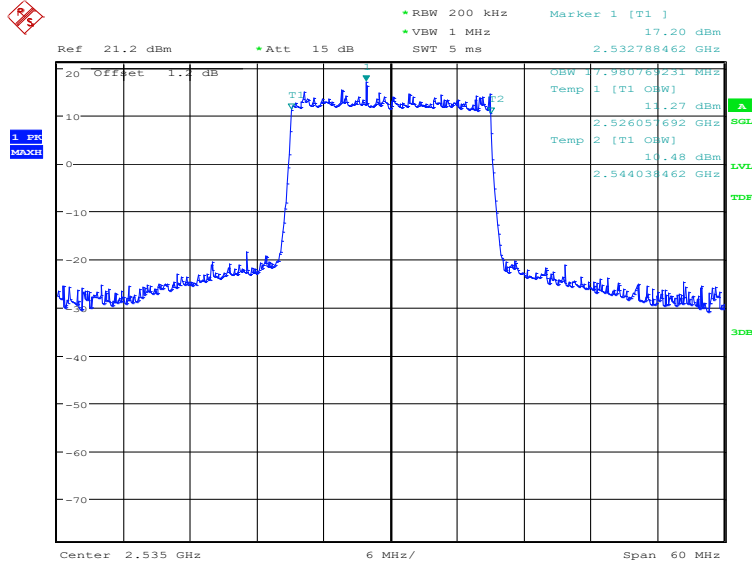


Date: 19.DEC.2019 12:40:58

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

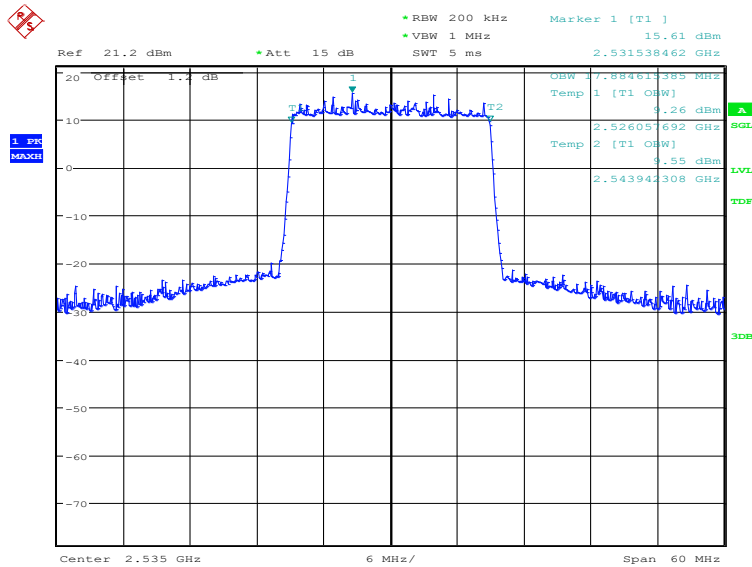
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2535.0	17980.77	17884.62	17980.77

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



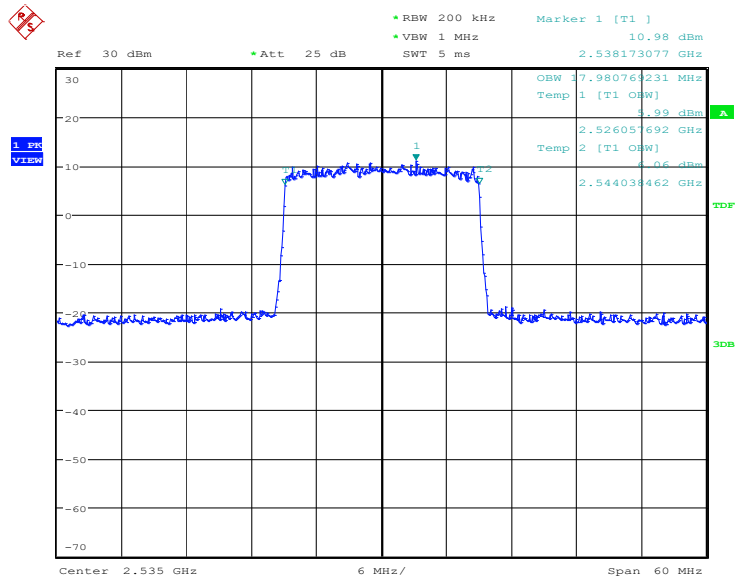
Date: 17.DEC.2019 10:03:20

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



Date: 17.DEC.2019 10:04:43

LTE band 7, 20MHz Bandwidth, 64QAM (99% BW)

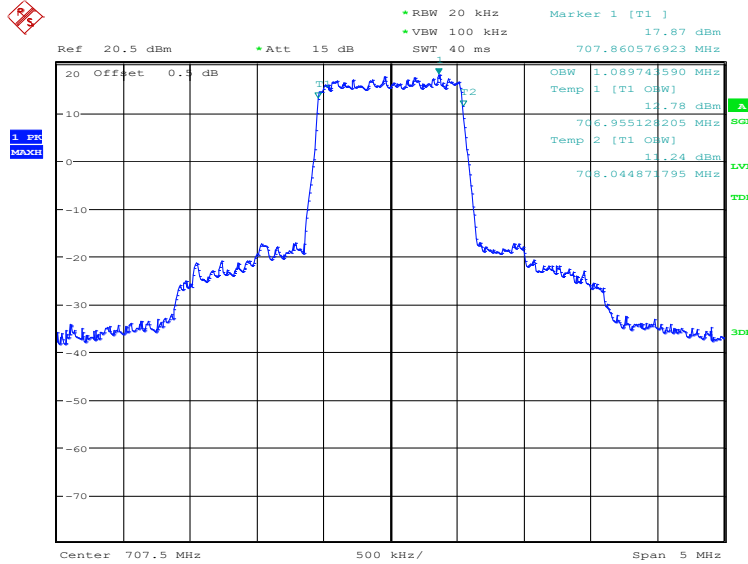


Date: 19.DEC.2019 12:42:12

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

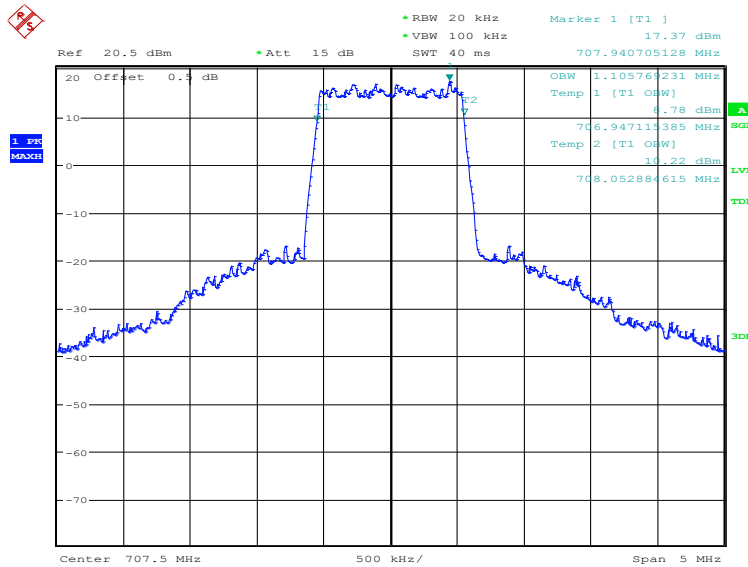
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
707.5	1089.74	1105.77	1089.74

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



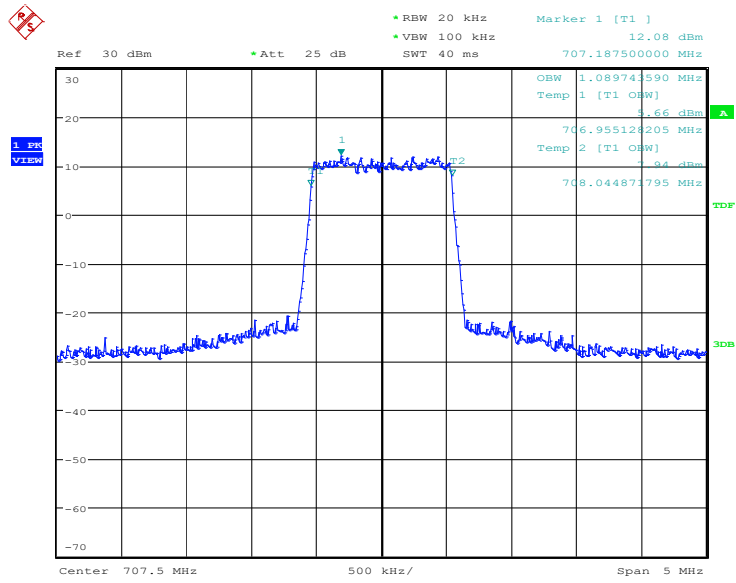
Date: 17.DEC.2019 07:02:39

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



Date: 17.DEC.2019 07:04:03

### LTE band 12, 1.4MHz Bandwidth, 64QAM (99% BW)



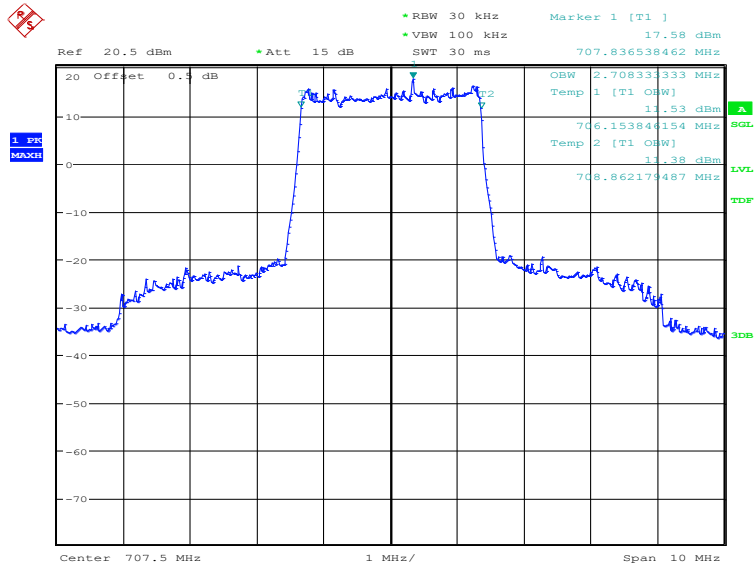
Date: 19.DEC.2019 09:34:09



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

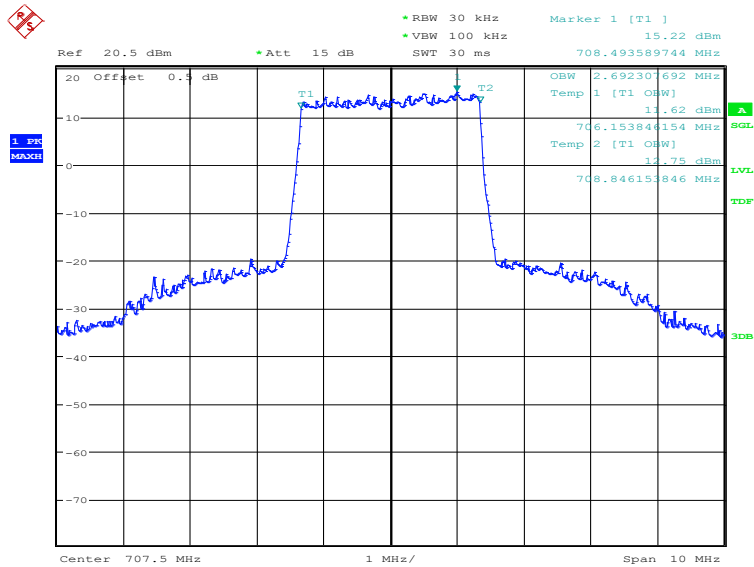
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
707.5	2708.33	2692.31	2692.31

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



Date: 17.DEC.2019 07:05:29

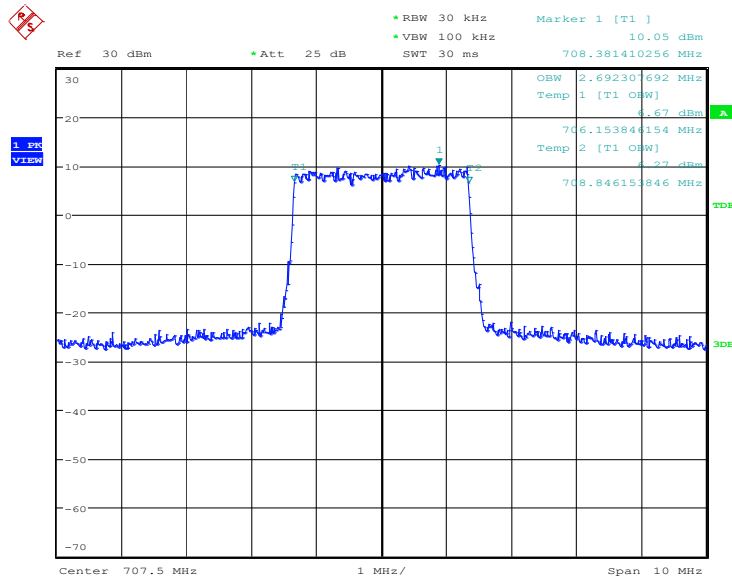
### LTE band 12, 3MHz Bandwidth, 16QAM (99% BW)



Date: 17.DEC.2019 07:06:54



### LTE band 12, 3MHz Bandwidth, 64QAM (99% BW)

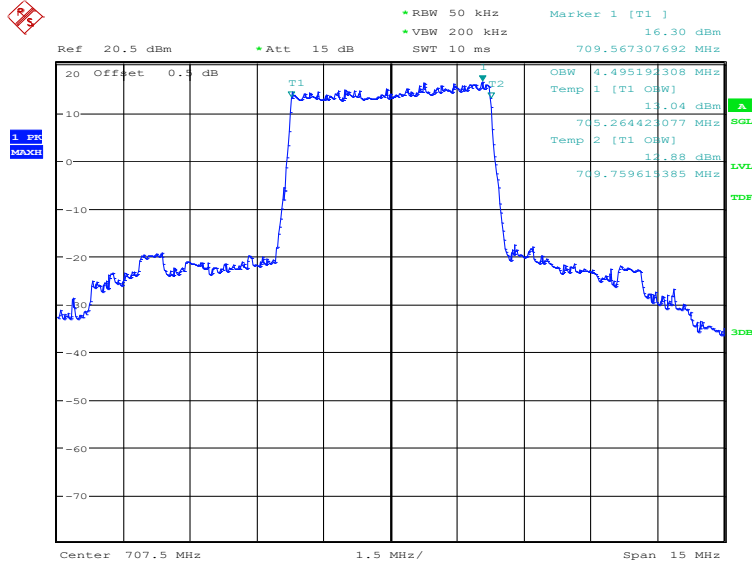


Date: 19.DEC.2019 09:35:51

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

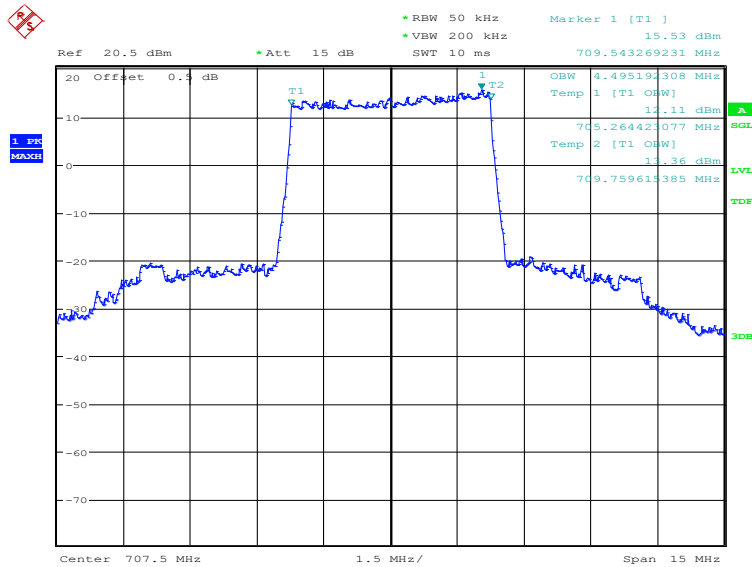
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
707.5	4495.19	4495.19	4495.19

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



Date: 17.DEC.2019 07:08:19

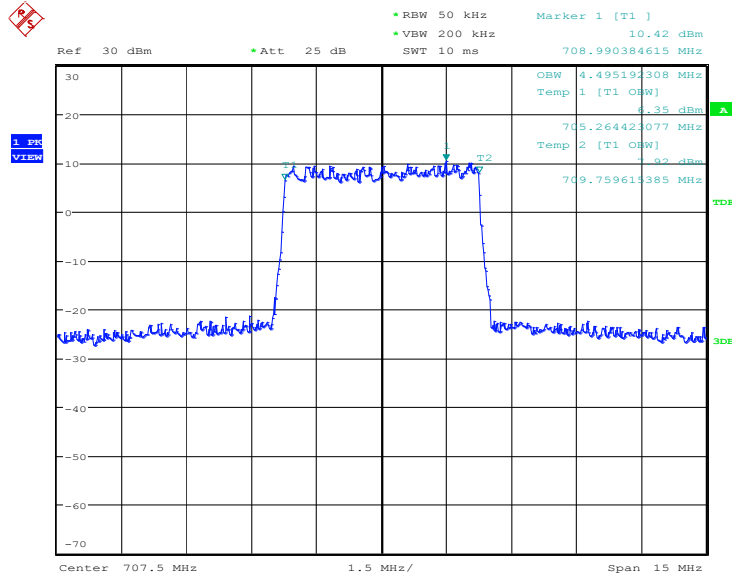
### LTE band 12, 5MHz Bandwidth, 16QAM (99% BW)



Date: 17.DEC.2019 07:09:44



### LTE band 12, 5MHz Bandwidth, 64QAM (99% BW)

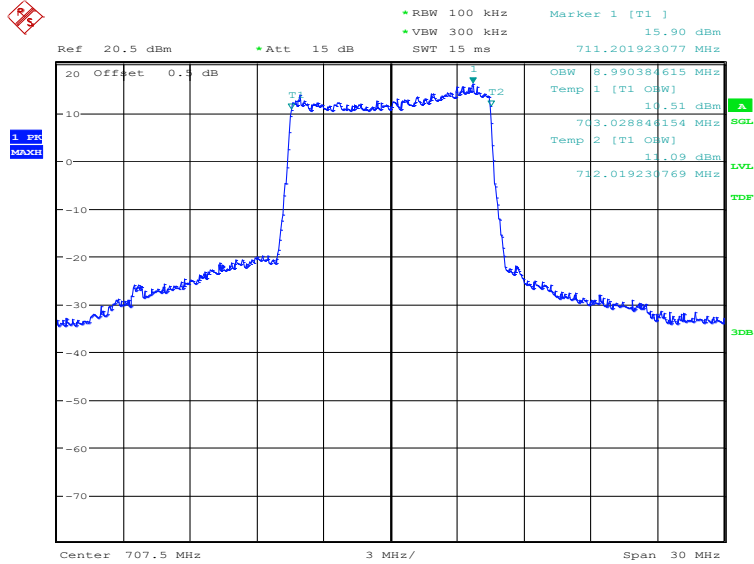


Date: 19.DEC.2019 09:38:03

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

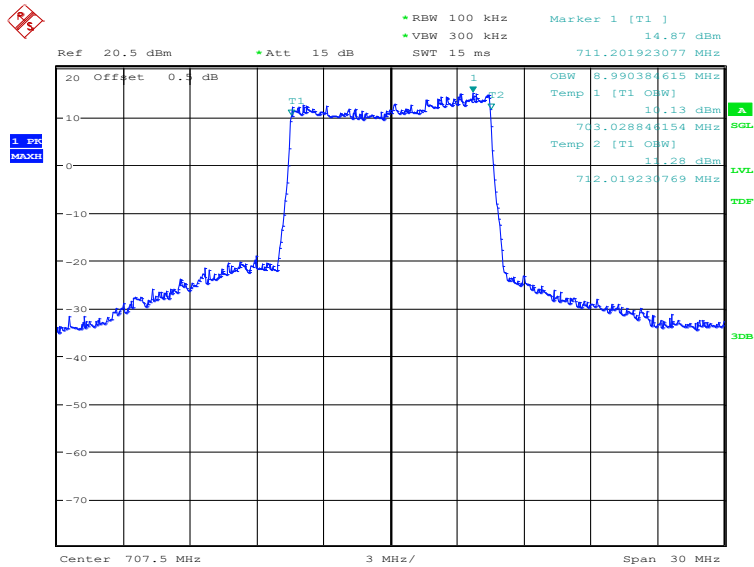
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
707.5	8990.38	8990.38	8990.38

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



Date: 17.DEC.2019 07:11:10

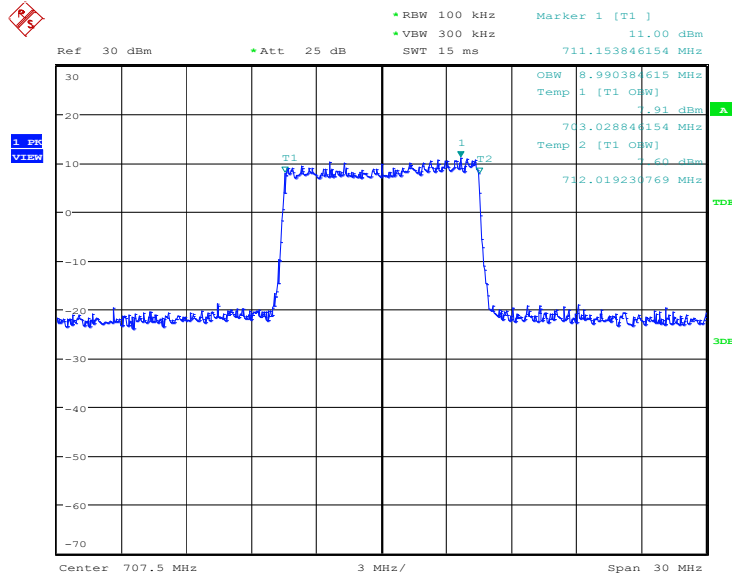
**LTE band 12, 10MHz Bandwidth, 16QAM (99% BW)**



Date: 17.DEC.2019 07:12:34



### LTE band 12, 10MHz Bandwidth, 64QAM (99% BW)

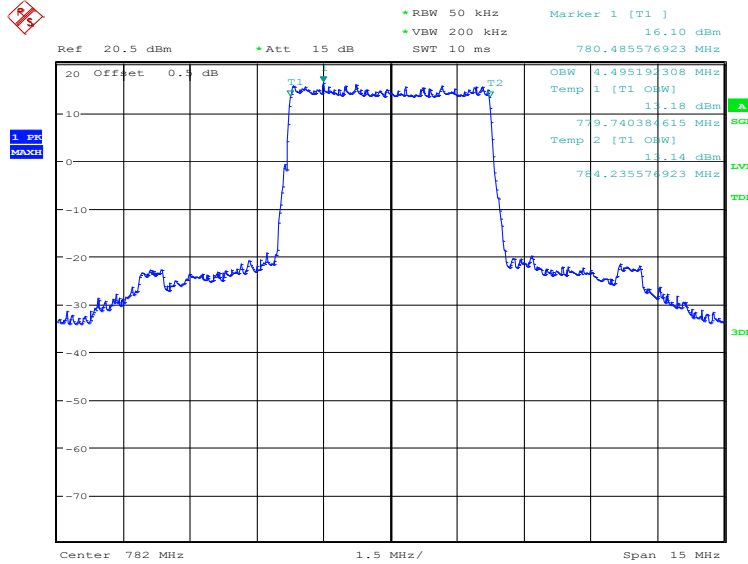


Date: 19.DEC.2019 09:39:58

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

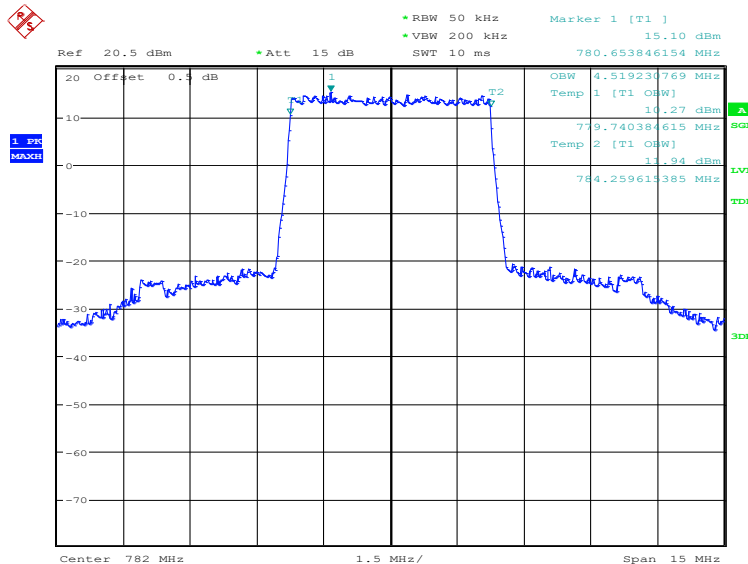
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
782.0	4495.19	4519.23	4495.19

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



Date: 17.DEC.2019 07:14:01

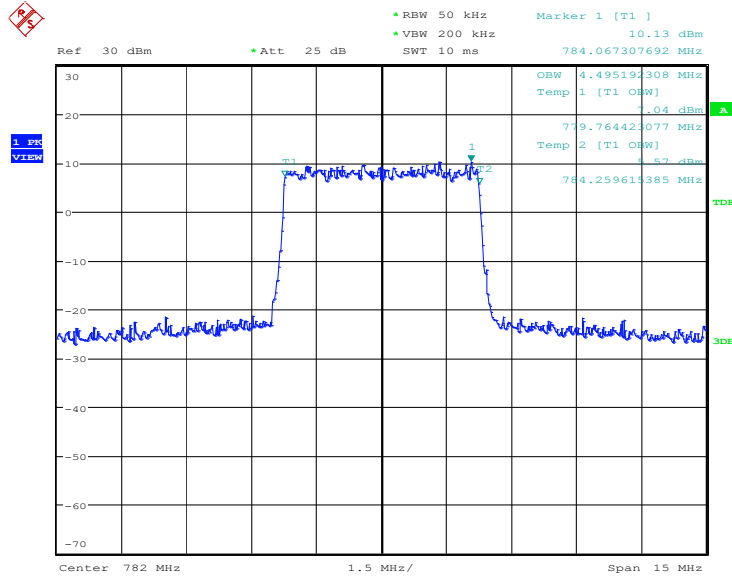
### LTE band 13, 5MHz Bandwidth, 16QAM (99% BW)



Date: 17.DEC.2019 07:15:26



### LTE band 13, 5MHz Bandwidth,64QAM (99% BW)



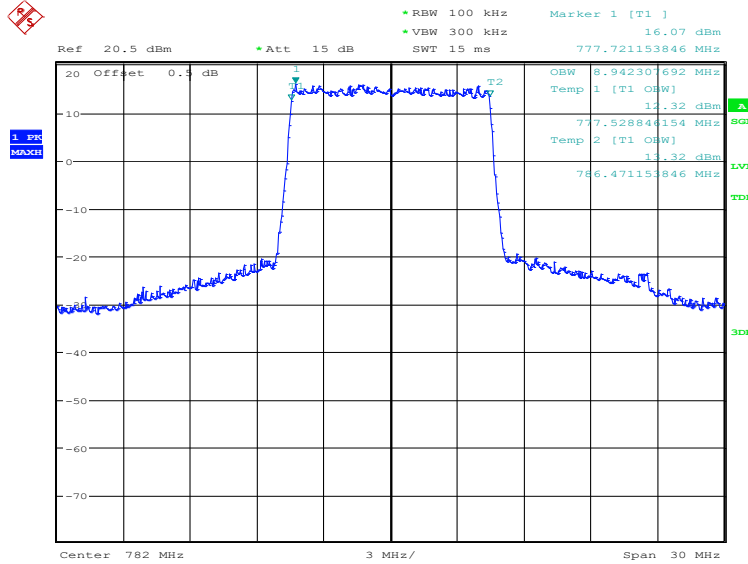
Date: 19.DEC.2019 09:24:46



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

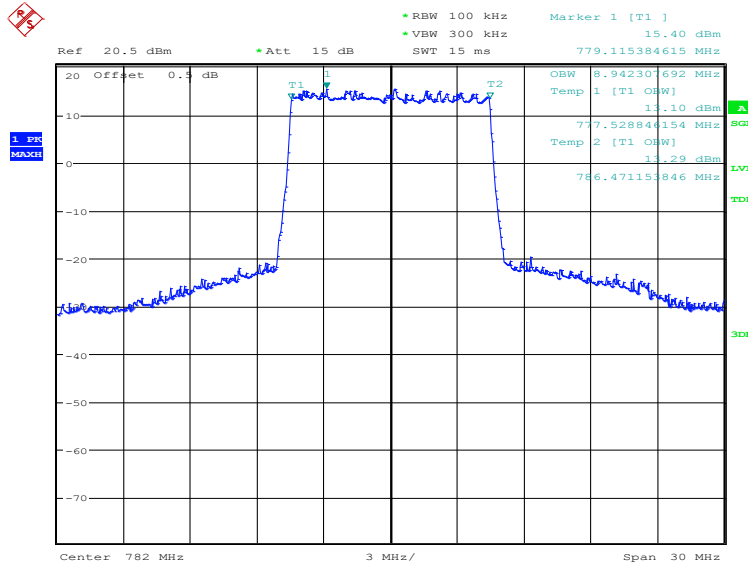
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
782.0	8942.31	8942.31	8990.38

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



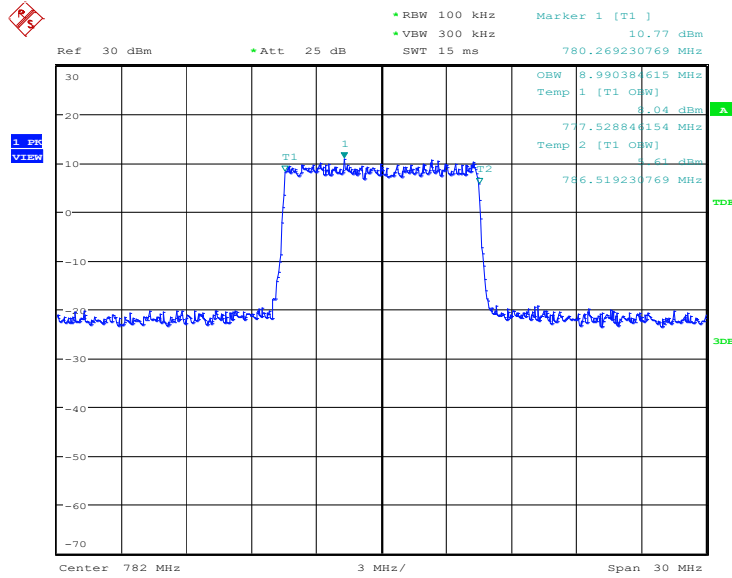
Date: 17.DEC.2019 07:16:52

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



Date: 17.DEC.2019 07:18:16

**LTE band 13, 10MHz Bandwidth, 64QAM (99% BW)**

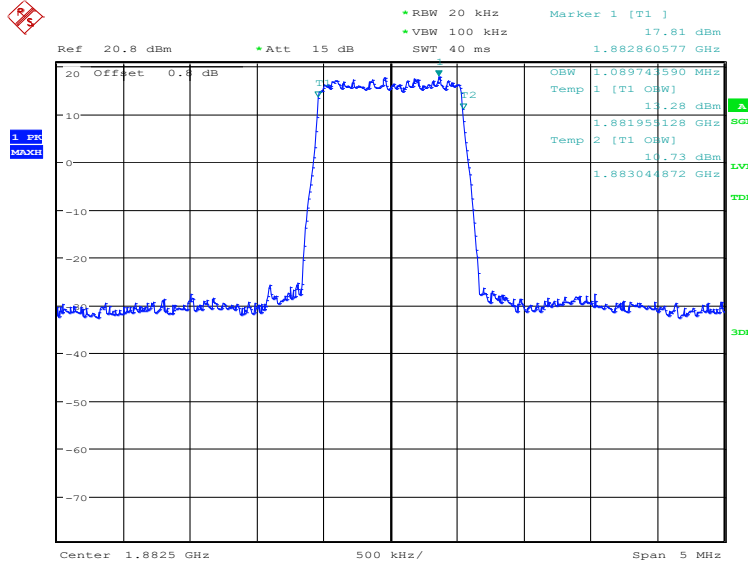


Date: 19.DEC.2019 09:26:25

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

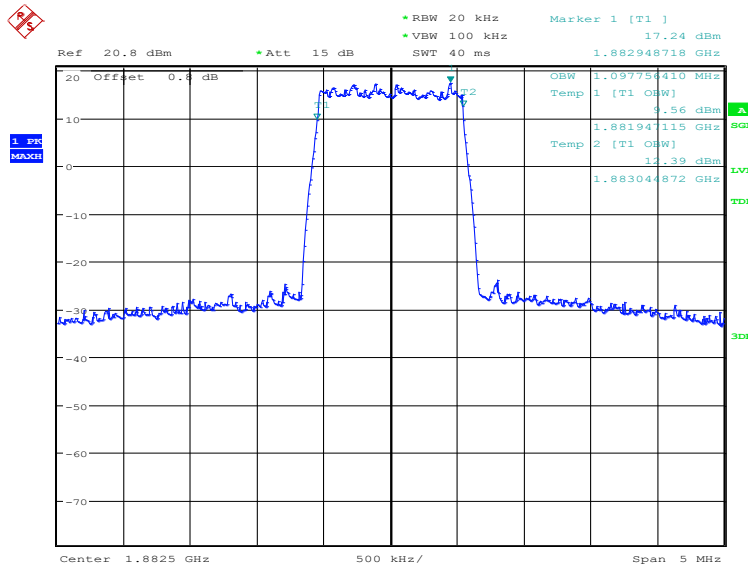
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	1089.74	1097.76	1089.74

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



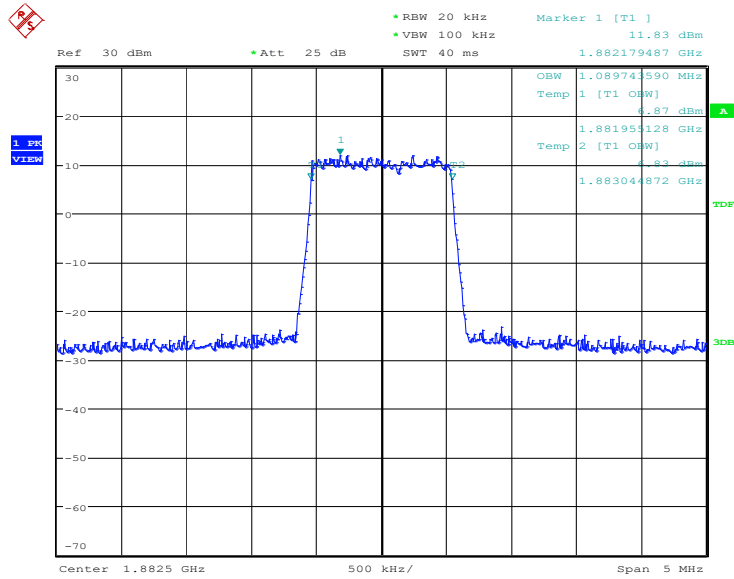
Date: 18.DEC.2019 09:55:39

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



Date: 18.DEC.2019 09:57:03

**LTE band 25, 1.4MHz Bandwidth, 64QAM (99% BW)**

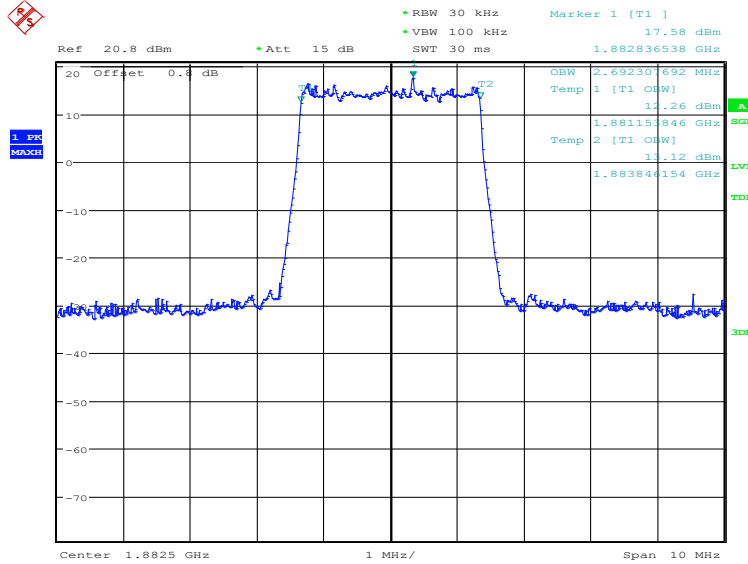


Date: 19.DEC.2019 08:22:30

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

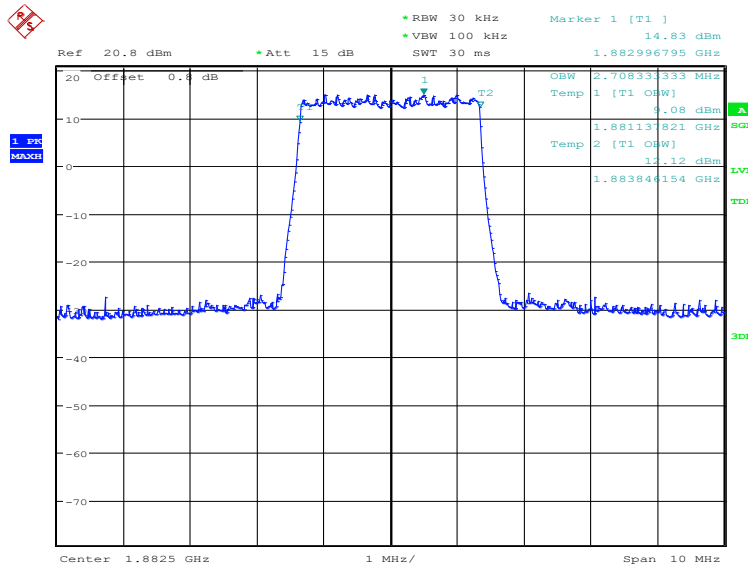
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	2692.31	2708.33	2692.31

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



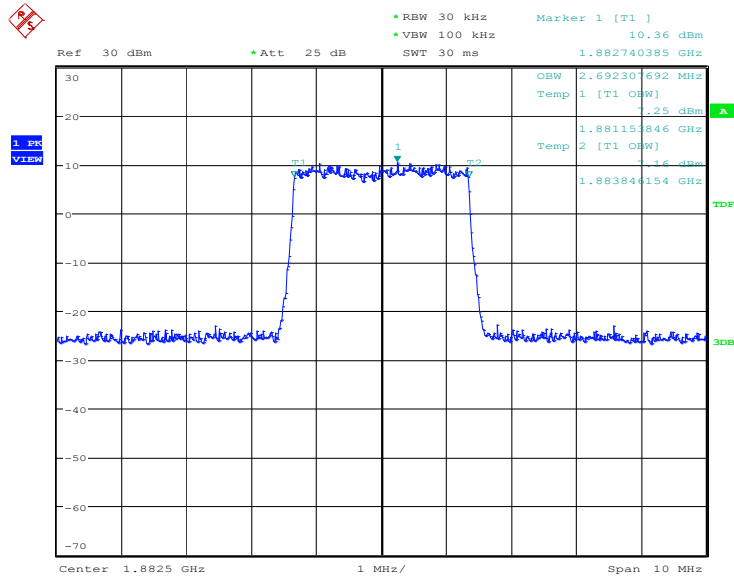
Date: 18.DEC.2019 09:58:28

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



Date: 18.DEC.2019 09:59:52

**LTE band 25, 3MHz Bandwidth, 64QAM (99% BW)**

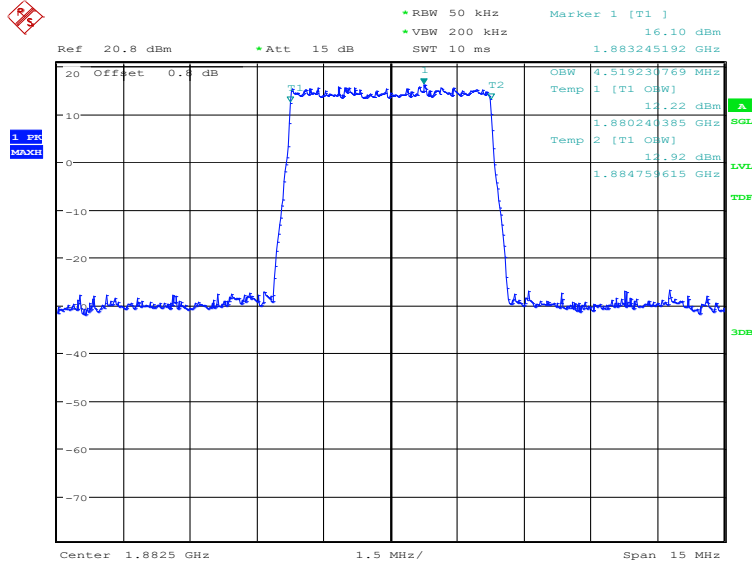


Date: 19.DEC.2019 08:25:09

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

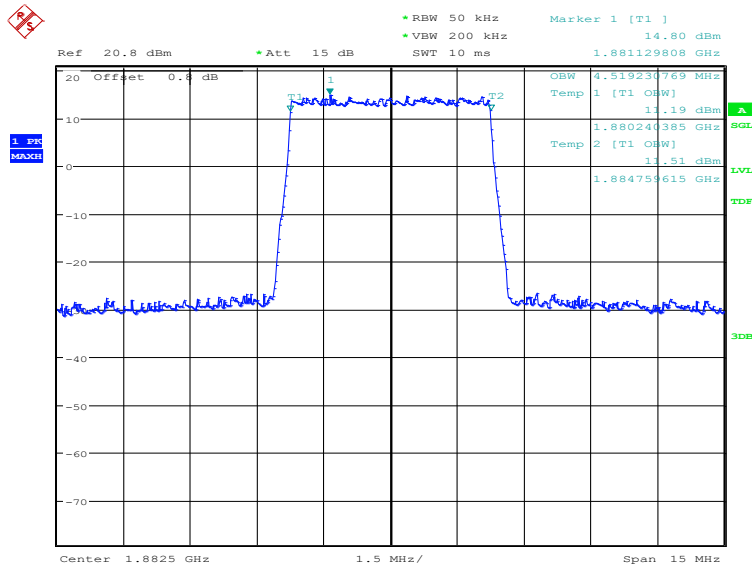
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	4519.23	4519.23	4495.19

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



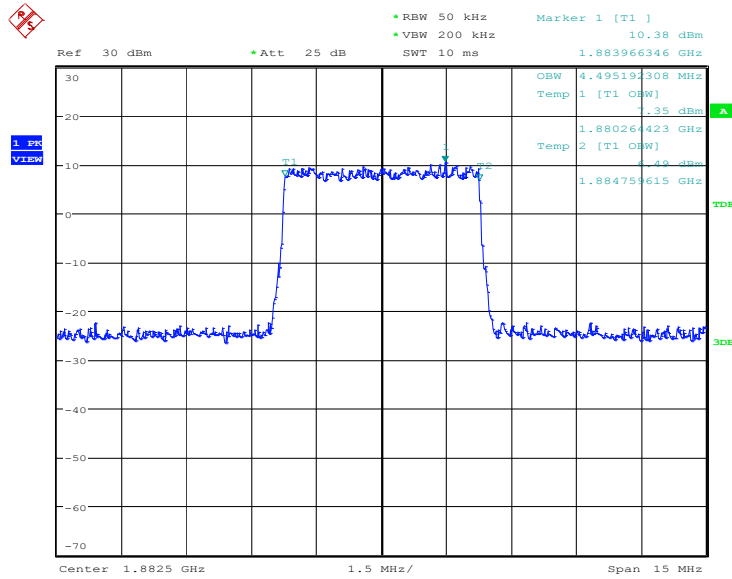
Date: 18.DEC.2019 10:01:17

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



Date: 18.DEC.2019 10:02:41

LTE band 25, 5MHz Bandwidth,64QAM (99% BW)



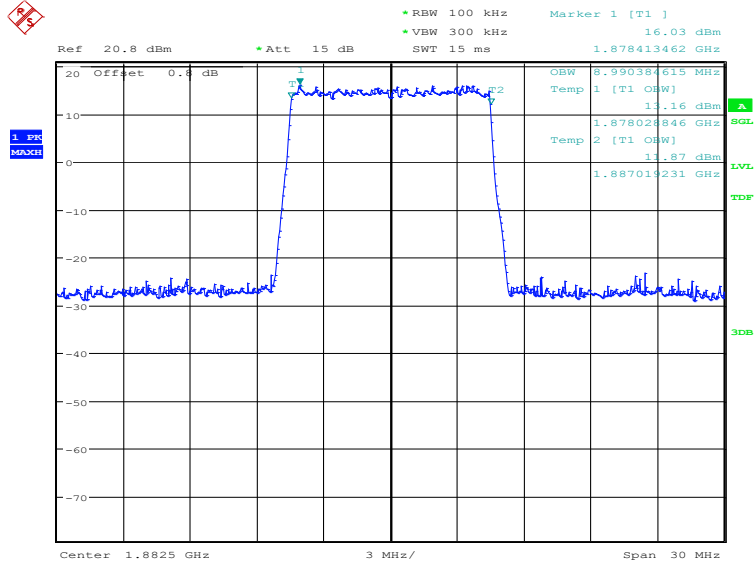
Date: 19.DEC.2019 08:29:15



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

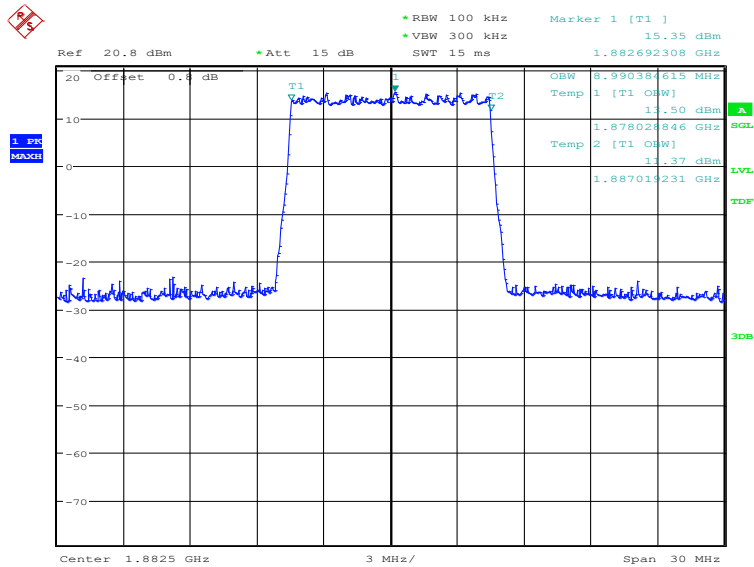
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	8990.38	8990.38	9038.46

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



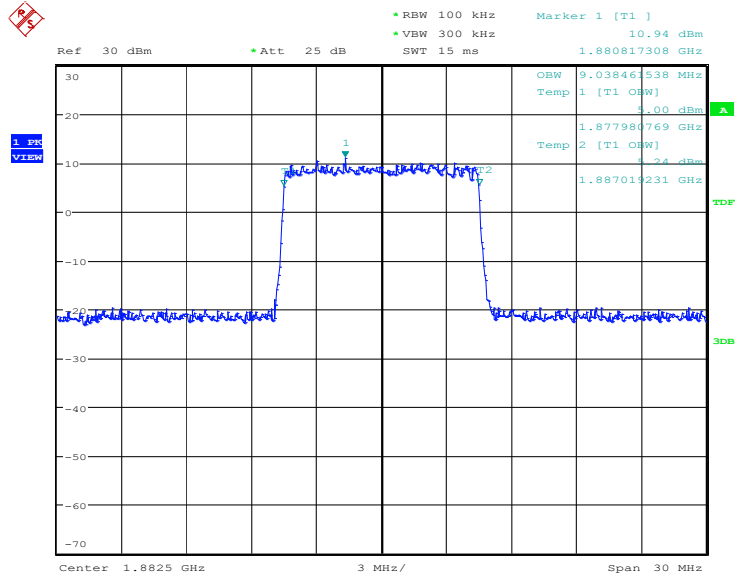
Date: 18.DEC.2019 10:04:07

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



Date: 18.DEC.2019 10:05:30

**LTE band 25, 10MHz Bandwidth, 64QAM (99% BW)**

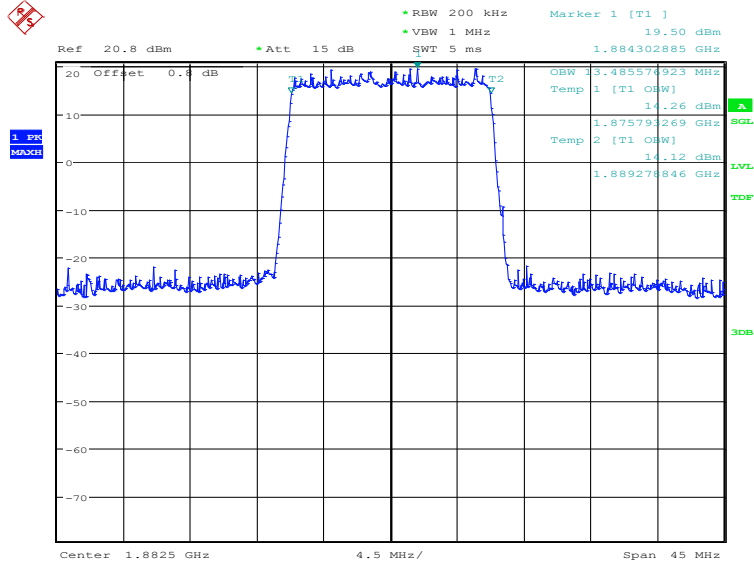


Date: 19.DEC.2019 08:33:10

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

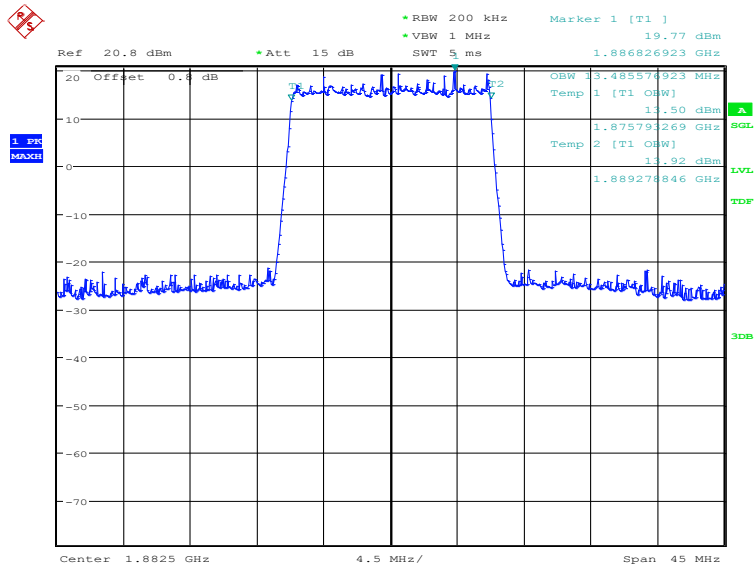
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	13485.58	13485.58	13485.58

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



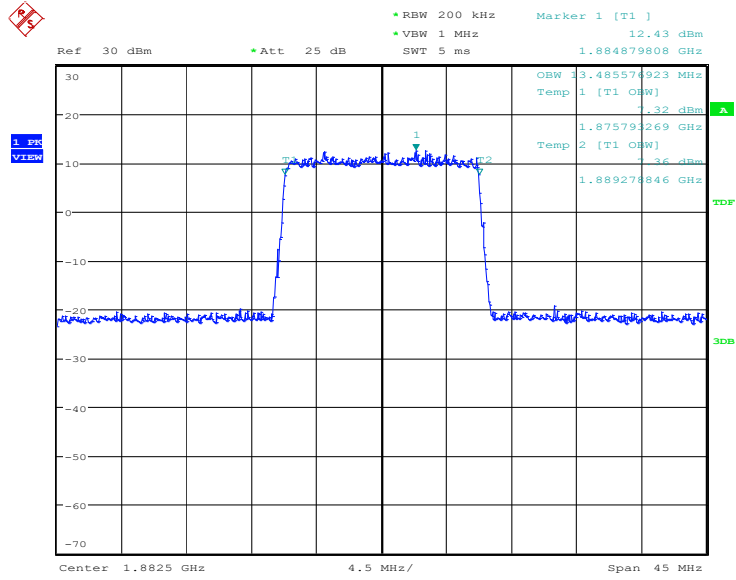
Date: 18.DEC.2019 10:06:56

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



Date: 18.DEC.2019 10:08:20

**LTE band 25, 15MHz Bandwidth, 64QAM (99% BW)**

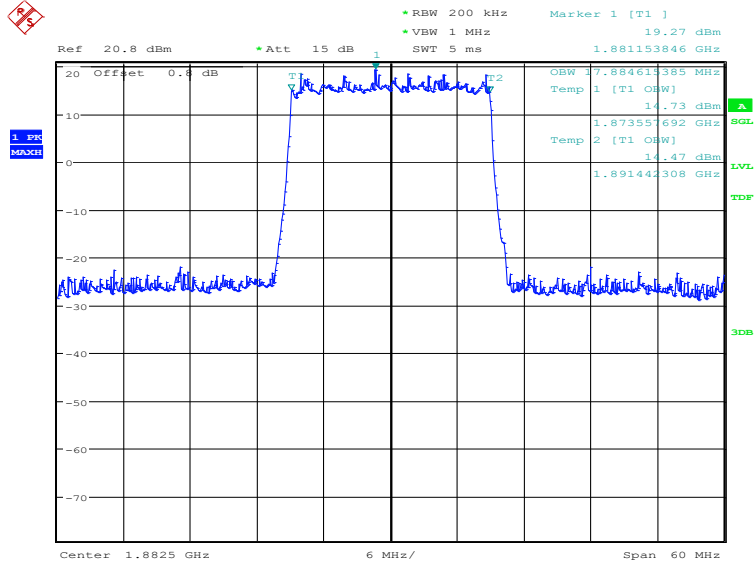


Date: 19.DEC.2019 08:35:45

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

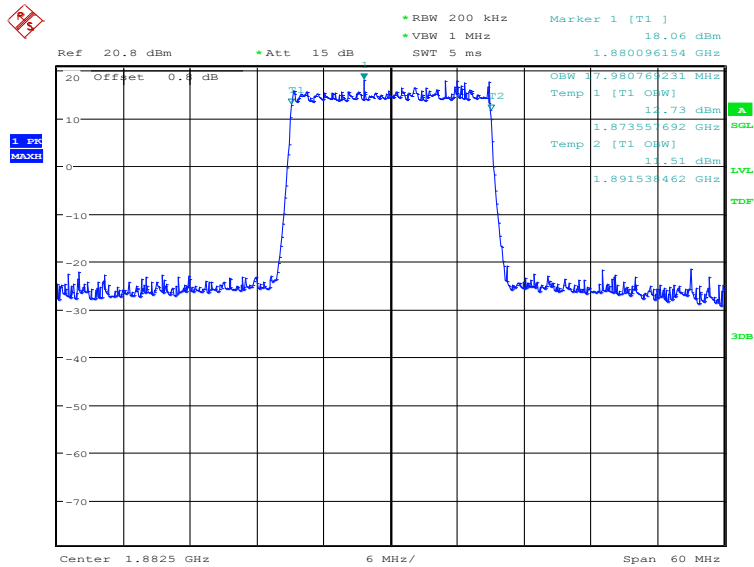
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1882.5	17884.62	17980.77	17980.77

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



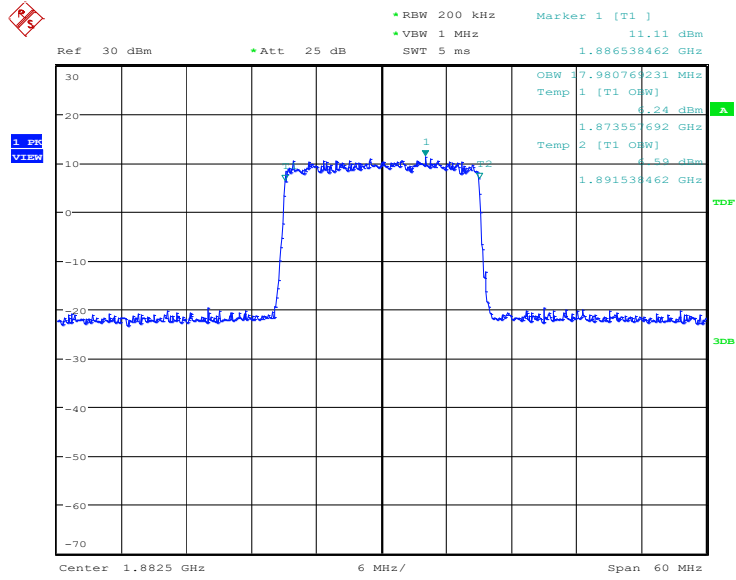
Date: 18.DEC.2019 10:09:45

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



Date: 18.DEC.2019 10:11:09

LTE band 25, 20MHz Bandwidth, 64QAM (99% BW)

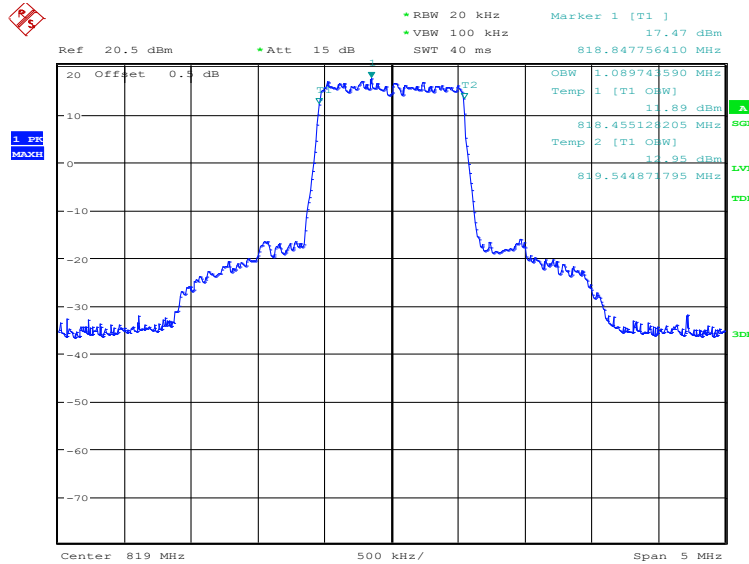


Date: 19.DEC.2019 08:37:17

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

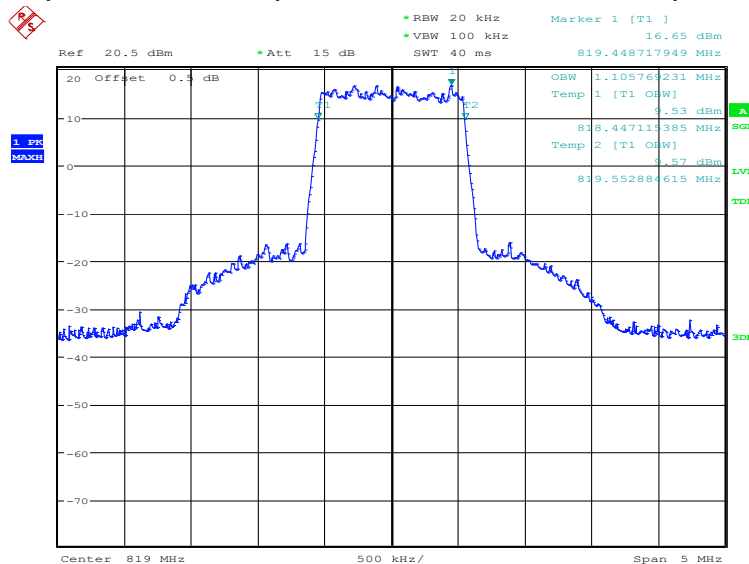
Frequency (MHz)	Occupied Bandwidth (99%)( kHz)		
	QPSK	16QAM	64QAM
819.0	1089.74	1105.77	1089.74

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



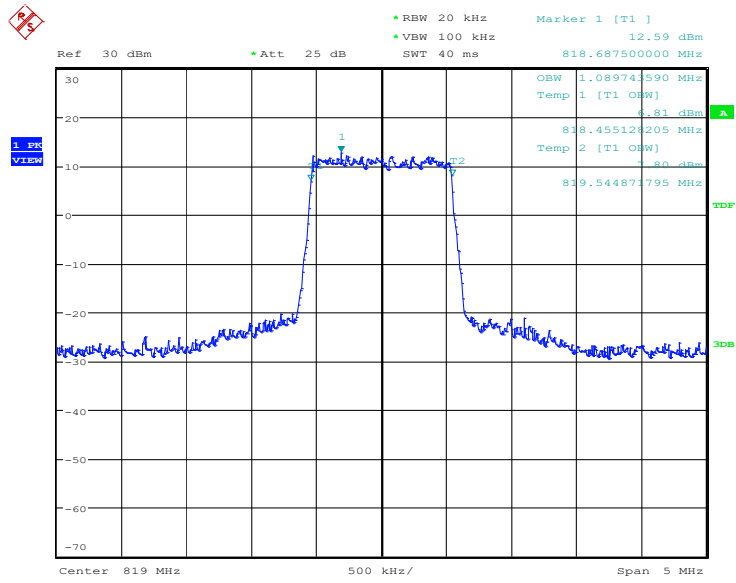
Date: 18.DEC.2019 10:28:29

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



Date: 18.DEC.2019 10:29:53

LTE band 26(814MHz~824MHz), 1.4MHz Bandwidth, 64QAM (99% BW)

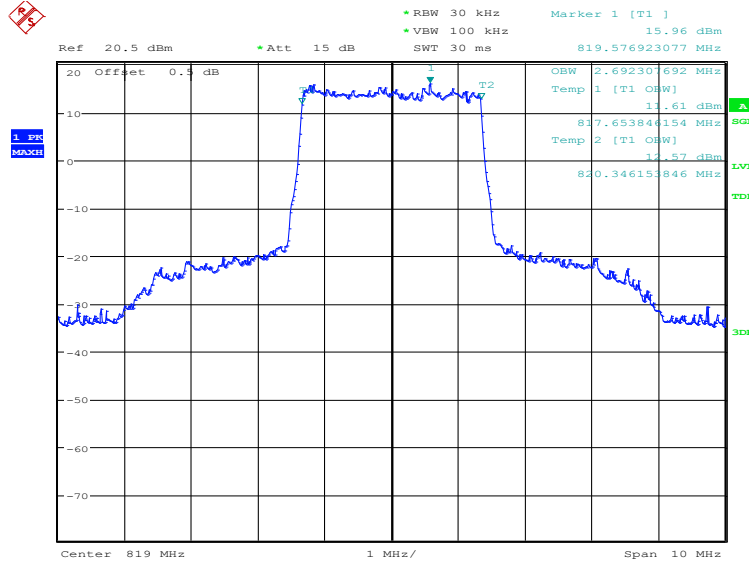


Date: 19.DEC.2019 08:58:41

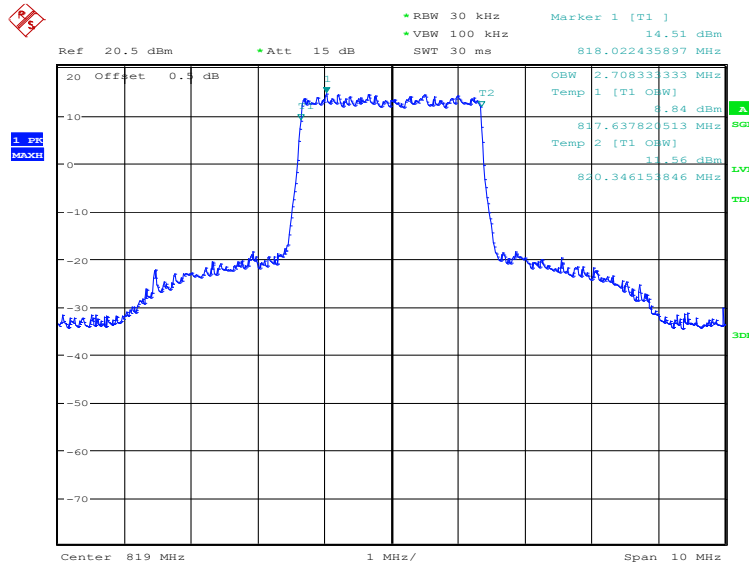


**LTE band 26(814MHz~824MHz), 3MHz (99%)**

Frequency (MHz)	Occupied Bandwidth (99%)( kHz)		
819.0	QPSK	16QAM	64QAM
	2692.31	2708.33	2692.31

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


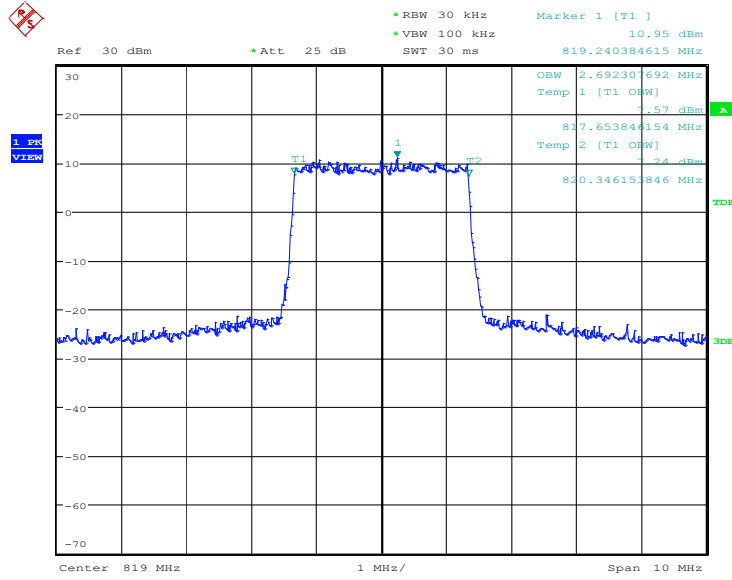
Date: 18.DEC.2019 10:31:18

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


Date: 18.DEC.2019 10:32:42



### LTE band 26(814MHz~824MHz), 3MHz Bandwidth, 64QAM (99% BW)

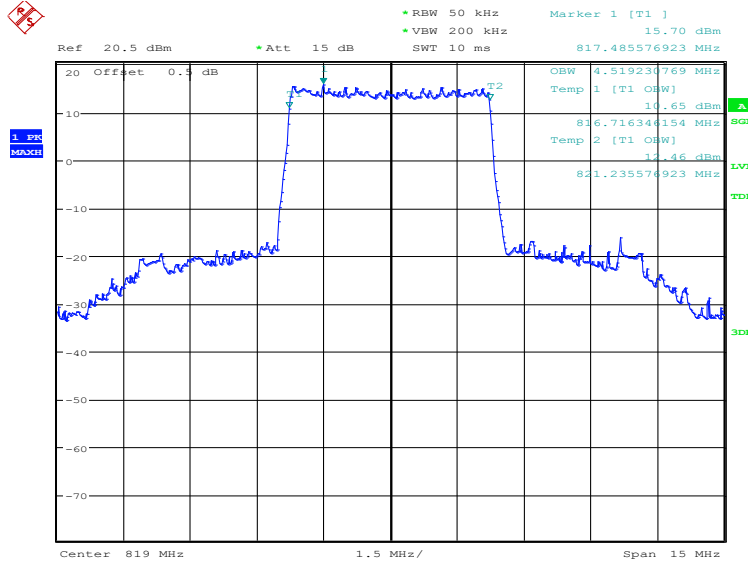


Date: 19.DEC.2019 09:00:01

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

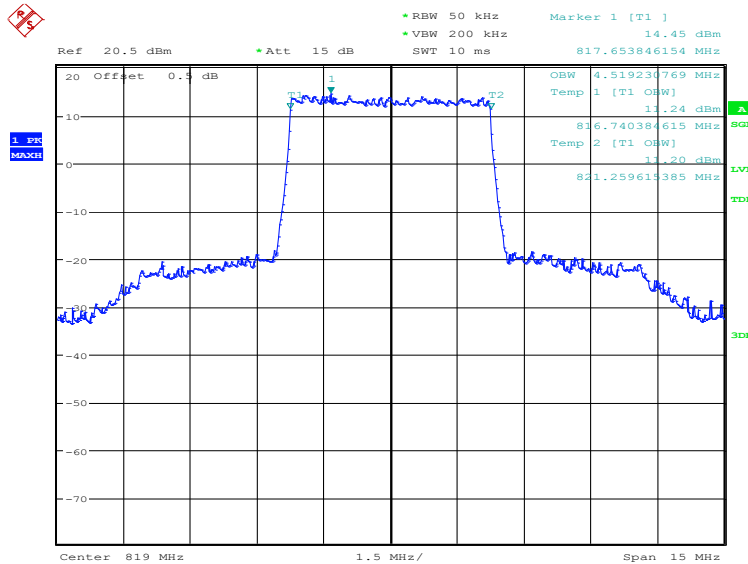
Frequency (MHz)	Occupied Bandwidth (99%)( kHz)		
	QPSK	16QAM	64QAM
819.0	4519.23	4519.23	4519.23

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



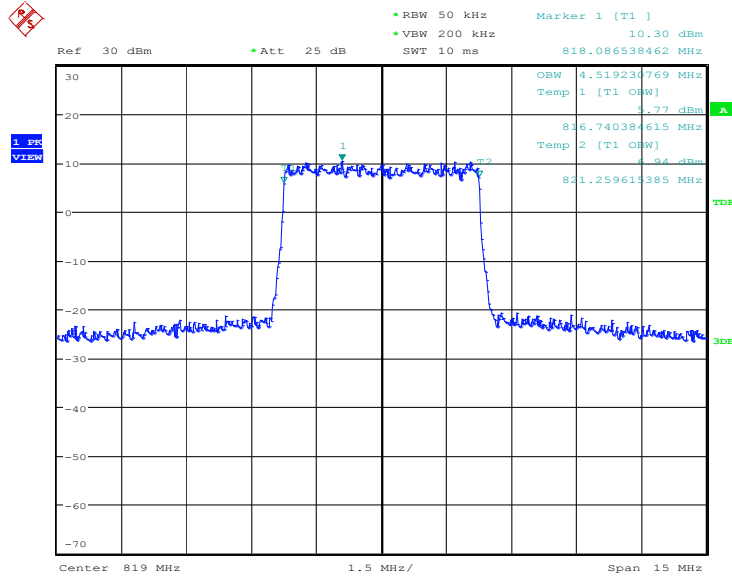
Date: 18.DEC.2019 10:34:08

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



Date: 18.DEC.2019 10:35:31

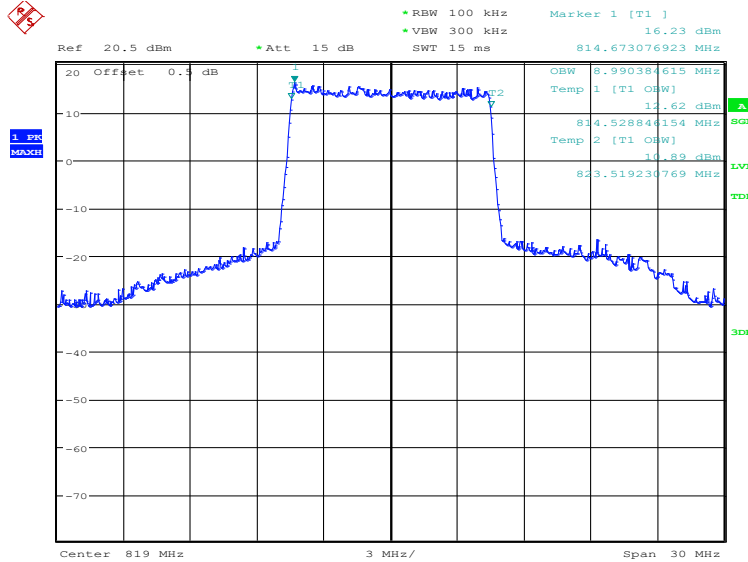
**LTE band 26(814MHz~824MHz), 5MHz Bandwidth, 64QAM (99% BW)**



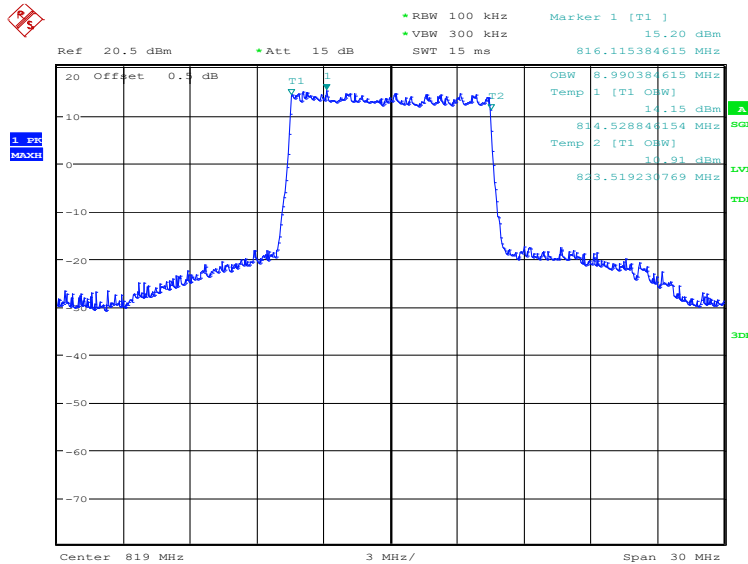
Date: 19.DEC.2019 09:03:10

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

Frequency (MHz)	Occupied Bandwidth (99%)( kHz)		
	QPSK	16QAM	64QAM
819.0	8990.38	8990.38	9038.46

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


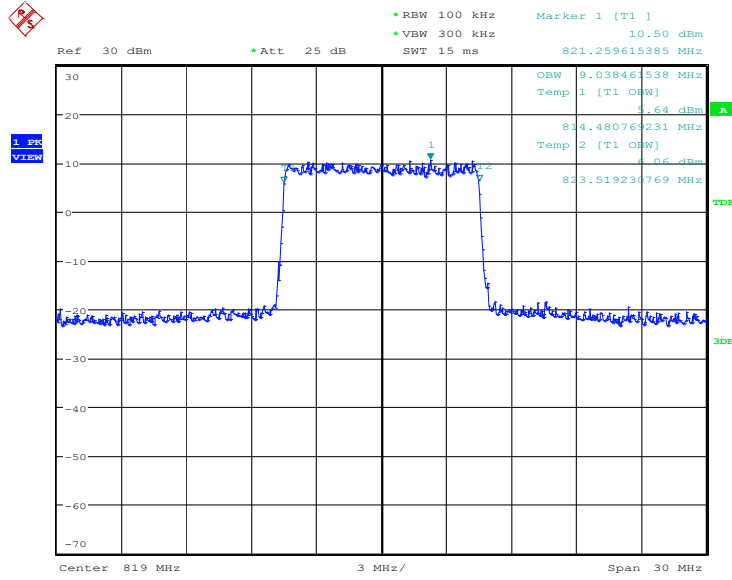
Date: 18.DEC.2019 10:36:57

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


Date: 18.DEC.2019 10:38:21



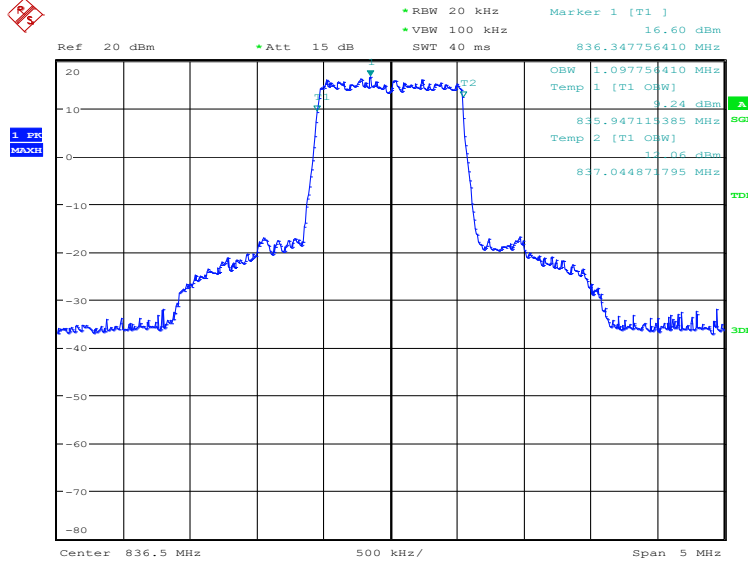
### LTE band 26(814MHz~824MHz), 10MHz Bandwidth, 64QAM (99% BW)



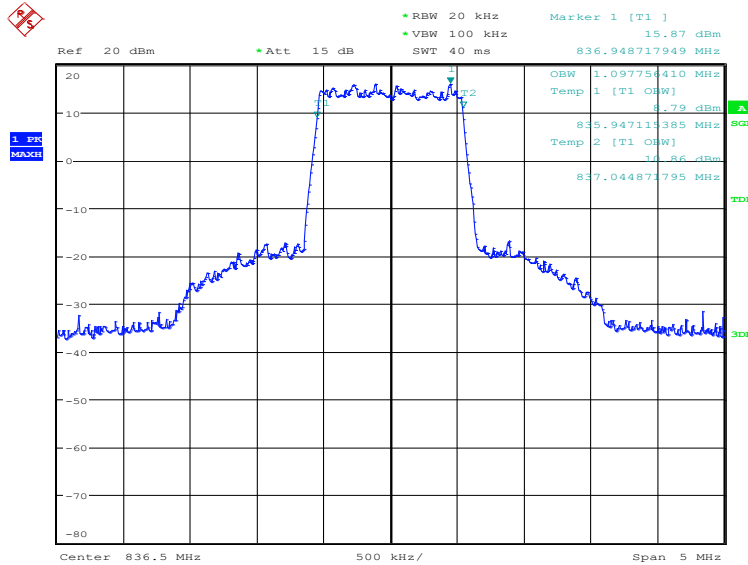
Date: 19.DEC.2019 09:05:06

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

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
836.5	1097.76	1097.76	1089.74

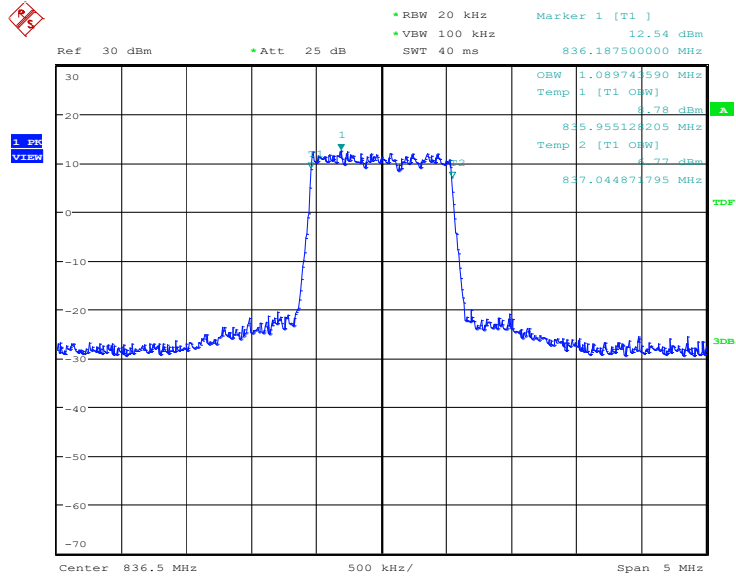
**LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, QPSK (99% BW)**


Date: 18.DEC.2019 10:13:36

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


Date: 18.DEC.2019 10:15:00

**LTE band 26(824MHz~849MHz), 1.4MHz Bandwidth, 64QAM (99% BW)**

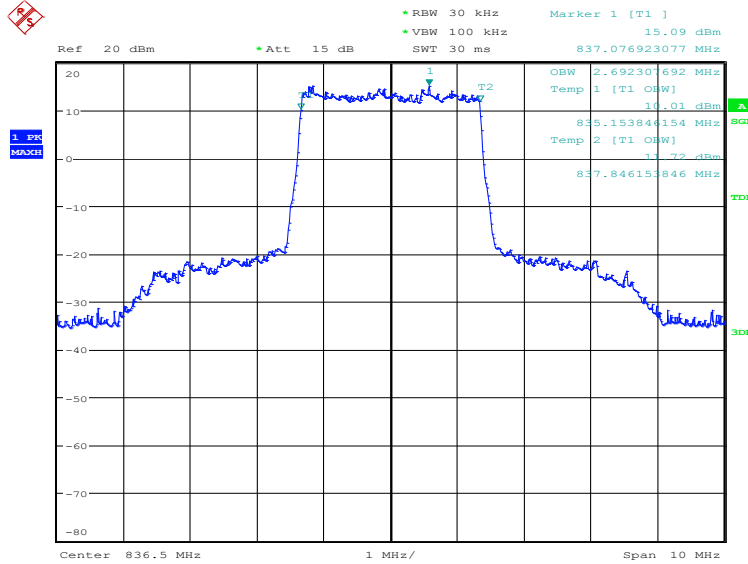


Date: 19.DEC.2019 08:45:06

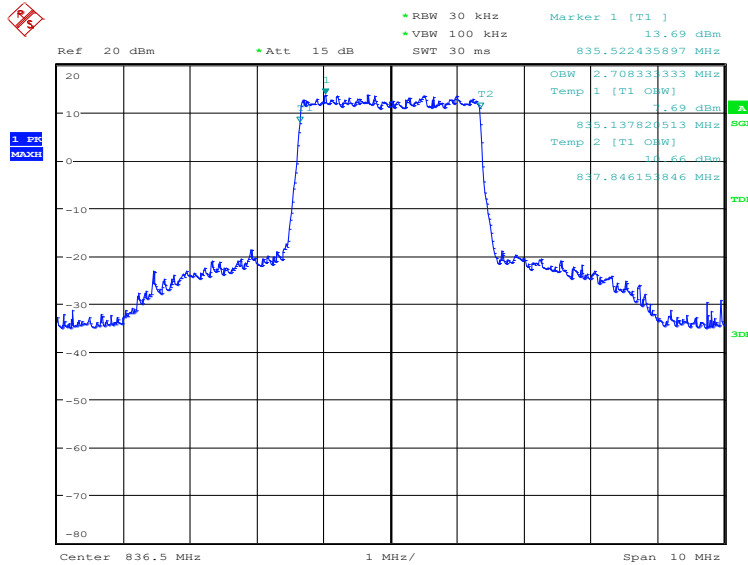


**LTE band 26(824MHz~849MHz), 3MHz (99%)**

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
836.5	2692.31	2708.33	2692.31

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


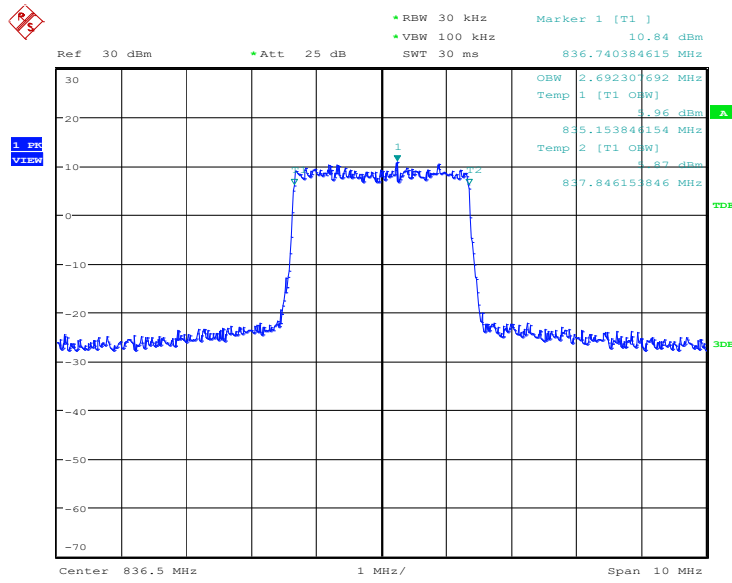
Date: 18.DEC.2019 10:16:25

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


Date: 18.DEC.2019 10:17:49



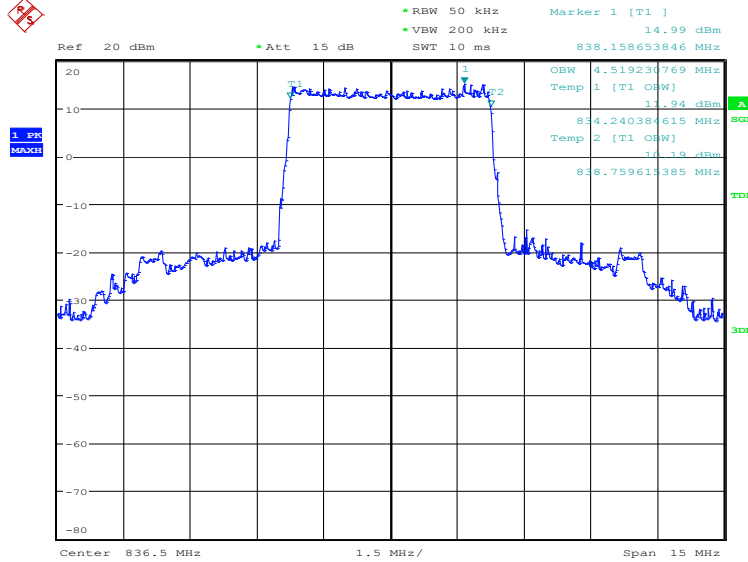
### LTE band 26(824MHz~849MHz), 3MHz Bandwidth, 64QAM (99% BW)



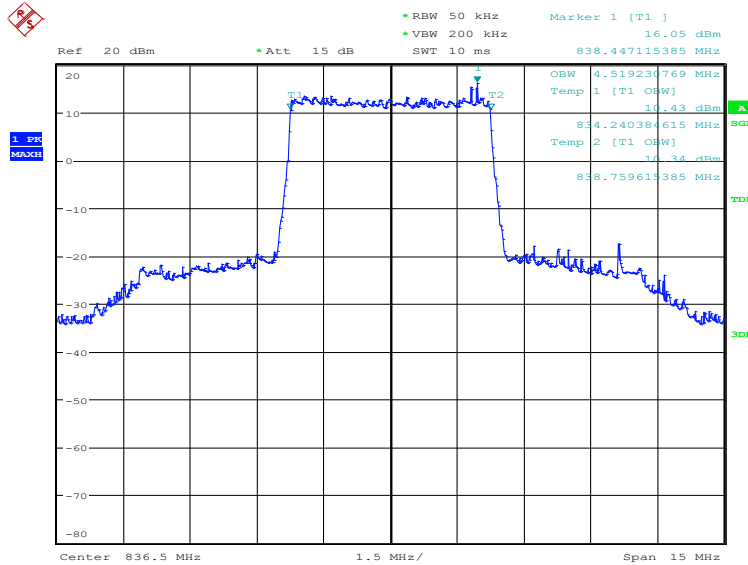
Date: 19.DEC.2019 08:46:41

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

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
836.5	4519.23	4519.23	4519.23

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


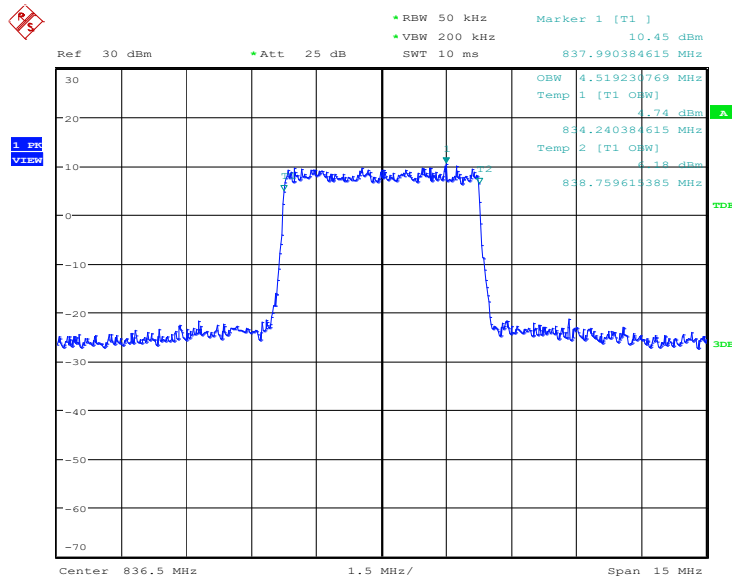
Date: 18.DEC.2019 10:19:14

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


Date: 18.DEC.2019 10:20:38



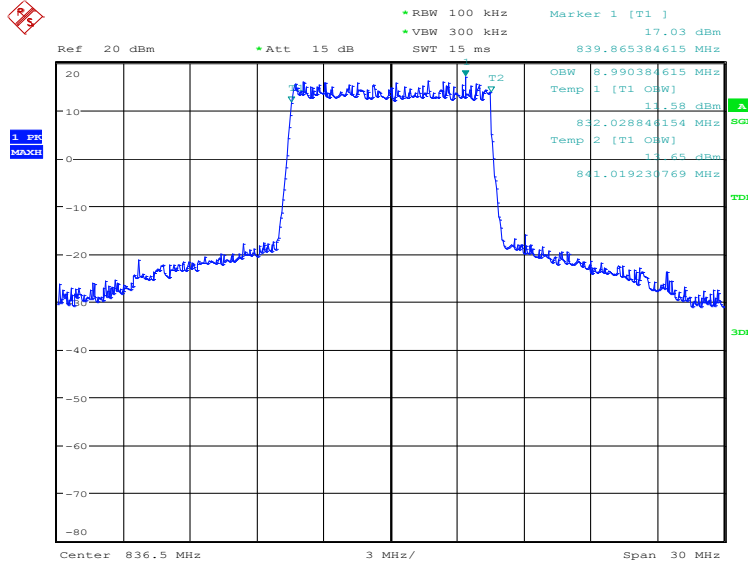
### LTE band 26(824MHz~849MHz), 5MHz Bandwidth, 64QAM (99% BW)



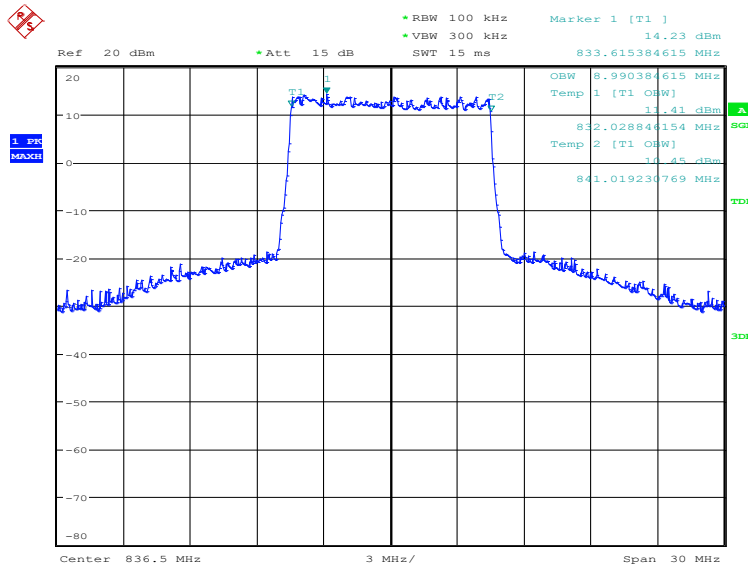
Date: 19.DEC.2019 08:48:04

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

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
836.5	8990.38	8990.38	8942.31

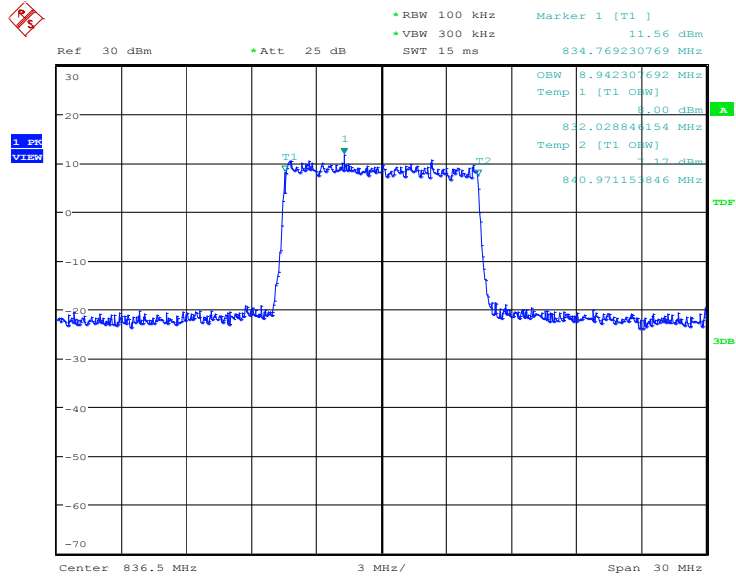
**LTE band 26(824MHz~849MHz), 10MHz Bandwidth, QPSK (99% BW)**


Date: 18.DEC.2019 10:22:03

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


Date: 18.DEC.2019 10:23:27

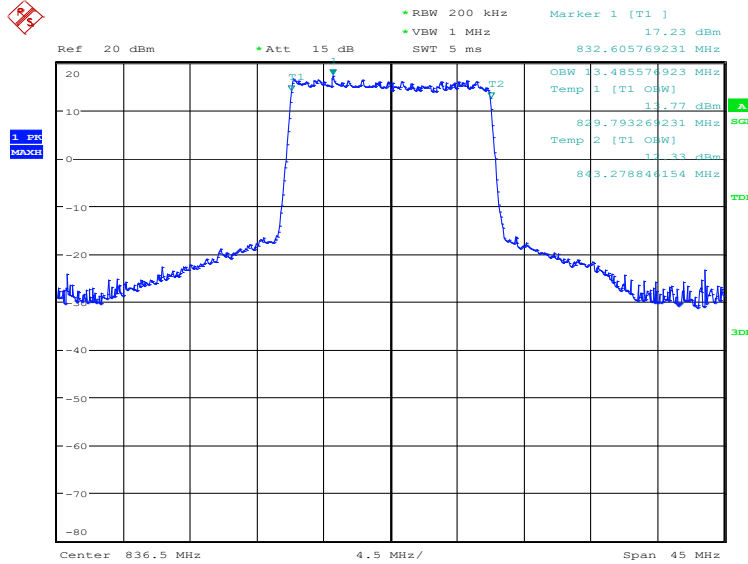
**LTE band 26(824MHz~849MHz), 10MHz Bandwidth, 64QAM (99% BW)**



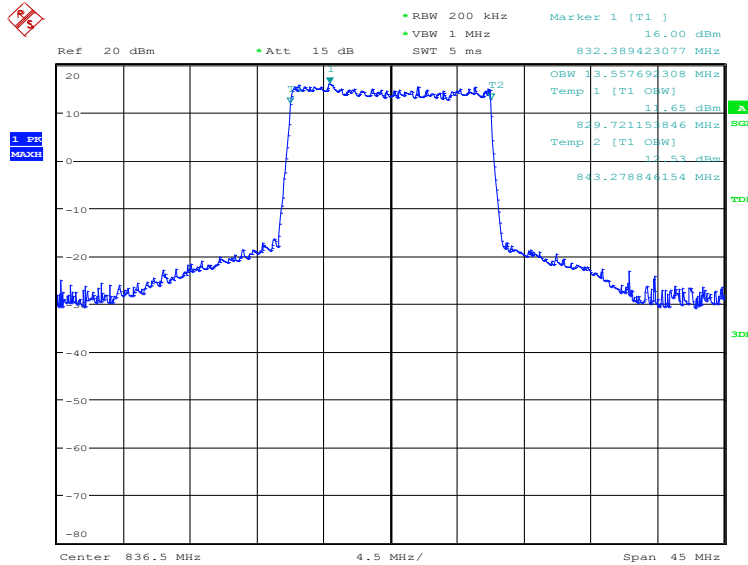
Date: 19.DEC.2019 08:49:28

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

Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
836.5	13485.58	13557.69	13485.58

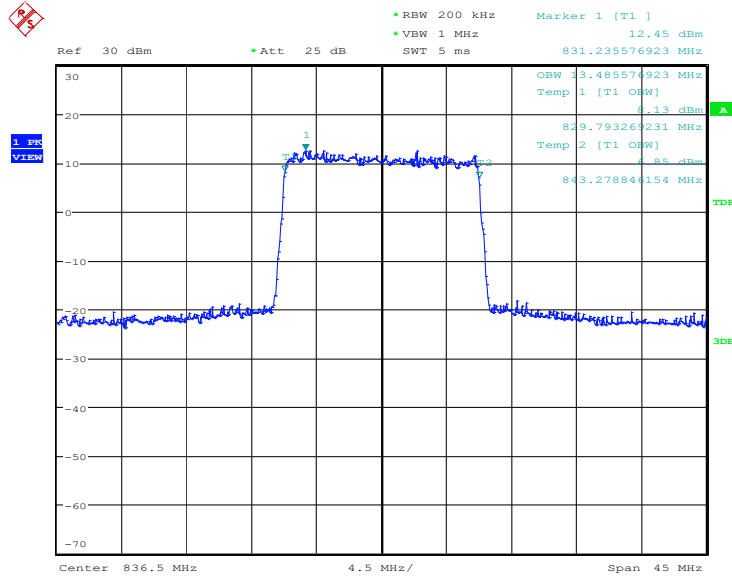
**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, QPSK (99% BW)**


Date: 18.DEC.2019 10:24:53

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


Date: 18.DEC.2019 10:26:16

**LTE band 26(824MHz~849MHz), 15MHz Bandwidth, 64QAM (99% BW)**



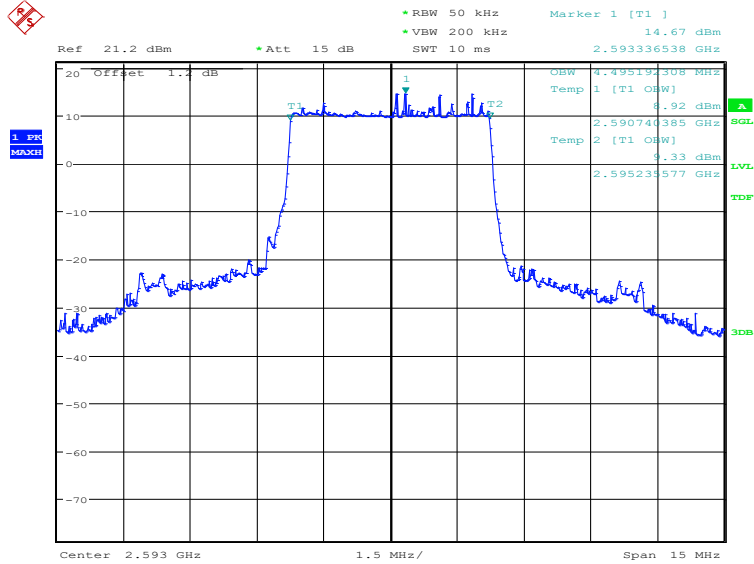
Date: 19.DEC.2019 08:54:06



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

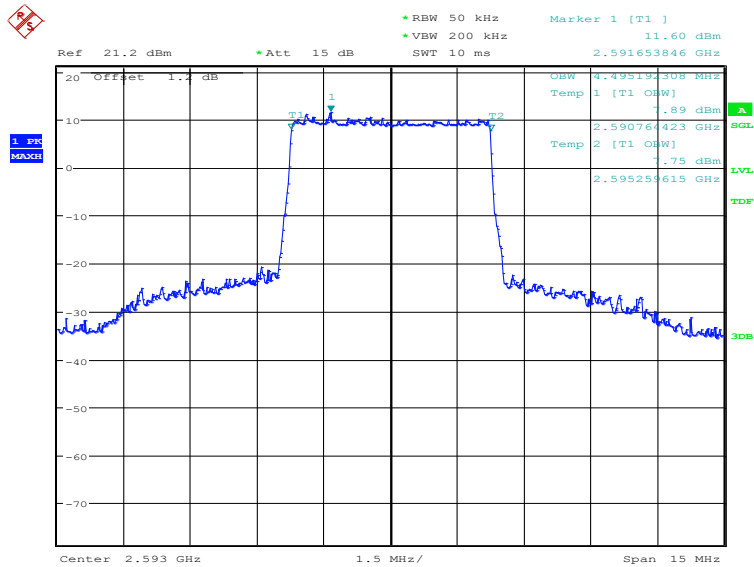
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2593.0	4495.19	4495.19	4495.19

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



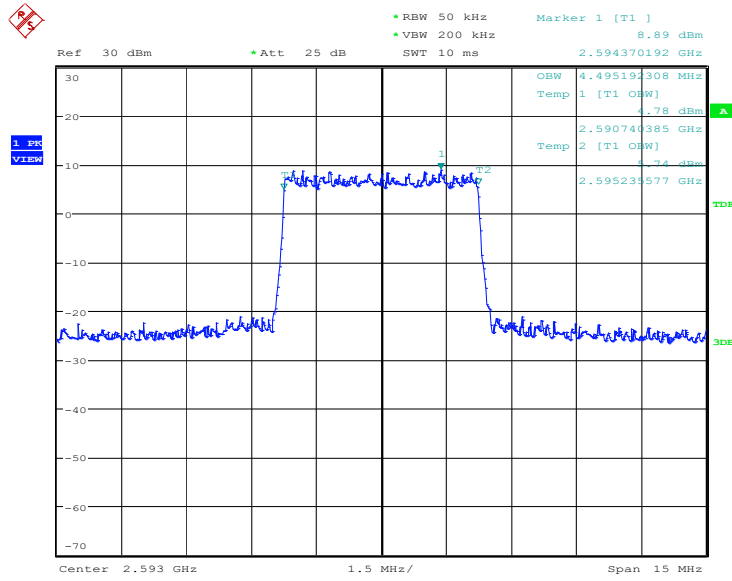
Date: 17.DEC.2019 10:06:47

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



Date: 17.DEC.2019 10:08:10

**LTE band 41, 5MHz Bandwidth,64QAM (99% BW)**

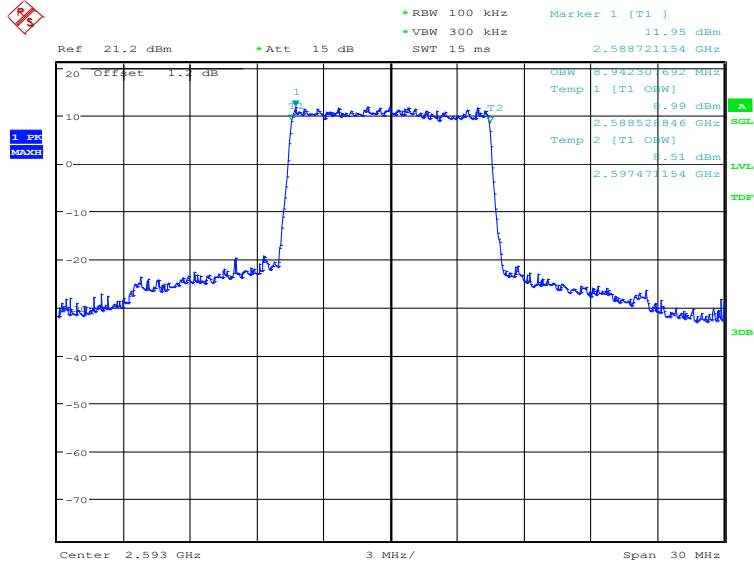


Date: 19.DEC.2019 12:57:18

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

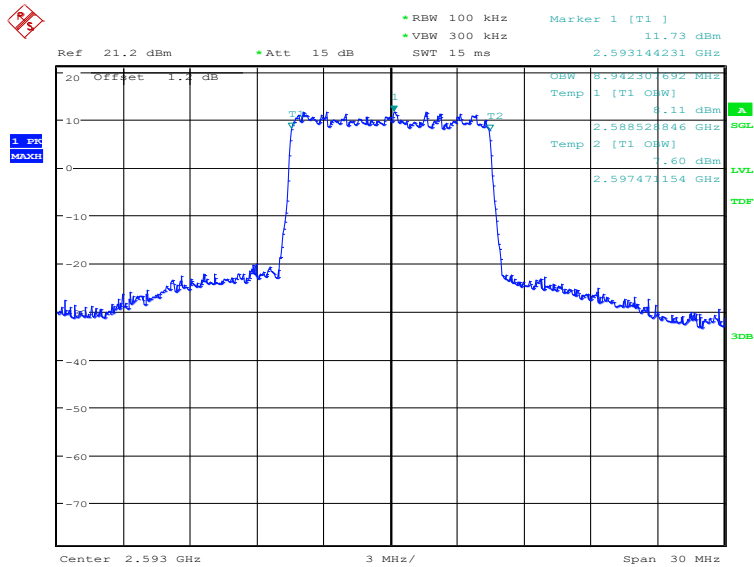
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2593.0	8942.31	8942.31	8990.38

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



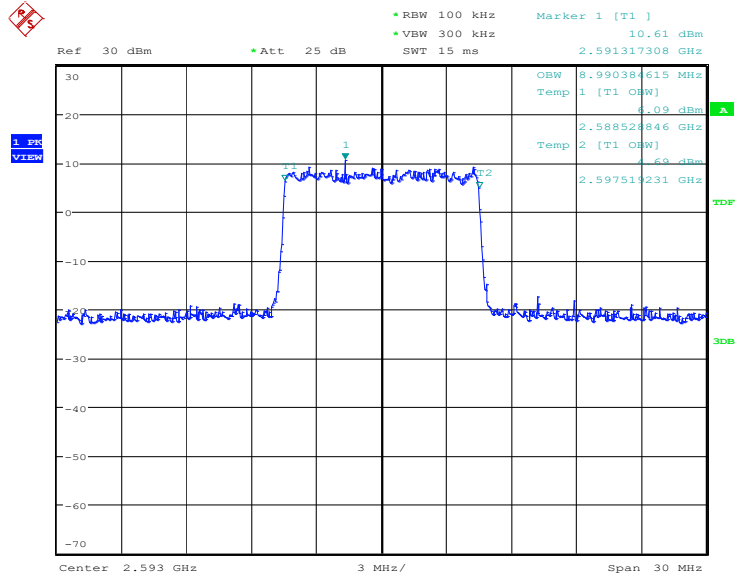
Date: 17.DEC.2019 10:09:36

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



Date: 17.DEC.2019 10:10:59

### LTE band 41, 10MHz Bandwidth, 64QAM (99% BW)

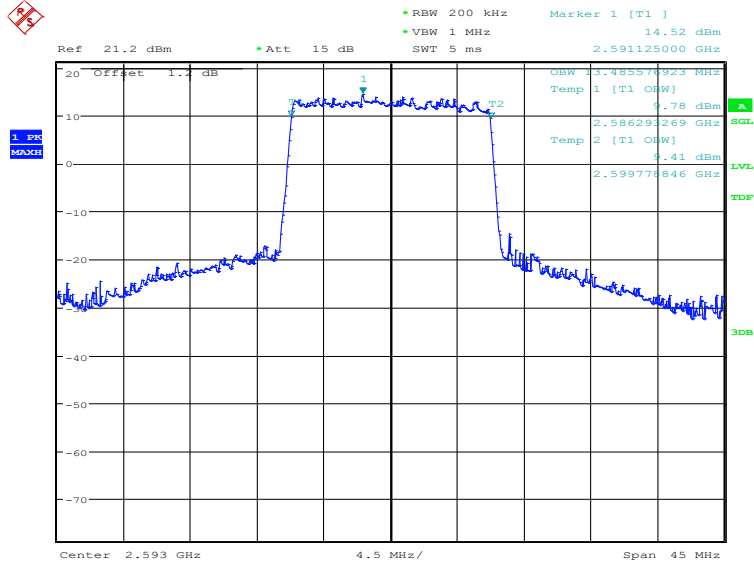


Date: 19.DEC.2019 12:52:02

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

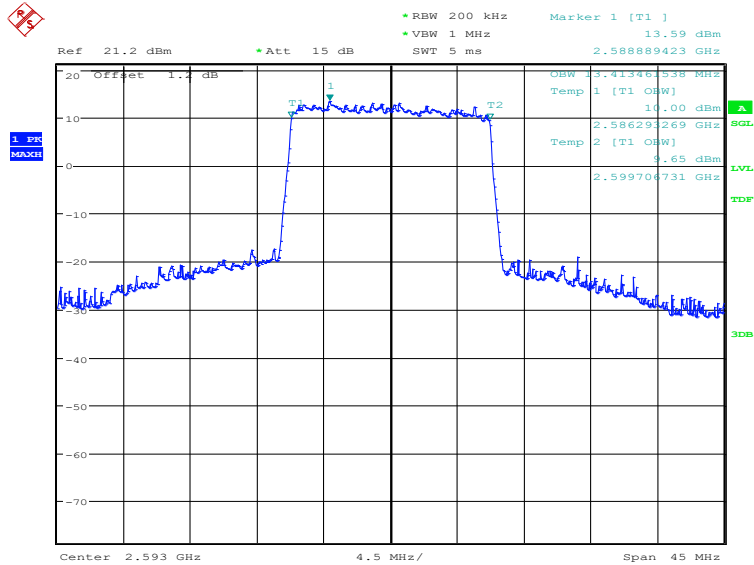
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2593.0	13485.58	13413.46	13485.58

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



Date: 17.DEC.2019 10:12:25

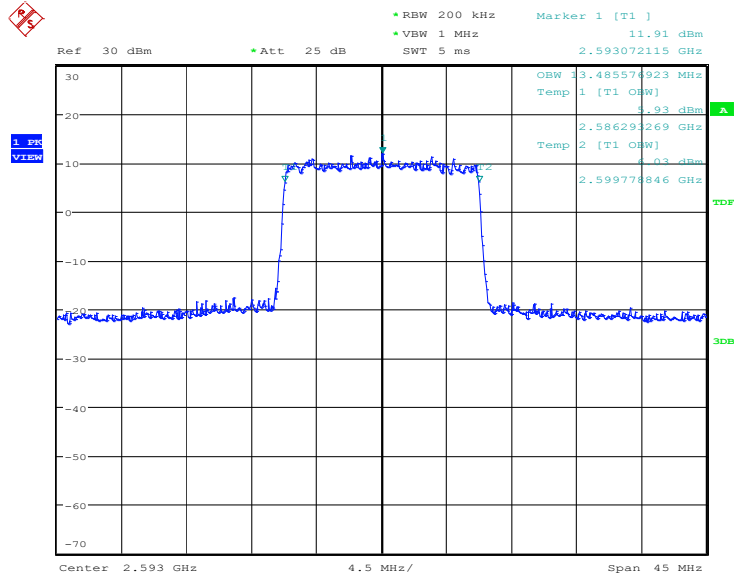
**LTE band 41, 15MHz Bandwidth,16QAM (99% BW)**



Date: 17.DEC.2019 10:13:48



### LTE band 41, 15MHz Bandwidth, 64QAM (99% BW)

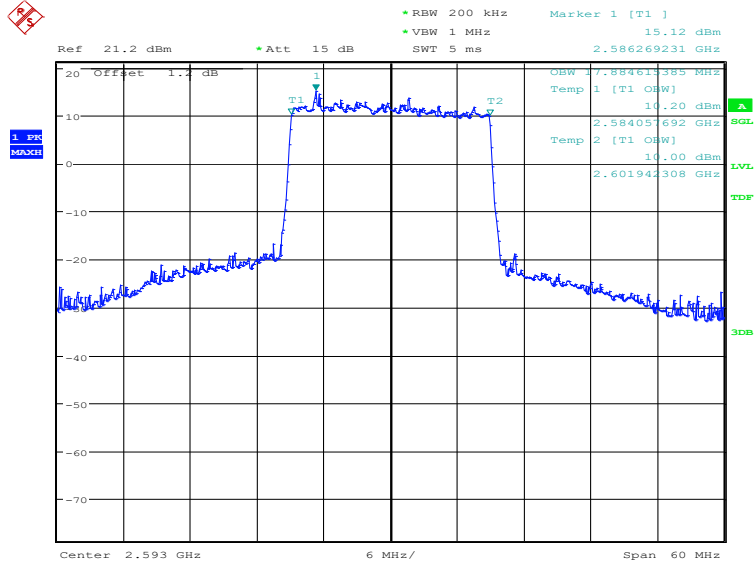


Date: 19.DEC.2019 12:53:37

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

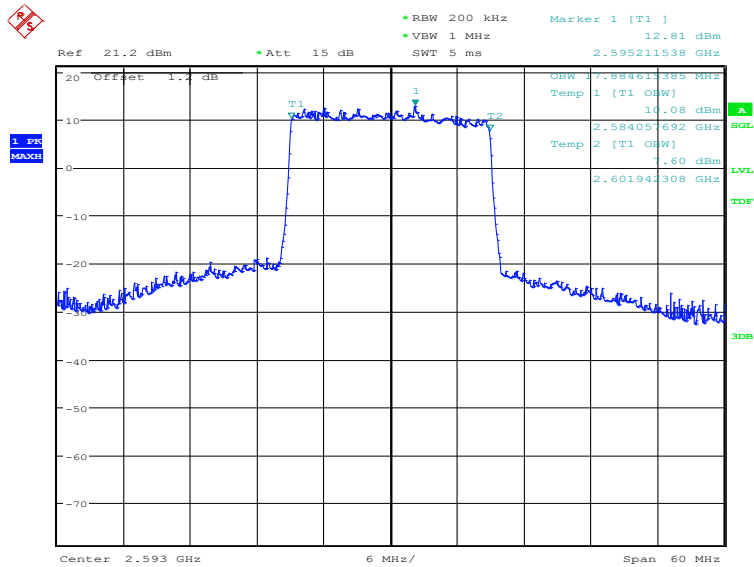
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
2593.0	17884.62	17884.62	17980.77

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



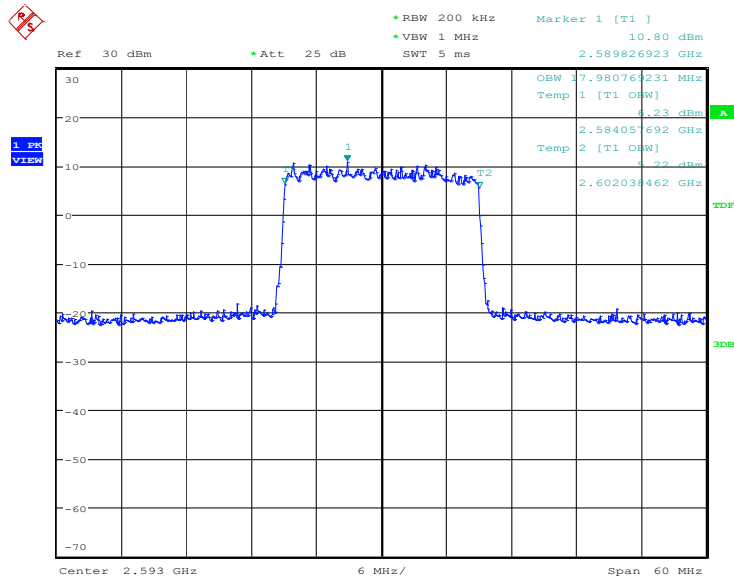
Date: 17.DEC.2019 10:15:14

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



Date: 17.DEC.2019 10:16:37

### LTE band 41, 20MHz Bandwidth, 64QAM (99% BW)



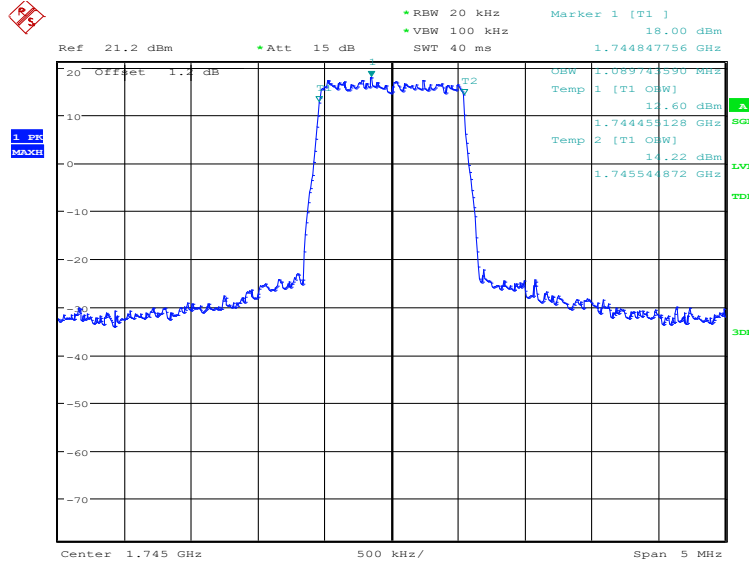
Date: 19.DEC.2019 12:55:00



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

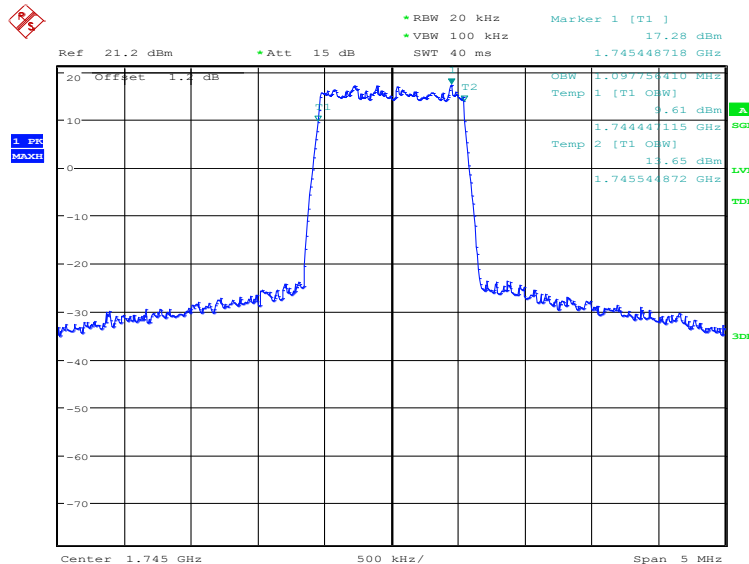
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1745.0	1089.74	1097.76	1089.74

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



Date: 18.DEC.2019 10:39:52

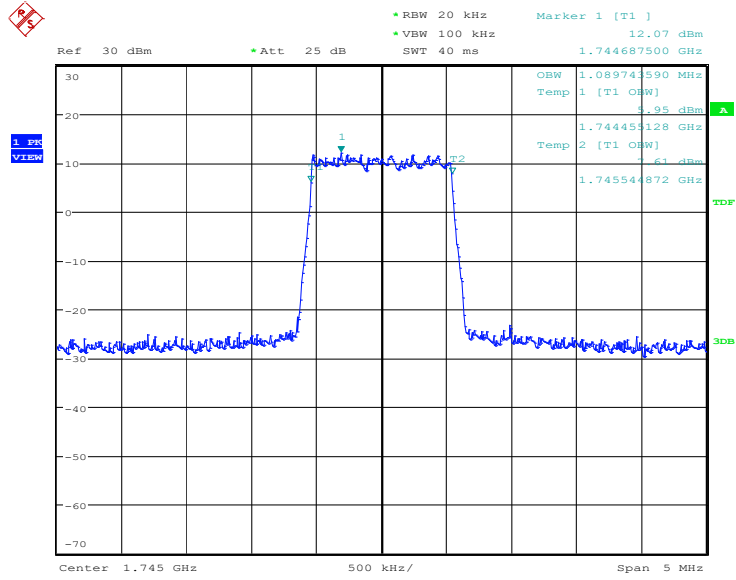
### LTE band 66, 1.4MHz Bandwidth, 16QAM (99% BW)



Date: 18.DEC.2019 10:41:16



### LTE band 66, 1.4MHz Bandwidth, 64QAM (99% BW)

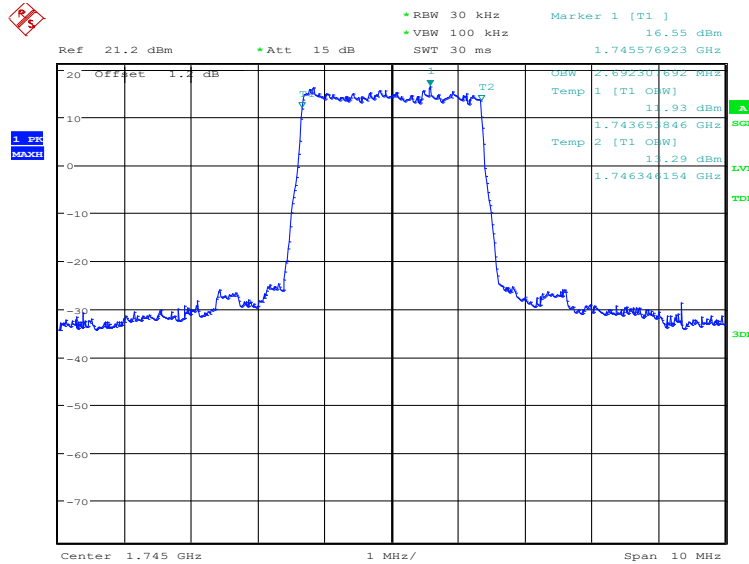


Date: 19.DEC.2019 09:08:32

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

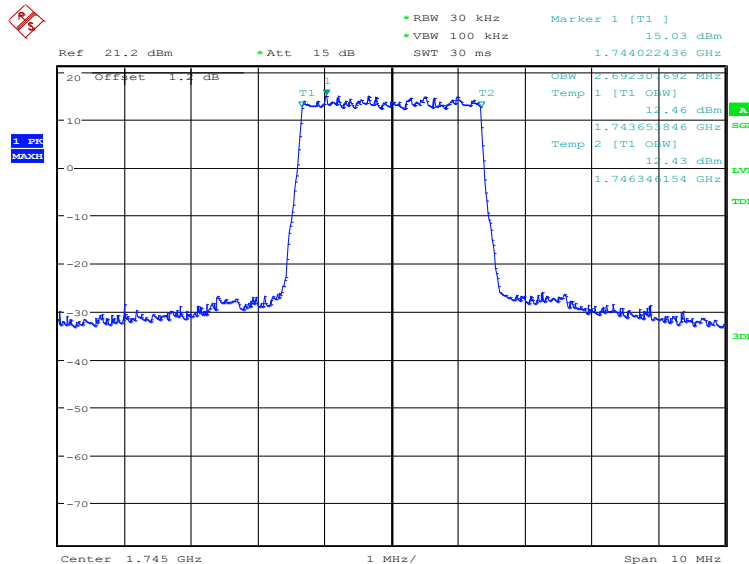
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1745.0	2692.31	2692.31	2692.31

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



Date: 18.DEC.2019 10:42:41

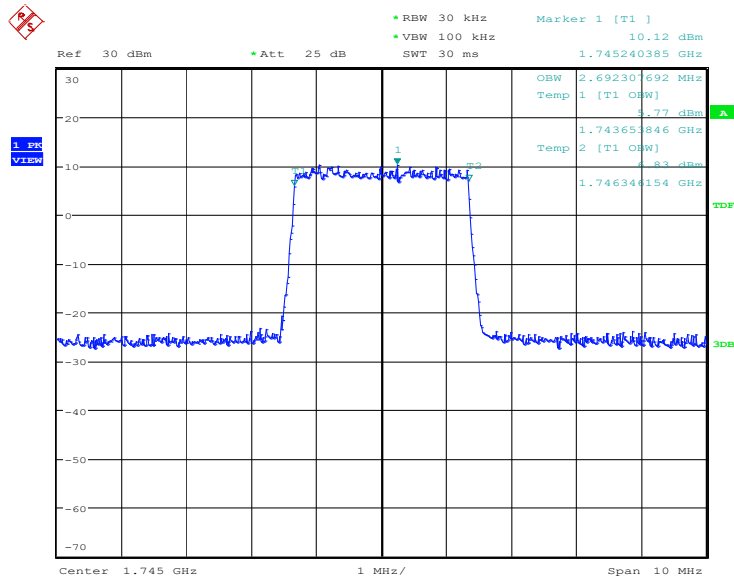
### LTE band 66, 3MHz Bandwidth, 16QAM (99% BW)



Date: 18.DEC.2019 10:44:05



### LTE band 66, 3MHz Bandwidth, 64QAM (99% BW)

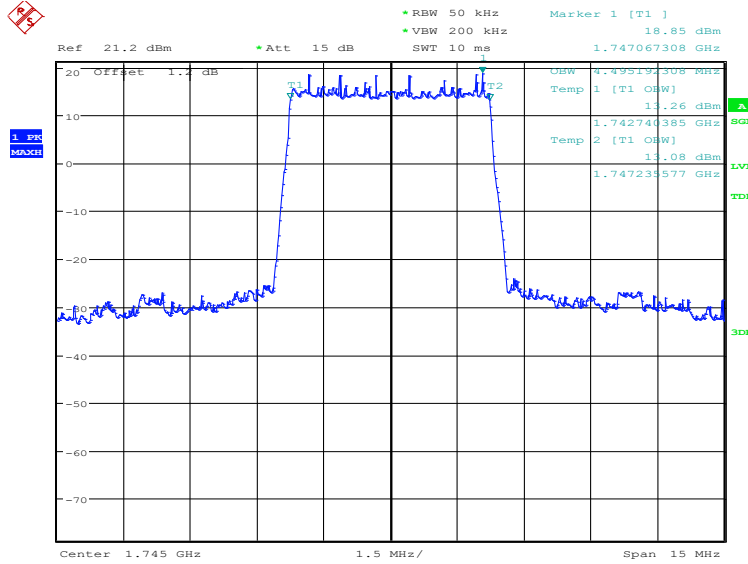


Date: 19.DEC.2019 09:09:47

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

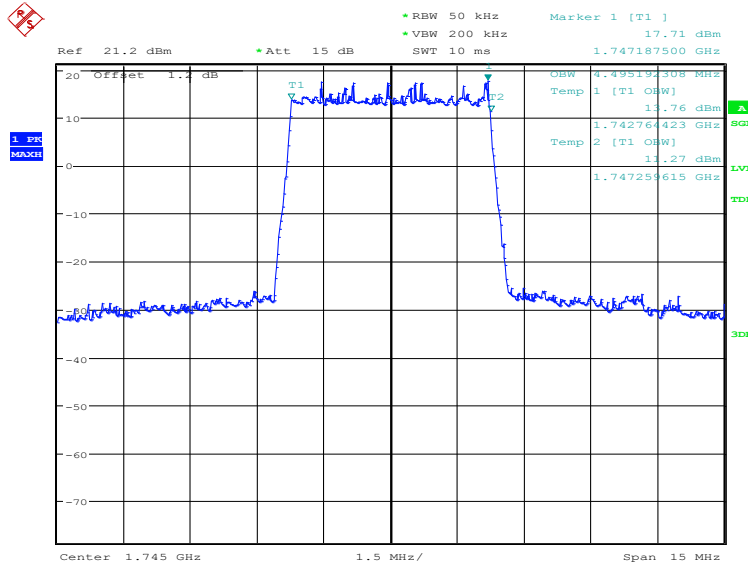
Frequency (MHz)	Occupied Bandwidth (99%) (kHz)		
	QPSK	16QAM	64QAM
1745.0	4495.19	4495.19	4495.19

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



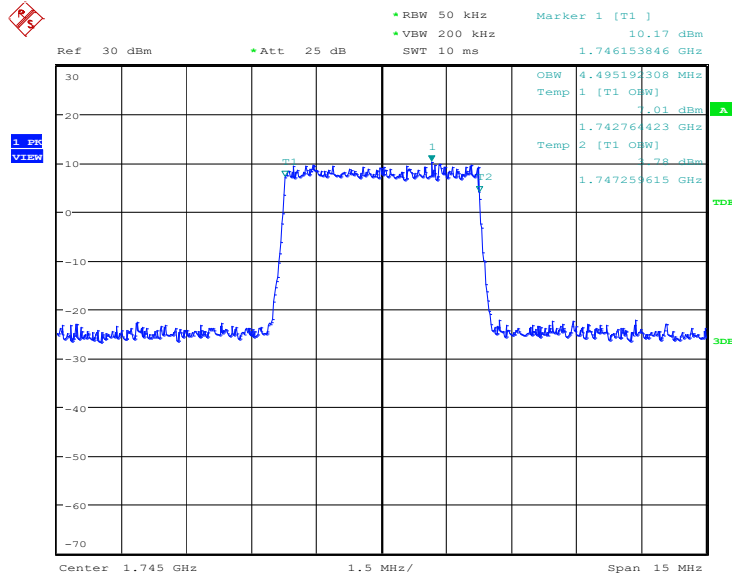
Date: 18.DEC.2019 10:45:30

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



Date: 18.DEC.2019 10:46:54

### LTE band 66, 5MHz Bandwidth, 64QAM (99% BW)



Date: 19.DEC.2019 09:11:06